START

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Vol. 1142 Number 1

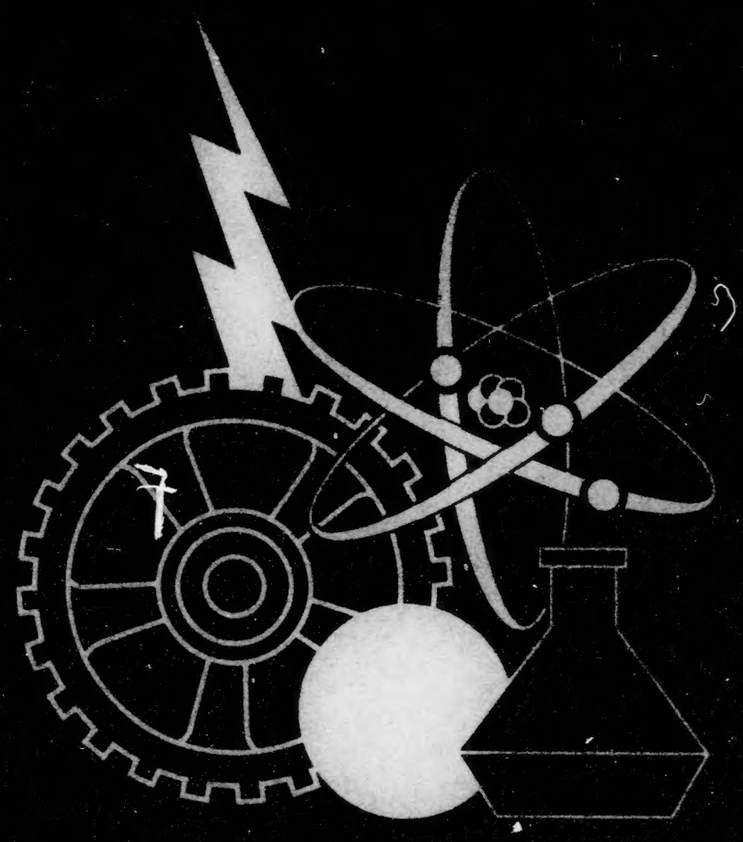
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 1, 1992



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
September 1, 1992 Volume 1142 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on August 29, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,860,381 through 4,862,516
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 27, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,536,889 through 4,538,300
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 28,1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,443	06/868,957	6/23/87
(4,456,122)	(06/451,085)	(6/26/84)
Re. 32,483	06/832,115	8/25/87
(4,456,472)	(06/449,959)	(6/26/84)
Re. 32,787	06/834,982	11/22/88
(4,456,320)	(06/402,528)	(6/26/84)
4,455,683	06/362,881	6/26/84
4,455,684	06/415,607	6/26/84
4,455,686	06/467,213	6/26/84
4,455,688	06/290,365	6/26/84
4,455,692	06/493,094	6/26/84
4,455,694	06/399,742	6/26/84
4,455,700	06/518,195	6/26/84
4,455,705	06/411,463	6/26/84
4,455,712	06/486,158	6/26/84
4,455,714	06/489,486	6/26/84
4,455,721	06/424,312	6/26/84
4,455,725	06/328,653	6/26/84
4,455,726	06/302,118	6/26/84
4,455,733	06/339,438	6/26/84
4,455,736	06/367,863	6/26/84
4,455,742	06/385,200	6/26/84
4,455,745	06/385,427	6/26/84
4,455,747	06/418,745	6/26/84
4,455,749	06/314,578	6/26/84
4,455,752	06/407,179	6/26/84
4,455,753	06/353,348	6/26/84
4,455,759	06/340,694	6/26/84
4,455,762	06/373,460	6/26/84
4,455,764	06/386,220	6/26/84
4,455,767	06/258,580	6/26/84
4,455,773	06/457,724	6/26/84
4,455,775	06/424,863	6/26/84
4,455,778	06/355,739	6/26/84
4,455,782	06/271,211	6/26/84
4,455,783	06/386,391	6/26/84
4,455,784	06/371,176	6/26/84
4,455,785	06/429,676	6/26/84
4,455,789	06/311,792	6/26/84
4,455,794	06/376,294	6/26/84
4,455,797	06/304,259	6/26/84
4,455,803	06/408,183	6/26/84
4,455,805	06/423,169	6/26/84
4,455,813	06/366,271	6/26/84
4,455,827	06/233,988	6/26/84
4,455,833	06/263,018	6/26/84
4,455,843	06/379,830	6/26/84
4,455,847	06/388,647	6/26/84
4,455,850	06/414,531	6/26/84
4,455,860	06/447,595	6/26/84
4,455,872	06/480,830	6/26/84
4,455,876	06/425,144	6/26/84
4,455,877	06/429,575	6/26/84
4,455,881	06/390,755	6/26/84
4,455,894	06/511,098	6/26/84
4,455,895	06/412,526	6/26/84
4,455,903	06/441,637	6/26/84
4,455,904	06/431,796	6/26/84
4,455,907	06/470,292	6/26/84
4,455,914	06/394,643	6/26/84
4,455,916	06/350,920	6/26/84
4,455,920	06/383,679	6/26/84
4,455,922	06/431,516	6/26/84
4,455,923	06/416,545	6/26/84
4,455,926	06/400,845	6/26/84
4,455,927	06/404,077	6/26/84
4,455,930	06/419,683	6/26/84
4,455,931	06/431,790	6/26/84
4,455,933	06/387,379	6/26/84
4,455,934	06/419,258	6/26/84
4,455,935	06/504,466	6/26/84
4,455,939	06/340,488	6/26/84
4,455,943	06/295,164	6/26/84
4,455,947	06/340,849	6/26/84
4,455,952	06/520,732	6/26/84
4,455,957	06/386,305	6/26/84
4,455,961	06/391,900	6/26/84
4,455,962	06/463,434	6/26/84
4,455,966	06/373,151	6/26/84
4,455,970	06/495,951	6/26/84
4,455,971	06/396,701	6/26/84
4,455,979	06/470,041	6/26/84
4,455,983	06/439,727	6/26/84
4,455,986	06/455,965	6/26/84
4,455,987	06/397,455	6/26/84
4,455,988	06/336,104	6/26/84
4,455,991	06/398,420	6/26/84
4,455,992	06/437,758	6/26/84
4,455,993	06/242,151	6/26/84

Patent Number	Serial Number	Issue Date
4,455,994	06/396,897	6/26/84
4,455,995	06/396,898	6/26/84
4,455,996	06/412,182	6/26/84
4,455,998	06/321,298	6/26/84
4,456,002	06/424,202	6/26/84
4,456,013	06/299,740	6/26/84
4,456,014	06/449,540	6/26/84
4,456,023	06/398,222	6/26/84
4,456,029	06/357,473	6/26/84
4,456,039	06/333,334	6/26/84
4,456,041	06/262,507	6/26/84
4,456,043	06/544,823	6/26/84
4,456,047	06/430,521	6/26/84
4,456,048	06/460,492	6/26/84
4,456,049	06/404,282	6/26/84
4,456,052	06/490,780	6/26/84
4,456,054	06/242,609	6/26/84
4,456,057	06/302,665	6/26/84
4,456,066	06/334,345	6/26/84
4,456,067	06/435,016	6/26/84
4,456,068	06/296,321	6/26/84
4,456,071	06/312,117	6/26/84
4,456,073	06/410,750	6/26/84
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4,456,106	06/326,663	6/26/84
4,456,108	06/303,452	6/26/84
4,456,109	06/301,123	6/26/84
4,456,114	06/331,939	6/26/84
4,456,115	06/373,979	6/26/84
4,456,117	06/323,853	6/26/84
4,456,121	06/257,143	6/26/84
4,456,124	06/441,305	6/26/84
4,456,128	06/404,342	6/26/84
4,456,131	06/492,743	6/26/84
4,456,136	06/506,321	6/26/84
4,456,139	06/438,605	6/26/84
4,456,143	06/510,623	6/26/84
4,456,152	06/374,072	6/26/84
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4,456,158	06/472,132	6/26/84
4,456,168	06/227,493	6/26/84
4,456,169	06/483,593	6/26/84
4,456,172	06/279,259	6/26/84
4,456,173	06/303,251	6/26/84
4,456,175	06/327,265	6/26/84
4,456,176	06/417,475	6/26/84
4,456,177	06/428,313	6/26/84
4,456,185	06/347,187	6/26/84
4,456,189	06/380,531	6/26/84
4,456,191	06/311,019	6/26/84
4,456,193	06/302,866	6/26/84
4,456,195	06/327,029	6/26/84
4,456,204	06/306,748	6/26/84
4,456,214	06/447,308	6/26/84
4,456,216	06/385,154	6/26/84
4,456,225	06/453,280	6/26/84
4,456,226	06/303,120	6/26/84
4,456,227	06/360,837	6/26/84
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4,456,230	06/438,744	6/26/84
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4,456,240	06/321,419	6/26/84
4,456,244	06/356,938	6/26/84
4,456,247	06/362,561	6/26/84
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4,456,249	06/497,274	6/26/84
4,456,257	06/418,815	6/26/84
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4,456,262	06/435,076	6/26/84
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4,456,269	06/426,642	6/26/84
4,456,271	06/385,546	6/26/84
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4,456,277	06/397,024	6/26/84
4,456,284	06/461,595	6/26/84
4,456,286	06/371,416	6/26/84
4,456,289	06/430,725	6/26/84
4,456,291	06/297,088	6/26/84
4,456,292	06/290,312	6/26/84
4,456,294	06/304,604	6/26/84
4,456,299	06/442,186	6/26/84
4,456,306	06/353,936	6/26/84
4,456,317	06/473,885	6/26/84
4,456,323	06/319,788	6/26/84
4,456,326	06/473,073	6/26/84
4,456,328	06/269,105	6/26/84
4,456,329	06/326,235	6/26/84
4,456,355	06/432,859	6/26/84
4,456,359	06/436,908	6/26/84
4,456,365	06/405,768	6/26/84
4,456,379	06/251,436	6/26/84
4,456,389	06/270,185	6/26/84
4,456,390	06/315,343	6/26/84
4,456,391	06/426,873	6/26/84
4,456,394	06/364,197	6/26/84
4,456,395	06/549,630	6/26/84
4,456,396	06/337,233	6/26/84
4,456,400	06/387,854	6/26/84
4,456,404	06/349,459	6/26/84
4,456,407	06/457,634	6/26/84
4,456,409	06/475,766	6/26/84
4,456,412	06/345,804	6/26/84
4,456,415	06/333,043	6/26/84
4,456,417	06/422,513	6/26/84
4,456,420	06/305,088	6/26/84
4,456,422	06/432,235	6/26/84
4,456,430	06/243,324	6/26/84
4,456,431	06/311,187	6/26/84
4,456,439	06/318,266	6/26/84
4,456,440	06/355,525	6/26/84
4,456,443	06/444,794	6/26/84
4,456,447	06/355,224	6/26/84
4,456,450	06/486,921	6/26/84
4,456,451	06/427,444	6/26/84
4,456,454	06/507,267	6/26/84
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4,456,468	06/425,813	6/26/84
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4,456,476	06/351,669	6/26/84
4,456,478	06/491,036	6/26/84
4,456,479	06/475,964	6/26/84
4,456,486	06/421,741	6/26/84
4,456,487	06/386,969	6/26/84
4,456,490	06/473,429	6/26/84
4,456,492	06/447,136	6/26/84
4,456,502	06/401,739	6/26/84
4,456,505	06/433,808	6/26/84
4,456,507	06/417,857	6/26/84
4,456,509	06/395,596	6/26/84
4,456,513	06/411,282	6/26/84
4,456,514	06/406,992	6/26/84
4,456,517	06/451,069	6/26/84
4,456,530	06/447,954	6/26/84
4,456,532	06/492,984	6/26/84
4,456,535	06/325,922	6/26/84
4,456,537	06/310,653	6/26/84
4,456,544	06/520,813	6/26/84
4,456,548	06/434,599	6/26/84
4,456,549	06/431,323	6/26/84
4,456,559	06/433,190	6/26/84
4,456,578	06/411,842	6/26/84
4,456,583	06/508,774	6/26/84
4,456,585	06/494,744	6/26/84
4,456,593	06/391,079	6/26/84

Patent Number	Serial Number	Issue Date
4,456,594	06/435,860	6/26/84
4,456,596	06/253,872	6/26/84
4,456,607	06/269,722	6/26/84
4,456,608	06/393,763	6/26/84
4,456,609	06/462,723	6/26/84
4,456,612	06/469,059	6/26/84
4,456,614	06/250,407	6/26/84
4,456,618	06/434,622	6/26/84
4,456,622	06/447,047	6/26/84
4,456,632	06/450,164	6/26/84
4,456,636	06/527,806	6/26/84
4,456,640	06/458,889	6/26/84
4,456,644	06/344,354	6/26/84
4,456,647	06/448,839	6/26/84
4,456,653	06/479,343	6/26/84
4,456,655	06/425,507	6/26/84
4,456,662	06/386,265	6/26/84
4,456,663	06/439,157	6/26/84
4,456,679	06/525,395	6/26/84
4,456,691	06/470,497	6/26/84
4,456,702	06/399,849	6/26/84
4,456,707	06/484,067	6/26/84
4,456,710	06/449,160	6/26/84
4,456,711	06/397,957	6/26/84
4,456,715	06/278,604	6/26/84
4,456,716	06/454,214	6/26/84
4,456,717	06/502,357	6/26/84
4,456,718	06/463,704	6/26/84
4,456,722	06/440,395	6/26/84
4,456,728	06/468,728	6/26/84
4,456,733	06/365,702	6/26/84
4,456,737	06/484,246	6/26/84
4,456,738	06/455,700	6/26/84
4,456,739	06/491,468	6/26/84
4,456,740	06/455,698	6/26/84
4,456,742	06/476,162	6/26/84
4,456,743	06/476,001	6/26/84
4,456,745	06/512,347	6/26/84
4,456,747	06/484,247	6/26/84
4,456,749	06/537,370	6/26/84
4,456,750	06/463,068	6/26/84
4,456,751	06/534,951	6/26/84
4,456,754	06/414,946	6/26/84
4,456,759	06/387,562	6/26/84
4,456,762	06/383,731	6/26/84
4,456,763	06/478,739	6/26/84
4,456,766	06/418,843	6/26/84
4,456,767	06/518,975	6/26/84
4,456,768	06/259,740	6/26/84
4,456,769	06/387,906	6/26/84
4,456,780	06/515,706	6/26/84
4,456,784	06/362,566	6/26/84
4,456,785	06/419,358	6/26/84
4,456,793	06/386,722	6/26/84
4,456,801	06/355,630	6/26/84
4,456,802	06/484,120	6/26/84
4,456,806	06/402,424	6/26/84
4,456,808	06/355,195	6/26/84
4,456,816	06/237,220	6/26/84
4,456,820	06/490,407	6/26/84
4,456,821	06/385,070	6/26/84
4,456,826	06/429,868	6/26/84
4,456,830	06/370,760	6/26/84
4,456,834	06/395,066	6/26/84
4,456,858	06/311,517	6/26/84
4,456,863	06/220,150	6/26/84
4,456,869	06/435,654	6/26/84
4,456,874	06/338,337	6/26/84
4,456,875	06/347,565	6/26/84
4,456,884	06/321,542	6/26/84
4,456,889	06/270,747	6/26/84
4,456,890	06/365,698	6/26/84
4,456,907	06/487,356	6/26/84
4,456,911	06/198,600	6/26/84
4,456,936	06/340,170	6/26/84
4,456,938	06/433,618	6/26/84
4,456,943	06/381,047	6/26/84
4,456,945	06/394,289	6/26/84
4,456,946	06/438,690	6/26/84
4,456,951	06/310,985	6/26/84
4,456,953	06/219,387	6/26/84
4,456,968	06/306,279	6/26/84
4,456,973	06/373,544	6/26/84
44,56,974	06/330,442	6/26/84
4,456,984	06/333,362	6/26/84
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4,457,009	06/388,828	6/26/84
4,457,010	06/292,035	6/26/84
4,457,013	06/351,538	6/26/84
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4,752,982	06/874,396	6/28/88
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4,752,999	07/093,589	6/28/88
4,753,010	06/840,068	6/28/88
4,753,011	07/014,933	6/28/88
4,753,012	07/045,629	6/28/88
4,753,014	07/027,603	6/28/88
4,753,015	07/007,562	6/28/88
4,753,022	07/043,090	6/28/88
4,753,026	06/859,447	6/28/88
4,753,030	06/859,139	6/28/88
4,753,032	07/078,841	6/28/88
4,753,033	07/011,447	6/28/88
4,753,050	06/869,405	6/28/88
4,753,055	06/897,832	6/28/88
4,753,056	07/040,028	6/28/88
4,753,063	06/927,516	6/28/88
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4,753,065	07/017,892	6/28/88
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4,753,069	06/908,627	6/28/88
4,753,072	07/013,393	6/28/88
4,753,086	07/104,000	6/28/88
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4,753,091	07/048,411	6/28/88
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4,753,093	06/766,112	6/28/88
4,753,107	06/837,951	6/28/88
4,753,110	07/043,404	6/28/88
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4,753,156	06/788,734	6/28/88
4,753,160	07/123,414	6/28/88
4,753,161	07/055,988	6/28/88
4,753,164	07/028,455	6/28/88
4,753,166	07/031,699	6/28/88
4,753,172	07/026,152	6/28/88
4,753,173	06/765,458	6/28/88
4,753,183	06/931,563	6/28/88
4,753,190	06/884,828	6/28/88
4,753,195	06/944,944	6/28/88
4,753,202	06/880,782	6/28/88
4,753,208	06/932,490	6/28/88
4,753,209	07/081,475	6/28/88
4,753,215	07/003,126	6/28/88
4,753,217	07/042,978	6/28/88
4,753,218	07/012,363	6/28/88
4,753,220	07/011,022	6/28/88
4,753,227	07/064,551	6/28/88
4,753,230	06/768,614	6/28/88
4,753,233	07/012,837	6/28/88
4,753,234	06/925,978	6/28/88

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4,753,235	06/911,147	6/28/88
7,753,237	06/860,107	6/28/88
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4,753,244	07/074,240	6/28/88
4,753,251	06/905,340	6/28/88
4,753,252	06/942,190	6/28/88
4,753,256	06/798,978	6/28/88
4,753,257	06/912,040	6/28/88
4,753,273	07/030,067	6/28/88
4,753,274	06/768,953	6/28/88
4,753,275	07/038,036	6/28/88
4,753,284	06/756,807	6/28/88
4,753,301	06/916,161	6/28/88
4,753,311	06/905,664	6/28/88
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4,753,321	07/051,579	6/28/88
4,753,327	07/061,457	6/28/88
4,753,329	07/093,268	6/28/88
4,753,335	06/702,967	6/28/88
4,753,338	06/822,887	6/28/88
4,753,340	06/819,909	6/28/88
4,753,343	07/036,957	6/28/88
4,753,349	06/687,931	6/28/88
4,753,359	07/112,704	6/28/88
4,753,360	07/096,939	6/28/88
4,753,362	07/084,137	6/28/88
4,753,364	07/009,059	6/28/88
4,753,372	06/946,587	6/28/88
4,753,373	06/852,238	6/28/88
4,753,376	07/027,310	6/28/88
4,753,377	07/035,053	6/28/88
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4,753,395	07/009,316	6/28/88
4,753,399	06/944,250	6/28/88
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4,753,656	07/049,943	6/28/88
4,753,657	06/691,627	6/28/88
4,753,674	06/579,655	6/28/88
4,753,675	06/920,018	6/28/88
4,753,683	06/929,571	6/28/88
4,753,687	07/045,490	6/28/88
4,753,690	06/896,037	6/28/88
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4,753,706	06/909,610	6/28/88
4,753,711	06/906,630	6/28/88
4,753,713	06/895,639	6/28/88
4,753,715	07/077,128	6/28/88
4,753,716	07/023,267	6/28/88
4,753,724	06/921,628	6/28/88
4,753,731	07/004,236	6/28/88
4,753,735	06/921,909	6/28/88
4,753,739	06/822,381	6/28/88
4,753,768	06/541,032	6/28/88
4,753,772	06/832,492	6/28/88
4,753,778	06/717,179	6/28/88
4,753,799	07/096,897	6/28/88
4,753,805	06/835,131	6/28/88
4,753,809	06/784,473	6/28/88
4,753,813	07/010,495	6/28/88
4,753,818	06/889,562	6/28/88
4,753,819	06/941,365	6/28/88
4,753,822	06/918,177	6/28/88
4,753,823	06/883,900	6/28/88
4,753,829	06/932,741	6/28/88
4,753,833	06/911,737	6/28/88
4,753,842	06/850,749	6/28/88
4,753,844	07/114,600	6/28/88
4,753,849	06/881,437	6/28/88
4,753,861	06/943,412	6/28/88
4,753,864	07/039,507	6/28/88
4,753,869	06/935,098	6/28/88
4,753,874	06/753,007	6/28/88
4,753,895	07/017,498	6/28/88
4,753,900	06/942,672	6/28/88
4,753,909	06/921,002	6/28/88
4,753,912	06/606,716	6/28/88
4,753,915	06/921,945	6/28/88
4,753,916	06/908,420	6/28/88
4,753,917	07/029,613	6/28/88

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4,753,927	06/820,137	6/28/88
4,753,930	07/013,609	6/28/88
4,753,933	07/002,929	6/28/88
4,753,936	07/002,094	6/28/88
4,753,940	06/827,118	6/28/88
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4,753,943	06/306,796	6/28/88
4,753,947	06/769,535	6/28/88
4,753,959	06/936,196	6/28/88
4,753,984	06/871,883	6/28/88
4,753,989	07/030,723	6/28/88
4,753,992	06/868,255	6/28/88
4,754,002	06/809,642	6/28/88
4,754,006	07/080,736	6/28/88
4,754,032	06/834,180	6/28/88
4,754,035	06/914,439	6/28/88
4,754,042	07/104,627	6/28/88
4,754,052	06/928,901	6/28/88
4,754,057	06/682,444	6/28/88
4,754,064	06/544,725	6/28/88
4,754,066	06/844,078	6/28/88
4,754,072	07/023,182	6/28/88
4,754,079	07/029,093	6/28/88
4,754,080	07/034,747	6/28/88
4,754,091	06/706,729	6/28/88
4,754,104	07/071,505	6/28/88
4,754,106	07/028,734	6/28/88
4,754,107	06/910,936	6/28/88
4,754,113	07/000,074	6/28/88
4,754,127	07/047,681	6/28/88
4,754,138	06/745,098	6/28/88
4,754,163	06/625,982	6/28/88
4,754,176	06/947,574	6/28/88
4,754,177	06/891,471	6/28/88
4,754,182	06/425,417	6/28/88
4,754,194	06/912,221	6/28/88
4,754,197	06/918,444	6/28/88
4,754,211	06/916,513	6/28/88
4,754,224	07/008,160	6/28/88
4,754,228	06/933,049	6/28/88
4,754,238	06/932,935	6/28/88
4,754,239	06/943,348	6/28/88
4,754,256	06/936,072	6/28/88
4,754,262	06/894,098	6/28/88
4,754,263	06/941,153	6/28/88
4,754,265	06/786,529	6/28/88
4,754,268	06/768,737	6/28/88
4,754,271	07/024,122	6/28/88
4,754,279	06/893,290	6/28/88
4,754,286	06/785,227	6/28/88
4,754,297	07/022,743	6/28/88
4,754,311	06/858,478	6/28/88
4,754,312	07/035,332	6/28/88
4,754,326	06/545,069	6/28/88
4,754,331	06/568,027	6/28/88
4,754,343	06/884,096	6/28/88
4,754,352	06/865,872	6/28/88
4,754,353	06/944,466	6/28/88
4,754,356	06/899,936	6/28/88
4,754,359	06/934,561	6/28/88
4,754,365	07/061,446	6/28/88
4,754,372	07/012,741	6/28/88
4,754,378	07/018,640	6/28/88
4,754,385	07/008,866	6/28/88
4,754,404	06/931,065	6/28/88
4,754,405	06/829,214	6/28/88
4,754,407	06/888,780	6/28/88
4,754,437	06/901,730	6/28/88
4,754,439	06/797,715	6/28/88
4,754,449	06/881,439	6/28/88
4,754,463	07/015,288	6/28/88
4,754,472	06/854,265	6/28/88
4,754,473	06/919,463	6/28/88
4,754,474	06/789,473	6/28/88
4,754,476	07/021,008	6/28/88
4,754,477	06/828,284	6/28/88
4,754,482	07/032,472	6/28/88
4,754,496	06/819,964	6/28/88

Erratum

In the list of patents which expired on January 19, 1992, due to failure to pay maintenance fees, in O.G. of March 24, 1992, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,700,892	06/917,516	10/20/87	10/10/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,494,491	06/382,445	1/22/85	5/26/82	6/29/92
4,690,844	06/665,295	9/01/87	10/26/84	7/10/92

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,733,189, Re. S.N. 07/917,339, Filed July 23, 1992, Cl. 324/309, MAGNETIC RESONANCE IMAGING SYSTEMS, William F. B. Punchard, et. al., Owner of Record: *Massachusettes Institute of Technology, Cambridge, Mass.*, Attorney or Agent: Charles L. Gholz, Ex. Gp.: 2613

4,805,960, Re. S.N. 07/915,892, Filed July 17, 1992, Cl. 297/85, WALL PROXIMITY CHAIR, Bill D. Tacker, Owner of Record: *Super Saglass Corp., Tupelo, Miss.*, Attorney or Agent: Robert A. Elwell, Ex. Gp.: 3507

4,823,318, Re. S.N. 07/918,168, Filed July 21, 1992, Cl. 365, DRIVING CIRCUITRY FDOR EEPROM MEMORY CELL,

Sebastiano D. Arrigo, et. al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.*, Attorney or Agent: W. James Brady III, Ex. Gp.: 2511

4,857,425, Re. S.N. 07/746,030, Filed Aug. 15, 1992, Cl. 430/1, MANUFACTURE OF INTEGRATED CIRCUITS USING HOLOGRAPHIC TECHNIQUES, Phillip J. Nicholas, Owner of Record: *Holotronic Technologies Ltd., London, England*, Attorney or Agent: Leo Stanger, Ex. Gp.: 1506

4,926,764, Re. S.N. 07/887,461, Filed May 22, 1992, Cl. 110/221, SEWAGE SLUDGE TREATMENT SYSTEM, Jos van den Broek, Owner of Record: *Inventor*, Attorney or Agent: Kevin J. Heinl, Ex. Gp.: 3404

4,936,661, Re. S.N. 07/904,373, Filed June 25, 1992, Cl. 359/692, ZOOM LENS WITH SHORT BACK FOCAL LENGTH, Ellis Betensky, et. al., Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka-Fu, Japan*, Attorney or Agent: Joseph W. Price, Ex. Gp.: 2507

4,941,841, Re. S.N. 07/916,189, Filed July 17, 1992, Cl. 439/377, ADAPTER AND A REMOVABLE SLIDE-IN CARTRIDGE FOR INFORMATION STORAGE SYSTEM, Julius C. Darden, et. al., Owner of Record: *Inventor*, Attorney or Agent: James A. Sheridan, Ex. Gp.: 3202

5,011,284, Re. S.N. 07/914,976, Filed July 15, 1992, Cl. 356/301, DETECTION SYSTEM FOR RAMAN SCATTERING EMPLOYING HOLOGRAPHIC DIFFRACTION, James M. Tedesco, et. al., Owner of Record: *Kaiser Optical Systems, Ann Arbor, Mich.*, Attorney or Agent: Allen M. Krass, Ex. Gp.: 2505

5,021,176, Re. S.N. 07/916,908, Filed July 20, 1992, Cl. 252/515, FRICTION MODIFIER, John Vincent Bullen, et. al., Owner of Record: *Ethyl Petroleum Additives Ltd., Bracknell, England*, Attorney or Agent: Doris M. Thompson, Ex. Gp.: 1105

5,078,442, Re. S.N. 07/916,188, Filed July 17, 1992, Cl. 296/26, PORTABLE PERFORMANCE PLATFORM, Douglas Rau, et. al., Owner of Record: *Wenger Corp., Owatonna, Minn.*, Attorney or Agent: Joseph H. Patterson, Esq., Ex. Gp.: 3102

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,283,621, Reexam. No. 90/002,790, Requested July 21, 1992, Cl. 235/375, APPARATUS AND METHOD OF STORING AND RETRIEVING INFORMATION, Robert Pembroke, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Walter C. Linder, Minnesota Mining and Manufacturing Co., St. Paul, Minn., Ex. Gp.: 2309, Requester: Owner

4,803,445, Reexam. No. 90/002,791, Requested July 21, 1992, Cl. 331/177R, VARIABLE FREQUENCY OSCILLATOR, Richard G. Yamasaki, Owner of Record: *Silicon Systems, Inc., Tustin, Calif.*, Attorney or Agent: Gary A. Hecker, Hecker & Harriman, Los Angeles, Calif., Ex. Gp.: 2502, Requester: Exar Corp., San Jose, Calif.

4,934,264, Reexam. No. 90/002,789, Requested July 20, 1992, Cl. 101/175, COLORHEAD PRINTER MOUNTING APPARATUS, Alton E. Gansky, et. al., Owner of Record: *Alton E. Gansky and William A. Harris, Colorado Springs, Colo.*, Attorney or Agent: Phillip A. Rein, Colorado Springs, Colo., Ex. Gp.: 3307, Requester: Robert T. Townsend, Townsend Industries, Inc., Altoona, Iowa

4,975,446, Reexam. No. 90/002,787, Requested July 6, 1992, Cl. 514/363, TREATMENT OF GLAUCOMA, Seymour F. Trager, et. al., Owner of Record: *Seymour F. Trager, Plainview, N.Y.; G. Michael Blackburn, Sheffield, United Kingdom*, Attorney or Agent: Fidelman & Wolffe, Washington, D.C., Ex. Gp.: 1205, Requester: University of Florida, c/o Kerkam, Stowell, Kondracki & Clarke, Falls Church, Va.

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Oct. 15, 1992.

Machado, Reinaldo P., 3215 Blueford Rd., Kensington, Md. 20895
O'Neill, T. Gary, 1670 Thomas Dolan Pkwy, R.R. No. 2, Dunrobin, Ontario, K0A 1T0 Canada
Wright, Ernest T., Jr., 11622 35th Ave., Beltsville, Md., 20705

Aug. 6, 1992 CAMERON WEIFFENBACH
Office of Enrollment and Discipline

Department of Commerce
Patent and Trademark Office
37 CFR Part 1 and Part 10

[Docket No. 920671-2171]
RIN 0651-AA55

Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent and trademark cases to: specify the types of correspondence which would no longer require original signatures; provide for facsimile transmission of certain correspondence to the Office; discontinue use of the drop box at Crystal Plaza Building 3 and at the Department of Commerce Building in Washington, D. C.; and clarify other provisions with respect to practice before the Office.
Dates: Written comments must be received on or before Oct. 13, 1992 to ensure consideration. An oral hearing will not be conducted.
Addresses: Address written comments to the Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, marked to the attention of Abraham Hershkovitz. Comments may be sent by facsimile to the attention of Abraham Hershkovitz at (703) 305-8825.
For Further Information Contact: Abraham Hershkovitz by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: The specific revisions proposed are discussed below:

(1) Types of correspondence no longer requiring original signatures(§ 1.4)

The phrase "correspondence" is proposed to be utilized since the terms "papers", "letters" and "fees" all fall within the generic definition of "correspondence". Prosecution of some applications has been significantly delayed in the past by the Office requirement that all responses be personally signed. That requirement for a personal signature would prevent the Office from accepting the filing of certain correspondence by facsimile transmission as explained in the discussion of proposed § 1.6(d).

It is therefore proposed that § 1.4(d) be added to specify the types of correspondence which require personal signatures and the manner in which correspondence should be signed. The Office will accept copies of correspondence which do not require an original handwritten signature, including photocopies or facsimile transmissions. For example, a photocopy or facsimile transmission of an amendment signed by the attorney may be submitted to the Office. However, a photocopy or any other reproduction of a signature may not be affixed, by anyone other than the person whose signature is being reproduced, to correspondence requiring a signature. Correspondence submitted to the Office with original signatures should be submitted with signatures in a color of ink different from the printing on the paper so that the Office may easily recognize that the correspondence has been personally signed. Correspondence bearing an original signature, if not submitted to the Office, should be retained by applicants as evidence of proper execution in the event that questions arise as to the authenticity of the photocopy or facsimile-transmitted correspondence. If a question of authenticity arises, the Office may require submission of the correspondence bearing the original signature.

Correspondence submitted in an application filed under the Patent Cooperation Treaty often require an original handwritten signature either by the treaty or the regulations under the treaty. Other examples where original signatures will continue to be required are in patent interference proceedings, enrollment and disciplinary investigations and disciplinary proceedings. Proposed § 1.4(e) identifies the types of correspondence which will continue to require original signatures. Copies, including photocopies or facsimile transmissions, of correspondence which require an original handwritten signature will not be accorded a filing date and may be disposed of. (See § 10.18 for signature requirements of a practitioner). Furthermore, when certified documents must be filed, such as a certified copy of a foreign patent application, pursuant to 35 U.S.C. 119; a certified copy of a foreign trademark registration, pursuant to 15 U.S.C. 1126(e); a certified copy of a final court order, pursuant to 15 U.S.C. 1119; or a certified copy of a U.S. trademark registration, only the original certification is acceptable for filing in the Office. However, this requirement for an original certification of documents does not apply to certifications such as required under §§ 1.8, 1.10 and 1.97(e). The phrase "personal signature" and "personally signed" as used in this section refers to an original handwritten signature.

(2) Identification of applications (§ 1.5)

Section 1.5(a) is proposed to be amended to make reference to the certificate procedure under § 1.8 consistent with the newly proposed title for § 1.8.

(3) Receipt of correspondence (§ 1.6)

A descriptive heading is proposed to be added to each paragraph of § 1.6 to identify the content of that paragraph.

The phrase "correspondence" is proposed to be utilized since the term "papers", "letters" and "fees" all fall within the generic definition of "correspondence".

Section 1.6(a) is proposed to be amended to clarify that correspondence transmitted by facsimile on weekends and Federal holidays within the District of Columbia, will be accorded the next business day as a receipt date.

Sections 1.6(b) and (c) are proposed to be amended to clarify that weekdays refer to any day except a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.6(c) is proposed to be amended to delete reference to the box locations in the lobby of Crystal Plaza Building 3, Arlington, Virginia and at the Department of Commerce Building in Washington, D.C. The use of the drop boxes was discontinued on April 21, 1992 and the hours of operation for the attorney's window were extended to midnight, the same hours the drop boxes were available. The public can now deposit correspondence with the Office and receive a receipt after normal business hours. See "Changes in How Papers May be Filed in the Patent and Trademark Office", 1137 *Off. Gaz. Pat. Office* 7 (April 7, 1992). Use of the drop boxes at Crystal Plaza Building 3 and Department of Commerce Building locations had caused problems for both the public and the Office. It occasionally had been difficult to determine the dates of actual deposit of correspondence in the boxes. On occasion, Office employees and/or members of the public had been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place at the Department. Additionally, there were instances of correspondence being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). As a result, on occasion, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the boxes at Crystal Plaza Building 3 and at the Department of Commerce Building. Given these difficulties, and the fact that the necessity for these boxes is greatly diminished as a result of the facsimile transmission and certificate of transfer (formerly mailing) procedures, § 1.6(c) is proposed to be permanently amended by deleting reference to the drop boxes at Crystal Plaza Building 3 and the Department of Commerce Building. While this procedural change has already been implemented, the Office welcomes comments regarding the boxes before the procedure is finalized.

A new section 1.6(d) is proposed to be added to specify the types of correspondence which may be transmitted by facsimile and current § 1.6(d) is proposed to be redesignated as § 1.6(e). The widespread use of facsimile transmission and the resulting time saved in correspondence between applicants and the Office prompted the Office to establish a trial program to accept facsimile transmission of certain correspondence. The policy on "Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmissions" was published at 1096 *Off. Gaz. Pat. Office* 30 (Nov. 15, 1988) and was supplemented in the notice "Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission" published at 1108 *Off. Gaz. Pat. Office* 15 (Nov. 14, 1989). A comparable policy for trademarks was announced at 1123 *Off. Gaz. Pat. Office* 18 (Feb. 12, 1991). In light of the success of the trial program, a policy on acceptance of facsimile transmission is proposed to be incorporated into § 1.6(d). The exceptions to the use of facsimile-transmitted correspondence have been reduced and are identified in proposed § 1.6(d)(1)-(8). The exceptions cover situations where the correspondence being transmitted are original documents or correspondence requiring original signatures as specified in proposed § 1.4 and situations where accepting a facsimile transmission would be unduly burdensome to the Office. As a courtesy, the Office will attempt to notify senders whenever a facsimile transmission received falls within one of these exceptions. Senders are cautioned against submitting such excepted correspondence by facsimile transmission since such correspondence will not receive a filing date or date of receipt in the Office, and are subject to disposal.

Drawings and other correspondence filed for the purpose of obtaining an application filing date will not be accorded a date of receipt if transmitted by facsimile. Formal drawings may not be filed by facsimile in patent applications because the quality of the drawings received by facsimile transmission is not of a quality sufficient to comply with the drawing requirements set forth in § 1.84. Applicants are therefore encouraged to submit by facsimile only informal drawings or proposed drawing corrections.

As to specimens and drawings in trademark cases, the proposed rule relaxes the requirements set out in the notice entitled "Filing of Certain Trademark Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission", 1123 *Off. Gaz. Pat. Office* 18 (Feb. 12, 1991). The proposed rule continues to prohibit the transmission by facsimile of the original application, the section 8 or section 9 affidavit, the statement of use or the amendment to allege use. However, the proposed rule permits the facsimile transmission of drawings or specimens in response to an Office action. The same standards of drawing clarity and size apply to drawings received via facsimile. In a like manner, facsimile-transmitted specimens must be legible in order to be accepted and examined as specimens.

The date of receipt accorded to any correspondence permitted to be sent by facsimile transmission is the date the complete transmission is received by an Office facsimile unit, unless the transmission is completed on a Saturday, Sunday or Federal holiday within the District of Columbia. Correspondence for which transmission was completed on a Saturday, Sunday or Federal holiday within the District of Columbia, will be accorded a receipt date of the next succeeding day which is not a Saturday,

Sunday or Federal holiday in the District of Columbia. As an example, correspondence sent by facsimile from California on a Friday at 8:45 p.m. is completely transmitted at 9:05 p.m. Pacific time. The complete transmission would be received in the Office around 12:05 a.m. Eastern time on Saturday. The receipt date accorded to the correspondence is the date of the following business day, which in this case, would be Monday.

(4) Certificate of Transfer procedure (§ 1.8)

The title of § 1.8 is proposed to be changed from Certificate of Mailing to the more generic Certificate of Transfer so as to include facsimile transmissions.

Section 1.8(a) presently prescribes procedures for the use of a certificate of mailing to file papers or fees in the Office by first class mail. The phrase "papers or fees" in § 1.8(a) is proposed to be changed to "correspondence" since both "papers" and "fees" fall within the generic definition of "correspondence". Paragraphs (a) and (b) of § 1.8 are proposed to be amended to include correspondence transmitted by facsimile. In the event that correspondence is filed by facsimile transmission, it is recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. This report should be retained by the sender, along with the correspondence used as the original, as evidence of content and date of transfer. Paragraph (a)(2) of § 1.8 is proposed to be amended to include separate headings for correspondence which relate to patents, trademarks and disciplinary proceedings. The sequence of some of the paragraphs found in § 1.8 (a)(2) has been changed in order to have those paragraphs listed under the appropriate heading. The ability to use the Certificate of Transfer procedures has been expanded to the filing of an affidavit under section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065(3), the filing of a notice of election to proceed by civil action in an *inter partes* proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit, the filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071 (a)(2), and the filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

Paragraph (a)(2)(vi) of § 1.8 is proposed to be redesignated as paragraph (a)(2)(viii) and amended to refer to section 14(1) or 14 (2) of the Trademark Act, 15 U.S.C. 1064, to conform with the numbering of the Trademark Law Revision Act of 1988. Other sections of paragraph (a)(2) of § 1.8 are proposed to be amended to identify the types of correspondence which will not receive the benefit of a certificate of transfer.

Paragraph (b) of § 1.8 outlines procedures to be followed to document the timely filing of correspondence in accordance with § 1.8(a) where such correspondence is not received by the Office. The phrase "correspondence or fees" in § 1.8(b) is proposed to be changed to "correspondence" since "fees" falls within the generic definition of "correspondence". One of the requirements of § 1.8(b) is that the party forwarding the correspondence or fee include a declaration, under §§ 1.68 or 2.20 of this chapter, attesting to the timely transfer. In order to be consistent with other sections in Parts 1 and 2 of this chapter, the practice under § 1.8(b) is proposed to be amended to permit a practitioner, as defined in § 10.1(r), to submit a statement rather than an oath or declaration under §§ 1.68 or 2.20 of this chapter.

New paragraph (c) of § 1.8 is proposed to be added to explicitly provide for additional evidence relating to the transfer of correspondence in accordance with paragraph (a) of this section. The Office may invoke this requirement where it is deemed appropriate to establish an actual date of mailing or transmission. See, e.g., *In re Klein*, 6 USPQ2d 1547 (Comm'r Pat. 1987). *aff'd sub nom. Klein v. Peterson*, 696 F. Supp. 695, 8 USPQ2d 1434 (D.D.C. 1988), *aff'd* 866 F.2d 412, 9 USPQ2d 1558 (Fed. Cir.) *cert. denied*, 490 U.S. 1091 (1989).

(5) Time for appeal or civil action (§ 1.304)

In section 1.304, paragraphs (a) and (c) are proposed to be amended to delete a statement that use of the certificate procedure under § 1.8 is prohibited so as to be consistent with proposed changes to § 1.8. It is also proposed to clarify a cross-reference to § 1.658 in paragraph (a).

(6) Submission of maintenance fees (§ 1.366)

Section 1.366(b) is proposed to be amended by deleting the words "of mailing" due to the proposed new title for § 1.8.

(7) Filing date of application for extension of patent term (§ 1.741)

Section 1.741(a) is proposed to be amended to refer to the proposed new title for the certificate procedure under § 1.8.

(8) Signature and certificate of practitioner (§ 10.18)

Section 10.18 is proposed to be modified to clarify signature requirements for correspondence signed by practitioners. The reference to § 1.4 of this chapter would make it apparent that copies, including photocopies or facsimile transmissions, of correspondence signed by practitioners will be accepted under appropriate circumstances.

(9) Misconduct (§ 10.23(c))

Section 10.23(c) is proposed to be amended to refer to the proposed new title for the certificate procedure under § 1.8 of this chapter.

Other Considerations

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these proposed changes is to incorporate existing Office policy into the regulations, permit the filing of certain correspondence without an original signature and permit the filing of certain correspondence by facsimile transmission.

The Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the proposed changes reduce procedural burdens. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These proposed rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0009 and 0651-0011.

List of Subjects
37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, the Office proposes to amend 37 CFR Parts 1 and 10 as follows, wherein deletions are indicated by brackets ([]) and additions by arrows (▶◀):

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In Section 1.4, the title is proposed to be revised and paragraphs (d)-(f) are proposed to be added to read as follows:

§ 1.4 Nature of correspondence ▶and signature requirements◀.

* * * * *

▶(d) Each piece of correspondence prepared to be filed in a patent or trademark application, reexamination proceeding, patent file or trademark registration file, which requires a person's signature, must be personally signed in permanent ink by that person. The personally signed correspondence containing the original, handwritten signature, or a copy, such as a photocopy or facsimile transmission (§ 1.6(d)), of the personally signed correspondence may be filed in the Patent and Trademark Office, except as provided in paragraphs (e) and (f) of this section. If the personally signed correspondence is filed, the color of ink used for the signature should be different from the printing on the paper. In the event that a copy of the personally signed correspondence is filed, the personally signed correspondence should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the personally signed correspondence. The phrase "personally signed" as used in this section means an original, handwritten signature.

(e) Correspondence requiring a signature and which relates to patent interference proceedings, enrollment and disciplinary investigations, disciplinary proceedings or international patent applications must be submitted with a personally signed, permanent ink signature.

(f) When a certified document must be filed, a copy, including a photocopy or facsimile transmission, of the certification is not acceptable.◀

3. Section 1.5(a) is proposed to be revised to read as follows:

§ 1.5 Identification of application, patent or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the [certificate of mailing] ▶Certificate of Transfer◀ procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit on the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

* * * * *

4. In section 1.6, the title is proposed to be revised, each paragraph is proposed to be defined by a separate heading, paragraphs (a)-(c) are proposed to be revised, paragraph (d) is proposed to be redesignated as paragraph (e) and revised and new paragraph (d) is proposed to be added to read as follows:

§ 1.6 Receipt of [letters and papers] ▶correspondence◀.

(a) ▶Date of receipt and Express Mail date of deposit.

Correspondence◀ [Letter and other papers] received in the Patent and Trademark Office [are] ▶is◀ stamped with the date of receipt except where such [letters and papers are] ▶correspondence is◀ filed in accordance with § 1.10 ▶or transmitted by facsimile in accordance with paragraph (d) of this section. No correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia. Correspondence◀ [Any such letters and papers] filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday or Federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday or Federal holiday within the District of Columbia. [No papers are received in the Patent and Trademark Office on Saturdays, Sundays, or Federal holiday within the District of Columbia.] ▶Correspondence transmitted by facsimile to the Patent and Trademark Office on a Saturday, Sunday or Federal holiday within the District of Columbia will be stamped with the next succeeding day which is not a Saturday, Sunday or Federal holiday within the District of Columbia, as the date of receipt.◀

(b) ▶Patent and Trademark Office Post Office pouch.◀

Mail placed in the Patent and Trademark Office pouch up to midnight on [weekdays, excepting] ▶any day, except◀ Saturdays ▶, Sundays◀ and ▶Federal◀ [federal] holidays ▶within the District of Columbia◀, by the post office at Washington, D.C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was placed in the pouch ▶by the U.S. Postal Service◀.

(c) ▶Correspondence delivered by hand.◀

In addition to being mailed▶, correspondence may be◀ [or] delivered by hand during [office] hours ▶the Office is open to receive correspondence◀ [, letters and other papers may be deposited up to midnight in a box provided at the guard's desk at the lobby of building 3 of the Patent and Trademark Office at Crystal Plaza, Arlington, Virginia and at the main entrance (14th Street) of the Department of Commerce Building, Washington, D.C., on weekdays except Saturdays and Federal holidays, and all papers deposited therein are considered as received in the Patent and Trademark Office on the day of deposit].

(d) ▶Facsimile transmission.

Except in the cases enumerated below, correspondence, including authorizations to charge a deposit account, may be transmitted by facsimile. The filing date accorded to the correspondence will be the date on which the complete transmission is received in the Patent and Trademark Office, unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia. See § 1.6(a). To facilitate proper processing, each transmission session should be limited to correspondence to be filed in a single national application or other proceeding before the Patent and Trademark Office. The application number of a patent or trademark application, the control number of a reexamination proceeding, the patent number of a patent, or the registration number of a trademark should be entered as a part of the sender's identification on a facsimile cover sheet. Facsimile transmissions are not permitted and if submitted, may be dis-

posed of, in the following situations:
(1) Correspondence which must be filed with a personally signed permanent ink signature as specified in § 1.4(e);
(2) Certified documents as specified in § 1.4(f);
(3) Correspondence which cannot receive the benefit of the certificate of transfer as specified in § 1.8(a)(2)(i)-(xi);
(4) Drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165 or 1.174;
(5) A request for reexamination under § 1.510;
(6) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1-5.8 of this chapter and directly related to the secrecy order content of the application;
(7) Requests for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);
(8) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal.

(e) Interruptions in the U.S. Postal Service.◀

If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any [paper or fee] ▶correspondence◀ which is:

(1) Promptly filed after the ending of the designated interruption or emergency; and
(2) Accompanied by a statement indicating that such [paper or fee] ©correspondence§ would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

5. Section 1.8 is proposed to be amended by revising the title and paragraphs (a) and (b) and by adding new paragraph (c) to read as follows:

§ 1.8 Certificate of [mailing] ▶transfer◀.

(a) Except in the cases enumerated below, [papers and fees] ▶correspondence◀ required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if:
(1) [They are] ▶it is transferred prior to expiration of the set period of time by being:
(i) deposited with the U.S. Postal Service with sufficient postage as first class mail◀ addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 [, and deposited with the U.S. Postal Service with sufficient postage as first class mail] ▶; and
(ii) transmitted by facsimile as set forth in § 1.6(d) to the Patent and Trademark Office◀ [prior to expiration of the set period:]; and
(2) [They] ▶It◀ also [include] ▶includes◀ a certificate for each [paper or fee] ▶piece of correspondence◀ stating the date of [deposit] ▶transfer◀. The person signing the certificate should have reasonable basis to expect that the correspondence would be [mailed] ▶transferred◀ on or before the date indicated. The actual date of receipt of the [paper or fee] ▶correspondence◀ will be used for all other purposes. This procedure dose not apply to ▶ and the benefit of the date of transfer on the certificate will not be extended to,◀ the following:

▶Relative to Patents◀

(i) The filing of a national patent application specification and drawing or other [papers] ▶correspondence◀ for the purpose of obtaining an application filing date:
[(ii) The filing of trademark applications;]
▶(ii) The filing of correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";◀
(iii) the filing of agreements between parties to an interference under 35 U.S.C. 135(c);
▶(iv) the filing of international applications for patent and all correspondence in international applications filed under chapter I and chapter II including the filing of documents and fees for entry in to the national stage, see § 1.491;

Relative to Trademarks

(v) The filing of trademark applications;◀
[(iv)] ▶(vi)◀ The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);
[(v)] ▶(vii)◀ The filing of an application for renewal of a [mark] registration under section 9 of the Trademark Act, 15 U.S.C. 1059;
[(vi)] ▶(viii)◀ The filing of a petition to cancel a registration of a mark under section 14 [(a)]▶, subsection (1)◀ or [(b)] ▶(2)◀ of the Trademark Act, 15 U.S.C. 1064 [(a), 1064(b)];
[(vii) The filing of an affidavit under section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065;
(viii) The filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit;
(ix) The filing of a notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2);
(x) The filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c);
(xi) The filing of international applications for patent and all papers and fees relating thereto;
(xii) The filing of a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail"; and
(xiii) Papers filed in connection with a disciplinary proceeding under Part 10 of this subchapter.
(xiv) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of a statement of use under § 2.88 (15 U.S.C. 1051(d)).
(xv) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of a request under § 2.89 (15 U.S.C. 1051(d)), for an extension of time to file a statement of use under § 2.88 (15 U.S.C. 1051(d)).
(xvi) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of an amendment to allege use in commerce under § 2.76 (15 U.S.C. 1051(c)).]
▶(ix) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1);
(x) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1); and

Relative to Disciplinary Proceedings

(xi) Correspondence filed in connection with a disciplinary proceeding under Part 10 of this subchapter.◀
(b) In the event that correspondence [or fees are] ▶is considered◀ timely filed ▶by being transferred◀ in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence [or fee] will be considered timely if the party who forwarded such correspondence [or fee]:
(1) informs the Office of the previous [mailing] ▶transfer◀ of the correspondence [or fee] promptly after becoming aware [of] ▶that◀ the Office [action] ▶has no evidence of receipt of the correspondence◀,
(2) supplies an additional copy of the previously [mailed] ▶transferred◀ correspondence [or fee] and certificate, and
(3) includes a [declaration under § 1.68 or § 2.20] ▶statement◀ which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely [mailing] ▶transfer. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter. If the transfer was by facsimile transmission, a copy of the sending unit's report confirming transmission may be used to support this statement.
(c) The Office may require additional evidence to determine if the correspondence was timely filed◀.

6. Section 1.304, paragraphs (a) and (c), are proposed to be revised as follows:

§ 1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time period provided under § 1.197(b) or § 1.658 ▶(b)◀, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires:
(1) 14 days after service of the notice of appeal or the summons and complaint or
(2) two months after the date of decision of the Board of Patent Appeal and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or § 1.645(a) or (b). The Commissioner may extend the time for filing an appeal or commencing a civil action
[(3)] for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or
[(4)] upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect. [The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).]

* * * * *

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(C)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint. [The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross appeal. See § 1.8(a)(2)(viii).]

7. Section 1.366(b) is proposed to be revised to read as follows:

§1.366 Submission of maintenance fees.

* * * * *

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362(d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in § 1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate [of mailing] procedures of either § 1.8 or § 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

* * * * *

8. Section 1.741, paragraph (a), is proposed to be revised to read as follows:

§ 1.741 Filing date of application

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of [Mailing] ▶Transfer◀" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10

* * * * *

Part 10-Representation of others before the Patent and Trademark Office

9. The authority citation for 37 CFR Part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

10. Section 10.18, is proposed to be revised to read as follows:

§ 10.18 Signature and certificate of practitioner.

(a) [Every paper] ▶Except where a copy, including a photocopy or facsimile transmission, of a personally signed piece of correspondence is permitted to be filed pursuant to § 1.4 of this chapter, every piece of correspondence◀ filed by a practitioner ▶on behalf of himself or herself or◀ representing an applicant or ▶a◀ party to a proceeding in the ▶Patent and Trademark◀ Office must bear the signature of, and be personally signed by, such practitioner except ▶for correspondence◀ [those papers] which [are] ▶is◀ required to be signed by the applicant or party. The signature of ▶a◀ practitioner [to] ▶on correspondence◀ [a paper] filed by him or her, ▶regardless of whether the correspondence has an original, handwritten signature or is a copy, including a photocopy or facsimile transmission, of the personally signed correspondence, ◀ constitutes a certificate that:
(1) The [paper] ▶correspondence◀ has been read by the practitioner;
(2) The [paper's] filing ▶of the correspondence◀ is authorized;
(3) To the best of his or her knowledge, information, and belief, there is good ground to support the [paper] ▶correspondence◀ including any allegations of improper conduct contained or alleged therein; and
(4) It is not interposed for delay.
(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See § 10.23(c)(15).

11. Section 10.23, paragraph (c)(9), is proposed to be revised to read as follows:

§ 10.23 Misconduct

* * * * *

(c) * * *
(9) Knowingly misusing a certificate of [mailing] ▶transfer◀ under § 1.8 of this [subchapter] ▶chapter◀ or a certificate of "Express Mail" under § 1.10 of this [subchapter] ▶chapter◀.

* * * * *

Aug. 4, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

PATENT NOTICES

Certificates of Correction For Week of September 1, 1992

D. 313,793	4,948,406	4,985,587	5,001,115
D. 314,474	4,948,944	4,985,978	5,001,740
D. 315,409	4,949,507	4,986,362	5,001,783
D. 316,483	4,949,590	4,987,162	5,001,784
D. 318,570	4,950,659	4,987,197	5,001,894
Re. 33,528	4,951,472	4,987,477	5,002,056
4,209,020	4,952,060	4,987,664	5,002,251
4,624,597	4,952,716	4,987,945	5,002,457
4,661,947	4,956,140	4,988,084	5,002,502
4,763,705	4,956,529	4,988,145	5,002,574
4,801,189	4,956,804	4,988,271	5,002,598
4,814,169	4,957,730	4,988,359	5,003,006
4,817,013	4,960,442	4,988,708	5,003,188
4,833,558	4,960,765	4,989,021	5,003,373
4,837,558	4,961,345	4,989,144	5,003,504
4,840,661	4,962,008	4,989,561	5,004,337
4,846,450	4,962,476	4,899,664	5,004,394
4,846,605	4,962,970	4,989,718	5,004,555
4,854,287	4,963,076	4,989,825	5,004,830
4,858,660	4,963,244	4,989,885	5,005,185
4,859,041	4,963,304	4,989,993	5,005,792
4,863,796	4,963,750	4,990,176	5,006,074
4,863,857	4,964,936	4,991,206	5,006,320
4,865,731	4,965,384	4,991,774	5,006,346
4,873,708	4,967,051	4,991,970	5,006,600
4,870,998	4,967,127	4,991,984	5,006,618
4,879,323	4,967,237	4,992,623	5,006,633
4,883,723	4,968,606	4,992,983	5,006,711
4,887,634	4,968,619	4,993,062	5,006,765
4,890,472	4,968,925	4,993,108	5,007,165
4,891,701	4,969,185	4,993,368	5,007,168
4,893,496	4,970,558	4,993,506	5,007,232
4,897,335	4,970,841	4,993,524	5,007,261
4,905,815	4,971,549	4,993,880	5,007,314
4,911,454	4,971,617	4,993,935	5,007,532
4,911,985	4,972,132	4,993,943	5,007,681
4,913,727	4,972,420	4,994,566	5,007,906
4,915,688	4,972,452	4,994,737	5,007,948
4,917,079	4,972,563	4,995,125	5,008,124
4,917,091	4,972,797	4,995,142	5,008,372
4,918,246	4,972,799	4,995,178	5,008,788
4,920,689	4,973,073	4,995,602	5,008,819
4,922,507	4,973,252	4,995,861	5,009,189
4,922,852	4,973,719	4,996,070	5,009,265
4,924,435	4,974,256	4,996,083	5,009,345
4,925,770	4,974,513	4,996,272	5,009,578
4,926,085	4,974,950	4,996,280	5,009,585
4,926,202	4,976,238	4,996,383	5,009,608
4,927,796	4,976,532	4,996,829	5,009,753
4,928,145	4,977,288	4,996,877	5,009,944
4,929,663	4,977,925	4,996,939	5,010,298
4,930,426	4,978,472	4,997,032	5,010,477
4,932,972	4,978,503	4,997,855	5,010,607
4,933,055	4,978,552	4,997,922	5,010,868
4,933,064	4,978,553	4,997,953	5,011,458
4,933,387	4,979,038	4,998,009	5,012,180
4,933,947	4,979,605	4,998,015	5,012,239
4,933,956	4,979,826	4,998,829	5,012,491
4,935,137	4,980,257	4,998,939	5,013,107
4,935,409	4,980,481	4,998,957	5,014,167
4,935,566	4,980,567	4,999,000	5,014,520
4,936,957	4,980,890	4,999,003	5,014,579
4,937,827	4,981,661	4,999,084	5,014,791
4,938,256	4,982,116	4,999,326	5,020,674
4,939,312	4,982,200	4,999,525	5,021,943
4,943,819	4,982,873	4,999,728	5,025,296
4,944,029	4,983,589	5,000,547	5,045,384
4,947,046	4,984,919	5,000,630	5,085,264
4,948,198	4,985,416	5,000,737	5,099,398

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Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Washington, D.C. 20231

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Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
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Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box ITU	All intent to use documents, excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

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In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particluar library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
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Alaska	Anchorage: Z. J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles City Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
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Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
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Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Siegesmund Engineering Library, Purdue University	(317) 494-2873
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
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Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
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West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	5/16/91
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	11/27/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	7/08/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/02/91
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Acting Director	308-0196	2/19/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	3/06/91
SPECIAL LAWS ADMINISTRATION GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	2/20/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	5/19/91
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	7/31/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY Director	308-0962	12/27/90
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	3/09/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	8/24/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	9/16/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	8/02/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	9/13/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-0651	7/02/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during August 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,897,596 to 3,902,195 inclusive
Plant Patents ..... 3,755 to 3,775

REEXAMINATIONS

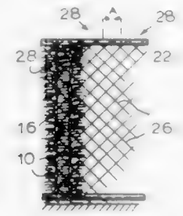
SEPTEMBER 1, 1992

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,872,647 (1782nd)
DECORATIVE ATTACHMENT FOR A CHAIN LINK FENCE

Francis M. Paradise, and James R. Paradise, both of Jamaica, N.Y., assignors to American Permahedge, Inc., Ronkonkoma, N.Y.

Reexamination Request No. 90/002,697, Apr. 10, 1992.
Reexamination Certificate for Patent No. 4,872,647, issued Oct. 10, 1989, Ser. No. 102,036, Sep. 29, 1987.
Int. Cl.[5] **E04H** *17/00*
U.S. Cl. 256—1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. An artificial hedge and/or shrubbery assembly comprising a chain link fence having a plurality of interlocking wires twisted together at spaced intervals to form a plurality of diamond shaped openings arranged in parallel rows, and a plurality of camouflage assemblies supported on said fence said camouflage assemblies comprising a central elongated axial support element and relatively stiff densely packed filament means fixedly carried by said support element and extending laterally of the axis thereof, said filament means forming a bush-like planar array that extends along the entire length of said support element, at least one of said camouflage assemblies being inserted in a selected plurality of rows of openings in said fence such that said support element passes through the openings in said selected rows so that when a plurality of such elements are thus inserted the fence assumes a hedge-like appearance.

B1 4,904,922 (1783rd)
APPARATUS FOR CONVERTING BETWEEN DIGITAL AND ANALOG VALUES

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Reexamination Request No. 90/002,287, Feb. 21, 1991.
Reexamination Certificate for Patent No. 4,904,922, issued Feb. 27, 1990, Ser. No. 225,055, Jul. 26, 1988.
Division of Ser. No. 104,690, Oct. 5, 1987, Pat. No. 4,831,282, which is a division of Ser. No. 714,503, Mar. 21, 1985, abandoned
Int. Cl.[5] **G05F** *3/08*
U.S. Cl. 323—316

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **21–23** and **25–31** is confirmed.

Claims **1**, **6–9**, **11**, **13**, **17**, **19**, **24** and **32** are determined to be patentable as amended.

Claims **2–5**, **10**, **12**, **14–16**, **18**, **20** and **33–35**, dependent on an amended claim, are determined to be patentable.

New claims **36–50** are added and determined to be patentable.

1. In combination for converting binary [valves] *values* to analog values where the binary values are represented by first and second pluralities of binary signals respectively corresponding to rows and columns,

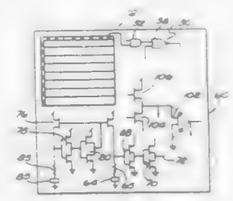
a plurality of output means disposed in a matrix defining rows and columns and having first inputs to the rows and second inputs to the columns,

first means for introducing the first plurality of signals to the inputs defining the rows,

second means for introducing the second plurality of signals to the inputs defining the columns,

third means responsive to a coincidence of the binary signals from the first and second pluralities on a particular one of the output means common to a particular row and a particular column for activating the particular output [member] *means*,

fourth means responsive to the activation of the particular output means for producing an activation of the output means preceding the particular output means in the particular row, and



fifth means responsive to the activation of the particular output means for producing an activation of the output means in the rows preceding the particular row, the output means including:

pluralities of first, second and third transistors each of the p-type and each having conductive and non-conductive states, the first, second and third transistors being disposed in groups, the first, second and third transistors in each group being associated with an individual one of the output means,

the first transistors being associated with the third, fourth and fifth means to become conductive in response to the signals from any of the associated third, fourth and fifth means for activating the associated output means, each of the first transistors having distributed capacitances receiving a charge upon a state of non-conductivity in such first transistor and discharging this charge through such first transistor upon a state of conductivity in such first transistor to shorten the time for making the [first] *second* transistor fully [conductive] *non-conductive*,

each of the second transistors being connected to the associated first transistor to become non-conductive upon a state of conductivity in such first transistor, such second transistor providing an output voltage dependent upon the state of conductivity or non-conductivity in such second transistor,

the charging of the distributed capacitances in each of the

first transistors during the state of non-conductivity in such first transistor being operative to prevent the output voltage from the associated second transistor from overshooting during the change in the operation of such associated second transistor from the state of non-conductivity to the state of conductivity,

each of the third transistors being biased to produce continually a substantially constant current and being connected to the associated ones of the first and second transistors to pass the substantially constant current through the associated first transistor during the state of conductivity in the associated first transistor and through the associated second transistor during the state of conductivity in the associated second transistor, and

means for accumulating the currents flowing through the second transistors to provide an indication of the analog value in accordance with the magnitude of such current.

STATUTORY INVENTION REGISTRATIONS

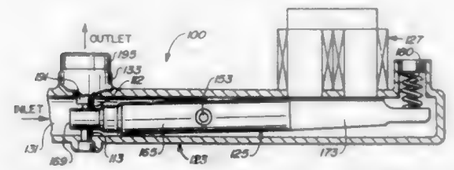
PUBLISHED SEPTEMBER 1, 1992

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1098
INTEGRATED VALVE ASSEMBLY

Charles E. Hallum, 11 Foxglove Way, Irvine, Calif. 92715

Filed Feb. 20, 1991, Ser. No. 657,801
Int. Cl.[5] B64G 1/26
U.S. Cl. 60—229 1 Claim



1. In combination with an integrated valve assembly having two identical high-thrust major nozzles, two identical low-thrust minor nozzles, two identical poppet valves, and four identical electric-solenoid-operated flapper valves each flapper valve including a flapper valve body and a flapper, each flapper including means for attaching a flapper tip thereto, the improvement to each of the flapper valves thereof which comprises:

a flapper tip disposed to attach to the flapper, said tip having a cylindrical hole extending entirely through said tip and generally oriented parallel to the direction of tip motion;

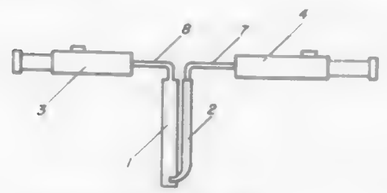
a generally cylindrical balance piston disposed to fit freely within said hole in said tip; and

means for axially constraining movement of said piston located within said tip relative to the flapper valve body.

H1099
LIQUID-DROP GENERATOR

William M. Sayler, Bradshaw, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 13, 1991, Ser. No. 746,689
Int. Cl.[5] B65D 47/18
U.S. Cl. 222—420 5 Claims



1. A liquid-drop generator comprising:

a first syringe containing a highly viscous, non-newtonian liquid,

a capillary having an upper and lower terminal end,

a feed-tube connecting said syringe to said upper end of said capillary,

a second syringe containing water,

a hypodermic needle penetrating said capillary adjacent said lower terminal end,

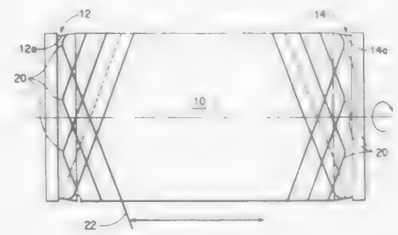
a second feed tube connecting said second syringe to said hypodermic needle,

whereby said first syringe ejects said non-newtonian fluid into said capillary until a pendant drop is formed at said lower terminal end, and said second syringe ejects water into said capillary to free said droplet from said capillary.

H1100
YARN BOBBIN

Mark D. Blue, 305 Brook Hollow Dr., Columbia, S.C. 29223

Filed Jul. 12, 1991, Ser. No. 729,374
Int. Cl.[5] B65H 75/10
U.S. Cl. 242—118.3 3 Claims



1. A yarn support tube for traverse wound yarn packages, said tube having tapered recesses extending around its circumference adjacent each of its ends, each recess being tapered toward the center of the support tube to provide a tapered surface at yarn winding reversals on the support tube, whereby as yarn is laid down in a reversal curve on said tapered surface, the normal component of yarn tension is greater than the transverse component of yarn tension causing the yarn to remain in place.

H1101
STRUCTURAL VIBRATION AND SHOCK ISOLATION IN A HIGH PRESSURE ENVIRONMENT

Ronald E. Waclawik, New Bedford, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

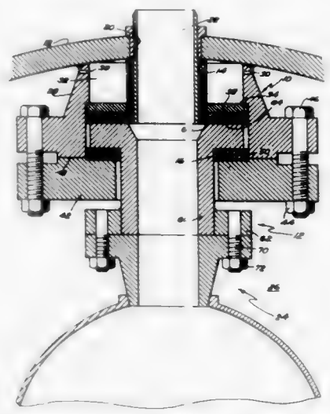
Filed Jun. 1, 1989, Ser. No. 359,895
Int. Cl.[5] F16L 55/02
U.S. Cl. 285—49 6 Claims

1. A system for conducting and containing a fluid having structural vibration and shock isolation for high axial loads on system components comprising:

structural vibration and shock isolation means having a fluid inlet pipe and a fluid outlet component, said structural and shock isolation means for providing vibration and shock isolation between said inlet pipe and said outlet component;

diffusing means comprising a diffuser connected to said

vibration and shock isolation means fluid outlet for diffusing said fluid; and

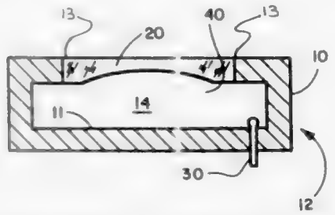


an air over water tank enclosing said fluid, said air over water tank rigidly connected to said fluid inlet pipe.

H110
FLUIDIC LASER CALORIMETER

Gordon R. McClellan, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1991, Ser. No. 764,570
Int. Cl.[5] G01K *17/20*
U.S. Cl. 374—32 **17 Claims**



1. A laser calorimeter for measuring laser energy comprising:
- a housing having a forward end defining an opening and an interior chamber, said chamber having an interior surface opposite said opening;
- a lens disposed in said opening of said housing and attached peripherally thereto whereby said laser energy may enter said housing chamber;
- a means disposed in said chamber for absorbing said laser energy in said housing chamber; and
- a means extending sealably through said housing and into said chamber for measuring changes in temperature in said means for absorbing said laser energy.

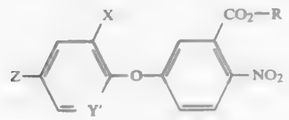
H1103
POST EMERGENCE HERBICIDAL COMPOSITIONS AND METHODS FOR USING SAME

Jean-Pierre Decor, Thurius, France, and Robert E. Holm, Belle Mead, N.J., assignors to Rhone-Poulenc Secteur Agrochimie, Lyons, France

Continuation of Ser. No. 277,506, Nov. 30, 1988, abandoned, which is a continuation of Ser. No. 946,567, Dec. 24, 1986, abandoned. This application Mar. 31, 1990, Ser. No. 504,099
Int. Cl.[5] A01N *43/40, 37/34, 37/40*
U.S. Cl. 71—94 **16 Claims**

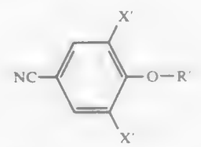
1. A herbicidal composition consisting essentially of:

A. A compound selected from 2-nitro-5-substituted phenoxybenzoic acids, salts and alkyl esters thereof and 2-nitro-5-substituted pyridyloxybenzoic acids, salts and alkyl esters thereof of the following formula:



wherein:
X is halogen; Y′ is C(Y) or N;
Y is hydrogen or halogen; Z is a halo-alkyl group of one or two carbon atoms;
R is selected from hydrogen, alkali metal and alkaline earth metal;

B. A compound selected from 3,5-dihalo-4-hydroxybenzonitrile derivatives of the formula



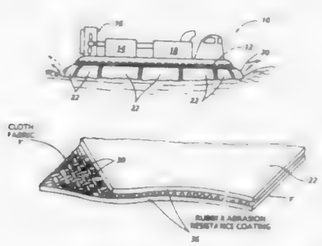
wherein X′ is an iodine or bromine atom, preferably a bromine atom; R′ is hydrogen, an alkali metal (e.g., Li, Na, K) an alkaline earth metal, ammonium, alkylammonium, dialkylammonium, or any other agronomically acceptable cation forming salt, or an alkanoyl (—COR[2]) group wherein R[2] is an alkyl group of one to twenty saturated or unsaturated carbon atoms, wherein the weight ratio of the Compound A to Compound B component is in the range of 0.3 to 3.

H1104
AIR CUSHION VEHICLE CONDUCTIVE/SEMICONDUCTIVE FLEXIBLE SKIRT, AND METHOD

Richard A. Cavanagh, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1990, Ser. No. 487,489
Int. Cl.[5] B32B *7/00, 15/00;* **D03D** *9/00;* **D04B** *1/00*
U.S. Cl. 428—256 **7 Claims**

1. An air cushion vehicle composite flexible skirt member which forms at least a portion of peripheral sealing means for the vehicle's generated air cushion, said skirt member comprising a durable, flexible fabric material having at least one and preferably both of its opposite surfaces coated with an elastomeric abrasion-resistant material to constitute the basic composite flexible skirt member, and further including electrically conductive means integrated throughout at least a substantial part of said composite skirt member, so as to provide a dissipating electrical discharge grounding path for potential static electrical energy generated in and around said vehicle during

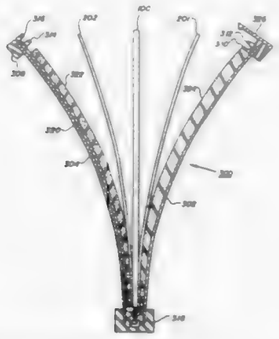


operational use more particularly in cold, low humidity environments.

H1105
ASYMMETRICAL RADIOGRAPHIC ELEMENTS, ASSEMBLIES AND PACKAGES

Richard J. Jebo, Rochester; Paul W. Twombly, Webster; Robert E. Dickerson, Rochester, and Phillip C. Bunch, Brighton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1990, Ser. No. 502,341
Int. Cl.[5] G03C *1/46*
U.S. Cl. 430—502 **31 Claims**



1. A radiographic element comprised of
a transparent film support,
first and second silver halide emulsion layer units coated on opposite sides of the film support, and
means for reducing to less than 10 percent crossover of electromagnetic radiation of wavelengths longer than 300 nm capable of forming a latent image in the silver halide emulsion layer units, said crossover reducing means being decolorized in less than 90 seconds during processing of said emulsion layer units,
characterized in that
said first and second silver halide emulsion layer units exhibit significantly different sensitometric characteristics and
means are provided for ascertaining which of said first and second emulsion layer units are positioned nearest a source of X-radiation during exposure.

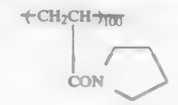
H1106
MULTI-LAYER SILVER HALIDE PHOTOGRAPHIC ELEMENT

Noriki Tachibana; Masato Nishizeki, and Nobuaki Kagawa, all of c/o Konica Corporation No. 1, Sakura-machi, Hino-shi, Tokyo 191, Japan

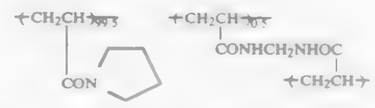
Continuation of Ser. No. 403,093, Sep. 5, 1989, abandoned. This application Aug. 15, 1991, Ser. No. 749,465
Claims priority, application Japan, Sep. 5, 1988, 63-220552
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—537 **1 Claim**

1. In a silver halide photographic element having a support and a plurality of hydrophilic colloidal layers on the support including a silver halide emulsion layer, the improvement wherein a binder being contained in one of said hydrophilic colloidal layers comprises a gelatin emulsion, the improvement comprising a polymer selected from the group consisting of compounds P-3, P-6 and P-10 as follows:

P-3



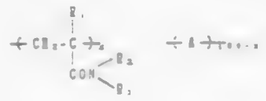
P-6



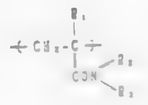
P-10

[with a cloud point, said polymer having a molecular weight in the range of 3,000 to 500,000 and the following formula (I)

(I)



where R_1 is a hydrogen atom or an alkyl group having 1—6 carbon atoms; R_2 and R_3 which may be the same or different are each a hydrogen atom, an alkyl group having 1—10 carbon atoms, an aryl group or an aralkyl group, provided that R_2 and R_3 are not a hydrogen atom at the same time, that R_2 and R_3 is such alkyl group that the sum of their carbon atoms is at least 3 and that R_2 and R_3 may combine to form a nitrogenous hetero ring together with the notrogen atom; X is in the range of 100—10; A is a recurring unit, provided that if A has a crosslinking group, the countent of recurring units represented by



is at least 50 mol %; and wherein said polymer with a cloud point is] contained in said gelatin emulsion in an amount of [5-50] 10 wt% of the total content of said gelatin binder.

H1107
LOW PROBABILITY OF INTERCEPT RADAR USING ATMOSPHERIC LOSS

Donald R Wehner, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 805,559
Int. Cl.[5] G01S *7/02*
U.S. Cl. 342—13 **9 Claims**

4. A low probability of intercept radar system using atmospheric loss to attenuate the radar signals as seen by long range interceptors comprising:

first means for generating a modulated radar waveform having a midband frequency approximately in the region of the lower water vapor absorption frequency of 22.2 GHz;

a shaped beam radar antenna operably coupled to said first means for transmitting a beam derived from said modulated waveform over a relatively short range low altitude area; and

radar receiver means for receiving and processing radar return signals from said transmitted modulated waveform.

REISSUES

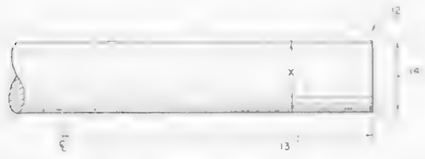
SEPTEMBER 1, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,046
HEAVY DUTY SHACKLE

James B. Shahan, Tulsa, Okla., assignor to American Hoist and Derrick Company, Tulsa, Okla.

Original No. 4,079,584, dated Mar. 21, 1978, Ser. No. 739,056, Nov. 5, 1976. Application for reissue Sep. 29, 1980, Ser. No. 192,059
Int. Cl.[5] B21L *13/00*; F16G *15/06*
U.S. Cl. 59—35.1 **7 Claims**



3. A shackle bow for heavy duty use *with wire rope slings* under large loads, as in anchor lines, comprising:

a. [a] *an approximately circular cross-section* rein section adjacent the two ends of said shackle for a selected length and of diameter X', each said rein section being between a central cylindrical portion and a flattened ear portion;

b. said central cylindrical portion being of a broadened flattened shape, having a U-shaped cross-section with a circular bottom surface, the radius of said bottom surface being at least substantially equal to X';

c. said shackle being in the shape of a bow, with said U-shape of said central cylindrical portion directed outwardly, around a central eye *a distance of at least equal to one-half the circumference of said central eye to where said central cylindrical portion joins with each said rein section*, said ears being substantially parallel, spaced apart a distance less than the diameter of said eye, and having coaxial central openings therein to receive a pin therethrough.

Re. 34,047
REFRIGERATION SYSTEM

Granville P. Elrod, Murfreesboro; John W. Westbrooks, Christiana, and Tracy L. McDonald, Winchester, all of Tenn., assignors to Standex International Corporation, Salem, N.H.

Original No. 4,852,365, dated Aug. 1, 1989, Ser. No. 224,500, Jul. 19, 1988. Application for reissue Apr. 3, 1991, Ser. No. 694,224
Int. Cl.[5] F25D *15/00*
U.S. Cl. 62—237 **17 Claims**

8. A refrigeration system comprising:

an insulated enclosure having a base, sides and a cover and refrigeration means;

closable access means in at least one side of said enclosure;

food rack means which is transportable into and out of said enclosure through said access means;

means on said food rack means to permit rotation of said food rack means;

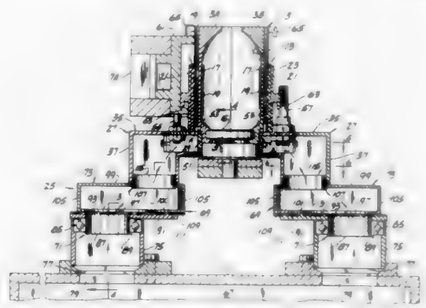
rotation means mounted to said enclosure; and

means for disengageably joining said rotation means to said food rack means when said food rack means is in said enclosure.

Re. 34,048
COOLING SYSTEM FOR A GLASSWARE FORMING MACHINE

James A. Bolin, Tulsa, Okla., assignor to I.M.T.E.C. Enterprises, Inc., Tulsa, Okla.

Original No. 4,750,929, dated Jun. 14, 1988, Ser. No. 81,148, Aug. 3, 1987. Continuation of Ser. No. 010,483, Feb. 3, 1987, abandoned, which is a continuation of Ser. No. 859,644, May 5, 1986, abandoned. Application for reissue Feb. 14, 1990, Ser. No. 480,028
Int. Cl.[5] C03B *9/38*
U.S. Cl. 65—265 **4 Claims**



1. A glassware forming machine *for forming glass bottles each having a bottom,* comprising:

a pair of carriers each pivoted on a first generally vertical axis for swinging movement toward and away from each other between an open and a closed position,

a plurality of mold members carried by each carrier, each mold member on each carrier being related to a mold member on the other so that, with the carriers in their said closed position, each mold member on one carrier mates

with a mold member on the other to define a mold cavity for molding [an item of glass] *a bottle,*

[each mold member having air passages extending upwardly from the bottom thereof for passage of air therethrough for cooling,]

a plenum carried by each carrier for delivering air *for cooling* to [the air passages of] the mold members,

each plenum having a generally flat top and part-circular recesses at one side thereof;

each mold member having a generally arcuate peripheral wall having air passages extending upwardly from the bottom thereof for passage of air upwardly therethrough for cooling;

each mold member further having a reduced-diameter lower end portion fitting in a respective recess of the respective plenum;

the bottom of the peripheral wall of the mold member constituting a shoulder at the upper end of the reduced-diameter lower end portion of the mold member seated on top of the plenum around said recess;

the plenum having ports in the top thereof registering with the passages in the mold member at the lower ends of said passages;

the cavity in each mold member being formed with its bottom, where the bottom of the bottle is formed, above said shoulder, whereby cooling air enters the passages from the ports in the plenum in proximity to the bottom of the cavity;

a chamber, below said carriers, for air to be blown into the plenums and thence up through said air passages, *and*

means for delivery of air from said chamber to each plenum allowing swinging of the carrier comprising, for each carrier:

[a first conduit member in communication with said chamber for delivery of air from said chamber through said first conduit member, the first conduit member being oscillable on a fixed generally vertical axis spaced from the carrier axis, and]

[a second conduit member in slidable sealed relation with the first conduit member for reciprocation related to the first conduit member and in communication with the first throughout the range of reciprocation of the second relative to the first, said second conduit member being pivotally interconnected with the respective plenum on a generally vertical axis, said pivotal interconnection being formed for passage of air from the second conduit member into the plenum,]

[the fixed generally vertical axis about which the first conduit member oscillates with respect to the chamber and the pivotal interconnection between the second conduit member and the plenum being relatively positioned so that as the carrier arms swing toward and away from each other between their said open and a closed position, the pivotal interconnection between the second conduit and the plenum crosses a line extending through the fixed generally vertical axis about which the first conduit member oscillates with respect to the chamber and the fixed axis about which the carrier arms pivot.]

a conduit member, one for each plenum, which receives air from the chamber and delivers it to the respective plenum, each said conduit member being movable in a generally horizontal plane between the top of the chamber and the bottom of the plenum, having an air inlet at the bottom adjacent one end thereof receiving air from the chamber, and having a pivotal interconnection at the top with the bottom of the plenum adjacent the other end of the conduit member with the pivotal interconnection constructed for flow of air centrally therethrough into the plenum.

Re. 34,049

ROD-LESS CYLINDER

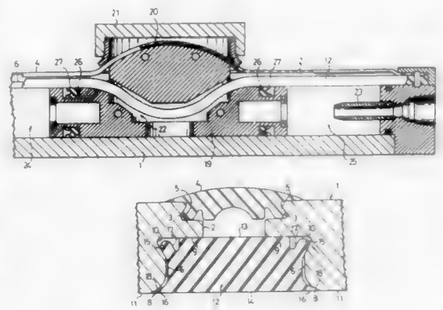
Teluomi Taki, Kasugai, and Shigehiro Toyoda, Hashima, both of Japan, assignors to CKD Corporation, Komaki, Japan

Original No. 4,829,881, dated May 16, 1989, Ser. No. 165,865, Mar. 9, 1988. Application for reissue May 13, 1991, Ser. No. 699,089

Claims priority, application Japan, Mar. 12, 1987, 62-57454; Jan. 6, 1988, 63-450[U]

Int. Cl.[5] F01B *29/00*

U.S. Cl. 92—88 6 Claims



1. A rod-less cylinder comprising:

a cylinder having an inner surface, an outer surface, a slit disposed at said outer surface and extending in the longitudinal direction of said cylinder, said slit being defined by a pair of opposing side surfaces, and a side recess formed at said inner surface and having a width larger than that of said slit so as to extend beyond both said side surfaces of said slit in the widthwise direction thereof, said side recess extending along the length of said slit and having a pair of first surfaces intersecting said side surfaces of said slit and a pair of second surfaces intersecting said first surfaces;

a piston mounted in said cylinder [to be movable] *for movement* in a reciprocating manner; and

a sealing member detachably fitted in said side recess for closing said slit, said sealing member having *a third surface facing said first surfaces, a pair of fourth surfaces each opposing one of the second surfaces,* a pair of holding ribs engageable with said second surfaces for holding said sealing member in said side recess, *each holding rib extending from an associated fourth surface at a position spaced from said third surface, relief grooves defined between said third surface and the respective holding ribs,* and a pair of sealing lips sealing the junctions between said inner surface of said cylinder and said side recess, [said sealing member including a supporting portion having a third surface facing said first surfaces, a pair of fourth surfaces opposing separate respective second surfaces, a separate plate-like holding rib on each of said fourth surfaces at a position spaced from said third surface, said holding ribs engaging said second surface, and a relief groove defined between said fourth surfaces and the respective holding ribs,] said third surface being positioned to engage said first surfaces to close said slit and to support said sealing member against said first surfaces when said sealing member is subjected to air pressure within said cylinder, said relief grooves permitting said holding ribs to move toward and away from said fourth surface.

Re. 34,050

FILTERING SYSTEM

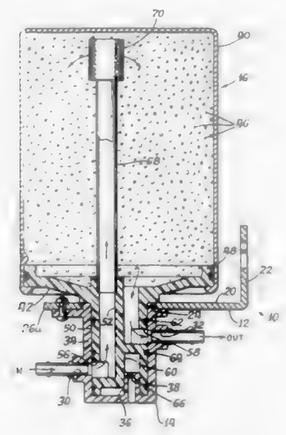
Jack W. Thomsen, LaGrange Park, and John W. Tadlock, West Chicago, both of Ill., assignors to Everpure, Inc., Westmont, Ill.

Original No. 4,725,354, dated Feb. 16, 1988, Ser. No. 837,197, Mar. 7, 1986. Continuation of Ser. No. 355,636, May 22, 1989, abandoned. Application for reissue Jun. 1, 1990, Ser. No. 532,223

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.[5] B01D *27/02, 27/08*

U.S. Cl. 210—232 36 Claims



26. A filter cartridge comprising:

a pressure vessel closed at one end including filter means disposed therein,

a closure member sealingly disposed in the open end of said pressure vessel, said closure member including,

(a) an annular base portion which is secured to the open end of said pressure vessel,

(b) an elongated cylindrical portion formed integrally with said base portion and adapted to be inserted into a mating head member in sealing engagement therewith,

(c) a pair of axially extending inlet and outlet passages formed in said elongated cylindrical portion,

(1) one of said passages being formed with a first communicating port in the cylindrical wall of said cylindrical portion,

(2) the other of said passages being formed with a second communicating port in the cylindrical wall of said cylindrical portion,

(3) said first and second communicating ports being adapted to establish communication with inlet and outlet ports of a head member with which said closure member is adapted to be associated,

(d) first, second and third seal members disposed on the cylindrical wall of said closure member, said first of said seal members being axially spaced from and disposed between said first and second communicating ports, and said second and third of said seal members being axially spaced from and on opposite sides of said first seal member for sealing the internal pressure from the surrounding atmosphere when the closure member is inserted into a head member with which the closure member is adapted to be associated.

Re. 34,051

VEHICLE SEAT WITH A SAFETY BELT SYSTEM

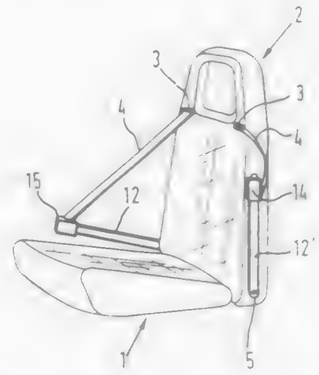
Elmar Deegener, Stelzenberg; Harald Wolsiefer, Krickenbach, and Heinz P. Cremer, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Original No. 4,919,488, dated Apr. 24, 1990, Ser. No. 352,890, May 17, 1989. Application for reissue Jan. 31, 1991, Ser. No. 648,975

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816834

Int. Cl.[5] A47C *31/00*

U.S. Cl. 297—468 10 Claims



1. A vehicle seat having a seat portion supported on slide rails, a back rest, and a safety belt system having a belt closure with two closure elements, the belts of which are connected in the area of the upper end section of the back rest to two upper connection points lying spaced from each other in the lateral direction of the seat, and in the area of the rear end of its seat portion, are connected to one of the lower ends of the back rest, said seat portion, or said slide rails, at two lower connecting points provided on the respective sides of the seat, one of said respective sides of the seat being an access side, comprising:

two lap belts (**6**) each running from one of the respective lower connecting points (**5**) to said closure elements (**14, 15**), respectively, of said belt closure;

two shoulder belts (**4**), each running from one of the respective upper connecting points to one of said closure elements (**14, 15**) of the belt closure, each of said lap belts (**6**) being guided by one of said shoulder belts (**4**);

first and second pivot arms (**12, 12'**), each defining a respective pivot plane for guiding the respective lap belts (**6**), said pivot arms (**12, 12'**) being connected with the seat frame in the area of one of the lower connecting points (**5**) respectively, so as to pivot about respective axes (**8, 11**) extending in the lateral direction of the seat;

said two pivot arms (**12, 12'**) being formed so as to resist bending in their respective pivot planes and to be elastically flexible laterally thereto;

said first pivot arm (**12**) being connected with the other pivot arm (**12'**) by gear means (**8, 9, 10**), the output of which is opposite to the input pivot movement;

wherein said second pivot arm (**12'**) is arranged on the access side of the seat and lies upright at the side of the seat adjacent to the back rest (**2**) in its stowed position, and said first pivot arm (**12**) extends forward and holds the shoulder belt (**4**) connected therewith at least nearly tensed when said second pivot arm is in its stowed position.

Re. 34,052

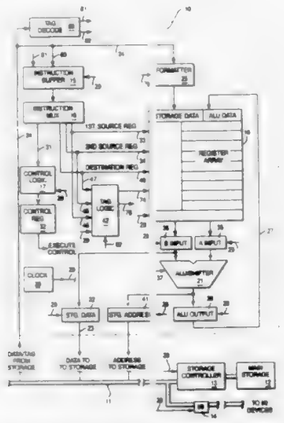
DATA PROCESSING SYSTEM WITH CPU REGISTER TO REGISTER DATA TRANSFERS OVERLAPPED WITH DATA TRANSFER TO AND FROM MAIN STORAGE

Phillip D. Hester, Austin, and William M. Johnson, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,630,195, dated Dec. 16, 1986, Ser. No. 615,984, May 31, 1984. Application for reissue Dec. 16, 1988, Ser. No. 285,827

Int. Cl.[5] G06F 7/00, 9/38, 9/34

U.S. Cl. 395—375 36 Claims



8. In a data processing system including a CPU, at least one external unit requiring data from or providing data to said CPU and an I/O bus for the transfer of said data between said CPU and external unit, said CPU comprising:

means for executing a sequence of instructions;

means connected to the executing means for transferring data to or from said external unit over said bus;

means connected to the executing means for storing data in a plurality of registers within said CPU;

means connected to the transferring means and storing means for internally transferring data within said CPU registers concurrently during the transfer of data to or from the external unit; and

control means connected to the executing means, transferring means and storing means for controlling the transfer of data wherein the transfer of data between CPU registers coincides with the transfer of data to or from the external unit, said control means further including means for

determining when data to be loaded into first one or more of the CPU registers by execution of a first of a sequence of instructions in said CPU has not been loaded in first one or more of the CPU registers as required by the first instruction

determining when data to be loaded into second one or more of the CPU registers by execution of a second within the sequence of instructions in said CPU has not been loaded in second one or more of the CPU registers as required by the second instruction and

simultaneously waiting for completion of execution of the first and second instructions while permitting the execution of other instructions of said sequence that do not require any data resulting from the completion of execution of said first or second instructions.

Re. 34,053

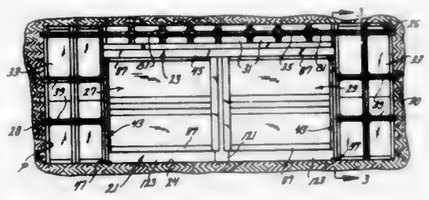
MINE DOOR SYSTEM

William R. Kennedy, and John M. Kennedy, both of Taylorville, Ill., assignors to Jack Kennedy Metal Products and Buildings, Inc., Taylorville, Ill.

Original No. 4,911,577, dated Mar. 27, 1990, Ser. No. 361,400, Jun. 5, 1989. Application for reissue Oct. 17, 1990, Ser. No. 599,344

Int. Cl.[5] E21D 9/00; E21F 1/00

U.S. Cl. 405—132 28 Claims



28. A mine door system for installation in a passageway in a mine, comprising a door frame adapted to be installed in the passageway to define a doorway, said door frame comprising a pair of supports at opposite sides of the doorway and a generally horizontal lintel member supported by said pair of supports and extending across the top of the doorway, and mine door means mounted on the door frame for movement between open and closed positions, at least one of said supports comprising a column having a plurality of column sections extensible and contractible heightwise relative to one another to enable adjustment of the length of the column to fit passageways of varying height.

PLANT PATENTS

GRANTED SEPTEMBER 1, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing

7,956

APPLE TREE — FIESTA CULTIVAR

Frank H. Alston, Maidstone, England, assignor to Plant Breeding International Cambridge Limited, Cambridge, United Kingdom

Filed Dec. 24, 1990, Ser. No. 639,271

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—34.1 1 Claim

1. A new and distinct variety of apple tree having the following combination of characteristics:

(a) is precocious and assumes a larger size than the Cox's Orange Pippin cultivar,
(b) exhibits a somewhat drooping growth habit which is particularly noticeable in young trees,
(c) forms in good yields attractive round and slightly flattened fruit having a smooth and shiny surface with a bright red blush which may be present as stripes and speckles on a yellow-green background and possessing an excellent flavor which is well retained upon storage, and
(d) commonly exhibits a genetic leaf mottle which is unrelated to disease;

substantially as herein shown and described.

7,957

CRAPE-MYRTLE NAMED PURPLE QUEEN

Kiyoshi Katsuo, Niigata, Japan, assignor to Hokuetsu Nohji Co., Ltd., Niigata, Japan

Filed May 25, 1990, Ser. No. 528,356

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—67.3 1 Claim

1. The new and distinct variety of crape-myrtle plant, substantially as herein described and illustrated.

7,958

STREPTOCARPUS PLANT NAMED THALIA

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Dec. 28, 1990, Ser. No. 635,708

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—87.13 1 Claim

1. A new and distinct cultivar of Streptocarpus plant named Thalia, as illustrated and described.

7,959

GERANIUM NAMED ECLIPSE RED

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Mar. 8, 1991, Ser. No. 666,886

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant substantially as herein shown and described characterized by dark green foliage with zonation, red-colored, semi-double flowers on large umbels, the plant being fast-rooting and growing with an open, vigorous habit.

7,960

GERANIUM NAMED AMERICANA WHITE

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Mar. 29, 1991, Ser. No. 678,549

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant substantially as herein shown and described, named Americana White, that is characterized by deep green foliage with a band of darker green zonation, white flower color, and semi-double flowers on large umbels, the plant being fast-rooting and having a vigorous growth habit.

7,961

GUZMANIA "LEMONADE"

David P. Millon, and Beth L. Millon, both of 21975 SW. 147 Ave., Goulds, Fla. 33170

Filed Mar. 18, 1991, Ser. No. 671,210

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—88.6 1 Claim

1. A new and distinct cultivar of Guzmania plant named 'Lemonade', as illustrated and described herein.

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PATENTS

GRANTED September 1, 1992

ERRATA

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395-425	5,144,551
369-275	5,144,552

PATENTS

GRANTED SEPTEMBER 1, 1992

GENERAL AND MECHANICAL

5,142,702

UPPER BODY OSTOMY GARMENT

Gladys G. Piloian, 585 W. Church Ave., Longwood, Fla. 32750

Filed Apr. 25, 1991, Ser. No. 691,570
Int. Cl.[5] A41D *1/04*
U.S. Cl. 2—102 9 Claims

1. A garment for supporting an ostomy appliance comprising:

an upper body undergarment, which is worn over the shoulders and around the upper portion of a users body, said undergarment includes an interior pocket for holding an ostomy appliance;

said interior pocket is lined with a moisture resistant pliable material for retaining moisture within said pocket.

5,142,703

NECKWEAR HAVING FABRIC LINING WITH AREAS OF DIFFERENT FABRIC CONSTRUCTION

Lex L. Basinger, Concord; Jeffery L. Rachel, Siler City; Jerry E. Snider, Albemarle, all of N.C., and Allan S. Lerner, New York, N.Y., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed May 30, 1991, Ser. No. 707,833
Int. Cl.[5] A41D *25/00*
U.S. Cl. 2—144 19 Claims

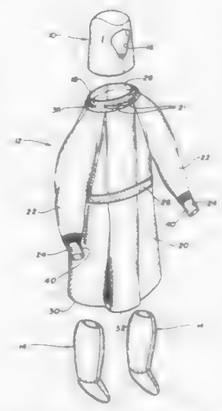
1. A neckwear comprising an outer fabric casing, a one-piece, multi-dimensional lining having opposing end portions and having a central neckband and knotting portion positioned between said end portions, said lining being carried within said casing and lying substantially coextensive with said casing along the length thereof, said lining being formed of a one-piece textile fabric cut substantially along the bias and wherein the central portion of said lining is formed of a first type of fabric construction and the end portions of the lining are formed of a second type of fabric construction.

5,142,704

SURGICAL HOOD

Tucker Viemeister, New York, N.Y.; Daniel Formosa, Montville, and Steven Russak, Hoboken, both of N.J., assignors to Chicopee, New Brunswick, N.J.

Filed Apr. 5, 1991, Ser. No. 681,226
Int. Cl.[5] A42B *1/04*
U.S. Cl. 2—202 5 Claims



1. A surgical hood having a top portion which is closed, a bottom portion which is open and a face opening therein, said face opening being in the form of a modified isosceles triangle having a base, a truncated apex and a pair of equal sides connecting said base with said truncated apex, the base of said triangular opening being located adjacent said top portion and said apex being located between said base and said bottom portion, said modified triangular opening having a pair of corners where said equal sides meet the ends of said base, said truncated apex and said pair of corners being rounded, and at least a portion of the equal sides of said modified triangular opening being curved inwardly toward the center of the face opening so as to provide a protective cover for the cheek area of the face of a wearer.

5,142,705

ADJUSTABLE HEADBAND FOR BASEBALL HELMET

John W. Edwards, 920 Martha Ave., Lancaster, Pa. 17601

Filed May 15, 1991, Ser. No. 700,409
Int. Cl.[5] A42B *3/00, 1/22*
U.S. Cl. 2—418 4 Claims

1. An adjustable headband for a helmet such as a baseball helmet to be worn on a head of a user, comprising:

an elongated band means;

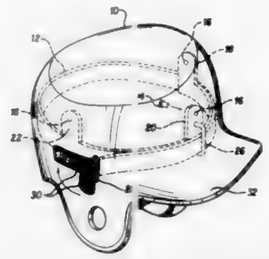
means for attaching said elongated band means to an inner surface of said helmet at three locations thereon;

guide means located on said attaching means adjacent two of said three locations, said guide means extending between said elongated band means and said helmet to guide a free end of said elongated band means around said user's head in overlapping fashion;

slot means on said helmet through which said free end of said elongated band means passes outside of said helmet; and

closure means on said free end of said elongated band means and externally on said he met; whereby

said headband may be adjus ed relative to the user's head to provide a snug fit of the he adband on the user's head while



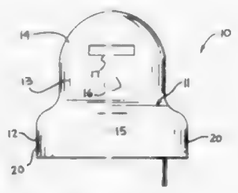
being worn by the user, by moving said free end of said elongated band means relative to said slot means and thereafter engaging the closure means on said free end of said elongated band mear s with the closure means externally on said helmet.

5,1 2,706

DRESSING GOWN HOOD

Vera F. Layhon, Box 135, Pembina, N. Dak. 58271

Filed Aug. 15, 19 1, Ser. No. 745,196
Int. Cl.[5] A42B *1/00*
U.S. Cl. 2—424 9 Claims



1. A dressing gown hood, comprising,

a flexible continuous fabri : hood, including a lower oval skirt mounted coaxially t an upper cylindrical body, with the upper cylindrical b dy including a semi-cylindrical crown mounted to an u per terminal end of the upper cylindrical body, and

the lower oval skirt joined continuously to the upper cylindrical body at a first inte section, and the upper cylindrical body joined to the se ni-cylindrical crown at a second intersection, and a first slit directed through the hood at the first intersection, and

a second slit of a "U" shape d configuration directed through the upper cylindrical bo ly aligned with the first slit, and

an eye slot directed adjace t to and below the second intersection aligned with the first slit and the second slit, and

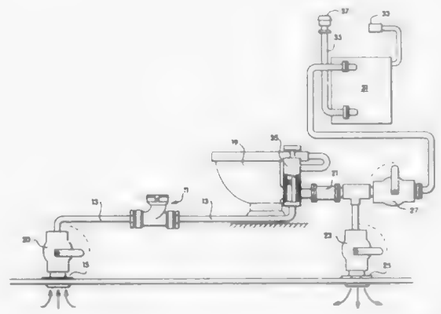
securement means mountec to the skirt for securement of the skirt about an individual s shoulder portions.

5,142,707

ADDITIVE INJECTION UNIT FOR A MARINE TOILET SYSTEM

Frederick Prue, P.O. Box 229, Billerica, Mass. 01821

Continuation-in-part of Ser. No. 273,993, Nov. 1, 1988, abandoned, and a continuation-in-part of Ser. No. 419,543, Oct. 10, 1989, abandoned. This application May 2, 1990, Ser. No. 518,538
Int. Cl.[5] A61L *2/16*; E03D *9/02*
U.S. Cl. 4—222 3 Claims



1. An arrangement for introducing an additive into a fluid flow which comprises, in combination,

a flow pipe formed from corrosion resistant plastic having a uniform diameter,

means for connecting said flow pipe in series fluid-flow with a conduit, said means for connecting said flow pipe being formed from corrosion resistant plastic,

a closed additive reservoir cavity formed by a main body section of said arrangement surrounding said flow pipe, said means for connecting said flow pipe in series flow relation, and a twist-on sealing cap covering an access passageway, said additive reservoir cavity comprising, in combination, a sanitary pipe tee joint having first and second circular mouths at opposing ends of a cylindrical transverse body pipe section and a third circular mouth at the outer end of a branch pipe section which extends radially outward from the middle of said transverse body pipe section, first and second annular size-reduction bushings inserted in and affixed to the said first and second mouths respectively for removably securing opposing ends of said flow pipe in a position extending axially through said transverse body pipe section,

at least one inlet aperture and at least one return aperture through said flow pipe, both of said apertures providing a fluid flow path between the interior of said pipe and said additive reservoir cavity, and said inlet aperture being positioned upstream from said return aperture to induce a portion of the fluid flowing through said conduit to flow through said additive reservoir cavity,

said access passageway leading into said additive reservoir cavity and being normally covered by said removable twist-on sealing cap which may be opened to permit an additive material to be introduced into said additive reservoir cavity and thereafter closed to provide a pressure tight seal for said additive reservoir cavity and to retain said material within said additive reservoir cavity, and

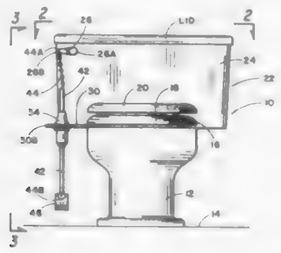
adjustable means for variably restricting the fluid flow path through said inlet aperture, said additive reservoir cavity, and said return aperture whereby the volume of fluid diverted through said additive reservoir cavity may be adjusted to vary the amount of additive introduced into said conduit.

5,142,708

FOOTFLUSH ADAPTER FOR URINALS

Michael J. Johnson, and Rebecca K. Johnson, both of 519 S. Independence, Sapulpa, Okla. 74066

Filed Mar. 7, 1991, Ser. No. 666,003
Int. Cl.[5] E03D *5/08*
U.S. Cl. 4—249 3 Claims



1. For use with a toilet having a toilet bowl with a generally horizontal upper surface on which a toilet seat is attached by bolts and a water closet connected to the toilet bowl having at least one generally vertical sidewall, the water closet having a flush valve actuator with a generally horizontal flush shaft extending through the vertical wall and a flush lever affixed to the flush shaft, the lever extending generally horizontally and parallel to and spaced from the wall and having an outer end, the toilet normally being flushed by the rotation of the lever by manual engagement with the lever, a foot flush adapter which permits flushing of the toilet without hand contact with the lever comprising:

an adapter plate supported to the toilet bowl horizontal upper surface by said bolts and extending from said surface, the adapter plate having a U-slot therein;

a tubular support member affixed to and received in said U-slot in said adapter plate by cooperation of a circumferential groove with said U-slot, said support member being generally vertically supported by said U-slot;

a rod slidably received in and vertically reciprocally supported in said tubular support member, the rod having an upper and a lower end;

said upper end of said rod being connected to the outer end of said flush lever; and

a generally horizontal foot member affixed to said rod at said lower end thereof, the foot lever being thereby supported adjacent the toilet bowl whereby downward displacement of said foot lever displaces said rod with respect to said support member, thereby causes the flush lever, to rotate the flush shaft to flush the toilet.

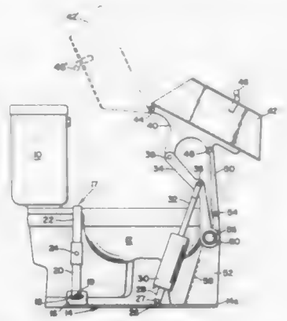
5,142,709

HYDRAULIC COMMODE ASSEMBLY

Micky L. McGuire, Leesburg, Ga., assignor to Hydra-Commode Lift Services, Inc., Gaithersburg, Md.

Filed Aug. 24, 1990, Ser. No. 571,984
Int. Cl.[5] A47K *13/10*
U.S. Cl. 4—667 7 Claims

1. A hydraulic commode assembly comprising a base support which, in use, fits around the base of a commode including a bowl, a first brace lug connected to said support on one side of the commode, a channel-shaped brace attached to said brace lug on one side of the commode and extending over the top of the commode rearwardly of the commode bowl, a second brace lug connected to said base support on the other side of the commode and to said channel-shaped brace, a cylinder lug attached to said base support approximately at the middle of the commode bowl, a seat for a user of the commode assembly, a hydraulic cylinder attached to said cylinder lug and including an extendable and retractable piston rod, first and second upright supports disposed, in use, one on each side of the commode and being secured to said base support near the front of the commode, said first and second upright supports each including first lower and second upper vertically spaced pivot connections, a support assembly for the seat including first and second laterally spaced, downwardly depending support members secured to each side of said seat, said first support member defining a pivot point toward the back of said seat, said second support member defining a laterally spaced pivot point toward the front of said seat, a first pair of pivotable link members including a pivotable dog leg link extending between, and pivotably connected to said first lower pivot connection of each said upright support and the pivot point of said first support member on each side of said commode, a second pivotable straight link extending between, and pivotably connected



to, said second upper pivot connection of each said upright support and to said pi ot point of second support member, on each side of said commode, at least one of said dog leg links being pivotably connected, intermediate the ends thereof, to said piston rod of said hydraulic cylinder-piston assembly, wherein with said piston rod in retracted position with respect to said cylinder said seat will assume a horizontal use position and with said piston rod in an extended position said seat will assume a tilted position near the front of said commode with the rear portion of said seat assuming a vertically higher position than the front of said seat, whereby in any position assumed by said seat said dog leg links and said straight links will cooperatively support said seat in such a manner that the paths of movement of said links never cross.

5,142,710

CONTROLLED TOILET FLUSHING SYSTEM

Olof Olson, 729 - 12th Avenue P.O. Box 553, North Branch, Minn. 55056

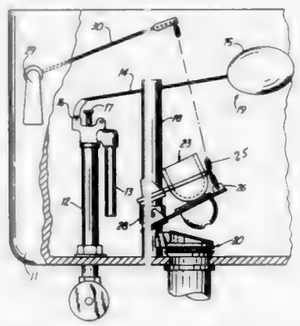
Filed Jul. 1, 1991, Ser. No. 724,589
Int. Cl.[5] E03D *1/14, 1/35*
U.S. Cl. 4—325 1 Claim

1. In combination with a toilet tank having a water reservoir, a water supply line coupled thereto, a discharge drain for delivering water from said reservoir to a toilet bowl disposed therebeneath, a ball cock valve means controlling the flow of water from such supply to said reservoir, an overflow standpipe mounted in said reservoir in communication with said discharge drain, a buoyant flapper valve closing an opening to said discharge drain and being pivotally mounted on said standpipe, and a water impervious discharge control and water saver for controlling the flow of water from said reservoir to said discharge drain, the improvement comprising:

(a) said discharge control and water saver having a generally cylindrical configuration with an open top and a closed bottom defining an upwardly open chamber;

(b) said discharge control and water saver further having a mounting portion formed therewith and extending substantially laterally from said chamber, said mounting portion being pivotally mounted on said standpipe at a posi-

tion above said flapper valve such that water contained in said reservoir can enter said chamber when such water is at a full level as controlled by said ball cock valve means, said mounting portion further being positioned on said standpipe such that at least a portion of said chamber



bottom is continuously in contact with an upper surface of said flapper valve when said flapper valve is pivoted upwardly;

whereby, said discharge control and water saver reduces the buoyancy of said flapper valve thereby allowing premature closing thereof.

5,142,711

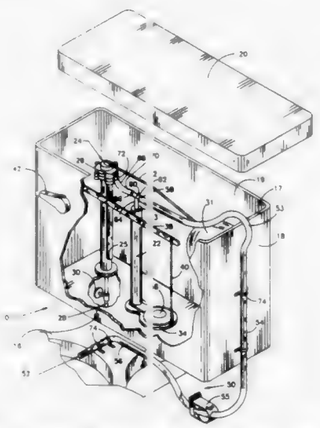
BIDET ASSEMBLY

Uday A. Parikh, 6737 Steeplechase Dr., Huntsville, Ala. 35806

Filed Jun. 17, 1991, Ser. No. 716,218

Int. Cl.[5] A47K *3/20*

U.S. Cl. 4—420.4 **17 Claims**



1. A bidet assembly adapted for use with a water closet having a water reservoir tank including a ballcock having water inlet and water outlet means in communication with an external water source, a hollow overflow tube having an upper opening, reservoir tank outlet means, a toilet bowl having a flat uppermost surface and being in communication with said reservoir tank outlet means, means for releasing water from said water reservoir tank through said reservoir tank outlet means to said toilet bowl, and means for actuating said ballcock for admitting water from said external water source through said water outlet means into said water reservoir tank, said bidet assembly comprising conduit means having a first end portion adapted to communicate with said water outlet means of said ballcock and a second end portion adapted to be secured to said toilet bowl uppermost surface, a connecting member having a plurality of ports, a first of said ports being disposed for receiving water from said ballcock outlet means, and a second of said ports being connected to said conduit means first end portion to provide water from said ballcock to the crotch area of the user of said water closet in response to actuation of said ballcock actuating means.

5,142,712

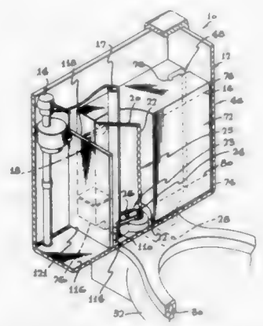
VACUUM ASSISTED TOILET

Arnold Hennessy, Wellington, Canada, assignor to Fluidmaster, Inc., Los Angeles, Calif.

Filed Nov. 26, 1990, Ser. No. 618,170

Int. Cl.[5] E03D *11/00*

U.S. Cl. 4—431 **6 Claims**



1. In a toilet which includes a tank, a toilet bowl, a tank inlet valve through which water is received into the tank up to a predetermined high water level, a tank flush valve through which water in the tank is flushed into the bowl, a toilet bowl outlet, and a vacuum source coupled to said outlet to apply a vacuum therein during flushing, the improvement wherein:

said vacuum source includes a container lying in said tank and having upper and lower portions, with said upper portion being sealed from said tank and said lower portion having an opening leading to water in said tank, so that when the tank water level around said container opening drops during flushing a vacuum is created in said container upper portion, said vacuum source also including a vacuum conduit extending between said container upper portion to said toilet outlet to apply a vacuum that aids in moving material through said outlet; and including

a baffle which divides said tank into two horizontally-spaced compartments, including a first compartment that includes said flush valve and said container opening, and a second compartment, said baffle having a bottom at the bottom of said tank and a top at a height that is a plurality of centimeters below said high water level, with the volumes of said compartments above said baffle merging, whereby when a flushing starts, water from above both compartments passes toward said flush valve, but when the water level drops below the top of the baffle substantially only water in said second compartment passes toward said flush valve.

5,142,713

SHOWER-SAUNA ADAPTER

Jeffrey J. Makool, P.O. Box 237, Otis Orchards, Wash. 99027-0237

Filed Jul. 11, 1991, Ser. No. 728,659

Int. Cl.[5] A61H *33/10*

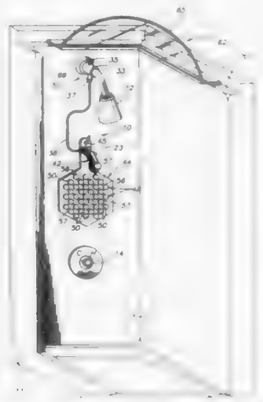
U.S. Cl. 4—525 **18 Claims**

1. An adapter for selectively converting a conventional shower, having a shower water outlet and upright shower stall walls, to a steam sauna, comprising:

a spray mist nozzle means for developing a spray mist in a prescribed pattern;

means for connecting the spray mist nozzle to the shower water outlet and for selectively delivering water from the shower water outlet under pressure to the spray mist nozzle;

mounting means for releasably securing the spray mist nozzle to one of the shower stall walls;



deflection plate means mountable to the one shower stall wall and adjacent to the mounting means and oriented angularly in relation to the spray mist nozzle to receive and deflect spray mist therefrom; and

wherein the deflection plate means includes diffusion surface means having at least one projection secured thereon for receiving and angularly dispersing spray mist from a pattern produced by the spray mist nozzle in a substantially diffused pattern.

5,142,714

WHIRLPOOL NOZZLE

Manfred Klotzbach, Düren, Fed. Rep. of Germany, assignor to Hoesch Metall & Kunststoffwerk GmbH & Co., Kreuzau-Schneidhausen, Fed. Rep. of Germany

PCT No. PCT/EP89/01199, § 371 Date Jun. 13, 1990, § 102(e) Date Jun. 13, 1990, PCT Pub. No. WO90/03774, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 11, 1989, Ser. No. 499,409

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 8812993[U]

Int. Cl.[5] A61H *33/02*

U.S. Cl. 4—542 **6 Claims**

1. A nozzle assembly for discharging a mixture of first and second fluids, comprising

(a) a housing defining an inner space constituting an antechamber; said housing including means defining first and second inlets for introducing the first and second fluids, respectively, into said antechamber;

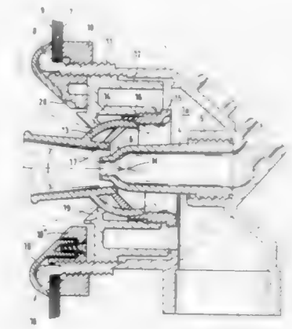
(b) a sleeve being disposed in said antechamber and being affixed to said housing; said sleeve being coupled to said second inlet for receiving the second fluid from said second inlet; said sleeve having a length, an outlet orifice remote from said second inlet, an exterior surface and a spherical sealing face formed on said exterior surface;

(c) a holding ring disposed in said antechamber and surrounding said sleeve;

(d) securing means for securing said holding ring to said housing for displacement relative to said sleeve in a direction parallel to said length thereof;

(e) force-receiving means provided on said holding ring and being accessible from an exterior of said housing for engagement by a force-exerting member to displace said holding ring parallel to the length of said sleeve;

(f) a nozzle body situated at least partially in said antechamber; said nozzle body having a spherical member and a nozzle outlet member defining a nozzle bore and being directed outwardly of said housing at one side thereof; said spherical member being hollow and being surrounded by said holding ring; said sleeve projecting into said spherical member and said outlet orifice of said sleeve opening into said nozzle outlet; said nozzle body further including a sealing face situated inside the spherical member and delimiting the nozzle bore; said sealing face of said nozzle body cooperating with the spherical sealing face of said sleeve for determining therewith an annular gap constituting a flow passage area through which the first fluid is



introduced from the antechamber into the nozzle outlet member; and

(g) retaining means for holding said spherical member captive in said holding ring; said retaining means permitting a pivotal motion of said nozzle body about a center of said spherical member; said retaining means coupling said nozzle body to said holding ring such that said nozzle body and said holding ring move substantially as a unit upon displacement of said holding ring relative to said sleeve along the length thereof; a size of said gap depending from a position of said holding ring relative to said sleeve; said holding ring having a limit position in which said gap is reduced to zero by a sealing contact between said spherical sealing face of said sleeve and the sealing face of said nozzle body; in said limit position said center of said spherical member coinciding with a center of said spherical sealing face of said sleeve.

5,142,715

FOUNDATION UNIT WITH SNAP-FIT MODULAR SPRINGS

Steven E. Ogle, and Danny L. Wylie, both of Carthage, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Continuation-in-part of Ser. No. 786,021, Oct. 31, 1991. This application Jan. 28, 1992, Ser. No. 827,007

Int. Cl.[5] A47C *23/04, 23/053*

U.S. Cl. 5—247 **14 Claims**

1. A box spring unit comprising:

a) a rectangular frame comprising two laterally spaced longitudinal frame members, two longitudinally spaced lateral frame members and a plurality of spaced longitudinal slats;

b) a planar top portion spaced above said frame, and comprising a first plurality of spaced parallel grid wires and a second plurality of spaced parallel grid wires lying perpendicular to and connected to said first plurality of spaced parallel grid wires;

c) a plurality of longitudinal modular springs extending between said planar top portion and said frame, each said longitudinal modular spring comprising two vertical legs and a planar top section, said planar top section comprising a centermost longitudinal section and two longitudinal end sections, each said longitudinal end section being generally parallel to and offset from said centermost longitudinal section and being connected thereto by a transverse straight portion, each said longitudinal end section being connected to one of said vertical leg sections, each said vertical leg being connected to said frame such that the centermost longitudinal section of each said longitudinal modular spring is generally parallel to said longitudinal frame members;

d) snap-fit means securing each said longitudinal modular spring to said planar top portion, said snap-fit means comprising a first parallel grid wire from said second plurality of spaced parallel grid wires extending over both transverse straight portions of said longitudinal modular spring, a second parallel grid wire from said second plurality of spaced parallel grid wires extending under both transverse straight portions of said longitudinal modular spring, and a pair of parallel grid wires from said first plurality of spaced parallel grid wires, wherein one of said pair of parallel grid wires extends over one of said longitudinal end sections of said longitudinal modular spring and another of said pair of parallel grid wires extends over another of said longitudinal end sections of said longitudinal modular spring;

e) a pad overlying said planar top portion; and

f) a fabric cover covering said pad, said planar top portion and all said modular springs.

5,142,716

FOUNDATION UNIT WITH SNAP-FIT MODULAR SPRINGS

Steven E. Ogle, and Danny L. Wylie, both of Carthage, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 31, 1991, Ser. No. 786,021

Int. Cl.[5] A47C *23/04, 23/053*

U.S. Cl. 5—247 **6 Claims**

1. A foundation unit, comprising:

a) a frame;

b) a planar top portion spaced above said frame, and comprising a first plurality of spaced parallel grid wires and a second plurality of spaced parallel grid wires lying perpendicular to and connected to said first plurality of spaced parallel grid wires;

c) a plurality of modular springs extending between said planar top portion and said frame, each said modular spring comprising two vertical leg sections and a top planar section, said top planar section comprising a centermost longitudinal section and two longitudinal end sections, each said longitudinal end section being generally parallel to and offset from said centermost longitudinal section and being connected thereto by a transverse straight portion, each said longitudinal end section being connected to one of said vertical leg sections, each said vertical leg section being connected to said frame; and

d) snap-fit means securing said modular springs to said planar top portion, said snap-fit means comprising a first parallel grid wire from said first plurality of spaced parallel grid wires extending over both transverse straight portions of said modular spring, a second parallel grid wire from said first plurality of spaced parallel grid wires extending under both transverse straight portions of said modular spring, and a pair of parallel grid wires from said second plurality of spaced parallel grid wires, wherein one of said pair of parallel grid wires extends over said one of said longitudinal end sections of said modular spring and another of said pair of parallel grid wires extends over another of said longitudinal end sections of said modular spring.

5,142,717

CONSTANT PRESSURE LOAD BEARING AIR CHAMBER

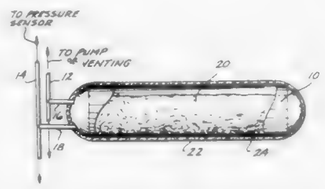
Lloyd D. Everard, Kent, Wash., and Wilbur S. Wridge, Jr., Portland, Oreg., assignors to Sustena, Inc., Kent, Wash.

Continuation-in-part of Ser. No. 261,027, Oct. 20, 1988, Pat. No. 4,995,124. This application Feb. 25, 1991, Ser. No. 660,622

The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.

Int. Cl.[5] A47C *27/08*

U.S. Cl. 5—450 **14 Claims**



1. An air mattress capable of supporting a load comprising:

an inflatable membrane defining a chamber having a chamber air pressure;

load supporting material disposed in said chamber;

a reservoir containing a quantity of air and charged to a selected pressure in fluid communication with said chamber and having a valve associated therewith controlling airflow from said reservoir to said chamber;

a selectively openable vent valve in fluid communication with said chamber;

a pressure sensor in fluid communication with said chamber for generating a sensed pressure signal representative of said chamber air pressure;

a pressure selector generating a desired pressure signal representative of a desired chamber air pressure; and

a control means connected to said reservoir valve and said vent valve and receiving said sensed pressure signal and said desired pressure signal for maintaining said chamber at approximately said desired chamber air pressure whereby when the load on said membrane causes said chamber air pressure to rise above said desired air pressure, said vent valve is opened until at least a portion of the load is supported by said load supporting material so that said chamber air pressure falls to approximately said desired air pressure and, whereby when said chamber air pressure falls below said desired air pressure, said reservoir valve is opened until said chamber air pressure rises to approximately said desired chamber air pressure.

5,142,718

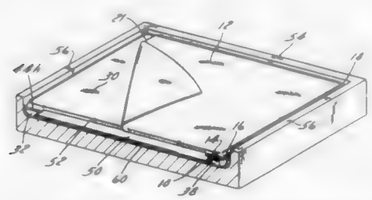
BED SHEET WITH RETAINER STRIPS TO FIT AND REMAIN SECURELY ON BED

J. W. C. Anderson, Louisville, and Frank G. Lauyans, Jr., Mt. Washington, both of Ky., assignors to Trident Manufacturing, Inc., Louisville, Ky.

Continuation of Ser. No. 542,246, Jun. 22, 1990. This application Sep. 17, 1991, Ser. No. 761,231

Int. Cl.[5] A47G *9/02*

U.S. Cl. 5—497 **5 Claims**



1. A bed sheet having a pocket for securely holding an end of a waterbed mattress, comprising:

a substantially flat sheet of material having head and foot edges and left and right edges; and

at least one retainer strip of material fastened to said sheet, said retainer strip stretching in both directions more than said substantially flat sheet of material, and substantially more in the head to foot direction than the left to right direction, said strip extending across the sheet from the left edge to the right edge and is fastened to the sheet at at least its foot edge and at said sheets left and right edges, forming a full-width pocket adapted to fit over at least one end of mattress said waterbed, in which the retainer strip will stretch in its head to foot direction over and under said at least one end of said mattress in response to dynamic forces acting upon said mattress as to retain the sheet on the mattress.

5,142,719

PATIENT SUPPORTING METHOD FOR AVERTING COMPLICATIONS OF IMMOBILITY

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation of Ser. No. 493,110, Mar. 12, 1990, abandoned, which is a division of Ser. No. 249,880, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 905,553, Sep. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,875, Oct. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,153, Dec. 17, 1984, abandoned. This application Feb. 19, 1991, Ser. No. 657,288

The portion of the term of this patent subsequent to Apr. 21, 2008, has been disclaimed.

Int. Cl.[5] A61G *7/00*

U.S. Cl. 5—609 **30 Claims**

1. A method of reducing pressure points, inhibiting the formation of bed sores, and minimizing pulmonary complications in an immobile patient comprising the steps of:

(a) inflating a plurality of transversely oriented side-by-side air bags to a selected pressure for supporting a patient thereon;

(b) inflating a first set of air bags to a pressure higher than the selected pressure to cause the patient to be rolled in a first direction;

(c) thereafter partially deflating the first set of air bags and inflating a second set of the air bags to a pressure higher than the selected pressure to cause the patient to be rolled in a second direction, the air bags of the second set being positioned between the air bags of the first set;

(d) thereafter partially deflating the second set of air bags and inflating the first set of air bags to a pressure higher than the selected pressure to cause the patient to be rolled in the first direction; and

(e) alternately repeating steps (c) and (d) while maintaining the pressure in each of the air bags at least equal to a baseline pressure.

5,142,720

POSITIONING DEVICE AND METHOD

Jimmie J. Kelso; Russell M. Hustead, both of Olathe, and Walter T. Miller, Leawood, all of Kans., assignors to Kansas Creative Device, Inc., Leawood, Kans.

Filed Jul. 22, 1991, Ser. No. 733,428

Int. Cl.[5] A61G *7/06*

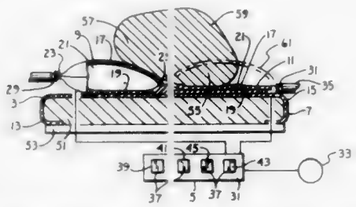
U.S. Cl. 5—630 **14 Claims**

12. A positioning device, comprising:

(a) an elongated mat constructed of flexible, sheet-like sterilizable material;

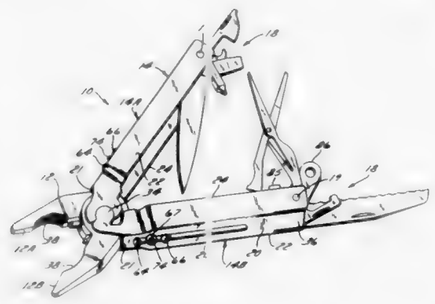
(b) a pair of elevators, each having a flexible, sterilizable outer surface; each one of said pair of elevators having an air-impenetrable compartment therein; each one of said

pair of elevators has an inboard edge; each of said pair of elevators is connected to said mat near the center of said mat; each of said pair of elevators is connected to said mat only along said inboard edge; and



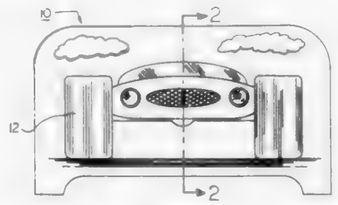
(c) control means for selectively and separately inflating and deflating each one of said pair of elevators.

5,142,721
POCKET TOOL WITH RETRACTABLE JAWS
George C. Sessions; Chuck D. Mills, both of Milwaukie; Bradford J. Parrish, Oregon City, and Douglas R. Hutchens, Lake Oswego, all of Oreg., assignors to Fiskars OY AB, Helsinki, Finland
Filed Mar. 8, 1991, Ser. No. 666,367
Int. Cl.[5] B25B 7/22
U.S. Cl. 7—128 47 Claims



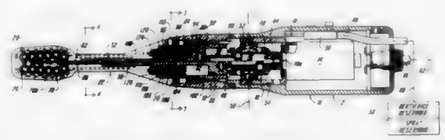
1. A tool with retractable cross-jaws capable of being moved into an exposed operating position by a single hand using inertial force, said tool comprising:
first and second jaws, each including a working portion and a tang interconnected by a bearing portion, said jaws being pivotally connected at said bearing portions to form said cross-jaws;
first and second handles, each including an internal channel therein;
means for slidably coupling said tangs to said handles for selective movement within said handle channels between an extended position in which said jaw working portions are disposed forward of said handles and are capable of pivotal movement with respect to each other in response to divergence and convergence of said handles, and
a retracted position in which said working portions are at least partially contained within said handle channels such that said working portions are prevented form substantial pivotal motion relative to each other, and said handles are prevented from substantially diverging; and
releasable biasing means for preventing said jaws from sliding with respect to said handles when said jaws are in said extended position.

5,142,722
TRANSFER PRINTING OF FURNITURE END PIECES
Kenneth W. Kolb, Louisville, Ky., assignor to Rosalco, Inc., Jeffersonville, Ind.
Filed Feb. 27, 1991, Ser. No. 661,678
Int. Cl.[5] D06P 3/54, 7/00
U.S. Cl. 8—471 9 Claims



1. A process for applying a disperse dye printed pattern to a wooden substrate comprising the steps of:
(a) applying an organic polymeric coating containing a pigment onto one surface of the substrate;
(b) curing said organic polymeric coating;
(c) applying a printed image to said organic polymeric coating by applying a carrier sheet containing sublimable dyes thereon;
(d) positioning a pad adjacent to the surface of the substrate having said carrier sheet applied thereto; and
(e) heating said disperse dyes on said carrier sheet under pressure to transfer the dyes onto said organic polymeric coating, wherein step (e) further includes heating both surfaces of the substrate and wherein the heated temperature of the surface of the substrate opposite said carrier sheet is about 10 to 15 degrees F greater than the heated temperature of the surface of the substrate adjacent to said carrier sheet.

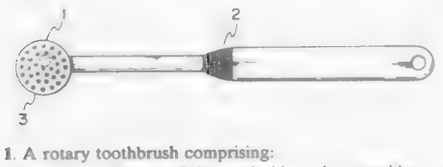
5,142,723
TOOTH CLEANING APPARATUS HAVING POWERED BRUSH AND SPRAY
L. Paul Lustig, 304 Greenwood St., Newton, Mass. 02159, and Andrew Tybinkowski, Boxford, Mass., assignors to L. Paul Lustig, Newton Centre, Mass.
Filed Nov. 9, 1990, Ser. No. 611,898
Int. Cl.[5] A61C 17/36; B08B 13/04
U.S. Cl. 15—22.1 5 Claims



1. Dental appliance apparatus comprising
A. manually deployable housing means,
B. power means mounted within said housing means, said power means including means for actuating brush elements of a dental brush tool and including means for controlling delivery of liquid to a dental tool,
C. a first tool mount on said housing means for removably and replaceably mounting any one of a dental brush tool and a dental spray tool to said housing means,
D. said dental brush tool having actuatable brush elements and having a second tool mount that couples removably and replaceably with said first tool mount for mounting said brush tool to said housing means operably coupled with said actuating means for actuating said brush elements for movement relative to the second tool mount, and

E. said dental spray tool having a liquid-discharging spray element and having a third tool mount that couples removably and replaceably with said first tool mount for mounting said spray tool to said housing means alternative to said brush tool and operably coupled with said controlling means for the delivery to said spray element of liquid supplied to said power means.

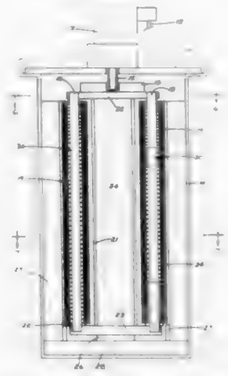
5,142,724
ROTARY TOOTHBRUSH
Sa R. Park, 703-405 Chugong Apt., Keapo-Dong, Kangnam-Ku, Seoul, Rep. of Korea 135-240
PCT No. PCT/KR90/00003, § 371 Date Oct. 4, 1990, § 102(e) Date Oct. 4, 1990, PCT Pub. No. WO90/09121, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 17, 1990, Ser. No. 576,479
Claims priority, application Rep. of Korea, Feb. 18, 1989, 89-1671; May 16, 1989, 89-6352
Int. Cl.[5] A46B 7/08
U.S. Cl. 15—28 6 Claims



1. A rotary toothbrush comprising:
a round brush head defining an inside and an outside;
a plurality of bristles arranged on said inside of the round brush head;
a grip member; and
a shaft member extending from said grip member, said shaft member rotatively connected to an eccentric aperture disposed on said outside of the round brush head at the end of the shaft member, said eccentric aperture being disposed between a short radius and a long radius, whereby the round brush head rotates more effectively and efficiently so as to perfectly clean the teeth.

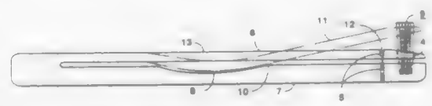
5,142,725
CARROUSEL PLATE WASHOUT UNIT
Timothy B. Hayes, 68 W. Raleigh, Mansfield, Ohio 44907, and Orville L. Hayes, Jr., 615 Orchard Dr., Mansfield, Ohio 44904
Filed Apr. 9, 1990, Ser. No. 506,686
Int. Cl.[5] A46B 13/04
U.S. Cl. 15—77 15 Claims

1. An apparatus for removing a portion of a coating comprising:
a. a tank which can be filled with an solvent; and,
b. a means inside the tank for supporting a flexible plate in a substantially cylindrical configuration; and,
c. a means inside said tank for mounting a brush means;
d. a means for brushing mounted on said mounting means such that the brush means is inside the cylindrical configuration defined by a plate when said plate is mounted on said support means;



e. a means for rotating the mounting means such that the brush means brushes coating from a plate mounted on said support means.

5,142,726
ADJUSTABLE BRISTLE LENGTH TOOTHBRUSH
Robert F. Mann, 11916 SW. Cove Rd., Vashon, Wash. 98070
Filed Apr. 3, 1991, Ser. No. 679,789
Int. Cl.[5] A46B 15/00
U.S. Cl. 15—167.1 5 Claims



1. A toothbrush comprising:
an elongated brush body having a handle end and a head end disposed opposite said handle end;
a plurality of flexible bristles extending perpendicularly to the length of said brush body, said bristles having an attachment end and a free end;
a rigid and fixed connection between said attachment end of said plurality of bristles and said head end of said brush body;
an appendage disposed longitudinally adjacent and parallel to said brush body, said appendage having a first end positioned adjacent and attached to said handle end of said brush body, a second end positioned adjacent said head end of said brush body, an intermediate portion disposed between said first and second ends, and a means for encircling said bristles at said second end of said appendage;
a means to allow said second end of said appendage to bend upwardly to a projected position in response to a downward pressure exerted at said intermediate portion of said appendage;
means to bias said second end of said appendage to an unbent position wherein said encircling means of said second end lies adjacent to said connection of said bristles to said head end of said brush body, said unbent position corresponding to a retracted position of said appendage;
said appendage bending means comprises a depression within said brush body located between said head end and said handle end of said brush body, said depression having a brim at a forward end of said depression to act as a bending fulcrum for said appendage, said intermediate

portion of said appendage located above said depression to allow a portion of said appendage to contact and bend upon said brim and subsequently force said second end to said projected position;

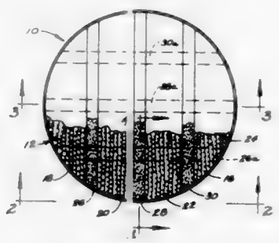
wherein, said retracted position defines a normal length of said bristles between said free end of said bristles and said second end of said appendage for contacting a person's teeth, said projected position defines a shorter length of said bristles between said free end of said bristles and said second end of said appendage for contacting a person's teeth.

5,142,727

CARPET SCRUBBING BONNET

James A. Koester, 3195 Wendover, Troy, Mich. 48084

Filed Oct. 28, 1991, Ser. No. 783,859
Int. Cl.[5] A47L *11/14*
U.S. Cl. 15—230 7 Claims



1. A carpet cleaning bonnet comprising:

(a) a backing member comprising a circular fabric pad;

(b) a plurality of spaced apart cleaning solution absorbent areas formed on said backing member;

(c) a plurality spaced apart scrubbing brush areas, formed on said backing member between said cleaning solution absorbent areas;

(d) said cleaning solution absorbent areas being spaced apart across the diameter of the backing member by means of the scrubbing brush areas and,

(e) said scrubbing brush areas comprises brush fibers disposed in parallel strips on the backing member and extending completely across the backing member, between the cleaning solution absorbent areas.

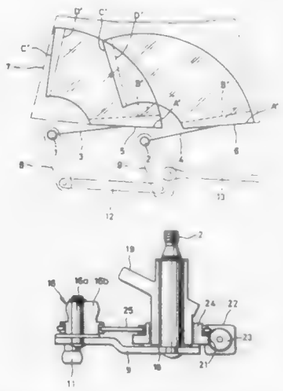
5,142,728

WINDSHIELD WIPER WITH VARIABLE WIPING STROKE

Tokihiko Yamamoto, Kariya, and Ryoichi Fukumoto, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1989, Ser. No. 436,703
Claims priority, application Japan, Nov. 16, 1988, 63-287630
Int. Cl.[5] A47L *1/00*; B60S *1/04*
U.S. Cl. 15—250.13 12 Claims

3. A variable stroke drive mechanism for a vehicle windshield paper, said mechanism comprising: main lever means, wiper actuating means, connecting means for connecting said main lever means and said wiper actuating means, said connecting means including first pin means, wiper arm means, second pin means for pivotally supporting said main lever means and said wiper arm means, said wiper actuating means including means for driving said main lever means to swing about said second pin means, said connecting means further including first eccentric means pivoted about said first pin means and connected with said wiper actuating means so that rotation of said first eccentric means causes a change in the distance between said second pin means and the connection between said main lever and said wiper actuating means, second eccentric means provided about said second pin means, interconnecting means for connecting said first and second



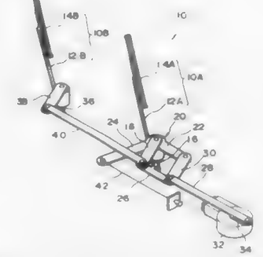
eccentric means, and stroke adjusting means for effecting a rotation of said second eccentric means.

5,142,729

WINDSHIELD WIPER APPARATUS INCLUDING RISE-UP MECHANISM

Shinji Imamura, Kosai, Japan, assignor to Asmo Co., Ltd., Shizuoka, Japan

Filed Oct. 22, 1990, Ser. No. 600,824
Claims priority, application Japan, Oct. 23, 1989, 1-275597; Mar. 12, 1990, 2-60730
Int. Cl.[5] B60S *1/06*
U.S. Cl. 15—250.16 21 Claims



1. A windshield wiper apparatus for a vehicle having a wiper motor, a first pivot shaft, a first wiper arm connected to said pivot shaft, a first link rod disposed between said motor and said first wiper arm for driving said first wiper arm during the operation of said wiper motor, and a first pivot lever having one end secured to said first pivot shaft and which undergoes a predetermined reciprocal rotation together with said first pivot shaft in response to movement of said first link rod in order to reciprocally rotate said first wiper arm, said windshield wiper apparatus for a vehicle comprising:

a first link having one end connected to said first pivot shaft such that said first link is rotatable relative to said first pivot shaft;

a second link having one end connected to a second end of said first pivot lever and having a second end connected to said first link rod;

a third link having one end connected to a second end of said first link, wherein said second link and said first link rod are connected to said third link; and

rotating means connected to said first link and being operative to rotate said first link to a predetermined wiping operating position and hold said first link in said wiping operation position during wiping operation of said windshield wiper apparatus, and being operative to rotate said first link about said first pivot shaft to a predetermined storage position whereby the windshield wiper apparatus is in a storage position.

5,142,730

LIQUID SPILL CLEAN-UP DEVICES

Jorma G. Braks, and Maxime A. Corso, both of 105 Northland Drive, Unit E, Waterloo, Ontario, Canada N2V 1Y8

Filed Aug. 22, 1991, Ser. No. 748,702
Int. Cl.[5] A47L *5/18*
U.S. Cl. 15—327.5 4 Claims

1. Apparatus for picking up spilt liquids from floor surfaces, comprising:

a container for receiving the spilt liquid, said container having a capacity of from about three to about ten gallons, and being provided with mounting means to allow the apparatus to be mounted manually and stored on a wall surface in an elevated position;

said mounting means of the container comprising an upstanding peripheral lip surrounding the top edge of the container adapted to be received and held by a depending hooked formation of a wall-mounted bracket, and a generally flat base adapted to rest on a flat base of the wall bracket spaced a distance from the hooked formation substantially corresponding to the height of the container;

a flexible hose having a proximal end communicating with the interior of the container and a distal and equipped with a pick-up head;

pneumatically operated suction means adapted to create reduced pressure in the interior of said container to effect drawing of liquid from the distal end of the hose into the container;

a shut off valve incorporated in the suction means, adapted to shut off the suction means when the container is filled with liquid to a predetermined level;

connection means for connecting said suction means to a source of compressed gas;

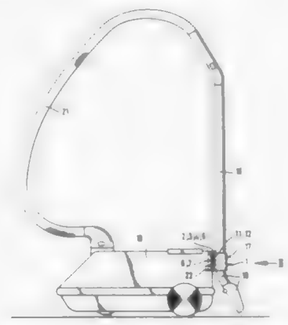
said apparatus being constructed entirely from non-electrically operated components.

5,142,731

DOMESTIC ELECTRICAL VACUUM CLEANER WITH SUCTION TUBE HOLDER

Gerald Resch, Rodgau, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Aug. 10, 1990, Ser. No. 565,350
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926743
Int. Cl.[5] A47L *9/00*
U.S. Cl. 15—339 9 Claims



1. A domestic electrical vacuum cleaner, comprising:

an appliance housing;

a suction hose releasably secured to the housing;

a suction tube and a suction nozzle arranged on the suction hose; and

coupling means for connecting at least one of the suction tube and the suction nozzle to the appliance housing, the coupling means (1) including two adjacent spaced longitudinal L-shaped sections (2, 3), each L-shaped section having a web (4, 5) and a flange (6, 7) which are of unequal length, the flange (6, 7) being arranged at one end of the webs (4, 5) of the L-shaped sections (2, 3) being spaced and fixedly secured to one of the suction tube or the suction nozzle at ends remote from the flanges (6, 7) of the L-shaped sections, the coupling means further including two L-shaped retaining members (11, 12) with legs of unequal length and with opposing flanges (13, 14) formed on the appliance housing (10) at a spacing from one another, the spacing between the opposing flanges (13, 14) being at least equal to the spacing of the webs (4, 5) of the L-shaped sections (2, 6), the opposing flanges (13, 14) being engageable behind the flanges (6, 7) of the L-shaped sections (2, 3) in a coupling position.

5,142,732

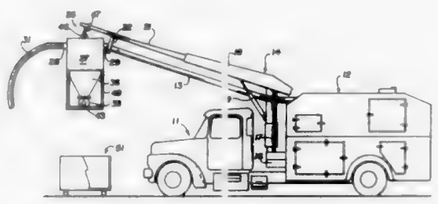
BULK SEPARATOR FOR INDUSTRIAL VACUUM MACHINE

Henry J. Davis, c/o A-D Machinery Sales Co., 1025 E. Oak St., Stockton, Calif. 95205

Filed Sep. 28, 1990, Ser. No. 589,991
Int. Cl.[5] A47L *5/38*
U.S. Cl. 15—352 6 Claims

1. A bulk separator comprising a vacuum-tight casing having an inlet, an outlet, a casing bottom, a valve in said bottom, said valve being vacuum-tight and having means to discharge bulk material separated in said casing out of said casing, an industrial vacuum machine having a machine inlet, a first hose between said machine inlet and said separator outlet; a second

hose extending from said separator inlet, a boom on said vacuum machine and means on said boom to support said first



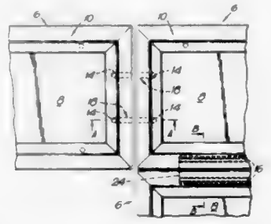
hose, and a lift eye on said separator and means connecting said lift eye and said boom to support said separator.

5,142,733

MAT HOLDERS

Philip Mogel, High Halden, and John Calvert, Epping, both of Great Britain, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 14, 1990, Ser. No. 628,301
Claims priority, application United Kingdom, Dec. 15, 1989, 8928367
Int. Cl.[5] A47G 27/04; A47K 7/02
U.S. Cl. 16—8 16 Claims



1. A holder for a flexible floor mat, the holder comprising:
a base having at least one connecting means; and
at least one flexible connecting member means having two ends and at least two complementary connecting means adapted to releasably engage the base connecting means with at least one aperture being defined by the connecting member means at a location between the two complementary connecting means whereby one end of the connecting member means is adapted to move slightly relative to the other end of the connecting member means, in a direction in a plane of the connecting member means perpendicular to said aperture; and
whereby the connecting member is adapted to releasably connect at least two adjacent mat holders to secure the holders together.

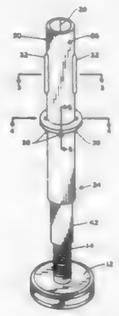
5,142,734

GLIDE SUPPORT ASSEMBLY

James A. Looman, Holland, and Thomas I. Kane, West Olive, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Sep. 26, 1990, Ser. No. 588,364
Int. Cl.[5] B60B 33/04; A47B 91/06; B21B 15/00; F16M 11/12
U.S. Cl. 16—19 17 Claims

1. A glide support assembly comprising a length of tubing having upper and lower portions, said lower portion defining an internal screw thread for threadedly receiving a threaded stem of a glide, an upper portion for reception in a bore in an article to be supported by such glide, said upper portion being formed with a rotation preventing projections to be driven into an article for preventing rotation of said tubing into an article bore, and a stop positioned below said upper portion for limiting movement of said tubing into an article, characterized in



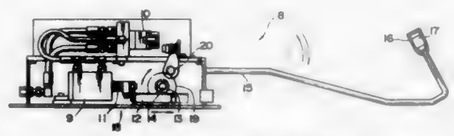
that said tubing is formed of rolled sheet metal and has a longitudinal seam.

5,142,735

DOOR OPEN POSITION FIXING DEVICE

Kazunori Konishi, Hyogo, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 15, 1991, Ser. No. 700,259
Claims priority, application Japan, May 15, 1990, 2-50976 [U]
Int. Cl.[5] E05F 5/02; B25J 11/00
U.S. Cl. 16—82 2 Claims



1. A door open position fixing device including:
a presser member comprising means to abut against a vehicle door openable up to a predetermined angle, said predetermined angle being different for vehicles of different kinds;
a driving mechanism for swingably driving said presser member to make said presser member press said door in an opening direction thereof and maintain an open condition of said door;
detecting means for detecting a swing degree of said presser member; and
control means for storing said predetermined angle for different kinds of vehicles, for reading said predetermined angle from said storing means, for comparing the detected swing angle with the predetermined angle and for controlling said driving mechanism to swingably drive said presser member so as to press said door in the opening direction until said swing degree of said presser member detected by said detecting means becomes equal to said predetermined angle.

5,142,736

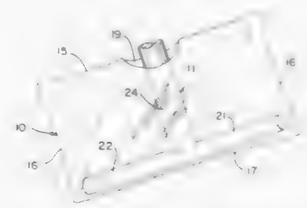
DISPOSABLE SLEEVE FOR COVERING HANDLES OF DENTIST'S LIGHTS AND METHOD OF USING THE SAME

Paul Kuehn, Eau Claire, Wis., and Thomas A. Lansing, Pine Springs, Minn., assignors to Pinnacle Products, Inc., Eau Claire, Wis.

Filed Sep. 20, 1990, Ser. No. 585,490
Int. Cl.[5] G05G 1/00
U.S. Cl. 16—111 R 7 Claims

1. A protective sleeve adapted to cover the handle of a dentist's light, comprising:

two flexible flat plastic film panels joined together at four edges to enclose an interior and a notch in the panels at a central part of the panels together defining an aperture in



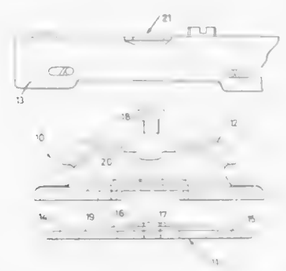
the sleeve and adapted in size and shape to admit a light handle of a dentist's light therethrough, the aperture formed along one edge part way across the width of the sleeve at the center of the edge.

5,142,737

BASE WITH ADJUSTABLE ELEMENTS FOR A HINGE WING

Franco Ferrari, Frazione Deviscio, 2 - 22053 Lecco, Como, and Carlo Migli, Lecco, both of Italy, assignors to Franco Ferrari, Lecco, Italy

Filed May 9, 1991, Ser. No. 698,160
Claims priority, application Italy, May 11, 1990, 21161/90[U]
Int. Cl.[5] E05D 11/10
U.S. Cl. 16—235 4 Claims



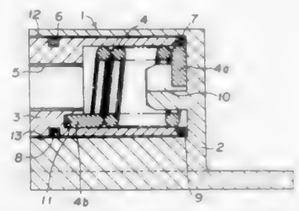
1. A hinge base of the type having coupling surfaces for an elongated wing of a furniture hinge onto which it can be fitted the base comprising a first element having an upper part provided with said coupling surfaces and a lower part having a recessed housing; a second element being elongated and having a securing through hole at each end adapted to receive screws to secure it to a piece of furniture, the first element including a centrally disposed connecting through hole for the shank of a screw for securing the first element to the second element, said recessed housing being shaped to receive said elongated second element in at least first and second positions relatively angularly spaced by 90° about said connecting through hole axis, said first element being configured to cover the ends and the securing through holes of said second member when said second member is disposed in said first receiving position in said recessed housing, and to expose the ends and the securing through holes of said second member when said second member is disposed in said second receiving position in said recessed housing.

5,142,738

HINGE DEVICE

Juji Ojima, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jul. 24, 1991, Ser. No. 735,051
Claims priority, application Japan, Jul. 24, 1990, 2-195185
Int. Cl.[5] E05F 5/08
U.S. Cl. 16—306 4 Claims



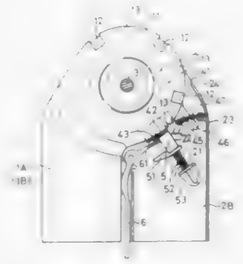
1. A hinge device having a case to be connected to one of a stationary component and a rotatable component, a rotatable cylinder to be connected to another of said stationary component and said rotatable component, and rotatably supported by said case, a high viscosity substance filled in a gap between said case and said rotatable cylinder, and a coil spring mounted between an end wall of said case and said rotatable cylinder, comprising:
a non-circular bearing formed coaxially on said rotatable cylinder into which a connecting rod is inserted;
an elastic "O" ring inserted into a gap formed by said end wall of said case and a chamfered end of said rotatable cylinder so as to seal said high viscosity substance;
an axial hole formed on said non-circular bearing into which a hook of said coil spring is inserted; and
a groove formed on a shaft portion protruding from said end wall of said case into which another hook of said coil spring is inserted.

5,142,739

LOCKABLE HINGE JOINT FOR FOLDING LADDERS

Sung C. Lin, Taipei, Taiwan, assignor to Palhood Industries Corporation, Taipei, Taiwan

Filed Jul. 2, 1991, Ser. No. 724,883
Int. Cl.[5] E05D 11/10
U.S. Cl. 16—326 8 Claims



1. A lockable hinge joint, comprising:
two inner shell halves forming a disk portion at one end thereof and a base portion at the other end thereof;
two outer shell halves forming a circular lid portion at one end thereof covering the outer surfaces of said disk portion of said two inner shell halves and a base portion at the other end thereof, said two outer shell halves having a central pivot bolt rotatably connecting said circular lid portion thereof to said disk portion of said two inner shell halves, and one said outer shell half defining an annular

space together with one said inner shell half at said circular lid portion;

a ring plate rotatably disposed in said annular space and coaxial with said circular lid portion and said disk portion, said ring plate having an extension on one side thereof, said extension having a stop formed thereon outside of said disk portion bent relative to the plane of said ring plate, and said ring plate further having a tension spring connecting said ring plate to an adjacent said outer shell half;

a plurality of spaced notches defined in the curved peripheral edge of said disk portion of said two inner shell halves;

a locking pawl disposed between said two outer shell halves for radial movement relative to said disk portion into and out of said notches of said disk portion; and

a pull handle pivotably connected between said two outer shell halves having a portion thereof engageable with said locking pawl for moving said locking pawl out of said notches;

wherein said stop of said ring plate is movable under the tension force of said spring to a position between said locking pawl and a said notch to prevent said locking pawl from entering said notch.

5,142,740

TOILET COVERING HINGE ASSEMBLY

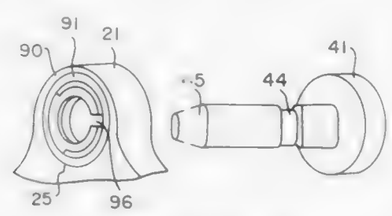
Tsutomu Amaki, Toyonaka, and Tsutomu Okumoto, Osaka, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 7, 1991, Ser. No. 711,777

Claims priority, application Japan, Jun. 9, 1990, 2-60878[U]; Jun. 9, 1990, 2-60879[U]; Jun 9, 1990, 2-60880[U]

Int. Cl.[5] E05D *5/12;* **A47K** *13/12*

U.S. Cl. 16—381 **10 Claims**



1. A hinge assembly for mounting a toilet covering to the rear of a toilet for rotation of the toilet covering about a hinge axis between a lowered and a raised position, said hinge assembly comprising:

a hinge element provided at the rear end of said toilet covering and having a bore extending along said hinge axis;

a hinge shaft extending through said bore to rotatively support said toilet covering

support means provided on the side of said toilet for receiving one end of said hinge shaft to permit said toilet covering to pivot about said hinge axis relative to said toilet; and

a retainer spring secured to said hinge element adjacent to said bore for latching said hinge shaft against an axial movement thereof, said retainer spring comprising an outer section and an inner section having an inner edge projecting radially inwardly of said bore and capable of being resiliently deformed into and out of latching engagement with a stepped shoulder in the outer surface of said hinge shaft, wherein said retainer spring comprises said outer section in a form of an annulus and said inner section in the form of a C-shaped ring with a slit, said C-shaped ring being struck from said annulus to be integrally connected thereto at a portion diametrically opposite of said slit so as to define a pair of resilient legs extending oppositely from that portion to said slit for engagement with said stepped shoulder of the said hinge shaft at the inner edges thereof, said C-shaped ring having a thickness less than said annulus to define said clearance between the corresponding faces of said annulus and said C-shaped ring when said annulus is adhered to said hinge element at one end of said bore.

5,142,741

CARDING ELEMENTS WITH VARIABLY INCLINED TEETH FOR WORKING TEXTILE FIBERS AND METHOD

Robert Demuth, Nurensdorf; Peter Fritzsche, Winterthur; Eduard Nüssli, Wiesendangen, and Paul Stäheli, Wilen bei Wil, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Dec. 4, 1990, Ser. No. 621,979

Claims priority, application Switzerland, Dec. 4, 1989, 348/89

Int. Cl.[5] D01G *15/08, 15/24, 15/80*

U.S. Cl. 19—113 **19 Claims**

1. A method of fine cleaning or carding textile fibres between a rotating drum of a fine clearing or carding machine and carding elements surrounding the drum and having clothing elements thereon, with the clothing elements on different ones of said carding elements differing from one another, wherein said clothing elements on a first carding element in a group of adjacent carding elements, arranged one following another in the direction of drum rotation, have a working angle which differs from the working angle of the clothing elements on a later carding element in said group in a manner to cause the clothing elements of said first carding element in said group to exert a less severe carding action on said fibers than the clothing elements on said later carding element, so that a effect increases over a predetermined peripheral zone of said drum occupied by said group of adjacent carding elements

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5,142,742

MAIN CYLINDER CASING SEGMENT

Daniel Erni, Frauenfeld, and Paul Staheli, wilen bei Wil, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Dec. 4, 1990, Ser. No. 621,841

Claims priority, application Switzerland, Dec. 4, 1989, 04349/89

Int. Cl.[5] D01G *15/08, 15/24, 15/32*

U.S. Cl. 19—113 **28 Claims**

1. A main cylinder casing segment for use with a revolving flat on a card, said segment comprising:

opposite end portions, for fastening on a frame of said card, and a longitudinal body between said end portions for covering the main cylinder;

said body comprising two plate-shaped parts, a first of said two plate-shaped parts having a surface being inwardly directed toward a working area of said card during operation of said card, a second of said two plate-shaped parts comprising a stiffener for segment; and

at least one longitudinally extending intermediate wall for connecting said first plate-shaped part with said second plate-shaped part and for transferring bending stresses between said parts.

5,142,743

ADJUSTABLE BUNDLING DEVICE

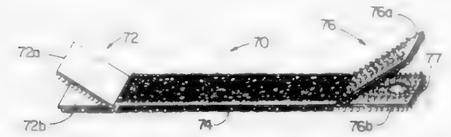
Blake S. Hahn, 529 Van Ness Ave., Torrance, Calif. 90501

Continuation-in-part of Ser. No. 241,010, Sep. 2, 1988, Pat. No. 4,939,818. This application Jul. 9, 1990, Ser. No. 550,252

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—16 R **12 Claims**



2. A bundling device comprising a flexible strap member with a top surface and a bottom surface and having (a) a center portion, (b) a first end portion attached to one end of the center portion, and (c) a second end portion attached to the other end of the center portion,

the center portion having a first type fastening material on the top and bottom surfaces thereof,

the first end portion having a second type fastening material on the top and bottom surfaces thereof, and

the second end portion also having the second type fastening material on the bottom surface thereof,

wherein the first type fastening material on the center portion is selected from the group consisting of hook type fastening material and loop type fastening material and the second type fastening material on the first and second end portions is the fastening material other than that on the center portion.

5,142,744

IGNITION SYSTEM WIRING HARNESS AND SPRING CLIP RETAINERS THEREFOR

E. Eugene Bruning, Normal, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 625,255, Dec. 10, 1990, Pat. No. 5,060,625. This application Aug. 12, 1991, Ser. No. 743,659

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—16 R **4 Claims**

1. A spring clip retainer for firmly holding flexible elongate members of various cross sectional sizes comprising;

a bracket having spaced apart slots therein;

a normally flat elongate spring clip deflected around the flexible elongate member and having opposite end portions slidably extending through the slots in the bracket;

means for retaining at least one of the end portions in the respective slot; and

wherein each of the end portions of the spring clip has an enlarged end thereon and one of said slots has a "T" shape, and the other of the slots has a rectangular shape.

5,142,745

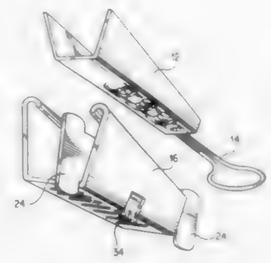
DROP WIRE CLAMP

Thim Setty, Edison, and Gene Coll, Cranford, both of N.J., assignors to Diamond Communication Products, Inc., Garwood, N.J.

Filed Mar. 22, 1991, Ser. No. 673,530

Int. Cl.[5] F16G *11/04*

U.S. Cl. 24—136 R **9 Claims**



1. A drop wire clamp device, said device comprising:

a wedge;

a bail wire protruding from said wedge;

a shell, said shell having an opening for receiving said wedge;

a shim, said shim having a plurality of substantially elliptical dimples formed therein, said shim being disposed within said shell, between the wire and the wedge, to maintain the wire in proper position without chafing the wire; and

pivot means for pivoting said shim within said shell, said pivot means including two inverted L-shaped prongs projecting from a mid-portion of said shim, and an opening formed in a mid-portion of said shell for accommodating said prongs therein, wherein said prongs engage the shell to hold the shim captive in the shell.

5,142,746

FASTENER MEANS

Tamao Morita, Tokyo, Japan, assignor to Tarmo Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1991, Ser. No. 790,990

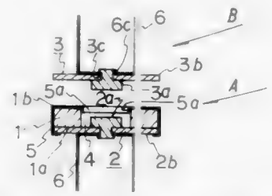
Claims priority, application Japan, Dec. 11, 1990, 2-409967

Int. Cl.[5] A44B *21/00*

U.S. Cl. 24—303 **3 Claims**

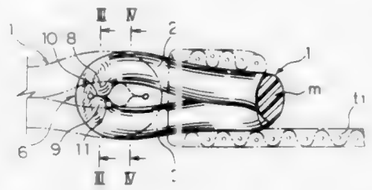
1. A fastener means comprising a permanent magnet having

a through-hole extending between the magnetic poles, a ferromagnetic member attached to one of the magnetic pole surfaces, and a ferromagnetic member attached to the other magnetic pole surface, which is characterized in that said ferromagnetic members are detachably attracted to each other via said through-hole, and that the surfaces of the permanent



magnet to which said ferromagnetic members are not attached, excluding the inner peripheral surface of the through-hole or including the inner peripheral surface of the through-hole at the mouth, are covered with a ferromagnetic material having the thickness of from 0.03 mm to 0.20 mm to minimize the flux leakage without substantially decreasing usable attraction force of the fastener means.

5,142,747
STRUCTURE OF COUPLING HEAD PORTION FOR COILED SLIDE FASTENER ELEMENT
Haruo Matsushima, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Jul. 3, 1991, Ser. No. 725,464
Claims priority, application Japan, Jul. 3, 1990, 2-176699
Int. Cl.[5] A44B *19/12*
U.S. Cl. 24—391 **1 Claim**



1. A coiled slide fastener element made by bending a monofilament of synthetic resin so as to have an upper leg portion, a coupling head portion, a lower leg portion, and a connecting portion in succession, wherein said coupling head portion comprises:

bent portions on an inner side of said coupling head portion, each of said bent portions terminating in bulging portions on opposite sides of said coupling head portion;

said bent portions being substantially semi-circular in cross-section and confronting each other via flat portions thereof, said flat portions being substantially in contact with each other;

wherein said bulging portions are relatively thick, and have a gently-sloped, non-recessed contour; and

whereby said contour and thickness of said bulging portions increases the coupling area of said coupling head portion.

5,142,748
BELT BUCKLE WITH INTERLOCKING DUAL TONGUE AND FLOATING PEG
James R. Anthony, Carmel; Michael A. Wiseman, Indianapolis, and Allan R. Lortz, Carmel, all of Ind., assignors to Indiana Mills and Manufacturing, Inc., Westfield, Ind.
Continuation-in-part of Ser. No. 536,170, Jun. 11, 1990, Pat. No. 5,038,446, which is a continuation-in-part of Ser. No. 370,240, Jun. 22, 1989, Pat. No. 5,023,981. This application Jun. 13, 1991, Ser. No. 714,710
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—573.5 **13 Claims**

1. A belt buckle-tongue combination comprising:

a buckle main body;

tongue means insertable along a plane into said buckle main body with said tongue means releasable lockable with said buckle main body;

a latch positioned in said main body and held captive therein, said latch movable in a linear direction between a latched position with said tongue means and an unlatched position;

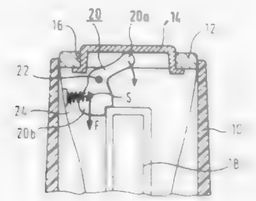
a floating peg slidably mounted to said main body and oriented so that the axis of said peg is aligned with the direction of linear motion of said latch when said latch moves between said latched and said unlatched position;

first means operably associated with said peg and said latch to move said peg to move said said latch back and forth between said latched position and said unlatched position; and

guide means mounted within said main body for defining an axis of movement for said peg and limiting movement of said latch, said guide means receiving said peg therein to confine movement of said peg along a single axis and limit said latch from assuming a position askew to said plane.

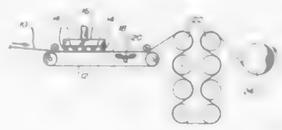
5,142,749
BUCKLE FOR VEHICLE SAFETY BELTS
Dieter Biller, Alfdorf-Brech, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany
Filed Mar. 11, 1992, Ser. No. 849,473
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1991, 9103556[U]
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—636 **5 Claims**

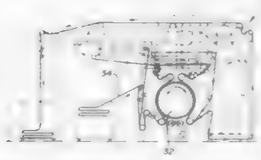
1. A buckle for vehicle safety belts comprising a loadbearing housing and a release button which is displaceably guided in said housing, said release button being biased by spring force into a rest position and comprising an actuating face, said actuating face of the release button being formed on a pushbutton which is integrated into said release button and guided displaceably in said release button over a limited travel distance in the displacement direction of the release button and is biased by spring force into a rest position, said release button carrying a two-armed blocking lever pivotally mounted thereon around a pivot axis and having a first lever arm which bears on said pushbutton and a second lever arm which, when said pushbutton (**14**) is in said rest position, lies opposite a stop member of the loadbearing housing, said second arm of the



blocking lever, when the pushbutton is depressed with respect to the release button, being pivoted away from said stop member to be moved past said stop member, and the spring force biasing the blocking lever into its rest position being smaller than the spring force biasing the release button into its rest position, the center of gravity of said blocking lever lying on the outer side of a plane running through said pivot axis of the blocking lever and parallel to a longitudinal direction of the buckle.

5,142,750
ABSORBENT WOUND DRESSING
John Dyer, Randolph; Grace Mathews, Princeton, and Matthew M. Major, Sayreville, all of N.J., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.
Division of Ser. No. 304,156, Jan. 31, 1989, Pat. No. 5,062,418. This application Jan. 30, 1991, Ser. No. 648,501
Int. Cl.[5] D06C *11/00;* **D04H** *1/06*
U.S. Cl. 26—29 R **5 Claims**





1. A method for producing a soft, bulky, highly absorbent nonwoven fabric comprising the steps of:

a. supporting a layer of staple length fibers on a porous forming belt, whose long direction defines a machine direction, the belt having alternating liquid impervious deflecting zones and liquid pervious entangling zones extending transversely to the machine direction,

b. moving the supported layer in the machine direction through a fiber rearranging zone within which streams of high pressure water are projected directly onto the layer.

c. passing the streams of water through the layer and support member in the fiber rearranging zone to form a nonwoven fabric having a repeating pattern of spaced parallel ribs extending in the cross direction of said fabric, each of said ribs comprising a highly entangled fibrous mass, and a plurality of spaced parallel and substantially straight fiber bundles ending between and interconnecting adjacent ribs with said fiber bundles being oriented in the machine direction of said fabric and substantially perpendicular to said ribs,

d. providing the fibers to the belt at a rate that will form fabric having a basis weight of from about 1.2 to 2.5 oz-/yd^2, and

e. subjecting said nonwoven fabric to a napping process on at least one side thereof, using a napping apparatus that comprises a plurality of napping wires, by directing the napping wires against the fabric in the machine direction of said fabric, said napping wires being substantially parallel to said fiber bundles and perpendicular to the ribs of said fabric, thereby raising and bulking the fibers in said rib areas of said fabric while leaving the fibers in said bundles extending between said ribs substantially undisrupted.

5,142,751
WEFT STRAIGHTENER
Shozi Senba, Osaka, Japan, assignor to Tsuchiya Machinery Co., Ltd., Kyoto, Japan
Filed Mar. 21, 1991, Ser. No. 672,912
Claims priority, application Japan, Mar. 31, 1990, 2-87247
Int. Cl.[5] D06C *3/00*
U.S. Cl. 26—51.3 **16 Claims**

1. In a weft straightener having a machine frame (**10**); a pair of wheels (**18**) for holding each selvedge of a cloth (**1**) on an outer periphery (**19**) of each wheel (**18**); wheel supporting means (**11** to **14**, **16**, **20**) for keeping each wheel (**18**) rotatably, inclinably and widthwise-movably on each side of the machine frame (**10**); wheel inclination adjusting means (**15**, **31** to **36**) for adjusting each wheel (**18**) to a desired inclination angle; wheel position adjusting means (**51** to **55**) for adjusting each wheel (**18**) to a desired position in a widthwise direction; and means for providing a difference of rotation speed between said wheels (**18**), while the cloth (**1**) is travelling with each said selvedge held on an outer periphery (**19**) of each wheel (**18**) and with a weft of said cloth skewed, so as to straighten said skewed weft of the cloth (**1**), the improvement comprising:

drum means (**66**, **67**), mounted inclinably and projectingly on an inside of each wheel (**18**), for supporting an edge portion of said cloth when a corresponding portion of said selvedge disconnects from said wheel outer periphery;

drum supporting means (**61**, **65**) for keeping each drum means (**66**, **67**) rotatably and substantially in a widthwise direction on each side of the machine frame (**10**); and

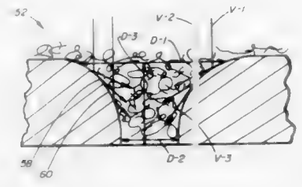
drum rotating means (**63**) for enabling each drum means (**66**, **67**) to rotate interlocking with each wheel (**18**).

5,142,752

METHOD FOR PRODUCING TEXTURED NONWOVEN FABRIC

John M. Greenway, Westwood, and Russell H. Hughes, Wrentham, both of Mass., assignors to International Paper Company, Purchase, N.Y.

Filed Mar. 16, 1990, Ser. No. 494,705
Int. Cl.[5] D04H *1/46*
U.S. Cl. 28—105 10 Claims



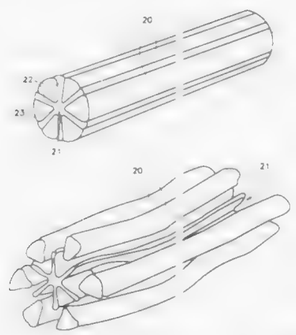
1. A method for producing a textured nonwoven fabric which comprises the steps of:
(a) supporting a composite web of staple fibers on an entangling member including a symmetrical pattern of void areas which are fluid pervious;
(b) directing a continuous curtain of columnar fluid downwardly through the nonwoven web and onto said entangling member;
(c) redirecting portions of the curtain of fluid by angles less than 90 degrees to concentrate the energy flux of the redirected fluid inside said symmetrical void areas; and
(d) traversing the web with the curtain until the fibers are randomized and entangled to produce a nonwoven fabric having a textured structure determined by said entangling member.

5,142,753

PROCESS FOR TREATING TEXTILE PIECES BY HIGH PRESSURE WATER JETS

Robert Bolliand, Ecully, and André Vuillaume, Biviers, both of France, assignors to Centre Technique Industriel dit: Institut Textile de France, France

Filed Feb. 26, 1991, Ser. No. 661,475
Claims priority, application France, Mar. 12, 1989, 90 03569
Int. Cl.[5] B28B *21/52*
U.S. Cl. 28—167 6 Claims



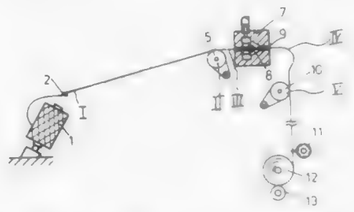
1. A process for individualizing unitary microfilaments in a textile piece constituted wholly or partly by yarns of continuous filament with adherent microfilaments, said process comprising the step of subjecting said piece, resting on a support screen, to the action of jets of water at a pressure of at least $4 \cdot 10^6$Pa.

5,142,754

METHOD AND APPARATUS FOR PRODUCING AN AIR TEXTURED YARN

Eberhard Krenzer, Ennepetal-Ruggeberg, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 399,599, Aug. 28, 1989, Pat. No. 5,054,174. This application Feb. 13, 1991, Ser. No. 654,827
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1990, 4004721
The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.
Int. Cl.[5] D02G *1/16;* D02J *1/08*
U.S. Cl. 28—271 19 Claims



1. A method of producing an air textured yarn having a relatively low residual shrinkage, and comprising the steps of
guiding an advancing substantially fully drawn continuous filament yarn about a rotatable godet,
heating the godet so as to heat the yarn to a temperature which is higher than the second order transition temperature of the yarn,
guiding the advancing yarn from said heated godet to an air jet nozzle while permitting the yarn to shrink and thereby reduce the residual shrinkage,
applying a jet of unheated air to the advancing yarn while passing the advancing yarn through said air jet nozzle and so as to cool the yarn to a temperature below the second order transition temperature of the yarn, and to impart loops, curls, bows and the like to the cooled yarn,
withdrawing the advancing yarn from said air jet nozzle, and then
winding the advancing yarn into a package.

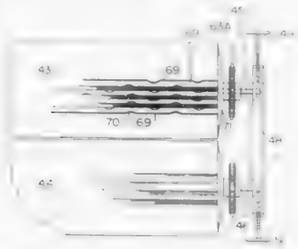
5,142,755

COMPOSITIONS OF MATTER FOR STOPPING FIRES, EXPLOSIONS AND OXIDATIONS OF MATERIALS AND BUILD UP OF ELECTROSTATIC CHARGES AND METHOD AND APPARATUS FOR MAKING SAME

Shaikh G. M. Y. Alhamad, P.O. Box 31590, Riyadh, 11418, and Sami I. Altikan, Riyadh, both of Saudi Arabia, assignors to Shaikh G. M. Y. Alhamad, Riyadh, Saudi Arabia

Division of Ser. No. 417,696, Oct. 5, 1989, Pat. No. 5,001,017, which is a continuation of Ser. No. 280,317, Dec. 6, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 605,540
Int. Cl.[5] B21D *31/04, 31/02*
U.S. Cl. 29—61 15 Claims

1. Apparatus for producing an expandable metal product comprising a pair of opposing rotatable cylinders, means for rotating said cylinders at substantially the same speed, and means for passing a continuous sheet of metal foil between said cylinders, the first of said cylinders having spaced apart discontinuous knives attached to its outer surface in lines transverse to the longitudinal dimension of said continuous metal sheet, and the second of said cylinders having corresponding base members cooperating with said knives to produce lines of discontinuous slits intercepting the longitudinal edges of said continuous sheet of metal foil.

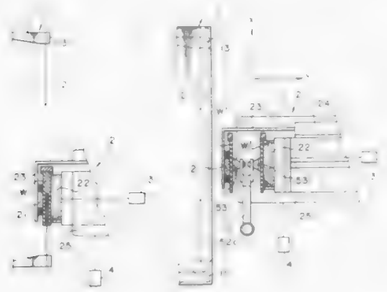


5,142,756

APPARATUS FOR LOADING AND RE-SLICING SEMICONDUCTOR WAFER

Tadashi Ibaraki, and Tsutomu Sato, both of Niigata, Japan, assignors to Naoetsu Electronics Company, Niigata, Japan

Filed Oct. 19, 1990, Ser. No. 599,861
Claims priority, application Japan, Oct. 31, 1989, 1-285287
Int. Cl.[5] B24B *7/00, 7/20;* B28D *1/04*
U.S. Cl. 29—25.01 5 Claims



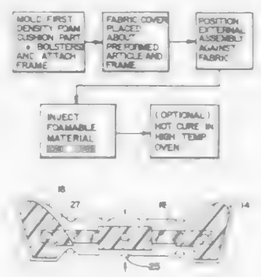
1. An apparatus for loading and re-slicing a semiconductor wafer having a core, said apparatus having longitudinal and lateral directions, said apparatus comprising:
a re-slicing mechanism provided with an ID saw driven vertically at high speed so as to re-slice an unprocessed semiconductor wafer into two sheets through substantially the center portion of the core thickness of said wafer;
a chucking mechanism provided to hold an unprocessed wafer vertically while said unprocessed wafer is subsequently re-sliced by said re-slicing mechanism
a longitudinal feeder mechanism provided to feed said chucking mechanism with said unprocessed wafer in said longitudinal direction so as to bring said wafer center portion to a correct position of a blade edge, and then further to retract said chucking mechanism with processed wafers upon the completion of a re-slicing process;
a lateral feeder mechanism provided to feed one of said chucking mechanism with said unprocessed wafer or said re-slicing mechanism in a lateral or vertical direction selectively for re-slicing said wafer center portion by the blade of said ID saw;
a loading and unloading mechanism for loading and unloading said unprocessed and processed wafers between an unprocessed wafer storage portion and a processed wafer recovery portion;
said longitudinal feeder mechanism further provided to feed said chucking mechanism with said unprocessed wafer so as to further position substantially the center portion of the core thickness of said wafer against the blade edge of said ID saw;
said chucking mechanism further provided to hold said unprocessed wafer at a position apart from the blade of said re-slicing mechanism, wherein said unprocessed wafer and processed wafers are movable between the position of said chucking mechanism and the position of said loading and unloading mechanism; and
said loading and unloading mechanism operating to convey and deliver said processed wafers which are unloaded from said chucking mechanism to said processed wafer recovery portion during the re-slicing process of a subsequent wafer by said re-slicing mechanism, and sequentially to take up another new unprocessed wafer from said unprocessed wafer storage portion and to convey said unprocessed wafer to a stand-by position to wait at said stand-by position until said processed wafer has been unloaded form said chucking mechanism.

5,142,757

METHOD OF MAKING AN UPHOLSTERED CUSHION ARTICLE

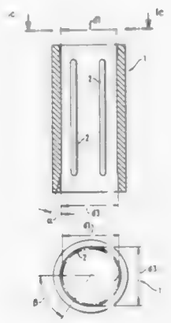
Christian Thary, Poste Restante, 91150 Etampes, France

Continuation of Ser. No. 371,256, Jun. 26, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,610
Int. Cl.[5] B68G *7/00*
U.S. Cl. 29—91.1 21 Claims



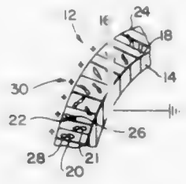
1. A method of manufacturing a multi-density cushion article covered with fabric having a preselected geometric shape, comprising the steps of:
(a) constructing a frame and a first foam cushion subassembly, said first cushion having a first density and comprising a peripheral portion of said subassembly;
(b) assembling the fabric about said subassembly to form a cavity;
(c) positioning a skeletal assembly comprising a plurality of discrete members against discrete portions of the outside of said fabric such that said skeletal assembly and said frame hold the fabric in the preselected geometric shape; and
(d) injecting a foamable material into said cavity formed by the fabric, whereby said foamable material forms a second foam cushion having a second density and is coupled to said first foam cushion.

5,142,753
TRANSPORT ROLLER FOR PAPER SHEETS
Johannes C. Delhaes, Eschenderweg 93, NL Voerendaal, Fed. Rep. of Germany
Filed Apr. 17, 1991, Ser. No. 686,158
Claims priority, application Fed Rep. of Germany, Apr. 21, 1990, 4012748
Int. Cl.[5] B60B 9/00
U.S. Cl. 29—117 4 Claims



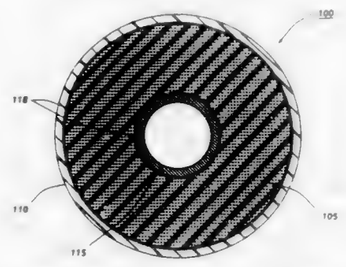
1. In a transport roller adapted to be press fittedly mounted on a hardened shaft for the feeding of widths of paper and comprising an external elastic cylindrical casing mounted on a bushing, the improvement which comprises said bushing being formed of a material of lower elasticity than said casing and of softer material than said shaft, said bushing including an inner cylindrical axially directed bore of larger diameter than the outer diameter of said shaft, said bushing including axially directed regularly angularly spaced apart protrusions extending radially inwardly into said bore, the axial endmost portions of said protrusions merging with said bore at acute angles, the radial innermost extremities of said protrusions lying on a circle, the diameter of said circle being less than the diameter of said shaft, said bushing including recesses on the outer face thereof in registry with said protrusions.

5,142,759
ROLL COVER APPARATUS
James Bonander, Clarks Summit, and Charles W. Jaget, Susquehanna, both of Pa., assignors to Beloit Corporation, Beloit, Wis.
Filed Aug. 27, 1991, Ser. No. 750,789
Int. Cl.[5] B21B 31/08
U.S. Cl. 29—130 11 Claims



1. A roll cover apparatus for covering a roll of a papermaking machine, said apparatus comprising:
a synthetic cover which is applied to an outer peripheral surface of the roll, the roll being of electrically conductive material;
a plurality of fibers randomly dispersed within said synthetic cover such that said plurality of fibers are disposed between said outer peripheral surface of the roll and an outer face of said synthetic cover; and
an electrically conductive material applied to an external boundary of at least some fibers of said plurality of fibers such that during use of the apparatus, when slippage occurs between a web of paper and said outer face of said cover, an electrostatic charge generated by said slippage is discharged by said conductive material from said outer face of said cover to the electrically conductive roll so that scorching of said web by discharge of said charge through said web is eliminated.

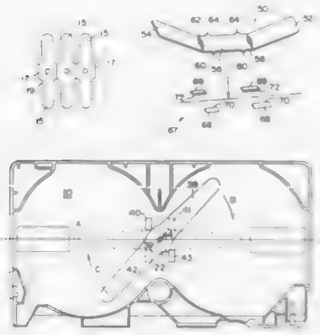
5,142,760
ARTICULATING IDLER ROLL
Conrad J. Bell, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 1, 1989, Ser. No. 360,176
Int. Cl.[5] B21B 31/08
U.S. Cl. 29—130 3 Claims



1. A copy sheet registration nip adapted to deskew incoming copy sheets, comprising: a drive roll; and a one piece, low cost, self-loading, articulating idler roll, said idler roll including an outer core member having an outer surface of sufficient hardness to be non-compliant when sheet material and said drive roll comes into contact with it, a shaft member and a compliant material positioned between said shaft member and outer core member, said compliant material being adapted to be deformed axially relative to said shaft member by said outer core member during articulation of said outer surface in order to allow said outer surface of said idler roll to articulate on said shaft member for sheet deskewing purposes.

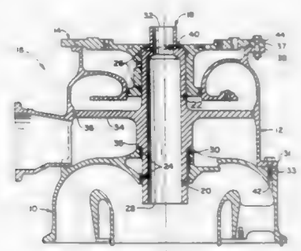
5,142,761
METHODS OF ASSEMBLING REEL LEAF SPRING/CASSETTE COVER COMBINATIONS
Anthony L. Gelardi, Porpoise; Craig Lovecky, Old Orchard Beach, both of Me.; Alan Lowery, Canton, Mass., and Robert Barstow, Alfred, Me., assignors to Shape Inc., Biddeford, Me.
Division of Ser. No. 458,428, Dec. 28, 1989, Pat. No. 4,986,491.
This application Nov. 21, 1990, Ser. No. 629,641
Int. Cl.[5] B23P 19/04; G11B 15/32
U.S. Cl. 29—445 4 Claims

1. A method for removably installing a reel leaf spring in a cassette cover, comprising the steps of:
(a) forming a cassette cover to include means for removably mounting a leaf spring;
(b) forming a leaf spring;
(c) moving the leaf spring in a direction at an angle to a longitudinal axis of the cover; and
(d) rotating the leaf spring in a first direction to removably mount the leaf spring via the removably mounting means, wherein the above steps include the substeps of:
forming a geometric projections on the cover, forming a geometric opening in the reel leaf spring, locating the opening on the projection and rotating the spring relative



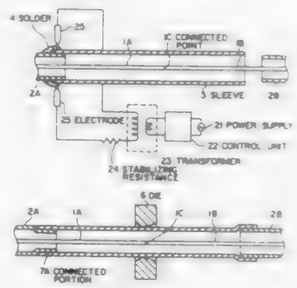
to the projection so that the opening undercuts the projection.

5,142,762
AIR CYCLE MACHINE ALIGNMENT
Paul J. Dziorny, Manchester, and Christopher McAuliffe, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Oct. 22, 1990, Ser. No. 603,979
Int. Cl.[5] B23B 35/00; B23P 17/00
U.S. Cl. 29—467 1 Claim



1. A method for aligning and assembling an air cycle machine including a rotating assembly encased in a stationary housing formed of a plurality of static housing segments and supported for rotation therein via a pair of axially spaced journal bearing means, a first of said journal bearing means supported on a first segment of said housing and a second of said journal bearing means supported on a second segment of said housing, said first and second journal bearing means each having an outer bearing race having a desired outer diameter; said method comprising the steps of:
machining an axially extending bearing bore of a desired diameter into each of said first housing segment and said second housing segment;
installing an O-ring into the bearing bore of each of said first housing segment and said second housing segment;
fitting a forward end of a fixture means into the bearing bore of said first housing segment whereby the forward end of the fixture means is supported by the O-ring in the bearing bore of said first housign segment and a central portion and an aft end of said fixture means extends coaxially outwardly from said first housing segment;
installing an intermediate housign segment onto the central portion of said fixture means whereby said intermediate housing segment is radially aligned with a first end of said intemediate housing segment abutting said first housing segment at an interface therebetween;
fitting the bearing bore of said second housing segment onto the aft end of said fixture means whereby the aft end of said fixture means is supported by the O-ring in the bearing bore of said second housing segment and said second housing segment abuts a second end fo said intermediate housing segment at an interface therebetween;
forming a first series of axially aligned holes through said first and intermediate housing segments at circumferentially spaced intervals about the periphery of the interface between said intermediate housings egment and said first housing segment disposed on said fixture means and forming a second series of axially aligned hoels through said second and intermediate housing segments at circumferentially spaced intervals about the periphery of the interface between said intermediate housing segment and said second housing segment disposed on said fixture means;
disassembling said first, said intermediate and said second housing segments from said fixture means;
installing said first journal bearing means in said first housing segment and said second journal bearing means ins aid second housing segment; and
assembling said first, said intermediate and said second housing segments together by inserting fastening means into and through said first series of axially aligned holes mated, thereby retaining the relative position of said first and said intermediate housing segments established when said first and said intermediate housing segments where first assembled on said fixture means and by inserting fastening means into and through said second series of axially aligne3d holes mated, thereby retaining the relative position of said intermediate and said second housing segments established when said second and said intermediate housing segments where first assembled on said fixture means, with said assembling step being performed without the housing segments located on the fixture means.

5,142,763
METHOD FOR CONNECTING OPTICAL FIBERS SEALED IN METAL PIPES
Shigeo Toya; Yoshiyuki Hiramoto; Koji Sasaki; Koichi Abe; Tatsuo Teraoka; Hirokazu Shiga, all of Ibaraki, and Yasunori Yoshie, Tokyo, all of Japan, assignors to Hitachi Cable, Ltd. and NKK Corporation, both of Tokyo, Japan
Division of Ser. No. 587,952, Sep. 25, 1990, Pat. No. 5,076,657.
This application Mar. 31, 1991, Ser. No. 672,966
Int. Cl.[5] B21D 39/04; H01R 43/02; G02B 6/38
U.S. Cl. 29—517 7 Claims



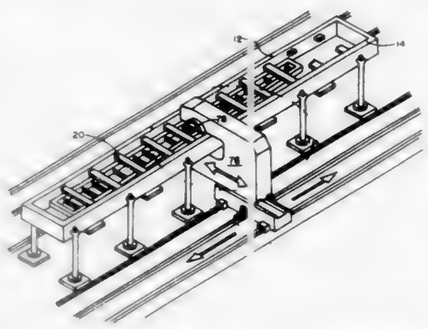
1. A method for connecting optical fibers positioned and sealed in metal pipes, comprising the steps of:
providing portions of said optical fibers exposed from said metal pipes;
connecting said portions of optical fibers exposed from said metal pipes to each other to provide connected optical fibers;
providing a sleeve for connecting said pipes;

positioning said sleeve at least partially over one of said metal pipes;
connecting said sleeve to one of said metal pipes at one end of said sleeve;
positioning said sleeve to a remaining one of said metal pipes coaxially therewith;
reducing an outer diameter of said sleeve to elongate said sleeve by a predetermined length so that said sleeve is overlapped on said remaining one of said metal pipes at another end of said sleeve; and
connecting said sleeve elongated by said predetermined length to said remaining one of said metal pipes at another end of said sleeve after said reducing step.

5,142,764
METHOD FOR TACK-FREE POSITIONING OF AIRCRAFT COMPONENTS FOR SUBSEQUENT FASTENING

Trevor D. Whiteside, Redondo Beach, Calif., assignor to The United States of America as represented by The Secretary of The Air Force, Washington, D.C.

Filed Nov. 28, 1990, Ser. No. 621,696
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—559 **4 Claims**



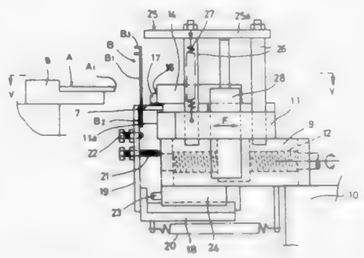
1. A method for tack-free positioning of panel and stringer components for subsequent fastening, said method comprising:
positioning said components in a jig frame in a desired assembly; and
clamping said stringers and said panel together and to said frame with movable clamps mounted on said frame, said clamps clamping stringers to panel to jig frame without need of further securing means, so that said components can be subsequently fastened without tacking,
whereby, after fastening, said clamps can be opened to release the so-fastened components from said clamps and from said jig frame and said clamps and said jig frame can be used to repeat the above process with other panel and stringer components.

5,142,765
LEAD MOUNTING APPARATUS

Kenji Tanaka, Ootsu, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Nov. 25, 1991, Ser. No. 796,798
Claims priority, application Japan, Dec. 7, 1990, 2-407275; Dec. 11, 1990, 2-410235
Int. Cl.[5] B23P *23/04* **H01R** *43/04*
U.S. Cl. 29—564.6 **10 Claims**

1. An apparatus for mounting leads to an object, particularly an electronic component, requiring lead connection by utilizing a leadframe which comprises a side band formed integrally with leads substantially at constant pitch, each lead having a clip end portion, the apparatus comprising:
transfer means for transferring the leadframe with the respective clip end portions directed upward and located above the object which is supported on one side of the leadframe transfer path;
cutter means for cutting the leadframe to provide a frame segment which contains a predetermined number of leads required for the object, the frame segment being allowed to descend after the cutting;

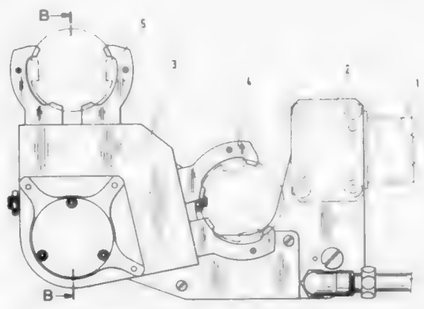


an operating head arranged ahead of the cutter means on the other side of the leadframe transfer path in opposition to the supported object, the operating head being movable toward and away from the object; and
lead resting means provided on the operating head for limiting descending movement of the frame segment and supporting the frame segment with the clip end portions thereof vertically aligned with the object.

5,142,766
TOOL EXCHANGER FOR PROGRAMMED-CONTROLLED MACHINE TOOLS

Gerhard Wehrmeister, Kempten, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Fed. Rep. of Germany

Filed May 9, 1990, Ser. No. 521,329
Claims priority, application Fed. Rep. of Germany, May 9, 1989, 8905795
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 483—15 **39 Claims**

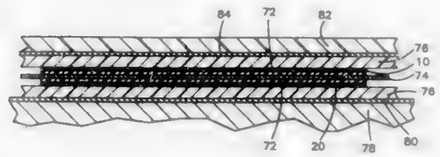


1. A tool exchanger for programmed machine tools comprising:
a device for conveyance of selected tools between a tool room and a main spindle of the machine tool;
a support mounted to the conveyance device;
a carrier support mount arranged on the support;
a pair of grip devices arranged in the carrier support mount to move along a prescribed rotation angle for rotating about an axis between an alternate position and at least one standby position; and
a pair of driving mechanisms for opening and closing the grip devices at the same time, each said driving mechanism including a hydraulic cylinder having a piston rod and a common pressure medium supply ensuring concurrent activation in an open and closed displacement direction;
the support mount including a locking device which blocks the grip devices in the standby position when the grip devices are closed.

5,142,767
METHOD OF MANUFACTURING A PLANAR COIL CONSTRUCTION

Lowell J. Adams, North Canton; William A. Beard, Jr., Uniontown; Steven C. Simshauser, Akron; Norbert A. Weisend, Jr., Cuyahoga Falls, and Thomas E. Wohlweender, Akron, all of Ohio, assignors to BF Goodrich Company, Akron, Ohio

Division of Ser. No. 437,489, Nov. 15, 1989, Pat. No. 4,875,644. This application Nov. 13, 1990, Ser. No. 613,170
Int. Cl.[5] H01F *41/06*
U.S. Cl. 29—602.1 **20 Claims**

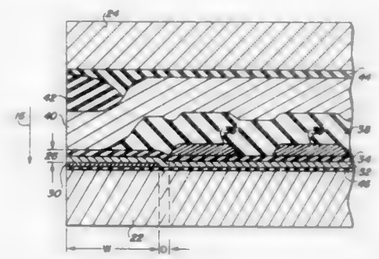


1. A method of manufacturing a planar coil construction for use in a force-producing device, comprising the steps of:
providing a first, sheet-like member defined by a first, continuous electrical conductor having a plurality of turns and first and second ends, the first end of the first conductor defining an electrical input and the second end of the first conductor defining an electrical output;
providing a second, sheet-like member defined by a second, continuous electrical conductor having a plurality of turns and first and second ends, the first end of the second conductor defining an electrical input and the second end of the second conductor defining an electrical output;
establishing an electrical connection between the second end of the first conductor and the first end of the second conductor;
disposing the first and second sheet-like members parallel to each other with selecting turns of the first electrical conductor being positioned adjacent to selected turns of the second electrical conductor such that the direction of current flow through the turns of the first conductor is substantially in the same direction as the current flow through the turns of the second conductor, wherein the step of disposing the first and second sheet-like members parallel to each other is carried out by:
providing first and second layers of two-sided tape, each layer being a size and shape to completely overlie the first and second sheet-like members;
applying the first layer of two-sided tape to a selected side of the first sheet-like member;
applying the second layer of two-sided tape to a selected side of the second sheet-like member;
providing a layer of dielectric material; and
attaching the exposed surfaces of the first and second layers of two-sided tape to the opposite sides of the layer of dielectric material.

5,142,768
METHOD FOR MAKING MAGNETIC HEAD WITH ENHANCED POLETIP

Joseph A. Aboaf; Edward V. Denison; Vincent N. Kahwaty, and Gerald Steving, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1991, Ser. No. 694,611
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **5 Claims**



1. A method of making a magnetic head comprising the steps of:
obtaining a substrate of a magnetic ferrite;
depositing a stripe of a magnetic material adjacent an edge of the obtained substrate to form at least a portion of a first pole piece;
depositing a gap producing insulating material over the deposited stripe and the substrate to form a magnetic gap layer;
depositing an electrically conductive material on the deposited insulating material to form conductor turns for the magnetic head, the first turn starting immediately adjacent the stripe as covered by the gap insulating material;
depositing an insulating material over the deposited conductive material forming the conductor turns;
depositing a magnetic material over the deposited gap producing insulating material and the conductor insulating material to form a second pole piece;
depositing a support insulating layer material over the deposited magnetic material adjacent a portion of the second pole piece;
depositing a leveling layer of insulating material over the deposited support insulating layer and the remaining portion of the deposited second pole piece material; and
bonding a closure block of non-magnetic ceramic material to the deposited leveling layer.

5,142,769
MONITOR AND CONTROL ASSEMBLY FOR USE WITH A CAN END PRESS

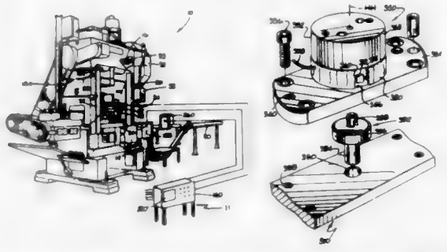
Phillip W. Gold, Lakewood, and Bruce A. Moen, Golden, both of Colo., assignors to Coors Brewing Company, Golden, Colo.

Continuation-in-part of Ser. No. 219,203, Jul. 14, 1988, Pat. No. 4,939,665. This application Feb. 14, 1990, Ser. No. 481,910
Int. Cl.[5] B21D *17/00*
U.S. Cl. 29—621.1 **10 Claims**

1. A method for modifying a lower base member of a progressive press station for enabling accurate load sensing in the press station wherein an unmodified lower base member comprises a generally cylindrical tool supporting, upper portion and comprises a lower attachment plate portion integrally formed with said upper cylindrical portion which is adapted for mounting said lower base member on a lower press shoe, said lower attachment plate portion having a lower base dowel pin bore extending therethrough in coaxial relationship with a central longitudinal axis of said upper cylindrical portion; said lower base member being located on said lower press shoe by an original dowel pin received in said lower base dowel pin

bore and in an oppositely positioned dowel pin bore in said lower press shoe, the method comprising the steps of:

a) radially and axially enlarging said lower base dowel pin bore whereby said enlarged bore extends axially into said generally cylindrical portion of said lower base member;



b) machiningly reducing the diameter of said upper cylindrical portion of said lower base member in an axial region thereof positional radially opposite a portion of said enlarged dowel pin bore; and

c) mounting a transducer on an axially extending surface of said upper cylindrical portion of said lower base member in said axial region thereof

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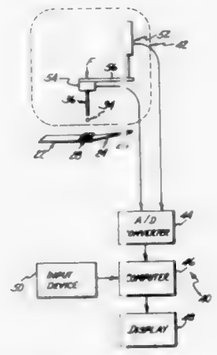
5,142,770

APPARATUS FOR PREDICTING TWIST OUT TORQUE IN A SWAGE MOUNT

Michael A. Cain, Oklahoma City, and David S. Allsup, Norman, both of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 509,469, Apr. 13, 1990, Pat. No. 5,097,584.
This application Nov. 7, 1991, Ser. No. 788,950
Int. Cl.[5] B25J *11/00*; B23Q *17/00*
U.S. Cl. 29—705 12 Claims



1. An apparatus for predicting twist-out torque of a spring loaded flexure arm and a support arm swage mounted together in a magnetic storage system in which the spring loaded flexure arm carries a magnetic head, comprising:

a position sensor for sensing position and producing an output representative of swage position during a swaging operation in which the spring loaded flexure arm and the support arm are swage mounted together;

a force sensor coupled to the position sensor for sensing swaging force and producing an output representative of swaging force during the swaging operation; and

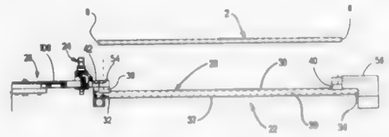
means connected to the position sensor and the force sensor for receiving the output representative of swage position and the output representative of swaging force and producing an output representative of swaging work over the swaging operation.

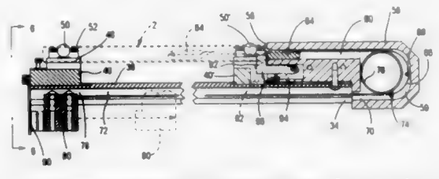
5,142,771

SPRING POWERED FEEDER FOR FEEDING ELECTRICAL CONNECTOR FROM A TUBE MAGAZINE

Steven T. Merkt, New Cumberland; Richard L. Schaeffer, Jr., Carlisle, and Dale E. Stough, Jr., Red Lion, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 18, 1991, Ser. No. 762,091
Int. Cl.[5] B23P *19/00*; B23Q *7/10*
U.S. Cl. 29—751 18 Claims





1. A feeding apparatus for feeding articles from a tube to a delivery station, the tube containing a plurality of articles in side-by-side relationship, the tube having first and second tube ends, the apparatus comprising:

a frame assembly having first and second locating means thereon for supporting the tube with the first and second tube ends adjacent to the first and second locating means respectively, the delivery station being adjacent to the first locating means,

an elongated flexible feeding member having first and second feeding member ends, the first feeding member end being located, at the beginning of an operating cycle, adjacent to the second locating means and in alignment with the second tube end of a tube which is supported on the frame assembly, the feeding member extending away from the second tube end at the beginning of an operating cycle so that the second feeding member end is remote from the second locating means, the feeding member having cross sectional dimensions which permit it to move axially through the tube,

guide means for guiding the feeding member along a feeding member path, the guide means and the feeding member path extending initially away from the second locating means and away from a tube supported on the frame assembly and then in the reverse direction back towards, and past, the second locating means and towards the first locating means, a portion of the feeding member path being beside, and parallel to, a tube supported on the frame assembly, and

actuator means for moving the feeding member along the feeding member path whereby,

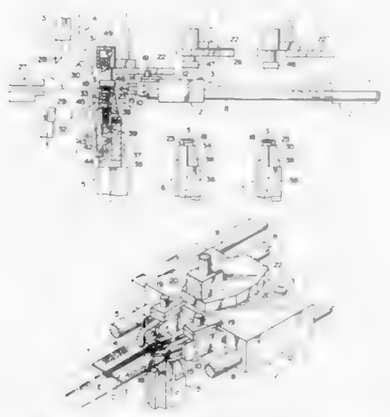
upon placement of a tube on the frame assembly and movement of the feeding member along the feeding member path, the first feeding member end will move into the tube at the second tube end and will push the articles from the first tube end to the delivery station.

5,142,772

APPARATUS FOR MANUFACTURING SLIDE FASTENERS EACH HAVING A SELECTED NUMBER OF SLIDERS

Kiichiro Ishikawa, Marietta, Ga., assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 756,338
Int. Cl.[5] A41H *37/06*
U.S. Cl. 29—768 11 Claims



1. An apparatus or manufacturing slide fasteners of a predetermined length from a continuous slide fastener chain, with a selected number of sliders threaded over each individual slide fastener, said apparatus comprising:

(a) a horizontally reciprocable gripper unit for gripping a leading end of the continuous slide fastener chain and feeding the slide fastener chain longitudinally along a feed path;

(b) a cutter unit disposed on said feed path for cutting the slide fastener chain into a succession of slide fasteners of a predetermined length:

(c) a plurality of three or more slider holding units disposed downstream of said cutter unit along the feed path of the slide fastener chain and movable between a first position to hold a corresponding number of sliders in said feed path of the side fastener chain to thread the sliders onto the slide fastener chain from the leading end thereof as the slide fastener chain is fed downstream by said gripper unit, and a second position remote from said first position and

(d) each of said slider holding units being operative independent of the operation of another slider holding unit so that at least a selected one of said slider holding units can be disposed in said first position to thread the corresponding slider onto the slide fastener chain.

5,142,773

SLIDER HOLDING APPARATUS

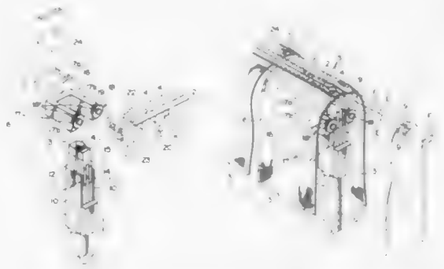
Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 21, 1991, Ser. No. 747,961
Claims priority, application Japan, Aug. 29, 1990, 2-89535[U]
Int. Cl.[5] A41H *37/06*
U.S. Cl. 29—768 3 Claims

1. An apparatus for holding a slider during threading through the slider a continuous slide fastener chain having a succession of fabric pieces along each of the opposite longitudinal marginal edges, the apparatus comprising:

(a) a slider holder for releasably holding a slider on its top surface, said slide holder being movable vertically between a lowermost position where the slider holder receives a slider and an uppermost position where the fabric-pieced slide fastener chain is threaded through the slider; and

(b) a slider holder retainer disposed on the path of vertical movement of the slider holder and comprising a U-shaped frame including a frame base and a pair of opposed legs, and a pair of rotary retainers having rear surfaces, said



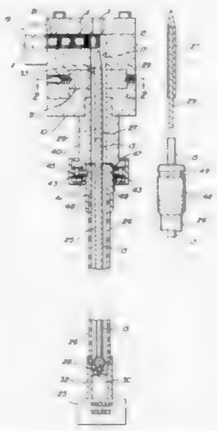
rotary retainers being respectively rotatably mounted on each of the distal ends of the opposed legs and disposed coplanar with each other; whereby, assuming the uppermost position, the slider holder comes between the legs, and a pair of side edges of the slider holder abut the rear surfaces of the rotary retainers.

5,142,774

APPARATUS AND METHOD FOR LOADING FASTENER COLLARS ONTO A MANDREL

Keith S. Jeffery, Rhinebeck, N.Y., assignor to Huck Manufacturing Co., Irvine, Calif.

Filed May 30, 1991, Ser. No. 707,485
Int. Cl.[5] B23Q *7/10*; B23P *19/04*
U.S. Cl. 29—810 15 Claims



1. A an apparatus for assembling annular fastener collars onto a flexible mandrel, comprising:

a housing having a passage formed therein;

means for feeding annular fastener collars into said passage;

a nose piece disposed within said passage and removably connected onto said flexible mandrel positioned within said passage of said housing for guiding said fastener collars onto said mandrel; and

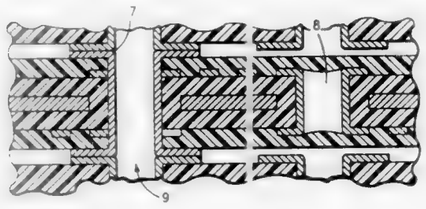
magnetic means carried by said housing and said noise piece for centering said nose piece in said passage.

5,142,775

BONDABLE VIA

John P. Wiley, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1990, Ser. No. 605,594
Int. Cl.[5] H01K 3/10
U.S. Cl. 29—852 11 Claims



1. A method of forming a multilayer printed circuit board comprising the steps of:

a. circuitizing a first dielectric to form a circuitization plane having circuitization leads and first pads thereon;

b. encapsulating the circuitization plane and the pads thereon with a second dielectric layer to form a relaminated core;

c. drilling through the second dielectric layer, a pad on the first circuitization plane, and the first dielectric to form a via or through hole;

d. depositing Cu in the via or through hole and on the second dielectric layer in proximity to the said via or through hole to form a plated via or through hole and a second pad, thereby forming a multilayer, relaminated core having a circuitization plane with circuitization leads and first pads and a bonding plane with a second pad, said second pad being separated from a corresponding first pad by the second layer of dielectric; and

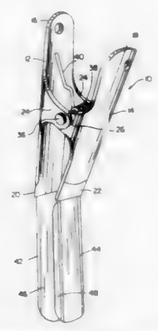
e. bonding said multilayer, relaminated core to another multilayer, relaminated core at facing pads thereon to form a stacked via joined at a bonding pad.

5,142,776

METHOD AND APPARATUS FOR HEAT SEALING OF JOINTS AND CONNECTIONS

Nicholas H. Neely, Norcross, Ga., assignor to Kabelmetal Electro GmbH, Fed. Rep. of Germany

Filed Mar. 18, 1991, Ser. No. 672,522
Int. Cl.[5] H01F 43/00
U.S. Cl. 29—859 21 Claims



1. Method for performing a heat sealing operation for environmentally isolating joints and connections comprising the steps of:

providing a pair of juxtaposed elongated members having ends prepared for connection;

providing another elongated member with its end prepared for connection to said ends of said pair of elongated members;

connecting said another elongated member with said pair of elongated members at their ends;

providing a heat shrinkable material and surrounding at least the connected ends of said another elongated member and said pair of elongated members with said heat shrinkable material; using a clamp to hold said heat shrinkable material together in an area between said pair of elongated members, said clamp including two pivotally connected juxtaposed clamp arms, each of said clamp arms having an elongated clamping jaw with a convex surface thereon, said clamping jaws extending outwardly from said clamp arms with said convex surfaces in an opposed relationship, and means operatively connected to said juxtaposed clamp arms and resiliently loading the same to place said convex surfaces into a clamping relationship with said heat shrinkable material therebetween; and

heating said heat shrinkable material to shrink said material around the connected ends of said another elongated member and said pair of elongated members to environmentally isolate the connected ends.

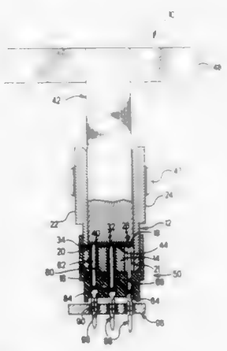
16. A clamp for use in a heat stealing operation for environmentally isolating joints and connections comprising two pivotally connected juxtaposed clamp arms; each of said clamp arms having an elongated clamping jaw with a convex surface along its longitudinal length; said clamping jaws extending outwardly from said clamp arms with said convex surfaces in an opposed relationship along their longitudinal lengths; and means operatively connected to said juxtaposed clamp arms and resiliently loading the same to place said convex surfaces into a clamping relationship.

5,142,777

PROGRAMMABLE TOOL FOR PROVIDING A STAGED ARRAY OF TERMINAL MEMBERS

Raymond D. Boyer, Enola; Donald L. Forker, and Kenneth R. Parmer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 27, 1991, Ser. No. 799,495
Int. Cl.[5] H01R 43/16; B23P 19/00
U.S. Cl. 29—884 10 Claims



1. A programmable tool for mounting a connector to a circuit board, said connector including a housing having a plurality of terminal-receiving passageways at respective locations and extending from a mounting to a mating face and a plurality of terminal members disposed within respective ones of said passageways in interference fit and movable therealong during circuit board mounting, the terminal members having first connecting portions exposed at said mating face for mating with corresponding terminal members of a complementary connector and second connecting portions extending from said mounting face and adapted to be electrically connected with contact means of said circuit board, at least first selected ones of said terminal members having their first connecting portions thereof ultimately disposed at different heights from first connecting portions of others of said terminal members, said tool comprising:

a guide member having a transverse body portion including opposed leading and rear surfaces and having first apertures extending therethrough at all terminal locations and defining a first array, said first apertures being adapted to non-engagingly receive therethrough corresponding first connecting portions of all of said terminal members;

at least a first plate member having opposed forward and rearward surfaces and having second apertures extending therethrough at selected ones of said terminal locations defining a second array, said forward surface of said first plate member being disposed rearwardly of said guide plate and at least proximate said rear surface thereof, said second apertures of said second array being aligned with corresponding first apertures of said first array and adapted to non-engagingly receive therethrough leading ends of said at least first selected ones of said terminal members after said at least first selected ones exit said corresponding first apertures of said guide members, said at least first selected ones defining a first group of terminal members;

a push member having a solid leading surface disposed rearwardly of said at least first plate member and at least proximate said rearward surface of said first plate member; and

means for securing said guide plate and said push member together with said at least first plate member being retained transversely therebetween defining a tool, such that upon positioning the second connecting terminal portions with said contact means of said circuit board and positioning and aligning said leading end of said tool guide member at least proximate said mating face of said connector housing, leading ends of all said terminal members are non-engagingly received within respective said first array apertures and upon applying downward force against said tool, said second connecting portions of said terminal members engage said contact means of said circuit board and as pressure is continued to be applied downwardly on the tool the resistance of said second connecting terminal portions as they engage respective said contact means forces respective said first connecting portions upwardly toward said tool, such that said first connecting portions of said at least first group of terminal members are moved through respective said second apertures of said second array and are pushed by said leading surface of said push member and others of said terminal members are pushed by said forward surface of the said at least first plate member as said tool mounts the connector to said circuit board, whereby upon removal of said tool from said connector housing, said terminal members are in a staged array with said first connecting portions of said first group of terminal members being higher than those of said other terminal members.

9. A method for forming a staged array of terminal members in a connector, said method comprising the steps of:

selecting a connector including a housing having a plurality of terminal-receiving passageways at respective locations and extending from a mounting to a mating face and a plurality of terminal members disposed within respective ones of said passageways in interference fit and movable therealong, the terminal members having first connecting portions exposed at said mating face for mating with corresponding terminal members of a complementary connector and second connecting portions extending from said mounting face and adapted to be electrically connected with contact means of said circuit board, at least first selected ones of said terminal members having their first connecting portions thereof ultimately disposed at different heights from first connecting portions of others of said terminal members;

providing a guide member having a transverse body portion including opposed leading and rear surfaces and having first apertures extending therethrough at all terminal locations and defining a first array, said first apertures being adapted to non-engagingly receive therethrough corresponding first connecting portions of all of said terminal members;

providing at least a first plate member having opposed forward and rearward surfaces and having second apertures extending therethrough at selected ones of said terminal locations defining a second array;

disposing said forward surface of said first plate member rearwardly of said guide plate and at least proximate said rear surface thereof such that said second apertures of said second array are aligned with corresponding first apertures of said first array and adapted to non-engagingly receive therethrough leading ends of said at least first selected ones of said terminal members after said at least first selected ones exit said corresponding first apertures of said guide members, said at least first selected ones defining a first group of terminal members;

disposing a push member having a solid leading surface rearwardly of said at least first plate and at least proximate said rearward surface of said first plate member;

securing said guide plate and said push member together with said at least first plate member being retained transversely therebetween defining a tool;

positioning said leading end of said tool guide member at least proximate said mating face of said connector housing such that said leading ends of all said terminal members are non-engagingly received within respective said first array apertures; and

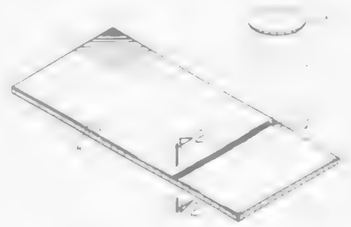
applying downward force against said tool such that such that said first connecting portions of said at least first group of terminal members are moved through respective said second apertures of said second array and are pushed by said leading surface of said push member and others of said terminal members are pushed by said forward surface of the said at least first plate member as said tool moves into the connector, whereby upon removal of said tool from said connector housing, said terminal members are in a staged array with said first connecting portions of said first group of terminal members being higher than those of said other terminal members.

5,142,778

GAS TURBINE ENGINE COMPONENT REPAIR

John J. Smolinski, Southington; Peter J. Draghi, Simsbury, and John R. Danielsen, East Hartford, all of Conn., assignors to United Technolgies Corporation, Hartford, Conn.

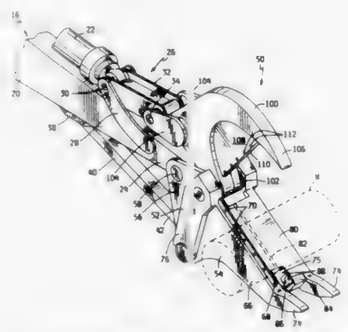
Filed Mar. 13, 1991, Ser. No. 668,580
Int. Cl.[5] B23P 19/02; B23K 26/00, 31/00
U.S. Cl. 29—889.1 12 Claims



1. A method for the repair and reconfiguration of a gas turbine engine turbine component which is covered by a protective coating comprising the steps of:

a. removing said protective coating from the surfaces of said component;
b. inspecting said component for defects and erosion of material, and for distortion from its original configuration;
c. adding material to said surfaces of said component in the areas requiring repair or replacement of eroded material;
d. bonding said added material to said component;
e. directing a laser beam at said surface of said component in said distorted areas such that localized areas of said surface of said distorted areas are melted, solidified and cooled to ambient temperature, thus forming a recast layer;
f. removing any excess material from said surface of said component; and
g. reapplying said protective coating to said surfaces of said component.

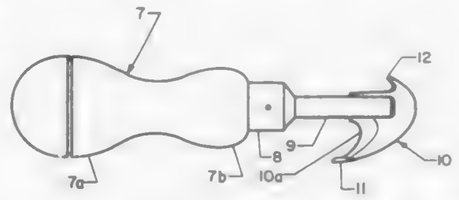
5,142,779
MOBILE WOOD AND TIRE SHEAR
Roy E. LaBounty, Two Harbors, Minn., assignor to LaBounty Manufacturing, Inc., Two Harbors, Minn.
Filed Dec. 2, 1991, Ser. No. 801,696
Int. Cl.[5] B23P *19/00*
U.S. Cl. 30—134 32 Claims



15. A heavy duty mobile wood and tire workpiece shear for connection to the dipper stick and hydraulic cylinder of a mobile machine such as a hydraulic excavator, comprising:
(a) a lower stationary jaw rigidly attachable to the dipper stick having a forwardly extending face plate for receiving and supporting the workpiece;
(b) an upper C-shaped swingable jaw having a cutting blade with a knife-like edge, the upper jaw being pivotally mounted to the lower jaw and connected to the hydraulic cylinder as to swing the upper jaw between opened and closed positions relative to the lower jaw and to bring the cutting blade down upon the face plate as to penetrate and shear through wood; and
(c) a first shearing blade releasably affixable along the knife-like edge of the cutting blade and a second shearing blade releasably affixable along the face plate as to bring the shearing blades into shearing relation as the upper jaw approaches the closed position as to also shear through tires.

5,142,780
ELECTRIC CABLE STRIPPING TOOL WITH CLAW
George I. Brewer, Box 113, Fulford Harbour, B. C., Canada V0S 1CO
Continuation of Ser. No. 498,592, Mar. 22, 1990, abandoned. This application Jun. 25, 1991, Ser. No. 721,081
Int. Cl.[5] B26B *27/00, 23/00*
U.S. Cl. 30—294 4 Claims

1. A manually operated tool for removing an outer sheathing of plastic material from a bundle of individually insulated electrical conductors, especially for three-conductor cable laid in a spiral pattern, comprising:
a. a handle with pulling lobes or grips;
b. a shank extending from an end of said handle, said shank having a bottom side;
c. a blade extending downward perpendicularly from said bottom side of said shank, said blade having a forward part facing in the direction of said handle;
d. said blade having on said forward part a U-shaped concave cutting edge, said concave cutting edge having a lowest and most distal extremity terminating in a shoe;
e. said shoe having a generally flat bottom, said shoe having a leading edge and sides which are in elevation convex and fully rounded, the thickness or elevation of said shoe being approximately 1/16 inch (1.6 mm) or under but being sufficiently thick to insure bluntness of said leading edge, said leading edge having a half-circle shape in plan, the sides of said shoe in plan converging rearwardly toward each other to merge with a trailing edge of said blade at a point where said bottom of said shoe ends, with said trailing edge of said blade sloping diagonally rear-

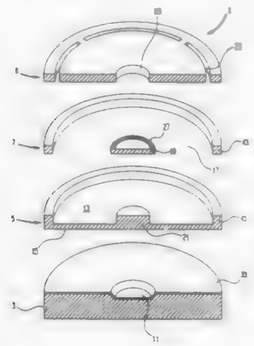


ward and upward from said shoe and continuing on above said shank to merge with a claw, said trailing edge of said blade merging with a trailing edge of said claw;
f. said shank having a top side from which said claw extends upwardly and forwardly toward said handle at an angle less than 45 degrees, said claw being shaped so as to be able to make an opening in a side of said cable sheathing sufficiently large to admit said shoe of said blade, said claw having a U-shaped concave leading edge facing said handle, a top segment of said U-shaped leading edge extending forwardly and terminating in a truncated point, a bottom segment of said U-shaped leading edge extending forwardly toward said handle and downwardly to join said shank and merge with said blade;
thereby to provide a single tool which rapidly performs the three operations necessary to conveniently remove a sheathing of plastic material from electric cable: first, to safely claw an opening in the side of the sheathing sufficient to admit the shoe of the blade; secondly, to slit a length of sheathing, and thirdly, using the blade as a pruning hook, to chop off the residue of slit sheathing.

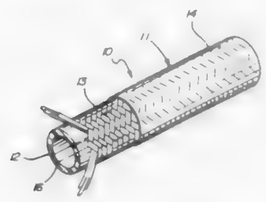
5,142,781
METHOD OF MAKING A MICROVALVE
Michael Mettner, Ludwigsburg, Fed. Rep. of Germany; Martin A. Schmidt, Reading, Mass.; Theresa Lober, Newton, Mass., and Michael A. Huff, Medford, Mass., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany and Mass. Inst. of Tech., Cambridge, Mass.
Filed Aug. 13, 1990, Ser. No. 566,997
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1989, 3926647
Int. Cl.[5] B29C *45/14*
U.S. Cl. 29—890.124 14 Claims

1. Method of making a microvalve by bonding together a plurality of layers each having upper and lower major surfaces, comprising the steps of:
providing a first wafer (3) serving as a carrier layer or initial top layer;
bonding onto said upper major surface of said first wafer or

layer (3) a second wafer (5) by its lower major surface, thereby forming a new top layer, and subsequently bonding on further wafers (7,9) by their respective lower surfaces, each being bonded to the upper major surface of a most recently bonded one of said layers; and
profiling the upper surface of each wafer, to provide a structure therein.



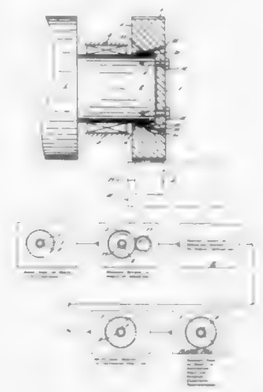
5,142,782
COATED BRAIDED HOSE METHOD AND ASSEMBLY
Norman S. Martucci, Birmingham, Mich., assignor to Teleflex Incorporated, Limerick, Pa.
Division of Ser. No. 416,151, Oct. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 305,643, Feb. 2, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 657,084
Int. Cl.[5] B29C *63/06*
U.S. Cl. 29—890.144 11 Claims



1. A method for constructing a hose assembly comprising the steps of: providing an inner tubular liner (12) of a fluorocarbon polymeric material; applying a braided reinforcing material (13) having gaps extending therethrough about the inner tubular liner (12); dispersing a second fluorocarbon polymeric material (14) and a carrier fluid into the reinforcing material (13), whereby the second outer fluorocarbon coating covers the braided material but does not extend radially outwardly from the periphery of the braided material, and sintering the assembly.

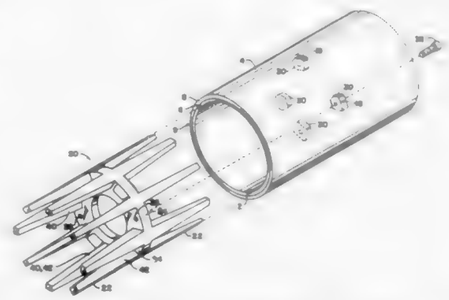
5,142,783
METHOD OF CORRECTING GEAR TOOTH SYSTEM ERRORS
Rudolf Melzer, Hainburg, and Valentin Gensheimer, Muhlheim/Main, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany
Filed Dec. 26, 1989, Ser. No. 456,374
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843955
Int. Cl.[5] B21D *53/28*
U.S. Cl. 29—893.2 9 Claims

1. A method of correcting tooth system errors in a gear pairing in which one of the gears is mounted on a shaft of the compartment to be driven comprising
mounting said one gear of the pairing on the shaft of the component to be driven with a relatively small radial clearance between the gear and shaft,
rotating said one gear, shaft and component after said gear is mounted thereon and measuring by a separate measuring facility in a single-flank rolling test the errors in the angle of rotation,



converting the determined errors in said angle of rotation into radial deviations in the tooth system of said one gear,
shifting said one gear radially with respect to said shaft to a corrected position to compensate for the determined radial deviations, and
connecting said one gear to said shaft in said corrected position without radial clearance between said one gear and shaft.

5,142,784
METHOD FOR MAKING A ROLLER ASSEMBLY FOR GRAIN SHELLERS
Stanley M. Lee, Tomball; Jimmy C. Terry, Spring, and John A. Mrosko, Katy, all of Tex., assignors to F.H. Maloney Company, Houston, Tex.
Continuation-in-part of Ser. No. 517,578, May 1, 1990. This application Apr. 18, 1991, Ser. No. 685,922
Int. Cl.[5] B02B *3/02*
U.S. Cl. 29—895.21 7 Claims



1. A method for making a roller assembly, the method comprising providing a round, tubular, rigid metal sleeve, forming counter sunk recesses extending radially through said metal sleeve, fixing screws in said counter sunk recesses with head portions of said screws recessed in an exterior surface of said

metal sleeve and with shank portions of said metal screws extending inwardly of said metal sleeve, detachably fixing locking lugs on the interior surface of said metal sleeve by threadably connecting locking lugs to said screws, said locking lugs extending radially inwardly of said metal sleeve and defining an interrupted annular collar on the interior circumference of said metal sleeve, and bonding a sleeve of flexible material to the entire lengthwise exterior surface of said metal sleeve, thereby providing a laminate sleeve assembly with locking lugs fixed thereto, providing a mounting hub assembly comprising a circular wall having ribs extending from said wall and substantially normal thereto, sliding said metal sleeve onto said ribs until said wall abuts said annular collar, and fixing said locking lugs to said wall, thereby connecting said sleeve assembly to said mounting hub.

5,142,785

RAZOR TECHNOLOGY

Manohar S. Grewal, Hanover, and Chong-Ping P. Chou, Lexington, both of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 692,010, Apr. 26, 1991, abandoned.
This application Aug. 26, 1991, Ser. No. 759,812
Int. Cl.[5] B26B *21/54*
U.S. Cl. 30—32 19 Claims

1. A process for forming a razor blade comprising the steps of

providing a substrate,

forming a wedge-shaped sharpened edge on said substrate that has an included angle of less than thirty degrees and a tip radius of less than twelve hundred angstroms;

depositing a layer of molybdenum on said sharpened edge;

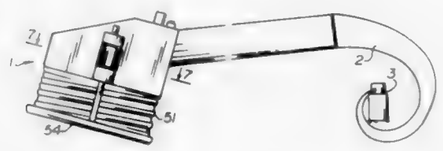
depositing a layer of diamond or diamond-like carbon material on said molybdenum layer; and applying an adherent polymer coating on said diamond or DLC coated cutting edge.

5,142,786

VACUUM-DRAWN HAIR CLIPPER

Rick E. Hunts, 885 Barsby St., Vista, Calif. 92083

Filed Oct. 21, 1991, Ser. No. 780,048
Int. Cl.[5] B26B *19/44*
U.S. Cl. 30—133 7 Claims



1. A precision hair clipper for cutting hair of a subject to a uniform length at a selectable spacing from the subject's scalp which comprises:

a housing defining a flow chamber having a substantially quandrangular inlet and an outlet connectable to a vacuum source;

a first blade fixedly mounted along a first side of said inlet, said first blade having a first row of shearing teeth along a transversal edge;

a second blade mounted against said first blade and having a second row of shearing teeth in line with said first row;

means for reciprocally and transversally sliding said second blade against said first blade;

a movable bar commensurate with said rows of teeth and spanning said inlet parallel to said rows; and

means for reciprocally translating said bar across said inlet between said teeth and a side of said inlet opposite said first side, said means for reciprocally translating comprising:

a parallelogrammic linkage comprising said bar, a link rod parallel to said bar, and two parallel members pivotally connected at each end to said bar and link rod;

a lever extending from one of said parallel members, said lever being pivotally connected to a pushrod about a fulcrum point; and

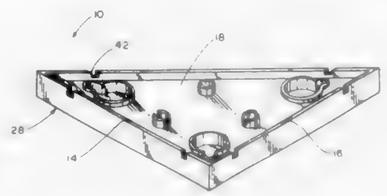
means for moving said lever around said fulcrum point.

5,142,787

MEANS AND METHOD FOR DEFINING A LAYOUT

Steven R. Dadisman, 8500 Michael Ray Dr., Louisville, Ky. 40219

Filed Aug. 22, 1991, Ser. No. 748,463
Int. Cl.[5] B43L *7/027*; G01C *15/12*
U.S. Cl. 33—1 G 8 Claims



1. A layout system comprising:

A) three identical triangular elements, each including

(1) a wall,

(2) a planar web spanning said wall,

(3) a plurality of female connection elements on said web, each female connection element including a tubular sleeve extending through said wall, and having a slot defined therein,

(4) a plurality of anchor elements on said web, each anchor element including a tubular sleeve extending through said web and having a lobar portion located near an apex of said triangular element,

(5) a plurality of first grooves defined through said wall at a right angle to said wall, and

(6) a plurality of second grooves defined through said wall at an oblique angle with respect to said wall; and

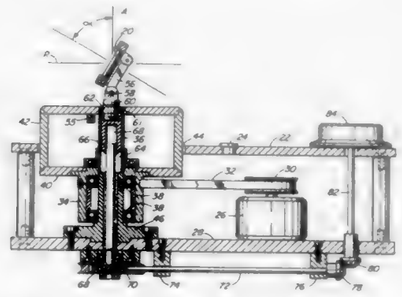
C) a plurality of tethering cables for attaching one triangular element to another triangular element, each tethering cable including a male connection element on each end thereof, said male connection elements being sized to be received in said female connection element slots, at least two of said plurality of tethering cables being equal in length.

5,142,788

LASER COMPASS

Miles D. Willetts, 5654 Kilmore Crescent East, Surrey, Canada V3S 6G1

Filed May 17, 1991, Ser. No. 702,595
Int. Cl.[5] G01B *11/26*; G02B *7/14*; G03B *21/28*
U.S. Cl. 33—227 3 Claims



1. A laser compass comprising:

(a) a laser light source for projecting a laser beam along an axis;

(b) a mirror;

(c) mirror rotating means for rotating said mirror within a rotation plane perpendicular to said axis, said mirror rotating means comprising:

(i) a rotatable mirror support;

(ii) first and second mirror support arms projecting upwardly from said mirror support;

(iii) drive means for rotatably driving said mirror support; and,

(d) mirror pivoting means for pivoting said mirror relative to said axis, said mirror pivoting means comprising:

(i) a link member projecting through said mirror support;

(ii) pivotal coupling means for pivotally coupling one end of said link member to said mirror;

(iii) securing means for pivotally securing said mirror between said support arms; and

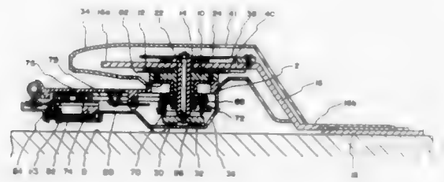
(iv) adjusting means coupled through said mirror support to an opposed end of said link member for adjustably displacing said link member relative to said mirror.

5,142,789

HEAD OF UNIVERSAL PARALLEL RULER

Kazutoshi Shimizu, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,276
Claims priority, application Japan, Jul. 27, 1990, 2-200328
Int. Cl.[5] B43L *13/08*
U.S. Cl. 33—438 6 Claims



1. A head of a universal parallel ruler for use on a drafting board, comprising:

a base adapted to be supported on and moved in parallel along the drafting board;

a scale mounting plate having an upper horizontal portion rotatably mounted on an upper portion of said base, and a lower horizontal portion disposed downwardly of said upper horizontal portion, said upper horizontal portion and said lower horizontal portion being disposed at opposing ends of said scale mounting plate;

a pair of straightedge members secured to said lower horizontal portion of said scale mounting plate and being adapted for movement along and in parallel with the drafting board; and

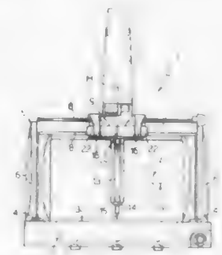
a handle member mounted to said upper horizontal portion of said scale mounting plate and being adapted to be gripped by an operator and manipulated in order to rotate said scale mounting plate relative to said base.

5,142,790

MEASURING MACHINE PROVIDED WITH HAND GRIP MEANS FOR DISPLACEMENT OF A MEASUREMENT HEAD OF THE MACHINE ALONG THREE AXES

Guglielmo Raho, Chieri, and Mauro Zona, Turin, both of Italy, assignors to D.E.A. Digital Electronic Automation SpA, Moncalieri, Italy

Filed May 4, 1990, Ser. No. 519,285
Claims priority, application Italy, May 8, 1989, 67332 A/89
Int. Cl.[5] G01B *5/03*
U.S. Cl. 33—503 17 Claims



1. A measuring machine comprising:

a base provided with a measuring plane and first guide means defining a first axis;

a first portal-type carriage movable along said first guide means of said base and provided with second guide means defining a second axis orthogonal to said first axis;

a second carriage movable along said second guide means; and

a measurement head carried by said second carriage and movable with respect to said second carriage along a third axis orthogonal to said first and second axes; said second carriage including a hand grip for manual displacement of said first and second carriages respectively along said first and second axes, said hand grip being symmetrical with respect to a vertical median plane of said second carriage parallel to said first axis and being provided with at least one actuating element for manual control of the translation of said measurement head, said hand grip further being rotatable to directly drive said actuating element through gears to move said measurement head along said third axis.

5,142,791

APPARATUS FOR POSITIONING SAMPLE

Toshinori Kobayashi; Masahiro Tsunoda; Takayasu Furukawa, all of Katsuta, and Isao Kobayashi, Chiyoda, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

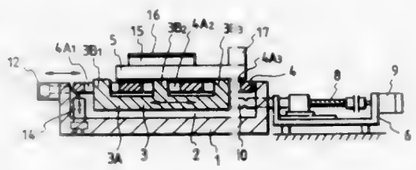
Filed Jun. 3, 1991, Ser. No. 709,317
Claims priority, application Japan, Jun. 2, 1990, 2-145141
Int. Cl.[5] B25H *1/00*; B23Q *16/00*
U.S. Cl. 33—573 24 Claims

1. An apparatus for positioning a sample by moving the sample in X, Y and Z axes directions: comprising:

a coarse adjustment stage having a base supported by a

coarse adjustment structure for moving the base in a X axis direction and in a Y axis direction and plural protrusions located on an upper surface of the base;

a fine adjustment stage having a plurality of through holes for moving said plural protrusions freely within the through holes, respectively, and a fine adjustment structure for moving the fine adjustment stage in the X, Y and Z axes directions; and



a sample hold base supported alternately by said coarse adjustment stage or said fine adjustment stage and transferred from said coarse adjustment stage to said fine adjustment stage or from said fine adjustment stage to said coarse adjustment stage by moving a Z axis moving member.

5,142,792

POSITION MEASURING DEVICE

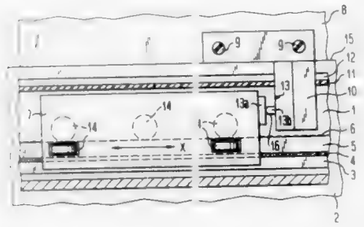
Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhaim GmbH, Traunreut, Fed. Rep. of Germany

Filed May 17, 1991, Ser. No. 702,223

Claims priority, application Fed. Rep. of Germany, May 31, 1990, 9006138[U]

Int. Cl.[5] G01B *7/02*

U.S. Cl. 33—702 6 Claims



1. In a position measuring device for measuring the relative positions of two objects, wherein a graduation of a graduation carrier connected to one of the objects is scanned by a scanning unit which is coupled in an articulated manner to the other of the objects through a coupling which is stiff in measuring direction, the scanning unit being slidable on an auxiliary guide means which is independent of a guide means of the two objects, and wherein the coupling includes two coupling parts which contact each other, the improvement comprising a sliding layer between the two coupling parts.

5,142,793

DIGITAL LINEAR MEASURING DEVICE

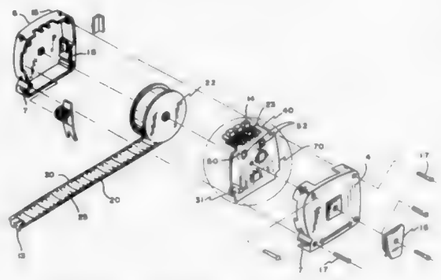
R. Stephen Crane, Annapolis, Md., assignor to Comtek Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 360,837, Jun. 2, 1989, Pat. No. 5,027,526. This application Apr. 2, 1991, Ser. No. 679,227

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] G01B *3/10;* G01D *5/34*

U.S. Cl. 33—763 6 Claims



1. A digital linear measuring device comprising:

a housing;

a reel located within said housing and a measuring tape wound on said reel, said housing having an opening through which said measuring tape is extendable as said reel is rotated;

incremental measuring means for generating incremental measuring data as said measuring tape is extended from said housing;

absolute measuring means for generating absolute measurement data as said measuring tape is extended;

processing means responsive to both said incremental measurement data and to said absolute measurement data for generating, based on said incremental measurement data and said absolute measurement data, an output reflecting linear extension of said measuring tape from said housing; and

display means responsive to said processing means for displaying information reflecting said linear extension of said measuring tape from said housing.

5,142,794

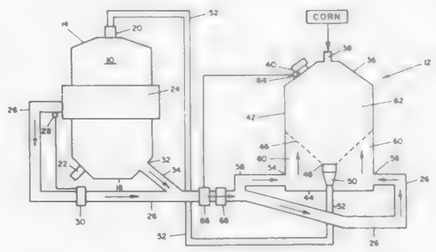
PROCESS AND APPARATUS FOR DRYING GRAIN

Elmo R. Meiners, Box 64, Anchor, Ill. 61720

Continuation-in-part of Ser. No. 392,741, Aug. 11, 1989, abandoned. This application Sep. 14, 1990, Ser. No. 583,036

Int. Cl.[5] F26B *3/00*

U.S. Cl. 34—35 12 Claims



1. A corn drying system comprising:

a corn dryer having a corn inlet, a corn outlet, a hot air inlet and an exhaust air outlet;

a steeping container having a bottom wall, a perforated floor mounted above and spaced from said bottom wall and defining a steeping chamber above said floor and an air plenum below said floor, a corn inlet located above said floor and communicating with said steeping chamber, an air inlet located below said floor and communicating with said air plenum, an air outlet located above said floor and communicating with said steeping chamber, and a corn outlet located at said bottom wall and communicating with said steeping chamber, said floor being perforated in a pattern that provides for even, uniform distribution of air form said air plenum through corn in said steeping chamber and thence through said air outlet;

conduit means for conveying exhaust air from said exhaust air outlet of said corn dryer to said air inlet of said steeping container;

conveying means for conveying corn from said corn outlet of said steeping container to said corn inlet of said corn dryer;

said perforated floor is frusto-conically shaped so as to slope downwardly and radially inwardly.

5,142,795

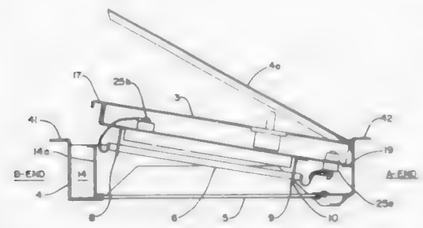
INFRA-RED LAMP MODULE

Ronald E. Abbott, Marion, Ohio, assignor to ABB Process Automation Inc., Columbus, Ohio

Filed Oct. 29, 1990, Ser. No. 605,048

Int. Cl.[5] F26B *23/04;* H05B *3/42*

U.S. Cl. 34—41 8 Claims



1. In an apparatus for heating a movable web, of the type including an elongate support frame and a plurality of heater modules releasably attached to said support frame; the improvement comprising:

said heater modules each comprising a housing and an inner panel assembly releasably captured therein;

said housing including a cover, having an open position and a closed position, allowing insertion and removal of said inner panel; and

means on said inner panel assembly operably supporting a plurality of heater elements, said means including a captive locking member slidably displaceable between a first position, whereat all of said heater elements are locked in position, and a second position, whereat all of said heater elements may be removed.

5,142,796

FLAMERESISTING APPARATUS

Hisao Anzai; Nobuyuki Yamamoto; Youichi Kodama; Yoshitaka Imai, and Tsutomu Daiguuji, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

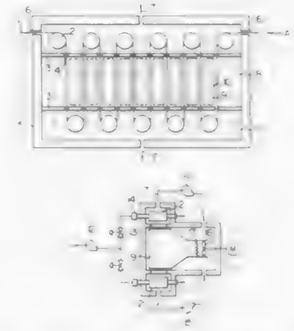
PCT No. PCT/JP90/00204, § 371 Date Oct. 23, 1990, § 102(e) Date Oct. 23, 1990, PCT Pub. No. WO90/10101, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 21, 1990, Ser. No. 598,638

Claims priority, application Japan, Feb. 23, 1989, 1-41695

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—62 7 Claims



1. In a flameresisting apparatus wherein two roller compartments enclosing a series of rollers provided face to face with one another for transferring precursor fiber are separated from a heat treatment section which includes at least one heat treatment compartment by two walls facing each other, said walls having apertures for passage of the precursor fiber, the improvement comprising:

1) the two walls facing each other are provided at such a distance from each other to enable the precursor fiber to pass from one wall to the other in 5 to 6 seconds,

2) said apparatus including means for maintaining the surface temperature of the rollers and the temperature of the roller compartments at a temperature 10° to 80° C. lower than the temperature of the heat treatment compartment and not lower than 180° C., and

3) said apparatus further including means for blowing heated air against the precursor fiber in the heat treatment compartment.

5,142,797

SHOE EMPLOYING NEGATIVE TOE ROCKER FOR FOOT MUSCLE INTENSIVE SPORTS

Charles D. Cole, III, 405 W. Palm, Redlands, Calif. 92373

Continuation of Ser. No. 392,485, Aug. 11, 1989, abandoned. This application Aug. 12, 1991, Ser. No. 747,466

Int. Cl.[5] A43B *3/00, 11/00*

U.S. Cl. 36—113 3 Claims

1. A shoe providing resilient support for supplementing the lantar muscle strength in a wearer's foot, the foot having toes, a ball, an instep and heel the shoe comprising:

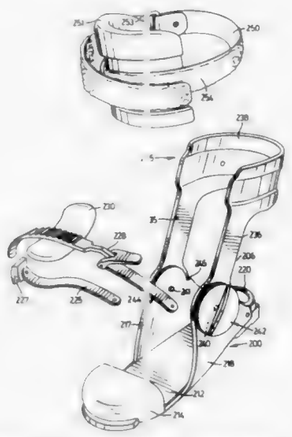
a resilient sole downwardly arched from a heel end to a toe end, the toe end terminating proximate the extremity of the toes of the wearer's foot, the downward arch preloading the sole to resiliently resist flattening responsive to a force applied substantially perpendicular to the sole on a toe portion of the sole extending from the ball of the wearer's foot to the extremities of the toes;

an upper attached to the sole and providing means for tightening the shoe across the instep of the foot, the means for tightening having medial and lateral lips in the upper each having an opposing edge defining a closure over a tongue;

a first plurality of tensioning means proximate the edge of each lip;
a second plurality of tensioning means distal the edge of each lip alternately spaced intermediate the first plurality of tensioning means;
means for preventing wrinkling of the lips comprising a plurality of cutouts intermediate the first plurality of tensioning means and extending from the edge of each lip to a vertex proximate the alternating second plurality of

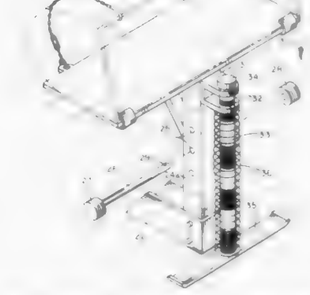
tensioning means, each cutout having an elastic web fastened therein, the elastic web expanded when the shoe is in a first downwardly arched preloaded condition and contracted with the shoe is in a second flattened condition; and
means for engaging the heel of the foot to prevent extracting the heel from the shoe when the wearer's weight is brought to bear on the sole of the shoe creating the force on the toe portion of the sole.

5,142,798
DOWNHILL SKI BOOT ASSEMBLY
William H. Kaufman; Frederick A. Harrison, both of Kitchener; Claude J. Gidman, Toronto, and Gerald Beekenkamp, Paris, all of Canada, assignors to William H. Kaufman Inc., Kitchener, Canada
Continuation-in-part of Ser. No. 647,973, Jan. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 549,920, Jul. 9, 1990, Pat. No. 5,068,984. This application Jun. 27, 1991, Ser. No. 722,221
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **14 Claims**



1. A downhill ski boot assembly, comprising:
a boot made of flexible materials enabling the wearer to walk normally, the boot having a sole, a toe, a heel, an ankle region, and a leg shaft; and
a boot brace made of a rigid material for receiving and holding the boot within it, said boot brace having a sole plate adapted to be insertable into a downhill ski binding, and a boot receiving structure, comprising:
a forefoot receiving means attached to the sole plate for receiving the toe of the boot;
inner and outer lower lateral support members extending upwardly from the sole plate;
a heel guard extending from one lower lateral support member to the other;
boot restraining means for urging the sole of the boot against the sole plate, said restraining means being attached to the lower lateral support members;
inner and outer upper lateral support means engageable with the leg shaft of the boot, said upper support means being attached pivotally to the lower lateral support members about the ankle region of the boot;
spring bias means at said pivotal ankle region adjacent the pivot to provide a gradient of resistance to the forward rotation of the upper lateral support means about the pivotal ankle region; and
securement means for securing the upper lateral support means about the leg shaft of the boot.

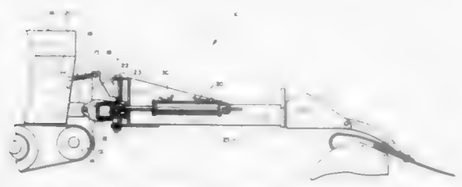
5,142,799
TRACTOR BACKHOE ATTACHMENT
Kennith L. Wood, Box 51, Bloomfield, N. Mex. 87413
Filed Nov. 21, 1991, Ser. No. 797,414
Int. Cl.[5] E02F *3/96*
U.S. Cl. 37—117.5 **5 Claims**



1. A tractor backhoe attachment for securement to a tractor bucket, wherein the tractor bucket includes a bucket entrance, including a bucket bottom wall spaced from a bucket top wall, the bucket bottom wall including a bottom wall lower edge and the bucket top wall including a top wall upper edge, wherein the lower edge and upper edge are arranged in a parallel relationship, and wherein the apparatus comprises,
a mounting plate, the mounting plate is arranged for securement in a coextensive relationship relative to an exterior surface of the bucket bottom wall, and wherein the mounting includes a mounting plate forward edge spaced from a mounting plate rear edge, the mounting plate forward edge includes first securement means for securement of the mounting plate to the bucket bottom wall lower edge, and
second securement means secured to the mounting plate rear edge for securement of the mounting plate to the bucket top wall upper edge, and

a support leg fixedly and orthogonally mounted to a bottom surface of the mounting plate extending downwardly therefrom, wherein the support leg includes a support leg lower distal end, and
a scoop detachably mounted to the support leg lower distal end.

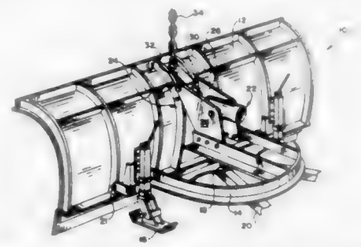
5,142,800
SNOW GROOMER TOW FRAME ALIGNMENT DEVICE
Scott J. Hales, and Terry L. Zollinger, both of Logan, Utah, assignors to Logan Manufacturing Company, Logan, Utah
Filed Dec. 27, 1991, Ser. No. 813,653
Int. Cl.[5] E01C *19/22*
U.S. Cl. 37—220 **6 Claims**



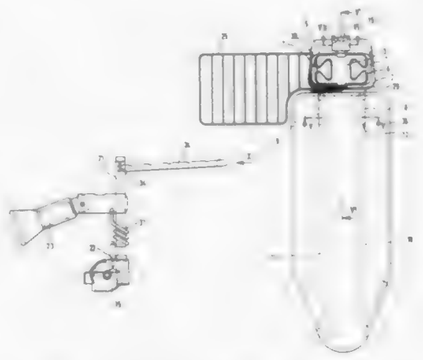
1. An automatic centering towing device for a snow grooming device propelled by a vehicle equipped to provide high pressure hydraulic fluid and direct current electrical power, said towing device comprising:
a frame including a foremost crossbar joined to the towing vehicle about a pivot having a horizontal axis lateral to the direction of travel of the vehicle, an elongate frame stem joined to the crossbar through a pivot having a vertical axis, said stem extending rearwardly therefrom to rigidly connect with a member to which the grooming device is attached, and double-acting hydraulic cylinder-and-ram means mounted to act between the crossbar and the frame stem to cause rotation therebetween about the vertical pivot axis to adjust the alignment of the grooming device with the vehicle;
conduit means supplying high pressure hydraulic fluid from the vehicle to operate the cylinder-and-ram means;
electronically operable valve means controlling a flow of said hydraulic fluid through the conduit means to supply the cylinder and ram means;
electronic switching means responsive to the state of alignment between the crossbar and stem;
electrical circuit means linking the fluid control valve means and the switching means, said circuit means including electronic means to automatically control the valve to direct operating fluid through the conduit means to the cylinder and ram means, to rotate the frame stem to restore alignment thereof with the vehicle.

5,142,801
LEVEL LIFT FRAMEWORK FOR CANISTER TYPE PLOW PUSH FRAME
Richard L. Feller, Monroe, Wis., assignor to Monroe Truck Equipment, Inc., Monroe, Wis.
Filed Sep. 9, 1991, Ser. No. 756,434
Int. Cl.[5] E01H *5/04*
U.S. Cl. 37—235 **11 Claims**

1. A snow plow leveling system having a chain and canister type actuator comprising:
a push frame;
a plow blade pivotally attached to a forward portion of the push frame to form a tilt pivot point therebetween;
a framework attached to the push frame and extending above said plow blade forward of the tilt pivot point, wherein said framework includes means, provided forwardly of the tilt pivot point, for engaging the chain and means for engaging the canister type actuator.

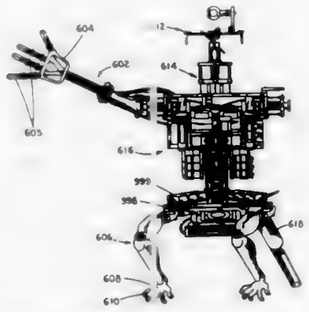


5,142,802
SUPPORT FOR AN APPLIANCE, NAMELY AN IRON
Guenther Krause, Alsfeld, Fed. Rep. of Germany, assignor to Krause-Werk GmbH & Co. KG, Alsfeld, Fed. Rep. of Germany
Filed Jan. 24, 1991, Ser. No. 645,989
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 9000832[U]
Int. Cl.[5] D06F *81/10*
U.S. Cl. 38—107 **16 Claims**



1. A support for an iron, said support being fastened to an ironing board and comprising:
a closed frame with a center recess, said frame being symmetrical with respect to a vertical center plane, said recess having mounted therein at least one adjustable support grid for supporting the iron, said frame having mounting means for facilitating a mounting of additional devices incidental to ironing, said support grid being formed by two support rods, each of which are pivotal about a horizontal axis, which is parallel with respect to the center plane, from a horizontal into an inclined position.

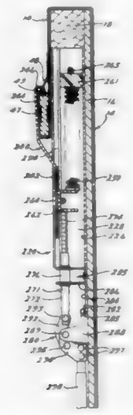
5,142,803
ANIMATED CHARACTER SYSTEM WITH REAL-TIME CONTROL
Victor H. Lang, W. Pueblo, Colo., assignor to Semborg-Recrob, Corp., Lansing, Ill.
Division of Ser. No. 410,114, Sep. 20, 1989. This application Oct. 10, 1990, Ser. No. 595,381
Int. Cl.[5] A63H 13/00
U.S. Cl. 40—411 5 Claims



1. An animated character which responds to control signals sent from a remotely located source, comprising:
an animated character body, movably controllable in response to the control signals, having a first mechanical servo mechanism, a second mechanical servo mechanism and a third mechanical servo mechanism, each for providing a force in response to the control signals;
cables coupled to the mechanical servo mechanisms and to a support member such that the respective forces are provided independently of the support member;
a ball and socket joint coupled to the support member and responsive to the cables to move the support member rotationally about the joint;
wherein the support member supports the joint to allow the cables to provide 3-dimensional movement.

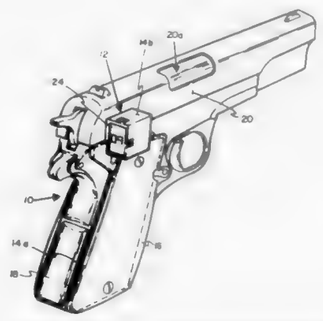
5,142,804
RELEASABLE ANCHORING AND TENSIONING APPARATUS FOR BILLBOARD DISPLAYS
David U. Hillstrom, Novi, and Nicholas A. DeRosa, Canton, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.
Continuation of Ser. No. 320,775, Mar. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 187,587, Apr. 28, 1988, Pat. No. 4,862,614. This application Jun. 24, 1991, Ser. No. 719,794
Int. Cl.[5] G09F 17/00
U.S. Cl. 40—603 21 Claims

1. An apparatus for anchoring and selectively tensioning and relaxing a sheet material display on a billboard, said apparatus comprising:
an elongated base member having a generally U-shaped lateral cross-section, said base member including a base plate portion and a pair of laterally spaced-apart leg portions protruding from said base plate portion, each of said leg portions having a slot formed therein, said slots facing generally toward one another;
means for fixedly interconnecting said elongated base member with the billboard;
clip member having a clip plate portion received within said slots for selective slidable longitudinal movement along said base member;
and attachment portion for releasably engaging a portion of the sheet material display;
clip biasing means for selectively resiliently biasing said clip member relative to said base member in a first longitudinal direction in order to selectively tension the sheet material on the billboard;
release means for selectively moving said clip member relative to said base member in an opposite longitudinal direction in order to relax the sheet material, said release means including a handle member movable between a first longitudinal position wherein said clip member is forcibly urged by said handle member against the resilient biasing force of said clip biasing means to relax the sheet material



and a second opposite longitudinal position wherein said clip biasing means is allowed to resiliently bias said clip member in said first longitudinal direction in order to selectively tension the sheet material;
said handle member being interconnected with said apparatus and pivotally movable generally longitudinally between said first and second longitudinal positions; and
said handle member also being pivotally movable generally laterally in either said first of said second longitudinal pivoted position.

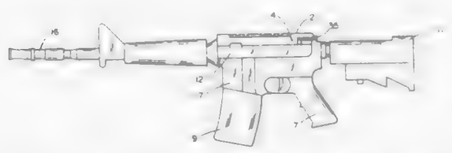
5,142,805
CARTRIDGE MONITORING AND DISPLAY SYSTEM FOR A FIREARM
John N. Horne, 2145 B 34th, and Michael A. Wolf, 3195 Arizona, both of Los Alamos, N. Mex. 87544
Continuation-in-part of Ser. No. 458,582, Dec. 29, 1989, Pat. No. 5,005,307. This application Mar. 4, 1991, Ser. No. 664,027
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] F41A 9/62
U.S. Cl. 42—1.02 10 Claims



1. In a semiautomatic or automatic firearm having a slide

means which slides relative to a frame upon firing of the firearm, and wherein said firearm is loaded by magazine means inserted into said frame of said firearm and from which cartridges are fed into the firearm, a cartridge monitoring and display system comprising:
slide switch means affixed to said frame, said slide switch means including a motion sensor responsive to sliding of said slide means relative to said frame, said slide switch means being operable to produce a slide signal upon sliding of said slide means relative to said frame;
magazine switch means affixed to said frame, said magazine switch means being operable to generate a magazine signal upon insertion of a magazine into said firearm;
a programmed control circuit affixed to said frame of said firearm and operable to receive said slide and magazine signals and to ascertain therefrom the total number of cartridges that are available for firing in said magazine and in the chamber of the firearm;
a visual display unit affixed to said frame and driven by said control circuit; and
wherein said programmed control circuit operates to receive said slide and magazine signals, and to produce on said visual display a visual display of the total number of cartridges contained in the firearm, including both the magazine and the chamber of the firearm.

5,142,806
UNIVERSAL RECEIVER SLEEVE
Richard E. Swan, 375 West St., W. Bridgewater, Mass. 02379
Filed Sep. 23, 1991, Ser. No. 763,966
Int. Cl.[5] F41C 27/00; F41G 1/387
U.S. Cl. 42—101 17 Claims

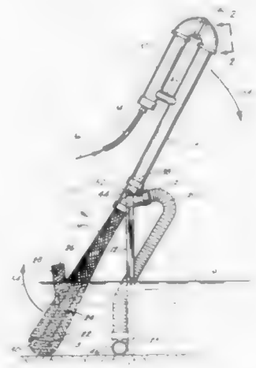


1. An improved means for interfacing modular enhancements to a firearm having a receiver with a stock and barrel attached thereto, comprising:
a bottom firearm interface section attached to said firearm receiver and having a longitudinal axis extending in spaced, parallel relation to the longitudinal axis of said firearm, said bottom section having a longitudinal, horizontally positioned base portion along its length, said base portion having two long side edges and a first longitudinal rail extending downward from said base portion adjacent one of the long side edges and a second longitudinal rail extending downward from said base portion adjacent the other of the long side edges, wherein said second rail is in spaced parallel relationship to said first rail and a longitudinal channel is formed between said first and second rails, said channel being fitted over a portion of the firearm receiver; and
a top enhancement interface section attached to said bottom interface section and having a longitudinal axis extending in spaced, parallel relation to the longitudinal axis of said firearm, said top interface section having a longitudinal, horizontally positioned base portion along its length, said base portion having two long side edges, and a first longitudinal rail extending upward from said base portion adjacent one of the long side edges and a second longitudinal rail extending upward from said base portion adjacent the other of the long side edges, wherein said second rail is in spaced parallel relationship to said first rail and a longitudinal channel is formed between said first and second rails.

5,142,807
DOUBLE-ENDED GRIPPER DEVICE
Theodore E. Sweet, 2601 Lucerne Way, Lake Isabella, Calif. 93240-9645
Filed Apr. 15, 1991, Ser. No. 684,840
Int. Cl.[5] A01K 97/00
U.S. Cl. 43—4 6 Claims

1. A double-ended gripper device comprising:
a central arm structure,
two spring-operated jaw structures extending oppositely from the central arm structure, said central arm structure comprising a central annular element and two separate arms extending oppositely from the annular element, each arm having an outer end spaced from the annular element, each arm having an eye encircling a portion of the annular element for sliding motion therealong, whereby each arm is swingable relative to the annular element plane and movable circumferentially about the annular element, and
each spring-operated jaw structure having a swivel connected with the outer end of one of said arms, whereby each jaw structure is independently adjustable relative to the central arm structure.

5,142,808
PIVOTABLE CRAYFISH TRAP
Aubrey J. Dupree, Jr., and Malcolm J. Dupree, both of P.O. Box 855, Gibson, La. 70356
Filed Nov. 1, 1991, Ser. No. 786,716
Int. Cl.[5] A01K 81/04
U.S. Cl. 43—6.5 18 Claims



1. An aquatic harvesting apparatus comprising:
(a) an elongated harvesting member pivotally mounted upon a support member between opposing end regions of said harvesting member;
(b) trap means secured to one end region of said harvesting

member for trapping aquatic life, said trap means comprising a conically-shaped wire mesh trap having a funnel means at one end with an opening therein through which said aquatic life may pass;

(c) counterweight means secured to the opposite end region of said harvesting member for selectively applying a counterweight to and removing a counterweight from said opposite end region of said harvesting member so as to selectively pivot said trap means about said support member between a first harvesting position and a second trap-emptying position;

(d) collecting means in communication with said trap means for collecting said trapped aquatic life when said counterweight is applied to said opposite end region of said harvesting member, thereby pivoting said trap means from its said first to said second position and,

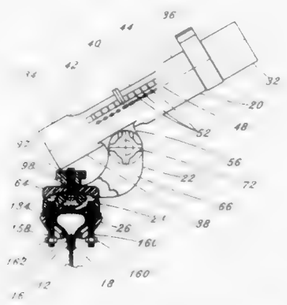
(e) means for selectively controlling the application and removal of said counterweight.

5,142,809

FISHING ROD HOLDER INCLUDING A NON-INVASIVE CLAMP FOR MOUNTING SAME TO A GUNWALE OR LIKE SURFACE

James R. O'Brien, 4355 Pilgrim Hollow Ct., Brookfield, Wis. 53005; Mohomed B. Agha, 3965 Suffolk La., Hoffman Estates, Ill. 60195; Roberet E. Luce, N169 W19820 Chestnut Ct., Apt. 11, Jackson, Wis. 53037; Paul S. Renard, 1428 Eder La., West Bend, Wis. 53095, and Mark G. Sellers, W310 N6732 Chenaqua, Hartland, Wis. 53029

Filed Dec. 19, 1990, Ser. No. 630,223
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—21.2 32 Claims



1. A fishing rod holder for use on a boat having a gunwale or like surface with first and second opposing sides that may be variously configured, the fishing rod holder removably mounting on the gunwale and comprising:

(a) a clamp removably mounted on the gunwale, and including:

(i) a base having a top surface and a bottom surface that opposes the top surface, the bottom surface resting upon the gunwale of the boat;

(ii) a first platen having interior and exterior surfaces and which is affixed on the base by a first hinge, the first platen folding at the first hinge such that the interior surface of the first platen rests in substantially juxtaposed relation against the first side of the gunwale;

(iii) a second platen having interior and exterior surfaces and which is affixed on the base by a second hinge, the second platen folding at the second hinge such that the interior surface of the platen rests in substantially juxtaposed relation against the second side of the gunwale; and

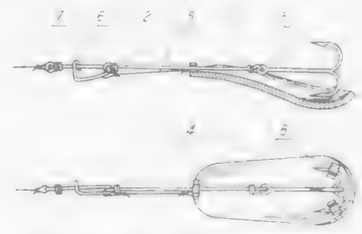
(b) a tube member mounted on the clamp and having a bore defined by an inside diameter which is dimensioned to receive a fishing rod therewithin.

5,142,810

ARTIFICIAL LURE

Konstantin Radtchenko, 235 Manhattan Ave., Jersey City, N.J. 07307

Division of Ser. No. 316,808, Feb. 28, 1989, Pat. No. 4,956,933.
This application Aug. 6, 1990, Ser. No. 562,805
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.04 6 Claims



1. An artificial lure comprising:

a main body;

a hook with a curved end and an eyelet end;

at least one eye mounted on a first end of the exterior of said body;

a springy eye mounted on a second end of the exterior of said body, removably engaging the curved end of said hook;

a rod connected to the eyelet end of said hook, said rod with hook forming an assembly slidably threaded through said eye so as to be adjacent said body;

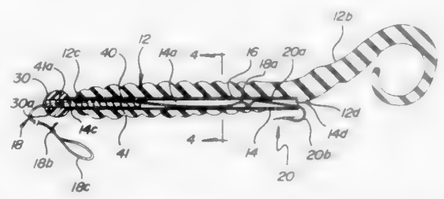
wherein a hook setting motion releases said curved end of said hook from said springy eye providing said hook with a larger range of movement, including movement relative to said main body, to efficiently set said hook in a fish's mouth.

5,142,811

FISHING LURE AND LURE ENHANCEMENT KIT

Carl W. Freeman, 1417 Jane Ave., Flint, Mich. 48506

Filed Apr. 4, 1991, Ser. No. 680,542
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.53 22 Claims



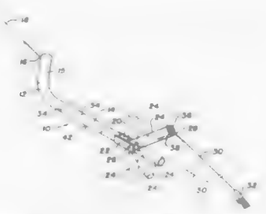
1. A fishing lure, comprising a relatively soft, pliable plastic body having an elongated passage therethrough, a relatively rigid tubular casing received in the passage, said casing including a bore having an open leading end and an open trailing end, a length of fish line received in the bore through said open leading end, and a hook having a shank portion received in the bore through said open trailing end and connected to the line in said bore.

5,142,812

FISH ATTRACTOR

Stephen Borden, 2144 Ferndale Road, Victoria, B.C., V8N 2Z1, Canada

Filed Aug. 29, 1991, Ser. No. 751,989
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—43.1 4 Claims



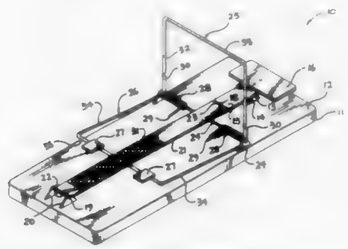
1. A fish attracting device comprising a first rigid elongated shaft having a substantially straight portion and a curved portion at one end of the straight portion, the said straight portion and curved portion lying in a first plane, the other end of the straight portion terminating in a hinged connection to a second rigid shaft which is straight and shorter than the first shaft and which is rotatable about the hinged connection in a second plane, said second plane being different from and angularly offset from said first plane, means for holding said second shaft at a given angle in relation to the first shaft said means being yieldable under the effect of a pull on the second shaft, means for securing a line to the free end of the curved portion, and means of securing a line to the free end of the second shaft.

5,142,813

MOUSE TRAP APPARATUS

Richard A. Prostler, Box 473, Claverack, N.Y. 12513

Filed Jul. 1, 1991, Ser. No. 723,767
Int. Cl.[5] A01M *23/30*
U.S. Cl. 43—81 1 Claim



1. A mouse trap apparatus comprising,

a support plate, the support plate including a planar top wall, the planar top wall mounting a first pivot axle in a parallel relationship relative to the top wall, with the first pivot axle mounting a first plate intermediate a first plate first end and a first plate second end, when the plate is orthogonally oriented relative to the first pivot axle, and

a second pivot axle oriented parallel to the first pivot axle and a support plate planar top wall, wherein the second pivot axle pivotally mounts a second plate at a first end of the second plate, and wherein the second plate includes a second plate second end, wherein the second plate second end is in contiguous abutment with the first plate second end in a first position and displaced relative to the first plate second end in a second position, and

a third pivot axle mounted between the first pivot axle and the second pivot axle adjacent the planar top wall and parallel thereto and oriented parallel to the first pivot axle and the second pivot axle, wherein the third pivot axle pivotally mounts a first U-shaped loop and a second U-shaped loop, the first U-shaped loop is fixedly and orthogonally mounted relative to the second U-shaped loop at an intersection, and the intersection is pivotally mounted relative to the third axle, and

the second U-shaped loop is positioned below the second plate, and the first U-shaped loop is oriented orthogonally relative to the support plate top wall in a first position and in contact with the first plate in a second position, and

the first plate includes a bait support plate mounted to the first plate second end, and the second U-shaped loop includes a second side leg orthogonally mounted relative to the third pivot axle, and a base leg spaced parallel relative to the third pivot axle, wherein the second base leg defines a second base leg spacing between the third pivot axle and the second base leg equal to or greater than a bait plate spacing defined between the bait plate and the third pivot axle, and at least spring member means mounted about the third pivot axle for biasing the first U-shaped loop into engagement with the bait support plate, and

the second U-shaped loop includes second side legs fixedly mounted to the first side legs of the first U-shaped loop, and wherein the second side legs include a second base leg, the second base leg is positioned in contiguous communication with a bottom surface of the second plate, and the second base leg includes a plurality of finger pads fixedly mounted to the second U-shaped loop for providing enhanced surface engagement with the second U-shaped loop for displacement of the second U-shaped loop in the first position, wherein the first plate is in alignment with the second plate, and

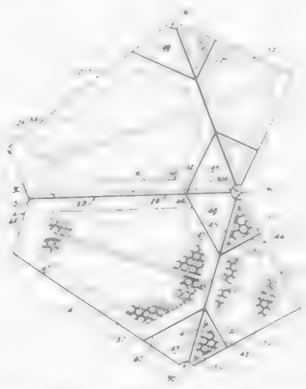
the first plate includes a first plate length between the first pivot axle and the first plate second end less than a spacing between the first pivot axle and the third pivot axle, and wherein the second plate defines a second plate length between the second plate first end and the second plate second end greater than a predetermined spacing between the second plate first end and the third pivot axle.

5,142,814

CRUSTACEAN TRAP

Dean P. Guidry, Rte. 3 Box 3859, St. Martinville, La. 70582

Filed Jul. 6, 1990, Ser. No. 549,367
Int. Cl.[5] A01K *69/10*
U.S. Cl. 43—105 13 Claims



1. A collapsible crayfish trap apparatus, comprising:

a) a trap body of plastic mesh material having at least three outer side walls each including at least an upper smaller wall portion and a lower larger wall, at least one of the

walls having intersecting border portions of strip material surrounding an area with an array of openings;
b) a plurality of elongated hinges that traverse one or more of the border portions each defining folds that allow the trap body to be collapsed or erected by bending one or more of the walls at the hinges;
c) the trap body having one or more inlets for allowing the entry of crayfish into the trap interior at least when the trap is erected;
d) a trap floor that connects to the side wall portions and each side wall has a segment that defines a portion of the trap floor, and;
e) an enlarged opening in the trap body, substantially larger than each of the inlets, for emptying crayfish from the trap

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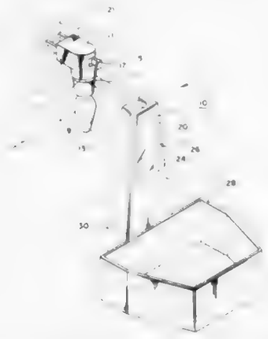
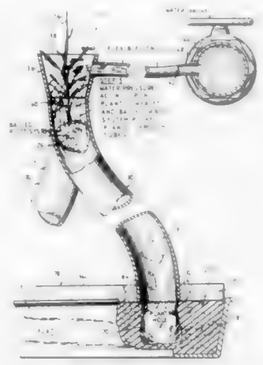
5,142,815
NIGHT LIGHT INSECT TRAP
Robert M. Birdsong, 6576 Hayes Dr., Riverdale, Ga. 30274
Filed Nov. 7, 1991 Ser. No. 788,145
Int. Cl.[5] A01M *1/04*
U.S. Cl. 43—113 10 Claims



1. An insect trap for use with a night light which has a removable cover comprising:
a housing defining a window for transmission of light emanating from a bulb of the night light, and defining a slot for receiving an indentation in a socket of the night light which holds the removable cover of the night light;
a light-transmitting cover for said window; and
a receptacle attached to said housing vertically disposed below said window of said housing for receiving insects which fall after hitting said light-transmitting cover for said window and for holding a substance to which insects adhere;
whereby insects are attracted to light emanating from the night light and impel themselves into said light-transmitting cover of said window becoming stunned and fall into said receptacle containing said substance to which insects adhere.

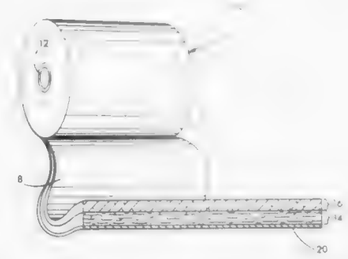
5,142,816
PLANTING DEVICE AND METHOD OF OPERATING THE SAME
William Tetenburg, 20 Marilyn St., Manorville, N.Y. 11949
Filed May 24, 1991, Ser. No. 705,113
Int. Cl.[5] A01G *9/08*
U.S. Cl. 47—1.01 4 Claims

1. An improved planting device in a planting machine being of the type having a conveyor carrying a plurality of flat plant trays therealong, with each tray having soil with a plurality of spaced apart planting holes therein, said improved planting device comprising means for transplanting by water pressure a



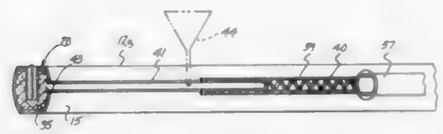
plurality of root plugs of plants into the planting holes in the soil of each of the trays on the conveyor.

5,142,817
PROTECTIVE WRAP FOR TREES AND OTHER PLANTS
David Rolf, Minneapolis, Minn., assignor to Lec Tec Corporation, Minnetonka, Minn.
Filed Jan. 9, 1991, Ser. No. 639,577
Int. Cl.[5] A01G *17/12*
U.S. Cl. 47—24 14 Claims



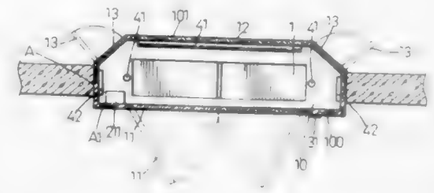
1. A protective wrap for plants comprising, a flexible tape backing comprising,
a flexible water insoluble polymeric sheet backing suited for being wound into rolls or dispensed as cut sheets,
a homogeneous hydrophilic stable matrix applied to the backing, said matrix being hydratable by atmospheric moisture and having a bonding surface adapted to conform to the contours of the plant and being sufficiently tacky to hold the tape in place after being wrapped around the plant, said matrix including
a) a liquid phase comprising a nonaqueous polar organic water-miscible liquid for plasticizing the matrix,
b) a water-soluble or water-swellable natural or synthetic hydrophilic film-forming polymer uniformly admixed with said liquid to form a flexible reservoir, and
c) a biologically active composition dispersed in the hydrophilic reservoir, said reservoir containing the biologically active composition being adapted to swell in a humid environment for carrying the biologically active composition from the reservoir toward a surface of the wrap where it can be released to the environment so as to provide controlled release of the protective composition for guarding the plant.

5,142,818
PLANT FEEDING AND SHIELD APPARATUS
Charles J. Weigert, P.O. Box 617, Hazelwood, N.C. 28738
Filed Jul. 1, 1991, Ser. No. 723,855
Int. Cl.[5] A01G *13/10, 29/00*
U.S. Cl. 47—25 1 Claim



1. A plant feeding and shield apparatus, comprising,
a torroidal ring member, the torroidal ring member including a plurality of ring segments interconnected in an end-to-end relationship, each ring segment including a forward end and a rear end, each ring segment including a forward projecting ring projecting forwardly beyond the forward end, and each rear end including a socket directed interiorly of the rear end, wherein each socket receives an adjacent projecting ring, and
each ring segment includes a top wall trough, each top wall trough of each ring segment is arranged in an aligned relationship to define an annular trough, and
each top wall trough includes a matrix of apertures directed therethrough, and
each ring segment includes a bottom wall, and each bottom wall includes a matrix of apertures directed therethrough, and
each projecting ring includes a plurality of projecting ring aligned ring bores, and
each socket includes a plurality of socket aligned bores, wherein the projecting ring aligned bores and the socket aligned bores are coaxially aligned when the ring segments are secured together, and
the aligned bores receive a spike therethrough for securement of the ring segments together and securement to an underlying support surface, and
each top wall trough of each ring segment includes a top wall opening, and an insert housing is selectively positionable within each top wall opening, each insert housing includes a cylindrical side wall, and each cylindrical side wall includes a matrix of side wall openings, and each insert housing includes an apertured lid, the apertured lid in planar alignment with the top wall trough when the insert housing is positioned within the top wall opening, and
each insert housing includes a housing bottom wall, and each housing bottom wall includes a threaded bore, and each apertured lid includes a lid threaded fastener orthogonally and integrally mounted to a bottom surface of said apertured lid, and the lid threaded fastener is threadedly received within the threaded bore of the bottom wall, and
each ring segment includes a granular filler material contained within each ring segment coextensively therethrough, and
an inner torroidal ring coaxially positioned within the torroidal ring member, the inner torroidal ring includes a plurality of inner ring segments, each inner ring segment includes a first tube mounted thereto, the first tube includes a spring member mounted within the first tube, and a second tube slidably mounted to the first tube, wherein the spring member biases the second tube in an extended relationship relative to the first tube, and the second tube includes a second tube forward end, and at least one of said ring segments includes a ring segment side wall opening directed through a side wall of the at least one ring segment to receive the second tube forward end therethrough, and the second tube includes a second tube opening, the second tube opening includes a funnel therewithin, and the second tube in fluid communication with the said at least one ring segment to direct fluid through the funnel, the second tube, and into the at least one said ring segment.

5,142,819
GREENHOUSE
Hung-Tzu Sung, 1F, No. 9, Alley 12, Lane 99, Sec. 3, Kang-Ning Rd., Taipei City, Taiwan
Filed Oct. 29, 1990, Ser. No. 604,882
Int. Cl.[5] A47G *7/00*
U.S. Cl. 47—40 7 Claims



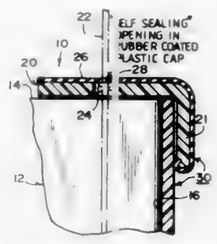
1. A greenhouse to be provided in a window opening having a windowsill, an inner side and an outer side, comprising:
an enclosed housing mounted on said window opening, said enclosed housing having a first operable window pane provided on said outer side of said window opening to allow air into said enclosed housing, and a second operable window pane provided on said inner side of said window opening;
an elongated plant box to contain soil to grow plants, said plant box being disposed inside said enclosed housing and accessible through said second operable window pane;
a watering device mounted on said enclosed housing adjacent to said second operable window pane, said watering device including a receptacle to contain liquid to water the plants, a watering pipe member communicated with said receptacle and extending into said plant box, and a water valve to control liquid flow from said receptacle to said pipe member; and
a surrounding temperature control device similarly mounted on said enclosed housing adjacent to said second operable window pane, said surrounding temperature control device including means for detecting if the immediate surrounding temperature at said plant box is between a maximum desired temperature and a minimum desired temperature, a cooling means actuated by said detecting means to maintain the immediate surrounding temperature below the maximum desired temperature, and a heating means actuated by said detecting means to maintain the immediate surrounding temperature above the minimum desired temperature.

5,142,820
MULTIPLE FLOWER STEM HOLDER
Thomas Aquino, 2439 Sycamore Ave., Wantagh, N.Y. 11793
Filed Dec. 13, 1990, Ser. No. 626,749
Int. Cl.[5] A01Q *5/04*
U.S. Cl. 47—41.12 8 Claims

1. A multiple flower stem holder, comprising:
a) a receptacle having an open top and a hollow interior adapted for receiving water therein;
b) a flat closure cap having a skirt to fit about the open top of said receptacle, so that said flat closure cap will cover the water within the hollow interior of said receptacle;
c) means in said flat closure cap, for allowing a plurality of flower stems to extend in a generally vertical position into the water in the hollow interior of said receptacle,
said allowing means includes said flat closure cap having a

plurality of apertures there hrough, each aperture being a sized to allow one flower stem to pass therethrough; and

d) means in said closure cap, for sealing each of the flower stems that extend through said flat closure cap and into the water in the hollow interior of said receptacle, said sealing means includes a pliable layer juxtaposed to said flat closure cap, said pliable layer having a plurality of crossed slots which align with the plurality of apertures in said flat closure cap so that when the flower stems are inserted into the crossed slots and through the apertures in said flat closure cap the crossed slots will automatically self seal about the flower stems.

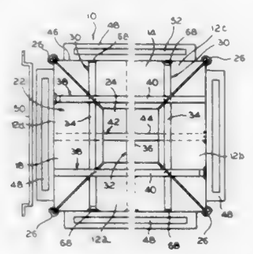


5,142,821

REUSABLE TREE/SHRUB CARRIER

Leslie E. Bell, 2414 Lynwood St., Morris, Ill. 60450

Filed Jul. 18, 1991 Ser. No. 732,161
Int. Cl.[5] A01G *9/02*
U.S. Cl. 47—76 13 Claims



1. A reusable tree/shrub carrier, comprising:

a plurality of side wall sections each configured so as to be arranged into a root ball container, each of said side wall sections being substantially identical in shape and having a side edge to be placed in juxtaposition to a side edge of an adjacent one of said side wall sections such that said container is generally shaped as a truncated pyramid having an open top and a smaller open bottom, and means for releasably securing said side edges of said side wall sections to form said root ball container; and

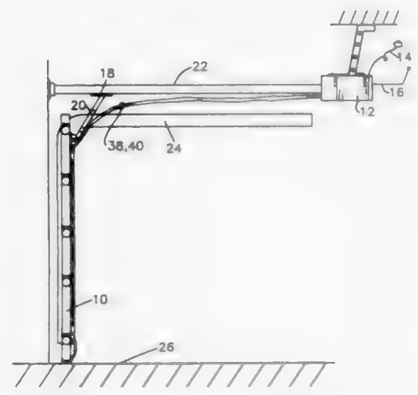
means for releasably securing a tree/shrub root ball within said root ball container during carrier transport thereof operatively associated with at least said open top of said root ball container, said ball securing means including at least a pair of retention strap assemblies operatively associated with said open top of said root ball container, said retention strap assemblies each including a strap mount associated with one of said side wall sections and a strap retainer associated with another of said side wall sections to be positioned directly opposite thereof, said strap mounts each having one end of a strap permanently secured thereto and said strap retainers each being adapted to releasably grip one of said straps at a point remote from said permanently secured end thereof.

5,142,822

SAFETY ARRANGEMENT FOR AUTOMATIC DOOR OPERATOR

Howard L. Beckerman, Middletown, N.J., assignor to Atlas Roll-Lite Door Corporation, Edison, N.J.

Filed Aug. 26, 1991, Ser. No. 750,185
Int. Cl.[5] E05F *15/02*
U.S. Cl. 49—27 13 Claims



1. A safety arrangement for a motor driven door, said door having an edge which is driven along a path toward and away from a fixed surface, the safety arrangement being effective for detecting an obstruction in said path, the arrangement comprising:

a first electrically conductive member fixedly secured to said edge;

an elongated flexible second electrically conductive member connected at one end to said first conductive member, said second conductive member being supported from said one end to its other end spaced and insulated from said first conductive member;

a capacitor connected between said other end of said second conductive member and a point on said first conductive member remote from where said one end of said second conductive member is connected to said first conductive member so as to form a loop;

controllable oscillator means for providing an oscillating electrical signal at a frequency which may be controllably varied;

means for applying said oscillating signal to said loop;

means for comparing the phase of the voltage across said capacitor to the phase of the current of said oscillating signal and providing an output signal at a voltage level indicative of the phase difference between said voltage and said current;

means for utilizing said output signal to control said oscillator means to vary the frequency of said oscillating signal so as to minimize the voltage level of said output signal; and

safety means utilizing said output signal for controlling movement of said door;

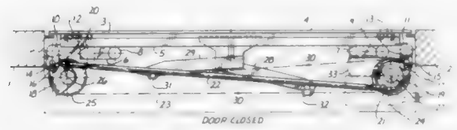
whereby when the door edge encounters an obstruction the second conductive member is moved closer to the first conductive member so that the inductance of the loop is suddenly changed, thereby suddenly changing the resonant frequency of the loop and increasing the magnitude of the output signal voltage.

5,142,823

SWINGING-SLIDING DOOR FOR VEHICLES

Rudolf Brandenburg, and Horst Goldbach, both of Ratingen, Fed. Rep. of Germany, assignors to Kiekert GmbH, Fed. Rep. of Germany

Filed Jun. 4, 1990, Ser. No. 532,377
Claims priority, application European Pat. Off., Jun. 2, 1989, [illegible]
Int. Cl.[5] E05F *17/00*
U.S. Cl. 49—118 9 Claims



1. A swinging-sliding door for vehicles, particularly passenger vehicles, each such vehicle having a wall structure, and door posts comprising:

a telescopic guide rail means (5) mounted by means of sviwel arms (6,7) to the wall structure, and being provided for holding the rail means when moving into and out of the wall structure;

at least one door leaf positioned for being outside and within the wall of the vehicle, respectively in an open and in a closed state for the door, said leaf being guided by the guide rail means for moving along the wall when the door is moved into the open state;

additional top and bottom rails (35,36) on the door leaf;

a driving device for operating the door leaf,

the driving device including at least one pivotable, roller carrying lever mounted on one of the door posts said lever swings the guide rail means and the door leaf from the closed position of the door leaf into a ready-to-open position that is into a plane outside the wall structure as the rollers run in the additional rails,

the driving device including an electro-motor (33) and gearing unit (37) and a drive pulley connected to the gearing unit for being driven by the gearing unit when the motor runs, the motor and gearing unit being positioned laterally above the opening of the door,

the driving device further having a case which turns as a result of reaction when the motor runs,

a traction means also included in the driving device and being connected to the pulley and being guided through a deflection pulley and connected to the door leaf for thereby drivingly coupling the drive pulley to the door leaf for shifting the leaf along the wall on turning of the drive pulley;

said case having a flange carrying an eccentric control pin and turning the pin on turning of the flanges as a result of the reaction when the motor runs

a control lever fastened to the door post, the control lever having a slot of a curved contour engaging the pin so that upon turning of the flange the pin moves the control lever which in turn turns the post to thereby pivot the roller carrying lever; and

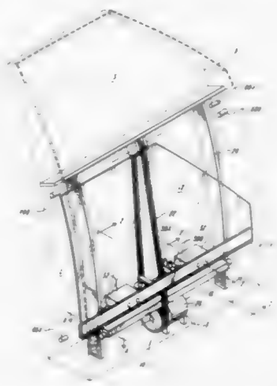
said control pin (16,17) in a door closing position being held in a dead center position in the curved contoured control lever so that the door is safely locked and can neither be opened manually nor by forces of the wind, the driving device through the flange exerting a reaction force onto the control lever which for a door opening results in the reaction force and turning of the pin and of moving the control lever to thereby unlock the lever so that the door leaf is permitted to be moved out of the plane of the wall permitting further sliding opening of the door through the traction means.

5,142,824

FOUR SIDE FLUSH SLIDING WINDOW ASSEMBLY

Gilles Le Compagnon, Dover, and David A. Rose, Amherst, both of N.H., assignors to Harvard Industries, The Kingston-Warren Corporation, Newfields, N.H.

Filed Sep. 23, 1991, Ser. No. 764,002
Int. Cl.[5] E05F *15/08*
U.S. Cl. 49—349 12 Claims



1. A sliding window assembly for moving a window between a cavity defined by a structure having an outer surface, and a space located above the cavity, the assembly comprising

a first motor for selectively moving the window between the cavity and the space,

a second motor for selectively moving the window between a first position substantially aligned with the cavity and a second position substantially aligned with the outer surface,

first sensing means for indicating when the window is substantially entirely within the cavity and when the window is substantially entirely within the space,

second sensing means for indicating when the window is in said first position and when the window is in said second position, and

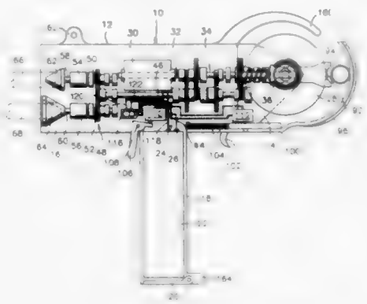
logic means connected to said first and second sensing means for controlling said first and second motors.

5,142,825

HAND-HELD ELONGATED STOCK MATERIAL CUTTER

Kenneth R. Floyd, 21 Tweed Rd., Fox Lake, Ill. 60020

Filed Apr. 25, 1991, Ser. No. 691,487
Int. Cl.[5] B24B *9/00, 23/02;* B23D *21/06;* B26D *3/16*
U.S. Cl. 51—5 C 18 Claims



1. A tool for cutting elongated stock including an elongated

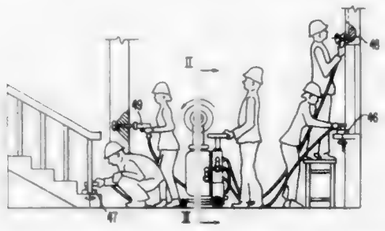
portable frame having opposite ends and opposite sides, a motor mounted from said frame a circular saw blade journaled from one end of said frame for rotation about a predetermined axis and including an outer periphery, drive means drivingly coupling said motor to said saw blade, a pair of first jaw means mounted from said frame and closely spaced on opposite sides of the plane of said saw blade for movement between extended and retracted limit positions in paths at least substantially disposed in a diametric plane of and containing said axis and with said first jaw means disposed and facing outwardly of said outer periphery when in said extended positions and shifted inwardly toward said axis when in said retracted positions, first biasing means connected between said frame and first jaw means yielding biasing said first jaw means toward said extended positions, second jaw means shiftably mounted from said frame and including portions spaced outwardly of said outer periphery, disposed on both sides of said plane of said saw blade and facing toward and opposing said first jaw means with said second jaw means portions being shiftable toward and away from said outer periphery and said first jaw means generally along said diametric plane, second biasing means yieldingly biasing said second jaw means away from said outer periphery, said frame including a handle for hand support of said frame and operable hand digit engagable first actuating means shiftably supported from said frame remote from said blade, engagable by a digit of hand engaged with said handle and operatively connected with said second jaw means for shifting said second jaw means toward said outer periphery against the biasing action of said second biasing means.

5,142,826

UNIVERSAL ABRADER

Chaoyin Zhang, 97 Construction Department of Huainan Coal Mining Administration, Anhui Province, China

Filed Aug. 15, 1989, Ser. No. 393,719
Claims priority, application China, Aug. 16, 1988, 88209886.1
Int. Cl.[5] B24B 23/00
U.S. Cl. 51—170 R 8 Claims



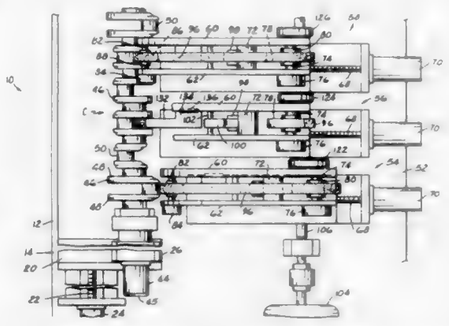
1. A universal abrader for abrading surfaces of various architectural members and having various shapes and tilting positions, comprising:
- a main body;
- a movable headstock supported movably on said main body;
- a totatable arm rotatively supported on said movable headstock;
- a processing tool assembly mounted at the free end of said rotatable arm and carrying a rotatable processing tool;
- a driving mechanism for rotating said processing tool;
- a motion supporting mechanism for supporting said movable headstock on said main body and enabling said movable headstock with respect to said main body not only to rotate but also to displace in a direction perpendicular to a plane in which said processing tool rotates;
- a rotation supporting mechanism for supporting said rotatable arm on said movable headstock; and
- a moving mechanism mounted under said main body, for moving said abrader on a supporting surface, wherein said motion supporting mechanism comprises a rotatable pivot for connecting said main body and said movable headstock, which at its one end extending into said headstock has an enlarged terminal head having a threaded hole therein perpendicular to the axis of said pivot, and a screw stem having its two ends mounted on a chassis of said headstock and engaged with said threaded hole, thus enabling said headstock relative to said main body not only to rotate around the axis of said pivot, but also to displace together with said screw stem in the axial direction of said screw stem by rotating said screw stem.

5,142,827

CRANKPIN GRINDER AND METHOD

James D. Phillips, Posen, Mich., assignor to J. D. Phillips Corporation, Alpena, Mich.

Filed Oct. 5, 1990, Ser. No. 593,694
Int. Cl.[5] B24B 1/00
U.S. Cl. 51—281 R 3 Claims



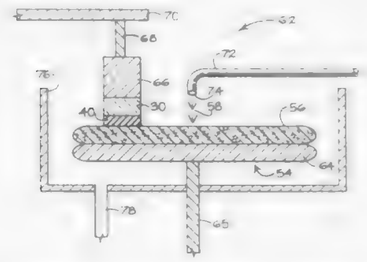
1. A method of grinding is plurality of crankpin journals provided on the longitudinally spaced apart transverse arms of an elongated crankshaft in positions disposed laterally outwardly from the central longitudinal axis of said carnkshaft at different angles around said central, longitudinal the peripheries of a plurality of cylindrical crankpin journals provided in longitudinally spaced apart relation along the length of an elongated crankshaft wherein said crankpin journals are each mounted on a pair of longitudinally spaced apart arms extending radially outwardly from said crankshaft in positions such that the centers of said crankpin journals are disposed radially outwardly from the central longitudinal axis of said crankshaft at different angles around said central, longitudinal axis and a full 360° of the peripheries of said crankpin journals is laterally accessible for grinding, comprising supporting and rotating said crankshaft about said central longitudinal axis thereof causing said crankpin journals to orbit said central longitudinal axis, providing a plurality of flexible, abrasive belts each having an abrasive surface on one side and a backing surface on the side opposite said abrasive surface, supporting said belts laterally adjacent the crankshaft opposite the respective crankpin journals, driving said belts linearly along paths substantially perpendicular to said crankshaft, laterally moving the driven belts toward and away from said crankshaft in a manner such the abrasive surfaces of said belts continuously grind the peripheries of the orbiting crankpin journals while said crankshaft rotates including projecting said belts between said crankpin arms as necessary to grind a full 360° of the peripheries of said crankpin journals, and backing up each belt at its point of contact with a crankpin journal periphery continuously during the complete orbiting of said crankpin journals around said central longitudinal axis.

5,142,828

CORRECTING A DEFECTIVE METALLIZATION LAYER ON AN ELECTRONIC COMPONENT BY POLISHING

John W. Curry, II, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jun. 25, 1990, Ser. No. 544,000
Int. Cl.[5] B24B 1/00
U.S. Cl. 51—281 R 14 Claims



1. A method of correcting a defective metallization layer on an electronic component, comprising: providing an electronic component with a substantially planar defective metallization layer on a substantially planar base layer;

removing the defective metallization layer by applying a polishing pad with a substantially planar polishing surface so that the entire defective metallization layer is removed from the base layer; and

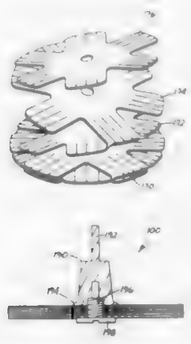
fabricating a new substantially planar metallization layer on the base layer to replace the defective metallization layer, thereby reworking the component.

5,142,829

ABRASIVE ARTICLE

Conrad M. Germain, White Bear Lake Township, Ramsey County, Minn., assignor to Minnesota Minning and Manufacturing Company, St. Paul, Minn.

Filed Jan. 31, 1992, Ser. No. 828,410
Int. Cl.[5] B24D 13/06
U.S. Cl. 51—405 9 Claims



1. An article for abrading a workpiece, the article comprising:

(a) a plurality of abrasive sheet members, having substantially identical geometric configuration each including:

(i) first and second opposed major surfaces, at least one of said major surfaces having an abrasive layer,

(ii) a main portion having an aperture formed therein and a center point, and

(iii) a plurality of arm portions radially projecting from said main portion, each respective arm portion perimetrically spaced from each adjacent arm portion by a constant angle with respect to said center point; and

(b) means for joining each adjacent pair of abrasive sheet members together in an aligned row,

said joining means connecting an arm portion of a first abrasive sheet member to an adjacent pair of arm portions of a second abrasive sheet member;

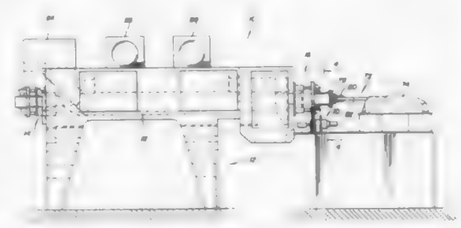
said joining means enabling said aligned row of sheet members to be Z-folded with said respective apertures substantially in register and with said arm portions of each respective sheet member angularly offset about said center point one-half of said constant angle with respect to said arm portions of each immediately adjacent sheet member to form the article.

5,142,830

ABRASIVE CLEANING MACHINE

James H. Carpenter, Hagerstown, Md., assignor to Pangborn Corporation, Hagerstown, Md.

Filed Apr. 20, 1990, Ser. No. 512,178
Int. Cl.[5] B24C 3/18
U.S. Cl. 51—419 22 Claims



1. An abrasive cleaning machine comprising a frame, a work supporting conveyor, and support means supporting said conveyor in said frame for axial reciprocating movement and for rotational movement, said frame having at opposite ends a support portion carrying first bearing means, a support sleeve mounted in each of said first bearing means for rotational movement within said frame, said conveyor having a support shaft at each end, second bearing means mounting each support shaft in a respective support sleeve for axial movement, first drive means connected to one of said support sleeves for effecting rotational movement of said one support sleeve, movement transferring means between said one support sleeve and a respective one of said support shafts, and second drive means connected to one of said support shafts for effecting reciprocating axial movement of said support shafts within said support sleeves whereby said conveyor is simultaneously axially reciprocated and rotated.

5,142,851

APPARATUS FOR TREATING CORNERED SURFACES

Robert T. Nelson, 12601 Arrowhead Terr., Oklahoma City, Okla. 73120

Filed Jan. 28, 1991, Ser. No. 646,299
Int. Cl.[5] B24C 9/00
U.S. Cl. 51—424 13 Claims

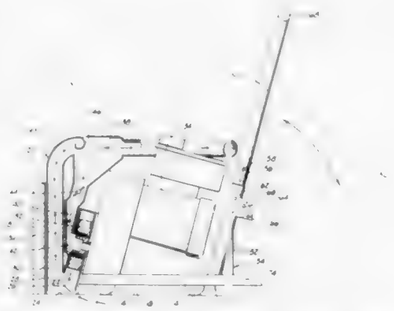
1. A surface treating apparatus for treating a first surface intersected by a second surface which second surface defines a plane forming and angle with the plane of the first surface, the apparatus comprising:

a movable frame having a front and a rear;

a housing supported on the frame, wherein the housing has an opening at the bottom thereof defining a blast zone on the first surface, wherein the housing above the blast zone defines a blast corridor and a rebound corridor continuous with the opening, wherein the rebound corridor has a first linear portion which is substantially perpendicular to the plane of the first surface, and wherein the first linear

portion of the rebound corridor and blast corridor form an acute angle;

a propeller supported in the housing adjacent the blast corridor for propelling abrasive material through the blast corridor towards the first surface, and wherein the propeller is capable of imparting sufficient kinetic energy to the abrasive material to treat the first surface and to cause the abrasive striking the first surface to rebound a distance therefrom into the first linear portion of the rebound corridor;



a hopper for collecting a supply of abrasive material and feeding the abrasive material to the propeller;

wherein the rebound corridor is further characterized by a second portion which directs the rebounding abrasive material from the first linear portion into the hopper; and

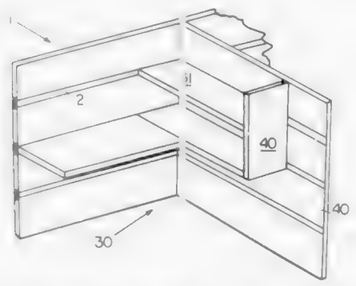
wherein that portion of the housing which defines the first linear portion of the rebound corridor forms the forwardmost aspect of the apparatus so that the blast zone can be positioned adjacent the line of intersection between the first surface and the second surface.

5,142,832

WALL MOUNTING SYSTEM

William K. Branham, Sr., and William K. Branham, II, both of Louisville, Ky., assignors to Bill Branham Designs, Ltd., Louisville, Ky.

Filed Sep. 14, 1990, Ser. No. 583,964
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—36 12 Claims



9. A workstation fabricated of slotted mounting panels which comprises;

A. a mounting panel and mounting assembly secured thereto in which;

1. said mounting panel comprises at least one elongated mounting slot having

a. an interior pocket portion bounded by a rear wall, a front wall and an entrance means bisecting said front wall,

b. said front wall extending from the edges of said rear wall forwardly in an arcuate configuration and having terminal lip-like portions forming the edges of said entrance means;

2. said mounting assembly comprising an arcuate base clamping member complementary to the arcuate configuration of said front wall of said pocket portion of said slot and having a width less than the width of the entrance means of said slot and a length greater than the width of said slot and a threaded hole in the center portion of said clamping member;

3. a threaded stud having one end fitted and threaded in said threaded hole of said clamping member for insertion of said clamping member into said pocket portion of said slot when said clamping member width is placed in alignment with the width of said entrance of said slot for selective movement of said stud into said pocket portion and against the rear wall of said pocket portion so that turning said threaded stud in said threaded hole and in abutment with said rear wall selectively moves said clamping member threaded thereon in and out of clamping engagement with the front wall of said pocket portion;

4. an external clip attached to said threaded stud and having a vertically projecting engagement portion;

B. a perpendicularly mounted panel assembly having elongated slots on each side which comprises;

1. a first slotted mounting panel

2. a second mounting panel

3. an intermediate spacing member holding said first and second mounting panels together in spaced and parallel relation;

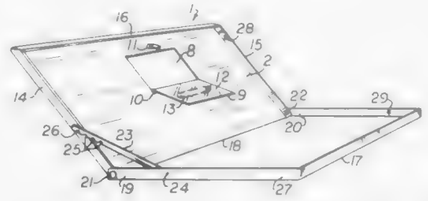
4. a second clip extending between the first and second panels which engages with the vertically projecting engagement portion of said external clip.

5,142,833

CAMOUFLAGE SCREEN

Oswald C. Svehaug, 1010 San Ysidro Blvd., San Ysidro, Calif. 92073

Filed Mar. 7, 1991, Ser. No. 665,881
Int. Cl.[5] E04B *1/344;* A01M *31/00*
U.S. Cl. 52—71 6 Claims



1. An outdoors camouflaging apparatus for hiding a first subject from a distally located second subject which comprises:

a structure installable in front of the first subject, said structure being shaped and dimensioned to obstruct the view of the first subject by the second subject, and including means for reflecting an image of the ground surface in front of said structure toward the second subject;

wherein said means for reflecting comprises a forward side of said structure facing the second subject being reflective and being upwardly slanted toward the second subject, said side comprising a see-through window shaped and dimensioned to allow the observation therethrough of the second subject by the first subject;

said structure comprising a generally flat panel having a reflective surface extending over an entire forward face; and

means for holding said panel in a slanted position above ground;

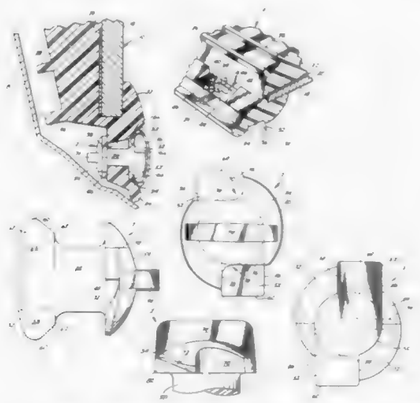
said means for holding comprising a substantially planar frame; and means for mounting said panel at a sharp angle above said frame including means for hingedly connecting a lower edge of said panel to a first side of said frame.

5,142,834

VEHICLE TRIM ASSEMBLY AND FASTENER THEREFOR

Thomas J. Laclave, Lake Orion, and Keith A. Nieboer, Holland, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Jul. 12, 1990, Ser. No. 552,308
Int. Cl.[5] F16B *21/02*
U.S. Cl. 52—208 36 Claims



1. A one-piece fastener adapted to be rotated upon insertion in a support element for attaching a first member to the support element comprising:

a shaft having two ends and a central axis;

at least one first member engaging flange at one end of said shaft, said flange extending outwardly from said shaft;

a retaining head having an underside facing said one end at the other end of said shaft, said retaining head including locking means for engaging at least one projection on the support element following rotation of said fastener to retain said fastener, the support element and the first member together; and camming means for engaging the projection during rotation to position said locking means in engagement with the projection

said camming means including a sloped surface on said underside of said retaining head, said sloped surface extending from a first position to a second position, said second position being spaced closer to said one end of said shaft than said first position;

said locking means including a locking recess positioned on said retaining head for receiving the projection on the support element after engagement with said sloped surface and resisting further rotation or counterrotation of said fastener, said locking recess being immediately adjacent said second position of said sloped surface such that said sloped surface terminates at said locking recess.

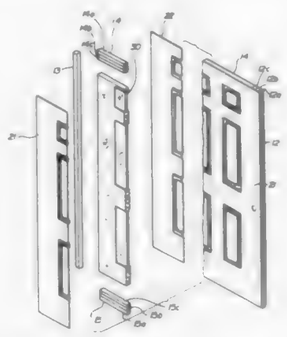
15. The assembly of claim 14 wherein said support element includes a projection thereon; said retaining head including locking means for engaging said projection on said support element following rotation of said fastener.

5,142,835

REACTION INJECTION MOLDED DOOR ASSEMBLY

Mark M. Mrocca, Dearborn, Mich., assignor to Taylor Building Products Company, West Branch, Mich.

Filed Oct. 12, 1990, Ser. No. 596,895
Int. Cl.[5] E04C *2/20*
U.S. Cl. 52—309.12 39 Claims



1. A door assembly comprising:

(i) a frame containing two opposite sides, a top rail, a bottom rail, a first stile adapted to receive a lock mechanism, and a second stile adapted to receive at least one hinge;

(ii) a core comprised of plastic foam disposed within said frame; and

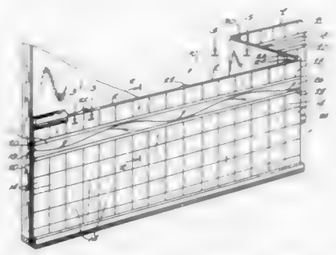
(iii) a skin having comprised of reaction injection molded resin having an exterior surface and an interior surface disposed on each of said opposite sides of said frame covering substantially all of said frame and said core and adhered to at least said frame.

5,142,836

WALL PANEL UNIT

David S. Kearns, Menomonee Falls, Wis., assignor to Design House, Inc., Germantown, Wis.

Filed Aug. 10, 1990, Ser. No. 565,566
Int. Cl.[5] F04C *2/32;* B44F *11/06*
U.S. Cl. 52—314 1 Claim



1. A wall panel unit suitable for assembly with a plurality of similar panel units to form a composite wall surface having the appearance of a tiled wall formed form individual tiles comprising:

a single sheet of vacuum formed material, having formed on one face thereof a plurality of substantially identical regular polygonal shapes, each of said shapes being immediately adjacent the neighboring shapes and being joined by surface indentations, thereby providing the appearance of individual tiles joined by grout; and

at least one horizontally oriented generally rectangular flat area formed in said material, said flat area having a horizontal dimension substantially greater than the largest dimension of any one of said shapes, and the length

thereof extends substantially the entire width of said sheet, the width of said flat area being no less than the largest dimension of said shapes, and further comprising trim strips, one on each side of and running the full length of said flat area, said trim strip being substantially narrower than said flat area.

said sheet further comprising a vertical edge flange portion formed along one entire vertical edge of said single sheet of material, adapted to be disposed in relation to a corresponding vertical edge of another one of said sheets placed adjacent to said sheet in such a way that the next adjacent sheet overlaps said edge flange, for creating a smooth appearance between adjacent sheets.

5,142,837

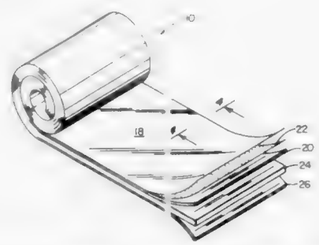
ROOF STRUCTURE

Robert S. Simpson, Fresno, and Robert E. Simpson, Mt. Vernon, both of Ohio, assignors to Mineral Fiber Manufacturing Corporation, Coshocton, Ohio

Division of Ser. No. 530,788, May 30, 1990, Pat. No. 5,096,759, which is a continuation-in-part of Ser. No. 225,053, Jul. 27, 1988, Pat. No. 4,936,938, and a continuation-in-part of Ser. No. 508,572, Apr. 11, 1990. This application Nov. 29, 1991, Ser. No. 800,279

Int. Cl.[5] E04B *5/10*; B3 B *7/12, 11/04, 11/06*

U.S. Cl. 52—409 4 Claims



1. A roof of a structure comprising, a roofing surface having an eave, an underlayment bonded to said roofing surface and a roofing material bonded to said underlayment,

said underlayment being applied over the roofing surface as a series of overlapping parallel strips, the first said underlayment strip being applied at and parallel to said eave, the overlap with the next adjacent parallel underlayment strip being about three inches,

said underlayment being formed of a mat of unwoven polyester fibers impregnated with asphalt, a layer of adhesive on said underlayment facing toward said roofing surface,

said roofing material being applied over said underlayment as a series of overlapping parallel strips, the first roofing material strip being applied at and parallel to said eave, the overlap with the next adjacent parallel roofing material strip being about three inches,

both said underlayment and roofing material strips having a width and a length, the width of said underlayment strip being different from the width of said roofing material strip, said difference being of such a magnitude that overlap areas of the roofing material strips are not in register with overlaps of the underlayment strips,

said roofing material strips including a sheet of aluminum foil adhesively bonded to a sheet of polyethylene, said adhesive bonding being an ionomer resin,

a coating of asphalt on said polyethylene covered by a release paper,

said asphalt coating including a blended mixture of a straight-run, unblown asphalt with a softening point of about 100°–120° F. and a penetration of about 90–140 dmm; styrene-butadiene radial block polymer; aromatic processing oil; hydrocarbon tackifying resin; antioxidant; and silica sand,

said asphalt coating serving as a bonding adhesive when applying the roofing sheet to a surface and also having the property flowing into any punctures and breaks in the polyethylene sheet, said asphalt coating having a thickness of about 0.04 inches.

5,142,838

STANDING SEAM ROOF ASSEMBLY AND SUPPORT APPARATUS

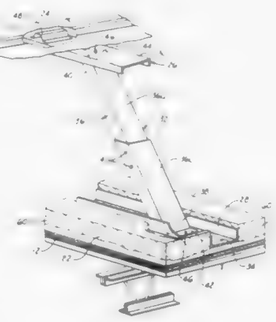
Harold G. Simpson, Mustang, and Leo E. Neyer, Edmond, both of Okla., assignors to Harold Simpson, Inc., Tulsa, Okla.

Division of Ser. No. 745,320, Jun. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 713,319, Apr. 22, 1985, Pat. No. 4,620,397, which is a continuation-in-part of Ser. No. 698,082, Feb. 4, 1985, abandoned, and a continuation-in-part of Ser. No. 568,083, Jan. 4, 1984, Pat. No. 4,597,234, which is a continuation-in-part of Ser. No. 503,299, Jun. 10, 1983, Pat. No. 4,534,148, which is a continuation-in-part of Ser. No. 481,858, Apr. 14, 1983, Pat. No. 4,525,976, which is a continuation-in-part of Ser. No. 481,844, Apr. 4, 1983, Pat. No. 4,700,522, which is a continuation-in-part of Ser. No. 428,568, Sep. 30, 1982, Pat. No. 4,602,468, which is a continuation-in-part of Ser. No. 378,241, May 14, 1982, Pat. No. 4,582,789. This application Sep. 1, 1989, Ser. No. 402,901

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[5] E04B *1/32*

U.S. Cl. 52—640 15 Claims



1. A slope build-up system for roofs comprising a plurality of spaced elongated spanning members adapted to be placed above an existing substantially flat roof, independently vertically adjustable stanchions supporting the spanning members at spaced intervals along their lengths whereby the spanning members can be held in a common plane having a required degree of slope relative to the existing roof, and the spanning members being adapted to receive and support thereon roof paneling, and each vertically adjustable stanchion comprising a pair of interfitting longitudinally adjustable channel sections, and means for locking the interfitting channel sections against relative longitudinal movement after the positions of said channel sections relative to each other have been adjusted to establish the required height for each stanchion.

5,142,839

METHOD FOR CONSTRUCTION OF REFRACTORY LINING FOR FURNACE

Robert P. Kraemer, P.O. Box 305, Pitman, N.J. 08071

Filed May 2, 1991, Ser. No. 694,576

Int. Cl.[5] E04B *1/35, 5/04*

U.S. Cl. 52—741 11 Claims

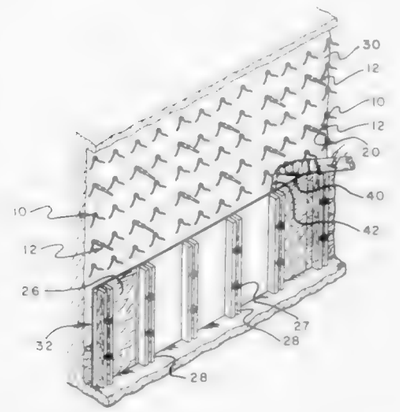
1. A method for lining furnace walls with cement-like monolithic insulation linings which comprises:

(a) providing a plurality of end weldable metal studs and anchoring by welding at one end each of said studs to a furnace wall to be insulated in a predetermined spaced array with each of said studs having a free end projecting outwardly from the furnace wall;

(b) providing a plurality of elongated wire hangers and securing said wire hangers at a central point thereof about each of the end welded metal studs with the opposite free ends thereof projecting inwardly from the furnace wall;

(c) providing a plurality of elongated stud extender members having an end adapted to be mounted on the free end of said end welded studs and an opposite free end, each of said stud extender members having a radial stop flange mounted thereon intermediate the ends thereof, and mounting said elongated stud extender members in a predetermined spaced array to said furnace wall by mounting the same on the free ends of a portion of said end welded studs secured to the furnace wall with said elongated extender members projecting substantially perpendicularly from the furnace wall and with the radial stop flanges mounted thereon disposed so as to provide a bearing surface with a substantially uniform level of spacing from the end mounted on the furnace wall;

(d) providing at least one thin planar panel member of a substantially rigid material and a size sufficient to substantially overlie at least a portion the surface of the furnace wall to be insulated, attaching said planar panel member to said furnace wall by impaling the same on a plurality of the free ends of elongated extender members projecting from said portion of furnace wall to be insulated with the free ends of said extender members projecting through said panel member and supporting said planar panel member on said elongated extender members with said panel member bearing on the bearing surface of substantially each of the radial stop flanges mounted on said plurality of stud extender members with said panel member disposed spaced from and substantially parallel to the furnace wall to be insulated, wherein a generally continuous space is defined therebetween;



(e) feeding a cement-like insulation material in the substantially continuous space between said supported planar panel member and said furnace wall until the space therebetween is substantially filled with said insulation material; and

(f) removing said panel member from said elongated extender members when said cement-like material is set sufficiently to be substantially self-supporting, wherein a substantially monolithic insulation lining for said furnace wall is constructed.

5,142,840

BAG OPENING DEVICE FOR AUTOMATICALLY OPENING PLASTIC BAGS IN SUPERMARKET CHECK-OUT COUNTERS INCORPORATING BAG DISPENSING MACHINES

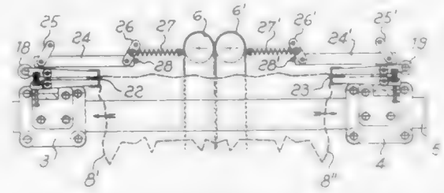
Angelo Cappi, Vignola, and Renato Rimondi, Bazzano, both of Italy, assignors to A.W.A.X. Progettazione E Ricerca S.r.l., Vignola, Italy

Filed Jul. 26, 1991, Ser. No. 736,395

Claims priority, application Italy, Aug. 1, 1990, 21170A/90

Int. Cl.[5] B65B *43/28*

U.S. Cl. 53—384.1 6 Claims



1. A device for opening a plastic bag in a supermarket check-out counter incorporating a plastic bag dispensing machine comprising:

a frame;

two guides (**3**, **4**) slidably mounted on said frame so that said guides are capable of a reciprocal horizontal motion within said frame;

two pliers (**1**, **2**) mounted on said two guides and positioned to grasp and pull apart two opposite sides of the bag fed by the plastic bag dispensing machine, each of said pliers comprising:

a pair of jaws (**9**, **9'** and **11**, **11'**), said jaws having a bag grabbing end and a spring end;

a pair of toothed wheels (**13**, **13'** and **14**, **14'**) that mesh with each other and onto each one of which is securely mounted one jaw of said pair of jaws;

a compression spring (**16**, **17**) positioned between said spring ends of said jaws to urge said grabbing end of said jaws together with a compression force; and

a roller (**18**, **19**) rotatably mounted to said spring end of one said jaws; and

an opening mechanism which engages said rollers of said pliers to counteract the compression force applied by said compression springs (**16**, **17**) and thereby to open the jaws (**9**, **9'** and **11**, **11'**) of each pliers (**1**, **2**)

5,142,841

BAG OPENING DEVICE FOR AUTOMATICALLY OPENING PLASTIC BAGS IN SUPERMARKET CHECK-OUT COUNTERS INCORPORATING BAG DISPENSING MACHINES

Angelo Cappi, Modena, and Renato Rimondi, Bologna, both of Italy, assignors to A.W.A.X. Progettazione E Ricerca S.r.l., Modena, Italy

Filed Jul. 26, 1991, Ser. No. 736,394

Claims priority, application Italy, Aug. 1, 1990, 21171 A/90

Int. Cl.[5] B65B *43/28*

U.S. Cl. 53—384.1 5 Claims

1. A device for opening a plastic bag in a supermarket check-out counter incorporating a plastic bag dispensing machine comprising:

a frame;

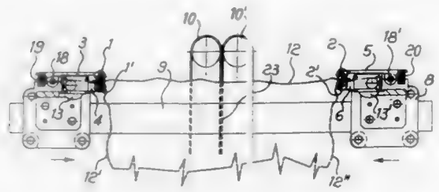
a horizontal rail (**9**) horizontally mounted on said frame;

two slides (**7**, **8**) slidably mounted on said horizontal rail (**9**) and capable of symmetrically approaching and separating from one another with respect to a central position where the plastic bag (**12**) to be opened is located;

two pairs of rollers (**1**, **1'** and **2**, **2'**), a pair of said pairs of rollers being mounted on each one of said two slides (**7**, **8**).

the rollers of each pair of rollers contacting one another; and

a motor-reducer (13, 13') operatively connected to said pairs of rollers (1, 1' and 2, 2') so that said motor-reducer is capable of rotating the rollers of one of said pairs of rollers in one direction and simultaneously rotating the rollers of the other of said pairs of rollers in an opposite direction



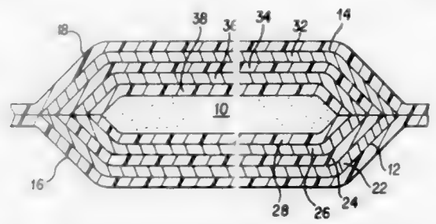
and so that when said pairs of rollers contact opposite sides of the plastic bag (12) said pairs of rollers upon rotation in a first direction grasp the sides of the plastic bag and then pull the sides of the plastic bag apart and when said pairs of rollers rotate in a second direction opposite to said first direction said rollers release the sides of the plastic bag.

5,142,842

METHOD FOR MAKING A FILM/FOIL PANEL

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Dec. 13, 1989, Ser. No. 450,107
Int. Cl.[5] **B65B** *11/52;* **B32B** *31/00*
U.S. Cl. 53—427 **1 Claim**



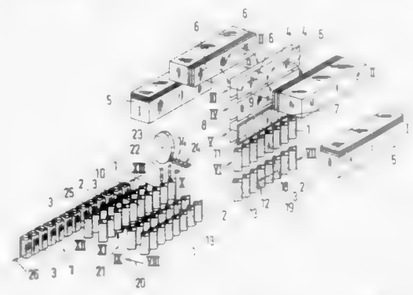
1. A method for making a film/foil panel comprising:
a) forming a thermoformable film to form a cavity;
b) lining the cavity with a first film/foil combination;
c) placing an insulating material into the lined cavity;
d) placing a second film/foil combination on the insulating material;
e) applying a top web over the second film/foil combination and sealing the top web to the thermoformable film, by a vacuum skin packaging process;
f) simultaneously with the application of the top web, bringing the first and second film/foil combinations together to substantially enclose the insulating material between the first and second film/foil combinations; and
g) placing the assembly of step (e) and (f) in a heating means to weld the films and foils of the film/foil combinations together.

5,142,843

METHOD OF MANUFACTURING A PACKAGE FOR FLOWABLE MEDIA AND THE USE OF A SYNTHETIC PLASTICS SHEET FOR THE MANUFACTURING PROCESS

Wilhelm Reil, Bensheim; Ulrich Deutschbein, Mühltal; Gerd Knobloch, Griesheim, and Udo Liebram, Pfungstadt, all of Fed. Rep. of Germany, assignors to Tetra Pak Holdings S.A., Pully, Switzerland

Filed Dec. 18, 1990, Ser. No. 629,277
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1989, 3941992
Int. Cl.[5] **B65B** *3/02;* **B29C** *51/02, 65/72, 69/00*
U.S. Cl. 53—453 **62 Claims**



1. A method of manufacturing a package which is filled with a flowable medium and composed of a tube and top and bottom walls constructed of a shapeable synthetic plastic material, comprising the steps of:
a) heating two prepared blanks, which are in the form of sheets, at a distance from each other by bringing said blanks into contact with heating jaws in at least two stages;
b) deep-drawing the middle portion of the heated prepared blanks;
c) welding said heated blanks within a frame-like strip to form a package space having an aperture in an upper wall;
d) cooling the resultant package which is fluid-tight with the exception of said aperture in an upper wall;
e) carrying away the cooled package;
f) filling said cooled package with flowable medium; and
g) sealing said package by masking said aperture with an opening member;
wherein the sheets of blanks are first cut in such a way that the outer edges lie within the outer contours of the heating jaws, and wherein at least at the bottom and the top wall, the frame-like strip does not project beyond the outer contours of the package, and wherein the heat for the deep-drawing step at least partially results from the heating stages.

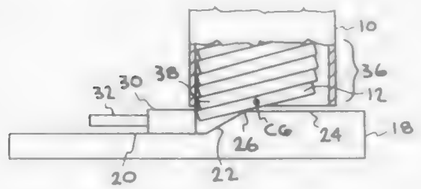
5,142,844

TAB MAGAZINE LOADER USING A PIVOT POINT

Ronald E. Frye, Jr., Newman, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 29, 1991, Ser. No. 751,275
Int. Cl.[5] **B65B** *5/10, 23/20, 35/52*
U.S. Cl. 53—475 **5 Claims**

1. Apparatus for loading a TAB carrier into a bottom-loading stacking magazine, comprising
means for applying a horizontal force to the trailing edge of a stiff TAB carrier;
means for elevating the leading edge of said TAB carrier and for inserting the TAB carrier into the open bottom area of the stacking magazine as the TAB carrier is moved by the horizontal force being applied to the trailing edge of the TAB carrier; and



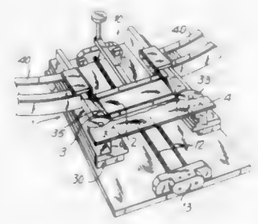
means for pivoting the stiff TAB carrier about a pivot line and into a horizontal position within the open bottom area of the stacking magazine.

5,142,845

CIGARETTE BOX ENDCAP INSERTION METHOD AND APPARATUS

Victor L. Maclauchlan, Chester, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 15, 1990, Ser. No. 567,808
Int. Cl.[5] **B65B** *7/28, 19/02;* **B31B** *11/06*
U.S. Cl. 53—489 **19 Claims**



1. An apparatus for inserting an endcap into an open end of a cigarette or like box, comprising:
slide traveling along a slide means defining a predetermined path, said slide having an area adapted to hold said box with the ends of said box parallel with said slide means,
a pusher pivotably secured on said slide, said pusher being located at a corner of said slide and behind said area of said slide adapted to hold said box, said pusher having a front face extending beyond a side of said slide,
a hopper, located at a side of said slide means, said hopper being adapted to hold said endcaps available at the side of said path, and
a guide rail extending along at least a portion of a side of said slide means, and located after said hopper along said path, said guide rail having a front face converging on said path at an angle of convergence sufficient to insert said endcap into an end of said box, wherein:
as said slide travels along said slide means, said pusher front face engages a frontmost endcap from said hopper and pushes it along said guide rail front face such that said endcap converges on said path and is inserted into the end of said box being held by said slide.

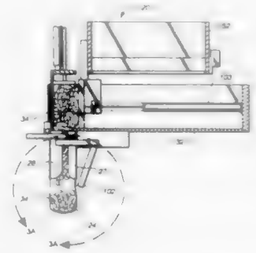
5,142,846

APPARATUS AND METHOD FOR BAGGING A PRODUCT

Daniel Alameda, Pacific Grove, Calif., assignor to Gabilan Manufacturing, Inc., Salinas, Calif.

Filed May 9, 1991, Ser. No. 697,608
Int. Cl.[5] **B65B** *57/02*
U.S. Cl. 53—506 **9 Claims**

1. In a bag filling apparatus including a bag distending assembly formed to hold an open bag end distended in an open condition at a bag filing station to receive a product to be bagged, and a bag transfer assembly formed to transfer said bag from said bag filling station to a bag closure station for closure of said open bag end, the improvement in said bag filling apparatus comprising:
said bag distending assembly includes an expandable and contractible snout-like assembly holding said bag end in said open condition with two circumferentially extending portions of an edge of said bag defining said bag and exposed for gripping while said bag end is distended;
said bag transfer assembly includes two bag gripping assemblies mounted for movement from a position permitting mounting of said bag on said bag distending assembly at said bag filling station to a position enabling gripping of said bag at said portions of said edge while said bag end is distended by said bag distending assembly, and gripper actuating means coupled to said gripper assemblies and producing gripping of said portions of said edge:



said bag distending assembly further being formed with two slots therein dimensioned to receive said bag gripping assemblies and positioned for extension of said portions of said edges across said slots for gripping, and said bag distending assembly being movable to a release position while said bag is gripped by said gripping assemblies at said bag filling station;
said gripping assemblies further being mounted for movement while gripping said bag from said bag filling station to said bag closure station to remove said bag from said bag distending assembly; and
pneumatic bag sensing means mounted on an exterior surface of said snout-like assembly and including at least one conduit having a discharge opening therein facing outwardly of said snout-like assembly, a source of gas under pressure fluid coupled to said conduit, and a pressure sensor fluid coupled to said conduit and sensing an increase in the resistance to the discharge of gas from said discharge opening upon positioning of said bag end over said discharge opening.

5,142,847

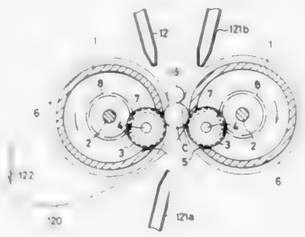
COIN WRAPPING MACHINE

Kenkichi Watanabe, Kawasaki, and Hideshi Sentoku, Tokyo, both of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1991, Ser. No. 743,211
Claims priority, application Japan, Aug. 9, 1990, 2-210896
Int. Cl.[5] **B65B** *11/04, 35/50*
U.S. Cl. 53—532 **16 Claims**

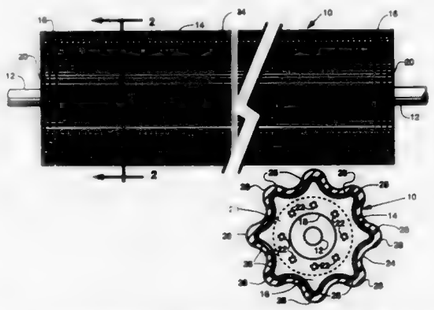
1. A coin wrapping machine having a pair of vertical stacking drums rotatable in opposite directions, spiral coin support guide means formed on the pair of stacking drums for supporting coins by their upper faces and stacking the coins between the drums, means for rotating said drums, means for horizontally transporting said coins between said drums and a pair of wrapping rollers for wrapping the thus stacked coins, said coin wrapping machine being constituted so that said stacking drums are hollow and one of said wrapping rollers is disposed

in each stacking drum in such a manner that a part thereof projects from an opening formed on a periphery of the stacking drum and that when coins are being wrapped, the coins can be held by the wrapping rollers and coin holding means disposed



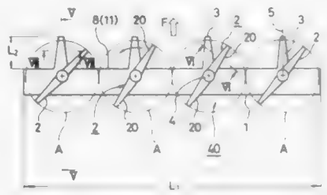
upstream of the pair of wrapping rollers with respect to a coin transportation direction, means for feeding wrapping material between said wrapping rollers and means for rotating said rollers to wrap the coins.

5,142,848
LIGHTWEIGHT CONDITIONING ROLL
Shaun A. Seymour, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.
Filed Jun. 17, 1991, Ser. No. 716,492
Int. Cl.[5] A01D *82/00*
U.S. Cl. 56—1 13 Claims



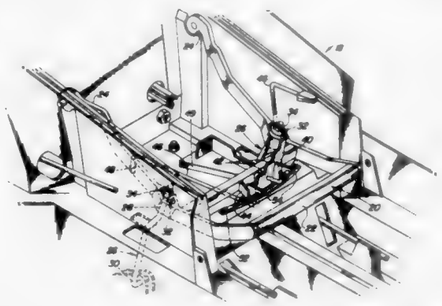
1. A conditioning roll rotatable mountable in an agricultural machine for use in conditioning crop material, said conditioning roll being rotatable about an axis of rotation, comprising:
a convoluted inner core defining a plurality of ridges extending generally parallel to said axis of rotation and being spaced around a circumferential periphery of said inner core; and
an outer shell fixed to the circumferential periphery of said inner core, said outer shell having a generally uniform thickness and defining an axially extending lobe corresponding to each said ridge of said inner core.

5,142,849
AQUATIC PLANT CUTTING APPARATUS AND AQUATIC PLANT RECOVERY BOAT EQUIPPED WITH THE APPARATUS
Tomohiko Amimoto, Sakura, and Shoji Takeuchi, Ichihara, both of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan
Filed Jun. 5, 1991, Ser. No. 710,485
Claims priority, application Japan, Sep. 28, 1990, 2-257168
Int. Cl.[5] A01D *44/00*
U.S. Cl. 56—8 14 Claims



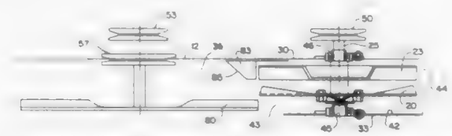
1. An aquatic plant cutting apparatus comprising: a first fixed edge having a ribbon-like shape and having a cutting edge at its front edge portion; and at least one rotary edge juxtaposed along the front edge portion of said first fixed edge.

5,142,850
MOWER DECK HEIGHT ADJUSTMENT MECHANISM
Jon M. Patterson, Wauwatosa; Wayne R. Hutchison, Mayville, and Richard D. Teal, Horicon, all of Wis., assignors to Deere & Company, Moline, Ill.
Filed Jun. 14, 1991, Ser. No. 715,177
Int. Cl.[5] A01D *34/74*
U.S. Cl. 56—17.1 9 Claims



1. A mechanism for selectively adjusting the cutting height of a mower deck carried by a vehicle having a frame, said mechanism comprising:
a lift handle having a laterally extending first end portion for engagement with the operator's hand and a second end portion pivotally coupled with the vehicle, said lift handle being coupled with the deck for shifting the deck vertically as the lift handle pivots;
a support means slidably carried by the vehicle frame and selectively shiftable laterally by the operator, said support means having a plurality of laterally spaced and vertically offset step means engagable with the lift handle for supporting the lift handle at a plurality of heights corresponding to respective lateral positions of the support means.

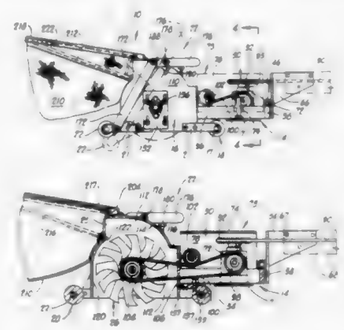
5,142,851
POST-PROCESSING APPARATUS FOR LAWN MOWERS AND THE LIKE
Bruce S. Lydy, West Bend; Dennis R. Schueller, Belgium; Dennis J. Nickel, Saukville, and James D. Rauwerdink, Franklin, all of Wis., assignors to Garden Way Incorporated, Troy, N.Y.
Continuation of Ser. No. 558,108, Jul. 24, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 822,698
Int. Cl.[5] A01D *34/64*
U.S. Cl. 56—13.4 13 Claims



1. Post processing apparatus for attachment to and use with a mower or the like have a housing and discharge opening, the post-processing apparatus cutting into small pieces discharged materials from the mower including cut grass, leaves and like vegetation exiting the mower discharge, comprising:
a post-processing housing having fixed top and bottom continuous walls and side walls depending from said top wall; said housing being attachable to a mower housing;
an entrance opening formed in said attachment housing for communication with the mower discharge to receive the discharged materials;
a discharge opening formed in said attachment housing of the post processor adjacent the top wall for discharging materials;
impeller means for creating air movement within said housing directed upwardly and outwardly of the discharge opening in said housing;
a cutting blade independent of the impeller means disposed for rotation within said attachment housing between the entrance opening and the discharge opening, said blade cutting into small pieces the materials in said housing and means for rotating said cutting blade and said impeller means.

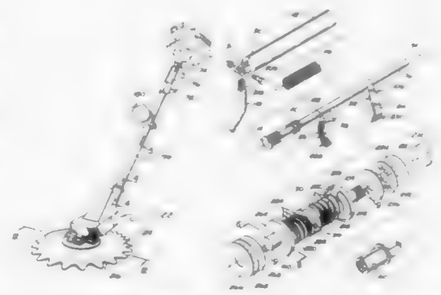
5,142,852
DETHATCHING APPARATUS
Danny L. Nelson, 9214 Sappington Rd., Sappington, Mo. 63126
Continuation of Ser. No. 500,027, Mar. 26, 1990, Pat. No. 5,036,651, which is a continuation-in-part of Ser. No. 288,977, Dec. 22, 1988, Pat. No. 4,910,948. This application Jul. 31, 1991, Ser. No. 738,807
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] A01D *34/48*
U.S. Cl. 56—16.6 4 Claims

4. A grass dethatching apparatus comprising:
a frame adapted for pivotally mounting the dethatching apparatus on a supporting prime mover;
a drum housing mounted on the forward end of said frame and having a thatch discharge opening in one side thereof;
forward roller means mounted on the forward side of said drum housing for adjusting the distance above the ground at which the drum housing is carried;
an adjusting linkage mounted on said drum housing and accessible at the upper side of said drum housing and connected to said forward roller means for facilitating manual adjustment of said forward roller means from a location above said drum housing to set the distance above the ground at which the drum housing is carried;
a rotary multi-bladed dethatching drum subassembly rotatably mounted in said drum housing for rotation about a substantially horizontal axis, said rotary drum subassembly including:
an elongated shaft;
a plurality of spacer elements mounted along the length of said shaft and contiguous to each other; and
a plurality of blades mounted axially along said shaft at axially spaced intervals, said blades being circumferentially offset from each other around said shaft, and each of said blades being mounted on, and keyed to, one of said spacer elements so that each of said blades is out of contact with said shaft;
a thatch-catching container mounted on said drum housing at a location for catching thatch discharged therefrom through said thatch-discharge opening;



means for driving said rotary dethatching drum subassembly in rotation about said substantially horizontal axis; and
means for adjustably raising and lowering said shaft within said drum housing to thereby concurrently raise and lower the entire rotary drum subassembly relative to said drum housing without disconnection of said driving means.

5,142,853
TOOL DRIVE ASSEMBLY AND RELATED TOOL DRIVE LINKAGE, TOOL WORK IMPLEMENT ASSEMBLY AND TOOL
Edward E. Routery, 2900 W. Highland, Chandler, Ariz. 85226
Filed Jun. 19, 1990, Ser. No. 540,539
Int. Cl.[5] A01D *34/68, 34/76*
U.S. Cl. 56—242 23 Claims



1. A tool drive assembly for driving a tool work implement for performing operations on matter external to the tool through movement by the implement, comprising:
a prime mover;
a driver shaft;
first linkage to couple said driver shaft to said prime mover and rotate said driver shaft;
an implement drive member to incorporate linear movement in response to said rotation of said driver shaft and to

impart movement to said work implement through said linear movement;

second linkage to couple said drive member to said work implement; and

third linkage to impart said linear movement to said drive member in response to said rotation of said driver shaft, including,

a worm element to rotate with said driver shaft including a first set of threads angled in a first direction and a second set of threads angled in a second direction, and

a tooth carrier carrying a first tooth to engage threads of said first set of threads to move said carrier in a first linear direction in response to said rotation of said worm element and a second tooth to engage threads of said second set of threads to move said carrier in a second linear direction in response to said rotation of said worm element, said tooth carrier being operatively connected to said drive member.

5,142,854

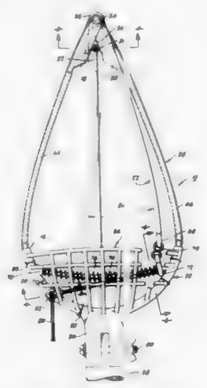
FRUIT HARVESTING DEVICE

Jose A. Chua, 3629 Ponderosa Trail, Pinole, Calif. 94564

Filed Apr. 1, 1991, Ser. No. 678,739

Int. Cl.[5] A01D *46/22, 46/24*

U.S. Cl. 56—335 **11 Claims**



1. A device for harvesting fruit attached to biological entity comprising:

a. a frame member, said frame member including a first cutting edge portion, integrally formed with said frame member;

b. a second cutting edge portion linked to said frame member and positioned immediately adjacent said first cutting edge portion said first and second cutting edge portions forming a converging channel for severing attachment of the fruit to the biological entity; and

c. handle means connected to said frame member for permitting the user to grip said frame member; said channel positioned at said frame member opposite to said connection of said handle to said frame member.

5,142,855

PUSH OR PULL LEAF RAKE

Joseph A. Guidarelli, 2703 Myrtle Ave., Schenectady, N.Y. 12306

Filed Apr. 5, 1991, Ser. No. 680,931

Int. Cl.[5] A01D *7/06*

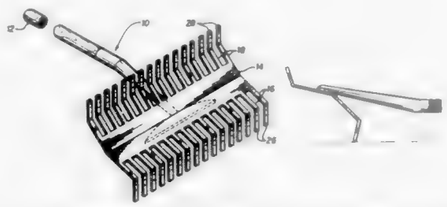
U.S. Cl. 56—400.16 **7 Claims**

1. A reversible dual functioning rake means comprising:

an elongated handle means having a first and a second end;

a rake head means having at least two sets of opposing tine means attached thereto, one set of said two sets of opposing tine means being suitably located to enable pulling of the rake means toward a user, and a second set of said two sets of opposing tine means being suitably located to enable pushing of the rake means away from said user;

said two sets of opposing tine means and said rake head means having a substantially S-shaped configuration in cross-section, each of said two sets of opposing tine means having tine ends, the tine ends of one of said two sets of opposing tine means facing in a direction opposite the direction of facing of the tine ends of the other of said two sets of opposing tine means; and



a socket means suitably attached to said rake head means for receiving one of said first and second ends of said elongated handle means; whereby

when said elongated handle means is oriented in a first position said one set of said two sets of opposing tine means is operative without further modification to enable pulling of the rake means towards the user, and when said handle means is rotated 180 degrees about the longitudinal axis thereof to a second position, the second set of said two sets of opposing tine means is operative without further modification to enable pushing of the rake means away from the user, the rake means being selectively pulled and pushed with equal ease.

5,142,856

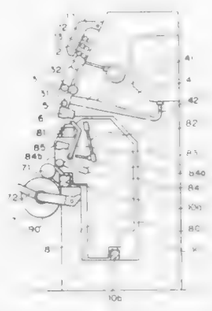
YARN PIECING METHOD FOR YARN SPINNING MACHINE

Takashi Nakayama, Otsu, and Takashi Iwade, Kyoto, both of Japan, assignors to Toray Engineering Co., Ltd., Osaka, Japan

Filed Nov. 8, 1990, Ser. No. 610,683

Int. Cl.[5] D01H *13/26, 7/46, 7/92*

U.S. Cl. 57—22 **9 Claims**



1. A yarn piecing method useable in a yarn spinning machine that includes a yarn processing portion comprising a drafting means for drafting a yarn, a yarn forming means for forming a yarn delivered from said drafting means and a yarn piecing means for piecing an end of a newly formed yarn spun from the yarn forming means with an end of a previously formed and already wound yarn withdrawn from a yarn package, said yarn piecing method comprising the steps of:

guiding newly formed yarn spun from said yarn forming means that is to be pieced with a previously formed and already wound yarn on a yarn package toward said yarn piecing means past a first yarn sensor provided between said yarn forming means and said yarn piecing means;

withdrawing a previously formed and already wound yarn from said yarn package;

guiding said previously formed yarn toward said yarn piecing means;

detecting through use of said first yarn sensor whether a yarn defect exists on said newly formed yarn before a piecing operation is carried out;

determining that said yarn piecing operation should be carried out when said first yarn sensor detects no yarn defect on said newly formed yarn and determining that said yarn piecing operation should not be carried out when said first yarn sensor detects a yarn defect on said newly formed yarn; and

piecing an end of said newly formed yarn and an end of said previously formed yarn withdrawn from said yarn package through operation of said yarn piecing means when it is determined in said determining step that a yarn piecing operation should be carried out.

5,142,857

METHOD AND APPARATUS FOR PRODUCING YARNS

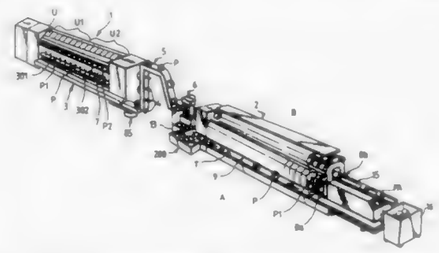
Isamu Matsui, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 27, 1990, Ser. No. 485,935

Claims priority, application Japan, Mar. 1, 1989, 1-49050

Int. Cl.[5] D01H *5/28, 7/92, 9/14;* **B65H** *54/02*

U.S. Cl. 57—281 **9 Claims**



1. A device for producing, sorting and twisting at least two different kinds of yarn, comprising:

a spinning device for simultaneously producing at least two types of yarn packages, the spinning device comprising a first plurality of spinning units for producing yarn packages of a first type, the packages of a first type comprising a first kind of yarn defining first predetermined characteristics and a second plurality of spinning units for producing yarn packages of a second type, the packages of a second type comprising a second kind of yarn defining second predetermined characteristics, the first predetermined characteristics differing from the second predetermined characteristics,

a twisting device comprising a circulating conveyor for conveying yarn packages on trays,

a carrier conveyor for transferring yarn packages from the spinning device to the twisting device,

package exchange means for removing empty bobbins from trays and mounting yarn packages produced by the spinning device on trays, the package exchange means being operably connected to the spinning device and the twisting device,

wherein at least one of the plurality of spinning units comprises:

a draft device for drafting a fiber bundle,

a plurality of air injection nozzles for producing a corresponding plurality of spun yarns by applying a twist to the drafted fiber bundle,

means for doubling the plurality of spun yarns to form a single, double yarn, and

a take-up device for producing a package of the single, doubled yarn.

5,142,858

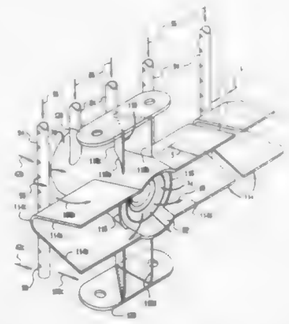
COMPACT FLAMEHOLDER TYPE COMBUSTOR WHICH IS STAGED TO REDUCE EMISSIONS

John J. Ciokajlo, and Harvey M. Maclin, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 21, 1990, Ser. No. 616,966

Int. Cl.[5] F02C *7/228, 9/34*

U.S. Cl. 60—39.33 **18 Claims**



1. A combustor for receiving compressed airflow from a compressor in a gas turbine engine comprising:

an annular outer liner having a forward end and an aft end;

an annular inner liner having a forward end and an aft end, and spaced radially inwardly from said outer liner to define therebetween a combustion zone and an annular outlet between said outer and inner liner aft ends;

a plurality of circumferentially spaced tubular domes fixedly joined to and spaced between said outer and inner liner forward ends, each of said domes including:

an annular inlet at a forward end of said dome for receiving a portion of said compressed airflow as pilot airflow;

a swirler fixedly disposed inside said dome and having a central tubular ferrule for receiving a first portion of said pilot airflow, and a plurality of circumferentially spaced primary swirl vanes for receiving and swirling a second operation of said pilot airflow; and

an outlet disposed at an aft end of said dome in flow communication with said combustion zone;

a plurality of pilot fuel injectors, each disposed in a respective one of said domes for injecting pilot fuel into said pilot airflow second portion for mixing therewith and for mixing with said pilot airflow first portion discharged from said ferrule for generating a pilot fuel/air mixture dischargeable from said dome outlets;

a plurality of main fuel spraybars extending between said domes and said outer and inner liners for injecting main fuel into a portion of aid compressed airflow channeled between said domes and said outer and inner liners as main airflow for generating a main fuel/air mixture dischargeable concentrically around said pilot fuel/air mixtures;

means or igniting said pilot fuel/air mixtures for generating pilot combustion gases in said combustion zone, said pilot combustion gases being effective for igniting said main fuel/air mixture for generating main combustion gases in said combustion zone;

an annular outer cowl extending upstream from said outer liner forward end and spaced from said domes to define

therebetween an outer flowpath having an outer inlet for receiving a portion of said main airflow as outer main airflow, and an outer outlet for discharging a portion of said main fuel/air mixture as an outer main fuel/air mixture into said combustion zone for generating outer main combustion gases; and

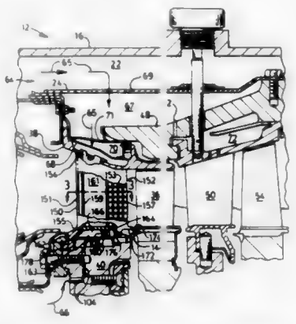
an annular inner cowl extending upstream from said inner liner forward end and spaced radially from said domes to define therebetween an inner flowpath having an inner inlet for receiving a portion of said main airflow as inner main airflow, and an inner outlet for discharging a portion of said main fuel/air mixture as an inner main fuel/air mixture into said combustion zone for generating inner main combustion gases.

5,142,859

TURBINE COOLING SYSTEM

Boris Glezer, Del Mar, and David M. Evans, Chula Vista, both of Calif., assignors to Solar Turbines, Incorporated, San Diego, Calif.

Filed Feb. 22, 1991, Ser. No. 658,830
Int. Cl.[5] F02C *3/00, 5/00*
U.S. Cl. 60—39.75 **18 Claims**



1. A gas turbine engine including a cooling air delivery system for cooling components of the gas turbine engine, a turbine, a compressor section and a compressor discharge plenum fluidly connecting the air delivery system to the compressor section comprising:

a fluid flow path interconnecting the compressor discharge plenum with the engine components to be cooled and having a cooling fluid flowing therethrough when the compressor section is in operation;

a nozzle and shroud assembly, said nozzle and shroud assembly including a plurality of individual nozzle and shroud members, each of said plurality of individual nozzle and shroud members including an outer and inner shroud portion and a nozzle vane portion having a nozzle plenum therein, said outer shroud portion having an inlet passage therein, said passage and said nozzle plenum being in fluid communication with each other, said inner shroud portion further including a cooling chamber therein being positioned generally radially inward of the nozzle plenum, a partition being interposed between the cooling chamber and the nozzle plenum, said partition defining a second exit passage therein, said cooling chamber in each of the nozzle and shroud members forming a generally annular reservoir when assembled in operating relationship and being in fluid communication through the second exit passage with the nozzle plenum, said annular reservoir having a plurality of directing passages exiting therefrom, each of the nozzle and shroud members further including a cantilevered flange being positioned radially external of the annular reservoir, said flanges extending axially from the inner shroud portion toward the turbine and forming a radial shroud flange arrangement of cantilevered nozzle and shroud flanges when assembled in operating relationship to each other;

a rotor assembly disposed axially adjacent the nozzle and shroud assembly, said rotor assembly including a rotor having a plurality of replaceable blades mounted thereon, each of the plurality of replaceable blades including a platform section, a cantilevered flange extending axially from the platform section on the side adjacent the nozzle and shroud assembly, said cantilevered flanges when aligned in their functionally assembled position establishing a radial blade flange arrangement of cantilevered turbine blade flanges;

said radial blade flange arrangement and said radial shroud flange arrangement axially overlapping each other in a preestablished radially spaced proximity forming a buffering zone therebetween, and said plurality of directing passages from the annular reservoir being substantially radially aligned with the buffering zone; and

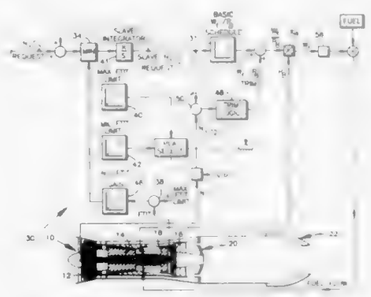
a second passage means entering into the annular reservoir and wherein said fluid flow path has a first flow of cooling fluid from the compressor section being directed through the nozzle and shroud assembly into the annular reservoir before exiting the plurality of directing passages from the annular reservoir into the buffering zone and a second flow of cooling fluid from the compressor being directed through a plurality of internal passages in the engine through the second passage means into the annular reservoir before exiting the plurality of directing passages from the annular reservoir into the buffering zone, and said second exit passage having a preestablished area for controlling the flow rate of the first flow of cooling fluid into the annular reservoir.

5,142,860

CONSTANT THRUST RETENTION TURBINE TEMPERATURE LIMIT SYSTEM

Mark A. Strange, Florissant, Mo.; Walter A. Ledwith, Jr., Palm Beach Gardens, Fla.; Johnny B. Davis; Stephen N. Finger, both of Jupiter, Fla., and Gerald Bracci, Tequesta, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 18, 1990, Ser. No. 539,940
Int. Cl.[5] F02C *9/28*
U.S. Cl. 60—39.281 **4 Claims**



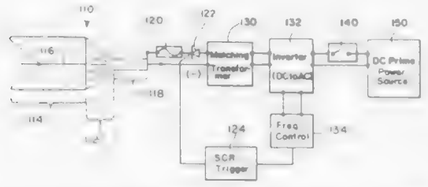
1. A control system for a gas turbine engine having a turbine, and a burner for generating fluid working medium for powering said turbine, fuel regulating means for regulating fuel flow to said burner, control means for controlling said fuel regulation means for regulating the flow of fuel to said burner in response to engine operating variables establishing the engine operating line for steadystate operation, temperature-limit means including trim logic means for trimming said control means for rescheduling fuel flow to said burner for establishing a temperature margin for each operating condition of said gas turbine engine, and said temperature limit means establishing a temperature margin which is a value between the temperature of the engine operating line and a predetermined temperature limit at a substantially constant value, whereby said gas turbine engine operates below said temperature limit during transient conditions.

5,142,861

NONLINEAR ELECTROMAGNETIC PROPULSION SYSTEM AND METHOD

Rex L. Schlicher, 8230 Stationhouse Ct., Lorton, Va. 22079-1204; Steven M. Rinaldi, ODC/AFSC, American Embassy, E-401 APO New York, N.Y. 09777-5000; David J. Hall, 460 Tahoe Dr., Pittsburgh, Pa. 15239; Peter M. Ranon, P.O. Box 6074, San Pedro, Calif. 90734, and Charles E. Davis, 13400 Lomas Blvd., N.E. #221, Albuquerque, N. Mex. 87112

Filed Apr. 26. 1991, Ser. No. 691,889
Int. Cl.[5] F02K *11/00*
U.S. Cl. 60—203.1 **14 Claims**



1. A nonlinear electromagnetic propulsion system, comprising antenna means driven by current pulse generating means coupled to a prime power source, with transmission line means coupling the current pulse generating means to the antenna means;

wherein the current pulse generating means includes means for providing a sawtooth wave having a relatively steep leading edge compared to the trailing edge;

wherein the antenna means comprises a three dimensional laminated geometry having an extremely low frequency (elf) radiating antenna structure in the form of a three dimensional asymmetric multiple-turn loop antenna whose geometry is optimized for the production of reaction thrust rather than the radiation of electromagnetic energy into space, with rigid three dimensional geometric asymmetry, made up of flat electrical conductors that form a partially closed volume in the loop antenna structure, which trap magnetic flux thereby causing a magnetic field density gradient along a single axis, wherein the magnetic field density gradient causes an imbalance in the magneto-mechanical forces that normally result from the interactions of the loop antenna's internal magnetic field with the current in the conductors of the loop antenna structure, as described by the Lorentz Force Law;

wherein the antenna means includes a plurality of return bundles and a center return conductor.

5,142,862

THRUST REVERSING SYSTEM FOR HIGH BYPASS FAN ENGINES

Robert B. Brown, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

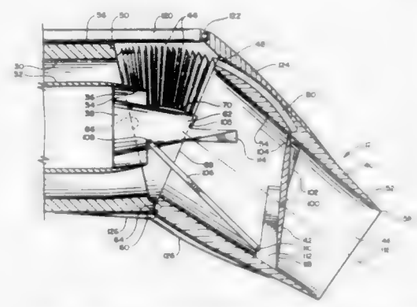
Filed Apr. 9, 1990, Ser. No. 511,891
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] F02K *3/02*
U.S. Cl. 60—226.2 **20 Claims**

1. A jet engine and thrust reversing assembly having a longitudinal axis, a forward end and a rear end, said assembly comprising:

a. an engine comprising an engine housing enclosing a thrust creating engine portion and having an intake end and an annular rear end portion from which exhaust is discharged into an exhaust area, said housing having an outer circumferential aerodynamic surface extending substantially entirely around said housing and extending lengthwise from said intake end to a rear end of said rear end portion in a manner that said surface is substantially entirely exposed to ambient air flow;

b. a thrust reversing subassembly comprising:

i. an annular thrust diverting structure having a cruise position and a thrust reversing position, said thrust diverting structure comprising a circumferential side wall which has an outer circumferential surface extending substantially entirely around said thrust diverting structure so that in the cruise position the outer circumferential surface of the thrust diverting structure forms substantially an entire circumferential rear portion of the outer circumferential aerodynamic surface of the housing which rear portion in the cruise position extends substantially entirely around said exhaust area, with a forward annular end portion of said thrust diverting structure being positioned adjacent to the annular rear end portion of the housing so as to form a rearward extension of said housing and to define a rear exhaust passageway portion from which the exhaust is discharged, said thrust diverting structure being pivotally moveable about a pivot location from the cruise position to the thrust reversing position where a portion of the forward annular end portion of the thrust diverting structure is spaced rearwardly from the annular rear end portion of the housing to form a transversely directed thrust diverting opening; and



ii. passageway blocking plate means which in the cruise position is located to permit flow through the rear exhaust passageway portion and in the thrust reversing position blocks flow through the rear exhaust passageway portion to create with the thrust diverting structure a flow diverting region to cause the exhaust to flow through the thrust reversing opening to create a reverse thrust.

5,142,863

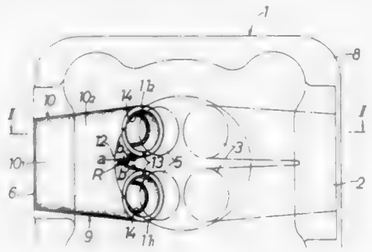
ENGINE PART PROVIDED WITH MANIFOLD TYPE EXHAUST PASSAGE

Hideaki Ushio; Seiji Nishimoto, and Koji Tamenori, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1990, Ser. No. 525,921
Claims priority, application Japan, May 18, 1989, 1-57475[U]; Jun. 16, 1989, 1-70945[U]
Int. Cl.[5] F01N *7/18*
U.S. Cl. 60—272 **18 Claims**

1. An engine part provided with a manifold type exhaust passage, comprising a cast main body and a manifold type ceramic liner which is cast in the main body and defines a manifold type exhaust passage, the ceramic liner including a hollow cylindrical liner body and a plurality of cylinder members branched from said liner body, wherein a through portion

is provided at a branched area of said ceramic liner for providing communication between inside and outside of the ceramic



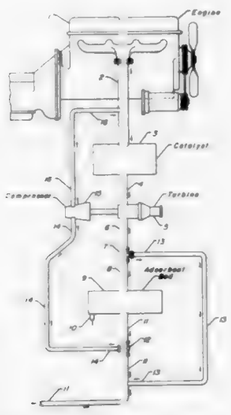
liner at which area adjacent cylinder members are branched apart, said through portion being filled with a molten metal at the time of casting said main body.

5,142,864

PROCESS FOR TREATING AN ENGINE EXHAUST STREAM EMPLOYING A CATALYST, AN ADSORBENT BED AND A TURBOCHARGER

Stephen Dunne, Bethel, Conn., assignor to UOP, Des Plaines, Ill.

Filed Sep. 30, 1991, Ser. No. 767,590
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—274 15 Claims



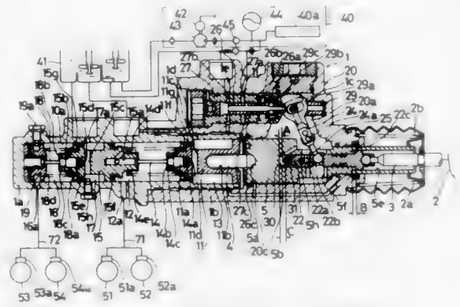
1. A process for treating an engine exhaust steam containing pollutants including hydrocarbons comprising directing the engine exhaust gas stream over a catalyst to give a first exhaust stream, flowing the first exhaust stream through the turbine side of a turbocharger to give a second exhaust stream which is then flowed through an adsorbent bed which comprises a molecular sieve bed which preferentially adsorbs the hydrocarbons versus water to provide a treated exhaust stream and discharging the treated exhaust stream into the atmosphere, said process being carried out for a time until the adsorbent bed temperature is about 150° C. to about 200° C. at which time the second exhaust stream is split into a major and minor portion, the major portion being diverted around the adsorbent bed and discharged into the atmosphere while the minor portion is flowed through the adsorbent bed for a time sufficient to desorb substantially all the hydrocarbons adsorbed on the molecular sieve bed to provide a third exhaust stream which is directed through the compressor side of the turbocharger and then directed back over the catalyst and after such time as necessary to desorb substantially all the hydrocarbons from the molecular sieve, directing the second exhaust stream completely around the adsorbent bed and discharging said stream to the atmosphere.

5,142,865

HYDRAULIC BOOSTER

Yuichiro Sakakihara, Hekinan, and Michiharu Nishii, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Mar. 26, 1991, Ser. No. 674,901
Claims priority, application Japan, Mar. 31, 1990, 2-34301[U]
Int. Cl.[5] B60T *13/20*
U.S. Cl. 60—555 6 Claims



1. A hydraulic braking mechanism, comprising:
a housing connected with a master cylinder,
an input rod movable by an operator, piston means connected to the input rod and slidable within the housing for applying a force to the master cylinder when the input rod is moved, said piston means comprising:
a power piston slidable within the housing, and
a reaction piston mounted in a first hole in the power piston and slidable relative to the power piston, the reaction piston being connected to the input rod at a connecting point,
booster means mounted in the housing for boosting the force supplied to the master cylinder,
motion transmitting linkage connected to the booster means and received within a second hole formed in the reaction piston for transmitting movement of the reaction piston to the booster means,
shock absorbing means for damping the movement of the reaction piston relative to the power piston, and
stop means for terminating movement of the reaction piston relative to the power piston, the stop means comprising a first stop surface on the power piston and a second stop surface on the reaction piston positioned to be engaged by the first stop surface, both the second stop surface and the connecting point being spaced in the same direction from the second hole.

5,142,866

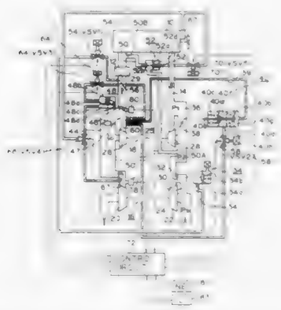
SEQUENTIAL TURBOCHARGER SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hiromichi Yanagihara; Shinobu Ishiyama; Taiichi Mori, and Toshiyuki Maehara, all of Shizuoka, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 17, 1991, Ser. No. 717,881
Claims priority, application Japan, Jun. 20, 1990, 2-160014
Int. Cl.[5] F02B *37/12;* F02M *25/07*
U.S. Cl. 60—605.2 10 Claims

1. An internal combustion engine, comprising:
an engine body;
an intake line for introducing a combustible mixture into the engine body;

an exhaust line for removing the exhaust gas from the engine body;
a first, large-volume turbocharger having a turbine thereof arranged in the exhaust line and a compressor thereof arranged in the intake line;
a second, small-volume turbocharger having a turbine thereof arranged in the exhaust line at position upstream of the turbine of the large-volume turbocharger in the direction of the flow of the exhaust gas, and a compressor thereof arranged in the intake line at a position downstream of the compressor of the large-volume turbocharger in the direction of the flow of the intake air;



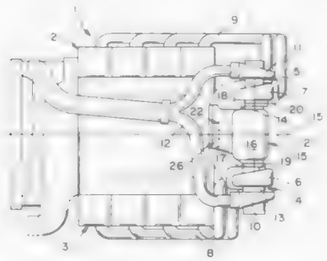
a bypass passageway connected to the exhaust line so as to bypass the turbine of the small-volume turbocharger;
exhaust switching valve means for controlling the flow of the exhaust gas in said bypass passageway;
means, responsive to engine operating conditions, for controlling the exhaust switching valve means to obtain a desired intake air pressure, and;
exhaust gas recirculation means for taking out an amount of exhaust gas from the exhaust line at a position located between the turbine of the large-volume turbocharger and the turbine of the small-volume turbocharger, and for introducing the taken out exhaust gas into the intake line.

5,142,867

COMPOUND TURBO-DRIVE FOR AN INTERNAL-COMBUSTION ENGINE

Horst Bergmann, Esslingen; Günter Fischer, Stuttgart, and Wolfgang Büschel, Fellbach, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Feb. 13, 1990, Ser. No. 479,167
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908286
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—612 10 Claims



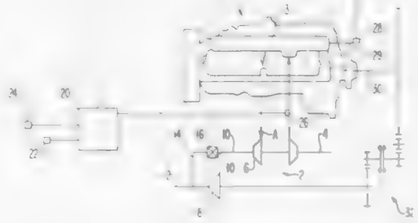
1. A compound turbo drive arrangement for an internal combustion engine having a plurality cylinders arranged in first and second banks sloping downwardly and inwardly toward each other in a V-form, comprising:
a reexpansion turbine arrangement having a double flow housing with first and second inlet ports integrated to said turbine housing and arranged at opposite ends thereof;
first and second exhaust gas turbochargers connected to receive exhaust gases from said first and second banks of cylinders, respectively, said first and second turbochargers being arranged at opposite ends of said double flow housing adjacent said first and second inlet ports so that said reexpansion turbine is situated between said turbochargers, each of said turbochargers having an outlet port connected to an inlet port of double flow housing;
reduction gear means coupled to an output of said reexpansion turbine for transmitting power therefrom to an accessory drive of said internal combustion engine;
said compound turbo drive arrangement having said first and second turbochargers arranged laterally of said cylinders and being arranged at an output end of said internal combustion engine; and
said exhaust-gas turbochargers and said reexpansion turbine being joined to form a single unit which is mounted to a gear casing of the reduction gear means and supported by a part of the crankcase of said internal combustion engine.

5,142,868

TURBOCOMPOUND ENGINE WITH POWER TURBINE BYPASS CONTROL

Peter V. Woon; Amarjit Ghuman; Rodoljub Radovanovic, all of Columbus, Ind.; Brian E. Walsham, Holmfirth, and Steven C. Francis, Huddersfield, both of England, assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Nov. 30, 1990, Ser. No. 620,210
Int. Cl.[5] F02G *5/00*
U.S. Cl. 60—624 8 Claims



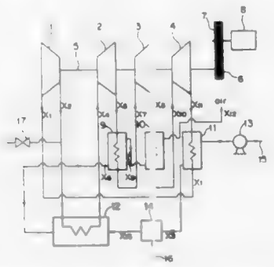
1. A turbocompound engine having a power turbine bypass control comprising:
an internal combustion engine having a crankshaft, an intake manifold and an exhaust manifold;
turbocharger means for converting exhaust gas energy into mechanical energy for boosting intake air pressure, said turbocharger means including a first turbine connected with said exhaust manifold;
power turbine means for converting energy remaining in exhaust gases exiting said first turbine into mechanical energy, said power turbine means coupled to the crankshaft of said engine;
exhaust passage means including a bypass valve wherein exhaust gas from said engine passes through said power turbine means when said bypass is in a closed position and at least some of the engine exhaust gas bypasses said power turbine means when said bypass valve is in an open position; and
bypass control means for determining whether the engine is operating under a low speed/high load condition and for opening said bypass valve in response to a determination of a low speed/high load condition.

5,142,859

CLOSED CYCLE TYPE HEAT ENGINE

Souichi Iizuka, Tokyo, and Yasutaru Yamada, Chiba, both of Japan, assignors to Technical Associate Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1991, Ser. No. 771,495
Claims priority, application Japan, Jun. 28, 1991, 3-183924
Int. Cl.[5] F01C *1/04*
U.S. Cl. 60—684 3 Claims



1. A closed cycle type heat engine in which a pressurized, heated working fluid is used to produce an output rotational force, comprising:

a rotatably support shaft;

a compressor for compressing working fluid, said compressor being mounted on said shaft and having an inlet and an outlet;

first, second and third turbines supported coaxially relative to said shaft and drivingly engaged therewith for effecting rotation of said shaft in response to working fluid flowing through said turbines, each of said turbines having a working fluid inlet and a working fluid outlet;

first, second and third heat exchangers respectively associated with said first, second and third turbines, each of said heat exchangers having a working fluid inlet and a working fluid outlet which communicate with one another, said working fluid inlet of each said heat exchanger communicating with said working fluid outlet of the associated turbine, said working fluid outlets of said first and second heat exchangers communicating respectively with said working fluid inlets of said second and third turbines, said working fluid outlet of said third heat exchanger communicating with said inlet of said compressor;

a fourth heat exchanger having a working fluid inlet and a working fluid outlet which communicate with one another, said working fluid inlet of said fourth heat exchanger communicating with said outlet of said compressor, said working fluid outlet of said fourth heat exchanger communicating with said working fluid inlet of said first turbine;

each of said heat exchangers having a further inlet and a further outlet which communicate with one another to permit fluid flow through the respective heat exchanger in heat exchange relationship with the working fluid therein, said further outlet of said fourth heat exchanger communicating with said further inlet of said first heat exchanger, and said further outlet of said first heat exchanger communicating with said further inlet of said second heat exchanger;

a combustion furnace interposed between said third and fourth heat exchangers and having an input communicating with said further outlet of said third heat exchanger and an output communicating with said further inlet of said fourth heat exchanger

an air blower connected to said further inlet of said third heat exchanger for blowing air through said third heat exchanger in heat exchange relationship with the working fluid therein and out said further outlet of said third heat exchanger to said combustion furnace input; and

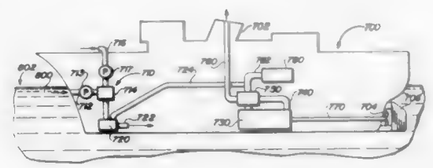
said combustion furnace including means for using air provided at said input thereof to produce at said output thereof heated combustion gas which flows serially through said fourth, first and second heat exchangers in heat exchange relationship with the working fluid therein.

5,142,870

HYDRAULIC COMPRESSOR AND FUEL FIRED TURBINE APPARATUS

Lonnie L. Angle, 1951 E. Fairfield, Mesa, Ariz. 85203

Division of Ser. No. 268,950, Nov. 8, 1988. This application Mar. 7, 1990, Ser. No. 490,084
Int. Cl.[5] F02C *1/04*
U.S. Cl. 60—668 5 Claims



1. In a vessel movable on a body of water and having a propeller and an output shaft connected to the propeller, a propulsion system, comprising, in combination:

turbine means connected to the output shaft;

an air eductor for entraining air in a flow of water;

water intake means for providing a flow of water from the body of water on which the vessel is moving to the eductor;

air intake means for providing air to be entrained in the flow of water by the eductor;

first conduit means for receiving the flow of water and entrained air from the eductor and for compressing the entrained air;

separator means for separating the water and the compressed air entrained in the water; and

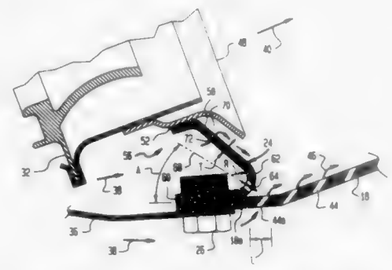
second conduit means extending from the separator means to the turbine means through which the compressed air flows from the separator to provide compressed air to the turbine means.

5,142,871

COMBUSTOR DOME PLATE SUPPORT HAVING UNIFORM THICKNESS ARCUATE APEX WITH CIRCUMFERENTIALLY SPACED COOLANT APERTURES

Elias H. Lampes, Lynn, and Clifford E. Allen, Jr., Newbury, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 22, 1991, Ser. No. 644,139
Int. Cl.[5] F23R *3/06*; F02C *7/00*
U.S. Cl. 60—756 11 Claims



1. A combustor dome comprising an annular dome plate disposed coaxially about an axial centerline axis, said dome plate including:

an annular central portion having a plurality of circumferentially spaced apertures for receiving a respective plurality of carburetors;

radially outer and inner support portions extending from said central portion for joining said dome plate to combustion liners;

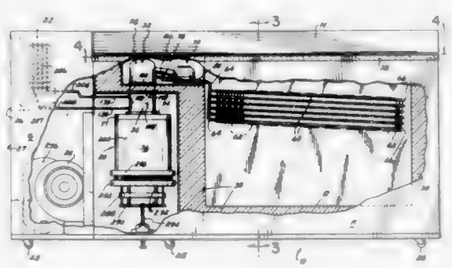
each of said outer and inner support portions including a first leg extending from said central portion, a second leg, and an arcuate apex joining said first leg to said second leg, said apex having in longitudinal section along said axial centerline axis a concave inner surface and a convex outer surface and a uniform thickness therebetween from said first leg to said second leg, and a plurality of circumferentially spaced coolant apertures for channeling cooling air therethrough.

5,142,872

LABORATORY FREEZER APPLIANCE

Russell C. Tipton, Williamstown, W. Va., assignor to Forma Scientific, Inc., Cincinnati, Ohio

Continuation of Ser. No. 514,768, Apr. 26, 1990, abandoned. This application Jul. 8, 1991, Ser. No. 728,771
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—6 26 Claims



1. A laboratory freezer appliance comprising:

an insulated freezer chamber;

heat transfer tubes in heat transfer communication with said chamber, said tubes being sloped from one end to another permitting the flow by gravity of a heat transfer fluid as a liquid downwardly along said freezer chamber and the counterflow of said fluid as a vapor;

a Stirling cycle heat pump of the type having a housing containing a linearly reciprocating piston and a displacer, said heat pump having a warm zone and a cold zone;

a condensating chamber in heat transfer communication with said cold zone for condensing said heat transfer fluid as a vapor to a liquid including first means for receiving said vapor and second means for returning said liquid; and

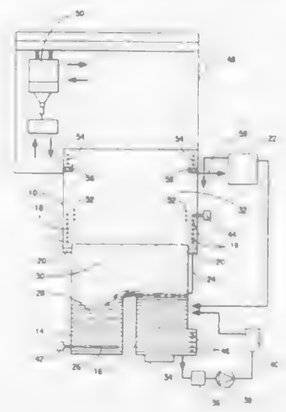
heat transfer fluid distribution means for receiving said condensed heat transfer fluid and distributing it to said heat transfer tubes and for receiving back from said heat transfer tubes said vapor and distributing it to said condensing chamber in a closed cycle of alternate condensation and vaporization of said heat transfer fluid and consequent cooling of said freezer chamber.

5,142,873

VAPOR CONTROL SYSTEM FOR VAPOR DEGREASING/DEFLUXING EQUIPMENT

Robert B. Ramsey, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 480,606, Feb. 15, 1990, Pat. No. 5,048,548. This application Jun. 10, 1991, Ser. No. 712,721
Int. Cl.[5] B08B *5/00, 7/04*; F26B *21/06*; F25J *3/00*
U.S. Cl. 62—11 9 Claims



1. A process for recovering solvent vapors in a vapor degreasing apparatus, according to the present invention, comprises the steps of:

(a) subjecting vapors above a boiling solvent to a first heat exchanger cooling step at a temperature below the dew point of the solvent vapors but above 32° F. (0° C.);

(b) subjecting vapors above the location of the first heat exchanger step to a second heat exchanger step at a temperature below 32° F. (0° C.);

(c) subjecting vapors above the location of the second heat exchanger step to a third heat exchanger step at a temperature within about 5° C. of the temperature of the second heat exchanger step; and

(d) isolating any recovered condensate produced from the third heat exchanger step such that it can be subjected to a drying step prior to being combined with condensate produced in the first and second heat exchanger steps.

5,142,874

CRYOGENIC APPARATUS

Radovan R. Maric, Ontario, Canada, assignor to Union Carbide Canada Limited, Toronto, Canada

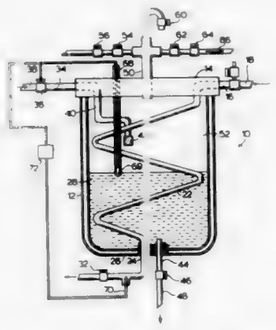
Division of Ser. No. 683,200, Apr. 10, 1991, Pat. No. 5,079,925, which is a continuation-in-part of Ser. No. 506,811, Apr. 10, 1990, abandoned. This application Sep. 27, 1991, Ser. No. 766,089
Int. Cl.[5] F17C *13/02*
U.S. Cl. 62—49.2 9 Claims

1. An apparatus for handling liquids and gases, which comprises:

insulated vessel means having an upper closure and a lower wall and housing a cooling zone into which a coolant medium may be introduced,

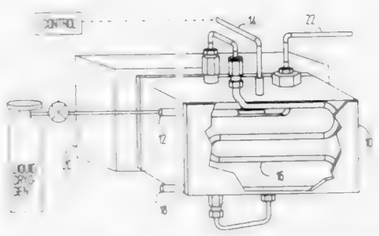
first inlet means communicating through said upper closure with first pipe means extending within said vessel means through said cooling zone to a first outlet means in said lower wall, whereby a liquid or gas may be passed from said first inlet means to said first outlet means in heat exchange relationship with said cooling zone and may be discharged from said first pipe means through said lower wall,

second inlet means communicating through said upper closure with second pipe means extending within said vessel means to second outlet means within said vessel, whereby a coolant medium may be introduced to said vessel means,
first solenoid valve means provided in said second inlet means for connecting a source of coolant medium to said second pipe means,
temperature sensing means located in operative relation to said first outlet means for sensing the temperature of said cooling zone, said temperature sensing means being operatively connected to said first solenoid valve means to open said first solenoid valve means when the temperature of said cooling zone detected by said temperature sensing means is above a predetermined temperature to permit



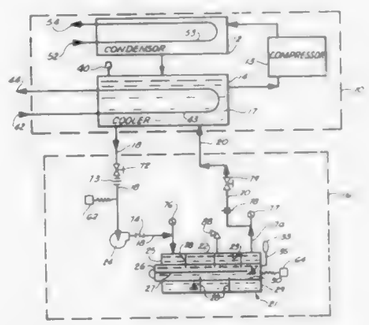
coolant medium to enter said cooling zone and to close said first solenoid valve when the temperature of said cooling zone detected by said temperature sensing means is below a predetermined temperature to prevent coolant medium from entering said cooling zone,
third outlet means communicating through said lower wall with said cooling zone for discharge of liquid coolant medium from said vessel means by a direct downward flow to a point of use of said liquid coolant medium,
fourth outlet means communicating through said upper closure with said cooling zone for discharge of gaseous coolant medium from said vessel means, and
level control means for controlling a level of liquid coolant medium in said cooling zone in said vessel means.

5,142,875
COOLED PUMPING SYSTEM
Michael S. James, New Castle, Del.; Meliss A. Powell, West Chester, Pa.; Mark A. Nickerson, Landenberg, Pa., and Louis T. Staats, III, Lincoln University, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 1, 1991, Ser. No. 662,687
Int. Cl.[5] F17C 9/02
U.S. Cl. 62—50.5 4 Claims



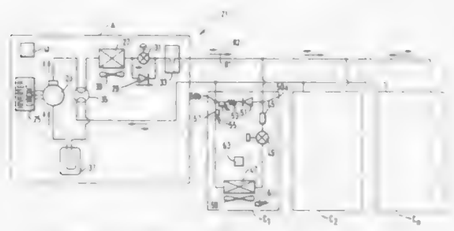
1. A cryogenically cooled reciprocating pumping system for ensuring that the pumping fluid is maintained at a desired temperature just prior to pumping, comprising:
a pump head; and
a pump body coupled to said pump head, wherein, the thermal conductivity of said pump body is lower than he thermal conductivity of said pump head; and
heat exchanger means coupled integrally to said pump head; and
temperature sensing means for sensing the actual temperature of the pumphead such that said actual temperature can be compared to said desired temperature, wherein an offset signal is generated in response thereto; and
cryogenic cooling means for simultaneously cooling both said pump head and said heat exchanger in response to said offset signal.

5,142,876
METHOD AND APPARATUS FOR HEATING REFRIGERANT IN A CHILLER
Darrell R. Snider, 4528 S. Pipkin Rd., Lakeland, Fla. 33811, and William C. Richardson, 6810 Spencer Cir., Tampa, Fla. 33610
Continuation-in-part of Ser. No. 539,546, Jun. 18, 1990, abandoned. This application Mar. 29, 1991, Ser. No. 677,476
Int. Cl.[5] F25B 45/00
U.S. Cl. 62—77 24 Claims



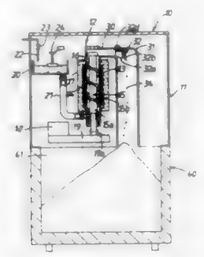
18. A method of heating a refrigerant in a refrigeration system including a system vessel having said refrigerant therein, comprising the steps of:
(a) removing a portion of said refrigerant from said system vessel;
(b) transporting said removed portion of refrigerant to heat exchange means;
(c) heating said refrigerant within the inner vessel of said heat exchange means, said heat exchange means comprising:
i. an apparatus vessel having said inner vessel therein, thereby forming a chamber therebetween, said inner vessel containing a fluid heat transfer medium therein; and,
ii. a heating element provided in said inner vessel, said heating element thereby being immersed in said fluid heat transfer medium;
(d) returning said heated refrigerant to said system vessel; and,
(e) controlling the temperature of said refrigerant flowing into and from said heat exchange means.

5,142,877
MULTIPLE TYPE AIR CONDITIONING SYSTEM WHICH DISTRIBUTES APPROPRIATE AMOUNT OF REFRIGERANT TO A PLURALITY OF AIR CONDITIONING UNITS
Keiichirou Shimizu, Shizuoka, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 21, 1991, Ser. No. 672,910
Claims priority, application Japan, Mar. 30, 1990, 2-084665
Int. Cl.[5] G01K 13/00
U.S. Cl. 62—129 10 Claims



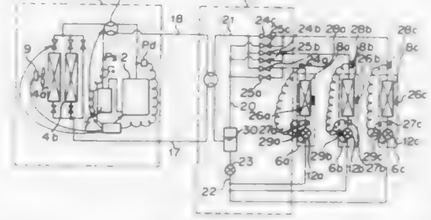
1. A multiple air conditioning system comprising:
a plurality of air conditioning units for respectively supplying conditioned air to spaces, each air conditioning unit having a required air conditioning capacity when operating;
a variable refrigerant supply unit for supplying refrigerant to the plurality of air conditioning units on the basis of the sum total of the required air conditioning capacity of each air conditioning unit;
means for respectively determining a target amount of refrigerant flowing into each air conditioning unit based on the corresponding required air conditioning capacities;
refrigerant flow control means for respectively detecting an actual amount of refrigerant flowing through each air conditioning unit;
refrigerant flow control means for respectively controlling the amount of refrigerant flowing through each air conditioning unit; and
means responsive to the refrigerant flow sensor means for regulating the refrigerating flow control means so that the respective actual amounts of refirgerant detected by the refrigerant flow sensor means reach the corresponding target amounts of refrigerant.

5,142,878
AUGER TYPE ICE MAKING MACHINE
Junichi Hida; Susumu Tatematsu, and Naoya Uchida, all of Nagoya, Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Aichi, Japan
Filed Jan. 22, 1991, Ser. No. 643,959
Claims priority, application Japan, Jan. 23, 1990, 2-5283[U]
Int. Cl.[5] F25C 1/00
U.S. Cl. 62—137 3 Claims



1. An auger type ice making machine having a cylindrical evaporator housing vertically arranged above an ice storage bin and being surrounded by an evaporator coil in a refrigeration circuit, an auger mounted for rotary movement within said evaporator housing, an auger motor in drive connection to said auger, a compressor motor in drive connection to a compressor in said refrigeration circuit, an ice discharge duct horizontally provided on an upper end of said evaporator housing to discharge pieces of hard ice therefrom, an upstanding tubular delivery chute having an upper end connected to said discharge duct and a lower end in open communication into said ice storage bin, an ice detection mechanism including a movable detection plate provided within the upper end of said delivery chute to be moved by abutment with the pieces of hard ice accumulated in said delivery chute, and an electric control apparatus responsive to movement of said detection plate for activating said auger motor and said compressor motor when said detection plate is retained in an initial position and for deactivating said auger motor and said compressor motor with a predetermined time delay when said detection plate has been moved from the initial position,
wherein said electric control apparatus comprises control means for determining the predetermined time to be shorter than a time for which said discharge duct between the upper end of said evaporator housing and said detection plate is filled with the pieces of hard ice discharged from said auger after movement of said detection plate.

5,142,879
AIR CONDITIONING SYSTEM
Takashi Nakamura; Tomohiko Kasai; Hidekazu Tani; Shigeo Takata, and Fumio Matsuoka, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 19, 1991, Ser. No. 672,071
Claims priority, application Japan, Mar. 19, 1990, 2-68955; Apr. 23, 1990, 2-107916; Apr. 23, 1990, 2-107917; Apr. 23, 1990, 2-107930
Int. Cl.[5] F25B 13/00
U.S. Cl. 62—160 6 Claims



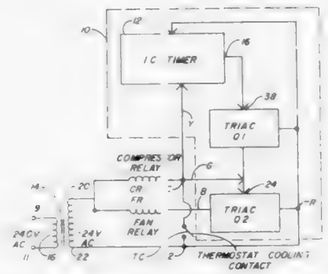
1. An air conditioning system for multiple rooms, comprising:
an outdoor unit including a variable delivery compressor, a four way reversing valve and an outdoor heat exchange unit;
two main connecting pipes composed of a high pressure main pipe and a low pressure main pipe to connect between outdoors and indoors;
a distribution controller which is connected to the main connecting pipes to divide them into a hugh pressure pipe, a low pressure pipe and a medium pressure pipe therein;
a plurality of indoor units which include indoor heat exchangers, respectively, which are one end connected to the medium pressure pipe through electronic expansion valves, respectively, and which are the other end selectively connected to either one of the high pressure pipe and the low pressure pipe, respectively;
detecting means for detecting either one of refrigerant temperatures and refrigerant pressures; and
control means for carrying out a predetermined control based on such detection.

5,142,880

AUTOMATIC FAN CONTRO .(AFC) UNIT OF LOW COST AND DURABLE CONSTR UCTION AND RELATED PROGRESS FOR IMPROV NG THE EFFICIENCY OF EXISTING AIR CONDITIONING SYSTEMS

Robert E. Bellis, 700 7th St., B ulder City, Nev. 89005

Continuation-in-part of Ser. No. 56,272, May 26, 1987, abandoned, which is a continuat on of Ser. No. 793,392, Oct. 31, 1985, abandoned. This applicatic n Oct. 6, 1988, Ser. No. 254,453
Int. Cl.[5] F 5D *17/00*
U.S. Cl. 62—182 4 Claims



1. An air conditioning con rol unit capable of being constructed on a small printed circ it board and operative solely in response to the opening and cl sing of indoor room thermostat contacts or a manual switch therefor, said unit connectable directly to a room indoor ther nostat for an existing air condition system without requiring ny other wiring connections to electrical circuitry remote fro n said room indoor thermostat, said unit comprising:

a. a low voltage room ther nostat fan terminal, F, connectable to a fan relay which i used for controlling the on and off operation of a fan asso iated with said air conditioning system,

b. a low voltage compresso r relay terminal, C, connectable to a compressor relay wh ch is used for controlling the on and off operation of a cor pressor for said air conditioning system, said compressor relay terminal C being further connectable to thermostat contacts, TC,

c. timing circuit means co nected to both of said fan relay and said compressor rela terminals F and C and responsive only to a change in voltage level at said compressor relay terminal C when sa d thermostat contacts, TC, open for energizing said fan re ay for a predetermined time after said compressor turns o F, and being non-responsive to other changes in low vo tage levels within said thermostat, whereby said air conditioning control unit may be economically constructe on a small printed circuit board without making wiring connections or changes remote from said thermostat and connected directly to said room indoor thermostat, and s id timing circuit means and has no effect on the on and off operation of said fan relay produced by the on and off switching of other heating or cooling units such as gas or oil fired units or electrical heating elements which may be connected to said thermostat,

d. said timing circuit mea s including an integrated circuit timer connected to said compressor relay terminal, C,

e. a first, sensitive gate TR IAC connected to said integrated circuit timer for switchi g on and off in response to the on and off operation of sai integrated circuit timer, and

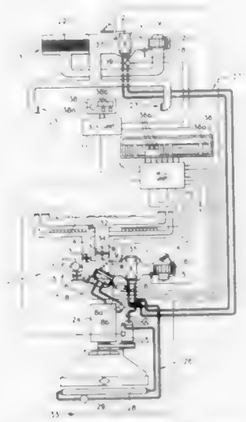
f. a second, power TRIA C connected between said first, sensitive gate TRIAC a d said fan relay terminal, F, for switching on and off in response to the operation of said first, sensitive gate TR AC and thereby continuing said fan relay to operate fo a predetermined time after said compressor shuts off.

5,142,881

AUTOMOBILE AIR CONDITIONING SYSTEM

Yoshiaki Nagayama, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 1, 1991, Ser. No. 677,401
Claims priority, application Japan, Mar. 31, 1990, 2-86497; Jan. 31, 1991, 3-32470
Int. Cl.[5] F25B *49/02*
U.S. Cl. 62—228.5 14 Claims



12. An air conditioning system for conditioning air inside of an automotive vehicle, comprising:

compressing means capable of varying a discharge volume thereof for compressing and discharging a refrigerant;

control means for detecting a thermal loading on said automotive vehicle to vary said discharge volume of said compressing means according to said thermal loading;

main air cooling means, disposed near said compressing means, for cooling air with said refrigerant, said refrigerant being delivered thereto from said compressing means, said air being cooled to a desired temperature which is manually set according to a demand for cooling a specific volume in said automotive vehicle, toward which air, conditioned by said main air cooling means, is directed;

auxiliary air cooling means, disposed away from said compressing means, for cooling air with said refrigerant delivered from said compressing means to a desired temperature which is manually set according to a demand for cooling another specific area in said automotive vehicle, toward which air, conditioned by said auxiliary air cooling means, is directed, said control means adjusting and forcing said compressing means to variably adjust said discharge volume depending upon a lower one of said desired temperatures;

another auxiliary air cooling means disposed away from said main and auxiliary air cooling means for cooling air with said refrigerant delivered from said compressing means to a desired temperature which is manually set according to a demand for cooling an area between said specific areas in said automotive vehicle, toward which air, conditioned by the other auxiliary air cooling means, is directed, said adjusting means forcing said compressing means to variably adjust said discharge volume depending upon at least a lowest one of said desired temperatures; and

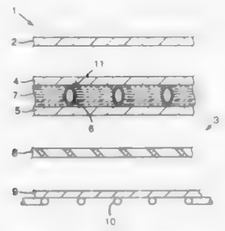
supplementary control means for forcing said main air cooling means, in operation, to increasingly change a temperature of air cooled by said main air cooling means when said desired temperature set according to a demand for cooling said specific area is lower than said desired temperature set according to a demand for cooling the other specific area.

5,142,882

SOLAR HEAT PUMP

Leonard B. Vandenberg, 710 Sanders Ave., Scotia, N.Y. 12302

Continuation-in-part and division of Ser. No. 611,197, May 17, 1984, Pat. No. 4,809,523. This application Mar. 6, 1989, Ser. No. 319,281
Int. Cl.[5] F25B *27/00*
U.S. Cl. 62—235.1 15 Claims



1. Heat transfer apparatus comprising:

(a) a first vapor jet compressor pump having a motive vapor inlet, a feed liquid inlet, a low pressure vapor inlet and a discharge outlet;

(b) a second vapor jet compressor pump having a motive vapor inlet, a feed liquid inlet, a low pressure vapor inlet and a discharge outlet;

(c) means for providing a first source of heated vapor at a relatively high temperature;

(d) a low pressure vapor source;

(e) means for operatively connecting the motive vapor inlets of the first and second vapor jet compressor pumps to the first source of heated vapor of means (c);

(f) means for operatively connecting the discharge outlet of the first vapor jet compressor pump to the feed liquid inlet of the second vapor jet compressor pump;

(g) means for operatively connecting the low pressure vapor inlet of at least one of the first and second vapor jet compressor pumps to the low pressure vapor source; and

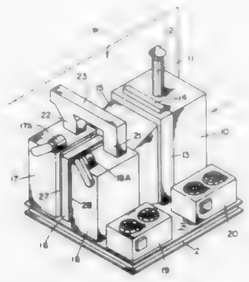
(h) means for operatively connecting the discharge outlet of the second vapor jet compressor pump to a heat transfer loop for fluid heat transfer medium including the feed liquid inlet of the first vapor jet compressor pump.

5,142,883

PARTIALLY REDUNDANT AIR CONDITIONING SYSTEM

Jimmie W. DeWitt, 3144 Hardwood Dr., Port Neches, Tex. 77651

Filed Mar. 25, 1991, Ser. No. 674,110
Int. Cl.[5] F25B *29/00*
U.S. Cl. 62—298 8 Claims



1. Unitized air conditioning apparatus for conditioning air for an enclosed space, said apparatus comprising:

an inlet air chamber through which air may be drawn;

first and second selectively operable air handling units by which air may be drawn through said inlet air chamber for subsequent discharge into said enclosed space;

refrigeration means for circulating refrigerant through said air handling units for heat exchange with said air prior to its discharge into said enclosed space; and

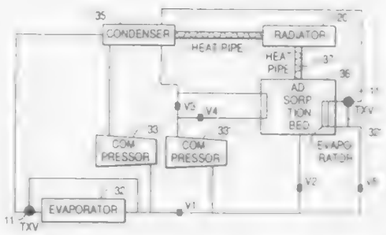
a common air chamber between said air handling units through which air passes from said inlet air chamber to either one of said air handling units, said common air chamber being provided with first and second isolation dampers through which said air must pass into said first and second air handling units, respectively, prior to said discharge into said enclosed space, each of said isolation dampers being selectively moveable between open positions, in which air is drawn through its respective air handling unit, and closed positions, in which air flow is blocked from its respective air handling unit.

5,142,884

SPACECRAFT ADSORPTION THERMAL STORAGE DEVICE USING A VAPOR COMPRESSION HEAT PUMP

Robert P. Scaringe, Rockledge; Clyde F. Parrish, Melbourne, and Lawrence R. Grzyll, Merritt Island, all of Fla., assignors to Mainstream Engineering Corporation, Rockledge, Fla.

Filed Feb. 1, 1991, Ser. No. 648,828
Int. Cl.[5] F24J *3/04*
U.S. Cl. 62—324.4 40 Claims



1. A vapor compression heat pump system, comprising:

at least one compressor;

a condenser and liquid receiver apparatus operatively connected with the at least one compressor;

a system evaporator operatively associated with the at least one compressor and the apparatus so as to evaporate a liquid refrigerant supplied from the apparatus;

a thermal expansion valve operatively associated with the system evaporator; and

means for thermal storage, including an adsorption bed, operatively arranged between one of the at least one compressor and the system evaporator, and the apparatus.

5,142,885

METHOD AND APPARATUS FOR ENHANCED SCROLL STABILITY IN A CO-ROTATIONAL SCROLL

Robert E. Utter, Whitehouse, Tex., and Daniel R. Crum, La Crosse, Wis., assignors to American Standard Inc., New York, N.Y.

Filed Apr. 19, 1991, Ser. No. 688,642
Int. Cl.[5] F01C *1/04*
U.S. Cl. 62—498 41 Claims

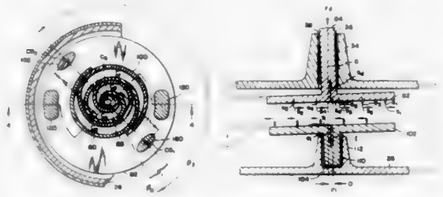
1. A scroll apparatus comprised of:

a first scroll member having a first scroll and plate and a first upstanding involute portion disposed on said first scroll end plate;

a second scroll member having a second upstanding involute portion disposed thereon in interleaving engagement with said involute of said first scroll member;

means for creating a dynamic imbalance in one of said scroll members the result of which is to enhance the nutational

stability of said one scrol member by creating a force which acts in opposition to and reduces the maximum



tipping moment to which said one scroll member is subject in operation; and

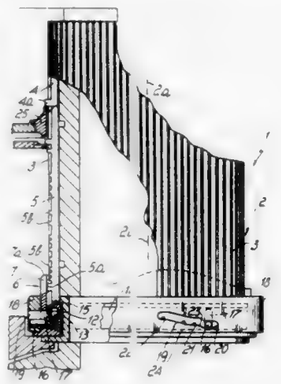
means for rotating said first and second scroll members.

5,14 ,886

CIRCULAR KNITTING MAC HINE WITH A DEVICE FOR REPREATING THE SELEC ION OF THE NEEDLES AT LEAST AT ONE THREAD FEED

Francesco Lonati, Brescia, It ly, assignor to Lonati S.p.A., Brescia, Italy

Filed Oct. 19, 199 , Ser. No. 599,552
Claims priority, application I aly, Oct. 31, 1989, 22205 A/89
Int. Cl.[5] I 04B *9/26*
U.S. Cl. 66—222 11 Claims



1. Circular knitting machine with a device for repeating needle selection at least at one thread feed, comprising; a needle cylinder having a lateral surface, a plurality of grooves defined on said lateral surface an axis defined by said needle cylinder, said grooves being substantially parallel to said axis of said needle cylinder, a needle and at least one selector being accommodated inside each of said grooves, said needle and said selector being slideable along a direction substantially parallel to said axis of said needle cylinder, said selector being arranged below said needle and having a lower end and a main heel, said selector being controllably oscillable, in a radial plane of said needle cylinder, from an extraction position, whereat said main heel protrudes radially from one of said grooves, to a sunk position, whereat said main heel is contained within said one of said grooves, actuation cams arranged laterally facing said needle cylinder and defining paths engageable by said main heel in said extraction position, said needle cylinder being rotatable relatively to said actuation cams and defining a direction of rotation, whereby rotation of said needle cylinder about said axis in said direction of rotation causes movement of said selector along said one of said grooves in a direction parallel to said axis, at least two feeds mutually angularly spaced with respect to said axis, selection means arranged upstream of at least one of said feeds according to said direction of rotation and controllably interacting with said selectors for causing oscillation movement of said selectors from said extraction position to said sunk position and vice versa, said machine further comprising a memory element, said memory element being arranged proximate to said lower end of said at least one selector and having an upper edge and at least one portion, said portion defining a curvilinear shape concentric to said needle cylinder, said memory element being arranged between said two feeds and controllably movable parallel to said axis from an inoperative position, whereat said memory element does not interfere with said oscillation movement of said selector, to an operative position, whereat said memory element defines differentiated paths for said lower end of said selector, whereby to maintain the position of said selector set previously by said selection means,

wherein said memory element comprises an annular body, said annular body being arranged concentrically to said needle cylinder and accommodated in a seat, said seat being defined adjacent a ring, said lower end of said selector resting on said ring, said ring defining a resting plane for said lower end of said selector and having a region comprised between said two feeds, said seat being open upwardly whereby to permit movement of said memory element between said inoperative position, whereat said upper edge is arranged below said resting plane, to said operative position, whereat said upper edge protrudes upwardly from said resting plane in said region of said ring comprised between said two feeds, and

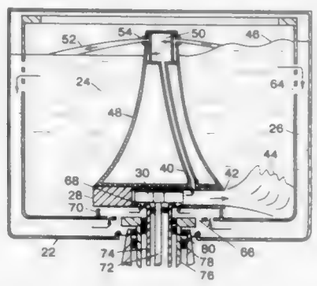
wherein said annular body has a recess, said recess being defined on said upper edge opposite said selection means, said recess defining a depth and a bottom, said depth of said recess being such that when said memory element is in said operative position, said bottom of said recess is arranged below or on a level with said resting plane.

5,142,887

RESONANT WAVE-JET AGITATOR WASHING MACHINE

Richard J. Priem, 13533 Mohawk Trail, Cleveland, Ohio 44130, and John P. Wanhainen, 21391 Erie Rd., Rocky River, Ohio 44116

Filed Apr. 24, 1991, Ser. No. 690,637
Int. Cl.[5] D06F *17/00*
U.S. Cl. 68—18 FA 10 Claims



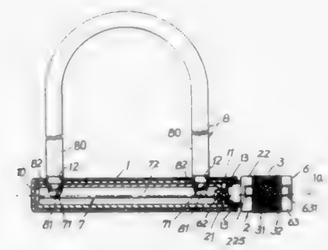
1. A washing machine comprising a washing chamber means for containing a body of washing fluid and material to be washed including an access opening, a sidewall extending about a vertical axis and a bottom wall joined to said sidewall, a rotating nozzle housing containing a discharge nozzle means, a pump mounted within said rotating nozzle housing, a drive means operably connected to said pump, said pump having an inlet in fluid communication with said body of washing fluid and an outlet in fluid communication with said discharge nozzle means, said discharge nozzle means discharges at least one fluid jet of a high velocity flow of washing fluid below the level of said body of washing fluid in said washing chamber means, a drive means operably connected to said rotating nozzle housing for rotation movement thereof at an angular velocity corresponding with the natural frequency of a rotating wave in said body of washing fluid in said washing chamber means to form a resonance rotating fluid wave in said body of washing fluid.

5,142,888

ROTATABLY UNLOCKABLE COMBINATION LOCK HAVING REMOVABLE SHACKLE

Chong-Kuan Ling, c/o Sinox Co., Ltd., P.O. Box 96-156, Taipei, Taiwan

Filed Jun. 27, 1991, Ser. No. 721,940
Int. Cl.[5] E05B *37/02*
U.S. Cl. 70—26 3 Claims



1. A combination lock comprising:

a cylindrical casing having two shackle holes formed therein for lockably inserting two leg members of a shackle generally U-shaped through said two shackle holes;

a lock body having a hollow spindle secured with an open end portion of said casing having a central hole formed through the hollow spindle;

a plurality of dials rotatably engageable with a plurality of sleeves rotatably mounted on said hollow spindle of said lock body;

a rotating knob having a bolt protruding inwardly from a knob disk and rotatably engageable in the central hole of said hollow spindle;

a locking member secured with said bolt of said rotating knob normally locking said two leg members of said shackle;

and means formed in said hollow spindle operatively retarding a rotation of said bolt of said knob;

whereby upon a rotation of said dials and sleeves to a predetermined opening combination to prevent retarding of the rotation of said bolt and upon a rotation of said knob to rotate said bolt and said locking member, said shackle will be unlocked and removable from said casing;

said plurality of dials and sleeves rotatably mounted on said hollow spindle and defined between an inner cap formed on an inner portion of said lock body proximate the open end portion of said casing opposite to a closed end portion of said casing, and an outer cap formed on an outer end portion of said lock body having said knob disk of said knob rotatably encasing said outer cap in said knob disk;

said outer cap of said lock body formed with an arcuate slot communicated with said central hole in said spindle for slidably limiting a cam protruding inwardly from said knob disk when rotating said knob for locking and unlocking said locking member; and

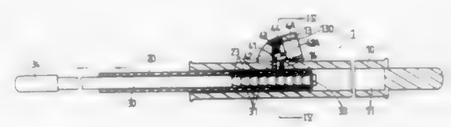
said hollow spindle formed with a positioning ball therein having a ball spring resiliently urging the ball to be engageable with a ball recess formed in said bolt of said rotating knob.

5,142,889

AUTOMOBILE STEERING LOCK

Steve Liu, No. 304, Chung Cheng South Road, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Apr. 16, 1991, Ser. No. 685,675
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 2 Claims



1. An antitheft device for attachment to a steering wheel of an automobile comprising:

a first elongated tubular member having an inner open end, a closed outer end and an elongated passageway extending along its axis, a solid iron bar extending outwardly from the closed outer end and a first U-shaped hook extending from the solid iron bar to engage said steering wheel from the inside thereof with an outer end of said solid iron bar extending a substantial distance beyond the periphery of said wheel;

a second elongated tubular member having an inner end, an outer end and a second elongated passageway extending along its axis therethrough, the second tubular member being adapted to extend in a telescopic manner within said elongated passageway of the first tubular member and a second U-shaped hook secured to the inner end of the second tubular member, having an opening facing opposite to the first U-shaped hook and adapted to engage said steering wheel from the inside thereof;

said second elongated tubular member having an elongated groove formed axially in a surface of a side wall of the second tubular member;

a pin hole transversely located in a side wall of the first tubular member so as to communicate with the elongated passageway in the first tubular member;

a pin press-fitted in the pin hole and protruding inwardly from the pin hole into the elongated groove for guiding the second tubular member to move axially yet preventing the second tubular member from rotation with respect to the first tubular member;

a plurality of openings axially aligned in a portion of a side wall close to the outer end of the second tubular member in an evenly spaced-apart relation;

a rod member adapted to extend in a telescopic manner within said second elongated passageway of said second tubular member and having an inner end formed with a handle and a plurality of spaced annular grooves circumferentially formed in a portion close to an outer end of the rod member;

a substantially C-shaped clip member engaged in an annular groove in an extreme outer end of the rod member with its outer circumference adapted to slide within the elongated passageway in the first tubular member and dimensioned to abut against the outer end of the second tubular member to limit the extension movement of the rod member with respect to the second tubular member;

a housing means firmly formed on the first tubular member close to the outer end of the first tubular member;

a lock;

a bore means offset with respect to the axis of the first tubular member defined in the housing means for firmly receiving the lock;

a vertical passageway bored from an outer side wall of the housing means and extending radially into the same to interconnect the bore means and the elongated passageway in the first tubular member;

rod-like bearing means including a rod-like bearing slidably accommodated in the vertical passageway in the housing

means and having a tenon member attached to an end thereof and arranged to be actuated between a locking position with the tenon member protruding into an opening in the second tubular member and an annular groove in the rod member and an unlocking position with the tenon member withdrawn from the opening and annular groove;

actuating member means for interconnecting the lock and the rod-like bearing means so as to control the position the tenon means in a locking or unlocking position through the rod-like bearing means member by means of the lock; and

a spring biasing the rod-like bearing towards the elongated passageway in the first tubular member.

5,142,890

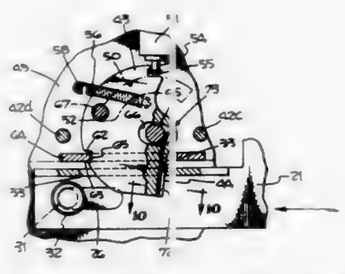
ELECTRO-MECHANICAL LOCK WITH ROTARY BOLT

Alan K. Uyeda, Pico Rivera; Klaus W. Gartner, Palos Verdes Estates; John Herrmann, Los Angeles, and Peter J. Phillips, Long Beach, all of Calif., assignors to La Gard, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 533,893, Jun. 6, 1990. This application Jul. 31, 1990, Ser. No. 562,200

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—277 15 Claims



1. An electro-mechanical rotary lock, comprising:

a housing, a bolt plate and a cover associated with said housing, said housing having a first opening, said bolt plate engaging said first opening, and providing a bolt passage;

a spring-biased rotary bolt which is rotatable between a protracted and a retracted position relative said bolt plate, said rotary bolt being generally D-shaped, and having a first and a second end, said rotary bolt extending outwardly relative said housing through said bolt passage when in said protracted position;

a locking means for normally restricting rotation of said rotary bolt;

an electronic combination entry device for manual entry for a coded sequence and an associated electrically-operated means for producing a code responsive signal to disengage said locking means; and

an entry preclusion means for restricting rotation of said rotary bolt in response to unauthorized forcing of said rotary bolt.

5,142,891

THICKNESS CONTROL SYSTEM FOR ROLLING MILL

Hiroaki Kuwano, Yokosuka, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

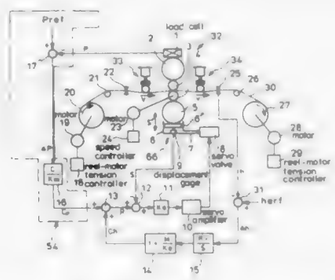
Continuation of Ser. No. 623,501, Dec. 7, 1990, abandoned. This application Jan. 23, 1992, Ser. No. 825,428

Claims priority, application Japan, Dec. 25, 1989, 1-335314; Jul. 13, 1990, 2-185878

Int. Cl.[5] B21B *37/02, 37/06*

U.S. Cl. 72—11 9 Claims

1. In a thickness control system for a rolling mill having a hydraulic roll gap control system for setting a roll gap between upper and lower work rolls for rolling a workpiece passing from an uncoiling reel on an entry side of said work rolls to a coiling reel on an exit side of said rolls, motor means including reel motor tension controllers for driving said coiling and uncoiling reels at speeds maintaining constant tension on said workpiece on the entry and exit sides of said work rolls, a mill module control unit for outputting an instruction signal to said hydraulic roll-gap control system on the basis of any difference between a reference rolling pressure and an actual rolling pressure during rolling detected by a load cell, the improvement comprising a tension controller separate from the tension controllers for said reels and disposed on at least said entry side



of said work rolls, said separate tension controller comprising: a tension detector for detecting the tension applied to the workpiece, means for applying a force directly to said workpiece to tension same, and means for adjusting the tension in said workpiece by varying the force exerted by said force applying means on said workpiece in response to a difference between a predetermined reference tension and the tension detected by said tension detector whereby any fluctuation in tension of said workpiece in response to a predetermined change in said roll gap is immediately detected and tension restored by said tension controller independently of operation of said reel drive tension contollers.

5,142,892

ARRANGEMENT FOR ADJUSTING THE ROLL GAP IN ROLLING MILL STANDS, PARTICULARLY IN STRIP ROLLING MILL STANDS FOR HOT OR COLD ROLLING

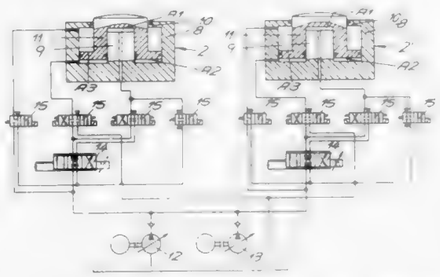
Oskar Noé, Mülheim, and Willi Dötsch, Oberhausen, both of Fed. Rep. of Germany, assignors to BWG Bergwerk-und-Walzwerk-Maschinenbau GmbH, Duisburg, Fed. Rep. of Germany

Filed Mar. 28, 1991, Ser. No. 676,952

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1990, 4010662

Int. Cl.[5] B21B *31/32*

U.S. Cl. 72—20 4 Claims



1. In an arrangement for adjusting a roll gap in a rolling mill stand for hot or cold rolling, the arrangement including at least two hydraulic adjusting cylinders which act through chocks from both sides on a work roll to be adjusted, each adjusting cylinder having two or more piston surfaces, and including means for applying pressure medium to one of the piston surfaces individually, to a combination of the piston surfaces and to all of the piston surfaces, the improvement comprising each adjusting cylinder including a cup-shaped piston guided in a cylinder housing on a cylinder shaft and in a cylinder collar, wherein pressure medium can be applied to one of or both of a central piston surface formed in an inner bottom of the cup-shaped piston and an annular piston surface formed by a rim of the cup-shaped piston, further comprising means for alternatingly applying pressure medium to both sides of the annular piston surfaces.

5,142,893

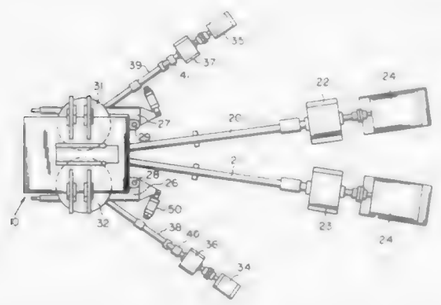
TUBE MILL

William Rozmus, Pittsburgh, and Rudy M. Trbovich, Midland, both of Pa., assignors to Italimpianti of America, Inc., Coraopolis, Pa.

Filed May 17, 1991, Ser. No. 701,742

Int. Cl.[5] B21D *19/04*

U.S. Cl. 72—95 4 Claims



1. In a seamless tube mill of the type comprising a mill stand through which the workpiece passes axially along a pass line, at least two sizing rolls journaled within the mill stand,

two disk rolls mounted to be driven in rotation on substantially parallel axes which axes are perpendicular to the pass line, said disk rolls having outer rims shaped and positionable to guide the workpiece along the pass line,

rotatable pivot frames on opposite sides of the pass line mounted for rotation on an axis substantially parallel to the axes of the disk rolls,

driven shafts journaled in the pivot frames on which the disk rolls are respectively mounted,

collapsible input shafts,

motors fixed relative to the mill stand for driving the collapsible input shafts through a fixed pivot universal joint,

right angle drive means mounted to the rotatable pivot frames for transferring torque from the collapsible input shafts to the driven shafts through universal joints,

whereby the rotatable pivot frames may be rotated away from the pass line to enable removal and replacement of the disk rolls without disconnecting and realigning the input shafts.

5,142,894

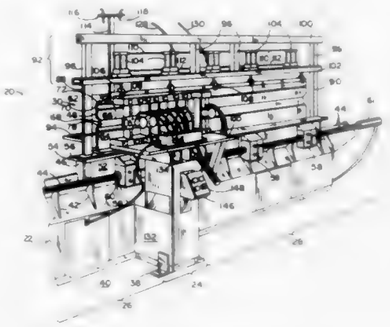
ROLL-FORMING METHOD

Timothy A. Gutowski, Spring Lake, Mich., assignor to Contour Roll Company, Grand Haven, Mich.

Filed Mar. 15, 1991, Ser. No. 670,241

Int. Cl.[5] B21D *5/08*

U.S. Cl. 72—129 23 Claims



1. A method for making three-dimensional metal parts with complex shapes, comprising:

providing a coil of metal strip stock having a substantially uniform width;

uncoiling a segment of the strip stock from the coil, and straightening the same to a substantially flat condition;

cutting from the flattened strip stock segment a predetermined length of the same to define a part blank;

providing a jig with a central, longitudinal axis, and clamp means located on the jig for securely, yet removably retaining the part blank therein, said clamp means including top and bottom elongated clamping members;

positioning the part blank generally centrally in the jig in alignment with said central longitudinal axis of said jig and between the top and bottom clamping members, such that opposite sides of the part blank extend outwardly from the jig to facilitate forming the same;

selecting at least two elongated cams and positioning same between the top and bottom clamping members;

clamping said at least two elongated cams and the part blank to said jig between said top and bottom clamping members in a sandwich-like arrangement so that same are held continuously along said predetermined length by use of said clamp means;

simultaneously slitting the opposite sides of the jig mounted part blank to form a slit blank with a predetermined non-uniform width, and opposite side edges thereof disposed precisely symmetrical to the central longitudinal axis of the jig, with one of said at least two cams determining said predetermined non-uniform width; and

simultaneously roll-forming the opposite sides of the slit blank to create a pair of upstanding flanges thereon disposed at selected angles with respect to the rest of the part blank with another of said at least two cams determining the complex three-dimensional shape, whereby complex, three-dimensional shapes can be accurately and efficiently formed.

5,142,895

METHOD FOR BENDING TUBES

Eugene H. Schuchert, Iowa City, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

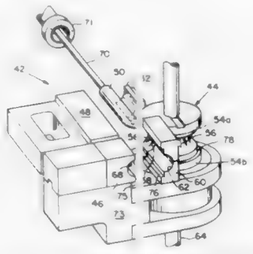
Filed May 15, 1989, Ser. No. 351,991

Int. Cl.[5] B21D *11/06, 7/04, 9/04*

U.S. Cl. 72—150 12 Claims

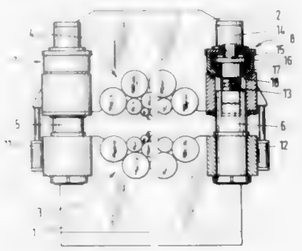
10. A method comprising the steps of:

providing a steel tube having an outer diameter of 2.5 inches or less and a wall thickness of 0.05 inches or less;
providing a bend die having a controlled-wrinkle tube groove comprising elongated indentations, said bend die having a centerline radius of 3.5 inches or less;
providing a pressure die and a clamp die;
seating said tube tangentially in said tube groove of said bend die;
clamping said tube to said bend die with said clamp die;



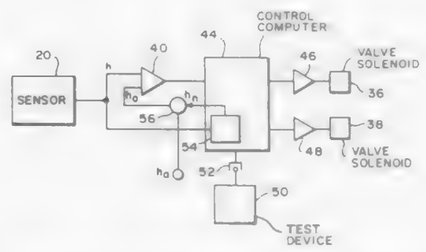
moving said tube tangentially toward said bend die with said pressure die while rotating said bend die and said clamp die to form a bend having controlled-wrinkles on the inside surface of said tube at said bend, said tube being bent without a ball mandrel inside of said tube;
directing hot combustion gases through said tube wherein turbulence of said combustion gases is increased by flowing over said controlled wrinkles on said inside surface of said tube at said bend; and
providing a flow of air across the outside of said tube to heat said air.

5,142,896
CLUSTER MILL WITH HYDRAULIC SCREW-DOWN
Bernd Berger, Kaarst, and Peter Reinthal, Hemer, both of Fed. Rep. of Germany, assignors to Sundwiger Eisenhutte Maschinenfabrik, Hemer, Fed. Rep. of Germany
Filed Nov. 15, 1990 Ser. No. 614,100
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939124
Int. Cl.[5] B21B *31/22, 31/32*
U.S. Cl. 72—242.4 **5 Claims**



1. A cluster mill comprising
an upper part having an upper set of rolls and a lower part having a lower set of rolls
a plurality of columns disposed between said upper part and said lower part, said columns being anchored in said lower part, said upper part being guided on said columns,
lifting means attached to said upper and lower parts for lifting and lowering said upper part relative to said lower part,
hydraulic screw-down means associated with said upper and lower parts for generating a roll force between said upper and lower sets of rolls after said lifting means has moved said upper and lower sets of rolls into an initial operating position, said lifting means being located outside of and operating independently of said hydraulic screw-down means,
said hydraulic screw-down means comprising a piston and cylinder arrangement associated with each of said columns, each piston being axially fixed to its associated column in an initial position, each piston and cylinder defining a cylinder space into which hydraulic fluid is introduced to generate said roll force.

5,142,897
HEIGHT ADJUSTMENT IN A VEHICLE FITTED WITH AIR SUSPENSION
Jürgen Pischke, Weissach, and Engelbert Tillhon, Lauffen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/EP89/00313, § 371 Date Oct. 15, 1990, § 102(e) Date Oct. 15, 1990, PCT Pub. No. WO89/09702, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 14, 1988, Ser. No. 585,163
Int. Cl.[5] G01D *18/00;* **B60G** *17/015*
U.S. Cl. 73—1 J **6 Claims**

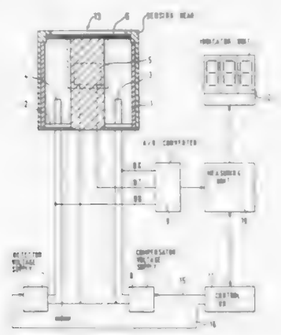


1. A method of calibrating a height sensor in an electronically controlled height regulating device of a multiple air spring suspension system of a vehicle, the method comprising the steps of:
disabling the height regulating function and externally controlling the air springs to bring the body height to a desired null position; and,
then programming said null position into the regulating device to serve as a reference value for the height regulation.

5,142,898
METHOD FOR OPERATING A MEASURING ARRANGEMENT FOR DETECTING THE COMPONENT OF COMBUSTIBLE GASES IN A GAS MIXTURE
Wolfgang Kauschke, and Werner Thoren, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany
Filed May 6, 1991, Ser. No. 696,088
Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4014930
Int. Cl.[5] G01N *27/16*
U.S. Cl. 73—23.31 **19 Claims**

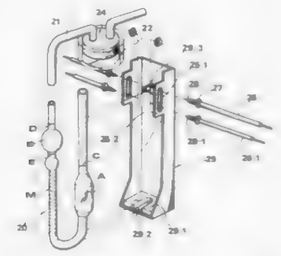
1. A method for operating a measuring arrangement for detecting a combustible gas in a gas mixture, the measuring arrangement including a display unit, a measuring unit connected to the display unit, a detector element, and, a compensator element which can be driven, the method comprising the steps of:
in a first operating phase, supplying the detector element with a detector operating current ID while supplying the compensator element with a first compensator component operating current IK1 thereby causing a first voltage UD and a second voltage UK to drop across said detector element and said compensator element, respectively;
forming a first measuring signal Ul for gas analysis from said first voltage UD and said second voltage UK;

in a second operating phase, supplying the compensator element with a second compensator component operating current IK in a partial heat-up phase during a time interval from a switch-in time point t0 to a time point t1;
extrapolating the steady-state terminal voltage U(t) at the



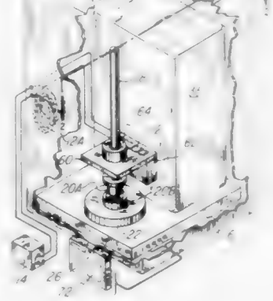
end of the heat-up phase from the slope of the compensator voltage UK(t) in the time interval t0 to t1 with a processing function; and,
forming a second measuring signal U2 for gas analysis from the extrapolated terminal voltage and said first voltage UD.

5,142,899
AUTOMATIC VISCOSITY MEASURING DEVICE
Su C. Park; Young M. Kuon, and Jin H. Kim, all of Korea, Rep. of Korea, assignors to SKC Limited, Rep. of Korea
Filed Nov. 27, 1990, Ser. No. 619,177
Claims priority, application Rep. of Korea, Nov. 27, 1989, 89-17243
Int. Cl.[5] G01N *11/04*
U.S. Cl. 73—55 **3 Claims**



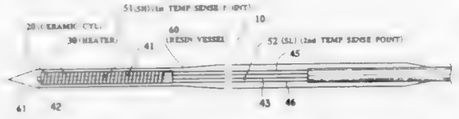
1. A viscosity measuring device using a computer, a Ostwald's viscosimeter, and a water bath, said device comprising:
an input/output control part connected to said computer for transmitting and receiving data and control signals;
a vacuum pump for providing vacuum pressure;
a speed controller and motor for driving said vacuum pump;
a switching part for connecting a power source to said speed controller and motor, said switching part being connected to a first input/output port of said input/output control part;
at least one solenoid valve connected by air pressure lines to said vacuum pump and to said Ostwald's viscosimeter for controlling the presence of vacuum pressure in said Ostwald's viscosimeter;
at least one drive circuit and at least one relay for controlling said solenoid valve, said drive circuit and relay being connected to a second input/output port of said input/output control part;
a first photosensor part connected by optical fiber to a first series of signal detection ports for detecting a sample at an upper marked line of said Ostwald's viscosimeter;
a second photosensor part connected by optical fibers to a second series of signal detection ports for detecting said sample at a lower marked line of said Ostwald's viscosimeter, said first photosensor part and said second photosensor part being connected to said input/output control part;
wherein said input/output control part operates said switching part according to the position of said sample in said Ostwald's viscosimeter and when said switching part connects said power supply to said speed controller and said motor, said vacuum pump delivers vacuum pressure to said Ostwald's viscosimeter through said air pressure lines extending from said vacuum pump through said solenoid valve to a buffer tube in said Ostwald's viscosimeter, further comprising a fixing bracket for holding said Ostwald's viscosimeter, said fixing bracket having at a lower end, a fixing piece with a fixing groove and in an upper end, an adjusting piece having projecting portions disposed on opposite sides of said Ostwald's viscosimeter, whereby said optical fibers can be adjustably positioned by a connector relative to said upper marked line and said lower marked line.

5,142,900
APPARATUS AND METHOD FOR TESTING VISCOSITY
Horace W. Duke, 8371 Highway 49, Pleasant View, Tenn. 37146
Filed Oct. 17, 1990, Ser. No. 599,057
Int. Cl.[5] G01N *11/10*
U.S. Cl. 73—54.39 **16 Claims**



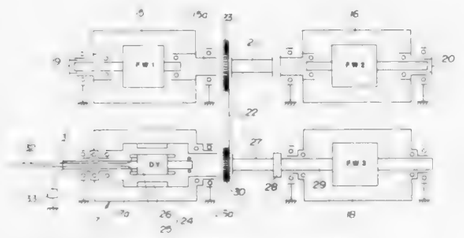
15. Apparatus for determining the viscosity of a liquid comprising:
a base;
an elongated rod having lower and upper portions, and a selected diameter and length supported by said base;
means for sensing strain occurring between said base and said rod;
a collar surrounding said rod, said collar having an inside diameter slightly greater than said rod, and said collar and said rod suitable for receiving a liquid to be tested in the slightly greater space between said rod and said collar; and
a first drive means coupled to said collar for moving said collar at a selected speed along said rod from said lower portion to said upper portion;
a second drive means for achieving rotation of said rod with respect to said collar operable to distribute said sample around said rod before said apparatus determines the viscosity of said liquid sample.

5,142,901
SPECIFIC HEAT BASED MOISTURE SENSOR
Yoshiharu Nagawa, and Yoshiaki Ishiguro, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Sep. 28, 1990, Ser. No. 589,593
Claims priority, application Japan, Oct. 25, 1989, 1-124036[U]
Int. Cl.[5] G01N *27/56*; G01K *7/10*
U.S. Cl. 73—73 2 Claims



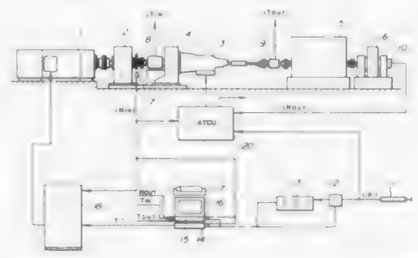
1. A specific heat based moisture sensor, comprising:
(a) a cylindrical member formed as a separate unit with two parallel axially-extending hollow portions formed therein to accomodate wires of a temperature sensor passed therethrough;
(b) a heater provided on an outer circumferential surface of said cylindrical member;
(c) a temperature sensor of thermocouple type formed by leads passed through the two hollow portions of said cylindrical member, said temperature sensor having:
(1) a first wire;
(2) a second wire;
(3) a third wire; and
(4) a first high temperature sense point between said first and second wires being located within one of the cylindrical hollow portions of said cylindrical member and a second low temperature sense point between said second and third wires being located outside said cylindrical hollow portions of said cylindrical member; and
(d) a waterproof synthetic resin formed so as to cover said cylindrical member and said heater, whereby moisture content of a substance is detected by measuring a change in temperature between the two temperature sense points, when said cylindrical member is inserted into the substance to be measured, while keeping heating power at a constant value.

5,142,902
TWIN ROLLER CHASSIS DYNAMOMETER
Sadao Fujimori, Tokyo, and Akira Yamamoto, Gunma, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan
Filed May 29, 1991, Ser. No. 706,993
Claims priority, application Japan, May 30, 1990, 2-140762
Int. Cl.[5] G01L *3/02*
U.S. Cl. 73—117 3 Claims



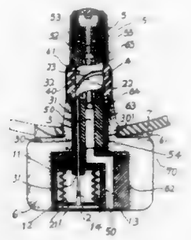
1. In a twin roller type chassis dynamometer
a load roller;
a free roller;
an outer rotor type dynamometer disposed within said free roller, said dynamometer having a rotor which is rotatably supported within said free roller; and
drive means for interconnecting the rotor of the dynamometer with said load roller and for driving the rotor to rotate at a higher rotational speed than said load roller.

5,142,903
DRIVING POWER SOURCE UNIT FOR AUTOMOTIVE POWER TRANSMISSON TESTING APPARATUS EMPLOYING MOTOR
Fumio Mizushina; Takashi Goto, both of Shizuoka, and Michio Nawa, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan
Division of Ser. No. 436,342, Nov. 13, 1989, Pat. No. 5,085,071.
This application Jul. 17, 1991, Ser. No. 731,641
Claims priority, application Japan, Nov. 14, 1988, 63-148307
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 2 Claims



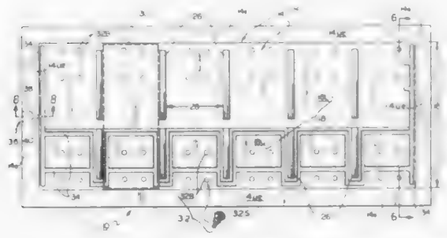
1. A test apparatus for an automotive power train comprising:
a low inertia driving power source means including a first motor, a second motor, and a step-up gear unit, said step-up gear unit including a first input shaft connected to said first motor and carrying a first input gear for driving the latter, a second input shaft connected to said second motor and carrying a second input gear for driving the latter, said second motor being independent of said first motor for independently driving said second input gear from said first input gear, an output shaft connected to a work and carrying a sole output gear for rotation therewith, a first and second intermediate gears supported on a rotary shaft, said first intermediate gear being adapted to mesh with said first input gear, said second intermediate gear being adapted to mesh with said second input gear, at least one of said first and second intermediate gear being movable for selectively engaging and disengaging with associated one of said first and second input shaft, and a third intermediate gear rigidly secured on said rotary shaft for rotation therewith and constantly meshed with said output gear for driving latter;
a first sensor for monitoring revolution speed at the input of said power train for producing an engine speed simulated data;
an engine load setting means for generating an engine load simulated data which is variable according to a desired pattern for testing various mode of operation of said power train;
means for deriving a torque demand for controlling said motors on the basis of said engine speed simulated data and said engine load simulated data, said torque demand deriving means having a plurality of torque variation characteristics relative to said engine speed simulated data value, each torque variation characteristics being set with respect to specific engine load simulated data value; and
means for controlling said motors on the basis of said torque demand for supplying input torque for said power train.

5,142,904
ISOTHERMALLY MEASURED TIRE GAUGE
Mike Le, 8F, No. 164, Chung-Hsiao East Road, Sec. 3, Taipei, Taiwan
Filed Jun. 25, 1991, Ser. No. 720,951
Int. Cl.[5] B60C *23/04*; G01L *7/06*
U.S. Cl. 73—146.8 10 Claims



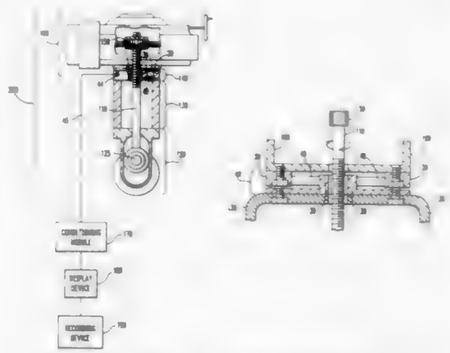
1. A tire gauge comprising:
a bellows telescopically mounted in a tire interior;
a flexible indicator rod secured with said bellows protruding outwardly through a rod hole formed in a rod-guiding means fixed in a fixing hole formed through a tire; said bellows and said rod hole in said rod-guiding means defining a closed air chamber filled with air at normal temperature and pressure condition;
a transparent cover secured on an upper outer portion of said rod-guiding means having a graduation scale formed thereon for showing a pressure indication value of said indicator rod slidably held in said rod-guiding means; and
a packing means sealably securing said rod-guiding means and said cover on said tire.

5,142,905
OVERLAPPED TEST SPECIMEN FIXTURE
Maureen B. Ezzo, Northford, and David J. Tuttle, Seymour, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Feb. 8, 1991, Ser. No. 652,837
Int. Cl.[5] G01N *19/04*; B32B *31/04*
U.S. Cl. 73—150 A 14 Claims



1. An overlapped test specimen fixture for preparing at least one pair of standardized coupons as a test specimen having at least one standardized bonding site of constant bonding area with an adhesive system to be tested applied thereto, the prepared test specimen having utility for characterization testing of the adhesive system applied to the at least one standardized bonding site, each of the standardized coupons of the at least one pair having a predetermined length, a predetermined width, and a predetermined thickness, comprising:
means for supporting the standardized coupons of the at least one pair in overlapping relation with respect to one another;
means for precisely positioning the standardized coupons of the at least one pair in lengthwise relation with respect to one another wherein overlapped, precisely lengthwise positioned standardized coupons of the at least one pair demarcate a predetermined overlap length;
means for precisely positioning the standardized coupons of the at least one pair in transverse relation with respect to one another wherein overlapped, precisely transversely positioned standardized coupons of the at least one pair demarcate a predetermined overlap width;
said supporting means, said lengthwise positioning means, and said transverse positioning means being operative in combination to precisely position the standardized coupons of the at least one pair in a predetermined overlapping relation to demarcate the test specimen having the at least one standardized bonding site of constant bonding area for application of the adhesive system to be tested, the constant bonding area being defined by the predetermined overlap length and width demarcated by the standardized coupons of the at least one pair precisely positioned in the predetermined overlapping relation; and
means for temporarily securing the precisely positioned, overlapped test specimen in immobile combination with said supporting means.

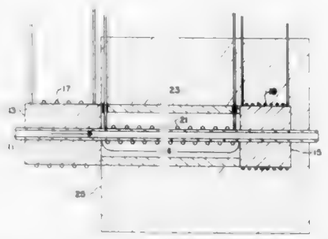
5,142,906
APPARATUS FOR MEASURING VALVE STEM LOADS IN A MOTOR OPERATED VALVE ASSEMBLY
Christopher P. Smith, Cobb County, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 9, 1990, Ser. No. 550,336
Int. Cl.[5] G01M *9/00*; G01L *1/22*; F16K *31/05*
U.S. Cl. 73—168 36 Claims



1. In a motor operated valve which includes an actuator, a valve yoke, a valve plug, and a valve stem for transferring motive force from the actuator to the valve plug to move the valve plug between an open and a closed position, a pre-calibrated apparatus is provided for measuring actual valve stem operating load comprising:
a first plate, said first plate including at least a top and bottom surface, said first plate top surface attached to the actuator;
a first plate aperture, centrally located on said first plate top surface and communicating with said first plate bottom surface;
a second plate, said second plate including at least a top and bottom surface and positioned parallel to and below the plane of said first plate, said second plate bottom surface attached to the valve yoke;
a second plate aperture, centrally located on said second plate top surface and communicating with said second plate bottom surface;
an inner load ring attached to said first plate bottom surface, centered around said first plate aperture;
an outer load ring attached to said second plate top surface,

said outer load ring having a radius greater than said inner load ring radius;
a plurality of web members radially linking said inner load ring and said outer load ring; and
thrust sensor means attached to at least one of said web members for measuring shear stresses within said web member.

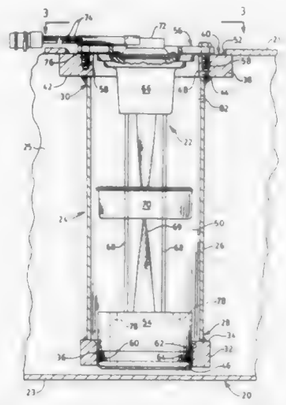
5,142,907
CONSTANT TEMPERATURE GRADIENT FLUID MASS FLOW TRANSDUCER
Luke D. Hinkle, Townsend, Mass., assignor to MKS Instruments, Inc., Andover, Mass.
Filed Apr. 17, 1991, Ser. No. 686,589
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—204.12 **15 Claims**



1. A flow rate transducer for generating an electrical output signal indicative of the flow rate of a fluid in a laminar flow measuring channel defined by a heat conducting capillary tube, the transducer comprising:
first temperature regulating means thermally connected to the upstream end of said measuring channel for maintaining the temperature of said upstream end at a first predetermined temperature;
second temperature regulating means thermally connected to the downstream end of said measuring channel for maintaining the temperature of said downstream end at a second predetermined temperature, higher than said first predetermined temperature;
temperature gradient means for causing the temperature rise along said measuring channel to be substantially linear;
electrical heating means for uniformly replacing the heat transferred from said measuring channel to said fluid flowing in said channel to maintain said linear temperature rise; and
output means for producing said output signal in response to the supplying of heat by said electrical heating means.

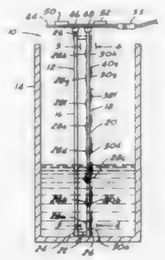
5,142,908
MOUNTING ASSEMBLY FOR FUEL LEVEL SENSOR
Robert O. Chamblin, Sr.; James A. Huenefeld, both of Chillicothe; Randal E. Hulva, East Peoria, and John R. Menk, Delavan, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed May 3, 1991, Ser. No. 700,384
Int. Cl.[5] G01F *23/24*
U.S. Cl. 73—319 **9 Claims**

1. An assembly for mounting a fuel level sensing apparatus with a fuel tank of a vehicle, comprising:
a tubular member having first and second end portions;
a base member having a surface portion and a wall portion defining an internal bore, said first end portion of said tubular member being joined to said base member surface portion;
a head member having first and second surface portions and a wall portion defining an internal bore, said first surface portion being joined to said fuel tank and said second surface portion being joined to said tubular member second end portion;
said fuel level sensing apparatus being positioned within said tubular member, said base member internal bore, and said head member internal bore;
a resilient cushioning ring positioned between said base member internal bore and said fuel level sensing apparatus; and



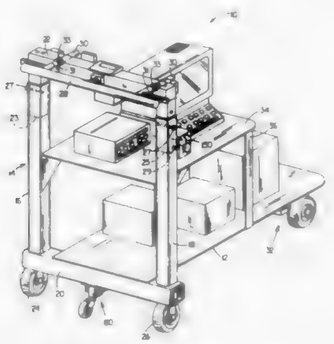
said sensing apparatus including a mounting portion and a guide portion, said mounting portion being adapted to be releasably joined to said head member, and said guide portion including a circumferential groove, said cushioning ring being positioned substantially within said groove, and said guide portion being adapted to be positioned within said base member internal bore.

5,142,909
MATERIAL LEVEL INDICATOR
James S. Baughman, 16341 E. 8 Mil Rd., Stanwood, Mich. 49346
Continuation-in-part of Ser. No. 912,434, Sep. 29, 1986, abandoned. This application Aug. 14, 1987, Ser. No. 85,377
Int. Cl.[5] G01F *23/26*
U.S. Cl. 73—304 C **8 Claims**



1. A system for indicating level of material in a vessel comprising:
resistance probe means including a plurality of electrically discrete resistor probes of electrically conductive construction positioned within the vessel in a spaced array extending height-wise of the vessel, said probes being characterized by having electrical resistances which vary as a function of heat dissipative coupling with material in the vessel,
said resistance probe means comprising a continuous layer of resistance material on a planar rectangular substrate, said resistance layer being of serpentine contour height-wise of the vessel, and first and second opposed electrical contact means positioned in alternate undulations of said resistive layer height-wise of the vessel, said resistance layer and said contact means being carried on one face of said substrate,
said first contact means comprising a first array of contacts extending from one edge of said substrate and being interconnected by an electrical bus which extends along said edge, said second contact means comprising discrete second contacts extending from an opposing edge of said substrate,
first circuit means individually connected to said discrete probes and being responsive to variation of said electrical characteristics, and
second circuit means coupled to said first circuit means and responsive to total variation of said electrical characteristics collectively at said probes for indicating level of material in the vessel adjacent to said probes.

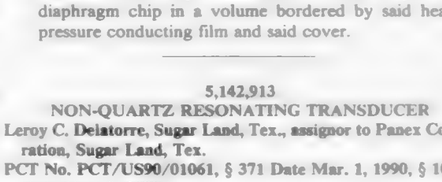
5,142,910
DYNAMIC PHYSIOLOGICAL FUNCTION TESTING APPARATUS AND METHOD
Henry M. Litchman, Providence, R.I., assignor to Occupational Orthopaedic Systems, Inc., Pawtucket, R.I.
Filed Jun. 27, 1990, Ser. No. 544,744
Int. Cl.[5] A61B *5/22*
U.S. Cl. 73—379 **19 Claims**



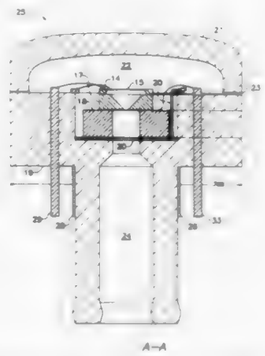
1. A dynamic physiological function measurement mobile apparatus, comprising
a mobile structure comprising a frame and a plurality of wheels and a handle disposed on said frame, and being of a size and weight for manual propulsion by a human;
a brake attached to at least one of said wheels for controlling the amount of force required for a human to move said structure, said brake permitting human propulsion, thereby simulating the force exerted by a human during a task; and
a directional sensor attached to said structure for indicating the direction in which said structure is moving.

5,142,911
DEVICE FOR MEASURING THE STRENGTH OF PIECES OF COMPRESSED MOLDING MATERIAL
Ernst Mathys, Schaffhausen, Switzerland, assignor to Georg Fischer AG, Schaffhausen, Switzerland
Filed Apr. 8, 1991, Ser. No. 681,939
Claims priority, application Switzerland, Apr. 6, 1990, 01184/90-4
Int. Cl.[5] G01N *3/48*
U.S. Cl. 73—573 **6 Claims**

1. In a device for measuring the strength of pieces of compressed molding material, the device including a stop surface and a probe pin insertable into the piece of molding material up to the stop surface, the probe pin being connected to a force sensor for measuring the resistance to insertion in the piece of molding material, a digital display for the measured value and current source, the improvement comprising the force sensor being a crystal unit, a frequency measuring logic and a microprocessor connecting the crystal unit to the digital display, and a housing containing all components of the device and the digital display, wherein the device is configured to be usable with one hand.



5,142,912
SEMICONDUCTOR PRESSURE SENSOR
Richard H. Frische, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 15, 1990, Ser. No. 538,956
Int. Cl.[5] G01L *9/06*
U.S. Cl. 73—702 **11 Claims**



A—A

1. A semiconductor pressure sensor comprising:
a header having a pressure port;
a piezoelectric device, having a center port, attached to said header at an end of the pressure port;
a back plate, having an orifice, attached to said piezoelectric device;
a diaphragm chip attached to said plate; and
a cover attached to said header, thereby completing an enclosure of said piezoelectric device, back plate and diaphragm chip in a volume bordered by said header, pressure conducting film and said cover.

5,142,913
NON-QUARTZ RESONATING TRANSDUCER
Leroy C. Delatorre, Sugar Land, Tex., assignor to Panex Corporation, Sugar Land, Tex.
PCT No. PCT/US90/01061, § 371 Date Mar. 1, 1990, § 102(e) Date Mar. 1, 1990
PCT Filed Mar. 1, 1990, Ser. No. 571,569
Int. Cl.[5] G01L *7/04, 11/00*
U.S. Cl. 73—704 **38 Claims**

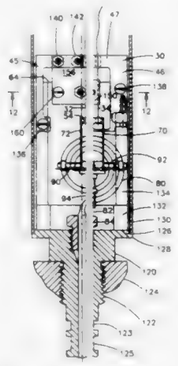
1. A force responsive resonator apparatus for use in obtaining frequency output signal from vibratory metal elements as a function of a moment force and tension including
a fixed base member;

an elongated movable coupling platform spaced from said fixed base member;

at least two elongated metal non-magnetic vibratable elements disposed in parallel relationship in a plane and attached to said base member and to said coupling platform;

means for mounting said coupling platform relative to said fixed base member and said vibratable elements for movement of said coupling platform to effect a tension force in each of said vibratable elements;

means acting on said coupling platform for applying a preset tension force to each of said vibratable elements;



means for applying a moment force to said coupling platform in the plane of said parallel relationship for changing the preset tension forces in each of said vibratable elements as a function of the moment force,

electromagnetic means for vibrating said vibratable elements and for producing a frequency output signal from each of said vibratable elements as a function of the tension forces in said vibratable elements

said metal vibratable elements being double ended tuning fork members constructed from a common plate member and each vibratable element having parallel portions; and

means for conducting current in opposite directions through the parallel portions of a vibratable element.

5,142,914

PIEZOELECTRIC PRESSURE SENSOR

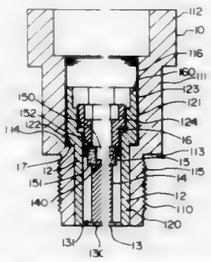
Hiroki Kusakabe, Osaka, and Masuo Takigawa, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1990, Ser. No. 604,211

Claims priority, application Japan, Nov. 2, 1989, 1-287002

Int. Cl.[5] G01L *7/08, 9/08*

U.S. Cl. 73—723 **10 Claims**



1. A piezoelectric pressure sensor of the type in which electric charges generated by applying a dynamic stress to a piezoelectric element are detected, comprising:

an outer sensor housing having a substantially cylindrical shape, including a fitting portion adapted to fit into a test article, the fitting portion having an outer surface; a diameter enlarged portion coaxial with the fitting portion and having a larger outer diameter than that of the fitting portion, the diameter enlarged portion having an inner surface; an outer annular shoulder integrally formed with both the fitting portion and the diameter enlarged portion; and a screw thread formed in the outer surface of the fitting portion for engaging with the test article, the outer annular shoulder being adapted to be urged against the test article to generate axial stress therein when the screw thread is engaged to the test article;

an inner sensor housing for housing the piezoelectric element, said inner sensor housing including a sensor portion adapted to be arranged within the fitting portion of the outer sensor housing in a manner to be axially movable relative to the latter; a proximal portion coaxial with the sensor portion and located on a side of the outer annular shoulder of the outer sensor housing opposite to a side of the outer annular shoulder on which said pressure receiving surface is located; a pressure receiving surface adapted to be subjected to a pressure in the test article; pressure transmitting means for transmitting the pressure, applied to the pressure receiving surface, to the piezoelectric element; and pre-stress applying means for urging the piezoelectric element against the pressure transmitting means to apply an axial pressure to the piezoelectric element; and

securing means arranged between the proximal portion of the inner sensor housing and the inner surface of the diameter enlarged portion of the outer sensor housing for securing the proximal portion of the inner sensor housing to the inner surface of the diameter enlarged portion.

5,142,915

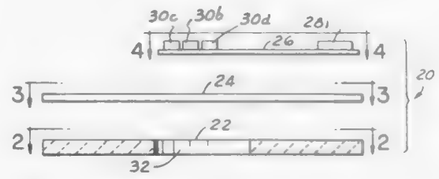
METHOD FOR FABRICATION OF FORCE SENSING ELEMENTS BY LAMINATING DIELECTRIC TAPE

John S. Bergstrom, Williamsburg, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Jul. 6, 1990, Ser. No. 549,327

Int. Cl.[5] G01L *1/22, 9/06*

U.S. Cl. 73—727 **21 Claims**



13. A force sensing element comprising a ceramic substrate, a ceramic tape that has been fired onto said substrate, said substrate and said tape being constructed and arranged such that a portion of said tape is disposed to overhang an edge portion of said substrate and thereby form a force sensing zone which is effective to induce measurable strain in said tape in response to force acting on said zone, and a conductor and thick film resistor system disposed on said tape so as to be effective to measure strain induced in said tape in response to force acting on said zone and thereby provide a signal thereof which is capable of electrical detection.

5,142,916

RUPTURE INITIATION INSPECTING METHOD AND APPARATUS

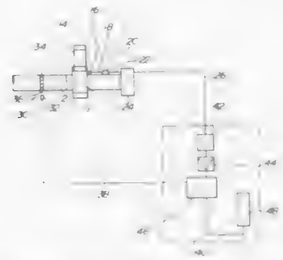
Takuro Yamaguchi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 25, 1991, Ser. No. 673,891

Claims priority, application Japan, Mar. 28, 1990, 2-80484

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—799 **6 Claims**



1. A method of inspecting a rupture initiation in a gear, comprising the steps of:

setting the gear on a rotary shaft for rotation therewith at a position where the gear to be tested is in mesh engagement with a gear having a degree of resistance to rotation;

rotating the rotary shaft;

with an elastic wave sensor attached to the gear to be tested, sensing all elastic wave and converting the elastic wave into an electric signal;

with a signal transmission device coupled to the elastic wave sensor, transmitting the electric signal, the signal transmission device having a capacity of transmitting low-frequency components of the electric signal;

dividing the transmitted electric signal into a signal segment each time the rotary shaft rotates a full rotation; and

averaging successive signal segments to produce an averaged signal waveform informing the presence of a rupture initiation in the gear to be tested.

5,142,917

APPARATUS AND METHOD FOR CHECKING MOVEMENT

Gian P. Mussini, St. Imier, Switzerland, and Charles T. Higgins, Richmond, Va., assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Jun. 12, 1991, Ser. No. 714,033

Claims priority, application Switzerland, Jun. 20, 1990, 2059/90

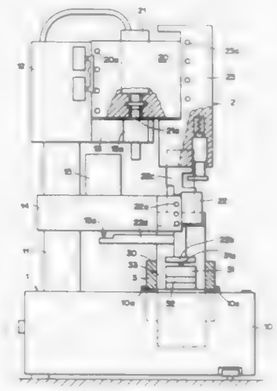
Int. Cl.[5] G01N *3/08*

U.S. Cl. 73—821 **10 Claims**

1. Apparatus for checking the steadiness of the rectilinear movement in a first direction of an object guided on a fixed support, said object being subject to a constant first force in said first direction causing said rectilinear movement and to a frictional force against said fixed support in a second direction opposite said first direction, said apparatus comprising:

a slider,

a force-measurement cell mounted on said slider, and



motor means for applying a third force for moving said slider in said first direction for imparting a steady rectilinear movement to said force-measurement cell.

5,142,918

APPARATUS TO MEASURE THE BENDING LENGTH AND BENDING RIGIDITY OF FABRICS

Frank Scaysbrook, Epping, and Nhan G. Ly, Baulkham Hills, both of Australia, assignors to Commonwealth Scientific & Industrial Research Organization, Campbell, Australia

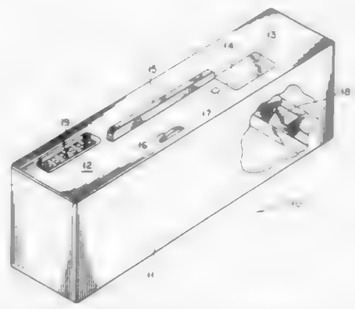
PCT No. PCT/AU89/00031, § 371 Date Aug. 15, 1990, § 102(e) Date Aug. 15, 1990, PCT Pub. No. WO89/07267, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 31, 1989, Ser. No. 548,909

Claims priority, application Australia, Feb. 5, 1988, PI6610

Int. Cl.[5] G01N *3/20*

U.S. Cl. 73—854 **5 Claims**



1. An apparatus to measure the bending length and bending rigidity of fabrics, said apparatus comprising:

a generally horizontal planar surface terminating at one end with an edge, upon which surface a strip of fabric is placed and along which it is moved, a distance transducer mounted adjacent to said surface to detect the distance moved by said strip;

a detector to determine when a leading edge of said strip passes the edge of said surface; and

an optical sensor to detect when said leading edge intersects a plane extending downwardly from said surface edge at an acute angle to the horizontal.

5,142,919

MAGNETOSTRICTION TYPE STRESS DETECTOR

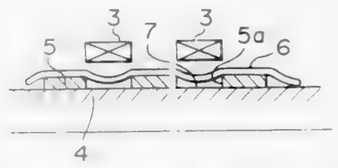
Hiroshi Satoh; Yoshihiko Utsui; Katsuhiko Honda, and Masahiko Hasegawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1990 Ser. No. 527,805

Claims priority, application Japan, May 29, 1989, 1-135203; May 29, 1989, 1-135204; May 31, 1989, 1-137940; Dec. 22, 1989, 1-333924

Int. Cl.[5] G01L *3/02*

U.S. Cl. 73—862.333 6 Claims



1. A magnetostriction type stress detector, comprising: a passive member to which an external force is applied, said passive member being formed of a magnetic material; a magnetic shielding member provided around said passive member, said magnetic shielding member being formed with a plurality of slits; and a detection coil provided around said magnetic shielding member for detecting a change in magnetic permeability due to a stress in said passive member generated by said external force, through said slits of said magnetic shielding member, wherein said magnetic shielding member is located in contact with or in proximity to said passive member under an unbonded condition.

5,142,920

DISSOLUTION CELL AND APPARATUS FOR DETERMINING SOLIDS-DISSOLVING KINETICS

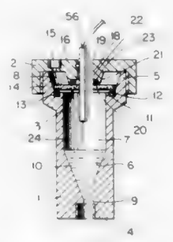
Gilles Bart, Donnery; Roland Dequin, and Jacques Paturat, both of Briare, all of France, assignors to Prolabo, Paris, France

Filed Dec. 20, 1990, Ser. No. 631,282

Claims priority, application France, Dec. 20, 1989, 89 17214

Int. Cl.[5] G01D *21/00*

U.S. Cl. 73—866 14 Claims



1. A dissolution cell for determining the kinetics of dissolution of a solid substance in a particular liquid, comprising (a) a housing receptacle having a closed bottom end and an open top end, an interior surface of said receptacle defining (i) a lowermost upwardly diverging conical zone provided with liquid inlet means extending from a tip of said control zone through the bottom end of said receptacle, (ii) a first essentially cylindrical zone surmounting said conical zone and (iii) a second essentially cylindrical zone surmounting said first essentially cylindrical zone and having a cross-sectional diameter greater than that of said first essentially cylindrical zone and being in communicating relationship therewith, said conical zone and said first essentially cylindrical zone defining a chamber for the dissolution of a solid substance in a liquid solvent, a solid substance disposed in said chamber, (b) means flowing a liquid solvent into and through said cell, (c) a closure leakproofedly secured to the open end of said receptacle and provided with solute outlet means, and (d) filtration means arranged to engage said interior surface of said receptacle at a region of communicating relationship between said first and said second essentially cylindrical zones, so as to be disposed in a pathway for the solute extending from said dissolution chamber to said solute outlet means, said closure including means engaging said filtration means to maintain said filtration means in engagement with said interior surface of said receptacle.

5,142,921

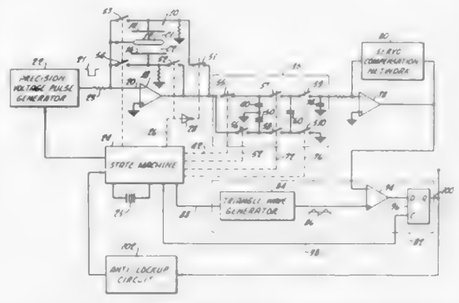
FORCE BALANCE INSTRUMENT WITH ELECTROSTATIC CHARGE CONTROL

Robert E. Stewart, Woodland Hills, and Keith O. Warren, Newbury Park, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 29, 1990, Ser. No. 605,947

Int. Cl.[5] G01D *3/06*; G01P *15/13*

U.S. Cl. 73—866.1 32 Claims



1. For use with a forced balanced instrument having a sensing member which is displaced from a null position in response to an input condition to be measured, and first and second electrostatic plates mounted adjacent to and on opposite sides of said sensing member and cooperating with said sensing member to form first and second capacitors, a method of controlling position of said sensing member comprising the steps of:

generating a pickoff signal indicative of displacement of said sensing member from a said null position;

repetitively applying to said sensing member a constant magnitude force, independent of displacement of said sensing member, alternately for first and second periods of time to respectively opposite sides of said sensing member in respective ones of first and second opposite directions; and

varying said first and second periods of time in response to said pickoff signal and to effect a difference in said first and second periods that is indicative of said input condition.

5,142,922

IMPACT SENSING APPARATUS

Kazunori Sakamoto, Toyota, and Atsushi Onoda, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 22, 1991, Ser. No. 673,676

Claims priority, application Japan, Mar. 27, 1990, 2-32380[U]

Int. Cl.[5] G05G *17/00*

U.S. Cl. 74—2 3 Claims

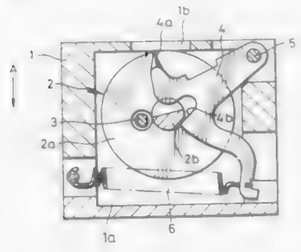
1. An impact sensing apparatus comprising:

a housing;

a weight having a disk-shaped main portion with a centroid and center of gravity, said weight being freely rotatably and movably supported within said housing about an axis offset from the position of said centroid and said center of gravity, said weight having a semicircular cam surface portion rotatable with and revolvable about the offset axis of the weight;

a firing lever pivotally supported on said housing for engaging said cam surface portion of said weight; and

a spring stretched between said housing and the firing lever for constantly biasing said firing lever in a direction engaging the firing lever with said cam surface portion of said weight;



said cam surface portion being rotatable and revolvable about said offset axis to move the firing lever during rotation in a direction opposite the biasing direction to disengage said cam surface portion from an engaging portion of the firing lever, said firing lever having a pin portion projecting from said housing in response to an impact in excess of a predetermined magnitude exerted upon said weight.

5,142,923

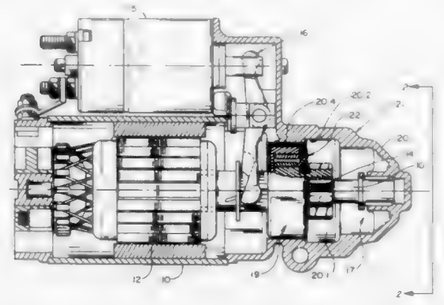
STARTER MOTOR WITH A PINION SEAL

Early C. McKnight, Columbus, and James W. Gibson, Steens, both of Miss., assignors to United Technologies Motor Systems, Inc., Columbus, Miss.

Filed Jul. 27, 1989, Ser. No. 386,827

Int. Cl.[5] F02N *15/06*

U.S. Cl. 74—6 2 Claims



1. An electric starter having a pinion that has teeth defining a profile and is axially movable in a pinion dome to engage a flywheel part of which extends into the pinion dome, there being a space between the pinion and an inner wall of the pinion dome and said pinion being rotatable on an axis, characterized by:

a seal for sealing said space, said seal comprising a circular disk that contacts said inner wall and contains a cut-out in said profile of the pinion teeth to fit tightly over teeth on the pinion, the seal being mounted and rotatable on the axis of said pinion and having its perimeter in close proximity to the inner wall of the pinion dome and being axially movable in synchronism with the pinion in the pinion dome when the pinion axially moves,

wherein said pinion includes a circular space adjacent said teeth in which the disk rests.

5,142,924

STARTER DEVICE FOR INTERNAL COMBUSTION ENGINES AND AN ELECTROMAGNETICALLY-OPERATED STARTER MOTOR PROVIDED WITH THE DEVICE

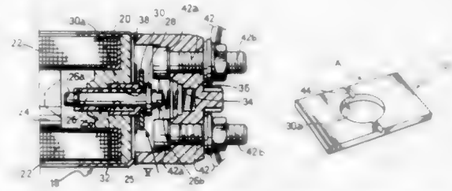
Giancarlo Fasola, Milan, and Pietro Navarra, Cologno Monzese, both of Italy, assignors to Industrie Magneti Marelli SpA, Milano, Italy

Filed Jun. 12, 1991, Ser. No. 714,418

Claims priority, application Italy, Jun. 12, 1990, 67426 A/90

Int. Cl.[5] F02N *15/06*; H01H *51/06*

U.S. Cl. 74—7 A 5 Claims



1. A starter device for internal combustion engines, including a hollow support structure, fixed contacts carried by the structure, a movable element slidable in the hollow support structure and carrying a movable electrical contact for cooperating with the fixed contacts, during starting, wherein the movable electrical contact (30) is comprised of a plastically-deformable metal plate having a notch in one face of the plate between said fixed contacts for damping the impact between the movable contact (30) and the fixed contacts (42).

5,142,925

DEVICE FOR ANIMATING MOVABLE PARTS

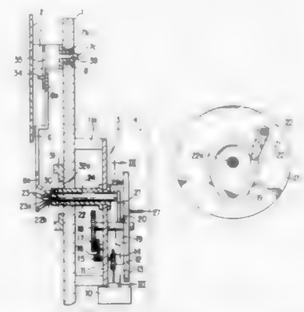
Henri Fauvel, Eculy, France, assignor to Euretal PLV, Bischheim, France

Filed Jan. 25, 1991, Ser. No. 645,691

Claims priority, application France, Jan. 25, 1990, 90 01570

Int. Cl.[5] F16H *21/28*; G09F *19/02*

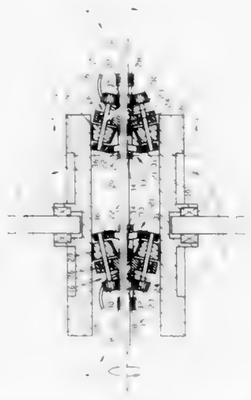
U.S. Cl. 74—54 8 Claims



1. Device for animating a movable part comprising: a disk rotated by a motor; said disk having a groove in the shape of a cam, a shaft orthogonal to the plane of said disk, a radial arm mounted on one end of said shaft, the radial arm being rotatable with the shaft, a pin mounted on the radial arm for engaging said groove, drive means for connecting the free end of said shaft opposite to the end on which the radial arm is mounted to the movable part to be animated;

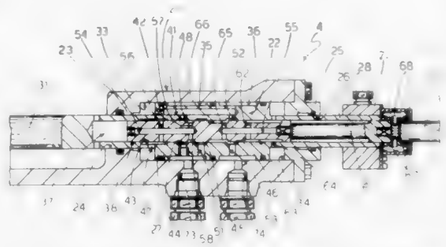
a support plate;
a tubular bearing; and
means for mounting the tubular bearing on the support plate;
wherein the motor and the disk are supported by the support plate and the shaft is received in said tubular bearing.

5,142,926
VARIABLE SPEED TRANSMISSION MECHANISM
Ching-Shiang Huang, 1F, No. 9, Lane 394, Chung Chen North Rd., Hsien, Sanchung City, Taipei, Taiwan
Filed Jan. 15, 1991, Ser. No. 641,477
Int. Cl.[5] F16H *15/00, 15/08*
U.S. Cl. 74—190 12 Claims



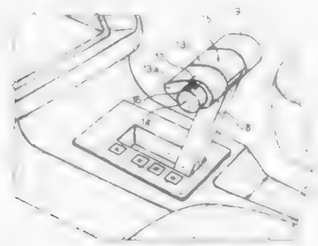
1. A variable speed transmission mechanism comprising: a pair of fly wheels positioned parallel to one another; a support for supporting the fly wheels each of the flywheels having a respective center and a respective rim; an input device radially extending between and contacting each of the pair of fly wheels at a position between the centers and the rims thereof, whereby power input is provided to drive and rotate the fly wheels; an output device radially extending between and contacting each of the pair of fly wheels at a position between the centers and the rims thereof, whereby power output is received from the driven fly wheels being transferred thereto, the output device having the same structure as the input device, wherein when the input device drives the fly wheels at a fixed speed, the necessary input power is able to be reduced by changing the positioning of one of the input and output devices relative to the centers and the rims of the flywheels, so that by means of the transmission of unequal inertia eccentric force, the output device may reach smooth effect of variable speed; and wherein the input device includes a frame, and a pair of frictional wheel assemblies including respective input shafts being pivotal relative to the frame for selective contact of the fly wheels with the friction wheel assemblies of the input device, and a hydraulic member mounted within the frame, the hydraulic member being operatively connected to the input shafts for selectively pivoting the friction wheel assemblies into and out of contact with the fly wheels.

5,142,927
DEVICE FOR CONTROLLING A GEAR BOX OF A VEHICLE, PARTICULARLY AN AGRICULTURAL TRACTOR
Giuseppe Amedei, Modena, and Angelo Rondelli, Cento, both of Italy, assignors to Fiatgeotech-Tecnologie per la Terra S.p.A., Modena, Italy
Filed Nov. 15, 1990, Ser. No. 613,067
Claims priority, application Italy, Nov. 23, 1989, 4953[U]
Int. Cl.[5] B60K *20/10*
U.S. Cl. 74—335 2 Claims



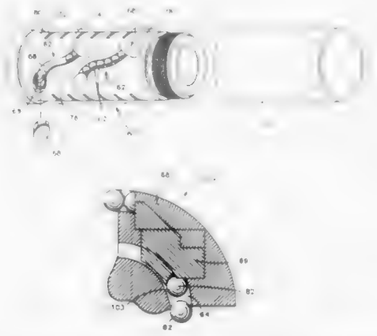
1. A device for controlling a vehicle gear box, particularly for an agricultural tractor, of the type comprising a manual level (2) movable by an operator between at least two working positions and one neutral position to achieve, in the working positions, the engagement of the gears of one stage of the gear box and, in a neutral position, the disengagement of these gears, a motion transfer unit (3) operably associated with the lever (2) such that movement of the lever into the two working positions causes retraction or extension of the motion transfer unit, and a hydraulic actuator (4) operable to select, from three predetermined positions, two operative and one neutral, and means (5) for engaging the gears, characterized by the fact that said actuator (4) is of a double acting follower type and comprises:
a body (21) having a cylindrical cavity (22);
a piston (27) axially slideable within said cavity (22) between three positions, two working end positions and a central neutral position;
two chambers (33 and 34) defined within said cavity (22) by axial ends of said piston (27);
a first rod (31) which extends from said piston (27) and which is adapted to actuate the engagement means (5);
a shaft (38, 61) operably connected to the motion transfer unit (3) such that said shaft is moved upon movement of the motion transfer unit;
an axial hole (37) formed in said piston (27) and in which said shaft (38, 61) is adapted to move; and,
a portion (38) of said shaft being shaped as a hydraulic distributor in such a way that in the neutral position of the lever (2) said portion assumes a position in said hole (37) corresponding to neutral in which said chambers (33 and 34) are connected to a discharge opening (74) formed in said body (21) so as to determine the neutral position of said piston (27), in such a way that to each operative position assumed by the lever (2) there corresponds a translation towards a working position of said portion (38) such as to put one of said chambers into communications with said discharge opening (74) and of the other with an inlet opening (73) for a fluid under pressure, such as to cause a force which translates said piston (27) in the same direction and the same distance as said portion (38).

5,142,928
AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR CARS COMPRISING A VARIABLE-SPEED DRIVE
Luigi B. Buti, Milan, and Enrica Fubini, Turin, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy
Filed Feb. 15, 1991, Ser. No. 655,509
Claims priority, application Italy, Feb. 16, 1990, 67114 A/90
Int. Cl.[5] F16H *59/06*
U.S. Cl. 74—335 9 Claims



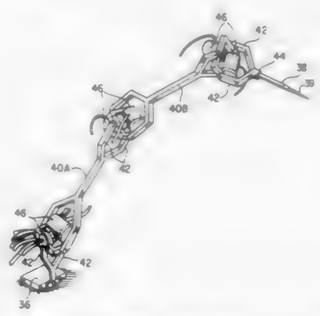
9. An automatic control system for cars, comprising:
a variable-speed drive (1) enabling the velocity ratio of an input shaft (2) and an output shaft (3) to be varied continuously;
said variable-speed drive (1) being activated by an actuator (4) controlled by an electronic control system (5) on the basis of engine and vehicle operating parameters;
a gear lever (8) with a number of settings, at least one setting enables said actuator (4) to receive electrical signals from said control system (5) for activating said variable-speed drive (1); and,
an actuating member (9) operably associated with said actuator (4), said actuating member (9) being mounted on and movable independent of said gear levers (8) thereby permitting a driver to manually adjust said variable-speed drive.

5,142,929
BALL NUT WITH TANGENTIAL NO LOAD-GUIDED RETURN PATH
Glenn R. Simpson, III, Hartland, Wis., assignor to Robec, Inc., San Carlos, Calif.
Filed Mar. 29, 1991, Ser. No. 677,797
Int. Cl.[5] F16H *55/17*
U.S. Cl. 74—459 15 Claims



1. A ball nut, which comprises a body having an axial bore extending through said body, at least one substantially helical path track on said axial bore for receiving a plurality of ball bearings for engaging threads of a lead screw, at least one return path for said plurality of ball bearings connecting ends of said at least one substantially helical path track and at least one pick-off for said plurality of ball bearings connecting said at least one substantially helical path track and said at least one return path to deflect said plurality of ball bearings from said at least one substantially helical path track while said plurality of ball bearings are under no load, said at least one pick-off engaging said at least one substantially helical path track tangent to said at least one substantially helical path track, said at least one pick-off comprising a return guide insert engaging said at least one substantially helical path track and said at least one return path including a return guide cover engaging said return guide insert, said return guide insert and said return path cover each having mating curved passages to define a smooth curve path from said at least one substantially helical path track to said at least one return path, said at least one substantially helical path track being configured adjacent to said at least one pick-off so that one of said plurality of ball bearings is free of load when adjacent to said at least one pick-off.

5,142,930
INTERACTIVE IMAGE-GUIDED SURGICAL SYSTEM
George S. Allen, 628 Westview Ave., Nashville, Tenn. 37205; Robert L. Galloway, Jr., 7736 Indian Springs Dr., Nashville, Tenn. 37221; Robert J. Maciunas, 6320 Chickering Woods La., Nashville, Tenn. 37215; Charles A. Edwards, II, 2316 Erin La., Nashville, Tenn. 37221, and Martin R. Zink, 1044 Berwick Trail, Madison, Tenn. 37195
Division of Ser. No. 433,347, Nov. 8, 1989, which is a continuation-in-part of Ser. No. 119,353, Nov. 10, 1987, Pat. No. 4,991,579. This application Mar. 29, 1991, Ser. No. 677,083
Int. Cl.[5] G05G *1/00;* B25J *17/00, 19/04*
U.S. Cl. 74—469 10 Claims



1. A mechanical arm that is manipulable by a human operator, with the movement of the arm being trackable by a computer coupled to the arm, comprising:
a base that is fixable to a surface;
a first pair of joints coupled to said base;
a first arm link coupled at a first end to the first pair of joints and having two degrees of freedom provided by said first pair of joints;
a second pair of joints coupled to a second end of said first arm link;
a second arm link coupled to a first end to the second pair of joints and having four degrees of freedom provided by said first and second pairs of joints;
a third pair of joints coupled to a second end of said second arm link;
a tool holder coupled to said third pair of joints and having six degrees of freedom provided by said first, second and third pairs of joints;
a separate encoder coupled to each joint that electrically encodes movement of a joint relative to another joint and produces signals indicating the amount and direction of movement of the joint; and
wherein each of said arm links has a longitudinal axis, said pairs of joints define axes of rotation for adjoining arm

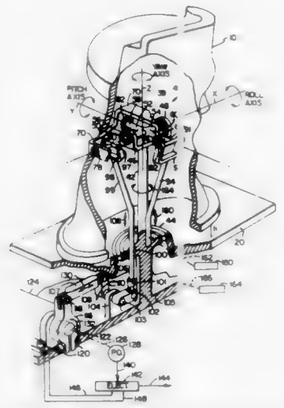
links, and each of said axes of rotation is free to assume an orientation that is not parallel to the longitudinal axis of either of said adjoining arm links.

5,142,931

3 DEGREE OF FREEDOM HAND CONTROLLER

Israel Menahem, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 14, 1991, Ser. No. 655,740
Int. Cl.[5] G05G *9/047;* **364C** *13/04*
U.S. Cl. 74—471 XY **22 Claims**



1. Three degrees of freedom hand controller apparatus including a grip for use by a controller's hand to produce output motion representative of turning motion of the hand about first, second and third mutually perpendicular axes intersecting at a point inside the grip, comprising:

first rotatable means (**46**) mounted within the grip for rotation about the first axis when the controller's hand moves the grip about the first axis;

second rotatable means (**52**) mounted within the grip on the first rotatable means for rotation about the second axis when the controller's hand moves the grip about the second axis;

third rotatable means (**70**) mounted within the grip on the second rotatable means for rotation about the third axis when the controller's hand moves the grip about the third axis;

first motion transmitting means connected to the first rotatable means and extending outside the grip to transmit rotary motion of the first rotatable means;

second motion transmitting means connected to the second rotatable means and extending outside the grip to transmit rotary motion of the second rotatable means; and

third motion transmitting means connected to the third rotatable means and extending outside the grip to transmit rotary motion of the third rotatable means.

5,142,932

FLEXIBLE ROBOTIC ARM

Israel A. Moya, Laurel, and Philip A. Studer, Silver Spring, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 4, 1991, Ser. No. 754,828
Int. Cl.[5] B25J *17/00, 18/06*
U.S. Cl. 74—479 **20 Claims**

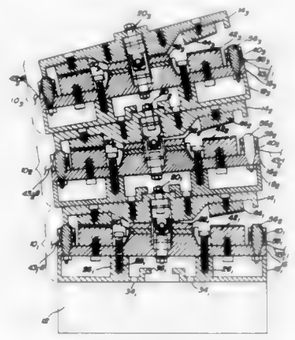
1. A flexible robotic arm, comprising:

a plurality of serially connected modules wherein each module includes,

a metallic base plate having a top surface,

a metallic top plate pivotally connected to the base plate and having a beveled bottom surface so as to conically nutate around the top surface of the base plate,

said base plate further having permanent magnet means located at the center and a plurality of energizable electro-



magnets arranged in a ring around the perimeter for generating a localized magnetic field for at least magnetically attracting thereto a predetermined peripheral portion of the top plate; and

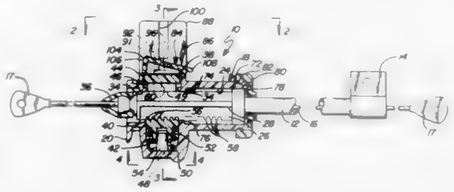
means for connecting predetermined base plates of said modules to adjacent top plates thereof.

5,142,933

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY HAVING CONDUIT LENGTH ADJUSTER

Dixon L. Kelley, New Baltimore, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed May 23, 1991, Ser. No. 704,614
Int. Cl.[5] F16C *1/10*
U.S. Cl. 74—502 **15 Claims**



1. A motion transmitting remote control assembly (**10, 10',10'**) comprising:

a conduit (**12, 12',12''**);

a motion transmitting core element (**16, 16', 16''**) movably supported by said conduit (**12, 12',12''**);

a slider member (**26, 26',26''**) fixedly secured to one of said conduit (**12, 12',12''**) and said core element (**16, 16',16''**);

support means (**18, 18',18''**) for slideably supporting said slider member (**26, 26',26''**) while preventing relative rotational movement therebetween;

locking means (**38, 38',38''**) for controlling the longitudinal sliding movement of said slider member (**26, 26',26''**) relative to said support means (**18, 18',18''**), said locking means (**38, 38',38''**) being movable between an engaged condition in which said locking means (**38, 38',38''**) is engaged with said slider member (**26, 26', 26''**) for preventing relative sliding movement therebetween in at least one direction and a disengaged condition in which said locking means (**38, 38',38''**) is disengaged from said slider

member (**38, 38',38''**) for permitting relative sliding movement therebetween in both directions;

biasing means (**50, 50',50''**) acting on said locking means (**38, 38',38''**) for continuously urging said locking means (**38, 38',38''**) toward said engaged condition;

and characterized by disengaging means (**84, 84', 84''**) for acting against said biasing means (**50, 50',50''**) to maintain said locking means (**38, 38',38''**) in said disengaged condition independent of an application of external forces to the assembly (**10, 10',10''**).

5,142,934

CHAIN SAW CONTROL

Magnus T. J. Persson, Huskvarna; Hans P. Lindblad, Alingsås, and Kenneth R. Skogward, Huskvarna, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 11, 1990, Ser. No. 580,581
Claims priority, application Sweden, Sep. 12, 1989, 8903001
Int. Cl.[5] F16C *1/10;* **B23D** *53/00, 57/02*
U.S. Cl. 74—502.4 **9 Claims**

1. In a chainsaw with an engine part (**18**) and a rear handle (**16**), a control, comprising:

a cable (**22**) enclosed in a sheath (**21**) for at least part of a length of the cable;

a finger grip (**12**) journalled on a handle shaft (**15**) in the rear handle and fastened to one end (**25**) of the sheath;

a lever journalled on the finger grip at a guide point (**30**) separate from the handle shaft and fastened to one end of the cable; and

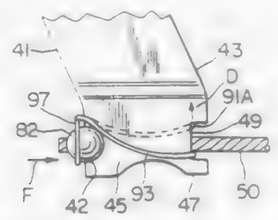
a fulcrum (**20**) in the rear handle located such that when the finger grip rotates, the fulcrum causes the lever to rotate thereby moving the cable relative to the sheath.

5,142,935

PARKING BRAKE LEVER CABLE RETAINER

Clyde E. Carr, Galien, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 25, 1991, Ser. No. 782,858
Int. Cl.[5] F16C *1/10*
U.S. Cl. 74—502.6 **8 Claims**



1. A brake lever cable retainer for a brake actuated by movement of a brake lever, the brake lever comprising at one end a longitudinal recess extending between a pair of spaced apart feet, the longitudinal recess extending from one side to an opposite side of said lever so that a cable may pass therethrough, one side of the lever having means for engaging an abutment end of said cable, the cable disposed within said longitudinal recess so as to extend from one side to the opposite side of said lever and having the abutment end thereof received within the engaging means, and the retainer for coupling said cable and abutment end with said lever, the retainer comprising a pair of spaced-apart legs extending across said lever from one side to the opposite side and located at respective front and rear sides of said lever, an end engagement portion extending along said one side of the lever to engage said end abutment of the cable, free ends of said legs each engaging the opposite side of said lever in order to bias said abutment end into engagement with said engagement means, and the free ends of said legs engaging and biasing said lever in opposite directions such that the retainer is stabilized relative to the lever and the abutment end is held in contact with the engagement means.

5,142,936

APPARATUS FOR DYNAMICAL BALANCING OF ROTATING OBJECTS AND METHOD FOR MAKING SAME

Peter J. McGale, P.O. Box 309, Fort Macleod, Alberta, Canada

Filed Jan. 31, 1992, Ser. No. 828,500
Int. Cl.[5] F16F *15/22*
U.S. Cl. 74—573 F **40 Claims**

1. A dynamical balancing device for balancing rotating objects, said balancing device operating continually while the object is in rotation, comprising:

a) an annular hoop with a hollow circular cross section further comprising a rigid outer hoop layer and a flexible inner hoop layer; and

b) a plurality of spherical weights confined to the interior of said annular hoop wherein said weights are free to move relative to said annular hoop; and

c) a quantity of damping fluid contained in the interior of said annular hoop; and

d) a means for attaching said annular hoop to a rotating object such that the plane of said annular hoop is perpendicular to the axis of rotation of said object and said annular hoop is concentric with the axis of rotation of said object.

5,142,937

DRIVING APPARATUS WITH A SPEED CHANGER FOR A BICYCLE

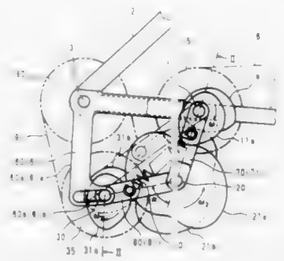
Toshiyuki Takahara, and Akira Takami, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 27, 1990, Ser. No. 572,654
Claims priority, application Japan, Aug. 28, 1989, 1-100295[U]; Jul. 25, 1990, 2-79401[U]
Int. Cl.[5] G05G *1/14;* **F16H** *55/17*
U.S. Cl. 74—594.3 **19 Claims**

1. A driving apparatus provided with a speed changer, for driving a bicycle, comprising:

a first rotary shaft receiving input driving power;

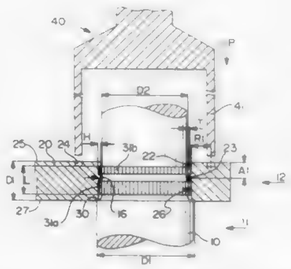
a second rotary shaft;
a third rotary shaft generating output driving power;
at least one primary angular velocity modulating means, having a first non-circular gear fixed to said first rotary shaft and a second non-circular gear supported by said second rotary shaft, for performing a first exponential function angular velocity modulation;
at least one secondary angular velocity modulating means, having said second non-circular gear and a third non-circular gear supported by said third rotary shaft through a one-way clutch, for performing a second exponential function angular velocity modulation; and
a spring member for generating an oblique biasing force intersecting first and second lines defined by said first rotary shaft and said second rotary shaft and said second rotary shaft and said third rotary shaft, respectively, so that a relative angle between said first rotary shaft and said third rotary shaft around said second rotary shaft increases.



5,142,938
DRIVE UNIT FOR A WIPER SYSTEM OF MOTOR VEHICLES AND METHOD OF MANUFACTURING SAME

Kurt Bauer, Ingersheim; Wilhelm Dörr, Bietigheim-Bissingen; Reinhard Edele, Sachsenheim; Werner Pfitzenmaier, Besigheim; Christian Roth, Bietigheim-Bissingen, and Eckhardt Schmid, Brackenheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP88/01032, § 371 Date Jul. 10, 1989, § 102(e) Date Jul. 10, 1989, PCT Pub. No. WO89/04780, PCT Pub. Date Jun. 1, 1989
Continuation of Ser. No. 393,920, Jul. 10, 1989, abandoned. This PCT application Nov. 12, 1988, Ser. No. 830,960
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738924
Int. Cl.[5] **F16C** *3/04;* **F16H** *21/18;* **B25G** *3/28*
U.S. Cl. 74—595 **8 Claims**

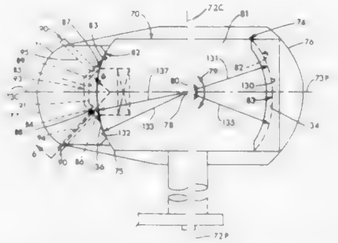


1. A drive unit comprising: a crank arm formed of malleable material defining a through bore and generally parallel front and back surfaces; and
an elongate element extending through said bore having a radially opening circumferential groove formed wherein of a half circular cross sectional shape, said groove disposed within said bore axially spaced from said front surface a distance A1,
said elongated element further having a radially extending arresting flange formed therein, axially abutting said back surface;
said elongated element also formed with first and second knurled areas on either side of said circumferential groove, said knurled areas each press fit into said bore; and
wherein crank arm material at said front surface of said crank arm is displaced so as to define a annular recess substantially concentric to said bore and radially spaced outwardly thereof by a distance R1, and material of said crank arm around said bore radially displaced to bulge radially into said half circle cross section of said circumferential groove, thereby forming a holding element axially affixing said crank arm to said elongate element.

5,142,938
BICYCLE CLEAT AND PEDAL WITH ADJUSTABLE FLOATING RELATIONSHIP

Eric A. Sampson, Denver, Colo., assignor to Sampson Sports, Inc., Denver, Colo.

Division of Ser. No. 398,819, Aug 25, 1989, abandoned. This application Jun. 25, 1991, Ser. No. 719,690
Int. Cl.[5] **G05G** *1/14;* **A43B** *5/00*
U.S. Cl. 74—594.6 **18 Claims**

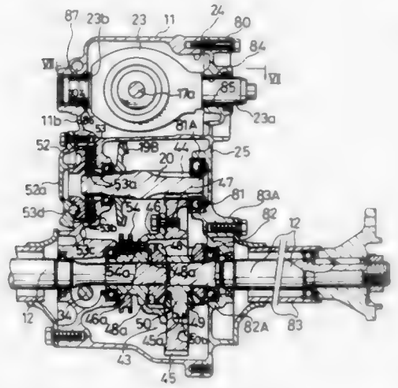


1. A cycle pedal system comprising:
a pedal body having means defining first bearing surfaces concentric with a vertical axis,
a shoe cleat having means defining second bearing surfaces concentric with said vertical axis,
said first and second bearing surfaces being complementary to permit relative rotary movement therebetween around said vertical axis,
said pedal body being provided with means for defining a first limit surface offset from said first bearing surfaces,
said shoe cleat being provided with means for defining a second limit surface offset from said second bearing surfaces and normally separated from said first limit surface by a first space to permit said relative rotary movement of said pedal body and said shoe cleat to be free for a relatively large arc of said relative rotary movement, and
means received in said shoe cleat and intersecting said respective first or second limit surface for reducing the effective amount of said first space to limit said relatively large arc of relative rotary movement to a selectable smaller arc of relative rotary movement.

5,142,940
VEHICLE TRANSMISSION ASSEMBLY

Toshiyuki Hasegawa, Ashiya, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Japan

Filed May 14, 1991, Ser. No. 699,904
Claims priority, application Japan, May 28, 1990, 2-55668[U]
Int. Cl.[5] **F16H** *57/02;* **F16D** *39/00;* **F01B** *3/00;* **B60K** *17/28*
U.S. Cl. 74—606 R **3 Claims**

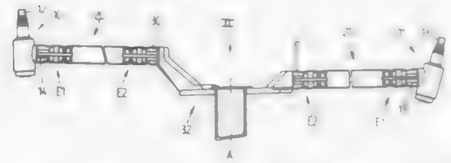


1. In a vehicle transmission assembly wherein axles of left and right rear wheels are supported rotatably by a transmission casing disposed between said left and right rear wheels, and wherein a hydrostatic transmission for changing the vehicle speed non-stepwisely is provided using, as a support, a plate member which is secured to a front of said transmission casing so as to close an opening in a front wall of said casing, said hydrostatic transmission having a hydraulic pump and a hydraulic motor which are disposed respectively on said plate member such that said hydraulic pump is positioned at a higher level than said hydraulic motor, the improvement characterized in:
that said hydraulic motor (**18**) is disposed on a front of said plate member (**15**) and includes a motor shaft (**18***a*) drivingly connected through a speed-reducing bevel gearing (**19**) to a speed-reduction shaft (**20**) which is disposed within said transmission casing (**11**) and extends laterally of said casing, said left and right rear wheel axles (**12**) being drivenly connected to said speed-reduction shaft;
that said hydraulic pump (**17**) is disposed within said transmission casing (**11**) and is fashioned to an axial plunger-type pump which includes a pump shaft (**17***a*) supported rotatably by said plate member (**15**), a cylinder block (**21**) disposed on a rear of said plate member and fixedly mounted on said pump shaft, plural plungers (**22**) slidably disposed in said cylinder block and extending rearwardly from said block, and a tiltable swash plate (**23**) disposed rearwardly of said cylinder block, said plungers engaging said swash plate; and
that a second opening (**24**) is formed in one of side walls (**11***a*) of said transmission casing (**11**) for assembling a transmission mechanism to be disposed between said speed-reduction shaft (**20**) and said left and right rear wheel axles (**12**) such that said second opening extends upwardly so as to permit to assemble said swash plate (**23**) into said transmission casing through said second opening, left and right support shafts (**23***a*, **23***b*) of said swash plate being rotatably supported by the other side wall (**11***b*) of said transmission casing and by a side cover (**25**) which is secured to an outer surface of said one side wall (**11***a*) so as to close said second opening.

5,142,941
WIPER SYSTEM

Eugen Amann, Besigheim; Peter Baumgarten, Coburg; Thomas Helh, Bietigheim-Bissingen, and Eckhardt Schmid, Brackenheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP90/00191, § 371 Date Nov. 8, 1990, § 102(e) Date Nov. 8, 1990, PCT Pub. No. WO90/09299, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 6, 1990, Ser. No. 585,153
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3003976
Int. Cl.[5] **F16H** *57/02;* **A47L** *1/02*
U.S. Cl. 74—606 R **20 Claims**

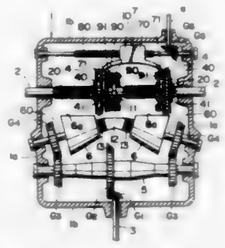


1. A wiper system for motor vehicles comprising at least one pivot-shaft assembly fixed to one end of a pipe-like carrier, said carrier having another end which is rigidly connected to a motor carrier member for receiving a drive motor, wherein said another end of the pipe-like carrier is plugged onto a stud formed by said motor carrier member and is fixed thereto, said pipe-like carrier having a generally circular, uniform cross-section throughout the axial length thereof.

5,142,942
CONICAL FRICTIONAL DIFFERENTIAL DRIVE STEERING MECHANISM

Hiroshi Fukaya, Fujimi, Japan, assignor to Hanix Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1991, Ser. No. 762,119
Claims priority, application Japan, Sep. 19, 1990, 2-249661
Int. Cl.[5] **B62D** *11/02*
U.S. Cl. 74—650 **1 Claim**



1. A differential device comprising,
a drive shaft pivotably mounted on a casing and connected to an engine;
a pair of left and right cones having the same shape and said cones being connected to said drive shaft so as to rotate at the same speed;
a pair of left and right wheel shafts pivotably mounted on said casing as rotating individually;
conical transmission surfaces of said left and right cones each accurately positioned in parallel to an axis of the corresponding wheel shafts;
a pair of left and right ring wheels having the same diameter and being fitted on said left and right wheel shafts respectively such that said ring wheels are engaged in a rotational direction and being slidable in an axial direction,

and said ring wheels transmissively make contact with outer conical surfaces of said left and right cones respectively;

a steering mechanism for moving said ring wheels axially of said wheel shafts in synchronism with an operational amount of said steering mechanism;

a pair of first brake teeth provided on said ring wheels respectively, and a pair of second brake teeth fixedly attached to said casing; and

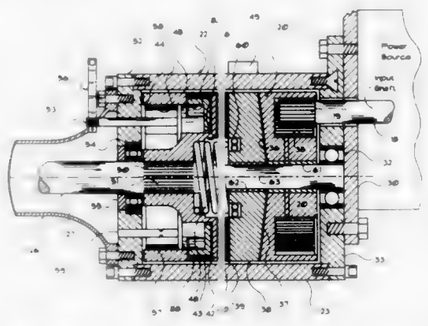
wherein when one of said ring wheels moves toward a smaller-diameter side of the corresponding cone, and gets off of the corresponding surface, the other ring wheel keeps making transmissive contact with a larger diameter of the other cone corresponding to the other ring wheel and when the ring wheels moves further said first brake teeth of one ring wheel contacts the corresponding second brake teeth fixedly attached to said casing.

5,142,943

CLUTCH DRIVE DIFFERENTIAL SYSTEM

Leon D. Hughes, 4709 N. Lamesa Rd., Midland, Tex. 79765

Filed Sep. 30, 1991, Ser. No. 768,388
Int. Cl.[5] F16H *35/04, 35/00*; F16D *21/00, 19/00*
U.S. Cl. 74—650 20 Claims



7. In a vehicle having a prime mover and a pair of wheels, an axle connected to each wheel; at least one axle being driven by said prime mover via a differential transmission comprising:

an input shaft having opposed ends, a ring gear, a gear fixed to one input shaft end engaging and driving the ring gear; a pressure plate. said ring gear and pressure plate have a cam assembly therebetween; said ring gear and pressure plate are journaled to said at least one axle; said pressure plate having a clutch pad on the side opposed to the cam thereof and said control cylinder having a clutch pad that is engaged with the clutch pad of the pressure plate;

means biasing said pressure plate and said control cylinder apart; said cam on said ring gear engages said cam on said pressure plate to force said ring gear and said pressure plate apart and thereby force the clutch pads on said control cylinder and said pressure plate together to thereby interconnect the input shaft to said at least one axle.

5,142,944

BACK EXERCISE APPARATUS

James A. McArthur, Coquitlam and David C. Short, Port Coquitlam, both of Canada, assignors to Baltimore Therapeutic Equipment Co., Hanover, Md.

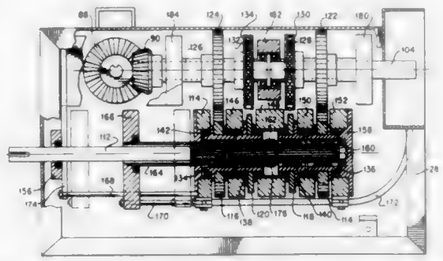
Division of Ser. No. 491,809, Mar. 8, 1990, Pat. No. 5,070,863.
This application Sep. 10, 1991, Ser. No. 757,300
Int. Cl.[5] F 6H *37/06*
U.S. Cl. 74—665 F 3 Claims

1. A gearbox, comprising:

an input shaft;

a pair of mutually axially aligned output shafts parallel to said input shaft;

means for selectively connecting said input shaft to a selected one of said output shafts for rotating said selected output shaft in either direction of rotation; and



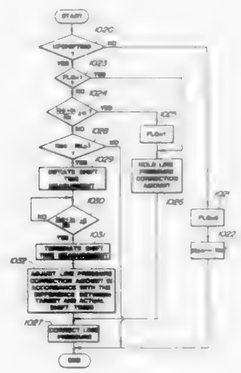
means for transmitting rotations of first and second of said output shafts to first and second force applying means, respectively.

5,142,945

POWER TRAIN CONTROL SENSOR MALFUNCTION DETECTION AND CONTROL ARRANGEMENT

Shigeki Shimanaka, Hadashino, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 31, 1989, Ser. No. 387,274
Claims priority, application Japan, Aug. 1, 1988, 63-190533
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 4 Claims



1. In a power train including an engine and a transmission operatively connected to said engine, the arrangement comprising:

sensing means, including a sensor, for sensing first and second rotational speeds, said first and second rotational speeds being indicative of respective rotational speeds of an input shaft and an output shaft of said transmission, and for using rotational speed data obtained during shifting to reduce shift shock; and

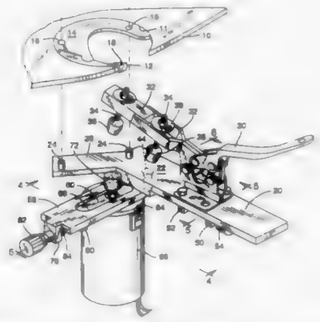
means for monitoring an output of said sensor between an issuance of a shift command signal and an initiation of a corresponding shift and for determining said sensor to be malfunctioning in the event that said output of said sensor between said issuance of said shift command signal and said initiation of said corresponding shift is indicative of a shift having been completed.

5,142,946

SHARPENER FOR CIRCULAR SAWS

John N. Fappas, Jr., Gresham, and Ronald W. Harriman, Portland, both of Oreg., assignors to Mobile Manufacturing Company, Troutdale, Oreg.

Filed Nov. 18, 1991, Ser. No. 793,203
Int. Cl.[5] B23D *63/14*
U.S. Cl. 76—37 15 Claims



1. A sharpener for circular saw blades of the type having teeth recessed in openings in the periphery of the saw blade, said teeth having a gullet portion and having at least one aperture used for tool insertion and removal of the teeth in the openings, said sharpener comprising:

a base member having a clamping surface portion,

at least one projection on said base member adjacent said clamping surface portion having insert engagement in at least one of the apertures in a saw tooth,

pivotal grinding wheel support means supported on said base member,

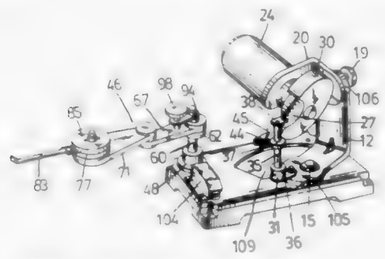
and clamp means on said base member releasably clamping said sharpener to opposite surfaces of a saw blade by clamping engagement of the saw blade between said clamping surface portion of said base member and said clamp means.

5,142,947

ADJUSTABLE MOTOR-OPERATED CIRCULAR SAW SHARPENER

Tian-Wang Wang, No. 45, Yi Chang Tung Road, Tai Ping Hsiang, Taichung Hsien, Taiwan

Filed Jul. 30, 1991, Ser. No. 737,644
Int. Cl.[5] B23D *63/14*
U.S. Cl. 76—42 1 Claim



1. A circular saw blade sharpener, comprising:

a base fastened in a work table;

a L-shaped bracket mounted on said base at the top, said L-shaped bracket having a first bolt hole and a first curved slot at one end, a second bolt hole and a second curved slot at an opposite end, a first graduated scale on the peripheral edge thereof adjacent to said first curved slot, and a second graduated scale on the peripheral edge thereof adjacent to said second curved slot;

a locating plate fastened in said first bolt hole on said L-shaped bracket and the angular position of which being controlled by a lock screw inserted through said first curved slot, said locating plate having

a L-shaped frame fastened in said second bolt hole on said L-shaped bracket to hold a motor and a grinding wheel and the angular position of which being controlled by a lock screw inserted through said second curved slot, said grinding wheel being driven to rotate by said motor and protected by a protective cover;

a guide arrangement mounted on said L-shaped bracket, said guide arrangement comprising a locating plate, said locating plate having a slot at one end adjustably secured to said first bolt by an adjusting screw and a unitary stub tube vertically disposed at an end of the locating plate with a rod fastened therein to hold a guide seat and a supporting plate, said guide seat comprising a ring portion at one end movably secured to said rod by a lock screw and an elongated slot at an opposite end, a guide member secured to the elongated slot on said guide seat by a screw, said guide member having two guide pins vertically aligned at one end;

a feed mechanism mounted on said base at the top in front of said guide arrangement, said feed mechanism comprising a bearer, a shaft vertically fastened in said bearer at the top by a pin, a stepped bush sleeved on said shaft and movably secured by a screw, a link transversely mounted on said stepped bush, said link having a first round hole pivoted to said stepped bush and secured in place by a screw and a second round hole at an opposite end, a movable seat having one end pivoted to the second round hole on said link and a round hole at an opposite end, a rotary table fastened in the round hole on said movable seat, a rectangular plate transversely fastened in a notch on said rotary table, a hand lever longitudinally connected to said rectangular plate for moving said rotary table, a locating plate fastened in said rotary table by a screw for holding the circular saw blade to be sharpened by a lock screw and a washer, a washer and a rubber ring and a connecting plate respectively mounted on said link above said stepped bush in proper order and secured in place by a screw fastened into a bolt hole on top of said shaft, said connecting plate having a round hole at an opposite end, and an adjusting knob having a screw rod at the bottom fastened through the round hole on said connecting plate into a bolt hole on said link to control the level position of said link on said shaft;

a power switch mounted on said base to control said motor to operate; and

wherein said feed mechanism is moved by the hand through said hand lever to carry the circular saw blade mounted on said locating plate toward said guide member and said grinding wheel, when said power switch is switched on permitting the teeth on said circular saw blade to be guided by said guide pins and ground by said grinding wheel.

5,142,948

HAMMER AND METHOD FOR MANUFACTURE THE SAME

Mou T. Liou, No. 25, Lane 86, Tawei Rd., Tali Hsiang, Taichung Hsien, Taiwan

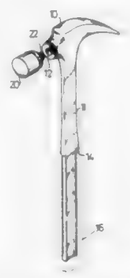
Filed Sep. 27, 1991, Ser. No. 766,541
Int. Cl.[5] B21K *5/14*
U.S. Cl. 76—103 2 Claims

1. A method for manufacturing a hammer comprising:

preparing a lower mold fixed on a base of a forging machine and an upper mold movable downward toward said lower mold in order to conduct forging operations, said lower mold including an even number of mold cavities formed

therein, said upper mold also including an even number of mold cavities formed therein corresponding to said mold cavities of said lower mold, said mold cavities being arranged anti-symmetrically such that the centers of gravity and the mass centers of said lower mold and said upper mold are identical and are located at the geometrical centers thereof;

disposing a material in each of said mold cavities of said lower mold, said material being heated to a temperature preferably higher than 900° C.;



moving said upper mold downward toward said lower mold in a reciprocating action in order to conduct forging operations so that a blank including an even number of prototypes of hammers is formed, said prototypes of hammers being connected by excess materials;

punching said blank in order to remove said excess materials so that said prototypes of hammers are separated;

finishing said prototypes of hammers in order to form said hammers such that an even number of hammers can be formed simultaneously.

5,142,949

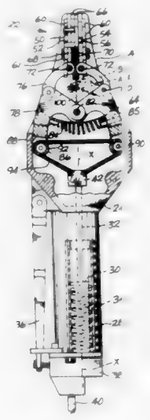
HAND HELD PNEUMATIC WIRE STRIPPER

Franklin D. Harsch, Renton, and Gary W. Gwin, Langley, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 19, 1991, Ser. No. 732,638

Int. Cl.[5] H02G *1/12*

U.S. Cl. 81—9.42 **15 Claims**



1. An improved wire stripper of a type having a pair of jaws movable toward and away from each other, and a pair of levers connected to at least one of said jaws and having end portions pivotable toward each other about a pivot axis to move said jaws together, wherein the improvement comprises:

an actuator including an actuating member and being powered to translate said member along an actuating axis perpendicular to said pivot axis;

an engagement surface carried by each of said end portions of said levers; and

a flexible connector that engages an end portion of said actuating member adjacent to said end portions of said levers, and extends continuously from said member, to one of said levers, to the other of said levers, and then back to said member; said connector engaging said engagement surfaces to exert a pulling force thereon and convert linear movement of said member along said actuating axis into pivotal movement of said end portions of said levers about said pivot axis; said pulling force having a first component parallel to said actuating axis, and a second component perpendicular to said actuating axis and to said pivot axis.

5,142,950

METHOD AND APPARATUS FOR PEELING COVERING FROM INTERMEDIATE PORTION OF COVERED ELECTRIC WIRE

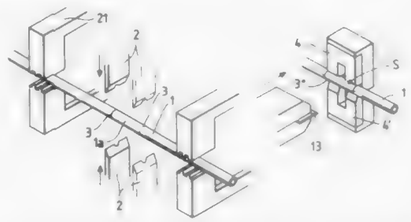
Yukinori Takano, and Mineo Takahashi, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,554

Claims priority, application Japan, Jun. 4, 1990, 2-144476

Int. Cl.[5] H02G *1/12*

U.S. Cl. 81—9.51 **20 Claims**



1. A method of peeling an intermediate portion of an insulative covering from a covered electric wire in a peeling position, said covered electric wire having a longitudinal axis, comprising the steps of:

placing and temporally fixing said covered electric wire in said peeling position;

forming annular slits at opposite ends of said intermediate portion in said covering;

fixing said intermediate portion in said peeling position from opposite sides thereof in a direction perpendicular to said axis;

forming a lateral slit in said intermediate portion in parallel relation to said axis; and

separating said intermediate portion from said electric wire with said intermediate portion remaining fixed in said peeling position from said opposite sides thereof, after all of said annular slits forming step, intermediate portion fixing step and lateral slit forming step have been finished.

5,142,951

TORQUE WRENCH

John N. Walton, Whitley Bay, England, assignor to Hedley Purvis Limited, Morpeth, England

Filed Mar. 19, 1991, Ser. No. 672,028

Claims priority, application United Kingdom, Mar. 20, 1990, 90062688

Int. Cl.[5] B25B *13/46*

U.S. Cl. 81—57.39 **7 Claims**

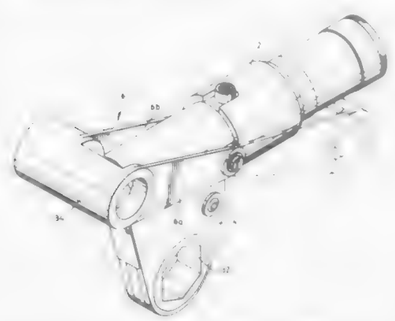
1. A torque wrench for rotating a component about a first axis, the torque wrench comprising:

an elongate body portion,

a hydraulic piston-cylinder assembly included in said body portion and having a line of action perpendicular to said first axis,

a drive mechanism actuated by said assembly to rotate an associated component about said first axis, and

a reaction member mounted to the body portion to be pivotal relative thereto about a second axis extending parallel with the first axis between different positions extending angularly outwardly of the body portion, the reaction member comprising first and second arm portions extending longitudinally of the body portion one to each side of



the second axis, each arm portion having a free end remote from the second axis and including, adjacent its free end, a socket, the reaction member being pivotal between a first position in which, in use, the socket adjacent the free end of the first arm portion is located over a fixed component and the socket adjacent the free end of the second arm portion is located over the component to be rotated, and a second position in which, in use, the socket adjacent the free end of the second arm portion is located over a fixed component and the socket adjacent the free end of the first arm portion is located over the component to be rotated.

5,142,952

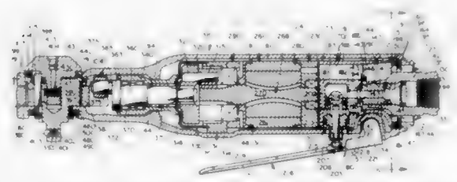
RATCHET TOOL

Gordon A. Putney, Lake Geneva; Martin S. Scolaro, Racine, and Kenneth C. Happ, Silver Lake, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed May 21, 1990, Ser. No. 526,498

Int. Cl.[5] B25B *13/46*

U.S. Cl. 81—57.39 **24 Claims**



1. A ratchet tool comprising: an elongated housing including first and second arms, each of said arms having a cylindrical opening with an axis, a drive body extending through said openings in said arms, a knob on said drive body, and means including an O-ring between said knob and said drive body spacing them apart axially for absorbing shock to said drive body.

5,142,953

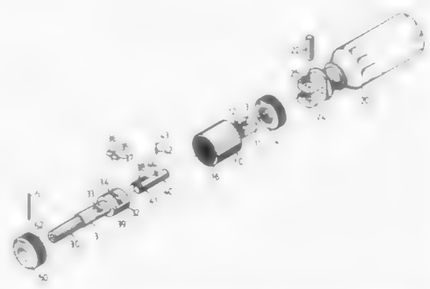
RATCHET SCREW DRIVER

Chi-Yeh Lin, No. 5-11, Lane 42, Jenhua Rd., Jenhua Tsun, Tali Hsiang, Taichung Hsien, Taiwan

Filed Sep. 25, 1991, Ser. No. 765,148

Int. Cl.[5] B25B *13/46*

U.S. Cl. 81—63 **2 Claims**



1. A screw driver comprising a sleeve having a handle member coupled to a first end thereof and having an open second end and having a plurality of teeth formed in an inner peripheral surface thereof; a head rotatably received in said sleeve and having an indent formed therein; a pawl rotatably supported in said indent and having two abutments formed thereon; a shaft formed integral with said head and extended outward beyond said open second end of said sleeve and having a pair of notches formed therein; a socket formed integral with said shaft; a bore formed in said shaft and said head; a rod rotatably received in said bore and having an aperture and a dent formed therein; a spring and a ball received in said dent of said rod and arranged such that said ball is biased to engage with said pawl; a knob engaged on said shaft and rotatably coupled to said open second end of said sleeve; a post extended through said knob and said notches of said shaft and said aperture of said rod so that said rod can be caused to rotate by rotation of said knob; and a first abutment of said two abutments being caused to engage with said teeth of said sleeve when said rod is rotated in one direction; and a second abutment being caused to engage with said teeth of said sleeve when said rod is rotated in a reverse direction.

5,142,954

MASONRY ANCHOR INSTALLATION TOOL

David E. Starke, Whitfield, Pa., assignor to Emhart, Inc., Newark, Del.

Filed May 31, 1991, Ser. No. 708,446

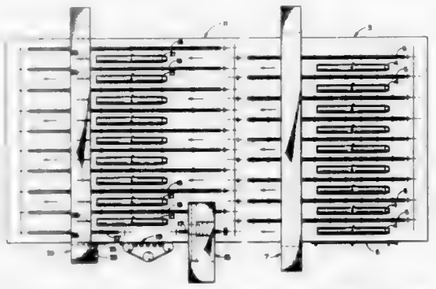
Int. Cl.[5] B25B *23/00*

U.S. Cl. 81—429 **2 Claims**

1. A masonry screw installation tool comprising

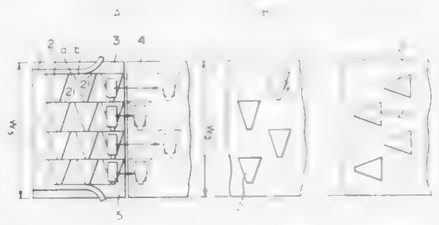
a drive tube having a hex bore extending axially into one end,
a nut driver having
a hex portion at one end to be received by said hex bore, and
a cylindrical portion at the other end having a screw head receiving opening, and
a cylindrical declutching sleeve closed at one end and open at the other end for slidably receiving said nut driver cylindrical portion,
an axial through hole extending through said closed end so that said cylindrical portion can be fully inserted into said cylindrical bore with said hex portion passing through said axial through hole into said drive tube hex bore to removably secure said declutching sleeve between said drive tube and said nut drive,
said axial through hole being selectively sized so that said nut driver can rotate while said declutching sleeve is stationary whereby when said declutching sleeve engages the surface into which the masonry screw is being installed, said declutching sleeve will remain stationary as said nut driver rotates, and
said declutching sleeve having an axial length selected so that a predetermined spacing will be defined between the open end of said declutching sleeve and the end of said nut driver when said nut driver and declutching sleeve are secured to said drive tube.

5,142,95[illegible]
LUMBER CUTTER FOR REMOVING END DEFECTS AND SAWING TO DESIRED LENGTHS
James C. Hale, Pea Ridge, Ark., assignor to Trienco, Inc., Montrose, Colo.
Filed May 16, 1991, Ser. No. 701,511
Int. Cl.[5] B27F *5/04*
U.S. Cl. 83—75.5 18 Claims



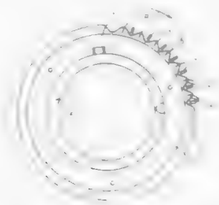
16. Apparatus for accepting lumber pieces from a scanner and for cutting said pieces to length, each of said pieces having a longitudinal dimension and a root end, comprising:
a conveyor for conveying lumber pieces along a path from the scanner to an output end and including a plurality of endless chain belts having lugs for engaging lumber pieces, said belts being generally horizontal, parallel, having a length extending along the direction of the conveyance, and spaced apart by no more than four feet,
a butt trimmer saw assembly juxtaposed with said conveyor remote from the output end thereof, said assembly including a circular saw slidably mounted for movement along a path of axial motion transverse to the length of said chain belts, with a blade of said saw positionable to intercept and cut said lumber pieces at or near their root ends, the controllable axial motion of said circular saw being at least one foot,
said circular saw having a rotatable saw blade mounted on a pivot arm for permitting said blade to move into and out of the path of said lumber pieces,
an actuator for moving said saw blade vertically between operative and inoperative positions,
a servo-mechanism for producing axial motion of said circular saw to a desired position under electronic control,
a set of cross-drive elongated rollers positioned downstream of said saw assembly with their longitudinal axes substantially parallel to the length of said chain belts for frictionally contacting said lumber pieces and moving them lengthwise transversely to the length of said chain belts in the direction of their root ends,
a first fence positioned to serve as a stop for said lumber pieces,
a second fence positioned downstream of said first fence, the downstream end of said second fence being movable in response to electronic control to adjust the lateral position of said lumber pieces selectively by an amount of at least about one-quarter inch,
an array of selectively operable cut-off saws positioned near the output end of said conveyor,
means for operatively positioning certain ones of said saws while positioning others of said saws in inoperable position,
a fixed root-end trimmer saw positioned substantially in alignment with said second fence, such that the position of said second fence determines whether the root end of a given lumber piece is intercepted by and cut by said fixed root-end trimmer saw, and
electronic control apparatus connected to receive signals from said scanner and generate signals responsive to the received signals for controlling said butt trimmer saw assembly, said second fence, and said cut-off saws.

5,142,956
APPARATUS FOR SPACING AND REORIENTING CROISSANT DOUGH PIECES
Sadao Ueno, and Yasunori Tashiro, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan
Filed Oct. 22, 1991, Ser. No. 782,005
Claims priority, application Japan, Oct. 23, 1990, 2-285621
Int. Cl.[5] B26D *7/00*; B65G *47/00*
U.S. Cl. 83—102 2 Claims



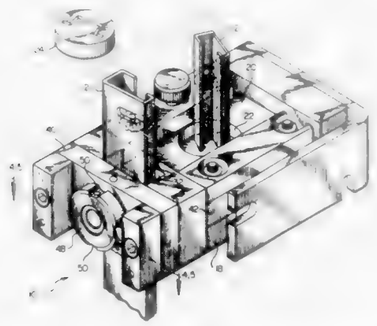
1. An apparatus for spacing and orienting croissant dough pieces, comprising an upstream conveyor for feeding a continuous dough sheet, a cutting means for cutting the dough sheet into pieces having polygonal shapes, with one relevant side in the feeding direction, a downstream conveyor arranged in series with the upstream conveyor, the downstream conveyor arranged to move faster that the upstream conveyor, a dough-spacing means located at the position where the dough pieces are transferred from the upstream conveyor to the downstream conveyor and arranged to space the dough pieces apart from one another in the feeding direction on the downstream conveyor in a staggered manner, and a reorienting means for turning the dough pieces to position the relevant side of each dough piece at right angles to the feeding direction of the downstream conveyor.

5,142,957
ROTARY CUTTER
D. W. Gallimore, 9, Chantrell Road, Newton, West Kirby, Merseyside L48 9XR, United Kingdom, assignor to Dennis W. Gallimore and Stephen J. Gallimore, both of Merseyside, both of, United Kingdom
Filed Jul. 8, 1991, Ser. No. 726,693
Claims priority, application United Kingdom, Jul. 7, 1990, 9015039
Int. Cl.[5] D01G *1/04*
U.S. Cl. 83—117 25 Claims



1. An improved rotary cutter comprising a cylindrical body mountable so as to be rotatable about its central axis and having a plurality of spaced apart elongate slots or grooves defined by opposite side wall surfaces and a bottom surface and extending along the outer surface of said body and having a longitudinal central axis, and in which grooves there are secured a plurality of resilient cutting blades which are normally flat in their unstressed condition out of said grooves and have a longitudinal cutting edge along one side; each of said slots or grooves being curved when viewed in section perpendicularly tranverse to said longitudinal axis of said grooves and dimensioned such as to receive the edge of one said blades remote from the cutting edge and securely frictionally retain such by the reactive pressure resulting from the deformation or bending of said blade to assume the curve of said slot or groove when locating the blade therein.

5,142,958
CUTTER FOR DIN RAIL
William F. Nordlin, and Billy J. Bauscher, both of Rockford, Ill., assignors to Greenlee Textron Inc., Rockford, Ill.
Filed Nov. 5, 1990, Ser. No. 609,253
Int. Cl.[5] B21D *28/24*; B23D *23/00*; B26D *5/02*
U.S. Cl. 83—559 11 Claims

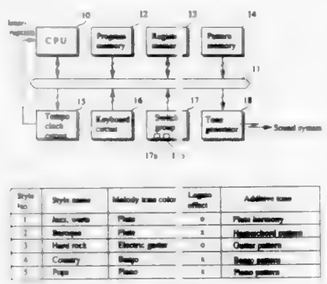


1. A rotating punch and die set for punching a workpiece at any of a plurality of angular orientations, comprising:
punch mounting means;
punch means rotatably mounted in said punch mounting means;
die mounting means;
die means rotatably mounted in said die mounting means;
means mounting said punch mounting means and said die mounting means for relative movement so as to advance and retract said punch means into and out of engagement with said die means;
interlocking means for releasably interlocking with said die means for preventing rotation thereof;
and release means for releasing said interlocking means in response to advancement of said punch means into engagement with said die means such that rotation of said die means can only be achieved with said punch means in engagement therewith to thereby positively maintain alignment between said punch means and said die means without regard for the angular orientation of the punch means and die means relative to a workpiece.

5,142,959
MIDI CONTROL APPARATUS AND MIDI SYSTEM
Masaharu Sakamoto; Shigeru Yamaguchi; Kazuhiko Mukai; Yukio Matsumoto; Shinji Suzuki; Toshiyuki Katsu; Tatsushi Iizuka; Kiyomi Yatsuhashi, and Hidenori Hidaka, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jan. 8, 1991, Ser. No. 637,671
Claims priority, application Japan, Jan. 10, 1990, 2-3260; Jul. 31, 1990, 2-203725
Int. Cl.[5] G10H *1/00*
U.S. Cl. 84—645 4 Claims

1. A MIDI control apparatus wherein an operation ON signal and an operation OFF signal are supplied to a MIDI instrument in response to a MIDI format signal included in a subcode signal supplied from a recording medium play apparatus, said control apparatus comprising:
subcode decoder means for decoding the subcode signal received from the recording medium play apparatus and for generating MIDI signals including the operation ON signal and the operation OFF signal;
storage means for storing content of the operation ON signal generated by said subcode decoder means in said control apparatus until the operation OFF signal corresponding to the operation ON signal is generated from said subcode decoder means; and
forced release means for supplying the operation OFF signal corresponding to content of the operation ON signal stored in said storage means to said MIDI instrument in response to a state signal representing discontinuous play state from said recording medium play apparatus.

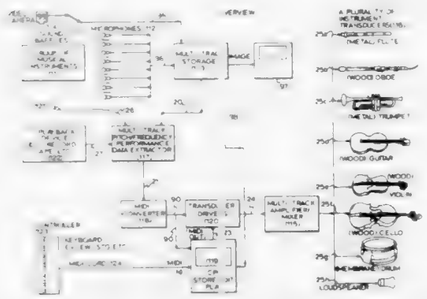
5,142,960
ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC CONTROL OF MELODY TONE IN ACCORDANCE WITH MUSICAL STYLE AS WELL AS TONE COLOR
Fumio Iwase, and Kotaro Mizuno, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Jun. 14, 1990, Ser. No. 537,650
Claims priority, application Japan, Jun. 15, 1989, 1-69947[U]
Int. Cl.[5] G10H *5/00, 1/02*
U.S. Cl. 84—662 8 Claims



Style No.	Style name	Melody tone color	Legato effect	Accompaniment tone
1	Jazz, swing	Piano	0	Piano harmony
2	Baroque	Piano	1	Harpsichord pattern
3	Hard rock	Electric guitar	0	Guitar pattern
4	Country	Banjo	1	Banjo pattern
5	Pops	Piano	1	Piano pattern

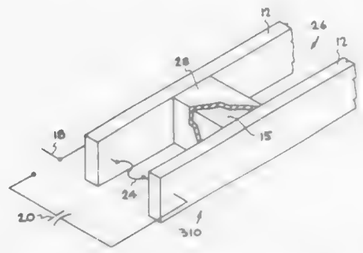
1. An electronic musical instrument, comprising:
melody playing means for performing a melody playing operation;
tone color specifying means for specifying a selected tone color;
musical style specifying means for specifying a selected musical style denoting a manner of execution of the melody playing means in performing a melody playing operation; and
legato deciding means for selectively employing a legato effect in the performing of a melody playing operation by the melody playing means based on the tone color specified by the tone color specifying means and the musical style specified by the musical style specifying means.

5,142,961
METHOD AND APPARATUS FOR STIMULATION OF ACOUSTIC MUSICAL INSTRUMENTS
Fred Paroutaud, 1316 Barry Ave #9, Los Angeles, Calif. 90025
Filed Nov. 7, 1989, Ser. No. 433,652
Int. Cl.[5] G10H *3/18 7/00, 3/14, 3/00*
U.S. Cl. 84—726 22 Claims



1. An apparatus for producing sound from an acoustic instrument having a magnetically excitable primary transducer comprising:
a storage means for storing sound outputs;
converting means coupled to said storage means for converting said sound output to a first signal;
driving means coupled to said first signal, said driving means providing a driver output signal;
a secondary transducer coupled to said driver output signal, said secondary transducer electromagnetically initiating vibration in said magnetically excitable primary transducer to create sound from said acoustic instrument.

5,142,962
PREVENTION OF BREAKDOWN BEHIND RAILGUN PROJECTILES
Ronald S. Hawke, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Apr. 20, 1989, Ser. No. 341,019
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 2 Claims

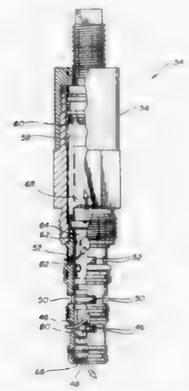


1. In a rail gun, an electromagnetic projectile accelerator having a pair of parallel conducting rails for guiding a projectile and means for energizing the rails to form a plasma arc directly behind the projectile to cause the projectile to accelerate its travel along the rails, wherein the improvement comprises:
a projectile having means for preventing secondary voltage breakdown and for preventing a secondary arc from forming behind the accelerating projectile by introducing a sufficient amount of a breakdown inhibiting gas containing at least one halogen atom between the rails after the projectile is accelerated to prevent the secondary arc from forming;
wherein the means for preventing the secondary voltage breakdown and for preventing the secondary arc from forming comprises:
means in the projectile for permitting the gas located inside of the projectile to flow therefrom when the projectile is accelerated.

5,142,963
LOAD REFERENCED PRESSURE REDUCING VALVE
Richard P. Piekutowski, Huber Heights, Ohio, assignor to Spectra-Physics Laserplane, Inc., Dayton, Ohio
Filed Oct. 25, 1991, Ser. No. 782,408
Int. Cl.[5] F15B *13/02, 13/08;* F16K *31/122*
U.S. Cl. 91—31 13 Claims

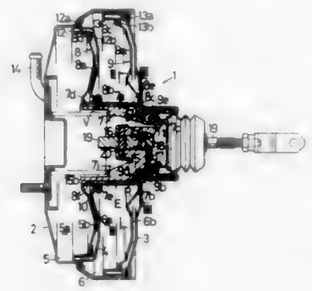
1. A variable pressure reducing valve which provides load-referenced pressure reduction independently of flow therethrough, said valve comprising:
a valve body having a cartridge bore and a plurality of ports, said plurality of ports including at least an inlet port, an outlet port, a tank port, and a load sensing port;
a cartridge, at least a portion of which is disposed in said cartridge bore, comprising:
a cartridge body defining:
a plurality of apertures, ones of said plurality of apertures generally aligned with ones of said ports, said apertures including at least one inlet aperture, at least one outlet aperture, at least one tank aperture and at least one load sensing aperture;

a spring chamber: and
a spool bore;
a spring disposed in said spring chamber; and
a spool slidably disposed in said spool bore and engaging said spring, said spool further including:
a first portion adapted to receive and convey fluid from said inlet aperture to said outlet aperture, said first



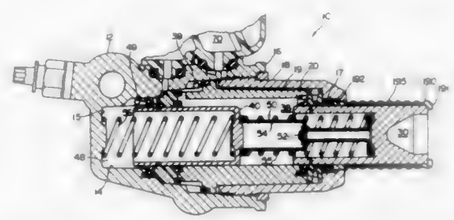
portion slidably positionable to vary the flow of said fluid between said inlet and outlet apertures;
a second portion adapted to receive and convey fluid and pressure from said load sensing aperture to said spring chamber; and
a third portion adapted to receive fluid leaking from said first portion inside said cartridge body and convey said fluid to said tank aperture.

5,142,964
NEGATIVE PRESSURE BOOSTER
Haruo Suzuki, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan
Filed Mar. 29, 1991, Ser. No. 677,051
Claims priority, application Japan, Apr. 5, 1990, 2-90669; Apr. 5, 1990, 2-90670
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—369.1 5 Claims



1. A negative pressure booster of tandem type which comprises:
a center plate dividing a chamber formed by a front shell and a rear shell into a front chamber and a rear chamber;
a valve body movably provided in said rear shell and said center plate for forward and backward movement and having a smaller diameter cylindrical unit penetrating the rear shell and a larger diameter cylindrical unit penetrating the center plate, and a graded step between said small diameter cylindrical unit and said larger diameter cylindrical unit;
a front power piston connected to said valve body and positioned in said front chamber, said front power piston including a cylinder unit surrounding said valve body;
a rear power piston connected to said valve body and positioned in said rear chamber;
a front diaphragm provided on a backside of said front power piston and dividing said front chamber into a first constant pressure chamber and a first variable pressure chamber;
a rear diaphragm provided on a backside of said rear power piston and dividing said rear chamber into a second constant pressure chamber and a second variable pressure chamber;
a control valve provided in said valve body and introducing atmospheric air into said first variable pressure chamber and said second variable pressure chamber during operation;
first grooves formed on a part of an outer periphery of said larger diameter cylinder unit of said valve body, said first grooves together with an inner periphery of said cylinder unit forming a vacuum passage communicating said first constant pressure chamber with said second constant pressure chamber;
second grooves formed on another part of said outer periphery of said larger diameter cylindrical unit of said valve body, said second grooves together with said inner periphery of said cylinder unit forming an air passage communicating said first variable pressure chamber with said second variable pressure chamber; and
a sealing member having a first part provided in said air passage for hermetically sealing between said vacuum passage and said air passage, and a second part squeezed by said graded step of said valve body and said rear power piston to hermetically seal between said second constant pressure chamber and said air passage.

5,142,965
MASTER CYLINDER PISTON RETAINER
Richard A. Zander, Niles, Mich., assignor to Allied-Signal Inc., Morristown, N.J.
Filed Aug. 28, 1991, Ser. No. 751,430
Int. Cl.[5] F01B *1/00*
U.S. Cl. 92—76 3 Claims



1. A master cylinder with a piston retaining member, comprising a master cylinder housing with a bore extending axially therein, a reservoir providing fluid for said bore, an end of said housing having an end member attached thereto and retaining a sleeve member within said bore, a pair of pistons associated with said master cylinder housing and one of said pistons extending exteriorly of the end member by means of an opening in said end member, the one piston retained within the opening by means of the piston retaining member, the piston retaining member comprising at one end a radially inwardly extending flange which engages an axial end of the one piston disposed exteriorly of the master cylinder, and a radially outwardly extending flange engaging a shoulder of said end mem-

ber at said opening such that the piston retaining member is connected with said end member, so that the one piston may move axially outwardly through said opening until engagement of the axial end with the inwardly extending flange, wherein the piston retaining member comprises a multi-ribbed expandable member which may expand axially to a predetermined maximum length for retention of said one piston.

5,142,966

RAPID COOKING APPARATUS FOR FOOD, IN PARTICULAR PASTA SUCH AS SPAGHETTI

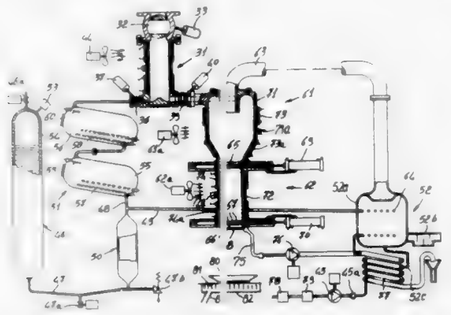
Gino Morandi, Bologna, and Ettore Santi, Feltre, both of Italy, assignors to Trading Service International S.r.l., Bologna, Italy

Continuation of Ser. No. 210,673, Jun. 21, 1988, abandoned. This application Dec. 3, 1990, Ser. No. 707,284

Claims priority, application Italy, Jun. 24, 1987, 3531 A/87; Jun. 26, 1987, 3538 A/87

Int. Cl.[5] A47J *19/00*

U.S. Cl. 99—352 **3 Claims**



1. Rapid cooking apparatus for food, in particular pasta such as spaghetti comprising

a volumetric distributor of food doses;

a heating unit for the preparation of superheated water;

means for pressurizing the superheated water in said heating unit at a pressure higher than that of superheated water;

a pressurized pre-cooking chamber having a first inlet connected to said volumetric distributor to receive food doses therefrom, a second inlet connected to said heating unit for entering a predetermined volume of superheated pressurized water into said pre-cooking chamber, and an outlet for discharging the pre-cooked food doses;

a first atmosphere-pressure cooking completion chamber having an inlet connected to said outlet of said pre-cooking chamber;

a second atmosphere-pressure cooking completion chamber arranged below said first cooking completion chamber and connected therewith and having a lower opening for discharging the food doses after cooking completion;

cutoff valves arranged between said pre-cooking and first cooking completion chambers, between said first and second cooking completion chambers and at said first and second inlets of said pre-cooking chamber and at said lower discharge opening of said second cooking completion chamber;

pneumatic actuators controlling said cutoff valves in time relationship so as to permit dropping of food doses into said pre-cooking chamber passage of said food doses from said pre-cooking chamber through said first cooking completion chamber into said second cooking completion chamber and discharge through said discharge opening;

said pre-cooking and cooking completion chambers having walls externally covered with a layer of metal which is a good heat conductor, said layer being in close contact with said walls;

electric resistors externally surrounding said layer of heat conducting metal;

cooling fans arranged so as to blow air against said walls;

thermostatic means for controlling said resistors and fans at a predetermined temperature according to the type of food to be cooked;

said pressurizing means comprising a water supply pump, a surge-tank plenum chamber and a separator arranged in series between said water supply pump and said plenum chamber, said separator comprising a substantially vertical tube having a lower end connected to said plenum chamber and an upper end connected to said water supply pump, said tube having a volume greater than said predetermined volume of superheated pressurized water to be supplied into said pre-cooking chamber;

means for sensing the pressure in said plenum chamber and controlling said water supply pump to maintain said pressure greater than that of saturated steam;

tube means for conveying steam and water from said first and second cooking completion chambers respectively;

heat recovering means connected to said tube means for recovering heat from said steam and water and for preheating the water supplied by said pump;

said heating unit comprising a first heater and a second heater connected in series and arranged to avoid formation of air and steam bubbles inside said heaters, said first heater being connected to said upper end of said tube and adapted to heat said pressurized water at a temperature proximate to preset final temperature and second heater being connected to said second inlet of said pre-cooking chamber and adapted to super-heat the water heated in said first heater at said preset final temperature and to supply a quantity of pressurized super-heated water sufficient to fill said pre-cooking chamber.

5,142,967

APPARATUS FOR MAKING WAFFLES

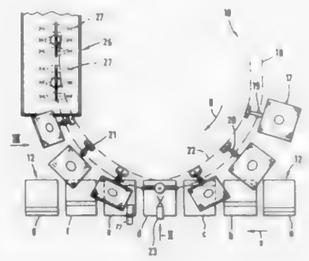
Heinrich Herting, Herne, Fed. Rep. of Germany, assignor to Firma Karl Oexmann, Inh. Wolfgang Oexmann, Gelsenkirchen/Hesslen, Fed. Rep. of Germany

Division of Ser. No. 609,386, Nov. 5, 1990. This application Aug. 27, 1991, Ser. No. 750,276

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1989, 3941987; Jun. 9, 1990, 4018513

Int. Cl.[5] A21B *5/02*

U.S. Cl. 99—373 **10 Claims**



1. An apparatus for making a waffle, the apparatus comprising:

a press having closable top and bottom halves;

means including a spray head for spraying a relatively thin pattern-forming batter in a pattern on one of the top and bottom halves of the press;

means for heating the pattern-forming batter on the one half sufficiently to at least partially cook it but insufficiently to make it peel off the one press half;

means for pouring onto the bottom half a thick body batter of a color different from that of the pattern-forming batter; and

means for heating the batters after closing of the press and thereby thoroughly cooking the batters together into a waffle.

5,142,968

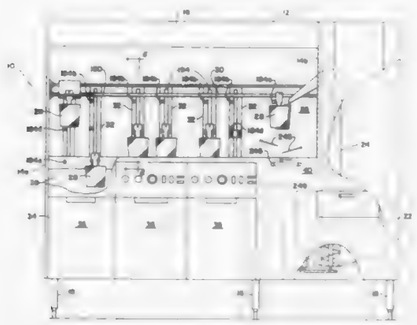
AUTOMATED DEEP FAT FRYER

Richard N. Caron, Dorchester; David H. McFadden, Lexington; John M. Collins, Ipswich, and John Dieckmann, Belmont, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation of Ser. No. 458,982, Dec. 29, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,606

Int. Cl.[5] A47J *37/00, 37/12*

U.S. Cl. 99—404 **23 Claims**



1. An automated fryer system for frying food in predetermined incremental amounts, said system comprising:

means for defining a loading station;

a plurality of frying means, each for independently frying said food in oil in said predetermined incremental amount;

horizontal transport means for transporting said food in said predetermined incremental amounts from said loading station to any one of a plurality of transfer positions, wherein the plurality of transfer positions are respectively located directly above the plurality of said frying means;

a plurality of independently operable vertical transport means, at least one for each of said frying means, each for selectively transporting said predetermined incremental amount of food up and down among a corresponding first position wherein said predetermined incremental amount of food is transferable between said horizontal and said vertical transport means at said corresponding transfer and first positions, a corresponding second position wherein said predetermined incremental amount of food is lowered to the respective frying means so that said predetermined incremental amount of food will fry in said oil, and a corresponding third position wherein said predetermined incremental amount of food is positioned above said respective frying means so as to allow oil to drip into said respective frying means after said predetermined incremental amount of food has been fried in said oil; and

means for selecting one of said vertical transport means for transporting said predetermined incremental amount of food up and down among said corresponding first, second and third positions.

5,142,969

KIMCHI FERMENTOR AND CONTROL SYSTEM THEREOF USING A KIMCHI CURING SENSOR

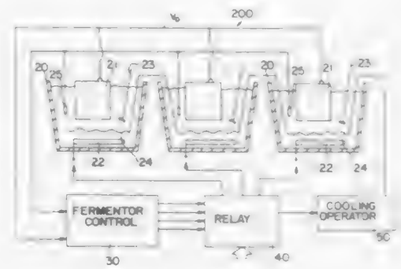
Jae K. Chun, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Nov. 30, 1988, Ser. No. 278,230

Claims priority, application Rep. of Korea, May 27, 1988, 6278

Int. Cl.[5] C12H *1/00*; A23B *4/00*

U.S. Cl. 99—468 **17 Claims**



1. A kimchi fermentor, comprising:

a kimchi case provided with a kimchi curing sensor for producing an electrical signal representing values of kimchi curing variables during curing;

means for affecting temperature ambient to the kimchi case;

heating means for inducing kimchi within said case to proceed toward fermentation;

a temperature sensor producing an electrical signal indicative of the temperature ambient to the kimchi case;

cooling means for maintaining said kimchi case in a storing mode after completion of kimchi curing;

a fermenting barrel provided with said temperature affecting means, said temperature sensor, said curing sensor, said heating means and cooling means;

a fermenting control system for generating control signals on a basis of input signals received from said temperature sensor and said kimchi curing sensor installed in said fermenting barrel; and

a relay operating portion for controlling operation of said heating means and said cooling means according to the control signals.

5,142,970

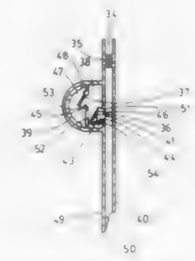
APPARATUS FOR STORING MATTER OUT OF CONTACT WITH GAS

Kenneth B. ErkenBrack, P.O. Box 4343, Charlottesville, Va. 22905

Filed Feb. 24, 1992, Ser. No. 840,332

Int. Cl.[5] A23B *7/00*; A23L *3/00*; B65D *33/01*

U.S. Cl. 99—472 **29 Claims**



1. An apparatus for storing matter without contact between said matter and gas, comprising: a container having interior

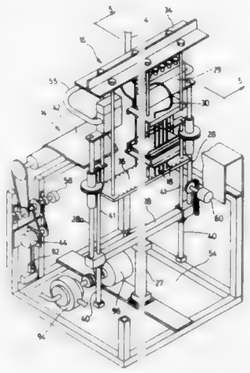
and exterior surface and a first opening for introduction and extraction of said storable matter, said first opening having a sealing means against ingress of gas, and said container having a second opening for egress of gas; a vacuum pump coupled to said second opening for extracting gas from said container, said vacuum pump in turn comprising a compressible body made of flexibly resilient material, having an internal compressible chamber with walls, said body and chamber having a tendency to contract in volume under external force applied to said walls and to expand on release of said force; an inlet tube having a proximal end coupled through a wall of said chamber for accepting gas from the second opening of the container, and a distal end located within the chamber; a unidirectional inlet valve arranged at the distal end of said inlet tube for permitting egress of gas from said inlet tube into the chamber and preventing ingress of gas from the chamber into said inlet tube and therefrom into the container; a means arranged on said inlet tube of locking said inlet tube shut against ingress of gas therethrough from the chamber into the container after gas is extracted therefrom by said vacuum pump; and a unidirectional outlet valve arranged in a portion of said walls distal from the container for permitting egress of gas from the chamber and presenting ingress of gas thereinto.

5,142,971

APPARATUS FOR INJECTING SUSPENDED MEAT SOLIDS INTO MEATS

Lyle W. Norrie, Etobicoke, Canada, assignor to Knud Simonsen Industries Limited, Rexdale, Canada

Filed Sep. 17, 1990, Ser. No. 583,205
Int. Cl.[5] A22C *17/00*; A23B *4/00*; A23L *1/31*
U.S. Cl. 99—487 8 Claims



1. Apparatus for the injection into meat sections of a cold milled particle reduction suspension of finely divided meat pieces (less than 2.0 mm in any dimension) in a liquid mixture, and comprising:

container means for receiving a supply of said suspension;

pump means on said container means for pumping said suspension from said container means at a constant pressure of a set point between about 30 and about 90 psi, to header means;

a plurality of injection needles connected to said header means, said injection needles defining axial passageways and axial openings at their free ends and defining points on respective said needles;

support means for supporting at least one said meat section in registration with said injection needles;

movement means for reciprocating said needles towards, into, and away from at least one said meat section on said support means;

smoothly curved conduit means connecting from said header means to said passageways in said needles, and,

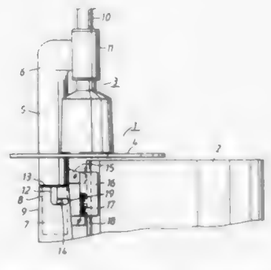
valve means on said header means for opening and closing all said conduit means simultaneously, said valve means being normally closed prior to insertion, and being all openable simultaneously when at least some of said needles enter said meat section, said pump means being operable to pump said suspension of meat pieces through all said valve means and all said injection needles at said pre-set pressure between about 30 and about 90 psi, and at a temperature of between about 26° F. and 42° F., whether said needles are located in a said meat section or not, and thereby ejecting said suspension from all said needles simultaneously.

5,142,972

FEEDING DEVICE FOR VEGETABLE CUTTING MACHINES

Jarl Sundquist, Sollentuna, Sweden, assignor to AB Hällde Maskiner, Kista, Sweden

Filed Apr. 1, 1991, Ser. No. 678,734
Claims priority, application Sweden, Apr. 4, 1990, 9001239
Int. Cl.[5] A23N *3/00*
U.S. Cl. 99—537 2 Claims



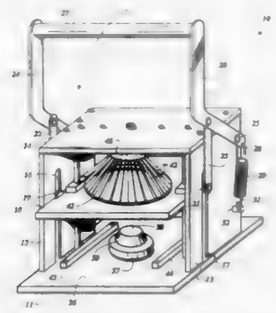
1. An improvement in vegetable cutting machines of the kind comprising a cylindrical feeder (1) which includes a vertically upstanding cylindrical tube (2) with a top end orifice and a bottom end orifice and a vegetable press-feed device (3) comprising a plate (4) which extends perpendicular to the longitudinal axis of the tube and which is linearly movable into and relative to said tube, wherein the vegetable feed device with said plate is carried by a stand-arm unit, including an upper arm part and a lower arm part, placed parallel with the tube, said upper arm part (6) having a downwardly projecting shaft (7), and said lower arm part having a tubular sleeve with encircling wall, wherein said shaft is received in and adapted to pivot in said tubular sleeve (8) thereby enabling the vegetable feed device with plate (4) to be swung away from the top orifice of said tube (2) to enable vegetables to be inserted into said tube for disintegration in said machine, and wherein a cutting tool comprising a rotatable disc provided with at least one knife is mounted adjacent the bottom orifice of the tube (2), said sleeve wall of the lower arm part (9) is penetrated to provide an L-shaped slot (12) with an upper vertical portion which extends parallel to the longitudinal axis of the sleeve and which extends to the upper edge (13) of said sleeve wall; said shaft (7) on the upper arm part (6) being provided with an outwardly projecting peg (14) intended for coaction with and interlocking with said L-shaped slot upon insertion and pivoting in the manner of a bayonet coupling; and said upper arm part (6) being provided with an outwardly projecting wing (15); a vertically shiftable stop block means is provided on the exterior of said tube; said wing functions to restrict pivotal movement of the upper arm part to a first position through coaction and abutment with said stop block means (16); said stop block means including a stop block and a bias spring whereby said stop block can be moved vertically against the action of said biasing spring away from the pivotal path of said wing so as to enable the upper arm part to be rotated to a second position past said first position, in which second position said peg (14) is positioned so as to be movable vertically in that vertical portion of the L-shaped slot (12) which extends parallel with the longitudinal axis of the stand arm-unit.

5,142,973

ONION CUTTER

Anton Tur, 209 Old Canton Rd., Marietta, Ga. 30068; Milan Repisky, 9785 Loblolly La., Roswell, Ga. 30075, and Nicholas M. Proia, Jonesboro, Ga. 30236

Continuation-in-part of Ser. No. 667,644, Mar. 11, 1991. This application Feb. 5, 1992, Ser. No. 831,174
Int. Cl.[5] A47J *17/00*
U.S. Cl. 99—538 7 Claims



1. An apparatus for cutting a work piece having an outer periphery and a center portion into a plurality of elongated pieces attached to the work piece and radially disposed about the center of the work piece comprising

a frame,

support means mounted on said frame for holding the work piece,

a cutter assembly having cutting blades for cutting the work piece, said cutting blades being configured to cut the work piece progressively from the outside periphery thereof toward the center portion, said cutter assembly having a first centrally located cutting blade holding ring having an outer diameter and an inner diameter,

means for moving said cutter assembly along an axis in a cutting direction to bear against the work piece and to cut through a portion of the work piece to produce a deeper cut in the cutting direction in the work piece at the outer periphery thereof than at the center portion,

stop means for halting the movement of said cutter assembly in said cutting direction prior to the work piece being severed into a plurality of individual independent pieces, and

means for separating said cutter assembly from the work piece comprising means for moving said cutter assembly in a direction opposite to said cutting direction,

first elongated ejector means mounted on said frame and coaxial with said cutter assembly, said first ejector means being adapted to pass through said first cutting blade holding ring to contact the work piece internally of the cutter assembly when the work piece is moved in the direction opposite to said cutting direction by the cutter assembly,

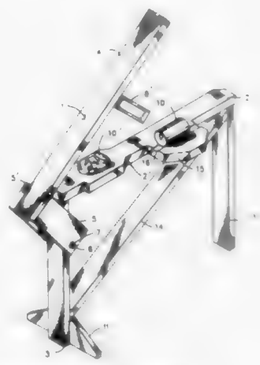
and second ejector means mounted on said frame coaxial with said first ejector means for contacting the work piece externally of the cutter assembly when the work piece is moved in the direction opposite to said cutting direction by the cutter assembly.

5,142,974

APPARATUS HAVING A PIVOTABLE ARM FOR CRUSHING CANS

John H. Fletcher, 1508 58th St. North, St. Petersburg, Fla. 33710

Continuation-in-part of Ser. No. 548,268, Jul. 5, 1990, Pat. No. 5,069,121. This application Nov. 26, 1991, Ser. No. 798,516
Int. Cl.[5] B30B *9/32, 7/00*
U.S. Cl. 100—137 13 Claims



1. A can crushing device comprising:

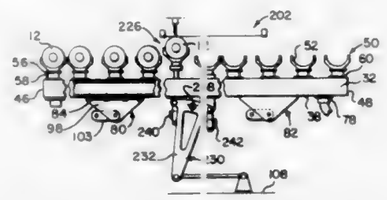
(a) a base plate having a planar upper surface and a width sufficient to accommodate thereon the length of the can to be crushed, having a length substantially greater than the width and having at least one leg extending perpendicularly downward from one end thereof for a distance of 6 to 18 inches; said base plate having an arm rigidly connected thereto and extending outwardly therefrom, the upper surface of said rigidly connected arm being in substantially the same plane as the upper surface of said base plate said arm being positioned on said base plate a substantial distance from that end thereof to which said at least one leg is extended;

(b) a movable arm having a width sufficient to cover the length of the can to be crushed, having a length sufficient to give the leverage required for crushing the can, and having at least one leg extending perpendicularly downward from one end thereof for a distance of at least 6 inches, said arm having the other end of said arm unattached, said at least one leg on said arm being positioned adjacent to said at least one leg on said base plate, said movable arm having rigidly connected thereto a bar having width of 1–2.5 inches and extending outwardly therefrom and positioned so that when said movable arm is moved downward said bar will come downward toward the arm rigidly connected to said base plate whereby the bar will partially crush a can positioned on said rigidly connected arm;

(c) a pivoting means positioned at least 6 inches below said base plate and connecting said at least one leg on said arm to said at least one leg on said base plate, and adapted to allow said arm to lay flat on said base plate and also to allow said arm to be moved away form said base plate by lifting the unattached end of said arm away from said base plate;

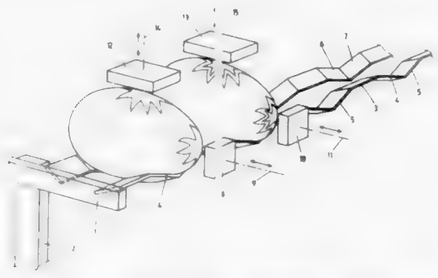
whereby a can positioned on said base plate between said base plate and said arm can be crushed by a force applied to the unattached end of said arm and directed toward said base plate and simultaneously a can positioned on said arm rigidly connected to said base plate will be partially crushed by said bar rigidly connected to said movable arm.

5,142,975
APPARATUS SUITABLE FOR RAPID SILK-SCREEN PRINTING OF PLASTIC CONTAINERS
David J. Podalsky, 12 Osgood Rd., Kensington, N.H. 03833; William M. Lamarre, 119 Water St., Unit 63, Beverly, Mass. 01915, and Heinz W. Stemmler, 5 Boutwell St., Wilmington, Mass. 01887
Filed Nov. 26, 1990 Ser. No. 618,081
Int. Cl.[5] B41F *17/22*
U.S. Cl. 101—40.1 16 Claims



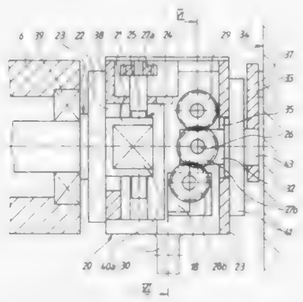
1. Means for transporting ware, one-piece-at-a-time, in a stepwise fashion, from one predetermined location to another comprising an elongated member of predetermined length having an upstream end and a downstream end and being disposed horizontally in a predetermined plane defined by spaced-apart upper and bottom surfaces and by vertically disposed spaced-apart side walls, said elongated member being further defined by an internal cavity extending the length thereof, an opening being provided in the bottom surface of the elongated member adjacent each said end communicating with the said internal cavity, a plurality of wareholders being provided on and connected to, in predetermined spaced-apart locations on, the said upper surface of the elongated member, an opening being provided in each of said plurality of wareholders communicating with said internal cavity, means connected to at least one of said bottom openings for providing a vacuum in the said internal cavity for holding the ware on each said respective wareholder, and means operatively connected to the said elongated member adjacent said upstream and downstream ends for reciprocally moving said elongated member in lengthwise direction in a downward direction from said horizontal plane and up again to said horizontal plane in a manner defining a semi-circular arc, and back again in the reverse direction to the original location of the beam in the said horizontal plane.

5,142,976
MACHINE FOR PRINTING A POULTRY EGG
Pierre Rouilleau, Oyonnax, France, assignor to Oeuromer S.A., Luxembourg-Kirchberg, France
Filed Feb. 5, 1991 Ser. No. 650,904
Claims priority, application France, Feb. 16, 1990, 90 01887
Int. Cl.[5] B41F *17/30*
U.S. Cl. 101—41 8 Claims



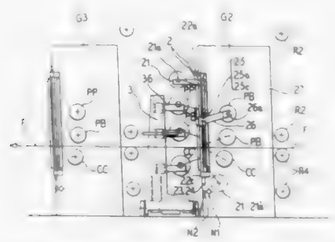
1. Machine for printing eggs comprising a support for the egg to be printed, a first inking pad for printing by tampography and a first mechanism for placing the inking pad in contact with the egg on the support and for moving it away, wherein the support comprises two pairs of facets, each facet being inclined in relation to the vertical, moving away from the vertical from the bottom to the top, and the facets of each pair forming between them an angle of between 60° and 120°, the distance between two facets of the same pair being less than the smallest dimension, in horizontal projection, of an egg, and the distance between two facets of two different pairs being less than the largest dimension, in horizontal projection, of an egg, and substantially only the facets of the support extend below the egg, said facets supporting said egg at spaced locations along its contour and defining an opening below the egg between said locations, the first inking pad being displaced by the first mechanism in a substantially horizontal direction, along the plane bisecting the dihedral formed by one of the pairs of facets.

5,142,977
DEVICE TO ENGAGE, DISENGAGE AND ADJUST THE INKING ROLLERS OR WETTING ROLLERS OF A PRINTING PRESS
Peter Gertsch, Niederscherli; Robert Imhof, Bern; Andreas Miescher, Ittigen, and Raffaele Faiazza, Bätterkinden, all of Switzerland, assignors to Maschinenfabrik WIFAG, Bern, Switzerland
Continuation of Ser. No. 385,238, Jul. 25, 1989, abandoned. This application Oct. 4, 1991, Ser. No. 772,592
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825517
Int. Cl.[5] B41F *31/32, 33/16*
U.S. Cl. 101—148 22 Claims



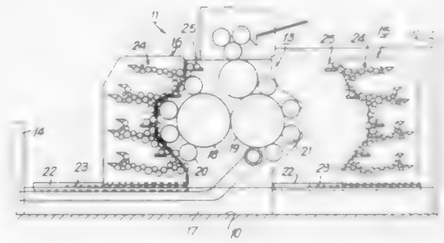
1. A device for positioning a transfer roller, the device comprising:
a frame;
a first stationary roller mounted on said frame;
a second stationary roller mounted on said frame;
a roller lock having means for mounting said roller lock displaceably on said frame in a first direction substantially tangential to the first stationary roller;
a first adjustment means for moving said roller lock in said first direction;
a roller lock position means for measuring position of said roller lock with respect to said frame;
a trunnion rotatably mounted to, and along the axis of, the transfer roller and having means for mounting said trunnion displaceably on said roller lock in a second direction substantially tangential to the second stationary roller and independent of said first direction;
a second adjustment means on said roller lock for moving said trunnion in said second direction independent of said first adjustment means moving said roller lock;
trunnion position sensing means for measuring position of said trunnion with respect to said roller lock; and
programmable control means for independently moving the transfer roller in said first and second direction by independently controlling said first and second adjustment means and for receiving predetermined position information from external sources, and actual position information from said roller lock and trunnion position sensing means, said programmable control means using said position information to control said first and second adjustment means.

5,142,978
OFFSET PRINTING MACHINE FOR VARIABLE PRINTING SIZES WITH AUTOMATIC LOADING AND UNLOADING OF THE PRINTING CYLINDERS
Edouard Borel, Corcelles-Sur Chavornay, Switzerland, assignor to Bobst SA, Switzerland
Filed Apr. 23, 1991, Ser. No. 689,504
Claims priority, application Switzerland, Apr. 25, 1990, 01402/90
Int. Cl.[5] B41F *13/44, 31/30*
U.S. Cl. 101—177 21 Claims



1. A web-fed offset printing machine for variable operating sizes, comprising:
at least one printing unit formed of a fixed frame having plate, blanket, and counter printing cylinders arranged substantially vertically with the plate cylinder in a top position, the frame being designed to accommodate the cylinders with varying diameters for varying printing sizes;
an upper movable cassette receivable on the fixed frame and having an inking station with a corresponding ink well, dipping rollers, distributing rollers, and inking rollers, means being provided for locating the cassette at a lower position in which the inking rollers can be in contact with a plate cylinder of a desired minimum size and an upper position in which the inking rollers are sufficiently set off from the plate cylinder to enable loading and unloading of the plate cylinder, blanket cylinder, and counter cylinder of a desired maximum size; and
movable means on both sides of the fixed frame for engagement with respective opposite ends of a central shaft of the cylinders on the printing unit for unloading the printing unit cylinders and placing them on supporting bars situated in a downstream vicinity of the printing unit and for loading different sized cylinders from the supporting bars onto the printing unit.

5,142,979
SAFETY DEVICE FOR PRINTING MACHINE
Hitoshi Funada, Chiba, and Toshi Ojima, Toride, both of Japan, assignors to Komori Corporation, Tokyo, Japan
Continuation of Ser. No. 700,872, May 10, 1991, abandoned, which is a continuation of Ser. No. 485,300, Feb. 26, 1990, abandoned. This application Dec. 27, 1991, Ser. No. 815,574
Claims priority, application Japan, Sep. 9, 1988, 63-224582; Sep. 9, 1988, 63-224583
Int. Cl.[5] B41F *5/18, 31/30, 33/12*
U.S. Cl. 101—183 6 Claims

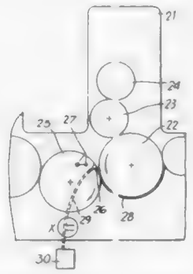


1. A safety system for a printing press comprising a horizontally stationary printing head, including at least one pair of printing cylinders, at least one inking unit mounted for movement between an advanced operative position relative to said printing head, and, a retracted position relative to said printing head, a first high-speed motor for driving said pair of cylinders, bi-directional drive means for advancing and retracting said inking unit, and a third low-speed motor for indexing said printing head during set-up and servicing of said printing head;
a first sensor operative to detect the presence of an operator and tools interposed between said printing head and said inking unit when said inking unit is other than in a fully advanced position;
a second sensor operative to detect the presence of an operator and tools positioned behind said inking unit when said inking unit is other than in a fully retracted position; and,
a switching control operatively connected to said first high speed motor, to said second inking unit advancing and retracting drive means, to said third low speed indexing motor, to said first sensor, and, to said second sensor;
said switching control permitting selective operation of said low speed indexing motor; said switching control having means selectively operable to enable said first motor in the absence of actuation of said first sensor;
said switching control means being operative to disable said drive means in the retract direction in the presence of actuation of said second sensor, while permitting operation of said drive means in the advance direction in the absence of actuation of said first sensor; and,
said switching control means being operative to disable said drive means in the advance direction in the presence of actuation of said first sensor, while permitting operation of said drive means in the retract direction in the absence of actuation of said second sensor.

5,142,980
PNEUMATIC CONTROLLER FOR A PRINTING MACHINE
Johannes Böttger, Weinböhla, and Falk Buschmann, Coswig, both of Fed. Rep. of Germany, assignors to KBA-Planeta AG, Radebeul, Fed. Rep. of Germany
Filed Apr. 17, 1991, Ser. No. 686,709
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1990, 3398253
Int. Cl.[5] B41F *13/24*
U.S. Cl. 101—233 7 Claims

1. In a pneumatic controller in a press machine for detecting the presence or absence of one of a plurality of sheets fed

through said press machine, the press machine having at least one turning shaft and containing a sheet feed cylinder on which said one of said sheets contacts during normal operation, the pneumatic controller comprising a suction system including a suction duct in the sheet feed cylinder and a source of low pressure connected to the suction duct, the suction duct open-



ing onto a surface of the sheet feed cylinder on which said one of said sheets contacts at least partially obstructing an air flow through said suction duct during normal operation, the improvement comprising a flow sensor (1) having a hot wire (16) and a surrounding protective jacket (15), said flow sensor being located in said suction duct and an analyzing circuit (2) connected to said flow sensor.

5,142,911

PRINTING SPEED DEPENDENT THROW ON/OFF CONTROL SYSTEM FOR A SHEET-FED OFFSET PRESS

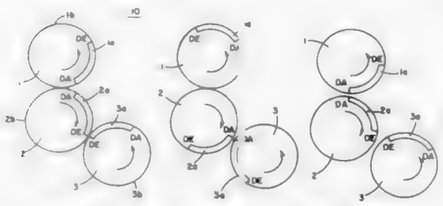
Dietrich Dettinger, Heusenstamm and Horst Klingler, Offenbach am Main, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Apr. 24, 1991, Ser. No. 690,654

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1990, 4013106

Int. Cl.[5] B41F *33/04*

U.S. Cl. 101—248 12 Claims



1. A printing unit of a sheet-fed offset press including:

first and second cylinders, each having a printing zone and a gripping zone, and the cylinders being mounted for rotation such that the first cylinder engages the second cylinder at a nip and the printing and gripping zones of the first cylinder are in registration with the printing and gripping zones of the second cylinder;

a control unit for generating triggering signals;

an actuating device responsive to the triggering signals of the control unit for engaging and disengaging the first cylinder to/from the second cylinder for the purpose of beginning/ending a printing cycle when the gripping zones of the first and second cylinders are opposite one another;

a speed sensor for sensing a value of a parameter indicative of the speed of the printing unit and providing the value of the parameter to the control unit; and

means in the control unit responsive to the value of the parameter for adjusting the timing of the trigger signals in order to ensure engagement and disengagement of the first and second cylinders occur when the gripping zones of the first and second cylinders are immediately adjacent one another for all speeds of the printing unit.

5,142,982

IGNITION DEVICE

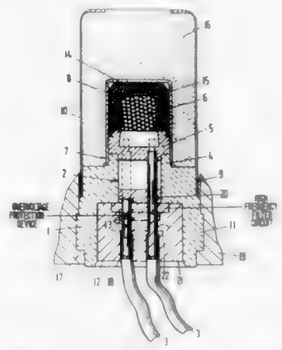
Gisela Diepold, Hechendorf; Bernhard Vetter, Bruckmühl, and Karl Unterforsthuber, Oberhaching, all of Fed. Rep. of Germany, assignors to Bayern-Chemie Gesellschaft fur flugchemische Antriebe mbH, Fed. Rep. of Germany

Filed Jan. 25, 1991, Ser. No. 645,696

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002088

Int. Cl.[5] F42C *19/08, 19/12*

U.S. Cl. 102—202.5 17 Claims



1. An ignition device comprising an electrically ignitable primary charge operatively arranged on a rotationally symmetrical basic body, a sealing cylindrical sleeve and a cap enclosing the primary charge, and a tamping sleeve operatively fastened to the device concentrically to the cap so as to define space filled with a secondary igniting substance, wherein the basic body is configured in one piece with a central bore for receiving electric connections of a primer capsule, and, at a primary-charge-side end of the bore, has a receiving arrangement for a base of the primer capsule and a projection for fastening the cap thereto, and the basic body further having an arrangement for fastening of the tamping sleeve and an integral surrounding ring on a circumference thereof configured to be tightly secured in a mating recess located completely within a housing.

5,142,983

SPRING-BIASED SUCTION TRANSFER ACTUATION SYSTEM FOR A MULTI-COLOR SHEET-FED ROTARY PRINTING PRESS

Ingo Kobler, Anhausen; Josef Mathes, Offenbach am Main, and Robert Ortner, Alzenau, all of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Apr. 19, 1991, Ser. No. 688,726

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1990, 4012497

Int. Cl.[5] B41F *1/30*

U.S. Cl. 101—409 3 Claims

1. A suction transfer actuation system for a multi-color sheet-fed rotary printing press having a press frame, first and second printing units and a sheet transfer drum including first and second gripper means disposed thereon, said suction transfer actuation system comprising, in combination,

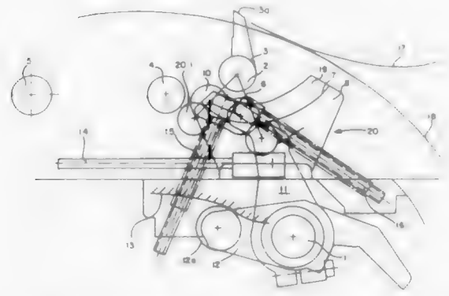
a plurality of hollow suction arms disposed on said transfer drum ahead of said first gripper means, said suction arms having proximate and distal ends,

rocker means including a hollow suction rocker shaft disposed on said transfer drum for rigidly supporting the proximate ends of said suction arms and for rocking the distal ends of said suction arms toward and away from the first printing unit,

at least one actuating lever rigidly connected at one end to said rocker shaft,

a guide rail defining a curved outer guide cam surface mounted on the transfer drum,

roller means including a pair of guide rollers mounted on the other end of said actuating lever for rolling engagement with said outer guide cam surface,



drive means including a drive cam rigidly mounted on the press frame, a drive lever pivotally disposed on the transfer drum, and follower means including a cam follower roller engageable with said drive cam for oscillating said drive lever so as to rock said hollow suction rocker shaft and said distal ends of said suction arms toward and away from the first printing unit under the guiding influence of said outer guide cam surface and said guide rollers,

means including a pair of compression springs for biasing said guide rollers against said outer guide cam surface,

support means for securing each spring so that one end thereof bears on said actuating lever and the other end thereof bears against the body of said sheet transfer drum, and said pair of compression springs being disposed substantially at right-angles to one another and substantially radially with respect to said hollow suction rocker shaft.

5,142,984

OPTICAL DETECTION DEVICE

Edward J. Stearns, and Robert H. Johnson, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 532,778, Jun. 4, 1990. This application Jan. 25, 1991, Ser. No. 645,757

Int. Cl.[5] F42C *13/02*

U.S. Cl. 102—213 2 Claims

1. A method of disabling an aircraft or other moving vehicle by jamming the engine, the method comprising the steps of:

trajecting a container having a coagulating material towards the vehicle;

detecting with an optical sensor when said container is a predetermined distance from the vehicle;

dispersing said coagulating material such that said material forms a cloud of said material moving in the direction of the vehicle, said coagulating material entering the vehicle's engine through air intake valves;

said step of detecting with an optical sensor including the steps of:

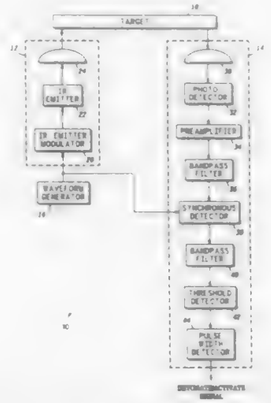
generating a unique wave form for subsequent correlation by a wave form generator;

transmitting a pulsating beam of light according to said unique wave form generated within a target sensor;

receiving light wave forms within a receiver of said target sensor;

receiving said pulsating beam of light within said receiver when said pulsating beam of light is reflected back to said target sensor;

comparing the wave form of all light wave forms received by said receiver with said pulsating light beam according to said unique wave form to select only said pulsating beam of light reflected back to said target sensor;



synchronously detecting said transmitted pulsating beam of light according to said unique wave form with said reflected pulsating light beam to correlate said transmitted and reflected lights beams;

generating an electrical signal when an electrical signal associated with said reflected pulsating light beam correlates with the wave form of said pulsating beam of light;

determining if said generated electric signal exceeds a predetermined threshold over a predetermined time; and

dispersing said material from the container when said generated electric signal exceeds said predetermined threshold over said predetermined time.

5,142,985

OPTICAL DETECTION DEVICE

Edward J. Stearns, and Robert H. Johnson, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 4, 1990, Ser. No. 532,778

Int. Cl.[5] F42C *13/02*

U.S. Cl. 102—213 5 Claims

1. An optical sensor comprising:

transmitter means;

receiver means coupled to said transmitter means;

wave form generator means coupled to said transmitter means and said receiver means;

said wave form generator means for generating a unique wave form;

said transmitter means adapted to transmit a light beam according to a pattern including said unique wave form;

said receiver means for receiving said transmitted light beam;

said receiver means comparing an electrical signal that results from said received light beam with said unique wave form to differentiate said transmitted light beam from other received light;

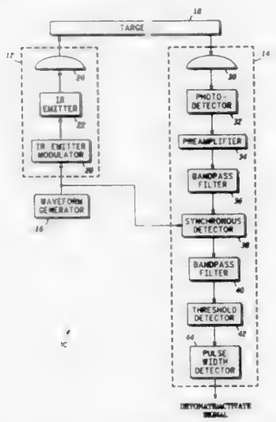
detector means for detecting when the intensity of said transmitted light beam received by said receiver means equals or exceeds a predetermined threshold over a predetermined time;

said detector means generating a detect signal when said intensity equals or exceeds said predetermined threshold over said predetermined time;

said detector means including

threshold means for detecting when said transmitted light beam is equal to or greater than said predetermined threshold;

pulse width means for determining when said predetermined threshold has been equalled or exceeded for said predetermined time;



said threshold means coupled to said receiver means to receive a signal resultant from said transmitted light beam;

said pulse width means coupled to said threshold means to receive another signal resultant from said transmitted light beam; and

said threshold means allowing only signals greater than said predetermined threshold to pass through to said pulse width means.

5,142,986

MINE, PARTICULARLY AN ANTI-TANK MINE

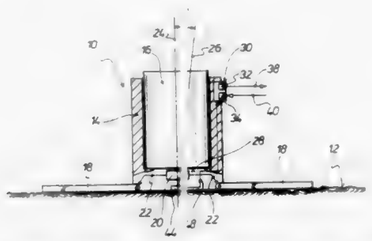
Bernd Gundel, Neuhaus, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 27, 1991, Ser. No. 722,341

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1990, 4023069

Int. Cl.[5] F42B *23/04*

U.S. Cl. 102—401 **6 Claims**



1. A mine including a warhead launching means having a warhead arranged therein and including aiming means; range-finding means positioned on said mine for determining the direction of travel and the measurement of an at least approximately horizontal distance between the mine in a lurking position thereof and a target which is to be attached, said range-finding means comprising means for determining the speed of travel of the target, said range-finding means being operatively connected with said aiming means for effectuating a setting of a specified elevation for the launching means of the warhead.

5,142,987

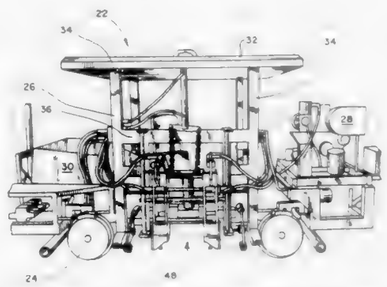
AUTOMATIC ANCHOR APPLICATOR

Donald C. Freymuth, Racine; Jeffrey S. Hon, Waterford; Dale K. Lange, Racine; Gerald J. Paulus, Racine; Thomas F. Petrykowski, Racine, and Robert L. Turner, Racine, all of Wis., assignors to Racine Railroad Products, Inc., Racine, Wis.

Filed Aug. 27, 1990, Ser. No. 573,234

Int. Cl.[5] E01B *29/32*

U.S. Cl. 104—17.2 **24 Claims**



1. An apparatus for applying an anchor to a tie-mounted rail, said apparatus comprising:

a frame defining an anchor load station for receiving anchors;

a head assembly movably mounted on the frame for vertical movement toward and away from a tie;

first transport means for moving an anchor from the anchor load station vertically downwardly without vertically moving the head assembly to an anchor transfer station;

second transport means for moving an anchor from the anchor transfer station into a position for adjustment on the rail;

adjuster means for moving the anchor along the rail and into abutment with the tie; and

an applicator assembly for placing a positioned anchor into a positive engagement with the rail.

5,142,988

AUXILIARY RAILROAD TRACK LIFTING INSTALLATION

Jörg Ganz, Etoy, Switzerland, assignor to Matisa Materiel Industriel S.A., Crissier, Switzerland

Filed Feb. 28, 1991, Ser. No. 662,776

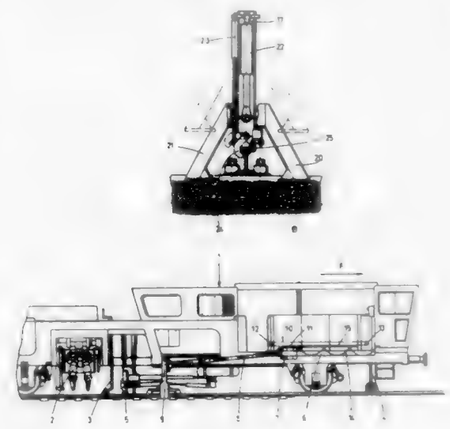
Claims priority, application Switzerland, Apr. 10, 1990, 1242/90

Int. Cl.[5] E01B *27/00*

U.S. Cl. 104—7.1 **20 Claims**

1. An auxiliary railroad track lifting assembly to be mounted on a railroad track construction machine which has means for lifting a switchgear unit, said auxiliary assembly assisting the lifting means of the railroad track construction machine in lifting the switchgear unit and comprising at least one arm having a first and a second end; means pivotably attaching said first end to the construction machine; means secured as said second end for grasping and lifting a railroad track rail by bearing on a subgrade; and means for enabling displacement of the constructing machine at least between two consecutive

tamping positions in an axial direction of the railroad track which said grasping and lifting means remains in place and for



displacing the construction machine relative to said grasping and lifting means.

5,142,989

PROPELLING MECHANISM AND TRAVELING DEVICE PROPELLED THEREBY

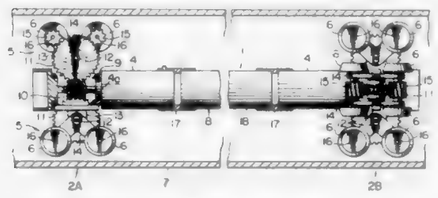
Koichi Suzumori, and Kokichi Aomori, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1991, Ser. No. 766,081

Claims priority, application Japan, Sep. 28, 1990, 2-259649

Int. Cl.[5] B61B *13/10*

U.S. Cl. 104—138.2 **6 Claims**



3. A traveling device comprising:

a steerable connecting means constituting a main body thereof and having front and rear ends, a plurality of propelling mechanisms coupled to at least said front and rear ends,

means for controllably deflecting said steerable connecting means in steering operation in any directions each of said propelling mechanisms comprising:

motive power means, a plurality of sun gears driven in rotation by said motive power means, at least two planet gears meshed with each one of said sun gears and rotatably supported at specifically spaced-apart positions to undergo axial rotation about their own axes and simultaneously to undergo orbital revolution around the periphery of said sun gear; and a plurality of traction wheels with treads rotating together with respective said planet gears, said treads being pressed into contact with said inner wall surface by said orbital revolution of the planet gears, driving power due to said axial rotation of the planet gears being transmitted by way of said treads of the wheels as traction to said inner wall surface.

5,142,990

SELF-PROPELLED AND ARTICULATED VEHICLE WITH TELESCOPIC JACKS TO CARRY PIPEWORK INSPECTION EQUIPMENT

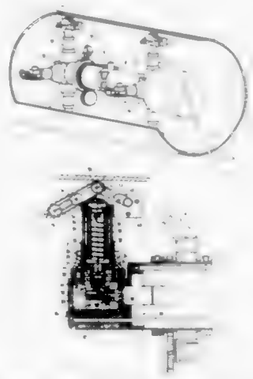
Andre Leonard, Seichamps, France, assignor to Ecole Superieure des Sciences et Technologies de l'Ingenieur de Nancy (ESSTIN), Meurthe et Moselle, France

Filed Jun. 11, 1991, Ser. No. 713,709

Claims priority, application France, Jun. 11, 1990, 90 07383

Int. Cl.[5] G01M *19/00*

U.S. Cl. 104—138.2 **20 Claims**



1. A self-propelled vehicle intended to move in a space of a pipe of an essentially circular cross-section and having an umbilical cord connected thereto, said vehicle comprising:

a central load-bearing structure, made of frame parts arranged adjacent to one another in a longitudinal direction of said vehicle;

jacks arranged in planes that are transverse to said longitudinal direction, with each of said jacks at a free end thereof having a driving means, whereby said driving means allow said vehicle to progress within the space by being pressed against an inner surface of the pipe; and

each of said jacks being provided with hollow rods of different diameters that are disposed concentrically about a longitudinal axis of said jack, with said hollow rods being connected to one another and to said jack by a first means for rotating said jack together with said hollow rods about said longitudinal axis.

5,142,991

INCLINED RAIL TROLLEY SAFETY DEVICE WITH LEVER OPERATED CABLE SHIEVE FOR TAKING UP SLACK IN THE CABLE TO CONTROL TROLLEY DRIVE

David L. Theis, Prior Lake, Minn., assignor to Access Mobility Systems, Inc., Shakopee, Minn.

Filed Jun. 14, 1991, Ser. No. 715,461

Int. Cl.[5] B61B *9/00, 12/04*

U.S. Cl. 104—178 **12 Claims**

1. In combination with a trolley riding an inclined track, a safety device for stopping the trolley, the combination comprising:

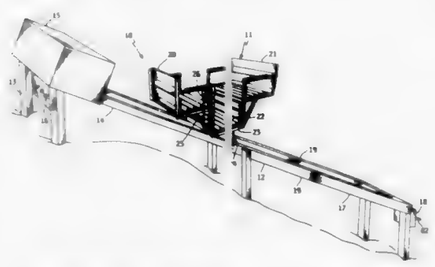
a) an inclined track having upper and lower portions;

b) a trolley riding the track;

c) operating means adjacent to the track for operating the trolley between the upper and lower portions and including a switch; and

d) a safety mechanism comprising a safety line extending between the upper and lower portions of the track and connected to the switch of the operating means, and engagement means on the trolley for continuously engaging the safety line and for taking up slack in the line to operate

the switch of the operating means to stop the trolley; wherein the safety mechanism includes isolation means connected between the switch and the line for isolating



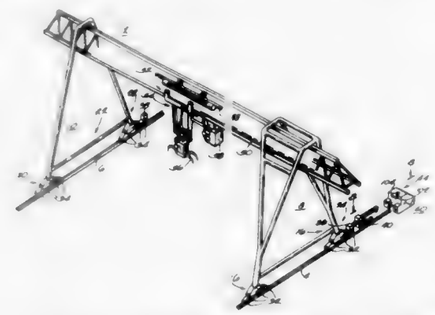
the switch from disturbances in the line during operation of the trolley to minimize premature tripping of the switch.

5,142,992

CRANE SECUREMENT LATCH

Herbert D. Long, Jr., West Allis, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Aug. 27, 1990, Ser. No. 572,287
Int. Cl.[5] B61K 7/06
U.S. Cl. 104—251 11 Claims



1. A latch for a crane travelable along a pair of generally parallel rails and having an overhead frame and a plurality of wheels engaging both of the rails for supporting the crane during its travel on the rails, comprising:

a latch arm pivotally mounted for vertical movement on the crane, the latch arm having a path of movement and being movable along said path substantially in the direction of travel of the crane, the latch arm having a downward projecting hook;

a stationary latch block having an upward projecting lip member positioned in the path of movement of the latch arm, the lip member and hook having an engaged position such that the crane is held from moving away from the latch block and a disengaged position in which the hook overlies the latch block whereby the crane can be moved away from the latch block; and

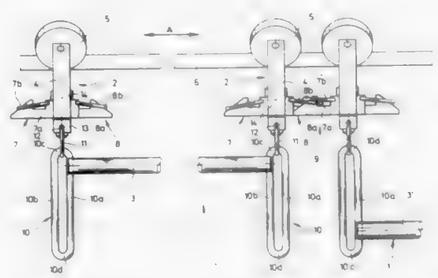
support means having a position below and spaced from the latch arm in said engaged position of the hook and movable to an upward position beneath and engaging the latch arm for supporting the latch arm in an upward position and the hook in said disengaged position.

5,142,993

CONVEYING MEANS

Johann Robu, Olching, and Rudolf Robl, Landsberg, both of Fed. Rep. of Germany, assignors to RSL Logistik GmbH & Co., Fed. Rep. of Germany

Filed Mar. 13, 1991, Ser. No. 668,996
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1990, 9003123
Int. Cl.[5] B65G 9/00
U.S. Cl. 105—148 16 Claims



1. A conveying unit for a suspension conveying system adapted to be operated by pushing and pulling forces, the system including an elevated rail defining a conveying direction, the unit comprising: two roller supports for rolling on the rail, each of the roller supports including two rollers adapted to engage the rail at upwardly facing surfaces thereof and a strap interconnecting the two rollers transversely to the conveying directions and having a mid portion which is arranged essentially below the rail when the unit is suspended on the rail for transport; a supporting element on which objects to be conveyed are to be disposed, the supporting element being connected to the straps of the two roller supports and arranged between the roller supports; and at least one coupling element for coupling to a corresponding coupling element of another conveying unit, the coupling element being rigidly connected to the mid portion of the strap of one of the roller supports at a location between the supporting element and the rollers.

5,142,994

PALLET AND APPARATUS FOR FORMING A PALLET WITH DEEP DRAWN LEGS

L. Bogue Sandberg, Chassell; Bruce A. Haataja, Lake Linden; Douglas C. Jurmu, Laurium; Robert D. Palardy, Houghton; Frank H. Story, Dollar Bay, and William A. Yates, Calumet, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

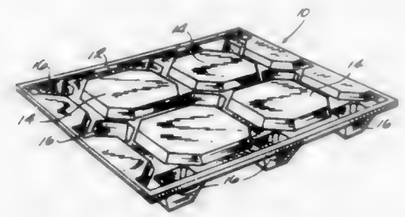
Continuation of Ser. No. 456,050, Dec. 26, 1989, which is a continuation of Ser. No. 227,007, Aug. 1, 1988, which is a division of Ser. No. 879,737, Jun. 30, 1986, Pat. No. 4,790,966.
This application Nov. 25, 1991, Ser. No. 799,018
Int. Cl.[5] B65D 19/24
U.S. Cl. 108—53.3 1 Claim

1. A pallet comprising:

a generally flat rectangular deck having a major plane and a flat upper surface,

a plurality of spaced apart hollow leg members integral with said deck and projecting downwardly from said deck to support said deck,

said deck and said leg members being molded as a one-piece unit from a mixture of a resinous particle board binder and thin elongated wood flakes, said thin elongated wood flakes being deposited in a loosely felted layered mat onto a supporting surface such that said thin elongated wood flakes lie in horizontal planes, the loosely felted layered mat being formed by depositing a first layer of thin elongated wood flakes onto a supporting surface and then depositing a second layer of thin elongated wood flakes onto the first layer, the first layer of thin elongated wood flakes of said loosely felted mat having selected portions, the thin elongated wood flakes of said selected portions being aligned in a first direction substantially parallel to one another, and the remainder of the thin elongated wood flakes forming said first layer lying in horizontal relation but in random orientation with resect to one another, and the second layer of said loosely felted mat having selected portions overlying said selected portions



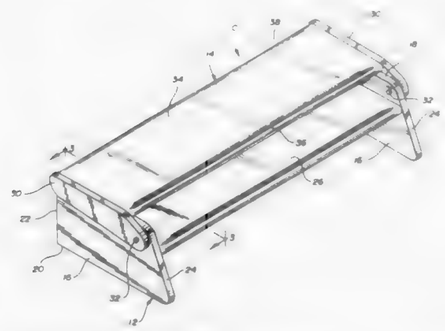
of said first layer and said selected portions of said second layer being comprised of thin elongated wood flakes aligned in substantially parallel relation to one another in a direction substantially perpendicular to the direction of alignment of the elongated wood flakes of said selected portions of said first layer, and the remainder of the thin elongated wood flakes forming said second layer lying in horizontal relation but in random orientation with respect on one another, said loosely felted mat being compressed in a mold to form said one-piece unit, and said hollow leg members being molded from said selected portions of said first layer and said selected portion of second said layer.

5,142,995

DRESSING KIT

Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyanwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.

Continuation of Ser. No. 463,398, Jan. 11, 1990, abandoned. This application Apr. 10, 1991, Ser. No. 683,072
Int. Cl.[5] A47B 57/00
U.S. Cl. 108—63 9 Claims



1. A dressing kit comprising:

a base, said base including a pair of opposing side walls, each of said side walls including a front edge and a top edge, and a shelf connecting said side walls, said shelf including a substantially flat upper surface for at least partially supporting an infant, the side walls of said base extending above the upper surface of the shelf and the shelf having a front edge aligned with the front edges of the sidewalls,

a cover pivotably mounted to said base, said cover including a pair of opposing side walls and a shelf connecting said side walls of said cover, the shelf of said cover being wider than the shelf of said base such that an edge portion of said shelf of said cover engages the front edges of the side walls of said base when in a first rotational position with respect to said base, the edge portion of said shelf of said cover being substantially co-extensive with the front edge of said shelf of said base when said cover is in the first rotational position for at least partially supporting an infant, said cover being rotatable to a second rotational position wherein the shelf of said cover engages the top edges of the side walls of said base and said shelf of said cover is substantially parallel to the shelf of said base, and in said second position the side walls of said cover are positioned in adjoining, parallel and side by side relation to the side walls of said base,

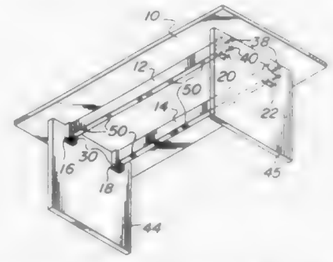
each of the side walls of said cover including a first end portion extending substantially beyond the edge portion of the shelf of said cover and being pivotably secured to the side walls of said base.

5,142,996

TABLE ASSEMBLY

William M. Thorn, Killen, Ala., assignor to Hunt Holdings, Inc., Wilmington, Del.

Filed Mar. 22, 1991, Ser. No. 673,329
Int. Cl.[5] A47B 3/06
U.S. Cl. 108—153 3 Claims



1. A table support assembly, comprising:

at least one hollow metal rail securable to a table top;

channel members of rectangular cross-section, one bonded to each end of said at least one rail, each said channel member having a first face which covers and extends below an open end of said rail member;

at least two internally-threaded insert members bonded to and extending within each of said channel members, each of said insert members having its threaded portion extending horizontally and parallel to said rail, said channel members each having holes in the wall thereof opposite from said face, which holes are aligned with said threaded portions, at least one of said insert members on each of said channel members being at a position which is lower than said rail;

table support means for supporting said table on a floor; and

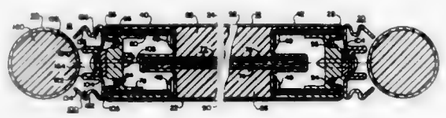
threaded fasteners extending through said table support means and said holes into said threaded portions of said insert members, to hold said table support means against said channel member.

5,14 ,997

PROJECTILE RESISTING SPACE DIVIDING SYSTEM

Ronald B. DeLong, Belmont; Michael W. Worthington, Big Rapids, and Floyd L. Cook, Jr., Muskegon Heights, all of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 199 , Ser. No. 607,421
Int. Cl.[5] F06B *9/00*
U.S. Cl. 109—49.5 18 Claims



1. A space dividing syste which resists penetration by projectiles, comprising:
a substantially rectangular panel,
said panel having first and second major opposed sides, and first and second vertical edges,
said panel including a metallic frame having upper and lower tubular rails and first and second tubular stiles which cooperatively defi e a window,
said upper and lower rails and first and second stiles having substantially flat front and back surfaces disposed in common front and back planes, respectively, inner surfaces which define said window, and outer surfaces,
each of said upper and lower rails and said first and second stiles having a configuration which defines a channel in the inner surface, with the channels in the inner surfaces of the rails and stiles cooperatively providing a continuous annular channel about the frame window,
each of said first and second stiles further defining first and second inner pockets respectively adjacent to the front and back surfaces,
projectile resistant material disposed in the first and second pockets of each of the first and second stiles,
and a rigid layer of projectile resistant material disposed in the frame window,
said rigid layer of projectile resistant material having first and second major opposed surfaces and perimetrical edges, with said perimetrical edges projecting into said annular channel, between and overlapping the first and second pockets containing the projectile resisting material.

5,14 2,998

APPARATUS AND METHOD FOR TREATING CONTAMINATED GAS EMISSIONS

Frederick E. Feitel, 10311 Mooreville Rd., Saline, Mich. 48176

Division of Ser. No. 442,133, Nov. 28, 1989, Pat. No. 5,005,495.
This application Dec. 11, 1990, Ser. No. 629,375
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] F23J *15/00*
U.S. Cl. 110—215 9 Claims

1. Apparatus for treating contaminated gas emissions received from a particulate material processor including a heating unit having a housing in which contaminated particulate material, such as soil, sludge or the like having volatile organic contaminants, is heated to remove the organic contaminants therefrom as contaminated gas emissions, the apparatus comprising:
an emissions processor including:
(a) a recirculating emissions pretreatment circuit having an inlet that receives the emissions from the heating unit and a fan that draws the emissions into the pretreatment circuit through its inlet, the pretreatment circuit having a condenser for removing condensible gases from the emissions and also having an outlet through which the pretreated emissions are returned back to the heating unit, and the fan of the emissions pretreatment circuit being located between the condenser and the outlet of the pretreatment circuit; and
(b) a final treatment system having an inlet from the pretreatment circuit at a location between the condenser

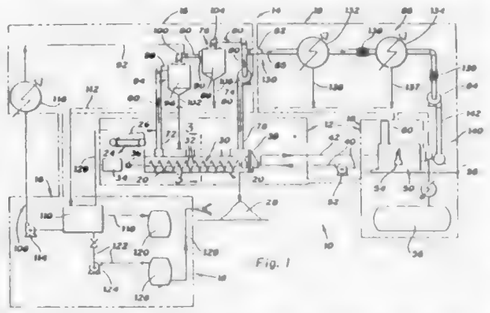


Fig. 1

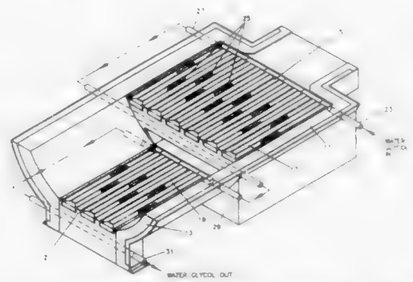
and the outlet thereof, the final treatment system including a fan for drawing off through its inlet a portion of the pretreated emissions flowing along the pretreatment circuit, and an emissions treater for treating the emissions to reduce the concentration of the organic contaminants.

5,142,999

INCINERATOR WITH FLUID-COOLED HEARTH

Mehran Etemad, Berwyn; Farshad Tavassoli, Norristown, and William E. Marceau, Sagertown, all of Pa., assignors to Axxon Corporation, Blue Bell, Pa.

Filed May 17, 1991, Ser. No. 702,008
Int. Cl.[5] B09B *3/00*; F23D *14/00*
U.S. Cl. 110—235 24 Claims



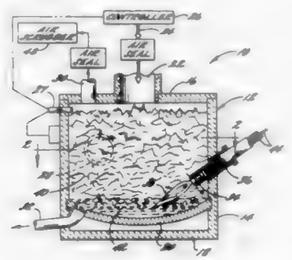
1. In an incinerator, the incinerator including a combustion hearth, the hearth having a combustion surface, the improvement wherein the combustion surface of the hearth comprises a refractory material which is formed as a slab with a plurality of upwardly-extending projections integrally formed with the slab, the projections defining a serpentine channel, and conduit means disposed within said channel, the conduit means occupying most of the channel, the conduit means including means for introducing a fluid into the conduit means.

5,143,000

REFUSE CONVERTING APPARATUS USING A PLASMA TORCH

Salvador L. Camacho, Raleigh, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed May 13, 1991, Ser. No. 698,914
Int. Cl.[5] F23G *5/00*, *5/10*
U.S. Cl. 110—250 12 Claims



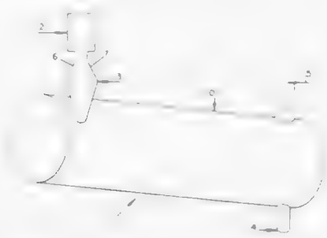
1. Apparatus for converting refuse, comprising:
an upstanding furnace chamber;
a hearth within and adjacent the bottom of said chamber;
refuse inlet means adjacent an upper portion of said chamber, refuse entering said chamber via said inlet means defining a column extending upwardly from said hearth;
an elongate plasma torch having a forward end from which a stream of hot plasma is emitted during operating of said torch;
said end of said torch being disposed within said chamber closely adjacent the bottom of said mass of said refuse, whereby heat generated by said torch passes through and along substantially the entire height of said column, and
first and second gas outlets communicating with said furnace chamber at first and second different elevations therein for conducting gases produced by heating of said refuse from said chamber.

5,143,001

PROCESS AND A DEVICE FOR TRANSFERRING LEACHABLE SUBSTANCE IN WASTE MATERIAL INTO GAS OR LEACH STABLE COMPOUNDS

Sven Eriksson, Falun, Sweden, assignor to SKF Plasma Technologies, Hofors, Sweden

Continuation of Ser. No. 469,637, Jan. 24, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 814,228
Claims priority, application Sweden, Jan. 25, 1989, 8900254
Int. Cl.[5] F23J *7/00*
U.S. Cl. 110—345 7 Claims



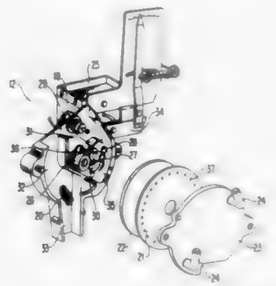
1. A process for converting environmentally harmful substances into gas or leach-stable compounds, comprising
i) providing at least one environmentally harmful substance containing at least one member selected from the group consisting of fluorides, sodium and cyanides, and which is in finely divided particulate form;
ii) pre-eating said environmentally harmful substance in a pre-reaction chamber, thereby producing a pre-heated harmful substance;
iii) providing a fuel in a furnace and combusting said fuel therein to maintain a furnace temperature which permits reaction of said pre-heated harmful substance with at least one reactant;
iv) reacting said preheated harmful substance with at least one reactant, thereby converting said pre-heated harmful substance into a gas or a leach-stable compound.

5,143,002

DEVICE TO STIR AND FEED SEEDS FOR PNEUMATIC DISTRIBUTORS OR SOWING MACHINES

Luigi Gaspardo, S.Vito al Tagliamento, Italy, assignor to Gaspardo SpA, Morsano Al Tagliamento (PN), Italy

Filed Oct. 26, 1990, Ser. No. 603,371
Claims priority, application Italy, Oct. 26, 1989, 83496 A/89
Int. Cl.[5] B65H *3/60*; G01F *13/00*
U.S. Cl. 111—185 6 Claims



1. A device to stir and feed seeds for pneumatic distributors of sowing machines, comprising:
a housing;
a perforated disk mounted in said housing on a drive shaft, said perforated disk dividing an interior of said housing into at least a first chamber on one side of said perforated disk and a second chamber on another side of said perforated disk, said first chamber having a space for entry of seeds;
a rotatable body mounted in said first chamber between said drive shaft and a sidewall of said housing, said rotatable body comprising at least two substantially filiform, elongate, resilient projections cooperating with said space for entry of seeds, wherein said projections take on a substantially arcuate form during rotation of said rotatable body so as to stir and separate seeds entering and within said first chamber, said projections have a length such that end portions of said projections scrape on said sidewall of said housing and on said drive shaft during rotation of said rotatable body; and
means for continuously rotating said rotatable body.

5,143,003

TUFTING MACHINE HAVING AN INDIVIDUAL NEEDLE CONTROL SYSTEM

George D. Dedmon, 106 Lovella, Rte. 7, Ringold, Ga. 30736

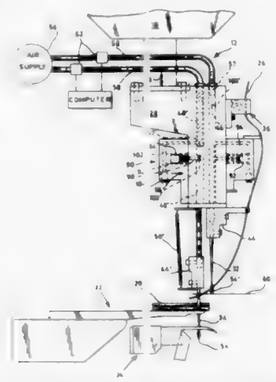
Continuation-in-part of Ser. No. 312,446, Feb. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 172,463, Mar. 24, 1988, Pat. No. 4,852,505. This application Nov. 13, 1990, Ser. No. 612,830
Int. Cl.[5] D05C *15/20*, *15/34*
U.S. Cl. 112—80.43 9 Claims

1. A tufting machine for inserting yarns into stitching in a base fabric, comprising:
at least one needle bar means;
a reciprocating carrier for said needle bar means;

means for supporting said base fabric in a plane substantially transverse to the reciprocation of said carrier;

needle means carrier by said needle bar means for penetrating said fabric wherein reciprocation of said carrier imparts a reciprocating movement to said needle means which are moved along preselected axes substantially transverse to said plane of said base fabric, said needle means including a plurality of needles selectively positionable on preselected axes within a preselected range of travel defining a stroke of said needle means, said stroke being selectively positionable along said preselected axes;

control means for independently adjusting the axial position of said stroke of each of said plurality of needles for selectively penetrating said fabric while said carrier reciprocates, said control means including pneumatic actuating means operatively associated with each of said plurality of needles for independently adjusting said axial position of



each of said plurality of needles with respect to said carrier, said control means independently adjusting said axial position of said stroke of each of said plurality of needles upon actuation of said pneumatic actuating means to a first selected pressure within said control means; and

pneumatically actuated locking means for independently and positively securing each of said plurality of needles in a sewing position when said stroke of said needle means is adjusted to a first stroke position for penetrating said fabric, said pneumatically actuated locking means independently and positively securing each of said plurality of needles upon actuation of said pneumatic actuating means to said first selected pressure within said control means and said pneumatically actuated locking means maintaining said independent and positive securement of each of said plurality of needles at a second selected pressure within said control means said second selected pressure being less than said first selected pressure.

5,143,004

SEWING APPARATUS INCLUDING AUTOMATIC BOBBIN RELOADING

Bar-Cochva Mardix, 39/B Harchasim St., Ramat Gan; Yaacov Sadeh, 11/6 Bialik Street, Nes Ziona, and Yaacov Makover, Moshav Beit Elazari, all of Israel

Continuation of Ser. No. 235,748, Aug. 23, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 522,392

Claims priority, application Israel, Nov. 25, 1987, 84584

Int. Cl.[5] D05B *59/04*

U.S. Cl. 112—186 17 Claims

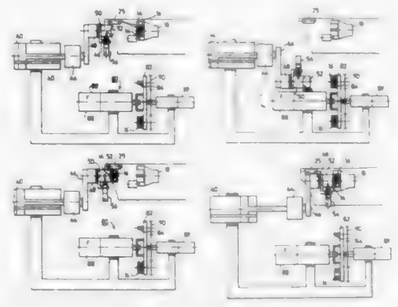
1. Sewing apparatus comprising:

a reciprocating sewing needle;

a bobbin within a case for feeding thread to the sewing needle, said bobbin and its case being disposed within a rotary housing which is rotated in synchronism with the reciprocations of the sewing needle;

sensor means for sensing a non-feeding of thread to the sewing needle; and

extraction-reloading means automatically effective upon



sensing the non-feeding of the thread to the sewing needle, for first extracting the bobbin and its case from the rotary housing, then extracting the bobbin from its case, then reloading the case with another bobbin having a supply of thread thereon and then returning the case with its reloaded bobbin into said rotary housing.

5,143,005

CONTRIVANCE FOR PASSING A GRASPING DEVICE FOR A THREAD INTO THE EYE OF A SEWING NEEDLE, AND APPLICATION OF THIS CONTRIVANCE

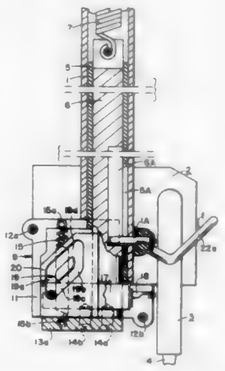
Antonio Jimenez, Meyrin; Yves Combepine, Bernex both of Switzerland, and Patrice Déeplante, Annemasse, France, assignors to Mefina S.A., Switzerland

Filed May 3, 1991, Ser. No. 695,227

Claims priority, application Switzerland, May 3, 1990, 1505/90

Int. Cl.[5] D05B *87/02*

U.S. Cl. 112—225 28 Claims



1. A contrivance for passing a device for grasping a thread into the eye of a sewing needle affixed to a support, including

a first movable means and first means solid with said support for guiding the first movable means, along a first path,

a second movable means and second means, solid with said first movable means, for guiding said second movable means along a second path,

stop devices limiting the displacement of each movable means on the respective path between a first and a second extreme position,

first restoring means and second restoring means tending to maintain the first and second movable means in their first extreme position, said first and second restoring means, being such that the effort to move the first and second movable means away from said first extreme position is greater for the second movable means,

means for driving said first and second movable means on their respective paths from the first extreme position to the second extreme position, against the action of said first and second restoring means,

a third movable means carrying said grasping device and a ramp for guiding said third movable means along a third path, the ramp being solid with said first movable means and having a profile and an orientation such that, when the first movable means occupies the second extreme position, the path imposed by the ramp upon said grasping device passes through the eye of said needle,

a kinematic linkage slaving said third movable means to said second movable means, wherein any displacement of said second movable means along said second path in a given direction corresponds to a similar displacement of said third movable means along said ramp, and wherein corresponding to the first and second extreme positions occupied by said second movable means on said second path are a first and a second limit position of said third movable means on said ramp such that, during the passage of said third movable means from the first to the second limit positions, said grasping device passes through the eye of said needle.

5,143,006

ASSEMBLY FOR DETACHABLY MOUNTING A TOOL ON A DRIVING MEMBER

Antonio Jimenez, Meyrin, Switzerland, assignor to Mefina S.A., Switzerland

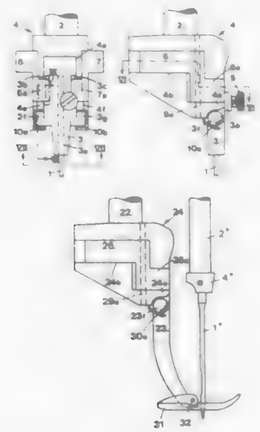
PCT No. PCT/CH90/00239, § 371 Date Jun. 13, 1991, § 102(e) Date Jun. 13, 1991, PCT Pub. No. WO91/05900, PCT Pub. Date May 2, 1991

PCT Filed Oct. 10, 1990, Ser. No. 689,818

Claims priority, application Switzerland, Oct. 13, 1989, 03742/89; Oct. 13, 1989, 03743/89

Int. Cl.[5] D05B *55/02, 29/12*

U.S. Cl. 112—226 15 Claims



1. Assembly for detachably mounting a tool on a driving member, comprising:

a tool carrier,

a mounting head for connecting the tool carrier to the driving member, the mounting head including at least one seat surface being cooperatively engaged with a corresponding portion of the tool carrier,

a device for holding the tool carrier in contact with the seat, and

means for positioning the mounting head in a specific position relative to the tool carrier when the tool carrier is held by the holding device, the positioning means including:

at least one stop member preventing displacement of the tool carrier on the seat,

abutment members disposed in a specific direction for preventing displacement of the tool carrier on the seat in any path transverse to said direction, and

at least one thrust member acting on the tool carrier in a direction for holding the tool carrier in permanent contact with the stop member in said specific position with respect to said mounting head,

said mounting head being formed by a body having at least a portion of an external surface hollowed out by a recess, said recess having a base, longitudinal side walls, a top wall and being open at one end thereof, at least a portion of the base of the recess forming said seat, at least a portion of the longitudinal side walls of the recess forming said abutment member, at least a portion of the top wall of the recess defining the other end of said recess forming said stop member,

said tool carrier including a plate portion having a shape which substantially corresponds to the shape of said recess of the mounting head, a first end of said plate portion being in contact with said stop member.

5,143,007

METHOD OF OPERATING SUBMERGED SUBMARINES AND SUBMARINE

Gunther Laukien, Silberstreifen, D-7512 Rheinstetten-Forchheim, and Arne Kasten, Karlsruhe, both of Fed. Rep. of Germany, assignors to Gunther Laukien, Rheinstetten-Forcheim, Fed. Rep. of Germany

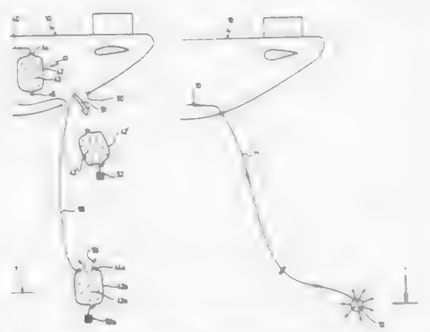
PCT No. PCT/DE90/00194, § 371 Date Nov. 15, 1990, § 102(e) Date Nov. 15, 1990, PCT Pub. No. WO90/10575, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 16, 1990, Ser. No. 602,317

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1989, 3908574

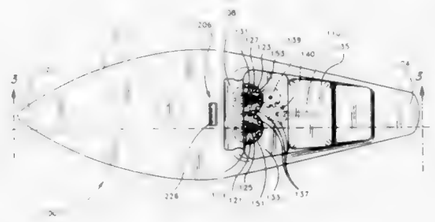
Int. Cl.[5] B63G *8/34*

U.S. Cl. 114—15 26 Claims



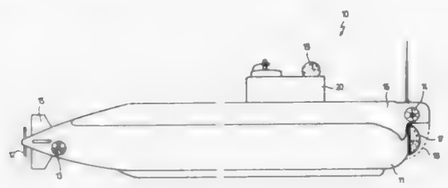
1. A method of operating submarines submerged in a surrounding sea, the method including a step of using sea water as cooling water to remove excess heat generated by the submarine during operating thereof, and including a further step of transferring the resulting heated-up cooling water into said surrounding sea, wherein said transferring step comprises the step of transferring said heated-up water to a depth far below said submarine.

5,14 ,008
SAILB DARD
Lawrence W. Hall, 675 4th St., Hermosa Beach, Calif. 90254
Filed Jul. 15, 199 , Ser. No. 729,704
Int. Cl.[5] B 3H *25/06*
U.S. Cl. 114—39.2 22 Claims



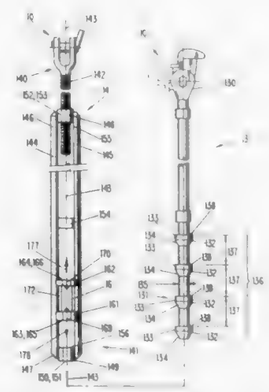
8. A wind-propelled sailboard craft, comprising:
a sailboard;
a sail assembly mounted on aid sailboard;
a dash formed on the upper surface of said sailboard, said dash being positioned such that a sailboarder operating said craft and holding said sail assembly may place his legs against said dash for support.

5,14 ,009
UNDERWATER VEHICL VITH A PASSIVE OPTICAL OBSERVATION SYSTEM
Günther Laukien, Silberstreife , Rheinstetten-Forchheim, Fed. Rep. of Germany
PCT No. PCT/DE90/00196, § 371 Date Nov. 15, 1990, § 102(e) Date Nov. 15, 1990, PCT Pub. No. WO90/10573, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 15, 990, Ser. No. 602,319
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1989, 3908575
Int. Cl.[5] B63B *3/13*
U.S. Cl. 114—66 8 Claims



1. An underwater vehicle having a pressure hull and having a passive optical observation system, said optical observation system having an entrance pupil with a diameter of more than 0.1 m and comprising:
an observation window having a diameter in the range from 0.3 to 3.0 m and having a curved surface;
a lens system with an entrance pupil, the diameter of which is less than the diameter of said observation window, said lens system being gimbal mounted to said pressure hull, having axes about which it may be rotated, and being stabilized with respect to said axes by means of a gyroscope; and
means for moving said lens system along an inner surface of said observation window.

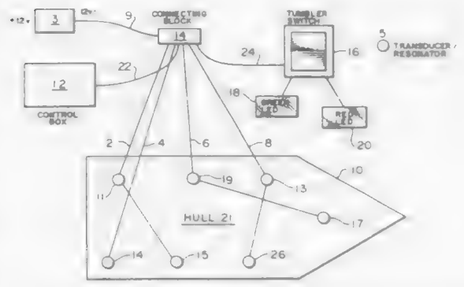
5,143,010
APPARATUS FOR SECURING CONTAINERS ON TRANSPORT VEHICLES
Peter Behr, and Matthias Horstmann, both of Hamburg, Fed. Rep. of Germany, assignors to MEC Marine Equipment and Consulting Behr and Horstmann GmbH, Hamburg, Fed. Rep. of Germany
Filed Oct. 4, 1990, Ser. No. 593,211
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1989, 3933131
Int. Cl.[5] B63B *25/24*
U.S. Cl. 114—75 12 Claims



1. In an apparatus for securing containers on transport vehicles, especially ships, comprising a connecting device, a first end of which is connectable to said container, and a clamping device, a first end of which is longitudinally adjustable via a threaded spindle and connectable to said transport vehicle, and with a second end of said connecting device which comprises a number of fastening stops with which a second end of said clamping device is connectable to said connecting device in suitably chosen increments, the improvement wherein:
said clamping device comprises a sliding carriage for receiving said fastening stops of said connecting device which sliding carriage is essentially freely movable in an axial direction of said clamping device;
said sliding carriage has at least two jaw-shaped cross-pieces for receiving and accommodating said fastening stops;
said cross-pieces have a respective through hole with a radial opening for receiving and accommodating said connecting device; and
said through hole of a first one of said cross-pieces, on a side facing said threaded spindle, is provided with a recessed portion which is essentially arranged axially to an axis of said through hole.

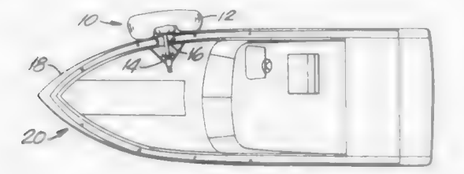
5,143,011
METHOD AND APPARATUS FOR INHIBITING BARNACLE GROWTH ON BOATS
Stephen Rabbette, 400 S. Beverly, Suite 214, Beverly Hills, Calif. 90212
Filed Feb. 5, 1991, Ser. No. 650,629
Int. Cl.[5] B63B *59/02*
U.S. Cl. 114—222 21 Claims

1. Apparatus for preventing barnacle growth and other marine life from growing on the hull of boats, the apparatus comprising in combination, a plurality of transducers adapted to be connected to the hull at spaced locations, and means for alternately driving the transducers to establish a resonance in the hull at a predetermined frequency, a plurality of channels each including at least one transducer and wherein said means alternately drives the channels so that the transducer in one



channel is energized while the transducer in another channel is de-energized.

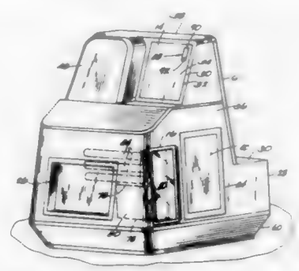
5,143,012
INFLATABLE TEMPORARY BOAT HULL SEAL ASSEMBLY
Marc J. Elkowitz, 28 Lighthouse Rd., Kings Point, N.Y. 11024
Filed Jul. 16, 1991, Ser. No. 730,461
Int. Cl.[5] B63B *43/16*
U.S. Cl. 114—227 9 Claims



1. An apparatus for temporarily sealing a hole extending from an inner surface to an outer surface of a hull of a boat comprising:
structural support portion including an elongated tubular member having opposed first and second ends, said tubular member having means for maintaining said support portion adjacent one of said surfaces of said boat hull;
generally circular inflatable hull seal portion extending from the second end of the elongated tubular member which when inflated is disposed adjacent to and in intimate contact with the other of said surfaces;
a container holding a volume of compressed material sufficient to fully inflate said inflatable hull seal portion, said container disposed in said elongated tubular member of said structural support portion, said container having a valve associated therewith and a flexible conduit extending therefrom for directing a rapid flow of compressed material into said inflatable seal portion, whereby said apparatus may be deployed by extending said inflatable seal portion through said hole and thereupon inflating said seal portion such that it is in intimate contact with one of said surfaces of said hull to prevent the passage of water though said hole.

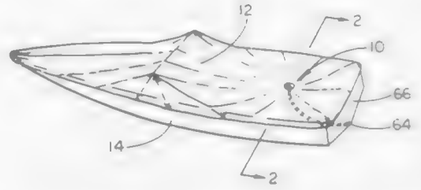
5,143,013
CENTER CONSOLE INCLUDING STORAGE LOCKER
Peter B. Huebner, Cape Coral, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Apr. 29, 1991, Ser. No. 693,940
Int. Cl.[5] B65D *1/22*
U.S. Cl. 114—343 9 Claims

1. A center console for a boat comprising a front side, a back side, a left side and right side, said sides defining a space therebetween, said back side also having a lower portion defining a vertical wall, a horizontally inclined shelf above said vertical wall, and first and second generally parallel, laterally adjacent, vertically inclined walls extending upwardly from said shelf,



said second vertically inclined wall being stepped forwardly from said first vertically inclined wall and said second vertically inclined wall having therein an opening, and a door closing said opening when in a closed position and located directly behind said first vertically inclined wall when in an open position.

5,143,014
TARPAULIN DRAINAGE SYSTEM
Daniel Gabison, 14553 SW. 77th St., Miami, Fla. 33183
Filed Jan. 11, 1991, Ser. No. 640,233
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—361 5 Claims



1. A drain apparatus for draining water from a top surface of a tarpaulin for covering a boat having a bilge and a drain hole through a transom thereof, the apparatus comprising:
a first member including a substantially flat top plate having a central aperture extending therethrough, said top plate structured and disposed for overlying engagement with the top surface of the tarpaulin in a substantially horizontal orientation,
said first member further including an elongate, hollow tube integrally formed about said central aperture on a lower side of said top plate and extending perpendicularly and downwardly therefrom, said hollow tube disposed in liquid receiving relation to the top surface of the tarpaulin and said central aperture,
said hollow tube including an open bottom end having a cutting edge disposed thereabout, said cutting edge terminating at a substantially sharp distal point, said cutting edge and said distal point being structured and configured for puncturing said tarpaulin so that said hollow tube can be readily passed therethrough in a substantially vertical orientation relative to said top plate and the tarpaulin,
a bottom keeper plate having an aperture formed therein being adapted for removable receipt about said hollow tube so as to be positioned in engaging relation with a bottom surface of said tarpaulin,
locking means for forcing said bottom keeper plate into

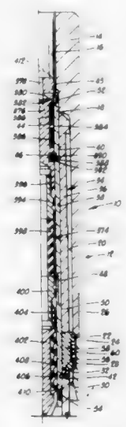
clamping relation to said top plate so as to maintain said first member in fixed attachment with the tarpaulin, and an elongate, substantially flexible conduit having a first end adapted for removable connection with said open bottom end of said hollow tube, said flexible conduit further having a second, opposite end adapted to be positioned in a drainage location, whereby water will drain from the top surface of the tarpaulin through said hollow tube and said flexible conduit attached thereto and out through said second, opposite end thereof.

5,143,015

COILED TUBING SET INFLATABLE PACKER, BRIDGE PLUG AND RELEASING TOOL THEREFOR

Eric P. Lubitz, Hartsville, S.C., and Scott T. MacLaughlin, Royal Palm Beach, Fla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 18, 1991, Ser. No. 643,297
Int. Cl.[5] E21B 33/127
U.S. Cl. 166—187 **36 Claims**



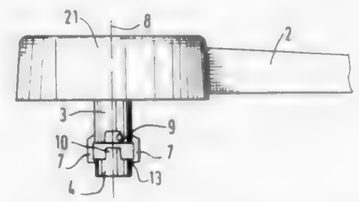
1. A downhole inflatable packing apparatus comprising:
an adaptor means for defining in inflation port therein;
mandrel means for sliding within said adaptor means and defining an inflation port therein aligned with said inflation port on said adaptor means when in an inflation position, said mandrel means being movable to a sealed position when weight is applied thereto wherein said inflation port in said mandrel means is unaligned with said inflation port in said adaptor means;
an inflatable packer element attached to said adaptor means and adapted for inflation by fluid pumped through the aligned inflation ports when said mandrel means is in said inflation position; and
pressure actuated releasing and locking means for releasing said mandrel means from said inflation position, thereby allowing movement of said mandrel means to said sealed position and for locking said mandrel means in said sealed position, wherein said pressure actuated releasing and locking means is moveable back to its initial position for releasing said mandrel means from said sealed position, thereby allowing movement of said mandrel means back to said inflation position and locking said mandrel means in said inflation position.

5,143,016

DIAL NEEDLE WITH INDEXED ANGULAR POSITION

Joël Fournier, Cergy Saint Christophe, France, assignor to Societe d'Applications Generales d'Electricite et de Mechanique Sagem, France

Filed May 7, 1991, Ser. No. 696,514
Claims priority, application France, May 16, 1990, 90 06108
Int. Cl.[5] G01D 13/22
U.S. Cl. 116—332 **7 Claims**



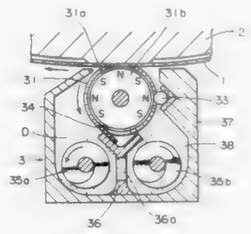
1. A measuring instrument dial needle for mounting on a drive shaft that extends along a shaft axis, said needle comprising:
(a) a body having a pointer extending radially of the shaft axis, and an interior axially-extending passage into which the shaft is inserted for joint turning movement about the shaft axis, said body being axially movable along the shaft;
(b) a support having an interior axially-extending passageway through which the shaft is inserted for joint turning movement about the shaft axis; and
(c) detachable connector means for integrally connecting the support and the body in a one-piece construction in which the body is spaced axially away from the support, said detachable connector means including weakened zones for detaching the body from the support upon axial movement of the body along the shaft to the support.

5,143,017

DEVELOPING DEVICE HAVING A BAFFLE PLATE BETWEEN PLURAL AUGERS WHICH CLEANS THE DEVELOPING ROLLERS

Satoshi Haneda; Masakazu Fukuchi; Shizuo Morita, and Shunji Matsuo, all of Tokyo, Japan, assignors to Konica Corporation, Japan

Filed Jan. 24, 1991, Ser. No. 645,586
Claims priority, application Japan, Jan. 29, 1990, 2-8033[U]
Int. Cl.[5] G03G 15/09
U.S. Cl. 118—658 **10 Claims**



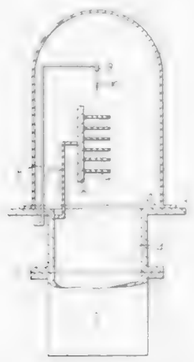
1. An apparatus for developing an electrostatic latent image on an image retainer with a developer by supplying said developer to said image retainer in a downstream direction, said apparatus comprising
a developing roll facing said image retainer comprising fixed magnetic poles arranged so as not to be in a position facing said partition,
a first agitating member and a second agitating member disposed below said developing roll,
a partition between said first member and said second member,
a developer remover on an upper portion of said partition for removing said developer from said developing roll,
a developer delivery portion upstream of said first agitating member, said first agitating member receiving said developer from said delivery portion and removed developer from said remover, said developer agitated by said first member is carried to and agitated by said second member, and said developer agitated by said second member is carried to said developing roll.

5,143,018

APPARATUS FOR DEPOSITING UNIFORM FILMS BY HOW-PRESSURE CHEMICAL VAPOR DEPOSITION

Douglas B. Meakin, Harrow-on-the-Hill, England, assignor to The General Electric Company, p.l.c., England

Continuation of Ser. No. 399,469, Sep. 5, 1989. This application Apr. 23, 1991, Ser. No. 690,041
Claims priority, application United Kingdom, Dec. 18, 1987, 8729547
Int. Cl.[5] C23C 16/00
U.S. Cl. 118—715 **5 Claims**



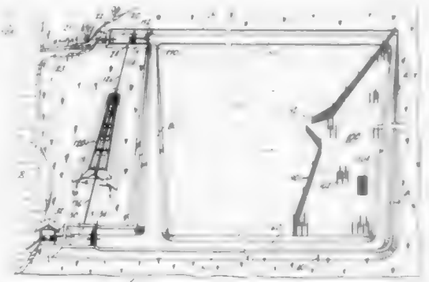
1. Apparatus for effecting deposition of a thin film of amorphous or polycrystalline silicon on a major surface of each of a plurality of substrates by a low-pressure chemical vapour deposition process, comprising:
(a) a deposition chamber having chamber dimensions and opposite ends;
(b) high-speed pump means connected to one of the ends of the chamber and operative to maintain the deposition pressure in the chamber at or below 20 milliTorr, the pump means having a conductance;
(c) a gas inlet adjacent the other of the ends of the chamber for introducing gas into the chamber so that the gas flows generally in a direction from the gas inlet to the pump means;
(d) substrate support means for supporting the substrates within the chamber oriented so that the major surfaces of the substrates are substantially perpendicular to the general gas flow direction;
(e) said chamber, said substrate support means and said substrates together having a combined conductance; and
(f) said chamber dimensions being so selected such that said combined conductance is at least ten times said conductance of the pump means.

5,143,019

APPARATUS AND PROCESS FOR FARMING SHRIMP

Gino Zane, 235 SW. LeJeune Rd., Miami, Fla. 33134

Filed Jan. 3, 1991, Ser. No. 638,278
Int. Cl.[5] A01K 61/00
U.S. Cl. 119—2 **7 Claims**



1. An impoundment for farming shrimp larvae and shrimp continuously and of specific size and said impoundment located in the proximity of salt and fresh water sources, comprising:
A. a retaining wall defining a substantially rectangular area with a channel adjacent to the inner side of said wall and a central portion having a bottom surface above the plane of a bottom surface of said channel, said central portion being substantially surrounded by said channel;
B. first reservoir means for storing salt water located in a corner location of said rectangular area in close proximity to said salt water source and at the end of said channel and said first reservoir means including means for discharging the salt water contained therein into said rectangular area and said means for discharging the salt water further including an outlet;
C. first pumping means for pumping the salt water from said salt water source into said first reservoir means;
D. second reservoir means for storing fresh water located in a corner location of said rectangular area in close proximity to said fresh water source and opposite to said first reservoir means;
E. second pumping means for pumping the fresh water from said fresh water source into said second reservoir means;
F. barrier means for dividing said rectangular area so that first and second sub-areas are defined and said first sub-area being farther away from said first and second reservoir means than said second sub-area, and said barrier means having an opening of relatively small dimensions with respect to said barrier means so that shrimp from said second sub-area is prevented from swimming into said first sub-area;
G. fishing net means positioned between said first reservoir means and said rectangular area so that the shrimps that are attracted towards the higher salinity areas can be captured with said fishing net means; and
H. a plurality of means for draining the water inside said retangular area to permit the regulation of currents, salinity, temperature, oxygen content, transparency, and hydrography of said impoundment.

5,143,020

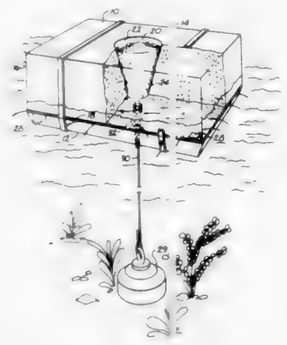
POND FERTILIZING APPARATUS

Joseph H. Patrick, 507 E. Creswell Ave., Greenwood, S.C. 29646

Filed Sep. 30, 1991, Ser. No. 767,508
Int. Cl.[5] A01K 61/00
U.S. Cl. 119—3 **4 Claims**

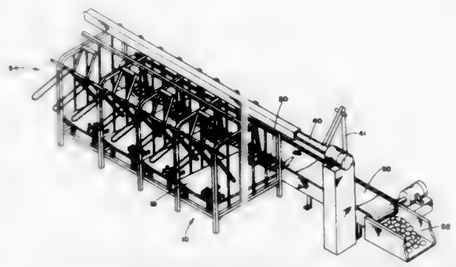
1. An apparatus for dispersing fertilizer in a pond comprising:

a floatation structure,
a receiver positioned below said floatation structure,
said floatation structure including a styrofoam block,
a funnel shaped opening provided in said styrofoam block having a large diameter opening adjacent a top of said styrofoam block and a smaller diameter opening adjacent a lower end of said block through which fertilizer is fed for being deposited in said receiver,
said receiver having a bottom with side walls extending upwardly therefrom,



said receiver being vertically spaced below said floatation structure,
spacers carried between said receiver and said styrofoam block for fixing the space between a bottom portion of said block and said receiver,
said floatation structure being of sufficient size to float on the surface of a body of water while permitting said receiver to be immersed below the surface of said water so that water can flow between said floatation structure and said receiver to dissolve any fertilizer deposited on said receiver.

5,143,021
AUTOMATIC ENCLOSURE NEST FOR DOMESTIC FOWL
Matti Shaley, 218 St. Andrews Rd., Statesville, N.C. 28677
Filed Sep. 19, 1991, Ser. No. 621,960
Int. Cl.[5] A01K *1/10*
U.S. Cl. 119—50 16 Claims



1. An automatic enclosure nest having an interior for receiving and ejecting domestic fowl comprising: a frame having continuous joining rails and side partitions cooperatively having a fowl entry and exit end and an egg removal end, the entry and exit end permitting the entry and exit of the domestic fowl and the egg removal end permitting the removal of the egg laid by the fowl while in the nest, a floor covering the nest interior movable from an inclined position assumed when the nest is empty to a substantially level position assumed when the fowl enters the nest and lays an egg on the then substantially level floor and back to the inclined position when the fowl leaves the nest, a trap positioned to allow the fowl entry to the nest when the nest is empty and to prevent fowl entry to the nest when the nest is occupied by another fowl; an ejector movable within the nest to force the fowl from the nest through the fowl entry and exit end; and means for driving the ejector to force the fowl from the nest through the fowl entry and exit end whereby an egg laid by a fowl while in the nest on the substantially level floor will roll from the nest through the nest egg removal end when the fowl is forced out of the nest and the floor on which the egg was laid returns to the inclined position.

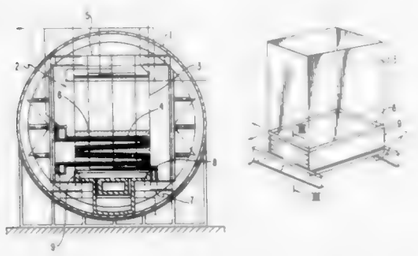
5,143,022
DEER FEEDER
John C. Fore, 33203 Hwy. 10-19, Denham Springs, La. 70726
Filed Oct. 4, 1991, Ser. No. 770,427
Int. Cl.[5] A01K *51/03*
U.S. Cl. 119—51.03 3 Claims

1. A method for feeding deer and other livestock, the method comprising the steps of:
(a) providing a container for a liquid feedstock, the container having a neck with a first set of threads on the exterior surface thereof;
(b) at least partially filling the container with the feedstock;
(c) providing a ball retainer having (c_1) a neck with a second set of threads on the interior surface thereof constructed and arranged to engage the first set of threads on the exterior surface of the neck of the container, (c_2) an indented shoulder, and (c_3) a retaining lip;
(d) disposing within the ball retainer a ball constructed and arranged to be rotatably retained between the indented shoulder and the retaining lip of the ball retainer and to dispense the liquid feedstock as the ball is rotated;
(e) attaching the ball retainer to the neck of the container by engaging the first and second sets of threads;
(f) inverting the container to bring the liquid feedstock into contact with the ball; and
(g) suspending the inverted container at a height where the ball can be licked by the livestock;
thereby providing a method for feeding the deer and other livestock by releasing the liquid feedstock in response to the rotation of the ball as the ball is licked by the livestock.

5,143,023
ANIMAL LITTER WITH CHEMICALLY BOUND CHEMICAL INDICATORS
Charles R. Kuhns, Pharr, Tex., assignor to KleanHeart, Inc., Austin, Tex.
Filed Oct. 16, 1990, Ser. No. 598,102
Int. Cl.[5] A01K *1/015*
U.S. Cl. 119—173 38 Claims

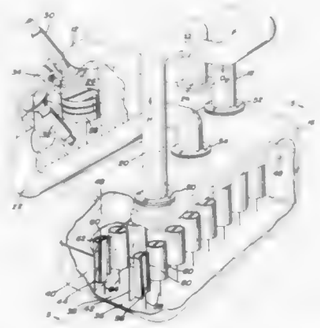
1. A litter for the accumulation of animal urine comprising a base material having the ability to exchange ions, and an effective amount of at least one chemical compound combined with the base material, where the chemical compound is selected from the group consisting of at least one chemical indicator which is free to react to provide a visual indication; at least one binding agent which is free to react to agglomerate with surrounding base material upon contact with a polyelectrolyte; and mixtures thereof.

5,143,024
PRESSURE FLUIDIZED BED FIRING BOILER
Tomomitsu Yokoyama; Katsuji Hamasaki, both of Tokyo, and Otsubo Koichiro, Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 13, 1990, Ser. No. 612,143
Claims priority, application Japan, Nov. 13, 1989, 1-131813[U]; Nov. 13, 1989, 1-131814[U]; Nov. 13, 1989, 1-294296
Int. Cl.[5] F22B *37/24*
U.S. Cl. 122—510 3 Claims



1. The combination of a cylindrical pressure vessel, a pressure fluidized bed firing boiler disposed within said pressure vessel, and support structure supporting said boiler in the pressure vessel,
said boiler having a main body including a suspended section and a bottom-supported section, and
said support structure including a support beam disposed at an upper interior portion of said pressure vessel and from which the suspended section of the main body of said boiler is suspended, a support beam disposed at a lower interior portion of said pressure vessel and supporting the bottom-supported section of the main body of said boiler at the bottom thereof, an expansion joint structurally interposed between said suspended section and the bottom-supported section of said pressure vessel so as to accommodate for differences in thermal expansion of said sections, the expansion joint comprising a metal plate having a plurality of undulations, and refractory heat-insulative material interposed between said metallic plate and the bottom-supported section of the main body of said boiler.

5,143,025
HYDROGEN AND OXYGEN SYSTEM FOR PRODUCING FUEL FOR ENGINES
John F. Munday, General Delivery, Shediac Bridge, New Brunswick, Canada E0A 3H0
Filed Jan. 25, 1991, Ser. No. 645,629
Int. Cl.[5] F02B *43/08*
U.S. Cl. 123—3 17 Claims

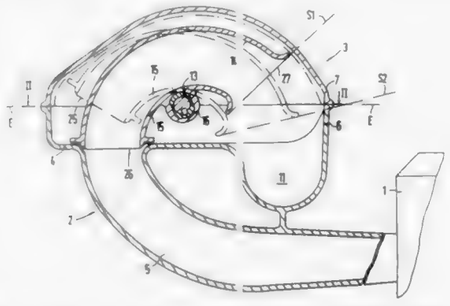


1. A water to fuel production apparatus for providing fuel for an internal combustion engine comprising:
a. a fuel production tank having at least a pair of dividers to separate said tank into a first compartment, a second compartment and a third compartment, where said pair of dividers seal each compartment from the others at the top of said tank, and connect said compartments along the bottom of said tank;
b. said first compartment having cathodes for the production of hydrogen, and an outlet connected to a hydrogen inlet pipe;
c. said second compartment having anodes for the production of oxygen, and an outlet connected to an oxygen inlet pipe;
d. said third compartment being between said first and said second compartment for providing water and exhaust water vapor to said compartments, and an inlet connected to an engine exhaust pipe for delivering exhaust water vapor to said third compartment;
e. said hydrogen inlet pipe and said oxygen inlet pipe being connected to an engine intake manifold for delivering fuel to the engine;
f. said cathodes and anodes having insulated cylindrical tubes surrounding each cathode and anode, each of said cathodes and anodes being supported above the bottom edge of said dividers and having electrical leads connected to a source of electricity to produce hydrogen and oxygen by electrolysis.

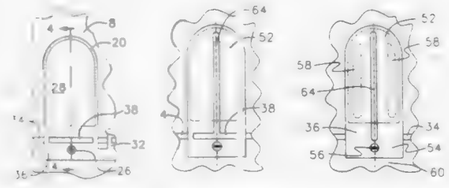
5,143,026
AIR INDUCTION SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE
Claus Brüstle, Heimsheim, and Winfried Krebs, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Dec. 23, 1991, Ser. No. 811,675
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1990, 4041200
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MB 9 Claims

1. An air induction system for a multi-cylinder internal-combustion engine, comprising at least one air collector, intake manifolds leading into an outer wall and connecting the at least one air collector to individual cylinders of the internal-combustion engine, pipe elbows operatively arranged inside the air collector, such that the pipe elbows in the air collector are held

openly on a shaft operatively arranged to be swivelled into multiple positions, wherein in one of the positions, one outlet opening of each pipe elbow rests directly on an inlet opening of the intake manifold.



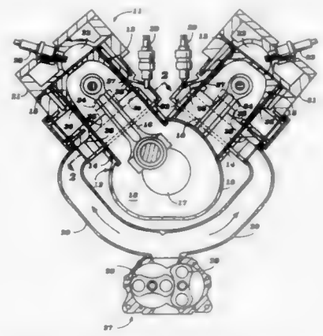
5,143,027
REED VALVES FOR TWO STROKE ENGINES
Robert M. Bergeron, Derry, N.H., assignor to Land & Sea, Inc., North Salem, N.H.
Filed May 1, 1991, Ser. No. 694,441
Int. Cl.[5] F02B 75/02
U.S. Cl. 123—65 V 17 Claims



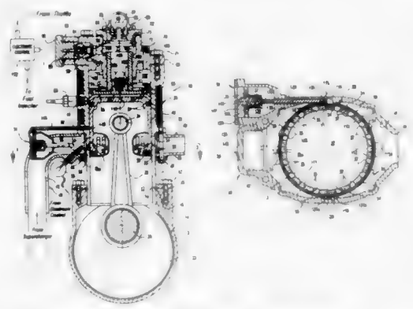
1. A reed for use in an intake of a two-stroke internal combustion engine comprising a resilient flat elongate member defining a central longitudinal axis, having a base end portion by which the reed may be attached to a reed valve body, a hinge area longitudinally contiguous with the base end portion and a free end portion opposite the base end; wherein
the hinge area and the free end portion are defined by a pair of substantially parallel lateral edges, said hinge area further having at least one completely closed opening therein extending through the member to define at least two laterally spaced hinge portions connecting the base end portion with the remainder of the member.

5,143,028
SUPERCHARGED V-TYPE TWO CYCLE ENGINE
Masanori Takahashi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed Dec. 6, 1990, Ser. No. 622,923
Claims priority, application Japan, Dec. 11, 1989, 1-320977
Int. Cl.[5] F02B 57/10, 33/38
U.S. Cl. 123—65 BA 13 Claims

1. A two cycle internal combustion engine having a pair of angularly related cylinder banks, defining a valley between said banks, each containing at least one cylinder bore, a pair of scavenge manifolds each at least partially encircling a cylinder bore of a respective bank, at least one scavenge passage extending from said scavenge manifold to the respective cylinder bore and opened and closed by a piston reciprocating therein, a crankcase containing a crankshaft rotatable about an axis, said cylinder banks extending on one side of a plane containing said crankshaft axis, and a supercharger for delivering a pressured charge to said scavenge manifolds positioned externally of said crankcase on the other side of said plane.

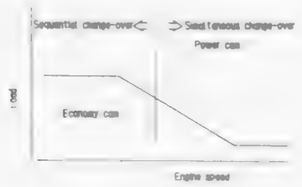


5,143,029
TWO CYCLE INTERNAL COMBUSTION HYDROCYCLE ENGINE
Howard W. Christenson, 128 W. 73rd St., Indianapolis, Ind. 46260
Division of Ser. No. 587,223, Sep. 24, 1990. This application Aug. 14, 1991, Ser. No. 745,277
Int. Cl.[5] F02B 75/02
U.S. Cl. 123—65 VA 7 Claims



1. An internal combustion engine comprising:
a hollow cylinder having a number of air intake ports and a number of gas exhaust ports therethrough in a common axial plane around said cylinder;
a compression piston reciprocatably disposed within said cylinder;
means for injecting an air-fuel mixture into said cylinder;
means for igniting said air-fuel mixture within said cylinder thereby producing combustion gases for driving said compression piston; and
a rotary valve assembly including;
a valve band rotatably encircling said cylinder at said common axial plane, said valve band having a number of first openings arranged to coincide with said air intake ports when said valve band is in a first position and a number of second openings arranged to coincide with said gas exhaust ports when said valve band is in a second position;
means responsive to the pressure within said cylinder for rotating said valve band around said cylinder between said first position and said second position, wherein said means for rotating said valve band includes;
a valve body defining a servo chamber;
a servo piston reciprocatably disposed within said servo chamber;
a gas pressure line communicating between said servo chamber and said cylinder; and
an actuator rod connected at one end to said valve band and at the other end to said servo piston such that reciprocation of said actuator rod rotates said valve band about said cylinder,
whereby said servo piston reciprocates within said servo chamber in response to changes in the pressure within said cylinder communicated through said gas pressure line, thereby reciprocating said actuator rod to rotate said valve band about said cylinder.

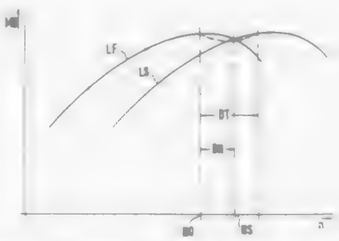
5,143,030
VARIABLE CAM ENGINE
Kenji Ikeura, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 21, 1991, Ser. No. 795,850
Claims priority, application Japan, Nov. 21, 1990, 2-316739
Int. Cl.[5] F01L 1/34
U.S. Cl. 123—90.16 4 Claims



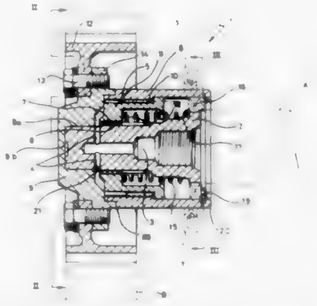
1. A variable cam engine wherein each cylinder has at least one valve driven by multiplicity of cams which given different engine torque outputs, comprising:
decision-making means which decides change-over of said cams along with a selection of a target cam according to the engine running conditions,
a cam change-oer mechanism which disengages a current cam from said valve and engages said target cam instead,
sensing means to sense crank shaft angle of the engine, sequential control means which, when said cam change-over is made at an engine speed below a predetermined speed, actuates said cam change-over mechanism at predetermined intervals starting from a specific cylinder and proceeding in turn through the other cylinders, and
regulating means which regulates the combustion in each cylinder corresponding to said cam change-over.

5,143,031
PROCESS AND AN ARRANGEMENT FOR INFLUENCING THE TIMING PERIODS OF AN INTERNAL-COMBUSTION ENGINE
Claus Bruestle, Heimsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Apr. 23, 1991, Ser. No. 689,471
Claims priority, application Fed. Rep. of Germany, May 4, 1990, 4014401
Int. Cl.[5] F01L 1/34; F02D 13/02
U.S. Cl. 123—90.16 24 Claims

1. A process for influencing the timing periods of an internal-combustion engine that has at least one intake valve and one exhaust valve used for a charge cycle, with the timing of the intake valve with respect to the exhaust valve being changeable by means of a shifting element controlled by an electronic control unit for at least one rotational shifting speed stored in the control unit, comprising:
displacing the rotational shifting speed to the value of an optimal rotational shifting speed that results in an optimal torque, said displacing being performed as a function of the time variation of the rotational speed of the internal-combustion engine by a rotational differential speed stored in at least one characteristic diagram of the control unit.



5,143,032
TIMING VARIATOR, PARTICULARLY FOR CHANGING THE RELATIVE TIMING BETWEEN A CAMSHAFT AND THE TIMING DRIVE MECHANISM OF AN INTERNAL COMBUSTION ENGINE
Renzo Tortul, San Pier D'Isonzo, Italy, assignor to Carraro S.p.A., Italy
Filed Jun. 28, 1990, Ser. No. 545,021
Claims priority, application Italy, Jun. 28, 1989, 41642 A/89
Int. Cl.[5] F01L 1/34
U.S. Cl. 123—90.17 12 Claims



1. A timing variator adapted to intervene, in use, between a shaft and a drive associated therewith, comprising:
a hub adapted to be coupled to said shaft,
an annular plunger fitted over said hub for axial translation over the hub,
an outer case surrounding said annular plunger to define relatively to the annular plunger at least one supply volume for a timing variator working servo-medium; said outer case being provided with means of coupling it to said drive,
toothed coupling means arranged between said hub and said annular plunger as well as between said annular plunger and said outer case, thereby causing, as a result of the longitudinal movement of the annular plunger relatively to said hub, a change in the relative angular positions of said hub and said outer case,
said outer case has a fully enveloping configuration with respect to said hub so as to provide complete isolation from the outside of said supply volume for said servo-medium,
said outer case comprises a cylindrical shroud portion encircling said annular plunger and a cap portion which covers the end of said hub remotely located, in use, from said shaft,

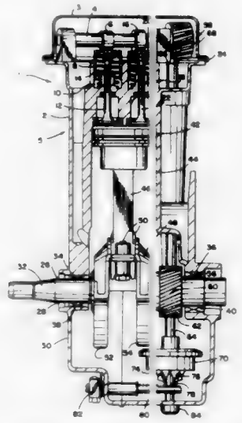
said shroud portion and said cap portion are connected to each other by welding means.

5,143,033

INTERNAL COMBUSTION ENGINE HAVING AN INTEGRAL CYLINDER HEAD

Robert K. Catterson, Brookfield; Norbert M. Vogl, Milwaukee, and Michael E. Kendziora, Hartland, all of Wis., assignors to Briggs & Stratton Corp., Milwaukee, Wis.

Filed Apr. 16, 1991, Ser. No. 685,835
Int. Cl.[5] F02F 7/00
U.S. Cl. 123—195 R 15 Claims



1. An internal combustion engine, comprising:
a first engine housing, including
at least one cylinder bore;
a first surface disposed near an end of said first engine housing;
a second engine housing including a second surface adapted to create an interface with said first surface;
a cam shaft disposed near said interface between said first surface and said second surface;
a crankshaft disposed near said interface between said first surface and said second surface;
a piston disposed within said cylinder bore; and
a connecting rod having one end interconnected with said piston and an opposite end interconnected with said crankshaft.

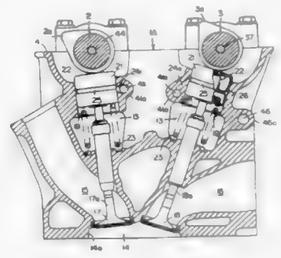
5,143,034

LUBRICATION SYSTEM FOR V-TYPE OVERHEAD CAMSHAFT ENGINE

Ichiro Hirose, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 28, 1991, Ser. No. 676,574
Claims priority, application Japan, Mar. 29, 1990, 2-33144[U]; May 24, 1990, 2-54785[U]
Int. Cl.[5] F01M 11/02
U.S. Cl. 123—196 R 9 Claims

1. A lubrication system for a double overhead camshaft engine having a cylinder head equipped with a hydraulic variable valve timing mechanism coupled to one of an intake and an exhaust overhead camshaft, the camshafts arranged in parallel to each other with respect to a crankshaft of the engine and supported, respectively, by bearing means for rotation and a hydraulic valve lash adjuster installed in the cylinder head for each valve, said lubrication system comprising:
a lubrication oil passage formed in said cylinder head for supplying pressurized oil to said bearing means for lubrication;
pressure regulating means disposed in said lubrication oil passage for providing a decrease in pressure of said pressurized oil;
a first oil supply passage formed in said cylinder head branching off from said lubrication oil passage ahead of said pressure regulating means for supplying pressurized oil to and lubricating said hydraulic valve lash adjusters;



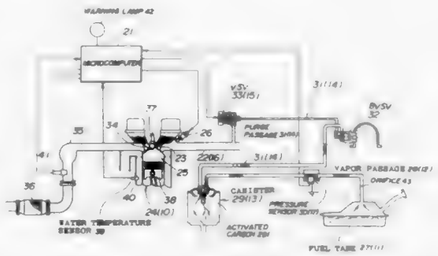
a second oil supply passage formed in said cylinder head extending from said first oil supply passage for supplying said pressurized oil to and actuating said hydraulic variable valve timing mechanism; and
control valve means disposed in said second oil supply passage for selectively opening said second oil supply passage to actuate said hydraulic variable valve timing mechanism with said pressurized oil.

5,143,035

APPARATUS FOR DETECTING MALFUNCTION IN EVAPORATED FUEL PURGE SYSTEM

Nobuaki Kayanuma, Gotenba, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 10, 1991, Ser. No. 777,757
Claims priority, application Japan, Oct. 15, 1990, 2-275607
Int. Cl.[5] F02M 33/02; F02D 77/00
U.S. Cl. 123—198 D 8 Claims



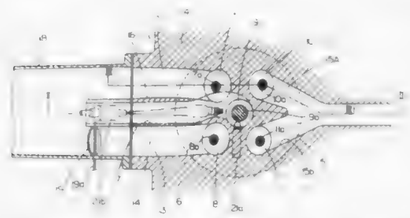
1. An evaporated fuel purge system for use in an internal combustion engine, comprising:
a fuel tank in which fuel is evaporated into a fuel vapor;
a canister including an adsorbent for adsorbing the fuel vapor from the fuel tank;
a vapor passage connecting said fuel tank to said canister for feeding the fuel vapor from said fuel tank into said canister;
a purge passage connecting said canister to an intake passage of the internal combustion engine for feeding the adsorbed fuel vapor in said adsorbent in said canister into said intake passage;
purge control valve means provided at an intermediate portion in said purge passage for controlling a flow of the adsorbed fuel vapor being fed by a vacuum pressure in said intake passage from said canister to said intake passage;
a pressure sensor provided at an intermediate portion in said vapor passage for outputting a signal indicative of pressure in said vapor passage; and
malfunction detection means responsive to said signal outputted by said pressure sensor for detecting a malfunction in said evaporated fuel purge system.

5,143,036

MULTI-VALVE INTERNAL COMBUSTION ENGINE

Toru Shiraishi; Shunji Masuda, and Noriyuki Iwata, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 27, 1991, Ser. No. 675,627
Claims priority, application Japan, Mar. 29, 1990, 2-84558
Int. Cl.[5] F02B 31/00
U.S. Cl. 123—308 9 Claims



1. A multi-valve internal combustion engine comprising:
a plurality of intake valves for one cylinder;
an engine body having a cylinder block formed with a cylinder bore, a cylinder head mounted on said cylinder block, and a piston, slidably received in said cylinder bore and, together with said cylinder block, cylinder bore and cylinder head, forming a combustion chamber; and
intake ports, in the same number as there are intake valves, formed in said cylinder head and opening into said combustion chamber, one of said intake valves disposed in each of said intake ports, one of said intake ports forming a helical passage opening into a center of said combustion chamber.

5,143,037

VARIABLE CAM ENGINE

Kunifumi Sawamoto, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 26, 1991, Ser. No. 797,950
Claims priority, application Japan, Nov. 26, 1990, 2-321678
Int. Cl.[5] F02D 9/00
U.S. Cl. 123—399 5 Claims

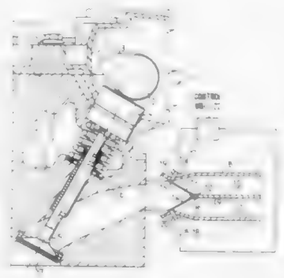
1. A variable cam engine including an economy cam having a profile which gives good fuel cost performance, a power cam having a profile which gives a large torque, means to select these cams according to the engine running conditions, and a mechanism to change over these cams such that the selected cam drives a valve of the engine, comprising:
means for detecting the accelerator depression of the engine,
a throttle valve provided in the engine air intake passage,
means for controlling the opening of said throttle valve such that a torque is generated according to said accelerator depression,
means for detecting said throttle valve opening,
means for computing a throttle valve target opening after a cam change-over such that the torque computed based on said throttle valve opening before the cam change-over is the same as the torque generated after the change-over,
means for computing an overshoot amount of said throttle valve from at least the engine speed and the difference of throttle valve opening before and after said change-over,
means for causing said throttle valve opening to overshoot by the computed amount compared to said target opening when a cam change-over is made,
means for computing a throttle valve return time constant based on at least the engine speed and the throttle valve opening immediately following said change-over, and
means for returning the throttle valve opening to said throttle valve target opening after said overshoot at a rate depending on said time constant.

5,143,038

INTERNAL COMBUSTION ENGINE WITH DELAYED CHARGING

Jan Dahlgren, Göthenburg, and Jan Karlsson, Västra Frölunda, both of Sweden, assignors to AB Volvo, a Swedish Body Corporate, Göthenburg, Sweden

Filed May 29, 1991, Ser. No. 707,066
Claims priority, application Sweden, May 30, 1990, 9001941-5
Int. Cl.[5] F02D 9/10
U.S. Cl. 123—403 5 Claims



1. In an internal combustion engine comprising a cylinder chamber, a piston in said cylinder chamber, an intake duct leading to said cylinder chamber, cylinder intake valve means for said cylinder chamber, auxiliary valve means arranged in said intake duct upstream of said intake valve means, and controlling means for controlling said auxiliary valve means to close said auxiliary valve means during an initial phase of an intake stroke of said piston to delay the flow of air-fuel mixture into said cylinder chamber, the improvement wherein said auxiliary valve means comprises two flaps, each flap being mounted at one end thereof such that the opposite end thereof is swingable between open and closed positions, said controlling means comprising electromagnetic operating means having activated and deactivated states, said electromagnetic operating means holding flaps in their closed positions during said activated state, said flaps arranged to swing in relatively opposite directions toward their closed positions, said mounted end of each flap being situated at a generally central location in said intake duct, said intake duct comprising two separate

passages separated by a partition wall, said flaps being arranged across respective ones of said passages.

5,143,039

FUEL DISTRIBUTOR FOR THE FUEL INJECTION SYTEMS OF INTERNAL COMBUSTION ENGINES

Karl Gmelin, Flein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

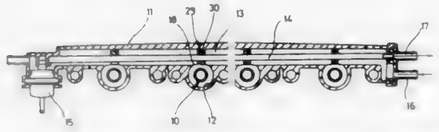
PCT No. PCT/DE90/00232, § 371 Date Jan. 2, 1991, § 102(e) Date Jan. 2, 1991, PCT Pub. No. WO90/13741, PCT Pub. Date Nov. 15, 1990

PCT Filed Mar. 23, 1990, Ser. No. 634,227

Claims priority, application Fed. Rep. of Germany, May 2, 1989, 3914487

Int. Cl.[5] F02M *55/02*

U.S. Cl. 123—470 6 Claims



1. A fuel distributor for fuel injection systems of internal combustion engines, having an elongate distributor housing which has a plurality of location holes made at axial intervals in a wall and at least one axially extending fuel line which leads tangentially past the location holes and which communicates with the location holes, in each case one opening penetrating the location hole wall and a fuel line wall, and a plurality of fuel injection valves which are inserted fluid-tightly in one location hole each, an annular space in said location hole surrounding said fuel injection valve, serving for a circulation of fuel, relative to the location holes, a valve space of the fuel injection valves inside a valve housing communicates with the annular space via at least one feed line, each fuel injection valve protrudes in each case with one fuel ejection opening out of the location hole, and flow restrictors (29) are arranged in the fuel line in association with each location hole (12), approximately centrally in relation to the opening (18) which permits fuel to flow into the fuel injection valve and to pass on to the next fuel injection valve in alignment therewith.

5,143,040

EVAPORATIVE FUEL CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

Koji Okawa; Kazuhiko Norota, and Hiroyuki Mizuno, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 7, 1991, Ser. No. 741,646

Claims priority, application Japan, Aug. 8, 1990, 2-211260; Aug. 31, 1990, 2-232046

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—684 15 Claims

1. An evaporative fuel control apparatus comprising:

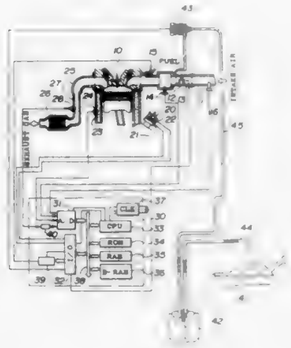
detection means for detecting operating conditions of an internal combustion engine and for supplying signals indicative of said operating conditions;

purge means for controlling a flow of fuel vapor from a fuel tank into an intake passage of the internal combustion engine;

calculation means for calculating a fuel injection amount in response to said signals supplied by said detection means;

first injection control means for varying a feedback correction factor of an air-fuel ratio of an air fuel mixture, in response to said signals supplied by said detection means, so as to maintain the air fuel ratio at a stoichiometric value, and for correcting the fuel injection amount which is calculated by the calculation means with the feedback correction factor thus varied;

second injection control means for correcting the fuel injection amount being calculated by the calculation means, in response to a concentration of fuel vapor in intake mixture which is determined from the feedback correction factor varied by the first injection control means; and



purge correction means for correcting a purging amount of fuel vapor being fed by the purge means into the intake passage, in response to the fuel vapor concentration determined from the feedback correction factor.

5,143,041

VENTING DEVICE FOR A FUEL TANK OF AN INTERNAL COMBUSTION ENGINE

Klaus Franzke, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

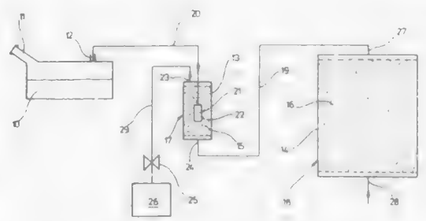
PCT No. PCT/DE90/00404, § 371 Date Feb. 25, 1991, § 102(e) Date Feb. 25, 1991, PCT Pub. No. WO91/00192, PCT Pub. Date Jan. 10, 1991

PCT Filed May 30, 1990, Ser. No. 656,092

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1989, 3921080

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—520 13 Claims



1. A venting device for a fuel tank of an internal combustion engine having a vent line which connects a vent branch of the fuel tank, via a fuel vapor filter having a storage effect for hydrocarbons, in particular an activated carbon filter, to atmosphere, and having an extraction line which leads to the intake system of the internal combustion engine and is connected to the fuel vapor filter, the fuel vapor filter is subdivided into a small-volume first filter part (17) and a large-volume second filter part (18) and the two filter parts (17, 18) are connected to one another by a relatively long tube (19) which prevents fuel crossing over as a result of diffusion and are arranged in series in the flow of fuel vapor in such a way that the vent and extraction line (20, 29) are connected to the first filter part (17) and the connection to the atmosphere is at the outlet (28) of the second filter part (18), and the volume of the first filter part (17) is dimensioned so that, after the completion of a test routine, comprising time phases of operation and of shut-off of the internal combustion engine, the first filter part (17) is laden to saturation with fuel vapor, and the volume of the second filter part (18) is dimensioned so that the quantity of fuel which evaporates during the filling of the fuel tank (10) can be absorbed by the said second filter part with the achievement of a high degree of loading.

5,143,042

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

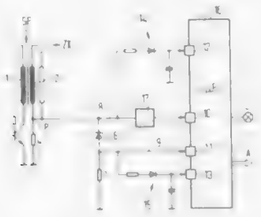
Günter Scheid, Pfakofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 5, 1991, Ser. No. 740,281

Claims priority, application European Pat. Off., Aug. 6, 1990, 90115095.3

Int. Cl.[5] F02P *17/00*

U.S. Cl. 123—630 5 Claims



1. An ignition device for internal combustion engines, comprising at least one ignition coil having primary terminals, first and second secondary terminals separated from said primary terminals, said first secondary terminal leading to at least one spark plug, a common point connected to said second secondary terminal, a sensor connected between said common point and a negative pole of a supply voltage source, a measuring line connected to said common point, an ignition control circuit connected to said measuring line for evaluating measurement signals being picked up at said measuring line, a series circuit of a voltage limiter and a resistor with a connecting point therebetween, said series circuit being connected parallel to said sensor, and a diagnosis line leading from said connecting point to said ignition control circuit and carrying diagnosis signals to be picked up and evaluated in said ignition control circuit.

5,143,043

ARROW POINT GUARD

Harry W. Brelsford, 233 E. Carrillo St., Ste. C, Santa Barbara, Calif. 93101-2187

Filed Feb. 14, 1991, Ser. No. 655,766

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—24.1 10 Claims

8. The combination of a bow having a bowstring, an arrow rest, a forward side, and a rear side; an arrow nocked in the bowstring and having a point, and an arrow guard, comprising:

a) a rod secured to the bow and projecting forwardly of the bow;

b) a transverse arm rotatably mounted on the rod;

c) and a cup-shaped arrow pint receptacle adjustably mounted on the arm and into which the forwardmost portion of the arrow pint is inserted whereby the point of the arrow is held to dispose the arrow close to the arrow rest of the bow.

5,143,044

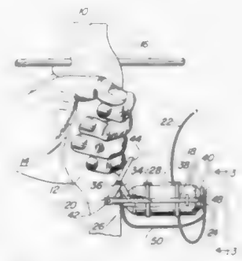
TRACKER ACTIVATOR FOR HUNTING BOW

Dana A. Bourquin, 3716 165th St., Blue Grass, Iowa 52726

Filed Jan. 18, 1991, Ser. No. 642,779

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—88 11 Claims



9. For use with a hunter's bow having adjacent to its grip portion a container for holding a supply of arrow-tracking string normally retained in the container by a removable cover on the container: activator mechanism, comprising a support mountable on the bow adjacent to the grip portion, ejector means movably carried by the support and including a portion engageable with the cover when the cover is on the container, said ejector means having an actuator portion manually operative by the hunter's hand grasping the grip portion of the bow for causing the ejector means to remove the cover from the container.

5,143,045

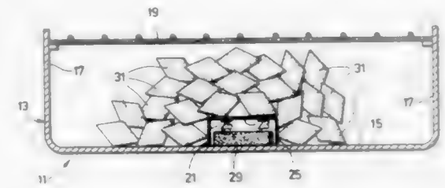
APPARATUS FOR IGNITING BRIQUETS

James A. Minnis, Rte. 4, Box 100, Terrell, Tex. 75160

Filed Sep. 16, 1991, Ser. No. 760,601

Int. Cl.[5] A47J *37/00*

U.S. Cl. 126—25 B 12 Claims

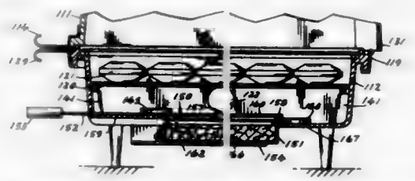


1. A method for preparing briquets for cooking food in a cooking utensil having a base for receiving briquets and a grill for supporting food above the briquets, the base having a width and a length, and the grill having a width and a length substantially the same as the corresponding width and length of the base, said method comprising the steps of:

providing an enclosure with a width and a length substan-

tially less than the corresponding width and length of the base;
placing a fire starter of solid flammable material within the enclosure and placing the fire starter and the enclosure on the base of the cooking utensil;
lighting the fire starter to create flames;
placing briquets on the base and over and in contact with the enclosure;
igniting the briquets with the flames from the starter;
placing the grill on the cooking utensil above the briquets for receiving food, and leaving the enclosure on the base under the briquets during cooking of the food.

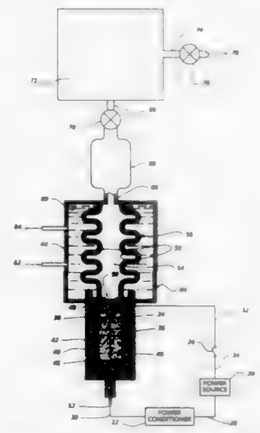
5,143,046
SOLIDIFIED OR SEMISOLIDIFIED FUEL BARBECUE GRILL
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Feb. 11, 1991, Ser. No. 653,599
Int. Cl.[5] F24C *5/00*
U.S. Cl. 126—43 **8 Claims**



1. A solidified or semisolidified fuel barbecue grill apparatus comprising:
a base member having a support portion constructed and arranged to support a cooking grid member;
solidified or semisolidified fuel support means connected to said base member to position solidified or semisolidified fuel below said grid member;
a grate member with spaced noncombustible material positioned thereon and between said cooking grid member and said fuel support means;
control means connected to said base member to adjustably and selectively expose said fuel to atmosphere in a uniform manner;
vent means in said base member to permit outside air to contact said fuel; and
a vented cover member supported by said base member and dimensioned to enclose a top of said base member.

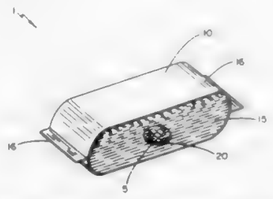
5,143,047
MATERIAL AND METHOD FOR FAST GENERATION OF HYDROGEN GAS AND STEAM
Woodrow W. Lee, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 20, 1991, Ser. No. 718,123
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] F24J *1/00*
U.S. Cl. 126—263 **20 Claims**

1. A method of generating hydrogen gas and useful heat energy, comprising the following steps in order:
(1) applying a high power pulse of electrical current to a metal electrical conductor causing the metal conductor to explode and thus disperse the metal into a mixture of water and an aluminum fuel powder which is
(a) aluminum metal powder or
(b) an aluminum alloy powder,
wherein the pieces of dispersed metal from the exploded conductor provide hot spots which initiate a chemical reaction between the aluminum fuel and water to generate hydrogen gas at high pressure and temperature in a confined first chamber;
(2) continuing to supply the high powered pulse of electrical current to drive the reaction between the aluminum fuel and water after the metal conductor has exploded;
(3) allowing the reaction between the aluminum fuel and water to go substantially to completion;



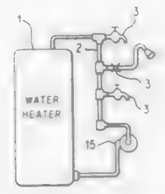
(4) then releasing the reaction mixture into a larger second chamber to complete the reaction;
(5) extracting useful heat energy from the reaction mixture by means of a heat exchanger; and
(6) separating the hydrogen gas from the remainder of the cooled reaction mixture.

5,143,048
DISPOSABLE INFANT HEEL WARMER
Henry H. Cheney, III, Campton, N.H., assignor to Consolidated Products and Services, Inc., Quincy, Mass.
Filed Sep. 23, 1991, Ser. No. 763,967
Int. Cl.[5] F24J *1/00*
U.S. Cl. 126—263 **6 Claims**



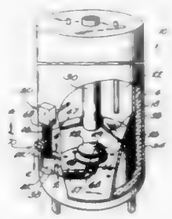
1. A disposable heat pack for warming the heel of an infant comprising:
a flexible container;
a supercooled aqueous sodium acetate solution carried within said flexible container; and
a nonmetallic, hermetically sealed container, comprised of two plates having perimeters fused together, containing sodium acetate crystal granules, said plates being made of a brittle plastic and each containing a knit line, said hermetically sealed container being confined within said flexible container in contact with said aqueous solution.

5,143,049
PUMP FOR SECONDARY CIRCULATION
Karsten A. Laing, and Nikolaus J. Laing, both of 632 Marsat Ct., Chula Vista, Calif. 92011
Continuation-in-part of Ser. No. 110,192, Oct. 19, 1987. This application Mar. 26, 1990, Ser. No. 498,711
Int. Cl.[5] F24H *1/00*
U.S. Cl. 126—362 **3 Claims**



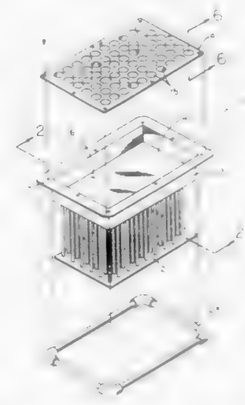
1. In a plumbing installation wherein hot water is piped from a reservoir to a plurality of taps by a distribution conduit, and wherein the distal end of the conduit is connected to the reservoir through a centrifugal recirculation pump protected by a backflow-inhibiting check valve, said pump having a rotary impeller directing water from the impeller hub region toward a peripheral, annular channel leading to an outlet port, wherein said impeller is attached to the rotor of a spherical gap electrical motor, said rotor and impeller being rockingly held against a single, central ball-bearing by magnetic coupling between the rotor-driven pole ring and the driving pole ring of the motor stator, the improvement comprises:
deleting the check valve; and
limiting the effect upon the pump of any backflow created by the drawing of hot water through the taps, including increasing the size of the peripheral channel.

5,143,050
WATER HEATER HEAT ROLLOUT SENSOR
Michael E. Spivey, Hartsville, S.C., assignor to AOS Holding Company, Wilmington, Del.
Filed May 10, 1991, Ser. No. 698,706
Int. Cl.[5] F23N *5/24*
U.S. Cl. 126—374 **10 Claims**



1. A water heater comprising
a tank defining a water chamber,
a combustion chamber located beneath said water chamber,
a flue extending through said water chamber and having a lower end communicating with said combustion chamber,
a gas burner located in said combustion chamber,
an outer jacket surrounding said tank and said combustion chamber, said jacket having therein an opening affording access to said burner,
a door closing said opening,
means for supplying gas to said burner, said supplying means including a gas conduit communicating with said burner, said conduit extending exteriorly of said jacket, and means for supplying gas to said conduit, said means for supplying gas to said conduit including a valve, and
means in contact with said conduit at a point substantially spaced from said burner for disabling said means for supplying gas to said conduit when the temperature of said supplying means exceeds a predetermined temperature, said disabling means closing said valve when the temperature of said conduit exceeds a predetermined temperature, and said disabling means including a sensor in contact with said conduit, said sensor being located exteriorly of said jacket and above said door.

5,143,051
PASSIVE SOLAR HEATING APPARATUS
Mark D. Bennett, 103 Macoupin Rd., Benld, Ill. 62009
Filed Dec. 16, 1991, Ser. No. 808,231
Int. Cl.[5] F24J *2/42*
U.S. Cl. 126—415 **5 Claims**

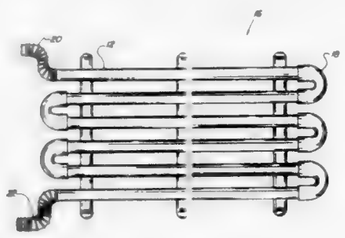


1. A passive solar heating apparatus, comprising,
a solar collector housing, the solar collector housing including a housing floor, and
a continuous housing side wall, and
a housing cavity defined within the housing above the floor within the side wall, and
a magnification lens member mounted coextensively over the cavity to an upper distal end of the side wall, and
a housing flange abutment integrally and orthogonally mounted to an upper distal end of the side wall extending exteriorly of the cavity, with a tubular flotation ring mounted in surrounding relationship relative to the side wall below the flange abutment in contiguous communication therewith, and
the lens assembly plate including a matrix of magnification lens members mounted within the lens assembly plate, and
a matrix of collector tubes integrally and orthogonally mounted to a bottom surface of the housing floor extending downwardly therefrom, the housing cavity and the collector tubes filled with aluminum oxide powder.

5,143,052
FLOATING SOLAR POOL HEATER
Terry E. Case, 4212 Meadowview Dr., Lakeland, Fla. 33809
Filed Oct. 7, 1991, Ser. No. 784,461
Int. Cl.[5] F24J *2/42*
U.S. Cl. 126—415 **3 Claims**

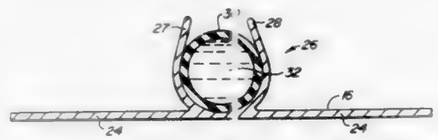
1. A new and improved solar pool heater comprising:
at least one conduit through which pool water may flow, said at least one conduit being exposed to solar energy so as to effect a heating of said pool water passing therethrough; and
float means attached to said at least one conduit, whereby

said conduit is maintained in a floating position on a surface of pool water, said float means comprising a sealed



tube having a captured air pocket, said sealed tube being positioned interiorly of said at least one conduit.

5,143,053
SOLAR COLLECTOR TUBE PLATE
Stephen C. Baer, Albuquerque, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.
Filed Mar. 11, 1991, Ser. No. 667,730
Int. Cl.[5] F24J *2/24*
U.S. Cl. 126—446 **8 Claims**

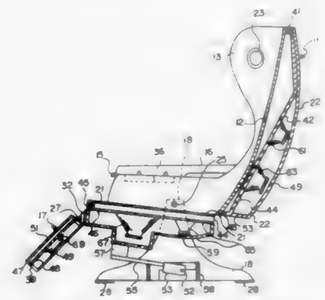


1. A conduit for a device such as a solar collector comprising:
a collector plate including a planar portion and a rigid elongate U-shaped channel portion, the channel portion of the collector plate intersecting the planar portion at the base of the U-shape and having legs extending away from the planar portion and tapering inwardly with respect to each other; and
a tube of elastic material adapted to carry a liquid subject to varying pressures due to freezing and other factors located within the channel portion of the collector plate, the interior surfaces of the legs of the channel portion proximate the planar portion of the collector plate being conformed to the exterior shape of the tube to confine the tube at least 50 percent but not the entirety of the circumference of tube, the distal portions of the legs extending beyond the surface of the tube,
whereby the unconfined portion of the tube stretches when the liquid expands with the inwardly tapered legs of the channel portion requiring that the radius of curvature of the unconfined portion of the tube decrease to minimize the chance that the elastic material will burst.

5,143,054
CERVICAL VIDEOSCOPE WITH DETACHABLE CAMERA UNIT
Edwin L. Adair, 2800 S. University Blvd., Denver, Colo. 80210
Continuation-in-part of Ser. No. 456,469, Dec. 22, 1989, Pat. No. 5,026,368, which is a division of Ser. No. 291,238, Dec. 28, 1988, Pat. No. 4,905,670. This application May 6, 1991, Ser. No. 695,727
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—18 **2 Claims**

1. A cervical videoscope apparatus including a vaginal speculum having a first fixed blade, a second blade mounted for pivotal movement toward and away from said fixed blade and spring means normally urging said second blade toward said first fixed blade, the improvement comprising:
a track mounted longitudinally along one of said blades;
a video camera unit removably mounted on said track;
a strap, having a first end fixedly attached to a first side of said track, extending around said video camera unit and having a second end with means for releasably attaching it to a second side of said track to secure said video camera unit to said track; and
means for adjustably positioning said video camera unit along said track for focusing.

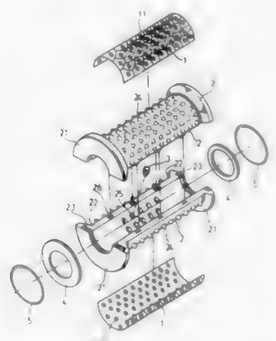
5,143,055
SOMATIC ACOUSTIC CHAIR
Byron C. Eakin, 3405 Ellenwood Ln., Tampa, Fla. 33618
Continuation of Ser. No. 459,098, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 238,424, Aug. 31, 1988, and a continuation-in-part of Ser. No. 417,690, Oct. 5, 1989. This application Oct. 3, 1991, Ser. No. 771,388
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—33 **3 Claims**



1. An acoustical somatic chair for exposing users to vibrations from sound for relaxing muscles and stimulating imagery, comprising:
a plurality of supports, each support having a lower chamber formed of a generally planar lower member, a generally planar intermediate member thereabove, and spacer members therebetween to define an essentially closed chamber, the spacer members of the lower chamber being rigid to define a fixed volume therebetween; each support also having an upper chamber formed of the generally planar intermediate member, a generally planar upper member thereabove, and spacer members therebetween to define an essentially closed chamber with a variable volume therebetween; loudspeaker means mounted in aperture means within each intermediate member with, the loudspeaker means facing upwardly for creating sound vibrations in the upper chamber to vary the volume of the upper chamber and with its magnet and coil means depending into the lower chamber; and resilient padding means disposed over the top surface of each generally planar upper member.

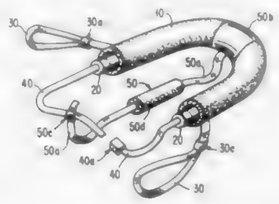
5,143,056
MASSAGING SLEEVE WITH MAGNETIC PROTUBERANCES
Chang Yih-Jong, P.O. Box 82-144, Taipei, Taiwan
Filed Jul. 30, 1991, Ser. No. 737,661
Int. Cl.[5] A61H *15/00*
U.S. Cl. 128—57 **1 Claim**

1. A massaging sleeve comprising:
a pair of half-cylindrical members that matingly engage to form a cylindrical member and have a body with a flange at both ends, said body being formed with a plurality of equidistant protuberances some of which are solid while others of which hollow in structure, said flange being provided with a recess;
a packing fitted into the recess of said flange;
a pair of pads each covering one of said half-cylindrical



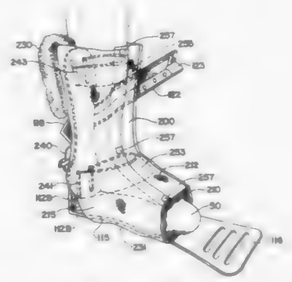
members and having a plurality of equidistant holes adapted to receive the protuberances of said cylindrical member;
a plurality of magnets each fitted into one of the hollow protuberances of said cylindrical member; and
two retainer rings for keeping said pads on said half-cylindrical members together.

5,143,057
OVERPRESSURE DEVICE FOR MECHANICAL TREATMENT OF THE HUMAN BODY
Louis J. DePasquale, 9 Remsen Cir., Yonkers, N.Y. 10710
Continuation-in-part of Ser. No. 440,514, Nov. 21, 1989, abandoned. This application Jun. 17, 1991, Ser. No. 716,071
Int. Cl.[5] A61H *7/00*; A63B *21/00*
U.S. Cl. 128—61 **20 Claims**



1. A therapeutic device for applying localized forces to areas of the body, such as the spinal column, of a living user, comprising:
body engaging means for locally contacting and applying a directed force against a portion of the body of a user, said body engaging means being of a firm bendable material and having a resiliently deformable surface adapted to be substantially conforming to the contour of said body portion and applying a manipulative force thereto when pressed firmly against it;
support means, extending substantially co-extensively within said body engaging means and being of a firmer bendable material than said body engaging means, for supporting said body engaging means along its length and pressing it against said body portion;
belt means connected to said support means for tying said support means about said body portion; and drawing means, fixedly attached to said support means, for applying a bending force to said support means to wrappingly press said body engaging means along its length with a firm evenly distributed pressure against said body portion.

5,143,058
FOOT AND LEG SPLINT
George H. Luber, Tampa, and Donna B. Maas, St. Petersburg, both of Fla., assignors to Care Co. Medical Products, Inc., Tampa, Fla.
Filed Nov. 6, 1990, Ser. No. 609,711
Int. Cl.[5] A61F *3/00, 5/04*
U.S. Cl. 602—28 **16 Claims**



1. A flexible foot splint comprising:
a unitary shell having an upright curved leg section and a curved foot section that extends substantially perpendicular to said leg section, the upright leg section being curved to partially embrace and support a patient's lower leg and the foot section being curved to support the arch of a patent's foot;
a heel section extending between said leg and foot sections, said heel section having an upright heel portion with a flattened rear surface extending over a predetermined distance between said curved leg section and a junction, and a flattened bottom portion extending substantially perpendicular to and joining said upright portion at said junction, said bottom portion having a flattened underside surface extending a predetermined distance from said upright heel portion to said curved foot section, said upright heel portion flexing in the vicinity of said junction between said upright and bottom portions of said heel section;
and means for removably securing to said shell a patient's foot and leg.

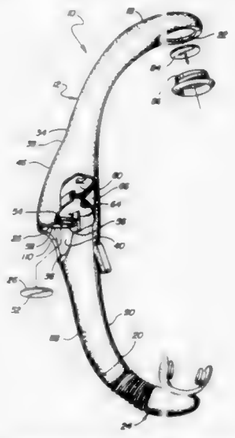
5,143,059
WATER TRAP FOR A SNORKEL
John B. Delphia, 1021 Schuyler Dr., White Lake, Mich. 48383
Filed Jul. 25, 1991, Ser. No. 735,847
Int. Cl.[5] B63C *11/16*
U.S. Cl. 128—201.11 **17 Claims**

1. A diving snorkel assembly (**10**) comprising:
a snorkel tube (**12**) having an inner surface (**14**) defining an air passageway (**16**) extending between first (**18**) and second ends (**20**) of said snorkel tube,
said first end (**18**) defining an air intake opening (**22**) in fluid communication with said passageway;
a mouthpiece (**24**) disposed on said second end of said snorkel tube (**12**) in fluid communication with said air passageway (**16**) and adapted to be received into the mouth of a skin diver;
a one-way exhaust valve (**26**) disposed between said mouthpiece (**24**) and said air intake opening (**22**) for allowing one-way flow of fluid out of said snorkel tube (**12**);
trap (**28**) means disposed in said air passageway (**16**) between said exhaust valve (**26**) and said air intake (**22**) for trapping liquid flowing through said air passageway (**16**) and re-

taining the liquid until the liquid is discharged from said snorkel tube (12) through said exhaust valve (26);

said trap means including duct means (30) surrounding said exhaust valve (26), extending into said air passageway (16) toward said air intake (22) and terminating at a receiving end (32) between said exhaust valve (26) and said air intake for providing fluid communication between said air passageway (16) and said exhaust valve (26);

said trap means further including canopy means (60) disposed in said air passageway (16) between said receiving



end (32) of said duct means (30) and said air intake (22) for channeling liquid flowing through said air passageway (16) into said duct means (30);

said canopy means (60) including a upper deflecting surface (62) and a lower deflecting surface (64) disposed between said upper deflecting surface and said receiving end (32) of said duct means (30);

said upper deflecting surface (62) being sloped down from a first end (72) adjacent said inner surface (14) of said snorkel tube (12) toward said duct means (30) to a second end (74).

5,143,060

INSULATED CARBON DIOXIDE ABSORPTION SYSTEM

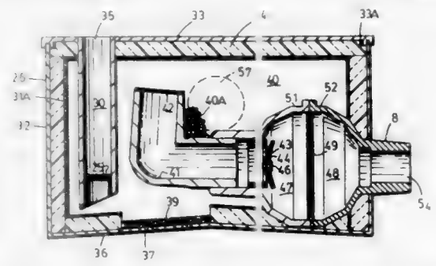
Charles A. Smith, 811 Starlite Dr., Louisville, Ky. 40207

Continuation-in-part of Ser. No. 363,531, June 8, 1989, abandoned.

This application Oct. 1, 1990, Ser. No. 590,947

Int. Cl.[5] H61M *16/22*

U.S. Cl. 128—205.28 **11 Claims**



1. A system for use with recirculation type breathing systems for conditioning air to be supplied to a patient including: conduit means from the patient to the system; enclosure means including a wall surrounding and retaining a bed of granular material for absorption of carbon dioxide from air exhausted from the patient through the conduit means; exhausted air inlet means to said enclosure means and return air outlet means from said enclosure means, where said exhausted air inlet means and return air outlet means are in communicative relation through said bed of granular material in said enclosure means; insulating means disposed adjacent and inside the wall of the enclosure means so that heat which is generated by adsorption of carbon dioxide onto said granular material is retained within said enclosure means and transferred to a return air stream emitted from said enclosure means; and a return conduit means in communicative relation between the return air outlet means and the patient for returning the return air stream to the patient.

5,143,061

SUPPLEMENTAL SEAL FOR OXYGEN MASK

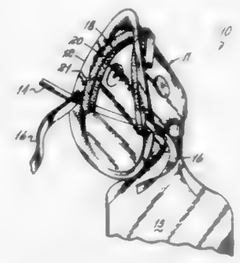
Stephen F. Kaimer, 5871 Long Spurling, Pleasant Plain, Ohio 45162

Continuation of Ser. No. 568,846, Aug. 17, 1990, abandoned.

This application Jul. 15, 1991, Ser. No. 730,220

Int. Cl.[5] A62B *18/08, 9/02*

U.S. Cl. 128—206.24 **6 Claims**



1. A method of delivering oxygen to a patient with a leakproof oxygen mask comprising the steps of:

providing a conventional oxygen mask having a peripheral sealing edge and a nose surrounding upper portion;

customizing the conventional oxygen mask to the face of a patient by,

(a) providing a strip of foam rubber having a length equal to approximately one-half of the circumference of said peripheral sealing edge,

(b) spacing said foam rubber strip inwardly of said peripheral sealing edge of said mask in said upper nose surrounding portion, locating said foam rubber in a position which will overlie the bridge of the patient's nose when the conventional oxygen mask is worn by the patient,

(d) adhesively attaching said foam rubber strip to said mask at said inwardly located position in said nose surrounding upper portion, thereby to provide cushioned engagement of said mask to the patient's face; and

(e) delivering oxygen to the patient via said customized mask.

5,143,062

ENDOTRACHEAL TUBE HAVING IRRIGATION MEANS

Keith A. Peckham, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

Filed Oct. 26, 1990, Ser. No. 605,216

Int. Cl.[5] A61M *16/04*

U.S. Cl. 128—207.14 **5 Claims**

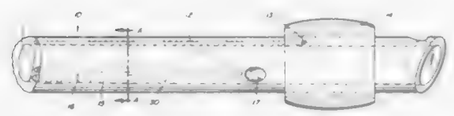
1. An endotracheal tube for insertion into the trachea of a patient, to enable mechanical ventilation of the lungs of the patient, said endotracheal tube comprising:

a main body comprising a tube having a wall surrounding and defining a single lumen tube, said main body comprising means to supply ventilating gases from an external source to the lungs of the patient and said main body having a proximal end and a distal end;

an inflatable cuff sealed to and surrounding said main body, at a location near the distal end of said main body, such that when said endotracheal tube is properly located within the patient, said inflatable cuff may be inflated to seal the trachea of the patient;

means to inflate and deflate said inflatable cuff; and

double lumen evacuating means for irrigation and/or for suction removal of secretions which may pool in the trachea around the endotracheal tube and above the inflatable cuff;



wherein said double lumen evacuating means comprises a first lumen and a second lumen formed within said wall of said main body, and extending parallel and in close proximity to each other, from the proximal end of said main body to a suction eye formed through a portion of said wall of said main body, said suction eye being located proximal to said inflatable cuff;

wherein said first lumen and said second lumen are separated by a separation wall along the majority of their lengths, from the proximal end of said main body to a position proximal to the beginning of said suction eye, such that said first lumen and said second lumen are connected at a position corresponding approximately to the location of said suction eye.

5,143,063

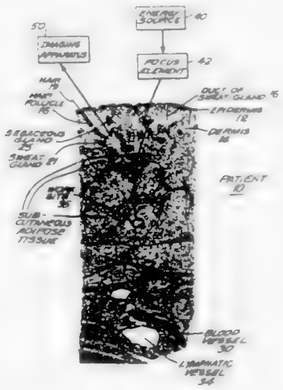
METHOD OF REMOVING ADIPOSE TISSUE FROM THE BODY

Donald G. Fellner, 40 E. 88th St., New York, N.Y. 10128

Filed Feb. 9, 1988, Ser. No. 153,963

Int. Cl.[5] A61F *7/00*

U.S. Cl. 128—399 **11 Claims**



1. A method of controlling obesity in a human subject by non-invasively eliminating excess healthy adipose tissue from a subcutaneous adipose tissue layer of the human subject, comprising the steps of:

determining a desired work site in the subject's subcutaneous adipose tissue layer containing excess healthy adipose cells to be eliminated;

focusing radiant energy on said cells to raise the temperature thereof; and

maintaining the energy focused on said work site until the excess healthy adipose tissue to be eliminated absorbs sufficient energy to cause cell destruction.

5,143,064

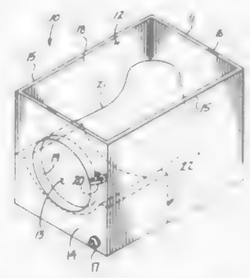
MEDICAL CHILLING APPARATUS

William P. Cochran, 300 Royal Oaks Blvd. #1303, Franklin, Tenn. 37064

Filed Nov. 5, 1990, Ser. No. 610,160

Int. Cl.[5] A61F *7/00*

U.S. Cl. 128—402 **1 Claim**



1. A medical chilling apparatus comprising,

a housing, the housing including a floor, a front wall, an end wall and spaced parallel side walls, and

a cylindrical opening directed medially through the front wall, and

a membrane means mounted interiorly of the housing and secured to the cylindrical opening for securement of an individual's foot therewithin, and

a chilling medium positioned within the housing in contiguous relationship with the membrane means for directing chilling of an anatomical body portion positioned within the membrane means, and

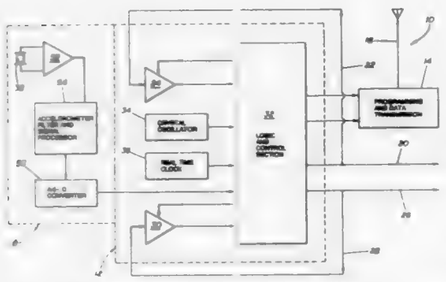
wherein the membrane means defines an "L" shaped fluid impermeable bag member, the bag member including a cylindrical forward end defining a bag diameter, and the cylindrical opening including a cylindrical collar defining a collar diameter, wherein the collar diameter is equal to the bag diameter, and a cylindrical clamp removably mounted about the cylindrical forward end of the bag member, and

wherein the front wall includes a drain plug removably mounted through the front wall adjacent the floor of the housing, and

wherein the bag member is wholly contained within the housing, and the housing includes an open upper end for reception of a chilling medium within the housing, and

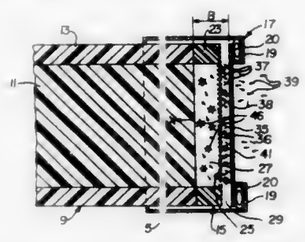
wherein the housing further includes a support, the support includes an arcuate top portion, wherein the arcuate top portion is in tangential alignment with a lower end portion of the cylindrical opening to receive and position the bag member thereon, and the support includes spaced parallel side legs, the spaced parallel side legs defining a predetermined width, and a width defined between the side walls interiorly of the housing equals the predetermined width, and the support is defined by a support length, and a length defined between the front wall and the end wall interiorly of the housing defines a predetermined length, wherein the predetermined length is greater than the support length.

5,143,065
IMPLANTABLE DEVICE WITH CIRCADIAN RHYTHM ADJUSTMENT
Robert A. Adkins, Angleton, and Ross G. Baker, Jr., Houston, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.
Division of Ser. No. 336,093, Apr. 11, 1989, Pat. No. 4,922,930.
This application Jan. 10, 1990, Ser. No. 463,233
Int. Cl.[5] A61N *1/362*
U.S. Cl. 128—419 PG 33 Claims



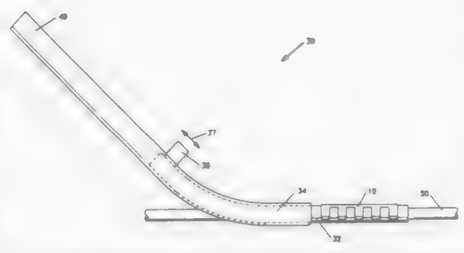
1. An implantable body function assistance device comprising:
means for influencing a body function of a patient;
means for sensing a parameter correlated to physiologic needs;
means for producing a predictive model of cyclic physiologic needs, the model comprising a plurality of periods, each period having a predicted duration and a predicted minimum physiologic need;
memory means for storing said predictive model
real time clock means synchronized with a diurnal cycle;
control means interconnecting the influencing means, the clock means, and the model producing means for controlling the output of said influencing means responsive to the model producing means and the clock means; and
means for modifying the model maintained by the memory means responsive to the sensing means and the real time clock means.

5,143,066
OPTICAL FIBER SENSORS FOR CONTINUOUS MONITORING OF BIOCHEMICALS AND RELATED METHOD
Claire Komives, and Jerome S. Schultz, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.
Filed May 8, 1990, Ser. No. 521,081
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—634 17 Claims



1. A sensor for sensing properties of sample analyte, for use with light source means and detection means operatively associated with an optical fiber, comprising:
a porous membrane, permeable to said analyte,
porous reflective surface means adjacent to said porous membrane, for defining a chamber therebetween,
dye-labeled analog-analyte in solution contained in said chamber,
receptor material disposed within said chamber, and said receptor material being capable of chemically binding with said analyte and said analog-analyte, and
transparent retention means wrapped across a wall of said reflective surface means facing out of said chamber such that said transparent retention means traps free dye-labeled analog-analyte which passes through said reflective surface means, and said retention means is transparent to an emission signal generated by fluorescence of said dye-labeled analog-analyte when said dye-labeled analog-analyte is excited with light.

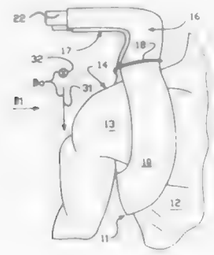
5,143,067
TOOL FOR IMPLANTABLE NEURAL ELECTRODE
Mark Rice, Monticello, and Robert J. Klepinski, St. Louis Park, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Jun. 7, 1990, Ser. No. 536,524
Int. Cl.[5] A61B *5/04;* A61N *1/05*
U.S. Cl. 128—642 4 Claims



1. An electrode system for implanting on nerve tissue having an outside diameter comprising:
a. an implantable electrode having a generally cylindrical body with a plurality of flexible circumferentially directed elements and having an electrically conductive surface;
b. a channel having an interior size greater than said outside diameter of said nerve tissue whereby said plurality of flexible circumferentially directed elements may be spread to position said implantable electrode on said channel and having said implantable electrode positioned thereon; and
c. means coupled to said channel for ejecting said implantable electrode from said channel.

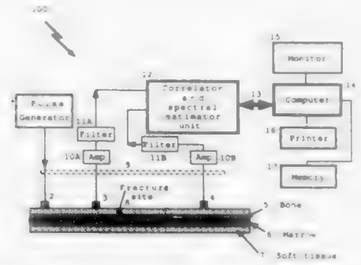
5,143,068
FLEXIBLE AND CURVED RADIO FREQUENCY (RF) COIL FOR THE HUMAN SHOULDER FOR MAGNETIC RESONANCE IMAGING APPARATUS
Frank Muennemann, Menlo Park, Calif., and Rodney Bell, Kalamazoo, Mich., assignors to Resonex, Inc., Sunnyvale, Calif.
Filed Nov. 26, 1990, Ser. No. 617,902
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.5 6 Claims

1. A shoulder coil assembly having a predetermined magnetic axis for transmitting and/or receiving signals from a human shoulder produced in a magnetic resonance imaging apparatus comprising:
inductive pickup coil means for substantially surrounding said human shoulder including a thin flexible, unitary, continuous band of conductive material substantially entirely covered with a flexible protective material, the central portion of said band being shaped to conform to the side of the human thorax and pass around the base of the arm, including when the band is laid out flat in substantially a single plane, a substantially 180 degree turn in said central portion around an axis perpendicular to said plane, the ends of the band terminating in connectors for



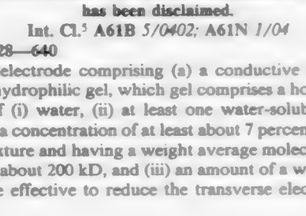
connection to a radio frequency cable for injection and/or extraction of the signals, said protective cover having facing interiors provided with mutually adhering surfaces which, when fastened together provide a conforming fit of the band to the top of the shoulder being imaged.

5,143,069
DIAGNOSTIC METHOD OF MONITORING SKELETAL DEFECT BY IN VIVO ACOUSTIC MEASUREMENT OF MECHANICAL STRENGTH USING CORRELATION AND SPECTRAL ANALYSIS
Seo J. Kwon, Worcester, Mass., and J. Lawrence Katz, Shaker Hgts., Ohio, assignors to Orthosonics, Inc., New York City, N.Y.
Continuation of Ser. No. 342,655, Apr. 24, 1989,. This application Aug. 3, 1990, Ser. No. 562,252
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.01 9 Claims



1. A method of measuring in vivo mechanical strength and structural integrity of hard tissues in a body having tissues, soft tissues and skin, comprising the steps of:
(a) mounting spaced apart ultrasound transducers over the skin and propagating an ultrasound signal from one of said transducers along the hard tissues and surrounding soft tissues;
(b) establishing a fixed reference signal for the ultrasound transducers;
(c) receiving the propagated ultrasound signal at another of said transducers;
(d) sorting the received propagated ultrasound signal according to a relative propagation delay time by correlating the received ultrasound signal with the fixed reference signal;
(e) determining a velocity, a propagation energy and a degree of dispersion of the ultrasound signal propagated along the hard tissues and the surrounding soft tissues based upon the propagated ultrasound sorting of step (d); and
(f) relating the velocity, propagated energy and degree of dispersion to the mechanical strength and the structural integrity of the hard tissues.

5,143,070
TRANSAXIAL COMPRESSION TECHNIQUE FOR SOUND VELOCITY ESTIMATION
Jonathan Ophir, and Youseph Yazdi, both of Houston, Tex., assignors to The University of Texas Systems Board of Regents, Austin, Tex.
Filed Nov. 17, 1989, Ser. No. 438,695
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.01 5 Claims



1. A method for estimating sound velocity in a target medium, comprising the steps of:
(A) acoustically coupling a first ultrasonic transducer to the surface of the medium;
(B) energizing the first transducer to transmit a first ultrasonic signal from the surface of the medium along a path into the medium;
(C) detecting the arrival time of a first echo signal of the first transmitted signal at the first transducer from a distal position along the path within the medium corresponding to a reference echo segment of the first echo signal;
(D) displacing a portion of the medium proximal the first transducer sufficiency to change said arrival time while maintaining acoustic coupling between the first transducer and the medium;
(E) energizing the first transducer;
(F) detecting the changes arrival time; and
(G) repeating steps (D) through (F), and determining the velocity of sound in the medium from the following equation:

$$c = \frac{2}{n} \sum_{i=1}^{n} \frac{\Delta Y_i}{\Delta t_i}$$

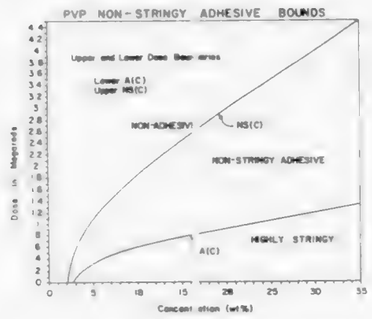
wherein c is the velocity of sound, n is the number of transducer displacement, ΔYi is the transducer displacement during the ith compression, and Δt_i is the ith measured change in arrival time of the echo signal.

5,143,071
NON-STRINGY ADHESIVE HYDROPHILIC GELS
Preston Keusch, New York; Keith A. Murdock, Suffern; Christine A. Czap, Montgomery, all of N.Y., and Linda Lennon, Scotsdale, Ariz., assignors to Nepera, Inc., Harriman, N.Y.
Continuation-in-part of Ser. No. 330,669, Mar. 30, 1989, Pat. No. 4,989,607. This application Mar. 26, 1990, Ser. No. 499,855
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] A61B *5/0402;* A61N *1/04*
U.S. Cl. 128—640 51 Claims

45. An electrode comprising (a) a conductive non-stringy adhesive hydrophilic gel, which gel comprises a homogeneous mixture of (i) water, (ii) at least one water-soluble polymer present at a concentration of at least about 7 percent by weight of said mixture and having a weight average molecular weight of at least about 200 kD, and (iii) an amount of a water-soluble electrolyte effective to reduce the transverse electrical resis-

tance of said gel to an impedance at 60 Hz of less than about 1,000 ohms,

which mixture had been exposed to a dose of radiant energy effective to provide a non-stringy hydrophilic gel which exhibits a sharp substantially featureless force-displacement profile, has an AED value of at least about 5 to less than about 50 gm/cm and has a peak-force value of at least about 180 grams; and (b) a suitable conductive member, in intimate contact with said gel, to which may be connected external electrical apparatus.

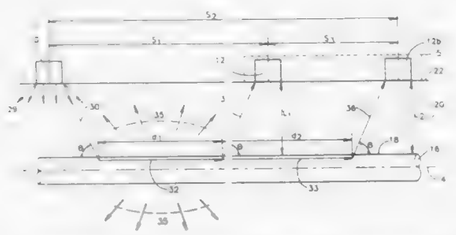


5,143,072

APPARATUS FOR DETERMINING THE MECHANICAL PROPERTIES OF A SOLID

Edward Kantorovich, Tel Aviv and Alex Rapoport, Rishon Lezion, both of Israel, assignors to Medicano Systems Ltd., Rishon Lezion, Israel

Filed May 29, 1991, Ser. No. 708,776
Claims priority, application Israel, Jun. 4, 1990, 94616
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—660.02 34 Claims



1. Apparatus for determining, through an interposed medium, the mechanical properties of a solid having a surface, the apparatus comprising:

ultrasonic transmission means located in a first location for transmitting ultrasonic waves through said interposed medium and through said solid and generally parallel to said surface;

at least one ultrasonic receiver unit located in each of second and third locations for receiving said ultrasonic waves, wherein said first, second and third locations are colinear along said surface;

means for locating said at least one ultrasonic receiver unit such that a first receipt time of an ultrasonic wave from said surface to said at least one ultrasonic receiver unit at said second location is generally equivalent to a second receipt time from said surface to said at least one ultrasonic receiver unit at said third location; and

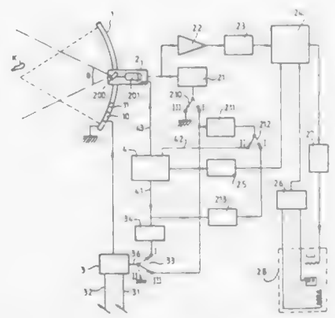
means for calculating said mechanical properties from ultrasonic waves transmitted by said ultrasonic transmission means once said first and second receipt times are generally equivalent.

5,143,073

WAVE APPARATUS SYSTEM

Jacques Dory, Coupvray-Esbly, France, assignor to EDAP International, S.A., France

Division of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application Jun. 14, 1988, Ser. No. 206,385
Claims priority, application France, Dec. 14, 1983, 83 20041; May 3, 1984, 84 06877
Int. Cl.[5] A61B 8/00; A61N 5/00
U.S. Cl. 128—660.03 40 Claims



1. Wave apparatus for treating a target within a body of transmitting energy across the skin comprising:

(a) a treatment transducer generating a wave treatment beam focused within the body on a target and drive means exciting said treatment transducer;

(b) means displacing said treatment transducer to aim said beam and to treat said target with said treatment beam;

(c) at least one separate imaging transducer generating a scanning ultrasound beam; said imaging transducer coupled to said treatment transducer; and

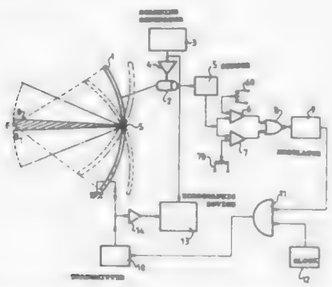
(d) at least one echography device comprising said imaging transducer, means effecting real time scanning of said target with said scanning beam, receiver means coupled to said imaging transducer receiving echoes formed by reflection of said scanning beam on reflecting surfaces of said target; and image forming means coupled to said receiver means converting said echoes into displayed images of said target; said image forming means further displaying a mark which indicates the position of a focus of said treatment beam; and treatment beam aiming means to bring said mark and said images into coincidence.

5,143,074

ULTRASONIC TREATMENT DEVICE USING A FOCUSSING AND OSCILLATING PIEZOELECTRIC ELEMENT

Jacques Dory, Coupvray, France, assignor to EDAP International, France

Continuation of Ser. No. 427,429, Oct. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 368,906, Jun. 19, 1989, Pat. No. 5,080,101, which is a continuation of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application May 3, 1991, Ser. No. 696,992
Claims priority, application France, Oct. 27, 1988, 88 14015
Int. Cl.[5] A61B 8/00; A61N 5/00
U.S. Cl. 128—660.03 7 Claims



1. An ultrasonic device for treatment of an anatomical anomaly, said device comprising:

(a) a power transducer in the form of a self-focussing cup associated with a power excitation generator generating power wave trains and with an echographic device transmitting an echographic beam and using said transducer as an echo receiver, said device further comprising:

(b) means for causing said echographic device continuously to oscillate during the treatment, at an oscillation speed and with an amplitude adapted for obtaining real time echographic beam scanning of a region of space containing the anatomical anomaly, and

(c) means for exciting said power transducer to produce treatment waves at moments when the echographic beam scans a predetermined restricted portion of said region.

5,143,075

ULTRASONOGRAPHIC APPARATUS FOR DIAGNOSIS

Yoshizo Ishizaka, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00357, § 371 Date Oct. 6, 1989, § 102(e) Date Oct. 6, 1989, PCT Pub. No. WO88/07838, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 8, 1988, Ser. No. 427,084
Claims priority, application Japan, Apr. 8, 1987, 62-84595
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—661.01 13 Claims

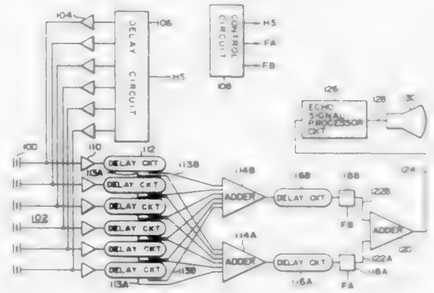
1. An ultrasonographic apparatus for diagnosis radiating ultrasonic waves toward an object and producing a sectional image of the object by dynamic focusing from echoes which are returned from the object, comprising:

wave receiving circuit means, having a plurality of electroacoustic transducers, for receiving echoes from the object and for producing a plurality of first signals representative of intensities of the echoes, the plurality of first signals being individually delayed by a plurality of delay times different from each other; and

selective signal combining means for selectively combining ones of the plurality of first signals which are associated with a particular depth in the object to produce a second signal representative of the combined first signals;

said wave receiving circuit means comprising delay means for delaying relative to one of the plurality of first signals another first signal which follows said one first signal by a predetermined time difference;

said predetermined time difference substantially corresponding to one-third of a period of the plurality of first signals, whereby the second signal holds substantially the same average level before and after said selective signal combining means changes selection of the plurality of first signals.

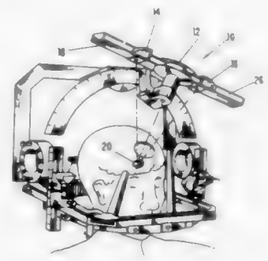


5,143,076

THREE-DIMENSIONAL BEAM LOCALIZATION MICROSCOPE APPARATUS FOR STEREOTACTIC DIAGNOSES OR SURGERY

Tyrone L. Hardy, 806 Sagebrush Ct., SE., Albuquerque, N. Mex. 87123, and Laura D. Brynildson, Albuquerque, N. Mex., assignors to Tyrone L. Hardy, Albuquerque, N. Mex.

Division of Ser. No. 428,242, Oct. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 290,316, Dec. 23, 1988, Pat. No. 5,099,846. This application Jul. 11, 1990, Ser. No. 552,164
Int. Cl.[5] A61B 6/08
U.S. Cl. 128—664 7 Claims



1. A stereotactic surgical beam localization apparatus disposed within a surgical microscope, the apparatus comprising:

stereotactic surgical frame means;

objective lens means of said surgical microscope attached to said stereotactic surgical frame means;

beam emitting means comprising laser means disposed within said surgical microscope for emitting at least two beams through said objective lens means from two separate and spaced points;

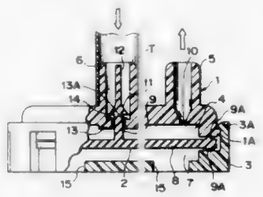
means for movably adjusting the relative positions to one another of said beam emitting points;

means for aiming said beams at user selected locations on a selected volumetric entity of a body; and

means for ascertaining desired information about the selected volumetric entity of the body mathematically from the positions of said beam emitting means in said apparatus, the relative positions to one another of said beam

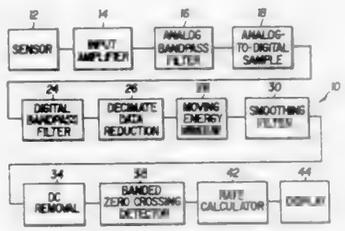
emitting means, and the aiming directions of beams from the beam emitting points.

5,143,077
CONSTANT-RATE DISCHARGE VALVE, AND ELECTRONIC AUTOMATIC SPHYGMOMANOMETER USING SAME
Susumu Kobayashi, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 480,643, Feb. 15, 1990, abandoned. This application Apr. 16, 1991, Ser. No. 686,879
Claims priority, application Japan, Feb. 20, 1989, 1-38444
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—677 8 Claims



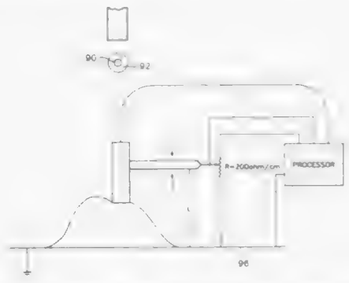
1. A constant-rate discharge valve for a sphygmomanometer, for providing a constant discharge rate, comprising:
a housing having an internal air chamber and an opening which is open to ambient atmosphere;
first and second air passageways which are separate from said opening, each having one end open to said air chamber and communication with each other via said air chamber, said second air passageway having a control orifice for controlling an air flow rate of air flowing therethrough; and
a valve body made of rubber like material disposed in said housing and arranged as a partition member to permanently separate said air chamber from said opening, said valve body including a deflecting portion which deflects and causes said valve body to interrupt communication between said first and second air passageways responsive to pressure in said air chamber being greater than a predetermined pressure, and said deflecting portion staying substantially in its original shape and said valve body permitting communication between said first and second air passageways when the pressure in said air chamber is less than said predetermined pressure, said deflecting portion always being in gaseous communication with ambient atmosphere through said opening;
said second air passageway being arranged to discharge air flowing therethrough to the atmosphere, whereby air which has flown into said valve from said first air passageway passes through said air chamber and through said control orifice and is discharged into the atmosphere from said second air passageway;
said valve body being actuated by a pressure difference across upstream and downstream sides of said control orifice produced by the flow rate of the entrant air so as to deflect said deflecting portion and close and interrupt said communication between said first and second air passageways responsive to said pressure difference being above a predetermined pressure difference, and said valve body being substantially in it original shape when said pressure difference is below said predetermine pressure difference such that said valve body permits communication between said first and second air passageways, whereby the flow rate of air discharged from said second air passageway via said control orifice is rendered constant.

5,143,078
RESPIRATION RATE MONITOR
Bruce C. Mather, and Dean C. Winter, both of San Antonio, Tex., assignors to Colin Electronics Co., Ltd., Japan
Continuation of Ser. No. 81,250, Aug. 4, 1987, abandoned. This application Sep. 29, 1989, Ser. No. 414,658
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—716 6 Claims



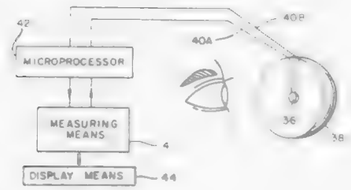
1. A system for monitoring the respiration rate of a patient, comprising:
means for detecting acoustical energy generated by said patient and for producing a first output signal in response thereto, said output signal comprising a component corresponding to breath sounds, a component corresponding to heart sounds and a component corresponding to ambient noise;
means for filtering said first output signal to remove said components corresponding to said heart sounds and ambient noise and for producing a second output signal corresponding only to said breath sounds;
means for producing an AC coupled energy signal corresponding to the breath sound energy level of said second output signal; and
means for identifying significant positive-going zero crossings in said AC coupled energy signal within a band of predetermined width and for correlating said significant zero crossings with the respiration rate of said patient.

5,143,079
APPARATUS FOR DETECTION OF TUMORS IN TISSUE
Ephraim Frei, Jerusalem, and Mordechai Moshitzky, Rehovot, both of Israel, assignors to Yeda Research and Development Company Limited, Rehovot, Israel
Filed Aug. 1, 1990, Ser. No. 561,530
Claims priority, application Israel, Aug. 2, 1989, 91193
Int. Cl.[5] A61B *5/05*
U.S. Cl. 128—734 7 Claims



1. A tumor detection system for detecting tumors in living human tissues based essentially on a determination of electric impedance values of localized regions of the tissues, comprising a probe comprising a plurality of planar hexagonal electrodes in a closely spaced geometric pattern, having a distance between adjacent electrodes, each of the electrodes being connected to detection circuitry;
wherein the detection circuitry comprises:
means for applying an AC signal to the tissue beneath each said electrode,
means for sensing the electrical properties of the tissues based upon the AC signal applied to the tissue,
means for providing an output indicative of the dielectric properties of each region of the tissue based upon signals indicating electrical properties of the tissues received from said means for sensing; and
means for visually displaying the output indicative of dielectric properties;
whereby tumors are detected by irregularities visible in said display means.

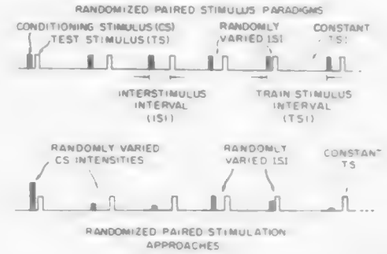
5,143,080
IN VIVO OSMOMETER
Kenneth K. York, 2300 N. Edgemont, Los Angeles, Calif. 90027
Continuation of Ser. No. 616,646, Nov. 21, 1990, abandoned, which is a division of Ser. No. 280,984, Dec. 7, 1988, Pat. No. 4,996,993. This application Jun. 18, 1991, Ser. No. 716,980
Int. Cl.[5] A61B *5/03*
U.S. Cl. 128—736 14 Claims



1. An osmometer comprising:
sensor means for sensing in vivo a physical quantity related to the vapor pressure of a bodily fluid of an eye;
an eye cup, said sensor means being mounted in said eye cup so as to be near the corneal surface of said eye when said eye cup is placed over said eye;
measuring means operatively connected to said sensor means for measuring the physical quantity sensed by said sensor means;
conversion means for converting a measured value of said physical quantity to a corresponding value of osmolarity; and
display means for displaying a visible representation of said value of osmolarity.

5,143,081
RANDOMIZED DOUBLE PULSE STIMULUS AND PAIRED EVENT ANALYSIS
Wise Young, and Kaoru Sakatani, both of New York, N.Y., assignors to New York University, New York, N.Y.
Filed Jul. 27, 1990, Ser. No. 558,345
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—741 25 Claims

1. A method for determining the behavior tendencies in response to repeated stimulation in a system in which a response evoked by such stimulation is measurable, comprising the steps of:
(1) stimulating said system with a train of pairs of stimuli the first of each pair of stimuli in said train being the conditioning stimulus (CS) and the second of each said pair being the test stimulus (TS), wherein each said test stimulus is maintained at a constant intensity and said conditioning stimuli are applied at a constant frequency and wherein the interstimulus interval between each conditioning stimulus and its associated test stimulus, the conditioning stimulus intensity and/or the conditioning stimulus site is varied randomly between predetermined parameters;
(2) measuring the response of said system evoked by said stimuli; and



(3) analyzing the measured response to determine the behavioral tendencies.

5,143,082
SURGICAL DEVICE FOR ENCLOSING AN INTERNAL ORGAN
Richard C. Kindberg, Doylestown, Pa.; Chao Chen, Edison, N.J.; Lyn Freeman, Flemington, N.J.; Constance E. Roshdy, New Egypt, N.J., and Alastair W. Hunter, Bridgewater, N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Apr. 3, 1991, Ser. No. 679,893
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—749 8 Claims

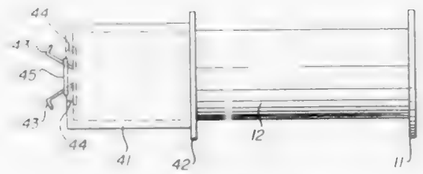
1. A medical device for enclosing an internal bodily organ or tissue during surgery comprising:
a) a continuous, filamentary strand having a distal noose portion secured with a knot, and a proximal free end portion, said free end portion enclosed within a generally rigid, longitudinal tubular sleeve so as to facilitate handling of said device, said knot configured in a manner so as to allow movement of the free end portion proximally and to prevent the noose portion from loosening when engaged about said bodily organ or tissue;
b) a surgical bag having an open end therein, said bag fixedly attached along substantially the entire perimeter of said open end thereof to said noose portion of said filamentary strand along substantially the entire circumferential length of said noose portion thereof; and
c) means for pulling said free end portion of said filamentary strand proximally so as to continually reduce the diameter of said noose portion thereby continually closing said open end of said surgical bag;
wherein said tubular sleeve is tapered at its distal end, and said knot abuts said tapered distal end when said free end portion of said filamentary strand is pulled proximally, and said tapered distal end has a cross-sectional diameter effective to prevent said knot from passing through said tubular sleeve when said free end portion of said filamentary strand is pulled proximally.

5,143,083

I.V. NEEDLE HOLDER

Habib Al-Sioufi, P.O. Box 654, Brookline, Mass. 02146, and Antoine J. Koudsi, 52 Blueberry Cir., Pelham, N.H. 03076

Division of Ser. No. 528,082, May 24, 1990, Pat. No. 5,062,837.
This application Sep. 10, 1991, Ser. No. 757,320
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—763 2 Claims



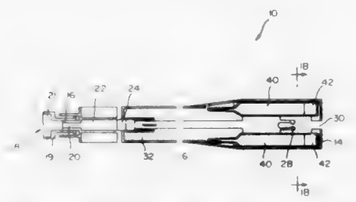
1. A blood collection needle holder comprising an elongated tube open at one end for receiving therein and holding a blood collection container, and locking means for releasably holding a blood collection needle in communication with said collection container disposed at the other end of said elongated tube, wherein said locking means is a plurality of laterally displaceable pairs of jaws disposed at said other end of said tube which grip and hold a portion of said blood collection needle in the closed position and release said needle when opened, said closed position being maintained by a longitudinally displaceable annular ring or collar slidably disposed around said jaws.

5,143,084

DISPOSABLE CARTRIDGE FOR SAMPLING AND ANALYZING BODY FLUIDS

James H. Macemon, Redmond, and Mark S. Schlosser, Seattle, both of Wash., assignors to SpaceLabs, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 528,801, May 24, 1990, abandoned. This application Nov. 16, 1990, Ser. No. 615,747
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—771 51 Claims



1. A method of analyzing a body fluid of a patient using a body fluid analyzer and a disposable sampling cartridge containing a body fluid reservoir, a first port communicating with said body fluid reservoir, a waste collection chamber, and at least one analyzing fluid adapted for use by said body fluid analyzer, said method comprising:
drawing a body fluid from the patient into said body fluid reservoir;
connecting said disposable sampling cartridge to said body fluid analyzer and expelling said body fluid from said reservoir into said body fluid analyzer;
analyzing said body fluid in said body fluid analyzer;
expelling said analyzing fluid from said sample collection cartridge into said body fluid analyzer for use by said body fluid analyzer either before or after said body fluid has been expelled from said reservoir into said body fluid analyzer;
before or after said body fluid and said analyzing fluid have been expelled from disposable sampling cartridge into said body fluid analyzer, conveying fluid from said body fluid analyzer to said waste collection chamber; and
disconnecting said sampling cartridge from said body fluid analyzer.

5,143,085

STEERABLE MEMORY ALLOY GUIDE WIRES

Bruce C. Wilson, 34 Twicwood La., Glen Falls, N.Y. 12801

Division of Ser. No. 49,152, May 13, 1987, Pat. No. 5,025,799.
This application Oct. 1, 1990, Ser. No. 590,811
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 16 Claims

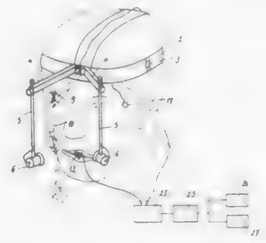
1. A steerable guide wire for insertion in a body vessel for use in guiding an associated catheter to a desired location within the vessel, the guide wire comprising an elongated coiled spring defining a lumen therein, wherein said coiled spring may assume a first directional shape;
said coiled spring fitted with a shape memory alloy component within said lumen annealed to a given second directional shape different than said first directional shape such that, upon the application of heat, said shape memory alloy component overcomes said first directional shape of said coiled spring to cause the guide wire to assume said second directional shape.

5,143,086

DEVICE FOR MEASURING AND ANALYZING MOVEMENTS OF THE HUMAN BODY OR OF PARTS THEREOF

Francois Duret, Le Grand-Lemps, and Jean-Louis Blouin, Vienne, both of France, assignors to Sopha Bioconcept S.A., Vienne, France

PCT No. PCT/FR89/00593, § 371 Date Jul. 27, 1990, § 102(e) Date Jul. 27, 1990, PCT Pub. No. WO90/05484, PCT Pub. Date May 31, 1990
PCT Filed Nov. 17, 1989, Ser. No. 548,948
Claims priority, application France, Nov. 18, 1988, 88 15484
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—777 17 Claims



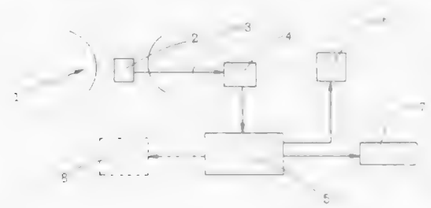
1. A device for measuring and analyzing movements of a part of a human head of a subject, which comprises:
a set of three light emitting diodes fixed in a removable manner on said part of said head whose movement is to be analyzed, the three light emitting diodes being arranged at the three points of a triangle on a common rigid element;
two sensors designed to follow the movements of the diodes and mounted on a fixed support in such a way that the diodes are located in fields of view of said sensors;
means for mounting said support on the head of the subject; and
means for controlling the lighting of the diodes, the functioning of the sensors and the processing of the data supplied by the latter.

5,143,087

ANALYSIS AND TREATMENT OF SWALLOWING DYSFUNCTION

Shirit Yarkony, 30 Agnon Street, Ramat-Aviv, Tel-Aviv, Israel

Filed Feb. 25, 1991, Ser. No. 660,678
Claims priority, application Israel, Mar. 1, 1990, 93587
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—780 16 Claims



1. A method of analyzing the swallowing of a subject, comprising the steps of:
1) providing displacement and/or pressure-activated transducing means;
2) positioning the said transducing means in the desired positioned relationship with the anatomical structure of the subject, the behavior of which during swallowing it is desired to analyze, e.g., the larynx of the subject;
3) sampling the signals generated by the transducing means when swallowing is performed;
4) analyzing the signals to determine swallow beginning and ending time and the relative induced intensity of the sampled signals at the sampling times; and
5) providing visual data or data points representing the induced intensity of the sampled signals representing the swallowing behavior of the subject.

5,143,088

APPARATUS FOR MONITORING THE MOTION COMPONENTS OF THE SPINE

William S. Marras, 225 Beach Trail Ct., Powell, Ohio 43065; Shelby W. Davis, Amlin, Ohio; Robert J. Miller, Westerville, Ohio, and Gary A. Mirka, Brecksville, Ohio, assignors to William S. Marras, Powell, Ohio

Continuation of Ser. No. 551,649, Jul. 11, 1990, Pat. No. 5,012,819, which is a continuation of Ser. No. 336,896, Apr. 12, 1989, abandoned. This application May 6, 1991, Ser. No. 696,370
Int. Cl.[5] A61B *5/11*
U.S. Cl. 128—781 6 Claims

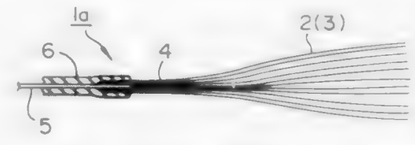
1. An apparatus for monitoring the motion components of the spine during movement of a patient, comprising:
movement sensing means for simultaneously monitoring movement in each of three separate planes,
support means for mounting said movement sensing means on the back of a patient such that said movement sensing means simultaneously monitors movement of the spine of the patient in each of the lateral, sagittal, and transverse planes, and such that the patient is fully ambulatory, and
means connected to said movement sensing means for producing an output signal representative of the angular position of the spine in each of said lateral, sagittal, and transverse planes when said movement sensing means is mounted on the back of the patient.

5,143,089

ASSEMBLY AND METHOD OF COMMUNICATING ELECTRICAL SIGNALS BETWEEN ELECTRICAL THERAPEUTIC SYSTEMS AND BODY TISSUE

Eckhard Alt, Eichendorffstrasse 52, 8012 Ottobrunn, Fed. Rep. of Germany

Filed May 1, 1990, Ser. No. 517,186
Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914662
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—784 21 Claims



1. A method of therapeutic treatment of a living body, comprising the steps of:
implanting into the body a flexible electrode consisting of multiple woven strands of tiny individual elongate uninsulated fibers composed of non-metallic substantially isotropic electrically conductive material electrically connected to a current-carrying lead, to form an electron-ion interface with blood and/or body tissue for efficient transfer of electrical energy along an entire substantial length of uninsulated surface of the fibers, in which the cumulative fiber surface presents an effective surface area considerably greater than the apparent actual surface area calculated from the linear dimensions of the electrode, and
transmitting electrical impulses through the lead to the electrode at one side of said electron-ion interface to deliver electrical energy from the impulses to the other side of the interface with rapid initial rise times as a consequence of the electrical characteristics of the interface.

5,143,090

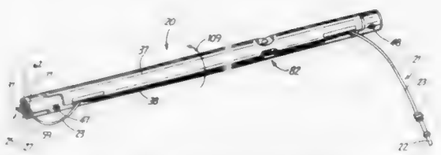
CARDIAC LEAD

Robert G. Dutcher; John C. Hill, and Robert J. Scott, all of Minneapolis, Minn., assignors to Possis Medical, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 600,627, Oct. 22, 1990, Pat. No. 5,040,545, which is a division of Ser. No. 430,596, Nov. 2, 1989, Pat. No. 4,972,847. This application May 30, 1991, Ser. No. 707,681
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—785 40 Claims

1. A cardiac lead connectable to a cardiac management device for transmitting electric current to and/or receiving

electrical signals from the myocardium of the heart comprising: an elongated flexible conductor wire means, sheath means of non-electrical conductive material surrounding said conductor wire means, an electrical connector attached to the wire means adapted to be connected to a cardiac management device, a head of non-electrically conductive material connected to said conductor wire means and sheath means, a helical electrode having a first end section extended into said head and connected to said conductor wire means and a helical second end section extended from said head adapted to be screwed into the myocardium of a heart, said second end section having an outer helical surface terminating in a point, a layer of platinum black particles attached to the outer helical surface of the second end section, said layer of platinum black particles having substantially uniform particle size and uniform distribution on said outer surface of the second end section of the electrode



whereby said layer has a continuous and uniform microporous outer platinum black surface location able in surface contact with the myocardium of the heart whereby said layer of platinum black particles decreases electrical losses at the electrode-tissue interface, establishes intimate contact between the electrode and myocardium, and maximizes voltage applied to said myocardium and lowers stimulation thresholds and increases amplitude of sensed electrical signals from the myocardium; a second electrode including a porous wire mesh secured to the support means surrounding the helical electrode engagable with the myocardium of the heart around the helical electrode when the helical electrode is attached to the myocardium, support means holding the second electrode on the head, and a second elongated flexible conductor wire connected to the support means located within the sheath means and electrically insulated from the first elongated flexible conductor wire means.

5,143,091

MULTI-POSITION DRAPE FOR SURGERY ON A LIMB

Gregg A. Patnode, and Robert L. Wheeler, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1990, Ser. No. 518,641
Int. Cl.[5] A61F 13/00
U.S. Cl. 128—853 12 Claims

1. A surgical drape comprising

a main sheet provided with a main sheet aperture,

and a pouch for collecting surgical fluids, said pouch comprising an inner wall and an outer wall, said inner wall having an elastomeric first fenestration and an elastomeric second fenestration, said fenestrations being adapted to receive a limb therethrough,

the inner wall of said pouch being attached to said main sheet at the edges of the aperture such that the aperture and the first fenestration align, and

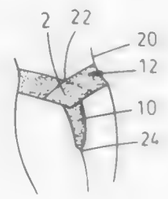
wherein said first and second fenestrations normally lie in a generally common plane when the drape is placed on a flat surface.

5,143,092

FLEXIBLE ABDOMINAL FLATTENER

Vivian D. Flowers, 94 Sunnyslope Dr., Middletown, Conn. 06457

Filed Apr. 12, 1991, Ser. No. 684,264
Int. Cl.[5] A61F 5/37
U.S. Cl. 128—875 3 Claims



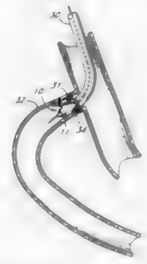
1. A flattener for a women's lower and upper hypogastric abdominal area comprising: a surround and loop of longitudinally elastic material said surround being formed from a first single length of said elastic material, said single length having two ends said ends being truncated at an angle of at least 145° and not more than 160°, said angularly truncated ends overlapping, said overlap being attached to each other so as to from angles which result in a rigid diamond shaped overlap; said loop being formed from a second length of said elastic material, said second length of elastic material having two ends, the first of said two ends being forkedly truncated to conform to the angle formed by said first length overlap, said forked end being perpendicularly attached and made part of said overlap; said overlap of said ends of said first length and said forkedly truncated second end forming a rigid non elastic pad, said pad useful for applying downward pressure to said lower and upper hypogastric abdominal area; said second end being perpendicularly truncated, said perpendicularly truncated second end being perpendicularly truncated, said perpendicularly truncated second end being perpendicularly attached to the midpoint of said surround opposite said overlap of said first end of said second length and said first length overlap said surround and said loop forming said abdominal flattener.

5,143,093

METHODS OF ANGIOPLASTY TREATMENT OF STENOTIC REGIONS

Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740

Filed Oct. 5, 1990, Ser. No. 593,666
Int. Cl.[5] A61M 29/02
U.S. Cl. 128—898 2 Claims



2. A method of angioplastic treatment of a stenotic region of the right coronary artery in which the guide catheter remains in place in the right coronary artery even though the stenosis is proximate to the ostium of the right coronary artery, comprising the steps of:

inserting the distal end of a sheath guide catheter into said ostium;

passing a balloon catheter through said sheath guide catheter until the balloon is entirely out of said sheath guide catheter and is in juxtaposition with said stenosis, said balloon catheter having a balloon length of about 0.5 millimeter so that the proximal end of the balloon is disposed anatomically distally of the ostium;

injecting a fluid into said balloon to inflate said balloon and to increase the diameter of said balloon and decrease the size of said stenosis while the distal end of said sheath guide catheter remains within said ostium;

removing said fluid from said balloon to deflate same; and

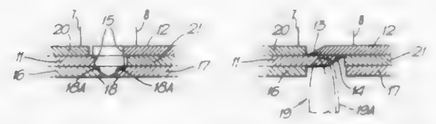
withdrawing said balloon catheter through said sheath guide catheter and withdrawing, for the first time, said sheath guide catheter from said ostium.

5,143,094

CIGARETTE MACHINE TRIMMING DEVICE

Victor W. Nash, Richmond, Va., and Francis R. Oakley, Kernersville, N.C., assignors to Molins PLC, United Kingdom

Filed Jun. 5, 1991, Ser. No. 710,331
Claims priority, application United Kingdom, Jun. 5, 1990, 9012541
Int. Cl.[5] A24C 5/18
U.S. Cl. 131—84.4 9 Claims



1. A trimming device for trimming a cigarette filler stream in a cigarette making machine, comprising two cooperating disc assemblies arranged to rotate at equal speeds about laterally spaced axes and including discs from the respective assemblies which overlap to trim the filler stream at a first trim level and are formed with cut-outs in their peripheries which register during rotation of the disc assemblies so as to allow additional quantities of tobacco to project through them, to form cigarette dense end portions of the filler stream, the two disc assemblies including additional discs arranged to cooperate so as to trim away, at a set level in relation to the first trim level, excess quantities of tobacco projecting through the cut-outs.

5,143,095

METHOD OF CUTTING TOBACCO

Manfred Lasch; Klaus-Georg Hackmack, and Reinhard Liebe, all of Hamburg, Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Mar. 16, 1990, Ser. No. 494,733
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3908937
Int. Cl.[5] A24B 3/07
U.S. Cl. 131—290 34 Claims

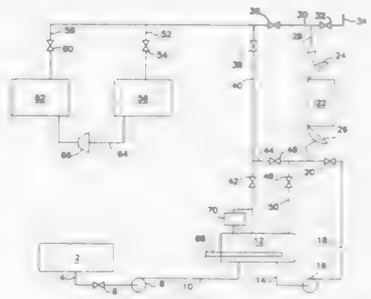
1. A method of comminuting tobacco leaves and/or ribs which are condensed into bales or portions of bales, comprising successive steps of (a) imparting to tobacco a moisture content of 10–17 percent and a temperature of at least 18°–25° C.; and (b) introducing the tobacco into a cutter.

5,143,096

METHOD AND APPARATUS FOR EXPANDING CELLULAR MATERIALS

Ira Steinberg, East Brunswick, N.J., assignor to The BOC Group, Inc., Murray Hill, N.J.

Filed Feb. 4, 1991, Ser. No. 650,322
Int. Cl.[5] A24B 15/18
U.S. Cl. 131—291 24 Claims



1. A process for impregnating a cellular material with liquefied gas at a predetermined pressure comprising the steps of charging the cellular material into an impregnation vessel, purging the impregnation vessel with inert gas, pressurizing the impregnation vessel with inert gas to said predetermined pressure, transferring liquefied inert gas into the impregnation vessel from a process vessel in which the liquefied gas is stored at said predetermined pressure, soaking the cellular material in the liquefied inert gas for a predetermined time period, transferring unabsorbed liquefied gas from the impregnation vessel to the process vessel, depressurizing the impregnation vessel by venting the inert gas therefrom and removing the impregnated cellular material from the impregnation vessel, the inert gas used to purge and pressurize the impregnation vessel being taken from a source independent of the liquefied inert gas contained in the process vessel, the pressure in said process vessel being maintained substantially constant at said predetermined pressure during the transfer of liquefied inert gas back and forth between said impregnation vessel and said process vessel and during said cellular material soaking step.

5,143,097

TOBACCO RECONSTITUTION PROCESS

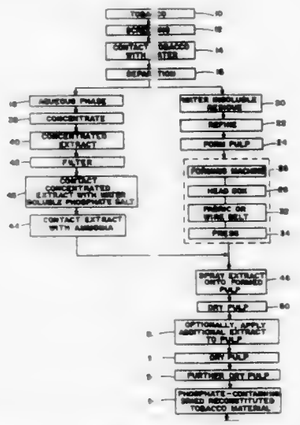
Edward J. Stephen Sohn, Lewisville; Harvey J. Young, Advance, and Edward Bernasek, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 28, 1991 Ser. No. 647,329

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] A 4B *15/12*

U.S. Cl. 131—356 10 Claims



1. A process for providing a reconstituted tobacco material, the process comprising the steps of:

(a) extracting components from tobacco material using a solvent having an aqueous character thereby providing (i) a solvent having extracted tobacco components therein, and (ii) a tobacco portion insoluble in the solvent;

(b) separating at least a portion of the solvent and extracted tobacco components therein from the insoluble tobacco portion; and then

(c) forming the insoluble tobacco portion into a predetermined shape;

(d) contacting the solvent and extracted tobacco components provided in step (b) with a water soluble phosphate salt;

(e) providing the portion of solvent and extracted components provided in step (d) at a pH of above about 5.5 to about 8; and

(f) contacting the insoluble tobacco portion of step (c) with the solvent and extracted tobacco components of step (d) to provide a phosphate-containing tobacco material.

5,143,098

MULTIPLE LAYER CIGARETTE PAPER FOR REDUCING SIDESTREAM SMOKE

Robert M. Rogers, Richmond; Gordon H. Bokelman, Chesterfield; Sheryl D. Baldwin, Richmond, and Susan S. Tafur, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 12, 1989, Ser. No. 365,137

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—365 16 Claims

1. A wrapper for a smoking article for reducing sidestream smoke comprising a single cellulosic sheet having two or more distinct zones overlying each other in such an arrangement so as to reduce sidestream smoke formed from multiple layers of cellulosic sheet material during the paper making process.

5,143,099

DOUBLE WRAPPED CIGARETTES WITH REDUCED SPOTTING AND METHOD OF MANUFACTURE

Marcelle Le Gars, Quimperle, and Nicolas Baskevitch, Parigne l'Eveque, both of France, assignors to Papeteries de Mauduit, Quimprele Cedex, France

Filed Aug. 13, 1990, Ser. No. 566,600

Claims priority, application France, Aug. 14, 1989, 89 10879

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—365 10 Claims

1. A cigarette comprising a tobacco column and an inner and outer wrapper, wrapped around said tobacco column said inner wrapper being between the outer wrapper and the tobacco column, the improvement wherein the inner wrapper is made of cellulose fibers having a basis weight of up to 30 g/m^2, and having pores made during paper manufacture or perforations made after manufacture in such a way that the inner wrapper has an air permeability of at least 500 Cresta units.

5,143,100

MANICURE SHEET

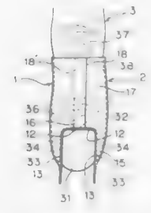
Mikako Kawakami, 3-28-1103, Honden 1-chome, Nishi-ku, Osaka, Japan

Filed Oct. 23, 1991, Ser. No. 781,728

Claims priority, application Japan, Nov. 20, 1990, 2-122212

Int. Cl.[5] A45D *29/00*

U.S. Cl. 132—285 7 Claims



1. A manicure sheet comprising a left-and-right pair of masking sheets (**1**), (**2**), each sheet having in a tip part thereof an L-shaped incision (**11**) defined by a basal side (**12**) corresponding to nail's basal edge, perpendicular side (**13**) corresponding to either of nail's opposite edges and a corner (**14**) of a curve connecting said basal (**12**) side and said perpendicular side (**13**) wherein sum of lengths of said joined basal sides (**12**), (**12**) is set larger than that of the nail's basal edge so that said masking sheets (**1**) and (**2**) can be partly overlapped to match said perpendicular sides (**13**) with the nail's opposite edges and also to match the nail's basal side with said basal edges (**12**), (**12**) and said corner (**14**) is selectively formed from a plurality of curves of arcs and elliptical arcs.

5,143,101

APPARATUS FOR WASHING LENSES

Avi Mor, 18 Nahal Kane Street, Kfar Sava, Israel

Filed Jan. 18, 1991, Ser. No. 643,917

Claims priority, application Israel, Jan. 25, 1990, 093174

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—58 R 3 Claims

1. A compact portable lens washing apparatus comprising:

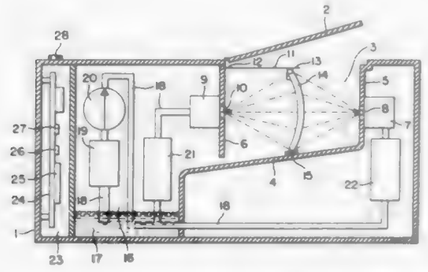
a box-like housing having provided therein a wash chamber, the housing further provided with a reservoir situated lower than the wash chamber for holding wash fluid and in flow communication with the wash chamber for receiving wash fluid back therefrom, a pair of nozzles oppositely disposed in said wash chamber and spaced apart to face one another,

a lens support floor inclined downwardly toward and in open communication with said reservoir and adapted to hold a lens between said nozzles so that each lens surface faces a different one of said nozzles,

a filter and a pump and a pipeline all adapted operatively in flow series to transport wash fluid from the reservoir and eject same from said nozzles onto said lens,

heating means adjacent to said nozzles and disposed in line between said reservoir and said nozzles for heating said wash fluid during a wash cycle and adapted for providing sufficient residual heat when turned off to vaporize residual wash fluid into the wash chamber during a drying cycle,

vapor maintaining means operatively associated with the heating means for maintaining an atmosphere of wash fluid vapors in said wash chamber after said pump has ceased transporting wash fluid,



a power source to operate said pump and said heating means and said vapor maintaining means,

a switch for activating said apparatus,

a blow dryer operatively associated with said wash chamber, and

electronic means including a wash cycle timer and a drying cycle timer which are activated when the switch is turned on, whereby when the switch is turned on wash fluid is ejected from the nozzles onto said lens in the wash chamber for a predetermined time, at the end of which time the lens is dried by the blow dryer in a vapor atmosphere of the wash fluid.

5,143,102

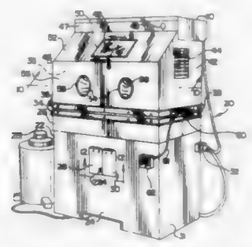
HIGH PRESSURE PARTS CLEANER AND METHOD

Ronald L. Blaul, Crystal Lake, Ill., assignor to Graymills Corporation, Chicago, Ill.

Filed Mar. 12, 1990, Ser. No. 495,050

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—58 R 8 Claims



1. Parts cleaner (**20**) including, in combination therein,

manipulatable pressure spraying means (**68**, **176**) operable to apply cleaning solution to separate off the material being carried from the surface of parts as cleaned of such material;

additive means (**14**) operable to introduce pH neutralizer quantities into the resulting material-carrying solution run-off from the spraying;

an operating switch member (**28**, **62**) and power circuitry (**24**) controlled thereby connected to the spraying means and to the additive means to simultaneously apply cleaning solution to the parts and to be neutralizing the material-carrying run-off therefrom down to acceptable pH level;

chamber forming means in the cleaner comprising a collecting tray basin constructed and arranged to issue forth the run-off;

a spray cabinet which mutually with the basin defines a common chamber;

said spray cabinet including a top, and translucent side walls resting on the tray basin for support; and

an internal lamp fixture carried by the cabinet top creating external luminosity to the cabinet walls and shining down within the chamber and illuminating the tray basin.

5,143,103

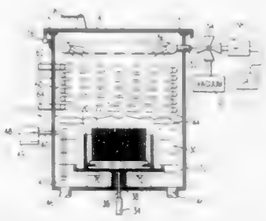
APPARATUS FOR CLEANING AND DRYING WORKPIECES

James E. Basso, Hopewell Junction; Parmesh K. Bhalla, Pleasant Valley; John J. Chahine, Poughkeepsie, all of N.Y.; Daro Diddell, San Diego, Calif.; Gregory J. Earle, Wallkill; Edward P. Gabriel, Newburgh, and Farrokh Yaghmaie, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1991, Ser. No. 637,415

Int. Cl.[5] B08B *3/12*

U.S. Cl. 134—98.1 14 Claims



1. An apparatus for cleaning and drying workpieces comprising a closed chamber, means for introducing a cleaning solvent to said chamber to a desired fill level, means for removing said solvent from said chamber, means for introducing an inert gas to said chamber and means for evacuating said chamber comprising a manifold disposed in said chamber and a multi-position valve disposed outside said chamber and connected to said manifold by means of a pipe extending through a wall of said chamber, means for supporting a workpiece carrier on a workpiece lifter which is movable with respect to said desired fill level of said cleaning solution, and means for transmitting megasonic energy to said solvent.

5,143,104

VENTED APPARATUS FOR STORING AND CLEANING AN ELEMENT

Wayne S. Iba, Mission Viejo; Gregory R. Holland, Irvine; Alix A. Moore, Santa Ana, and Walter A. York, Mission Viejo, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Dec. 7, 1990, Ser. No. 624,057

Int. Cl.[5] B08B *3/04*

U.S. Cl. 134—135 11 Claims

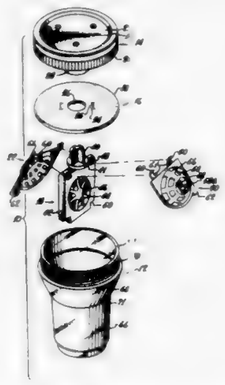
1. A vented contact lens storage and cleaning container comprising:

a container having a side wall, a bottom wall and an open top;

a cap removably attached to said container and closing off said opening in said container, said cap having an upper surface and a lower surface, said cap having a recess in said lower surface and a vent hole located within said recess and extending through said cap;

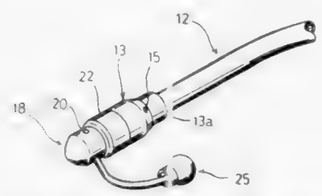
a gas and liquid impermeable gasket adjacent said vent hole in said cap including at least one "H"-shaped perforation

extending therethrough which acts as a one way valve, said "H"-shaped perforation forming a pair of adjacent flaps which are normally closed and in abutting relationship forming a fluid-tight seal, said flaps being deflectable at sufficiently high pressure levels to move away from their normal closed position to permit gas to vent through



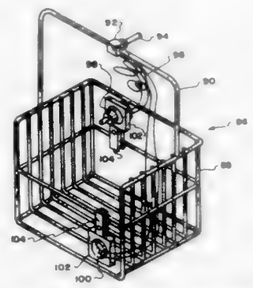
said perforation and out of said vent hole and said caps thereby providing two hinged venting flaps allowing fast evacuation of gasses generated within said container; and basket means removably mounted in the interior of said container for removably containing contact lenses and allowing liquid to freely flow over the contact lenses.

5,143,105
CLEANING DEVICE FOR TUBE
Shinzou Katayama, Park Komo 201, No. 15-10, Minaminagareyama 3-chome, Nagareyama-shi, Chiba-ken, 270-01, Japan
Filed Aug. 12, 1991, Ser. No. 743,638
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—167 C 4 Claims



1. A cleaning device for a tube comprising a nozzle supporting body (13) fixedly attached to an insertion end portion of a cleaning hose (12) adapted to be inserted into said tube (11), a nozzle (18) supported by said nozzle supporting body (13) on an end opposite form said cleaning hose, said nozzle including a nozzle rotatable head portion 18*b*, at least one first ejection hole in said nozzle rotatable head portion perpendicular to a nozzle introduction passage 21 in said rotatable head portion along an axis of said nozzle support body and toward an inner wall of said tube, an elongated flexible nozzle guide member fixedly attached by one end to said nozzle rotatable head portion, said elongated nozzle guide member including a rotatable slide member on an end not attached to said nozzle rotatable head portion, a plurality of second injection holes formed in an oblique direction away from said rotatable head portion in a tubular portion of said nozzle supporting body so as to provide a water flow under pressure to permit said cleaning device to be self-propelled, whereby said slide member is slidably and rotatably guided on the inner peripheral wall of said tube for movement along the length of the tube for cleaning the same.

5,143,106
ULTRASONIC PARTS CLEANING CONTAINER
John H. Bannon, 4208 Crownfield Ct., Westlake Village, Calif. 91361
Division of Ser. No. 650,242, Feb. 4, 1991, Pat. No. 5,088,510.
This application Dec. 12, 1991, Ser. No. 806,699
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—184 1 Claim



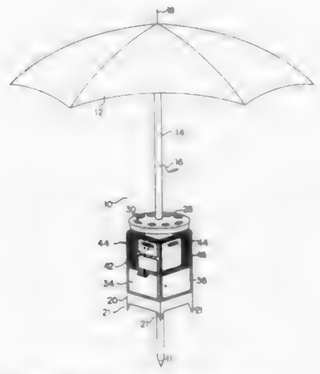
1. A parts container adapted to be submerged in a bath with a cleaning solution, said parts container to minimize ultrasonic energy losses plus allow usage of non-toxic cleaning solutions, said parts container comprising:
a wire basket having an entry access opening at the top, said wire basket being formed by a crossed series of wire rods; and
an ultrasonic transducer assembly being selectively mounted on a said wire rod, said ultrasonic transducer assembly to be positionable to direct the energy emitted therefrom to a specific area within the confines of said parts container, said ultrasonic transducer assembly being removably clamped onto a said wire rod of said parts container.

5,143,107
RAINING UMBRELLA
Jean M. Kelley, 2415 Parkland Dr., Florence, S.C. 29501
Filed Nov. 30, 1990, Ser. No. 621,036
Int. Cl.[5] A45B *3/00*
U.S. Cl. 135—16 12 Claims

1. A play umbrella, comprising:
a hollow handle, having a first end and a second end and an interior;
a plurality of support spokes, attached to and extending radially outward from said hollow handle first end;

a canopy mounted to said plurality of support spokes;
a plurality of hollow, perforated tubes attached to said plurality of support spokes and connected at one end to the interior of said hollow handle; and
attachment means for connecting a water supply to said hollow handle second end.

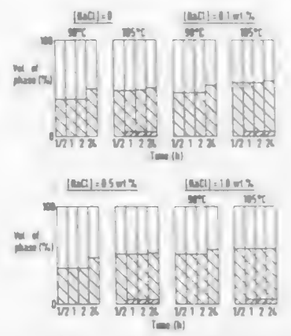
5,143,108
BEACH UMBRELLA
Robert J. Kenney, 20 E. Linden St., Alexandria, Va. 22301
Filed Jan. 26, 1990, Ser. No. 470,697
Int. Cl.[5] A45B *3/00*
U.S. Cl. 135—16 11 Claims



1. A portable beach umbrella comprising:
a vertical central support shaft;
a closable umbrella member mounted adjacent an upper end of said support shaft;
a base member mounted adjacent a lower end of said support shaft for stabilizing said beach umbrella, wherein said base member includes a plurality of depending leg members insertable into soft ground subsequent to insertion of a base end of said central support shaft into the soft ground;
an interiorly accessible compartment member mounted on said base member and around said support shaft, said shafts located at an axially central portion of said compartment member, said interiorly accessible compartment member including a first utility level mounted on said base member and a second utility level mounted on said first utility level, each of said first and second utility levels being independently rotatably at central axes thereof about said vertical central support shaft; and
means for supporting refreshments on top of said compartment member.

5,143,109
METHOD FOR BREAKING EMULSIONS
Spencer E. Taylor, Camberley, England, assignor to The British Petroleum Company p.l.c., London, England
Filed Aug. 20, 1990, Ser. No. 570,052
Claims priority, application United Kingdom, Aug. 24, 1989, 8919244
Int. Cl.[5] F17D *1/16*; B01D *17/00*
U.S. Cl. 137—13 13 Claims

1. A method for recovering the surfactant from a dispersion or emulsion of oil and water containing a temperature sensitive surfactant which method comprises the steps of heating the dispersion or emulsion to a temperature above the cloud point of the surfactant under conditions of temperature and aqueous phase salinity such that the dispersion or emulsion breaks and



separates into an oil layer, an aqueous layer and a surfactant layer, and recovering the surfactant layer.

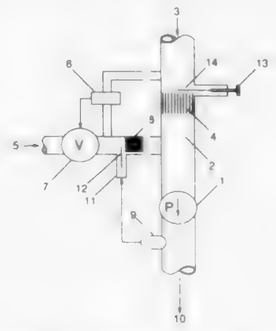
5,143,110
SEISMIC GAS SHUTOFF VALVE
Ashton E. Simpson, Hayward, Calif., assignor to EMAC, Inc., Hayward, Calif.
Filed Nov. 12, 1991, Ser. No. 791,963
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—38 8 Claims

1. A seismic shutoff valve comprising:
a housing having a lower chamber and an upper chamber in communication with one another, said lower chamber having an inlet and an outlet separated by a valve seat, said upper chamber having a floor which is angled downwardly and inwardly,
an actuating mechanism comprising a piston, having a valve gate and a ridge which are separated by a groove, and a plurality of balls disposed within said upper chamber,
said piston being held suspended above said valve seat by said balls which rest on said floor, extending partially into said groove, with said ridge resting on said balls,
until the valve is subjected to a horizontal acceleration which dislodges said balls from said groove, thereby releasing said piston which drops into a position where said valve gate sealingly engages said valve seat.

5,143,111
MULTIFLUID FLOW CONTROL UNIT
Enoch J. Durbin, 246 Western Way, Princeton, N.J. 08540
Filed Jan. 28, 1991, Ser. No. 646,177
Int. Cl.[5] F02B *43/00*
U.S. Cl. 137—100 10 Claims

1. Apparatus for combining two or more flowing fluids in fixed proportions wherein each fluid is separately caused to flow through porous structures with a pore diameter sufficiently small so that viscous forces in the fluid flowing through

said porous structure are larger than inertial forces in the fluid over the desired range of flows, additionally comprising a



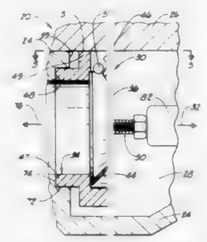
common chamber downstream of said porous structures wherein said flowing fluids are joined.

5,143,112

TOP-ENTRY CHECK VALVE WITH CARTRIDGE SECURED BY THREADED PROJECTIONS

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Sep. 18, 1991 Ser. No. 762,811
Int. Cl.[5] F16K *15/03, 43/00*
U.S. Cl. 137—315 **21 Claims**



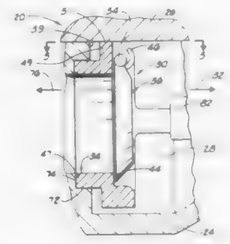
1. A top entry check valve, comprising:
a valve cartridge assembly, including a seat, cage and disc;
a body having upstream and downstream ends, a valve chamber therein communicating with the upstream and downstream ends thereof, and an access opening in a side wall thereof communicating with the valve chamber of a size to accommodate the entry and removal of the valve cartridge assembly therethrough, said body also having an annular shoulder therein facing downstream sized to engage and prevent the valve cartridge from moving upstream;
a bonnet removably attached to the body over said access opening forming a wall of the valve chamber; and
projection means threadedly secured to the cartridge assembly and extending radially therefrom downstream from the cartridge assembly into adjustable engagement with abutment surfaces extending from at least one interior wall of the valve chamber downstream of the cartridge assembly for removably securing the cartridge assembly within the valve chamber through the access opening as a single unit and limiting the downstream movement of the cartridge assembly within the valve chamber.

5,143,113

TOP-ENTRY CHECK VALVE WITH CARTRIDGE SECURED BY PROJECTIONS

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Sep. 18, 1991, Ser. No. 761,594
Int. Cl.[5] F16K *15/03, 43/00*
U.S. Cl. 137—315 **20 Claims**



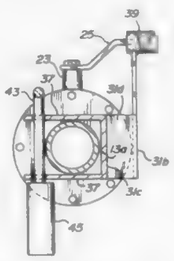
1. A top entry check valve, comprising:
a valve cartridge assembly, including a seat, cage and disc;
a body having upstream and downstream ends, a valve chamber therein communicating with the upstream and downstream ends thereof, and an access opening in a side wall thereof communicating with the valve chamber of a size to accommodate the entry and removal of the valve cartridge assembly therethrough, said body also having an annular shoulder therein facing downstream sized to engage and prevent the valve cartridge from moving upstream;
a bonnet removably attached to the body over said access opening forming a wall of the valve chamber; and
fixed projection means extending radially from the cartridge assembly downstream of the cartridge assembly, abutment surfaces extending from at least one interior wall of the valve chamber downstream of the cartridge assembly, said cartridge assembly being removably secured as a single unit within the valve chamber when the cartridge assembly is rotated in one direction to permit the fixed projection means to wedge against the abutment surfaces to maintain the cartridge assembly fixed within the valve chamber, and rotated in the opposite direction to permit the fixed projection means to clear the abutment surfaces to allow the cartridge assembly to be removed from the valve chamber through the access opening as a single unit.

5,143,114

BALL VALVE LOCKOUT MECHANISM

Keith E. Daniels, Central, S.C., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Feb. 25, 1991, Ser. No. 659,820
Int. Cl.[5] F16K *27/08*
U.S. Cl. 137—385 **6 Claims**



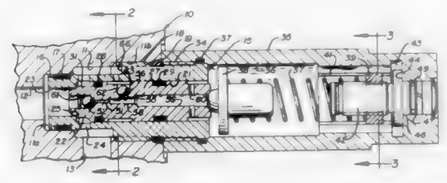
1. A removable lockout mechanism for a manually-operated ball valve installed in a pipe line which must be entirely removed form the pipe line in order to operate the ball valve wherein the ball vale has a manual handle turnable around an axis that is normal to the axis of the pipe line in which the valve is installed; said removable lockout mechanism comprising a detachable bracket that includes a hollow element adapted for placement on the valve handle when the handle is turned to a closed position extending normal to the pipe line axis, and a channel element adapted to partially encircle the pipe lien; and retainer means for releasable holding the channel element on the pipe line, said bracket comprised of a connector plate means extending between said hollow element and said channel element; said hollow element extending in one direction relative to the connector plate means, and said channel element having its flanges extending in an opposite direction relative to the connector plate means.

5,143,115

BI-DIRECTIONAL PRESSURE RELIEF VALVE

Arthur H. Geyler, Jr., Rockford, Ill., assignor to Delta Power Hydraulic Co., Rockford, Ill.

Filed Feb. 11, 1992, Ser. No. 833,978
Int. Cl.[5] F16K *17/18*
U.S. Cl. 137—493 **11 Claims**



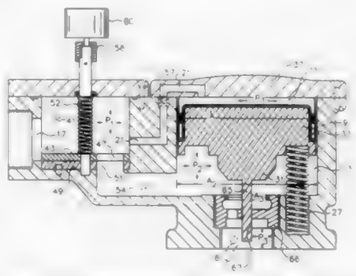
1. A bi-directional pressure relief valve for relieving pressure in either direction between two fluid lines in a hydraulic system, the valve comprising valve casing means defining a valve bore, a valve chamber at one end of the valve bore and a pressure chamber communicating with an end of the valve bore remote from the valve chamber, a first port for communicating a first fluid line with the valve chamber, a second port for communicating a second fluid line with the valve chamber, the first port having a valve seat coaxial with said bore and the valve seat having a cross-sectional area smaller than the cross-sectional area of the valve bore, a valve member having a first portion slidable in the bore and reduced portion on one end engageable with the seat to shut-off flow between the first and second ports, spring means yieldably urging said valve member toward said valve seat to a closed position, first chamber vent passage means communicating said pressure chamber with said first port when the valve member is in the closed position and first check valve means in said first vent passage means arranged to close and block flow from said first port to said pressure chamber when the fluid pressure at said first port is greater than the fluid pressure in said pressure chamber, second chamber vent passage means communicating said pressure chamber with said second port when the valve member is in the closed position and second check valve means in said second vent passage means arranged to close and block flow from the second port to said pressure chamber when the fluid pressure at the second port is greater than the fluid pressure in the pressure chamber.

5,143,116

FLOW REGULATING VALVE AND SYSTEM USING THE SAME

Paul K. Skoglund, P.O. Box 848, Woodinville, Wash. 98072

Continuation-in-part of Ser. No. 540,297, Jun. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 448,552, Dec. 11, 1989, abandoned. This application May 24, 1991, Ser. No. 708,098
Int. Cl.[5] F16K *31/363*
U.S. Cl. 137—487 **33 Claims**



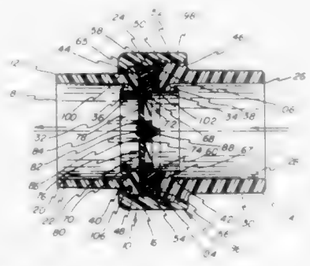
1. A pressure independent fluid flow regulating valve comprising:
a valve body having an inlet and an outlet forming a flow passage through said valve body;
a piston mounted in a bore intersecting said flow passage, said piston dividing said bore into first and second chambers, said inlet and said outlet connected with said second chamber;
outlet varying means on said piston for varying the cross-sectional area of said outlet based on the pressure differential between said first chamber and said second chamber;
a reference pressure passage connected to said inlet and to said first chamber of said bore;
an adjustable throttle means disposed in said flow passage for varying the cross-sectional area of said flow passage;
spring means biasing said piston toward said reference pressure passage; and
means for guiding reciprocation of said piston in said bore, said means for guiding reciprocation including an elongate member in said bore and an opening in registration with said elongate member whereby relative reciprocation between said elongate member and said opening occurs upon piston reciprocation.

5,143,117

BREAK AWAY CHECK VALVE

Donald J. Klein, Jackson, Tenn., assignor to Tomkins Industries, Inc., Dayton, Ohio

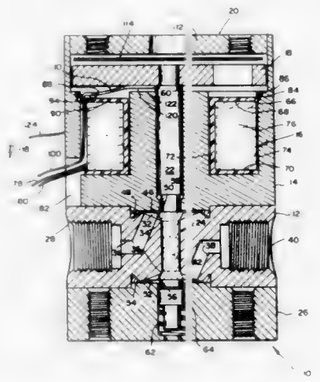
Filed Aug. 29, 1991, Ser. No. 751,554
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—512.15 **12 Claims**



1. A check valve assembly comprising:

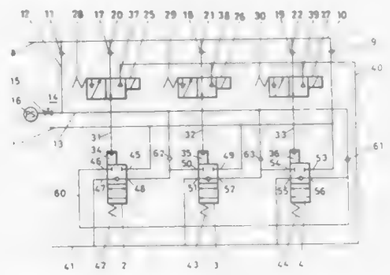
a first pipe section having a first sealing surface,
a second pipe section having a second sealing surface,
an insert member having front and rear surfaces engaging said first and second sealing surfaces, respectively,
means defining an aperture through said insert member,
a resilient diaphragm member extending across said aperture and including a tab portion and a pair of semi-circular flap portions connected to said tab portion along a pair of hinge portions, said hinge portions being defined by two elongated areas having a substantial reduction in material thickness relative to a thickness of said flap portions, said flap portions each defining upper and lower flap surfaces wherein each of said upper and lower flap surfaces lie in a single plane extending from a location adjacent to said hinge portion to a peripheral edge of a respective flap portion defining a radial outer boundary of said diaphragm member, said diaphragm member allowing fluid flow through said insert member in a first direction and preventing fluid flow through said diaphragm in a second direction, and
a nut member extending around said insert member and engaging said first and second pipe sections for holding said front and rear surfaces in contact with said first and second sealing surfaces.

5,143,118
SOLENOID CONTROL VALVE
Akos Sule, 4 Gates Ave., Roseland, N.J. 07068
Filed Feb. 14, 1991, Ser. No. 656,240
Int. Cl.[5] F16K *31/06*
U.S. Cl. 137—554 12 Claims



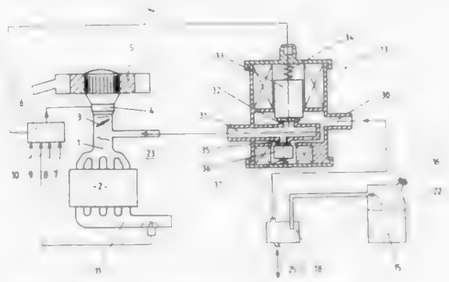
1. A solenoid control valve comprising:
a valve body,
fluid control means disposed in said valve body, and comprising diaphragm and poppet means,
electrically operated solenoid means mounted on said valve body with said solenoid means comprising a solenoid housing, a solenoid coil, a solenoid bobbin, and an armature disposed for actuation by said solenoid means,
electrical switch means having a fixed portion and a moveable portion with said fixed portion comprising said solenoid housing and with said moveable portion comprising said armature,
actuation means connected to said armature for actuation of said fluid control means respective to the position of said armature,
electrical connection means continuously providing electrical contact with said armature means, and
mechanical stop means formed in said solenoid housing with said armature means making electrical and mechanical contact with said mechanical stop means at one end of its travel.

5,143,119
DRIVE FOR A FEED VALVE
Rico Plangger, Turgi, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Dec. 13, 1990, Ser. No. 626,983
Claims priority, application Switzerland, Dec. 21, 1989, 4574/89
Int. Cl.[5] F15B *19/00;* **F16K** *37/00*
U.S. Cl. 137—557 6 Claims



1. A drive for a feed valve comprising:
a hydraulically pressurized actuating line;
means for controlling the pressure in the actuating line, said means for controlling the pressure in the actuating line having first, second and third valves connected to one another;
a test system which is pressurized via fluidic connection with said means for controlling the pressure in the actuating line;
a sensor for sensing a pressure drop in the test system, and
a non-return valve provided in a connecting line between each of said first, second and third valves and the test system, each said non-return valve permitting a throughflow from said test system toward each of said first, second, and third valves, respectively.

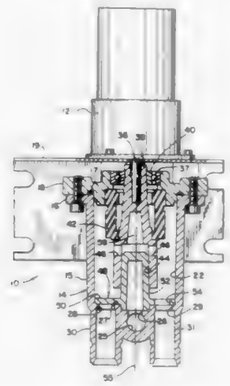
5,143,120
ELECTROMAGNETIC VALVE ASSEMBLY
Reinhard Tinz, Bross-Biberau, and Joachim Heinemann, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany
Filed Mar. 13, 1991, Ser. No. 668,871
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008266
Int. Cl.[5] G05D *7/06*
U.S. Cl. 137—601 3 Claims



1. Electromagnetic valve assembly comprising

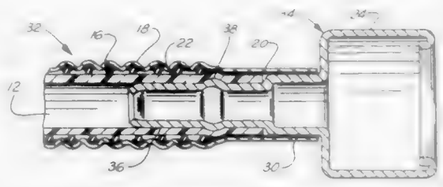
an inlet,
an outlet,
a main valve between said inlet and said outlet, said main valve comprising a main valve seat defining an opening having a cross sectional area, a main closing element lying between said inlet and said main valve seat, a main spring which urges said closing element against said seat, and main magnetic means comprising a magnetic coil effective to open said valve,
an auxiliary valve in parallel with said main valve between said inlet and said outlet, said auxiliary valve comprising an auxiliary valve seat defining an opening having a smaller cross sectional area than the cross-sectional area in the opening defining the main valve seat, an auxiliary closing element lying between said inlet and said auxiliary valve seat and having a smaller inertial mass than the main closing element, an auxiliary spring which urges said auxiliary closing element against said auxiliary valve seat, and auxiliary magnetic means comprising a magnetic coil effective to open said auxiliary valve, and
control means for simultaneously activating said magnetic coils in pulses having a variable duration and frequency, whereby, upon subjecting said main valve element and said auxiliary valve element to fluid pressure and activating the respective magnetic coils, the auxiliary valve element will open first and thus reduce the fluid pressure on the main valve element, the duration and frequency of the pulses determining the supply of fluid from said inlet to said outlet.

5,143,121
FLUID PULSE GENERATING APPARATUS
Michael D. Steinhardt, Kiel; Kathleen S. DeKeyser, Hingham, and Jeffrey F. Tempas, Oostburg, all of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Nov. 8, 1991, Ser. No. 790,272
Int. Cl.[5] F16K *11/074*
U.S. Cl. 137—624.13 10 Claims



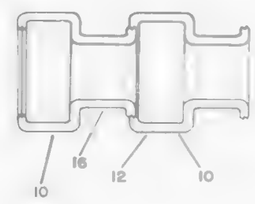
1. An apparatus for producing a pulsated flow of a fluid comprising:
a housing with a chamber, a first fluid inlet, a second fluid inlet at one end of the chamber, and a fluid outlet through a wall at the one end of the chamber;
a rotary valve disposed within the chamber and having a means which alternately opens and closes the fluid outlet as said valve rotates, and disposed so that fluid flowing into the chamber from the first fluid inlet produces movement of the valve toward the wall at the one end of the chamber whereas fluid flowing into the chamber from the second fluid inlet produces movement of the valve away from the wall; and
means for producing rotational movement of said valve.

5,143,122
COMPOSITE FLEXIBLE CONDUIT ASSEMBLY
Delbert L. Adkins, Mount Clemens, Mich., assignor to Bundy Corporation, Warren, Mich.
Filed Sep. 11, 1990, Ser. No. 580,488
Int. Cl.[5] F16L *39/02*
U.S. Cl. 138—109 37 Claims



1. A flexible conduit comprising a flexible and elongate inner tube of a polymer material, a flexible and elongate coil of wire having a plurality of loops telescopically received over said inner tube, a flexible and elongate tubular outer jacket of a polymer material telescoped over said coil, a pair of couplings each received in one end of said outer jacket and inner tube, each of said couplings and said inner tube having a fluid tight seal therebetween so that a fluid under pressure may be retained in said inner tube and couplings, a seal between each coupling and said outer jacket, said outer jacket is a heat shrinkable polymer material and is shrunk into firm engagement with said coil of wire throughout the length of said coil, and said outer jacket and inner tube cooperate to define a dead air space between them in which said coil is received and encapsulated between them, and said coil adjacent each end overlapping in part one of said couplings and being isolated from direct contact therewith by said inner tube.

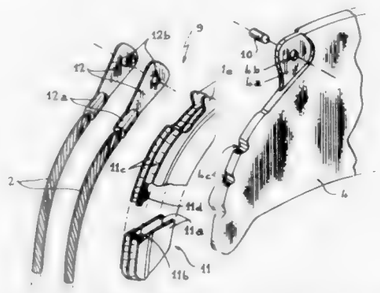
5,143,123
CYLINDRICAL ARMOR
Marvin K. Richards, Chandler, and James W. Ryan, Phoenix, both of Ariz., assignors to Simula, Inc., Phoenix, Ariz.
Filed Aug. 18, 1989, Ser. No. 395,496
Int. Cl.[5] F16L *15/00, 27/00*
U.S. Cl. 138—120 13 Claims



1. A cylindrical armor for protecting a conduit disposed therethrough comprising:
a plurality of cylindrical links, each cylindrical link having a reduced end and an enlarged end, the ends being shaped for engagement with the ends of adjacent identical cylindrical links, wherein the ends of each link comprise means for selectively making said engagement between each pair of adjacent identical cylindrical links either rigid or slidable and flexible without disassembling the cylindrical armor, the links of each pair remaining interconnected in both the rigid and the slidable and flexible configurations, the links also remaining interconnected as the engagement is converted from either configuration to the other configuration, wherein the means for selectively making said

engagement either rigid or slidable and flexible includes flanges which are correspondingly threaded, and wherein the engagement between adjacent links is rigid when the adjacent links are threadedly engaged and slidable and flexible when the links' flanges are rotated past threaded engagement.

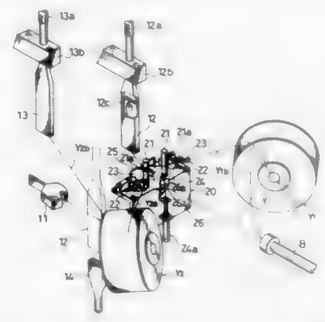
5,143,124
CABLE WEAR PAD FOR DOBBY SHEDDING LEVER
Jean-Paul Froment, Faverges, France, assignor to S. A. Des Etablissements Staubli (France), Faverges, France
Filed Apr. 19, 1991, Ser. No. 687,758
Claims priority, application France, May 16, 1990, 90 06336
Int. Cl.[5] D03C *1/14*
U.S. Cl. 139—88 7 Claims



1. A system for fastening the end of at least one drawing cable to a suspension lever of a textile dobby of the negative type wherein the lever includes an outer edge, the system comprising, the drawing cable having a mounting eye secured to the end thereof, a flange on the outer edge of the lever, fastening means for securing said mounting eye to said flange, a bearing pad of U-shaped cross section adapted to be seated over the outer edge of the lever, said bearing pad and the outer edge of the lever, said bearing pad and the outer edge of the lever including complementary mating surface portions adapted to oppose any relative sliding between the lever and said bearing pad, said complementary mating surface portions including a plurality of projecting ribs on said bearing pad which are cooperatively seated within a plurality of spaced depressions in the outer edge of the lever, said bearing pad including an outer face, and at least one groove in said outer face forming a guide for the at least one cable.

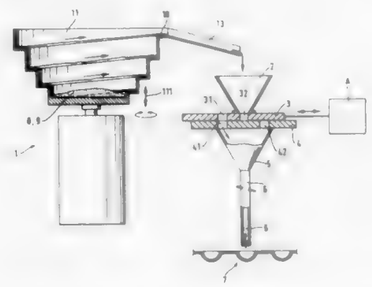
5,143,125
TRANSFER TAIL FORMING APPARATUS FOR WEFT FEEDERS
Yasuyuki Tamatani, and Kanji Tsuji, both of Kanazawa, Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan
Filed Oct. 2, 1990, Ser. No. 591,835
Claims priority, application Japan, Oct. 4, 1989, 1-259695; Jan. 26, 1990, 2-17582
Int. Cl.[5] D03D *47/34*
U.S. Cl. 139—450 24 Claims

1. A transfer tail forming apparatus for changing a yarn supply to a loom without interrupting a continuous operation of the loom, said transfer tail forming apparatus comprising:
a positioning means for automatically arranging and positioning a tail end of yarn on a feeder now in use and a leading end of yarn on a preliminary feeder to a knotter operating position for connection together by a knotter; and
a stand-by means for holding in tension a transfer tail formed by said knotter in a predetermined stand-by posture; while a leading end of yarn is continuously fed from said feeder now in use to said loom while said transfer tail is



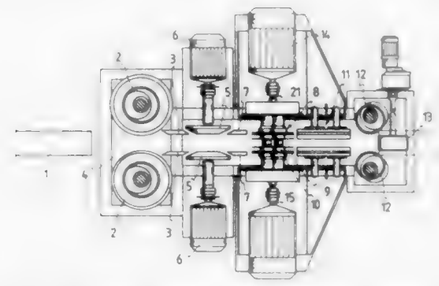
held in said predetermined stand-by posture while said loom is operating.

5,143,126
VIBRATORY PROCESS AND APPARATUS FOR AGGLOMERATING AND METERING NON-FLOWABLE POWDERS
Beate Boesch, Roggenhouse, France, and Satish C. Khanna, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 23, 1991, Ser. No. 645,079
Claims priority, application Switzerland, Jan. 29, 1990, 266/90
Int. Cl.[5] G01F *11/00*; B65B *1/34*
U.S. Cl. 141—1 6 Claims



1. A method for metering small quantities of a non-flowable or poorly flowable fine-grained powder which comprises the steps of (1) feeding said fine-grained powder to a mechanical vibration device, (2) mechanically vibrating said powder in said mechanical/vibration device to form flowable grain agglomerations, (3) transporting said agglomerations to a metering device, (4) metering the desired amounts of agglomerations and (5) collecting said metered amounts.

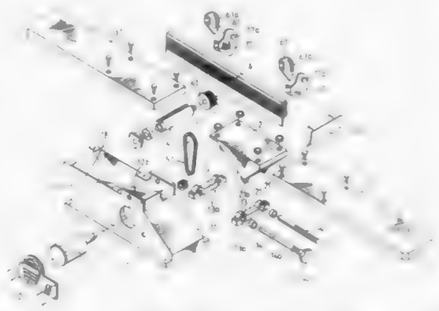
5,143,127
SAWING MACHINE
Kauko Rautio, Kolmihaarantie 1, 52700 Mäntyharju, Finland
PCT No. PCT/FI89/00051, § 371 Date Oct. 25, 1990, § 102(e) Date Oct. 25, 1990, PCT Pub. No. WO89/10824, PCT Pub. Date Nov. 16, 1989
PCT Filed Mar. 22, 1989, Ser. No. 601,692
Claims priority, application Finland, May 10, 1988, 882172
Int. Cl.[5] B27C *9/00*
U.S. Cl. 144—39 4 Claims



1. An apparatus for the cutting and sawing of logs, said apparatus comprising
means for feeding logs,
chipping cutter head means for chipping the log surface, a first cutting unit means mounted on one side of the log to engage the log,
said cutting unit means including a pair of spaced apart axle sets,
each of said axle sets having mounted thereon at least one disc saw for sawing the logs in a lengthwise direction and at least one chipper edge for chipping a board to the right width,
means for moving said cutting unit means to said pair of spaced apart axle sets are moved and the position of said at least one disc saw and said at least one chipper edger on each of said axle sets is changed relative to the log, a second cutting unit means mounted on an opposite side of the log to engage the log,
said second cutting unit means including a pair of spaced apart axle sets with each of said axle sets having mounted thereon at least one disc saw and at least one chipper edger, and
means for moving said second cutting unit means so that said pair of spaced apart axle sets are moved and the position of said at least one disc saw and said at least one shipper edger is changed relative to the log.

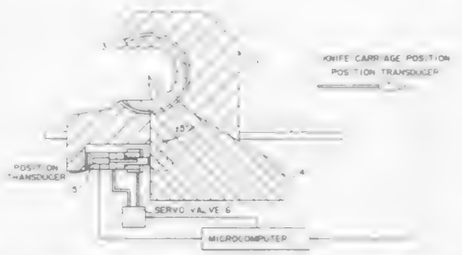
5,143,128
TABLE-TOP PLANER
Chin-Te Chen, Taichung, Taiwan, assignor to Shin Luen Facturing Factory Co., Ltd., Taichung, Taiwan
Filed Mar. 5, 1991, Ser. No. 664,856
Int. Cl.[5] B27G *19/00*; B27C *1/00*
U.S. Cl. 144—117 R 4 Claims

1. A table-top planer comprising:
a) a hollow base frame having an air intake hole and a guide board seat adjustably secured to the frame at one end thereof;
b) a first guide board longitudinally mounted on said base frame and disposed in a horizontal position;
c) a second guide board longitudinally mounted on said guide board seat and disposed in a horizontal position corresponding to the position of said first guide board;
d) the base frame including a slope portion and a slide way portion, the guide board seat being mounted on the slope portion, and the slide way portion for guiding cut chips out of said base frame;
e) the slope portion including a pair of opposed bolt holders transversely secured at opposite ends thereof for fastening at least a guide rod and at least an adjusting screw rod to secure said guide board seat thereto, said adjusting screw rod having an outer thread portion fastened with an inner thread portion formed on said guide board seat at a bottom thereof for controlling the elevation of said guide board seat on said slope portion through a revolving control; and



f) a plane iron transversely mounted on said base frame between said first and second guide boards, said slide way portion having a curved end disposed below the plane iron and a plurality of vent holes for communicating with the air intake hole of said base frame for permitting induced outside air to rapidly blow therethrough and expel cut chips from the slide way portion.

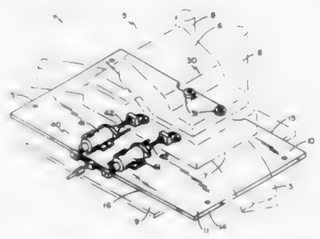
5,143,129
APPARATUS FOR ADJUSTING THE PITCH ANGLE OF A KNIFE BLADE IN A VENEER LATHE
Juha Toivio, Lahti, Finland, assignor to Raute Oy of Vesijarvenkatu, Lahti, Finland
Continuation-in-part of Ser. No. 581,846, Sep. 13, 1990. This application Jul. 10, 1991, Ser. No. 727,684
Claims priority, application Finland, Sep. 18, 1989, 894389
Int. Cl.[5] B27L *5/00*; B27B *1/00*
U.S. Cl. 144—211 3 Claims



1. Apparatus for adjusting the pitch angle of a knife blade in a veneer lathe comprising:
a feed carriage mounted for movement on guides fixed to a lathe frame,
a blade carriage supporting the knife blade, said blade carriage comprising a massive member pivotally mounted by trunnions on the feed carriage so as to rotate under the force of gravity,
means operative between the feed carriage and the blade carriage for supporting the blade carriage against the force of gravity in an angularly biased position relative to the feed carriage, and

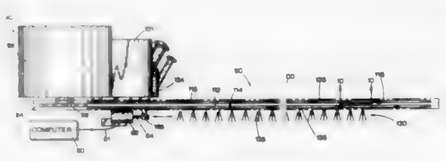
control means responsive to different types of wood for allowing the means for supporting the blade carriage to retract at different rates under the force of gravity exerted on the blade carriage.

5,143,130
JIG FOR CURVED MOLDINGS
Robert L. Bonyman, 70 Chestnut Rd., Tewksbury, Mass. 01876
Filed Oct. 7, 1991, Ser. No. 772,063
Int. Cl.[5] B27B *27/02*; B27C *5/02*
U.S. Cl. 144—253 F 9 Claims



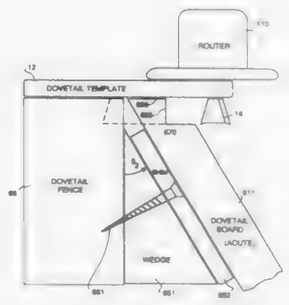
1. A jig for guiding a wood piece of any curvature in a path for engagement with a cutting tool having a cutter head, vertical support rods and a table, comprising:
a base for attachment to said cutting tool table whereby said jig is positioned directly under said cutting tool cutter head;
a guide wheel assembly comprised of a set of two guide wheels permanently mounted in a side-by-side relationship on one side of the base; and
an adjustable guide assembly comprised of two removably mounted pneumatic cylinders mounted opposite to the permanent guide wheels on said base, each said cylinder driving a piston arm with a horizontally positioned guide wheel bolted to the piston arm's distal end.

5,143,131
SELECTABLE SPRAY PATTERN CHAIN SAW BAR SYSTEM
Christopher D. Seigneur, West Linn, and Robin A. Plumbley, Portland, both of Oreg., assignors to Blount, Inc., Montgomery, Ala.
Filed Oct. 25, 1991, Ser. No. 782,432
Int. Cl.[5] B27M *1/00*; B27B *1/00*; A01G *23/08*
U.S. Cl. 144—364 51 Claims



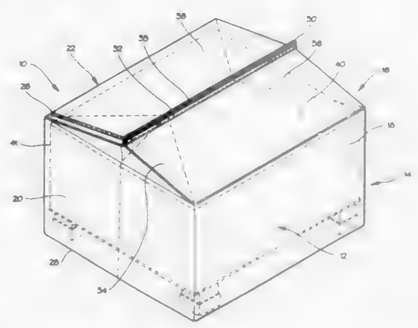
1. A fluid spraying saw bar, comprising:
a bar member having an attachment end for attachment to a chain saw, a peripheral edge including guide means for guiding an endless cutting chain about a portion of the peripheral edge, two opposing outer surfaces, an elongate chamber for receiving a fluid, and plural fluid emitting holes extending from the chamber to at least one of the outer surfaces; and
a flow controller shiftably received in the bar member chamber to selectively control fluid flow through the fluid emitting holes to provide a predetermined spray pattern of fluid from the saw bar.

5,143,132
SYSTEM FOR MAKING DOVETAIL JOINTS INCLUDING ACUTE AND OBTUSE ANGLE DOVETAILS AND BOX JOINTS
David A. Keller, 1327 I St., Petaluma, Calif. 94952
Filed Aug. 21, 1990, Ser. No. 571,055
Int. Cl.[5] B27M *3/00*
U.S. Cl. 144—372 13 Claims



1. Using a dovetail template fixedly joined to a dovetail fence, a method for cutting dovetails in an end of a dovetail board which is to be joined to a pin board at an intended angle other than a right angle comprising:
constructing said dovetail fence to have a surface forming an apex angle with respect to said dovetail template equal to the amount different from 90 degrees of said intended angle;
aligning said dovetail board with said surface such that said end contacts said dovetail template; and
using a dovetail bit to form dovetail cuts in said dovetail board as guided by said dovetail template.

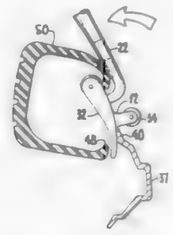
5,143,133
FURNITURE COVERING FOR SHIPMENT
Mark C. Speckman, Greensboro, N.C., assignor to U.S. Packaging, Inc., High Point, N.C.
Filed Jan. 21, 1992, Ser. No. 823,160
Int. Cl.[5] B65D *30/08*
U.S. Cl. 150—158 1 Claim



1. A collapsible covering for protection of furniture during shipment comprising a sheet of flexible material formed into a generally parallelepipedic configuration having a plurality of wall panel portions, said wall panel portions being joined to provide an open end portion and a closed end portion, whereby the placement of said covering over a furniture item will result in said wall panels assuming an open disposition having first and second gussets formed in said wall panels whereby said closed end portion forms a generally flat surface

on said furniture item, said flexible material having a plurality of plys juxtaposed and attached to one another to form said sheet, said plys formed of recyclable materials including a first outer ply formed of extensible kraft paper, an inner ply formed of glassine paper, a first plurality of intermediate plys formed of recycled indented kraft paper, and at least one additional intermediate ply formed of extensible kraft paper, all of said plys being joined together using a water soluble adhesive, and said wall panels being joined together by stitching consisting of natural fibers.

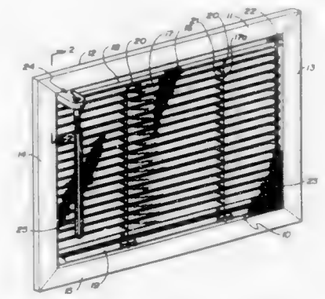
5,143,134
TIRE INSTALLATION TOOL
Loi V. Tran, 1028 Jackson St., Easton, Pa. 18042
Filed Jul. 24, 1991, Ser. No. 734,917
Int. Cl.[5] B60C *25/04*
U.S. Cl. 157—1.3 22 Claims



1. A tool for installing a tire on a wheel rim, the tire having axially spaced beads at a radially inward edge, the rim having axially spaced flanges at a radially outward edge, the tool comprising:
an elongated body member defining a handle end and a tool end, the tool end having a connector portion;
a tool head at the tool end of the elongated body member, the tool head having:
a tire engaging member terminating in an insertion end and a contact end, the tire engaging member having a back face attached at an end of the connector portion, and a front face on an opposite side of the tire engaging member;
a tire contact part extending above the front face at the contact end; and,
a wheel rim contact member extending from the back face and terminating in a wheel rim contact part, wherein a portion of the tire engaging member between the insertion end and the wheel rim contact member is insertable between one of the tire beads and an adjacent one of the rim flanges.

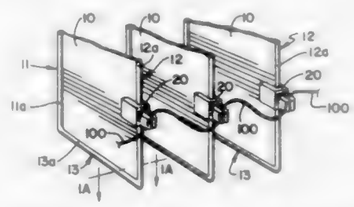
5,143,135
LOW PROFILE HEADRAIL VENETIAN BLIND
Otto Kuhar, Garfield, N.J., assignor to Levolor Corporation, Sunnyvale, Calif.
Filed Jan. 18, 1991, Ser. No. 643,388
Int. Cl.[5] E06B *9/38*
U.S. Cl. 160—107 31 Claims

1. A venetian blind having a series of horizontal slats extending from a headrail, said headrail containing a slats-tilting mechanism and means for raising the slats to a slats stacked position and for lowering the slats to an extended position, said slats-tilting mechanism comprising:
at least one elongated guide channel fixed in said headrail along a headrail longitudinal axis;
at least a pair of clamping blocks in said channel, each being movable in said channel in a to and fro direction parallel to said headrail axis;
at least two slat ladders, each having two ladder legs with upper distal ends;
means for fixedly attaching distal ends of the ladder legs to said clamping blocks;
a looped chain having spaced portions fixed to said clamping blocks; and



means for driving said chain in incremental orbital directions such that the ladder legs of each pair of ladder legs are pulled in opposite directions to and fro by driven motion of said looped chain to thereby tilt said slats.

5,143,136
CLIP ASSEMBLY FOR VERTICAL LOUVERS
Julius F. John, Redondo Beach, Calif., assignor to Home Fashions, Inc., Santa Monica, Calif.
Filed Aug. 23, 1991, Ser. No. 749,429
Int. Cl.[5] E06B *9/30*
U.S. Cl. 160—173 14 Claims



1. A clip assembly in combination with a blind assembly, the blind assembly having a plurality of free-hanging elongated vertical louvers supported at adjacent upper ends thereof so as to hang in substantially vertical positions at preselected, spaced relations to one another and to enable rotation of the louvers about longitudinal axes of rotation between an open louver position and a closed louver position; each said louver having a bottom edge, and a front and a back longitudinal edge and being laterally sized so that the front edge of each louver overlaps the back edge of the next adjacent louver in the closed louver position, the clip assembly comprising:
a plurality of clips, each said clip being attached to a portion adjacent an edge of one said louver; and,
a cord connecting adjacent clips having a length between each clip equal to or greater than the preselected, spaced relations between the louvers,
each said clip having
a generally resilient gripping portion for engaging and gripping said portion of the louver adjacent said one edge of the louver, said gripping portion including two extending members forming a louver channel therebetween for receiving said portion, and
an integral head portion for clamping said cord therein,
said head portion including two posts extending outwardly from said gripping portion in a direction substantially

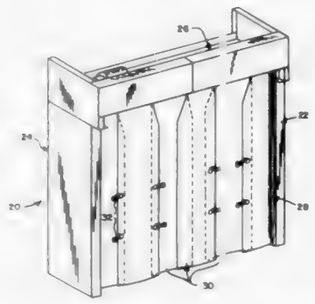
opposite that of said two extending members forming a cord channel therebetween for receiving said cord.

5,143,137

OVERLAPPING SEAL FOR INSULATED FOLDING DOOR

Floyd D. West, Galena, Ill., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Mar. 8, 1990, Ser. No. 490,335
Int. Cl.[5] E05D *15/26*
U.S. Cl. 160—199 **19 Claims**



1. For use in a high speed folding door having a plurality of panels suspended from an overhead track and drive means for moving said panels between an open and a closed position, a panel adapted for mutually overlapping positioning with another similar panel when the door is closed, each of said panels comprising:

a sheet-like, flexible partition comprised of a transparent material;

first and second insulating layers disposed on opposed surfaces of said flexible partition, wherein said insulating layers include respective apertures arranged in mutual alignment to form a windown in the panel; and

breakaway double interlocking seal means disposed on an overlapping edge portion of the panel for connecting the panel to another similar panel in a sealed manner when the door is closed while allowing separation of the panels from each other when the door is opened.

5,143,138

SCREEN MOLDING

Jerry J. Zwart, 44 Parry Rd., Stamford, Conn. 06907

Filed Sep. 19, 1991, Ser. No. 762,441
Int. Cl.[5] A47H *13/00*
U.S. Cl. 160—395 **1 Claim**

1. A new and improved screen retaining assembly comprising:

molding means attachable to an existing porch frame, window frame, or the like;

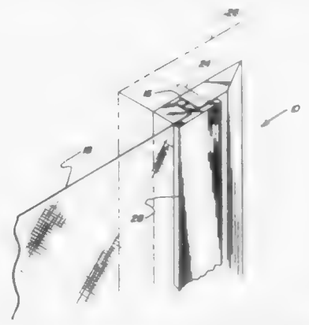
groove means formed in said molding means;

first flexible strip means frictionally engageable with said groove means, thereby to hold an edge of flexible screen within said groove means wherein said screen edge is positioned between said groove means and said first flexible strip means;

decorative cap strip means attachable to said molding means so as to conceal said groove means having said first flexible strip means retained therein, said decorative cap strip means being frictionally engageable with said groove means, said decorative cap strip means further including a longitudinally extending, centrally disposed bulbous member which is frictionally engageable with said groove means;

second flexible strip means removably attachable to said longitudinally extending bulbous member, said second flexible strip means being frictionally engageable with said groove means to retain said decorative cap strip means in position over said molding means, said second flexible strip means further including rearwardly extending edges which operate to prevent said second flexible strip means from becoming disengaged with said groove means; and

tack means attached to said second flexible strip means, said



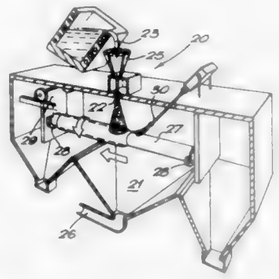
tack means being engageable with said first flexible strip means when said second flexible strip means is positioned within said groove means, said tack means further including a use of barbed points which engage said first flexible strip means, thereby to effect a removal of said first flexible strip means from said groove means upon a removal of said second flexible strip means from said groove means.

5,143,139

SPRAY DEPOSITION METHOD AND APPARATUS THEREOF

Alan G. Leatham, Swansea; Charles R. Pratt, Neath, both of Wales, and Peter F. Chesney, Duncanville, Tex., assignors to Osprey Metals Limited, West Glamorgan, United Kingdom

PCT No. PCT/GB89/00626, § 371 Date Jan. 22, 1991, § 102(e) Date Jan. 22, 1991, PCT Pub. No. WO89/12115, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 6, 1989, Ser. No. 613,891
Claims priority, application United Kingdom, Jun. 6, 1988, 8813335; Feb. 7, 1989, 8902722
Int. Cl.[5] B05C *5/04*; C23C *4/12*; B22F *9/08*
U.S. Cl. 164—46 **26 Claims**



16. A method of spray deposition comprising the steps of:

providing a spray chamber;

atomizing a stream of liquid metal or metal alloy of a first composition inside the spray chamber into a spray of atomized droplets having a mean axis;

providing a metal or metal alloy collector of a second, different, composition supported for rotation about an axis transverse to the mean axis of the spray;

roughening the surface of the collector to provide a key for a mechanical bond for atomized droplets deposited thereon;

rotating the collector about its axis;

directing the spray of atomized droplets at the collector so that a deposit is formed about the collector and a bonded interface is formed between the deposit and the collector;

retaining the collector as an integral part with said deposit;

working the integral deposit and collector by extrusion to substantially eliminate porosity in the region of the bonded interface; and

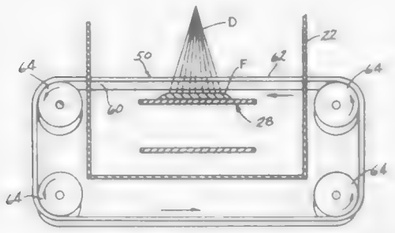
extruding the deposit and the collector as a compound tube the outside of which is of said first composition and the inside of which is of said second composition.

5,143,140

SPRAY CASTING OF MOLTEN METAL

Thomas J. Melillo, East Haven; Michael A. D'Onofrio, Branford; W. Gary Watson, Cheshire, and Sankaranarayanan Ashok, Bethany, all of Conn., assignors to Olin Corporation, Chesire, Conn.

Filed Mar. 4, 1991, Ser. No. 663,509
Int. Cl.[5] B22D *23/00*
U.S. Cl. 164—46 **4 Claims**



2. A process for spray casting molten metal comprising:

(a) atomizing a spray of molten metal into metal particles in a divergent spray pattern,

(b) moving a substrate along a path so an area thereon is disposed below the atomizing means for receiving a deposit of said particles in said spray pattern to form a product, and

(c) deflecting a portion of the leading edge of the spray pattern away from the center of the spray pattern into a position to avoid contact with said substrate.

5,143,141

PROCESS AND APPARATUS FOR THE CONTROLLED-PRESSURE CASTING OF MOLTEN METALS

Claudio Frulla, Busto Arsizio, Italy, assignor to TVA Holding S.p.A., Busto Arsizio, Italy

Filed Aug. 8, 1990, Ser. No. 564,276
Claims priority, application Italy, Aug. 24, 1989, 21546 A/89
Int. Cl.[5] B22D *18/02*
U.S. Cl. 164—120 **18 Claims**

1. Process for the controlled pressure-casting of molten metal, comprising the steps of:

providing an extractable punch and a fixed die;

positioning said punch within said die whereby to define between said punch and said die, a casting cavity,

providing at least one duct leading into said casting cavity;

providing a metered amount of molten metal;

pouring said metered amount of molten metal into said casting cavity through said at least one duct;

moving said punch inside said die whereby to create a pressure sufficient to distribute said metered amount of molten metal throughout said casting cavity;

exerting a compression force on said metered amount of metal contained in said casting cavity;

maintaining said compression force until said metered amount of molten metal solidifies completely, whereby to produce a formed part located on said die in said casting cavity;

separating said formed part from said casting cavity by moving said punch away from said die;

removing said punch from said die, and;

extracting said formed part from said die.

9. Apparatus for the controlled pressure-casting of molten metal, comprising

at least one die;

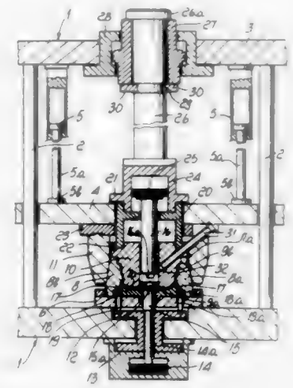
a fixed structure supporting said die;

a movable structure which is movable with respect to said fixed structure;

a movable punch connected to said movable structure and being insertable into said die;

control means for activating said movable punch,

a casting cavity defined between said movable punch and said die;



at least one duct provided in said movable structure and communicating with said casting cavity;

first means for compressing molten metal fed into said casting cavity through said at least one duct, said first compression means being slidably and sealingly mounted in said movable structure and controllably activatable to compress metal in said casting cavity with said punch inserted into said die, and

first and second actuation means for moving said punch in at least two directions with preset strokes, said actuation means including;

means for moving said punch to a position whereat said die is partially closed before introduction of molten metal into said casting cavity through said duct,

means for further moving said punch to totally close said die after feeding molten metal into said casting cavity, and;

means for lifting said punch to allow extraction of solidified cast metal from said casting cavity.

5,143,142

MOLD MAKING MACHINE HAVING VIBRATOR FOR REMOVING PATTERN PLATE FROM PREPARED MOLD

Nobuto Imamura, and Jun Miyamoto, both of Aichi, Japan, assignors to Tokyu Co., Ltd., Japan

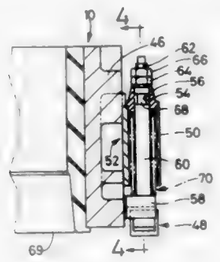
Filed Jun. 3, 1991, Ser. No. 709,159
Claims priority, application Japan, Jun. 6, 1990, 2-148151
Int. Cl.[5] B22C *19/06*
U.S. Cl. 164—189 **10 Claims**

1. A mold making machine having a pattern plate and a pair of flasks which are superposed on each other such that said pattern plate is interposed between said flasks, said pattern

plate having an integrally formed pattern and cooperating with said pair of flasks to define two mold cavities for forming two sections of a casting mold, said mold making machine comprising:

at least one pattern-plate removing mechanism each including a vibrator supported by one of said pair of flasks, and support means provided on said one of said pair of flasks, for supporting said vibrator such that said vibrator is movable in a direction in which said pattern plate and said pair of flasks are superposed on each other,

said support means including (a) a positioning sleeve fixed to said one of said pair of flasks such that said positioning sleeve extends in said direction, (b) a mounting rod which



is connected at one end thereof to said vibrator and extends through said positioning sleeve, and (c) biasing means defined by a coil spring disposed around said mounting rod and interposed between said positioning sleeve and said vibrator, said coil spring biasing said vibrator against said pattern plate in said direction, such that said vibrator is movable with said mounting rod being movable through said positioning sleeve, so that a vibrating force of said vibrator is transmitted to said pattern plate upon operation of said vibrator, to thereby remove said pattern plate from said sections of the casting mold prepared, and from said one flask, said support means preventing said vibrating force from being transmitted to said one flask.

5,143,143

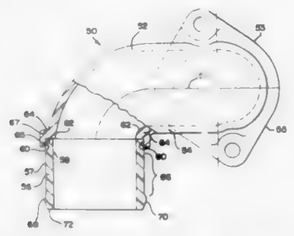
MULTIPIECE FOAM PATTERN FOR MAKING HOLLOW CASTING HAVING AN INTEGRAL HOSE CONNECTION

Edward F. Tausk, Downers Grove, Ill., assignor to Navistar International Transportation Corp., Chicago, Ill.

Division of Ser. No. 485,099, Feb. 26, 1990, Pat. No. 5,076,345. This application Dec. 20, 1991, Ser. No. 811,762

Int. Cl.[5] B22C *7/02*

U.S. Cl. 164—246 **7 Claims**



1. A multipiece pattern for making a hollow casting having a hose connection element integrally formed therewith comprising:

a first rigid foam pattern section defining a body portion of said casting, said first pattern section including means defining an opening to an interior portion of said pattern section; and

a second rigid foam cylindrical pattern section defining said hose connection element, said second pattern section having one end disposed in said opening in said first pattern section for attachment thereto.

5,143,144

REAR SPACER OF A MOULD FOR PRESSURE CASTING FLAT METAL PRODUCTS SUCH AS SLABS

Maurice R. Laloi, Planfoy; Michel F. Courbier, Le Breuil, and Robert R. Vatant, Saint-Chamond, all of France, assignors to Creusot-Loire Industrie, Puteaux and Clecim, Cergy Pontoise, both of, France

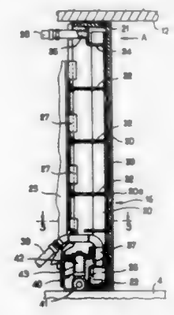
PCT No. PCT/FR90/00025, § 371 Date Sep. 10, 1991, § 102(e) Date Sep. 10, 1991, PCT Pub. No. WO90/07999, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1990, Ser. No. 721,577

Claims priority, application France, Jan. 16, 1989, 89 00456

Int. Cl.[5] B22D *18/04*

U.S. Cl. 164—306 **14 Claims**



1. A rear spacer of a mould for pressure casting a flat metal products of great thickness which serves as a movable mould boundary in a direction of the width of the flat metal product, on the side opposite to where molten metal enters the mould, the spacer is connected to a device for displacing the spacer in the longitudinal direction of the mould so as to have, towards the inside of the cavity of the mould, a movable metal moulding wall which is cooled by circulating water, comprising:

a hollow body made from a single piece of stainless steel of hollow form, having a U-shaped transverse section including a concave part which faces towards a rearside of the mould and a convex face which forms the moulding wall which contacts the molten metal;

a metal inner sleeve which is bent so as to have a substantially U-shaped transverse section, disposed inside the hollow body over a substantial part of the length of the hollow body, so that a free space of small thickness, the transverse section of said free space being in the form of a U, is made between the hollow body and the inner sleeve,

ends of walls of the inner sleeve, corresponding to branches of the U formed spaced, being welded to the inside of the hollow body over the entire length of the moulding wall; and

feeding and recovering means for feeding and recovering cooling water disposed in the longitudinal end parts of the hollow body in communication with the free space at its end for establishing a circulation of cooling water in the free space in contact with the inner surface of the hollow body.

5,143,145

MOULD FOR PRESSURE CASTING FLAT METAL PRODUCTS SUCH AS SLABS

Robert A. Vatant, Saint-Chamond; Michel F. Courbier, Le Breuil, and Jean-Pierre L. Chalencon, Saint-Chamond, all of France, assignors to Creusot-Loire Industrie, Puteaux and Clecim, Cergy Pontoise, both of, France

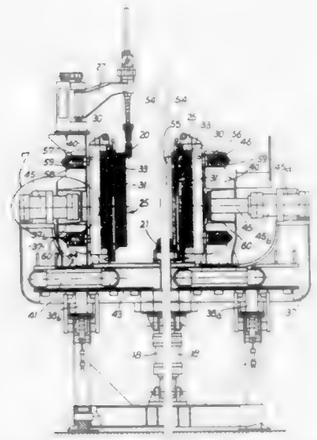
PCT No. PCT/FR90/00026, § 371 Date Sep. 10, 1991, § 102(e) Date Sep. 10, 1991, PCT Pub. No. WO90/07995, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1990, Ser. No. 720,778

Claims priority, application France, Jan. 16, 1989, 89 00453

Int. Cl.[5] B22D *18/04*

U.S. Cl. 164—306 **19 Claims**



1. A mould for pressure casting flat metal products or great thickness and considerable length comprising.

a frame for supporting and tilting the mould;

two parallel lateral walls intended to come into contact, on inner opposite moulding faces, with cast metal to form faces of a slab, said lateral walls are mounted so as to be movable on the frame in transverse directions perpendicular to the moulding faces;

means for displacing and clamping said lateral walls in the transverse direction;

spacers between the lateral walls for establishing a space in which the slab is cast, against which the lateral walls are clamped,

rigid support beams disposed substantially over the entire length of the lateral walls and mounted so as to be movable transversely relative to the frame,

elastic joining means for displacing and clamping said lateral walls to said support beams,

the frame of the mould comprising at least one rigid transverse structure element disposed in a zone which is substantially distant from longitudinal ends of the frame, said structure element comprising two end bearing parts between which are disposed the support beams of the lateral moulding walls; and

means for transverse displacement and clamping of each of the walls including at least one dual-action jack carried by an end bearing part of the transverse structure element of the frame connected to the support beam of the corresponding lateral wall in a zone substantially distant from the longitudinal ends of said support beam so as to perform, solely by virtue of the at least one dual-action jack, both displacement of the lateral walls, and clamping of the lateral walls against the spacers.

5,143,146

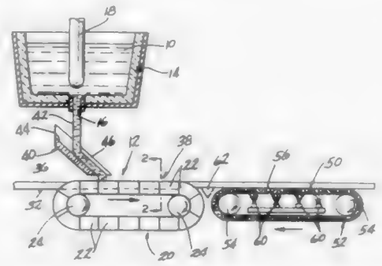
CASTING OF METAL STRIP

W. Gary Watson, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Aug. 6, 1991, Ser. No. 740,747

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—479 **10 Claims**



1. A process for casting metal into sheet or strip comprising:

a. providing a source of molten metal,

b. passing a moving substrate underneath the source of molten metal with a planar portion thereof passing through a position at which a deposit of molten metal is placed on said substrate,

c. feeding said molten metal onto said substrate, and

d. maintaining said molten metal on said substrate as a liquid until turbulence is dissipated and thereafter and cooling the metal to form a solidified strip.

6. An apparatus for casting metal into sheet or strip comprising:

a. means for feeding molten metal,

b. a moving substrate having a planar portion placed underneath said feeding means in a position to receive a deposit thereon,

c. said substrate, being of a refractory material,

d. the length thereof being long enough for maintaining said molten metal as a liquid until the turbulence from said feeding is dissipated, and

d. cooling means located downstream of said moving substrate for cooling said molten metal to form a solidified strip.

5,143,147

COOLING PROCESS ASSOCIATED WITH A PROCESS EMPLOYING ANHYDROUS HYDROFLUORIC ACID

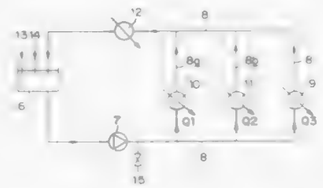
Daniel Cauvy, Bambiderstroff; Francis Couget, Striring-Wendel; Raymond Slota, Porcelette, and Bernard Villemin, Verneuil En Halatte, all of France, assignors to Elf Atochem S.A., Paris, France

Filed May 2, 1991, Ser. No. 694,306

Claims priority, application France, May 3, 1990, 90 05579

Int. Cl.[5] F28F *23/00*

U.S. Cl. 165—1 **14 Claims**



1. In a process comprising passing a stream containing hydrofluoric acid in indirect heat exchange against a cooling

fluid, the improvement comprising employing as said cooling fluid:

an aqueous solution of at least one compound which is

(a) a strong base;

(b) a salt resulting from the combination of a strong base and an acid having a pKa higher than 3.5;

(c) a salt of an amphoteric oxide with a base; or

(d) compounds which, in contact with water, are converted into one of the above mentioned compounds;

said cooling fluid is circulated in a closed circuit; and

said process conducted with said cooling fluid being at a lower pressure than said stream containing hydrofluoric acid.

5,143,148

THERMAL STORAGE APPARATUS

Albert E. Merryfull, Sydney, Australia, assignor to Berhaz Pty. Limited, St. Ives, Australia

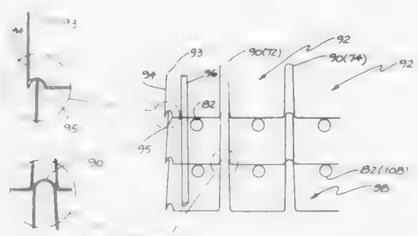
PCT No. PCT/AU90/00002, § 371 Date Aug. 28, 1990, § 102(e) Date Aug. 28, 1990, PCT Pub. No. WO90/07688, PCT Pub. Date Jul. 12, 1990

PCT Filed Jan. 3, 1990, Ser. No. 571,667

Claims priority, application Australia, Jan. 3, 1989, PJ2146; Feb. 3, 1989, PJ2546

Int. Cl.[5] **F28D** *20/00*; **F25D** *3/00*

U.S. Cl. 165—10 **34 Claims**



34. A thermal storage apparatus as claimed in claim 32 wherein said paths are spiral.

5,143,149

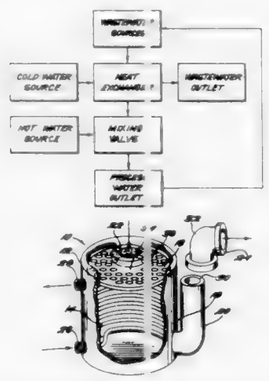
WASTEWATER HEAT RECOVERY APPARATUS

James W. Kronberg, 108 Independent Blvd., Aiken, S.C. 29801

Filed Jun. 21, 1991, Ser. No. 718,518

Int. Cl.[5] **F24D** *17/00*; **F24H** *1/16*

U.S. Cl. 165—32 **9 Claims**



1. Apparatus for providing process water from water having a first temperature using wastewater having a second temperature and hot water having a third temperature, said first temperature lower than said second temperature and said third temperature higher than said second temperature, said apparatus comprising:

heat exchange means for placing wastewater in thermal communication with said water so that heat flows from said wastewater to said water to form preheated water having a fourth temperature, said fourth temperature intermediate said first and said second temperatures; and

mixing means in fluid communication with said heat exchange means for mixing said preheated water with said hot water to produce process water having a fifth temperature intermediate said third temperature and said fourth temperature,

said mixing means having valve means for admitting a variable amount of said hot water to said mixing means in response to the temperature of said preheated water, said valve means having an open position and a closed position, said valve means admitting essentially no hot water when in said closed position,

said mixing means having means for adjusting said valve means to change the temperature of said process water,

said valve means further comprising

at least one first rod having a first thermal expansion coefficient,

at least one second rod, separate from said at least one first rod, having a second thermal expansion coefficient, at least one second thermal expansion coefficient being greater than said first thermal expansion coefficient,

yoke means for connecting said least one first and said at least one second rod together,

said preheated water producing thermal expansion of said at least one first and said at least one second rods, thereby causing a deflection of said rods,

said valve means moving in response to said deflection between said open position and said closed position.

5,143,150

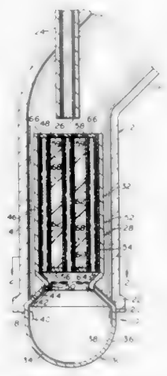
GEOTHERMAL HEAT CONVERTER

James M. Johnston, 2002 W. Washington, Jackson, Mich. 49203

Filed Feb. 10, 1992, Ser. No. 833,167

Int. Cl.[5] **F28D** *15/02*; **F24J** *3/08*

U.S. Cl. 165—45 **7 Claims**



1. A geothermal heat converter for use in a geothermal well having a vertically oriented heat resistant conduit having a lower open end comprising, in combination, a body having a lower hollow region defining a cup having outer and inner surfaces and an upper elongated hollow region defining a housing having upper and lower ends, said housing lower end being in communication with the interior of said lower region cup and being in a heat transfer relationship to said lower region cup, spaced lower and upper head plates within said housing transversely disposed to the length of said housing located adjacent said housing lower and upper ends, respectively, a plurality of tubes having lower and upper ends within said housing supported within said head plates and extending therethrough whereby said tubes, lower ends communicate with said cup, means sealing said tube's upper ends, openings defined in said upper head plate intermediate said tubes, a sealing surface defined upon said cup outer surface for engaging and sealing said cup to the conduit lower end, a liquid heat transfer medium within said cup and said tubes, said cup being formed of a tungsten carbon material and said cup outer surface being coated with platinum.

5,143,151

END MANIFOLD FOR A HEAT EXCHANGER

Ronald A. Pain, Eltham, Australia, assignor to Heat Transfer Pty. Ltd., Victoria, Australia

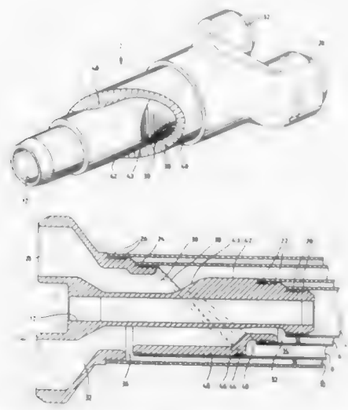
PCT No. PCT/AU89/00447, § 371 Date Apr. 12, 1991, § 102(e) Date Apr. 12, 1991, PCT Pub. No. WO90/04147, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 12, 1989, Ser. No. 671,875

Claims priority, application Australia, Oct. 12, 1988, PJ0938/88

Int. Cl.[5] **F28D** *7/10*

U.S. Cl. 165—154 **13 Claims**



1. An end manifold (2) for a concentric tube heat exchanger, said manifold including first sealing means (22) which, in use, form a seal with a first tube (6), second sealing means (24, 44) which, in use, form a seal with a second tube (8), the first sealing means being located closer to a forward end of the manifold and the second sealing means being located closer to a rearward end of the manifold, a first fluid flow path (14) being defined between the first and second tubes (6 and 8), said manifold including a first port (30) which, in use, communicates with said first fluid flow path (14) characterised in that the manifold includes a shoulder (38), the orientation of which is oblique with respect to the axes of said tubes.

5,143,152

HEAT EXCHANGER APPARATUS AND METHOD FOR PROCESSING FRUITS AND VEGETABLES

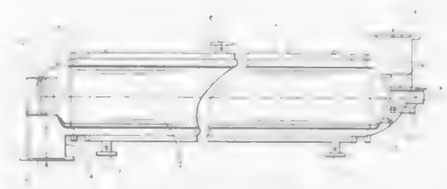
Camillo Catelli, Parma, Italy, assignor to Rossi & Catelli S.p.A., Parma, Italy

Continuation of Ser. No. 575,779, Aug. 31, 1990, abandoned. This application Aug. 15, 1991, Ser. No. 746,197

Claims priority, application Italy, Sep. 29, 1989, 40144 A/89

Int. Cl.[5] **F28D** *7/10*

U.S. Cl. 165—154 **20 Claims**



1. A heat exchanger for processing fruits, vegetables, and other agricultural products having elongated foreign objects of more than five centimeters in length such as pieces of plant, weeds, vines, grass and the like being carried therewith, said heat exchanger comprising:

a container of elongated shape having a product inlet orifice and a product outlet orifice spaced from said product inlet orifice; a heating body positioned inside said container extending substantially the entire length of said container, said heating body being shaped and arranged to form, between the external surface of said heating body and the internal surface of said container, a jacket connecting said product inlet orifice with said product outlet orifice of said container; said jacket having at least one cross sectional dimension sufficiently large to permit passage therethrough of the agricultural product and the elongated foreign objects of more than five centimeters in length, the ratio of the height of said jacket to said at least one cross sectional dimension being less than 1:7; and

an external heating shell disposed about said container and forming an external covering to said container.

5,143,153

ROTARY OIL WELL PUMP AND SUCKER ROD LIFT

Ronald L. Bach, 727 M113, and Richard G. Bach, 7604 Henry, both of Kingsley, Mich. 49649

Filed Jul. 31, 1991, Ser. No. 738,341

Int. Cl.[5] **E21B** *19/00*

U.S. Cl. 166—68.5 **15 Claims**

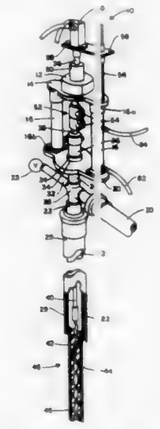
1. In an apparatus for pumping oil from a well which includes a well casing and a tubing string mounted in the well casing, the apparatus comprising a rotary pump stator mounted to the lower end of the tubing string; a first carrier plate supported on the ground above the well casing; a sucker rod disposed in the well casing and supported by the first carrier plate; a rotary pump rotor mounted to the lower end of the sucker rod and in register with the rotary pump stator for pumping fluid from a producing formation at the lower end of the tubing string; and a motor mounted to the first carrier plate and coupled to the sucker rod to rotatively drive the sucker rod; the improvement comprising:

at least one fluid cylinder between the first carrier plate and the ground;

a fluid circuit connected to the fluid cylinder to raise and lower the first carrier plate with respect to the ground; and

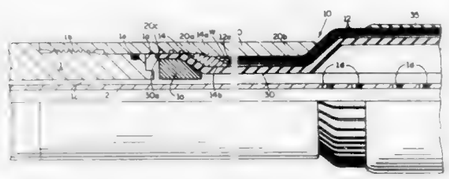
a control valve in the fluid circuit to selectively control the flow of fluid through the fluid circuit to selectively con-

trol the raising and lowering of the first carrier plate with respect to the ground to thereby selectively raise and



lower the sucker rod and the pump rotor with respect to the pump stator.

5,143,154
INFLATABLE PACKING ELEMENT
Rustom K. Mody, Houston, and Lloyd A. Halbardier, deceased, late of Pasadena, Tex. by Anna L. Halbardier, heiress, assignors to Baker Hughes Incorporated, Houston, Tex.
Continuation of Ser. No. 492,841, Mar. 13, 1990, abandoned. This application Sep. 25, 1991, Ser. No. 766,965
Int. Cl.[5] E21B *33/127*
U.S. Cl. 166—187 7 Claims

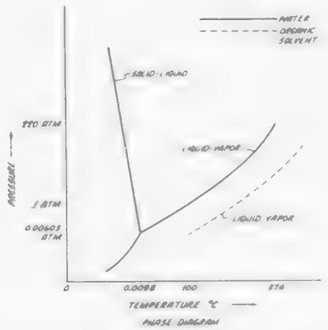


5. An inflatable packing element for use in a subterranean well comprising in combination
a pair of tubular bodies having internally projecting annular shoulders;
a pair of end rings formed of a weldable material and respectively insertable in said tubular bodies;
a plurality of elongated flexible ribs also formed of a weldable material;
said ribs being disposed in a cylindrical, overlapping array, with each rib having its opposite ends respectively welded to the exterior of said end rings;
a sleeve of elastomeric material inserted in said cylindrical array of ribs;
a sleeve of elastomeric material disposed over at least a portion of said cylindrical array of ribs;
an external load carrying shoulder on each said ring; and
said load carrying external shoulders being respectively abuttable with said internal shoulders of said tubular bodies to transit tension loads imposed on said ribs by inflation of said elastomeric sleeve.

5,143,155
BACTERIOGENIC MINERAL PLUGGING
Frederick G. Ferris, and Lester G. Stehmeier, both of Calgary, Canada, assignors to Husky Oil Operations Ltd., Calgary, Canada
Filed Mar. 5, 1991, Ser. No. 664,769
Int. Cl.[5] E21B *43/22*
U.S. Cl. 166—246 22 Claims

1. A process to reduce the permeability of a subsurface geological formation by mineral precipitation, said process consisting of:
(i) providing to said formation a microorganism culture having the capability to sustain metabolic activity within the environment of said formation,
(ii) injecting an aqueous mineralization medium into said formation, and
(iii) precipitating mineral matter from said mineralization medium.

5,143,156
ENHANCED OIL RECOVERY USING ORGANIC VAPORS
Bruce W. Bromley, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Sep. 27, 1990, Ser. No. 589,097
Int. Cl.[5] E21B *43/24, 43/267, 43/40*
U.S. Cl. 166—267 10 Claims



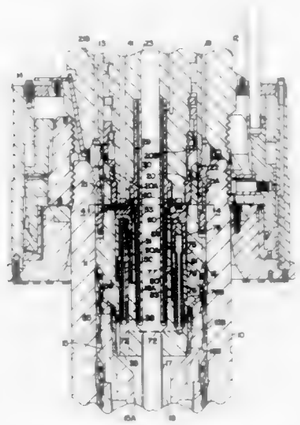
1. An enhanced oil recovery process comprising the steps of:
(a) recovering a low viscosity oil from a low viscosity oil-containing formation,
(b) heating at least the low viscosity oil recovered in step (a) to above its boiling temperature and below its decomposition temperature to form an organic vapor, the recovered low viscosity oil having a boiling point above standard temperature and pressure (STP) and being miscible with crude oil having an API gravity less than about 20,
(c) injecting the organic vapor into at least a portion of an oil-bearing formation, and
(d) withdrawing oil from the formation.

5,143,157
CATALYST FOR BREAKER SYSTEM FOR HIGH VISCOSITY FLUIDS
Weldon M. Harms, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Jun. 19, 1991, Ser. No. 717,753
Int. Cl.[5] E21B *43/26*
U.S. Cl. 166—300 16 Claims

1. A method of fracturing a subterranean formation penetrated by a wellbore wherein the static temperature of the formation adjacent said wellbore is below about 140° F., comprising injecting into the wellbore and into contact with the formation at a rate and pressure sufficient to fracture the formation an aqueous fluid comprising:
(a) an aqueous liquid;
(b) a thickening agent comprising at least one member selected from the group consisting of guar, hydroxypropyl guar, carboxymethylhydroxypropyl guar, carboxymethylhydroxyethyl cellulose and carboxymethylcellulose, present in an amount sufficient to increase the viscosity of said aqueous liquid; and
(c) a breaker to reduce the viscosity of the liquid after contact with said formation comprising an effective amount of (i) ammonium persulfates or alkali metal persulfates in at least partially water-soluble form and (ii) a second constituent comprising at least one compound selected from the group consisting of erythorbic acid and its salts, hydroxylamine hydrochloride, deltagluconolactone and its isomers, gluconic acid and its salts, citric acid and its salts and a copper ion releasing compound.

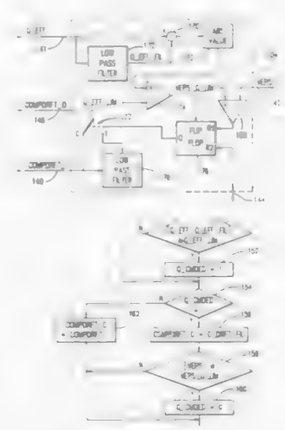
12. In an aqueous fluid for use in treating subterranean formations at temperatures within the range of from about 35° to about 130° F. which are penetrated by a wellbore, said fluid containing
(a) as a thickening agent to increase the viscosity of said fluid, from about 10 to about 100 pounds per 1000 gallons of fluid, a water soluble, dispersable or swellable polysaccharide comprising at least one member selected from the group of guar, hydroxypropylguar, hydroxyethylcellulose and carboxymethylhydroxyethylcellulose and
(b) a breaker to reduce the viscosity of said fluid after a period of time comprising an effective amount of (i) ammonium persulfate or alkali metal persulfate in at least partially water-soluble form and (ii) a second constituent comprising at least one compound selected from the group consisting of erythorbic acid and its salts, hydroxylamine hydrochloride, dihydroxymaleic acid and its salts, deltagluconolactone and isomers thereof, gluconic acid and its salts, citric acid and its salts and a cupric ion releasing compound.

5,143,158
SUBSEA WELLHEAD APPARATUS
Bruce J. Watkins, and Blake T. DeBerry, both of Houston, Tex., assignors to Dril-Quip, Inc., Houston, Tex.
Filed Apr. 27, 1990, Ser. No. 516,119
Int. Cl.[5] E21B *33/043*
U.S. Cl. 166—344 15 Claims



1. For use in a subsea wellhead including a wellhead housing having a bore therethrough and a casing hanger supported within the bore for suspending a casing string within the well bore, apparatus comprising
a tubing hanger including a body having a bore therethrough connectable to the upper end of a tubing string and adapted to be supported in the bore of the housing above the casing hanger so as to suspend the tubing string therein,
said hanger body having passageway means therethrough including first and second sections for connecting respectively with the annulus between the casing and tubing strings and the bore of the wellhead housing thereabove and with one another through port means, and
means for opening and closing the passageway means including a valve member having a body reciprocable within a chamber in the hanger body which forms a continuation of the first section of the passageway means at one end and which is closed at its opposite end,
said valve member body having
a hole therethrough connecting with its opposite ends,
a pair of longitudinally spaced seal rings thereabout sealably slidable within equal diameter portions of the chamber and first section of the passageway means between positions in which both seal rings are in the chamber to open the port means and one of the seal rings is within said first section to close the port means, and
means responsive to pressure fluid from a remote source for moving the valve member from opened to closed and from closed to open position.

5,143,159
DRAFT CONTROL SYSTEM WITH DUAL MODE DRAFT SENSITIVITY
Steven C. Young, Lancaster; Bradley A. Nielsen, New Holland, both of Pa., and Matthew T. Miller, Waterloo, Iowa, assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Jun. 3, 1991, Ser. No. 709,185
Int. Cl.[5] A01B *63/112*
U.S. Cl. 172—8 13 Claims



3. In an automatic draft control system for controlling the movement of a vehicle-mounted hitch to a position commanded by a draft command signal, said system including draft sensing means for producing a draft feedback signal representative of hitch draft, error determining means responsive to said draft command signal and said draft feedback signal for producing a position error signal, and means responsive to said position error signal for moving the hitch toward the position commanded, the improvement comprising:
draft sensitivity control means responsive to changes in said draft command signal for low pass filtering said draft

feedback signal before it is applied to said error determining means, said draft sensitivity control means including

first means responsive to said draft command signal for setting an indicator when said draft command signal changes; and,

second means for supplying the low pass filtered draft feedback signal to the error determining means only while said indicator is set,

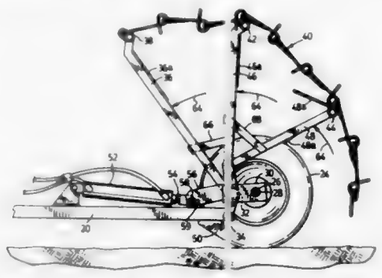
the second means supplying the draft feedback signal directly to said error determining means while said indicator is not set.

5,143,160

CHAIN HARROW CARTS

R. Elwin May, R.R.#5, Belwood, Ontario, Canada N0B 1J0

Filed Mar. 22, 1991, Ser. No. 673,789
Int. Cl.[5] A01B *35/02, 63/14*
U.S. Cl. 172—311 18 Claims



1. A cart for a chain harrow comprising:

a cart frame;

a pair of cart wheels mounted by the cart frame for rotation about respective wheel axes and on which the cart runs;

a draw bar and at least one cross bar mounted on the cart frame to extend generally parallel to the wheel axes with the cross bar or bars ahead of the draw bar in the forward direction of operative movement of the cart;

the chain harrow being attachable to the draw bar along a respective edge of said chain harrow so as to be drawn along the ground in an operative position behind the cart frame as the cart moves forward;

draw bar and cross bar mounting means mounting the draw bar and each cross bar on the cart frame for lifting movement about respective draw bar and cross bar transverse pivot axes parallel to the wheel axes;

the draw bar being movable about its draw bar transverse pivot axis to lift the attached edge of the harrow upward away from its operative position to a stored position; and

each cross bar being movable about its respective cross bar transverse pivot axis to engage the chain harrow at a location along its length spaced from the draw bar and any adjacent cross bar to support the chain harrow above the ground in its stored position.

5,143,161

RIGHT ANGLE POSITIVE FEED TAPPER

Pierre G. Vindez, Redondo Beach, Calif., assignor to P.V. Tool, Inc., Gardena, Calif.

Filed Sep. 20, 1991, Ser. No. 763,438
Int. Cl.[5] B23B *47/22*
U.S. Cl. 173—19 2 Claims

1. A positive feed tapper having a drive gear train for a spindle threaded in a lead nut affixed to a housing for said tapper so that as said spindle is driven by a motor through said drive gear train within said housing, said spindle advances a tool for cutting threads on the inner surface of a hole in a workpiece, said positive feed tapper having means for retracting said spindle to withdraw said tool from tapped threads on said inner surface of said hole in said workpiece once said spindle has been advanced a predetermined extent, said retracting means comprising

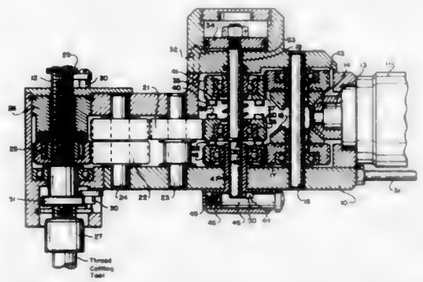
a shaft for supporting a first coupling gear in said drive gear train to turn on a bearing resting on said housing, a second coupling gear having upper and lower side teeth, said second coupling gear being engaged by upper side teeth of said first coupling gear with lower side teeth of said second coupling gear, said second coupling gear being supported on said shaft to turn on a bearing resting on a flange integral with said shaft, and a third coupling gear, said third coupling gear being supported on said shaft to turn on a bearing resting on a coil spring around said shaft between said second and third coupling gears, said third coupling gear turning on a bearing held against said housing by said coil spring,

a gear train for continually driving said third gear in a direction opposite to which said first gear is continually driven by said motor,

side teeth on said third coupling gear for engaging upper side teeth on said second coupling gear when said second coupling gear is raised against said coil spring by raising said shaft to an extent sufficient for upper side teeth of said second coupling gear to engage lower side teeth of said third coupling gear,

means for sensing when said spindle has been advanced said predetermining extent,

means responsive to said spindle advancement sensing means for producing a force to raise said shaft against the force of



said coil spring said sufficient extent, thereby raising said second coupling gear on said shaft for said lower side teeth of said second gear to disengage upper side teeth of said first coupling gear, and said upper side teeth of said second coupling gear engage said lower side teeth of said third coupling gear,

an idle gear in said drive gear train having radial teeth engaging radial teeth of said second coupling gear at all times before and after being raised,

means for sensing when said spindle has been retracted an extent equal to the extent advanced,

means responsive to said retraction sensing means for terminating said shaft raising force, thereby allowing said coil spring between said second coupling gear and said third coupling gear to cause upper side teeth of said second coupling gear and lower side teeth of said third gear to disengage,

means responsive to said shaft being raised for engaging means for limiting an extent said shaft may be lowered under the force of said coil spring so that while upper side teeth of said second coupling gear disengages from lower side teeth of said third coupling gear, lower side teeth of said second coupling gear are prevented from re-engaging said upper side teeth of said first coupling gear, thereby placing said positive feed tapper in an idle mode with said spindle retracted but not driven while said motor continues to drive said first and third coupling gears, and

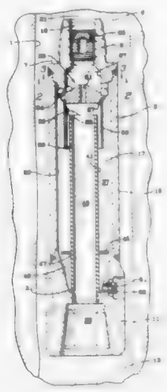
means for manually resetting said limiting means to allow said shaft to be lowered under the force of said coil spring to an original position, thereby placing said positive feed tapper in a tapping mode with said spindle being driven to advance as it turns in said lead nut.

5,143,162

DEVICE FOR REMOVING DEBRIS FROM A DRILLHOLE

Leland H. Lyon, and Ernest C. Hinck, both of Roanoke, Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 27, 1991, Ser. No. 766,866
Int. Cl.[5] E21B *4/00*
U.S. Cl. 175—100 11 Claims



1. A device for removing debris from a drillhole, said drillhole being made by a fluid-activated, percussion, down-the-hole drill tool, said tool adapted to be suspended at its top end from a drill string having an axial bore, comprising:

(a) inlet means for fluidly communicating with said drill string axial bore and for receiving a flow of a mixture of gaseous percussive fluid and other matter from said drill string axial bore;

(b) separator means positioned adjacent said top end of said tool for receiving a flow of a mixture of gaseous percussive fluid and other matter from said drill spring axial bore, for separating into phases and collecting in a bottom end of said separator means substantially all of said other matter from said gaseous percussive fluid and for thereafter transmitting said percussive fluid through said device to said tool, while simultaneously transmitting said collected other matter and at least some of said percussive fluid out of said separator means into the drillhole annulus, for removing said debris.

5,143,163

DIGGING TOOTH

Stephen P. Stiffler, New Enterprise; David J. Waite, Bedford, both of Pa.; Robert L. Frost, Sherman, Tex., and Wayne H. Beach, Roaring Spring, Pa., assignors to Kennametal Inc., Latrobe, Pa. and Reedrill Inc., Sherman, Tex.

Filed Aug. 29, 1991, Ser. No. 751,914
Int. Cl.[5] E21B *10/44, 10/56, 10/62*
U.S. Cl. 175—385 26 Claims

1. A replaceable digging tooth for an earth auger comprising:

a generally oblong body member including an elongated leading surface, an elongated trailing surface, and a first and second side surface, said leading and trailing surfaces and first and second side surfaces terminating in a forward working face having a plurality of inserts, each insert having a generally cylindrical portion integral a top portion which tapers to a point to form a conical tip; and

a shank depending from said body member and receivable in a support block of the earth auger;

wherein said tips are aligned to define a linear cutting line which is inclined with respect to a reference plane perpendicular to the axis of said shank, and wherein the axes of said inserts are aligned parallel to form a cutting plane which is inclined with respect to said reference plane.

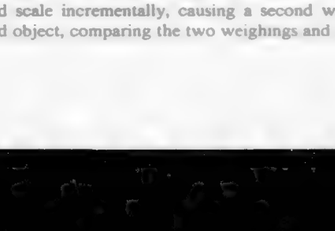
14. A tool for drilling holes in the earth comprising:

(a) an auger including:

(1) a central shaft terminating in a pilot bit at its lower end;

(2) a downwardly spiraling flight structure affixed to the shaft and extending generally radially therefrom, said flight structure terminating in a leading edge adjacent the pilot bit;

(3) a plurality of support blocks radially spaced along the leading edge of the flight structure which extend from an innermost position adjacent the central shaft to an outermost position adjacent to the outer rim of the



flight structure, each support block having a tooth receiving pocket formed therein;

(b) a plurality of digging teeth mounted within respective support blocks, each of the digging teeth including:

(1) a generally oblong body member including an elongated leading surface, an elongated trailing surface, and a first and second side surface, said leading and trailing surfaces and first and second side surfaces terminating in a forward working face having a plurality of inserts, each insert having a generally cylindrical portion integral a top portion which tapers to a point to form a conical tip; and

(2) a shank depending from said body member and receivable in a support block of the earth auger;

wherein said tips are aligned to define a linear cutting line which is inclined with respect to a reference plane perpendicular to the axis of said shank, and wherein the axes of said inserts are aligned parallel to form a cutting plane which is inclined with respect to said reference plane

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5,143,164

APPARATUS AND METHOD FOR IMPROVING THE ACCURACY OF WEIGHING AN OBJECT

Rathindra Nahar, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 23, 1991, Ser. No. 704,538
Int. Cl.[5] G01G *19/52, 19/40, 21/24*
U.S. Cl. 177—50 32 Claims

1. A system for obtaining the accurate weight of objects which may not be placed properly on a scale, comprising:

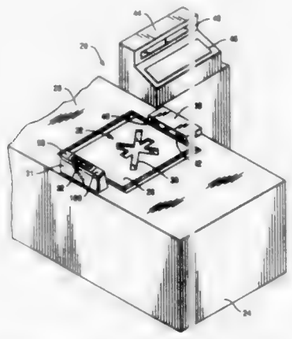
a scale for weighing objects;

support means for said scale;

motive means for moving said scale relative to said support means;

control means for causing a first weighing of an object placed on the scale, causing said motive means to move said scale incrementally, causing a second weighing of said object, comparing the two weighings and generating

a signal descriptive of the result of the comparison of the two weighings; and



means responsive to said signal for informing an operator to reposition the object on the scale if it is not positioned correctly.

5,143,165

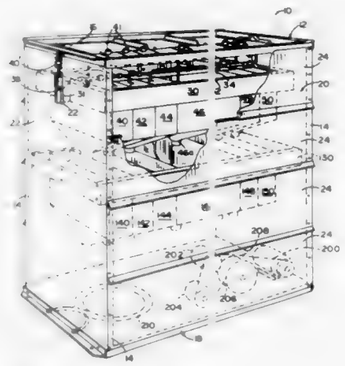
LIQUID WEIGH SYSTEM

Richard M. Hough, Lansing, Mich., assignor to Hough International, Inc., Albertville, Ala.

Filed Jan. 22, 1991, Ser No. 643,350

Int. Cl.[5] G01G *13/16, 19/22;* **B65B** *1/30*

U.S. Cl. 177—59 **20 Claims**



1. A weigh system comprising:
a plurality of hoppers for receiving materials to be weighed;
a discharge outlet for each said hopper, and valve means for each said discharge outlet;
a suspension support for said hoppers, each said hopper being suspended from said support;
a frame;
load cells supporting said suspension support from said frame for indicating total weight load in all of said hoppers; and
means for actuating all of said valve means to discharge said hoppers when a predetermined total weight is reached.

5,143,166

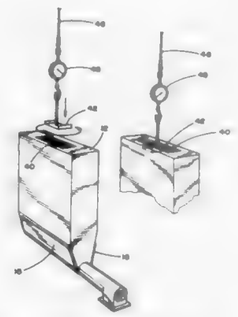
MICRO WEIGHING SYSTEM

Richard M. Hough, 4821 Delta River Dr., Lansing, Mich. 48906

Division of Ser. No. 649,753, Feb. 1, 1991. This application Dec. 11, 1991, Ser. No. 804,961

Int. Cl.[5] G01G *23/00, 19/22*

U.S. Cl. 177—128 **10 Claims**



1. A weighing mechanism comprising:
support framework configurated for receiving a plurality of adjacent removable hoppers;
a plurality of ingredient hoppers removably supported on said framework;
each of said ingredient hoppers comprising hoist receiving means for enabling said hopper to be hoisted from or onto said framework, and a discharge conveyor and outlet for controllably discharging an ingredient from said ingredient hopper; and
a weigh hopper beneath said discharge outlets for receiving ingredients from said discharge outlets.

5,143,167

FOUR-WHEEL-DRIVE MOTOR VEHICLE OF TRANSVERSELY-DISPOSED ENGINE TYPE

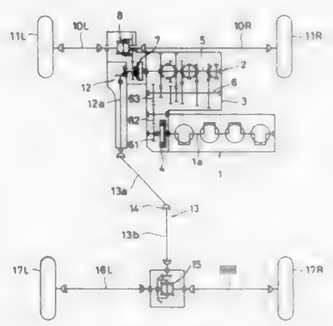
Naomune Moriyama; Takahito Yokouchi; Reiji Kikuchi, all of Yokohama; Koichi Yamamoto, Hiroshima; Hideaki Akaboshi, Hiroshima; Ayumu Doi, Hiroshima, and Masaki Kadokura, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 4, 1990, Ser. No. 577,972

Claims priority, application Japan, Sep. 4, 1989, 1-229942; Nov. 30, 1989, 1-311853

Int. Cl.[5] B60K *17/344*

U.S. Cl. 180—248 **22 Claims**



1. A four-wheel-drive motor vehicle, comprising:
an engine and a transmission, both disposed transversely at a front part of a vehicle body, a center differential for distributing a driving torque from said transmission to a front wheel side and a rear wheel side, said transmission including an input shaft and an output shaft, said input shaft and said output shaft being arranged substantially parallel to one another;
wherein said engine and said transmission are disposed so as to be offset from each other in the longitudinal direction of the vehicle body and to locate a gravitational center of the engine and transmission combination in a rearward position of an axle of front wheels, said output shaft of said transmission extends in a transverse direction of the vehicle with said output shaft and said center differential disposed coaxially, and a transmission ratio is changed by switching a gear transmission channel between said input shaft and said output shaft.

5,143,168

STEERING GEAR RACK AND TRANSFER PINION ARRANGEMENT FOR FOUR-WHEEL DRIVE VEHICLE DERIVED FROM TRANSVERSELY MOUNTED FRONT ENGINE-FRONT DRIVE SYSTEM

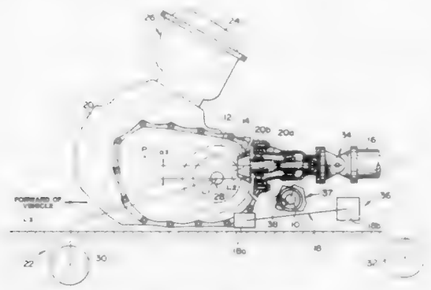
Kiyoshi Sagara, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 18, 1991, Ser. No. 670,925

Claims priority, application Japan, Apr. 24, 1990, 2-108152

Int. Cl.[5] B60K *17/344*

U.S. Cl. 180—374 **8 Claims**



1. A four-wheel drive vehicle comprising:
an engine transversely mounted at a front;
a transaxle joined with said engine to constitute a power unit and having a differential gear for transmitting engine power to front wheels;
a transfer ring gear operatively connected with said transaxle for taking out engine power therefrom;
a transfer pinion meshing with said tranfer ring gear for transmitting engine power to rear wheels; and
a steering gear rack adjacent to said transfer pinion;
in which an axis of said transfer pinion is disposed higher than an axis of said transfer ring gear, and said steering gear rack is disposed lower than said transfer pinion.

5,143,169

LOUDSPEAKER DIAPHRAGM PROVIDED WITH A REAR LOAD

Alfred Ziegenberg, Villingen-Schwenningen-Marbach, and Edmund Schiessle, Schorndorf, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

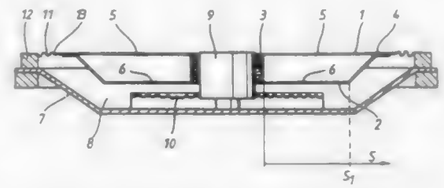
Filed Sep. 4, 1990, Ser. No. 577,002

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929266

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—144 **17 Claims**

1. Loudspeaker arrangement comprising:
a speaker housing,
a movable coil disposed along a central speaker housing axis,
a first loudspeaker diaphragm having its outer peripheral edge connected to the housing and its inner peripheral edge connected to the coil,
and a second loudspeaker diaphragm having its inner peripheral edge connected to the coil at an axial spacing from the first loudspeaker diaphragm and having its outer peripheral edge connected to the first loudspeaker diaphragm at a location spaced inwardly of the outer peripheral edge of the first loudspeaker diaphragm such that said first and



second loudspeaker diaphragms define a substantially closed volume therebetween,
wherein openings are provided in at least one of the first and second loudspeaker diaphragms to accommodate movement of air into and out of the substantially closed volume defined between the first and second loudspeaker diaphragms and thereby improve vibration characteristics of the loudspeaker arrangement.

5,143,170

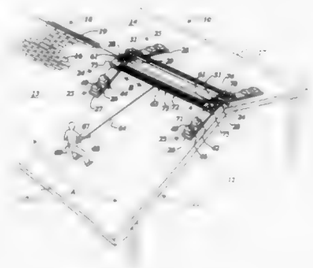
SAFETY DEVICE FOR ROOF WORK

Don Hunt, 442 Cove Dr., Marietta, Ga. 30067, and Jimmy R. Howard, P.C. Box 143, Felton, Ga. 30140

Filed Oct. 28, 1991, Ser. No. 783,395

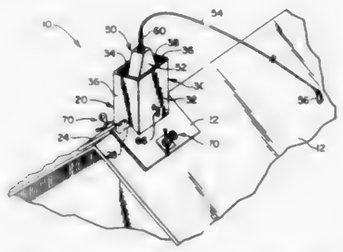
Int. Cl.[5] A62B *35/00*

U.S. Cl. 182—3 **10 Claims**



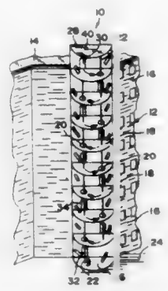
1. Safety support apparatus for supporting a worker on a pitched roof having a pair of sloped roof surfaces terminating at a peak, said apparatus comprising
a plurality of elongated sleeper bars adapted to be interlocked together and to be positioned straddling the peak of the roof;
at least one stabilizing means adapted to be mounted on each of said sleeper bars for exerting a downward force to stabilize and maintain said sleeper bars adjacent the surface of the roof;
means attached to each of said sleeper bars for detachably mounting said stabilizing means on said sleeper bars and adapted to engage and lock said stabilizing means to said sleeper bars; and
a restraining line adapted to be releasably attached to one end to said sleeper bars and at its other end to a harness worn by a worker for restraining the movement of the worker over the surface of the roof.

5,143,17
ROOF LIFELINE SAFETY SYSTEM AND ANCHOR ASSEMBLY THEREFOR
William Glynn, West Suffield; John Rexroad, Lyme, and David S. Denny, Middle Haddam, all of Conn., assignors to SINCO Incorporated, East Hampton, Conn.
Continuation-in-part of Ser. No. 586,895, Sep. 24, 1990, Pat. No. 5,054,576. This application Feb. 5, 1991, Ser. No. 650,937
Int. Cl.[5] A62B *35/00*
U.S. Cl. 182—3 **33 Claims**



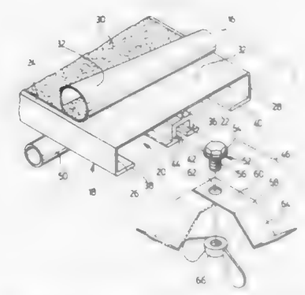
1. A safety system for a pitched roof comprising:
lifeline means comprising a housing, a lifeline receivable by said housing and extendable and retractable relative thereto;
bracket means for mounting said lifeline means for disposition above the roof at the peak thereof comprising frame means for receiving said lifeline means and pod means pivotally mounted to said frame means, said pod means comprising a pair of legs and a mounting plate connecting said legs and extending at an oblique angle thereto to define shoulder means for engagement against said roof on opposing pitched sides thereof;
securement means for securing said lifeline means to said frame means; and
anchoring means for anchoring said shoulder means to said roof.

5,143,17
SLIDE AND SEEK FIRE ESCAPE
Ward E. Rhoads, 711 Palmwood St., Delta, Ohio 43515
Filed Jul. 29, 1991, Ser. No. 737,070
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—100 **2 Claims**



1. A slide and seek fire escape for a high rise building having a roof and multiple floors, said fire escape comprises:
a) a plurality of balconies stacked one above the other in one to one correspondence with the roof and each floor of the building, with alternate said balconies each having right and left staggered escape apertures respectively; and
b) a pair of elongated slide poles in which a first of said slide pole extends through said balconies in the center of the right escape apertures, while a second slide pole extends through said balconies in the center of the left escape apertures, so that a person can exit the building during a fire by entering one said balcony and slide down the first slide pole to another said balcony and walk to the second slide pole and slide down, thereby repeating the slides until the person reaches ground level, wherein each said balcony includes:
i) a transparent front enclosure to reduce the fear of heights for the person when exiting the building during the fire;
ii) a rear wall having a doorway positioned in a location which is away and distant from the escape aperture; and
iii) a fire door hinged to one side of the doorway in said rear wall so that the person opening said fire door when entering said balcony has to walk over to an opposite side of said balcony to reach the slide pole in the center of its respective escape aperture.

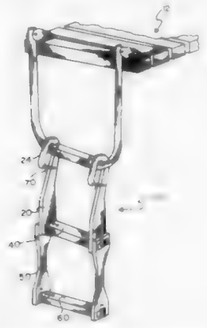
5,143,173
EXTRUDED ALUMINUM PLANK FOR SCAFFOLD
Ronald Lubinski, 40 Centenial Heights Ct., Meaford, Ontario, Canada N0H 1Y8
Filed Dec. 17, 1990, Ser. No. 627,957
Int. Cl.[5] E04G *5/08, 1/15*
U.S. Cl. 182—119 **7 Claims**



1. A plank for use in an environment containing dangerous contaminants, comprising:
an integral aluminum extrusion of preselected length having an elongate shape transverse to its length, the extrusion comprising a top wall defining an upper surface of preselected width, a pair of spaced-apart opposing sidewalls extending downwardly from the top wall and having a height less than the preselected width, and a hollow interior; and,
sheet material attached to the upper surface of the extrusion with an adhesive and having a rough exposed face, the adhesive being selected to soften at a predetermined temperature to release the sheet material from the extrusion whereby, when contaminated, the sheet material may be stripped for disposal and the extrusion cleaned.

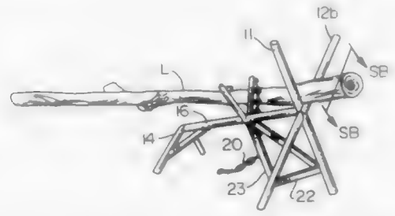
5,143,174
DISMOUNTABLE LADDER
William E. Davis, 915 Justice Dr., Tampa, Fla. 33613
Filed Nov. 4, 1991, Ser. No. 787,521
Int. Cl.[5] E06C *1/36, 1/38*
U.S. Cl. 182—151 **9 Claims**

1. A dismountable ladder for use with dive platforms, comprising in combination:
a pair of similarly shaped vertical upper side members, the upper end of each upper side member being shaped as a downwardly facing U-shaped hook means adapted to releasably receive a portion of a dive platform, the lower end of each upper side member having opening means with screw holes extending from interior of the opening means to exterior of the lower end of the upper side member;
a horizontal upper step member releasably coupled within the opening in the lower ends of the upper side members,



the upper step member having a plurality of screw holes therein; and
screw means for securing the upper step member to the upper side members through the screw holes of the upper side members and upper step member.

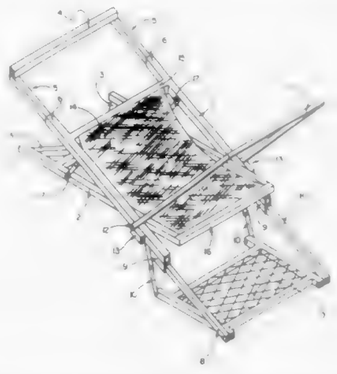
5,143,175
CUTTING APPARATUS
Robert B. Tomko, R.D. 3, Box 117, Columbia Cross Roads, Pa. 16914
Filed Nov. 14, 1991, Ser. No. 791,341
Int. Cl.[5] B23Q *3/00;* **B27B** *21/00;* **B25H** *1/06*
U.S. Cl. 182—181 **7 Claims**



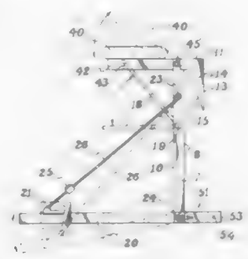
1. Apparatus for supporting logs and brush during cutting operations, which comprises in combination:
a first pair of rigid members adapted when seated atop a generally-level ground surface, to present a generally V-shaped upper notch area within which one end of a log may be supported at a first elevation;
a second pair of rigid members extending from said ground surface to a second elevation less than said first elevation, and spaced apart from said first pair of rigid members; and
an interconnecting bar means rigidly interconnecting said first and second pairs of members.

5,143,176
CLIMBING TREE STAND
Bryan A. Burdette, Rte. 2, Box 23970, Deer Trail Rd., Benton, La. 71006
Filed Oct. 15, 1990, Ser. No. 577,466
Int. Cl.[5] A45C *15/00*
U.S. Cl. 182—187 **7 Claims**

1. A portable climbing apparatus for ascending and descending a tree and designed to support a person in seating or standing position, comprising a generally rectangular main frame and a generally rectangular base frame pivotally carried by said main frame; engaging members provided on said base from for contacting and gripping the front of the tree; gripping means provided on one end of said main frame for contacting and gripping the back of the tree; and a support means comprising a sling seat mounted on said main frame and said base frame for supporting the person in said portable climbing apparatus.

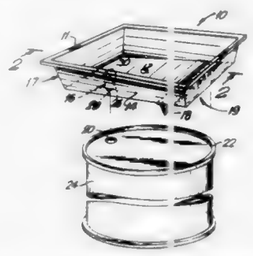


5,143,177
TREE STAND
Terry B. Smith, 1760 Hubert Rd., Midland, Mich. 48640
Filed Dec. 6, 1991, Ser. No. 802,854
Int. Cl.[5] A01M *31/00*
U.S. Cl. 182—187 **4 Claims**



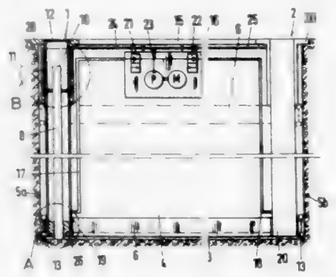
1. A stand adapted for attachment to a tree or post, comprising, in combination, a flexible, elongated support means adapted to form a variable sized, closed loop and to be placed in circumferential relationship with a tree or post, and a stand portion, comprising:
a substantially vertically deposed support frame, said support frame further including near the upper terminus thereof an attachment means adapted to be releasably attached to said loop, said attachment means comprising one or more projections extending laterally behind said support frame and angularly downward to describe one or more tapered faces adapted to contact said loop and one or more rear edges adapted to contact the surface of the tree or post such that downward force from the weight of the stand portion increasingly tightens the loop and causes the rear edge of the attachment means to press more tightly against the tree or post, or
a platform means attached to the support frame near the lower terminus thereof.

5,143,178
FLUID COLLECTION AND DRAINAGE PAN
Andrew V. Latham, Jr., 545 Abbott Ave., Ridgefield, N.J. 07657
Continuation of Ser. No. 173,289, Mar. 25, 1988, abandoned.
This application Nov. 22, 1989, Ser. No. 442,422
Int. Cl.[5] F01M 1/00
U.S. Cl. 184—106 15 Claims



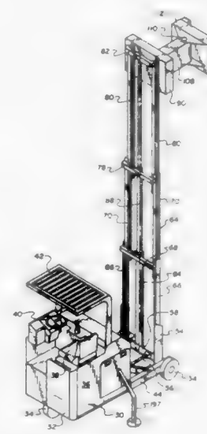
1. In a drainage pan for receiving fluid drained from one or more components positioned in the pan and transferring the fluid to a vertical conventional fluid storage drum having a sealable fluid inlet and a circumferential rim formed at, and extending above the top of the drum, the drainage pan being mountable on the top of the drum adjacent the drum inlet and comprising a tray bottom having a front and a back end, a drainage aperture formed in the tray bottom adjacent the front end of the tray bottom and tray sidewalls that extend generally vertically from the tray bottom between the front and back ends, the improvement comprising:
a drainage conduit extending substantially downwardly from the drainage aperture, the drainage conduit being insertable into the drum inlet for transferring drained fluid from the drainage pan into the storage drum; and
an integral support secured to the drain bottom for supporting and elevating the back end of the drainage pan, the integral support being adapted to securely mount the drainage pan on the rim of the drum above the drum inlet.

5,143,179
LIFTING HOIST FOR MOTOR VEHICLES
Roland Hornstein, Pfaizgrafenweiler, Fed. Rep. of Germany, assignor to Franz Hornstein GmbH & Co. KG, Fed. Rep. of Germany
Filed Mar. 28, 1991, Ser. No. 676,961
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 9003685[U]
Int. Cl.[5] B66F 7/20
U.S. Cl. 187—8.41 28 Claims



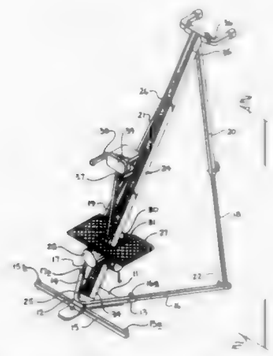
1. A lifting hoist for motor vehicles, said hoist comprising:
a pit having a foundation, side walls and end walls;
lifting cylinder means comprising at least one hollow lifting cylinder mounted in said pit and adapted to hold motor vehicle carrying apparatus on the upper end thereof, the interior of said lifting cylinder being open to pressurized fluid, the top end of said cylinder being sealed by a cover plate;
a high pressure unit for providing pressurized oil to said lifting means;
a supporting frame anchored in said pit on said foundation;
a guide bushing for each said lifting cylinder mounted to said frame;
a rod mounted to said foundation and generally axially projecting into each said lifting cylinder, the upper end of said rod and the inside facing surface of side cover plate forming opposed pressure surfaces for lifting said lifting cylinder;
means in the lower end of each said lifting cylinder for providing a sliding seal with respect to said rod;
at least one lubricating space formed between said lifting cylinder and said guide bushing;
first conduit means coupling said lubricating space with said high pressure unit; and
means for supplying pressurized oil to said lubricating space pursuant to selected movement of said cylinder with respect to said rod.

5,143,180
LOAD LIFT TRUCK
Clark N. Harper, 8814 Oak Valley Dr., Sandy, Utah 84093
Continuation of Ser. No. 312,119, Feb. 17, 1989, Pat. No. 5,036,952. This application May 6, 1991, Ser. No. 696,248
Int. Cl.[5] B66B 9/20
U.S. Cl. 187—9 E 11 Claims



1. A lift truck comprising:
a chassis supported by a ground engaging means;
a load carrying carriage mechanically associated with said chassis;
a first displacement means mechanically associated with said carriage for displacing said carriage longitudinally along said chassis;
a second displacement means mechanically associated with said carriage for displacing said carriage laterally along said chassis; and
a third displacement means, mechanically associated with said carriage for angularly rotating said carriage about said chassis;
wherein said first, second and third displacement means are simultaneously operable to maneuver a load carried by said carriage to a selected location and orientation.

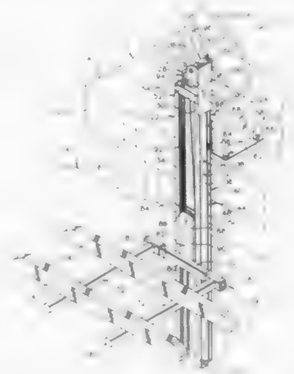
5,143,181
PLATFORM LIFT APPARATUS
Lawrence B. Bixby, 17335 SE. 67th St., Rte. 2, Box 1671, Oklawaha, Fla. 32179
Filed Oct. 7, 1991, Ser. No. 772,327
Int. Cl.[5] B66B 9/20
U.S. Cl. 187—10 9 Claims



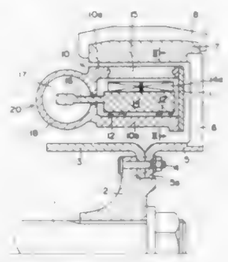
1. A platform lift apparatus, comprising,
a base plate, the base plate including a first tube fixedly mounted to the base plate, wherein the first tube includes a first stabilizer leg directed therethrough, and
a second tube mounted to the base plate and to the first tube, and a third tube mounted to the base plate, the first tube, and the second tube, wherein the second tube and the third tube are joined at an acute included angle therebetween, and
the second tube includes a second stabilizer leg and the third tube includes a third stabilizer leg, and
a guide track fixedly mounted to the base plate adjacent the first tube, the second tube, and the third tube, with the guide track canted forwardly of the base plate and oriented medially of the second tube and the third tube, the guide track including a gear rack coextensive with the guide track and formed to a top surface thereof, and
a platform mounted to the guide track, the platform including a drive motor, the drive motor including drive gears, the drive gears in cooperation with the gear rack, whereupon rotation of the drive motor and the drive gears displacement of the platform relative to the guide track is effected.

5,143,182
LOW-PROFILE WATERCRAFT LIFT
Samuel T. Basta, 2457 - 137th Ave. SE., Bellevue, Wash. 98005
Filed Apr. 22, 1991, Ser. No. 689,301
Int. Cl.[5] B66B 9/20
U.S. Cl. 187—11 7 Claims

1. A low-profile lift for jet skis and other small watercraft to be used in combination with a dock in a body of water, the dock having a top surface and a side wall, the lift comprising:
a single rail;
a base plate for attaching said rail to only the top surface of the dock such that said rail is positioned adjacent the side wall of the dock in a vertical orientation to extend above and below the dock into the water, said base plate including means for transferring all forces exerted on said rail to the top surface of the dock;
a carrier adapted to ride on said rail for movement between a lowered position at one end of said rail and a raised position at the other end of said rail;
means associated with said carrier for cradling the watercraft such that as said carrier moves along said rail, the watercraft is raised from and lowered to the body of water; and
means for moving said carrier between said raised position and said lowered position comprising a winch centrally mounted on the top of said rail, and means for attaching said winch to the top of said rail such that said winch can be positioned and attached at one of at least three orientations while said carrier and said cradling means remain in fixed orientation with respect to said rail to provide selective access to a user.



5,143,183
EDDY CURRENT BRAKING SYSTEM
Tohru Kuwahara, Kawasaki, Japan, assignor to Isuzu Motors Ltd., Tokyo, Japan
Filed Jul. 19, 1991, Ser. No. 733,138
Claims priority, application Japan, Jul. 30, 1990, 2-201820
Int. Cl.[5] B60L 7/28; F16D 65/00
U.S. Cl. 188—158 15 Claims



1. A vehicle braking system comprising
a brake structure defining an annular surface means;
annular magnet support means disposed adjacent to said annular surface;
a plurality of circumferentially spaced apart pairs of circumferentially spaced apart permanent magnets mounted on said magnet support means and circumferentially spaced apart thereon, each said pair arranged with like polarities facing said annular surface and the polarities of said pairs of permanent magnets facing said annular surface alternating circumferentially;
annular pole piece support means;
a plurality of ferromagnetic pole pieces mounted on said pole piece support means and circumferentially spaced apart in positions between said annular surface and said permanent magnets, each said pole piece disposed adja-

cent to a pair of said permanent magnets and having a circumferential length substantially greater than the circumferential length of either of said adjacent pair of permanent magnets; and

adjustment means for producing relative angular movement between said magnet support means and said pole piece support means so as to change the circumferential alignment between each of said pole pieces and said pair of permanent magnets adjacent thereto.

5,143,184

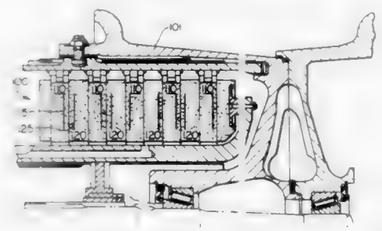
CARBON COMPOSITE BRAKE DISC WITH POSITIVE VIBRATION DAMPING

David R. Snyder, Stow, Ohio; Lawrence E. McAllister, Granger, and Jaring V. Veen, South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J

Filed Feb. 14, 1991, Ser. No. 655,000

Int. Cl.[5] F16D *6. /10*

U.S. Cl. 188—218 XL **38 Claims**



1. A disc for a friction mechanism including a brake or clutch, the disc having parallel faces for engagement with opposing faces of associated friction mechanism members, said disc comprising a single integral disc member made of carbon composite friction material which includes an internal insert member disposed completely internally of said disc member, the insert member effecting positive vibration damping of the disc member during operation of said friction mechanism.

5,143,185

CONTROLLABLE HYDRAULIC VIBRATION DAMPER FOR AUTOMOTIVE VEHICLES

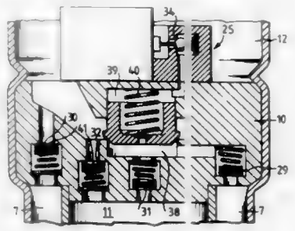
Hans-Christof Klein, Hattersheim, and Uwe Sievers, Darmstadt, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Continuation of Ser. No. 383,776, Jul. 21, 1989, abandoned. This application Jun. 28, 1991, Ser. No. 726,148

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1988, 3827255

Int. Cl.[5] F16F *9/46;* **B60G** *17/08*

U.S. Cl. 188—299 **7 Claims**



1. A controllable hydraulic damper for automotive vehicles comprising:

a tubular housing having a first cover means at one end;

a valve assembly housing fixed within said housing spaced from said first cover means to define a compensating chamber therebetween within said tubular housing, said compensating chamber containing hydraulic fluid;

a working cylinder fixed at one end to said valve assembly housing and extending to the other end of said tubular housing;

a second cover means closing the other end of each of said tubular housing and said working cylinder;

a piston slidably mounted in said working cylinder;

a piston rod fixed to said piston and extending to said other end of said working cylinder and out through said second cover means;

a channel within said tubular housing and outside of said working cylinder extending to said valve assembly housing;

said piston defining a first working chamber defined in said working cylinder between said piston and said valve assembly housing;

a second working chamber defined in said working cylinder between said piston and said second cover means hydraulic fluid disposed in said first and second working chambers;

at least one recess placing said second working chamber in constant communication with said channel;

a common chamber defined in said valve assembly housing;

a first one way acting valve means in said valve assembly housing allowing pressurized hydraulic fluid to pass into said common chamber from said first working chamber when said piston is moved towards said first working chamber while preventing reverse flow therefrom;

a second one way acting valve means in said valve assembly housing allowing pressurized fluid from said second working chamber to pass into said common chamber by way of said channel when said piston moves towards said second working chamber, while preventing reverse flow therefrom;

a controllable valve in said valve assembly controllably establishing a varying degree of restrictive communication between said common chamber and said compensating chamber;

a third one way acting valve means in said valve assembly housing allowing hydraulic fluid to be drawn into said first working chamber from said compensating chamber when said piston is moved away from said first working chamber while preventing reverse flow therefrom; and

a fourth one way acting valve means in said valve assembly housing allowing hydraulic fluid to be drawn into said second working chamber by way of said channel from said compensating chamber when said piston moves away from said second working chamber while preventing reverse flow therefrom, whereby said controllable valve provides varying degrees of restriction over flow from both said first and second working chambers.

5,143,186

METHOD AND APPARATUS FOR ABSORBING MECHANICAL SHOCK

Magnus B. Lizell, Bjorns Backe 2, 18235 Danderyd, Sweden

Continuation of Ser. No. 478,236, Feb. 9, 1990, Pat. No. 5,025,899, which is a continuation of Ser. No. 154,343, Jan. 13, 1988, Pat. No. 4,923,038. This application Jun. 24, 1991, Ser. No. 720,261

Claims priority, application Canada, Jun. 5, 1986, 510950; PCT Int'l Appl., Mar. 18, 1987, 87/00615

Int. Cl.[5] F16F *9/46;* **B60G** *11/26*

U.S. Cl. 188—299 **61 Claims**

1. A direct acting hydraulic shock absorber mechanically communicating with an automobile comprising:

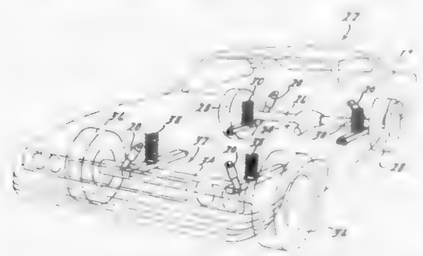
a pressure cylinder forming a working chamber having first and second portions operable to store damping fluid, said damping fluid being operable to flow between said first and second portions of said working chamber;

first valve means for controlling the flow of said damping fluid between said first and second portions of said working chamber during compression of said shock absorber, said first valve means includes a first valve disk and a vertically displaceable first valving member disposed proximate to said valve disk;

a pressure chamber in fluid communication with said first portion of said working chamber and said first valve means and being operable to receive said damping fluid under pressure, said first valving member being vertically displaceable in response to said pressure of said damping fluid in said pressure chamber;

electrical controllable flow means for regulating the flow of damping fluid between said pressure chamber and said second portion of said working chamber; and

second valve means for controlling the flow of said damping fluid between said first and second portions of said working chamber during rebound of said shock absorber.



5,143,187

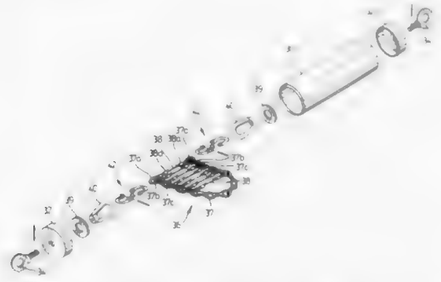
ENERGY ABSORBER FOR HORIZONTAL LIFELINES IN FALL ARREST SYSTEMS

Raymond H. McQuarrie, Brampton, and Andrew C. Sulowski, Etobicoke, both of Canada, assignors to Ontario Hydro, Toronto, Canada

Filed Jan. 22, 1991, Ser. No. 644,383

Int. Cl.[5] F16F *7/12*

U.S. Cl. 188—376 **6 Claims**



1. An energy absorber for a horizontal lifeline used in a fall protection system, comprising:

an elongate, flexible strength component to opposite ends of which is transmitted the tension shock load produced in the horizontal lifeline by arresting a fall, said strength component being a metal chain having a selected static breaking strength greater than the maximum tension shock load encountered in use of the fall protection system; and

a plurality of sequential and independent energy absorbing components being linear segments, each firmly attached at opposite ends thereof to corresponding links of said chain, so that said chain is held by said energy absorbing components in the shape of a loop open at the ends of the chain and tension applied at opposite ends of said chain is borne by each of said energy absorbing components only after the preceding energy absorbent component has broken, the breaking strength of each said energy absorbing component being selected not to exceed a desired maximum arrest load and the number of said energy absorbing components being selected so that not all of them will break when the fall protection system arrests the fall of an object of a predetermined mass falling freely a predetermined distance.

5,143,188

ARTICLE INCORPORATING AT LEAST TWO COMPARTMENTS INTENDED TO CONTAIN VARIOUS OBJECTS

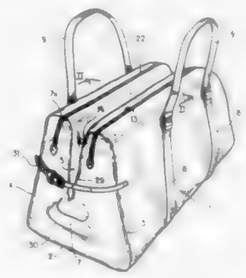
Jean-Louis Robinet, Neuilly-sur-Seine, France, assignor to Francois Marot S.A., Paris, France

Filed Nov. 6, 1991, Ser. No. 788,619

Claims priority, application France, Nov. 19, 1990, 90 14367

Int. Cl.[5] A45C *13/00*

U.S. Cl. 190—111 **8 Claims**



1. An article incorporating at least two independently accessible compartments which are intended to contain various objects therein, comprising:

an outer envelope having a pleated top surface with first and second longitudinal edges and opposite end edges, opposite side surfaces having top edges adjacent the first and second longitudinal edges, a bottom surface, and opposite end wall surfaces with each end wall surface having a notch formed therein which conforms with the shape of the opposite end edges of the top surface and which forms arm portions on each end wall surface;

a first closure means connecting the first longitudinal edge with the top edge of one side surface, the first closure means is moveable so that in a first closed position the first closure means prevents access to the interior of the outer envelope and in a second opened position the first closure means defines a first opening to provide access to the interior of the outer envelope;

at least one first inner pouch housed within the outer envelope and contiguous to one side surface of the outer envelope, the first inner pouch having lip portions that are joined to the outer envelope and the first closure means so that when the first closure means is in the second position the first inner pouch is accessible from outside the outer envelope, and wherein the outer envelope is deeper than the first inner pouch;

a second closure means connecting the second longitudinal edge with the top edge of the other side surface, the second closure means is moveable so that in a first closed position the second closure means prevents access to the interior of the outer envelope and in a second opened position the second closure means defines a second opening to provide access to the interior of the outer envelope; and

at least one second inner pouch housed within the outer envelope and contiguous to the other side surface of the outer envelope, the second inner pouch having lip por-

tions that are joined to the outer envelope and the second closure means so that when the second closure means is in the second position the second inner pouch is accessible from outside the outer envelope, and wherein the second inner pouch extends into the outer envelope along one side of, and beneath, the first inner pouch.

5,143,189

PAWL-RATCHET FREE-WHEEL MECHANISM FOR A BICYCLE HUB

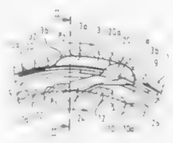
Gerhard Meier-Burkamp, Bergrheinfeld, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 12, 1991, Ser. No. 743,999

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1990, 4025708

Int. Cl.[5] F16D *41/30*

U.S. Cl. 192—64 **18 Claims**



1. A pawl-ratchet free-wheel mechanism for a bicycle hub, comprising:

two rotor members (**10**,**1**) rotatable about a common axis (A), namely an inner rotor member (**10**) having an outer circumferential surface (**10***a*), and an outer rotor member (**1**) having an inner circumferential surface (**9**) radially opposite to said outer circumferential surface (**10***a*).

at least one pawl member (**20**) for transmitting a torque between said rotor members (**10**,**1**),

said outer circumferential surface (**10***a*) being provided with ratchet teeth means (**12**), said inner circumferential surface (**9**) being provided with at least one bearing pocket (**3**), said bearing pocket (**3**) having a bearing face (**3***a*, **3***b*), said bearing face (**3***a*, **3***b*) having circumferentially opposite end portions (**3***b*), said pawl member (**20**) having a counter-bearing portion (**20***a*) engagable with said bearing face (**3***a*, **3***b*), said pawl member (**20**) further having a teeth engagement portion (**24**) engagable with said ratchet teeth means (**12**),

spring means (**26**) for biasing said teeth engagement portion (**24**) of said pawl member (**20**) towards engagement with said ratchet teeth means (**12**),

said pawl member (**20**) being positioned in at least one axial direction by positioning means (**30**,**7**),

said inner circumferential surface (**9**) being provided with a circumferentially extending groove (**5**) adjacent said pocket (**3**), said groove (**5**) having a bottom surface (**5***a*) which intersects with said pocket (**3**) and two side faces (**7**) which form a part of said positioning means (**30**,**7**),

said positioning means (**30**,**7**) further comprising an annular positioning member (**30**) accommodated by said groove (**5**) and locked against movement in circumferential direction with respect to said outer rotor member (**1**), said annular positioning member (**30**) having at least one window (**32**) in overlapping relationship with respect to said pocket (**3**), said at least one pawl member (**20**) being located within said window (**32**) and being axially positioned by said window (**32**).

5,143,190

FRICTION CLUTCH UNIT AND METHOD OF PRODUCING IT

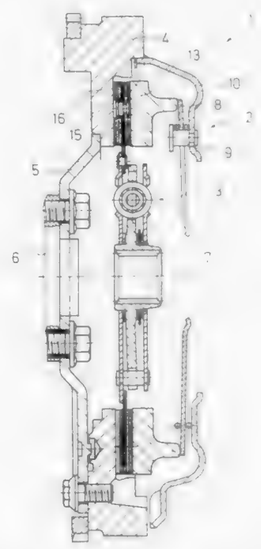
Holger Westendorf, Dittelbrunn; Andreas Krause, Schonungen, and Friedrich Kittel, Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Division of Ser. No. 695,618, May 3, 1991. This application Jul. 24, 1991, Ser. No. 735,053

Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014470

Int. Cl.[5] F16D *13/50*

U.S. Cl. 192—70.27 **19 Claims**



1. An apparatus for a friction clutch structural unit which comprises:

a flywheel which defines an axis of rotation of said friction clutch;

a clutch housing which is fastened to the flywheel by an attachment means in a defined axial position relative to said flywheel;

a pressing plate which is guided at the clutch housing so as to be nonrotational and axially mobile;

a clutch disk and friction lining arrangement located axially between the flywheel and the pressing plate; and

a clutch main spring arrangement which tensions the pressing plate through the friction lining against the flywheel which arrangement has a predetermined spring force in the axial position of the clutch housing relative to the flywheel defined by said attachment means;

wherein one of the flywheel and a component rigidly connected thereto, and the clutch housing have guide faces which have a cylindrical contour, at least in sectors;

wherein the guide faces center the clutch housing relative to the flywheel and which, in the absence of the attachment means, permits a radially centered axial displacement of the clutch housing relative to the flywheel and having a displacement range which permits the adjustment of a predetermined spring force; and further wherein the attachment means retains the clutch housing against one of the flywheel and a component rigidly connected thereto in a region where the guide faces are radially adjacent to one another.

5,143,191

COUPLING FORCE CONTROL SYSTEM FOR FLUID COUPLING

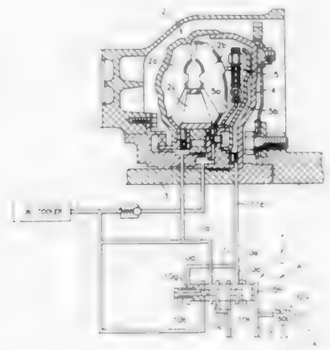
Hidetoshi Nobumoto, and Minzi Sakaki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 27, 1991, Ser. No. 766,191

Claims priority, application Japan, Sep. 27, 1990, 2-261227

Int. Cl.[5] F16D *23/00*

U.S. Cl. 192—76 **5 Claims**



1. A coupling control system for a fluid coupling with a hydraulically operated lockup mechanism for use with an automotive engine comprising:

sensor means for detecting engine operating conditions of the automotive engine;

activation means for applying hydraulic pressure to the lockup mechanism to couple and uncouple the fluid coupling;

release control means for controlling said activation means to decrease gradually the hydraulic pressure at a predetermined rate so as to uncouple the fluid coupling with a gradually decreasing coupling force in a predetermined engine operating condition; and

rate changing means for changing said predetermined rate so as to advance uncoupling of the fluid coupling when said sensor means detects engine loads higher than a predetermined engine load while said release control means controls said activation means to gradually decrease the hydraulic pressure.

5,143,192

FRICTION CLUTCH OR FRICTION BRAKE

Herbert Vojacek, Munich, and Hermann Pflaum, Maisach, both of Fed. Rep. of Germany, assignors to Sinterstahl GmbH, Fussen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 478,045, Feb. 1, 1990, abandoned, which is a continuation of Ser. No. 262,232, Oct. 21, 1988, abandoned, which is a continuation of Ser. No. 83,868, Aug. 7, 1987, abandoned, which is a continuation of Ser. No. 733,477, May 13, 1985, abandoned. This application Apr. 25, 1991, Ser. No. 693,763

Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417813

Int. Cl.[5] F16D *13/60*; B23P *25/00*

U.S. Cl. 192—107 M **21 Claims**

1. A method for making a friction body for use in a friction clutch or a friction brake having a fluid-lubricated, curved surface which comprises the steps of:

providing a flat metal sheet substrate;

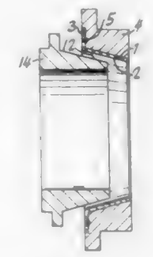
sprinkling a powdered friction material on the substrate;

sintering the sprinkled friction material on the substrate;

compressing the sintered friction material on the substrate at least one time and;

drawing the flat substrate with the compressed friction material thereon to form the curved friction body.

12. A friction ring for use in fluid-lubricated clutches, brakes and synchronizing equipment, the friction ring comprising:



a curved metal sheet substrate which is continuous without any joints and having an inner surface and an outer surface; and

a layer of sprinkled, sintered, and thereafter compressed friction material bonded onto at least one surface of the substrate, the friction ring being formed by reshaping a flat metal sheet substrate having the sprinkled, sintered, and compressed friction material bonded thereto.

5,143,193

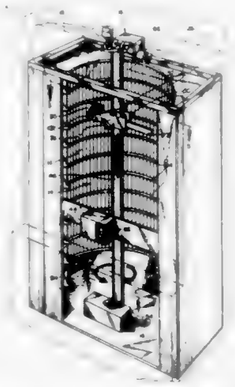
AUTOMATED LIBRARY ARTICLE TERMINAL

Ronald Geraci, 9653 El Clair Ranch Rd., Boynton Beach, Fla. 33437

Continuation of Ser. No. 443,017, Nov. 29, 1989, abandoned, which is a continuation of Ser. No. 213,537, Jun. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 131,260, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 801,129, Nov. 22, 1985, abandoned. This application May 14, 1991, Ser. No. 701,616

Int. Cl.[5] G07F *7/00, 11/62*

U.S. Cl. 194—212 **20 Claims**



1. An automated machine for use in the storage, vending and receipt of articles comprising, in combination: an external wall having a delivery chute mounted thereto and extending therethrough, control means accessible for operation externally of said machine by a user to automatically stock, vend and selectively accept return of and re-stock, so that they can be revended, a plurality of reusable articles each having a unique code; storage means having a plurality of individual compart-

ments, each for storing one of said plurality of articles; retrieval means movable relative to said storage means for retrieving user-selected articles from said compartments and for delivering the retrieved article to a user by way of said delivery chute, and for retrieving a returned article from said delivery chute and placing said returned article in an unoccupied one of said compartments; memory means for storing information corresponding to the location of said plurality of articles in said machine; code reader means mounted in said machine for reading the code of any article handled by the retrieval means and for generating an article code signal representation of the code so read, and transmitting said article code signal to said memory means; location signal generating means coupled to said retrieval means for generating a signal corresponding to the location of an article and for transmitting said article location signal to said memory means, whereby said memory means is updated with information corresponding to the article code and location of each article handled by said retrieval means; wherein said compartment means are arrayed in generally horizontally stacked, arcuate rows, each row extending over a major fractional portion of a circle and comprising a plurality of said compartment means in generally side-by-side array; and further including row indicia means and compartment indicia means associated respectively with said rows and with said compartments; indicia sensor means mounted to said retrieval means and responsive to said indicia means for producing position signals corresponding to the position of said retrieval means relative to said indicia means and for transmitting said position signals to said control means; wherein said indicia means include indicia for marking the location of each individual compartment; and wherein said control means further includes correction means for comparing the position signals produced in response to said indicia means to signals generated by said location signal generating means and for generating correction signals for correcting the position of said retrieval means to the extent necessary for properly aligning the retrieval means with each compartment for retrieving or replacing an article from or to said compartment.

5,143,194

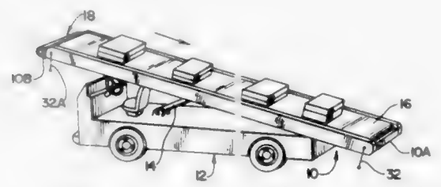
SAFETY SHUT DOWN SYSTEM FOR LUGGAGE CONVEYOR SYSTEM

Andy Sang, 434 W. Touhy, Lot 268, Des Plaines, Ill. 60018

Filed Jul. 5, 1991, Ser. No. 726,265

Int. Cl.[5] B65G *43/08*

U.S. Cl. 198—301 **2 Claims**



1. A luggage conveyor system that can be associated with a vehicle for loading or unloading and it is automatically halted when luggage or other jamming objects become lodged therein comprising: an ignition system with means for activating said conveyor system;

engine driving means that is operatively associated with said conveyor system to drive said system when said ignition is activated;

a manually closed relay that feeds current to said engine from said ignition system when said ignition system is activated and said conveyor system having a pressure-sensitive switch that is disposed and connected to be tripped in response to the force of a jamming object being lodged in said conveyor system, said pressure-sensitive switch causing said relay to open and to deenergize said engine driving means by cutting off the current being supplied to it and in turn halt said conveyor system in order that the jamming objects can be dislodged therefrom;

said conveyor system having manual means for reversing the conveyor direction to dislodge jamming objects therefrom after said engine has been halted;

said conveyor system having a safety bumper means in contact with the vehicle being loaded or unloaded to protect it from direct contact with the conveyor system and said pressure-sensitive switch is disposed between said safety bumper and said conveyor system;

said conveyor system having rotating conveyor end rollers with one of said rotating conveyor end rollers being adjacent to an end of said conveyor system with a space therebetween that has luggage frequently loaded therein that is included in said conveyor system, and said pressure-sensitive switch is a ribbon switch and it is disposed in said space between said conveyor system and said conveyor end rollers of said conveyor system in order to sense pieces jammed in the space between said roller and said safety bumper.

5,143,195

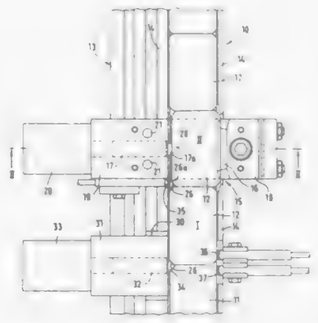
ASSEMBLY STATION

Detlef Bloecker, Keonigswinter, Fed. Rep. of Germany, assignor to Protech Automation GmbH, Fed. Rep. of Germany

Filed Sep. 25, 1991, Ser. No. 765,293

Int. Cl.[5] B65G *15/64*

U.S. Cl. 198—345.3 **12 Claims**



1. An assembly station comprising a conveyer (10) for conveying workpiece carriers (12) thereon, a stopper means (30) for stopping the workpiece carriers (12) on the transport path, and a positioning and holding means (15) for receiving a workpiece carrier (12) stopped in a receiving position and subsequently releasing said workpiece carrier (12) for further transport,

wherein the stopper (30) means comprises a movable stopper (34) projecting laterally into the transport path, and wherein the stopper means (30) is positioned by a distance corresponding to at least one workpiece carrier length downstream of a workpiece carrier (II) held by the positioning and holding means (15), so that the workpiece carrier (II) to be received by the positioning and holding means (15) is held in the receiving position by at least one leading workpiece carrier (I) having been stopped by the stopper means (30).

5,143,196

PRODUCTION OF GLAZINGS ON A PRODUCTION LINE COMPRISING SEVERAL WORKSTATIONS

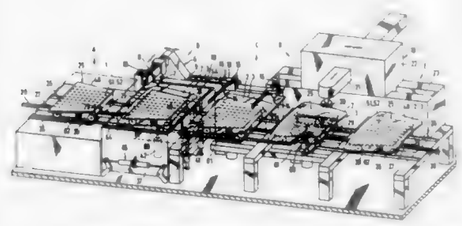
Klaus Henn; Ansgar Elfgen; Ludwig Schwartz, and Helmut Krumm, all of Aachen, Fed. Rep. of Germany, assignors to Saint Gobain Vitrage International, Courbevoie, France

Filed Dec. 12, 1990, Ser. No. 626,366

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 3941277

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—345.3 **24 Claims**



3. An apparatus for producing glazings on a production line comprising

a plurality of workstations at which tasks are preformed on glass sheets,

a conveying system for transporting said glass sheets to each of said workstations, said conveying system comprising a plurality of mobile supports and means for moving said supports through said workstations,

an attachment system for attaching said glass sheets to said mobile supports, said glass sheet on its periphery extending beyond said mobile support,

a positioning system for precisely arranging said mobile supports and therefore the glass sheets which are attached thereto within said workstations so that said tasks can be performed on said sheets, and

means for supporting the entire periphery of the glass sheet in a desired working position in at least one of said workstations.

5,143,197

DEVICE FOR TURNING FLAT OBJECTS, SUCH AS FOR EXAMPLE BUNDLES OF NOTES

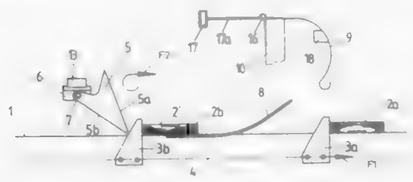
Hartmut K. Sauer, Himmelstadt, Fed. Rep. of Germany, assignor to De La Rue Giori, S.A., Lausanne, Switzerland

Filed Jan. 15, 1992, Ser. No. 822,034

Claims priority, application Switzerland, Feb. 28, 1991, 00611/91

Int. Cl.[5] B65G *47/248*

U.S. Cl. 198—409 **7 Claims**



1. Device for turning flat objects (*2a*, *2b*, *2c*), such as for example bundles of notes, which are transported in uniform fashion as material to be conveyed on a conveying track (1) with the aid of pushers (*3a*, *3b*, *3c*), characterised in that a thrusting mechanism which accelerates the objects and has a thrusting member (5) moved at least approximately parallel to the conveying track is provided along a turning zone, which member has a front face (*5a*), inclined backwards in relation to the conveying direction and is moved periodically with an acceleration relative to the conveying speed out of a starting position into an end position and back into the starting position by a drive arrangement (20 to 27), the motion period of this thrusting member (5) being given by the quotient of the distance between successive objects on the conveying track and the conveying speed, and in that an upwardcurved ramp (8), the start of which lies tangentially to the conveying track (1), and, at a distance from the end of this ramp, in the track of motion defined by the latter, a guide track (9) curved further upwards and bent to an at least vertical orientation are arranged in the turning zone in such a way that each object, under acceleration by the thrusting member (5), is pushed up on the ramp (8) and the guide track (9), then tilted backwards through an angle of over 90° and, after the removal of the thrusting member (5) out of its end position, falls back onto the conveying track (1) having been turned.

5,143,198

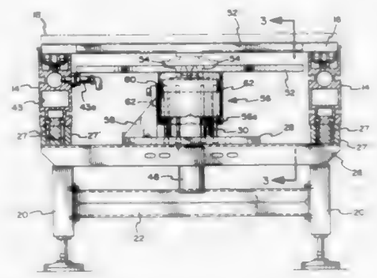
TURNABLE CYLINDER FOR A CONVEYOR SYSTEM

Daniel E. Hale, Bartlett, and Thomas A. Johnson, Germantown, both of Tenn., assignors to Industrial Conveyor Company, Inc., Memphis, Tenn.

Filed Oct. 21, 1991, Ser. No. 780,050

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—414 **19 Claims**



1. A turntable for a conveyor system comprising:

a) a cylinder having a longitudinal axis mounted to a stationary base plate;

b) a non-rotatable piston disposed within said cylinder and mounted for reciprocal movement along said longitudinal axis;

c) bushing means co-axially disposed about the cylinder axis for rotatably mounting means for supporting an article;

d) means for stabilizing said article supporting means during rotation;

e) said stabilizing means being co-axially mounted on said bushing means and including means for stopping said article supporting means from rotating; and

(f) said article supporting means being raised and lowered with respect to said base plate by the reciprocal movement of said piston.

5,143,199

HYDROSTATIC COOKER INFEED

Donald E. Evans, Hilliard, Ohio, assignor to Don Evans and Associates, Inc., Hilliard, Ohio

Continuation of Ser. No. 415,084, Sep. 29, 1989, abandoned. This application Jul. 2, 1991, Ser. No. 726,635

Int. Cl.[5] B65G *47/30*

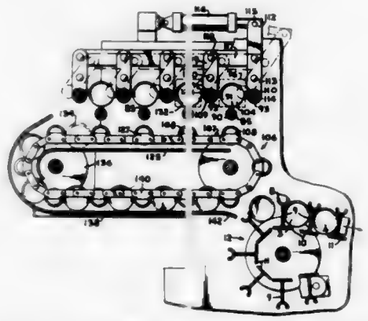
U.S. Cl. 198—418.1 **9 Claims**

1. An infeed apparatus for supplying containers to a cooker including an endless chain having flights; said cooker having a loading station; comprising:

(a) a transfer conveyor for assembling said containers axially in end-to-end relationship to one another into sticks of a

predetermined length; said transfer conveyor having a single cable for frictionally assembling the containers into a stick; said transfer conveyor including an assembly pocket having an elongate support rod substantially centered therebelow for supporting the containers within said pocket; said transfer conveyor having an elongate pair of guide rods positioned above said support rod for maintaining the containers thereon, when in a supporting configuration thereof; said guide rods being laterally spaced to allow the containers to pass therebetween;

(b) a loading conveyor having at least one open flight; said loading conveyor cooperating with said transfer conveyor to receive each stick therefrom as a unit and adapted to transfer each of the sticks onto the endless chain of the cooker; said loading conveyor including an upper run having an underlying shelf for supporting the containers



therein; said loading conveyor including a lower run having an underlying sleeve for supporting the containers therein; said upper run of said loading conveyor sleeve adapted to receive the containers from said transfer conveyor; said lower run of side loading conveyor adapted to receive the containers from said upper run of said loading conveyor; said shelf of said upper run of said loading conveyor and said sleeve of said lower run of said loading conveyor cooperatively adapted to convey the containers from the upper run of said loading conveyor to the lower run of said loading conveyor; said sleeve of said lower run of said loading conveyor further adapted to direct the containers into an empty one of the flights of the cooker chain at the cooker loading station; and

(c) linkage means to operably transfer each of the sticks from said transfer conveyor to said loading conveyor.

5,143,200

GUIDE WALL MODULE FOR ORDERING APPARATUS HAVING ROTATOR WALLS

Stuart C. Fuller, Rte. 2, Box 55, Goode, Va. 24556

Filed Jul. 5, 1991 Ser. No. 726,078

Int. Cl.[5] B65G *47/12*

U.S. Cl. 198—453 **16 Claims**

1. A guide wall module for apparatus for ordering a flow of randomly arranged cylindrical articles on a conveyor surface into a single file leading to an article single file portion of the apparatus, comprising:

(1) an array composed of:

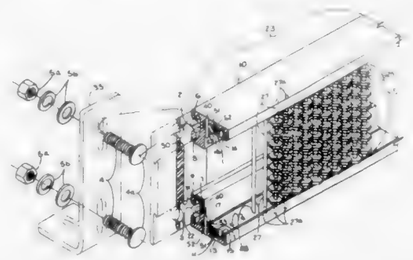
(i) a plurality of rotators;

(ii) arranged for rotation on axles having ends extending beyond the rotator array thereon;

(iii) the rotator array being disposed in a substantially vertical stand of superimposed rotators;

(2) a frame formed in a U-configuration having a base and facing sides extending outwardly from the base, the facing sides being sufficiently spaced apart to receive and retain the array therebetween at a point sufficiently far from the base to allow free rotation of the rotators;

(i) the facing sides having opposed facing longitudinal channels slidably receiving and retaining bearing



mounts for rotatably supporting the axle ends of the array;

(ii) the base having mounting means for attaching the wall module to the apparatus as a wall thereof in a position to contact cylindrical articles on the conveyor surface.

5,143,201

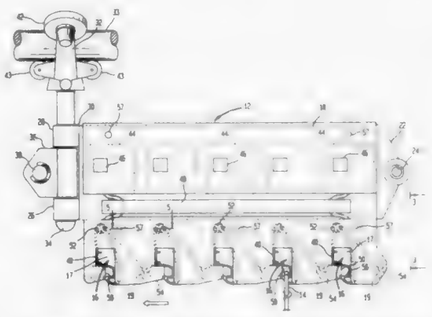
CARRIER ASSEMBLY

Bernard Speckhart, Short Hills, and Paul M. Berson, Mountain Lakes, both of N.J., assignors to White Conveyors, Inc., Kenilworth, N.J.

Filed Jan. 22, 1991, Ser. No. 643,411

Int. Cl.[5] B65G *43/00*

U.S. Cl. 198—502.3 **28 Claims**



1. An apparatus for supporting and conveying hooked members comprising:

a frame including at least one receptacle formed therein adapted to receive a hooked member, and defining at least one aperture corresponding in position to the at least one receptacle; and

at least one latch member pivotally supported within the receptacle and including a latch portion and integral biasing portion adapted to be flexed relative to the latch portion, the latch portion including a support surface adapted to support a hooked member and being normally biased into a first position supporting a hooked member within the receptacle and adapted to be flexed toward the biasing portion into a second position for receiving or releasing the hooked member.

5,143,202

SCREW CONVEYOR

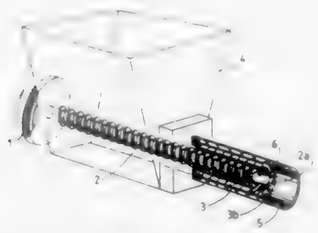
Rolf Lehmann, Seon, and Reinhold Hodel, Oberentfelden, both of Switzerland, assignors to K-Tron Technologies, Inc., Wilmington, Del.

Filed Sep. 12, 1991, Ser. No. 757,933

Claims priority, application Switzerland, Sep. 14, 1990, 2995/90

Int. Cl.[5] B65G *33/00*

U.S. Cl. 198—670 **14 Claims**



1. A screw conveyor with a feed screw rotatably mounted in a fixed tube provided with a filling opening, comprising:

a tube rotatably mounted at a discharge end of the fixed tube, said rotatably mounted tube driven at a rotational speed proportional to a rotational speed of the feed screw, the feed screw having a substantially horizontal axis.

5,143,203

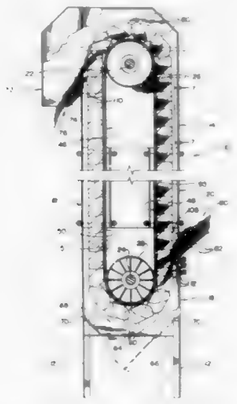
GRANULAR MATERIAL TRANSFER APPARATUS

Pat S. Hinner, Merrill, Wis., assignor to Merrill Iron & Steel, Inc., Merrill, Wis.

Filed May 14, 1991, Ser. No. 699,740

Int. Cl.[5] B65G *17/36*

U.S. Cl. 198—708 **6 Claims**



1. Apparatus for transporting bulk granular material from a source at one height to a receptacle at an elevated height, comprising:

(a) a continuous web conveyor belt; and

(b) a plurality of material transporting carriages carried by said conveyor belt and spaced at defined intervals therealong, each carriage including a back wall, a floor having a first panel which, when the carriage moves along oppositely-moving runs of said conveyor belt, extends, at a first acute angle, in a direction of conveyor belt movement and away from said back wall proximate a trailing edge of said back wall, and a second panel, extending outwardly from a distal end of said first panel at a second angle, more acute relative to said back wall, to define a recess behind said first panel, and a roof which, when the carriage moves along said oppositely-moving runs of said conveyor belt, extends away from said back wall proximate a leading edge thereof at substantially the same acute angle as that of said second floor panel and terminates adjacent a juncture of said first and second floor panels of an immediately forwardly adjacent carriage and is received within a recess defined behind said first panel of the immediately forwardly adjacent carriage to provide, along with said second floor panel of the immediately forwardly adjacent carriage, with which said roof is coplanar, a substantially-continuous deflection surface.

5,143,204

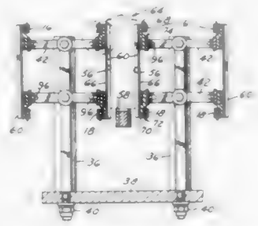
CONVEYOR CHAIN GUIDE RAIL SYSTEM

Barry C. Owen, Southfield, and Timothy H. Drury, Howell, both of Mich., assignors to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Dec. 23, 1991, Ser. No. 812,411

Int. Cl.[5] B65G *19/00*

U.S. Cl. 198—726 **10 Claims**



1. For use with a packaging machine base and a conveyor having a pair of spaced endless chains and a plurality of carton conveying compartments cooperatively mounted therebetween, a chain guide rail system comprising a substantially Z shaped polymer segment including first and second legs and an interconnecting center section, a pair of stainless steel strips operatively connected to said base, wherein said first leg of said polymer segment supports the endless chain and compartment components and said second leg thereof is confined between said stainless steel strips.

5,143,205

FREE-FLOW CONVEYOR CHAIN

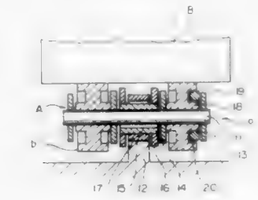
Kazutaka Fujimoto, Ishikawa, Japan, assignor to Enuma Chain Manufacturing Co., Ltd., Ishikawa, Japan

Continuation of Ser. No. 443,871, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 48,601, May 11, 1987, abandoned. This application May 29, 1991, Ser. No. 708,832

Claims priority, application Japan, May 13, 1986, 61-70736[U]

Int. Cl.[5] B65G *17/24*

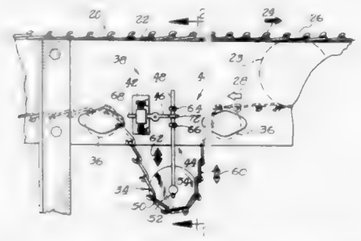
U.S. Cl. 198—779 **4 Claims**



1. A conveyor chain element for use in conjunction with a guide rail comprising:

a guide roller in sliding engagement with said guide rail;
a pin having an outer end and an intermediate portion received by said guide roller;
at least one supporting roller;
means for rotably mounting said supporting roller adjacent said outer end of said pin;
a first side of said supporting roller having an annular groove of fixed axial dimension formed therein;
a resilient O-ring partially disposed in said annular groove having cross sectional diameter in its relaxed state greater than the axial dimension of said annular groove;
a washer fixedly secured to the end of said pin adjacent said annular groove and having a surface compressed against the surface of said O-ring which in turn is compressed against the surface of said annular groove to impart frictional resistance against the rotation of said supporting roller.

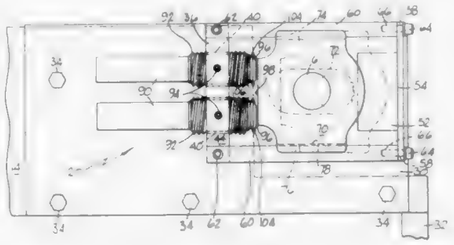
5,143,206
ROD CONVEYOR SWITCH
Don R. Hoover, Milford, Ind., assignor to CTB, Inc., Milford, Ind.
Filed Jun. 11, 1991, Ser. No. 713,458
Int. Cl.[5] B65G *15/00*
U.S. Cl. 198—810 **8 Claims**



1. A switch assembly for terminating the operation of a conveyor apparatus, said conveyor apparatus including a conveyor belt, said switch assembly comprising: conveyor belt sensing means for sensing displacement of said conveyor belt and switch means operatively coupled with said conveyor belt sensing means for responding to predetermined conditions sensed by said conveyor belt sensing means; said conveyor belt sensing means including a displacement assembly movably engaged with said conveyor apparatus for detecting displacement of said conveyor belt and a connecting member operatively attached to said displacement assembly for transmitting displacement of said displacement assembly to said switch means; wherein said displacement assembly includes a weighted member positioned on said conveyor belt for removing slack therefrom, a generally vertical member operatively attached to said weighted member, upper and lower limit members adjustably attached to said vertical member for defining a range of movement of said displacement assembly.

5,143,207
TENSION CONTROLLING AND SHOCK ABSORBING APPARATUS FOR AN ENDLESS CONVEYOR
David M. Pruett, Canon City, Colo., assignor to Portec, Inc., Oak Brook, Ill.
Filed Jun. 6, 1991, Ser. No. 712,087
Int. Cl.[5] B65G *23/44*
U.S. Cl. 198—814 **17 Claims**

1. Apparatus for conveying articles comprising:
a fixed frame;
at least a pair of spaced apart rotatable shafts mounted on said frame and having an endless conveyor belt trained therearound;
drive means for rotating at least one of said resilient shafts to move said endless conveyor belt;
bearing means mounted on said frame and rotatably supporting each of said shafts;
mounting means for mounting at least one of said bearing means for sliding movement relative to said frame;

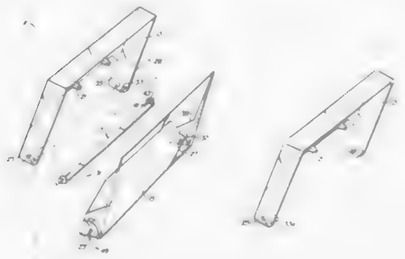


resilient force applying means for applying a resilient force on said mounting means to maintain the proper tension in said endless conveyor belt; and
shock absorbing means parallel to and independent of said force applying means for only absorbing excessive forces placed on said resilient force applying means.

5,143,208
LEVEL SENSOR
Edward M. Shostek, Fairview, and Francis J. Zelina, Lake City, both of Pa., assignors to American Sterilizer Company, Erie, Pa.
Filed Feb. 20, 1991, Ser. No. 657,926
Int. Cl.[5] H01H *29/00*
U.S. Cl. 200—187 **13 Claims**

1. A level sensor comprising:
a first mercury switch having opposed ends and a first electrical contact located at one end;
a second mercury switch having opposite ends and a second electrical contact located at one end wherein said second mercury switch is positioned adjacent to said first mercury switch;
an electrical circuit operatively connected to said first and second mercury switches and being responsive to said first and said second mercury switches;
means for securing the positions of said first and second mercury switches relative to each other; and
means for independently pivotally adjusting each of said first and second mercury switches to a desired degree about a transverse axis lying in a horizontal plane adjacent to said first and second mercury switches wherein said transverse axis lies intermediate the ends of said first and second mercury switches.

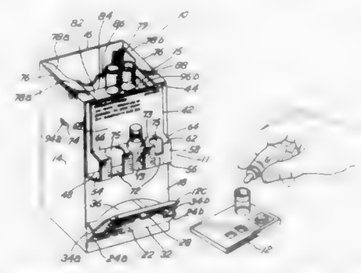
5,143,209
AUTOMATIC EXTENSION CASSETTE CONTAINER
Ernest D. Boshek, Jr., San Jose, Calif., assignor to Tandy Corporation, Fort Worth, Tex.
Filed Apr. 11, 1991, Ser. No. 683,910
Int. Cl.[5] B65D *85/672*
U.S. Cl. 206—45.16 **9 Claims**



1. A container used to removably house a cassette therein comprising;
a base portion including a bottom having a front edge and a rear edge, a back extending upwardly form the bottom along the rear edge and a first partial top extending from the back and overlying a first portion of the bottom;
a cover portion pivotally attached to said base portion for pure rotational movement about a pivot axis, said base portion and said cover portion forming an enclosure for said cassette, said cover portion being pivotal between a closed position and an open position;
the cover portion including parallel sides, a front extending perpendicular to the sides and a second partial top extending from the sides and the front, the second partial top sized to overlie a second portion of the bottom;
a cassette driver extending from and movable with the sides, the cassette driver positioned spaced apart from the pivot axis so to engage and drive said cassette from a first, stored position within said enclosure to a second, extended position partially outside the enclosure when said cover portion is pivoted from said closed position to said open position, thereby providing enhanced access to a cassette when at said second, extended position.

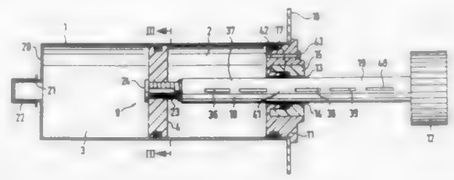
5,143,210
FOLDABLE PROTECTIVE PACKAGE FOR STORING, DISPENSING, AND DISPLAYING DIAGNOSTIC KIT COMPONENTS
S. John Warwick, 1141 Avenida Amantea, La Jolla, Calif. 92037; Lonna J. Williams, 13705 Stoney Gate Pl., San Diego, Calif. 92128, and Robert F. Eisele, 25432 Fallen Oak, Laguna Niguel, Calif. 92677
Filed Jan. 31, 1991, Ser. No. 648,466
Int. Cl.[5] B65D *69/00, 5/50*
U.S. Cl. 206—45.130 **32 Claims**

1. A foldable carton for displaying the chemical reagents and for dispensing the chemically impregnated test devices in a diagnostic test kit comprising:
a rear wall, side walls, and a front wall connected along generally parallel vertical fold lines to provide a multi-sided body that is capable of slidably stacking a plurality of chemically impregnated test devices,
a bottom closure for said multi-sided body,
a top closure for said multi-sided body, and
a dispensing flap;
said top closure comprising a cover panel having an inside face and an outside face, said cover panel being hingedly secured at a first end to the front wall along a fold line and having at its opposite end a tuck flap for tucking inwardly of the rear wall, said inside face having a rack capable of securing thereon from 1 to 4 containers of chemical reagents, said rack being positioned on the inside face, whereby when said carton is opened and the cover panel is folded forward along the fold line at said first end so as to substantially overlay a portion of the front wall, the containers of chemical reagents secured by said rack are facing forward in an upright position for convenient viewing; and
said dispensing flap being positioned on said front wall substantially near said bottom closure, said dispensing flap



being defined by a hinge line near the bottom of said front wall and by a line of weakened separation extending substantially across said front wall, said line of weakened separation defining an area having a length and height that is dimensionally greater than one of the chemically impregnated test devices to be dispensed from said carton, whereby when said line of weakened separation is separated and said dispensing flap is folded forward along its hinge line, there is created an opening capable of permitting the sequential withdrawal of the chemical impregnated test devices contained within said foldable carton.

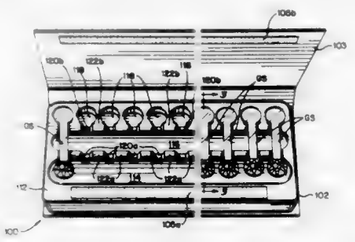
5,143,211
MULTI-CHAMBERED CONTAINER
Lothar Miczka; Mathias Pauls, both of Appenzell, and Ricco Kehl, Eichberg, all of Switzerland, assignors to Rathor Ag, Appenzell, Switzerland
Filed Apr. 19, 1989, Ser. No. 340,373
Claims priority, application European Pat. Off., Apr. 22, 1988, 88106451
Int. Cl.[5] B65D *25/08*
U.S. Cl. 206—221 **13 Claims**



1. A multi-chamber container, comprising:
at least two chambers, defined by at least one chamber partition wall;
at least one chamber partition wall, disposed between said chambers, movable through the container, and having at least one orifice defined therein which interconnects said chambers and which is adapted to receive a threaded valve spindle;
a shutoff member movable between an open position, wherein said chambers are connected by said orifice, and a closed position, wherein said orifice is blocked;
a tappet operably connected with said shutoff member and actuable from outside the container;
a threaded valve spindle disposed in said orifice and operably connected with said tappet for rotation of said spindle

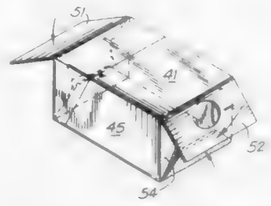
in said orifice, said spindle having a terminal end defining a stop for abutting a first side of said chamber partition wall in sealing contact, said spindle having a valve plate at a second end for abutting a second, opposite side of said chamber partition wall in sealing contact, said valve plate and said stop being layable into the respective sides of said chamber partition wall as a result of alternating rotation of said tappet, said shutoff member being a portion of said spindle and being defined by longitudinal grooves on said spindle extending as far as said stop at said terminal end of said spindle and terminating in front of said valve plate.

5,143,212
GEMSTONE COLOR COMMUNICATION KITS
Kenneth G. Roberts, and Elaine E. Roberts, both of Warwick, R.I., assignors to K. G. Roberts & Associates, Inc., East Greenwich, R.I.
Continuation-in-part of Ser. No. 417,685, Oct. 5, 1989. This application Apr. 3, 1991 Ser. No. 680,671
Int. Cl.[5] G01J 3/46
U.S. Cl. 206—223 24 Claims



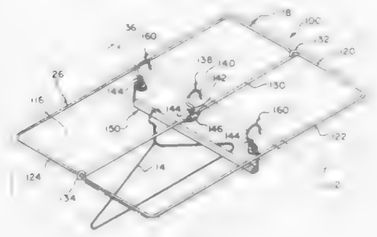
1. A kit for assisting in color evaluations of transparent natural colored gemstones comprising:
a number of colored simulated gemstones formed of a molded transparent colored plastics material, said simulated gemstones each having a gemstone body portion and a handle portion which radially projects from said gemstone body portion; wherein
said gemstone body and handle portions of said simulated gemstones are in the form of a one-piece unitary structure and thereby have the same selected color characteristic in terms of color hue, chroma and/or value that is different from the color characteristics of others of said simulated gemstones in the kit, but wherein said gemstone body and handle portions are structurally configured to diffuse light differently so that a somewhat different color attributable to said gemstone body portion is perceptible as compared to the perceptible color which is attributable to said handle portion; and wherein
said handle portions allow each said simulated to be grasped manually so as to permit manipulation of the simulated gemstone in ambient light conditions for purposes of comparing the color characteristics of said simulated gemstone with a natural colored gemstone having similar color characteristics such that a relatively course color comparison may be made between the natural colored gemstone and said handle portion of said simulated gemstone, and a relatively fine color comparison may be made between the natural gemstone and said gemstone body portion of said simulated gemstone.

5,143,213
MULTI-PACK FLIP-TOP CIGARETTE CARTON
Pamela D. Moore, Chesterfield; Linwood L. Pitt, Jr., Richmond, and Howard W. Vogt, Jr., Providence Forge, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Oct. 9, 1990, Ser. No. 594,325
Int. Cl.[5] B65D 85/10
U.S. Cl. 206—273 38 Claims



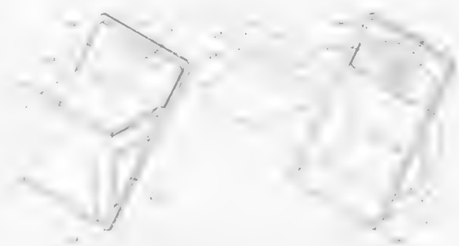
1. A blank for forming a flip-top cigarette carton, the blank comprising:
(a) an outside front panel defined by a top score line, a bottom score line parallel to the top score line, and first and second side score lines transverse of the top and bottom score lines;
(b) an outside side panel connected to the outside front panel at the first side score line, and further defined by a side score line parallel to the first side score line, and top and bottom side score lines transverse of the side score line and the first side score line;
(c) a back panel connected to the outside side panel at the side score line, and further defined by a back score line parallel to the side score line, and top and bottom back score lines transverse of the side score line and back score line;
(d) a short side flap connected to the back panel at the back score line, and further defined by a side short side flap margin parallel to the back score line, and top and bottom short side flap margins transverse of the back score line and the side short side flap margin;
(e) an outside long side flap connected to the outside front panel at the second side score line, and further defined by a flap score line parallel to the second side score line, and top and bottom flap score lines transverse of the second score line and the flap score line;
(f) an innerframe connected to the outside long side flap at the flap score line;
(g) a top long flap connected to the outside front panel at the top score line;
(h) a bottom long flap connected to the outside front panel at the bottom score line;
(i) a top short flap connected to the back panel at the top back score line;
(j) a bottom short flap connected to the back panel at the bottom back score line;
(k) a bottom trailing dust flap connected to the outside long side flap at the bottom flap score line;
(l) a bottom leading dust flap connected to the outside side flap at the top side score line; and
(m) the bottom long flap having a greater area than the combined areas of the bottom short flap, the bottom trailing dust flap and the bottom leading dust flap.
26. A cigarette carton, the cigarette carton comprising:
(a) an outside front panel defined by a top score line, a bottom score line parallel to the top score line, and first and second side score lines transverse of the top and bottom score lines;
(b) an outside side panel connected to the outside front panel at the first side score line, and further defined by a side score line parallel to the first side score line, and top and bottom side score lines transverse of the side score line and the first side score line;
(c) a back panel connected to the outside side panel at the side score line, and further defined by a back score line parallel to the side score line, and top and bottom back score lines transverse of the side score line and back score line;
(d) a short side flap connected to the back panel at the back score line, and further defined by a side short side flap margin parallel to the back score line, and top and bottom short side flap margins transverse of the back score line and the side short side flap margin;
(e) an outside long side flap connected to the outside front panel at the second side score line, and further defined by a flap score line parallel to the second side score line, and top and bottom flap score lines transverse of the second score line and the flap score line;
(f) an inside long side flap connected to the outside long side flap at the flap score line, and further defined by an inside front score line parallel to the flap score line, and top and bottom inside long side flap margins transverse of the flap score line and the inside front score line;
(g) an inside front panel connected to the inside long side flap at the inside front score line, and further defined by an inside side score line parallel to the inside front score line, and top and bottom inside front panel margins transverse of the inside front score line and the inside side score line;
(h) an inside side panel connected to the inside front panel at the inside side score line, and further defined by a side inside side panel margin parallel to the inside side score line, and top and bottom inside side panel margins transverse of the inside side score line and the side inside side panel margin;
(i) a top long flap connected to the outside front panel at the top score line;
(j) a bottom long flap connected to the outside front panel at the bottom score line;
(k) a top trailing dust flap connected to the outside long side flap at the top flap score line;
(l) a bottom trailing dust flap connected to the outside long side flap at the bottom flap score line;
(m) a top leading dust flap connected to the outside side panel at the top side score line;
(n) a bottom leading dust flap connected to the outside side panel at the bottom side score line;
(o) a top short flap connected to the back panel at the top back score line;
(p) a bottom short flap connected to the back panel at the bottom back score line; and
(q) the top long flap having a greater area than the combined areas of the top short flap, the top leading dust flap, and the top trailing dust flap.

5,143,214
HANGING GARMENT STORAGE BAG
Robert Freelander, Long Beach, Calif., and Nicholas Marzano, New York, N.Y., assignors to Richards Homewares, Inc., Long Beach, Calif.
Filed Dec. 9, 1991, Ser. No. 806,001
Int. Cl.[5] B65D 85/18
U.S. Cl. 206—287 14 Claims



1. In a hanging garment bag having a flexible covering that defines an enclosure within which garments are hung from a clothes rod, and including a rigid frame disposed within said enclosure and a frame hook secured to said rigid frame and projecting upwardly through said covering for attachment to said clothes rod, and a garment rack for supporting garments within said enclosure, the improvement comprising a pair of garment rack hooks coupled to said garment rack and projecting upwardly through said covering and hooked over said clothes rod, whereby said garment rack is suspended directly from said clothes rod independently of said rigid frame.

5,143,215
BATTERY DISPLAY PACKAGE
William L. Hartley, Annapolis, Md., and John E. Allen, Avon Lake, Ohio, assignors to P.T.P. Industries, Baltimore, Md. and Eveready Battery Company, Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 544,402, Jun. 27, 1990, Pat. No. 5,018,622. This application Apr. 17, 1991, Ser. No. 685,181
The portion of the term of this patent subsequent to May 4, 2007, has been disclaimed.
Int. Cl.[5] B65D 85/62
U.S. Cl. 206—333 19 Claims



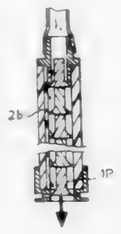
5. A package for the display of batteries comprising a housing formed by a front blister and a rear blister and having a substantially diagonal seam formed therebetween for joining the front and rear blisters to one another, the housing sized to receive therein at least two lower batteries disposed substantially horizontally therein in a side-by-side arrangement and at least two upper batteries disposed substantially horizontally therein in a side-by-side arrangement on top of the lower batteries, and a header formed with the front blister and the rear blister of the housing and extending upwardly therefrom, such that the package may be hung being supported by the header and further such that packages may be stacked vertically by inverting one package over the other, so that the headers are oriented along the respective fronts of the vertically adjacent packages; and
wherein the front blister has a top portion, the top portion of the front blister being substantially adjacent to the header when the front and rear blisters are joined to one another, and further wherein the package is further comprised of the top portion of the front blister having a pocket formed therein to receive and display therein at least a portion of advertising material that extends from this pocket into the header portion when the front and rear blisters are joined to one another.

5,143,216

PROCESS FOR DISTRIBUTION OF PIECES SUCH AS RIVETS, AND APPARATUS FOR CARRYING OUT THE PROCESS

Jean-Marc Aurtol, and Philippe Bornes, both of Flourens, France, assignors to Ste. Ateliers de la Haute Garonne-ets Auriol et Cie., France

Division of Ser. No. 447,501, Dec. 7, 1989
This application Sep. 28, 1990, Ser. No. 589,685
Claims priority, application France, Dec. 8, 1988, 88 16292
Int. Cl.[5] B65D *85/24*; B65G *59/00*; B65H *3/08*; B23Q *7/10*
U.S. Cl. 206—338 6 Claims



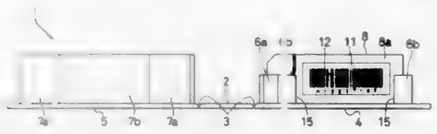
1. An apparatus for orienting identical pieces, comprising at least one tube (2) having a hollow center (2*a*) for housing and guiding a plurality of said pieces aligned one after another therein, at least one groove (2*b*) arranged on the internal surface of the tube in such a manner as to open into the hollow center along the length thereof, and stop members (3, 4) situated at the ends of the tube for retaining the pieces, said tube (2) being filled with said pieces comprising rivets arranged in a column, said rivets having heads such that the transverse cross section of the heads correspond to the transverse cross section of the tube and such that the cross sectional area of the heads substantially equals the cross sectional area of the tube excluding the at least on groove.

5,143,217

TAPE-CARTRIDGE CASE WITH THIN, SINGLE LAYER SIDE WALL FOR READING UPC CODE

Tadao Igarashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 1, 1991, Ser. No. 649,913
Claims priority, application Japan, Feb. 2, 1990, 2-9785[U]
Int. Cl.[5] B65D *85/672*
U.S. Cl. 206—387 5 Claims



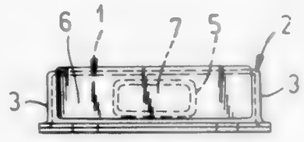
1. A tape-cartridge case, in which a tape cartridge is accommodated, formed of transparent synthetic resin and comprising:
a lower plate;
an upper plate similar in shape to the lower plate;
a connecting plate for connecting the lower plate to the upper plate, said connecting plate having two hinges, one provided on opposite respective edges thereof;
a first side wall projecting from the lower plate to partially surround the accommodated tape cartridge;
a second side wall projecting from the upper plate to surround the first side wall in a closed position, wherein the upper plate and connecting plate are folded on the two hinges to a position where the upper plate is parallel with the lower plate; and
said first side wall having a portion removed therefrom to provide an opening therein and having a first continuous wall portion adjacent an edge of said connecting plate and a second continuous wall portion opposite said first continuous wall portion and said second side wall includes a projected portion projecting inwardly toward the tape cartridge and fitting into said opening in said closed position,
wherein a bar code provided on a side surface of the tape cartridge faces the opening in said first wall so that only said projected portion of said second side wall formed of transparent synthetic resin will lie between the bar code and a bar code reader when the tape cartridge is set within the first side wall on the lower plate and said second side all surrounds said first side wall.

5,143,218

SELF-SERVICE PACKAGE FOR SMALL PARTS WITH RUPTURABLE LABEL

Friedrich-Wilhelm Brauckmann, Lüdenscheid, Fed. Rep. of Germany, assignor to Brauckmann & Pröbesting GmbH & Co. KG, Lüdenscheid, Fed. Rep. of Germany

PCT No. PCT/DE89/00558, § 371 Date Mar. 4, 1991, § 102(e) Date Mar. 4, 1991, PCT Pub. No. WO90/02693, PCT Pub. Date Mar. 22, 1990
PCT Filed Aug. 25, 1989, Ser. No. 663,906
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829778
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—467 3 Claims



1. A self-service package assembly for small parts comprising:
a cup-shaped bottom part provided with:
a bottom, and
a perimeter wall extending outwardly from said bottom;
a cup-shaped lid part provided with:
a top,
a respective perimeter wall extending inwardly from said top and formed with an inner side and an outer side, said perimeter wall of said lid part being formed with an opening entirely bounded by the perimeter wall of the lid part, said wall of said lid part overlapping said wall of said bottom part in a closed position of said package, so that said top and bottom are spaced from and face each other; and
an adhesive label on said outer side of said perimeter wall of said lid part, said label covering said opening and adhered to said peripheral wall of said bottom part substantially only within said opening in said closed position.

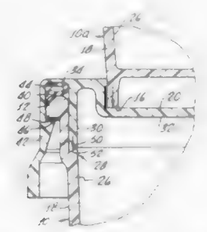
5,143,219

STACKABLE CONTAINER WITH PROTECTED LID SEAL

George Yates, Jr., 151 Cumberland Rd., Glendale, Calif. 91202

Filed Apr. 8, 1991, Ser. No. 681,783
Int. Cl.[5] B65D *41/16*
U.S. Cl. 206—508 15 Claims

1. A stackable container comprising:
lip means for defining an open end of the stackable container;
a bottom;
a continuous sidewall interconnecting said lip means and said bottom;
lid means for engaging said lip means and for covering the stackable container open end, said lid means comprising a depending member having an angled end surface;
elastic means for providing a seal between said lid means and said lip means when the lip means is engaged by the lid means;
means for limiting compression of the elastic means when load is applied to the lid means in a manner comprising the lid means against the lip means; and



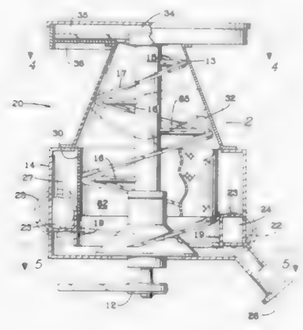
means for preventing radially outward movement of said continuous sidewall causing disengagement of the lid means from the lip means upon stacking of multiple stackable containers on one another with the bottom on one stackable container stacked on the top of another stackable container, said last recited means comprising a shelf molded into the sidewall and having a surface at an acute angle to the sidewall, said surface being configured, positioned and sized for mating with the lid angled end surface.

5,143,220

APPARATUS FOR SCREENING TO REMOVE KNOTS FROM A FLUID BORNE SLURRY OF FIBERS AND KNOTS

Douglas L. G. Young, Nashua, and Donald B. Johnson, Bedford, both of N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 8, 1990, Ser. No. 610,696
Int. Cl.[5] B07B *1/22*
U.S. Cl. 209—17 22 Claims



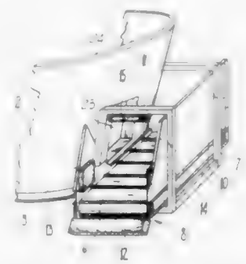
1. A screening apparatus for separating coarse solid particles from a fluid borne slurry, comprising:
a substantially vertical housing having a feed chamber means located near the bottom of said housing for receiving a fluid borne suspending of fine and coarse solid particles;
a screening chamber within said housing above and in communication with said feed chamber and bounded by a cylindrical rotatable screen having a vertical axis and fully immersed in said slurry;
a fine particle accepts chamber located within said housing radially outboard of said screen and having a fine particle accepts outlet;
a fluid free coarse particle discharge outlet located at the top of said housing in communication with said screening chamber below; and
means operatively associated with said screen for transporting said coarse particles upward through said screening chamber to said fluid free coarse particle discharge outlet.

5,143,221

APPARATUS FOR SCREENING ANIMAL FODDER PRODUCTS UNLOADED FROM MIXING TRUCKS

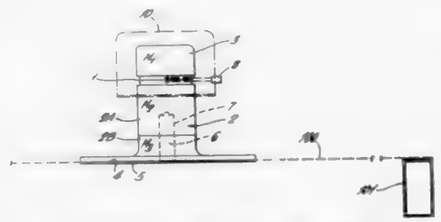
Tiziano Faccia, via Padova 102, 35026 Conselve (Province of Padova), Italy

Filed Dec. 10, 1990, Ser. No. 624,446
Claims priority, application Italy, Dec. 15, 1989, 30780 B/89
Int. Cl.[5] B03C *1/22*
U.S. Cl. 209—215 2 Claims



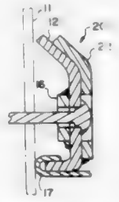
1. Apparatus for screening animal fodder products comprising a container having a substantially annular side wall and a base and being mounted on a chassis having wheels, a supporting structure mounted on said chassis adjacent to said container, an opening provided in said annular side wall of said container, a door for selectively closing said opening, and a conveyor belt being supported by said supporting structure and being located beneath said opening, thereby for fodder to flow out of said container through said opening to said conveyor belt, said supporting structure comprising a pair of side walls arranged at the sides of said conveyor belt and extending upwardly therefrom, said supporting structure further comprising at least one upper horizontal member extending above said conveyor belt between said pair of side walls, a lower chute through which the animal fodder products are conveyed by said conveyor belt being defined which is transversely delimited by said pair of side walls and which is upwardly delimited by said conveyor member and which is downwardly delimited by said conveyor belt, said conveyor belt having an outlet end where the animal fodder products depart from said conveyor belt, said apparatus further comprising a plurality of permanent magnets, said plurality of permanent magnets comprising a first permanent magnet fixed to said upper horizontal member and facing downwardly towards said conveyor belt, a second permanent magnet and a third permanent magnet connected each to a respective one of said pair of side walls and both facing inwardly of said lower chute, and a fourth permanent magnet connected to said supporting structure directly below said outlet end of said conveyor belt, thereby to effectively remove and retain any ferromagnetic material inadvertently contained in animal fodder being conveyed through said chute and beyond said outlet end of said conveyor belt.

5,143,222
SIEVING APPARATUS
John Monteith, Twickenham, United Kingdom, assignor to Russell Finex Limited, London, England
Continuation of Ser. No. 324,930, Mar. 17, 1989, abandoned.
This application Oct. 11, 1990, Ser. No. 596,749
Claims priority, application United Kingdom, Nov. 14, 1988, [illegible]
Int. Cl.[5] B07B 1/12
U.S. Cl. 209—364 5 Claims



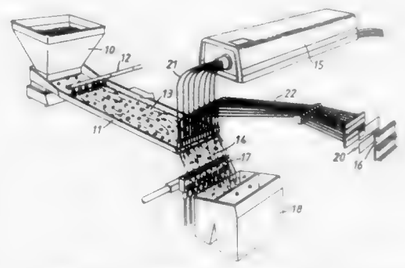
1. A sieving apparatus comprising a base, a frame mounted on the base, a grating attached to the frame, and at least one ultrasonic means coupled to the grating to effect ultrasonic vibration thereof relative to the frame each of said at least one ultrasonic means comprising a piezoelectric transducer, the piezoelectric transducer comprising at least one piezoelectric element sandwiched between first and second bodies of unequal mass, wherein the first body is formed of a first part having a first diameter and a second part which are mutually disengageable, said first part being sandwiched between said at least one piezoelectric element and said second part, and said second part being plate-like to provide a planar circular surface of a diameter which is large relative to said first diameter, said surface being directly bonded to the grating.

5,143,223
REINFORCED SCREEN RAIL
Harold Herren, 802 Main St., Platteville, Colo. 80651
Filed Nov. 7, 1991, Ser. No. 788,811
Int. Cl.[5] B07B 1/46
U.S. Cl. 209—405 9 Claims



1. A reinforced screen rail for use in a screen deck to tension and retain a screen between two upright side panels; wherein said screen rail includes first and second side surfaces and upper and lower portions; wherein said upper portion is curved in the direction of said first side surface; wherein said lower portion includes a leg projecting in the direction of said first side surface; wherein said screen rail includes a plurality of spaced apertures therethrough for receipt of a bolt means having a head; wherein the improvement comprises a metal reinforcement layer extending substantially along the entire length of said screen rail and being secured to said second side surface thereof; wherein said reinforcement member includes a plurality of openings therethrough corresponding to said spaced apertures and sized to receive the head of the bolt means; and further comprising a reinforcement member surrounding each of said openings and being secured to said first side surface of said screen rail.

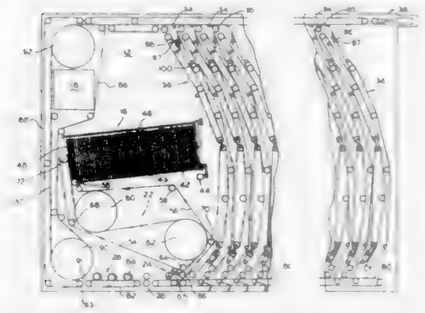
5,143,224
METHOD AND APPARATUS FOR SEPARATING DIAMONDS FROM ASSOCIATED GANGUE
Steven P. Burchell, Farnham, United Kingdom, assignor to Turret Holdings Limited, British Virgin Isls.
Continuation-in-part of Ser. No. 488,378, Feb. 23, 1990, abandoned, which is a continuation of Ser. No. 188,799, filed as PCT/GB87/00565, Aug. 11, 1987, abandoned. This application Mar. 11, 1991, Ser. No. 667,430
Claims priority, application United Kingdom, Aug. 20, 1986, 8620247
Int. Cl.[5] B07C 5/342
U.S. Cl. 209—579 20 Claims



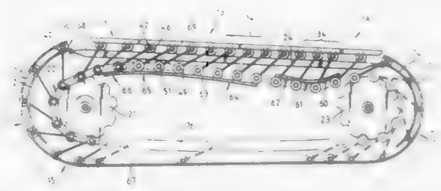
1. A method for separating diamonds from associated gangue in a diamondiferous material, comprising the steps of:
a. mixing the diamondiferous material with a liquid comprising water or a water-containing solution to form a slurry;
b. passing the slurry through laser radiation of known wavelength produced by a continuous wave YAG or Nd-YAG laser in the infrared part of the electromagnetic spectrum to cause Raman spectral scattering of radiation from the slurry;
c. collecting and filtering radiation scattered from the slurry, with said filtering step passing radiation in a narrow band including the Raman wavelength for diamond;
d. detecting the filtered radiation with a detector;
e. analyzing the filtered radiation to determine whether it is indicative of the presence of diamond; and
f. separating, on the basis of such analysis, high diamond content slurry from low diamond content slurry.

5,143,225
CARRIER SEQUENCED BAR CODE SORTER FOR DOCUMENTS
K. George Rabindran, Morton Grove; Thomas Faber, Skokie; David Filicicchia, Schaumburg; Kenneth L. Guenther, Park Ridge; Joseph Kalika, Niles; Melvin T. Kerstein, Lincolnwood; Girish B. Shah, Schaumburg, and David Wiley, Palatine, all of Ill., assignors to Bell & Howell Company, Skokie, Ill.
Filed Mar. 27, 1990, Ser. No. 500,408
Int. Cl.[5] B07C 5/36; B65H 85/00
U.S. Cl. 209—584 45 Claims

1. A carrier sequenced bar code sorter, suitable for sorting documents carrying indicia, said sorter comprising in combination: document input means for receiving documents carrying indicia on a document face and discharging a sequence of individual documents, transporting means for moving said sequence of documents, signal generating indicia reading means for receiving said individual documents and generating signals responsive to the indicia on each individual document, electronic means for receiving and interpreting said signals from said reading means, a plurality of stacker buffer means for receiving documents, sorting means controlled by said electronic means for sorting each of said documents according to its individual indicia into one of said stacker buffer means, each of said plurality of stacker buffer means being of the pass through type where the documents enter at a first end and egress at a second end of said stacker buffer means, and each of said plurality of stacker buffer means including a pair of flexible opposed powered belts for moving documents form its first end to its second end.

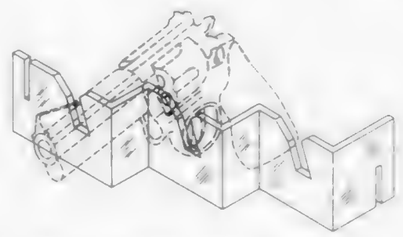


5,143,226
APPARATUS FOR SORTING ARTICLES ACCORDING TO SIZE
John I. Walton, 15 Edward Street, Laidley, Queensland, 4341, Australia
PCT No. PCT/AU89/00342, § 371 Date Jan. 31, 1991, § 102(e) Date Jan. 31, 1991, PCT Pub. No. WO90/01378, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 11, 1989, Ser. No. 646,604
Int. Cl.[5] B07C 5/06
U.S. Cl. 209—624 13 Claims



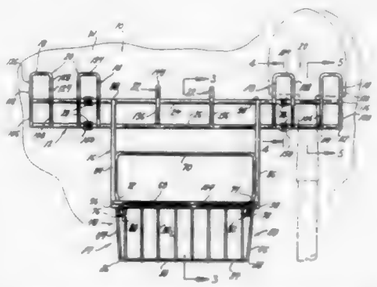
1. Apparatus for sorting articles according to size comprising a plurality of elongate conveyor members, first and second continuous chains, a plurality of rigid rods pivotally linking said conveyor members to said first and second continuous chains, each said conveyor member being pivotally connected at opposite ends thereof to respective said rigid rods that extend perpendicular to the axis of said conveyor member and are pivotally connected respectively to said first and second continuous chains, a drive mechanism for driving at least one of said first and second chains in a circuitous path to move said conveyor members in a continuous looped path, a conveyor support for supporting said conveyor members in a line along a section of said looped path which functions as an article support surface, and first and second rigid tracks over which each said continuous chain passes as the conveyor members pivotally linked thereto move along said section of said looped path, each rigid track being formed by two metal plates, one of which is arranged to increase the distance between the continuous chains and the support surface, and the other of which is arranged to decrease the distance between the continuous chains and the support surface, and wherein the line of conveyor members which constitute the support surface are spaced from one another by increasing spacings in the direction of movement of the conveyor, said increase in spacings being effected, at least in part, by virtue of the individual chain links to which the conveyor members are connected being drawn closer to said support surface by said rigid tracks, in the direction of movement of the conveyor members, said spacings being such as to permit selected size articles to pass therethrough and to thereby be sorted from articles of larger sizes.

5,143,227
DISPLAY STAND FOR HANDGUNS
Alan Schubert, 6021 SW. 40th St., Miramar, Fla. 33023
Filed Dec. 14, 1990, Ser. No. 628,857
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—64 3 Claims



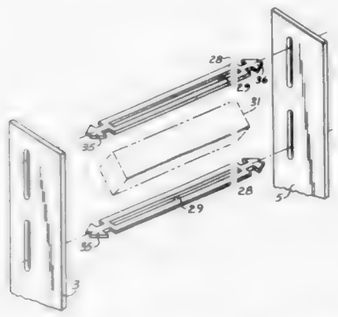
1. A stand for displaying handguns, constructed from a single piece of plastic material, said material being bent or moulded into relatively right angles to form one or more rectangular shaped handgun positioning sections, each said handgun positioning section having a trapezoidal shaped slot to recieve therein the trigger guard and adjacent frame area of a handgun, and two or more rectangular unit support sections.

5,143,228
GARDEN EQUIPMENT SUPPORT RACK
William D. Arnold, Florissant, Mo., assignor to Lee/Rowan Company, St. Louis, Mo.
Filed Mar. 27, 1992, Ser. No. 859,090
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—70.6 18 Claims



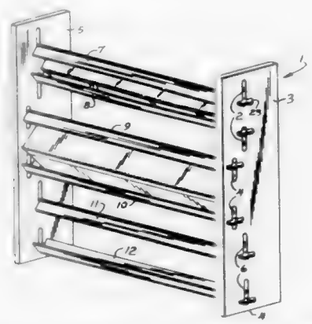
1. A garden equipment support rack for attaching to the front face of a mounting structure and for removably and uprightly supporting tools of the type having an implement mounted on a handle, comprising:
a basket having a front, a back, two opposite side walls and having flange portions which extend outwardly from and have inner edges joined to the side walls, and
a fixed frame for attaching to the mounting structure and for removably supporting the basket, said fixed frame comprising:
first means for removably supporting said basket by the flange portions;
second means for removably and uprightly supporting a plurality of said tools;
third means for attaching to the mounting structure and for securely supporting the first and second means.

5,143,229
HOLDER FOR HOUSEHOLD WRAP CARTONS
Richard LaCorte, 7029 N. Tahoma, Chicago, Ill. 60646
Continuation-in-part of Ser. No. 638,051, Jan. 31, 1991. This application Jun. 14, 1991, Ser. No. 715,346
Int. Cl.[5] A47G *29/00*
U.S. Cl. 211—71 4 Claims



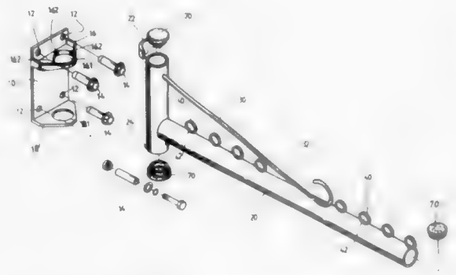
1. A holder for household wrap cartons, comprising:
a) first and second sidewalls having portions defining a plurality of elongated slots, said slots on the first sidewall having corresponding slots on the second sidewall; and
b) a plurality of identical support members including means for engaging a corner of said cartons consisting of planar members having rectilinear openings therein that receive the corners of a wrap carton and means engageable with said slots for allowing said support members to slide in said slots relative to said sidewalls said support members extending between the corresponding slots on the first and second sidewalls and being arranged in opposed pairs such that the openings of the planar members of the opposed pairs of support members face each other and can be moved into and out of engagement with opposite corners of the carton to retain a carton between the opposed pairs of support members by sliding the means engageable with said slots along said slots.

5,143,230
HOLDER FOR HOUSEHOLD WRAP CARTONS
Richard LaCorte, 7029 N. Tahoma, Chicago, Ill. 60646
Filed Jan. 3, 1991, Ser. No. 638,051
Int. Cl.[5] A47G *29/00*
U.S. Cl. 211—71 5 Claims



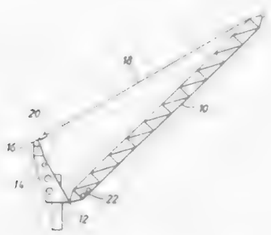
1. A holder for household wrap cartons comprising:
(a) first and second sidewalls having portions defining a plurality of elongated slots, said slots on the first sidewall having corresponding slots on the second sidewall; and
(b) a plurality of identical support members including means for engaging a corner of said cartons consisting of V-shaped members having recesses for engaging the corners of a wrap carton and means engageable with said slots for allowing said support members to slide in said slots relative to said sidewalls, said support members extending between the corresponding slots on the first and second sidewalls and being arranged in opposed pairs such that the recesses of the V-shaped members of the opposed pairs of support members face each other and can be moved into and out of engagement with opposite corners of the carton to retain a carton between the opposed pairs of support members by sliding the means engageable with said slots along said slots.

5,143,231
PROP
R. J. Chang, No. 70, Lane 61, Chung Shan Rd., Sha Lu Town, Taichung Hsien, Taiwan
Filed Aug. 29, 1991, Ser. No. 751,790
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—96 3 Claims



1. A prop comprising:
a) a wall plate including a vertical wall portion for attachment to a wall, first and second horizontal wall portions extending transversely from the vertical wall portion, a hole formed in the second horizontal wall portion and a plurality of notches formed around the periphery of the hole;
b) the second horizontal wall portion being relatively thicker than the first horizontal wall portion, the second horizontal wall portion including a first end portion welded to the vertical wall portion and a second end portion spaced from the vertical wall portion, and the first end portion being thicker than the second end portion;
c) a main frame for holding garment hangers, the main frame including a short vertical rod rotatably secured to the first and second horizontal wall portions and through the hole, and a long horizontal rod extending from a lower portion of the short vertical rod and forming a right angle therewith; and
d) a key secured to the short vertical rod for selective engagement in anyone of the plurality of notches to establish the angular position of the main frame relative to the wall plate.

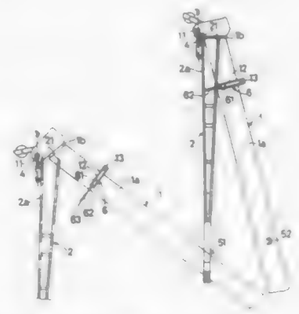
5,143,232
CRANE LOAD INSTRUMENT AND METHOD THEREFOR
James T. Stewart, 17923 Fireside Dr., Spring, Tex. 77379, and David C. Toalson, 330 Meissner Rd., Bellville, Tex. 77418
Filed Sep. 18, 1991, Ser. No. 761,439
Int. Cl.[5] B66C *13/16*
U.S. Cl. 212—154 15 Claims



1. A crane load detection system for a gantry crane mechanism having a boom with a main hoist and having a gantry establishing a gantry tie-down point, said gantry crane mechanism further having a boom hoist having a deadline connected to said gantry tie-down point, and including:
(a) an electronic strain gage load cell being located in said deadline of said boom hoist and providing an output signal representing the load being applied to said deadline and is located near said tie-down point of said gantry by said deadline;
(b) a pendulum potentiometer and transmitter being mounted on said boom for measuring the precise angle of said boom and providing an electrical output signal representing said boom angle; and
(c) a microprocessor having inputs for receiving said output signals of said electronic strain gage load cell and said pendulum potentiometer and transmitter, said microprocessor being programmed with data representative of said crane including crane dimensions, load radius charts, reaving of the boom hoist and main hoist, and the weight of the boom, empty blocks, bridle blocks, and wire rope, said microprocessor solving triangles and using vector and trigonometric function calculating the radius of rotation, the actual weight of the load including the weight of the empty blocks and the percent of the load as compared to the maximum load for which said crane is designed.

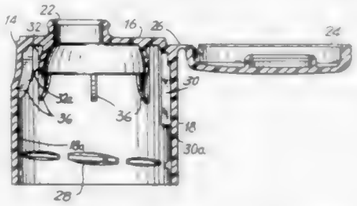
5,143,233
JIB STRETCHING AND FOLDING DEVICE FOR USE IN A CRANE
Yukio Koizumi, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Sep. 12, 1991, Ser. No. 758,586
Claims priority, application Japan, Sep. 13, 1990, 2-245069
Int. Cl.[5] B66C *23/42*
U.S. Cl. 212—188 5 Claims

1. A jib stretching and folding device for use in a crane including:
a telescopic boom having a forward end portion;
a jib having a base end portion, the base end portion of the jib being connected to a forward end portion of the boom, the jib being movable between a stretched position where the jib is stretched out from the forward end portion of the boom and a folded position along one side surface of the boom through an intermediate step of putting the jib into a vertically suspended position about a connection point of the base end portion of the jib and the forward end portion of the boom;
the jib stretching and folding device comprising:
(I) a jib maneuvering cylinder having an extendible actuating member, the cylinder being mounted on the boom in such a manner that the extendible actuating member projects outward from the lower surface of the boom when the extendible actuating member is extended;
(II) an engaging portion provided in the extendible actuating member of the jib maneuvering cylinder;
(III) an engaging member mounted to the jib so as to selectively engage with the engaging portion by movement of the engaging member in a lengthwise direction of the jib;



(IV) a guide surface formed in at least one of the engaging member and the engaging portion for guiding the engaging member in the lengthwise direction of the jib so as to engage with the engaging portion when the jib is in the vertically suspended position and the jib maneuvering cylinder is in an extended state in a jib folding operation.

5,143,234
SINGLE WALLED DISPENSING CLOSURES WITH POSITIVE ALIGNMENT MEANS
Richard D. Lohrman, Grayslake, Ill., and Klaus Thanisch, Bulay, Fed. Rep. of Germany, assignors to Zeller Closures, Inc., Libertyville, Ill.
Filed Aug. 12, 1991, Ser. No. 744,089
Int. Cl.[5] B65D *55/02, 47/08*
U.S. Cl. 215—235 18 Claims



1. A single wall snap hinge closure for a bottle, the bottle having a front face, a threaded neck and an alignment means positioned thereon, the closure having a circumference and an axis and being comprised of:
a) a skirt having an interior and an exterior and a thumb recess upon the exterior;
b) a top having an opening to permit dispensing of contents of the bottle;
c) means for sealing the opening on the top;
d) screw thread means for mating with the threads on the neck of the bottle, said thread means being formed on a helical path on the interior surface of the skirt; and
e) an alignment mans positioned on the interior surface of the skirt, the alignment means being dimensioned to fit within a space between the interior surface of the skirt and an exterior of the bottle neck; said alignment means of the closure being adapted to abut the alignment means positioned upon the bottle neck during threading of the clo-

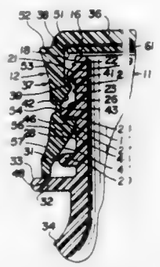
sure upon the bottle neck, such abutment resulting in an interference to further threading of the closure upon the bottle and resulting in positive alignment of the thumb recess with the front face of the bottle.

5,143,235

BOTTLE NECK HAVING MEANS TO PREVENT COMPRESSION OF CAP SKIRT

Richard E. Repp, San Jose, Calif., assignor to Cap Snap Co., San Jose, Calif.

Filed Aug. 15, 1990, Ser. No. 567,591
Int. Cl.[5] B65D *1/02 41/48*
U.S. Cl. 215—256 15 Claims



1. A container neck for use with a snap-on type cap having a top disk and a depending peripheral skirt, said skirt having snap-on locking means on its interior tamper-evident means on its lower portion including at least a part of said locking means and removal means for said tamper evident means for removing that portion of said skirt containing said tamper-evident means, said skirt having a substantially horizontal lower edge at the bottom of said tamper-evident means,

said neck having an upper lip and the exterior of said neck below said lip comprising circumferential, horizontal, snap-on bead means engageable with said locking means, whereby when said cap is seated on said neck said cap is held on said neck until said removal means is employed by the user to remove said tamper-evident means, and at least one thin ring extending outwardly of said neck which, when said cap is seated on said neck, is located above said lower edge of said skirt and positioned to fit inside the lower portion of said skirt substantially above said lower edge of said skirt to secure said skirt against inward pinching or compression, said ring having top and bottom surfaces spaced apart a distance substantially less than the distance between said bead means and said lower edge of said skirt and said ring extending outwardly at least as far as said bead means, said bottom surface being substantially horizontal.

5,143,236

PACKAGING UNIT FOR IMPROVING PRESERVATION OF THE PRODUCT DURING STORAGE

Jean-Louis H. Gueret, Paris, France assignor to L'Oreal, Paris, France

Filed Jun. 14, 1991, Ser. No. 715,801
Claims priority, application France, Jun. 15, 1990, 90 07496
Int. Cl.[5] B65D *47/36*
U.S. Cl. 215—311 8 Claims

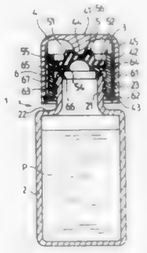
1. Packaging unit for enclosing a product and improving preservation thereof, comprising:

a container having a neck zone, into which the product is entered;

a capsule attached to said neck zone of said container;

a valve associated with said capsule, said valve serving as a means by which pressure is changed in said container; and

said valve comprising a flexible elastic membrane having the shaped of a cylindrical cap including an edge and a base, at least one opening being formed in said membrane, wherein said valve can remain closed by virtue of the inherent elasticity of said membrane and can open by the application of an aspiration and/or injection member over said membrane base, wherein a top cap is fixed to said



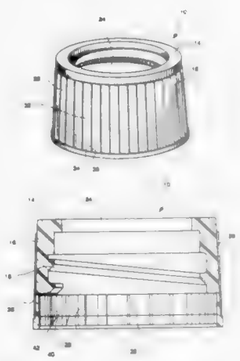
capsule, and covers said capsule and said valve with which it is associated, said capsule having an outer wall and an inner wall with one of said walls having means for preventing rotation of said top cap relative to said capsule.

5,143,237

RATCHET CAP FOR MOUNTING A DISPENSING DEVICE ONTO A CONTAINER

Lewis K. Lindsey, and Douglas S. Martin, both of Forest City, N.C., assignors to AFA Products, Inc., Forest City, N.C.

Filed Sep. 20, 1991, Ser. No. 762,761
Int. Cl.[5] B65D *41/04*
U.S. Cl. 215—330 15 Claims



1. A connecting assembly for mounting a fluid dispensing device onto a container, said assembly comprising:

a cap for receiving and connecting said dispensing device onto said container;

a cylindrical neck finish on top of said container for receiving said cap;

said cap as well as said cylindrical neck finish having threads for mutual engagement;

said cap having an orifice within its top wall for receiving said fluid dispensing device;

means for locking said cap on said container for preventing said cap from being unlocked accidentally;

said means for locking including ratchet teeth inside said cap and ratchet teeth on the outside of said cylindrical neck finish arranged for mutual engagement;

said ratchet teeth inside said cap having a rearwardly extending short back face and a forwardly extending long front face whereby said short back face and said long front face form an acute but almost rectangular angle and said

short back face of one ratchet tooth extends from said long front face of an adjacent ratchet tooth;

said short back faces of said ratchet teeth having a slight slant off a radial line passing through the center of said cap;

said slight slant being a trailing slant; and

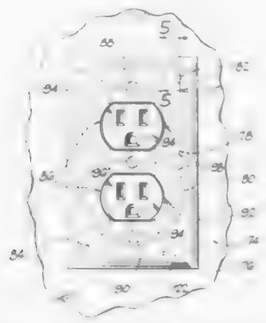
said ratchet teeth inside said cap being uniformly distributed whereby said light slant facilitates backing off of the rachet teeth inside the cap from the ratchet teeth on the bottle neck finish.

5,143,238

ELECTRICAL JUNCTION AND SWITCH BOXES

George A. Bardaville, 3201 Townline Rd., Traverse City, Mich. 49684

Filed Jan. 11, 1991, Ser. No. 640,286
Int. Cl.[5] H02G *3/08*
U.S. Cl. 220—3.2 17 Claims



1. An electrical service housing mountable in walls and cielings, comprising a unitary integrally formed main body, said main body comprising at least first and second longitudinally extending body portions in fixed relationship to each other, said first body portion comprising first outer surface means, wherein said first outer surface means comprises a first arcuate outer surface portion, said second body portion comprising second outer surface means, wherein said second outer surface means comprises a second arcuate outer surface portion, wherein said first and second body portions meet each other as to form at least first and second longitudinally extending junctures fixedly spaced from each other, end wall means of fixed configuration integrally formed with both said first and second longitudinally extending body portions and formed generally transverse to said first and second longitudinally extending body portions and to said at least first and second longitudinally extending junctures, said end wall means being joined to said first and second longitudinally extending body portions and to said at least first and second longitudinally extending junctures as to be situated generally at a first relatively rearward end of said first and second longitudinally extending body portions, wherein said first and second longitudinally extending body portions and said end wall means collectively at least in part define a chamber which extends from the interior of said first longitudinally extending body portion between said first and second longitudinally extending junctures and into the interior of said second longitudinally extending body portion, wherein said chamber has an access opening at an end thereof which is relatively forward and oppositely disposed to said first relatively rearward end and said end wall means, wherein said access opening and said chamber are effective for at least the partial reception therein of at least one associated electrical device, wherein said at least first and second longitudinally extending junctures somewhat project inwardly into said chamber, and wherein the distance by which said longitudinally extending junctures project inwardly into said chamber is such as to permit the passage everywhere therebetween of said at least one associated electrical device.

5,143,239

QUICK RELEASING DEVICE FOR A TANK

Wen C. Yang, Taichung, Taiwan, assignor to Biastro International Co., Ltd., Taichung, Taiwan

Filed Jun. 19, 1991, Ser. No. 717,465
Int. Cl.[5] B65D *53/00*
U.S. Cl. 220—254 4 Claims

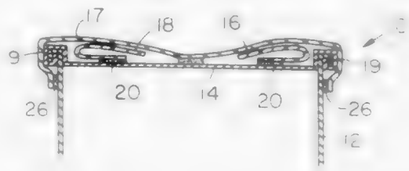
1. A releasing device for a tank comprising a bolt threadedly engageable within an opening formed in a bottom portion of said tank, said bolt including a head formed on one end thereof and a bore longitudinally formed therein, a recess formed in said bolt; a plug engageable within said bore of said bolt for blocking said bore and having a ring coupled to one end thereof, a hole formed in said plug, a protrusion including a spring and a ball received in said hole of said plug; said ball being biased by said spring to engage with said recess of said bolt when said plug is engaged within said bore of said bolt so that said plug can be retained in place, and said plug can be pulled out of said bolt by said ring.

5,143,240

CAN CONSTRUCTION

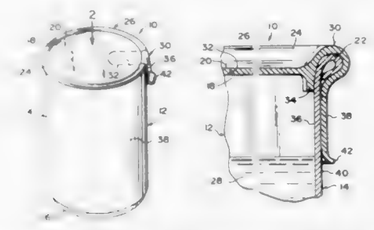
William J. Timson, Pocassett, Mass., assignor to Wellesley Research Associates, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 606,564, Oct. 31, 1990, Pat. No. 5,027,968. This application Jun. 27, 1991, Ser. No. 722,525
Int. Cl.[5] B65D *17/00*
U.S. Cl. 220—260 24 Claims



1. A sealed container having, a side wall, a peripheral rim and a permanently fixed top to a body having a volume containing a material, a cover positioned over said fixed top, at least one strip means positioned on said top having a first end adhered either to said fixed top or to said cover and the second end adhered to said sidewall, said at least one strip having a stress bias such that when said top is severed from said container, one end of said strip becomes positioned away from contact with said top and extends outwardly away from said peripheral rim thereby supporting said can top and preventing said top from sinking into the material.

5,143,241
CAN SEAL
John M. Szymanski, 4115 Monroe St., Omaha, Nebr. 68107
Filed May 23, 1991, Ser. No. 704,790
Int. Cl.[5] B65D *17/14*
U.S. Cl. 220—270 1 Claim



1. An improved can seal in combination with a beverage can have a generally cylindrical body and interior surface with a closed bottom end, a cylindrical open top end, a top closure said can seal comprising:

a) the open top end of the body having an outwardly curled edge which smoothly extends from said interior surface

b) the top closure having an outwardly hemmed edge formed snuggling and completely over said outwardly curled edge of the body, to form a sealing rim on said curled edge and body, and to form a sealing rim on said curled edge and interior surface so that all of the liquid contents within the body can be extracted therefrom without any obstruction from said sealing rim; further including a pull tab formed in one side of the top closure and into a portion of said outwardly hemmed edge so that when said pull tab is broken and removed therefrom, all of the liquid contents can be poured through the opening in the top closure and smoothly past said curled edge of the body, wherein said pull tab further includes a downwardly extending finger having a sealing surface mating smoothly with said curled edge and said interior surface of said body to prevent leakage of the liquid contents before said pull tab is removed therefrom; wherein said pull tab further includes a downwardly extending elongated band which fits continuously against the exterior surface of the body, said band having a curved distal end so that said elongated band can be conveniently grasped and pulled up to released said pull tab from the top closure; exposing an unobstructed smooth pouring opening.

5,143,242
PAINT BUCKET WITH DISPOSABLE LINER
David S. Millasich, 400 18th Pl., Manhattan Beach, Calif. 90266
Filed Apr. 25, 1991, Ser. No. 691,086
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—404 2 Claims

1. A painter's bucket which comprises:

a container having an inner reservoir and an upper perimeter rim;

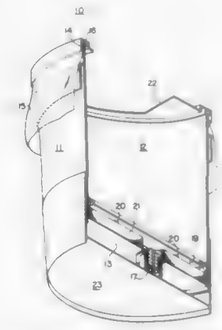
a flexible liner being positioned within the reservoir and in contact with the upper perimeter rim;

sealing means forming an airtight seal between the liner and the container;

air extraction means for extracting air from between the container and the liner;

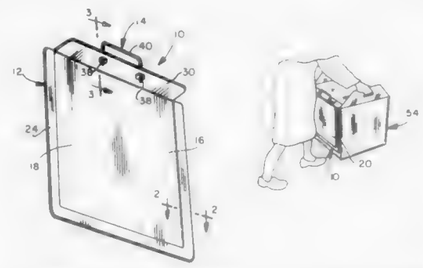
a suspended bottom being positioned within the reservoir for supporting the liner in spaced relation to the air extraction means, said suspended bottom comprising:

an open-celled base plate support member being positioned within the reservoir between the liner and the container; and



a base plate being positioned between the base plate support member and the liner.

5,143,243
PROTECTIVE BARRIER APPARATUS
Keith J. Colling, Brownsburg, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.
Filed Apr. 30, 1991, Ser. No. 693,382
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—409 9 Claims



1. A protective barrier apparatus for protectively isolating a medical waste container having a top wall and a side wall joined together at an outside corner of the container, the apparatus comprising:

a side panel for isolating the side wall of the container;

a top panel joined to the side panel and extending at an angle therefrom, for isolating at least a portion of the top wall of the container;

handle means joined to the top panel for lifting the apparatus into place on the container; and

anchor means for releasably securing the apparatus to the container to prevent inadvertent dislodgment therefrom, said anchor means comprising portions of said handle means downwardly extending below said top panel.

5,143,244
MULTI-WALLED PIPES AND STORAGE TANKS FOR TOXIC AND CORROSIVE FLUIDS
Donn Kauffman, Daphne, Ala., assignor to Theresa M. Kauffman, Daphne; Joseph J. Boswell, Mobile and George L. Williamson, Daphne, all of, Ala.
Continuation-in-part of Ser. No. 552,619, Jul. 16, 1990, abandoned. This application Oct. 11, 1991, Ser. No. 775,225
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—445 11 Claims

1. A multi-walled vessel having improved circumferential and axial strength for transporting and storing fluids, comprising:

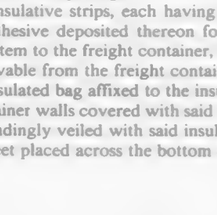
(a) a first containment wall comprised of chopped fiberglass and continuous fiberglass strands and resin;

(b) a highly chemically resistant barrier on the inner surface of said first containment wall;

(c) a plurality of substantially circumferential support ribs integrally bonded to said first containment wall;

(d) said support ribs having feet by means of which said support ribs become integrally bonded to said first containment wall;

(e) a first layer of closed cell foam located between said first containment wall and the inside surface of said ribs;



(f) a second containment wall comprised of chopped fiberglass and continuous fiberglass strands and resin;

(g) said second containment wall being integrally bonded to said ribs;

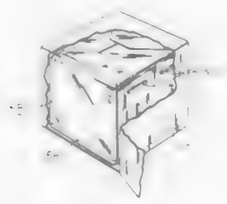
(h) a second layer of closed cell foam located in the interstitial space between said first containment wall, said second containment wall and the outside surfaces of said ribs;

(i) a leak alarm to detect liquid seepage;

(j) said leak alarm further comprising a cable running along the length of the vessel; and

(k) said cable being totally encased by said feet of said support ribs.

5,143,245
LEAK-PROOF INSULATING SYSTEM FOR FREIGHT CONTAINERS
Thomas G. Malone, La Jolla, Calif., assignor to Cargo Technology Corporation, San Diego, Calif.
Continuation-in-part of Ser. No. 494,684, Mar. 16, 1990. This application Apr. 25, 1991, Ser. No. 691,514
Int. Cl.[5] E04B *1/74*
U.S. Cl. 220—445 15 Claims



1. A leak-proof freight container insulation system capable of retrofitting a conventional uninsulated freight container, said insulation system comprising:

a plurality of insulative strips, each having opposing sides having an adhesive deposited thereon for attaching the insulation system to the freight container, the strips being readily removable from the freight container;

a multi-layer insulated bag affixed to the insulative strips so that the container walls covered with said insulative strips are correspondingly veiled with said insulated bag; and

an insulated sheet placed across the bottom of the insulated bag.

5,143,246
RECYCLING GARBAGE SEPARATOR
Rose A. Johnson, 210 Belle Lake Dr., Nashville, Tenn. 37221; Deborah L. Johnson, 3199A Post Woods Dr., NW., Atlanta, Ga. 30339; Barbara J. Rogers, 7124 Old Harding Pike, Nashville, Tenn. 37221, and Kenneth C. Spain, Jr., 1004 Fairwin Ave., Nashville, Tenn. 37216
Filed Aug. 16, 1991, Ser. No. 745,765
Int. Cl.[5] B65F *1/08*
U.S. Cl. 220—524 7 Claims

1. A structure for separately storing various types of refuse, comprising:

an outer container comprising an outer frame for receiving a plurality of rigid inner containers, said outer frame comprising four side walls generally configured to define a single rectangular opening said side walls of said outer container each having a relatively large opening formed therein to minimize thereby the weight of the outer container and the amount of material necessary to make the structure;

a first cover portion pivotally attached to a first side wall of said outer container and a second cover portion pivotally attached to a second side wall of said outer container, said first and second cover portions each having one or more openings formed therein;

wherein said plurality of inner containers have a generally rectangular shape defined by four connected side walls and a connecting bottom wall for sealing the bottom portion of each inner container, said inner containers further comprising an open end opposite to said bottom wall through which said refuse may be inserted into said inner containers;

and wherein said inner containers each comprise a handle pivotally attached to an opposing pair of said four side walls of said inner container at points spaced from the midpoint of said opposing pair of side walls.

5,143,247
LIQUID CONTAINER STABILIZING DEVICE
Ross Gavle, P.O. Box 232431, Anchorage, Ak. 99523
Filed Apr. 22, 1991, Ser. No. 688,675
Int. Cl.[5] B65D *21/02*
U.S. Cl. 220—630 8 Claims

1. A stabilizing device for a frusto conic liquid container having a closed bottom surface and an open upper surface, said upper surface having a diameter greater than said bottom surface said stabilizing device comprising:

a support surface;

said stabilizing device comprises a frusto conic section having an open top and bottom surface, said bottom surface having a diameter greater than said top surface, said bottom surface rests on said support surface and said open top has a diameter selected to accept the closed bottom surface of said cup therein for support thereby; and

at least one frangible recess is positioned circumferentially around the surface of said device to allow, by removal of a portion of the side wall of said stabilizing device along a

selected frangible recess, for the adjustment of the diameter of said open top of said stabilizing device to accept various diameter liquid containers

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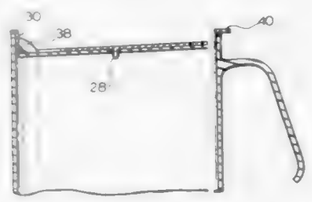
5,143,248

RECLOSEABLE COFFEE CUP COVER

David P. Sawatsky, 12 Ballycastle Crescent, Brampton, Ontario, Canada L6Z 2V5

Filed Jun. 13, 1990, Ser. No. 537,842
Int. Cl.[5] B65D *47/20, 51/18*
U.S. Cl. 220—711 **8 Claims**



1. A removable closure cover for use with a drinking vessel such as a cup or mug, said cover having a fixed first portion for attachment to the mouth of the vessel with an aperture therethrough adjacent an edge portion thereof for the passage of fluid therethrough; pintle means located beneath said cover first portion; a second cover portion rotatably secured by said pintle means beneath the first cover portion and selectively rotatably movable relative thereto in opening and closing relation with the aperture.

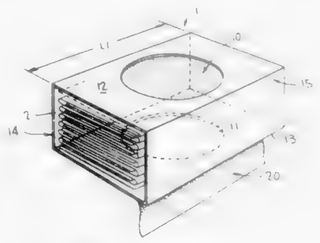
5,143,249

STACKED SANITARY PAPER, DISPENSER, AND METHOD FOR MAKING A STACK

Jean Saint Criq, Le Chesnay, and Henriette Bros, Asnieres, both of France, assignors to Kaysersberg SA, Kaysersberg, France

PCT No. PCT/FR89/00305, § 371 Date Feb. 16, 1990, § 102(e) Date Feb. 16, 1990, PCT Pub. No. WO89/12418, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 16, 1989, Ser. No. 465,250
Claims priority, application France Jun. 17, 1988, 88 08108
Int. Cl.[5] B65H */00*
U.S. Cl. 221—34 **5 Claims**

1. A stack of sanitary papers in combination with a dispenser wherein said stack of sanitary papers comprises folded interleaved sheets constituting a pile positioned inside a sleeve open at both ends for insertion into said dispenser which is capable of holding at least one of said stacks of sanitary papers and dispensing said sheets; said sleeve providing a continuous band around said folded interleaved sheets and comprising a first pair of opposite side walls which are parallel and adjacent to said sheets' folded edges, a second pair of side walls which are parallel to said sheets' surface and perpendicular to said first pair of side walls, and an opening in at least one of said side walls of said second pair of side walls wherein said opening does not extend through said side wall's ends and said opening is parallel to said sheets' folded edges; and said dispenser comprises an envelope of right-parallelipipedic shape having a



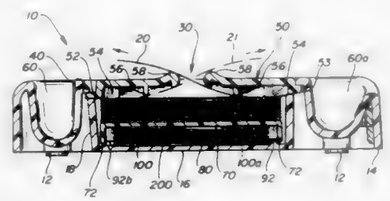
height which corresponds to the height of one or more of said stacks of sanitary papers, a lower base surface having an area of approximately the same area as said surface of said folded sheets of said stack, a first and second side support positioned adjacent and perpendicular to the bottom of first and second opposite vertical side walls of said envelope and perpendicular to said sheets' folded edges so as to define an opening which is larger than said opening in said sleeve of said stack and is between 40% to 80% of said base surface.

5,143,250

DESK CADDY FOR REFILLABLY DISPENSING SELF-STICKING FANFOLDED NOTEPAPER FEATURING VERTICALLY MOVEABLE PLATFORM ON TRACKING MEANS

L. Wayne Freitag, Oak Ridge, N.J., assignor to The Bates Manufacturing Company, Hackettstown, N.J.

Filed Nov. 14, 1989, Ser. No. 436,560
Int. Cl.[5] B65H *1/08*
U.S. Cl. 221—59 **4 Claims**



1. A refillable dispenser for dispensing a stack of fanfolded notepaper having each sheet coated with a narrow adhesive band along one edge on one side, the sheets being stacked with adhesive-coated edges of successive sheets disposed along alternative opposite edges, the refillable dispenser comprising:

(a) a tray having at least one side wall and a bottom wall defining a cavity therein, the at least one side wall having a vertical tracking means for defining vertical movement within the cavity;

(b) a removable cover for placing over the cavity of the tray, having a centrally transverse opening extending therethrough for dispensing individual sheets of fanfolded notepaper from a stack;

(c) cover securing means for releasably fastening the removable cover to the tray, the cover securing means comprising:

a snap deflection member disposed on the top of one of said side walls or said removeable cover;

a shoulder disposed on the other of said removeable cover or one of said side walls adapted to coact with said deflection member;

tab means extending from said removable cover on the side opposite the deflection member; and

recess means disposed in said side wall adjacent said tab means adapted to coact with said tab means;

(d) a platform of suitable size for receiving a stack of fanfolded notepaper, having guide means for controlling movement of the platform, said guide means cooperating with the vertical tracking means; and

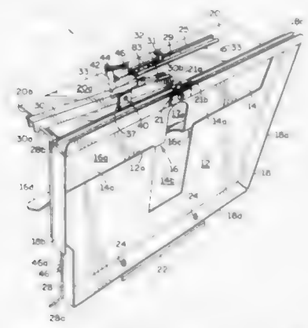
(e) biasing means for upwardly urging the platform towards and upper position of the vertical tracking means.

5,143,251

SINGLE VEND DEVICE FOR A NEWSPAPER VENDING MACHINE

Allen P. Kahanek, Yoakum, and Ralph J. Ullman, Shiner, both of Tex., assignors to Kaspar Wire Works, Inc., Shiner, Tex.

Filed Oct. 15, 1991, Ser. No. 775,616
Int. Cl.[5] B65H *3/00*
U.S. Cl. 221—152 **1 Claim**



1. An anti-theft device for a newspaper vending machine having cabinet for substantially enclosing newspapers, an elevator shelf onto which the newspapers are stacked, a manually operated door to provide access to the interior of the cabinet, a means to lockingly engaging the door, and a coin controlled mechanism to engage and disengage the locking means, the anti-theft device comprising:

a front panel with a front and rear surface, for substantially blocking access to the newspaper stack, the front panel having a perimeter thereon dimensioned to removably engage the cabinet of the newspaper vending machine, the front panel with walls defining a "T-shaped" opening, the arms of the opening being of sufficient width to extract a newspaper widthwise therefrom, the leg of the opening being substantially less than the width of a newspaper;

key operative locking means engageable with the perimeter of said front panel to lock said front panel to the walls of the cabinet;

a mounting base with a top and a bottom surface integral with said front panel located above the T-shaped opening of said front panel, said mounting base projecting substantially perpendicular from the rear surface of said front panel;

a closure plate pivotally mounted to the rear surface of said front panel above the T-shaped opening and below said mounting base, said closure plate dimensioned to substantially cover the arms of the T-shaped opening, said closure plate having a flat portion and a bent portion, said closure plate with a leading edge defining the edge between the two portions, said closure plate for moving between a closed position, the closed position with the leading edge substantially flush against the lower edge of the rear surface of the walls defining the arms of the T-shaped opening, the closed position substantially preventing access to the newspapers and an open position, said open position reached by rotation of said closure plate from the closed position until the leading edge of said closure plate is at a position removed from the walls defining the lower edge of the T-shaped opening, the open position defining an access width through which the newspaper is removed from the interior of the cabinet;

a sheet slidably mounted to and flush with said bottom surface of said mounting base, the sheet operatively engaged with the rear surface of the closure plate such that movement of the closure plate towards the open position causes the sheet to slide away from said front panel and across said bottom surface of said mounting base;

means to adjust said access width of the open position of said closure plate, said means comprising walls defining a line of adjustment holes through said mounting base, a pin dimensioned to engage the adjustment holes, pin retainment means, and a channel mounted in alignment with the adjustment holes to guide the pin retainment means, the width adjustment means further comprising an edge of said slidably mounted sheet, the edge in acute angular relationship to the line of adjustment holes for engagement with the pin;

means biasing said closure plate towards the closed position;

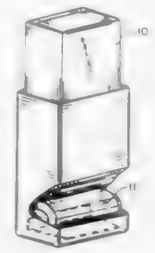
means to resettably lock the closure plate in the closed position, said closure plate lock means comprising arm means, pin means, reset means, and walls defining a pair of holes, one of the pair being in said mounting base and the other of the pair being in said sliding sheet, the pairs being in alignment when said closure plate is in the closed position, the arm means coupled to the door of the newspaper cabinet, the arm means to raise the pin out of the aligned holes in said sliding sheet and said mounting plate, when said closure plate is in the closed position, the pin released from its raised position by reset means upon movement of the closure plate from the closed position, thereby allowing the pin to re-engage the holes upon return of said closure plate to the closed position.

5,143,252

PORTABLE PACKAGE AND SYSTEM FOR STORING AND DISPENSING PHOTOGRAPHIC FILM CARTRIDGES

Zhimin Shi, 25-17 39th Ave., Long Island City, N.Y. 11101

Filed Nov. 5, 1990, Ser. No. 609,271
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—185 **5 Claims**



1. A container for use in storing and dispensing photographic film cartridges, comprising:

a package of film cartridges, said package having four walls, a bottom, a top and an outlet which extends across one wall and into each of the adjacent walls to allow the cartridges to be dispensed, said outlet being located above the bottom of the package to prevent the cartridges from dropping out of the package; and

a housing for the package, said housing having four walls, a

bottom, an open top into which the package can be inserted, an outlet which corresponds to the outlet on the package, and at least one magnet adjacent to the outlet for holding the cartridges in the package.

5,143,253

CHIP PACKAGING MEANS AND SUPPLY MECHANISM FOR SUPPLYING CHIPS BY USING THE CHIP PACKAGING MEANS

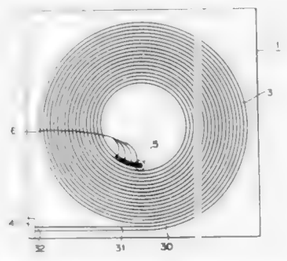
Kuniaki Takahashi; Koji Kudo, and Tetsuo Takahashi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 402,041

Claims priority, application Japan, Sep. 2, 1988, 63-115835[U]; Feb. 23, 1989, 1-20975[U]; Apr. 26, 1989, 1-49038[U]; Apr. 28, 1989, 1-51491[U]; Jul. 28, 1989, 1-195957

Int. Cl.[5] **B65H** *1/00*

U.S. Cl. 221—197 **26 Claims**



1. Chip packaging means packing chips and also serving as a chip supply source, comprising:

a substantially plate-like body having a substantially spiral passageway formed in its interior and an outlet formed therein as a continuation of said spiral passageway to communicate with the exterior of said body;

a plurality of chips received in a row in said spiral passageway of said body; and

means for facilitating forwarding of said chips along said passageway to said outlet to discharge said chips from said outlet.

5,143,254

DEVICE FOR THE METERING OF GRANULAR OR POWDERED PRODUCTS AND METHOD OF MIXING RAW RUBBERS USING THIS DEVICE

Daniel Laurent, Meylan, France, assignor to Sedepro, Paris, France

Filed Jul. 3, 1991, Ser. No. 725,355

Claims priority, application France Jul. 12, 1990, 90 09011

Int. Cl.[5] **B67B** *7/00*; **C01F** *11/10*

U.S. Cl. 222—1 **5 Claims**

1. A metering device for granular or powdered products comprising:

product feed means;

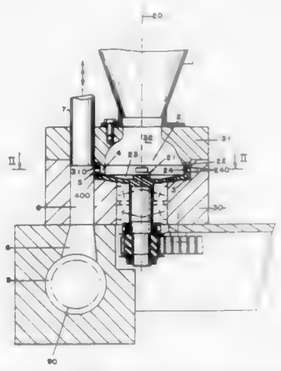
a rotor comprising a circular plate onto which the product is delivered by said feed means, said plate having at its edge a cylindrical wall pierced by at least one recess;

a cylinder containing the rotor so adjusted with respect to the said cylindrical wall as to leave a slight clearance which permits rotation of the rotor within the cylinder, the cylinder having an opening arranged axially opposite the recess or recesses;

a screen which is fixed with respect to the cylinder and arranged axially at the same level as said opening, radially inwards of the cylindrical wall and so adjusted with respect to it as to permit movement of the rotor, said screen extending over an angle on both sides beyond the opening by an amount corresponding at least to the angular opening of the said recess;

means driving the rotation of the said rotor.

5. A method for the continuous mixing of uncured rubber by continuously introducing an elastomer into a mixing chamber and continuously incorporating therein a precisely metered powdered product, characterized by the fact that the metering consists in feeding powdered product to a rotor comprising a circular plate onto which the product is delivered by the feed means, said plate having at its edge a cylindrical wall pierced by at least one recess, causing the rotor to turn in a cylinder containing the rotor, so adjusted with respect to said cylindrical wall as to leave a slight clearance which permits the rotation of the rotor within the cylinder, the cylinder comprising an opening disposed axially opposite the said recess or recesses, providing a screen fixed with respect to the cylinder and arranged axially at the same level as said opening radially inwards of the cylindrical wall, so adjusted with respect to the latter as to permit movement of the rotor, the said screen protruding at an angle beyond both sides of the opening by an amount corresponding to at least the angular opening of said recesses.



5,143,255

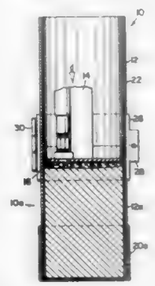
HOT MELT ADHESIVE CONTAINER FOR USE WITH HEATED PLATEN DISPENSING EQUIPMENT

Lawrence L. Micek, Stillwater, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Nov. 2, 1990, Ser. No. 608,988

Int. Cl.[5] **B67D** *5/60*

U.S. Cl. 222—1 **5 Claims**



5. A method for dispensing urethane to a use locus with heated platen dispensing equipment, said method comprises:

(a) removing a first lid from a container of isocyanate containing adhesive, said container having a container body, a first open end, a second open end, and a lid on the first open end and the second open end;

(b) contacting the heated platen with the hot melt urethane containing adhesive exposed at the first open end of the container;

(c) dispensing the hot melt in liquid form through the heated platen;

(d) ceasing dispensing of the hot melt in liquid form;

(e) removing the second lid from the second open end of the container and placing the second open end in contact with a first open end of a second container body; and

(f) sealing the interface between the first container body and the second container body using a hinged collar containing means to fix the collar around the interface, preventing release of a toxic concentration of isocyanate.

5,143,256

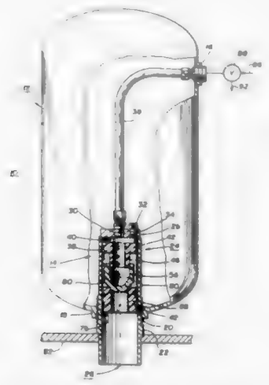
GAS ACCUMULATOR AND BLASTER APPARATUS

Theodore S. Wadensten, P.O. Box 9, Wyoming, R.I. 07068

Filed Apr. 22, 1991, Ser. No. 689,467

Int. Cl.[5] **B65G** *69/00*

U.S. Cl. 222—3 **12 Claims**



1. A gas accumulator and blaster apparatus for selectively and intermittently fluidizing granular material being contained in storage bins, said apparatus including:

(a) a pressure tank for storing a compressed gas, said pressure tank having a selectively located inlet port and a selectively located outlet port;

(b) a quick release valve adapted for removable mounting in said outlet port, said quick release valve having a selected portion interior of said pressure tank, said quick release valve including:

(b1) an elongated outer sleeve member, said outer sleeve member having a first end a second end, said first end having an end cap fastened thereon in a substantially fluid-tight relationship, said first end also having a check valve provided therein and thereon for allowing uni-directional flow of a pressurized gas from interior of said first end of said outer sleeve member into said pressure tank.

(b2) a guide member adapted for being retained interior of said outer sleeve member at a selectively spaced relationship with said end cap, said guide member including a first diameter portion, and a shouldered portion, said first diameter portion adapted for providing a substantially fluid-tight seal with an interior surface of said outer sleeve member, said shouldered portion having a selectively sized second diameter, said shouldered portion projecting from an end of said first diameter portion in a direction distal said end cap, said guide member having a selectively sized circular passageway therethrough, said first diameter portion, said second diameter of said shouldered portion, and said passageway being in a substantially concentric alignment;

(b3) a movable substantially cup-shaped piston member, said piston member including a selectively sized outside diameter, a hollow recess, and a nose portion, said nose portion having a selectively angled chamfered edge, said hollow recess being selectively sized to provide a sliding fit with said shouldered portion of said guide member, said hollow recess having a selected depth for allowing said piston member to telescopically move a predetermined amount onto said shouldered portion of said guide member, said outside diameter being selectively sized to provide a clearance fit with said interior surface of said outer sleeve member;

(b4) an annular seat member selectively located intermediate said first end and said second end of said outer sleeve member, said seat member adapted for being removably retained within said outer sleeve member, a sealing means for providing a substantially air-tight connection between said annular seat member and said outer sleeve member, said seat member having a selectively sized bore therethrough, said bore having at least one chamfered end, said chamfered end being adapted to mate with the chamfered edge of said nose portion of said piston member for providing a substantially fluid-tight seal as and when desired;

(b5) at least one transverse aperture in and through the wall of said sleeve member, said transverse aperture being located in a selected relationship with said chamfered end of said seat member;

(c) a conduit member for connecting said inlet port with a through aperture located in said end cap, said conduit member providing a substantially fluid-tight conduit for selectively filling said accumulator and blaster apparatus with said gas and then subsequently exhausting said gas from interior of said piston member and said guide member; and

(d) wherein said quick release valve is disposed for allowing said cup shaped piston member to rest on said chamfered end of said annular seat member by gravity for stopping gaseous communication between said transverse aperture and said selectively sized bore in said seat member, said quick release valve further adapted for providing a greater seating force between said piston member and said seat member as and when a gas under pressure is introduced into said guide member and into said hollow recess in said piston member, said quick release valve adapted for quickly urging said piston member away from said seat member as and when said gas under pressure is exhausted from said recess, said guide member, and said conduit; said urged away piston member providing gaseous communication between said transverse aperture and said through bore of said seat member, said communication allowing for any gas under pressure in said pressure tank to escape through said second end.

5,143,257

SYSTEM FOR PROPORTIONED LIQUID DISPENSING

Mickey D. Austin, Duncanville, and Richard J. Keller, Mesquite, both of Tex., assignors to Kelrus Corp., Mesquite, Tex.

Filed Dec. 4, 1990, Ser. No. 621,773

Int. Cl.[5] **B67D** *5/00*

U.S. Cl. 222—57 **13 Claims**

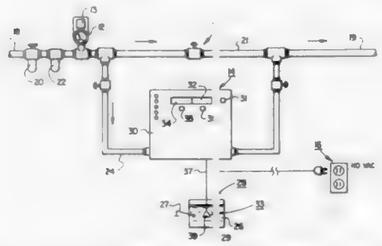
1. A dispensing system for proportional mixing of selected liquids comprising:

a flow meter adapted to be installed in a first conduit containing a flowing source of a first liquid to be mixed, said flow meter being characterized as providing an externally emitted signal correlated to the flow rate being encountered;

an energizeable pump operably arranged for its discharge to be connected to said first conduit downstream of said meter;

a second conduit connected to the intake of the said pump for receiving a quantity of a second liquid to be mixed with said first liquid;

a pressure sensor adapted to sense pressure values of said first liquid in said first conduit and to emit an output signal correlated to changes in the pressure being sensed; and



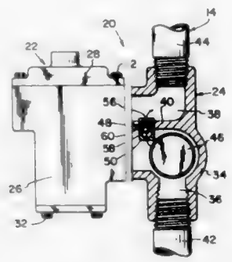
control means operable to receive the emitted signals from both said pressure sensor and said flow meter for varying the operation of said pump in controlled correlation to the combined values of said signals.

5,143,258

PRESSURE RELIEF FOR VACUUM OPERATED VALVE

Armin E. Mittermaier, Fort Wayne, Ind., assignor to Tokheim Corporation, Fort Wayne, Ind.

Filed May 15, 1991, Ser. No. 700,583
Int. Cl.[5] B67D *5/16*
U.S. Cl. 222—73 **4 Claims**



1. A liquid fuel dispensing system comprising:

a reservoir of liquid fuel, said liquid fuel having a vapor pressure;

a valved nozzle;

a fuel conduit providing the flow of fuel from the reservoir to the nozzle;

actuable pump means for pumping fuel through the conduit;

regulator valve means in said conduit for permitting the passage of fuel through said conduit upon actuation of said pump means, said regulator valve means having an inlet and an outlet, said conduit having an upstream portion positioned between the reservoir and said inlet and a downstream portion positioned between said outlet and said nozzle;.

passage means arranged in parallel with said regulator valve means for permitting fuel to flow directly from said upstream portion to said downstream portion and to bypass said regulator valve means; and

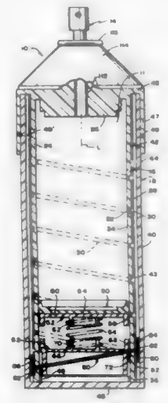
pressure relief valve means associated with said passage means for intermittently enabling the flow of fuel from said upstream portion to said downstream portion, said pressure relief valve means enabling fuel flow when the vapor pressure of fuel in said upstream portion exceeds a predetermined value.

5,143,259

NON-AEROSOL DISPENSER HAVING A MANUALLY ENERGIZABLE PISTON

John E. Williams, 8029 Brimfield Ave., Panorama City, Calif. 91402

Continuation-in-part of Ser. No. 438,065, Nov. 20, 1989, abandoned. This application May 2, 1990, Ser. No. 517,716
Int. Cl.[5] B67D *5/00*
U.S. Cl. 222—80 **18 Claims**



1. A spray dispenser comprising cylindrical wall means defining a contents chamber, discharge valve means disposed at one longitudinal end of said chamber, piston means disposed in said chamber in longitudinally spaced relationship from said discharge valve means, said piston means carrying cutting edge means directed toward said cylindrical wall means; and manually actuable means for inducing said piston to travel toward said discharge valve means while forcing said cutting edge means to cut through said cylindrical wall means, said manually actuable means comprising an additional cylindrical wall means disposed around said first-named cylindrical wall means whereby the former comprises outer wall means and the latter comprises inner wall means, said outer wall means being rotatable relative to said inner wall means and including a groove having longitudinally spaced ends, one of said longitudinally spaced ends being situated closer to said discharge valve than the other of said longitudinally spaced ends, said piston means carrying guide means received in said groove for sliding movement therein as said piston means approaches said discharge valve means, whereby said piston means moves longitudinally relative to said outer wall means as said piston means approaches said discharge valve means.

5,143,260

AEROSOL ADAPTER CLAMP AND POWER SYSTEM

Terrence Loychuk, North Vancouver, Canada, assignor to Nozone Dispenser Systems, Inc., Vancouver, Canada

Filed Jun. 5, 1990, Ser. No. 533,286
Int. Cl.[5] B65D *35/20*
U.S. Cl. 222—95 **19 Claims**

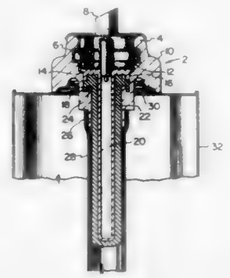
1. A circular hollow adapter with a top and base portion, the top for receiving an aerosol nozzle and cup, and the base for being fitted to an opening at the top of an aerosol container comprising:

(a) a circular rounded rim formed at the top of the adapter, said rounded rim being adapted to mate with a sealing rim of an aerosol nozzle and cup:

(b) a base sealing lip formed in the base portion of the adapter at a location below the rounded rim, said base sealing lip being adapted to mate with a peripheral edge of the aerosol container top opening;

(c) a shoulder formed around the interior surface of the hollow adapter at a location below the rounded rim and above the base of the adapter, the shoulder being adapted to receive an open end of a hollow, non-pleated resilient first internal power tube;

(d) a sleeve formed around the interior surface of the adapter of a diameter smaller than the diameter of the shoulder (c), the sleeve being at a location below the shoulder (c) and coextensive with the base of the adapter, the sleeve being adapted to engage an outer surface of an open end of a hollow resilient second power tube;



(e) a hollow non-pleated resilient first interior power tube closed at one end and open at the opposite end, having a consistent thickness throughout most of its length, the open end fitted to the shoulder; and

(f) a hollow resilient second power tube closed at one end and open at the opposite end having a consistent thickness throughout most of its length, fitting on the outside of the inner resilient first power tube (e), the open end outer surface sealingly engaging the sleeve (d).

5,143,261

MULTI-COMPARTMENT CONTAINER FOR PROPORTIONAL DISPENSING OF A PLURALITY OF LIQUIDS

James L. Drobish, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 453,562, Dec. 20, 1989, abandoned. This application May 20, 1991, Ser. No. 708,071
The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.
Int. Cl.[5] G01F *11/26*
U.S. Cl. 222—129 **20 Claims**

1. A container for successively dispensing substantially uniform volumes of a plurality of liquid ingredients such that the liquids are simultaneously dispensed in a desired proportion relative to each other to form a predetermined quantity of a mixture, said container comprising:

(a) a plurality of separate compartments, each compartment having a neck and being adapted to house a multiplicity of volumes of a different one of said liquid ingredients, each neck having an aperture located at its distal end;

(b) a plurality of tubular metering devices,

(i) each said metering device having a tubular body, said tubular body having an upper and lower end wall, said upper end wall having a dispensing opening located therein, said tubular body also having a vent opening located therein providing communication between the interior of said metering device and the interior of said container, an axially extending vertical wall dividing the upper portion of the interior of said metering device into a metering chamber sealed at the top by said upper end wall and a dispensing passage which communicates with the exterior of said device through said dispensing opening, said vertical wall terminating above said lower end wall of said metering device, leaving an undivided collecting chamber in the bottom portion of the interior of said metering device, said collecting chamber being in communication at its upper end with both said metering chamber and said dispensing passage; a transverse baffle projecting from said vertical wall intermediate said metering chamber and said collecting chamber, said baffle blocking off the lower end of said metering chamber, except for the portion thereof furthest removed from the dispensing passage, and serving to prevent flow of said liquid in either direction between the metering and the collecting chambers during the normal course of pouring a previously measured volume from the container; and

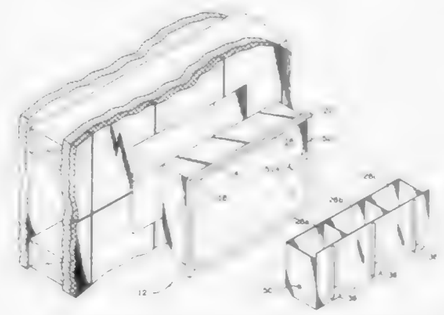
(ii) one of said metering devices being telescoped into each said aperture, said metering devices being so-arranged relative one another that the dispensing openings face in the same pouring direction and the outer surfaces of the upper end walls are generally coplanar, each said metering device being adapted to successively dispense substantially uniform volumes of one said liquid ingredient such that said liquid ingredient is dispensed in a desired proportion relative to the other said liquid ingredients to form a predetermined quantity of said mixture.

5,143,262

RECESSED SOAP DISPENSER

Gregory D. Edlund, 160 SW. 12th Ave., Suite 101-C, Deerfield Beach, Fla. 33442

Filed May 21, 1991, Ser. No. 708,779
Int. Cl.[5] B67D *5/06, 5/38, 5/52, 5/64*
U.S. Cl. 222—129 **11 Claims**



1. A soap dispenser containing a dispensing apparatus, said

soap dispenser adapted to be recessed within a bathroom wall, comprising:

a rectangular main housing defined by a pair of opposing side walls, an upper wall, and a partially sloped rear wall; and

a secondary housing rotatably mounted within said main housing, said secondary housing defined by a front wall, a rear wall, a chamfered base wall, and a pair of opposing side walls, thereby forming a storage chamber having an open top end, said secondary housing being rotatably mounted in said main housing from a first closed position with said secondary housing rear wall abutting said main housing rear wall, to a second open position thereby facilitating access to said storage chamber, and

dispensing means for actuating said dispensing apparatus disposed within said storage chamber, said dispensing means rigidly attached to said secondary housing.

5,143,263

SPRAY DISPENSER HAVING A NON-USE STORAGE RECESS FOR A DISCHARGE TUBE

Arthur E. Newell, 500 Danbury Ln., Topeka, Kans. 66606

Filed Jul. 16, 1991, Ser. No. 730,489
Int. Cl.[5] B05B *15/06*; B65B *83/14*
U.S. Cl. 222—538 14 Claims

1. A fluid dispensing apparatus, which comprises:

(a) a container with a body having a generally cylindrical sidewall, a bottom, an interior at least partially enclosed by said sidewall and said bottom, an exterior surface, a top and a neck having an opening communicating with said interior;

(b) dispensing means for dispensing fluid from the container through the neck thereof;

(c) actuator means for mounting on said body neck and for actuating the dispensing means, said actuator means being removable from a use position on said body neck and including an actuator extension tube;

(d) receptacle means formed in said body for selectively receiving said actuator extension tube;

(e) said receptacle means comprising a channel extending longitudinally along and open at said body exterior surface; and

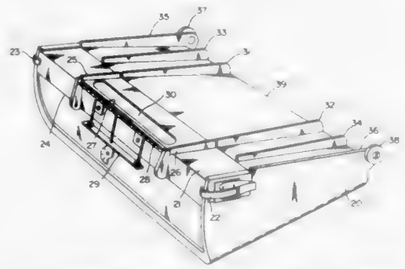
(f) said channel terminating at a downwardly-closed lower end in spaced relation above said container body bottom and at an upwardly-open upper end at said container top wall.

5,143,264

FLAT FINISHING BOX APPARATUS FOR DISPENSING MATERIAL IN A VARIETY OF SWATH WIDTHS

Donald M. MacMillan, Chilliwack, Canada, assignor to Concorde Tool Corp., Surrey, Canada

Continuation-in-part of Ser. No. 476,827, Feb. 8, 1990, abandoned. This application Feb. 4, 1991, Ser. No. 650,005
Int. Cl.[5] E04F *21/06*
U.S. Cl. 222—567 2 Claims



1. A flat finishing apparatus comprising, in combination, a box assembly and a plurality of attachable/detachable heads, each of said plurality of heads comprising a base, an edge assembly and an edge assembly adjustment apparatus,

said base incorporating a mouth having a first width,

said edge assembly having a second width corresponding to said first width,

said edge assembly and edge assembly adjustment apparatus being attached to said base,

said first and second widths being different in each of said plurality of heads,

whereby said apparatus is adapted to dispense material in a variety of swath widths from said box assembly.

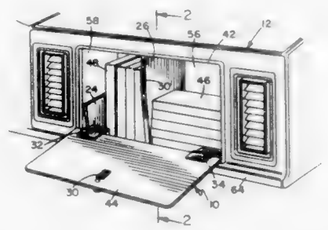
said box assembly further having a third width, first and second extremities of said third width, a center portion, a first portion near said first extremity of said third width, a second portion near said second extremity of said third width and a first channel interconnecting said first portion to said center portion and a second channel interconnecting said second portion to said center portion.

5,143,265

ARTICLE HOLDER FOR AN OPEN DASHBOARD COMPARTMENT

Stephen W. Schultz, 2917 Columbine, San Diego, Calif. 92105

Filed Dec. 24, 1990, Ser. No. 633,148
Int. Cl.[5] B60R *7/00*; B60N *3/12*
U.S. Cl. 224—42.42 11 Claims



1. A cassette and article holder for installation in and removable from an open compartment type storage space in the dashboard of a truck, where the compartment has top, bottom and rear walls, two side walls with a front compartment opening along a given plane, and the compartment has a front, lower ledge in the plane of the opening with an upper portion of the rear wall angled forwardly toward the opening, said holder comprising:

a base sized to support cassettes and shaped to fit into the compartment and substantially cover the bottom wall,

at least one vertical member secured to said base and shaped to fit into said compartment,

said vertical member has a front edge surface partially in the plane of the compartment opening and a rear edge surface positionable adjacent the rear wall of the compartment,

said rear edge surface of said vertical member is angled forwardly toward the opening and presses against the upper angled portion of the rear wall when the holder is in position in the compartment,

a holder ledge secured to a lower front edge of said vertical member adjacent to the compartment edge for retaining cassettes in the holder,

a front cover shaped to cover the compartment opening,

hinge means connected to a lower side edge of said cover and to a upper side of the holder ledge for pivotally moving the cover from an open position to a closed position adjacent the front edge surface of said vertical member,

and means for releasably holding said cover to said vertical member in the position of closing the compartment opening.

5,143,266

HARNESS

William L. Heckerman, Bozeman, and Brad B. Heckerman, Belgrade, both of Mont., assignors to Butler Creek Corporation, Belgrade, Mont.

Division of Ser. No. 348,717, May 8, 1989, Pat. No. 4,924,557, which is a division of Ser. No. 817,420, Jan. 10, 1986, Pat. No. 4,827,578. This application Mar. 5, 1990, Ser. No. 489,473
Int. Cl.[5] A45F *3/00*
U.S. Cl. 224—150 3 Claims

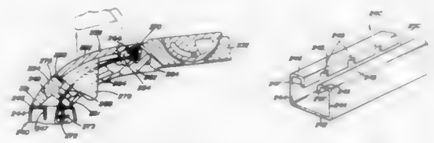
1. A carrying device comprising a first strap formed from a soft, resilient, flexible, foam-like material and a second strap formed from a stronger elastic material, said first and second straps overlying each other and extending in the same direction, said second strap fixedly attached to said first strap at uniformly spaced intervals and in such a way that the second strap forms a plurality of loops between its points of attachment to said first strap, the length of said second strap between the extreme points of attachment being greater than the length of said first strap between said extreme points when said straps are in a relaxed state, said loops sized so that when the first strap is stretched, beyond a certain point, the loops in the second strap become taut limiting further stretching of the first strap before the first strap can stretch enough to tear.

5,143,267

ARTICLE CARRIER

John S. Cucheran, 931 Lakeshore Dr., Lake Orion, Mich. 48236, and John A. Bott, Grosse Pointe Shores, both of Mich., assignors to John A. Bott

Continuation-in-part of Ser. No. 246,770, Sep. 20, 1988, Pat. No. 4,972,983. This application Jul. 6, 1990, Ser. No. 550,107
Int. Cl.[5] B60R *9/04*
U.S. Cl. 224—321 28 Claims



1. An article carrier for an automobile comprising:

at least two side rails fixedly secured on a generally horizontally extending exterior automobile body surface;

said side rails extending generally longitudinally of the automobile;

said side rails each including means forming a channel member;

a pair of bracket members disposed upon said side rails and at least one restraining bar extending laterally between and secured adjacent its opposite ends to said bracket members;

each said channel member further including locking means for enabling said bracket members to be detachably secured at an infinite number of positions along said side rails;

means on each of said bracket members and cooperable with each said locking means of each said channel member for detachably securing and longitudinally adjusting said bracket members and said restraining bar at infinite positions along said channel members; and

each said channel member including integrally formed means for cooperating with said securing and adjusting means to enable fixed, locking engagement of said bracket members and said restraining bar at a plurality of predetermined positions along each said channel member;

wherein each said channel member includes inwardly extending ledges which terminate to define a channel and flanges extending downwardly from said ledges; and

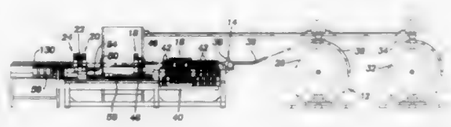
wherein said means for cooperating with said securing and adjusting means of each said channel member includes a plurality of notches defined in one of said flanges and longitudinally spaced along said one of said flanges.

5,143,268

FLAT TUBE CUTTING TECHNIQUES

Steven L. Stroup, Jr., Bluffton, Ind., assignor to Crown Unlimited Machine, Inc., Bluffton, Ind.

Filed Jul. 17, 1991, Ser. No. 731,455
Int. Cl.[5] B26F *3/00*
U.S. Cl. 225—2 6 Claims



1. A method of separating an indeterminate length of metal tubing into predetermined lengths having substantially burr-free parted ends comprising the steps of providing a length of hollow flat tubing having substantially flat faces and rounded edges, applying clamping pressure to said tubing at spaced

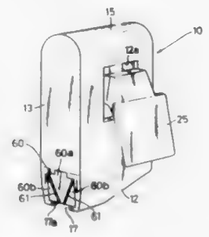
apart locations by first and second gripping means, deeply scoring lines of equal depth on opposite faces of said tubing with each line being in a plane normal to a longitudinal axis of said length of tubing, applying a high impact force along said longitudinal axis and in a direction away from said lines by sharply striking one of said gripping means with a high impact force, the magnitude of said force being sufficient to fracture said tube along said line without any substantial elongation or cold flow of said metal.

5,143,269

MEDICAL STAPLER

Kanji Matsutani; Kimio Suzuki, both of Takanezawa; Masatoshi Fukuda, Utsunomiya, and Katsutoshi Sato, Kamikawachi, all of Japan, assignors to Matsutani Seisakusho Co., Ltd., Japan

Filed Jan. 22, 1992, Ser. No. 824,105
Claims priority, application Japan, Feb. 12, 1991, 3-38934
Int. Cl.[5] A61B *17/068*
U.S. Cl. 227—177 8 Claims



1. A medical stapler comprising:

(a) a casing including a front wall having an opening at a lower end portion thereof;

(b) staple supply means mounted within said casing so as to hold a plurality of staples in contiguous relation to one another, said staple supply means sequentially supplying said staples to a position near said opening, each of said staples having a crown portion and a pair of legs extending respectively from opposite ends of said crown portion, and said crown portion of a foremost one of said plurality of staples extending in substantially parallel relation to said front wall;

(c) shaping means mounted on said casing so as to shape the foremost staple, disposed near said opening, in such a manner said pair of legs of said foremost staple are brought toward each other and

(d) a mirror mounted on an outer surface of said front wall in the vicinity of an upper edge of said opening.

5,143,270

SYSTEM FOR ASSEMBLING MOTORCAR VEHICLE BODY

Akio Hamada; Keizaburo Ohtsuki; Takashi Kubo, and Hiroshi Sasamoto, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1991, Ser. No. 788,695
Claims priority, application Japan, Nov. 28, 1990, 2-326464; Nov. 28, 1990, 2-326465; Nov. 28, 1990, 2-326467
Int. Cl.[5] B23K *37/04*
U.S. Cl. 228—4.1 8 Claims

1. A system for assembling a motorcar vehicle body by combining a floor panel, side panels and a roof panel, said system comprising:

a first-floor portion;

a second-floor portion;

said first-floor portion having a main working line provided with:

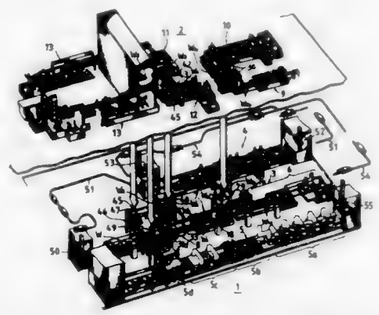
a vehicle body assembling station having disposed on both sides thereof welding apparatuses with welding jigs on which the side panels can be set in position;

a floor panel assembling line which is disposed on an upper-stream side of said vehicle body assembling station; and

a floor panel parts working line which is disposed on a still further upper-stream side of said vehicle body assembling station for working partial floor panel constituting parts;

said second-floor portion having another floor panel parts working line for working remaining floor panel constituting parts and a roof panel working line;

means for charging the floor panel constituting parts worked in said floor panel parts working line disposed on said first-floor portion to the floor panel assembling line;



means for lowering the floor panel constituting parts worked in said floor panel parts working line disposed on said second-floor portion from said second-floor portion to charge them to said floor panel assembling line so that these constituting parts are combined together in said floor panel assembling line to assemble the floor panel;

means for charging the floor panel to said vehicle body assembling station; and

means for lowering the roof panel worked in said roof panel working line from said second-floor portion to a neighborhood of said vehicle body assembling station and charging it to said vehicle body assembling station so that the side panels which are set to said welding jigs are combined in said vehicle body assembling station to the floor panel and the roof panel to assemble the motor car vehicle body.

5,143,271

DEVICE FOR ASSEMBLING THE PARTS INTERVENING ON A FACE-PLATE CORRESPONDING TO AN ESPAGNOLETTE OR BOLT LOCK FOR A SWINGING AND TILTING LEAF

Jean-Jacques Kautt, Strasbourg, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed Dec. 16, 1991, Ser. No. 807,185
Claims priority, application France, Jan. 7, 1991, 91 00176
Int. Cl.[5] B23K *37/04*; B23Q *7/00*
U.S. Cl. 228—6.1 12 Claims

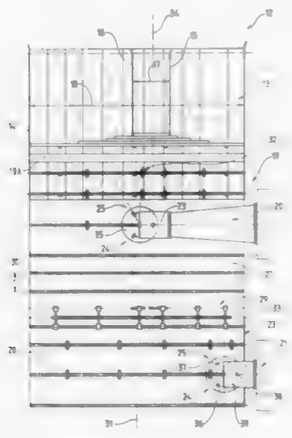
1. Device for assembling the parts intervening on a face-plate corresponding to an espagnolette or bolt lock for a door, window or the like comprised of a sash-frame and a swinging and tilting leaf, this leaf having a front edge onto which is applied said face-plate (**1**), this latter comprising a front face (**4**) oriented towards the sash-frame and onto which is inserted a safety shoulder (**6**), formed by a square-shaped part, capable of co-operating with a keeper or the like arranged on the sash-frame with a view to impeding the leaf from moving upwards when it is in tilting position, said face-plate furthermore comprising a rear face (**2**) intended for being applied against the front edge of said leaf and onto which is fixed at least one

casing (**3**) capable of accomodating a control mechanism for locking organs such as operating rods or the like, this device comprising automatic means for the assembling by welding of the casing or casings (**3**) and the safety shoulder (**6**) onto the face-plate (**1**), these automatic assembling means being comprised of:

face-plate supplying means (**13**),

handling means (**19A**) for arranging said face-plates (**1**) one after another and transversally onto a step-by-step conveyer (**19**),

means (**32**) for positioning the face-plates (**1**) with respect to a station (**20**) for the assembling by welding of a casing (**3**) and this through a reference plane (**10**) located close to the median plane (**11**) of the position of said casing (**3**) on said face-plate (**1**),



means (**33**) for positioning said face-plates (**1**) with respect to a station (**21**) for the assembling by welding of a safety shoulder (**6**) according to a reference plane (**9**) present on said face-plates (**1**) close to the position on this latter of said safety shoulder (**6**).

said stations (**20, 21**) for the assembling by welding of the casing or casings (**3**) and the safety shoulder (**6**), respectively, being fixedly arranged with respect to the conveyer (**19**) and integrating means (**24**) for supplying casings (**3**) and safety shoulders (**6**), means (**25**) for checking the presence of these latter and means for positioning and holding, before welding, these casings (**3**) or these safety shoulders (**6**).

5,143,272

DESOLDERING DEVICE

Michael Carlomagno, Redwood City; Paul F. Busch, Palo Alto, both of Calif., and Steven James, Portland, Oreg., assignors to Metcal, Inc., Menlo Park, Calif.

Filed Jul. 9, 1991, Ser. No. 727,451
Int. Cl.[5] B23K *1/018*
U.S. Cl. 228—20 7 Claims

1. A desoldering tool having a base unit including upper and lower members securable to one another, a solder collection chamber located in the lower member, a selectively activatable source of vacuum in the lower member, a cartridge having a tip and an electric heater in said tip, the tip having a bore therethrough, the tip being removably secured in the upper member and having a hollow pipe communicating with the bore in the tip and extending over the solder collection chamber, characterized by

a further chamber in communication with the source of vacuum,

a porous member removable disposed in said further chamber,

said solder collection chamber having a base surface with a channel formed therein extending into communication with said porous member, and

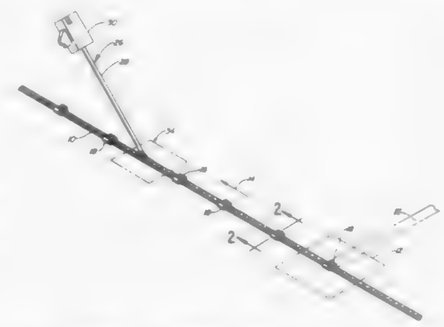
a solder collection chamber liner removably disposed in said solder collection chamber and seated on said base surface thereof.

5,143,273

ATTACHMENT OF SOLDER BUTTONS TO ELONGATED CONDUCTOR

Edward C. Topel, Worth, Ill., and Mario Garritano, Oak Lawn, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Continuation of Ser. No. 193,565, Jun. 13, 1988, abandoned, which is a division of Ser. No. 927,257, Nov. 20, 1986, Pat. No. 4,785,988. This application Nov. 20, 1991, Ser. No. 798,028
Int. Cl.[5] B23K *101/36*
U.S. Cl. 228—56.3 26 Claims



1. An elongated conductor which carries a plurality of spaced masses of solder in intimate, substantially surrounding relation with the elongated conductor, and a lead, heat welded with said conductor.

5,143,274

PROCESS AND APPARATUS FOR THE MANUFACTURE OF OPTICAL MODULES

Jean-Jacques Laupretre, Laversines; Franck Chapelet, Beauvais, and Dominique Brethenou, Quincy S/Senart, all of France, assignors to Societe Poptica S.A. & Commissariat a l'Energie Atomique, Paris, France

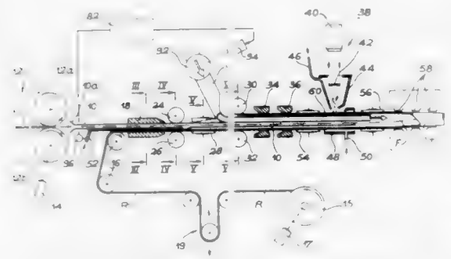
PCT No. PCT/FR90/00558, § 371 Date Mar. 20, 1991, § 102(e) Date Mar. 20, 1991, PCT Pub. No. WO91/01506, PCT Pub. Date Feb. 7, 1991

PCT Filed Jul. 23, 1990, Ser. No. 659,426

Claims priority, application France, Jul. 24, 1989, 89 09938

Int. Cl.[5] B23K *31/02*; H04B *9/00*

U.S. Cl. 228—102 22 Claims



1. Process for the manufacture of optical modules incorporating a tight metal tube (T), in which is received at least one optical fibre (F) embedded in a sealing product (G), characterized in that it comprises the following stages:

introducing the optical fibre into a rectilinear guide tube (10) at a controlled introduction speed;

progressively shaping the metal tube around the guide tube from a metal ribbon (R) until a closed tube with a longitudinal joint line (L) is obtained;

welding said closed tube along the longitudinal joint line;

injecting the sealing product into the welded tube through an injection pipe (60) issuing into the said tube below the welding joint;

measuring the instantaneous values of the tensile force applied to the welded tube, the travel speed and the temperature of said welded tube; and

controlling the speed of introduction of the optical fibre (F) into the guide tube (T) as a function of the measured instantaneous values, so as to obtain a predetermined ratio between the lengths of the metal tube and the optical fibre.

5,143,275

METHOD FOR REPAIRING A GLASS LAYER OF GLASS-LINED EQUIPMENT

Tatsuo Hara, Sumiyoshi-miyamachi; Akihiko Hogetsu, Kobe, and Shigeo Uegaki, Fukae-honmachi, all of Japan, assignors to Shinko Pantec Co., Ltd., Japan

Continuation-in-part of Ser. No. 707,621, May 30, 1991, which is a division of Ser. No. 529,935, May 29, 1990, Pat. No. 5,053,251.

This application Nov. 12, 1991, Ser. No. 790,567

Claims priority, application Japan, Nov. 15, 1990, 2-310976

Int. Cl.[5] B23K *31/00*

U.S. Cl. 228—119 16 Claims

1. A method for repairing a glass layer of glass-lined equipment comprising the steps of:

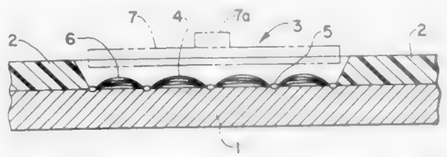
(a) removing a damaged portion of the glass layer of the glass-lined equipment, to expose a metal substrate thereunder;

(b) securing a metallic fiber-containing sheet to the exposed metal substrate;

(c) impregnating the sheet with a glass repairing agent;

(d) solidifying the repairing agent;

(e) heating the repairing agent at a sufficiently low temperature to prevent damage to a glass layer surrounding the removed, damaged portion due to a difference in thermal expansion between the metal substrate and the glass layer surrounding the removed, damaged portion; and



(f) repeating the steps of (c), (d) and (e) until the glass repairing agent is approximately equal in thickness to the glass layer adjacent to the damaged portion.

5,143,276

DOMED STRUCTURES AND A METHOD OF MAKING THEM BY SUPERPLASTIC FORMING AND DIFFUSION BONDING

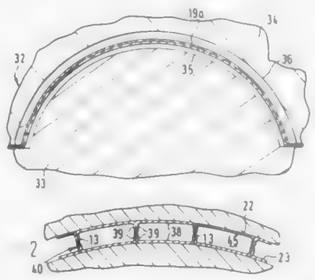
Martin H. Mansbridge; David Stephen, and John Norton, all of Bristol, United Kingdom, assignors to British Aerospace Plc, London, United Kingdom

Continuation-in-part of Ser. No. 404,422, Sep. 8, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 688,100

Claims priority, application United Kingdom, Sep. 9, 1988, 8821222

Int. Cl.[5] B23K *20/18, 28/02*; B21D *47/00*

U.S. Cl. 228—157 15 Claims



1. A method of manufacturing a deep domed cellular metallic structure having walls of cellular construction comprising a convex surface and a concave surface opposed to the convex surface and defining a cavity, the greatest height of the cavity being at least one third of its greatest width, the method including the steps of:

providing at least two metal sheets having superplastic characteristics;

joining two of said sheets by face-to-face metallic bonds or welds and forming the sheets into a stack;

sealing the perimeter edges of said stack but including means for the admission of pressurised inert gas between said sheets thus forming an inflatable envelope assembly;

placing said stack in a fixture including means for sealingly clamping said stack within said fixture at or about its perimeter and means for the admission of a supply of pressurised inert gas to one external face of said stack;

heating said stack and said fixture to a temperature suitable for superplastic forming, applying gas pressure to one external face of said stack such that the stack is expanded superplastically to a pre-defined domed shape having a height that is at least one third its width;

placing said pre-formed stack in a mould tool having opposed concave and convex surfaces defining between them a space of domed form, the height of the convex surface being at least one third its width;

heating the stack to a temperature suitable for superplastic forming and diffusion bonding, supplying inert gas under pressure between said sheets, thereby expanding by superplastic forming the outermost sheets of said pre-formed stack to conform to the convex and concave mould surfaces to form the said concave and convex surfaces of the structure and further causing the said sheets joining by face-to-face metallic bonds to expand about said metallic bonds to form webs extending between the convex and the concave surfaces of the structure thereby defining the said cellular construction, and further causing any sheets of the stack that are not already joined to the other sheets of the stack by face-to-face metal bonds to be diffusion bonded to at least one other sheet of the stack.

5,143,277

METHOD FOR THE MOUNTING OF MINIATURE ELECTRONIC BEAM LEAD COMPONENTS

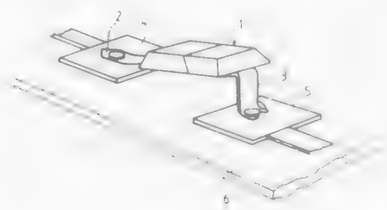
Pascal Roche, Chartres, and Claude Courtin, Chatenay Malabry, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Jan. 24, 1992, Ser. No. 825,068

Claims priority, application France, Feb. 5, 1991, 91 01270

Int. Cl.[5] H05K *3/34*

U.S. Cl. 228—179 2 Claims



1. A method for the mounting, on a flexible substrate, of miniature electronic components with beam leads to be soldered, wherein said method consists, after a first connection lead of a component has been soldered to a metallized zone of the substrate, in arching each of the other connection leads during their soldering by pressing the connection lead considered on a metallized zone of the substrate by means of a tip of a soldering tool while, at the same time, making an approaching movement towards the body of the component with this tip before carrying out the soldering operation itself.

5,143,278

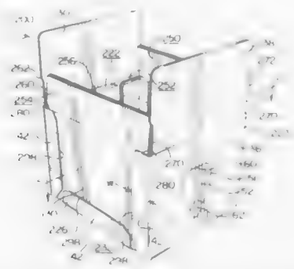
REINFORCED BULK MATERIAL BOX

Paul F. Petriekis, Palos Park; Michael Wilford, Chicago, and James Zavodsky, Schaumburg, all of Ill., assignors to Packaging Systems, Inc., Westmont, Ill.

Filed May 2, 1991, Ser. No. 694,837

Int. Cl.[5] B65D *5/34*

U.S. Cl. 229—23 R 36 Claims



1. A system for forming a six wall box comprising:

an elongate body blank having transverse fold lines defining sequential first, second, third, fourth, and fifth panels, each of the panels having opposed lateral sides;

a plurality of body flanges, one flange extending from each lateral side of the second, and fourth panels, each of the body flanges having a width; and

two side blanks, each having opposed lateral sides, opposed top and bottom ends, and a thickness, each of the side blanks further including a pair of side flanges, one of each of the side flanges extending from each lateral side of the first and second side blanks, the side flanges terminate short of the top end of the side blank by a distance.

5,143,279

GIFT CARD AND ENVELOPE

Alfred L. Gaines, 1315 Randolph St., NW., Washington, D.C. 20011

Filed Sep. 28, 1990, Ser. No. 589,596

Int. Cl.[5] B65D *27/00*

U.S. Cl. 229—68 R 7 Claims

1. Means for presenting a monetary gift comprising in combination an envelope and associated card, said envelope having a front surface and a rear surface with a flap contiguous with said front surface, said rear surface having means positioned on one side of said surface to position a check on one side of said surface and indicia transfer material positioned on an opposite side of said rear surface in alignment with said check positioning means; said card having front and rear panels, each front and rear panel, respectively, having an interior surface, said interior surface on one panel resembling a skeletonized check form and said interior surface on said other panel bearing an appropriate sentiment.

5,143,280

PACKAGE FOR FLOWABLE CONTENTS WITH AN INTEGRALLY MOULDED HANDLE HAVING MOULD-ENGAGING STABILIZING MEANS

Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Holdings S.A., Lausanne, Switzerland

Continuation of Ser. No. 528,124, May 22, 1990, abandoned.

This application Jan. 14, 1992, Ser. No. 823,071

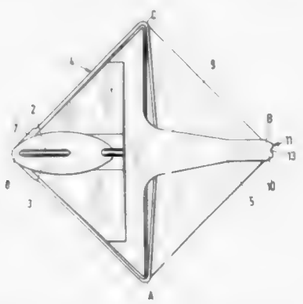
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917609

Int. Cl.[5] B65O *5/46*

U.S. Cl. 229—117.23 3 Claims

1. In a package for flowable contents comprising a tube (1) at the ends of which there are a bottom and a top (4); the top (4) consisting at least partially of thermoplastic synthetic material with no carrier material, and being integrally moulded onto and along the top edge of the tube (1), said tube consisting of carrier material coated on at least one side with a thermoplastic synthetic material; the integrally moulded top (4) having at least three corners, a pouring edge (7) and two planes forming an angle, of which the first plane of the top (4) is parallel with the bottom of the tube while the second plane (6) consists at least partially of the tube material and is connected to a handle (5); the handle having an upper horizontal member (9) and a rear vertical member (10) diametrically opposite the

pouring edge, said rear vertical member having a front face and a rear face, said members (**9**, **10**) and said second plane forming a gripper aperture centrally thereof and abutting said front face of said rear vertical member; said handle (**5**) formed of said members (**9**, **10**) being connected to the top (**4**) by being



integrally moulded to the second plane within the vertical outer contours of the package: the improvement comprising said vertical member (**10**) of said handle being straight and having on said rear face (**11**) opposite said gripper aperture at least one retaining groove (**13**).

5,143,,81

FOLDING BOX PACKAGE OF A LIQUID-TIGHT, HEAT SEALABLY COATED COMPOSITE CARDBOARD MATERIAL, MORE PARTICULARLY A FOIL MOUNTED COMPOSITE CARDBOARD MATERIAL

Hans-Willi Mainz, Heinsberg-Karken, and Lutz Schneider, Hückelhoven, both of Fed. Rep. of Germany, assignors to PKL Verpackungssysteme GmbH, Linnich, Fed. Rep. of Germany

Filed Dec. 10, 1991, Ser. No. 805,453

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1991, 4102021

Int. Cl.[5] B65D *5/40*

U.S. Cl. 229—132 **5 Claims**

1. A folding box package of a liquid-tight composite cardboard material, more particularly a foil mounted composite cardboard material heat sealably coated on at least the inside, said package having a flat bottom folded-on in one piece and closed by at least one seam, more particularly a web seam (**5**), applied flat thereagainst, and two pairs of opposite triangular folding pockets (**3**) lying flat and sealed over their complete surface, characterized in that at least the inside heat sealable coating of the areas (**2**, **4**) to be sealed is perforated right into the cardboard.

5,143,282

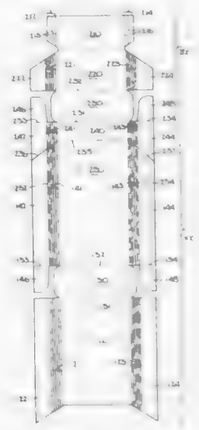
APPARATUS AND METHOD FOR MAINTAINING CLOSED HINGED LID BOXES

Xuan M., Pham, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,884

Int. Cl.[5] B65D *43/16*

U.S. Cl. 229—160.1 **23 Claims**



1. A rounded corner hinged lid box having an open position and a closed position, comprising:

a lid having

a first front panel having a first height and a first width and a first and second sides,

a second front panel having a second height and a second width, the second width being approximately the same as the first width and the second height being greater than 50% of the first height, the second front panel being secured in superposition to the first front panel and further comprising a first tab and a second tab, the first tab extending from one side of the lid second front panel and the second tab extending from the other side of the lid second front panel so that the tabs are respectively in superposition to the first and second rounded corners of the lid;

a rear panel,

a first rounded corner at one of the first or second sides of the first front panel, and

a second rounded corner at the other of the first or second sides of the first front panel;

a body having

a bottom panel,

a front panel having a third height and a third width and a first and second sides, the third width being approximately the same as the first width,

a rear panel,

a first rounded corner at one of the first or second sides of the front panel;

a second rounded corner at the other of the first or second sides of the front panel;

a hinge for connecting the lid rear panel to the body rear panel so that the body front panel and its first and second corners are respectively aligned with the first lid front panel and its first and second corners;

an innerframe having

a front panel having an upper portion and a first and second sides,

a first rounded corner at one of the first or second sides of the front panel, and

a second rounded corner at the other of the first or second sides of the front panel; and

means for securing the innerframe in superposition to and alignment with a portion of the body front panel and its first and second corners so that the upper portion of the innerframe front panel and its first and second rounded corners extend above the body front panel and its first and second rounded corners, whereby the tabs are in frictional contact with the first and second rounded corners of the lid and the first and second rounded corners of the innerframe when the lid is closed.

5,143,283

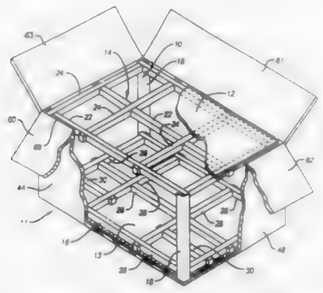
REINFORCED CONTAINER FOR LARGE OBJECTS

Gary D. Lancaster, Lewisburg, Tenn., assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 12, 1991, Ser. No. 684,707

Int. Cl.[5] B65D *5/42*

U.S. Cl. 229—199 **19 Claims**



14. In a reinforced container for use in shipping a large object including a framework and a covering fitted around said framework, said framework defining a space for receiving said object, said framework including: a bottom latticework for supporting said object; a top latticework disposed substantially parallel to said bottom latticework to define said space between said latticeworks; and a plurality of spaced parallel post members extending and interposed between said latticeworks to maintain said space, the improvement wherein each of said top and bottom latticeworks comprises:

a plurality of tubular skeleton elements having U-shaped cutouts in respective tube walls thereof and engaged together in an interlocking notched fashion by means by said U-shaped cutouts to form a lattice structure having a planar side; and

a securing sheet laminated onto at least some portion of said planar side of said lattice structure to hold said tubular elements together in engagement.

5,143,284

SECURITY MAILBOX

Abelardo Socarras, 1390 W. 38 St., Hialeah, Fla. 33012

Filed Sep. 16, 1991, Ser. No. 760,490

Int. Cl.[5] A47G *29/14*

U.S. Cl. 232—21 **3 Claims**

1. A security mailbox comprising:

an outer housing including a front wall and a rear wall and an interior chamber,

a dividing wall extending from said front wall to said rear wall in said interior chamber, defining an upper compartment and a lower compartment,

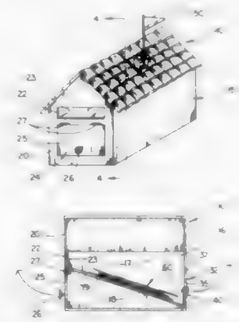
said front wall including a smaller, upper opening and a lower, larger opening, both extending substantially across a width of said front wall,

said upper opening including flap means movably secured in covering relation to said opening such that mail may be slid therethrough into said upper compartment,

said flap means including a strip hingedly attached along its upper edge to an upper portion of said upper opening and being normally disposed in covering relation to said upper opening, said strip being structured to be easily pushed inwardly and upwardly to allow mail to be passed therethrough, while falling into covering position over said upper opening after the mail has passed into said upper compartment,

said lower opening including a hingedly attached front door structured to be movable between an open and a closed position so as to facilitate access to said lower compartment,

said dividing wall attached to said front wall between said upper opening and said lower opening and angled downwardly with an opposite end attached to substantially the



bottom of said rear wall, thereby causing mail inserted through said upper opening to slide towards said rear wall, said dividing wall being structured and disposed so as to be substantially hidden from normal view when said front door is open,

said rear wall including a rear opening having a hingedly attached back door which opens outwardly to allow access to said upper compartment,

locking means for locking said back door in a closed position, and

said outer housing further including a signal flag thereon which is movable between a substantially vertically oriented position and a horizontally oriented position.

5,143,285

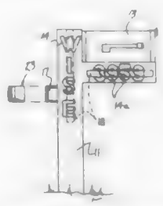
ILLUMINATED MAILBOX SUPPORT WITH PHOTO-CELL

Brian E. Wise, 3959 Warm Spring Rd., Chambersburg, Pa. 17201

Filed Feb. 19, 1991, Ser. No. 657,407

Int. Cl.[5] B65D *91/00*

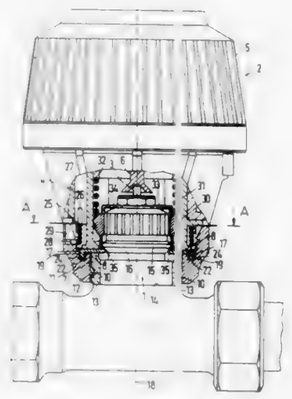
U.S. Cl. 232—39 **1 Claim**



1. An illuminated mailbox post comprising, in combination, an elongated longitudinally aligned support post, the support post included an elongated support plate orthogonally mounted to a midpoint of the support post, and the support plate mounting an elongated mailbox member extending therealong for reception of mail therewithin, and

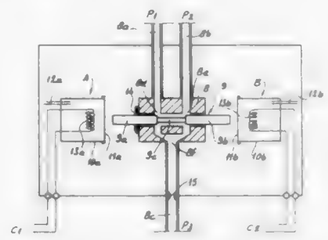
the support post including an elongate cavity, and
the support post including a plurality of transparent windows defining a messaged directed through the support post, and
a first illumination bulb mounted within the cavity, longitudinally aligned with the support post and positioned adjacent the windows, and
a photo-cell switch means for effecting selective actuation of the illumination bulb during conditions of limited available light, and
the support plate includes an elongate housing with an elongate cavity, the elongate cavity including a second illumination bulb mounted therewithin in electrical communication with the first illumination bulb, and a further plurality of transparent windows positioned within the support plate adjacent the first illumination bulb, and
the photo-cell switch means includes a photo-cell housing mounted to the support post to the exterior surface thereof, the photo-cell housing defined by a cylindrical configuration and including a first and second polarized lens rotatably mounted at a forward end of the housing, wherein the first and second lens are rotatably mounted relative to each other and the housing to adjust available light directed interiorly of the housing to actuate the photo-cell switch means, and
including a photo-cell cover cap the cover cap including a resilient cylindrical sleeve, the cylindrical sleeve defined by an internal diameter, and wherein the photo-cell housing is defined by an external diameter wherein the internal diameter is substantially equal to the external diameter to mount the resilient cylindrical sleeve coextensively overlying the housing, and the sleeve including a photochromic lens mounted at a forward terminal end of the sleeve, wherein the photochromic lens is positioned adjacent to and overlying the first and second polarized lens to further adjust available light directed into the photo-cell switch means.

5,143,286
THERMOSTATIC VALVE
Henning B. Hansen, Silkeborg; Stefan P. Maroti, Holstebro; Bjarne Frederiksen, and Knud Lykkegaard, both of Silkeborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Filed Nov. 25, 1991, Ser. No. 796,864
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1990, 4038141
Int. Cl.[5] F24F *11/06*
U.S. Cl. 236—42 11 Claims



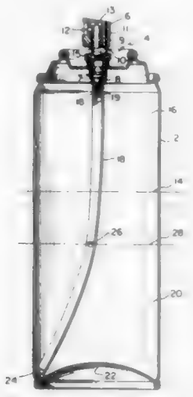
1. A thermostatic valve that has a central axis and includes a valve housing having an abutment face and a tapered clamping face, and a thermostat top part comprises a fixed base that has an axial hollow cylindrical base foot having an end face and is pushable axially onto the valve housing until the base foot end face engages the abutment face, the thermostat top part also having a retainer ring surrounding the base foot and being axially and rotatably secured to the base foot, the retaining ring being rotatable relative to the valve housing in a first angular direction and in an opposite second angular direction, at least one clamping element radially adjustable in the base foot for bearing against the clamping face and creating a clamping force between the end face and the abutment face, the retaining ring having a guide face bearing against the clamping element to radially move the clamp element away from the clamping face when the retainer ring is rotated in the first angular direction, the guide element extending arcuately at least partially around the central axis and having a first arcuate end and a second arcuate end lying in a radial plane, and being of increasing spacing relative to the central axis from the first arcuate end to the second arcuate end for displacing the clamping element radially away from the clamping face as the retainer ring is rotated in a first angular direction, first spring means acting between the retainer ring and the fixed base for constantly urging the retainer ring to rotate in the second angular direction, and a locking ring having a radial outer circumference surface, surrounding the valve housing and axially movable in the base foot from a first end position that the clamping element bears against radial outer circumferential surface of the locking ring and a second position out of the path of movement of the clamping element, and second spring means acting against the locking ring for constantly urging the locking ring to the first position.

5,143,287
CONTROL DEVICE FOR A SYSTEM REGULATING THE VENTILATION FLOW OF A CONTROLLED-ATMOSPHERE ROOM, AND FUNCTIONING CYCLES THEREOF
Pierre Jardinier, Gournay S/Marne, France, assignor to Societe d'Etude et de Recherche en Ventilation et Aeraulique S.E.R.-V.A., France
Filed Oct. 31, 1990, Ser. No. 606,931
Claims priority, application France, Nov. 6, 1989, 8914752
Int. Cl.[5] F24F *13/10*
U.S. Cl. 236—493 13 Claims



1. Control device for a system regulating the ventilation flow of a controlled-atmosphere room comprising at least one sensor located in the room to pick up desired information such as temperature, humidity, carbon dioxide level or other similar levels, or occupancy or nonoccupancy of the room, a deformable bladder type valve located in a ventilation duct of the room and controlled by a control pressure of said valve as a function of information picked up by the sensor, comprising, in combination, a pressure divider connected to two pressure sources for delivering the control pressure of the valve based on different pressures delivered by said two pressure sources and containing a movable element, deformable capsules located adjacent said movable element of said pressure divider and acting on said movable element to cause said control pressure to vary as a function of instruction signals, energy-supply means for changing the internal pressure in said capsules to deform said capsules as a function of the instruction signals, means for rendering said capsules independent from effects of variations in atmospheric pressure, and a control element of said energy supply means for receiving an information signal emitted by the sensor and for emitting, in a predetermined cycle composed of a series of powering and relaxation periods for the two capsules, said instruction signals for controlling said control pressure.

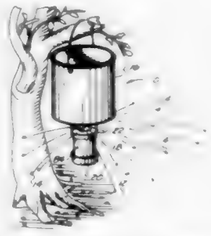
5,143,288
COMPRESSED GAS AEROSOL SPRAY SYSTEM WITH A DIP TUBE VAPOR TAP HOLE
Karl A. Kohler; Frank M. Bado, and Richard E. Krueger, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Feb. 14, 1991, Ser. No. 655,038
Int. Cl.[5] B05B *7/32*; B65D *83/32*
U.S. Cl. 239—1 18 Claims



1. Aerosol spray apparatus for use in a compressed-gas aerosol spray system, comprising:
an aerosol spray valve containing an actuator having an exit orifice for emitting an aerosol spray; and
a dip tube coupled to said valve and extending into the spray system, said tube having (a) an upper portion having a continuous outer surface above an initial liquid level in the spray system, and (b) a lower portion extending below the initial liquid level, said lower portion having a liquid entrance hole and a vapor tap hole above said liquid entrance hole, said vapor tap hole allowing compressed gas to enter said tube and mix with the liquid within the tube when the liquid level is lower than said vapor tap hole to substantially renew spray characteristics of the aerosol spray.

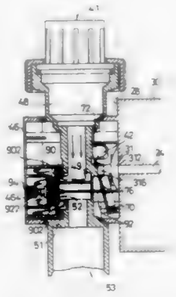
5,143,289
APPARATUS AND METHOD FOR AUTOMATICALLY DISPERSING AGGREGATE MATERIAL
William C. Gresham, 2809 Fisher Rd., Edmond, Okla. 73013, and William H. Gresham, 6009 Parkhurst Rd., Edmond, Okla. 73034
Filed Mar. 26, 1991, Ser. No. 675,402
Int. Cl.[5] A01K *5/02*, *39/014*
U.S. Cl. 239—7 20 Claims

1. An apparatus for automatically dispersing aggregate material on a predetermined schedule and for retarding dispersal of said aggregate material other than on said predetermined schedule, said apparatus comprising:
a hopper for holding said aggregate material, said hopper having an opening in a lower section thereof;
a distributor residing generally below said hopper opening, said distributor having a floor for receiving said aggregate material from said hopper and said distributor having upright walls peripherally disposed relative to said floor,



said upright walls having an unobstructed opening therein; and
means, coupled to said distributor, for rotating said distributor in accordance with said schedule, said rotation causing said distributor to disperse said aggregate material through said opening in said upright walls.

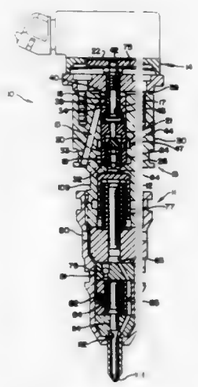
5,143,290
SINGLE-SPRINKLER CONTROLLER
Po H. Wang, No. 91, Kuotai Rd., Chunan Chen, Miaoli Hsien, Taiwan
Filed Jul. 11, 1991, Ser. No. 728,590
Int. Cl.[5] B05B *12/02*; A01G *27/00*
U.S. Cl. 239—70 5 Claims



1. A single-sprinkler controller comprising:
a timer with input means for the input of data of sprinkling time for said sprinkler and display means for displaying said sprinkling time of said sprinkler;
a motor being housed in a casing with a mount wall, an input end of said motor being electrically connected to and operatively controlled by said timer based on said data, an output end of said motor being engaged with a reduction gear assembly mounted on a first shaft which is rotatably mounted on said mount wall, a rotor disc being mounted on said first shaft at an outer side of said casing adjacent to said mount wall, said rotor disc having a plurality of ridges formed on a surface thereof distal to said mount wall;
a cam mounted on said first shaft and a pressure sensitive wheel in connection with a microswitch, said cam having a plurality of lobe portions and recessed portions between two said lobe portions corresponding to said ridges, said ridges being in functional alignment with said lobe portions, said pressure sensitive wheel being actuated by one of said lobe portions of said cam upon a rotation of said

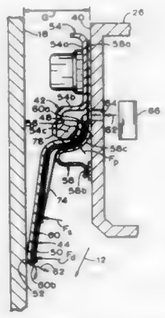
motor to activate said microsv itch which is electrically connected to said timer to swit :h said motor off;
a pivot member pivotably mounte d to said mount wall; and
a valve assembly comprising:
an enclosure with a chamber having a first open side mounted to and sealed by sai mount wall and a second open side;
an inlet conduit having a first in et in fluid communication with a water supply provided outside said enclosure and a first outlet provided in said chamber;
an outlet conduit having a seco nd inlet in said first outlet and a second outlet in fluid c mmunication to the sprinkler;
a rear cover mounted to and se ling said second open side of said chamber; and
a valve means provided in said hamber, said valve means being initially in a first status when neither of said ridges contact said pivot member, such that said inlet conduit is not in fluid communicatio with said outlet conduit, and said valve means being u geable by said pivot member to a second status when ne of said ridges contacts and urges said pivot membe , such that said inlet conduit is in fluid communicatio with said outlet conduit.

5,143,291
TWO-STAGE HYI RAULIC ELECTRICALLY-CONTROLL ED UNIT INJECTOR
James J. Grinsteiner, Roselle, Ill., as signor to Navistar International Transportation Corp., Chic go, Ill.
Continuation of Ser. No. 678,576, Mar. 20, 1992, abandoned. This application Mar. 16, 199 2, Ser. No. 851,130
Int. Cl.[5] F02M *47/00*
U.S. Cl. 239—88 **19 Claims**



1. In a hydraulic, electrically-co ntrolled, unit fuel injector for an engine including a selectivel operable solenoid, a high pressure valve means operated by t e solenoid, and an intensifier piston chamber, said injector b ing hydraulically actuated to inject fuel by high pressure flu d supplied from a source through said valve means to said ntensifier piston chamber, the improvement wherein said valv e means comprises:
pilot valve means operatively c upled to said solenoid for axial movement therewith betv een a closed position communicating said high pressur fluid from said source through said pilot valve means and then to a poppet valve chamber and an injection posit on relieving high pressure fluid from said poppet chambe ; and
poppet valve means disposed in aid poppet valve chamber for axial movement therein u der the influence of said pilot valve between a closed p sition preventing communication of said high pressure fl id to said intensifier piston chamber, said closed positio existing when said pilot valve is communicating said h gh pressure fluid from said source through said pilot valve means and then to said poppet valve chamber, and an injection position providing communication of said high pressure fluid to said intensifier piston chamber, said injection position existing when said pilot valve prevents communication of said high pressure fluid from said source through said pilot valve means and then to said poppet valve chamber, said poppet valve means further including dumping means providing pressure relief of said intensifier piston chamber when said poppet valve is in said closed position.

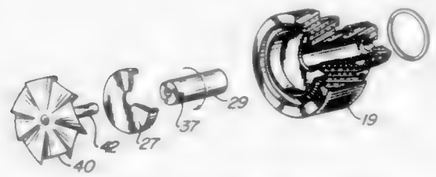
5,143,292
COOLED LEAF SEAL
Donald M. Corsmeier, Cincinnati, Ohio, and Stephen G. Browning, Syracuse, N.Y., assignors to General Electric Company, Cincinnati, Ohio
Filed May 9, 1991, Ser. No. 697,542
Int. Cl.[5] F02K *1/38*
U.S. Cl. 239—127.3 **17 Claims**



1. A seal assembly for sealing a gap between a movable flap and a stationary sidewall comprising:
a housing fixedly joined to said flap, and including a plenum;
a leaf seal having a proximal end rotatably joined to said housing to define a hinge therewith; a distal end positionable adjacent to said sidewall in sliding contact therewith for sealing flow of a gas therebetween, said gas having a first pressure; and a plurality of internal flow channels extending from said proximal to distal ends, each including an inlet at said proximal end disposed in flow communication with said plenum, and an outlet at said distal end; and
means for supplying a cooling fluid into said plenum for flow through said flow channels at a second pressure greater than said first pressure.

5,143,293
MIST-PRODUCING DEVICE
Raul R. Pairis, 40880-B Country Center Dr., #Q, Temecula, Calif. 92591
Filed Sep. 24, 1990, Ser. No. 587,120
Int. Cl.[5] B05R *1/34*
U.S. Cl. 239—222.17 **5 Claims**

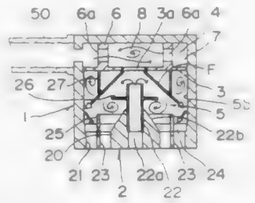
1. A water mist-producing device, comprising:
a nozzle housing having a flow passage therein defined at least partially by a cylindrical wall surface, said passage having an upstream end exposed to water supply pressure and a downstream end at a lower pressure, said cylindrical wall surface having a longitudinal axis defining the axis of the passage,
a transverse end wall in said housing extending across said downstream end of the flow passage, said transverse end wall defining a hole,
a rotary cylindrical flow restrictor pin floatably disposed in said passage and having an upstream end exposed to the water supply pressure, a cylindrical side surface within and in spaced relation to said cylindrical wall surface for flow of water axially between the pin side surface and the cylindrical wall surface, and a downstream end in registration with said transverse end wall, the radial clearance between the pin side surface and the wall surface being sufficiently small that a measurable pressure drop is produced between the pin upstream and downstream ends, whereby the water supply pressure urges the pin downstream end into engagement with said transverse end wall, said transverse end wall and the downstream end of the pin being so configured that a chamber is defined between said hole and the downstream end of the pin when the pin is engaged with the transverse end wall, said pin engaging the transverse end wall along a circumferential edge portion of the pin end, so that said chamber is concentric with the hole, said restrictor pin having a plurality of miniature flow ducts in its downstream end to conduct jets of water from the pin side surface to said chamber when the pin is engaged with the transverse end wall, each miniature flow duct extending from the pin side surface at a chordal angle, whereby water flowing within the ducts exerts rotary force on the pin, said hole having a cross-sectional area of sufficient size that fluid in said chamber is essentially at atmospheric pressure, said hole having a cross-sectional area substantially greater than the combined cross-sectional area of the miniature flow ducts so that water is rapidly depressurized upon entering said chamber, whereby the water is separated into a large multiplicity of fine particles before reaching the hole in the end wall.



5,143,294
PLIANT CONTAINER FOR STORAGE OF A LIQUID AND LIQUID APPLICATION THEREFROM
Arnold M. Lintvedt, 6891 Central Ave., Lemon Grove, Calif. 91945
Filed Apr. 8, 1991, Ser. No. 681,790
Int. Cl.[5] B05B *11/00*
U.S. Cl. 239—328 **3 Claims**

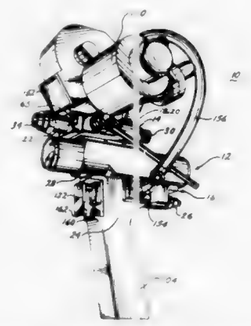
1. An improved liquid container for a spraying device for storage of the liquid for dispensing from the spraying device, said spraying device having a spray nozzle and a siphon or dip tube having a distal end for delivery of the liquid from the storage container to said nozzle comprising:
said improved container being pliant, having a sealable opening and sealing means for sealingly engaging said siphon or dip tube inserted into said opening with said distal end extending substantially to the opposite side of said improved container, said sealing means comprises a removable cap for said opening having a central aperture and a resilient frusto conic plug having a central aperture for insertion between said removable cap and said opening whereby said apertures are in alignment and said siphon or dip tube extends through said central apertures into said improved pliant container, means for translating said removable cap toward said opening, whereby when said removable cap is translated toward said opening said resilient plug is forced against said opening and said siphon or dip tube sealing said opening and said siphon or dip tube together.

5,143,295
BUBBLY WATER OUTLET DEVICE
Kenji Okayama; Yoshitaka Oba; Masahiko Imazono; Masatoshi Enoki; Masao Shimizu; Yoshiki Ohta; Koji Nakano; Eiji Matsuda; Osamu Tokunaga; Tomoaki Nakano; Hachihei Watanabe, and Toshihide Ushita, all of Fukuoka, Japan, assignors to Toto Ltd., Fukuoka, Japan
Filed Nov. 16, 1990, Ser. No. 614,905
Claims priority, application Japan, Nov. 21, 1989, 1-304491; Nov. 24, 1989, 1-305079
Int. Cl.[5] B05B *1/08, 1/18, 7/00*
U.S. Cl. 239—403 **24 Claims**



1. A bubbly water outlet device comprising:
a swirl chamber connected to a water supply source and being adapted to swirl a flow of water;
a bubbler chamber connected to said swirl chamber through a discharge port provided substantially at a center of said swirl chamber;
said bubbler chamber being provided with an air hole means for sucking in the air from the exterior by virtue of inflow of water from said discharge port, said bubbler chamber having a discharge end, said air hole means projecting from said discharge end of said bubbler chamber into said bubbler chamber.

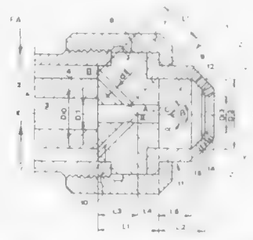
5,143,296
PNEUMATIC SPRAY GUN
A. G. Saurwein, Kent, and Ronald L. Rivers, Auburn, both of Wash., assignors to PMC, Inc., Sun Valley, Calif.
Filed Feb. 19, 1991, Ser. No. 657,562
Int. Cl.[5] B05B 7/04, 7/08, 7/12
U.S. Cl. 239—415 37 Claims



1. A spray gun for mixing a first fluid stream with a second fluid stream and discharging a mixed fluid stream comprising:
a hand-held housing;
a first valve disposed within the housing for controlling the flow of the first fluid stream through the housing, including a first valve passage having an inlet port and an outlet port that are positionable for fluid communication with a first fluid supply passage in the housing and a first fluid discharge passage in the housing, respectively, to open the first valve;
a second valve disposed within the housing for controlling the flow of the second fluid stream through the housing, including a second valve passage having an inlet port and an outlet port that are positionable for fluid communication with a second fluid supply passage in the housing and a second fluid discharge passage in the housing, respectively, to open the second valve;
means rigidly interconnecting the first and second valves for opening the first valve to start flow of the first fluid stream and for delayed opening of the second valve to start flow of the second fluid stream after flow of the first fluid stream has started, wherein the means for opening the first and second valves positions the first valve passage in fluid communication with the first fluid supply and discharge passages, followed by positioning of the second valve passage in fluid communication with the second fluid supply and discarged passages while the first valve passage remains in fluid communication with the first fluid supply and discharge passages; and
means disposed within the housing for mixing the first fluid stream and the second fluid stream to discharge a mixed fluid stream.

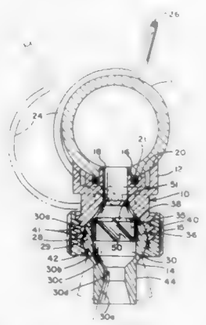
5,143,297
ATOMIZER FOR VISCOUS LIQUID FUELS
Gennaro De Michele, Pisa, and Mario Graziadio, Pontedera, both of Italy, assignors to Ente Nazionale Per L'Energia Electrica, Rome, Italy
Filed Mar. 22, 1991, Ser. No. 673,718
Claims priority, application Italy, Mar. 26, 1990, 9352 A/90
Int. Cl.[5] B05B 7/04
U.S. Cl. 239—427 6 Claims

1. Improved atomizer for viscous liquid fuels for use with a combustion chamber comprising a first mixer and a second mixer for mixing the fuel with an atomizing fluid supplied respectively by a central inlet and side inlets, said first mixer comprising a first mixing chamber into which said fuel and said fluid are fed respectively through said central and side inlets, said second mixer comprising a second mixing chamber aligned with said first mixing chamber along a longitudinal axis, to which premixed fuel and atomizing fluid are fed, and a plurality of outlets to inject the atomized fuel into the combustion chamber, said atomizer being characterized by the fact that said plurality of outlets from said second mixing chamber is formed by two rows of orifices arranged according to two



concentric circumferences angularly equidistanced and radially aligned, axes of said orifices converging in a common point located inside said second mixing chamber along said longitudinal axis, the angles α and β formed by said axes of two orifices symmetrical with respect to the longitudinal axis and belonging to said inner and outer circumferences respectively being such that $\alpha-\beta\geq 20°$.

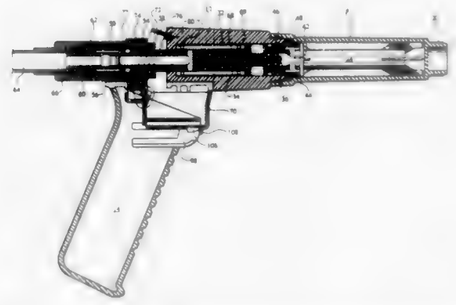
5,143,298
SPRAY NOZZLE ASSEMBLY WITH SWIVEL MOUNTED HOLLOW CONE SPRAY TIP
Alexander S. Prokopoff, Chicago, Ill., assignor to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany
Filed Oct. 31, 1990, Ser. No. 606,438
Int. Cl.[5] B05B 1/34, 15/08
U.S. Cl. 239—494 34 Claims



1. A spray nozzle assembly comprising
a body formed with a liquid flow passageway and a ball-shaped socket,
a nozzle tip having a fluid passageway for communication with said body passageway and a ball shaped mounting end for selected swivel positioning within said body socket,
means for retaining said nozzle tip in a selected swivel position in said body socket so that liquid directed through said body and tip passageways discharges from said tip in a predetermined direction with respect to said body,
a vane for imparting swirling movement to liquid directed through said tip whereby liquid discharging from said tip has a hollow cone spray pattern, said vane having a pair of liquid flow passageways communicating with said body and tip passageways, and said vane passageways each having a diameter of at least 0.22 the maximum diameter

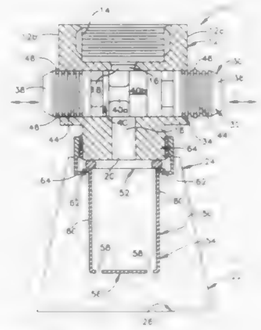
of the ball shaped mounting end of said tip and extending through said vane without the existence of an axial see-through condition so that all liquid passing through the vane is tangentially directed.

5,143,299
SPRAY GUN
Sergio G. Simonetti, Westport, Conn., and Sidney J. Goodman, Paramus, N.J., assignors to Melnor Industries, Inc., Moonachie, N.J.
Filed Mar. 26, 1991, Ser. No. 675,138
Int. Cl.[5] B05B 9/01
U.S. Cl. 239—526 22 Claims



1. A spray gun, for use primarily with a source of pressurized liquid provided through a supply hose, said spray gun comprising:
a body having first and second open end portions with an internal passageway extending therebetween;
hose connection means disposed longitudinally generally adjacent said first end portion of said body, suitable for receiving said supply hose;
a plunger, having an open end and a sealing end, slidably disposed within said passageway in said body and movable between open and closed positions,
said plunger having a longitudinal bore formed partially therethrough, said longitudinal bore extending between said open end and a generally central portion of said plunger,
said plunger including at least one radial bore extending through a wall thereof at said central portion, said radial bore providing fluid communication between said longitudinal bore and said internal passageway of said body,
said open end of said plunger extending rearwardly from said first open end portion of said body and secured to said hose connection means, whereby said supply hose is maintained in fluid communication with said longitudinal bore of said plunger, and
said sealing end of said plunger being configured to seal said second open end portion of said body when said plunger is in said closed position, thereby preventing the outward flow of said liquid through said second end portion, and allow the outward flow of said liquid when said plunger is in said open position;
handle means secured to said body for providing a gripping region by which the user can hold and aim said spray gun; and
operating means associated with said handle means for allowing the user to selectively move said plunger between said open and closed positions, a first portion of said operating means being configured for engagement with one or more of the user's fingers, and a second portion of said operating means being operative to longitudinally slide said plunger between said open and closed positions in response to movement of said first portion of said operating means.

5,143,300
SHOWERHEAD
William Cutler, 230 Rte. 206, Bldg. #2, Flanders, N.J. 07836
Filed Jul. 2, 1990, Ser. No. 547,051
Int. Cl.[5] B05B 1/18
U.S. Cl. 239—562 8 Claims

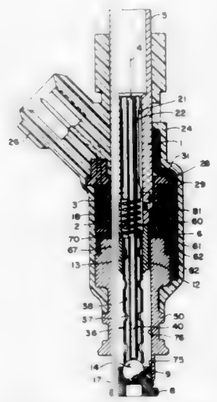


1. A showerhead comprising:
a) means for attaching said showerhead to a water supply;
b) a nozzle having an inner wall, and inlet end and an outlet end;
c) a one-piece and cylindrical cup-shaped member disposed in said nozzle and having a cylindrical-shaped wall spaced from the inner wall of said nozzle and having an open end in fluid communication with said water supply and another end having a circular disc section;
d) said disc section being closer to the outlet end of said nozzle than to the inlet end of said nozzle;
e) said disc section having spray-forming holes formed therein for producing a pulsating spray of water;
f) a water pressure regulator having a movable pin movable relative to said nozzle to a plurality of flow positions to restrict the flow of water as said pin is moved in one direction and to increase the flow of water as said pin is moved in the opposite direction;
g) said movable pin having means for selecting an presetting maximum and minimum flow positions; and
h) having cylindrical cup-shaped member having holed in said cylindrical wall.

5,143,301
ELECTROMAGNETICALLY ACTUABLE VALVE
Ferdinand Reiter, Markgroeningen, and Rudolf Babitzka, Kirchberg-Neuhof, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE90/00856, § 371 Date Aug. 19, 1991, § 102(e) Date Aug. 19, 1991, PCT Pub. No. WO91/10061, PCT Pub. Date Jul. 11, 1991
PCT Filed Nov. 10, 1990, Ser. No. 752,436
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942306
Int. Cl.[5] F16K 31/06; F02M 51/08
U.S. Cl. 239—585.4 24 Claims

1. An electromagnetically actuable valve for a fuel injection valve for fuel injection systems of mixture-compressing, spark-ignited combustion engines having a pipe-shaped core surrounded by a magnetic coil, the top end of said core being constructed as a fuel inlet connecting piece, an armature facing the core and a connecting pipe arranged concentrically with respect to the valve longitudinal axis and having a pipe wall which is connected at its one end to the armature and at its other end to a valve closing element that cooperates with a

fixed valve seat, as well as a stop device which limits the opening path of the valve closing element, the stop device is constructed as a stop rod (40, 45) which is arranged concentri-



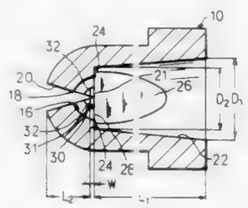
cally with respect to the valve longitudinal axis, said stop rod projects into the connecting pipe (36) and in the opening position of the valve touches the valve closing element (14, 44).

5,143,302

AIRLESS SPRAY NOZZLE

Hideo Sakuma, Hatano, Japan, assignor to Shimon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991 Ser. No. 655,073
Claims priority, application Japan, Feb. 15, 1990, 2-34194
Int. Cl.[5] B05B *1/04*
U.S. Cl. 239—599 4 Claims



1. An airless spray nozzle comprising:

a front nozzle section having a substantially hemi-spherical depression having an inner surface open to the rear and having a front portion with a transverse groove intersecting said depression to form a lenticular orifice-type injection port;

a rear nozzle section formed integral with said front nozzle section and provided therein with a through-hole in a manner to be coaxial with said depression and communicating with said depression;

a pair of steps arranged at the boundary between said through-hole of said rear nozzle section and said depression of said front nozzle section opposite to each other;

said steps each being arranged so as to extend in a radial direction outward of said depression, said radial direction being substantially perpendicular to a line defined by connecting both ends of said injection port;

a pair of main slants formed on the inner surface of said rear nozzle section defining said through-hole, said slants being opposite to each other and positioned on both ends of said orifice-type injection port

said main slants being arranged so as to slope forwardly toward the axis of said through-hole;

a pair of first auxiliary slants formed on said inner surface of said depression opposite to each other and contiguous to said main slants;

said first auxiliary slants each being slantingly arranged so as to slope forwardly toward the axis of said depression at an inclination angle different from that of said main slants; and

a pair of second auxiliary slants formed on said inner surface of said depression forward of said first auxiliary slants and contiguous thereto;

said second auxiliary slants each being slantingly arranged so as to slope forwardly toward the axis of said depression at an inclination angle larger than that of said first auxiliary slants;

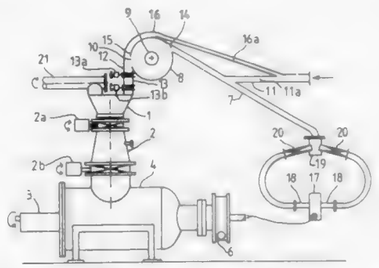
said groove having a bottom arranged in a manner to be aligned in proximity with the front end of each of said first auxiliary slants.

5,143,303

METHOD AND EQUIPMENT FOR PROCESSING OF PARTICULARLY FINELY DIVIDED MATERIAL

Jouko Niemi, Pirkkala, Finland, assignor to Oy Finnpulva AB, Pirkkala, Finland

Filed May 23, 1991, Ser. No. 689,852
Claims priority, application Finland, Nov. 28, 1988, 885525
Int. Cl.[5] B02C *19/06*
U.S. Cl. 241—5 13 Claims



1. A method for processing of particularly finely divided material, the method comprising:

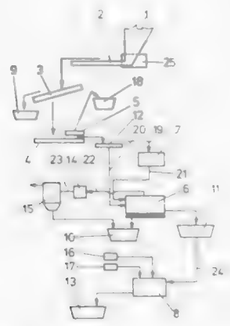
feeding the material, by means of a mechanical feeder device, into a pressurized equalization tank; feeding the material out of the equalization tank, by means of a screw conveyor, as a uniform flow into a fluidization chamber; mixing process gas with the uniform flow to produce a gas-solid suspension; accelerating the gas-solid suspension, by means of positive pressure prevailing in the fluidization chamber, through a bifurcation device, and through acceleration nozzles of a counter-jet-grinder grinding chamber, the counter-jet-grinder grinding chamber being connected to branch pipes of the bifurcation device, to grind solid particles to form a ground gas-solid suspension; passing the ground gas-solid suspension, produced in the grinding chamber, by an effect of an after-pressure of the grinding chamber, through a connection pipe into a centrifugal classifier; removing a fine fraction of the ground gas-solid suspension, the fine fraction being carried by a gas through a substantially axial opening; passing additional air, of lower pressure, into the connection pipe so as to lower the solids content in the gas-solid suspension for removing a coarse fraction of the ground gas-solid suspension from the centrifugal classifier through a removal opening in a peripheral face of the classifier into a pocket positioned outside the peripheral face; and removing the course fraction gathered in the pocket batchwise to normal atmospheric pressure through a closing device placed in a bottom of the pocket.

5,143,304

PROCESS AND DEVICE FOR PROCESSING RESIDUES FROM REFUSE INCINERATORS

Leo Schwyter, Sirnach, Switzerland, assignor to Leo Schwyter AG, Rikon im Tosstal, Switzerland

PCT No. PCT/CH89/00105, § 371 Date Oct. 1, 1990, § 102(e) Date Oct. 1, 1990, PCT Pub. No. WO89/12609, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 2, 1989, Ser. No. 499,362
Claims priority, application Switzerland, Jun. 16, 1988, 2316/88
Int. Cl.[5] B02C *21/00*
U.S. Cl. 241—19 16 Claims



1. A process for processing slag from a garbage and waste incinerator, the process comprising the steps of:

moving dry slag directly from the incinerator and without prior quenching;

after the dry slag leaves the incinerator, coarsely cleaning the dry slag by separating unburned coarse material and magnetic particles from the dry slag;

fractionating the dry and coarsely cleaned slag into two fractions, a toxic substances-containing fraction containing all of the particles that are smaller than 2 mm, and an product slag fraction containing particles larger than 2 mm; and

recovering said product slag fraction, said product slag fraction having levels of toxic substances sufficiently low to permit use of the product slag fraction in other processes

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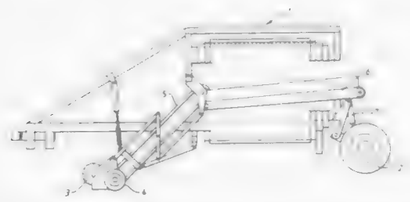
5,143,305

SOIL TREATMENT APPARATUS AND METHOD

Paul V. Dunham, and Russell D. Garrod, both of Soham, England, assignors to L.R.S. Limited, Soham, England

Filed Jun. 13, 1991, Ser. No. 713,371
Claims priority, application United Kingdom, Jun. 13, 1990, 9013229
Int. Cl.[5] B02C *4/08*
U.S. Cl. 241—24 10 Claims



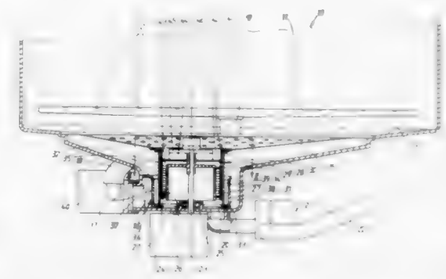
1. A soil treatment apparatus for removing therefrom particles within a predetermined size range, comprising a movable frame, means attached thereto to excavate soil as the frame is moved, first separation means to which the excavated soil passes and which allow material of less than a first predetermined size to pass through and which discard material of size greater than said first predetermined size, a second separation means adapted to retain material of size greater than a minimum of said predetermined size range and to discard material of size less than said minimum, storage means for said retained material and means to transfer said retained material to said storage means.

5,143,306

WASTE DISINTEGRATING DEVICE FOR A DISHWASHER

Nils S. Nilsson, Ödesbög, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 19, 1991, Ser. No. 687,987
Claims priority, application Sweden, Apr. 26, 1990, 9001501
Int. Cl.[5] B02C *23/00*
U.S. Cl. 241—46.012 11 Claims



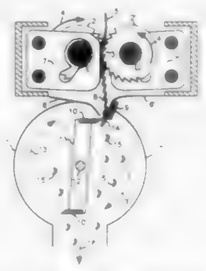
1. A device for a dishwasher comprising a tub (10) in which liquid by means of a circulation pump (17) and at least one rotating wash arm (11) is sprayed onto the dishes, collected at the bottom (13) of the tub and discharged by means of a drain pump (21), the bottom being provided with a collecting means (42) for waste dislodged from the dishes, the device further comprising a rotating and cutting means (44) driven independently of the circulation pump (17) and cooperating with the collecting means (42) for disintegrating the waste on the collecting means so that the disintegrated waste falls down into a container (43) which is in communication with the inlet of the drain pump (21).

5,143,307

SECONDARY CUTTER APPARATUS FOR PLASTIC SIZE REDUCTION EQUIPMENT

Lynn C. Lundquist, 10833 NE. Russell, Portland, Oreg. 97220

Filed Mar. 11, 1991, Ser. No. 667,677
Int. Cl.[5] B02C *18/08*
U.S. Cl. 241—60 17 Claims



1. An improved material handling and cutting mechanism

comprising: a primary rotating cutter assembly, having opposing counter-rotating cutters with mutually meshing cutter discs, and cutting means arranged about the periphery of the cutter discs which perform a primary cutting action which forms shreds of a predefined shape of the material being cut:

a secondary cutting section including a rotating cutting blade having an open rotor frame with opposed, spaced apart cutter knives carried thereon, which cooperates with a bed knife thereby forming a cutting point, for cutting shreds into chips of uniform size; and

a deflector to direct the shreds from the primary cutting section to said secondary cutting section, said deflector being constructed and arranged to maintain the shreds in the same orientation as in the primary cutting section, said deflector including a pair of spaced apart deflector plates which define a discharge point from the primary cutting section;

wherein said secondary cutting section is located such that shred exiting said discharge point of the primary cutting section is delivered in a substantially straight line to said cutting point.

5,143,308

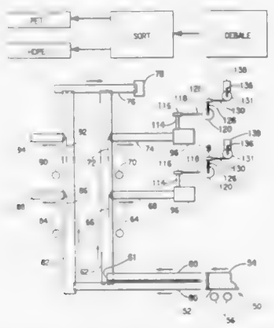
RECYCLING SYSTEM

Nazim S. Hally, Wilmington; Eric J. Koelsch, Newark, and Joseph M. Shields, Jr., Wilmington, all of Del., assignors to Plastic Recycling Alliance, LP, Chadds Ford, Pa.

Filed Mar. 26, 1991, Ser. No. 674,986

Int. Cl.[5] B03B *9/06*

U.S. Cl. 241—76 **16 Claims**



1. Apparatus for the recovery of at least uncolored PET, colored PET, uncolored HDPE, and colored HDPE from a compacted mass of post consumer plastic articles comprising crushed containers of uncolored PET, or colored PET, of uncolored HDPE, and of colored HDPE and at least two additional plastics selected from the group consisting of articles of polypropylene, polystyrene, and polyvinyl chloride, and at least three contaminants selected from the group consisting of paper, metal, glue, plastic film, dirt and residue from the contents of said containers, the association of said containers and contaminants in said compacted mass including both (i) a physical mixture thereof as in the case of a mixture of containers of different plastic identities and as in the case of containers being associated by coating with the residue of their contents and/or dirt, (ii) mechanical engagement between plastic containers or between plastic containers and said contaminants as in the case of screw-on bottle caps on containers and retaining rings for said caps, and (iii) adhesive engagement between plastic containers and contaminants caused by said glue as in the case of container labels and base cups for containers, whereby a plastic article in said engagement with a plastic container of different plastic identity is also a contaminant for said different plastic, said apparatus comprising

(a) means for breaking down the physical mixture of said crushed containers in said compacted mass into individual containers,

(b) means for conveying said individual containers and their associated contaminants along a path, including means for distributing said containers within said path so as to be separable from one another by sortation,

(c) means for sorting said containers of uncolored PET, colored PET, uncolored HDPE, and colored HDPE from one another and from the remainder of the broken-down compacted mass being conveyed by said conveying means, by selective removal of said containers of uncolored PET, colored PET, uncolored HDPE, and colored HDPE from said conveying means, said containers including their associated contaminants,

(d) means for collecting the remainder of said broken-down compacted mass after being subjected to said sorting means,

(e) means for separately granulating the sorted containers of uncolored PET, colored PET, uncolored HDPE, and colored HDPE to form flakes of said containers

(f) means for separating said contaminants from the flakes of said granulated articles, which contaminants become separable from said flakes as a result of being subjected to said granulating means,

(g) means for treating said flakes to remove the remaining contaminants therefrom, said treatment including wet processing so as to remove any dirt, residue of contents, and at least the glue present on said flakes, whereby the adhesively engaged contaminants become removable from said flakes,

(h) means for drying the resultant substantially pure flakes, and

(i) means for collecting the resultant substantiaily pure flakes of uncolored PET, colored PET, uncolored HDPE, and colored HDPE separate from one another so as to be available for recycling by melt fabrication.

5,143,309

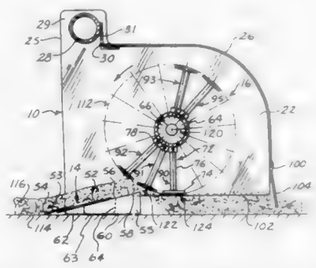
APPARATUS FOR CONDITIONING THE FLOOR OF A POULTRY REARING AREA

Edward F. Endom, P.O. Box 543, Ellisville, Miss. 39437

Division of Ser. No. 304,333, Sep. 21, 1981, Pat. No. 4,708,294. This application Oct. 23, 1987, Ser. No. 111,651

Int. Cl.[5] B02C *21/02*

U.S. Cl. 241—101.7 **1 Claim**



1. A poultry litter disintegrating machine comprising a housing which is substantially open at its forward side and bottom and being provided with end walls and at least a partly curved top wall, a rigid hitch structure on the housing adjacent to its forward side and oxtending above the top of the housing and being adapted for coupling with a tractor three point hitch, a transverse horizontal axis flail rotor within and journaled on the housing and extending between the housing end walls and carrying a multiplicity of pivoted flail hammers having litter chopping heads along its length, power drive means for the flail rotor including a drive component on one end wall of the housing, runners on the housing adapted to engage a poultry house floor during movement of the machine therealong, and a fixed somewhat inclined litter layer pre-cutting blade on the housing near its bottom and forward side and said runners and near the bottom of said flail rotor.

5,143,310

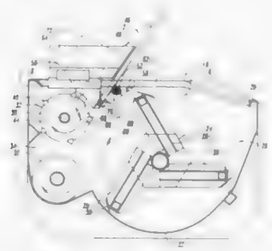
COMBINED HAY PROCESSOR AND FEED MIXER

Benjamin R. Neier, Dodge City, Kans., assignor to Roto-Mix Enterprises, Ltd., Dodge City, Kans.

Filed Feb. 8, 1991, Ser. No. 652,564

Int. Cl.[5] B02C *19/22*

U.S. Cl. 241—101.8 **20 Claims**



1. A combined hay processor and feed mixer comprising,

a chamber having upper and lower zones, opposite end walls,

opposite side walls, a bottom wall and an open top, mixing means in the lower zone of said chamber, a longitudinally extending hay chopper auger in the upper zone of said chamber, and

a hay feed system in the upper zone of said chamber above said hay chopper auger for channeling hay into said hay chopper auger.

5,143,311

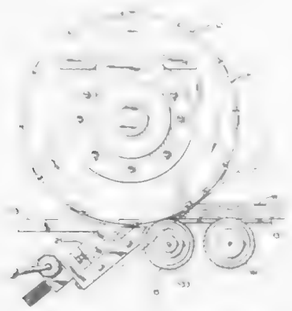
WOOD SHAVINGS FORMING APPARATUS AND CUTTING ROLL ADAPTED FOR USE THEREWITH

James E. Laster, Greensboro, N.C., assignor to Newman Machine Company, Inc., Greensboro, N.C.

Filed May 17, 1990, Ser. No. 525,148

Int. Cl.[5] B02C *18/22, 18/18*

U.S. Cl. 241—280 **22 Claims**



1. Apparatus for forming wood shavings from wood stock, comprising:

a rotatable cutting roll having a generally cylindrical peripheral surface, and a plurality of cutting elements projecting from said surface for engaging and cutting wood shavings from the leading edge portion of wood stock advanced along a predetermined path of travel to said roll, and

feed means adjacent said path of travel for controlling the advancement of the wood stock along said path of travel, said feed means including a first rotatable roll positioned closely adjacent said cutting roll and below said path of travel and substantially underlying said cutting roll and having peripheral teeth engagable with the wood stock advanced along said path of travel, said teeth being inclined rearwardly relative to the direction of rotation of said first roll such that said teeth have a negative rake angle in the range of 5° to 20° and wherein said first feed roll is positioned so that the resultant force vector of said cutting elements on the leading edge portion of wood stock advanced along the predetermined path of travel is in a direction toward said first feed roll.

5,143,312

MULTILAYER HOLLOW FIBER WOUND BODY

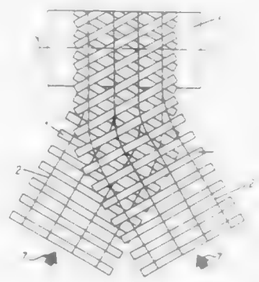
Ulrich Baurmeister, Wuppertal, Fed. Rep. of Germany, assignor to Akzo NV, Arnhem, Netherlands

Division of Ser. No. 166,458, Mar. 10, 1988, Pat. No. 4,940,617. This application Dec. 7, 1989, Ser. No. 447,417

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707584; Feb. 8, 1988, 3803693

Int. Cl.[5] B65H *81/00*

U.S. Cl. 242—7.020 **10 Claims**



1. A process for the production of a multilayer hollow fiber wound body comprising:

spirally winding around an axis of rotation at least two superposed hollow fiber mats wherein each of said hollow fiber mats includes hollow fibers and transverse fibers extending across said hollow fibers, said hollow fibers being attached to and held in place by said transverse fibers; the hollow fibers of adjacent mats being disposed in a mutually crossing manner before winding; the hollow fibers within each said mat being spaced from adjacent hollow fibers in the mat at a first regular distance, and the transverse fibers within each said mat being spaced from adjacent transverse fibers in the mat at a second regular distance, a ratio of the second regular distance between adjacent transverse fibers to the first regular distance between adjacent hollow fibers being in the range of 2 to 40; each pair of adjacent hollow fibers defining a parallelogram with each pair of adjacent transverse fibers; each of said hollow fibers in said mats extending substantially linearly in said mats without having any bent portions at least prior to winding; the hollow fibers of at least one of said mats extending in a direction which is non-parallel to said axis of rotation.

5,143,313

METHOD AND APPARATUS FOR WINDING YARN

Kenji Ohashi, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 383,365, Jul. 20, 1989, Pat. No. 5,044,571. This application Feb. 28, 1991, Ser. No. 662,632

Claims priority, application Japan, Jul. 27, 1988, 63-187720

Int. Cl.[5] B65H *54/38, 54/48*

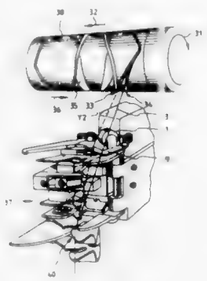
U.S. Cl. 242—18.1 **12 Claims**

1. A method of winding yarn on package, the yarn being

wound on the package defining a wind number, the method comprising the steps of:

providing a rotatable traverse drum for traversing the yarn in a first direction and a second direction,

winding yarn on the package using the rotatable traverse drum, and



selectively changing the wind number of the yarn from a first wind number in the first direction to a second wind number in the first direction as the drum rotates, the first wind number being different than the second wind number.

5,143,314

APPARATUS FOR WINDING AN INSULATION PLY

Osmo Soikkeli, Lappeenranta, Finland, assignor to Oy Partek Ab, Parainen, Finland

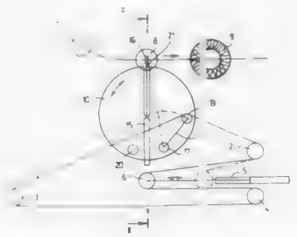
PCT No. PCT/FI89/00115, § 371 Date Feb. 13, 1991, § 102(e) Date Feb. 13, 1991, PCT Pub. No. WO89/12776, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 14, 1989, Ser. No. 623,803

Claims priority, application Finland, Jun. 23, 1988, 883043

Int. Cl.[5] B65H *18/00, 18/08, 20/24, 81/06*

U.S. Cl. 242—67.10 R **3 Claims**



1. Apparatus for winding a ply of an insulating material onto a core to form a chute, comprising:

first and second spaced apart support members, said support members being generally parallel to each other and supported for rotating movement about a common axis between a ready position and an operation position;

a moveable endless belt supported for movement along a path located between the support members;

core engaging means located adjacent the support members and moveable relative thereto for engaging empty cores and moving an empty core to a core winding position wherein the core is generally coaxial with said common axis, and for moving a wound core from the core winding position to a core discharge position; and

a roller mounted on the support members and moveable relative thereto, to engage the endless belt and to move the belt (i) to a position extending around the core in the winding position, wherein the belt guides the insulating material ply onto one of the cores to form a chute thereon, and (ii) away from the core in the winding position.

5,143,315

METHOD AND DEVICE FOR FORMING COILS OF METAL WIRE

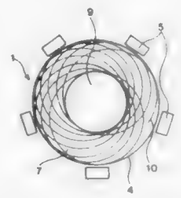
André Faessel; Claude Pochon, both of Metz; Jean-Pierre Mazzocco, Mexi, and Jean-Claude Valetti, Ugny, all of France, assignors to Unimetal, Metz, Cedex 1, France

Filed Jan. 22, 1991, Ser. No. 644,219

Claims priority, application France, Feb. 12, 1990, 90 01713

Int. Cl.[5] B21C *47/02*

U.S. Cl. 242—83 **19 Claims**



1. A method for forming a coil of magnetizable metal wire, comprising:

causing preformed turns of said wire to fall into a forming pit, said pit having a substantially cylindrical wall with a vertical axis, said turns of said wire being caused to fall into said pit so that said turns are superimposed on one another and form a coil, and

exerting on said turns during the fall of said turns into the forming pit a radial force of attraction that acts in a direction toward said cylindrical wall of said pit while causing said direction of said radial force of attraction to rotate about said vertical axis.

5,143,316

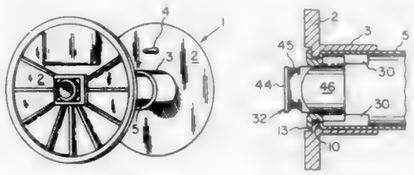
SPOOL ASSEMBLY

Charles R. Goetz, Carnegie, Pa., and Charles G. Goetz, New York, N.Y., assignors to Advanced Products Incorporated, Pittsburgh, Pa.

Filed May 9, 1990, Ser. No. 521,046

Int. Cl.[5] B65H *54/553, 75/14, 75/22*

U.S. Cl. 242—129.5 **12 Claims**



1. A spool assembly having an elongated spindle with an end portion at each end, resilient locking means formed on each end portion of said spindle, a pair of spaced end plates having an inner face, a centrally located opening formed in each of said end plates and locking means formed on the periphery of each of said openings adapted to cooperate with said resilient locking means on said end portions of said spindle, a hub extending from the inner face of each of said end plates adapted to receive an end portion of said spindle, each of said end portions of said spindle being located within a hub and said resilient locking means on said end portion engaged with said locking means on the periphery of one of said openings in one of said end plates and a moveable slide located within each of said end portions of said spindle, each of said slides adapted to move axially relative to said spindle whereby each of said slides is in the retracted position when said spool assembly is being loaded and may be moved to the extended position when said spool assembly is being unloaded, and a means on each of said slides adapted to be aligned with said resilient locking means formed on an end portion of said spindle when each of said slides is in a retracted position within one of said end portions of said spindle for providing sufficient clearance between the exterior of said means on said slide and said resilient locking means formed on the end of said spindle to permit the resilient locking means on each of said end portions of said spindle to move inwardly when said resilient locking means on each of said end portions of said spindle and the locking means formed on the periphery of each of said openings are engaged to interlock the spindle and the end plate.

5,143,317

TAPE CASSETTE WITH DUAL HUB LOCK TORSION SPRINGS

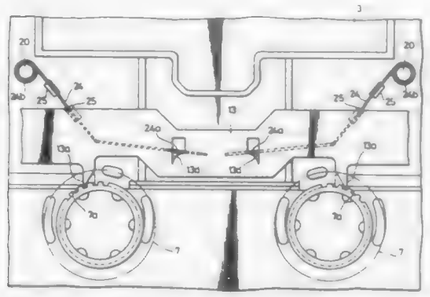
Masanobu Sugiyama, Miyagi, Japan, assignor to Sony Corporation, Shinagawa, Japan

Filed Dec. 11, 1990, Ser. No. 625,885

Claims priority, application Japan, Dec. 20, 1989, 1-330839

Int. Cl.[5] G11B *15/18, 15/22*

U.S. Cl. 242—199 **3 Claims**



1. A magnetic tape cassette having a cassette casing formed of upper and lower parts, reel hubs accommodated within said cassette casing and around which a magnetic tape is wound, a hub lock member for locking said reel hubs, a tape loading pocket portion formed on any one of said upper and lower parts, a slider for covering and uncovering reel shaft insertion apertures, a slider lock member provided on a part of said cassette casing through which said reel shaft insertion apertures are formed for locking said slider at an uncovering position and at a covering position and limiter pins for preventing said slider lock member from being deformed beyond a predetermined limit, said magnetic tape cassette comprising:

a left hub lock spring and an independent right hub lock spring, each for independently spring-biasing said hub lock member in a direction for locking said reel hubs from rotation, wherein each of said left and right hub lock springs comprises an elongate torsion spring having a coil spring formed on a first end of said elongate torsion spring, each of said coil spring portions being arranged around respective ones of said limiter pins, a second end of each of said elongate torsion springs opposite said first end being engaged with said hub lock member, and an intermediate portion of each of said elongate torsion springs located between said second end and said coil spring being engaged with and secured to a plurality of engagement supporting portions formed on one of said upper and lower parts.

5,143,318

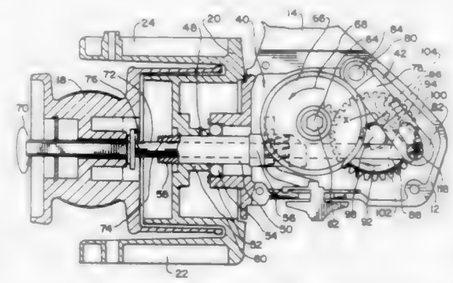
SPOOL OSCILLATION STRUCTURE FOR FISHING REEL

Steven M. Tipton, Tulsa, and Dennis E. Roberts, Owasso, both of Okla., assignors to Zebco Corporation, Tulsa, Okla.

Filed Jun. 18, 1990, Ser. No. 539,805

Int. Cl.[5] A01K *89/01*

U.S. Cl. 242—241 **11 Claims**



1. In a fishing reel of the type having a housing, a line carrying spool, a rotor mounted for rotation relative to the housing for directing line onto the spool, a rotatable crank handle for operating said rotor, and means for reciprocating/oscillating the spool along a line with respect to the housing as the crank handle and rotor are operated to direct line onto the spool, said reciprocating/oscillating means including a center shaft movable in a fore direction and an aft direction with respect to the housing for effecting reciprocating/oscillating movement of the spool, said reciprocating/oscillating means comprising:

said center shaft being movable through a cycle (a) in one of said fore and aft directions through a first part of said cycle and (b) in the other of said fore and aft directions through a second part of said cycle; and

said reciprocating/oscillating means including means for moving the center shaft at a first velocity through said first cycle part and at a second velocity through said second cycle part for a given rotational velocity of said crank handle,

said first and second velocities being different,

said reciprocating/oscillating means comprising an oscillating pivot arm having spaced first and second ends, first means for pivotably connecting the first end of the oscillating pivot arm to the housing for pivoting movement relative thereto about a first axis, second means for connecting the center shaft to the second end of the oscillating pivot arm and for causing the center shaft to move in said fore and aft directions in response to pivoting of the first end of the oscillating pivot arm in opposite directions about said first axis, and means for effecting said pivoting of the first end of the oscillating pivot arm about the first axis in response to rotation of the crank handle,

said means for effecting pivoting of the first end of the first oscillating pivot arm comprising a drive gear that is rotatably mounted about a fixed axis substantially parallel to the first axis, a first pin on the drive gear and a first slot in the oscillating pivot arm for reception of the first pin on the drive gear,

said first pin moving reciprocatively in the first slot as the pivot arm oscillates,

said reel including means for rotating the drive gear in response to rotation of the crank handle,

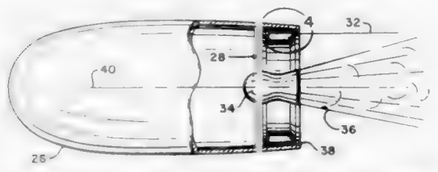
wherein said oscillating pivot arm is bifurcated to define first and second laterally overlapping legs defining a second slot therebetween and the center shaft has an extension which resides at least partially in the second slot between the first and second legs.

5,143,319

METHOD AND APPARATUS FOR DISPENSING AN OPTICAL FIBER FROM A POWERED MISSILE THROUGH THE MOTOR EXHAUST

George W. LeCompte, Tucson, Ariz. assignor to Hughes Aircraft Company, Los Angeles, Calif

Filed Feb. 1, 1991, Ser. No. 649,507
Int. Cl.[5] F41G 7/32
U.S. Cl. 244—3.12 4 Claims



1. A method of dispensing an optical fiber from within a missile of the type having a rocket motor generating an exhaust plume from an aft end of the missile comprising the following steps:

positioning a wound fiber pack within the aft end portion of the missile with the rocket motor encircled by the fiber pack, wherein said fiber pack includes an initial length of optical fiber within a protective jacket;

releasing optical fiber from the pack along a path intersecting a portion of the exhaust plume at a location radially spaced from a central axis of the plume, thereby significantly reducing the adverse affect of direct, prolonged contact between the exhaust plume and the optical fiber; and

applying a continuous braking force only to the initial, protected length of optical fiber after the optical fiber has separated from the wound fiber pack.

5,143,320

SPOILER TORQUE CONTROLLED SUPERSONIC MISSILE

Léon Boyadjian, Igny, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 12, 1990, Ser. No. 626,510
Claims priority, application France, Dec. 12, 1989, 89 16406
Int. Cl.[5] F42B 10/62
U.S. Cl. 244—3.21 30 Claims

1. Supersonic guided missile comprising a fuselage terminating in a front nose and in a rear base and provided externally with fixed aft planes and a torque inducing device comprising at a longitudinal distance from the center of gravity of said missile, at least one spoiler transversely mobile between a configuration retracted inside said fuselage and an active deployed configuration in which said spoiler projects laterally from said fuselage.

5,143,321

FOLDING PROTECTIVE COVER FOR TURBO-ENGINES

Thomas H. Jackson, 7939 Ridgegate West Dr., Indianapolis, Ind. 46268, assignor to Thomas H. Jackson, Indianapolis, Ind.

Filed Sep. 9, 1991, Ser. No. 756,349
Int. Cl.[5] B64D 33/00
U.S. Cl. 244—536 3 Claims

1. A folding protective cover for turbo-engines which is comprised of:

a generally circular ring shaped frame comprised of four generally planar arc shaped curved sections which describe approximately 90 degrees of arc each and are pivotally linked by three hinges affixed to the end portion of said arc shaped curved sections thereby providing means of folding said frame into a general arc shape which describes approximately 90 degrees of arc;

means for securely latching together the end portions of the two generally planar arc shaped curved sections of said generally circular ring shaped frame which are not affixed to a hinge;

means for permitting two of said hinges which pivot on an axes perpendicular to that of the pivotal axis of the hinge which is opposite of said latching means to rotate through a range of approximately 185 degrees;

a waterproof fabric material panel affixed across the center of said generally circular ring shaped frame;

a gasket composed of a resilient material affixed to the outer perimeter of said generally circular ring shaped frame;

a ribbon of fabric material having one end which is affixed to one section of said generally circular ring shaped frame in order to improve visibility and provide means of retaining the invention in the folded position;

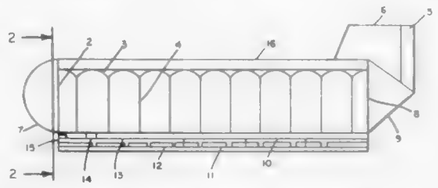
a plurality of handles affixed to said folding protective, cover for turbo-engines providing a means of grasping said folding cover.

5,143,322

GROUND HANDLING, ALTITUDE CONTROL AND LONGITUDINAL STABILITY OF AIRSHIPS

Earl W. Mason, 5460 White Oak Ave. A232, Encino, Calif. 91316

Continuation-in-part of Ser. No. 569,555, Aug. 20, 1990, abandoned, which is a continuation of Ser. No. 332,163, Apr. 3, 1989, abandoned. This application Jan. 14, 1991, Ser. No. 640,585
Int. Cl.[5] B64B 1/06
U.S. Cl. 244—96 6 Claims



1. A non-rigid pressurized airship comprising:

(a) a single gas cell extending substantially the full length of said airship,

(b) a pair of ballonets, each mounted adjacent said gas cell and extending along a respective side of said gas cell,

(c) an envelope enclosing said gas cell and said ballonets,

(d) a water ballast compartment suspended from said envelope,

(e) a cargo compartment suspended from said water ballast compartment,

(f) a least one engine mounted to drive said airship and

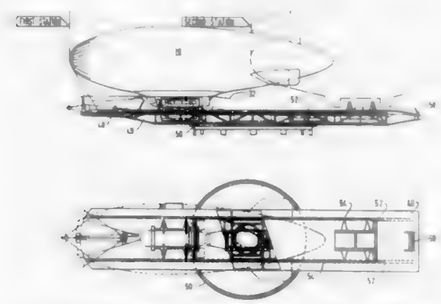
(g) a weighing means for measuring the weight of the cargo in said cargo compartment and the weight of water in said water ballast compartment to determine the lift required.

5,143,323

AIRSHIP HANDLING SYSTEM

Farouk Husain, 24a Aberdeen Road, London, England N5 2UH, and Edwin Mowforth, 20 Blackheath Grove, Wonnersh, Surrey, England GU5 0PU

Filed Jun. 18, 1990, Ser. No. 539,608
Claims priority, application United Kingdom, Jul. 28, 1986, 8618319
Int. Cl.[5] B64F 1/12
U.S. Cl. 244—116 11 Claims



1. An airship handling system on which an airship would be capable of alighting and exchanging a load module, and from which said airship would be capable of take-off, said airship being adapted to receive said module for an accommodation of passages or cargo, said airship handling system comprising:

a platform having an axis, said platform further including an arrester system arranged to engage said airship in order to bring said airship to rest on said platform in a shorter distance than would otherwise be normally practicable;

a circular track, as a first track, upon which said platform is mounted so that said platform is capable of being turned to align its axis with a direction of a wind;

an exchange point at which the passengers or cargo would be able to be loaded onto, and unloaded from, said load module independently of the position of said airship; and,

means for transferring said load module between said exchange point and said airship.

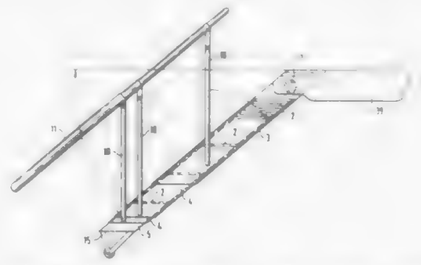
5,143,324

AIRCRAFT CABIN STAIRS

Gerd Cornelius, Hasloh, and Stefan Kroll, Hamburg, both of Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,709
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1990, 4026192
Int. Cl.[5] B64C 1/24; E06C 9/08
U.S. Cl. 244—129.6 13 Claims

1. Aircraft cabin stairs integrated in the aircraft fuselage for connecting the aircraft fuselage to a parking area surface, comprising a frame with steps, said frame comprising at least an end segment and a main segment each having side stringers which are connected in a telescoping manner to each other, and a number of the steps being slidably mounted in the region of the main segment such that the steps are free to slide in the direction of a longitudinal axis of the stairs so that the steps



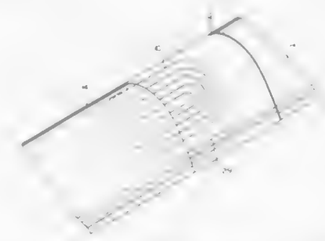
are equally oriented to each other in both a pushed together state and an extended state of the side stringers and only spacing of the steps changes, and so that planes of the steps maintain their orientation relative to the side stringers in both the pushed together and extended states

5,143,325

ELECTROMAGNETIC REPULSION SYSTEM FOR REMOVING CONTAMINANTS SUCH AS ICE FROM THE SURFACES OF AIRCRAFT AND OTHER OBJECTS

Peter B. Zieve, Seattle, and Samuel O. Smith, Woodinville, both of Wash., assignors to Electroimpact, Inc., Seattle, Wash.

Filed Jan. 3, 1991, Ser. No. 637,070
Int. Cl.[5] B64D 15/20
U.S. Cl. 244—134 D 18 Claims



1. An electromagnetic repulsion system for removing ice from aircraft having aircraft surfaces, comprising:

a relatively thin coil for electrically conducting material having two opposing surfaces, wherein the coil is located exteriorly of a selected aircraft surface;

a first, electrically conducting member in the vicinity of one surface of the coil, wherein eddy currents are induced in the first member upon the occurrence of a pulse of electrical current in the coil;

a second member in the vicinity of the other surface of the coil, wherein the second member is resistant to eddy currents being induced therein; and

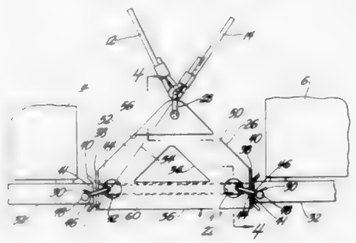
means for discharging a rapidly rising pulse of electrical current into the coil so as to cause eddy currents to be induced in the first member with resulting rapid repulsion between the first member and the coil, in turn resulting in the removal of ice from the aircraft in the vicinity of the coil.

5,143,326

VEHICLE AIR LIFT RIG

Jeffery S. Parks, Macomb, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1991, Ser. No. 740,527
Int. Cl.[5] B64D *3/00*; B66C *13/04*
U.S. Cl. 244—137.4 10 Claims



1. A rig for joining two payload items suspendable from an aircraft, the rig comprising:

two rig plates faced toward one another;

the rig plates defining engagement apertures and defining isthmus zones between the engagement apertures and opposed ends of the rig plates the isthmus zones each having a neck from which the isthmus zones diverge;

swingable means disposed at each of the opposed ends for connecting the rig plates to the payload items, the swingable means having movable members pivotably connected to the payload items;

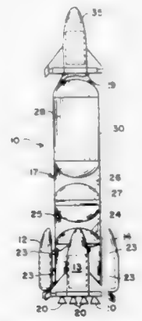
wherein intermediate segments of the movable members travel along diverging portions of the isthmus zones as the rig plates rise, thereby drawing the payload items into contact with the opposed ends of the rig plates.

5,143,327

INTEGRATED LAUNCH AND EMERGENCY VEHICLE SYSTEM

James A. Martin, Gloucester, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1990, Ser. No. 575,737
Int. Cl.[5] B64G *1/40*
U.S. Cl. 244—158 R 11 Claims



1. A heavy launch vehicle for placing a payload into a spatial orbit about the Earth comprising:

an elongated expendable propellant tank;

a plurality of propulsion modules releasably attached to and circumferentially disposed around the exterior surface of one end of said expendable tank;

a payload releasably attached to the end of said expendable tank opposite to said propulsion modules;

said elongated expendable propellant tank having multiple internal, individual, propellant tanks disposed in tandem relationship therein;

each of said plurality of propulsion modules including a pair of rocket engines;

thrust connection structure disposed between said expendable tank and said engines and serving to releasably secure said engines in operative thrust position; and

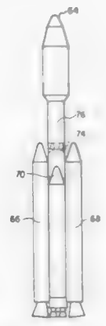
propellant lines extending from said expendable tank through said thrust connection structure to each of said rocket engines, said rocket engines being supplied with propellant exclusively from said expendable propellant tank.

5,143,328

LAUNCH VEHICLE WITH RECONFIGURABLE INTERSTAGE PROPELLANT MANIFOLDING AND SOLID ROCKET BOOSTERS

Byron P. Leonard, 13700 Tahiti Way, Marina Del Rey, Calif. 90292

Continuation-in-part of Ser. No. 417,278, Oct. 5, 1989, Pat. No. 5,129,602, and Ser. No. 417,736, Oct. 5, 1989, Pat. No. 5,141,181. This application Jan. 30, 1990, Ser. No. 472,096
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] B64G *1/00, 1/40*
U.S. Cl. 244—158 R 28 Claims



1. A launch vehicle comprising:

a first stage including at least one solid rocket motor;

a second stage having first propellant tanks and a first liquid propellant burning rocket engine;

a third stage, configured so as to burn in parallel with said first and second stages, having a second propellant tank and a second liquid propellant burning rocket engine;

means for transferring liquid propellant between said second stage and said third stage; and

means for reconfiguring the liquid propellant transferring means in response to detection of a non-nominal condition in the form of a benign failure condition in said second or third stage.

5,143,329

GAS TURBINE ENGINE POWERED AIRCRAFT ENVIRONMENTAL CONTROL SYSTEM AND BOUNDARY LAYER BLEED

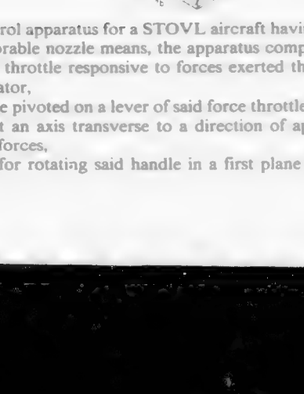
George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 531,718, Jun. 1, 1990. This application Aug. 1, 1991, Ser. No. 738,985
Int. Cl.[5] B64C *21/06*
U.S. Cl. 244—209 7 Claims

1. An environmental control system and aircraft boundary layer bleed system apparatus powered by an aircraft propulsive gas turbine engine, said apparatus comprising:

a bleed air means to bleed compressor bleed air from a compressor stage of the gas turbine engine,

a starting air turbine in fluid supply communication with said bleed air means effective for extracting energy from the bleed air supplied by said bleed air means and converting the extracted energy to useful work,



a work transmission means operably connected to said starting air turbine effective to return the work from said air turbine to the engine, a first bleed duct in fluid supply communication with said energy extraction and work conversion means to supply bleed air exhaust from said air turbine to a means for conditioning cabin air for an aircraft, and

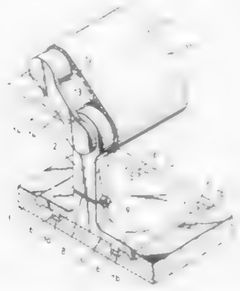
at least one means for bleeding boundary layer air form the surface of the aircraft.

5,143,330

CONTROL APPARATUS

Arthur Kaye, Warton, Great Britain, assignor to British Aerospace Public Limited Company, London, England

Filed Mar. 20, 1991, Ser. No. 672,312
Claims priority, application United Kingdom, Apr. 17, 1990, 9008526
Int. Cl.[5] B64C *13/04*
U.S. Cl. 244—234 4 Claims



1. Control apparatus for a STOVL aircraft having an engine and vectorable nozzle means, the apparatus comprising:

a force throttle responsive to forces exerted thereon by an operator,

a handle pivoted on a lever of said force throttle for rotation about an axis transverse to a direction of application of said forces,

means for rotating said handle in a first plane to predetermined angular positions dependent on said forces and effective in use to provide first control signals to remotely located means for controlling engine thrust the magnitude of which is indicated by said predetermined angular positions, and

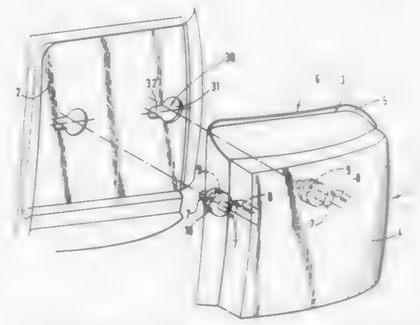
means for pivoting said lever in a second plane generally orthogonal to said first plane and effective in use to provide second control signals to remotely located means for controlling the orientation of said vectoring means between a horizontal position for normal flight and a vertical position for take-off, landing or hovering flights.

5,143,331

ARRANGEMENT AND PROCEDURE FOR AUTOMATICALLY MOUNTING A UNIT OF EQUIPMENT ON A SUPPORT, FOR EXAMPLE A LIGHTING AND/OR INDICATING LAMP UNIT ON A MOTOR VEHICLE

Francois Robert, Pont, France, assignor to Valeo Vision, Bobigny, France

Filed Jun. 7, 1991, Ser. No. 711,858
Claims priority, application France, Jun. 8, 1990, 90 07129
Int. Cl.[5] G12B *9/00*
U.S. Cl. 248—27.1 9 Claims



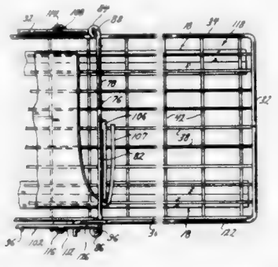
1. An arrangement comprising a support and a unit of equipment removably mounted on the support, the support defining a support wall and the arrangement further including fastening means for removably securing the said unit to the support wall, the said fastening means comprising at least one combination of elements wherein each said combination includes a mounting hole formed through the support wall, a mounting pin carried by the said unit for extending removably through the said mounting hole, and retaining means adapted to engage on the mounting pin and to bear against the support wall so as to secure the mounting pin and therefore the said unit to the support wall, and wherein, in the or each said fastening means:

(a) the mounting hole comprises a first part having transverse dimensions such as to enable the said retaining means to pass freely through it, and a second part laterally extending the said first part, the dimensions of the second part being smaller than those of the said retaining means whereby to retain the latter in the said second part of the hole;

(b) the retaining means comprise a retaining ring having a peripheral groove defining a pair of generally transverse flanks and a middle zone separating the said flanks, the transverse dimension of the said flanks being inferior to those of the said second hole part and the longitudinal extent of the said groove being at least equal to that of the corresponding thickness of the support wall, and wherein the said retaining means further comprises a locking means carried by the retaining ring and releasably engaging the said mounting pin, whereby the said generally transverse flanks are adapted to engage on either side of

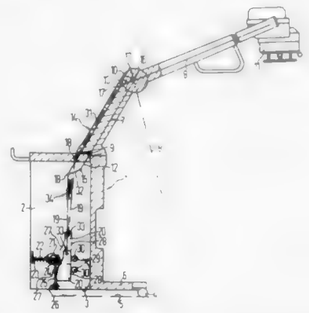
the support wall so as to retain the retaining ring in both longitudinal directions.

5,143,332
SLIDING RECEPTACLE FOR SUPPORTING AN OPENED BAG AND STORING FOLDED BAGS
Charles Camilleri, St. Louis, Mo., assignor to Lee/Rowan Company, St. Louis, Mo.
Filed Apr. 11, 1991, Ser. No. 683,843
Int. Cl.[5] A47H 77/00
U.S. Cl. 248—95 19 Claims



1. A sliding support and storage apparatus for bags, the apparatus being slidable longitudinally fore and aft relative to a base, the apparatus comprising:
receptacle means including a first means for supporting an opened bag on the receptacle means, and a second means for storing at least one folded bag on the receptacle means; and
support means for supporting the receptacle means on a base,
the support means includes a first sliding support means and a second sliding support means, the first sliding support means is secured to an underside of the receptacle means and the second sliding support means is securable to the base to keep stationary relative to the base, the first sliding support means engages the second sliding support means secured stationary to the base to mount the first sliding support means for sliding movement on the second sliding support means and thereby mount the receptacle means for sliding movement on the base,
the first sliding support means engages the second sliding support means secured stationary to the base to mount the first sliding support means for pivoting movement on the second sliding support means and relative to the second sliding support means, and thereby mount the receptacle means for pivoting movement relative to the base;
the first sliding support means includes at least one rail secured to the receptacle means, the rail extends longitudinally and has a lateral side, and the second sliding support means includes at least one track securable to the base, the track engages the lateral side of the rail to mount the rail for sliding movement on the track; and,
the rail has opposite fore and aft ends and has fore and aft stops secured to the fore and aft rail ends, respectively; and,
the track has opposite fore and aft ends, the fore stop of the rail engages the fore end of the track to stop rearward sliding movement of the rail on the track and the aft stop of the rail engages the aft end of the track to stop forward sliding movement of the rail on the track.

5,143,333
WEIGHT COUNTERBALANCE MEANS
Hans-Erik Warden, Upplands, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Aug. 22, 1990, Ser. No. 570,901
Claims priority, application Sweden, Aug. 25, 1989, 89028310
Int. Cl.[5] F16L 3/00
U.S. Cl. 248—123.1 12 Claims



1. A weight counterbalancing means for an x-ray apparatus articulating arm having first and second arm members, one end of the first arm member being hingedly secured to the x-ray apparatus and operative to rotate about a first horizontal axis and the other end of the first arm member being hingedly connected via a second horizontal axis to one end of the second arm member at whose other end an apparatus is secured, each arm member being provided with a lever member that is part of a parallelogram system whose connecting nodes comprise in part an end of the lever arm of the first arm member not connected in the first arm member; in part the hinged connection between the first and second arm member; and in part an end of the lever arm of the second arm member not connected to the second arm member, only a remaining connecting node of the parallelogram system being directly subject to a vertically directed constant force that counterbalances the articulating arm around the first, horizontal axis so that the articulating arm is held in equilibrium in every position, the vertically directed constant force being exerted by a counterbalance that is hingedly connected to the remaining connecting nodes such that the counterbalance in every position of the arm members is directed downward, the vertically directed constant force being provided in part by a weight that is secured to the remaining connecting node, the weight secured to the remaining connecting node being a wedge shape member with at least one sloped surface and whose movement is restricted to a vertical direction, a spring providing a biasing force against the sloped surface of the wedge-shaped member such that a vertically directed sub-force that serves in part as the constant force arises, and the lever members having a length such that the force that counterbalances the articulating arm is constant independently of the position of the articulating arm.

5,143,334
LOW MOVING MASS TWO AXIS GIMBAL
Freeman D. Sardou, Fullerton, and Robert S. Chandler, Jr., Phillips Ranch, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed May 21, 1990, Ser. No. 703,645
Int. Cl.[5] F16M 11/12
U.S. Cl. 248—184 4 Claims

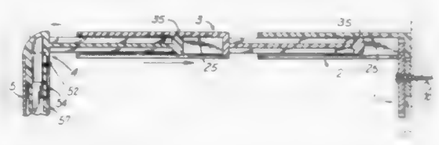
1. A machine comprising:
(a) a drive gimbal having a drive ring, an axis, and a support;
(b) a payload gimbal having a payload ring;
(c) a plurality of push rods, each push rod having a drive end and a payload end, the drive end being attached to the drive gimbal ring by a drive universal joint, and the payload end being attached to the payload gimbal ring by a payload universal joint;
(d) a first motor mounted on the support and connected for rotating the axis with respect to the support;

(e) a second motor mounted on the axis and connected for rotating the drive ring with respect to the axis.

5,143,335
HANDLE SUPPORT ASSEMBLY
Gail B. Frankel, Dallas, Tex., assignor to Kel-Gan Inc., Dallas, Tex.
Continuation of Ser. No. 460,860, Jan. 31, 1990, Pat. No. 5,020,755. This application Jun. 3, 1991, Ser. No. 709,716
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] E04G 3/00
U.S. Cl. 248—215 11 Claims

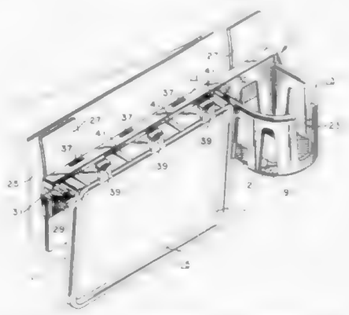
1. A support assembly system for use wih a generally cylindrical horizontal bar, shaft, or handle, comprising:
a body portion;
an end portion extending upwardly from said body portion, said end portion circumferentially and frictionally gripping said generally cylindrical horizontal bar, shaft, or handle; and
means for removably mounting a generally cylindrical receptacle to said body portion, said generally cylindrical receptacle extending downwardly from said body portion.

5,143,336
CURTAIN ROD MOUNTING ASSEMBLY
Dannie L. McMichael, West Kingston, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.
Filed Nov. 26, 1990, Ser. No. 618,107
Int. Cl.[5] A47H 15/00
U.S. Cl. 248—265 5 Claims



1. A curtain rod mounting assembly comprising:
a mounting clip for mounting to a window frame or wall;
a hollow base member having means for connecting to said mounting clip and being disposed for receiving a valance extender therein and having a serrated or dimpled portion along one inside surface of said base member;
a valance extender having means for slidably engaging with said base member and having means for cooperating with said serrated or dimpled portion of said base member for adjustably and precisely positioning said valance extender in said base member and further having a serrated or dimpled portion along one inside surface of said valance extender; and
a curtain rod bracket having means for cooperating with said serrated or dimpled portion of said valance extender for adjustably and precisely positioning said curtain rod bracket in said valance extender.

5,143,337
FOOD SERVER DEVICE
Max J. Tomayko, Jr., 130 Riverermont Ct., Cheswick, Pa. 15024, and Robert A. Germain, 5126 Chestnut Hill Dr., Ashtabula, Ohio 44004
Filed May 25, 1990, Ser. No. 529,143
Int. Cl.[5] A47G 29/02
U.S. Cl. 248—311.2 7 Claims



1. A food serving device adapted to be mounted on a support surface, comprising:
a frame and mounting means for detachably mounting said frame to said support surface;
a tray operable between a horizontal in-use position and a vertical storage position, said tray including a plurality of cam-like bumpers positioned to engage said frame when said tray is in said in-use position;
locking tabs on said tray vertically engageable in complementary locking slots in said frame in the in-use position;
means mounting said tray to said frame operable to permit

pivoting and translation movement relative to said frame during movement of said tray between in-use and storage positions whereby when said tray is pivoted to an in-use position, the locking tabs engage in said slots by gravity to lock said tray in said in-use position; and

said cam-like bumpers are vertically oriented when said tray is in said in-use position and taper upwardly with the thinnest portion of said cam-like bumpers being at the top when said tray is in said in-use position.

5,143,338

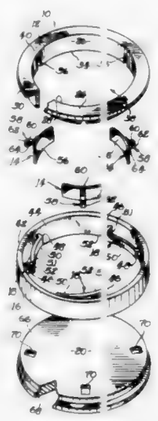
HOLDING DEVICE

Philip C. Eberlin, Chicago Heights, Ill., assignor to Woodwork Restoration, Inc., Chicago Heights, Ill.

Filed Jul. 30, 1991, Ser. No. 737,674

Int. Cl.[5] A47B 1/08

U.S. Cl. 248—313 **11 Claims**



1. A holding device useful for holding a plurality of objects in a plurality of positions comprising: a top, an actuable body, and a base; the top having a depending portion defining a holding aperture; the top being connected to the base at the depending portion; the actuable body being disposed about the depending portion; adjustable holding elements disposed within the holding aperture; and means for shifting the adjustable holding elements between an extended and a retracted position upon actuation of the actuable body.

5,143,339

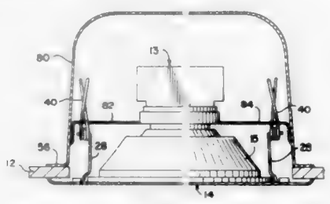
SPEAKER MOUNTING ASSEMBLY

Daniel W. Ashcraft, Torrance, and Steve G. Romeo, Los Angeles, both of Calif., assignors to JBL, Incorporated, Northridge, Calif.

Filed Mar. 1, 1991, Ser. No. 663,151

Int. Cl.[5] B42C 13/00

U.S. Cl. 248—343 **19 Claims**



1. An assembly including a speaker, a ceiling or wall, and means for supporting the speaker on the ceiling or wall comprising a baffle associated with said speaker, said baffle having a grille face exposed on the exterior of said ceiling or wall and an opposed interior face, brackets supported on said interior face, inwardly extending frame clips connected to said brackets, springs connected to at least some of said clips, a support structure located in spaced relationship with said interior face, openings defined by said support structure for receiving said springs, said springs each including spring arms adapted to engage opposite side edges of said openings, said arms being urged apart and thereby urging said interior face toward said support structure, said interior face being adapted to be pulled away from said support structure in opposition to the action of said spring arms to permit access to said speaker, and including a protective can mounted around said speaker and support structure, said support structure including means for attachment of said can.

5,143,340

LOAD SUPPORT

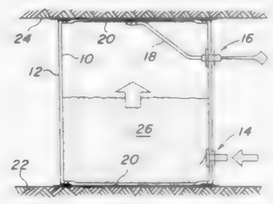
Richard R. Wood, Johannesburg; Norman J. Cook, and John R. Thorpe, both of Natal, all of South Africa, assignors to Fosroc International Limited, Birmingham, Great Britain

Continuation of Ser. No. 530,670, May 30, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 824,689

Claims priority, application South Africa, May 30, 1989, 89/4085

Int. Cl.[5] E21D 15/00

U.S. Cl. 248—354.2 **10 Claims**



1. A method of providing a load support between a floor and a roof of a structure, the method comprising: placing a container having an inflatable water impervious bag with an interior compartment in a space between the floor and the roof, the container having both an inflet valve and a pressure relief outlet valve communicating with the interior compartment, the valves being spaced apart and in use arranged with the outlet valve uppermost; locating the container at a desired location for providing the load support; introducing a gas via the inlet valve into the interior compartment until gas escapes through the pressure relief outlet valve to fully expand the container free of any support to its side walls toward the floor and the roof; supplying a settable material into the water impervious bag of said container via the inlet valve while allowing the gas to escape via the outlet valve until the container contains sufficient settable material under pressure to support the roof relative to the floor, said water impervious bag allowing the material to set therein without allowing leakage of liquid therefrom.

5,143,341

RESILIENT KEYBOARD REST AND LAP ADAPTER

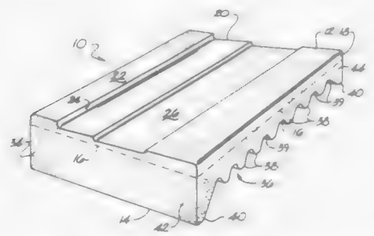
Robert W. Juster, 55 Valley View, Chappaqua, N.Y. 10514

Filed Jul. 30, 1990, Ser. No. 559,897

Int. Cl.[5] A47B 97/04

U.S. Cl. 248—444 **15 Claims**

1. A device for use with a computer keyboard or similar article to reduce physical stress on a user of such keyboard, said device comprising a main body of foamed resilient material having an upper support surface with a first area adapted for receiving and supporting a computer keyboard or the like at a predetermined angle relative to the user, and with a second area adjacent said first area and situated generally along an edge of said main body, said second area being adapted for resilient engagement with the palms and wrists of a user operating a computer keyboard received on said first area, so that a user's physical stress of interacting with such keyboard is reduced for the prevention of repetitive motion injuries and cumulative trauma disorders; wherein said second area is generally raised relative to the adjacent portion of said first area, and said first area is inclined towards the base of said second area for collectively forming therewith stop means for maintaining the position of a keyboard received on said upper



support surface, said main body is generally rectangular, said device further includes lap adapter means, operatively forming a lower support surface of said main body, for supporting said device on the lap of a user; and further wherein said lap adapter means comprises foamed resilient material having a lower engagement surface adapted for engagement with a user's lap and integrally defining therein traction means for limiting movement of said device laterally relative to the user's lap, said traction means comprising a row of a plurality of ribs of resilient material with channels defined therebetween.

5,143,342

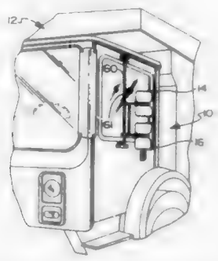
VIBRATION DAMPENED DUAL MIRROR APPARATUS FOR A VEHICLE

Franklin D. Hutchinson, 28000 Bell, New Boston, Mich. 48164, and William Schmidt, 21000 Woodruff, Rockwood, Mich. 48173

Filed Apr. 15, 1991, Ser. No. 685,138

Int. Cl.[5] A47G 1/24

U.S. Cl. 248—476 **5 Claims**



1. A vibration dampened dual mirror apparatus for a vehicle comprising:

(a) first and second spaced apart mirror assemblies, each having a visual reflective surface on at least one side thereof;

(b) means for supporting each mirror assembly comprising:

(1) a support arm for each mirror assembly, each arm having a first leg and a second leg, the second leg removably attached to an associated mirror assembly;

(2) a clamping bracket for each support arm removably attached to the first leg;

(c) means for attaching each mirror assembly to the support arm comprising:

(1) a cover for covering the support arm; and

(2) means for fastening the cover to the mirror body;

(d) means for dampening vibrations to the mirror assemblies comprising:

(1) a vertically extended elongated rod having a first flanged end and a second flanged end, the first flanged end being connectable to the first mirror assembly arm and associated clamping bracket, the second flange end being connectable to the second mirror assembly support arm and associated clamping bracket;

(e) means for mounting the dampening apparatus to the surface of a vehicle comprising:

(1) a mounting bar extending substantially parallel to the mounting surface having an upper end, a middle section and a lower end, the upper and lower ends removably attached to the vehicle, the middle section removably attached to the first mirror assembly support arm and their associated clamping brackets; and

(2) a means for attaching the first and second end of the mounting bar to the vehicle.

5,143,343

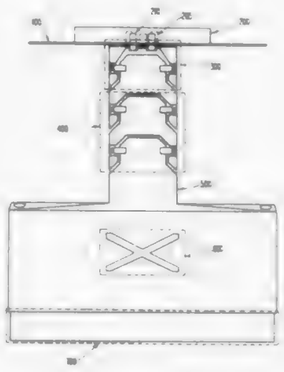
AUTOMOBILE RADIO SECURITY SYSTEM

Daniel P. Katz, 132 Cornell Rd., Bala Cynwyd, Pa. 19004

Filed Jan. 9, 1990, Ser. No. 462,267

Int. Cl.[5] F16M 13/00

U.S. Cl. 248—551 **24 Claims**



1. A secure mounting enclosure for an electronic device, adapted to be fixed in place by attachment to a structural member of a vehicle or similar structure, and to provide a completely surrounding enclosure for said device, said enclosure having a wall capable of being opened to provide access to said device and; wherein said enclosure is secured to said structural member by at least a mating pair of male and female locking elements, one of said elements being securely affixed to said structural member, and the other of said elements being securely affixed to said enclosure.

5,143,344

APPARATUS FOR MANUFACTURING PRECAST CONCRETE ARTICLES

David L. Johnson, and Robert A. Johnson, both of Bonita Springs, Fla., assignors to Johnson Brothers Precision Precast Products, Inc, Bonita Springs, Fla.

Division of Ser. No. 227,689, Aug. 3, 1988, Pat. No. 5,096,648. This application Nov. 26, 1991, Ser. No. 798,614

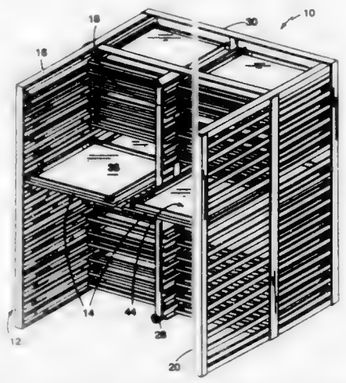
Int. Cl.[5] B28B 1/14, 7/26

U.S. Cl. 249—120 **7 Claims**

1. A system for molding precast concrete articles comprising:

a) a rack comprising a first vertical wall member including a

first set of generally horizontal, spaced apart rails, and a second vertical wall member opposing said first wall member and including a second set of generally horizontal, spaced apart rails corresponding to said first set of



rails, said first and second wall members having first and second constant widths, respectively, said second width being less than said first width; and

b) a tray containing one or more precast concrete article molds slidably mounted on said rails.

5,143,345

TWO-WAY ELECTROMAGNETIC VALVE

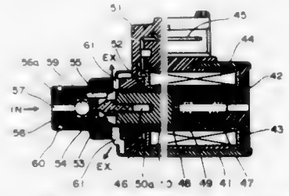
Nobuaki Miki, Kariya; Kiyohiko Sugiura, Hekinan; Takeshi Nasu; Masayuki Sugiura, both of Anjo, and Masao Saito, Nishio, all of Japan, assignors to Aisin Aw Co., Ltd., Japan

Filed Dec. 28, 1990, Ser. No. 633,450

Claims priority, application Japan, Dec. 28, 1989, 1-338192

Int. Cl.[5] F16K *31/06*

U.S. Cl. 251—129.02 **4 Claims**



4. A two-way electromagnetic valve comprising: an electromagnetic operator comprising:

an electromagnetic coil defining a central axial opening;

means for supplying current to the coil to energize the coil;

a core provided in the central axial opening for supporting the coil;

a sleeve extending at least part way into the central axial opening and mounted around the core;

a yoke fitted around one end of the sleeve; and

a plunger provided slidably within the sleeve for reciprocating axial motion responsive to the energization of the coil; and

a valve portion providing a valve seat and comprising:

an inlet port;

an outlet port;

an outer valve body having an axial recess, and having said inlet port formed therein, in fluid communication with said recess;

an inner valve body closing said recess and having an axial bore, opening to said recess, for receiving said plunger; and

a ball mounted in said recess between said outer valve body and said inner valve body for engagement by said plunger by forward movement of said plunger, responsive to deenergization of said coil, and disengagement from said plunger by rearward movement of said plunger, whereby said ball seats and unseats from said valve seat thereby opening said inlet port for fluid flow in through said inlet port and out through said outlet port.

5,143,346

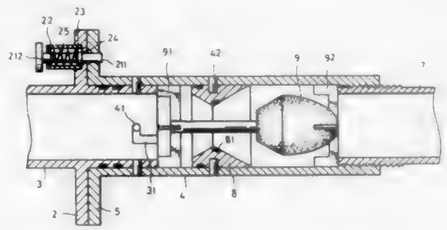
QUICK RELEASE WATER FAUCET JOINT

Kun-Yang Chen, 9-1, Lane 161, Hsing An Road Sec. 1, Taichung, Taiwan

Filed Sep. 24, 1991, Ser. No. 763,910

Int. Cl.[5] F16L *37/28*

U.S. Cl. 251—149.5 **5 Claims**



1. A quick release faucet joint comprising:

a first flanged portion provided over the rear ingress of a faucet head;

a generally cylindrical coupling sleeve provided on the rear of said first flanged portion and in communication with the water ingress of said faucet head;

at least two roughly L-shaped locking grooves formed on the periphery of the terminal end of said coupling sleeve at predetermined radial positions thereon;

a coupling ferrule having a second flanged portion provided on the front thereof and a rear portion thereof adapted for coupling to a water outlet pipe;

at least two locking pins provided in said coupling ferrule at predetermined positions therein, each said locking pin protruding radially inwards from the inner periphery of said coupling ferrule and adapted for engaging a said locking groove in said coupling sleeve;

a positioning means for preventing the further rotation of said coupling sleeve relative to said coupling ferrule when said coupling sleeve is positioned within said coupling ferrule and said locking grooves are engaged with said locking pins;

wherein, said locking grooves can be engaged with selected said locking pins by inserting said coupling sleeve into said coupling ferrule so that each said locking pin slides into a corresponding said locking groove, and rotating said coupling sleeve in a predetermined direction so that said locking pin abuts an inner terminal end of said locking groove.

5,143,347

REVOLVABLE QUICK COUPLING

Yeong D. Lee, and Yeong H. Lee, both of 2F, No. 29, Lane 89, Hsin Sheng Street, Pan Chiao City, Taipei Hsien, Taiwan

Filed Jan. 14, 1992, Ser. No. 820,387

Int. Cl.[5] F16L *37/28*

U.S. Cl. 251—149.6 **1 Claim**

1. A revolvable quick coupling for connecting two air pipes together, the improvement comprising:

an intermediate connecting member, said intermediate connecting member having a through hole through a central axis thereof;

a rear socket mounted on said intermediate connecting member at one end, said rear socket having a plurality of rolling balls on an annular groove thereof at the inside;

a rotary ring revolvably set inside said rear socket and supported on said rolling balls;

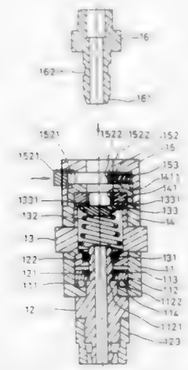
a first air pipe connector connected, to an air compressor by an air pipe, said first air pipe connector having a unitary stepped tube at one end inserted through said rear socket and said rotary ring, said stepped tube having a first annular groove rising behind a second annular groove, said first annular groove being secured to said rotary ring by a C-shaped retainer ring;

a seal ring mounted on said second annular groove to seal up the gap between said first air pipe connector and said rear socket;

a first spring means received in the through hole inside said intermediate connecting member and supported on said first air pipe connector;

a stepped metal element received in the through hole inside said intermediate connecting member and supported on said first spring means, said stepped metal element having an air hole on a peripheral wall thereof;

an inner socket mounted on said intermediate connecting member at an opposite end thereof;



a rubber ring received inside said inner socket and mounted on said stepped metal element to seal up said air hole;

a front socket mounted on said inner socket, said front socket having a pivot hole on a peripheral wall thereof;

a retainer positionally located and slidable within a groove formed within said front socket and supported on a second spring means, said retainer having an oval hole through a body thereof and a stub rod at one end extended out of the pivot hole on said front socket;

a second air pipe connector for connecting said first air pipe connector to a pneumatic tool, said second air pipe connector having an annular groove on a tapered end thereof inserted through said front socket and retained within said oval hole; and

wherein inserting said second air pipe connector into said front socket causes said air hole on said stepped metal element to be released from said seal ring for passing a flow of compressed air; pressing on said stub rod causes said second air pipe connector to be released from the constraint of said oval hole on said retainer permitting said second air pipe connector to be removed from said front socket; rotating the pneumatic tool which is connected to said second air pipe connector causes said second air pipe connector to rotate on said first air pipe connector.

5,143,348

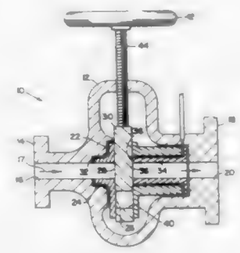
EASY-OPENING, HIGH PRESSURE GATE VALVE

Dwight Baker; James C. Baker, both of P.O. Box 249, Rush Springs, Okla. 73082; Randall King, 525 Allen, Duncan, Okla. 73533, and Elton W. Eads, Rt. 1 Box 76E, Ninnekah, Okla. 73067

Filed Aug. 23, 1991, Ser. No. 749,275

Int. Cl.[5] F16K *3/18*

U.S. Cl. 251—158 **26 Claims**



1. A valve seat assembly for a gate valve, said assembly comprising:

a) a seat member having an annular cross section and including a first transverse end face defining a valve seat and a second transverse end face spaced from the first end face along a longitudinal axis of the seat member;

b) a gate lifter member for lifting and spacing a gate valve gate from a valve seat, the lifter member positioned adjacent to and slidable relative to the seat member in a direction parallel with the seat member longitudinal axis, the lifter member including a first transverse end adjacent the valve seat and defining a guide surface adapted to contact a planar surface of a gate of a gate valve, the guide surface adapted to be substantially coplanar with the valve seat in an initial position of the seat member and lifter member, and a second transverse end spaced from the first transverse end so that fluid pressure imposed upon the second transverse end of the lifter member shifts the lifter member relative to the seat member so that the guide surface of the lifter member urges a gate valve gate away from the valve seat.

5,143,349

VALVE WITH FLOW SHIELD

Harald Körfgen, Fröndenberg; Heinz Hirsch, Soest, and Vinzenz Grendel, Hemer, all of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Sep. 10, 1990, Ser. No. 580,939

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930083

Int. Cl.[5] F16K *3/02*

U.S. Cl. 251—314 **10 Claims**

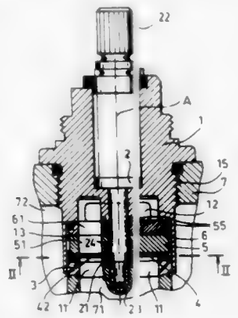
1. A flow-control valve comprising:

a housing;

a valve plate fixed in the housing and formed relative to a direction of flow through the valve with a flat upstream face and with an outlet port opening at the face;

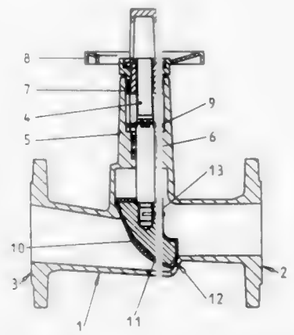
a control plate fixed in the housing and formed relative to the flow direction with a flat downstream face riding on the valve-plate face and with a throughgoing inlet port opening at the face, the control plate being slidable on the valve plate for alignment of the ports and flow through the valve from the inlet port to the outlet port and for misalignment of the ports for restricted flow from the inlet port to the outlet port; and

a shield plate fixed in the housing immediately upstream of the control plate and formed with an aperture aligned in



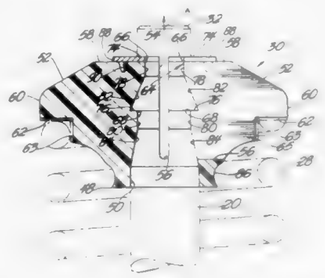
the direction with and of generally the same shape as the port of the valve plate.

5,143,350
GATE VALVE
Alois Illy, Limburgerhof, and Heinz-Jürgen Ruckert, Grossniedesheim, both of Fed. Rep. of Germany, assignors to KSB Aktiengesellschaft, Frankenthal/Pfalz, Fed. Rep. of Germany
PCT No. PCT/EP90/00067, § 371 Date Jul. 22, 1991, § 102(e) Date Jul. 22, 1991, PCT Pub. No. WO90/08276, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 12, 1990, Ser. No. 730,863
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1989, 3901695.1
Int. Cl.[5] F16K 3/00
U.S. Cl. 251—326 12 Claims



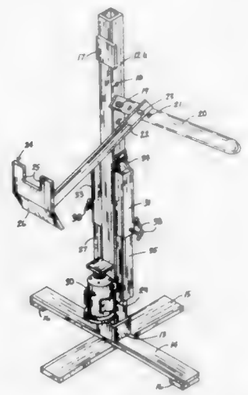
1. A valve, comprising a one-piece housing which defines a chamber and a flow path intersecting said chamber and having a section to one side of the chamber, said chamber being provided with a first non-circular sealing surface; and a valving element insertable into and withdrawable from said chamber through said flow path and having a second non-circular sealing surface which is substantially complementary to said first sealing surface, said valving element being movable in said chamber between a first position in which said second sealing surface engages said first sealing surface to obstruct said flow path and a second position in which said second sealing surface defines a clearance with said first sealing surface, said section of said flow path having a first maximum dimension as considered in planes normal to said flow path, and said second sealing surface delimiting a region having a second maximum dimension greater than said first maximum dimension.

5,143,351
SELF-LOCKING VALVE SPRING RETAINER
Daniel H. Pierce, 1330 Lyonhurst Rd., Birmingham, Mich. 48009
Filed Aug. 29, 1991, Ser. No. 751,735
Int. Cl.[5] F01L 3/10
U.S. Cl. 251—337 15 Claims



8. A self-locking valve spring retainer (30) for operatively retaining a return spring (28) on the stem (20) of a poppet valve (16), said retainer (30) comprising:
a central axis (A);
an annular base ring (48) having a substantially cylindrical inner periphery defining an axially extending stem passage (50) for surrounding the valve stem (20);
a plurality of arms (52) extending in cantilever fashion axially from said base ring (48) and surrounding said stem passage (50) for flexing outwardly from said base ring (48) as said retainer (30) is pressed over the end of the valve stem (20) to an operative position;
and characterized by two axially spaced locking steps (66, 68) projecting radially inwardly from each of said arms (52) for automatically engaging and interlocking with two mating projections (70, 72) on the valve stem (20) to decrease the concentration of shear stresses within said retainer (30).

5,143,352
SNOWMOBILE LIFT APPARATUS
Donald R. Latimer, 1714 Pine La., Delta Junction, Ak. 99737
Filed Jun. 21, 1990, Ser. No. 541,320
Int. Cl.[5] B66F 3/00
U.S. Cl. 254—131 2 Claims



1. A lifting apparatus comprising in combination,

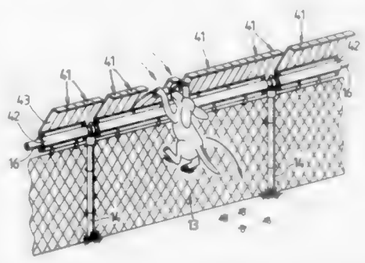
an elongate longitudinally aligned support post, the support post including an upper terminal end and a lower terminal end, and
a base member, the base member including a socket, the socket complementarily receiving the lower terminal end of the support post selectively therewithin, the socket integrally and orthogonally mounted to a top surface of a top support leg, and
the top support leg pivotally mounting a bottom support leg underlying the top support leg with a top support leg pivot axle directed medially through the bottom support leg and a top support leg, and
the support post including a series of aligned axle apertures directed orthogonally through a side surface of the support post, and
a first link including a first link pivot axle wherein the first link pivot axle is selectively receivable within one of the series of axle apertures, and
the first link pivot axle orthogonally and integrally mounted adjacent a forward terminal end of the first link, and
a second link pivotally mounted to the first link adjacent a rear terminal end of the second link, and
the second link including a bifurcated lift plate integrally mounted to a forward end of the second link, and
wherein the top support leg includes a support boss integrally mounted to a bottom surface of the top support leg adjacent each terminal end of the top support leg, and each support boss defining a predetermined length therebetween, and the predetermined length substantially equal to or greater than a further predetermined length defined by the bottom support leg to permit reception and alignment of the bottom support leg to the top support leg between each support boss, and
wherein the first link includes a series of first link apertures, and the second link includes a second link pivot axle selectively receivable within one of the first link apertures to pivotally mount the second link relative to the first link with the second link pivot axle integrally and orthogonally mounted to the second link adjacent the rear terminal end of the second link, and
wherein the bifurcated lift plate includes a bottom plate fixedly mounted orthogonally to the forward terminal end of the second link and a top plate integrally mounted at an obtuse angle to the bottom plate to direct the top plate rearwardly of the bottom plate with a plurality of spaced legs defined by the top plate with the spaced legs mounted to a top portion of the top plate spaced from the bottom plate, and
including an abutment plate mounted to the support post adjacent the upper terminal end of the support post, and
including a "U" shaped spring clip fixedly mounted to a forward surface of the support post underlying the abutment plate and spaced above the bottom terminal end of the support post, and a lifting jack selectively securable within the "U" shaped spring clip to permit selective removal of the lifting jack relative to the support post.

5,143,353
METHOD FOR LAYING OPTICAL FIBER UNIT AND APPARATUS THEREFOR
Hiroaki Sano; Yoshiaki Terasawa, and Shigeru Tanaka, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Feb. 22, 1991, Ser. No. 658,868
Claims priority, application Japan, Feb. 28, 1990, 2-48512
Int. Cl.[5] B63B 35/04
U.S. Cl. 254—134.3 FT 7 Claims

1. A method for laying an optical fiber unit through a duct line comprising the steps of:
drawing said optical fiber unit from a feeding reel through a guide tube and a pressure-sending device into a duct line by a driving device;
directing a gas under pressure from said pressure-sending device into said duct line co-current with the advancing direction of said optical fiber unit; and

directing a gas under pressure from said pressure-sending device into said guide tube counter-current from the advancing direction of said optical fiber unit.

5,143,354
ANIMAL RETENTIVE FENCE ATTACHMENT
McEdward M. Nolan, 3420 Far Hill Cir., Birmingham, Ala. 35243
Filed Aug. 29, 1991, Ser. No. 751,504
Int. Cl.[5] E04H 17/00
U.S. Cl. 256—12 6 Claims



1. Apparatus for preventing an animal from transversing a fence at the top thereof comprising:
(a) means for providing a region of instability proximal said top of said fence comprising a plurality of flexible members extending upwardly and outwardly from said fence with each one of said plurality of flexible members in lateral abutting relationship with at least one adjacent flexible member to form a substantially continuous row of said flexible members along the top of said fence; and
(b) means for rigidly affixing said plurality of flexible members to said fence such that each of said plurality of flexible members is prevented from rotation about a horizontal axis.

5,143,355

APPARATUS FOR MANUFACTURING OXYGEN-FREE COPPER

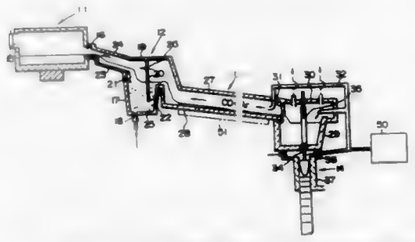
Takuro Iwamura; Tsugio Koya, both of Omiya; Izumi Sukekawa, Tokyo; Hideru Hagiwara, Tokyo; Haruhiko Asao, Tokyo; Toshiaki Shigematsu, Tokyo, and Hideki Sato, Osaka, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Division of Ser. No. 439,936, Nov. 2, 1989, Pat. No. 5,037,471. This application Jun. 5, 1990, Ser. No. 710,813

Claims priority, application Japan, Nov. 21, 1988, 63-294179

Int. Cl.[5] C22B 9/05

U.S. Cl. 266—160 14 Claims



1. An apparatus for manufacturing an oxygen-free copper comprising:

a deoxidizing device for blowing a reducing gas containing hydrogen gas into a molten copper to react with oxygen dissolved in the molten copper to remove the same;

a melting furnace connected to said deoxidizing device for melting a copper material to produce said molten copper;

a dehydrogenating device connected to said deoxidizing device for exposing the molten copper treated in said deoxidizing device to an ambient gas comprised of a gas with a low hydrogen partial pressure to remove hydrogen dissolved in the molten copper; and

a continuous casting machine for casting the molten copper thus dehydrogenated.

5,143,356

SINTERING MACHINE

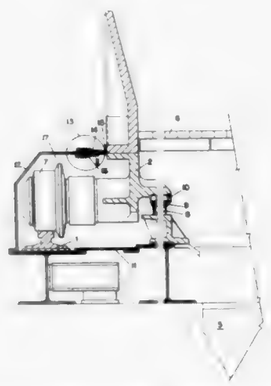
Hubertus A. J. Wittebrood, Neerlangowaard, Netherlands, assignor to Hoogovens Groep BV, Ijmuiden, Netherlands

Filed Jun. 13, 1991, Ser. No. 714,831

Claims priority, application Netherlands, Jun. 19, 1990, 9001386

Int. Cl.[5] C21B 7/16

U.S. Cl. 266—179 6 Claims



1. A sintering machine having a plurality of grate cars arranged in a train and containing grates for supporting material to be sintered, longitudinally extending support means along which said train of grate cars travels in a travel path, a plurality of suction boxes arranged beneath said travel path of the grate cars, suction means connected to said suction boxes to create a partial vacuum beneath said grates, and sealing means for sealing the suction boxes to said grate cars, said sealing means comprising, at at least one side of said grate cars, a casing structure enclosing said support means for the grate cars and being provided with at least one flexible air seal to said grate cars to restrict exterior air flow into said casing structure, said great cars having wheels running on said support means, and at at least one of its longitudinal ends, said casing structure being provided with blocking means for restricting longitudinal air flow, said blocking means including a passage along which said wheels pass, said passage being shaped to conform to the shape of the wheels so as to restrict air flow along said passage.

5,143,357

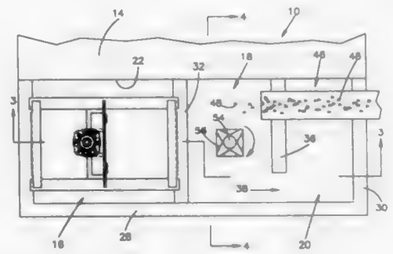
MELTING METAL PARTICLES AND DISPERSING GAS WITH VANED IMPELLER

Ronald E. Gilbert, Chardon, and George S. Mordue, Ravenna, both of Ohio, assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Nov. 19, 1990, Ser. No. 614,914

Int. Cl.[5] C21C 7/00

U.S. Cl. 266—235 17 Claims



1. Apparatus for melting metal particles in a bath of molten metal, comprising:

an impeller, the impeller including a rectangular prism having upper and lower faces, four sidewalls, a width (A), a depth (B), and a height (C), with (A) being approximately equal to (B), the impeller defining a hub on the upper face, the impeller further including a plurality of vanes projecting radially outwardly of the hub, the vanes being disposed on the upper face, the impeller being immersible in the bath of molten metal; and

an elongate, rotatable shaft rigidly connected to the impeller and projecting from the upper face, the shaft projecting from the upper surface of the bath.

5,143,358

FLUID-FILLED MOUNTING DEVICE

Masayuki Hibi, Komaki; Yoshiki Funahashi, Iwakura, and Katsuhiro Goto, Komaki, all of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

PCT No. PCT/JP89/00565, § 371 Date Jan. 30, 1990, § 102(e) Date Jan. 30, 1990, PCT Pub. No. WO89/12184, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 6, 1989, Ser. No. 460,071

Claims priority, application Japan, Jun. 6, 1988, 63-138770; Dec. 7, 1988, 63-309115

Int. Cl.[5] F16M 1/00

U.S. Cl. 267—140.13 9 Claims

1. A fluid-filled mounting device comprising:

a first and second support member which are disposed so as to be spaced apart from each other by a predetermined distance in a load-receiving direction in which a vibrational load is applied, said first and second support members being attached to respective members which are connected by the mounting device in a vibration damping or isolating manner;

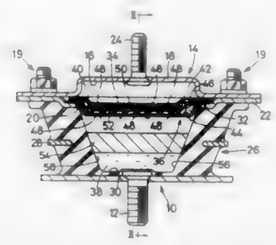
an elastic rubber body interposed between said first and second support members, for elastically connecting the first and second support members to each other;

a pressure-receiving chamber and a variable-volume equilibrium chamber provided between said first and second support members, such that a partition wall extending in a direction substantially perpendicular to said load-receiving direction is disposed between said pressure-receiving and equilibrium chambers, said pressure-receiving chamber being disposed on the side of said first support member for receiving vibrations to be damped or isolated, while said equilibrium chamber being disposed on the side of said second support member, at least a part of said equilibrium chamber being constituted by a flexible diaphragm;

a predetermined non-compressible fluid filling said pressure-receiving chamber and said equilibrium chamber;

an orifice passage for connecting said pressure-receiving chamber and said equilibrium chamber with each other, so as to permit the fluid to flow between the pressure-receiving and equilibrium chambers;

a block-shaped movable member which is freely movable accommodated within said pressure-receiving chamber and divides the pressure-receiving chamber into two sections, said block-shaped movable member having a pair of



end surfaces opposite to each other in said load-receiving direction, one end surface disposed toward the partition wall and the other end surface disposed away from the partition wall, and a side surface connecting between said end surfaces, said side surface cooperating with an inner wall of the pressure-receiving chamber to define a resonance portion having a predetermined space through which the non-compressible fluid flows between said two sections of the pressure-receiving chamber upon application of the vibrational load to the mounting device, said movable member being biased to move in a direction away from the partition wall when the mounting device is in an operative position; and

support means provided between said movable member and the inner wall of said pressure-receiving chamber, for preventing the end surface of the movable member disposed away from the partition wall from contacting the inner wall of the pressure-receiving chamber in said load-receiving direction, said support means including opposite portions of an inner wall of said elastic rubber body which face each other in at least one direction perpendicular to said load-receiving direction, said opposite portions being tapered such that a distance between the opposite tapered portions gradually decreases in said direction away from the partition wall, said movable member having a configuration whose length is smaller than a maximum value of said distance between said opposite tapered portions and larger than a minimum value of said distance, the movable member biased in said direction away from the partition wall being supported by said opposite tapered portions in abutting contact therewith.

5,143,359

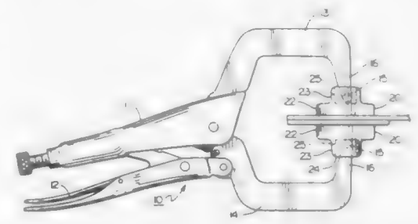
SWIVEL CLAMP GUARD

Matthew A. Bush, 244 Wynnfield Dr., Syracuse, N.Y. 13214

Filed May 13, 1991, Ser. No. 699,369

Int. Cl.[5] B25B 1/00

U.S. Cl. 269—6 10 Claims



1. A protective gripping member for a gripping clamp of the type that has at least one generally C-shaped or L-shaped jaw having a jaw arm with lateral protuberances at its distal tip, the gripping member removably fitting onto said distal tip and pivoting about a transverse axis formed by said protuberances, the gripping member comprising a block of a synthetic resin material having a distal gripping surface and a slot with an opening at a proximal side of the block to receive said distal tip of the jaw arm, the slot being provided with recess means formed as disposed internal recesses on opposite side walls thereof to receive said lateral protuberances, such that said gripping member is installed by placing it onto said distal tip with the latter in the slot and then rotating the gripping member to lodge said recesses onto said protuberances.

5,143,360

APPARATUS FOR VERTICAL ADJUSTMENT OF A CLAMPING DEVICE

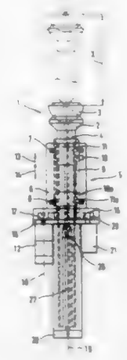
Enno Wilken, and Helmut Eickhorst, both of Varel, Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Bremen, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 717,971

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1990, 4019936

Int. Cl.[5] B25B 11/00

U.S. Cl. 269—21 4 Claims



1. An improved apparatus for height adjustment of a clamping element of a negative pressure clamping arrangement,

upon which large area workpieces, such as metal sheeting, are retained for purposes of caching, the improvement comprising:

a base member;

means for adjustably maintaining the height of the clamping element on the base member, said adjustably supporting means including a bearing sleeve held in the base member by two roller bearings axially spaced from each other, two ball screw-spindle nuts retained in the bearing sleeve approximately in the plane of the roller bearings, a spindle, a guide tube surrounding the spindle, and an adjustment spring fastened in the guide tube and engaging the spindle so as to act as a torque blocker, the spindle being supported in the bearing sleeve by said ball screw-spindle nuts so as to be adjustable in height and axially displaceable in the surrounding guide tube via the torque blocker adjustment spring, the clamping element being fastened on an end of the spindle opposite the adjustment spring; and

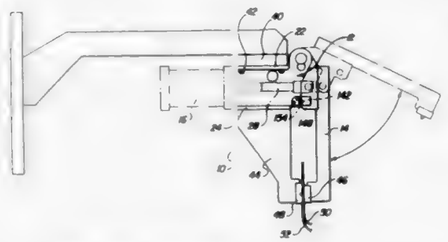
means for rotating the bearing sleeve, including a drive motor, a first pinion connected to the drive motor, and a gear wheel circumferentially connected with the bearing sleeve and meshing with the first pinion of the drive motor.

5,143,361

POWER CLAMP

Jeffrey S. McNamara, Rochester Hills, and Kosta Dimefski, Warren, both of Mich., assignors to Peninsular, Inc., Roseville, Mich.

Continuation of Ser. No. 496,142, Mar. 19, 1990, Pat. No. 5,046,706. This application Jul. 12, 1991, Ser. No. 729,354
Int. Cl.[5] B25Q *3/08*
U.S. Cl. 269—32 18 Claims



1. A power clamp comprising

a clamp head housing;

a reciprocating actuating cylinder having a piston rod with a major axis said cylinder coupled with said clamp head housing;

movable clamp arm means for clamping a workpiece; and

means coupled between the piston rod and the clamp arm for pivoting the arm to a release position when the rod is extended from the cylinder with said means pivoting the arm to a clamping position for clamping the workpiece; and

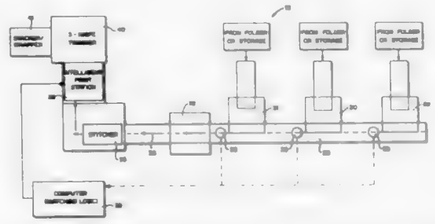
said means being defined by three, rotational only pivotal connections, said means including an outer pivoting link having one end pivotally connected at a first pivotal connection to a stationary member, and an intermediate link having one end pivotally connected at a second pivotal connection to another portion of the outer link which moves with the piston rod, with another end of the intermediate link being pivotally connected at a third pivotal connection to the piston rod and said intermediate link moving in a direction along the major axis and said first and second pivots located on a bottom surface of said clamping arm with said second pivot located between said first pivot and the workpiece.

5,143,362

PUBLICATION PERSONALIZATION

I. Gerald Doane, and Franklin L. Burket, both of Grand Island, N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jul. 15, 1991, Ser. No. 729,724
Int. Cl.[5] B41F *13/54*
U.S. Cl. 270—1.1 25 Claims



1. A method of forming a book, having a cover adapted to receive address information, from a plurality of signatures, comprising the steps of automatically:

(a) printing at least one personalized signature with variable, detectable, personalized printing;

(b) assembling the personalized signature with at least one other signature;

(c) detecting the detectable personalized printing on the personalized signature; and

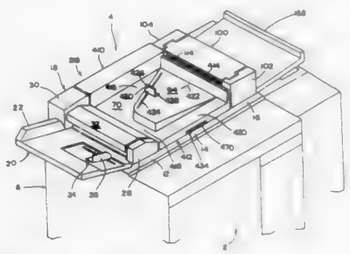
(d) in response to (c), printing address information on the cover.

5,143,363

AUTOMATIC DOCUMENT CONVEYING DEVICE

Yoichiro Irie, Suita; Yoshiyuki Takeda; Tsuyoshi Nagao, both of Osaka, and Yasuhiko Kida, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Osaki, Japan

Filed Nov. 16, 1990, Ser. No. 614,199
Claims priority, application Japan, Nov. 28, 1989, 1-306686
Int. Cl.[5] B65H *5/22*
U.S. Cl. 271—6 8 Claims



1. An automatic document conveying device for an image processor having a housing with a transparent plate disposed on the upper surface thereof for placement thereon of a document to be processed, said conveying device comprising:

a document introduction portion including an introduction portion frame member disposed on the upstream side of the transparent plate, a document table extending in the upstream direction from said introduction portion frame member, means defining a document introduction passage within said introduction portion frame member and extending from said document table toward the transparent plate, document sending means mounted on said introduction portion frame member for sending a plurality of documents from said document table one by one into said document introduction passage, document introduction

means mounted on said introduction portion frame member for introducing onto said transparent plate a document that has been sent into said document introduction passage, and an introduction portion drive source mounted on said introduction portion frame member for driving said document sending means and said document introduction means;

a main portion including a movable main portion frame member mounted for pivoting between a closed position covering said transparent plate and an open position in which said transparent plate is exposed to view, document conveying means mounted on said main portion frame member for conveying a document along said transparent plate when said main portion frame member is in the closed position, and a main portion drive source mounted on said main portion frame member for driving said document conveying means; and

a document delivery portion including a delivery portion frame member disposed on the downstream side of the transparent plate, means defining a document delivery passage within said delivery portion frame member, means defining a document re-introduction passage within said delivery portion frame member, branching from said document delivery passage and extending toward the downstream end of the transparent plate, document delivery means mounted on said delivery portion frame member for delivering a document through said document delivery passage and selectably onto a document receiving tray or into said document re-introduction passage for re-introduction onto the transparent plate, the document initially being conveyed from said transparent plate into said document delivery passage by said document conveying means in said main portion, and a delivery portion drive source mounted on said delivery portion frame member for driving said document delivery means;

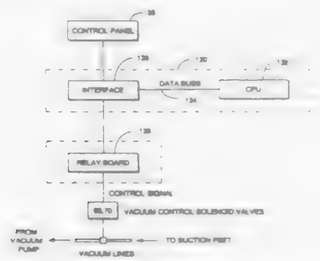
the driving force from each of said document introduction portion, said main portion, and said document delivery portion acting only on said document introduction portion, said main portion, and said document delivery portion, respectively.

5,143,364

SUCTION CONTROL SYSTEM FOR PRINTING OR DUPLICATING MACHINES

Joseph S. Kharzo, Chicago; David W. Grostick, Barrington; Jiann-Shing Liang, Mount Prospect, and Narasimha Swamy, Streamwood, all of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Jan. 9, 1991, Ser. No. 638,937
Int. Cl.[5] B65H *3/08*
U.S. Cl. 271—108 18 Claims



7. In a printing, duplicating or like machine which includes a vacuum suction feeder for feeding sheets seriatim to a printing couple of the machine, the sheets being provided in a stack which may comprise both relatively low weight stock sheets and relatively high weight stock sheets, a suction control system comprising:

a source of vacuum;

a conduit connecting said source of vacuum to said suction feeder;

input means for determining relative weight of any given sheet in a stack, wherein said input means comprises a presettable counter means for entering a count vale representing a quantity of sheets at a relatively high weight and a quantity of sheets at a relatively low weight; and

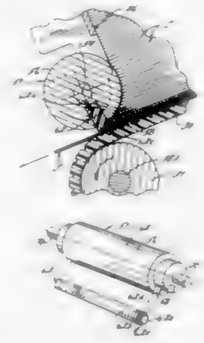
control means operatively associated with any one of said suction feeder, source of vacuum or conduit for automatically adjusting vacuum at said suction feeder responsive to relative weight of any given sheet determined by said input means.

5,143,365

PAPER SHEET FEEDING APPARATUS

Ronald J. Green, E11412B North Reedsburgh Rd., Baraboo, Wis. 53913

Continuation-in-part of Ser. No. 393,135, Aug. 14, 1989, Pat. No. 4,991,831. This application Jan. 2, 1991, Ser. No. 636,597
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] B65H *3/52, 7/04, 7/14*
U.S. Cl. 271—121 22 Claims

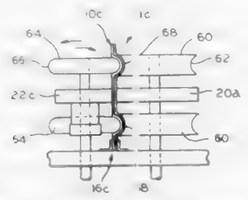


18. A gate forming member for use with an apparatus for serially feeding sheets in a forward direction from the bottom of a generally vertical stack of such sheets and comprising:

a generally cylindrical roll defining a central axis and an outer peripheral surface which is concentric to said central axis, said outer peripheral surface having a groove extending axially along the length thereof, with said groove defining opposing parallel side walls and a bottom wall, and

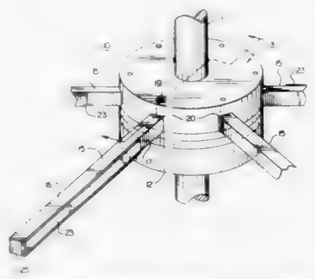
a bar disposed in said groove, with said bar being composed of a material having a higher coefficient of friction than the material of said roll and including parallel opposite side edges and being sized so that the opposite side edges are pressed into engagement with said opposing side walls of said groove and a portion of said bar extends beyond said peripheral surface, said portion of said bar which extends beyond said outer peripheral surface including an edge surface which extends generally along a tangent to said outer peripheral surface, and wherein said bar has a quadrilateral cross section configuration which comprises said parallel opposite side edges and inclined upper and bottom edges, and with one of said upper and bottom edges defining said edge surface, and whereby said bar may be removed and replaced in said groove so that the other of said upper and bottom edges defines said edge surface.

5,143,366
MAIL FEEDER
Eduard Svyatsky, Libertyville, Ill., assignor to Bell & Howell Company, Skokie, Ill.
Filed Sep. 7, 1990, Ser. No. 579,380
Int. Cl.[5] B65H 3/06
U.S. Cl. 271—122 8 Claims



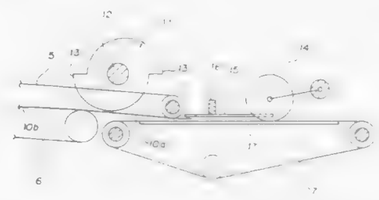
1. A document separation system including at least one separation roller system having a cooperative pair of drive and separation rollers defining a nip therebetween for receiving foldover documents, said drive and separation rollers being located on parallel spaced shafts and operative to contact said foldover documents medially between opposite free longitudinally disposed edges, spaced beam forming roller means disposed in axially spaced relation on said parallel spaced shafts on opposite sides of said driver and separation roller pair in a manner to establish spaced longitudinally extending artificial beam means in said foldover documents to counterbalance any twisting reaction created by separation forces imposed by said roller pair.

5,143,367
ROTARY VACUUM WICKETTER WITH REMOVABLE SPLIT WEAR PLATES
Earl T. Pottorff, 2346 Taylor Rd., Savannah, N.Y. 13146
Filed Jan. 7, 1991, Ser. No. 637,682
Int. Cl.[5] B65H 29/24
U.S. Cl. 271—196 9 Claims



1. Rotary vacuum pickup apparatus for carrying flat workpieces from a first work station and placing the workpieces on a wicket at a second work station comprising:
a vacuum hub assembly formed of a stationary hub and a rotary hub superposed on one another and having a common axis,
the stationary hub including vacuum channel means for applying vacuum over a predetermined angular portion of the superposed rotary hub, and
the rotary hub having a peripheral surface, an axial surface in communication with the vacuum channel means of the stationary hub, and a plurality of spaced sockets which penetrate to said axial surface to communicate with said vacuum channel means; and
a plurality of radial arms mounted in the rotary hub and projecting radially outward therefrom, each said arm including a tube closed at its radially outward end, having a male portion at its radial inward end which fits into a respective one of said sockets and having a flat longitudinal face on the side that faces in the rotation direction of said rotary hub and which is provided with perforations therethrough so that the arm can carry said workpieces by vacuum from the first work station to said second work station;
comprising the improvement wherein said stationary hub and said rotary hub each include a body portion and a wear-plate portion removably attached thereto, said stationary hub and rotary hub wear plate portions being in rotational sliding contact with one another, and each said wear plate portion being formed of a semi-rigid plastic synthetic resin material which has been impregnated with a lubricating agent.

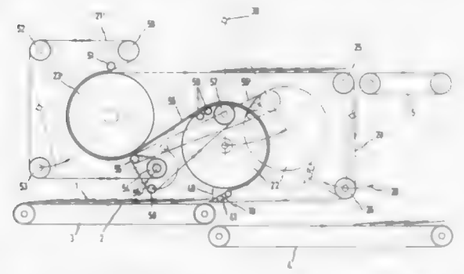
5,143,368
PAPER DODGING DEVICE
Hirotaka Kiyota, and Masaaki Nakajima, both of Chiba, Japan, assignors to Komori Corporation, Tokyo, Japan
Filed May 31, 1991, Ser. No. 708,458
Claims priority, application Japan, Jun. 25, 1990, 2-66009[U]
Int. Cl.[5] B65H 29/66
U.S. Cl. 271—202 6 Claims



1. A paper dodging device comprising a pair of upper and lower high-speed belts for feeding paper to a low-speed paper, a delivery side of said upper high-speed belt being overlapped above an inlet side of said low-speed belt, and a rotatable snubber disposed above the inlet side of said low-speed belt for maintaining a vertical position relation between foregoing paper and following paper, said snubber having an outer diameter gradually increasing towards the rear side with respect to the rotational direction of said snubber and having paper dropping portions formed at the outer peripheral end of increasing diameter for peeling a rear end of paper from said upper high-speed belt.

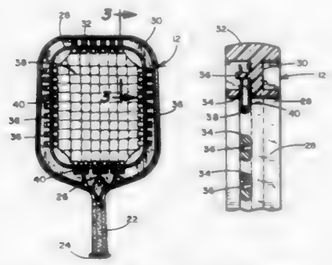
5,143,369
APPARATUS FOR PARTING A SHINGLED FLOW OF FLAT PRODUCTS, PARTICULARLY OF AT LEAST TWO-LAYER PAPER PRODUCTS
Ronald Meisel, D-8113 Kochel/See, Am Lainbach 23, and Michael Hast, Geranienstrasse 6A, D-8000 München 70, both of Fed. Rep. of Germany
Filed Dec. 5, 1990, Ser. No. 622,550
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1989, 3940243
Int. Cl.[5] B65H 29/66
U.S. Cl. 271—303 2 Claims

1. An apparatus for parting a shingled flow of flat products, particularly of at least two-layer paper products for conveying said products to either of two vertically spaced-apart conveying paths, comprising a rotatable deflector sheave having means for conveying said products to one of said two conveying paths; a wedge-shaped deflector means for insertion into the shingled flow, comprising an interacting pair of press belts for discharging the component of the shingled flow parted by the wedge-shaped deflector means; means for pivoting said deflector sheave and said wedge-shaped deflector means about a point of rotation above said shingled flow, comprising a bracket connected to said deflector sheave and said wedge-shaped deflector means, whereby said wedge-shaped deflector means is insertable into said shingled flow of paper products and retractable at a speed in the conveying direction which exceeds the conveying speed of the shingled flow; wherein the wedge-shaped deflector means is followed in the conveying direction by said deflector sheave having a press belt; further



comprising an overhead conveyor following the deflector sheave in the conveying direction; further comprising an endless rider belt inserted between the deflector sheave and the overhead conveyor, and the overhead conveyor further comprises a pair of press bands, wherein the rider belt an the pair of press bands revolve about a common axis when the wedge-shaped deflector means is inserted into the shingled flow.

5,143,370
BALL RACKET
Loren L. Richards, Wayzata, Minn., assignor to Rammer, Inc., St. Paul, Minn.
Filed Jan. 6, 1992, Ser. No. 817,058
Int. Cl.[5] A63B 69/40
U.S. Cl. 273—26 B 9 Claims

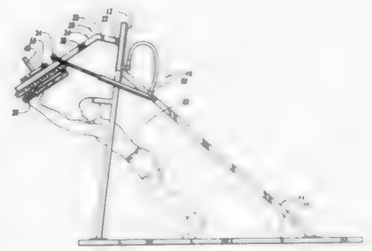


1. A sports racket for striking a ball comprising:
(a) a generally rectangular frame member with rounded corners defining a central opening, a front face, a rear face and an integrally formed flange extending perpendicular to the plane of said central opening and surrounding said central opening, said flange including a plurality of regularly spaced slits extending parallel to said plane of said central opening and a corresponding plurality of posts disposed in alignment with said plurality of slits and projecting perpendicular to said rear face of said frame member;
(b) a string net having a perimeter strand and centrally disposed within said central opening of said frame member; and
(c) a plurality of elastic bands individually looped through said perimeter strand of said sting net and extending individually through said slits in said flange, each of said bands having opposed ends with apertures formed therethrough for fitting about said posts.

5,143,371
GOLFER'S AID
Ronald L. Strahan, 2416 Apple Way, Edmond, Okla. 73013
Filed Feb. 6, 1992, Ser. No. 832,204
Int. Cl.[5] A47L 13/02; A45F 5/00; A63B 57/00; B26B 1/02
U.S. Cl. 273—32 B 9 Claims

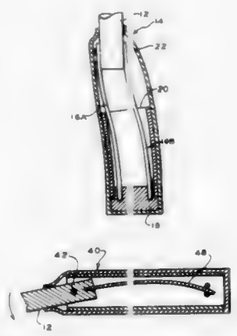
1. A golf accessory comprising:
a flexible body formed by a straight portion and an angled portion overlying said straight portion and having an open end and a closed end so that the body forms a flexible clip, and wherein the body is sized to be held in the palm of the hand of a user;
an elongate blade means for rotatably attaching said blade to the straight portion of the body at the open end of the body, the blade having a first end and a second end, wherein the first end has U-shaped portion with first and second arms which protrude from said open end for repairing divots are stored between said straight and angled portions; and
a strip of hook and loop fabric attached to the outer surface of the straight portion of the body.

5,143,372
FOOTBALL TRAINING DEVICE
Thomas J. Wilson, Ames, Iowa, assignor to Power Performance, Inc., Ames, Iowa
Filed Oct. 16, 1990, Ser. No. 598,219
Int. Cl.[5] A63B 67/00
U.S. Cl. 273—55 R 20 Claims



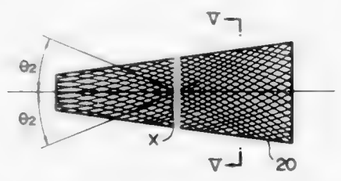
1. A football training device comprising,
a frame having a pivot arm extending downwardly over an exercise area, said arm having a lower free end,
a pad positioned on the lower free end of said pivot arm,
said pivot arm positioned to pivot through an arc from a down position with said arm extending downwardly to a raised position in response to a person applying pressure to said pad, said pad on said lower free end of said pivot arm being at a height requiring a person to crouch upon making initial hand contact with said pad to have maximum mechanical advantage while pressing forwardly and upwardly through an exercise, and
said pad being spring mounted on the lower end of said pivot arm to cushion a persons contact with said pad when exercising.

5,143,373
TENNIS RACKET
Juergen Meissner, 551 Rte. 10, Randolph, N.J. 07869
Division of Ser. No. 218,830, Jul. 13, 1988, abandoned. This application Jul. 12, 1990, Ser. No. 552,335
Int. Cl.[5] A63B 69/38
U.S. Cl. 273—73 R 26 Claims



1. A sports racket comprising
a head having a hitting surface lying in a facial plane;
a shaft connected to the head, the shaft including a first end connected to the head and a second, opposite end;
a handle having a gripping area for grasping said racket during play, said handle having a central axis; and
coupling means for elastically coupling said handle to said second end of said shaft effectively only at a position substantially adjacent to the gripping area of said handle in a substantially non-rotatable manner about said central axis, such that said hitting surface can deflect in a direction substantially transverse thereto, said coupling means including spring board means for always bringing said shaft into effective linear alignment with said handle after a ball has been hit so that said racket can be used for rehitting a ball without manual resetting of said shaft with respect to said handle, said spring board means having one end connected with the second end of said shaft and out of engagement with the handle and an opposite end connected with said handle and out of engagement with the shaft, said spring board means including two spring boards in spaced, substantially parallel relation, each said spring board including one end connected to said handle and an opposite end connected to said second end of said shaft.

5,143,374
GOLF CLUB SHAFT AND PROCESS FOR MANUFACTURING SAME
Osamu Shibasaki, Utsunomiya, Japan, assignor to Somar Corporation, Japan
Filed Feb. 15, 1991, Ser. No. 655,914
Claims priority, application Japan, Feb. 16, 1990, 2-35468
Int. Cl.[5] A63B 53/10
U.S. Cl. 273—80 B 3 Claims

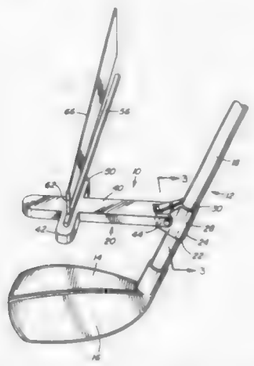


1. A golf club shaft having first and second opposing ends and having a tubular inner layer formed of a first, fiber-reinforced plastic and containing a first fiber group wound at a first winding angle within the range of 20–45° relative to the longitudinal shaft axis and an outer layer formed of a second, fiber-reinforced plastic and containing a second fiber group wound at a second winding angle within the range of 5–30° relative to the longitudinal shaft axis, said outer layer being integrally bonded onto the outer surface of said inner layer, the first winding angle at any point in the longitudinal direction of the shaft being greater than the second winding angle at that point, the second winding angle being maximum at an intermediate point located along an intermediate lengthwise portion of the shaft and decreasing toward both ends of the shaft.

5,143,375
GOLF CLUB FINGER SUPPORT DEVICE
Judd R. Wilkins, 281 Littletown Quarter, Williamsburg, Va. 23185
Filed Apr. 16, 1991, Ser. No. 685,867
Int. Cl.[5] A63B 53/14
U.S. Cl. 273—81 D 4 Claims

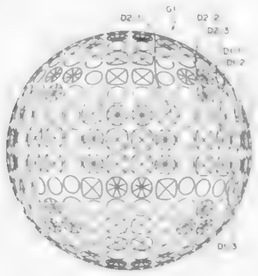
1. In combination, a golf club and a finger engaging attachment for said golf club to assist the golfer in positioning and supporting key fingers on said golf club during the golf swing, comprising:
said golf club having an elongated shaft with a handle grip portion disposed at one end and a golf club head, including a ball engaging face, disposed at the other end thereof;
said finger engaging attachment having a first cylindrical portion disposed parallel with said golf club shaft and a separate second cylindrical portion rotatable from a first operative position parallel with said golf club head and extending transversely from and in the same vertical plane as that of said first cylindrical portion to a second inoperable position perpendicular to said golf club head and in parallel adjacency to said first cylindrical portion;
means for securing said first cylindrical portion to said elongated shaft;
said second cylindrical portion having parallel first and second flat ends;
hinge means connecting said first and said second cylindrical portions together;
said hinge means including a bracket connected to, in parallel relationship with and adjacent an end of, each said first and said second cylindrical portions;
said hinge means permitting rotative movement of said second cylindrical portion from a first operative position wherein said first flat end of said second cylindrical portion is in engagement with a surface of said first cylindrical portion and wherein said second cylindrical portion is disposed parallel with said golf club head, transverse to, and in the same vertical plane as that of said first portion; to a second and inoperative position wherein said second cylindrical portion is spaced from, parallel with said first cylindrical portion, and perpendicular to said golf club head, to facilitate storage, and insertion/removal of said golf club in a golf bag.

5,143,376
GOLF CLUB SWINGING GUIDE
Knute Johnson, P.O. Box 7045, Victoria, British Columbia, Canada V9B 4Z2
Filed Oct. 11, 1991, Ser. No. 774,881
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—186.2 5 Claims



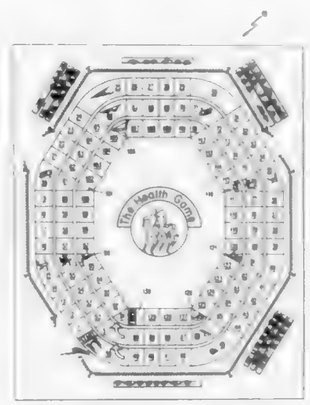
1. A golf club swinging guide for a golf club having a shaft and a head with a striking face, the guide comprising:
a mount having means for connecting the mount to a golf club generally above the head of the club; and
a vane pivotally connected to the mount, the vane being freely pivotal and responsive to movement of air so the vane visibly aligns itself in a direction the golf club is swung.

5,143,377
GOLF BALL
Kengo Oka, Kobe, and Shinji Ohshima, Nishinomiya, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 2, 1991, Ser. No. 739,458
Claims priority, application Japan, Feb. 4, 1991, 3-035400
Int. Cl.[5] A63B 37/12
U.S. Cl. 273—232 3 Claims



1. A golf ball having dimples on the surface thereof and at least one great circle path which does not intersect the dimples in a spherical zone defined by said great circle to each circumference formed in correspondence with a central angle of less than approximately 15° with respect to said great circle, represented as an (L) spherical zone and a spherical zone other than said (L) spherical zone represented as an (F) spherical zone, whereby noncircular dimples are arranged in said (L) spherical zone in an amount more than 60% of all dimples arranged in said (L) spherical zone and circular dimples are arranged in said (F) spherical zone in an amount more than 60% of all dimples arranged in said (F) spherical zone.

5,143,378
HEALTH GAME
Deborah L. Joel, 2127 Ashburton St., Baltimore, Md. 21216
Filed Jan. 15, 1991, Ser. No. 641,203
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—243 15 Claims



1. A game board comprising:
manually manipulable means bearing indicia for making a chance selection;
a plurality of playing pieces each representing a player;
a plurality of health question cards containing player questions;
a game board having a playing surface thereon;
a first series of playing locations defined about said playing surface in substantially contiguous relationship having a shape of an octagon, comprising a playing path wherein said playing pieces are moved in discrete steps between successive locations;
a second series of playing locations defined about said playing surface in substantially contiguous relationship having

the shape of an octagon, and located within said first series of playing locations, comprising a playing path wherein said playing pieces are moved in discrete steps between successive locations, and wherein said first series of playing locations include at least one location that a player whose piece lands therein is to move to the second series of playing locations;

a third series of playing locations defined about said playing surface in substantially contiguous relationship having the shape of an octagon, and located within said first and second series of playing locations, comprising a playing path wherein said playing pieces are moved in discrete steps between successive locations, and wherein said second series of playing locations include at least one location that a player whose piece lands thereon is to move to the third series of playing locations; and

wherein said first, second and third series of playing locations includes a first plurality of locations indicating that a player whose piece lands thereon contracts a health problem and a second plurality of locations indicating that a player whose piece lands thereon obtains a preventive health care certificate indicating attributes of health which may be used to avoid a health penalty.

5,143,179

Patent Not Issued for This Number

5,143,380

BROADHEAD FOR AN ARROW

Richard Maleski, 4 South Street Plymouth, Conn. 06782

Filed Jan. 4, 1991, Ser. No. 637,464

Int. Cl.[5] F42B *6/08*

U.S. Cl. 273—422 20 Claims

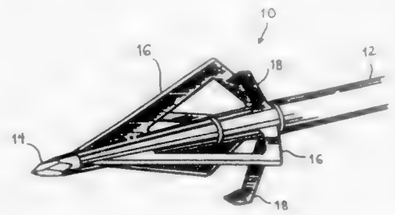
1. A broadhead for an arrow comprising:

a body member having a pointed tip end and a shaft securement end;

a plurality of blades attached to said body member; and

at least one penetration limiting member attached to said body member and positioned between at least two of said blades;

wherein said penetration limiting member comprises a first leg attached to said body member and a second leg having one end attached to said first leg and extending at an angle to said first leg towards said pointed tip end and having a second end positioned at a distance from said first leg to



define a gap between said second end and said body member.

5,143,381

PIPE JOINT SEAL

Lowell D. Temple, Fort Wayne, Ind., assignor to Pipe Gasket & Supply Co., Inc., Fort Wayne, Ind.

Filed May 1, 1991, Ser. No. 694,211

Int. Cl.[5] F16J *15/10*

U.S. Cl. 277—1 5 Claims

1. The method of sealing an annular space created between a sealing surface of a spigot at an end of a length of pipe and an internal sealing surface on a bell shaped end of another length of pipe comprising the steps of providing a sealing member having an annular elastomeric body with an enclosed annular chamber and an annular slit in the body communicating with the chamber, introducing a grease-like lubricant into the chamber, positioning the sealing member intermediate a sealing surface of a spigot at one end of a first length of pipe and an internal sealing surface on a bell shaped end of a second length of pipe, inserting the spigot of the first length of pipe into the bell end of the second length of pipe so that one of said pipes engages the body and opens the slit exposing the grease to the sealing surface of said one pipe.

5,143,382

PRESSURE RELIEVING SLIPPER SEAL SYSTEM

Martin M. Maringer, Fort Wayne, Ind., assignor to W. S. Shamban & Company, Santa Monica, Calif.

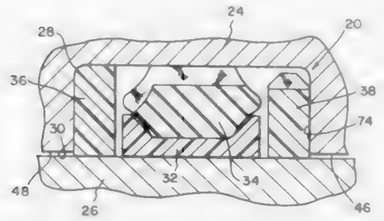
Filed Mar. 4, 1991, Ser. No. 664,341

Int. Cl.[5] F16J *15/48*

U.S. Cl. 277—29 14 Claims

1. A sealing system for use in sealing a rod bore and reciprocating rod, said rod bore and said rod including a pair of glands separating a system pressure region from an ambient pressure region, said sealing system comprising:

first and second seal assemblies, each of said seal assemblies adapted to be respectively disposed in one of said glands, said seal assemblies defining an interstage volume, said first seal assembly including a pressure relieving means for relieving pressure in said interstage volume whereby said sealing system may operate in either a pressurized state or pressure relieved state;



said pressure relieving means including at least one backup ring, said backup ring having a channel means for allowing pressure to be relieved from said interstage volume when said sealing system is in said pressure relieved state.

5,143,383

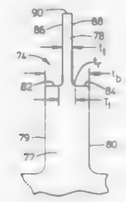
STEPPED TOOTH ROTATING LABYRINTH SEAL

Christopher C. Glynn, Hamilton; Byron E. Swanson, West Chester, and Melvin Bobo, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 376,178, Jun. 30, 1989, abandoned, which is a continuation of Ser. No. 38,452, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 903,825, Sep. 3, 1986, abandoned, which is a continuation of Ser. No. 752,482, Jul. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 616,262, Jun. 4, 1984, abandoned. This application Feb. 21, 1990, Ser. No. 483,594

Int. Cl.[5] F16J *15/447;* **F01D** *11/02*

U.S. Cl. 277—53 3 Claims



1. A rotating labyrinth seal comprising:

a) a base having an outer peripheral surface, and

b) a plurality of radially directed seal teeth rings, each ring extending circumferentially around said outer peripheral surface of said base, each of said seal teeth rings having:

c) a body portion having a pair of radially extending substantially parallel body walls, the distance between said body walls being the thickness (t_b) of said body portion, and

d) a tip portion having a pair of radially extending tip walls substantially parallel to each other and to said body walls, the distance between said tip walls being the thickness (t_t) of said tip,

each of said body portions further having a pair of body circumferential surfaces situated on opposite sides of the associated tip portion, each of said tip portions further having a top circumferential surface coaxial to said pair of body circumferential surfaces of the associated body portion, the junction between said tip walls and said body circumferential surfaces being a fillet having a fillet radius (t_r) and wherein the ratio of said body thickness (t_b) to the sum of said tip thickness (t_t) plus twice the fillet radius (t_r) is greater than about 1.0 and less than about 3.2.

5,143,384

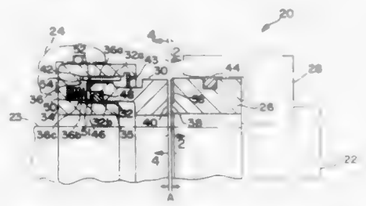
BI-DIRECTIONAL, NON-CONTACT FACE SEAL

Abraham Lipschitz, Warwick, R.I., assignor to EG&G Sealol, Inc., Providence, R.I.

Filed Apr. 14, 1989, Ser. No. 337,828

Int. Cl.[5] F16J *15/16*

U.S. Cl. 277—96.1 27 Claims



1. A bi-directional seal for sealing, from the ambient, a pressurized fluid in the interior of a housing fitted with a rotatable shaft, the seal comprising:

a rotor fixed to the shaft for rotation with the shaft, said rotor including a first annular sealing face substantially perpendicular to the shaft, the first annular sealing face having an inner and outer diameter;

a stator axially slidably held relative to the housing for movement toward and away from said rotor, said stator including a second annular sealing face substantially perpendicular to the shaft, the second annular sealing face having an outer and an inner diameter;

said first and second annular sealing faces being aligned with and opposed to each other, a variable gap between said faces providing a channel for the pressurized fluid to flow toward the ambient;

means for preventing the rotation of said stator relative to the housing;

sealing means for substantially preventing the flow of pressurized fluid to the ambient in areas other than across said sealing faces;

means for biasing said stator and its second annular sealing face toward said rotor and its first annular sealing face; and

a plurality of radial grooves for producing a gap between said first and second annular sealing faces regardless of the direction of rotation in response to relative rotation between the first and second annular sealing faces, the grooves having a curved shape with respect to a radial cross-section, said radial cross-section having a dimension defining the width of each groove, said groove having a depth, said width being greater than the depth of said groove, the grooves extending a portion of the distance between the inner and outer diameter and the grooves being in fluid communication with the pressurized fluid, the grooves thereby providing a hydrodynamic bi-directional non-contact seal, each groove being isolated from the remaining of said plurality of grooves by a continuous land surface.

5,143,385

SHAFT SEAL

Stefan Sponagel, Rimbach, and Waldemar Wachowitz, Hemsbach, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Continuation of Ser. No. 660,969, Feb. 26, 1991, abandoned, which is a continuation of Ser. No. 400,577, Aug. 30, 1989, abandoned. This application Jan. 31, 1992, Ser. No. 830,509

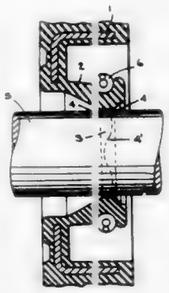
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830706

Int. Cl.[5] F16J *15/32*

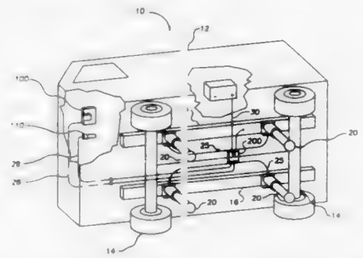
U.S. Cl. 277—134 6 Claims

1. A shaft seal comprising: a stiffening ring and a lip ring made of a polymeric material connected thereto; said lip ring

having a cylindrical surface surrounding a shaft to be sealed at a very short distance away from said shaft and at least one retaining rib having a height of 0.15 to 0.3 mm and projecting from said cylindrical surface toward said shaft; the cylindrical surface, the retaining rib, and the shaft surrounding capillary-active free spaces, the capillary-active free spaces being completely filled with medium to be sealed during standstill of the shaft and forming a completely self-contained liquid film at a dynamic sealing zone, the cylindrical surface extending axially beyond each of said at least one retaining rib on both sides in axial direction and the retaining rib surrounding the shaft sine-like and continuously.

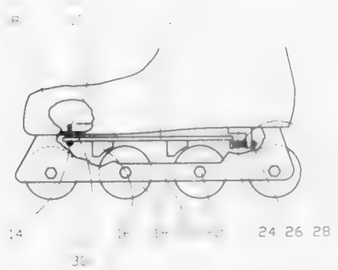


5,143,386
AUTOMATIC LEVELING SYSTEM
Jorge Uriarte, 13 Cornwallis, Irvine, Calif. 92714
Filed Nov. 28, 1990, Ser. No. 618,940
Int. Cl.[5] B60S 9/00; B62D 37/00
U.S. Cl. 280—6.1 22 Claims



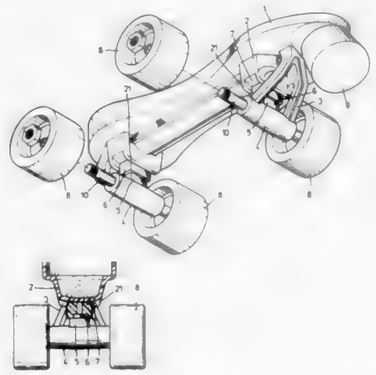
1. In an apparatus for leveling a vehicle, including a plurality of jacks mounted at different locations to the vehicle, and control means for selectively controlling said jacks to extend and contract, the improvement wherein said control means comprises a level sensor for providing output signals corresponding to the degree of tilt of separate axes extending between said jacks, and means responsive to separate ones of said output signals for energizing separate said jacks to extend or contract independently of one another, where a plurality of said jacks may be energized simultaneously, thereby increasing the speed of leveling of said vehicle.

5,143,387
ROLLER SKATE BRAKE ASSEMBLY HAVING TOE ACTUATOR WITHIN THE BOOT
Jeff M. Colla, 8729 Bentwood Dr., Eden Prairie, Minn. 55344, assignor to Jeff M. Colla, Eden Prairie, Minn.
Filed Sep. 3, 1991, Ser. No. 754,020
Int. Cl.[5] A63C 17/14, 17/06
U.S. Cl. 280—11.2 11 Claims



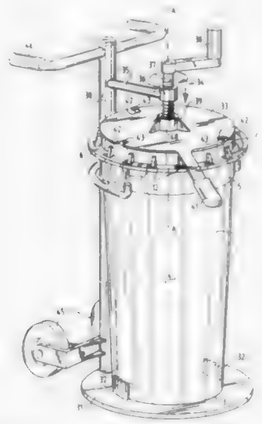
1. A roller skate with a boot having an integrated braking structure comprising:
- a toe actuator in said skate boot having a means to allow movement of said toe actuator, and
- a brake assembly and at least one brake pad, attached to said toe actuator and said roller skate for coupling braking energy to a plurality of wheels rotatably attached to said roller skate and
- means interconnected with the brake assembly for normally holding said brake assembly forward of said wheels in a nonbraking position, and
- means for controllably coupling a toe movement of a user with said toe actuator through said brake assembly to said at least one brake pad, whereby more safely braking said roller skate wheels.

5,143,388
INTEGRAL MOLDED SKATE TRUCK
Ting-Hsing Chen, Tainan Hsien, Taiwan, assignor to Far Great Plastics Industrial Co., Ltd., Tainan Hsien, Taiwan
Filed Apr. 24, 1991, Ser. No. 690,480
Int. Cl.[5] A63C 17/02
U.S. Cl. 280—11.28 1 Claim



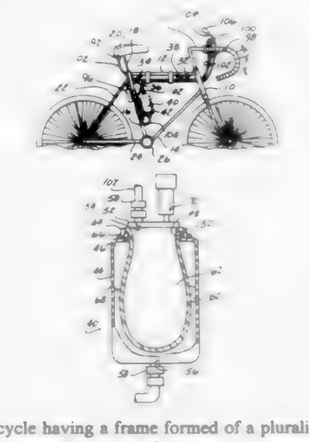
1. An integral injection molded skate truck for a skate comprising:
- a baseplate wheel assembly being mounted on the underside of said skate and defining a laterally extending curved recess depending therefrom and formed by two downwardly extending flanges one at a front end and one at a rear end thereof; two beams having one end of each said beam connected together and formed with and depending from said baseplate and extended at an angle downwardly and outwardly therefrom; a cylindrical axle hub connected between the other ends of said beams extending perpendicularly thereto and being aligned with said curved recess; said cylindrical axle hub having a peg connected centrally thereto and extending upwardly, aligned with said curved recess, an upper portion thereof being stacked rigidly in a buffer; an upper portion of said buffer being received in said curved recess of said baseplate and being confined between said two flanges of said curved curved recess whereby said hub, peg, buffer and recess are vertically aligned.

5,143,389
WHEELED SUPPORT FRAME FOR A REMOVABLE PLASTIC CONTAINER HAVING CLOSURE AND ACTUATING DEVICE
Godefridus H. J. Jonkers, Helmond, Netherlands, assignor to Wiva Verpakkingen B.V., Oosterhaut, Netherlands
Filed Mar. 19, 1991, Ser. No. 672,165
Claims priority, application Netherlands, Mar. 23, 1990, 9000977
Int. Cl.[5] B62B 1/14
U.S. Cl. 280—47.26 16 Claims



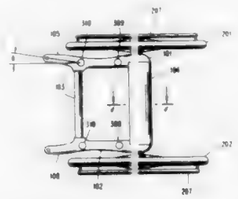
1. The combination of a plastic container, a cooperable cover and an actuating device for connecting or disconnecting the cover with respect to the container, said plastic container comprising a bottom having a peripheral edge and a wall which is connected continuously to the peripheral edge of said bottom and, with the bottom placed on a horizontal surface, extends upwardly therefrom, said wall defining a circular upper edge having an outwardly-extending lip; said cover defining a circular outer edge and including first engagement means and L-shaped locking means having first and second legs attached to said outer edge, said first leg extending downwardly when said cover is positioned on the upper edge of said container and said second leg being lockable against said outwardly-extending lip of said container when said cover is positioned on said container and rotated relative to said container; and said actuating device comprising a supporting plate on which the bottom of said container is adapted to be positioned, a frame member which extends away from said supporting plate, an arm which extends away from said frame member, and a pressure member which is movably attached to said arm so as to be capable of pressing said cover against said container when said container is positioned on said support plate, said pressure member including second engagement means for cooperation with said first engagement means of said cover when said pressure member is pressed against said cover, and handgrip means connected to said pressure member to facilitate manual rotation of said pressure member and consequently rotation of said cover relative to said container when said pressure member is pressed against said cover.

5,143,390
PRESSURIZATION APPARATUS FOR CYCLE MOUNTED ACCESSORIES
Patrick M. Goldsmith, 3949 Clifton Ridge, Highland, Mich. 48357
Filed Nov. 30, 1990, Ser. No. 620,084
Int. Cl.[5] B62J 11/02
U.S. Cl. 280—201 7 Claims



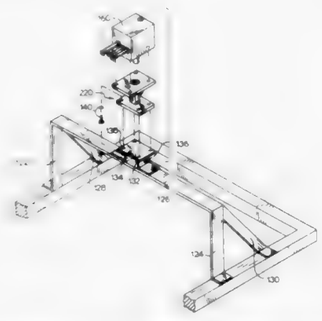
1. In a cycle having a frame formed of a plurality of interconnected, tubular members, the improvement comprising:
- at least one of the tubular members having a sealed interior chamber for storing a pressurized fluid;
- first valve means, mounted on the at least one of the tubular members and disposed in fluid flow communication with the interior chamber, for enabling the supply of pressurized fluid into the interior chamber and the discharge of pressurized fluid from the interior chamber;
- second valve means connected in fluid flow communication with the interior chamber;
- the second valve means being manually movable between a first position for discharging pressurized fluid from the interior chamber through the first valve means and a second position blocking the flow of pressurized fluid from the interior chamber; and
- a pressurized fluid responsive device mounted on the cycle and connected in fluid flow communication with the first valve means;
- the pressurized fluid responsive device including:
  - a hollow container for storing a liquid, the container having an inlet and an outlet;
  - an expandable chamber disposed in the container;
  - the inlet being disposed in fluid flow communication with the interior chamber and the interior of the expandable chamber such that pressurized fluid supplied through the inlet to the expandable chamber causes the expandable chamber to expand and exert pressure on the liquid in the container; and
  - discharge valve means, connected in fluid flow communication with the outlet of the container, for selectively discharging liquid from the interior of the container.

5,143,391
MODULAR WHEELCHAIR
A. Scott Robertson, Pasadena; Richard Geiger, Fremont, and Robert W. Lishman, LeSelva Beach, all of Calif., assignors to Medical Composite Technology Soquel, Calif.
Continuation-in-part of Ser. No. 515,119, Apr. 27, 1990, Pat. No. 5,076,602, which is a continuation-in-part of Ser. No. 515,120, Apr. 27, 1990, which is a continuation-in-part of Ser. No. 516,057, Apr. 27, 1990, which is a continuation-in-part of Ser. No. 516,048, Apr. 27, 1990. This application Nov. 14, 1990, Ser. No. 612,859
Int. Cl.[5] B62M 1/14
U.S. Cl. 280—250.1 16 Claims



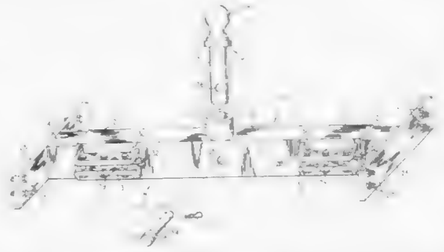
1. A modular wheelchair comprising:
a main frame, said main frame including two opposing side rails connected by at least one cross bar, an anterior end of each of said opposing side rails having a cantilevered arm, the cantilevered arm of each side rail being positioned at an angle Θ outwardly relative to the remaining portion of each side rail;
a pair of main driving wheels mounted on opposite sides of said main frame such that said main frame is positioned at a predetermined distance from a travel surface;
a pair of casters mounted on opposite sides of said main frame on said cantilevered arms forward of said pair of main driving wheels;
hub means for adjusting a camber angle of each of said pair of driving wheels while maintaining said main frame at said predetermined distance from said travel surface;
a seat assembly securable to said main frame, said seat assembly having means for adjusting a center of gravity of said seat assembly relative to said main frame while maintaining said drive wheels at a predetermined wheel base.

5,143,392
RETRACTABLE HOSE SYSTEM
David M. Collins, Chicago, Ill. assignor to Donna L. Jones, Wonder Lake, Ill., a part interest
Filed Apr. 16, 1991 Ser. No. 685,738
Int. Cl.[5] B60D 1/62
U.S. Cl. 280—420 19 Claims



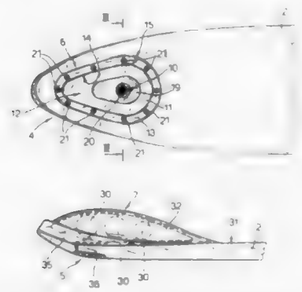
1. A box assembly and means for mounting said box assembly on a semi-trailer truck, said box assembly serving to protect at least one air hose and at least one electric cord on said semi-trailer truck, said semi-trailer truck including a tractor and a trailer, said means for mounting secures said box assembly to said tractor, and means for removably connecting said box assembly to said trailer, said box assembly including a container, at least one reel storage means, a heating means, and an anti-freeze injecting means, wherein:
a. said at least one reel storage means, said heating means for heating contents of said container, and said anti-freeze injecting means are operably mounted within said container;
b. said container includes therein means for operably mounting said at least one reel storage means within said container;
c. said container further includes therein means for operably mounting said heating means within said container;
d. said container further includes therein means for operably mounting said anti-freeze injecting means within said container;
e. said heating means is operably connected to an electrical system of said tractor; and
f. said anti-freeze injecting means is operably connected to an air compression means of said tractor.

5,143,393
GOOSENECK TRAILER MOUNTING BALL INSTALLATION FOR PICK-UP TRUCK
Paul R. Meyer, Holton, Ind., assignor to Una-Goose Company, Inc., Holton, Ind.
Filed Mar. 19, 1991, Ser. No. 672,171
Int. Cl.[5] B60D 1/06, 1/52
U.S. Cl. 280—491.1 8 Claims



1. A gooseneck trailer hitch assembly for mounting to the frame and underneath the bed of a pick-up truck, comprising:
a hitch adapted to engage a mating coupling on a gooseneck type trailer; and
an installation sub-assembly for mounting said hitch to the frame so that said hitch extends upwardly from the bed of the pick-up truck, including
(a) a support body having a sleeve for removably receiving said hitch, said sleeve adapted to be positioned within an opening fashioned in the bed of the pick-up truck and extending vertically from said support body so as to lie no higher than substantially flush with the level of the bed, and
(b) at least two connecting members slidably mounted in telescopic fashion to opposite sides of said support body and extending outwardly therefrom, each of said connecting members including means for fastening said connecting members to the frame of the pick-up truck, the relative extension of said connecting members from said support body being continuously adjustable within their range of movement,
wherein no portion of said installation sub-assembly extends into the space overlying the bed of the pick-up truck.

5,143,394
SKI PROVIDED WITH A VIBRATION DAMPING DEVICE
Angelo Piana, Casalborgone, Italy, assignor to Tua Ski S.r.l., Occhieppo Superiore, Italy
Filed Nov. 19, 1990, Ser. No. 615,064
Claims priority, application Italy, Nov. 24, 1989, 68039 A/89
Int. Cl.[5] A63C 5/07
U.S. Cl. 280—602 10 Claims

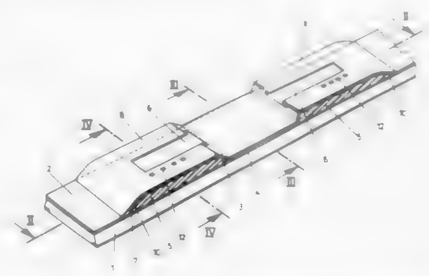


1. A ski comprising a body having opposite ends and a device for damping vibrations which arise in the ski itself, said device comprising at least one concentrated mass suspended to at least one end of said body of said ski so as to be able, in response to vibrations of said body, to enter into vibrations, said at least one concentrated mass being floatingly carried by a front end of the ski, in the vicinity of an upwardly curved tip thereof, said vibration damping device including a concentrated mass defined by a metal olive shaped element, a resiliently deformable membrane formed of elastomeric material and carrying said olive shaped element fixedly secured substantially at its center, a cavity passing through said front end of the ski, and means for fixedly securing an outer peripheral edge of said membrane to a perimetral rim of said cavity in such a way that said olive shaped element is housed within the cavity and the cavity is closed by said membrane.

3. A ski comprising a body having opposite ends and a device for damping vibrations which arise in the ski itself, said device comprising an extremely small number of concentrated masses freely movable in a liquidless cavity at at least one end of said body of said ski so as to be able, in response to vibrations of said body, to enter into vibrations, by colliding against each other and against walls which define the cavity, so as to damp said vibrations which arise in the ski itself.

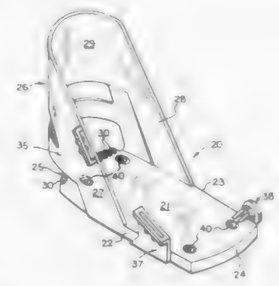
5,143,395
SKI
Bernhard Mayr, Hard, Austria, assignor to Head Sportgerate Gesellschaft m.b.H. & Co. OHG, Wuhrkopfweg, Austria
Filed Apr. 3, 1991, Ser. No. 680,144
Claims priority, application Austria, Apr. 5, 1990, 820/90; Sep. 17, 1990, 1888/90
Int. Cl.[5] A63C 5/075
U.S. Cl. 280—602 19 Claims

1. A ski having a longitudinal direction, and ends, and a top chord, with integrated elements for the attachment of components of a binding system for the ski, wherein the ski is rigidly bonded to an essentially plate-shaped carrier body that extends in the longitudinal direction of the ski in an area of the carrier body that lies between the ends of the ski in the longitudinal direction of the ski; said carrier body incorporating guide elements for the attachment of components of the binding system, the guide elements extending in the longitudinal direction of the ski, outside the area that is rigidly bonded to the ski; and the ends of the carrier body in the longitudinal direction of



the ski being arranged at a distance from an upper side of the top chord of the ski.

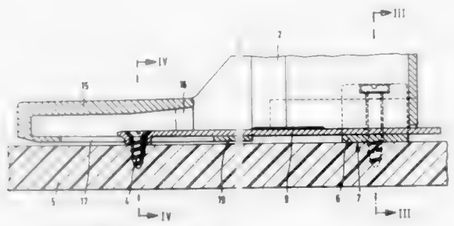
5,143,396
BINDING FOR A SNOWBOARD AND A SNOWBOARD INCORPORATING THE BINDINGS
Gad Shaanan; Serge Provost, and Jerome Foy, all of c/o 19151 Cruickshank, Baie D'Urfe, Quebec, Canada H9X 3N9
Filed Jul. 25, 1991, Ser. No. 736,279
Claims priority, application Canada, Nov. 21, 1990, 2030429
Int. Cl.[5] A63C 9/14
U.S. Cl. 280—607 20 Claims



1. A binding for a snowboard, comprising;
a base having opposite sides and front and rear ends;
an enclosing member having opposed spaced apart side members and an arcuate rear member, said rear member joining said side members at a rear position, the side members extending upwardly and rearwardly from said sides of said base at rear position on the base;
a first pair of fastening means comprising a first fastening means on one side member on one side of the base, and a second fastening means on the other side member, on the other side of said base;
a second pair of fastening means comprising a first fastening means on said one side of the base adjacent to the front end and a second fastening means on the other side of the base, adjacent to the front end;
a single removable locking member extending from said second fastening means of said first pair of fastening means to said second fastening means of said second pair of fastening means for engagement with each of said second fastening means of each said first and second pairs, said single removable locking member including a first attachment means for attaching one end of a first strap, and also including second attachment means for attaching one end of a second strap;
said first fastening means on each said first and second pairs

of fastening means comprising means for attachment of the other end of each said first and second straps;
attachment means for attaching the binding to a snowboard.

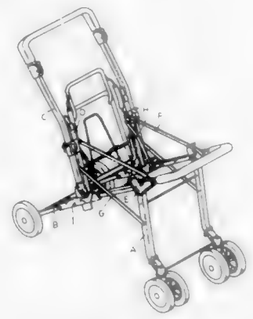
5,143,397
SKI BINDING
Premek Stepanek, Garmisch-Partenkirchen, and Ludwig Wagner, Farchant, both of Fed. Rep. of Germany, assignors to Marker International, Salt Lake City, Utah
Filed Aug. 3, 1990, Ser. No. 389,318
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826424
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—633 16 Claims



1. A ski binding comprising:
base plate means to be attached to a ski, said base plate means having a fixed end portion and a free end portion said fixed end portion adapted to be fixedly attached to the ski with said plate being spaced from the ski;
carriage means adapted to be slidably attached to the ski relative to said base plate means, said carriage means having a transverse portion extending below said base plate means adjacent said fixed end portion for holding said carriage means against transverse movement away from the ski; and
slide means clamp longitudinally spaced on the ski from the fixed end portion of said base plate means, and separate from said base plate means, said slide clamps means being fixedly mountable to the ski and having holding means including means extending below the free end of said base plate means and means extending above portions of said carriage means for holding said carriage means and said free end portion of said base plate means against transverse movement away from the ski.

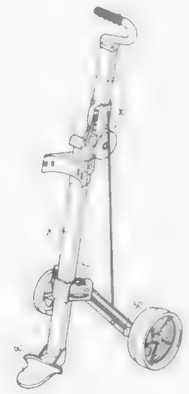
5,143,398
COLLAPSIBLE STRUCTURE FOR A STROLLER
Jerry M. S. Teng, 24-8, Hsu-Chung Ying, Chung-Jung Tsun, An-Ting Hsiang, Tai-Nan Hsien, Taiwan
Filed Jul. 3, 1991, Ser. No. 725,497
Int. Cl.[5] B62B *7/08*
U.S. Cl. 280—642 4 Claims

1. An improved collapsible structure for a stroller comprising front legs, rear legs, handle grip, and a back rest, characterized in that:
a seat member pivotally connected at one end with the rear leg and having a raised flat surface located at a free end, said flat surface being provided with a recess found in a lower edge;
an engaging member located on said rear leg has a flange formed on one end thereof and is contiguous the flat surface of said seat member, said flange being received in the recess of the flat surface of said seat member;
a limit block mounted on the connection between said back rest and said handle grip and having a notch and a stop edge, said stop edge bearing against the upper surface of said flange and said notch receiving the flat surface of said seat member;



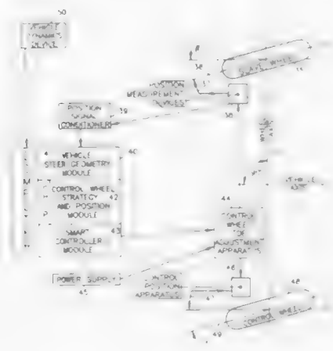
whereby the stroller rear legs and back rest are lockingly coupled to prevent inadvertent collapsing of said stroller.

5,143,399
GOLF CART
John Son Liu, P.O. Box 82-144, Taipei, Taiwan
Filed May 23, 1991, Ser. No. 704,376
Int. Cl.[5] B62B *1/12*
U.S. Cl. 280—646 1 Claim



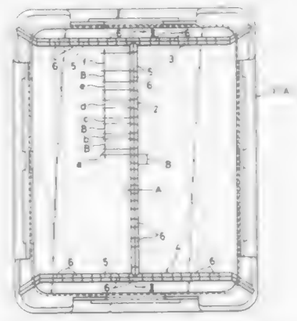
1. A golf cart comprising:
an upper rod with a handle grip;
a pivot joint including an upper member, a lower member and a U-shaped rod, said lower member being provided with an engaging portion in which there is a through hole and a chamber with a diameter slightly larger than the hole, said upper member having a flanged wall with a plurality of holes, said U-shaped rod having a long end, a short end and a loop for passage of a finger between said long end and said short end, said long end having a groove for engaging with a C-ring so as to keep a compressed spring in the chamber of said lower member;
a lower rod locked into said pivot joint;
a fixed member being a rectangular tubular member and fixedly locked on bottom of said lower rod, said fixed member having at both sides a wing member which makes an angle of 45 degrees with the fixed member and is composed of two plates on each of which there is a recess and a plurality of transverse slots, said wing members being formed with two through holes for connecting a lever, a T-shaped rib between said wings, a reinforcing rib on an outer side of said wings and a rectangular rib joining distal ends of T-shaped rib;
an axle member connected to said lever and having a pivot seat on which there is a shaft, a reinforcing plate, and a cylindrical portion, wherein said reinforcing plate has a notch and said cylindrical portion is provided with a sleeve, two protuberances and a curved rib with a flange; and
a supporting seat fixedly mounted on a lower end of the lower rod and having two webs with a threaded hole for engaging the lower rod, a horseshoe receiving plate and a curved stop between the web and the receiving plate.

5,143,400
ACTIVE TOE ADJUSTMENT APPARATUS
Gerald R. Miller, and Jean P. Couratier, both of Greer, S.C., assignors to Michelin Recherche et Technique, Switzerland
Continuation of Ser. No. 392,214, Aug. 10, 1989, abandoned.
This application Jul. 5, 1991, Ser. No. 727,400
Int. Cl.[5] B62D *17/00*
U.S. Cl. 280—661 3 Claims



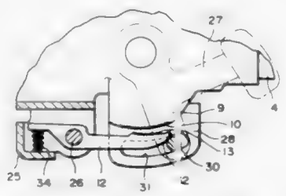
1. An apparatus for use on a land vehicle having at least a pair of steerable wheels, including a slave wheel and a control wheel, with their steer angles controlled by standard steering linkages and in which each vehicle wheel rotates about an axis, said apparatus comprising:
means for sensing the steer angle of a slave steerable wheel during turning maneuvers of said vehicle;
means for calculating a turn axis of intersection between a vertical plane containing the axis of rotation of a front slave steerable wheel and a vertical plane containing the axis of rotation of a rear slave steerable or fixed wheel using the steer angles sensed by said sensing means and producing toe adjustment angle signals;
means for computing a strategy to provide electrical strategy signals as a function of said vehicle turning maneuvers and said turn axis location;
means for calculating toe adjustment angles for the steer angle of a control steerable wheel using the geometry of said standard steering wheel using the geometry of said standard steering linkages and said strategy signals such that all the axis of rotation of all steerable wheels substantially intersect said turn axis and producing toe adjustment angle signals;
means for outputting electrical control signals as a function of said toe adjustment angle signals; and
a toe adjustment apparatus attached to a standard steering linkage to effect toe adjustment angle change, said toe adjustment apparatus having an electrical motor with a power supply controlled by said electrical control signal output means, a gear box connected to said electrical motor and a mechanical actuator apparatus attached to a standard steering linkage, which has been modified to allow said attachment, and to the gear box, said mechanical actuator apparatus comprising:
a) a slidably mounted tie rod sleeve and a fixed tie rod sleeve both suitably attached to said standard steering linkage being a modified tie rod of said vehicle, said tie rod being bisected and a section removed to accommodate said two sleeves;
b) an actuator device with a screw shaft slidably mounted therein and attached at one end to said slidably mounted tie rod sleeve;
c) an actuator housing which contains said actuator device suitable attached to said fixed tie rod sleeve at one end and having an aperture in the other end to permit the slidably mounted tie rod sleeve to move in or out of said aperture as said actuator device moves said screw shaft;
d) means for rotating a gear shaft, using said electrical motor, a predetermined pusher of turns to advance said screw shaft and thereby changing the length of said tie rod, thereby adjusting the toe angle of at least one steerable wheel of said vehicle; and
e) means for detecting the actual number of turns of said screw shaft and providing feedback signals for proper control of the length of said tie rod.

5,143,401
COVER FOR ACCOMMODATING AN AIR BAG
Takayasu Zushi, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan
Filed Apr. 15, 1991, Ser. No. 684,850
Claims priority, application Japan, May 24, 1990, 2-134682
Int. Cl.[5] B60R *21/20*
U.S. Cl. 280—731 12 Claims



1. A cover for accommodating an air bag, comprising,
a surface layer made from soft resin and defining an external surface of said cover; and
a core layer made from hard resin and laminated inside the surface layer, said core layer defining an inner surface of said cover and having a groove for tearing the cover when the air bag is inflated, and a plurality of holes situated inside and along the groove to be spaced apart from each other to facilitate tearing of the cover, each hole having a bottom located in the core layer so that the holes are not directly exposed to the surface layer to thereby prevent contraction of the surface layer when cured.

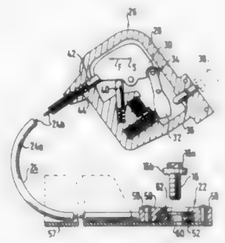
5,143,40
TILT TYPE STEERING DEVICE
Kiyoharu Higashino, Gunma; Sakae Matsumoto, Takasaki, and Hiroshi Kihara, Maebashi, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 4, 1991, Ser. No. 663,459
Claims priority, application Japan, Mar. 6, 1990, 2-21850[U]
Int. Cl.[5] B62I *1/18*
U.S. Cl. 280—775 6 Claims



1. A tilt type steering device comprising:
supporting bracket means fixed to a vehicle body;
a steering column having one end which is pivotally supported from said supporting bracket means on a first lateral axis;
a first gearing member fixed to a bottom portion of said steering column and having a convex bottom surface with first gear teeth formed along a circular arc around said first lateral axis;
a second gearing member having one end which is pivotally supported from said supporting bracket means on a second lateral axis and another end having an upper surface with second gear teeth engageable with and disengageable from said first gear teeth;
tilt lever means swingably movable for causing said first gear teeth and said second gear teeth to be brought into and out of engagement with each other;
a pair of supporting plates fixed to opposite lateral sides of said first gearing member and each having an elongate hole with a lower edge forming a circular arc shape around said first lateral axis; and
shaft means connected to said tilt lever means for movement therewith and spanning said elongate holes, said shaft means being disposed for engaging a bottom surface of said second gearing member so as to urge said first and second gear teeth into engagement and to release the engagement of said first and second gear teeth, according to the swinging movement of said tilt lever means.

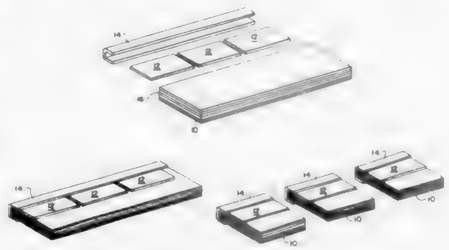
5,143,40
SAFETY MECHANISM FOR A RESTRAINT SYSTEM IN VEHICLES
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany
Filed May 10, 1991, Ser. No. 698,659
Claims priority, application European Pat. Off., May 11, 1990, 90108887.2
Int. Cl.[5] B60R *22/3*; H01H *35/02*
U.S. Cl. 280—806 23 Claims

1. A safety mechanism for a vehicle safety apparatus such as a pretensioner in a vehicle safety belt restraining system or a gas bag restraining system in a vehicle, the vehicle safety apparatus having a movable actuating member, said safety mechanism comprising:
blocking means for blocking actuating movement of said actuating member;
said blocking means including a blocking member connected by a sheathed cable to a rotatably mounted component rotatably driven by a mounting screw for said safety mechanism and jointly rotatable with said mounting screw on tightening thereof;
rotational movement of said component moving said blocking member from a blocking position into a release position to enable actuating movement of said actuating member; and



spring means for biasing said blocking member into its blocking position, said spring means, on loosening said mounting screw, automatically returning said blocking member to its blocking position.

5,143,404
NOTE PAD
Richard G. Flowers, Jr., 15715 Lone Tree, Houston, Tex. 77084
Filed May 16, 1991, Ser. No. 701,201
Int. Cl.[5] B42D *1/00*
U.S. Cl. 281—21.1 6 Claims



1. A note pad comprising
a stack of sheets of note paper having binding edges and a top surface,
a flat advertising structure having an upper surface, a lower surface with advertising on the lower surface and a binding edge, and
binding means engaging the binding edges of the sheets and the upper surface of the advertising structure
said binding means being sufficiently flexible to allow said structure to pivot away from the sheets exposing all of the top surface of the top sheet.

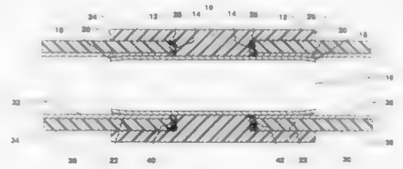
5. A multiple note pad structure comprising
a stack of note sheets having a width equal to the desired length of individual note pads and a length at least equal to a multiple of the desired width of the note pad,
said stack having a top surface and a binding edge,
a plurality of advertising structures each of said structures having an upper surface, a lower surface on which advertising material is included thereon and a binding edge, and
means for binding the edges of the note sheets and the advertising structures on the top surface of the note sheets and in covering relationship to the portion of the top of said note sheets along its bound edge.

5,143,405
BEARER MEDICAL INFORMATION BOOKLET
Yousef Daneshvar, 33200 Slocum, Farmington, Mich. 48024
Filed Apr. 16, 1990, Ser. No. 495,738
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—31 11 Claims

1. A booklet for containing personal medical information about the bearer of the booklet, said booklet comprising a front cover and a back cover that are joined by a line of folding to allow the front and back covers to be opened and closed, and an area of the inside of each of said covers comprising receiving means for receiving sheet material, and said booklet further including sheet material containing medical information about the bearer removably received on said receiving means, said booklet including one or more interior sheets each having an edge that is substantially coincident with said line of folding so as to form a leaf of the booklet which also folds about said line of folding and which contains additional medical information about the bearer, and in which said one or more interior sheets includes a transparent plastic containing a pocket into which is removably inserted an information sheet containing at least some of the additional medical information about the bearer.

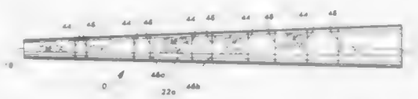
5,143,406
Patent Not Issued For This Number

5,143,407
PIPE COUPLING WITH COPPER SLEEVE ENGAGING COPPER LINED PIPE
Emmet Cokeh, 17101 Hiawatha St., Granada Hills, Calif. 91344
Filed Feb. 25, 1991, Ser. No. 660,421
Int. Cl.[5] F16L *13/10*
U.S. Cl. 285—55 17 Claims



1. A pipe coupling comprising:
a pair of sections of copper-lined pipe to be connected; and
a pipe coupling device comprising a cylindrical member formed of plastic with a central inwardly-extending boss,
a copper pipe, dimensioned to frictionally engage the copper lining of said sections of pipe to be connected, extending coaxially through said sleeve and supported by said boss, and
a pair of annular recesses each encircling a respective end of said coaxial pipe adjacent each end of said cylindrical member to permit the ends of said pipe to be connected to be inserted into said recess in a manner to encircle said coaxial pipe and to facilitate joining of the pipe to be connected to said cylindrical member; and
adhesive means securing said pipe to be connected to said cylindrical member.

5,143,408
VARIABLE SIZE PIPE CONNECTOR
Eric B. Holtsmark, 321 Scenic Ave., Piedmont, Calif. 94611
Filed Nov. 22, 1991, Ser. No. 789,882
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—93 11 Claims



1. A fluid tight, variable size pipe connector for securing together two pipe ends having different inside diameters, said connector comprising:
an elongate, tapered coupling tube of generally uniform, end to end configuration, having a frustoconical exterior surface and being made of a pliable material;
means defining a frustoconical interior surface within said tube, generally concentric with respect to said exterior surface;
a tube wall defined by said interior and exterior surfaces and having a generally uniform thickness throughout the length of said tube;
said coupling tube terminating in a first, narrow inside diameter end and a second, wide inside diameter end; and
indicia means arrayed along said coupling tube exterior surface, defining cut lines for slicing a frustoconical coupling tube segment from said connector, said segment thus having open pipe connecting ends, said indicia means

being directly, dimensionally related to the diameters of pipe ends to be connected together.

5,143,409

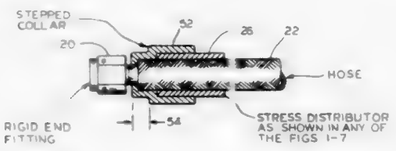
STRESS RELIEF DEVICE

Anthony J. Lalikos, Springfield, Mass., assignor to Titeflex Corporation, Springfield, Mass.

Continuation-in-part of Ser. No. 400,325, Aug. 30, 1989, abandoned. This application Jul. 10, 1990, Ser. No. 548,513

Int. Cl.[5] F16L *15/00*

U.S. Cl. 285—116 22 Claims



1. A dynamic stress relief device for a substantially non-metal kinetic, large displacement, high frequency flexing hose, said device comprising an end fitting having an insert section and an outer collar associated therewith; a highly flexible substantially non-metal hose made primarily of an elastomer material, said insert section fitting into said hose and making it rigid in the area of said insert, said hose also fitting into, surrounded by, and secured to said outer collar; a flexible sleeve fitting over the rigid area adjacent said insert and extending out over said highly flexible kinetic hose, said flexible sleeve providing a progressively greater flexibility extending from a minimum flexibility near said end fitting and in said rigid area to a maximum flexibility remote from said end fitting whereby said hose is bendable without either kinking or experiencing undue localized fatigue; a portion of said sleeve adjacent said end fitting being fitted into and surrounded by said collar, over and surrounding said hose, and extending from said end fitting outwardly over said hose for a distance which is in a range of not less than three times the outside diameter of said hose and not more than twenty times.

5,143,410

BRANCH CONNECTORS FOR HIGH-PRESSURE BRANCHED FUEL PIPE

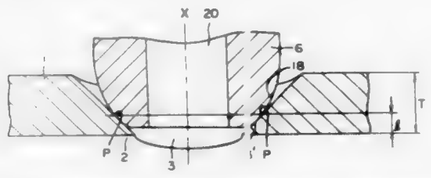
Kazunori Takikawa, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Filed Jun. 26, 1991, Ser. No. 721,286

Claims priority, application Japan, Jun. 30, 1990, 2-173848

Int. Cl.[5] F16L *41/12*

U.S. Cl. 285—197 6 Claims



1. A combination of branch connectors and a high-pressure main fuel pipe, said combination comprising:

a main pipe having a generally cylindrical wall with opposed inner and outer surfaces, the inner surface defining an axially extending circulation passage through which high-pressure fuel circulates, the wall defining a radially thickness T extending from the inner surface to the outer surface thereof;

a plurality of holes extending radially through the wall of the main pipe and communicating with the circulation passage, the holes being spaced from each other axially of the passage;

pressure-receiving seat surfaces each formed around a respective one of the holes of the main pipe, the pressure-receiving seat surfaces defining curved surfaces symmetrical about a radius of the main pipe extending centrally through the respective hole and the diameter of the curved pressure receiving sent surface increasing at radially outwardly disposed locations on the wall of the main pipe, the branch connectors being juxtaposed on the holes, each said branch connector having a fluid passage extending axially therethrough and being in communication with the circulation passage of the main pipe, the push head portion bearing against the pressure-receiving seat surface;

coupling metal fittings mounted to surround the main pipe, each said coupling metal fitting having threads for fastening the branch connectors to the main pipe;

the push head portions of the respective branch connectors being substantially spherical surfaces having centers located on the axes of the respective branch connectors;

the spherical push head portion of each branch connector contacting the respective pressure-receiving seat surface on a line;

the spherical push heads and the curved pressure-receiving seat surfaces being dimensioned such that a distance l from the inner surface of the main pipe to said line of contact between the spherical push head portion of each branch connector and the respective curved pressure-receiving seat surface is such that the relations $'5\ T < l < \frac{3}{4}\ T$ hold whereby efficient sealing between the branch connectors and the main pipe is achieved without deterioration to the main pipe at the inner and outer surfaces thereof.

5,143,411

THREADED TUBULAR CONNECTION

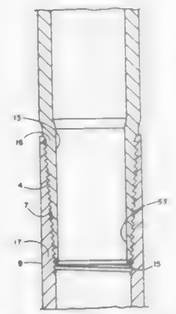
John D. Watts, P.O. Box 79466, Houston, Tex. 77279

Continuation-in-part of Ser. No. 315,271, Feb. 24, 1989, Pat. No. 5,018,771, which is a continuation-in-part of Ser. No. 897,069, Jul. 18, 1986, Pat. No. 4,813,717 which is a continuation of PCT/US85/0260, Feb. 19, 1985, abandoned, which is a continuation of PCT/US84/1936, Nov. 23, 1984 abandoned. This application May 24, 1991, Ser. No. 705,328

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—333 8 Claims



1. A high efficiency integral connection for non-upset joints of oilwell pipe or the like, comprising: at least two joints of pipe joined together and forming joints of pipe, each joint of pipe being formed with tapered internal threads at a first end; the joints each having a second end formed with tapered external threads dimensioned such that one such joint may be sealingly connected directly with another such joint; the threads being of sufficient length and taper such that the wall strength of the first end in the area of the the smallest diameter of thread engagement is at least three-fourths of the average pipe wall strength and the wall strength of the second end in the area of the largest diameter of thread engagement is at least three-fourths of the average pipe wall strength.

5,143,412

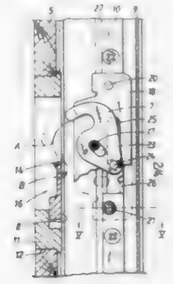
LOCKING MECHANISM FOR SLIDING WINDOWS AND DOORS

Per-Olof Lindqvist, Onsala, Sweden, assignor to Fixfabriken AB, Sweden

Filed Feb. 12, 1991, Ser. No. 654,306

Int. Cl.[5] E05C *3/04*

U.S. Cl. 292—200 9 Claims



1. A locking mechanism for a window or a sliding door having a frame and a pair of adjacent sashes at least one of which is slidable behind the other with respect to said frame in movement directions, each of said pair of sashes having a meeting rail extending in an elongation direction, said meeting rails adapted to lie adjacent one another when said sashes are in a closed position, said locking mechanism comprising

an engagement member connected to one of said meeting rails and moveable in an operating plane transverse to said movement directions, said engagement member having a curved end,

a receiving element connected to the other one of said meeting rails, said receiving element having an inclined surface extending oblique to said movement directions and an engagement surface disposed transverse to said operating plane,

a handle connected to said one of said meeting rails and moveable between a locked position and an unlocked position, and

an operating mechanism including means for moving said curved end of said engagement member into engagement with said inclined surface of said receiving element responsive to movement of said handle from said unlocked position to said locked position, said operating plane, said inclined surface and said engagement surface being arranged so that, upon movement of said handle from said unlocked position to said locked position, said curved end of said engagement member first acts upon said inclined surface to displace said pair of sashes away from one another in opposite movement directions and then acts upon said engagement surface to draw said meeting rails toward one another in directions transverse to said movement directions.

5,143,413

GATE BRACKET CONNECTOR WITH A PAIR OF U-SHAPED YOKE MEMBERS

Vernon Vandenhoek, Lynnville, Iowa 50153

Filed May 24, 1991, Ser. No. 705,580

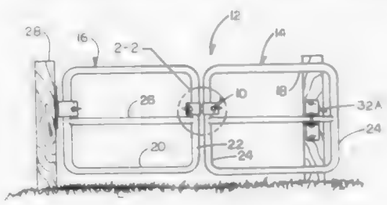
Int. Cl.[5] F16B *7/00*; **F05C** *3/04*

U.S. Cl. 292—302 6 Claims

1. A bracket connector for a double gate structure including a pair of gates movable to and from closed positions wherein said gates are located substantially in a common plane with vertical outer end members of the gates adjacent one another, comprising;

a pair of U-shaped yoke members having base portions interconnecting spaced apart legs, said U-shaped yoke members being formed from rigid one piece plates and the outer ends of the yoke members including aligned openings to receive a removable closure pin,

pin means interconnecting said base portions positioned in



adjacent relationship with said yoke members being positioned in back to back relationship whereby said yoke members are rotatable, each pair of spaced apart legs extending in opposite directions along a common axis which is parallel to the axis of said pin means, and said yoke members adapted to straddle the adjacent vertical outer end members of the gates as said yoke members are rotated relative to each other for alignment with the adjacent vertical outer end members of the gates.

5,143,414

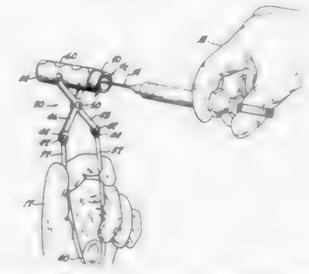
MEDICAL DEVICE FOR HOLDING HYPODERMIC SYRINGE NEEDLE CAPS

Davey G. Rosellini, 1950 Balearic Dr., Costa Mesa, Calif. 92626

Filed Sep. 24, 1990, Ser. No. 587,069

Int. Cl.[5] A61M *5/32*; **B25B** *9/00*

U.S. Cl. 294—99.2 17 Claims



1. A medical device for holding caps for capping hypodermic syringe needles, said needle cap-holding device comprising:

a. an elongate, manually-operable handle;

b. first and second cap-holding jaws and means for mounting said jaws to said handle so as to cause the jaws to be in a closed condition when the handle is not operated and so as to cause the jaws to open from said closed condition toward an open condition when the handle is operated by a user,

said jaws having an inner opening sized to grip a needle cap when the jaws are in the closed condition and having an axial length which is substantially greater than the cross sectional dimension of the jaws when the jaws are in the closed condition,

said mounting means mounting the jaws so that a longitudinal axis thereof is substantial perpendicular to the longitudinal axis of the handle and so that the jaws have one pair of longitudinally opposing edges which are distal relative

to the handle and another pair of opposing longitudinal edges which are proximal relative to the handle,

said pair of distal edges being relatively thin so as to enable the jaws to pick up a needle cap from a surface when the handle is operated to cause the jaws to be in the open condition and when the jaws are returned to the closed condition;

c. biasing means for urging the jaws toward the closed condition when the handle is not operated; and

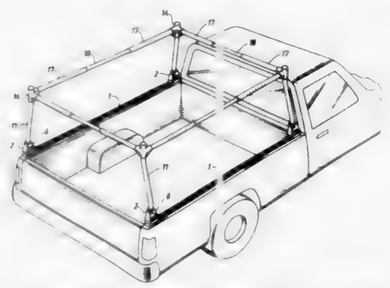
d. stopping means attached to one end region of at least one of the jaws for preventing a held cap from being pushed axially through the jaws during a needle capping operation.

5,143,415

DISASSEMBLABLE, LIGHTWEIGHT TRUCK UTILITY RACK

Michael Boodah, Seal Beach, Calif., assignor to Jemb Rack Systems, Inc., Huntington Beach, Calif.

Filed May 31, 1991, Ser. No. 708,496
Int. Cl.[5] B60R 9/00
U.S. Cl. 296—3 **6 Claims**



1. An apparatus for carrying objects over an open bed of a truck, the open bed having two opposed longitudinal sides, said apparatus comprising:

two rail tracks each mountable at a respective longitudinal side of the open bed, each track having a length dimension and being provided with a slot which extends along the length dimension;

two pairs of base members, each pair of base members being associated with a respective track, each said base member being formed to define a stanchion-receiving aperture:

a plurality of fastening means each associated with a respective one of said base members for detachably fastening each of said base members to its associated track at any selected point along the length dimension of said associated track, each said fastening means including a first fastening member which is retained in the respective base member and a second fastening member which is retained in said slot of a respective one of said tracks, said first and second fastening members being detachably engageable with one another to secure said respective base member to said respective track, so that said aperture of said respective base member is oriented in a substantially upward direction;

four elongate stanchions each having opposed first and second ends, said first end of each said stanchion being insertable into said stanchion-receiving aperture of a respective one of said base members to extend substantially vertically;

four cross members each composed of at least two parts which are telescopically engaged with one another to permit adjustment of the length of each said cross member;

four corner members each formed to define two at least approximately mutually perpendicular cross member-receiving apertures and a stanchion-receiving aperture, said second end of each said stanchion being insertable into said stanchion-receiving aperture of a respective one of said corner members and one end of each said cross member being insertable into a respective cross member-receiving apertures of a respective one of said corner members to form a rack structure in which said cross members form a rectangular frame which lies in at least a substantially horizontal plane and which is supported at a defined height above the open bed of the truck by said stanchions; and

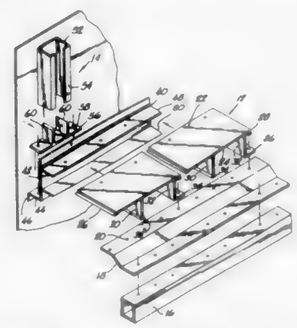
spring-loaded locking means for locking each end of each of said stanchions and each end of each of said cross members in a respective one of said apertures in a releasable manner.

5,143,416

VEHICLE BODY

Vahe Karapetian, 4801 Los Feliz Blvd., Los Angeles, Calif. 90027

Continuation of Ser. No. 362,236, Jun. 6, 1989, Pat. No. 4,991,897. This application Nov. 8, 1990, Ser. No. 611,299
Int. Cl.[5] B62D 27/00
U.S. Cl. 296—29 **4 Claims**



1. A vehicle body comprising

two spaced side rails to either side and extending longitudinally of the vehicle, each said side rail being integrally formed including in cross section a vertically disposed web, a lower flange extending laterally outwardly of said web, and having a vertically disposed mounting flange extending downwardly from the outer end of said lower flange, and at least one mounting flange extending laterally inwardly of said web;

a floor assembly including floor members extending from one said side rail to the other said side rail and to said mounting flanges one each said side rail, said floor member being attached to said mounting flanges;

rib members positioned on and extending upwardly from said lower flange and affixed to said vertically disposed side rail webs, said rib members being channels in cross section with each having an open side with rib flanges extending longitudinally of said channels and toward one another along said open side thereof, each said web extending upwardly of said mounting flanges on each said side rail and said rib flanges being fastened to said webs above said mounting flanges;

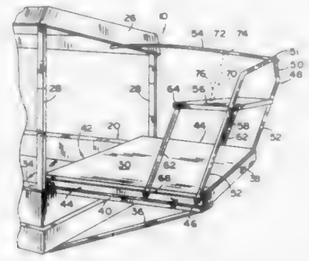
frame clips, each said frame clip including a base and spaced attachment legs extending normal to said base from inwardly of the ends of said base, said base being fastened to said lower flange outwardly of said spaced attachment legs, said spaced attachment legs extending into one end of a said rib member, fitting closely therein, said attachment legs each being fastened to said rib member.

5,143,417

SHELVING UNIT FOR COLLAPSIBLE CAMPERS

George C. Philley, Topeka; Homer Ratliff, Avilla, and Ira H. Kauffman, Goshen, all of Ind., assignors to Starcraft RV, Inc., Topeka, Ind.

Filed Jul. 5, 1991, Ser. No. 726,296
Int. Cl.[5] B60P 3/355
U.S. Cl. 296—176 **4 Claims**



1. A shelf for a collapsible camper, comprising:

a platform adapted to extend from said collapsible camper;

an end frame having a first pair of legs each coupled to an opposite side of said platform and adapted to pivot upwardly in an arc from a first position substantially parallel to said platform to a second position having an angle measured along said arc of greater than 90°;

a shelf pivotally coupled to said end frame between said first pair of legs and disposed substantially parallel to said platform;

a second pair of legs, each interconnecting an end of said shelf to one of said opposite sides of said platform for preserving said substantially parallel orientation of said shelf to said platform with said end frame moving from said first position through to said second position; and

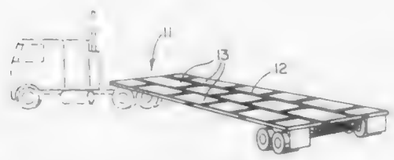
a ceiling rod having one end pivotally coupled to said end frame and having an opposite end detachably coupled to a roof of said camper, for raising and lowering said end frame and said shelf with respect to said platform.

5,143,418

FLOORING PANELS FOR FLAT PLATFORM TRAILERS

Robert J. M. Fouquet, 4701 Cove Cliff Road, North Vancouver, Canada V7G 1H7

Division of Ser. No. 446,381, Dec. 5, 1989, Pat. No. 5,041,322. This application May 6, 1991, Ser. No. 696,225
Int. Cl.[5] B62D 21/02
U.S. Cl. 296—182 **14 Claims**



1. A trailer or truck deck comprising:

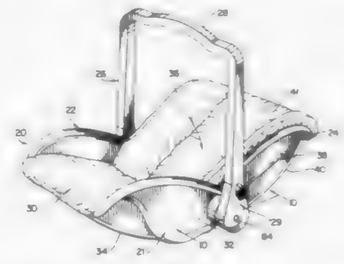
a base frame including a series of transversely extending joists arranged at a uniform close spacing in the longitudinal direction of the deck, and a series of rectangular panels arranged in abutting relationship overlying and secured to said joists, each panel being of composite layered wood veneer construction, of uniform thickness, and having a moisture impermeable coating on each of its major surfaces, the panels being arranged longitudinally such that they abut over said joists, the abutting ends of said panels being recessed to receive a metal strap that spans the abutting ends of the panels and is secured through them to the underlying joist by suitable fastening means.

5,143,419

COLLAPSIBLE INFANT CARRIER WITH PIVOT-OPEN LOCK, PIVOT-CLOSED LOCK AND COAXIAL HANDLE LOCK

Sidney Tepper, Milburn, N.J., and Khipra Nichols, Rumford, R.I., assignors to Playskool Baby, Inc., Pawtucket, R.I.

Filed Sep. 30, 1991, Ser. No. 767,828
Int. Cl.[5] A47C 4/52
U.S. Cl. 297—183 **8 Claims**



1. An infant carrier comprising:

a collapsible shell assembly including a seat and a backrest which is pivotally connected to the seat along a pivot axis, said seat and said backrest being pivotable between a closed position wherein said seat and said backrest form an angle of less than 90°, and an open position wherein said seat and said backrest form an angle of greater than 90°;

means for locking said seat and said backrest in said open position;

means for locking said seat and said backrest in said closed position; and

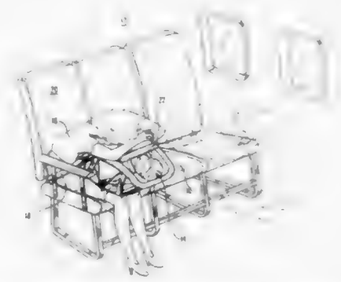
a handle assembly attached to said shell assembly and including a carrying handle which is pivotable about said axis, and a handle locking mechanism for locking said handle in a plurality of pivoted positions about said axis.

5,143,420

AIRPLANE SAFETY SEAT FOR LAP CHILDREN

Stanley Switlik, 33 E. Welling Ave., Pennington, N.J. 08534

Filed Jun. 12, 1990, Ser. No. 536,519
Int. Cl.[5] A47C 1/08
U.S. Cl. 297—250 **6 Claims**



1. A lap usable child carrier apparatus for use on an airplane comprising:

a frame having a front and a back and a first and second sidewall attached to said back, said sidewalls formed from a resilient tubular material and comprising an oval portion which at least partially defines an egg-shaped space, and a

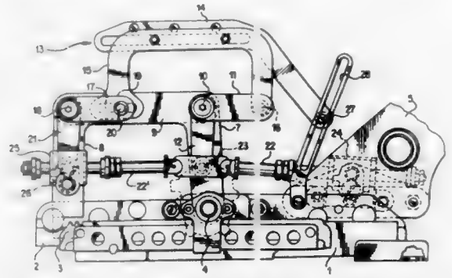
V-shaped portion attached to said oval portion for providing resilient strength to said oval portion;
a bucket seat which fits in said frame and between said sidewalls;
crash protection means selectively positionable over a child placed in said bucket seat for preventing an adult from contacting said child in the event of an airplane crash, said crash protection means including a first section rotatably connected to said frame and a second section rotatably connected to said first section, said second section including at least two legs, and a crash protection pad attached to said first section of said crash protection means; and,
rotation means for rotatably connecting said first section to said frame and for permitting said crash protection means to be rotated with respect to said bucket seat,
wherein said crash protection pad faces said adult when said apparatus is in position on the lap of said adult on an said airplane.

5,143,421

VEHICLE SEAT HAVING A SEAT SURFACE WHICH IS ADJUSTABLE BOTH AS TO HEIGHT AND INCLINATION

Hans W. Voss, Rockenhausen; Heinz P. Cremer, Kaiserslautern; Harald Cwiertnia, and Peter-Ulrich Putsch, both of Rockenhausen, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 337,471, Apr. 13, 1989, abandoned, which is a division of Ser. No. 54,769, May 27, 1987, Pat. No. 4,842,334. This application Oct. 31, 1990, Ser. No. 607,635
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617810
Int. Cl.[5] B60N 2/18
U.S. Cl. 297—338 14 Claims



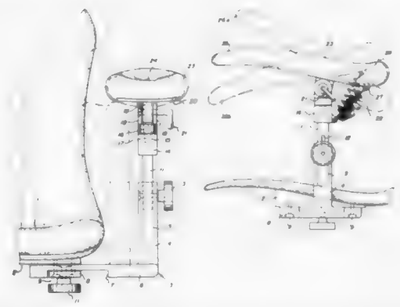
1. Vehicle seat in which the inclination of the back rest and the inclination and height of the seat surface are adjustable, having:
(a) an upholstery support for the upholstery forming the seat surface, in which the height and inclination of the upholstery support are adjustable relative to a seat support means that is connected with the vehicle,
(b) a rear height adjustment device supported by the seat support means and supporting a rear part of the upholstery support, said rear height adjustment device comprising a first angled lever having upper and lower ends which, at an intermediate point, is pivotally connected to and which can be pivoted about a first axle supported on the seat support means and running in the lateral direction of the seat,
(c) a front height adjustment device supported by the seat support means and supporting a front part of the upholstery support, said front height adjustment device comprising a second angled lever having upper and lower ends which, at an intermediate point, is pivotally connected to and which can be pivoted about a second axle supported on the seat support means and running in the lateral direction of the seat, said front and rear parts of said upholstery support being pivotally supported by said upper ends of said second and first levers, respectively,
(d) a first drive mechanism coupled to said rear height adjustment device at said first lever lower end by a first spindle and first turning knuckle, and coupled to said front height adjustment device at said second lever lower end by a second spindle and second turning knuckle disposed between said first and second lever lower ends, said first drive mechanism activating said rear and front height adjustment devices together,
(e) a second drive mechanism coupled to said front height adjustment device at said second lever lower end and coupled to said rear height adjustment device at said first lever lower end by said second spindle and said first turning knuckle, said second drive mechanism activating only said front height adjustment device, and
(f) a guide provided for the upholstery support, said guide being connected to the seat support means, said guide extending in a direction inclined backwardly with respect to a vertical direction, and means are provided interconnecting said guide and said upholstery support, wherein said guide, in cooperation with said interconnecting means, superimposes a backwards movement of the upholstery support over the vertical adjustment when the upholstery support is moved upward and superimposes a forward movement over the vertical adjustment when the upholstery support is moved downward.

5,143,422

ADJUSTABLE ACTIVE ARM SUPPORT FOR KEYBOARD OPERATORS

Gerd Althofer, 440 E. 79th St., New York, N.Y. 10021, and Richard M. Kowal, 23 W. 73rd St., New York, N.Y. 10023

Filed Apr. 22, 1991, Ser. No. 688,289
Int. Cl.[5] A47C 7/54
U.S. Cl. 297—411 10 Claims



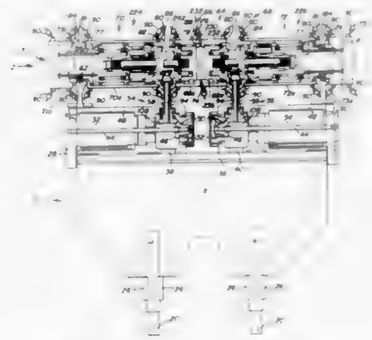
1. An active arm support for a user sitting in a chair comprising, in combination:
a longitudinal armrest having a longitudinal axis and front and rear end portions,
a support means for mounting said armrest adjacent the chair and including a support member,
a first pivot means for pivotally mounting the armrest relative to said support means for pivotal movement of the longitudinal axis of said armrest in a vertical plane while the user is sitting on a seat of the chair and including an uppermost limit of pivotal movement in the vertical plane of one of said end portions,
a second pivot means for pivotally mounting said armrest for pivotal movement relative to said support member of said support means in a generally horizontal plane perpendicular to the vertical plane, and
a spring means engaging one of the end portions of the armrest for urging said first-mentioned one of the end portions of said armrest to the uppermost limit of the pivotal movement thereof, for urging the longitudinal axis of said armrest parallel to a vertical plane of symmetry of the chair, and for providing a vertical lift about said first pivot means to said first-mentioned one end portion when moved from the uppermost limit by engagement with a forearm of the user seated on the seat whereby the forearm is actively supported.

5,143,423

DRUM ASSEMBLY FOR A CONTINUOUS MINER

Maurice K. LeBegue; Jon C. Blackstock; Clarence H. Woodford, II, and Leonard M. Sanders, all of Fairmont, W. Va., assignors to Tamrock World Corporation, N.V., Curacao, Netherlands Antilles

Filed Jan. 18, 1991, Ser. No. 643,721
Int. Cl.[5] F21C 27/24
U.S. Cl. 299—76 20 Claims



1. A drum assembly for a continuous mining machine,
a boom member on a mining machine,
a cutter drum assembly rotatably mounted on the front of said boom member,
said cutter drum assembly including a first drum end portion and a second drum end portion,
said first and second drum end portions being adjacently positioned in spaced relation to form a pair of independent drum sections,
input drive means for rotating said first and second drum end portions so that said pair of independent drum sections rotate independently of each other,
cutting elements positioned on said drum sections, and
said drum sections arranged to dislodge material from a mine face upon rotation of said respective sections.

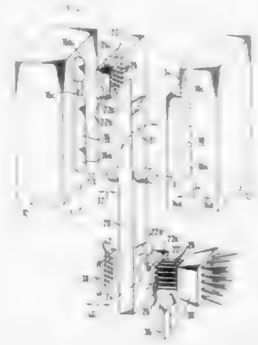
5,143,424

BRUSH MAKING MACHINE

Bart G. Boucherie, Izegem, Belgium, assignor to G. B. Boucherie N.V., Izegem, Belgium

Filed May 31, 1991, Ser. No. 708,369
Claims priority, application European Pat. Off., Jun. 28, 1990, 90112340.6
Int. Cl.[5] A46D 3/08
U.S. Cl. 300—2 8 Claims

1. A brush making machine comprising a mold for injection molding brush bodies having tufts of bristles embedded in the molding material, wherein
a) said mold comprises:
a first mold member having a mold cavity corresponding to a first portion of the brush body to be molded;
a second mold member having a mold cavity corresponding to a second portion of the brush body to be molded; and
a plate member provided with a molding surface and with holes for receiving tufts of bristles such that said tufts protrude from said molding surface, the plate member being adapted to close a portion of said mold cavity of said first mold member;
b) said mold members are movable with respect to each other between a mold closing position in which their cavities define together a molding chamber and a mold opening position, and said plate member is movable between a mold closing position and a tuft loading position spaced from said mold closing position;
c) said molding surface of said plate member delimits a mold cavity corresponding to a first head portion of the brush body to be molded, the remaining head portion of the brush body being defined by a portion of the mold cavity of said first mold member;



d) said plate member has an outer shape which is complementary to a recess formed in said second mold member, the mold cavities of said plate member and of said second mold member communicating with each other substantially at a neck portion of the brush body when said plate member and said second mold member are in their mold closing positions so as to form a common continuous mold cavity; and
e) said plate member is mounted on a carrier, said carrier mounting at least one further similar plate member and being movable to move one of said plate members to its mold closing position and simultaneously the other plate member to its tuft loading position, and vice-versa.

5,143,425

DEVICE FOR CUTTING BRISTLES OF TOOTH BRUSHES TO DIFFERENT LENGTHS IN DIFFERENT SELECTED AREAS OF A TUFT PATTERN

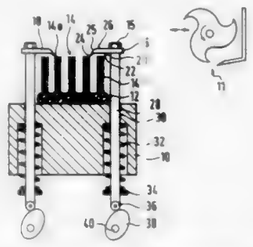
Lionel P. Boucherie, Izegem, Belgium, assignor to G. B. Boucherie N.V., Izegem, Belgium

Filed May 22, 1991, Ser. No. 704,021
Claims priority, application European Pat. Off., May 31, 1990, 90110324
Int. Cl.[5] A46D 9/02, 1/06, 3/08
U.S. Cl. 300—2 20 Claims

1. A device for cutting bristles of tooth brushes to different lengths in different selected areas of a tuft pattern comprising:
a support for holding a brush head having tufts of bristles projecting therefrom,
at least one shield member associated with a selected area of the tuft pattern and movable with respect to said support at least in a direction parallel to the bristles between a rest position distant from the brush head and the bristle tips and an active position close to the brush head, said shield member, when moving from its rest position to its active position, engaging and bending the bristles in the selected area while leaving unaffected the bristles outside the selected area;

a cutter for cutting the exposed ends of the bristles outside the selected area; and

ramp means provided on said shield member for engaging the tips of the bristles in the selected area of the tuft pat-



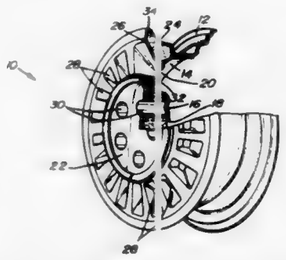
tern and for imparting a radial component of movement to the engaged bristle tips to bend the corresponding bristles in directions away from the bristles outside the selected area upon movement of said shield member from its rest position to its active position.

5,143,426

VEHICLE WHEEL CONSTRUCTION

Kenneth L. Todd, Roseville, Mich., assignor to Masco Industries, Inc., Taylor, Mich.

Division of Ser. No. 434,155, Nov. 13, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 726,620
Int. Cl.[5] B60B 7/00
U.S. Cl. 301—37 P 7 Claims



1. A composite styled wheel having a metal wheel including a rim adapted to receive a vehicle tire and a central disc for mounting the composite wheel to a vehicle, the central disc including a plurality of vent opening and a plurality of bolt holes for mounting the wheel, said composite wheel comprising:

a structural base molded against a first side of the metal wheel, said base having a configuration substantially identical to the configuration of the composite wheel ornamentation, said base molded such that said vent openings and bolt holes remain exposed; and

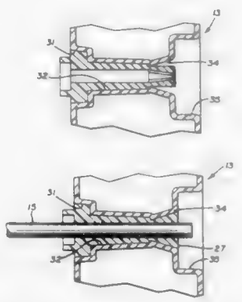
a fascia covering said structural base and conforming to the surface configuration of said base in order to capture said base against the first side of the metal wheel, said fascia intermingling with an outer surface layer of said base to form an integral bond therewith and extending into and engaging said vent openings of the metal wheel to mechanically lock said fascia to the metal wheel, said integral bond preventing separation of said fascia from said base and said mechanical lock preventing separation of said fascia and base form the metal wheel.

5,143,427

DRIVE WHEEL CONNECTION FOR A TOY VEHICLE AND METHOD OF ASSEMBLY

Larry C. Dick, Sugar Bush Knolls, Ohio, assignor to The Little Tikes Company, Hudson, Ohio

Filed May 21, 1991, Ser. No. 703,606
Int. Cl.[5] B60B 27/02
U.S. Cl. 301—111 12 Claims



1. A drive wheel assembly for a toy vehicle comprising an axle; a wheel having a hub; a generally axial aperture in said wheel hub on the side of said wheel facing said axle, at least a portion of said aperture being tapered; a bushing positioned in said aperture in said wheel hub and having a first axle receiving aperture extending therethrough; said bushing including expandable means having a second axle receiving aperture therein communicating with said first axle receiving aperture; said second axle receiving aperture having a first end and a second end, and being defined by a plurality of expandable segments having slots therebetween; said first end of said second axle receiving aperture having a greater diameter than said second end thereof such that said second axle receiving aperture is tapered from said first end to said second end; said second end having a lesser diameter than the diameter of said axle prior to the insertion of said axle therethrough; said expandable segments being engageable with said tapered portion of said aperture in said wheel hub such that when said axle is positioned in said second axle receiving aperture, said expandable segments engage said tapered portion of said aperture in said wheel hub to affix said bushing to said wheel.

5,143,428

WHEEL BRAKING CONTROL APPARATUS FOR REDUCING PRESSURE FLUCTUATIONS BETWEEN TWO BRAKE LINES

Hiroshi Toda, Kariya; Hideyasu Miyata, Nagoya; Hiroaki Takeuchi; Nobuyasu Nakanishi, and Koichi Kondo, all of Toyota, all of Japan, assignors to Aisin Seiki K. K., Aichi, Japan

Filed Sep. 28, 1990, Ser. No. 589,367
Claims priority, application Japan, Sep. 29, 1989, 1-115086[U]
Int. Cl.[5] B60T 8/62
U.S. Cl. 303—113 AP 6 Claims

1. An anti-lock wheel braking control apparatus comprising:

brake applying means including brake applying hydraulic cylinders provided in association with a pair of wheels, for applying a braking force to each wheel;

pressure supplying means for supplying a pressurized fluid to the brake applying means;

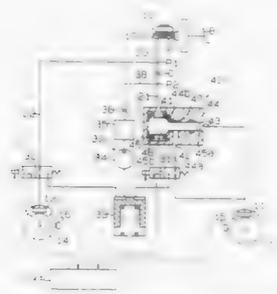
a brake fluid circuit for coupling the pressure supplying means to the brake applying means, the brake fluid circuit being divided into two brake lines at a dividing point, the brake lines each having an end connected to the brake applying means;

a reservoir for receiving brake fluid;

a pair of line switching means, each line switching means being associated with a particular brake line for selectively alternatively coupling the brake applying means to the pressure supplying means and the reservoir;

a pressure compensation line connected between the reservoir and a first one of the brake lines at a junction point between the dividing point and the brake applying means for delivering fluid from the reservoir to the first brake line;

interference eliminating means, disposed between the dividing point and the junction, for reducing the coupling of pressure fluctuations between the two brake lines;



said pressure supplying means including a master cylinder;

said interference eliminating means including a nozzle provided between the dividing point and junction point; and

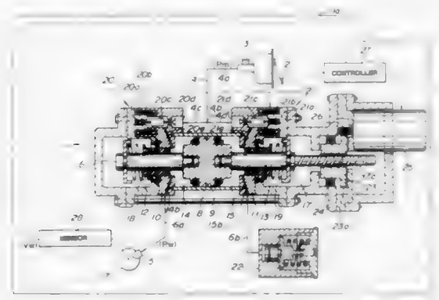
said first brake line having a flow control valve for controlling a flow rate of a fluid flowing in said first brake line based on the difference between a fluid pressure on a master cylinder side and a fluid pressure on a brake applying hydraulic cylinder side, the flow control valve being disposed between the junction and the brake applying means.

5,143,429

HYDRAULIC MODULATOR WITH EQUAL, OPPOSING CHAMBERS FORMED BY A PISTON

Akira Higashimata, Yokosuka; Takeshi Fujishiro, and Shigeki Yoshioka, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Jan. 24, 1991, Ser. No. 645,415
Claims priority, application Japan, Jan. 25, 1990, 2-13672
Int. Cl.[5] B60T 8/32; F15B 5/00
U.S. Cl. 303—115 EC 21 Claims



4. A fluid pressure control system comprising:

a cylinder means comprising a piston and a means defining first and second fluid chambers separated by said piston;

a valve means for opening said first and second chambers to a fluid pressure source, and closing said first and second chambers so that said first and second chambers form, respectively, first and second closed hydraulic circuit sections which are isolated from each other and further isolated from the pressure source;

a drive means for moving said piston to vary a volume of said first chamber and thereby varying a fluid pressure confined in said first closed hydraulic section; and

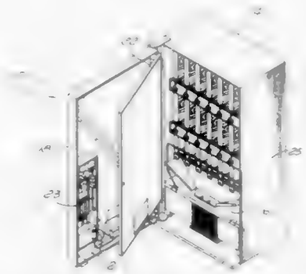
wherein said drive means includes a means for receiving an electric control signal and reciprocating said piston in accordance with said control signal so that a relationship between a displacement of said piston and said control signal is fixed.

5,143,430

INNER DOOR LATCH

Christopher R. Craven, and Richard A. Pollock, both of Fresno, Calif., assignors to The Vendo Company, Fresno, Calif.

Filed Sep. 6, 1990, Ser. No. 578,915
Int. Cl.[5] A47B 48/02
U.S. Cl. 312—291 12 Claims



1. A vending machine, comprising:

a dispensing means having a refrigerated compartment therein;

an outer door attached to said dispensing means;

an inner door hinged to said outer door, said inner door for sealing said refrigerated compartment;

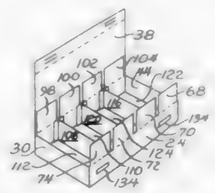
latching means mounted to said outer door, said latching means of one-piece construction and having a ridge integrally formed therewith, said ridge configured to enable said inner door when urged against said outer door from a first separated position to pass over said ridge to a second adjacent position, an appropriate amount of force applied to separate said inner and outer doors causing said inner door to roll over said ridge and swing away form said outer door to said first separated position.

5,143,431

PORTABLE CORRUGATED CARDBOARD MEDICINE CABINET

Margo W. Udell, Skokie, Ill., assignor to Medique Products Co., Skokie, Ill.

Filed Jun. 12, 1990, Ser. No. 537,027
Int. Cl.[5] A47B 43/02
U.S. Cl. 312—259 10 Claims



1. A cabinet formed from corrugated cardboard blanks, comprising:

a first blank assembled to form a cabinet assembly having a rear panel, a pair of opposed side panels, a top panel, a bottom panel and a movable cover panel defining an enclosable volume of space;
a second blank formed to define a first, upper shelving unit;
a third blank formed to define a second, lower shelving unit; and
means for retaining said first and second shelving units in said volume of space including a fourth blank having a panel and a plurality of flaps inserted between said first and second shelving units and dimensioned such that a friction fit results between the fourth blank and the second and third blanks wherein a portion of said second and third blanks are trapped between said plurality of flaps and the panel of the fourth blank

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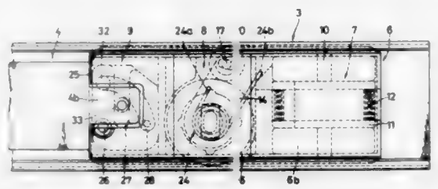
5,143,432

MECHANISM FOR CONTROLLING THE TRAVEL OF A STRUCTURAL MEMBER

Kazuyoshi Obshima, and Selichi o Tamura, both of Tokyo, Japan, assignors to Sugatsune Industrial Co., Ltd., Tokyo, Japan

Filed May 23, 1991, Ser. No. 704,413
Claims priority, application Japan, May 23, 1990, 2-133140
Int. Cl.[5] A47 3 *88/00*
U.S. Cl. 312—319.1 3 Claims



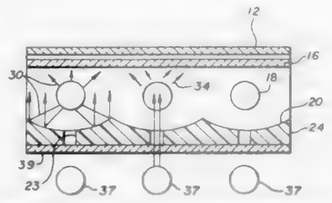
1. A mechanism for controlling the travel of a movable structural member along rails, said mechanism comprising a fixed member provided with a pair of fixed rails, a pair of sliding rails engaged with the respective fixed rails and a movable member arranged on said sliding rails, a pair of traveler devices connected to said sliding rails and engaged with the respective fixed rails for movement therealong, a pair of spring means connected between said fixed member and said traveler devices for pulling the respective traveler devices in a given direction along said fixed rails, a pair of travel controllers mounted on said sliding rails each comprising at least two rollers, the outer peripheries of said rollers being frictionally contacted with each and oppositely facing surfaces of the corresponding fixed rail, a pair of lock devices including first and second operational modes and operatively associated with said traveler devices, said fixed rails and said movable member and operative, when in said first operational mode, to prevent movement of said movable member relative to said traveler devices, and further operative to shift to said second operational mode upon movement of said traveler devices in said opposite direction relative to said fixed rails to predetermined positions in said opposite direction and release said movable member for movement thereof relative to said traveler devices in said opposite direction and also operative, upon subsequent movement of said movable member in said given direction relative to said traveler devices, to shift to said first operational mode to lock said movable member to said traveler devices for movement therewith in said given direction and release said traveler devices from said fixed rails for movement therealong under the biasing action of said spring means in said given direction, said lock devices each comprising a lock plate releasably coupled with the corresponding sliding rail for angularly displacement about a pivot axis stationary with said corresponding sliding rail, said lock devices including means operative to securely hold the respective traveler devices to the fixed rails responsive to rotation of said lock plates at the time of coupling with the respective sliding rails, said rollers being movably mounted from said travel controllers and biased against said oppositely facing surfaces with sufficient friction generated therebetween to cause the travel controllers to function as dampers that dampen the biasing action of the spring means only when the traveler devices are pulled back into the fixed member as the sum of the diameters of the two rollers is so determined that it is greater than the distance between the oppositely facing surfaces of the fixed rails.

5,143,433

NIGHT VISION BACKLIGHTING SYSTEM FOR LIQUID CRYSTAL DISPLAYS

James F. Farrell, Etobicoke, Canada, assignor to Litton Systems Canada Limited, Etobicoke, Canada

Filed Nov. 1, 1991, Ser. No. 786,484
Int. Cl.[5] G01D *11/28*
U.S. Cl. 362—29 25 Claims



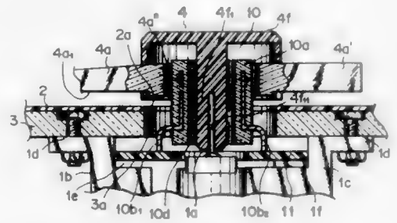
1. A backlit electrooptic modulated light valve display panel which is readable with the unaided eye under bright lighting conditions of day light and is readable with night vision equipment under dark conditions of night which comprises:
an electrooptic modulated light valve panel for controllably modifying light being transmitted therethrough into readable colored patterns of information;
a means for emitting high intensity light through said electrooptic modulated light valve panel and activated for daylight viewing of the display; and
a means for emitting low intensity light through said electrooptic modulated light valve panel for viewing in dark conditions with night vision equipment, and with said means for emitting high intensity light deactivated.

5,143,434

METER FOR AUTOMOBILES

Noriaki Ohta; Minoru Iwazaki, and Hiroyasu Shiratori, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 676,983
Claims priority, application Japan, Mar. 30, 1990, 2-32701[U]; Oct. 3, 1990, 2-103623[U]
Int. Cl.[5] G01D *11/28*
U.S. Cl. 362—29 5 Claims



1. A meter for automobiles comprising:

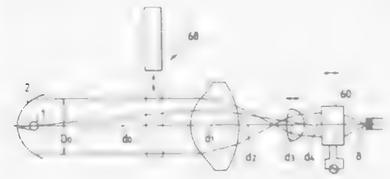
a pointer shaft driven to rotate according to a measured quantity;
a pointer secured to said pointer shaft, said pointer having an indicating portion;
a face plate arranged below the pointer;
a face plate lighting means;
a light conducting member attached to an underside portion of said face plate, said light conducting member being adapted to introduce light from said face plate lighting means, said face plate lighting means comprising a light source other than a light emitting diode for illuminating letters on said face plate; and
a light emitting diode secured to a fixed mounting portion, said light emitting diode having a light emitting portion having a cylindrical shape to allow said pointer to be secured to said pointer shaft inside a hollow portion of said cylindrical light emitting portion so that light radiated from the light emitting portion when said light emitting diode is turned on can be introduced into said indicating portion of said pointer for illuminating said indicating portion.

5,143,435

ILLUMINATION SYSTEM FOR ENDOSCOPES

Akira Kikuchi, Kanagawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1990, Ser. No. 591,806
Claims priority, application Japan, Oct. 2, 1989, 1-255175
Int. Cl.[5] F21V *7/04*
U.S. Cl. 362—32 24 Claims



1. An illumination system for endoscopes, comprising:
a light source,
a reflector for reflecting a portion of light emitted from said light source,
a condenser optical system for focusing the light emitted from said light source and the portion of light reflected by said reflector onto a predetermined location, and
a plurality of light guides having numerical apertures different from one another and functioning selectively to receive the light focused by said condenser optical system,
wherein said condenser optical system including a means for changing numerical aperture of a light beam incident from said condenser optical system onto each of said light guides in conjunction with the numerical aperture of each of said light guides.

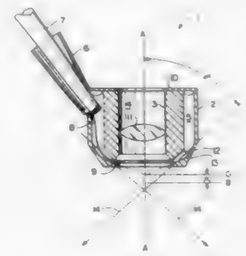
5,143,436

RINGLIGHT FOR USE IN HIGH RADIATION

George A. Baylor, West Mifflin, Pa., and Howard S. Jacket, Springhill, Fla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1991, Ser. No. 665,112
Int. Cl.[5] F21Y *8/00*
U.S. Cl. 362—32 15 Claims

1. A ringlight for use in a high radiation environment providing an annular array of light-emitting elements centered about a viewing passage, the improvement comprising:
a first annular body, a second annular body, each annular body having an inner and an outer surface, said second annular body mounted concentrically within said first annular body so as to form a single annular light-emitting aperture and an annular void between the inner surface of said first annular body and the outer surface of said second annular body, and a plurality of optical fibers extending into said void and having end portions thereof secured



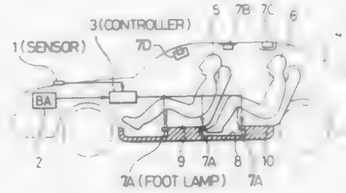
therein so as to form an annular array of optic fiber end surfaces at said light-emitting aperture, said first and second bodies cooperating to angle the end portions of said plurality of optical fibers toward a central axis of said viewing passage.

5,143,437

VEHICLE ROOM ILLUMINATING APPARATUS

Yohsio Matsuno; Shinichiro Choji, both of Machida; Kenichi Sasaki, Neyagawa, and Yoshinori Tanabe, Hirakata, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Jun. 15, 1990, Ser. No. 538,333
Claims priority, application Japan, Jun. 26, 1989, 1-164457
Int. Cl.[5] B60Q *3/00*
U.S. Cl. 362—80 19 Claims



1. A vehicle room illuminating apparatus for an automotive vehicle, comprising:
(a) illuminating means for illuminating a vehicle room;
(b) optical sensing means for sensing external brightness; and
(c) controlling means responsive to said optical sensing means, for adjustably illuminating the vehicle room under consideration of human eye adaptation to the external brightness.

5,143,438

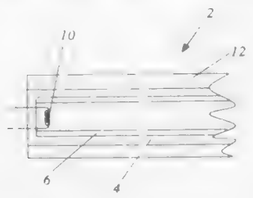
LIGHT SOURCES

Len Giddens, Slough; John C. White, Caddesdon Oxford, and John G. Holden, Hemel Hempstead, all of England, assignors to Thorn EMI plc, London, England

Filed Oct. 10, 1991, Ser. No. 774,314
Claims priority, application United Kingdom, Oct. 15, 1990, 9022343
Int. Cl.[5] F21V *9/16*
U.S. Cl. 362—84 11 Claims

1. A luminaire comprising a glass housing tube containing excitation means for exciting a phosphor material thereby to

provide radiation having a wave engtth greater than 420 nanometers, and a sleeve member, arranged to at least partially surround the glass housing tube and which sleeve member



comprises a plastics material containing at least one fluorescent dye for providing visible light when excited by the radiation provided by the phosphor material, said sleeve member arranged to be supported by said tube.

5,143,439

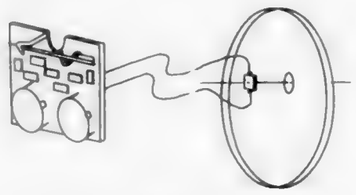
HIGH EFFICIENCY NOVELTY FLASHER ASSEMBLY

Edward D. Lewis, Speedway, and Timothy D. Hogue, Indianapolis, both of Ind., assignors to Buztronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 516,537, Apr. 30, 1990, abandoned. This application Jul. 26, 1991, Ser. No. 735,665

Int. Cl.[5] F21L *2/08*

U.S. Cl. 362—103 15 Claims



1. A novelty button assembly comprising:
- a front plate adapted to bear an indicia on its face and to provide an opening to receive a light emitting diode at any location coordinated with the indicia on its face;
- an electronic assembly comprising a printed circuit board bearing an electronic flasher circuit including a light emitting diode connected to the electronic flasher circuit on said printed circuit board by flexibel conducting means, said flexible conducting means permitting the location of the light emitting diode at any location in said front plate, said light emitting diode and said front plate being adapted to hold said light emitting diode in said opening when said front plate is fastened to said printed circuit board;
- said electronic flasher circuit comprising a switching transistor serially connected with a small current limiting resistance between a battery and said light emitting diode, a switching transistor control network including a control transistor serially connected between the emitter to base junction of the switching transistor and said battery, and a resistor-capacitor network comprising a high resistance connected with said battery with a capacitor and with the base of said control transistor, said high resistance substantially determining the rate of charging of sad capacitor by said battery, and so isolating the base of said control transistor and light emitting diode to ensure a bright emission from said light emitting diode with a minimal conduction time of said switching transistor, thereby providing a duty cycle that is effective in conserving battery power.

5,143,440

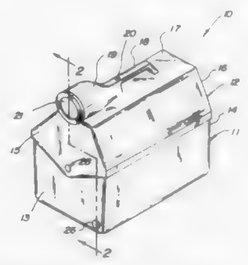
ILLUMINATED LUNCH BOX

Clinton D. Trampota, 118 Cumberland Gap, Victoria, Tex. 77904

Filed Jan. 8, 1992, Ser. No. 818,247

Int. Cl.[5] A45C *15/06*

U.S. Cl. 362—156 4 Claims



1. An illuminated lunch box, comprising,
- a lower container shell, including an upper container shell hingedly mounted to the lower container shell, with the lower container shell including a lower container front wall spaced from and parallel a lower container rear wall, and
- the upper container shell including an upper container shell front wall parallel to an upper container raer wall, with the upper container front wall hingedly mounted to and parellel the lower container front wall, and the upper container rear wall hingedly mounted to and parallel the lower container rear wall, and
- the upper container including an upper container top wall extending between the upper container front wall and the upper container rear wall, and the lower container including a lower container floor extending between the lower container front wall and the lower container rear wall, and
- a handle mounted medially and fixedly to the upper container top wall, and
- an illumination housing mounted to the upper container top wall longitudinally aligned with the handle, with the illumination housing extending to the upper container front wall, and
- a switch mounted at an intersection of the illumination housing and the handle in operative communication with a plurality of batteries mounted within the lower container to effect selective illumination of the illumination housing.

5,143,441

MINIATURE FLASHLIGHT

Anthony Maglica, Ontario, Calif., assignor to Mag Instrument, Inc, Ontario, Calif.

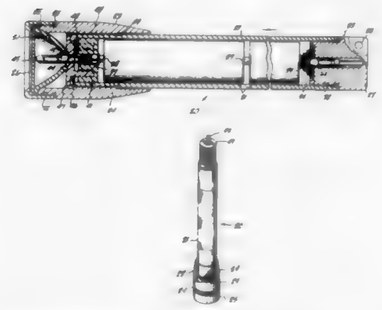
Continuation of Ser. No. 553,977, Jul. 16, 1990, abandoned, which is a continuation of Ser. No. 356,361, May 23, 1989, Pat. No. 4,942,505, which is a continuation of Ser. No. 222,378, Jul. 19, 1988, Pat. No. 4,899,265, which is a continuation of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Dec. 18, 1991, Ser. No. 809,846

Int. Cl.[5] F21L *7/00*

U.S. Cl. 362—263 1 Claim

1. A flashlight powered by at least one battery, comprising
- a barrel for retaining the at least one battery, said barrel having first and second ends;
- a lamp bulb having two contacts and a filament;
- a socket for holding said lamp bulb, said socket being retained at least partially within said barrel adjacent said first end thereof and being adapted to locate said bulb filament axially beyond said first end;

- a substantially parabolic reflector having a central opening therein adapted to receive said lamp bulb;
- a substantially planar lens;
- a head assembly for retaining said reflector and said lens in a mutually fixed relationship and being rotatably disposed at said first end to be controllably axially translatable along said barrel such that the relative positional relationship between said reflector and said lamp bulb may be varied, thereby varying a reflection disperaion of a light beam emanating through said lens from said lamp bulb;
- a tail cap being engageable with said barrel at said second end;



- an electrical circuit for coupling said two contacts of said lamp bulb with first and second electrodes of at least one battery positioned in said barrel, said electrical circuit not including conduction through said head assembly wherein relative motion of said head assembly in the axial direction away from said barrel separates said head assembly from said barrel to expose said lamp bulb and allow for a dispersion of substantially spherical illumination with said head assembly removed from said first end of said barrel;
- a rotary switch in said electrical circuit, said rotary switch selectively opening and closing said electrical circuit with the at least one battery retained within said barrel, said switch including one of said first and second ends of said barrel as a first switch contact.

5,143,442

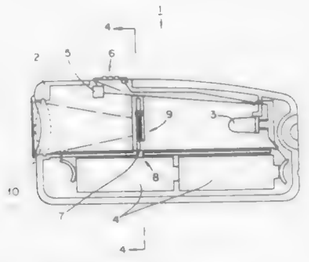
PORTABLE PROJECTION DEVICE

Masaaki Ishikawa, Tokyo, and Masao Yamada, Tachikawa, both of Japan, assignors to Tamapack Co., Ltd., Tokyo, Japan

Filed May 7, 1991, Ser. No. 696,643

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—253 10 Claims



1. A portable projection device comprising
- a case-like body,
- a light-passing hold formed in a wall of said body,
- a light-emitting means located within said body, opposite to said light-passing hole,
- a power source located within said body for providing power to operate said light-emitting means,
- a removable lens system covering said light-passing hole,
- a display means within said body, interposed said light-emitting means and said light-passing hole, an image on said display means being projected from said portable projection device through said light-passing hole and said removable lens system when light is emitting from said light-emitting means,
- a slidable switch having a plurality of operational positions, and
- an electronic circuit means for controlling operation of said light-emitting means in response to said slidable switch being positioned to an operational position, said electronic circuit means including first and second interconnected NOR gates and a switching transistor

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5,143,443

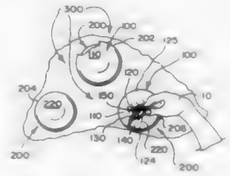
LIGHT PERMEABLE, COLOR ADDING, SELF-SECURING STRESSED COVERS FOR LARGE DISPLAY LIGHT-EMITTING DEVICES, AND METHODS

Brent D. Madsen, Providence, Utah, assignor to Integrated Systems Engineering, Inc., Logan, Utah

Filed Aug. 31, 1990, Ser. No. 575,929

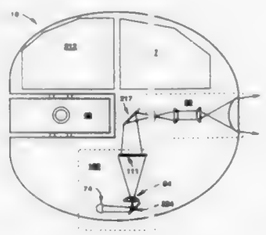
Int. Cl.[5] F21V *17/04*; H01K *1/32*

U.S. Cl. 362—255 41 Claims



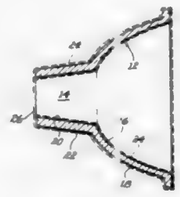
1. Separable integumental color imparting filter cover for diametrally enlarged placement upon and self-biased stressed retention against a light source enclosure, the integumental color imparting filter cover comprising:
- wall means comprising silicone rubber having memory and defining a hollow interior comprising an unstressed first diametral size, the wall means and the memory thereof accommodating (1) substantial manual diametral streched enlargement of the hollow interior so as to be larger than and to substantially surround at least a portion of the diametral size of the light source enclosure and (2) only partial reduction in the stretched diametral size of the hollow interior upon manual release so that the wall means are compressively self-biased due to the said memory contiguously against at least a portion of the light source enclosure to releasibly through forcibly affix said integumental color imparting filter cover upon the light source enclosure;
- the wall means comprising selective light permeable means which pass the rays of a predetermined color of light therethrough;
- the selective light permeable means comprising organic pigment colorant means.

5,143,4 4
COMPUTER CONTROI LED LIGHT WITH CONTINUOUSLY VARIABLE COLOR TEMPERATURE, COLOR, MAGNIFICATION, OCUS, AND POSITION
Gary A. Shields, 134 Northgate D rive, Welland, Ontario, Canada L3C 5Y5
Division of Ser. No. 514,466, Apr. 25, 1990, Pat. No. 5,045,983. This application May 7, 1 991, Ser. No. 696,818
Claims priority, application U ted Kingdom, Apr. 26, 1989, 8909515
Int. Cl.[5] F21V 9/00
U.S. Cl. 362—293 1 Claim



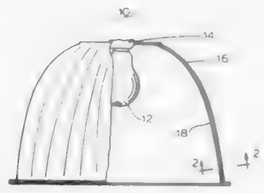
1. A lighting system for contr lling the colour, colour temperature, magnification and focu of a light beam comprising:
means for providing a wide s ectrum light beam having a wavelength of from 380 nm to 700 nm;
a heat absorbing condenser f r controlling the predetermined colour temperature o said beams;
a liquid crystal display panel aving a matrix of windows arranged in groupings of t ree windows, each passing varying and predetermined amounts of blue light, red light and green light respec tively, the windows of each said grouping being in such c ose proximity as to condense light beams passing theret rough into a single visible beam;
means for passing said beam th ough at least one grouping of windows on said liquid crys al display panel, and
a lens system for projecting th beams from said grouping to form a composite beam of p redetermined colour.

5,143,4 45
GLASS REFLECTORS LPCVD COATED WITH OPTICAL INTERFERE CE FILM
Robert L. Bateman, Chagrin Fa ls, and Thomas G. Parham, Mayfield Village, both of Ohio assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 10, 1989, Ser. No. 419,233
Int. Cl.[5] F21V 7/22
U.S. Cl. 362—293 33 Claims



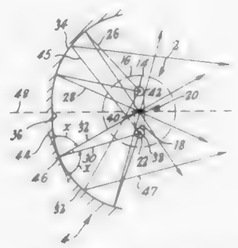
1. A reflector made of light tr nsparent material comprising a front reflecting portion havin a light reflecting surface for projecting reflected light forwa d of said reflector and a rear portion terminating in an elon ated, rearwardly protruding cavity wherein the interior surfa e of said cavity does not form part of said forward reflecting surface, said reflector being coated on said light reflecting surface and on the inside surface or outside surface of said cavity or both of said surfaces of said cavity with an optical interference coating which selectively reflects and transmits different portions of the electromagnetic spectrum.

5,143,446
LIGHTING FIXTURE WITH AN IMPROVED LIGHT TRANSMITTING FILM
Josh T. Barnes; Thomas F. Barnes; Earl E. Smith, and Dale A. Troppman, all of Charlevoix, Mich., assignors to Lexalite International Corporation, Charlevoix, Mich.
Filed Feb. 11, 1992, Ser. No. 833,520
Int. Cl.[5] F21J 9/00
U.S. Cl. 362—293 6 Claims



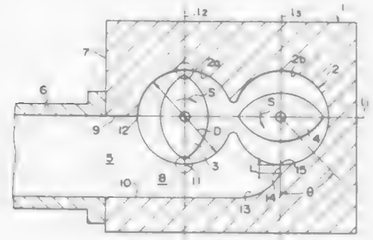
1. An improved lighting fixture including a light source comprising: an enclosure for said light source including
light reflecting and/or light transmitting means for reflecting and/or transmitting visible light;
a light transmitting film disposed adjacent and between said light source and said light reflecting and/or light transmitting means; said light transmitting film being formed of a glutarimide acrylic copolymer.

5,143,447
LAMP SYSTEM HAVING A TORROIDAL LIGHT EMITTING MEMBER
David R. Bertenshaw, 35 Ridgeway Close, Lightwater, Surrey GU18 5XX, England
Filed Aug. 5, 1991, Ser. No. 740,295
Int. Cl.[5] F21Y 7/14
U.S. Cl. 362—297 20 Claims



1. A lamp assembly comprising a light emitting member of generally torroidal shape defining a central light-transmissive opening, and defining a center of said opening, and a reflector positioned and having a shape such as to reflect light received from said light emitting member through said central opening, said reflector having a center, said shape being such that the reflector has a cross-section comprising first and second arcs which are substantially symmetrical with respect to a line joining points at said centers of the reflector and the opening respectively and being that described by rotating said arcs about said line in which each said arc is elliptical and defines first and second foci, in which each said arc has its first focus positioned substantially within said central opening and its second focus positioned substantially within the light emitting member.

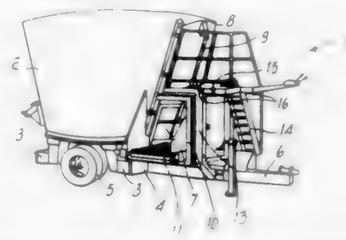
5,143,448
TWO-SHAFT CONTINUOUS MIXING APPARATUS
Hiroshi Ueda; Kazuyoshi Imuta; Hirofumi Kimura; Naoyuki Tashiro, all of Kobe, and Syouji Yasuda, Amagasaki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Jul. 22, 1991, Ser. No. 735,630
Int. Cl.[5] B28C 7/16; A21C 1/06, 1/00
U.S. Cl. 366—77 4 Claims



1. A two-shaft continuous mixing apparatus, comprising:
a housing having a feed opening at one end for feeding materials to be mixed;
a discharge port provided in another end of said housing, on one side of said housing;
two rotors rotatably mounted in a mixing chamber formed in said housing and having substantially horizontally aligned centerlines;
a discharge control device connected outside of said discharge port for controlling the discharge of mixed materials;
a material passage formed so as to communicate with said mixing chamber and extending nearly horizontally from said discharge port;
said material passage having an upper surface positioned no higher than the horizontal centerlines of said rotors and above a lower end of said mixing chamber and forming an edge with said mixing chamber, and a lower surface of said material passage extending to a longitudinal centerline of the rotor furthest from said discharge port and forming another edge with said mixing chamber adjacent said longitudinal centerline, wherein the material is scraped off said edges and flows through said discharge port as said rotors are rotated.

5,143,449
FIBROUS PRODUCT MIXING TRUCK
Tiziano Faccia, Via Padova 102 - 35026, Conselve, Italy
Continuation of Ser. No. 493,055, Mar. 5, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 742,186
Claims priority, application Italy, Mar. 10, 1989, 30624/89[U]
Int. Cl.[5] A01K 5/02; A01D 90/10
U.S. Cl. 366—349 3 Claims

1. A fibrous product mixing truck comprising a mixing container, said truck further comprising:
a chassis means for supporting said mixing container, said mixing container being mounted on said chassis means at a rear portion thereof and said chassis means defining a forward extension extending forwardly from said rear portion, said chassis means being provided with a wheel means, said forward extension of said chassis means being connectable to appropriate transport means for transporting said chassis means with said mixing container mounted thereon,
a weighing cell means for weighing products contained in said mixing container,
an unloading door means provided on said mixing container means for allowing unloading of products contained in said mixing container, said unloading door means facing forwardly form said mixing container to thereby face said forward extension of said chassis means,
an unloading belt means arranged below said unloading door means for receiving products passing through said unloading door means from said mixing container, said unloading belt means being adapted to convey products contained thereon laterally from said forward extension of said chassis means,
a belt support frame means for supporting said unloading belt means,
a ladder and platform means extending upwardly from said forward extension of said chassis means for allowing internal inspection and control of said mixing container upwardly thereof,
a supporting shoulder frame means for supporting said ladder and platform means,

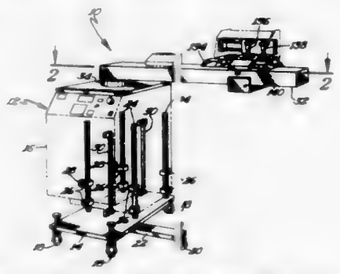


wherein said belt support frame means is connected directly to said mixing container thereby said unloading belt means is independent of said forward extension of said chassis means, and wherein said supporting shoulder frame means is connected directly to said forward extension of said chassis means thereby said ladder and platform means is independent of said mixing container, and wherein said weighing cell means is interconnected directly between said mixing container and said rear portion of said chassis means, whereby said weighing cell means weigh directly products contained in said mixing container and products placed on said unloading belt means, independently of said ladder and platform means thereof, and wherein said belt support frame means comprises a fixed support being constituted by a substantially quadrangular frame connected directly to said mixing container and a movable frame which is slidably movable on said fixed support, said movable frame supporting rollers and said unloading belt means being a belt rotatably wound around said rollers, said movable frame being laterally slidable on guiding surfaces defined on said movable frame and said quadrangular frame, said movable frame being slidably movable by means of a fluid-actuated piston means.

5,143,450
APPARATUS FOR HANDLING DEVICES UNDER VARYING TEMPERATURES
Nathan R. Smith, and Steven E. Schmitt, both of Stillwater, Minn., assignors to Aetrium, Inc., North St. Paul, Minn.
Filed Feb. 1, 1991, Ser. No. 649,657
Int. Cl.[5] G01N 25/00, 25/72
U.S. Cl. 374—12 13 Claims

1. Apparatus for handling and thermally conditioning devices utilizing thermally conditioned gas, with the device having a bottom and a core, comprising, in combination: a shaft having an inner bore; means for rotatably mounting the shaft about an axis; a thermal socket; means for removably attaching the device to the thermal socket; a contactor for

mating with the thermal socket with the device located within the mating thermal socket and the contactor; means for reciprocating the thermal socket relative to the shaft in a first direction for mating with the contactor, with the reciprocating means including means for removably connecting to the thermal socket with a vacuum; means for holding the thermal socket against the removably connecting means in the first direction at least when vacuum is not being applied to the removably connecting means, with the thermal socket being movable relative to the connecting means generally perpendicular to the first direction when vacuum is not being applied to the removably connecting means; alignment pins secured to one of the thermal socket and the contactor; alignment notches formed in the other of the thermal socket and the contactor, with the alignment pins being slideably received within the alignment notches to align the mating of the thermal socket and the contactor, with the alignment pins and notches moving the thermal socket on the removably connecting means into alignment with the contactor when vacuum is not being applied to the removably connecting means and as the thermal socket and the contactor are being mated and with the application of vacuum to the connecting means connecting the thermal socket to the contactor; a first tube located in the inner bore of the shaft and rotatable about the axis, with the first tube including an inlet for the thermally conditioned gas; a secondary tube intersecting and in fluid communication with the first tube, with the secondary tube extending from the first tube spaced from and parallel to the first direction of the reciprocation of the thermal socket; a thermal tube having a first end reciprocally received within and in sealing engagement with the secondary tube and having a second end in fluid communication with the thermal socket, with the thermal tube reciprocating within the secondary tube with the reciprocation of the thermal socket; with the thermal socket comprising, in combination: a base; a first bore formed in the base having a size; an insert having an end and an outside surface of a shape complementary to but of a size smaller than the size of the bore, with the outside surface of the insert being concentrically located within the bore to form an annular gap between the bore and the insert, with the device removably attaching means located on the end of the insert; and a passageway formed in the base and in fluid communication with the second end of the thermal tube, with the passageway terminating in the bore with the thermally conditioned gas flowing into the annular gap.



5,143,451

METHOD TO MEASURE A TEMPERATURE WITH A PELTIER ELEMENT

Lars O. A. Milligard, Ostersund, Sweden, assignor to Affarsverket FFV, Eskilstuna, Sweden

Continuation of Ser. No. 412,490, Sep. 26, 1989, abandoned. This application May 20, 1991, Ser. No. 704,840

Claims priority, application Sweden, Sep. 29, 1988, 8803459

Int. Cl.[5] G01N *25/04*

U.S. Cl. 374—25 12 Claims

1. A method for the purpose of determining the freezing point of a liquid comprising the steps of:

bringing a surface of a Peltier element, having two surfaces and two lead terminals, into contact with a liquid, the freezing point of which is desired to be determined;

feeding a known direct current through said Peltier element at first in one direction during a first interval of time, then in an opposite direction during a second interval of time so that said liquid is alternately heated and cooled;

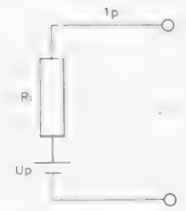
repeatedly determining the temperatures of both surfaces of said Peltier element during the first and second intervals by: detecting the voltage across said terminals as said current is applied;

periodically interrupting said current to said Peltier element;

measuring a Seebeck voltage of said Peltier element during said interruption;

determining internal resistance of said Peltier element from values representing said supplied current, said detected voltage and said Seebeck voltage;

calculating the existing means temperature of said Peltier element from said internal resistance;



calculating the existing temperature difference between said surfaces of said Peltier element from said Seebeck voltage;

computing the temperature of a first surface of said Peltier element by adding half of said temperature difference to said means temperature;

computing the temperature of a second surface of said Peltier element by subtracting half of said temperature difference from said means temperature,

generating a temperature curve from the temperatures determined for said surface brought into contact with said liquid, wherein the temperature curve so achieved in the vicinity of the freezing point is called the solidification curve;

identifying a characteristic discontinuity in the solidification curve; and

registering the temperature of said surface at the time of said discontinuity.

5,143,452

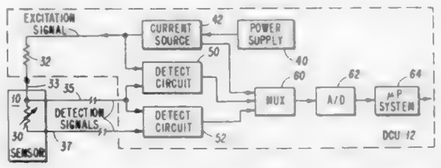
SYSTEM FOR INTERFACING A SINGLE SENSOR UNIT WITH MULTIPLE DATA PROCESSING MODULES

Lynn F. Maxedon, and Thomas C. Olson, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Feb. 4, 1991, Ser. No. 650,142

Int. Cl.[5] G01K *7/00, 3/00*

U.S. Cl. 374—170 10 Claims



1. A fault-tolerant system for interfacing a single sensor unit requiring an excitation signal with multiple data centralizing units, comprising:

(a) a fixed resistor;

(b) a sensor in a sensor unit which is connected in series with said fixed resistor for determining a parameter; and

(c) a plurality of data centralizing units each of which includes:

(1) a voltage source connected across said fixed resistor and said sensor unit,

(2) a first voltage detection circuit adapted for detecting the voltage drop across said fixed resistor and generating a signal output indicative of said drop,

(3) a second voltage detection circuit adapted for detecting the voltage drop across said sensor units and generating a signal output indicative of said drop, and

(4) processor means for responding to said signal outputs to produce a signal indicative of conditions affecting said sensor unit.

5,143,453

TEMPERATURE MONITORING DEVICE CONTAINING AT LEAST ONE ELEMENT OF AN ALLOY WHICH MEMORIZES ITS SHAPE

Renée P. W. Weynant née Girones, Cadenet, France, assignor to G.I.R., Cadenet, France

Division of Ser. No. 499,333, Jun. 1, 1990, Pat. No. 5,018,874. This application Nov. 27, 1990, Ser. No. 619,193

Claims priority, application France, Oct. 4, 1988, 88 13245; Oct. 3, 1989, PCT/FR89/00510

U.S. Cl. 374—205 12 Claims

1. A temperature monitoring device which comprises a casing of synthetic material containing a motor element made of at least one alloy which memorizes its shape and associated with a movement transmission element consisting of a piston and a rod, and acting on at least one indicator element irreversibly recording each overstepping of a predetermined temperature, said casing being provided with a transparent window enabling the state of the indicator element to be viewed, said indicator element including a wheel mounted for pivoting in the casing, rotatable in one direction only, and equipped on its periphery with teeth directed towards the rear with reference to the direction of rotation, said motor element including a spring of said alloy which memorizes its shape mounted in a cylinder whose axis is substantially tangential to the circumference of the wheel, one end of said spring being braced on the bottom of the casing while its other end bears on said piston which is mounted for sliding in the cylinder, the free end of said rod being equipped with a resiliently deformable member bearing against a tooth on the wheel, the stroke of the spring being such that a cycle of deformation brings about the rotation of the wheel by an angle equal to the angle between two successive teeth on the wheel, the casing being equipped with a stop against which a finger fastened to wheel is intended to come to bear before the wheel has pivoted 360°.

5,143,454

ANTI-VIBRATION LINEAR MOTION GUIDE UNIT

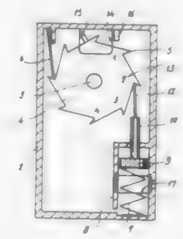
Kunihiko Morita, Koganei, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 675,206

Claims priority, application Japan, Mar. 27, 1990, 2-31475[U]

Int. Cl.[5] F16C *29/02*

U.S. Cl. 384—37 12 Claims



1. A sliding contact type linear motion guide unit, comprising:

a rail extending over a desired length and including at least one guide surface;

a slider mounted on said rail to be moveable relative to said rail therealong; and

a sliding member interposed between said rail and said slider, said sliding member including an elastic solid member and a contact member, whereby said elastic solid member is disposed between said slider and said contact member and said contact member has a contact surface which is in sliding contact with said at least one guide surface of said rail;

wherein said rail has a top guide surface and a pair of side guide surfaces and said slider has a top inner surface opposite to said top guide surface of said rail and a pair of inner side surfaces, each opposite to a corresponding one of said side guide surfaces of said rail, and wherein said sliding member includes a top sliding member portion interposed between said top guide surface of said rail and said top inner surface of said slider and a pair of side sliding member portions, each of which is interposed between a corresponding opposed pair of said side guide surfaces of said rail and said inner side surfaces of said slider.

5,143,455

BEARING SLEEVE WITH NOTCHED END

Richard T. Squyres, P.O. Drawer AA, Ingleside, Tex. 78362

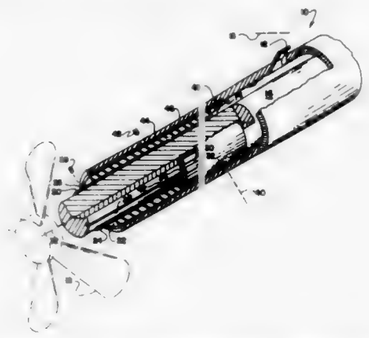
Filed Feb. 25, 1991, Ser. No. 659,728

Int. Cl.[5] F16C *3/00*

U.S. Cl. 384—97 13 Claims

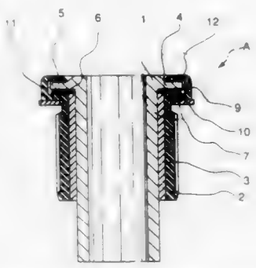
1. In combination, a housing having a passage therethrough providing an exposed end and an inaccessible end, a shaft extending through the passage having a first end exposed through the exposed passage end and a second end, and a bearing mounting the shaft for rotation relative to the housing including a first rigid sleeve surrounding the shaft having a notched end, means captivating the first sleeve to the shaft for rotation therewith including a radially extending member on

the shaft meshing with the notched sleeve end, and a second annular sleeve of resilient rubber-like material around the first



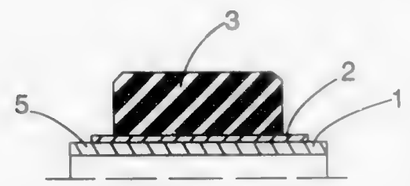
sleeve and affixed thereto having a plurality of parallel grooves providing lands therebetween.

5,143,456
ELASTIC SLIDING BEARING
Ernst-Günter Jördens, and Helmut Kammel, both of Damme, Fed. Rep. of Germany, assignors to Lemförder Metallwaren AG, Lemförde, Fed. Rep. of Germany
Filed May 22, 1991, Ser. No. 704,317
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1990, 4036050
Int. Cl.[5] F16C 27/02
U.S. Cl. 384—275 3 Claims



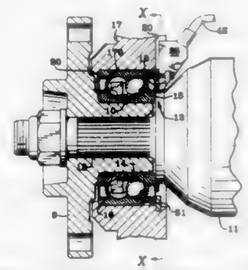
1. An elastic sliding bearing for chassis parts in motor vehicles, comprising: an inner bushing including an axial bearing surface formed by a flange projection defining a sliding surface; an outer bushing; an elastomeric body surrounding the outer bushing and surrounding said axial bearing surface of said inner bushing and including at least one sealing lip acting against said flange projection; a disk, supported with one side on said sliding surface of said flange projection of said inner bushing, positioned between said sliding surface and said elastomeric body; and, recesses formed in said elastomeric body on a surface in contact with said disk to form an axial bearing surface, thereby reducing axial rigidity of said elastomeric body in an edge zone that is in contact with said plastic disk.

5,143,457
ELASTIC PIVOTING SLIDE BEARING
Rolf Langhof, Offenbach, and Hans-Kurt Kohl, Gorxheimertal, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany
Filed Dec. 10, 1990, Ser. No. 625,219
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1989, 3940600
Int. Cl.[5] F16C 33/04, 27/02
U.S. Cl. 384—276 11 Claims



1. An elastic pivoting slide bearing comprising:
an inner sleeve having a cylindrical outer surface;
a slide sleeve shrunk into a rotatable engagement with said outer surface comprised of a circumferentially continuous shrinkable tube material; and
a support sleeve surrounding and fixedly attached to said slide sleeve.

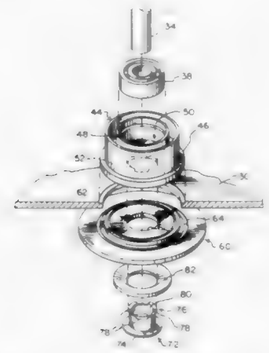
5,143,458
BEARING WITH ROLLING ELEMENTS EQUIPPED WITH AN ADJUSTABLE INFORMATION PICKUP DEVICE
Denis Aiff, and Christian Hajzler, both of Annecy, France, assignors to The Torrington Company, Torrington, Conn.
Filed Mar. 11, 1991, Ser. No. 667,204
Claims priority, application France, Apr. 18, 1990, 90 04824
Int. Cl.[5] F16C 19/00
U.S. Cl. 384—448 16 Claims



1. An antifriction bearing for mounting in a housing, the antifriction bearing comprising:
an outer race having an outer peripheral surface and an inner peripheral surface, one of the peripheral surfaces having a groove;
an inner race rotatable relative to the outer race;
a plurality of rolling elements located between the inner and outer races;
an annular encoder rotatable with the inner race;
a sensor support comprising an arcuate band having an axially extending lip which matingly engages the groove in the outer race such that, before mounting of the bearing in the housing and before attachment of a sensor, the sensor support is fixed radially and axially with respect to the outer race while permitting angular displacement therebetween; and

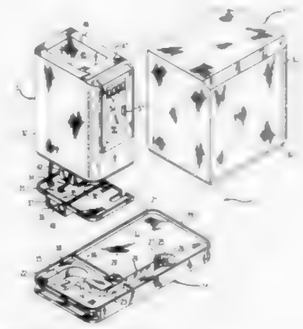
a sensor removably attached to the sensor support.

5,143,459
BAYONET SPINDLE MOUNT AND A METHOD THEREFORE
Daniel J. Plutt, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.
Filed Dec. 26, 1990, Ser. No. 633,782
Int. Cl.[5] F16C 43/00
U.S. Cl. 384—537 14 Claims



1. An apparatus for mounting a spindle for rotation in a housing, said apparatus comprising:
a spindle;
a housing for containing said spindle
bearing means for rotatably mounting said spindle;
a circular mounting cap having an upper portion for receiving said bearing means;
means for clamping said mounting cup to a first surface inside said housing;
said clamping means comprising:
a tubular clamp having a lower end abutting against a second surface on the outside of said housing to clamp said cup against said first surface on the inside of said housing;
first teeth formed around the outer circumference of the upper end of said clamp, said first teeth extending radially outward a predetermined distance from the longitudinal axis of said clamp and extending longitudinally inward a predetermined distance from said upper end of said clamp;
an inner hole formed in the lower end of said cup extending longitudinally at least partway into said cup;
second teeth formed about the inner circumference in said inner hole at said lower end of said cup, said second teeth extending radially inward a predetermined distance from said inner hole and extending longitudinally inward a predetermined distance from said lower end;
wherein said first teeth are inserted in the spaced formed between said second teeth and said second teeth are inserted in the spaces between said first teeth so that said upper end of said clamp can be inserted into said inner hole of said cup;
said predetermined distances being such that after said upper end of said clamp has been fully inserted into said cup, said cup and said clamp are rotatable relative to one another to lock said cup and said clamp from disengagement from each other and to clamp said cup against said first surface on the inside of said housing;
spring means to resiliently bias said first teeth of said clamp against said second teeth of said cup to restrain said clamp and said cup from disengaging from each other and to axially preload said spindle to isolate said spindle and said bearing from vibrations and shock; and
bearing cap means mounted between said spring means and said housing for sealing the interior of said housing from the exterior environment by the spring means biasing said bearing cap means against the exterior of the housing.

5,143,460
PORTABLE HUMIDIFIER
Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.
Continuation-in-part of Ser. No. 487,315, Mar. 2, 1990, abandoned. This application Aug. 20, 1991, Ser. No. 747,514
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] F24F 3/14; H05B 3/78
U.S. Cl. 392—405 23 Claims



1. A humidifier comprising:
a base means defining a boiler cavity;
a liquid supply means supported on said base means and having a discharge opening communicating with said boiler cavity and adapted to maintain a given level of liquid therein; and
an evaporation unit mounted on said base means and substantially unattached thereto so as to facilitate complete separation therefrom so as to provide access to said cavity; said unit comprising an electrically energized resistive heating element projecting into said boiler cavity and adapted to induce evaporation of liquid contained thereby, and a vapor passage defining means having a receiving end communicating with said cavity so as to receive vapor therefrom and a discharge end for discharging the vapor received from said cavity.

5,143,461
PRINTER
Teruhisa Inoue, Shizuoka, and Toshiharu Shimosato, Shizuoka, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Jul. 13, 1990, Ser. No. 552,020
Claims priority, application Japan, Jul. 14, 1989, 1-182186
Int. Cl.[5] B41J 33/16
U.S. Cl. 400—225 6 Claims

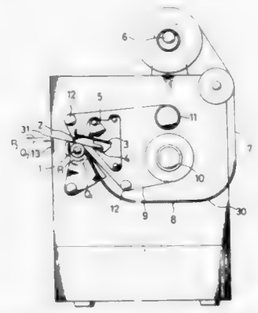
1. A printer comprising:
paper supply means for supplying elongated print paper;
paper discharge means for discharging said print paper;
guide means for guiding said paper from said paper supply means to said paper discharge means;
reversible platen means for feeding said paper along said guide means from said paper supply means to said paper discharge means;
reversible ribbon core means for winding and retaining an elongated ink ribbon;
thermal head means for contacting said platen and printing on said print paper, wherein said ribbon and said print paper are sandwiched between said thermal head means

and said platen means for carrying out said printing on said print paper;

reversible take-up spool means for taking up said ribbon drawn from said ribbon core means and guided through said guide means between said platen means and said thermal head means;

platen reverse driving means for reversely rotating said platen means and feeding back said print paper and said ribbon while said platen means is in contact with said thermal head means and said print paper and ribbon contact each other between said contacting platen means and thermal head means;

resistance removing means for removing resistance which is from said take-up spool means to said ribbon upon reverse rotation of said platen means, wherein said print paper and said ribbon are fed back by said platen reverse driving



means at the same speed without relative slippage so as to prevent a staining of the print paper due to slippage relative to the ribbon; and

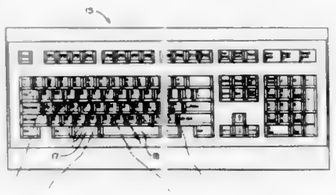
ribbon core reverse driving means for reversely rotating said ribbon core means and rewinding said ribbon around said ribbon core means upon reverse rotation of said platen means, said ribbon core reverse driving means comprising a supply spool which can rotate independently of said ribbon core means and torsion spring means for connecting said supply spool with said ribbon core means and storing a reverse biasing force for said ribbon core means when said ribbon core means is forwardly rotated to twist said torsion spring means such that when said platen means is reversely rotated, the reverse biasing force of said torsion spring means rewinds said ribbon around said ribbon core means.

5,143,462

ERGONOMICALLY EFFECTIVE BACKSPACING METHOD

Robert D. Klauber, Fairfield, Iowa, assignor to Keyboard Advances, Inc., Fairfield, Iowa

Filed Apr. 14, 1989, Ser. No. 339,075
Int. Cl.[5] B41J *5/08, 19/62*
U.S. Cl. 400—486 **9 Claims**



1. A keyboard for a computer, electronic typewriter, word processor and the like, comprising:

a plurality of alphanumeric keys arranged corresponding to touch typing position;

at least one backspace/erase key positioned within reach of at least one thumb of a typist having fingers positioned on said alphanumeric keys in touch typing position, said at least one backspace/erase key, automatically causing both backspacing to, and erasure of, at least one typed character is response to a single depression thereof; and

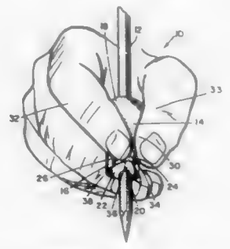
at least one space key positioned within reach of at least one thumb of a typist having fingers positioned on said alphanumeric keys in touch typing position, and wherein said at least one backspace/erase key is positioned adjacent said at least one space key.

5,143,463

WRITING AID

Richard L. Pozil, 10333 Mississippi Ave., Los Angeles, Calif. 90025, and Lois J. Provda, 208 Lasky Dr., Beverly Hills, Calif. 90212

Continuation of Ser. No. 632,811, Dec. 24, 1990, abandoned.
This application Feb. 7, 1992, Ser. No. 833,465
Int. Cl.[5] G09B *11/00;* **A46B** *5/02;* **B43K** *3/00*
U.S. Cl. 401—6 **25 Claims**



1. A writing aid comprising:

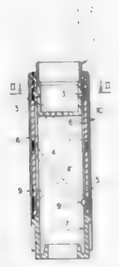
a generally longitudinally extending pear-shaped body defining a substantially triangularly contoured cross-sectional area having a first end section and second bulbous end section, said first end section having a cross-sectional area substantially less than a cross-sectional area of said second bulbous end section, said body having a longitudinally directed through passage for insert therethrough of a writing implement, said pear-shaped body consisting of first, second and third external surfaces for contiguous interface respectively with a user's thumb, index finger and middle finger, said first surface being continuously concave and extending from said first end section to said second bulbous end section for contiguous interface with substantially the entire contacting area of a first joint of said thumb of said user, said second surface being continuously concave and extending from said first end section to said second bulbous end section for contiguous interface with a first joint and at least a portion of a second joint of said index finger, said third surface being continuously concave in said longitudinal direction and located in said first end section for contiguous interface with said middle finger of said user, each of said surfaces defining a respective side of said triangularly contoured cross-sectional area of said pear-shaped body, whereby when said writing instrument is inserted through said passage in said longitudinally extending pear-shaped body with a writing tip extending therethrough and adjacent said first end section, said body acts as an aid in achieving a correct, relaxed writing position of the fingers and hand of said user.

5,143,464

CASE WITH ROTARY MECHANISM FOR SUBSTANCES IN STICK FORM

Claude Susini, Sennecey Le Grand, and Pascal Mejean, Veyrier du Lac, both of France, assignors to Reboul-SMT, Créteil, France

Filed Jun. 6, 1991, Ser. No. 711,073
Claims priority, application France, Jun. 8, 1990, 90 07133
Int. Cl.[5] A45D *40/06, 40/12*
U.S. Cl. 401—78 **6 Claims**



1. A case for a substance in stick form and in particular lipstick, comprising two mutually rotating concentric coaxial sleeves, and a stick-holder cup adapted to slide axially within the two sleeves, the sleeves including a stationary outer sleeve and a rotary inner sleeve, the outer sleeve being provided with two internal helical grooves symmetrically displaced by 180°, the rotary inner sleeve being provided with two diametrically opposite and symmetrical longitudinal slots, each slot being branched-off at 90° into a recess at each end of travel of the cup, said recess having an orientation opposite to the rotation of the sleeve which brings the cup to an end of its travel, said recess having a width less than the width of said helical grooves, said cup being provided with two radial nipples relatively displaced by 180°, each nipple having a proximal portion including a first section adapted to slide snugly in said longitudinal slot and said recesses, and a distal portion including a second section adapted to slide snugly in said helical groove, said first section being reduced with respect to said second section, so that said nipples when engaged in said recesses are prevented from accidental disengagement through the abutment of said distal portion over edges of the recesses.

5,143,465

FLASHLIGHT BALL-POINT PEN

Hsien-Te Hou, No. 5, Lane 279, Chung Cheng Rd., Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed May 24, 1991, Ser. No. 705,534
Int. Cl.[5] B43K *29/10*
U.S. Cl. 401—195 **5 Claims**

1. An improved flashlight ball-point pen comprising:

a cap which includes a cylindrical body; a shaft on which the cylindrical body is rotatably mounted; a battery contained within said cylindrical body; an actuating ring movable with the cap; an engaging member; a shield; an anode plate; a cathode; a shank which forms a ball-point pen reservoir and which includes a nib at one end; a conducting strip; a reflector; a light bulb; a coiled spring and a spiral spring,

wherein said actuating ring has a central hole; a ledge at one side facing downwardly towards said nib end; and a recess at a periphery of said actuating ring which forms means for moving said conducting strip with respect to said cathode in response to movement of the cap;

wherein said engaging member includes a boss at a central protion, and a passage extending through the boss along an axis of the boss and divided into two partitions; and a through hole extending in a direction of said axis between said boss and the cylindrical body, said engaging member and boss being fixedly connected to said shaft,

wherein said shield includes an arcuate glass portion which faces downwardly toward said nib end and a protrusion portion facing upwardly toward said cap and protruding through said through hole to engage said ledge,

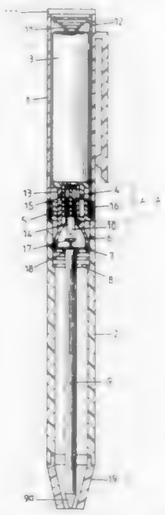
wherein said shank includes a reflector at a top portion opposite said nib and located underneath and in contact with said shield,

wherein said battery has a negative end connected to an end of said coiled spring and a positive end connected to an end of said anode plate,

wherein another end of said anode plate extends through the central hole of said acuating ring and through one of said partitions of said engaging member, and is connected with one contact of said light bulb,

wherein another contact of said bulb is inserted into the other of said two partitions and electrically connected with said cathode,

wherein said conducting strip has an end in contact with the



other end of said coiled spring, another end of said conducting strip extending downwardly toward said nib end and having a protuberance near said other end in contact with an outer surface of said engaging member and forming means for engaging and disengaging said cathode upon rotation of said cap and shaft relative to one another, and

wherein said spiral spring is arranged on a circular bulged portion within said shaft and has a second end which engages a bottom end of said reflector to bias said shank against said shield and said protruding portion of said shield against said actuating ring, such that rotation of said shield and actuating ring relative to each other cause engagement and disengagement of said ledge and protruding portion and consequent extension and retraction, respectively, of said nib,

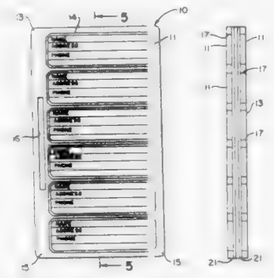
wherein by rotating said cap or said shaft, said bulb is lit when said protuberance contacts said cathode and said nib is extended ro retracted in response to engagement and disengagement of said ledge from said protruding portion of said shield, simultaneously or at different times depending on the relative rotational position of the cap and shaft.

5,143,466

NOTEBOOK PAGE WITH PRESSURE-SENSITIVE REPOSITIONABLE LABELS ON BOTH SIDES THEREOF

Judith A. Moncrieff Baldwin, New York, and Suzanne Wozniak, Brookyln, both of N.Y., assignors to Strategic Financial Communications Corp., New York, N.Y.

Continuation of Ser. No. 608,241, Nov. 2, 1990, abandoned. This application Dec. 18, 1991, Ser. No. 810,530
Int. Cl.[5] B42F *13/00*
U.S. Cl. 402—79 3 Claims



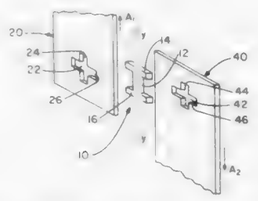
1. A notebook page comprising:
(a) a liner layer;
(b) a first web of paper stock;
(c) a second web of paper stock;
(d) pressure-sensitive adhesive releasably bonding said first and second webs to opposite sides of said liner layer; and
(e) binder engaging means formed in a side edge of said page to adapt said page for retention, along with similar pages, in a binder mechanism; wherein
said liner layer is calendared paper having uniform surface release characteristics on both sides or plastic having pressure-sensitive release properties; and
said first and second webs are repositionable label stock kiss die cut to form removable and repositionable labels within permanent matrices on both sides of said liner layer, said permanent matrices defining zones for repositioning removed labels.

5,143,467

FASTENING SYSTEM

Ernest A. Gardner, 142½ Canal Ave., NW., Canal Fulton, Ohio 44614

Filed Oct. 11, 1991 Ser. No. 775,014
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 21 Claims



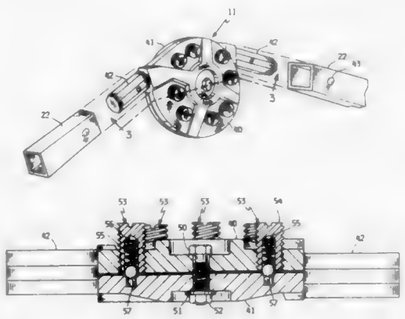
1. A fastening system comprising in combination:
at least two substantially planar pieces, each of which has two opposite faces and at least one slotted bore extending through the piece from one face to the other, the pieces being positioned in adjacent face-to-face contact with each other and with at least one bore of one planar piece being substantially aligned with a bore in the other piece, the contacting faces of the pieces being the inner faces and the opposite faces being the outer faces; and
fastener characterized by a central stem portion having a cross bar portion positioned transversely across each of its ends, the cross bar portion on at least one end of the stem being of a size and shape to pass through a certain location in the aligned bores in both pieces when the fastener is oriented in the proper position with respect to the bores, said fastener interconnecting the pieces together by having the stem of said fastener extending through the bores in both pieces and the cross bar portion on each end of the stem lying outside the bores in such a position that when the fastener is placed in tension by relative sliding movement of at least one of the planar pieces with respect to the other, the fastener tilts within the bores causing the cross bar portions to bear against the outer faces of the pieces to clamp the pieces together in planar face-to-face contact with each other.

5,143,468

ARTICULABLE JOINT AND SUPPORT FRAME FOR EXHAUST HOSE

Josef Pausch, Hopkins, Minn., assignor to General Resource Corporation. Hopkins, Minn.

Filed Apr. 5, 1991, Ser. No. 680,948
Int. Cl.[5] F16D *3/00*
U.S. Cl. 403—92 9 Claims



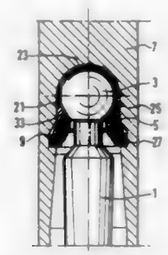
1. An articulable joint for releasably locking two elements relative to each other, comprising:
(a) a first joint portion connectable to one of the elements and being generally disk-like in shape, the first joint portion comprising a seating inner surface and a sufficient plurality of ball seats formed in the seating inner surface to define a circle;
(b) a second joint portion pivotally joined to the first joint portion and being generally disk-like in shape, the second joint portion comprising an apertured inner surface for confronting the seating inner surface of the first joint portion, the second joint portion further comprising a sufficient plurality of threaded apertures arranged to define a circle, the first and second joint portions having generally the same circumference;
(c) a plurality of threaded connectors for respectively engaging the threaded apertures, each of the connectors comprising a cavity, a ball disposable in the cavity, and a coil spring for biasing the ball outwardly of the cavity against one of the respective ball seats whereby each of the balls is engagable with each of the ball seats to releasably lock the joint portions and elements at a number of predetermined positions, and whereby each of the connectors is incrementally adjustable independently of the other connectors.

5,143,469

RETENTION SOCKET FOR A PIVOT

Leonardo Cadeddu, Crema, Italy, assignor to Bendix Italia, Crema, Italy

Filed Jul. 17, 1991, Ser. No. 731,607
Claims priority, application Italy, Aug. 3, 1990, 67616 A/90
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—133 3 Claims



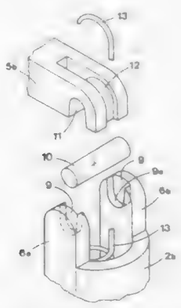
1. A socket for retaining a pivot-forming spherical head of a rod in a cavity of substantially cylindrical shape and having an annular groove, said socket comprising a first part of hemispherical shape matched to said spherical head, a second part of cylindrical shape matched to the shape of said cavity, a third part of substantially frustoconical shape a free end of which has a diameter larger than that of said cavity in order to penetrate into said annular groove, and longitudinal slots in said second and third parts, said socket being produced from an elastic material, the socket providing a permanent automatic assembly of the spherical head and socket in said cavity by which the socket fits resiliently over the spherical head and both socket and spherical head are inserted into the cavity until the third part is deformed resiliently inwardly by a surface of the cavity and then expands resiliently outwardly into said annular groove such that the assembly is permanently captured in the cavity.

5,143,470

DEVICE FOR PIVOTABLE LINKAGE BETWEEN TWO LEVERS

Antonio Jimenez, Meyrin, Switzerland, and Patrice Deplante, Annemasse, France, assignors to Mefina S.A., Switzerland

Filed Nov. 29, 1991, Ser. No. 798,926
Claims priority, application Switzerland, Nov. 29, 1990, 3779/90
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—149 6 Claims



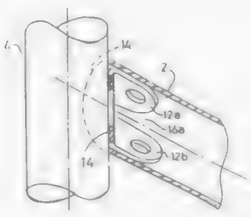
1. A device for pivotable linkage between two levers (*2a*, *5a*; *2b*, *5b*), in which one end of a first lever (*2a*, *2b*) has a fork that between its tines (*6a*, *6b*; *7a*, *7b*) receives one end of a second lever (*5b*), characterized in that a recess (**9**) is made on each of said tines (*6a*, *6b*) in the longitudinal direction of this tine, thus opening out at its end to form a passage for lateral introduction of the end of a pivot (**10**) between said tines, the bottom of the side face (*9a*) of each recess (**9**) forming a bearing surface for one of the ends of said pivot (**1**); the adjacent end of the second lever (*5a*, *5b*) has a recess (**11**) opening laterally on one of its faces for engagement with the portion of the pivot (**10**) extending between the tines (*6a*, *6b*; *7a*, *7b*) of the fork; and elastic means (**13**) exerting an oriented lateral pressure upon the end of this second lever (*5a*, *5b*) to keep the pivot (**10**) and said bearing surfaces, on the one hand, and the bottom of the recess (**11**) of the second lever (*5a*, *5b*) and the pivot (**10**), on the other, constantly in contact with one other.

5,143,471

TUBULAR REINFORCEMENT ELEMENT AND METHOD OF MAKING SAME

[redacted]el Spinner, 8 Dov Hoz, Rishon LeZion, Israel

Continuation-in-part of Ser. No. 424,786, Oct. 20, 1989, abandoned. This application May 15, 1990, Ser. No. 523,523
Int. Cl.[5] F16B *11/00*; B62K *19/22*
U.S. Cl. 403—190 15 Claims



1. A tubular joint internal reinforcement element between two tubular members, said element comprising,
an axially four-slotted cylindrical section integral with and extending outwardly from a coextensive concave end wall,
said axially four-slotted cylindrical section defining four axially extending tabs,
a first end of each of said four axially extending tabs integrally joined on a peripheral edge of said coextensive concave end wall,
said peripheral edge of said coextensive concave end wall being defined by said first end of each of said four axially extending tabs,
wherein said element is formed from a flat stamped sheet metal blank by a single stage double action drawing process.

5,143,472

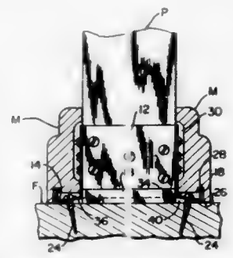
ANCHOR BRACKET ASSEMBLY

Robert H. Reed, 25557 Snyder Ave., Conifer, Colo. 80433, and Robert B. Reed, 26209 Wildflower Trail, Evergreen, Colo. [redacted]

Filed Jun. 13, 1990, Ser. No. 537,347
Int. Cl.[5] F16B *7/08*
U.S. Cl. 403—230 8 Claims

1. An anchor bracket assembly for securing a newel in upstanding relation to a floor surface with one end of said newel in direct engagement with said floor surface, said bracket assembly comprising:
a plurality of bracket members each including an angularly extending flange portion inclining downwardly and away from said newel at an acute angle to said floor surface, an upper attaching portion, and a lower edge of said flange portion resting on said floor surface; and
first securing means for securing said upper attaching portion to said newel, and second securing means for securing

said angular flange portion to said floor surface whereby to dispose said one end of said newel against said floor surface, said second securing means defined by elongated



fasteners extending through openings in said flange portions and into said floor surface at an obtuse angle to said newel.

5,143,473

SECURING DEVICE WITH FASTENING ELEMENT HAVING ROTATION STOPPING MEANS

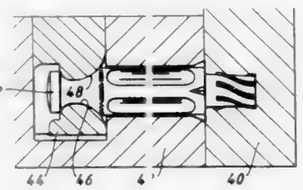
David N. Harley, Dorset, England, assignor to Titus Tool Company, Limited, Iver, England

Filed Feb. 21, 1991 Ser. No. 658,614

Claims priority, application United Kingdom, Feb. 22, 1990, 9004003

Int. Cl.[5] B25G *3/20*; F16B *15/08*

U.S. Cl. 403—231 17 Claims



1. A securing device for use in firmly fixing two panel members together, the device comprising a fastening element and a tightening member, wherein the fastening element has a longitudinal axis and end portions adapted for insertion in bores in respective ones of said panel members and is provided with stop means to limit insertion of a first one of said end portions in its respective bore to a predetermined depth, said stop means comprising a plurality of fin members on the surface of the fastening element arranged so that one end of each fin member butts up against a portion of the surface of the panel member peripheral to the opening of said respective bore when said first end portion is inserted therein, the other end of each fin member being adapted to cut into the wall of the other bore during fixing of the two panel members, thereby facilitating full contact between the panel members when they are fixed together by action of the tightening member on the second end portion of the fastening element.

5,143,474

CONNECTOR FOR PROFILED MEMBERS

Gerd Vieler, Iserlohn, Fed. Rep. of Germany, assignor to Gerd und Bernd Vieler KG, Iserlohn, Fed. Rep. of Germany

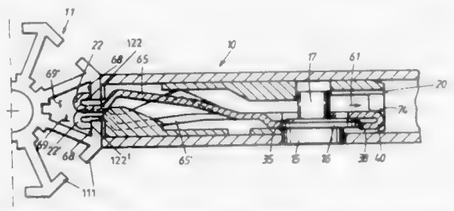
Filed Aug. 3, 1990, Ser. No. 562,484

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1989, 3926598; Jan. 18, 1990, 4001317; Apr. 18, 1990, 4012332

Int. Cl.[5] F16B *7/04*

U.S. Cl. 403—252 31 Claims

1. A connector for separably coupling a first profiled member having an internal space and an open end affording access to the internal space with a second profiled member having an internal compartment behind a wall which has an internal surface and an inlet affording access to the compartment, comprising a housing receivable in the internal space of the first profiled member; a coupling member movable in said housing and including at least one claw disposed outside of said housing and being insertable into the compartment of he second profiled member to engage the internal surface of the wall; and means for moving said coupling member relative to said housing, including an eccentric rotatably mounted in said



housing and being accessible at the exterior of the first profiled member when said housing is received in the internal space of the first profiled member, said coupling member further including a first motion receiving projection adjacent said eccentric and disposed between said eccentric and said at least one claw, a second motion receiving projection adjacent said eccentric opposite said first projection, and an end portion remote from said at least one claw, said second projection being an integral part of said end portion and said end portion having overlapping first and second sections.

5,143,475

BENDING DEVICE

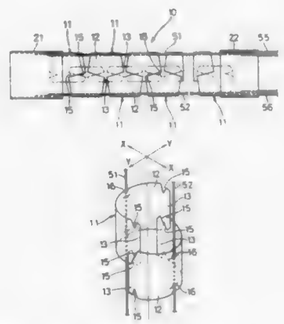
Toshio Chikama, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,611

Claims priority, application Japan, Mar. 14, 1990, 2-61201

Int. Cl.[5] F16B *5/07*; A61B *1/00*

U.S. Cl. 403—291 5 Claims



1. A bending device comprising:

(a) an articulation assembly comprising a number of segments, each of said segments having a semi-cylindrical portin and a pair of extension portions extending respectively from opposite circumferential ends of said semi-cylindrical portion in a direction of the circumference of said semi-cylindrical portion, a pair of notches being formed respectively in opposite axial ends of said segment at the boundary between each of the opposite circumferential ends of said semi-cylindrical portion and each of said extension portions, a number of said segments being arranged along a line in such a manner that said semi-cylindrical portions of any two adjacent ones of said segments are directed in opposite directions, respectively, said pair of notches in one axial end of one of the adjacent segments being engaged respectively with said pair of notches in one axial end of the other segment opposed to the one axial end of said one segment, so that the adjacent segments can be angularly movable relative to each other about those portions of said adjacent segments engaged with each other, said pair of extension portions of said one segment being disposed inwardly of said semi-cylindrical portion of said other segment, and said pair of extension portions of said other segment being disposed inwardly of said semi-cylindrical portion of said one segment; and

(b) operating wire means for bending said articulation assembly, said operating wire means being subjected at its proximal end to an operating force, and said operating wire means being fixed at its distal end to a distal end of said articulation assembly.

5,143,476

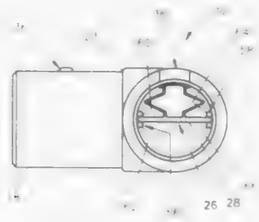
SNAP LOCK SYSTEM FOR TUBULAR PARTS

Harry Pruis, 14729 Spring Valley Rd., Morrison, Ill. 61270

Filed Jan. 11, 1991, Ser. No. 640,161

Int. Cl.[5] F16B *7/10*

U.S. Cl. 403—328 16 Claims



1. A locking mechanism for locking together first and second interfitted tubular members, said first tubular member having a wall with inner and outer wall surfaces and fitting within said second tubular member, comprising in combination;

parallel opposing longitudinally extending track means being located on said inner wall surface within said first of said tubular members,

locking means disposed within said first tubular member and longitudinally slidable along said track means,

said locking means including a base portion, a button and a spring urging said button outwardly from said base portion through an aperture in the wall of said first tubular member, said aperture being equally distant from each of said parallel track means,

said base portion having mutually parallel edges for providing slidable engagement in said track means and

said second tubular member having an aperture in the wall thereof for disposition over said aperture in the wall of said first tubular member for receiving said button when said first tubular member is positioned within said second tubular member.

5,143,477

SHAFT CONNECTING STRUCTURE

Makoto Kanehira, Hirakata; Toshio Takahashi, Toyonaka, and Takerou Nakagawa, Osaka, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

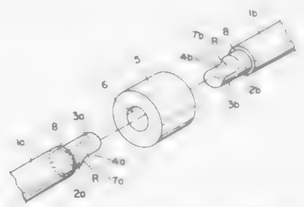
Filed Jul. 30, 1991, Ser. No. 738,161

Claims priority, application Japan, Aug. 1, 1990, 2-81107

Int. Cl.[5] F16B *1/00*

U.S. Cl. 403—341 3 Claims

1. In a driving mechanism comprising a pair of shafts arranged in end-to-end coaxial relationship to form a continuous shaft structure, a shaft connecting structure in which each of said shafts has at least one element projecting axially therefrom, said shaft element having a sector-shaped transverse cross-section, in which each shaft also has an axially extending, sector-shaped groove receiving and mating with each axially projecting sector-shaped element of the other shaft, in which said projecting elements and grooves extend along a portion of



said shaft structure, and including means providing a sleeve having a cylindrical opening, said sleeve surrounding said portion of the shaft structure, said portion of the shaft structure fitting in said cylindrical opening of the sleeve with a clearance fit, and said elements being radially reduced with respect to the shafts from which they project, whereby a shoulder is formed on each shaft, the shoulders on the shafts being engageable with said sleeve and thereby impeding axial movement thereof.

5,143,478

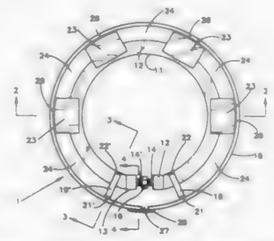
ADJUSTABLE MANHOLE COVER SUPPORT WITH SPANNERS

Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio 44126

Continuation-in-part of Ser. No. 536,691, Jun. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 362,257, Jun. 6, 1989, Pat. No. 4,963,053, Ser. No. 362,216, Jun. 6, 1989, Pat. No. 4,966,489, Ser. No. 366,177, Jun. 13, 1989, Pat. No. 4,969,771, Ser. No. 473,324, Feb. 2, 1990, and Ser. No. 362,277, Jun. 6, 1989, Pat. No. 4,969,770, which is a continuation-in-part of Ser. No. 323,622, Mar. 14, 1989, abandoned, Ser. No. 207,325, Jun. 15, 1988, abandoned, Ser. No. 207,326, Jun. 15, 1988, abandoned, Ser. No. 76,668, Jul. 23, 1987, Pat. No. 4,834,574, Ser. No. 201,573, Jun. 1, 1988, Pat. No. 4,867,600, Ser. No. 207,266, Jun. 15, 1988, Pat. No. 4,867,601, and Ser. No. 207,185, Jun. 15, 1988, Pat. No. 4,872,780. This application Mar. 18, 1991, Ser. No. 670,710

Int. Cl.[5] E02D *29/14*

U.S. Cl. 404—26 37 Claims



1. A manhole cover support for raising the grade of an existing cover-receiving structure for a circular manhole, said receiving structure having a circular rim establishing a top outer periphery, the cover support comprising:

a base ring for fitting inside the existing manhole cover-receiving structure, said base ring having nominal outside diameter of D_1 and at least one adjustable joint for adjustment of the base ring periphery;

a lateral cover keeper ring rising from a level near the top of the base ring and extending above and around it, said

keeper ring having nominal inside diameter of D_2 which is substantially larger than said diameter D_1 and an outer periphery that is at least substantially coextensive with the outer periphery of the top of the cover-receiving structure;

means for making an adjustment in the periphery of the base ring, and

a plurality of spanners which bridge the distance between the rings, the inner terminal of each spanner making contact with the base ring at or near its top, the outer terminal of each spanner making contact with the keeper ring at or near its bottom,

at least a pair of the spanners being connecting spanners having their inner terminals connected to the base ring and their outer terminals connected to the keeper ring to constitute a linkage between said rings,

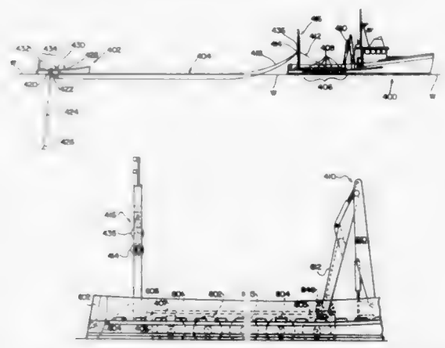
the spanners and/or the keeper ring being disposed to reposition themselves in the cover support structure in response to and in accommodation of an adjustment in the periphery of the base ring.

5,143,479

CARRIER VESSEL ESPECIALLY SUITABLE FOR OIL SPILL CONTAINMENT

Malcolm B. Whidden, Jr., P.O. Box 280, South Harpswell, Me. 04079

Division of Ser. No. 571,148, Aug. 23, 1990, Pat. No. 5,087,152. This application Dec. 10, 1991, Ser. No. 804,410
Int. Cl.[5] B63B *35/32*
U.S. Cl. 405—66 19 Claims



1. A carrier vessel for carrying, deploying or retrieving sections of a boom for containment of oil or other substance on the surface of water, the carrier vessel comprising:

a hold section shaped to contain a plurality of substantially compactly stored reels, each reel including a drum and at least one disk-shaped end section having a rim, each reel's drum adapted to have wound thereon a section of the boom; and

a crane including a drive wheel means for contacting the rims and for controlling rotational motion of the reels.

5,143,480

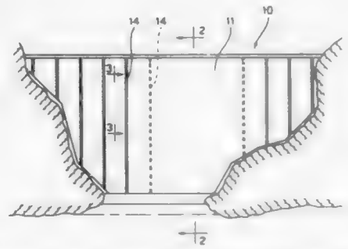
METHOD FOR PROTECTING DAMS, WITH PRESSURELESS DEHYDRATION BY CONDENSATION AND DRAINAGE OF THE WATER IN THE DAM BODY

Alberto Scuero, Turin, Italy, assignor to Sibelon S.r.l., Novara, Italy

Filed May 16, 1991, Ser. No. 701,126
Claims priority, application Italy, May 29, 1990, 20462 A/90
Int. Cl.[5] E02B *7/04*
U.S. Cl. 405—107 16 Claims

1. Method for the protection and pressureless drainage of water present in a hydraulic concrete structure of a dam body and similar hydraulic works, according to which a waterproof protective sheathing is provided and stretched onto a surface of said hydraulic structure, the improvement comprising the steps of:

providing an air space between said surface of the structure and an elastically yieldable protective sheathing defining a steam barrier;



drawing off water from said dam body by causing the migration of the water in steam form into said air space;

condensing said steam by contacting it with said steam barrier;

collecting condensed water in said air space; and

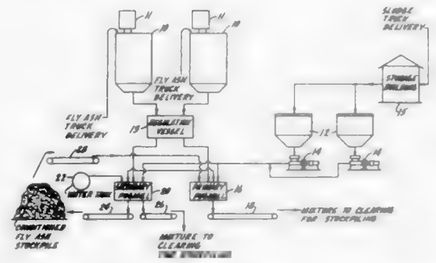
outwardly discharging said condensed water from said air space by non-pressurized water channel means provided on the surface of said hydraulic structure.

5,143,481

METHOD OF TREATING MUNICIPAL SEWAGE SLUDGE AND PRODUCT PRODUCED THEREBY

Glenn O. Schumacher, Medina; LaVerne Weber, Elgin; Mitchell Nowicki, Naperville; Alan Dunbar, Plainfield, and Jeffrey M. Douglas, Palos Park, all of Ill., assignors to American Fly Ash Company, Naperville, Ill.

Filed Apr. 18, 1991, Ser. No. 679,510
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—129 8 Claims



1. A method of stabilizing sewage sludge having substantial amounts of bacterial pathogens comprising:

placing an amount of said sludge in a pug mill;

adding to said sludge an additive selected from the group consisting of FBCR, fly ash, or a combination of FBCR and fly ash;

mixing said sludge and said additive to form a substantially uniform mixture, said mixture being formed without any separately added lime, said additive being added in an amount sufficient to cause a substantial exothermic chemical reaction, when mixed with said sludge,

storing said mixture for a predetermined period of time at a predetermined temperature sufficient to cause said pathogens to be effectively eliminated from said mixture by heat generated by said exothermic chemical reaction.

5,143,482

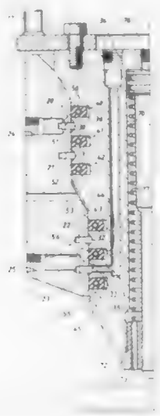
Patent Not Issued For This Number

5,143,483

HYDRAULIC STAB SUBASSEMBLY FOR REMOTELY OPERATED VEHICLE VERTICAL INTERFACE TOOL

William H. Petersen, Mandeville, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed May 6, 1991, Ser. No. 695,876
Int. Cl.[5] F16L *1/12*
U.S. Cl. 405—191 9 Claims



1. An hydraulic stab sub for inserting into a remote receptacle for establishing hydraulic communication with the receptacle, said stab sub comprising:

at least one seal means, said seal means being disposed on said stab sub and being movable radially between the first position in which it is retracted to a position at least in line with the outer surface of the stab and a second position in which it is radially expanded into sealing engagement with the surface of said receptacle; and

means for applying hydraulic pressure to said seal means to move it radially outward into sealing engagement with the surface of said receptacle.

5,143,484

MINE CRIBBING DEVICE AND METHOD

Maurice Deul, 817 Hillaire Dr., Pittsburgh, Pa. 15243

Filed Feb. 26, 1991, Ser. No. 661,495
Int. Cl.[5] E21D *11/00*
U.S. Cl. 405—288 7 Claims

1. A method of supporting roofs in an underground mine having a floor and a roof comprising the steps of

1. forming crib members having the compressive strength of solid concrete members while avoiding the catastrophic failure of solid concrete members by

a. injecting concrete mix into motor vehicle tires;

b. allowing said concrete to cure to substantially its final strength; and

2 placing sufficient crib members in a stack axially aligned along an axis from floor to roof to form a crib extending from the floor to the roof of the mine.

5,143,485

TRANSPORT AIR CONTROL

Jürg Faas, Dinhard; Christoph Stäheli, Frauenfeld; Robert Demuth, Nürensdorf, and Robert Moser, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jun. 11, 1990, Ser. No. 536,210
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1989, 3919744; Dec. 7, 1989, 3940524
Int. Cl.[5] B65G *53/04*
U.S. Cl. 406—14 20 Claims

1. A method of operating a pneumatic transport system in a process line of a spinning mill, the pneumatic transport system extending from a bale opening machine via at least one additional machine to a carding system, wherein fiber flocks are transported through ducts by means of airflows generated by fans, the airflows being adapted to be affected by units, the units comprising fans, adjustable flaps, leakage air openings, and induction boxes, said method comprising the steps of:

(a) measuring, in each of a plurality of critical regions, the respectively prevailing static pressure by means of pressure sensors;

(b) determining whether at least one of said respectively prevailing static pressures is outside of a predetermined desired range;

(c) adjusting at least one of said units in a manner to affect said at least one of said respectively prevailing static pressures to change same in a direction toward or into said desired range, if said at least one of said respectively prevailing static pressures is outside of said predetermined desired range;

(d) determining the magnitude of a change in a prevailing static pressure in at least one further critical region affected by said step of adjusting;

(e) adjusting a further one of said units in a manner to affect said prevailing static pressure in said at least one further critical region to change same toward or into a predetermined desired range for said at least one further critical

region, if said prevailing static pressure of said at least one further critical region is outside of said predetermined desired range for said at least one further critical region; and

(f) repeating steps (a) through (e), as necessary, until measured pressures lie in said desired ranges.

5,143,486

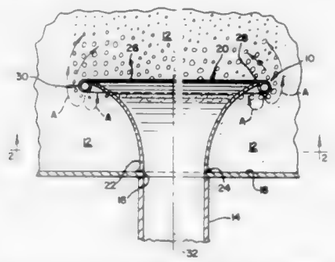
FLOW PROMOTER FOR FLUIDIZED SOLIDS

David R. Geoffroy, Holden, Mass., assignor to Riley Stoker Corporation, Worcester, Mass

Filed Mar. 1, 1991, Ser. No. 662,754

Int. Cl.[5] B65G *53/16*

U.S. Cl. 406—90 **6 Claims**



1. A device for promoting the flow rate of solid particulates from a fluidized bed into a downcomer extending from a discharge outlet formed in a wall beneath said bed, said device comprising:

a hollow, generally funnel-shaped element having a lower end connected upstream of said discharge outlet and an upper end portion upwardly of said lower end flared outwardly at progressively higher levels above said wall to form an enlarged flow entrance for said fluidized solid particulates to move from said bed toward said discharge outlet into said downcomer;

said funnel element having an open upper end forming a rim around said flow entrance spaced above said wall and having a flow cross-section greater than that of said discharge outlet; and

bubble means adjacent said rim for injecting gaseous fluid into said bed to fluidize said solid particulates to move more easily toward said flow entrance of said funnel element,

said bubble means comprising an annular hollow fluid conduit supplied with pressurized fluid and having gaseous fluid outlets spaced apart thereon for injecting said gaseous fluid into said bed of solid particulates,

said annular fluid conduit comprising a generally circular ring adjacent the level of said flow entrance with said gaseous fluid outlets spaced apart around said ring, and formed on a lower portion of said ring away from said flow entrance.

5,143,487

THROW AWAY TIP

Makoto Shirai, and Katsuhiko Sumida, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed May 2, 1990, Ser. No. 518,632

Claims priority, application Japan, May 12, 1989, 1-54838

Int. Cl.[5] B23P *15/28*

U.S. Cl. 407—117 **8 Claims**

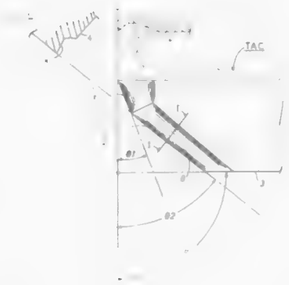
1. A throw away tip for back-turning work material by cutting into the work material during depth setting in a first direction and during machining in a second direction different from the first direction, comprising:

an end cutting flank for cutting said work material in said first direction, said end cutting flank forming an end cutting angle between said end cutting flank and a first plane,

at least one middle cutting flank abutting said end cutting flank and forming an entering angle between said at least one middle cutting flank and said first plane, and

a side cutting flank abutting said at least one middle cutting flank for machining said work material in said second direction, said side cutting flank forming a setting angle between said cutting flank and said first plane; wherein

said first plane contains a line defined by said second direction and is orthogonal to a line defined by said first direction; and said end cutting angle and said entering angle are



acute angles, said entering angle is greater than said end cutting angle, and said setting angle is greater than said entering angle.

5,143,488

Patent Not Issued For This Number

5,143,489

METHOD OF DRILLING BORES

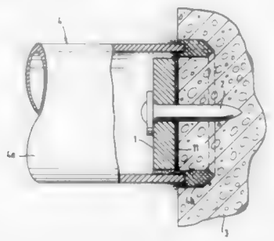
Werner Bogner, Munich; Rolf Spangenberg, Gauting, and Paul Deutschenbaur, Germering, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Aug. 30, 1991, Ser. No. 753,031

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1990, 4027868; May 6, 1991, 4114703

Int. Cl.[5] B23B *35/00*

U.S. Cl. 408—1 R **6 Claims**



1. A method of drilling an axially extending bore in a structural component (3, 7, 13) using a hollow cylindrically shaped core drill bit (4, 14), wherein the method comprises the steps of fixing a guide member on a surface of the structural component and centering the guide member with respect to the axis of the bore to be drilled, applying the core drill bit (4, 14) in contact with the surface of the structural component and guiding the bit on at least one circumferentially extending surface of said guide extending in the axial direction of the bore as the bit drills into the structural component, fixing the guide (1, 5) to the surface of the structural component (3, 7, 13) by an adhesive (11, 18), and covering the adhesive (11, 18) by a removable protective foil on the surface of the guide prior to applying the guide to the surface of the structural component (3, 13).

5,143,490

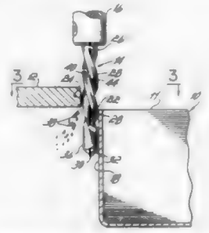
BIT FOR CUTTING SHEETROCK

Robert K. Kopras, Black Earth, Wis., assignor to Roto Zip Tool Corporation, Cross Plains, Wis.

Filed Jul. 26, 1991, Ser. No. 736,398

Int. Cl.[5] B23B *51/08*; B23C *51/10*

U.S. Cl. 408—26 **11 Claims**



1. A bit for cutting axially and laterally through a sheetrock panel, said bit comprising,

a tip for cutting axially,

a plurality of body flutes for cutting laterally, said flutes forming a spiral on said bit which extends toward said tip in a direction which, when the bit is rotated in use, tends to resist advancement of the bit into a panel being cut,

an unfluted annular band extending around said bit between said tip and a leading end of said spiral, said unfluted band providing a bearing surface on which said bit can be guided around an electrical outlet box to cut a panel covering said box, and

a shank by which said bit can be chucked.

5,143,491

Patent Not Issued For This Number

5,143,492

DEVICE AND TOOL BIT FOR CUTTING ALL KNOWN TYPES OF THREADS (EXCEPT BUTTRESS THREAD) IN ONE SINGLE WORK PROCESS

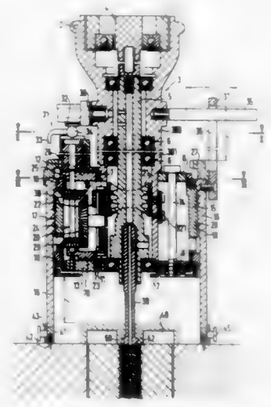
Felix Leeb, Zum Espat 3, 8388 Mettenhausen, Fed. Rep. of Germany

Continuation of Ser. No. 601,041, Oct. 23, 1990, abandoned, which is a continuation of Ser. No. 322,771, Mar. 13, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 726,711

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810884

Int. Cl.[5] B23C *3/32*

U.S. Cl. 409—74 **17 Claims**



1. An apparatus for producing an internally threaded drill hole in a solid material without predrilling, comprising:

a thread cutting tool eccentrically guidable about a drill hole axis at a rotationally driven spindle of the tool, and axially displaceable, which tool has an end face preceded by cutters so as to produce hole;

means for rotationally driving the tool spindle;

a cylindrical rotatable spindle housing in which the tool spindle is mounted so as to be radially adjustable, the spindle housing having an external guiding thread portion (20);

means for radially adjusting the tool spindle, said adjusting means including axially spaced eccentric plates connected with one another and mounted for rotation in and with respect to and eccentric to the axis of the spindle housing, and the spindle being mounted for rotation in the eccentric plates about an axis eccentric to the axis defined by the plates, means for rotating the eccentric plates with respect to the spindle housing, and means for fixing the eccentric plates against rotation with respect to the housing;

a holder placeable on a workpiece to be machined and having an internal further guiding thread portion (19), the spindle housing (15) being disposed in the holder so that the guiding thread portion (20) is in engagement with the further guiding thread portion (19) disposed at the holder; and

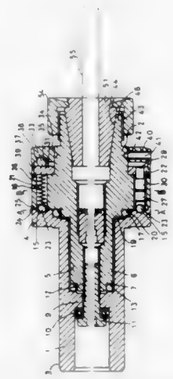
means for rotationally driving the spindle housing from rotation of the tool spindle so that said housing is axially displaced by the engagement between the guiding thread portions, the axial displacement of the spindle housing causing the cutting tool to be axially displaced, the tool spindle drive means participating in the tool spindle's eccentric and axial movements.

5,143,493

VIBRATING CUTTING TOOL

Kozo Najima; Hirohumi Tsuyaguchi; Tsutomu Aoki; Fukuo Wakano, and Masahiro Ida, all of Osaka, Japan, assignors to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan

Filed Dec. 2, 1991 Ser. No. 801,515
Claims priority, application Japan, Nov. 30, 1990, 2-339144
Int. Cl.[5] B23C 5/26
U.S. Cl. 409—141 3 Claims



1. A vibrating cutting tool comprising an input shaft driven by a live spindle of a machine tool, an output shaft having a cutter mounting portion, means for coupling said input shaft and said output shaft together so as to be at least circumferentially movable relative to each other, one of said input shaft and said output shaft being formed with recesses, the other being formed with holes at locations opposite to said recesses, moving elements mounted partially in said recesses and partially in said holes with a predetermined amount of gap defined between said moving elements and said recesses or the peripheral surfaces of said holes, said gaps restricting circumferential movements of said moving elements, springs mounted in said holes for pressing said moving elements against said recesses, and stopper means mounted in said holes with a predetermined gap defined between said stopper means and said moving elements for restricting the movement of said moving elements in a direction in which said springs are compressed.

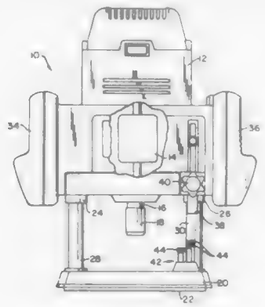
5,143,494

DEPTH OF CUT LOCK MECHANISM FOR A PLUNGE TYPE ROUTER

Ronald C. McCurry, West Union, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.

Filed Oct. 18, 1991, Ser. No. 779,073
Int. Cl.[5] B27C 5/10; B23C 1/20
U.S. Cl. 409—182 10 Claims

1. A plunge type router comprising:
- a motor housing with a drive motor secured therein, said motor having a shaft extending outwardly from the lower end of said motor housing and adapted to have a cutting tool secured thereto;
- a base plate displaceable substantially vertically relative said motor housing;
- means for guiding the displacement of said base plate including a hollow guide sleeve secured to said motor housing and a guide tube secured to said base plate, said guide tube being arranged for sliding movement within said guide sleeve and said guide sleeve being formed with a lateral opening exposing said guide tube;
- a plug member;
- a hollow member having exterior threads at one end so as to be threadedly secured to said motor housing, the interior of said hollow member having a major axis substantially perpendicular to the major axes of said guide tube and said guide sleeve and co-linear with the axis of said exterior threads, the interior of said hollow member communicating with said guide sleeve lateral opening, and said plug



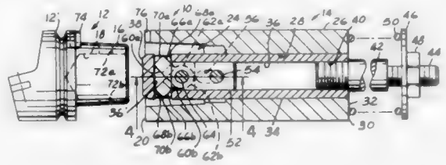
member being captured within said hollow member interior so as to extend through said lateral opening; and
- means for rotating said hollow member about said interior major axis.

5,143,495

COUPLING SYSTEM FOR MACHINE TOOLS

Ronald P. Bosek, Davisburg, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Oct. 29, 1990, Ser. No. 605,064
Int. Cl.[5] B23C 5/26
U.S. Cl. 409—233 23 Claims



1. A coupling system for lockably coupling together machine tool components, said coupling system comprising:
- a toolholder, comprising:
  - a body having a forward end and a rearward end, said body having an axially disposed drawbar bore extending between said forward and rearward ends thereof, said drawbar bore forming a tool profile cavity substantially adjacent said forward end of said body;
  - a drawbar guidably positioned within said drawbar bore of said body for slidable movement within said drawbar bore, said drawbar having a forward end and a rearward end, said forward end of said drawbar projecting axially into said tool profile cavity, said drawbar having an axially disposed carrier bore extending from said rearward end thereof to a blind terminus at said forward end thereof, said drawbar having a pair of apertures adjacent said forward end thereof;
  - a carrier located within said carrier bore of said drawbar, said carrier being fixedly connected with respect to said body at a predetermined location within said carrier bore;
  - a pair of locking fingers rotatably connected with said carrier, each locking finger of said pair of locking fingers having a finger tip, each finger tip being respectively aligned with each aperture of said pair of apertures in said drawbar, each said finger tip cooperating with its respective aperture to abuttably cause rotation

of said locking fingers in response to slidable movement of said drawbar with respect to said body; and
- a tool, comprising:
  - a tool portion; and
  - a tool profile projecting from said tool portion, said tool profile being shaped reciprocal with respect to said tool profile cavity of said body for being seatably received by said tool profile cavity, said tool profile further defining a drawbar cavity dimensioned for receiving said drawbar therewithin, said tool profile having a pair of finger slots, each finger slot being alignable with a respective said aperture in said drawbar;

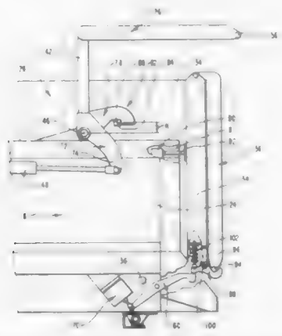
wherein axial movement of said drawbar toward said forward end of said body causes said apertures to abuttably interact with said locking fingers to thereby cause said locking fingers to rotate until said finger tips are retracted into said drawbar, and further wherein axial movement of said drawbar away from said forward end of said body causes said apertures to abuttably interact with said locking fingers to thereby cause said locking fingers to rotate until said finger tips erupt outwardly from said draw bar and be engagably received by said finger slots in said tool profile.

5,143,496

LATCHING SYSTEM FOR TRANSFER TRUCK AND TRAILER SET

Fred P. Smith, and Fred T. Smith, both of Alpine, Utah, assignors to Superior Trailer Works, Inc., Fontana, Calif.

Filed Feb. 22, 1991, Ser. No. 661,050
Int. Cl.[5] B62D 27/06
U.S. Cl. 410—68 16 Claims



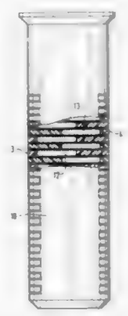
1. A latching system for a transfer truck and trailer set, the transfer truck of the set having a body capable of tilting to empty contents therefrom through a truck tailgate, and the transfer trailer of the set having a body capable of being separated from the trailer, the truck tailgate being openable from a closed position to permit the trailer body to be received into and secured to the truck body for tilting therewith to empty contents from the trailer body through a trailer tailgate having an open and a closed position, the latching system comprising:
- (a) a double-acting tailgate cylinder, said tailgate cylinder being activated by a pressurized fluid applied to head end thereof to move the truck tailgate into a trailer body receiving position in which the trailer body is receivable into the truck body, and said tailgate cylinder being activated by said pressurized fluid applied to the rod end thereof to urge the truck tailgate out of said trailer body receiving position thereof toward the closed position thereof and into a trailer body retaining position in which the trailer body is secured in the truck body;
- (b) a trailer body retention pin attached to the outside of the trailer body at a position forward of the rear end of the truck when the trailer body is received thereinto;
- (c) a retention arm fixed relative to the truck tailgate for movement therewith, said retention arm avoiding interaction with said trailer body retention pin in the trailer body receiving position of the truck tailgate, and said retention arm engaging and locking said trailer body retention pin in said trailer body retaining position of the truck tailgate;
- (d) truck body access means pneumatically coupled to said head end of said tailgate cylinder for applying a pressurized fluid thereto; and
- (e) retention arm activation means for rapidly moving the truck tailgate out of said trailer body receiving position thereof into said trailer body retaining position thereof, said retention arm activation means comprising:
  - (i) truck tailgate lowering means pneumatically coupled to said head end and said rod end of said tailgate cylinder for reducing pressure in said head end of said tailgate cylinder and for applying said pressurized fluid to said rod end of said tailgate cylinder;
  - (ii) pneumatic control means for terminating activation of said truck body access means and initiating activity of said truck tailgate lowering means.

5,143,497

EXPANSIBLE PLUG FOR FIXING TO A SOLID OR HOLLOW BUILDING MATERIAL

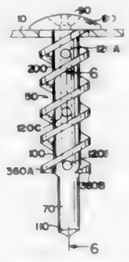
Manfred Haage, Dornstetten-Aach, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG., Waldachtal, Fed. Rep. of Germany

Filed Aug. 26, 1991, Ser. No. 749,701
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1990, 4026944
Int. Cl.[5] F16B 13/04, 13/06
U.S. Cl. 411—33 6 Claims



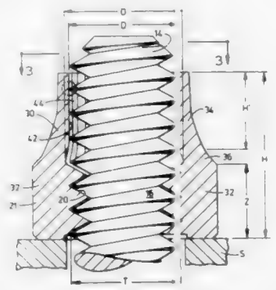
1. In an expansible plug for fixing on solid or hollow building material, comprising a plug shank having a plurality of expansion elements, said expansion elements having a screw bore extending therethrough so that said screw bore can receive a fixing screw that displaces the expansion elements laterally when said fixing screw is screwed into said screw bore, the improvement wherein the expansion elements comprise a plurality of laterally displaceable expansion discs (3,4) having eccentric bores (12,13) and being arranged one after the other, so that the bores (12,13) of adjacent discs (3,4) are staggered with respect to one another and overlap one another to form an overlapping region, so that the overlapping region of the eccentric bores (12,13) forms a constricted screw hole (15) acting as said screw bore, and comprising a plug head (5) at one end of the plug shank (1) and a pressure collar (7) at another end of the plug shank opposite to and remote from the plug head (5), said pressure collar (7) having an axial bore (8) and being connected to said expansion disks (3,4), said pressure collar (7) being a sleeve-shaped shank part joining the plug shank (1) at said other end.

5,143,498
ROOFING FASTENING DEVICE
Robert E. Whitman, 2465 Knights Hill, Toledo, Ohio 43614
Filed Jun. 21, 1990, Ser. No. 541,827
Int. Cl.[5] F16B *39/02, 39/30*
U.S. Cl. 411—82 3 Claims



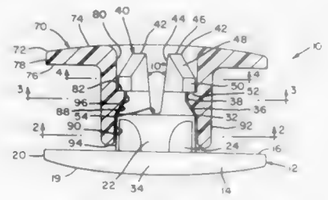
1. A longitudinally extending fastening member adapted to penetrate a roof structure for purposes of securing roof covering to such roof structure, such device comprising:
(a) a longitudinally extending shank member, such shank member having a circumferential surface, and said shank having a head thereon and a bottom portion, with said circumference having a double helical threaded member therein, with such threaded members having serrations on the external edge surfaces thereof;
(b) chamber means with an internal spatial area, in said fastening device to receive a liquid sealer, said chamber means having an opening, to spatial areas outside fastening device in said outer circumferential surface of said shank member and said head member, and said chamber member communicating with said openings on said outer circumference of said shank member whereby there is spatial continuity between the internal spatial area of said chamber means and said openings.

5,143,499
DEFORMABLE CYLINDER LOCKNUT
Melvin Bobo, Cincinnati; Peter W. Mueller, Morrow, and Thomas F. McClure, Middletown, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Apr. 22, 1991, Ser. No. 689,206
Int. Cl.[5] F16B *39/284*
U.S. Cl. 411—247 16 Claims



1. A deformable cylinder locknut for application to a threaded shaft in a gas turbine engine, comprising
means including a first threaded portion for threadedly receiving the threaded shaft therein; and a second deformable cylindrical sleeve portion for receiving the threaded shaft therein;
said first and second portions being integrally and coaxially formed in a unitary structure wherein said cylindrical sleeve portion can be deformed elliptically to provide sleeve to thread locking force contact with a threaded surface of the shaft inserted therein.

5,143,500
SNAP ENGAGING FASTENER SYSTEM FOR PROVIDING ROTARY MOTION
Eric J. Schuring, Caledon East, and Vince Girimonte, Downsview, both of Canada, assignors to ITW Plastiglide, Concord, Canada
Filed Feb. 28, 1991, Ser. No. 661,970
Int. Cl.[5] F16B *19/00, 21/00*
U.S. Cl. 411—339 8 Claims

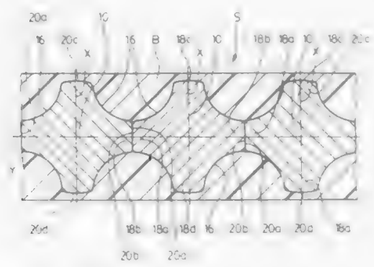


1. A two part fastener system, comprising:
a male member; and
a female member;
said male member including a shank having an end and having serially along its axis toward said end a first generally cylindrical portion; a first generally frustoconical portion; a second generally cylindrical portion of less diametrical extent than that of said first cylindrical portion; a third generally cylindrical portion having a diameter which is substantially equal to that of said first cylindrical portion and defining a radial shoulder, extending substantially perpendicular with respect to said axis of said shank, along with said second cylindrical portion; and a second generally frustoconical portion; a groove also extending axially inwardly from said shank end so as to bifurcate at least said first and second frustoconical portions and said third and second cylindrical portions;
said female member including a bore having a series of internal surfaces including a frustoconical surface for biasing said bifurcated shank end radially inwardly, and a surface defining a radial shoulder, extending substantially perpendicular with respect to a longitudinal axis of said bore of said female member, for operative cooperation with said shank shoulder,
the axial and radial dimensions of said second cylindrical shank portion and said first frustoconical shank portion of said male member relative to the dimensions of said frustoconical and shoulder surfaces of said female bore being such that when said male and female members axially assembled together, a locking snap action connection between said male and female members is achieved wherein said operative cooperating radial, axial, and frustoconical surfaces permit only rotary movement of said male and female members relative to each other while substantial axial movement of said male and female members with respect to each other is effectively prevented.

5,143,501
GROOVED NAIL AND STRIP
Walter H. Leistner, 97 Alamosa Drive, and Alfred S. Hertz, 77 Hillhurst Blvd., both of Toronto, Canada
Filed Jul. 22, 1991, Ser. No. 733,651
Int. Cl.[5] F16B *15/08*
U.S. Cl. 411—442 13 Claims

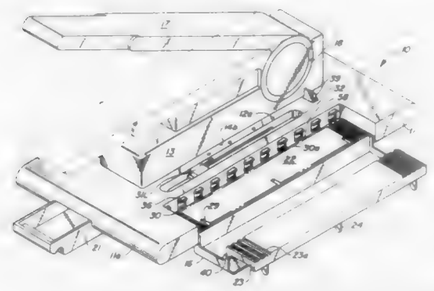
1. A nail containing a predetermined unit weight of metal per unit of length, equivalent to a cylindrical wire nail having a predetermined diameter W and perimeter P and an equivalent unit length, and said nail comprising:

a shank portion having a predetermined length, and having a regular shape along its length and defining a central longitudinal axis with a first transverse axis X and a second transverse axis Y normal to said X axis;
a point at one end of said shank portion;
four reduced portions on said shank portion extending longitudinally thereof from said point, and parallel to said central axis of said shank portion, said reduced portions being oriented to face along axes directed between said X and said Y axes and being spaced diametrically apart from one another and defining a dimension reduced relative to said predetermined diameter W whereby to lie inside said perimeter P;



two ridges formed between said reduced portions, defining ridge crest portions said ridge crest portions being spaced apart on opposite sides of said shank portion by a distance C, where C is equal to W plus between about 5 and 10% of W;
planar surface portions on said shank portion lying in predetermined spaced planes parallel to one another and oriented to lie along said Y axis whereby a said planar surface portion of one said nail may lie against a planar surface portion of a next adjacent nail in a strip, with said ridge crest portions extending from said shank outwardly from each said nail in said strip, on opposite sides of said strip and,
a head on said end of said nail remote from said point.

5,143,502
PAPER SHEETS BINDING APPARATUS
Rick J. Kaufmann, Los Gatos, and Loren D. Stirling, Pleasanton, both of Calif., assignors to Taurus Tetraconcepts, Inc., Mountain View, Calif.
Filed Feb. 27, 1991, Ser. No. 661,737
The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.
Int. Cl.[5] B42B *9/00*
U.S. Cl. 412—16 32 Claims



1. Apparatus for punching and binding a stack of paper sheets including an apparatus housing;
a punch mechanism in said housing including hole punch elements accessible to paper sheets insertable along a linear edge of said housing;
a punch operational means connected to said housing for actuating said punch mechanism;
means interconnecting said punch operational means to said punch elements for punching apertures in paper sheets inserted into said punch mechanism at said linear edge;
binding means in said housing for binding a stack of apertured paper sheets; and
wherein said binding means comprises
recess means for accepting a first binding strip having a series of holes generally corresponding in size and spacing to the apertures in a paper sheets stack placed thereon;
means for accepting a second binding strip having flexible studs projecting therefrom of a size and spacing generally corresponding to the holes in the first binding strip, the studs passing through the apertures in the paper sheets stack and through the first binding strip holes, with ends of the studs projecting from the first binding strip; and
bending means in said housing for bending the stud ends, said bending means comprising at least one bending blade positioned below the first binding strip and being laterally movable to bend each projecting stud ends into an underside stud-holding groove in said first binding strip; and
means for connecting said at least one bending blade to said punch operational means, motion of said punch operational means resulting in movement of said at least one bending blade.

5,143,503
IMAGE-FORMING APPARATUS PROVIDED WITH BOOKBINDING DEVICE
Yukihiro Ito, Osaka; Yutaka Shigemura, Takarazuka; Takashi Kondo, Sakai; Hideo Umezawa, Amagasaki; Mitsuharu Yoshimoto, Nara; Satoshi Yano, Takatsuki, and Junichi Oura, Hirakata, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Sep. 17, 1990, Ser. No. 583,643
Claims priority, application Japan, Sep. 28, 1989, 1-113844[U]; Sep. 28, 1989, 1-113845[U]; Sep. 28, 1989, 1-253652; Sep. 28, 1989, 1-253653; Sep. 28, 1989, 1-253654
Int. Cl.[5] B42C *9/00*
U.S. Cl. 412—37 18 Claims

1. A combination binding apparatus, for use in binding papers to an inner surface of a back cover of a binder with an adhesive, and image forming apparatus, comprising:
a housing;
a binder receiving portion mounted to said housing for receiving a binder along a binder insertion direction, said binder receiving portion being elongated along said binder

insertion direction and having a binder insertion opening at an insertion end thereof;

means, provided in said binder receiving portion, for heating the adhesive to bind the papers to the inner surface of the back cover of the binder;

a cover means, mounted at said binder insertion opening of said binder receiving portion, for movement between closed and open positions, for covering said binder insertion opening when in said closed position and for allowing insertion of the binder, through said binder insertion opening and into said binder receiving portion, when in said open position;

biasing means for biasing said cover means toward said closed position; and

wherein said cover means, when in said closed position, is inclined relative to said binder insertion direction and is further operable for guiding foreign matter, incident on said cover means when in said closed position, away from said binder insertion opening of said binder receiving portion.

5,143,504

METHOD OF MANUFACTURING A SEAM CONNECTION

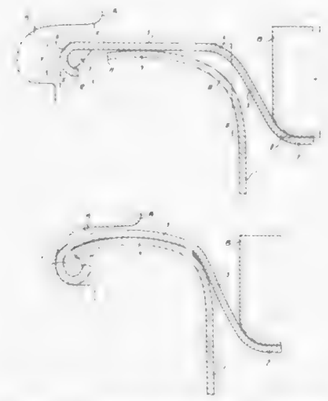
Gerleen H. Braakman, Soest, Netherlands, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Continuation of Ser. No. 440,763, Sep. 18, 1989, abandoned. This application Aug. 28, 1991, Ser. No. 758,308

Claims priority, application Netherlands, Sep. 21, 1988, 8802339

Int. Cl.[5] **B21D** *51/32*

U.S. Cl. 413—6 **7 Claims**



1. In a method of manufacturing a seam connection, between and edge of a radially outwardly extending flange (**9**) at one end of a body (**1**) of a metal container which is a figure of revolution having an axis, and an edge flange (**5**) of a metal end closure wall (**2**), in which said edge flange (**5**) is provided with a precurl (**6**) with a small radius, the inner diameter of said precurl (**6**) being larger than the thickness of the end edge (**11**) of said extending flange (**9**), which extending flange (**9**) at the location of a transition (**10**) toward the body (**1**) has a curvature having a radius of a magnitude such that a gradual bend transition is obtained from the body (**1**) toward said extending flange (**9**) and said edge flange (**5**) of said end closure wall (**2**) merges into said end closure wall (**2**) by a curvature (**4**), which edge and extending flanges (**5, 9**) after placing and axially pressing said end closure wall (**2**) and said body (**1**) upon each other are rolled into each other with the aid of at least one seaming roller (**14**) having a groove (**15**), which roller (**14**) is displaced in circumferential direction with respect to said body (**1**) and radially toward the body (**1**) to perform the rolling into each other of said edge and extending flanges (**5, 9**) inside said groove (**15**) of said seaming roller (**14**) with simultaneous centering and supporting of said end closure wall (**2**) on the inner side of said edge flange (**5**) of said end closure wall (**2**), said groove (**15**) of said seaming roller (**14**) having a height (K), which is larger than a thickness (V) of said precurl (**6**) measured in a direction parallel to said axis;

the improvement wherein an upstanding edge (**3**) of said end closure wall (**2**) and said transition (**10**) between said body (**1**) and said extending flange (**9**) are entirely spaced apart from each other, and wherein

said precurl (**6**) at the beginning of the seaming operation is guided into that portion of said groove (**15**) of said seaming roller (**14**) which, seen in axial direction, is closer to the other end of said body (**1**), and wherein

it is an underside (**12**) of said precurl (**6**) which first comes into contact with said portion of said groove (**15**).

5,143,505

ACTUATOR SYSTEM FOR PROVIDING FORCE FEEDBACK TO A DEXTROUS MASTER GLOVE

Grigore C. Burdea, New York, N.Y., and Jiachen Zhuang, Piscataway, N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Feb. 26, 1991, Ser. No. 661,515

Int. Cl.[5] **B25J** *13/02*

U.S. Cl. 414—5 **13 Claims**

1. An actuator system for use with a glove having a palm surface, a plurality of digits and back surface with a plurality of sensors mounted thereon for generating electrical signals responsive to the movement of said digits, said system comprising:

a first digit support connectable to a first digit of said glove;

a palm support spaced from said first digit support and positionable on the palm surface of said glove;

a first actuator means comprising a pneumatic cylinder, extending between said supports for providing force feedback to said first digit support as a result of electrical signals generated by at least one of said sensors; and,

a first sphere joint for connecting said first actuator means to said palm support, said first sphere joint including an air passageway for communicating with said first pneumatic cylinder.

5,143,506

APPARATUS FOR RELATIVELY ARRANGING INDIVIDUAL PARTS

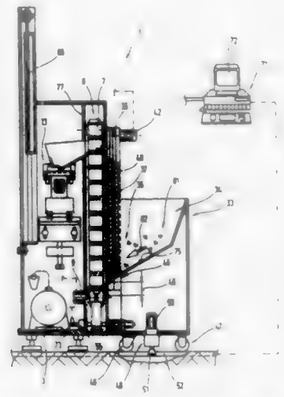
Walter Sticht, Karl-Heinrich-Waggerl-Strasse 8, A-4800 Attnang-Puchheim, Austria

Filed Jul. 21, 1990, Ser. No. 586,421

Claims priority, application Austria, Sep. 27, 1989, 2253/89

Int. Cl.[5] **B65G** *41/00*

U.S. Cl. 414—421 **12 Claims**



1. An apparatus for arranging individual parts, which comprises

(a) a machine frame;

(b) a conveying device for the individual parts, the conveying device being mounted on the machine frame and comprising

(1) a chute having a pivotal bottom, a front wall and a rear wall, and

(2) a conveyor extending in a plane, the front wall extending parallel to the conveyor plane;

(c) a storage container defining a storage area for a randomly arranged quantity of said individual parts;

(d) a docking device for exchangeably connecting the storage container to the front wall, the storage container having an outlet for supplying the individual parts to the pivotal conveyor chute bottom and the conveyor conveying the individual parts supplied thereto; and

(e) a linear sorting conveyor arranged adjacent the rear wall for receiving the conveyed individual parts and for orienting the individual parts.

5,143,507

WHEEL HANDLING APPARATUS

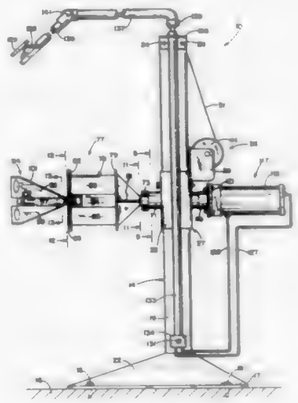
Ronald E. Haugen, and David T. Murphy, both of Forest City, Iowa, assignors to Vix Design Products, Inc., Forest City, Iowa

Filed May 7, 1990, Ser. No. 519,581

Int. Cl.[5] **B60B** *31/06*

U.S. Cl. 414—427 **30 Claims**

1. An apparatus for handling a wheel comprising: a support, a generally upright mast, means mounting the mast on the support, a carrier assembly, said carrier assembly including means mounted on the mast for movement along said mast, means connected to the carrier assembly and mast operable to move the carrier assembly relative to the mast, means for holding the carrier assembly in a selected position on said mast, wheel holder means for holding and supporting the wheel, said wheel holder means includes a body and head means, means mounting the body on the carrier assembly for movement with the carrier assembly whereby the wheel carried by the wheel holder means moves with the carrier assembly relative to said mast, power means mounted on the carrier assembly and connected to the wheel holder means for holding and supporting the wheel on the wheel holder means, rod means connecting the head means to the power means whereby the power means operates to move the head means relative to the body to hold and support the wheel on the wheel holder means, said body including housings, arms movably mounted on the housings



engagable with the wheel to hold the wheel, said head means including a plurality of fin means having inwardly converging edges engagable with said arms to move said arms outwardly into engagement with the wheel when the power means moves the head means toward the body thereby holding and supporting the wheel on said arms.

5,143,508

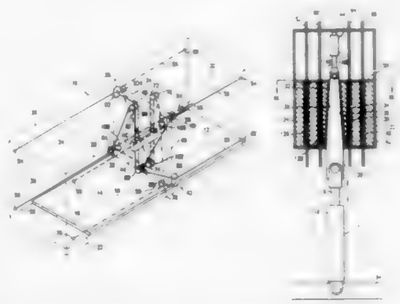
CARGO CARRYING VEHICLE HAVING A MOVABLE BULKHEAD LOCATED THEREIN

David E. Lutz, P.O. Box 810, and David W. Lutz, P.O. Box 4444, both of Carlisle, Pa. 17013

Filed Feb. 5, 1991, Ser. No. 651,025

Int. Cl.[5] **B60P** *1/00*

U.S. Cl. 414—510 **38 Claims**



33. A cargo carrying vehicle comprising:

(a) a body having an interior, an internal floor, a left internal sidewall having an upper edge and a lower edge, a right internal sidewall having an upper edge and a lower edge, a longitudinal axis, a front end, and a rear end;

(b) a movable bulkhead mounted in said interior above said internal floor for movement relative to said body, said movable bulkhead having an upper right corner, a lower right corner, an upper left corner, a lower left corner, a central vertical transverse plane, a central vertical longitu-

dinal plane, a front face, a rear face, an upper edge, and a lower edge;

(c) an inextensible cable that has a first end mounted on said body adjacent said rear end of said body and a second end mounted on said body adjacent said front end of said body;

(d) a pneumatic cylinder one end of which is mounted on said movable bulkhead and that is operable in the direction parallel to the adjacent run of said inextensible cable; and

(e) a clamp that is mounted on the other end of said pneumatic cylinder and that grips and releases said inextensible cable.

5,143,509

PROCESS AND APPARATUS FOR REMOVING ARTICLES FROM AN UNDERLAYER WITH HIGH FRICTIONAL RESISTANCE

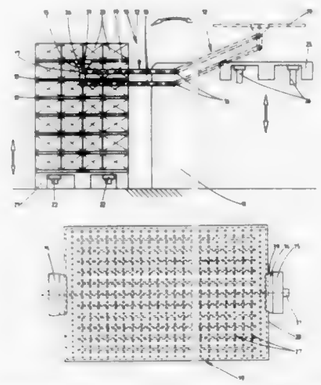
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Apr. 27, 1990, Ser. No. 515,990

Claims priority, application Fed. Rep. of Germany, May 3, 1989, 39145980

Int. Cl.[5] **B65G** *59/00, 47/90*

U.S. Cl. 414—796 **20 Claims**



1. An unloading apparatus for carrying out a process for removing articles from a horizontally oriented underlayer having a high frictional resistance, there being plural underlayers stacked on a pallet, and each underlayer having a layer of articles placed on a horizontal upper side of the underlayer, said process comprising the steps of:

a) supplying compressed air, from two opposite lateral sides of one of said underlayers (**19**) to a cavity (**29**) in said one underlayer (**19**);

b) generating with the compressed air an air cushion at the upper side of said one underlayer (**19**) and underneath the articles placed thereon; and

c) removing the articles from said one underlayer (**19**) by means of only a horizontal movement of an unloading apparatus (**10**), said articles horizontally gliding on said air cushion during said only horizontal movement, wherein said generating step comprises forming the air cushion by forcing the compressed air through vertically directed air outlets (**27**) in the upper side of said one underlayer (**19**);

said unloading apparatus comprising two compressed-air nozzles, wherein each of said underlayer (**19**) is provided with two connection ports (**18**), each connection part receiving one of said compressed-air nozzles (**14**) and a respective connection port (**18**) being located on a corresponding one of said opposite lateral sides of said underlayer (**19**), wherein the cavity (**29**) in said underlayer (**19**) is in communication with said communication ports (**18**) and with said air outlets (**27**) in the upper side of said underlayer (**19**);

wherein said unloading apparatus (**10**) comprises a horizontally movable pusher (**23**) for removing said articles from said underlayer (**19**) by horizontal movement of said articles;

wherein said two compressed-air nozzles (**14**) lockingly engage said two connection ports (**18**) and are arranged on two gripping arm means (**12**), respectively, of said unloading apparatus (**10**) for removing said underlayer (**19**) from the pallet, said underlayer (**19**), after the articles are removed therefrom, being removable in a horizontal orientation from the pallet and deposited onto a deposited onto a depositing surface (**25**) by said gripping arm means (**12**); and

wherein each of said gripping arm means (**12**) comprises two parallel pivotable arms (**13**) which are pivotally secured to said unloading apparatus (**10**), and a respective connecting piece pivotally secured to said pivotable arms, a respective connecting piece (**15**) carrying one of said compressed-air nozzles (**14**), such that said connecting pieces (**15**) with said compressed-air nozzles (**14**) are movable in a vertical plane without changing their orientation relative to said arms.

5,143,510

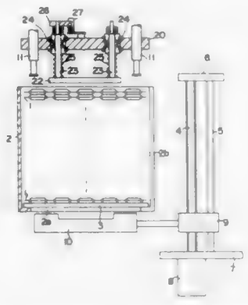
LEAD FRAME SEPARATING DEVICE

Tohru Takamura; Ryuta Yamaguchi, and Noboru Fujino, all of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Nov. 5, 1990, Ser. No. 609,425

Int. Cl.[5] **B65G** *59/04*

U.S. Cl. 414—796.7 **2 Claims**



1. A lead frame separating device comprising:

a detection means which moves up and down said detection means being urged in a downward direction so as to contact an uppermost lead frame of a stack of lead frames in a lead frame magazine;

a detection sensor which detects movement of said detection means and generates an output signal when said detection means contacts said uppermost lead frame;

a chuck means installed above said lead frame magazine so as to chuck the uppermost lead frame; and

a raising and lowering means for raising lead frames stacked in a lead frame magazine and for stopping the raising of said lead frames stacked in said lead frame magazine and then raising the lead frames in an amount required to chuck the uppermost lead frame by the chuck means, when the output signal from the detection sensor is generated; and wherein

said detection means comprises:

a supporting plate provided above said magazine;

a detection member provided adjacent said chuck means;

at least one guide rod for slidably coupling said detection member to said supporting plate; and

a spring means provided on said guide rod for urging said detection member downwardly towards said uppermost lead frame.

5,143,511

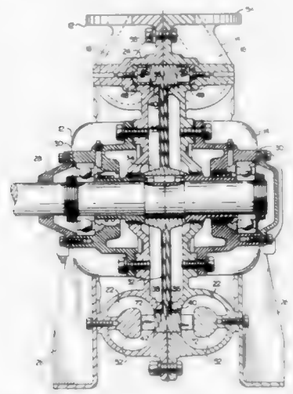
REGENERATIVE CENTRIFUGAL COMPRESSOR

Alain Verneau, Elancourt, France, and Barry Dittler, Fayetteville, N.Y., assignors to Lamson Corporation, Syracuse, N.Y.

Filed Sep. 28, 1990, Ser. No. 589,795

Int. Cl.[5] **F04D** *29/16*

U.S. Cl. 415—55.4 **20 Claims**



1. Regenerative centrifugal compressor comprising:

a rotor having an axis, a rim, and a row of impeller blades that extend axially from one side of the rim, said blades having a radially inward intake edge and a radially outward discharge edge; a housing for said rotor and having a gas inlet and a compressed gas outlet angularly spaced apart, a generally annular compression chamber formed in said housing having a radial extend to envelop said impeller blades and extending circumferentially from said gas inlet to said gas outlet in the rotation direction of said rotor, the housing including an annular core extending within said compression chamber adjacent said axial tips of said impeller blades to define a toroidal pathway for gas that is impelled by said blades, the core extending generally from said inlet to said outlet in the rotational direction of the rotor to guide gas impelled by said blades from the radially outer discharge edges to the radially inner intake edges of said impeller blades; a stripper seal extending from said outlet to said inlet in the rotation direction of the rotor, said stripper seal having an open passage of substantially the same cross section as a profile of said blades in the rotational direction to strip compressed gas in said compression chamber and block compressed gas from flowing from the outlet to the inlet; and an inlet baffle formed in said housing at said gas inlet for ducting intake gas around said impeller blades and said compression chamber at said inlet to enter the compression chamber only at a radially inward side thereof.

5,143,512

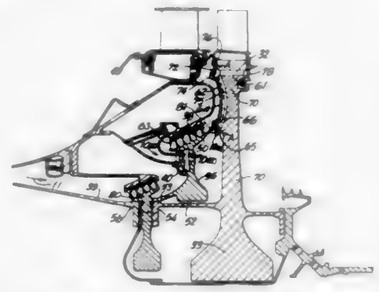
TURBINE ROTOR DISK WITH INTEGRAL BLADE COOLING AIR SLOTS AND PUMPING VANES

Robert J. Corsmeier, Cincinnati; Robert L. Sponseller, West Chester; James R. Reigel, and Harvey M. Maclin, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 28, 1991, Ser. No. 661,930

Int. Cl.[5] **F01D** *5/14*

U.S. Cl. 415—115 **13 Claims**



1. A rotor disk for a gas turbine engine, comprising:

a hub portion;

a web portion extending radially outwardly from said hub portion;

a rim portion disposed on a radially outer end portion of said web portion;

an enlarged material section defining a boss projecting axially from said web portion and extending radially inwardly from said rim portion to define an end wall projecting from an intermediate portion of said web portion;

an internal slot formed through said enlarged material section and extending radially from said rim portion to said end wall, said slot forming an entry port in said end wall for admitting cooling air into said slot for pumping said cooling air radially outwardly adjacent said web portion and into said rim portion; and

a sealing surface formed on said boss adjacent said end wall.

8. A forward seal and rotor disk assembly, comprising:

a rotor disk comprising a hub portion, a web portion, a rim portion, and a material section extending axially forwardly from said web portion and having a plurality of slots formed there-through;

a forward seal comprising a hub portion, a first labyrinth seal, and an air shield arm projecting from said first labyrinth seal and sealingly engaging said material section of said rotor disk; and

a second labyrinth seal for sealing compressor discharge leakage air, said second labyrinth seal comprising a support arm for supporting said forward seal.

5,143,513

DISHWASHER PUMP

David I. Ellingson, Newton; Herbert E. Scott, Kellogg, and James E. Sparks, Newton, all of Iowa, assignors to Maytag Corporation, Newton, Iowa

Filed Nov. 14, 1990, Ser. No. 612,800

Int. Cl.[5] **F01D** *5/12*

U.S. Cl. 415—119 **3 Claims**

1. A dishwasher pump comprising:

a drive motor;

a pump housing;

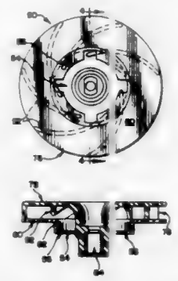
a first pumping chamber located within said housing having fluid ingress and egress openings;

a second pumping chamber located within said housing having fluid ingress and egress openings, said second chamber axially spaced from said first pumping chamber;

a first impeller rotated by said motor for moving fluid be-

tween said first pumping chamber's ingress and egress openings, said first impeller including a cover having an opening defining a fluid inlet portion;

a second impeller rotated by said motor for moving fluid between said second pumping chamber's ingress and egress openings; and



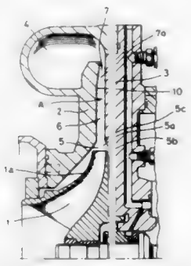
throttling means fixed to said cover adjacent said fluid inlet portion of said first impeller and rotatable therewith, said throttling means including flange means extending transversely relative to the axis of rotation for reducing the impeller fluid inlet area to lower pump noise by interrupting air pockets entrained in fluid entering the fluid inlet portion of said first impeller.

5,143,514

DIFFUSER OF CENTRIFUGAL COMPRESSOR

Yasunori Adachi, Itami, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Filed Jun. 13, 1990, Ser. No. 537,920
Claims priority, application Japan, Jun. 13, 1989, 1-151365
Int. Cl.[5] F01B 25/02; F01D 9/00
U.S. Cl. 415—150 7 Claims



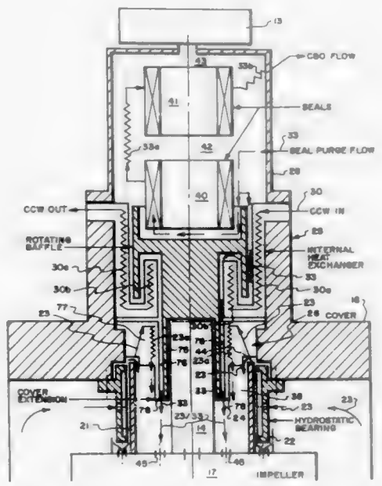
1. A diffuser of a centrifugal compressor comprising a passage defined by a pair of opposed rigid outer lateral walls disposed downstream of a fluid outlet of an impeller for guiding a fluid flowing from said impeller to a scroll, said passage including an inlet passage portion, an outlet throttling passage portion disposed at a fluid outlet portion of the diffuser, and an intermediate passage portion having a constant passage width equal to a minimum width of the inlet passage portion, wherein a passage width of said outlet throttling passage portion is gradually narrowed downstream from a starting point located at a position in the passage at which dynamic pressure of said fluid is almost perfectly changed to a static pressure, a minimum passage width of the outlet throttling passage portion is ½ or more and ¾ or less than the passage width of the intermediate passage portion, and wherein the starting point from which the outlet throttling portion is throttled is positioned between 70% and 90% of a length of the passage of said diffuser, as measured from an inlet throttling portion of the diffuser.

5,143,515

PUMP WITH SEAL PURGE HEATER

Clark S. Boster, Whittier; Sankaraiyer Gopalakrishnan, Brea; Carl F. Reimers, Fullerton, and Gordhan K. Vaghasia, Cerritos, all of Calif., assignors to BW/IP International, Inc., Long Beach, Calif.

Filed Aug. 9, 1990, Ser. No. 564,607
Int. Cl.[5] F01D 5/08
U.S. Cl. 415—179 11 Claims



1. A pump having an impeller for pumping high temperature product water connected to a motor by a shaft with sealing means around said shaft with said sealing means being subjected to cooler seal purge water to cool and prevent contamination of said sealing means and a first heat exchanger subjected to said seal purge water and component cooling water located between said impeller and said sealing means to protect the sealing means from said high temperature product water and wherein said cooler seal purge water is directed from said first heat exchanger toward said impeller to cool said shaft and to be mixed with said high temperature product water, the improvement comprising:

means for heating said seal purge water before it mixes with said product water including,

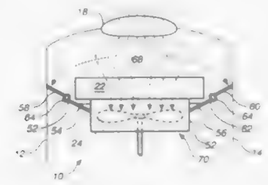
a second heat exchanger means extending along said shaft for separating said seal purge water from said product water as said seal purge water flows along said shaft, said second heat exchanger means being thermally conductive and having an inner wall defining a first passage for the flow of said seal purge water and an outer wall defining a second passage for the flow of product water, both said passages having outlets near said impeller in a mixing region containing product water at low pressure, means for centrifugally generating a source of product water at a higher pressure than the pressure in said mixing region and in an area located radially outward of said shaft and said second heat exchanger, inlet means located radially outwardly of said shaft and said second heat exchanger opening said second passage to the high pressure product water in said area thereby forming a pressure gradient between the high pressure product water in said area and the lower pressure product water in said mixing region causing the flow of product water along said outer wall to heat said purge water in said first passage by thermal conductivity.

5,143,516

RECIRCULATION SHIELD AND FAN SHROUD ASSEMBLY

Steven Christensen, Livermore, Calif., assignor to Paccar Inc., Bellevue, Wash.

Continuation of Ser. No. 306,982, Feb. 6, 1989, abandoned. This application Jun. 18, 1991, Ser. No. 716,770
Int. Cl.[5] F01P 5/06
U.S. Cl. 415—182.1 2 Claims



1. In an apparatus for directing the flow of air relative to a radiator and a fan of an internal combustion engine mounted in an engine compartment defined by opposed engine tunnel walls, said apparatus including a fan shroud mounted around said fan to enhance and direct the flow of air through said radiator, and a recirculation seal extending radially in said engine compartment from said radiator to said engine tunnel walls and preventing recirculation of air from said fan to a position in front of said radiator, the improvement in said apparatus comprising:

at least one rubber recirculation shield bracket molded integrally with said fan shroud and extending radially therefrom toward said engine tunnel walls;

at lease one recirculation seal being mounted to said shield bracket and radially outwardly cantilevered from said bracket to form, an airtight fan shroud assembly between said fan shroud and walls.

5,143,517

TURBOFAN WITH DYNAMIC VIBRATION DAMPING

Gérard R. E. R. Vermont, Coubert, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.M.C.A.", Paris, France

Filed Aug. 8, 1991, Ser. No. 742,010
Claims priority, application France, Aug. 8, 1990, 90 10107
Int. Cl.[5] F01D 5/26
U.S. Cl. 416—190 9 Claims

1. A fan for a turboshaft engine comprising:

a disc having an axis of rotation and a periphery defining a plurality of teeth spaced evenly apart around said disc and a plurality of recesses of dovetail-shaped cross-section disposed between said teeth,

a plurality of blades secured to the periphery of said disc, each of said blades comprising

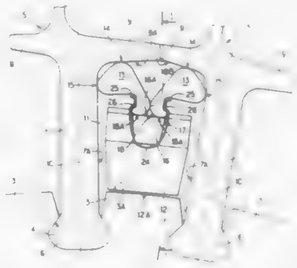
a root having a dovetail shape corresponding to that of said recesses, said root being received in a respective one of said recesses,

a stem extending radially outwards from said root,

a profiled portion defining the blade proper disposed radially outwards from said stem, and

two platforms extending transversely from said stem, one on each side thereof, at the junction between said stem and said profiled portion of the blade,

said disc and said blades defining a plurality of spaces, each of said spaces being delimited by the stem and one of said platforms of a first of said blades, the stem and one of said platforms of a second of said blades adjacent said first



blade, and the peripheral surface of said tooth disposed between the roots of said first and second blades,

a plurality of flyweights disposed one in each of said spaces, and

a plurality of rigid rockers disposed two in each of said spaces so that said two rockers are interposed between said flyweight in said space and the stems and platforms of said first and second blades delimiting said space such that, under the action of centrifugal force generated by rotation of said disc, said flyweight acts on said first and second blades through said rockers, said two rockers mutually engaging each other while a first of said rockers bears on the stem and the platform of said first blade at separate positions, the second of said two rockers bears on the stem and the platform of said second blade at separate positions, and said flyweight bears on both said first and said second rockers.

5,143,518

COSMETIC COMPOSITIONS FOR DYEING AND FOR BLEACHING HAIR

Annie Madrange, Saint Germain en Laye, and Patrick Canivet, Paris, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 301,879, Jan. 26, 1989, abandoned, which is a continuation of Ser. No. 37,015, Apr. 10, 1987, abandoned. This application Jun. 24, 1991, Ser. No. 719,366
Claims priority, application France, Apr. 10, 1986, 86 05149
Int. Cl.[5] A61K *7/13*

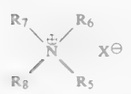
U.S. Cl. 8—405 27 Claims

1. A storage stable alkaline cosmetic composition for dyeing or bleaching hair, said composition being dilutable with an oxidizing solution and comprising in an aqueous medium

(a) at least one fatty acid soap present in an amount ranging from 1 to 25 weight percent based on the total weight of said composition, said fatty acid soap being selected from the group consisting of alkali metal salt of a C_{12}–C_{18} fatty acid containing a saturated or unsaturated fatty chain, an alkanolamine salt of a C_{12}–C_{18} fatty acid containing a saturated or unsaturated fatty chain and mixtures thereof,

(b) at least one cationic or amphoteric silicone polymer present in an amount ranging from 0.05 to 5 weight percent based on the total weight of said composition, said cationic or amphoteric silicone polymer being selected from the group consisting of (i) a polysiloxane in which at least one silicon atom in the chain carries an aliphatic amino group, and amine group of which is primary, secondary, tertiary or quaternary, (ii) a polysiloxane in which at least one silicon atom in the chain carries an aliphatic amino group, the amine group of which has the betaine structure and (iii) a mixture of (i) and (ii);

(c) at least one cationic surfactant present in an amount ranging from 0.05 to 5 weight percent based on the total weight of said composition, said cationic surfactant being a compound having the formula



(IV)

and being selected from the group consisting of

(1) a compound of formula IV wherein R_5 and R_6 represent methyl and R_7 and R_8 have the following meanings

(i) R_7 and R_8 represent a linear aliphatic radical containing from 12 to 22 carbon atoms, an aliphatic radical derived from tallow fatty acids and containing 14 to 22 carbon atoms, or

(ii) R_7 represents a linear aliphatic radical containing 14–22 carbon atoms and R_8 represents methyl or benzyl, or

(iii) R_7 represents an alkylamidopropyl radical wherein the alkyl moiety has 14–22 carbon atoms and R_8represents an alkylacetate group wherein the alkyl moiety has 12–16 carbon atoms, or

(iv) R_7 represents a gamma-gluconamidopropyl radical, an aliphatic radical derived from tallow fatty acids or a C_{16}–C_{18} alkyl radical, and R_8 represents hydroxyethyl, and

$X^{\ominus}$ represents an anion,

(2) a compound of formula IV wherein

R_5 represents alkylamidoethyl, alkenylamidoethyl or a mixture thereof, said alkyl moiety containing 14–22 carbon atoms and originating from tallow fatty acids and said alkenyl moiety containing 14–22 carbon atoms and originating from tallow fatty acids, and

R_6 and R_7 together with the nitrogen atom to which they are attached form a 2-alkyl-4,5-dihydroimidazole heterocycle ring wherein the alkyl moiety is derived from tallow fatty acids,

R_8 represents methyl and

$X^{\ominus}$ represents a methosulphate ion, and

(3) a compound of formula IV wherein R_5, R_6, and R_7 form with the nitrogen atom to which they are attached a six membered aromatic heterocyclic ring,

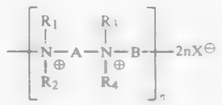
R_8 represents a C_{14}–C_{18} alkyl radical and

$X^{\ominus}$ represents a halide anion;

(d) at least one alkalizing agent present in an amount sufficient such that the pH of said composition is higher than 7, said alkalizing agent being selected from sodium hydroxide, potassium hydroxide, aqueous ammonia and an alkanolamine;

(e) at least one cationic polymer present in an amount ranging from 0.05 to 5 weight percent based on the total weight of said composition, said cationic polymer being selected from the group consisting of:

(1) a quaternary polyammonium polymer selected from the group consisting of (a) a polymer consisting of repeating units of the formula



(V)

wherein

(i) R_1, R_2, R_3 and R_4, each independently, represent an aliphatic, alicyclic or arylaliphatic radical containing 1–20 carbon atoms or a C_1–C_6 hydroxyaliphatic radical, or

(ii) R_1 and R_2 and R_3 and R_4, together or separately, form with the nitrogen atoms to which they are attached a heterocyclic ring or a heterocyclic ring containing a second heteroatom other than nitrogen, or

(iii) R_1, R_2, R_3 and R_4 represent a linear or branched C_2–C_6 alkyl group substituted by a nitrile group, an ester group, an acyl group, an amide group, a group of the formula

or a group of the formula

wherein R'_7 represents alkylene and D represents a quaternary ammonium group,

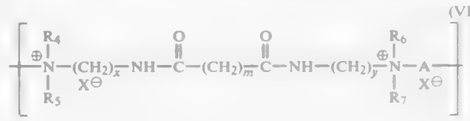
A and B represent a linear or branched, saturated or unsaturated polymethylene group containing 2 to 20 carbon atoms or a linear or branched saturated or unsaturated polymethylene group containing 2 to 20 carbon atoms and containing in the main chain one or more of an aromatic ring, an oxygen atom, a sulphur atom, a sulphoxide group, a sulphone group, a disulphide group, an amine group, an alkylamine group, a quaternary ammonium group, a hydroxyl group, a ureido group, an amide group or an ester group, or

A and R_1 and R_3 together with the two nitrogen atoms to which they are attached form a piperazine ring,

$X^{\ominus}$ is an anion derived from an inorganic or organic acid, and

n is such that the molecular weight of the polymer ranges from 1,000 to 100,000 and

(b) a polymer consisting of repeating units of the formula

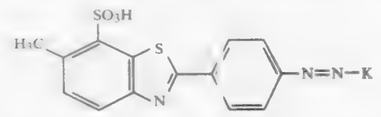


(VI)

wherein
R_4, R_5, R_6 and R_7, each independently represent hydrogen, methyl, ethyl, propyl, 2-hydroxyethyl, 2-hydroxypropyl, or $—CH_2—CH_2—(O—CH_2—CH_2)_p—OH$ wherein p is 0 or an integer ranging from 1 to 6, with the proviso that R_4, R_5, R_6 and R_7 do not simultaneously represent hydrogen,
x and y, each independently, represent integers ranging from 1 to 6,
m is 0 or an integer ranging from 1 to 34,
X is a halogen atom, and
A is a divalent group having the formula, $—CH_2—CH_2—O—CH_2—CH_2—$;
(2) a vinylpyrrolidone/dialkylaminoalkyl acrylate quaternized or not;
(3) a vinylpyrrolidone/dialkylaminoalkyl methacrylate quaternized or not;
(4) poly (methacrylamidopropyltrimethyl ammonium chloride);
(5) a cationic protein which is a chemically modified polypeptide bearing amine or quaternary ammonium groups at the end of the chain or grafted onto the chain;
(6) a polyaminoamide selected from the group consisting of
(i) a water soluble polyaminoamide obtained by condensation of an acidic compound with a polyamine,
(ii) a crosslinked water soluble polyaminoamide obtained by condensation of an acidic compound with a polyamine,
(iii) an alkylated water soluble polyaminoamide obtained by condensation of an acidic compound with a polyamine,
(iv) a polyaminoamide resulting from the condensation of a polyalkylenepolyamine with a polycarboxylic acid and alkylated with a difunctional agent, and
(v) a polyaminoamide obtained by reacting a polyalkylenepolyamine comprising two primary amine groups and at least one secondary amine group with a dicarboxylic acid, the molar ratio between the said polyalkylenepolyamine and the said dicarboxylic acid being between 0.8/1 and 1.4/1, the resulting polyaminoamide being reacted with epichlorohydrin, the molar ration of epichlorohydrin to the secondary amine groups of the polyaminoamide being between 0.5/1 and 1.8/1;
a crosslinked polyaminoamide
an alkylated polyaminoamide; and
mixtures thereof.

5,143,519
CONCENTRATED ACID DYE SOLUTIONS: STORAGE STABLE AQUEOUS DYE CONCENTRATE WITH DI-ETHYL-AMINO PROPYLAMINE
Willy Stingelin, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Mar. 29, 1991 Ser. No. 677,721
Claims priority, application Switzerland, Apr. 3, 1990, 1102/90
Int. Cl.[5] C09B *67/00, 29/03, 67/36*
U.S. Cl. 8—527 15 Claims

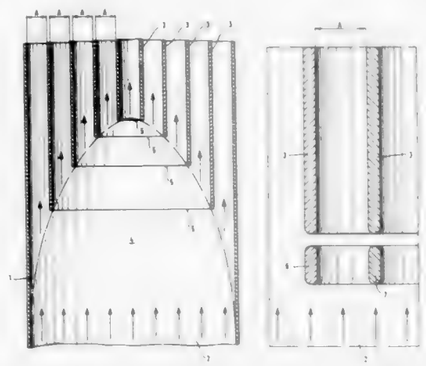
1. A concentrated aqueous dye solution, comprising
a) 7 to 30% by weight of a dye of the formula



(1)

in which K is a coupling component of the acetoacetanilide, pyridone, pyrazolone or pyridinidine series,
b) at least 0.1 but less than 1 mol of 3-diethylamino-1-propylamine, per mol of dye of the formula (1),
c) a quantity of a hydroxyalkylamine such that altogether 1.5 to 5 mol of the components b) and c) are present per mol of dye, and
d) if desired, other additives.

5,143,520
METHOD OF AND RADIANT COOLER FOR RADIANT COOLING OF PRODUCT MASS STREAM DISCHARGED FROM A GASIFICATION REACTOR
Hans-Günter Richard, Essen, and Gerhard Wilmer, Hattingen, both of Fed. Rep. of Germany, assignors to Krupp Koopers GmbH, Essen, Fed. Rep. of Germany
Filed Dec. 18, 1989, Ser. No. 452,234
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844347
Int. Cl.[5] C10J *3/20, 3/84, 3/52, 3/48*
U.S. Cl. 48—87 14 Claims

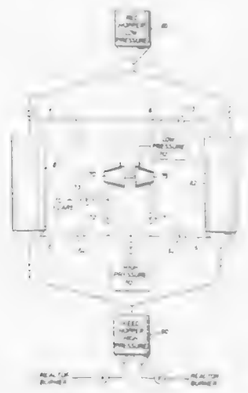


5. A radiant cooler for radiant cooling of a a product gas mass quantity from a gasification reactor, comprising a cylindrical radiant cooling casing having an axis; means forming a product gas inlet for supplying the product gas mass stream and an outlet for a radiant-cooled product gas; additional radiant cooling walls located in the region of said radiant cooling casing, said additional radiant cooling walls being formed as cylindrical radiant cooling walls and arranged in a flow direction of the product gas after the pre-cooling region concentrically relative to one another and at a distance from said radiant cooling casing to form cylindrical layer streams and cooled to a temperature excluding the caking of particles emitted from said gasification reaction product gas, said cylindrical radiant cooling walls being spaced from said radiant cooling casing and from one another by a distance which is 0.5–3 times the thickness of a layer having an emission degree of approximately 0.86.

5,143,521
METHOD FOR PRODUCING GAS USING ENERGY RECOVERING COAL FEEDING STEPS
Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Division of Ser. No. 588,892, Sep. 27, 1990, Pat. No. 5,017,196.
This application May 15, 1991, Ser. No. 700,276
Int. Cl.[5] C10J *3/46*
U.S. Cl. 48—210 5 Claims

1. A process for the production of synthesis gas wherein coal is partially oxidized at an elevated temperature and pressure by feeding finely divided coal and oxygen through a feed line to a gasification zone of a reactor, comprising the steps of:
providing a first and second pressure-isolatable chamber, said first chamber being at a lower pressure than said second chamber, each of said chambers having a solids inlet, a solids outlet and a pressure vent line, into which chambers a selected mass of particulate coal may be selectively received at essentially atmospheric pressure conditions from a low pressure storage point and selectively and alternatingly discharged therefrom at high pressure to a high pressure feed hopper wherein said first and second

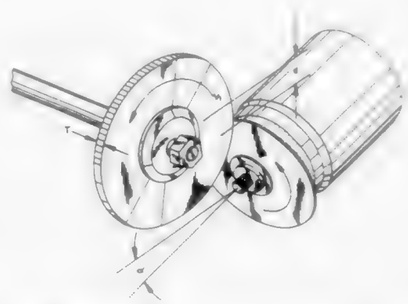
chambers are selectively placed in fluid communication with each other for pressure equalization therebetween, and wherein each of said vent lines is selectively and alternately placed in fluid communication with a common line between said first and second chambers and with a pressure recovery means located in said common line;
transferring a selected first mass of said particulate coal under atmospheric pressure conditions to said first pressure-isolatable chamber with its outlet closed;
selectively isolating said first chamber from said low pressure storage point by closing said chamber inlet after said



selected first mass of particulate coal has been transferred thereto;
partially pressurizing said first chamber by depressurizing said second chamber through said pressure recovery means and said common line to said first chamber;
generating additional pressure energy by said pressure recovery means and further pressurizing said first chamber therewith;
isolating said first chamber and pressurizing it to said high pressure; and
transferring said first coal mass to said feed hopper.

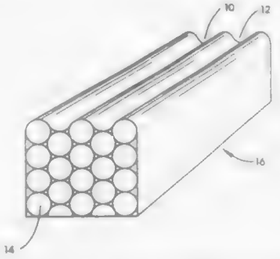
5,143,522
ABRASIVE PRODUCTS CONTAINING FUSED ALUMINA ZIRCONIA AND REDUCED TITANIA
Brian Gibson, Gatley, England, and Robert J. Seider, Ransomville, N.Y., assignors to Washington Mills Electro Minerals Corporation, Niagara Falls, N.Y.
Continuation-in-part of Ser. No. 917,235, Oct. 7, 1986, which is a continuation of Ser. No. 676,594, Nov. 30, 1984, which is a continuation of Ser. No. 477,065, Mar. 21, 1983, which is a continuation of Ser. No. 205,062, Nov. 7, 1980, abandoned. This application Nov. 29, 1988, Ser. No. 277,618
Claims priority, application United Kingdom, Nov. 9, 1979, 7938957
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—295 37 Claims

1. An abrasive grit comprising from about 20 to about 50% by weight of zirconia of which more than 25% by weight of the zirconia present is in tetragonal crystal form; from 1.5 to about 10%, expressed as titanium dioxide, of reduced titania; from 0.03 to about 0.5% total carbon; impurities, if any, in an amount on analysis expressed as the oxides of not more than



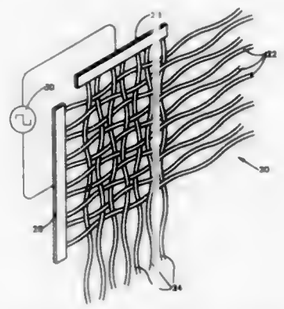
3% by weight, including less than 1% SiO_2; and a balance of alumina, said abrasive grain being a fused grit.

5,143,523
DUAL-COATED DIAMOND PELLETS AND SAW BLADE SEMGENTS MADE THEREWITH
Roger R. Matarrese, Upper Arlington, Ohio, assignor to General Electric Company, Worthington, Ohio
Filed Sep. 20, 1991, Ser. No. 762,999
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 15 Claims



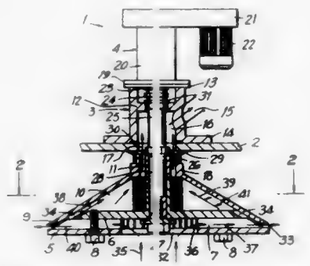
1. A method for making metal-clad diamond particle pellets which comprises the steps of:
(a) coating diamond particles with a carbide-forming metal;
(b) forming a bed of said coated abrasive particles of step (a) with fluidizing gas:
(c) spraying onto the bed of gas-fluidized coated abrasive particles of step (b) a slurry of metallic powder, a binding agent, and a volatile solvent, for a time until each coated abrasive particle of step (a) is outer coated with at least about 20 wt-% of said metallic powder to form metal powder-coated abrasive pellets, said metallic powder having a sintering temperature that is at least about 50° C. lower than the melting point temperature of said carbide-forming metal;
(d) recovering said metal powder-coated abrasive pellets of step (c) substantially devoid of said volatile solvent;
(e) heating said recovered coated abrasive pellets under conditions to form a sintered continuous outer metal coating on said abrasive pellet; and
(f) heating said pellets of step (e) at a second higher temperature to liquefy said carbide-forming metal for forming some metal carbide from said diamond particle.

5,143,524
ELECTROSTATIC PARTICLE FILTRATION
Ion I. Inculet, London, Canada; John R. Lackner, Westlake, and James C. Murphy, Broadview Hts., both of Ohio, assignors to The Scott Fetzer Company, Westlake, Ohio
Filed Feb. 20, 1990, Ser. No. 481,854
Int. Cl.[5] B03C *3/00*
U.S. Cl. 55—2 20 Claims



15. A method of filtering particulate matter from an air stream, said method comprising the steps of:
a) filtering said air stream through a multi-element conductive mesh including two sets of conductive electrically insulated filaments, said sets being woven together but electrically insulated one from the other;
b) applying an electrical potential difference between said filament sets, and
c) repeatedly reversing the polarity of said applied electrical potential difference.

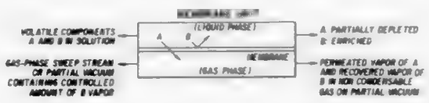
5,143,525
PROCESS AND APPARATUS FOR BREAKING UP FOAM INTO ITS LIQUID AND GASEOUS COMPONENTS
Konstantin Sotirianos, Stäfa, Switzerland, assignor to Chemap AG, Volketswil, Switzerland
Filed Jun. 24, 1991 Ser. No. 719,825
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020645
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—52 30 Claims



1. In a process of breaking up a foam into a liquid component and a gaseous component by action of centrifugal forces, comprising drawing the foam in one axial direction by suction and then accelerating the foam in another radial direction by action of the centrifugal forces, the improvement comprising feeding the gaseous component through at least one gas outlet prior to forcing the liquid component through a liquid discharge outlet.

5,143,526
PROCESS OF TREATING ALCOHOLIC BEVERAGES BY VAPOR-ARBITRATED PERVAPORATION
Eric K. Lee, Acton; Vinay J. Kalyani, Tewksbury, and Stephen L. Matson, Harvard, all of Mass., assignors to Sepracor, Inc., Marlborough, Mass.
Division of Ser. No. 463,098, Jan. 10, 1990, Pat. No. 5,013,447, which is a continuation-in-part of Ser. No. 382,615, Jul. 19, 1989, Pat. No. 5,013,436, which is a division of Ser. No. 296,255, Jan. 12, 1989, Pat. No. 4,933,198, which is a continuation-in-part of Ser. No. 897,489, Aug. 18, 1986, Pat. No. 4,816,407, which is a division of Ser. No. 786,787, Oct. 11, 1985, Pat. No. 4,778,688.
This application May 2, 1991, Ser. No. 695,040
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] B01D *61/36*
U.S. Cl. 55—158 1 Claim

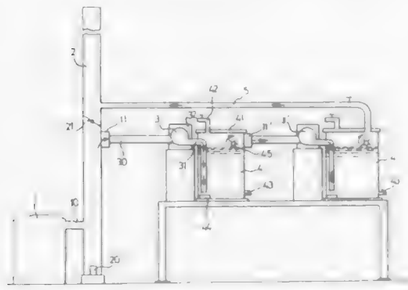
GENERAL IMPLEMENTATION OF VAPOR-ARBITRATED PERVAPORATION



1. An apparatus for manipulating the concentration of at least one preselected member of a plurality of volatile components present in a liquid comprising:
(a) a membrane having a feed side and a permeate side opposite said feed side, said membrane being permeable to at least one preselected member of a plurality of volatile components present in a given liquid;
(b) means for introducing said liquid against said feed side of said membrane;
(c) means for providing a gas-phase extraction fluid to said permeate side of said membrane, said extraction fluid comprising a vapor mixture capable of arbitrating the pervaporation of said volatile components such that a portion of said preselected member passes from said feed side of said membrane to said permeate side of said membrane and mixes with said extraction fluid,
while a substantial proportion of the remaining members of said plurality of volatile components is retained in said liquid on said feed side of said membrane; and
(d) means for regulating the composition, flow, temperature or pressure of said extraction fluid; and
(e) means for processing and recycling said extraction fluid, such that a second liquid on said feed side of said membrane is provided in which the concentration of said preselected member has been manipulated to the desired level.

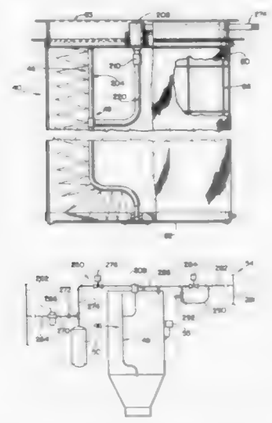
5,143,527
WASTE GAS-PURIFYING DEVICE
Guo Tian-Song, 80-3, Ryh Nan RDg330201, Dah-Jea Town, Tai-Jong Shian, Taiwan
Filed Apr. 24, 1991, Ser. No. 690,304
Int. Cl.[5] B01D *47/02, 47/12*
U.S. Cl. 55—222 7 Claims

1. A waste gas purifying device comprising:
a) a washing tank having a bottom and containing a washing liquid;
b) a vacuum pump having an inlet adapted to receive waste gas and an outlet;
c) a discharge pipe operatively associated with the outlet of the vacuum pump, the discharge pipe having an outlet end disposed in the washing tank adjacent to the bottom of the tank;
d) a bubble breaker disposed on the bottom of the washing tank opposite the outlet end of the discharge pipe;
e) cooling means operatively associated with the vacuum pump to dissipate heat from the vacuum pump comprising: a housing enveloping the vacuum pump; and a cooling medium circulating through the housing in contact with the vacuum pump; and



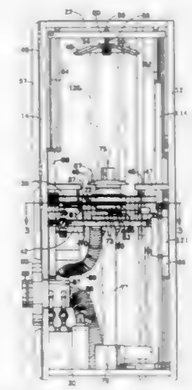
f) an exhaust fan operatively associated with the inlet of the vacuum pump to direct waste gases into the inlet.

5,143,528
LINT COLLECTOR
Anthony A. Dongelmans, Bryan, Ohio, assignor to Challenge Industries, Bryan, Ohio
Filed Feb. 14, 1990, Ser. No. 479,715
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—283 39 Claims



1. An apparatus for collecting lint from a gas, comprising a substantially gas impervious shell, a gas passageway through said shell, and a lint-collecting component having a longitudinal axis and including a lint-collecting surface substantially surrounding said longitudinal axis, said lint-collecting surface including a substantially cylindrical screen, said longitudinal axis being positioned in a relatively vertical direction, said shell including a shell cylindrical portion and said cylindrical screen being positioned in a coaxial arrangement with said shell cylindrical portion, said lint collecting surface including a substantially planar circular screen substantially completely covering an axial end of said cylindrical screen, said axial end being a bottom axial end of said cylindrical screen.

5,143,529
FILTER CLEANING APPARATUS
Orville D. Means, Jr., 25570 Highway 79, San Ysabel, Calif. 92070
Filed Dec. 13, 1990, Ser. No. 626,738
Int. Cl.[5] B01D *46/38*
U.S. Cl. 55—290 20 Claims

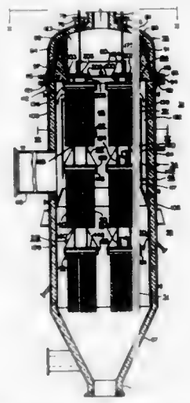


1. A filter cleaning apparatus for cleaning generally tubular filters, comprising:
a support frame;
mounting means mounted on said support frame for supporting a generally tubular filter having an axis for rotation about said axis;
air nozzle means mounted for vertical movement along a surface of a generally tubular filter supported in said mounting means for directing an air jet against said filter surface for dislodging debris therefrom; and
vacuum nozzle means mounted adjacent to and moveable with said air jet means for drawing in debris dislodged by said air nozzle.

5,143,530
FILTERING APPARATUS
Gaurang B. Haldipur, Monroeville, and William J. Dilmore, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 22, 1990, Ser. No. 600,953
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—341.1 17 Claims

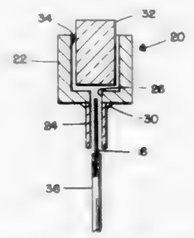
1. Filtering apparatus for separating particulate from a gas stream including a vessel, gas-stream inlet means connected to said vessel, outlet means connected to said vessel for discharging the gas processed by said filtering apparatus, a tube sheet connected to said vessel, separating said outlet means from said inlet means, at least one cluster for removing particulate from said gas, said cluster including a plurality of filter units, each said filter unit including an array of filter tubes and a filter clean-gas chamber, each tube having an open end and a closed end, means connecting each tube of a said filter unit at its open end to, and in communication with, said filter clean-gas chamber of said last-named filter unit, means, connected to said cluster and to said tube sheet, for mounting said cluster with said filter units extending from said tube sheet in succession longitudinally of said vessel with said filter tubes including said closed ends in gas-stream filtering communication with said inlet means, and a separate conductor associated with each said filter unit of each array separate from said mounting means, connected to the filter clean-gas chamber of said associated filter unit of each array and to said tube sheet with said filter

tubes in communication with said outlet means through said filter clean-gas chambers and through said tube sheet for con-



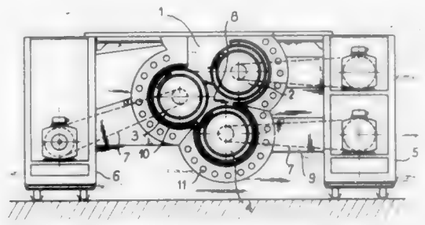
ducting gas processed by said each array to be discharged by said outlet means.

5,143,531
HERMETIC FIBER OPTIC-TO-METAL CONNECTION TECHNIQUE
Daniel P. Kramer, Centerville, Ohio, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C
Filed Apr. 10, 1991, Ser. No. 683,019
Int. Cl.[5] C03C 25/02
U.S. Cl. 65—3.11 4 Claims



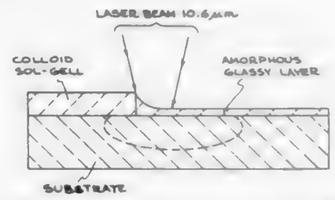
1. A method of hermetically sealing an optical fiber into a metal component, comprising the steps of:
(a) placing a quantity of molten glass into a cup-like cavity in the metal component;
(b) inserting an end of an optical fiber from a remote location into the molten glass through a minor opening at the bottom of the cup-like cavity;
(c) cooling the glass to solidify it and form a seal between the solidified glass, the optical fiber end, and the metal component.

5,143,532
METHOD OF FORMING MINERAL FIBERS
Alain Giboult, Rantigny; Jean-Yves Aube, and Daniel Sainte-Foi, both of Clermont, all of France, assignors to Isover Saint-Gobain, Courbevoie, France
Filed Jul. 2, 1991, Ser. No. 724,779
Claims priority, application France, Jul. 2, 1990, 90 08315
Int. Cl.[5] C03B 37/05
U.S. Cl. 65—6 11 Claims



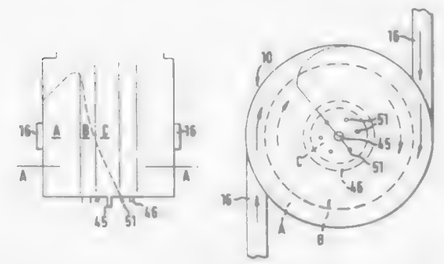
1. A method of forming mineral fibers, comprising the steps of:
pouring the material to be fibered in the molten state, and at a temperature greater than 900° C., onto the peripheral surface of the first of a series of centrifuging wheels which rotate at high speed, whereby the material is substantially accelerated and sent to at least a second wheel from which a part of the material is transformed into fibers under the effect of centrifugal force;
emitting a stream of gases in the immediate vicinity of the said wheels, in a direction substantially parallel with the axes of rotation of the wheels, wherein for at least one of the centrifuging wheels the emitted gas stream is at a temperature between 250° and 900° C.; and
entraining the fibers in the gas stream at a position surrounding the wheels.

5,143,533
METHOD OF PRODUCING AMORPHOUS THIN FILMS
Raymond M. Brusasco, Livermore, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.
Filed Aug. 22, 1991, Ser. No. 748,585
Int. Cl.[5] C03C 25/02
U.S. Cl. 65—18.1 13 Claims



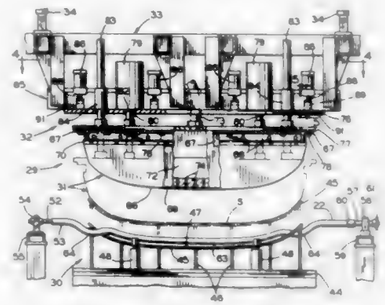
1. A method of producing a transparent thin film of amorphous material on a substrate by sintering which comprises:
a. coating a substrate with a thin film of an inorganic glass forming particulate material possessing the capability of being sintered; and
b. irradiating said thin film of said particulate material for a period of from about 1 to about 10 seconds with a laser beam at a beam translation speed of 0.3–10 mm/sec and of sufficient power to cause sintering of said inorganic glass forming particulate material below the temperature of liquidus thereof, and to convert said particulate material to an amorphous transparent thin film on said substrate.

5,143,534
HEAT PROCESSING OF PARTICULATE MATERIAL WITH A QUENCHING GAS WHICH SWIRLS AROUND THE PROCESSING ZONE
David N. Kilner, Horsham; Keith D. Humphrey, Hove; Lionel M. Little, East Grinstead; Duncan R. Carr, and Lewis G. Sharp, both of Horsham, all of England, assignors to Shell Research Limited, London, United Kingdom
Filed May 31, 1990, Ser. No. 531,248
Claims priority, application United Kingdom, Jun. 26, 1989, [illegible]
Int. Cl.[5] C03B 19/10
U.S. Cl. 65—21.3 10 Claims



6. A method of heat processing particles of glass comprising the steps of:
introducing a first current of a mixture of a combustible gas and a gas capable of oxidizing the combustible gas, into a substantially cylindrical chamber arranged with its axis substantially vertical, the mixture being introduced at a lower end of the chamber;
igniting the combustible gas to form a flame containing combustion gases in which the combustion gases have a speed of less than 10 m/s, said flame creating a heat processing zone within the chamber;
introducing a second current of a gas into the chamber adjacent the chamber side wall, said second current having a component of velocity generally tangential to the chamber side wall at its point of introduction, to provide a quenching zone, in which said second current swirls around the flame;
introducing particles of glass into the chamber at the lower end thereof; and
passing the particles of glass through the heat processing zone of the flame and into the quenching zone where they harden and from where they are collected, in which the mixture of the combustible gas is directed upwardly into the chamber in an axial direction from a burner located in the central region of the lower end of the chamber, and the particles of glass are entrained in a carrier gas and the particles of glass entrained in the carrier gas are directed from injection means spaced radially outwards from the burner such that the particles are directed at an angle to the axis of the chamber such that they pass through the heat processing zone, and in which further combustible gas is introduced into the chamber at the lower end thereof in an axial direction from a position spaced radially outwards from the position of introduction of the particles of glass.

5,143,535
METHOD OF AND APPARATUS FOR BENDING GLASS SHEETS
Richard A. Herrington, Walbridge, Ohio, and Jeffrey R. Flaugher, Carlton, Mich., assignors to Libbey-Owens-Ford Co., Toledo, Ohio
Filed Jul. 19, 1991, Ser. No. 732,780
Int. Cl.[5] C03B 23/023
U.S. Cl. 65—106 23 Claims



1. A method of bending a glass sheet to a desired curvature comprising,
heating said glass sheet to substantially the softening temperature thereof;
positioning said heated glass sheet in a generally horizontal plane between and in spaced relation to a pair of upper and lower press members having opposed complemental shaping surfaces corresponding to the desired curvature, said upper press member being carried on a support structure including a base plate secured to an upper platen frame, said upper platen frame being mounted for vertical movement toward and away from the generally horizontal plane and said upper press member being mounted for reciprocating movement relative to the base plate;
elevating said lower press member to engage and lift said heated glass sheet above the generally horizontal plane;
lowering said upper press member relative to said base plate into pressing engagement with said heated glass sheet to bend said heated glass sheet to the desired curvature between the complemental shaping surfaces;
raising said upper press member relative to said base plate; and
lowering said lower press member to return the bent glass sheet to the generally horizontal plane.

5,143,536
GEL ROOTING COMPOSITION AND METHOD
Walter H. Runkis, 457 Oak Manor, Fairfax, Calif. 94930
Filed Oct. 5, 1987, Ser. No. 104,788
Int. Cl.[5] A01N 25/04
U.S. Cl. 71—77 24 Claims

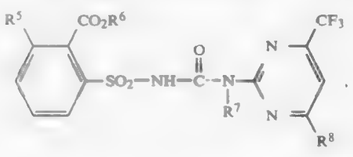
1. A rooting composition comprising a water swellable gel containing auxin in an amount effective to stimulate root growth, said gel comprising a high molecular weight organic acid, ketone or ester or combinations thereof.

5,143,537
CONTROL OF FLOWERING OF TROPICAL ORNAMENTALS
Benny O. Tjia, Homestead, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.
Continuation of Ser. No. 411,344, Sep. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 231,129, Aug. 11, 1988, abandoned. This application Mar. 14, 1991, Ser. No. 668,755
Int. Cl.[5] A01N *43/54*
U.S. Cl. 71—92 6 Claims

1. A process for inducing the flowering of Ixora at a time of the year when the prevailing high temperatures are from about 75° F. to about 90° F., comprising applying an effective amount of ancymidal about 75 to about 80 days before flowering is desired.

5,143,538
N-((6-TRIFLUOROMETHYLPYRIMIDIN-2-YL)-AMINOCARBONYL)-2-CARBOALKOXYBENZENESULFONAMIDES, AND THEIR USE
Karl-Otto Westphalen, 58 Mausbergweg, 6720 Speyer, Fed. Rep. of Germany
Division of Ser. No. 337,866, Apr. 14, 1989, Pat. No. 5,069,710. This application May 22, 1991, Ser. No. 704,235
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813623
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] C07D *239/69, 239/47;* A01N *43/54*
U.S. Cl. 71—92 12 Claims

1. An N-((6-Trifluoromethylpyrimidin-2-yl)-aminocarbonyl)-2-carboalkoxybenzenesulfonamide of the formula Ib



Ib

where the substituents have the following meanings:
R^5 is hydrogen, fluorine or chlorine,
R^6 is C_1–C_3-alkyl,
R^7 is hydrogen or methyl, and
R^8 is hydrogen or C_1–C_2-alkoxy.

5,143,539
METHOD AND COMPOSITION FOR PROTECTING PLANTS AGAINST INJURY FROM THE INTERACTION OF AN ORGANOPHOSPHATE INSECTICIDE-NEMATICIDE AND AN AHAS INHIBITING HERBICIDE
James B. Lovell, 99 Woosamonsa Rd., Pennington, N.J. 08534-3504
Filed Apr. 18, 1991, Ser. No. 690,188
Int. Cl.[5] A01N *43/54, 41/10, 57/10, 31/08*
U.S. Cl. 71—92 17 Claims

1. A method for the inhibition, prevention or amelioration of injury to a crop plant resulting from the interaction of an organophosphate systemic soil pesticide and an acetohydroxyacid synthase inhibiting herbicide applied to the crop plant or the locus in which it is planted or growing which comprises applying an antioxidant (1) to the soil in which the plant is planted or growing (2) to the seed or propagating organ of the crop plant (3) with the pesticide being applied to the soil in which the plant is planted or growing or (4) to the soil between the seed, propagating organ or root system of the crop plant.

5,143,540
DENSIFICATION OF CERAMIC-METAL COMPOSITES
Aleksander J. Pyzik; Irving G. Snyder, Jr., both of Midland; Robert R. McDonald, Traverse City, all of Mich., and Alexander Pecnenik, Los Angeles, Calif., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 143,560, Jan. 13, 1988, Pat. No. 4,961,778. This application Sep. 18, 1990, Ser. No. 584,548
Int. Cl.[5] C22C *29/12, 29/06, 29/14;* C04B *35/52*
U.S. Cl. 75—233 9 Claims

1. A densified ceramic and metal composition, consisting of:
a ceramic, in an amount of at least 50 percent by volume of said composition, wherein said ceramic is selected from the group consisting of SiB_4, AlB_2, $Al_{12}C_2$, Al_4BC, MgO, mullite, AlN, Si_3N_4 or mixtures thereof; and
a metal, wherein said metal is selected from the group consisting of Al, Mg, Ti, Fe, Ni, Co, Mn, Cu, Si, or their alloys, and said composition is substantially fully dense.

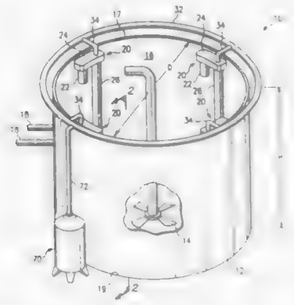
5,143,541
PROCESS FOR PRODUCING POWDERED METAL SPRAY COATING MATERIAL
Nobuhiro Sugitani, Tokyo, Japan, assignor to Sugitani Kinzoky Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 523,223, May 14, 1990, Pat. No. 5,039,477. This application May 31, 1991, Ser. No. 708,762
Claims priority, application Japan, Jun. 2, 1989, 1-139228; Sep. 5, 1989, 1-228343
Int. Cl.[5] C22C *33/04*
U.S. Cl. 75—338 2 Claims

1. A process for producing a powdered metal spray coating material consisting of two or more of Ni, Cr and Co, and 0.1 to 1.0% by weight of Y based on the total weight of the spray coating material, wherein if Co is present, the content of Co is in a range of 20 to 40% by weight, and the balance selected from the group consisting of Ni and Cr, and if Cr is present, the content of Cr is in a range of 15 to 30% by weight, and the balance is selected from the group consisting of Ni and Co; said process comprising the steps of melting and homogenizing starting metals consisting essentially of the above composition in a vacuum and forming them into a metal powder by a gas atomizer.

5,143,542
PROCESS FOR PRODUCING MAGNETIC METAL POWDER FOR MAGNETIC RECORDING
Kokichi Miyazawa, Suzuka; Masatsuyo Maruo, Moriyama, and Toshihiko Kawamura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan
Filed Dec. 20, 1990, Ser. No. 631,365
Claims priority, application Japan, Dec. 22, 1989, 1-334547
Int. Cl.[5] B22F *9/22*
U.S. Cl. 75—349 19 Claims

9. In a process for producing a magnetic metal powder by reducing a metal compound composed mainly of hydrous iron oxides or iron oxides, while heating, the improvement which comprises, prior to reducing, adding a boron compound to the metal compound, and then both (1) heat treating the compounds in a gas atmosphere having a water vapor partial pressure of 10 mmHg or higher at a temperature of 350°-750° C., and (2) heat treating the compounds in a non-reducing atmosphere at a temperature of 550°-900° C.

5,143,543
BIOLOGICAL CONVERSION METHOD
William W. Reid, Englewood, Colo., and Joseph L. Young, Reno, Nev., assignors to U.S. Gold Corporation, Denver, Colo. and Denay Creek Gold Mining Company, San Francisco, Calif.
Filed Aug. 23, 1991, Ser. No. 749,288
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] C22B *3/18*
U.S. Cl. 75—744 8 Claims



1. A method for mixing a component into a biological conversion medium, comprising the steps of:
pumping a portion of the medium from a biological conversion zone into an injection zone;
injecting said component into said portion of the medium in said injection zone to form a combined stream;
directing said combined stream to a static mixer;
forming a plurality of said combined streams and then recombining said plurality of streams to form a mixed stream;
returning said mixed stream to said biological conversion zone.

5,143,544
TIN LEAD PLATING SOLUTION
Richard Iantosca, West Palm Beach, Fla., assignor to Shipley Company Inc., Newton, Mass.
Continuation of Ser. No. 532,819, Jun. 4, 1990. This application Jul. 29, 1991, Ser. No. 737,186
Int. Cl.[5] C23C *18/54, 18/48, 18/16*
U.S. Cl. 106—1.22 8 Claims

1. An acid solution for plating a porous reflowable tin lead alloy having a melting point not exceeding 400° F., having a tin content ranging between 50 to 82 weight percent and a lead content ranging between 50 and 18 weight percent over a cupreous surface in a thickness of at least 100 microinches within a time not exceeding 15 minutes, said solution having the following composition:

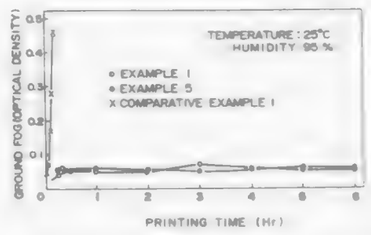
Sn^{++}	0.05 to 0.50 moles/liter
Pb^{++}	0.01 to 0.15 moles/liter
$Sn^{++} + Pb^{++}$	0.05 to 0.60 moles/liter
ratio Sn^{++}:Pb^{++}	1.0:3.0 to 50.0:1.0
complexing agent	0.05 to 2.50 moles/liter
lead plating rate promoter	up to 0.60 moles/liter
pH controller	to pH 0 to 1.5
thickness promoter	up to 1.00 mole/liter
water	to 1 liter.

water to 1 liter.

5,143,545
ANTIFOULING MARINE COATINGS
Arthur V. Stiffey, Slidell, La.; Kevin R. Hart, Poplarville, and Diane K. Arwood, Bay St. Louis, both of Miss., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 20, 1991, Ser. No. 668,841
Int. Cl.[5] C09D *5/16*
U.S. Cl. 106—15.05 8 Claims

1. An antifouling marine coating having dispersed therethrough an antifouling effective amount of antibiotic material which is toxic to gram negative, LPS-producing microorganisms of the genus Oceanospirillum, and which is selected from a group consisting of erythromycin, neomycin, streptomycin, and chloroamphenicol.

5,143,546
RECORDING MATERIAL
Toshiya Yuasa; Kohzoh Arahara, both of Kawasaki, and Takashi Kai, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 3, 1991, Ser. No. 637,208
Claims priority, application Japan, Jan. 8, 1990, 2-000406
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 9 Claims



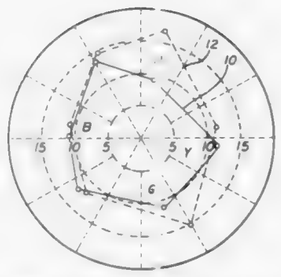
1. A recording material comprising at least a solvent and an electrolyte and showing a change in adhesiveness when placed between a pair of electrodes under voltage application to adhere substantially selectively to one of the electrodes, wherein said solvent comprises a reaction product between a ring-opening product of an alkylene oxide —R—O)$_n$ and glycerin or phenol, wherein R is an alkylene group having 2–10 carbon atoms and n is an integer; wherein the reaction product is contained in a proportion of 20–80 wt. parts per 100 wt. parts of the recording material; and wherein the electrolyte is contained in a proportion of 0.0001 mol per liter of the solvent to the saturation solubility.

5,143,547
SPECIFIC DYE SET FOR THERMAL INK-JET PRINTING ON PLAIN AND COATED PAPERS
William D. Kappele, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 26, 1991, Ser. No. 749,740
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 4 Claims

3. A set of inks containing yellow, magenta, and cyan dyes for thermal ink-jet printers having at least 300 dpi print capability, said yellow ink having the formula

Acid Yellow 23	about 0.5 to 5.0 wt %
diethylene glycol	about 5 to 15 wt %
bactericide	about 0.1 to 1.0 wt %
water	balance,

said magenta ink having the formula



Direct Red 227	about 0.5 to 5.0 wt %
diethylene glycol	about 5 to 15 wt %
bactericide	about 0.1 to 1.0 wt %
water	balance, and

said cyan ink having the formula

Acid Blue 9	about 0.5 to 5.0 wt %
diethylene glycol	about 5 to 15 wt %
bactericide	about 0.1 to 1.0 wt %
water	balance.

5,143,548

COATING COMPOSITION HAVING PLATELIKE IRON OXIDE PARTICLES

Ken Okura, Tokyo; Satoru Matsuzaki, Iwata; Tsutomu Katamoto, and Nanao Horiishi, both of Hiroshima, all of Japan, assignors to Toda Kogyo Corp., Hiroshima and Dainichiseika Color & Chemicals Mfg. Co. Ltd., Tokyo, both of, Japan

Continuation-in-part of Ser. No. 756,562, Sep. 11, 1991, Pat. No. 5,112,403, which is a continuation-in-part of Ser. No. 530,862, May 31, 1990, abandoned. This application Dec. 3, 1991, Ser. No. 801,519

Claims priority, application Japan, Jun. 5, 1989, 1-143811

Int. Cl.[5] C09C *1/22*

U.S. Cl. 106—459 **13 Claims**

1. A coating composition comprising plate-like iron oxide particles having an average particle diameter of 4 to 25 μm, a lamellar thickness of 0.16 to 5 μm and a plate ratio (average particle diameter:lamellar thickness) of 5:1 to 25:1; a coloring pigment; a film-forming polymer; and an organic solvent.

5,143,549

PREPARATION OF CATALYTICALLY ACTIVE FILLERS FOR POLYOLEFIN COMPOSITES

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 19, 1991, Ser. No. 732,567

Int. Cl.[5] C09C *3/08*

U.S. Cl. 106—499 **30 Claims**

1. A process for the in-situ preparation of a catalytically active olefin-polymerizing filler compound for polyoflefin composites comprising:

(a) drying a filler compound having a neutral-to-acidic surface by mixing said filler compound in a liquid alkane and water and distilling an azeotropic mixture comprising said alkane and water; and

(b) attaching an olefin-polymerizing transition metal compound to the dried filler compound from step (a) so as to make a catalytically active filler.

5,143,550

WASTE DISPOSAL

George A. Willacy, 35, Henblas, Flint Mountain, Clwyd CH6 5PW, United Kingdom

PCT No. PCT/GB89/01174, § 371 Date May 21, 1991, § 102(e) Date May 21, 1991, PCT Pub. No. WO90/03951, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 2, 1989, Ser. No. 689,796

Claims priority, application United Kingdom, Oct. 8, 1988, 8823670

Int. Cl.[5] C04B *7/00, 18/02;* B09B *3/00*

U.S. Cl. 106—697 **14 Claims**

1. In a method of disposal of hydrocarbon sludge, consisting essentially of mixing said sludge with spent silica-alumina catalyst, so as to form friable aggregates of the particulate fines, wherein the improvement comprises that the spent silica-alumina catalyst is in the form of particulate fines of a particle size not exceeding 50 microns and is present in a proportion by weight exceeding that of said sludge, so as to form friable aggregates of said particulate fines in which individual particles of said friable aggregates are bound together by said sludge.

5,143,551

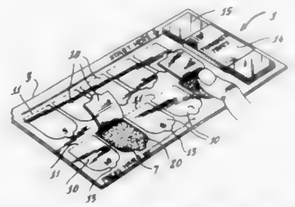
SINGLE USE INKING CARD FOR FINGERPRINTING

Stanley I. Mason, Jr., and David S. Draeger, both of Weston, Conn., assignors to Crisis Communication, Inc., Weston, Conn.

Filed Jan. 5, 1990, Ser. No. 461,295

Int. Cl.[5] A61B *5/117*

U.S. Cl. 118—31.5 **5 Claims**



1. A single use, reciosable fingerprinting inking kit usable to apply dry ink to fingers so that fingerprints can be placed elsewhere, said kit including

a front sheet and a back sheet secured together in overlapping relationship, said sheets being formed of flexible card,

said front sheet being cut to define at least one opening therein, with a hinged panel covering said opening, said opening being surrounded on all sides by other portions of said front sheet, said cut being of such strength that said panels will open when said sheets are flexed, means for securing said panel shut after it has once been opened,

an inking sheet having fingerprint powder on one side thereof, said powder having a thickness between about 0.4 and about 0.5 mil, and

said inking sheet being secured between said front sheet and said back sheet with the side bearing said powder facing said openings,

whereby said panel can be individually opened to expose said fingerprint powder, a finger can then be pressed against said powder to receive the proper amount of ink to make a full, but unsmudged print, and the kit can thereafter be interlocked closed to cover the remaining said powder.

5,143,552

COATING EQUIPMENT

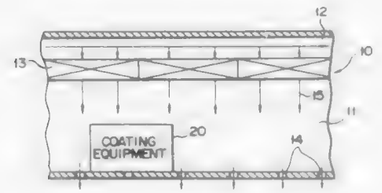
Masahi Moriyama, Tokorozawa, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Continuation of Ser. No. 320,619, Mar. 8, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 711,729

Claims priority, application Japan, Mar. 9, 1988, 63-55688

Int. Cl.[5] B05B *15/04, 15/02*

U.S. Cl. 118—666 **15 Claims**



1. Coating equipment comprising:

a coating apparatus including a plurality of processing units for performing a series of steps from application of a resist or a developing agent to the surface of an object to be coated to form a coating layer on the object, a transfer mechanism for transferring the object from a certain processing unit to another processing unit, and a passage for said transfer mechanism, the surface of the object being supported horizontal at least during the coating step of the resist or the developing agent;

vertical down flow-generating means for generating a vertical down flow of clean air, which is supplied from above the object to the entire surface region of the object at least during the coating step of the resist or the developing agent;

exhaust means for exhausting vertically downward the air supplied to the object; and

control means for controlling the temperature and humidity of the air which is to be supplied to the object.

5,143,553

CONTROL APPARATUS OF IGNITION CURRENT CONDUCTING TIME

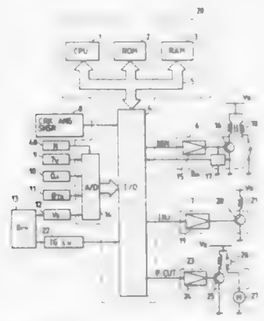
Takashi Mukaihira, Katsuta; Noboru Sugiura, Mito, and Ryoichi Kobayashi, Toukai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,620

Claims priority, application Japan, Mar. 15, 1990, 2-62676

Int. Cl.[5] F02P *3/06*

U.S. Cl. 123—609 **17 Claims**



1. A control apparatus for controlling the dwell time in an ignition circuit of an internal combustion engine by controlling a semiconductor device through which current is supplied to an ignition coil of said ignition circuit, comprising:

a water temperature sensor for detecting the water temperature of cooling water of said engine;

control means for controlling said semiconductor device to conduct for a dwell time during which current is supplied to said ignition coil;

time setting means for selecting a predetermined time interval which is inversely proportional to detected water temperature;

discrimination means for detecting that said engine is in a predetermined state when a time period, during which a reference signal from a crank angle sensor is not outputted, is larger than said selected predetermined time interval; and

means responsive to said discrimination means detecting said predetermined state for controlling said control means to shorten said dwell time by a predetermined amount.

5,143,554

PROCESS FOR WASHING POWDERY AND/OR GRANULAR RESINS AND A WASHING DEVICE THEREFOR

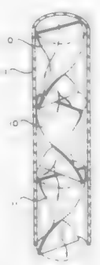
Yoshinari Koyama, and Daigo Shirota, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 571,477

Claims priority, application Japan, Aug. 28, 1989, 1-221151

Int. Cl.[5] B08B *9/00*

U.S. Cl. 134—25.5 **12 Claims**



1. A process for washing a powdery and/or granular resin comprising; contacting said resin with a washing liquid in a countercurrent fashion in a tubular body with a plurality of static mixing elements comprising first, continuous clockwise spiral, static mixing element means, and second, continuous counterclockwise spiral, static mixing element means, wherein both of said mixing elements are disposed in series in alternating relationship, wherein each of said spiral elements comprises flute means disposed at an angle of about 30 to 180°, and wherein the ends of said flute means of each of said mixing elements intersect with the end of the flute means of the next series mixing element at an angle of about 30° to 90°.

5,143,555

TRAVELLING DOCTOR BLADE

C. Lamar Brady, Selma, Ala., assignor to International Paper Company, Purchase, N.Y.

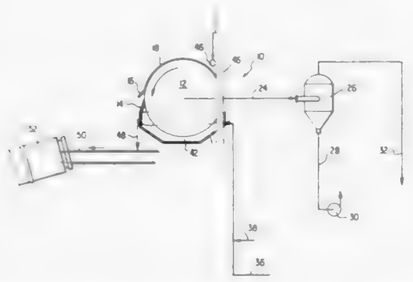
Continuation of Ser. No. 482,610, Feb. 21, 1990, abandoned. This application Jul. 1, 1991, Ser. No. 726,713

Int. Cl.[5] B01D *24/44, 24/46, 29/62, 33/06*

U.S. Cl. 134—42 **8 Claims**

1. An apparatus for removing a mud layer fromt e porous surface of a rotating vacuum drum, the apparatus including means for applying a vacuum to the interior of a rotating porous drum, the lower portion of the drum adapted to rotate in a vat having therein a calcium carbonate containing a mud slurry, a first knife positioned along and contiguous to the

drum surface, the first knife being stationary and of a length substantially equal to the width of the drum, a second knife positioned along and contiguous to the drum surface, said second knife being of a length less than the width of the drum, means for reciprocating said second knife along the width of the drum means for reciprocating said second knife along the



width of the drum from one drum end to the other, said knives both adapted to scrape off a portion only of a mud layer from the drum surface, the second knife adapted to contact and scrape off a portion only of a mud layer on the drum prior to the first knife contacting and scraping off mud on the drum, both knives spaced from the drum surface, said second knife located nearer to the drum surface than the first knife.

5,143,556

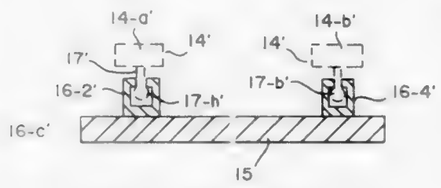
SUPPORT FOR PHOTOVOLTAIC ARRAYS

Ronald W. Matlin, 9 Whittier Rd., Lexington, Mass. 02173

Continuation-in-part of Ser. No. 322,628, Mar. 13, 1989, Pat. No. 4,966,631. This application Oct. 29, 1990, Ser. No. 604,924

Int. Cl.[5] H01L *31/042*

U.S. Cl. 136—244 **19 Claims**



1. A supported photovoltaic array comprising

a support structure; and

a set of photovoltaic modules mounted on said support structure, with each module separated from an adjoining module and clipped at its underside to said support structure by at least one attachment clip inwardly displaced from the edges of said module.

5,143,557

SURFACE COATING MADE FROM AN ALUMINUM-BASED ALLOY

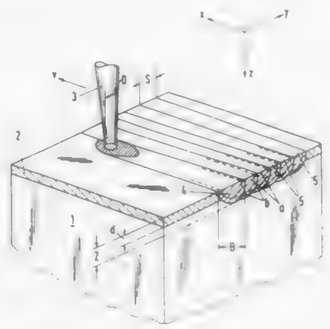
Michel Pierantoni; Eberhard Blank, both of Lausanne; Michel Carrard, Buchillon, and Jean-Daniel Wagniere, Lausanne, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 377,883, Jul. 10, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 611,321

Claims priority, application Switzerland, Jul. 19, 1988, 2760/88

Int. Cl.[5] C21D *10/00*

U.S. Cl. 428—654 **17 Claims**



1. In combination,

a metal substrate containing at least 50 weight % aluminum; and

an aluminum-based alloy surface coating on said substrate obtained by moving a high energy beam at a speed of advance sufficient to locally melt a metal coating on said substrate while allowing the molten mass to solidify at a speed of solidification of at least 30 millimeters per second, said surface coating containing at least 50 weight % aluminum, 1 to 25 weigth % silicon and at least one element from a group consisting of iron, nickel, cobalt, manganese and chronium, said coating having a maximum layer thickness of 0.5 millimeters with rapidly solidified hard regions of at least 50% of said coating, said hard regions having a micro-hardness (HV 0.05) with a minimum value in dependence on the concentration (C) in weight % of said at least one element equal to $134+(2.6C)+(0.44C^2)$.

5,143,558

METHOD OF HEAT TREATING METAL PARTS IN AN INTEGRATED CONTINUOUS AND BATCH FURNACE SYSTEM

John W. Smith, Brighton, Mich., assignor to Thermo Process Systems Inc., Livonia, Mich.

Filed Mar. 11, 1991, Ser. No. 667,464

Int. Cl.[5] C21D *9/00*

U.S. Cl. 148—225 **11 Claims**

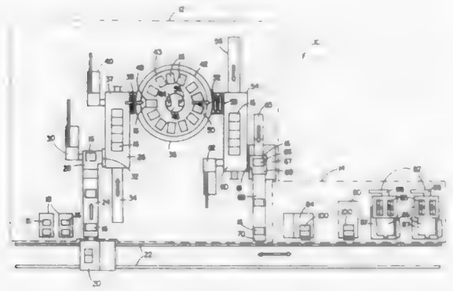
1. A method for heat treating trays of metal parts in a combination continuous and batch furnace system, comprising the steps of

loading parts of a particular type to be heat treated into at least one parts tray;

determining whether to heat treat said parts of said particular type with said continuous furnace system or said batch furnace system;

individually loading each said tray containing said parts into said continuous furnace system in response to a determination to heat treat said parts with said continuous furnace system; and

coupling a plurality of said trays containing said parts of said particular type and loading said coupled trays into said



batch furnace system in response to a determination to heat treat said parts with said batch furnace system.

5,143,559

BORONIZED SLIDING MATERIAL HAVING HIGH STRENGTH AND METHOD FOR PRODUCING THE SAME

Shogo Muramatsu, and Tomotada Yasuda, both of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Jan. 17, 1991, Ser. No. 642,581

Claims priority, application Japan, Jan. 18, 1990, 2-7101

Int. Cl.[5] C22C *29/14*

U.S. Cl. 148—279 **12 Claims**

1. A boronized sliding material, which consists essentially of, a steel substrate comprising a non-boronized sorbitic structure; and

a boronized layer on said sorbitic steel substrate.

5,143,560

METHOD FOR FORMING FE-B-R-T ALLOY POWDER BY HYDROGEN DECREPITATION OF DIE-UPSET BILLETS

Manfred Doser, Edmore, Mich., assignor to Hitachi Metals, Inc., Ltd., Purchase, N.Y.

Filed Apr. 20, 1990, Ser. No. 512,643

Int. Cl.[5] H01F *1/02*

U.S. Cl. 148—101 **30 Claims**

1. A method for treating an Fe-B-R-T permanent magnet alloy, in which R is at least one of yttrium, scandium, lanthanum, the rare earth elements in the lanthanoid series, or mixture thereof, and in which T is at least one transition element at least one element selected from the group consisting of gallium, silicon, aluminum, zinc, or mixtures thereof, said method comprising the sequential steps of:

subjecting the Fe-B-R-T alloy to a die upsetting operation to form a die-upset alloy;

heating said die-upset Fe-B-R-T alloy in a hydrogen-containing atmosphere at a pressure between 250 and 760 mm Hg at a first temperature and for a time sufficient to bring about substantially hydriding of said alloy, said first temperature being up to about 500° C; and

heating said hydrided Fe-B-R-T ally by linearly increasing the temperature of said alloy from said first temperature to a second temperature of about 400° to 650° C. in a vacuum of no more than 10^{-2} mm Hg or in an inert atmosphere having a partial pressure of hydrogen of no more than 10^{-2} mm Hg, for a time sufficient to bring about substantially complete dehydriding of said alloy;

said time, said first temperature and said second temperature and pressure of hydriding and dehydriding being selected together so as to yield a resulting alloy powder or readily friable Fe-B-R-T alloy material having good intrinsic magnet coercivity, while avoiding the growth of large crystals in said resulting alloy.

5,143,561

METHOD OF PRODUCING GRAIN ORIENTED SILICON STEEL SHEETS HAVING IMPROVED MAGNETIC PROPERTIES AND A CONTINUOUS INTERMEDIATE ANNEALING EQUIPMENT THEREFOR

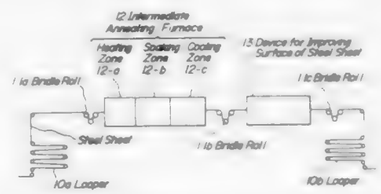
Kunio Kitamura, Chiba; Namio Suganuma, and Tadashi Naito, both of Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 368,323, Jun. 1, 1989, abandoned. This application Oct. 3, 1991, Ser. No. 770,712

Claims priority, application Japan, Jul. 21, 1987, 62-179994

Int. Cl.[5] B21B *45/06*

U.S. Cl. 148—111 **6 Claims**



5. In a method of producing grain oriented silicon steel sheets having improved magnetic properties containing C: 0.02~0.1% and Si: 2.5~4.0% and a small amount of an inhibitor(s), the steps comprising in the following order:

subjecting said steel sheet to a hot rolling treatment;

annealing said hot rolled steel sheet;

subjecting said steel sheet to a first cold rolling treatment;

intermediate annealing said steel sheet;

smoothening the surface of said steel sheet;

subjecting said steel sheet to a tandem cold rolling treatment;

decarburization annealing said steel sheet; and

finish annealing said steel sheet.

5,143,562

BROADLY APPLICABLE PHOSPHATE CONVERSION COATING COMPOSITION AND PROCESS

Mervet S. Boulos, Troy, Mich., assignor to Henkel Corporation, Ambler, Pa.

Filed Nov. 1, 1991, Ser. No. 786,694

Int. Cl.[5] C23C *22/34*

U.S. Cl. 148—247 **19 Claims**

1. A liquid aqueous composition of matter, comprising water and:

(A) a water soluble component providing in aqueous solution dissolved complex fluoride ions selected from the group consisting of fluoborate (BF_4^{-2}), fluohafnate (HfF_6^{-2}), fluosilicate (SiF_6^{-2}), fluotitanate (TiF_6^{-2}), fluozirconate (ZrF_6^{-2}), and mixtures thereof;

(B) a water soluble component providing in aqueous solution ions selected from the group consisting of fluoride (F^-), bifluoride (HF_2^-), and mixtures thereof;

(C) a water soluble iron chelating agent component selected from molecules each of which contains at least two moieties selected from the group consisting of —COOH, —OH, and mixtures thereof;

(D) a water soluble component source of dissolved hydroxylamine in aqueous solution;
(E) a water soluble source of dissolved phosphate ions; and
(F) a water soluble component providing in aqueous solution dissolved oxidizing agents selected from the group consisting of (i) p-nitrobenzene sulfonic acid, water soluble salts thereof, and mixtures thereof and (ii) water soluble salts of molybdic acids and mixtures thereof; and optionally,
(G) a component including one or more surfactants to promote cleaning of the metal surface to be treated; and, optionally,
(H) a hydrotrope component to increase the solubility of the constituents of component ((i); and, optionally,
(J) a component of antifoam agent or agents, wherein:
the ratio by weight of component (A) to component (B) is in the range from about 0.3:1.0 to about 1.6:1.0;
the ratio of g/L of component (B) to g-eq/L of component (C) is in the range from about 15:1 to about 300:1;
the ratio of g-eq/L of component (C) to g/L of component (D) is in the range from about 1:6 to about 1:320;
the ratio by weight of component (D) to component (E) is in the range from about 1:8 to about 1:80; and
the ratio of the concentration in g/L of component (E) to the concentration in M of component (F) is in the range from about 2000:1 to about 20,000:1 if component (F) is made up of water soluble salts of molybdic acids or mixtures thereof and is in the range from about 400:1 to 4000:1 if component (F) is made up of p-nitrobenzene sulfonic acid, water soluble salts thereof, or mixtures thereof.

5,143,564

LOW POROSITY, FINE GRAIN SIZED STRONTIUM-TREATED MAGNESIUM ALLOY CASTINGS

John E. Gruzleski, Pointe Claire, and Abdulcelil Aliravci, Ste. Foy, both of Canada, assignors to McGill University, Montreal, Canada

Filed Mar. 28, 1991, Ser. No. 676,819
Int. Cl.[5] C22C *23/00*; C22F *1/00*
U.S. Cl. 148—420 19 Claims

1. A method of producing a cast magnesium alloy part characterized by a low microporosity comprising:
adding strontium to a molten melt of a magnesium alloy in an amount effective to concentrate the microporosity of the alloy on casting,
casting said melt and shifting the concentrated microporosity to an appendix of the desired cast part, and
removing the appendix with said concentrated microporosity.

5,143,563

CREEP, STRESS RUPTURE AND HOLD-TIME FATIGUE CRACK RESISTANT ALLOYS

Daniel D. Krueger; Jeffrey F. Wessels, both of Cincinnati, Ohio, and Keh-Minn Chang, Schenectady, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 4, 1989, Ser. No. 417,098
Int. Cl.[5] C22C *19/05*; C22F *1/10*
U.S. Cl. 148—410 10 Claims

1. A stress rupture-resistant nickel base superalloy article having improved low cycle fatigue life at elevated temperatures, consisting essentially of, in weight percent, about 10.9% to about 12.9% cobalt, about 11.8% to about 13.8% chromium, about 4.6% to about 5.6% molybdenum, about 2.1% to about 3.1% aluminum, about 4.4% to about 5.4% titanium, about 1.1% to about 2.1% niobium, about 0.005% to about 0.025% boron, about 0.01% to about 0.06% carbon, up to about 0.06% zirconium, about 0.1% to about 0.3% hafnium, and the balance essentially nickel, the article characterized by a microstructure having an average grain size of from about 20 microns to about 40 microns, with coarse gamma prime having a size of about 0.3 to about 0.4 microns located at the grain boundaries, and fine intragranular gamma prime with a size of about 30 nanometers uniformly distributed throughout the grains, the article further characterized by a microstructure having carbides and borides located at the grain boundaries.

5,143,565

Patent Not Issued For This Number

5,143,566

COMPOSITE SOLID PROPELLANT WITH A METAL/INORGANIC FLUORIDE ADMIXTURE OR A STABLE BURNING RATE

Rüdiger Strecker, and Alois Harrer, both of Waldraiburg, Fed. Rep. of Germany, assignors to Bayern-Chemie GmbH, Aschau, Fed. Rep. of Germany

Filed May 10, 1979, Ser. No. 40,396
Claims priority, application Fed. Rep. of Germany, May 12, 1978, 2820783
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.9 8 Claims

1. A composite solid propellant with a stable burning rate comprising an oxidizer, a binder system of telomeric polybutadiene or copolymers of butadiene and acrylonitrile with terminal functional groups or functional groups distributed statistically along the chain, which are hardened by means of corresponding hardeners into rubber-elastic binders, finely pulverized, readily oxidizable metals and optionally plasticizers and burning rate moderators, wherein one or more of said metals is agglomerated with inorganic fluorides and said agglomerate is incorporated into the composite solid propellant, wherein said agglomerate consists of 80% to 96% by weight, of boron with a purity of 86% to 99%, and an average particle size of 0.5 μm to 5 μm, 1% to 15% by weight of fluorides selected from the group consisting of the alkali metal fluorides and cryolites of the alkali metals of the formula:

$$M_3AlF_6$$

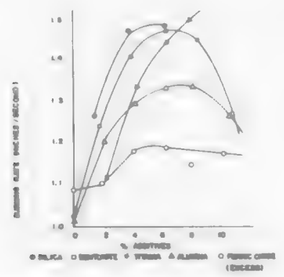
where M is an alkali metal, as well as an agglomeration auxiliary agent in amounts of 1% to 10% by weight, said agglomerate having a particle size of between 100 μm and 2,000 μm.

5,143,567

ADDITIVE APPROACH TO BALLISTIC AND SLAG MELTING POINT CONTROL OF AZIDE-BASED GAS GENERANT COMPOSITIONS

Robert D. Taylor, Hyrum, and Lewis R. Huntsman, Willard, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Aug. 23, 1991, Ser. No. 749,032
Int. Cl.[5] C06B *35/00*
U.S. Cl. 149—35 17 Claims



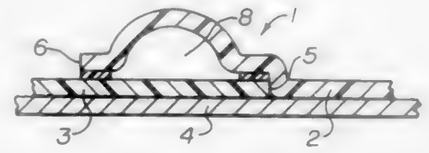
1. A composition for generating nitrogen gas consisting essentially of (all percents by weight):
A. between about 65 and 74 percent of azide fuel,
B. between about 17 and 25 percent iron oxide oxidizer,
C. between about 3.5 and 6.0 percent of a co-oxidizer selected from the group consisting of metal nitrites, nitrates and mixtures thereof,
D. between about 2.5 and 8.0 percent of a metal oxide additive selected from the group consisting of silica, alumina, titania and mixtures thereof,
E. up to about 6.0 percent bentonite, and
F. up to about 4.0 percent molybdenum disulfide,
said composition having a controllable burning rate between about 1.0 and 1.5 inches per second.

5,143,568

METHOD FOR LEAK DETECTION AND NON-DESTRUCTIVE QUALITY CONTROL TESTING FOR ROOFING SEAMS

James P. Sheahan, Midland, Mich., assignor to J.P. Sheahan & Associates, Midland, Mich.

Filed Oct. 25, 1989, Ser. No. 426,213
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—64 27 Claims



1. A method of non-destructive testing comprising:
(A) overlapping at least two pieces of roofing material in preparation for creating a seam wherein the roofing material is selected from a group consisting of (a) elastomeric roofing materials and, (b) thermoplastic roofing materials;
(B) bonding the overlapped roofing materials at approximately the leading edge of the bottommost roofing material;
(C) bonding the overlapped roofing materials at approximately the leading edge of the uppermost roofing material approximately parallel to the bond created in (B), thereby creating a seam;
(D) bonding the overlapped roofing materials at least at each of the terminal ends of the seam created, thereby forming an unbonded void area between the bond created in (B), the bond created in (C), the bonds created in (D), and the overlapped roofing materials;
(E) providing a gas injection means at any point along the seam length to be tested;
(F) injecting a gas into the unbonded void area to create a known pressure within the unbonded void area;
(G) determining the bond area and the bond strength for the bonded seams.

5,143,569

METHOD FOR MANUFACTURING A THREE DIMENSIONAL LAMINATE FROM DOUBLE PILE FABRICS

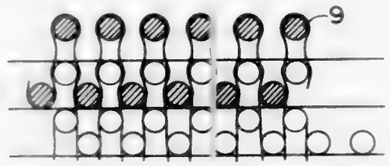
Hajime Gotoh, and Tadasi Yokoti, both of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 385,230, Jul. 26, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,505
Claims priority, application Japan, Jul. 29, 1988, 63-191564
Int. Cl.[5] B32B *5/08, 5/12, 7/04*; D03D *27/10*
U.S. Cl. 156—148 2 Claims

1. A method for manufacturing a three dimensional laminate form having a fastening effect, comprising the steps of:
preparing double-pile fabrics made of reinforced fibers having pile yarn running in a warp direction defining a warp pile;
said fabrics containing linear pieces each having a longitudinal axis around which the wrap pile is looped, said linear

pieces being located alternately below and above a plane of the fabric from out of which the pile extends, and capable of fixing a configuration of the pile, each loop of the warp pile enclosing a linear piece, spaces between the loops being unoccupied;

laminating said fabrics so that pile of each said fabrics is inserted in unoccupied spaces in a layer of the pile of an adjacent one of said double-pile fabrics thereby obtaining a three dimensional laminated form;



with a result that the loops of the pile of each fabric lie between the loops of the pile of the adjacent fabric;

wherein said linear pieces all on the same side of the plane of the fabric are spaced from each other in a direction parallel to the plane of the fabric defining a spacing perpendicular to the longitudinal axis of the linear pieces, said spacing having a distance smaller than the largest cross sectional dimension parallel to the plane of the fabric of said linear pieces to achieve a fastening structure between at least two of said fabric which have been laminated.

5,143,570

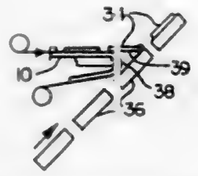
COMPOSITE FACESTOCKS AND LINERS

Melvin S. Freedman, Beachwood, Ohio, assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation of Ser. No. 322,720 Mar. 13, 1989, abandoned, which is a division of Ser. No. 88,402, Aug. 24, 1987, Pat. No. 4,888,075, which is a division of Ser. No. 853,772, Apr. 18, 1986, Pat. No. 4,713,273, which is a continuation-in-part of Ser. No. 699,204, Feb. 5, 1985, abandoned. This application Sep. 3, 1991, Ser. No. 758,385

Int. Cl.[5] B29C *47/06*

U.S. Cl. 156—230 30 Claims



1. A method of manufacturing liner for label, tape or sign stock comprising the steps of providing a plurality of at least two charges of filmforming resin including a core or base charge associated with the forming of a core or base and at least one skin charge associated with the forming of at least one skin, mixing a filler or fillers in at least said core or base charge, or also additionally in at least one skin charge, after preselecting said filler or fillers to include lumpy filler components, that is, filler components of sufficient relative size as compared to film thickness, and sufficient circularity to affect the roughness of a face of the resulting coextrudate, and extruding said charges to thereby form a filled coextrudate constituting a multilayer polymeric liner with a filler-roughened face and comprising cojoined layers including a core or base layer and at least one skin layer, subsequently transporting the coextrudate for further processing by passing the roughened face of the coextrudate in guided contact with steel drive rolls or idler rolls, with said rolls interacting with said roughened face in guiding relationship therewith.

5,143,571

METHOD OF MOLDING A GOLF CLUB HEAD

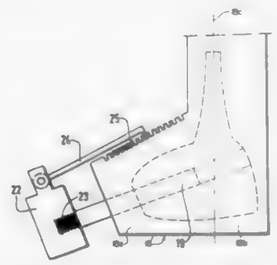
Rene Lacoste, Paris, France, and Catherine Lacoste de Prado, Madrid, Spain, assignors to Patentex S.A., Switzerland

Continuation-in-part of Ser. No. 290,235, Dec. 22, 1988, abandoned. This application Oct. 3, 1991, Ser. No. 770,546

Claims priority, application France, Dec. 24, 1987, 87 18147

Int. Cl.[5] B29C *45/36*

U.S. Cl. 156—245 18 Claims



1. A method of manufacturing a golf club head of predetermined shape and volume having a sole, a top face, a homogeneous front face for striking a golf ball and a rear face opposite said front face, said method creating cavities reducing the weight of said head to a predetermined extent without changing its shape and volume, said method comprising:

providing a mold having front and rear portions corresponding to front and rear faces of said head,

introducing at least two elements into the interior of said mold through apertures in said rear portion, each said element projecting into said mold a determined distance less than the distance between said rear and front faces,

introducing a hardenable material into said mold and around said projecting elements to achieve a predetermined head shape,

hardening said material to produce a molded head,

withdrawing said projecting elements from said material to leave at least two said cavities of predetermined length in said head, and

removing said molded head from the mold.

5,143,572

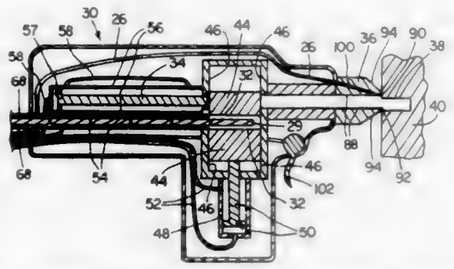
DOWEL SHOOTING APPARATUS

J. Mel Hatch, 4850 S. Hidden Cove Clr., Murray, Utah 84123

Filed Feb. 23, 1990, Ser. No. 483,673

Int. Cl.[5] B25C *1/00*; B29C *65/48*

U.S. Cl. 156—293 9 Claims



1. Apparatus for inserting dowels into preformed cavities in a workpiece, said apparatus comprising

a sliding block received in a slideway for reciprocating movement in said slideway;

means for feeding dowels in end-to-end fashion to a feed station near one end of said slideway;

a bore which extends between opposite sides of said block, with said bore being oriented substantially transverse of the sliding movement of said block in said slideway;

means for moving said block alternately back and forth between a loading position near one end of said slideway wherein said bore receives a dowel from said feed station and an ejection position near the opposite end of the slideway;

a push rod positioned at one side of said slideway near the opposite end of the slideway, said push rod being in alignment with said bore in said block when the block is in the dowel ejection position;

an elongate, flexible tube having first and second ends, with the first end mounted at an opposite side of said slideway from said push rod so as to be in alignment with said push rod and also in alignment with said bore in said block when the block is in the dowel ejection position;

means for moving said push rod back and forth between a retracted position adjacent to said bore and an extended position in which the push rod extends through said bore in said block when the block is in the dowel ejection position such that the dowel in the bore is pushed into said flexible tube;

a dowel shooting gun having a chamber for holding a dowel and a barrel through which the dowel passes as it is being inserted into a cavity;

means for interconnecting said second end of said flexible tube with said chamber;

a second sliding block received in a second slideway for reciprocating movement in said second slideway;

said chamber is formed from an opening which extends between opposite sides of said block, with said opening being oriented substantially transverse of the sliding movement of said second block in said second slideway;

means for sliding said second block alternately back and forth between a loading position in which said second end of said flexible tube is in alignment with said chamber such that a dowel can be received in said chamber from said flexible tube and an ejection position in which said chamber is aligned with said barrel;

a striker for engaging a dowel in said chamber when said chamber is in alignment with said barrel; and

means for moving the striker back and forth between a retracted position and an ejection position, with the dowel being pushed from the chamber through said barrel into said preformed cavity in the workpiece when the striker moves to the ejection position.

5,143,573

PROCESS AND DEVICE FOR APPLYING A FLEXIBLE LAYER TO ROLLERS FOR GRAPHIC MACHINES

Ernst Ammon, Seidenweg, and Robert Langach, Zollikofen, both of Switzerland, assignors to Wifag, Bern, Switzerland

Filed Jun. 26, 1990, Ser. No. 544,207

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3921037

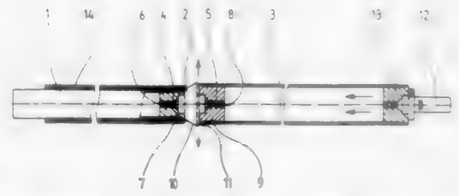
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.

Int. Cl.[5] B23P *11/02*

U.S. Cl. 156—294 9 Claims

1. A process for applying a flexible layer to transfer linking rollers for use in graphics machines, comprising the steps of:

providing a roller including a dimensionally stable carrying tube, said carrying tube having a first mounting end and a second mounting end for providing a compressed gas conduit; providing a compressed gas connection at said first mounting end and passing gas through said first mounting end and through said compressed gas conduit to said second mounting end; providing a tubular body of flexible material having a length, the support tube having an external diameter smaller than an internal diameter of the tubular body; providing a transition piece including a first connection end and a second connection end, said first connection end providing a transition piece conduit extending from said first connection end to a discharge zone; said transition piece also having a conical surface and a discharge side, said conical surface including a small diameter end, the small diameter end providing a diameter substantially equal to said external diameter of said support tube and including a large diameter end, said large diameter end providing a diameter large than an external diameter of said carrying tube, said discharge side providing a substantially angled surface extending from said large diameter end to a reduced diameter end, the reduced diameter end having a diameter substantially equal to a



diameter of said carrying tube, a region between said reduced diameter end and said large diameter end defining said discharge zone; pushing said tubular body over said support tube; connecting said support tube to said second end of said transition piece; connecting said first end of said transition piece to said second end of said carrying tube; supplying compressed air through said compressed gas conduit and said transition piece conduit to direct compressed air from said discharge zone outwardly of said transition piece and simultaneously rearwardly, in a direction of said carrying tube; and, pushing said flexible body from said support tube to said carrying tube over said transition piece and establishing an air cushion between said carrying tube, said transition piece and said tubular body.

5,143,574

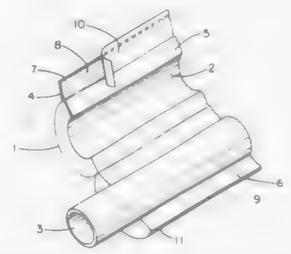
STORAGE STABLE ADHESIVE AND BONDING METHOD EMPLOYING THE SAME

Gerald H. Knittel, Brecksville, Ohio; Stanley D. Smith, Northfield, Ohio; Richard C. Spector, Akron, Ohio, and Jack M. McClintock, Pittsburgh, Pa. assignors to Morgan Adhesives Co., Stow, Ohio

Division of Ser. No. 249,119, Sep. 26, 1988, Pat. No. 4,996,088. This application Feb. 27, 1991, Ser. No. 661,834

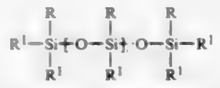
Int. Cl.[5] C09J *5/02*

U.S. Cl. 156—307.5 19 Claims



1. A method of obtaining improved peel adhesion with an acrylic adhesive composition comprising mixing a catalytic

amount of a catalyst with an acry ic adhesive containing about 1 to 10 percent by weight of a no i-reactive organic silicone of the formula



where R and R^1 are an alkyl, a cy:loalkyl or an aryl group and Pc has values of about 10 to abou t 1500 with the proviso that, R and R^1 may be the same or di ferent to form said composition, spreading said composition c n a first surface and a second surface, drying the adhesive, th n bringing said first surface and said second surface into ad hering position to effect an adhesion between said surfaces.

5,143,575

SPIRAL WOUND FILTER AND METHOD OF MAKING SAME

Horst Glässel, Schwabach; Reinhard Jaus, Nürnberg, and Egbert Hellwig, Feucht, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

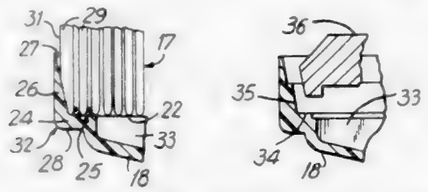
PCT No. PCT/DE89/00544, § 371 Date Mar. 8, 1991, § 102(e) Date Mar. 8, 1991, PCT Pub. No. WO90/05009, PCT Pub. Date May 17, 1990

PCT filed Aug. 22, 1989, Mar. 8, 1991, Ser. No. 671,893

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 3837423

Int. Cl.[5] B01D *27/08*

U.S. Cl. 156—309.9 **14 Claims**



14. Process for making a fuel filter comprising a housing having an inlet connector and an outlet connector for a fluid to be filtered, a middle tube located in the housing, a filter element arranged in the housing, the filter element consisting of a band-shaped filter material wound spirally around the middle tube to form a plurality of complete turns including an outermost complete turn and also end faces of the filter element on opposite ends thereof, and a thermoplastic bottom cover cap, which engages the filter element and which has a peripheral welding surface (**25**) which extends transversely relative to the longitudinal axis of the filter (**10**), at least the outermost complete turn (**29**) of one of said end faces of the filter element (**17**) being sealingly welded to the welding surface (**25**) of the cover cap (**18**; **52**; **62**), said process including the steps of applying a heating punch (**36**) to the cover cap (**18**; **52**; **62**), partially melting the welding surface (**25**) with the heating punch, after said partially melting pressing the filter element (**17**) into the welding surface (**25**) and allowing the melting surface (**25**) to solidify to form a sealing connection with the filter element.

5,143,576

AUTOMATIC WEEDING SYSTEM AND METHOD OF USE

David J. Logan, Bloomfield, Conn., assignor to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Aug. 10, 1990, Ser. No. 566,123

Int. Cl.[5] B31B *31/00*

U.S. Cl. 156—353 **19 Claims**

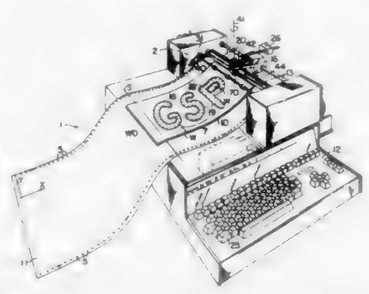
1. A system for automatically weeding about a graphic cut in a sheet of sign material having an upper surface and a lower surface releasably adhesively attached to an underlying base layer sheet, said system comprising:

a support;

a work surface provided on said support;

an overlay sheet having an upper surface and an opposite lower surface facing said sign material sheet;

sheet material feeding means cooperating with said work surface for feeding sheet material comprising a base layer sheet, said sign material sheet and an overlay sheet across said work surface in a direction parallel to its length, said sheet material including a bonding material interposed between said sign material sheet and said overlay sheet for selectively bonding portions of said cut sign material sheet with said overlay sheet and said bonding material having sufficient bonding strength to pull the cut graphic from the underlying base layer sheet;



tool means movable relative to said work surface for cooperating with said sheet material to cause bonding of said overlay sheet with portions of said sign material sheet in response to movements of said tool means over the sheet material with the bonding material interposed between said sign material sheet and said overlay sheet and;

control means connected with said sheet material feeding means and said tool means for coordinating movement between said tool means and said sheet material feeding means to cause the tool means to follow an offset path along the graphic cut in the sign material sheet resulting in the selective bonding of the overlay sheet with the sign material sheet along said portions corresponding to the path followed by said tool means over said cover sheet.

5,143,577

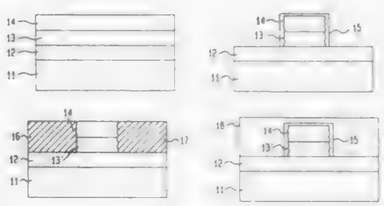
SMOOTH-WALL POLYMERIC CHANNEL AND RIB WAVEGUIDES EXHIBITING LOW OPTICAL LOSS

David Haas, Springfield; Hyun-Nam Yoon, New Providence, and Chia-Chi Teng, Piscataway, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Feb. 8, 1991, Ser. No. 653,332

Int. Cl.[5] B44C *1/22*; B29C *37/00*; C23F *1/00*

U.S. Cl. 156—625 **36 Claims**



1. A method for constructing an optical waveguide which comprises:

(a) forming a first thin film cladding of a polymer on a supporting substrate;

(b) etching a channel within and longitudinally across the first cladding thin film;

(c) applying an optically transparent polymer thin film smooth-wall lining to the inner surface dimension of the etched channel;

(d) filling the channel with a polymer optical waveguiding medium which has a higher refractive index than the first cladding thin film; and

(e) applying a second thin film cladding of a polymer which is in contact with the channel polymer waveguiding medium, and which has a lower refractive index than the polymer waveguiding medium;

wherein the polymer waveguiding medium exhibits second order nonlinear optical susceptibility.

5,143,578

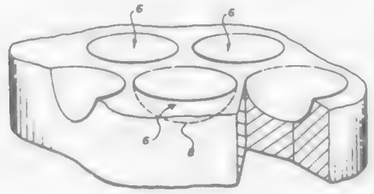
METHOD FOR ENGRAVING SOLID ARTICLES WITH LASER BEAMS

Pierre Luthi, Mornex, France, assignor to Union Carbide Coatings Service Technology Corporation, Danbury, Conn.

Filed Aug. 7, 1990, Ser. No. 563,611

Int. Cl.[5] B44C *1/00*

U.S. Cl. 156—643 **9 Claims**



1. A method for engraving a series of consecutive cells in at least a portion of a solid surface of a liquid transfer roll by impinging on the solid surface a pulsed laser beam in relative motion with said surface and wherein the pulses of the laser beam are formed in a series of consecutive groups with each group comprising two or more consecutive spaced-apart and non-concentric pulses and wherein each group impinging said solid surfaces forms an individual cell in said solid surface with each cell being a basin shaped cell having a substantially oval opening with a major diameter axis and a minor diameter axis intersecting at a center axis point of the cell; said cells are formed and aligned in the surface of the roll in substantially parallel rows perpendicular to the longitudinal axis of the roll, and a line drawn through the center axis point of a cell in a row and the central axis point of an adjacent cell in an adjacent row forms an angle of between 0° and 60° with a line drawn parallel to the longitudinal axis of the roll.

5,143,579

TREATMENT OF BLACK LIQUOR WITH A SCREW EXTRUDER EVAPORATOR

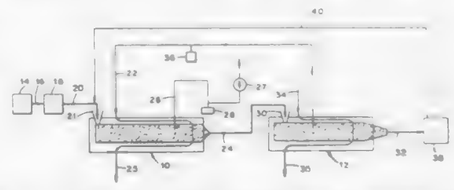
Jasper H. Field, Goshen, and Vladimir B. Lesokhin, Chester, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jul. 31, 1991, Ser. No. 738,334

Int. Cl.[5] D21C *11/10*

U.S. Cl. 162—30.1 **15 Claims**

1. A method for treating black liquor from a kraft or soda pulping process wherein the black liquor is to be used as a fuel for a soda recovery furnace, the method comprising forcibly conveying the black liquor through an elongate conduit having an internal diameter and having a reduced diameter die opening at one end relative to the internal diameter of the conduit and containing at least one vent at a position along its length while maintaining the temperature of the black liquor at least about 80° C. so that the black liquor is progressively compacted as it is conveyed through the conduit toward the die opening to cause the separation of liquid components from the black liquor into the vent by expression and vaporization and cause the black liquor to be extruded from the die opening at an increased solids concentration, and using the extruded black



liquor as a fuel for a soda recovery furnace, whereby the concentration of solid components in the black liquor is increased to provide an improved quality fuel for the soda recovery furnace.

5,143,580

PROCESS FOR REDUCING THE AMOUNT OF HALOGENATED ORGANIC COMPOUNDS IN SPENT LIQUOR FROM A PEROXIDE-HALOGEN BLEACHING SEQUENCE

Jiri J. Basta, Partille; Lillemor K. Holtinger, Nödinge; Marie R. Samuelsson, Stenungsund, and Per G Landgren, Väröbacka, all of Sweden, assignors to Eka Nobel AB, Bohus, Sweden

Filed Apr. 23, 1991, Ser. No. 689,502

Claims priority, application Sweden, Apr. 23, 1990, 9001449

Int. Cl.[5] D21C *9/14, 9/16*

U.S. Cl. 162—40 **9 Claims**

1. A process for reducing the amount of halogenated organic compounds in the spent liquor from delignification and bleaching of chemically digested lignocellulose-containing pulp, comprising the steps of

(a) treating the pulp with a complexing agent, thereby altering the trace metal profile of the pulp, said treating step being carried out at a pH in the range of from about 3.1 to about 9.0 and at a temperature of from about 10° C. to about 100° C.,

(b) washing the pulp from step (a) to remove the metals complex bound to the complexing agent);

(c) delignifying the pulp from step (b) with a peroxide-containing compound at a pH in the range of from about 7 to about 13;

(d) bleaching the pulp from step (c) with a halogen-containing compound, and

(e) recycling the spent bleach liquor from step (d) to one of the preceding steps (a) or (c), wherein the combination of pH, temperature and reaction time in step (a) or (c) brings about a considerable degradation of adsorbable organic halogens formed in step (d).

5,143,581

METHOD OF PEROXIDE BLEACHING OF PULP PRETREATED WITH A SEQUESTERING AGENT THEN WITH A SULPHITE AND REDUCING AGENT

Michel Devic, Sainte-Foy-Les-Lyon, France, assignor to Atochem, Puteaux, France

Filed Mar. 6, 1991, Ser. No. 665,531

Claims priority, application France, Mar. 7, 1990, 90 03128

Int. Cl.[5] D21C *9/10, 9/16*

U.S. Cl. 162—72 **10 Claims**

1. A process for the manufacture of high-yield pulps bleached with the aid of hydrogen peroxide in an alkaline medium, comprising subjecting with pulp to be bleached successively to:

(a) a pretreatment with the aid of a sequestering agent for metal ions, followed by a washing operation.

(b) a treatment with sulphite and a reducing agent which is more electronegative than the sulphite ion, which act together and in a medium of initial pH between about 7

and 12.5, followed by a washing operation to remove the sulphite ions and the reducing agent, and

(c) to a bleaching treatment with the aid of hydrogen peroxide in alkaline medium in the presence of a quantity of silicate of between about 0% to 1%.

5,143,582

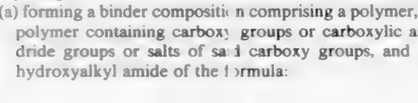
HEAT-RESISTANT NONWOVEN FABRICS

Charles T. Arkens, Hatfield, Pa. Charles E. Cluthe, Regency Park, Singapore, and Reginald T. Smart, Horsham, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 6, 1991, Ser. No. 696,417
Int. Cl.[5] D21H *11/00*
U.S. Cl. 162—135 12 Claims

1. A method for making a heat-resistant nonwoven fabric comprising:

(a) forming a binder composition comprising a polymer, said polymer containing carboxy groups or carboxylic anhydride groups or salts of said carboxy groups, and a β-hydroxyalkyl amide of the formula:



wherein A is a bond, hydrogen or a monovalent or polyvalent organic radical derived from a saturated or unsaturated alkyl radical wherein the alkyl radical contains from 1-60 carbon atoms; aryl; tri-lower alkyleneamino; or an unsaturated radical containing at least one ethylenic group [>C=C<]; R^1 is hydrogen lower alkyl having 1-5 carbon atoms, or hydroxyalkyl having from 1-5 carbon atoms, R^2 and R^3 are the same or different, being hydrogen, straight or branched chain lower alkyl having 1-5 carbon atoms or one of the R^2 and one of the R^3 radicals may be joined to form, together with the carbon atoms to which they are attached, cycloalkyl; n is an integer having a value of 1 or 2 and n' is an integer having a value of 0 to 2 or when n' is 0, a polymer or copolymer (i.e., n has a value greater than 1 preferably 2-10) formed from the β-hydroxyalkylamide when A is an unsaturated radical;

(b) contacting a nonwoven comprising heat-resistant fibers with said binder composition; and

(c) heating said binder composition at a temperature of from about 125° C. to about 400° C. until a cured polymer is obtained.

5,143,583

PREPARATION AND SYNTHESIS OF MAGNETIC FIBERS

Robert H. Marchessault, 611 Ave. du Boise, #9k, Montreal, Quebec H3S 2V8; Patrice Rioux, 6177, rue Albanie, Brossard, Québec J4Z 1G5, and Serge Picard, 3962, 32 ième Avenue, Shawinigan, Québec G9N 5Z8 all of Canada

Filed Apr. 2, 1991, Ser. No. 679,105
Int. Cl.[5] D21H *17/70*
U.S. Cl. 162—138 21 Claims

1. A method of producing magnetic papermaking fibers comprising:

providing a biopolymer papermaking fiber mass of fibers having ionic groups bearing cations which undergo ion exchange with ferrous ions,

contacting the fiber mass with an aqueous ferrous salt solution and allowing ion exchange to proceed between said cations and said ferrous ions,

precipitating said ferrous ions as ferrous hydroxide within said fibers,

oxidizing the ferrous hydroxide to form fine particles of magnetic iron oxide within said fibers, and drying the fiber mass.

5,143,584

PAPER AND FIBER-REINFORCED PACKAGING FILM AND SAUSAGE PRODUCTS PRODUCED THEREFROM, PROCESS FOR PRODUCING SAME

Klaus-Dieter Hammer, Mainz; Manfred Siebrecht, and Hermann Winter, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 4, 1990, Ser. No. 532,677
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005794
Int. Cl.[5] D21H *17/30*
U.S. Cl. 162—175 15 Claims

1. A process for producing a paper comprising the steps of:

(a) adding a water-soluble alginate to an aqueous suspension of cellulose fibers;

(b) forming the resultant mixture into a sheet or web;

(c) drying the sheet; and then

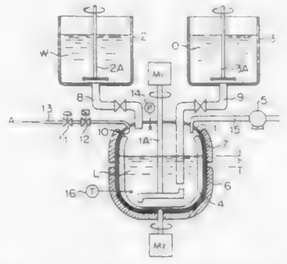
(d) converting the water-soluble alginate so as to form a substantially water-insoluble alginic acid or alginate.

5,143,585

METHOD OF REMOVING ORGANIC SOLVENTS

Kazuyoshi Ichikawa; Shinichi Suzuki; Sanae Oyama, and Hideaki Kimura, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,923
Claims priority, application Japan, Sep. 20, 1988, 63-235700; Sep. 28, 1988, 63-243582
Int. Cl.[5] B01D *3/10, 3/34, 3/42*
U.S. Cl. 203—2 15 Claims



1. A method of removing, during distillation, an organic solvent having a boiling point below that of water from a liquid having a changing vapor pressure and containing water and an organic solvent, which liquid is contained in a tank, said method comprising removing air from said tank, adjusting an air pressure in said tank fluctuating within the range of 2 to 20 mmHg above and below said vapor pressure within a short period of time so that bubble formation can be substantially prevented.

5,143,586

ELECTROCHEMICAL MACHINING PROCESS AND EQUIPMENT

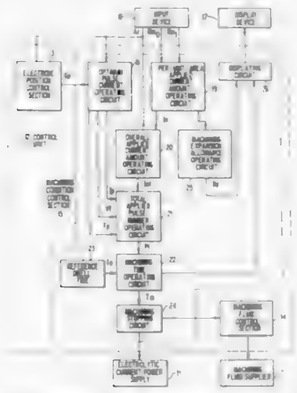
Yoshio Ozaki, and Shigeo Yamada, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,619
Claims priority, application Japan, Apr. 26, 1990, 2-108933; Apr. 26, 1990, 2-108934; Nov. 28, 1990, 2-328439
Int. Cl.[5] B23H *3/02, 3/10, 7/32*
U.S. Cl. 204—129.43 10 Claims

1. A method for electrochemical machining of a work piece using an electrochemical machining device including a tool electrode opposing the workpiece across a machining gap and means for supplying a pulse current to the machining gap via electrolyte provided in the machining gap, said method comprising the steps of:

determining a pulse current having a magnitude and pulse width selected so as to provide uniform electrochemical machining over a surface area of said workpiece;

dividing said pulse current into a plurality of partial pulse currents each having a partial pulse width;



calculating a plurality of rest periods based on said partial pulse widths; and

applying said partial pulse currents, each of said partial pulse periods separated by at least one of said rest periods.

5,143,587

METHOD FOR ETCHING AN ALUMINUM FOIL FOR AN ELECTROLYTIC CAPACITOR

Eiji Endoh, Yokohama, and Haruo Jinbo, Fujisawa, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo and Elna Company Ltd., Fujisawa, both of, Japan

Filed Jan. 24, 1992, Ser. No. 825,092
Int. Cl.[5] C25F *3/04*
U.S. Cl. 204—129.85 24 Claims

1. A method for etching an aluminum foil for an aluminum electrolytic capacitor, which comprises immersing the aluminum foil in an etching solution containing a polymer electrolyte having cation exchange groups dissociable in the etching solution, and applying an electric current thereto.

5,143,588

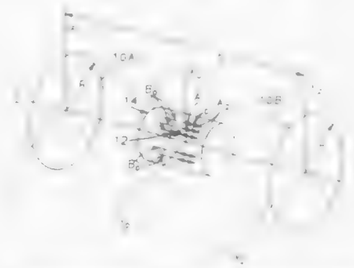
TECHNIQUES FOR ENHANCING THE PERMEABILITY OF IONS THROUGH MEMBRANES

Abraham R. Liboff, Birmingham, Mich.; Bruce R. McLeod, Bozeman, Mont., and Stephen D. Smith, Lexington, Ky., assignors to Life Resonances, Inc., Bozeman, Mont.

Continuation of Ser. No. 280,848, Dec. 7, 1988, which is a continuation of Ser. No. 923,760, Oct. 27, 1986, Pat. No. 4,818,697. This application Aug. 2, 1990, Ser. No. 561,844
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] C25B *5/00;* C12N *13/00*
U.S. Cl. 204—155 35 Claims

1. Apparatus for regulating the permeability of a predetermined ion having a predetermined charge-to-mass ratio through a membrane located in a space subjected to a local static magnetic field, the space defining at least one reference path passing through the membrane, the reference path extending in a first direction and also extending in a second direction opposite the first direction, said apparatus comprising:

field creating means responsive to signals for creating a magnetic field which, when combined with the local magnetic field, results in a resultant magnetic field having a flux density with at least one component representable by a component vector having a direction extending in the first direction along the path and having a magnitude that fluctuates at a predetermined rate to create a nonzero average value, wherein the ratio of the predetermined rate to the nonzero average value is a function of the charge-to-mass ratio of the predetermined ion; and



signal generating means for generating said signals, at least some of said signals being generated at the predetermined rate.

5,143,589

PERFLUOROPOLYETHERS CONTAINING A HALOGEN DIFFERENT FROM FLUORINE AND HAVING AN ACID END GROUP

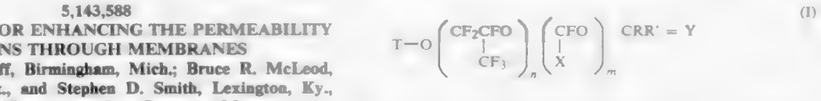
Giuseppe Marchionni, and Anna Staccione, both of Milan, Italy, assignors to Ausimont, S.r.L., Milan, Italy

Continuation of Ser. No. 346,458, May 2, 1989, abandoned. This application Jan. 29, 1991, Ser. No. 648,328
Claims priority, application Italy, May 2, 1988, 20406 A/88
Int. Cl.[5] C07C *41/01*
U.S. Cl. 204—157.92 3 Claims

1. A process for preparing the perfluoropolyethers consisting of randomly distributed sequences of perfluorooxyalkylene units selected from the group consisting of

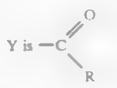
$-CF_2CFO-$ (with CF_3), $-CF_2CF_2O-$, CF_2O, and $-CFO-$ (with CF_3)

and having an acid end group, the other end group being a perfluoroalkyl group containing one or two atoms of a halogen other than fluorine, and comprising the following formulas:



(I)

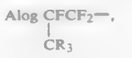
where: X is F or CF_3, R=F or Cl or Br or I, R', alike or different from R, is also F or Cl or Br or I,



wherein:

R is the same as described above or it is the corresponding carboxylic group —COOH or the salts and esters thereof,

T is a perfluoroalkyl group containing one or two atoms of Cl or Br or I, such as Alog CF_2—,



Alog $CF_2CF(CF_3)$—, wherein Alog is Cl or Br or I; or in

other words, a perfluoroalkyl group wherein one or two of the halogen atoms may be chlorine or bromine or iodine, the remaining halogen atoms being fluorine;
n ranges from 1 to 15;
with m/n being between 0.01 and 0.5, and

$$T'—O(CF_2CF_2O)_p(CF_2O)_z CRR'Y \quad (II)$$

where:
T' = Alog CF_2CF_2—, Alog CF_2—, Alog CF_2CF(Alog)—,
R, R' Alog, Y are the same as defined above for formula (I),
p ranges from 1 to 20, s/p from 0.5 to 2,

$$T''—O—(CF_2CF_2O)_o\left(\begin{array}{c}CF_2C=O\\|\\CF_3\end{array}\right)_q\left(\begin{array}{c}CFO\\|\\X\end{array}\right)_z CRR'—Y \quad (III)$$

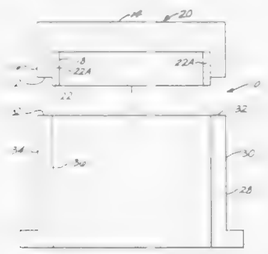
where:
Y, X, R, and R' are the same as defined above for formula (I), and
T'' is equal to T or T', o and g are integers, zero included, o+g=1–20, and z/o+g ranges from 0.01 to 0.05, comprising, photooxidizing C_3F_6 and/or C_2F_6 and/or C_2F_4 in the presence of a perhalogenated ethylene containing at least an atom of halogen different from fluorine, at a temperature from −20° to −100° C., with gaseous oxygen, with ultraviolet irradiation of the liquid reaction mixture, and subsequently eliminating the peroxide groups by heat-treatment at 180°–220° C., or by photochemical treatment with ultraviolet radiations.

5,143,590

METHOD OF MANUFACTURING SPUTTERING TARGET ASSEMBLY

Susan D. Strothers, Spokane; Robert G. Delano, Valleyford, and Garold L. Steed, Spokane, all of Wash., assignors to Johnson Matthey Inc., Valley Forge, Pa.

Filed Jul. 10, 1991, Ser. No. 728,249
Int. Cl.[5] C23C *14/34*; B23K *15/00*
U.S. Cl. 204—298.12 **9 Claims**



1. A method of manufacturing a sputtering target assembly having a target member and a backing member capable of producing an assembly wherein during manufacture distortion of the sputtering target assembly is not greater than about 0.003-inches in the lateral direction and not greater than about 0.005-inches in the transverse direction, comprising:
providing a target member having an upper lateral target surface, a lower end and a side wall with an inner surface and an outer surface;
providing a backing member for the target member, said backing member having a top surface and a side wall with inner and outer surfaces, the top surface of the backing member being adapted to engage the lower end of the target member;
providing a shoulder in the outer surface of the side wall of the target member that extends inwardly and downwardly from the outer surface at the lower end of the target member and terminates in a lip, one side of the lip being at the inner surface;
positioning the top surface of the backing member within said shoulder of the target member so that said top surface is in surface-to-surface contact with the target member and the inner surface is in surface-to-surface contact with the lip, said side wall of said backing member being sized with respect to said shoulder so that the outer surface of the side wall of the backing member is substantially coextensive with the outer surface of the side wall of target member;
firmly holding the target and backing members together and electron beam welding the surface-to-surface contact areas of said target and backing members; and
machining the inner surface of the side wall of the backing member and the lip of the target member to remove the lip and provide a coextensive inner surface along the inner surfaces of the backing member and target member.

5,143,591

METHOD OF PRODUCING ULTRA STABLE ALUMINUM OXIDE FOR HIGH VOLT ELECTROLYTIC CAPACITORS AND PRODUCT THEREOF

Jesse S. Shaffer, Columbia, S.C., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1991, Ser. No. 714,121
Int. Cl.[5] C25D *11/04*
U.S. Cl. 205—50 **10 Claims**

1. A method of manufacturing an an essentially pure aluminum electrolytic capacitor foil particularly adapted for use in high voltage AC motor start capacitors, said method comprising:
a) electrolytically etching aluminum foil of an aluminum content of at least 99.88% in a hot aqueous solution of 8–20% by weight of sodium chloride and then immersing the etched aluminum foil in a 4–10% solution of hot nitric acid,
b) removing the etched aluminum foil from said hot nitric acid solution and then immediately thereafter immersing said foil in a dilute aqueous solution of H_3PO_4 to thereby passivate said foil;
c) electrifying said passivated foil at a first voltage of at least 150 but not greater than 250 volts in a 0.05 to 1.0% solution by weight of an ammonium salt of a member selected from the group consisting of phosphates, silicates and vanadinates, until leakage current is substantially reduced;
d) further electrifying said foil at a second voltage of about twice said first voltage in a solution of 0.01 to 1.0% by weight of an ammonium salt of an aliphatic dicarboxylic acid of at least 9 carbons and 0.005 to 0.01% by weight of ammonium phosphate until an essentially amorphous oxide layer is formed on said foil.

5,143,592

PROCESS FOR PREPARING NONCONDUCTIVE SUBSTRATES

Salvador Toro, Forest Hills, N.Y., assignor to Olin Corporation, Cheshire, Conn.

Filed Jun. 1, 1990, Ser. No. 531,602
Int. Cl.[5] C25D *5/34*
U.S. Cl. 205—210 **24 Claims**

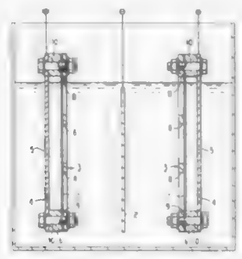
1. A process for treating a nonconductive substrate consisting essentially of the following steps:
(a) contacting said substrate with a strong acid solution selected from the group consisting of concentrated sulfuric acid and methane sulfonic acid;
(b) then contacting the substrate with an aqueous basic solution consisting essentially of an alkali metal hydroxide or an alkaline earth metal hydroxide as the base; and
(c) contacting the substrate with a reducing agent dissolved in a strong acid wherein said reducing agent is selected from the group consisting of an hydroxyl amine, dihydrazine sulfate, ethanolamine, and a glycol ether, and wherein said strong acid is selected from the group consisting of fluoroboric acid, hydrochloric acid, concentrated sulfuric acid, and methane sulfonic acid.

5,143,593

METHOD OF COPPER PLATING

Kenichi Ueno; Kazuhiro Hirao, and Genzo Yamane, all of Kanagawa, Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Jun. 18, 1991, Ser. No. 716,870
Claims priority, application Japan, Jun. 20, 1990, 2-162192
Int. Cl.[5] C25D *3/38, 5/54, 21/14*
U.S. Cl. 205—291 **10 Claims**



1. A method of copper-plating a material which comprises performing electrolysis using an electrolytic plating cell which has been separated by a diaphragm into an anode chamber having therein an insoluble metal electrode as an anode and a cathode chamber having therein the material to be plated as a cathode, and further using as an electrolyte a solution containing copper ions and an additive, said electrolyte being fed to the cathode chamber in a manner such that copper ion concentration in the electrolyte within the cathode chamber is kept constant and further being fed to the anode chamber at a rate of from about 0.2 to 11 ml/KAh.

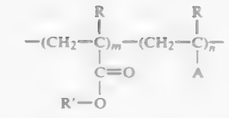
5,143,594

REFINERY ANTI-FOULANT - ASPHALTENE DISPERSANT

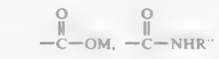
William K. Stephenson, Sugar Land; Bradley D. Mercer, Houston, and David G. Comer, Sugar Land, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 687,160, Apr. 18, 1991, Pat. No. 5,100,531, which is a continuation-in-part of Ser. No. 655,478, Feb. 14, 1991, Pat. No. 5,073,248, which is a division of Ser. No. 433,885, Nov. 8, 1989, Pat. No. 5,021,498. This application Nov. 12, 1991, Ser. No. 790,314
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] C08L *33/06*
U.S. Cl. 208—48 AA **3 Claims**

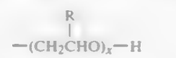
1. A method of dispersing asphalt and asphaltene in petroleum, crude oil, or any hydrocarbon fraction thereof exposed to heat transfer processes in an oil refinery, which method comprises adding an effective anti-foulant amount of asphalt-/asphaltene polymeric anti-foulant to said petroleum, crude oil, or fraction thereof, said polymeric anti-foulant comprising an admixture of Polymer A and Polymer B ranging from 100 to 5 weight percent A and from 0 to 95 weight percent B, where Polymer A is an alkyl substituted phenol-formaldehyde liquid resin having a weight average molecular weight ranging from about 1,000 to about 20,000, and an alkyl substituent containing from 4 to 24 carbon atoms, which alkyl substituent may be linear or branched alkyl group; and Polymer B is a hydrophilic-lipophilic vinylic polymer having a structure essentially as follows:



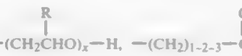
wherein R is chosen, at each occurrence, from hydrogen and method groups; and R' is a hydrocarbonaceous group containing from 4–24 carbon atoms and chosen from linear or branched alkyl groups, aromatic, cyclic, alkaryl, aralkyl groups, and mixtures thereof; and
A is chosen from the groups,



and mixtures thereof; and M is chosen, at each occurrence, from the group hydrogen alkali metal cations, alkaline earth metal cations, ammonium ions, protonated amines, quaternary amines, hydroxyl ethyl, hydroxy propyl and



groups, and mixtures thereof; and R'' is chosen, at each occurrence, from the group



and mixtures thereof; and m and n are both integers of sufficient number to achieve a weight average molecular weight ranging from about 5,000–250,000, and being of such a ratio as to describe the presence of from 95 to 5 weight percent of the lipophilic monomer, m, and from 5 to 95 weight percent of the hydrophilic monomer, n, and wherein x ranges from 1 to 20.

5,143,595

PREPARATION OF OXIDATION-STABLE AND LOW-TEMPERATURE-STABLE BASE OILS AND MIDDLE DISTILLATES

Juergen Thomas, Fussgoenheim; Roland Spahl, Lorsch; Thomas Anstock, Weisenheim; Ansgar Eisenbeis, Georgsmarienhuette, and Wolfgang Schmid, Wallenhorst, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 1, 1991, Ser. No. 654,883
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003175
Int. Cl.[5] C10G *69/00*
U.S. Cl. 208—58 **6 Claims**

1. A process for the preparation of a base oil and middle distillate which is stable to oxidation and low temperatures from a mineral oil fraction having a boiling range above 350° C., which comprises:
in a first step, converting the mineral oil fraction on a hydrocracking catalyst under hydrocracking conditions at a pressure of 40 to 150 bar and a temperature of 300° to 450° C., to an extent of from 20 to 80% by weight into fractions which boil below 360° C., separating the reactor effluent, if necessary, into liquid and gas phases in a high-pressure separator; and
in a second step, treating the entire reactor effluent or only the liquid phase, directly or after removal of the fractions boiling below 360° C. by distillation, with hydrogen at form 200° to 450° and at from 20 to 150 bar in the presence

of a catalyst which contains a crystalline pentasil borosilicate zeolite, alumina and/or amorphous alumosilicate as the carrier material and one or more metals from Group VIb and/or Group VIII of the Periodic Table and phosphorus, and, after distillation of the hydrogenation product, obtaining a middle distillate in the boiling range from 180° to 360° C. having a pour point of below −30° C. and an oxidation-stable residue having a boiling point >360° C., a viscosity index of from 10 to 135 and a pour point of below −12° C.

5,143,596

PROCESS FOR UPGRADING A SULPHUR-CONTAINING FEEDSTOCK

Ian E. Maxwell; Frederik Muller, both of Amsterdam; Frank H. H. Khouw, The Hague; Kim H. Knor, The Hague, and Jacques Lucien, The Hague, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 23, 1990, Ser. No. 617,844

Claims priority, application United Kingdom, Nov. 24, 1989, 8926555

Int. Cl.[5] C10G 45/00, 6./02, 69/08, 35/06

U.S. Cl. 208—89 20 Claims

20. A process for upgrading a sulphur-containing feedstock comprising a hydrocarbon mixture substantially boiling in the range of 70° to 220° and which has been derived from a catalytic cracking process and wherein the hydrocarbon mixture comprises more than 50 ppmw of sulphur which process comprises reforming the hydrocrabon mixture, wherein in the reforming step a catalyst is applied which comprises a metal-containing crystalline silicate having a Si/M molar ratio of 25 to 250, and wherein M is a metal selected from the group consisting of Ga, Mo, W, Zn, and mixtures thereof, subsequently hydrotreating the hydrocarbon mixture, wherein in the hydrotreating step a metal-containing catalyst is applied, wherein the metal is selected from the group consisting of Ni, Mo, Co, and mixtures thereof, wherein the reforming step is carried out at a temperature of 400° to 550° C., a pressure of from 10 to 30 bar and a space velocity of from 0.5 to 5 g/g/h, and wherein the hydrotreating step is carried out a temperature of 250° to 350° C., a hydrogen partial pressure of from 3 to 15 bar and a space velocity of from 2.0 to 10 g/g/h, and recovering therefrom a product substantially boiling in the gasoline range and having decreased sulphur content, and wherein aromatization is effected of at least 50% of olefins and/or naphthenes initially present in the feedstock.

5,143,597

PROCESS OF USED LUBRICANT OIL RECYCLING

Steven W. Sparks, Cherry Hill, N.J.; Gerald J. Teitman, Vienna, Va., and Salvatore T. M. Visconti, Holland, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 10, 1991, Ser. No. 639,647

Int. Cl.[5] C10G 9/14

U.S. Cl. 208—131 23 Claims

1. A process of used lubricating oil recycling which comprises:

(a) introducing a coker feed to the coker furnace which elevates the temperature of the coker feed to a temperature necessary to carry-out delayed coking of the feed;

(b) recycling a used lubricating oil by adding the lubricating oil to the heated coker feed downstream of the coker furnace at a rate sufficient to maintain the temperature of the coker process stream at a temperature sufficient for delayed coking and to prevent premature coking of the feed; and

(c) carrying out delayed coking of the feedstock in a coker drum from which coke and liquid coker products are removed.

5,143,598

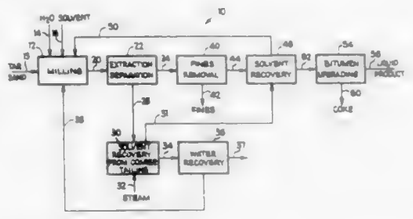
METHODS OF TAR SAND BITUMEN RECOVERY

Robert J. Graham; John J. Helstrom, both of Naperville, Ill.; Lawrence B. Peck, Houston, Tex.; Richard A. Stone, Yorkville, and Edward J. Bernier, Jr., Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 546,828, Oct. 31, 1985, Pat. No. 4,722,782. This application Jan. 14, 1988, Ser. No. 144,248

Int. Cl.[5] C10G 1/04

U.S. Cl. 208—390 35 Claims



1. A method of recovery of bitumen from tar sands comprising the steps of:

mixing tar sands, an organic solvent effective in solubilizing bitumen including asphaltenes from the mineral of said tar sand and a displacing amount of no more than about one void volume of an aqueous medium effective in displacing bitumen-rich solvent from said ground tar sands and in avoiding substantially spontaneous emulsion formation to form a first mixture, said mixing being at tar sands mixing conditions including mixing intensity and duration to suspend said tar sand and provide sufficient mass transfer between phases of said first mixture without significant emulsion formation, said first mixture being readily separable to a bitumen solution and a sand-water mixture upon cessation of said mixing;

separating a bitumen-rich solvent phase from said first mixture leaving an aqueous mineral phase containing a residual amount of said solvent; and

recovering bitumen from the bitumen-rich solvent phase.

5,143,599

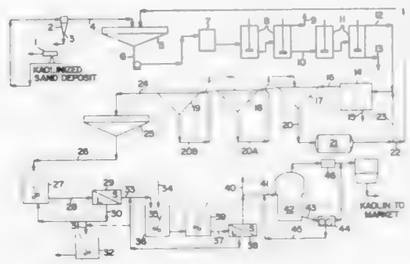
PROCESS FOR REFINING KAOLIN

Gary Derdall, and Robin L. Phinney, both of Saskatoon, Canada, assignors to Kaolin Industries, Ltd., Saskatchewan, Canada

Filed Jul. 29, 1991, Ser. No. 736,801

Int. Cl.[5] B03D 1/02, 1/08, 1/10; C04B 33/04

U.S. Cl. 209—166 25 Claims



1. A process for producing kaolin of enhanced brightness from kaolinized sand deposits containing silica, quartz, feldspar, ilmenite or other minerals and having a low grade and brightness level, comprising the steps of:

extracting kaolin-bearing ore from said deposits;

reducing the size of said ore and rejecting material of greater than 35 micron size;

subjecting the minus 35 micron kaolin-bearing material to a first froth floatation separation operation under quiescent alkaline conditions to separate the float concentrate from the float tails;

rejecting the float concentrate containing at least a portion of the silica impurities;

thickening and acidifying the kaolin-bearing float tails;

subjecting the float tails to a second froth floatation separation operation under quiescent acidic conditions;

removing the second float concentrate as a kaolin-bearing stream;

exposing the kaolin-bearing stream at a low solids density to a high intensity magnetic field to separate and reject paramagnetic minerals from the kaolin stream;

size classifying the kaolin-bearing stream from the high intensity magnetic field into at least two streams, one of which streams is a 2 micron stream containing particulate matter of generally 2 microns or less, and the remainder of said streams containing particulate matter generally greater than 2 micron;

rejecting the streams of greater than 2 micron matter;

leaching the generally 2 micron or less stream to dissolve ferrous iron;

dewatering the 2 micron stream and recovering the kaolin therein.

5,143,600

APPARATUS FOR FEEDING AIR INTO A FLOTATION CELL

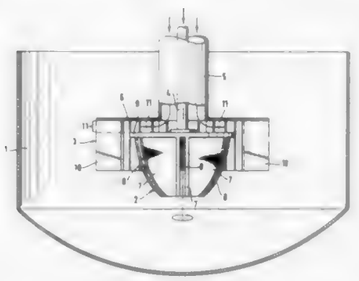
Matti O. Leiponen, Espoo; Launo L. Lilja, and Valto J. Mäkitalo, both of Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jan. 9, 1991, Ser. No. 639,040

Claims priority, application Finland, Jan. 10, 1990, 900123

Int. Cl.[5] B03D 1/16; B01F 3/04

U.S. Cl. 209—169 13 Claims



1. An apparatus for feeding air into a flotation mechanism, wherein the apparatus comprises a stator and rotor each provided with a generally disc-shaped top cover, said disc-shaped stator top cover having a larger diameter than said disc-shaped rotor top cover and said stator top cover being concentrically positioned above and adjacent to said rotor top cover thereby defining an air distribution duct between said top covers, said rotor top cover having a plurality of rotor blades extending vertically downwardly from said rotor top cover and said stator top cover having a plurality of stator blades extending vertically downwardly therefrom to below the top cover of the rotor, air supply means comprising an air supply pipe having its lower end attached to a central opening in said stator top cover thereby communicating with said air distribution duct, said air supply pipe diameter being substantially smaller than said rotor top cover diameter and means to rotate said rotor.

5,143,601

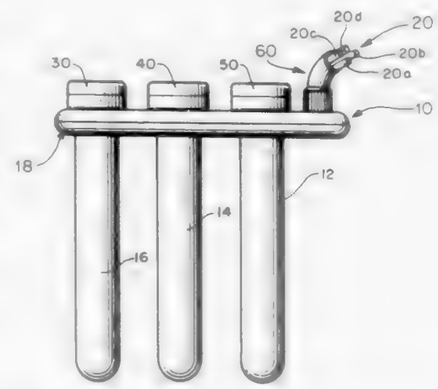
FLUID PURIFICATION SYSTEM

Jack P. Slovak, and Robert A. Slovak, both of Reno, Nev., assignors to Water Factory Corporation, Irvine, Calif.

Filed Oct. 6, 1989, Ser. No. 418,093

Int. Cl.[5] B01D 61/08

U.S. Cl. 210—90 26 Claims



21. A fluid treatment apparatus for connection to a plurality of external components through a plurality of external component fluid connection tubes, including a tube connected to feed source and a tube connected to a spigot, the fluid treatment device comprising:

a fluid distribution manifold including a plurality of internal fluid channels, one end of each of the fluid channels terminating at a first channel port in the outer surface of the distribution manifold and the other end of each of the fluid channels terminating at a second channel port in the surface of the distribution manifold, the distribution manifold further including a plurality of cartridge receiving apertures, said manifold being composed of at least two sections, at least one of said sections having grooves at the interface thereof such that adjoining sections sealed together define said internal fluid channels;

a multiport connector including a plurality of fluid channels, each multiport connector fluid channel including a first port for connecting to one of the external component fluid connection tubes and a second port for connection to the distribution manifold, the multiport connector configured such that a predetermined one of the second ports in the multiport connector aligns with a predetermined one of the first channel ports in the distribution manifold;

means for attaching the external component fluid connection tubes to the multiport connector; and

a plurality of discrete fluid treatment cartridges, each fluid treatment cartridge including a sump, the sump of each cartridge including at least one fluid inlet port and at least one fluid outlet port, the sump configured such that the at least one fluid inlet port aligns with a predetermined one of the second channel ports in the distribution manifold and the at least one outlet port aligns with a predetermined one of the second channel ports in the distribution manifold, each of the treatment cartridges including a post adapted to be received in one of the cartridge receiving apertures, each of the posts comprising means for affixing the respective treatment cartridge to the distribution manifold, said manifold eliminating the need for fittings and tubing for connecting the cartridges and allowing easy replacement of said cartridges.

5,143,602

APPARATUS FOR THE SEPARATION OF SOLIDS FROM FLUIDS OR SEDIMENTS FROM EMULSIONS

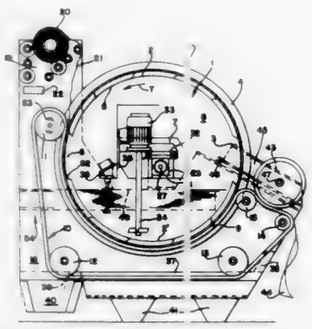
Ralf F. Piepho, Wennigsen, Fed. Rep. of Germany, assignor to Ralf F. Piepho Abwassertechnick GmbH, Fed. Rep. of Germany

Filed Nov. 26, 1990, Ser. No. 618,165

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1989, 3939426

Int. Cl.[5] B01D *13/048*

U.S. Cl. 210—97 31 Claims



1. An apparatus for the separation of solids from a fluid or sediments precipitated from emulsions, having mixing means; a reaction chamber with the mixing means therein; dosing means for metering a chemical mixture into the reaction chamber for mixing with the fluid in the chamber; a filter belt; a cylinder drum around which the filter belt rotates; and a continuous conveyor belt composed of individual links which rotates the cylinder drum which is supported in a suspended manner within a curve of the conveyor belt, whereby the filter belt is conveyed along between the conveyor belt and the casing of the cylinder drum, and wherein the improvement comprises:

the cylinder drum having a casing with at least one opening therein and sidewalls on the cylinder drum having at least one opening into which said dosing means extends;

said dosing means supporting said mixing means in said cylinder drum;

a level switch also supported on said dosing means in said cylinder drum; and

a fluid inlet for introducing fluid which is to be processed into the interior of said cylinder drum, said fluid inlet extending through an opening in at least one of said sidewalls.

5,143,603

APPARATUS AND SYSTEM FOR REMOVING LOW DENSITY LIQUIDS FROM OIL PRODUCTION WATER TANKS

Paul C. Gibbs, Big Spring, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed May 24, 1991, Ser. No. 705,476

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—122 19 Claims

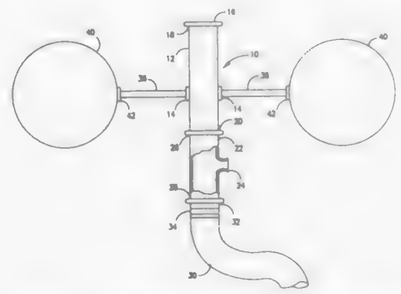
1. An apparatus for removing low density liquids from an oil production water tank, comprising:

(a) a vertically disposed elongated hollow base member having an upper end and a lower end, said base member having at least two radially spaced mounting bosses affixed in a horizontal plane thereto at a distance between said upper and lower ends of said base member;

(b) a plug mounted at said upper end of said base member;

(c) a hollow inlet member having a first end and a second end, said first end mounted to said lower end of said base member, said inlet member further having a substantially horizontally disposed fluid inlet in fluid communication with at least said second end of said inlet member;

(d) at least two substantially horizontally disposed arms, said arms each having a first end and a second end, said first end of each being mounted to said radially spaced mounting bosses of said base member;



(e) at least two hollow float members each of said float members having a connecting boss mounted thereon, said connecting bosses of said float members connected to said second end of said arms; and

(f) an elongated flexible tubular member having a first end and a second end, said first end in fluid communication with said second end of said hollow inlet member.

5,143,604

ONE-WAY GUIDED FILTER PAD ASSEMBLY

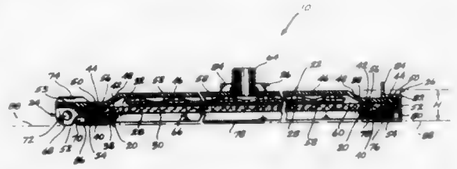
Richard A. Bernard, Kirkland, and John G. Gardner, Woodinville, both of Wash., assignors to Filtercorp, Inc., Woodinville, Wash.

Continuation-in-part of Ser. No. 527,566, May 22, 1990, Pat. No. 5,075,000. This application May 3, 1991, Ser. No. 695,580

The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.

Int. Cl.[5] B01D *46/10*

U.S. Cl. 210—168 30 Claims



1. A filter pad assembly used in conjunction with a pumping unit to filter a contaminated fluid, the filter pad assembly comprising:

a filter pad having an entrance side and an exit side, said filter pad further having a seating cut-out formed therein at a location along its periphery;

a sealing member having filter pad contacting means and an inlet opening through which the contaminated fluid enters, said filter pad contacting means having a peripheral configuration and dimension substantially matching that of said filter pad;

a filter pad support member having a seating surface and an inwardly disposed filter pad support screen against which said filter pad is positioned, said seating surface having a peripheral configuration and dimension substantially matching that of said filter pad to ensure that only said exit side of said filter pad may rest against said seating surface, said filter pad support member further having an outlet aperture through which the filtered fluid exits after passing through said filter pad; and

securing means for maintaining said sealing member and said filter pad support member in a closed operative position such that said filter pad contacting means of said sealing member compresses said filter pad against said seating surface of said filter pad support member to create a substantially fluid-tight seal, thereby preventing contaminated fluid from exiting said outlet aperture of said filter pad support member without passing through said filter pad.

5,143,605

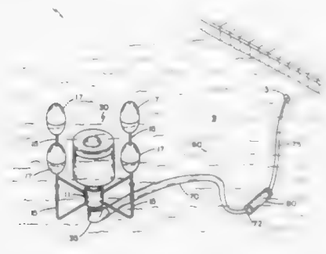
MOBILE FLOATING SKIMMER

David Masciarelli, 392 Neponset St., Canton, Mass. 02021

Filed Nov. 25, 1991, Ser. No. 797,171

Int. Cl.[5] E04H *3/20*

U.S. Cl. 210—169 7 Claims



1. A mobile floating skimmer for use in a swimming pool having a filter pump assembly and a vacuum fitting, comprising:

a flotation apparatus with a skimmer head assembly, comprising:

a vertical cylindrical pipe section with an annular bracket radially attached thereto and surrounding a portion thereof;

a plurality of L-shaped elements laterally and radially extending from said bracket, each L-shaped element having a horizontal section with two ends and an upwardly extending vertical section with two ends, wherein one end of each horizontal section is attached to the bracket and the other end of the horizontal section forms an L-shaped elbow with one end of the vertical section;

a plurality of flotation bulbs, one for each L-shaped element, slidably attached to the vertical sections of each L-shaped element;

wherein the uppermost end of each vertical section terminates in a stop flange which defines the maximum upward movement of each flotation bulb; and

a flexible conduit assembly interconnecting said skimmer head assembly with said vacuum fitting, said flexible conduit assembly having a first flexible conduit interconnecting said skimmer head assembly with a leaf canister, and a second flexible conduit interconnecting said leaf canister with said vacuum fitting.

5,143,606

ARRANGEMENT FOR CLEANING CONTAMINATED GROUND WATER

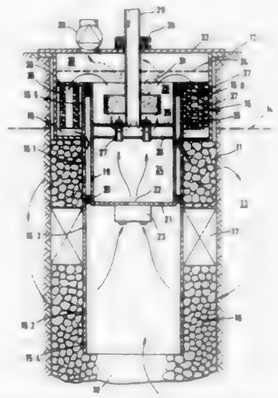
Bruno Bernhardt, Reutlingen, Fed. Rep. of Germany, assignor to IEG Industrie-Engineering GmbH, Reutlingen, Fed. Rep. of Germany

Filed Nov. 22, 1991, Ser. No. 797,427

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1990, 4037059

Int. Cl.[5] B01D *19/00*; C02F *1/20*

U.S. Cl. 210—170 20 Claims



1. An arrangement for cleaning contaminated ground water and a ground region through which it flows, comprising a shaft extending to a region of the ground water to be cleaned and having upper and lower water permeable shaft walls separated from one another by a separating wall and sealing means across the diameter of the shaft a shaft insert means constructed and arranged to provide a flow path for aspirating of water from a ground region through one of said water permeable shaft walls, cleaning said ground water, and reintroducing the water into the ground region through the other of said water permeable shaft walls, wherein said shaft insert comprises said separating wall, a suction pump connected to a passage means extending through said separating wall to a water aspiration region of said shaft; a gas chamber above said passage through which a gas is supplied through a pipe leading to the oustide air; a water cleaning chamber which is connected to said passage above said gas chamber, and means for contacting air from said gas chamber with water in said cleaning chamber; means for circulating water from said cleaning chamber to a water recirculation region of said shaft; and means for supplying a negative pressure to a water free region of said shaft above an upper water level.

5,143,607

ARRANGEMENT FOR DRIVING OUT VOLATILE IMPURITIES FROM GROUND WATER

Bruno Bernhardt, Reutlingen, Fed. Rep. of Germany, assignor to IEG Industrie-Engineering GmbH, Reutlingen, Fed. Rep. of Germany

Filed Dec. 13, 1991, Ser. No. 807,173

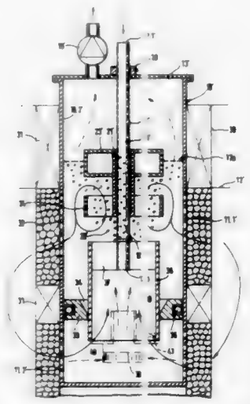
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1990, 4039824

Int. Cl.[5] B01D *19/00*; C02F *1/20*

U.S. Cl. 210—170 7 Claims

1. An arrangement for driving out volatile impurities from ground water by air or another gas, comprising a shaft extending to a ground water region, having at least locally in said ground water region a water-permeable wall; a ventilator communicating with said shaft for producing a negative pres-

sure and aspirating air from a shaft portion located above a ground water surface level; a pipe extending in said shaft to an area under said ground water level so as to form an air receiving chamber, said pipe being in communication with the outside air, and having a lower end region provided with nozzle openings at least partially under said ground water level; a



screening sleeve arranged concentrically relative to said pipe and at least partially covering said end region of said pipe provided with said nozzle openings, said screening sleeve being supported displaceably relative to said pipe by means for sealing said sleeve relative to said pipe; and a floating body means coupled with said sleeve floating on the surface of the groundwater.

5,143,608

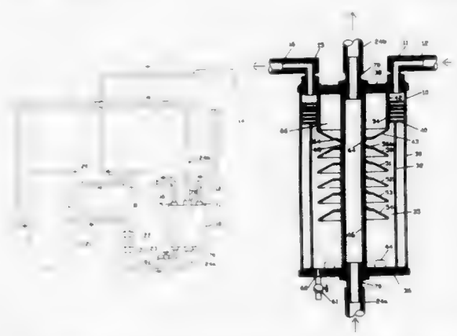
SYSTEM OF SEPARATION FROM A LIQUID

William M. Marshall, Sr., Salem, Va., assignor to Morf, Inc., Salem, Va.

Filed Aug. 31, 1990, Ser. No. 576,264

Int. Cl.[5] B01D *17/38*

U.S. Cl. 210—171 9 Claims



1. Apparatus for removing water from liquid fuel moving under pressure, comprising separate inlet means and outlet means for connecting the apparatus to a fuel line; means forming a conduit having a hollow interior which is enclosed except at its inlet and outlet ends, said inlet end being connected to receive liquid fuel from said inlet means, and said conduit having an intermediate portion extending helically about a helical axis and being thereby capable of generating centrifugal force on fuel passing through said intermediate portion, said force being directed radially outwardly from said axis; a settling chamber having one end remote from the conduit outlet end; and inner wall and an outer wall, the outer wall having a portion surrounding the conduit and a portion surrounding the inner wall and spaced therefrom to form a space therebetween; and the inner wall being positioned between the settling chamber and the outer wall and being effective to pass flow of liquid fuel along but not through the inner wall; an inlet into the settling chamber connected to conduct flow from the space between the inner and outer walls into the remote end of the settling chamber; the inner wall comprising flow separating means extending across the outlet end of the conduit to divide the area across the outlet into an outer portion and an inner portion, the outer portion of the divided area being further from said helical axis than the inner portion of the divided area and being positioned to discharge into the space between the inner and outer walls, whereby flow from the conduit is divided into an outer stream and an inner stream, the outer stream being directed into said space between the inner and outer walls and thence into the settling chamber; an outlet from the settling chamber remote from said inlet into the settling chamber; and means to conduct flow from said settling chamber outlet and flow from said inner area of the conduit outlet to said outlet means of the apparatus through a space surrounded by said intermediate portion of the conduit.

5,143,609

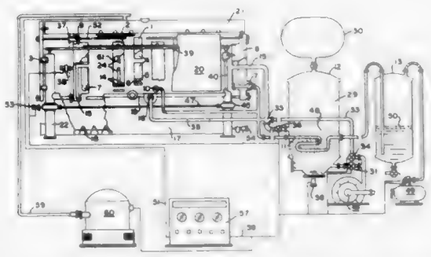
METHOD FOR DEWATERING AND DRYING A LIQUID/SOLID SLURRY AND AN APPARATUS FOR USING THE METHOD

Beltcho A. Beltchev, Sofia, Bulgaria, assignor to Bulgarska Industrialna Stopanska Associatia, Sofia, Bulgaria

Division of Ser. No. 265,194, Oct. 31, 1988, Pat. No. 4,999,118, which is a continuation-in-part of Ser. No. 910,904, Sep. 24, 1986, abandoned. This application Oct. 16, 1990, Ser. No. 598,558

Int. Cl.[5] B01D *25/68*

U.S. Cl. 210—185 10 Claims



1. An apparatus for dewatering and drying of a liquid/solid slurry mass, comprising

a plurality of vacuum filter plates having vacuum chambers, and

a plurality of heat plates having reception porous chambers;

said filter plates and said heat plates being connected alternately in succession;

said vacuum filter plates and said heat plates being pivotally mounted at a top portion thereof and suspended from vibrating means;

said heat plates each having a fluid membrane with a first central throughbore, said fluid membrane allowing the passage of fluid therethrough and said porous chambers lying on opposite sides of said membrane;

said vacuum filter plates each having a pair of porous partitions with a second central throughbore, said first central throughbore communicating with said second central throughbore, said vacuum chamber being disposed between said porous partitions;

said vacuum chambers each having an intermediate canal connected to a draining main canal which main canal is connected to a vacuum source;

said succession of alternately connected plates being arranged such that said throughbores and said main canal terminate at one end with a self-propelled head and at another end with a fixed head;

a feeding compressing container having a heat exchanger, said container being connected to said throughbores for feeding the slurry to be dried;

said heat exchanger connecting said main canals to said vacuum source, whereby said slurry is fed from said container through said throughbores where its solid part is separated by said membranes and its liquid part is drawn through said vacuum chambers into said heat exchanger and to a drain;

a hopper with a screw worm mounted beneath said plates and said fixed and self-propelled heads, said hopper having air ducts and a plurality of supporting columns, a ventilation dome being mounted on said columns;

whereby after said liquid part is removed from said slurry, said solid part is ventilated by said air ducts and said ventilation dome, loosened from said membranes by said vibrating means, collected in said hopper, and discharged from said hopper by said screw worm.

5,143,610

FILTER ASSEMBLIES

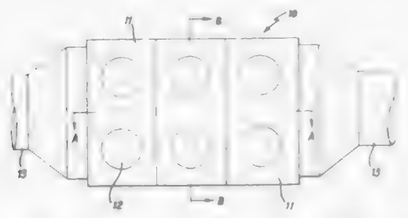
Raymond Doig, Greater Manchester, and Peter Stessl, Lancashire, both of United Kingdom, assignors to British Nuclear Fuels PLC, Cheshire, England

Filed Jul. 1, 1991, Ser. No. 724,138

Claims priority, application United Kingdom, Jul. 10, 1990, 9015136

Int. Cl.[5] B01D *29/11*

U.S. Cl. 210—232 4 Claims



1. A filter assembly for insertion in a fluid flow line comprising a plurality of intercommunicating filter modules, each module comprising a housing with an internal partition dividing the housing into a first and a second compartment to form a set of first compartments and a set of second compartments on opposite sides of the partitions of the assembled modules, the respective compartments in each of the sets intercommunicating with one another and each set being connectable to the flow line, at least one filter element in one of the compartments of each module and mounted at an opening in the partition whereby flow from the flow line enters the compartments at one side of the partitions, passes through the filter elements and filtered flow exits along the flow line from the compartments at the opposite side of the partitions, the assembly having selectively closable openings in both compartments at each of its ends thus allowing the flow from the flow line to be introduced through the filter in either of opposite directions as selected.

5,143,611

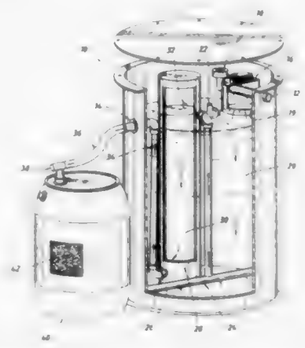
APPARATUS FOR SEPARATING OIL FROM WATER

Alfred R. Pate, Jr., Tyler, Tex., assignor to Summit Oil Company, Inc., Tyler, Tex.

Filed Feb. 6, 1992, Ser. No. 831,946

Int. Cl.[5] C02F *9/00*

U.S. Cl. 210—256 4 Claims



1. An apparatus for separating oil from water, which comprises:

a tank forming a primary separation chamber having an inlet for receiving a mixture of oil and water and an outlet;

means in said tank connected to the inlet for separating air from the mixture of oil and water and having a plurality of orifices located therein for passage of the mixture of oil and water into the primary separation chamber in the tank for allowing the oil to coalesce and rise to the top of said tank for removal from the primary separation chamber;

a container located in said tank for forming a secondary separation chamber for allowing the oil in the fraction that exits from the primary separation chamber to coalesce and rise to the top of said container for removal therefrom, the fraction that exits from the primary separation chamber being isolated from the turbulence and flow of the oil and water mixture in the primary separation chamber when in said container;

an effluent header located at the bottom of the primary separation chamber for collecting the fraction that exits from the primary separation chamber and for routing the fraction into said container for secondary separation;

a conduit for routing the water which settles to the bottom of said container to the outlet of said tank; and

an external canister having activated carbon therein connected to the outlet of said tank for filtering the water exiting from said tank through the activated carbon to remove organics therefrom.

5,143,612

HOLLOW FIBER FILTER MODULE

Katsuhiko Hamanaka, Otsu, and Yoshio Kanda, Fuji, both of Japan, assignors to Asahi Kasei Kobyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1991, Ser. No. 774,980

Claims priority, application Japan, Oct. 15, 1990, 21-271174

Int. Cl.[5] B01D *63/02*

U.S. Cl. 210—321.8 6 Claims

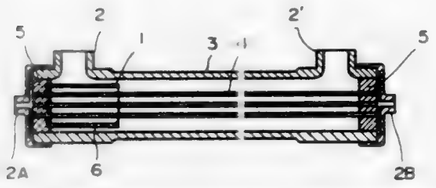
1. A hollow fiber filter module

said filter module to be used for external pressure type filtration in which a liquid to be filtered is brought into contact with the outer wall surface of a hollow fiber membrane and a filtrate is withdrawn from the inner wall surface of the membrane, comprising,

a substantially cylindrical casing having a liquid introducing nozzle at least at one end portion of the cylindrical casing

in its periphery and having a bundle of porous hollow fibers disposed in said cylindrical casing along the length of said cylindrical casing, each porous hollow fiber having an opening in at least one end of said fiber, said bundle of hollow fibers being connected at both ends thereof to end portions of said cylindrical casing,

saod bundle of porous hollow fibers being enclosed at one end portion of said bundle corresponding to said end portion having said liquid introducing nozzle by a hollow, liquid flow control member securely provided in the cylindrical casing, said liquid flow control member being positioned so as to provide a spacing between the outer surface of said control member and the inner surface of said cylindrical casing,



said liquid introducing nozzle comprising an outer opening, an inlet opening in the peripheral wall of the cylindrical casing and a nozzle wall stemming from the circumference of said inlet opening in the peripheral wall of the cylindrical casing to said outer opening and having an extended hollow which is defined by the inner surface of said nozzle wall extending from said outer opening toward said inlet opening, said inlet opening having a larger diameter than that of said hollow at any portion thereof, inclusive of said outer opening, said diameter of said inlet opening being defined as a diameter measured across the opening at the inner walls surface of said cylindrical casing, whereby the resistance to the liquid in said liquid introducing nozzle is held down to a minimum so that the pressure of the liquid can be effectively exerted on the hollow fibers.

5,143,613

COUNTER-CURRENT MEMBRANE MODULE FOR LIQUID SEPARATION

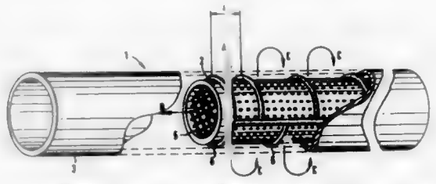
Johan G. A. Bitter, Amsterdam; Harry Futselaar, and Imre G. Racz, both of Enschede, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1991, Ser. No. 722,433

Claims priority, application Netherlands, Jul. 3, 1990, 9001514

Int. Cl.[5] B01D *63/00*

U.S. Cl. 210—321.8 **20 Claims**



1. A counter-current membrane module for liquid separations comprising:

a hollow shell;

a countercurrent membrane module enclosed by said shell;

means for providing a local transverse current of sufficient magnitude to provide substantially higher mass transfer and substantially less fouling, with a general countercurrent, including, a plurality of seals located between said shell and said membrane module for defining a plurality of spaces between said shell and said membrane module, said spaces defining at least first and second segments transversely of said membrane module for providing a path for current flow from one side of said first segment, through said first segment to the opposite side of said membrane module, thence reversing said current flow through said second segment and back through said membrane module; and

at least one fiber mat located in each of said segments, said fiber mats comprising hollow fiber membranes arranged such that the channels of said hollow fiber membranes extend through the wall of said membrane module and connect to the spaces between said shell and said membrane module.

5,143,614

MEMBRANE DEVICE FOR FILTRATION, SEPARATION, OR CATALYTIC REACTION

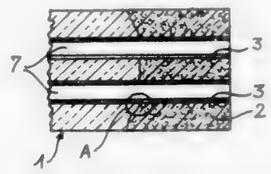
Raymond Soria, Bazet, and Jacques Gillot, Laloubere, both of France, assignors to Societe des Ceramiques Techniques, Bazet, France

Filed Feb. 14, 1991, Ser. No. 654,988

Claims priority, application France, Feb. 16, 1990, 90 01897

Int. Cl.[5] B01D *71/04*

U.S. Cl. 210—321.61 **39 Claims**



1. A membrane device for filtration, separation, or catalytic reaction, the device comprising:

a macroporous block of sintered ceramic material, of sintered metal, or of sintered glass, the block being pierced by parallel longitudinal channels whose surfaces are covered by said membrane made of an organic material or a sintered ceramic material or sintered glass, the porosity of the membrane being finer than that of the block;

means for injecting a fluid to be purified into said channels via first ends thereof;

means for collecting residual fluid from second ends of said channels;

the pores at both ends of said macroporous block being filled with a porous sintered filler material;

wherein said filler material comprises at least two types of grain: grains of a first type called "frame" grains having a diameter lying in the range about 1% to about 20% of the diameter of the pores of said block; and grains of the second type called "finishing" grains having a diameter lying in the range about 0.2% to about 20% of the diameter of the frame grains, and being received in the pores defined between said frame grains.

5,143,615

APPARATUS AND METHOD FOR REMOVING LIQUID FROM A COMPOSITION AND FOR STORING THE DELIQUIFIED COMPOSITION

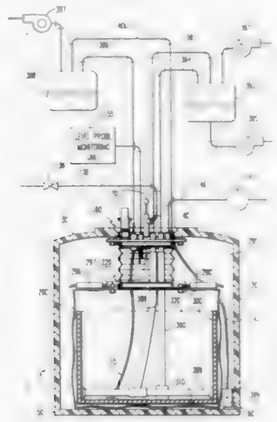
Bryan A. Roy, Harrison; Gregory F. Boris, Sewell, both of N.J.; John J. Campbell, Prospect Park, Pa.; John G. Funk, Raleigh, N.C.; David J. Wozniak, Gloucester Township, Camden County, N.J.; James D. Gibson, Voorhees, N.J., and Robert M. McCauley, Vincentown, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 524,241, May 16, 1990, Pat. No. 5,022,995.

This application Jan. 25, 1991, Ser. No. 645,925

Int. Cl.[5] B01D *29/42*

U.S. Cl. 210—350 **19 Claims**



1. An apparatus for removing fluid from a composition, comprising:

(a) a shell for providing primary containment for the composition;

(b) compression means disposed in said shell and surrounding the composition for compressing the fluid from the composition;

(c) filter means disposed in said shell for containing the composition generally therewithin and for filtering the fluid compressed from the composition; and

(d) vacuum means connected to said filter means for suctioning the fluid from said filter means and for producing a pressure differential across said compression means and for collapsing said compression means about said filter means and the composition for compressing the composition.

5,143,616

COMPOSITE STRUCTURE AND METHOD OF MAKING

David B. Pall, Roslyn Estates, and Stephen A. Geibel, Cortland, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed May 15, 1991, Ser. No. 700,268

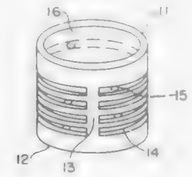
Int. Cl.[5] B01D *67/00, 71/56, 71/68*

U.S. Cl. 210—500.38 **53 Claims**

1. A composite structure comprising:

a support including a surface which is at least slightly soluble in a solvent; and

a substrate together with a membrane, the membrane comprising a resin soluble in the solvent and being formed and integrally secured to the surface of the support contemporaneously, the membrane bonding to the support as the membrane forms and the surface of the support reforms.



5,143,617

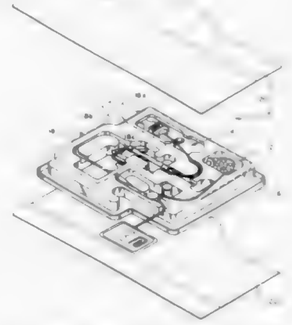
IN-LINE MOISTURE FILTER USABLE IN AN IMPROVED PACKAGING SYSTEM FOR A STERILIZABLE CALIBRATABLE MEDICAL DEVICE

Richard W. Grabenkort, Barrington, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 20, 1990, Ser. No. 632,711

Int. Cl.[5] B01D *15/00*

U.S. Cl. 210—502.1 **4 Claims**



1. An in-line moisture filter comprising a longitudinal outer housing having opposite ends, a filter element comprising moisture absorbent material disposed in the housing to remove liquid from gases passing through the filter, a plurality of internal ribs located in spaced relation on an inner peripheral wall of the housing, each extending longitudinally along said inner wall of the housing, to support and displace the filter element from the inner peripheral wall of the housing, thus to define passages within the housing between the ribs and the filter element containing the absorbent material, to enable gases flowing through said passages for drying to experience no significant pressure drop in their flow from one end of the filter housing to the other, the gasses flowing through an interior portion of the housing not passing through the absorbent material in the filter element, but rather through the passages between the housing and the filter element provided by said ribs, thereby to extract moisture from said gases passing through the filter.

5,143,618

PROCESS FOR THE TREATMENT OF ORGANIC WASTEWATER

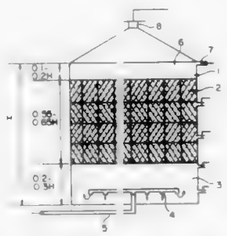
Shin W. Hyun, Seoul, and In C. Kang, Euiwang, both of Rep. of Korea, assignors to Hyundai Engineering Co., Ltd., Seoul, Rep. of Korea

Filed May 15, 1991 Ser. No. 700,393

Claims priority, application Rep. of Korea, Aug. 30, 1990, 90-13436

Int. Cl.[5] C02F *3/10, 3/04*

U.S. Cl. 210—615 5 Claims



1. A process for the treatmen of organic wastewater having 3,000 to 30,000 ppm B.O.D., which comprises the steps of:

(a) passing organic wastewa er out through a lower space disposed in the lower port on of a vessel having a height H, wherein the height of sa d lower space is about 0.2 H to 0.3 H, and wherein a thick and hard sludge blanket layer forms within said lower space after the treatment of said wastewater,

(b) passing said organic wast water of step (a) out through a medium layer member dis osed in the middle portion of said vessel, wherein the he ght of said media layer member contains a plurality of me lia layers, each of said medial layers having as bent portion inclined to about 55° to 65°, and

(c) passing said organic was ewater of step (b) out through an upper space disposed i the upper portion of said vessel, wherein the height of t he upper space is about 0.1 H to 0.2 H, and from said lower space to said upper space through said medium laye member, wherein the velocity of a flow stream is about 0 5 to 2.5 m/day for about 1 to 5 days, whereby the organi wastewater treatment process effectively concentrates organic wastewater and effectively removes contamina its from the blanket and media layers.

5,143,619

SECONDARY TREATMENT OF AN INTEGRATED PAPER MILL EFFLUENT

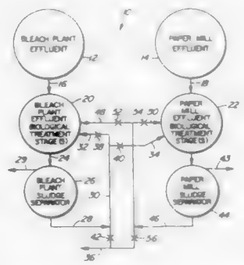
Vasudha S. Vipat, Burnaby, Canada, assignor to MacMillan Bloedel Limited, Canada

Filed May 10, 1991, Ser. No. 698,032

Int. Cl.[5] C02F *3/12*

U.S. Cl. 210—624 18 Claims

1. An activated sludge treatment system for an integrated paper mill having a first source of effluent containing BOD and AOX and a second source of effluent containing BOD but substantially free of AOX comprising separately treating said first and said second effluents with activated sludge, said first effluent being treated for a preselected hydraulic retention time sufficient to substantially complete bio-degradation of said BOD and to permit bio-adsorption of AOX but for a time insufficient to permit significant release of bio-adsorbed AOX and then separating said first effluent treated for said preselected retention time into a clarified liquor and a first sludge, treating said second effluent for a selected retention time sufficient to substantially complete bio-degradation of BOD in said second effluent, then separating said second effluent treated for said selected retention time into a second clarified liquor and a second sludge, returning at least a portion of said first sludge and a portion of said second sludge to said first treatment stage in relative amounts so that treatment of said first effluent by a



combination of said first and said second sludges permits said portion of said second sludge to remove AOX from said first effluent by bio-adsorption.

5,143,620

MEMBRANE SEPARATION PROCESS

Kechia J. Chou, Wappingers Falls, and Kathleen M. Hellmuth, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 25, 1991, Ser. No. 720,333

Int. Cl.[5] B01D *61/36*

U.S. Cl. 210—640 6 Claims

5. The method of treating a charge containing water and organic oxygenate which comprises

maintaining a membrane assembly including (i) a porous support layer of a polyacrylonitrile, at least a portion of the surface —CN groups of which have been hydrolyzed to —COOH groups and (ii) a separating elastomer membrane mounted on and bonded to said porous support layer;

maintaining a pressure drop across said non-porous separating elastomer membrane;

passing a charge aqueous solution of an organic oxygenate into contact with the high pressure side of said non-porous separating elastomer membrane whereby at least a portion of said water in said charge aqueous solution and a lesser portion of organic oxygenate in said charge aqueous solution pass by pervaporation through said non-porous separating elastomer as a lean mixture containing more water and less organic oxygenate than are present in said charge aqueous solution and said charge aqueous solution is converted to a rich liquid containing less water and more organic oxygenate than are present in said charge aqueous solution;

recovering as permeate from the low pressure side of said non-porous elastomer membrane, said lean mixture containing more water and less organic oxygenate than are present in said charge aqueous solution, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and

recovering as retentate from the high pressure side of said non-porous separating membrane said rich liquid containing a lower water content and a higher organic oxygenate content than are present in said charge aqueous solution.

5,143,621

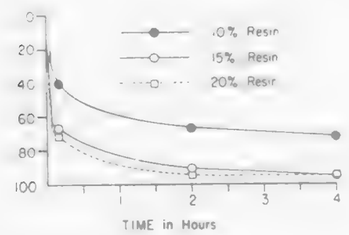
METHOD OF CHEMICAL DECONTAMINATION

Philip W. Bartram, Abingdon; Noel C. DiBona, Aberdeen Proving Ground, both of Md.; James H. Buchanan, Newark, Del., and Dennis K. Rohrbaugh, Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 17, 1991, Ser. No. 718,319

Int. Cl.[5] B01D *15/04*

U.S. Cl. 210—690 4 Claims



1. In a method of decontaminating a non-aqueous chlorofluorocarbon solvent which contains mustard, the improvement consisting essentially of contacting said solvent with a polydivinylbenzene macroreticular strong acid resin to absorb up to about 95 percent of said mustard, said polydivinylbenzene macroreticular strong acid resin being present in the amount of between about 10 and 20 percent by weight based on said solvent.

5,143,622

PHOSPHINIC ACID-CONTAINING POLYMERS AND THEIR USE IN PREVENTING SCALE AND CORROSION

Dodd W. Fong, Naperville; Mary A. Kinsella, Manhattan; James F. Kneller, LaGrange Park, and John W. Sparapany, Bolingbrook, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 5, 1991, Ser. No. 710,591

Int. Cl.[5] C02F *5/14*

U.S. Cl. 210—700 5 Claims

1. A method of inhibiting scale and corrosion of metal surfaces in contact with scale forming and/or corrosive industrial process waters which comprises treating such waters with at least one part per million of an acrylamide homopolymer and acrylic acid homopolymer or co-polymer of acrylic acid with acrylamide having a molecular weight within the range of 1,000–50,000 which have been modified to contain from 1 to 30 mole percent of amido(C_2–C_6 alkyl)phosphinic acid groups and the alkali metal, ammonium and amine salts thereof.

5,143,623

NUTRIENT AND PARTICLE REMOVAL: METHOD AND APPARATUS FOR TREATMENT OF EXISTING LAKES, PONDS AND WATER BODIES

Brian L. Kroll, 4515 Verity, Sanford, Mich. 48657

Filed Jun. 17, 1991, Ser. No. 716,273

Int. Cl.[5] B01D *21/01, 21/02*

U.S. Cl. 210—705 35 Claims

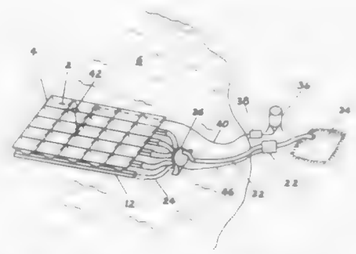
1. A method of treating a body of water to decrease suspended particle matter and nutrient load thereof, comprising the steps of:

a) providing and positioning a plurality of collection chambers connected side-by-side in a two dimensional array supported upon a horizontally movable raft in the body of water such that an unconfined region of the liquid above or below the array can be treated,

b) introducing a chemical precipitating agent to said region to form precipitate that reduces said nutrient load,

c) capturing the precipitate and particle matter in said region in the collection chambers as said precipitate and said particle matter move toward said collection chambers while the collection chambers are communicated to a receiving conduit, and

d) periodically removing the captured precipitate and particle matter by establishing a pressure on the receiving conduit to cause liquid flow therethrough that is effective to carry said captured precipitate and particle matter through said receiving conduit for discharge therefrom to a disposal location.



5,143,624

METHODS FOR DETACKIFICATION OF PAINT SPRAY OPERATION WASTES

Lewis D. Morse, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 2, 1991, Ser. No. 695,041

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—712 13 Claims

1. A method of treating circulating paint spray booth water containing over-sprayed, solvent-borne paint, which comprises:

(a) adjusting the alkalinity of the water to between about 20 and 600 ppm, on a calcium carbonate basis, by adding a source of alkalinity to the water;

(b) adding to the water a mixture of a homopolymer of poly(diallylamine) and a homopolymer of poly(N-methylolacrylamide) wherein the weight ratio of poly(-diallylamine) to poly(N-methylolacrylamide) in the mixture is in the range of about 1:10 to 1:1 on an active basis;

(c) contacting the over-sprayed, solvent-borne paint with the water after completing step (a) and step (b);

(d) adding an effective amount of a flocculant to the water after completing steps (a), (b) and (c); and

(e) removing resulting sludge from the water.

5,143,625

METHOD AND APPARATUS FOR CLARIFYING LIQUID USING A PULSATING SLUDGE BED AND PART OF CONCENTRATED SLUDGE

P. Temple Ballard, Richmond, Va., assignor to Infilco Degremont, Richmond, Va.

Filed Feb. 20, 1991, Ser. No. 658,018

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—713 6 Claims

1. An apparatus for treatment of water, comprising:

a source of water to be treated;

a source of a suitable coagulant to add to said water;

a source of a suitable flocculant to add to said water;

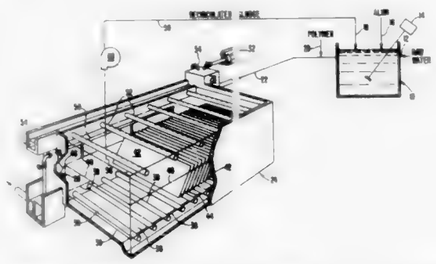
a pulsating sludge bed clarifier;

a sludge blanket within said clarifier having a top surface and a bottom surface;

a vacuum chamber connected to said clarifier for causing said clarifier to pulsate;

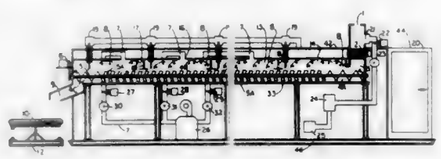
a conduit and mixing tank containing a mechanical stirring device into which said source of coagulant and said source

of water is inserted to combine and mix said coagulant and said water;
a conduit connecting said mixed water and coagulant to said vacuum chamber;
a flocculant conduit for connecting said source of flocculant for discharge into said mixture of water and coagulant prior to said vacuum chamber;



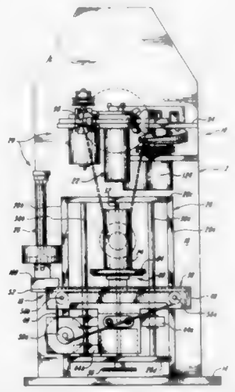
a sludge recycle conduit for removing part of said sludge from said clarifier and inserting it into said mixing tank so that said sludge can mix with said water and said flocculant prior to said water flowing into said clarifier;
a sludge discharge conduit for removing excess sludge from said clarifier; and
a water discharge conduit for removing clarified water from said clarifier.

5,143,626
SLUDGE DEHYDRATER HAVING SPECIALLY DESIGNED AUGERS AND INFRARED HEATER ELEMENTS
James E. Nugent, Lafayette, La., assignor to Sludge Drying Systems, Inc., Breaux Bridge, La.
Filed Jul. 10, 1990, Ser. No. 552,784
Int. Cl.[5] B01D *1/00*; F24C *15/24*
U.S. Cl. 210—748 10 Claims



3. A process for treating a waste stream, comprising the steps of;
(a) Providing a continuous waste stream to a plurality of enclosed longitudinal conveyor troughs;
(b) Heating the paths of said troughs by means of a plurality of variably angled infrared heating elements located within said troughs;
(c) Transporting and mixing said waste stream along the paths said conveyor troughs by means of a rotating auger in each of said troughs, each of said augers having a plurality of variably pitched paddles; and
(d) Ejecting said treated waste stream from said troughs.
4. A process for treating a waste stream as recited in claim 3 wherein said waste stream is sewage sludge.

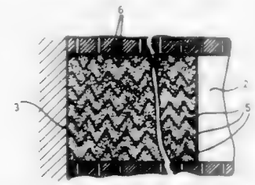
5,143,627
METHOD AND APPARATUS FOR PREPARING CELLS FOR EXAMINATION
Stanley N. Lapidus, Bedford, N.H.; Lewis T. Polk, Jr., Bedford, Mass.; Fredric L. Farber, Chestnut Hill, Mass.; J. Morgan Barlas, Malden, Mass., and Anne A. Hurley, Carver, Mass., assignors to Cytyc Corporation, Marlboro, Mass.
Filed Jul. 9, 1990, Ser. No. 550,142
Int. Cl.[5] B01D *37/00, 33/00*
U.S. Cl. 210—767 36 Claims



1. A method for a mechanized collection of sample cells that are in liquid suspension, for visual examination, said method comprising the steps of
A. introducing a cell-dispersing device into the liquid suspension of cells,
B. operating said cell-dispersing device for dispersing the sample cells,
C. providing a filter device having a screen filter with a porosity for blocking sample cells of interest and for passing smaller particles and with a filter surface on which the blocked cells collect and from which the collected cells are subsequently transferred to a viewing device in contact with that surface,
D. immersing said filter device in the liquid suspension of cells and directing a flow of the cell-suspending liquid through said filter device for collecting sample cells of interest on the filter surface, and
E. withdrawing said filter device with sample cells collected thereon from the cell-suspending liquid, with a spatial distribution ready for said visual examination.

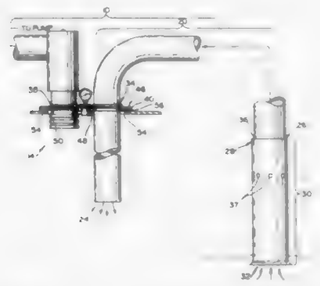
5,143,628
METHOD OF THE DEWATERING OF SLUDGE
Reinhard Bott, Waldbronn; Robert Kern, Weingarten; Thomas Langeloh, Mühlhausen, and Holger Gross, Wörth, all of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany
Filed Apr. 25, 1991, Ser. No. 691,315
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1990, 4013786
Int. Cl.[5] B01D *25/12, 25/32*
U.S. Cl. 210—770 10 Claims
1. A method of dewatering a sludge, comprising the steps of:
(a) introducing a volume of sludge to be dewatered into a dewatering press between two relatively movable surfaces comprising a wall and a movable surface formed by a press piston adapted to press said sludge volume between them;
(b) subdividing said sludge volume into autodraining volume fractions with flexibly deformable partitions uncontrollably contracting upon compression of said sludge volume;

(c) compressing said sludge volume subdivided by said partitions with a dewatering pressure in excess of 10 bar between said surfaces to express water from said sludge, contract said partitions and form a sludge cake; and



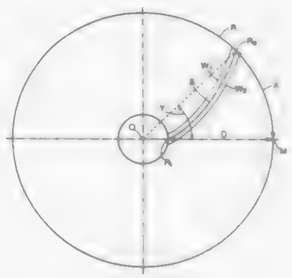
(d) thereafter extending said partitions to break up said sludge cake and recover said partitions therefrom.

5,143,629
APPARATUS AND METHOD FOR MINIMIZING AND RECOVERING FLUID CARGO SPILLS
Christian L. Lint, P.O. Box 9884, Seattle, Wash. 98109
Filed Jun. 8, 1990, Ser. No. 535,469
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—776 9 Claims



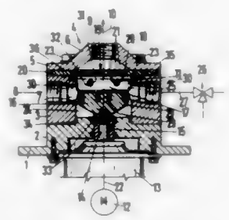
3. An apparatus for recovering materials in a marine environment, comprising:
a vacuum source;
a substantially airtight hold of a marine vessel connected to said vacuum source by a substantially airtight vacuum passage; and
a pickup mechanism, said pickup mechanism forming at least one substantially airtight passage between said enclosure and said materials in said marine environment, said pickup mechanism further comprising:
at least one pickup nozzle, each said pickup nozzle being substantially cylindrical and having a connector end and a suction end; and
at least one pickup conduit having at least two ends, with at least one said end of each said pickup conduit connected to said connector end of said at least one pickup nozzle and at least one remaining said end of each said pickup conduit connected to said airtight enclosure so that when said vacuum source is engaged and said enclosure is evacuated, materials are sucked into said suction end and through said pickup nozzle and pickup conduit into said enclosure, wherein each said pickup nozzle further comprises a plurality of apertures arrayed around said pickup nozzle a distance from said suction end, where the distance for each said aperture is approximately equal.

5,143,630
ROTARY DISC FILTRATION DEVICE
Philip M. Rolchigo, Edison, N.J., assignor to Membrex, Inc., Fairfield, N.J.
Filed May 30, 1991, Ser. No. 708,069
Int. Cl.[5] B01D *33/15*
U.S. Cl. 210—780 81 Claims



1. A rotary disc filtration device for filtering fluid to produce permeate and retentate, said device comprising:
(a) a fluid filtration gap for holding fluid to be filtered, said gap being defined by two oppositely disposed substantially parallel closely spaced facing surfaces, one surface defining the gap being the first surface of a first filter through which the permeate passes from the gap and the other surface defining the gap being the surface of a disc, the surface of the disc or the surface of the filter having at least one spiral groove in fluid communication with the fluid when fluid is in the gap, the spiral groove subtending an angle Y in polar coordinates of at least ten degrees on the disc surface or filter surface;
(b) means for introducing fluid into the fluid filtration gap; and
(c) means to rotate the disc or the filter to produce permeate.

5,143,631
FILTERING DEVICE, ESPECIALLY FOR THE SEPARATION OF COARSE PARTICLES FROM A LUBRICANT SUSPENSION, AND PROCESS FOR ITS USE
Hansjörg Furrer, Ziefen, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland
Filed Jul. 3, 1991, Ser. No. 725,471
Claims priority, application Switzerland, Oct. 7, 1991, 2297/90
Int. Cl.[5] B01D *33/46*
U.S. Cl. 210—791 10 Claims



1. Filtering device, especially for the separation of coarse particles from a lubricant suspension, comprising.
a housing, (2, 3, 4) having a housing part (3) and a housing cover (4), detachably placed on the housing part (3),
said housing part (3) exhibiting an interior (24) and an intake (7) for the suspension (8) to be filtered, and said housing cover (4) exhibiting a filtrate outlet (9),

a rotor (14), arranged in said interior (24) of said housing part (3), and a rotor axis extending in an axial direction (22),

a filter (11) being formed by a flat, plane filter means (11), arranged perpendicular to said axial direction (22) between said housing part (3) and said housing cover (4), so that it can be replaced after removal of the housing cover (4),

said rotor (14) including at least one stripping lamella (17) for stripping the solids settling on the filter (11) and guide surface means (30) and compression spring means (29) for guiding and pressing said at least one lamella (17),

said at least one lamella (17) projecting beyond said guide surface means (30) at least in said axial direction (22) and being mounted to slide in said axial direction (22) between said guide surface means (30) and being pressed by said compression spring means (29) in said axial direction (22) onto said filter (11), in order to slide on the filter and thereby strip the solids away from the filter when said rotor (14) is rotating,

said intake (7) coming out at least approximately radially to said axial direction (22) so close to the filter (11) into said interior (24) of said housing part (3), that suspension (8) flowing through said intake (7) is directed at least partially onto the at least one lamella (17) in order to wash away solids settling on the at least one lamella (17) due to the stripping action.

5,143,632

POLYSILOXANE POLYMER HAVING PENDANT AROMATIC GROUPS USEFUL IN ENHANCED OIL RECOVERY USING CARBON DIOXIDE FLOODING

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research and Technology Co., San Francisco, Calif.

Filed Mar. 14, 1991 Ser. No. 669,156
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 **9 Claims**

1. A solution comprising carbon dioxide, a polymer, and a cosolvent, wherein the polymer comprises a polysiloxane polymer having pendant phenyldialkylsilyl groups; and wherein the cosolvent is selected from the group consisting of:

(a) alcohols having from 1 to 8 carbon atoms.

(b) aromatics having a single ring and from 6 to 10 carbon atoms.

(c) ketones having from 3 to 10 carbon atoms.

(d) carboxylic acid esters where the carboxylic acid portion has from 2 to 4 carbon atoms and the ester portion has from 1 to 10 carbon atoms

(e) hydrocarbons having from 2 to 20 carbon atoms, and

(f) ethers and glycol ethers having from 2 to 10 carbon atoms.

5,143,633

OVERBASED ADDITIVES FOR LUBRICANT OILS CONTAINING A MOLYBDENUM COMPLEX, PROCESS FOR PREPARING THEM AND COMPOSITIONS CONTAINING THE SAID ADDITIVES

Roger Gallo, La Salle; Pierre Hornaert, St Pierre de Chandieu, and Jean-Philippe Roman, Lyon, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Jun. 18, 1990, Ser. No. 539,856
Claims priority, application France, Jun. 19, 1989, 89 08095
Int. Cl.[5] C10M *125/10, 139/00*
U.S. Cl. 252—18 **36 Claims**

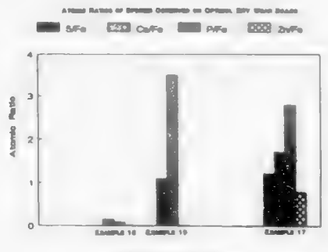
1. An overbased additive for lubricant oils, comprising a composition formed by carbonation of a mixture comprising: at least one detergent or detergent precursor, at least one compound selected from the group consisting of alkali metal oxide, alkali metal hydroxide, alkali metal alcoholate, alkaline earth metal oxide, alkaline earth metal hydroxide and alkaline earth metal alcoholate and at least one hydrocarbon insoluble organic molybdenum complex.

5,143,634

ANTI-WEAR ENGINE AND LUBRICATING OIL

Elaine M. Quinga, Batavia, and Lake A. Schaap, South Holland, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jan. 17, 1991, Ser. No. 642,465
Int. Cl.[5] C10M *141/02*
U.S. Cl. 252—33 **25 Claims**



1. An anti-wear engine and lubricating oil comprising:

a base oil;

an anti-wear component comprising the Mannich products of benzotriazole or the reaction products of benzotriazole, with formaldehyde and at least one aliphatic amine selected from the group consisting of primary or secondary amines and present in a concentration ranging from about 0.1 percent to about 4.0 percent by weight of said lubricating oil;

a sulfur-containing compound comprising at least one member selected from the group consisting of sulfurized olefinic compounds having from about 3 to about 30 carbon atoms, organic sulfides, and polysulfides wherein said sulfur-containing compounds is present in a concentration ranging from about 0.1 percent to about 4.0 percent by weight of said lubricating oil; and

a metallic component having at least one member selected from the group consisting of calcium, magnesium, strontium and barium and present in a concentration ranging from about 0.1 percent to about 4.0 percent by weight of said lubricating oil.

5,143,635

HYDRAULIC DRAG REDUCING AGENTS FOR LOW TEMPERATURE APPLICATIONS

John C. O'C. Young, and Christopher B. Murray, both of Halifax, Canada, assignors to Energy, Mines & Resources - Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 615,232, Nov. 19, 1990, abandoned. This application Nov. 6, 1991, Ser. No. 788,451
Claims priority, application Canada, Feb. 2, 1990, 2009210
Int. Cl.[5] C10M *173/02*
U.S. Cl. 252—34 **8 Claims**

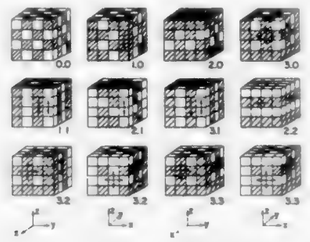
5. A drag reducing composition for use in reducing friction exhibited by an aaueous liquid passing through a conduit at sub-ambient temperatures close to or below the freezing point of water, said composition comprising: (1)an alkyl trimethylammonium surfactant, in which the alkyl group contains more than ten carbon atoms and (2) an organic counterion comprising 2,6-dihydroxybenzoate to provide effective drag reduction at sub-ambient temperatures close to or below the freezing point of water.

5,143,636

CONTROLLED-POROSITY PIEZOELECTRIC CERAMIC

Philippe Gaucher, Gif sur Yvette; Jean-Pierre Ganne, Orsay, and Jean-Claude Dubois, St Remy les Chevreuses, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Jul. 11, 1991, Ser. No. 728,617
Claims priority, application France, Aug. 7, 1990, 90 10065
Int. Cl.[5] C04B *35/46*
U.S. Cl. 252—62.9 **5 Claims**



1. A process to manufacture a controlled porosity piezoelectric ceramic, the process consisting of the following steps:

synthesis of a gel in the presence of a solvent,

synthesis, using an autoclave, of an aerogel by drying the gel at pressure and temperature conditions which are hypercritical for the solvent,

production of the ceramic by calcining the aerogel.

5,143,637

MAGNETIC FLUID COMPOSITION

Atsushi Yokouchi, Yokohama, and Toshikazu Yabe, Yurigaoka, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 657,180
Claims priority, application Japan, Feb. 20, 1990, 2-38705
Int. Cl.[5] C09K *3/00*; H01F *1/28*
U.S. Cl. 252—62.52 **12 Claims**

1. A magnetic fluid, consisting essentially of:

a dispersion medium made of a low-volatile organic solvent;

ferromagnetic particles dispersed in the organic solvent;

a low molecular weight dispersant having a lipophilic group and a polar group, the lipophilic group having an affinity for the organic solvent, the surface of each of the ferromagnetic particles being covered with the dispersant; and

an additive added to the dispersion medium, having a lipophilic group and a polar group, the additive lipophilic group having a macromolecular chain;

wherein the polar group of the additive is at least one of a carboxyl group and a sulfonic group.

5,143,638

LOW POWER LOSS MN-ZN FERRITES

Masakatsu Yamazaki; Tetsu Narutani, and Hideaki Kobiki, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Feb. 28, 1991, Ser. No. 662,425
Claims priority, application Japan, Mar. 3, 1990, 2-50828
Int. Cl.[5] C04B *35/38*
U.S. Cl. 252—62.59 **1 Claim**

1. A low power loss Mn-Zn ferrite consisting essentially of 52–54.5 mol % of Fe_2O_3, 33–40 mol % of MnO and 6–14 mol % of ZnO and containing 0.005–0.040 wt % of SiO_2, 0.02–0.20 wt % of CaO, 0.01–0.08 wt % of Nb_2O_5 and 0.005–0.08 wt % of Sb_2O_3.

5,143,639

USE OF (C_1–C_4) ALKYL ESTERS OF ALIPHATIC (C_8–C_{22}) MONOCARBOXYLIC ACIDS FOR REMOVING FAT, INKS AND THE LIKE FROM PRINTING MACHINES

Børge Krawack, Højbjerg, Denmark, assignor to Aarhus Oliefabrik A/S, Aarhus C, Denmark

PCT No. PCT/DK89/00222, § 371 Date Mar. 26, 1991, § 102(e) Date Mar. 26, 1991, PCT Pub. No. WO90/03419, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 25, 1989, Ser. No. 671,807
Claims priority, application Denmark, Sep. 26, 1988, 5331/88
Int. Cl.[5] C11D *7/22, 1/18*; C23D *17/00*
U.S. Cl. 252—162 **14 Claims**

1. A method of removing ink from a printing machine which comprises cleaning the machine with an agent comprised of 50–100% by weight of (C_1–C_5) alkyl ester of an aliphatic (C_8–C_{22}) monocarboxylic acid, 0–50% by weight of vegetable oil and 0–10% by weight of surfactant.

5,143,640

POLYETHER LUBRICANTS

John R. Moxey, Southampton, England, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 378,016, Jul. 11, 1989, abandoned. This application Jun. 21, 1991, Ser. No. 719,075
Claims priority, application United Kingdom, Jul. 21, 1988, 8817415
Int. Cl.[5] C10M *145/34*
U.S. Cl. 252—52 A **9 Claims**

1. An industrial or automotive lubricating oil composition consisting essentially of

(a) one or more mineral oils and

(b) more than 60% by weight of a polyether having the general formula

$$RX[(C_3H_6O)_n(C_pH_{2p}O)_pH]_m$$

wherein

R is either an alkyl or alkylphenyl group having from 9 to 30 carbon atoms

X is selected from O, S or N

y is 6 to 30

m is 1 or 2

n and p are integers such that the polyether contains between 1 and 35% by weight of ($C_pH_{2p}O$) units and between 35 and 80% by weight of (C_3H_6O) units.

5,143,641

ESTER PERHYDROLYSIS BY PRECONCENTRATION OF INGREDIENTS

Charles C. Nunn, Rutherford, N.J., assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Sep. 14, 1990, Ser. No. 582,281
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—186.38 **18 Claims**

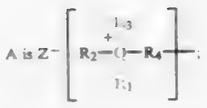
1. A bleaching composition comprising:

(i) a peroxygen compound capable of generating perhydroxyl anion in an aqueous solution; and

(ii) an organic carbonate bleach precursor having a leaving group whose conjugate asset has a pKa of greater than 13 and a structure which is:

$$A-(O)_m-\overset{O}{\overset{\|}{C}}-(O)_n-B$$

wherein:



R_1, R_2 and R_3 are each a radical selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, polyoxyalkylene, and $R_4(O)_mC(O)_n$;

R_4 is selected from a bridging group consisting of alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, and polyalkoxylene, and wherein the bridging group can be unsubstituted or substituted with C_1–C_{20} atoms selected from the group consisting of alkyl, alkenyl, benzyl, phenyl and aryl radicals;

Z^- is a monovalent or multivalent anion leading to charge neutrality when combined with Q^+ in the appropriate ratio and wherein Z^+ is sufficiently oxidatively stable not to interfere significantly with bleaching by a peroxy carbonic acid;

Q is nitrogen;

m and n are 1; and

B is A or an alkyl radical; and

the peroxygen compound and precursor being present in a relative molar ratio of greater than about 1:1.

5,143,642

LIQUID-CRYSTALLINE MEDIUM FOR ELECTROOPTICAL DISPLAY ELEMENTS BASED ON THE ECB EFFECT

Joachim Krause, Dieburg; Thomas Geelhaar, Mainz; Reinhard Hittich, Modautal; Ulrich Finkenzeller, Plankstadt; Bernhard Rieger, Munster/Altheim, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

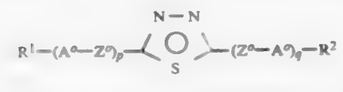
Filed Jan. 11, 1991. Ser. No. 641,024

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1990, 4000858; Jan. 18, 1990, 4001290; Jan. 18, 1990, 4001291; Jan. 18, 1990, 4001292; Jan. 18, 1990, 4001294

Int. Cl.[5] C09K *19/34, 19/12;* **C07D** *285/12*

U.S. Cl. 252—299.61 **2 Claims**

1. A nematic liquid crystal medium which comprises a thiadiazole derivative of Formula



I

wherein p+q is 2, A^* is 1,4-phenylene, one Z^* group is $-CH_2CH_2-$, the other remaining Z^* groups are single bons, and R^1 and R^2 are each, independently of one another, an alkyl group of up to 5 carbon atoms in which one $-CH_2-$ group may be replaced by —O—.

5,143,643

OPTICALLY ACTIVE MESOMORPHIC COMPOUND

Takashi Iwaki; Kenji Shinjo; Akio Yoshida; Masataka Yamashita, all of Kanagawa; Kazuharu Katagiri, Tokyo; Chieko Hioki; Takeshi Togano, both of Kanagawa; Yoko Yamada, and Masahiro Terada, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 82,650, Aug. 7, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 373,640

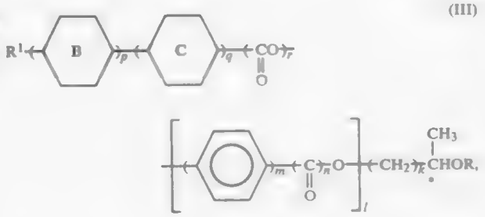
Claims priority, application Japan, Aug. 8, 1986, 61-186578; Aug. 21, 1986, 61-193974; Sep. 30, 1986, 61-230049; Jul. 27, 1987, 62-188301; Jul. 29, 1987, 62-187498; Jul. 29, 1987, 62-187499; Jul. 29, 1987, 62-187500

Int. Cl.[5] C09K *19/34, 19/52, 19/30, 19/12*

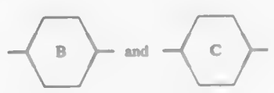
U.S. Cl. 252—299.61 **167 Claims**

1. A mesomorphic compound represented by the following formula (III):

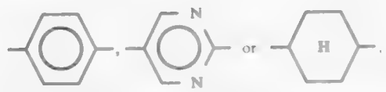
(III)



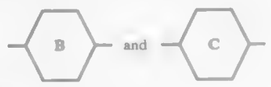
wherein R represents a linear alkyl group having 1–18 carbon atoms, C* represents an asymmetric carbon atom, k is an integer of from 2 to 5, l is 0 or 1, and l is 1, m is 0, 1 or 2 and n is 0 or 1; R^1 represents an alkyl or alkoxy group having 1–18 carbon atoms;



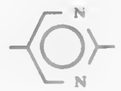
respectively denote



p, q and r are respectively 0 or 1, p and q satisfying the relation of $p+q[+r] \geqq 1$ with the proviso that (i)



cannot both be



simultaneously; (ii) p+q=2 and r is 1 when l is 0; (iii) m is 1 or 2, n is 0 or 1 and r is 1 when l=1 and p+q=1; (iv) r and n are respectively 0 when l is 1, p+q=2 and m=0; and (v) r and n are respectively 0 or 1 when l is 1, p+q=2 and m is 1.

5,143,644

CARBOXYLIC ACID ESTER COMPOUNDS, AND THEIR RELATED MATTERS AND METHOD OF PRODUCING THE SAME

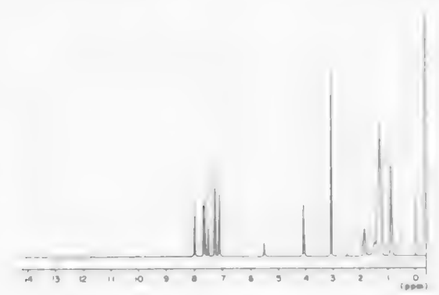
Hideo Yamaoka; Toyji Shimizu; Fujihisa Matsunaga; Shinichi Nishiyama; Toru Yamanaka, and Shoichi Miyakoshi, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 6, 1990, Ser. No. 505,592

Claims priority, application Japan, Apr. 6, 1989, 1-87301; Apr. 6, 1989, 1-87302; Apr. 6, 1989, 1-87303; Apr. 6, 1989, 1-87304; Apr. 6, 1989, 1-87305

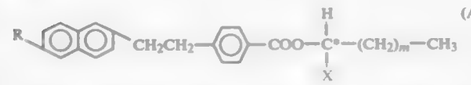
Int. Cl.[5] C09K *19/32;* **C07C** *69/76;* **G02F** *1/13*

U.S. Cl. 252—299.62 **28 Claims**



1. A carboxylic acid ester compound represented by the formula (A);

(A)



wherein R represents a radical selected from the group consisting of an alkyl group having 6–18 carbon atoms, an alkoxy group having 6–18 carbon atoms, and a halogenated alkyl group having 6–18 carbon atoms, X represents $-CF_3$ or $-CH_2-CH_3$, m is an integral number of 1–10 when X is $-CF_3$, and an integral number of 2–10 when X is $-CH_2-CH_3$, and C* represents an asymmetric carbon atom.

5,143,645

METHOD FOR SUPPRESSING PROCESS DUST EMISSIONS USING A SALT OF A FATTY ACID AS A FOAMING AGENT

Donald C. Roe, Southampton, Pa., assignor to Betz Laboratories, Trevose, Pa.

Continuation of Ser. No. 209,948, Jun. 22, 1988, Pat. No. 4,971,720, which is a continuation-in-part of Ser. No. 41,902, Apr. 24, 1987, Pat. No. 4,897,218. This application Nov. 15, 1990, Ser. No. 595,563

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] C09K *3/22;* **C04B** *7/48*

U.S. Cl. 252—313.1 **25 Claims**

1. A process for suppressing process dust emissions in the handling of solid material which process comprises

a) forming a solution of demineralized make-down water and a foaming agent, which foaming agent is a salt of a fatty acid having between about eight and eighteen carbons;

b) forming the foam from the solution; and

c) contacting the solid material with the foam.

18. In a process in which solid materials are subjected to treatment with a dust suppression medium, the improvement which comprises applying as said dust suppression medium a medium formed by dissolving a foaming agent in demineralized water, which foaming agent is a salt of a fatty acid having between about eight and eighteen carbons.

5,143,646

POLYSACCHARIDE RESOLVING GELS AND GEL SYSTEMS FOR STACKING ELECTROPHORESIS

Samuel Nochumson, Randolph, N.J.; Foner P. Cartis, Rockland, Me.; Jonathan H. Morgan, Camden, Me., and Francis H. Kirkpatrick, Owls Head, Me., assignors to FMC Corporation, Philadelphia, Pa.

PCT No. PCT/US90/00184, § 371 Date Jun. 20, 1991, § 102(e) Date Jun. 20, 1991

PCT Filed Jan. 16, 1990, Ser. No. 691,041

Int. Cl.[5] B01J *13/00;* **C25D** *13/00*

U.S. Cl. 252—315.3 **33 Claims**

1. An aqueous electrophoretic resolving gel composition comprising:

(A) two hydrogels, at least one of which has been derivatized and, independently, at least one of which has been depolymerized sufficiently to reduce the casting-effective viscosity of the total resolving gel composition; other than a combination of (i) hydroxyethyl agarose which was subsequently depolymerized and (ii) 1,2-dihydroxypropyl agarose;

(B) water; and

(C) a resolving gel buffer.

5,143,647

SYNTHESIS GAS GENERATION STARTUP PROCESS (C-2556)

Geoffrey R. Say; James H. Taylor; David C. Long, all of Baton Rouge, La., and Rocco A. Fiato, Basking Ridge, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 7, 1991, Ser. No. 711,697

Int. Cl.[5] C07C *27/14*

U.S. Cl. 252—373 **11 Claims**

1. A method for starting up a fluidized bed or spouted bed steam reforming-partial oxidation process for converting a feed gas comprising methane to a product comprising hydrogen and carbon monoxide and unconnected methane which comprises the sequential steps of:

(a) heating to reaction temperature the fluidized bed or spouted bed comprised of essentially inert particles, in the presence of oxygen, in an oxiding atmosphere, and in the substantial absence of a reforming catalyst;

(b) converting to a reducing atmosphere; and

(c) introducing into the fluidized bed or spouted bed sufficient Group VIII metal containing catalyst and converting, in the presence of oxygen, the feed gas to the product.

5,143,648

ASCORBIC ACID DERIVATIVE AND USE AS ANTIOXIDANT

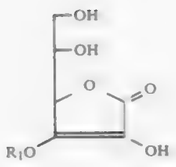
Toshio Satoh; Yasunori Niiro; Hisao Kakegawa, and Hitoshi Matsumoto, all of Tokushima, Japan, assignors to Nippon Hypox Laboratories Incorporated, Tokyo, Japan

Division of Ser. No. 382,270, Jul. 20, 1989, Pat. No. 5,061,812. This application Aug. 20, 1991, Ser. No. 748,176

Int. Cl.[5] C09K *15/22;* **C07D** *411/12*

U.S. Cl. 252—403 **18 Claims**

1. An ascorbic acid derivative represented by the formula (Ia):



(Ia)

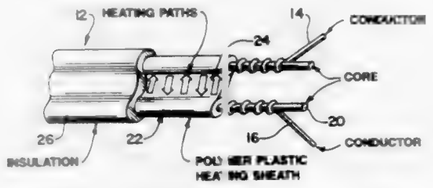
wherein R_1 is selected from the group consisting of a heterocyclic ring-containing an alkyl group.

5,143,649

PTC COMPOSITIONS CONTAINING LOW MOLECULAR WEIGHT POLYMER MOLECULES FOR REDUCED ANNEALING

Brian D. Blackledge, Taylorsville, and William M. Rowe, Jr., De Kalb, both of Miss., assignors to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 824,193, Jan. 30, 1986, Pat. No. 4,818,439, which is a continuation-in-part of Ser. No. 805,880, Dec. 6, 1985, abandoned. This application Mar. 2, 1989, Ser. No. 317,764
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—511 14 Claims



1. A method of manufacturing a polymeric composition capable of exhibiting PTC behavior having an essentially stable and constant conductivity essentially without annealing comprising mixing together a first semicrystalline polymer; 4 to 25% by weight of the composition of carbon black and a sufficient amount of a second semicrystalline polymer having a sufficient number of molecules of a molecular weight of 40,000 or less to substantially eliminate an annealing period necessary to achieve an electrically conductive material exhibiting PTC behavior.

5,143,650

ELECTROPHORETIC COATABLE SEALANT COMPOSITIONS COMPRISING POLYVINYL CHLORIDE AND FURNACE CARBON BLACK

Janet M. Gerace, and Michael J. Gerace, both of Dayton, Ohio, assignors to Aster, Inc., Dayton, Ohio

Filed Nov. 13, 1990, Ser. No. 612,541
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] H01B *1/24;* C08K *5/9*
U.S. Cl. 252—511 8 Claims

1. An electrophoretic coatable sealant composition for use in assembling automobile bodies comprising:

(a) a finely divided polyvinyl chloride resin in an amount from about 20% to 35% by weight;

(b) a plasticizer in an amount from about 15% to 45% by weight;

(c) a thermoplastic polymeric resin selected from the group consisting of polyethylene, polyamides, polyvinyl butyrals, polyvinyl acetate, cellulose derivatives, polyesters, polymethyl methacrylates and ethacrylates, polyvinyl ethers, polyurethanes, ethylene vinyl acetate, vinyl acetate ethylene, vinyl acetate, acrylonitrile, acrylonitrile butadiene copolymer, chlorinated ethylene vinyl acetate, polyepsilon caprolactone, methyl methacrylate, polybutylene terephthalate and mixtures thereof in an amount from about 2% to 25% by weight;

(d) an adhesion promoter in an amount from about 3% to 15% by weight, said adhesion promoter comprising an unsaturated organosilane, an acrylic monomer and an unsaturated acid or anhydride monomer;

(e) a conductive filler in an amount from about 0.5 % to 10% by weight, said conductive filler being an electroconductive non-treated furnace carbon black; and

(f) a nonconducting filler selected from the group consisting of ground and precipitated calcium carbonate, precipitated silica, clays and talcs in an amount from about 0% to 20% by weight.

5,143,651

ZINC OXIDE-BASED COMPOSITION FOR LOW AND MEDIUM VOLTAGE VARISTORS

Jean-Pierre Caffin, Dijon, France, assignor to Compagnie Europeenne De Composants Electroniques LCC, Courbevoie, France

Filed Sep. 7, 1990, Ser. No. 578,683
Claims priority, application France, Sep. 8, 1989, 89 11751
Int. Cl.[5] H01B *1/00;* H01C *7/10*
U.S. Cl. 252—518 3 Claims

1. A low medium voltage varistor composition, consisting essentially of zinc oxide and the following oxides in the weight percentages shown below:

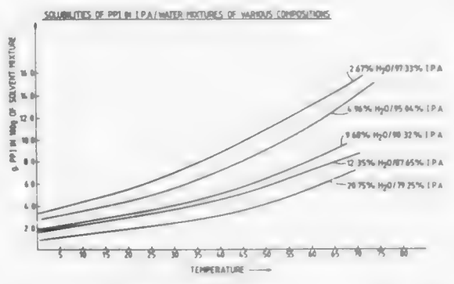
2.5	≦ Sb_2O_3	≦ 4.5
0.8	≦ Co_3O_4	≦ 1
0.4	≦ NiO	≦ 1
≦	< Cr_2O_3	≦ 0.8
0.6	≦ Mn_3O_4	≦ 0.8
4.2	≦ Bi_2O_3	≦ 4.6
0.05	≦ PbO	≦ 0.15
0.001	≦ SiO_2	≦ 0.005
0.001	≦ Al_2O_3	≦ 0.002
0.04	≦ B_2O_3	≦ 0.07.

5,143,652

REDUCED FLAMMABILITY MIXTURE BASED ON ISOPROPANOL

David S. L. Slinn, Bristol, United Kingdom, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 26, 1991, Ser. No. 690,827
Claims priority, application United Kingdom, Apr. 27, 1990, 9009504
Int. Cl.[5] C09K *21/00;* C03C *23/00*
U.S. Cl. 252—602 3 Claims



1. A mixture comprising two phases:

(1) a ternary phase having isopropanol as the major ingredient and comprising isopropanol and water substantially saturated with a perfluorocarbon having a boiling point in the range of 30° to 60° C. selected from the group consisting of perfluoro-n-hexane and perfluoromethylcyclopentane; and

(2) a ternary phase comprising isopropanol, water and the perfluorocarbon of phase (1), said perfluorocarbon being the major ingredient.

5,143,653

PROCESS FOR IMMOBILIZING RADIOACTIVE ION EXCHANGE RESINS BY A HYDRAULIC BINDER

Guy Magnin; Marie-Francoise Magnin, both of Le Havre, and Veronique Aubert, Rambouillet, all of France, assignors to Societe Anonyme: Societe Generale pour les Techniques Nouvelles-SGN, Cedex, France

Continuation-in-part of Ser. No. 314,828, Jan. 12, 1989, abandoned. This application Mar. 19, 1991, Ser. No. 675,756
Int. Cl.[5] G21F *9/16*
U.S. Cl. 252—628 13 Claims

1. A process for immobilizing, by a hydraulic binder, radioactive ion exchange resins which contain borates, said resins being in a suspension, comprising the steps of:

(a) decanting said resins 100%;

(b) placing the decanted resins in a vessel;

(c) adding to said vessel an eluant solution having between 100 and 300 grams per liter of $Ca(NO_3)_2$ with the proportion of eluant solution being from 1 to 2 liters per kilogram of said decanted resins;

(d) adding to said vessel a hydraulic binder of low hydration heat to said resins and eluant solution, the relative weight of the water of the eluant solution to the binder (by weight) being such that

$$0.3 \leq \frac{\text{water of the eluant solution (in weight)}}{\text{binder (in weight)}} \leq 0.5; \text{ and}$$

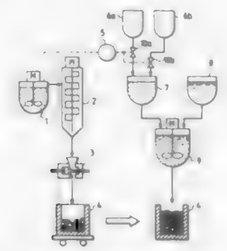
(e) mixing the contents of said vessel, the percent (by weight) of the said resins, hereinafter referred to as dry resins, to the contents of the vessel being between 3% and 10%.

5,143,654

METHOD AND APPARATUS FOR SOLIDIFYING RADIOACTIVE WASTE

Makoto Kikuchi; Masato Ohura, both of Hitachi; Shin Tamata, Higashiibaraki; Koichi Chino, Hitachi, and Kiyomi Funabashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 13, 1990, Ser. No. 581,904
Claims priority, application Japan, Sep. 20, 1989, 1-243671
Int. Cl.[5] G21F *9/16*
U.S. Cl. 252—629 15 Claims



1. A method of solidifying a radioactive waste having at least one radioactive nuclide j with solidifying agent to produce a solidified radioactive waste, comprising:

concentrating the radioactive waste to reduce its volume and produce a concentrated radioactive waste;

determining a concentration ratio α representing a reduction in volume of the waste resulting from said concentrating;

before said concentrating, determining a value of radioactive concentration of the radioactive waste that is to be solidified;

calculating a radioactive concentration C_j for said radioactive nuclide j of the solidified radioactive waste as a product of the concentration ratio α and the value of radioactive concentration of the radioactive waste that is to be solidified;

adjusting a distribution coefficient of the solidifying agent in accordance with the radioactive concentration C_j of said calculating and mixing together at least two solidifying agent components selected according to their respective distribution coefficients from a plurality of solidifying agent components having different distribution coefficients so that an amount of leaching of the solidified radioactive waste is smaller than or equal to a fixed predetermined value; and

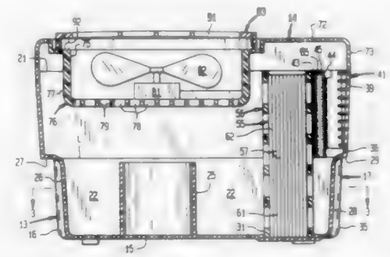
filling a container with the solidifying agent and the concentrated radioactive waste whereby after hardening the solidified radioactive waste is produced.

5,143,655

EFFICIENTLY PACKAGED HUMIDIFIER DEVICE

Bernard Chiu, Ashland, Mass.; Jui-Shang Wang, Taipei, Taiwan, and Frank Marino, Upton, Mass., assignors to Duracraft Corporation, Sudbury, Mass.

Filed Jul. 8, 1991, Ser. No. 726,677
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—24 19 Claims



1. A humidifier comprising:

a base defining a reservoir adapted to retain a liquid volume; said base having an open top and a horizontal cross section including a substantially rectangular portion, and a substantially circular portion intersecting and projecting into said rectangular portion; and said base comprising a substantially circular sidewall forming said circular portion, a substantially rectilinear endwall, a first substantially rectilinear sidewall extending between said circular sidewall and one end of said endwall, and a second substantially rectilinear sidewall extending between said circular sidewall and an opposite end of said endwall; said first sidewall, said second sidewall and said endwall forming said rectangular portion;

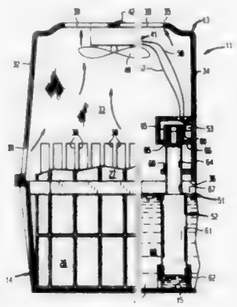
an inlet wall defining an air inlet;

a blower assembly demountably supported by said base and covering said open top; said blower assembly comprising an upper wall defining an air outlet disposed above said circular portion, a fan blade disposed between said circular portion and said air outlet, and an electrical motor coupled to said fan blade; and

wick means retained by said base in said rectangular portion, said wick means comprising a source portion disposed in said reservoir and an evaporative portion disposed thereabove and between said air inlet and said fan blade, said wick means adapted to provide liquid flow by capillary

action from said source port on to said evaporative portion.

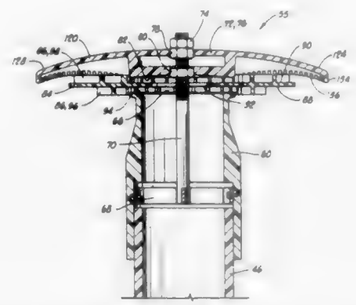
5,143,656
HUMIDIFIER WITH A TAMPER PROOF LIQUID LEVEL RESPONSIVE SHUT-OFF
Frank Marino, Upton, Mass., and Johnson Peng, Chang-Haw, Taiwan, assignors to Duracraft Corporation, Sudbury, Mass.
Filed Oct. 28, 1991, Ser. No. 783,738
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—26 21 Claims



1. A humidifier comprising:
base means defining a reservoir for retaining a liquid volume;
electrically energized humidification means for inducing dispersion of liquid contained by said reservoir;
electrical supply means for supplying electrical energy to said humidification means;
electrical switch means coupled between said supply means and said humidification means and having active and inactive states, said switch means adapted in said active state to allow said supply of electrical energy to said humidification means and adapted in said inactive state to prevent said supply of electrical energy to said humidification means;
operator means coupled to said electrical switch means and adapted for movement between active and inactive positions, said operator means adapted in said active position to induce said active state of said electrical switch means and in said inactive position to induce said inactive state of said electrical switch means;
float means disposed in said reservoir and adapted for movement in response to changes in the level of liquid therein, said float means comprising an actuator portion for inducing said movement of said operator means and having a cross-section of given shape; and
wall means limiting access to said electrical switch means and defining an opening conforming to said given shape, said opening receiving said actuator portion and accommodating movement thereof.

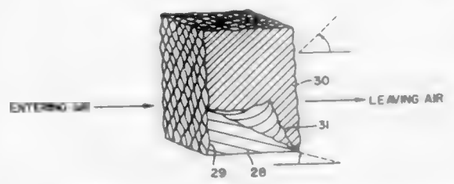
5,143,657
FLUID DISTRIBUTOR
Harold D. Curtis, Rte. 2, Box 13[illegible], Chickasha, Okla. 73018
Filed Jun. 13, 1991, Ser. No. 714,848
Int. Cl.[5] B05B *3/04, 3/10, 1/32, 1/26*
U.S. Cl. 261—89 50 Claims

1. A fluid distributing apparatus, comprising:
a supply header having a fluid outlet defined therein;
a limit means attached to said supply header, said limit means having a limit surface defined thereon spaced from said fluid outlet;
a rotatable slinger plate located between said fluid outlet and said limit surface, said slinger plate having first and second sides facing said fluid outlet and said limit surface, respectively, and said slinger plate having a central opening defined therethrough, said central opening being aligned with said fluid outlet so that fluid flowing out of said fluid outlet splits into first and second streams, said first stream being an annular stream flowing across said first side of said slinger plate, and said second stream flowing through said second opening of said slinger plate in contact with



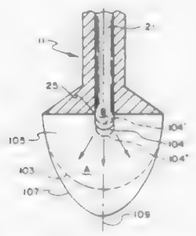
said slinger plate, then spreading into an annular second stream flowing between said limit surface and said second side of said slinger plate; and
impeller means, connected to said slinger plate, for rotating said slinger plate as fluid flows through said fluid outlet past said impeller means.

5,143,658
ALTERNATING SHEET EVAPORATIVE COOLING PAD
Patricia T. Thomas, North Fort Myers, Fla., assignor to Munters Corporation, Fort Myers, Fla.
Filed Sep. 23, 1991, Ser. No. 763,938
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—112.2 12 Claims



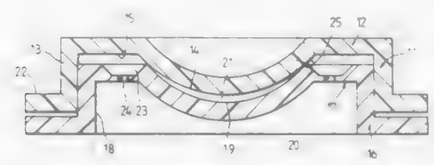
1. In a contact body for use in a gas and liquid contact apparatus in which the gas and the liquid flow in cross flow relationship to one another composed of first and second sets of corrugated sheets having corrugations defined in a direction transversely of the horizontal plane of said contact body, said sheets of the first set being disposed alternatively with the sheets of the second set, with the corrugations of the first set crossing the corrugations of the second set; said crossed corrugations defining passageways penetrating from edge to edge of the body, the corrugations of said corrugated sheets bearing against one another so that the sheets touch where the crests of their respective corrugations cross, the corrugations of the first set of sheets being inclined upwardly in the direction of gas flow, the corrugations of the second set of sheets inclining downwardly in the direction of gas flow, the inclinations of said crossed corrugations being non-symmetrical relative to a vertical plane extending perpendicular to the direction of a gas stream entering the body, the corrugations of said first set of sheets having a greater inclination to said horizontal plane than the corrugations in said second set of sheets and defining a bisector of the angle between said corrugations of said two sets of sheets inclining downwardly in a direction opposite to the direction of air flow thereby counteracting a lateral displacement of the liquid air stream over the sheets under action of gas flow, wherein the improvement comprises, said corrugations of said first set of sheets having a smaller amplitude then the corrugations of the second set of sheets.

5,143,659
METHOD AND APPARATUS FOR MANUFACTURING ASPHERICALLY SHAPED SMALL LENSES
David P. Hamblen, Rochester, and Sharma Ravi, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 417,980, Oct. 4, 1989, Pat. No. 5,040,961.
This application Aug. 16, 1991, Ser. No. 745,667
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—1.1 9 Claims



4. A method of making an aspheric lens having a gradient index of refraction, said method comprising the steps of:
a. providing a hollow pedestal;
b. forming a drop of first liquid monomer, having a first index of refraction, on a downwardly facing horizontal end surface of said pedestal, said end surface having a perimeter defined by a sharp edge;
c. flowing a second liquid monomer, having a second index of refraction, through the hollow pedestal and into said first monomer, such that a gradient index profile is built, said sharp edge being adapted, by virtue of surface tension in said liquid monomers, to form a boundary of the free aspheric liquid monomer-to-ambient-atmosphere surface of said drop; and
d. curing said inter diffused monomers to form said surface of said drop into a convex surface of the completed aspheric lens.

5,143,660
METHOD OF CASTING A CONTACT LENS
Ronald S. Hamilton, Winchester, and William E. Seden, Fareham, both of England, assignors to National Research Development Corporation, London, England
Continuation-in-part of Ser. No. 423,237, Oct. 18, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 620,722
Claims priority, application United Kingdom, Nov. 2, 1988, 8825650; Mar. 2, 1989, 8904720
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—1.4 14 Claims



1. A method of cast moulding a contact lens comprising the steps of:
placing a monomer in a mould having a mould cavity between relatively movable male and female mould surfaces, either one of the mould surfaces having a rigid shoulder integral therewith for forming a peripheral seal between the two mould surfaces to close the cavity, at least one of the mould surfaces being flexible under a loading pressure;
closing said mould cavity with monomer filling the cavity;
placing the mould in a pressure vessel;
applying a superatmospheric pressure so that said loading pressure acts on the mould surfaces and forms a pressurized seal around said rigid shoulder; and
curing the monomer whereby said loading pressure causes deflection of one of the mould surfaces to maintain the surfaces in contact with the lens as the monomer shrinks during polymerisation.

5,143,661
SILICONE-HARDENED PHARMACEUTICAL MICROCAPSULES
James R. Lawter, Goshen, and Michael G. Lanzilotti, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Continuation of Ser. No. 54,372, May 26, 1987, Pat. No. 5,000,886. This application Oct. 22, 1990, Ser. No. 602,414
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] A61K *9/50*
U.S. Cl. 264—4.3 35 Claims

1. A composition of matter comprising a microencapsulated pharmaceutical agent, wherein the microscapules are prepared by phase separation microencapsulation employing a volatile silicone fluid as a hardening agent, and wherein the microcapsules are comprised of pharmaceutical agent, biocompatible encapsulating polymer, and volatile silicone fluid hardening agent.

5,143,662
PROCESS FOR PREPARING PARTICLES OF BIOABSORBABLE POLYMER
Michael P. Chesterfield, Norwalk; Ross R. Muth, Brookfield, and John Kennedy, Stratford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Feb. 12, 1991, Ser. No. 654,219
Int. Cl.[5] B29B *9/10*
U.S. Cl. 264—8 30 Claims

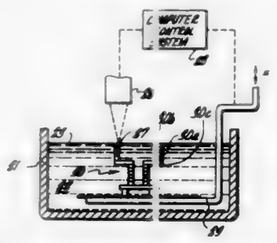
1. Method for producing particles of polymer which comprises
subjecting a polymer having a viscosity of at least about 0.28 cp. to rotary atomization employing a rotary atomization unit possessing a substantially circular rotating element upon whose surface the polymer breaks up into particles which are thrust away from the rotating element to solidify in free flight,
the conditions of rotary atomization providing solid particles of the polymer within a range of average particle size of from about 0.1 to about 3 mm., and including
a polymer temperature of from about 200 to about 300° C.,
a rate of rotation of said rotating element of from about 100 to about 1,000 rpm., and
a temperature of said rotating element of from about 200 to about 300° C.,
whereby fiber-forming tendencies of the polymer are suppressed.

5,143,663
STEREOLITHOGRAPHY METHOD AND APPARATUS
Richard N. Leyden, Topanga; Thomas A. Almouist, San Gabriel; Mark A. Lewis, Valencia, and Hop D. Nguyen, Little Rock, all of Calif., assignors to 3D Systems, Inc., Valencia, Calif.
Filed Jun. 12, 1989, Ser. No. 365,444
Int. Cl.[5] B29C *35/08, 41/02*
U.S. Cl. 264—22 39 Claims

22. An improved stereolithographic apparatus for producing a part by forming successive cross-sectional patterns of said part at a selected surface of a material capable of selective

physical transformation upon exposure to prescribed synergistic stimulation including means for forming coatings of said material on said cross-sections as they are formed and for building up said part in a step-wise fashion, the improvement comprising means for integrating part cleaning and post-curing in the same apparatus with part building, including means for building the part, means for immersing at least a portion of the part in a volume of liquid stripping medium, and means for supplying synergistic stimulation to at least some of the immersed portion of the part to effect post-curing after substantially removing the excess material from the portion.

26. An improved stereolithographic method for forming a



part from a material capable of selective physical transformation upon exposure to prescribed synergistic stimulation including forming successive cross sectional patterns of the part on a selected surface of the material, forming a coating of said material on said cross-sections as they are formed and building up the part in a step-wise fashion, the improvement comprising the steps of integratably performing part cleaning and post-curing in the same apparatus with part building including the step of forming the part, the step of immersing at least a portion of the part in a volume of liquid stripping medium, and the step of exposing at least some of the immersed portion of the part to synergistic stimulation to effect post-curing after substantially removing excess material from the portion.

5,143,664

METHOD OF PREPARING A POROUS STRUCTURAL UNIT

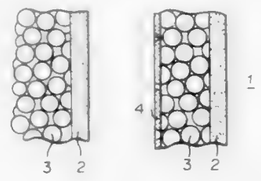
Yoshihiro Noguchi; Toshihisa Inai; Yutaka Takahashi, all of Hanazono, and Hideharu Tanaka, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Mitsubishi Electric Home Appliance Co., Ltd., Saitama, both of, Japan

Division of Ser. No. 429,496, Oct 31, 1989, Pat. No. 5,108,833. This application Jun. 26, 1991, Ser. No. 721,243

Claims priority, application Japan, Oct. 31, 1988, 63-275688; Apr. 24, 1989, 1-104228; Apr. 28, 1989, 1-110996; Aug. 11, 1989, 1-208418

Int. Cl.[5] B29C *43/20*

U.S. Cl. 264—113 17 Claims



1. A method of preparing a porous structural unit which comprises:

a step of putting a material including resin particles into a space formed by first and second molds,

a step of producing a temperature difference between said first and second molds,

a step of pressing said material with said molds, and

a step of heating at least one of said molds to a temperature sufficient to soften said resin particles in said material, whereby a layer having a higher specific gravity produced at the high temperature side of said molds and a porous layer having a lower specific gravity produced at the low temperature side are formed in one piece,

wherein said first mold has a heat capacity different from that of said second mold.

5,143,665

METHOD OF PRODUCING MOLDS THAT CAN BE WASHED AWAY WITH WATER AND USE OF SUCH MOLDS

Neville H. Clubbs; Hans-Joachim Förster, both of Schwetzingen; Ulrich Kiefer, Eppelheim, and Jürgen Bleh, Mutterstadt, all of Fed. Rep. of Germany, assignors to Giulini Chemie GmbH, Ludwigshafen/Rh, Fed. Rep. of Germany

Division of Ser. No. 344,979, Apr. 28, 1989, abandoned. This application Mar. 28, 1991, Ser. No. 676,275

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814528

Int. Cl.[5] B29C *33/52*

U.S. Cl. 264—221 20 Claims

1. A method of producing a mold which can be washed away with water after use thereof in a molding process provided that the mold is heated for at least 2 hours at a temperature of at least 125° C. prior to being removed by washing away with water, the method comprising:

a. providing a ceramic composition by dry mixing:

(i) from about 30 to about 80 weight percent of at least one hemihydrate selected from the group consisting of alpha-calcium sulfate hemihydrate and beta-calcium sulfate hemihydrate;

(i.i.) from about 5 to about 45 weight percent of fireclay; and

(i.i.i.) from about 5 to about 25 weight percent of at least one silicate-based filler;

b. mixing about 100 parts by weight of the ceramic composition under stirring into from about 46 to about 54 parts by weight of water to form a slurry;

c. pouring the slurry into a formation mold suitable for forming the mold;

d. allowing the slurry contained in the formation mold to set and form a set body;

e. removing the set body from the formation mold; and

f. drying the set body to provide the mold.

5,143,666

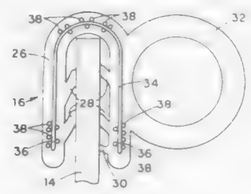
METHOD FOR MANUFACTURING AN IMPROVED ELASTOMERIC STRIP

Michael J. McManus; David H. Berry, and Harold P. Dover, all of Maryville, Tenn., assignors to Schlegel Corporation, Rochester, N.Y.

Division of Ser. No. 345,612, Apr. 28, 1989, Pat. No. 5,009,947. This application Jan. 28, 1991, Ser. No. 647,713

Int. Cl.[5] E06B *7/16*

U.S. Cl. 264—26 12 Claims



1. A method of manufacturing an elastomeric strip of substantially U-shaped cross-section which is adapted to be

mounted on a flange having longitudinally-spaced curved sections, comprising the steps of:

(a) forming a support frame having longitudinally displaceable frame portions;

(b) reinforcing the frame portions of the support frame with longitudinally extending, degradable, reinforcing material to inhibit longitudinal displacement of the support frame portions during the coating operation; (c) advancing the reinforced support frame through an extrusion die: (d) extruding a coating of an elastomeric material on the reinforced support frame as it is advanced through the extrusion die to form an elastomeric strip without degrading the degradable material; and (e) selectively degrading all of the longitudinal reinforcing material of the strip within a plurality of longitudinally spaced regions corresponding to the longitudinally-spaced curved sections of the flange such that the degraded regions are substantially unrestricted longitudinally by reinforcing material, whereby the degraded regions of the elastomeric strip more faithfully follow the curved sections of the flange when the strip is mounted thereon.

5,143,667

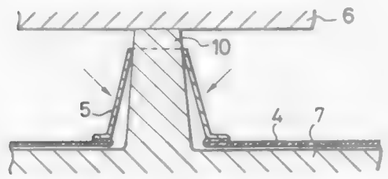
SKIN COVERED FOAMED PLASTIC SEAT WITH HOLES

Ichiro Matsuura; Takashi Sugiura; Fumio Miyauchi, and Toyoharu Chiyoshi, all of Ayase, Japan, assignors to Ikeda Bussan Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 395,034, Aug. 17, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 611,325

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.6 3 Claims



1. A method of manufacturing a skin covered foamed plastic seat with holes therein, the skin covered foamed plastic seat comprising a pad member covered by a skin cover having holes corresponding to holes of the pad member, and the method comprising the steps of:

providing a skin cover and separate trim covers;

attaching the separate trim covers to the skin cover at the holes of the skin cover;

placing the skin cover with the attached trim covers on a molding surface having bossings for forming the holes of the pad member so that the trim covers cover side faces of the bossings; and

pouring liquid foam resin onto the skin cover placed on the molding surface and allowing the liquid foam resin to stiffen, so that the holes are made in the pad member by the bossings, and so that the trim covers are covering circumferential faces of the holes.

5,143,668

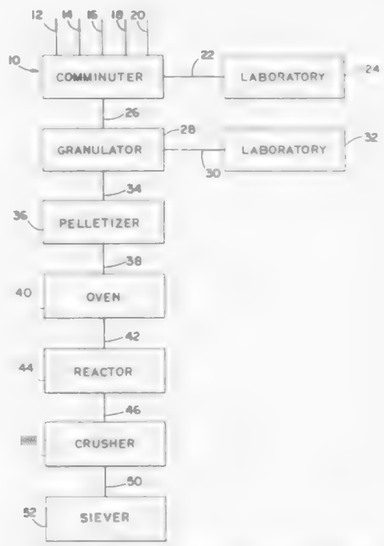
PROCESS FOR MAKING A REACTION-SINTERED CARBIDE-BASED COMPOSITE BODY WITH CONTROLLED COMBUSTION SYNTHESIS

George T. Hida, Amherst, N.Y., assignor to Benchmark Structural Ceramics Corporation, Amherst, N.Y.

Continuation-in-part of Ser. No. 254,108, Oct. 6, 1988, Pat. No. 5,032,332. This application Jul. 10, 1991, Ser. No. 728,235

Int. Cl.[5] C04B *35/65*

U.S. Cl. 264—63 14 Claims



1. A process of preparing a sintered composite material comprised of alumina and silicon carbide, comprising the steps of sequentially:

(a) providing a mixture comprised of from about 17 to about 34 percent of aluminum from about 11 to about 24 percent of amorphous carbon, and from about 55 to about 63 percent of silica, based on total weight of aluminum, carbon, and silica, wherein:

1. said aluminum has a specific surface area of from about 0.2 to about 1.1 square meters per gram, has a particle size distribution which ranges from about 4 to about 28 microns, and has at least 80 weight percent of its particles in the range of from about 6 to about 12 microns.

2. said amorphous carbon has a specific surface area of at least about 4 square meters per gram, and

3. said silica has a specific surface area of from about 1.2 to about 400 square meters per gram;

(b) comminuting said mixture until a substantially single-phase material is produced;

(c) granulating said single-phase material until substantially all of the particles in the material have a maximum dimension of from about 50 to about 2,000 microns;

(d) forming said granulated material into a green body;

(e) heating said green body to a temperature of from about 400 to about 600 degrees centigrade;

(f) packing said green body in an inert powder, thereby forming an inert-powder/green body assembly; and

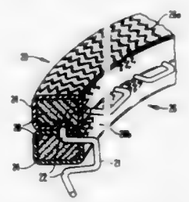
(g) heating said inert-powder green body assembly to a temperature of from about 700 to about 900 degrees centigrade, thereby causing said green body to ignite, to combust, and to produce a sintered body.

5,143,669

FIBER-REINFORCED MOLDED RACQUET FRAME

Jonathan C. Mott, Nr. Guildford, England, assignor to Diversified Products Corporation, Opelika, Ala.

Division of Ser. No. 265,333, Oct. 24, 1988, Pat. No. 4,935,185, which is a continuation of Ser. No. 838,791, Mar. 12, 1986, abandoned. This application Jun 18, 1990, Ser. No. 539,215
Claims priority, application United Kingdom, Mar. 12, 1985, 8506351
Int. Cl.[5] A63B 49/10; B29C 33/14
U.S. Cl. 264—103 15 Claims



1. A method of making a fiber-reinforced molded racquet frame, said method comprising the steps of:
forming a first core including a tube having at least one layer of woven reinforcing fibers;
forming a second core including a tube having at least one layer of woven reinforcing fibers;
forming a mold cavity within a mold in the shape of a racquet frame with a first portion of the mold cavity formed in an upper mold plate and a second portion of the mold cavity formed in a lower mold plate;
forming a plurality of string-securing members each comprising a first portion shaped to receive and position at least one string of stringing to be secured in the frame and a second portion adapted to be embedded in the frame;
placing the first and second cores in the mold cavity;
supporting the string-securing members such that upon closure of the mold, the second portions are disposed inside the mold cavity and entrapped between the two cores while the first portions project out of the mold cavity into the area which will be surrounded by the molded frame;
closing the mold and thereby placing the opposing surfaces of the upper mold plate and the lower mold plate into contact with one another;
injecting a plastics material having a low setting temperature and a low viscosity into the mold around the core;
allowing the plastics material to harden in the mold cavity to thereby form the molded racquet frame and to thereby form a thin layer between the mold cavity and an outer surface of the tube, thereby providing upon removal from the mold cavity a finished surface defining an outer racquet frame surface which requires no additional processing; and
removing the molded racquet frame formed of the cores and hardened plastics material from the mold cavity.

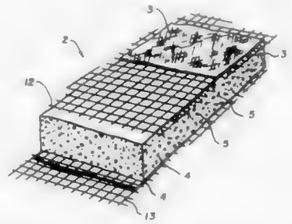
5,143,670

SLAB SHAPED BUILDING COMPONENTS AND METHOD OF FORMING SAME

Ferdinando De Buzzaccarini, West Vancouver, Italy, assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 19, 1989, Ser. No. 382,803
Claims priority, application Italy, Jul. 19, 1988, 21413 A/88
Int. Cl.[5] B28B 1/16
U.S. Cl. 264—113 7 Claims

1. A process for forming slab shaped building components, comprising the steps of:
wetting a plurality of expanded polystyrene beads with water and water-soluble synthetic resin, in a quantity proportional to the amount of said beads, to coat said beads;
adding an amount of an inert filler proportional to the amount of beads;
at least one of the steps of drying and polymerizing said beads
mixing said coated beads with predetermined proportions of cement, sand, fluidifying additive and water to form a mixture;
placing a layer of the mixture in a form;
laying a first piece of mesh material on said layer;



covering said first piece of mesh material by introducing into said form a predetermined additional quantity of the mixture;
laying on top of said additional quantity a second piece of mesh material;
covering said second mesh material with said mixture in said form;
curing said mixture; and
withdrawing a thus-formed slab-shaped element from said form.

5,143,671

FLUIDIZED BED PROCESS FOR TREATING PIGMENTS

Kimberly T. Peters, Johnson City; E. Phillip Smith, Blountville, and Shane K. Kirk, Church Hill, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1990, Ser. No. 607,409
Int. Cl.[5] C08K 5/36; B29B 9/12
U.S. Cl. 264—117 31 Claims

1. In a process for producing a treated granular pigment product in a fluidized bed using a binder as a granulating assistant, the improvement comprising use of at least one water-dispersible, sulfonate group-containing polyester as said binder.

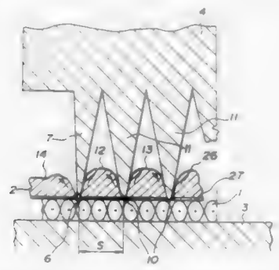
5,143,672

METHOD FOR FORMING EMBLEM OF THERMOPLASTIC SYNTHETIC RESIN FILM

Eiji Kuwahara, Excellence Shioya No. 105, No. 648-3, Aza Otani, Shioya-Cho, Tarumi-Ku, Kobe-Shi, Hyogo-Ken, Japan

Filed Dec. 20, 1988, Ser. No. 286,730
Claims priority, application Japan, Dec. 23, 1987, 62-326417; Dec. 24, 1987, 62-327889; Dec. 28, 1987, 62-333488
Int. Cl.[5] B29C 43/20
U.S. Cl. 264—132 14 Claims

1. A method for forming a gold-laced emblem of thermoplastic synthetic resin comprising the steps of:
(a) forming a woven fabric-like fine uneven pattern on an outer surface of the thermoplastic synthetic resin film having a metal deposited layer on a lower surface thereof,
(b) superposing the film on an upper surface of a base,
(c) pressing the film by an engraving die having one or more fusion cutters having sharp cutting edges along a profile line of a pattern to be shaped and one or more pressing cutters, an edge face of which is slightly above a cutting edge face of the sharp cutting edges,
(d) high-frequency-induction-heating the film by the engraving die so as to plasticize and swell the film to both sides of each pressing cutter in a quantity corresponding to film portions intruded by each pressing cutter, and so as to melt the thermoplastic synthetic resin film by each pressing cutter at film portions contacted with the pressing cutting edges of each pressing cutter to reduce a thickness



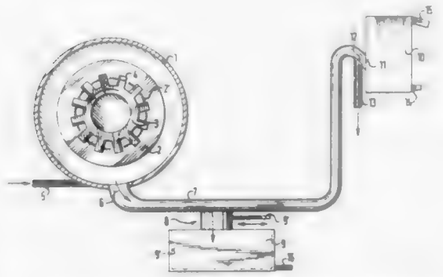
of the film at film portions pressed by the pressing cutting edges so that the base can be visually observed through the reduced thickness film, and
(e) then removing the thermoplastic synthetic resin film outside the profile line.

5,143,673

PROCESS AND APPARATUS FOR UNDERWATER GRANULATION OF MOLTEN THERMOPLASTIC MATERIAL PARTICULARLY DURING START-UP PERIODS

Albert Grimminger, Leonberg, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 19, 1990, Ser. No. 615,333
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941418
Int. Cl.[5] B29B 9/06
U.S. Cl. 264—142 20 Claims



1. A process for the granulation of a molten thermoplastic material in a liquid medium, comprising:
passing a molten thermoplastic material through openings in an orifice plate to produce strands of the thermoplastic material,
discharging the strands into a liquid cooling medium flowing through a granulator housing,
cutting the strands of thermoplastic material in the liquid medium to form granulates of thermoplastic material in the liquid medium,
discharging the granulates and liquid medium from the housing to a post-treatment station, and
during start-up of the process,
forming the liquid cooling medium flowing through the granulator housing as an annular ring which surrounds said orifice plate so that initially the strands of melt from said openings in the orifice plate are discharged into air and are cut into granules which then drop into the ring of liquid cooling medium,
discharging the granules from the housing in the liquid medium flowing through the housing,
diverting the flow of the granules and the liquid medium discharged from the housing, before the granules and liquid medium reach the post-treatment station, at a relatively low back-pressure until the throughput of the molten thermoplastic material in the openings of the orifice plate reaches a predetermined value, and then
terminating said diverting of the flow of granules and liquid medium and conveying the granules and liquid medium to said post-treatment station which increases the back-pressure of the liquid medium in the housing causing the housing to become filled with said liquid medium.

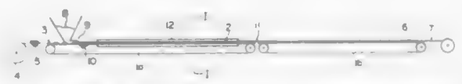
8. Apparatus for the granulation of a molten thermoplastic material in a liquid medium comprising
a granulator housing having an inlet and an outlet for flow of a liquid cooling medium through said housing,
an orifice plate operatively disposed relative to said housing and having openings through which molten thermoplastic material is passed and discharged as strands into the liquid cooling medium flowing through said housing,
cutting means in said housing adjacent to said orifice plate for cutting the strands of molten thermoplastic material discharged from the openings in said orifice plate into granulate,
post-treatment means for post-treating said granulate,
means for conveying said granulate and the cooling liquid medium flowing from said outlet of said housing to an inlet of said post-treatment means, and
diverting means connected to the conveying means between the outlet of the housing and the inlet of the post-treatment means for selectively diverting flow of liquid medium and granulate from said post-treatment means,
said inlet of said post-treatment means being at a level above the outlet of the housing and above the diverting means.

5,143,674

PROCESS FOR FORMING FERROCEMENT PRODUCTS

Christopher J. Busck, Auckland, New Zealand, assignor to Fibre Cement Technology Limited, Auckland, New Zealand

Filed Oct. 16, 1989, Ser. No. 422,112
Claims priority, application New Zealand, Oct. 14, 1988, 226585
Int. Cl.[5] B28B 5/00, 7/14; B29C 53/02; B29D 7/00
U.S. Cl. 264—145 21 Claims



1. A process for continuous for semi-continuous production of thin walled planar or rectilinear ferrocement products comprising the steps of:
forming a liquid or semi-liquid cement mortar including incorporating in the mortar one or more agents for causing or controlling development of a plastic state by the mortar in which developed plastic state the mortar possesses sufficient plasticity and cohesion to enable a thin sheet of ferrocement composed of the mortar with reinforcing material to be removed from a production apparatus and allowed to fully cure to form a solid product away from the production apparatus,
positioning reinforcing materials for the ferrocement product on a continuous or semi-continuous production apparatus, the reinforcing materials being disposed in at least one layer and including ferrous materials in a form of wire or mesh,
placing the mortar as a thin layer to a required wall thickness

of the product on the production apparatus while in the liquid or semi-liquid state and so that the thin layer of mortar surrounds the reinforcing materials in the reinforcing layer, and the layer of reinforcing materials extends along a length of and within the thin layer of mortar to provide the thin sheet of ferrocement,

allowing or causing the state of the mortar whilst on the production apparatus to develop from the liquid or semi-liquid state to the plastic state wherein the mortar possesses sufficient plasticity and cohesion to enable the thin layer of mortar with the layer of reinforcing materials maintained in position therein to be removed from the production apparatus as the thin sheet of ferrocement before full curing of the mortar occurs,

removing the thin sheet of ferrocement or lengths thereof with the reinforcing layer therein from the production apparatus while in the developed plastic state and before full curing of the mortar occurs, and

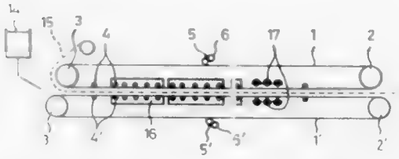
allowing the removed thin ferrocement sheet or lengths thereof with the reinforcing layer therein to fully cure while away from the production apparatus to form the solid ferrocement product.

5,143,675

PROCESS FOR PREPARING SYNTHETIC RESIN MOLDED ARTICLES HAVING GOOD ANTISTATIC PROPERTY

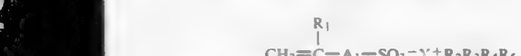
Naoki Yamamoto, and Hiroki Hatakeyama, both of Otake, Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,183
Int. Cl.[5] B29C *39/10*; B32B *27/08*
U.S. Cl. 264—171 8 Claims



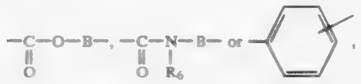
1. A process for the preparation of a synthetic resin molded article having a good antistatic property, which comprises the steps of:

forming on the molding surface of a casting mold a film of an antistatic polymer by polymerizing an anionic monomer represented by the following general formula (I) or a mixture comprising at least 20% by weight of said anionic monomer and up to 80% by weight of at least one monomer copolymerizable therewith:



(I)

wherein R_1 represents a hydrogen atom or a methyl group, A_1 represents $(CH_2)_n$,



X represents a nitrogen atom or a phosphorus atom, R_2, R_3, R_4 and R_5 independently represent an alkylene, arylene or aralkylene group having 1 to 18 carbon atoms which may have a substituent, n is 0, 1 or 2, B represents an alkylene, arylene or aralkylene group having 1 to 18 carbon atoms which may have an ester bond, and R_6 represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms;

casting a starting material of a synthetic resin as the substrate into the casting mold;

polymerizing said starting material to transfer said film to the surface of the substrate; and

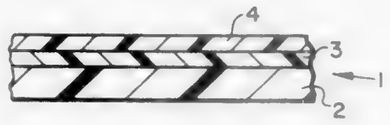
withdrawing the obtained molded article from the casting mold.

5,143,676

PROCESS FOR PRODUCTION OF A FILM INCLUDING A SILICONE LAYER

Josef Müller, Josef-Kolb-Str. 20, 8557 Eggolsheim, and Alfred Neudecker, Buckenhofener Str. 41, 8550 Forchheim, both of Fed. Rep. of Germany

Filed Nov. 23, 1990, Ser. No. 617,136
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1989, 3938808
Int. Cl.[5] B29C *47/04*
U.S. Cl. 264—171 6 Claims



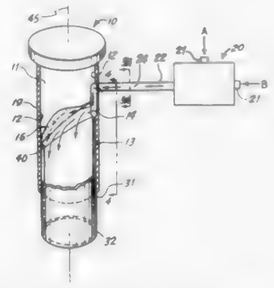
1. In a process for the production of a film at least one side of which is provided with a silicone layer which requires coloring, for identification purposes, the improvement which comprises producing the film by coextrusion so that the coextruded film comprises at least three layers, one of which is an outer layer of silicone and under which is a colored intermediate layer with a further layer on the other side of the intermediate layer, whereby the coextruded siliconized film is colored without including coloring pigment in the silicone layer itself.

5,143,677

CO-EXTRUSIONS METHODS

Robert J. Blemberg, Appleton; John P. Eckstein, Neenah, and Mark E. Nordness, Appleton, all of Wis., assignors to American National Can Company, Chicago, Ill.

Continuation-in-part of Ser. No. 204,485, Jun. 9, 1988, abandoned, and a continuation-in-part of Ser. No. 140,096, Dec. 31, 1987, Pat. No. 4,944,972. This application Dec. 28, 1989, Ser. No. 458,488
Int. Cl.[5] B29C *47/06, 47/20*
U.S. Cl. 264—173 13 Claims



1. A method of fabricating a tubular multiple layer polymeric film from a plurality of in-feed streams of melted polymer, said method comprising the steps of:

(a) feeding said in-feed streams into a coextrusion feedblock, said feedblock receiving said in-feed streams and combining said in-feed streams into a multiple layer melt stream, said melt stream comprising at least 2 layers;

(b) conveying said multiple layer melt stream from said feedblock to an annular crosshead groove in an annular extrusion die, said die comprising a fluid communication passage extending between an inlet and an exit in said die;

(c) forcing said melt stream through said crosshead groove, over a pair of transition ramps on opposing sides of said passage, and into an annular film-forming channel; and

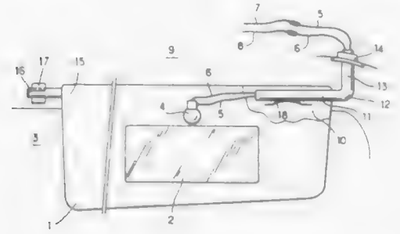
(d) forcing said melt stream through said film-forming channel and out of said die at said die exit, thereby forming said exit melt stream into said tubular multiple layer polymeric film.

5,143,678

ANGLED SUPPORT ARM FOR A SUN-VISOR WHICH IS ELECTRICALLY POWERED BY CONDUCTORS

Charles B. Prillard, Rupt sur Moselle, France, assignor to Rockwell ABS - France, Paris, France

Filed Mar. 11, 1991, Ser. No. 667,447
Claims priority, application France, Mar. 13, 1990, 90 03194
Int. Cl.[5] B28B *7/22*
U.S. Cl. 264—255 12 Claims



7. A method of making an angled support arm for a sunvisor, said support arm being made of a plastic material and supporting at least two electrical conductors, a portion of said conductors passing through said support arm, wherein said plastic material is molded over said portion of conductors by injection in two stages comprising:

a first stage in which a plastic material is molded over said portion of said conductors in a first mold to obtain a support arm blank in which said plastic material constitutes a block with said portion of said conductors therein, said blank having at least a portion thereof which is smaller in section than a corresponding section of said support arm; and

a second stage in which said blank is itself overmolded in a second mold by a plastic material to obtain said finished support arm.

5,143,679

METHOD FOR SEQUENTIALLY STRETCHING ZERO STRAIN STRETCH LAMINATE WEB TO IMPART ELASTICITY THERETO WITHOUT RUPTURING THE WEB

Gerald M. Weber, Loveland, and James W. Richardson, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

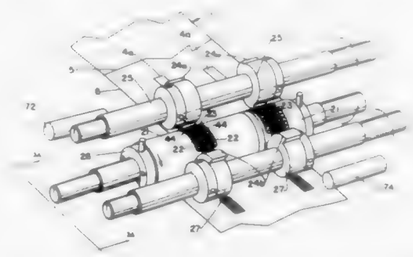
Filed Feb. 28, 1991, Ser. No. 662,543
Int. Cl.[5] B29C *55/04*
U.S. Cl. 264—288.8 22 Claims

1. An improved method for sequentially stretching a zero strain stretch laminate web to impart elasticity thereto in the direction of stretching, at least up to the point of initial stretching, without rupturing said zero strain stretch laminate web, said method comprising the steps of:

(a) feeding a zero strain stretch laminate web comprising a substantially untensioned first elastomeric ply intermittently secured to a substantially untensioned second ply comprising a continuous web which is elongatable, but which exhibits less elastic recovery than said first ply, between a first pair of opposed pressure applicators having three-dimensional surfaces which, at least to a degree, are complementary to one another;

(b) subjecting the portions of said zero strain stretch laminate web located between said first pair of opposed pressure applicators to incremental stretching by causing said three-dimensional surfaces of said first pair of opposed pressure applicators to mesh with one another, at least to a degree, whereby said second elongatable ply is permanently elongated, at least to a degree, by said initial incremental stretching;

(c) removing at least one of said first pair of pressure applicators from contact with the surface of said initially



stretched portion of said zero strain stretch laminate web, thereby relieving the stretching tension on said initially stretched portion of said laminate web; and

(d) subjecting said initially stretched portions of said zero strain stretch laminate web to further incremental stretching by contacting the exposed surface of said partially stretched zero strain stretch laminate web with a second pair of opposed pressure applicators having three-dimensional surfaces which are also, at least to a degree, complementary to one another, but which mesh to a greater degree than said first pair of opposed pressure applicators, whereby said second elongatable ply is further permanently elongated with minimal damage by said sequential stretching operations so that said laminate web is elastically extensible in the direction of incremental stretching, at least up to the point of stretching by said second pair of opposed pressure applicators, and the width of said laminate web measured in said direction of stretching is substantially the same as before said initial stretching was applied once the incremental stretching forces are removed from said zero strain stretch laminate web.

5,143,680

METHOD AND APPARATUS FOR DEPOSITING MOISTURE-ABSORBENT AND THERMOPLASTIC MATERIAL IN A SUBSTRATE

Julius J. Molnar, Amherst; Ernest J. Fena, Rocky River, both of Ohio; David W. Folden, Delmont, Pa.; Douglas A. Schneider; Richard A. Becker, both of Lorain, Ohio; Charles L. Fimmen, Elyria, Ohio; David M. Selestak, Avon, Ohio, and Robert Shlapak, Wakeman, Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed May 17, 1990, Ser. No. 525,880
Int. Cl.[5] D04H *1/70*
U.S. Cl. 264—511 78 Claims

1. Apparatus for forming a non-woven pad of fibrous material with a first material and a thermoplastic material inter-

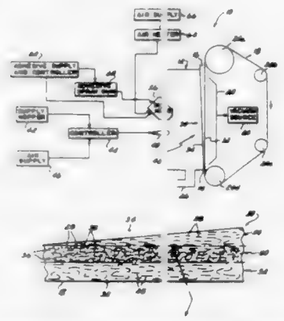
spersed throughout a selected po tion of the thickness of said non-woven pad, comprising:

a forming chamber having an i terior;

pad support means for supporti ig said non-woven pad, said pad support means being movable in a first direction within said interior of said forming chamber;

means for introducing fibrous material into said interior of said forming chamber;

vacuum means for applying a vacuum to draw said fibrous material onto said pad suppor means, said fibrous material forming said non-woven pad on said pad support means which increases in thickness in said first direction of movement of said pad suppo t means;



first dispenser means for interm ixing said first material with a portion of said fibrous ma erial being drawn onto said pad support means at a prede ermined location within said forming chamber;

second dispenser means for forming thermoplastic fibers from said thermoplastic mat rial and for dispensing said thermoplastic fibers into saic forming chamber for intermixing with said first mater al and said fibrous material being drawn onto said pad su pport means at said predetermined location to form a laye r of intermixed fibrous material, first material and therm plastic fibers within a predetermined portion of said thic ness of said non-woven pad while maintaining another po rtion of said thickness of said non-woven pad substantially free of said first material and said thermoplastic fibers.

5,143,611

EXTRUSION BLOW MOLDING OF MULTILAYER HOLLOW BODIES WITH LAYER DISTURBANCES LIMITED TO FLASH

Werner Daubenbüchel, Bergisch-Gladbach; Otto Eiselen, Königswinter; Karsten Friedrichs, Bad Honnef; Erich Kiefer, and Peter Klüsener, both of Bonn, all of Fed. Rep. of Germany, assignors to Krupp Kautex Maschinenbak GmbH, Bonn, Fed. Rep. of Germany

Continuation of Ser. No. 410,190, Sep. 20, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 670,502

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831836

The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.

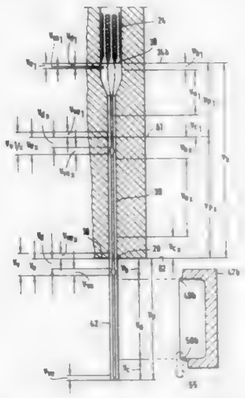
Int. Cl.[5] B29C *49/04, 49/22, 49/78*

U.S. Cl. 264—515 **34 Claims**

1. A process for producing multilayer hollow bodies by blow molding of multilayer preforms batch extruded through an outlet opening of a single extrusion head, the extrusion head further including a laminate formation region, a communicating duct connecting the laminate formation region and the outlet opening, and a storage chamber located along the communicating duct upstream from the outlet opening and defined by emptying means, the emptying means being movable in a filling stroke movement between second and first limit positions for accumulating material in the storage chamber and in an emptying stroke movement between the first and second limit positions for ejecting material from the storage chamber, each preform having a tubular wall with at least two layers of different thermoplastic materials laminated together, a substantially identical predetermined volume of laminate material being extruded into each preform, comprising the steps of:

moving the emptying means in the filling stroke movement while feeding at least two different thermoplastic materials as separate, mutually adjacent flows through the laminate formation region, the separate flows joining together in the laminate-formation region to form a laminate material entering the communicating duct and accumulating in the storage chamber;

moving the emptying means in the emptying stroke movement to eject one predetermined volume of laminate material into the communicating duct downstream from the storage chamber and to extrude one predetermined volume of the laminate material from the communicating duct through the extrusion head opening as one preform, at least part of the laminate material being formed in the laminate formation region during at least one of a beginning of the emptying stroke movement, an ending of the emptying stroke movement, a beginning of the filling stroke movement and an ending of the filling stroke move-



ment being disturbed in laminate structure, the one extruded preform passing from the outlet opening into a mold cavity of a divided, blow molding mold, the one preform having first and second end portions and a central portion between the end portions, the first end portion preceding the central portion through the extrusion head outlet opening and the second end portion trailing the central portion through the extrusion head outlet opening, at least the central portion of the preform having been held in the communicating duct during at least the prior filling stroke movement; and

expanding at least part of the central portion of the one preform within the mold cavity to form a hollow body while squeezing off at least the first and second end portions of the one preform outside the mold cavity as excess flashing, the one preform including laminate material disturbed in laminate structure during at least one of the beginning and ending of one of the emptying stroke and filling stroke movements, and the volume of the communicating duct between the laminate formation region and the outlet opening, with the emptying means in the second limit position, being selected such that laminate material is held in the communicating duct for at least one emptying stroke movement and one subsequent filling stroke movement and is further selected such that the squeezed-off first and second end portions of the one preform contain at least essentially all of the disturbed laminate structure in the one predetermined volume of the laminate material forming the one preform.

5,143,682

DEVICE FOR THE UNIFORM SPREADING OF COVERING MATERIAL

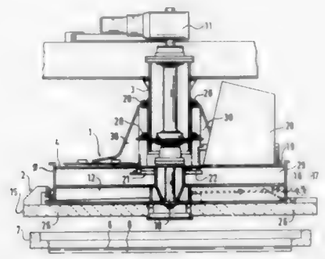
Robert Dhuyvetters, Zwijnaarde, Belgium, assignor to Repa International Limited, Dublin, Ireland

Filed Mar. 30, 1990, Ser. No. 502,268

Claims priority, application Belgium, Mar. 30, 1989, 089 00357

Int. Cl.[5] C21C *7/00*

U.S. Cl. 266—216 **10 Claims**



1. An apparatus for uniformly spreading granular or powdered material over a casting mold containing molten steel or metal, which spreading apparatus comprises a rotating assembly and a fixed assembly, wherein:

(a) said rotating assembly comprises a drive shaft and suspended therefrom a generally cylindrical distribution bin adapted to receive said granular or powdered material;

(b) said distribution bin is provided with one or more recessed troughs extending radially of said distribution bin from about the center portion thereof;

(c) said troughs comprise outflow openings through which material may be delivered from the bin;

(d) said fixed assembly comprises a cover for said distribution bin and located above said bin; and

(e) said cover is provided on its underside with at least one scraper.

5,143,683

PROTECTIVE SHIELD HAVING HEAT CONDUCTIVE PROPERTIES

Barry S. Glassman, Belair, Md.; Philip D. Stelts, Center Valley, Pa.; Joseph W. Hlinka, Bethlehem, Pa.; Charles R. Beechan, Bethlehem, Pa., and Lester A. Foster, Jr., Baltimore, Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

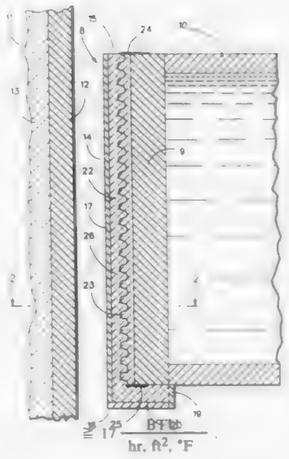
Filed Jun. 18, 1991, Ser. No. 716,888

Int. Cl.[5] C21C *5/50*

U.S. Cl. 266—246 **8 Claims**

1. In a water cooled trunnion ring supporting a tiltable steelmaking vessel, the water cooled trunnion ring including an inside wall having a surface facing said vessel, said inside wall being disposed in an concentrically spaced relationship to said vessel and providing a gap therebetween, wherein the improvement comprises one or more shields for protecting said water cooled trunnion ring from molten steel erupting from a vessel wall burn through, each said shield positioned within said gap and comprising:

a) a refractory material resistant to a continuous stream of molten steel for a period of at least 140 seconds and having a conductance



$\frac{BTUft}{hr.\ ft^2.\ °F}$

said refractory material attached to and contiguous with said inside wall surface facing said vessel, whereby said refractory material being contiguous with said inside wall surface facilitates conduction of heat from said vessel into said water cooled trunnion ring, and

b) retaining means attached to said water cooled trunnion ring, said retaining means supporting said refractory material contiguous with said inside wall surface facing said vessel.

5,143,684

INSULATED ROLLER ASSEMBLY FOR A ROLLER FURNACE

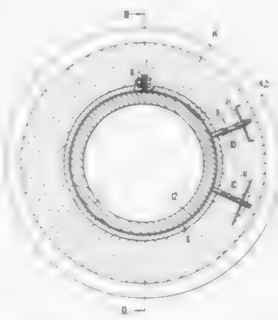
Hermann Stein, Dürkheim, and Alwin Vogel, Eisenberg, both of Fed. Rep. of Germany, assignors to Didier-Werke, Wiesbaden, Fed. Rep. of Germany

Filed May 15, 1991, Ser. No. 700,459

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025935

Int. Cl.[5] C21B *3/00*

U.S. Cl. 266—274 **25 Claims**



1. A roller assembly for supporting slabs in a roller furnace, comprising:

an elongated roller;

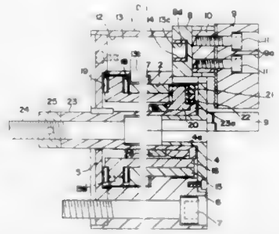
a plurality of carrier rings on said elongated roller at spaced intervals;

a first fiber mat disposed on the periphery of said elongated roller between said carrier rings;
a fibrous spraying compound sprayed on said first fiber mat, said fibrous spraying compound having a binder therein binding said fibrous spraying compound to said first fiber mat; and
a precompressed second fiber mat disposed laterally between said carrier rings and said fibrous spraying compound.

5,143,685
PROCESS FOR PURIFICATION OF ORTHO-CHLOROTOLUENE
Beth McCulloch, Barrington, Ill., assignor to UOP, Des Plaines, Ill.
Filed Dec. 28, 1988, Ser. No. 290,794
Int. Cl.[5] C07C *17/38, 7/13*
U.S. Cl. 570—211 10 Claims

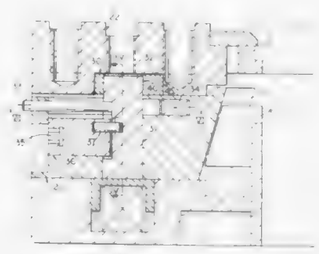
1. A process for separating ortho-chlorotoluene from a feed mixture comprising ortho-chlorotoluene and para-chlorotoluene which process comprises contacting said feed mixture at adsorption conditions, with an adsorbent comprising an L zeolite having potassium cations or mixtures thereof with sodium at cation exchange sites, selectively adsorbing said para-chlorotoluene in preference to said ortho-chlorotoluene and removing the relatively non-adsorbed ortho-chlorotoluene from contact with the adsorbent.

5,143,686
CHUCK WITH FOUR DIFFERENTIAL JAWS
Tokichi Shimizu, 73-1, 2-Chome Umedacho, Kiryu-shi, Gunma Prefecture, Post Code 376-06 Japan
PCT No. PCT/JP89/01306, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO90/07394, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 26, 1989, Ser. No. 571,651
Claims priority, application Japan, Jan. 5, 1989, 64-1083; Jan. 5, 1989, 64-1084
Int. Cl.[5] B23B *31/16*
U.S. Cl. 279—110 6 Claims



1. A chuck with four differential jaws comprising four jaws two each held opposingly and slidably in jaw grooves formed in cross at right angle on a front face of a chuck body, a driving cam for driving differential cams movable by movement of a drawing bar in axial direction along the axis and rotatable around the axis, a set of cylindrical outer and inner differential cams each having a long hole provided in different angle to engage with said driving cam at the same time and being driven in counter directions by said movement of the driving cam in the axial direction so as to cause, when the rotation of one of said differential cam is restricted, the other differential cam is rotated differentially by the rotation and movement of the driving cam along the long hole on the restricted differential cam, and jaw driving cams each disposed inserted in a bore therefor provided in the chuck body and each consisting of an engaging projection to engage with one of said differential cams respectively and a jaw driving means to engage with each of said jaws, and further, each said bore being disposed on the center line of jaw grooves formed in cross at right angle on a chuck body, and the jaw driving cams being formed to be capable of conversion to types for inward fixing, outward fixing and positioning.

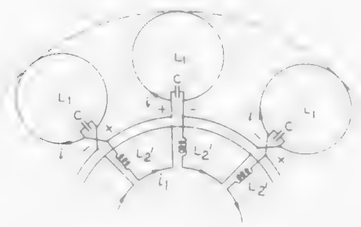
5,143,687
RAPID CHANGE WEDGE CHUCK WITH POSITIVE LOCK
Carl J. Howard, Kingsley, and Donald J. Wrobel, Traverse City, both of Mich., assignors to Sheffer Collet Company, Traverse City, Mich.
Filed Feb. 7, 1991, Ser. No. 652,125
Int. Cl.[5] B23B *31/16*
U.S. Cl. 279—123 10 Claims



1. The improvement in a chuck equipped with jaws, said chuck having a body equipped with radially extending recessed guideways opening through the circumferential face of the chuck body along which the jaws can be slidably moved radially of the chuck body, each jaw having an inner member and an outer member, said outer member having a rectangular cavity recessed into its rear face, said cavity having a pair of spaced apart parallel end walls extending transversely of the jaw support and perpendicular to a radius of the chuck body and a pair of spaced apart side walls, a plate having at least two pairs of parallel walls seated in said cavity, a circular hole recessed in said plate, the center of said hole being centered on an axis which itself extends between the centers of two parallel sides and passes through the geometric center of said plate said hole being offset along said axis from said plate's geometric center, stop means having one end of a size and shape to closely and slidably seat in said recessed hole in said plate with the radial position of said jaw being determined by which side of said pair of parallel surfaces are positioned to seat against the end surface of said cavity adjacent the center of said chuck.

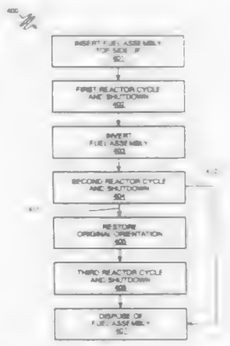
5,143,688
SURFACE ELECTRICAL COIL STRUCTURES
Peter Mansfield, Nottingham, England, assignor to National Research Development Corporation, London, England
Continuation of Ser. No. 365,563, Jun. 14, 1989, abandoned. This application Jul. 2, 1991, Ser. No. 726,161
Claims priority, application United Kingdom, Jun. 15, 1988, 8814187
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 15 Claims

1. A surface electrical coil structure for use as a signal receiver comprising:
a plurality of coils, each coil comprising at least one electrical conductor positioned adjacent to a volume, each coil being electrically connected to provide a desired signal response from the volume, in which each coil is positioned and sized such that there is a predetermined distance between the electrical conductors of each coil, the coils being in a non-overlapping situation to enable the signal receiver to receive signals from the far field at least equal to those received from an equivalent large coil; and
a delay line configuration connected between said coils, including a plurality of capacitors connected between said coils which uses an inductance and a capacitance of each



said capacitor as tuning elements of the delay line configuration

operating said reactor a second time;
shutting down said reactor;



reinstalling said fuel assembly with said first axial end above said second axial end; and
operating said reactor a third time.

5,143,689
METHOD FOR DETERMINING THE COEFFICIENT OF THERMAL EXPANSION OF COKE
Jeffrey B. Hauser, Middleburgh Hts.; Stephen C. Paspek, Broadview Hts., and Harry A. Adams, Bedford Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Continuation of Ser. No. 612,050, Nov. 9, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 821,298
Int. Cl.[5] G01N *25/16*
U.S. Cl. 374—55 21 Claims

1. A method for determining the coefficient of thermal expansion of coke, comprising:
(a) grinding a coke sample;
(b) mixing said coke sample with a binder pitch in a heated environment;
(c) hot pressing to at least 1000 p.s.i. the heated mixture of said coke and said binder pitch in a die to form a pellet;
(d) baking said pellet to at least 800° C.;
(e) measuring the thermal expansion of said pellet; and
(f) calculating the thermal expansion of said coke from the thermal expansion of said pellet.

5,143,690
FUEL-ASSEMBLY INVERSION FOR DUAL-PHASE NUCLEAR REACTORS
Steven P. Congdon, Los Gatos, and Russell M. Fawcett, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.
Continuation-in-part of Ser. No. 553,073, Jul. 10, 1990. This application Jun. 3, 1991, Ser. No. 709,534
Int. Cl.[5] G21C *19/00*
U.S. Cl. 376—267 2 Claims

1. A fuel management method for a dual-phase nuclear reactor, said method comprising:
installing a fuel assembly having first and second axial ends so that said first axial end is above said second axial end;
operating said reactor a first time;
shutting down said reactor;
reinstalling said fuel assembly so that its second axial end is above said first axial end;

5,143,691
FUEL ASSEMBLY WITH FLOW TRIPPER FOR A BOILING WATER REACTOR
Hans-Joachim Lippert, Höchstadt/Aisch, and Wendelin Kraemer, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Nov. 28, 1990, Ser. No. 619,903
Claims priority, application European Pat. Off., Nov. 29, 1989, 89121996.6
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—443 11 Claims

1. Fuel assembly for boiling water reactor, comprising an elongated case having an interior and inner surfaces, a base part having inlet openings discharging into the interior of said case for coolant flowing in a given flow direction, a head part having outlet openings leading out of the interior of said case for the coolant flowing in said given flow direction and at a given coolant flow cross section, mutually parallel fuel rods containing nuclear fuel and being disposed in said case between said base and head parts, said inner surfaces of said case having a profile with a rectilinear alignment as seen in said given flow direction and flow trippers extending transversely to said alignment in the form of bulges protruding inwardly, each of said bulges having an impact surface facing toward the coolant flow substantially perpendicular to said given flow direction

for reducing the coolant flow cross section to produce a pressure difference between the interior and exterior of the wall, and a sloped surface facing away from said impact surface for gradually enlarging the coolant flow cross section in said given flow direction.

5,143,692

METHOD OF MAKING A SUBSTRUCTURE FOR A DENTAL RESTORATION

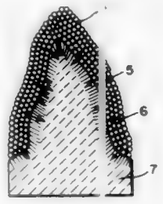
Joseph M. van der Zel, Zwaag, Netherlands, assignor to Elephant Edelmetaal B.V., Hoorn, Netherlands

Filed Jul. 2, 1991, Ser. No. 722,477

Claims priority, application Netherlands, Jul. 3, 1990, 9001516

Int. Cl.[5] G22F 7/00

U.S. Cl. 419—8 39 Claims



1. A method of making a substructure for a dental restoration, which dental restoration has a substructure of an essentially dental metal and, fired thereon, a coating of an essentially dental ceramics, comprising applying a mixture of a dental metal powder and a thermoplastic polymeric material having a melting point above 50° C. onto a model of a porous refractory material by means of a heated instrument and molding said mixture into a desired shape to form an assembly, heating the assembly so obtained to a temperature at which the thermoplastic polymeric material liquefies and is absorbed from the coating into the model, followed by raising the temperature of the assembly to a temperature at which the thermoplastic polymeric material is expelled from the assembly, and raising the temperature further to a sufficiently high temperature for sintering the dental metal powder into a solid metal mass.

5,143,693

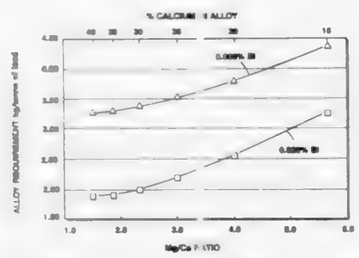
MAGNESIUM-CALCIUM ALLOYS FOR DEBISMUTHIZING LEAD

Douglas J. Zuliani, Stittsville, and Bernard Closset, Toronto, both of Canada, assignors to Timminco Limited, Ontario, Canada

Division of Ser. No. 446,150, Dec. 5, 1989, Pat. No. 5,041,160, which is a continuation-in-part of Ser. No. 226,868, Aug. 1, 1988, abandoned. This application Mar. 22, 1991, Ser. No. 673,538

Int. Cl.[5] C22C 23/00

U.S. Cl. 420—402 2 Claims



1. An alloy for use in removing impurities from molten lead, said alloy consisting essentially of magnesium and calcium having a ratio of magnesium to calcium ranging from about 1.2:1 to about 3.0:1 on a weight basis, said magnesium and calcium being present in said alloy in an amount of at least about 85% by weight, said calcium being present in an amount of about 25 to 45% by weight.

5,143,694

TEST STRIP EVALUATING INSTRUMENT FOR MULTIPLE TEST STRIPS

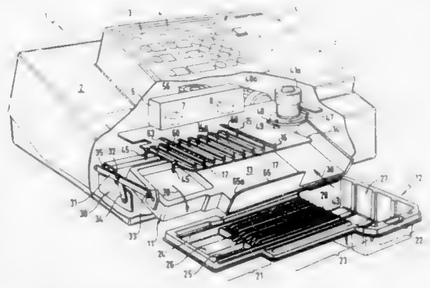
Dieter Schäfer, Schriesheim; Stephan Sattler, Peissenberg; Peter Scheunert, Mannheim; Franz Laufenberg, Grünstadt; Hans List, Lampenhain; Klaus Steeg, Kronau, and Eugen Serrallach, Edingen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 4, 1990, Ser. No. 622,053

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1989, 3940152

Int. Cl.[5] G01N 21/13, 35/04

U.S. Cl. 422—65 13 Claims



1. A test strip evaluating instrument for conducting tests on a plurality of elongated test strips, said instrument comprising:

a transport and positioning means for transporting the test strips in a direction at generally right angles to a longitudinal extent of the test strips, from a test strip feed area along a transport path to a disposal area;

at least one measuring station having an optical measuring means disposed along said transport path for optically testing said test strips;

a disposable transport insert formed of a plastic material, said disposable transport insert completely covering a bottom portion of said transport path and having a plurality of spaced apart rails for slidably supporting the test strips, each of said plurality of rails extending in a direction which is generally parallel to a transport direction of said test strips and being formed as longitudinal ribs in said plastic material, wherein liquid from said test strips which contacts said disposable transport insert is prevented from contacting other areas of said instrument;

at least two rows of cam elements, each of said two rows of cam elements being aligned in said transport direction and being driven synchronously with each other in a periodically recurring movement path such that said two rows transport the test strips in a step-wise manner along said plurality of rails, wherein said two rows of cam elements engage the test strips from above and extend downwardly between adjacent ones of said plurality of rails;

a bearing means for supporting said transport insert, said bearing means having a support surface for supporting the transport insert in a central area of said transport insert which lies between said test strip feed area and said disposal area; and

a rigid contact-pressure means, having an underside against which the test strip is pressed elastically during measurement, provided at said measuring station, said rigid contact-pressure means being located at a predetermined distance from said optical measuring unit.

5,143,695

PROCESS AND DEVICE FOR THE CONTINUOUS ANALYSIS OF THE COMPOSITION OF GASES

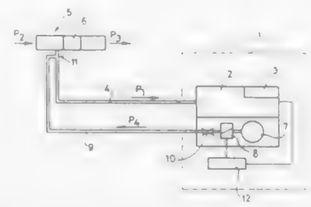
Johannes M. E. van den Burg, Houten, Netherlands, assignor to Mijnhardt B.V., Bunnik, Netherlands

Continuation of Ser. No. 500,738, Mar. 28, 1990. This application Nov. 7, 1991, Ser. No. 790,143

Claims priority, application Netherlands, Mar. 31, 1989, 8900800

Int. Cl.[5] A61B 5/08

U.S. Cl. 422—84 9 Claims



1. A process for continuously determining the correlation between the flow rate and the composition of gases which may fluctuate greatly and which pass through a measuring head which determines the flow rate of said gases comprising:

providing a measuring head which determines the flow rate of gases, whose composition may fluctuate greatly; analyzing

the composition of said gases being analyzed using analysis equipment which is placed a distance away from the measuring head and is connected thereto by a sampling line through which it is drawn using a suction pump; providing a calibration gas for determining transit time between the measuring head and the analysis equipment being fed via a calibration gas line to the sampling line at a point near where the sampling line connects to the measuring head, said calibration gas being fed as a series of calibration gas impulses from the analyzing equipment to the sampling line via the calibration gas line; and determining the average transit time of the gases in the conditions prevailing locally at the moment using said analyzing equipment for substantially continuously determining the correlation between the flow rate and the gas composition.

5,143,696

SELECTIVE GAS SENSOR

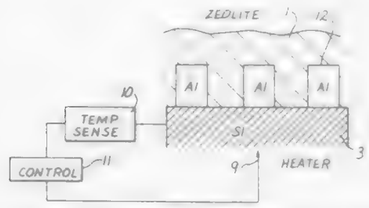
Juergen Haas, Meersburg, and Carsten Plog, Markdorf, both of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 30, 1990, Ser. No. 605,511

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1989, 3936758

Int. Cl.[5] G01N 27/00, 27/04

U.S. Cl. 422—90 15 Claims



1. In a sensor for selective determination of gases which includes an electric capacitor with a gas permeable sensitive layer serving as a dielectric, wherein the improvement comprises:

the gas permeable sensitive layer being composed of an ordered crystalline structure having primary pores, the diameter of which corresponds at least in order to magnitude to the kinetically effective diameter of molecules of a gas to be detected, so that these molecules penetrate deeply into secondary pores of the gas permeable sensitive layer by diffusion thereby changing the dielectric constant of the gas permeable sensitive layer.

5,143,697

DEVICE FOR EXTRACTING PARTICULATE MATERIALS OF A FLUIDIZED BED FROM THE FLUIDIZATION ENCLOSURE

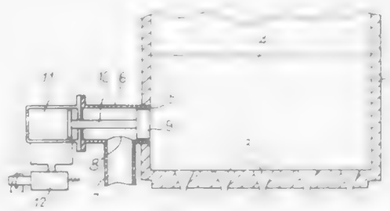
Guy Marlair, Flers-En-Escrebieux, France, assignor to Charbonnages De France, Rueil Malmaison Cedex, France

Filed May 16, 1990, Ser. No. 524,033

Claims priority, application France, May 19, 1989, 89 06562

Int. Cl.[5] B01J 8/18

U.S. Cl. 422—115 5 Claims



1. A device for extracting particulate material from a fluidized bed thereof contained in a fluidization enclosure the device comprises:

a fluidization enclosure containing an enclosure opening provided through a side wall of the fluidization enclosure, said enclosure opening communicating with a tube such that the tube extends outside the fluidization enclosure, said tube being further constructed so as to extend perpendicularly to the side wall;

a duct having a duct opening connected substantially perpendicularly to said tube and extending downwards;

a piston slidably mounted in sealed manner inside the tube, said tube being constructed so as to allow the piston to slide between a first position and a second position, wherein said piston is constructed so as to shut the enclosure opening when in said first position and further constructed so as to at least partially uncover said enclosure opening of said duct when at the second position so as to provide flow communication between said opening of said enclosure and said duct opening of said duct; and

control means for displacing the piston inside the tube between said first position and said second position.

5,143,698

APPARATUS FOR INTERNAL BACKMIX COOLING

William J. Koves, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Filed Mar. 5, 1990, Ser. No. 488,920

Int. Cl.[5] F27B 15/16; B01J 8/20

U.S. Cl. 422—144 1 Claim

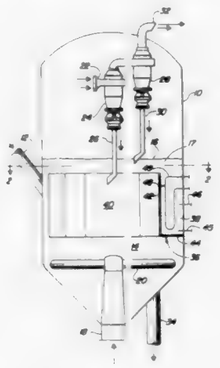
1. An apparatus for regenerating a fluidized catalyst by the combustion of coke and removing heat generated by said coke combustion, said apparatus comprising:

a) a vertically elongated regeneration vessel;

b) an at least partially cylindrical partition located inside said regeneration vessel along a vertical axis, said partition dividing the interior of said vessel into a central combus-

tion chamber and an outer cooling chamber and said partition having a height less than the height of said vessel such that said regeneration vessel defines an upper volume in open communication with said combustion chamber and said cooling chamber in the top of said regeneration vessel and said cooling chamber having lateral sides defined by said partition comprising a plurality of vertically extended sections having overlapping vertical sides and a bottom substantially closed to catalyst flow therethrough arranged such that the only flow of catalyst between said cooling chamber and said combustion chamber is in said upper volume;

c) u-shaped cooling coils extending vertically in said cooling chamber for circulating a cooling fluid through the interior of said coils and indirectly exchanging heat with the interior of said chamber;



d) a regeneration gas distributor located in a lower portion of said regeneration vessel for distributing regeneration gas about said combustion chamber;

e) a first plurality of nozzles located at a first elevation for introducing a fluidizing gas into a lower portion of said cooling chamber;

f) a second plurality of nozzles located above said first plurality of nozzles at a second elevation for introducing fluidizing gas into said cooling chamber;

g) a gas outlet for withdrawing fluidizing gas and stripping gas from said upper volume

h) a catalyst inlet for supplying coke-containing catalyst particles to said combustion chamber at a location below the top of said cooling chamber; and

i) a catalyst outlet for withdrawing catalyst particles from said combustion chamber.

5,143,699

MIXING APPARATUS

Rainer Herter, Waldwick, N.J., assignor to Werner & Pfleiderer Corp., Ramsey, N.J.

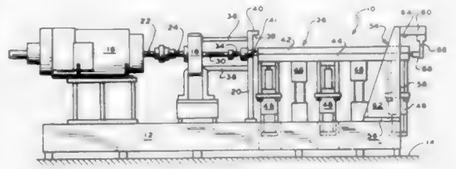
Filed Jul. 5, 1988, Ser. No. 215,269
Int. Cl.[5] B01F *7/08*
U.S. Cl. 422—163 **12 Claims**

1. Apparatus for the continuous mixing of material, comprising:

drive means;

a processing section, said processing section comprising a first barrel section and a second barrel section, said first and second barrel sections cooperating to define at least one bore within which to mix said material, and means associated with said at least one bore for permitting entry of said material into said bore and exiting of said material from said bore, said first and second barrel sections being displaceable between a closed or operating position, in which respective mating surfaces are in surface-to-surface engagement, and an open position, in which the respective mating surfaces are spaced apart;

at least one mixing screw operatively connected to said drive means and extending into said at least one bore defined by said first and second barrel sections; and



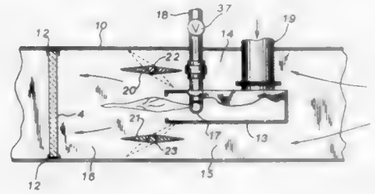
means for displacing said first and second barrel sections between said closed position and said open position such that the mating surfaces experience no sliding, relative movement parellel thereto.

5,143,700

CERAMIC FILTER CONSTRUCTION FOR USE IN CATALYTIC INCINERATION SYSTEM

Gene H. Anguil, Milwaukee, Wis., assignor to Anguil Environmental Systems, Inc., Milwaukee, Wis.

Filed Oct. 15, 1990, Ser. No. 597,497
Int. Cl.[5] F01N *3/08*
U.S. Cl. 422—176 **6 Claims**



1. A ceramic filter construction operable in an incineration mode and a cleaning mode, comprising a plenum defining a flow path for a gas containing particulate material and having an upstream end and a downstream end, a gas permeable ceramic filter disposed in said plenum and having an upstream surface, fuel burner means disposed in said plenum and spaced upstream of said filter and dividing said plenum into a pair of gas flow passages, said burner means being constructed and arranged to direct a flame toward said surface, damper means disposed in each flow passage to control the flow of gas through the respective passage, each damper means being movable between a closed position and an open position, said damper means both being open during the incineration mode so that gas will flow through both passages on opposite sides of the flame, and operating means for independently moving each damper means between the open and closed positions during the cleaning mode to cause a differential in the volume of gas passing through said passages and on opposite sides of said flame to thereby deflect and direct the flame across said surface.

5,143,701

METHOD AND AN APPARATUS FOR THE TREATMENT OF EXHAUST GAS FROM IC ENGINES

Oskar Schatz, Waldpromenade 16, D-8035 Gauting, Fed. Rep. of Germany

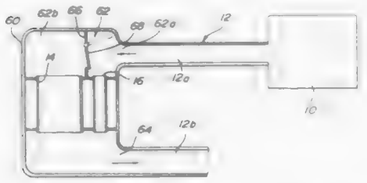
Filed Jun. 8, 1990, Ser. No. 535,475
Int. Cl.[5] F01N *3/18, 3/28*
U.S. Cl. 422—177 **17 Claims**

1. A method for treating exhaust gases of internal combustion engines comprising:

providing a catalytic converter coupled with an exhaust conduit from the internal combustion engine, said catalytic converter including a housing with a preconverter and a main converter positioned in parallel with respect to one another, and means for directing flow of exhaust gases through said preconverter and main converter, said flow directing means positioned within said housing;

passing exhaust gases into said converter housing;

positioning said flow directing means in said housing in a first position such that said exhaust flow passes only through said preconverter;



heating said main converter with said exhaust gases passing through said preconverter to a predetermined temperature;

moving said flow directing means to a second position in said housing after said main converter is heated to said predetermined temperature such that said exhaust flow passes through said preconverter and said main converter; and

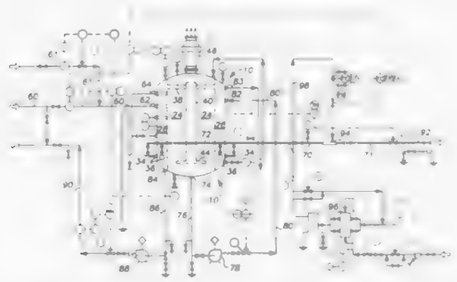
exiting said exhaust gas from said housing.

5,143,702

TWO STAGE WHITE LIQUOR OXIDATION APPARATUS

Bruce Der, Richmond, Canada; Bruce W. Beckstrom, Seattle, and Elmer F. Guthrie, Bellevue, both of Wash., assignors to A. H. Lundberg Associates, Inc., Bellevue, Wash.

Filed Oct. 22, 1990, Ser. No. 601,221
Int. Cl.[5] D21C *11/00*
U.S. Cl. 422—185 **8 Claims**



1. A reaction vessel apparatus for intimately contacting unoxidized white liquor with a quantity of oxidizing gas such as air, comprising:

a) a generally cylindrical tank having a generally vertically disposed cylindrical outer wall with a vertical longitudinal axis, said outer wall being closed at its upper and lower ends to define a closed reaction vessel,

b) cylindrical bulkhead wall means concentrically disposed within said reaction vessel a predetermined distance from said outer wall and constructed to define a central chamber and an annular outer chamber which inner and outer chambers are sealed from each other,

c) oxidizing air supply means for said reaction vessel including at least one inlet supply means connected and leading to said annular outer chamber, said air supply means also including air connector conduit means extending from said annular outer chamber to near the bottom of said central chamber and further including air venting means from said central chamber,

d) first liquor inlet means extending from outside said reaction vessel through said annular outer chamber and said bulkhead wall into said central chamber where a first stage oxidation step takes place,

e) first liquor outlet means in the lower portion of said central chamber including transfer conduit means for directing said liquor from said first liquor outlet means,

f) second liquor inlet means connected to said transfer conduit means and also connected to and extending into said annular outer chamber wherein a second stage oxidation step of said liquor is achieved, and

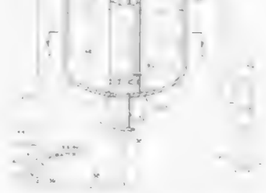
g) second liquor inlet means in the lower portion of said annular outer chamber of directing and transferring oxidized liquor from said reaction vessel.

5,143,703

FLUID FLOW CONTROL AND ISOLATION

Keith W. Hovis, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1990, Ser. No. 632,819
Int. Cl.[5] F28D *21/00*
U.S. Cl. 422—208 **4 Claims**



1. An apparatus for isolating a fluid comprising:

a vessel defining a volume comprising a top zone, a medial zone and a bottom zone, said vessel having (1) an inlet means for accepting an admixture of two immiscible fluids having different densities into said volume, said volume sufficient to allow said admixture to separate, and (2) an outlet means in said medial zone for withdrawing separated liquid having lesser density;

baffle means extending upwardly within the volume of said vessel defining a space within said baffle means from the bottom of said vessel to the top of said vessel

with means for permitting fluid flow through said baffle means from outside said baffle means to inside said baffle means only in the top zone and the bottom zone of said volume; and

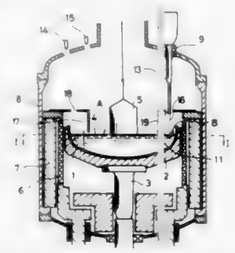
standpipe conduit means extending through said vessel and terminating in open communication with said medial zone within the space defined by said baffle means to thereby convey separated liquid having greater density from said vessel to the exterior of said vessel.

5,143,704

APPARATUS FOR MANUFACTURING SILICON SINGLE CRYSTALS

Yasumitsu Nakahara; Kenji Araki, and Hiroshi Kamio, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 500,798, Mar. 28, 1990, abandoned. This application Jun. 27, 1991, Ser. No. 722,259
Claims priority, application Japan, Oct. 26, 1989, 1-277094
Int. Cl.[5] B01D 9/00
U.S. Cl. 422—248 4 Claims



1. An apparatus for manufacturing columnar single silicon crystals with a diameter of 12 cm-30 cm, having a rotating crucible and heated by an electric resistance heater surrounding the side wall of said crucible which comprises:

(a) a fused quartz cylindrical partition member separating the crucible into a material melting section and a single crystal growing section, said partition member fixed to the bottom of the crucible, the top thereof being arranged as projecting above the surface of the molten silicon and having a plurality of small holes through which molten silicon can flow only in one direction, that is, from the materials melting section to the single crystal growing section;

(b) means for introducing granular silicon or chunks of silicon, into said material melting section; and

(c) a heat keeping plate consisting of a disk-like member having a round opening at its center and a hole for introducing said granular silicon or chunk of silicon and a cylindrical member connected to the inner periphery of said opening, covering only the surface of the molten silicon in the raw materials melting area and the top and the inner side of the partition projecting above the surface of molten silicon, wherein said disk-like member and said cylindrical member consist essentially of a tantalum or molybdenum plate which has a thickness of 3 mm or less.

5,143,705

METHOD AND APPARATUS FOR GAS PHASE POLYMERIZATION OF OLEFINS IN VERTICALLY STACKED REACTORS

Gerald M. Platz, Conroe, Tex., assignor to Brown & Root USA, Inc., Houston, Tex.

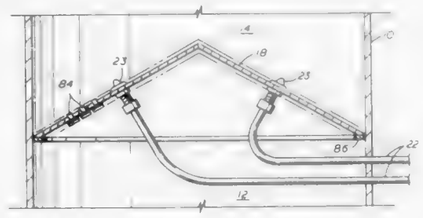
Division of Ser. No. 273,969, Nov. 18, 1988, Pat. No. 5,034,195.
This application Feb. 22, 1991, Ser. No. 697,631
Int. Cl.[5] B01J 4/00
U.S. Cl. 422—311 2 Claims

1. An apparatus for distributing fluidizing medium in a gas phase fluidized bed polymerization reactor, said apparatus comprising:

a conical distribution plate to be disposed in and sealed along a mounting ring within a reactor with its apex pointing upwardly;

a plurality of port flow controllers having means for establishing fluidized flow and adjusting the direction of fluidizing medium therethrough prior to start up of the reactor such that fluidizing medium sweeps said distribution plate during operation, thereby keeping said distribution plate free of build-up of polymerization products; and

a plurality of openings defined in said conical distribution plate having means to receive said port flow controllers



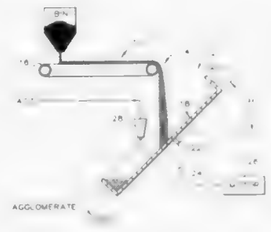
from an underside of said distribution plate while polymerization products are present within the reactor.

5,143,706

SULFUR ABSORBANTS

Paul F. Schubert, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 542,996, Jun. 25, 1990, Pat. No. 5,077,261.
This application Sep. 13, 1991, Ser. No. 759,333
Int. Cl.[5] C01B 17/16
U.S. Cl. 423—230 5 Claims



1. A process for removing hydrogen sulfide from a fluid stream comprising the step of:

contacting said fluid stream under absorbing conditions with an absorption composition consisting essentially of a calcined mixture of zinc oxide, silica and a fluorine-containing acid.

5,143,707

SELECTIVE CATALYTIC REDUCTION (SCR) OF NITROGEN OXIDES

Jeffrey S. Beck, Princeton, N.J.; Richard F. Socha, Newtown, Pa.; David S. Shihabi, Pennington, N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 24, 1991, Ser. No. 735,232
Int. Cl.[5] B01J 8/00; C01B 21/00
U.S. Cl. 423—239 25 Claims

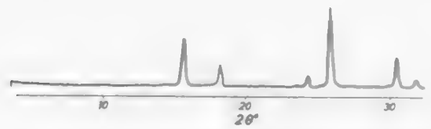
1. A method of converting nitrogen oxides to nitrogen by contacting the nitrogen oxides with a reducing agent in the presence of a catalyst which is effective for the reduction of nitrogen oxides comprising an inorganic, non-layered, porous, crystalline phase material having pores with diameters of at least about 13 Å and exhibiting, after calcination, an X-ray diffraction pattern with at least one d-spacing greater than about 18 Å with a relative intensity of 100, and having a benzene adsorption capacity of greater than about 15 grams benzene per 100 grams at 50 torr and 25° C.

5,143,708

TETRACOSAHEDRAL SILICEOUS PARTICLES AND PROCESS FOR PREPARATION THEREOF

Tadahisa Nakazawa, Tokyo; Masahide Ogawa, Shibata; Kiyoshi Abe, Shibata; Kazuhiki Suzuki, Shibata, and Jun Suzuki, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,177
Claims priority, application Japan, Mar. 31, 1987, 62-76395; Mar. 23, 1988, 63-67223
Int. Cl.[5] C01B 33/26, 33/12; H01B 3/20
U.S. Cl. 423—328 14 Claims



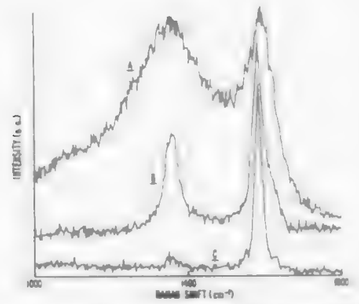
8. An electroviscous fluid which comprises an insulating oil and a filler dispersed therein, wherein said filler comprises an active analcime having a chemical composition comprising 60 to 95% by weight of SiO_2, 0.3 to 20% by weight of Al_2O_3 and 0.02 to 11% by weight of Na_2O based on the three components, an X-ray diffraction pattern inherent to analcime and a moisture adsorption of 7 to 30% by weight as determined under conditions of a relative humidity of 90%, an ambient temperature of 25° C. and a standing time of 24 hours, wherein individual particles of the active analcime have a tetracosahedral or angle-rounded tetracosahedral particulate shape and the primary particle size is 0.1 to 50 μm as determined according to the electron microscope method, said active analcime being present in an amount of 10 to 70% by weight based on the oil.

5,143,709

PROCESS FOR PRODUCTION OF GRAPHITE FLAKES AND FILMS VIA LOW TEMPERATURE PYROLYSIS

Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 365,801, Jun. 14, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 639,732
Int. Cl.[5] C01B 31/02
U.S. Cl. 423—449 13 Claims



1. A process for the production of conductive carbon flakes and films comprising pyrolyzing a reactant gas consisting of:

a cyclic aromatic hydrocarbon and a non-reactive gas;

in the presence of an dehydrogenating agent selected from the group consisting of bromine and chlorine, in the absence of both metal and organometallic compound;

at a temperature of at least about 800° C.;

wherein said cyclic aromatic hydrocarbon is selected from the group consisting of:

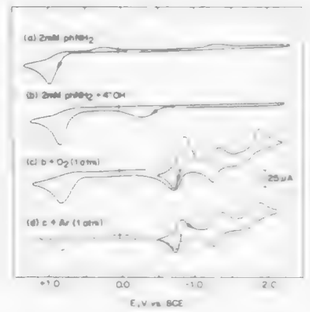
halogen substituted, alkyl substituted, and unsubstituted unsaturated monocyclic and polycyclic carbon/hydrogen compounds.

5,143,710

METHODS FOR PRODUCING SUPEROXIDE ION IN SITU

Donald T. Sawyer; Seungwon Jeon, and Paul K. S. Tsang, all of College Station, Tex., assignors to The Texas A & M University System, College Station, Tex.

Filed Dec. 22, 1989, Ser. No. 455,571
Int. Cl.[5] C01B 15/04
U.S. Cl. 423—581 12 Claims



1. A method for generating superoxide ion comprising:

a) preparing a solution of a hydrogen donor in an aprotic solvent;

b) adding an effective amount of a compound into the solution which produces hydroxide ions in the solution;

c) adding anthraquinone to the solution; and

d) dissolving dioxygen int he solution and reacting the hydrogen donor, the dissolved dioxygen and the hydroxide ions or alkoxide ions as reactants to produce a concentration of superoxide ions in the solution.

5,143,711

PROCESS FOR MANUFACTURING A PRECURSOR POWDER FOR USE IN MAKING A VARISTOR AND A POWDER MANUFACTURED IN THIS PROCESS

Wolfgang Kluge; Roger Perkins, both of Baden; Marco Rossinelli, Fislisbach, all of Switzerland, and William J. Dawson, Columbus, Ohio, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Dec. 5, 1989, Ser. No. 446,459
Int. Cl.[5] C01G 1/00
U.S. Cl. 423—593 17 Claims

1. A process for manufacturing a precursor powder containing dopants for use in making a metal oxide varistor, having a metal ion stoichiometry of said dopant, comprising the steps of:

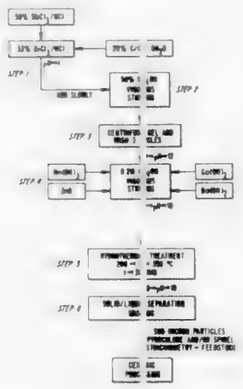
(a) preparing a homogeneous aqueous dispersion of metal oxides or metal hydroxides or mixtures thereof having said metal ion stoichiometry, said dispersion comprising three or more elements selected from the group consisting of zinc, antimony, bismuth, manganese, cobalt, chromium, barium, nickel, rare earths, silicon, tin, aluminum, boron and mixtures thereof,

(b) heating said dispersion in a closed pressure reactor to a temperature between 200° and 350° C. in order to hydrothermally treat said homogeneous dispersion,

(c) cooling said hydrothermally treated dispersion to a temperature below about 100° C.,

(d) separating the precursor powder from a solution result-

ing from the hydrothermal treatment of said homogeneous dispersion, and



wherein the precursor powder obtained is primarily of the spinel or pyrochlore or spinel and pyrochlore crystalline formulation.

5,143,712

NEW METHOD OF DETERMINING A CITE OF INFLAMMATION UTILIZING ELAM-1 LIGANDS

Brian K. Brandley, Alameda; Michael Tiemeyer, Oakland; Stuart J. Swiedler, Oakland; Margaret Moreland, Berkeley, and Hans Schweingruber, Mountain View, all of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Continuation-in-part of Ser. No. 6 3,113, Nov. 15, 1990, which is a continuation-in-part of Ser. No 559,856, Jul. 30, 1990. This application Jan. 7, 199 , Ser. No. 637,868

Int. Cl.[5] A61K *49/02, 49/00*

U.S. Cl. 424—1.1 **9 Claims**

1. A method of determining a site of inflammation in a patient, comprising the steps of:

administering to a patient an effective amount of an ELAM-1 ligand attached to a detectable label wherein the ELAM-1 ligand comprises a disaccharide or repeating disaccharide unit, a fucose residue connected at its 1-position to a disaccharide unit and a sialic acid residue connected to a terminal disaccharide unit;

allowing the labeled ELAM-1 ligand sufficient time to circulate in the patient and attach to ELAM-1 in the patient; and

detecting the label and its location in the patient and thereby determining the site of inflammation.

5,143,713

99MTC LABELED LIPOSOMES

William T. Phillips; Robert W. Klipper, both of San Antonio, Tex.; James H. Timmons, Tacoma, Wash., and Alan S. Rudolph, Bowie, Md., assignors to Board of Regents, The University of Texas System, Austin, Tex. and The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No 530,847, May 30, 1990. This application Nov. 5, 1990, Ser. No. 610,204

Int. Cl.[5] A61K *43/00, 49/02, 9/127*

U.S. Cl. 424—1.1 **31 Claims**

1. A method of preparing a radio-labelled liposome, comprising incubating the liposome with gamma-emitting radionuclide-labeled alkyleneamine oxime and an antioxidant, said incubating being for a period of time sufficient to form radio-labeled liposomes.

5,143,714

MATERIAL AND PROCEDURE FOR TESTING AND CONTROL OF IMMUNOSTAINING TECHNIQUES

Raymond F. Cosgrove, Wallasey; Terence P. Male, Helsby, and Graeme M. Smalley, Manchester, all of England, assignors to Shandon Scientific Limited, Cheshire, England

Filed May 31, 1989, Ser. No. 359,381

Claims priority, application United Kingdom, Jun. 9, 1988, 8813628

Int. Cl.[5] G01N *33/48, 33/563, 33/559;* **C12Q** *1/00*

U.S. Cl. 424—3 **9 Claims**

1. A test material comprising a gel block having installed at discrete separated locations therein a plurality of gel pellets formed from the same gel material from which said gel block is formed individually impregnated with specific antigen concentration confined to the respective pellets.

5,143,715

ORGANIC CONTRAST AGENT ANALOG AND METHOD OF MAKING SAME

James L. Barnhart, Encinitas, Calif., assignor to Molecular Biosystems, Inc., San Diego, Calif.

Filed Mar. 28, 1990, Ser. No. 500,471

Int. Cl.[5] A61K *31/19*

U.S. Cl. 424—5 **1 Claim**

1. A modified organic contrast agent analog, comprising N-triflouroacetyl-iopanoic acid.

5,143,716

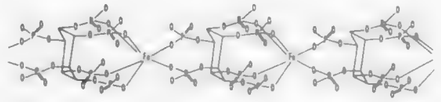
PHOSPHORYLATED SUGAR ALCOHOLS, MONO- AND DI-SACCHARIDES AS CONTRAST AGENTS FOR USE IN MAGNETIC RESONANCE IMAGING OF THE GASTROINTESTINAL REGION

Evan C. Unger, 13365 E. Camino La Cebadilla, Tucson, Ariz. 85749

Filed Feb. 1, 1991, Ser. No. 649,437

Int. Cl.[5] G01N *31/00, 24/00;* **A61K** *31/715, 31/665*

U.S. Cl. 424—9 **22 Claims**



1. A method of providing an image of the gastrointestinal region of a patient comprising

(a) administering to the patient, orally or rectally, a diagnostically effective amount of a contrast medium comprising (i) a polyphosphorylated compound selected from the group consisting of polyphosphorylated sugar alcohols, polyphosphorylated monosaccharides, and polyphosphorylated disaccharides comprising at least five carbon atoms, and (ii) a paramagnetic ion, and

(b) scanning the patient using magnetic resonance imaging to obtain visible images of that region.

5,143,717

BURN FOAM AND DELIVERY SYSTEM

Richard C. Davis, Tampa, Fla., assignor to Code Blue Medical Corporation, Clearwater, Fla.

Continuation of Ser. No. 139,542, Dec. 30, 1987, abandoned. This application Aug. 2, 1989, Ser. No. 388,735

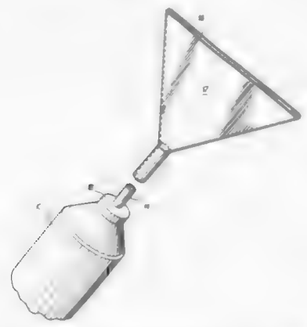
Int. Cl.[5] A61K *9/12, 31/635, 33/38, 35/74*

U.S. Cl. 424—45 **12 Claims**

1. A pH neutral antibiotic formulation adapted for topical application as a clinically water soluble foam having a micelle structure and having the physical and chemical properties of remaining in the foam state for at least twenty-four (24) hours after application, comprising:

a quantity of approximately 1% by weight of an antibiotic having molecules of generally linear structure with one end thereof being more hydrophilic than the other, with the other end being more hydrophobic, suspended in an oil-in-water emulsion,

said oil-in-water emulsion including between approximately 2.45 and 11.17% by weight of white petrolatum, between approximately 2.45 and 11.17% by weight of a fatty alcohol, between approximately 0.98 and 4.46% by weight of an emollient, between approximately 1.46 and 6.70% by weight of an emulsifying agent, between approximately 1.14 and 5.20% by weight of a humectant, a preservative



and between 50% and up to 80.22% (by weight) water by weight; and,

said emulsion being aerosolized by an inactive aliphatic hydrocarbon gaseous propellant of approximately 10% by weight into a stable micelle-like foam structure with membranes forming bubbles thereof including said antibiotic molecules of linear structure aligned with their more-hydrophilic ends generally facing away from a hollow chamber of the bubbles and the more-hydrophobic ends generally pointing down into the hollow chamber, whereby a more water soluble portion of the antibiotic is directed toward outside of the bubble and a more water insoluble portion is directed toward inside the bubble.

5,143,718

ANTIPERSPIRANT COMPOSITION

Daniel Bar-Shalom, Kokkedal, Denmark, assignor to Riemann Trading ApS, Naerum, Denmark

PCT No. PCT/DK88/00148, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO89/02264, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 6, 1988, Ser. No. 487,967

Claims priority, application Denmark, Sep. 15, 1987, 4835/87

Int. Cl.[5] A61K *7/32, 7/38*

U.S. Cl. 424—47 **10 Claims**

1. An antiperspirant composition comprising $AlCl_3$ and an aluminium salt of at least one organic acid dissolved or dispersed in a suitable carrier, said acid, being selected from the group consisting of acetic, propionic, citric, acetylsalicylic, benzoic, salicylic, ascorbic, nicotinic, tartaric, phtalic, lactic, oleic, linoleic, undecenoic, octanoic, palmitic, ricinoleic, stearic, acetylcretosinic, succinic, carbamoylphenoxyacetic, diacetylsalicylic, anthranilic, mefenamic, gentisic, tolfenamic, acetotartaric, agaric, formic, subacetic, ellagic, fumaric, malic, morrhuic, oxalic, para-amino-benzoic, gallic, cinnamic, isoascorbic, sorbic, aminocaproic, aminomethylbenzoic, tranxenamic, glycine, alanine, valine, leucine, isoleucine, serine and threonine and being present in an amount capable of substantially neutralising the amount of hydrogen chloride formed by the hydrolysis of the amount of $AlCl_3$ present, said $AlCl_3$ and said aluminium salt or salts of the acid or acids being present in said composition in amounts corresponding to a total aluminium content of up to 3.0 gram atom per kilogram of composition.

5,143,719

ANTICALCULUS ORAL COMPOSITION CONTAINING COMBINATIONS OF ORGANOPHOSPHORUS POLYCARBOXYLATE COTELOMERS AND INORGANIC POLYPHOSPHATE SALTS

David L. Elliott, Hawthorne, and Catherine L. Howie-Meyers, Bloomingdale, both of N.J., assignors to Chesebrough-Pond's USA Co., Greenwich, Conn.

Filed Apr. 16, 1991, Ser. No. 686,208

Int. Cl.[5] A61K *7/16*

U.S. Cl. 424—52 **13 Claims**

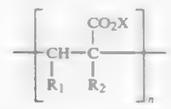
1. An oral dentifrice composition comprising:

(i) about 0.1 to about 10% of at least one inorganic polyphosphate salt; and

(ii) about 0.01 to about 10% of a polymer present to control build-up of tartar, said polymer having the formula I:

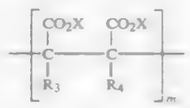
(I)

wherein A is a random polymeric residue comprising at least one unit of structure II,



(II)

and at least one unit of structure III, different from a unit of structure II,



(III)

and B is a hydrogen or a residue A; m and n are integers sufficient to provide polymer of weight averaged molecular weight ranging from about 400 to about 5000; m and n in residue A may each be the same or different from respective m and n in residue B; R is an —OX, where X is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, transition metal, ammonium, alkyl amine, alkanolammonium residues and mixtures thereof; R_1, R_2, R_3 and R_4 are hydrogen, methyl, ethyl radicals or combinations thereof, the molar ratio of structure II to structure III ranging from about 5:1 to about 1:5, structure II being formed from monomers selected from the group consisting of acrylic, methacrylic, alpha-substituted acrylic, betacarboxyalkyl acrylic acids or salts, and mixtures thereof, structure III being formed from monomers selected from the group consisting of maleic, fumaric, mesaconic, citraconic acid residues including their anhydrides or salts, and mixtures thereof, a molar ratio of total monomer to hypophosphite utilized to prepare the polymer ranging from about 40:1 to about 1:1, and wherein mono- or di-substituted hypophosphite groups are present at the chain end or between monomer units in the chain.

5,143,720

DISINFECTING AND SANITIZING COMPOSITIONS

John A. Lopes, Troy, Mich., assignor to Microcide, Inc., Troy, Mich.

Filed Nov. 28, 1990, Ser. No. 619,245
Int. Cl.[5] A61K 7/22, 7/16
U.S. Cl. 424—55 10 Claims

1. An anhydrous disinfecting and sanitizing dry powder concentrate composition having improved shelf life and stability, capable of dilution with water to form an antimicrobial solution, the concentrate composition consisting essentially of:

a) an anionic surfactant present in an amount of from about 0.025 weight percent to about 7.5 weight percent, based on the total weight of the concentrate composition;

b) an acidic component, present in an amount effective to produce a pH of below pH 5.0 upon dilution with water to make an aqueous alcohol free mouthwash solution of the concentrate and such that said anionic surfactant is present in solution at about 0.0025% to about 0.075%.

5,143,721

METHOD OF SMOOTHING AND REDUCING FINGERNAIL CRACKING AND PEELING BY RUBBING OR BUFFING WITH DOLOMITE POWDER

Frances Beachy, P.O. Box 2049, Rancho Santa Fe, Calif. 92067

Filed Jul. 15, 1991, Ser. No. 729,625
Int. Cl.[5] A01N 7/04, 7/043
U.S. Cl. 424—61 7 Claims

1. The method of reducing cracking and chipping of fingernails and toenails which comprises the steps of:

providing a finely divided powder consisting essentially of dolomite; and

rubbing fingernails and/or toenails with an effective amount of said powder;

whereby cracking and chipping of those nails is reduced.

5,143,722

COSMETIC MAKEUP COMPOSITIONS COMPRISING WATER-IN-OIL EMULSIONS CONTAINING PIGMENT

Jane Hollenberg, New York, N.Y.; Lou A. Lombardi, Scotch Plains, N.J., and Marlene Tietjen, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.

Continuation of Ser. No. 590,603, Sep. 25, 1990, abandoned, which is a continuation of Ser. No. 418,982, Oct. 5, 1989, abandoned, which is a continuation of Ser. No. 203,576, May 26, 1988, abandoned, which is a continuation of Ser. No. 8,997, Dec. 19, 1986, abandoned. This application Jun. 12, 1991, Ser. No. 713,496
Int. Cl.[5] A61K 7/021
U.S. Cl. 424—63 15 Claims

1. A cosmetic make-up composition which is a water-in-oil emulsion comprising

a) an oil phase which comprises

i) about 2 to 50% by weight of the oil phase of a coated pigment consisting essentially of finely divided particles of pigment whose surfaces are chemically bonded to, and physically completely coated by, polysiloxane which coating renders the particles hydrophobic, and

ii) up to about 97% by weight of the oil phase of a silicone component selected from the group consisting of dimethyl polysiloxane having the formula $(CH_3)_3SiO(-Si(CH_3)_2O)_d—Si(CH_3)_3$ wherein the degree of polymerization d is effective to give the fluid a viscosity of 0.65 to one million centistokes at 25° C.; cyclomethicone having a degree of polymerizaton of 3 to 6; organopolysilioxane having the formula:

$$X(CH_3)_2SiO—Y—Si(CH_3)_2X$$

wherein X is alkyl or alkoxy having 1 to 30 carbon atoms and Y is a chain of 1 to 100 repeating (Si—O) units containing 1 to 100 units of the formula $(—Si(R_1)(R_2)O—)$ and 0 to 100 units of the formula $(Si(R_3)(R_4)O)$ wherein each of R_1, R_2, R_3 and R_4 can be alkyl containing 2 to 30 carbon atoms, phenyl, or phenyl connected to the Si atom by a vinyl group or an alkylene bridge 1 to 3 carbon atoms long; wherein each R_1 and R_3 can also be $—CH_3$, and each R_1 and R_2 can also be trimethylsiloxy; and mixtures thereof;

b) 15 to 60% by weight of the total composition of an aqueous phase;

c) a surfactant which is a polydiorganosiloxane-polyoxyalkylene copolymer containing at least one polydiorganosiloxane segment consisting of

$$R_b SiO_{(4-b)/2}$$

siloxane units wherein b has a value of from 0 to 3 inclusive, there being an average of approximately 2 R radicals per silicon in the copolymer, and R denotes a radical selected from the group consisting of methyl, ethyl, vinyl, phenyl and a divalent radical bonding a polyoxyalkylene segment to the polydiorganosiloxane segment, at least 95 percent of all R radicals being methyl; and containing at least one polyoxalkylene segment having an average molecular weight of less than 5000 and consisting of from 0 to 50 mol percent polyoxypropylene units and from 50 to 100 mol percent polyoxyethylene units, at least one terminal portion of said polyoxyalkylene segment being bonded to said polydiorganosiloxane segment, any terminal portion of said polyoxyalkylene segment not bonded to said polydiorganosiloxane segment being satisfied by a terminating radical;

d) and further comprising a silicone-free surfactant having an HLB of 2–12;

wherein said surfactants are present in a combined amount effective to form a stable emulsion of said water phase in said oil phase.

5,143,723

COLORED COSMETIC COMPOSITIONS

Luis C. Calvo, Bayshore, and David W. Peters, Amityville, both of N.Y., assignors to Estee Lauder, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 275,434, Nov. 23, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 485,963
Int. Cl.[5] A61K 7/021, 7/025, 7/043, 7/13
U.S. Cl. 424—63 35 Claims

1. A cosmetic composition comprising: (a) a pigment formed by incorporating a solvated dye into a resin that is transparent to light and acts as a solvent for the dye, the pigment being ground to a particle size of about 5–150 microns that is suitable for use in a cosmetic composition, and (b) a cosmetic carrier having admixed therein said pigment in an amount of about 0.5%–50% by weight of the composition, effective to provide an attractive cosmetic effect to the composition when it is applied to a person's skin, hair or nails.

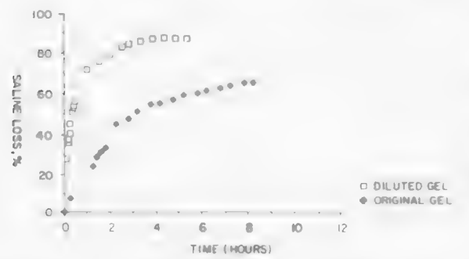
5,143,724

BIOCOMPATIBLE VISCOELASTIC GEL SLURRIES, THEIR PREPARATION AND USE

Edward Leshchiner, Cresskill; Endre A. Balazs, Fort Lee, both of N.J.; Nancy E. Larsen, Highland Mills, N.Y., and Adelya Leshchiner, Cresskill, N.J., assignors to Biomatrix, Inc., Ridgefield, N.J.

Filed Jul. 9, 1990, Ser. No. 550,287
Int. Cl.[5] A61K 31/74, 31/79, 31/785
U.S. Cl. 424—78.08 6 Claims

1. A biocompatible viscoelastic gel slurry comprising a two phase mixture, a first phase being a particulate biocompatible gel phase, said gel phase comprising a chemically cross-linked glycosaminoglycan, or said glycosaminoglycan chemically co-cross-linked with at least one other polymer selected from the group consisting of polysaccharides and proteins, said gel phase being swollen in a physiologically acceptable aqueous medium and being uniformly distributed in the second phase, said second phase comprising a polymer solution of a water-soluble biocompatible polymer selected from the group consisting of polysaccharides, polyvinylpyrrolidone and poly



ethyleneoxide in said physiologically acceptable aqueous medium, and wherein the polymer solution in the two phase mixture constitutes from 0.01 to 99.5% and the gel phase constitutes the remainder.

5,143,725

METHOD AND COMPOSITION FOR ATTRACTING MULLEIN BUGS

Robert F. Smith, Kentville; Harold D. Pierce, Jr., Burnaby; John H. Borden, Burnaby; Leslie J. Chong, Burnaby, and Nairn W. Hay, Vancouver, all of Canada, assignors to Phero Tech Inc., Delta, Canada

Filed Nov. 30, 1990, Ser. No. 620,279
Int. Cl.[5] A61K 31/235; A01N 25/00
U.S. Cl. 424—84 6 Claims

1. A composition for attracting male mullein bugs, *Campylomma verbasci* comprising a mixture of an effective amount of butyl butyrate and an effective amount of 2 (E)-crotyl butyrate.

5,143,726

T CELL EPITOPES OF THE HEPATITIS B VIRUS NUCLEOCAPSID PROTEIN

George B. Thornton; Ann M. Moriarty; David R. Milich, and Alan McLachlan, all of San Diego, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation of Ser. No. 106,538, Oct. 7, 1987, Pat. No. 4,882,145, which is a continuation-in-part of Ser. No. 939,617, Dec. 9, 1986, Pat. No. 4,818,527. This application Nov. 20, 1989, Ser. No. 439,099
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] A61K 39/00, 39/29; C07K 7/00, 15/00
U.S. Cl. 424—88 5 Claims

5. A method of enhancing the immunogenicity of a polypeptide immunogen comprising operatively linking to said polypeptide immunogen a T cell stimulating polypeptide consisting essentially of about 15 to about 70 amino acid residues having a sequence corresponding in sequence to a portion of the amino acid residue sequence of HBcAg from about position 70 to about position 140 from the amino terminus thereof.

5,143,727

METHOD FOR PREVENTING DIARRHEA

Takusaburo Ebina, Sendai, Japan, assignor to Sendai Institute of Microbiology, Sendai and Mitsubishi Kasei Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 473,750, Mar. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 255,808, Apr. 20, 1981, abandoned. This application Aug. 29, 1988, Ser. No. 239,003
Claims priority, application Japan, Aug. 29, 1980, 55-119312
Int. Cl.[5] A61K 39/12, 39/42
U.S. Cl. 424—89 5 Claims

1. A method for preventing diarrhea in man caused by human rotavirus, comprising:

administering to a person a therapeutically effective amount of milk or ingredients thereof collected from a milk producing animal immunized with human rotavirus.

5,143,728

PSYLLIUM-CONTAINING FILLING COMPOSITIONS AND METHODS

James W. Cappel, Fairfield, Ohio, and Robert D. Rece, Edgewood, Ky., assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 492,220, Mar. 13, 1990, abandoned, which is a continuation of Ser. No. 83,441, Sep. 4, 1987, abandoned. This application May 1, 1991, Ser. No. 700,090
Int. Cl.[5] A61K 35/78
U.S. Cl. 424—195/00 12 Claims

1. Psyllium-containing filling compositions having a non-gummy lubricious texture comprising, by weight of the composition:

(a) from about 1% to about 50% of psyllium fiber;

(b) from about 10% to about 75% of glycerin;

(c) from about 0% to about 80% of at least one sweetener; and

(d) from about 0% to about 10% of at least one flavorant;

and wherein further said composition is fluid and has an A_w of 0.35 or less to avoid substantial gelation of the components of said composition such that the composition has a non-solid and non-gummy texture.

5,143,729

FADE RESISTANT WATER AND SOIL REPELLENT COMPOSITION FOR FABRIC

Peter B. Thompson, Blagdon Bristol, England, assignor to Fadeguard, Inc., N.H.

Continuation of Ser. No. 891,271, Jul. 29, 1986, abandoned. This application Feb. 25, 1991, Ser. No. 659,546
Int. Cl.[5] D06M 13/152, 13/13, 13/352, 15/256
U.S. Cl. 424—402 17 Claims

1. A fabric treatment spray which is effective to impart fade resistance and fluid and soil repellency to fabric without impairing the hand, coloration, or flexibility of the fabric, and which comprises a UV absorbing compound selected from the group consisting of hydroxybenzotriazoles, hydroxybenzophenones, hydroxymethyoxybenzophenones, and hydroxyphenylbenzotriazoles, dissolved in a non-reactive fluid-repellent and soil-repellent fluorinated polymeric binder solution to permit spraying of particles of the combined ingredients in a micron particle size in the range of 1 to 300, the ratio range of UV absorbing compound to repellent being from about 2–30% to 98–70%, wherein the limits of weight per square foot of spray, as applied in a thin layer of about 20 microns, are from about 0.1 gram per square foot to about 1 gram per square foot of UV absorbing compound and from about 0.1 gram per square foot to about 3 grams per square foot of binder solution.

5,143,730

RESORBABLE BONE WAX

Johann-Friedrich Fues, Grevenbroich, and Wolfgang Ritter, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 385,138

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825211

Int. Cl.[5] A61F *2/28, 2/02*

U.S. Cl. 424—426 27 Claims

1. A resorbable, viscous to solid wax for the mechanical staunching of blood on hard bodily tissue, comprising: at least one oligomer composition formed by the esterification of at least one acid selected from the group consisting of glycolic acid and lactic acid or derivatives of such oligomers with at least one composition selected from the group consisting of monohydroxyl alcohols, polyhydroxyl alcohols and the corresponding carboxylic acids; and at least one body-compatible salt of an organic or an inorganic acid homogeneously distributed in the wax, the at least one oligomer composition being neutralized with a body-compatible salt forming composition and wherein the bone wax composition contains at least 35 mol percent lactic acid residues based on the sum of lactic acid residues and glycolic acid residues in the oligomeric and monomeric state.

5,143,731

BODY CAVITY DRUG DELIVERY WITH THERMO-IRREVERSIBLE POLYOXYALKYLENE AND IONIC POLYSACCHARIDE GELS

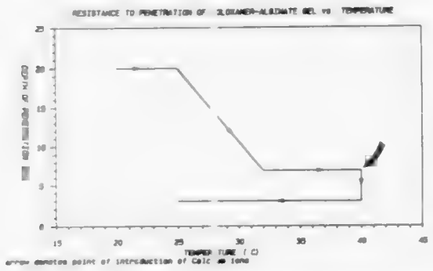
Tacey X. Viegas; Lorraine E. Reeve, both of Ann Arbor, and Raymond L. Henry, Grosse Pointe Woods, all of Mich., assignors to Mediventures Incorporated, Dearborn, Mich.

Filed Aug. 7, 1990, Ser. No. 563,640

The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.

Int. Cl.[5] A61K *9/107, 47, 34, 47/36;* A61L *15/44*

U.S. Cl. 424—486 22 Claims



1. A process for treating a condition requiring pharmacological treatment, which comprises administering to a body cavity of a mammal requiring pharmacological treatment a composition comprising a hyperosmotic, isoosmotic, or hypoosmotic aqueous gel having a buffered pH, which is a liquid at room temperature or below and a thermoreversible gel at mammalian body temperature, said aqueous gel comprising an ionic polysaccharide and

(A) a polyoxyalkylene block copolymer of the formula

$$Y[(A)_n—E—H]_x \quad (I)$$

wherein A is a polyoxyalkylene moiety having an oxygen/carbon atom ratio of less than 0.5, x is at least 1, Y is derived from water or an organic compound containing x reactive hydrogen atoms, E is a polyoxyethylene moiety, n has a value such that the average molecular weight of A is at least about 500 to about 900, as determined by the hydroxyl number of an intermediate,

$$Y[(A)_n—H]_x \quad (II)$$

and wherein the total average molecular weight of the copolymer is at least about 5000,

(B) a pharmacologically effective amount of a drug selected from the group consisting of antibacterials, antihistamines and decongestants, antiinflammatories, antiparasitics, antivirals, local anesthetics, antifungals, amebedicals, trichomonocidals, analgesics, antiarthritics, antiasthmatics, anticoagulants, anticonvulsants, antidepressants, antidiabetics, antineoplastics, antipsychotics, antihypertensives, antiprotozoals, spermicidals, and muscle relaxants, and

(C) a pharmaceutically acceptable buffer sufficient to maintain the pH of said aqueous composition at a desired level, and, optionally, a latent form of a counter-ion capable of thermoirreversibly gelling said composition

wherein said composition contains about 0.01% to about 60% by weight of said drug, about 10 to about 50% by weight of said polyoxyalkylene polymer, and about 0.2 to about 2.5% by weight of said ionic polysaccharide.

5,143,732

ORALLY ADMINISTERED PHARMACEUTICAL AGENT FOR IRON AND MAGNESIUM SUBSTITUTIVE THERAPY

Joachim Helbig, Tutzing, and Hans G. Classen, Stuttgart, both of Fed. Rep. of Germany, assignors to Verla-Pharm Arzneimittelfabrik Apotheker H.J. V. Ehrlich GmbH & Co., Tutzing, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,993

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809625

Int. Cl.[5] A61K *33/26, 33/14, 31/295, 31/205*

U.S. Cl. 424—647 18 Claims

1. An orally administered pharmaceutical drug useful for iron and magnesium substitutive therapy, consisting essentially of a combination of a therapeutically effective amount of one or more pharmaceutically and physiologically compatible iron compounds which do not interfere with enteral magnesium absorption, a therapeutically effective amount of magnesium-L-aspartate hydrochloride matter and sufficient chlorine atoms dissociable in aqueous media to saturate the available magnesium valances, said chlorine atoms available from chloride salts of aid magnesium compounds or from one or more pharmaceutically and physiologically compatible compounds providing chlorine ions in aqueous media.

5,143,733

INJECTION MOLDING APPARATUS

Stefan Von Buren, Toronto, and Vitaly Akselrud, Richmond Hill, both of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Apr. 19, 1991, Ser. No. 687,497

Int. Cl.[5] B29C *45/23*

U.S. Cl. 425—130 10 Claims

1. A molding apparatus for molding articles and preforms having multilayered walls, which comprises:

at least one mold cavity, said cavity having a nozzle individual thereto with a gate area in the nozzle adjacent the mold cavity;

a hot runner system including a first and second conduit means for supplying a first and second thermoplastic material, respectively, to aid mold cavity, each material originating from a separate source, wherein the conduit means define separate and individual channels for each thermoplastic material;

heating means associated with the apparatus for maintaining said materials at their appropriate temperatures in said conduit means;

a first nozzle channel communicating with said first conduit means, gate area and mold cavity for feeding a first material from said first conduit means to said gate area and thence to said mold cavity;

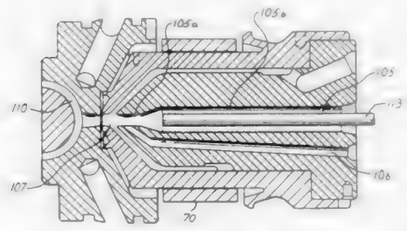
a second nozzle channel communicating with said second conduit means and first nozzle channel; and

means for feeding a small metered amount of second material to said second nozzle channel in an amount less than about 3% of the total weight of the material fed to the mold cavity;

a valve stem movable in said first nozzle channel;

wherein said first nozzle channel has a constricted region adjacent and upstream of said gate area sized to receive said metered amount of second material and a region upstream of the constricted region wider than the constricted region, with the second nozzle channel communicating with the first nozzle channel in said constricted region, including means for moving the valve stem from a forward position seated in the constricted region to block access to the gate area from the first and second nozzle channel, to a position permitting entry of said metered amount of second material into the constricted region while blocking access to the constricted region from the first nozzle channel, to a rearward position in the relatively wider region to open access to the gate area from the first nozzle channel,

whereby said metered amount of second material is fed from said second nozzle channel to said constricted region and subsequently to said gate area and mold cavity by first material from said first nozzle channel.



5,143,734

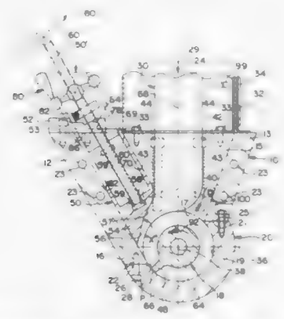
ADJUSTABLE CONVERGING EXTRUDER HOPPER

Stuart A. Sardinskas, Bethany; Mathew Mormino, Jr., Seymour, and Michael R. Kearney, Milford, all of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed Jun. 6, 1991, Ser. No. 711,321

Int. Cl.[5] B29C *47/92, 47/78, 47/66*

U.S. Cl. 425—143 27 Claims



1. An adjustable converging extruder hopper for feeding molten plastic to an extruder feed screw rotatable about its axis and into an extruder barrel in which the feed screw is rotating, the rotating feed screw having at least one screw flight with a tip movable in a circular path about said axis, said hopper comprising:

two side walls;

two end walls interconnecting said side walls;

at least one of said side walls sloping downwardly inwardly toward the other side wall;

said hopper having means for assembly with an extruder barrel with said one sloping side wall defining a wall line extending in a direction substantially tangent to said circular path;

deflector means movable along said wall line toward and away from an extruder feed screw in an extruder barrel with which the hopper is assembled;

said movable deflector means having a deflector surface including at least one face inclined at an acute angle to said wall line; and

adjusting means for adjusting positioning of said movably deflector means along said wall line toward and away from the extruder feed screw.

5,143,735

APPARATUS FOR PRODUCING CRISP LONG TERM PRESERVATION SMALL LOAVES

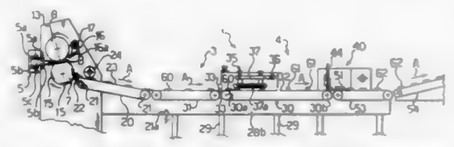
Angelo Varvello, and Franco Varvello, both of Vigevano, Italy, assignors to Societe Des Produits Nestle S.A., Perugina, Italy

Division of Ser. No. 205,004, Jun. 3, 1988, Pat. No. 4,849,230, and a continuation of Ser. No. 880,151, Jun. 30, 1986, abandoned. This application Apr. 27, 1989, Ser. No. 433,796

Claims priority, application Italy, Jul. 1, 1985, 21392 A/85

Int. Cl.[5] B29C *53/02*

U.S. Cl. 425—220 10 Claims



1. A system for producing crisp, long term preservation, small loaves on an industrial scale, comprising:

a forming machine having a feeder assembly, a molding station and a forming station laid sequentially to each other, said feeder assembly including a plurality of parallel, sequentially-laid driven feeder roll pairs, a gap between corresponding feeder roll pairs decreasing in width from the most upstream feeder roll pair to the most downstream feeder roll pair, said molding station including first and second counter-rotating driven rolls journalled on a framework with their axes parallel, said first roll having a plurality of mold cavities uniformly distributed across its skirt, said second roll having a smooth surface skirt;

said first and second rolls being mounted in pressure contact with each other along a common generatrix line;

said forming station comprising a frame carrying a carpet conveyor mounted thereto, and a folder device supported on said frame over a working run of said carpet conveyor, said folder device including a slide guided on said frame in a parallel direction to the working run of said carpet conveyor, a crosspiece fast with said slide and extending bridge-like over the working run of said carpet conveyor, a plurality of rods supported to move at least in a plane on said crosspiece and extending perpendicularly to the working run, drive means for reciprocating said rods toward and away from the working run, and a corresponding plurality of template pairs attached to said frame on the working run, the templates in each pair being laid symmetrically with respect to the plane of movement of a respective one of said rods and mutually set apart from the plane to delimit a passageway for said rod therebetween,

whereby to fold loaves, said one of said rods forces loaves through the passageway.

5,143,736

NOZZLE TOUCH DEVICE IN AN INJECTION MOLDING APPARATUS

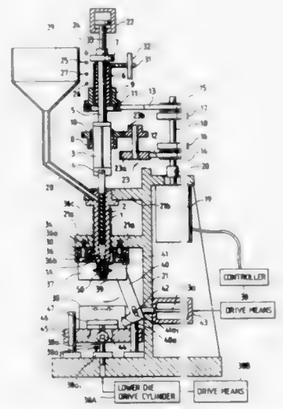
Masaaki Kumamura, Yokohama; Ryohei Inaba, Kawasaki; Shojiro Danmoto, Ushiku, and Mitsuo Arai, Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1990, Ser. No. 531,639

Claims priority, application Japan, Jun. 2, 1989, 1-64000[U]; Jun. 19, 1989, 1-70806[U]; Jun. 19, 1989, 1-70807[U]; May 16, 1990, 2-127889

Int. Cl.[5] B29C *45/66*

U.S. Cl. 425—567 4 Claims



1. A nozzle touch mechanism in an injection molding apparatus,

said injection molding apparatus comprising.

a screw housed in a heating cylinder;

rotating means for rotating said screw;

linear moving means for moving said screw linearly;

a motor for driving said rotating means;

driving means for driving said linear moving means; and

a base member for supporting said screw, said rotating means, said linear moving means, said motor, and said driving means, wherein said screw, said linear moving means and rotating means are supported by said base member along a vertical axis.

said nozzle touch mechanism comprising:

a support member mounted on said base member;

a member for mounting an upper die member, mounted on said support member;

wherein an upper die member is mounted to said member for mounting an upper die member so that a molding material entrance port of the upper die member engages an injection port of the heating cylinder; and

a spring member provided between said member for mounting an upper die member and said support member so as to exert a nozzle touch force on the heating cylinder and the upper die member wherein said upper die member is movable against a lower die member to form a mold cavity.

5,143,737

METHOD TO PRODUCE UNSATURATED MILK FAT AND MEAT FROM RUMINANT ANIMALS

Thomas Richardson, Davis, Calif., assignor to The Regents of the University of California, Alameda, Calif.

Continuation-in-part of Ser. No. 420,905, Oct. 13, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 597,997

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—002 8 Claims

1. An improved method for the modification of an unsaturated lipid containing food material, said method consisting essentially of:

(a) producing an aqueous emulsion having

(i) a non-toxic unsaturated lipid containing food material to be encapsulated; and

(ii) an acid and enzyme sensitive non-toxic crosslinkable protein material which contains a non-toxic reducing sugar material, which materials surround and encapsulate said unsaturated lipid containing food substance at a pH of between about 5 to 8.5 to produce an emulsion which emulsion is then substantially dried;

(b) subjecting the dried emulsion obtained in step (a) adjusted to a pH of about 7–8 to elevated temperature reaction conditions of between about 25° and 190° C. for between 2 and 72 hours to crosslink said crosslinkable protein material with a reducing sugar and encapsulate the lipid containing food substance;

(c) mixing the encapsulated material obtained in step

(b) with a ruminant feed; and

(d) feeding the modified food and feed mixture to a ruminant thereby to produce modified milk or meat having a reduced amount of saturated fat and an increased amount of unsaturated fat.

5,143,738

COMPUTERIZED FOOD PRODUCT EXTRUSION MACHINE AND METHOD

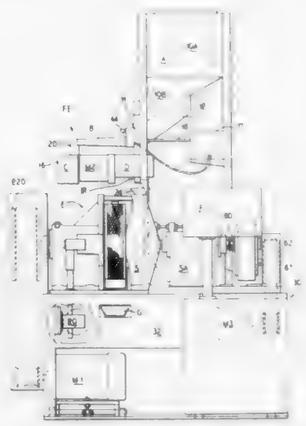
Ronnie Nordin, Beloit, Wis., assignor to American Extrusion International, Inc., Boca Raton, Fla.

Filed Mar. 11, 1991, Ser. No. 667,469

Claims priority, application Japan, Feb. 9, 1990, 2-028372

Int. Cl.[5] A23L *1/00;* B02C *25/00*

U.S. Cl. 426—231 27 Claims



8. A method for controlling a food extruder wherein food product is extruded in a gap between a rotor and a stator to form a cellular food product, said rotor being rotatably driven about an axis by a first motor and axially driven by a second motor, said food product being delivered to said gap through

said stator via a stator feed conveyor, the method comprising in part the steps of:

automatically positioning said rotor to a first axial position relative to said stator during start-up of said food extruder;

automatically repositioning said rotor to a second axial position relative to said stator when said first motor consumes at least a preselected amount of energy;

automatically repositioning said rotor to a third axial position relative to said stator after said rotor has been in said second position for a first preselected duration of time; and

repositioning said rotor to a fourth axial position relative to said stator after said rotor has been in said third position for a second preselected duration of time, whereby optimal product formation is obtained.

5,143,739

PROCESS FOR TREATING POULTRY CARCASSES TO CONTROL SALMONELLAE GROWTH

Fredric G. Bender, Houston, and Eugene Brotsky, Pittsburgh, both of Pa., assignors to Rhone-Poulenc Inc.

Continuation-in-part of Ser. No. 530,131, May 29, 1990, Pat. No. 5,069,922, which is a continuation of Ser. No. 308,357, Feb. 9, 1989, abandoned. This application Jun. 7, 1991, Ser. No. 712,260

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] A23L *3/34;* A22C *21/00*

U.S. Cl. 426—332 15 Claims

1. A process for treating poultry carcasses comprising contacting the poultry with a treatment solution having a pH above about 11.5, said solution containing trialkali metal orthophosphate present in an amount of from about 4% or greater based on the weight of the solution, the proviso that the treatment solution does not contain alcohol, said treatment being conducted for a period of time effective to remove, reduce over retard salmonella contamination and/or growth and insufficient to cause organoleptic depreciation of the poultry.

5,143,740

PROCESS FOR PREPARING CEREAL FLAKES

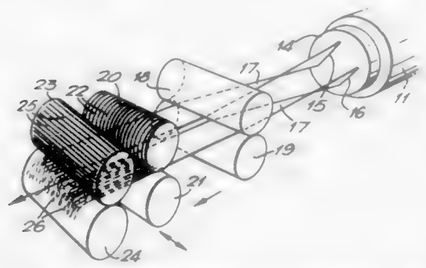
Claude Blanchard, Corsier a/Vevey; Alfred Morand, Blonay, and Robert H. Schmidt, Semsales, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 614,927, Nov. 16, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 719,652

Claims priority, application European Pat. Off., Dec. 2, 1989, 89122258.0

Int. Cl.[5] A23L *1/00;* A23P *1/00*

U.S. Cl. 426—446 18 Claims



1. A process for the preparation of cereal flakes comprising extrusion-cooking a dough in an extruder-cooker, extruding the cooked dough from the cooker through a rectangularly shaped orifice to form an expanded and puffed extruded dough, stretching the extruded dough to obtain a stretched dough having a density of from 75 g/liter to 200 g/liter, cutting the stretched dough into flakes and then roasting the flakes.

5,143,741

CONCENTRATED, SUBSTANTIALLY NON-AGGREGATED CASEIN MICELLES AS A FAT/CREAM SUBSTITUTE AND A METHOD FOR REDUCING THE FAT CONTENT IN FOOD PRODUCTS

Joseph S. Podolski, 5334 Suffield Ter., Skokie, Ill. 60077, and Maher Habib, 356 Walnut St., Des Plaines, Ill. 60016

Continuation of Ser. No. 618,008, Nov. 26, 1990, abandoned, which is a continuation of Ser. No. 358,654, Jun. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 202,082, Jun. 3, 1988, abandoned. This application Oct. 30, 1991, Ser. No. 784,112

Int. Cl.[5] A23C *9/142;* A23L *1/19*

U.S. Cl. 426—565 23 Claims

1. A method for reducing fat or cream in a whipped or quiescently frozen or refrigerated dessert containing the same which comprises substituting all or a portion of the fat or cream with substantially non-aggregated casein micelles wherein the casein micelles are present in the whipped or quiescently frozen or refrigerated dessert in an amount of at least about 6 percent by total weight.

5,143,742

PROCESS FOR PRODUCING A DAIRY PRODUCT USABLE AS A SPREAD

Johann Maroudas, Nordfelder Reihe 20, 3000 Hannover, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 359,404, May 31, 1989, abandoned. This application Oct. 7, 1991, Ser. No. 772,282

Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818421; Apr. 21, 1989, 3913125

Int. Cl.[5] A23C *23/00;* A23D *7/02*

U.S. Cl. 426—585 13 Claims

1. A process of producing a food product consisting of:

dehydrating water from a starting material selected from the group consisting of curds, yogurt and kefir to reduce its weight 50% to 85%, and directly thereafter adding vegetable oil to the resulting dehydrated material in an amount equal to 4% to 40% of the weight of said dehydrated material, said vegetable oil having a high content of unsaturated fatty acids, and stirring said dehydrated material and said added oil at room temperature, without the addition of heat, until there is obtained a product of soft, creamy consistency with a solidity similar to that of butter.

5,143,743

METHOD OF EVALUATION OF ALLOYS FOR GALVANIC PROTECTION OF STEEL

Bryan E. Wilde, Granville, Ohio, and Michael K. Budinski, Pittsford, N.Y., assignors to The Ohio State University, Columbus, Ohio

Continuation-in-part of Ser. No. 256,187, Oct. 7, 1988, Pat. No. 4,917,966, which is a continuation of Ser. No. 17,810, Feb. 24, 1987, abandoned. This application Apr. 13, 1990, Ser. No. 509,031

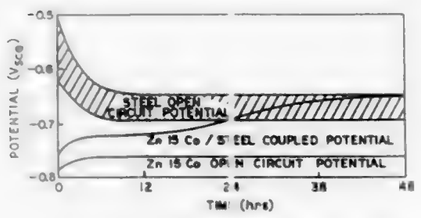
Int. Cl.[5] B05D *1/18*

U.S. Cl. 427—8 7 Claims

1. A method for galvanic protection of steel, other than stainless steel, in an environment in which said galvanic protection is sought, which method comprises:

coupling galvanically the steel to an alloy of a composition having a galvanic corrosion potential less than the critical cathodic protection potential of the steel in said environment with, before said coupling, a determination of the

galvanic corrosion potential of the composition of the alloy in said environment and a determination of the critical cathodic protection potential of the steel in said environment.

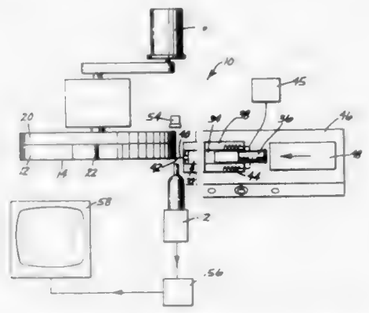


5,143,744

DYNAMIC CONTACT ANGLE MEASUREMENT SYSTEM

Jerry J. Barth, Red Wing, and Gary R. Zvan, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 19, 1991, Ser. No. 717,534
Int. Cl.[5] B05D *1/26*
U.S. Cl. 427—8 9 Claims



1. An apparatus for measuring the dynamic contact angle of a coating fluid on a coating substrate during coating comprising:
a rotatable coating wheel;
a discrete coating substrate segment wrapped around the coating wheel;
a coating tube having a narrow outlet nozzle, wherein the outlet nozzle produces a coating having no edge bead;
means for moving the coating fluid through the coating tube;
means for measuring the contact angle between the coating fluid and the coating substrate.

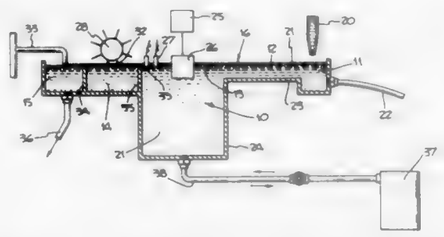
6. A method of measuring the dynamic contact angle of a coating fluid on a discrete coating substrate segment during coating comprising the steps of:
mounting the coating substrate segment around a coating wheel;
locating the narrow outlet nozzle of a coating tube adjacent the coating wheel;
rotating the coating wheel at a surface speed equal to the speed at which the coating fluid is typically coated;
ejecting the coating fluid from the coating tube outlet nozzle onto the coating substrate in a narrow stripe as the coating substrate passes around the coating roller, to produce a coating having no edge bead; and
measuring the dynamic contact angle of the coating fluid on the coating substrate.

5,143,745

INTERMITTENT FILM DEPOSITION METHOD AND SYSTEM

Thomas C. Maganas, 1200 Ardmore Ave., Manhattan Beach, Calif. 90266, and Alan L. Harrington, 2508 Floyd Ave., Modesto, Calif. 95350

Filed Aug. 16, 1991, Ser. No. 746,774
Int. Cl.[5] B05D *1/20*
U.S. Cl. 427—8 20 Claims



12. A method for forming and depositing a monomolecular layer of amphiphilic molecules on a substrate, from a monomolecular film formed on the surface of a carrier fluid, comprising the steps of:
a. dividing a receptacle into casting, compression and film removing regions, said compression region being of substantially greater depth than the other regions to allow for the complete immersion of a substrate to be coated;
b. providing a continuous flow of a carrier fluid into said receptacle to a predetermined depth for supporting the film, said carrier fluid flowing from said casting region to said removal region through said compression region;
c. interposing a rotatable barrier between said compression and removal regions;
d. moving a substrate to be coated in and out of said compression region through the carrier fluid and the film, thereby coating the substrate with the film; and
e. removing unused film from the surface of the carrier fluid in said removal region,
whereby said barrier isolates the film in said compression region from the film in said removal region so that the removal of film does not affect the film in said compression or casting regions.

5,143,746

PROCESS FOR PRODUCING MAGNETITE-COATED ELECTRODE

Hideo Inoue, Urawa; Setsuo Yoshimoto, and Sakae Ikegami, both of Tanouramachi, all of Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1991, Ser. No. 650,279
Claims priority, application Japan, Feb. 5, 1990, 2-26772
Int. Cl.[5] B05D *1/00*
U.S. Cl. 427—34 9 Claims

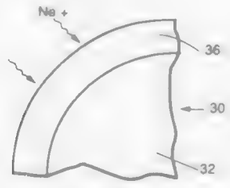
1. A process for producing a magnetite-coated electrode which comprises kneading an iron oxide powder together with water and an organic binder, molding the resultant kneaded product under pressure sufficient to prepare a molded article, baking the molded article in a gas atmosphere mainly composed of a member selected from the group consisting of carbon dioxide and steam under conditions sufficient to prepare a magnetite sinter having an Fe to O ratio of 3:3.7 to 4.0, pulverizing said sinter to form a powder and spray coating a metallic substrate with said powder by means of plasma spray coating, plasma jet spray coating, explosive spray coating or water plasma spray coating in a neutral gas atmosphere to form a magnetite coating on the surface of the metallic substrate.

5,143,747

DIE IMPROVED TOOLING FOR METAL WORKING

Jesse N. Matossian, Woodland Hills; Joseph A. Wysocki, Oxnard; Robert G. Wilson, Canoga Park; Frederick G. Yamagishi, Newbury Park, all of Calif., and Edward F. Ryntz, Jr., Warren, Mich., assignors to Hughes Aircraft Co., Los Angeles, Calif. and General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1991, Ser. No. 654,868
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 19 Claims



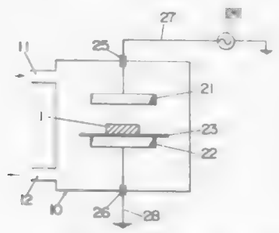
1. A process for working a workpiece using a tool having a preselected shape, comprising the steps of:
furnishing a substrate having the preselected shape of a material-working tool;
coating the substrate with a coating of a silicon-modified organic material; and
implanting the coating with a sufficient number and energy of inert gas atoms to transform the silicon-modified organic material at least in part to a silicon carbide-containing coating.

5,143,748

TIMBER SURFACE IMPROVING TREATMENT PROCESS

Hiroyuki Ishikawa; Hiroaki Usui; Yasushi Sawada, all of Kadoma; Satiko Okazaki, 2-20-11, Takaido-Higashi, Suginami-ku, Tokyo, and Masuhiro Kogoma, 843-15, Shimoshinkura, Wako-shi, Saitama, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka; Satiko Okazai, Tokyo and Masuhiro Kogoma, Wako, all of, Japan

Filed Oct. 25, 1991, Ser. No. 783,022
Claims priority, application Japan, Oct. 26, 1990, 2-289903; Jul. 15, 1991, 3-173691
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—40 6 Claims



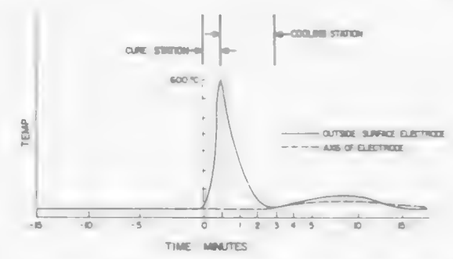
1. A process of improving timber surface properties comprising the following steps of:
reducing a moisture content of a timber below a fiber saturation point for said timber; and
exposing said timber to a plasma mixture of an inert gas and a reactive gas including at least one element selected from the group consisting of C, N, O, F, and S, said plasma mixture being generated by a glow-discharge at near atmospheric pressure.

5,143,749

METHOD FOR TREATING A GRAPHITE OR CARBON BODY TO FORM A PROTECTIVE COATING

Francis E. Wise, Medina, Ohio, and Philip D. Coleman, Columbia, Tenn., assignors to UCAR Carbon Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 419,332, Oct. 10, 1989, abandoned.
This application Jul. 1, 1991, Ser. No. 725,892
Int. Cl.[5] B05D *3/02, 5/12*
U.S. Cl. 427—45.1 10 Claims



1. A method for treating graphite or carbon porous bodies in sequence to form a protective coating at the surface of each body comprising the steps of:
(a) contacting a surface of each graphite or carbon porous body with a precursor material containing a phosphate compound to cause said precursor material to penetrate into said graphite or carbon porous body;
(b) controlling the depth of penetration of the precursor material into each graphite or carbon body so that only a predetermined region of the body extending from its surface to a depth of between about $\frac{1}{8}$ inch to about $\frac{1}{4}$ inch is impregnated with precursor material;
(c) placing each impregnated carbon body on a moving conveyor assembly line oriented to pass the impregnated region of each graphite or carbon body adjacent a high frequency induction heating coil so as to preferentially heat the impregnated surface;
(d) controlling the power of the induction heating coil, the frequency of the coil, and the relative velocity between the impregnated surface and the coil such that the impregnated region is heated up to a peak of 600° C. for forming an insoluble phosphate compound from said precursor material in the impregnated region of each graphite or carbon body;
(e) quench cooling the impregnated surface of the carbon body while on-line on the moving conveyor assembly immediately following said induction heating so as to rapidly withdraw heat from the impregnated region before substantial heat conduction occurs further into the interior of the graphite of carbon body; and
(f) serially removing each body from said moving assembly line.

5,143,750

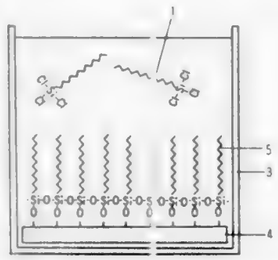
METHOD OF MANUFACTURING CHEMICALLY ADSORBED FILM

Yoshikazu Yamagata, Moriguchi; Norihisa Mino, Settu; Kazufumi Ogawa, Hirakata, and Mamoru Soga, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 19, 1991, Ser. No. 810,114
Claims priority, application Japan, Dec. 21, 1990, 2-404860
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—57 15 Claims

1. A method of forming a chemically adsorbed monomolecular film on the surface of a substrate, wherein the surface of the substrate contains active hydrogen groups, the method comprising:

(A) preparing a chemical adsorbing material solution by dissolving a chemical adsorbing material in a non-aqueous organic solvent, said chemical adsorbing material having end functional molecular groups capable of reacting with the active hydrogen groups on the substrate surface;



(B) dipping the substrate in said chemical adsorbing material solution and applying ultrasonic waves, thereby causing adsorption of the chemical adsorbing material to the substrate surface; and

(C) washing non-reacted chemical adsorbing material away from the substrate surface using a non-aqueous organic solution.

5,143,751

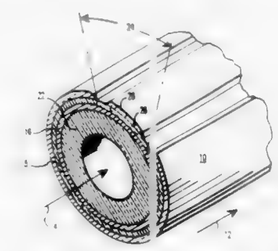
METHOD OF MAKING HIGHLY SINTERABLE LANTHANUM CHROMITE POWDER

Von L. Richards, and Subhash C. Singhal, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1990, Ser. No. 495,884

Int. Cl.[5] B05D *5/12, 3/02*

U.S. Cl. 427—126.3 **13 Claims**



1. A method of making a highly sinterable lanthanum chromite powder containing a dopant metal, comprising the steps:

(1) separately dissolving a La source, a Cr source and a source of a dopant metal selected from the group consisting of Ca, Sr, Co, Ba, Mg, and mixtures thereof, in a mixture of an acid selected from the group consisting of polycarboxylic acids, hydroxy acids and mixtures thereof, and a polyhydroxy alcohol, to form a solution of each;

(2) evaporating a substantial amount of each of the solutions formed in step (1), and any precipate formed is filtered out of the solutions;

(3) mixing the solutions together in the desired proportions to achieve a desired ratio of La, Cr and dopant metal, heating the solution mixture to reduce alcohol content and then further heating under a vacuum condition until esterification and polymerization occur, to form submicron polymer precipitates;

(4) continuing heating the solution mixture under a vacuum condition until a foamed, porous mass of amorphous organic polymeric material forms;

(5) heating the foamed amorphous polymeric material to burn off organic components and produce a hard, somewhat porous, charred material comprising La, Cr, and dopant metal;

(6) grinding the somewhat porous charred material to a powder;

(7) heating the somewhat porous, charred, ground powder at from 590° C. to 950° C., in a flowing atmosphere of inert gas containing from 100 ppm to 50,000 ppm O_2 and less than 300 ppm CO_2, for a time effective to provide a sinterable material having a high specific surface area of from 7 m^2/g to 30 m^2/g, consisting essentially of $LaCrO_3$, containing from 5 weight % to 20 weight % of a chromite of the dopant metal;

(8) adding the high specific surface area sinterable material solids to an aqueous solution mixture of a nitrate of Cr and a nitrate of a dopant metal selected from the group consisting of Ca, Sr, Co, Ba, Mg, and mixtures thereof, to form a slurry, where the total nitrate is added in an amount effective to provide from 3 weight % to 20 weight % dopant metal chromate upon subsequent evaporation and heating in step (11);

(9) grinding the particles in the slurry to provide particles of a sinterable material having a diameter up to 3 micrometers in the slurry;

(10) taking the nitrate slurry with the ground particles and simultaneously evaporating solvent and coating the particles of sinterable material with a solidified mixture of nitrates, to provide dry, coated particles; and

(11) heating the dry, coated particles at a temperature effective to convert the nitrate coating to a chromate coating, where the chromate coating constitutes from 3 weight % to 20 weight % of the total weight of the coated particles, to provide a highly sinterable powder having a high specific surface area of from 7 m^2/g to 30 m^2/g.

5,143,752

FILTERING MATERIAL OF APATITE AND GLUCAN USED FOR SURGICAL MASKS AND METHOD OF MAKING IT

Tooru Nakajima, and Sumiaki Tsuru, both of Tokyo, Japan, assignors to Bestex Kabushiki-Kaisha, Tokyo, Japan

Filed Jan. 30, 1992, Ser. No. 828,359

Int. Cl.[5] A62B *18/02*

U.S. Cl. 427—244 **5 Claims**

2. A method of producing a filtering material, comprising;

a step of preparing an aqueous treatment solution in which porous apatite particles of 0.5 to 40% by weight and a water soluble glucan of 0.5 to 15% by weight are dispersively dissolved,

a step of immersing a sheet-shaped raw material in said aqueous treatment solution to result in containing of said particles aided by said glucan having a property of a binder, and

a subsequent step of drying said sheet-shaped material.

5,143,753

SUPPRESSION OF ELECTROOSMOSIS WITH HYDROLYTICALLY STABLE COATINGS

Milos V. Novotny; Kelly A. Cobb, both of Bloomington, Ind., and Vladislav Dolnik, Brno, Czechoslovakia, assignors to Indiana University Foundation, Bloomington, Ind.

Division of Ser. No. 603,589, Oct. 26, 1990. This application Sep. 16, 1991, Ser. No. 760,677

Int. Cl.[5] B05D *3/00, 3/04*

U.S. Cl. 427—299 **17 Claims**

1. A method for treating a solid surface bearing exposed silanol groups to reduce the presence of electrostatic charges at said groups, said method comprising:

(a) treating said surface to convert said exposed silanol groups to silicon halide groups;

(b) reacting said surface so treated with an organometallic compound which includes an aliphatic group R containing a terminal ethenyl moiety, to convert said silicon halide groups to Si—R groups with said terminal ethenyl moiety retained; and

(c) reacting said Si—R groups with a neutral organic species capable of addition polymerization at said terminal ethenyl group to form a polymer layer covalently bonded to said surface.

5,143,754

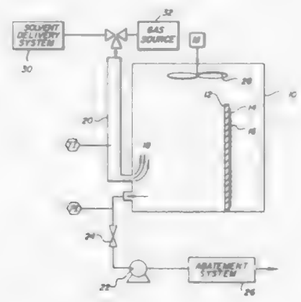
SOLVENT FUSING OF THERMAL PRINTER DYE IMAGE

Michael E. Long, Penfield; David L. VanGalio, Brockport, and Helmut Weber, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1991, Ser. No. 739,070

Int. Cl.[5] B05D *3/04*

U.S. Cl. 427—335 **3 Claims**



1. An environmentally safe method of fusing a thermal printing dye image into a receiver, comprising the steps of:

(a) placing the receiver containing a dye image into an enclosure;

(b) reducing the absolute pressure in the enclosure to below atmospheric pressure;

(c) introducing a predetermined effective quantity of vaporized solvent concentration, such that the sum of the partial pressure of the added solvent vapor and the initial gas pressure in the enclosure does not equal or exceed atmospheric pressure, to fuse the dye image into the receiver with no significant distortion of the dye image; and

(d) evacuating solvent vapor from the enclosure.

5,143,755

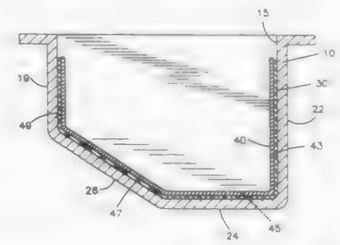
METHOD OF USING A SOUND DAMPING COMPOSITION

Dan T. Moore, III, Cleveland Heights; Edward A. Collins, Avon Lake, and Maurice E. Wheeler, Ashtabula, all of Ohio, Assignors to Soundwich, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 302,615, Mar. 6, 1989, Pat. No. 4,952,610, which is a division of Ser. No. 103,392, Oct. 1, 1987, Pat. No. 4,851,271. This application Aug. 27, 1990, Ser. No. 573,370

Int. Cl.[5] C08G *18/14*

U.S. Cl. 427—373 **17 Claims**



1. A method of providing for damping of vehicular noise transmitted from or through a surface of a housing, comprising the steps of:

forming a liner which has a mating configuration with said surface;

forming a plastic composition comprising a major amount of at least one urethane polymer, a minor amount of an olefin polymer, and an effective amount of filler;

processing said composition to form a blank sheet;

positioning said blank sheet in contact with at least a portion of said surface;

positioning said liner in contact with at least a portion of said blank sheet; and

securing said liner and blank sheet to said surface of said housing to form a unitary structure of said liner, said blank sheet and said housing.

5,143,756

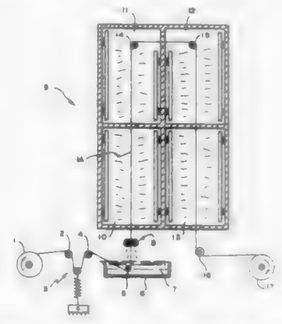
FIBER REINFORCED EPOXY PREPREG AND FABRICATION THEREOF

Michael J. Cibulsky, Binghamton; Kostas Papathomas, Endicott, and George P. Schmitt, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1990, Ser. No. 572,554

Int. Cl.[5] B05D *3/02*

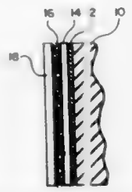
U.S. Cl. 427—386 **18 Claims**



1. A method for fabricating a fiber reinforced epoxy prepreg containing dicyandiamide which comprises:

obtaining a curable epoxy composition containing dicyandiamide in an effective crosslinking amount and a curable epoxy material selected from the group of epoxy polymers, epoxy polymer precursors and mixtures thereof;
subjecting the curable epoxy composition containing dicyandiamide and epoxy material to elevated temperatures to thereby form a substantially prereacted product,
then impregnating said fiber with said prereacted product;
and then thermally advancing the prereacted product to the desired state of crosslinking to thereby form the prepreg.

5,143,757
ENCAPSULATING A SUBSTRATE
George Skinner, 6913 Wooden Rail La., Charlotte, N.C. 28227
Division of Ser. No. 325,376, Mar. 17, 1989, Pat. No. 5,019,195.
This application Jan. 17, 1991, Ser. No. 642,473
Int. Cl.[5] B05D *1/36, 7/00*
U.S. Cl. 427—407.1 12 Claims



1. A method for encapsulating a potentially hazardous layer between a substrate and at least an outer chip resistant protective layer, to render the material comprising said potentially hazardous layer essentially non-hazardous during normal use of said substrate, comprising the steps of:
(a) selecting a liquid capable of adhering to said potentially hazardous layer and of forming said outer chip resistant protective layer;
(b) applying said liquid to said potentially hazardous layer to form said at least an outer chip-resistant protective layer such that material comprising said potentially hazardous layer is enclosed between said outer chip-resistant protective layer and said substrate

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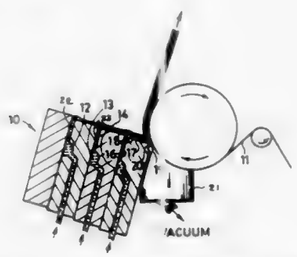
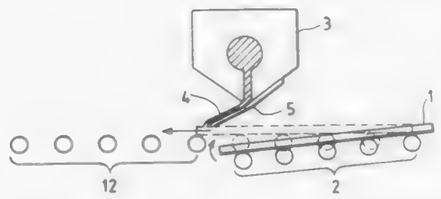
5,143,758
COATING BY MEANS OF A COATING HOPPER WITH COATING SLOTS WHERE THE COATING COMPOSITION HAS A LOW SLOT REYNOLDS NUMBER
William D. Devine, Chili, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 28, 1991, Ser. No. 676,950
Int. Cl.[5] B05D *1/30*
U.S. Cl. 427—420 7 Claims



1. The method for coating a photographic composition on a moving support by means of a coating hopper having one or more coating slots which comprises:
(a) determining the conditions for flowing said composition through said slot or slots which correspond to a slot Reynolds number no greater than about 10;
(b) flowing said composition through said slot or slots under said conditions; and
(c) receiving said composition flowing from the coating hopper on said moving support.

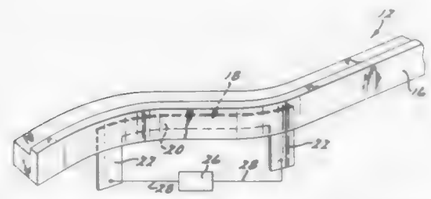
5,143,759
METHOD AND APPARATUS FOR APPLYING AN EMULSION LAYER TO PHOTOGRAPHIC PLATES INCLUDING PIVOTING CONVEYANCE ROLLERS
Hiroki Saito, and Seiji Ishizuka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 10, 1991, Ser. No. 727,741
Claims priority, application Japan, Jul. 13, 1990, 2-185860
Int. Cl.[5] B05D *1/30*
U.S. Cl. 427—420 4 Claims



1. In a method of manufacturing a photographic plate of glass using an apparatus in which an elastic flexible hanger is provided at the bottom of a liquid feeder located over the movement passage for the base of said plate, and said base is moved into contact with said hanger at the lower end thereof so that a liquid flowing out from said feeder is applied to said base, the improvement wherein: said base and said hanger are kept out of contact with each other until the leading edge of said base passes under said hanger; said base and said hanger are put into contact with each other after the leading edge of said base has passed under said hanger so that said application is started; and said base and said hanger are put out of contact with each other immediately before said liquid is applied to said base at the trailing edge thereof;
wherein said base is conveyed past said hanger with a set of upstream rollers and a set of downstream rollers located respectively upstream and downstream of said hanger; and
wherein said step of putting said base and said hanger into contact with each other comprises swinging said upstream rollers around a first predetermined axis, and said step of putting said base and said hanger out of contact with each other comprises swinging said downstream rollers around a second predetermined axis.

5,143,760
EXTRUDED MOLDING WITH DESIRED CONTOURED FORMATION
James E. Mistopoulos, Dearborn Heights, Mich., assignor to The Standard Products Company, Cleveland, Ohio
Filed Jun. 27, 1990, Ser. No. 544,337
Int. Cl.[5] B60R *13/04*
U.S. Cl. 428—31 12 Claims

1. A molding for attachment to an automotive vehicle, comprising:
an extrusion member extending longitudinally and having a longitudinally extending groove; and
a flexible, electrically conductive insert in only a local area of said extrusion, said insert having a longitudinal length disposed in said groove, each end of said length having a tab extending laterally therefrom and adapted to be connected to a source of electrical power to heat said insert and extrusion member in said local area to facilitate forming the local area to a predetermined contour.

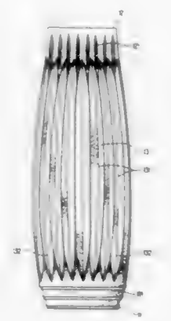


5,143,761
THERMOPLASTIC FLUOROPOLYMER ADHESIVE COMPOSITION
Achilles Chiotis, Menlo Park, and Pravin Soni, Union City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 288,371, Dec. 21, 1988, abandoned.
This application Apr. 17, 1991, Ser. No. 687,191
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] C08L *27/16;* H01R *4/72*
U.S. Cl. 428—35.1 14 Claims

1. An adhesive composition comprising:
(a) about 40 to about 70% by weight of a thermoplastic fluoropolymer which is a thermoplastic copolymer of vinylidene fluoride and at least one other monomer;
(b) about 5 to about 25% by weight of an elastomeric fluoropolymer;
(c) about 5 to about 25% by weight of a thermoplastic ethylene copolymer comprising at least 50 mole % of units derived from ethylene and at least 5 mole % of units derived from at least one unsaturated comonomer containing at least one polar group; and
(d) about 5 to about 20% by weight of a tackifier;
with the proviso that the combined amounts of (c) and (d) are less than about 30% by weight and that the ratio of (c) to (d) is less than about 2:1, all percentages by weight being based on the total weight of the four components.

5,143,762
INNOVATED LIMB COVERING
Jung H. Ho, No. 16, Lane 69, Hsueh Fu Rd., Taichung, Taiwan
Filed Jan. 15, 1991, Ser. No. 641,587
Int. Cl.[5] A41D *13/00;* B65D *65/00*
U.S. Cl. 428—35.7 4 Claims

1. A limb covering comprising:
a main covering body of tubular elastic material having a plurality of longitudinal folds extending substantially the entire length of said body and disposed about the entire circumference thereof;
an elastic binder at one end of said main covering body having a plurality of adjacent step-like portions each having a different radius with the radius of each portion decreasing toward said one end; and
an elastic band at an opposite end of said main covering body of the same elastic material as said main covering body



with said main covering body, said elastic band and said elastic binder being formed as one continuous piece.

5,143,763
OXYGEN SCAVENGER
Shinichi Yamada; Isamu Sakuma, both of Otsu; Yoshio Himeshima, Yokohama; Takao Aoki, Otsu; Tadahiro Uemura, Kyoto, and Akira Shirakura, Tokyo, all of Japan, assignors to Toray Industries, Inc., Japan
Filed Jul. 11, 1991, Ser. No. 728,528
Claims priority, application Japan, Jul. 13, 1990, 2-186457
Int. Cl.[5] B65D *53/00, 81/26*
U.S. Cl. 428—36.2 19 Claims

1. An oxygen scavenger comprising:
an oxygen absorbent composition including an oxygen absorbent and a resin containing said oxygen absorbent therein said resin being substantially impermeable to moisture under normal atmospheric conditions but permeable to moisture and oxygen under a high-moisture condition; and
an oxygen permeable film covering said oxygen absorbent composition and involving a polymeric asymmetric porous membrane whose outer surface portion in the thickness direction of said asymmetric porous membrane is formed as a dense skin layer, said dense skin layer having a thickness in the range of 0.01 to 1 μm and having pores with a pore size of 0.0005 to 0.5 μm, said pores being smaller than pores of the remaining portion of said asymmetric porous membrane.

5,143,764
FLEXIBLE PACKING MATERIAL IN SHEET OR WEB FORM
Ake Rosén, Helsingborg, Sweden, assignor to Tetra Pak Holdings S.A., Pully, Switzerland
Filed Jul. 26, 1989, Ser. No. 385,178
Claims priority, application Sweden, Aug. 1, 1988, 8802777; Aug. 1, 1988, 8802778
Int. Cl.[5] B29D *9/00*
U.S. Cl. 428—36.5 7 Claims

1. A web for liquid tight packing containers comprising:
a first extruded base layer of mineral-filled thermoplastic

material having between about 50% and about 80%, based on the total weight of the thermoplastic material, of an inorganic particulate mineral filler, said thermoplastic material being a propylene-based polymer having a melt index of between 0.5 and 5.0 according to ASTM (2.16 kg, 230° C.), said first base layer being provided with a plurality of crease lines in a surface of said first base layer, said crease lines being formed, through plastic deformation, concurrently with the extrusion of the first base layer or immediately thereafter while the first base layer is in a softened state;

a second extruded base layer which is laminated to the first base layer, one of said first and second base layers containing mica and the other base layer including calcium salt, whereby when the web is formed into a container, the base layer containing mica is on the interior of the container; and

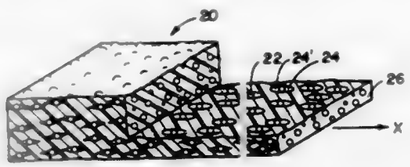
an intermediate layer of foamed propylene-based polymer positioned between said first and second base layers and joining said two base layers together, said foamed propylene-based polymer of said intermediate layer having a melt index of between 0.5 and 5.0 according to ASTM (2.16 kg. and 230° C.).

5,143,765

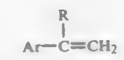
SHAPED ARTICLES FROM ORIENTABLE POLYMERS AND POLYMER MICROBEADS

Larry K. Maier; Elizabeth K. Priebe, both of Rochester; Jong S. Lee, Pittsford; Paul E. Woodgate, Spencerport, all of N.Y., and Glen C. Smith, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

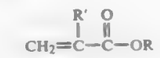
Continuation-in-part of Ser. No. 625,283, Dec. 11, 1990, which is a division of Ser. No. 457,894, Dec. 15, 1989, Pat. No. 4,994,312.
This application Mar. 21, 1991, Ser. No. 673,227
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] B32B *3/26, 5/16;* D02G *3/00*
U.S. Cl. 428—36.5 24 Claims



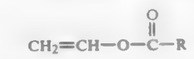
1. An article shaped as a film, sheet, bottle, tube, fiber, or rod wherein said article comprises a continuous oriented thermoplastic polymer having dispersed therein microbeads of a cross-linked polymer coated with a slip agent and which are at least partially bordered by void space formed from substantially closed cells so that substantially no open fluid transport path extends across opposed sides of said article, said microbeads being present in an amount of about 5–50% by weight based on the weight of said oriented polymer, said void space occupying about 2–60% by volume of said shaped article wherein said cross-linked polymer comprises polymerizable organic material which is a member selected from the group consisting of an alkenyl aromatic compound having the general formula



wherein Ar represents an aromatic hydrocarbon radical, or an aromatic halohydrocarbon radical of the benzene series and R is hydrogen or the methyl radical; acrylate-type monomers include monomers of the formula



wherein R is selected from the group consisting of hydrogen and an alkyl radical containing from about 1 to 12 carbon atoms and R′ is selected from the group consisting of hydrocarbon and methyl; copolymers of vinyl chloride and vinylidene chloride, acrylonitrile and vinyl chloride, vinyl bromide, vinyl esters having the formula



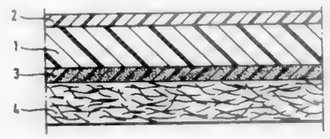
wherein R is an alkyl radical containing from 2 to 18 carbon atoms; acrylic acid, methacrylic acid, itaconic acid, citraconic acid, maleic acid, fumaric acid, oleic acid, vinylbenzoic acid; the synthetic polyester resins which are prepared by reacting terephthalic acid and dialkyl terephthalics or ester-forming derivatives thereof, with a glycol of the series $(HO(CH_2)_nOH$ wherein n is a whole number within the range of 2–10 and having reactive olefinic linkages within the polymer molecule, the hereinabove described polyesters which include copolymerized therein up to 20 percent by weight of a second acid or ester thereof having reactive olefinic unsaturation and mixtures thereof, and a cross-linking agent selected from the group consisting of divinylbenzene, diethylene glycol dimethacrylate, diallyl fumarate, diallyl phthalate and mixtures thereof.

5,143,766

SELF-ADHESIVE BITUMINOUS ROOFING AND SEALING WEB WITH COVER SHEET

Ute Wenz, Wiesbaden, and Ekkehard Beer, Bad Schwalbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1991, Ser. No. 650,762
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1990, 4003861
Int. Cl.[5] B32B *11/00, 11/04;* D06N *5/00*
U.S. Cl. 428—40 23 Claims



1. A self-adhesive bituminous sealing web, comprising a support layer having two surfaces each covered with a bituminous coating, a first adhesive layer bonded on the surface not covering the support layer of one of the bituminous coatings, and a cover sheet disposed on said first adhesive layer, wherein said cover sheet comprises at least one first layer comprised of a thermoplastic polymer and at least one second layer selected from the group consisting of a woven fabric and a non-woven material comprised of highly tear-resistant plastic fibers or threads, and wherein said first layer is disposed on said first adhesive layer.

5,143,767

PROCESSES FOR PREPARING ELECTRET FILTERS

Satoshi Matsuura; Masayuki Mito, and Yoshio Shinagawa, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,000
Claims priority, application Japan, Jan. 12, 1988, 63-4464; Jan. 28, 1988, 63-17969
Int. Cl.[5] B32B *5/26, 7/10, 31/08, 31/20*
U.S. Cl. 428—109 19 Claims

1. A reinforced type electret filter which comprises a nonwoven fabric composed of an electrically charged synthetic fiber web having embossed surface portions and a reticular product made of a synthetic fiber, only the surface of embossed portions of aid nonwoven fabricd being fused and said nonwoven fabric and said reticular product being in contact with each other, substantially all the contacting portions of said nonwoven fabric and the fiber constituting said reticular product being thermowelded.

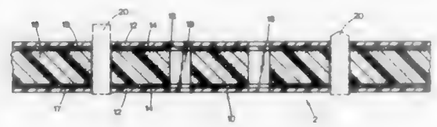
7. A process for preparing an electret filter which comprises feeding a nonwoven fabric composed of an electrically charged synthetic fiber web at a temperature lower by 5° to 50° C. than a softening temperature of said synthetic fiber with a reticular product made of a synthetic fiber between cooperating embossing and flat rolls to emboss portions of the surface of said synthetic fiber web, thereby fusing only the surfaces of embossed portions of said nonwoven fabric and sumultaneously thermowelding almost all the contacting portions of said nonwoven fabric and the synthetic fiber constituting said reticular product to integrate said nonwoven fabric and said reticular product into a solid structure.

5,143,768

LAMINATED DIEBOARD STRUCTURE

Ronald C. Wilderman, Sumner, and David W. Park, Puyallup, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 30, 1991, Ser. No. 753,113
Int. Cl.[5] B32B *1/04*
U.S. Cl. 428—68 21 Claims



1. A laminated dieboard structure comprising:

a core having first and second opposed major surfaces, the core being of a plastic material of a density of from ten to thirty pounds per cubic foot;

first and second cover sheets each having opposed major surfaces, the core being positioned between respective major surfaces of the cover sheets to form the laminated structure, the cover sheets each comprising cellulosic material impregnated with a heat-curable polyisocyanate within a range of from about eight percent to about thirty percent by weight of polyisocyanate to cellulosic material, the polyisocyanate being heat cured under conditions of temperature and pressure to form a polyurea-cellulose composite.

5,143,769

DEOXIDIZER SHEET

Takehiko Moriya, Tokyo; Toshio Komatsu, Ibaraki, and Yoshiaki Inoue, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,426
Claims priority, application Japan, Sep. 22, 1988, 63-236218
Int. Cl.[5] A23L *3/3436;* B32B *27/18;* B65B *55/19;* B65D *81/28*
U.S. Cl. 428—76 22 Claims

1. A deoxidizer sheet comprising:

a first layer containing a mixture of

(a) a deoxidation reaction main agent essentially containing iron powder and a metal halide, and

(b) a fixing material containing natural or synthetic fibers and heat-meltable fibers or a heat-meltable resin powder; and

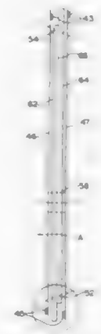
a pair of second layers between which said first layer is sandwiched and fixed by heat-melting, whereby said heat-meltable fibers or resin powders are melted by heat melting and bind said main deoxidation reaction agent with said natural or synthetic fibers.

5,143,770

MULTILAYER INSULATION BLANKET, FABRICATING APPARATUS AND METHOD

John D. Gonczy, Oak Lawn; Ralph C. Niemann, Downers Grove, and William N. Boroski, Aurora, all of Ill., assignors to Universities Research Association, Inc., Washington, D.C.

Filed Sep. 1, 1988, Ser. No. 239,559
Int. Cl.[5] B32B *3/06, 7/02*
U.S. Cl. 428—78 13 Claims



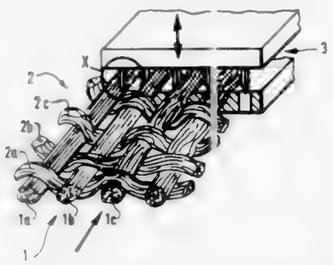
1. A multiple layer insulation blanket fabricated according to the method comprising winding a continuous sheet of thermally reflective polymer film around the circumference of a substantially cylindrical rotatable mandrel to form multiple layers, binding said layers along at least two lines substantially parallel to the edges of the circumference of said mandrel, cutting said layers along a line substantially parallel to the axle of said mandrel, and removing said layers from said mandrel, said mandrel having a radially outwardly presented surface of fixed radius, said surface substantially arcuate in cross-section taken in a direction coplanar to the axle of said mandrel.

5,143,771

TEXTILE REINFORCEMENT WHICH CAN BE USED TO MAKE VARIOUS COMPOSITES AND METHOD FOR ITS MANUFACTURE

André Fourezon, Le Cheylard, France, assignor to Etablissements Les Fils D'Auguste Chomarat et Cie, France

Filed May 10, 1990, Ser. No. 521,739
Claims priority, application France, May 19, 1989, 89 06828
Int. Cl.[5] B32B 3[illegible]/00
U.S. Cl. 428—91 6 Claims



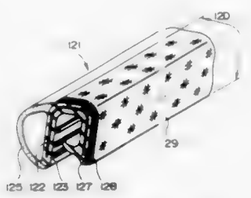
1. A textile reinforcement which can be used to make various composites in the form of a sheet in which the majority of the basic filaments are arranged in a same direction, wherein the securing of said basic filaments (1*a*, 1*b*, 1*c*) is ensured by a fibrous structure (2*a*, 2*b*, 2*c*) which is not only interlaced with the abovementioned unidirectional threads in the manner of a fabric but also comprises fibers which extend partially perpendicularly between two consecutive series of the parallel filaments (1*a*, 1*b*, 1*c*).

5,143,772

RUBBER SHAPED ARTICLES HAVING A FINISHING LAYER AND A PROCESS FOR PRODUCTION THEREOF

Tadanobu Iwasa, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishigasugai, Japan

Filed Feb. 12, 1991, Ser. No. 654,032
Claims priority, application Japan, Feb. 19, 1990, 2-37883; Feb. 19, 1990, 2-37884; Feb. 19, 1990, 2-37885; Feb. 19, 1990, 2-37886; Feb. 19, 1990, 2-37887; Feb. 19, 1990, 2-37888; Feb. 21, 1990, 2-39938
Int. Cl.[5] B32B 3/04, 3/26, 25/04; E06B 7/16
U.S. Cl. 428—122 10 Claims



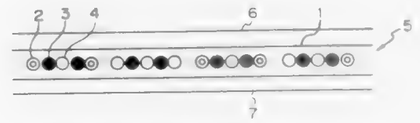
1. An article of manufacture comprising
(a) an EPDM rubber substrate,
(b) a PVC layer formed on the substrate, and
(c) an adhesive layer binding the PVC layer to the substrate comprising a rubber blend of NBR, EPDM, and optionally SBR.

5,143,773

HIGHLY HYGROSCOPIC LAMINATE

Masami Takuno, Kawasaki, Japan, assignor to Showa Denko K.K., Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,485
Claims priority, application Japan, Mar. 29, 1990, 2-81613
Int. Cl.[5] B32B 3/10, 5/16, 5/18, 7/04
U.S. Cl. 428—137 10 Claims



1. A hygroscopic laminate comprising a hygroscopic layer which comprises a gas permeable film, and a water-absorbing polymer and at least one humectant selected from the group consisting of acetic acid, propionic acid, glycolic acid, lactic acid, hydracrylic acid, pyruvic acid and pyrrolidonecarboxylic acid and sodium, potassium, calcium and magnesium salts of these acids, which are wrapped in the gas permeable film; a porous non-water retention sheet; and a water impermeable sheet, the porous non-water retention sheet being disposed on one side of the hygroscopic layer and the water impermeable sheet being disposed on the other side of the hygroscopic layer, to thereby sandwich the hygroscopic layer.

6. A hygroscopic laminate as set forth in claim 1, wherein the porous non-water retention sheet is selected from uniformly perforated polyethylene, polypropylene and polyester films and non-woven polyester and polyolefin fabrics.

5,143,774

NONWOVEN FIBROUS EMBOSSED PLASTIC FILM

Leopoldo Cancio, Cincinnati, Ohio; Thomas C. Ryle, Burlington, Ky., and Pai-Chuan Wu, Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Filed Sep. 1, 1989, Ser. No. 401,667
Int. Cl.[5] B32B 1/00
U.S. Cl. 428—169 5 Claims

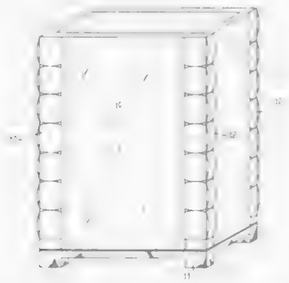
1. An embossed thermoplastic liquid barrier film having a nonwoven fibrous three-dimensionally embossed pattern in the film on both sides, said film having a thickness of about 0.5 to about 2 mils and an embossed depth sufficient to provide the embossed pattern comprising, on the film top side, raised random fiber bosses intersecting other random fiber bosses, said bosses raised at different heights and having depressed areas therebetween to provide said visible pattern and on the opposite film side another visible nonwoven fibrous embossed pattern is provided substantially corresponding to and underlying said film top side pattern, said top side pattern of raised random fiber bosses and depressed areas therebetween overly respectively corresponding depressed fiber areas and raised fiber bosses on the underside of said film, said film having a soft hand feel.

5,143,775

SHOCK-ABSORBING WRAPPING AND A METHOD FOR MANUFACTURING SUCH WRAPPING

Roine Olsson, Åkarp, and Bo Hellgren, Tyreso, both of Sweden, assignors to AB Akerlund & Rausing and Electrolux Major and Floor Care Appliances Aktiebolag, both of, Sweden

Filed May 22, 1989, Ser. No. 355,442
Claims priority, application Sweden, May 30, 1988, 88020037
Int. Cl.[5] B32B 1/00
U.S. Cl. 428—178 3 Claims



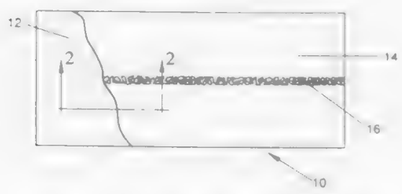
1. A shock-absorbing wrapper comprising first and second longitudinally extending webs, said first and second longitudinal webs being connected at an intermediate longitudinally extending area, said first longitudinally extending web including first and second longitudinally extending rows of permanently thermoformed gas filled recesses with a minimum degree of mechanical memory, said first and second longitudinally extending rows of permanently thermoformed recesses being on either side of said intermediate longitudinally extending area, said intermediate longitudinally extending area having a transverse dimension sufficiently large to permit said shock-absorbing wrapper to be folded along said intermediate longitudinally extending area such that said first and second longitudinally extending rows of thermoformed recesses can be juxtaposed with each other.

5,143,776

TISSUE LAMINATES HAVING ADHESIVELY JOINED TISSUE LAMINAE

Edward J. Givens, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 24, 1991, Ser. No. 719,428
Int. Cl.[5] B32B 9/00
U.S. Cl. 428—194 10 Claims



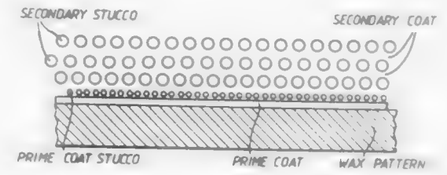
1. A laminate of two tissue laminae adhesively joined by hot melt adhesive forming a pattern comprising a single longitudinally oriented strip having a width less than about 5 centimeters.

5,143,777

CERAMIC MOULD MATERIAL

David Mills, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed May 3, 1990, Ser. No. 518,431
Claims priority, application United Kingdom, May 20, 1989, 8911666
Int. Cl.[5] S32B 5/16
U.S. Cl. 428—212 6 Claims



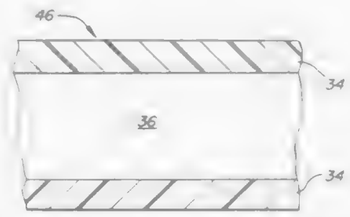
1. Ceramic mould material for use in equiaxed casting of metals and stable up to 1500° C., the material comprising a first layer comprising a hardened ceramic slurry and a bubble material selected from the group consisting of alumina and mullite and at least one additional layer comprising a hardened slurry and a bubble material selected from the group consisting of alumina and mullite, wherein a particle size of the bubble material in the first layer is smaller than a particle size of the bubble material in the additional layer.

5,143,778

LAMINATE STRUCTURAL PLASTIC MATERIAL

Lyle H. Shuert, 1034 Stratford Pl., Bloomfield Hills, Mich. 48013

Filed Oct. 31, 1990, Ser. No. 606,171
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—213 51 Claims



1. A laminate structural material comprising:
central inner core layer formed of a polyolefin material essentially devoid of reinforcing filler materials; and
a pair of outer skin layers sandwiching said core layer therebetween and each formed of a polyolefin material having a percentage by weight of a reinforcing filler material higher than the percentage by weight of filler material in said inner core layer, wherein said core layer has a thickness at least twice as great as the thickness of each skin layer.

5,143,779

REBULKABLE NONWOVEN FABRIC

David D. Newkirk, Greer, and Henry S. Ostrowski, Simpsonville, both of S.C., assignors to Fiberweb North America, Inc., Simpsonville, S.C.

Filed Dec. 23, 1988, Ser. No. 288,834
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—218 24 Claims

1. A bulky nonwoven fabric suitable for use in constructing

absorbent personal care products and resulting from the heat treatment of a dense precursor nonwoven fabric, said dense precursor nonwoven fabric comprising crimped thermoplastic bicomponent fibers and having a basis weight in the range of 10–40 grams per square yarn, said bulky nonwoven fabric having a substantially greater bulk than said dense precursor nonwoven fabric such that the ratio of the density of the dense precursor nonwoven fabric to the density of the bulky nonwoven fabric is at least about 1.4.

5,143,780

HYDRATED FIBROUS MATS FOR USE IN CURING CEMENT AND CONCRETE

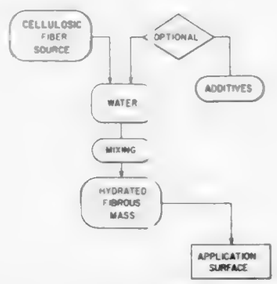
Leslie L. Balassa, Shore Dr., Bloomming Grove, N.Y. 10914

Continuation-in-part of Ser. No. 518,726, May 4, 1990, Pat. No. 5,096,748, which is a continuation-in-part of Ser. No. 259,174, Oct. 18, 1988, which is a continuation-in-part of Ser. No. 20,110, Apr. 24, 1987, Pat. No. 4,787,928, which is a division of Ser. No. 744,119, Jun. 12, 1985, Pat. No. 4,665,993. This application Nov. 9, 1990, Ser. No. 613,230

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] B32B *13/00, 23/04, 5/16*

U.S. Cl. 428—283 23 Claims



1. A cement or concrete composite comprising:

a layer of cement or concrete, and at least one outer layer of a curing composition comprising cellulose fibers, water, a viscosity enhancing polymer, a hygroscopic swelling agent and a solar reflective agent wherein said fibers comprise 20–80%, said polymer 2–30%, and said swelling agent 5–40% by weight of said curing composition minus water.

5,143,781

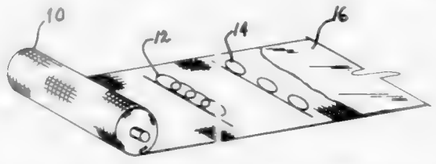
ANISOTROPIC CONTINUOUS STRAND MATS

Sidney G. Dunbar, Granville, Ohio, and Lee J. Goss, Huntingdon, Pa., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 17, 1990, Ser. No. 628,128

Int. Cl.[5] B32B *5/04, 5/08, 5/12;* C03B *37/02*

U.S. Cl. 428—288 10 Claims



1. An anisotropic preformable continuous strand mat comprising continuous strands of glass fiber filaments, the strands having an irregular pattern of elongated elliptical strand loops in the mat oriented in a cross-machine direction that also contain somewhat straight strands with "pigtail" ends also oriented in a cross-machine direction wherein the mat has a loop formation ratio (LFR) greater than 1.0 and less than 6.5.

6. A mat according to claim 1, including a binder matrix of a thermosetting binder, a thermoplastic binder or a combination thereof.

5,143,782

THERMAL TRANSFER RECORDING SHEET

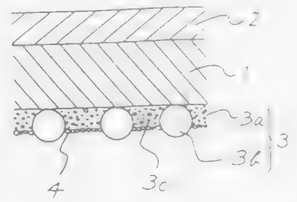
Takashi Morishima, Tokyo; Yukichi Murata, Sagamihara; Tadashi Okabayashi, and Yutaka Kawai, both of Kurashiki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,325

Claims priority, application Japan, Aug. 2, 1989, 1-200930

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—327 8 Claims



1. A thermal transfer recording sheet comprising a base film, a heat transferable ink layer formed on one side of the base film and a heat resistance lubricating layer formed on the other side of the base film, wherein said heat resistance lubricating layer comprises round particles, fine particles having a particle size smaller than that of the round particles and a heat resistant binder resin, as the main components, and the round particles are projecting from the standard surface of the heat resistant lubricating layer, wherein the particle size distribution of the round particles is substantially within the range of from 0.5 to 5 μm, wherein the particle size distribution of the fine particles is substantially within the range of from 0.01 to 0.1 μm, and wherein the average particle size of the fine particles is at most 1/10 of the average particle size of the round particles.

5,143,783

POROUS FILM OF POLYTETRAFLUOROETHYLENE AND PREPARATION THEREOF

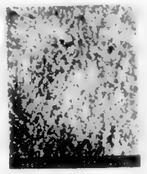
Tetsuo Shimizu, and Kazutaka Hosokawa, both of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Nov. 13, 1989, Ser. No. 435,170

Claims priority, application Japan, Nov. 18, 1988, 63-293252

Int. Cl.[5] B32B *5/116, 27/32;* B29D *27/04*

U.S. Cl. 428—327 6 Claims



1. A process for producing a polytetrafluoroethylene porous film consisting essentially of applying an aqueous dispersion of emulsion polymerized polytetrafluoroethylene particles having an average minor particle size of 1 to 500 nm and an average aspect ratio of at least 10 on a substrate, drying the applied dispersion to obtain the polytetrafluoroethylene porous film.

5,143,784

SOLUBLE CALIXARENE DERIVATIVE AND FILMS THEREOF

Naoko Mita, Tokyo, Japan, assignor to NEC Corporation, Japan

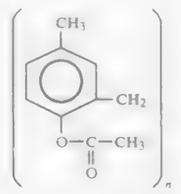
Filed May 2, 1991, Ser. No. 694,491

Claims priority, application Japan, May 10, 1990, 2-120310; Sep. 19, 1990, 2-249151

Int. Cl.[5] B32B *27/16;* B05D *3/12;* G03C *5/00;* C08L *61/14*

U.S. Cl. 428—336 10 Claims

1. A film of acetylated methyl-calix[n]arene represented by the formula (I):



(I)

where n is an integer from 4 to 8, the film being thicker than 10 nm and formed from a solution of said acetylated methyl-calix-[n]arene in an organic solvent by applying said solution directly to a substrate and thereafter removing said solvent.

5,143,785

CYANATE ESTER ADHESIVES FOR ELECTRONIC APPLICATIONS

Jean-Marc P. Pujol, Rhone, France; Joyce B. Hall, North St. Paul, Minn.; Peter B. Hogerton, White Bear Lake, Minn.; Fred B. McCormick, Maplewood, Minn., and Jeanne M. Tingerthal, White Bear Lake, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1990, Ser. No. 568,586

Int. Cl.[5] B32B *7/12;* H01B *1/22;* C08F *2/46;* C08J *3/28;* C08L *29/14, 67/02, 69/00, 71/02, 77/06*

U.S. Cl. 428—352 40 Claims

1. An energy curable, one-part, adhesive composition adapted to be used in electronic applications, comprising the reaction product of an admixture of:

a) an effective amount of a curable cyanate ester resin including one or more cyanate ester compounds;

b) an effective amount of a thermoplastic polymer; and

c) an effective amount of a catalyst comprising an organometallic compound, for the reaction of said cyanate ester compounds;

wherein said adhesive composition is curable in 60 seconds or less at 180° C.

5,143,786

COMPOSITE FIBERS, WATER-ABSORBING MATERIAL USING THE COMPOSITE FIBERS AS A BASE MATERIAL AND METHOD FOR PRODUCING THE SAME

Toyoaki Tanaka; Akira Nakamura; Yoshisuke Kamei, and Akihiro Hashimoto, all of Kawsaki, Japan, assignors to Showa Denko Kabushiki Kaisha, Japan

Division of Ser. No. 68,039, Jun. 29, 1987, Pat. No. 5,071,705. This application May 31, 1991, Ser. No. 708,692

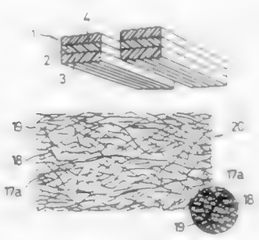
Claims priority, application Japan, Nov. 1, 1985, 60-243863; Dec. 18, 1985, 60-282986

Int. Cl.[5] D02G *3/00;* D04H *1/58*

U.S. Cl. 428—357 10 Claims

1. A water-absorbing material comprising: pulverized pulp, water-absorbing agent and short composite fibers having a length in the range of 70–90 mm;

said composite fibers being prepared by stretching a base layer comprising a three-layer film having an intermediate layer of a thermoplastic resin and outer layers of a thermoplastic resin, the resin of the intermediate layer having a higher melting point than the resin of the outer layers, and



then splitting said film, said fibers having the same sectional structure as in said base material.

5,143,787

METHOD OF COATING A CARBON COATED MAGNETIC RECORDING MEDIUM SURFACE WITH A FLUOROPOLYMER LUBRICANT

Duncan W. Frew, Alamo, and Robert P. Shadwick, San Jose, both of Calif., assignors to Unisys Corp., Detroit, Mich.

Division of Ser. No. 902,239, Aug. 28, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 328,977

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[5] G11B *5/00*

U.S. Cl. 428—408 25 Claims

1. A method of over-coating a carbon coated metallic magnetic recording medium surface with fluoro-polymer lubricant said recording surface being characterized by active hydroxyls, this method involving selecting reactive fluoro-polymer lubricant material having reactive terminations at both ends of a backbone;

applying the reactive fluoropolymer lubricant material to said recording surface and allowing it to react there so as to create a relatively thin, continuous uniform reacted-film characterized by the bonding of each termination to an active hydroxyl in or on this recording surface; then stripping-away excess, unreacted reactive fluoropolymer lubricant material whereby to provide superior resistance to lubricant spin-off and to like depletion phenomena.

5,143,788

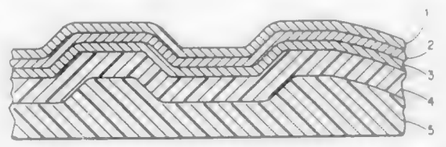
COATING COMPOSITION OF POLYESTERURETHANE AND MULTIFUNCTIONAL EPOXY COMPOUND

Jeffery W. Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 449,006, Dec. 12, 1989. This application Nov. 20, 1991, Ser. No. 795,318

Int. Cl.[5] B32B *27/40*

U.S. Cl. 428—423.3 14 Claims



1. A composite useful as an exterior vehicle part comprising the following layers of components:

a. 10–125 micron thick layer of a glossy clear thermoplastic finish of a cured coating composition bonded firmly to

b. 5–75 micron thick layer of a thermoplastic pigment containing layer of a cured coating composition bonded to

c. 125–1250 micron thick layer of a flexible thermoformable material that is bonded to

d. 500–25,000 micron thick layer of a rigid synthetic resinous material;

wherein the coating composition before being cured comprises about 10–70% by weight binder solids and correspondingly about 90–30% by weight organic liquid carrier, wherein the binder consists of about

(1) 80–99 percent by weight of a carboxyl functional polyesterurethane having a weight average molecular weight of about 80,000 to 200,000 and is the reaction product of about 60–90 percent by weight of a hydroxy functional polyester, about 1–5 percent by weight of a hydroxy containing carboxylic acid containing one carboxyl group and two hydroxyl groups, and about 5–30 percent by weight of an organic polyisocyanate selected from the group of aliphatic, cycloaliphatic or aromatic diisocyanate and contains up to 15 percent by weight, based on the weight of the polyesterurethane, of an organic triisocyanate; where n

the hydroxy functional polyester is the reaction product of about 1.2–1.4 equivalents of a diol of the formula HOROH and about 1 equivalent of dicarboxylic acid of the formula $R^1(COOH)_2$ or an anhydride of such an acid where R is an aliphatic cycloaliphatic or aromatic hydrocarbon radical having 2–6 carbon atoms and R^1 is an aliphatic, cycloaliphatic or aromatic hydrocarbon radical having 6–12 carbon atoms and

(2) 1–20 percent by weight of multifunctional aliphatic, cycloaliphatic or aromatic epoxy compound which cross-links with the polyesterurethane upon curing of the composition.

5,141,789

MIRRORBACK COATING

Timothy J. Sanford, Randolph, N.Y.; Joseph Soltys, London, Canada, and Charles L. Cesnik, Indianapolis, Ind., assignors to Lilly Industrial Coatings, Inc., Indianapolis, Ind.

Division of Ser. No. 626,461, Dec. 18, 1990, Pat. No. 5,094,881, which is a continuation-in-part of Ser. No. 463,424, Jan. 11, 1990, Pat. No. 5,075,134. This application Oct. 21, 1991, Ser. No. 780,723

Int. Cl.[5] B32B *15/08, 17/06*

U.S. Cl. 428—432 28 Claims

1. An article having a metallic surface and a protective coating layer over the metallic surface made from a hardened organic resin coating system, selected from the group consisting of alkyd resins, modified alkyd resins, acrylic resins, melamine formaldehyde resins, urea formaldehyde resins, and combinations of the above, incorporating a corrosion inhibitor selected from the group consisting of hydrogen cyanamide and 2-cyanoacetamide.

5,143,790

INTEGRALLY-DAMPED STEEL COMPOSITE LAMINATED STRUCTURE AND METHOD OF ATTACHING SAME

Stanley S. Sattinger, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 9, 1989, Ser. No. 391,804

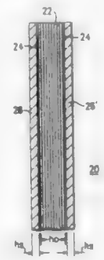
Int. Cl.[5] B32B *15/08*

U.S. Cl. 428—457 25 Claims

1. A laminated panel, comprising:

a reinforced load bearing composite core, said reinforced load-bearing composite core having a first and a second face;

at least one layer of adhesively bonded viscoelastic damping polymer film, said layer bonded to at least one of said faces of said reinforced composite core; and



at least one sheet of steel, said sheet of steel layered upon said layer of adhesively bonded viscoelastic damping polymer film.

5,143,791

METHOD FOR TREATMENT OF CELLULOSE FIBRES AND PRODUCTION OF COMPOSITE MATERIALS OF THE TREATED CELLULOSE FIBRES IN COMBINATION WITH RESINS

Per Flodin, Hovas, and Pawel Zadorecki, Onsala, both of Sweden, assignors to Polyrand AB and Polycell Kompositer, Hovas, Sweden

PCT No. PCT/SE85/00125, § 371 Date Jan. 15, 1986, § 102(e) Date Jan. 15, 1986, PCT Pub. No. WO85/04200, PCT Pub. Date Sep. 26, 1985

Continuation of Ser. No. 638,032, Jan. 7, 1991, abandoned, which is a continuation of Ser. No. 300,236, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 802,206, Nov. 19, 1985, abandoned. This PCT application Mar. 19, 1985, Ser. No. 826,686

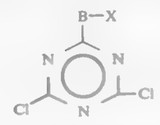
Claims priority, application Sweden, Mar. 9, 1984, 8401500

Int. Cl.[5] D06M *13/322;* C08J *5/06*

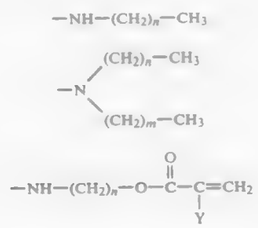
U.S. Cl. 428—481 4 Claims

1. A method of treating cellulose fibres and forming a composite therefrom which comprises

(1) impregnating the fibres with a solution, dispersion or melt of a compound having the formula:



wherein B-X is selected from the group consisting of



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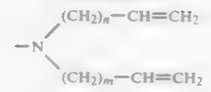


wherein n and m stand for an integer of from 1 to 18 and Y is CH_3 or H;

(2) thereafter treating the impregnated fibres with aqueous alkali and heat treating at a temperature at or above the fusion point of said compound whereby said compound is reacted through its Cl substituent with cellulose hydroxy;

(3) thereafter washing and drying;

(4) then impregnating the thus modified cellulose fibres with a resin; and

(5) curing the resulting product to form said composite.

5,143,792

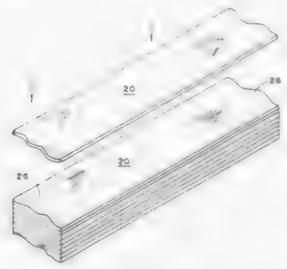
METHOD OF FORMING A FLITCH AND PRODUCING NOVEL SHEETS OF VENEER

Lloyd Cramer, 5715 Pinehaven Dr., Greensboro, N.C. 27410, and Stephen A. Cramer, 2703C Centennial, High Point, N.C. 27265

Filed Sep. 3, 1991, Ser. No. 754,139

Int. Cl.[5] B32B *9/00;* B27D *1/00*

U.S. Cl. 428—528 19 Claims



1. A method of forming a flitch from sheets of veneer comprising the steps of: joining a plurality of veneer sheets in a face-to-face relationship; applying pressure to bond the joined veneer sheets and form a flitch; coating the ends of the formed flitch to resist checking and splitting of the flitch; heating the flitch in an oven; cooking the flitch in a water bath; removing the flitch from the cooking water bath; preparing the flitch for slicing; slicing the formed flitch into a plurality of veneer sheets; and passing sliced sheets through a dryer.

5,143,793

DECORATED HOLLOW ELEMENT

Christophe Masse, La Tronche, and Michel Philippe, Vienne, both of France, assignors to Cebal, Clichy, France

Continuation-in-part of Ser. No. 279,579, Dec. 5, 1988, Pat. No. 4,956,906. This application Mar. 15, 1990, Ser. No. 493,777

Claims priority, application France, Dec. 1, 1988, 88 16099

Int. Cl.[5] B21K *21/00*

U.S. Cl. 428—577 13 Claims

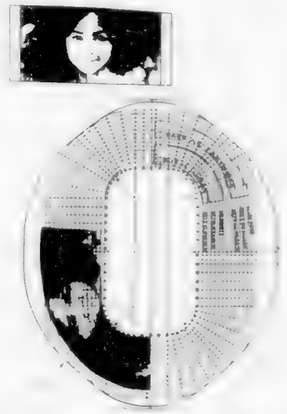
8. Hollow metallic or metalloplastic element drawn or drawn-ironed from a decorated blank, comprising a bottom surrounded by a non-deformed contour and surmounted by an outer skirt having a degree of curvature which varies peripherally, and which is decorated with an image formed from lines of dots of ink, the decorated surface of said skirt comprising zones of level h:2R at least equal to 0.5, where h is the height of the zone with respect to the contour and R is the radius of curvature of the contour corresponding to the zone, said zones comprising at a given level, portions peripherally expanded and portions peripherally contracted, relative to the average condition at said level, said element formed by a method comprising the steps of:

a) locating on a test blank a plurality of reference points distributed over the entire surface of the test blank which will be affected by the drawing or drawing-ironing;

b) drawing or drawing-ironing the test blank into a test product and determining new positions of the reference points, each said new position corresponding to a reference point on the test blank;

c) forming a block of a decoration to be obtained on the product, and locating on the decoration the new positions of the reference points on the test product;

d) converting said decoration into a plurality of dots of each



inking color, and determining the position of each dot with respect to the new position of a reference point;

e) relocating each said dot with respect to each other individually, from a new position to the corresponding reference point on the test blank;

f) locating on a film a plurality of reference points corresponding to the reference points on said test blank, and printing said film with each dot of the decoration reproduced in a location corresponding to the reference point on the test blank to which the dot was relocated, to form a film blank;

g) decorating a blank with said film blank; and

h) drawing or drawing-ironing said decorated blank to form said hollow element.

5,143,794

MAGNETIC RECORDING MEDIA FOR LONGITUDINAL RECORDING, PROCESS FOR PRODUCING THE SAME AND MAGNETIC MEMORY APPARATUS

Hiroyuki Suzuki, Kawasaki; Yoshihiro Shiroishi, Hachioji; Sadao Hishiyama, Sayama; Tomoyuki Ohno, Kokubunji; Yotsuo Yahisa, Fuchu; Yoshibumi Matsuda, Kokubunji; Norikazu Tsumita, Kanagawa; Masaki Ohura, Odawara; Takaaki Shirakura, Chigasaki; Noriyuki Shige, Odawara, and Kazumasa Takagi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 391,181

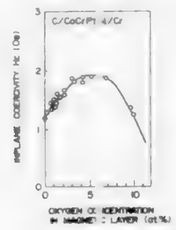
Claims priority, application Japan, Aug. 10, 1988, 63-197919; Aug. 24, 1988, 63-208317; Mar. 6, 1989, 1-051889

Int. Cl.[5] H01F *1/00*

U.S. Cl. 428—611 8 Claims

1. A magnetic recording medium for longitudinal recording which comprises a nonmagnetic substrate, a nonmagnetic metallic underlayer composing at least one metal element selected from the group consisting of Cr, Mo, W, V, Nb and Ta, and containing 0.1 to 10 at. % oxygen, formed on the nonmagnetic substrate, and a magnetic layer of Co-based alloy,

formed on the nonmagnetic metallic underlayer, the magnetic layer comprising 1 to 35 at. % of at least one first additive element selected from the group consisting of Pt and Ir, 1 to 17 at. % of at least one second additive element selected from the



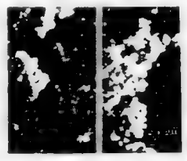
group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Ge and Si, except for Si, whose concentration is 1 to 40 at. %, and 0.1 to 10 at. % of oxygen, sum total of the first and second additive elements and the oxygen being 1.2 to 50 at. %.

5,143,795

HIGH STRENGTH, HIGH STIFFNESS RAPIDLY SOLIDIFIED MAGNESIUM BASE METAL ALLOY COMPOSITES

Santosh K. Das, Randolph; Chi-Fong Chang, Morris Plains, and Derek Raybould, Denville all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Feb. 4, 1991, Ser. No. 650,134
Int. Cl.[5] C22C *15/00*
U.S. Cl. 428—614 12 Claims



1. A magnesium based metal matrix alloy composite article consolidated from a mixture consisting essentially of a rapidly solidified magnesium based alloy powder and a discontinuous, ceramic reinforced constituent consisting of SiC particulates present in an amount ranging from about 5 to 30% by volume of said mixture.

5,143,796

GLASS WINDSHIELD FOR MOTOR VEHICLES WITH COMBINED CAPABILITIES OF SUN RADIATION SCREEN AND IMAGE COMBINER

Francesco Sebastiano, Termoli, and Liberto Massarelli, Vasto, both of Italy, assignors to Societa Italiana Vetro - Siv - S.p.A., San Salvo CH, Italy

Filed Mar. 12, 1991, Ser. No. 668,252
Claims priority, application Italy, Mar. 12, 1990, 47742 A/90
Int. Cl.[5] C03B *5/26*
U.S. Cl. 428—623 3 Claims

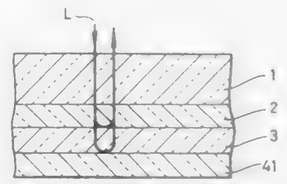
1. A glass windshield for a motor vehicle with combined capabilities of solar radiation screen and image combiner, having a coating on the whole of one of its major surfaces, in which said coating consists essentially of the following sequences of layers: an outer TiO_2 or Al_2O_3 layer, an inner Al_2O_3 or SiO_2 layer, one or two metal layers having a thickness from 60 to 300 Å, said metal being selected from the group consisting of silver and aluminum, with the proviso that said metals are different when two metal layers are provided, an additional inner Al_2O_3 or SiO_2 layer, and an additional outer TiO_2 or Al_2O_3 layer, all said inner and outer layers having a thickness from 40 to 1500 Å, with the proviso that at least one of said outer and inner layers has a thickness from 300 to 1500 Å, and the further proviso that said inner and outer layers cannot both be Al_2O_3.

5,143,797

MAGNETO-OPTIC RECORDING MEDIUM

Kazuo Hashima; Kazuhiko Tsutsumi, and Hiroshi Sugahara, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 15, 1989, Ser. No. 394,012
Claims priority, application Japan, Aug. 30, 1988, 63-217128
Int. Cl.[5] G11B *11/10, 7/24*
U.S. Cl. 428—694 15 Claims



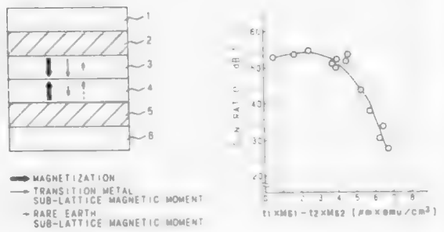
1. A magneto-optic recording medium comprising:
a substrate;
a dielectric film disposed on said substrate;
a magnetic film disposed on said dielectric film; and
a reflective film disposed on and in direct engagement with said magnetic film, on the side thereof opposite to said substrate, and formed of titanium nitride; and
whereby said reflective film reflects light transmitted through said magnetic film and has a low thermal conductivity adjacent said magnetic film.

5,143,798

MAGNETO-OPTICAL RECORDING MEDIUM HAVING DOUBLE MAGNETIC LAYERS INCLUDING A LIGHT RARE EARTH ELEMENT AND SATISFYING A SPECIFIED CONDITION INVOLVING THE PRODUCT OF THE THICKNESS AND MAGNETIZATION SATURATION OF SAID LAYERS

Yoshio Fujii, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 14, 1992, Ser. No. 820,507
Claims priority, application Japan, Jan. 16, 1991, 3-44550
Int. Cl.[5] G11B *11/12, 11/10, 13/04, 5/66*
U.S. Cl. 428—694 6 Claims



1. A magneto-optical recording medium comprising;
a substrate;
a first magnetic layer which is composed of a rare earth-transition metall alloy and contains a light rare earth element, and in which a transition metal sub-lattice magnetic moment is dominant at room temperature; and
a second magnetic layer which is composed of a rare earth-transition metal alloy, and in which a rare earth sub-lattice magnetic moment is dominant at room temperature;
wherein the directions to stabilize magnetization of said first and second magnetic layers are inverse from each other; and wherein an expression shown below is satisfied.

$$t1 \times Ms1 - t2 \times Ms2 \leqq 5(\mu m \times emu/cm^3)$$

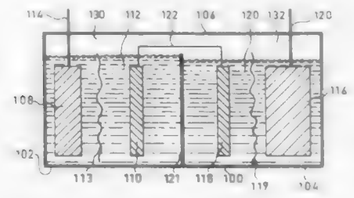
wherein
t1 (μm): Film thickness of said first magnetic layer
t2 (μm): Film thickness of said second magnetic layer
Ms1 (emu/cm³): Saturation magnetization of said first magnetic layer
Ms2 (emu/cm³): Saturation magnetization of said second magnetic layer.

5,143,799

SEALED BATTERIES WITH ZINC ELECTRODE

Boris Tsenter, Jerusalem, Israel, assignor to Battery Technologies International, Ltd., Jerusalem, Israel

Filed Jan. 21, 1992, Ser. No. 822,816
Int. Cl.[5] H01M *10/36*
U.S. Cl. 429—9 15 Claims



1. An electrochemical cell, comprising:
(a) a first sealed compartment containing a first electrolyte and a first gas space;
(b) a second sealed compartment containing a second electrolyte and a second gas space, said second gas space being in communication with said first gas space;
(c) a first electrode in contact with said first electrolyte;
(d) a second electrode in contact with said second electrolyte;
(e) a first hydrogen electrode in contact with said first electrolyte; and
(f) a second hydrogen electrode in contact with said second electrolyte and electrically connected to said first hydrogen electrode.

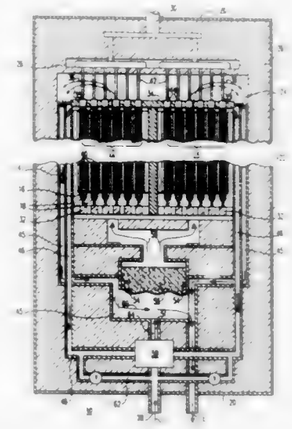
5,143,800

ELECTROCHEMICAL CELL APPARATUS HAVING COMBUSTED EXHAUST GAS HEAT EXCHANGE AND VALVING TO CONTROL THE REFORMABLE FEED FUEL COMPOSITION

Raymond A. George, Forest Hills; Delmer Q. Hoover, Churchill Boro; Larry A. Shockling, and Philip Reichner, both of Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1990, Ser. No. 559,110
Int. Cl.[5] H01M *8/06*
U.S. Cl. 429—20 16 Claims

1. An electrochemical apparatus comprising: fresh gaseous feed fuel inlet; gaseous feed oxidant inlet; gaseous spent fuel recirculation channel; separate, hot combusted exhaust gas exit channel; a combustion chamber; a generator chamber located between the combustion chamber and a reforming chamber and containing a plurality of electrochemical cells, each cell having an exterior fuel electrode and an interior air electrode; and a reforming chamber containing a reforming material; where the spent fuel recirculation channel passes from the generator chamber to combine with the fresh feed fuel inlet at a circulation and mixing apparatus, a reformable fuel mixture channel connects the circulation and mixing apparatus and the reforming chamber, the reforming chamber is connected to the generator chamber, a portion of the hot combusted exhaust gas exit channel surrounds the reforming chamber, and the fresh



feed fuel inlet has a by-pass channel into the gaseous spent fuel recirculation channel said by-pass channel having valving to control fresh feed fuel flow to the gaseous spent fuel recirculation channel.

5,143,801

SOLID OXIDE FUEL CELLS, AND AIR ELECTRODE AND ELECTRICAL INTERCONNECTION MATERIALS THEREFOR

J. Lambert Bates, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Oct. 22, 1990, Ser. No. 605,861
Int. Cl.[5] H01M *8/10*
U.S. Cl. 429—33 25 Claims

7. A solid oxide electrochemical fuel cell comprising:
a solid oxide air electrode and an adjacent solid oxide electrical interconnection which commonly include the cation Y,
the air electrode predominately comprising $Y_{1-a}Q_aMnO_3$, where "Q" is selected from the group consisting of Ca and Sr or mixtures thereof and "a" is from 0.1 to 0.8,
the electrical interconnection being substantially gas impermeable and comprising $Y_{1-b}Ca_bCr_{1-c}Al_cO_3$, where "b" is from 0.1 to 0.6 and "c" is from 0.0 to 0.3;
a yttria stabilized solid electrolyte comprising $(1-d)ZrO_2$-$(d)Y_2O_3$ where "d" is from 0.06 to 0.5; and
a solid fuel electrode comprising $X\text{-}ZrO_2$, where "X" is an elemental metal.

5,143,802

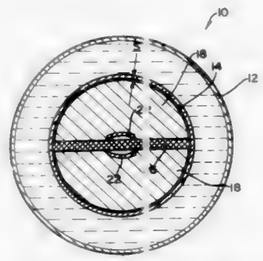
ELECTROCHEMICAL CELL

Michael Wright, Allestree, England, assignor to AABH Patent Holdings Societe Anonyme, Luxembourg

Filed Mar. 11, 1991, Ser. No. 667,299
Claims priority, application United Kingdom, Mar. 12, 1990, 9005483
Int. Cl.[5] H01M *10/39*
U.S. Cl. 429—103 16 Claims

1. A high temperature rechargeable electrochemical power storage cell which comprises a cell housing divided by a separator into an anode compartment and a cathode compartment, the anode compartment containing an active anode substance which is an alkali metal M and the cell having an operating temperature at which the alkali metal is molten, the separator

being capable of conducting ions of the alkali metal of the anode therethrough during charge/discharge cycling of the cell at said operating temperature, and the cathode compartment containing a cathode comprising an electronically conductive electrolyte-permeable porous matrix having, dispersed therein, an active cathode substance which is solid at the operating temperature, the cell having a charged state in which the active cathode substance has the formula $THal_2$ in which Hal is a halide and T is a transition metal selected from the group consisting of Fe, Ni, Cr, Co, Mn, Cu and mixtures thereof, the matrix being impregnated with an alkali metal haloaluminate molten salt electrolyte which is molten at the operating temperature of the cell and has as its alkali metal the same alkali



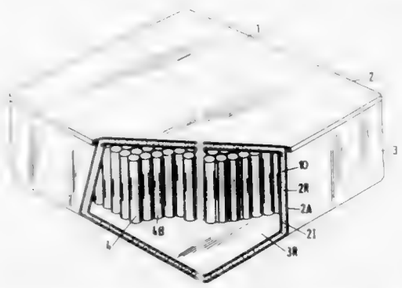
metal M as that of the anode and comprises the same halide Hal as that of the active cathode substance $THal_2$, the atomic ratio of Al:M in the molten salt electrolyte being at most 1:1, the cathode comprising also, in contact with the matrix, a porous, electrolyte-permeable reservoir of material which is electrochemically and chemically inert in the cathode environment, said reservoir having an ability to wick the molten salt electrolyte at the operating temperature of the cell which ability is less than the ability of the matrix to wick said molten salt electrolyte, the cell having a fully discharged state in which the matrix is saturated with said molten salt electrolyte and the reservoir containing sufficient said molten salt electrolyte impregnated therein to ensure that the matrix remains saturated therewith during charging of the cell.

5,143,803

HIGH-TEMPERATURE STORAGE BATTERY

Walter Andres, Ludwigshafen; Wilfried Flory, Brühl, and Stefan Mennicke, Leimen-Gauangelloch, all of Fed. Rep. of Germany, assignors to ABB Patent GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 692,307
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013268
Int. Cl.[5] H01M *10/50*
U.S. Cl. 429—120 12 Claims



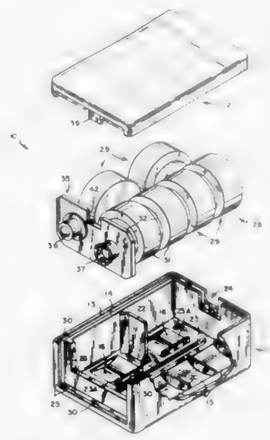
1. High-temperature storage battery, comprising a thermal insulation having an inner space, interconnected storage cells disposed in said inner space, and a retainer formed of an electrically non-conductive material at least regionally surrounding and combining said storage cells into at least one storage cell block and permanently holding said storage cells in a position fixed during assembly, said retainer being formed of at least one coarse-grained material serving as a filler material and at least one binder selected from the group consisting of inorganic and organic binders.

5,143,804

BATTERY ASSEMBLY

William J. McArthur, and Donald A. Thompson, both of Clemmons, N.C., assignors to Duracell Inc., Bethel, Conn.

Filed May 8, 1991, Ser. No. 697,358
Int. Cl.[5] H01M *2/22*
U.S. Cl. 429—148 16 Claims



1. A battery comprising
a container including
a housing; and
a cover;
an assembly of cells each having an anode element and a cathode element, said cell assembly including
a first plurality of cells, each having a first orientation, stacked in a first configuration;
a second plurality of cells, each having an orientation different from the orientation of said first plurality of cells, stacked adjacent said first plurality of cells in a second configuration, all of the cells in both of said pluralities being electrically connected in series;
a terminal board having a positive and a negative terminal for providing external connections to said battery, said positive terminal being connected to a cathode element of one of the cells of said assembly and said negative terminal being connected to an anode element of another one of the cells of aid assembly;
said housing and cover each having a plurality of corresponding nesting cavities formed in an interior surface thereof, said housing further having a slot formed at one end thereof, the assembly of cells being positioned within said housing and said cover so that said first and second plurality of cells are securely nested in the nesting cavities of said housing and said cover and said terminal board is securely positioned in said slot;
at least one opening formed at one end of said container for permitting air to enter said container for contact with the cells therein; and
means for preventing other objects from entering said container through said at least one opening and making contact with any of the cells therein.

5,143,805

CATHODIC ELECTRODE

Menahem Anderman, Phoenix, Ariz.; Steven L. Johnson, Catonsville, Md.; Michael C. Saft, North Potomac, Md., and David Zuckerbrod, Baltimore, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 384,854, Jul. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 85,330, Aug. 14, 1987, Pat. No. 4,853,305, which is a continuation-in-part of Ser. No. 843,347, Mar. 24, 1986, abandoned. This application May 3, 1990, Ser. No. 521,060
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[5] H07M *4/62*
U.S. Cl. 429—217 13 Claims

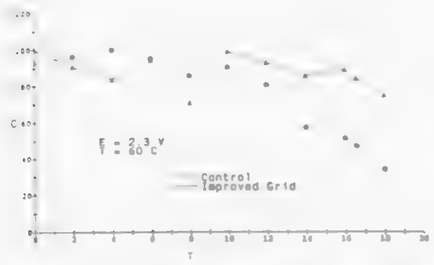
1. An electrode suitable for use in a non-aqueous battery system comprising at least one microporous sheet capable of being a free-standing sheet composed of a substantially homogeneous composition of from about 70–98 weight percent of electrochemically active and electrically conductive particulate material composed of at least one metal chalcogenide having a metal selected from titanium, zirconium, hafnium, niobium, copper, iron, tantalum, vanadium, manganese, chromium, cobalt, nickel and mixtures of said metals alone or together with intercalated metals, said particulate material has up to about 30 weight percent of a conductive carbon particulate having an average particle size of from about 1 to 100 millimicrons, from about 2–30 weight percent of polyethylene having a weight average molecular weight of from 150,000 to about 5,000,000 and from 0 to about 5 weight percent of an organic plasticizer for said polyethylene; and a current collector composed of a conductive material, said collector being in intimate contact with each of said at least one microposous sheet.

5,143,806

PROCESS FOR FORMING BARIUM METAPLUMBATE

Norma K. Bullock, Pewaukee, and Wen-Hong Kao, Brown Deer, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 345,993, May 2, 1989. This application Mar. 28, 1991, Ser. No. 676,845
Int. Cl.[5] H01M *4/56*
U.S. Cl. 429—228 14 Claims



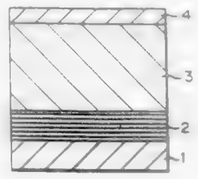
1. A process for coating a solid substrate with a layer of barium metaplumbate, comprising:
(a) forming a layer of lead oxide on the surface of the substrate; and
(b) reacting the lead oxide layer with a barium salt at an elevated temperature high enough to allow the reaction to proceed but less than the melting point of the substrate under conditions effective to form the barium metaplumbate coating.

5,143,807

ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH SUPERLATTIC BARRIER LAYER

Shuji Yoshizawa, and Tatsuya Ikezue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 124,272, Nov. 24, 1987, abandoned.
This application Sep. 18, 1989, Ser. No. 408,384
Claims priority, application Japan, Nov. 29, 1986, 61-284595; Nov. 29, 1986, 61-284596; Nov. 29, 1986, 61-284597; Dec. 26, 1986, 61-315562; Dec. 26, 1986, 61-315570; Dec. 26, 1986, 61-315572
Int. Cl.[5] G03G *5/082, 5/14*
U.S. Cl. 430—65 1 Claim



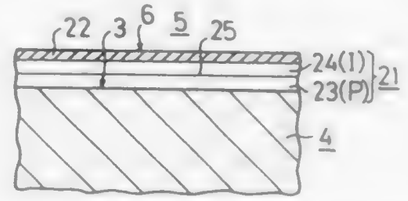
1. An electrophotographic receptor comprising a conductive substrate, a barrier layer formed thereon, and a photoconductive layer formed on said barrier layer for generating photocarriers upon radiation of light, wherein said barrier layer has a portion formed by alternately stacked first thin layers comprising amorphous silicon containing at least one element belonging to Group III or V of the Periodic Table, and second thin layers comprising amorphous boron nitride, said first and second thin layers forming a superlattice structure, wherein said second thin layers have a band gap wider than that of said first thin layers.

5,143,808

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 577,006, Sep. 4, 1990, Pat. No. 5,070,364, which is a division of Ser. No. 452,355, Dec. 19, 1989, Pat. No. 4,999,270, which is a division of Ser. No. 116,337, Nov. 2, 1987, Pat. No. 4,889,783, which is a division of Ser. No. 814,083, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 502,583, Jun. 9, 1983, abandoned, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Oct. 31, 1990, Ser. No. 606,187
Claims priority, application Japan, Jun. 25, 1980, 55-86801
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—66 2 Claims



1. An electrophotographic printing member comprising:
a conductive substrate;
a photoelectrically sensitive, electrically chargeable, semiconductor layer formed on said conductive substrate;
wherein the photoelectrically sensitive, electrically chargeable layer has a non-single crystal semiconductor layer on the substrate and an insulating or semi-insulating layer on

the non-single crystal semiconductor layer and having an external surface and permeability to light and electrical carriers;

wherein the non-single crystal semiconductor layer has a first layer on the side of the substrate and a second layer on the first layer and wherein the first layer is P or N type and the second layer is substantially I type; where said second layer is thicker than any of said first and said insulating or semi-insulating layers;

where said external surface of said insulating or semi-insulating layer can be used as the printing surface; and

where said insulating or semi-insulating layer comprises a silicon compound containing carbon or nitrogen either in stoichiometric or non-stoichiometric amounts.

5,143,809

COLOR TONER

Tadashi Kaneko; Shoichi Nakano; Yoshiaki Kobayashi, and Takahira Kasuya, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,963

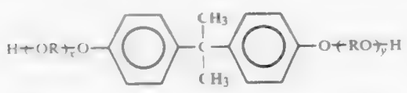
Claims priority, application Japan, Dec. 15, 1989, 1-323914

Int. Cl.[5] G03G *9/087*

U.S. Cl. 430—105 **8 Claims**

1. A color toner comprising 100 parts by weight of a polyester resin prepared by condensation polymerization of the following components (1) and (2) 0.1 to 5 parts by weight of a zinc complex of an aromatic oxycarboxylic acid which may have a substituent, and 1 to 20 parts by weight of a colorant;

Component (1): diol represented by the following Formula (a):



wherein R represents an ethylene group or a propylene group; and X and Y each represent an integer, provided that a sum of X and Y is within a range of 2 to 7 in average:

Component (2): a mixture of a divalent acid component comprising a divalent carboxylic acid having an aliphatic hydrocarbon side chain of 3 to 22 carbon atoms or a lower alkyl ester thereof, and a trivalent acid component comprising a trivalent carboxylic acid or an anhydride thereof in a ratio of 10 to 50 mole % of the total acid components.

5,143,810

MAGNETIC TONER FOR DEVELOPING ELECTROSTATIC IMAGE

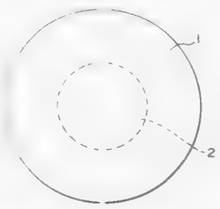
Keita Nozawa, and Seiichi Takagi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1990, Ser. No. 530,155

Claims priority, application Japan, May 30, 1989, 1-134683

Int. Cl.[5] G03G *9/083, 9/107, 9/00*

U.S. Cl. 430—106.6 **11 Claims**



1. A magnetic toner for developing an electrostatic image, comprising a binder resin and a spherical magnetic powder having a coercive force from 40–70 Oe, wherein;

said spherical magnetic powder comprises spherical magnetic particles;

the spherical magnetic particle has a surface layer having a composition different from its core; and

the surface layer is formed of a ferrite having an oxide of a divalent metal other than iron in an amount of from 1.5 to 13 mol % in terms of divalent metal ion.

5,143,811

TONER COMPOSITION FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE AND AN IMAGE-FORMING METHOD USING THE SAME

Takayuki Itakura, Moriguchi; Takashi Teshima, Ibaraki; Tomohide Iida, Minamikawachi, and Hirofumi Horio, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1990, Ser. No. 597,233

Claims priority, application Japan, Oct. 16, 1989, 1-269544; Oct. 31, 1989, 1-285796

Int. Cl.[5] G03G *9/08*

U.S. Cl. 430—111 **7 Claims**

1. A toner composition for developing an electrostatic latent image on an image-holding body, comprising:

toner having an mean particle size of about 6 to 10 μm and a toner particle distribution wherein 70% or more of the toner is 0.6 to 1.2 times of the mean particle size, the amount of toner particles having a diameter of 5 μm or less is at most 10 wt % and the amount of toner particles having a diameter of 16 μm or more is at most 2 wt %; and

hydrophobic silica treated with a compound including a polymethylsilyl group in an amount of about 0.05 to 2 parts by weight per 100 parts by weight of toner.

5,143,812

COLOR TONER AND PROCESS FOR FIXING THE SAME

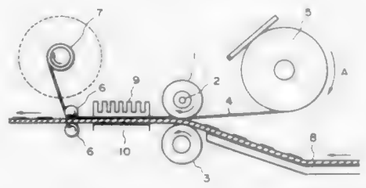
Hiromi Mori; Reiko Morimoto, both of Yokohama, and Tatsuya Nakamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 508,706, Apr. 13, 1990. This application Feb. 4, 1992, Ser. No. 830,867

Claims priority, application Japan, Apr. 17, 1989, 1-95157

Int. Cl.[5] G03G *13/20*

U.S. Cl. 430—124 **30 Claims**



1. A process for fixing a color toner image, comprising:

heating a color toner image disposed on a toner-supporting member by the medium of a film, to thereby fix the color toner image to the toner-supporting member,

wherein said color toner image comprises a color toner or a mixture thereof, and the color toner comprises a resin composition and a colorant; said resin composition comprising a paraffin wax and a resin produced by suspension polymerization of a polymerizable monomer comprising a vinyl monomer or a mixture of vinyl monomers in combination with paraffin wax and said colorant, said paraffin wax comprising 5–50% based on the weight of said resin composition; said resin composition comprising a THR (tetrahydrofuran)-soluble component and substantially no toluene-insoluble component; said THF-soluble component providing a molecular weight distribution in the GPC (gel permeation chromatography) thereof such that (i) there is a peak (Mp1) in the molecular weight range of 500 to 2,000, and a peak (Mp2) in the molecular weight range of 10,000 to 100,000; (ii) the weight-average molecular weight range (Mw) being 10,000 to 80,000, (iii) the number-average molecular weight (Mn) being 1,500 to 8,000, (iv) and the ratio of Mw/Mn≧3.

5,143,813

LIGHT-SENSITIVE PHOTOPOLYMERIZABLE AND DIAZONIUM SALT POLYCONDENSATION PRODUCT CONTAINING COMPOSITION AND RECORDING MATERIAL INCLUDING A MIXTURE OF BINDERS

Klaus Joerg, Ingelheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 1, 1990, Ser. No. 473,402

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903001

Int. Cl.[5] G03F *7/021, 7/032, 7/033*

U.S. Cl. 430—162 **18 Claims**

1. A light-sensitive mixture comprising in admixture:

a) about 5 to 60% by weight of a diazonium salt polycondensation product comprising repeating units A—N_2X and B which are bonded to one another through intermediate members which are derived from condensable carbonyl compounds, A being the radical of an aromatic diazonium compound which is condensable with formaldehyde and B being the radical of a compound which is free of diazonium groups and condensable with formaldehyde,

b) about 50 to 65% by weight of a free-radical-polymerizable compound having at least one terminal ethylenically unsaturated group and a boiling point at atmospheric pressure above 100° C.,

c) about 0.05 to 10% by weight of a polymerization initiator which forms free radicals under the action of actinic radiation,

d) as a binder, a reaction product of an intramolecular anhydride of an organic polycarboxylic acid with a hydroxyl-containing synthetic polymer which has no further functional groups capable of reacting with acid anhydrides, which is insoluble in water and soluble in organic solvents and in aqueous alkaline solutions, said binder having an acid number between about 10 and 70; and

e) as a further binder, about 5 to 50% by weight, based on the total amount of binder, of an acid organic polymer comprising carboxyl groups and having an acid number above about 70,

wherein the total weight percent of d) plus e) is about 5–80%.

5,143,814

POSITIVE PHOTORESIST COMPOSITIONS WITH O-QUINONE DIAZIDE, NOVOLAK AND PROPYLENE GLYCOL ALKYL ETHER ACETATE

Thomas R. Pampalone, Mendham, N.J., assignor to Hoechst Celanese Corporation, Short Hills, N.J.

Division of Ser. No. 501,970, Mar. 28, 1990, Pat. No. 5,066,561, which is a continuation of Ser. No. 263,968, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 914,217, Oct. 2, 1986, abandoned, which is a continuation of Ser. No. 791,252, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,468, Jun. 11, 1984, Pat. No. 4,550,069. This application Oct. 8, 1991, Ser. No. 772,976

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.[5] G03F *7/023;* **G03C** *1/60, 1/76*

U.S. Cl. 430—165 **24 Claims**

1. A positive photoresist composition consisting essentially of, in admixture, from about 15% to about 99% by weight, based on the solid parts of said composition, of at least one novolak resin, about 1% to about 85% by weight, based on the solid parts of said composition, of at least one o-quinone diazide photosensitizer, and a sufficient amount of propylene glycol alkyl ether acetate to increase the photospeed of said composition.

5,143,815

LIGHT-SENSITIVE MIXTURE BASED ON 1,2-NAPHTHOQUINONE-DIAZIDES, AND REPRODUCTION MATERIAL PRODUCED WITH THIS MIXTURE

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,628

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1987, 3729034

Int. Cl.[5] G03F *7/022, 7/023;* **G03C** *1/54*

U.S. Cl. 430—192 **10 Claims**

1. A positive-working light-sensitive mixture comprising, in admixture:

a resinous binder that is insoluble in water and soluble or at least swellable in aqueous-alkaline solutions, present in an amount sufficient to produce a uniform layer when the mixture is coated on a support; and

a photosensitive naphthoquinone-diazide-sulfonic acid ester of the formula I

in which

D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl or 1,2-naphthoquinone-2-diazide-5-sulfonyl radical,

R_1 is hydrogen or an -OD group, and

R_2 is alkyl substituted or unsubstituted aryl, the compound of formula I being present in an amount sufficient to render exposed areas of a coating of the mixture soluble in aqueous-alkaline developer.

5,143,816

LIGHT-SENSITIVE COMPOSITION COMPRISING A POLYSILOXANE AND A NAPHTHOQUINONE

Kazuyoshi Mizutani, and Toshiaki Aoai, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 23, 1990, Ser. No. 555,599

Claims priority, application Japan, Jul. 28, 1989, 1-196108

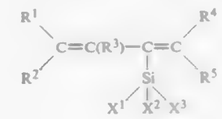
Int. Cl.[5] G03F *7/023, 7/075;* **C08G** *77/04, 77/20*

U.S. Cl. 430—192 **13 Claims**

1. A light-sensitive composition comprising:

(a) a polysiloxane compound having at least 1 mol % of a structural unit derived from a product of a thermal cycloaddition reaction between a compound of formula (I), (II), (III) or (IV) and a compound of formula (V), (VI), (VII) or (VIII), and

(b) an ester of 1,2-naphthoquinone-2-diazide-4-or 5-sulfonic acid and a mono- or poly-hydroxyphenyl compound;



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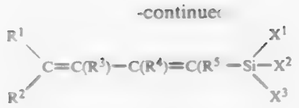

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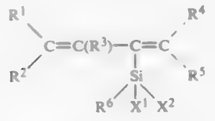

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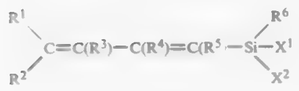

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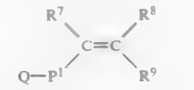

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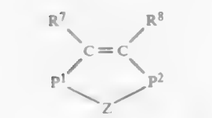

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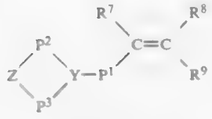
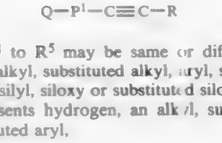


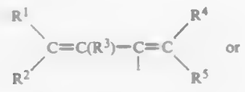
(VII)



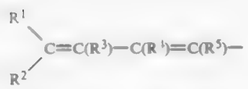
(VIII)

wherein R^1 to R^5 may be same or different and represent hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, silyl, substituted silyl, siloxy or substituted siloxy groups,

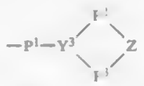
R^6 represents hydrogen, an alkyl, substituted alkyl, aryl, substituted aryl,



or



R^7 to R^9 represent hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, alkoxy, substituted alkoxy, cyano, nitro groups, $—P^1—Q$ or



which may contain —O—, —CO—, —COO—, —OCO—, —$CONR^{10}$—, —$NR^{10}CO$—, —SO_2— or —SO_3—,

R^{10} represents hydrogen, an alkyl, substituted alkyl, aryl or substituted aryl group,

R^7 and R^8 or R^7 and P^1 may combine to form a ring,

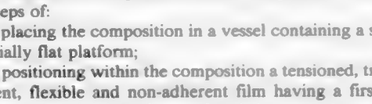
X^1 to X^3 represent hydroxy groups or hydrolyzable groups,

P^1 to P^3 represent single bonds, alkylene, substituted alkylene, arylene or substituted arylene groups which may contain —O—, —CO—, —COO—, —OCO—, —$CONR^{10}$—, —$NR^{10}CO$—, —SO_2— or —SO_3—,

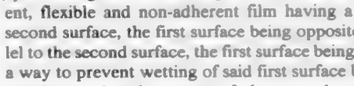
Y^3 represents a trivalent aromatic ring,

Q represents an acid group having pKa of not more than 12,

Z represents



, —CONHCO—, —CON(OH)CO—,



wherein

Y^{n+2} represents a (n+2) valent aromatic ring, and

n is an integer of 1 to 3.

5,143,817

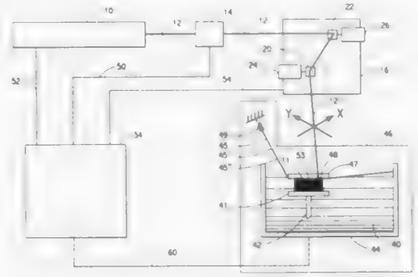
SOLID IMAGING SYSTEM

John A. Lawton, Landenberg, Pa., and Roxy N. Fan, E. Brunswick, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1989, Ser. No. 455,473

Int. Cl.[5] **B05D** *3/06;* **B29D** *11/00;* **G03B** *35/00;* **G03C** *9/08*

U.S. Cl. 430—269 **34 Claims**



1. A method for quickly and accurately fabricating an integral three-dimensional object from successive solidified layers of a deformable and photoformable composition comprising the steps of:

(a) placing the composition in a vessel containing a substantially flat platform;

(b) positioning within the composition a tensioned, transparent, flexible and non-adherent film having a first and a second surface, the first surface being opposite and parallel to the second surface, the first surface being disposed in a way to prevent wetting of said first surface by the composition, and at least part of the second surface being disposed in a way to be in contact with the composition;

(c) securing on top of the film at a first position, a substantially flat, substantially rigid and substantially transparent plate having an upper and a lower planar surface, the upper surface being opposite and parallel to the lower surface, such that the lower planar surface of the plate is parallel to and in contact with the first surface of the film, the plate guiding the film to an original position so that the film becomes parallel and lies on top of the flat platform at a distance equal to the thickness of a layer;

(d) exposing imagewise the photoformable composition contained between the film and the platform to radiation through the transparent plate and through the transparent film, in order to form a solidified layer, with the requirement that the radiation is high enough to cause reasonable adherence between the solidified layer and the platform;

(e) removing the transparent plate from the first position on top of the platform to a second position away from the platform;

(f) peeling the film from the solidified layer, and from the unexposed deformable composition;

(g) causing the deformable composition to flow over the solidified layer;

(h) increasing the distance between the platform and the original position of the film by the thickness of a layer;

(i) repositioning the film within the composition as in step (b);

(j) resecuring the plate at the first position on top of the film, such that the lower planar surface of the plate is parallel to and in contact with the first surface of the film, the plate guiding the film such that it is parallel to and lying on top of the previously solidified layer at a distance equal to the thickness of a layer;

(k) exposing imagewise to radiation, through the transparent plate and through the transparent film, the photoformable composition contained between the film and the previously solidified layer in order to form a new solidified layer, with the requirement that the radiation is high enough to cause reasonable adherence between the newly solidified layer and the previously solidified layer;

(l) removing the transparent plate again from the first position on top of the platform to the second position away from the plate;

(m) peeling the film from the newly solidified layer and from the unexposed deformable composition; and

(n) repeating steps (g) through (m) until the integral three-dimensional object is formed.

19. An apparatus for quickly and accurately fabricating an integral three-dimensional object from successive solidified layers of a deformable and photoformable composition comprising an assembly of:

imaging means for imagewise exposing to radiation each of the successive layers of the photoformable composition; and

a coating station comprising,

a vessel for containing the composition;

a substantially flat platform disposed within the vessel;

a transparent, flexible and non-adherent film supported under tension over the platform, the film having a first and a second surface, the first surface being opposite and parallel to the second surface, the film intended to be operable within the composition in a manner preventing wetting of the first surface by the composition, and allowing at least part of the second surface to be in contact with the composition;

a substantially flat, substantially rigid and substantially transparent plate secured at a first position on top of the film, the plate having an upper and a lower planar surface, the upper surface being at the opposite side of and parallel to the lower surface, such that the lower planar surface of the plate is also parallel to and in contact with the first surface of the film, the plate guiding the film to be on top and parallel to the flat platform;

placement means for controllably varying the distance between the second surface of the film and the platform in order to allow the successive layers of the photoformable composition to be formed under said second surface and be solidified by the imagewise exposure to radiation provided by the imaging means;

means for removing the plate from its first position to a second position;

means for causing the deformable composition to flow over the solidified layer; and

means for peeling the film.

5,143,818

BORATE COINITIATORS FOR PHOTOPOLYMERIZABLE COMPOSITIONS

Gregory C. Weed, Towanda, Pa., and Bruce M. Monroe, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1991, Ser. No. 649,358

Int. Cl.[5] **G03C** *1/73*

U.S. Cl. 430—281 **20 Claims**

1. A photopolymerizable composition comprising:

(A) an ethylenically unsaturated monomer capable of free-radial initiated polymerization; and

(B) an initiator system activatible by actinic radiation, said initiator system comprising:

(1) an anionic dye capable of absorbing actinic radiation, and

(2) a borate salt containing (a) an alkali metal cation or a quaternary ammonium cation and (b) a borate anion coinitiator represented by the formula:

$BX_1X_2X_3X_4^-$

wherein X_1, X_2, X_3, And X_4, the same or different, are selected from the group consisting of alkyl, aryl, aralkyl, alkenyl, alkynyl, alicyclic, heterocyclic, and allyl groups, with the proviso that at least one of X_1, X_2, X_3, and X_4 is not aryl.

5,143,819

AQUEOUS DEVELOPING, PHOTOCURABLE COMPOSITION, PHOTOSENSITIVE ARTICLES HAVING LAYERS MADE THEREFROM AND METHOD OF IMPROVING THOSE ARTICLES

Srinivas K. Mirle, and Arthur L. Berrier, both of Ellicott City, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

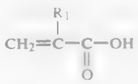
Filed Jan. 25, 1991, Ser. No. 645,848

Int. Cl.[5] **G03C** *1/725;* **G03F** *7/025*

U.S. Cl. 430—286 **34 Claims**

1. A photocurable composition comprising

(a) an acid-containing copolymer consisting essentially of monomer units of butadiene and monomer units of the formula.



wherein R_1 is hydrogen or methyl, having an acid content in the range of 0.1–0.5 ephr, which is a solid having a Mooney viscosity of at least about 20 to 60 or a liquid having a weight average molecular weight of about 5,000 to 30,000 modified by a difunctional chain extender until it becomes a solid; and

(b) a nitrogen-containing compound having a polymerizable ethylenically unsaturated group wherein said nitrogen-containing compound is present in an amount sufficient to render the composition suitable for use in a flexible photosensitive article.

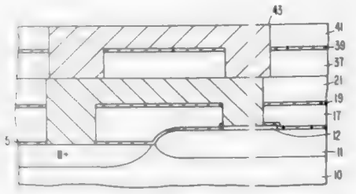
5,143,820
METHOD FOR FABRICATING HIGH CIRCUIT DENSITY, SELF-ALIGNED METAL LINENS TO CONTACT WINDOWS

Harish N. Kotecha, Manassas, Va.; Han A. Protschka, Gaithersburg, Md.; Dave Stanasolovich, Ithaca, N.Y., and Jake Theisen, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 429,900, Oct. 31, 1989, abandoned. This application Jul. 11, 1991, Ser. No. 730,504

Int. Cl.[5] G03C 5/00; H01L 21/306

U.S. Cl. 430—314 26 Claims



1. A method for fabricating a patterned conductive layer self-aligned to underlying contact windows in a dielectric layer on a substrate comprising the steps of:

forming a photosensitive layer over said dielectric layer, said photosensitive layer having full height areas, partial height areas and no height areas over said dielectric layer, wherein said no height areas and said partial height areas are aligned to each other;

in a first etching step, selectively etching said dielectric layer in said no height areas where said photosensitive layer is substantially totally removed to form contact windows which at least partially penetrate said dielectric layer;

in a second etching step, selectively etching to remove said partial height areas of photosensitive layer;

in a third etching step, etching said dielectric layer in said partial height areas to a predetermined depth to form channels for said patterned conductive layer, and in said no height areas entirely through said dielectric layer to form contact windows to said substrate;

depositing a conductive material over said dielectric layer; and,

planarizing said conductive layer to remove excess amounts of said conductive layer from said dielectric layer;

wherein said second and third etching steps sequentially follow the previous etching step.

5,143,821
COLOR PHOTOGRAPHIC MATERIAL COMPRISING A 2-ALKOXY PYRAZOLO[1,5-A]BENZIMIDAZOLE COLOR COUPLER

Michael W. Crawley, Watford, and Andrew W. Gibson, Woodhead, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

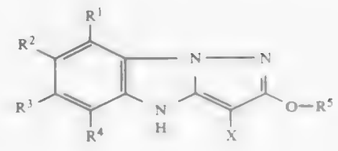
Filed Jan. 22. 1991, Ser. No. 643,600

Claims priority, application United Kingdom, Jan. 23, 1990, 9001484

Int. Cl.[5] G03C 7/31

U.S. Cl. 430—387 8 Claims

1. A photographic element comprising a support bearing at least one photographic silver halide emulsion layer and at least one dye-forming coupler which is represented by the formula:



(I)

wherein

R^1 to R^4 are each hydrogen or a substituent,

R^5 is an alkyl or substituted alkyl group, and

X is hydrogen or a coupling-off group selected from halogen, SR, S-heterocycle, OR, OSO_2R, OCOR and N-containing heterocycles attached to the coupling position by the N atom, where R is alkyl (including cycloalkyl) substituted alkyl, aryl or substituted aryl;

and wherein at least one of R^1 to R^5 or X contain a ballast group capable of rendering the coupler nondiffusible in photographic layers.

7. A process of forming a dye image in an exposed photographic element comprising a support bearing a photographic silver halide emulsion, said process comprising developing the photographic element with p-phenylenediamine color developing agent in the presence of a color coupler comprising the coupler of claim 1.

5,143,822
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL ELEMENT WITH ANTIHALATION LAYER CONTAINING OPTICAL BRIGHTENER

Shouji Nishio, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 800,409

Claims priority, application Japan, Nov. 30, 1990, 2-339415

Int. Cl.[5] G03C 1/06

U.S. Cl. 430—522 7 Claims

1. A silver halide photographic light-sensitive material comprising a reflective support having thereon a photographic layer including a silver halide emulsion layer and an atihalation layer provided between said support and said silver halide emulsion layer, wherein said antihalation layer contains fine dispersed particles of a compound represented by the following formula I, and at least one of said silver halide emulsion layer and said antihalation layer contains a fluorescent whitening agent;

$$A=L_1-(-L_2=L_3)_m B \quad (I)$$

wherein A is a 2-pyrazoline-5-on nucleus; B is an 4-aminoaryl group; L_1, L_2 and L_3 are each a methine group; and m is 0 or 1, provided that the compound satisfies at least one of the following requirements;

(1) said aminoaryl group represented by B has a carboxyl group, a sulfonamido group, an aminosulfonylamino group or a sulfamoyl group,

(2) said 2-pyrazoline-5-on nucleus represented by A has a carboxyl group; a sulfonamido group; an aminosulfonylamino group; an aliphatic group having a carboxyl group, a sulfonamido group or an aminosulfonylamino group; a heterocyclic group having a carboxyl group, a sulfonamido group or an aminosulfonylamino group; an aryl group having a carboxyl group, a sulfonamido group or an aminosulfonylamino group; or a group having a sulfamoyl group.

5,143,823
COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING COLOR COUPLERS

Friedrich-Wilhelm Kunitz, Wermelskirchen, Fed. Rep. of Germany, assignor to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

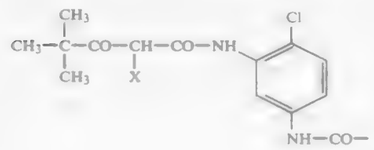
Filed Sep. 19, 1991, Ser. No. 762,426

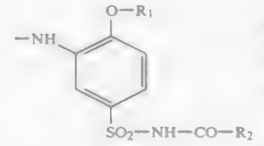
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1990, 4031159

Int. Cl.[5] G03C 7/36

U.S. Cl. 430—556 4 Claims

1. A color photographic recording material containing at least one photosensitive silver halide emulsion layer and, associated therewith, a non-diffusing α-acylacetanilide yellow coupler of which the anilide group is substituted by a substituent containing an N-acylsulfamoyl group, characterized in that the yellow coupler corresponds to the following formula





in which

X is a group releasable during the color coupling reaction;

R_1 is alkyl;

R_2 is alkyl.

5,143,824
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING CYAN DYE-FORMING COUPLER

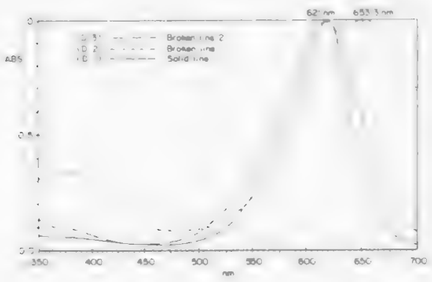
Katsuyoshi Yamakawa, and Jiro Tsukahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1991, Ser. No. 691,558

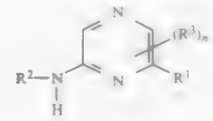
Claims priority, application Japan, Apr. 26, 1990, 2-111176

Int. Cl.[5] G03C 7/38

U.S. Cl. 430—558 26 Claims



1. A silver halide color photographic material comprising a support and at least one photosensitive silver halide emulsion layer formed on siad support, wherein said at least one photosensitive silver halide emulsion layer contains at least one cyan dye-forming coupler selected from the group consisting of compounds represented by the following general formula (I):



(I)

wherein R^1 represents an electron-donating group; R^2 represents a hydrogen atom, a substituted or an unsubstituted aliphatic group, a substituted or an unsubstituted aromatic group or a substituted or an unsubstituted heterocyclic group; R^3 represents a substitutent group; and n represents an integer of 0 to 2.

5,143,825
STABILIZED SUBSTRATE FOR USE IN AN IMMUNOASSAY

Koshy T. Chacko, Mundelein; Karen L. Fitzgerald, Wheeling, and James J. Markese, Downers Grove, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 1, 1990, Ser. No. 487,331

Int. Cl.[5] G01N 33/52; C12Q 1/42

U.S. Cl. 435—7.9 5 Claims

5. A 4-methylumbelliferyl phosphate substrate for use in an immunoassay and resistant to deterioration by endogenous enzyme comprising 4-methylumbelliferyl phosphate and from 0.01 to 0.05 gram mole per liter EDTA or EGTA in a solution of pH from about 10 to about 10.5.

5,143,826
METHOD FOR IDENTIFYING FELINE BLOOD TYPE B

Joseph E. Smith, Manhattan, Kans., assignor to Kansas State Univ. Research Foundation, Manhattan, Kans.

Filed Nov. 9, 1990, Ser. No. 611,185

Int. Cl.[5] G01N 33/53, 33/48

U.S. Cl. 435—7.25 3 Claims

1. A method to detect feline blood type B comprising:

a. combining feline blood with a sufficient amount of buffered *Triticum vulgaris* lectin to agglutinate said feline blood type B;

b. detecting agglutination; and

c. correlating agglutination with feline blood type B.

5,143,827
PROCESS FOR BIOTECHNOLOGICAL UPGRADING OF SHALE OIL

Ronald M. Atlas, Louisville, Ky., and Jackie Aislabie, Rotorua, New Zealand, assignors to Southern Pacific Petroleum, Ogden, Utah

Continuation-in-part of Ser. No. 298,355, Jan. 19, 1989, Pat. No. 5,049,499. This application Nov. 5, 1990, Ser. No. 608,702

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] C12P 1/04; C12R 1/395, 1/39; C12Q 1/24

U.S. Cl. 435—30 11 Claims

1. A process for biotechnological upgrading of raw shale oil which is free of damaging nitrogen-containing compounds, said oil containing nitrogen-containing compounds which comprises inoculating the raw shale oil with microbial strains which possess the capability of selectively degrading the nitrogen-containing compounds without attacking the hydrocarbons contained therein and being selected from the group consisting of strains of Pseudomonas aeruginoise, Pseudomonas aeruginoisa, Pseudomonas fluorescens and Acinetobacter sp., and mixtures thereof, said strains being produced by preparing a series of enrichment cultures wherein microbial cultures present in soil sources contaminated with petroleum were repeatedly added to media containing the shale oil as the only

source of nitrogen, and after a series of subcultures to ensure maintenance of growth on medium in which the shale oil was the sole source of nitrogen, the enriched cultures are analyzed to determine which compounds if any in the shale oil have been changed, and then selecting those above noted strains which destroy the nitrogen-containing compounds, said inoculation being conducted in the presence of a source of carbon other than that contained in the raw shale.

5,143,828

METHOD FOR SYNTHESIZING AN ENZYME-CATALYZED POLYMERIZED MONOLAYER

Joseph A. Akkara, Holliston; David L. Kaplan, Stow; Lynne A. Samuelson, West Newton, all of Mass.; Braja K. Mandal, Oak Park, Ill.; Sukant K. Tripathy, Acton; Ferdinando F. Bruno, Lawrence, both of Mass., and Kenneth A. Marx, Francestown, N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C. and University of Massachusetts Lowell, Lowell, Mass.

Filed Dec. 31, 1991, Ser. No. 815,213

Int. Cl.[5] C12P *7/22, 1/00;* C12N *9/02, 9/04*

U.S. Cl. 435—41 13 Claims

1. A method for synthesizing an enzyme-catalyzed, polymerized monolayer comprising the steps of:

a) spreading at least one or more monomers selected from the group consisting of a phenol an an aromatic amine over a water-miscible solvent subphase having an air-subphase interface, said one or more monomers being capable of forming a monolayer at said air-subphase interface and said one or more monomers being polymerizable with an oxidase enzyme system by introducing the enzyme into the subphase;

b) compressing said air-subphase interface so as to form a monolayer comprising said one or more monomers whereby there is an arrangement of monomers at the interface wherein at least one monomer is aligned at the interface while at least one other monomer is partitioned to varying degrees between the subphase and air-subphase interface; and

c) polymerizing said monomers to form a copolymerized monolayer with said enzyme system.

5,143,829

HIGH LEVEL EXPRESSION OF BASIC FIBROBLAST GROWTH FACTOR HAVING A HOMOGENEOUS N-TERMINUS

Stewart A. Thompson, Mountain View, and Judith A. Abraham, Sunnyvale, both of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.

Filed Mar. 29, 1990, Ser. No. 501,206

Int. Cl.[5] C12N *1/21, 15/18, 15/00*

U.S. Cl. 435—69.4 11 Claims

1. A method for producing a modified form of human basic fibroblast growth actor having a homogeneous N-terminus which comprises expressing, in *E. coli* strain B, a DNA sequence encoding the 155-amino acid precursor form of human basic fibrolast growth factor less one of the two alanine residues immediately following the N-terminal methionine; and recovering the expressed protein without the N-terminal methionine residue.

5,143,830

PROCESS FOR THE PRODUCTION OF A POLYPEPTIDE

Ian B. Holland, 24 Woodcroft Avenue, Leicester, LE2 6HE, England; Nigel Mackman, 375 Bonair St., LaJolla, Calif. 92037, and Jean-Marc Nicaud, 71, rue Vauvenargues, F-75018, Paris, France

PCT No. PCT/GB87/00331, § 371 Date Feb. 26, 1988, § 102(e) Date Feb. 26, 1988, PCT Pub. No. WO87/06953, PCT Pub. Date Nov. 19, 1987

PCT Filed May 14, 1987, Ser. No. 138,035

Claims priority, application United Kingdom, May 15, 1986, 8611832

Int. Cl.[5] C12N *15/62, 15/63, 15/09;* C07H *21/04*

U.S. Cl. 435—69.7 11 Claims

7. A process for the production of a polypeptide, in which host cells, which express transport proteins effective to secrete a peptide comprising a C-terminal secretion sequence, transformed or transfected with DNA coding for a fusion protein comprising the polypeptide and a further peptide comprising a C-terminal secretion sequence are cultured to express and secrete the fusion protein.

5,143,831

FRUCTOSE 1,6-DIPHOSPHATE ALDOLASE CATALYZED STEROSELECTIVE SYNTHESIS OF SUGARS

Chi-Huey Wong, College Station; John R. Durrwachter, Corpus Christi, and Richard L. Pederson, College Station, all of Tex., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 30, 1988, Ser. No. 238,756

Int. Cl.[5] C12P *19/26*

U.S. Cl. 435—84 21 Claims

1. A method for preparing optically pure N-containing sugars comprising:

enzymatically condensing an optically impure chiral aldehyde acceptor with dihydroxyacetone phosphate or dihydroxyacetone with a catalytic amount of inorganic arsenate in the presence of an aldolase to form an N-containing sugar said N-containing sugar forming a cyclic imine when the N-group is an amino; and

recovering a substantially optically pure N-containing sugar.

5,143,832

ATCC 53620 PRODUCTION OF A TRIACETYLENIC DIOXOLONE WITH MICROBISPORA SP. SCC 1438

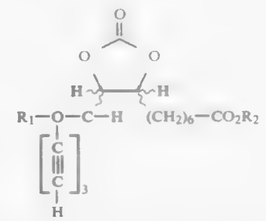
Mahesh Patel, Verona; Ann C. Horan, Summit; Joseph A. Marquez, Montclair, all of N.J., and J. Allan Waitz, Portola Valley, Calif., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 89,278, Aug. 25, 1987, Pat. No. 4,956,383. This application Jul. 3, 1990, Ser. No. 547,902

Int. Cl.[5] C12P *17/04;* C12N *1/20;* C07D *317/36*

U.S. Cl. 435—126 1 Claim

1. A process for producing a compound of the formula



wherein R_1 and R_2 are hydrogen, which comprises cultivating *Microbispora sp.* SCC 1438, ATCC 53620, in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen, under submerged aerobic conditions and isolating therefrom said compound.

5,143,833

PROCESS FOR THE PRODUCTION OF SUCCINIC ACID BY ANAEROBIC FERMENTATION

Rathin Datta, 442 W. Melrose Ave., #3, Chicago, Ill. 60657

Continuation-in-part of Ser. No. 873,031, Jun. 11, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 301,788

Int. Cl.[5] C12P *7/46, 1/04;* C12N *1/20;* C07C *51/42*

U.S. Cl. 435—145 3 Claims

1. A method of producing succinate which comprises growing an anaerobic succinate producing microorganism which has all the identifying characteristics of *Anaerobiospirillum succiniciproducens* ATCC No. 53488 in a medium containing least about 20 g/l of an assimilable carbohydrate, other required nutrients and sodium ions under anaerobic conditions in the presence of dissolved carbon dioxide in equilibrium with a partial pressure of at least 0.1 atmosphere of carbon dioxide which maintaining the pH within the range of 5.8 to 6.4 until a substantial portion of the carbohydrate has been consumed and the yield of succinate is at least 50% by weight of the carbohydrate consumed and then recovering the succinate.

5,143,834

PROCESS FOR THE PRODUCTION AND PURIFICATION OF SUCCINIC ACID

David A. Glassner, 4454 Satinwood Rd., Okemos, Mich. 48864, and Rathin Datta, 442 W. Melrose Ave., #3, Chicago, Ill. 60657

Continuation-in-part of Ser. No. 301,788, Jan. 25, 1989, which is a continuation-in-part of Ser. No. 873,031, Jun. 11, 1986, abandoned. This application Mar. 17, 1989, Ser. No. 325,404

Int. Cl.[5] C12P *7/46, 1/04;* C12N *1/20;* C07C *51/42*

U.S. Cl. 435—145 4 Claims

1. A process for producing succinic acid of high purity which comprises:

(a) growing an anaerobic organism which has all the identifying characteristics of *Anaerobiospirillum succiniciproducens* ATCC No. 53488 under anaerobic conditions in a fermentor on a medium containing at least 20g/l of assimilable carbohydrate and other required nutrients in the presence of dissolved carbon dioxide in equilibrium with a partial pressure of at least 0.1 atmosphere of carbon dioxide while maintaining the pH within the range of 5.8 to 6.4 until a succinate salt in a yield of at least 50 weight percent based on consumed carbohydrate is formed in the broth;

(b) subjecting the broth containing the succinate salt first to desalting electrodialysis to preferentially recover and concentrate the succinate salt into an aqueous stream and to remove nitrogenous impurities; and

(c) subjecting the aqueous stream containing the concentrated succinate salt from the desalting electrodialysis to water-splitting electrodialysis to convert the succinate salt to a base and a succinic acid stream.

5,143,835

ALKALOPHILIC METHANOGEN AND FAST METHANE FERMENTATION METHOD

Naoki Nakatsugawa, River-side Tsumita 303, 18-1, Shirako 3-chome, Wako-shi, Saitama-ken, and Koki Horikoshi, 39-8, Sakuradai 4-chome, Nerima-ku, Tokyo, both of Japan, assignors to Research Development Corporation of Japan, Tokyo; Naoki Nakatsugawa, Wako and Koki Horikoshi, Tokyo, all of, Japan, a part interest

Filed Mar. 6, 1989, Ser. No. 318,907

Claims priority, application Japan, Mar. 7, 1988, 63-53294; Mar. 7, 1988, 63-53295

Int. Cl.[5] C12P *5/02;* C12N *1/20;* C02F *3/00*

U.S. Cl. 435—167 7 Claims

1. A biologically pure culture of *Methanosarcina alcaliphilum* NY-728 (FERM BP-2309) which is an alkalophilic methanogen having optimum growth pH of about 8.1 to about 8.7.

2. A method for the production of methane which comprises the steps of:

(a) culturing a methanogen in a culture medium containing a first methanogenic substrate selected from the group consisting of methanol and methylamine, then

(b) culturing the methanogen in a culture medium containing a second methanogenic substrate selected from the group consisting of acetic acid, acetates and hydrogen-carbon dioxide, and

(c) recovering the methane produced,

wherein the methanogen is *Methanosarcina alcaliphilum* NY-728 (FERM BP-2309), and the fermentation is carried out at pH of about 8.1 to about 8.7.

5,143,836

PLASMIDS FOR EXPRESSION OF HUMAN SUPEROXIDE DISMUTASE (SOD) ANALOGS CONTAINING LAMBDA PL PROMOTER WITH ENGINEERED RESTRICTION SITE FOR SUBSTITUTING RIBOSOMAL BINDING SITES AND METHODS OF USE THEREOF

Jacob R. Hartman, Holon; Amos B. Oppenheim, Jerusalem; Marian Gorecki, and Haim Aviv, both of Rehovot, all of Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 767,143, Aug. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 644,245, Aug. 27, 1984, abandoned. This application May 13, 1988, Ser. No. 194,424

Int. Cl.[5] C12N *9/02, 15/70*

U.S. Cl. 435—189 15 Claims

1. A plasmid for the production of an enzymatically active polypeptide analog of human Cu-Zn superoxide dismutase having the identical amino acid sequence as, tand the biological activity of, naturally-occurring human Cu-Zn superoxide dismutase but an N-terminus which is not acetylated which upon introduction into a suitable *Escherichia coli* host cell containing the thermolabile repressor C_I renders the host cell capable, upon increasing the temperature of the host cell to a temperature at which the repressor is inactivated, of effecting expression of DNA encoding the human Cu-Zn superoxide dismutase polypeptide analog comprising:

a double-stranded DNA molecule which comprises in 5' to 3' order the following:

a DNA sequence which contains the promoter and operator P_LO_L from λ bacteriphage;

an N utilization site selected from the group consisting of Nut_L and Nut_R for binding antiterminator protein produced by *Escherichia coli* host cell;

a first unique restriction enzyme site which is EcoRI;

a DNA sequence which contains a ribosomal binding site selected from the group consisting of the natural β-lactamase ribosomal binding site derived from pBR233, and the symthetic ribosomat binding site having the sequence:

AATTCAATAATATTGAAAAAGGAAGAG
GTTATTATAACTTTTTCCTTCTCAT;

an ATG initiation condon;

a second unique restriction enzyme site which is NdeI; and

DNA encoding the human Cu-Zn superoxide dismutase polypeptide analog inserted into the NdeI restriction enzyme site in phase with the ATG initiation codon;

and which additionally includes a DNA sequence which contains an origin of replication from a bacterial plasmid pBR322 capable of autonomous replication in the *Escherichia coli* host cell and a DNA sequence which contains a gene associated with a selectable or identifiable phenotype trait which is manifested when the plasmid is present in the *Escherichia coli* host cell, the distance between the 3' end of the P_LO_L promoter and operator sequence and the 5' end of the N utilization site being less than about 80 base pairs and the distance between the 3' end of the N utiliza-

tion site and the 5' end of the ribosomal binding site being less than about 300 base pairs.

8. A host vector system for the production of a polypeptide analog of human Cu-Zn superoxide dismutase comprising the plasmid of claim 1 in a suitable *Escherichia coli* host cell.

9. A host vector system of claim 8, wherein the host cell is *Escherichia coli* A1637 (ATCC Accession No. 39385).

10. A host vector system of claim 8 wherein the host cell is *Escherichia coli* A1645 (ATCC Accession No. 39783).

11. A host vector system of claim 8 wherein the host cell is *Escherichia coli* A2097 (ATCC Accession No. 39786).

5,143,837

ENZYME COMPLEX HAVING COLLAGENOLYTIC ACTIVITY ISOLATED FROM CRABS

Vyacheslav Sova, Petropavlovsk; Alexander Strongyn; Olga Klimova, both of Moscow, and Vadim Stadnikov, Petropavlovsk, all of U.S.S.R., assignors to Scientific Center, Moscow, U.S.S.R.

Filed Jun. 6, 1990, Ser. No. 534,191

Claims priority, application U.S.S.R., Jun. 9, 1989, 4700495

Int. Cl.[5] C12N *9/48*

U.S. Cl. 435—212 **13 Claims**

1. An enzyme complex having collagenolytic activity, comprising a mixture of collagenolytic proteases from crabs, said collagenolytic proteases having the ability to cleave bovine lens capsule collagen type IV and having molecular weights of from about 23,000 to 36,000 daltons wherein said enzyme complex is isolated in aqueous solutions, without the use of organic solvents, from hepatopancreas of crabs, and wherein said crabs are selected from the group consisting of paralithodes and chionocetes species and said enzyme complex possesses a collagenolytic to activity of more than about 3.300 Mandl units/mg at pH 7.5.

5,143,838

METHOD OF PRODUCING THROMBIN FROM FACTOR II USING CALCIUM IONS FOR THE CONVERSION ON AN ANION EXCHANGER

Michael Kraus, Frankfurt, and Wolfgang Möller, Oberursel, both of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Dreieich, Fed. Rep. of Germany

Filed Dec. 20, 1989, Ser. No. 453,555

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843126

Int. Cl.[5] C12N *9/74*; A61K *3/14*; C07K *3/00*

U.S. Cl. 435—214 **5 Claims**

1. A method of producing thrombin from Factor II comprising the steps of:

a) applying a solution of citrated plasma or citrated plasma fraction containing Factor II onto an equilibrated anion exchanger to bind Factor II thereto;

b) applying a solution containing calcium ions to the exchanger to convert the Factor II to thrombin, and

c) selectively eluting the thrombin from the carrier.

5,143,839

ASSAY OF ENDOPEPTIDASES AND NOVEL PURIFIED BACTERIAL ENZYME

Shmaryahu Blumberg, Rishon Le Zion; Anya Spungin, Givatayim; Fred E. Indig, and Daniela B. Meir, both of Ramat Gan, all of Israel, assignors to Ramot Ltd., Tel-Aviv, Israel

Filed Aug. 7, 1990, Ser. No. 563,347

Claims priority, application Israel, Aug. 7, 1989, 91235

Int. Cl.[5] C12Q *1/37*; C12N *9/52*

U.S. Cl. 435—220 **12 Claims**

1. A substantially pure aminopeptidase obtained from *Streptomyces griseus* having the N-terminal sequence Ala-Pro-Asp-Ile-Pro-Leu, having an apparent molecular weight of (a) 33 kDa obtained from SDS-polyacrylamide gel electrophoresis and 21 kDa obtained from gel filtration on Superose 12 or (b) 34 kDa obtained from SDS-polyacrylamide gel electrophoresis and 22.5 kDa obtained from gel filtration on Superose 12, and containing 1.05 ±0.14 g atom of zinc per mole of said aminopeptidase.

5,143,840

SUBSTANTIALLY PURIFIED PROTEOLYTIC ENZYME FROM BACILLUS SPEC. USNI 4828 METHOD OF MAKING AND USING IT

Hansjoerg Rettenmaier, Gruenstadt; Andreas Kreimeyer, Speyer; Johannes Perner, Neustadt, and Paul Diessel, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

PCT No. PCT/EP89/01163, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO90/04022, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 4, 1989, Ser. No. 499,376

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834550

Int. Cl.[5] C12N *9/54, 1/00*; C11D *17/00*

U.S. Cl. 435—221 **3 Claims**

1. A substantially purified proteolytic enzyme from Bacillus spec. DSM 4828, which has an amino acid composition of Asx 12.1%, Thr 4.8%, Ser 7.9%, Glu 6.9%, Pro 5.2%, Gly 12.9%, Ala 12.0%, Cys 0.3%, Val 7.9%, Met 3.2%, Ile 4.2%, Leu 6.5%, Tyr 4.9%, Phe 1.4%, His 3.6%, Lys 1.9% and Arg 4.0%, an amino-terminal amino acid sequence of Gln-Thr-Val-Pro-Cys-Gly-Ile-Pro-Tyr-Ile-Tyr-Ser-Asp-Val-Val-His-Arg-Gln-Gly-Tyr-Phe-Gly-Asn-Gly-Val, which has a pH range for protease activity of 7 to 12, with an optimal of pH 12, which has a temperature range for protease activity of 20° C. to 70° C., with an optimal activity temperature of 60° C., whose molecular weight is about 27,000 daltons and whose isoelectric point is at pH 8.5

5,143,841

GANGLIOSIDE CERAMIDASE AND PROCESS FOR PRODUCING SAME

Yoshio Hirabayashi, Shizuoka; Tatsurokuro Tochikura; Setsu Kadowaki, both of Kyoto, and Kenji Yamamoto, Shiga, all of Japan, assignors to Toyo Jozo Company, Ltd., Shizuoka, Japan

Division of Ser. No. 230,465, Aug. 9, 1988, Pat. No. 4,997,760. This application Sep. 12, 1990, Ser. No. 553,116

Int. Cl.[5] C12N *9/78, 9/00*

U.S. Cl. 435—227 **7 Claims**

1. A purified ganglioside ceramidase enzyme which acts on ganglioside GM2 to hydrolyze said ganglioside to a lysoganglioside and a fatty acid, where said ganglioside ceramidase essentially does not hydrolyze neutral glycolipids and essentially does not hydrolyze unglycosylated ceramides.

5,143,842

MEDIA FOR NORMAL HUMAN MUSCLE SATELLITE CELLS

Richard G. Ham, and Judith A. St. Clair, both of Boulder, Colo., assignors to The University of Colorado Foundation, Inc., Boulder, Colo.

Filed Nov. 1, 1988, Ser. No. 265,785

Int. Cl.[5] C12N *5/08, 5/00*

U.S. Cl. 435—240.2 **22 Claims**

1. Human muscle satellite cell growth with serumfree supplement comprising nutrient medium MCDB120: about 0.5 mg/ml serum albumin; about 1×10^{-6}M dexamethasone; about 10 ng/ml epidermal growth factor; and about 0.5 mg/ml fetuin.

11. A serum-free human muscle satellite cell growth medium supplement which comprises serum albumin, dexamethasone, epidermal growth factor and fetuin.

5,143,843

METHOD FOR PRODUCTION OF MONOCLONAL ANTIBODIES FOR CANCER DIAGNOSIS AND THERAPY

M. Jules Mattes, Flushing; Lloyd J. Old, New York, and Kenneth O. Lloyd, Bronx, all of N.Y., assignors to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

Continuation of Ser. No. 556,860, Jul. 19, 1990, abandoned, which is a continuation of Ser. No. 12,267, Feb. 9, 1987, abandoned, which is a continuation of Ser. No. 556,579, Nov. 30, 1983, abandoned. This application Jul. 18, 1991, Ser. No. 732,724

Int. Cl.[5] C12N *5/20*; C07K *15/28*

U.S. Cl. 530—388.85 **6 Claims**

1. The hybridoma cell line designated MA 103 having A.T.C.C. Accessories No. HB 8408.

5,143,844

CONSTRUCTION OF AN IGG BINDING PROTEIN TO FACILITATE DOWNSTREAM PROCESSING USING PROTEIN ENGINEERING

Lars Abrahmsén, Stockholm; Tomas Moks, Täby; Björn Nilsson, Sollentüna, and Mathias Uhlén, Upsala, all of Sweden, assignors to KabiGen AB, Stockholm, Sweden

Filed Oct. 9, 1990, Ser. No. 594,564

Claims priority, application Sweden, Dec. 13, 1985, 8505922

Int. Cl.[5] C12N *15/31, 15/62, 15/63*

U.S. Cl. 435—257.3 **30 Claims**

1. A recombinant DNA fragment (Z) coding for an immunoglobulin G binding domain related to staphylococcal protein A, wherein the methionine codon of said fragment has been replaced by a codon of an amino acid residue other than methionine enabling expression of a methionine-free protein, wherein the codon of the first amino acid residue as defined by trysin digestion of native protein A, has been replaced by a valine codon, so as to enable polymerization of said fragment to any multiplicity to enhance the binding capacity of the translated product.

5,143,845

MIXTURE OF SACCARIFYING LACTIC ACID PRODUCING AND BUTYRIC ACID PRODUCING BACTERIA

Takashi Masuda, Tokyo, Japan, assignor to Toa Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 86,951, Aug. 19, 1987, abandoned. This application Nov. 16, 1990, Ser. No. 616,820

Claims priority, application Japan, Sep. 3, 1986, 61-206018; Oct. 6, 1986, 61-236073

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] C12N *1/20*

U.S. Cl. 435—252.4 **4 Claims**

1. A mixture of bacteria consisting essentially of:

(a) a lactic acid producing bacteria selected from a member of the group consisting of *Streptococcus faecalis, Streptococcus faecium, Streptococcus lactis, Streptococcus thermophilus, Lactobacillus bulgaricus, Lactobacillus jugurt, Lactobacillus acidophilis, Lactobacillus plantarum, Lactobacillus bifidus, Bifidobacterium bifidum, Bifidobacterium infantis and Bifidobacterium longum.*

(b) a saccharifying bacteria selected from a member of the group consisting of *Bacillus mesentericus, Bacillus subtilis,* and *Bacillus natto,* and

(c) a butyric acid producing bacteria selected from a member of the group consisting of *Clostridium butyricum* and *Clostridium acetobutyricum*

in a proprtion of 1 to 8 parts by weight of saccharifying bacteria and 1 to 8 parts by weight of butyric acid producing bacteria per part by weight of lactic acid producing bacteria.

5,143,846

PROTEASE DEFICIENT BACTERIAL HOSTS

Eva Huala, Belmont, and Frederick M. Ausubel, Newton, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 169,488, Mar. 17, 1988, Pat. No. 4,970,147. This application May 2, 1990, Ser. No. 515,940

Int. Cl.[5] C12N *1/21, 15/31, 15/70*

U.S. Cl. 435—252.33 **9 Claims**

1. An *E. coli* bacterial host, wherein said host possesses a mutation in snoC, and wherein said mutation results in a decreased rate of degradation of recombinantly-produced NifA.

5,143,847

ENZYME-FIXED BIOREACTOR

Mitsuo Kawase, Chita; Yasuko Yoshida, Nagoya, and Hitoshi Yonekawa, Aichi, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Nov. 27, 1989, Ser. No. 441,475

Int. Cl.[5] C12M *1/40*

U.S. Cl. 435—288 **3 Claims**

1. A fluid-solid contact device, comprising:

a contact column;

solid particles contained in said column;

a moveable piston member arranged at least at one end of said column for packing said particles uniformly and densely within said column, thereby preventing relative movement of said particles within said column when a fluid passes therethrough;

a hollow piston rod member attached to said piston for introducing a fluid into said column to contact said particles; and

means for discharging said fluid from said column after contacting said particles.

5,143,848

METHOD OF STABILIZING COLOSTRUM FOR IMMUNOCHEMICAL EXAMINATION

Rudolf Scholten; Lucas A. T. Hilgers, and Marinus W. Weststrate, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Sep. 10, 1990, Ser. No. 579,580

Claims priority, application Netherlands, Sep. 13, 1989, 8902284

Int. Cl.[5] G01N *33/06, 1/00*

U.S. Cl. 436—8 **7 Claims**

1. A stabilization kit to be used for stabilizing a sample of colostrum or milk which is intended for immunochemical examination, characterised in that the kit comprises a stabilizing system comprising the following components:

(a) an antimicrobial agent,

(b) a buffer solution which is capable of buffering the sample to be examined at a pH between 5 and 8, and

(c) at least two non-ionic surface-active substances, and that the kit may further comprise instructions for use, stipulating that the sample of colostrum or milk taken for the immunochemical examination must be stabilized by add-

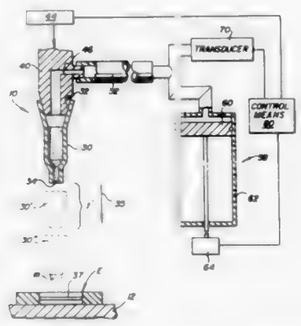
ing said stabilizing system as soon as possible after taking the sample.

5,143,849

TIP TO SURFACE SPACING FOR OPTIMUM DISPENSING CONTROLLED BY A DETECTED PRESSURE CHANGE IN THE TIP

James V. Barry, Rochester; Raymond F. Jakubowicz, Rush, and J. Eric Hamann, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1991, Ser. No. 672,980
Int. Cl.[5] G01N *35/02, 35/08;* **B01L** *3/02*
U.S. Cl. 436—50 **7 Claims**



1. A method for dispensing a variety of different body liquids in a controlled stream onto a plurality of different test elements, using dispensing means for dispensing a body liquid and comprising a dispensing tip, transducer means for detecting the pressure applied to a body liquid in said dispensing means and pressure altering means for altering said pressure, and means for moving said dispensing means relative to a test element, the method comprising the steps of

a) aspirating a body liquid of unknown surface tension into said dispensing tip,

b) advancing said tip with liquid therein towards a supplied test element,

c) during step b), creating an exterior meniscus of liquid protruding from said tip with said pressure altering means and detecting any pressure changes in said tip with said transducer means,

d) automatically sensing the intercept of said meniscus with the test element by detecting with said transducer means a predetermined amount of decrease in pressure,

e) terminating the advancing of step b) upon sensing said decrease in pressure in step d) to create a tip-to-element spacing, and

f) dispensing liquid from said tip with said pressure altering means,

so that proper tip-to-test element spacing is achieved during step f) regardless of poor mechanical tolerances.

5,143,850

DETECTION OF RADIOISOTOPE LABELED COMPONENTS IN A CAPILLARY

Stephen L. Pentoney, Jr., Yorba Linda, and Richard N. Zare, Stanford, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 23, 1990, Ser. No. 557,439
Int. Cl.[5] G01N *23/00, 33/00;* **C25B** *1/00*
U.S. Cl. 436—57 **21 Claims**

1. A method for analyzing radioisotope labeled components carried in a separation medium in a capillary, the method comprising the steps of:

electrophoretically separating the components;

freezing a section of the capillary containing the components; and

analyzing the components while they are held in the frozen section.

5,143,851

METHOD FOR SEPARATING DIPHENYLUREA (DPU) AND PHENYLTHIOHYDANTOIN-TRYPTOPHAN (PTH-TRP) ALLOWING UNAMBIGUOUS IDENTIFICATION OF TRP IN AUTOMATIC SEQUENCE ANALYSIS

Thomas Mueller, Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 13, 1990, Ser. No. 493,062
Int. Cl.[5] G01N *33/00;* **B01D** *15/08*
U.S. Cl. 436—89 **2 Claims**

1. A method for determining the presence of tryptophan in a sample, said method comprising:

treating said sample so as to form the phenylthiohydantoin derivative of amino acids present in said sample; and

subjecting said treated sample to reverse-phase high-performance liquid chromatography on a PTH-C18 reverse-phase column;

wherein said chromatography is performed using a two stage gradient of a first solution and a second solution;

wherein said first solution is an acetate buffer containing trimethylamine and tetrahydrofuran and having a pH of about 3.8 to about 4.6 and said second solution comprises acetonitrile;

wherein said gradient begins with a first stage during which said first solution and said second solution are mixed to produce a substantially linear increase in the concentration of said second solution from an initial concentration of about 7–13% of said second solution by volume to a final concentration of about 32–36% of said second solution by volume; and

wherein a second stage follows said first stage wherein the concentration of said second solution is maintained at a constant concentration of about 32–36% of said second solution by volume.

5,143,852

ANTIBODIES TO LIGAND ANALOGUES AND THEIR UTILITY IN LIGAND-RECEPTOR ASSAYS

Gunars E. Valkirs, Escondido, and Kenneth F. Buechler, San Diego, both of Calif., assignors to Biosite Diagnostics, Inc., San Diego, Calif.

Filed Sep. 14, 1990, Ser. No. 583,046
Int. Cl.[5] G01N *33/543, 33/558, 33/563, 33/577*
U.S. Cl. 436—501 **21 Claims**

1. Method for determining the presence of at least one target ligand, capable of competing with a ligand analogue conjugate for binding sites available on a ligand receptor, said ligand analogue conjugate comprising at least one ligand analogue coupled to a signal development element, in a fluid sample suspected of containing said target ligand, comprising the steps of:

a. contacting said fluid sample with a ligand receptor and a ligand analogue conjugate such that the amount of ligand analogue conjugate that is not bound to ligand receptor is related to the concentration of the target ligand in the sample;

b. contacting the fluid from step (a) with at least one ligand analogue antibody having a first affinity for said ligand analogue conjugate, and a second affinity for said target ligand, wherein said first affinity is at least 100 times greater than said second affinity, and said second affinity is greater than zero, wherein an amount of said ligand analogue conjugate not bound to ligand receptor is bound by ligand analogue antibody;

c. contacting the fluid from step (b) with a receptor capable of binding to said ligand analogue antibody;

d. removing ligand analogue antibody bound to said receptor from said fluid;

e. measuring the amount of said ligand analogue conjugate bound to said ligand analogue antibody by developing a signal from said signal development element; and

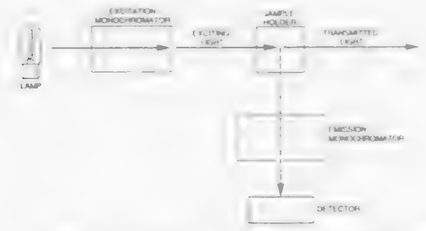
f. relating said measured amount of said ligand analogue conjugate to the presence or amount of said target ligand in said fluid sample.

5,143,853

ABSORBANCE MODULATED FLUORESCENCE DETECTION METHODS AND SENSORS

David R. Walt, Lexington, Mass., assignor to Trustees of Tufts College, Medford, Mass.

Continuation of Ser. No. 878,128, Jun. 25, 1986, Pat. No. 4,822,746. This application Feb. 2, 1989, Ser. No. 305,176
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] G01N *33/53, 33/536, 21/00*
U.S. Cl. 436—501 **14 Claims**



1. A method for detecting an analyte of interest in a fluid sample, said method comprising the steps of:

admixing the fluid sample comprising a discrete absorber ligand whose spectral properties are influenced by and correlatable with the analyte of interest in the sample with a chemically non-reactive fluorophore to form a reaction mixture, said absorber ligand having a definable light absorption spectrum, said fluorophore having a definable light absorption spectrum and a definable light emission spectrum each of which overlaps the light absorption spectrum of said absorber ligand, said fluorophore of said formed reaction mixture being able

(a) to absorb exciting light energy of a first wavelength,

(b) to transfer a part of said fluorophore absorbed energy to said absorber ligand of said reaction mixture for absorption, said transfer being selected from the group consisting of radiative and non-radiative energy transfers, and

(c) to emit the other part of said fluorophore absorbed energy as emitted light of a second wavelength;

introducing exciting light energy of the first wavelength to said reaction mixture sufficient to cause said fluorophore to absorb said exciting light energy, wherein a portion of said fluorphore absorbed energy is transferred to and absorbed by such absorber ligand as is present in said reaction mixture, and wherein another portion of said fluorophore absorbed energy is emitted by said fluorophore as light of the second wavelength; and

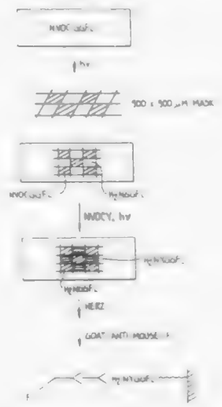
detecting said light of the second wavelength emitted by said fluorophore of said reaction mixture, said detected emitted light being a measure of the analyte of interest in the sample.

5,143,854

LARGE SCALE PHOTOLITHOGRAPHIC SOLID PHASE SYNTHESIS OF POLYPEPTIDES AND RECEPTOR BINDING SCREENING THEREOF

Michael C. Pirrung, Durham, N.C.; J. Leighton Read; Stephen P. A. Fodor, both of Palo Alto, Calif., and Lubert Stryer, Stanford, Calif., assignors to Affymax Technologies N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 362,901, Jun. 7, 1989, abandoned. This application Mar. 7, 1990, Ser. No. 492,462
Int. Cl.[5] G01N *33/543;* **C07K** *1/04;* **B01J** *19/00*
U.S. Cl. 436—518 **13 Claims**



1. A method of identifying at least one polypeptide for binding with a receptor comprising the sequential steps of:

a) generating a pattern of light and dark areas by selectively irradiating at least a first area of a surface of a substrate, said surface comprising polypeptides immobilized on said surface, said polypeptides having a photoremovable protective group, without irradiating at least a second area of said surface, to remove said protective group from said polypeptides in said first area;

b) simultaneously contacting said first area and said second area of said surface with a first amino acid to couple said first amino acid to said polypeptides in said first area, and not in said second area, said first amino acid having said photoremovable protective group;

c) generating another generating another pattern of light and dark areas by selectively irradiating with light at least a part of said first area of said surface and at least a part of said second area to remove said protective group in said at least a part of said first area and said at least a part of said second area;

d) simultaneously contacting said first area and said second area of said surface with a second amino acid to couple said second amino acid to said polypeptides in said at least a part of said first area and said at least a part of said second area;

e) performing additional irradiating and amino acid contacting and coupling steps so that a matrix array of at least 100 different polypeptides is formed on said surface, each different polypeptide synthesized in an area of less than 0.1 cm^2, whereby said different polypeptides have amino acid sequences and locations on said surface defined by the patterns of light and dark areas formed during the irradiating steps and the amino acids coupled in said contacting steps; and

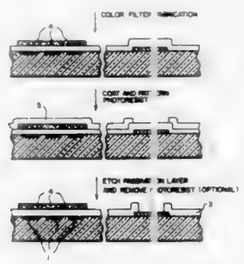
f) contacting said surface with a receptor and identifying which polypeptides on said surface specifically bind to said receptor.

5,143,85[illegible]

METHOD FOR MAKING CONTACT OPENINGS IN COLOR IMAGE SENSOR PASSIVATION LAYER

Laurel J. Pace, Rochester, and William C. McColgin, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1991, Ser. No. 716,445
Int. Cl.[5] H01L *21/56, 27/14, 31/0216*
U.S. Cl. 437—3 5 Claims



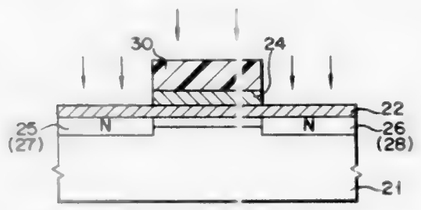
1. A method of making contact openings for a bonding pad pattern in an inorganic passivation layer on which color filters have been fabricated, comprising the steps of:
(a) forming an inorganic passivation layer over an array of photosensing elements and their associated bonding pad patterns;
(b) providing a color filter array over the passivation layer;
(c) forming a photoresist layer that covers the color filter array and other exposed layers;
(d) forming a pattern in the photoresist such that portions over the bonding pad areas are opened; and
(e) removing by wet etching selective regions of the passivation layer to expose the bonding pads.

5,143,85[illegible]

METHOD OF MANUFACTURING MES FET

Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 46,161, May 5, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 238,995
Claims priority, application Japan, May 9, 1986, 61-104693
Int. Cl.[5] H01L *21/338*
U.S. Cl. 437—22 3 Claims



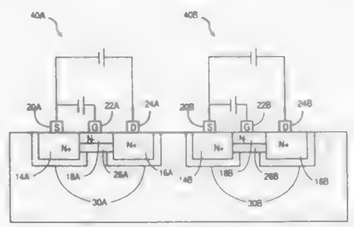
1. A method of manufacturing a MES FET, comprising the steps of:
(a) forming a GaAs epitaxial layer of one conductivity type including a portion serving as a channel layer on a semi-insulative GaAs substrate, by use of a crystal growth technique which allows control at atomic layer level;
(b) forming a first metal film including a portion serving as a Schottky gate electrode on the entire surface of said GaAs epitaxial layer, using the crystal growth technique which allows control at atomic layer level, immediately after the epitaxial layer-forming step and using an apparatus which is the same apparatus used in forming said GaAs epitaxial layer;
(c) ion-implanting a high-concentration impurity of the one conductivity type into source and drain high-concentration layer-forming regions, through said first metal film;
(d) forming a second metal film on the entire surface of said first metal film;
(e) performing activation annealing, after the ion-implanting step, while said first and second metal films remain on said epitaxial layer; and
(f) patterning said first metal film to form said Schottky gate electrode by selectively etching said first metal film after activation annealing.

5,143,857

METHOD OF FABRICATING AN ELECTRONIC DEVICE WITH REDUCED SUSCEPTIBLITY TO BACKGATING EFFECTS

Eric P. Finchem, Beaverton; William A. Vetanen, Sherwood; Bruce Odekirk, Hillsboro, and Irene G. Beers, Tigard, all of Oreg., assignors to TriQuint Semiconductor, Inc., Beaverton, Oreg.

Division of Ser. No. 267,967, Nov. 7, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 561,211
Int. Cl.[5] H01L *21/338*
U.S. Cl. 437—22 15 Claims



1. A method of fabricating an integrated circuit, comprising:
providing a substrate having a source region, a drain region and a third region, each of N+ conductivity, the third region being spaced from the source and drain regions by a region of semi-insulating material, and the source and drain regions being spaced by a channel region of N— conductivity,
introducing P-type dopant into said substrate to surround the third region,
providing electrodes in ohmic contact with the source, drain and third regions respectively, and
providing an electrode over the channel region.

5,143,858

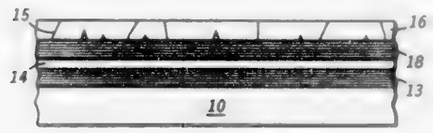
METHOD OF FABRICATING BURIED INSULATING LAYERS

Mamoru Tomozane, and H. Ming Liaw, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1990, Ser. No. 502,906
Int. Cl.[5] H01L *21/265, 21/76*
U.S. Cl. 437—24 7 Claims

1. A method of fabricating a buried insulating layer, comprising the steps of:
providing a semiconductor substrate;
implanting a first dopant which reacts to form an insulating layer to a predetermined depth in the semiconductor substrate;
annealing the semiconductor substrate to form a first buried insulating layer in the semiconductor substrate, wherein a portion of the semiconductor substrate above the buried insulating layer is called a superficial semiconductor layer;

forming a semiconductor layer on the superficial semiconductor layer;
implanting a second dopant which reacts to form an insulating layer into the superficial semiconductor layer and the semiconductor layer; and



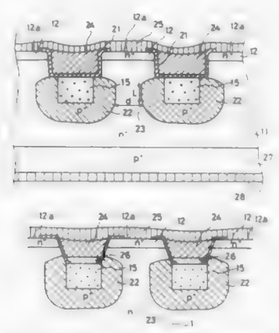
annealing the semiconductor substrate to form a second buried insulating layer, wherein the first buried insulating layer and the second buried insulating layer are separated by a portion of the superficial semiconductor layer.

5,143,859

METHOD OF MANUFACTURING A STATIC INDUCTION TYPE SWITCHING DEVICE

Masana Harada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 356,054, May 23, 1989, abandoned. This application May 2, 1990, Ser. No. 518,300
Claims priority, application Japan, Jan. 18, 1989, 1-9014
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 5 Claims



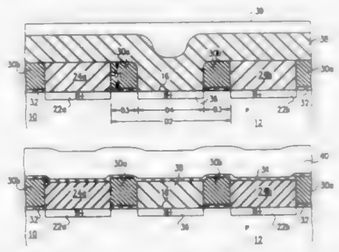
1. A method of manufacturing a static induction type switching device comprising the steps of:
(a) preparing a first conductivity type semiconductor substrate having top and bottom major surfaces;
(b) forming a first conductivity type region on said top major surface of said semiconductor substrate;
(c) selectively removing said first conductivity type region and said semiconductor substrate to thereby define first trenches which are arrayed substantially in parallel with said top major surface;
(d) forming polysilicon regions containing second conductivity type impurities in bottom portions of said first trenches by providing material substantially made of polysilicon having second conductivity impurities into each of said first trenches, and removing a top portion of said material from each of said first trenches to thereby obtain said polysilicon regions and from each of said first trenches, removing said top portion of said material together with respective parts of said semiconductor substrate and said first conductivity type region which surrounds said top portion of said material, to thereby define second trenches with which respective entrance side portions of said first trenches are replaced, respectively, wherein an aperture size of each of second trenches larger than an aperture size of each first trench;
(e) diffusing said second conductivity type impurities from said polysilicon layers serving as diffusion sources to thereby form diffused regions on peripheries of said polysilicon regions, said diffused regions serving as gate regions with said polysilicon regions; and
(f) forming a first or second conductivity type second main electrode region on said bottom major surface of said semiconductor substrate.

5,143,860

HIGH DENSITY EPROM FABRICAITON METHOD HAVING SIDEWALL FLOATING GATES

Allan T. Mitchell, Garland; Bert R. Riemenschneider, Murphy, and Howard L. Tigelaar, Allen, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 137,401, Dec. 23, 1987, abandoned. This application Apr. 17, 1991, Ser. No. 686,734
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—43 7 Claims



1. A method of forming an electrically programmable memory on a substrate having a semiconductor surface area of a first conductivity type, said method comprising the steps of:
forming first and second spaced apart regions of a second conductivity type at the semiconductor surface, said first and second regions of said second conductivity type spaced apart by a first region of said first conductivity type at the semiconductor surface, said first region of said first conductivity type extending from said first region of said second conductivity type to said second region of said second conductivity type;
forming first and second field insulator regions overlying the first and second regions of said second conductivity type, respectively, so that said first and second field insulator regions have first and second sidewalls, respectively, the first sidewall facing the second sidewall and the first and second sidewalls extending away from the substrate surface; and
forming first and second sidewall floating gates on the first and second sidewalls, respectively, said first and second sidewall floating gates spaced apart by a portion of said first region of said first conductivity type.

5,143,861

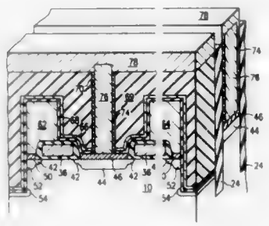
METHOD MAKING A DYNAMIC RANDOM ACCESS MEMORY CELL WITH A TUNGSTEN PLUG

Timothy E. Turner, Roanoke, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 6, 1989, Ser. No. 320,064
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 13 Claims

1. A method for forming a memory cell for a dynamic random access memory, comprising:
providing a substrate having at least one surface;
forming an MOS transistor on the surface of the substrate having a gate electrode separated from the surface of the substrate by a layer of gate oxide to define a channel

thereunder, the transistor having source/drain regions on either side of the channel;
forming a layer of insulating material over the gate electrode of the MOS transistor on all sides thereof and on the upper surface thereof;
forming a layer of tungsten on one source/drain region;
forming a layer of masking material over the transistor;
patterning the masking layer to define an opening to expose at least a portion of the layer of tungsten disposed over the one source/drain region and a portion of the layer of insulating material over the gate electrode;
depositing tungsten in the opening such that it builds upward from the exposed portion of the tungsten layer to create an essentially vertical plug having an upper surface and at



least two side surfaces, the plug defining the lower plate of a storage capacitor;
removing the masking layer and depositing a conformal layer of insulating material over the plug and transistor;
forming a conformal layer of conductive material over the conformal layer of insulating material, the portion of the conformal conductive layer overlying the plug comprising the upper plate of the storage capacitor;
forming a planarized layer of insulating material over the conductive layer;
forming an opening through the planarized layer of insulating material, the conformal conductive layer and the conformal layer of insulating material to expose the other of the source/drain regions of the MOS transistor; and
forming a contact in the opening.

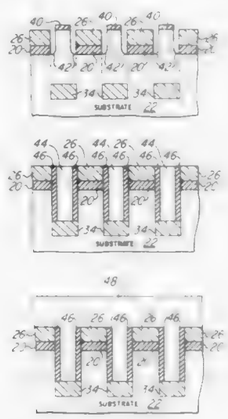
5,143,862

SOI WAFER FABRICATION BY SELECTIVE EPITAXIAL GROWTH

Mehrdad M. Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1990, Ser. No. 619,785
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—62 **9 Claims**

1. A method of forming a semiconductor-on-insulator wafer comprising:
a. anisotropically etching a surface of a substrate to form trenches having walls and bottoms;
b. anisotropically depositing a first insulator over said substrate surface and on said trench walls and bottoms;
c. etching to remove first insulator from substantial portions of said trench walls, but leaving first insulator on said trench bottoms, thereby exposing portions of said semiconductor substrate;
d. epitaxially growing semiconductor material on said exposed portions of said semiconductor substrate to partially fill said trenches;
e. depositing sidewall forming material, said sidewall forming material being different from said first insulator;
f. anisotropically etching said sidewall forming material to form sidewalls on portions of said trench walls and to bare surfaces of said epitaxially grown semiconductor material;
g. forming an etch mask material on said bare surfaces of said epitaxially grown semiconductor material;
h. removing said sidewalls and uncovering areas of said epitaxially grown semiconductor material;
i. anisotropically etching said uncovered areas of semiconductor material until said first insulator on said trench bottoms is reached, thereby leaving islands of semiconductor material on said first insulator on said trench bot-



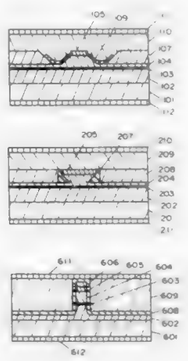
toms and leaving exposed walls of semiconductor material on said islands and on said substrate;
j. forming a second insulator on said exposed walls of semiconductor material;
k. removing said etch mask material; and
l. epitaxially growing semiconductor material to merge said semiconductor islands.

5,143,863

METHOD OF MANUFACTURING SEMICONDUCTOR LASER

Kiyoshi Ohnaka, Moriguchi, and Mototsugu Ogura, Takaichi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 437,934, Nov. 17, 1989, Pat. No. 5,029,175.
This application Apr. 9, 1991, Ser. No. 683,181
Claims priority, application Japan, Dec. 8, 1988, 63-311114; Jun. 15, 1989, 1-153369
Int. Cl.[5] H01L *21/20, 21/203*
U.S. Cl. 437—129 **3 Claims**



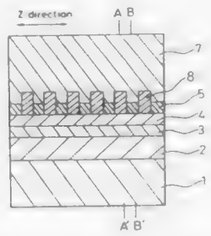
1. A method of manufacturing a semiconductor laser comprising: a step of forming an AlGaInP cladding layer of one conductive type, an active layer, an AlGaInP cladding layer of another conductive layer and a contact layer of another conductive layer on a GaAs substrate; a step of etching in stripes the AlGaInP cladding layer of one conductive type, the active layer, the AlGaInP cladding layer of another conductive type and the contact layer of another conductive type; a step of forming an amorphous layer lower in refractive index than the AlGaInP cladding layer of another conductive type and AlGaInP cladding layer of one conductive type on the entire surface; a step of coating the surface with a film which is the same in etching rate as the amorphous layer, and a step of exposing the surface of the contact layer of another conductive type by etching the stripe-shaped amorphous film together with the coating film.

5,143,864

METHOD OF PRODUCING A SEMICONDUCTOR LASER

Akira Takemoto; Hitoshi Watanabe; Masatoshi Fujiwara, and Syoichi Kakimoto, all of Itami, Japan, assignors to Misubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 510,839, Apr. 18, 1990, Pat. No. 5,093,835.
This application Jul. 29, 1991, Ser. No. 737,057
Claims priority, application Japan, Jun. 30, 1989, 1-170469
Int. Cl.[5] H01L *21/18*
U.S. Cl. 437—129 **4 Claims**



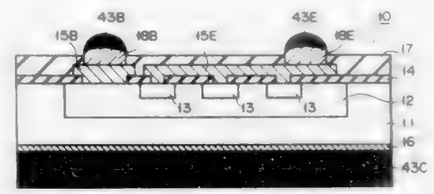
1. A method of producing a semiconductor laser device comprising:
successively growing on a first conductivity type semiconductor substrate a first conductivity type cladding layer having a refractive index, an active layer having an energy band gap, a second conductivity type barrier layer having a larger energy band gap than that of said active layer, and a second conductivity type absorption layer having an energy band gap no larger than that of said active layer;
producing an etching mask having a periodic stripe pattern along a cavity length direction on said absorption layer;
etching and removing said absorption layer using said etching mask to produce grooves in said absorption layer;
selectively growing a refractive index matching layer having a larger energy band gap than that of said active layer and a higher refractive index than that of said cladding layer, burying said grooves using said etching mask as a selective growth mask; and
removing said mask and growing a second conductivity type cladding layer on said absorption layer and refractive index matching layer.

5,143,865

METAL BUMP TYPE SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Makoto Hideshima, Tokyo; Tetsujiro Tsunoda, Fujisawa; Shinjiro Kojima, Chigasaki, and Masaru Ando, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 399,234, Aug. 29, 1989, abandoned.
This application Jul. 17, 1991, Ser. No. 731,392
Claims priority, application Japan, Sep. 2, 1988, 63-219726
Int. Cl.[5] H01L *21/28*
U.S. Cl. 437—183 **9 Claims**



1. A method for manufacturing semiconductor devices comprising the steps of:
forming an active region for at least one semiconductor element in a main surface area of a semiconductor substrate;
forming an electrode layer, which contains aluminum as the main component, on the semiconductor substrate by deposition, and then patterning the electrode layer to thereby form an electrode wiring pattern connected to the active region;
covering said electrode wiring pattern with an insulation film;
selectively removing said insulation film to expose part of said electrode wiring pattern;
forming a nickel layer on a back surface of said semiconductor substrate and in ohmic contact therewith;
covering said nickel layer with a protective coating;
forming a first bump on the exposed part of said electrode wiring pattern by dipping said semiconductor substrate into molten metal while simultaneously applying ultrasonic waves to the molten metal, said molten metal containing zinc of 1 to 10% in mass percentage and at least one element selected from a group consisting of tin, lead and aluminum with said at least one element being present in an amount not less than 50% in mass percentage;
eliminating said protective coat; and
forming a second bump having a composition including lead, tin, and at least one of silver and copper, and a melting point lower than that of said first bump, and an electrode on said nickel layer, which second bump forming step is performed without actually remelting said first bump at a temperature lower than the melting point of said first bump.

5,143,866

DRY ETCHING METHOD FOR REFRACTORY METALS, REFRACTORY METAL SILICIDES, AND OTHER REFRACTORY METAL COMPOUNDS

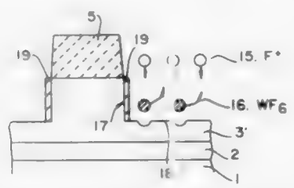
Takeshi Matsutani, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 387,921, Aug. 1, 1989, abandoned. This application Jan. 17, 1991, Ser. No. 642,167
Claims priority, application Japan, Aug. 6, 1988, 63-196785
Int. Cl.[5] H01L *21/00, 21/02, 21/205, 21/263*
U.S. Cl. 437—187 **16 Claims**

1. A dry etching method for etching a refractory metal or a compound thereof by a plasma discharge in an etching chamber to form an etched pattern on a substrate, said etched pat-

tern having a sidewall and a bottom surface in which the lateral etching on the sidewall is prevented, comprising the steps of:

mixing gases of an etchant gas for etching said refractory metal and a deposit gas for depositing said refractory metal, keeping a mixing rate of said etchant gas and deposit gas so as to balance the etching and the deposition of



refractory metal, while maintaining a partial pressure of said deposit gas in a range of 15 to 30 per cent of a total gas pressure in said etching chamber; and

introducing a plasma discharge on said substrate in a direction to make ions impact vertically to the surface of said substrate.

5,143,867

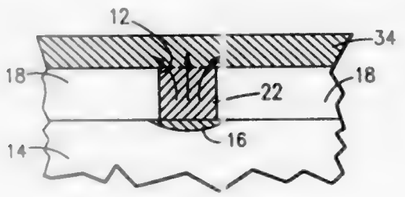
METHOD FOR DEPOSITING INTERCONNECTION METALLURGY USING LOW TEMPERATURE ALLOY PROCESSES

Francois M. d'Heurle, Ossining, and James M. E. Harper, Yorktown Heights, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 13, 1991, Ser. No. 654,999

Int. Cl.[5] H01L *21/28*

U.S. Cl. 437—188 34 Claims



1. A method for filling a VLSI high aspect ratio recess in an interconnection structure defined in a dielectric layer disposed on one main planar surface of a substrate with a metal comprising the steps of:

(a) providing a low melting point alloy of a metal and an alloying element;

(b) depositing said alloy into the recess of the interconnection structure at a deposition temperature which is below the alloy melting point;

(c) purifying said alloy by diffusing the alloying element to a surface layer formed on said dielectric layer and removing said surface layer, thereby leaving the metal in the interconnection structure.

5,143,868

COMMUNICATION BOX ASSEMBLY

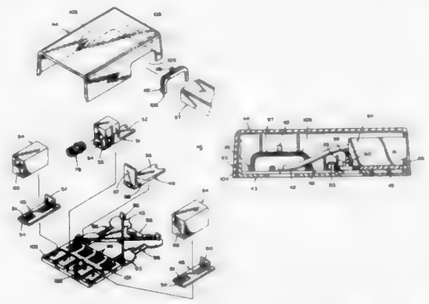
Jack E. Caveney, Hinsdale; John J. Bulanda, New Lenox; Richard L. Fischer, Lisle; Andrew J. Stroede, and Donald C. Wiencek, both of Tinley Park, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Continuation of Ser. No. 543,934, Jun. 22, 1990, Pat. No. 5,013,260, which is a division of Ser. No. 421,418, Oct. 16, 1989, Pat. No. 4,950,184, which is a division of Ser. No. 179,157, Apr. 8, 1988, Pat. No. 4,875,888. This application May 1, 1991, Ser. No. 694,518

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] H01R *13/73*

U.S. Cl. 439—535 20 Claims



1. A communication assembly for interchangeably mounting communication connectors for use in an office environment, comprising:

an integrally molded plastic assembly mounting means having means for attaching the assembly mounting means to a mounting surface;

a plurality of connector mounting inserts, the inserts having an elongate body member including connector mounting means for securing a connector to the body member, the inserts having a common length and having a multiple of a common width whereby the inserts are interchangeable within the assembly; and

insert mounting means integrally formed in the assembly mounting means for independently mounting and positively locking each insert to the assembly mounting means against movement in any direction such that each insert can be individually mounted or individually removed without disturbance of any part of the insert mounting means which mounts an adjacently mounted insert; wherein the insert mounting means positions adjacent connector mounting inserts in juxtaposition along adjacent lateral edges thereof such that the space needed to mount a plurality of inserts to the assembly mounting means is minimized.

5,143,869

BORIDE-ZIRCONIUM OXIDE-NITROGEN CARBIDE-BASED CERAMICS

Tadahiko Watanabe, and Kazuhisa Shobu, both of Tosu, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 716,928

Claims priority, application Japan, Jun. 18, 1990, 2-160842

Int. Cl.[5] C04B *35/56, 35/58*

U.S. Cl. 501—87 6 Claims

1. Boride-zirconium oxide-nitrogen carbide-based ceramics prepared by sintering a mixture consisting essentially of 20 to 88% by weight of one or more metallic borides and 10 to 70% by weight of a powder of zirconium oxide, with 2 to 70% by weight of one or more cubic nitrogen carbides selected from the group consisting of Ti(C, N) and Zr(C, N).

5,143,870

METHOD OF MODIFYING CERAMIC COMPOSITE BODIES BY A POST-TREATMENT PROCESS AND ARTICLES PRODUCED THEREBY

Terry D. Claar, Newark; Gerhard H. Schiroky, Hockessin, and William B. Johnson, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 296,239, Jan. 12, 1989, which is a continuation-in-part of Ser. No. 137,382, Dec. 23, 1987, Pat. No. 4,915,736. This application Jul. 12, 1990, Ser. No. 551,352

Int. Cl.[5] C04B *35/56, 35/65*

U.S. Cl. 501—87 21 Claims

1. A method of producing a self-supporting body comprising producing a first composite body by:

selecting a parent metal;

providing a permeable mass comprising at least one material selected from the group consisting of a donor material and a carbon donor material;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to permit infiltration of molten parent metal into said permeable mass and to permit reaction of molten parent metal with said permeable mass;

continuing said infiltration reaction for a time sufficient to produce said first composite body; and

subjecting said first composite body to a post-treatment process, wherein said post-treatment process comprises exposing said first composite body to at least one environment selected from the group consisting of a boriding environment, a nitriding environment and a high temperature assisted consolidation environment, which modifies at least a portion of said first composite body, thereby forming said self-supporting body.

5,143,871

CLAY BODIES OF CHINA AND BALL CLAYS CONTAINING HEAT TREATED CLAY COMBINED WITH RAW CLAY COMPONENTS

Samuel M. Leese, Ippiepen, and Dennis Mitchell, Ashburton, both of United Kingdom, assignors to Watts Blake Bearne & Co. PLC, Devon, United Kingdom

PCT No. PCT/GB89/01094, § 371 Date May 22, 1990, § 102(e) Date May 22, 1990, PCT Pub. No. WO90/03347, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 19, 1989, Ser. No. 474,077

Claims priority, application United Kingdom, Sep. 20, 1988, 8822127; Apr. 20, 1989, 8908933

Int. Cl.[5] C04B *33/04, 33/24*

U.S. Cl. 501—150 11 Claims

1. A casting composition for use in the manufacture of china articles, the composition comprising:

about 10 to 20 parts by weight of a treated clay product which has been prepared by heating clay, the heating conditions being such that kaolinite in the clay is converted to metakaolin, while substantially avoiding the formation of mullite;

about 5 to 20 parts by weight of raw ball clay;

about 10 to 35 parts by weight of raw china clay; water;

a suitable flux; and

a suitable filler the total combined weight of the flux and filler being not less than the combined weight of the treated clay product, the raw ball clay and the raw china clay.

5,143,872

METHOD OF REGENERATING INACTIVE AND POISONED PLATINUM CATALYSTS

Franz-Josef Weiss, Neuhofen, and Hugo Fuchs, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 16, 1991, Ser. No. 730,757

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1990, 4022852

Int. Cl.[5] B01J *23/96, 38/64;* L01B *21/20*

U.S. Cl. 502—25 1 Claim

1. A method of regenerating of deactivated platinum-on-graphite catalysts, used for the manufacture of hydroxylammonium salts by the catalytic reduction of nitrogen oxide with hydrogen in aqueous mineral acids, which comprises: contacting the platinum-on-graphite catalyst with an aqueous solution containing from 2 to 20% by weight of alkali metal hydroxide and/or alkali metal carbonate, such solution having a pH of more than 9, at a temperature of from 15° to 100° C. for a period of from 10 to 300 minutes separating the platinum-on-graphite catalyst from the solution, and washing the regenerated catalyst with dilute mineral acid and with water.

5,143,873

PROCESS FOR ACTIVATION OR REGENERATION OF NICKEL CATALYST

Henry E. Bryndza, Avondale, Pa., and Albert L. Casalnuovo, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1990, Ser. No. 627,992

Int. Cl.[5] B01J *31/40, 31/12, 38/50;* C07C *253/00*

U.S. Cl. 502—33 35 Claims

1. A process for regenerating degraded nickel hydrocyanation catalysts consisting of contacting a degraded nickel compound with a borohydride compound of the formula $M(BR_3H)_y$ and a phosphorus compound of the formula $P(OR')_3$ under an inert atmosphere, wherein M is an electropositive ion excluding nickel, y is equal to the net charge of the electropositive ion, and R and R' aryl or alkyl of up to 8 carbon atoms, carried out within a temperature range of 0° C. to 80° C., in the presence of a solvent and wherein each equivalent of degraded Ni compound is treated with 2–6 equivalents of $M()Br_3H)_y$ and 4–10 equivalents of $P(OR')_3$.

5,143,874

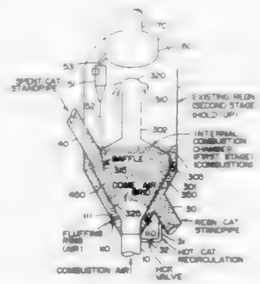
CATALYST REGENETATION IN HIGH EFFICIENCY REGENERATOR HEATED BY INDIRECT HEAT EXCHANGE

Mark S. Ross, Lawrenceville, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 464,068, Jan. 12, 1990, abandoned. This application Feb. 19, 1991, Ser. No. 657,781

Int. Cl.[5] B01J *38/36, 21/20;* C10G *11/18;* F27B *15/08*

U.S. Cl. 502—42 8 Claims



1. In a process for regenerating in a regenerator vessel a coke contaminated fluidized catalytic cracking catalyst by contact

with an oxygen-containing regeneration gas in a coke combustor having sidewall portion and a base portion and comprising a first dense bed to produce at least partially regenerated catalyst and carbon monoxide, discharging from the coke combustor the at least partially regenerated catalyst and gas up into a contiguous dilute phase transport riser having a base connective with the coke combustor and afterburning in the transport riser carbon monoxide to CO_2 and discharging from the dilute phase transport riser regenerated catalyst which is collected in a second dense bed of hot regenerated catalyst and flue gas which is removed from the process, the improvement comprising heating said spent catalyst in said coke combustor without recycle of hot regenerated catalyst, by maintaining at least a portion of the sides, and essentially the entire base portion of the coke combustor immersed within, and in a heat exchange relationship with, the second dense bed of regenerated catalyst, and wherein at least a portion of the regeneration gas added to the coke combustor is added via an inlet line which passes through, and is in a heat exchange relationship with, the second dense bed of hot regenerated catalyst and wherein the coke contaminated catalyst added to the coke combustor is added via a catalyst inlet line which is at least partially immersed in, and in a heat exchange relationship with, the second dense bed of hot regenerated catalyst.

5,143,875

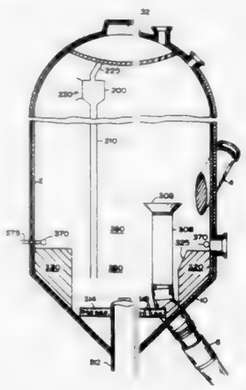
BUBBLING DENSE BED CATALYST REGENERATOR WITH HIGHER EFFICIENCY BASE REGION

Hartley Owen, Belle Mead, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 6, 1991, Ser. No. 651,173

Int. Cl.[5] B01J *38/34, 21/20;* C10G *11/18;* F27B *15/08*

U.S. Cl. 502—43.000 6 Claims



1. A process for regenerating spent cracking catalyst containing coke by burning the coke with a regeneration gas in two contiguous dense phase fluidized beds maintained in a single regenerator vessel, an upper bubbling fluidized bed having a cross sectional area and operating at bubbling fluidized bed catalyst regeneration conditions including a superficial vapor velocity and a lower dense phase fluidized bed, having a cross sectional area of 25 to 90% of the cross sectional area of said upper bubbling fluidized bed, and operating at fluidized bed catalyst regeneration conditions including a superficial vapor velocity at least 5% greater than the superficial vapor velocity in said upper bubbling bed, and wherein said lower dense phase fluidized bed is open to and covered by said upper bubbling dense bed; by

adding said spent catalyst, as a stream flowing down from a spent catalyst inlet at an elevation above said lower dense bed, and wherein at least 90% of said spent catalyst is carried by its momentum through said upper bubbling dense bed to said lower dense bed;

heating said spent catalyst in said lower dense bed by recycling to said lower dense bed not regenerated catalyst by a catalyst recycle means;

partially regenerating at least a majority of said spent catalyst in said lower dense phase fluidized bed at catalyst regeneration conditions including a superficial vapor velocity of about 3.5 to 10 fps and temperature of 500° to 900° C. by adding to a lower portion of said lower dense bed a majority of the regeneration gas, at least partially regenerating said spend catalyst to produce at least partially regenerated catalyst and flue gas containing oxygen and discharging partially regenerated catalyst and oxygen containing flue gas from said lower dense bed up into said upper bubbling dense bed said; and

completing catalyst regeneration in said bubbling dense phase upper bed at catalyst regeneration conditions including a lower superficial vapor velocity than said lower dense bed and a temperature of 500° to 900° C. by burning additional coke from said partially regenerated catalyst with said oxygen containing flue gas from said lower dense bed to produce regenerated catalyst in said upper bubbling dense bed; and

withdrawing from said upper bubbling dense bed regenerated catalyst as a product of the process.

5,143,876

PREPARATION OF HYDROXYL-RICH ZEOLITES

Clarence D. Chang, Princeton, and Stuart D. Hellring, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 789,267, Oct. 18, 1985, abandoned. This application Mar. 30, 1990, Ser. No. 501,977

Int. Cl.[5] B01J *29/06*

U.S. Cl. 502—64 28 Claims

1. A method of preparing hydroxyl-rich zeolites comprising providing as a reactant, a zeolite, which has suffered a loss of tetrahedral aluminum, and has been subjected to an elevated temperature of at least 500° C., and then subjecting the reactant zeolite to ammoniation; subjecting the ammoniated zeolite to conditions equivalent to second elevated temperature which ranges up to 450° C. whereby ammonia is evolved and the zeolite contains hydroxyl groups absent from the reactant zeolite.

2. The method of claim 1, wherein ammoniation is conducted by treating the reactant zeolite with ammonia or with an aqueous solution containing a source of ammonia or ammonium ion.

4. The method of claim 1, which further includes the step of contacting said elevated temperature treated ammoniated reactant with $SiCl_4$ or $AlCl_3$.

15. A zeolite exhibiting the X-ray diffraction pattern of ZSM-5, having suffered loss of framework aluminum, the Fourier Transform Infrared Spectrograph of which exhibits absorbance at about 3720 cm^{-1} and at about 3745 cm^{-1}.

5,143,877

PROCESS FOR PREPARATION OF A CATALYST

John W. Geus, Bilthoven, and Eliza Boellaard, Breukelen, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 13, 1991, Ser. No. 668,829

Claims priority, application United Kingdom, Mar. 16, 1990, 9005964

Int. Cl.[5] B01J *27/26*

U.S. Cl. 502—60 21 Claims

1. A process for the preparation of catalysts or catalyst precursors containing at least one metal and/or metal compounds wherein a complex cyanide of the general formula $M_1M_2(CN)_{p-x}(Y)_x$ wherein M_1 represents a cationic moiety comprising at least one metal ion, NH_4^+ or a quarternary ammonium ion; M_2 forms part of the anionic moiety and represents at least one polyvalent metal, CN represents a cyanide moiety as defined hereinbefore, Y represents one or more ligands, p is a number ranging from 2–8, x is a number ranging from 0–4 and p/x is at least 1 when x>0, present on a carrier is subjected to a decomposition treatment under oxidative conditions.

5,143,878

ZEOLITE TREATING PROCESS

Pei-Shing E. Dai, and David E. Sherwood, Jr., both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 533,222, Jun. 4, 1990, Pat. No. 5,112,473. This application Aug. 2, 1991, Ser. No. 739,362

Int. Cl.[5] B01J *29/10*

U.S. Cl. 502—66 12 Claims

12. A novel catalyst comprising

(i) an acidified zeolite prepared from a charge zeolite selected from the group consisting of (i) an ammonium form of dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120, (ii) a hydrogen form of dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120, and (iii) a metal exchanged dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120 and a Lattice Constant of about 24.30 A–24.50 A which acidified zeolite charge is characterized by the presence of Secondary Pores of diameter of about 100 A–600 A which has been prepared by the process which comprises contacting said charge zeolite with acidic medium at 75° F.–140° F. for 0.5–6 hours thereby converting said charge zeolite into an acidified zeolite characterized by (i) an increased Secondary Pore Volume of about 0.114–0.20 cc/g, (ii) a decreased Lattice Constant of about 24.23 A–24.33 A, (iii) a Secondary Pore Mode of about 115 A–145 A, (iv) a Secondary Pore Mode of about 100 A–600 A, and (v) a Surface Silicon to Aluminum Atom Ratio of about 24–45; and

recovering said acidified zeolite characterized by (i) an increased Secondary Pore Volume of about 0.14–0.20 cc/g, (ii) a decreased Lattice Constant of about 24.23 A–24.33 A, (iii) a Secondary Pore Mode of about 115 A–145 A, and (v) a Surface Silicon to Aluminum Atom Ratio of about 24–45

ii; a binder;

(iii) at least one Group VIB metal; and

(iv) at least one non-noble Group VIII metal.

5,143,879

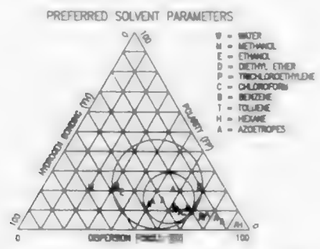
METHOD TO RECOVER ORGANIC TEMPLATES FROM FRESHLY SYNTHESIZED MOLECULAR SIEVES

D. Duayne Whitehurst, Titusville, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 18, 1991, Ser. No. 732,515

Int. Cl.[5] B01J *29/00, 37/08*

U.S. Cl. 502—85 26 Claims



19. A method for removing a directing agent from a porous synthetic material comprising an inorganic, porous, non-layered crystalline phase material exhibiting, after calcination, an X-ray diffraction pattern with at least one peak at a d-spacing greater than about 18 Angstrom Units with a relative intensity of 100, and a benzene adsorption capacity of greater than 15 grams benzene per 100 grams of said material at 50 torr and 25° C., said porous synthetic material having said templating agent sorbed within pores of said synthetic material, said recovery method comprising:

(a) contacting said porous synthethic material with polar solvent having dissolved therein at least one cation donor, said polar solvent characterized by solubility parameters f_d, f_p, and f_h which are defined by the area of the larger circle of the Teas diagram of FIG. 41, wherein each of said sorbed templating agent and said cation donor are soluble in said extraction solvent; and

(b) holding said porous synthetic material, said extraction solvent, and said cation donor of step (a) in contact at elevated temperature for a period of time sufficient to desorb at least a portion of said templating agent from said synthetic material.

20. The method of claim 19 wherein said polar solvent is selected from the group consisting of aromatic or aliphatic ethers, alcohols, amines, halogenated hydrocarbons, and carboxylic acids.

5,143,880

SOLID CATALYST COMPONENT FOR USE IN POLYMERIZATION OF α-OLEFINS

Toshio Sasaki; Takeshi Ebara, both of Ichihara, and Kiyoshi Kawai, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 11, 1991, Ser. No. 667,747

Claims priority, application Japan, Mar. 14, 1990, 2-064725

Int. Cl.[5] C08F *4/656*

U.S. Cl. 502—112 32 Claims

1. A solid-catalyst component for use in the polymerization of α-olefins obtained by

reducing a titanium compound represented by the following general formula:

$$Ti(OR^1)_nX_{4-n}$$

wherein R^1 represents a hydrocarbon group having 1 to 20 carbon atoms, X represents a halogen atom and n represents a number satisfying $0<n\leqq 4$, with an organomagnesium compound in the presence of an organic silicon compound of the following general formulas

$$Si(OR^2)_mR^3_{4-m}$$

$$R^4R^5_2SiO)_pSiR^6_3 \text{ or}$$

$$(R^7_2SiO)_q$$

wherein R^2 represents a hydrocarbon group having 1 to 20 carbon atoms, R^3, R^4, R^5, R^6 and R^7 each represents a hydrocarbon group having 1 to 20 carbon atoms or a hydrogen atom, m represents a number satisfying $0<m\leqq 4$, g represents an integer of 1 to 1,000, and g represents an integer of 2 to 1,000 to produce a solid product,

treating the solid product with a carboxylic acid ester,

treating the ester-treated solid product with a mixture of an ether compound and titanium tetrachloride or with a mixture of an ether compound, titanium tetrachloride and a carboxylic acid ester to obtain a trivalent titanium compound-containing solid catalyst precursor, and

prepolymerizing on the solid catalyst precursor a small quantity of an olefin in the presence of an organoaluminum compound to obtain a solid catalyst component for use in the polymerization of α-olefins.

5,143,881

TRANSITION-METAL CATALYST COMPONENT FOR A ZIEGLER CATALYST SYSTEM, AND THE USE OF SAID SYSTEM

Ulrich Buesches, 9 Schaumsla dstrasse, 6800 Mannheim 1; Roland Salve, 44 Pfarrer-Friedrich-Strasse, 6700 Ludwigshafen, and Godofredo Follmer, 1 Am Hoellpfad, 6719 Neuleiningen, all of Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,118

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1990, 4008734

Int. Cl.[5] C08F *4/685*

U.S. Cl. 502—113 **7 Claims**

1. A transition-metal catalyst component for a Ziegler catalyst system, obtained by

1) mixing, in a solvent, an inorganic, oxidic carrier with

1.1) a vanadium trihalide alcohol complex of the formula $VY_3 \cdot nZ$—OH, where
Y is chlorine or bromine,
n is from 1 to 6, and
Z is a monovalent, saturated, aliphatic, aromatic or araliphatic hydrocarbon radical having not more than 10 carbon atoms, and

1.2) a titanium halide or a titanium trihalide/aluminum trihalide complex, where the halogen can be chlorine and/or bromine, or a titanium trihalide complex of the formula $TiY_3 \cdot nZ$—OH or mixtures thereof, where
Y is chlorine or bromine,
n is from 1 to 6, and
Z is a monovalent, saturated, aliphatic, aromatic or araliphatic hydrocarbon radical having not more than 10 carbon atoms, and

1.3) a compound of the formula $BX_nY_mR_p$ or $SiX_nY_mR_q$ or mixtures thereof, where
X is OR,
Y is chlorine, bromine or hydrogen, and
R is a C_1–to C_{18}-hydrocarbon radical, with the proviso that $n > 0$ and $n+m+p = 3$ or $n+m+q = 4$,

2) removing the solvent by evaporation,

3) mixing the solid-phase intermediate from step 2) with

3.1) an organoaluminum catalyst component of the formula AlR_mX_{3-m}, where
R is a C_1– C_{18}-hydrocarbon radical,
m is from 1 to 3, and
X is OR, chlorine, bromine or hydrogen, and

3.2) an organic carboxylate or an organosilicon compound or a mixture thereof in an organic solvent, and

4) isolating the solid-phase intermediate by filtration, washing and drying.

5,143,882

TRANSITION-METAL CATALYST COMPONENT FOR A ZIEGLER CATALYST SYSTEM, AND THE USE OF SAID SYSTEM

Ulrich Buesches, Mannheim, and Roland Salve, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,119

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1990, 4008735

Int. Cl.[5] C08F *4/685*

U.S. Cl. 502—113 **10 Claims**

1. A transition-metal catalyst component for a Ziegler catalyst system, obtained by

1) mixing, in a solvent, an inorganic, oxidic carrier with

1.1) a vanadium trihalide/alcohol complex of the formula VY_3nZ—OH, where
Y is chlorine or bromine,
n is from 1 to 6, and
Z is a monovalent, saturated, aliphatic or araliphatic hydrocarbon radical having not more than 10 carbon atoms, and

1.2) a titanium trihalide or a titanium trihalide/ aluminum trihalide complex, where the halogen can be chlorine and/or bromine, or a titanium trihalide complex of the formula $TiY_3 \cdot nZ$—OH or a mixture thereof, where
Y is chlorine or bromine,
n is from 1 to 6, and
Z is a monovalent, saturated, aliphatic or araliphatic hydrocarbon radical having not more than 10 carbon atoms or a mixture thereof, and

1.3) a zirconium tetrahalide, where the halogen can be chlorine and/or bromine,

2) removing the solvent by evaporation,

3) mixing the solid-phase intermediate from step (2) with

3.1) an organoaluminum catalyst component of the formula AlR_mX_{3-m}, where
R is a C_1– to C_{18}-hydrocarbon radical,
m is from 1 to 3, and
X is OR, chlorine, bromine or hydrogen, and

3.2) an organic carboxylate or an organosilicon compound or a mixture thereof in an organic solvent, and

4) isolating the solid-phase intermediate by filtration, washing and drying.

5,143,883

MODIFIED SILICA BASED CATALYST

Charles K. Buehler, Naperville; Richard W. Fries, Joliet, and Thomas J. Pullukat, Hoffman Estates, all of Ill., assignors to Quantum Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 435,495, Jul. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 99,190, Sep. 21, 1987, abandoned. This application Oct. 1, 1990, Ser. No. 590,992

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.[5] C08F *4/654*

U.S. Cl. 502—119 **10 Claims**

1. A catalyst precursor for reaction with a titanium halide to form a catalyst for the production of a stereospecific alpha olefin polymer comprising a silica support treated to reduce surface hydroxyl or silanol group content reacted with a magnesium compound selected from the group consisting of hydrocarbyloxy magnesium, hydrocarbyloxy magnesium halides, and mixtures thereof, further reacted with at least one titanium compound having the structural formula $Ti(OR)_nX_m$ where R is aryl, alkyl, alkaryl or mixtures thereof; X is halogen; n is an integer of 1 to 4; and m is 0 or an integer of 1 to 3 with the provision that the sum of n and m is 4, and thereafter reacted with a titanium halide with the proviso that the titanium halide is not the same as said titanium compound having the formula $Ti(OR)_nX_m$.

5,143,884

ACRYLIC ADHESIVE COMPOSITION AND ORGANOBORON INITIATOR SYSTEM

Martin M. Skoultchi, Somerset, and Nicholas V. Merlo, Edison, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 692,766, Apr. 29, 1991, Pat. No. 5,106,928. This application Dec. 19, 1991, Ser. No. 810,319

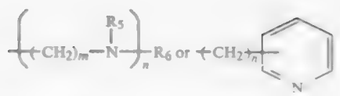
Int. Cl.[5] B01J *31/00*

U.S. Cl. 502—160 **7 Claims**

1. A two-part initiator composition comprising:

A) a stabilized organoboron amine complex of the formula:

where R, R_1 and R_2 are alkyl of 1 to 10 carbon atoms or phenyl, R_3 and R_4 are hydrogen or alkyl of 1 to 10 carbon atoms, or



where R_5 and R_6 are hydrogen or alkyl of 1 to 10 carbon atoms, m is 2 to 10 and n is 1 to 6, and

B) an effective destabilizing amount of an organic acid activator having the formula:

R—COOH

where R is H, alkyl or alkenyl of 1 to 8 carbon atoms or aryl of 6 to 10 carbon atoms.

5,143,885

CATALYSTS FOR THE METATHESIS OF OLEFINS AND FUNCTIONALIZED OLEFINS

Siegfried Warwel, Aachen; Hans-Gerd Jägers, Gladbeck, and Andreas Deckers, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 22, 1991, Ser. No. 658,861

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1990, 4006540

Int. Cl.[5] B01J *21/02, 21/36, 21/12; C07C 6/00*

U.S. Cl. 502—202 **7 Claims**

1. A catalyst for the metathesis of olefins and functionalized olefins, which consists essentially of B_2O_3—Re_2O_7 on an Al_2O_3—SiO_2 substrate, having a Be_2O_3—Re_2O_7 content of from 2 to 30% by wt., based on the Al_2O_3—SiO_2 content.

5,143,886

CATALYTIC COMPOSITION FOR THE DEHYDROGENATION OF C_2–C_5PARAFFINS

Rodolfo Iezzi; Franco Buonomo, both of San Donato Milanese, and Domenico Sanfilippo, Paullo, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Feb. 5, 1991, Ser. No. 650,966

Claims priority, application Italy, Feb. 7, 1990, 19283 A/90

Int. Cl.[5] B01J *21/06, 21/08, 23/62*

U.S. Cl. 502—242 **4 Claims**

1. A catalytic composition for the dehydrogenation of C_2–C_5-paraffins comprising:

(a) platinum, in an amount within the range of from 0.01 to 3% by weight,

(b) tin, in an amount within the range of from 0.06 to 1.5% by weight, and

(c) a support comprising at least one selected from the group consisting of titanated silica and titanium silicalite, in which the amount of titanium in the support is within the range of from 0.05 to 3% by weight.

5,143,887

CATALYST SYSTEM FOR REMOVAL OF CALCIUM FROM A HYDROCARBON FEEDSTOCK

Chi-Wen Hung, San Rafael, and Bruce E. Reynolds, Martinez, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 560,627, Jul. 31, 1990, which is a continuation-in-part of Ser. No. 459,179, Dec. 29, 1989, abandoned, and a continuation-in-part of Ser. No. 457,985, Dec. 28, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 776,146

Int. Cl.[5] B01J *21/08, 23/74*

U.S. Cl. 502—259 **2 Claims**

1. A catalyst system comprising catalyst particles capable of hydrodemetalating a hydrocarbon feedstock having at least 1 ppm oil-soluble calcium, wherein said catalyst particles are characterized by:

(a) a support comprising silica;

(b) an average pore size greater than 150 Angstrom;

(c) less than 5% of the pore volume in pores of diameter greater than 1000 Angstrom;

(d) a surface area of less than about 250 m^2/g.; and

(e) less than 10 wt. % of a Group VIII metal, wherein the Group VIII metal is selected from the group consisting of nickel and cobalt, for removal of oil-soluble calcium from said feedstock.

5,143,888

GROUP VIII CATALYST SUPPORTED ON MIXTURE OF ZINC ALUMINATE AND CALCIUM ALUMINATE

Michael E. Olbrich, Naperville, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 513,407, Apr. 23, 1990, Pat. No. 5,073,662. This application Jan. 21, 1991, Ser. No. 718,512

Int. Cl.[5] B01J *23/58, 23/78*

U.S. Cl. 502—329 **7 Claims**

1. A method of improving the activity and selectivity of a dehydrogenation or a dehydrocyclization, or both catalyst composition consisting essentially of a zinc aluminate support mixed with calcium aluminate and a metal catalyst selected from the group consisting of Group VIII metals, comprising the step of:

adding to said zinc aluminate support calcium aluminate in the amount in the range of from about 5 to about 25 weight percent to form a mixture of calcium aluminate and zinc aluminate.

5,143,889

ACTIVE CARBON AND PROCESSES FOR PREPARATION OF SAME

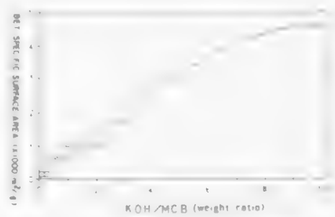
Kasuh Takahiro, Kobe, and Morino Gunji, Izumi, both of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 391,515, Jul. 19, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 631,258

Claims priority, application Japan, Nov. 20, 1987, 62-294831; Jun. 27, 1988, 63-158510

Int. Cl.[5] C01B *31/12*; B01J *20/20*

U.S. Cl. 502—427 **3 Claims**



1. A process for preparing active carbon having a specific surface area of 3000 to 4600 m^2/g, the process comprising:

depositing an activating auxiliary on the surface of meso-carbon microbeads obtained from coal-derived pitch, the activating auxiliary being at least one of NaOH and KOH and used in an amount about 5 to about 10 times the weight of meso-carbon microbeads, and

activating washing and drying the meso-carbon microbeads.

5,143,890

HEAT SENSITIVE RECORDING MATERIAL

Tetsuo Tsuchida, Takarazuka; Yukihiro Abe, Kobe; Tomoyuki Okimoto, Nishinomiya, and Tomonosuke Saito, Ibaraki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd. and Sanko Kaihatsu Kagaku Kenkyusho Corporation, both of Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 617,110
Claims priority, application Japan, Nov. 30, 1989, 1-313789
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—201 8 Claims

1. A heat sensitive recording material comprising a substrate and a heat sensitive recording layer thereon incorporating a colorless or light-colored basic dye and a color acceptor reactive with the dye to form a color when contacted therewith, the recording material being characterized in that 1-(4-methoxyphenoxy)-2-(2-methylphenoxy)ethane is contained in the heat sensitive recording layer.

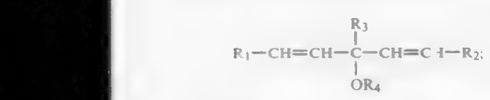
5,143,891

DIVINYL CARBINOL OR CARBINOL DERIVATIVE CHROMOGENIC COMPOUNDS AND THEIR USE IN RECORD MATERIAL

Kenneth J. Shanton, Neenah, Wis., assignor to The Wiggins Teape Group Limited, Hampshire, England

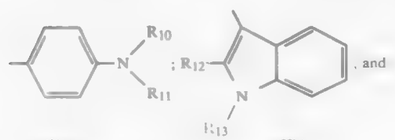
Filed Nov. 15, 1990, Ser. No. 613,019
Claims priority, application United Kingdom, Nov. 15, 1989, 8925802
Int. Cl.[5] B41M *5/136, 5/30*
U.S. Cl. 503—218 10 Claims

1. A record material comprising a support and a chromogenic compound of the formula (I):

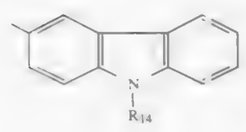


(I)

wherein R_1 and R_2 are the same or different and are selected from the group of compounds represented by the formulae (II):



(IIa) (IIb)



(IIc)

wherein the benzene ring of the group of formula (IIa) may be further substituted, and wherein R_{10} and R_{11} are each independently hydrogen or an optionally-substituted alkyl, aryl or aralkyl group, or R_{10} and R_{11} together with the nitrogen atom to which they are attached form an optionally-substituted heterocyclic ring, which may include one or more additional hetero atoms; R_{12}, R_{13} and R_{14} are each independently hydrogen or an optionally-substituted alkyl, aryl or aralkyl group; R_3 is an optionally-substituted aryl group; and R_4 is hydrogen or an optionally-substituted alkyl, aryl or aralkyl group.

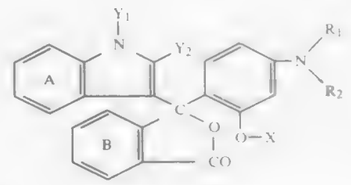
5,143,892

CHROMOGENIC PHTHALIDES

Rudolf Zink, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 395,639, Aug. 16, 1989, Pat. No. 5,039,822.
This application May 14, 1991, Ser. No. 700,002
Claims priority, application Switzerland, Aug. 17, 1988, 3072/88
Int. Cl.[5] B41M *5/16*
U.S. Cl. 503—220 6 Claims

1. A pressure-sensitive or heat-sensitive recording material which comprises a support which contains, or has coated thereon as color former, at least one chromogenic phthalide of formula



(I)

wherein

X, R_1 and R_2 are each independently of the other C_3–C_6alkyl,

Y_1 is hydrogen, alkyl of not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or is acyl of 1 of 12 carbon atoms, benzyl or benzyl which is substituted by halogen, cyano, lower alkyl or lower alkoxy,

Y_2 is hydrogen, lower alkyl or phenyl, and

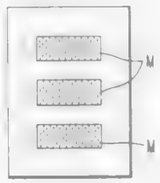
the benzene rings A and B are each independently of the other unsubstituted or substituted by halogen, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, amino, mono-lower alkylamino, di-lower alkylamino or lower alkanoylamino.

5,143,893

SUBLIMATION-TYPE THERMAL IMAGE TRANSFER RECORDING MEDIUM

Hidehiro Mochizuki, Numazu; Masaru Shimada, Shizuoka, and Yutaka Ariga, Fuji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,318
Claims priority, application Japan, Nov. 27, 1990, 2-320815; Feb. 14, 1991, 3-40787; Jul. 5, 1991, 3-165652
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 8 Claims



1. A sublimation-type thermal image transfer recording medium comprising a support, a dye-supply layer and a dye-transfer layer which are successively overlaid on said support, each layer comprising a sublimable dye and an organic binder agent in which said sublimable dye is dispersed, and a top layer provided on said dye-transfer layer, comprising a non-dyeable resin or a low-dyeable resin

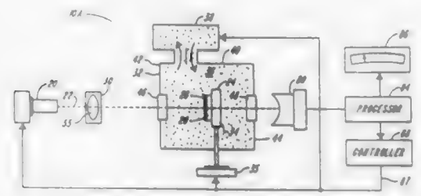
wherein part of said sublimable dye in said dye-supply layer is in the state of undissolved particles, and said sublimable dye in said dye-transfer layer is in the stage of individually dispersed molecules.

5,143,894

FORMATION AND HIGH RESOLUTION PATTERNING OF SUPERCONDUCTORS

Mordechai Rothschild, 100 Clearwater Rd., Newton, Mass. 02162; Daniel J. Ehrlich, 11 Grant Pl., Lexington, Mass. 02173, and Jerry G. Black, 108 Trapelo Rd., Lincoln, Mass. 01773

Continuation of Ser. No. 108,426, Oct. 14, 1987, abandoned.
This application Aug. 16, 1989, Ser. No. 395,145
Int. Cl.[5] B05D *3/06, 5/12*
U.S. Cl. 505—1 12 Claims



1. A method of forming a superconductive pattern in a selected ternary metal oxide material, the method comprising:

forming a film of superconductive material upon a substrate; and

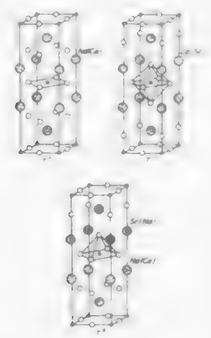
selectively irradiating regions of the film with photons in a predefined pattern to transform regions of the film from a superconducting state to a non-superconducting state by photothermally-induced material changes.

5,143,895

R-CE-CU-O SUPERCONDUCTING OXIDE MATERIAL WHEREIN R IS AT LEAST ONE ELEMENT SELECTED FROM THE GROUP CONSISTING OF PR, ND, AND SM

Shinichi Uchida, Fuchu; Yoshinori Tokura, Chofu, and Hidenori Takagi, Tokyo, all of Japan, assignors to The University of Tokyo, Tokyo, Japan

Filed Jan. 25, 1990, Ser. No. 470,011
Claims priority, application Japan, Jan. 25, 1989, 1-15549
Int. Cl.[5] C01F *17/00;* C01G *3/02;* H01L *39/12*
U.S. Cl. 505—1 7 Claims



1. Superconducting oxide material with a crystal structure of either Nd_2CuO_4 type or oxygen-deficient perovskite type, the material consisting essentially of a composition having a general chemical formula or

$$(R_{1-x}Ce_x)_{m+1}Cu_mO_{3m+1-p}$$

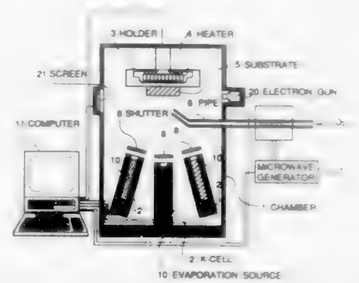
R being at least one rare earth element selected from the group consisting of Pr, Nd, and Sm, m being 1, $O<x<1$, and $O \leqq y \leqq m$, wherein the critical onset temperature of the material is as high as 24K.

5,143,896

PROCESS AND SYSTEM FOR PREPARING A SUPERCONDUCTING THIN FILM OF OXIDE

Keizo Harada; Hideo Itozaki, and Shuji Yazu, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 31, 1990, Ser. No. 604,896
Claims priority, application Japan, Oct. 31, 1989, 1-284357; Oct. 31, 1989, 1-284358; Oct. 31, 1989, 1-284359; Oct. 31, 1989, 1-284360
Int. Cl.[5] C23C *14/24*
U.S. Cl. 505—1 8 Claims



1. A system for depositing a thin film of oxide superconductor having a layered crystal structure on a substrate by a molecular beam epitaxy (MBE) machine comprising a chamber in which a high vacuum can be created, means for introducing oxygen gas into said chamber, a microwave generator for exiting the oxygen gas, means for heating said substrate positioned in said chamber, means for controlling independently temperatures of evaporation sources, means for controlling independently shutters for said evaporation sources, and an analyzer for monitoring crystal structures of thin films deposited on said substrate, characterized in that output image signals from the analyzer (**20**, **21**) for monitoring crystal structures of a thin film deposited on the substrate (**5**) is compared with image data of a known superconducting oxide stored in a memory of a computer (**11**) so that a crystallization promotive operation of the thin film deposited on the substrate (**5**) is effected in an oxygen gas atmosphere and that next film-forming operation is restarted after the output image signals from the analyzer become substantially identical with the image data stored in the memory.

5,143,897

FLEXIBLE, HIGH TEMPERATURE SUPERCONDUCTIVE CABLES

Gerhard B. Ziemek, Langenhagen, Fed. Rep. of Germany; Izyaslav G. Peshkov, Moskau, U.S.S.R.; Grigorij Svalov, Moskau, U.S.S.R.; Victor E. Sytnikov, Moskau, U.S.S.R., and Valerij A. Mitrochin, Moskau, U.S.S.R., assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

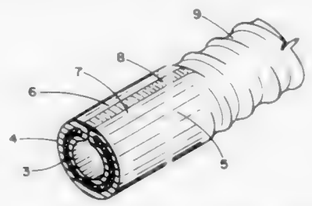
Filed Feb. 12, 1991, Ser. No. 653,894
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1990, 4006094
Int. Cl.[5] H01L *38/24*
U.S. Cl. 505—1 6 Claims

1. A method of manufacturing a flexible, high temperature superconductive cable, comprising the steps of:

longitudinally imbedding a ceramic oxide material having high temperature, superconductive characteristics in a

band source member of metallic material thereby encasing longitudinal surfaces of said ceramic oxide material in said metallic material;

compressing by a rolling process said band source member and said encased ceramic oxide material into an elongated flat band with the length of said encased ceramic oxide material being extended to the length of said elongated flat



band and forming a high temperature superconductor therethrough;

deforming by longitudinal drawing and shaping said elongated flat band into a hollow tubular member;

welding longitudinal adjacent edges of said hollow tubular member; and

corrugating said welded, hollow tubular member.

5,143,898

SUPERCONDUCTING WIRE

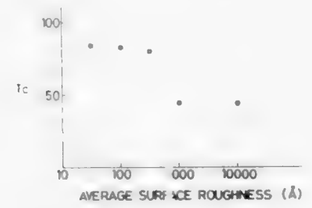
Satoshi Takano, and Noriki Hayashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 5, 1990, Ser. No. 475,048

Claims priority, application Japan, Feb. 4, 1989, 1-26094; Feb. 4, 1989, 1-26095

Int. Cl.[5] **B 2B** *9/00*

U.S. Cl. 505—1 **4 Claims**



1. A superconducting wire comprising:

a flexible base material of metal, Ni base alloy or yttrium stabilized zirconia having average surface roughness of not more than 0.05 μm

a high T_C oxide superconducting layer formed on said base material.

5,143,899

PROCESS FOR PREPARING PHENYL BUTYRONITRILES AND PERFUMERY USE OF 2,2-DIMETHYL-4-PHENYL VALERONITRILE

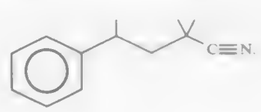
Anubhav P. S. Narula, Hazlet; John J. De Virgilio, Freehold, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 13, 1991, Ser. No. 759,155

Int. Cl.[5] **A61K** *7/46*

U.S. Cl. 512—6 **6 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and perfumed polymers comprising the step of intimately admixing with said consumable material an aroma augmenting or enhancing quantity of the compound having the structure:



5,143,900

PERFUMES CONTAINING N-LOWER ALKYL NEOALKANAMIDE (S)

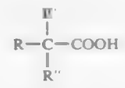
Robert J. Steltenkamp, and Craig F. Eaton, both of Somerset, N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 354,545, May 19, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 665,504

Int. Cl.[5] **A61K** *7/46*

U.S. Cl. 512—26 **8 Claims**

1. An insect repellent liquid perfume which comprises an insect repelling and perfuming proportion, within the range of 0.1 to 98%, of N-lower alkyl neodecanamide wherein the lower alkyl is ethyl or methyl or a mixture thereof, and wherein the neodecanoic acid corresponding to the neodecanoyl moiety thereof is of the formula



wherein the total number of carbon atoms in R+R′+R″ is 8, in which about 31% of such neodecanoic acid is of a structure wherein R′ and R″ are both methyl and R is hexyl, about 67% of the neodecanoic acid is of a structure wherein R′ is methyl, R″ is alkyl of a carbon atoms content greater than that of methyl and less than that of R, and R is of a carbon atoms content less than that of hexyl and greater than that of R″, and about 2% of the neodecanoic acid is of a structure wherein R′ and R″ are both of a carbon atoms content greater than that of methyl and less than that of R, and R is of a carbon atoms content less than that of hexyl and greater than those of R′ and R″, and a perfuming proportion of a perfuming component which is selected from the group consisting of essential oils, esters, ethers, aldehydes, alcohols, hydrocarbons, ketones and lactones.

5,143,901

PREPARATION FOR TREATING AND PREVENTING THROMBOSES AND THROMBOEMBOLIC COMPLICATIONS, USE OF SUCH A PREPARATION AND A METHOD OF PRODUCING THE SAME

Hans P. Schwarz, Vienna; Ewald Molinari, Modling; Yendra Linnau, and Susanne Pfeiler, both of Vienna, all of Austria, assignors to Immuno Aktiengesellschaft, Austria

Filed Jun. 19, 1990, Ser. No. 540,357

Claims priority, application Austria, Jun. 26, 1989, 1551/89

Int. Cl.[5] **A61K** *37/00*

U.S. Cl. 514—2 **6 Claims**

1. A method for preventing thrombosing comprising administering to a patient a therapeutic composition immobilized on artificial vein surfaces, said composition comprising protein S having a concentration at least 50 times that present in native plasma and being purified by one of polyclonal antibody affinity chromatography and monoclonal antibody affinity chromatography and free from C4b-binding protein.

5,143,902

GLUCAGON ANALOGS WITH ASP[9] REPLACEMENTS OR DELETIONS

Robert B. Merrifield, Creskill, N.J., and Cecilia G. Unson, New York, N.Y., assignors to The Rockefeller University

Continuation of Ser. No. 575,970, Aug. 31, 1990, abandoned. This application Dec. 16, 1991, Ser. No. 807,644

Int. Cl.[5] **A61K** *37/28;* **C07K** *7/10, 7/34*

U.S. Cl. 514—12 **18 Claims**

1. Glucagon analogs characterized by the removal of the L-aspartic acid residue at the 9-position or its replacement with an amino acid residue other than an L- dibasic amino acid containing up to 5 carbon atoms and by a relative binding activity of at least about 10% and an inhibition index up to about 150, or a pharmaceutically acceptable acid addition salt thereof.

5,143,903

METHOD OF TREATMENT WITH TRIPEPTIDE PHARMACEUTICAL COMPOSITIONS AS IMMUNOMODULATORS

Vincenzo Polita; Giovanna De Luca; Giovanni Di Stazio, and Mario Materazzi, all of Rome, Italy, assignors to Polifarma S.p.A., Rome, Italy

Filed Sep. 14, 1990, Ser. No. 582,168

Claims priority, application Italy, Oct. 5, 1989, 48430A/89

Int. Cl.[5] **C07K** *5/06, 5/08*

U.S. Cl. 514—18 **6 Claims**

1. A method for modulating the immune response in a mammal comprising administering to said mammal a therapeutically immuno-modulating effective amount of a tripeptide compounds of formula

A—X—B

in which

A indicates PYR, PRO, Z-PRO,

B indicates TRP, PHE, TYR,

X indicates GLY, VAL, GLU, ASP, SER. ALA, ASN, GLN, ILE, LEU, PRO, LYS and ARG; or pharmaceutically acceptable salts or pharmaceutically acceptable esters of said compound.

5,143,904

THERMAL TRANSFER DYE IMAGE-RECEIVING SHEET

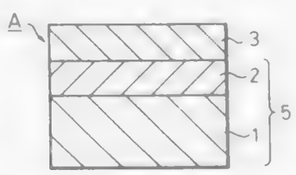
Toshihiro Minato; Masaru Kato, both of Tokyo; Kenji Yasuda, Yachiyo; Norio Yamamura, Yokohama, and Masahiro Kamiya, Tokyo, all of Japan, assignors to Oji Paper Co., Ltd, Tokyo, Japan

Filed Jul. 13, 1990, Ser. No. 552,270

Claims priority, application Japan, Jul. 18, 1989, 1-183635; Oct. 30, 1989, 1-279767; Oct. 30, 1989, 1-279768; Dec. 14, 1989, 1-322644

Int. Cl.[5] **B41M** *5/035, 5/26*

U.S. Cl. 503—227 **12 Claims**



1. A thermal transfer dye image-receiving sheet comprising:

a substrate sheet comprising a support sheet comprising, as a principal component, a cellulose pulp and a front coated layer formed on the front surface of the support sheet and comprising, as a principal component, a thermoplastic resin; and

a dye image-receiving layer formed on a front surface of the front coated layer and comprising, as a principal component, a resinous material capable of being dyed with dyes for forming colored images,

said front surface of the front coated layer having a Bekk smoothness of 100 to 5000 seconds, and a surface roughness (Ra value) of 0.5 to 2.0 μm, determined in accordance with JIS B 0601,

said substrate sheet having a rigidity of 700 mgf or less determined in the direction along which the dye image-receiving sheet is moved during a thermal transfer operation and in accordance with a test method defined in TAPPI, T543pm 84, and

said front coated layer and said dye image-receiving layer satisfying the relationships (1) and (2):

$$k_2/_1 \geqq 1 \quad (1)$$

and

$$t_2/t_1 \leqq 1 \quad (2)$$

wherein k_1 represents the thermal conductivity of the front coated layer, k_2 represents the thermal conductivity of the dye imagereceiving layer, t_1 represents the thickness of the front coated layer and t_2 represents the thickness of the dye image-receiving layer.

5,143,905

METHOD AND MEANS FOR EXTENDING THE HOST RANGE OF INSECTICIDAL PROTEINS

Natarajan Sivasubramanian, and Brian A. Federici, both of Riverside, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 3, 1990, Ser. No. 518,575

Int. Cl.[5] **C07K** *3/08;* **A61K** *37/00, 39/07, 39/12*

U.S. Cl. 514—21 **23 Claims**

1. A method for increasing the host range or toxicity of an insecticidal protein or a protein domain exerting its activity via interaction with the gut epithelium of insects within its host range, comprising delivering said insecticidal protein or protein domain to the gut epithelium of a target insect with the aid of a targeting protein or protein domain capable of binding to said gut epithelium of said target insect.

5,143,906

KEDARCIDIN ANTITUMOR CHROMOPHORE AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

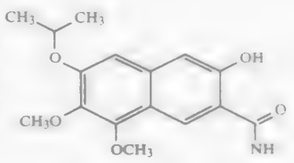
John E. Leet, Wallingford, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Sep. 26, 1991, Ser. No. 763,465

Int. Cl.[5] **A61K** *31/70;* **C07H** *17/00*

U.S. Cl. 514—30 **2 Claims**

2. A pharmaceutical composition which comprises a tumor-inhibiting amount of kedarcidin chromophore having the formula



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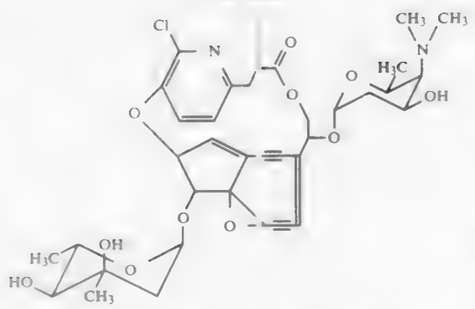


and a pharmaceutically acceptable carrier or diluent.

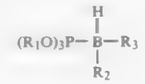
5,143,907

PHOSPHITE-BORANE COMPOUNDS, AND METHOD OF MAKING AND USING THE SAME

Bernard F. Spielvogel, Raleigh; Anup Sood, Durham, and Iris H. Hall, Chapel Hill, all of N.C., assignors to Boron Biologicals, Inc., Raleigh, N.C.

Filed May 10, 1991, Ser. No. 701,682
Int. Cl.[5] A61K *31/69;* **C07F** *9/142, 9/141, 9/06*
U.S. Cl. 514—64 **12 Claims**

1. A phosphite-borane compound corresponding to the general formula:



wherein:

each R_1 is independently selected from: H; C_1–C_{10} alkyl; alkylaryl; aralkyl; aryl; monovalent metal ions; and quaternary ammonium cations of the formula $(R_4)_4N^+$, wherein each R_4 is independently selected from H and C_1–C_{10} alkyl;

R_2 is selected from H and C_1–C_{10} alkyl; and

R_3 is selected from $CNCH_2CH_3^+BF_4^-$, COOH, carboxyl salts, $COOR_5$, and $CONHR_5$, wherein R_5 is selected from C_1–C_{10} alkyl, alkylaryl, aralkyl, and aryl, with the proviso that if at least one of the R_1 substituents is H, monovalent metal ion, or quaternary ammonium cation, then R_3 may also be CN.

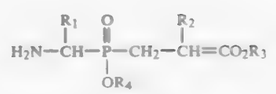
5,143,908

ANTIBACTERIAL AGENTS AND POTENTIATORS OF CARBAPENEM ANTIBIOTICS

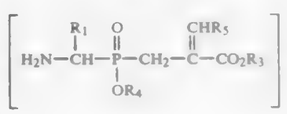
William H. Parsons, Rahway; William R. Schoen, Edison; Arthur A. Patchett, Westfield, all of N.J., and Masao Taniguchi, Machida, Japan, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 356,662, May 22, 1989, abandoned, which is a continuation of Ser. No. 927,027, Nov. 5, 1986, abandoned. This application Jul. 11, 1990, Ser. No. 551,665
Int. Cl.[5] A61K *31/66*
U.S. Cl. 514—114 **10 Claims**

1. A pharmaceutical composition useful in the treatment of antibacterial infections which comprises a pharmaceutically acceptable carrier and a pharmaceutically effective amount to treat bacterial infections of an antibacterial compound of formula I:



I



II

wherein

R_1 is
H, or
CH_3;

R_2 is
(a) hydrogen;
(b) C_1–C_{12} linear or branched alkyl;
(c) C_1–C_{12} linear or branched monoalkenyl;
(d) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 and wherein said above values from R_2 can be substituted by one halo, hydroxy, carboxy, C_1–C_4 alkoxycarbonyl, C_7–C_{16} arylalkoxycarbonyl, C_3–C_7 cycloalkyl, C_1–C_4 alkoxy, C_6–C_{12} aryloxy, amino, mono- or di-C_1–C_8 alkylamino, thio, C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{16} aralkylthio, or the radical $-S-(CH_2)_n-CH-(NH_2)COOH$, where n=1–2; with the proviso that R_2 is at least C_2 alkyl if substituted by one of the above-defined thio groups, and wherein the aryl ring can be further substituted by one C_1–C_4 linear or branched alkyl, trihalomethyl, nitro, halo, cyano or sulfonamido;

R_3 and R_4 are
hydrogen,
C_1–C_4 alkyl;

wherein the carbon atoms attached to R_1 are D(S) or DL(SR) and R_2 are D(R) or DL(RS) stereoconfiguration.

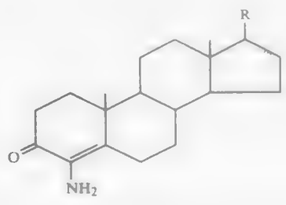
5,143,909

AMINOSTEROIDS IN A METHOD FOR INHIBITING C17-20 LYASE

Philip M. Weintraub, Cincinnati; Cynthia A. Gates, Fairfield, and Thomas R. Blohm, Madeira, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Mar. 19, 1991, Ser. No. 671,555
Int. Cl.[5] A61K *31/56;* **C07J** *41/00*
U.S. Cl. 514—177 **9 Claims**

1. A method for inhibiting $C_{17\text{-}20}$ lyase enzyme which comprises administering, to a patient in need of such inhibition, an effective amount of a compound of the formula:



wherein the dotted lines indicate the optional presence of a double bond, R is $-(C_{1\text{-}6}$ alkyl)-OZ Or $-(C_{2\text{-}6}$ alkyl)-$(OZ)_2$ and Z is hydrogen, $C_{1\text{-}6}$ alkyl, phenyl—$(C_{1\text{-}4}$ alkyl), (Y-substituted phenyl)—$(C_{1\text{-}4}$ alkyl), $C_{1\text{-}6}$ alkanoyl, benzoyl or Y-substituted benzoyl wherein Y is methyl, halogen or methoxy.

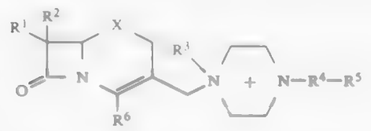
5,143,910

PIPERAZINIOCEPHALOSPORINS

Hiroshi Onoue, Nara; Toshiro Konoike, and Hiroyuki Ishitobi, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 23, 1990, Ser. No. 571,411
Claims priority, application Japan, Sep. 7, 1989, 1-232631
Int. Cl.[5] C07D *501/38;* **A61K** *31/545*
U.S. Cl. 514—201 **19 Claims**

1. A piperaziniocephalosporin of the following formula:



wherein,

R^1 is acylamino having up to 20 carbon atoms;

R^2 is hydrogen or methoxy;

R^3 is alkyl;

R^4 is carbonyl;

R^5 is substituted or unsubstituted hydroxyphenyl or hydroxypyridone, wherein said groups may be substituted by amino, hydroxy, alkali metaloxy, alkaline earth metal oxy, 1C to 8C alkoxy, 1C to 8C acyloxy, 3C to 9C silyloxy, 7C to 15C aralkoxy, 2C to 9C alkoxycarbonyloxy, halogen, nitro, cyano, carboxy, carbamoyl, 2C to 9C alkoxycarbonyl, 8C to 15C aralkoxycarbonyl, 1C to 8C alkyl, 2C to 9C alkenyl and monocyclic heterocyclyl thio;

R^6 has a negative charge and is COO—, or R^6 is an anion in combination with an unprotected or protected carboxy group, wherein said carboxy group may be protected by 1C to 8C alkyl, 7C to 19C aralkyl, 6C to 12C aryl, 1C to 12C N-substituted amino, 3C to 12C hydrocarbylsilyl and 3C to 12C hydrocarbylstannyl, or wherein said carboxy group may form an amminio, arylinio, lithium, sodium, potassium, magnesium, calcium or aluminum salt, or wherein said carboxyl group may form an ester with a moiety selected from the group consisting of:

2C to 15C alkanoyloxyalkyl,

3C to 15C alkoxycarbonyloxyalkyl, 2C to 8C alkoxyalkyl,

4C to 8C oxacycloalkyl, 8C to 12C substituted aralkyl, 6C to 12C aryl and 2C to 12C alkenyl; and

X is S or S→O.

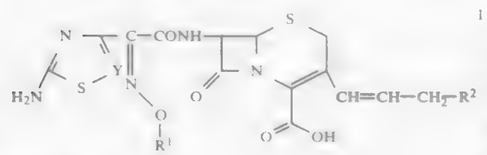
5,143,911

ANTIBIOTIC C-3 DI-HYDROXYPHENYL SUBSTITUTED CEPHALOSPORIN COMPOUNDS, COMPOSITIONS AND METHOD OF USE THEREOF

Hajime Kamachi, Chiba; Kiyoto Imae, Kawasaki, and Takaaki Okita, Tokyo, all of Japan, assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Aug. 23, 1990, Ser. No. 572,516
Int. Cl.[5] C07D *501/24;* **A61K** *31/545*
U.S. Cl. 514—202 **21 Claims**

1. A compound of the formula

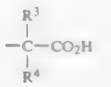


I

wherein

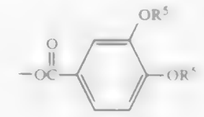
Y is N or CH;

R^1 is hydrogen, a straight, branched, or cyclic lower alkyl group having up to six carbon atoms or a radical of the formula

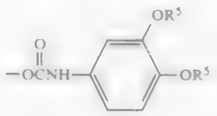


in which R^3 and R^4 are each independently hydrogen, methyl, or ethyl, or R^3 and R^4, taken together with the carbon atom to which they are attached, may be a cycloalkylidene ring containing from 3 to 5 carbon atoms;

R^2 is a radical selected from the group consisting of



and



wherein R^5 is hydrogen or acetyl;

or a nontoxic pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

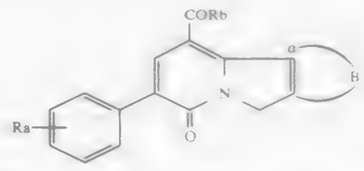
5,143,912

TRICYCLIC PYRIDONE DERIVATIVES

Serge Burner, Durmenach-Ferrette, France, and Ulrich Widmer, Rheinfelden, Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Aug. 2, 1991, Ser. No. 739,757
Claims priority, application Switzerland, Aug. 21, 1990, 2700/90
Int. Cl.[5] A61K *31/40;* **C07D** *471/12*
U.S. Cl. 514—210 **9 Claims**

1. A compound of the formula



I

wherein Ra is hydrogen or halogen, Rb is $-NR^2R^3$ wherein R^2 and R^3 taken together with the nitrogen atom to which they are attached is a 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl which is unsubstituted or mono- or disubstituted by lower alkyl, hydroxy, lower alkoxy, lower hydroxyalkyl, lower alkoxyalkyl or phenyl; B and the carbon atom denoted by α taken together is a group of the formula $>C_\alpha—CR^4=CH—CH=CH—$ and R^4 is hydrogen, fluorine or chlorine, or a pharmaceutically acceptable acid addition salt of the compound of formula I.

5,143,913

[3S(Z)]-3-[[(2-AMINO-4-THIAZOLYL)[[2-(HYDROXYAMINO)-2-OXOETHOXY]IMINO]ACETYL]AMINO]-2,2-DIMETHYL-4-OXO-1-AZETIDINYL SULFATE

Robert Zahler, Princeton, N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 177,196, Apr. 4, 1988, abandoned. This application May 10, 1991, Ser. No. 700,884

Int. Cl.[5] A61K *31/425*; C07D *417/12*

U.S. Cl. 514—210 **2 Claims**

1. [3S(Z)]-3-[[(2-amino-4-thiazolyl)[[2-(hydroxyamino)-2-oxoethoxy]imino]acetyl]amino]-2,2-dimethyl-4-oxo-1-azetidinyl sulfate, or a pharmaceutically acceptable salt thereof.

2. A method of treating a gram-positive or gram-negative bacterial infection in a mammalian host which comprises administering to said host an effective amount of [3S(Z)]-3-[[(2-amino-4-thiazolyl)[[2-(hydroxyamino)-2-oxoethoxy]iminoacetyl]amino]-2,2-dimethyl-4-oxo-1-azetidinyl sulfate, or a pharmaceutically acceptable salt thereof.

5,143,914

2-HETEROARYLPHENYL-CARBAPENEM ANTIBACTERIAL AGENTS

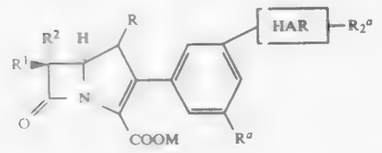
Frank P. DiNinno, Old Bridge; Ravindra N. Guthikonda, Edison, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 25, 1991, Ser. No. 720,325

Int. Cl.[5] C07D *487/04*; A61K *31/40*

U.S. Cl. 514—210 **13 Claims**

1. A compound of the formula:



(I)

wherein:

R is H or CH_3;

R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

HAR

is a 5- or 9-membered mono- or bicyclic heteroaryl ring system wherein 1 atom is O or S or an 8-membered bicyclic heteroaryl ring system wherein 2 atoms are O and/or S; all the other atoms being carbon

R^a is each independently selected from the group consisting of hydrogen and the radicals set out below:

a) a trifluoromethyl group: —CF_3;

b) a halogen atom: —Br, —Cl, —F, or —I;

c) C_1–C_4 alkoxy radical: —OC_{1-4} alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of —OH, —OCH_3, —CN, —$C(O)NH_2$ —$OC(O)NH_2$, CHO, —$OC(O)N(CH_3)_2$, —SO_2NH_2, —$SO_2N(CH_3)_2$, —$SOCH_3$, —SO_2CH_3, —F, —CF_3, —$COOM^a$ (where M^a is hydrogen, alkali metal, methyl or phenyl), tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above) and —SO_3M^b (where M^b is hydrogen or an alkali metal);

d) a hydroxy group: —OH;

e) a carbonyloxy radical: —O(C=O)R^z, where

R^z is C_1–C_4 alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above or tri-substituted with —F;

f) a carbamoyloxy radical: —O(C=O)N(R^y)R^z, where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)—, —$S(O)_2$— or —NR^e—, to form a ring (where R^e is hydrogen, C_1–C_4 alkyl, and C_1–C_4 alkyl mono-substituted with R^q and the ring is optionally mono-substituted with Rq as defined above);

g) a sulfur radical: —$S(O)_n$—R^z where n=0–2, and R^z is defined above;

h) a sulfamoyl group: —$SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

i) azido: N_3

j) a formamido group: —N(R^t)—C(O)H, where

R^t is H or C_1–C_4 alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

k) a (C_1–C_4 alkyl)carbonylamino radical: —N(R^t)—C(O)C_{1-4} alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

l) a (C_1–C_4 alkoxy) carbonylamino radical: —N(R^t)—C(O)OC_1–C_4 alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

m) a ureido group: —N(R^t)—C(O)N(R^y)R^z where R^t, R^y and R^z are as defined above;

n) a sulfonamido group: —N(R^t)SO_2R^z, where R^z and R^t are as defined above;

o) a cyano group: —CN;

p) a formyl or acetalized formyl radical: —C(O)H or —$C(OCH_3)_2H$;

q) (C_1–C_4 alkyl)carbonyl radical wherein the carbonyl is acetalized: —$C(OCH_3)_2C_1$–C_4 alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

r) carbonyl radical: —C(O)R^z, where R^z is as defined above;

s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: —C(R^y)=NOR^z where R^y and R^z are as defined above, except they may not be joined together to form a ring;

t) a (C_1–C_4 alkoxy)carbonyl radical: —C(O)OC_{1-4} alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

u) a carbamoyl radical: —C(O)N(R^y)R^z where R^y and R^z are as defined above;

v) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group: —(C=O)—N(OR^y)R^z where R^y and R^z are as defined above, except they may not be joined together to form a ring;

w) a thiocarbamoyl group: —C(S)N(R^y)(R^z) where R^y and R^z are as defined above;

x) carboxyl: —$COOM^b$, where M^b is as defined above;

y) thiocyanate: —SCN;

z) trifluoromethylthio: —SCF_3;

aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

ab) an anionic function selected from the group consisting of: phosphono [P=O(OM^b)$_2$]; alkylphosphono {P=O(OM^b)—[O(C_1–C_4 alkyl)]}; alkylphosphinyl [P=O(OM^b)—(C_1–C_4 alkyl)]; phosphoramido [P=O(OM^b)N(R^y)R^z and P=O(OM^b)NHR^z]; sulfino (SO_2M^b); sulfo (SO_3M^b); acylsulfonamides selected from the structures $CONM^bSO_2R^x$, $CONM^bSO_2N(R^y)R^z$, $SO_2NM^bCON(R^y)R^z$; and SO_2NM^bCN, where

R^x is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S in the case of a 5-membered ring, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally mono-substituted by R^q, as defined above; M^b is as defined above; and R^y and R^z are as defined above;

ac) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH or N(C_1–C_4 alkyl) and in which one additional carbon atom may be replaced by NH or N(C_1–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

ad) C_2–C_4 alkenyl radical, optionally monosubstituted by one of the substituents a) to ac) above and phenyl which is optionally substituted by R^q as defined above;

ae) C_2–C_4 alkynyl radical, optionally monosubstituted by one of the substituents a) to ac) above;

af) C_1–C_4 alkyl radical;

ag) C_1–C_4 alkyl mono-substituted by one of the substituents a)–ac) above;

ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from -S- and NR^t (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents a) to ag) above; and

M is selected from:

i) hydrogen;

ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group; or

iii) an alkali metal or other pharmaceutically acceptable cation.

5,143,915

DIHYDROPYRIMIDINE MACROCYCLIC LACTONES USEFUL AS CALCIUM ANTAGONISTS AND AGONISTS

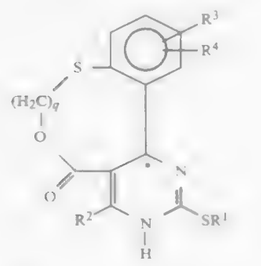
George C. Rovnyak, Hopewell, and Spencer D. Kimball, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 25, 1990, Ser. No. 558,266

Int. Cl.[5] A61K *31/55, 31/505, 31/535*; C07D *497/04*

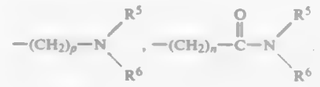
U.S. Cl. 514—212 **10 Claims**

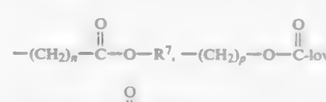
1. A compound of the formula

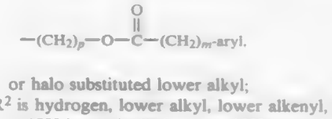


its 3,4-dihydropyrimidine tautomer form and pharmaceutically acceptable salts thereof, wherein:

R^1 is lower alkyl, lower alkenyl, lower alkynyl, —$(CH_2)_m$-cycloalkyl, —$(CH_2)_m$-aryl, —$(CH_2)_n$-heterocyclo, —$(CH_2)_p$—OH, —$(CH_2)_p$—O-lower alkyl, —$(CH_2)_p$—O—$(CH_2)_m$-aryl, —$(CH_2)_p$—SH, —$(CH_2)_p$—S-lower alkyl, —$(CH_2)_p$—S—$(CH_2)_m$-aryl,

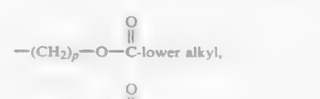


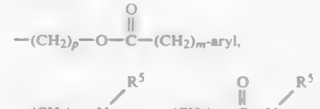


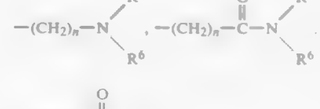


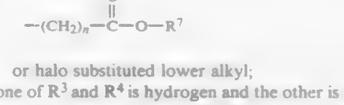
or halo substituted lower alkyl;

R^2 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, —$(CH_2)_m$-cycloalkyl, —$(CH_2)_m$-aryl, —$(CH_2)_n$-heterocyclo, —$(CH_2)_n$—OH, —$(CH_2)_n$—O-lower alkyl, —$(CH_2)_n$—O—$(CH_2)_m$-aryl, —$(CH_2)_n$—SH, —$(CH_2)_n$—S-lower alkyl, —$(CH_2)_n$—S—$(CH_2)_m$-aryl,



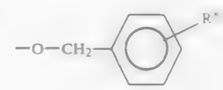


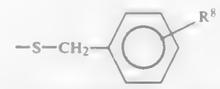




or halo substituted lower alkyl;

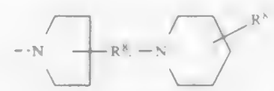
one of R^3 and R^4 is hydrogen and the other is lower alkyl of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, halo, nitro, cyano, hydroxy, amino, —N—H-alkyl wherein alkyl is 1 to 4 carbons, —N(alkyl)$_2$ wherein alkyl is of 1 to 4 carbons, CF_3, NCS—, $OCHF_2$,





—O—CH_2-cycloalkyl, or —S—CH_2-cycloalkyl; or R^3 and R^4 are each independently methyl, methoxy, methylthio, halo, CF_3, nitro, amino, or $OCHF_2$;

R^5 and R^6 are independently selected from the group consisting of hydrogen, lower alkyl, and —$(CH_2)_m$-aryl or R^5 and R^6 together with the N atom to which they are attached complete a heterocyclic ring of the formula



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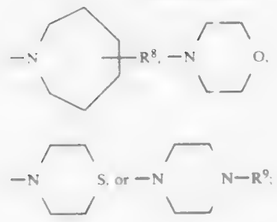
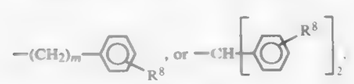


R^7 is hydrogen, lower alkyl, $-(CH_2)_m$-aryl, or a pharmaceutically acceptable salt forming ion;
R^8 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, hydroxy, or CF_3;
R^9 is hydrogen, lower alkyl of 1 to 4 carbons,



m is zero or an integer from 1 to 6;
n is an integer from 1 to 6;
p is an integer from 2 to 6; and
q is an integer from 3 to 8;
and wherein "heterocyclo" refers to 2- and 3-thienyl; 2- and 3-furyl; 2-, 3- and 4-pyridyl; imidazolyl; 4-, 5- 6-, and 7-indolyl; 4-5- 6-, and 7-isoindolyl; 5-, 6-, 7-, and 8-quinolinyl; 5-, 6-, 7-, and 8-isoquinolinyl; 4- 5-, 6- and 7-benzothiazolyl; 4-, 5-, 6- and 7-benzoxazolyl; 4-, 5-, 6-, and 7-benzimidazolyl; 4-, 5-, 6-, and 7-benzoxadiazolyl; and 4-, 5-, 6-, and 7-benzofurazanyl.

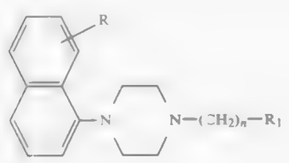
5,143,916

NAPHTHYLPIPERAZINES USEFUL AS 5-HT_{1A} RECEPTOR LIGANDS

Gilbert Lavielle, La Celle Saint-Cloud; Michel Laubie, Vaucresson, and Francis Colpaert, Le Vesinet, all of France, assignors to Adir et Compagnie, Courbevoie, France

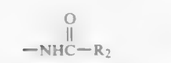
Filed Dec. 19, 1990, Ser. No. 629,824
Claims priority, application France, Dec. 20, 1989, 89 16882
Int. Cl.[5] **C07D** *409/12, 319/18, 319/20;* **A61K** *31/495*
U.S. Cl. 514—255 **8 Claims**

1. A compound of formula I:



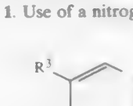
(I)

in which:
n represents 1 to 4,
R represents hydrogen, halogen alkyl having 1 to 6 carbon atoms, hydroxyl or alkoxy having 1 to 6 carbon atoms,
R_1 represents a radical of formula A_1:



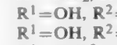
(A1)

in which R_2 represents alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl—unsubstituted or substituted with one or more halogen atoms, with one or more alkyl radicals having 1 to 6 carbon atoms, or with one or more alkoxy radicals having 1 to 6 carbon atoms, -an —O-alkyl radical having 1 to 6 carbon atoms,
a radical of formula A_2:



(A2)

in which R_3 represents alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, or phenyl-unsubstituted or substituted with one or more halogen atoms, with one or more alkyl radicals having 1 to 6 carbon atoms, or with one or more alkoxy radicals having 1 to 6 carbon atoms,
a radical of formula A_3:



(A3)

in which R_4 represents alkyl having 1 to 6 carbon atoms or phenyl unsubstituted or substituted with one or more halogen atoms or with one or more alkyl or alkoxy radicals having 1 to 6 carbon atoms,
or a radical of formula A_6:

(A6)

in which formulae X, Y and Z, which may be identical or different, each represent hydrogen halogen alkyl having 1 to 6 carbon atoms, or alkoxy having 1 to 6 carbon atoms, its stereoisomers and its addition salts with a pharmaceutically-acceptable inorganic or organic acid.

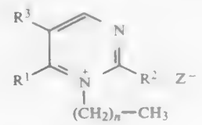
5,143,917

PHARMACEUTICAL PREPARATIONS

Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice Chem.-Pharm. Fabrik Putter GmbH & Co. KG, Iserlohn, Fed. Rep. of Germany

Division of Ser. No. 82,899, Aug. 6, 1987, Pat. No. 4,965,357. This application May 24, 1990, Ser. No. 529,094
Int. Cl.[5] **A61K** *31/505;* **C07D** *239/26, 239/30, 239/34*
U.S. Cl. 514—256 **2 Claims**

1. Use of a nitrogen-containing heterocycle of the formula



in which:
the combination of R^1, R^2 and R^3 is a member selected from the group consisting of
$R^1=R^2=R^3=H$;
$R^1=NH_2$, $R^2=OH$, and $R^3=H$;
$R^1=OH$, $R^2=OH$, and $R^3=CH_3$;
$R^1=OH$, $R^2=OH$, and $R^3=H$;
$R^1=F$, $R^2=OH$, and $R^3=H$; and
$R^1=OH$, $R^2=OH$, and $R^3=F$;

n is 8 to 20; and
Z^- is a member selected from the group consisting of chloride, bromide, iodide, maleate, formate, acetate, propionate, hydrogen sulfate, malate, fumarate, salicylate, alginate, gluconate, glucoronate, galactoronate, ethyl sulfate and $H_2PO_4^-$;
as a pharmaceutically active substance at pH 6-8 in a polar solvent for the control of an infection by microorganisms in a host suffering therefrom.

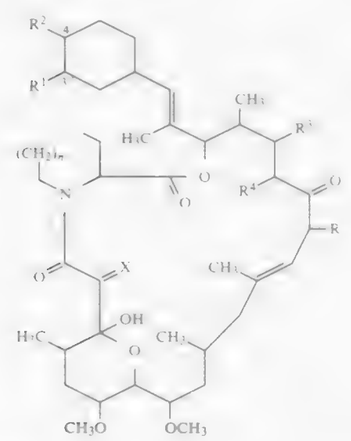
5,143,918

HALOMACROLIDES AND DERIVATIVES HAVING IMMUNOSUPPRESSIVE ACTIVITY

Richard J. Bochis, East Brunswick, and Matthew J. Wyvratt, Jr., Mountainside, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 596,177, Oct. 11, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 759,747
Int. Cl.[5] **A61K** *31/695, 31/395;* **C07D** *498/16*
U.S. Cl. 514—291 **9 Claims**

1. A compound of formula I:



(I)

wherein:
R is methyl, ethyl, propyl or allyl;
R^1 and R^2 are independently halo, hydroxy, and C_1–C_8 alkoxy, with the proviso that at least one R^1 or R^2 is halogen; R^3 is hydrogen or hydroxy and R_4 is hydrogen; or R^3 and R^4 can be taken together to form a double bond; X=O or (HO, H) and n is 1 or 2.

9. A method for the topical treatment of inflammatory and hyperproliferative skin diseases and or cutaneous manifestations of immunologically-mediated illnesses comprising the administration to a mammalian species in need of such treatment an effective amount of a compound of formula I according to claim 1.

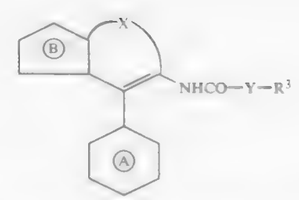
5,143,919

THIENOPYRIDINE DERIVATIVES AND THEIR PHARMACEUTICAL USE

Kanji Meguro, Nishinomiya; Hiroyuki Tawada, Takatsuki, and Hitoshi Ikeda, Higashiosaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

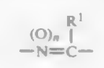
Filed Aug. 13, 1991, Ser. No. 744,492
Claims priority, application Japan, Aug. 17, 1990, 2-217309; May 23, 1991, 3-118444
Int. Cl.[5] **A61K** *31/435;* **C07D** *495/04*
U.S. Cl. 514—291 **23 Claims**

1. A thienopyridine derivative of the formula (I):

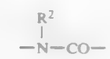


(I)

wherein the ring A is an optionally substituted benzene ring; the ring B is an optionally substituted thiophene ring: X is a group of the formula:



(wherein R^1 is hydrogen, alkyl or alkoxy; and n is 0 or 1) or a group of the formula:



(wherein R^2 is hydrogen or alkyl); Y is a single bond, —NH—, alkylene having 1 or 2 carbon atoms or —CH=CH—; and R^3 is an optionally substituted hydrocarbon group, or its salt.

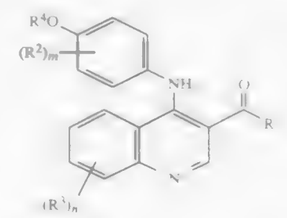
5,143,920

SUBSTITUTED 4-AMINOQUINOLINE DERIVATIVES AS GASTRIC SECRETION INHIBITORS

Robert J. Ife; Thomas H. Brown, and Colin A. Leach, all of Stevenage, England, assignors to SmithKline Beckman Intercredit B.V., Netherlands

Filed Feb. 23, 1989, Ser. No. 314,684
Claims priority, application United Kingdom, Feb. 25, 1988, [illegible]
Int. Cl.[5] **A61K** *31/47;* **C07D** *215/42, 215/44*
U.S. Cl. 514—313 **18 Claims**

1. A compound of structure (I):



(I)

wherein
R^1 is hydrogen, C_{1-6}alkyl, -C_{1-6}alkoxy;
R^2 is hydrogen, C_{1-6}alkyl or halogen;
m is 1 or 2;
R^3 is hydrogen, halogen, C_{1-6}alkoxy or C_{1-6}alkanoyl;
n is 1; and
R^4 is hydrogen;
or a salt thereof.

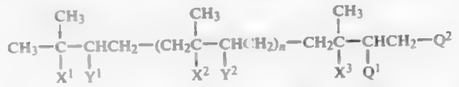
5,143,921

TERPENE AMINO ALCOHOLS AND MEDICINAL USES THEREOF

Koichi Kanehira, Kurashiki; Katsushi Eziri, Okayama; Manzo Shiono; Yoshiji Fujita, both of Kurashiki, and Johji Yamahara, Otsu, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 887,431, Jul. 21, 1986, Pat. No. 4,946,857. This application Jun. 4, 1990, Ser. No. 533,395
Claims priority, application Japan, Jul. 19, 1985, 60-160782; Mar. 7, 1986, 61-50784; Apr. 11, 1986, 61-84822
Int. Cl.[5] A61K *31/435, 31/40;* C07D *211/22*
U.S. Cl. 514—315 18 Claims

1. A terpene amino alcohol of the formula



wherein X^1 is a hydrogen atom or a hydroxyl group and Y^1 is a hydrogen atom, or X^1 and Y^1 taken together represent a bond; X^2 is a hydrogen atom or a hydroxyl group and Y^2 is a hydrogen atom, or X^2 and Y^2 taken together represent a bond; Q^1 and Q^2 are such that either one is Y^3 with the other being

and X^3 is a hydrogen atom or a hydroxyl group; Y^3 is a hydroxyl group when X^3 is a hydrogen atom, or Y^3 is a hydrogen atom or a hydroxyl group when X^3 is a hydroxyl group; R^1 and R^2 may be the same or different and each is a hydrogen atom, a lower alkyl group which may be substituted, an aryl group which may be substituted or a 4-piperidinyl group which may be substituted, provided that at least one of R^1 and R^2 is a 4-piperidinyl group which may be substituted, or R^1 and R^2 taken together with the adjacent nitrogen atom form a piperidino group; and n is an integer of 0 to 2; or a pharmacologically acceptable ester or salt thereof.

5,143,922

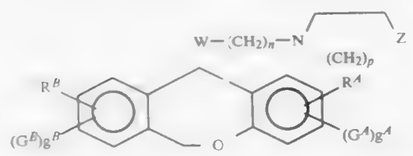
TRICYCLIC THROMBOXANE A_2 ANTAGONISTS

Etsuo Oshima, Shizuoka; Hiroyuki Obase, Mishima; Akira Karasawa; Kazuhiro Kubo, both of Shizuoka; Ichiro Miki, Tokyo; Akio Ishii; Hidee Ishii, both of Shizuoka, and Kenji Ohmori, Mishima, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

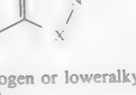
Division of Ser. No. 281,545, Dec. 8, 1988, Pat. No. 4,994,463. This application Nov. 20 1990, Ser. No. 616,095
Claims priority, application Japan, Dec. 14, 1987, 62-315769; Feb. 3, 1988, 63-23543
Int. Cl.[5] A61K *31/445;* C07D *405/12*
U.S. Cl. 514—320 10 Claims

1. A tricyclic compound represented by formula (I):

(I)



wherein ------ represents single bond or double bond;
W represents —S— or =CH—;
n is 1, 2, 3, or 4;
one of R^A and R^B represents hydrogen and the other represents —Y—M wherein Y represents single bond, —CR^1—R^2—$(CH_2)_m$—, or —CR^1=CR^2—$(CH_2)_m$— wherein each of R^1 and R^2 independently represents hydrogen or lower alkyl and m is 0, 1, 2, 3 or 4, in which the left side of each formula is bound to the mother nucleus; and M represents —$COOR^3$ wherein R^3 represents hydrogen or lower alkyl, —$CONR^{3a}R^{3b}$ wherein each of R^{3a} and R^{3b} independently has the same significances for R^3 as described above, or tetrazolyl;
each of G^A and G^B independently represents lower alkyl, halogen, hydroxyl, or lower alkoxyl;
each of g^A and g^B independently represents 0, 1, 2 or 3;
Z represents



wherein L represents hydrogen, hydroxyl, or lower alkoxy; E^2 represents single bond, —CO—, or

wherein R^4 represents hydrogen or lower alkyl; and Q represents aryl having 6 to 10 carbon atoms, aralkyl having 7 to 20 carbon atoms or aralkenyl having 8 to 18 carbon atoms which is optionally substituted with 1 to 3 substituents on the aromatic ring, selected from the group consisting of lower alkyl, halogen, trifluoromethyl, hydroxyl, lower alkoxyl and methylenedioxy formed together with the ortho-position of the aromatic ring;

wherein Q has the same significance as described above;
p is 1, 2 or 3;
and a pharmaceutically acceptable salt thereof.

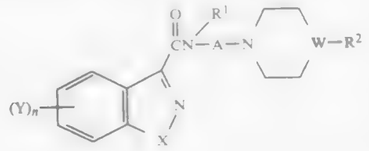
5,143,923

BENZOISOTHIAZOLE- AND BENZIOSOXAZOLE-3-CARBOXAMIDES

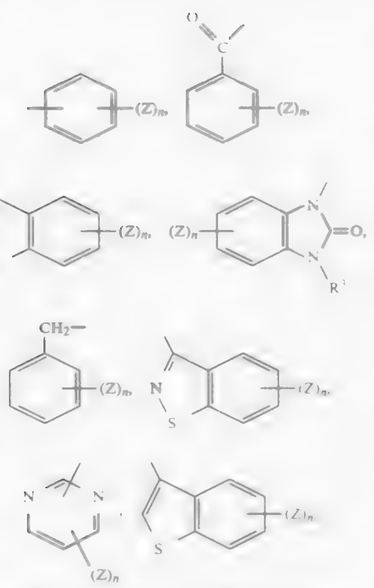
Nicholas J. Hrib, Somerville, and John G. Jurcak, Union City, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 29, 1991, Ser. No. 693,168
Int. Cl.[5] A61K *31/445;* C07D *413/10, 417/10*
U.S. Cl. 514—321 21 Claims

1. A compound of the formula



wherein R^1 is hydrogen or loweralkyl; R^2 is loweralkyl or a group of the formula



R^3 is hydrogen or loweralkyl; A is loweralkylene, a group of the formula —CHR^4CH=$CHCHR^4$—, or —CHR^4C≡CH-R^4—; R^4 is hydrogen or loweralkyl; X is O or S; W is CH; Y is hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, or trifluoromethyl; Z is hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, or trifluoromethyl; n is 1 or 2 wherein the solid line (—) refers to the point of attachment of the group to the indicated member of the formulas; the geometric and optical isomers thereof, or a pharmaceutically acceptable salt thereof.

5,143,924

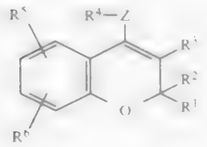
OXODIHYDROPYRIDYL CHROMAN DERIVATIVES

Rolf Gericke, Seeheim; Manfred Baumgarth; Ingeborg Lues, both of Darmstadt; Rolf Bergmann, Reichelsheim, and Jacques De Peyer, Bern, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 23, 1990, Ser. No. 555,700
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1989, 3924417
Int. Cl.[5] C07D *405/12*
U.S. Cl. 514—337 12 Claims

1. A chroman compound of formula I

(I)



in which
R^1 is A,
R^2 is H or A, or
R^1 and R^2 together are also C_{3-6}-alkylene,
R^3 is CHO or CH_2OH,
R^4 is oxodihydropyridyl-1-,
R^5 is CN,
R^6 is H,
Z is O, NH or a bond,
A is C_{1-6}-alkyl, -alkyl is C_{1-6}-alkylene and Ac is C_{1-8}-alkanoyl or C_{7-11}-aroyl or a pharmaceutically acceptable salt thereof.

5,143,925

ALTERATION OF RATE AND CHARACTER OF HAIR GROWTH

Douglas Shander, 16112 Howard Landing Dr., Gaithersburg, Md. 20878, and Margaret G. Funkhouser, 1332 S. Pollard St., Arlington, Va. 22204

Continuation of Ser. No. 632,126, Dec. 20, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 794,321
Int. Cl.[5] A61K *31/42*
U.S. Cl. 514—378 6 Claims

1. The process of reducing the rate of mammalian hair growth which comprises the step of applying to the skin of mammals free from a disease characterized by elevated transglutaminase activity a composition containing an inhibitor of transglutaminase at a dosage effective to reduce the rate of said hair growth

5,143,926

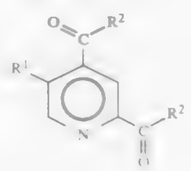
SUBSTITUTED PYRIDINE-2,4-DICARBOXYLIC ACID COMPOUNDS AND METHODS OF USE THEREOF

Ekkehard Baader, Königstein/Taunus; Martin Bickel, Bad Homburg; Dietrich Brocks, Wiesbaden; Volkmar Günzler, Marburg-Cappel; Stephan Henke, Bad Soden am Taunus, and Hartmut Hanauske-Abel, Dexheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 164,406, Mar. 4, 1988, Pat. No. 5,004,748. This application Oct. 31, 1990, Ser. No. 606,451
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707429
Int. Cl.[5] A61K *31/44;* C07D *213/78*
U.S. Cl. 514—354 8 Claims

1. A substituted pyridine-2,4-dicarboxylic acid derivative of the formula I

(I)



in which:
R^1 denotes alkyl, alkenyl or alkynyl with up to 9 C atoms, the radicals mentioned being optionally interrupted by a carbonyl group and the radicals mentioned being optionally mono- or disubstituted by halogen, hydroxyl, nitro, cyano, amino, C_1-C_4-alkoxy carboxyl, C_1-C_4-alkoxycarbonyl, C_1-C_4 alkylcarbonyloxy or C_1-C_4-alkyl- or C_1-C_4-dialkylamino, or optionally substituted by phenyl or naphthyl, these aryl radicals mentioned being in turn optionally monosubstituted by halogen, carboxyl, amino, C_1-C_4-alkyl or C_1-C_4-dialkylamino or hydroxyl, and
R^2 denotes a substituent of the formula —OR^4 or R^4—N—R^5, in which
R^4 denotes hydrogen or C_1-C_{12}-alkyl, which is optionally mono- or disubstituted by
halogen, hydroxyl, cyano, carboxyl, C_1-C_4-alkoxy, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkylcarbonyloxy, or C_1-C_4-alkyl- or C_1-C_4-dialkylamino, or is optionally substituted by phenyl, which is in turn optionally mono-, di- or trisubstituted by halogen, C_1-C_4alkyl or C_1-C_4 -alkoxy, it also being possible for the substitu-

ents to differ independently of one another in the case of polysubstitution, or

R^4 denotes cyclohexyl, which is optionally benzo-fused, or

R^4 denotes phenyl, naphthyl, thienyl, furyl, pyrrolyl or pyridyl, the phenyl, naphthyl and pyridyl radicals being optionally mono-, di- or trisubstituted and the thienyl, furyl and pyrrolyl radicals being optionally monosubstituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, it also being possible for the substituents to differ independently of one another in the case of polysubstitution, and

R^5 denotes or C_1–C_3-alkyl, R^5 in the case of C_1–C_3-alkyl radicals together with R^4, which in this case denotes C_3–C_5-alkyl, optionally forming a heterocyclic saturated 6-membered ring, it also being possible for the heterocyclic 6-membered ring to contain a second nitrogen atom and in turn to be substituted by phenyl or phenyl-C_1–C_3-alkyl,

and it also being possible for the two radicals R^2 bonded to the pyridine skeleton via the carbonyl group in the 2- and 4-position to differ independently of one another, and it also being possible for all the alkyl radicals mentioned with more than 2 carbon atoms to be branched, or the physiologically tolerated salt, excluding 5-ethyl-pyridine-2,4-dicarboxylic acid and the compounds in which R^1 is an aminoethyl radical.

5,143,927

3-(THIAZOLIDONE, OXAZOLIDINONE, IMIDAZOLIDINONE)-INDOLES AS ANTIINFLAMMATORY AGENTS

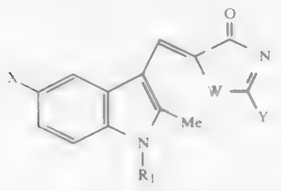
Diane H. Boschelli, Plymouth, and David T. Connor, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 9, 1991, Ser. No. 697,823

Int. Cl.[5] **C07D** *417/06;* **A61K** *31/425*

U.S. Cl. 514—369 **10 Claims**

1. A compound of the formula (I)



I

or a pharmaceutically acceptable salt thereof; wherein

(1) R_1 is hydrogen, lower alkyl or

wherein R_4 is lower alkyl, phenyl, or phenyl substituted by from one to three of lower alkyl, lower alkoxy, hydroxy, halogen, trifluoromethyl NO_2, mercapto, lower alkylthio, $NR_{10}R_{11}$ wherein R_{10} and R_{11} are independently hydrogen or lower alkyl;

(2) X is hydrogen, hydroxyl, chlorine, bromine, fluorine, iodine, or O-lower alkyl;

(3) Y is

a) NH_2;

b) SR_2 wherein R_2 is lower alkyl or CH_2COOR_3 where R_3 is hydrogen or lower alkyl;

c) $S(O)_nR_2$ wherein n is 1 or 2 and R_2 is as defined above;

d) NR_2R_3 wherein R_2 and R_3 are as defined above;

e) NHCN;

f) $NHC(A)NHR_3$ wherein A is oxygen, sulfur, or HN and R_3 is as defined above;

g) $NR_3(OR_{3a})$ wherein R_3 is as defined above and R_{3a} is hydrogen or lower alkyl;

h) $NHNHC(S)NH_2$;

i) $NHNHC(NH)NH_2$;

(4) W is sulfur;

(5) Me is methyl.

5,143,928

3,5-DI-TERTIARYBUTYL-4-HYDROXYPHENYLMETHYLENE DERIVATIVES OF 2-SUBSTITUTED THIAZOLIDINONES, OXAZOLIDINONES, AND IMIDAZOLIDINONES AS ANTIINFLAMMATORY AGENTS

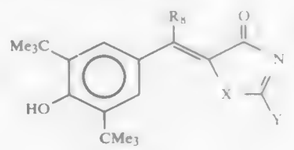
Wiaczeslaw A. Cetenko; David T. Connor; Jagadish C. Sircar; Roderick J. Sorenson, and Paul C. Unangst, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 499,937, Mar. 27, 1990, abandoned. This application Jan. 18, 1991, Ser. No. 640,711

Int. Cl.[5] **C07D** *277/54, 277/36;* **A61K** *31/415*

U.S. Cl. 514—369 **46 Claims**

1. A compound of the formula I



I

and a pharmaceutically acceptable base or acid addition salt thereof: wherein

Me is methyl;

X is S;

R_8 is hydrogen or methyl;

Y is SCH_3, $SOCH_3$, SO_2CH, NR_1R_2, NHCN

$(CH_2)_mCO_2R_4$, $N(OH)COR_5$, NR_4W, $S(CH_2)_nCO_2R_6$, or NR_7COR_6;

n is 1, 2 or 3;

m is 1 to 5;

R_1 and R_2 are independently H, lower alkyl, phenylalkyl, in which phenyl is unsubstituted or substituted as defined below, or $(CH_2)_nNR_6R_7$;

R_3 is H, lower alkyl, phenyl or phenyl substituted by one, two or three substituents of one or more of each of alkyl of one to four carbons, OR_4, SR_4,

C(O)OR_4, hydroxymethyl, NR_6R_7, nitro or halogen;

R_4 is H or lower alkyl;

R_5 lower alkyl, phenyl or phenyl substituted as defined above, or CF_3;

R_6 is H or lower alkyl;

R_7 is lower alkyl;

Z is O, S, NH, NCN; and

W is CO_2R_7 wherein R_7 is as defined above, $(CH_2)_mCOOH$,

$(CH_2)_mOH$, or $C(CH_2OH)_3$.

5,143,929

2-SUBSTITUTED THIAZOLIDINONE, OXAZOLIDINONE, AND IMIDAZOLIDINONE DERIVATIVES OF FENAMATES AS ANTIINFLAMMATORY AGENTS

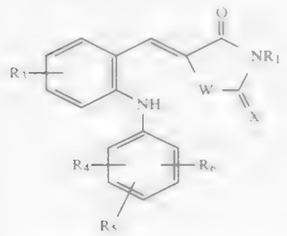
Thomas R. Belliotti, Ypsilanti; Diane H. Boschelli, Plymouth; David T. Connor, Ann Arbor, and Catherine R. Kostlan, Saline, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 9, 1991, Ser. No. 697,822

Int. Cl.[5] **C07D** *277/34, 277/36, 277/54;* **A61K** *31/425*

U.S. Cl. 514—364 **20 Claims**

1. A compound of the formula (I)



I

and a pharmaceutically acceptable salt thereof; wherein

(1) X is oxygen, sulfur, or NH;

(2) W is sulfur;

(3) R_1 is lower alkyl or CH_2COOR_2 wherein R_2 is as defined above;

(4) R_3, R_4, R_5, and R_6 are independently

i) hydrogen;

ii) fluorine;

iii) chlorine;

iv) bromine;

v) iodine;

vi) trifluoromethyl

vii) lower alkyl;

viii) CN;

ix) hydroxy;

x) lower alkoxy;

xi) NO_2;

xii) NR_7R_8 wherein R_7 and R_8 are independently hydrogen, lower alkyl or acyl;

xiii) $S(O)_n$- lower alkyl wherein n is an integer of 0–2.

5,143,930

THIAZOLIDINE DERIVATIVES WITH ANTI-DIABETIC ACTIVITY, THEIR PREPARATION AND THEIR USE

Takao Yoshioka; Takashi Fujita; Tsutomu Kanai; Kanichi Nakamura; Hiroyoshi Horikoshi; Kunihiro Sasahara, and Takeshi Kinoshita, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

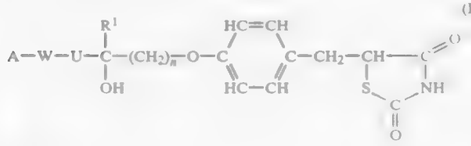
Filed Jan. 24, 1991, Ser. No. 645,108

Claims priority, application Japan, Feb. 7, 1990, 2-28023

Int. Cl.[5] **C07D** *417/12;* **A01K** *31/425*

U.S. Cl. 514—369 **34 Claims**

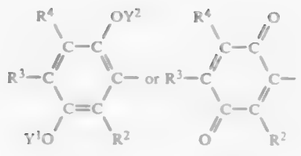
1. A compound of formula (I):



(I)

in which:

A represents a group of formula (II) or (III):



(II) (III)

W represents a methylene group ($>CH_2$), a carbonyl group ($>C=O$) or a group of formula $>C=N-OV$ in which V represents a hydrogen atom, a sulfo group, an acyl group as defined below or an alkyl group which has from 1 to 8 carbon atoms and which is unsubstituted or has at least one substituent selected from the group consisting of substituents (a), defined below;

U represents a methylene group; or W is absent and U represents a carbon-carbon double bond between the group represented by A and the group $-CR^1(OH)-$;

R^1 represents a hydrogen atom or an alkyl group having from 1 to 8 carbon atoms;

R^2 and R^4 are independently selected from the group consisting of hydrogen atoms and alkyl groups having from 1 to 8 carbon atoms;

R^3 represents a hydrogen atom or an alkyl group having from 1 to 10 carbon atoms;

Y^1 and Y^2 are independently selected from the group consisting of hydrogen atoms and hydroxy-protecting groups, said hydroxy-protecting groups being: aliphatic acyl groups having from 1 to 25 carbon atoms; halogenated alkanoyl groups having from 2 to 6 carbon atoms; alkoxyalkanoyl groups in which the alkoxy part has from 1 to 5 carbon atoms and the alkanoyl part has from 2 to 6 carbon atoms; alkenoyl or alkynoyl groups having from 3 to 6 carbon atoms; aromatic acyl groups in which the aryl part has from 6 to 14 ring carbon atoms and is a carbocyclic group, which is unsubstituted or has from 1 to 5 substituents selected from the group consisting of substituents (c), defined below; heterocyclic groups having 5 or 6 ring atoms, of which 1 or 2 are hetero-atoms selected from the group consisting of oxygen, sulfur and nitrogen atoms, which groups may be unsubstituted or may have at least one substituent selected from the group consisting of substituents (c), defined below, and oxygen atoms; tri-substituted silyl groups, in which all three or two or one of the substituents are alkyl groups having from 1 to 5 carbon atoms, and none, one or two of the substituents are aryl groups, as defined above; alkoxyalkyl groups, in which the alkoxy and alkyl parts each have from 1 to 5 carbon atoms; alkoxy-substituted alkoxymethyl groups in which each alkoxy part has from 1 to 5 carbon atoms; halogenated alkoxymethyl groups in which the alkoxy part has from 1 to 5 carbon atoms; halogenated ethyl groups; arylselenyl-substituted ethyl groups, in which the aryl part is as defined above; aralkyl groups in which the alkyl part has from 1 to 5 carbon atoms and the aryl part is a carbocyclic aryl group which has from 6 to 14 ring carbon atoms and which may be unsubstituted or substituted on the aryl part with an alkyl group, an alkoxy group, a nitro group, a halogen atom, a cyano group, or an alkylenedioxy group having from 1 to 3 carbon atoms; alkoxycarbonyl groups having from 2 to 7 carbon atoms and which are unsubstituted or substituted with a halogen atom or a tri-substituted silyl group, as defined above; alkenyloxycarbonyl groups in which the alkenyl part has from 2 to 6 carbon atoms; sulfo groups; and aralkyloxycarbonyl groups, in which the aralkyl part is as defined above;

n is 1, 2 or 3;

said acyl group included in the definition of V is: an unsubstituted aliphatic acyl group which contains from 1 to 6 carbon atoms; a substituted aliphatic acyl group which

contains from 2 to 6 carbon atoms and which is substituted with at least one substituent selected from the group consisting of substituents (b), defined below; an aromatic acyl group in which the aryl part is a carbocyclic aromatic ring which has from 6 to 14 ring carbon atoms and which is unsubstituted or has at least one substituent selected from the group consisting of substituents (c), defined below; or a heterocyclic acyl group having a heterocyclic ring containing 5 or 6 ring atoms, of which 1, 2 or 3 are heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur atoms, the heterocyclic ring being unsubstituted or having at least one substituent selected from the group consisting of substituents (c), defined below, and oxygen atoms;

said substituents (a) are selected from the group consisting of alkoxycarbonyl groups having from 2 to 6 atoms, carboxy groups and carbocyclic aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or have at least one substituent selected from the group consisting of substituents (c), defined below;

said substituents (b) are selected from the group consisting of halogen atoms and alkoxy groups having from 1 to 5 carbon atoms;

said substituents (c) are selected from the group consisting of alkyl groups having from 1 to 5 carbon atoms, alkoxy groups having from 1 to 5 carbon atoms, halogen atoms, halogenated alkyl groups having from 1 to 3 carbon atoms, nitro groups, hydroxy groups, alkoxycarbonyl groups having from 2 to 6 carbon atoms and aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or have at least one substituent selected from the group consisting of substituents (d), defined below; and

said substituents (d) are selected from the group consisting of alkyl groups having from 1 to 5 carbon atoms, alkoxy groups having from 1 to 5 carbon atoms, halogen atoms, halogenated alkyl groups having from 1 to 3 carbon atoms, nitro groups and hydroxy groups;

and salts thereof.

5,143,931

LEUKOTRIENE ANTAGONISTS CONTAINING TETRAZOLYL GROUPS

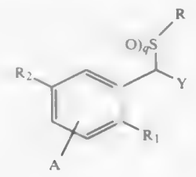
John G. Gleason, Downingtown; Ralph F. Hall, and Irene Uzinskas, both of Villanova, all of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation of Ser. No. 66,592, Jun. 24, 1982, abandoned. This application Dec. 21, 1990, Ser. No. 631,530

Int. Cl.[5] C07D *257/10;* **A61K** *31/41*

U.S. Cl. 514—381 **25 Claims**

1. A compound of formula (I)



wherein

q is 0, 1 or 2;

R_1 is $(L)_a$—$(CH_2)_b$—$(T)_c$—B wherein a is 0 or 1, b is 3 to 14; c is 0 or 1;

L and T are independently oxygen, sulfur or CH_2 with the proviso that L and T are not sulfur when q is 1 or 2; and

B is C_{1-4} alkyl, ethynyl, trifluoromethyl, isopropenyl, furanyl, thienyl, cyclohexyl, or phenyl optionally monsubstituted with Br, Cl, CF_3, C_{1-4} alkyl C_{1-4} alkoxy, methylthio, or thrifluoromethylthio;

R_2 and A are independently selected from the H, CF_3, C_{1-4} alkyl, C_{1-4} alkoxy, F, Cl, Br, I, OH, NO_2 or NH_2; or

R_1 and A are H and R_2 is $(L)_a$—$(CH_2)_b$—$(T)_c$—B wherein a, b, c, L, T, and B are defined above;

Y is $(CHX)_n(CH_2)_p$—Z wherein

R_3 is OH, NH_2, aryloxy or C_{1-6} alkoxy;

n is 0 or 1;

p is 0, 1;

X is H, OH, C_{1-4} alkyl, C_{1-4} alkoxy, or F; and

Z is COR_3;

R is

m is 0 to 6, but m is 1 to 6 when W is imidazole;

R_4 and R_5 are independently hydrogen or C_{1-4} alkyl at any position when m is not 0;

W is tetrazolyl unsubstituted or substituted with one to three

R_4 and R_5 are as defined above;

j is 0 to 6; and

V is hydrogen, C_{1-4} alkyl, COR_3, SO_3H, SO_2H, SO_2NH_2, $COCH_2OH$, $CHOHCH_2OH$, or tetrazolyl, with R_3 as defined above; or

a pharmaceutically acceptable salt thereof.

5,143,932

MICROBICIDAL HALOGENOALLYL-AZOLYL DERIVATIVES

Manfred Jautelat, Burscheid; Klaus Stroech, Solingen; Gerd Hänssler, Leverkusen; Stefan Dutzmann, Hilden; Karl-Heinz Kuck, Langenfeld, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

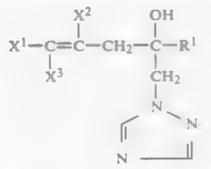
Filed Jan. 25, 1991, Ser. No. 645,951

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003180

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

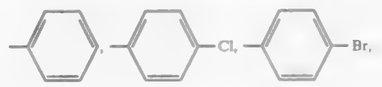
U.S. Cl. 514—383 **9 Claims**

1. A halogenoallyl-azolyl derivative of the formula



in which

R^1 represents a radical of the formula



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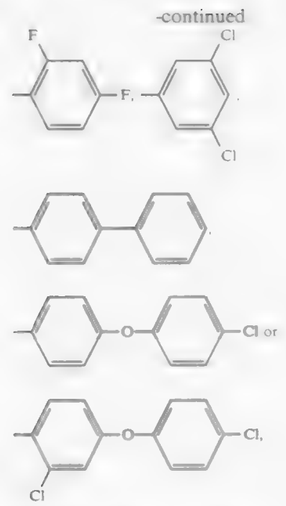


X^1 represents chlorine or bromine,

X^2 represents chlorine or bromine, and

X^3 represents hydrogen, chlorine or bromine, or an addition product thereof with an acid or metal salt.

5,143,933

3-ARYL-5-ALKYLTHIO-4H-1,2,4-TRIAZOLES

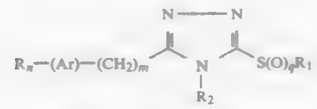
John M. Kane, Cincinnati, and Francis P. Miller, Loveland, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 630,659, Dec. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 463,082, Jan. 10, 1950, Pat. No. 4,981,863, which is a division of Ser. No. 126,191, Dec. 4, 1987, Pat. No. 4,900,743, which is a continuation-in-part of Ser. No. 7,063, Jan. 27, 1987, abandoned. This application Oct. 4, 1991, Ser. No. 770,837

Int. Cl.[5] A61K *31/41;* **C07D** *249/12*

U.S. Cl. 514—384 **9 Claims**

1. A method for the treatment of convulsant seizures to a patient in need thereof which comprises administering a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein

Ar is phenyl or naphthyl;

R_1 is C_{1-6} lower alkyl;

R_2 is hydrogen or C_{1-6} lower alkyl;

R is C_{1-6} lower alkyl, C_{1-6} alkoxy, hydroxy, halogeno or trifluoromethyl, and n is zero, 1 or 2, or R_n—(Ar) is methylenedioxyphenyl: and

each of m and q is zero, 1 or 2.

5,143,934

METHOD AND COMPOSITION FOR CONTROLLED DELIVERY OF BIOLOGICALLY ACTIVE AGENTS

Pia Lading, Gentofte, Denmark; Yvonne Landsholm, Oxie, Sweden, and Tomas Norling, Copenhagen, Denmark, assignors to A/S Dumex (Dumex Ltd.), Copenhagen, Denmark

Filed Oct. 20, 1989, Ser. No. 424,416

Int. Cl.[5] A61K *31/415*

U.S. Cl. 514—396 **25 Claims**

1. A composition for delivery of a biologically active agent to a body site in an animal or human comprising at least one monoglyceride and at least one vegetable oil, in amounts sufficient to form a reverse hexagonal liquid crystalline phase when in contact with an aqueous liquid, and an effective amount of the biologically active agent dispersed therein, said composition being a gel at about room temperature and having a melting point below about body temperature

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5,143,935

BENZAMIDE DERIVATIVES

Hiromichi Fujiwara; Akihiko Ogawa; Hideyo Sakiyama, and Toshiaki Tamura, all of Hyogo, Japan, assignors to Teikoku Chemical Industry Co., Ltd., Osaka, Japan

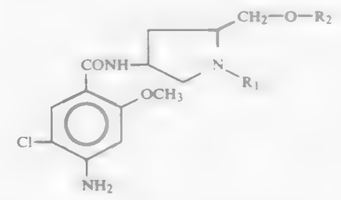
Filed Oct. 16, 1991, Ser. No. 777,011

Claims priority, application Japan, Oct. 16, 1990, 2-277976

Int. Cl.[5] A61K *31/40;* **C07D** *207/04*

U.S. Cl. 514—426 **5 Claims**

1. A benzamide derivative represented by the formula:



in which R_1 is hydrogen atom, lower alkyl, halogen substituted lower alkyl or aralkyl group; R_2 is hydrogen atom or lower alkyl group.

5,143,936

BENZOPYRAN COMPOUND AND ITS PHARMACEUTICAL USE

Tsutomu Yamanaka; Toshio Seki; Toru Nakajima, and Osamu Yaoka, all of Nakatsu, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

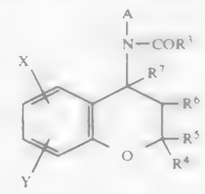
Division of Ser. No. 340,271, Apr. 19, 1989, Pat. No. 5,021,432. This application Mar. 21, 1991, Ser. No. 672,657

Claims priority, application Japan, Apr. 26, 1988, 63-103222; Nov. 1, 1988, 63-278142; Nov. 25, 1988, 63-299190

Int. Cl.[5] A61K *31/44, 31/38;* **C07D** *405/12, 333/32*

U.S. Cl. 514—456 **5 Claims**

1. A benzopyran compound of the formula (I)



(I)

wherein A represents —OR^1 (wherein R^1 represents hydrogen, formyl, an alkanoyl, benzoyl, naphthoyl, phenylalkyl or naphthylalkyl having, as the alkyl moieties, straight- or

branched-chain alkyls having 1 to 4 carbon atoms, or a phenylalkyl or a naphthylalkyl each substituted on the aromatic ring by at least one of halogen, lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl, cyano, nitro and amino; R^3 represents hydrogen, a lower alkyl, a lower alkoxy, amino, a mono- or di-lower alkylamino, an amino-lower alkyl, a hydroxy-lower alkyl, a halo-lower alkyl, a lower alkoxy-lower alkyl, a lower alkoxycarbonyl-lower alkyl, phenyl, naphthyl, or phenyl or naphthyl each substituted on the aromatic ring by at least one of halogen, lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl, cyano, nitro and amino; R^4 and R^5 are the same or different, and respectively represent hydrogen or a lower alkyl, or taken together form an alkylene having 2 to 5 carbon atoms; R^6 represents hydroxyl, formyloxy, an alkanoyloxy, a haloalkanoyloxy, a lower alkoxycarbonyloxy, benzoyloxy, naphthoyloxy, 2-furoyloxy, 3-furoyloxy, nicotinoyloxy, 4-pyridylcarbonyloxy, 2-thenoyloxy, 3-thenoyloxy, carbamoyloxy, a mono- or di-lower alkylcarbamoyloxy and R^7 represents hydrogen, or R^6 and R^7 taken together form a bond and X and Y are the same or different, and respectively represent hydrogen, halogen, nitro, cyano, a lower alkyl, a lower alkoxy, a halo-lower alkyl, carboxyl, formyl, an alkanoyl, benzoyl, naphthoyl, a halo-alkanoyl, carbamoyl, a lower alkylsulfinyl, phenylsulfinyl, naphthylsulfinyl, or phenylsulfinyl or naphthylsulfinyl each substituted on the aromatic ring by at least one of halogen, lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl, cyano, nitro and amino, a lower alkylsulfony, phenylsulfonyl, naphthylsulfonyl, or phenylsulfonyl or naphthysulfonyl each substituted on the aromatic ring by at least one of halogen, lower alkyl, lower alkoxy, hydroxyl, trifluoromethyl, cyano, nitro and amino, sulfonamido or a mono- or di-lower alkyl sulfonamido, or a pharmaceutically acceptable salt thereof.

5,143,937

BENZENESULFONAMIDES AND A PROCESS FOR THEIR PREPARATION

Hans-Jochen Lang, Hofheim am Taunus; Ernold Granzer, Kelkheim, and Bela Kerekjarto, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 480,932

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905075

Int. Cl.[5] C07C *311/39, 311/29;* A61K *31/18*

U.S. Cl. 514—603 **4 Claims**

1. A benzenesulfonamide selected from the group consisting of

5-N-(3,5-di-tert.-butyl-4-hydroxyphenylsulfamoyl)-2-chlorobenzene-N,N-dimethylsulfonamide,

5-N-(3,5-di-tert.-butyl-4-hydroxyphenylsulfamoyl)-2-chlorobenzene-N-methylsulfonamide,

5-N-(3,5-di-tert.-butyl-4-hydroxyphenylsulfamoyl)-2-chlorobenzenesulfonamide, or

3-N-(3,5-di-tert.-butyl-4-hydroxyphenylsulfamoyl)-4-chlorobenzenesulfonamide.

5,143,938

PROPANAMINES, THEIR PHARMACOLOGICAL PROPERTIES AND THEIR APPLICATION FOR THERAPEUTIC IN PARTICULAR ANTIDIARRHEAL, PURPOSES

Alain Calvet, L'Hay-les-Roses; Agnès Grouhel, Meudon; Henri Jacobelli, Paray Vieille Poste; Jean-Louis Junien, Sevres, and Xavier Pascaud, Paris, all of France, assignors to Jouveinal S.A., Paris, France

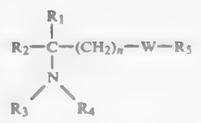
Filed Feb. 26, 1991, Ser. No. 660,873

Claims priority, application France, Feb. 28, 1990, 90 02495

Int. Cl.[5] A61K *31/1.5;* C07C *215/08*

U.S. Cl. 514—653 **7 Claims**

1. A compound which is a propanamine of general formula (I)



(I)

in which:

R_1 is a phenyl radical optionally mono-, di- or trisubstituted in an identical or different manner with halogen atoms or lower alkyl, lower haloalkyl or lower alkoxy radicals,

R_2 is a lower alkyl radical,

R_3 and R_4 are a hydrogen atom or a lower alkyl, lower alkenyl or lower cycloalkylalkyl radical, and are different or identical without, however, both being lower cycloalkylalkyl,

R_5 is a 5- to 7-membered cycloalkyl radical or a phenyl radical, which radicals are optionally mono-, di- or trisubstituted in an identical or different manner with halogen atoms or lower alkyl, lower haloalkyl or lower alkoxy radicals,

and W represents

a group =CH—QH,

or a group =C=Q, in which groups

Q is an oxygen or sulfur atom,

n has the value 2 or 3,

W being =C=Q only when R_3 and R_4 are not both hydrogen, and their additions salts with pharmaceutically acceptable acids.

5,143,939

METHOD OF TREATING SOIL AND AGRICULTURAL CROPS FOR CONTROLLING WORMS AND NEMATODES

Henry A. Browning, Rte. 1, Box 90, Quitman, Ga. 31643

Division of Ser. No. 459,273, Dec. 29, 1989, Pat. No. 5,026,734, which is a continuation-in-part of Ser. No. 297,185, Jan. 12, 1989, abandoned. This application Jun. 21, 1991, Ser. No. 719,015

Int. Cl.[5] A01N *31/14*

U.S. Cl. 514—723 **9 Claims**

1. A method of treating soil and agricultural crops for controlling worm or nematode pests which comprises applying to the infected location thereof a pesticidally effective amount of a composition comprising a liquid carrier and at least one nonionic surfactant represented by the formula:

where

n is from 9–15 and

m is from 3–40.

5,143,940

AMBIPHILE CREAM

Eberhard Nurnberg, Uttenreuth/Weiher; Uwe Leonhardt, Topen; Otto P. Hornstein, Uttenreuth; Gabriele Griessmeyer, Erlangen, and Harald Perschbacher, Bad Homburg von der Hohe, all of Fed. Rep. of Germany, assignors to Stada Arzneimittel AG, Bad Vilbel, Fed. Rep. of Germany

Continuation of Ser. No. 333,388, Mar. 31, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 630,729

Claims priority, application European Pat. Off., Apr. 8, 1988, 88105632

Int. Cl.[5] A61K *47/00*

U.S. Cl. 514—785 **17 Claims**

1. An ambiphilic cream base consisting essentially of:

(a) water, and lipids or lipid-like substances forming a fatty phase.

(b) oil-in-water and water-in-oil emulsifiers, and

(c) glycerol, sorbitol or mixtures thereof,

wherein each of the components is present in an amount effective to provide an ambiphilic cream, and provided that the ambiphilic cream contains no glycerol monostearate or propylene glycol.

13. An ambiphilic cream base consisting essentially of:

(a) water;

(b) isopropyl myristate as a component of a fatty phase;

(c) oil-in-water and water-in-oil emulsifiers; and optionally,

(d) glycerol, sorbitol, or mixtures thereof;

wherein each component is present in an amount effective to provide an ambiphilic cream, and provided that the ambiphilic cream contains no propylene glycol.

5,143,941

ENERGY ABSORBING, WATER BLOWN, RIGID POLYURETHANE FOAM

Richard C. Rossio, Troy; Mark A. Easterle, Rochester, and Jackson, Allen Park, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 634,643, Dec. 27, 1990. This application Nov. 21, 1991, Ser. No. 795,453

Int. Cl.[5] C08J *9/34*

U.S. Cl. 521—51 **8 Claims**

1. A method of preparing an energy absorbing polyurethane foam, comprising;

A) reacting in a closed, preheated, prepared mold a formulation capable of producing a predominantly open-celled energy absorbing foam, comprising;

i) a compound containing isocyanate reactive hydroxyl groups selected from the group consisting of aliphatic glycols, dihydroxy aromatics, bisphenols, hydroxyl terminated polyoxyalkylenes polyols, polyesters, polyacetals, and mixtures thereof,

ii) an organic isocyanate selected from the group consisting of 4,4′-diphenylmethane diisocyanate, mixtures of 4,4′- and 2,4-diphenylmethane diisocyanate, polymethylene polyphenylene polyisocyanate, modified diphenylmethane diisocyanates and mixtures thereof, wherein other organic isocyanates may be present in minor amounts.

iii) a catalyst,

iv) water present in amounts sufficient to act as a blowing agent and a cell opening agent,

v) a surfactant, and

vi) a cross-linker,

B) demolding and curing said article, wherein the cured foam has a molded density of from about 2.0 pcf to about 4.5 pcf and a crush strength which remains constant from about 10 percent to about 70 percent deflection at loads less than 70 psi.

5,143,942

POLYURETHANES

William R. Brown, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 28, 1991, Ser. No. 783,211

Int. Cl.[5] C08G *18/02, 18/18*

U.S. Cl. 521—110 **1 Claim**

1. A process which comprises (a) casting into a mold a reaction mixture at ambient temperature of an admixture of an alkylthio substituted aromatic diamine selected from the class consisting of 3,5-di(methylthio)-2,4-diaminotoluene, 3,5-di(methylthio)-2,6-diaminotoluene, 3 methylthio-2,6-diaminotoluene and 1,3,5-triethylthio-2,6 diaminotoluene and admixtures as the sole diamines used in the process, at least one polyol selected from the group consisting of polyalkylene ether polyol, polymer polyol or mixtures thereof, water, a cell stabilizer consisting of one glycol amine selected from the group consisting of monoethanol amine and diethanol amine, an organosilicone stabilizer and reaction promotors with an isocyanate terminated component having a free isocyanate content by weight of from about 0.1 to about 50%; and (b) curing the reaction mixture in the mold at temperatures of about 77–302° F. (25–150° C.) to form a polyurethane-urea foam and removing the polyurethane-urea foam from the mold.

5,143,943

SYNERGISTIC STABILIZER COMPOSITIONS FOR POLYOLS AND POLYURETHANE FOAM

Richard A. Suhoza; Bruce R. Garney, both of Norwalk, and Robert B. Lander, Fairfield, all of Conn., assignors to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

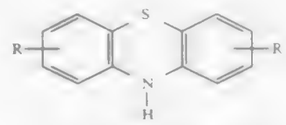
Filed Feb. 18, 1992, Ser. No. 836,486

Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—115 **1 Claim**

1. In the preparation of polyurethane foams by reacting a polyether polyol and polyisocyanate, the improved method of reducing discoloration due to scorch of polyurethane foams comprising the steps of (i) adding to the polyol about 0.01 to 5.0 percent by weight of a liquid stabilizer composition consisting of (a) 2,6-di-tert-butyl-4-sec-butyl phenol, (b) a reaction product of diisobutylene, styrene and diphenylamine wherein the weight ratio of diisobutylene to styrene ranges from about 2:1 to 5:1 and the mole ratio of the mixture of diisobutylene and styrene to diphenylamine ranges from about 1.3:1 to 2:1 and

(c) phenothiazine compound of the formula



wherein each R is independently hydrogen or and alkyl group having 9 to 26 carbon atoms and wherein the ratio of the phenol compound to the reaction product is about 1:5 to 5:1 and the ratio of the mixture of components (a) and (b) to the phenothiazine compound is about 5.0:0.1 to 4.0:1.0, (ii) stirring the polyol and stabilizer mixture at ambient temperature and (iii) curing in the presence of a reaction catalyst and foaming agent.

5,143,944

3-QUINUCLIDINOL CATALYST COMPOSITIONS FOR MAKING POLYURETHANE FOAMS

Ann C. L. Savoca, Sinking Spring, and Mark L. Listemann, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 30, 1992, Ser. No. 828,433

Int. Cl.[5] C08J *9/00;* C07D *251/32;* C08G *18/08*

U.S. Cl. 521—129 **4 Claims**

1. In a method for preparing a polyurethane foam which comprises reacting an organic polyisocyanate and a polyol in the presence of a blowing agent, a cell stabilizer and a catalyst, the improvement which comprises employing a catalyst composition consisting essentially of 3-quinuclidinol.

5,143,945

CARBOXYLIC ACID MODIFIED CARBON DIOXIDE CO-BLOWN POLYURETHANE-POLYISOCYANURATE FOAMS

Thomas W. Bodnar, Macungie, Pa.; Leslie A. Cole, New Haven, Conn., and Shenghong A. Dai, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 382,527, Jul. 19, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 612,723

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—130 **20 Claims**

1. A closed cell rigid polyurethane-polyisocyanurate foam

prepared by bringing together under foam forming conditions a mixture comprising (a) an organic polyisocyanate; (b) a polyol; (c) a blowing agent mixture comprising (i) a halocarbon blowing agent and (ii) an organic carboxylic acid wherein said carboxylic acid group is attached to a non-aromatic carbon atom and wherein the proportion of equivalents of said carboxylic acid to the total equivalents of tertiary amine present in the reaction mixture is at least about 1.2:1; and (d) a trimerization catalyst.

5,143,946

PROCESS AND APPARATUS FOR THE PRODUCTION OF A FLOWABLE REACTION MIXTURE FROM AT LEAST TWO FLOWABLE REACTIVE COMPONENTS

Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Königswinter; Ferdinand Althausen, Neunkirchen; Helmut Duschanek, Königswinter, and Reiner Raffel, Siegburg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Jan. 31, 1992, Ser. No. 830,164

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1991, 4103532

Int. Cl.[5] C08G 18/00

U.S. Cl. 521—155 **3 Claims**

1. A process for the production of a flowable reaction mixture from at least two flowable reactive components which react with one another to form a solid or a foam material, comprising injecting the reactive components into a mixing zone where said components are mixed in a continuous flow, throttling the mixture stream issuing from the mixing zone, dividing the throttled mixture into two sub-streams which flow around a piston and which recombine opposite the division point and form a sink stream (negative source stream) at right angles to themselves.

5,143,947

RADIATION CURABLE COMPOSITION BASED ON 4-HYDROXYSTYRENE COPOLYMERS

Balaram Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 13, 1989, Ser. No. 435,891

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] C08F 2/50, 2. 7/00, 12/24, 22/28

U.S. Cl. 522—121 **13 Claims**

1. A radiation curable composition consisting essentially of a blend of (A) about 30 to about 80 weight percent of a copolymer of 4-hydroxystyrene and another monomer which is an alkadiene or an allyl ester of an ethylenically unsaturated acid; (B) about 20 to about 70 weight percent of a polyethylenically unsaturated radiation polymerizable compound; (C) about 0 to about 40 weight percent of a monoethylenically unsaturated radiation polymerizable monomer, wherein the weight percents are based on the total weight of (A), (B) and (C); (D) an optional photoinitiator and optional photoactivator, wherein the copolymer contains about 10 to about 90 mole percent 4-hydroxystyrene and about 90 to about 10 weight percent other monomer.

5,143,948

SEMICONDUCTOR ELEMENT PROTECTING COMPOSITIONS

Hiroshige Okinoshima, Annaka and Hideto Kato, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1990, Ser. No. 561,865

Claims priority, application Japan, Aug. 2, 1989, 1-201005

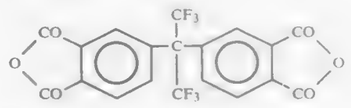
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.[5] C08K 9/06

U.S. Cl. 523—212 **15 Claims**

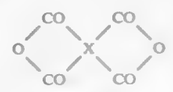
1. A semiconductor element protecting composition comprising a polyimide resin, a solvent therefor, and finely divided silica, wherein said polyimide resin is prepared by polymerizing

(A) a tetracarboxylic acid dianhydride component consisting essentially of 10 to 50 mol % of the acid dianhydride of the structural formula:



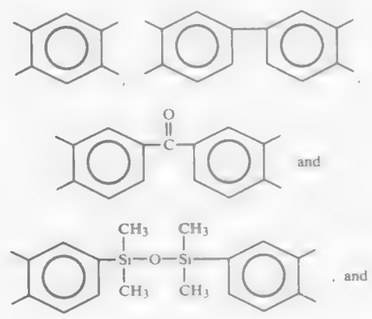
(1)

and 90 to 50 mol % of an acid dianhydride of the structural formula:



(2)

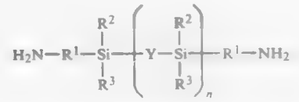
wherein X is a tetravalent organic group selected from the class consisting of



and

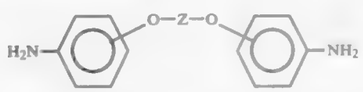
, and

(B) a diamine component consisting essentially of 10 to 80 mol % of a silicon diamine of the structural formula:



(3)

wherein R^1 is a divalent organic group having 1 to 18 carbon atoms, R^2 and R^3 are independently selected from substituted or unsubstituted monovalent hydrocarbon groups having 1 to 10 carbon atoms, Y is an oxygen atom or a divalent hydrocarbon group having 1 to 10 carbon atoms, and letter n is an integer of from 1 to 100, and 90 to 20 mol % of an ether diamine of the formula:



(4)

wherein Z is a divalent organic group having 6 to 18 carbon atoms containing an aromatic ring, with the proviso that diamine component (B) consists essentially of 5 to 100 mol % of the silicon diamine and (3) and 95 to 0 mol % of the ether diamine of formula (4) when Y in formula (3) is an oxygen atom.

5,143,949

AQUEOUS BASED, STRIPPABLE COATING COMPOSITION AND METHOD

George W. Grogan, and Robert H. Boyd, both of Dallas, Tex., assignors to Groco Specialty Coatings Company, Dallas, Tex.

Continuation of Ser. No. 523,228, May 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 299,632, Jan. 23, 1989, abandoned. This application Dec. 2, 1991, Ser. No. 800,694

Int. Cl.[5] C08L 19/02, 29/04, 1/28

U.S. Cl. 523—334 **2 Claims**

1. A clear, strippable coating composition applied as a film which when dried has a thickness in the range from about 1.5 to 5.0 mils, the strippable coating composition, comprising:

a blend of non-volatile components comprising about 41–71% by weight of the coating composition, including:

about 34–54% by weight polyvinyl acetate emulsion;

about 7–15% by weight of a release agent selected from the group consisting of paraffin wax emulsion, polyvinyl alcohol and mixtures thereof;

about 0.1–0.6% by weight non-ionic surfactant as a wetting aid;

about 0.1–0.6% by weight defoamer;

about 0.1–0.8% by weight dispersing aid; and

about 1–5% by weight thickener;

the strippable coating composition also comprising about 29–59% by weight of the coating composition of volatile components, including:

about 0.1–2.5% by weight plasticizer the plasticizer component being selected from the group consisting of glycerine, dibutylphthalate and 2,2,4-trimethyl-1,3-pentanediol monoisobutyrate;

about 28.9–56.5% by weight water;

the strippable coating composition being characterized as drying to form a clear film which is strippable for up to one year by water spray.

5,143,950

POWER COATING OF EPOXY RESIN MIXTURE AND POLYVINYL BUTYRAL OR FORMAL RESIN

Katugi Kitagawa, Saitama, and Akira Shinozuka, Chiba, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Continuation of Ser. No. 229,412, Aug. 8, 1988, abandoned. This application Oct. 18, 1990, Ser. No. 600,288

Claims priority, application Japan, Feb. 7, 1987, 62-26771

Int. Cl.[5] C08K 3/26, 3/36, 3/22, 3/40

U.S. Cl. 523—429 **13 Claims**

1. An epoxy resin powder coating composition which comprises 100 parts by weight of bisphenol A mixed epoxy resin having a number average molecular weight from 2,200 to 4,000 and comprising (A) a first bisphenol A epoxy resin having a number average molecular weight from 2,700 to 6,500, (B) second bisphenol A epoxy resin having a number average molecular weight from 300 to 500, (C) a novolak epoxy resin, 6 to 15 parts by weight of polyvinyl butyral resin or polyvinyl formal resin, a hardener, and a filler, wherein the content of said novolak epoxy resin is from 10 to 30% by weight of said mixed epoxy resin.

5,143,951

EPOXY RESIN COMPOSITION FOR SEMICONDUCTOR SEALING

Ken Ohta; Wataru Kosaka, and Kenichi Yanagisawa, all of Utsunomiya, Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Oct. 25, 1990, Ser. No. 603,076

Claims priority, application Japan, Nov. 22, 1989, 1-301973; Nov. 22, 1989, 1-301974; Nov. 22, 1989, 1-301975; Nov. 30, 1989, 1-309303; Feb. 22, 1990, 2-039603

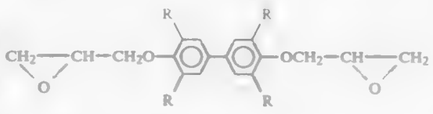
Int. Cl.[5] C08F 283/10, 283/12; C08G 77/38, 77/04

U.S. Cl. 523—435 **22 Claims**

1. An epoxy resin composition for semiconductor sealing, comprising an essential components:

(A) an epoxy resin comprising 30–100% by weight, based on the total amount of the epoxy resin, of at least one epoxy compound selected from the group consisting of naphthalene epoxy compounds represented by the following formula and biphenyl epoxy compounds represented by the following formula:

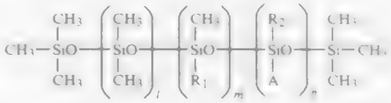
[III]



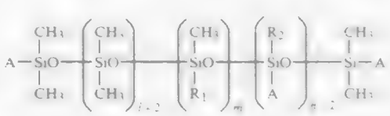
[IV]

wherein R is H or CH_3,

(B) a phenolic resin curing agent comprising 30–100% by weight, based on the total amount of the phenolic resin curing agent, of a silicone-modified phenolic resin curing agent obtained by reacting a phenolic resin with at least one of silicone compounds represented by the following formulas and:

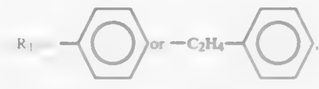


[I]

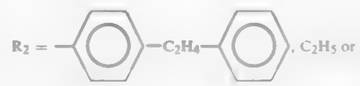


[II]

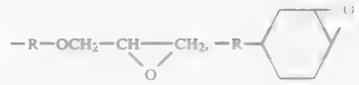
wherein



or



A is —R—COOH,



or H,

R is a lower alkylene group,

$10 \leqq N = 1+m+n+2 \leqq 200$,

$0 \leqq m/N \leqq 0.1$, and $5 \leqq N/n \leqq 50$,

(C) 70–90% by weight of an inorganic filler based on the total weight of the composition, and

(D) a curing accelerator.

5,143,952

PROCESS FOR THE PRODUCTION OF CEMENT-SYNTHETIC POLYMER COMPOSITE MOLDED BODIES

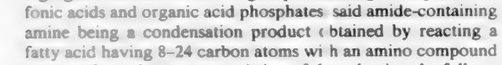
Takasi Sabeki; Hideaki Matsuda, both of Marugame; Kinya Yokota, Shiga, and Tominobu Mayuzumi, Ootsu, all of Japan, assignors to Okura Industrial Co., Ltd. and Dai-Ichi Kogyo Seiyaku Co., Ltd., both of, Japan

Filed Sep. 27, 1991, Ser. No. 766,180

Int. Cl.[5] **C08J** *5/14*

U.S. Cl. 524—5 **3 Claims**

1. A process for the production of a composite, molded article, wherein a water in oil emulsion containing a vinyl monomer, water, a cement, a polymerization initiator and an emulsifier is molded and the resulting molded body is hardened by polymerizing said vinyl monomer while hardening said cement, characterized in that said emulsifier includes a neutralization product of an amide-containing amine with a neutralizing agent selected from the group consisting of organic sulfonic acids and organic acid phosphates said amide-containing amine being a condensation product obtained by reacting a fatty acid having 8–24 carbon atoms with an amino compound selected from the group consisting of those having the following general formulas (I) and (II):



(I)

(II)

wherein R^1, R^2, R^3 each represent, independently from each other, hydrogen, an alkyl group having 1–24 carbon atoms or an alkenyl group having 1–24 carbon atoms, x is an integer of 1–4, y is an integer of 1–8 and z is an integer of 1–4.

5,143,953

N-ALKYL MALEIMIDE THERMAL STABILIZERS FOR VINYL HALIDE POLYMERS

Naser Pourahmady, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 28, 1990, Ser. No. 635,042

Int. Cl.[5] **C07D** *207/27, 207/267, 405/04;* **C07K** *5/3415*

U.S. Cl. 524—104 **35 Claims**

1. A composition exhibiting improved dynamic thermal stability, wherein said compound comprises in the substantial absence of an added free radical generator a vinyl or vinylidene halide polymer, and a N-substituted maleimide containing one maleimide unit, said maleimide is selected from the group consisting of N-(C_1 to C_{12}) maleimides, N-aralkyl maleimides having 1 to 12 carbon atoms in the N-alkyl portion, N-(C_4 to C_{26}) cycloaliphatic maleimides, N-(C_2 to C_{30}) oxyalkyl ether maleimides, and N-(C_2 to C_{10}) oxyheterocyclic maleimides.

5,143,954

LOW-FORMALDEHYDE, SELF-CROSSLINKING POLYMER LATEX COMPOSITION

Thomas W. Hutton, Doylestown, and Donald W. Novak, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 27, 1990, Ser. No. 618,759

Int. Cl.[5] **C08K** *5/34, 5/16, 5/11, 5/10*

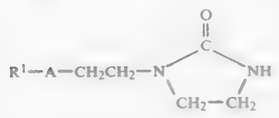
U.S. Cl. 524—106 **10 Claims**

1. A low-formaldehyde polymer latex composition, the composition comprising:

at leat one polymer latex, and

at least one formaldehyde-scavenging agent selected from

a) a compound having the formula



wherein A is selected from O, NH, and NR^2; R^1 is selected from H, 3-allyloxy-2-hydroxypropyl, methacryloyl, acryloyl and methacryloxyaceto; and R^2 is 3-allyloxy-2-hydroxypropyl when R′ is 3-allyoxy-2-hydroxypropyl;

b) a compound having the formula $R^3CH_2R^4$, wherein

R^3 and R^4 are both $—C(O)OR^5$;

R^3 is $CH_3C(O)—$ and R^4 is $—C(O)OR^5$;

R^3 is —CN and R^4 is selected from $—C(O)NH_2$ and $—C(O)OR^5$; or

R^3 is $CH_3C(O)—$ and R^4 is $—C(O)OCH_2CH_2OC(O)C(CH_3)=CH_2$; and

R^5 is a C_1–C_6 hydrocarbon radical;

c) a compound having the formula

$$NCCH_2C(O)OCH_2—CH—(CH_2CH_2OC(O)CH_2CN)_2;$$

d) hydroxylamine;

e) salts of hydroxylamine with an acid, the acid having an acid dissociation constant the negative logarithm of which is no greater than about 5.0; and

f) the polymerized residue of a compound having the formula

wherein A is selected from O, NH, and NR^2; R^6 is selected from 3-allyloxy-2-hydroxypropyl, methacryloyl, acryloyl or methacryloxyaceto; and R^2 is 3-allyloxy-2-hydroxypropyl when R′ is 3-allyoxy-2-hydroxypropyl; and

g) the polymerized residue of a compound having the formula

$$CH_3C(O)—CH_2—C(O)OCH_2CH_2OC(O)C(CH_3)=CH_2.$$

5,143,955

POLYPHENYLENE ETHER-HIGH IMPACT POLYSTYRENE BLENDS HAVING IMPROVED FLAMMABILITY PERFORMANCE

Ronald Kendall, deceased, late of NL Voorhout, Netherlands by Karen Kendall, executrix ; Ronald H. Place, Vincent, Ohio, and Renate I. Warren, Coolville, Ohio, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 82,337, Aug. 6, 1987, abandoned. This application May 28, 1991, Ser. No. 706,444

Int. Cl.[5] **C08K** *5/03, 5/51, 71/12*

U.S. Cl. 524—151 **17 Claims**

1. A polymer blend composition having improved flammability performance comprising:

(a) a polyphenylene ether resin;

(b) a high impact polystyrene resin wherein the polystyrene resin has a weight average molecular weight, Mw, of about 250,000 or less;

(c) a flame retardant; and

(d) a high molecular weight polystyrene resin having a

weight average molecular weight, Mw, greater than about 600,000, and comprising a polystyrene homopolymer or a polystyrene copolymer formed from 0.1 to 0.7 weight percent of a nonstyrene di- or tri-functional monomer which provides a branched structure in the copolymer, said high molecular weight polystyrene resin being included in an amount sufficient to provide the blend composition with improved flammability performance.

5,143,956

FREE-FLOWING POLYAMIDE MOLDING COMPOUNDS

Harald Pielartzik; Hans-Detlef Heinz; Rolf Dhein, all of Krefeld, and Aziz E. Sayed, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 19, 1991, Ser. No. 656,680

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 4006404

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

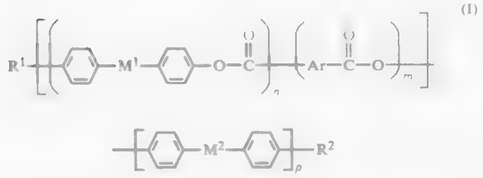
Int. Cl.[5] **C08K** *5/20, 5/17, 5/10*

U.S. Cl. 524—219 **16 Claims**

1. Free-flowing polyamide molding composition comprising a mixture of

i) 85 to 99.9% by weight polyamides and

ii) 0.1 to 15% by weight low molecular weight, liquid-crystalline hydroxyl esters and/or ester amides corresponding to formula (I)



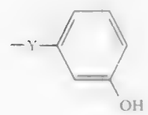
(I)

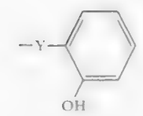
in which

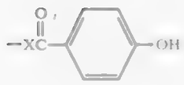
—Ar is a C_{6-20} aromatic radical which is mononuclear or polynuclear wherein the polynuclear radical is either attached by a bond or fused,

R^1 and R^2 is the same or different and each represents a group of the formula (III)–(XI)

(III)







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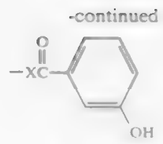

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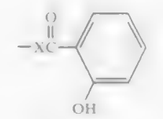

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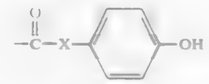
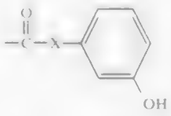
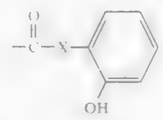


(IX)



(X)



(XI)

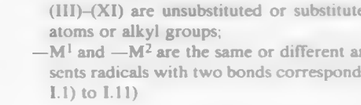
wherein

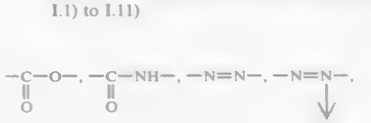
Y is a chemical bond, a difunctional C_{1-10} hydrocarbon radical or an $—SO_2$ group;

X is O or NH; and wherein the aromatic rings in formulae (III)–(XI) are unsubstituted or substituted by halogen atoms or alkyl groups;

$—M^1$ and $—M^2$ are the same or different and each represents radicals with two bonds corresponding to formula I.1) to I.11)

(I.1) to (I.11)





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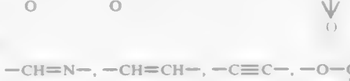


m is 0, 1 or 2,

n is 1 or 2,

(V) o is 1, 2, 3 or 4 and

p is 0 or 1,

and/or

liquid-crystalline oligomeric easters and/or easter amides corresponding to formula (II) with statistical distribution of the structural units

(VI)

-continued

$$[-NH-R^5-Y'\frac{}{}_{e} +R^3]$$

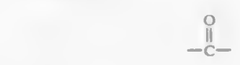
in which

Ar^a is a difunctional, unsubstituted or substituted mononuclear or polynuclear aromatic radical containing 6 to 24 carbon atoms which polynuclear radical is directly bonded or even fused;

Ar^b is a difunctional, unsubstituted or substituted, mononuclear or polynuclear aromatic radical containing 6 to 30 carbon atoms;

R^4 and R^5 represent alkyl wherein R^4 contains 0 to 40 carbon atoms and R^5 contains 3 to 40 carbon atoms or both R^4 and R^5 together represent a cycloaliphatic radical containing 5 to 15 carbon atoms or an unsubstituted, difunctional, mononuclear or polynuclear aromatic radical containing 6 to 24 carbon atoms;

Y' represents —O—,



or —NH—,

b is 0 to 10;

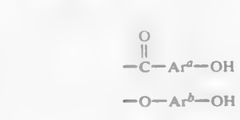
c is 1 to 9;

d is 0 to 9;

e is 0 to 3

and in which

R_3, depending on its attachment to the other units, represents substituents corresponding to formulae (XII)–(XIV)



(XII)

$$-O-Ar^b-OH \quad \text{(XIII)}$$

$$-NH-R^5-OH \quad \text{(XIV)}$$

where the symbols are as defined above and wherein the average molecular Mn of the units corresponding to formula (II) being no greater than 4,000 and, optionally,

iii) from 0.001 to 150% by weight, based on the total weight of components i) and ii), of conventional additives.

5,143,957

SOLID GOLF BALLS REINFORCED WITH ANHYDROUS METAL SALTS OF ALPHA, BETA-ETHYLENICALLY UNSATURATED CARBOXYLIC ACIDS

Takatsugu Hashimoto, Tokyo; Yoshinori Egashira, Iruma, and Takeshi Kinoshita, Tokorozawa City, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,080

Int. Cl.[5] C08K *5/09;* **A63B** *37/06*

U.S. Cl. 524—397 **12 Claims**

1. A solid golf ball, exhibiting improved hardness, durability and velocity, comprising:

a vulcanizable rubber selected from the group consisting of natural rubber, synthetic rubber and mixtures thereof; and

from about 5 to 100 parts by weight of a reinforcing filler comprising an essentially anhydrous metal salt of an α,β-ethylenically unsaturated carboxylic acid per 100 parts of said vulcanizable rubber, said salt having a crystalline structure consisting essentially of plates and fibers.

5,143,958

GELLABLE AQUEOUS COMPOSITION AND ITS USE IN ENHANCED PETROLEUM

Thomas P. Lockhart, San Donato Milanese, and Giovanni Burrafato, Tavazzano, both of Italy, assignors to Eniricerche S.p.A. and Agip S.p.A., Milan, Italy

Filed Mar. 27, 1990, Ser. No. 499,682

Claims priority, application Italy, Mar. 31, 1989, 19970 A/89

Int. Cl.[5] C09K *7/02*

U.S. Cl. 524—219 **13 Claims**

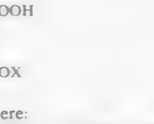
1. A gellable aqueous composition for reducing the permeability of high-permeability zones in an oil reservoir, comprising:

a) water;

b) a high-molecular weight natural or synthetic water-soluble polymer cross-linkable by means of Cr^{3+} ions;

c) a water-soluble inorganic Cr^{3+} salt;

d) a gelation-retardant organic ligand definable by the formula:



I

where:

R is a direct single bond, or a saturated or unsaturated linear or branched aliphatic hydrocarbon radical with from 1 to 6 carbon atoms, or a cycloalkyl radical with from 3 to 7 carbon atoms, or an aryl radical;

X is NR″R‴ (where R″ and R‴, which may be equal or different, are H or an alkyl radical with from 1 to 5 carbon atoms);

and relative water-soluble salts;

the polymer b) being present in a concentration of between 1000 and 50,000 ppm (ppm = parts per million by weight); the salt c) being present in a concentration of between 10 and 5000 ppm evaluated as metal; the polymer/Cr^{3+} weight ratio varying from 1:1 to 1000:1; the organic ligand/Cr^{3+} molar ratio varying from 0.5 to 500:1; the composition having a pH equal to or less than about 7.0.

5,143,959

COMPOSITIONS FOR USE WITH CHLORINATED POLYMERS

Louis Carette, Issy Les Moulineaux, and Gerard Velleret, Paris, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 19, 1991, Ser. No. 687,518

Claims priority, application France, Apr. 20, 1990, 90 05295

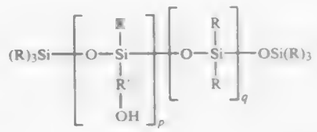
Int. Cl.[5] C08J *3/20;* **C08K** *5/54;* **C08L** *83/06*

U.S. Cl. 524—267 **22 Claims**

1. A composition comprising:

a) dawsonite, hydrotalcite, or a mixture thereof,

b) a (γ-hydroxyalkyl)polyorganosiloxane oil of general formula (I)



(I)

wherein,

R, which may be the same or different, represent a methyl or phenyl radical, with at least 60 mol% of R being methyl radicals,

R′ represents a linear or branched alkylene radical having 2 to 6 carbon atoms,

p represents an average number from 1 to 30, and

q represents an average number from 1 to 100,

c) an organic zinc compound, and

d) an organic calcium, magnesium, barium or lanthanide compound, or a mixture thereof.

5,143,960

MODIFIED ETHYLENE COPOLYMER

Akitaka Senuma, Yokohama; Toshiyuki Nagai, Ayase; Kiroku Tsukada, and Akio Hayashi, both of Yokohama, all of Japan, assignors to Nippon Unicar Company Limited, Danbury, Conn.

Filed Sep. 12, 1989, Ser. No. 406,287

Int. Cl.[5] C08F *255/02, 261/02, 222/40;* **B32B** *27/28*

U.S. Cl. 525—282 **9 Claims**

1. A composition comprising (i) a copolymer of (a) ethylene; (b) one or more polar unsaturated compounds selected from the group consisting of alcohols each having one OH group; acids, each having one COOH group; and esters, each of which, is the reaction product of an alcohol having one OH group and an acid having one COOH group; and (c) an N-substituted maleimide or (ii) a copolymer of (a) ethylene and (b) one or more polar unsaturated compounds as defined above grafted with (c) an N-substituted maleimide wherein the comonomers (a), (b) and (c) are present in the copolymer in about the following proportions based on the weight of the copolymer:

	Comonomer	Percent by weight
(a)	ethylene	70 to 94
(b)	polar unsaturated compound	5 to 30
(c)	N-substituted maleimide	0.01 to 10

5,143,961

HOT MELT ADHESIVE COMPRISING WATER SOLUBLE POLYALKYLOXAZOLINE AND WATER INSOLUBLE POLYMER

Steven L. Scholl, Cottage Grove; Eugene R. Simmons, Maplewood; Keith C. Knutson, Columbia Heights, and William L. Bunnelle, Stillwater, all of Minn., assignors to H. B. Fuller Licensing & Financing Inc., Wilmington, Del.

Continuation of Ser. No. 67,706, Jun. 29, 1987, abandoned. This application Dec. 21, 1989, Ser. No. 455,917

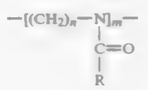
Int. Cl.[5] C08L *79/00, 53/00;* **C08K** *5/04*

U.S. Cl. 524—317 **22 Claims**

1. An aqueous alkali dispersible hot melt adhesive composition comprising:

(a) about 10–30 wt % of a thermoplastic aqueous insoluble polymer having a molecular weight of about 10,000 to 200,000, a glass transition temperature of about −90° to 100° C. and a melt index of about 11 to 125 (g/10 minutes @190° C.) wherein said thermoplastic aqueous insoluble polymer is present in a concentration less than that necessary to form a nondispersible elastic;

(b) about 1–75 wt % of an N-substituted polyalkyleneimine of the formula:



wherein n is about 2–3, m is about 100–10,000, and R is a C_{1-3} alkyl group;

(c) about 2–90 wt % of a functional diluent selected from the group consisting of an acid functional organic compound having an acid number of at least 75 and a hydroxy substituted organic compound having a hydroxyl number of 150 or greater; and

(d) about 0–60 wt % of a compatible plasticizer or tackifier.

5,143,962

METHOD OF GRANULATING RESORCINOL/SILICA MIXTURES, THE GRANULATES OBTAINED IN THIS MANNER AND THEIR USE

Siegfried Wolff, Bornheim-Mertin; Udo Görl, Meckenheim, and Karl Meier, Alfter, all of Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany

Filed Mar. 28, 1991, Ser. No. 676,337

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013258

Int. Cl.[5] C08K *5/13, 3/36;* **C08L** *61/12*

U.S. Cl. 524—346 **6 Claims**

1. A method of granulating resorcinol/silica mixtures which comprises transporting a mixture of 5 to 95 % by weight resorcinol and 5 to 95 % by weight precipitated silica by conveyor worms to two pressing rollers whose shafts are attached vertically above one another and whose contact pressure can be varied, compacting said mixture between said rollers, breaking up the compacted mixture with a cake breaker to obtain a granulate with maximum grain size and separating the remaining dusty portion of said mixture.

5,143,963

THERMOPLASTIC POLYMERS WITH DISPERSED FLUOROCARBON ADDITIVES

Robert E. Sterling, Homosassa Spg, and Eugene P. Goldberg, Gainesville, both of Fla., assignors to RES Development Corp., Lecanto, Fla.

Continuation of Ser. No. 446,675, Dec. 6, 1989, abandoned. This application Jan. 9, 1991, Ser. No. 639,232

Int. Cl.[5] C08K *5/06*

U.S. Cl. 524—366 **14 Claims**

1. A composition of matter consisting essentially of a thermoplastic polymer and a perfluorinated hydrocarbon-polyether additive formed by melt-blending said thermoplastic polymer and from about 0.01% to less than 1%, by weight, of said perfluorinated hydrocarbon-polyether additive selected from the group consisting of an oil, gum, grease and mixtures thereof, said additive having a lower surface energy than that of said polymer; said blending resulting in a substantially homogeneous admixture of said polymer and said additive; said admixture, upon cooling, resulting in a solid thermoplastic composition wherein the concentration of said additive through a cross-section of said solid thermoplastic composition is lower in the interior thereof and higher at the surfaces thereof.

5,143,964

ANTISHRINKING UNSATURATED POLYESTER RESIN COMPOSITION

Gilles Behar, Saint Aubin; Jean-Claude Oginski, Labourse, and Alain Martinet, Saint Nicholas Lez Arras, all of France, assignors to Cray Valley SA, Puteaux, France

Filed Apr. 5, 1991, Ser. No. 681,008

Claims priority, application France, Apr. 5, 1990, 90 04354

Int. Cl.[5] C08K *5/09*

U.S. Cl. 524—400 **18 Claims**

1. A moldable unsaturated polyester resin composition comprising an unsaturated polyester resin/styrene mixture, fillers, glass fibers, an antishrinkage agent and a demolding agent, wherein said demolding agent is calcium montanate.

5,143,965

MAGNESIUM HYDROXIDE HAVING FINE, PLATE-LIKE CRYSTALLINE STRUCTURE AND PROCESS THEREFOR

Steven F. Mertz, Ludington, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 26, 1990, Ser. No. 633,818

Int. Cl.[5] C09C *1/02;* **C01F** *5/08;* **C08K** *3/10*

U.S. Cl. 524—436 **10 Claims**

1. A process for the production of a magnesium hydroxide having a particulate, crystalline structure characterized predominantly as having a fine, plate-like form and a median particle size of about 0.7 micron to about 1 micron, a unit layer

thickness of 30 to 200 Angstroms and a particle size distribution in which 80% of said particles are within about 0.3 to about 1.4 microns comprising:

(A) mixing by ultrasonic mixing means at ambient pressure and ambient or elevated temperature an aqueous alkaline material reactant selected from the group consisting of an amine, an alkaline earth metal hydroxide, and an alkali metal hydroxide and an aqueous magnesium containing salt reactant to produce an aqueous reactant mixture which comprises about 20 to about 70% by weight of a mixture of reactants comprising said alkaline material and a magnesium containing salt and

(B) post heat treating said aqueous reactant mixture at ambient pressure to precipitate said magnesium hydroxide.

8. Solid particles of magnesium hydroxide produced by the process of claim 1 and coated with an anionic surface active agent, said magnesium hydroxide having a particulate, crystalline structure characterized predominantly as fine, plate-like

form, a unit layer thickness of 30 to 200 Angstroms, a median particle size of up to about 0.7 micron, and a particle size distribution in which about 80% of said particles are within about 0.3 to about 1.4 microns.

9. A thermoplastic synthetic resin composition containing magnesium hydroxide produced by the process of claim 1 and, coated or uncoated with an anionic surface active agent, said magnesium hydroxide having a particulate, crystalline structure characterized predominantly as fine, plate-like form, a unit layer thickness of 30 to 200 Angstroms, having a median particle size of up to about 1 micron, and a particle size distribution in which 80% of said particles are within about 0.3 to about 1.4 microns.

5,143,966

VINYL ACETATE/ETHYLENE COPOLYMER EMULSIONS HAVING IMPROVED WET TACK PROPERTIES

Hsueh-Chi Lee, and William E. Tenney, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 7, 1990, Ser. No. 609,960

Int. Cl.[5] C08F *2/30, 18/08;* **C08L** *31/04, 29/04*

U.S. Cl. 524—459 **9 Claims**

1. In a vinyl acetate-ethylene copolymer emulsion prepared by the aqueous emulsion copolymerization of vinyl acetate and ethylene in the presence of a polyvinyl alcohol stabilizing system, the improvement which comprises a vinyl acetate-ethylene copolymer emulsion prepared in the presence of 3.5 to 6 wt % of a stabilizing system consisting essentially of:

(a) 0.2 to 1.5 wt % low molecular weight, partially hydrolyzed polyvinyl alcohol,

(b) 0.5 to 2.5 wt % medium molecular weight, partially hydrolyzed polyvinyl alcohol, and

(c) 1 to 4 wt % medium molecular weight, fully hydrolyzed polyvinyl alcohol and/or high molecular weight, fully hydrolyzed polyvinyl alcohol,

the weight percentages based on vinyl acetate monomer.

5,143,967

FREQUENCY SENSITIVE CONDUCTIVE RUBBER COMPOSITION

Ram M. Krishnan, Stow, and Chia-Li Sun, Hudson, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 27, 1991, Ser. No. 675,842

Int. Cl.[5] C08K *3/04*

U.S. Cl. 524—496 **2 Claims**

1. A sulfur cured rubber composition characterized by exhibiting a substantially linear, positively sloped, curve of log conductivity ($ohm^{-1}cm^{-1}$) versus applied pressure to the said rubber composition for an applied sinusoidal electrical energy having a frequency in the range of about 10 Hz to about 500 kHz; wherein said rubber composition is comprised of (1) 100 parts by weight natural rubber of grade SMR 5CV purity or better, and, homogeneously dispersed therein, (2) about 30 to about 45 parts by weight of at least one carbon black having a surface area characterized by an iodine absorption number in a range of about 220 to about 300 a relatively high structure characterized by a dibutylphathalate value in a range of about 150 to about 210 and a particle size of an average in the range of about 20 to about 50 nanometers.

5,143,968

POLYSTYRENE-POLYISOPRENE-POLYSTYRENE BLOCK COPOLYMERS, HOT MELT ADHESIVE COMPOSITIONS, AND ARTICLES PRODUCED THEREFROM

Charles F. Diehl; Jean M. Tancrede, and Michael O. Myers, all of Baton Rouge, La., assignors to The Dow Chemical Company and Exxon Chemical Patents, Inc., Midland, Mich.

Filed Aug. 11, 1989, Ser. No. 393,545

Int. Cl.[5] C08L *9/06*

U.S. Cl. 524—534 **7 Claims**

1. A hot melt adhesive composition useful in bonding a polyethylene or polypropylene substrate to a tissue, or nonwoven article at temperatures below that damaging to the substrate while providing superior heat resistance superior static time to failure with low viscosity, good peel adhesion and tack in the assembly of disposable articles which comprises

from about 15 percent to about 35 percent based on the weight of the hot-melt adhesive composition, of an A-B-A block copolymer wherein the B component is polyisoprene having an average molecular weight ranging from about 30,000 to about 70,000, the A component is polystyrene having an average molecular weight ranging from about 12,000 to about 20,000, the overall molecular weight of the block copolymer ranges from about 60,000 to about 110,000 and wherein the A component is present in an amount of at least 27 parts to about 50 parts per 100 parts by weight of the block copolymer,

from about 45 percent to about 70 percent of a compatible primary tackifying resin, based on the weight of the hot-melt adhesive composition,

from 0 percent to about 30 percent of a plastizing oil or secondary tackifying resin, based on the weight of the hot melt adhesive composition, and

from about 0.1 percent to about 2 percent of a stabilizer, based on the weight of the hot-melt adhesive composition.

5,143,969

HEAT-CURABLE BISMALEIMIDE MOLDING COMPOSITIONS

Bernd Reck, Beindersheim; Rita A. Laschober; Dale Gerth, both of Ludwigshafen, all of Fed. Rep. of Germany, and Jack D. Boyd, Westminster, Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 24, 1991, Ser. No. 719,440

Int. Cl.[5] C08L *37/00;* **C08F** *22/40*

U.S. Cl. 524—548 **2 Claims**

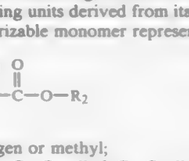
1. A heat-curable bismaleimide resin, containing

A. a bismaleimide,

B. an aromatic dialkenyl compound,

C. from 1 to 40% by weight, based on A+B+C, of a monoalkenyl compound,

wherein the monoalkenyl compound C has the general formula



(I)

where either

a) R^1 is allyl or propenyl and R^2 is hydrogen, or

b) R^1 is hydrogen, R^2 is allyl or propenyl and the OH group is ortho to R^2.

5,143,970

PROCESS FOR MAKING NITROCELLULOSE-ACRYLIC LATICES

Syed M. Ahmed, Hockessin, Del., assignor to Aqualon Company, Wilmington, Del.

Division of Ser. No. 637,794, Jan. 8, 1991. This application Jun. 3, 1991, Ser. No. 709,659

Int. Cl.[5] C08K *5/49*

U.S. Cl. 524—710 **4 Claims**

1. A process for preparing a nitrocellulose/acrylic emulsion for wood finishing lacquers with lower Volatile Organic Compound (VOC) involves the steps:

(1) mixing water wet nitrocellulose with a nitrogen content of 10.9 to 12.2% with at least one monomer selected from the group of butyl acrylate, methylmethacrylate and ethylhexyl acrylate and at least one surfactant to produce a mixture;

(2) emulsifying the mixture by the addition of water to form an oil-in-water emulsion; and

(3) adding initiator to the oil-in-water emulsion and polymerizing at a temperature of from 20° to 90° C. to produce a nitrocellulose/acrylic latex emulsion with a particle size below 0.25 microns.

5,143,971

RUBBERY CARBOXYLATED ACRYLATE POLYMER, LATEX, AND PREPARATION THEREOF

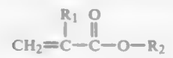
Vic Stanislawczyk, North Ridgeville, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 376,281, Jun. 6, 1989, Pat. No. 4,956,434, which is a continuation-in-part of Ser. No. 310,262, Feb. 13, 1989, Pat. No. 4,879,364, which is a continuation-in-part of Ser. No. 921,166, Oct. 20, 1966, abandoned. This application Jun. 28, 1990, Ser. No. 545,252

Int. Cl.[5] C08L *31/00;* **C08F** *22/02*

U.S. Cl. 524—833 **6 Claims**

1. A process for preparing a latex comprising an aqueous medium having dispersed therein particles of rubbery carboxylated acrylate polymer consisting essentially of predominantly acrylate-containing, cross-linked polymer chains including repeating units derived from itaconic acid and at least one copolymerizable monomer represented by the structure



wherein

R_1 is hydrogen or methyl;

R_2 represents C_1–C_{20} alkyl, C_2–C_7 alkoxyalkyl, C_2–C_7 alkoxythioalkyl, or C_2–C_7 cyanoalkyl;

said itaconic acid is present in the range from about 1 phr to about 20 phr;

at least 40 phr of said acrylate is present as an alkyl acrylate in which alkyl is C_4–C_8;

said process comprising,

(a) confining at least one-half of the itaconic acid to be copolymerized before remaining monomers are added, in a polymerization zone in which the temperature and pressure are maintained within specified limits, and,

(b) adding to said itaconic acid in said polymerization zone, from about 0.1 to about 20 phr of a crosslinking monomer, all remaining itaconic acid, and at least 70 phr of said one copolymerizable monomer, under conditions at which it is copolymerizable with said itaconic acid and crosslinking monomer,

whereby said latex is characterized by carboxyl-rich polymer chains present as discrete agglomerates randomly distributed within said latex.

5,143,972

PRESSURE-SENSITIVE ADHESIVE COMPOSITION

James D. Groves, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 17, 1990, Ser. No. 525,155

Int. Cl.[5] C08L *51/06, 53/02*

U.S. Cl. 525—71 **16 Claims**

1. A composition comprising a blend consisting essentially of:

(1) an adhesive composition comprising a tacky pressure-sensitive adhesive; and

(2) a normally tacky and pressure-sensitive adhesive composition comprising a polymer having in its backbone at least a major portion by weight of polymerized monomeric acrylic or methacrylic acid ester of a non-tertiary alcohol having from 1 to 14 carbon atoms with the average number of carbon atoms being about 4 to about 12, and grafted to the backbone, polymeric moieties having a Tg greater than 20° C. and a weight average molecular weight above 2,000,

said adhesive of adhesive composition (1) having moieties that associate with the polymeric moieties grafted to the backbone of the polymer of adhesive composition (2).

5,143,973

MOULDING COMPOSITIONS OF LOW DOUBLE REFRACTION

Horst Brüggemann, Cologne; Dieter Freitag, Krefeld; Lothar Meier, Sprockhoevel; Christian Lindner, and Hans-Eberhard Braese, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 436,114, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 205,734, Jun. 13, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 512,558

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721054; Mar. 23, 1988, 3809779

Int. Cl.[5] C08L *33/08, 51/04*

U.S. Cl. 525—85 **4 Claims**

1. Thermoplastic moulding compositions of extremely low double refraction and a transmittance from 85.7% to 89.2% at 550 nm consisting essentially of mixtures of

A. PVC

B. a (ter)polymer of vinyl monomers produced by the polymerization of a mixture of monomers comprising styrene, α-methyl styrene, acrylonitrile and methyl methacrylate which

C. is grafted on to a rubber phase consisting essentially of diene rubbers.

5,143,974
LOW-PROFILE UNSATURATED POLYESTER RESIN COMPOSITION
Kenji Nagai, Aichi; Kyosuke Fukushi, Kuwana, and Kazuo Matsuyama, Gamagouri, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan
Filed Aug. 13, 1990, Ser. No. 565,698
Claims priority, application Japan, Aug. 24, 1989, 1-215935
Int. Cl.[5] C08L 67/06
U.S. Cl. 525—92 5 Claims

1. A low-profile unsaturated polyester resin composition, consisting essentially of (A) an unsaturated polyester, (B) a monomer copolymerizable with said unsaturated polyester, and (C) an A-B type block copolymer, provided that the weight ratio of (A) said unsaturated polyester to (B) said monomer is in the range of 20:80 to 70:30, (C) said A-B type block copolymer has a number average molecular weight in the range of 10,000 to 200,000 and accounts for a proportion in the range of 3 to 27% by weight, based on the total amount of (A) said unsaturated polyester and (B) said monomer, the weight ratio of the A segment to the B segment in (C) said A-B type block copolymer is in the range of 95:5 to 5:95, said A segment is a product of a mixture consisting of vinyl acetate and butylacrylate in a weight ratio in the range of 25:75 to 95:5, and said B segment is a product of a mixture consisting of styrene and a monomer copolymerizable with styrene in a mixing ratio in the range of 100:0 to 70:30.

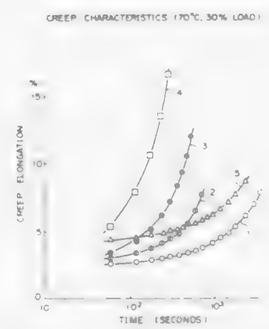
5,143,975
POLYVINYL CHLORIDE BLENDS
William S. Greenlee, Avon Lake; Philip L. Kinson, Brecksville; Sally A. Kline, Westlake; Murali Rajagopalan, and Charles A. Daniels, both of Avon Lake, all of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio
Filed May 9, 1991, Ser. No. 698,018
Int. Cl.[5] C08L 27/06
U.S. Cl. 525—205 11 Claims

1. A rigid blend composition comprising a first uncrosslinked polyvinyl chloride polymer (PVC) having an inherent viscosity measured per ASTM-D 1243 (I.V) up to about 0.55,
from 0.1 to about 10 weight parts per 100 weight parts combined polyvinyl chloride of a second uncrosslinked polyvinyl chloride polymer having an inherent viscosity of from 0.8 to 1.6,
and an impact modifier wherein the inherent viscosity for said second polyvinyl chloride must be from 0.2 to 1.0 inherent viscosity units higher (ΔI.V.) than said inherent viscosity for said first polyvinyl chloride.

5,143,976
POLYOLEFIN RESIN COMPOSITES
Teruaki Ashihara; Shingo Tone, both of Takasago, and Ryozo Orita, Himeji, all of Japan, assignors to Toyo Kasei Kogyo Company Ltd., Osaka, Japan
Filed Jan. 16, 1991, Ser. No. 640,733
Claims priority, application Japan, Jan. 26, 1990, 2-16664
Int. Cl.[5] C08L 23/28, 51/06
U.S. Cl. 525—227 6 Claims

1. A polyolefin resin composition comprising as main ingredients, a graft polymer obtained by the graft polymerization of acrylic oligomers (A) and polydiene (B) onto a chlorinated polyolefin (C) containing 10–60 weight percent of chlorine.

5,143,977
RESIN OR RUBBER ARTICLE REINFORCED WITH A POLYOLEFIN FIBER HAVING IMPROVED INITIAL ELONGATION
Kazuo Yagi, Ohtake, and Hiroyuki Takeda, Ohno, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Division of Ser. No. 279,084, Dec. 2, 1988, Pat. No. 5,015,525.
This application Mar. 11, 1991, Ser. No. 668,138
Claims priority, application Japan, Dec. 3, 1987, 62-304484
Int. Cl.[5] C08L 23/00; D02G 3/00
U.S. Cl. 525—240 1 Claim



1. A reinforced resin or rubber article comprising a resin or rubber containing therein a reinforcing amount of a polyolefin fiber comprising a drawn composition which is a blend of (A) ultra-high-molecular-weight polyethylene having an intrinsic viscosity (η) of at least 5 dl/g with (B) ultra-high-molecular-weight ethylene/α-olefin copolymer having an intrinsic viscosity (η) of at least 5 dl/g and containing 0.5 to 10 α-olefin groups of at least 3 carbon atoms per 1000 carbon atoms on average, at an (A):(B) weight ratio of 10:90 to 90:10, said composition before drawing having an intrinsic viscosity (η) of at least 5 dl/g as a whole, and containing 0.2 to 5.0 α-olefin groups of at least 3 carbon atoms as side chains per 1000 carbon atoms on the average, and said drawn fiber having the following properties: (i) when measured under restraint conditions using a differential scanning calorimeter, has at least two close crystal melting peaks at temperatures higher by at least 15° C. than the inherent crystal melting temperature (Tm) of the polyethylene determined as the main peak at the time of the second temperature elevation, (ii) an initial elongation of less than 5% when measured 60 seconds from the time of initiation of application of a load, corresponding to 30% of the breaking load applied at room temperature to a test sample 1 cm long, at ambient temperature of 70° C., (iii) an average creep rate of at least 1×10^{-4} sec $^{-1}$ when measured over the period of from 90 to 180 seconds after the time of initiating the application of said load, (iv) a strength retention ratio of at least 90% when measured after a heat history at 170° C. for 5 minutes, (v) an elastic modulus of at least 30 GPa at room temperature, and (vi) a tensile strength of at least 1.5 GPa.

5,143,978
DYNAMICALLY PARTIALLY CROSSLINKED THERMOPLASTIC ELASTOMER CONTAINING POLYBUTENE-1
Dominic A. Berta, Wilmington, Del., assignor to Himont Incorporated, Wilmington, Del.
Filed Aug. 28, 1990, Ser. No. 574,711
Int. Cl.[5] C08L 23/26, 23/12, 23/16
U.S. Cl. 525—240 8 Claims

1. A dynamically partially cured thermoplastic elastomer comprising, by weight, (a) 20 to 70 parts propylene polymer material selected from the group consisting of (i) crystalline polypropylene having an isotactic index of greater than 90% and (ii) an ethylene-propylene random copolymer having an ethylene content of up to about 10%, (b) 20 to 60 parts amorphous ethylene-propylene copolymer rubber, (c) 8 to 30 parts semi-crystalline, low density, essentially linear ethylene-propylene copolymer, xylene insoluble at room temperature, wherein the total amount of (a)+(b)+(c) is 100 parts, and (d) 2 to 20 parts of polybutene-1 based on 100 parts of (a)+(b)+(c), where the ratio of polybutene-1 to rubber is less than 0.5.

5,143,979
MOLDING MATERIAL
Yoshikatsu Nishi, Yokohama; Masayoshi Oshima, Niiza; Tadao Natsuume, Yokosuka, and Teiji Kohara, Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd, Tokyo, Japan
Filed Jun. 20, 1990, Ser. No. 540,727
Claims priority, application Japan, Jun. 24, 1989, 1-162422
Int. Cl.[5] C08F 32/06
U.S. Cl. 525—332.1 18 Claims

1. A molding material comprising a hydrogenated product of a polymer formed by ring-opening polymerization of a norbornene-type monomer, the hydrogenated product having a number average molecular weight (Mn), measured by high-performance liquid chromatography, of 20,000 to 50,000, a weight average molecular weight (Mw), measured by the same, of 40,000 to 80,000 and a Mw/Mn ratio of not more than 2.5 and having a volatile content of not more than 0.3% by weight.

5,143,980
METHOD OF PRODUCING CHLORINATED RUBBER
Itsuo Kimura; Kentaro Nobori, and Shigeki Hikasa, all of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan
Filed Apr. 5, 1991, Ser. No. 680,924
Claims priority, application Japan, Jun. 29, 1990, 2-172145
Int. Cl.[5] C08F 8/22
U.S. Cl. 525—358 8 Claims

1. A method of producing organic solvent-soluble chlorinated rubber having a chlorine content of 60 to 75% by a method of chlorinating rubber latex with chlorine gas in an aqueous medium, comprising the steps of:
(A) adding a nonionic or cationic surfactant to a rubber latex prior to chlorination and then adding acid to acidify the latex,
(B) chlorinating the rubber latex to an at least 30% chlorine content at a temperature of not higher than 50° C. while blocking off the light in a first step of chlorination, and
(C) carrying out the remaining chlorination while irradiating the product of (B) with ultraviolet rays in a second step of chlorination.

5,143,981
RESIN COMPOSITION
Hiroomi Abe; Kenji Nagaoka, and Takashi Sanada, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Dec. 7, 1990, Ser. No. 624,305
Claims priority, application Japan, Dec. 8, 1989, 1-320241; Dec. 8, 1989, 1-320242
Int. Cl.[5] C08L 71/12
U.S. Cl. 525—391 2 Claims

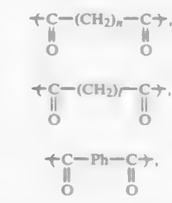
1. A process for preparing a resin composition which comprises melt kneading (a) a polyphenylene ether and (b) an olefin represented by the following formula (I):

$$C_nH_{2n} \quad (I)$$

wherein n is an integer of 10–30.

5,143,982
POLYOXYMETHYLENE RESIN COMPOSITION
Masahiko Niino, Kurashiki, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Apr. 24, 1991, Ser. No. 690,343
Int. Cl.[5] C08L 61/02, 67/02, 67/03
U.S. Cl. 525—400 10 Claims

1. A polyoxymethylene resin composition comprising 50–97% by weight of a polyoxymethylene resin and 3–50% by weight of a polyester random copolymer comprising a diol residue A and a dicarboxylic acid residue B,
said diol residue A being represented by the formula $-(O-R-O)-$, wherein R is an alkyl group of 2–12 carbon atoms, and
said dicarboxylic acid residue B being represented by at least one of formulae (1), (2) and (3),



(1)

(2)

(3)

wherein n is an integer of 2–6, l is an integer of 7–24, and Ph is an aromatic hydrocarbon residue, the proportion of (1) to the sum of (1), (2) and (3) being 20–100% by mol, provided that when said proportion is 100% by mol, (1) consist of at least two different types of (1).

5,143,983
HEAT RESISTANT POLYAMIDE FILM
Naomichi Yamagishi, Abiko, and Masashi Hasegawa, Tsuchiura, both of Japan, assignors to Mitsubishi Kasei Polytec Company, Tokyo, Japan
Continuation of Ser. No. 495,157, Mar. 19, 1990, abandoned.
This application Sep. 6, 1991, Ser. No. 758,511
Claims priority, application Japan, Mar. 22, 1989, 1-70125
Int. Cl.[5] B29C 55/12; C08L 77/00
U.S. Cl. 525—432 7 Claims

1. A heat resistant polyamide film which is obtained by melt-extruding into a sheet a polyamide composition comprising a mixture of a preformed polyamide (A) composed of diaminobutane and adipic acid and a preformed semi-aromatic polyamide (B) having no substantial crystallinity composed of a polyamide containing an aromatic dicarboxylic acid and an aliphatic diamine in an amount of at least 80% by weight of the polyamide-constituting components, in a weight ratio of (A):(B)=99.9:0.1 to 30:70, quenching the sheet, then biaxially stretching it at least 2.0×2.0 times, followed by heat setting at a temperature of at least 205° C., and which has a heat distortion initiation temperature of at least 130° C.

5,143,984
PROCESS TO PREPARE HIGH MOLECULE WEIGHT POLYESTER
Waylon L. Jenkins, Kingsport; Gerry Rhodes, Gray, and Mark Rule, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 21, 1992, Ser. No. 822,797
Int. Cl.[5] C08F 20/20
U.S. Cl. 525—437 6 Claims

1. A process for preparing a polyester having an inherent viscosity of at least 0.5 comprising
(A) preparing an admixture of a molten polyester having an inherent viscosity of less than 0.5, a titanium alkoxide and a 13X zeolite, and
(B) subjecting the admixture to a time and temperature

sufficient to increase the inherent viscosity of the polyester to at least 0.5.

5,143,985

BLENDS OF A POLY(ARYL ETHER KETONE) AND A POLYARYLATE

Lloyd M. Robeson, Whitehouse Station, and James E. Harris, Piscataway, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 396,819, Aug. 22, 1989, Pat. No. 5,011,894, which is a continuation of Ser. No. 295,114, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 87,175, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 797,765, Nov. 14, 1985, abandoned, which is a continuation of Ser. No. 625,915, Jun. 29, 1984, abandoned. This application Feb. 8, 1991, Ser. No. 653,343

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.[5] C08F *20/00*

U.S. Cl. 525—437 14 Claims

1. A blend comprising a crystalline poly(aryl ether ketone) and a liquid crystalline polyarylate selected from the group consisting of:

(a) a homopolymer of p-hydroxybenzoic acid,

(b) a copolymer of p-hydroxybenzoic acid, terephthalic and isophthalic acids and 4,4'-biphenol,

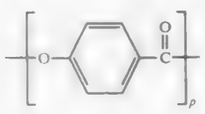
(c) a copolymer of p-hydroxybenzoic acid and 6-hydroxy-2-naphthoic acid in a 75/25 molar ratio,

(d) a copolyester obtained by polymerizing p-acetoxybenzoic acid in a polyethylene terephthalate matrix and;

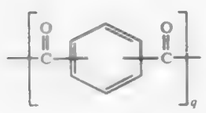
(e) a copolymer of p-hydroxybenzoic acid, terephthalic acid and 4,4'-biphenol.

(f) a liquid crystalline polyarylate of recurring moieties of Formulae VI, VII and VII

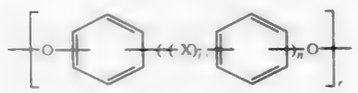
(VI)



(VII)

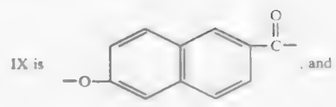


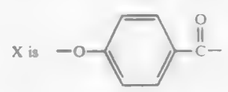
(VIII)



wherein X is —O— or —SO_2—; m is 0 or 1; n is 0 or 1; q:r=10:15 to 15:10; p:q=100:100 to 100:1; p+q+r=3 to 600; the carbonyl groups of the moiety of Formula VI or VII are linked to the oxy groups of a moiety of Formula VI or VIII; the oxy groups of the moiety of Formula VI or VIII are linked to the carbonyl groups of the moiety of Formula VI or VII;

(g) a melt processable wholly aromatic polyester capable of forming a thermotropic melt phase at a temperature below approximately 350° C., consisting essentially of the recurring moieties of IX and X which may include substitution of at least some of the hydrogen atoms present upon an aromatic ring wherein:

IX is  , and

X is 

with said optional substitution if present being selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, and mixtures of the foregoing, and wherein said polyester comprises approximately 10 to 90 mole percent of moiety IX, and approximately 10 to 90 mole percent of moiety X.

5,143,986

POLYMER MIXTURES OF AN AROMATIC POLYETHER KETONE AND A THERMOPLASTIC POLYMER

Knud Reuter, Krefeld; Günter Weymans, Leverkusen; Rolf Dhein, Krefeld, and Erich Meier, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,837

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1988, 3836183

Int. Cl.[5] G08B *11/00, 61/04*

U.S. Cl. 525—437 4 Claims

1. A mixture comprising

(a) from 0.1 to 99.9 wt.%, based on the total amount of components (a) and (b), of an aromatic polyether ketone having a recurring structural unit of the formula

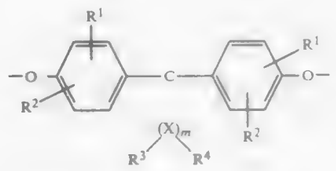
—O—E—O—E'—

wherein

(1) —E'—is difunctional aromatic ketone group of the formula

in which Ar and Ar' are the same or different and represent difunctional aromatic radicals containing from 6 to 50 carbon atoms, and

(2) —O—E—O— is a difunctional diphenolate residue wherein from 0.1 mol-% to 100 mol-% of said diphenolate residues correspond to the formula



in which

R^1 and R^2 independently represent hydrogen, halogen, C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-10} aryl, or C_{7-12} aralkyl;

m is an integer of from 4 to 7;

R^3 and R^4 are selected individually for each X and independently represent hydrogen or C_{1-6} alkyl; and

X represents carbon;

with the proviso that, on at least one X, both R^3 and R^4 represent C_{1-6} alkyl; and

(b) from 0.1 to 99.9 wt.%, based on the total amount of components (a) and (b), of one or more other organic polymers selected from the group consisting of

(1) amorphous thermoplastics,

(2) partially crystalline thermoplastics, and

(3) elastomers having a glass transition temperature below 0° C.

5,143,987

POLYURETHANE REACTIVE ADHESIVE COMPOUNDS CONTAINING FINELY DISPERSED POLYMERS

Eduard Hänsel, Wuppertal; Heinrich Hess, Cologne; Günter Arend, Dormagen; Gerhard Grögler, Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 577,979

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930138

Int. Cl.[5] C08F *210/00, 216/00, 220/00*

U.S. Cl. 525—458 10 Claims

1. A polyurethane reactive adhesive compound comprising:

A) one or more polyisocyanates having an inactivated particle surface,

B) at least one isocyanate reactive compound having a molecular weight MG_w greater than 400, and

C) finely dispersed polymer particles, wherein the polymer is solid at temperatures below 70° C. and has a molecular weight MG_w of at least 3000, and is selected from the group consisting of a linear hydroxypolyurethane, a copolyamide, a copolymer of α-olefins, a polyvinyl alcohol, a polyvinyl formal, a polyvinyl acetal, a substantially linear polyester, a copolymer of acrylonitrile, butadiene and styrene having a polybutadiene content of 0.1 50% by weight, a (co)polymer of polyvinyl chloride, polyethylene, a copolymer of styrene and acrylonitrile.

5,143,988

HIGH REFRACTIVE-INDEX HYBRID MATERIAL PREPARED BY TITANIUM ALKOXIDE AND A PHOSPHINE CONTAINING OLIGOMER

Bing Wang, and Garth L. Wilkes, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation-in-part of Ser. No. 441,493, Nov. 27, 1989. This application Jul. 13, 1990, Ser. No. 552,634

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

Int. Cl.[5] C08F *283/00*

U.S. Cl. 525—471 5 Claims

1. An inorganic/organic hybrid material having transparency and a refractive index of no less than about 1.65 which comprises the sol-gel derived, hydrolytically cocondensed reaction product of a titanium alkoxide and a trialkoxysilane-capped poly(arylene ether phosphine oxide).

5,143,989

NON-LEACHABLE FIRE RETARDANT

Chun Y. Lo, Bartlett, and Thomas A. Lehtinen, St. Charles, both of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Sep. 23, 1988, Ser. No. 248,691

Int. Cl.[5] C08G *8/28*

U.S. Cl. 525—504 3 Claims

1. A flame reaistant material containing a non-leachable resin made by condensation of a fusible phenol-formaldehyde resin and diethyl-N,N-bis(hydroxyethyl)aminomethyl phosphonate in an alkaline medium at a temperature of at least about 250° F.

5,143,990

TERMINATION OF ANIONIC POLYMERIZATION USING HYDROGEN

Carma J. Gibler, Houston; Linda R. Chamberlain, Richmond, and Thomas F. Brownscombe, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 14, 1990, Ser. No. 522,693

Int. Cl.[5] C08F *2/38*

U.S. Cl. 526—82 23 Claims

1. In a process for anionically polymerizing monomers with an organoalkali metal anionic polymerization initiator in a suitable solvent thereby creating a living polymer, the improvement which comprises terminating the living polymer at the end of the polymerization by the addition of a material selected from the group consisting of hydrogen and its isotopes.

5,143,991

COPOLYMER DESOILING AGENT

Yoshio Amimoto, Takatsuki; Yuko Hirata, Neyagawa; Masaru Hirai, Suita, and Akihiko Ueda, Nishinari, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Jun. 19, 1990, Ser. No. 540,210

Claims priority, application Japan, Jun. 21, 1989, 1-160514; Jul. 27, 1989, 1-197103

Int. Cl.[5] C08F *18/20*

U.S. Cl. 526—245 15 Claims

1. A copolymer comprising:

(a) an acrylate or methacrylate ester having a fluoroalkyl group,

(b) a polyalkylene glycol acrylate or methacrylate,

(c) an acrylate or methacrylate ester having a hydroxyl group, and

(d) at least one compound selected from the group consisting of an alkyl acrylate, an alkyl methacrylate and butadiene.

5,143,992

METHATHESIS POLYMERIZABLE ADDUCTS OF A DIVINYLCYCLOHYDROCARBON AND CYCLOPENTADIENE

Donald R. Kelsey, Fulshear, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 12, 1991, Ser. No. 729,262

Int. Cl.[5] C08G *61/08*

U.S. Cl. 526—283 28 Claims

1. A process for the polymerization under ring-opening polymerization conditions of a mixture comprising a major proportion of (1) adducts of a divinyl cyclohydrocarbon compound of up to 20 carbon atoms containing two vinyl groups as substituents on carbon atoms at least one carbon atom apart on an aliphatic ring system of from 5 to 10 carbon atoms and of 1 ring or 2 fused rings and cyclopentadiene, and (2) cyclopentadiene oligomers in the presence of an olefin methathesis catalyst system and, optionally, added dicyclopentadiene.

5,143,993

SILANE COMPOUND FOR USE IN THE SYNTHESIS OF SEMICONDUCTING POLYMERS WITH PERPENDICULARLY ARRANGED CORES AND METHOD OF SYNTHESIZING SAID COMPOUND

James M. Tour; Ruilian Wu, and Jeffry S. Schumm, all of Columbia, S.C., assignors to University of South Carolina, Columbia, S.C.

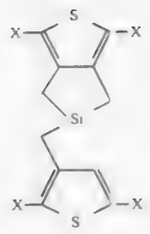
Division of Ser. No. 492,543, Mar. 12, 1990, Pat. No. 5,059,695.

This application Aug. 5, 1991, Ser. No. 740,319

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 5 Claims

1. A method of preparing a compound of the formula



wherein X is a reactive group through which polymeric subunits can be bonded to the compound, comprising the steps of

(a) reacting tetrakis(3'-trimethylsilyl-2''-propynyl)silane with zirconocene dichloride and n-butyl lithium;

(b) adding sulfur monochloride to the reaction product of step (a), whereby a compound wherein X is $SiMe_3$ is formed; and

(c) optionally reacting the compound wherein X is $SiMe_3$ with reagents to convert X to other reactive groups.

5,143,994

POLYISOCYANATE MIXTURE, A PROCESS FOR ITS PREPARATION AND ITS USE IN POLYURETHANE COATING COMPOSITIONS

Hans J. Laas, Cologne; Reinhard Halpaap, Odenthal-Gloebusch; Josef Pedain, Cologne, and Jürgen Mosbach, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,315

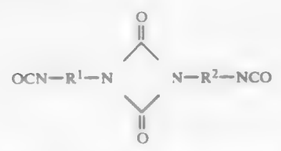
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1990, 4029809

Int. Cl.[5] C08G *18/74*

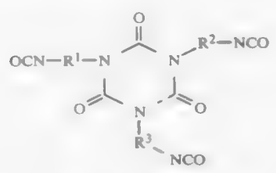
U.S. Cl. 528—45 9 Claims

1. A polyisocyanate mixture which has a uretdione content (calculated as $C_2N_2O_2$) of 8 to 25% by weight and an isocyanurate content (calculated as C_3N_3O) of not more than 24% by weight and comprises

a) 20 to 60% by weight of a uretdione diisocyanate corresponding to formula I



b) 0 to 40% by weight of an isocyanurate triisocyanate corresponding to the formula II



c) 15 to 60% by weight of higher homologues of the polyisocyanates corresponding to formulas I and II containing more than one uretdione ring and/or isocyanurate ring and

d) a total of not more than 1% by weight of 1,6-diisocyanatohexane (HDI) and 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethyl cyclohexane (IPDI),

wherein the percentages of a), b), c) and d) add up to 100, based on the weight of a), b), c) and d), and wherein

R^1, R^2 and R^3 are identical or different and represent the hydrocarbon radicals linking the isocyanate groups of HDI or IPDI, in the latter case the isocyanate groups being linked to the cycloaliphatic ring, provided that at least 15 mole % and not more than 95 mole % of the radicals mentioned represent hexamethylene radicals.

5,143,995

ADHESIVES BASED ON POLYOLS AND POLYISOCYANATES

Walter Meckel, Neuss; Eduard Hänsel, Wuppertal; Otto Ganster, Odenthal; Günter Arend, Dormagen, and Jörg Büchner, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 27, 1991, Ser. No. 722,715

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1990, 4021113

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—59 10 Claims

1. A transparent adhesive containing isocyanate groups based on at least one polyol and at least one polyisocyanate, characterized in that the adhesive contains a urea group corresponding to the following formula

X—R—NH—CO—NH—R'—Y

in which

X and Y may be the same or different and represent NCO and/or —Z—CO—NH—, X and Y being attached to R and R' via the N atom of the NH group,

Z represents O, S, NH,

R and R' may be the same or different and represent the residue of a polyisocyanate containing at least two NCO groups of different reactivity after removal of the two NCO groups.

5,143,996

PRIMERLESS ADHESIVE FOR FIBERGLASS REINFORCED POLYESTER SUBSTRATES

Daniel A. Chung, Dublin, and Laurence G. Dammann, Westerville, both of Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Continuation of Ser. No. 602,448, Oct. 23, 1990, which is a continuation of Ser. No. 376,261, Jul. 16, 1989, which is a continuation of Ser. No. 87,914, Aug. 20, 1987, Pat. No. 4,876,741. This application Feb. 4, 1992, Ser. No. 831,122

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—60 16 Claims

1. A two part structural polyurethane adhesive composition useful for adhering a first unprimed fiber reinforced polyester substrate to a second unprimed substrate comprising a blend of a

a) prepolymer component comprising the reaction product of a polyol and an aromatic polyisocyanate, said prepolymer component having 3 to 15 percent free isocyanate groups,

b) an aliphatic polyisocyanate, and

c) a curative component comprising a polyfunctional polyether polyol and a diamine.

5,143,997

POLYCARBONATE-POLYOL COMPOSITION AND POLYCARBONATE(METH) ACRYLATE COMPOSITIONS AND URETHANE(METH) ACRYLATE COMPOSITIONS PREPARED THEREFROM

Toshio Endo; Takaaki Murai, and Tatsumi Fujii, all of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 11, 1990, Ser. No. 595,423

Claims priority, application Japan, Oct. 11, 1989, 1-264513; Dec. 8, 1989, 1-320050; Dec. 13, 1989, 1-323071; Sep. 7, 1990, 2-237316

Int. Cl.[5] C08G *18/28*; C08F *283/02*; C08J *3/28*

U.S. Cl. 528—60 8 Claims

1. A polycarbonate-polyol composition obtained by the ester interchange reaction of a polycarbonate-diol composition with a compound having three hydroxyl groups, a compound having four hydroxyl groups or mixtures thereof.

5,143,998

HYDROXY-FUNCTIONAL POLY(AMIDE ETHERS) AS THERMOPLASTIC BARRIER RESINS

David J. Brennan; Anthony P. Haag, and Jerry E. White, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 660,381, Feb. 26, 1991, Pat. No. 5,089,588, which is a division of Ser. No. 599,212, Oct. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 344,630, Apr. 27, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,288

Int. Cl.[5] C08G *59/00, 65/08, 65/14*

U.S. Cl. 528—99 7 Claims

1. A thermoplastic polymer having excellent barrier to oxygen in both dry and moist environments and having repeating units represented by the formula:

wherein each Ar^1 is independently a divalent aromatic moiety, each R^1 is a predominantly hydrocarbylene moiety, each R^2 is independently hydrogen or a monovalent aliphatic moiety, and each R^3 is independently a predominantly hydrocarbylene moiety.

5,143,999

HARDENABLE MIXTURES OF EPOXIDE RESIN MATERIALS CONTAINING POLYOXYALKYLENE-DITHIOLS AND POLYAMINES

Frans Setiabudi, Bad Krozingen, Fed. Rep. of Germany, and Jean-Pierre Wolf, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 22, 1989, Ser. No. 441,133

Claims priority, application Switzerland, Nov. 23, 1988, 4350/88; Sep. 7, 1989, 3247/89

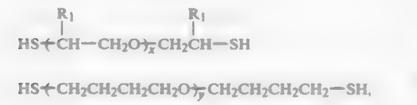
Int. Cl.[5] C08G *59/50*

U.S. Cl. 528—109 17 Claims

1. A hardenable mixture of materials, comprising

(a) an epoxide resin

(b) a dithiol of the formula I or II



(I)

(II)

in which the R_1s independently of one another are hydrogen or methyl, x is an integer from 2 to 50 and y is an integer from 1 to 30, and

(c) an aliphatic, cycloaliphatic or heterocyclicpolyamine having at least two primary amino groups.

5,144,000

METHOD FOR FORMING CROSSLINKING POLYETHERIMIDE OLIGOMERS

Clyde H. Sheppard, Bellevue, Wash., and Hyman R. Labowitz, Rolling Hills Estates, Calif., assignors to The Boeing Company, Seattle, Wash.

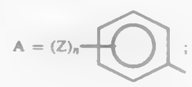
Division of Ser. No. 215,090, Jul. 5, 1988, Pat. No. 4,958,031, which is a division of Ser. No. 16,703, Feb. 20, 1987, Pat. No. 4,851,495. This application Jul. 9, 1990, Ser. No. 550,075

Int. Cl.[5] C08G *73/10*

U.S. Cl. 528—170 15 Claims

1. A method for making polyetherimide oligomers comprising the step of:

consensing about 2 m moles of nitrophthalic anhydride with about m+1 moles of dialcohol, about m moles of diamine, and about 2 moles of A—NO_2, wherein:

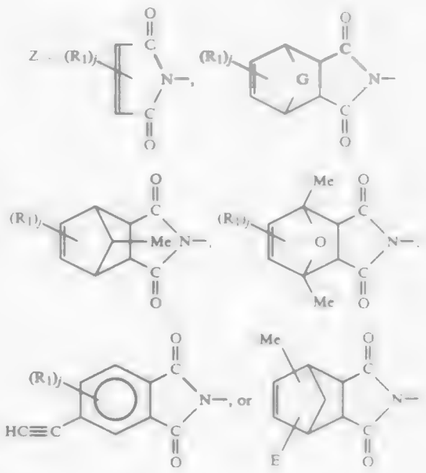


n=1 or 2;

m=an integer greater than or equal to 1;

E=allyl or methallyl;

R_1=any of lower alkyl, lower alkoxy, aryl, or substituted aryl;

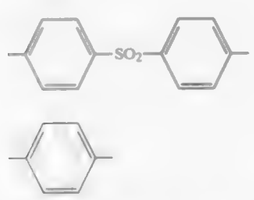


j=0, 1, or 2; and

G=—CH_2—, —O—, —S—, or —SO_2—.

5,144,001
AROMATIC AMORPHOUS THERMOPLASTIC POLYMERS
Louis M. Maresca, Belle Mead, N.J., assignor to Amoco Corporation, Chicago, Ill.
Continuation of Ser. No. 233,185, Aug. 17, 1988, abandoned, which is a continuation of Ser. No. 9,439, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 795,758, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 451,192, Dec. 20, 1982, abandoned, which is a continuation of Ser. No. 186,466, Sep. 12, 1980, abandoned. This application Jan. 19, 1990, Ser. No. 468, 63
Int. Cl.[5] C08G 75/23, 65/40, 8/02, 14/00
U.S. Cl. 528—171 6 Claims

1. An amorphous thermoplastic terpolymer consisting essentially of the following repeating units which are connected by ether linkages:



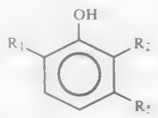
I

II

said terpolymer is produced by the reaction of dichlorodiphenyl sulfone and a mixture of hydroquinone and dihydroxydiphenyl sulfone.

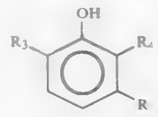
5,144,002
THERMOPLASTIC MOLDING COMPOUND BASED ON MODIFIED CO-POLYPHENYLENE ETHER
Udo Kowalczik, Bochum; Wolfgang Neugebauer, Duelmen, and Martin Bartmann, Recklinghausen, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany
Filed Aug. 22, 1990, Ser. No. 570,887
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1989, 3931332
Int. Cl.[5] C08G 65/38
U.S. Cl. 528—218 8 Claims

1. A molding thermoplastic, comprising a polyphenylene ether, wherein said polyphenylene ether is prepared by oxidative coupling of a phenol of the formula I,



I

wherein R_1 and R_2 are alkyl with 1 to 6 carbon atoms or phenyl, or R_1 is t-butyl and R_2 is H, and R_5 is alkyl with 1 to 6 carbon atoms or H; with a comonomer of the formula II,

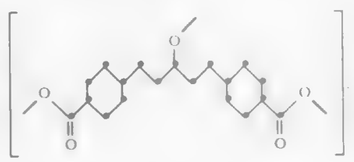


II

wherein R_3 is the same as R_1 or substituted or unsubstituted benzyl, and R_4 is substituted or unsubstituted benzyl, and wherein said substituted or unsubstituted benzyl has 7 to 12 carbon atoms.

5,144,003
TRIFUNCTIONAL MONOMER COMPOUNDS, POLYESTERS DERIVED THEREFROM AND THERMOSETTING COATING COMPOSITIONS CONTAINING THE POLYESTERS
William W. Blount, Jr., and Joseph R. Zoeller, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 612,154, Nov. 13, 1990, Pat. No. 5,025,086. This application Mar. 6, 1991, Ser. No. 665,059
Int. Cl.[5] C08G 63/02, 63/06
U.S. Cl. 528—272 9 Claims

1. A cross-linkable enamel composition comprising a curable polyester comprising
(1) a curable polyester comprising
(a) about 1 mole percent to about 20 mole percent of a residue of the formula



(b) diol and/or triol or higher polyol residues;
(c) dicarboxylic acid residues; and
(2) a cross-linking agent.

5,144,004
PROCESS FOR PREPARING ARYLENE SULFIDE SULFONE/SULFOXIDE POLYMERS
Rex L. Bobsein, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 10, 1990, Ser. No. 625,244
Int. Cl.[5] C08G 75/14, 75/18, 75/20
U.S. Cl. 528—388 13 Claims

1. A process for producing an arylene sulfide sulfone/sulfoxide polymer comprising contacting: (a) at least one dihaloaromatic sulfone, (b) at least one dihaloaromatic sulfoxide, (c) at least one organic amide, (d) at least one sulfur-containing compound selected from the group consisting of alkali metal sulfides, alkali metal bisulfides and hydrogen sulfide, and (e) water.

5,144,005
CONTINUOUS PROCESS FOR REMOVING UNSTABLE COMPONENTS FROM CRUDE OXYMETHYLENE COPOLYMER
Günter Sextro; Karl-Friedrich Mück; Karlheinz Burg, all of Wiesbaden, and Eberhard Fischer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 4, 1988, Ser. No. 152,170
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703790
Int. Cl.[5] C08G 2/10, 2/28
U.S. Cl. 528—480 13 Claims

1. In a continuous process for catalytically co-polymerizing trioxane with co-monomers, then adding reactants including catalyst deactivator and stabilizer to the crude co-polymer, the improvement according to which the co-polymerization is conducted in a co-polymerization zone at a temperature between 70° C. and 125° C., gaseous co-polymerization products are separated from the crude co-polymerizate discharged from the co-polymerization zone, the crude co-polymerizate discharge from the co-polymerization zone is completely melted within about 30 seconds after the discharge, the added reactants are not added until after the complete melting, and the co-polymer is maintained above its melting point but not over 260° C. throughout such addition.

5,144,006
OXIDATIVE FOLDING OF PEPTIDE AND PROTEIN SUBSTRATES USING HYDROCARBON SULFOXIDES
James P. Tam, New York, N.Y., assignor to The Rockefeller University, New York, N.Y.
Filed Jun. 13, 1991, Ser. No. 714,659
Int. Cl.[5] C07K 17/00, 15/00, 3/02
U.S. Cl. 530—345 7 Claims

1. A method for the oxidative folding of peptide and protein substrates containing oxidizable sulfhydryl groups which comprises reacting the substrate in a buffered aqueous medium at a pH of from about 2 to 10 for a period of from 0.5 to 20 hours with a molar excess of a substituted or unsubstituted hydrocarbon sulfoxide selected from the group consisting of symmetrical and non-symmetrical dialkyl sulfoxides containing up to six carbon atoms and further sulfoxides in which the sulfur atom and the carbon atoms to which they are joined are united to form a cyclic aliphatic ring containing four or five carbon atoms.

5,144,007
THYROID HORMONE RECEPTOR
Magnus Pfahl, Solana Beach, Calif., assignor to La Jolla Cancer Research Foundation, La Jolla, Calif.
Continuation of Ser. No. 266,529, Nov. 3, 1988, abandoned. This application Oct. 24, 1990, Ser. No. 604,334
Int. Cl.[5] C07K 13/00, 15/28
U.S. Cl. 530—350 4 Claims

1. A substantially purified polypeptide having a sequence consisting essentially of the amino acids shown in FIG. 1 for herbA-T.

5,144,008
ARTIFICIAL CARRIER FOR IMMOBILIZATION OF BIOLOGICAL PROTEINS
Mikio Ikeda, Tachikawa; Shingo Morishita, Hachioji, and Ichiro Matsuda, Hidaka, all of Japan, assignors to Fujirebio Inc., Tokyo, Japan
Filed Oct. 26, 1990, Ser. No. 603,022
Claims priority, application Japan, Oct. 27, 1989, 1-278478
Int. Cl.[5] A61K 37/12, 39/00; G01N 33/544; C12N 11/08
U.S. Cl. 530—354 4 Claims

1. An artificial carrier for immobilization of biological proteins, comprising a plurality of particles, said particles being comprised of an acid-treated gelatin, sodium hexametaphosphate and a high-molecular acid salt selected from the group consisting of polyacrylates, polymethacrylates, polystyrenesulfonates, polyethylenesulfonates and polyvinylsulfonates, and said particles being water-insolubilized by treatment with an aldehyde.

5,144,009
CONJUGATES IN WHICH A MONOVALENT CARBOXYLIC IONOPHORE IS ASSOCIATED BY MEANS OF A COVALENT BOND WITH A MACROMOLECULE, THEIR USE AS IMMUNOTOXIN POTENTIATORS AND THE INTERMEDIATE ACTIVATED INOPHORES
Franz Jansen, Castries, and Pierre Gros, Montpellier, both of France, assignors to Sanofi, Paris, France
Division of Ser. No. 34,712, Apr. 6, 1987, Pat. No. 4,919,928, which is a continuation of Ser. No. 733,660, May 13, 1985, abandoned. This application Dec. 28, 1989, Ser. No. 458,444
Claims priority, application France, May 23, 1984, 84 08073; Jul. 13, 1984, 84 11208
The portion of the term of this patent subsequent to Sep. 17, 2007, has been disclaimed.
Int. Cl.[5] C07K 17/02, 15/14; A61K 39/44
U.S. Cl. 530—363 17 Claims

1. A conjugate comprising a monovalent carboxylic ionophore coupled by means of a covalent bond to a human protein, said conjugate functioning as an in vitro potentiator for immunotoxins.

5,144,010
METHOD OF PRODUCING MONOCLONAL AUTO-ANTI-IDIOTYPIC ANTIBODIES
Bernard F. Erlanger, Whitestone, and William L. Cleveland, New York, both of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.
Continuation of Ser. No. 767,516, Aug. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 644,550, Aug. 27, 1984, abandoned. This application Nov. 18, 1989, Ser. No. 273,654
Int. Cl.[5] C07K 15/28; C12N 5/16
U.S. Cl. 530—387.2 1 Claim

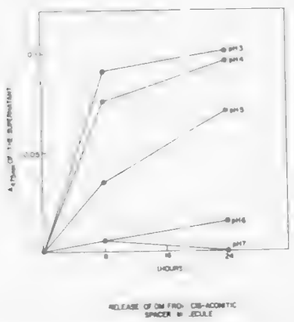
1. An isolated monoclonal, auto-anti-idiotypic antibody capable of binding to an adenosine receptor produced according to the method comprising:
(a) contacting lymphoid cells of an animal under suitable conditions with an effective auto-anti-idiotypic antibody-raising amount of N^6-carboxypentamethylene adenosine conjugated to a protein, so that the lymphoid cells produce auto-anti-idiotypic antibodies thereto,
(b) collecting the antibody-producing lymphoid cells at least three days after contacting them with the N^6-carboxypentamethylene adenosine conjugate,
(c) fusing the antibody-producing lymphoid cells so collected with appropriate myeloma cells to produce a series of hybridoma cells, each of which produces a monoclonal antibody,
(d) screening under suitable conditions the series of hybridoma cells so produced to identify a hybridoma cell which secretes a monoclonal antibody capable of binding to both the adenosine receptor and an antibody directed to N^6-carboxypentamethylene adenosine,
(e) separately culturing the hybridoma cell so identified in an appropriate medium, and
(f) separately recovering under suitable conditions the monoclonal, auto-anti-idiotypic antibody produced by the hybridoma cell.

5,144,011

ACIDITY-SENSITIVE SPACER MOLECULE TO CONTROL THE RELEASE OF PHARMACEUTICALS FROM MOLECULAR CARRIERS

Wei C. Shen, Needham, and Hugues J.-P. Ryser, Concord, both of Mass., assignors to Boston University, Boston, Mass.

Continuation of Ser. No. 924,821, Oct. 30, 1986, abandoned, which is a continuation of Ser. No. 277,633, Jun. 26, 1981, Pat. No. 4,631,190. This application Feb. 6, 1989, Ser. No. 308,960
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[5] C07K *17/06*; A61K *39/44, 47/48*
U.S. Cl. 530—391.5 12 Claims



RELEASE OF DM FROM CIS-ACONITIC SPACER MOLECULE

1. A molecular conjugate that is hydrolyzed when subjected to acidity, which comprises:
a) a first molecule which is bonded to a second molecule through a moiety that is not attached to said second molecule in a cis configuration with an acidic moiety;
b) said second molecule comprising an alkene possessing at least two acidic moieties attached to said second molecule in a cis configuration; and
c) a third molecule which is bonded to one of said acidic moieties attached to said second molecule in a cis configuration.

5,144,012

CYTOTOXIC DRUG CONJUGATES

David A. Johnson, Carmel; Bennett C. Laguzza, and William L. Scott, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 229,941, Aug. 3, 1988, Pat. No. 5,028,697. This application Feb. 15, 1991, Ser. No. 656,343
Int. Cl.[5] C07K *17/06, 17/14, 15/28*
U.S. Cl. 530—391.9 5 Claims

1. A derivatized antibody of the formula

$$Ab[CO{-}X{=}R^8]_m$$

wherein
m is an integer from 1 to about 10;
R^8 is O, $(OCH_3)_2$ or $(OCH_2CH_3)_2$;
Ab is a physiologically-acceptable antibody or antigen-recognizing fragment thereof, which recognizes an antigen associated with an undesirable cell;
X is a linker of the formula

$$-(CH_2)_n-\underset{\displaystyle R}{\overset{\displaystyle |}{C}}{=}$$

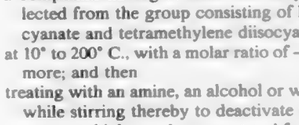
$$-(CH_2)_nAr{-}CH{=}$$

$$-(CH_2)_n{-}CO{-}NH{-}(CH_2)_r{-}CH{=} \quad \text{or}$$

-continued

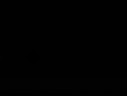
$$-CH{-}(CH_2)_n{-}NH{-}CO{-}R^2{-}CH{=};$$

R is hydrogen, phenyl, or phenyl substituted with one or two nitro, halogen, cyano or trifluoromethyl groups;
Ar is



R^1 is hydrogen, amino, amino-C_1–C_4 alkyl, hydroxy-C_1–C_4 alkyl, or guanidino-C_1–C_4 alkyl;
R^2 is $(CH_2)_n$

n is an integer from 0 to 5 provided when X is $-(CH_2)_n-Ar-C=$ and Ar is



n may not be 0.

5,144,013

BODY FLUID PURIFYING MATERIAL AND METHOD FOR PURIFYING BODY FLUID BY USE THEREOF

Nagayoshi Sakamoto, Ichihara, Japan, assignor to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 613,960, Nov. 13, 1990, abandoned, which is a continuation of Ser. No. 97,956, Sep. 17, 1987, abandoned. This application Dec. 19, 1991, Ser. No. 810,303
Claims priority, application Japan, Sep. 24, 1986, 61-223653; Sep. 24, 1986, 61-223654; Jul. 30, 1987, 62-189009; Jul. 30, 1987, 62-189010
Int. Cl.[5] C07K *17/10*; C08B *37/12, 15/06, 37/02*
U.S. Cl. 530—415 4 Claims

1. A material for removing immunoglobulins, IgG of multiple myeloma patient, immune complexes or rheumatoid factors from blood or plasma, comprising a water-insoluble compound obtained by reacting
one or more compounds having hydroxyl groups and being selected from the group consisting of agarose, cellulose, dextran, chitin, chitosan, and polyvinyl alcohol with
a compound having at least one isocyanate group and selected from the group consisting of hexamethylene diisocyanate and tetramethylene diisocyanate;
at 10° to 200° C., with a molar ratio of —NCO/—OH of 1 or more; and then
treating with an amine, an alcohol or water at 10° to 200° C. while stirring thereby to deactivate unreacted isocyanate groups which may be present and form said material with a nitrogen content under dry state of 3.0 to 8.0% by weight when deactivated with water or alcohol, or a nitrogen content of 3.5 to 9.0% by weight when deactivated with amine.
2. A method for removing anti-T-cell antibodies from blood or plasma containing said antibodies, which comprises contacting the blood of an organ transplantation patient or the plasma separated from said blood with an adsorbent, thereby adsorbing and removing anti-T-cell antibody, and thereafter removing the blood from contact with adsorbent; and wherein the adsorbent comprises a product obtained by reacting a water-insoluble polymeric compound having hydroxyl groups selected from the group consisting of agarose, cellulose, dextran, chitin, chitosan, and polyvinyl alcohol
wherein the compound having at least one isocyanate group is at least one of hexamethylene diisocyanate and tetramethylene diisocyanate.

5,144,014

PROCESS FOR PRODUCTION OF MONOAZO LAKE COATED WITH WATER-INSOLUBLE METAL SALT OF ROSIN

Hitoshi Sugamo; Nobuyuki Tomiya, and Yusuke Watabe, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,312
Claims priority, application Japan, Aug. 11, 1989, 1-208550
Int. Cl.[5] C09B *63/00*; C09D *11/00*
U.S. Cl. 534—573 16 Claims

1. A process for the production of a monoazo lake coated with a water-insoluble metal salt of rosin, which comprises:
(a) adding a salt of at least one metal selected from the group consisting of calcium, barium and strontium for forming a lake of a monoazo dye to a mixed aqueous solution containing a monoazo dye having a soluble group and an alkali metal salt or ammonium salt of rosin to form a mixture of a monoazo lake with a rosin metal salt,
(b) adjusting said mixture to pH of 3 to 5 to dissociate only a metal of the rosin metal salt and removing free metals, and
(c) adjusting said resulting mixture to pH of 9 to 12 and then adding a salt of at least one metal selected from zinc, aluminum, copper and manganese for insolubilizing rosin in water to the mixture to form a rosin salt of the metal for insolubilizing rosin in water.
2. A process for the production of a monoazo lake coated with a water-insoluble metal salt of rosin, which comprises:
(a) adding a salt of at least one metal selected from the group consisting of calcium, barium and strontium for forming a lake of a monoazo dye to a mixed aqueous solution containing a monoazo dye having a soluble group and an alkali metal salt or ammonium salt of rosin to form a mixture of a monoazo lake with a rosin metal salt, and
(b) adding a salt of at least one metal selected from the group consisting of zinc, aluminum, copper and manganese for forming a lake of a monoazo dye to said mixture, and adjusting the resultant mixture to an acidic area of not less than pH 4 to replace only a metal of the rosin metal salt with the metal for insolubilizing rosin in water.

5,144,015

SYNTHESIS OF PYRAZOLE DYES

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 632,294, Dec. 21, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 738,409
Int. Cl.[5] C09B *29/036, 29/09, 29/30, 29/36*
U.S. Cl. 534—752 6 Claims

1. A process for preparing a 1-alkyl-3-secondary or tertiary alkyl-4-cyano-pyrazol-5-yl azo dye or a 1-alkyl-3-aryl-4-cyano-pyrazol-5-yl azo dye comprising:
(a) reacting a 3-secondary or tertiary alkyl-4-cyano-5-amino pyrazole or a 3-aryl-4-cyano-5-amino pyrazole with a diazotizing reagent to form a pyrazol-5-yl diazonium salt;
(b) allowing said diazonium salt to react with an aromatic coupling component to form a 3-secondary or tertiary alkyl-4-cyano-pyrazol-5-yl azo dye or a 3-aryl-4-cyano-pyrazol-5-yl azo dye; and
(c) reacting the product of step b) with an alkylating agent in the presence of a base to form a 1-alkyl-3-secondary or tertiary alkyl-4-cyano-pyrazol-5-yl azo dye or a 1-alkyl-3-aryl-4-cyano-pyrazol-5-yl azo dye.

5,144,016

ALGINATE GELS

Gudmund Skjak-Braek, and Storker Moe, both of Trondheim, Norway, assignors to Protan Biopolymer A/S, Drammen, Norway

Filed May 29, 1991, Ser. No. 706,994
Claims priority, application Norway, May 29, 1990, 902386
Int. Cl.[5] C08B *37/07*; B01J *13/00*
U.S. Cl. 536—3 10 Claims

1. A covalently cross-linked alkali metal and ammonium alginate gel having a swellability of 10–300 times its volume in water or 2–70 time its volume in physiological saline solution while retaining its original shape.

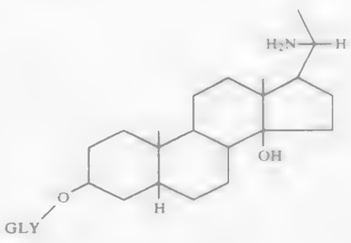
5,144,017

COMPOUNDS THAT BIND TO DIGITALIS RECEPTOR

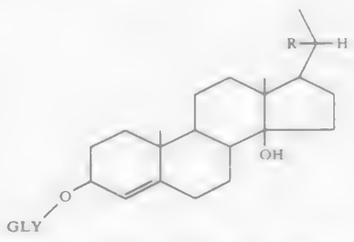
Frank S. LaBella, Oakbank, and John F. Templeton, Winnipeg, both of Canada, assignors to University of Manitoba, Winnipeg, Canada

Continuation-in-part of Ser. No. 379,191, Jul. 13, 1989, abandoned. This application Jan. 9, 1990, Ser. No. 462,234
Claims priority, application United Kingdom, Jul. 13, 1988, 8816619; Dec. 12, 1988, 8828974; May 5, 1989, 8910332
Int. Cl.[5] C07J *5/00*; A61K *31/705*
U.S. Cl. 536—5 2 Claims

1. A C3-glycoside derivative of a 14β-hydroxypregnane and having the formula:



wherein GLY is a glycoside radical selected from the group consisting of glucoside, rhamnoside and tridigitoxoside.
2. A C3-glycoside derivative of a 14β-hydroxypregnane and having the formula:



where GLY is a glycoside radical selected from the group consisting of glucoside, rhamnoside and tridigitoxoside and R is an amino group.

5,144,018

2',3'-DIDEOXY-ADENOSINE DERIVATIVES

Hiroyoshi Kuzuhara; Masajiro Kawana, both of Wako; Noritsugu Yamasaki, Niiza, and Masahiro Nishikawa, Kamifukuoka, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

PCT No. PCT/JP88/00393, § 371 Date Dec. 23, 1988, § 102(e) Date Dec. 23, 1988, PCT Pub. No. WO88/08427, PCT Pub. Date Nov. 3, 1988

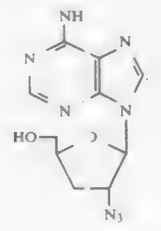
PCT Filed Apr. 22, 1988, Ser. No. 295,205

Claims priority, application Japan, Apr. 23, 1987, 62-100903; Jul. 10, 1987, 62-172721

Int. Cl.[5] C07H *19/16*; A61K *47/26*

U.S. Cl. 536—26 3 Claims

1. The compound 2'-3'-dideoxy-2'-azido-adenosine having the formula



5,144,019

RIBOZYME CLEAVAGE OF HIV-I RNA

John J. Rossi, Glendora; Edouard M. Cantin, Los Angeles; John A. Zaia, Arcadia, and Pairoj Chang, San Dimas, all of Calif., assignors to City of Hope, Duarte, Calif.

Filed Jun. 21, 1989, Ser. No. 369,489

Int. Cl.[5] C07H *17/00*; A61K *37/54*

U.S. Cl. 536—27 3 Claims

1. A snythetic catalytic RNA ribozyme strand targeted to a region of HIV-I RNA having the sequence $GAAAC(X)_nGU$ in which X is any nucleotide and the value of n is from 0 to about 50, said snythetic catalytic ribozyme strand having the formula 3' YAGNAGUCZ 5' in which N is any nucleotide, Y and Z are flanking sequences of at least five nucleotides complementary to sequences adjacent to cleavage site in the $GAAAC(X)_nGU$ target RNA sequence.

5,144,020

HIGH PRODUCTIVITY SPHEROID NITROCELLULOSE

Kwan F. Fung, Middletown, N.J., assignor to Aqualon Company, Wilmington, Del.

Filed May 17, 1991, Ser. No. 701,755

Int. Cl.[5] C08B *5/02*, *5/04*

U.S. Cl. 536—35 9 Claims

1. A spheroid nitrocellulose prepared from dried water-wet fibrous nitrocellulose treated with a solvent, characterized in that water-wet nitrocellulose dried to a moisture content of 2.5 to 10% is treated with a solvent/cosolvent mixture and densified to a nonfibrous from via bilateral agitation to produce a free flowing spheroid nitrocellulose having a slower burn rate than alcohol-wet densified nitrocellulose.

5,144,021

RETICULATED CELLULOSE AND METHODS AND MICROORGANISMS FOR THE PRODUCTION THEREOF

Ben-Bassat Arie, Walnut Creek; Robert Bruner, El Cerrito; Sharon Shoemaker, Fairfield, all of Calif.; Yehoshua Aloni, Kfar-Saba, Israel; Harry Wong, San Leandro, Calif.; Donald C. Johnson, Auburn, and Amar Neogi, Seattle, both of Wash., assignors to Weyerhaeuser Company, Federal Way, Wash.

Division of Ser. No. 196,496, May 19, 1988, Pat. No. 5,079,162, Continuation-in-part of Ser. No. 900,086, Aug. 28, 1986, abandoned, Continuation-in-part of Ser. No. 788,994, Oct. 18, 1985, abandoned. This application Jan. 30, 1991, Ser. No. 633,761

Int. Cl.[5] C08B *1/00*; C12N *1/20*

U.S. Cl. 536—56 8 Claims

1. A reticulated cellulose product characterized as having a reticulated structure and having strands of cellulose that interconnect forming a grid-like pattern extending in three dimensions to give a fenestrated appearance when viewed with a scanning electron microscope.

5,144,022

METHOD OF PRODUCING POWDERY HIGH HLB SUGAR FATTY ACID ESTER

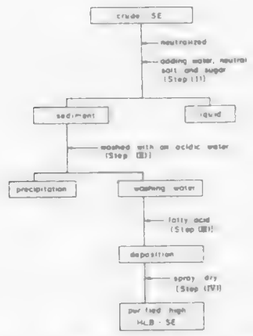
Shusaku Matsumoto, Kyoto; Yoshio Hatakawa, Higashiosaka, and Akihiko Nakajima, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Japan

Filed Apr. 30, 1990, Ser. No. 516,512

Claims priority, application Japan, May 9, 1989, 1-116466

Int. Cl.[5] C07H *13/02*, *11/00*

U.S. Cl. 536—119 20 Claims



1. A method of producing purified powdery high HLB sugar fatty acid esters, which comprises adjusting pH value of a reaction mixture comprising unreacted sugar, unreacted fatty acid methyl ester, catalysts, soaps, fatty acids and volatile matter, in addition to said sugar fatty acid esters, to a neutral range; adding water in a ratio of 5:1 to 40:1 by weight based on the weight of the reaction mixture, neutral salts and sugar to said reaction mixture to give sediments; washing the sediments with acidic water, and adding fatty acids to the washing liquid to separate depositions; neutralizing the depositions; and then spray drying the resultant.

5,144,023

PROCESS FOR THE SYNTHESIS OF POLYOL FATTY ACID ESTERS

Gerardus W. M. Willemse, Vlaardingen, Netherlands, assignor to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 278,693, Dec. 1, 1988, abandoned. This application Nov. 18, 1991, Ser. No. 794,829

Claims priority, application United Kingdom, Dec. 11, 1987, 8728960; Sep. 15, 1988, 8821584.3

Int. Cl.[5] C07H *13/06*

U.S. Cl. 536—124 19 Claims

1. A process for the synthesis of polyol fatty acid polyesters which comprises the steps of

(1) forming a mixture of one or more polyol compounds selected from the group of sugar polyols having at least 4 free hydroxyl groups, and fatty acid oligoesters thereof, a C_8 to C_{24} fatty acid lower-alkylester, a transesterification catalyst, and one or more solvents,

(2) homogenizing and removing the one or more solvents from the mixture by spray drying and

(3) reacting the solvent-free mixture under transesterification conditions.

5,144,024

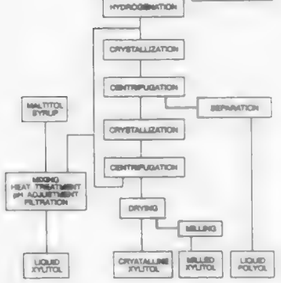
SHELF STABLE LIQUID XYLITOL COMPOSITIONS

Tammy Pepper, 38 Napoleon Road, St. Margarets, Twickenham, Middlesex TW1 3EP, Great Britain, and Pasi Keipinen, Jokitormanpolku 6, SF-48400 Kotka, Finland

Filed Oct. 11, 1990, Ser. No. 596,064

Int. Cl.[5] C13F *1/02*; C07H *1/08*; A23G *3/00*

U.S. Cl. 536—128 22 Claims



1. A non-crystallizing liquid xylitol composition having a dry solids content of 60–80%, wherein said dry solids are comprised of 50–90% xylitol and 10–50% non-xylitol monomeric or dimeric polyols.

5,144,025

PROCESS FOR THE RESOLUTION OF INTERMEDIATES USEFUL IN THE PREPARATION OF 1,5-BENZOTHIAZEPINES

Dario Tentorio, Vigano', Italy, assignor to Zambon Group S.p.A., Vicenza, Italy

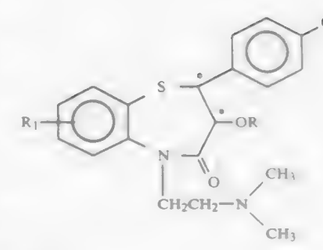
Filed Apr. 5, 1990, Ser. No. 504,860

Claims priority, application Italy, Apr. 2, 1990, 20134 A/89

Int. Cl.[5] C07D *281/10*

U.S. Cl. 540—491 10 Claims

1. A process for the preparation of the compounds of formula


(I)-cis

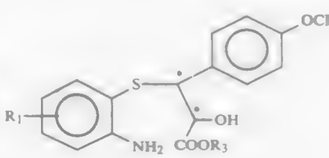
wherein

R represents a hydrogen atom or acetyl,

R_1 represents a hydrogen atom or chlorine atom,

the asterisks mark the asymmetric carbon atoms;

which comprises the treatment of a racemic mixture of a compound of formula


IV-A (threo)

wherein

R_1 represents a hydrogen or chlorine atom,

R_3 represents a C_1–C_3 alkyl,

the asterisks mark the asymmetric carbon atoms;

with optically active tartaric acid or analogs thereof in a suitable organic solvent, the separation of the diastereoisomeric salts of compound IV-A with optically active tartaric acid or analogs thereof, the optional liberation of the salts and the crystallization in a suitable solvent of the enantiomerically enriched mixture thus obtained.

5,144,026

BORON CONTAINING COMPOUNDS AND THEIR PREPARATION AND USE IN NEUTRON CAPTURE THERAPY

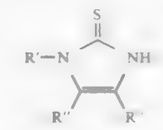
Detlef Gabel, Bremen, Fed. Rep. of Germany, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 660,077, Feb. 25, 1991. This application Feb. 4, 1992, Ser. No. 831,021

Int. Cl.[5] C07D *233/04*, *243/04*

U.S. Cl. 540—500 6 Claims

1. A compound of the formula



wherein R' is alkyl having 1 to 7 carbon atoms or hydrogen; R'' is hydrogen, alkyl having 1 to 7 carbon atoms, dihydroxyboryl, or alkylcarboranyl wherein the alkyl group has 1 to 7 carbon atoms, provided that one R'' must be a boron containing group and the other R'' must be hydrogen or alkyl and their salts with physiologically compatible organic and inorganic bases or acids.

5,144,027

CEPHALOSPORINS, PROCESS FOR PRODUCING THE SAME, INTERMEDIATES THEREOF AND PROCESS FOR PRODUCING THE INTERMEDIATES

Hiroshi Sadaki; Hirokazu Narita; Hiroyuki Imaizumi, all of Toyama; Yoshinori Konishi Takaoka; Takihiro Inaba, Namerikawa; Tatsuo Hirakawa, Higashitonami; Hideo Taki, Sagamihara; Masaru Tai, Toyama; Yasuo Watanabe, Toyama, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

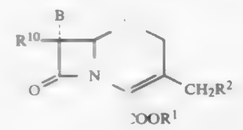
Division of Ser. No. 22,432, Mar. 6, 1987, abandoned, which is a division of Ser. No. 654,681, Sep. 26, 1984, Pat. No. 4,673,738, which is a division of Ser. No. 314,912, Sep. 23, 1981, Pat. No. 4,489,072. This application May 24, 1991, Ser. No. 707,221

Claims priority, application Japan, Sep. 25, 1980, 55-132253; Nov. 12, 1980, 55-158184; Dec. 3, 1980, 55-175263

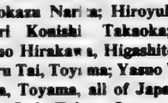
Int. Cl.[5] C07D *501/20*

U.S. Cl. 540—222 8 Claims

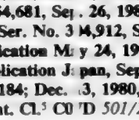
1. A method for producing a 7-(substituted or unsubstituted amino)-3-substituted methyl-Δ^3 cephem-4-carboxylic acid represented by the following formula or a salt thereof:



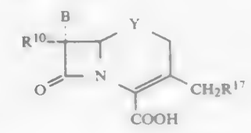
wherein R^1 represents a hydrogen atom or a conventional carboxyl-protecting group in the field of cephalosporin; R^2 represents a 2-(1,2,3,4-tetrazolyl) group in which the carbon atom in tetrazolyl ring may be substituted by a substituent selected from the group consisting of halogen, C_{1-14}alkyl, benzyl, phenethyl, 4-methyl-benzyl, naphthylmethyl, phenyl, naphthyl, indanyl, C_{2-10}alkenyl, hydroxyl, protected hydroxyl, oxo, C_{1-14}alkylthio, nitro, cyano, amino, protected amino, C_{1-14}alkylamino, di-C_{1-14}alkylamino, C_{1-12}acyl, C_{1-12}acyl-C_{1-14}alkyl, carboxyl, protected carboxyl, carbamoyl, amino-C_{1-14}alkyl, N-C_{1-14}alkylamino-C_{1-14}alkyl, N,N-di-C_{1-14}alkylamino-C_{1-14}alkyl, hydroxy-C_{1-14}alkyl, hydroxyimino-C_{1-14}alkyl, C_{1-14}alkoxy-C_{1-14}alkyl, carboxy-C_{1-14}alkyl, C_{1-14}alkoxycarbonyl-C_{1-14}alkyl, benzyloxycarbonyl-C_{1-14}alkyl, phenethyloxycarbonyl-C_{1-14}alkyl, 4-$_{14}$alkyl, 4-methylbenzyl-oxcarbonyl-C_{1-14}alkyl, naphthylmethyloxycarbonyl-C_{1-14}alkyl, sulfo-C_{1-14}alkyl, sulfo, sulfamoyl-C_{1-14}alkyl, sulfamoyl, carbamoyl-C_{1-14}alkyl, carbamoyl-C_{2-10}alkenyl and N-hydroxycarbamoyl-C_{1-14}alkyl, said tetrazolyl group being attached to the exomethylene group at the 3-position of the cephem ring through a carbon-nitrogen bond; R^{10} represents an amino group or a protected amino group represented by the formula,



or by the formula,



in which R^{11}, R^{12}, R^{13}, R^{14} and R^{15}, which may be identical or different, are hydrogen atoms or C_{1-14}alkyl, C_{2-10}alkenyl, C_{3-7}cycloalkyl, C_{5-7}cycloalkenyl, phenyl, naphthyl, indanyl, benzyl, phenethyl, 4-methylbenzyl, naphthylmethyl, furyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thiadiazolyl, oxadiazolyl, thiatriazolyl, oxatriazolyl, pyridyl, N-methyl-piperidinyl, quinolyl, phenazinyl, 1,3-benzodioxolanyl, benzofuryl, benzothienyl, benzoxazolyl, benzothiazolyl, coumarinyl or acyl groups, which acyl can be derived from formic acid, acetic acid, propionic acid, butanoic acid, isobutanoic acid, pentanoic acid, methoxyacetic acid, methylthioacetic acid, acrylic acid, crotonic acid, cyclohexanoic acid, cyclopentaneacetic acid, cyclohexaneacetic acid, cyclohexanepropionic acid or cyclohexadieneacetic acid; and B represents a hydrogen atom or a C_{1-5}alkoxy group, which consists essentially of reacting a cephalosporanic acid represented by the formula:



wherein R^{10} and B have the same meanings as defined above; R^{17} represents a conventional acyloxy or carbamoyloxy group in the cephalosporin field; and Y represents >S or >S→O, or its conventional derivative in the carboxyl group in the cephalosporin field or a salt thereof, with tetrazole in which nitrogen atom in tetrazole is attached to hydrogen atom and the carbon atom in tetrazole may be substituted by a substituent selected from the group as defined for R^2, in an organic solvent in the presence of boron trifluoride or a complex compound of boron trifluoride and then, if necessary, removing the resulting by-product 1-tetrazolyl isomer, and if desired, removing the protecting group, protecting the carboxyl group or converting the product to a salt.

5,144,028

2-(9-FLUORENONYL)-CARBAPENEM INTERMEDIATES

Mark L. Greenlee, Rahway; Frank P. DiNinno, Old Bridge; Lovji D. Cama, Tennfly, and James V. Heck, Scotch Plains, all of N.J., assignors to Merck & Co. Inc., Rahway, N.J.

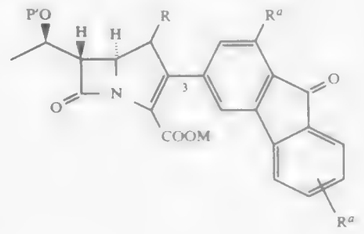
Filed Oct. 9, 1990, Ser. No. 594,809

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] C07D *487/04;* A61K *31/40;* C07F *7/18*

U.S. Cl. 540—302 6 Claims

1. A compound of structural formula:



wherein:

R is H or CH_3;

R^a are independently selected from the radicals set out below: H, CH_2OH, CH_2OP', OP', CO_2M, CO_2CH_3, $CONH_2$, Cl, Br, I, CN, CHO, SCH_3, $SOCH_3$ or SO_2CH_3;

P' is a removable hydroxyl protecting group; and

M is a removable carboxyl protecting group.

5,144,029

DERIVATIVES OF 1-[3-(4-HYDROXYPHENYL) 1-HYDROXY 1-PROPYL] BENZENE SUBSTITUTED IN POSITION 2 BY AN AMINOALKYLENEOXY CHAIN, THE METHOD OF PREPARING SAME AND THE APPLICATION THEREOF TO THERAPEUTICS

Mona Ward, Courbevoie; Pierre-André Ph. Settembre, Houilles; Alain Renaud, Rueil-Malmaison, and Michel Langlois, Buc, all of France, assignors to Delalande S.A., Courbevoie, France

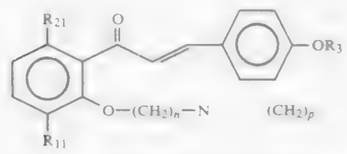
Division of Ser. No. 339,815, Apr. 18, 1989, Pat. No. 5,017,572. This application Jan. 3, 1991, Ser. No. 637,075

Claims priority, application France, Apr. 22, 1988, 88 05382

Int. Cl.[5] C07D *223/04, 211/22, 207/08*

U.S. Cl. 540—610 7 Claims

1. Compounds of the general formula:



(III)

in which: R_3 is hydrogen, 2-tetrahydropyranyl or benzyl

R_{11} and R_{21} are such that:

either R_{11}=methoxy, in which case R_{21} is a group chosen from the following: C_1–C_4 alkyl; C_2–C_8 alkyloxy; C_5–C_7 cycloalkyloxy; benzyloxy;

or R_{21}=methoxy, in which case R_{11} is a group chosen from the following: C_2–C_7 alkyloxy; C_2–C_8 alkyloxy substituted by a methoxy group; C_1–C_4 trifluoroalkyloxy; C_3–C_4 alkenyloxy; C_5–C_7 cycloalkyloxy; benzyloxy; C_1–C_4 alkylthio;

n=2 or 3; and

p=4, 5 or 6.

5,144,030

FLUORESCENE POLARIZATION IMMUNOASSAY FOR TETRAHYDROCANNABINOIDS

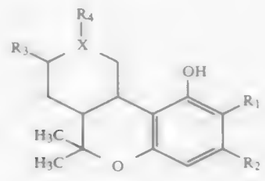
Nai-Yi Wang, Mundelein; Robert E. Dubler, Gurnee; Frank S. Ungemach, Lake Villa; Roland L. Walters, Barrington, and Susan A. Thacker, Naperville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 14,950, Feb. 17, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,266

Int. Cl.[5] C07D *491/16, 311/80*

U.S. Cl. 546—89 14 Claims

1. A tracer comprising the structure:



wherein:

R_1 is H when R_2 is n-pentyl, R_3 is H, R_4 is RZQ, and X is =C—, —C= or —CH; or

R_1 is H when R_2 is n-pentyl, R_3 is RZQ, R_4 is CH_3 and X is =C—, —C= or —CH; or

R_1 is RZQ when R_2 is n-pentyl, R_3 is H, R_4 is CH_3 or COOH, and X is =C—, —C= or —CH; or

R_1 is H when R_2 is —CH_2RZQ, R_3 is H, R_4 is CH_3 or COOH, and X is =C—, —C= or —CH; or

R_1 is H when R_2 is R_5, R_3 is H, R_4 is H or RZQ, and X is —N—;

R_5 is an alkyl group of from about 5 to about 9 carbon atoms;

R is a linking group consisting of from about 0 to about 15 carbon atoms and heteroatoms, wherein said heteroatoms are N, O, S, Cl, Br, I or F;

Z is C=O, C=NH, NH, or SO_2; and

Q is fluorescein or a derivative of fluorescein, said fluorescein or derivative of fluorescein providing said tracer with the ability to emit fluorescence.

5,144,031

PROCESS FOR THE PRODUCTION OF ISOCYANURATE POLYISOCYANATES, THE COMPOUNDS OBTAINED BY THIS PROCESS AND THEIR USE

Josef Pedain, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 6, 1991, Ser. No. 696,433

Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015155

Int. Cl.[5] C07D *251/34;* C08G *18/79*

U.S. Cl. 544—193 9 Claims

1. A process for the production of an isocyanurate group-containing polyisocyanate which comprises

a) partially trimerizing the isocyanate groups of a (cyclo)aliphatic diisocyanate in the presence of a catalyst which accelerates the trimerization of isocyanate groups and optionally in the presence of an inert solvent,

b) terminating the trimerization reaction at the desired degree of trimerization required and

c) removing unreacted starting diisocyanate and any other volatile constituents,

said process additionally comprising

d) adding to the reaction mixture prior to step c) 1 to 30% by weight, based on the weight of said diisocyanate, of at least one monohydric alcohol containing ester groups and corresponding to the formula

wherein

R is an optionally olefinically unsaturated (cyclo)aliphatic C_{1-18} hydrocarbon radical which may contain ether groups,

m is a whole or a fractional number having a value from 1 to 2 and

n is an integer of 3 to 5,

and reacting said alcohol with a portion of the isocyanate groups present to form urethane groups,

provided that on completion of the reactions of steps a) and d), the reaction mixture contains at least 10% by weight of unreacted diisocyanate, based on the weight of the reaction mixture excluding inert solvent.

5,144,032

PREPARATION OF TERTIARY AMINE BORANE ADDUCTS

Anthony J. Arduengo, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 387,362, Jul. 19, 1989, Pat. No. 5,034,464, which is a continuation of Ser. No. 253,991, Oct. 5, 1988, abandoned. This application Apr. 19, 1991, Ser. No. 687,674

Int. Cl.[5] C07F *5/02*

U.S. Cl. 544—229 27 Claims

1. A process for the production of tertiary amine borane adducts which comprises reacting an alkali metal borohydride with carbon dioxide and a tertiary amine in the presence of an organic solvent chosen so that it does not react with reactants or products followed by isolating of the tertiary amine borane adduct, said reacting and isolating performed in the substantial absence of water, where the water content is below about

1% water so that the above low levels of water are maintained throughout the reaction and isolation of the tertiary amine borane adduct.

27. The compound 2-methyl-1,4-diazabicyclo[2.2.2]octane-monoborane.

5,144,033

PROCESS FOR OBTAINING ALMOST FLUORESCENCE-FREE XANTHINES

Rudolf Knieps; Ottamar Jaenicke, both of Kelkheim, and Walter Schönfeld, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1991, Ser. No. 654,487

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1990, 4004618

Int. Cl.[5] **C07D** *473/04*

U.S. Cl. 544—273 **6 Claims**

1. A process for obtaining almost fluorescence-free xanthines, which comprises precipitating xanthines which contain at least one unsubstituted nitrogen atom in the molecule from an aqueous-alkaline solution by CO_2.

5,144,034

PROCESS FOR THE SYNTHESIS OF CYCLOPENTENE DERIVATIVES OF PURINES

M. Ross Johnson, Chapel Hill; Michael R. Peel, Durham, and Daniel D. Sternbach, Chapel Hill, all of N.C., assignors to Glaxo Inc., Research Triangle Park, N.C.

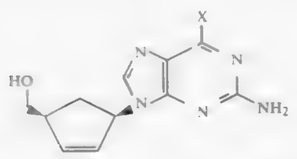
Filed Apr. 6, 1990, Ser. No. 505,969

Int. Cl.[5] **C07D** *47. /18, 473/40*

U.S. Cl. 544—276 **20 Claims**

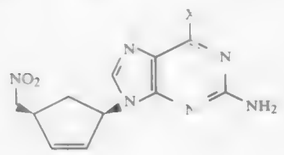
1. A method for preparing of a compound of formula (IX),

(IX)



wherein X is chloro, bromo or iodo, comprising reacting a compound of formula (VIII),

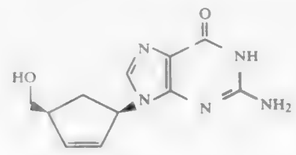
(VIII)



with a strong, sterically hindered base followed by ozone and reacting the product with a reducing agent to yield the compound of formula (IX).

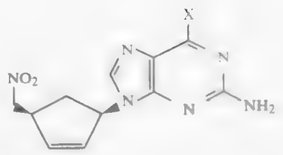
13. The method for the synthesis of (−)-carbovir, the 1′ R-cis enantiomer of the compound of formula (II),

(II)



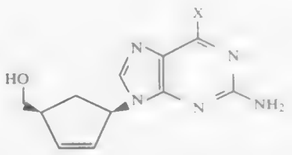
(a) which comprises: reacting a compound of formula (VIII),

(VIII)



wherein X is chloro, bromo or iodo, with a strong, sterically hindered base followed by ozone and reacting the product with a reducing agent to yield a compound of formula (IX), and

(IX)



(b) reacting a compound of formula (IX) sequentially with a source of ammonia followed by an enzymatic hydrolysis agent which selectively yields (−)-carbovir.

5,144,035

N-SUBSTITUTED PIPERIZINE DERIVATIVES

Toshiyasu Mase, Chiba; Hiromu Hara, Saitama, and Toshimitsu Yamada, Ibaraki, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 337,064, Apr. 12, 1989, Pat. No. 4,948,795. This application Apr. 10, 1990, Ser. No. 506,957

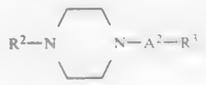
Claims priority, application Japan, Apr. 28, 1988, 63-108743

Int. Cl.[5] **A61K** *403/06*

U.S. Cl. 544—295 **3 Claims**

1. An N-substituted piperazine derivative having the formula (II) and a salt thereof:

(II)



wherein A^2 represents a lower alkylene group, R^2 represents a hydrogen atom or a lower alkanoyloxy group and R^3 represents a furyl, thienyl, imidazolyl, pyrrolidinyl, or pyrimidinyl group.

5,144,036

N-SUBSTITUTED QUINOLINIUM SALTS

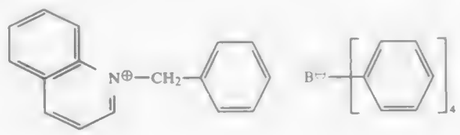
Peter S. Alexandrovich, and John C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1990, Ser. No. 560,631

Int. Cl.[5] **C07F** *5/02*

U.S. Cl. 546—13 **2 Claims**

1. An N-substituted quinolinium salt having the structure:



5,144,037

1,5-DIDEOXY-1,5-IMINO-D-GLUCITOL DERIVATIVES

Richard A. Partis, Evanston; Francis J. Koszyk, Chicago, and Richard A. Mueller, Glencoe, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 418,091, Oct. 12, 1989, Pat. No. 5,003,072, which is a continuation-in-part of Ser. No. 266,767, Nov. 3, 1988, abandoned. This application Jan. 10, 1991, Ser. No. 639,613

Int. Cl.[5] **C07D** *491/052, 211/42*

U.S. Cl. 546—116 **34 Claims**

1. An O-acylated derivative of N-substituted 1,5-dideoxy-1,5-imino-D-glucitol in which from one to four of the free hydroxyl groups are O-acylated with carboxylic alkanoyl radicals selected from the group consisting of ω,ω,ω-trifluoro alkanoyl having from three to eight carbon atoms, carboxylic cycloalkanoyl groups having from four to ten carbon atoms and carboxylic acyclic alkanoyl groups having from two to ten carbon atoms, wherein the N-substituent is a radical selected from the group consisting of p-decylbenzoyl, 2-(acetyloxy)-benzoyl, 2-thiopheneacetyl, trans-3-furanacryoyl, 3-methyoxy-phenylacetyl and 3-(trifluoromethyl)benzoyl, and alkyl radicals having from one to fourteen carbon atoms, provided that when the alkyl radical has from one to five carbon atoms the O-acylated groups are ω,ω,ω-trifluoro alkanoyl or carboxylic cycloalkanoyl.

5,144,038

PROCESS FOR THE PRODUCTION OF 2-HYDROXY-3-HALO-5-NITROPYRIDINES

Detlev Worsch, Brigerbad, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Filed Jul. 17, 1991, Ser. No. 731,334

Claims priority, application Switzerland, Jul. 17, 1990, 2373/90

Int. Cl.[5] **C07D** *213/72, 213/55*

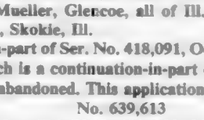
U.S. Cl. 546—297 **7 Claims**

1. Process for the production of 2-hydroxy-3-halo-5-nitropyridines of the formula:

I

wherein Hal is chlorine, bromine or iodine, comprising nitrating a 5-halo-6-hydroxynicotinic acid of the formula:

II



wherein Hal has the above meaning, in the presence of nitric acid and sulfuric acid.

5,144,039

PROCESS FOR PRODUCING OPTICALLY ACTIVE ALCOHOL

Yukio Yoneyoshi, Otsu; Gohfu Suzukamo, Ibaraki; Naoto Konya, Takatsuki, and Takaharu Ikeda, Ibaraki, all of Japan, assignors to Sumitomo Electric Company, Limited, Osaka, Japan

Filed Jan. 29, 1990, Ser. No. 471,966

Claims priority, application Japan, Jan. 30, 1989, 1-022243; Apr. 18, 1989, 1-099730

Int. Cl.[5] **C07D** *249/08;* **C07C** *29/143*

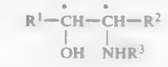
U.S. Cl. 548—268.4 **33 Claims**

1. A process for producing an optically active alcohol comprising:

1) reacting

(A) an optically active amino alcohol represented by the formula (I)

(I)



wherein

R^1 is phenyl which may be substituted by C_1–C_5 alkyl or C_1–C_5 alkoxy, R^2 is C_1–C_4 alkyl, R^3 is hydrogen, and the carbon atoms having a mark * are each an asymmetric carbon atom, and

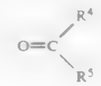
an acid selected from the group consisting of mineral acids, carboxylic acids and organic sulfonic acids, or an acceptable salt of the optically active amino alcohol (I) and said acid, with

(B) a metal borohydride, in the presence of

(C) at least one member selected from the group consisting of water, sulfides selected from the group consisting of dialkyl monosulfides in which each alkyl has 1–4 carbon atoms, dialkyl disulfides in which each alkyl has 1–4 carbon atoms and cyclic sulfides having 4 carbon atoms, cyclic ethers having 4 carbon atoms and dialkyl ethers in which each alkyl has 1–4 carbon atoms, to obtain a product and

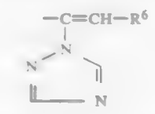
2) reacting the product of step 1with a prochiral ketone represented by the formula (II)

(II)



wherein $R^4$and R^5 are different and selected from the group consisting of C_1–C_6 alkyl, aryl having 5–17 carbon atoms, aralkyl having 7–11 carbon atoms and 2-substituted-1-triazoleethylene represented by the formula (III)

(III)



wherein R^6 is a halogen- or haloalkyl-substituted or unsubstituted phenyl or cycloalkyl.

5,144,040

PROCESS FOR THE PREPARATION OF 1-(ACYLAMINOALKYL)-2-IMIDAZOLINES SUBSTITUTED IN THE 2 POSITION

Georg-Wolfgang Eckhardt, Frankfurt am Main; Karl-Heinz Keil, Hanau-Mittelbuchen, and Manfred Schrod, Weiterstadt, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP89/00197, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO89/08106, PCT Pub. Date Sep. 8, 1989

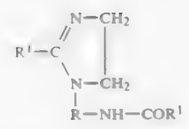
PCT Filed Mar. 1, 1989, Ser. No. 573,041

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807246

Int. Cl.[5] **C07D** *233/26;* **A61K** *7/50;* **C11D** *3/28*

U.S. Cl. 548—352 **15 Claims**

1. Process for the preparation of 1-(acylaminoalkyl)-2-imidazolines substituted in the 2-position of the general formula I



(I)

in which

R is an alkylene radical of the formula $—CH_2CH_2—$, $—CH_2CH_2CH_2—$, $—CH(CH_3)CH_2—$ or $—CH(CH_3)CH_2CH_2—$ and R^1 is a fatty acid radical of 7 to 25 C atoms derived from a fatty acid by elimination of the carboxyl group, by reaction of a fatty acid of the general formula II

$$R^1COOH \quad (II)$$

and/or a glyceride and/or an ester of this fatty acid with a dialkylenetriamine of the general formula III

$$NH_2—(CH_2)_2—NH—R—NH_2 \quad (III)$$

which R and R^1 have the above-mentioned meanings, at elevated temperatures, in which an acylation product of the dialkylenetriamine is first formed, which is then cyclized at elevated temperature under subatmospheric pressure, while distilling off the water, to give the compound of the formula I, characterized in that the fatty acid of the formula II and/or a glyceride and/or an ester of this fatty acid and the compound of the formula III are reacted in a molar ratio of (1.8 to 2.25):1 by initially introducing an educt at a temperature of T_1 and metering in the second educt in liquid form, while maintaining a temperature of T_1 in the reaction mixture during the addition and a temperature of T_2 after the addition until the start of the cyclization and distilling off the water and/or the alcohol and/or the glycerol formed through a rectification column and, after the formation of the acylation product, carrying out the cyclization at a temperature of at least 140° C. and a subatmospheric pressure of at least 50 mbar in which

a) if a fatty acid of the formula II is used, T_1 is a temperature of 170° C. to 250° C., but at most up to the boiling point of the initially introduced educt T_2 is a temperature of 170° to 250° C., and

b) if a glyceride or ester of the fatty acid is used, T_1 is a temperature of 100° to 250° C., at most up to the boiling point of the initially introduced educt and T_2 is a temperature of 100° to 250° C., at most up to the boiling point of the reaction mixture.

5,144,041

PROCESS FOR THE PREPARATION OF 2-ARYL-1-SUBSTITUTED-5-(TRIFLUOROMETHYL) PYRROLE COMPOUNDS USEFUL AS INSECTICIDAL, ACARICIDAL AND NEMATOCIDAL AGENTS AND AS INTERMEDIATES FOR THE MANUFACTURE OF SAID AGENTS

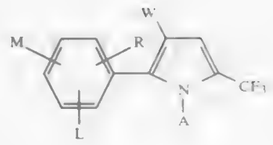
Robert F. Doehner, Jr., East Windsor, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 634,286, Dec. 26, 1990. This application Mar. 20, 1992, Ser. No. 854,165

Int. Cl.[5] C07D *207/30, 207/34*

U.S. Cl. 548—531 5 Claims

1. A process for the preparation of a compound of formula I



(I)

wherein

A is C_1–C_6 alkyl, phenyl, phenyl substituted with halogen or C_1–$_6$ alkyl substituted with phenyl;

W is CN, NO_2 or $COOR_1$;

L is hydrogen or halogen and

M and R are each independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl C_1–C_4 alkylsulfonyl, CN, NO_2, halogen, CF_3, R_2CF_2Z, R_3CO or NR_4R_5 and when M and R are on adjacent positions they may be taken together with the carbon atoms to which they are attached to form a ring in which MR represents the structure $—OCH_2O—$, $—OCF_2O—$ or $—CH=CH—CH=CH—$;

Z is $S(O)_n$ n or O;

R_1 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl or phenyl;

R_2 is hydrogen, F, CHF_2, CHFCl or CF_3;

R_3 is C_1–C_4 alkyl, C_1–C_4 alkoxy or NR_4R_5;

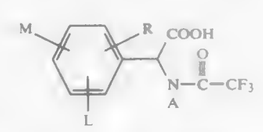
R_4 is hydrogen or C_1–C_4 alkyl;

R_5 is hydrogen, C_1–C_4 alkyl or R_6CO;

R_6 is hydrogen or C_1–C_4 alkyl; and

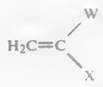
n is an integer of 0, 1 or 2

which comprises reacting a compound of formula II



(II)

wherein A, L, M and R are as defined above with about one molar equivalent of a compound of formula III



(III)

wherein X is Cl or Br and W is described above and at least one molar equivalent of an organic base in the presence of an acid anhydride and a solvent at an elevated temperature.

5,144,042

PROCESS FOR PREPARING OPTICALLY ACTIVE 3-HYDROXYPYRROLIDINE DERIVATIVES

Nobuo Seido; Yoshiki Okeda, and Hidenori Kumobayashi, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

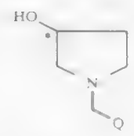
Filed Apr. 9, 1991, Ser. No. 682,273

Claims priority, application Japan, Apr. 11, 1990, 2-93962

Int. Cl.[5] C07D *207/12*

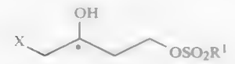
U.S. Cl. 548—541 5 Claims

1. A process for preparing an optically active 3-hydroxypyrrolidine derivative represented by formula (III):



(III)

wherein Q represents a substituted or unsubstituted phenyl group; and * indicates an asymmetric carbon atom, comprising reacting an optically active 4-halo-3-hydroxybutane derivative represented by formula (I):



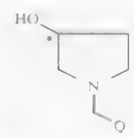
(I)

wherein * is defined above, R^1 represents a lower alkyl group or a substituted or unsubstituted phenyl group; and X represents a halogen atom, with a benzylamine derivative represented by formula (II), said reacting being in an alcohol solvent in the presence of a base:

$$N_2NCH_2Q \quad (II)$$

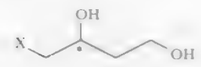
wherein Q is as defined above.

2. A process for preparing an optically active 3-hydroxypyrrolidine derivative represented by formula (III):



(III)

wherein Q represents a substituted or unsubstituted phenyl group; and * indicates an asymmetric carbon atom, comprising reacting an optically active 4-halo-1,3-butanediol represented by formula (IV):

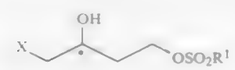


(IV)

wherein * is as defined above; and X represents a halogen atom, with a sulfonyl compound represented by formula (V), wherein a solution of the optically active 4-halo-1,3-butanediol represented by formula (IV) dissolved in an organic solvent selected from the group consisting of halogenated hydrocarbons, ethers, and pyridine, is mixed with a base and the sulfonyl compound represented by formula (V) at −30° to 10° C.:

$$R^1SO_2Cl \quad (V)$$

wherein R^1 represents a lower alkyl group or a substituted or unsubstituted phenyl group, to obtain an optically active 4-halo-3-hydroxybutane derivative represented by formula (I):



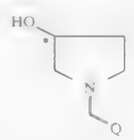
(I)

wherein R^1, X, and * are as defined above; and reacting the compound represented by formula (I) with a benzylamine derivative represented by formula (II):

$$H_2NCH_2Q \quad (II)$$

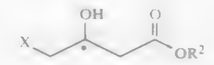
wherein Q is as defined above.

3. A process for preparing and optically active 3-hydroxypyrrolidine derivative represented by formula (III):



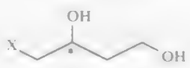
(III)

wherein Q represents a substituted or unsubstituted phenyl group; and * indicates an asymmetric carbon atom, comprising reducing an optically active 4-halo-3-hydroxybutyric acid ester represented by formula (VI) with calcium borohydride in dried dioxane under water-free conditions at from −10° to 30° C.:



(VI)

wherein * is as defined above; R^2 represents a lower alkyl group; and X represents a halogen atom, to obtain an optically active 4-halo-1,3-butanediol represented by formula (IV):

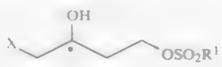


(IV)

wherein X and * are as defined above, reacting the compound represented by formula (IV) with a sulfonyl compound represented by formula (V), wherein a solution of the optically active 4-halo-1,3-butanediol represented by formula (IV) dissolved in an organic solvent selected from the group consisting of halogenated hydrocarbons, ethers, and pyridine, is mixed with a base and the sulfonyl compound represented by formula (V) at −30° to 10° C.:

$$R^1SO_2Cl \quad (V)$$

wherein R^1 represents a lower alkyl group or a substituted or unsubstituted phenyl group, to obtain an optically active 4-halo-3-hydroxybutane derivative represented by formula (I):



(I)

wherein R^1 X and * are as defined above; and reacting the compound represented by formula (I) with a benzylamine derivative represented by formula (II):

$$H_2NCH_2Q \quad (II)$$

wherein Q is as defined above

5,144,043

CLEAVABLE BIFUNCTIONAL COUPLING AGENTS

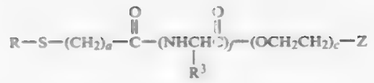
Richard T. Dean, Downingtown, Pa.; Raymond H. Boutin, Wilmington, Del., and Robert W. Weber, Downingtown, Pa., assignors to Centocor, Malvern, Pa.

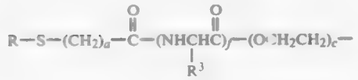
Continuation-in-part of Ser. No. 207,261, Jun. 15, 1988. This application Aug. 24, 1988, Ser. No. 235,999

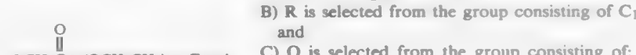
Int. Cl.[5] C07D *207/448*

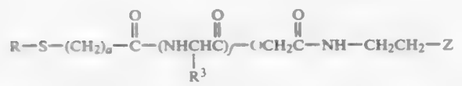
U.S. Cl. 548—548 6 Claims

1. A bifunctional coupling agent which has the formula selected from the group consisting









wherein a is an integer from 1 to 3 inclusive; c is an integer from 1 to 7 inclusive; f is an integer from 3 to 6 inclusive; R is R^1CO— or R^1S—, wherein R^1 is selected from the group consisting of lower alkyl; lower alkyl substituted with one or more groups selected from the group consisting of alkoxy groups, alkyl groups, aryl groups, hydroxy groups and carboxy groups; aryl; and aryl substituted with one or more groups selected from the group consisting of alkoxy groups, alkyl groups, aryl groups, hydroxy groups and carboxy groups; R^3 is selected from hydrogen, optionally substituted lower alkyl, and optionally substituted aryl; and Z is maleimido.

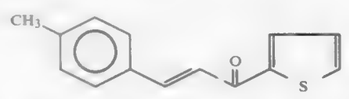
5,144,044

NON-LINEAR OPTICAL MATERIAL AND NON-LINEAR OPTICAL DEVICE

Yoshitaka Goto, Tsukuba, and Masaharu Nakayama, Tsuchiura, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 586,756
Claims priority, application Japan, Sep. 27, 1989, 1-249221
Int. Cl.[5] C07I *333/22*
U.S. Cl. 549—70 **7 Claims**

1. In a non-linear optical device in which an organic compound is disposed in a light beam, the improvement wherein the organic compound is 3-(2-thienyl)-1-(4-methylphenyl)propene-3-one represented by the formula (I)



(I)

said compound having a crystal in which a space group determined by the X-ray analytical method is $P2_1$.

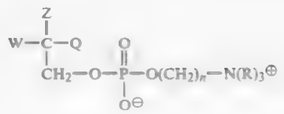
5,144,045

PHOSPHOCHOLINE DERIVATIVE INHIBITORS OF PHOSPHOLIPASE A_2

Allan Wissner, Ardsley, N.Y.; Robert E. Schaub, Upper Saddle River, N.J.; Kenneth E. Green, Yorktown Heights, and Philip R. Hamann, Garnerville, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 13, 1990, Ser. No. 612,745
Int. Cl.[5] C07F *9/06, 9/02*
U.S. Cl. 549—219 **35 Claims**

1. A compound, including the individual R and S enantiomer and the racemic mixture, represented by the formula:



wherein:

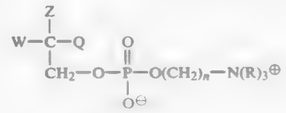
A) n is an integer from 2 to 6;

B) R is selected from the group consisting of C_1–C_4 alkyl; and

C) Q is selected from the group consisting of: —CH_2—S—R',

and W is hydrogen and Z is selected from the group consisting of hydrogen and —CH_2—O—X wherein R' and X are selected from the group consisting of C_1–C_4 alkyl.

7. A compound, including the individual R and S enantiomer and the racemic mixture, represented by the formula:

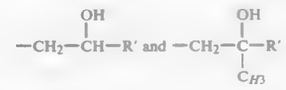


wherein:

A) n is an integer from 2 to 6;

B) R is selected from the group consisting of C_1–C_4 alkyl; and

C) Q is selected from the group consisting of:



and W is hydrogen and Z is —CH_2—O—X wherein R' and X are selected from the group consisting of C_1–C_{24} alkyl.

5,144,046

SYNTHESIS OF CYCLIC KETENE ACETALS

Saughagya C. Mathur, 1007 Deer Park Ct., Longview, Tex. 76504

Filed Feb. 14, 1991, Ser. No. 654,994
Int. Cl.[5] C07D *321/06, 323/02, 323/04*
U.S. Cl. 549—347 **12 Claims**

1. A process for producing cyclic ketene acetals comprising reacting at an elevated temperature a halogenated cyclic ketene acetal with a hydroxide compound selected from alkali metal hydroxides, alkaline earth metal hydroxides and mixtures thereof in a non-reactive alcohol capable of dissolving the hydroxide compound at the elevated temperature, the concentration of the hydroxide compound at the elevated temperature, the concentration of the hydroxide compound in the alcohol solution is between about 20 and about 80 weight percent based on the total of hydroxide compound and alcohol, thereby producing a cyclic ketane acetal wherein the elevated temperature is sufficient for an adequate reaction rate but not so high as to result in low selectivity.

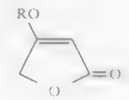
5,144,047

PROCESS FOR THE PRODUCTION OF TETRONIC ACID ALKYL ESTERS

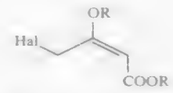
Laurent Duc, Chermignon, and John McGarrity, Visp, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed Jul. 19, 1990, Ser. No. 554,372
Claims priority, application Switzerland, Jul. 20, 1989, 2706/89
Int. Cl.[5] C07D *307/00*
U.S. Cl. 549—429 **21 Claims**

1. Process for the production of a tetronic acid alkyl ester of the formula:



wherein R is an alkyl group with 1 to 6 C atoms, consisting essentially of cyclizing a 4-halo-3-alkoxy-2-butene carboxylic acid lower alkyl ester of the formula:



wherein Hal is chlorine or bromine, and R has the above-named meaning, at a temperature between 190° and 260° C.

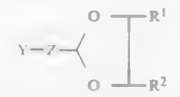
5,144,048

DICARBOALKOXY DIOXOLANE DERIVATIVES

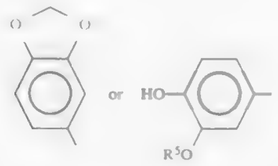
Philip A. Christenson, Midland Park; Paul J. Riker, Lodi, both of N.J.; Denise A. Anderson, Brooklyn, N.Y., and John M. Yurecko, Jr., Dayton, N.J., assignors to L. Givaudan & Cie, S.A., Geneva, Switzerland

Filed Dec. 12, 1990, Ser. No. 626,348
Int. Cl.[5] C07D *317/26*
U.S. Cl. 549—435 **10 Claims**

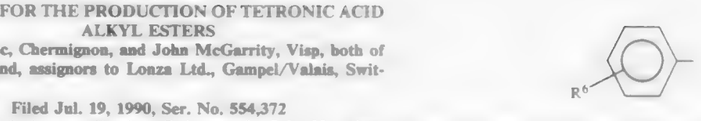
1. Dicarboalkoxy dioxolane derivatives, comprising compounds represented by the formula:



wherein R^1 and R^2 may be the same or different and are represented by the formula $—CO_2R^3$, wherein R^3 is selected from the group consisting of hydrogen and lower alkyl, provided that in at least one of R^1 and R^2, R^3 is lower alkyl; Z is a direct bond or —CH═C(R^4)—, wherein R^4 is n-hexyl; and Y is represented by the formula, when Z is a direct bond,



wherein R^5 is lower alkyl; and Y is represented by the formula, when Z is —CH═C(R^4)—,



wherein R^6 may be the same or different and is selected from the group consisting of hydrogen, lower alkyl, and OR^7, wherein R^7 is selected from the group consisting of hydrogen and lower alkyl.

5,144,049

VOLATILE LIQUID PRECURSORS FOR THE CHEMICAL VAPOR DEPOSITION OF COPPER

John A. T. Norman, Whitehall, and Beth A. Muratore, Elverson, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 650,332, Feb. 4, 1991, Pat. No. 5,085,731.
This application Oct. 23, 1991, Ser. No. 781,447
Int. Cl.[5] C07F *1/08, 7/08*
U.S. Cl. 556—12 **9 Claims**

1. A volatile liquid organometallic copper complex capable of selectively depositing a copper film onto metallic or other electrically conducting portions of a substrate surface under CVD conditions, said complex having the structural formula:

wherein R^1 and R^3 are each independently C_1–C_8 perfluoroalkyl, R^2 is H, F or C_1–C_8 perfluoroalkyl, R^4 is H, C_1–C_8 alkyl, or $Si(R^6)_3$, each R^5 is independently H or C_1–C_4 alkyl and each R^6 is independently phenyl or C_1–C_8 alkyl.

5,144,050

RUTHENIUM(II)-BINAP DIKETONATE COMPLEXES

Albert S. C. Chan, St. Louis, and Scott A. Laneman, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 1, 1991, Ser. No. 769,277
Int. Cl.[5] C07F *15/00*
U.S. Cl. 556—20 **10 Claims**

1. A ruthenium phosphine diketonate complex represented by the formula:

wherein

n represents 1 and 2;

m represents an integer determined by the formula 2−n; and

X and Y independently represent diketones, chelating ligands and nonchelating anionic ligands; provided that at least one of X and Y represents a diketonate anion.

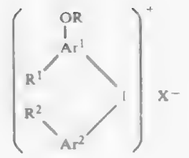
5,144,051

BRANCHED ALKOXYPHENYL IODONIUM SALT PHOTOINITIATORS

Carl R. Kessel, and Ellen O. Aeling, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

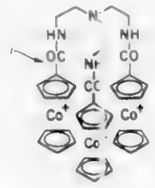
Filed May 29, 1990, Ser. No. 529,639
Int. Cl.[5] C07F *13/00*; C08G *59/68, 59/72*
U.S. Cl. 556—64 **2 Claims**

1. An aromatic iodonium salt represented by the formula:



wherein:
Ar^1 and Ar^2 are phenyl;
R is a branched chain alkyl group having 6 to 8 carbon atoms;
R^1 and R^2 are hydrogen; and
X^- is a halogen-containing complex anion selected from the group consisting of: tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, hexachloroantimonate, and hexafluoroantimonate.

5,144,052
REDOX RESPONSIVE ANION RECEPTORS
Paul D. Beer; Jana Hodacova, and Sally Stokes, all of Oxford, England, assignors to Metre International, Inc., Westminster, Colo.
Filed Aug. 30, 1991, Ser. No. 752,789
Int. Cl.[5] C07F 15/06; C07C 15/12
U.S. Cl. 556—144 **12 Claims**



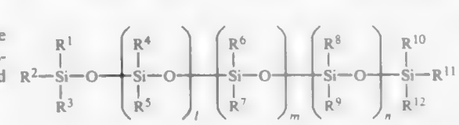
1. A class of ligands capable of solution recognition of anions, wherein each ligand comprises:
a cobalticinium moiety; and
an adjacent —CO—NH— amide linkage.

5,144,053
ALUMINUM ALKYLS AND LINEAR 1-OLEFINS FROM INTERNAL OLEFINS
Robert H. Allen; Keith G. Anderson; Steven P. Diefenbach; Ronny W. Lin; Larry H. Nemec; Andrew D. Overstreet, and Gene C. Robinson, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.
Division of Ser. No. 674,104, Mar. 25, 1991. This application Dec. 9, 1991, Ser. No. 804,039
Int. Cl.[5] C07F 5/06
U.S. Cl. 556—190 **12 Claims**

1. A process for making an alkyl aluminum compound from an internal olefin, said process comprising:
(a) reacting (i) a linear internal olefin containing 4 to about 30 carbon atoms or a mixture of such internal olefins and (ii) a trialkyl aluminum which contains less than about 1.0 wt % of aluminum hydride impurity, the mole ratio of said linear internal olefins to said trialkyl aluminum being about 1-40/1, in the presence of a catalytic amount of a nickel-containing isomerization/displacement catalyst to cause isomerization of the internal olefinic double bond to form at least some linear 1-olefin and to cause the linear 1-olefin so-formed to displace alkyl groups from said trialkyl aluminum and form an alkyl aluminum compound wherein at least one of the alkyl groups bound to aluminum is a linear alkyl derived from said linear 1-olefin.

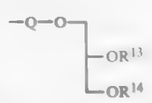
5,144,054
SILOXANE DERIVATIVES, PRODUCING METHOD THEREOF AND AGENTS INCLUDING SILOXANE DERIVATIVE
Yasushi Shioya, Chiba; Yuji Suzuki, Sakura; Ken Takeuchi, Haga; Koji Yoshino, and Akira Kawamata, both of Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Aug. 27, 1991, Ser. No. 750,535
Claims priority, application Japan, Aug. 30, 1990, 2-228958; Sep. 26, 1990, 2-256732
Int. Cl.[5] C07F 7/08; C08G 77/04
U.S. Cl. 556—445 **14 Claims**

1. A siloxane derivative represented by general formula (1)



(1)

wherein at least one of R^1 to R^{12} is a group represented by general formula (2)



(2)

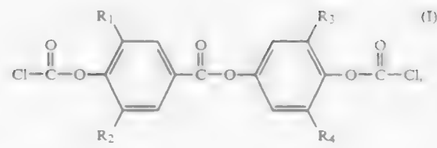
wherein Q is a divalent hydrocarbon group having 3 to 20 carbon atoms, R^{13} and R^{14} are hydrogen atom or a hydrocarbon group having 1 to 5 carbon atoms, and at least one of R^{13} and R^{14} is hydrogen atom; the remainings of R^1 to R^{12} are straight-chain, branched-chain or cyclic hydrocarbon groups having 1 to 30 carbon atoms or groups represented by general formula (3)

(3)

wherein X is a divalent hydrocarbon group having an ether bonding and/or ester bonding and R^{15} is a straight-chain, branched-chain or cyclic hydrocarbon group having 1 to 30 carbon atoms; l, m and n are numbers of 0 to 2000, and at least one of R^1 to R^3 and R^{10} to R^{12} is a group represented by general formula (2) when l+m+n=0 except that one of R^1 to R^{12} is a group represented by general formula (2) wherein Q is trimethylene and R^{13} and R^{14} are both hydrogen atoms; and the remainings of R^1 to R^{12} are all methyl groups.

5,144,055
LIQUID CRYSTALLINE BIS-CHLOROCARBONIC ACID ESTERS
Hanns P. Müller, Bergisch Gladbach; Bernhard Jansen, Cologne; Wolfgang Calaminus, Bonn, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 315,859, Feb. 27, 1989, Pat. No. 4,980,441. This application Jun. 26, 1990, Ser. No. 544,265
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808274
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—281 **1 Claim**

1. Bis-chlorocarbonic acid esters of 4-hydroxybenzoic acid-(4'-hydroxyphenyl)-esters corresponding to the following formula

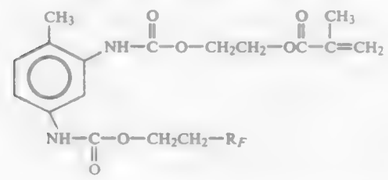


(I)

wherein
R_1, R_2, R_3 and R_4 denote, independently of one another, hydrogen, a halogen atom of a C_1 to C_6 alkyl group.

5,144,056
FLUORINATED ACRYLIC MONOMERS AS HYDROPHOBIC AND OLEOPHOBIC AGENTS
Marie-Jose Lina, Tassin La Demi Lune, and Andre Dessaint, Clermont, both of France, assignors to Atochem, Hauts-de-Seine, France
Continuation of Ser. No. 932,807, Nov. 18, 1986, abandoned. This application Mar. 14, 1989, Ser. No. 323,100
Claims priority, application France, Dec. 3, 1985, 85 17882
Int. Cl.[5] C07C 271/28
U.S. Cl. 560—25 **2 Claims**

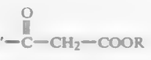
1. A fluorinated acrylic monomer of the formula:



in which R_F denotes a perfluoroalkyl radical containing from 4 to 16 carbon atoms.

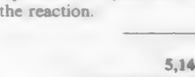
5,144,057
PROCESS FOR THE PRODUCTION OF 3-OXOCARBOXYLIC ACID ESTERS
Martin Eyer, Glis, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland
Filed Oct. 11, 1991, Ser. No. 774,876
Int. Cl.[5] C07C 69/76
U.S. Cl. 560—51 **17 Claims**

1. Process for the production of a 3-oxocarboxylic acid ester of the general formula:



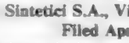
(1)

wherein which R means:
a straight-chain or branched alkyl radical with 1 to 20 C atoms,
an alkenyl or alkinyl radical with 3 to 6 C atoms,
a cycloalkyl radical,
an ethyl radical substituted with an alkoxy group with 1 to 4 C atoms,
an alkyl or alkenyl radical with 1 to 4 C atoms substituted with an optionally substituted phenyl group, or
an optionally substituted aryl radical, and R' means:
a straight-chain or branched alkyl radical with 1 to 20 C atoms, which can be substituted by at least one halogen, at least one lower alkoxy group, lower alkylthio group, an optionally-substituted aryl, a cycloalkyl, an aryloxy, an arylthio or at least one saturated or unsaturated heterocycle, excluding unsubstituted methyl,
a straight-chain or branched alkenyl radical with 2 to 20 C atoms, which can be substituted by at least one halogen or an aryl,
an alkinyl radical, which can be substituted by aryl,
an optionally substituted cycloalkyl or cycloalkenyl radical,
an optionally substituted monocyclic or polycyclic aryl radical, or
an optionally substituted saturated or unsaturated monocyclic or polycyclic heterocyclic radical,
comprising acylating of the magnesium enolate of a corresponding acetoacetic acid ester of the general formula:



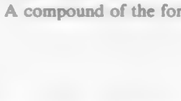
(2)

with a corresponding carboxylic acid chloride of the general formula:



(3)

to a corresponding 2-acylacetoacetic acid ester of the general formula:



(4)

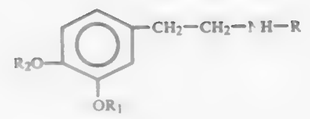
wherein in each case R and R' have the above-mentioned meanings, the acylation being performed in the presence of a tertiary amine, and subsequently cleaving the acetyl group.

5,144,058
COLORLESS GRAINED ALPHA-FORM CRYSTALS OF TETRAKIS [3-(3,5-DI-T-BUTYL-4-HYDROXYPHENYL)PROPIONYLOXYMETHYL]METHANE AND PROCESS FOR ITS MANUFACTURE
Atsushi Nishimura, Saitama, Japan, assignor to International Chemical Consultant, Ltd., Japan
Filed Jun. 15, 1990, Ser. No. 538,818
Claims priority, application Japan, Mar. 30, 1990, 2-83124
Int. Cl.[5] C07C 69/76
U.S. Cl. 560—75 **12 Claims**

1. A process for the production of tetrakis [3-(3,5-di-t-butyl-4-hydroxyphenyl) propionyloxymethyl] methane in the form of alpha-form colorless crystals, by reacting pentaerythritol with lower-alkyl 3-(3,5-di-t-butyl-4-hydroxyphenyl)propionates in the presence of a catalyst and aliphatic hydrocarbons having a boiling point of from 100° C. to 300° C. as reaction solvent wherein the formed alcohol is removed by fractionation using a fractionating column, followed by crystallization from said aliphatic hydrocarbon and wherein
the amount of aliphatic hydrocarbons as reaction solvent is in the range between 20 and 300 wt %, on the basis of theoretical yield of product and as crystallization solvent in the range between 50 and 400 wt %, on the basis of theoretical yield of product and wherein
the product is crystallized from the solvent present during the reaction.

5,144,059
CATECHOLAMINE ESTERS
Cesare Casagrande, Arese, and Francesco Santangelo, Milan, both of Italy, assignors to Simes Societa Italiana Medicinali E. Sintetici S.A., Vicenza, Italy
Filed Apr. 20, 1990, Ser. No. 512,212
Claims priority, application Italy, Apr. 20, 1989, 20208 A/89
Int. Cl.[5] C07L 69/76
U.S. Cl. 560—109 **12 Claims**

1. A compound of the formula



(I)

wherein
R is hydrogen or methyl;
R_1 and R_2, different from each other are a group R_3CO wherein R_3 is
a C_1–C_{10} straight or branched alkyl,
phenyl optionally substituted by one or two substituents selected from C_1–C_3 alkyl, C_1–C_3 alkoxycarbonyl, C_1–C_3 alkylcarbonyloxy, C_1–C_3 alkylcarbonyl and halogens, or
a group $—NR_4R_5$ wherein R_4 and R_5, which may be the same or different, are hydrogen, C_1–C_{10} alkyl or phenyl optionally substituted by one or two substituents selected from C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkoxycarbonyl, C_1–C_3 alkylcarbonyloxy, C_1–C_3 alkylcarbonyl and halogens, or R_4 and R_5, together, are a polymethylene chain having from 4 to 7 carbon atoms;
or, one from R_1 and R_2 has the above mentioned meanings and the second one is a group $R_4R_5—N—SO_2$ wherein R_4 and R_5 have the above mentioned meaning;
or a salt thereof with an organic or inorganic pharmaceutically acceptable acid.

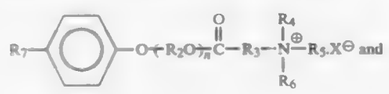
5,144,060

BETAINE ESTERS OF POLYOXYALKYLENE ETHER

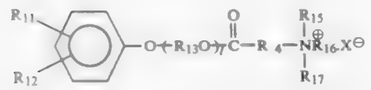
Hiroshi Morita, Chiba; Eiichi Hirota, Funabashi, and Yasuo Ishizaki, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 251,007, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 869,781, Jun. 2, 1986, abandoned. This application Aug. 15, 1990, Ser. No. 568,670
Claims priority, application Japan, Jun. 4, 1985, 60-120975; Oct. 11, 1985, 60-226406; Dec. 27, 1985, 60-295186
Int. Cl.[5] C07C *229/00*
U.S. Cl. 560—170 **4 Claims**

1. An emulsifying agent for emulsion polymerization comprising at least one member selected from the group consisting of compounds having the formula (II) and (III):



(II)



(III)

wherein R_2 represents an alkylene group having 2 to 4 carbon atoms, R_3 represents an alkylene group having 1 to 5 carbons atoms, R_4 to R_6 independently represent an alkyl group having 1 to 3 carbon atoms or $—C_2H_4OH$, n represents an average addition mole number of 1 to 20, and X represents an inorganic or organic anion, R_7 represents an alkyl group having 6 to 20 carbon atoms, R_{11} and R_{12} independently represent an alkyl group having 6 to 20 carbon atoms, R_{13} represents an alkylene group having 2 to 4 carbon atoms, R_{14} represents an alkylene group having 1 to 5 carbon atoms, R_{15}, R_{16} and R_{17} independently represent an alkyl group having 1 to 3 carbon atoms or $—C_2H_4OH$, and l is an average addition mole number of 1 to 30.

5,144,061

PREPARATION OF ALKENECARBOXYLIC ESTERS

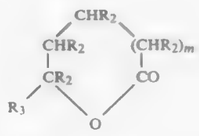
Wolfgang Hoelderich, Frankenthal; Fritz Naeumann, Mannheim, and Rolf Fischer, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 116,865
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638010
Int. Cl.[5] C07C *67/30*
U.S. Cl. 560—212 **10 Claims**

1. A process for preparing an alkenecarboxylic acid ester of the formula I

I

where R_1 is alkyl of 1 to 6 carbon atoms, R_2 is hydrogen or alkyl of 1 to 4 carbon atoms, the substituents being identical or different, and n is 1, 2 or 3, which comprises: reacting a lactone of the formula II



II

where R_2 has the same meanings as in formula I, R_3 is hydrogen or methyl and m is 0, 1 or 2, with the proviso that n and m differ by 1 when R_3 is hydrogen and by 2 when R_3 is methyl, with an alkanol of 1 to 6 carbon atoms at from 50° to 450° C. in the presence of an acidic zeolite.

5,144,062

PROCESS FOR PRODUCING METHYL FORMATE

Shien-Chang Chen, Taipei; Wan-Jy Cheng; Fu-Shen Lin, both of Kaohsiung, and Fu-Juh Huang, Kaohsiung, all of Taiwan, assignors to Dairen Chemical Corporation, Taipei, Taiwan

Continuation-in-part of Ser. No. 340,212, Apr. 19, 1989, abandoned. This application Sep. 7, 1990, Ser. No. 578,958
Int. Cl.[5] C07C *67/40, 69/06*
U.S. Cl. 560—239 **5 Claims**

1. A process for producing methyl formate by vapor phase dehydrogenation of methanol in the presence of a catalyst consisting essentially of copper oxide, chromium oxide, and a sodium compound wherein the weight ratio of copper oxide to chromium oxide is from 95/5 to 75/25 and the sodium content is from 0.1 to 0.5 wt. %, at a temperature of from 140° to 280° C. and and at a pressure of from 1.0 to 10 atm.

5,144,063

USE OF HYDROXYTRIPHENYLBORATES TO PURIFY WASTE STREAMS

Jeffrey M. Sullivan, 1303 Carolina Ave., Longmont, Colo. 80501

Filed Jul. 12, 1991, Ser. No. 729,143
Int. Cl.[5] C07F *5/02*
U.S. Cl. 562—7 **3 Claims**

1. A compound having the formula

$$Cs\ B\ (X)_3\ OH$$

in which X is any aryl group.

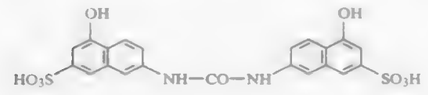
5,144,064

PREPARATION OF J-ACID UREA

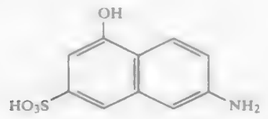
Erwin Hahn, Heidelberg; Udo Mayer, Frankenthal; Friedrich-Wilhelm Raulfs, Limburgerhof, and Ulrike Schloesser, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 23, 1991, Ser. No. 764,359
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1991, 4120366
Int. Cl.[5] C07B *273/00*
U.S. Cl. 562—49 **12 Claims**

1. A process for preparing J-acid urea of the formula



which comprises the steps of:
reacting 7-amino-4-hydroxynaphthalene-2-sulfonic acid (J-acid) of the formula



with urea at from 100°–140° C. under a pressure ranging from atmospheric pressure to 10 bar in an inert solvent to form a reaction mixture;
acidifying said reaction mixture to precipitate unreacted J-acid; and
removing said precipitated unreacted J-acid from said reaction mixture.

5,144,065

PROCESS FOR THE PREPARATION OF AMINOARYLSULPHONIC ACIDS

Guido Steffan, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1991, Ser. No. 737,635
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1990, 4025131
Int. Cl.[5] C07C *303/22, 309/29, 309/35*
U.S. Cl. 562—68 **4 Claims**

1. Process for the preparation of aminoarylsulphonic acids by catalytic hydrogenation of nitroarylsulphonic acids with hydrogen in the presence of Raney nickel or Raney nickel/iron in aqueous media under a hydrogen pressure of 100 to 300 bar and at temperatures of 130° to 160° C., comprising finely dispersing the hydrogen in the aqueous catalyst suspensions such that the primary surface area of the gas bubbles is more than 60,000 m^2/m^3 of H_2 and in that the nitroarylsulphonic acids are fed into the hydrogenation mixture in the form of solutions or suspensions which, depending on the nitroarylsulphonic acid used, contain 0.40 to 0.55 mol of nitroarylsulphonic acid per kg of feed solution or suspension.

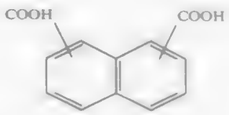
5,144,066

METHOD OF PRODUCING NAPHTHALENEDICARBOXYLIC ACIDS AND DIARYLDICARBOXYLIC ACIDS

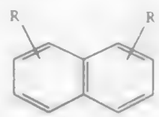
Noboru Saitou, Takatsuki; Koichi Hirota; Ren Hasebe, both of Suita; Norimasa Okuda, Kyoto, and Ikuyo Katsumi, Osaka, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Jun. 25, 1991, Ser. No. 720,682
Claims priority, application Japan, Jun. 26, 1990, 2-167313; Jun. 26, 1990, 2-167314; Dec. 25, 1990, 2-405852
Int. Cl.[5] C07C *51/265*
U.S. Cl. 562—416 **24 Claims**

1. A method of producing naphthalenedicarboxylic acids of the formula



comprising:
oxidizing dialkyl-substituted naphthalene of the formula



(wherein R and R' respectively represent an alkyl group selected from the group consisting of methyl, ethyl and isopropyl groups, and wherein R and R' are the same or different from each other,
with a gas containing molecular oxygen under liquid phase conditions in the presence of a catalyst comprising copper and bromine in an organic solvent,
wherein the ratio of copper to bromine in the catalyst in numbers of atoms is 1:a, a being in the range of $0.1 \leqq a \leqq 100$.

5,144,067

PROCESS FOR THE COPRODUCTION OF ALKYL IODIDES AND ALPHA-IODOCARBOXYLIC ACIDS AND/OR ANHYDRIDES THEREOF

Joseph R. Zoeller; Michael R. Cushman, both of Kingsport, Tenn.; Regina M. Moncier, Bristol, Va., and Brent A. Tennant, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1989, Ser. No. 414,239
Int. Cl.[5] C07C *27/00, 51/00*
U.S. Cl. 562—479 **9 Claims**

1. Process for the coproduction of (1) an alkyl iodide and (2) an α-iodocarboxylic acid, a mono-α-iodo-carboxylic anhydride or a mixture thereof which comprises contacting a mixture of an iodine compound and a carboxylic anhydride with a peroxide at an elevated temperature.

5,144,068

METHANOL CARBONYLATION PROCESS

Brad L. Smith, Portland; G. Paull Torrence, Corpus Christi; Adolfo Aguiló, Corpus Christi, and James S. Alder, Corpus Christi, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 870,267, Jun. 3, 1986, Pat. No. 5,001,259, which is a continuation-in-part of Ser. No. 699,525, Feb. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 606,730, May 3, 1984, abandoned. This application Jan. 7, 1991, Ser. No. 615,846

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] C07C *51/12, 53/08*

U.S. Cl. 562—519 16 Claims

1. In a process for producing acetic acid by reacting methanol with carbon monoxide in a liquid reaction medium containing a rhodium catalyst and comprising water, acetic acid, methyl iodide, and methyl acetate and subsequently recovering acetic acid from the resulting reaction product, the improvement which comprises:

maintaining catalyst stability and system productivity by maintaining in said reaction medium during the course of said reaction about 0.1 wt% to less than 14 wt% of water together with (a) an effective amount in the range of about 2 wt% to 20 wt% of a catalyst stabilizer selected from the group consisting of iodide salts which are soluble in said reaction medium in effective concentration at reaction temperature, (b) about 5 wt% to 20 wt% of methyl iodide, and (c) about 0.5 wt% to 30 wt% of methyl acetate.

5,144,069

PROCESS FOR THE PREPARATION OF FLUOROALIPHATIC AMINOCARBOXYLATE SURFACTANTS

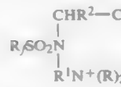
Richard M. Stern, Woodbury; Richard A. Guenthner, White Bear Lake; Roger R. Alm, Lake Elmo, and Thomas K. Wilkinson, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 13, 1990, Ser. No. 626,739

Int. Cl.[5] C07C *315/00*

U.S. Cl. 562—556 21 Claims

1. A process for the synthesis of the class of compounds represented by the formula:



wherein:

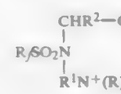
R_f is a fluoroaliphatic radical;

R^1 is a divalent organic radical selected from the group consisting of alkylene, oxyalkylene, arylene, alkarylene, and aralkylene;

R represents like or different groups each of which is independently selected from the group consisting of alkyl, aryl, alkaryl, and aralkyl, or the two R groups along with attached nitrogen can form a heterocyclic ring;

R^2 is independently selected from the group consisting of hydrogen and methyl;

said process of synthesis comprising the addition reaction (b) of $R_fSO_2N(H)R^1N(R)_2$ with $CHR^2{=}CR^2COOH$ to produce said compound



wherein said reaction (b) is carried out at a temperature above about 90° C.

5,144,070

PROCESS FOR THE PREPARATION OF α-IODOCARBONYL COMPOUNDS

Joseph R. Zoeller; Michael R. Cushman, both of Kingsport, Tenn., and Regina M. Moncier, Bristol, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,421

Int. Cl.[5] C07C *27/00, 51/00*

U.S. Cl. 562—887 10 Claims

3. Process for the preparation of mono-α-iodo-carboxylic anhydride which comprises reacting a carboxylic anhydride, the carboxylic acid moiety of which contains at least one α-hydrogen atom, with molecular iodine at a temperature of about 0 to about 175° C., wherein the mole ratio of anhydride:I_2 is at least 2.

5,144,071

METHOD FOR PRODUCING AN OPTICALLY ACTIVE AZOLYL-α,β-UNSATURATED ALCOHOL

Yukio Yoneyoshi, Ohtsu; Gohfu Suzukamo, Ibaraki; Yoji Sakito, Takarazuka, and Toshio Nishioka, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

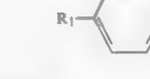
Filed Dec. 22, 1989, Ser. No. 454,948

Claims priority, application World Int. Prop. O., Apr. 3, 1984, PCT/JP84/00162

Int. Cl.[5] C07F *5/02*

U.S. Cl. 564—9 7 Claims

1. A boron hydride compound modified with an optically active amino alcohol represented by the formula (II),



(II)

wherein R_3 represents a C_1–C_8 alkyl or C_7–C_{11} aralkyl, R_4, R_5 represents a C_7–C_{16} aralkyl group or a phenyl which may be substituted with a C_1–C_6 alkoxy, and the mark * means an asymmetric carbon, obtained by reacting a metal boro hydride with an acid salt of the optically active amino alcohol in a molar ratio of a range of from 0.3:1 to 1.2:1.

5,144,072

ANTI-ARRHYTHMIC AGENTS

George C. Buzby, Jr., Blue Bell, and Thomas J. Colatsky, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

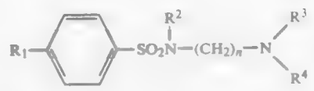
Filed Oct. 21, 1988, Ser. No. 260,855

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[5] C07C *311/41*

U.S. Cl. 564—82 3 Claims

1. A compound of the formula:



in which

R^1 is alkylsulfonamido of 1 to 6 carbon atoms;

R^2 is ethyl;

R^3 is hydrogen;

R^4 is ethyl; and

n is one of the integers 2, 3 or 4; or a pharmaceutically acceptable salt thereof.

5,144,073

PROCESS FOR PREPARATION OF DIPEPTIDES

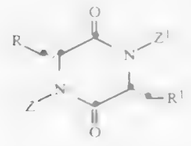
John C. Hubbs, Rte. 10, Box 354, Kingsport, Tenn. 37664

Continuation-in-part of Ser. No. 239,494, Aug. 31, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 406,994

Int. Cl.[5] C07C *126/00*

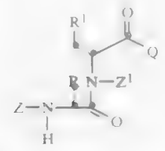
U.S. Cl. 564—164 8 Claims

1. A process comprising contacting a compound of the formula



(II)

with a nucleophile, in the presence of an appropriate base, under conditions such that a compound is formed of the formula:



(III)

wherein R and R^1 are different and are each, independently, hydrogen, alkyl, hydroxy, aryl, C_1 to C_{10} substituted alkyl, C_1 to C_{10} alkoxy, C_7 to C_{12} substituted arylalkyl, C_1 to C_{10} acyl, C_1 to C_{10} carboxyalkyl or C_1 to C_{10} acyloxy; Z is a nitrogen-protecting group; Z^1 is hydrogen or a nitrogen-protecting group provided that the ability of the Z substituent to withdraw electrons is greater than that of the Z^1 substituent; and Q is a residue of a nucleophile.

5,144,074

PROCESS FOR THE SYNTHESIS OF CARBOXAMIDES

Mark L. Listemann, Whitehall; Ronald Pierantozzi, and John N. Armor, both of Orefield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 24, 1988, Ser. No. 159,807

Int. Cl.[5] C07C *231/12, 233/18*

U.S. Cl. 564—224 14 Claims

1. A process for the synthesis of carboxamides having the structural formula:

$R^1CHR^2CH(OR^3)NHCHO$

wherein:

R^1 is H, C_1–C_6 alkyl or aryl;

R^2 is H, C_1–C_6 alkyl;

R^3 is benzyl, C_1–C_8 alkyl or hydroxyalkyl;

said process comprising reacting an aldehyde having the structural formula: R^1CHR^2CHO wherein R^1 or R^2 are as defined above, with an alcohol having the structural formula: R^3OH, wherein R^3 is as defined above, and formamide having the structural formula $HCONH_2$ in an alcohol:formamide ratio of 1:1 to 5:1, in the presence of a strong acid catalyst present in a concentration of at least 6 mole % compared to formamide, at a temperature in the range of 0°–200° C.

5,144,075

PROCESS FOR THE PREPARATION OF N,N-DIHYDROCARBYLHYDROXYLAMINES

Joseph Suhadolnik, Ossining, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 17, 1991, Ser. No. 642,619

Int. Cl.[5] C07C *239/08, 239/10, 239/12*

U.S. Cl. 564—301 9 Claims

1. An improved process for the preparation of a symmetrically substituted N,N-dihydrocarbylhydroxylamine of formula I

$(RCH_2)_2NOH$ (I)

wherein

R is straight or branched chain alkyl of 1 to 17 carbon atoms, said alkyl substituted by phenyl, cycloalkyl of 5 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms, wherein the improvement comprises

reacting at ambient temperature

(a) an aldehyde RCHO, where R is defined above, and

(b) from 0.5 to 0.6 equivalents of hydroxylamine hydrochloride per each equivalent of RCHO,

reactants (a) and (b), being dissolved in an organic solvent which is or contains a major portion of a lower alkanol, under an atmosphere of hydrogen at 15'60 psi (1.05–4.2 Kg/cm^2) pressure in the presence of a catalytically effective amount of a noble metal hydrogenation catalyst till hydrogen uptake is complete, and

isolating the desired N,N-dihydrocarbylhydroxylamine of formula I from its hydrochloride salt using alkali.

5,144,076

PREPARATION OF 3,5-DIAMINO BENZOTRIFLUORIDE

Ramesh Krishnamurti, Amherst; Lawrence B. Fertel, Williamsville; Henry C. Lin, Grand Island, all of N.Y., and Mahendra K. Dosi, Alpharetta, Ga., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 608,912, Nov. 5, 1990, abandoned. This application Oct. 1, 1991, Ser. No. 769,910

Int. Cl.[5] C07C *209/36*

U.S. Cl. 564—417 20 Claims

1. A process for the preparation of 3,5-diaminobenzotrifluoride which comprises treating 4-chloro-3,5-dinitrobenzotrifluoride, in a solvent selected from the group consisting of C-3 to C-6 secondary and tertiary alcohols, acetonitrile, low molecular weight esters of C-2 of C-4 alcohols and C-2 to C-4 acids, diethyl ether, tetrahydrofuran, ethylene glycol dimethyl ether, diethylene glycol dimethyl ether, triethylene glycol dimethyl ether, and tetraethylene glycol dimethyl ether, with hydrogen gas under a pressure of about 50 to 300 psi, in the presence of a suitable catalyst which comprises palladium on an inert carrier, and in the presence of a base selected from the group consisting of alkali metal and alkaline earth metal carbonates and bicarbonates, and alkali metal salts of C-2 to C-6 aliphatic carboxylic acids.

5,144,077

PROCESS FOR WORKING UP THE CRYSTALLIZATION MOTHER LIQUOR FROM THE RESOLUTION OF THE RACEMATE OF 1-(4-CHLOROPHENYL)-ETHYLAMINE

Johannes R. Jansen, and Hans-Joachim Knops, both of Monheim, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 798,678

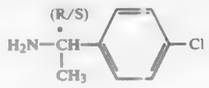
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1990, 4039447

Int. Cl.[5] C07C *209/84, 209/86, 209/88*

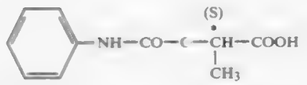
U.S. Cl. 564—438 4 Claims

1. Process for working up the ethanolic crystallization mother liquor which is obtained in the resolution of the race-

mate of 1-(4-chlorophenyl)-ethylamine of the formula (I) with S-(−)-N-phenylcarbamoyllactic acid of the formula (II)

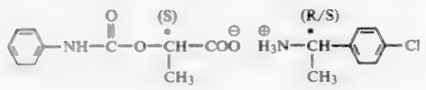


(I)



(II)

said crystallization mother liquor comprising ethanol, S-(−)-1-(4-chlorophenyl)-ethylamine, R-(+)-1-(4-chlorophenyl)-ethylamine and S-(−)-N-phenylcarbamoyl- acetic acid wherein, in a first step the solvent ethanol is removed by distillation and in a second step the residue is stirred with tert.-butyl methyl ether of toluene to form a crystalline salt of racemic 1-(4-chlorophenyl)-ethylamine and (S)-(−)-N-phenylcarbamoyllactic acid of the formula (III)



(III)

which is then isolated and the remaining mother liquor resulting after the present treatment comprises S-(−)-(4-chlorophenyl)-ethylamine and R-(+)-1-(4-chlorophenyl)-ethylamine.

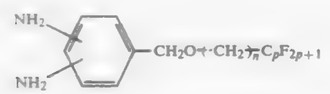
5,144,078

FLUORINE CONTAINING DIAMINOBENZENE DERIVATIVES AND ITS USE

Yu Nagase; Yuriko Takamura, both of Sagamihara; Noriaki Kohtoh, Funabashi; Hiroyoshi Fukuro, Funabashi, and Toyohiko Abe, Funabashi, all of Japan, assignors to Sagami Chemical Research Center and Nissan Chemical Industries, Ltd., both of Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,555
Claims priority, application Japan, Mar. 30, 1990, 2-80855
Int. Cl.[5] C07C *21 /00*; C08G *8/02*
U.S. Cl. 564—472 1 Claim

1. A fluorine-containing diaminobenzene derivative of a general formula (I):



(I)

where n represents an integer of 1 to 6, p represents an integer of 1 to 12.

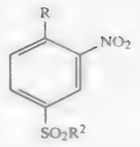
5,144,079

PREPARATION OF TRISUBSTITUTED BENZENE INTERMEDIATES

Peter K. Wehrenberg, Oakland, Calif., assignor to Imperial Chemical Industries Plc, London, England

Filed Feb. 14, 1991, Ser. No. 656,394
Int. Cl.[5] C07C *315/00*
U.S. Cl. 568—30 2 Claims

1. A process for the preparation of a compound having the structural formula



wherein R is methyl or ethyl and R^2 is C_1–C_4 alkyl comprising

(a) preparing a first mixture of 1.0 mole of 2-nitrotoluene or 2-nitro ethylbenzene, about 1.0 to 20.0 mole of C_1–C_4 alkyl sulfonic acid and a catalytic amount of boric acid or boric anhydride and

(b) adding to the first mixture at a temperature above 50° C. about 2.5 to 4.0 moles of thionyl chloride

(c) heating the resulting mixture at a temperature above about 120° C. to form the desired product.

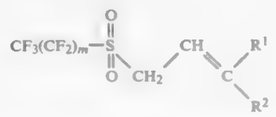
5,144,080

METHOD FOR PREPARING ISOPRENOID CYCLOPROPANE 1,1-DICARBOXYLATES AND DERIVATIVES THEREOF AND NOVEL INTERMEDIATES

Scott A. Biller, Ewing, N.J., and Cornelia Forster, Bensalem, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

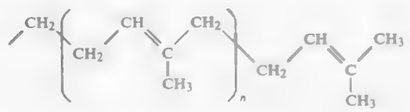
Division of Ser. No. 573,507, Aug. 27, 1990, Pat. No. 5,095,136.
This application Aug. 30, 1991, Ser. No. 753,135
Int. Cl.[5] C07C *317/08*
U.S. Cl. 568—35 2 Claims

1. A compound having the structure



IIA

wherein R^1 and R^2 are the same or different and are CH_3 or



at least one of R^1 and R^2 being other than CH_3 and m is 0 to 5 and n is 0 to 3.

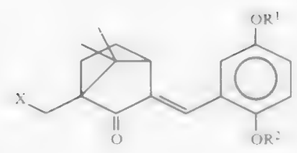
5,144,081

DIALKOXYBENZYLIDENE-CAMPHOR DERIVATIVES

Ulrich Heywang, Darmstadt; Roland Martin, Weinheim, and Ingeborg Stein, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,844
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4027980
Int. Cl.[5] C07C *119/537*
U.S. Cl. 568—326 9 Claims

1. A dialkoxybenzylidenecamphor compound of formula I



I

wherein

R^1 and R^2, in each case independently of one another, are a straight-chain or branched alkyl radical having 1 to 10 C atoms, and

X is H or SO_3H.

5,144,082

ALKYLPHENOL LUBRICANTS FROM ALPHA-OLEFIN DIMER

Thomas R. Forbus, Newtown, Pa., and Bruce P. Pelrine, Trenton, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 312,277, Feb. 21, 1989, abandoned. This application Apr. 17, 1991, Ser. No. 686,459
Int. Cl.[5] C07C *37/14*
U.S. Cl. 565—785 3 Claims

1. Aklylphenol compositions useful as lubricants or additives comprising the alkylation product of at least one alkylatable phenol compound and a mono-olefinic C_{12}–C_{40} hydrocarbon in contact with an acidic alkylation catalyst, said olefin having the structure $R_1R_2CH=CH_2$, where R_1 and R_2 are alkyl groups which may be the same or different, the olefin comprising a product or by-product of the oligomerization of a C_6–C_{20} 1-alkene under oligomerization conditions in contact with supported reduced metal oxide catalyst, said metal oxide catalyst comprising a lower valence state form of at least Group VIB metal.

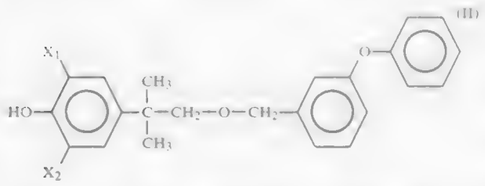
5,144,083

PROCESS FOR PRODUCING P-HYDROXYNEOPHYL M-PHENOXYBENZYL ETHER

Hideyuki Akieda; Naoki Sato; Koichi Morinaga; Yoshinori Ide; Ryuichi Mita, and Mitsumasa Umemoto, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

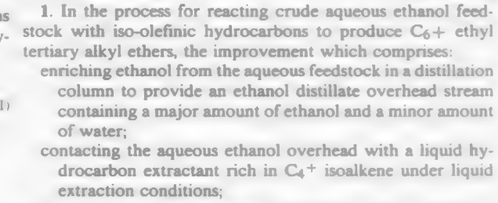
Filed Oct. 2, 1990, Ser. No. 591,637
Claims priority, application Japan, Oct. 3, 1989, 1-256985; Oct. 5, 1989, 1-258874; Oct. 5, 1989, 1-258875
Int. Cl.[5] C07C *41/01*
U.S. Cl. 568—636 27 Claims

1. A process for producing a p-hydroxyneophyl m-phenoxybenzyl ether represented by the formula (II)



(II)

wherein X_1 and X_2 are independently a hydrogen atom or a halogen atom by subjecting a corresponding p-alkoxyneophyl m-phenoxybenzyl ether represented by the formula (I)



wherein R represents a lower alkyl group, and X_1 and X_2 have the same definitions as above to ether cleavage, in which process the ether cleavage reaction is effected in an aprotic polar solvent, using a lower alkoxide of an alkali metal or of an alkaline earth metal or using a metal hydroxide in the presence of a lower alcohol.

5,144,084

PROCESS FOR THE CONVERSION OF OLEFINS TO ALCOHOLS AND/OR ETHERS

Charles M. Sorensen, Wilmington, Del.; Philip Varghese, Voorhees, and David O. Marler, Deptford, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 534,329, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 296,110, Jan. 12, 1989, abandoned. This application Nov. 20, 1991, Ser. No. 798,017
Int. Cl.[5] C07C *41/05*
U.S. Cl. 568—695 7 Claims

1. In a process for the hydration of an light olefin feed comprising propylene to iso-propyl alcohol, di-iso-propyl ether or mixtures of iso-propyl alcohol and di-iso-propyl ether in which the light olefin feed undergoes reaction with water and/or iso-propyl alcohol at a temperature from ambient up to about 300° C., a pressure of at least 5 Atm., at a mole ratio of water and/or iso-propyl alcohol to total olefin in the reaction zone from about 0.1 to about 30, in a reaction zone in which there is present an acidic zeolite hydration catalyst comprising zeolite beta, the improvement which comprises employing said zeolite which has been bound with a binder which consists essentially of at least one essentially non-acidic refractory oxide selected from the group consisting of titania and zirconia.

5,144,085

FEEDSTOCK DEWATERING AND ETHERIFICATION OF CRUDE ETHANOL

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 28, 1990, Ser. No. 500,356
Int. Cl.[5] C07C *41/06*
U.S. Cl. 568—697 10 Claims

1. In the process for reacting crude aqueous ethanol feedstock with iso-olefinic hydrocarbons to produce C_6+ ethyl tertiary alkyl ethers, the improvement which comprises:

enriching ethanol from the aqueous feedstock in a distillation column to provide an ethanol distillate overhead stream containing a major amount of ethanol and a minor amount of water;

contacting the aqueous ethanol overhead with a liquid hydrocarbon extractant rich in C_4+ isoalkene under liquid extraction conditions;

recovering an aqueous phase containing a minor amount of ethanol and a major amount of water;

recovering a substantially water-free organic extract phase comprising the hydrocarbon extractant and a major amount of ethanol introduced in the feedstock;

reacting ethanol and C_4+ isoalkene from the extract phase in contact with an acid etherification catalyst under substantially anhydrous catalytic reaction conditions to pro-

duce ethyl tertiary-alkyl ether product; and recycling the aqueous phase as reflux to the distillation column.

5,144,085

ETHER PRODUCTION

Mohsen N. Harandi; Werner O. Haag, both of Lawrenceville; Hartley Owen, Belle Mead, and Weldon K. Bell, Pennington, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 6, 1991, Ser. No. 695,843
Int. Cl.[5] C07C *41/09*
U.S. Cl. 568—698 16 Claims

1. An integrated continuous process for the production of diisopropyl ether and substantially pure propene from a mixed aliphatic feedstock containing propene and propane, comprising the steps of:

a) contacting the aliphatic feedstock and water in a first reaction zone with acidic olefin hydration catalyst under olefins hydration conditions whereby an effluent stream containing isopropanol and unreacted aliphatic hydrocarbon is produced substantially free of di-isopropyl ether;

b) separating the first reaction zone effluent stream to recover unreacted hydrocarbon and an oxygenate stream comprising isopropanol;

c) contacting said isopropanol oxygenate stream with a zeolite acidic etherification catalyst in a second reaction zone under etherification conditions to produce an etherification effluent stream containing di-isopropyl ether, water and propene; and

d) fractionating the etherification effluent stream to produce a substantially pure propene product stream and an ether product stream.

12. A continuous process for production of diisopropyl ether and propene from isopropanol feed comprising:

contacting an isopropanol-rich feedstream, containing at least 80% isopropanol and containing not more than 15 wt % water, with acidic etherification catalyst comprising zeolite Beta under etherification conditions at reaction temperature of about 90°–200° C. to convert isopropanol to di-isopropyl ether, water and propene with about 30 to 90% approach to equilibrium.

5,144,087

PROCESS FOR THE PREPARATION OF DIBROMONITRO-ALCOHOLS AND BLENDS WITH DIBROMONITRO-ALCOHOLS

James E. Williams, and Scott Thornburgh, both of West Lafayette, Ind., assignors to Great Lakes Chemical Corp., W. Lafayette, Ind.

Continuation of Ser. No. 631,301, Dec. 20, 1990, Pat. No. 5,075,510. This application Oct. 16, 1991, Ser. No. 777,088
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] C07C *205/00, 205/13*
U.S. Cl. 568—713 20 Claims

1. A process for the preparation of dibromonitro-alcohols which comprises reacting dibromonitromethane and a C_1–C_3 aldehyde in aqueous media at an acid pH of between about 4.0 and about 7.0.

5,144,088

MANUFACTURE OF NEOPENTYL GLYCOL (I)

Jeffrey S. Salek, Oakdale Boro, and Joseph Pugach, Monroeville Boro, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1991, Ser. No. 691,927
The portion of the term of this patent subsequent to Sep. 8, 2009, has been disclaimed.
Int. Cl.[5] C07C *45/45, 29/14, 31/20*
U.S. Cl. 568—457 14 Claims

1. Method of making hydroxypivaldehyde and its dimer comprising reacting paraformaldehyde with isobutyraldehyde in the presence of a catalyst comprising a tertiary amine and one or more oxides of elements of Groups IB, IVA, IVB, VA, VB, VIB and VIII of the periodic table.

5,144,089

2-ETHYL-2-HEXENAL BY ALDOL CONDENSATION OF BUTYRALDEHYDE IN A CONTINUOUS PROCESS

Blaise J. Arena, Des Plaines, and Jennifer S. Holmgren, Bloomingdale, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Oct. 21, 1991, Ser. No. 779,755
Int. Cl.[5] C07C *45/72*
U.S. Cl. 568—463 20 Claims

1. A process of preparing 2-ethyl-2-hexenal by the aldol condensation of n-butyraldehyde comprising flowing a mass of n-butyraldehyde through a fixed mass of a basic catalyst consisting essentially of a solid solution of magnesium oxide and aluminum oxide having a surface area from about 250 to about 350 m^2/g at a temperature between about 80° and about 200° C. and recovering from the effluent 2-ethyl-2-hexenal as the aldol condensation product.

5,144,090

METHOD FOR PREPARING ACROLEIN OR METHACROLEIN

Tadatoshi Honda; Tokio Nagayama, both of Kanagawa; Nobuhiko Horiuchi, Yamaguchi; Jun Kitagawa, Yamaguchi; Kazunori Kawahara, Yamaguchi, and Masami Murakami, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 6, 1991, Ser. No. 711,032
Claims priority, application Japan, Jun. 6, 1990, 2-146296; Nov. 14, 1990, 2-306139; Nov. 14, 1990, 2-306141
Int. Cl.[5] C07C *45/37, 45/35*
U.S. Cl. 568—476 6 Claims

1. A method for preparing acrolein or methacrolein which comprises subjecting propylene, secondary propanol, isobutylene or tertiary butanol to gas phase catalytic oxidation with molecular oxygen in the presence of a catalyst represented by the following general formula (I):

$$Mo_aBi_bFe_cX_dY_eZ_fO_z \quad (I)$$

wherein X represents at least one element selected from the group consisting of Ni and Co; Y represents at least one element selected from the group consisting of K, Rb, Cs and Tl; and Z represents at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ce, Ti, Zr, Nb, Cr, W, Mn, Cu, Ag, Zn, Cd, B, Al, Si, Ge, Sn, Pb, P, As, Sb, S, Se and Te; a, b, c, d, e, f and g each represents an atomic ratio of the corresponding element and when a is 12, b=0.1~10, c=0.1~20, d=2~20, e=0.01~2, f=0~4 and g represents the number of oxygen atoms required for satisfying the valency requirement of the constituent elements, method being characterized in using a catalytic composition obtained by separately preparing solutions each of which contains the starting compound for the foregoing catalyst components, mixing these solutions within a short period of time without aging, spray-drying the resulting mixture immediately after the mixing and then calcining the dried powders.

5,144,091

PREPARATION OF ACROLEIN OR METHACROLEIN BY CATALYTIC GAS-PHASE OXIDATION OF PROPENE OR ISOBUTENE

Hans Martan, Frankenthal; Ulrike Wegerle, Worms; Wilhelm Ruppel, Schwetzingen; Lothar Riekert, Karlsruhe; Dieter Becker, Sulzbach a. T., and Michael Kotter, Bruchsal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 732,910
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1990, 4023239
Int. Cl.[5] C07C *45/35*
U.S. Cl. 568—479 2 Claims

1. A process for the production of acrolein or methacrolein by catalytic gas-phase oxidation of propene or isobutene by a molecular oxygen-containing gas in a tubular fixed bed reactor at elevated temperatures on catalytically active oxides with a ≧90% conversion of the initial olefin on a single passage, wherein the temperature of the gases containing said oxygen-containing gas and either of propene or isobutene in the direction of flow along the tubes from their entrance until the conversion of the initial olefin is from 30 to 70% is from 360° C. to 420° C. and is then adjusted to from 360° C. to 300° C. until the conversion of the initial olefin is from 80 to 90% and is thereafter maintained at from 330° C. to 390° C. until the gases emerge from the tubes.

5,144,092

PERFLUOROPOLYETHERS AND PROCESSES FOR THEIR PREPARATION

Antonio Marraccini; Antonio Pasquale, both of Novara; Anna M. Staccione, and Giuseppe Marchionni, both of Milan, all of Italy, assignors to Ausimont S.r.l., Milan, Italy

Filed Mar. 5, 1991, Ser. No. 664,858
Claims priority, application Italy, Mar. 6, 1990, 19585 A/90
Int. Cl.[5] C07C *43/11*
U.S. Cl. 568—615 16 Claims

1. Peroxide perfluoropolyethers having the formula:

$$AO(CF_2O)_a(CF_2{-}CFO)_b(CFO)_c(O)_dB \quad (I)$$

wherein the units (CF_2O),

$$(CF_2{-}CFO), (CFO)$$

and (O) are randomly distributed along the chain;

X represents at least one $(R'O)_mR''$ group, wherein R' is selected from the group consisting of

$$-CF_2-,\ -CF_2-CF_2-,\ \text{and}\ -CF_2-CF-,$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad CF_3$$

R'' is a perfluoroalkyl group selected from the group consisting of straight chain groups having 1 to 10 carbon atoms, branched chain groups having 3 to 10 carbon atoms and cyclic groups having 3 to 6 carbon atoms, and m ranges from 0 to 6;

a, b, c and d are each zero or integers such that the sum of b+c is equal to or higher than 2, the sum of a+b+c is equal to or higher than 2 and the sum of a+b+c+d is equal to or higher than 2;

with the proviso that when a, c or both a and c are not zero and b is not zero, the ratio b/(a+c) ranges from 10^{-2} to 10^3; when a and c are both not zero, the ratio c/a ranges from 10^{-2} to 10^2; and when d is not zero, the ratio d/(a+b+c) ranges from 10^{-2} to 0.8;

A and B are end groups, either like or different from each other, selected from the group consisting of:

$$-COF,\ YCF_2-CF-,\ YCF-CF_2-,\ YCF_2-,\ Y-CF-$$
$$\qquad\quad |\qquad\quad |\qquad\qquad\qquad\qquad |$$
$$\qquad\quad O\qquad\quad O\qquad\qquad\qquad\qquad O$$
$$\qquad\quad |\qquad\quad |\qquad\qquad\qquad\qquad |$$
$$\qquad\quad X\qquad\quad X\qquad\qquad\qquad\qquad X$$

and a P radical selected from the group consisting of R^3 and $R^4{-}O{-}(CF_2O)_n{-}CF_2-$, in which R^3 is a perfluoroalkyl radical containing from 1 to 10 carbon atoms, R^4 is a perfluoroalkyl radical containing from 1 to 3 carbon atoms, and n has a value of from 1 to 10, and Y is —F, —Cl, —COF or a P radical as above defined.

5,144,093

PROCESS FOR PURIFYING AND END-CAPPING POLYOLS MADE USING DOUBLE METAL CYANIDE CATALYSTS

John W. Reisch; Michael M. Martinez, both of Guilford, and Maurice Raes, Branford, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 29, 1991, Ser. No. 692,753
Int. Cl.[5] C07C *41/34*
U.S. Cl. 568—621 18 Claims

1. In a process for producing an ethylene oxide-capped polyol which is essentially free of catalyst residues, wherein the polyol is produced using a double metal cyanide catalyst, the improvement which comprises after polyol formation the steps of:

(a) contacting a catalyst residue(s)-containing polyol with an effective amount of an oxidant selected from the group consisting of: oxygen-containing gas(es), peroxide(s), sulfuric acid, and combinations thereof, to cause said catalyst residue(s) to form insoluble residues that are insoluble in the polyol,

(b) separating the insoluble residues from the polyol by a method selected from the group consisting of filtration and ion exchange separation to provide an essentially double metal cyanide catalyst residue-free polyol,

(c) treating said double metal cyanide catalyst residue-free polyol with a base to provide a base-treated polyol, and vacuum stripping said base-treated polyol,

(d) contacting said base-treated polyol with ehtylene oxide to produce an ethylene oxide-capped polyol containing base, wherein at least a portion of the secondary hydroxyl groups on said polyol are converted into primary hydroxyl groups, and

(e) separating said base from said ethylene oxide capped polyol by a method selected from the group consisting of filtration in the presence of magnesium silicate, extraction, centrafugation, and combinations thereof, to provide a purified ethylene oxide capped polyol.

5,144,094

DIARYL ETHERS BY DEHYDRATION OF PHENOLS

John R. Richmond, High Beach, and Saad F. Tahir, London, both of England, assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 583,757, Sep. 17, 1990, abandoned. This application Aug. 29, 1991, Ser. No. 707,312
Int. Cl.[5] C07C *41/09*
U.S. Cl. 568—635 4 Claims

1. A method of making diaryl ethers comprising dehydrating a phenol at a temperature from about 350° to about 550° C. in the presence of a catalyst comprising a composite resulting from the reduction of tungsten (VI) oxide deposited on a refractory inorganic oxide selected from the group consisting of alumina, zirconia, and titania, said composite having been reduced with hydrogen at a temperature between about 250°

and about 450° C. for a time effective to partially reduce the

tungsten (VI) oxide, and recovering the resulting diaryl ether.

5,144,095

SUBSTITUTED CYCLOPENTADIENES, METHODS OF MANUFACTURE AND USES

Clifford G. Venier, and Edward W. Casserly, both of The Woodlands, Tex., assignors to Pennzoil Products Company, Houston, Tex.

Continuation-in-part of Ser. No. 323,749, Mar. 15, 1989, Pat. No. 5,012,022, which is a continuation of Ser. No. 170,654, Mar. 15, 1988, abandoned, which is a division of Ser. No. 112,378, Oct. 22, 1987, Pat. No. 4,849,566, and a continuation-in-part of Ser. No. 323,164, Mar. 15, 1989, Pat. No. 4,929,782, which is a continuation of Ser. No. 170,653, Mar. 15, 1988, abandoned, which is a division of Ser. No. 112,378, Oct. 22, 1987, Pat. No. 4,849,566, and a continuation-in-part of Ser. No. 323,906, Mar. 15, 1989, Pat. No. 5,012,021, which is a continuation-in-part of Ser. No. 170,652, Mar. 18, 1988, abandoned, which is a division of Ser. No. 112,378, Oct. 22, 1987, Pat. No. 4,839,566, which is a continuation-in-part of Ser. No. 909,305, Sep. 19, 1986, Pat. No. 4,721,823. This application Feb. 25, 1991, Ser. No. 660,469

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[5] C07C *2/86*

U.S. Cl. 585—20 11 Claims

1. Tertiary alkyl substituted cyclopentadienes of the following formula:

wherein R_1 is hydrogen or non-tertiary alkyl of 1 to 4 carbon atoms, R_2 is tertiary-alkyl of 4 to 12 carbon atoms, and a is 2 or 3, with the proviso that when R_1 is hydrogen, a is 3 and R_2 is attached to the cyclopentadiene ring through a tertiary carbon.

5,144,096

NONLINEAR FUNCTION GENERATION APPARATUS, AND MUSICAL TONE SYNTHESIS APPARATUS UTILIZING THE SAME

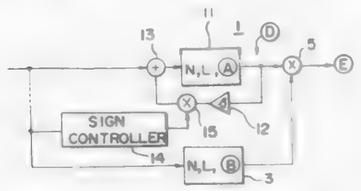
Toshifumi Kunimoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 13, 1990, Ser. No. 613,163

Claims priority, application Japan, Nov. 13, 1989, 1-292257; Nov. 22, 1989, 1-301950

Int. Cl.[5] G10H *1/14*

U.S. Cl. 84—659 6 Claims



1. A nonlinear function generation apparatus comprising:

hysterisis function generation means for generating a hysterisis function using an input signal as a variable, said hysterisis function generation means including basic nonlinear function generation means for generating a nonhysterisis basic nonlinear function, and feedback means for positively feeding back an output from said basic nonlinear function generation means to an input side of said basic nonlinear function generation means to be combined with the input signal and supplying the combined signal to said basic nonlinear function generation means whereby a hysterisis function is provided;

nonhysterisis function generation means for generating a nonhysterisis function using the input signal as a variable; and

synthesis arithmetic means for synthesizing the functions outputted from said hysterisis and nonhysterisis function generation means to provide an overall desired nonlinear function having hysterisis.

5,144,097

CARRIER CLIP APPARATUS FOR LINEAR LINKLESS AMMUNITION SYSTEMS

Ronald R. Snyder, Sr., Irvine, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Sep. 27, 1991, Ser. No. 767,101

Int. Cl.[5] F42B *39/08*

U.S. Cl. 89—35.1 19 Claims

2. Carrier clip apparatus for use in linear linkless ammunition systems, said carrier clip apparatus comprising:

cradle means for holding an ammunition round between two spaced apart sprocket driven chains and enabling passage of the ammunition round through the linear linkless ammunition system without separate guide surfaces for contacting the ammunition round to control round movement through the linear linkless ammunition system, said cradle means including means for attaching the cradle means to the chains and leg means, protruding from one side of the cradle means, for guiding the ammunition round as the chain is moved through the linear linkless ammunition system; and

retainer chip means, attached to an opposite side of said cradle means, for releasably holding said ammunition round to the cradle and against said leg means, said retainer clip means comprising a bendable edge portion extending to said one side of the cradle in a spaced apart relationship with said leg means.

5,144,098

CONDUCTIVELY-JACKETED ELECTRICAL CABLE

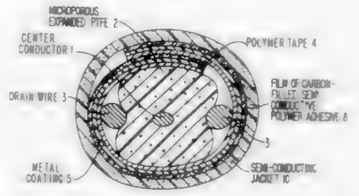
Herbert G. VanDeusen, Bear, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 490,811, Mar. 8, 1990. This application Mar. 8, 1991, Ser. No. 666,326

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] H01B *7/34*

U.S. Cl. 174—36 6 Claims



1. A conductively-jacketed electrical cable comprising from inside to outside:

(a) two or more conductive metal center conductors each separately surrounded by an electrically insulating material;

(b) one or more electrically conductive metal drain wires positioned parallel to said center conductors along the length of said cable outside of said insulating material;

(c) a layer of metal-coated polymer tape coated on the side opposite the metal coating with a thin adhesive layer of semiconductive polymer film and wrapped around said center conductors, said insulating materials, and said drain wires as a unit, said tape being positioned so that its metal side is adjacent said drain wires; and

(d) a semiconductive thermoplastic polymer protective jacket.

5,144,099

TRIM AND METHOD OF USE

Ronald Cardy, London, United Kingdom, assignor to JanFlow Ltd., Essex, England

Filed Jul. 17, 1990, Ser. No. 554,124

Claims priority, application United Kingdom, Jul. 18, 1989, [illegible]16369

Int. Cl.[5] H02G *3/14*

U.S. Cl. 174—66 8 Claims

1. In combination:

a main surface having therein a cavity surrounded by a recessed portion for accommodating a fitting with a faceplate;

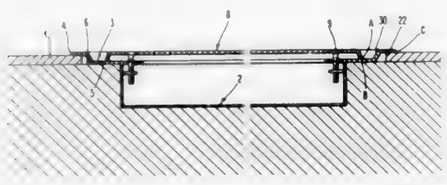
a trim;

a fitting having a faceplate;

said trim having the form of a one-piece component composed of:

a first continuous portion having inner and outer opposed surfaces, the inner surface of said first continuous portion of the trim overlying said cavity and said recessed portion, said inner surface of said first continuous portion tightly abutting said recessed portion thereby establishing a substantially continuous area of sealing contact therewith, said outer surface of said first continuous portion tightly abutting said faceplate thereby establishing a substantially continuous area of sealing contact therewith;

a second continuous portion having inner and outer opposed surfaces, said second continuous portion projecting outwardly from said first continuous portion, said first continuous portion lying inboard said second continuous portion;



a third portion connecting said first continuous portion and second continuous portion;

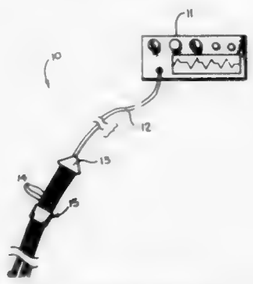
means for securing said faceplate of the fitting against said trim with said inner surface of said second continuous portion tightly abutting said main surface to establish a substantially continuous area of sealing contact therewith, said means for securing said faceplate overlying said cavity.

5,144,100

WIRE SEPARATOR APPARATUS

Gregory G. Andel, 2123 Shilling Chase Ct., Kennesaw, Ga. 30144

Filed Dec. 31, 1990, Ser. No. 636,191
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—135 1 Claim



1. A wire separator apparatus connected to a monitoring device, wherein the wire separator apparatus includes a wire loom directed therefrom, with the wire loom including a harness mounted at a terminal end of the wire loom spaced from the monitoring device, with a plurality of wire leads directed from the harness, with each of the wire leads including a connector loop mounted at a free terminal end of each wire lead, and

a wire separator module means adjustably mounted to the wire leads for securement of the wire leads in a spaced parallel relationship adjacent the connector loops, and

the wire separator module includes a forward end wall spaced from and parallel to a rear end wall, a top wall spaced from and parallel to a bottom wall, and a right side wall spaced from a left side wall, and a plurality of through-extending parallel bores directed through the module from the forward end wall coextensively through the end wall, and the module including a longitudinal axis orthogonally oriented relative to the forward and rear walls, with the bores arranged parallel to the longitudinal axis, and

each of the parallel bores includes a conically flared forward end portion adjacent and in communication with the forward end wall, and a conically flared rear end portion positioned and in communication with the rear end wall, and a central cylindrical bore in communication with the conically flared forward and rear end portions, and

the top wall includes a groove directed through the top wall and orthogonally oriented relative to the longitudinal axis, the groove diametrically bisecting each of the parallel bores, and

a resilient securement tether mounted within the groove to secure the wire leads within the wire separator module, and

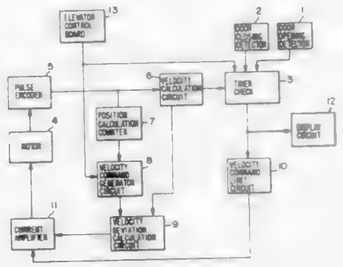
wherein the tether includes an axle positioned adjacent the right side wall, and the tether including a first length less than that defined by a groove length defined by the groove, wherein the tether is stretched to a second length substantially equal to the groove length, and the tether includes a securement ring mounted at a free end of the tether spaced from the axle, and a hook member mounted to the left side wall to permit securement of the securement ring to the hook member.

5,144,101

CONTROL APPARATUS FOR ELEVATOR DOORS USING VELOCITY LIMITING CIRCUITS

Masanori Tawada; Masamoto Mizuno; Terumi Hirabayashi, and Toshiyuki Kodera, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 28, 1991, Ser. No. 705,928
Claims priority, application Japan, May 25, 1990, 2-133745
Int. Cl.[5] B66B *13/14*
U.S. Cl. 187—103 9 Claims



9. An apparatus for controlling elevator doors comprising:

a velocity calculation circuit for calculating actual operation velocity of elevator doors;

a timer check circuit coupled with said velocity calculation circuit for comparing the actual operation velocity with a reference velocity measured at a predetermined check time independent of door position and generating an abnormality signal when the actual velocity exceeds the reference velocity;

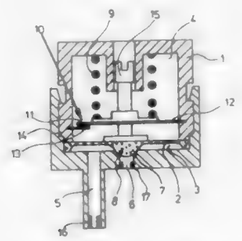
a velocity limiting circuit coupled with said timer check circuit for generating a maximum velocity command signal responsive to the abnormality signal generated by said timer check circuit which clips the actual operation velocity of the elevator doors at a predetermined level.

5,144,102

FLUID PRESSURE SWITCH ADAPTED FOR LOW FLUID PRESSURE AND THROUGHPUTS

Werner Buse, Kaarst, Fed. Rep. of Germany, assignor to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,503
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1990, 9013153[U]
Int. Cl.[5] H01H *35/34*
U.S. Cl. 200—83 Q 11 Claims



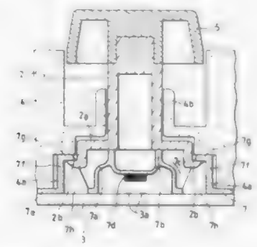
1. A switch responsive to the throughput and pressure of a fluid comprising a housing, a flexible membrane in said housing dividing the housing into first and second chambers, a fluid inlet in the first chamber, a fluid outlet in the first chamber, valve means operatively coupled to said membrane for opening and closing said fluid outlet depending on fluid pressure in said first chamber and on deformation of said membrane resulting from said fluid pressure, electrical switch means in said second chamber having open and closed states, means urging said electrical switch means to one of said states, said means being operatively coupled to said membrane for changing the state of said switch means to the other state thereof upon deformation of said membrane and opening of said fluid outlet.

5,144,103

KEY SWITCH

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 663,430
Claims priority, application Japan, Mar. 9, 1990, 2-056506; Mar. 12, 1990, 2-057973
Int. Cl.[5] H01H *13/70, 1/10*
U.S. Cl. 200—344 7 Claims



1. A key switch comprising:

a key operator having an operation unit for operating a key, a shaft unit positioning below the operating unit, and a claw unit extending outside of the shaft unit;

a frame having a guide unit for guiding the shaft unit of said key operator in a predetermined direction, a first lower surface formed at the outer periphery of the guide unit, and a second lower surface formed at the outer periphery of the first lower surface;

a circuit forming device having a fixed contact and

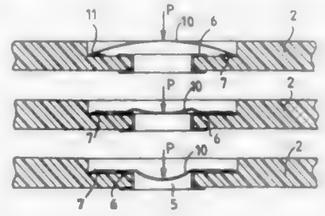
an elastic sheet member having a base portion sandwiched between the second lower surface of said frame and the upper surface of said circuit forming device, a dome portion projecting from the base portion and having an upper end for pushing up the lower end of the shaft unit of said key operator, and an upper end portion formed at the outer periphery of the dome portion and projecting from the base portion, the upper end portion being sandwiched between the first lower surface of said frame and the upper surface of the claw unit of said key operator.

5,144,104

MINIATURE SWITCH DEVICE WITH TACTILE EFFECT

Claude Bedoya, Montigny-le-Bretonneux, France, assignor to Sextant Avionique, France

Filed Mar. 25, 1991, Ser. No. 673,926
Claims priority, application France, Mar. 30, 1990, 90 04065
Int. Cl.[5] H01H *1/10*
U.S. Cl. 200—512 4 Claims



1. A switch device with tactile effect which comprises:

i) a printed circuit board having a planar support surface, said planar support surface having located thereon an external annular conducting element having a first diameter and an internal annular conducting element, said internal annular conducting element being substantially coaxial with said external annular conducting element and bordering a central cavity formed in said board, said central cavity having a second diameter and a determined depth and

ii) a continuously spherical skill cap made from an electrically conducting and resiliently deformable material said skull cap comprising a spherical central portion having a concavity which may be inverted under the effect of an operating force and a circular peripheral edge having a diameter substantially equal to said first diameter, such that said peripheral edge is maintained in electric contact with said external annular conducting element,

wherein said first and second diameters are in ratio substantially equal to 3 so that, after undergoing a reversal of concavity under the effect of said operating force, said spherical central portion is engaged in said central cavity and bears on a circular edge of the internal annular conducting element.

5,144,105

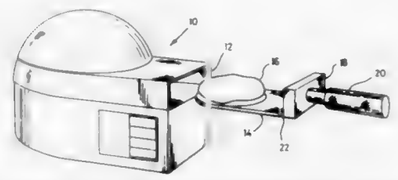
MICROWAVE HEATING APPARATUS WITH A COMBINED FOOD SCOOP AND DOOR

David H. Briggs, Manor House Farm, Silchester NR Reading RG7 2HL, and Richard F. Freeman, 13 High Street, Linton, Cambridge CB1 6HS, both of Great Britain

PCT No. PCT/GB89/01151, § 371 Date May 22, 1991, § 102(e) Date May 22, 1991, PCT Pub. No. WO90/03717, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 28, 1989, Ser. No. 671,830
Claims priority, application United Kingdom, Sep. 28, 1988, 8822707
Int. Cl.[5] H05B *6/76*
U.S. Cl. 219—10.55 D 6 Claims

1. A microwave-powered heating apparatus comprising a heating chamber formed internally with a concave surface for reflecting microwave energy; a microwave source for directing microwave energy into the chamber; an opening formed in

the chamber to enable insertion and removal of foodstuff to be heated; and a fully removable closure member for closing said opening and having a substantially horizontal platform for supporting foodstuff, said platform being generally in the form



of a flat scoop onto which can be slipped a foodstuff of relatively large area, whereby the insertion of the foodstuff into the chamber and the closing of said opening is effected in a single operation.

5,144,106

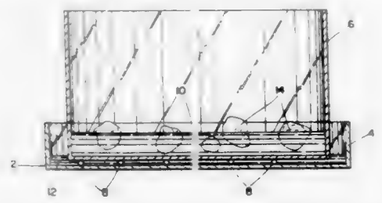
MICROWAVE COOKING UTENSIL EMPLOYING TWO DIFFERENT MICROWAVE SUSCEPTORS

Joyce M. Kearns, New City, N.Y., and Richard Scarpellino, Ramsey, N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 291,812, Dec. 29, 1988, Pat. No. 4,963,708, which is a continuation of Ser. No. 166,062, Mar. 9, 1988, Pat. No. 4,795,649. This application Oct. 15, 1990, Ser. No. 597,984

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E 10 Claims



1. A cooking utensil for cooking or reheating comestibles with microwave energy comprising:

an inner vessel;

an outer vessel;

means for maintaining a space between the outer surface of the bottom of the inner vessel and the inner surface of the outer vessel;

a quantity of a first microwave susceptible liquid placed in said outer vessel wherein said inner vessel is in conductive heat transfer contact with the microwave susceptible liquid contained within the outer vessel, wherein said first microwave susceptible liquid is an organic liquid which possesses a high dielectric loss factor as well as a boiling point greater than 150° C.; and

a solid second microwave interactive material in conductive heat transfer contact with the microwave susceptible liquid said first microwave susceptible liquid and said second microwave interactive material effective to enable said cooking utensil to reach optimum cooking, frying or reheating temperatures in a shorter period of time than either said first liquid or second material alone.

5,144,107

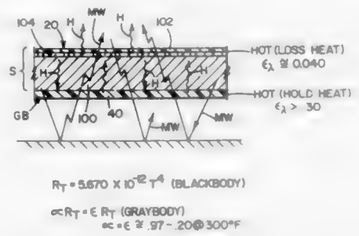
MICROWAVE SUSCEPTOR SHEET STOCK WITH HEAT CONTROL

Yigal Peleg, Solon, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Apr. 11, 1990, Ser. No. 508,256

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E 44 Claims



$R_T = 5.670 \times 10^{-12} T^4$ (BLACKBODY)

$\alpha R_T = \epsilon R_T$ (GRAYBODY)

$\alpha = \epsilon \geq .97 - 20@300°F$

1. In a blankable, foldable microwave reactive heat susceptor sheet stock of the type having two generally parallel surfaces and comprising a thin paper board sheet with a laminated, coterminous reactive layer including a microwave permeable support film with a microwave reactive stratum, the improvement comprising: a gray body layer with an absorptivity over about 0.50 and microwave permeable, said graybody layer being applied coterminously with at least a portion of said parallel surfaces and having an absorptivity value greater than said laminated microwave reactive layer.

5,144,108

KILN FOR PRODUCING LITHARGE BY MEANS OF THE CALCINATION OF MASSICOT

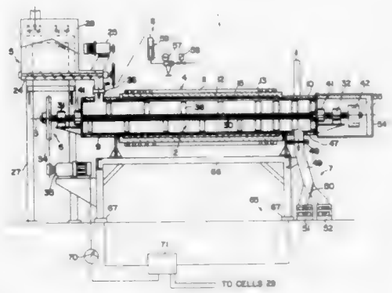
Roberto Passarotto, Brugherio, Italy, assignor to Minemet Italia S.p.A., Milan, Italy

Filed Jun. 27, 1990, Ser. No. 544,691

Claims priority, application Italy, Jul. 5, 1989, 21104 A/89

Int. Cl.[5] H05B *6/64*

U.S. Cl. 219—10.71 17 Claims



1. A kiln for producing litharge by means of calcination of massicot or raw material in powder form advancing inside its interior which comprises screw feeder means having one single tubular body containing raw material, said tubular body having a major axis, a first head, and a second head, means for feeding raw material to the kiln installed at the first head, an electromagnetic induction heating unit along said tubular body wherein said electromagnetic induction heating unit is externally coaxial with the tubular body and comprises, starting from an external surface of said tubular body, a tube of ferromagnetic material, at least one layer of insulting refractory material and an induction coil and between the tubular body and the tube of ferromagnetic material an air space is provided,

inside which an inert gas is contained, means for feeding oxidating air, and means for discharging the material from the kiln.

5,144,109

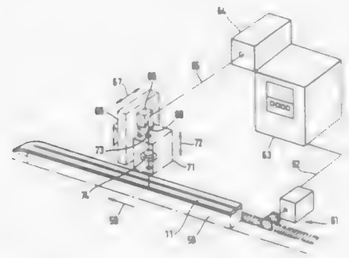
METHOD FOR THE STEEL EDGES OF SKIS OR THE LIKE

Hans Klingel, Teckstrasse 9, 7141 Möglingen, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 479,062

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.85 33 Claims



1. Method for treating the steel edges of skis and other runner devices that have a runner base top layer with a first outer surface, two steel edge profiles mounted on two longitudinal edges of said runner base top layer, each with a second outer surface facing downwards when in use and a third outer surface facing laterally, which method includes the following steps:

a) levelling the heights of the first and second outer surfaces if they are not level relative to each other,

b) bringing at least the edge area in the corner between the second and third outer surfaces to the hardening temperature of the steel of the steel edge profile by laser beam,

c) moving the laser beam and runner device relative to each other in the longitudinal direction of the steel edge profile, and

d) drawing off heat to prevent detrimental heating up of the volume of the runner device around the steel edge profile in the area of the point of incidence of the laser beam.

5,144,110

PLASMA SPRAY GUN AND METHOD OF USE

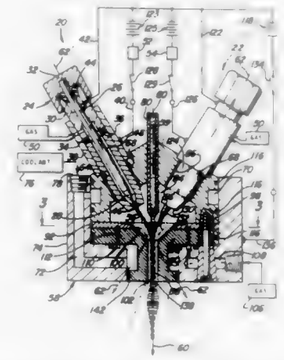
Daniel R. Marantz, 25 Cedar La., Sands Point, N.Y. 11050, and Herbert Herman, 30 Waterview Dr., Pt. Jefferson, N.Y. 11777

Continuation-in-part of Ser. No. 267,145, Nov. 4, 1988, Pat. No. 4,982,067. This application May 11, 1990, Ser. No. 522,351

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.48 39 Claims

1. A plasma spray apparatus, comprising: an anode; means for generating a first plasma stream of ionized plasma gas said first plasma generating means including a first plasma deflecting means coupled to said anode and adapted to receive said first plasma stream and to direct said received stream to said anode; means for generating a second plasma stream of ionized plasma gas intersecting said first plasma stream within aid anode, said second plasma generating means including a second plasma deflecting means; means for extending and electromagnetically coalescing said first and second plasma streams into a free-standing plasma of ionized plasma gas; and means



for supplying feedstock into said free-standing plasma, whereby said feedstock is heated and accelerated.

5,144,111

ELECTRIC CIGAR LIGHTER WITH BIMETALLIC SNAP ACTIVE TEMPERATURE CONTROLLED SWITCHING OFF

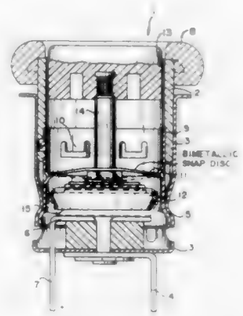
Alexander Von Gaisberg, Beilstein, and Klaus-Philipp Merz, Karlsruhe, both of Fed. Rep. of Germany, assignors to Schoeller & Co. Elektrotechnische Fabrik GmbH & Co., Frankfurt, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 588,861

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932603

Int. Cl.[5] F23Q *7/22*; H05B *1/02*

U.S. Cl. 219—265 4 Claims



1. An electric lighter for installation in a dashboard of a motor vehicle, comprising:

an electrically conductive lighter plug which contains an electrically conductive glow-coil dish with a glow coil, said glow coil having one end electrically connected to said glow coil dish and another end connected to said lighter plug;

a negative-pole terminal and a positive-pole terminal;

an electrically conductive socket which can receive said lighter plug and latch said lighter plug therein, said socking being a plug-in contact electrically connected to said negative-pole terminal, said socket establishing an electrical connection with said light plug when said lighter plug is inserted therein;

a switch contact means associated with said lighter plug and

socket for electrically connecting said lighter plug to said positive-pole terminal;

temperature responsive opening means for opening said switch contact means upon heating of said opening means by said glow coil to a predetermined temperature;

said switch contact means comprising a fixed non-flexible switch contact element secured in a plane of a bottom of said socket in electrically insulated relationship thereto and electrically connected to said positive pole terminal and said glow-coil dish which is mounted at the end of said lighter plug and arranged for movement relative thereto into and out of electrical contact with said switch contact element;

said opening means being disposed within said lighter plug adjacent said glow-coil dish and being in heat exchange relation with said glow coil and said opening means being arranged to move said glow-coil dish out of electrical contact with said switch contact element upon attainment of a predetermined temperature.

5,144,112

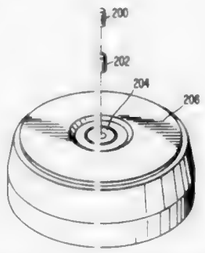
FOOD SERVICE INDICATION SYSTEM

W. Burk Wyatt; Kevin B. Cundiff, both of Brentwood, and Kenneth R. Little, Jr., Nashville, all of Tenn., assignors to Aladdin Synergetics, Incorporated, Nashville, Tenn.

Division of Ser. No. 567,361, Aug. 15, 1990, which is a continuation-in-part of Ser. No. 394,204, Aug. 15, 1989, and a continuation-in-part of Ser. No. 471,483, Jan. 29, 1990, and a continuation-in-part of Ser. No. 541,129, Jun. 20, 1990, which is a continuation-in-part of Ser. No. 394,204, , and a continuation-in-part of Ser. No. 471,483,. This application Sep. 9, 1991, Ser. No. 756,800

Int. Cl.[5] H05B *3/68*

U.S. Cl. 219—386 16 Claims



1. A food service process, said process comprising the steps of:

providing a plate of hot food;

providing a dome having a solid core thermochromic member and a heat conductive sleeve surrounding the member embedded within a top surface of the dome;

covering the plate of hot food with the dome;

transporting the dome covered plate to a different location for consumption;

at the different location, observing the color of the thermochromic member; and

determining from the observed color whether the plated food is at a suitable hot temperature for consumption.

5,144,113

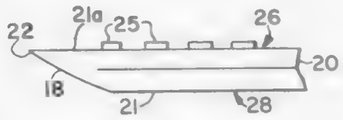
ELECTRICALLY HEATED DEICER FOR AIRCRAFT BLADES

Henry B. Hall, Madison, Conn., and James A. Cook, Agawam, Mass., assignors to Safeway Products, Inc., Middletown, Conn.

Filed Nov. 30, 1988, Ser. No. 277,698

Int. Cl.[5] H05B *3/16*

U.S. Cl. 219—549 1 Claim



1. An electrically heated deicer to be affixed to a propeller blade, a helicopter rotor blade, or other blade for aircraft which blade has at least an electrically non-conductive portion on one surface thereof comprising:

a thin, flat, flexible electrically non-conductive wear-resistant body having opposed uninterrupted faces,

a thin flat conductive foil resistance heater disposed along and affixed to a non-conductive face of said wear-resistant body, said non-conductive face of said wear-resistant body with the foil resistance heater thereon intended to be affixed to the non-conductive portion on one surface of the blade,

said wear-resistant body having tapered side and end edges extending beyond said thin, flat conductive foil resistance heater for securement to said blade to present an improved air foil shape, said edges being tapered toward the resistance heater side of the body,

and a reinforced non-conductive mesh disposed within the wear resistant body.

5,144,114

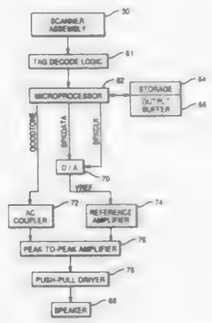
VOLUME CONTROL APPARATUS

Christopher J. Wittensoldner, and Denis M. Blanford, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 15, 1989, Ser. No. 408,193

Int. Cl.[5] H03G *3/00;* G06K *7/10*

U.S. Cl. 235—375 24 Claims



1. Volume control apparatus for controlling the volume of a speaker, comprising:

optical scanning means for scanning visible coded indicia, and producing scanning signals representative thereof;

logic decode means coupled to said scanning means for providing digital information representative of said coded indicia from said scanning signals;

processor means coupled to said logic decode means, for distinguishing coded indicia bearing a code relating to a change in speaker volume from other coded indicia and for producing a tone signal, a data signal and a clock signal in response to receiving of digital information representing a change in speaker volume from said logic decode means;

digital-to-analog converter means coupled to said processor means for receiving said data signal and said clock signal from said processor means and generating a reference level signal in response thereto;

AC coupler means coupled to said processor means for receiving said tone signal therefrom and generating a first AC signal in response thereto;

peak-to-peak amplifier means coupled to said digital-to-analog converter means and to said AC coupler means for generating a second AC signal related in waveform to said first signal and related in amplitude to said reference level signal;

push-pull driver means coupled to said peak-to-peak amplifier means to provide a speaker drive signal; and

speaker means coupled to said push-pull driver means to be driven by the speaker drive signal.

5,144,115

TRANSACTION INQUIRING METHOD AND APPARATUS

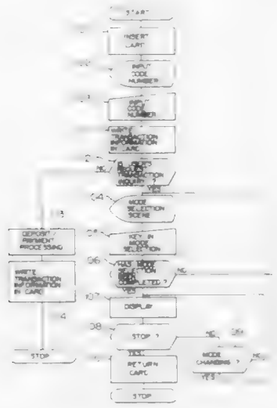
Yasuhisa Yoshida, Owariasahi, Japan, assignor to Hi Tachi, Ltd., Tokyo, Japan

Filed Jan. 15, 1991, Ser. No. 641,725

Claims priority, application Japan, Jan. 29, 1990, 2-018666

Int. Cl.[5] G06F *15/30*

U.S. Cl. 235—379 8 Claims



1. A transaction inquiring method comprises the steps of:

inserting an IC card into an ATM (automatic teller machine);

making an on-line transaction with a center office for the ATM and writing in an IC card the information on transactions made until now on the account of an IC card owner which is held in the center office;

designating the transaction information to be inquired;

retrieving the designated transaction information out of the transaction information written in the IC card; and

displaying the retrieved transaction information on a display screen.

5,144,116

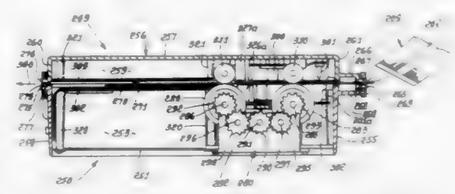
APPARATUS FOR PROCESSING A CARD HAVING DISPLACEABLE BUBBLES THEREON

Henry C. Harbers, Jr., Templeton, Calif., assignor to Escorp, Inc., San Luis, Calif.

Filed Oct. 5, 1990, Ser. No. 592,992

Int. Cl.[5] G06K *7/04*

U.S. Cl. 235—444 16 Claims



1. Apparatus for processing a menu device comprising

a) a card,

b) bubbles on said card having positions corresponding to selectable data, at least some of the bubbles extending in a row,

c) each bubble having a first position projecting upwardly from said plane of said card, and a second position into which it is displaced relative to said plane of the card, by finger pressure, to indicate selection of data corresponding to bubble position on said card, said apparatus comprising:

d) first means for detecting which of said bubbles are so displaced, and

e) second means to engage displaced bubbles and to urge them back toward said first positions after the first means detects which of the bubbles are displaced to second positions,

f) and means receiving the card for driving the card bodily edgewise in a card travel direction so that all bubbles on the card pass relatively over said second means which causes progressive flexing and unflexing of the card proximate said second means as the card progresses edgewise in response to said driving, said second means including multiple projections extending toward opposite sides of the card and having card engaging elongated edges angled relative to the card length and width dimension such that displaced bubbles in a row will not all be similarly engaged by the elongated edge of a projection.

5,144,117

ILLUMINATION TYPE OPTICAL RECORDED INFORMATION READING DEVICE

Kazuo Hasegawa; Hisashi Murata, both of Furukawa, and Ikuo Ouchi, Miyagi, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 653,191

Claims priority, application Japan, Feb. 27, 1990, 2-18308[U]; Apr. 17, 1990, 2-99373

Int. Cl.[5] G06K *7/10;* H05B *37/02;* F21V *5/08;* G05F *1/577*

U.S. Cl. 235—455 5 Claims

1. An illumination type optical recorded information reading device comprising:

a plurality of light emitting elements (1 to 10) adapted to emit light by supplying thereto driving currents on the basis of a supply voltage (V_{cc}) of a common power supply (28);

a media (16) adapted to be illuminated by said light emitting elements (1 to 10) as a light source, said media (16) having an optical indication (17) recorded thereon;

photo detecting means (19, 20) for converting optical information from said media (16) to electrical information (b);

a plurality of driving elements (31 to 35) integrally formed on a semiconductor substrate connected in series through

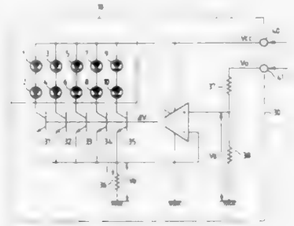
said light emitting elements (1 to 10) to said power supply (28);

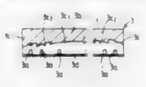
current detecting means (36) for outputting as a driving current detecting signal (V_R) a total amperage (I) of driving currents flowing through said driving elements (31 to 35) by supplying current to a series circuit having said driving elements (31 to 35), said power supply (28) and said light emitting elements (1 to 10); and

control means (39) for comparing said driving current detecting signal (V_R) from said current detecting means (36) with a reference signal (V_S) for calculation of a reference current value to be supplied to said light emitting elements (1 to 10), and supplying a control signal (ΔV) to said driving elements (31 to 35) so as to obtain a target light quantity from each of said light emitting elements (1 to 10);

whereby said media (16) is stably illuminated by the light from each of said light emitting elements (1 to 10), and said electrical information (b) is accurately obtained from said photo detecting means (19, 20).

3. An illumination type optical recorded information reading device comprising:





a media (1) having an optical indication (2) recorded thereon;

photo detecting means (4, 5) for detecting a recorded surface of said media (1) in a predetermined maximum detectable range (W, W') and converting said optical indication (2) to electrical information;

a light emitting element (3a) for supplying light for illuminating said maximum detectable range (W, W') of said photo detecting means (4, 5); and

light conducting means (3) for conducting the light emitted from said light emitting element (3a) to said media (1);

wherein a distribution of an illuminance of the light for illuminating said media (1) through said light conducting means (3) is set in such a manner that the illuminance at positions spaced away from a central portion of said maximum detectable range (W, W') is higher than the illuminance at said central portion, and that the illuminance at opposite end portions of said maximum detectable range is lower than the illuminance at said positions spaced away from said central portion.

5,144,118

BAR CODE SCANNING SYSTEM WITH MULTIPLE DECODING MICROPROCESSORS

Robert J. Actis; Craig D. Cherry and Andrew P. Taussig, all of Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 5, 1990, Ser. No. 488,107
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 35 Claims

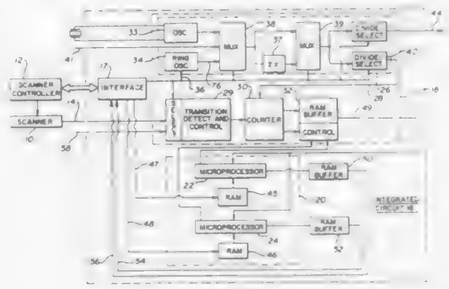
1. A system for scanning bar code labels and for providing data related thereto, comprising:

scanning means for optically scanning bar code labels and providing an electrical, binary scan signal in response thereto, and

an integrated circuit including

converter means, responsive to said scanning means, for translating said electrical, binary scan signal into a related sequence of digital words, said converter means including

a clock for providing a clock signal, said clock comprising a programmable oscillator for providing a clock signal of adjustable frequency in response to a frequency control command, whereby compensation may be provided for variations in the manufacture of said integrated circuit and for variations in operating conditions,



a counter circuit, responsive to said electrical, binary scan signal and to said clock signal, for measuring the time between successive transitions of said clock signal and providing a digital word related thereto, and

a first random access memory, responsive to said counter circuit, for storing successive digital words received from said counter circuit,

and

microprocessor means, responsive to said converter means, for translating said related sequence of digital words into data.

5,144,119

INSTANT PORTABLE BAR CODE READER

George E. Chadima, Jr., Cedar Rapids, Iowa, and Vadim Laser, Cincinnati, Ohio, assignors to Norand Corporation, Cedar Rapids, Iowa

Division of Ser. No. 364,704, Jun. 9, 1989, Pat. No. 5,038.024, which is a continuation of Ser. No. 325,177, Mar. 17, 1989, abandoned, which is a division of Ser. No. 234,880, Aug. 19, 1988, abandoned, which is a division of Ser. No. 827,286, Feb. 7, 1986, Pat. No. 4,766,300, which is a continuation of Ser. No. 637,693, Aug. 6, 1984, Pat. No. 4,570,057, which is a division of Ser. No. 334,811, Dec. 28, 1981, abandoned. This application May 18, 1990, Ser. No. 525,754
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—472 3 Claims

1. An improved bar code reader system of the type having:

(a) a hand-held bar code reader unit including a reader head portion with a frontally directed window means providing optical coupling of said reader unit with a bar code having a complete line of bar code information, said reader head portion having a top side which is upwardly directed during reading of a bar code with vertically disposed bars, and a handle portion extending from said reader head portion providing for hand-held support of said reader unit;

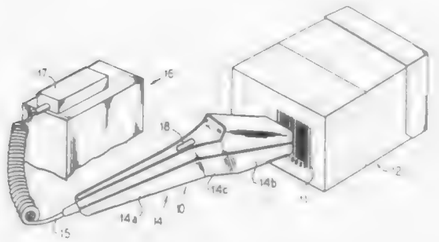
(b) manually actuatable trigger means for initiating a bar code reading operation;

(c) said hand-held bar code reader unit being of configuration such that during said bar code reading operation an operator manually grasping said handle portion moves said reader unit by means of said handle portion to place said reader unit in reading relationship with said bar code and to direct said window means towards said bar code information such that said bar code is located in front of said reader unit;

(d) said reader head portion having a battery powered automatic bar code reader system therein including a light source energizable for producing light energy to be directed outwardly through said window means, and being operable to effectively illuminate said bar code elements simultaneously over a substantial range of distances;

(e) said battery powered automatic bar code reader system being operable in an automatic bar code reading operation while said reader unit is stationary as a whole, to receive reflected light energy through said window means from said bar code elements simultaneously after said light energy has been outwardly through said window means to generate from said reflected light energy a useful bar code signal corresponding to a complete line of bar code information;

(f) said battery powered automatic bar code reader system



comprising a photodetector operable to supply an effective output in response to said reflected light energy from said bar code at any of said substantial range of distances in front of said reader unit; and

(g) signal processing circuit means connected with said photodetector means amplifying and digitizing the output therefrom so as to provide a useful bar code signal corresponding to a complete line of bar code information of a bar code located frontally of the reader unit at any of said substantial range of distances therefrom;

wherein the improvement comprises:

(A) said battery powered automatic bar code reader system further comprising reflected light gathering means interposed in a reflected light path for said reflected light energy between said window means and said photodetector and operative with respect to bar codes at any of said substantial range of distances for concentrating reflected light energy from such bar codes at said photodetector for effective detection thereof; and

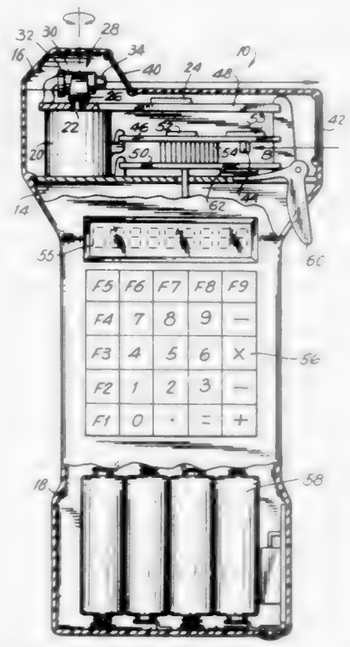
(B) a single printed circuit board having said signal processing circuit means thereon and having said photodetector fixedly secured therewith, said reflected light gathering means being mechanically connected with said single printed circuit board such that said photodetector is maintained in optical alignment with said reflected light gathering means along said reflected light path.

5,144,120

MIRRORLESS SCANNERS WITH MOVABLE LASER, OPTICAL AND SENSOR COMPONENTS

Mark J. Krichever, Hauppauge; Boris Metlitsky, Stony Brook; Edward D. Barkan, South Setauket; Howard M. Shepard, Great River, and Jerome Swartz, Old Field, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y. and Symbol Technologies, Inc., Bohemia, N.Y.

Filed May 11, 1988, Ser. No. 193,265
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—472 45 Claims



1. A mirrorless scanner arrangement in a light scanning system for reading coded indicia having parts of different light reflectivity, said system being of the type including:

(A) a light source component for emitting a light beam,

(B) an optical component for optically modifying and directing the light beam along an optical path toward coded indicia located in the vicinity of a reference plane exteriorly of the system,

(C) a photodetector component having a field of view and operative for detecting at least a portion of light of variable intensity reflected off the coded indicia, and for generating an electrical signal indicative of the detected light intensity, and

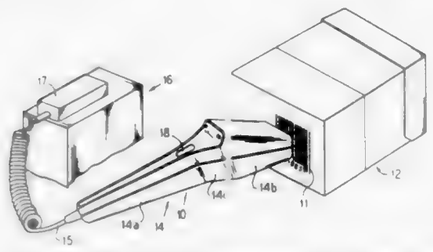
(D) means for decoding the electrical signal into data identifying an object bearing the coded indicia,

said arrangement comprising:

(a) means for mounting at least one of the components for repetitive, reciprocating movement relative to another of the components; and

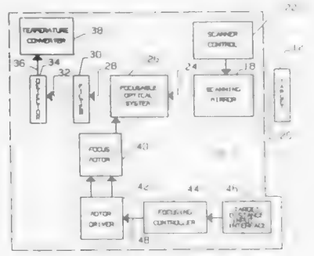
(b) drive means for repetitively reciprocatingly moving the mounting means and said at least one component to scan at least one of said light beam and said field of view over the coded indicia to identify the object bearing the coded indicia.

5,144,121
INSTANT PORTABLE BAR CODE READER
George E. Chadima, Jr., Cedar Rapids, Iowa, and Vadim Laser, Cincinnati, Ohio, assignors to Norand Corporation, Cedar Rapids, Iowa
Continuation of Ser. No. 364,704, Jun. 9, 1989, Pat. No. 5,038,024, which is a continuation of Ser. No. 325,177, Mar. 17, 1989, abandoned, which is a division of Ser. No. 234,880, Aug. 19, 1988, abandoned, which is a division of Ser. No. 827,286, Feb. 7, 1986, Pat. No. 4,766,300, which is a continuation of Ser. No. 637,693, Aug. 6, 1984, Pat. No. 4,570,057, which is a continuation of Ser. No. 334,811, Dec. 28, 1981, abandoned. This application May 18, 1990, Ser. No. 526,104
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—472 13 Claims



1. An improved bar code reader system of the type having:
(a) a hand-held bar code reader unit including a reader head portion with a frontally directed window means providing optical coupling of said reader unit with a bar code having a complete line of bar code information, said reader head portion having a top side which is upwardly directed during reading of a bar code with vertically disposed bars, and a handle portion extending from said reader head portion providing for hand-held support of said reader unit;
(b) manually actuatable trigger means for initiating a bar code reading operation;
(c) said hand-held bar code reader unit being of configuration such that during said bar code reading operation an operator manually grasping said handle portion moves said reader unit by means of said handle portion to place said reader unit in reading relationship with said bar code and to direct said window means towards said bar code information such that said bar code is located in front of said reader unit;
(d) said reader head portion having a battery powered automatic bar code reader system therein including a light source energizable for producing light energy to be directed outwardly through said window means, and being operable to effectively illuminate said bar code elements simultaneously over a substantial range of distances;
(e) said battery powered automatic bar code reader system being operable in an automatic bar code reading operation while said reader unit is stationary as a whole, to receive reflected light energy through said window means from said bar code elements simultaneously after said light energy has been directed outwardly through said window means to generator from said reflected light energy a useful bar code signal corresponding to a complete line of bar code information;
(f) control means responsive to manual actuation of said trigger means to effect a plurality of successive bar code reading cycles during the course of said bar code reading operation until said bar code reading operation is terminated, and being operable to automatically terminate said bar code reading operation upon determining that one of said bar code reading of cycles has resulted in a valid bar code reading; and
(g) an output cable emanating from said handle portion;
wherein the improvement comprises:
said light source being located substantially within said head portion and said control means includes a battery powered programmed decoder located substantially within said handle portion and in proximity to said output cable, said battery powered programmed decoder being programmed to decode said bar code signals indicating complete lines of bar code information generated by said battery powered automatic bar code reader system.

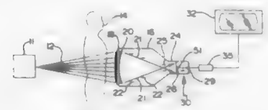
5,144,122
SCANNING RADIATION SENSOR WITH AUTOMATIC FOCUS CONTROL FOR OPTIMAL FOCUS AND METHOD
William J. Danley, Highland Park; Jeffrey M. Kresch, Gurnee, and Eugene F. Kalley, St. Charles, all of Ill., assignors to Square D Company, Palatine, Ill.
Filed Oct. 19, 1990, Ser. No. 601,481
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—201.2 21 Claims

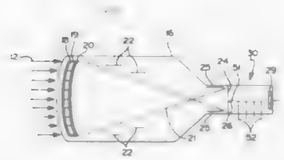


1. In a scanning radiation sensor having a scanning optical system for collecting exitance from selected spots located on a target, a detector for converting the collected exitance into an electrical signal for each spot and means for converting the electrical signal into a representation of radiation of the selected spots, the improvement being an apparatus for automatically obtaining an optimal focus of the optical system to minimize the largest resolution for said spots, comprising:
means for receiving an input representative of the distance from the optical system to the selected spot on the target closest to the optical system;
means for receiving an input representative of the distance from the optical system to the selected spot on the target farthest from the optical system;
means responsive to said inputs representative of the farthest and closest distance for automatically determining an optimal focus setting for the scanning optical system; and
means responsive to said optimal focus automatically determining means to automatically adjust the focus of the scanning optical system to said optimal focus setting.

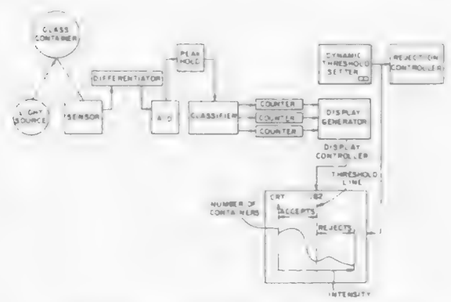
5,144,123
X-RAY IMAGE DISSECTING INTENSIFIER WITH PINHOLE APERTURE ANODE FOR IMAGE DISSECTION
Karl Malashanko, P.O. Box 362, Little Lake, Mich. 49833
Filed Jun. 6, 1991, Ser. No. 710,979
Int. Cl.[5] H01J 31/50
U.S. Cl. 250—213 VT 9 Claims

1. An x-ray image observing device comprising:
(a) means for generating an x-ray image the x-ray image comprising of x-ray photons of a subject;
(b) an image dissecting intensifier tube, the tube comprising:
(1) an outer casing;
(2) an input phosphor disposed within the casing, the input phosphor receiving the x-ray photons from the means for generating and converting the x-ray photons to visible light photons;
(3) a photocathode disposed in the casing adjacent to the phosphor, the photocathode receiving the visible light photons and converting them to electrons;
(4) a plurality of axially aligned electrostatic lenses, the lenses accelerating and focusing the electrons, the electrons passing through the lenses from one to another serially;
(5) an anode adjacent to the lenses, the anode drawing the electrons through the tube, the anode having a pinhole aperture formed therein, the anode allowing the electrons to pass through the aperture in a dissected manner;
(6) a plurality of horizontal and vertical deflection plates disposed within the casing adjacent to the anode; and
(7) a multiplier tube, the multiplier tube attached to the anode and having a second cathode, a plurality of dynodes and a second anode, the multiplier tube receiving the electrons through said anode and amplifying the electrons;
(c) a video control unit, the unit adding horizontal and vertical sweep signals to the amplified electrons, the sweep signals mixing with the amplified electrons to provide a mixed signal capable of display on a video monitor.





5,144,124
GLASS CONTAINER INSPECTION MACHINE WITH PLOT DISPLAY OF CONTAINER AND LIGHT INTENSITY
Robert A. Hansen, Elmira, N.Y., assignor to Emhart Industries, Inc., Newark, Del.
Filed Nov. 19, 1990, Ser. No. 615,233
Int. Cl.[5] G01N 9/04
U.S. Cl. 250—223 B 4 Claims



1. An apparatus for inspecting formed glass containers for imperfections such as checks comprising
light source means illuminating a glass container to be inspected,
sensor means for sensing light reflected from the glass container to be inspected
means for displaying a plot of number of containers vs. light intensity,
means for selecting a predetermined light intensity along said plot for defining the demarcation between accepted formed containers and rejected formed containers, and
means for rejecting formed containers having a light intensity above said predetermined light intensity.

5,144,125
FIBER OPTIC BASED FIRE DETECTION AND TRACKING SYSTEM
Hudson R. Carter, Granville, and Cevdet G. Koksal, Alliance, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Dec. 12, 1990, Ser. No. 626,605
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.15 10 Claims

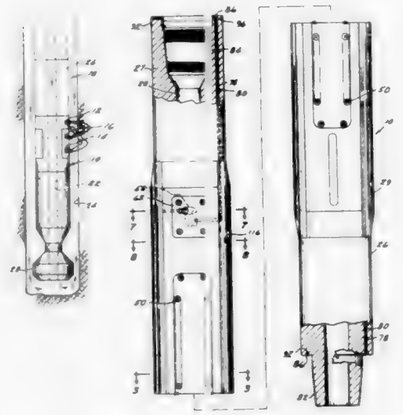
1. An apparatus for detecting and locating a fire, comprising:
at least one optical fiber with a melting point defining a threshold temperature for fire detection, said at least one optical fiber having a first and a second end;
a first optical time domain reflectometer connected to said first end of said at least one optical fiber for sending a light pulse through said at least one optical fiber at a first input end, said first optical time domain reflectometer detecting the light pulse sent through said at least one optical fiber and timing a flight of the light pulse originating at the first input end of said at lease one optical fiber and reflected back;
a second optical time domain reflectometer connected to said second end of said at least one optical fiber for sending a light pulse through said at least one optical fiber at a second input end, said second optical time domain reflectometer detecting the light pulse sent through said at least one optical fiber and timing a flight of the light pulse originating at the second input end of said at least one optical fiber and reflected back; and
a computer in communication with said first and second optical time domain reflectometers for determining linear resolution of said at least one optical fiber from the timed flight of light pulses of the first and second optical time domain reflectometers for detecting and locating the fire.

5,144,126

APPARATUS FOR NUCLEAR LOGGING EMPLOYING SUB WALL MOUNTED DETECTORS AND ELECTRONICS, AND MODULAR CONNECTOR ASSEMBLIES

Carl A. Perry, Middletown; Guy A. Daigle, Plainville, both of Conn.; Steven Rountree, Lafayette, La.; George Talmadge, Clinton, Conn.; John Grunbeck, Wallingford, Conn., and Mark Wassell, Glastonbury, Conn., assignors to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Apr. 17, 1990 Ser. No. 511,537
Int. Cl.[5] G01V 5/00, 5/10
U.S. Cl. 250—254 48 Claims



1. A nuclear logging apparatus for logging a borehole formation comprising:

a drill collar sub having a sub wall and having opposed ends;

a radioactive source in said sub;

at least one detector assembly in said sub, said detector assembly being spaced from said radioactive source and said detector assembly being positioned to detect radiation resulting from emissions emitted by said source;

electronic circuit means communicating with said detector assembly, said electronic circuit means including microprocessor means for analyzing radiation detected from said detector assembly and providing a nuclear log of a borehole formation;

at least one chamber in said sub wall;

at least one chamber cover, said chamber cover including attachment means for forming fluid tight and removable attachment to said at least one chamber; and

said detector assembly and said electronic circuit means being positioned in said at least one chamber.

5,144,127

SURFACE INDUCED DISSOCIATION WITH REFLECTRON TIME-OF-FLIGHT MASS SPECTROMETRY

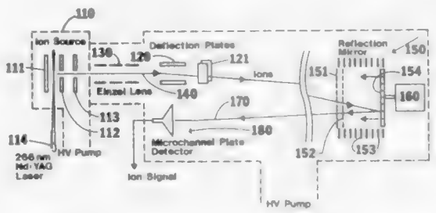
Evan R. Williams, 1177 Amarillo Ave., Apt. #9, Palo Alto, Calif. 94303, and Richard N. Zare, 724 Santa Ynez, Stanford, Calif. 94305

Filed Aug. 2, 1991, Ser. No. 739,904
Int. Cl.[5] H01J 49/40
U.S. Cl. 250—287 19 Claims

1. A time of flight mass spectrometer, comprising:

a parent ion source means for generating a beam of parent ions that are accelerated along a flight path; and

an ion reflectron positioned along said flight path, wherein said ion reflectron comprises a movable surface with an adjustable potential, said movable surface adaptable by proper alignment of its position along said flight path, by adjustment of said surface potential, or both, to cause said beam of parent ions to strike said movable surface, so that



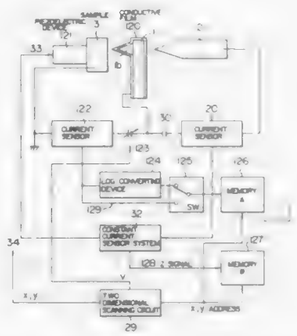
collision of said parent ions with said movable surface dissociates said parent ions into ion fragments.

5,144,128

SURFACE MICROSCOPE AND SURFACE MICROSCOPY

Tsuyoshi Hasegawa, Kokubunji; Sumio Hosaka, Tokyo; Shigeyuki Hosoki, Hachioji; Yukio Honda, Fuchu, and Masakazu Ichikawa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1991, Ser. No. 649,898
Claims priority, application Japan, Feb. 5, 1990, 2-24549; Feb. 7, 1990, 2-26036
Int. Cl.[5] G01N 23/00
U.S. Cl. 250—306 5 Claims



1. A surface microscope apparatus for analyzing a sample surface, comprising:

a cantilever whose displacement is caused by an atomic force exerted between a tip of the cantilever and a sample;

means for detecting the displacement of the cantilever with respect to a sample surface, and for providing data representing said displacement;

means, employing the cantilever, for scanning a surface of a sample;

means for forming an atomic force image of a sample surface on the basis of the displacement data provided by the detecting means;

means for establishing a voltage difference between the cantilever and a sample surface to cause a tunneling current between the cantilever and the sample surface;

means for providing data representing the tunneling current caused by said voltage difference; and

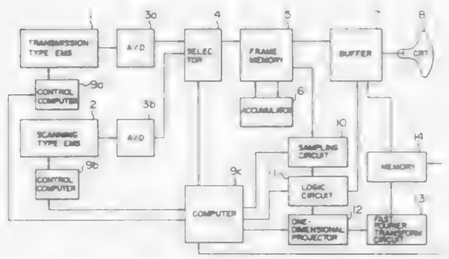
means for forming an image of the thickness of an insulating film on said sample, including means for forming said insulating film thickness image on the basis of the tunneling current data.

5,144,129

ELECTRON MICROSCOPE

Hiroyuki Kobayashi, Mito; Koichi Kanaya, Mitaka; Norio Baba, Tokyo, and Mitsuo Ogasawara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 630,843
Claims priority, application Japan, Dec. 25, 1989, 1-332753
Int. Cl.[5] H01J 37/07
U.S. Cl. 250—307 6 Claims



1. A method of focusing adjustment/astigmatism correction of an electron microscope comprising the steps of:

(a) accumulating, in a predetermined one-dimensional direction, intensities in a two-dimensional intensity distribution of an image obtained by said electron microscope at a predetermined focal point;

(b) applying Fourier transform to an accumulated function obtained in step (a);

(c) accumulating functions after the Fourier transform of step (b) to obtain an accumulated value;

(d) changing the focal point of said electron microscope by a predetermined amount and repeating said steps (a) to (c) to obtain a curve of the accumulated values as a function of one of an amount of defocusing and an amount of astigmatism for different focal points; and

(e) determining one of a proper focus position and a position of minimum astigmatism based on one of an extreme point and a substantial center position of symmetry of said curve of the accumulated values.

5,144,130

METHOD FOR THE ELECTRICAL ADJUSTMENT OF AN OPTICAL ROW OF SENSORS

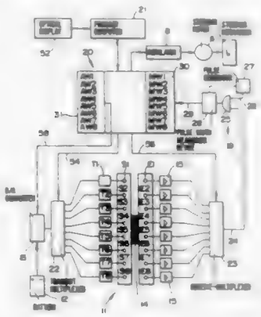
Urs Meyer, Niederglatt; Rene F. Oberhaensli, Wiesendangen, and Dominik Haeusler, Unterageri, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Continuation-in-part of Ser. No. 480,205, Feb. 14, 1990. This application Aug. 16, 1990, Ser. No. 568,515
Claims priority, application Switzerland, Feb. 16, 1989, 538/89; European Pat. Off., Feb. 16, 1990, 90103072.6
Int. Cl.[5] G05B 1/00
U.S. Cl. 250—202 23 Claims

1. A method for the adjustment of a row of optical sensors used for guiding a driverless vehicle along an optical guideway and secured transversely with respect to the direction of travel of the vehicle, comprising the steps of:

prior to scanning of the optical guideway by means of the row of sensors, electrically adjusting the row of sensors to at least a predetermined measurement value at a substantially uniform calibration surface, the surface being spaced from the row of sensors for reflecting light impulses from the row of sensors;

obtaining an adjustment value for each of the sensors, during the step of adjusting, for producing the predetermined measurement value for each of the sensors; and



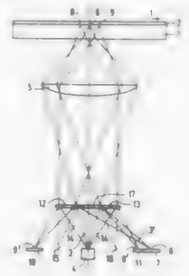
storing said adjustment values, obtained during the adjustment of each individual sensor, in an adjustment table.

5,144,131

DEVICE FOR OPTICALLY SCANNING AN INFORMATION PLANE DETECTING BORDER PORTIONS OF LIGHT BEAM

Willem G. Opheij; Henricus M. M. Kessels, and Christiaan H. F. Velzel, all of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1991, Ser. No. 718,734
Claims priority, application Netherlands, Sep. 12, 1990, 9002007
Int. Cl.[5] G05B 1/00
U.S. Cl. 250—202 20 Claims



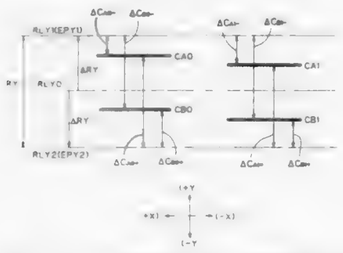
1. A device for optically scanning a radiation-reflecting information plane having tracks, which device comprises a radiation source supplying a scanning beam, an objective system for focusing the scanning beam to a scanning spot in the information plane and for reimaging the scanning spot on a radiation-sensitive detection system for generating an information signal, and a tracking grating arranged in the radiation path between the radiation source and the objective system for forming two tracking beams which are focused by the objective system in two tracking spots in the information plane, said spots being reimaged on two tracking detectors for generating a tracking error signal, characterized in that the tracking grating comprises two parts located in one plane at both sides of the scanning beam, which parts capture border portions of the beam from the radiation source.

5,144,13

METHOD OF AND DEVICE FO COMPENSATING FOR READING-POSITION ERROI OF IMAGE SENSOR

Ryuji Kitakado, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jul. 24, 1991, Se . No. 734,926
Claims priority, application Japa , Jul. 27, 1990, 2-200673
Int. Cl.[5] H04N *1/28, 1/387*
U.S. Cl. 250—208.1 **16 Claims**



1. A method of compensating fo a positional error in reading an image of an objective mate ial with an image scan system having at least one image sens r, wherein said image scan system is operable to read said mage while scanning said objective material in an image-scan ing direction, said method comprising the steps of:

(a) on said image scan system, de ermining a positional tolerance range for an image rea ing position of said image sensor, wherein

said image reading position of sa id image sensor is included in said positional tolerance ra ge, and

said positional tolerance range as such a front end and a rear end that a direction from said rear end to said front end is in parallel with said im ge-scanning direction;

(b) determining a reference po ition on said rear end or behind said rear end with res ect to said image-scanning direction;

(c) measuring a positional dev ation between said image reading position of said imag sensor and said reference position;

(d) reading said image of said objective material with said image sensor while scanning s id objective material in said image-scanning direction to o tain an image signal representative of said image of sai objective material; and

(e) delaying said image signal by a delay time proportional to said positional deviation to compensate for a positional error in reading said image o said objective material.

5,144,13

UNCOOLED INFRARED D ETECTOR READOUT MONOLITHIC INTEGRA ED CIRCUIT WITH INDIVIDUAL PIXEL SIG NAL PROCESSING

Dana Dudley, Dallas; Kirk D. Pete son, Plano, and Charles M. Hanson, Richardson, all of Tex , assignors to Texas Instruments Incorporated, Dallas, Tex

Filed Apr. 4, 1991, S r. No. 680,210
**Int. Cl.[5] H01 ** *40/14*
U.S. Cl. 250—208.1 **24 Claims**

1. A detector circuit which co prises, in combination:

(a) a matrix of unit cells;

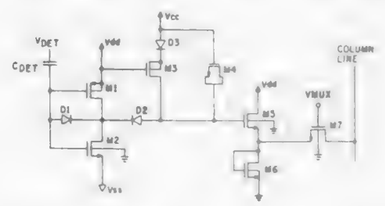
(b) a row address circuit controlling operation of each of said unit cells; and

(c) a column address circuit c upled to each of said unit cells;

(d) each of said unit cells comp rising:

(i) a capacitive detector;

(ii) an amplifier having an in ut coupled to said detector and an output, and a very high resistance feedback circuit coupled between said input and said output;



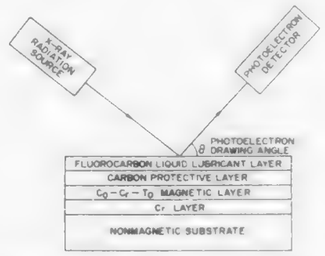
(iii) a low pass filter coupled to the output of said amplifier; and a switch coupled to said filter.

5,144,134

METHOD FOR DETERMINING THE QUALITY OF A LUBRICANT LAYER ON A MAGNETIC RECORDING MEDIUM BY DETECTING ELECTRONS AT VARYING DRAWING ANGLES

Katsumi Onodera, and Youichi Tei, both of Matsumoto, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Jun. 5, 1991, Ser. No. 711,168
Claims priority, application Japan, Jun. 5, 1990, 2-146632
Int. Cl.[5] H01J *37/00*
U.S. Cl. 250—307 **6 Claims**



1. A method for determining the quality of a lubricant layer, formed from lubricant molecules having main chain and polar group portions, on a surface of a magnetic recording medium having a protective layer which comprises:

(a) exposing the lubricant layer to a radiation source for X-ray photoelectron spectroscopy while varying the photoelectron drawing angle;

(b) determining the numbers of emitted electrons at varying drawing angles corresponding to the main chain and polar group portions and the drawing angle which the number of emitted electrons corresponding to the main chain portions is at its maximum; and

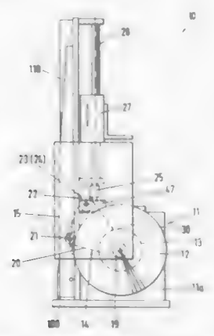
(c) assessing the degree of orientation of the polar group portion towards the protective layer from the information collected in step (b), wherein a high degree of orientation towards the protective layer is indicative of a high quality lubricant layer.

5,144,135

IMAGE PLATE SCANNER

Jules Hendrix, Notkestrasse 85, D-2000 Hamburg 52, and Arno Lentfer, Bacherweg 5c, D-2000 Hamburg 61, both of Fed. Rep. of Germany

PCT No. PCT/EP90/01612, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO91/04629, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 22, 1990, Ser. No. 689,268
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1989, 8911380
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—327.2 **21 Claims**



1. An image plate scanner for laser beam scanning a circular image plate that has previously been exposed to X-rays to form thereon image elements spaced at radial distances from a central point of the image plate, said image plate scanner comprising a image plate carrier for carrying an image plate to be scanned; electromotor means for rotating said image plate carrier with an adjustable rotational speed with the image plate detachably mounted thereon; an image element scanning unit; a drive assembly for driving said image element scanning unit at a presettable speed of advance to radially displace said image element scanning unit across the image plate so that each image element is scanned at a constant tangential speed; laser light supply means; and an optical image element scanner including optoelectronic measured value transmission means, a photomultiplier and signal conditioning means.

5,144,136

DEVICE FOR SIMULTANEOUSLY MEASURING PARTICLE OR QUANTUM BEAMS FROM MANY SAMPLES AT ONCE

Helmut Kubisiak, Dobel, Fed. Rep. of Germany, assignor to RSM Analytiche Instrumente GmbH, Fed. Rep. of Germany

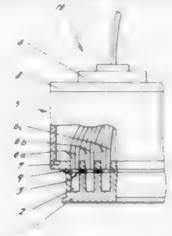
Filed Sep. 6, 1990, Ser. No. 578,627
Claims priority, application European Pat. Off., Sep. 7, 1989, 89116502.9
Int. Cl.[5] G01T *1/204*
U.S. Cl. 250—328 **2 Claims**

1. A device for simultaneously measuring the levels of liquid scintillation of a plurality of samples, comprising:

a microplate having a plurality of wells for respectively receiving a plurality of samples of light-radiating material, each well being enclosed, having an opening at the top and having photon reflecting walls;

a plurality of light conductors, at least two for each well, each light conductor being positioned through the opening at the top of a well to receive the light emanating from the sample in the well; and

means for simultaneously measuring the light received by the light conductors and for determining therefrom the respective level of liquid scintillation of each sample, said means including first means for processing the signals from each of a first one of the two light conductors associated with each well, second means for processing the signals from each of a second one of the two light conductors associated with each well, and means for comparing the outputs of the first and second processing means to determine the liquid scintillation level of each sample.



5,144,137

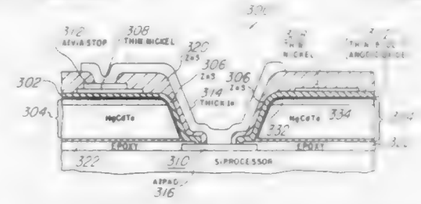
Patent Not Issued For This Number

5,144,138

INFRARED DETECTOR AND METHOD

Michael A. Kinch, Dallas, and C. Grady Roberts, McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 6, 1989, Ser. No. 417,931
Int. Cl.[5] H01L *25/00, 27/14;* **G01T** *24/00*
U.S. Cl. 250—332 **14 Claims**



1. A radiation detector, comprising:

(a) an insulated gate over a layer of semiconductor material, said material with a first bandgap adjacent said gate and a second bandgap a depletion region depth from said gate, said first bandgap larger than said second bandgap, and said second bandgap of energy comparable to the energy of at least a portion of photons of radiation to be detected;

(b) a potential source intermittently connected between said gate and said layer; and

(c) a gate potential detector.

5,144,139

CAPILLARY FLOW DEVICE

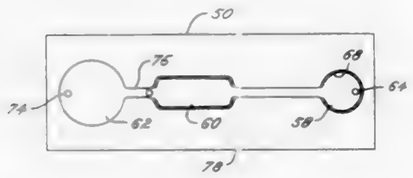
Robert S. Hillman, Cupertino; Michael E. Cobb, Sunnyvale; Jimmy D. Allen, Los Altos; Ian Gibbons, Menlo Park; Vladimir E. Ostoich, San Jose, and Laura J. Winfrey, Belmont, all of Calif., assignors to Biotrack, Inc., Mountain View, Calif.

Continuation of Ser. No. 651,283, Feb. 5, 1991, which is a continuation of Ser. No. 472,130, Jan. 30, 1990, Pat. No. 5,004,923, which is a division of Ser. No. 177,625, Apr. 5, 1988, Pat. No. 4,948,961, which is a division of Ser. No. 880,793, Jul. 1, 1986, Pat. No. 4,756,884, which is a continuation-in-part of Ser. No. 762,748, Aug. 5, 1985, abandoned. This application Jul. 19, 1991, Ser. No. 732,596
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[5] G01N *21/49, 31/22*
U.S. Cl. 250—341 **3 Claims**

1. A method for detecting agglutination of particles, which comprises:

adding a fluid sample to a capillary passageway in a cartridge containing a diagnostic reagent that interacts with

said sample to produce an agglutination system comprising said particles;



passing a beam of light through said sample in said capillary passageway while said particles are in motion relative to said beam; and

detecting in said fluid the presence of agglutinated particles.

5,144,140

DETECTION OF EXPLOSIVES

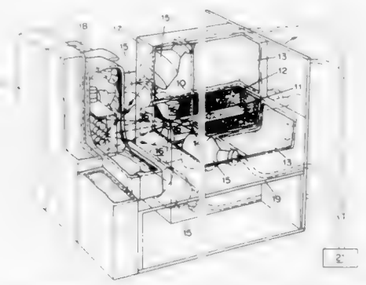
Julian D. Allyson, Glasgow; Ramon Spackman, and Gwilyn D. James, both of Oxfordshire, all of United Kingdom, assignors to Cogent Limited, United Kingdom

Continuation of Ser. No. 564,161, Aug. 7, 1990, abandoned. This application Jun. 4, 1991, Ser. No. 711,113

Claims priority, application United Kingdom, Aug. 14, 1989, 8918484

Int. Cl.[5] G01N *23/222*

U.S. Cl. 250—358.1 **8 Claims**



1. An apparatus for detecting the presence of explosives comprising:

at least a first and a second neutron source;

a plurality of gamma ray detectors for generating outputs in dependence on detected gamma rays;

analysis means for generating signals corresponding to the output of each detector and for investigating those signals to detect whether explosive is present; and

article support means for supporting an article to be analyzed such that a part of the supported article lies at a target point within the apparatus;

wherein said plurality of gamma ray detectors each lie on the circumference of the base of an imaginary right circular cone in space having its apex at said target point, and the axes of said cone passing through said first neutron source, said plurality of gamma ray detectors being spaced around the circumference of the base of said cone with two of said plurality of gamma ray detectors being respectively on opposite sides of said first neutron source, and

wherein at least two of said plurality of gamma ray detectors also lie on the base of a further imaginary right circular cone, said second neutron source being located on the axis of said further right circular cone, and the apex of said further right circular cone being spaced from the apex of said right circular cone by the same distance as the spacing of said first and second neutron sources.

5,144,141

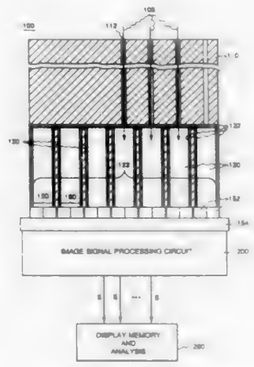
PHOTODETECTOR SCINTILLATOR RADIATION IMAGER

Henri M. Rougeot, and Donald E. Castleberry, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 19, 1991, Ser. No. 746,847

Int. Cl.[5] G01T *1/20*

U.S. Cl. 250—369 **16 Claims**



1. A large area radiation imaging device comprising:

a plurality of scintillator elements arranged in an array, each of said elements being separated from adjoining elements by an interstitial barrier, said barrier comprising a radiation absorptive material;

a plurality of clusters of internal gain photodetectors, each of said clusters comprising more than one photodetector;

each of said scintillator elements being optically coupled to one of said clusters of internal gain photodetectors; and

an image signal processing circuit comprising a plurality of subgroup processing circuits, each of said subgroup processing circuits being electrically coupled to a plurality of said clusters of photodetectors;

each of said subgroup processing circuits having multiplexing means for sampling electrical signals generated by each of said photodetectors in said clusters coupled to said subgroup processing circuit so as to produce an imaging signal corresponding to the energy level of, and location on, said scintillator array of the detected incident radiation

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5,144,142

BLANKING APERTURE ARRAY, METHOD FOR PRODUCING BLANKING APERTURE ARRAY, CHARGED PARTICLE BEAM EXPOSURE APPARATUS AND CHARGED PARTICLE BEAM EXPOSURE METHOD

Shunsuke Fueki; Hiroshi Yasuda, both of Yokohama; Kiichi Sakamoto, Tokyo, and Yasushi Takahashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 18, 1990, Ser. No. 525,062

Claims priority, application Japan, May 19, 1989, 1-126121; Sep. 14, 1989, 1-239623; Sep. 25, 1989, 1-248835

Int. Cl.[5] H01J *37/47*

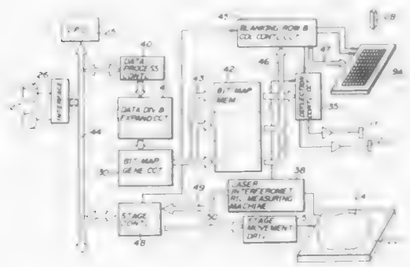
U.S. Cl. 250—396 R **27 Claims**

1. A blanking aperture array for use in a charged particle beam exposure for shaping a charged particle beam, said blanking aperture array comprising:

a substrate:

at least m rows by n columns of apertures arranged two-dimensionally in said substrate, each of said apertures having a pair of blanking electrodes, where m and n are integers greater than one; and

n m-bit shift registers provided on said substrate, each of said n m-bit registers couples to corresponding pairs of said blanking electrodes of said apertures which are arranged in a corresponding ith column, for applying voltages



dependent on pattern data to m pairs of the blanking electrodes of said apertures in the ith column, where i = 1, 2, . . . , n, said pattern data being related to a pattern which is to be exposed using the blanking aperture array.

5,144,143

DEVICE FOR THE IONIZATION OF METALS HAVING A HIGH MELTING POINT, WHICH MAY BE USED ON ION IMPLANTERS OF THE TYPE USING ION SOURCES OF FREEMAN OR SIMILAR TYPE

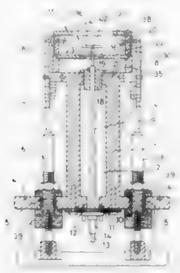
Mario Raspaglies, San Giovanni La Punta, and Candido Medulla, Trecastagni, both of Italy, assignors to Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno, Catania, Italy

Filed Jan. 16, 1991, Ser. No. 641,692

Claims priority, application Italy, Jan. 23, 1990, 19134 A/90

Int. Cl.[5] H01J *27/00*

U.S. Cl. 250—426 **4 Claims**



1. An ion implanter using a Freeman-type ion source, comprising:

a cylindrical casing provided with an internal cavity having a longitudinal axis,

an arc chamber superimposed over said cylindrical casing and having an external casing held at a positive voltage,

an electrical filament housed in said arc chamber and connected to an electrical current supply,

a repeller plate housed in said arc chamber in front of said filament and held at a first negative voltage with respect to the external casing of said arc chamber,

a gas inlet for feeding an ionizable gas into said chamber and,

a support for a metal to be ionized which is housed in said arc chamber in a location intermediate between said filament and said repeller plate and out of the electron flow emerging from the filament and is electrically connected to an electrode held at a second negative voltage lower than said first negative voltage.

5,144,144

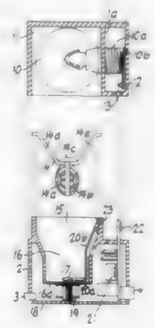
CONTACT LENS CLEANING AND DISINFECTING SYSTEM

Simcha Borovsky, Fair Lawn, N.J., assignor to American Vision, Inc., Glen Rock, N.J.

Filed Jul. 19, 1991, Ser. No. 732,623

Int. Cl.[5] H01J *37/20;* **G01N** *23/00*

U.S. Cl. 250—455.11 **20 Claims**



1. A contact lens cleaning and disinfecting system comprising:

an enclosed housing having a chamber for holding a volume of fluid therein;

a source of ultraviolet (UV) radiation mounted at an upper portion of the chamber above the volume of fluid;

a lens holder having lens holder portions for holding respective contact lenses in the chamber immersed in the volume of fluid;

a turbulence mechanism for inducing turbulence in the volume of fluid with sufficient force to dislodge particles, films, and other deposits from the lenses into the fluid; and

an electronic control unit for operating the source of ultraviolet radiation to disinfect the dislodged particles, films, and other deposits in the fluid.

5,144,145

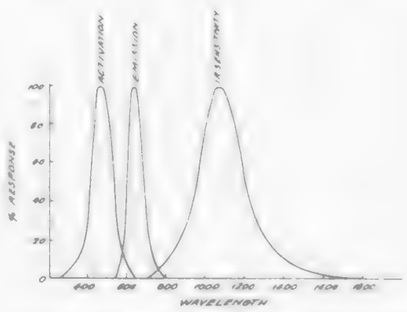
OPTICAL IMAGE SUBTRACTION EMPLOYING ELECTRON TRAPPING MATERIALS

Suganda Jutamulia, Rockville, Md.; George M. Storti, Washington, D.C., and Joseph Lindmayer, Potomac, Md., assignors to Quantex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 419,479, Oct. 10, 1989, Pat. No. 5,029,253. This application May 8, 1991, Ser. No. 697,002

Int. Cl.[5] G03C *5/16*

U.S. Cl. 250—484.1 **14 Claims**



1. A method of image subtraction, comprising the steps of:

(a) writing a first image into an electron trapping material, said first image comprising a pattern of electromagnetic

radiation of a first wavelength, said electron trapping material having a plurality of energy levels including a ground level and a trapping level, said electromagnetic radiation of a first wavelength raising electrons in said electron trapping material from said ground level to said trapping level at selected locations corresponding to said first image;

(b) writing a second image into said electron trapping material, said second image comprising a pattern of electromagnetic radiation of a second wavelength, said electromagnetic radiation of a second wavelength releasing trapped electrons in said electron trapping material at selected locations corresponding to said second image, such that electrons remain in traps only at locations in said electron trapping material where said second image does not coincide with said first image; and

(c) uniformly exposing said electron trapping material to electromagnetic radiation of said second wavelength to release said remaining electrons from their traps, resulting in the emission of incoherent light from said electron trapping material in a pattern corresponding to the difference between said first image and said second image.

5,144,145

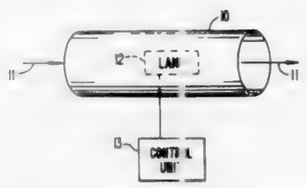
METHOD FOR DESTRUCTION OF TOXIC SUBSTANCES WITH ULTRAVIOLET RADIATION

Alexander Wekhof, Emeryville, Calif., assignor to Ultraviolet Energy Generators, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 549,506, Jul. 6, 1990, abandoned. This application Apr. 11, 1991, Ser. No. 684,458

Int. Cl.[5] A61L 2/10

U.S. Cl. 250—492.1 **4 Claims**



4. A process for the destruction of toxic substances by photodissociation comprising the steps of:

providing an extended spectral band of ultraviolet radiation lying within the range of 175 to 360 nanometers;

pulsing the ultraviolet radiation at a pulse repetition rate of at least about 5 Hertz, the pulsed extended spectral band of ultraviolet radiation having a characteristic rms power ratio of rms power to average power, a characteristic peak power ratio of peak power to average power, and a characteristic average power density; and

adjusting said pulse repetition rate, said rms power ratio, said peak power ratio, and said average power density relative to one another to maximize destruction of said toxic substances and toxic byproducts thereof.

5,144,147

ION IMPLANTATION APPARATUS AND METHOD OF CLEANING THE SAME

Masakazu Shiozaki, Yamato, and Katsuya Okumura, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

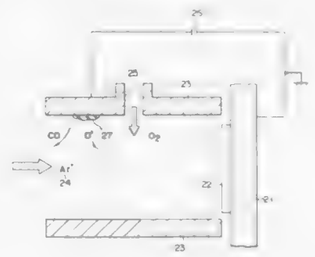
Filed Aug. 28, 1991, Ser. No. 750,949

Claims priority, application Japan, Aug. 31, 1990, 2-230078

Int. Cl.[5] H01J 37/36

U.S. Cl. 250—492.2 **6 Claims**

1. An ion implantation apparatus, comprising a sample holder and a gauge acting as a passageway of an ion beam running toward the sample, said gauge being provided with a



gas inlet port for introducing a reactive gas into the ion beam passageway to remove a stain attached to said gauge.

5,144,148

PROCESS FOR REPOSITIONING ATOMS ON A SURFACE USING A SCANNING TUNNELING MICROSCOPE

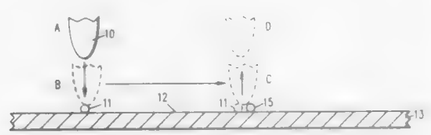
Donald M. Eigler, Santa Cruz, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 432,657, Nov. 7, 1989, Pat. No. 4,987,312. This application Aug. 17, 1990, Ser. No. 569,270

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] H01J 37/30

U.S. Cl. 250—492.3 **26 Claims**



1. A method of fabricating a desired multi-atom structure on a substrate, comprising the steps of:

providing a plurality of atoms of the same type; and

using an STM, repositioning said atoms on the substrate to create the structure.

5,144,149

ELECTRICAL SIGNAL TO THERMAL IMAGE CONVERTER

Henry A. Frosch, 6200 Wilson Blvd. Apt. 809, Falls Church, Va. 22044

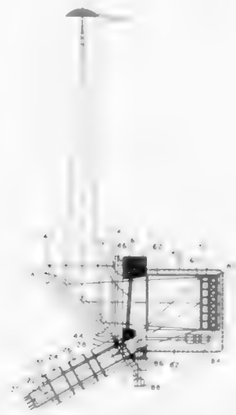
Filed Jan. 22, 1991, Ser. No. 644,031

Int. Cl.[5] G21F 4/00

U.S. Cl. 250—493.1 **12 Claims**

1. A device for converting electrical signals to thermal images, comprising a directed beam source of energy and means for varying the intensity, for focusing, and for deflecting said beam, and a reticulated target, having separate and independent elements each fortuitously placed upon and bonded to a substrate, said substrate coupled to a heat sink, said target

converting the input energy from the beam to a thermal pattern emitting energy of another wavelength or form, viewed



by the device under test on the side of said target being irradiated by said energy source.

5,144,150

CONFIGURATION MEASURING APPARATUS

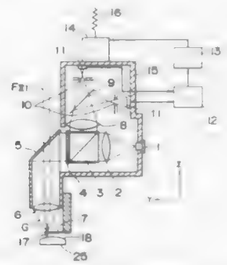
Keiichi Yoshizumi, Osaka, and Keishi Kubo, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 6, 1991, Ser. No. 665,224

Claims priority, application Japan, Mar. 7, 1990, 2-55330

Int. Cl.[5] G01B 9/02

U.S. Cl. 250—561 **6 Claims**



1. A configuration measuring apparatus, comprising:

a contacting member for contacting and tracing a surface of an object to be measured;

a supporting member for supporting said contacting member, said supporting member having a reflecting surface;

an optical probe supporting said contacting member by supporting said supporting member, said optical probe comprising

an objective lens having an optical direction extending in the Z-direction of an orthogonal XYZ coordinate system and an automatic focusing means for moving said objective lens in the Z-direction so that a focusing point of said objective lens is maintained positioned at said reflecting surface of said supporting member even if said reflecting surface of said supporting member is dislocated, and

means for measuring a Z-coordinate of said reflecting surface of said supporting member by allowing interference of a laser beam reflected by said reflecting surface of said supporting member with a reference light;

driving means for moving said optical probe in at least the X-direction of the X and Y-direction of said XYZ coordinate system; and

means for measuring the position of said optical probe in at least the X-direction of the X and Y-directions of said XYZ coordinate system;

wherein the configuration of the surface of the object in at least the X and Z-direction of the XYZ coordinate system can be measured using said optical probe with said contact member for tracing the surface of the object.

5,144,151

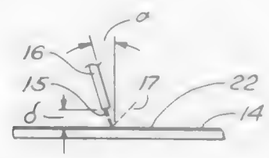
APPARATUS AND METHOD FOR DETECTING THE PRESENCE OF A DISCONTINUITY ON A GLASS SURFACE

Brent A. Thorne, 6519 Heritage, West Bloomfield, Mich. 48332, and Salvatore J. Riera, 61801 Cetnor, Washington, Mich. 48094

Filed Mar. 20, 1991, Ser. No. 672,173

Int. Cl.[5] G01N 21/86

U.S. Cl. 250—571 **14 Claims**



1. An apparatus for detecting the presence or absence of a discontinuity on a glass surface, the apparatus comprising:

transmitting means for emitting incident infrared electromagnetic radiation toward the glass surface and for receiving that portion of the infrared electromagnetic radiation reflected from the glass surface which is coincident with the incident radiation;

positioning means for positioning the transmitting means to direct the incident radiation and coincident portion of the reflected radiation at an angle from a line perpendicular to the glass surface; and

sensing means optically connected to the transmitting means for sensing the relative magnitude of the coincident portion of the reflected radiation relative to the incident radiation and determining the presence or absence of a discontinuity on the glass surface in accordance therewith.

5,144,152

RECTIFIER CABINET STATIC BREAKER

Roger A. Costantino, Jr, Mifflin, and Ronald J. Gliebe, Library, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 30, 1990, Ser. No. 530,513

Int. Cl.[5] H02J 1/00

U.S. Cl. 307—11 **13 Claims**

1. In a power distribution system rectifier cabinet, a static breaker apparatus comprising:

a latch bus;

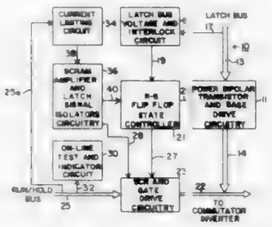
a run/hold bus;

a SCR (silicon controlled rectifier) circuit inserted in said run/hold bus; and

sensing circuitry connected to said latch bus and monitoring the status of power thereon, said circuitry also being connected to control the conducting state of said SCR, wherein said sensing circuitry includes:

a power bipolar transistor and base drive circuitry connected into said latch bus;

a latch bus voltage interlock circuit connected to sense the condition of said latch bus; and



an R-S flip-flow state controller circuit connected to said latch bus voltage interlock circuit, said R-S state controller circuit being connected on a first output to said power bipolar transistor and base drive circuitry and one a second output to said SCR circuit.

5,144,153

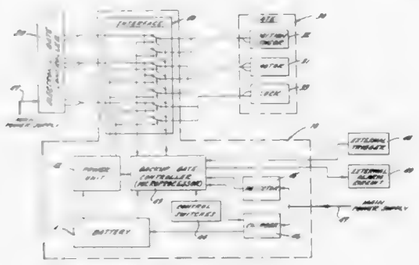
METHOD AND APPARATUS FOR OPERATING MOTORIZED GATE UPON LOSS OF ELECTRICAL POWER THERETO

Leroy E. Scheppmann, II, Fairfield, Iowa, assignor to Automation and Protection Systems, Inc., El Cajon, Calif.

Filed Oct. 2, 1989, Ser. No. 416,068

Int. Cl.[5] **H02J** *9/06*; **E05F** *15/20*

U.S. Cl. 307—66 **41 Claims**



1. A motorized gate comprising:

a gate;

a gate motor for opening and closing said gate;

an electronic gate controller for controlling operation of said gate motor;

a gate power supply for providing electrical power to said electronic gate controller;

gate power detecting means, electrically connected to the gate power supply, for sensing loss of power from said gate power supply;

backup gate controlling means connected to said gate power detecting means and said gate motor, for causing said gate motor to open said gate during a loss of power, said backup gate controlling means including a control switch for selecting one of an automatic operating mode and an external trigger operating mode, said backup gate controlling means when in the automatic operating mode opening said gate responsive to a loss of power, and said backup gate controlling means when in the external trigger operating mode opening said gate in response to a loss of power and an external trigger; and

one of said gate power detecting means and said backup gate controlling means including delay means for ignoring momentary power outages;

whereby the motorized gate may be opened in response to loss of power thereto or in response to a loss of power and an external trigger.

5,144,154

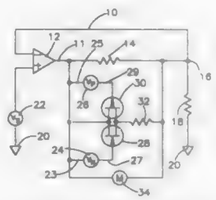
RANGE CHANGING USING N AND P CHANNEL FETS

John G. Banaska, Brunswick, Ohio, assignor to Keithley Instruments, Inc., Cleveland, Ohio

Filed May 21, 1990, Ser. No. 526,291

Int. Cl.[5] **H03K** *17/56*; **G01R** *15/08*

U.S. Cl. 307—242 **8 Claims**



1. A circuit for switching a range-changing impedance having first and second terminals into or out of a parallel range-selecting network having first and second legs, said first terminal being connected to said first leg, said circuit comprising:

a voltage means connected between said legs, said voltage means providing a voltage to be ranged;

an n-channel FET having a gate, a source and a drain, said n-channel FET source being connected to said second leg and said n-channel FET drain being connected to said second terminal;

a p-channel FET having a gate, a source and a drain, said p-channel FET source being connected to said second leg and said p-channel FET drain being connected to said second terminal;

a first drive means connected between said n-channel FET gate and source for selectably turning on or off said n-channel FET when said n-channel FET drain is negative with respect to said n-channel FET source and turning said n-channel FET off otherwise; and

a second drive means connected between said p-channel FET gate and source for selectably turning on or off said p-channel FET when said p-channel FET drain is positive with respect to said p-channel FET source and turning said p-channel FET off otherwise, wherein said FETs switch said impedance into or out of said network in response to said first and second drive means.

5,144,155

POWER SOURCE APPARATUS USING TIME SENSITIVE SWITCHING

Kozo Maenishi, Nagaokakyo, and Makoto Watanabe, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Division of Ser. No. 271,220, Nov. 14, 1988, Pat. No. 5,018,050. This application Feb. 5, 1991, Ser. No. 651,457

Claims priority, application Japan, Nov. 17, 1987, 62-289847; Nov. 19, 1987, 62-176807; Nov. 24, 1987, 62-179248; Nov. 24, 1987, 62-179249; Nov. 26, 1987, 62-180174; Nov. 26, 1987, 62-180175; Nov. 26, 1987, 62-180176; Nov. 26, 1987, 62-180177; Nov. 26, 1987, 62-298200; Nov. 30, 1987, 62-182540; Nov. 30, 1987, 62-183576; Nov. 30, 1987, 62-304366

Int. Cl.[5] **G05F** *1/00*

U.S. Cl. 307—254 **5 Claims**

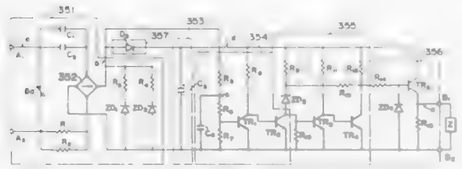
1. A power source apparatus comprising:

a rectifier to rectify an AC input applied between a pair of input terminals;

a smoothing circuit which is connected in parallel between output terminals of said rectifier and smooths an output of the rectifier;

an output circuit, including a semiconductor switching element, for on/off controlling a DC output smoothed by said smoothing circuit and for outputting an output voltage on a pair of output terminals;

a switching circuit for turning on said semiconductor switching element when an output voltage of the smoothing circuit reaches a predetermined value; and



a voltage detecting circuit which is connected in parallel between the output terminals of the rectifier for detecting the rectifier output by a time constant smaller than a time constant of the smoothing circuit, thereby turning on/off the semiconductor switching element.

5,144,156

PHASE SYNCHRONIZING CIRCUIT WITH FEEDBACK TO CONTROL CHARGE PUMP

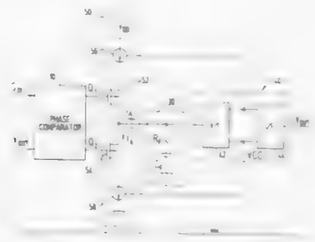
Takeshi Kawasaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 17, 1991, Ser. No. 716,686

Claims priority, application Japan, Jun. 15, 1990, 2-157044; Jun. 15, 1990, 2-157045; Apr. 1, 1991, 3-68115

Int. Cl.[5] **H03K** *5/13*, *5/00*

U.S. Cl. 307—262 **9 Claims**



1. A phase synchronizing circuit comprising:

phase comparison means for effecting a comparison between the phase of a first input signal, and the phase of a second input signal so as to output a phase difference detection signal representative of the difference in phase between the first and second input signals;

charge means connected to receive a power supply voltage for passing, in accordance with said phase difference detection signal, a drive current;

loop filter means connected to be selectively charged or discharged by said drive current so as to produce an output voltage;

voltage-electric current converting means operative for generating a converted electric current in response to the output voltage of said loop filter means; and

electric current-frequency converting means for producing an oscillator output signal at a frequency which is in response to the value of said converted electric current, as a source of the second input signal,

wherein said charge means has a controlled electric current source for said drive current which supplies an electric current in response to said converted electric current.

5,144,157

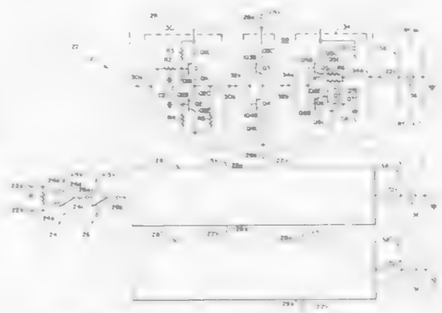
PIN DIODE DRIVER CIRCUIT FOR RADAR SYSTEM

Mark E. Russell, Londonderry, N.H., and David C. Miller, Greenfield, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 23, 1991, Ser. No. 763,852

Int. Cl.[5] **H03K** *17/60*, *3/01*

U.S. Cl. 307—270 **17 Claims**



1. A timing delay circuit comprising:

a first transistor having a control electrode coupled to an input terminal, a reference electrode coupled to a first DC bias terminal and an output electrode coupled to an output terminal of said timing delay circuit;

a second transistor having a control electrode coupled to said input terminal, a reference electrode coupled to a second DC bias terminal and an output electrode; and

a third transistor having a control electrode coupled to said output electrode of said second transistor, a reference electrode coupled to said second DC bias terminal and an output electrode coupled to the output terminal of said timing delay circuit.

5,144,158

ECL LATCH CIRCUIT HAVING A NOISE RESISTANCE CIRCUIT IN ONLY ONE FEEDBACK PATH

Yasunori Kanai, Inagi; Kazumasa Nawata; Mitsuhisa Shimizu, both of Kawasaki; Hiroki Yada; Taichi Saitoh, both of Yokohama, and Toshiaki Sakai, Kuwana, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 412,624, Sep. 28, 1989, abandoned, which is a continuation of Ser. No. 188,667, Apr. 29, 1988, abandoned, which is a continuation of Ser. No. 94,078, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 798,294, Nov. 15, 1985, abandoned. This application Apr. 17, 1990, Ser. No. 511,958

Claims priority, application Japan, Nov. 19, 1984, 59-242371; Apr. 8, 1985, 60-074085

Int. Cl.[5] **H03K** *17/16*

U.S. Cl. 307—272.1 **16 Claims**

1. A latch circuit comprising:

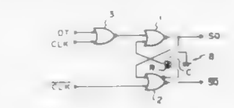
a first gate circuit having input terminals for receiving a data signal and a clock signal, and having an output terminal providing the data signal in response to the clock signal;

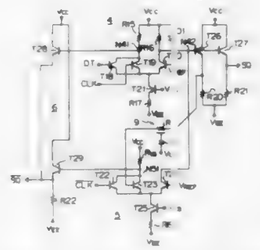
a second gate circuit having a first input terminal operatively connected to the output terminal of said first gate circuit for receiving the data signal, having a second input terminal and having an output terminal;

a third gate circuit having a first input terminal operatively connected to receive an inverted clock signal, having a second input terminal and having first and second output terminals;

a first feedback line connected between the output terminal of said second gate circuit and the second input terminal of said third gate circuit;

a second feedback line connected between the first output terminal of said third gate circuit and the second input terminal of said second gate circuit, the second output terminal of said third gate circuit and the output germinal of said second gate circuit outputting complementary





signals in response to a latched state of said latch circuit; and

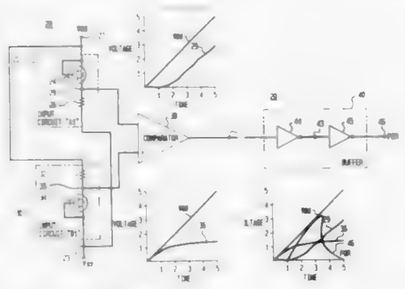
noise resistance means, operatively connected to only said second feedback line including at least a signal delay element, for eliminating noise in said second feedback line and maintaining operation speed of said latch circuit.

5,144,159

POWER-ON-RESET (POR) CIRCUIT HAVING POWER SUPPLY RISE TIME INDEPENDENCE

Anthony E. Frisch, and David W. Strangfellow, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Nov. 26, 1990, Ser. No. 617,713
Int. Cl.[5] G11C *1/00*
U.S. Cl. 307—272.3 **19 Claims**



1. Circuitry comprising:

a differential amplifier having first and second input terminals and having an output terminal which is coupled to an output terminal of the circuitry;

a first circuit branch having a first load element and a first diode, a first terminal of the first load element being coupled to a first terminal of the first diode and to the first input terminal of the differential amplifier and a second terminal of the first diode being coupled to a first power supply terminal of the circuitry in a forward biased relationship with said first power supply terminal;

a second circuit branch having a second load element and a second diode, a first terminal of the second load element being coupled to a first terminal of the second diode and to the second input terminal of the differential amplifier and a second terminal of the second diode being coupled to a second power supply terminal of the circuitry in a forward biased relationship with said second power supply terminal; and

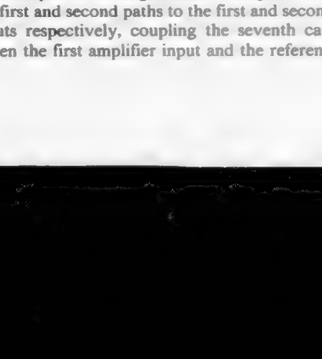
the second terminal of the first diode being further coupled to the second terminal of the second load element and the second terminal of the second diode being further coupled to the second terminal of the first load element.

5,144,160

FULLY DIFFERENTIAL SAMPLE AND HOLD ADDER CIRCUIT

Kuang-Lu Lee, and Shean-Yih Chiou, both of Taipei, Taiwan, assignors to Acer Incorporated, Taiwan, Taiwan

Filed Oct. 19, 1990, Ser. No. 600,526
Int. Cl.[5] H03K *5/153, 5/22, 5/159*
U.S. Cl. 307—353 **5 Claims**



1. A fully differential sample and hold adder circuit comprising:

an operational amplifier having a first output, a second output, a first input and a second input;

a first capacitor (C1) and a second capacitor (C5) for coupling respectively a first and a second circuit input to a first path;

a third capacitor (C2) and a fourth capacitor (C6) for coupling respectively a third and a forth circuit input to a second path;

a first feedback means comprising a fifth capacitor (C3) coupled between the first input and the first output of the amplifier;

a second feedback means comprising a sixth capacitor (C4) coupled between the second input and the second output of the amplifier;

a seventh capacitor (C7) and an eighth capacitor (C8); and

a plurality of switches each having a first position and a second position, said plurality of switches coupling a single-ended voltage (Vaux) and a voltage (V) to the first and second circuit inputs respectively, coupling respectively a second voltage (−V) and a reference voltage to the third and fourth circuit inputs, coupling the seventh capacitor between the first amplifier output and reference voltage or the first amplifier input, coupling the eighth capacitor between the second amplifier output and the reference voltage or the second amplifier input, and coupling the first and the second paths to the first and second amplifier outputs, respectively, when the plurality of switches are each in the first position;

said plurality of switches coupling the first, second and third circuit inputs to the reference voltage and the fourth circuit input to the single-ended voltage (Vaux), coupling the first and second paths to the first and second amplifier inputs respectively, coupling the seventh capacitor between the first amplifier input and the reference voltage,

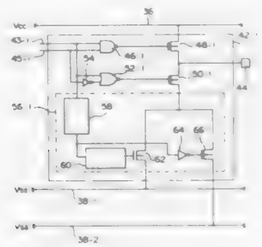
and coupling the eighth capacitor between the second amplifier input and the reference voltage when the plurality of switches are in the second position.

5,144,161

LOGIC CIRCUIT FOR SWITCHING NOISE REDUCTION

Takeshi Inaba, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,506
Claims priority, application Japan, Mar. 16, 1990, 2-65913
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **21 Claims**



1. A circuit comprising:

a first conductive line for receiving and applying a first electric potential;

a second conductive line for receiving and applying a second electric potential;

a third conductive line, distinct from said second conductive line, for receiving and applying said second electric potential;

first, second, third and fourth transistors each having a respective path of controllable conductivity between first and second electrodes and each having a respective gate electrode;

the first electrode of said first transistor being coupled to said first conductive line;

the first electrode of said second transistor being coupled to the second electrode of said first transistor through a first node, the second electrode of said second transistor being coupled to a second node;

the first electrode of said third transistor being coupled to said second node, the second electrode of said third transistor being coupled to said second conductive line;

the first electrode of said fourth transistor being coupled to said second node, the second electrode of said fourth transistor being coupled to said third conductive line;

a control circuit responsive to an input signal having a first and second logic level, said control circuit being coupled to the gate electrodes of said first, second, third and fourth transistors, for controlling the respective controllable conductive paths of each of said first, second, third and fourth transistors so as to produce an output signal substantially having the first or second electric potentials from said first node; and

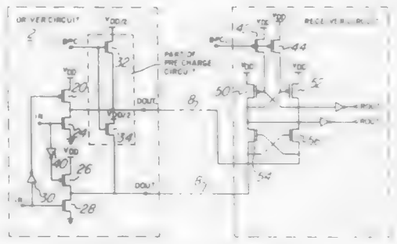
said control circuit further controlling said transistors such that the third transistor is conducting prior to the input signal being changed from the first logic level to the second logic level until the output signal is substantially changed from the first electric potential to the second electric potential, and such that the fourth transistor is changed to a conductive state after the output signal is substantially changed from the first electric potential to the second electric potential.

5,144,162

HIGH SPEED SIGNAL DRIVING SCHEME

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 13, 1990, Ser. No. 553,207
Int. Cl.[5] H03K *17/04, 17/16*
U.S. Cl. 307—443 **11 Claims**



1. A signal driver which comprises:

a driver circuit;

a signal line connected to said driver circuit;

a precharge circuit, said precharge circuit being operable to precharge said signal line to a predetermined voltage which is less than the supply voltage to said driver and said precharge circuit; and

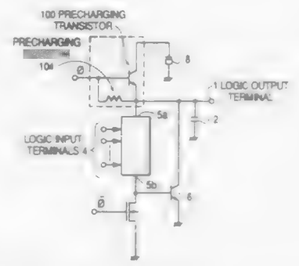
a receiver circuit, said receiver circuit being operable to output logic high and logic low voltage levels from said precharged signal line.

5,144,163

DYNAMIC BICMOS LOGIC GATES

Akira Matsuzawa, Neyagawa; Shota Nakashima, Osaka, and Haruyasu Yamada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 324,038, Mar. 14, 1989. This application Feb. 20, 1990, Ser. No. 631,283
Claims priority, application Japan, Mar. 14, 1988, 63-59719
Int. Cl.[5] H03K *19/01*
U.S. Cl. 307—446 **4 Claims**



1. A dynamic logic gate comprising:

a logic output terminal;

a capacitor connected to said logic output terminal;

a precharge means, comprising a bipolar transistor having a base connected to a clock for precharging and having an emitter connected to said capacitor and having a resistance means connected between said base and emitter of said bipolar transmitter and having a CMOS logic gate connected to said logic output terminal, for receiving and operating synchronously with said clock to precharge said capacitor to a prescribed voltage lever during a precharge period corresponding to one half cycle of said clock;

a partial logic gate having at least logic input terminal and first and second output terminals, wherein, depending on

the logic state of said at least one logic input terminal, a current is allowed to flow between said first and second output terminals or is cut off, and wherein said first output terminal is connected to the said logic output terminal;

another bipolar transistor having an emitter which is grounded, and having a collector which is connected to said logic output terminal, and having a base which is connected to said second output terminal of said partial logic gate; and

a discharge means for discharging charge stored in said base of said another bipolar transistor during said precharge period of clock.

5,144,164

BICMOS CURRENT SWITCHING CIRCUIT HAVING A PLURALITY OF RESISTORS OF A SPECIFIED VALUE

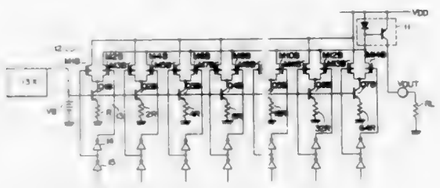
Yasuhiro Sugimoto; Satoshi Mizoguchi, both of Yokohama, and Hiromi Mafune, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 323,696, Mar. 15, 1989, abandoned. This application Aug. 14, 1990 Ser. No. 567,708

Claims priority, application Japan, Mar. 18, 1988, 63-66536

Int. Cl.[5] H03K *17/16 19/094*

U.S. Cl. 307—446 **10 Claims**



1. A current switching circuit comprising:

a first external circuit;

a second external circuit;

a first current supply means for supplying a first constant current to said second external circuit;

a second current supply means for supplying a second constant current to said second external circuit;

wherein each of said first current supply means and said second current supply means includes:

a constant current supply means for supplying a present constant current, said constant current supply means including a bipolar transistor and a resistor for limiting said present constant current, said bipolar transistor and said resistor defining a current path, said resistor connected between an emitter of said bipolar transistor and a circuit ground;

a switching means for switching said present constant current between said first external circuit and said second external circuit, said switching means including a first field effect transistor and a second field effect transistor of the same channel type, a first end of a drain-source path of said first field effect transistor and a first end of a drain-source path of said second field effect transistor commonly connected to said bipolar transistor, a second end of the drain-source path of said first field effect transistor connected to said first external circuit and a second end of said drain-source path of said second field effect transistor connected to said second external circuit, and a gate of said first field effect transistor being responsive to a first logic input signal and a gate of said second field effect transistor being responsive to a second logic input signal which is antiphasic to said first logic input signal;

wherein said resistor in the switching means of said first current supply means has a different resistive value than that of said resistor in the switching means of said second current supply means.

5,144,165

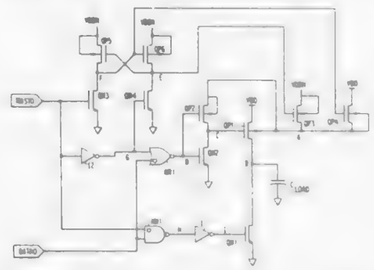
CMOS OFF-CHIP DRIVER CIRCUITS

Sang H. Dhong, Mahopac; Wei Hwang, Armonk, and Hyun J. Shin, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1990, Ser. No. 628,255

Int. Cl.[5] H03K *19/20, 3/01*

U.S. Cl. 307—451 **16 Claims**



1. A CMOS output driver circuit for providing off-chip interfacing to an external bus having a higher voltage than an on-chop supply voltage comprising:

a data terminal connected to receive data to be transmitted off-chip;

a single PMOS pull-up transistor having gate, source, drain and n-well electrodes, said drain electrode being connected to an output node connected to said external bus, said gate terminal normally being connected to receive said data to be transmitted off-chip via said output node, and said source electrode being connected to said on-chip supply voltage;

a tri-state control terminal connected to receive a tri-state control signal;

tri-state means connected to said tri-state control terminal for biasing the n-well of said PMOS pull-up transistor to a higher one of said on-chip supply voltage or a voltage approximately that of said external bus voltage when said output driver circuit is tri-stated;

an on-chip pump circuit generating said voltage approximating that of said external bus when the output of said driver circuit is tri-stated;

level shifting circuit means responsive to said tri-state control signal for generating first and second tri-state control signals;

first gate means responsive to said first tri-state control signal when said driver circuit is tri-stated, said first gate means biasing the n-well of said PMOS pull-up transistor to said voltage of approximating that of said external bus voltage; and

second gate means responsive to said second tri-state control signal when said driver circuit is not tri-stated, said second gate means biasing the n-well of said PMOS pull-up transistor to said on-chip supply voltage.

5,144,166

PROGRAMMABLE LOGIC CELL AND ARRAY

Rafael C. Camarota, San Jose; Frederick C. Furtek, Menlo Park; Walford W. Ho, and Edward H. Browder, both of Saratoga, all of Calif., assignors to Concurrent Logic, Inc., Sunnyvale, Calif.

Filed Nov. 2, 1990, Ser. No. 608,415

Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—465.1 **10 Claims**

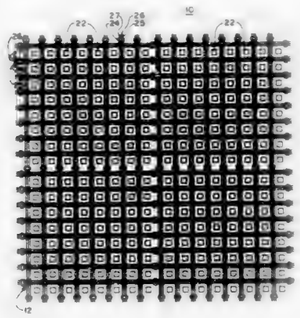
1. A programmable logic array comprising:

a plurality of logic cells, wherein each cell except those at the edges of the array has four nearest-neighbor cells, one to the left (or West), one to the right (or East), one above (or to the North) and one below (or to the South) so as to form an array in which said logic cells are aligned in rows and columns, each cell comprising:

eight inputs, two from each of its four nearest neighbors,

eight outputs, two to each of its four nearest neighbors,

means for storing a plurality of control bits,



means for multiplexing the eight inputs onto first and second input leads, the inputs connected to said input leads being specified by control bits stored in said storing means, and

logic means for generating signals on said outputs in response to signals on said input leads and control bits stored in said storing means.

5,144,167

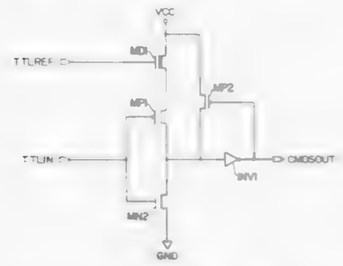
ZERO POWER, HIGH IMPEDANCE TTL-TO-CMOS CONVERTER

Cameron McClintock, Mountain View, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed May 10, 1991, Ser. No. 701,686

Int. Cl.[5] H03K *19/0175, 19/20*

U.S. Cl. 307—475 **4 Claims**



1. A buffer circuit for converting a TTL input signal to a CMOS output signal, said buffer circuit drawing little or no current and presenting a high input impedance for any input signal level, said buffer circuit comprising:

a source of CMOS logical one potential;

a source of CMOS logical zero potential;

a TTL input signal source;

a source of a predetermined reference potential;

first and second complementary transistor switch means having their gates connected to said TTL input signal source and their source-drain channels connected in series to said source of CMOS logical zero potential;

third depletion device transistor switch means having its gate connected to said source of a predetermined reference potential and its source-drain channel connected in series between said source to CMOS logical one potential and, via the series connection of the source-drain channels of said first and second complementary switch means, said source of CMOS logical zero potential; and

high input impedance inverter means for logically inverting the signal at a node in the series connection of the source-drain channels of said first and second complementary switch means between said first and second switch means, said predetermined reference potential being selected so that said third depletion device transistor switch means and the one of said first and second transistor switch means which is connected to said third depletion device transistor switch means are held off by any valid TTL logical one input signal, and so that any valid TTL logical zero input signal turns on said third depletion device transistor switch means and said one of said first and second transistor switch means.

5,144,168

SELF LATCHING INPUT BUFFER

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 569,359, Aug. 17, 1990, abandoned. This application Nov. 26, 1991, Ser. No. 799,872

Int. Cl.[5] H03K *19/0175, 0/96*

U.S. Cl. 307—475 **5 Claims**

1. An input buffer comprising:

a latch comprising a first inverter connected to a second inverter,

a first pull-down device connected to said latch and being operable to latch the outputs of said first and second inverter,

a third inverter, operable to switch said pull-down device both on and off,

a first transistor connected to the output of said first inverter,

a second transistor connected to the output of said second inverter,

a logic element operable to receive input from said first and second inverter outputs, said logic element being further operable to transmit an output signal to the inputs of said third inverter and said first and second transistors;

a third transistor connected to said first transistor;

a fourth transistor connected to said second transistor, and

a second pull-down device connected to said third and fourth transistors.

5,144,169

OPERATIONAL AMPLIFIER CIRCUIT

Atsushi Hirabayashi, Tokyo; Kyoichi Murakami, Kanagawa; Kenji Komori, Tokyo, and Masaaki Ishihara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 759,927

Claims priority, application Japan, Sep. 19, 1990, 2-247334

Int. Cl.[5] H03K *5/22;* **G06G** *7/12;* **H03F** *3/45*

U.S. Cl. 307—490 **4 Claims**

1. An operational amplifier circuit, comprising:

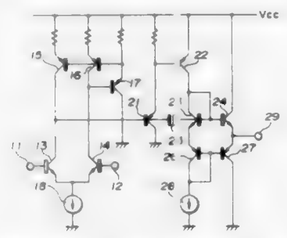
a pair of emitter common transistors forming a differential amplifier circuit including a first conductivity type first and second transistors;

a current mirror circuit including a second conductivity type third and fourth transistors having commonly con-

nected bases and collectors which are connected with the first and second transistors, respectively, and a second conductivity type fifth transistor having an emitter connected with the common bases and a base connected with the collector of the fourth transistor; and

an output circuit including a second conductivity type sixth transistor having a base connected with the collector of the first transistor and a second conductivity type seventh transistor having a base connected with the emitter of the sixth transistor for outputting an output of the collector of the seventh transistor; wherein:

said output circuit further includes a first conductivity type diode-like-connected eighth transistor included in a second current mirror circuit and having a collector connected with the collector of the seventh transistor and a base connected with the base of a first conductivity type ninth transistor also included in the second current mirror circuit, the commonly connected bases of the eighth and ninth transistors being coupled with the base of the sixth transistor, the emitter of the eighth transistor being connected with the emitter of a second conductivity type and diode-like-connected tenth transistor, the base of the tenth transistor being connected with the base of a second conductivity type eleventh transistor, the collector of the tenth transistor being grounded via a constant current source so that an output is outputted from the connection between the emitters of the ninth and eleventh transistors.

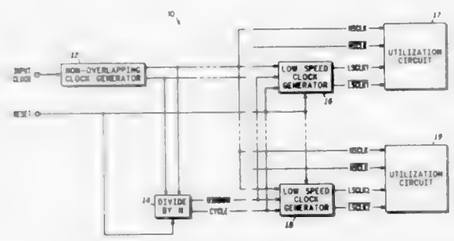


5,144,170

CIRCUIT AND METHOD OF ALIGNING CLOCK SIGNALS

Lanny L. Parker, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1991, Ser. No. 723,098
Int. Cl.[5] H03K *9/06*
U.S. Cl. 307—528 **16 Claims**



1. A circuit for aligning a first clock signal to a second clock signal, comprising:

first means for generating a time slot window signal in response to the second clock signal; and

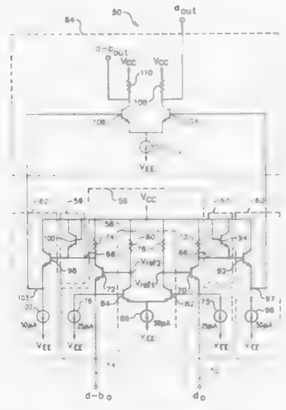
second means having first and second inputs coupled for receiving the second clock signal and said time slot window signal respectively and having an output for providing the first clock signal, said second means detecting a phase difference between the first clock signal and the second clock signal during said time slot window signal and adjusting a transition of the first clock signal to align with the second clock signal.

5,144,171

HIGH-SPEED DIFFERENTIAL-FEEDBACK CASCODE SENSE AMPLIFIER

Jeffrey M. Huard, Puyallup, Wash., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 15, 1990, Ser. No. 613,411
Int. Cl.[5] H03F *3/45*; **G11C** *7/00*
U.S. Cl. 307—530 **18 Claims**



1. A sense amplifier for amplifying the current difference across a pair of bit-sense lines to generate a data output signal, the sense amplifier comprising an output stage and a voltage clamp, the voltage clamp coupled to said pair of bit-sense lines and generating a pair of voltage clamp output signals, said pair of voltage clamp output signals coupled to said output stage, said output stage generating said data output signal, the voltage clamp comprising:

a differential-feedback gain stage coupled to said pair of bit-sense lines for amplifying the current difference across said bit-sense lines to generate a pair of feedback voltage signals wherein said differential-feedback gain stage comprises first and second transistor means, said first transistor means coupled at one terminal to a first of said pair of bit-sense lines and biased by a current signal to continuously maintain said first transistor means in a conducting state and to generate said first feedback voltage signal at a second terminal, said second transistor means coupled at one terminal to a second of said pair of bit-sense lines and biased by a current signal to continuously maintain said second transistor means in a conductive state and to generate said second feedback voltage signal at a second terminal; and

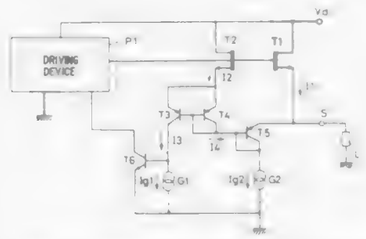
an amplifier stage coupled to said differential-feedback gain stage, the differential amplifier stage receiving at one input a first of said pair of feedback voltage signals, the amplifier stage receiving at a second input a second of said pair of feedback voltage signals, said amplifier stage amplifying said first and second feedback voltage signals to generate said pair of voltage clamp output signals.

5,144,172

DETECTION CIRCUIT OF THE CURRENT IN AN MOS TYPE POWER TRANSISTOR

Sergio Palara, Acicastello, and Donato Tagliavia, Palermo, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Milan, Italy

Filed Oct. 30, 1990, Ser. No. 605,271
Claims priority, application Italy, Nov. 30, 1989, 22551 A/89
Int. Cl.[5] H03K *3/33, 3/01*
U.S. Cl. 307—570 **18 Claims**



1. A circuit for detecting the current in a MOS type power transistor, the power transistor having a gate, a drain, and a source; the circuit comprising:

a detection transistor having a gate, a drain, and a source, the drain of the detection transistor being connected to the drain of the power transistor and the gate of the detection transistor being connected to the gate of the power transistor, the detection transistor having a current flowing therethrough equal to a fraction of a current flowing through the power transistor;

comparison means connected to the detection transistor for comparing a first current with a second current and for producing a detection signal of the value of the current in the power transistor in relation to the difference between the first current and the second current, the first current being equal to a fraction of the current flowing through the detection transistor and the second current being a reference current having a pre-set value; and,

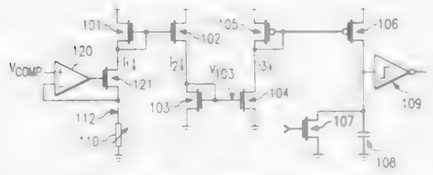
current generation means connected to the power transistor and to the detection transistor for generating a further reference current of a value which ensures that the voltage between the gate and the source of the power transistor is equal to the voltage between the gate and the source of the detection transistor.

5,144,173

PROGRAMMABLE DELAY LINE INTEGRATED CIRCUIT HAVING PROGRAMMABLE RESISTOR CIRCUIT

Titkwan Hui, Richardson, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 374,102, Jun. 30, 1989, abandoned.
This application Aug. 7, 1991, Ser. No. 742,571
Int. Cl.[5] H03K *5/159*; **G06G** *7/12*
U.S. Cl. 307—603 **16 Claims**



1. An integrated circuit delay line, comprising:

an integration capacitor;

a current source connected to charge said capacitor;

a reset transistor connected to discharge said capacitor when said reset transistor is turned on; and

a thresholding circuit connected to provide a digital output signal whenever said capacitor has charged up to a predetermined voltage;

wherein said current source is controlled by a programmable resistor circuit connected to a node which receives a controlled voltage;

and wherein said programmable resistor circuit includes:

a programmable resistor string controlled by a first set of control bits to directly switch the resistance at said first node; and

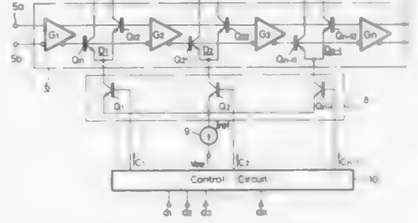
a plurality of current-steering gates controlled by a second set of control bits and connected to selectably switch one or more additional current components for said resistor string.

5,144,174

PROGRAMMABLE DELAY CIRCUIT HAVING A BUFFER STAGE CONNECTED IN CASCODE BETWEEN THE OUTPUTS OF A PLURALITY OF DIFFERENTIAL AMPLIFIERS AND THE OUTPUT TERMINAL

Daisuke Murakami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 9, 1991, Ser. No. 697,670
Claims priority, application Japan, May 11, 1990, 2-119792
Int. Cl.[5] H03K *5/159, 3/01*; **G06G** *7/12*
U.S. Cl. 307—608 **5 Claims**



1. A programmable delay circuit comprising:

(a) an input terminal to which an input signal to be delayed is supplied;

(b) N (N≧2) delay circuits of a plurality of stages connected in cascade;

(c) a plurality of differential amplifiers respectively connected to respective stages between said plurality of stages of delay circuits and having a pair of differential amplifier transistors and current switches for supplying a drive current from a common current source to said pair of differential amplifier transistors;

(d) an output terminal commonly coupled to respective output terminals of said pair of differential amplifier transistors of said plurality of differential amplifiers;

(e) a buffer stage connected in cascode between said respective output terminals of aid plurality of differential amplifiers and said common output terminal; and

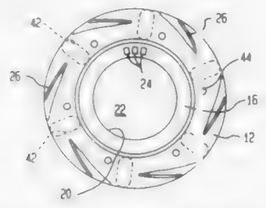
(f) a digital control circuit for selecting only one of said current switches of said plurality of differential amplifiers.

5,144,175

COOLING FAN FOR ELECTRIC MOTORS

Jack L. Cragg, Cincinnati, Ohio, assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed May 15, 1991, Ser. No. 700,723
Int. Cl.[5] H02K *1/32, 9/06*
U.S. Cl. 310—63 13 Claims



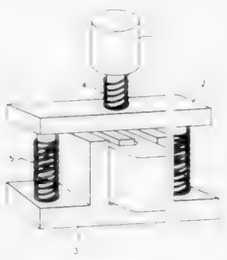
1. An improved rotor for an induction motor, comprising:
a rotor core including a plurality of spaced ventilation openings and defining an aperture for capturing a motor shaft;
at least one end connector adjoining the rotor, and having a plurality of spaced fan blades, each of the fan blades having backward curving inner and outer surfaces with the outer surface substantially perpendicular to the end connector, and positioned in order to direct air flow radially outward, wherein each of the plurality of fan blades is oriented on the end connector to form a blade entry angle of between 20° and 40°, has a leading edge substantially perpendicular to the end connector, and extends from a point adjacent to the end connector to a top edge and tapers from the point to the top edge and has a trailing edge inwardly biased with respect to the outer surface.

5,144,176

THREE-MASS ELECTROMAGNETIC VIBRATING SYSTEM

Boaz Popper, Haifa, Israel, assignor to Ricor Ltd., Cryogenic & Vacuum Systems, En-Harod, Israel

Filed Apr. 16, 1990, Ser. No. 508,732
Claims priority, application Israel, Apr. 17, 1989, 89983
Int. Cl.[5] H02K *7/065*; B65G *27/24*
U.S. Cl. 310—81 7 Claims



1. A vibration system comprising:
a first driven mass;
a second mass representing a first electromagnetic member, and
a third mass representing a second magnetic member, wherein a vibrating gap attracts the second mass to the third mass in an oscillating manner through electrical current fluctuations, and the system further comprises a first spring being connected between the first and the second mass; and a second spring connected between the second and the third mass, the magnitude of the mean first mass and second mass determining the construction of the third mass by the equation

$$M_3 = \frac{M_2 (2\pi f)_2 + F/a_1}{M_1 (2\pi f)^2 + F/a_1}$$; wherein

M_3 is the third mass,
M_1 is the second mass,
f is the vibrating frequency of the electromagnet, and
F/a_1 is the required magnetic force amplitude per unit stroke amplitude of the driven mass,
together with slight deviations, from that magnitude according to the application of the system, and the two springs being constructed according to the equations

$$K_1 = M_1 (2\pi f)^2, \text{ and}$$

$$K_2 = M_3 (2\pi f)^2 + \frac{F/a}{M_1}$$

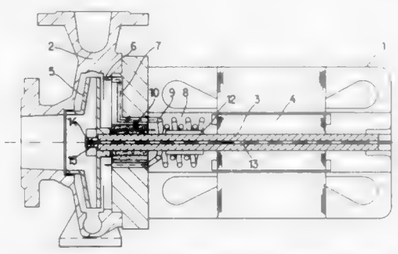
wherein K_1 is the rate of spring 1 and K_2 is the rate of spring 2, respectively.

5,144,177

CANNED MOTOR PUMP WITH HEAT EXCHANGER IN ROTOR CHAMBER

Peter Rupprecht, Bayreuth, Fed. Rep. of Germany, assignor to KSB Aktiengesellschaft, Frankenthal/Pfalz, Fed. Rep. of Germany

PCT No. PCT/EP89/01195, § 371 Date Apr. 12, 1991, § 102(e) Date Apr. 12, 1991, PCT Pub. No. WO90/04279, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 10, 1989, Ser. No. 671,773
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834668
Int. Cl.[5] H02K *9/197*
U.S. Cl. 310—86 8 Claims



1. A canned motor for a fluid flow machine designed to convey explosive liquids, comprising a sealed housing defining a rotor chamber having a flow restricting outlet for evacuation of gases in response to admission of liquid into said chamber; a rotor disposed in said chamber and arranged to drive the fluid flow machine; heat-exchanger means in said chamber defining a path for the flow of a heat-exchange medium; and means for admitting a heat-exchange medium into said path, said admitting means extending from said chamber.

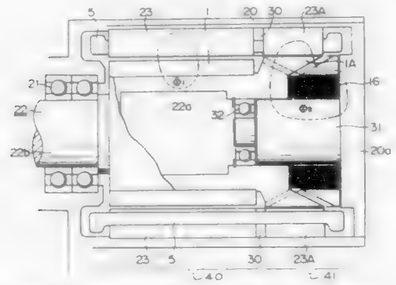
5,144,178

BRUSHLESS GENERATOR WITH MAGNET AND CLAW-TOOTH DUAL ROTOR

Tsuneo Sugiura, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,339
Int. Cl.[5] H02K *16/02, 19/30*
U.S. Cl. 310—114 8 Claims

1. A generator comprising a permanent magnet rotor formed on a hollow rotating member rotatably mounted in a casing, a Randell rotor mounted adjacent to said permanent magnet rotor and adapted for being rotated with said permanent magnet rotor, an armature coil mounted in association with said permanent magnet rotor and said Randell rotor, a first bearing provided at one end of said casing and adapted for rotatably supporting one end of said hollow rotating member, a retainer



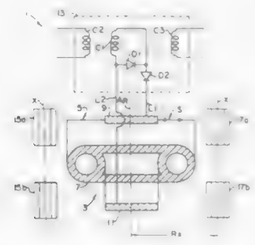
protrudingly mounted on the other end of said casing, a Randell field coil mounted on said retainer, and a second bearing mounted on said retainer and adapted for supporting a hollow section of said hollow rotating member, said hollow rotating member being rotatably supported by said first bearing and said second bearing provided in said hollow section.

5,144,179

SUPERCONDUCTING BRUSHLESS HOMOPOLAR MOTOR WITH MULTIPLE WINDING ROTOR

Mohamed A. Hilal, Madison, Wis.; Jerry D. Lloyd, and Alan D. Crapo, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 3, 1991, Ser. No. 679,747
Int. Cl.[5] H02K *31/00*
U.S. Cl. 310—178 10 Claims



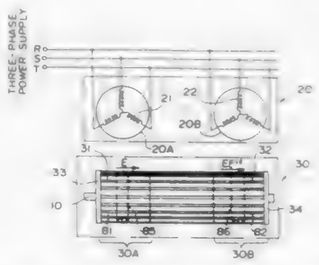
1. A brushless, homopolar electric motor comprising:
rotor means including at least one rotor winding having a plurality of turns, and a rotor assembly on each end of which is installed a distribution disk, respective ends of the rotor winding being connected to one of the disks;
flux pumping means for inductively charging the rotor winding and including rectifier means comprising a half-wave rectifier for supplying an electrical current to the rotor winding, the rotor means further including means for electrically interconnecting the respective ends of the rotor winding with the half-wave rectifier for the disks to be electrically connected across an electrical output of the half-wave rectifier; and,
switch means for controlling operation of the flux pumping means.

5,144,180

TWO-STATOR INDUCTION SYNCHRONOUS MOTOR

Toshihiko Satake, Higashihiroshima, and Yukio Onogi, Hiroshima, both of Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1991, Ser. No. 671,116
Claims priority, application Japan, Mar. 16, 1990, 2-67649; Oct. 31, 1990, 2-296735; Dec. 18, 1990, 2-411999
Int. Cl.[5] H02K *17/18, 19/00*
U.S. Cl. 310—212 20 Claims



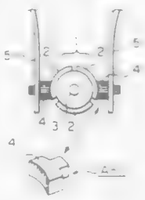
1. A two-stator induction synchronous motor comprising:
a unitary rotor having a first rotor assembly and a second rotor assembly which are provided on a common rotary axis and each of which is formed by a permanent magnet and a rotor core; a plurality of conductive members which contact each of said rotor cores; and a pair of short-circuit rings connecting said conductive members at their ends,
said first rotor assembly and said second rotor assembly respectively having a first pair and a second pair of magnetic poles of said permanent magnets disposed in such a relative relation that said first pair of magnetic poles and said second pair of magnetic poles are displaced by 180 degrees with each other;
a first stator and a second stator facing surroundingly said first rotor assembly and said second rotor assembly, respectively; and
a phase shifting means which produces a phase difference of 0 degree or 180 degrees between a voltage which said first stator produces in said conductive members by a rotating magnetic field generated around said first rotor assembly faced by said first stator and a voltage which said second stator produces in said conductive members by a rotating magnetic field generated around said second rotor assembly faced by said second stator.

5,144,181

CARBON BRUSH FOR MINIATURE MOTORS AND METHOD OF MAKING SAME

Isao Shibuya, Matsudo, Japan, assignor to Mauvchi Motor Co., Ltd., Chiba, Japan

Filed Mar. 14, 1991, Ser. No. 669,041
Claims priority, application Japan, Mar. 16, 1990, 2-66671
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—254 3 Claims



1. A carbon brush for miniature motors comprising a metal-

plated graphite brush including 0.1 wt.% to 12.0 wt.% of a fibrous material of particles of a size less than 40 microns and a length less than 50 microns; metal-plated graphite powder being formed by coating graphite powder with a metallic layer, and pressure-forming and sintering said graphite powder to which said fibrous material is added; said graphite powder containing less than 0.05 wt.% of ashes.

5,144,182

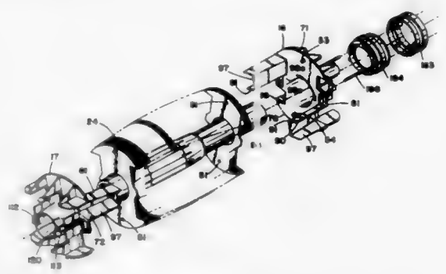
SKEWED ROTOR ASSEMBLY

Jerome J. Lemmer, Oakdale; Gary B. O'Malley, Fridley, and Rickie A. Evenson, Ham Lake, all of Minn., assignors to Onan Corporation, Minneapolis, Minn.

Filed Sep. 4, 1991, Ser. No. 754,631

Int. Cl.[5] H02K *1/06*

U.S. Cl. 310—217 17 Claims



1. A rotor assembly comprising:

(a) first and second end caps; each of said end caps having a head portion and a pair of legs; each end cap leg having at least one skewed wall panel oriented to accept a skewed stack of laminates;

(b) a skewed stack of laminates positioned between said first and second end cap head portions; each laminate of said skewed stack of laminates having an edge portion aligned with a skewed wall panel of said end cap legs; and,

(c) a wire strand wrapped in first and second coils around said first and second end caps

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5,144,18

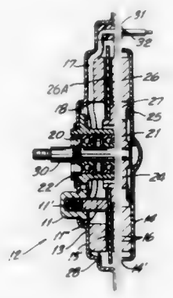
FLAT MOTOR OF REDUCED LENGTH

Jeffrey J. Farrenkopf, Smithtown, N.Y., assignor to Kollmorgen Corporation, Simsbury, Conn.

Filed Nov. 20, 1990, Ser. No. 615,983

Int. Cl.[5] H02K *1/22*

U.S. Cl. 310—268 15 Claims



1. A flat D.C. electric motor having a reduced length from front to rear comprising in combination:

a stationary housing have front and rear housing assemblies and including end caps;

a rotating shaft disposed in said stationary housing on a central axis of said motor and at least part of which shaft protrudes through the front housing assembly of said stationary housing;

a stator assembly located in said stationary housing;

an armature assembly having planar windings located in said stationary housing;

means for mounting the stator and armature assemblies in said stationary housing and for rotating said armature assembly in a planar path past said stator assembly located in said stationary housing;

said stator assembly including a magnetic circuit assembly directing a magnetic field to said planar windings of said armature assembly in a direction normal to a plane of said armature assembly;

commutation means, including a brush assembly, located in said stationary housing in a vicinity of said armature assembly and on the same side thereof as that portion of said rotating shaft protrudes through said stationary housing for electrically energizing the planar windings of said armature assembly and imparting a rotary motion thereto past said stator assembly;

and wire means connected to said brush assembly and exiting said stationary housing at a point radially distant from said central axis of said motor and outside an outer diameter of said armature assembly and which pass through an interior of said stationary housing between the front housing assembly and the rear housing assembly, whereby disposition of said commutation means including said brush assembly results in a motor of reduced length from front to rear and which is adaptable to being disposed in a limited space configuration.

5,144,184

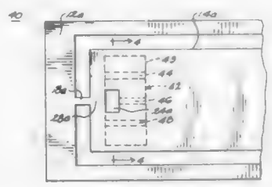
MICROMECHANICAL DEVICE WITH A TRIMMABLE RESONANT FREQUENCY STRUCTURE AND METHOD OF TRIMMING SAME

Paul Greiff, Wayland, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jan. 26, 1990, Ser. No. 470,938

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—312 12 Claims



1. A micromechanical device having a trimmable, resonant structure comprising:

a semiconductor substrate including a first support frame;

a resonant structure disposed within said support frame;

first and second flexible elements proximate opposing edges of said resonant structure, said first and second flexible elements flexibly coupling and supporting said resonant structure within said support frame, to permit rotation of said resonant structure about a first axis which passes through said flexible elements; and

means for establishing a trimmable resonant frequency for said resonant structure, including first and second elongated openings proximate a first end of said first and second flexible elements, said elongated openings forming first and second tension relief beams adjacent said first and second flexible elements and to which said first and second flexible elements are attached, said tension relief beams having a predetermined length and flexible in a direction parallel to said axis which passes through said flexible elements, for deflecting a first distance along said axis under longitudinal tension from said flexible elements, for providing stress relief of longitudinal tensile forces between said resonant structure and said flexible elements, thereby establishing a trimmable resonant frequency for said resonant structure.

5,144,185

SAW DEVICE

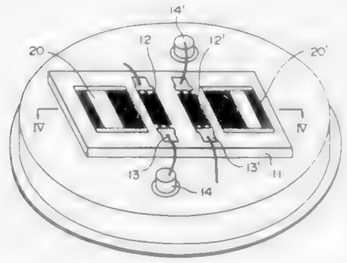
Akitsuna Yuhara, Kawasaki; Jun Sasaki, Sagamihara; Hiromi Isomae, Nakaminato; Shozi Kawakubo, Ibaraki, and Jun Yamada, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 263,078, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 2,286, Jan. 12, 1987, abandoned. This application Jul. 9, 1990, Ser. No. 549,643

Claims priority, application Japan, Jan. 13, 1986, 3428/86; Mar. 5, 1986, 46138/86

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—313 B 4 Claims



1. A SAW device comprising:

a piezoelectric substrate; and

at least one set of interleaved electrodes formed on said substrate and mainly consisting of Al, at least one set of electrodes containing an additive of another metal, added to said Al, selected from the group consisting of Zn, and Ge, said SAW device being capable of operating at at least one of a higher power, frequency and amplitude signals than a SAW device having Al-Cu electrodes.

5,144,186

ULTRASONIC SANDWICH TRANSDUCER WITH AN ASTIGMATIC SONIC LOBE

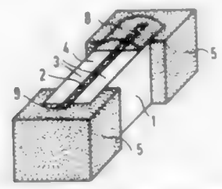
Rudolf Thurn, Kemnath, and Hans-Joachim Burger, Kümmersbruck, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 29, 1990, Ser. No. 604,867

Claims priority, application European Pat. Off., Oct. 30, 1989, [illegible]

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—326 11 Claims



1. An ultrasonic sandwich transducer with an astigmatic sonic lobe, comprising:

at least one small rectangular piezoceramic plate;

first and second layers of material, one on each side of said plate to thereby form a sandwich structure having a longitudinal side and longitudinal ends; and

first and second damping elements that each include means for damping out-of-phase vibrations such that secondary lobes are not generated, said damping elements being disposed at the longitudinal ends of said sandwich structure,

whereby when the ultrasonic sandwich transducer is operated on the fourth planar vibrational mode of the small piezoceramic plate, the longitudinal side of the ultrasonic sandwich transducer serves as a sound transmission surface.

5,144,187

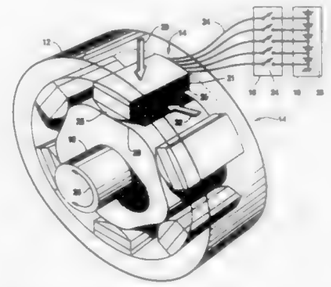
PIEZOELECTRIC MOTOR

Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Continuation of Ser. No. 498,125, Mar. 23, 1990, abandoned. This application Jul. 29, 1991, Ser. No. 737,819

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—328 12 Claims



1. A piezoelectric motor, comprising:

a motor housing;

a motor shaft having an axis and a surface with a plurality of sloped undulations, said shaft extending within said housing and rotatable about its axis;

at least two piezoelectric actuators rigidly fixed within said housing;

activating means connected to said actuators for inducing said actuators to move radially appling a radial force toward the axis of said shaft, said actuator directly contacting the sloped undulation of said shaft surface, the sloped undulation translating the radial force into tangential force to rotate said shaft;

wherein the actuators are positioned such that at least one actuator is in force applying contact with a slopped undulation of said shaft surface at all times.

5,144,188

SPARK PLUG FOR INTERNAL COMBUSTION ENGINE

Junichi Kagawa, and Wataru Matsutani, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd, Nagoya, Japan

Filed Apr. 19, 1991, Ser. No. 688,120

Claims priority, application Japan, Apr. 20, 1990, 2-102818

Int. Cl.[5] H01T *13/16, 13/32*

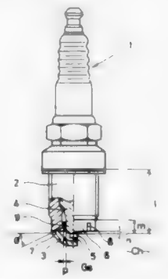
U.S. Cl. 313—11.5 4 Claims

1. In a spark plug including a cylindrical metallic shell whose front end is extended into a combustion chamber of an internal combustion engine,

the spark plug comprising:

a tubular insulator concentrically located within the metallic shell so as to provide an annular clearance between an inner wall of a front end of the metallic shell and an outer

wall of a front end of the insulator, a width of the clearance ranges from 0.4 mm to 0.9 mm;
a center electrode concentrically located within the insulator;
an extension skirt which is extended from the metallic shell to the combustion chamber, a length of the extension skirt ranges from 1.0 mm to 3.0 mm inclusive;
a plurality of axial slits circumferentially provided with the extension skirt of the metallic shell;



a tapered surface provided by plating off an inner edge of a front end of the metallic shell an angle of the tapered surface falling within a range from 20 degrees to 40 degrees inclusive; and
an outer electrode, having a front end securely welded to the tapered surface of the metallic shell, while the other end of the outer electrode is bent to oppose a front end of the center electrode to form a spark plug gap therebetween.

5,144,189

AUTOMOTIVE HIGH VOLTAGE DISCHARGE LIGHTING SYSTEM AND ASSEMBLY

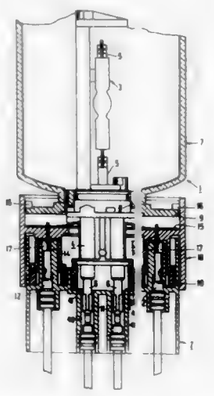
Johannes A. A. M. Van Heeswijk, and Josephus F. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 530,486, May 30, 1990, abandoned, which is a continuation of Ser. No. 283,002, Dec. 8, 1988, abandoned, which is a continuation of Ser. No. 68,873, Jul. 1, 1987, abandoned. This application May 13, 1991, Ser. No. 701,294

Claims priority, application Netherlands, Mar. 6, 1987, 8700542

Int. Cl.[5] H01J *5/54, 5/60*

U.S. Cl. 313—51 **17 Claims**



1. An automotive lighting system, comprising:
a discharge lamp comprising a discharge device, a lamp cap having a pair of parallel cylindrical lamp contacts extending therefrom, and a pair of current supply conductors each connected to said discharge device and a respective lamp contact;
a socket for connection with said lamp cap, said socket comprising a first pair of fixedly spaced socket contacts positioned for contacting a respective lamp cap contact when said socket engages said lamp cap to establish a first conductive path from one of said first socket contacts, through its respective lamp cap contact, continuing through a respective current supply conductor to said discharge device and from said discharge device through the other current supply conductor to the other lamp cap contact and its respective first socket contact, and a second pair of contacts which are recessed and fixedly spaced from each other;
an energizing circuit connected to said first socket contacts for energizing said discharge device, said energizing circuit being connected to said discharge device through said first conductive path when said first socket contacts are in contact with said lamp cap contacts;
a low voltage circuit for feeding said energizing circuit which comprises said second pair of socket contacts, said second pair of contacts defining a normally open circuit discontinuity in said low voltage circuit such that said energizing circuit is disabled and no voltage is applied across said first socket contacts when said lamp cap contacts are not in contact with said first pair of socket contacts; and
means for electrically bridging said spaced second contacts to close said circuit discontinuity in said low voltage circuit and enable said energizing circuit only when said lamp cap contacts are in contact with said first socket contacts, thereby defining a second conductive path which extends from one of said second socket contacts, through said means for electrically bridging, and ending at the other of said second contacts.

5,144,190

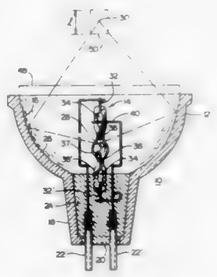
LIGHT SOURCE HAVING DESIRED COLOR TEMPERATURE AND CHROMATICITY

Brian J. Thomas, Phoenix; Timothy W. Graham, Union Springs, and Daniel C. Briggs, Camillus, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Division of Ser. No. 483,901, Feb. 20, 1990, Pat. No. 5,059,146. This application May 10, 1991, Ser. No. 698,074

Int. Cl.[5] H01J *5/16*

U.S. Cl. 313—113 **9 Claims**



1. A lamp apparatus for combining radiant energy of substantially distinct spectral bands to produce a light source having predetermined color temperature or chromaticity characteristics, said apparatus comprising:
arc discharge lamp means for generating emissions of radiant energy from at least two spatial emission regions,
each of said spatial emission regions emitting radiant energy in a substantially distinct spectral band;
reflector means for optically directing a substantial portion of the radiant energy emitted from said emission regions,
said reflector means having a positioning region that contains a near focus and a combining region that contains a far focus; and
mounting means supporting said lamp generating means substantially within the positioning region of said reflector means, adjacent but displaced from said near focus a predetermined amount such that selected amounts of the radiant energy emitted from each of said spatial emission regions is substantially directed to the far focus and combined within the combining region of said reflector means to produce a light source having predetermined color temperature or chromaticity characteristics.

5,144,191

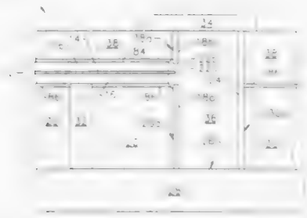
HORIZONTAL MICROELECTRONIC FIELD EMISSION DEVICES

Gary W. Jones, and Ching-Tzong Sune, both of Raleigh, N.C., assignors to MCNC, Triangle Park, N.C.

Filed Jun. 12, 1991, Ser. No. 714,275

Int. Cl.[5] H01J *19/24*

U.S. Cl. 313—308 **28 Claims**



1. A microelectronic field emitter comprising:
a horizontal substrate having a horizontal face;
a first insulating layer on said horizontal face, said first insulating layer having a first vertical sidewall;
a first horizontal emitter electrode on said first insulating layer with one end thereof extending adjacent said first vertical sidewall; and
a vertical extraction electrode on said first vertical sidewall with one end thereof extending adjacent said first horizontal emitter electrode, said one end of said first horizontal emitter electrode and said one end of said vertical extraction electrode forming an electron emission gap therebetween and
a horizontal cap, spaced from said horizontal face, for encapsulating said first horizontal emitter electrode and said vertical extraction electrode.

5,144,192

HIGH-PRESSURE DISCHARGE LAMP

Clemens Barthelmes, Berlin, Fed. Rep. of Germany, assignor to Patent Treuhand Gesellschaft fur elektrische Gluenlampen m.b.H., Munich, Fed. Rep. of Germany

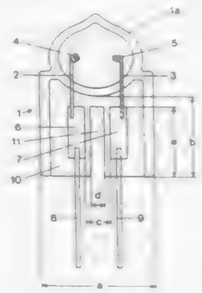
Filed Jul. 18, 1991, Ser. No. 732,080

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1990, 4024603

Int. Cl.[5] H01J *61/30, 61/36*

U.S. Cl. 313—318 **20 Claims**

1. A single-ended pinch-sealed lamp (1, 12) having
a quartz envelope defining a lamp axis, said envelope forming a bulb portion (1*a*, 12*a*) and a connecting portion, said connecting portion being unitary with the bulb portion and forming a pinch seal (10, 13) closed off at the bulb portion;
two electrode shafts (2, 3) extending into the bulb portion;
two terminal leads (8, 9; 16, 17) extending outwardly of the pinch seal (10, 13);
two sealing foils (6, 7; 14, 15) connecting said electrode shafts (2, 3) and said terminal leads (8, 9; 16, 17) and melted gas-tightly into said pinch seal; and
a fill including a metal halide compound which, in operation of the lamp, becomes vaporized within said bulb portion, and comprising
an arrangement for inhibiting, in operation of the lamp, electrolytic current flow between said sealing foils, which



is characterized by an elongated, essentially axially extending current flow inhibiting region located between said foils (6, 7; 14, 15) and including a pinch seal section (11, 18) formed in said pinch seal (10, 13) having a thickness which is reduced with respect to the pinch seal outside of said region, said thickness being between 0 and, at most, 0.3 mm, which pinch seal section (11, 18) starts at the outer terminal end of the pinch seal (10, 13) and extends up to at least about the ends of the foils (6, 7; 14, 15) proximate to said bulb portion.

5,144,193

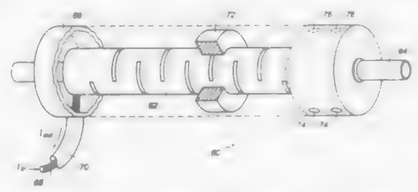
HIGH FIELD PULSED MICROWIGGLER COMPRISING A CONDUCTIVE TUBE WITH PERIODICALLY SPACE SLOTS

Roger W. Warren, Santa Fe, N. Mex., assignor to The United State of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 7, 1990, Ser. No. 623,866

Int. Cl.[5] H01S *3/0959;* **H01J** *23/34*

U.S. Cl. 315—4 **10 Claims**



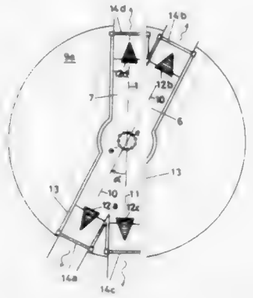
6. A microwiggler assembly responsive to a pulsed input current for generating an oscillating electromagnetic field, comprising:
a conductive tube defining a cylindrical wall disposed longitudinally about an axis and said cylindrical wall having a predetermined circumference at a fixed radial distance from said axis, said wall having slots oriented perpendicular to said axis axially spaced at periodic intervals along said tube in alternating 180° relationships, said slots each having a length effective to eliminate quadrupole effects in said electromagnetic field; and
a conductive cylinder surrounding said tube for return current from said conductive tube.

5,144,194

QUASI-OPTICAL GYROTRON HAVING ANGULARLY SPACED QUASI-OPTICAL RESONATORS LYING IN A COMMON PLANE

Giorgio Agosti, Wettingen, and Hans-Günter Mathews, Oberehrendingen, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Apr. 19, 1990, Ser. No. 511,311
Claims priority, application Switzerland, Apr. 19, 1989, 1490/89-6
Int. Cl.[5] H01J *23/18, 25/02;* H03B *9/01*
U.S. Cl. 315—005 11 Claims



1. A quasi-optical gyrotron for the production of mm electromagnetic radiation in form of mm waves, comprising:

an inner space formed by an evacuated gyrotron chamber with a gyrotron main axis; said inner space being delimited from an outer space by a housing of said gyrotron chamber;

first means disposed in said inner space for generating a beam of electrons which run on an electron beam axis aligned parallel to said gyrotron main axis;

second means disposed in said inner space for producing a static magnetic field; said magnetic field being aligned parallel to said electron beam axis; said magnetic field causing said electrons running on said electron beam axis to gyrate;

a first high-power resonator disposed in said inner space including two first mirrors lying on a first resonator longitudinal axis aligned perpendicular to said electron beam axis; said first mirrors defining a first resonator cavity; said first mirrors being at a certain distance from one another along said first resonator longitudinal axis and having a lateral extension perpendicular to said first resonator longitudinal axis;

at least one second high-power resonator disposed in said inner space including two second mirrors lying on a second resonator longitudinal axis aligned perpendicular to said electron beam axis; said second mirrors defining a second resonator cavity; said second mirrors being at a certain distance from one another along said second resonator longitudinal axis and having a lateral extension perpendicular to said second resonator longitudinal axis;

said beam of electrons exciting a first and at least one second electromagnetic alternating field corresponding to electromagnetic radiation in said first and at least one second high-power resonators, respectively;

said first and second resonator longitudinal axes lying in a common plane and oriented at an angle therebetween which is greater than zero; whereby said first and second high-power resonators have a central part of said first and second resonator cavity in common, through which said electron beam passes; and

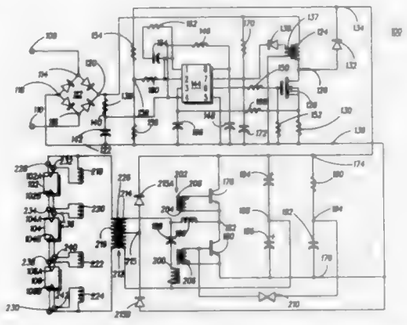
third means disposed in said inner space for releasing said electromagnetic radiation in to said outer space in the form of mm waves at said first and second mirrors.

5,144,195

CIRCUIT FOR DRIVING AT LEAST ONE GAS DISCHARGE LAMP

John G. Konopka, Barrington, and Mihail S. Moisin, Lake Forest, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 28, 1991, Ser. No. 705,865
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—94 17 Claims



1. A circuit for driving at least one gas discharge lamp having heatable filaments, the circuit comprising:

input terminals for connection to a source of voltage supply;

output terminals for connection to the filaments of the gas discharge lamp;

oscillator means coupled to the input terminals and to the output terminals for producing a high-frequency output voltage for application to the gas discharge lamp;

oscillator activation means coupled to the input terminals and to the oscillator means for activating the oscillator means after a first predetermined delay,

voltage boost means comprising an inductive boost circuit and coupled to the input terminals and to the oscillator means for causing the oscillator means to produce a boosted output voltage when the voltage boost means is unactivated; and

voltage boost activation means coupled to the voltage boost means for activating the voltage boost means after a second predetermined delay;

the second predetermined delay being longer than the first predetermined delay, the unboosted output voltage produced by the oscillator means after the first predetermined delay and before the second predetermined delay being sufficient to heat the filaments but insufficient to initiate striking in the lamp, and the boosted output voltage produced by the oscillator means after the second predetermined delay being sufficient to initiate striking in the lamp, whereby the filaments are pre-heated prior to striking in the period between the first and second predetermined delays.

5,144,196

PARTICLE SOURCE, ESPECIALLY FOR REACTIVE IONIC ETCHING AND PLASMA-SUPPORTED CVD PROCESSES

Rainer Gegenwart, Roedermark, and Jochen Ritter, Laubach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

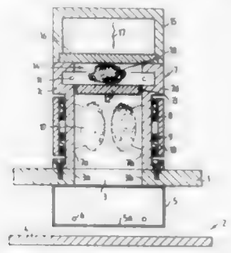
Filed Sep. 30, 1991, Ser. No. 768,994
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1991, 4119362
Int. Cl.[5] H05H *1/46*
U.S. Cl. 315—111.41 5 Claims

1. A particle source, especially for reactive ion etching and plasma-enhanced CVD processes in pass-through apparatus

for treating a large-area substrate, having a container completely enveloping a first plasma, a vacuum coating chamber having a chamber wall, surrounding chamber walls of the container being enveloped by an at least bipolar magnetic field generator which produces a magnetic field which fulfills an electron-cyclotron resonance, a waveguide connected to the container through an opening for the feeding of electromagnetic waves for the production of the first plasma, and a coupling window permeable to the electromagnetic waves closing the opening between the waveguide and the container, characterized in that

a) the container enveloping the first plasma is configured as a plasma chamber of a substantially parallelepipedal shape,

b) the interior spaces of the plasma chamber and of the



vacuum chamber are joined together by a common opening in the floor of the plasma chamber and in the chamber wall,

c) in the plasma chamber directly in front of the coupling window there is an additional guard window which is thermally well uncoupled from the surrounding chamber walls of the plasma chamber and has a substantially constant gap between the guard window and the chamber walls,

d) a separate gas feeding is performed of inert O_2 or N_2 gas into the space between the coupling window and the guard window, and of reactive gas into the space between the guard window and the substrate, and

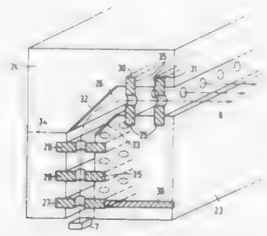
e) between the coupling window and the guard window an intermediate plasma is ignitable and thus the power distribution of the electromagnetic waves can be influenced.

5,144,197

DISPLAY DEVICE HAVING WALLS FOR PASSAGE OF ELECTRON BEAMS

Petrus J. M. Peters, and Henricus A. A. R. Crooijmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1989, Ser. No. 448,031
Claims priority, application Netherlands, Dec. 15, 1988, [illegible]
Int. Cl.[5] H01J *29/72*
U.S. Cl. 313—422 8 Claims



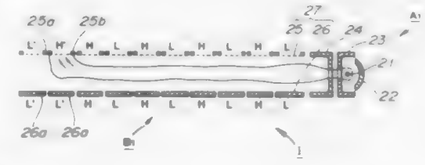
4. A display device comprising a display screen, means for emitting a row of electron beams and an electron-optical system for the row of electron beams, the system comprising at least one common electrode for the row of electron beams, said display device further comprising two bodies having facing walls, said walls forming a cavity for the passage of the electron beams, and the at least one common electrode extending between the walls and attached to the walls, characterized in that the walls have slots for the at least one electrode, which slots extend in a direction parallel to the row emitting means, in that the at least one electrode is plate shaped, and in that the bodies are provided with conducting channels which end in the slots.

5,144,198

ELECTRON FEEDER FOR FLAT-TYPE LUMINOUS DEVICE

Shigeo Itoh; Mikio Yokoyama, and Kazuhiko Tsuburaya, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Continuation of Ser. No. 390,219, Aug. 7, 1989, abandoned. This application May 15, 1991, Ser. No. 700,425
Claims priority, application Japan, Aug. 11, 1988, 63-200342
Int. Cl.[5] H01J *29/50, 1/62;* G09G *3/30*
U.S. Cl. 313—422 4 Claims



1. An electron feeder for a flat-type luminous device including an air-tight envelope having electrodes arranged therein and kept at a high vacuum and a display section arranged in said envelope and including a phosphor layer and an anode conductor, comprising:

at least one electron source arranged in said envelope for emitting electrons therefrom and at least one electron beam guide arranged in said envelope for guiding electrons emitted from said electron source and introduced through one end thereof thereinto toward the other end thereof along a plane opposite to said display section;

said electron beam guide including at least a plurality of front wire electrodes positioned opposite to said display section and separated from one another in the direction of traveling of the electrons emitted from said electron source and a plurality of rear wire electrodes arranged in parallel with said front wire electrodes and separated from one another in the direction of traveling of said electrons, said plurality of front wire electrodes and said plurality of rear wire electrodes forming a plurality of guide electrode sections, each said guide electrode section constituted by a predetermined number of said front wire electrodes and a predetermined number of said rear wire electrodes facing said predetermined number of front wire electrodes;

said guide electrode sections comprising means for alternately applying thereto at least two different voltages to adjacent electrode sections to guide said electrons toward the other end of said electron beam guide;

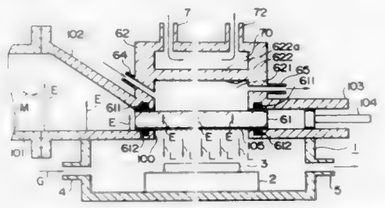
said front wire electrodes and said rear wire electrodes positioned in proximity to a position of said display section are selected to have applied thereto a deflecting voltage to induce said electrons from said electron feeder section to said display section.

5,144,199

MICROWAVE DISCHARGE LIGHT SOURCE DEVICE

Masakazu Taki; Kenji Yoshizawa, and Junichi Nishimae, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1991, Ser. No. 637,636
Claims priority, application Japan, Jan. 11, 1990, 2-4762; Jun. 26, 1990, 2-170916
Int. Cl.[5] H01J 7/26
U.S. Cl. 313—484 19 Claims



1. A microwave discharge light source device comprising:
a dielectric plate capable of transmitting light and having first and second major surfaces parallel to each other and first and second end surfaces perpendicular to said major surfaces;
planar emission means having a discharge space having at least one side defined by said dielectric plate and having two major surfaces and two end surfaces generally perpendicular to the major surfaces thereof, said discharge space being filled with a plasma emission medium;
light-transmitting microwave-reflecting means disposed in a position such as to face said discharge space through said major surfaces of said dielectric plate, said light transmitting microwave-reflecting means being parallel to said major surfaces of both said dielectric plate and said planar emission means said light-transmitting microwave-reflecting means being capable of transmitting light while reflecting microwaves;
waveguide means for leading a microwave, which has an electric field component in a direction perpendicular to said major surfaces of said dielectric plate, to the first end surface of said dielectric plate, and for introducing the microwave into the dielectric plate through a magnetic wave coupling at this first end surface;
wherein a microwave electric field is formed in said discharge space so that the plasma emission medium emits light by an electric discharge, the light thus emitted being extracted through said major surfaces of said dielectric plate and said light-transmitting micro-wave reflecting means.

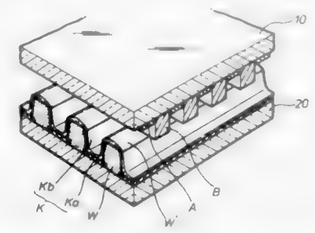
5,144,200

PLASMA DISPLAY PANEL AND MANUFACTURING METHOD THEREOF

Dae-il Kim, Kyunggi, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea

Filed May 24, 1991, Ser. No. 705,562
Claims priority, application Rep. of Korea, May 25, 1990, 90-7654
Int. Cl.[5] H01J 17/49
U.S. Cl. 313—584 12 Claims

1. A plasma display panel comprising:
a face substrate and a rear substrate facing and spaced apart from said face substrate by a predetermined distance;
a plurality of striped anodes disposed on said face substrate;
a plurality of cathodes oriented perpendicular to said anodes and disposed on said rear substrate;
each of said cathodes is divided into a striped first cathode element formed on said rear substrate and a U-shaped second cathode element disposed on said first cathode element and having a curved lower end and two vertical upper parts so as to form a cupped space facing said face substrate.

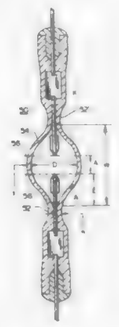


5,144,201

LOW WATT METAL HALIDE LAMP

Timothy W. Graham, Union Springs, and Daniel C. Briggs, Camillus, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 23, 1990, Ser. No. 484,166
Int. Cl.[5] H01J 17/16
U.S. Cl. 313—634 37 Claims



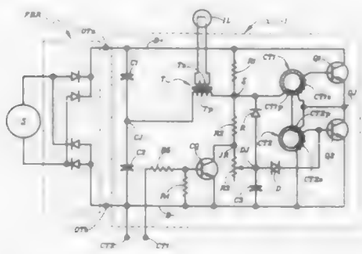
1. A metal halide arc discharge lamp that includes:
an envelope of light transmissive material including a bulb portion, a pair of transitional neck portions extending from said bulb portion and a pair of stem portions extending from said transitional neck portions;
said bulb portion of said envelope defining an arc chamber therein and having an external surface area of such valve as to produce a wall loading not exceeding about 35 watts/cm^2;
a fill of mercury, inert gas and a metal halide contained within said arch chamber, said mercury and said metal halide being adapted to substantially vaporize during operation of said lamp;
a pair of electrodes extending into said arch chamber from said pair of neck portions respectively and having electrode tips spaced apart from one another by a distance A within said arc chamber to produce an arc loading value that is greater than 150 watts/cm;
said neck portions of said envelope each having a wall surrounding a segment of said electrodes, respectively, the walls of said neck portions each having a reduced section;
said lamp having a power input rating in a range of about between 1.5 watts and 35.0 watts and the wall thickness of the neck portions having a reduced section in the range of about between 0.3 and 1.5 mm; and
a pair of inlead assemblies electrically coupled to said pair of electrodes respectively and passing from said electrodes through a sealed section in said stem portions to the exterior of said lamp.

5,144,202

HIGH-FREQUENCY POWER SUPPLY FOR INCANDESCENT LAMP

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 548,197, Jul. 5, 1990, Pat. No. 5,083,255, which is a continuation of Ser. No. 667,691, Nov. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 487,817, Apr. 22, 1983, Pat. No. 4,506,318. This application Aug. 7, 1991, Ser. No. 741,575
The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.
Int. Cl.[5] H05B 41/00
U.S. Cl. 315—151 20 Claims



1. An arrangement comprising:
a source providing a relatively low-frequency AC power line voltage at a pair of power line terminals;
incandescent lamp having a pair of lamp terminals; and
power supply connected between the power line terminals and the lamp terminals; the power supply being operative to provide a relatively high-frequency AC lamp voltage across the lamp terminals; the AC lamp voltage having: (i) a fundamental frequency at least twenty times higher than that of the AC power line voltage (ii) numerous complete relatively short half-cycles during each complete relatively long half-cycle of the AC power line voltage, with each of the numerous complete relatively short half-cycles having a peak magnitude; and (iii) the absolute value of the peak magnitude of the numerous complete relatively short half-cycles varying in time such as to be proportional to the absolute value of the instantaneous peak magnitude of the AC power line voltage, at least during a substantial portion of each relatively long half-cycle of the AC power line voltage.

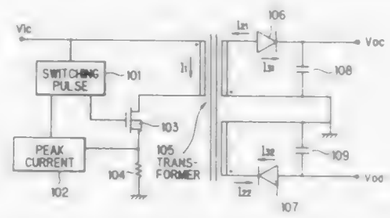
5,144,203

CIRCUIT FOR DRIVING AN ELECTRIC FIELD LUMINOUS LAMP

Yuji Fujita, and Kouzou Iwata, both of Shiga, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 515,022
Claims priority, application Japan, Apr. 26, 1989, 1-49770; May 31, 1989, 1-138568; Aug. 29, 1989, 1-222097
Int. Cl.[5] G09G 3/10
U.S. Cl. 315—169.3 8 Claims

1. A circuit for driving an electric field luminous lamp, comprising:
a DC-DC converter including a peak current detecting means for generating a constant DC electric power output, said DC-DC converter being connected to a DC power supply, said DC-DC converter including a transformer, a switching means connected to a primary winding of said transformer, and a control circuit for controlling ON and OFF of said switching means, wherein said peak current detecting means detects a current flowing through said primary winding of said transformer, when said switching means is turned ON, and controls a duration for which said switching means remains ON to maintain a constant peak current, such that the DC-DC converter supplies a constant electric power therefrom; and



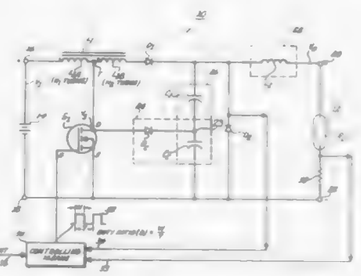
a DC-AC inverter for applying an AC voltage to said electric field luminous lamp to be driven, said DC-AC inverter receiving said constant DC electric power output.

5,144,204

TAPPED-INDUCTOR BOOST CONVERTOR FOR OPERATING A GAS DISCHARGE LAMP

Louis R. Nerone, Brecksville, and John G. Basch, Westlake, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 28, 1991, Ser. No. 705,854
Int. Cl.[5] H05B 37/00, 39/00, 41/14
U.S. Cl. 315—209 R 17 Claims



1. In a tapped-inductor boost converter having a pair of input terminals connected to a power source capable of providing a DC input voltage thereto and a pair of output terminals for providing a gas discharge lamp an output voltage greater than or equal to the input voltage, said converter further comprises:
an inductor comprising first and second windings and a tap between said windings;
an active switch member connected to said tap;
means for controlling and cyclically rendering said active switch conductive and non-conductive in a manner such that current flow through said first winding is effectively controlled thereby and further, such that said output voltage is also variably controlled thereby;
a passive switch coupled to said inductor and effective such that, current through said second winding is controlled thereby;
means for filtering said output voltage;
clamping means cooperatively associated with said output filtering means and receptive of a signal which is proportionate to said output voltage, said clamping means being effective for clamping voltage being variable as a function of variations in said output voltage across said active switch member, said clamping voltage being variable as a function of variations in said output voltage, said clamping means including a clamping diode and a clamping capaci-

tor and being further effective so that energy stored in the leakage inductance of said inductor is transferred to said gas discharge lamp thereby.

5,144,205

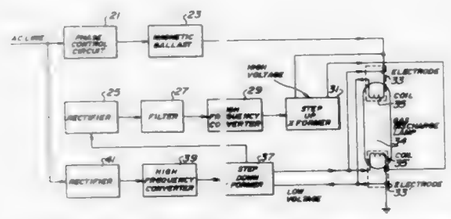
COMPACT FLUORESCENT LAMP DIMMING SYSTEM

Eric R. Motto, Center Valley, and Scott R. Jurell, Hellertown, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation-in-part of Ser. No. 353,984, May 18, 1989. This application Dec. 12, 1989, Ser. No. 450,185

Int. Cl.[5] H05B *37/00, 41/14*

U.S. Cl. 315—244 26 Claims



1. A control system for providing electrical power from a source to a gas discharge lamp, comprising:

a) a resonant circuit having input and output terminals, said lamp being connectable across said output terminals to provide parallel loading of said resonant circuit; and

b) driving means to provide a symmetrical high-frequency ac driving voltage across said input terminals to achieve a resonant response in said resonant circuit and produce a voltage across said output terminals sufficient to strike and maintain an electric discharge in said lamp, said driving means comprising an oscillating circuit including a switching transistor controlled by a regenerative base-drive transformer wherein said driving means after striking said electric discharge drives said resonant circuit at a frequency away from a peak response frequency of said resonant circuit.

5,144,206

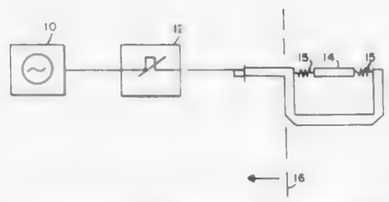
ELECTRODELESS HID LAMP COUPLING STRUCTURE WITH INTEGRAL MATCHING NETWORK

Scott J. Butler, N. Oxford; Walter P. Lapatovich, Marlborough, and Jason Bochinski, Natick, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Sep. 10, 1991, Ser. No. 757,094

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—248 20 Claims



1. An integral RF applicator and impedance matching network comprising

a first helical coupler receiving input power at a first end and having a second end facing a gap to contain a lamp capsule;

a second helical coupler positioned coaxial with said first helical coupler, receiving input power at a first end and having a second end facing the gap to contain the lamp capsule with coupling means which delay power to the second helical coupler to cause the first and second coupler to be approximately 180° out of phase; and

a quarter-wave transformer having a first end coupled to the first end of the first helical coupler and a second end coupled to a shunt reactance and a high frequency power supply.

5,144,207

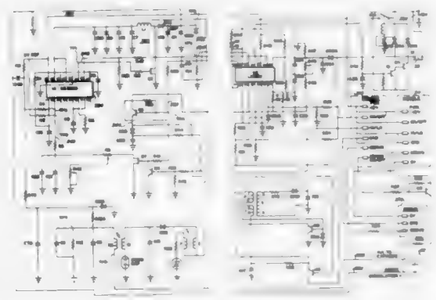
CIRCUIT AND METHOD FOR IGNITING AND OPERATING AN ARC LAMP

Robert L. Brunson, 15860 Emma La., Moreno Valley, Calif. 92370

Division of Ser. No. 351,149, May 12, 1989. This application Sep. 20, 1991, Ser. No. 763,428

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—291 32 Claims



1. A circuit for igniting and operating an arc lamp of the type adapted for use in a search light, comprising:

(a) a power source for providing electrical energy to said circuit;

(b) a modulator for generating output pulses and being controllable by input signals applied thereto to selectively interrupt the generation of the output pulses and to control the duty cycle of the output pulses in accordance with current flowing in said arc lamp;

(c) a switched regulator, connected to a first electrode of said arc lamp, responsive to the output pulses from said modulator for generating, in a first instance, an output voltage of sufficient magnitude to enable said arc lamp to ignite upon the application of a high voltage pulse to said arc lamp and, in a second instance, occurring substantially at the time of ignition of said arc lamp, reducing the magnitude of the output voltage to a prescribed level sufficient to sustain operation of said arc lamp;

(d) a comparator, responsive to the output voltage of said switched regulator, for providing an inhibit signal to said modulator to inhibit the generation of output pulses therefrom for a period substantially equal to the time between the occurrences of said first and second instances; and

(e) a lamp igniter, connected between said modulator and a second electrode of said arc lamp, and responsive to the inhibit signal from said comparator, for generating a high voltage pulse, greater in magnitude than the output voltage from said switched regulator, to ignite said arc lamp, said lamp igniter providing to said modulator a signal proportional to arc lamp current to thereby direct said modulator to alter the duty cycle of the output pulses from said modulator to control the magnitude of the output voltage supplied, from said switched regulator, to the first electrode of said arc lamp and thereby control the current flowing through said arc lamp at a level sufficient to sustain the operation thereof.

5,144,208

DEVICE FOR ADJUSTING A NOMINAL VALUE OF THE DIMENSION OF AN ACTUATOR, THE LONGITUDINAL DIMENSION OF WHICH CAN BE CHANGED BY APPLYING AN EXTERNAL ELECTROMAGNETIC OR ELECTROSTATIC FIELD

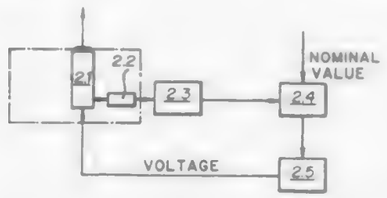
Edmund Schiessle, Schorndorf; Khaldoun Alasafi, Schwäbisch-Gmünd, and Ralf Gutöhrlein, Fellbach-Schmiden, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Feb. 26, 1991, Ser. No. 661,012

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008643

Int. Cl.[5] H01L *41/08*

U.S. Cl. 318—118 9 Claims



1. A device for adjusting a nominal value of the dimension of an actuator, a longitudinal dimension of which is changeable by application of an external electromagnetic or electrostatic field, the magnitude of the external electromagnetic or electrostatic field being associated with the longitudinal dimension of the actuator, comprising:

means for generating a signal characterizing the longitudinal dimension of the actuator;

a comparison device that compares the signal characterizing the longitudinal dimension with a predetermined nominal value to detect a deviation of the longitudinal dimension from the predetermined nominal value;

a control device that outputs a correcting variable when a difference between the longitudinal dimension of the actuator and the predetermined nominal value is detected by the comparison device, the correcting variable being predetermined in such a manner that the detected difference disappears;

an actuator;

a position sensor element;

a soft-magnetic and highly magnetoelastic layer, which is part of the position sensor and is connected to the actuator in such a manner that a change in length of the actuator produces a change in the mechanical stress in the layer;

an inductance which is part of the position sensor element, wherein the change in the mechanical stress in the layer produces a change in the value of the inductance; and

means for generating a signal characterizing the change in the longitudinal dimension on the basis of the change in inductance, including means for inferring the mechanical stress in the layer from the magnitude of the inductance and means for inferring the longitudinal dimension of the actuator from the mechanical stress in the layer.

5,144,209

BRUSHLESS DC MOTOR

Toshio Inaji, Minoo, and Makoto Gotou, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 28, 1991, Ser. No. 722,676

Claims priority, application Japan, Jul. 4, 1990, 2-176721; Jul. 4, 1990, 2-176722; Sep. 17, 1990, 2-247710

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—254 22 Claims

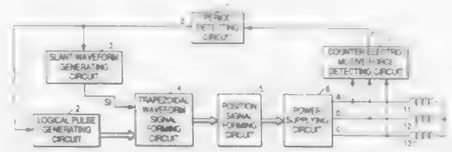
1. A brushless DC motor comprising:

a plurality of stator windings;

a counter electromotive force detecting circuit for generating a pulse signal train in response to counter electromotive forces respectively induced in said plurality of stator windings;

a logical pulse generating circuit for generating multi-phase pulse signals in response to said pulse signal train;

a slant waveform signal generating circuit for generating a slant waveform signal in response to said pulse signal train;



a trapezoidal waveform signal forming circuit for forming trapezoidal waveform signals from the multi-phase pulse signals outputted from said logical pulse generating circuit and the slant waveform signal outputted from said slant waveform signal generating circuit; and

a power supplying circuit for receiving the trapezoidal waveform signals from said trapezoidal waveform signal generating circuit as position signals of the rotor and for supplying electrical power to said plurality of stator windings in response to said position signal.

5,144,210

CAPSTAN SERVO DEVICE

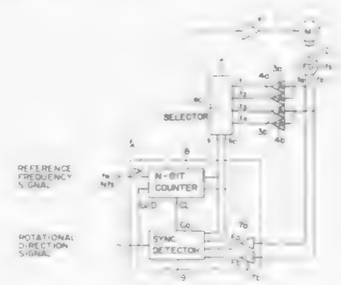
Tsuguo Sato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1991, Ser. No. 783,257

Claims priority, application Japan, Oct. 31, 1990, 292132

Int. Cl.[5] H02K *29/10;* **G05B** *19/08*

U.S. Cl. 318—560 5 Claims



1. A capstan servo device comprising:

a frequency generator for detecting the rotation rate of a capstan motor and generating two-phase FG signals mutually having a 90° phase difference;

a selector for selecting one of input four-phase signals mutually having a 90° phase difference, said four-phase signals being obtained by inverting and not inverting said two-phase FG signals and amplifying the same; and

a sync signal generator including an N-bit counter (where $N \geqq 2$) to receive a reference frequency signal inputted thereto and generating a sync signal by phase-comparing the two high-order bits of the frequency-divided output of said counter with said two-phase FG signals;

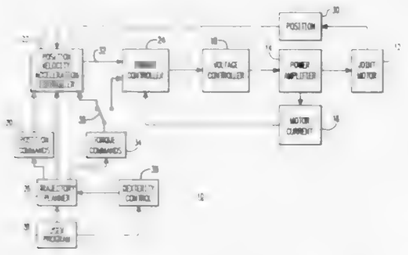
wherein the rotation speed of said capstan motor is controlled in accordance with an error voltage signal selected by said selector in response to the sync signal.

5,144,211

MULTIAXIS ROBOT CONTROLLER HAVING WORKPOINT TORQUE CONTROL

Kenneth E. Daggett, Murrysville, and Zimei M. Onaga, Blawnox, both of Pa., assignors to Stäubli International Ag, Switzerland

Filed Jan. 31, 1989, Ser. No. 304,973
Int. Cl.[5] B25J 9/18
U.S. Cl. 318—568.11 4 Claims



1. An electronic control for a robot having end effector means and further having multiple axes each having a joint drive motor supplied by a power amplifier, said control comprising:

means for generating position and velocity commands for each robot axis, thereby defining the operation of the robot end effector;

means for generating position and velocity feedback signals for each robot axis;

means for generating a motor torque command for each axis;

means for generating a motor torque request for each axis as a function of position and velocity errors between command and feedback values and as a function of the motor torque command;

means for generating a signal representing motor and current supplied by the power amplifier for each axis; and

means for generating a voltage drive signal for each power amplifier as a function of any error between the torque request and the current feedback for the corresponding robot axis, said torque command generating means and said position command generating means are jointly implemented in trajectory planning means so that generated position commands reflect torque commands along the path of robot end effector motion.

5,144,212

DISPLAY PROCESSING APPARATUS

Satoru Izawa, and Mitsutaka Sumita, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,553
Claims priority, application Japan, Feb. 13, 1990, 2-32151
Int. Cl.[5] G05B 19/18
U.S. Cl. 318—569 13 Claims

1. A numerical control device for an electric discharge machining apparatus comprising:

a timer unit for counting the elapsed time of electric discharge machining;

a machining parameter measuring unit for measuring a machining parameter;

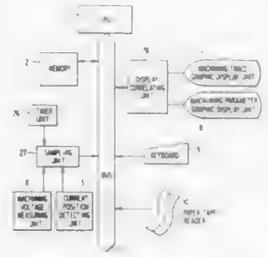
a current position detecting unit for detecting a current position;

a sampling unit for periodically and concurrently sampling the elapsed time data, the machining parameter data and the current position data;

a memory unit for storing the sampled data and machining condition data;

display means for presenting a machining trace graphic display and a graphic display illustrating the variation of said machining parameter data with elapsed time, based on the data stored in the memory unit; and

a display correlating unit for relating the elapsed time data,



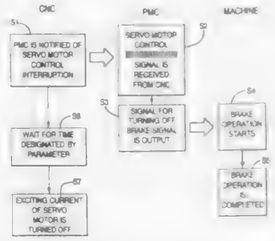
the machining parameter data and the current position data together to cause the display means to present the machining trace graphic display and the display showing the machining parameter data in correlation.

5,144,213

BRAKE CONTROL METHOD OF GRAVITY AXIS

Takao Sasaki, Hachioji; Kunihiko Murakami, Hino, and Masahiko Hosokawa, Minamitsuru, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP89/01165, § 371 Date Jul. 17, 1990, § 102(e) Date Jul. 17, 1990, PCT Pub. No. WO90/07737, PCT Pub. Date Jul. 12, 1990
PCT Filed Nov. 16, 1989, Ser. No. 548,986
Claims priority, application Japan, Dec. 28, 1988, 63-334880
Int. Cl.[5] G05B 19/18
U.S. Cl. 318—569 3 Claims



1. A gravity axis brake control method of controlling the brake of the gravity axis of a computerized numerically controlled machine tool, comprising the steps of:

causing a computerized numerical control to notify a programmable controller at a first time that the control of a servo motor of said gravity axis will be interrupted;

outputting a signal from said programmable controller to said machine tool for actuating said brake to lock the gravity axis by a second time; and

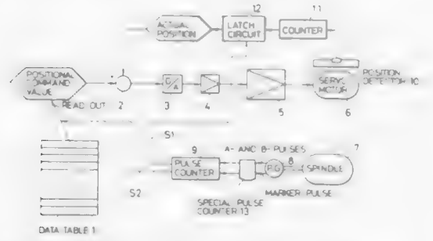
causing said computerized numerical control to turn off an exciting current of said servo motor after a preset brake operation completion period, at least as long as the difference between the first and second times, has passed since the first time.

5,144,214

NUMERICAL CONTROL SYSTEM FOR MOVING WORK OR CUTTER IN SYNCHRONISM WITH THE ROTATION OF A SPINDLE

Toshiteru Komatsu, and Kunio Miura, both of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed May 22, 1990, Ser. No. 526,906
Claims priority, application Japan, May 24, 1989, 1-130989
Int. Cl.[5] G05B 19/18
U.S. Cl. 318—600 5 Claims



1. A numerical control system comprising:

data tables for storing position command information of a feed axis in correspondence with a rotational angle of a spindle of a numerically controlled machine and tool, said system controls the rotational angle of said spindle in synchronism with the position of said feed axis based on the pulses of a marker phase and of A- and B-phases from a spindle pulse generator which is connected to said spindle;

a memory means for storing set values;

a counting means for counting the pulses of the A- and B-phases from said spindle pulse generator and for clearing the counted value with the pulse of the marker phase;

a marker pulse generating means for generating marker pulses when the values counted by said counting means has reached a set value stored in said memory means; and

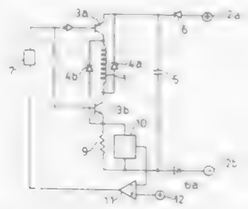
switching means for switching the pulses in the marker phase from said spindle pulse generator to the marker pulses from said marker pulse generating means at the time of synchronized operation based on the marker pulses from said marker pulse generating means and the content of said data tables.

5,144,215

CURRENT SUPPLY CONTROL APPARATUS FOR AN INDUCTANCE LOAD

Itsuki Bahn, Nerima, Japan, assignor to Kabushikigaisha Sekogiken, Tokyo, Japan

PCT No. PCT/JP90/01127, § 371 Date Apr. 30, 1991, § 102(e) Date Apr. 30, 1991, PCT Pub. No. WO91/03870, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 4, 1990, Ser. No. 678,319
Claims priority, application Japan, Sep. 11, 1989, 1-233046
Int. Cl.[5] H02P 5/40
U.S. Cl. 318—701 1 Claim



1. A current supply control circuit for an inductance load, comprising:

first and second semiconductor switching elements connected across an inductance load;

a dc power source for supplying power to said inductance load through said first and second semiconductor switching elements;

a first diode reversely connected to a series junction of said first semiconductor switching element and said inductance load;

a second reversely connected to a series junction of said second semiconductor switching element and said inductance load;

a current sensing circuit for detecting an energizing current for said inductance load, thereby obtaining a detected voltage;

a reference voltage including a set voltage with an optional waveform;

a third diode for back flow prevention forwardly inserted on a side of said dc power source for supplying power to said inductance load;

a small-capacity capacitor connected in parallel with a series junction of said first and second semiconductor switching elements, said inductance load, and said current sensing circuit; and

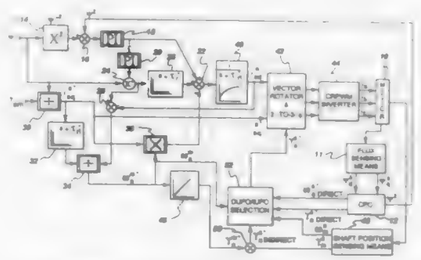
a chopper circuit adapted to render said first and second semiconductor switching elements nonconducting so that accumulated magnetic energy in said inductance load is prevented from flowing into the plus terminal of said dc power source by means of said third diode for back flow prevention when said reference voltage is exceeded by the detected voltage from said current sensing circuit, to convert said accumulated magnetic energy into electrostatic energy of said small-capacity capacitor by means of said first and second diodes and to apply said electrostatic energy accumulated in said small-capacity capacitor to said inductance load when applying power to said inductance load, thereby causing said energizing current to fall rapidly, and to cause said first and second semiconductor switching elements to conduct when said energizing current is lowered to a predetermined value, whereby the rise of said energizing current is quickened by means of a high voltage of said small-capacity capacitor.

5,144,216

HIGH SPEED FLUX FEEDBACK FOR TUNING A UNIVERSAL FIELD ORIENTED CONTROLLER CAPABLE OF OPERATING IN DIRECT AND INDIRECT FIELD ORIENTATION MODES

Rik W. A. A. De Doncker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1991, Ser. No. 769,692
Int. Cl.[5] H02P 5/40
U.S. Cl. 318—807 33 Claims



1. A flux feedback system for a field-oriented controller for an induction motor, comprising:

flux sensing means for sensing the direct and quadrature components Ψ_d^s and Ψ_d^s, respectively, of flux in a stationary reference frame linked to a predetermined phase of the induction motor;

means for calculating the square of the flux amplitude Ψ^2 from the direct and quadrature components of flux according to:

$$\Psi^2 = \Psi_d^2 + \Psi_q^2,$$

digital means for approximating the actual frequency ω of flux according to:

$$\omega_n = \frac{1}{T}\,\frac{1}{\Psi^2}\,(\Psi_{d(n-1)}\Psi_{qn} - \Psi_{q(n-1)}\Psi_{dn}),$$

where T represents the sampling interval;

integrator means for integrating the actual frequency of flux to provide the flux angle γ;

feedback loop means having an open loop gain K*, said feedback loop means comparing the square of the flux amplitude Ψ^2 with an amplitude-squared flux command Ψ^{2*} and providing a difference signal therefrom to tune said open loop gain K* and generate a tuned stator current signal for operation of the field-oriented controller at a commanded flux and a commanded slip frequency; and

vector rotator means for receiving the flux angle γ from said integrator means and the stator current signal from said feedback loop means and generating signals therefrom for driving the induction motor

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5,144,217

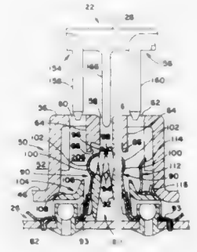
CORDLESS TOOL BATTERY HOUSING AND CHARGING SYSTEM

Billy J. Gardner, Rocky Mount, N.C., and Ralph A. Secoura, Timonium, Md., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 167,063, Mar. 3, 1989. This application Sep. 29, 1989, Ser. No. 415,456

Int. Cl.[5] H01M *10/46;* **H02J** *7/00*

U.S. Cl. 320—2 **49 Claims**



1. A battery pack and charger assembly in combination comprising:

a battery pack having a terminal block including an insulator carrying a pair of spaced apart terminal pins, the insulator including an elongated insulating member extending between the pins, the insulating member and the terminal pins being generally parallel and extending in a first direction when the battery pack is inserted in the charger assembly;

a charger assembly including (1) a receptacle for accepting the insertion of the battery pack, (2) a terminal assembly for engagement by the terminal block of the battery pack, the terminal assembly including a pair of normally retracted terminal blades, and (3) a housing for substantially enclosing the terminal assembly, said housing including a receptacle with a sunken floor and substantially upright walls, the floor including apertures registering with the terminal assembly; and

terminal blade control means included in the terminal assembly of the charger assembly responsive to engagement by the insulating member of the battery pack terminal block, for erecting the terminal blades into an operating position so that when the battery pack is inserted into the charger assembly each terminal pin makes electrical contact with one of the terminal blades.

5,144,218

DEVICE FOR DETERMINING THE CHARGE CONDITION OF A BATTERY

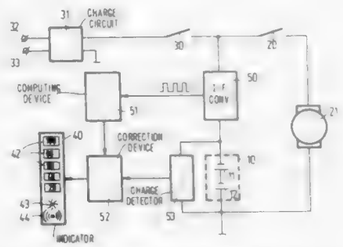
Geert J. Bosscha, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 516,652, Apr. 30, 1990, abandoned. This application Nov. 13, 1990, Ser. No. 613,347

Claims priority, application Netherlands, Oct. 25, 1989, 8902639

Int. Cl.[5] H02J *7/04*

U.S. Cl. 320—44 **20 Claims**



1. A device for determining the charge condition of a battery comprising:

a current-frequency converter, including means for sensing a current flow through the battery, for generating pulses at a frequency which is dependent on the current flowing through the battery;

computing means for determining a computed relative charge condition of the battery by counting the number of converter pulses generated; and

indicator means for indicating the computed charge condition as a fraction of the capacity of the battery,

detection means for detecting at least one actual relative charge condition of the battery when it is being charged or discharged; and

correction means, including means for comparing the actual relative charge condition with the computed relative charge condition, for adjusting the computed relative charge condition when the detected actual relative charge condition deviates from the computed relative charge condition, said correction means being adapted to modify the number of pulses needed to represent a predetermined variation of the computed relative charge condition of the battery.

5,144,219

VOLTAGE-REGULATOR FOR GENERATOR

Gerhard Conzelmann, Leinfelden-Oberaichen; Walter Kohl, Bietigheim, and Karl Nagel, Gomaringen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00236, § 371 Date Nov. 16, 1990, § 102(e) Date Nov. 16, 1990, PCT Pub. No. WO90/12443, PCT Pub. Date Oct. 18, 1990

PCT Filed Mar. 23, 1990, Ser. No. 602,291

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 4006387

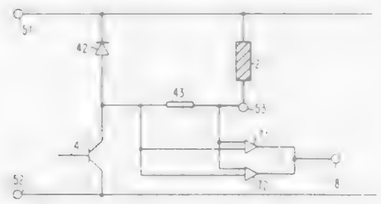
Int. Cl.[5] H02J *7/24*

U.S. Cl. 322—25 **10 Claims**

1. Voltage regulator for a generator having a load and an exciting winding, consisting essentially of a first transistor having a base, an emitter and a collector acting as a controlled

semiconductor switch; a recovery diode connected electrically in parallel with said exciting winding, in series with said first transistor and to the collector of said first transistor; a nonlinear integrator of a relative turn-on period of a current through the exciting winding connected electrically with said first transistor for control of said first transistor,

wherein said nonlinear integrator comprises the exciting winding, a first measurement resistor connected in series with said recovery diode and said first transistor and also in series with said exciting winding and said first transistor, said first measurement resistor being connected to one of said collector and said emitter of said first transistor; a second measurement resistor connected electrically in series with the recovery diode and in parallel with said exciting winding so that said resistors are connected in series with each other and form a voltage divider, a first operational amplifier having at least two operational amplifier inputs and an output, said first measurement resistor being connected across the inputs of the first operational amplifier, a second operational amplifier also having two inputs and an output, said second measurement resistor being connected across the inputs of the second operational amplifier, said outputs of said operational amplifiers being connected in parallel; means for adjusting said operational amplifiers so as to produce an output variable containing a predetermined correction function, and means for connecting said outputs of said operational amplifiers to said first transistor and for controlling said first transistor, so that a resistance experienced by the current flowing through the exciting winding and the semiconductor switch is different from that experienced by the current flowing through the exciting winding and the recovery diode so as to maintain a generator voltage of said generator constant independently of load and speed.



5,144,220

VEHICLE AC GENERATOR CONTROL SYSTEM

Shiro Iwatani, and Hirofumi Watanabe, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,431

Claims priority, application Japan, Nov. 30, 1989, 1-313853; Nov. 30, 1989, 1-313854

Int. Cl.[5] H02J *7/14*

U.S. Cl. 322—28 **11 Claims**

1. A vehicle AC generator control system for a vehicle having an engine, said system comprising:

an AC generator having a field coil and a drive torque load;

a rectifier for rectifying an AC output of said AC generator;

a battery connected to the output terminals of said rectifier; and

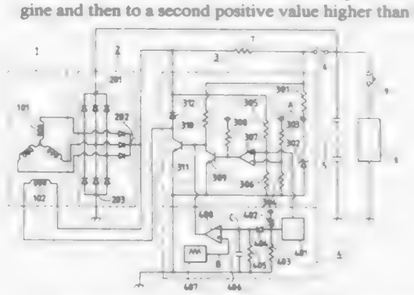
a voltage regulator having a switching element connected in series to said field coil;

said voltage regulator comprising:

means for detecting the terminal voltage of either said rectifier or battery to detect start-up of the engine;

means for measuring a predetermined period of time after start-up of the engine; and

control means for controlling a field current with the aid of said switching element to adjust an output voltage of said AC generator to a predetermined value, wherein the predetermined value is a first positive value lower than a voltage appearing across said battery during the predetermined period of time after start-up of the engine and then to a second positive value higher than the voltage appearing across said battery after the predetermined period of time has elapsed, whereby the drive torque load of said AC generator is eliminated for the predetermined period of time after start-up of the engine is detected.



5,144,221

Patent Not Issued For This Number

5,144,222

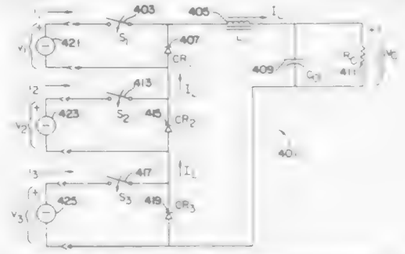
APPARATUS FOR CONTROLLING THE INPUT IMPEDANCE OF A POWER CONVERTER

Edward Herbert, 1 Dyer Cemetery Rd., Canton, Conn. 06019

Continuation-in-part of Ser. No. 638,197, Jan. 7, 1991. This application Feb. 5, 1991, Ser. No. 650,914

Int. Cl.[5] G05F *1/40*

U.S. Cl. 323—271 **10 Claims**



1. A power converter of the type generally known as a buck converter, comprising

a plurality of inputs,

each of the plurality of inputs being for one of a plurality of power sources

a plurality of switching means

each of the plurality of switching means being connected in series with one of the plurality of inputs and one of the plurality of power sources so that each of the plurality of switching means can either connect or disconnect each one of the power sources,

a plurality of rectifying means, one for each of the plurality of switches and the plurality of power sources

each of the plurality of rectifying means being connected from the return of on of the plurality of power sources to one of the plurality of switching means so as to comprise a bypass circuit for each of plurality of power sources and the plurality of the switching means when the switching means is open so as to disconnect the power source

the plurality of power sources and the plurality of switches comprising a series circuit having a plurality of rectifying means for bypassing such that when any of the plurality of

switching means is closed, at least one of the plurality of inputs is in series as part of the series circuit, and when any of the plurality of switching means is open, at least one of the plurality of power sources is bypassed by at least one of the rectifying means

the series circuit comprising the plurality of power sources, the plurality of switching means and the plurality of rectifying means being connected from a ground return to the input of an inductor,, and

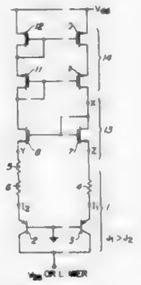
an output capacitor connecting from the output of the inductor to the ground return.

5,144,223

BANDGAP VOLTAGE GENERATOR

Peter B. Gillingham, Kanata, Canada, assignor to Mosaid, Inc., Ontario, Canada

Filed Mar. 12, 1991, Ser. No. 667,880
Int. Cl.[5] G05F *3/20*
U.S. Cl. 323—313 **16 Claims**



1. A bandgap voltage generator comprising:

(a) a pair of bipolar transistors connected in common collector configuration,

(b) resistors in series with bipolar transistor emitters for establishing a positive temperature coefficient voltage drop sufficient to offset a negative emitter-base voltage drop,

(c) a first pair of field effect transistors connected as a source follower in series with the emitters of the bipolar transistors for establishing a bandgap potential difference,

(d) a current comparator connected in series with the drains of the first pair of field effect transistors, whose output drive the gates of said first pair of transistors for controlling the emitter currents in the bipolar transistors, and

(e) said current comparator and said common collector being connected across a power source.

5,144,224

MILLIMETER WAVE FLOW CYTOMETER

Lawrence E. Larsen, 308 Hamilton Ave., Silver Spring, Md. 20901

Filed Apr. 1, 1991, Ser. No. 678,245
Int. Cl.[5] G01N *1/00*; G01R *27/04*
U.S. Cl. 324—71.4 **9 Claims**

9. A method of cytometric evaluation of isolated cells, comprising the steps of:

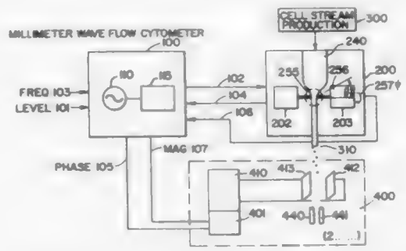
(a) Isolating said cells in a fluid and hydrodynamically focusing said cells single-file in an interaction zone of dimensions comparable to a single cell;

(b) Generating and closely coupling incident microwave energy of a predetermined frequency into said interaction zone;

(c) Receiving closely coupled waves affected by each cell in the interaction zone while mechanically rotating at least one of the generating or receiving wave directions in at least one plane;

(d) Measuring at least one complex S-parameter based on readings from the generated and received values as a function of frequency and as a function of the angular position for said mechanical rotation;

(e) Processing data generated during said measuring step to



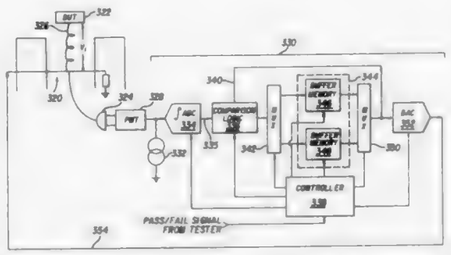
classify each cell under analysis as a member of one of predetermined reference groups, said reference groups being previously defined by applying measuring steps to known calibrating samples of cells and fluids.

5,144,225

METHODS AND APPARATUS FOR ACQUIRING DATA FROM INTERMITTENTLY FAILING CIRCUITS

Christopher G. Talbot, Menlo Park, and Neil Richardson, Palo Alto, both of Calif., assignors to Schlumberger Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 332,345, Mar. 31, 1989, abandoned.
This application Jul. 25, 1991, Ser. No. 737,553
Int. Cl.[5] G01R *15/12*
U.S. Cl. 324—73.1 **11 Claims**



1. A method of acquiring data representing intermittent failure of a circuit, comprising the steps of:

(a) defining a first data storage buffer as a good-data buffer and a second data storage buffer as a temporary data buffer;

(b) probing said circuit during application of a pattern of test vectors of said circuit to acquire data representing a quantitative potential measurement of a conductor within said circuit;

(c) adding said acquired data with stored data from said good-data buffer, and storing the sum in said temporary data buffer;

(d) determining whether said circuit has failed to operate in an expected manner in response to said pattern and, if said circuit has failed to operate in said expected manner, reversing definitions of said good-data buffer and said temporary-data buffer; and

(e) repeating steps (b)–(d),

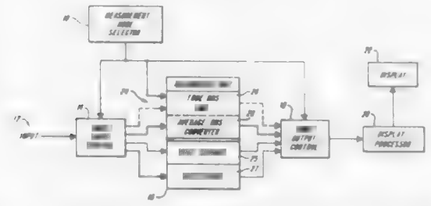
whereby data stored in said good-data buffer comprises a sum of acquired data representing a quantitative potential measurement of a conductor within said circuit when said circuit is failing.

5,144,226

MULTI-MODE MEASURING SYSTEM

Peter J. Rapp, Elmont, N.Y., assignor to Core Industries, Bloomfield Hills, Mich.

Filed May 17, 1991, Ser. No. 702,245
Int. Cl.[5] G06F *15/56*; G01R *15/08*
U.S. Cl. 324—132 **22 Claims**



14. A true RMS and Average RMS signal measuring system comprising:

means for receiving an input signal to be measured;

mode selector means, for providing at least one measurement mode selection signal, for selecting one signal measurement mode from among a plurality of available signal measurement modes, said plurality of available signal measurement modes including a True RMS measurement mode and an Average RMS measurement mode;

at least one signal measurement unit, responsive to a measurement mode control signal, and selectably operable as one of a True RMS signal measurement converter and an Average RMS signal measurement converter, said signal measurement converters selectably operative for processing an input signal according to said measurement mode selection signal, and for providing a measurement output signal corresponding to said input signal processed according to said measurement mode selection signal;

mode control means, coupled to said at least one signal measurement unit, and responsive to said at least one measurement mode selection signal, for providing a measurement mode control signal for controlling the processing of said input signal by said signal measurement unit according to said measurement mode selection signal, and for providing said measurement output signal to a display means; and

signal measurement display means, responsive to said measurement output signal, for displaying a value of the measurement of the input signal according to said measurement mode selection signal.

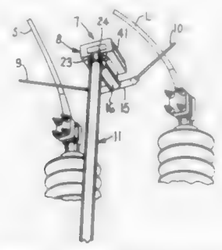
5,144,227

DIGITAL HIGH-VOLTAGE METER FOR DETECTING A LOAD TO SOURCE VOLTAGE AND A NEUTRAL POSITION OF A UTILITY VOLTAGE REGULATOR

Lewis A. Shaw, Hastings, Mich., assignor to Hastings Fiber Glass Products, Inc., Hastings, Mich.

Continuation-in-part of Ser. No. 609,375, Nov. 5, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 758,788
Int. Cl.[5] G01R *1/06*
U.S. Cl. 324—149 **26 Claims**

1. A device for indicating the difference between the source voltage and the load voltage of an electrical utility voltage regulator and detecting the neutral position of the regulator, comprising: a casing; a pair of elongated, electrically conductive probes mounted on said casing and adapted to contact the source and load conductors of the regulator; a pair of high-voltage resistor means each connected in series with one of said probes, said resistor means being encapsulated in an electrical insulating material; a battery-powered digital voltmeter in said casing, said voltmeter having a pair of input terminals each connected in series with one of said resistor means so that a pair of A.C. signals are supplied to said voltmeter when said probes contact the source and load conductors; means for providing a resultant A.C. signal indicative of said difference; means for converting said resultant A.C. signal to a D.C. signal; and support means connected to said casing and having



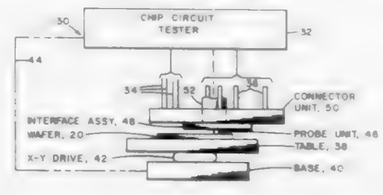
a fixture for releasably connecting said casing to an elongated, electrically insulating hot stick.

5,144,228

PROBE INTERFACE ASSEMBLY

Michael A. Sorna, Poughkeepsie, and Donald J. Papae, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1991, Ser. No. 690,404
Int. Cl.[5] G01R *1/00, 1/02*
U.S. Cl. 324—158 P **18 Claims**



1. A probe interface assembly for connecting a circuit tester to a circuit chip, the assembly comprising:

a plurality of parallel electrically conductive planes, and a plurality of electrically insulating planes disposed between the electrically conductive planes;

an array of terminals on a first side of the assembly facing the circuit tester for connection with the circuit tester, and an array of probes on a second side of the assembly facing the circuit chip for connection with the circuit chip;

means for connecting individual ones of said array of terminals with individual ones of said array of probes, said means for connecting including a plurality of vias extending through individual ones of said conductive planes and individual ones of said insulating planes for communicating electrical signals and electric power from said first side to a second side of the assembly;

wherein said plurality of parallel electrically conductive planes includes a set of signal planes comprising strip conductors for conducting electric signals, a set of power planes for conducting electric power, and a set of ground planes;

individual ones of said signal planes are disposed adjacent individual ones of said power planes to form a transmission line with a desired impedance;

individual ones of said ground planes are disposed adjacent individual ones of said power planes to form capacitors with said individual power planes, said set of power planes includes at least one power plane for conduction of electric power at at least one voltage, and each of said insulating planes disposed between a power plane and a ground plane is composed of dielectric material for increasing capacitance of one of said capacitors; and

wherein said power planes are located in a portion of the

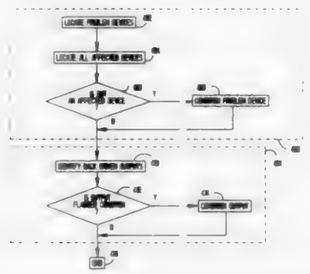
assembly closer to said second side, and said signal planes are located in a portion of said assembly closer to said first side in order to minimize lengths of paths for conduction of signals from the tester to the chip.

5,144,225

METHOD FOR SELECTIVELY CONDITIONING INTEGRATED CIRCUIT OUTPUTS FOR IN-CIRCUIT TEST

Darrell B. Johnsrud, and Darvin D. Raph, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 30, 1991, Ser. No. 752,412
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **8 Claims**



1. In an automated test equipment system for testing a circuit board containing a plurality of interconnected digital devices, a method for generating an in-circuit test for a device under test wherein interconnected digital devices which need conditioning may be selectively conditioned, said method comprising the following steps:

(1) indicating in a device models library which device outputs are not to be back-driven without conditioning;

(2) receiving electrical interconnect data for the interconnected digital devices on the circuit board;

(3) determining from said electrical interconnect data which interconnected digital devices have outputs which are driving an input of the device under test such that said outputs will be back-driven during testing of the device under test; and

(4) determining from the device models library which back-driven outputs should be conditioned prior to testing the device under test.

5,144,230

METHOD AND SYSTEM FOR TESTING INTEGRATED CIRCUITS BY CYCLE STEALING

Mehdi Katoozi, Bellevue, and George S. LaRue, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

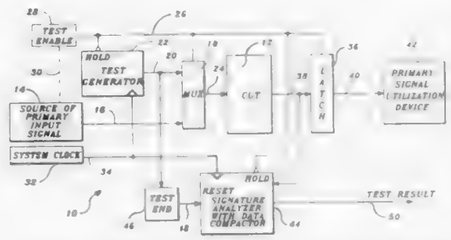
Filed Nov. 26, 1990, Ser. No. 618,050
Int. Cl.[5] G01R *15/14*; **G06F** *11/00*
U.S. Cl. 324—158 R **21 Claims**

1. A self-test system for use in testing a circuit that performs a primary function, the primary function including processing an input signal from a primary source to produce an output signal, said self-test system comprising:

(a) test generator means for producing a test signal used in testing the operation of the circuit;

(b) self-test enable means for determining when the circuit is required to perform its primary function and producing a self-test enable signal during an interval of time that the circuit is not required to perform its primary function;

(c) multiplexer means, having a first input connected to the test generator means to receive the test signal, a second input connected to the primary source to receive the input signal applied to the circuit when it is performing its primary function, and a third input connected to said self-test enable means to receive said self-test enable signal, for responding to the self-test enable signal by connecting the test signal to the circuit in place of the input signal from the primary source, and in the absence of the self-test enable signal, operative to connect the input signal from the primary source to the circuit; and



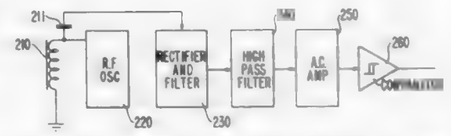
(d) test analysis means connected to receive the output signal from the circuit, for determining if the circuit is operating properly as a function of the output signal produced by the circuit in response to the test signal, whereby a self test of the circuit is only performed while the circuit is not performing its primary function and thus does not interfere with the primary function of the circuit.

5,144,231

EDDY CURRENT DETECTOR FOR DETECTING AN OBJECT WITH OFFSET COMPENSATION

Jeffrey Tenenbaum, P.O. Box 490, Southfield, Mich. 48037; Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098, and Teiji Okuyama, 533 Oak, Birmingham, Mich. 48009

Continuation of Ser. No. 252,794, Sep. 30, 1988, abandoned. This application Apr. 23, 1991, Ser. No. 688,710
Int. Cl.[5] G01P *3/49, 3/489*; **H03D** *1/04*; **H03H** *17/00*
U.S. Cl. 324—164 **6 Claims**



1. An eddy current detector capable of detecting a condition of movement of an object having surface variations, said detector comprising:

a sensing probe adapted to be aligned to said object for inducing eddy currents in said object and sensing said eddy currents and providing a corresponding sensing signal;

an RF oscillator coupled to said sensing probe for providing current for inducing said eddy currents in said object;

demodulating means coupled to said sensing probe for demodulating said sensing signal;

separating means for separating out any components of said sensing signal caused by said surface variations;

said separating means including:

a) a high pass filter coupled to said demodulating means for filtering an output of said demodulating means;

b) an amplifier coupled to said high pass filter for amplifying an output of said high pass filter; and

c) a high frequency roll-off capacitor coupled to said amplifier and located in a feedback loop of said amplifier for attenuating any residual RF components in said sensing signal; and

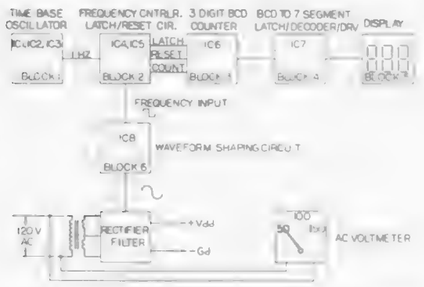
discriminating means coupled to said separating means for discriminating the level of said sensing signal to indicate the present of said surface variations.

5,144,232

TESTING DEVICE FOR AN ELECTRIC GENERATOR

Larry W. Veenstra, 2325 S. Holly Place, Denver, Colo. 80222

Filed Apr. 29, 1991, Ser. No. 692,949
Int. Cl.[5] G01P *3/46*; **G01R** *31/02*
U.S. Cl. 324—177 **1 Claim**



1. An RPM and voltage indicator for an electrical generator comprising:

time base means for establishing a time base for said indicator, said time base means being utilized to establish a time base set at one hertz;

latch/reset means triggered by an output of said time base means;

counter means for measuring a frequency from an output of said latch/reset means, said counter means comprising a three digit BCD counter;

latch/decoder/driver means for receiving an output from said counter means;

display means for displaying a frequency received from an output of said latch/decoder/driver means;

power supply means which includes a transformer having a rectifier and filter, said transformer supplying a necessary direct current voltage to power said indicator;

a wavefore shaping circuit tapped into said transformer to supply said frequency for a frequency input;

a voltmeter tapped into primary windings of said transformer so as to provide a continuous reading of an input voltage which is an output voltage of said generator.

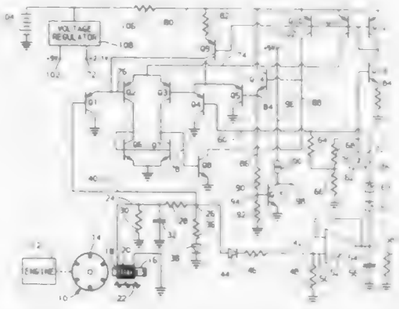
5,144,233

CRANKSHAFT ANGULAR POSITION VOLTAGE DEVELOPING APPARATUS HAVING ADAPTIVE CONTROL AND DIODE CONTROL

Rebecca A. Christenson, Kokomo, and Brian K. Good, Greentown, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 30, 1991, Ser. No. 751,200
Int. Cl.[5] G01B *7/30*; **G01P** *3/489*
U.S. Cl. 324—207.25 **5 Claims**

1. Apparatus for developing a series of square-wave pulses that are related to the angular position of the crankshaft of an internal combustion engine comprising, a variable reluctance sensor having a pick-up coil a wheel driven by said engine associated with said sensor having a plurality of slots, said pick-up coil having an alternating voltage induced therein as a said slot on the said wheel passes said sensor, a voltage comparator having at least first and second inputs and an output, said output being coupled to square-wave voltage developing means for developing said square-wave pulses, means connecting said pick-up coil to said first input of said comparator, a peak detector means, a capacitor, means connecting said peak detector means to said capacitor, means connecting said peak detector means to said pick-up coil operative to cause said capacitor to be charged to a voltage that is related to the peak voltage of said alternating voltage, means connected to said capacitor and to said second input of said comparator for applying a voltage to said second input of said comparator that is related to the voltage across said capacitor, said comparator switching its state to provide a voltage at its output that causes said square-wave voltage developing means to develop a voltage transition that defines the leading edge of a square-wave pulse when the voltage at said first input of said comparator



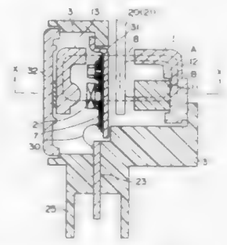
attains a value related to the voltage at said second input of said comparator, means for preventing charging of said capacitor until the amplitude of said alternating voltage exceeds a predetermined value, said last named means comprising a diode connected between said pick-up coil and said peak detector means, and means for maintaining said voltage applied to said second input of said comparator at a fixed value when there is no voltage on said capacitor.

5,144,234

HALL-EFFECT SENSOR WITH INTEGRALLY MOLDED FRAME AND PLATE SUPPORTED HALL ELEMENT

Shigemi Murata, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Division of Ser. No. 493,526, Mar. 14, 1990, Pat. No. 5,093,617. This application Apr. 8, 1991, Ser. No. 681,610
Claims priority, application Japan, Mar. 14, 1989, 1-59539; Mar. 15, 1989, 1-60706; Mar. 15, 1989, 1-60707; Mar. 15, 1989, 1-60708; Mar. 15, 1989, 1-60709
Int. Cl.[5] G01B *7/30, 7/14*; **F02P** *7/07*; **H01L** *23/32*
U.S. Cl. 324—235 **5 Claims**



1. A Hall-effect sensor, comprising:

flux generating means for generating a magnetic flux, wherein said flux generating means has a magnet for generating a magnetic flux, a first flux guide kept in contact with said magnet, and a second flux guide which is arranged in a position to face said magnet and said first flux guide with a gap therebetween,

a Hall element disposed in the path of said magnetic flux,

a molded frame which holds said flux generating means and said Hall element integrally therewith,

positioning and fixing means for positioning and fixing said

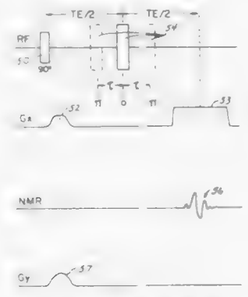
Hall element to said molded frame, said positioning and fixing means comprising a plate disposed in the path of said magnetic flux and installed in said molded frame, and a peripheral circuit coupled to said Hall element and commonly mounted therewith, wherein said Hall element is fixed to said plate, said plate being interposed between said magnet and said Hall element.

5,144,235

METHOD OF DECOMPOSING NMR IMAGES BY CHEMICAL SPECIES

Gary H. Glover, Menlo Park, Calif., and Erika Schneider, New Berlin, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 10, 1990, Ser. No. 566,199
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **11 Claims**



1. A method of producing separate images of a first chemical species and a second chemical species in an imaged body, from three complex NMR multi-pixel images S_O, S_1, and S_{-1} of the body, the first and second chemical species having relative phase shifts of 0, π, and $-\pi$ in the three images, S_O, S_1, and S_{-1} respectively, comprising the steps of:

combining the NMR images to create a B_O image;

fitting a low order surface to the continuous portions of the B_O image;

measuring the difference between the low order surface and the B_O image;

correcting the phase of the B_O image if the difference between adjacent pixels exceeds a predetermined value;

producing a switch function dependant on the corrected B_O image; and

combining the NMR multi-pixel images to produce a first and second chemical species image using the switch function to identify the predominant chemical species of each pixel in the chemical species images.

5,144,236

METHOD AND APPARATUS FOR R.F. TOMOGRAPHY

Lawrence M. Strenk, Middleburg Hts., Ohio, assignor to Strenk Scientific Consultants, Inc., Middleburg Heights, Ohio

Filed Aug. 17, 1990, Ser. No. 570,204
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **14 Claims**

1. A method for imaging a radio frequency energy absorbing object, said method comprising

transmitting radio frequency energy through said object in a first direction, a portion of said radio frequency energy being absorbed by said object and a portion being transmitted through said object

receiving said transmitted portion of said radio frequency energy in said first direction;

converting said received radio frequency energy into a first absorption quantity representative of the portion of said radio frequency energy absorbed by said object in said first direction;

repeating said transmitting, receiving and converting steps for a plurality of additional directions, each of said directions lying in a plane and each repetition providing an additional absorption quantity, said object having dimensions within said plane, one of said dimensions being a greatest dimension; and

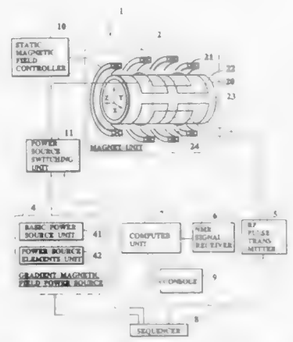
transforming said absorption quantities into an image of the object within said plane, said radio frequency energy having a wavelength greater than said greatest dimension.

5,144,237

METHOD AND APPARATUS OF NUCLEAR MAGNETIC RESONANCE IMAGING WITH OPTIMIZED GRADIENT MAGNETIC FIELD POWER SOURCE

Motohisa Yokoi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 27, 1990, Ser. No. 544,421
Claims priority, application Japan, Jun. 29, 1989, 1-165355
Int. Cl.[5] G01B *33/20*
U.S. Cl. 324—309 **6 Claims**



1. A nuclear magnetic resonance imaging apparatus, comprising:

means for generating a static magnetic field;

X-, Y-, and Z-gradient magnetic field coils for generating gradient magnetic fields to be superposed on the static magnetic field in X, Y, and Z directions respectively;

means for supplying a required amount of current to the gradient magnetic field coils, including:

a basic power source for supplying a current up to a predetermined amount to the gradient magnetic field coils;

a plurality of power source elements, each capable of supplying a prescribed amount of current;

wherein said power source elements are connected to the basic power source in a configuration in which the basic power source is supplemented by a necessary number of said power source elements;

wherein a total amount of current supplied by said basic power source and said power source elements becomes equal to the required amount of current when a sum of currents supplied by the power source elements is added to a current due to the basic power source;

means for applying RF pulses onto an object to be examined placed in the static magnetic field;

means for collecting nuclear magnetic resonance signals from the object to be examined resulting from the RF pulse; and

means for processing the collected nuclear magnetic resonance signals.

5,144,238

MAGNETIC RESONANCE IMAGING APPARATUS

Gösta J. Ehnholm, Helsinki, Finland, assignor to Instrumentarium Corporation, Helsinki, Finland

Filed Dec. 26, 1990, Ser. No. 633,798
Claims priority, application United Kingdom, Dec. 29, 1989, [illegible]
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—316 **14 Claims**

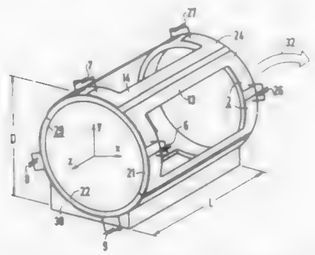
1. An electron spin resonance enhanced magnetic resonance imaging apparatus having means arranged to generate a primary magnetic field of a first value during periods of nuclear spin transition excitation and magnetic resonance signal detection for the generation of electron spin resonance enhanced magnetic resonance images of a subject and means arranged to generate a primary magnetic field of a second and higher value during periods of nuclear spin transition excitation and magnetic resonance signal detection for the generation of native magnetic resonance images of said subject.

5,144,239

CIRCULARLY POLARIZING RF ANTENNA FOR AN MRI APPARATUS

Ralph Oppelt, Weiher, and Horst Siebold, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 10, 1990, Ser. No. 565,137
Claims priority, application European Pat. Off., Aug. 16, 1989, 89115110.2
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 **2 Claims**



1. In a magnetic resonance imaging apparatus for producing tomograms of an examination subject, the improvement of a circularly polarizing RF antenna comprising

a carrier consisting of non-electrically conducting material forming at least a portion of a hollow cylinder;

four current loops disposed on said carrier, each current loop consisting of two U-shaped conductors, each U-shaped conductor having lateral legs terminating in respective ends, each of the two U-shaped conductors forming a current loop being disposed so that the respective ends of the lateral legs are opposite each other in mirror symmetric fashion, each of the legs disposed opposite each other being bridged by a resonant capacitor; and

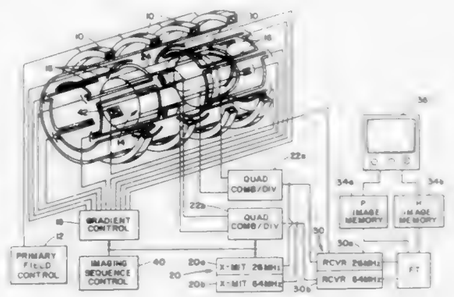
said carrier being divided axially between at least two of said current loops so that at least one of said current loops is removable from a remainder of the carrier without electrical contact to any other of said current loops.

5,144,240

NMR SPECTROSCOPY AND IMAGING COIL

Mehrdad Mehdizadeh, Wilmington, Del.; David A. Lampman, Lakewood, and Paul T. Orlando, Mentor, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 392,653, Aug. 11, 1989, Pat. No. 5,045,792, which is a continuation-in-part of Ser. No. 234,278, Aug. 19, 1988, Pat. No. 4,918,388, and Ser. No. 199,202, May 26, 1988, Pat. No. 4,879,516, which is a continuation-in-part of Ser. No. 120,475, Nov. 13, 1987, Pat. No. 4,839,594, and Ser. No. 86,277, Aug. 17, 1987, Pat. No. 4,841,248, said Ser. No. 120,475, is a continuation-in-part of Ser. No. 931,726, Nov. 17, 1986, Pat. No. 4,752,738, and Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356, said Ser. No. 86,277, is a continuation-in-part of Ser. No. 931,726, , and Ser. No. 765,708. This application Feb. 6, 1991, Ser. No. 651,306
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 **22 Claims**



1. A magnetic resonance imaging apparatus comprising:

a means for creating a primary magnetic field through an examination region;

a gradient field means for selectively causing magnetic field gradients across the primary magnetic field;

a first radio frequency means for supplying radio frequency resonance excitation and manipulation signals of a first frequency;

a second radio frequency means for supplying radio frequency resonance excitation and manipulation signals of a second frequency;

a radio frequency coil which is concurrently tuned to both the first and second frequencies for selectively exciting magnetic resonance of nuclei in the examination region which are excited to resonance at the first and second frequencies;

a first coupling means for selectively coupling the first radio frequency means with the radio frequency coil;

a second coupling means for selectively coupling the second radio frequency means with the radio frequency coil;

a reconstruction means for reconstructing magnetic resonance signals emanating from the examination region into an electronic representation of nuclei which resonate at

the first frequency and into an electronic representation of nuclei which resonate at the second frequency;

a first memory means for selectively storing representations of the nuclei which resonate at the first frequency;

a second memory means for storing the representations of nuclei that resonate at the second frequency; and,

means for displaying the first and second frequency representations.

5,144,241

CIRCULARLY POLARIZING RF ANTENNA FOR AN MRI APPARATUS HAVING A C-MAGNET

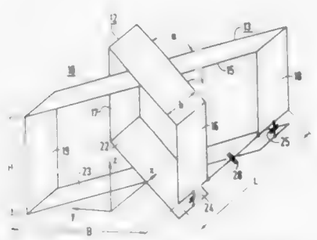
Ralph Oppelt, Weiher; Wilhelm Duerr, and Horst Siebold, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1990, Ser. No. 567,739

Claims priority, application European Pat. Off., Aug. 16, 1989, 89115129.2

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **18 Claims**



1. In a magnetic resonance imaging tomography apparatus for examining a subject extending along the x-axis of a rectangular coordinate system and having a magnet for generating a fundamental magnetic field extending in the direction of the z-axis, said magnet having spaced pole surfaces connected by a yoke and defining an examination volume therebetween in which a region to be examined of said subject is disposed, the improvement of a circularly polarized RF antenna comprising:

first and second antenna systems each in the form of a loop;

each of said first and second antenna systems including a middle leg disposed approximately parallel to one of said pole surfaces, two lateral legs connected to said middle leg, and a return path, said return path being electrically connected to the end of a first of said lateral legs in its antenna system, and being connected via a resonant capacitor to the end of a second of said lateral legs in its antenna system;

said loops of said first and second antenna systems being disposed so that said middle legs cross; and

at least one decoupling capacitor connected between said first and second antenna systems.

5,144,242

CONTINUALLY LOADABLE MICROCODE STORE FOR MRI CONTROL SEQUENCERS

Jack H. Zeilenga, San Francisco, and John Hoenninger, III, Oakland, both of Calif., assignors to The Regents of the Univeristy of California, Oakland, Calif.

Filed Aug. 23, 1990, Ser. No. 571,258

Int. Cl.[5] G01R *33/20*

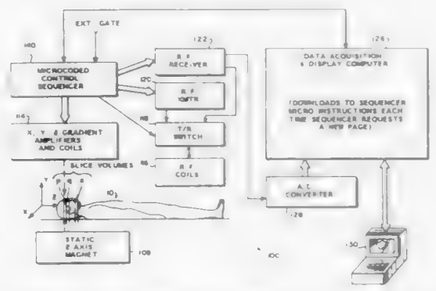
U.S. Cl. 324—312 **21 Claims**

1. A microcoded NMR pulse sequencer for providing real time NMR system control signals, said sequencer including:

a writable microcode control store adapted to store micro-instructions;

a readout circuit operatively coupled to read a sequence of micro-instructions from said microcode control store;

an output circuit coupled to receive said micro-instructions read by said readout circuit, said output circuit generating output signals for controlling real time generation of a sequence of NMR pulse stimulations; and



a loading circuit operatively coupled to said control store, said loading circuit effecting loading of micro-instructions into said control store without interrupting said real time generation of said sequence of NMR pulse stimulations.

5,144,243

RF COIL SYSTEM FOR USE IN MAGNETIC RESONANCE IMAGING APPARATUS

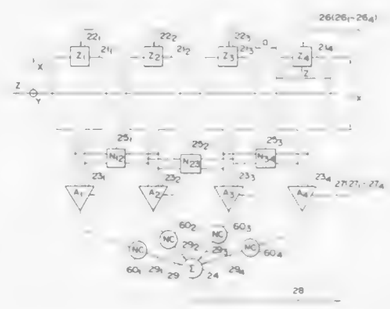
Kazuto Nakabayashi, Ootawara, Japan, and Timothy R. Fox, Chicago, Ill., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1991, Ser. No. 654,183

Claims priority, application Japan, Feb. 14, 1990, 2-31474

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **15 Claims**



1. An RF coil system for use in a magnetic resonance imaging apparatus, said coil system being adapted to perform at least one of application of an excitation high-frequency magnetic field and detection of magnetic resonance signals, comprising:

a plurality of coil elements arranged at regularly spaced intervals without any overlap between said coil elements; and

means for putting each of said coil elements into an operative state or an inoperative state individually.

5,144,244

ERROR-PROOF DECOUPLING OF TRANSMISSION AND RECEPTION ANTENNAS IN A NUCLEAR MAGNETIC RESONANCE APPARATUS

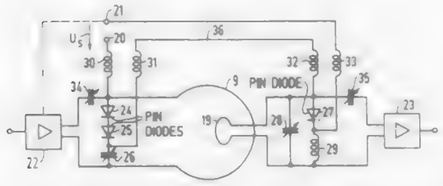
Helmut Kess, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,174

Claims priority, application European Pat. Off., Sep. 18, 1989, 89117249

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—322 **4 Claims**



1. In a nuclear magnetic resonance apparatus, a matching and tuning unit for a transmission antenna and a reception antenna comprising:

means for tuning and matching a transmission antenna including a first PIN diode connected to said transmission antenna for switching the connection of tuning and matching components to said transmission antenna;

means for tuning and matching a reception antenna including a second PIN diode connected to said reception antenna for switching the connection of tuning and matching components to said reception antenna;

said first and second PIN diodes being connected in series in terms of d.c. voltage with a control voltage so that said reception antenna is detuned relative to the nuclear magnetic resonant frequency and the transmission antenna is tuned to the nuclear magnetic resonant frequency given a first direction of the control voltage and so that the reception antenna is tuned to the nuclear magnetic resonant frequency and the transmission antenna is detuned with respect to the nuclear magnetic resonant frequency given a second direction of the control voltage.

5,144,245

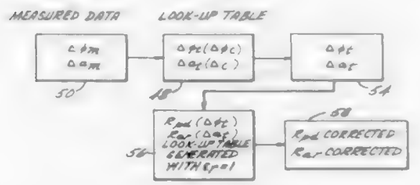
METHOD FOR EVALUATING A BOREHOLE FORMATION BASED ON A FORMATION RESISTIVITY LOG GENERATED BY A WAVE PROPAGATION FORMATION EVALUATION TOOL

Macmillan M. Wisler, New Haven, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Apr. 5, 1991, Ser. No. 680,987

Int. Cl.[5] G01V *3/30*

U.S. Cl. 324—338 **18 Claims**



1. A method for evaluating a subterranean borehole formation using a wave propagation formation evaluation tool wherein the wave propagation formation evaluation tool obtains a measured phase difference $\Delta\Phi_m$ and a measured amplitude ratio $\Delta\alpha_m$, with both $\Delta\Phi_m$ and $\Delta\alpha_m$ having an error component associated therewith, comprising the steps of:

(1) determining a true formation resistivity R_t over a preselected range of values for water volume V_w and water conductivity σ_{wR} using a low frequency mixing law;

(2) determining a relative dielectric constant ϵ_r over said preselected range of values for V_w and σ_{wR} using a high frequency mixing law;

(3) determining a theoretical phase difference $\Delta\Phi$ and a theoretical amplitude ratio $\Delta\alpha$ as a function of R_t and ϵ_r;

(4) determining a first set of resistivities, R_{pd} $(\Delta\Phi)$, as a function of $\Delta\Phi$;

(5) determining a second set of resistivities, R_{ar} $(\Delta\alpha)$, as a function of $\Delta\alpha$;

(6) drilling a subterranean borehole through a formation using a wave propagation formation evaluation tool to define a subterranean borehole formation;

(7) measuring $\Delta\Phi_m$ and $\Delta\alpha_m$ with said wave propagation formation evaluation tool;

(8) comparing R_{pd} $(\Delta\Phi)$ to $\Delta\Phi_m$ to determine a corrected R_{pd};

(9) comparing $R_{ar}(\Delta\alpha)$ to $\Delta\alpha_m$ to determine a corrected R_{ar};

(10) generating a formation resistivity log from said corrected R_{pd} and said corrected R_{ar}; and

(11) evaluating the subterranean borehole formation based on said generated formation resistivity log.

5,144,246

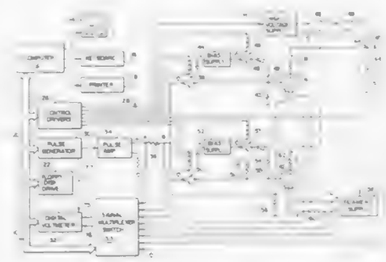
VACUUM TUBE CHARACTERIZATION APPARATUS

Frank A. Stelloh, Brookfield, and Gregory J. Derzay, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed May 20, 1991, Ser. No. 703,066

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—405 **16 Claims**



1. An apparatus for characterizing a vacuum tube that has an anode, a cathode and a grid comprising:

means for applying a bias potential across the anode and the cathode of the vacuum tube;

means for specifying a plurality of grid voltages;

means for generating a series of consecutive pulses at each of the specified grid voltages and for coupling the pulses to the grid of the vacuum tube; and

means for measuring a plurality of operational parameters of the vacuum tube by automatically measuring a different one of the parameters during different pulses of each series.

5,144,247

METHOD AND APPARATUS FOR REDUCING IR ERROR IN CATHODIC PROTECTION MEASUREMENTS

Robert M. Speck, Richmond, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1991, Ser. No. 655,881

Int. Cl.[5] G01N *27/42*

U.S. Cl. 324—425 **11 Claims**

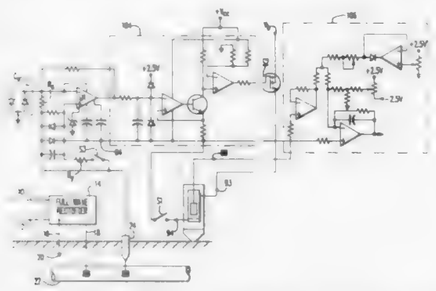
1. An apparatus for measuring cathodic protection voltage

levels on a concealed conductive structure, said apparatus comprising:

a probe including a standard half cell reference electrode, a working electrode and an auxiliary electrode mounted in a fixed spacial relationship to each other, said reference electrode, working electrode and auxiliary electrode each being in contact with an electrolytic solution;

a voltage measuring device for receiving a voltage from said reference electrode, said voltage measuring device providing an indication of the voltage difference between said reference electrode and a common reference point;

means for connecting and disconnecting said working electrode with said common reference point;



means for detecting voltage between said concealed conductive structure which is subject to a cathodic protection voltage and said common reference point;

means for providing a bias voltage to said auxiliary electrode in response to a voltage level between said concealed conductive structure and said common reference point; and

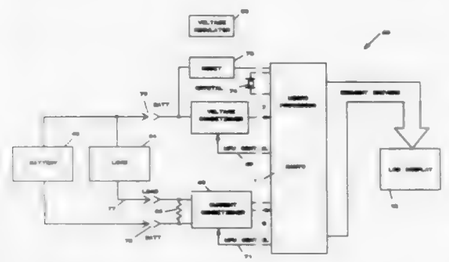
wherein the voltage measured by said voltage measuring device provides an indication of the adequacy of cathodic protection voltage levels on said concealed conductive structure.

5,144,248

METHOD AND APPARATUS FOR MEASURING THE VOLTAGE AND CHARGE OF A BATTERY

Richard B. Alexandres, Clear Lake; Dennis P. Kindschuh, Mason City, both of Iowa; Larry Hall, Kansas City, Mo.; Perry B. Peden, Lenexa, Kans.; Larry Klusman, and Steve Potratz, both of Lenexa, Kans., assignors to Alexander Manufacturing Company, Mason City, Iowa

Filed May 22, 1989, Ser. No. 355,679
Int. Cl.[5] G01N *27/27*
U.S. Cl. 324—428 **2 Claims**



1. An apparatus comprising

a. a load;

b. a NiCad battery coupled to said load;

c. a shunt resistor coupled in series between said battery and said load

d. a current conditioner coupled in parallel with said shunt;

e. a voltage conditioner coupled in parallel with said load wherein said voltage conditioner further comprises means for supplying a reference voltage, means coupled to said NiCad battery and said supplying means for developing a comparison signal representing the difference between said reference voltage to said voltage of said NiCad battery, means coupled to said developing means for integrating said comparison signal, and means coupled to said microprocessor and said integrating means for indicating the time of said integrating;

f. a microprocessor coupled to said current conditioner and said voltage conditioner for periodically determining current and voltage of said NiCad battery; and

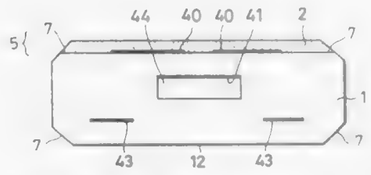
g. a liquid crystal display coupled to said microprocessor for periodically displaying said current and said voltage of said NiCad battery.

5,144,249

OXYGEN SENSOR

Akiyoshi Kurishita, Kasugai; Masanori Katsu, Nagoya, and Masami Kato, Handa, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 13, 1991, Ser. No. 668,552
Claims priority, application Japan, Mar. 22, 1990, 2-72693
Int. Cl.[5] G01N *27/58*
U.S. Cl. 324—439 **4 Claims**



1. An oxygen sensor comprising

an oxygen sensor element in the form of an elongated plate having an oxygen detection section having defined edges at the end of said oxygen sensor element, said oxygen detection section generating electromotive force between electrodes according to oxygen concentration or varying electrical resistance, said oxygen detection section generating electromotive force comprising a measuring electrode formed on one surface of a solid electrolytic body, a porous protective layer, and a reference electrode formed on the other surface of the solid electrolytic body, chamfering being applied to edges formed parallel to the lengthwise direction of said oxygen sensor element which is exposed to gas to be measured.

5,144,250

POWER AMPLIFIER TIME DOMAIN REFLECTOMETER

Brian W. Little, Marion, Iowa, assignor to Rockwell International Corporation

Filed Sep. 27, 1990, Ser. No. 589,876
Int. Cl.[5] G01R *31/11, 27/04*
U.S. Cl. 324—533 **14 Claims**

1. Apparatus integral with an RF data transmission system for determining during data transmission the identity of a system component in said system suffering from an impedance failure, comprising:

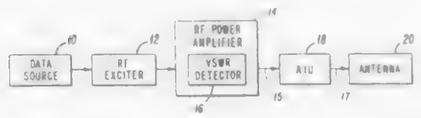
means for generating an RF signal;

means for modulating the RF signal with data;

first means operative during data transmission for detecting an aspect of the forward component of said RF signal;

second means operative during data transmission for detecting the same aspect of the reverse component of said RF signal;

means operative during data transmission, referenced to said



RF signal for timing the delay between detection of the aspect of the forward component of said RF signal and the aspect of the reverse component of said RF signal; and

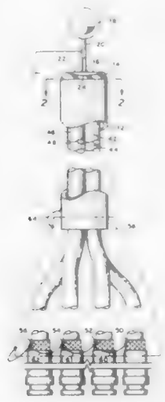
means responsive to the time delay for identifying the system component in which said impedance failure occured.

5,144,251

THREE-AXIS PARTICLE IMPACT PROBE

George E. Fasching; Nelson S. Smith, Jr., and Carroll E. Utt, all of Morgantown, W. Va., assignors to The United States Department of Energy, Washington, D.C.

Filed Apr. 2, 1991, Ser. No. 679,488
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—661 **10 Claims**



1. A three-axis particle impact probe comprising:

a tubular housing having disposed across one end thereof a layer of flexible, non-conducting material;

a shaft having an exposed impact sensing head fixedly mounted at one end thereof and a ground electrode fixedly mounted to and transverse to its other end, said ground electrode being secured to said flexible layer and arranged for cantilevered movement of the shaft and attached electrode in response to movement of the head produced by particle impact;

a plurality of sensing electrodes disposed in a planar array traversing the end of said housing adjacent to said flexible layer, said grounded electrode and said sensing electrodes being spaced apart on opposite faces of said flexible material and forming capacitors between the ground electrode and each of the sensing electrodes, the distance between the ground electrode and sensing electrodes being changeable responsive to particle impact;

means for exciting said sensing electrodes;

means for obtaining signal outputs responsive to changes in capacitance resulting from movement of the ground electrode; and

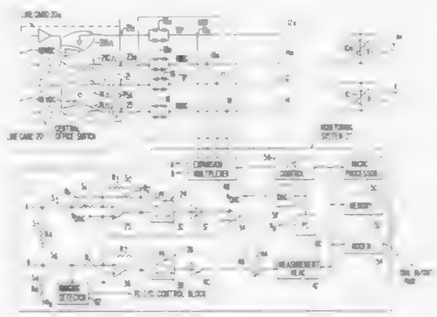
signal output processing means enabling x-, y-, and z- axis components of particle impact vectors to be determined.

5,144,252

METHOD AND APPARATUS FOR TRANSDUCER MEASUREMENTS ON A METALLIC PAIR

Richard L. Walsworth, Pittsford, and Edward K. Siu, Rochester, both of N.Y., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 27, 1990, Ser. No. 619,931
Int. Cl.[5] H04B *3/46*
U.S. Cl. 324—713 **20 Claims**



1. An arrangement for measuring the resistance of a transducer which is coupled across a pair of conductors that are each coupled through separate sets of blocking diodes to a line card, said conductors carrying a variable voltage, comprising:

means for iteratively measuring a voltage of a first one of the conductors to ground;

means for tracking said voltage from the first conductor to ground such that current flow is allowed through only one of said sets of blocking diodes; and

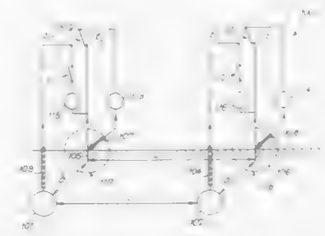
means for determining from the iteratively measured voltages a value of the resistance of the transducer.

5,144,253

METHOD AND APPARATUS FOR DETERMINING INTERACTIONS DUE TO DIRECT CURRENTS ON ADJACENT BURIED METAL STRUCTURES

Michel Blanchard, Estrees Saint Denis, France, assignor to Gaz De France, Paris, France

Filed Dec. 21, 1990, Ser. No. 631,319
Claims priority, application France, Dec. 27, 1989, 89 17281
Int. Cl.[5] G01R *27/08*
U.S. Cl. 324—715 **19 Claims**



1. Apparatus for determining the interactions due to direct currents on first and second adjacent buried metal structures, at least one of which is connected to a direct current source, such as a cathodic protection device, wherein the apparatus comprises:

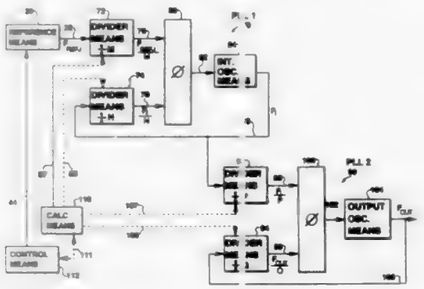
a) first and second metal calibrated specimen test pieces respectively made from materials analogous to those from which the first and second structures are made, said first and second specimen test pieces being placed in contact with the ground approximately over respective ones of said first and second buried structures in such a manner that the distance L' between the first and second specimen test pieces is substantially equal to the distance L between said first and second structures;
b) first and second reference electrodes disposed in the immediate proximity of respective ones of said first and second specimen test pieces;
c) first and second potential take off points which are isolated relative to ground and which are provided on respective ones of said first and second metal structures;
d) a first on/off switch connected between the first isolated potential take-off point and a first current measuring device itself connected to the first specimen test piece, and a second on/off switch connected between the second isolated potential take-off point and a second current measuring device itself connected to the second specimen test piece; and
e) a first single-pole changeover switch for selectively connecting one terminal of a first voltage measuring device whose other terminal is connected to the first reference electrode either to the said first potential take-off point or else to the said first specimen test piece, and a second single-pole changeover switch for selectively connecting one terminal of a second voltage measuring device whose other terminal is connected to the second reference electrode either to said second potential take-off point, or else to said second specimen test piece.

5,144,254

DUAL SYNTHESIZER INCLUDING PROGRAMMABLE COUNTERS WHICH ARE CONTROLLED BY MEANS OF CALCULATED INPUT CONTROLS

William G. Wilke, 24 Prescott St., Arlington, Mass. 02174

Filed Sep. 30, 1991, Ser. No. 769,108
Int. Cl.[5] H03L *7/00;* **H03K** *5/13*
U.S. Cl. 328—14 **18 Claims**



1. In a frequency synthesizer of a type employing an adjustable reference means, and a first PLL of known type locked thereto, and a second PLL of known type locked to the output of said first PLL, and a calculation and control means operatively connected to said first and second PLL's, a method for generating an output signal F_{out} from said second PLL, having a low noise, adjustable frequency, which is a close approximation to a requested frequency F_{req}, said method comprising the steps of:
(a) receiving a request for an output frequency F_{req};
(b) selecting a value F_{refj} within the frequency range of said adjustable reference means;
(c) calculating a plurality of integer pairs X_i, Y_i that, taken as a ratio X_i/Y_i, are approximations to the ratio F_{req}/F_{refj};
(d) factoring said X_i into two integer factors Q_i and N_i, whereby $X_i = Q_i * N_i$;
(e) factoring said Y_i into two integer factors P_i and M_i, whereby $Y_i = P_i * M_i$;
(f) selecting a pair X_k, Y_k, from among said plurality of pairs, with the largest value of Y_k and wherein each of said integer factors Q_k, N_k, P_k and M_k is respectively less than pre-specified maximum values Q_{max}, N_{max}, P_{max}, and M_{max};
(g) calculating a value, responsive to the equation: $err = -F_{req} - F_{out} = F_{req} - (N_k/M_k) * (Q_k/P_k) * F_{refj}$;
(h) comparing said calculated value to a pre-selected limit value, and upon the condition that said calculated value is larger than said limit value, selecting a new value of F_{refj}, and repeating steps (b) through (h); and upon the condition that said calculated value is smaller than said limit value, proceeding to step (i);
(i) adjusting said adjustable reference means to generate a reference signal of frequency F_{refj}, wherein F_{refj} is the reference frequency value in use when step (h) was satisfied;
(j) generating an intermediate signal FI in an intermediate oscillator in said first PLL, said intermediate oscillator responsive to a first control signal;
(k) sending said integer M_k to a first programmable divider responsive to said reference signal F_{refj}, wherewith to program its divide value, and sending said integer N_k to a second programmable divider responsive to said intermediate signal FI wherewith to program its divide value;
(l) dividing said reference signal F_{refj} by said integer M_k in said first programmable divider, to produce a divided signal (F_{refj}/M_k), and dividing said intermediate signal FI by said second integer N_k in said second programmable divider, to produce a second divided signal (FI/N_k);
(m) comparing said two divided signals in a first comparison means, to produce said first control signal that is responsive to the difference between F_{refj}/M_k and FI/N_k;
(n) controlling said intermediate oscillator by means of said first control signal to cause said first PLL to lock, and whereby $FI = N_k/M_k * F_{refj}$;
(o) generating an output frequency signal (F_{out}) in an output oscillator in said second PLL, said output oscillator responsive to a second control signal;
(p) sending said integer P_k to a third programmable divider responsive to said intermediate signal FI, wherewith to program its divide value, and sending said integer Q_k to a fourth programmable divider responsive to said output signal F_{out}, wherewith to program its divide value;
(q) dividing said intermediate signal FI by said integer P_k in said third programmable divider, to produce a divided signal (FI/P_k), and dividing said output signal F_{out} by said integer Q_k in said fourth programmable divider, to produce a second divided signal (F_{out}/Q_k);
(r) comparing said two divided signals in a second comparison means, to produce a second control signal that is responsive to the difference between FI/P_k and F_{out}/Q_k;
(s) controlling said output oscillator by means of said second control signal to cause said second PLL to lock, and whereby $F_{out} = Q_k/P_k * FI = Q_k/P_k * N_k/M_k * F_{refj}$.

5,144,255

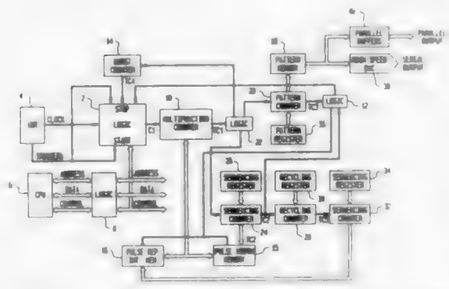
MULTIPLE SYNCHRONIZED AGILE PULSE GENERATOR

Jacob H. Malka, Fair Lawn, N.J., and Mordechai Friedlander, Chestnut Ridge, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 28, 1991, Ser. No. 783,461
Int. Cl.[5] H03K *5/13, 3/04;* **H03B** *19/00;* **G06M** *3/00*
U.S. Cl. 328—62 **15 Claims**

14. A multiple synchronized agile pulse generator, comprising:
first means for providing first controlling outputs;
first memory means for storing pulse width data;

second memory means for storing pulse repetition interval data;
the first and second memory means connected to the first means for alternately applying the stored pulse width data and the stored pulse repetition interval data thereto, with said first means providing the first controlling outputs in response to the applied data;
second means connected to the first means and responsive to the first controlling outputs therefrom for providing second controlling outputs;



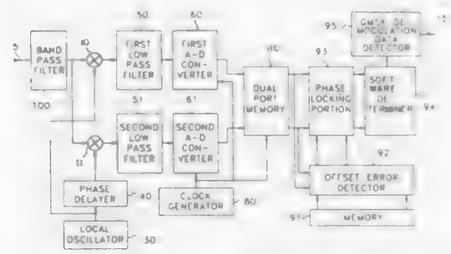
pattern counter means connected to the second means, with the second controlling outputs controlling the clocking rate of the pattern counter means so that said pattern counter means provides pulse pattern data;
third memory means connected to the pattern counter means for storing the pulse pattern data therefrom; and
means connected to the third memory means for accessing the stored pulse pattern data.

5,144,256

METHOD AND APPARATUS FOR DEMODULATING A GMSK SIGNAL

Mu-gil Lim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Jun. 28, 1991, Ser. No. 723,278
Claims priority, application Rep. of Korea, Dec. 31, 1990, 90-22760
Int. Cl.[5] H03D *3/00*
U.S. Cl. 329—302 **5 Claims**



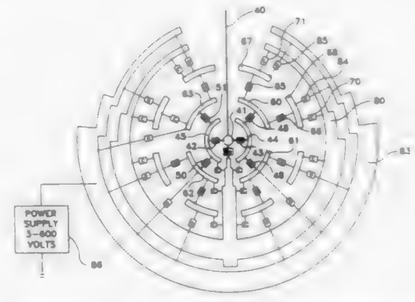
1. A method for demodulating a GMSK signal comprising:
a frequency converting step of shifting a received GMSK signal into a baseband and separating the shifted signal into I and Q component signals;
an A-D converting step of quantizing the I and Q component signals of the baseband separated in the frequency converting step and encoding the quantized I and Q component signals received to generate I and Q component data;
an offset error detecting step of checking the correlation between the I and Q component data generated in said A-D converting step and the standard waveform data to detect a slot interval and an offset error;
a phase locking step of selecting the I and Q component slot data by the slot interval information and the offset error amount detected in said offset error detecting step and compensating the offset error of the selected I and Q component slot data; and
software decision step of integrating a predetermined number of data among the I and Q component slot data compensated in the phase locking step and determining the I and Q component demodulation data according to the result of the integration.

5,144,257

DISTRIBUTED ARRAYS OF MICROELECTRONIC AMPLIFIERS

Kenneth S. Karsten, Jr., Bethlehem, and Frank F. Francisco, Easton, both of Pa., assignors to ITT Corporation, New York, N.Y.

Filed Sep. 30, 1991, Ser. No. 767,511
Int. Cl.[5] H03F *3/60*
U.S. Cl. 330—54 **24 Claims**



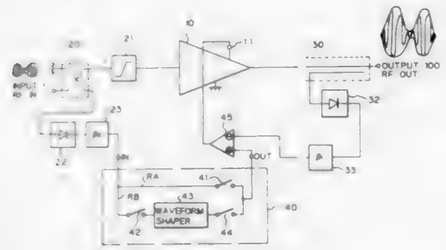
1. A distributed triode array for providing increased power operation at microwave frequencies, comprising:
a plurality of banks of vacuum microelectronic triodes each bank comprising a plurality of microelectronic triodes on an integrated circuit substrate wherein the plurality of triodes in each bank are interconnected by capacitive coupling devices formed in said substrate and including biasing means formed in said substrate, said plurality of banks arranged on said substrate according to a concentric pattern manifested in that there is a central bank of microelectronic triodes, with a first even number of banks of said plurality of banks disposed about said central bank on a first concentric pattern, with each bank in said first number of a segmented configuration and symmetrically disposed about said central bank, and with a second even number of banks greater than said first number disposed about a second larger concentric pattern and each bank in said second number of a segmented configuration and symmetrically disposed about said central bank and symmetrically disposed about said first even number of banks, an outer concentric coupling pattern disposed about said second concentric pattern and coupled to said first and second banks for receiving power from each of said concentric banks, and
a concentric biasing ring disposed about said outer coupling pattern and coupled to said biasing means for biasing each of said plurality of banks.

5,144,258

POWER AMPLIFIER SYSTEM FOR RADIO TRANSMITTER AND METHOD FOR USING THE SAME

Eiichi Nakanishi; Tetsuo Onodera, and Haruhiko Akiyama, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 729,601
Claims priority, application Japan, Jul. 19, 1990, 2-189439
Int. Cl.[5] H03G 3/20
U.S. Cl. 330—129 8 Claims



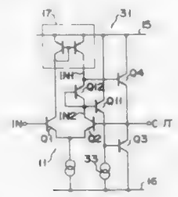
1. A power amplifier system comprising:
a non-linear power amplifier for amplifying an inputted RF signal, said non-linear power amplifier having a control terminal;
a means for obtaining an envelope signal of the inputted RF signal;
a means for obtaining an envelope signal of the outputted RF signal;
a means for receiving the envelope signal of the inputted RF signal and that of the outputted RF signal, obtaining a feedback voltage from the difference between the inputted envelope signal and the outputted envelope signal, and applying the feedback voltage to the control terminal; and
a burst control means interposed between the means for obtaining the envelope signal of the inputted RF signal and the means for obtaining the feedback voltage.

5,144,259

AMPLIFIER HAVING A PUSH-PULL OUT-PUT STAGE

Yoshihiro Yoshida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 1, 1991, Ser. No. 694,076
Claims priority, application Japan, May 10, 1990, 2-120597
Int. Cl.[5] H03F 3/45, 3/30
U.S. Cl. 330—255 12 Claims



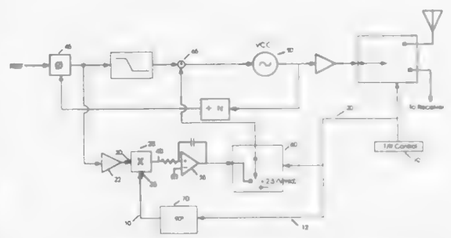
2. A push-pull output circuit for an amplifier having first and second out-puts, comprising:
first and second input terminals for receiving the first and second outputs of said amplifier;
an output terminal;
first and second potential sources;
a first circuit element connected between said first and second input terminals;
a first transistor of a first polarity type having a base coupled to said second input terminal, a collector directly connected to said first potential source, and an emitter;
a constant current source coupled between the emitter of said first transistor and said second potential source;
a second transistor of a second polarity type having a base coupled to the emitter of said first transistor, a collector coupled to said second potential source, and an emitter coupled to said output terminal; and
a third transistor of the first polarity type having a base coupled to said first input terminal, a collector coupled to said first potential source, and an emitter coupled to said output terminal.

5,144,260

METHOD AND APPARATUS FOR PERTURBATION CANCELLATION OF A PHASE LOCKED OSCILLATOR

Bradley C. Stribling, Danville, and Roger J. O. Eline, Los Gatos, both of Calif., assignors to Rose Communications, Inc., Santa Clara, Calif.

Filed Sep. 25, 1991, Ser. No. 765,435
Int. Cl.[5] H03L 7/16
U.S. Cl. 331—10 18 Claims



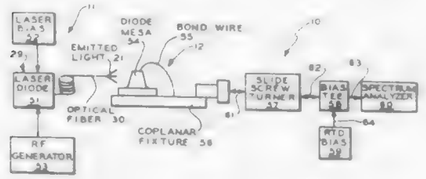
1. An anti-pulling loop mechanism for the cancellation of deleterious perturbations caused by a perturbating signal to the frequency of a phase locked oscillator, said phase locked oscillator comprising a controlled oscillator which generates an oscillating signal output in accordance with a control signal input, a phase detector to detect the difference between a reference signal and the oscillating signal output, the control signal input generated by a control signal means and dependent upon the difference detected by the phase detector, said anti-pulling loop mechanism comprising:
an amplifier means coupled to receive the output phase detector of the phase locked oscillator to extract and amplify the signal present at the phase detector's output which evidences the perturbations prior to input to the synchronous amplitude detector;
a reference signal generated from the perturbating signal;
a synchronous amplitude detector coupled to receive the output of the amplifier and the reference signal to determine the magnitude and polarity of the amplified signal with reference to the reference signal;
a controllable signal injection circuit to supply a cancellation signal to the control signal input of the oscillator;
an integrator circuit coupled to receive the output of the synchronous amplitude detector and to generate a signal to control the signal injection circuit, said integrator circuit establishing a steady state operating point at the minimum perturbation;
a combining means coupled to receive the cancellation signal and the control signal of the phase locked oscillator to generate a combined signal of the cancellation signal and the control signal output to the oscillator;
whereby the oscillator is controlled minimizing errors caused deleterious perturbations.

5,144,261

OPTICALLY INJECTION LOCKED RESONANT TUNNEL DIODE OSCILLATOR

James F. Harvey, Tinton Falls; Robert A. Lux, Toms River; Thomas P. Higgins, Tinton Falls; Arthur Paolella, Howell, and Dana J. Sturzebecher, Tinton Falls, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 15, 1992, Ser. No. 821,729
Int. Cl.[5] H03L 7/00
U.S. Cl. 331—66 9 Claims



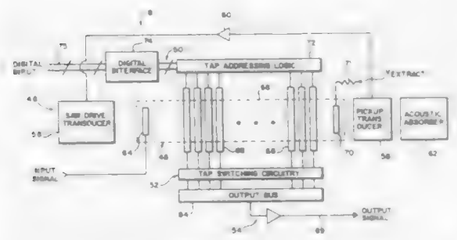
1. An injection locked oscillator comprising:
an intensity modulated optical signal delivery system;
oscillator circuitry; and
a resonant tunnel diode incorporated in the oscillator circuitry, the resonant tunnel diode being exposed to an intensity modulated optical signal delivered by the optical signal delivery system;
whereby the resonant tunnel diode is biased such that it oscillates at a free running frequency and the free running oscillation of the resonant tunnel diode is capable of being locked to the phase and frequency of the intensity modulated optical signal when the modulated optical signal approaches the free running oscillation frequency.

5,144,262

ACOUSTIC CHARGE TRANSPORT SELECTABLE DELAY LINE AND DELAY LINE OSCILLATOR FORMED THEREWITH

Billy J. Hunsinger, Urbana, Ill., assignor to Electronic Decisions Incorporated, Urbana, Ill.

Filed Oct. 10, 1989, Ser. No. 420,109
Int. Cl.[5] H03B 5/20; H03H 9/68; H01L 41/117
U.S. Cl. 331—107 A 29 Claims



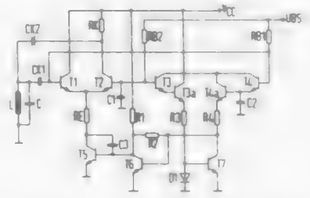
1. A delay device, comprising:
a) a semi-conductor chip;
b) an acoustic charge transport channel disposed on said chip and having first and second opposite ends and a longitudinal axis;
c) means disposed at said first end of said channel for injecting an electronic signal into said channel;
d) means coupled to said channel for generating a single frequency, large amplitude surface acoustic wave through said channel along a propagation direction from said first end to said second end for thereby transporting the electronic signal through said channel;
e) a plurality of means operable associated with said channel end disposed along the propagation direction of the surface acoustic wave for non-destructively sensing the electronic signal as the electronic signal is transported by the surface acoustic wave;
f) means monolithically disposed on said chip and operably connected to said sensing means for preselecting any one of said sensing means, thereby extracting a delayed replica of the signal from said channel;
g) means operably connected to said preselecting means for processing the extracted delayed replica of the signal for generating an output; and
h) said generating means comprising a delay line oscillator operably coupled to said channel.

5,144,263

METHOD FOR AMPLITUDE CONTROL OF AN OSCILLATOR OUTPUT SIGNAL, AND CIRCUIT CONFIGURATION FOR PERFORMING THE METHOD

Josef Fenk, Eching/Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 717,988
Claims priority, application European Pat. Off., Jun. 20, 1990, 90111680.6
Int. Cl.[5] H03L 5/00
U.S. Cl. 331—109 10 Claims



1. A method for controlling the amplitude of the output signal of an oscillator including at least one oscillator transistor having emitter and base leads, a controllable current source connected between the emitter lead of the at least one oscillator transistor and a supply potential, the current source being controllable by a controlled variable, and a frequency-determining element connected at least to the base lead of the at least one oscillator transistor, which comprises supplying a direct voltage variation at the emitter lead of the at least one oscillator transistor resulting from a change in amplitude of a signal applied to the base lead of the at least one oscillator transistor as the controlled variable for the current of the controllable current source.

5,144,264

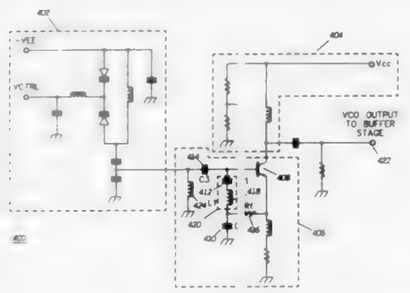
WIDEBAND VOLTAGE CONTROLLED OSCILLATOR HAVING OPEN LOOP GAIN COMPENSATION

Thomas C. K. Chong, and Prakash Chacko, both of Celugor/-Penang, Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1991, Ser. No. 786,697
Int. Cl.[5] H03B 5/00
U.S. Cl. 331—117 R 12 Claims

1. A voltage controlled oscillator for operating within a predetermined operating frequency range, comprising:
an active element; and
feedback means coupled to the active element for providing feedback to the active element, the feedback means including a feedback compensation means for decreasing the feedback ratio (β) of the feedback means as the operat-

ing frequency of the voltage controlled oscillator is increased and for providing for a substantially constant open



loop gain over the predetermined operating frequency range.

5,144,265

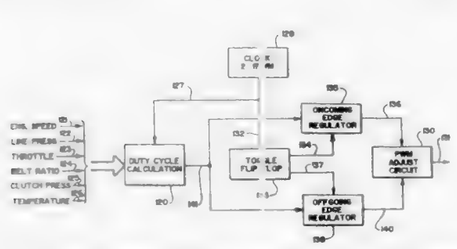
PULSE WIDTH MODULATION TECHNIQUE

Werner P. Petzold, Harwood Heights, Ill., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Division of Ser. No. 555,715, Jul. 19, 1990. This application Dec. 5, 1991, Ser. No. 803,173

Int. Cl.[5] H03K *7/08*

U.S. Cl. 332—109 **5 Claims**



1. A control system for regulating the duty cycle of a pulse train by regulating the oncoming and offgoing edges of each pulse in the train as a function of preselected data, including:

a pulse width adjust circuit, having a first input connection for receiving a first control signal to determine the timing of the oncoming edge of a given pulse, a second input connection for receiving a second control signal to determine the timing of the offgoing edge of said given pulse, and an output connection for providing the pulse train in accordance with received first and second control signals;

a duty cycle calculation circuit, having input means for receiving the preselected data and an output connection; and

a timing circuit, coupled between the output connection of the duty cycle calculation circuit and the input connections of the pulse width adjust circuit, operable to cause the duty cycle calculation circuit to generate a desired duty cycle signal, and to pass the desired duty cycle signal alternately to the first and second input connections of the pulse width adjust circuit, such that the duty cycle signal is calculated and utilized twice in the generation of each pulse in the pulse train.

5,144,266

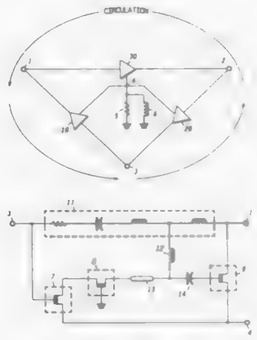
BROADBAND HIGH FREQUENCY ACTIVE MMIC CIRCULATOR

Richard M. Dougherty, Scottsdale, and Stephen W. Boser, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 4, 1991, Ser. No. 650,120

Int. Cl.[5] H03H *11/38*

U.S. Cl. 333—1 **12 Claims**



1. An active monolithic microwave integrated circuit (MMIC) signal circulator capable of high frequency performance with contourable bandpass characteristics, the active MMIC signal circulator having a plurality of at least three input/output ports and comprising:

a first cascode network, wherein the first cascode network comprises a plurality of at least two transistors, the first cascode network including a first node coupled to the first input/output port, a second node coupled to the third input/output port, and a common node;

a second cascode network, wherein the second cascode network comprises a plurality of at least two transistors, the second cascode network including a first node coupled to the third input/output port, a second node coupled to the second input/output port, and a common node;

a third cascode network, wherein the third cascode network comprises a plurality of at least two transistors, the third cascode network including a first node coupled to the second input/output port, a second node coupled to the first input/output port, and a common node; and

common feedback means coupled to each of the common nodes of the first cascode network, the second cascode network, and the third cascode network.

5,144,267

VARIABLE SLOPE NETWORK FOR OFF-PREMISES CATV SYSTEM

Lamar E. West, Jr., Maysville, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 446,603, Dec. 6, 1989. This application Nov. 28, 1990, Ser. No. 619,630

Int. Cl.[5] H03H *7/03, 7/07*

U.S. Cl. 333—28 R **20 Claims**

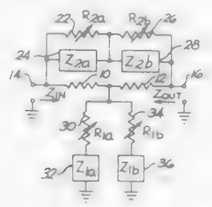
1. A controlled compensation network having an input terminal and an output terminal comprising:

an impedance connected between the input terminal of the network and a junction node;

an impedance connected between said junction node and the output terminal;

a bridge impedance connected between the input terminal and the output terminal comprising the series combination of a first controlled resistance connected in parallel with a first impedance and a second controlled resistance connected in parallel with a second impedance;

a shunt impedance connected between said junction terminal and ground comprising the parallel combination of a third controlled resistance connected in series with a third impedance and a fourth controlled resistance connected in series with a fourth impedance; and



means for controlling the resistances of said first and third resistances in the opposite direction to said second and fourth resistances.

5,144,268

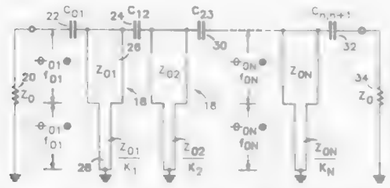
BANDPASS FILTER UTILIZING CAPACITIVELY COUPLED STEPPED IMPEDANCE RESONATORS

John H. Weidman, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 382,045, Jul. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 132,756, Dec. 14, 1987, abandoned. This application Jun. 20, 1991, Ser. No. 722,397

Int. Cl.[5] H01P *1/203*

U.S. Cl. 333—204 **1 Claim**



1. A microstrip medium bandpass filter comprising:

a plurality of lumped element capacitor means;

a plurality of distributed microstrip stepped impedance resonator means wherein each of said plurality of distributed microstrip stepped impedance resonator means comprises:

first and second transmission line means of diverse impedance and of equal length;

said first transmission line means coupled to said plurality of lumped element capacitor means;

said first and second transmission line means coupled to each other in series;

said second transmission line means coupled to an electric ground; and

said plurality of distributed microstrip stepped impedance resonator means coupled in parallel to each other by said plurality of lumped element capacitor means.

5,144,269

DIELECTRIC FILTER HAVING EXTERNAL CONNECTION FORMED ON DIELECTRIC SUBSTRATE

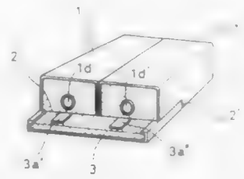
Atsushi Itoh, Daitoh, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 19, 1991, Ser. No. 671,615

Claims priority, application Japan, Mar. 20, 1990, 2-71651; Jul. 24, 1990, 2-196572

Int. Cl.[5] H01P *1/202*

U.S. Cl. 333—206 **11 Claims**



1. A dielectric filter comprising:

a plurality of coaxial resonators; and

external connection means,

each said coaxial resonator including

a dielectric block having an outer peripheral surface and inner peripheral surfaces parallel to a common axis and having first and second end faces crossing over said common axis,

first and second conductive layers formed respectively on said outer peripheral surfaces and said inner peripheral surfaces,

a third conductive layer formed on said second end face and connecting the first and second conductive layers, and

a depressed part for receiving said external connection means and formed in juxtapose with said second conductive layers by removing at least a portion of the first conductive layer and the dielectric block on said outer peripheral surface in the vicinity of said first end face,

said external connection means including

an dielectric substrate, and

an electrode for an external connection formed on said dielectric substrate.

5,144,270

ELECTROMAGNETIC POWER RELAY WITH ACTUATION SLIDE

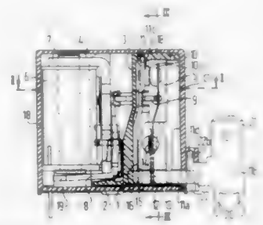
Helmut Schedele, Diessen, and Franz Rappl, Feldkirchen Westerham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 3, 1991, Ser. No. 725,642

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1990, 9013221[U]

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—80 **7 Claims**



1. An electromagnetic power relay, comprising:

a set of contacts including at least one stationary cooperating contact element and a movable contact element, said

movable contact element being a leaf spring clamped at one end relative to its longitudinal extent;
a magnetic system having an armature movable by selective application of electrical energy to said magnetic system; and
a slide connected between said armature and said movable contact element by which said armature moves said movable contact element from a quiescent position to a working position, said slide being movable in a direction generally perpendicular to the longitudinal extent of said leaf spring, said slide exerting force on a broad side of said leaf spring only at an edge region of said leaf spring, said slide being card-shaped and an end of said slide facing toward said leaf spring being substantially U-shaped with two outside legs, said substantially U-shaped end of said slide including a short actuation section adjacent one of said two outside legs, said short actuation section being substantially parallel to a surface of said leaf spring, said substantially U-shaped end of said slide also including a free edge section that is free of said leaf spring, said free edge section being adjacent said short actuation section.

5,144,271

ELECTROMAGNETIC POWER RELAY

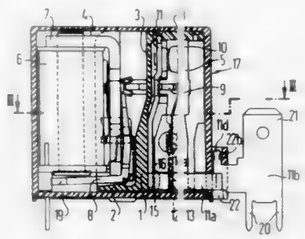
Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 3, 1991, Ser. No. 725,643

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1990, 9013223[U]

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—83 **2 Claims**



1. An electromagnetic power relay, comprising:
a housing having:
a base member of an insulating material defining a contact space and a magnetic system space, said base member defining receptacle slots extending, from the outside in two opposite directions, and
a cap mounted over said base member to substantially enclose the relay therewithin;
a magnetic system mounted in said magnetic system space of said housing;
a spring carrier plugged into one of said receptacle slots in said base member;
a set of contacts including a contact spring and a cooperating contact element in said contact space of said housing, said contact spring and said cooperating contact element being secured generally parallel to one another and generally perpendicular relative to a bottom side of said housing, said cooperating contact element being plugged into one of said receptacle slots in said base member, said contact spring being fastened to said spring carrier;
a first terminal rail electrically connected to said contact spring and extending along an outside of said contact space between said base member and said cap to an end face of said housing, said first terminal rail having an end section extending beyond the end face of said housing;
a second terminal rail electrically connected to said cooperating contact element and extending along an outside of said contact space between said base member and said cap to the end face of said housing, said second terminal rail having an end section extending beyond the end face of said housing, said second terminal rail being substantially parallel to said first terminal rail;
downwardly directed solder terminals and upwardly directed plug terminals formed on said end sections of each of said first and second terminal rails;
said first and second terminal rails each being crimped inwardly toward one another at bend regions adjacent the end face of said housing so that said end sections of each of said first and second terminals are at an insulating distance from respective planes of opposite outside surfaces of said housing;
pockets on said cap at the end face of said housing, said bend regions of said first and second terminal rails being contained within said pockets, said pockets having openings from the top and openings from the bottom; and
fastening projections extending from inwardly offset portions of said end sections of said terminal rails in a region of said pockets, said fastening projections being anchored in said pockets.

5,144,272

ELECTROMAGNETIC SOLENOID FOR OIL HYDRAULIC CONTROL VALVES

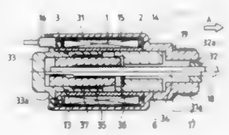
Toshihiko Nishimura, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,256

Claims priority, application Japan, Apr. 11, 1990, 2-39286[U]

Int. Cl.[5] H01F *7/08;* **F16K** *31/02*

U.S. Cl. 335—255 **7 Claims**



1. An electromagnetic solenoid for oil hydraulic control valves comprising:
an electromagnetic coil wound around a bobbin;
a case for accommodating said electromagnetic coil, said case being made of a magnetic material;
a cylindrical fixed iron core secured to a front portion of said case;
a sleeve bearing being secured to an inside diameter portion on the front end side of said case and having an axially extending oil flow notch member at an outside diameter portion thereof;
a magnetic path iron core being coupled with the rear end side of said case;
an operating rod passing through an inside diameter portion of said fixed iron core with a gap, a front end portion of said operating rod extruding while supported by said sleeve bearing so as to be movable in an axial direction of said electromagnetic solenoid, an outside diameter portion on the rear end side of said operating rod having an axially extending oil flow notch member;
a hollow movable iron core including a first inside diameter portion on the rear end side of which being secured to said outside diameter portion of said operating rod and a second inside diameter portion on the front end side of said movable iron core, said second inside diameter portion being formed so as to have an oil flow gap with respect to said outside diameter portion of said operating rod;
a magnetic sleeve bearing secured to the inside diameter of said magnetic path iron core to support said hollow movable iron core; and
a nonmagnetic stopper washer passing through said operating rod and inserted into an axially extending air gap formed between said fixed iron core and said movable iron core, said nonmagnetic stopper washer having an oil flow notch for allowing oil to flow in an axial direction of said electromagnetic solenoid.

5,144,273

HIGH LIMIT THERMOSTAT APPARATUS

Kenneth L. Hayden, Bardstown, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 15, 1991, Ser. No. 731,186

The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.

Int. Cl.[5] H01H *37/04, 37/52*

U.S. Cl. 337—380 **7 Claims**

1. A fluid flow temperature control comprising an integral, elongated housing formed of electrically insulative material having a mounting plate with first and second spaced, parallel slots extending therethrough, the housing having front, rear and side walls extending from the mounting plate to an open distal end, first and second pairs of slots formed in the housing walls in communication with the open distal end and having an end surface, the slots of each pair being aligned in facing relation with each other, first and second control terminals having an elongated main body portion and each having a quick connect blade formed at a first end of the control terminal which is offset from the main body portion by a double ninety degree bend, the control terminals having a second end, each control terminal received in a respective slot of the mounting plate with the blade extending outwardly from the mounting plate and the main portion received in the housing extending along the side walls, first and second elongated extension terminals having first and second opposite ends, the first end of each extension terminal received in a respective pair of slots bottomed out against the end of their respective pair of slots and being welded to a respective second end of the control terminals, a thermostatic switch having first and second spaced terminals, the second end of the extension terminals being welded to the respective terminals of the thermostatic switch, the double ninety degree bend forming a laterally extending portion which extends parallel and contiguous to the mounting panel for a selected distance whereby the extension terminals are held in place bottomed out against the end of their respective pair slots by the laterally extending portions which extend parallel to the mounting panel without the use of any fasteners.

5,144,274

SEALED VARIABLE RESISTOR

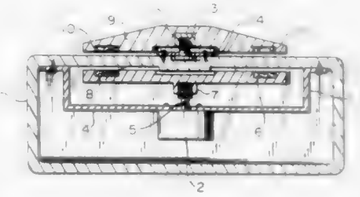
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Nov. 28, 1990, Ser. No. 618,795

Claims priority, application Japan, Nov. 28, 1989, 1-137428[U]

Int. Cl.[5] H01C *10/14, 10/32*

U.S. Cl. 338—12 **3 Claims**



1. A device to effect low-frequency electrotherapy in a humid environment, comprising:
an active electrode;
a dispersive electrode;
a low-frequency oscillator having output terminals connected with said electrodes;
a battery connected with said low-frequency oscillator for its energization;
a variable resistor with a shaft, said variable resistor being connected between the output terminals of said oscillator and electrodes;
a sealing container in which said low-frequency oscillator, battery and variable resistor are enclosed;
a dial knob in a circular plate form, said dial knob being rotatably provided outside said container;
a first pair of magnets, both magnets being separately attached to said dial knob;
an arm member in a circular plate form, said arm member being rotatably provided inside said container and centrally attached to the shaft of said variable resistor; and
a second pair of magnets, both magnets being separately attached to said arm member such that said arm member moves in association with the rotation of said dial knob.

5,144,275

POSITIONING CYLINDER, ESPECIALLY FOR SUBTERRANEAN MINING

Lothar Sebastian, Bochum; Karl-Heinz Berger, Herten-Langenbochum; Friedel Amling, Gelsenkirchen-Horst, and Gerhard Hecken, Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Jan. 30, 1991, Ser. No. 647,822

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003151

Int. Cl.[5] H01C *13/00*

U.S. Cl. 338—67 **4 Claims**

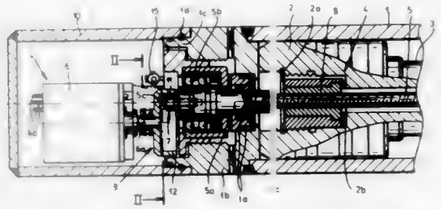
1. A positioning cylinder assembly, especially for subterranean mining, comprising:
a fluid-operated cylinder, said cylinder formed with cylindrical walls along an axial direction;
a piston having piston walls in slidable contact with said cylinder walls axially displaceable in said cylinder and having a piston rod, one of said cylinder and said piston being connectable to a load; and
position-measuring means for measuring a displacement of said piston relative to said cylinder, said position-measuring means comprising:
a threaded spindle having a predetermined pitch and rotatable relative to said cylinder along a spindle axis and a nut threadedly engaging said spindle, said nut and

said spindle being relatively axially displaced upon displacement of said piston in said cylinder to rotate said spindle upon axial displacement of said piston,

a rotary potentiometer on said cylinder rotatable to signal displacement of said piston and having a limited rotary stroke,

a friction-wheel transmission having an input-rotation-/output-rotation ratio interconnecting said spindle and said potentiometer for matching the pitch of said spindle with the rotary stroke of said potentiometer and additionally forming a slip clutch between said spindle and said rotary potentiometer; and

a rocker carrying said rotary potentiometer and pivotal about an axis parallel to said spindle axis, and a spring connected to said rocker providing tension thereunto.



5,144,276

ROTARY POTENTIOMETER

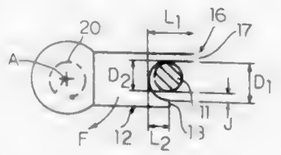
Patrice Bertin, Mery-sur-Oise, and Roger Texier, La Courneuve, both of France, assignors to Valeo, Paris, France

Filed Apr. 10, 1990, Ser. No. 506,814

Claims priority, application France, Apr. 13, 1989, 89 04890

Int. Cl.[5] H01C *10/32*

U.S. Cl. 338—162 **8 Claims**



1. A rotary potentiometer acting as a sensor comprising a moveable finger, a lever, means mounting the lever rotatably and in contact with said finger, whereby the lever acts as a follower member adapted to the movement of the said finger, and resilient return means rotatably biasing the lever permanently towards the finger, wherein the lever is in the form of a fork comprising a first arm adapted to lie in contact with the moveable finger which is to be followed and a second arm, together adapted to lie on either side of the finger, the first arm being to the rear of the second arm in relation to the direction of rotation in which the lever is biased by the resilient return means, and the first arm being longer than the second arm, and wherein, when a relationship has been established between the displacement of the finger and calibrated electrical control pulses, each corresponding to a particular elementary displacement, the distance between the first and second arms of the lever is made greater than a corresponding dimension of said finger by an amount lying between one and two times said elementary displacement in such a way that the signal delivered by the potentiometer remains stationary during an electrical pulse, while its normal course is resumed on the next following electrical control pulse and it may be deduced from this that the said lever of said potentiometer is jammed and that this must be corrected.

5,144,277

SEALING STRUCTURE FOR ELECTRICAL PARTS

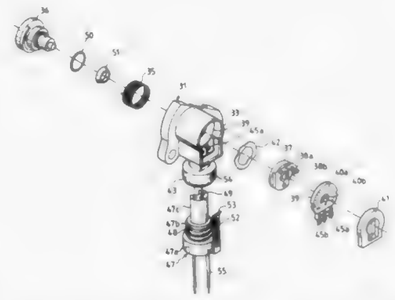
Kanji Ishihara, and Tsumoru Oka, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 9, 1991, Ser. No. 697,565

Claims priority, application Japan, May 11, 1990, 2-48540[U]

Int. Cl.[5] H01C *10/32, 10/36*

U.S. Cl. 338—164 **3 Claims**



1. A sealing structure suitable for use in electrical parts, which comprises:

a casing having one end thereof defined as an opening face, an attachment hole defined in the other end thereof, and a hollow cylindrical body formed therein which extends at right angles to the side of said casing, said casing further having an air passage which is defined in the side thereof and communicates with a hollow portion of said cylindrical body;

a driving shaft having one end projecting from said attachment hole and rotatably mounted within said casing;

a sliding-element receiver attached to the other end of said driving shaft and rotated in response to the rotation of said driving shaft;

an insulating substrate disposed adjacent to said sliding-element receiver in said casing and in an opposing relationship thereto and having a conductive pattern formed on the surface of said insulating substrate, said conductive pattern disposed in an opposing relationship to said sliding-element receiver;

sliding elements mounted on said sliding-element receiver in such a manner that said sliding elements are brought into sliding contact with said insulating substrate in a face-to-face manner; and

a connector having contacts whose outer side is provided with a sealing member mounted thereon and whose tip portions are received with terminals fixed to the conductive pattern inserted therein;

whereby a cover is fitted onto said opening face of said casing and a filler material is charged into a region between said cover and the inner-wall face of said casing, and an opening face of said cylindrical body is sealed tight with said sealing member after press-fitting of said connector into said cylindrical body.

5,144,278

VARIABLE IMPEDANCE DEVICE AND CIRCUIT FOR SENSING ADJUSTMENT THEREOF

Robin C. Moseley, Allentown; Jonathan A. Barney, Whitehall, both of Pa., and Arjuna Karunaratne, Union City, Calif., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 1, 1989, Ser. No. 388,185

Int. Cl.[5] H01C *10/50*

U.S. Cl. 338—198 **19 Claims**

1. A combination variable impedance device and switch comprising, in combination:

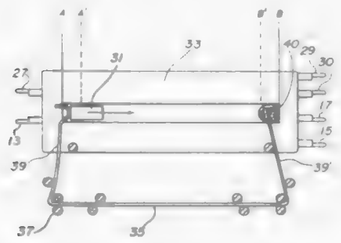
(a) an extended resistive element,

(b) an extended switching element, substantially co-extensive with said resistive element, and including alternating conductive and substantially non-conductive regions, said conductive regions being electrically connected,

(c) at least one extended conductive element, substantially co-extensive with said resistive element, and

(d) conductive sliding means to electrically connect said at least one conductive element to said resistive element and said switching element, respectively, at a selectable point along their extent

whereby movement of said conductive sliding means causes the resistance between at least one end of said resistive element and said conductive element to vary and at the same time causes the conductive state between said switching element and said conductive element to alternate.



5,144,279

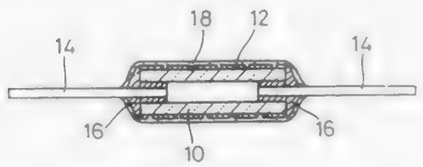
RESISTOR ELEMENT WITH THIN POROUS METALLIC LAYER COVERED WITH GLASS COATING

Yasuhito Yajima, and Hiroshi Nakajima, both of Nagoya, Japan, assignors to NGK Insulators, Inc., Japan

Filed May 24, 1991, Ser. No. 705,652

Int. Cl.[5] H01C *1/02*

U.S. Cl. 338—270 **8 Claims**



1. A resistor element for determining a parameter, comprising:

a ceramic support having a bearing surface;

an electrically resistive metallic layer formed on said bearing surface of said ceramic support, said metallic layer having a plurality of pores which extend from an outer surface of said metallic layer to said bearing surface of said ceramic support, each of said pores having an area which is not smaller than that of a circle having a diameter of 1μm, an average spacing between adjacent ones of said pores being not larger than 5μm; and

a glass coating covering said metallic layer.

5,144,280

BI-DIRECTIONAL MULTI-FREQUENCY RIPPLE CONTROL SYSTEM

Peter M. Foord, Wattle Park, Australia, assignor to The Electricity Trust of South Australia, Australia

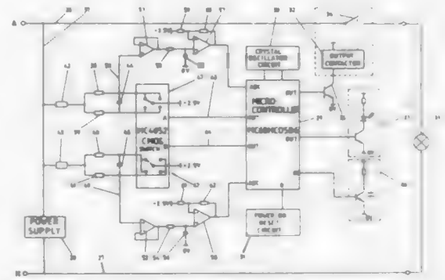
Continuation-in-part of Ser. No. 89,663, Aug. 24, 1987, Pat. No. 4,868,539, and a continuation-in-part of Ser. No. 723,615, Apr. 15, 1985, abandoned. This application Aug. 4, 1989, Ser. No. 389,528

Claims priority, application Australia, Apr. 17, 1984, PG4614

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] H04M *11/04*

U.S. Cl. 340—310 A **10 Claims**



1. In a ripple control system for an alternating current electric power distribution network which comprises a transmitter for transmitting a code and a receiver for receiving said code, said transmitter being coupled to the distribution network to superimpose a signal on the power frequency waveform as a sequence of waveform distortions, improvements comprising:

frequency control means to accurately generate closely spaced frequencies in the transmitter to enable use of multi-frequency codes, said frequency control means comprising an inductance/capacitance resonant combination, a transmitter crystal oscillator, a transmitter programmable frequency divider and electronic switches between the crystal oscillator and the resonant combination, operation of the switches being controlled by the oscillator the frequency of which is selectively divided by the programmable frequency divider to a frequency lower than the resonant frequency combination,

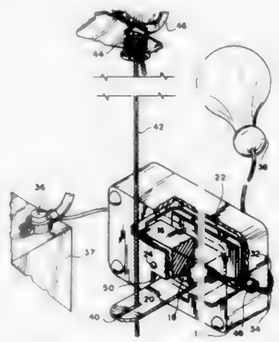
the receiver comprising an input detector circuit having two synchronous filters squaring and summing means, a receiver crystal oscillator, a receiver programmable frequency divider and discrimination means, the synchronous filters being 90 degrees out of phase with each other and driven by frequencies derived from the receiver crystal oscillator by the operation of the frequency divider,

the squaring and summing means squaring and summing the outputs of the synchronous filter thus forming a non-phase sensitive detector, and said discrimination means comprising a microcontroller coupled to the output of each said synchronous filter to be responsive to the magnitude of output of the non-phase sensitive detector, and to zero crossings of the synchronous filters outputs such that signal rejection occurs when

(a) said non-phase sensitive output magnitude is below a set threshold, or

(b) the time between successive zero crossings of either one of said synchronous filter outputs is less than a set minimum.

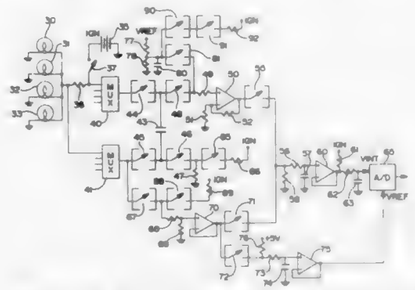
5,144,281
HOOD ORNAMENT THEFT ALARM
Norman E. Peterson, 1470 Harper Rd. #12, Mason, Mich. 48854
Filed Aug. 23, 1990, Ser. No. 571,105
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—426 11 Claims



1. A hood ornament alarm for a hood ornament attached to a hood with a resilient means extending through a hole in said hood to retain said ornament in place, said hood ornament alarm comprising:
switch housing means attached underneath said hood of an automobile;
switch means contained within said switch housing means:
mounting means for attaching said hood ornament alarm underneath said hood of said automobile;
switch activating means for activating said switch means;
a lever attached to said switch housing means and adjacent to said switch activating means, said lever containing a vertical portion and a horizontal portion;
spring means for biasing said lever in a de-activated position wherein said spring means are axially disposed about said mounting means, said spring means disposed between said vertical portion of said lever and said switch means;
connection means for connecting said lever to said resilient means;
electrical contact means for connecting said switch means to a vehicle power point and a vehicle horn;
whereby when said hood ornament is deflected or pulled away from said automobile, said switch means will activate thereby completing a circuit and sounding said vehicle horn.

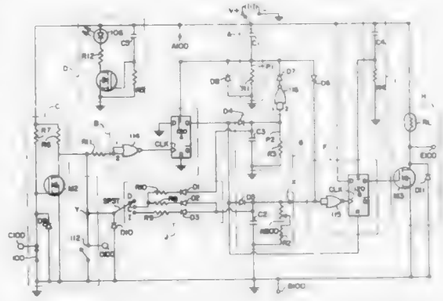
5,144,282
ADAPTIVE LAMP MONITOR WITH FIRST AND SECOND COMPARISON RATES
Gregory E. Sutterlin, Wexford, Pa.; Samuel Lorincz, Boardman, and Charles E. Vink, Niles, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 18, 1991, Ser. No. 643,383
Int. Cl.[5] B60Q *11/00*
U.S. Cl. 340—458 15 Claims

1. Lamp monitor apparatus for a vehicle lamp circuit having one or more lamps connected in parallel through a lamp switch to an electric power source, the lamp monitor apparatus comprising, in combination:
first means for sensing the value of an electrical parameter varying with total lamp current in the lamp circuit when the lamp switch is closed to energize the lamps;
second means for repeatedly comparing, at a first rate, the sensed value with a first predetermined percentage of a learned reference and signaling a lamp outage if the sensed value does not exceed the first predetermined percentage; and
third means for repeatedly comparing, at a second rate



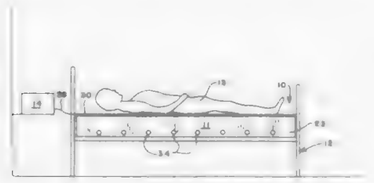
slower than the first rate, the sensed value with the learned reference and adjusting the learned reference by an increment toward the sensed value when no lamp outage is signaled.

5,144,283
ENERGY EFFICIENT ALARM SYSTEM AND REGULATIVE CENTRAL CONTROL UNIT
Kenneth P. Arens, 1612 Holley St., Holmen, Wis. 54636, and Brian W. Murphy, Silver Springs, Md., assignors to Kenneth P. Arens, Holmen, Wis.
Filed Jun. 18, 1990, Ser. No. 539,979
Int. Cl.[5] G08B *29/00*
U.S. Cl. 340—506 14 Claims



1. An alarm system operated under a low rate of power consumption and regulated by a central control unit equipped to monitor multiple sensory devices operatively associated therewith and to regulatively trigger an alarm signal in response to sensing signals detected by said sensing devices, said system comprising:
A) sensing means for detecting and emitting a sensing signal in response to an environmental disturbance;
B) a central control unit for receiving and monitoring the sensing signal which unit includes:
1) first circuit means for generating a first control signal in response to sensing means;
2) alarm detection means for outputting an alarm detection signal in response to said first control signal;
3) means for outputting an alarm triggering signal in response to said alarm detection signal; and
4) second circuit means responsive to said alarm triggering signal for generating an alarming signal; and
C) a source of D.C. power for powering said control unit;
with said means for generating a first control signal comprising a normally off mosfet, said mosfet having a gate, a source, and a drain, said mosfet having its gate connected to said source of D.C. power and its drain connected to said alarm detection means, at least one intrusion sensing device having a normally closed switch connected to the gate of said mosfet, at least one intrusion sensing device having a normally open switch connected to the drain of said mosfet, whereby said first control signal will be generated in response to an intrusion detected by any of said intrusion sensing devices.

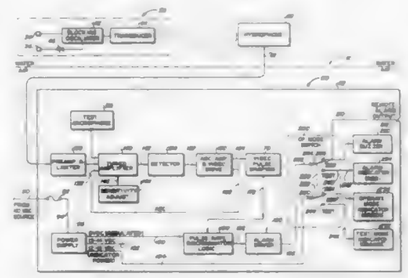
5,144,284
PATIENT-MONITORING BED COVERING DEVICE
Rawlings H. Hammett, P.O. Box 307, Grandview, Mo. 64030
Filed May 22, 1991, Ser. No. 704,113
Int. Cl.[5] G08B *23/00*; A61F *5/48*
U.S. Cl. 340—573 6 Claims



1. A bed covering device adapted to cover a mattress and detect urination and movement of a person lying thereupon, said device being adapted for use with a monitoring device capable of detecting closed- and open- circuit conditions and suitably recording signals and alarming an attendant, said bed covering device comprising:
a) a fitted bedsheet having a perimeter adapted to embrace the edges of said mattress,
b) a waterproof compliant detection sheet having upper and lower surfaces and a border attached to said fitted bedsheet adjacent the perimeter thereof, said detection sheet adapted to be interposed between said fitted sheet and said person,
c) compliant flat moisture detection means removably associated with the upper surface of said detection sheet, said detection means having electrical characteristics that change upon contact with an aqueous fluid,
d) compliant flat pressure sensitive means disposed upon the lower surface of said detection sheet for detecting compressive force exerted by said person, and
e) electrical connector means emergent from said moisture detection means and said pressure sensitive means and configured to connect in modular fashion with said monitoring device and alarm.

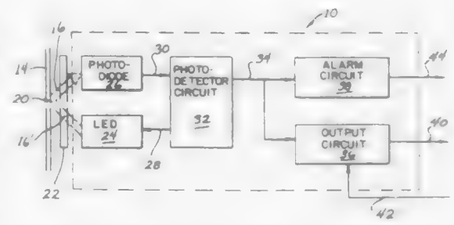
5,144,285
PULSED ULTRASONIC SWIMMING POOL ALARM APPARATUS
Milton W. Gore, 16036 N. 47th Dr., Maricopa County, Glendale, Ariz. 85306
Filed Nov. 29, 1990, Ser. No. 619,473
Int. Cl.[5] G08B *13/18, 21/00*
U.S. Cl. 340—573 7 Claims

1. Pulsed ultrasonic alarm apparatus for providing an alarm when a child has fallen into a body of water, such as a swimming pool, comprising, in combination:
means for providing a swept frequency output signal in the body of water in response to the child's falling into the body of water the sweeping of said frequency preventing fixed dead spots in the body of water;
receiver means in the body of water for detecting at least some part of the swept frequency output signal; and



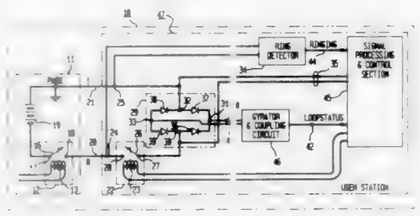
means for providing an alarm signal in response to the detected output signal.

5,144,286
PHOTOSENSITIVE SWITCH WITH CIRCUIT FOR INDICATING MALFUNCTION
George E. Rollins, Chelmsford, Mass., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.
Filed Aug. 6, 1990, Ser. No. 563,175
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—635 6 Claims



4. In a photosensitive detector for detecting light traveling along an optical path to be modulated by a plurality of moving objects and producing an intensity signal including a plurality of aperiodic pulses each pulse corresponding to the passage of one such object to indicate the instant of each passage and thus the number of such passages, the degree of modulation being adversely affected by the environment of the path, its alignment with respect to the objects and the optical characteristics of the objects, a diagnostic alarm comprising:
a first threshold detector for producing a count pulse when the pulse of the intensity signal rises above a first threshold;
a second threshold detector for producing a reset pulse when the pulse of the intensity signal rises above a second threshold;
a counter connected to the first and second threshold detectors for counting the count pulse from the first threshold detector to produce a count value indicating the passages of the objects and resetting the count value in response to the reset pulse from the second threshold detector; and
an alarm means for producing an alarm signal in response to a predetermined count value at from the counter to indicate the presence of adverse effects on the modulation.

5,144,287
CURRENT LEVEL SENSING CIRCUIT FOR USE WITH GYRATOR CIRCUITRY
Joseph D. Remson, San Jose, Calif., assignor to ROLM Systems, Santa Clara, Calif.
Filed Dec. 28, 1990, Ser. No. 635,049
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—664 22 Claims

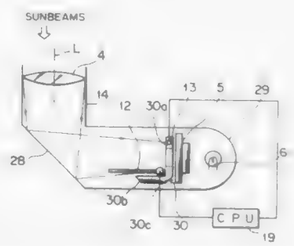


1. A current level sensing circuit for sensing attainment of a predetermined electric current level in a two wire circuit, said sensing circuit comprising:
a gyrator connected in a first path across said two wire circuit and having an output connection;
coupling means connected to said gyrator output connection, said coupling means producing a binary output signal having a first level in response to first signals in said gyrator output connection representing two wire circuit current below said predetermined electric current level and having a second level in response to second signals in said gyrator output connection representing two wire circuit current at least equal to said predetermined electric current level;
binary indicating means responsive to the coupling means binary output signals for indicating the level of such output signals;
said coupling circuit comprising
a current source connected in series with said indicating means; and
means for switching current between a first current path including said current source and connected across said two wire circuit in parallel with said gyrator, and a second current path including said current source and said indicating means connected in series across said two wire circuit in parallel with said gyrator, said coupling means binary output signal appearing in said second current path; and
means, responsive to said gyrator output, for causing said current switching means to switch a further predetermined current from its first path to its second path to produce said second level binary output signal, and to switch current form its second path back to its first path to produce said first level binary output signal.

5,144,288
COLOR LIQUID-CRYSTAL DISPLAY APPARATUS USING DELTA CONFIGURATION OF PICTURE ELEMENTS
Hiroshi Hamada; Toshiaki Takamatsu, both of Yamatokoriyama, and Naofumi Kimura, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 722,591 Apr. 12, 1985, abandoned.
This application Apr. 5, 1990, Ser. No. 506,542
Claims priority, application Japan, Apr. 13, 1984, 59-75301
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—702 13 Claims

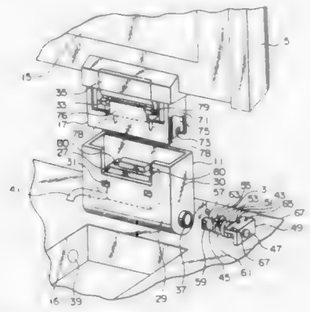
1. A color liquid crystal display apparatus, comprising:
a plurality of picture element groups arranged in a matrix, each picture element group including,
a plurality of color picture elements, each color picture element associated with a particular color corresponding to red, green, or blue,
said plurality of color picture elements being arranged in a delta configuration;
a plurality of scanning electrodes arranged in parallel and extending over said matrix in a first direction; and
a plurality of signal electrodes arranged in parallel and extending over said matrix in a second direction perpendicular to said first direction;
said picture element groups being arranged parallel to said scanning electrodes and in such a manner that said color picture elements are disposed in a plurality of lines along said first direction, color picture elements of the same color in any two adjacent lines being arranged at a 1.5 element pitch in said first direction, color picture elements of the same color in any two alternate lines being arranged in parallel along said second direction,
each said signal electrode being of a zigzag configuration and being connected only to color picture elements of the same color on alternating sides of said signal electrode in alternating ones of the plurality of lines, respectively, so as to drive only color picture elements of the same color through each signal electrode,
said scanning electrodes being connected to at least two color picture elements of picture element groups parallel thereto.

5,144,289
INDICATION DISPLAY UNIT FOR VEHICLES
Tsuyoshi Ohshima, Susono, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Continuation of Ser. No. 228,893, Dec. 23, 1988, abandoned.
This application Apr. 25, 1991, Ser. No. 690,392
Claims priority, application Japan, Dec. 25, 1987, 62-195889[U]
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—705 7 Claims



1. An indication display unit for a vehicle enabling a driver to sight an indicated image on a windshield thereof, comprising:
a display device for indicating an image thereon;
a lens through which said indicated image is projected on the windshield;
a transparent light conducting means for conducting external light relative to said indication display unit to a light detecting element, and positioned between said display device and said lens, such that a substantial portion of the external light is directed thereto, said transparent light conducting means having a light detecting element positioned and a window portion defined therein, said window portion being formed in a size such that only the indicated image can be projected through said window portion;
a shutter means for intercepting the external light relative to said indication display unit and light external to said transparent light conducting means, and rotatably arranged near said light conducting means, said transparent light conducting means being structured in "L" shape having a horizontal surface and a vertical surface, and said shutter means being rotatably arranged in front of said vertical surface, so that when said shutter means is activated to intercept incident light, the light is reflected toward said horizontal surface of said light conducting means; and
a control means for controlling said shutter means.

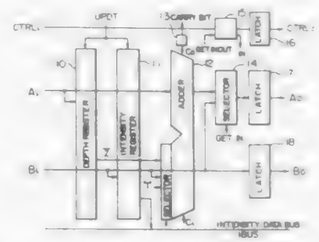
5,144,290
DISPLAY UNIT ATTACHMENT DEVICE
Masami Honda, Ome, and Youji Sato, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 30, 1989, Ser. No. 428,772
Claims priority, application Japan, Oct. 31, 1988, 63-142297[U]
Int. Cl.[5] B09G *3/02*
U.S. Cl. 340—711 5 Claims



1. A portable apparatus comprising:
a base unit including a front portion having a keyboard and a rear portion having a socket mounting surface;
a socket mounted on the socket mounting surface and being rotatable between a first socket position for covering the socket mounting surface and a second socket position for exposing the socket mounting surface, the socket having an attaching portion;
a display unit having a display and a leg portion removably attached to the socket attaching portion, the display unit being rotatable between a closed position for covering the keyboard and an open position for viewing the display whenever the leg portion is attached to the socket attaching portion;
biasing means fixed to the base unit for generating a biasing force for urging the display unit toward the open position whenever the display unit is in the closed position, the biasing means transmitting the biasing force directly to the leg portion and indirectly to the socket through the leg portion whereby the biasing force acting on the socket is released whenever the leg portion is removed from the socket and the socket is freely rotatable between the first socket position and the second position.

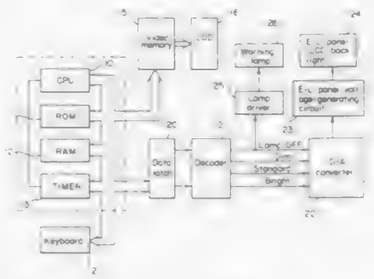
5,144,291
MEANS FOR ELIMINATING HIDDEN SURFACE
Teiji Nishizawa, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 2, 1987, Ser. No. 115,411
Int. Cl.[5] G09G *1/16*
U.S. Cl. 340—729 11 Claims

11. Means for eliminating hidden surface in a graphic display device for displaying a three-dimensional polyhedral object on a two-dimensional screen while performing hidden surface elimination, comprising:
a plurality of processors connected to form a one-dimensional array, each of said processors including a depth register for storing a depth value of a frontmost polyhedral in each pixel, an intensity register for storing intensity data relating to said polyhedral in the pixel, an adder for performing a calculation of the depth value, a region judgment relating to the polyhedral, and a size judgement regarding the depth value in a time division fashion, and a control means for storing the depth value and the intensity of the polyhedral in the depth register



and the intensity register respectively only when a newly inputted depth value of a polyhedral is smaller or not larger than the stored depth value,
whereby each of said processors performs a processing operation with respect to a corresponding pixel such that said array performs hidden surface elimination for one scan line.

5,144,292
LIQUID CRYSTAL DISPLAY SYSTEM WITH VARIABLE BACKLIGHTING FOR DATA PROCESSING MACHINE
Tomikatsu Shiraishi, and Isao Kawano, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 17, 1986, Ser. No. 886,423
Claims priority, application Japan, Jul. 17, 1985, 60-158580
Int. Cl.[5] G02F *1/13*
U.S. Cl. 340—784 5 Claims



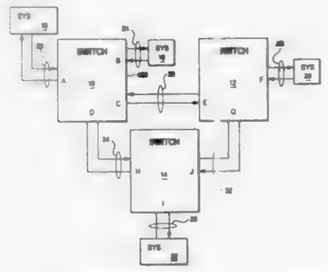
1. A data processing machine, comprising:
memory means for storing control instructions and data;
processing means for executing said control instructions and processing said data;
liquid crystal display means for displaying data, including an electroluminscent backlighting panel;
means for driving said electroluminescent backlighting panel at several levels of luminosity; and
means for selecting a specific level of luminosity to cause said driving means to drive said electroluminescent backlighting panel at said specific level;
said means for selecting including a data latch circuit which outputs a specific luminosity level code to said means for driving.

5,144,293

SERIAL LINK COMMUNICATION SYSTEM WITH CASCADED SWITCHES

Gerlad L. Rouse, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1990, Ser. No. 629,748
Int. Cl.[5] H04Q 3/00
U.S. Cl. 340—825.02 13 Claims



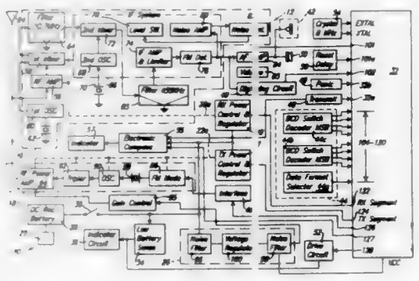
1. A serial link communications system comprising:
(a) a first switch means connected to a plurality of devices for providing a serial link channel between any such first plurality of devices connected thereto;
(b) a second switch means connected to a second plurality of devices for providing a serial communications channel between any two of the second plurality of devices; and
(c) wherein said first switch means further includes a serial link connection providing data and control routing information to said second switch means and each of said switch means includes cascade switch means for providing a serial link channel between a device of said first plurality of devices and a device of said second plurality of devices.

5,144,294

RADIO FREQUENCY MESSAGE APPARATUS FOR AIDING AMBULATORY TRAVEL OF VISUALLY IMPAIRED PERSONS

Louis W. Alonzi, Royal Oak; David C. Smith, Fenton; Gary J. Burlak, Rochester Hills, and Marion Mirowski, Bloomfield Hills, all of Mich., assignors to LIJ Industries, Inc., Royal Oak, Mich.

Filed Oct. 17, 1990, Ser. No. 598,988
Int. Cl.[5] H04Q 7/00
U.S. Cl. 340—825.49 15 Claims



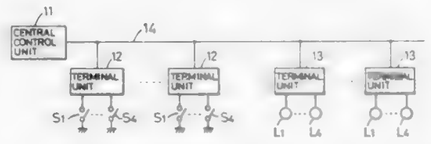
1. An apparatus for aiding ambulatory travel by a visually handicapped person, comprising:
first transceiver means operable to be carried and held in a hand of a visually handicapped person for transmitting a message request signal in response to a command from a handicapped individual, said message request signal having a limited signal strength corresponding to a first transmission distance;
said first transceiver means having battery means for providing power thereto;
second transceiver means fixedly disposed at a predetermined reference location for receiving said message request signal once said message request signal is transmitted by said first transceiver means while said first transceiver means is within a predetermined reception distance of said second transceiver means, and for generating in response thereto a modulated, radio frequency, location-indicating message signal; and
said first transceiver means further having means for receiving said modulated, radio frequency, location-indicating message signal and automatically generating in response thereto a modulated, location-indicating audio message in accordance with said modulated, radio frequency, location-indicating message signal, said audio message being operable to audibly inform said visually handicapped person of said person's arrival at said previously unknown reference location and the identity of said previously unknown reference location;
and wherein said first transceiver means comprises electronic compass means responsive to the earth's magnetic field and selectively controllable by said handicapped person for generating upon request by said handicapped person a directional indicating signal of varying signal strength as said electronic compass means is pointed in North, South, East and Westerly geographic directions, said directional indicating signal being perceptible by said handicapped person to aid said person in becoming orientated relative to said North, South, East and Westerly geographic directions.

5,144,295

INTERRUPTION PROCESSING SYSTEM IN TIME DIVISION MULTIPLEX TRANSMISSION SYSTEM

Yuji Nakagawa; Satoru Suzaki, and Motoharu Terada, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 21, 1990, Ser. No. 570,606
Claims priority, application Japan, Sep. 14, 1989, 1-239090; Mar. 15, 1990, 2-65010
Int. Cl.[5] H04Q 9/00
U.S. Cl. 340—825.12 16 Claims



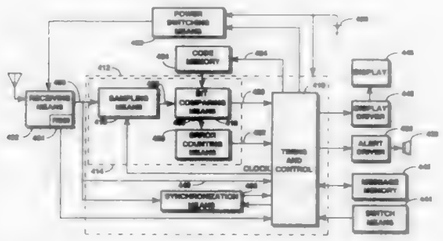
11. A method for handling interrupts in a time division multiplexed communication system having a central control unit and a plurality of remote terminals organized into a plurality of groups, comprising the steps of:
(a) continuously polling the remote terminals with a dummy transmission signal;
(b) generating an interrupt request signal at a remote terminal having at least some of a plurality of superior bits of the remote terminal's unique address;
(c) generating a series of group access signals having address data determined by adding sequential variations of bits to the at least some of a plurality of superior bits received by the central control unit in the interrupt request signal to identify the remote terminal requesting an interrupt, and;
(d) receiving, in said central control unit, updated supervisory input from said remote terminal.

5,144,296

ADAPTIVE BATTERY SAVING CONTROLLER WITH SIGNAL QUALITY DETECTING MEANS

Michael J. DeLuca, and Tuan K. Nguyen, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 7, 1990, Ser. No. 578,997
Int. Cl.[5] H04B 7/00
U.S. Cl. 340—825.44 20 Claims



1. A communication receiver capable of receiving a carrier signal having a binary coded message signal modulated thereon and including address code words and message code words corresponding thereto, said communication receiver comprising:
means for receiving and demodulating the transmitted coded message signal;
signal quality detecting means, coupled to said receiving means, for generating a quality indication signal indicating an acceptable carrier signal quality level when the magnitude of the received coded message signal is equal to or greater than a predetermined signal magnitude;
decoding means, coupled to said receiving means, for decoding the received address code words to identify the corresponding message code words intended therefore;
said decoding means further including distinguishing means for distinguishing address code words and message code words; and
battery saving means, responsive to said decoding means and the quality indication signal, for suspending the supply of power to said receiving means following substantially upon the detection by said distinguishing means of received message code words not intended for the communication receiver.

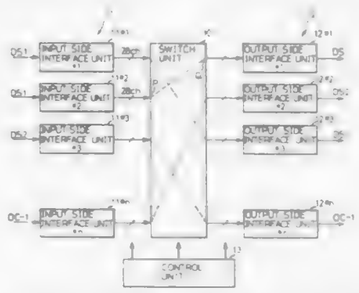
5,144,297

DIGITAL CROSS CONNECTION APPARATUS

Katsuichi Ohara, Kunitachi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 3, 1991, Ser. No. 637,227
Claims priority, application Japan, Jan. 9, 1990, 2-1745
Int. Cl.[5] H04Q 11/04
U.S. Cl. 340—825.79 11 Claims

1. A digital connection apparatus comprising:
a switch unit which performs a cross connection;
an input side interface unit which is provided at an input side of the switch unit and receives a plurality of input side transmission line signals composed of two or more types of virtual tributary (VT) signals; and
an output side interface unit which is provided at an output side of the switch unit and transmits signals which have been cross connected by the switch unit as a plurality of output side transmission line signals, wherein
the switch unit is operative to divide the virtual tributary (VT) sizes of the input side transmission line signals into whole integers by predetermined common size unit and



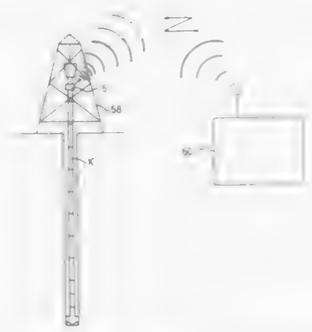
perform the cross connection using the resultant divided VT signals as a cross connection unit.

5,144,298

DYNAMOMETRIC MEASURING ASSEMBLY FOR A DRILL PIPE EQUIPPED WITH MEANS OF RADIOTRANSMISSION

Henry Henneuse, Billere, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Filed Jul. 22, 1991, Ser. No. 733,644
Claims priority, application France, Jul. 27, 1990, 90 09638
Int. Cl.[5] G01V 1/00
U.S. Cl. 340—854.6 6 Claims



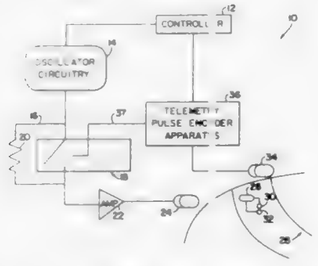
1. Dynamometric measuring device for a drill pipe comprising:
a) sensors attached to the drill pipe;
b) a first electronic circuit attached to the drill pipe for conditioning the signals supplied by the sensors;
c) a radio transmitter mounted in a fixed manner on the drill pipe for transmitting the signals supplied by the sensors;
d) a remote acquisition unit for receiving said signals; and
e) a radio receiver for receiving signals transmitted by the remote acquisition unit, said radio receiver comprising adjustment means for adjusting the measuring device in response to signals transmitted by the remote acquisition unit.

5,144,299

TELEMETRY POWER CARRIER PULSE ENCODER

David C. Smith, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 29, 1990, Ser. No. 530,015
Int. Cl.[5] G08C 15/16
U.S. Cl. 340—870.18 8 Claims



1. A system for controlling the operation of a sensor on a moving member, said system comprising on a five member:

an oscillator means for generating a power carrier signal having a frequency and an amplitude;

a selection means for providing command signals that select a mode of operation of the sensor;

a telemetry encoder apparatus for receiving said command signals and generating therefrom encoding signals for digitally modulating said power carrier signal in accordance with said selected mode of sensor operation;

a programmable switching means receiving said power carrier signal for modulating said power carrier signal amplitude in accordance with said encoder signals;

an impedance means receiving said power carrier signal for electrically shunting said programmable switching means

a transmitting means for receiving and transmitting said modulated power carrier signal; and

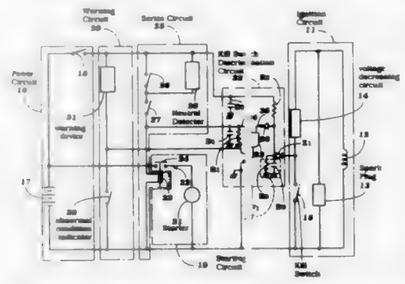
a receiver means positioned on the moving member for providing electrical power and control signals to the sensor directly from said digitally modulated power carrier signal.

5,144,300

STARTING DEVICE FOR MARINE PROPULSION ENGINE

Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 30, 1990, Ser. No. 502,533
Claims priority, application Japan, Mar. 30, 1989, 1-78904
The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—984 2 Claims



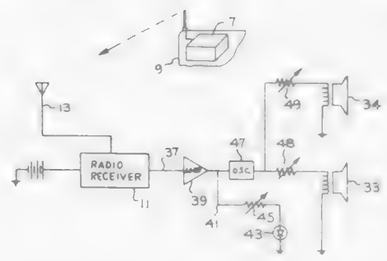
1. A warning system for a spark ignition internal combustion engine having a starter for starting said engine, a starter switch for actuating said starter to start said engine, an ignition system for firing a spark plug of said engine, a kill switch for disabling said ignition system to stop the running of said engine, means for sensing when said starter switch is operated and said kill switch is enabled, a warning device for providing a warning signal, an abnormal when running and when said running condition is abnormal and means for effecting operation of said warning device in response to each of the sensing of an abnormal condition by said abnormal running condition sensor and the attempt to start the engine with the kill switch enabled by closure of the starter switch.

5,144,301

SCHOOL BUS LOCATOR SYSTEM

Timothy C. Jackson, 3420 Linderwood Dr., Augusta, Ga. 30906, and Jeffrey G. Parks, 5214 NW. Rogers La. 406, Lawton, Okla. 73505

Filed Feb. 19, 1991, Ser. No. 656,460
Int. Cl.[5] G08G 1/123
U.S. Cl. 340—994 1 Claim



1. A school bus locator system comprising a radio transmitter in a remote on-the-road school bus; an individual radio receiver in each of the homes of school children; said radio receiver being operable to generate an electric signal when the remote school bus is within a predetermined distance of said radio receiver;

a light emitting diode associated with said radio receiver to be energized to emit a light signal thereby when the remote bus is a predetermined geographical distance from said radio receiver;

an oscillator associated with said radio receiver in electrical parallelism with the light-emitting diode for generating audible beeper signals separate from the emitted light signal; two separate speakers connected to said oscillator in electrical parallelism with each other for broadcasting separate beeper signals;

three separate adjustable resistance means connected to the light emitting diode and each of the two speakers to determine the minimum geographical spacing between the remote school bus and the radio receiver required for the light emitting diode to be energized and for the respective speakers to begin broadcasting;

a housing for said radio receiver, light-emitting diode oscillator, the separate speakers and said three separate adjustable resistance means; the housing simulating the appearance of a miniature school bus;

the housing including a front wall and a bottom wall, said bottom wall comprising horizontal flat sections (27) simulating the undersurface of the miniature bus, and two spaced semi-circular sections (29) simulating lower surface areas of the miniature bus road wheels; said housing front wall having two inset circular wall sections (31) simulating side surface areas of the miniature bus road wheels;

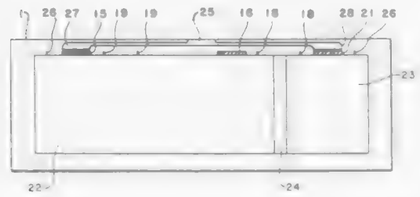
each of said speakers being located within the housing behind each of the two inset circular wall sections that form the simulated road wheels; each said inset circular wall sections having a series of radial openings extending therethrough to simulate wheel spoke openings; each of said speakers being oriented so that its beeper signal is directed through the associated spoke openings.

5,144,302

MODULAR KEYBOARD

Andrew Carter, Saratoga, and Troy Hulick, San Jose, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 333,131, Apr. 4, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 667,355
Int. Cl.[5] H05K 5/02
U.S. Cl. 341—20 24 Claims



1. A computer system having a modular keyboard apparatus, said modular keyboard apparatus comprising;

a keyboard housing assembly with an opening for coupling a first modular input device and a second modular input device in a first or a second configuration;

said first modular input device having a plurality of tabs for coupling with said keyboard housing assembly and a first connector for providing a plurality of different input signals;

said second modular input device having a plurality of tabs for coupling with said keyboard housing assembly and at least two first connectors for providing a plurality of different input signals;

said keyboard housing assembly having at least two second connectors for coupling with one of said first connectors of each of said first modular input device and said second modular input device, so that when said first modular input device and said second modular input device, so that when said first modular input device and said second modular input device are in said first configuration, said first connector of said first modular input device is coupled to a first of said at least two second connectors and a first of said at least two of said first connectors of said second modular input device is coupled to a second of said at least two second connectors, said keyboard housing assembly further comprising a third connector, said third connector coupled to said at least two second connectors and said computer system.

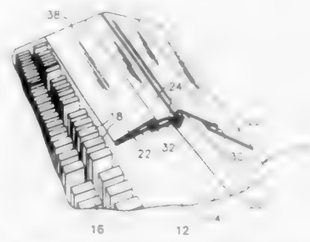
5,144,303

STACKED COMPUTER KEYBOARD FUNCTION KEY MULTIPLE TEMPLATE RETAINERS

Ronald W. Purcell, 500 Hidden Valley Rd., Grants Pass, Oreg. 97527

Filed Sep. 19, 1990, Ser. No. 584,754
Int. Cl.[5] H03M 11/00; B42F 17/00
U.S. Cl. 341—23 11 Claims

1. In combination component keyboard of the type including an upwardly facing surface above which input data keys project including an upper row of function keys spaced forward of a rear margin of said surface, said rear margin terminating rearwardly in a downwardly extending rear surface, a plurality of elongated, stiff function key template strips for selective positioning across said rear margin forward of the rear extremity thereof with each strip including front and rear longitudinal margins, a plurality of elongated strips of flexible material each having first and second longitudinal margins, first means stationarily securing said first margins to said rear surface in superposed and substantially registered relation, second means stationarily securing said second margins to said rear longitudinal margins, the width of said flexible material strips between said first and second margins thereof being sufficient to support said stiff template strips in superposed generally registered positions from said rear margin in close



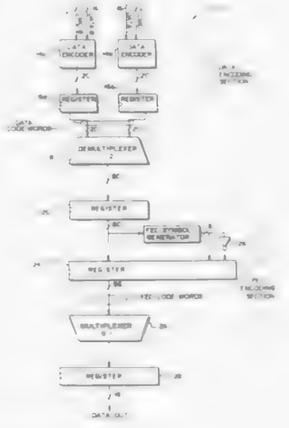
juxtaposition with said upper row of function keys, said flexible material strips being smoothly reversibly bendable adjacent and along said first margins and operable to swing the corresponding stiff template strips upwardly and rearwardly away from said upwardly facing surface and downwardly over said rear surface into generally superposed, inverted registered positions, spaced below said first margins.

5,144,304

DATA AND FORWARD ERROR CONTROL CODING TECHNIQUES FOR DIGITAL SIGNALS

Donald H. McMahon, Gansevoort, N.Y.; Alan A. Kirby, Hollis, N.H.; Bruce A. Schofield, Tyngsboro, and Kent Springer, Westford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 381,045, Jul. 17, 1989, abandoned. This application Sep. 10, 1991, Ser. No. 758,242
Int. Cl.[5] H03M 7/30, 13/00, 7/46
U.S. Cl. 341—58 26 Claims



1. An encoder, comprising:

A. sequence encoding means for encoding each of a plurality of bit sequence of a digital signal into a plurality of first codewords, each first codeword being characterized by a maximum run length below a pre-selected limit, and a cumulative DC-offset below a pre-selected limit,

B. protection encoding means coupled to said sequence encoding means for receiving the first codewords there-

from and generating a plurality of error protection symbols from the first codewords, and

C. block-forming means coupled to said sequence encoding means and said protection encoding means for forming a block comprising a plurality of the first codewords and a plurality of the error protection symbols.

5,144,305

TRANSMISSION ARRANGEMENT COMPRISING A BLOCK CODE ENCODED MAIN CHANNEL AND AN AUXILIARY CHANNEL

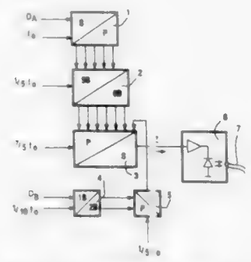
Hans J. Götz, Nürnberg, and Rainer Hembes, Ober-Olm, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1991, Ser. No. 718,732

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1990, 4020963

Int. Cl.[5] H03M *7/00*; H04J *3/12*

U.S. Cl. 341—73 **12 Claims**



1. A transmitting arrangement for digital data, comprising first means for providing a data signal encoded with a first block code, to form a main signal for transmission on a main channel, characterized in that the arrangement further comprises:

second means for separately encoding auxiliary data with a balanced second block code having a simpler structure than said first block code, to form an auxiliary signal for transmission on an auxiliary channel, and

means for transmitting said main and auxiliary signals as a data stream arranged such that the data stream consists alternately of at least one block of the main channel and a bit of the block-encoded auxiliary channel.

5,144,306

NOISE SHAPING CIRCUIT

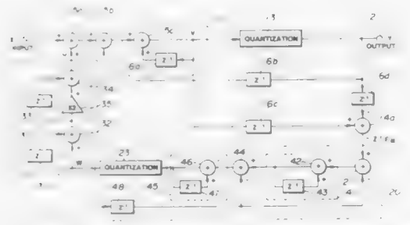
Toshihiko Masuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 759,930

Claims priority, application Japan, Sep. 20, 1990, 2-248875

Int. Cl.[5] H03M *7/36*

U.S. Cl. 341—76 **6 Claims**



1. A noise shaping apparatus for producing M-bit output digital data by requantizing N-bit input digital data, the noise shaping apparatus comprising:

a first quantizer for quantizing said input digital data,

a first feedback circuit for feeding back a quantization error component of said first quantizer to an input side of said first quantizer for constituting a first degree noise shaping circuit, and

a second feedback circuit for feeding back a quantization error component of said first quantizer to an input side of said first quantizer,

said second feedback circuit comprising

synthesizing means to which quantization error signals from said first quantizer are supplied,

a second quantizer for quantizing output signals from said synthesizing means,

transfer characteristic means for applying predetermined transfer characteristics to quantization errors of said second quantizer, an output of said transfer characteristic means being supplied to said synthesizing means, and

differentiation means for differentiating an output of said second quantizer for supplying a differentiated output to an input side of said first quantizer.

5,144,307

METHOD OF CONTROLLING DOUBLE INTEGRAL A-D CONVERTER

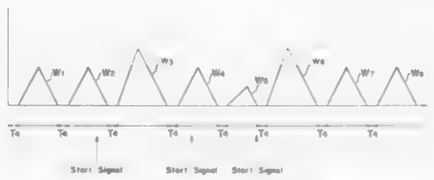
Tomohide Takatsuka, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 722,904

Claims priority, application Japan, Jun. 28, 1990, 2-171159

Int. Cl.[5] H03M *1/10*

U.S. Cl. 341—120 **1 Claim**



1. A method of controlling a double integral A-D converter comprising the steps of:

obtaining correction data by performing a first A-D conversion of a ground voltage input when no A-D converting start signal is input;

obtaining measured A-D conversion data by performing a second A-D conversion of an input signal when the A-D converting start signal is received;

determining an initiating time required for an integrating capacitor to discharge therefrom a residual electric charge other than an absorbed electric charge caused by a dielectric absorption property thereof;

repeating the first and second A-D conversions in a sequence which is determined by the presence of absence of the A-D converting start signal and in which successive A-D conversions are temporally separated by the initiating time of the integrating capacitor; and

determining that said sequence of A-D conversions includes an occurrence of said first A-D conversion successively followed by an occurrence of said second A-D conversion, and thereafter subtracting the correction data obtained in the first A-D conversion from the measured A-D conversion data obtained in the second A-D conversion.

5,144,308

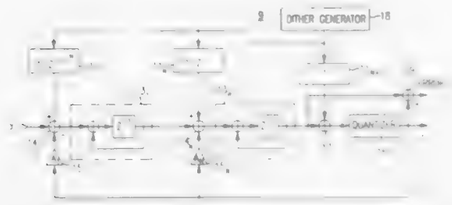
IDLE CHANNEL TONE AND PERIODIC NOISE SUPPRESSION FOR SIGMA-DELTA MODULATORS USING HIGH-LEVEL DITHER

Steven R. Norsworthy, Emmaus, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 21, 1991, Ser. No. 703,527

Int. Cl.[5] H03M *1/20*

U.S. Cl. 341—131 **17 Claims**



6. A multi-stage sigma-delta modulator having a plurality of stages, at least one stage having:

at least one integrator having an input and an output; and,

a quantizer having a predetermined step size, the input thereof coupling to the output of the integrator;

characterized by:

means for adding a dither signal to at least one stage in the modulator, the dither signal having a predetermined normalized power in the AC component thereof;

wherein the minimum normalized AC power of the dither signal is about:

$$\frac{2^{-2(N-1)}}{12} \text{ for } N \geq 2;$$

or

$$1/12 \text{ for } N = 1;$$

of the square of the predetermined step size of the quantizer; and,

wherein N is the number of integrators in the stage.

5,144,309

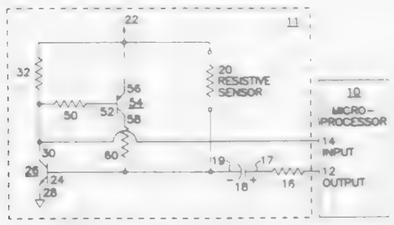
ANALOG-TO-DIGITAL CONVERTER TO BE USED ALONG WITH A RESISTIVE SENSOR

John T. Adams, Minneapolis; T. Michael Tinsley, Coon Rapids, and Phyllis L. Brown, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 6, 1991, Ser. No. 651,688

Int. Cl.[5] H03M *1/06*

U.S. Cl. 341—155 **14 Claims**



1. An analog to digital converter adapted to be connected to a microprocessor for measuring a value representative of a resistance value of a variable resistive sensing means, said analog to digital converter comprising:

variable resistive sensing means having its resistance dependent upon a condition being sensed, a first side of said variable resistive sensing means adapted to be connected to a voltage supply;

charge storage means to be charged and discharged at varying rates proportional to said resistance value of said variable resistive sensing means, a first side of said charge storage means adapted to be connected to the microprocessor, a second side of said charge storage means connected to a second side of said variable resistance sensing means; and

a first switching means having an input, an output, and a switch control, said switch control connected to said second side of said charge storage means, said input adapted to be connected to the voltage supply, and said output connected to a point of common potential, said input further adapted to be connected to the microprocessor, wherein said charge storage means is discharged through said variable resistive sensing means, causing said first switching means to change states when said charge storage means has discharged to a predetermined level, causing said input to change states which is communicated to the microprocessor.

5,144,310

A/D CONVERTER UTILIZING SUCCESSIVE APPROXIMATION

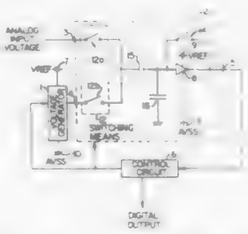
Fumiki Sato, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1990, Ser. No. 610,485

Claims priority, application Japan, Mar. 5, 1990, 2-054009

Int. Cl.[5] H03M *1/38*

U.S. Cl. 341—161 **4 Claims**



1. An analog-to-digital converter comprising:

voltage generating means comprising a reference voltage input, a voltage output and at least one control input signal for selectively generating voltages at the voltage output derived from the reference voltage input in response to the state of voltages applied to the control input signal;

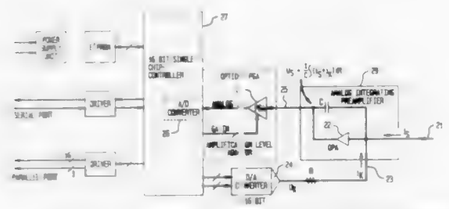
comparator means comprising first and second inputs, a comparator voltage supply input and an output for outputing a first voltage level when the first comparator input voltage is greater than the second comparator input voltage and for outputing a second voltage level when the second comparator input voltage is greater than the first comparator input voltage, where the second comparator input is coupled to the voltage output of the voltage generating means and where the first comparator input is coupled to an analog signal to be converted;

control means comprising an input and at least one output for applying voltage states to the control input signal in response to the output of the comparator means, where the control means input is coupled to the output of the comparator means, where the outputs of the control means are coupled to the control input signals of the voltage generating means and where the outputs of the control means are the digital output of the analog-to-digital converter; and

a common supply voltage directly connected both to the

reference voltage input of the voltage generating means and to the comparator voltage supply input.

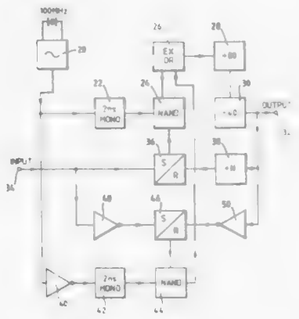
5,144,311
APPARATUS FOR CONVERTING ANALOG SIGNALS INTO DIGITAL SIGNALS
Wolfhardt Buhler, Munich; Hans Poisel, Dachau, and Gert Trommer, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany
Filed Jan. 12, 1990, Ser. No. 464,441
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1989, 3901399
Int. Cl.[5] H03M 1/12, 1/50, 1/06
U.S. Cl. 341—166 9 Claims



1. An input circuit for connection to an analog-to-digital converter, comprising:
computer means for controlling operation of the input circuit;
an integrator that further comprises first amplifier means and a capacitor means connected between an input and output of the first amplifier in a feedback connection, the input to the integrator being the input of the first amplifier means and the output of the integrator being the output of the first amplifier means, with the input to the integrator being a summed signal including a measuring signal and a signal output from a digital-to-analog converter;
a programmable amplifier that has an input that connects to the output of the integrator and an output that connects to the input of an analog-to-digital converter, the analog-to-digital converter having an output that connects to an input to the computer means, the programmable amplifier for programmably amplifying signals input thereto from the integrator;
digital-to-analog converter that has an input that connects to an output of the computer means and the output connects to the input of the integrator, the digital-to-analog converter for converting signals output from the computer means that control integrator operations so the output of the integrator remains in a non-saturated region; and
resistor means connected between the output of the digital-to-analog converter and the input to the integrator, the resistor means having a predetermined relationship with the capacitor means for integrating the summed signal input to the integrator.

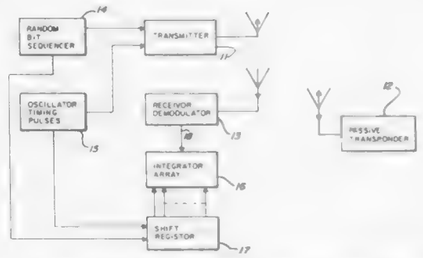
5,144,312
LOCATING SYSTEM
John D. McCann, Steventon, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Jul. 9, 1990, Ser. No. 553,253
Claims priority, application United Kingdom, Jul. 22, 1989, 8916815
Int. Cl.[5] G01S 13/74, 5/02
U.S. Cl. 342—42 8 Claims

1. A system for locating a transponder within a defined area, the system comprising a base station and two spaced-apart slave stations at known locations, the transponder and at least those slave stations remote from the base station each incorporating a means to receive signals transmitted from the base stations, an electronic flywheel circuit, and a means to bring the flywheel circuit into synchronism with the received signal from the base station, the signal from the base station being modulated at the frequency of the flywheel circuitry, the transponder also incorporating means to transmit a radio signal modulated at the frequency of the flywheel circuit at a predetermined time interval after receipt of the said signal from the base station, said time interval being set by reference to the



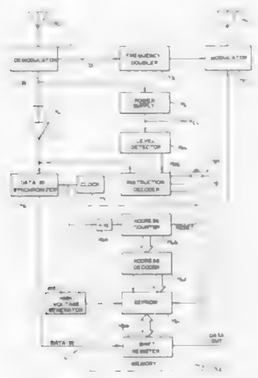
flywheel circuit of the transponder, and each slave station incorporating means to receive the radio signal from the transponder and to determine by reference to the flywheel circuit of the respective slave station the time of receipt thereof, the system also including means to determine from the known locations of the base station and the two slave stations and from the times of receipt of the radio signal from the transponder the location of the transponder.

5,144,313
METHOD FOR PROCESSING TRANSMITTED AND REFLECTED SIGNALS FOR REMOVING UNWANTED SIGNALS AND NOISE FROM WANTED SIGNALS
Steffen Kirknes, Innbygda, N-7580 Selbu, Norway
Filed Apr. 24, 1991, Ser. No. 690,498
Int. Cl.[5] G01S 13/82
U.S. Cl. 342—44 14 Claims



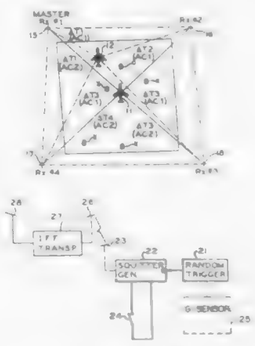
1. A method in an identification system, wherein a radar signal is transmitted from a transmitter, said signal is arranged to be received by a mobile, bit-coded identification transponder which returns a coded signal that is received by a receiver; the received coded signals are processed in order to remove unwanted signals and noise from the reflected, coded and wanted signals, wherein a pseudo-random bit sequence is used, characterized by comprising the steps of:
phase modulating the radar signal with a pseudo-random bit sequence,
dividing the modulated radar signal in time slots, forming a pulse train, which is transmitted,
passively reflecting from the transponder the transmitted pulse train signal, said transponder being encoded with binary coded information, and the reflected pulse train is modulated with the binary code of the transponder,
said receiver receiving and demodulating the reflected, coded pulse train signal using the same pseudo-random bit sequence and same time slots as were used at transmission, both of which being time delayed in order to demodulate the reflected pulse train signal to store, average and process the identification code from the bit-coded transponder for individual recognition.

5,144,314
PROGRAMMABLE OBJECT IDENTIFICATION TRANSPONDER SYSTEM
Eric Malmberg, Santa Cruz; Hien Tran, Aptos, and Zbigniew Siemiatkowski, Watsonville, all of Calif., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.
Continuation of Ser. No. 113,234, Oct. 23, 1987, abandoned. This application Dec. 11, 1991, Ser. No. 808,084
Int. Cl.[5] G01S 13/80
U.S. Cl. 342—44 17 Claims



1. A transponder comprising:
a means for demodulating a received signal to produce a data signal in which each data character is encoded as a pair of different signal levels;
an instruction decoder for detecting an operation instruction in the data signal;
a means for storing indicium of each signal level of the data signal, and having one mode of operation in which the indicia of each signal level is written into said means for storing in response to a signal from said instruction decoder, and having another mode of operation in which previously stored indicia are read from said means for storing;
a modulator for modulating a carrier signal in response to he indicia read from said means for storing; and
means for powering the transponder with energy from the received signal.

5,144,315
SYSTEM FOR ACCURATELY MONITORING AIRCRAFT POSITION DURING TRAINING EXERCISES
Carl E. Schwab, Huntington Stat., N.Y., and Fred N. S. Goodrich, Barnstead, N.H., assignors to Cardion, Inc., Woodbury, N.Y.
Continuation-in-part of Ser. No. 537,000, Jun. 13, 1990, abandoned, which is a continuation of Ser. No. 308,594, Feb. 10, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 625,040
Int. Cl.[5] G01S 13/80, 13/06
U.S. Cl. 342—49 25 Claims



1. A system for tracking an aircraft, equipped with an IFF transponder which emits a signal containing a data signal identifying the aircraft altitude during training exercises, comprising:
a squitter transmitter mounted on said aircraft for interrogating said transponder whereby said data signal is transmitted;
a plurality of ground receiving stations spaced apart over a test range;
a communication link connecting said receiving stations; and,
means at one of said receiving stations for receiving information from said other receiving stations over said communication link identifying the time of arrival of said transmitted data signal to each receiving station, and calculating from said time of arrivals the position of said aircraft.

5,144,316
EFFICIENT BATCHED-REPORT GATING TECHNIQUE
Jeffrey K. Uhlmann, Alexandria, Va., and Miguel R. Zuniga, Greenbelt, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 20, 1991, Ser. No. 811,335
Int. Cl.[5] G01S 13/72
U.S. Cl. 342—189 2 Claims

1. A method for tracking a plurality of objects, said method comprising steps for:
generating a track data set;
receiving reports from said plurality of objects over a time interval;
partitioning said time interval into a preselected number of subintervals;
associating each of said reports with the subinterval corresponding to the time said each of said reports was received in said step for receiving; and
for at least one subinterval of said preselected number of subintervals:
copying at least one track of said track data set to a point in time within said at least one subinterval to form a copied track data set associated with said at least one subinterval;
performing a correlation of said copied track data set with

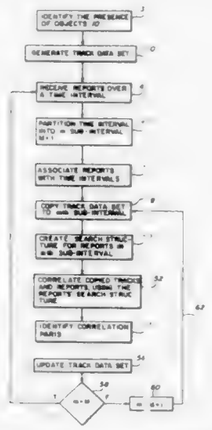
said reports associated with said at least one subinterval, said correlation comprising steps for:

setting up a search structure for said reports associated with said at least one of said subinterv als;

using said search structure, said copied tracks, and a preselected criterion for determining correlation between a track and a report, to perform said correlation;

identifying which members of said copied data set and said associated reports correlate according to said criterion;

updating said track data set responsive to said step for identifying.



5,144,317

METHOD OF DETERMINING MINING PROGRESS IN OPEN CAST MINING BY MEANS OF SATELLITE GEODESY

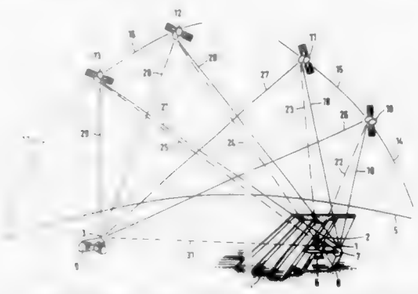
Herbert Duddek, Bergheim; Wilfried Klemmer, Dahlem, and Herbert Koeppen, Bergheim, all of Fed. Rep. of Germany, assignors to Rheinbraun Aktiengesellschaft, Köln, Fed. Rep. of Germany

Filed Mar. 27, 1991, Ser No. 675,691

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1990, 4011316

Int. Cl.[5] H04B 7/185; G01S 5/02

U.S. Cl. 342—357 9 Claims



1. A method of determining mining progress and the mined mass in a deposit to be mined in open cast mining, using a large-scale extraction apparatus which comprises a travelling support structure, a support portion mounted movably thereon, and at least one extraction device carried on the support portion, comprising the steps carried out when mining material in the deposit, of:

receiving signals from at least four satellites by means of a first receiver disposed on said support portion of the extraction apparatus;

while said signals from at least four satellites are being received by said first receiver, receiving said signals by means of at least one further receiver disposed on the extraction apparatus at a position which is spaced from, but defined with respect to, the first receiver;

ascertaining the geodetic position of said first receiver from the signals received by said first receiver;

ascertaining the geodetic position of said further receiver from the signals received by said further receiver; and

determining, from the geodetic positions of said first and further receivers, the orientation in space of the support portion of the extraction apparatus;

whereby a model of the deposit can be established in which the parts of the deposit which have already been mined are identified.

5,144,318

APPARATUS AND METHOD FOR NAVIGATING VEHICLE USING GPS

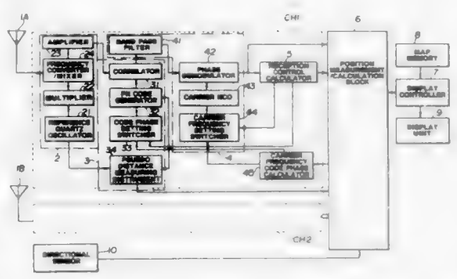
Hisao Kishi, Kanagawa, Japan, assignor to Nissan Motor Company, Ltd., Japan

Continuation-in-part of Ser. No. 468,723, Jan. 24, 1990, abandoned. This application Aug. 1, 1991, Ser. No. 738,505

Claims priority, application Japan, Jan. 26, 1989, 1-15080

Int. Cl.[5] H04B 7/85; G01S 5/02

U.S. Cl. 342—357 15 Claims



1. A GPS navigating apparatus for a movable object, comprising:

a) a plurality of GPS antennae installed at positions other than the roof top of the movable object in which the GPS navigating apparatus is mounted;

b) first means for deriving a forward direction of the movable object;

c) second means for selecting any of a plurality of satellites from which each GPS antenna can receive electromagnetic waves on the basis of orbit data of the respective satellites, mounting positions of the GPS antennae, and forward direction of the movable object; and

d) third means for selecting any of the satellites required to calculate a present position of the movable object from among the satellites from which the GPS antennae can receive the electromagnetic waves.

5,144,319

PLANAR SUBSTRATE FERRITE/DIODE PHASE SHIFTER FOR PHASED ARRAY APPLICATIONS

Roger G. Roberts, Auburn, Ga., assignor to Electromagnetic Sciences, Inc., Norcross, Ga.

Filed Mar. 14, 1991, Ser. No. 669,883

Int. Cl.[5] H01Q 3/24; H01P 1/185, 1/195

U.S. Cl. 342—372 32 Claims

8. An RF phase shifting arrangement for use in a phased array, said arrangement comprising:

an RF transceiver;

an RF antenna element;

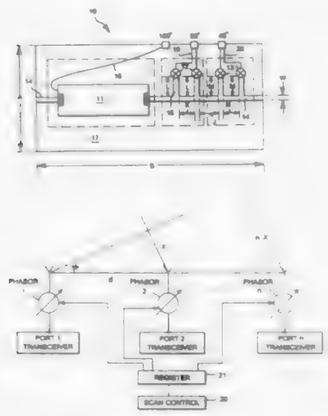
a dielectric substrate;

a microstrip RF circuit with first and second ends and being located on said substrate, said first end connected to said transceiver and said second end connected to said antenna element;

a first non-reciprocal ferrite phase shifter stage serially connected in said microstrip for selectively providing an increment of phase shift greater than 90°;

a second reciprocal semiconductor phase shifter stage serially connected to said microstrip for selectively providing an increment of phase shift; and

control means for controlling each phase shifter stage to selectively provide incremental amounts of phase shift to the RF signals passing between said transceiver and said antenna element.



5,144,320

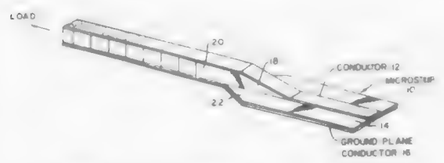
SWITCHABLE SCAN ANTENNA ARRAY

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 10, 1992, Ser. No. 833,259

Int. Cl.[5] G01S 3/24; H01Q 13/24

U.S. Cl. 342—374 9 Claims



1. An antenna array comprising:

a plurality of antenna elements, each antenna element being separated from one another at a predetermined distance and each antenna element comprising a microstrip transmission line which includes a strip conductor and a ground plane conductor separated by a dielectric substrate, the substrate having an antenna portion formed therein having radiating means permitting RF energy supplied to said microstrip transmission line to be directionally radiated away from said microstrip transmission line at said antenna portion, the direction of radiation being a function of the frequency of the RF energy supplied to said microstrip transmission line and the predetermined distance of separation of the antenna elements;

switching means for switchably supplying input RF energy to a selected one of said antenna elements; and

RF energy to said switching means;

wherein said antenna portion is defined by a platform between said strip conductor and said ground plane conductor at said antenna portion which is substantially thicker than at other portions of said substrate.

5,144,321

METHOD DEVICE AND MICROWAVE ANTENNA SYSTEM FOR APPLYING DISCRETE DELAYS TO A SIGNAL

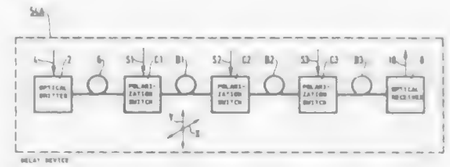
Michel Biet, Massy, France, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 14, 1991, Ser. No. 670,345

Claims priority, application France, Mar. 16, 1990, 90 03397

Int. Cl.[5] H01Q 3/26

U.S. Cl. 342—375 6 Claims



1. Device for applying discrete delays to a signal, said device comprising at least one delay switching stage, each said switching stage comprising: a delay unit adapted to receive an optical wave conveying

an input signal to be delayed and to apply to said wave a stage delay having selectively either a high value or a low value, and

a switching unit adapted to receive a delay select signal appropriate to said stage and to be responsive thereto by controlling the delay applied by said delay unit so that said optical wave after passing through said switching stage conveys a stage output signal having said stage delay relative to said input signal, wherein

said delay unit incorporates a single optical delay line in the form of a polarization holding optical fiber having two principal transverse directions constituting a slow direction and a fast direction so that two optical waves at the same frequency polarized in said slow and fast directions propagate in said fiber with respective relatively low and relatively high velocities, and

said switching unit comprises at least one polarization switch at the input of said optical delay line and controlled by said delay select signal to polarize said optical wave in said slow direction or said fast direction of said fiber and thereby to assign to said stage delay either said high value or said low value, respectively.

5,144,322

LARGE-APERTURE SPARSE ARRAY DETECTOR SYSTEM FOR MULTIPLE EMITTER LOCATION

William F. Gabriel, Annadale, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1988, Ser. No. 275,873

Int. Cl.[5] G01S 3/16, 3/28

U.S. Cl. 342—383 5 Claims

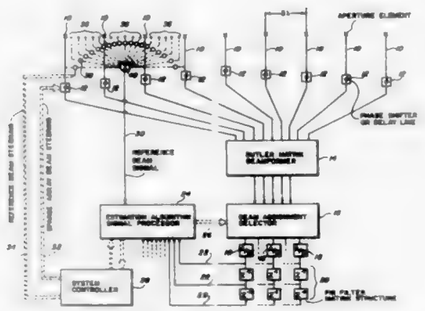
1. A detector array system comprising:

a sparse array of sensors;

a reference array of sensors, said reference array being fully-filled;

means for shaping the response of said reference array, said

reference array and said means for shaping adapted to cooperate to cause said response of said reference array to comprise one main lobe and a plurality of sidelobes, said mainlobe being substantially larger than said sidelobes,



said mainlobe having a substantially flat magnitude over a preselected continuous range of look angles; and

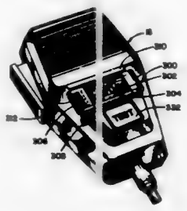
means for forming a cross-correlation of signals detected by said sparse array and said reference array.

5,144,323

PROTECTED SWITCH FOR EMERGENCY LOCATION SYSTEM

E. Hubbard Yonkers, Contoocook, N.H., assignor to Tendler Technologies, Inc., Chestnut Hill, Mass.

Filed May 22, 1991, Ser. No. 703,927
Int. Cl.[5] G01S *1/08*; H01H *13/04, 9/20*
U.S. Cl. 342—386 **8 Claims**



1. Apparatus for protecting a finger-depressable switch from accidental activation, said switch having a legend on a top surface thereof, comprising:

a non-frangible switch covering member including a lever having a transparent portion thereof adapted to overlie said switch such that said switch legend is readable through said transparent portion;

means including a spring-loaded pivot to one side of said lever for removably mounting said member over said switch such that in a protected position said member is in a position over said switch and is not movable away from said switch by other than manual means; and such that in an unprotected position, said member is manually moved away from its covering position, whereby depression of said switch is prevented as long as said lever covers said switch and,

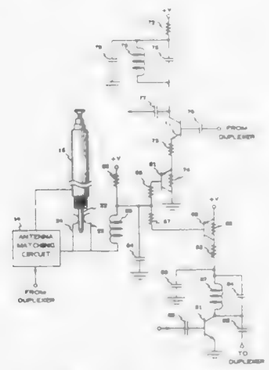
spaced apart guard projections positioned to either side of said lever along the length thereof such that in its protected position, said lever lies over said switch between and below said guard projections.

5,144,324

ANTENNA ARRANGEMENT FOR A PORTABLE TRANSCEIVER

Melissa C. Chin, Kinnelon; James G. Evans, Colts Neck, and Denis P. Orlando, Freehold, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 2, 1989, Ser. No. 388,454
Int. Cl.[5] H01Q *1/10, 1/24*
U.S. Cl. 343—702 **8 Claims**



2. An antenna switching arrangement for use with a telescoping antenna, the arrangement comprising:

a telescoping antenna having a plurality of cylindrical interlocking sections including at least a first small diameter section and a second larger diameter section, the small diameter section being coaxially aligned with and disposed in the larger diameter section when the antenna is in a collapsed position and coaxially aligned and projecting outwardly from the larger diameter section in a first direction when the antenna is in an extended position;

contact means connected to the small diameter section for extending the small diameter section for projecting outwardly from the larger diameter section in a second direction opposite that of the first direction when the antenna is in the collapsed position; and

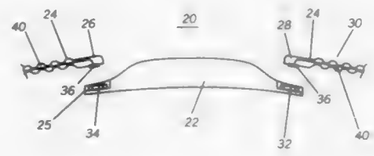
switch activating means activatable by the projecting of the small diameter section in the second direction when the antenna is in the collapsed position, the contact means contacting an adjacent conducting member for providing an electrical activation signal.

5,144,325

DETACHABLE WRIST BAND ANTENNA

Robert Kurcbart, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 2, 1991, Ser. No. 739,577
Int. Cl.[5] H01Q *1/12*
U.S. Cl. 343—718 **19 Claims**



1. A detachable loop antenna for use in a wrist band radio, comprising:

a wrist band having two end portions;

connector means within the end portions of the wrist band for detachably electronically coupling the loop antenna to the radio, wherein said connector means comprises snap fit connectors; and

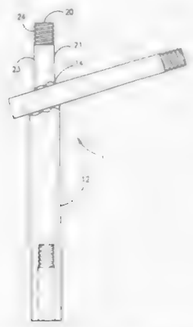
a conductive runner coupled to the radio via the connector means, wherein the conductive runner lies within the wrist band forming the loop antenna.

5,144,326

WHIP TILT ADAPTER

Alan S. Christinsin, 1201 Dawn Dr., Belleville, Ill. 60220

Filed Nov. 14, 1990, Ser. No. 612,384
Int. Cl.[5] H01Q *1/32*
U.S. Cl. 343—715 **2 Claims**



1. A method of using a long flexible whip antenna, wherein said whip antenna has a first distal end and a second threaded end, and wherein said whip antenna is at least about 12 feet long, said method comprising the steps of:

A) providing a vehicle and an antenna base which is attached to said vehicle, said antenna base having a threaded upper end, said threaded upper end of said antenna base being compatible with said second threaded end of said whip antenna such that said second threaded end of said whip antenna is connectable to said threaded upper end of said antenna base;

B) providing an adapter which includes:

a) a vertical shaft having a lower threaded end and an upper end, said lower threaded end of said vertical shaft being compatible with said threaded upper end of said base such that both said second threaded end of said whip antenna and said lower threaded end of said vertical shaft are connectable to said threaded upper end of said antenna base;

b) whip antenna support means for selectively supporting said long flexible whip antenna in a near-horizontal position relative to said vehicle and for supporting said flexible whip antenna in a generally vertical position relative to said vehicle, said whip antenna support means being connected to said upper end of said vertical shaft, said whip antenna support means comprising an elongated support member for extending laterally from said upper end of said vertical shaft, said elongated support member having a threaded first end which is distal from said upper end of said vertical shaft, said threaded first end of said elongated support member being compatible with said second threaded end of said whip antenna such that said second threaded end of said whip antenna is connectable to said threaded first end of said elongated support member; and

c) means for establishing electrical connectivity between said threaded first end of said elongated support member and said antenna base;

C) attaching said adapter to said antenna base by connecting said lower threaded end of said vertical shaft to said threaded upper end of said antenna base;

D) while said adapter is attached to said antenna base, attaching said long flexible whip antenna to said adapter by connecting said second threaded end of said flexible whip antenna to said threaded first end of said elongated support member of said adapter;

E) using said elongated support member of said adapter to support said whip antenna in said near-horizontal position relative to said vehicle;

F) while said whip antenna is supported in said near-horizontal position by said elongated support member, performing NVIS radio wave propagation by propagating HF radio waves from said whip antenna;

G) while said adapter is attached to said antenna base, using said whip antenna support means to support said whip antenna in said generally vertical position; and

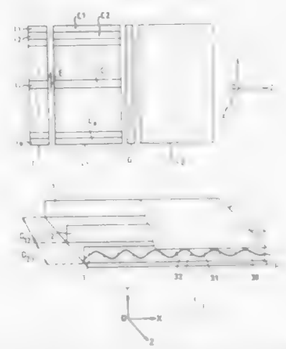
H) while said whip antenna is supported in said generally vertical position by said antenna support means of said adapter, performing radio wave propagation by propagating radio waves from said whip antenna.

5,144,327

SOURCE OF MICROWAVE RADIATION FOR AN ELECTRONIC SWEEPING ANTENNA WHICH ABSORBS REFLECTED ENERGY

Claude Chekroun, Gif S/Yvette, and Gérard Collignon, Limours, both of France, assignors to Thomson-CSF Radant, Cedex, France

Filed Dec. 11, 1990, Ser. No. 625,480
Claims priority, application France, Dec. 26, 1989, 89 17170
Int. Cl.[5] H01Q *11/04, 3/460*
U.S. Cl. 343—731 **6 Claims**



1. A source of microwave radiation for the transmission and reception of microwave radiation along a first direction, the electric field of which is substantially directed along a second direction, normal to the first direction, the source including a plurality of conductive planes appropriately spaced to form channels, said plurality of conductive planes spaced in a direction substantially parallel to the second direction, each channel comprising:

a first conductive plane forming a short-circuit to said microwave radiation, extending substantially in a third direction perpendicular to said first and second directions;

a second plane forming an incidence filter, located at a distance from the first plane of substantially half a wavelength of said microwave radiations aid filter including a resistive means;

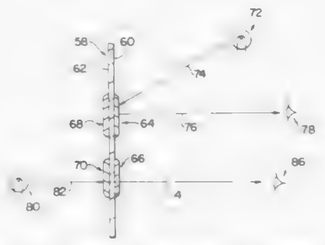
a third plane spaced apart and substantially parallel to said second plane, bearing a snake line microwave radiator, the filter at lest partially absorbing microwave radiation which is received with a non-zero angle of incidence

5,144,128

METHOD FOR PRODUCING AN IMAGE ON A SUBSTRATE HAVING THE SAME SPECTRAL CONTENT WITH FRONT AND BACK ILLUMINATION

Dale Blake, Wooster, Ohio, and Donald Redding, Pasadena, Calif., assignors to Metromedia Company, Secaucus, N.J.

Filed Jun. 20, 1990, Ser. No. 540,892
Int. Cl.[5] B41J *./005, 29/19*
U.S. Cl. 346—1.1 11 Claims



1. Method for obtaining substantially an equivalent spectral content from an ink film carried on a surface when illuminated by a light source located in front of the surface carrying the ink film as when illuminated by a light source located behind the surface carrying the ink film, said method comprising the steps of:

applying a first ink film in a predetermined thickness on a first surface in a predetermined location,

applying a second ink film in a predetermined thickness on a second surface in a predetermined location;

said first and second ink films being in registry;

passing light through said first ink film thickness twice from a light source located on the same side as said first surface and passing light through said second ink film and said first ink film from a light source located on the opposite side of said first surface whereby light passes through two film thicknesses such that a viewer observing said first ink film on the same side as said first ink film observes light having the same spectral content as light passing through said second ink film and said first ink film from a light source located on the side opposite said first ink film and the viewer.

5,144,329

RECORDING APPARATUS AND METHOD WHICH TAKES INTO ACCOUNT IMAGE INFORMATION BEING RECORDED

Tomoyuki Takeda, Yokohama; Takehiro Yoshida, Tokyo; Takeshi Ono, Yokohama; Makoto Kobayashi, Tama; Satoshi Wada, Kawasaki; Yasushi Ishida, Tokyo; Minoru Yokoyama, Yokohama; Akihiro Tomoda, Yokohama; Masakatsu Yamada, Yokohama, and Takashi Awai, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1990, Ser. No. 552,016
Claims priority, application Japan, Jul. 14, 1989, 1-180525; Jul. 3, 1990, 2-174461
Int. Cl.[5] G01D *9/00* B41J *2/325, 2/01*
U.S. Cl. 346—1.1 9 Claims

1. A recording apparatus for recording an image on a recording medium, comprising:

a head member having a number of heat generating elements for recording;

conveying means for conveying said recording medium;

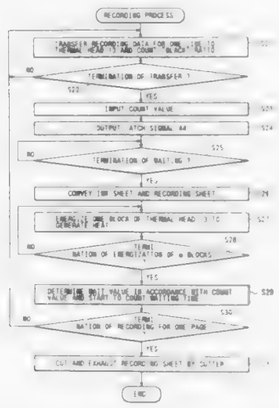
discriminating means for discriminating a ratio of a quantity of said heat generating elements to be driven by a recording signal for a predetermined line to the number of said heat generating elements; and

changing means for changing a time interval between recording of said predetermined line and recording of a previous line according to the ratio discriminated by said discriminating means.

7. A thermal recording method for recording an image on a recording medium, comprising the steps of:

transmitting recording information for a line to a thermal head, the thermal head having a number of heat-generating elements;

measuring for the line a driving ratio relative to the number of heat generating elements provided on said thermal head;



conveying said recording medium and a member supporting an ink layer by a predetermined amount;

recording by energizing said heat generating elements according to said recording information for the line;

determining a time interval between termination of recording for a preceding line and beginning a next recording for a next line in accordance with a next driving ratio corresponding to a next line which is measured at said measuring step; and

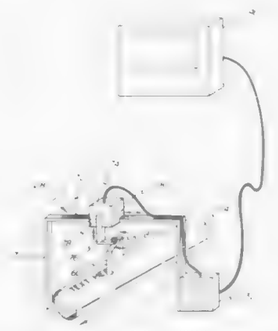
starting the next recording after the time interval.

5,144,330

METHOD AND APPARATUS FOR PRINTING ON PIPE

Charles G. Bennett, 1057 Racine Ave., Columbus, Ohio 43204

Filed Dec. 21, 1990, Ser. No. 631,841
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—1.1 16 Claims



1. In a pipe processing system comprising a host computer having a memory for storing information relating to pipe in said system, a print engine having a microcontroller connected to said host computer, and a print station having a printer connected to said print engine; a method of providing pipe with an identification mark comprising the steps of:

inputting inventory data to said host computer corresponding to a pipe in said system,

conveying said pipe into said print station,

transmitting a message from said host computer to said print engine querying the status of said print engine,

transmitting a message from said print engine to said host computer indicating that said print engine is ready to receive a message to be printed,

transmitting a message to be printed from said host computer to said print engine,

said microcontroller including a memory for storing said message and said message containing pipe identification data,

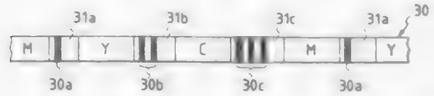
providing an input signal to said print engine in response to a predetermined position of said pipe in said print station, said input signal causing said print engine to initiate a print operation wherein said print engine activates said printer to print said message containing pipe identification data.

5,144,331

DRIVE CONTROL METHOD FOR THERMAL TRANSFER PRINTER

Toshiaki Amano, Iwate, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 731,841
Claims priority, application Japan, Aug. 20, 1990, 2-219813
Int. Cl.[5] G01D *9/00, 15/00;* B41J *2/325*
U.S. Cl. 346—1.1 4 Claims



1. A drive control method for a thermal transfer printer adapted to carry out printing by detecting a mark formed on an elongated ink medium for indicating an ink layer formed on said ink medium, and pressing a thermal head through the ink medium against a printing paper to transfer the ink layer onto the printing paper by heat; said drive control method comprising the steps of:

moving said ink medium spaced from said printing paper so as to bring a blank portion formed between said mark and said ink layer into opposition to said thermal head, said blank portion being coated with no ink;

pressing said thermal head through said blank portion against said printing paper to bring said thermal head into pressure contact with said blank portion and said printing paper; and

moving said thermal head relative to said printing paper, and simultaneously heating said thermal head to transfer the ink of said ink layer onto said printing paper.

5,144,332

METHOD OF CONTROLLING HEAD IN IMAGE RECORDING APPARATUS

Takayuki Okuie, Ibaraki, Japan, assignor to Komori Corporation, Tokyo, Japan

Filed Apr. 2, 1990, Ser. No. 502,831
Claims priority, application Japan, Apr. 17, 1989, 1-95365
Int. Cl.[5] B41J *2/07, 2/215*
U.S. Cl. 346—1.1 5 Claims

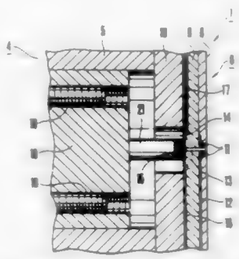
1. A method of controlling a head in an image recording apparatus, comprising the steps of:

bringing a valve body made of a diaphragm into tight contact with a valve seat having an ink nozzle;

supplying pressurized ink to a contact portion between said valve body and said valve seat;

controlling a gap formed between said valve body and said valve seat upon supply of the pressurized ink by an actuator fixed to said valve body; and

discharging the pressurized ink from said ink nozzle through the gap controlled by said actuator, the pressurized ink discharged from said ink nozzle being surrounded by air



flow sprayed from an air nozzle, wherein an outlet of said air nozzle from which air is ejected and an outlet of said ink nozzle from which ink is ejected both lie in a single plane, whereby said air flow is formed around said ink nozzle such that the pressurized ink travels straight due to the air flow.

5,144,333

PROCESS FOR THE STORAGE OF INFORMATION IN AN ORGANIC RECORDING LAYER

Jin Mizuguchi, and Alain C. Rochat, both of Fribourg, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 4, 1990, Ser. No. 532,531
Claims priority, application Switzerland, Jun. 9, 1989, 2173/89
Int. Cl.[5] G11B *9/00*
U.S. Cl. 346—1.1 15 Claims

1. A process for the storage of information in an organic recording layer comprising a quinacridone, a dithioquinacridone, a quinacridone quinone, a phthalocyanine or a diketo-pyrrolopyrrole, monoketomonothioketo-pyrrolopyrrole or dithioketo-pyrrolpyrrole which process comprises local treatment of the surface of said organic recording layer with an organic solvent in accordance with the shape of the information to be marked thereby altering its absorption spectrum, its photoconductivity or both in such a way that information is produced and stored respectively at the treated areas of this layer.

5,144,334

THERMOSENSITIVE RECORDING METHOD USING SUBLIMATION-TYPE THERMOSENSITIVE IMAGE RECEIVING RECORDING MEDIUM

Akira Suzuki, Mishima; Hidehiro Mochizuki, Numazu; Masaru Shimada, Shizuoka; Hiroyuki Uemura, and Naoya Moroboshi, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

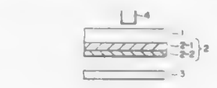
Filed Feb. 7, 1990, Ser. No. 476,596
Claims priority, application Japan, Feb. 16, 1989, 1-37365; Feb. 28, 1989, 1-47673; Jul. 11, 1989, 1-177169; Jul. 18, 1989, 1-183718; Jan. 23, 1990, 2-12003
Int. Cl.[5] G01D *15/10;* B41M *3/12*
U.S. Cl. 346—1.1 18 Claims

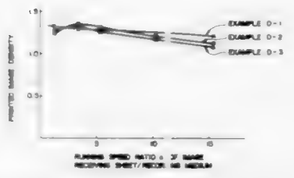
1. A thermosensitive recording method comprising the steps of:

(1) superimposing a sublimation-type thermosensitive image transfer recording medium on an image receiving sheet which image transfer recording medium comprises a support and an ink layer formed thereon, comprising a sublimable dye and one or more organic binder agents in which said sublimable dye is dispersed in the form of

granules, wherein the size of the granules are sufficiently large to provide improved printed image density with an increase in the number of printing times, and

(2) applying heat imagewise to said sublimation-type thermosensitive image transfer recording medium so as to





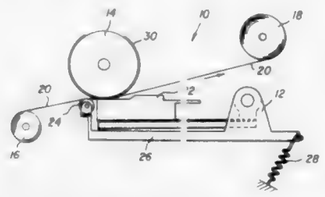
transfer imagewise said sublimable dye form said image transfer recording medium to said image receiving sheet by a heat application means while moving said recording medium and said image receiving sheet in such a manner that the running speed of said image receiving sheet is greater than that of said image transfer recording medium.

5,144,335

THERMAL PRINTER DONOR GUIDE ROLLER

Daniel C. Maslanka, and Michael J. Ehmann, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1991, Ser. No. 769,695
Int. Cl.[5] **B41J** *2/325, 17/28, 17/30;* **G01D** *15/00*
U.S. Cl. 346—76 PH **2 Claims**



1. A thermal printer, comprising:

a printer frame;

a rotatable print drum mounted on said printer frame;

a print head pivotally connected to said printer frame for movement toward and from said drum;

a donor web passing between said drum and said print head, said print head pressing said donor web against said drum during printing;

a guide roller; and

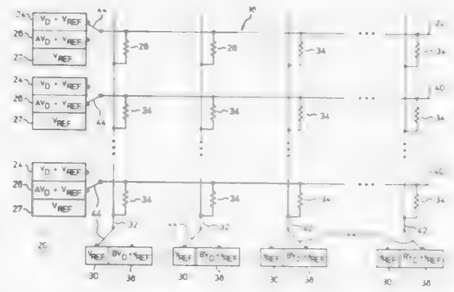
a guide roller frame pivotally connected to said frame and pivotally movable independently of said print head toward and from said print drum, said guide roller frame supporting said guide roller and moving said guide roller toward said print drum to contact said donor web to urge said donor web toward said print drum to prevent lifting of said thermal head from said print drum by said donor web during printing.

5,144,336

METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF THERMAL INK JET AND THERMAL PRINTHEADS THAT HAVE A HEATING MATRIX SYSTEM

King-Wah W. Yeung, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 468,493, Jan. 23, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 778,029
Int. Cl.[5] **G01D** *15/00;* **H04N** *1/032, 1/034;* **B41J** *2/35*
U.S. Cl. 346—76 PH **15 Claims**



1. An apparatus, comprising:

a. a printhead having a known efficiency, η;

b. a matrix located on the printhead, the matrix having:

i. n rows and m columns of resistors that are either addressed resistors or unaddressed resistors;

ii. an addressed row that may have one or more addressed resistors;

iii. an unaddressed row that does not have any addressed resistors;

iv. an addressed column that has an addressed resistor; and

v. an unaddressed column that does not have any addressed resistors;

c. an addressed row driver that drives the addressed row with V_D+V_{Ref};

d. an addressed column driver that drives the addressed column with a reference voltage, V_{Ref}; and

e. a means for driving the unaddressed row and the unaddressed column with voltages having a magnitude that causes the addressed column and the unaddressed column to dissipate the same amount of average residual power so that the temperature of the printhead is constant regardless of the number of addressed resistors.

5,144,337

IMAGE FORMING APPARATUS CAPABLE OF FORMING AN IMAGE BY DOTS HAVING VARIOUS DIAMETERS

Tomoatsu Imamura, Isehara; Masumi Sato, Yokohama; Tomonori Tanaka, Yokohama; Takamasa Hayashi, Yokohama, and Toshitaka Senma, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 594,024
Claims priority, application Japan, Oct. 12, 1989, 1-263931
Int. Cl.[5] **H04N** *1/21*
U.S. Cl. 346—108 **5 Claims**

1. An image forming apparatus capable of forming an image by dots having various diameters, comprising:

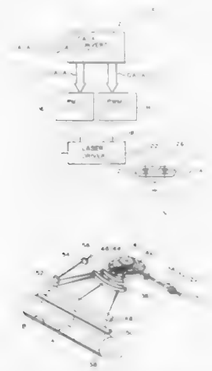
an image carrier for forming a latent image thereon;

optical writing means for scanning said image carrier with a light beam to form the latent image;

data converting means for separating image data fed thereto from the outside into first data and second data;

first changing means for generating, in response to said first data, a first output for changing the duration of the light beam issuing from said optical writing means and irradiating said image carrier in order to change a diameter of a dot mainly in a main scanning direction; and

second changing means for generating, in response to said second data, a second output for changing an intensity of the light beam issuing from said optical writing means in



order to change the diameter of a dot mainly in a subscanning direction;

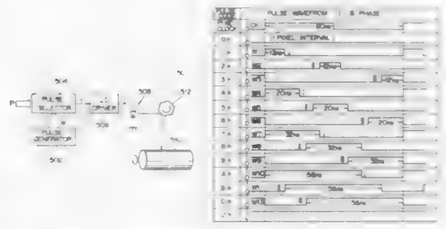
wherein each combination of first data and second data generates a dot of a unique size, and each dot is generated based on first and second data independent of first and second data used to generate any other dot.

5,144,338

IMAGE RECORDER USING PULSE WIDTH MODULATION

Yukio Sakano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,541
Claims priority, application Japan, Apr. 28, 1989, 1-107537
Int. Cl.[5] **H04H** *1/21*
U.S. Cl. 346—108 **9 Claims**



1. An image recorder for recording an image by reading image data produced by quantizing said image pixel by pixel, subjecting said read image data to image processing, and then controlling a signal supplied to a laser beam which is pulse width modulated, said image recording comprising:

phase information generating means for generating phase information representative of a recording position within one pixel interval at which a pixel of interest is to be recorded, on the basis of pixel data of two pixels preceding and following said pixel of interest in a main scanning direction of the laser beam, said phase information generating means storing in advance the phase information of a pixel of interest in relation to a combination of density data of pixels preceding and following the pixel of interest, and said pixel of interest is addressed by the density data of said preceding and following pixels to thereby generate said phase information of said pixel of interest;

pulse generating means for generating a plurality of pulses each having a different phase within one pixel interval; and

pulse selecting means for selecting one of said plurality of pulses being generated by said pulse generating means in response to said phase information generated by said phase information generating means.

5,144,339

LASER SCANNER WITH DEFLECTOR AND PHOTOSENSITIVE DRUM CONTROL

Tsuyoshi Ohashi, Hashima, and Shinichi Hirahata, Kagamigahara, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 30, 1990, Ser. No. 606,126
Claims priority, application Japan, Feb. 7, 1990, 2-11860[U]
Int. Cl.[5] **H04N** *1/21*
U.S. Cl. 346—108 **16 Claims**

1. An exposing device for scanning a photosensitive member with a laser beam, said exposing device comprising:

laser beam emitting means for emitting a laser beam based on information of an image;

deflecting means for deflecting the laser beam emitted from said laser beam emitting means to the photosensitive member;

moving means for moving said deflecting means to effect scanning of the photosensitive member with the laser beam deflected by said deflecting means; and

controlling means for stopping said moving means only after a predetermined time period passes from the end of scanning of the photosensitive member.

5,144,340

INKJET PRINTER WITH AN ELECTRIC CURTAIN FORCE

Hideo Hotomi, and Hisashi Myochin, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 490,329, Mar. 8, 1990, abandoned. This application Aug. 14, 1991, Ser. No. 746,801
Claims priority, application Japan, Mar. 10, 1989, 1-58194; May 9, 1989, 1-115853
Int. Cl.[5] **B41J** *2/01, 2/06*
U.S. Cl. 346—140 R **22 Claims**

1. An inkjet printer which comprises:

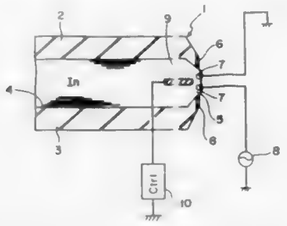
a nozzle for containing ink and having an exit opening through which the ink may be spattered;

means for forming an unequal alternating electric field oriented towards the exit opening at a constant level;

means controlled separately from the electric field forming means for injecting an electric charge into ink situated within the unequal alternating electric field; and

means for controlling the charge injecting means to vary an

amount of electric charge to be injected into the ink in accordance with an image forming signal while said elec-



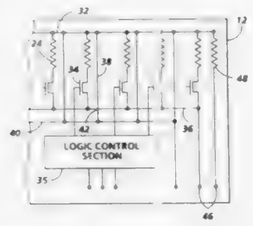
tric field forming means maintains said electric field at a constant level.

5,144,341

THERMAL INK JET DRIVERS DEVICE DESIGN/LAYOUT

Abdul M. El Haten, Hawthorne; Steven A. Buhler, Redondo Beach, and Putul D. Patel, Diamond Bar, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1991, Ser. No. 692,087
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R **18 Claims**



1. An ink jet printhead of the type having a plurality of channels, each channel being supplied with ink and having an opening which serves as an ink droplet ejecting nozzle a heating element being positioned in each channel, ink droplets being ejected from the nozzles by the selective application of current pulses to the heating elements in response to data signals from a data signal source, the heating elements transferring thermal energy to the ink causing the formation and collapse of temporary vapor bubbles that expel the ink droplets, said printhead further comprising a common return and a first and second electrically conductive power bus, two ballast resistors, said second power bus being connected at its ends to a predetermined voltage, said first power bus being connected at its respective ends to said predetermined voltage by a respective one of said ballast resistors, said power busses interconnected by a series combination of leads extending between said heating elements and respective low resistance connections which are formed beneath or above said common return.

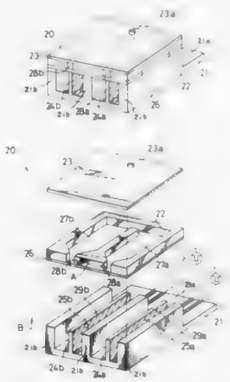
5,144,342

HEAD FOR INK-JET PRINTER

Hiroshi Kubota, Yamato-Takada, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 533,579, Jun. 5, 1990, abandoned. This application Nov. 20, 1991, Ser. No. 798,341
Claims priority, application Japan, Jun. 9, 1989, 1-147089
Int. Cl.[5] B41J *2/045*
U.S. Cl. 346—140 R **10 Claims**

1. A head for ink-jet printer comprising:
an elastic plate;
a plurality of walls defining a plurality of ink chambers together with said elastic plate;
a plurality of nozzles, each being provided in one of said walls and each of said nozzles being in communication with one of said chambers;
a base block including a base plate portion which is disposed parallel to said elastic plate at an opposite side of said walls, and a plurality of frame member portions each shaped in a plate, each of which is disposed perpendicular to said elastic plate and connected to said base plate portion at one end thereof and attached to said elastic plate at another end thereof at a position of said elastic plate corresponding to a boundary of said chambers;



a plurality of piezoelectric elements, each shaped in a plate, having a side face, which defines a thickness of said piezoelectric elements, and disposed such that opposes said elastic plate at each of said chambers for pressing said elastic plate at said side faces by an expansion due to a piezoelectric effect in a direction toward said side faces, said peizoelectric elements and said frame member portions being arranged alternatively on said base plate portion and in parallel to each other; and
electrode means attached to each of said piezoelectric elements for applying an electric voltage across each of said piezoelectric elements so as to cause said piezoelectric effect.

5,144,343

IMAGE RECORDING METHOD AND APPARATUS

Sayoko Oba; Kenji Okuna; Katsumi Muroi, all of Ibaraki; Katsubumi Ouchi, Chigasaki; Tsutomu Iimura, Tachikawa, and Ryoji Kojima, Katsuta, all of Japan, assignors to Hitachi Ltd.; Hitachi Metals, Ltd. and Hitachi Koki Co., Ltd., all of Tokyo, Japan

Filed Jun. 21, 1990, Ser. No. 541,313
Claims priority, application Japan, Jun. 21, 1989, 1-156793
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—155 **6 Claims**

1. An image recording apparatus comprising:
a recording electrode having electrode needles aligned in columns;
a driving circuit for individually applying an image recording potential and a non-image recording potential to said electrode needles;
a recording medium composed of an insulating layer with an electrically conductive layer on the surface thereof;
voltage applying means for applying a D.C. potential to said conductive layer relative to the non-image recording potential, whereby electrically conductive toner is supplied between said recording electrode and said recording medium, said driving circuit individually applying an

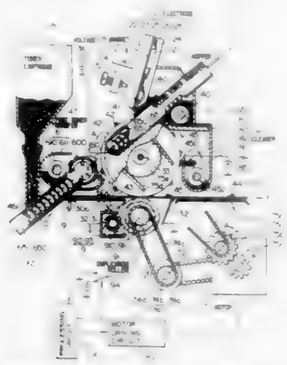


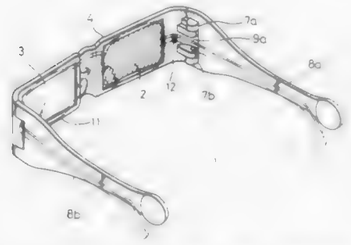
image potential to said electrode needles to record a toner image on said recording medium.

5,144,344

SPECTACLES FOR STEREOSCOPIC PICTURES

Katsumasa Takahashi, Tokyo; Takuya Nakamaru, Kanagawa, and Osamu Iino, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 24, 1990, Ser. No. 527,822
Claims priority, application Japan, May 25, 1989, 1-60529[U]; May 25, 1989, 1-60530[U]
Int. Cl.[5] G02C *7/10*; G02B *27/22*
U.S. Cl. 351—44 **13 Claims**



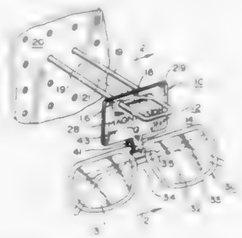
1. Spectacles for viewing of stereoscopic images based upon the principle of the Pulfrich effect, comprising:
first and second light filtering lenses, said first light filtering lens being optically less dense relative to said second light filtering lens;
a frame supporting said first and second light filtering lenses, wherein said frame comprises:
a front frame portion supporting said first and second light filtering lenses, said front frame portion being symmetrical in a right and left direction and an up and down direction so that said spectacles may be worn with said first light filtering lens over the right eye of the wearer or inverted so that said first light filtering lens is worn over the left eye; and
a pair of temple pieces mounted on each of two sides of said front frame portion, said temple pieces being symmetrical in an up and down direction so that each temple piece may be supported on either ear of the wearer; and
a direction mark applied to at least one of said frame and said first and second light filtering lenses, said direction mark being indicative of a direction of picture movement for viewing a picture through said first and second light filtering lenses as a stereoscopic image using the Pulfrich effect.

5,144,345

HANGER FOR DISPLAYING EYEGLASSES

Michael S. Nyman, Ft. Lauderdale, Fla., assignor to Al-Site Corp., Miami, Fla.

Continuation of Ser. No. 278,546, Dec. 1, 1988, Pat. No. 4,976,532, and a continuation-in-part of Ser. No. 145,222, Jan. 19, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 606,179
The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.
Int. Cl.[5] G02C *1/00*; A47F *7/02*; A41D *27/22*
U.S. Cl. 351—158 **5 Claims**



1. The combination of an eyeglass display member and an eyeglass hanger member comprising:
an eyeglass display member having an exterior surface;
cantilever support means for supporting an eyeglass hanger member, said cantilever support means extending outwardly in a first direction from said eyeglass display member exterior surface;
an eyeglass hanger member for mounting a pair of eyeglasses, said pair of eyeglasses including first and second lenses and a frame, said frame including temples and means for mounting said first and second lenses in a side-by-side relationship with a gap therebetween, said frame further including a bridge portion extending across said gap, said temples being pivotable with respect to said lenses within said frame and selectively movable between a folded, closed position when the eyeglasses are hung from the eyeglass display member and unfolded, open position in which the temples are substantially perpendicular to said lenses to enable the eyeglasses to be tried on by a potential user;
said eyeglass hanger member made from flat sheet material and having an upper edge, a lower edge and a width dimension, the width dimension of said hanger member being greater than the width of the bridge;
means for securing a portion of said frame of said pair of eyeglasses to said hanger member to enable the temples of the frame to be selectively displaced between said closed position and said open position, said means for securing locating at least a portion of said eyeglasses at a position below said hanger member;
opening means formed in said hanger member below the upper edge thereof, said opening means for receiving the cantilever support means and securing a horizontal orientation for the eyeglasses when said hanger member is mounted on said cantilever support means, said opening means configured so that while receiving said cantilever support means, said hanger member can be slidably movable thereon; and
said cantilever support means extending through a hanger member opening means in a manner to position the eyeglasses associated therewith with the temples in a substantially horizontal position so that when the temples of said eyeglasses are in a folded, closed position said temples do not penetrate the display member exterior surface and are

substantially parallel to the fol led temples of any other pair of eyeglasses whose hange member is supported by said cantilever support means a lowing a plurality of said eyeglasses hanger members to e supported thereon.

5,144,346

OPHTHALOMOLOGICAL APPARATUS FOR ALIGNMENT AND R EFRACTION

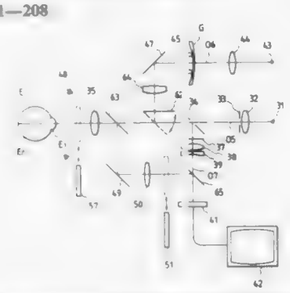
Yukitsugu Nakamura, Sagamihara; Toshimi Kobayakawa, Yokohama, and Hiroshi Aoki, Kawas ki, all of Japan, assignors to Canon Kabushiki Kaisha, Toky , Japan

Filed Apr. 26, 1991, Se . No. 691,782

Claims priority, application Japar , Apr. 27, 1990, 2-112909; May 18, 1990, 2-128388; Jun. 1, 199), 2-143457; Jun. 15, 1990, 2-156969

Int. Cl.[5] A61B *3/14*

U.S. Cl. 351—208 **12 Claims**



1. An ophthalmological apparat s comprising:

an alignment observing system having a first light sensor which is substantially conju ate with an anterior eye portion of an eye to be exami ed;

an eye refractive power measurir g system having a first light source for projecting a beam t an eye fundus of the eye to be examined and arranged to neasure a refractive power of the eye by receiving light re flected at the eye fundus by means of a second light senso ;

means for holding a lens to be e amined at a position which is different from a position wl ere the eye to be examined is placed; and

a lens refractive power measuri g system having a second light source for projecting a b am to a lens to be examined and arranged to measure a l ns refractive power by receiving the beam from said econd light source which passes through said lens, by m eans of a third light sensor,

wherein said first light source a id said second light source are different from each other nd said third light sensor is commonly used with at least either said first light sensor or said second light sensor.

5,144,347

Patent Not Issued For This Number

5,144,348

IMAGE BEARING TEMPLA E FOR INSTANT FILM ASSEMBL AGES

Frederick L. DiSanzo, Waltham, a d George J. Farrell, Bedford, both of Mass., assignors to Pola oid Corporation, Cambridge, Mass.

Filed Dec. 3, 1990, S er. No. 620,897

Int. Cl.[5] G03 3 *17/24*

U.S. Cl. 354—108 **11 Claims**

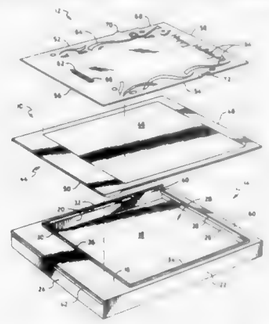
1. A film assemblage including an image bearing template formed from a single sheet of ma erial for use with a cassette having an exposure window and a film exit opening and at least one film unit adapted to be positi ned within the cassette with its photosensitive area in alignment with the exposure window, comprising in combination:

a cassette having an exposure window in a forward wall thereof, a film exit opening in a leading end wall and a trailing end wall;

a least one film unit located within said cassette with a photosensitive area located in alignment with said exposure window;

a thin transparent image bearing sheet having leading and trailing edges and longitudinally extending, laterally spaced, side edges, said sheet having a first dimension substantially the same as a lateral dimension of said exposure window and a second dimension greater than a longitudinal dimension of said exposure window;

first means formed from said thin sheet protruding integrally upward from said thin sheet at a location intermediate said leading and trailing edges and spaced inwardly of said side edges, said first means having a lateral dimension substan-



tially less than the corresponding lateral dimension of said exposure window, said first means being adapted to be located in a position substantially adjacent to a laterally extending edge of said exposure window so as to cooperate therewith to prevent the removal of said thin sheet from said cassette in response to the movement of said film unit from said cassette via said film unit opening; and

second means formed from said thin sheet extending integrally upward from said thin sheet at laterally opposite edges of said thin sheet at locations intermediate said leading and trailing edges, said second means being spaced apart by a distance substantially equal to the lateral dimension of said exposure opening and being adapted to engage adjacent longitudinally extending edges of said exposure opening.

5,144,349

REAL IMAGE MODE VARIABLE MAGNIFICATION FINDER OPTICAL SYSTEM

Shigeru Kato, Hachiouji, and Kazuteru Kawamura, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1991, Ser. No. 718,283

Claims priority, application Japan, Jun. 21, 1990, 2-163640

Int. Cl.[5] G03B *13/12*

U.S. Cl. 354—222 **4 Claims**

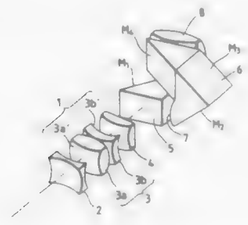
1. A real image mode variable magnification finder optical system disposed separately from a photographing optical system and comprising, in the order from the object side, an objective having a positive refractive power and an eyepiece having a positive refractive power wherein:

said objective comprises a first lens component having a negative refractive power, a second lens component having a positive refractive power and a third lens component having a positive refractive power;

a first reflecting surface for erecting an image is disposed between said third lens component and an intermediate image surface; and

said second lens component and said third lens component

are moved along the optical axis for variation of magnification and correction of diopter, while keeping said first lens component stationary, so as to set the airspace re-



served between said second lens component and said third lens component at a maximum width thereof in the vicinity of a middle field angle.

5,144,350

PHOTOGRAPHIC FILM CARTRIDGE

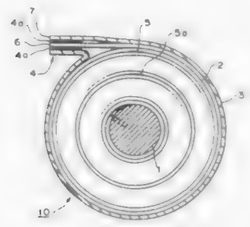
Koichi Takahashi; Kazuo Okutsu; Hisashi Takahashi; Masuhiko Hirose; Haruo Ichikawa; Kuniharu Kitagawa, and Hideaki Kataoka, all of Minami-ashigara-shi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 472,521, Jan. 30, 1990, abandoned. This application Mar. 22, 1991, Ser. No. 672,754

Claims priority, application Japan, Jan. 31, 1989, 1-21862; Aug. 24, 1989, 1-218172; Jan. 12, 1990, 2-5251

Int. Cl.[5] G03B *17/26*

U.S. Cl. 354—275 **4 Claims**



1. A photographic film cartridge comprising: a spool; a film wound into a roll on said spool with one end connected with said spool; and a cartridge case, said spool extending substantially coaxially with respect to said cartridge case and being carried at opposite end portions by opposite end walls of said cartridge case of rotation about a longitudinal axis of said spool, said cartridge case being provided with a film outlet through which an end of said film is fed out of said cartridge and a shielding material on inner surfaces of said film outlet for keeping the interior of said cartridge case shielded from external light wherein said cartridge includes means for enabling said film to be conveyed through said film outlet when said spool is rotated in the unwinding direction, said enabling means including a plurality of adhesive means including an adhesive substance for detachably, adhesively adhering a winding of the roll of film to an adjacent winding of the roll of film, said spool being capable of being rotated in the unwinding direction from outside of the cartridge thereby advancing said film.

5,144,351

Patent Not Issued For This Number

5,144,352

CONTROL APPARATRUS OF FOCUS AND SHUTTER OF CAMERA

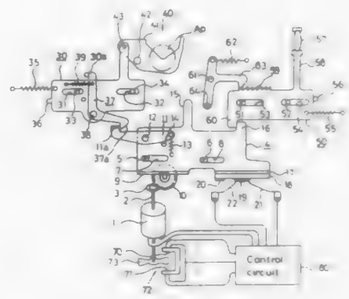
Tetsuji Shono, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1990, Ser. No. 508,359

Claims priority, application Japan, Apr. 14, 1989, 1-94789; Apr. 27, 1989, 1-108929

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—400 **22 Claims**



1. A focus and shutter control apparatus of a camera comprising:

an actuating member adapted to be driven by a reversible motor;

an automatic focus control mechanism for determining displacement of a focus adjusting lens in accordance with a displacement of said actuating member in one direction wherein said actuating member drives said focus adjusting lens;

a shutter control mechanism for determining an opening angle of a shutter mechanism in accordance with a displacement of said actuating member in another direction; and

means for biasing said shutter mechanism in a direction to open a photographing aperture, so that an opening movement of said shutter mechanism is effected by said biasing means, and said closing movement being effected by movement of said actuating member in response to a reversal of said reversible motor.

5,144,353

OPTICAL SYSTEM DRIVING DEVICE OF CAMERA

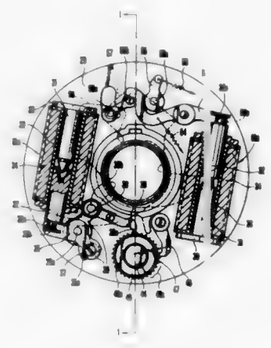
Yukio Odaka, and Hideo Ikari, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1990, Ser. No. 550,013

Claims priority, application Japan, Jul. 11, 1989, 1-178362; Jul. 18, 1989, 1-184977

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 **46 Claims**



1. An optical system driving device for a camera, comprising:

a) displacement means for actuating a phototaking optical system by displacement;

b) driving means, arranged to alternately assume either a first state or a second state, for shifting said displacement means to a first given degree in a predetermined direction when the first state changes to the second state, and for shifting said displacement means in a direction reverse to the predetermined direction to a second given degree which is smaller than the first given degree when the second state changes to the first state;

c) first stopping means for stopping said driving means in the first state;

d) second stopping means for stopping said driving means in the second state; and

e) photographing means for performing photography under a condition that said driving means is selectively stopped by either said first stopping means in the first state or said second stopping means in the second state.

5,144,354

Patent Not Issued For This Number

5,144,355

CAMERA HAVING AUTOMATIC FOCUS ADJUSTING APPARATUS

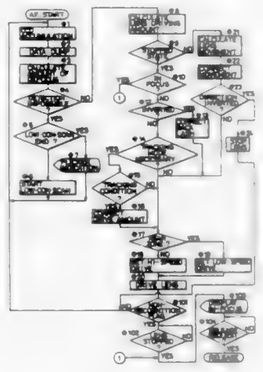
Masataka Hamada, and Tokuji Ishida, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1991, Ser. No. 661,229

Claims priority, application Japan, May 16, 1988, 63-118634

Int. Cl.[5] G03B *3/10*

U.S. Cl. 354—400 **12 Claims**



1. A camera having an automatic focus adjusting apparatus, comprising:

(a) focus detecting means for detecting a focusing condition of a photographic lens to output a focus signal;

(b) movement detecting means for detecting movement of an object and for outputting movement information;

(c) calculating means for predicting an in-focus lens position at a time of exposure control based on said focus signal and said movement information, and for calculating a predicted amount of drive for driving the photographic lens to the in-focus position;

(d) driving means for driving said photographic lens;

(e) determining means for determining whether the amount of drive by said driving means has reached the predicted amount of drive;

(f) a manual operating member;

(g) releasing means for performing a releasing operation independent of said focus detection, when said determining means determines that the amount of drive by said driving means has reached said predicted amount of drive after said manual operating member is operated; and

(h) exposure controlling means for starting exposure controlling operation after the releasing operation of said releasing means.

5,144,356

TEMPERATURE COMPENSATED INFRARED OPTICAL IMAGING SYSTEM

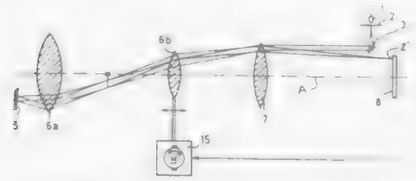
Gunther Kurbitz, Konigsbronn-Zang; Dieter Marx, Aalen-Waldhausen, and Harald Heinrich, Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 561,958

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1989, 3925964

Int. Cl.[5] G03B *3/00, 13/18*

U.S. Cl. 354—402 **8 Claims**



1. A method for eliminating an effect of temperature variations on an adjustable focus of an infrared optical imaging system for camera-like apparatus having as its primary function imaging of infrared radiation emanating from sources outside said apparatus by directing incident image-forming infrared radiation through said system and focusing said incident radiation on a signal-generating detector, comprising the steps of:

mounting an auxiliary heat source in proximity to said optical imaging system, said heat source emitting auxiliary infrared-focussing radiation of preselected wavelength and intensity;

directing said auxiliary infrared-focussing radiation immediately from said auxiliary heat source to said infrared optical imaging system so that it is focused on said detector along with said incident image-forming infrared radiation;

monitoring and analyzing signals generated by said detector in response to said immediately-directed infrared-focussing radiation from said auxiliary heat source; and

adjusting the focus of said infrared optical imaging system until said signals generated by said immediately-directed auxiliary infrared-focussing radiation indicate said focus is optimized.

5,144,357

AUTOMATIC FOCUS DETECTING MEANS

Tokuji Ishida; Toshio Norita; Masataka Hamada, and Hiroshi Ootsuka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 267,304, Nov. 4, 1988, Pat. No. 4,999,841. This application Dec. 20, 1990, Ser. No. 630,887

Claims priority, application Japan, Nov. 6, 1987, 62-280482

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] G03B *13/36*; G02B *7/34*

U.S. Cl. 354—402 **8 Claims**

1. An automatic focus condition detecting device comprising:

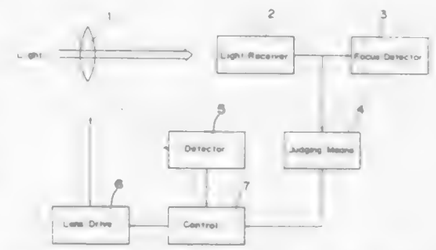
an objective lens;

first means for receiving light from an object in a first focus detecting area through said objective lens;

first means responsive to the output of said first receiving means for detecting a focus condition of said objective lens;

first means responsive to the output of said first receiving means for judging whether or not it is possible for said first means to detect a focusing condition of said objective lens;

second means for receiving light from an object in a second focus detecting area, which is different from the first focus detecting area, through said objective lens;



second means responsive to the output of said second receiving means for detecting a focus condition of said objective lens;

second means responsive to the output of said second receiving means for judging whether or not it is possible for said second detecting means to detect a focusing condition of said objective lens;

means for assisting in making it possible to detect a focusing condition of said objective lens; and

means for activating said assisting means, responsive at least to said first judging means, when said first judging means judges that it is impossible for said first detecting means to detect a focusing condition and, moreover, said second judging means judges that it is possible for said second detecting means to detect a focusing condition.

5,144,358

AUTOMATIC FOCUSING CAMERA

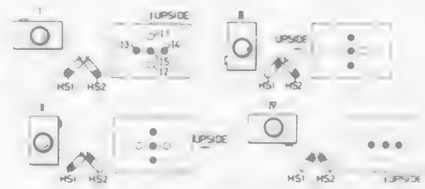
Hiroyuki Tsuru; Tadashi Otani, both of Tokyo, and Shigemasa Sato, Chiba, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 317,742, Mar. 1, 1989, abandoned. This application Oct. 24, 1990, Ser. No. 603,246

Claims priority, application Japan, Mar. 2, 1988, 63-48878

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—403 **23 Claims**



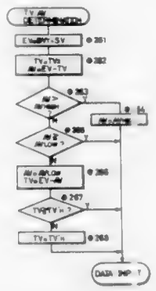
1. An automatic focusing camera comprising:

a camera housing;

distance measurement means including light emitting means formed integrally with said camera housing and provided with plural light emitting elements for respectively emit-

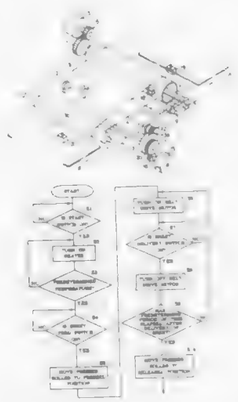
ting radiation beams toward mutually different portions of an object field;
position detecting means for detecting a position of said camera housing; and
control means for selectively driving a part of said plural light emitting elements for the emission of said radiation beams, that varies in response to the position of said camera housing detected by said position detecting means.

5,144,359
APERTURE VALUE DETERMINING DEVICE FOR A FLASH SYSTEM
Kohtaro Hayashi; Toshihiko Karasaki; Yasuteru Yamano, and Koji Hata, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 351,809, May 15, 1989, Pat. No. 5,051,769. This application Jul. 15, 1991, Ser. No. 730,104
Claims priority, application Japan, May 16, 1988, 63-118622; Jul. 30, 1988, 63-190784
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—419 5 Claims



1. An aperture value determining apparatus of a camera for flash photography, comprising:
means for producing an object distance signal representative of a distance to an object to be photographed;
means for producing a film speed signal representative of a film speed of a film loaded
means for producing a guide number signal representative of a light amount of a flash light emission;
means for producing a shutter speed signal representative of a shutter speed set in said camera;
means for measuring brightness of a scene to be photographed to produce a brightness signal representative of said measured brightness;
means for determining an exposure value on the basis of said film speed signal and said brightness signal;
means for calculating a first aperture value for flash photography, on the basis of said object distance signal, said film speed signal, and said guide number signal;
means for setting a second aperture value, which is equal to or larger than a fully opened aperture value of a photographing lens;
means for comparing said first aperture value with said second aperture value; and
means for determining a control aperture value on the basis of said shutter speed signal and said exposure value wherein said control aperture value is determined to be larger than or equal to said second aperture value when said first aperture value is larger than or equal to said second aperture value, and that said control aperture value is determined to be larger than or equal to said first aperture value when said first aperture value is smaller than said second aperture value.

5,144,360
THERMAL FIXING DEVICE IN AN IMAGE RECORDING APPARATUS
Kazuhito Iahida, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Dec. 26, 1990, Ser. No. 633,989
Claims priority, application Japan, May 10, 1990, 2-48985[U]
Int. Cl.[5] G03B *27/52*
U.S. Cl. 355—27 16 Claims

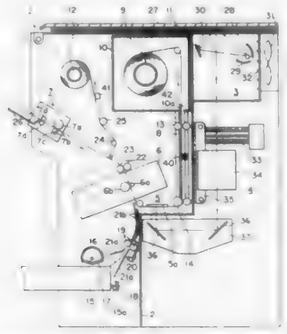


1. A thermal fixing device in an image recording apparatus, comprising:
a heat roller for applying heat to an image formed on a surface of a recording medium;
a presser-roller disposed in such a manner that said presser-roller can be brought into contact with and moved away from said heat roller, thereby changing the positions of the heat roller and the presser-roller relative to each other;
a tautly mounted thermal fixing belt, said thermal fixing belt passing between said heat roller and said presser-roller and feeding the recording medium between said heat roller and said presser-roller in a state in which the recording medium is supported between the heat roller and the presser-roller;
signal outputting means for outputting a signal when at least one of; a) a predetermined period of time has elapsed after passage of the recording medium having the image on the surface thereof between said heat roller and said presser-roller and completion of its thermal fixation; and b) a power switch is turned off while the thermal fixation of a subsequent image is still in an un-started state after passage of the recording medium having the image on the surface thereof between said heat roller and said presser-roller and completion of its thermal fixation; and
roller-separating means for separating said presser-roller from said heat roller based on the signal output from said signal outputting means.

5,144,361
IMAGE RECORDING APPARATUS CAPABLE OF DETECTING MEDIUM LOADING FAILURE
Hiroshi Morisaki, Nishikasugai, and Kenji Sakakibara, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Oct. 26, 1990, Ser. No. 604,880
Claims priority, application Japan, Oct. 30, 1989, 1-282242
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—27 4 Claims

1. An image recording apparatus comprising:
a plurality of frames defining an internal space of the image recording apparatus;

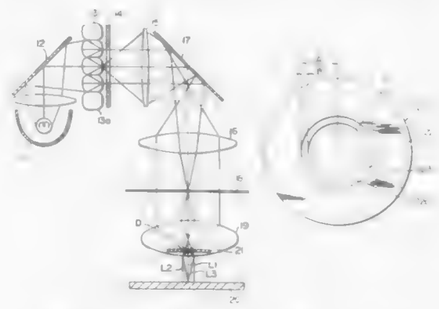
a medium cartridge detachably disposed in the internal space of the image recording apparatus, said medium cartridge accommodating an elongated, web-like photosensitive recording medium wound around a supply shaft, a leading edge of the recording medium being adapted to be drawn out of said medium cartridge;
a take-up shaft for winding the recording medium supplied from said medium cartridge;
medium moving means capable of bidirectionally moving the recording medium along a predetermined medium feed path provided between said medium cartridge and said take-up shaft, the recording medium being moved in



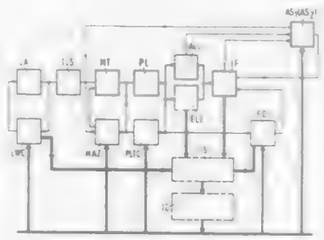
a first direction to attach the leading edge of the recording medium to said take-up shaft to thus perform loading of the recording medium;
sensing means disposed a predetermined distance from said medium cartridge for sensing the recording medium at a plurality of predetermined spaced positions; and
control means for controlling said medium moving means to move the recording medium in the first direction the predetermined distance and to move the recording medium in a second direction opposite the first direction when the recording medium is not sensed by said sensing means at one of said predetermined spaced positions.

5,144,362
PROJECTION ALIGNER
Kazuya Kamon, Itami; Yasuhito Myoi, Amagasaki; Teruo Miyamoto, Amagasaki; Yoshie Noguchi, Amagasaki, and Masaaki Tanaka, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Nov. 12, 1991, Ser. No. 790,446
Claims priority, application Japan, Nov. 14, 1990, 2-306238; Jan. 8, 1991, 3-11541
Int. Cl.[5] G03B *27/42*
U.S. Cl. 355—53 17 Claims

1. A projection aligner comprising:
a light source for producing light;
a condenser lens system for directing light from said light source onto a mask on which a circuit pattern is formed;
a projecting lens system for collecting on the surface of a wafer the light transmitted through said mask; and
a pupillary member disposed on a pupillary surface of said projecting lens system, said pupillary member including at least one transmitting zone for transmitting light transmitted through said mask and a phase shift member disposed within part of the transmitting zone for producing a predetermined phase shift in light transmitted through part of the transmitting zone.



5,144,363
APPARATUS FOR AND METHOD OF PROJECTING A MASK PATTERN ON A SUBSTRATE
Stefan Wittekoek; Marinus A. Van Den Brink, and Theodorus A. Fahner, all from Veldhoven, all of Netherlands, assignors to ASM Lithography B.V., Veldhoven, Netherlands
Filed Jan. 24, 1991, Ser. No. 645,158
Claims priority, application Netherlands, Mar. 5, 1990, 9000503
Int. Cl.[5] G03B *27/42*
U.S. Cl. 355—53 71 Claims



1. A method of projecting a mask pattern onto a substrate by means of a projection lens system and a projection beam, the mask pattern provided in a mask table and the substrate provided in a substrate table, which method comprises the following steps:
providing a mask having mask reference marks in the mask table,
providing a reference plate having reference plate marks in the projection beam on the substrate table,
projecting the image of at least one mark of the mask on a corresponding mark of the reference plate by means of the projection beam and the projection lens system,
detecting projection radiation from the illuminated reference plate mark by means of radiation-sensitive image detectors,
electronically processing the detector signals to an alignment calibration signal and a magnification error signal,
adjusting an alignment device and setting the magnification of the projection lens system by means of the respective signals,
removing the reference plate from the substrate table and providing a production substrate on the table, and
repetitively projecting a production mask successively in different positions on the production substrate,
characterized in that simultaneously with the signals of the

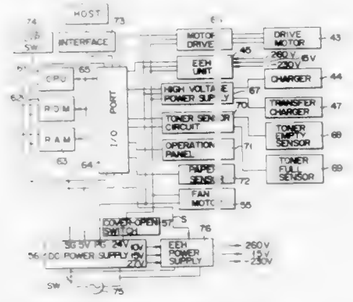
image detection device also signals of a substrate table position detection device and of an optical focus error detection device are electronically processed, in that a plurality of image detectors is used for each reference plate mark, in that said detectors only receive radiation from an associated reference plate mark, and in that the signals of the image detection device, of the substrate table position detection device and of the optical focus error detection device are also processed to a calibration signal for the focus error detection device and to at least one control signal with which at least one of the parameters influencing the image quality is adjusted.

5,144,364

POWER SUPPLY FOR ELECTROPHOTOGRAPHY APPARATUS

Toshiyuki Ichikawa, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,384
Claims priority, application Japan, Mar. 22, 1990, 2-72828; Mar. 22, 1990, 2-72830
Int. Cl.[5] G03B 2 '/72
U.S. Cl. 355—69 4 Claims



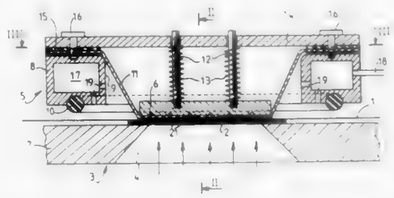
1. A power supply device comprising:
first output means for outputting a power supply voltage of a first potential;
second output means for outputting a power supply voltage of a second potential;
means for connecting said first and second output means;
means for applying a predetermined central potential to said connecting means;
reference potential means for generating a reference potential having a predetermined potential difference from the central potential;
first detection potential means for generating a first detection potential corresponding to the first potential;
second detection potential means for generating a second detection potential corresponding to both the first potential and the second potential;
first control means for controlling said first output means to minimize a potential difference between the first detection potential and the reference potential;
second control means for controlling said second output means to minimize a potential difference between the second detection potential and the central potential; and
means for forcibly changing at least one of the first detection potential and the reference potential using a predetermined control signal, so that both the first potential and the second potential change toward the central potential.

5,144,365

DEVICE FOR REPRODUCING IMAGES, BY CONTACT, ON AN UNEXPOSED PHOTOGRAPHIC FILM FROM A TRANSPARENT ORIGINAL

Albert B. Visage, Saint Germain des Prés, 45220 Chateaurenard, France

Filed Oct. 11, 1991, Ser. No. 775,725
Claims priority, application France, Oct. 15, 1990, 90 12686
Int. Cl.[5] G03B 27/20
U.S. Cl. 355—91 9 Claims



1. Device for reproducing images, by contact, on an unexposed photographic film (1) from a transparent original (2), notably a photographic negative or a slide, of the type comprising a support (3) provided with a window (4), the original being intended to block the window, while the film is intended to be placed in front of the original, a frame (5) located in front of the support (3) and provided with pressing means (6), the support and the frame being displaceable in relation to one another between an inactive position in which the pressing means cannot exercise any action on the film or the original, and an active position in which the pressing means can press the film against the original, and the latter against the support, means for creating a negative pressure between the original and the film when the support and the frame are in their active positions, and a light source to print the film through the original, characterized in that the support (3) is formed by a plate (7), while the frame (5) comprises a body (8) provided with a central recess (9) located opposite the window (4) and the dimensions of which are greater than those of the latter, an annular seal (10) fixed around the recess, on the portion of the body that is turned towards the plate, and a membrane (11) fixed at the portion of the body that faces away from the plate and projecting out of the recess in such a way that it comes closer to the plate than the seal does under the action of the pressing means (6), the plate, the body, the seal and the membrane delimiting, in the active positions of the support and the frame, a negative pressure chamber (20) suitable for connection to a vacuum source.

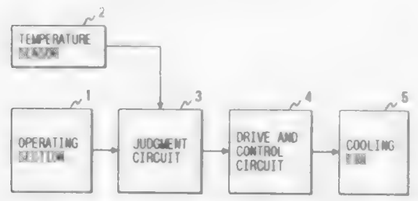
5,144,366

COOLING SYSTEM FOR USE IN AN IMAGE FORMING MACHINE

Hiroyuki Sakamoto; Naruyuki Miyamoto; Ichirou Takahashi; Takashi Nagashima, and Hiroyuki Arai, all of Osaka, Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Oct. 31, 1991, Ser. No. 784,941
Claims priority, application Japan, Oct. 31, 1990, 2-294068
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—208 7 Claims

1. A cooling system for an image forming machine, comprising:
means for cooling the inside of the image forming machine;
an operating section for inputting a signal representing a required number of sheets to be copied continuously;
means for detecting temperature inside of the image forming machine, said detecting means comprising a single temperature sensor;
means for determining a voltage value in accordance with an output signal of said operating section and an output signal of said temperature detecting means; and



means for driving said cooling means in accordance with said voltage value determined by said voltage value determining means.

5,144,367

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 577,006, Sep. 4, 1990, Pat. No. 5,070,369, which is a division of Ser. No. 452,355, Dec. 19, 1989, Pat. No. 4,999,220, which is a division of Ser. No. 116,337, Nov. 2, 1987, Pat. No. 4,889,783, which is a division of Ser. No. 814,083, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 502,583, Jun. 9, 1983, abandoned, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Oct. 31, 1990, Ser. No. 606,188
Claims priority, application Japan, Jun. 25, 1980, 55-86801
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.[5] G03G 15/22
U.S. Cl. 355—211 3 Claims

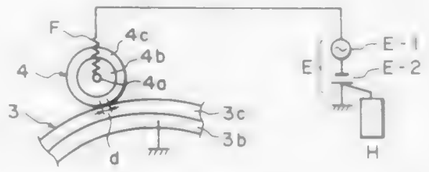
1. An electrostatic photocopying machine comprising:
a printing member including
a conductive substrate;
a photoelectrically sensitive, electrically chargeable, semiconductor layer formed on said conductive substrate;
wherein the photoelectrically sensitive, electrically chargeable layer has a non-single crystal semiconductor layer on the substrate and an insulating or semi-insulating layer on the non-single crystal semiconductor layer and having an external surface and permeability to light and electrical carriers;
wherein the non-single crystal semiconductor layer has a first layer on the side of the substrate and a second layer on the first layer and wherein the first layer is P or N type and the second layer is substantially I type;
where said external surface of said insulating or semi-insulating layer can be used as the printing surface;
where said insulating or semi-insulating layer comprises a silicon compound containing carbon or nitrogen either in stoichiometric or non-stoichiometric amounts; and
means for providing said charge on said external surface of the insulating or semi-insulating layer of the printing member;
means for projecting a light image on said printing member to thus form an electrostatic charge image; and
means for developing the electrostatic charge image to form a visible image pattern on the insulating or semi-insulating layer of the printing member.

5,144,368

CHARGING DEVICE AND IMAGE FORMING APPARATUS HAVING SAME

Yukihiro Ohzeki; Junji Araya, and Tatsunori Ishiyama, all of Yokohama, Japan, assignors to Canon Kabushki Kaisha, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,643
Claims priority, application Japan, Nov. 15, 1989, 1-294820
Int. Cl.[5] G03G 15/02
U.S. Cl. 355—219 65 Claims



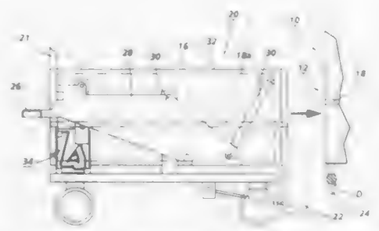
1. A charging device, comprising:
a content member contactable to a member to be charged; and
voltage applying means for applying to said contact member a voltage having a voltage level which periodically changes, to charge said member to be charged;
wherein said voltage applying means constant-voltage-controls said contact member in a first period and constant-current-controls said contact member in a second period, wherein a constant voltage level V2 in the first period is determined in the second period.

5,144,369

DEVELOPER UNIT ALIGNMENT, REMOVAL AND INTERCHANGE SYSTEM

Lawrence R. Benedict, Rushville, and A. Lance Marchese, Honeoye Falls, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 10, 1991, Ser. No. 757,150
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—245 9 Claims



1. In a system for exchanging a developer unit of a copying or printing machine, in which the developer unit is moved between an independent floor movable developer unit transporter and a development station in said machine while said movable developer unit transporter is docked in alignment with said machine, the improvement wherein:
said floor movable developer unit transporter has liftable

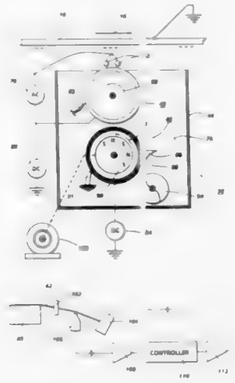
development unit holding means adopted to hold and lift a said developer unit thereon;
and said floor movable developer unit transporter includes means for automatically lifting said development unit holding means up to the same level as said development station in said machine, so that a said developer unit thereon is in alignment with said development station in said machine for exchanging a said developer unit, irrespective of variations in the level of said developer unit transporter and said machine due to respective floor level variations;
wherein said means for automatically lifting said development unit holding means up to the same level as said development station in said machine comprises operator foot pedal actuated lever means movable to automatically lift said development unit holding means up to the same level as said development station irrespective of said variations in the level of said developer unit transporter and said machine;
further including docking means for assisting the vertical and lateral alignment of said developer unit transporter with said machine for said docking;
and further including latching means for latching said development unit holding means in said aligned position with said development station of said machine until said latching means is released.

5,144,370

APPARATUS FOR DETECTING THE VIBRATION OF ELECTRODE WIRES AND CANCELING THE VIBRATION THEREOF

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1991, Ser. No. 785,967
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—247 **12 Claims**



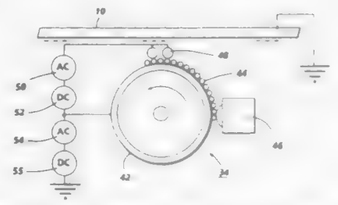
1. An apparatus for developing a latent image, including:
a housing defining a chamber storing at least a supply of toner therein;
a donor member spaced from a surface and adapted to transport toner to a development zone adjacent the surface;
a tensioned electrode member positioned in the space between the surface and said donor member, said electrode member being closely spaced from said donor member and being electrically biased to detach toner from said donor member so as to form a cloud of toner in the space between said electrode member and the surface with the toner developing the latent image; and
means, in communication with said electrode member, for detecting the vibration of said electrode member and substantially canceling vibrations of said electrode member.

5,144,371

DUAL AC/DUAL FREQUENCY SCAVENGELESS DEVELOPMENT

Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1991, Ser. No. 739,359
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—249 **24 Claims**



1. Apparatus for forming images on an image receiving surface with developer, said apparatus comprising:
a supply of marking particles;
means for transporting marking particles from said supply to an area adjacent said image receiving surface;
means including an AC voltage source operated at a first frequency for forming transported marking particles into a uniform cloud of marking particles;
means including an AC voltage source operated at a second frequency different from said first frequency for controlling the spacing of said marking particle cloud relative to said image receiver without strongly interacting with said image receiving surface;
said means for forming transported marking particles into a cloud comprising a wire electrode structure disposed between said transport and said image receiving surface;
said first frequency being relatively high for minimizing wire electrode vibration and said second frequency being relatively low for enabling a relatively large gap between said image receiving surface and said wire electrode structure; and
said first frequency being in the order of 5–15 kHz and said second frequency being in the order of 3–5 kHz.

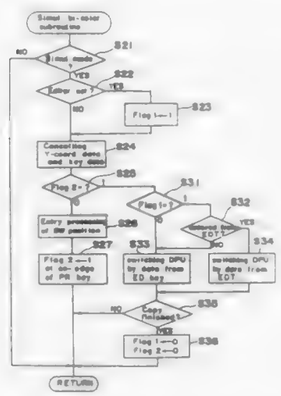
5,144,372

COPYING MACHINE OPERABLE IN SIMULTANEOUS MULTI-COLOR MODE

Hirohisa Miyamoto, and Kenzo Nagata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 273,575, Nov. 21, 1988, abandoned.
This application Oct. 8, 1991, Ser. No. 771,810
Claims priority, application Japan, Nov. 20, 1987, 62-294507
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—328 **7 Claims**

1. A copying machine comprising:
image forming means for forming an image on paper adapted to move in a paper moving direction and including plural developing units each of which contains a developer of a color different from each other;
editorial designation means for designating a kind of edition for editing images to be copied, said editorial designation means comprising mode designation means for designating a simultaneous multi-color mode in which the developing units are switched from one to another within one copying operation and a point entry means for designating an arbitrary point in an image of a document in orthogonal coordinates, said arbitrary point corresponding to an intersection of a first line extending in a direction perpendicular to the paper moving direction and a second line extending in a direction parallel to the paper moving direction; and
control means, when said simultaneous multi-color mode is designated by operating said mode designation means and a point is designated by said point entry means, for operating said image forming means so as to switch the developing unit from one to another at the first line containing the point designated by said point entry means while ignoring the second line for all purposes in said simultaneous multi-color mode.

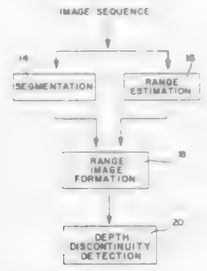


5,144,373

DETECTION OF RANGE DISCONTINUITIES IN STEREOSCOPIC IMAGERY

Keith E. Moler, Santa Ana, Calif., assignor to Loral Aerospace Corp., New York, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,542
Int. Cl.[5] G01C *11/22*
U.S. Cl. 356—2 **6 Claims**



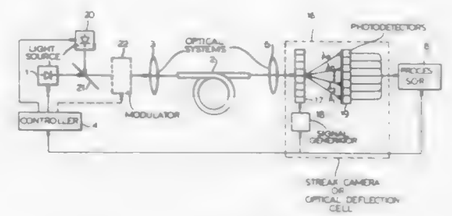
1. A method of generating range discontinuity information in an imaged scene, comprising the steps of:
a) locating intensity transitions in a pair of stereoscopically related images of said scene;
b) locating identifiably corresponding intensity transitions in said related images;
c) computing a parameter related to the range of said corresponding intensity transitions;
d) defining closed regions of similar intensity in said scene;
e) assigning to said regions parameter values derived from the computed parameter of corresponding intensity transitions lying within said regions; and
f) locating the boundary between adjacent regions for which said assigned parameter values are substantially different.

5,144,374

OPTICAL SPECTROSCOPY SYSTEM

Giorgio Grego, Venaria, Italy, assignor to Cselt - Centro Studi e Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed Apr. 11, 1991, Ser. No. 684,041
Claims priority, application Italy, Apr. 27, 1990, 67314 A/90; Oct. 22, 1990, 67813 A/90
Int. Cl.[5] G01J *3/12*
U.S. Cl. 356—326 **9 Claims**



1. A method of spectral analysis of light radiation, comprising the steps of:
a) sending a pulse of light radiation into a diffractive element of known and controlled characteristics and capable of causing temporal and spatial dispersion of various wavelengths in the radiation sent into said diffractive element;
b) evaluating the dispersion of the wavelengths in the radiation leaving said diffractive element; and
c) determining a position of a spatially dispersed pulse on a detector by deflecting wavelengths differently upon output from said diffractive element, thereby obtaining information on said wavelengths.

5,144,375

SAGNAC OPTICAL LOGIC GATE

M. Christina Gabriel, Fair Haven; Henry H. Houh, Sea Bright, and Norman A. Whitaker, Atlantic Highlands, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 10, 1990, Ser. No. 521,774
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—345 **45 Claims**

1. An arrangement having an input port for receiving an input signal and a transmission medium comprising a controllable propagation speed material through which the input signal travels, COMPRISING:
means for injecting a signal pulse applied at said input port, into said material, to develop an interacting signal that travels in said material in one direction and a reference signal that travels in said material in the opposite direction;
means for controllably injecting a pump pulse into said material, to travel through said material in said one direction at a speed that is different from the speed of said interacting signal and to thus form two co-acting pulses that travel at said one direction, with the timing of said pump pulse, in relation to said interacting signal, controlled to position the faster one of the co-acting pulses behind the slower one of the co-acting pulses, to cause the

faster one of the co-acting pulses to overtake and surpass the slower one of the co-acting pulses as the co-acting pulses travel in said material; and

means for combining said reference signal after its travel through said material and said interacting pulse after its travel through said material.

5,144,376

COMPOUND SEMICONDUCTOR DEVICE

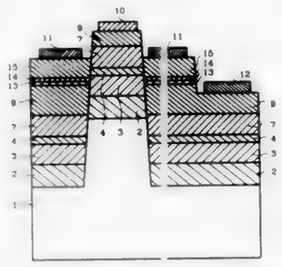
Ki-young Kweon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed May 9, 1991, Ser. No. 697,685

Claims priority, application Rep. of Korea, Aug. 21, 1990, 90-12887

Int. Cl.[5] H01L *29/73, 29/203*

U.S. Cl. 357—16 5 Claims



1. A semiconductor device comprising:

a semi-insulating substrate having a mesa structure region surrounded by a recessed region, the recessed region being formed at a predetermined depth below the mesa structure region, with side walls extending from the recessed region to the mesa structure region;

a collector contact layer of a first semiconductor material formed over the mesa structure region and the recessed region, but not over the side walls, said collector contact layer being highly doped with a first conductivity type impurity;

a collector layer of the first semiconductor material formed on said collector contact layer and overlapping the mesa structure region and the recessed region but not the side walls, said collector layer being doped with said first conductivity type impurity and having a density lower than a density of said first impurity of said collector contact layer;

a base layer of the first semiconductor material formed on said collector layer and overlapping the mesa structure region and the recessed region but not the side walls, said base layer being highly doped with a second conductivity type impurity;

an emitter layer of a second semiconductor material formed on said base layer and overlapping the mesa structure region and the recessed region but not the side walls, said second semiconductor material having an energy band gap wider than that of said first semiconductor material, said emitter layer being doped with said first conductivity type impurity;

an emitter contact layer of the first semiconductor material formed on said emitter layer and overlapping the mesa structure region and the recessed region, said emitter contact layer being highly doped with said first conductivity type impurity, a first portion of said emitter contact layer which overlaps the recessed region making contact with a portion of said collector contact layer which overlaps the mesa structure region, and a second portion of said emitter contact layer which overlaps said recessed region making contact with a portion of said collector layer which overlaps said mesa structure region, said first portion of said emitter contact layer and said second portion of said emitter contact layer being separated from each other in the area of said side walls; and

a base contact layer of the first semiconductor material formed over said emitter contact layer only overlapping said recessed structure portion, said base contact layer being highly doped with said second conductivity type impurity, and being formed thicker than said base layer, said base contact layer making contact with said base layer overlapping said mesa structure region.

5,144,377

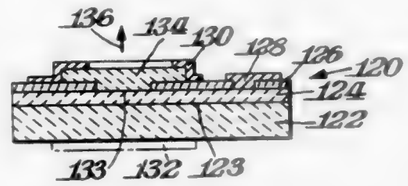
HIGH-SPEED HETEROJUNCTION LIGHT-EMITTING DIODE

Allen M. Barnett, Newark, Del., and John B. Berryhill, Logan, Utah, assignors to University of Delaware, Newark, Del.

Filed Apr. 4, 1991, Ser. No. 680,378

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 17 Claims



1. A high speed heterojunction light-emitting diode comprising a structure which includes a substrate made from a short minority carrier lifetime semiconductor material having a conductivity, said structure having a top surface and a back surface, a dielectric coating on said top surface, vias in said dielectric coating, a top semiconductor layer on said dielectric coating contacting said substrate through one of said vias, said semiconductor layer being of opposite conductivity to said substrate, a heterojunction area in the area where said semiconductor layer contacts said substrate, and a pair of contacts comprising an anode contact and a cathode contact on said structure.

5,144,378

HIGH ELECTRON MOBILITY TRANSISTOR

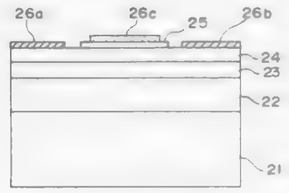
Kohki Hikosaka, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 664,696, Mar. 5, 1991, abandoned. This application Oct. 15, 1991, Ser. No. 774,137

Claims priority, application Japan, Mar. 6, 1990, 2-53924

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 13 Claims



1. A semiconductor device, comprising:

a substrate having an upper major surface and a lower major surface;

a channel layer having an upper major surface and a lower major surface and provided on the upper major surface of the substrate, said channel layer comprising an undoped first group III-V compound semiconductor material having a first lattice constant and containing indium arsenide as a component, said first group III-V compound semiconductor material having a first conduction band characterized by a first energy level at the upper major surface of the channel layer and a first valence band characterized by a second energy level at the upper major surface of the channel layer such that the second energy level is separated from the first energy level by a first band energy gap;

a two-dimensional electron gas formed in the channel layer along the upper major surface thereof as a substantially scatter-free path of electrons;

an electron supplying layer having an upper major surface and a lower major surface and provided on the upper major surface of the channel layer so as to form a heterojunction interface between the upper major surface of the channel layer and the lower major surface of the electron supplying layer, said electron supplying layer comprising a second group III-V compound semiconductor material having a second lattice constant and doped to the n-type by a doping of impurity atoms and supplying electrons to the channel layer to form the two-dimensional electron gas therein;

source electrode means provided on the upper major surface of the electron supplying layer for injecting electrons into the electron supplying layer;

drain electrode means provided on the upper major surface of the electron supplying layer for collecting electrons from the electron supplying layer; and

gate electrode means provided on the upper major surface of the electron supplying layer for controlling the passage of the electrons in the two-dimensional electron gas;

said second group III-V compound semiconductor material having a second conduction band characterized by a third energy level at the lower major surface of the electron supplying layer and a second valence band characterized by a fourth energy level at the lower major surface of the electron supplying layer such that the fourth energy level is separated from the third energy level by a second band gap, said second group III-V compound semiconductor material having a composition determined such that the second lattice constant matches to the first lattice constant so that the passage of the electrons through the two-dimensional electron gas occurs substantially identical with a case wherein the first and second lattice constants are identical with each other, and such that the first energy level of the first conduction band is located at an energetically lower level than the fourth energy level of the second valence band;

said second group III-V compound semiconductor material being doped by the impurity atoms to a concentration level such that the Fermi level is located between the third and fourth energy levels of the second group III-V compound semiconductor material.

5,144,379

SEMICONDUCTOR DEVICE HAVING A GROUP III-V EPITAXIAL SEMICONDUCTOR LAYER ON A SUBSTRATE

Takashi Eshita, Ohmorinishi, and Toshikazu Inoue, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 15, 1991, Ser. No. 669,980

Claims priority, application Japan, Mar. 15, 1990, 2-65124

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 9 Claims

1. In a semiconductor device,

a substrate of a first material having an upper major surface and a lower major surface, said first material comprising a material having crystallographic discrepancies relative to a group III-V semiconductor compound to be epitaxially grown thereon such that a potential for propagation of dislocations and leakage of current generally exists;

a buffer layer having an upper major surface and a lower major surface and comprising a second material, said second material comprising a group III-V compound semiconductor material having a first resistivity, a first lattice constant and a first band gap, said buffer layer being expitaxially grown on the upper major surface of the substrate;

a barrier layer having an upper major surface and a lower major surface and comprising a third material, said third material comprising a group III-V compound semiconductor material that is different from the second material, said third material having a second resistivity substantially larger than the first resistivity and a second lattice constant different from the first lattice constant, said third material having a second band gap substantially larger

than the first band gap, said barrier layer being provided on the upper major surface of the buffer layer such that the upper major surface of the buffer layer makes a contact with the lower major surface of the barrier layer;

an active layer comprising a fourth material, said fourth material comprising a group III-V compound semiconductor material, said active layer having an upper major surface and a lower major surface and being provided on the upper major surface of the barrier layer; and

an active device provided on the active layer such that the active device at least has a part formed in the active layer, said active device being provided above the upper major surface of the barrier layer.

5,144,380

DIAMOND SEMICONDUCTOR DEVICE WITH A NON-DOPED DIAMOND THIN FILM BETWEEN A DIAMOND ACTIVE LAYER AND A SUBSTRATE

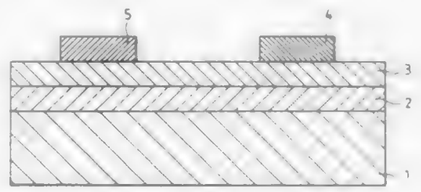
Tunenobu Kimoto; Tadashi Tomikawa, and Nobuhiko Fujita, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 4, 1990, Ser. No. 592,794

Claims priority, application Japan, Oct. 4, 1989, 1-259256

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 7 Claims



1. A semiconductor device comprising:

a substrate;

a non-doped diamond thin film formed directly on said substrate;

a diamond active layer formed directly on the non-doped diamond thin film; and

contacts formed directly on said diamond active layer;

wherein said non-doped diamond thin film substantially reduces the influence of at least one of interface states and

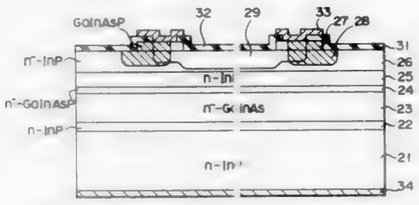
surface impurities upon the active layer, and wherein said non-doped diamond thin film insulates said active layer from said substrate.

5,144,381

SEMICONDUCTOR LIGHT DETECTOR UTILIZING AN AVALANCHE EFFECT AND HAVING AN IMPROVED GUARD RING STRUCTURE

Hideto Furuyama, Tokyo, and Tetsuo Sadamasa, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 413,489, Sep. 27, 1989, Pat. No. 4,992,386. This application Oct. 23, 1990, Ser. No. 602,174
Claims priority, application Japan, Dec. 14, 1988, 63-315619
Int. Cl.[5] H01L *29/205, 31/06*
U.S. Cl. 357—30 11 Claims



1. A semiconductor light detector comprising:
a first semiconductor layer of a first conductivity type having a multi-layer structure including a light absorbing layer, an avalanche multiplication layer, and a window layer having a flat surface;
a light detecting region formed in the window layer, said light detecting region defining a first p-n junction in combination with said first semiconductor layer; and
a guard ring formed in the window layer to surround said peripheral portion of said light detecting region, said guard ring defining a second p-n junction in combination with said first semiconductor layer, the guard ring defining the second p-n junction having a concentration gradient lower than that of the light detecting region defining said first p-n junction, wherein the junction depth of said peripheral portion of said light detecting region is less than that of a central portion of said light detecting region, and a junction depth of said guard ring is greater than that of said peripheral portion of said light detecting region.

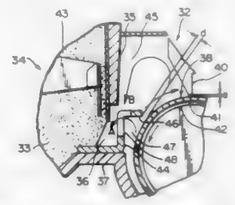
5,144,382

DEVELOPING DEVICE WITH A SCRAPING UNIT ARRANGED TO FORM A STIRRING AREA

Naotaka Funayama, Yamato-Koriyama; Ikuo Itoh, Nara; Masatoshi Kaneshige, Ikoma and Toshiyuki Kurosaka, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 18, 1990, Ser. No. 599,817
Claims priority, application Japan, Oct. 25, 1989, 1-279409; Oct. 30, 1989, 1-283643
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—253 16 Claims

1. A developing device with a scraping unit arranged to form a stirring area, which device is capable of mixing developers with magnetic toners and of providing the developers having a uniform magnetic tone density to a photoconductor for a copying machine, said device having a developing tank which contains a roller composed of a sleeve and a magnetic body with the magnetic body being concentrically disposed inside of the sleeve, the magnetic body and the sleeve being rotatable with respect to each other, said device further having a magnetic toner supply tank disposed adjacent to the developing tank for supplying the magnetic toners to the developing tank through a toner supply port, said developing device comprising:
means coupled to said developing tank for controlling an amount of said developers to be supplied to said sleeve;
means disposed between said toner supply port and said control means, for scraping said developers from said sleeve, said scraping means having a throughhole for causing said scraped developers to be mixed with said magnetic toners supplied from said toner supply tank through said toner supply port in accordance with a magnetic force produced by said magnetic body so as to produce a flow of said developers through said throughhole,



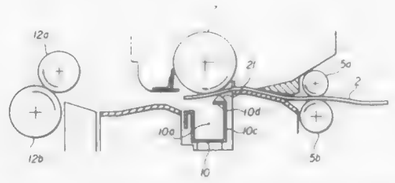
said scraping means having a scraping part which is bent in a direction toward said developing roller for scraping said developers from said sleeve, said scraping means being arranged so that a stirring portion is formed in association with said sleeve for stirring said developers scraped from said sleeve and said magnetic toners supplied from said toner supply tank through sad toner supply port, and said scraping means further having end parts and being formed of a predetermined shape with one of the end parts thereof forming said scraping part and the other one of the end parts thereof being bent in parallel with said one of said end parts so as to be fastened to a part of said device.

5,144,383

TRANSFER ASSEMBLY OF ELECTROPHOTOGRAPHIC PRINTER

Toshiro Murano, and Masato Sakai, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 665,965
Claims priority, application Japan, Mar. 26, 1990, 2-29646
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—274 5 Claims



1. A transfer assembly of an electrophotographic printer comprising:
a photoconductor drum;
charger means disposed against said photoconductor drum for charging a surface of said photoconductor drum;
exposure means for exposing said charged photoconductor drum to form an electrostatic latent image thereon;
developing means disposed against said photoconductor drum for providing adhesion of a toner to the electrostatic latent image to form a toner image on said photoconductor drum;
transfer means disposed adjacent to said photoconductor drum for transferring the toner image to a recording medium; and

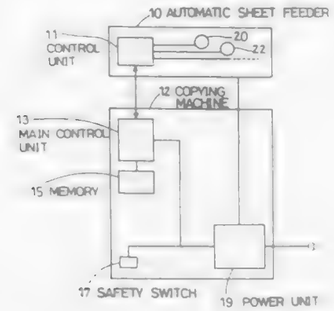
fuser means for fixing the transferred toner image on the recording medium;
wherein a part of said transfer means, which first touches the recording medium to which the toner image is to be transferred, is provided with a conductive material for providing a gradual discharge of electric charge from the recording medium; and
wherein said transfer means comprises:
an internal wire for effecting the transfer of said toner;
a shield plate surrounding said internal wire; and
a guide member disposed so that it contacts said recording medium above said shield plate to cause said recording medium to move smoothly between said transfer means and said photoconductor drum.

5,144,384

AUTOMATIC SHEET FEEDER HAVING MEANS FOR RESUMING CONTINUOUS COPYING AFTER POWER STOPPAGE

Hiroyuki Fujita, Sakai; Kazushi Takimoto, Kadoma, and Keiichi Taguchi, Kyoto, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Dec. 27, 1990, Ser. No. 634,490
Claims priority, application Japan, Dec. 29, 1989, 1-341111
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—308 2 Claims



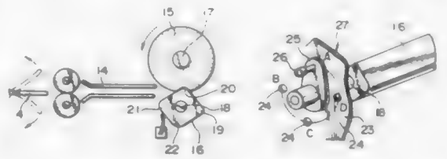
1. A system including an image reader for reading an image of a sheet placed at a preset reading site and a sheet feeder for automatically feeding a sheet to the reading site of the image reader, the system comprising:
a power supply unit provided in the image reader for supplying power to the sheet feeder;
a power switch provided in the image reader for stopping the supply of power to the sheet feeder from the power supply;
a state memory provided in the image reader for storing state data indicating whether the sheet feeder had been operating at a time when the supply of power to the sheet feeder was stopped;
first resuming means provided in the image reader for sending state data after the supply of power to the sheet feeder is resumed; and
initializing means provided in the sheet feeder for initializing the sheet feeder when the supply of power to the sheet feeder is started, whereby a sheet on the reading site is ejected; and
second resuming means provided in the sheet feeder for averting initializing by the initializing means when the power supply to the sheet feeder is started and state data from the image reader indicates that the sheet feeder had been operating at the time the supply of power to the sheet feeder was stopped.

5,144,385

CURL REMOVING DEVICE FOR AN IMAGE RECORDER

Tatsuo Tani, Urayasu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 799,954
Claims priority, application Japan, Nov. 29, 1990, 2-332658; Nov. 29, 1990, 2-332659; Nov. 29, 1990, 2-332660; Nov. 29, 1990, 2-332661; Jun. 26, 1991, 3-154248
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—309 9 Claims



1. A device incorporated in an image recorder for removing the curl of a recording sheet, comprising:
a rotatable elastic roller disposed on a transport path defined in said image recorder for transporting the recording sheet, said elastic roller being located at the inner side with respect to the direction of the curl of said recording sheet;
a rotatable pressing member having a center of rotation parellel to the center of rotation of said elastic roller and located at the outer side with respect to the direction of the curl, said pressing member having a polygonal cross-section and a plurality of curved portions each having a particular radius of curvature on the periphery thereof; and
fixing means for fixing said pressing member in a position where any one of said curved portions presses against the periphery of said elastic roller.

5,144,386

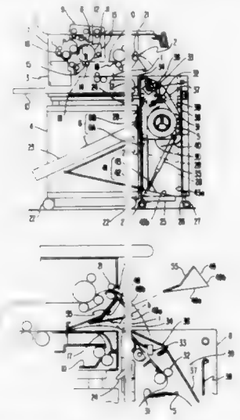
IMAGE-FORMING APPARATUS HAVING A MANUAL PAPER SUPPLY PORT LOCATED ABOVE A PAPER DISCHARGING PORT

Takeshi Matsuo, Higashi-Osaka, and Mitsutoshi Takemoto, Yao, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 12, 1991, Ser. No. 668,255
Claims priority, application Japan, Mar. 19, 1990, 2-70806; Mar. 19, 1990, 2-70808; Jul. 10, 1990, 2-183452
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—321 25 Claims

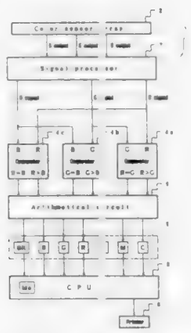
1. An image-forming apparatus, comprising:
an image-forming apparatus body having image forming means for forming an image on paper passing therethrough;
a manual paper supply port on a front side of said image-forming apparatus body for supplying paper to said image forming means;
a paper discharging port on the front side of said image-forming apparatus body for discharging paper after an image has been formed thereon by said image forming means, said paper discharging port being located above said manual paper supply port;
a deck having said image-forming apparatus body mounted thereon, said deck defining an internal space below said image-forming apparatus body;
a passage means defining a paper discharging passage that extends in a vertical direction for passing paper from said paper discharging port around the front side of said image-forming apparatus body and guiding the paper downward; and

a paper discharging tray extending in said internal space of said deck below said paper discharging passage for receiv-



ing paper discharged from said paper discharging port and passed and guided by said paper discharging passage.

5,144,387
COLOR IMAGE FORMING APPARATUS
Hideyuki Tanaka, Hyogo; Takao Ichihashi, and Hiroyuki Deguchi, both of Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Nov. 5, 1991, Ser. No. 788,095
Claims priority, application Japan, Nov. 13, 1990, 2-308243
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 5 Claims

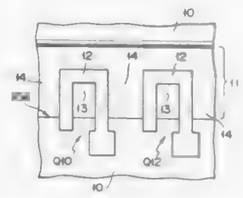


1. A color image forming apparatus which is provided with an image sensor making outputs for every primary color of light through reading and resolving color images to the three primary colors thereof and can reproduce the color images by repeating the developing operations by a plurality of color kinds of developing agent according to the outputs per primary color from the image sensor, comprising;

color distinguishing means for distinguishing colors based on the outputs per primary color from the image sensor when a color image is read, and

developer drive means for executing the developing operations by operating only one or two developers which accommodate the corresponding one or two kinds of developing agent when the color distinguished by the color distinguishing means can be expressed only with one or two kinds of developing agent.

5,144,388
SEMICONDUCTOR DEVICE HAVING A PLURALITY OF FETS FORMED IN AN ELEMENT AREA
Shizuo Sawada, and Masaki Ogihara, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 5, 1991, Ser. No. 664,827
Claims priority, application Japan, Mar. 7, 1990, 2-53745
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 46 Claims



1. A semiconductor device, comprising:

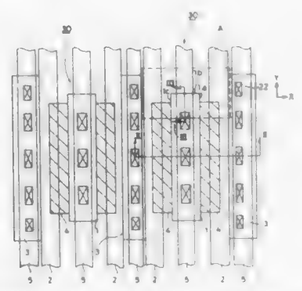
a semiconductor substrate of a first conductivity type;

an element isolation film formed on a major surface of said semiconductor substrate to define an element region, a boundary of said element region formed by said element isolation film;

at least first, second, third, and fourth current terminal regions of a second conductivity type formed in said element region; and

electrodes formed on a surface of said element region above respective channels between said current terminal regions and having respective electrode lengths defined in accordance with a direction parallel to a current flow between said current terminal regions via said respective channels, whereby said current thermal regions and said electrodes form at least three field effect transistors.

5,144,389
INSULATED GATE FIELD EFFECT TRANSISTOR WITH HIGH BREAKDOWN VOLTAGE
Mitsuyoshi Nakamura, and Kazuaki Miyata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 17, 1990, Ser. No. 583,384
Claims priority, application Japan, Sep. 18, 1989, 1-241336
Int. Cl.[5] H01L *29/10, 29/68, 29/74*
U.S. Cl. 357—23.4 7 Claims



1. An MIS FET with a high breakdown voltage comprising:

a semiconductor substrate of a first conductivity type having a major surface,

a gate electrode formed on the major surface of said semiconductor substrate with an insulation film provided therebetween, said gate electrode having a gate length defined by opposite ends thereof,

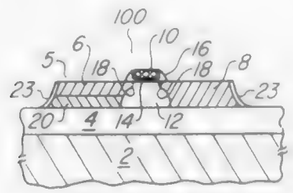
a first impurity region of a second conductivity type formed on the major surface of said semiconductor substrate having upper and lower boundary regions parallel to said major surface of said substrate, and a peripheral boundary region laterally circumscribing said first impurity region between said upper and lower boundary regions, wherein said peripheral boundary region is displaced from one of said opposite ends of said gate electrode in the direction of the gate length of said gate electrode,

a second impurity region of the second conductivity type formed on the major surface of said semiconductor substrate having upper and lower boundary regions parallel to said major surface of said substrate, and a peripheral boundary region laterally circumscribing said second impurity region between said upper and lower boundary regions, said peripheral boundary region having a first portion and a second portion, wherein said first portion and said second portion are displaced from the other of said opposite ends of said gate electrode in the direction of the gate length of said gate electrode,

a third impurity region of the second conductivity type having a concentration of impurity lower than that of said second impurity region formed in only lateral contact with said second impurity region at only said first portion of said peripheral boundary region near the major surface of said semiconductor substrate,

said second impurity region having a pn junction region formed between said semiconductor substrate and said second portion of said peripheral boundary region of said second impurity region.

5,144,390
SILICON-ON INSULATOR TRANSISTOR WITH INTERNAL BODY NODE TO SOURCE NODE CONNECTION
Mishel Matloubian, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 471,660, Jan. 23, 1990, abandoned, which is a continuation of Ser. No. 241,167, Sep. 2, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 663,190
Int. Cl.[5] H01L *27/01*
U.S. Cl. 357—23.7 13 Claims



8. A field-effect transistor, comprising:

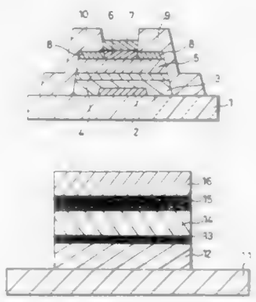
source and drain regions of a first conductivity type disposed at a surface of a semiconductor;

a gate disposed over said surface, at a location between said source and drain regions;

a body node region of a second conductivity type disposed under said gate and between said source and drain regions; and

a tunnel diode connected between said source and said body node region with said tunnel diode being not externally shorted and with said field-effect transistor not having a tunnel diode between said drain and said body node region, whereby the body node is biased to a potential close to that of the source region.

5,144,391
SEMICONDUCTOR DEVICE WHICH RELIEVES INTERNAL STRESS AND PREVENTS CRACKING
Hiroshi Iwata; Shigeru Noguchi; Satoshi Ishida; Keiichi Sano, and Shoichiro Nakayama, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Feb. 20, 1991, Ser. No. 658,386
Claims priority, application Japan, Feb. 28, 1990, 2-50563
Int. Cl.[5] H01L *45/00, 27/12, 29/78, 29/68*
U.S. Cl. 357—23.7 10 Claims



1. A semiconductor device for relieving stress and preventing cracking, comprising:

a semiconductor thin film;

first and second insulator films provided in such arrangement that said semiconductor thin film is sandwiched therebetween and each contains a constituent element of said semiconductor thin film; and

means for relieving internal stress and preventing cracking, said relieving and preventing means including first and second multilayered graded layers each having a plurality of respective insulating thin films each containing the constituent element of said semiconductor thin film and a constituent element of said insulator films deposited therein so that a content of the constituent element of the insulator films in said insulating thin films decreases in the direction of said semiconductor thin film, said first and second multilayered graded layers each being interposed between said semiconductor thin film and a respective one of said insulator films.

5,144,392
THIN-FILM TRANSISTOR CIRCUIT
Stanley D. Brotherton, Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 606,019, Oct. 30, 1990, abandoned. This application Jul. 9, 1991, Ser. No. 727,291
Claims priority, application United Kingdom, Nov. 29, 1989, [illegible]
Int. Cl.[5] H01L *29/78;* H03K *3/26;* G02F *1/13;* H02H *3/00*
U.S. Cl. 357—23.7 22 Claims

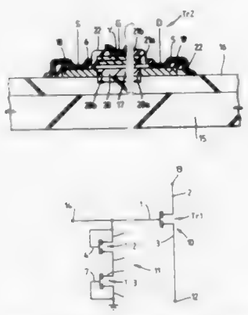
1. A thin-film transistor circuit comprising a main thin film transistor and two subsidiary thin film transistors, each of said main and subsidiary thin film transistors having respective source, drain and gate electrodes, wherein for each of said subsidiary thin film transistors, its respective gate electrode and one of its respective source and drain electrodes are coupled together and the other of said source and drain electrodes of each of said subsidiary thin film transistors are coupled together, each of said subsidiary thin film transistors having:

a respective threshold voltage at which the respective subsidiary thin film transistor is rendered conducting when a first voltage of a first polarity exceeding said respective threshold voltage is applied to its respective gate electrode; and

a respective channel region with a length selected for caus-

ing the respective subsidiary thin film transistor to break down when a second voltage of a polarity opposite to the first polarity and exceeding the threshold voltage of the other subsidiary thin film transistor is applied across the source and drain electrodes of the respective subsidiary thin film transistor;

wherein said subsidiary thin film transistors are coupled between the gate electrode of said main thin film transistor and a reference potential so as to form an input protection



device which causes a first of said subsidiary thin film transistors to conduct and a second of said subsidiary thin film transistors to break down when a third voltage exceeding said first voltage, is applied to the gate electrode of said main thin film transistor, and for causing said second subsidiary thin film transistor to conduct and said first subsidiary thin film transistor to break down when a fourth voltage having a polarity opposite to that of said third voltage and exceeding said first voltage is applied to the gate electrode of the main thin film transistor.

5,144,393

STRUCTURE FOR A PSD TYPE FIELD EFFECT TRANSISTOR

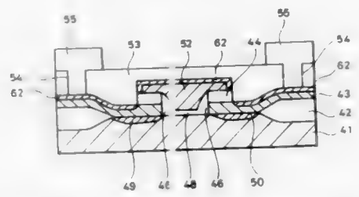
Takehisa Yamaguchi, and Masahiro Shimizu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 461,543, Jan. 5, 1990, abandoned. This application May 22, 1991, Ser. No. 703,717

Claims priority, application Japan, Apr. 4, 1989, 1-86011

Int. Cl.[5] H01L *29/06*

U.S. Cl. 357—23.9 **12 Claims**



1. A PSD-type field effect transistor, comprising:

a silicon substrate having a horizontal major surface;

source and drain impurity regions spaced apart from each other in the major surface of said substrate to define a channel region therebetween;

source and drain electrodes formed on the major surface of said substrate and contacting said source and drain impurity regions;

a gate insulating film formed on the surface of said substrate;

a gate electrode on said gate insulating film above the channel region of said substrate said gate electrode having a T-shaped cross-section with opposing upper arms extending over said source and drain electrodes;

a first side-wall insulating film formed between said gate electrode and said pair of source and drain electrodes, first and second surfaces of said side-wall insulating film contacting said pair of source and drain electrodes and said major surface of the substrate, respectively, a remaining surface of said side-wall insulating film being arcuate;

an insulating layer on said source and drain electrodes extending outwardly from said first sidewall insulating film and vertically separating said gate electrode and said source and drain electrodes, an outer side surface of said insulating layer lying in a common vertical plane with an outer side surface of said gate electrode; and

a first high conductivity layer including as metal on a portion of said source and drain electrodes extending outwardly from said common vertical plane.

5,144,394

SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING SAME

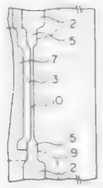
Mitsuru Hirao, Ibaraki; Masataka Minami, Koganei, and Shoji Shukuri, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 575,581

Claims priority, application Japan, Sep. 1, 1989, 1-224444

Int. Cl.[5] H01L *29/06, 27/01, 27/12, 29/34*

U.S. Cl. 357—23.11 **12 Claims**



1. A semiconductor device comprising:

a gate electrode formed on a gate insulating film which in turn is formed on an active region, enclosed by a first element isolating film, which active region is formed in a major surface of a semiconductor substrate having a first conductivity type; and

regions having a second conductivity type, which are separated by a channel region under said gate electrode in which a channel is induced,

wherein said second conductivity type regions are defined by said first element isolating film at the sides opposite to said gate electrode, and

wherein at least a part of said channel region in said active region is enclosed by a second element isolating film which is thinner than said first element isolating film, and wherein said first and second element isolating films are both formed on said major surface of said semiconductor substrate.

5,144,395

OPTICALLY DRIVEN SEMICONDUCTOR DEVICE

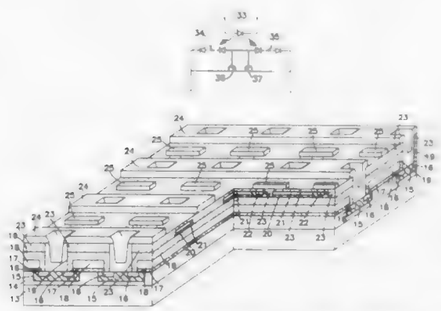
Toshiaki Miyajima, Ikoma; Kazumasa Kioi, Fujiidera; Mituo Matunami; Tukasa Doi, both of Tenri; Minoru Yoshioka, Shiki, and Masayoshi Koba, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Continuation of Ser. No. 375,327, Jul. 3, 1989, abandoned. This application Mar. 19, 1991, Ser. No. 672,764

Claims priority, application Japan, Jul. 4, 1988, 63-166438; Aug. 5, 1988, 63-196343

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **8 Claims**



1. An optically driven semiconductor device having a first output terminal and a second output terminal comprising:

a semiconductor substrate of a first conductivity type;

a pair of vertical field effect transistors formed on said substrate, each of said transistors being composed of a plurality of vertical transistor elements which comprise a first semiconductor layer of a second conductivity type formed on said substrate, a second semiconductor layer of a third conductivity type formed in the surface area of said first semiconductor layer, a third semiconductor layer of the first conductivity type formed in the surface area of said second semiconductor layer, a gate insulating film formed on said first semiconductor layer so as to come in contact with said second semiconductor layer, and a gate semiconductor layer formed on said gate insulating film; and

a pair of optoelectric transducers, each of which is formed on an insulating film above a corresponding transistor and connected between the gate and the source of said corresponding transistor, and each of said optoelectric transducers comprising a fourth semiconductor layer of the third conductivity type formed on said insulating film and a fifth semiconductor layer of the first conductivity type formed in the surface area of said fourth semiconductor layer,

wherein said pair of transistors have the substrate in common as a drain and are connected in reverse series with each other between said first output terminal and said second output terminal.

5,144,396

CAPPING LAYER FABRICATION

Stephen K. Sargood, Oakhurst, N.J., assignor to British Telecommunications public limited company, London, England

Continuation of Ser. No. 156,698, Feb. 17, 1988, abandoned. This application Dec. 4, 1989, Ser. No. 445,146

Claims priority, application United Kingdom, Feb. 17, 1987, [illegible]

Int. Cl.[5] H01L *27/14, 29/167, 23/48, 29/161*

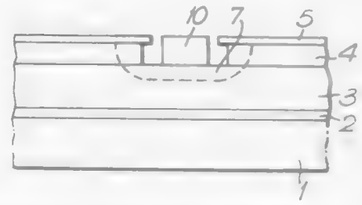
U.S. Cl. 357—30 **26 Claims**

1. An optical semiconductor junction device comprising:

an active layer having a surface,

a capping layer overlying said active layer,

a junction defined by the boundary of a volume selectively doped with a dopant to lie at least partially in the active layer and to extend into the capping layer,



a window being defined in the capping layer exposing a part of the surface of the active layer within the boundary of the selectively doped volume, and

an electrical contact layer deposited on at least a part of the active layer exposed by the window and providing an ohmic electrical contact to said active layer.

5,144,397

LIGHT RESPONSIVE SEMICONDUCTOR DEVICE

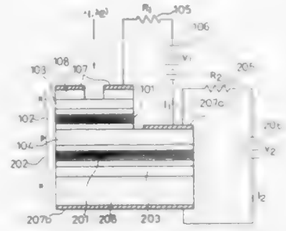
Yasunori Tokuda, and Noriaki Tsukada, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 2, 1990, Ser. No. 487,292

Claims priority, application Japan, Mar. 3, 1989, 1-52651; Mar. 3, 1989, 1-52652; Mar. 8, 1989, 1-55497; Mar. 8, 1989, 1-55498; Nov. 22, 1989, 1-301935

Int. Cl.[5] H01L *29/161, 29/205, 29/225*

U.S. Cl. 357—30 **2 Claims**



1. A light responsive semiconductor apparatus comprising:

first and second semiconductor light responsive devices, each device including an intrinsic layer in which a multiple quantum well structure is buried for the generation of a photocurrent in response to the absorption of incident light, each intrinsic layer being sandwiched between a p-type layer and an n-type layer, the light responsive devices being disposed on a continuous substrate wherein the intrinsic layers of the first and second devices are serially arranged for the passage of incident light substantially parallel to the layers sequentially through the first and second devices; and

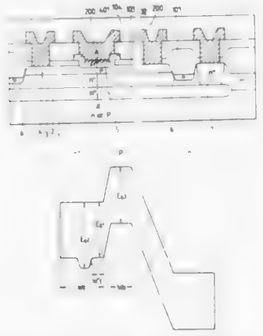
first and second external resistors respectively corresponding to said first and second devices and electrically connected across the respective devices for indicating the flow of a photocurrent generated in response to absorption of incident light by the respective devices, the values of the first and second resistors being chosen to provide a discontinuous change in the respective photocurrents of both devices at respective first and second critical wavelengths of incident light, the first critical wavelength being longer than the second critical wavelength.

5,144,398

SEMICONDUCTOR DEVICE AND PHOTOELECTRIC CONVERSION APPARATUS USING THE SAME

Masakazu Morishita, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 500,797, Mar. 28, 1990, abandoned.
This application Dec. 31, 1991, Ser. No. 815,844
Claims priority, application Japan, Mar. 29, 1989, 1-77442; Mar. 29, 1989, 1-77443; Mar. 29, 1989, 1-77444
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—34 20 Claims



1. A semiconductor device comprising an emitter region of a first conductivity type, a base region of a second conductivity type, and a collector region of said first conductivity type, wherein at least a vicinity of an interface of an emitter region to base region junction is formed by Si;

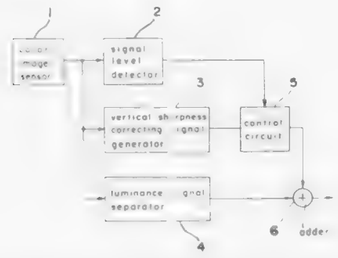
a polycrystalline or single crystalline $Si_{1-x}C_x$ ($x \leqq 0.5$) is formed on a region formed by the Si within said emitter region, and a junction between a region of the Si and a region of the polycrystalline or the single crystalline $Si_{1-x}C_x$ is a graded heterojunction and is provided at a position distant from an edge of a depletion layer produced at a junction between said emitter and base regions.

5,144,399

COLOR IMAGE PICKUP APPARATUS

Masaaki Nakayama, Hirakata, and Yoshinori Kitamura, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 11, 1991, Ser. No. 713,154
Int. Cl.[5] H04N *9/64*
U.S. Cl. 358—37 10 Claims



1. A color image pickup apparatus comprising

a color image sensor for taking out the color information from the object to be photographed, as a color signals different for each of the horizontal lines having a color filter arrangement,

a signal level detecting circuit for detecting the signal level for each of the picture elements of the above described color image sensor, and generating the control signal when the signal level is larger than the reference level,

a luminance signal separating circuit for separating the luminance signal from the output signal of the above described color image sensor,

a vertical sharpness correcting signal generating circuit from the output signal of the above described image sensor or from the above described luminance signal,

a control circuit for controlling the above described correcting signal by the above described signal level detecting output,

an adding circuit for composing the output signal of the above described control circuit and the above described luminance signal,

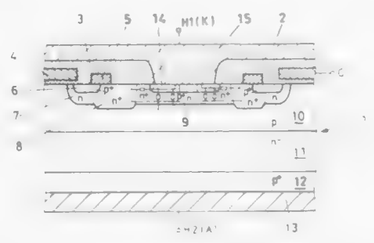
where the luminance signal corrected in the sharpness is adapted to be obtained by the output of the above described adding circuit.

5,144,400

POWER SEMICONDUCTOR DEVICE WITH SWITCH-OFF FACILITY

Friedhelm Bauer, Baden, Switzerland, assignor to ASEA Brown Boveri Ltd., Baden, Switzerland

Filed Feb. 1, 1991, Ser. No. 649,068
Claims priority, application Switzerland, Feb. 13, 1990, 461/90-0
Int. Cl.[5] H01L *29/74, 29/747, 29/10, 29/48*
U.S. Cl. 357—38 7 Claims



1. A power semiconductor device comprising

(a) a multiplicity of first unit cells disposed next to one another and connected in parallel inside a semiconductor substrate between a first main electrode and a second main electrode;

(b) a sequence of differently doped layers inside each of the first unit cells, which sequence includes, starting from the side of the second main electrode, an emitter layer, a first base layer oppositely doped to the emitter layer, a second base layer oppositely doped to the first base layer and an emitter region oppositely doped to the second base layer, embedded in the second base layer and connected to a first main-electrode metallization, and which sequence forms a thyristor structure; and

(c) at least one emitter ballast resistor inside each of the first unit cells, which emitter ballast resistor is inserted into the connection between the emitter region and the first main-electrode metallization,

wherein

(d) the emitter region is of annular or strip-like construction and encloses a central region which is doped in the same sense, but more lightly;

(e) the central region is inserted into the connection between the emitter region and the first-main-electrode metallization and acts as an emitter ballast resistor;

(f) a contact region which is doped in the same sense, but more heavily and which is connected directly to the first main-electrode metallization is let into the central region; and

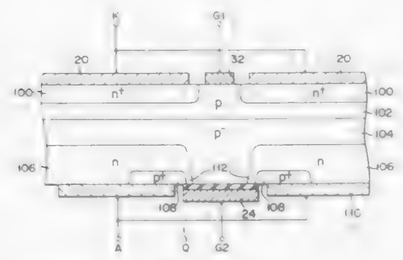
(g) said contact region is interrupted in the interior by at least one oppositely and heavily doped short-circuit region which connects the first main-electrode metallization disposed above the contact region to the central region disposed below the contact region.

5,144,401

TURN-ON/OFF DRIVING TECHNIQUE FOR INSULATED GATE THYRISTOR

Tsuneo Ogura, Yokohama, and Akio Nakagawa, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 371,275, Jun. 28, 1989, Pat. No. 4,994,696, which is a division of Ser. No. 161,095, Feb. 26, 1988, Pat. No. 4,866,315, and a continuation-in-part of Ser. No. 373,279, Jun. 26, 1989, Pat. No. 4,959,703. This application Jul. 31, 1989, Ser. No. 386,763
Claims priority, application Japan, Jun. 5, 1989, 1-142767
Int. Cl.[5] H01L *29/74*
U.S. Cl. 357—38 17 Claims



1. A thyristor comprising:

a first emitter layer of a first conductivity type;

a first base layer of a second conductivity type;

a second base layer of the first conductivity type;

a second emitter layer of the second conductivity type, said first base layer having a first surface portion which is in lateral contact with said first emitter layer, and a second surface portion which is in lateral contact with said second base layer and separated from said second emitter layer by a layer portion of said second base layer which is positioned between said first base layer and said second emitter layer;

a first electrode connected to said second emitter layer;

a second electrode connected to said first emitter layer;

a first gate electrode formed on said first surface portion of said first base layer; and

a second gate electrode insulatively disposed above said second surface portion of said first base layer to form a voltage-controlled switching transistor together with said first base layer and said second emitter layer, said layer portion of said second base layer serving as a channel region of said transistor.

5,144,402

SEMICONDUCTOR SWITCHING DEVICE AND METHOD OF CONTROLLING A CARRIER LIFE TIME IN A SEMICONDUCTOR SWITCHING DEVICE

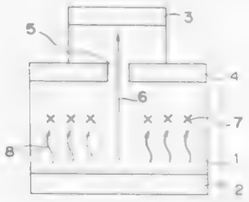
Tadaharu Minato, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 233,823
Claims priority, application Japan, Aug. 19, 1987, 62-206856
Int. Cl.[5] H01L *29/74, 27/14*
U.S. Cl. 357—38 1 Claim

1. A semiconductor switching device having a semiconductor layer through which a main current flows characterized in that said semiconductor layer is structured so that the carrier life time in said semiconductor layer is different between a first portion of said semiconductor layer serving as a path for most of said main current and a remaining portion of said semiconductor layer;

said semiconductor switching device includes a static induction thyristor comprising a first conductivity type semiconductor substrate;

a second conductivity type first electrode region formed on a back surface of said semiconductor substrate;



a first conductivity type second electrode region formed on a top surface of said semiconductor substrate; and

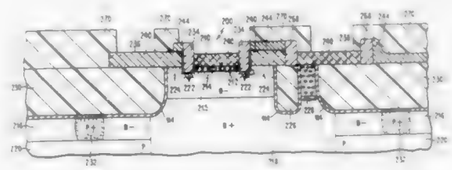
a second conductivity type gate region formed in the middle of said semiconductor substrate to form a channel surrounded by said gate region.

5,144,403

BIPOLAR TRANSISTOR WITH TRENCH-ISOLATED EMITTER

Shang-yi Chiang, Walnut Creek; Wen-Ling M. Huang, Milpitas; Clifford I. Drowley, and Paul V. Voorde, both of Moutain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 307,876, Feb. 7, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,725
Int. Cl.[5] H01L *21/385, 21/425*
U.S. Cl. 357—49 2 Claims



1. A bipolar transistor comprising:

a substrate;

a horizontally extending epitaxial layer formed on and above said substrate, said epitaxial layer having a lower surface contacting said substrate and an upper surface facing away from said substrate, said upper surface defining an upper epitaxial surface level, said epitaxial layer having a collector and an upper active region, said collector extending from said lower surface part way through said epitaxial layer, said upper active region extending from said collector to said upper surface, said upper active region including an emitter, an intrinsic base, an extrinsic base, and a link base,

said emitter extending downwardly toward said collector from said upper surface,

said intrinsic base being located between said emitter and said collector,

said extrinsic base extending downwardly from said upper surface to said collector, said extrinsic base being spaced from said emitter,

said link base electrically and physically coupling said extrinsic base with said intrinsic base, said link base being spaced below said upper epitaxial surface level;

a polysilicon emitter contact formed on said upper surface,

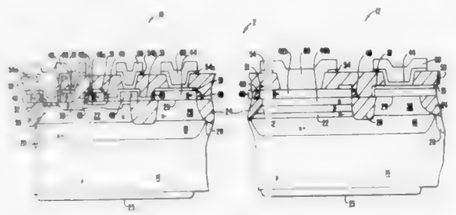
said emitter contact being in physical and electrical contact with said emitter;
a polysilicon base contact formed on said upper epitaxial surface, said base contact being in physical and electrical contact with said extrinsic base, said base contact being spaced from and coplanar with said emitter contact; and
a dielectric wall extending upwardly from said link base through said upper epitaxial surface level and to a level above said emitter contact so as to electrically isolate said emitter from said extrinsic base and said emitter contact from said base contact;
whereby, current is prevented by said dielectric wall from flowing horizontally so that vertical current flow is enhanced, maximizing transistor gain and frequency bandwidth.

5,144,404

POLYSILICON SCHOTTKY CLAMPED TRANSISTOR AND VERTICAL FUSE DEVICES

Ali A. Iranmanesh, Federal Way, Wash., and George E. Ganschow, Trabuco Canyon, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 22, 1990, Ser. No. 571,346
Int. Cl.[5] H01L 29/48, 29/72, 29/04, 27/02
U.S. Cl. 357—51 12 Claims



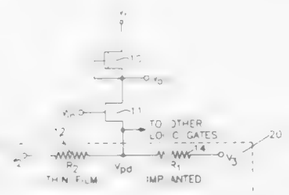
2. A vertical fuse comprising:
a polysilicon emitter contact region having a top surface said top surface in direct contact with a first non-refractory contact metal;
a polysilicon collector contact region with a top surface, a portion of said top surface in contact with a first refractory metal, said first refractory metal being in contact with said first contact metal; and
a base region between said emitter contact and said collector contact.

5,144,405

TEMPERATURE COMPENSATION APPARATUS FOR LOGIC GATES

John F. Naber, Hardy, Va., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 13, 1991, Ser. No. 744,311
Int. Cl.[5] H01L 27/02, 23/58; G06G 7/10; H03B 1/04
U.S. Cl. 357—51 20 Claims



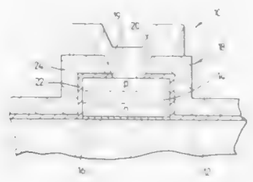
1. A temperature compensation apparatus for supplying a compensated potential enabling semiconductor integrated circuit logic gates formed on an IC substrate to be biased to exhibit adequate noise margin operation over a wide temperature range, comprising:
a voltage divider located on said substrate and formed by the series combination of a first thin film resistor and a second implanted resistor, with the common terminal between said resistors coupled to at least one logic gate on said substrate.

5,144,406

DIODE DEVICES AND ACTIVE MATRIX ADDRESSED DISPLAY DEVICES INCORPORATING THEM

Michael C. Hemings, Eindhoven, Netherlands, and John M. Shannon, Whyteleafe, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1990, Ser. No. 608,419
Claims priority, application United Kingdom, Nov. 24, 1989, 8926582
Int. Cl.[5] H01L 29/34
U.S. Cl. 357—54 39 Claims



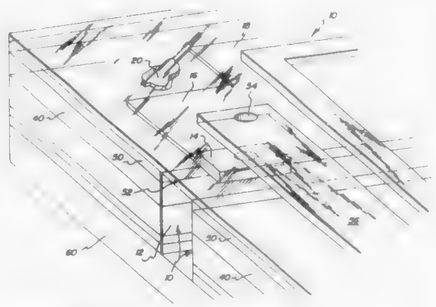
1. A thin film diode device comprising on a substrate a first conductive layer, a diode structure and a second conductive layer, the first and second conductive layers contacting at least a portion of opposing surfaces of the diode structure, and passivation material at least partly surrounding the diode structure and comprising a layer of insulating material, characterised in that the passivation material further includes a layer of semi-insulating semiconductor material, the layer of insulating material extending between the diode structure and the semi-insulating semiconductor layer.

5,144,407

SEMICONDUCTOR CHIP PROTECTION LAYER AND PROTECTED CHIP

Robert J. Wojnarowski, Ballston Lake, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 374,889, Jul. 3, 1989, abandoned. This application Jul. 31, 1990, Ser. No. 561,216
Int. Cl.[5] H01L 29/34
U.S. Cl. 357—54 4 Claims



1. In combination:

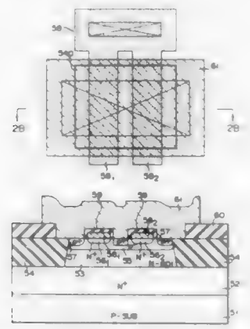
a semiconductor chip having external contact pads on a first surface thereof;
a first polymer dielectric layer at least 2 microns thick disposed on and adhered to substantially all of said first surface of said chip, including said external contact pads,
a second polymer layer disposed on said first polymer layer; and
a third polymer layer disposed on said second polymer layer;
said first polymer layer being a thermoset material and said second polymer layer being a thermoplastic material.

5,144,408

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND METHOD OF MANUFACTURING THE SAME

Hiroshi Iwasaki, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 528,324, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,215, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 240,484, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 837,385, Mar. 6, 1986, abandoned. This application Jul. 12, 1991, Ser. No. 730,518
Claims priority, application Japan, Mar. 7, 1985, 60-45137; Mar. 8, 1985, 60-46023; Mar. 15, 1985, 60-51720; Mar. 29, 1985, 60-65230; Mar. 29, 1985, 60-65231
Int. Cl.[5] H01L 29/72, 23/48
U.S. Cl. 357—59 18 Claims



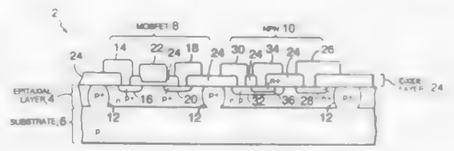
1. A semiconductor device having a bipolar transistor formed in a semiconductor layer comprising:
a base region of a first conductivity type, said base region having a surface area;
an emitter electrode layer having an impurity of a second conductivity type doped therein, said emitter electrode layer having a plurality of parallel elongated first portions spaced apart from each and at least one second portion formed integral with said first portions;
a plurality of parallel elongated emitter regions of said second conductivity type formed in said base region, said plurality of parallel elongated emitter regions being formed by diffusion of said impurity of said second conductivity type from said emitter electrode layer into said surface area of said base region;
said plurality of parallel elongated first portions of said emitter electrode layer having end parts, being in overlaid contact with one of said parallel elongated emitter regions, extending beyond said surface area of said base region, and being connected electrically to each other only at said end parts only by said second portion formed integral with said first portions, to electrically connect said parallel elongated emitter regions to each other;
a field insulation layer formed in said semiconductor layer and surrounding said base region; and
a base electrode layer insulatively disposed over said emitter electrode layer and in contact with said surface area of said base region;
said emitter electrode layer extending from said base electrode layer to said field insulation layer.

5,144,409

ISOTOPICALLY ENRICHED SEMICONDUCTOR DEVICES

Tso-Ping Ma, Branford, Conn., assignor to Yale University, New Haven, Conn.

Continuation of Ser. No. 577,526, Sep. 5, 1990, abandoned. This application Nov. 16, 1990, Ser. No. 615,425
Int. Cl.[5] H01L 29/161, 27/14, 27/02
U.S. Cl. 357—61 25 Claims



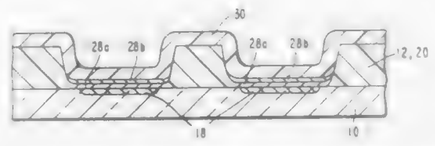
1. A semiconductor structure comprising:
a single-crystal region composed of an isotopically enriched silicon having a higher proportion of the ^{28}Si isotope than is present in naturally occurring silicon; and
a semiconductor device formed within said isotopically enriched single-crystal region.

5,144,410

OHMIC CONTACT FOR III-V SEMICONDUCTOR DEVICES

David A. Johnson, Camarillo, Calif., assignor to Vitesse Semiconductor Corporation, Camarillo, Calif.

Continuation of Ser. No. 331,250, Mar. 29, 1989, abandoned. This application May 14, 1991, Ser. No. 702,151
Int. Cl.[5] H01L 21/06, 21/12
U.S. Cl. 357—63 12 Claims



1. A thermally stable, low contact-resistance ohmic contact for a III–V semiconductor device comprising an ohmic contact metal contacting a portion of a doped region of said III–V semiconductor, characterized in that the surface of said portion has a thin film comprising a surface treatment thereon comprising a Group VI species and having a depth below said surface of at most a few monolayers.

5,144,411

METHOD AND STRUCTURE FOR PROVIDING IMPROVED INSULATION IN VLSI AND ULSI CIRCUITS

Carter W. Kaanta, Colchester, and Stanley Roberts, Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

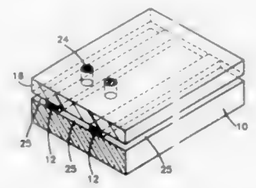
Division of Ser. No. 286,443, Dec. 16, 1988, Pat. No. 4,987,101. This application Sep. 28, 1990, Ser. No. 590,290
Int. Cl.[5] H01L 23/48
U.S. Cl. 357—68 4 Claims

1. A VLSI or ULSI chip carrier structure for mounting a chip comprising:
a. a dielectric base member of insulating material,
b. a plurality of discrete spaced metal conducting lines

formed on said base member and extending upwardly therefrom;

c. a dielectric cap member of insulating material superimposed over said base member and supported at least in part by said metal lines;

d. said cap member, said base member, and said metal lines



defining a plurality of spaces therebetween, each of said spaces having a dielectric constant of less than 2.0;

e. wherein said cap member is characterized by the presence of access openings, said access openings being sealed with an insulating material, and said cap member further characterized by the presence of openings for providing interlayer contact, said openings being filled with metal.

5,144,412

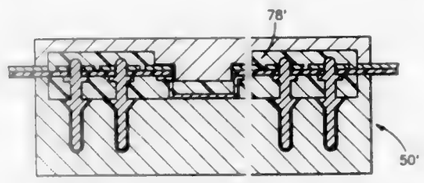
PROCESS FOR MANUFACTURING PLASTIC PIN GRID ARRAYS AND THE PRODUCT PRODUCED THEREBY

Kin-Shiung Chang, Meriden; Thomas A. Armer, New Haven, both of Conn., and William G. Bridges, San Jose, Calif., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 145,977, Feb. 2, 1988, Pat. No. 4,965,227, which is a continuation-in-part of Ser. No. 52,327, May 21, 1987, Pat. No. 4,816,426, which is a continuation-in-part of Ser. No. 16,614, Feb. 19, 1987, abandoned. This application Aug. 2, 1990, Ser. No. 562,481

Int. Cl.[5] H01L *23/02, 23/28;* H02B *1/00;* H05K *7/02*

U.S. Cl. 357—74 31 Claims



1. A pin grid array package for housing an integrated circuit, comprising:

an interconnect tape defining a metal interconnect circuit pattern, said tape having first and second opposing surfaces, said circuit pattern defining a plurality of leads;

a plurality of holes in said metal circuit pattern;

a plurality of terminal pins each having a pin head disposed at one end, a shoulder and a groove between said shoulder and said pin head, said pinhead being slightly greater in diameter than said holes in said metal circuit pattern whereby said interconnect tape is mechanically locked into said groove;

a terminal pin inserted through each of said holes whereby said terminal pin extends outward from both said first and second opposing surfaces of said interconnect tape; and

a polymer resin encapsulating said pin head and said groove and at least a portion of said interconnect tape and said shoulder.

5,144,413

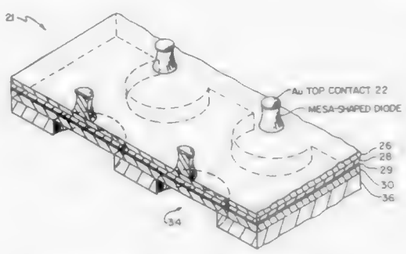
SEMICONDUCTOR STRUCTURES AND MANUFACTURING METHODS

Michael G. Adlerstein, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 323,101, Mar. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 918,646, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 740,707, Jun. 3, 1985, abandoned, which is a division of Ser. No. 323,781, Nov. 23, 1981, Pat. No. 4,536,469. This application Jul. 22, 1991, Ser. No. 734,069

Int. Cl.[5] H01L *23/02*

U.S. Cl. 357—81 5 Claims



1. A semiconductor structure comprising:

a support layer having a plurality of apertures therein;

a heat conductive layer disposed on the support layer; and

a plurality of semiconductor elements disposed on the heat conductive layer and disposed over the support layer with the support layer supporting the heat conductive layer and the semiconductor elements and, with at least one of such elements being disposed over a corresponding one of the plurality of apertures in said support layer.

5,144,414

GHOST CANCELLING DEVICE WITH WAVEFORM CHECKING CIRCUIT

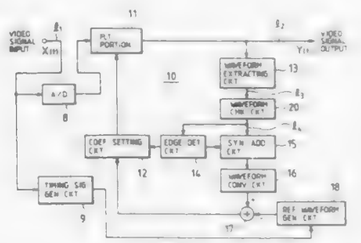
Yuji Nishi, Iwai; Shigehiro Ito, Toride; Tatsushi Koguchi, Iwai, and Kazuyuki Ebihara, Toride, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 27, 1990, Ser. No. 635,001

Claims priority, application Japan, Dec. 27, 1989, 1-341342

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—36 5 Claims



1. A ghost cancelling device using a ghost-cancelling reference signal to detect a ghost, the ghost-cancelling reference signal including a ghost canceller reference signal and an auxiliary signal pairing with the ghost canceller reference signal, the ghost canceller reference signal and the auxiliary signal being arranged at a predetermined period in such a manner to have predetermined phases, said ghost-cancelling device comprising a filtering portion made up of a transversal filter for cancelling a ghost component included in input video signals, a waveform extracting circuit for extracting a part of the input

video signal which corresponds to a predetermined period of time and includes the ghost-cancelling reference signal, a waveform converting circuit for performing the waveform conversion of the signal corresponding to the predetermined period of time extracted from the input video signal, a subtracter for comparing an output of the waveform converting circuit with a preset reference waveform and outputting a signal in accordance with the result of the comparison, a coefficient setting circuit for setting coefficients having values in accordance with the output signal of said subtracter, and a waveform checking circuit interposed between said waveform extracting circuit and said waveform converting circuit for deciding whether or not the output of the waveform extracting circuit should be sent to the waveform converting circuit, wherein said waveform checking circuit includes:

a first decision operating means, operable in a period of time in which a burst signal is originally present but currently absent by being cancelled by said subtracter, for receiving the ghost canceller reference signals separated from each other by a predetermined period of time and obtained by cancelling a horizontal synchronization signal and a burst signal by subtracting the ghost-cancelling reference signal from the output of said waveform extracting circuit, for calculating and accumulating square values of data indicated by the ghost canceller reference signals, and for deciding from the accumulated square value whether or not remnants of the horizontal synchronization signal and the burst signal are present in the ghost canceller reference signal;

a second decision operation means, operable in a predetermined period of time in which a ghost canceller reference signal is originally present, for receiving the ghost-cancelling reference signals that are included in the output of said waveform extracting circuit and separated from each other by a predetermined period of time, for detecting characteristics of the waveform of the ghost canceller reference signal from the received ghost-cancelling reference signals, and for deciding from characteristics of the waveform of the ghost canceller reference signal whether or not the ghost canceller reference signal is present; and

a third decision operation means for receiving the results of the decisions made by said first and second decision operation means and for deciding, from the received results of the decisions made by said first and second decision operation means, whether or not the output of the waveform extracting circuit should be sent to the waveform converting circuit.

5,144,415

APPARATUS FOR PROCESSING INFORMATION CARRIED BY ELECTRO-MAGNETIC RADIATION BEAM

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga; Tsutou Asakura, both of Yokohama; Masato Furuya, and Tetsuji Suzuki, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 18, 1990, Ser. No. 510,739

Claims priority, application Japan, Apr. 18, 1989, 1-98515; May 22, 1989, 1-128069

Int. Cl.[5] H04N *3/10, 1/028;* G02F *1/135*

U.S. Cl. 358—43 8 Claims

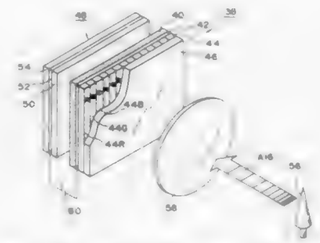
1. An apparatus for processing information carried by an electro-magnetic radiation beam, comprising:

charge latent image holding member on which charge latent images are prerecorded;

beam generating means for generating an electro-magnetic radiation beam which is a superimposition of a plurality of electro-magnetic radiation beams having different wavelength ranges;

filter means for separating said superimposed beam generated by said beam generating means into said plurality of electro-magnetic radiation beams; and

photo-modulation member provided adjacent to said charge latent image holding member an electro-optic effect occurring therein for each of said plurality of electro-magnetic radiation beams separated by said filter means corresponding to said charge latent images prerecorded on said charge latent image holding member wherein



said prerecorded charge latent images are reproduced by way of said electro-optic effect.

5,144,416

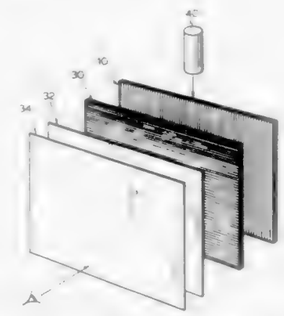
VIDEO DISPLAY AND IMAGING DEVICES HAVING LIQUID CRYSTAL SCANNING

Eastman Hart, 1655 Pickering Parkway, Apt. 102, Pickering, Ontario, Canada L1V 6L3

Filed Oct. 10, 1990, Ser. No. 594,945

Int. Cl.[5] H04N *3/14, 9/30*

U.S. Cl. 358—56 15 Claims



1. A device for filtering light and selectively permitting the passage of light from a light source to a light-absorbing medium in a video display device or imaging device, comprising

a liquid crystal matrix having a first array of closely spaced liquid crystal lines oriented orthogonally to a second array of closely spaced parallel liquid crystal lines, and

control means for sequentially deactivating the lines of liquid crystal in the first array for the duration of a cycle of sequential deactivation of the liquid crystal lines in the second array.

5,144,417

PROJECTION TYPE TELEVISION APPARATUS

Kazuo Tsukagoshi; Hiroshi Tetsuda, and Hiroshi Kawamura, all of Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 631,151

Claims priority, application Japan, Dec. 26, 1989, 1-341432

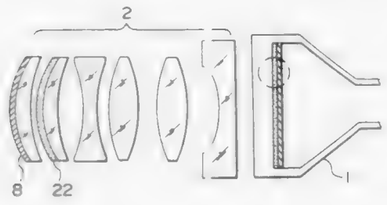
Int. Cl.[5] H04N *9/14*

U.S. Cl. 358—60 22 Claims

7. A projection type television apparatus comprising:

(a) a cathode ray tube including a face plate pane and a display screen of a fluorescent material layer disposed on an inner surface of the face plate plane;

(b) a series of green projection lenses arranged in front of the display screen of the cathode ray tube;
(c) a first color selecting means, disposed in a predetermined position of an optical light path passing through said series of green projection lenses and said cathode ray tube, said first color selecting means having a high refractive factor to light having a wavelength of at least 570 nm, for refracting light having a wavelength above 570 nm; and
(d) a second color selecting means, disposed in a second predetermined position, different from said first predetermined position, of said optical light path passing through



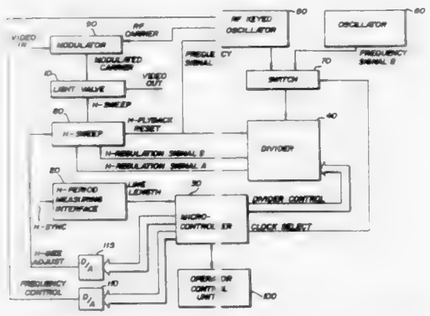
said series of green projection lenses and said cathode ray tube and having at least one of a high reflection factor and a high absorption factor to light having a wavelength of at most 520 nm, for performing at least one of reflecting and absorbing of light having a wavelength below 520 nm, wherein said second color selecting means is a plastic lens colored by soaking in a coloring liquid to cause infiltration of the coloring liquid to a surface of said plastic lens in order to obtain a transmittivity characteristic to perform at least one of reflection and absorption of light having a wavelength of at most 520 nm.

5,144,418

CRYSTAL STABILIZATION OF AMPLITUDE OF LIGHT VALVE HORIZONTAL SWEEP

David W. Brown, Fulton; Terrence E. Rogers, Clay; Richard L. Sundin, Sr., and Ralph A. Henry, both of Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 18, 1990, Ser. No. 629,734
Int. Cl.[5] H04N 9/31, 5/74
U.S. Cl. 358—60 12 Claims



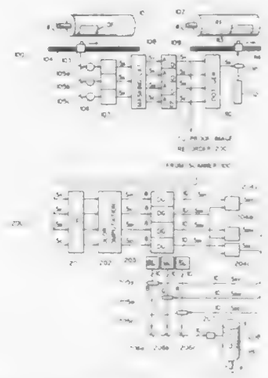
1. In a video projection system, apparatus for establishing a horizontal size of a display raster in response to information for a display to be presented, the information including synchronization data indicative of a desired horizontal size of the display raster, comprising:
first reference signal generating means having an output and for generating a first reference signal having a predetermined frequency;
divider means having an input coupled to the output of the reference signal generating means for receiving the first reference signal, the divider means further for dividing down the first reference signal in response to the synchronization data for forming a secondary reference signal;
counter means for counting a predetermined number of cycles of the secondary reference signal, the counter means further for generating a first sampling signal after a first predetermined number of cycles and for generating a second sampling signal after a second predetermined number of cycles of the secondary reference signal; and
horizontal sweep generator means for generating a horizontal sweep signal in response to the first and second sampling signal, wherein the horizontal sweep signal is indicative of the horizontal size of the display raster.

5,144,419

METHOD OF AND APPARATUS FOR RECORDING COLOR IMAGE

Kimihiro Nakatsuka, and Masafumi Tagaya, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Oct. 23, 1990, Ser. No. 601,647
Claims priority, application Japan, Oct. 31, 1989, 1-285823
Int. Cl.[5] H04N 1/46
U.S. Cl. 358—75 20 Claims



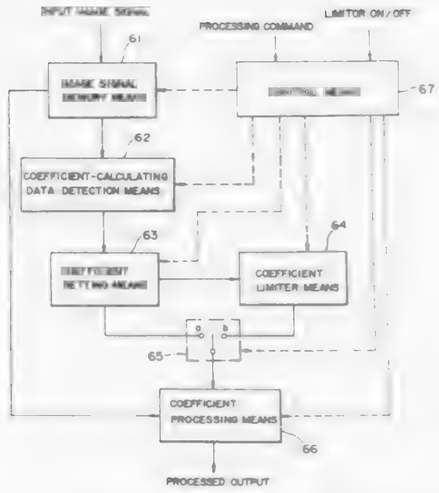
1. A method of recording a color image on a color photosensitive material, comprising the steps of:
(a) obtaining first to fourth image signals which respectively represent density levels of yellow, magenta, cyan and black components of a color original image for each pixel;
(b) converting said first to fourth image signals into first to fourth halftone dot signals, respectively;
(c) obtaining first to third composite halftone dot signals by:
(c-1) combining said first halftone dot signal with said fourth halftone dot signal through a first logical operation to obtain said first composite halftone dot signal;
(c-2) combining said second halftone dot signal with said fourth halftone dot signal through a second logical operation to obtain said second composite halftone dot signal; and
(c-3) combining said third halftone dot signal with said fourth halftone dot signal through a third logical operation to obtain said third composite halftone dot signal; and
(d) modulating exposure beams with said first to third composite halftone dot signals while scanning a color photosensitive material with said exposure beams, to thereby obtain a color image on said color photosensitive material.

5,144,420

COLOR IMAGE PROCESSING APPARATUS THAT MULTIPLIES COLOR DIFFERENCE SIGNALS BY GENERATED COEFFICIENTS TO ACHIEVE SATURATION CONTROL WITHOUT CHANGING COLOR PHASE

Hideaki Omuro, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,245
Claims priority, application Japan, Aug. 15, 1989, 1-209655
Int. Cl.[5] G03F 3/08
U.S. Cl. 358—80 6 Claims



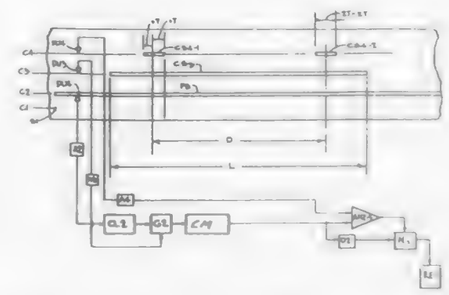
1. Image processing apparatus having a color saturation controller for processing a color image signal to be printed, said apparatus comprising:
input means for providing an incoming color image signal;
color difference means responsive to said input means for deriving color difference signals from said incoming color image signal, said color difference signals having a predetermined allowable dynamic range extending between an upper limit and a lower limit;
detecting means responsive to said color difference means for detecting difference values between said upper limit and a maximum value of said color difference signals and between said lower limit and a minimum value of said color difference signals and for selecting the smaller of said difference values as a minimum difference value between said allowable dynamic range of color difference signals and said derived color difference signals;
coefficient setting means responsive to said detecting means for generating a coefficient value based on said detected minimum difference value; and
multiplying means responsive to said coefficient setting means for correcting the levels of said derived color difference signals by multiplying said generated coefficient value and said color difference signals.

5,144,421

METHODS AND APPARATUS FOR SCANNING OBJECTS AND GENERATING IMAGE INFORMATION

Jerome H. Lemelson, Ste. 286, Unit 802, 930 Tahoe Blvd., Incline Village, Nev. 89451-9436

Continuation of Ser. No. 453,789, Dec. 20, 1989, Pat. No. 5,128,753, which is a continuation of Ser. No. 906,969, Sep. 15, 1986, Pat. No. 4,984,073, which is a continuation of Ser. No. 723,183, Apr. 15, 1985, Pat. No. 4,660,086, which is a continuation of Ser. No. 394,946, Jul. 2, 1982, Pat. No. 4,511,918, which is a division of Ser. No. 13,608, Feb. 16, 1979, Pat. No. 4,338,626, which is a continuation of Ser. No. 254,710, May 18, 1972, Pat. No. 4,118,730, which is a continuation-in-part of Ser. No. 267,377, Mar. 11, 1963, which is a continuation-in-part of Ser. No. 626,211, Dec. 4, 1956, Pat. No. 3,081,379, and a continuation-in-part of Ser. No. 477,467, Dec. 24, 1954, abandoned. This application Apr. 23, 1992, Ser. No. 872,344
Int. Cl.[5] H04N 7/18
U.S. Cl. 358—101 12 Claims



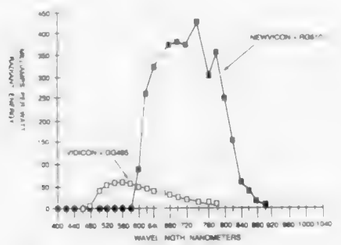
1. A method for scanning an object and generating image information about the object, comprising:
a) generating a radiation beam;
b) controlling said radiation beam to cause it to scan a plurality of paths intersecting an object positioned in an image field, said object containing a predetermined image area having variable scannable information including abrupt changes in light reflectivity, so that light energy is variably reflected during at least part of the scanning movement of said beam, and wherein said plurality of paths scanned by said radiation beam cover an area in said image field which is larger than said predetermined image area;
c) detecting variations in the reflected light energy of said beam as it scans said object in said image field, and generating electrical detection signals which are modulated in accordance with said variations in the reflected light energy of at least a portion of said image field including said predetermined image area;
d) electronically processing said electrical detection signals and generating electrical control signals;
e) computer analyzing said electrical control signals and generating coded electrical signals defining at least a portion of the variable scannable information detected during at least one of said scanning paths intersecting said predetermined image area; and
f) employing said coded electrical signals to control the operation of an indicating means to cause it to indicate the detected variable scannable information in said predetermined image area.

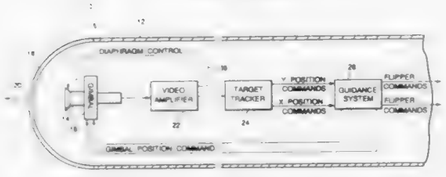
5,144,422

OPTIMAL TELEVISION IMAGING SYSTEM FOR GUIDED MISSILE

Leland R. Baker, and Lewis J. Golden, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 24, 199 , Ser. No. 720,054
Int. Cl.[5] H 04N *7/18*
U.S. Cl. 358—109 **19 Claims**





1. A television guided missi e system, comprising:
a missile;
a television camera mounte on the missile for generating an electronic image of a fiel of view forward of the missile; and
guidance means mounted in the missile for generating guidance control signals for g iding the flight of the missile in response to said electron c image;
the television camera inclu ing:
a lens assembly for formi g an optical image of said field of view;
optoelectronic image tra sducer means onto which said optical image is focusse d by the lens assembly for generating electronic image signals corresponding to said optical image;
signal processing means for generating said electronic image in response to s id image signals; and
optical filter means disp osed in the optical path of the optical image and h ving a predetermined spectral passband selected such that the transducer means generates said image signal only in response to a spectral portion of said optical mage within a wavelength range of approximately 600 to 900 nanometers.

5,144,423

HDTV ENCODER WITH F ORWARD ESTIMATION AND CONSTANT RATE MOTION VECTORS

Scott C. Knauer, Mountainside; Kim N. Matthews, Watchung; Arun N. Netravali, Westfield; Eric D. Petajan, Watchung; Robert J. Safranek, New Providence, and Peter H. Westerink, Newark, all of N.J., assig ors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 11, 1990, Ser. No. 626,356
Int. Cl.[5] H 4N *7/12, 7/18*
U.S. Cl. 358—133 **14 Claims**

1. An HDTV encoder comprising:
a forward estimation blo k responsive to applied image frame pixel signals, I(t), which includes
means, responsive to sa d image frame pixel signals, for developing a plurality of different types of control signals within a chose n processing time interval, T, and
means for delaying said applied image frame signals by said chosen processing time interval to develop a delayed signal, I(t−T); and

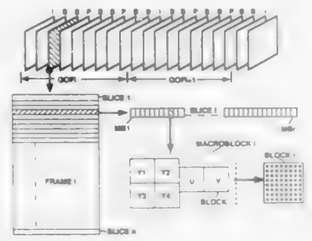
an encoding loop responsive to said control signals and to said delayed signal I(t−T) for developing quantized code signals for said applied image frame pixel signals.

5,144,424

APPARATUS FOR VIDEO DATA QUANTIZATION CONTROL

Tristan Savatier, Los Angeles, Calif., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Oct. 15, 1991, Ser. No. 776,022
Int. Cl.[5] H04N *7/133*
U.S. Cl. 358—133 **9 Claims**



1. In a video signal compression apparatus of the type which provides compressed frames of data arranged as macroblocks of data, said macroblocks including a plurality in blocks of coded data susceptible of quantization, quantizing apparatus comprising:
a quantizer receptive of said macroblocks of data for quantizing coded data according to a predetermined quantizing function on a macroblock-by-macroblock basis and responsive to a complexity control signal for altering said quantizing function;
means, responsive to blocks within and adjacent respective macroblocks of data for generating said complexity control signals for said respective macroblocks.

5,144,425

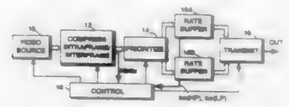
APPARATUS FOR HIERARCHICALLY DIVIDING VIDEO SIGNALS

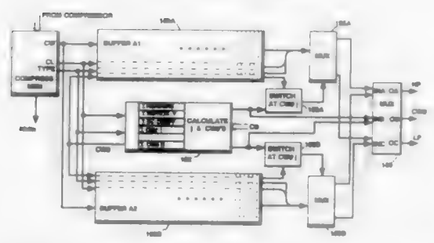
Kuriacose Joseph, Plainsboro, N.J., assignor to General Electric Company, Princeton, N.J.

Filed Aug. 26, 1991, Ser. No. 749,836
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—133 **9 Claims**

1. Apparatus for parsing compressed video data between a high priority channel having a first channel capacity and a low priority channel having a second channel capacity, said compressed video data occurring as codewords of different types and in groups of frames, each group of frames including an intraframe encoded frame and interframe encoded frames, said apparatus characterized by:
a source of said compressed video data;

high and low priority rate buffers included in said high and low priority channels respectively, said rate buffers including means for generating respective signals indicating their current occupancy status;
means responsive to a value Hfrac and said codewords for classifying said codewords according to a predetermined hierarchy of said types, and applying to the high priority rate buffer, according to said hierarchy, the codewords of said types representing the Hfrac fraction of said compressed video data, and applying the remainder of said compressed video signal to said low priority rate buffer;





means responsive to the signal indicating the current occupancy of the high priority rate buffer, for generating said value Hfrac for respective frames of each group, wherein for each group of frames, the value of Hfrac for said intraframe encoded frame, is of a magnitude to cause the intraframe encoded data to substantially fill the high priority rate buffer, and the value of Hfrac for said interframe encoded frames, is of a magnitude to tend to cause the high priority rate buffer to empty over a group of frames.

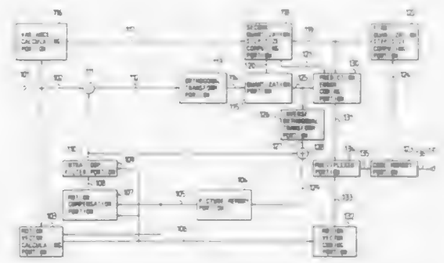
5,144,426

MOTION COMPENSATED PREDICTION INTERFRAME CODING SYSTEM

Akiyoshi Tanaka, Kawasaki; Satoshi Matsuya, deceased, late of Sagamihara by Yasue Matsuya, legal heir ; Wataru Fujikawa, Yokohama; Hiroyuki Uwabo, Tokyo; Ikuo Inoue, Yokohama, and Atsushi Nagata, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 12, 1990, Ser. No. 597,853
Claims priority, application Japan, Oct. 13, 1989, 1-266478; Oct. 13, 1989, 1-266479; Jan. 19, 1990, 2-11284; Jun. 19, 1990, 2-160520
Int. Cl.[5] H04N *7/133, 7/137*
U.S. Cl. 358—133 **17 Claims**

1. A motion compensated prediction interframe coding system comprising:
an analog-to-digital conversion means for performing an analog-to-digital conversion of a television signal;
a block dividing means for dividing a predetermined area of the television signal digitalized by said analog-to-digital conversion means into blocks each having a predetermined size;
a motion vector calculating means for calculating a motion vector, which represents a motion of a television picture represented by the television signal, of each block and for judging with respect to each block whether or not the motion compensation is performed by using by the motion vector;
a motion compensation means for performing a motion compensation of a reproduced picture signal of a previous frame with respect to each block of which the motion compensation is determined by said motion vector calculating means to be effected and for calculating predicted gray levels of pixels of each block of which the motion compensation is effected;
a prediction error evaluating means for computing the difference between the gray level of each pixel of a coding block of the television picture and the predicted gray level thereof as a prediction error thereof;
an orthogonal transform means for performing an orthogonal transform of the prediction error of each pixel of a coding block of the television picture so as to obtain orthogonal transform coefficients;
a first quantization step-size computing means for computing a first step size for the quantization from an amount of generated codes;
a variance calculating means for calculating a variance of the gray levels of the pixels of each block of input television signal;
a second quantization step-size computing means for classifies the blocks into a predetermined number of classes



according to the variance and computing a second step size for the quantization of each block from the first step size;
a quantization means for quantizing coefficients of an orthogonal transform by using the second step size to obtain quantized coefficients of orthogonal transform;
an orthogonal transform coefficient coding means for performing the coding of the prediction error, the first step size and information on the classes and the quantized coefficients of the orthogonal transform;
a quantized prediction error calculating means for effecting an inverse orthogonal transform of the quantized coefficients of the orthogonal transform to obtain quantized prediction errors;
a reproduced picture calculating means for calculating a reproduced picture from the quantized prediction errors and the predicted gray levels of the pixels of the blocks;
a memory portion for storing the reproduced picture; and
a motion vector coding means for performing the coding of the motion vectors.

5,144,427

TELEVISION RECEIVER DECODER APPARATUS FOR BANDWIDTH-COMPRESSED HIGH DEFINITION TELEVISION SIGNAL

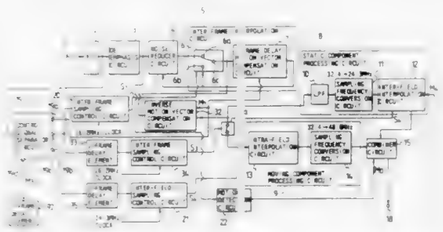
Masahiro Kitaura, Nagareyama, and Tomoaki Uchida, Noda, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 20, 1990, Ser. No. 540,748
Claims priority, application Japan, Jun. 20, 1990, 1-157994
Int. Cl.[5] H04N *7/12, 7/13*
U.S. Cl. 358—136 **3 Claims**

1. A high definition television receiver decoder apparatus for processing a transmitted television signal including image data sample values produced by inter-frame and inter-field offset sampling to achieve bandwidth compression and including, transmitted with each field of the television signal, and

inter-frame and inter-field motion vector data expressing respective amounts of uniform picture motion of the field, the decoder apparatus comprising a motion component processing system for executing intra-field interpolation of successive fields, a static component processing system, area motion detection means for judging whether each of the sample values is part of a moving region within a picture expressed by a field, and combining means for combining output sample values produced from the motion component processing system and static component processing system in proportions determined by the area motion detection means to thereby output image sample values, wherein said decoding apparatus operates on data of successive sets of four successively received fields (n_1, n_2, n_3, n_4), of which a fourth field (n_4) is a current field which is currently being received by said apparatus, and wherein the static component processing system comprises:

inter-frame interpolation and motion vector compensation means for combining a first one (n_1) of said four successively received fields with a third one (n_3) of the fields after applying an amount of phase shift to sample values of said third field (n_3) in accordance with said inter-frame motion vector data, to thereby obtain a first combined



field, and for combining a second one (n_2) of said fields with said fourth current one (n_4) of said four fields after applying a fixed amount of phase shift to sample values of said current field (n_4) in accordance with said inter-frame motion vector data, to thereby obtain a second combined field, and moreover for supplying said second field (n_2) to said motion component processing system in synchronism with outputting said second combined field; and

inter-field interpolation and motion vector compensation means for combining said first combined field with said second combined field after applying a fixed value of phase shift to sample values of said first combined field in accordance with said inter-field motion vector data, to thereby obtain a third combined field, with sample values of said third combined field being successively inputted to said combining means;

wherein said motion component processing system executes intra-field interpolation of said second one (n_2) of said four successively received fields, and wherein said second field (n_2) which occurs two fields prior to said current field (n_4) is utilized as a time axis reference field for each of said motion component processing system and said static component processing system.

5,144,428

METHOD AND APPARATUS FOR DECODING IMAGE SIGNALS USING TWO PROCESSING MODES

Hidenori Okuda, and Shigeki Maeaki, both of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Aug. 15, 1991, Ser. No. 745,184
Claims priority, application Japan, Aug. 16, 1990, 2-216664
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—136 **20 Claims**

1. Am image signal decoding apparatus for decoding input encoded signals encoded by using an orthogonal transform of interframe differential signals of image signals, comprising:

means for recovering orthogonal transform coefficients for the interframe differential signals from the input encoded signals;

means for integrating interframe difference information by using the orthogonal transform coefficients for the interframe differential signals recovered by the recovering means in order to reproduce the image signals, the integrating means being capable of operating in two processing modes including:

a first processing mode for applying an inverse orthogonal transform to the orthogonal transform coefficients in order to recover the interframe differential signals, and

then integrating the interframe difference information by using the recovered interframe differential signals on a pel domain defined in terms of picture elements; and

a second processing mode for integrating the interframe difference information by using the orthogonal transform coefficients on a transformed domain defined in terms of the orthogonal transform coefficients; and

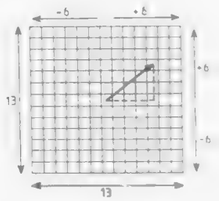
means for controlling the integrating means to operate in the first processing mode in a case where a number of input blocks per unit time in the input encoded signals is less than a prescribed threshold value, and in the second processing mode in a case where the number of input blocks per unit time in the input encoded signals is not less than a prescribed threshold value.

5,144,429

HIGH DEFINITION TELEVISION TRANSMISSION AND RECEPTION SYSTEM WITH AN IMPROVED MOTION ESTIMATOR AND WITH REDUCED DATA THROUGHPUT

Mohammad R. Haghiri, Sceaux, and Philippe Guichard, Verrieres Le Bx, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 366,802, Jun. 14, 1989, Pat. No. 5,031,039. This application Jul. 8, 1991, Ser. No. 727,805
Claims priority, application France, Jun. 21, 1988, 88 08301
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—138 **18 Claims**



1. A television transmission system in which an image is processed as a sequence of frames each comprising first and second fields, each of said fields being divided into a plurality of image parts, the system comprising a motion estimator for

determining motion vectors for a number of said image parts, said system further comprising:

means for determining an optimum motion vector for a first image part of a second field of a subsequent frame by examining a plurality of respective prior motion vectors determined for each of a group of said number of image parts, said group comprising a second image part of a second field of a preceding frame and a plurality of image parts spatially adjacent to said second image part, said second image part having the same respective spatial position as said first image part within their respective fields; and

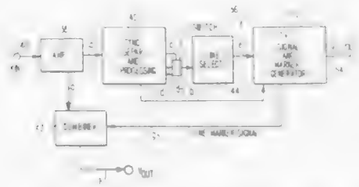
means coupled to said motion estimator, for transmitting data representing said motion vectors on a digital transmission channel.

5,144,430

DEVICE AND METHOD FOR GENERATING A VIDEO SIGNAL OSCILLOSCOPE TRIGGER SIGNAL

Eduardo I. Boelart, Buena Park, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 9, 1991, Ser. No. 742,992
Int. Cl.[5] H04N *17/00*
U.S. Cl. 358—139 **21 Claims**



1. A device for generating an oscilloscope trigger signal for use in observing on an oscilloscope a selected portion of a plurality of raster scan lines of a video signal applied to said oscilloscope, each said scan lines having a given length defined by the horizontal synchronization (sync) pulses of said video signal, said device comprising:

means responsive to said video signal applied as an input thereto for generating a video display marker signal corresponding to and manifesting the length and time of occurrence of the selected corresponding portion of said lines; and

means responsive to said video signal applied as an input thereto for generating an oscilloscope trigger signal manifesting the time of occurrence of said selected portion.

5,144,431

TELEVISION SIGNAL TRANSMISSION SYSTEM WITH TEMPORAL PROCESSING

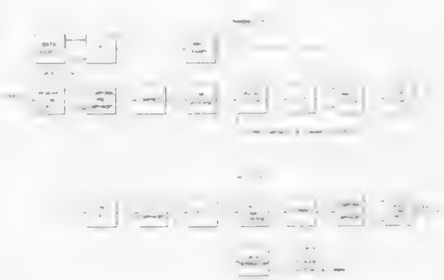
Richard W. Citta, Oak Park, and Ronald B. Lee, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 238,956, Aug. 31, 1988, which is a continuation-in-part of Ser. No. 176,893, Apr. 4, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,152
Int. Cl.[5] H04N *7/04*
U.S. Cl. 358—141 **17 Claims**

1. A method of processing a television signal comprising the steps of:

providing a baseband television signal;

temporal filtering said baseband television signal with a first recursive type feedback temporal filter for reducing the power level thereof by subtracting a selected portion, less than 100%, of each image field of the baseband television signal from the immediately following image field thereof; and



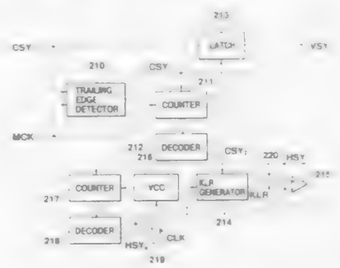
transmitting the reduced power level temporal filtered baseband television signal

5,144,432

SYNCHRONIZING CIRCUIT FOR AN IMAGE PICKUP SYSTEM

Yoshihito Higashitsutsumi, Gifu, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 29, 1991, Ser. No. 692,664
Claims priority, application Japan, Apr. 27, 1990, 2-113138; May 25, 1990, 2-136458; May 31, 1990, 2-142314
Int. Cl.[5] H04N *5/08, 5/10*
U.S. Cl. 358—153 **8 Claims**



1. A synchronizing circuit which receives a composite synchronous signal including both a vertical synchronous component having a vertical scanning period and a horizontal synchronous component having a horizontal scanning period and generates a horizontal synchronous signal and a vertical synchronous signal, said synchronizing circuit comprising:

an edge detector for detecting an edge of said composite synchronous signal and outputting a pulse signal at every edge;

a half killer circuit for eliminating an output pulse having a shorter period than a predetermined period from the output pulse of said edge detector and outputting said horizontal synchronous signal;

a vertical synchronous signal separator for detecting the state of said composite synchronous signal in the vicinity of said edge and outputting said vertical synchronous signal;

a counter which is reset by said vertical synchronous signal generated by said vertical synchronous signal separator and counts in synchronism with said horizontal synchronous signal;

a blanking period detector for detecting the blanking period of vertical scanning operation by decoding the count value of said counter; and

a control means for controlling said half killer circuit to operate only during said blanking period;

a counter for counting a predetermined number of reference clock pulses; and

gate means for stopping output pulse from said edge detector at predetermined intervals on the basis of a count value of said counter of said half killer circuit.

5,144,433

INTERFERENCE-FREE DIGITAL SYNCHRONIZING SIGNAL DETECTOR FOR TV

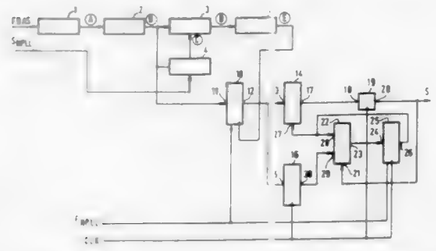
Gerhard Pletz-Kirsch, and Jügen Lentl, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1990, Ser. No. 587,315

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1989, 3931860

Int. Cl.[5] H04N *5/08 5/10*

U.S. Cl. 358—155 **8 Claims**



6. A digital circuit for detecting synchronizing pulses in a composite TV signal comprising:

a separating stage which separates TV signal portions of a composite TV signal that exceed a threshold level,

means for applying a composite TV signal to an input of said separating stage,

a level detector responsive at least to a pulse-type output signal of the separating stage, said level detector including a storage device for a stored sampling value of the TV signal and means for comparing an instantaneous sampling value of the TV signal with said stored sampling value so that, during time intervals in which the TV signal portions are separated in the separating stage and simultaneously the instantaneous sampling value exceeds the stored sampling value, the comparing means causes a marker pulse to be generated and causes a transfer device to replace the stored sampling value in the storage device with the instantaneous sampling value, and

means for erasing, at a predetermined time in each time interval between consecutive synchronizing pulses, the stored sampling value, whereby a last marker pulse before erasing of the stored sampling values marks a detected synchronizing pulse.

5,144,434

VIDEO SIGNAL PROCESSING DEVICE USING LOOK-UP TABLE

Shinichi Yamashita, Kanagawa, and Mitsugu Tanaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1990, Ser. No. 550,284

Claims priority, application Japan Jul. 13, 1989, 1-182027; Jul. 13, 1989, 1-182028; Jul. 13, 1989, 1-182029; Jul. 13, 1989, 1-182030

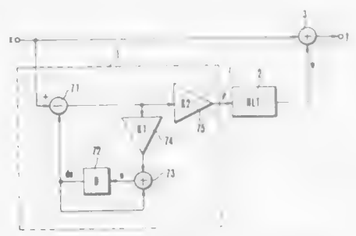
Int. Cl.[5] H04N *5/14*

U.S. Cl. 358—166 **14 Claims**

1. A video signal processing device comprising:

(a) input means for receiving a digital video signal;

(b) an infinite impulse response digital highpass filter arranged to receive the digital video signal from said input means, said high-pass filter including a subtracter arranged to receive as one of inputs thereof the digital video signal from said input means, a coefficient multiplier arranged to multiply an output digital signal of said subtracter by a predetermined coefficient, and an accumulator arranged to accumulate an output digital signal of said coefficient multiplier and to supply an output digital signal thereof to the other input of said subtracter;



(c) look-up table means for looking up a table by using an output digital signal of said filter as an address, said look-up table means having a non-linear input-output characteristic; and

(d) addition means for adding together the digital video signal received from said input means and an output digital signal of said look-up table means.

5,144,435

NOISE IMMUNITY IN N SIGNALS

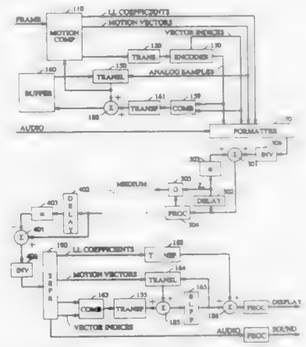
Scott C. Knauer, Mountainside, and Arun N. Netravali, Westfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 1, 1990, Ser. No. 532,526

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.[5] H04N *5/213*

U.S. Cl. 358—167 **6 Claims**



1. A TV receiver including means, responsive to input signals for receiving a plurality of line scan signals during a line scan interval of a TV frame and for receiving vector signals during a retrace interval of said TV frame, frame buffer means for storing a current set of signals representing at least a portion of a video frame, translator means for combining said current set of signals stored in said buffer means with said vector signals, means for augmenting output signals of said translator means in response to said line scan signals, and means for storing output signals of said means for augmenting in said frame buffer means, characterized in:

a de-emphasis circuit interposed between said input signals and said means for receiving, including

delay means responsive to said line scan signals within said input signals for storing signals of a preselected number of line scan signals;

attenuation means responsive to said line scan signals within said input signals for attenuating the signal of said plurality of line scan signals by a selected factor; and

means for combining input signals of said delay means and output signals of said attenuation means to develop output signals of said de-emphasis circuit.

5,144,436

Patent Not Issued For This Number

5,144,437

PICTURE REDUCING APPARATUS TAKING AVERAGES FROM LINE MEMORIES FOR P-I-P

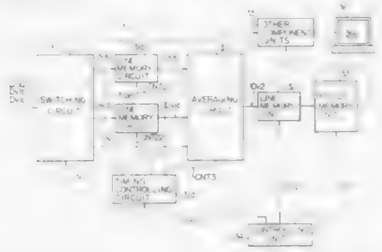
Mayu Miyauchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1990, Ser. No. 634,562

Claims priority, application Japan, Dec. 29, 1989, 1-342891

Int. Cl.[5] H04N *7/01, 5/45*

U.S. Cl. 358—183 **4 Claims**



1. An image processing system for reproducing a small-sized picture scaled down from an original picture, comprising:

a) a scale-down unit supplied with pieces of first video data information indicative of parts of said original picture corresponding to a plurality of lines of a screen, respectively, and producing a piece of second video data information indicative of a part of said small-sized picture on a single line of aid screen, said pieces of fist video data information being sampled at respective first predetermined timings;

b) a line memory unit supplied from said scale-down unit with said piece of second video data information for temporarily memorizing thereinto and allowing said piece of second video data information to be read out therefrom; and

c) a field memory unit supplied from said line memory unit with pieces of second video data information indicative of said small-sized picture for temporarily memorizing thereinto and allowing said pieces of second video data information to be read out therefrom at respective second predetermined timings repeated at intervals shorter than those of said first predetermined timings, wherein said scale-down unit comprises

a-1) a switching circuit having an input port supplied with said pieces of first video data information and distributing said pieces of first video information to a plurality of output ports thereof, respectively,

a-2) a plurality of line memory circuits respectively coupled to said plurality of output ports except for one of said output ports and memorizing said pieces of first video data information, respectively, and

a-3) an averaging circuit coupled to said line memory circuits and said one of said output ports and operative to average values respectively represented by said pieces of first video data information so as to calculate a weighted average for determining the value represented by said piece of second video data information, one of said pieces of first video data information at the center of said plurality of output ports being weighted by a factor larger than those of the other of said pieces of first video data information.

5,144,438

MULTICHANNEL SCANNING METHOD

Yong-san Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 28, 1989, Ser. No. 398,983

Claims priority, application Rep. of Korea, Dec. 24, 1988, 88-17401

Int. Cl.[5] H04N *5/262, 5/45*

U.S. Cl. 358—183 **23 Claims**

1. A multichannel scanning method for a multiple picture-in-picture television system capable of displaying a plurality of sub-pictures on a main picture, comprising the steps of:

initializing said system in response to a multichannel scanning start command to enable display video images from different channels of reception for sources of video image signals;

selecting and storing a sequence of a plurality of said channels, each of said channels having a respective image signal;

successively delivering image signals of said sources for a first plurality of said plurality of channels within said sequence to a respective first number of positions on said main picture for display of sub-pictures;

setting the remaining sub-pictures of said plurality of sub-pictures;

delivering remaining image signals for corresponding ones of said plurality of channels not included in said first plurality, successively to said first number of positions;

upon display of an image signal from a final one of said plurality of sources, re-displaying a sub-picture corresponding to a first one of said sources, and successively displaying sub-pictures corresponding to said sources within said sequence; and

terminating said system operation in response to a multichannel scanning termination command.

5,144,439

MONO FM RADIO IN A TELEVISION RECEIVER

Leroy S. Wignot, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 6, 1990, Ser. No. 561,589

Int. Cl.[5] H04N *5/44*

U.S. Cl. 358—188 **8 Claims**

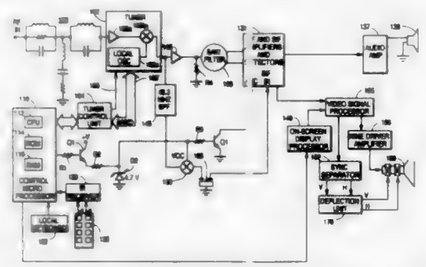
1. A television receiver, comprising:

tuner means for operating in a first mode for receiving television RF signals, said tuner means selecting a particular

television RF signal from a plurality of television RF signals in response to a control signal, and converting said selected television RF signal to a television intermediate frequency signal;

intermediate frequency (IF) signal processing means for receiving said converted television intermediate frequency signal and amplifying it, said intermediate frequency (IF) signal processing means including sound intermediate frequency (SIF) signal processing means for receiving and processing sound signals at a television intercarrier sound intermediate frequency;

said tuner means also operating in a second mode as a first frequency conversion stage for a double conversion broadcast FM radio signal receiver, for receiving broadcast FM radio RF signals, said tuner means selecting a particular broadcast FM radio RF signal from a plurality of broadcast FM radio RF signals in response to said control signal, and for converting said particular broadcast FM radio RF signal to a first intermediate frequency;



control means for generating said control signal for causing said tuner means to select one of said particular television RF signal and said particular broadcast FM radio RF signal;

a second frequency conversion stage of said double conversion broadcast FM radio signal receiver, said second frequency conversion stage receiving said broadcast FM radio signal at said first intermediate frequency and converting said broadcast FM radio signal at said first intermediate frequency to a second intermediate frequency, said second intermediate frequency being said television intercarrier sound intermediate frequency; and

said sound intermediate frequency (SIF) signal processing means receives said broadcast FM radio signal at said second intermediate frequency for processing, and includes means for demodulating audio signals from said signal at said second intermediate frequency.

5,144,440

NATIONAL WEATHER RADIO RECEPTION BY SYNTHESIZING ONLY CENTER FREQUENCY

Leroy S. Wignot, and Kevin E. Northrup, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 6, 1990, Ser. No. 561,586
Int. Cl.[5] H04N *5/44*
U.S. Cl. 358—188 7 Claims

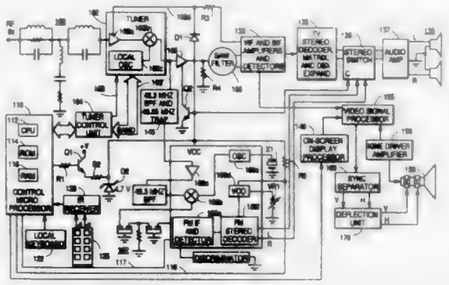
1. A television receiver, comprising:

tuner means for operating in a first mode for receiving television RF signals, said tuner means selecting a particular television RF signal from a plurality of television RF signals in response to a control signal;

said tuner means also operating in a second mode as a first frequency conversion stage for a double conversion broadcast FM radio signal receiver, for receiving broadcast FM radio RF signals and FM broadcast signals of the National Weather Service, said tuner means selecting one of a particular broadcast FM radio RF signal from a plurality of broadcast FM radio RF signals and a broadcast FM signal of said National Weather Service in response to said control signal, and for converting said selected FM RF signal to a first intermediate frequency;

a second frequency conversion stage of said double conversion broadcast FM radio signal receiver, said second frequency conversion stage receiving said selected FM radio signal at said first intermediate frequency and converting said selected FM radio signal at said first intermediate frequency to a second intermediate frequency;

means for demodulating audio signals from said selected FM radio signal at said second intermediate frequency;



said double conversion FM signal receiver also being tuned by a control means substantially to the center of the band of frequencies of the National Weather Service, said FM signal receiver automatically receiving signals broadcast on any one of the frequencies of said band of National Weather Service frequencies; and

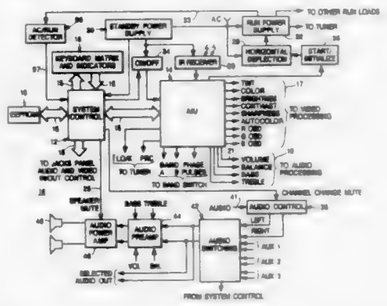
said control means generating said control signal for causing said tuner means to select one of said particular television RF signal, said particular broadcast FM radio RF signal, and said signals of said National Weather Service band of frequencies.

5,144,441

QUIETING RECEIVER DURING POWER INTERRUPTION

Bradley A. Sparks, and Robert E. Morris, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Mar. 23, 1989, Ser. No. 327,880
Int. Cl.[5] H04N *5/63*
U.S. Cl. 358—190 25 Claims



1. A receiver, comprising:

at least one run power supply; an auxiliary power source for generating power for a certain period of time during AC power interruption;

a tuner circuit energized by the at least one run power supply, and having a local oscillator, a prescaler, a phase detector and an integrator interconnected in a phase locked control loop for tuning the receiver to a given channel by detecting a corresponding input signal, a spurious tuning control signal being generated in the control loop during AC power interruption;

an audio circuit energized by the at least one run power supply, for reproducing an audio component in the input signal;

means for detecting an intermittent AC power interruption and generating a power loss control sign; and,

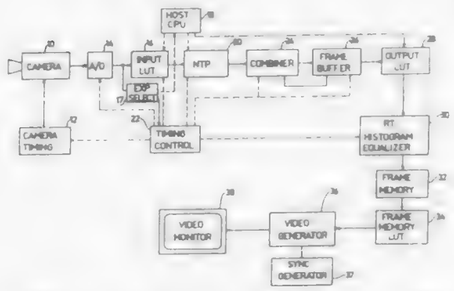
means energized by the auxiliary power supply and responsive to the power loss control signal when the intermittent AC power interruption is detected, for disabling the tuner circuit to prevent abrupt detuning responsive to the spurious tuning control signal and for disabling the audio circuit.

5,144,442

WIDE DYNAMIC RANGE CAMERA

Ran Ginosar, Nofit; Oliver Hilsenrath, and Yehoshua Zeevi, both of Haifa, all of Israel, assignors to I Sight, Inc., Orangeburg, N.Y.

Continuation of Ser. No. 338,547, Aug. 2, 1989, abandoned. This application Nov. 21, 1991, Ser. No. 799,666
Claims priority, application Israel, Feb. 8, 1988, 87306
Int. Cl.[5] H04N *5/30, 5/14, 5/238*
U.S. Cl. 358—209 10 Claims



1. Wide dynamic range video imaging apparatus comprising:

sensor means for providing a plurality of video images of a scene at different exposure levels; and

means for processing the plurality of video images to produce a combined video image including image information from the plurality of video images by applying neighborhood transforms to the plurality of video images.

5,144,443

APPARATUS FOR REPRODUCING CHARGE LATENT IMAGE WITH VIBRATION OF ELECTRODE TO MODULATE FIELD GENERATED BY IMAGE THEREBY ELECTRO-OPTICALLY MODULATING A READING LIGHT

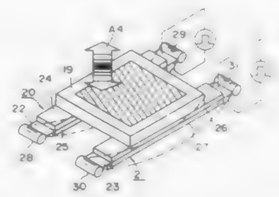
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga; Tsutou Asakura, both of Yokohama; Masato Furuya, Yokosuka, and Tetsuji Suzuki, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 4, 1990, Ser. No. 505,240
Claims priority, application Japan, Apr. 6, 1989, 1-87247
Int. Cl.[5] H04N *1/21, 3/10;* G02F *1/135*
U.S. Cl. 358—209 6 Claims

1. An apparatus for reproducing a charge latent image prerecorded on a recording medium composed of at least a photo-modulation layer and a charge holding layer laminated thereto and holding said charge latent image, said apparatus comprising:

two electrodes interposing said recording medium therebetween, said two electrodes connected to each other, one of which is spaced from the recording medium, a reading light permeating said photo-modulation layer; and

vibrating means vibrating said one of the two electrodes to modulate an electric field generated between the two



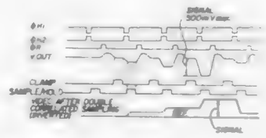
electrodes by said charge latent image prerecorded on the recording medium, thereby said reading light is electro-optically modulated to reproduce said charge latent image.

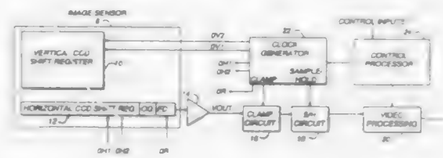
5,144,444

METHOD AND APPARATUS FOR IMPROVING THE OUTPUT RESPONSE OF AN ELECTRONIC IMAGING SYSTEM

Steven D. MacLean, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1991, Ser. No. 710,388
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—209 3 Claims





1. An electronic image system comprising:

a. a solid-state image sensor including an image receiving register and an output shift register, first transfer means for transferring image signals from the image receiving register to the output shift register in response to first clocking signals, and second transfer means for transferring image signals from the output shift register to an output signal line in response to second clocking signals;

b. an amplifier coupled to the output signal line;

c. a clamping circuit coupled to the amplifier that operates in response to a clamp clock signal;

d. a sample/hold circuit coupled to the clamping circuit that operates in response to a sample/hold clock signal;

a clock generator coupled to the image sensor, the clamping circuit, and the sample/hold circuit; the clock generator generating the first clocking signals, the second clocking signals, the clamp signal, and the sample/hold clock signal, wherein the second clocking signals are at the same state when the clamp clock signal and the sample/hold clock signal are generated so that cross talk normally caused by the second clocking signals is prevented.

5,144,445

SOLID-STATE IMAGE PICKUP APPARATUS HAVING A PLURALITY OF PHOTOELECTRIC TRANSDUCERS ARRANGED IN A MATRIX

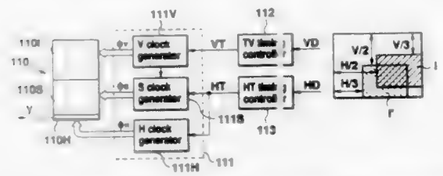
Yoshihito Higashitsutsumi, Gifu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 19, 1990, Ser. No. 630,282

Claims priority, application Japan, Dec. 26, 1989, 1-337358; Dec. 26, 1989, 1-337359; Jun. 28, 1990, 2-171519

Int. Cl.[5] H04N *3/14, 5/335, 7/04*

U.S. Cl. 358—213.11 **15 Claims**



1. A solid-state image pickup apparatus for outputting a video signal displaying an image on a reproducing screen comprising:

(A) a solid-state image pickup device having a plurality of photoelectric transducers which are arranged in a matrix in the horizontal and vertical directions and generating information charges which correspond to an image pattern having pixels the number of which in the vertical direction is equivalent to 1/n (n is an integer) of the number of the pixels of said reproducing screen;

(B) a vertical transfer means for transferring said information charges in the vertical direction;

(C) a horizontal transfer means for transferring and outputting to each horizontal line said information charges transferred in the vertical direction;

(D) a driving means for driving said horizontal transfer means such that said horizontal transfer means transfers and outputs said information charges for one line in the period of 1/n of the horizontal scanning period on said reproducing screen; and

(E) a timing control means for setting the operation timing of said driving means in correspondence with a synchronizing signal on said reproducing screen, thereby obtaining said video signal for displaying said image which is 1/n as large as said reproducing screen in horizontal and vertical directions in a specified region of said reproducing screen.

5,144,446

IMAGE DEFECT CORRECTING CIRCUIT FOR A SOLID STATE IMAGER

Fumihiko Sudo, and Takashi Asaida, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,715

Claims priority, application Japan, Jan. 31, 1990, 2-021121; Apr. 13, 1990, 2-098003

Int. Cl.[5] H04N *5/335*

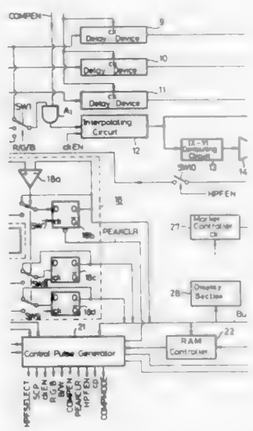
U.S. Cl. 358—213.11 **19 Claims**

1. An image defect correcting circuit for a solid state imager, comprising:

a) comparing means for comparing levels of output signals from respective pixels of a solid state image pickup element illuminated on its whole surface with a light of uniform brightness with a predetermined level;

b) position data generating means for generating position data indicative of a position of pixel which outputs a signal of a peculiar level on the basis of the compared result of the comparing means;

c) interpolating means for interpolating an output signal output from a pixel located at the position indicated by the position data by using an output signal derived from another pixel and generating an interpolated output signal; and



d) switching means for selectively switching between the output signals of the respective pixels and the interpolated output signal of the interpolating means on the basis of the position data .

5,144,447

SOLID-STATE IMAGE ARRAY WITH SIMULTANEOUSLY ACTIVATED LINE DRIVERS

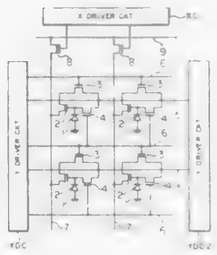
Hajime Akimoto, Hachioji; Shinya Ohba, Kanagawa, and Mitsuyuki Mitsui, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,314

Claims priority, application Japan, Mar. 31, 1988, 63-76174; Apr. 13, 1988, 63-89053; May 20, 1988, 63-121724

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.11 **16 Claims**



1. A solid-state imaging device comprising a plurality of photoelectric conversion elements, a plurality of signal amplifying means for receiving and amplifying respective electric signals produced by optical signals incident upon said photoelectric conversion elements, a plurality of power supply lines each of which supplies electric power to at least one of said plurality of signal amplifying means, a plurality of power supply line driving means each of which drives all of said power supply lines by providing electric power to said power supply lines, and transfer means for reading out the outputs of said signal amplifying means, wherein said plurality of power supply line driving means supply substantially the same electric power with substantially the same clock timing to each of said power supply lines.

5,144,448

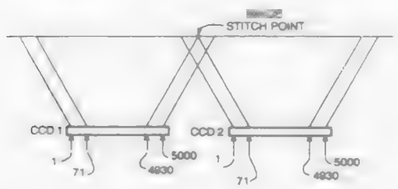
SCANNING APPARATUS USING MULTIPLE CCD ARRAYS AND RELATED METHOD

Cecil V. Hornbaker, III, New Carrolton, Md.; Thomas C. Driggers, Falls Church, and Edward W. Bindon, Fairfax, both of Va., assignors to Vidar Systems Corporation, Herndon, Va.

Filed Jul. 31, 1990, Ser. No. 560,732

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.13 **27 Claims**



1. An apparatus for scanning an image line by line to produce data representative of the image comprising:

a plurality of linear arrays, each of the arrays having a plurality of photosensitive pixel elements arranged in succession along a linear axis of the array;

means for moving the image relative to the arrays;

means for supporting the arrays in position to scan the image with the linear axis of the arrays extending substantially perpendicular to the direction of movement of the image relative to the arrays;

means for determining a starting pixel element for each array;

means for reading video image data from each of the arrays beginning at the starting pixel element for each array and ending a predetermined number of pixel elements after the starting pixel element, said reading means comprising:

means for providing to each of the arrays a number of clock pulses corresponding to the starting pixel element for each array in order to reach the video image data,

memory means for storing in sequential memory locations flag data corresponding to the predetermined number of pixel elements for each array,

counter means for sequentially addressing the memory means,

means for providing clock pulses to each of the arrays in response to the flag data read from the memory to transport the video image data out of the arrays; and

means for forming a composite scan line of data representative of a single line of the image from the video image data read from each of the arrays.

5,144,449

IMAGE SENSING SYSTEM

Tokuji Ishida; Toshio Norita, and Jun Hasegawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 618,998, Jan. 28, 1990, abandoned, which is a division of Ser. No. 437,526, Nov. 16, 1989, Pat. No. 5,010,409, which is a continuation of Ser. No. 141,080, Jan. 5, 1988, Pat. No. 4,905,033. This application Aug. 9, 1991, Ser. No. 742,558

Claims priority, application Japan, Jan. 6, 1987, 62-950; Mar. 18, 1987, 62-63459

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.26 **2 Claims**

1. A solid state image device comprising:

first light receiving means for receiving light and for outputting a first electric signal;

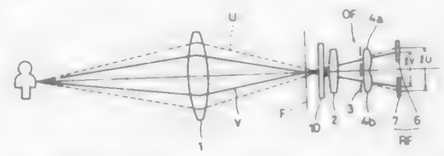
second light receiving means being made of a same material as said first light receiving means and cutting off light to output a second electric signal;

shift register for inputting the first and second electric signals respectively and shifting and outputting the electric signals in synchronization with a clock signal;

capacitor connected to an output terminal of said shift register;

reset means for resetting said capacitor each time the electric signals are shifted;

first sample hold means for sampling and holding a voltage of the reset capacitor;



first subtracting means for subtracting the held voltage and a voltage of said capacitor after reset;

second sample hold means for sampling and holding a voltage corresponding to said second light receiving means outputted from said first subtracting means; and

second subtracting means for subtracting the held voltage of said second sample hold means and a voltage corresponding to said first light receiving means outputted from said first subtracting means.

5,144,450

AUTO FOCUS FREQUENCY CONVERSION FILTER FOR CCD IMAGERS HAVING DIFFERENT NUMBERS OF PIXELS

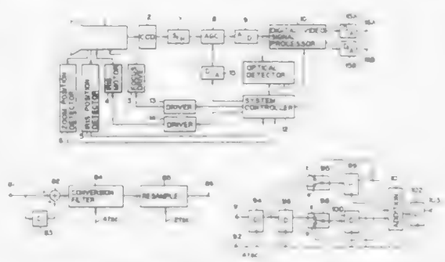
Akihiro Kikuchi, Chiba; Toshiharu Kondo, Kanagawa; Takashi Kohashi; Fumiaki Kato, both of Chiba, and Katsuaki Hirota, Kanagawa, all of Japan, assignors to Sony corporation, Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 660,016

Claims priority, application Japan, Feb. 27, 1990, 2-47010

Int. Cl.[5] H09N *5/232*

U.S. Cl. 358—227 **12 Claims**



1. A sampling frequency conversion filter circuit for converting an input digital signal of a first sampling frequency into a digital signal of a second sampling frequency, comprising:

a delay circuit for delaying the input digital signal of said first sampling frequency by a predetermined time;

a first multivibrator circuit for receiving the input digital signal of said first sampling frequency in synchronism with clock pulses at said second sampling frequency;

a second multivibrator circuit for receiving the digital signal of said first sampling frequency delayed by the predetermined time output from said delay circuit in synchronism with clock pulses of said second sampling frequency;

an adder circuit for adding an output of said first multivibrator circuit and an output of said second multivibrator circuit to produce a converted filter output signal; and

control circuit means for controlling respective inputs of said first and second multivibrator circuits to obtain from said adder circuit an output equivalent to over-sampling

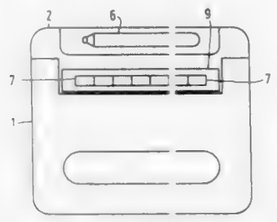
the digital signal of said first sampling frequency at a frequency that is a common multiple of said first sampling frequency and said second sampling frequency.

5,144,451

PORTABLE LIQUID-CRYSTAL TV SET WITH A VIDEO RECORDER/PLAYER

Mitsuo Yamamoto, and Mineo Sato both of Kanagawa, Japan, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1990, Ser. No. 581,831
Claims priority, application Japan Sep. 14, 1989, 1-107142[U]
Int. Cl.[5] H04N 5/64
U.S. Cl. 358—254 1 Claim



1. A video device comprising a combination of a portable liquid-crystal TV set and a video recorder-player, said device comprising a cover portion and a case portion, said cover portion being foldable so as to provide open and closed positions in regard to said case portion said case portion comprising a video tape cassette holder and a video recorder player portion for cooperating with a video tape cassette present in said video tape cassette holder and a plurality of rows of switch buttons comprising an upper row of switch buttons including first buttons for activating said video recorder-player portion and a lower row of switch buttons including second buttons for utilizing memory functions, said cover portion, in the closed position, covering said lower row of switch buttons but leaving visible and accessible said upper row of switch buttons, said cover portion being provided at its surface opposing said cover portion with a small-sized liquid crystal TV screen for receiving TV broadcasts or for monitoring reproduction of TV broadcasts or said monitoring being carried out with said cover portion being in said open position and operation of said video recorder-player portion, not requiring said liquid crystal TV screen, capable of being carried out with said cover portion in the closed position.

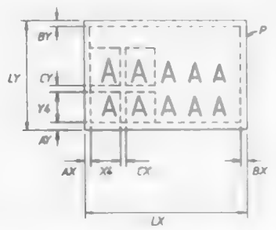
5,144,452

IMAGE FORMING APPARATUS IN WHICH IS CALCULATED THE NUMBER OF IMAGES AT A GIVEN MAGNIFICATION TO DUPLICATE REPEATEDLY ON A GIVEN SIZE RECORDING MEDIUM WITHOUT INTERFERENCE

Yasuo Abuyama, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 2, 1991, Ser. No. 694,760
Claims priority, application Japan, May 14, 1990, 2-123764
Int. Cl.[5] H04N 1/23, 1/393
U.S. Cl. 358—296 6 Claims

1. An image forming apparatus comprising:
means for receiving an image information;
means for duplicating an image corresponding to the received image information on a recording medium;
means for providing a magnification rate with respect to the received image information;
means for calculating a number of times to duplicate repeatedly, without interference, a same image corresponding to a received image information on a one recording medium by the duplicating means, based on a size of the received image information, the size of the recording medium and the provided magnification rate; and



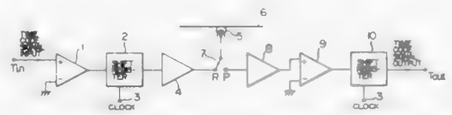
means for controlling the duplicating means to repeatedly duplicate the same image on different sections of the one recording medium the number of times calculated by the calculating means at the provided magnification rate.

5,144,453

APPARATUS FOR DELAYING LONGITUDINAL TIME CODE SIGNAL FOR DIGITAL VIDEO TAPE RECORDER

Atsuo Sugn, Kamagaya, and Shigemitsu Higuchi, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 336,786
Claims priority, application Japan, Apr. 15, 1988, 63-91348
Int. Cl.[5] H04N 9/79
U.S. Cl. 358—311 16 Claims



1. A digital video signal record/play-back apparatus comprising:
(a) a first means for recording a video signal on a recording medium;
(b) a second means for playing-back said recorded video signal from said recording medium;
(c) a third means for recording a longitudinal time code signal corresponding to said video signal with a first predetermined time delay on said recording medium; and
(d) a fourth means for playing-back said recorded longitudinal time code signal from said recording medium with a second predetermined time delay.

5,144,454

METHOD AND APPARATUS FOR PRODUCING CUSTOMIZED VIDEO RECORDINGS

Brian L. Cury, 87 Maple St., Teaneck, N.J. 07766

Division of Ser. No. 429,104, Oct. 31, 1989, Pat. No. 5,099,337.
This application Aug. 15, 1991, Ser. No. 745,408
Int. Cl.[5] H04N 5/28, 5/64
U.S. Cl. 358—335 1 Claim

1. A recording apparatus comprising:
a first housing having first audio and video equipment and a first patch board to which said first audio and video equipment is connected;
a second housing stackable on said first housing, said second housing having second audio video equipment and a second patch board to which said second audio and video equipment is connected;
a video camera;
a microphone;
means for connecting said camera to one of said first and second patch boards and said microphone to one of said first and second patch boards and said first patch board to said second patch board, whereby in the case where said connecting means connects said camera to said one of said first and second patch boards and said microphone to said one of said first and second patch boards and said first patch board to said second patch board, a recording apparatus for combining a live audio and video performance with prerecorded audio and video signals in which the

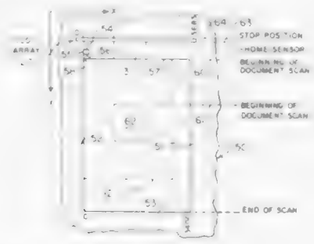
live performance is prompted by prompts that are synchronized to the prerecorded audio signals is comprised by said first audio and video equipment, said second audio and video equipment, said camera, and said microphone; and
an enclosure surrounding the first and second housings, said enclosure including a viewing area through which the prompts may be viewed.

5,144,455

METHOD AND APPARATUS FOR LOCATING THE DOCUMENT REFERENCING CORNER IN A DOCUMENT SCANNER

Irene F. Stein, Fort Collins; Steven L. Webb, Loveland, and David W. Boyd, Greeley, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

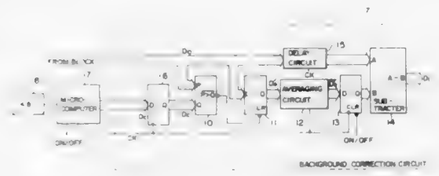
Continuation of Ser. No. 474,975, Feb. 5, 1990, abandoned. This application Nov. 1, 1991, Ser. No. 787,694
Int. Cl.[5] H04N 1/04
U.S. Cl. 358—443 6 Claims



1. A document scanner comprising;
a platen with a rectangular transparent area for supporting a document to be scanned;
said platen being divided into logical portions by an orthogonal X,Y coordinate system comprising a X-axis and a Y-axis intersecting at a (0,0) origin, wherein said X-axis is defined by a transparent area first end, said Y-axis is defined by a transparent area first side, and said transparent area first end and said transparent area first side meet at a transparent area reference corner which defines said origin, said coordinate system oriented such that said transparent area is located within positive values of X and Y;
a platen leading edge comprising the portion of said platen located in the negative-Y area of said coordinate system, said platen leading edge having a platen reflectivity;
a platen side edge comprising the portion of said platen located in the negative-X area of said coordinate system;
a light source providing illumination on said platen;
optical means for focusing light reflected from said platen onto a linear array of light sensors;
a scan line on said platen defined by a narrow linear area on said platen being sensed by said array of light sensors;
said array of light sensors providing analog voltages corresponding to light intensities;
analog to digital conversion means for converting said analog voltages into digital numerical values;
memory means for storing said digital numerical values;
movement means for relative movement between said scan line and said platen, wherein movement is orthogonal to said X-axis;
home sensor means for approximately locating said scan line relative to said origin in the Y-direction, wherein said scan line is moved relative to said platen in the negative-Y direction until a mechanical stop position is reached, then said scan line is moved relative to said platen in the positive-Y direction until said home sensor means is reached, thereby defining a home position;
a target located within said platen leading edge, said target having a reflectivity with a high contrast relative to said piaten reflectivity, said target further comprising a target Y-direction edge parallel to said Y-axis and located a precise and known distance from said X-axis, and a target X-direction edge parallel to said X-axis and located a precise and known distance from said Y-axis;
a rectangular target area surrounding said target, said target area having a location in the Y-direction fixed relative to said home position, and having a location in the X-direction fixed relative to said array of light sensors;
said target area having a target area first side and a target area second side parallel to said X-axis and having Y-direction locations fixed relative to said home position, wherein said target X-direction edge is known to be between said target area first side and said target area second side;
said target area having a target area third side and a target area fourth side parallel to said Y-axis, said target area third side having a X-direction location optically corresponding to a first target area light sensor within said array of light sensors, said target area fourth side having a X-direction location optically corresponding to a second target area light sensor within said array of light sensors, said first target area light sensor and said second target area light sensor being fixed within said array of light sensors, and wherein said Y-axis optically corresponds to a first transparent area sensor within said array of light sensors, said first transparent area sensor being variable and known to be between said first target area light sensor and said second target area light sensor;
a first sensor group comprising a group of light sensors within said array of light sensors which is illuminated by reflected light from said target area in the X-direction whenever said scan line is within said target area in the Y-direction;
a second sensor group comprising a group of light sensors within said array of light sensors which is illuminated by reflected light from said transparent area whenever said scan line is within said transparent area in the Y-direction, said second sensor group extending in the positive X direction from said first transparent area sensor;
controller means for:
(a) moving said scan line relative to said platen to said home position;
(b) moving said scan line relative to said platen in the positive-Y direction through said target area;

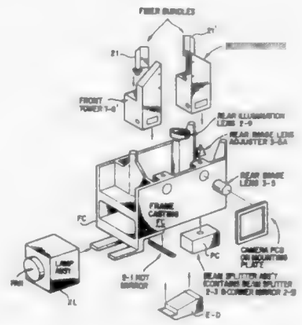
(c) storing in said memory means light intensities from light sensors within said first sensor group, thereby storing an image of said calibration target and part of said leading edge;
(d) determining a target X-direction edge location within said target area and a target Y-direction edge location within said target area by determining lines of high contrast within said image;
(e) using said target Y-direction edge location within said target area to calculate a precise Y-direction location of said scan line relative to said origin; and
(f) using said target X-direction edge location within said target area to determine said first transparent area sensor;
whereby said origin is precisely located relative to said home position and said second sensor group is precisely located within said array of light sensors.

5,144,455
IMAGE PROCESSING APPARATUS AND METHOD
Yukio Sakano, Fuchu, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jan. 2, 1990, Ser. No. 460,046
Claims priority, application Japan, Jan. 21, 1989, 1-11008; Jan. 21, 1989, 1-11009; Oct. 12, 1989, 1-264005
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—443 30 Claims



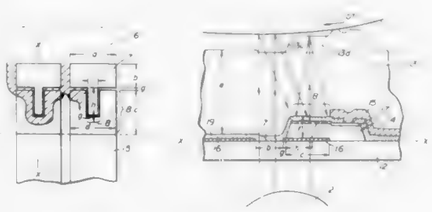
1. An image processing apparatus for processing image data read out from a document comprising:
comparing means for determining whether or not input gradation levels of pixels included in a predetermined matrix are equal to or higher than a reference gradation level, said pixels including a pixel of concern and a predetermined number of peripheral pixels;
converting means for converting the input gradation levels of said pixels equal to or higher than said reference gradation level into a predetermined gradation level less than said reference gradation level and for passing the input gradation levels of said pixels less than said reference gradation level as they are;
averaging means, coupled to said converting means, for averaging said predetermined gradation level of each of said pixels having the input gradation levels equal to or higher than said reference gradation level and said input gradation levels of the remaining pixels to thereby output an averaged gradation level of said pixel of concern; and
output means for deriving a background corrected gradation level of said pixel of concern from said input gradation level of said pixel of concern and said averaged gradation level relating thereto.

5,144,457
INTEGRATED IMAGING ASSEMBLY
Gary Copenhaver, Canton; Johan Bakker, Union Lake, and John Vala, Plymouth, all of Mich., assignors to Unisys Corporation (Formerly Burroughs Corporation), Detroit, Mich.
Division of Ser. No. 419,045, Oct. 10, 1989, Pat. No. 5,063,461.
This application Aug. 29, 1991, Ser. No. 737,949
Int. Cl.[5] A04N *1/00*
U.S. Cl. 358—474 21 Claims



1. An integrated array of cooperating optical and thermal components adapted to be used with prescribed transport-imaging means disposed along a prescribed up-pivoting transport-platform with a plurality of coupling-apertures, mounted thereon, this array comprising:
a single mount-casting MC carrying prescribed load means and including a plurality of coupling-extensions, each adapted to be co-located with a respective one of said coupling apertures on the underside of said platform and also including a pair of mount-site means; a pair of like optical-tower units each enclosing and positioning a cooperating array of optical components, each being adapted to engage, and be mounted on, a respective one of said mount-site means; a heat generating Spectral Radiation Source means arranged and adapted to be attached to said casting MC; and Heat-Dissipation means disposed in infra-red receiving relation with said Source means, and adapted to trap and dissipate this infra-red radiation, this Dissipation means being attached to said Source means and said casting MC.

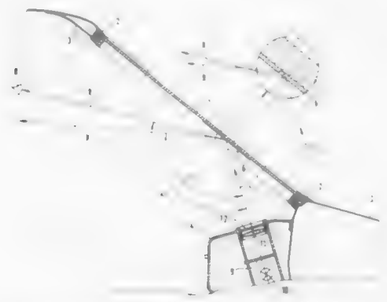
5,144,458
TOTAL CONTACT TYPE IMAGE SENSOR
Kazuhiko Adachi, Shibatamachi, and Masafumi Kumano, Sendai, both of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics Co., Ltd., Natori, both of, Japan
Filed May 7, 1990, Ser. No. 519,756
Claims priority, application Japan, May 12, 1989, 1-119660
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—482 24 Claims



1. A total contact type image sensor comprising:

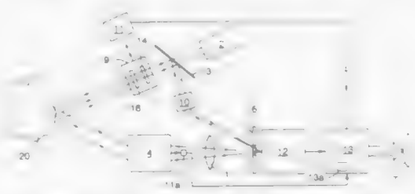
a transparent substrate;
an opaque layer formed on said transparent substrate and having document illuminating windows;
a photosensitive layer formed on said transparent substrate and said opaque layer;
a plurality of photoelectric conversion elements arranged on said transparent substrate with a predetermined pitch, said transparent substrate, said opaque layer, a photosensitive layer and said photoelectric conversion elements forming a stacked structure; and
a transparent protection layer which covers a surface of said stacked structure,
said photoelectric conversion elements respectively having at least one concave portion in a plan view of the total contact type image sensor,
said document illumination windows being respectively formed on a periphery of a corresponding one of said photoelectric conversion elements with a 1:1 relationship,
said document illuminating windows respectively having at least one convex portion in the plan view in correspondence with the concave portion of a corresponding one of said photoelectric conversion elements so as to be adjacent to the corresponding one of said photoelectric conversion elements.

5,144,459
WINDSHIELD REFLECTOR FOR IMAGING SIGNALS INTO VIEW OF DRIVER
Armin Felske, Wolfsburg; Bernd Stoffregen, Braunschweig; Manfred-Andreas Beeck, Gifhorn; Gerd Sauer, Stolberg-Venwegen; Michael Hassiepen, and Detlev Rebenstorff, both of Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, D'Alsace, France
Filed Sep. 2, 1986, Ser. No. 903,041
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532120
Int. Cl.[5] G02B *5/32, 27/10*
U.S. Cl. 359—13 7 Claims



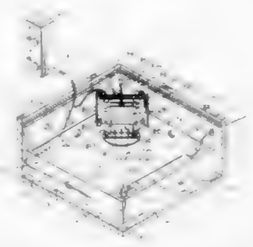
1. A windshield for motor vehicles with a partially-transmissive, partially-reflective hologram functioning as and having reflective characteristics of a mirror and fixedly mounted on a curved layer on or within said windshield according to the shape of said windshield for reflecting light from the interior of the vehicle bearing optical information or signals into the field of view of a driver as a result of which said optical information or signals are recognizable by the driver within the same field of view as is suitable for the observation of traffic, said hologram having a surface of reflection that is different from the surface of said windshield such that a ray of light incident on said hologram is reflected by said hologram at an angle that is different from the angle at which the same ray of light is reflected by said windshield whereby if said light bearing optical information or signals is reflected by the windshield it is not reflected into the field of view of the driver, said reflective hologram selectively reflecting a narrow band of light, the wavelength of which is the same as the wavelength of said optical information or signals to be reflected and said reflective hologram being formed such that, without the interposition of any other image forming device, it reflects said optical information or signals so that said optical information or signals appear to be at a large distance in front of said windshield.

5,144,460
HIGH CONTRAST-RESOLUTION CAMERA
Joseph S. Barbanell, Concord, Calif., assignor to The DZ Company, Concord, Calif.
Filed Dec. 11, 1990, Ser. No. 625,941
Int. Cl.[5] G03H *1/16*; G02B *27/46*; G06K *9/76*
U.S. Cl. 359—29 29 Claims



26. A method for registering an image, including the steps of:
generating an image of an object using coherent radiation;
generating component signals which comprise a spatial homodyne equivalent of the image;
registering the component signals of the spatial homodyne equivalent; and
performing image compression on the component signals.

5,144,461
PORTABLE HOLOGRAPHIC RECORDING APPARATUS
Philip R. Horan, 308 Carlton Dr., Syracuse, N.Y. 13214
Filed Jun. 20, 1991, Ser. No. 718,298
Int. Cl.[5] G03H *1/04*; G03B *17/26*
U.S. Cl. 359—30 19 Claims



1. Apparatus operable to create a holographic film image of a three-dimensional object on a holographic film comprising:
a) a light-tight housing having a substantially planar bottom surface and including a removable cover to access the interior of said housing;
b) a coherent light source positioned in said housing interior and selectively operable to emit a coherent light beam directed along a fixed path to impinge upon an object positioned at a first point along said fixed path;
c) means releasably mounting a holographic film in said housing interior at a second point along said fixed path between said light source and said first point, said film including first and second, opposite planar surfaces lying in spaced, parallel planes substantially perpendicular to said housing planar bottom surface when mounted in said housing interior;
d) means operable to substantially reduce vibrational effects to said coherent light source, said object and said holographic film during creation of said holographic film image;

e) light beam diffusing means positioned at a third point along said fixed path between said light source and said second point and operative to diffuse said light beam sufficiently to impinge upon substantially the entire area of said first planar surface of said film and pass through said film to impinge upon and be reflected by said object and impinge upon said second, opposite planar surface of said film thereby forming said holographic image of said object on said film;

f) a light-tight, removable film casing configured to surround and protect said holographic film from destructive over-exposure due to ambient or artificial light during deposit in and removal from said light-tight housing interior;

g) means operable externally of said housing to selectively move said film casing about said film between fully covering and fully uncovering positions when said film is mounted in said housing, thereby allowing said diffused light to impinge upon said film when said casing is in said fully uncovering position; and

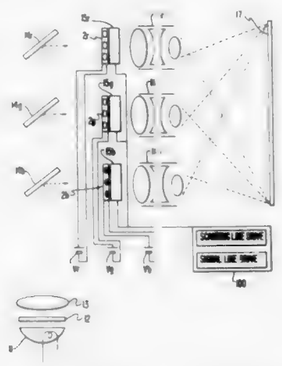
h) means selectively operable externally of said housing to cause said coherent light beam to travel along said fixed path and impinge upon said film for a predetermined amount of time.

5,144,462

LIQUID CRYSTAL PROJECTION COLOR DISPLAY APPARATUS HAVING MICROLENS ARRAYS WITH CONTROLLABLE REFRACTIVE POWER

Akira Otsuka, Amagasaki; Shin Ichiro Ishihara, Takatsuki; Yoshito Miyatake, Neyagawa, and Sadayoshi Hotta, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 29, 1990, Ser. No. 620,883
Claims priority, application Japan, Dec. 5, 1989, 1-314360
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—41 **4 Claims**



1. A projection color display apparatus for imaging a color image comprising:

a light source means for outputting three primary color light beams of red, green and blue as approximately parallel light beams;

three liquid crystal display device means each for passing a corresponding one of said three primary color light beams so as to thereby form an optical image in accordance with an image signal; and

projection lens means for projecting said optical image on a screen;

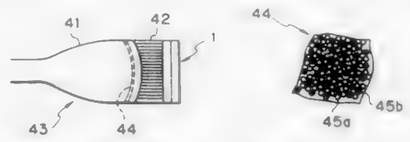
said three liquid crystal display device means each including a liquid crystal display panel having a plurality of pixels arranged in a matrix, a microlens array arranged on the light-source side of said liquid crystal display panel and having a plurality of microlenses formed in a matrix and a refractive power which is controllable by an application of an electric field, and an electric field application means for applying a predetermined electric field in accordance with said corresponding one of said three primary color light beams to said microlens array so as to thereby make each of said plurality of microlenses have a predetermined refractive power; wherein said predetermined electric field is applied simultaneously with said corresponding one of said three light beams.

5,144,463

LIQUID CRYSTAL LIGHT VALVE USING NON-MONOCHROMATIC WRITING LIGHT

Hideki Hatano; Akira Yokoi; Masayuki Iwasaki, and Takashi Yamaji, all of Iruma, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 14, 1990, Ser. No. 627,580
Claims priority, application Japan, Mar. 8, 1990, 2-57737
Int. Cl.[5] G02F *1/135, 1/13*
U.S. Cl. 359—72 **3 Claims**



1. A liquid crystal display unit comprising:

a photoconductive type liquid crystal light valve having a photoconductive layer, a light reflecting layer, and a liquid crystal layer laminated between a pair of opposing transparent electrodes; and

a writing optical system for irradiating the writing light to said liquid crystal light valve, wherein said writing optical system uses a non-monochromatic light as a writing light;

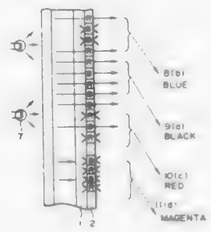
wherein said writing optical system comprises a light source emitting the writing light having at least two wavelengths and a two-dimensional scanning system for deflecting the writing light emitted from said light source two-dimensionally and for scanning said liquid crystal light valve two-dimensionally.

5,144,464

POLYMER LIQUID CRYSTAL DEVICE

Toshikazu Ohnishi, Tokyo; Shuzo Kaneko, Yokohama, and Takashi Kai, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 538,729, Jun. 15, 1990, abandoned.
This application Feb. 4, 1992, Ser. No. 829,544
Claims priority, application Japan, Jul. 10, 1989, 1-175619
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—98 **23 Claims**



1. A polymer liquid crystal device, comprising:

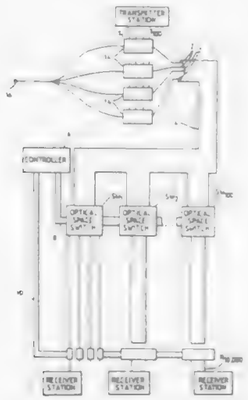
a color polymer liquid crystal layer comprising a plurality of minute polymer liquid crystal elements, said polymer liquid crystal elements comprising plural species of polymer liquid crystals colored in at least two colors and disposed in a prescribed planar pattern wherein said different colors of polymer liquid crystal elements comprise said different species of polymer liquid crystals, whereby the polymer liquid crystal elements scatter or transmit light incident thereto in intensities depending on selectively and thermally controllable states of the polymer liquid crystal elements to effect a display in which different colors of polymer liquid crystal elements scatter or transmit different wavelengths of light including light of a longest wavelength and light of a shorter wavelength; wherein a color of the polymer liquid crystal elements scattering or transmitting the longest wavelength light are disposed in a larger areal proportion than the other color of the polymer liquid crystal elements scattering or transmitting the shorter wavelength light.

5,144,465

SWITCHED OPTICAL NETWORK

David W. Smith, Woodbridge, England, assignor to British Telecommunications public limited company, London, England

PCT No. PCT/GB88/01019, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO89/05085, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 18, 1988, Ser. No. 378,208
Claims priority, application United Kingdom, Nov. 20, 1987, 8727260
Int. Cl.[5] H04J *14/00*
U.S. Cl. 359—117 **50 Claims**



50. A switched optical network for connecting signals from any one of a plurality of transmitter stations with any one of a plurality of receiver stations comprising:

at least two optical multiplexing means each responsive to signals from two or more transmitter stations to provide optically multiplexed signals corresponding to the transmitter station signals;

a plurality of optical demultiplexing means each associated with a respective receiver and each responsive to an optically multiplexed signal and a selection signal to output one transmitter station signal to the corresponding respective receiver station;

an optical switch means responsive to switch signals to optically couple any one of the optically multiplexed signals to any one of the demultiplexing means;

each said multiplexing means includes a plurality of optical sources for providing power at two or more wavelengths, a plurality of modulators, each modulator being optically coupled to one of the optical sources and being responsive to the signals from a transmitter station to provide an optical signal representative of that transmitter station signal, and a plurality of optical combiners for combining the optical signals to form the optically multiplexed signals;

a plurality of distinct units for housing said modulators such that all the modulators of the network whose optical outputs form part of the same multiplexer are housed in the same unit, wherein the number of units is equal to the number of distinct wavelengths from the optical sources; and

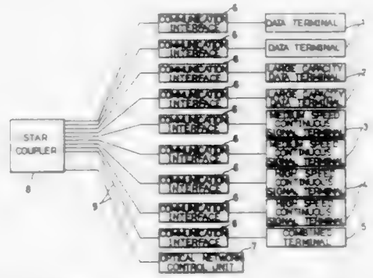
the modulators of each unit are formed on a single lithium niobate substrate.

5,144,466

OPTICAL FIBER COMMUNICATION METHOD AND MULTIMEDIA OPTICAL FIBER NETWORK USING THE SAME

Kenji Nakamura, Hadano; Masao Majima, Atsugi, and Noboru Yamamoto, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1989, Ser. No. 415,764
Claims priority, application Japan, Oct. 4, 1988, 63-251452; Dec. 16, 1988, 63-316498; Sep. 18, 1989, 1-240074
Int. Cl.[5] H04J *4/00, 14/00*
U.S. Cl. 359—123 **53 Claims**



8. A multimedia optical fiber network comprising:

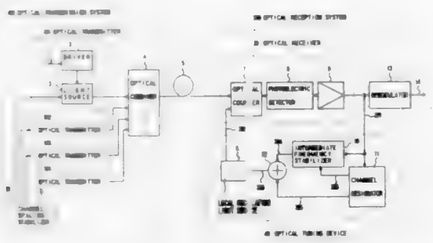
first data terminals, connected to an optical fiber, for conducting a packet switching communication by using a first optical wavelength;

second data terminals connected to said optical fiber, for conducting a time division multiplexing communication using a second optical wavelength, under a control of said packet switching communication using said first optical wavelength;

third data terminals, connected to said optical fiber, for conducting a circuit switching communication using a third optical wavelength, under a control of said packet switching communication using said first optical wavelength; and

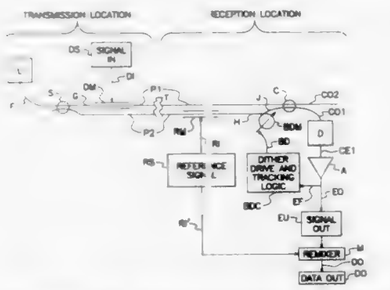
a communication control terminal, connected to said optical fiber, for controlling said time division multiplexing communication between said second data terminals using said second optical wavelength and said circuit switching communication between said third data terminals using said third optical wavelength, on the basis of said packet switching communication using said first optical wavelength.

5,144,467
OPTICAL TUNING METHOD AND APPARATUS SUITABLE FOR SELECTIVE RECEPTION OF OPTICAL FREQUENCY DIVISION MULTIPLEX SIGNALS
Shigeki Kitajima, Kokubunji; Kiichi Yamashita, Kanagawa; Shinya Sasaki, Kodaira, and Hideaki Tsushima, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 25, 1990, Ser. No. 557,721
Claims priority, application Japan, Jul. 28, 1989, 1-194098
Int. Cl.[5] H04J *14/02*; H04B *10/06*
U.S. Cl. 359—124 12 Claims



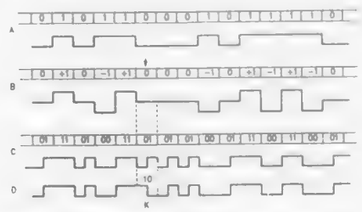
1. A method of performing channel change in an optical reception system including an optical receiver having an optical coupler for combining an optical frequency division multiplex signal, which has a plurality of channels with each channel being designated by a sequential channel number, with a local oscillation optical signal corresponding to a selected one of the plurality of channels, and a photoelectric detector for providing an intermediate frequency signal from the combined optical signals by means of heterodyne or homodyne detection, said method comprising the steps of:
changing the frequency of the local oscillation optical signal from the frequency of the selected channel in a direction toward the frequency of a target channel;
detecting the number of times the changing local oscillation optical signal reaches a frequency corresponding to a channel of the optical reception system; and
stopping the changing of the frequency of the local oscillation optical signal when the number of channel frequencies reached by the local oscillation optical signal equals the difference between the number of the selected channel and the number of the target channel.

5,144,468
MIXING INTERFEROMETER USED AS A COMMUNICATIONS LINK
Robert T. Weverka, Boulder, Colo. assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 16, 1989, Ser. No. 367,395
Int. Cl.[5] H04B *10/12*
U.S. Cl. 359—173 23 Claims



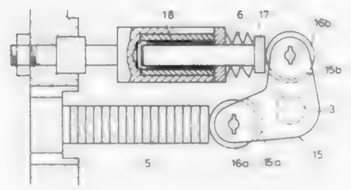
1. A communication link for use with a data input signal having at least one data-input-signal frequency, from a data-input-signal source, and comprising:
a source of optical radiation;
means defining two optical paths for carrying optical radiation;
a beam splitter for receiving optical radiation from the radiation source and causing respective fractions of the received optical radiation to propagate along the two optical paths;
at least one transmission-associated optical phase modulator connected to receive the data input signal from the data-input-signal source, and to impress upon the two optical paths a first relative optical phase difference that is related to the data input signal;
said two optical paths carrying the optical radiation from the beam splitter and modulator;
a reference-signal source for developing a reference signal having a reference-signal frequency, said reference-signal source being remote from the splitter and the transmission-associated modulator;
at least one reception-associated optical phase modulator connected to receive the reference signal from the reference-signal source, and to impress upon the two paths a second relative optical phase difference that is related to the reference signal, said reception-associated modulator being remote from the splitter and the transmission-associated modulator;
a beam combiner for receiving optical radiation along the two optical paths and developing a composite of the received optical radiation, said combiner being remote from the splitter and the transmission-associated modulator; and
an optical detector for receiving the composite radiation from the combiner and in response thereto developing an output signal;
said output signal including a component whose frequency is proportional to the difference between the frequency of the data input signal and the frequency of the reference signal.

5,144,469
METHOD FOR THE TRANSMISSION OF DATA BETWEEN TWO STATIONS BY MEANS OF OPTICAL WAVEGUIDES
Martin Brahms, Hanover, and Ziaedin Chahabadi, Munder, both of Fed. Rep. of Germany, assignors to Ke Kommunications Elektronik GmbH & Co., Fed. Rep. of Germany
Continuation-in-part of Ser. No. 353,966, May 18, 1989. This application Jul. 3, 1991, Ser. No. 725,544
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818936
Int. Cl.[5] H04B *10/04*
U.S. Cl. 359—181 13 Claims



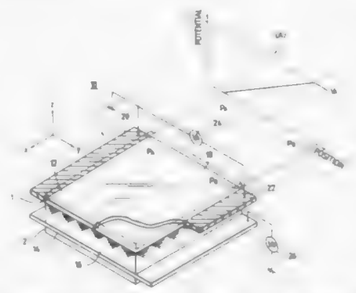
1. A method of transmitting an additional optical channel of data in a system for transmission of a main optical channel of data between a transmitting and a receiving station by means of an optical waveguide, wherein the transmitting station receives the data as electrical bits coded in accordance with fixed rules and a transcoder in the transmitting station recodes the data to an optical code having double bits representing each electrical bit for transmission over the optical waveguide and the receiving station includes a transcoder for recoding the optical double bits back to the bits of the fixed electrical code, comprising the steps of:
inserting into the main channel, at the transcoder of the transmitting station, optical double bits in any desired position in place of double bits of the main channel at defined spacings known to the transcoder of the receiving station, said optical double bits representing bits of one significance of the additional optical channel and having a bit rate lower than that of the main channel, the bits of the additional optical channel being inserted into the main channel as double bits that are identical to a forbidden bit combination that results during the recoding of the electrical to the optical code;
sampling from the main channel at the transcoder of the receiving station, at said defined spacings the optical double bits, the presence of a forbidden bit combination in a sampled optical double bit representing a bit of one significance of the additional optical channel and the absence of a forbidden bit combination in a sampled optical double bit representing a bit of the additional optical channel of an opposite significance; and
recovering, at the receiving station, the bits of the main channel that were replaced by the forbidden bit combination by means of sequential logic to apply the fixed rules of the electrical code to identify the replaced bits.

5,144,470
LASER SCANNER DRIVING APPARATUS
Kazuo Ota, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
PCT No. PCT/JP90/00461, § 371 Date Oct. 25, 1991, § 102(e) Date Oct. 25, 1991, PCT Pub. No. WO90/13842, PCT Pub. Date Nov. 15, 1990
PCT Filed Apr. 5, 1990, Ser. No. 768,712
Claims priority, application Japan, Apr. 28, 1989, 1-110025
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—224 20 Claims



1. A laser scanner driving apparatus in which a rectilinear displacement of a piezoelectric actuator rotates a lever against a reaction force of a reaction spring and then a displacement amplifier amplifies this rotational displacement to provide a large scanning angle, comprising rotatable contactors between a free end of said piezoelectric actuator (5) and one contact portion of said lever (15), and between a free end of a plunger (17) supported by a reaction spring (6) and the other contact portion of said lever (15)

5,144,471
OPTICAL SCANNING SYSTEM FOR SCANNING OBJECT WITH LIGHT BEAM AND DISPLAYING APPARATUS
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Tsutou Asakura, Yokohama; Masato Furuya; Tetsuji Suzuki, both of Yokosuka, and Hirohiko Shinonaga, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Jun. 26, 1990, Ser. No. 543,404
Claims priority, application Japan, Jun. 27, 1989, 1-164855
Int. Cl.[5] G02F *1/01*
U.S. Cl. 359—245 10 Claims

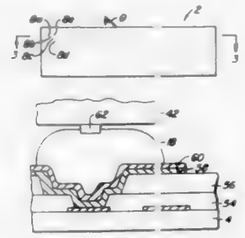


1. An electromagnetic radiation beam scanning system comprising:
a light modulation layer showing an electro-optic effect;
first and second electrodes sandwiching said light modulation layer, said first electrode having a transparent section and a pair of terminal sections placed at end portions of said transparent section, an impedance of each of said pair of terminal sections being much lower than an impedance of said transparent section;
first and second polarizers sandwiching said light modulation layer;
first power source means for applying a first voltage to said pair of terminal sections;
second power source means for applying a second voltage to said second electrode; and
light source means or emitting an electromagnetic radiation beam toward said light modulation layer,
wherein said light modulation layer has an elongated region in which an effective voltage for the electro-optic effect becomes zero in response to application of said voltages to said pair of terminal sections nd second electrode due to said first and second power source means thereby causing said light modulation layer, combined with said polarizers, to produce a narrowed beam when a light beam is introduced thereto from said light source means.

5,144,472
ELECTRICAL CONTACTS FOR AN ELECTRO-OPTIC MODULATOR
Henry W. Sang, Jr., Cupertino; Mark S. Bernstein, Belmont, and Michael A. Berkovitz, Sebastopol, all of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed May 17, 1990, Ser. No. 525,280
Int. Cl.[5] G02F *1/03*
U.S. Cl. 359—254 21 Claims

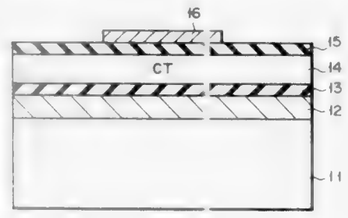
1. A modulator for varying at least one characteristic of light passing through modulator comprising:
a) a crystal, said crystal responsive to application of an electric field thereon so as to change at least one optical property of said crystal;
b) a plurality of high aspect ratio electrodes contacting said crystal, said electrodes having a first spacing therebetween;

c) a dielectric layer over said p urality of electrodes, said dielectric layer comprising:
i) an upper surface; and
ii) at least one aperture extendi g from said surface to each of said plurality of electrode s;



d) a conductive metal region exte nding through each of said apertures and across said upper surface over at least one adjacent electrode.

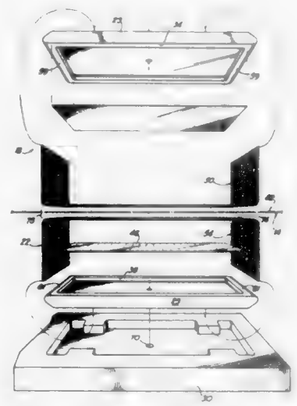
5,144,47:
ORGANIC THIN FILM DI SPLAY ELEMENT
Nobuhiro Gemma, Yokohama; To hio Nakayama, Fujisawa; Syun Egusa, Yokohama; Akir Miura, Toride; Makoto Azuma, Yokohama; Shinya Aoki Kawasaki, and Katsuyuki Naito, Yokohama, all of Japan, as signors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 29, 1990, S r. No. 500,925
Claims priority, application Japa a, Mar. 31, 1989, 1-83515; Sep. 29, 1989, 1-254895; Sep. 29, 1 89, 1-254943
The portion of the term of this paten subsequent to Oct. 3, 2006, has been disc imed.
Int. Cl.[5] G02F *1/01 1/07, 1/03*
U.S. Cl. 359—270 12 Claims



1. An organic thin film display element, comprising:
a pair of electrodes;
an organic thin film interposed between said electrodes and including both donor molecules and acceptor molecules; and
an insulating layer having a relat ve dielectric constant of 10 or more, and interposed betwe en at least one of said electrodes and said organic thin film.

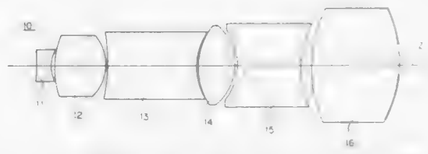
5,144,474
PERFORATED PROCESSIN G APPARATUS AND METHOD
John B. Keable, Knoxville, Tenn. and Steve Bostic, Atlanta, Ga., assignors to Delphi Technol gy, Inc., Atlanta, Ga.
Continuation-in-part of Ser. No. 3 0,112, Mar. 29, 1989. This application Nov. 28, 198 , Ser. No. 442,193
Int. Cl.[5] G03D *5/00*
U.S. Cl. 354—319 23 Claims

1. An apparatus for processing a photographic emulsion on the first surface of a substrate having opposed first and second surfaces, comprising:
a. a distendable material positioned for contact with the emulsion when the material is distended;
b. means for distending the material by delivering a photographic processing chemical through the material to the emulsion; and



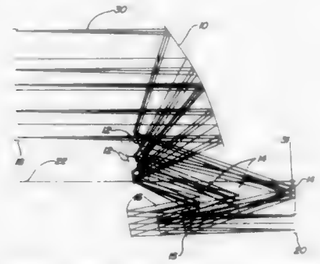
c. means, opposite the substrate from the distending means, for permitting the delivered photographic processing chemical to lubricate the second surface of the substrate.

5,144,475
OBJECTIVE LENS SYSTEM FOR USE WITHIN MICROSCOPE
Takahisa Hayashi, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Mar. 20, 1991, Ser. No. 672,472
Claims priority, application Japan, Mar. 23, 1990, 2-74298; Apr. 24, 1990, 2-109848
Int. Cl.[5] G02B *21/16*
U.S. Cl. 359—355 9 Claims



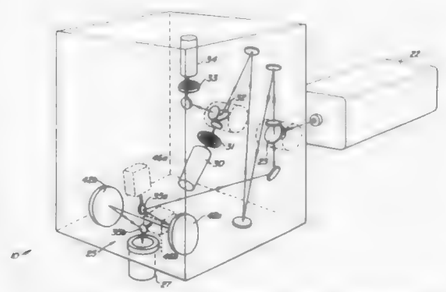
1. An objective lens system for a microscope, comprising:
a first lens made of quartz, said first lens having a negative power;
a second lens made of either quartz or fluorite, said second lens having a positive power;
a third lens made of quartz, said third lens having a negative power;
a fourth lens made of fluorite, said fourth lens having a positive power;
a fifth lens made of quartz, said fifth lens having a negative power; and
a sixth lens made of fluorite, said sixth lens having a positive power,
wherein said first to said sixth lenses are disposed in that order from an object side to an image formation side with predetermined air spacings therebetween.

5,144,476
ALL-REFLECTIVE ZOOM OPTICAL SYSTEM
Reynold S. Kebo, 520 Beloit Ave., Los Angeles, Calif. 90049
Filed Apr. 24, 1989, Ser. No. 348,618
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] G02B *17/06, 23/06*
U.S. Cl. 359—366 20 Claims



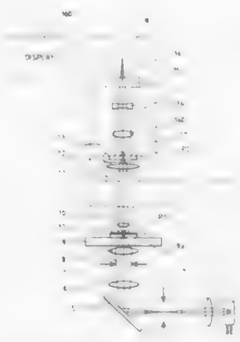
1. A reflective zoom optical system comprising:
a mirror fixably positioned about a central axis; and means for reflecting an image of an object being viewed through an exit pupil for viewing, said reflective means including two or more mirrors positioned to receive light from or reflect light to said fixed mirror and said two or more mirrors movable through a plurality of positions to effect magnification or field of view of the system.

5,144,477
METHOD OF OPERATING A SCANNING CONFOCAL IMAGING SYSTEM
John G. White, Cambridge, England, assignor to Medical Research Council, Great Britain
Division of Ser. No. 561,488, Aug. 1, 1990, Pat. No. 5,032,720, Continuation of Ser. No. 464,577, Jan. 16, 1990, abandoned, Continuation of Ser. No. 179,681, Apr. 11, 1988, abandoned.
This application Jan. 30, 1991, Ser. No. 647,661
Int. Cl.[5] G02B *21/00, 26/10*
U.S. Cl. 359—368 2 Claim



1. In the operation of a scanning confocal microscope, a method comprising the steps of:
forming a beam spot;
collecting light emanating from the region of the beam spot;
directing the light so collected along a path;
collimating the light along the path, the light so collimated being generally characterized by a beam diameter;
passing the light through an aperture generally commensurate in size with the beam diameter, the path length to the aperture being relatively long compared to the aperture, the path being further devoid of pinhole spatial filters;
detecting the light passing through the aperture; and
said collecting, directing, collimating, and passing steps being performed to prevent light that emanates from points away from the beam spot location from passing through the aperture and being detected by said detecting step.

5,144,478
MICROSCOPE INCLUDING FIRST AND SECOND STAGES IN CONJUGATE PLANES
Kunio Toshimitsu, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed May 28, 1991, Ser. No. 705,944
Claims priority, application Japan, May 28, 1990, 2-138025
Int. Cl.[5] G02B *21/06, 21/26, 21/36*
U.S. Cl. 359—392 16 Claims

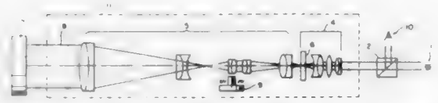


1. A microscope including:
a first stage for placing a specimen on a first plane;
a second stage for placing said specimen on a second plane;
a first optical system including an objective lens and being provided between said first plane and said second plane so that said first plane and said second plane are in conjugate relationship with respect to said first optical system;
a Koehler illuminating optical system for supplying an illuminating light beam for illuminating said first plane, said illuminating optical system supplying said illuminating light beam to said second plane through said first optical system when the specimen is placed on said second plane; and
observation means for observing therethrough the image of the specimen formed on a third plane, said observation means being provided with a second optical system to cause the image of the specimen placed on said first plane to be formed on said third plane by cooperation with said first optical system, or cause the image of the specimen placed on said second plane to be formed on said third plane.

5,144,479
COMBINED TELESCOPE AND AUTOCOLLIMATOR
Yehudit Aharon; Oren Aharon, both of 23rd, Shikma st., Haifa 34739, and Any Cohen, 39/5 Mimon st., Haifa 32588, all of Israel
Filed Jun. 12, 1991, Ser. No. 714,308
Claims priority, application Israel, Jun. 21, 1990, 094811
Int. Cl.[5] G01B *11/26;* G02B *23/04, 27/32*
U.S. Cl. 359—424 3 Claims

1. An optical autocollimator for alignment, comprising a telescope; a light source that illuminates an eyepiece reticule of said telescope through an eyepiece of said telescope; a light projecting means for projecting the light into the eyepiece

reticule without obstructing the image displayed by the telescope when observed through said light projecting means,



wherein said eyepiece reticule provides both a source reticule and an image formation are for said telescope.

5,144,480

KEPLERIAN ZOOM FINDER OPTICAL SYSTEM

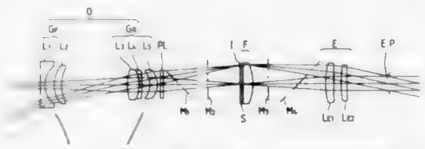
Koichi Ohshita, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,605

Claims priority, application Japan, Oct. 22, 1990, 2-283964; Nov. 28, 1990, 2-328220

Int. Cl.[5] G02B *23/14, 15/177;* G03B *13/02*

U.S. Cl. 359—432 **17 Claims**



1. A Keplerian zoom finder optical system including:

an objective lens unit comprising a forward group having negative refractive power and a rearward groups having positive refractive power, said objective lens unit having positive refractive power as a whole and having the magnification changing function of changing the finder magnification by the spacing between said forward group and said rearward group being changed;

an eyepiece unit having positive refractive power for enlarging and observing therethrough a spatial image formed by said objective lens unit; and

an image erecting optical system for erecting an inverted spatial image formed by said objective lens unit;

said forward group in said objective lens unit comprising a first lens having negative refractive power and a positive meniscus-shaped second lens having its convex surface facing the object side, and being designed to have negative refractive power as a whole;

said rearward group in said objective lens unit comprising a biconvex third lens, a negative meniscus-shaped fourth lens cemented to said third lens and having its concave surface facing the object side, and a positive meniscus-shaped fifth lens having its convex surface facing the image side, and being designed to have positive refractive power as a whole.

5,144,481

SUBMERGED METER READING APPARATUS

John J. Pettito, Sr., 203 Hedge St., Clarksburg, W. Va. 26301

Filed May 14, 1991, Ser. No. 699,593

Int. Cl.[5] G02B *27/02*

U.S. Cl. 359—440 **6 Claims**

1. A viewing apparatus for enabling a human user to visually read a meter submerged in water or the like, comprising:

(a) an elongated tubular body member having a side wall defining a hollow interior chamber, an upper end constructed to allow the user to look into said interior chamber, and a lower end for positioning adjacent a submerged meter to be read therewith;

(b) a transparent cap secured to the lower end of said body member to enable said body member to be partially submerged in water without it entering the interior of said body member;

(c) a magnifying lens positioned in the interior of said body member near said lower end thereof, to produce a magnified image of the meter when viewed through said body member;

(d) light means mounted on said body member for illuminating the meter to be read including:

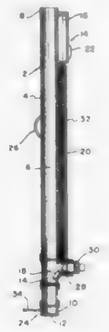
(1) a power supply connected with said body member;

(2) a light source;

(3) wiring means operatively connecting said light source with said power supply; and

(4) switch means operatively connected with said wiring means for selectively operating said light source between on and off conditions;

(e) a laterally extending access portal in said sidewall of said



body member near the lower end thereof and positioned above said magnifying lens to enable access to the interior of said body member for cleaning said magnifying lens and servicing said light source, and a water tight closure member for selectively closing said access portal;

(f) and further wherein said power supply is connected with said body member above said access portal, and said light source is positioned in said access portal and operable to direct light into the interior of said body member from above said magnifying lens downwardly through said magnifying lens and said transparent cap, thereby illuminating the meter to be read when the lower end of said body member is positioned adjacent the meter, and further comprising a water proof conduit member for housing said wiring means extending externally of said body member from said power supply and intersecting said access portal.

5,144,482

THREE DIMENSIONAL VIEWING APPARATUS INCLUDING A STACK OF TRANSPARENT PLATES AND RELATED METHOD

Dennis R. Gould, 4180 LaHonda Rd., San Gregorio, Calif. 94074

Filed May 13, 1991, Ser. No. 698,807

Int. Cl.[5] G02B *27/27, 27/10;* G03C *9/08*

U.S. Cl. 359—478 **15 Claims**

1. An apparatus for use in viewing a two dimensional image, for producing a three dimensional effect to a viewer, comprising:

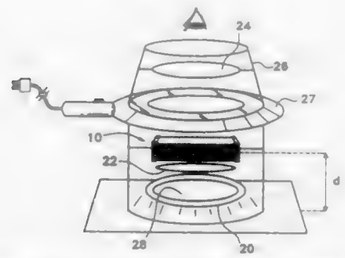
a stack of substantially parallel and substantially transparent plates positioned between the two dimensional image and the viewer,

the stack of plates including spacer means between adjacent plates for holding the plates in substantially parallel and closely spaced relationship without obstructing view through the stack of plates,

illumination means for illuminating the two dimensional image,

said plates being nearly one hundred percent transmissive to light from the image, but partially reflective, and

the number of said plates being sufficient to produce a three dimensional effect whereby some elements of the image



appear closer to the viewer than other elements of the image, but the number being not so great as to cause excessive reflection such that the viewer has difficulty seeing the image comfortably.

5,144,483

DIFFRACTIVE MULTIFOCAL OPTICAL DEVICE

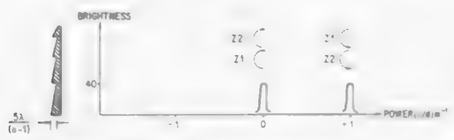
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233

Continuation of Ser. No. 456,226, Dec. 22, 1989, which is a continuation of Ser. No. 280,899, Dec. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 863,069, May 14, 1986, Pat. No. 5,017,000. This application Apr. 17, 1991, Ser. No. 662,137

The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.

Int. Cl.[5] G02B *27/44;* G02C *7/04;* A61F *2/16*

U.S. Cl. 359—565 **3 Claims**



1. A multiple focal point profiled phase plate having a plurality of annular concentric zones in which a repetitive step with an optical path length equal to one-half wavelength is incorporated into the profile between blazed facets to provide two focal points of substantially equal brightness of about 40% of the intensity of the incident light.

5,144,484

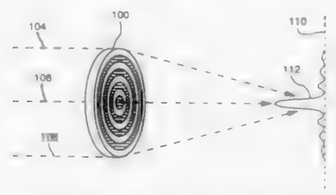
BINARY OPTIC LENS DESIGN USING FLIP-FLOP OPTIMIZATION

William H. Southwell, Thousand Oaks, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Oct. 15, 1990, Ser. No. 597,934

Int. Cl.[5] G02B *3/00, 9/00*

U.S. Cl. 359—565 **6 Claims**



1. A method of fabricating a binary optic lens to achieve a predetermined effect on light propagating through the lens, comprising the steps of:

specifying an initial lens design with a plurality of discontinuous subaperture regions in the lens;

assigning each subaperture region a relative phase difference of 0 or π;

calculating the net intensity of light propagating through the lens by coherently summing the wave amplitudes for all of the subaperture regions at a given point in the image plane of the lens;

changing the assigned phase difference for one of the subaperture regions;

recalculating the intensity by coherently summing the wave amplitude for all of the subaperture regions at the given point;

assigning the changed phase difference to the selected subaperture regions if the intensity increases over the previously calculated intensity;

repeating the steps of changing, recalculating, and assigning for all of the subaperture regions;

repeating the steps of changing, recalculating, assigning, and repeating until the calculated intensity no longer increases; and

arranging the relative thicknesses of the subaperture regions in the lens such that each subaperture region having an assigned phase difference of π introduces a phase difference of π on light propagating through that subaperture region with respect to light propagating through each subaperture region having an assigned phase difference of 0.

5,144,485

LENS HAVING A SURFACE TREATING COMPOSITION FOR REFLECTION PREVENTING FILM

Shinji Ninomiya, and Kazuhiro Naganuma, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Division of Ser. No. 260,227, Oct. 20, 1988, abandoned. This application Oct. 23, 1990, Ser. No. 602,899

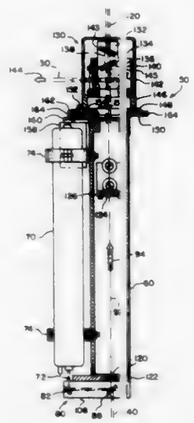
Claims priority, application Japan, Oct. 20, 1987, 62-264987; Sep. 5, 1988, 63-221566

Int. Cl.[5] G02B *1/10;* C08L *83/04*

U.S. Cl. 359—580 **7 Claims**

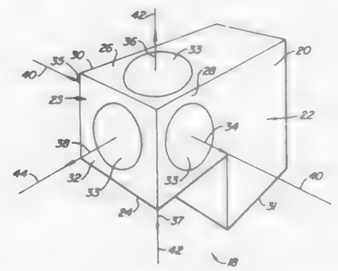
1. A lens comprising a base material having thereon a reflection preventing inorganic film, and further having on the reflection preventing inorganic film a film isolating the reflection preventing inorganic film from the outer atmosphere which is formed from a surface treating composition for the reflection preventing film which comprises at least one surface treating agent selected from the group consisting of a reactive organic polysiloxane compound containing a reactive amino group and a reactive organic polysiloxane compound containing a reactive epoxy group, wherein said reactive amino group and said reactive epoxy group are reactive with said reflection preventing film, and said reactive organic polysiloxane compound containing an amino group is selected from the group consisting of di(aminomethyl)dimethylpolysiloxane, di(aminoethyl)-dimethylpoly-siloxane, di(aminopropyl)dimethylpolysiloxane and di(aminobutyl)dimethylpolysiloxane and wherein said reactive organic polysiloxane compound containing an epoxy group is selected from the group consisting of di(glycidoxymethyl)dimethylpolysiloxane, di(glycidoxyethyl) dimethylopolysiloxane, di(glycidoxypropyl)dimethylpolysiloxane and di(glycidoxybutyl)dimethylpolysiloxane.

5,144,485
LASER BEAM APPARATUS FOR PROVIDING MULTIPLE REFERENCE BEAMS
Edward E. Hart, Springfield, Ohio, assignor to Spectra-Physics Laserplane, Inc., Dayton, Ohio
Filed Oct. 1, 1990, Ser. No. 590,677
Int. Cl.[5] G02B 27/14; G01B 11/26
U.S. Cl. 359—629 10 Claims



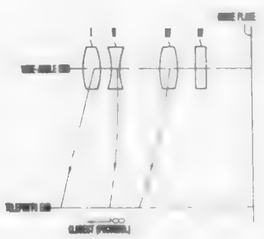
1. An apparatus for projecting a light beam to provide a plurality of reference beams, comprising:
means for providing a primary light beam in an initial path;
first beam diverting means for intercepting said primary beam and diverting a first portion thereof into a first direction to emerge from said apparatus in said first direction as a first stationary reference beam and a second portion thereof into a second direction substantially parallel to said first direction;
second beam diverting means for intercepting said second portion of said primary beam and permitting a first part of said second portion to pass therethrough and emerge from said apparatus as a second stationary reference beam and for diverting a second part of said second portion into a third direction which is substantially perpendicular to said first and second directions to define a third reference beam; and wherein
said first beam diverting means comprises a first prism having a first surface which is fully reflective for intercepting and diverting said primary beam from said initial path substantially 90 degrees into a fourth direction toward a second surface of said first prism, said second surface of said first prism being partially reflective and partially transmissive for diverting said second portion of said primary beam from said fourth direction substantially 90 degrees into said second direction and allowing said first portion and a third portion of said primary beam to exit from said first prism therethrough in said fourth direction, a second prism having a fully reflective surface for reflecting said first portion and said third portion of said primary beam into a fifth direction back toward said second surface of said first prism, said fifth direction being parallel and opposite to said fourth direction, and said second surface of said first prism further diverting said first portion of said primary beam reflected by said reflective surface of said second prism from said fifth direction substantially 90 degrees into said first direction to emerge from said apparatus as said first stationary reference beam while allowing said third portion of said primary beam to pass therethrough.

5,144,487
PORTABLE LASER DEVICE FOR ALIGNMENT TASKS
William H. Hersey, Corte Madera, Calif., assignor to Pacific Laser, San Francisco, Calif.
Filed Sep. 3, 1991, Ser. No. 753,724
Int. Cl.[5] G02B 27/14; G01B 11/26
U.S. Cl. 359—629 9 Claims



1. An apparatus for projecting alignment lines, comprising:
a housing;
projection means, pendulously suspended in said housing, for projecting output beams;
magnetic means for damping pendular motion of said projection means;
said magnetic means including a magnet mounted in said housing below said projection means and a bowlshaped copper plate, rigidly suspended from said projection means such that said copper plate is positioned above said magnet with a gap therebetween sufficiently small that eddy currents are generated in said plate by motion thereof above said magnet;
said projection means including laser means for emitting visible light, collimator means for forming said visible light into a collimated beam, and optical means for dividing said collimated beam into at least three output beams; and
said output beams being projected from said housing in different but generally perpendicularly related directions, whereby said output beams may be used as alignment lines.

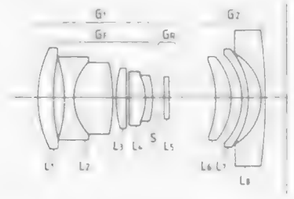
5,144,488
ZOOM LENS
Hiroshi Endo, Kanagawa, and Sadatoshi Takahashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 29, 1991, Ser. No. 647,226
Claims priority, application Japan, Feb. 1, 1990, 2-23365; Feb. 1, 1990, 2-23366
Int. Cl.[5] G12B 15/14, 15/16
U.S. Cl. 359—686 26 Claims



1. A zoom lens comprising:
in the order from the object side,
a first lens group of positive refractive power;
a second lens group of negative refractive power;

a third lens group of positive refractive power; and
a last lens group,
wherein a zooming is performed by varying an air separation between every successive two of said lens groups, and a focusing is performed by moving only said second lens group, with respect to an image plane.

5,144,489
COMPACT WIDE-ANGLE ZOOM LENS
Atsushi Shibayama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed May 15, 1991, Ser. No. 700,514
Claims priority, application Japan, May 18, 1990, 2-128352; Jun. 28, 1990, 2-171174; Aug. 17, 1990, 2-216650; Sep. 27, 1990, 2-257929; Dec. 27, 1990, 2-407623
Int. Cl.[5] G02B 15/14
U.S. Cl. 359—689 60 Claims



1. A wide angle zoom lens comprising: a first lens group having a positive refractive power and a second lens group having a negative refractive power, with the distance between the first and second lens groups being variable for varying the magnification of the wide angle zoom lens,
said first lens group, sequentially from an object, including:
a front group composed of a first lens component assuming a meniscus configuration in which its convex surface is directed to said object and having a positive refractive power, a second lens component having a more intensive concave surface directed to said object and having a negative refractive power, a third lens component having either one of positive and negative refractive powers and a fourth lens component having a positive refractive power; and
a rear group composed of a fifth lens component having a positive refractive power,
said second lens group, sequentially from said object, including: a sixth lens component assuming a meniscus configuration in which its convex surface is directed to an image and having a positive refractive power, a seventh lens component assuming a meniscus configuration in which its convex surface is directed to said image and having a negative refractive power and an eighth lens component assuming a meniscus configuration in which its convex surface is directed to said image and having a negative refractive power,
said wide angle zoom lens being constructed to satisfy the following conditions:

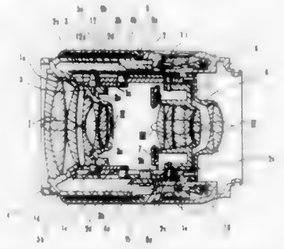
$$1.0 < f_1/Y < 1.19$$

$$0.9 < |f_2/Y| < 1.16, f_2 < 0$$

$$1.21 < \beta_{2W} < 1.40$$

where f_1 is the focal length of said first lens group, f_2 is the focal length of said second lens group, Y is the maximum image height on an image surface, and β_{2W} is the image forming magnification of said second lens group at a wide-angle end.

5,144,490
ZOOM LENS
Haruhiko Yamanouchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 25, 1990, Ser. No. 603,539
Claims priority, application Japan, Oct. 30, 1989, 1-284594
Int. Cl.[5] G02B 15/00
U.S. Cl. 359—694 26 Claims

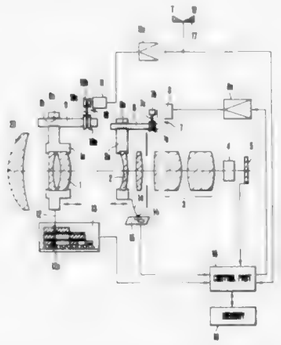


1. A zoom lens in which a focusing movement amount of a focusing-and-zooming lens arranged to be moved for both focusing and zooming is varied according to a change of focal length brought about by a zooming action, comprising:
a) a zooming cam member arranged to rotate around an optical axis in response to zooming;
b) a zoom cam formed in said zooming cam member;
c) a first cam follower arranged to engage said zoom cam;
d) a zooming lens group arranged to be movable in association with the movement of said first cam follower;
e) a focusing cam member;
f) a focus cam formed in said focusing cam member;
g) a second cam follower arranged to engage said focus cam;
h) said focusing-and-zooming lens arranged to be movable in association with the movement of said second cam follower;
i) a focusing rotation member arranged to rotate said second cam follower in response to a focusing action; and
j) a moving mechanism arranged to vary the position of said focus cam by rotating and moving said focusing cam member in the direction of an optical axis in response to the rotation of said zooming cam member, in such a manner that a range of engagement of said second cam follower with said focus cam in said focusing action varies and the position of said second cam follower in the optical axis direction varies.

5,144,491
APPARATUS WITH LENS CONTROL DEVICE
Tatsuzo Ushiro, Saitama; Naoya Kaneda, Kanagawa; Hiroyuki Wada, Kanagawa, and Masahide Hirasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 19, 1990, Ser. No. 510,973
Claims priority, application Japan, Apr. 24, 1989, 1-103786; May 30, 1989, 1-136599; May 30, 1989, 1-136600
Int. Cl.[5] G02B 15/00
U.S. Cl. 359—697 25 Claims

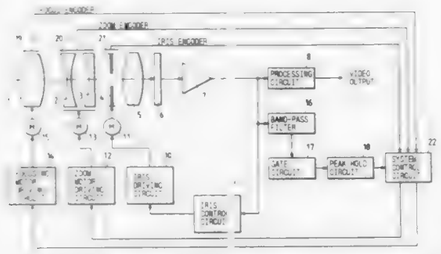
1. An optical apparatus comprising:
a) a first lens arranged to perform a magnifying power varying action;
b) a second lens arranged to perform a focusing action and a compensating action which is required when the power varying action is performed;
c) focus detecting means for detecting a focused state of an image;
d) first control means for driving said second lens on the basis of information from said focus detecting means in such a way as to obtain an in-focus state;
e) detecting means for detecting a state of said second lens; and
f) second control means for enabling said detecting means to

perform the detecting action thereof by driving said second lens into a normal focus adjustable state after driving said second lens to a reset state, said second control means



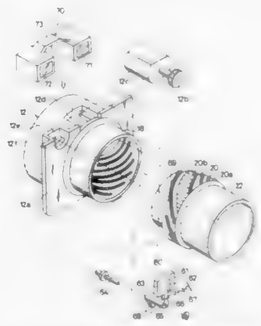
being arranged to set a lens driving speed at which said second lens is to be driven from said reset state to said focus adjustable state at a higher speed than a driving speed set by said first control means.

5,144,492
LENS CONTROL SYSTEM
Ryunosuke Iijima, Ebina, and Kitahiro Kaneda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 8, 1991, Ser. No. 667,191
Claims priority, application Japan, Mar. 12, 1990, 2-62300; Sep. 17, 1990, 2-248185; Sep. 17, 1990, 2-248187
Int. Cl.[5] G03B *15/00*
U.S. Cl. 359—698 11 Claims



1. A lens control system comprising: focusing lens driving means for driving a focusing lens to effect focusing; zooming lens driving means for driving a zooming lens for zooming operation; focusing lens position detecting means for detecting the position of said focusing lens; zooming lens position detecting means for detecting the position of said zooming lens; and control means for controlling said focusing lens driving means to stop said focusing lens at a predetermined position when said zooming lens position detecting means detects that said zooming lens is in a macro region.

5,144,493
ZOOM LENS BARREL AND CAMERA INCORPORATING SUCH BARREL
Hiroshi Nomura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1989, Ser. No. 361,632
Claims priority, application Japan, Jun. 3, 1988, 63-137019; Jun. 24, 1988, 63-83592[U]; Jun. 24, 1988, 63-83593[U]; Jun. 24, 1988, 63-83594[U]; Jun. 24, 1988, 63-83595[U]; Jun. 27, 1988, 63-84733[U]; Jun. 27, 1988, 63-84734[U]; Jun. 27, 1988, 63-84735[U]; Jun. 27, 1988, 63-84736[U]; Jul. 6, 1988, 63-89557[U]; Jul. 6, 1988, 63-89558[U]; Jul. 22, 1988, 63-97075[U]
Int. Cl.[5] G02B *15/00*
U.S. Cl. 359—700 155 Claims



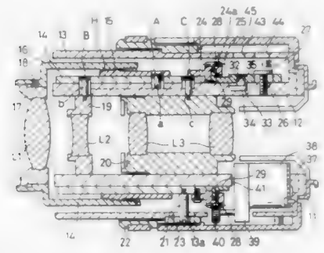
1. A zoom lens barrel adapted to be attached to a camera having an optical axis, said zoom lens barrel comprising a stationary barrel and a rotatable cam ring which is adapted to be driven by means for driving said cam ring, said driving means being stationary along the optical axis of said camera, said cam ring being movably supported by said stationary barrel for movement along said optical axis, during zooming operation of front and rear movable lens groups, in association with rotation of said cam ring, said cam ring including at least two cam grooves which are adapted to receive said front and rear movable lens groups, wherein the axial positions of said movable lens groups, wherein the axial positions of said movable lens groups are at least partially determined by said cam grooves, said zoom lens barrel further comprising helicoidal connecting means for connecting said cam ring and said stationary barrel.

5,144,494
ZOOM LENS BARREL
Tetsuo Sekiguchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 14, 1991, Ser. No. 655,298
Claims priority, application Japan, Feb. 14, 1990, 2-33009
Int. Cl.[5] G02B *7/04*; G03B *13/00*
U.S. Cl. 359—700 22 Claims

1. A zoom lens barrel in which positions of all lens groups along the optical axis are determined in accordance with a position of a cam ring along an optical axis, said cam ring being rotatably supported by a stationary cylinder, said zoom lens barrel comprising:

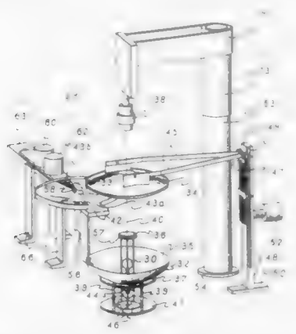
an adjusting ring mounted over said stationary cylinder in such a manner that said adjusting ring is movable relative to said stationary cylinder and along the optical axis, said cam ring and said adjusting ring being successively positioned along the direction of the optical axis; and

means for connecting said adjusting ring to said cam ring in such a manner that said adjusting ring and said cam ring can be rotated relative to each other and can be moved



along the optical axis as a single body for a back focal distance adjustment of the zoom lens.

5,144,495
SYSTEMS FOR ILLUMINATING AND EVALUATING SURFACES
Henry A. Merton, Slidell; James R. Diefenthal, New Orleans; William D. Radigan, New Orleans; Soumitra Sengupta, New Orleans, and Emmett J. Lenaz, Jr., New Orleans, all of La., assignors to Compugrade, Inc, New Orleans, La.
Division of Ser. No. 473,744, Feb. 1, 1990, which is a continuation-in-part of Ser. No. 128,494, Dec. 3, 1987, Pat. No. 4,899,392. This application Sep. 4, 1991, Ser. No. 755,023
Int. Cl.[5] G02B *27/02*
U.S. Cl. 359—798 20 Claims



1. A system for uniformly illuminating a surface of a target object with light at varying angles of incidence relative to the object surface and the optical axis of a viewing means, said system comprising:

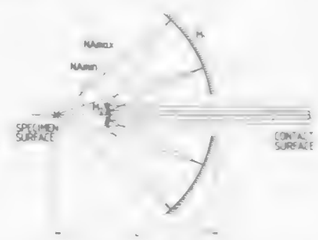
a light source positioned coaxial with the optical axis, said light source being spaced from said target object and located relative thereto such that direct light from said source is blocked from reaching said surface of the object;

first means for reflecting light from said source in a pattern substantially concentric with the optical axis;

second means for reflecting light from said source towards said surface of the target object, said second reflecting means being positioned in the path of the substantially concentric light pattern reflected from said first reflecting means; and

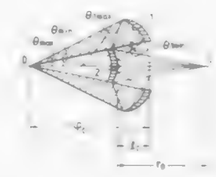
means for varying the spacing of the second reflecting means from the target object.

5,144,496
REFLECTING OBJECTIVE SYSTEM INCLUDING A NEGATIVE OPTICAL POWER SECOND MIRROR WITH INCREASING NEGATIVE OPTICAL POWER OFF-AXIS
Shingo Kashima, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jul. 18, 1990, Ser. No. 553,639
Claims priority, application Japan, Jul. 19, 1989, 1-184561; Jul. 19, 1989, 1-184562; Jul. 19, 1989, 1-192747; Jul. 19, 1989, 1-192748
Int. Cl.[5] G02B *17/06, 5/10*
U.S. Cl. 359—859 6 Claims



1. A reflecting objective system comprising, in the travelling order of the light incident from the object side, a first reflecting mirror having a positive optical power and a second reflecting mirror having a negative optical power arranged symmetrically with regard to an optical axis common thereto, both of said reflecting mirrors having aspherical surfaces symmetrical with regard to said optical axis, and said second reflecting mirror having such a shape as to progressively strengthen the negative optical power thereof from the optical axis toward the marginal portion thereof.

5,144,497
SCHWARZSCHILD OPTICAL SYSTEM
Mikiko Kato, Hachiouji, and Yoshinori Iketaki, Oume, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 6, 1990, Ser. No. 489,006
Claims priority, application Japan, Mar. 7, 1989, 1-54751
Int. Cl.[5] G02B *5/10, 21/00*
U.S. Cl. 359—859 4 Claims



1. A Schwarzschild optical system having a pair of first and second conjugate points, wherein said Schwarzschild optical system with a magnification m, comprising a multilayer film concave mirror having a radius of curvature r_1 and an aperture at a center portion of said concave mirror, disposed a distance ρ_0 apart from said first conjugate point toward said second conjugate point and a multilayer film convex mirror having a radius of curvature r_2, disposed a distance r_0 apart from said second conjugate point toward said first conjugate point and a vertex distance l_0 apart from said concave mirror satisfies

$$2m\ l_0\rho_0/(m\rho_0+ml_0-r_0)\times 0.9 \leqq r_1 \leqq 2\ m\ l_0\rho_0/(m\rho_0+ml_0-r_0)\times 1.1$$

$$2\ l_0r_0/(r_0+l_0-m\rho_0)\times 0.9 \leqq r_2 \leqq 2\ l_0r_0/(r_0+l_0-m\rho_0)\times 1.1$$

and where an effective diameter H of said convex mirror is given by

$$\frac{r_0}{m}(N.A.) \times 0.8 \leq H \leq \frac{r_0}{m}(N.A.) \times 1.5$$

in accordance with a numerical aperture N.A. on the side of said first conjugate point of said Schwarzschild optical system, the reflecting surface of said convex mirror is provided with a uniform multilayer film such that an incident angle θ_{02} at which reflectance is maximized with respect to light of a particular wavelength λ satisfies the following condition in regard to said numerical aperture:

$$\alpha(\theta_{02}, N.A.) \geq 0.5\ \alpha_{max}$$

where

$$\alpha(\theta_{02}, N.A.) \left[\frac{1}{2\epsilon^2} \{ \log| (\epsilon\theta - \theta_{02})^2 + B| + \log| (\epsilon + \theta_{02})^2 + B| \} + \frac{\theta_{02}}{\epsilon^2 \cdot \sqrt{B}} \left(\tan^{-1} \frac{\epsilon\theta - \theta_{02}}{\sqrt{B}} - \tan^{-1} \frac{\epsilon\theta + \theta_{02}}{\sqrt{B}} \right) \right]_{\theta_{min}}^{\theta_{max}} + \frac{1}{2} \left(1 + \frac{1}{m} \right) + \frac{\rho_0 \quad r_1}{r^1}$$

$$\theta_{max} = \sin^{-1}(N.A.)$$

$$\theta_{min} = \frac{r_0}{\rho_0 - r_1 + r_2} \cdot \frac{1}{m} \cdot (N.A.)$$

$B = 2\beta/(\sin\theta_{02} \cdot \cos\theta_{02})$

β = mean value of an imaginary part of complex index of refraction in the multilayer film

α_{max} = maximum value of $\alpha(\theta_{02}, N.A.)$.

5,144,498

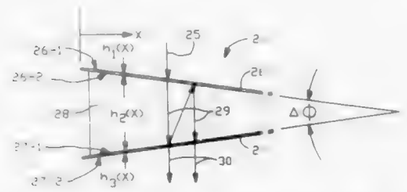
VARIABLE WAVELENGTH LIGHT FILTER AND SENSOR SYSTEM

Kent D. Vincent, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1990, Ser. No. 480,172

Int. Cl.[5] G02B *5/20*

U.S. Cl. 359—885 **84 Claims**



1. Light filter apparatus having a band pass with a central wavelength for light that varies with displacement of position in a selected spatial direction in a light-receiving surface of a filter, the apparatus comprising:

a first stratum of filter material, having first and second spaced apart, light-receiving surfaces facing each other, that is partly transmitting and partly reflecting for light received at a light-receiving surface thereof and having a wavelength in a selected pass band of wavelengths, where a distance of separation h(x) of the two surfaces increases monotonically with displacement of a position coordinate x in the selected direction, and for at least one position the distance of separation is approximately equal to $m\lambda_c/2n$, where m is a positive integer and n is the real part of the refractive index of the filter material for light of a selected wavelength λ_c in the selected pass band; and

a second stratum of filter material, having first and second, spaced apart, light-receiving surfaces facing each other with a distance of separation that varies with displacement of position in the selected direction, that is at least partly transmitting for light having the wavelength λ_c, that is substantially fully absorbing or reflecting for light having a second wavelength approximately equal to a wavelength of any transmittance side band of the first stratum of filter material, and that is positioned so that light issued from one of the first stratum and the second stratum is received by the other stratum.

5,144,499

OPTICAL SHAPED ARTICLE FOR CRT AND HAVING PARTICULAR SPECTRAL TRANSMITTANCE CHARACTERISTICS

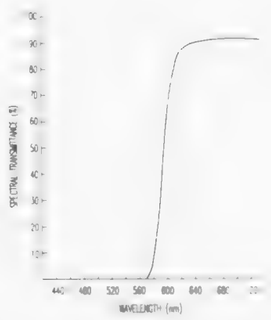
Seiichi Kawanami, Nakajo; Tatsuo Sugiyama, Tokyo; Yoshiro Suzuki, Ichikawa; Yasutaro Ito, Arakawa, and Yuji Annaka, Toyosaka, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jul. 22, 1991, Ser. No. 733,802

Claims priority, application Japan, Jul. 25, 1990, 2-198289

Int. Cl.[5] G02B *5/22; C03C 4/08;* **H04N** *9/16*

U.S. Cl. 359—885 **12 Claims**



1. An optical shaped article for a CRT comprising a transparent synthetic resin containing a red dyestuff and having spectral transmittances of 0 to 5% at a wavelength of 570 nm, 20 to 55% at 590 nm and 80 to 95% at 620 nm.

5,144,500

METHOD AND APPARATUS FOR REPRODUCING MULTIPLY RECORDED DATA

Kentaro Odaka, Tokyo; Shinya Ozaki, Kanagawa, both of Japan, and Brian Milthorp, Bristol, United Kingdom, assignors to Sony Corporation, Tokyo, Japan and Hewlett-Packard Limited, Berkshire, England

Continuation of Ser. No. 294,059, Jan. 5, 1989, abandoned. This application Jul. 5, 1991, Ser. No. 728,304

Claims priority, application United Kingdom, Jan. 8, 1988, 8800350

Int. Cl.[5] G11B *5/09*

U.S. Cl. 362—32 **8 Claims**

1. A data recorder for recording on a recording medium digital data supplied from an external source, comprising:

first means for organizing the supplied data into a plurality of frames and for organizing the frames into frame groups, each frame group containing a predetermined number of consecutive frames, with main data and sub data in each frame, said first means including a means for generating a first signal and a second signal, wherein the first signal indicates whether the main data in a given frame group is the same data as the main data in the preceding frame group and wherein the second signal indicates whether the main data in a given frame group is the same data as the main data in the subsequent frame group; and

second means connected to the first means for recording the organized data track by track on the recording medium in each track, with the main data and sub data of each frame being recorded in a first area and a second area, respectively, in each corresponding track, wherein the second means includes a means for recording the first and second signals in the second area of each track forming part of the frame group including the trailing end track of the frame group.

5,144,501

DATA RECORDER AND METHOD OF OPERATION

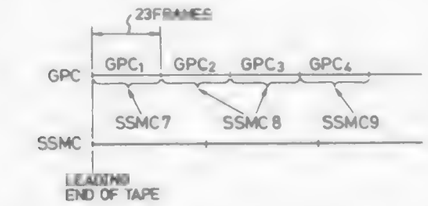
Yoshizumi Inazawa; Shinya Ozaki, both of Kanagawa, Japan; Brian Milthorp, and Bruce Thompson, both of Wokingham, England, assignors to Sony Corporation, Tokyo, Japan and Hewlett-Packard Limited, Berkshire, England

Continuation of Ser. No. 293,695, Jan. 5, 1989, abandoned. This application Aug. 8, 1991, Ser. No. 745,991

Claims priority, application United Kingdom, Jan. 8, 1988, 8800351

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—48 **10 Claims**



1. A data recorder for recording on a recording medium digital data supplied from an external source, comprising:

first means for organizing the supplied date into a plurality of frames, with main data and sub data for each frame, and for generating a plurality of different types of data segmentation units, a first type of such data segmentation units being a group of a predetermined number of consecutive frames, a group count signal indicating the number of frame groups counted from a leading end of the recording medium, and a second count signal indicating the number of another type of such data segmentation units counted from the leading end of the recording medium to a trailing end frame of the current frame group; and

second means connected to the first means for recording the organized data frame by frame on the recording medium in discrete areas corresponding to each frame, with the main data and sub data of each frame being recorded in a first area and a second area, respectively, in each corresponding discrete area and the group count signal and second count signal are recorded in the second area of each discrete area of each frame forming part of the frame group, including the trailing end frame of the frame group.

5,144,502

CASSETTE RECORDER MAGNETIC READ HEAD ARRANGEMENT FOR AUTOREVERSE

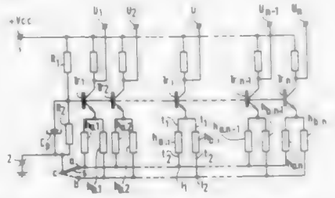
Gerardus H. J. Somers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1990, Ser. No. 621,117

Claims priority, application Netherlands, May 30, 1990, 9001211

Int. Cl.[5] G11B *5/09, 15/14*

U.S. Cl. 360—63 **6 Claims**



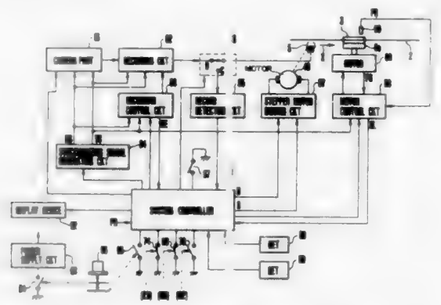
1. Read head arrangement comprising a plurality of n first read heads and a plurality of n second read heads, all of the magnetoresistance type, the n first read heads being arranged for reading a signal, for example, a digital audio signal, from n first tracks running parallel to each other and in the longitudinal direction of a magnetic record carrier on this record carrier, the n second read heads being arranged for reading a signal, for example, a digital audio signal, from n tracks running parallel to each other and in longitudinal direction of the record carrier on this record carrier, the n second tracks running to the n first tracks on the record carrier, the read head arrangement comprising output terminals for supplying to these output terminals the signals read from the n tracks by the n first and second read heads, characterised in that n is greater than 2, in that the read head arrangement has n output terminals and n amplifier stages, each amplifier stage having an input with a low-dynamic input resistance and an output, in that the output of the i-th amplifier stage is coupled to the i-th output terminal, the input of the i-th amplifier stage being coupled to a first terminal of both the i-th first read head and the i-th second read head, a second terminal of the i-th first read head being coupled to a first terminal of a switching means, the second terminal of the i-th second read head being coupled to a second terminal of this switching means, a third terminal of the switching means being coupled to a point of constant potential, and in that the switching means is arranged for connecting the first or the second terminal to the third terminal, and in that i ranges from 1 to n.

5,144,503

PROCESS FOR CONTROLLING AN ACCESS POSITION OF A RECORDING HEAD WHICH ENABLES RECORDING AT EACH RECORDING POSITION ON A RECORDING MEDIUM WITHOUT DOUBLE RECORDING AND A DEVICE THEREFOR

Nobuo Fukushima; Masaya Maeda, and Nobuo Tezuka, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 423,707, Oct. 16, 1989, abandoned, which is a continuation of Ser. No. 826,498, Feb. 5, 1986, abandoned. This application Oct. 2, 1991, Ser. No. 769,568
Claims priority, application Japan, Feb. 7, 1985, 60-22634
Int. Cl.[5] G11B *19/02, 21/02*
U.S. Cl. 360—69 25 Claims



21. A method for determining a position for starting recording in a recording device in which the recording is performed successively from a first to a second end position of a record bearing medium whereby a detecting means for detecting the presence of a record on an exchangeable record bearing medium has access to the recording positions of the record bearing medium and detects the presence or the absence of a record, the exchange of said record bearing medium being detected while main power of said recording device is shut down, and said detecting means is shifted to said second end position on the assumption that the exchange of said bearing medium has been detected, discrimination being effected by taking off and insertion of said record bearing medium, said method including a first mode in which the starting recording position is determined while the presence of record is detected from said second end position, and a second mode in which the starting record position is determined without shifting said detecting means to said second end position only on the assumption that the exchange of said record bearing medium has not been detected.

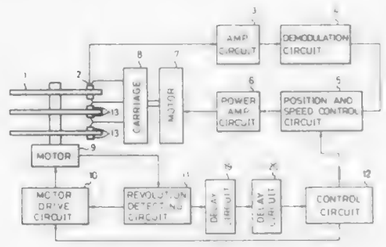
5,144,504

METHOD OF CONTROLLING POSITIONING OF MAGNETIC HEAD OF DISK DRIVE UNIT AND DISK DRIVE UNIT EXECUTING SAME

Takamasa Kitazawa, Nagano, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 30, 1990, Ser. No. 530,524
Claims priority, application Japan, Jun. 2, 1989, 1-141840
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—78.04 6 Claims

1. A disk drive unit comprising:
at least one data magnetic head;
a servo head driven by a same carriage as used for the at least one data magnetic head;
a magnetic disk to which information is written by the at least one data magnetic head and from which information is read by the at least one data magnetic head and the servo head;
a revolution detecting means for detecting a speed of rotation of the magnetic disk;
a drive means for rotating the magnetic disk at a predetermined speed of rotation in response to results of a detection by said revolution detecting means;
a servo control means for positioning the at least one data magnetic head at an arbitrary cylinder in response to servo information read by the servo head from the magnetic disk;
a first delay means which is turned ON for a first predetermined time when the revolution detecting means detects a predetermined speed of rotation of the disk;



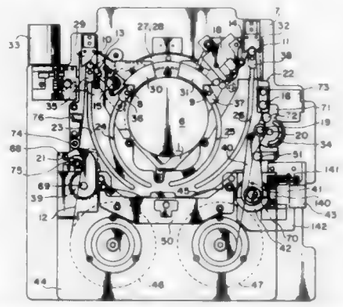
a second delay means which is turned ON for a second predetermined time when the first delay means is turned OFF; and
a control means for withdrawing the at least one data magnetic head and the servo head to evacuating areas provided on the magnetic disk during the time for which the second delay means is turned ON, for controlling the reading and writing operations by the at least one data magnetic head and the servo head when the second delay means is turned ON, and for positioning the at least one data magnetic head at one cylinder after the second delay means is turned OFF.

5,144,505

MECHANISM FOR WINDING A TAPE FROM A TAPE CASSETTE ONTO A ROTATABLE CYLINDER OF A VCR

Hisao Kaneko; Kichizaemon Okazaki, both of Yokohama, and Toshimichi Terada, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 430,416, Nov. 2, 1989. This application Nov. 19, 1991, Ser. No. 794,026
Claims priority, application Japan, Nov. 7, 1988, 63-279342; Jun. 14, 1989, 1-149582
Int. Cl.[5] G11B *5/008*
U.S. Cl. 360—85 4 Claims



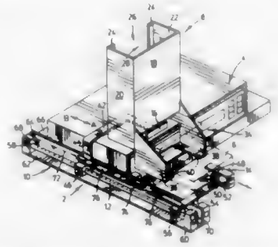
1. A tape loading mechanism for a VCR of the helical scan type in which a magnetic tape is withdrawn out of a tape cassette and wound round the outer peripheral surface of a rotatable cylinder mounted on a cylinder base, said mechanism comprising:
a plurality of movable tape guide members reciprocable independently and separately from each other between a first position near said tape cassette and a second position located around the outer peripheral surface of said rotatable cylinder and more remote from said tape cassette than said first position, all of or a plural number of said movable members being on a tape running upstream side or a tape running downstream side with respect to said rotatable cylinder around at least the outer peripheral surface of said rotatable cylinder,
said all of or plural number of said movable members being movable along the outer periphery of said rotatable cylinder at respective positions offset from each other in the outward radial direction of said rotatable cylinder,
said movable members each comprising a first movable portion which comes into contact with a face of said magnetic tape, and a second movable portion connected to said first movable portion for supporting said first movable portion, and
said magnetic tape being contacted with said movable members and thereby withdrawn out of said tape cassette when said movable members are operated to move from said first position toward said second position, and said magnetic tape being put back into said tape cassette when said movable members are operated to move from said second position toward said first position; and
guide passage forming means,
said guide passage forming means being fixed to a stationary component side of said mechanism to be arranged along the outer peripheral surface of said rotatable cylinder, and having such size and configuration as to allow connection of said first position and said second position with each other, for forming guide passages along which said movable members are moved round the outer peripheral surface of said rotatable cylinder, said guide passage forming means a including
a plurality of guide portions formed independently of each other between said first position and said second position along respective movement paths along which respective ones of said movable members are moved between said first position and said second position,
each of said plurality of guide portions being engaged with respective ones of said second movable portions of said plurality of movable members and wherein said tape loading mechanism includes stationary tilt guide members fixed to the stationary component side of said mechanism, said stationary tilt guide members each having its surface brought into contact with said magnetic tape withdrawn out of said tape cassette by said movable members for converting the attitude and the running direction of said magnetic tape, and said stationary tilt guide members each being located between respective ones of said plurality of movable members on the tape running path under a condition that said movable members have been moved to at least said second position, wherein
said plurality of movable tape guide members are arranged such that said movable members are disposed in plural number independently and separately from each other for each of the tape running upstream side and the tape running downstream side with respect to said rotatable cylinder respectively around opposite sides of the outer peripheral surface of said rotatably cylinder; and
said guide passage forming means is arranged such that in association with said tape guide members, said guide portions are formed in plural number independently and separately from each other for the tape running upstream side and/or the tape running downstream side with respect to said rotatable cylinder respectively around the opposite sides of the outer peripheral surface of said rotatable cylinder, and wherein said guide passage forming means is arranged such that a first guide portion and a second guide portion are tilted in the moving direction of said tape guide members from said first position toward said second position with the plane of said tape cassette being as a reference, and have tilt angles larger than those of a third guide portion and a fourth guide portion which are disposed more remote from the outer peripheral surface of said rotatable cylinder than said first guide portion and said second guide portion, respectively, and wherein said first guide portion and said second guide portion are substantially parallel to a plane of said tape cassette.

5,144,506

CASSETTE LOADER HAVING SIMULTANEOUS PUSHER AND GRIPPER MOVEMENT

Surinder Sabota, Mississauga, Canada, assignor to Strongfield International plc, London, England

Filed Feb. 7, 1990, Ser. No. 476,519
Int. Cl.[5] G11B *15/68*
U.S. Cl. 360—92 20 Claims



1. A cassette changer for loading and unloading cassettes from a recorder comprising:
a. a magazine for holding a plurality of cassettes adjacent said recorder;
b. displaceable means for loading one cassette from said magazine into said recorder in a first position and for unloading said one cassette from said recorder to a second position;
c. a shaft;
d. said displaceable means mounted for slidable movement along said shaft between said first and second positions;
e. flexible means for moving said displaceable means between said first and second positions;
f. an electrical motor associated with said flexible means for moving said displaceable means between said first and second positions so as to sequentially load and unload said cassettes into and from said recorder respectively.

5,144,507

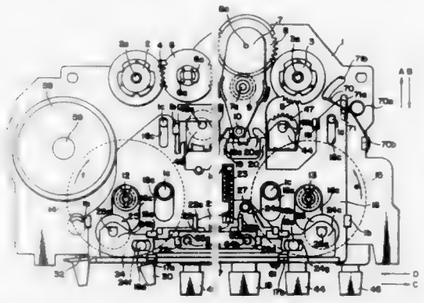
CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS WITH A SINGLE PINCH LEVER ASSEMBLY

Kazuhito Kurita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 511,075, Apr. 19, 1990, abandoned. This application Nov. 5, 1991, Ser. No. 787,752
Claims priority, application Japan, Apr. 27, 1989, 1-108769
Int. Cl.[5] G11B *15/29, 15/44, 15/00*
U.S. Cl. 360—96.2 7 Claims

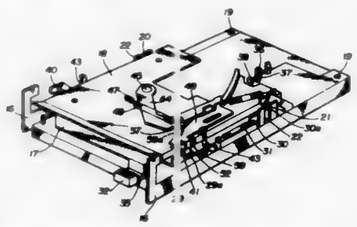
1. An auto-reverse tape recording and/or reproducing apparatus for use with a cassette containing magnetic tape wound on reels, the tape recording and/or reproducing apparatus comprising:
a. a magnetic record and/or reproducing head assembly;
b. an operator actuated play button;
c. a pair of capstans rotatable in opposite directions with respect to each other;
d. a pair of reel bases for rotating the reels around which the magnetic tape is wound;
e. a play mode base movable in a first direction perpendicu-

lar to a straight line connecting the pair of reel bases in response to an operation of the play button;
f. a pair of pinch rollers spaced a distance apart and respectively corresponding to the pair of capstans;
g. a single pinch lever having two ends on each of which a different one of the pinch rollers is rotatably mounted;
h. head supporting means on the play mode base and between the capstans for supporting the magnetic record and/or reproducing head assembly;



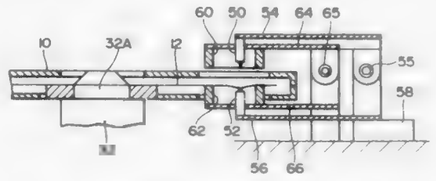
i. tape guide means supported on the pinch lever and between the capstans for guiding the magnetic tape which contacts with the magnetic record and/or reproducing head assembly;
j. pinch lever supporting means on the play mode base for supporting the pinch lever so that the pinch lever can be freely moved in a second direction parallel to the straight line connecting the pair of reel bases; and
k. pinch roller engagement means for selectively sliding the pinch lever in the second direction so as to urge the pinch rollers against the capstan.

5,144,508
DISC CARTRIDGE LOADING DEVICE
Masayuki Noda, Kanagawa, and Yukio Kobayashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 22, 1990, Ser. No. 600,834
Claims priority, application Japan, Oct. 24, 1989, 1-124286
Int. Cl.[5] G11B *17/02, 17/04*
U.S. Cl. 360—99.06 **6 Claims**



1. A disc cartridge loading device comprising
a cartridge holder for holding a disc cartridge inserted therein,
and ejection mechanism for shifting the disc cartridge in a discharging direction opposite to a disc cartridge inserting direction for discharging the disc cartridge out of said cartridge holder,
a unitary retention lever supported on said cartridge holder for sliding movement relative to said cartridge holder in the inserting discharging directions and for rotation relative to said cartridge holder and having an engaging portion for pivoting into a retention opening in a side wall of said cartridge holder and engagement with an engaging recess provided in said disc cartridge,
biasing means for biasing said retention lever in said inserting direction and into rotation in a direction in which said engaging portion engages in said engaging recess of said disc cartridge, and
engagement releasing means for sliding said retention lever in the direction of discharging of said disc cartridge out of said cartridge holder and rotating said retention lever so that said engaging portion is pivoted out of said retention opening in the side wall of said cartridge holder and engagement between said engaging portion and said engaging recess is released.

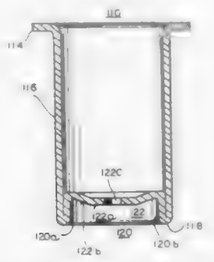
5,144,509
DOUBLE-SIDE MAGNETIC RECORDING-REPRODUCING APPARATUS WITH FIXED POSITION MAGNETIC HEADS
Tomoyuki Nishiyama, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 19, 1989, Ser. No. 354,340
Claims priority, application Japan, May 23, 1988, 63-125363
Int. Cl.[5] G11B *5/54*
U.S. Cl. 360—105 **6 Claims**



1. A double-side magnetic recording-reproducing apparatus comprising:
a spindle motor having a driving shaft mounted thereon with a magnetic recording medium, for rotating said magnetic recording medium mounted on the driving shaft thereof;
a top magnetic head and a bottom magnetic head, which are arranged at predetermined distances above and below respectively, said magnetic recording medium mounted on the driving shaft of said spindle motor;
a head-feeding means for moving the top and bottom magnetic heads in a radial direction of said magnetic recording medium; and
a means for switching surfaces of magnetic recording or reproducing, for vertically moving upwardly or downwardly said spindle motor by a predetermined value to selectively bring either a top surface of said magnetic recording medium mounted on the driving shaft of said spindle motor into contact with the top magnetic head or an undersurface of said magnetic recording medium into contact with the bottom magnetic head, respectively.

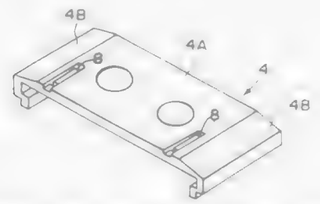
5,144,510
CONDUCTIVE PEDESTAL FOR USE WITH SOLID STATE OVERVOLTAGE ARRESTER
Richard Kaczmarek, Chicago, Ill., assignor to Reliance Comm/-Tec Corporation, Chicago, Ill.
Filed Feb. 14, 1991, Ser. No. 655,641
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—119 **15 Claims**

1. A line protector for a communications circuit comprising:
a) means for connections to ground;
b) a solid state overvoltage arrester having first and second electrodes, said first electrode connected to first and second line terminals; and
c) a hollow conductive pedestal having a first end, said first end receiving said second electrodes, and a second end in contact with said ground connection means;



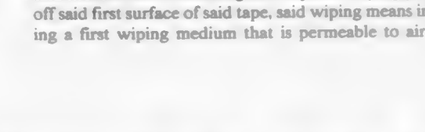
wherein said conductive pedestal first end has a U shaped recess for receiving said second electrode, said U shaped recess having a middle portion which is closer to said pedestal first end than the rest of said U shaped recess.

5,144,511
MAGNETIC TAPE CASSETTE
Shingo Katagiri; Shigeru Nishiyama, and Hiroyuki Tahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 19, 1991, Ser. No. 746,533
Claims priority, application Japan, Aug. 20, 1990, 2-86966[U]; Aug. 20, 1990, 2-86967[U]; Oct. 12, 1990, 2-107396[U]
Int. Cl.[5] G11B *23/087*
U.S. Cl. 360—132 **6 Claims**



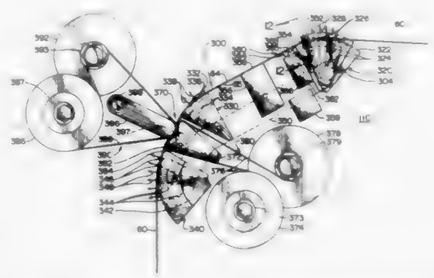
1. A magnetic tape cassette having a cassette casing (1) and a magnetic tape accommodated in the casing, said casing comprising a casing body (2) and a slider member (4) mounted for sliding motion between a closed position and an open position, said slider member having a pair of guide grooves (8) formed on an outer surface thereof remote from the casing body and extending from a first end of the slider member toward another, opposite end thereof, each of said guide grooves having first and second engaging holes (8*a*, 8*b*) formed on a bottom of said guide groove, extending through said slider member, open to an inner surface thereof, and spaced from each other in a longitudinal direction of said guide groove, said casing body being provided with a pair of locking projections (6*a*) each of which is resiliently urged toward one of said guide grooves from the inner surface of said slider member and is adapted to be selectively engaged with said first and second engaging holes so that a tip portion thereof projects into said guide groove, said locking projections holding said slider member in the closed position when they are engaged with said first engaging holes (8*a*) and holding said slider member in said open position when they are engaged with said second engaging holes (8*b*), and said locking projections being disengaged from said engaging holes by a pair of lock release projections (12) provided on a surface of a magnetic recording and/or reproducing system and sliding along said guide grooves when said magnetic tape cassette is loaded in said magnetic recording and/or reproducing system, wherein
said outer surface (4A) of said slider member which is opposed to an upper surface of said magnetic recording and/or reproducing system on which said lock release projections are provided is cut obliquely on opposite sides thereof from positions close to and outwardly of said guide grooves to respective side edges, to define an inclined surface (4B) on opposite sides of said outer surface of said slider member.

5,144,512
MAGNETIC RECORDING DISK HAVING TEXTURED SURFACE
Kiyoshi Ota; Kazuhiro Kimura, and Kenji Yazawa, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jan. 22, 1991, Ser. No. 644,222
Claims priority, application Japan, Jan. 19, 1990, 2-008508; Nov. 2, 1990, 2-298724
Int. Cl.[5] G11B *5/82*
U.S. Cl. 360—135 **8 Claims**



1. A magnetic recording disk comprising:
a flat smooth substrate with a physically abraded surface having a uniform series of physical circumferential texturing; and
a magnetic layer formed over said substrate and having radial roughness factors Rp and Rv selectively determined to satisfy the condition of $Rp/Rv \geqq 0.6$.

5,144,513
METHOD AND APPARATUS FOR CLEANING MAGNETIC TAPE HAVING AIR BEARINGS AND VACUUM-ASSISTED CLEANING
Larry R. Gadsby, Norristown, Pa.; Larry J. Pittman, Wheatridge, and Philip J. Chermak, Lafayette, both of Colo., assignors to Data Pure Corporation, Longmont, Colo.
Filed Jun. 21, 1989, Ser. No. 369,595
Int. Cl.[5] G11B *23/50, 15/67*
U.S. Cl. 360—137 **30 Claims**



1. Tape cleaning apparatus for removing particles from a first surface of an elongated strip of magnetic tape that has said first surface and a second surface on opposite sides of the strip, comprising:
first wiping means positioned for contacting relation with said first surface of said magnetic tape for wiping particles off said first surface of said tape, said wiping means including a first wiping medium that is permeable to air posi-

tioned for contacting said first surface of said tape, and first vacuum means positioned adjacent said first wiping medium such that said first wiping medium is positioned between said tape and said first vacuum means when said first wiping medium is in contact with said first surface of said tape for creating a low pressure area in said first wiping medium adjacent said tape to assist in positively seating and holding said first surface of said tape in biased contact with said first wiping medium and for drawing air and particles from said first surface of said tape into said first wiping medium and retaining them there; and

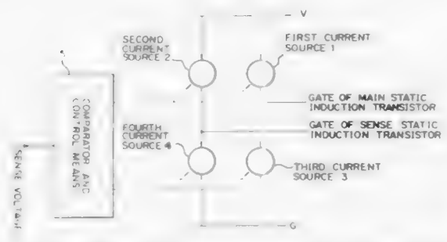
drive means adapted for connection to said magnetic tape for moving said magnetic tape in relating to said first wiping means.

5,144,514

TRANSISTOR DEVICE DRIVE CIRCUIT

Kazunari Sekigawa, and Hirokazu Tsujimoto, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jun. 21, 1990, Ser. No. 541,832
Claims priority, application Japan Jun. 26, 1989, 1-160728
Int. Cl.[5] H02H *7/00*; G05F *1/40*
U.S. Cl. 361—18 **10 Claims**



1. A semiconductor device drive circuit for turning on and off a semiconductor device having a main static induction transistor and a sense static induction transistor with the latter having a source area 1/k of that of the former, wherein k is an integer, said drive circuit comprising:

a first current source means having a first terminal for connection to a first terminal of a power supply and having a second terminal for connection to a gate of said main static induction transistor for applying a bias to said main static induction transistor when said first current source means is operated;

a second current source means having a first terminal for connection to said first terminal of said power supply and a second terminal for connection to said sense static induction transistor for applying a bias to said sense static induction transistor having a current value of 1/k of that of said first current source means when said second current source means is operated;

a third current source means having a first terminal grounded and a second terminal connected to said second terminal of said first current source means;

a fourth current source means having a first terminal grounded and a second terminal connected to said second terminal of said second current source means; and

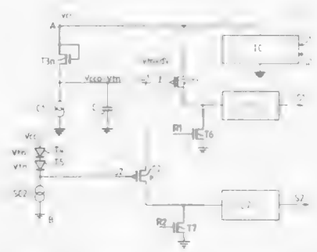
comparing and control means including a source of reference voltage and means for coupling to said semiconductor device for sensing the current flowing through said sense static induction transistor, said comparing and control means being coupled to all of said current source means for turning said first and second current source means on for applying said bias when said semiconductor device is to be turned on, and for turning off said first and second current source means and turning on said third and fourth current source means when the voltage obtained by sensing said current flowing through said sense static induction transistor is higher than said reference voltage.

5,144,515

DETECTOR OF FAST VARIATION IN THE SUPPLY OF INTEGRATED CIRCUITS

Serge Fruhauf, Peynier, and Fré éric Breugnot, Gournay Sur Marne, both of France, assignors to SCS-Thomson Microelectronics S.A., Gendelly, France

Filed Dec. 7, 1990, Ser. No. 624,336
Claims priority, application France, Dec. 8, 1989, 89 16296
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—18 **24 Claims**



22. A process for detecting fast variations in the supply voltage at a supply voltage terminal of an integrated circuit even when the thus varied supply voltage does not exceed the range of nominal values of said supply voltage, said process comprising:

applying said supply voltage to a current limiting transistor and a first detection transistor, wherein said current limiting transistor has a threshold voltage that is lower, in terms of absolute value, than the threshold voltage of said first detection transistor;

providing a current flow through said current limiting transistor to a first terminal of a capacitor upon said supply voltage exceeding the threshold voltage of aid current limiting transistor to charge said capacitor to a voltage which is substantially Vcco-Vtn, where Vcco is the stable value of the supply voltage and Vtn is the threshold voltage of the current limiting transistor;

applying the voltage at said first terminal of said capacitor to the gate of said first detection transistor;

maintaining, in a stable voltage supply mode, the capacitor charged with a voltage at said first terminal of said capacitor which is substantially Vcco-Vtn, where Vcco is the stable value of the supply voltage and Vtn is the threshold voltage of the current limiting transistor, thereby maintaining at the gate of said first detection transistor a voltage which is the difference between the supply voltage and the voltage at the first terminal of said capacitor;

whereby, when the supply voltage varies swiftly from the stable voltage supply mode as compared with the charging time of said capacitor, the voltage drop between said supply voltage terminal and the gate of said first detection transistor increases and the conduction state of said first detection transistor changes when the thus increased voltage drop exceeds the threshold voltage of said first detection transistor; and

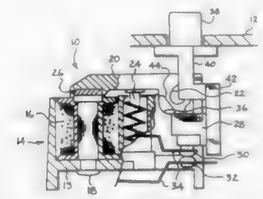
modifying the operation of a portion of the integrated circuit when said first detection transistor changes state after a stable voltage supply mode has been achieved.

5,144,516

LEAKAGE CURRENT CIRCUIT INTERRUPTER DEVICE

John C. K. Sham, Hong Kong, Hong Kong, assignor to Wing Shing Products Company, Ltd., Aberdeen, Hong Kong

Filed Feb. 4, 1991, Ser. No. 650,056
Int. Cl.[5] H02H *3/16*
U.S. Cl. 361—49 **25 Claims**



1. A switching device for opening a circuit upon detection of a predetermined leakage current level, said device comprising:

a housing;

sensing circuit means for detecting said leakage current, said sensing circuit means generating a signal upon detection of leakage current;

electromagnet means having a solid core;

electrical contact means including a pair of stationary contacts and a corresponding pair of movable contacts, said movable contacts movable between a set position in which said movable contacts contact said stationary contacts to maintain said circuit and conduct electricity through said contacts, and a tripped position in which said movable contacts are spaced from said stationary contacts such that said circuit is open and electricity does not flow through said contacts; and

a latching mechanism for maintaining said movable contacts in electrical contact with said stationary contacts, said latching mechanism including a pivotable arm, a permanent magnet secured to an end of said arm, a biasing means for biasing said arm to a position corresponding to said tripped position of said contacts, and an engagement member for securing said arm in a position corresponding to said set position of said contacts;

said contacts being spaced apart when said arm is in said tripped position and being in electrical contact when said arm is in said set position; said permanent magnet being attracted to said solid core of said electromagnet when said arm and said contacts are in said set position;

wherein said electromagnet means generates a magnetic field in response to said signal from said sensing circuit means, said field having the same polarity as said permanent magnet to repel said magnet from said core, said arm and contacts being moved as said magnet is repelled form said set position to said tripped position to open said circuit and interrupt electrical flow between said contacts.

5,144,517

INTRINSICALLY SAFE BARRIER DEVICE

Hermann Wieth, Chagrin Falls, Ohio, assignor to Pepperl + Fuchs, Inc., Twinsburg, Ohio

Continuation of Ser. No. 424,680, Oct. 20, 1989, abandoned.
This application Aug. 12, 1991, Ser. No. 746,047
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—55 **22 Claims**

1. A protection barrier device comprising:

first and second input terminals adapted for connection of the device with an associated direct current voltage source;

first and second output terminals adapted for connection of the device with an associated device disposed in a hazardous area, the first output terminal being in a first low-impedance series path with the first input terminal and the second output terminal being in second low-impedance series path with the second input terminal;

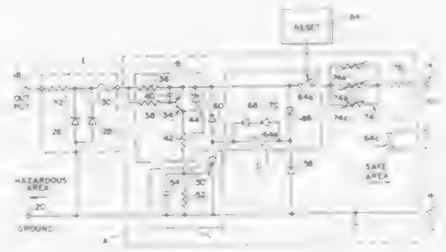
current sensing means for sensing current in at least one of the first and second series paths;

excess current level signal generating means for generating an excess current level signal in accordance with a sensed excess current level consisting of current in excess of a pre-selected level;

amplifier means, powered at least in part by excess current in at least one of the first and second series paths, for amplifying the excess current level signal provided by the excess current level signal generating means to form a trigger signal;

crowbar circuit means for providing a low resistance crowbar circuit current path between the first and second series paths in accordance with the trigger signal; and

switching means for impeding current flow through at least one of the first and second series paths in accordance with current passing through the crowbar circuit current path.

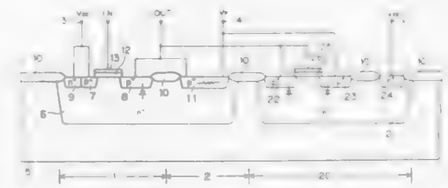


5,144,518

SEMICONDUCTOR INTEGRATED CIRCUIT

Yukio Miyazaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,372
Claims priority, application Japan, Oct. 23, 1989, 1-275417
Int. Cl.[5] H02H *9/00*; H01L *27/02*
U.S. Cl. 361—56 **5 Claims**



1. A semiconductor integrated circuit for improving a withstand surge voltage of an output circuit formed by high breakdown voltage field effect transistors, comprising:

an input terminal for receiving a control signal;

a first field effect transistor having a first electrode and a bulk connected to a first potential point, a control electrode connected to said input terminal and a second electrode;

a load connected between said second electrode of said first field effect transistor and a second potential point;

an output terminal connected to said second electrode of said first field effect transistor; and

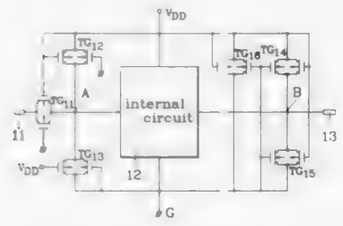
a second field effect transistor having a first electrode and a control electrode connected to said output terminal, a second electrode connected to said second potential point and a bulk connected to said first potential point.

5,144,519

ELECTROSTATIC PROTECTION CIRCUIT FOR SEMICONDUCTOR CHIP

Deugsoo Chang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 29, 1991, Ser. No. 706,803
Claims priority, application Rep. of Korea, Oct. 29, 1990, 90-17381
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—58 **8 Claims**



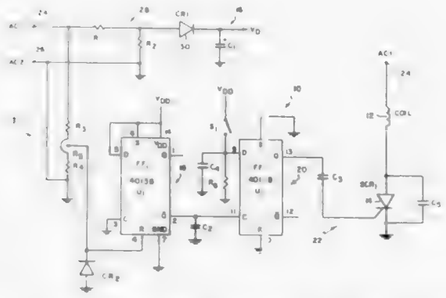
1. A semiconductor chip protection circuit comprising:
a first transmission gate for connection between an input terminal of an internal circuit and an input pin of the semiconductor chip;
a second transmission gate for connection between the input terminal of the internal circuit and a power terminal;
a third transmission gate for connection between the input terminal of the internal circuit and a ground terminal;
a fourth transmission gate for connection between an output terminal of the internal circuit and the power terminal;
a fifth transmission gate for connection between the output terminal of the internal circuit and the ground terminal; and
at least one sixth transmission gate for connection between the power terminal and the ground terminal.

5,144,520

POWER SOLENOID DRIVE CIRCUIT WITH SWITCH BOUNCE REJECTION

Edward I. Parker, Holden, and Harold Weiss, Marlboro, both of Mass., assignors to Stanley-Parker Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 451,862, Dec. 18, 1989, abandoned, and Ser. No. 325,438, Mar. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,291, Aug. 4, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 740,883
Int. Cl.[5] H01H *47/00*
U.S. Cl. 361—153 **19 Claims**



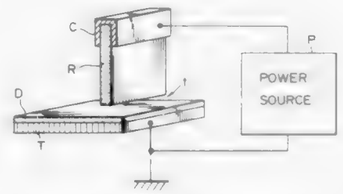
1. A driver circuit which is responsive to an input AC line voltage for providing a variable power drive signal to a load circuit, said driver circuit comprising:
a) means for receiving the input AC voltage;
b) timing circuit means for producing a variable timing signal that is synchronized to the AC voltage cycle and that can be started at a variable time corresponding to a preselected phase angle in the positive half-cycle of the AC voltage cycle;
c) switch actuated means responsive to said timing signal for generating a control signal for a selected period of time that is related to one cycle of the input AC voltage, said selected time period occurring only during the time that the input AC voltage is in the positive portion of its cycle;
d) means for applying said timing signal to said switch actuated control signal generating means;
e) switch means for actuating said control signal generating mean to produce said control signal; and
f) firing means responsive to said control signal for providing a drive signal to the load circuit during the time period that the control signal is applied to the firing means.

5,144,521

DISCHARGING MEMBER AND CHARGING DEVICE USING THE SAME

Izumi Tagoku, and Eishu Ohdake, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,073
Claims priority, application Japan, Dec. 28, 1988, 63-328805; Jan. 18, 1989, 1-7633
Int. Cl.[5] H01T *23/00*
U.S. Cl. 361—225 **36 Claims**



1. A discharging member located to face an object with the intermediary of a gap for charging, with a voltage being applied from a power source to each of said discharging member and said object, a surface of said object by a discharge which occurs in said gap, said discharging member comprising:
a body;
a resistor constituting one end of said body and defining a discharging end which faces the object with the intermediary of said gap, said resistor having a resistance in a range from 10^6 Ω-cm to 10^{11} Ω-cm, wherein the surface of the object is charged by a discharge occurring between the object and the discharging end of the resistor which faces the object with the intermediary of the gap;
a connecting end connected to the power source at the other end of said body; and
a conductive connector which connects said connecting end to said power source.

5,144,522

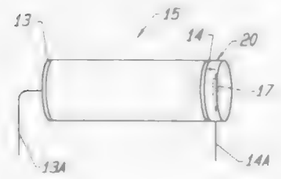
CRITICALLY DAMPED CAPACITOR AND METHOD OF MAKING SAME

Richard N. Marsh, Cool, Calif., assignor to Constant Velocity Transmission Lines, Inc., Auburn, Calif.

Filed Apr. 22, 1991, Ser. No. 689,168
Int. Cl.[5] H01G *4/00, 7/00*
U.S. Cl. 361—306 **34 Claims**

1. A critically damped capacitor comprising:
means for providing a capacitance having first and second cylindrical, concentric electrically conductive plate members which are longitudinally displaced relative to each other such that one edge of each fo said first and said second plate members extends beyond an adjacent edge of the other of said plate members, said second plate member being electrically insulated from said first plate member and said capacitance providing means having a capacitance C, a parasitic inductance L_S and a parasitic resistance R_S;
means for providing an additional resistance R_A in series with said parasitic resistance R_S such that

$$R_A=(\omega L_S)-R_S$$



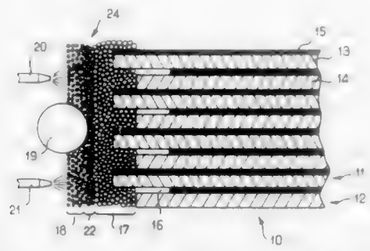
and;
first and second capacitor lead members coupled to said first and said second plate members, respectively, with said means for providing said additional resistance R_A being coupled in series with at least one of said first and second capacitor lead members, said first and second capacitor lead members being provided for connecting said capacitor in an electrical circuit.

5,144,523

FOIL CAPACITOR AND METHOD FOR THE MANUFACTURE OF SUCH A CAPACITOR

Michel Pageaud, and Michel Dautriche, both of Seurre, France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Jun. 7, 1991, Ser. No. 711,871
Claims priority, application France, Jun. 8, 1990, 90 07170
Int. Cl.[5] H01G *4/18, 1/14*
U.S. Cl. 361—308 **8 Claims**



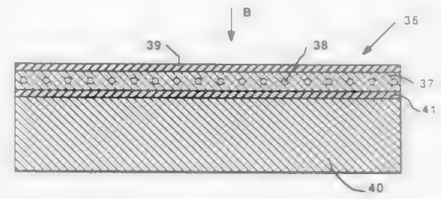
1. A method for the manufacture of a foil capacitor made by the stacking of metallized bands constituting a block, said bands being appropriately connected mechanically and electrically by output plates located on the lateral walls of the block, wherein each place is constituted by a succession of an odd number of layers of metal or of metal alloy made independently of one another, each even-order layer being formed by an alloy of the metals or of the metal alloys of the odd-order layers that are contiguous to it, comprising the steps of:
a) spraying a metal or metal alloy constituting the odd numbered layer onto said bands on the lateral walls of said block to form a cast odd numbered layer of said output plates,
b) spraying a metal or metal alloy constituted of both the odd and even numbered layers of metal or metal alloy onto said first odd numbered layer to form an even numbered layer of said output plates,
c) spraying a metal or metal alloy constituting the odd numbered layers onto said even numbered layer to form an odd numbered layer of said output plates, and, if necessary, repeating steps b) and c).

5,144,524

LIGHT TRAP FOR BLOCKING REFLECTION AND SCATTERING OF LIGHT

Barclay J. Tullis, Palo Alto, and James B. Kruger, Half Moon Bay, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 186,879, Apr. 27, 1988, Pat. No. 5,004,340.
This application Jan. 22, 1991, Ser. No. 643,863
Int. Cl.[5] F21V *9/00*
U.S. Cl. 362—293 **14 Claims**



1. A light trap for blocking an incident monochromatic beam of light, comprising:
a first substrate of light absorbing material having an antireflectance film coated planar surface; and
a second substrate of light absorbing material, having an antireflectance film coated surface which is parallel to, and in position to receive any of a monochromatic light beam reflected from said first substrate surface,
whereby any of said monochromatic light beam which is reflected by said first substrate surface is absorbed by said second substrate surface.

5,144,525

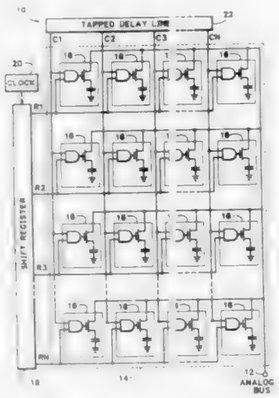
ANALOG ACQUISITION SYSTEM INCLUDING A HIGH SPEED TIMING GENERATOR

Charles L. Saxe; Steven K. Sullivan, both of Beaverton, and Grigory Kogan, Portland, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Sep. 27, 1990, Ser. No. 589,222
Int. Cl.[5] G11C *27/04*
U.S. Cl. 365—45 **66 Claims**

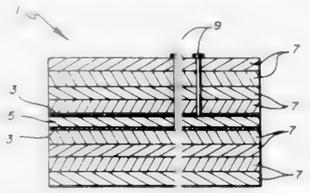
1. An analog acquisition system comprising:
(a) an analog bus;
(b) an analog memory array including analog capture cells for capturing and storing a signal on the analog bus, each capture cell having an analog input coupled to the analog bus and first and second digital inputs, the analog capture cells being arranged in a plurality of columns and rows, each column having an associated column input coupled to the first digital input of each analog capture cell in the column, and each row having an associated row input coupled to the second digital input of each analog capture cell in the row;
(c) a shift register having an input for receiving a clock

signal and a plurality of shifted outputs coupled to the row inputs of the analog memory array; and



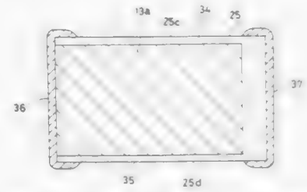
(d) a tapped delay line having a plurality of strobe outputs for providing a propagating signal edge to the column inputs of the analog memory array.

5,144,525
LOW TEMPERATURE CO-FIRED CERAMIC STRUCTURE CONTAINING BURIED CAPACITORS
Thanh Vu, Westminster, and Tsen-Tsou Shih, Cypress, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 5, 1991, Ser. No. 740,359
Int. Cl.[5] H01G 4/10
U.S. Cl. 361—321 6 Claims



1. A low temperature co-fired ceramic structure containing a buried capacitor, said capacitor including:
a. a first electrode;
b. a second electrode;
c. high K dielectric material between said first and second electrode; and
d. low K dielectric material arranged symmetrically about said first and second electrodes with respect to a plane passing through the approximate center of said high K dielectric material.

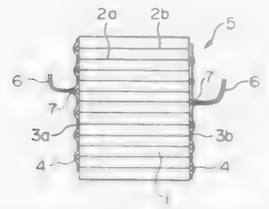
5,144,527
MULTILAYER CAPACITOR AND METHOD OF FABRICATING THE SAME
Toshinori Amano, and Susumu Mori, both of Nagaokakoyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
PCT No. PCT/JP90/01075, § 371 Date Mar. 14, 1991, § 102(e) Date Mar. 14, 1992, PCT Pub. No. WO91/03064, PCT Pub. Date Jul. 3, 1991
PCT Filed Aug. 24, 1990, Ser. No. 663,942
Claims priority, application Japan, Aug. 24, 1989, 1-218275; Aug. 24, 1989, 1-218276; Aug. 24, 1989, 1-218277; Aug. 24, 1989, 1-218278; Aug. 24, 1989, 1-218279; Oct. 4, 1989, 1-261204; Oct. 6, 1989, 1-262495; Oct. 16, 1989, 1-269278; Oct. 16, 1989, 1-269279
Int. Cl.[5] H01G 4/30, 7/00, 1/14
U.S. Cl. 361—321 19 Claims



1. A multilayer capacitor which has a monolithic type dielectric body having respective opposed pairs of end surfaces, side surfaces, and top and bottom surfaces, in which a plurality of dielectric layers are laminated with inner electrodes being interposed therebetween and in which the width of said inner electrodes between said side surfaces is made smaller than that of said dielectric layers so that side margin regions are provided at side parts of the inner electrodes, and having a pair of outer electrodes formed on respective end surfaces of said monolithic type dielectric body which are conductively connected to predetermined ones of said inner electrodes;
the multilayer capacitor being characterized in that said side margin regions are formed by etching side edges of said inner electrodes, at said side surfaces of the monolithic type dielectric body;
wherein the inner electrodes initially have the same width as said dielectric layers, and the side edges of the inner electrodes are exposed at said side surfaces, before said etching;
each of said outer electrodes extending onto said side, top and bottom surfaces from the respective end surface so as to form a five-sided cap on said monolithic type dielectric body.

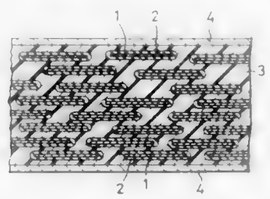
5,144,528
LAMINATE DISPLACEMENT DEVICE
Junichi Watanabe, Kumagaya; Takahiro Someji, Fukaya; Yoshiyuki Watanabe, Fukaya, and Shigeru Jomura, Tokyo, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan
Filed Sep. 19, 1991, Ser. No. 762,300
Claims priority, application Japan, Oct. 1, 1990, 2-263635
Int. Cl.[5] H01G 4/10
U.S. Cl. 361—321 4 Claims

1. A laminate displacement device comprising:
a plurality of thin plates made of an electromechanical converting material for forming a laminate body;
internal electrodes formed on a lamination surface of said thin plates, put between said thin plates in a sandwich shape, constituting said laminate body, exposed to side surfaces of said laminate body, and used alternately as electrodes of first conductivity type and second conductivity type;
a first insualting layer formed on one side surface of said laminate body except for portions corresponding to the internal electrodes used for the electrodes of first conductivity type exposed on the side surface of said laminate body;
a second insulating layer formed on another side surface of said laminate body except for portions corresponding to the internal electrodes used for the electrodes of second conductivity type exposed on the side surface of said laminate body;



a first external electrode bridging electrically said internal electrodes used as the electrodes of first conductivity type exposed on the one side surface of said laminate body; and
a second external electrode bridging electrically said internal electrodes used as the electrodes of second conductivity type exposed on the other side surface of said laminate body.

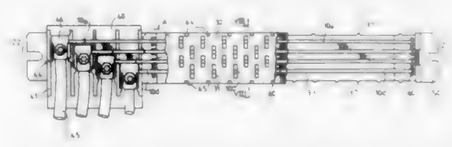
5,144,529
CAPACITOR AND PROCESS FOR PRODUCING SAME
Yasunori Takahashi, Tokyo, Japan, assignor to Fujikin Soft Co., Ltd., Osaka, Japan
Filed Sep. 12, 1991, Ser. No. 758,061
Int. Cl.[5] H01G 4/08, 7/00
U.S. Cl. 361—323 6 Claims



1. A capacitor comprising a multiplicity of needlelike metal particles dispersed in a synthetic resin film and so oriented that the axes thereof are positioned in parallel to the surface of the film, and an electrode provided on each of opposite surfaces of the synthetic resin film, the metal particles having a diameter of up to 0.1 μm, a length 5 to 10 times the diameter and a specific surface area of 30 to 100 m^2/gr and being covered with a dielectric oxide over the surface thereof.

5,144,530
POWER DISTRIBUTOR DEVICE FOR ELECTRIC INSTALLATIONS
Jacques Cohen, Couchey; Daniel Nourry, Dijon, and Jean-Pierre Thierry, Couternon, all of France, assignors to Telemecanique, France
Filed May 2, 1990, Ser. No. 517,866
Claims priority, application France, May 3, 1989, 89 06150
Int. Cl.[5] H02B 1/20
U.S. Cl. 361—378 8 Claims

1. An electric power distributor device for supplying low voltage apparatuses, comprising:
a support member;
an elongate insulating case of generally rectangular cross section, said case comprising at least two modular length sections and joining means interlocking said length sections in an end-to-end relationship, said case having a front face with a plurality of orifices regularly distributed on said front face, and an opposite face with first and second end regions, and fixing means securing said first and second end regions on said support member;
a plurality of parallel power bars housed in said case along the length thereof; a plurality of input power supply conductors and an upstream connection box interlocked with an adjacent modular length section of the case, said connection box including said first end region of the case and

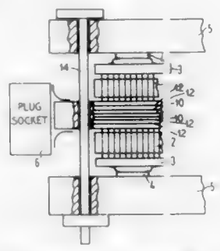


housing clamping means connecting said input power supply conductors to one end of said power bars; a plurality of output conductors having terminations which pass through said orifices and connect said output conductors to said power bars; and
an expansion absorbing end member having two portions movable relative to each other connected to said second end region of the case allowing relative heat expansion between the case and the support member.

5,144,531
ELECTRONIC APPARATUS COOLING SYSTEM
Hiroshi Go, Zama; Shizuo Zushi, and Mitsuo Miyamoto, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 7, 1991, Ser. No. 637,690
Claims priority, application Japan, Jan. 10, 1990, 2-1540
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—382 8 Claims

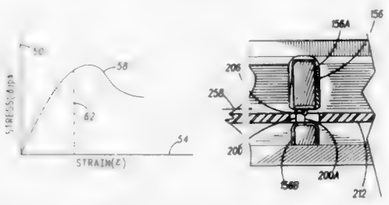
1. In an electronic apparatus cooling system comprising a plurality of circuit modules mounted on an electronic apparatus, a plurality of cooling plates each having a coolant path and being coupled heat conductively with a different one of said circuit modules, a supply duct, a return duct, a plurality of flexible hoses for connecting said coolant paths of the cooling plates in series between said supply duct and said return duct, and a circulating system for circulating a coolant through said supply duct, said series-connected coolant paths and hoses and said return duct, the improvement comprising a plurality of quick couplers for connecting said hoses to said supply duct, said return duct and said coolant paths, respectively; wherein at least the quick couplers for connecting the hoses to said supply duct and said return duct, respectively, are valved quick couplers.

5,144,532
CIRCUIT BOARD ASSEMBLY
Hermann Wessely, Munich, and Otmar Fritz, Neukeferloh, both of Fed. Rep. of Germany, assignors to Siemens Nixdorf Informationssystem AG, Fed. Rep. of Germany
Filed May 15, 1991, Ser. No. 700,502
Claims priority, application Fed. Rep. of Germany, May 16, 1990, 4015788
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—385 8 Claims



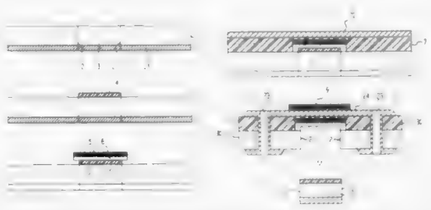
1. A circuit board assembly, comprising:
a multi-layer printed circuit board formed in laminating technology having a plurality of layers laminated over one another and contact locations on at least one surface thereof:
pressure contacts pressed against said contact locations of said multi-layer printed circuit board;
further printed circuit boards formed in micro-wiring technology upon which are mounted integrated circuit units forming an electrical circuit, said further printed circuit boards being connected electrically to said multi-layer printed circuit board by said pressure contacts;
cooling plates pressing directly against a surface of each of said integrated circuit units on said further printed circuit boards; and
clamp means connected between said multi-layer printed circuit board and said further printed circuit boards and said cooling plates to exert a pressing force therebetween.

5,144,533
SELF-LOCKING HOUSING ASSEMBLY
Thomas A. Annett, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 27, 1991, Ser. No. 722,442
Int. Cl.[5] H05K 1/14
U.S. Cl. 361—395 22 Claims



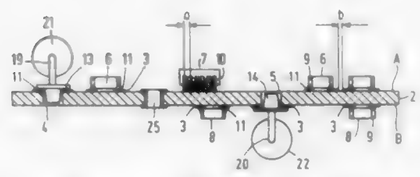
20. An apparatus for supporting an electrical circuit, said apparatus comprising:
an electrical circuit board for supporting the electrical circuit thereupon, said electrical circuit board having a plurality of notches formed into side portions thereof; and
a housing for affixing the electrical circuit board in position at a predetermined distance above a bottom surface thereof, said housing assembly having: a housing bottom wall defining the bottom surface and a plurality of raised shoulder portions formed integral with the housing bottom wall and disposed to extend above the surface thereof, said plurality of raised shoulder portions having top surfaces which together form a support surface for receiving the circuit board thereupon and for permitting limited sliding translation of the circuit board, once positioned thereupon, between an unlocked and a locked position; housing side walls formed integral with said housing bottom wall and extending upwardly therefrom, said housing side walls having longitudinal axes extending in directions corresponding to directions of translation permitted of the circuit board upon the support surface, and at least one rib member formed upon each of the housing side walls, said rib members having longitudinal axes extending in directions at angles relative to a plane defined by the support surface, each of the rib members of dimensions permitting mated engagement with said notches formed in the circuit board, and formed of a top portion and a bottom portion, said top and bottom portions, respectively, of each rib member separated by separation distances forming gaps; and a clamp formed integral with each rib member, each of said clamps comprised of elastically-deformable material and positioned to extend into the gaps separating the top and bottom portions of the rib members such that the sliding translation of the circuit board along the support surface to the locking position exerts compressive forces against each of the clamps to elastically deform the clamps thereby, such the forces exerted by the clamps, once elastically deformed, for clamping forces for fixedly engaging the circuit board to the housing assembly.

5,144,534
METHOD FOR MANUFACTURING RIGID-FLEXIBLE CIRCUIT BOARDS AND PRODUCTS THEREOF
Horst Kober, Berggewann 5, 6940 Weinheim, Fed. Rep. of Germany
Filed Feb. 5, 1991, Ser. No. 650,482
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1990, 4003344
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] H05K 1/00, 3/02
U.S. Cl. 361—398 35 Claims



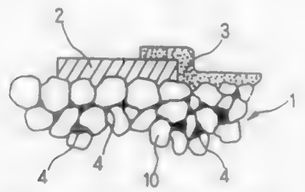
1. A method for making rigid-flexible circuit boards, comprising the steps of:
(a) forming a slot which defines a removable plug in a rigid circuit board, the board comprising a rigid layer disposed to one or between two conductive layers;
(b) applying a separation layer to the plug;
(c) forming a bonded region between a flexible insulating layer and the rigid circuit board that does not prevent removal of the plug;
(d) applying a continuous adhesive film or a prepreg to the circuit board on the same side as the flexible insulating layer;
(e) applying an outer conductive layer to the surface defined by the flexible insulating layer and the continuous adhesive film or prepreg to form a composite A; and
(f) removing the plug to form a flexible region in the rigid circuit board.
33. A circuit board, comprising:
a rigid layer having disposed thereon at least one conductive layer and a removable plug defined by slots in the rigid layer;
a separation layer disposed on said plug;
a flexible insulating layer bonded to a side of the rigid layer to form a bonded region, wherein the bonded region of the flexible insulating layer to the rigid layer does not prevent removal of the plug;
a continuous adhesive layer on the same side as the flexible insulating layer to form a composite; and an outer conductive layer on a surface of said composite.

5,144,535
METHOD OF MOUNTING ELECTRICAL AND/OR ELECTRONIC COMPONENTS OF A PRINTED CIRCUIT BOARD
Ludovicus Megens; Petrus H. A. A. Vriens; George A. A. Asselman, and Gerardus Notenboom, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 10, 1990, Ser. No. 508,040
Claims priority, application Netherlands, Apr. 20, 1989, 8900987
Int. Cl.[5] H05K 3/30, 3/34
U.S. Cl. 361—400 4 Claims



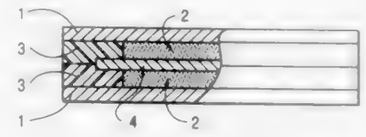
1. A printed circuit board with surface mounted device (SMD) components and wire components comprising a printed circuit board having printed conductors, SMD components secured to the printed circuit board conductors by reflow soldering, intermediary connection elements secured to the board for securing the wires of said components thereto, the connection elements being secured to the conductors on the printed circuit board by solder joints between the connection elements and the conductors and the connection wires of the wire components being welded to the connection elements.

5,144,536
ELECTRONIC CIRCUIT SUBSTRATE
Kiyotaka Tsukada, and Yukihiro Noda, both of Gifu, Japan, assignors to Ibiden Co., Ltd., Ogaki, Japan
Filed Jul. 24, 1990, Ser. No. 556,521
Claims priority, application Japan, Aug. 3, 1989, 1-201757; Aug. 31, 1989, 1-225951; Sep. 1, 1989, 1-226585; Sep. 21, 1989, 1-245952; Sep. 22, 1989, 1-247048
Int. Cl.[5] H05K 1/03, 3/32
U.S. Cl. 361—402 22 Claims



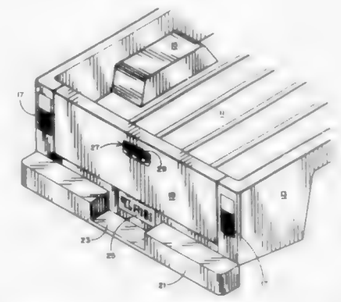
1. An electronic circuit substrate comprising:
a porous ceramic sintered body with film devices directly formed on a surface thereof;
a resin filled in the pores of said porous ceramic sintered body;
wherein a bottom surface of said film devices are fit into the pores and recesses on the surface of said porous ceramic sintered body in close contact therewith in a wedged state; and
wherein said porous ceramic sintered body has an average pore diameter of 0.2 to 15 μm and a porosity of not less than 10 vol %.

5,144,537
ELECTRIC DOUBLE LAYER CAPACITOR
Yoshinobu Tsuchiya, Fujisawa; Ken Kurabayashi, Chigasaki, and Yoriaki Niida, Yamato, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan
Filed Dec. 28, 1990, Ser. No. 635,038
Claims priority, application Japan, Dec. 28, 1989, 1-341003
Int. Cl.[5] H01G 9/00
U.S. Cl. 361—502 14 Claims



1. An electric double layer capacitor comprising:
a gasket assembly defining a space therein;
a pair of polarized electrodes disposed in said space;
an isolating membrane disposed between said polarized electrodes;
a pair of current collectors disposed on and bonded to upper and lower surfaces, respectively, of said gasket assembly and said polarized electrodes; and
each of said polarized electrodes being composed of minute active carbon particles of coal tar which have a specific surface area ranging from 1,000 to 4,000 m^2/gram, and an electrolytic solution.

5,144,538
ILLUMINATED TAIL LIGHT HANDLE
Gary Harris, Wilsonville, Oreg., assignor to Harris, Sanchez & Sandifer, Orange, Calif.
Filed Dec. 5, 1991, Ser. No. 803,107
Int. Cl.[5] B60Q 1/00
U.S. Cl. 362—80 11 Claims



1. An illuminated combination tail light handle for a vehicle having a lever operated tail gate latch mechanism, said handle further comprising:
an exterior housing having a planar portion, and adapted for attachment to a surface, a first face extending generally perpendicular to said planar surface, said first face and

said rectangular planar portion defining a clearance space opening to facilitate manual grasping of said handle and to accommodate a lever, an illumination face at an angle less than ninety degrees with respect to said planar portion; and

means for illuminating said illumination face, attached to said exterior housing.

5,144,539

ILLUMINATION DEVICE

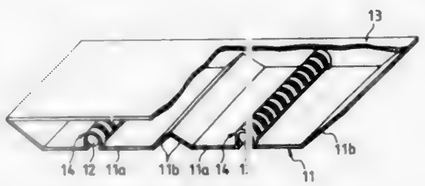
Hideaki Katoh; Nobuhisa Noguchi; Yutaka Kikuchi; Isamu Kaneko, all of Saitama; Toshiaki Sugimoto; Seiki Kitahara, both of Tokyo; Teruo Hoshi, Chiba; Minoru Suzuki, Saitama, and Shuichi Satoh, Tokyo, all of Japan, assignors to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan

Division of Ser. No. 7,216,429, Jul. 7, 1988, Pat. No. 5,038,259. This application May 28, 1991, Ser. No. 706,306

Claims priority, application Japan, Jul. 9, 1987, 169728/87; Sep. 29, 1987, 62-147482/87[U]; Sep. 29, 1987, 62-147483/87[U]; Oct. 7, 1987, 62-152808/87[U]; Nov. 30, 1987, 62-181121/87[U]; Dec. 28, 1987, 62-197346[U]; Jan. 26, 1988, 63-7692/88[U]; Jan. 29, 1988, 63-9712/88[U]

Int. Cl.[5] F21M *7/14*

U.S. Cl. 362—256 **6 Claims**



1. An illumination device comprising:
a reflecting plate having first and second sides;
at least one linear light source arranged on said first side of said reflecting plate;
a diffusing plate arranged on said second side of said reflecting plate; and
a light quantity adjusting member formed integrally with said reflecting plate.

5,144,540

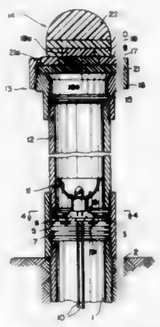
DECORATIVE OUTDOOR LIGHT FIXTURE

Lance E. Hayes, 324 Hillsmere Dr., Annapolis, Md. 21403

Filed Dec. 16, 1991, Ser. No. 807,230

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—268 **16 Claims**



1. A decorative outdoor light fixture comprising support means to be mounted in the ground and to extend upwardly therefrom, said support means including conduit means, electrical conductors positioned within said conduit means, an electrical socket mounted in said conduit means, the opposite ends of said electrical conductors being connected to said socket and a source of power, respectively; an upwardly facing lamp positioned in said conduit means and connected to said socket, a selected decorative light filter and lens assembly positioned on the upper end of said conduit means, and a pipe union securing said decorative light filter and lens assembly to the upper end of said conduit means, whereby each light filter and lens assembly emits a particular colored decorative light effect to the surrounding atmosphere.

5,144,541

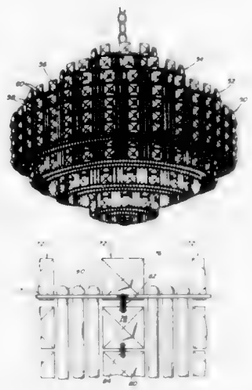
HOOKLESS GALLERY ASSEMBLIES FOR CHANDELIERS

Arnold Schonbek, Plattsburgh, N.Y., assignor to A. Schonbek & Co., Inc., Plattsburgh, N.Y.

Continuation-in-part of Ser. No. 725,347, Jul. 3, 1991, abandoned. This application Oct. 7, 1991, Ser. No. 772,281

Int. Cl.[5] F21S *1/06*

U.S. Cl. 362—405 **17 Claims**



1. A gallery assembly for a decorative lighting chandelier, comprising:
a plurality of decorative chains each comprising an uppermost crystal and at least one additional crystal flexibly connected to said uppermost crystal by a connector; and
a gallery ring for supporting said decorative chains, said gallery ring including a plurality of spaced-apart openings, each opening including a crystal-receiving portion that is sized and shaped to receive said uppermost crystal and to support said uppermost crystal in a predetermined position, each opening further including a gap portion that joins said crystal-receiving portion to one side edge of said gallery ring, said gap portion being sized such that said decorative chains can be installed on said gallery ring by passing said connector through the gap portion of a selected opening and lowering the decorative chain into the crystal-receiving portion of the opening until the uppermost crystal rests on said gallery ring, and the decorative chain hangs from said gallery ring.

5,144,542

RETRACTABLE LIGHT FIXTURE

Daniel G. Puglisi, 476 Copperstone Cir., Casselberry, Fla. 32707

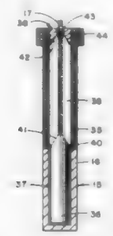
Filed Dec. 13, 1991, Ser. No. 806,103

Int. Cl.[5] F21S *1/00*

U.S. Cl. 362—386 **19 Claims**

11. A retractable light fixture comprising:

a housing having sides, a bottom and being open on one end thereof;
a cover covering an open end to said housing;
a lamp attached to said cover;
an electrically actuated solenoid forming a solenoid casing attached inside said housing and having a solenoid arm attached to said cover for raising said cover and lamp attached thereto to thereby extend said lamp outside said housing and for lowering said cover when said solenoid arm is retracted;



electrical conductor connected between an electrical source and to said solenoid and to said lamp for powering said lamp and solenoid, said electrical conductor having a remote switch therein;
latch means for holding said solenoid arm and said cover and lamp attached thereto in an extended position, said latch means including a first electric magnet powered by said electrical conductor, whereby said light fixture raises said lamp and turns said lamp on upon electrical power being applied to said light fixture by actuating said remote switch in said electrical conductor.

5,144,543

DOMESTIC APPLIANCE HAVING ELECTRICALLY ISOLATED INPUT CONTROL CIRCUITRY

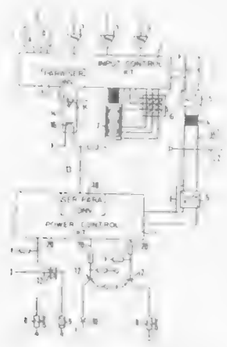
Ralf-Jürgen Striek, and Peter Müller, both of Berlin, Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga. and Bosch-Siemens Hausgeräte GmbH, Münich, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 631,959

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942430

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—16 **15 Claims**



1. A domestic appliance comprising:
one or more controlled devices driven by a high voltage supply;
a power control circuit supplying control signals to said controlled devices;
a low voltage input control circuit electrically isolated from said high voltage supply and including a touch panel for inputting operator commands, said input control circuit developing control commands for supply to said power control circuit;
an electrically isolated serial communication path between said low voltage input control circuit and said power control circuit for communicating said control commands therebetween, said power control circuit generating control signals operating said controlled devices in response to receipt of said control commands;
a parallel to serial signal converter coupled between said low voltage input control circuit and said serial communication path; and
a serial to parallel signal converter coupled between said serial communication path and said power control circuit.

5,144,544

POWER FEED SYSTEM FOR TELEPHONE AND/OR INFORMATION TECHNOLOGY TERMINALS

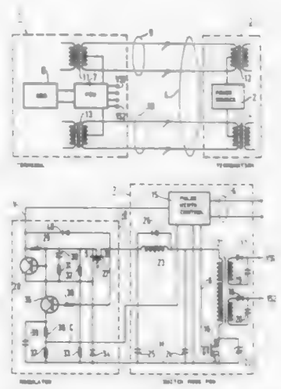
Dany Jenneve, and Gilles Misslin, both of Strasbourg, France, assignors to Alcatel Business Systems, Paris, France

Filed Aug. 30, 1990, Ser. No. 574,726

Claims priority, application France, Aug. 31, 1989, 89 11427

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—21 **4 Claims**



1. A power feed system for a terminal which is at least partly fed by a telephone transmission and power supply link, said system comprising:
a power converter type switch mode power supply unit connected to said link;
a regulator connected to an input of said power supply unit and including a current limiter through which said terminal is at least partly fed by said link;
means for progressively starting up said power supply unit when said terminal is powered up via said link, by temporarily delaying the supply of power to the terminal by the switch mode power supply unit.

5,144,545

SAFETY LIGHT FOR SWIMMING POOL

David W. Klitzing, Rte. 2, Box 143, Altamont, Ill. 62411

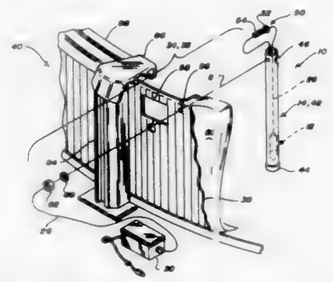
Filed Aug. 21, 1991, Ser. No. 747,937

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—101 **8 Claims**

1. A safety light comprising a high output lamp sealed in a transparent casing with a watertight closure member, said lamp connected to current carrying lines passing through the watertight closure member; and,
an elongated bracket having first and second ends with

means proximate the first end for detachably attaching the bracket vertically to a sidewall of a swimming pool above the water line and with means for suspending the lamp and



casing assembly proximate the second end of the elongated bracket whereby the safety light can be installed in the swimming pool without draining the pool.

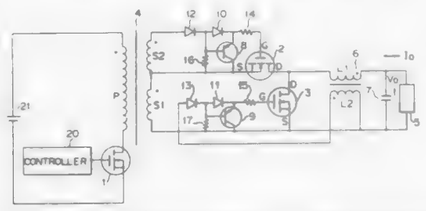
5,144,546
FLASHLIGHT HOLDER
Steven Burdi, Palm Harbor, Fla., assignor to Lumitech, Inc., Destin, Fla.
Filed Feb. 3, 1992, Ser. No. 829,216
Int. Cl.[5] F21L 7/00
U.S. Cl. 362—191 **12 Claims**

1. A flashlight holder for clamping a flashlight to a cylindrical support in a mutually perpendicular relationship comprising a flashlight clamp portion and a support clamp portion, said support clamp portion including two generally semicircular portions attachable to each other so as to encircle a said cylindrical support; said flashlight clamp portion including a cylindrical bore with inside threading, a hollow bushing member with outside threading to engage said inside threading and a hollow to closely fit around said flashlight, and a resilient O-ring seated in a circular groove in said cylindrical bore and adapted to be compressed by advancement of said bushing.

5,144,547
RECTIFYING CIRCUIT WITH FETS
Kazuhiko Masamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jun. 6, 1991, Ser. No. 711,631
Claims priority, application Japan, Jun. 8, 1990, 2-148619
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—127 **4 Claims**

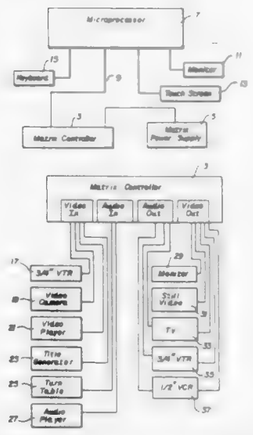
1. A rectifying circuit for rectifying an AC voltage fed from an AC power source, comprising:

a first and a second FET (Field Effect Transistors) serving as rectifying elements, said first and second FETs having drains thereof commonly connected at a junction, a current from said AC power source being applied to between sources of said first and second FETs to cause a rectified output voltage to appear on said junction; and



gate discharging means for half-wave rectifying drive voltages for said first and second FETs and discharging charges stored in gate capacitances of said first and second FETs.

5,144,548
ROUTING SWITCHER
Jerry R. Salandro, Greensburg, Pa., assignor to IRIS Technologies, Inc., Greensburg, Pa.
Continuation-in-part of Ser. No. 320,402, Mar. 8, 1989, abandoned, which is a continuation of Ser. No. 219,592, Jul. 15, 1988, abandoned. This application Jul. 13, 1989, Ser. No. 379,097
Int. Cl.[5] G05B 19/42, 15/02; H04Q 19/00
U.S. Cl. 364—138 **20 Claims**



1. A routing switcher for connecting selected source devices with selected destination devices:

a plurality of terminals assigned as source terminals to each of which a source device is connectable;

a plurality of terminals assigned as destination terminals to each of which a destination device is connectable;

a cross-point switching matrix selectively connecting selected destination terminals to selected source terminals in response to control signals;

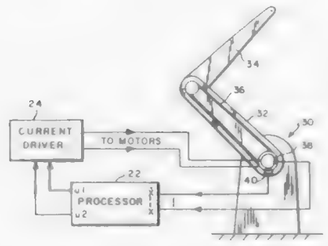
a display device displaying a plurality of device icons;

input means through which icons on said display device are selected; and

a digital computer connected to said cross-point switching matrix, said display device and said input means and programmed to assign selected of said device icons on the display device to selected source terminals as source icons and to assign other of said device icons to selected destination terminals as destination icons, and to be responsive to the subsequent selection of a source icon and a destination icon to generate control signals operating said cross-point

switching matrix to connect the selected source terminal to the selected destination terminal to form a signal route.

5,144,549
TIME DELAY CONTROLLED PROCESSES
Kamal Youcef-Toumi, Newbury, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Jun. 29, 1990, Ser. No. 546,024
Int. Cl.[5] G05B 13/02; G06F 15/46
U.S. Cl. 364—148 **9 Claims**



1. A method for controlling the operation of a process having a plurality of input variables and a plurality of state variables dependent on said input variables, said method comprising:

periodically measuring said state variables to obtain a present value of said state variables and to store past values of said state variables;

generating desired dynamics for said state variables from a vector of desired state variables and a vector of commands so as to produce a corresponding constant matrix for each vector;

determining an error vector corresponding to differences between the present values of said state variables and the vector of desired state variables;

estimating effects of unknown dynamics on said process by using calculations representative of convolutions involving past values of said state variables;

calculating present desired effects by substituting into said desired dynamics, the present value of said state variables and a present value of the vector of commands;

combining said estimated effects of unknown dynamics with said present desired effects;

multiplying said combination of effects by a pseudo inverse of a control matrix to obtain a control value; and

combining said control value with the product of said error vector and a feedback gain matrix to produce signals for use in adjusting said input variables.

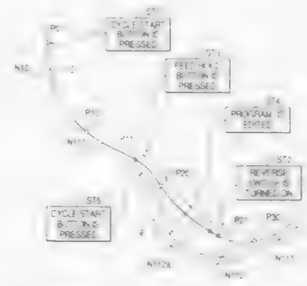
5,144,550
TEST RUN CONTROL METHOD
Takao Sasaki, Hachioji; Kunihiko Murakami, Hino, and Masafumi Sano, Minamitsuru, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP90/00169, § 371 Date Oct. 1, 1990, § 102(e) Date Oct. 1, 1990, PCT Pub. No. WO90/10263, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 9, 1990, Ser. No. 582,203
Claims priority, application Japan, Feb. 22, 1989, 1-42428
Int. Cl.[5] G05B 19/405, 19/403
U.S. Cl. 364—192 **6 Claims**

1. A test run control method for testing a computerized numerical control (CNC) apparatus to check a generated NC program, comprising the steps of:

reading data block by block from an NC program in response to a test run start command, converting the data into execution blocks while forwarding a tool in a forward travel, and storing the data in the form of execution blocks and modal data necessary for a preliminary processing in a reverse function memory;

reversing the tool in a reverse travel based on the data in the form of execution blocks stored in said reverse function memory in response to a reverse command;

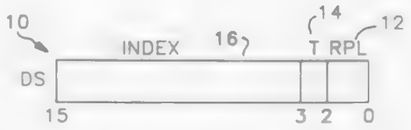
stopping said reverse travel at a given time in response to a stop command to allow said NC program to be edited in a prescribed range;



editing the program in said prescribed range with editing means; and

effecting the preliminary processing based on the modal data stored in said reverse function memory in response to a test run restart command, and executing the edited NC program.

5,144,551
COMPUTER MEMORY MANAGEMENT METHOD UTILIZING SEGMENTATION AND PROTECTION TECHNIQUES
Darren J. Cepulis, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Continuation of Ser. No. 354,144, May 19, 1989, abandoned. This application Jun. 13, 1991, Ser. No. 714,552
Int. Cl.[5] G06F 12/00
U.S. Cl. 395—425 **3 Claims**



1. A method for memory management in a computer system operating in a multi-task environment,

the computer system conforming to an industry standard of memory management utilizing a segmented addressing technique to locate and describe information within said computer system memory, the addressing technique utilizing:

a plurality of registers;

a shared global segment descriptor table, the global descriptor table including a multiplicity of segment descriptor caches, the segment descriptor caches describing and locating wherein the computer system memory information shared by multiple tasks may be accessed and having a privilege level which sets access rights to the global segment descriptor cache; and

at least one local segment descriptor table, the local descriptor table including a multiplicity of segment descriptor caches, the segment descriptor caches describing and locating wherein the computer system memory information unique to a particular task may be accessed and hav-

ing a privilege level which sets access rights to the local segment descriptor cache,

the computer system having first and second mutually incompatible operating modes for addressing memory, the first operating mode conforming to the above the industry standard addressing technique, the second mode addressing information by physical location in the computer system memory, the first operating mode capable of addressing more memory than the second operating mode,

the computer system having an operating system capable of supporting either of the mutually incompatible operating and addressing modes, the operating system allocating at least two of the registers for addressing memory in excess of that capable by the second addressing mode, thereby requiring that the computer system be operating in the first mode to load the allocated registers,

the computer system having in memory a table of prestored values corresponding to the registers and associated global and local segment descriptor cache,

the method being directed to the loading of all registers and global and local segment descriptor caches from the table of prestored values while operating in the second operating mode, the method comprising:

(a) trapping an illegal operation code exception generated by the computer system in response to an instruction requesting the loading of all registers and descriptor caches while operating in the second mode;

(b) interrupting control of the computer system operating system;

(c) retrieving the allocated segment selector register values from the prestored table and determining if the register values are equal to a valid predetermined value;

(d) modifying the retrieved segment selector register values to the predetermined value and modifying the privilege level of the segment descriptor caches corresponding to the allocated segment selector registers to the lowest possible privilege level within the computer system when the retrieved allocated segment selector register and corresponding segment descriptor values are not equal to the predetermined value;

(e) creating entries in the global and local descriptor tables for the modified segment selector register and corresponding descriptor caches

(f) comparing the allocated segment selector registers values in the prestored table with said modified allocated selector register values and replacing the table values with said modified values when not equal to said modified allocated segment register values;

(g) determining the address location information for the allocated segment selector values and corresponding segment descriptor caches and loading same into corresponding segment selector and segment descriptor entries in the prestored table;

(h) switching the computer system from the second operating mode to the first operating mode;

(i) loading as current values for the computer system allocated segment selector registers and corresponding segment descriptor caches selector values from the prestored table;

(j) switching the computer system from the first operating mode to the second operating mode;

(k) loading as current values for the computer system segment selector registers and corresponding segment descriptor and control caches the remaining values from the prestored table; and

(l) returning control of the computer to the operating system.

5,144,552

OPTICAL INFORMATION STORAGE MEDIUM HAVING GROOVES AND PITS WITH SPECIFIC DEPTHS, RESPECTIVELY

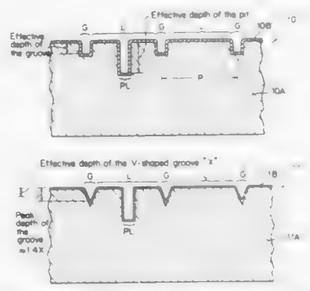
Michiharu Abe, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 449,296, Dec. 5, 1989, abandoned, which is a division of Ser. No. 311,447, Feb. 14, 1989, abandoned, which is a continuation of Ser. No. 76,670, Jul. 23, 1987, abandoned. This application May 6, 1991, Ser. No. 698,353

Claims priority, application Japan, Jul. 25, 1986, 61-175295; Jul. 25, 1986, 61-175296; Jul. 31, 1986, 61-180707

Int. Cl.[5] **G11B** *7/007, 7/24*

U.S. Cl. 369—275.4 **4 Claims**



1. An optical information storage medium comprising:

a transparent substrate having parallel, concentric, or helical tracking guide grooves defined in one surface thereof and information tracks which are positioned between the guide grooves, in the direction perpendicular to the grooves, and are arranged side-by-side a performat area composed of discrete pits and disposed on at least one of said information tracks, and a recording film capable of absorbing and reflecting light and disposed on said surface, said tracking guide grooves having an effective depth "d" which is 0.075 to 0.20 times the wavelength of a recording/reproducing laser beam in said transparent substrate;

in which the depth "D" of said pits is 0.35 to 0.45 times said wavelength.

5,144,553

ELECTRONIC VEHICLE TOLL COLLECTION SYSTEM AND METHOD

John J. Hassett, 32 Pond St., Marblehead, Mass. 01945, and John M. Harrison, 17 Dartmouth St., Concord, N.H. 03301

Filed May 17, 1990, Ser. No. 525,103

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] **G06F** *15/21;* **G07B** *15/00;* **G08G** *1/00*

U.S. Cl. 364—401 **12 Claims**

1. A method for automatically collecting tolls from a vehicle moving along a roadway, the method comprising the steps of

providing at least a first toll facility through which the vehicle can pass for toll collection,

providing an in-vehicle toll processor having storage for storing a toll-money-available signal representative of a monetary quantity available for debiting in a toll transaction at an upcoming toll facility,

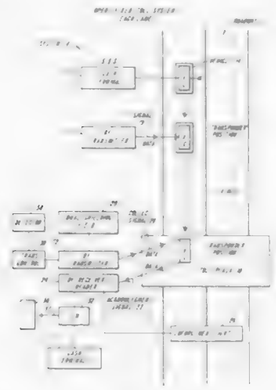
loading the toll processor with an electronic gross-toll-amount signal representative of an initial toll-money-available value,

transmitting, from a first toll-facility-identification site corresponding to and remote from a first toll facility, a first toll-facility-identifier signal uniquely representative of the location of the first toll facility,

said in-vehicle toll processor being receptive to receive said first toll-facility-identifier signal,

said in-vehicle toll processor being arranged to calculate, in response to the first toll-facility-identifier signal, a toll amount to be debited at the first toll facility,

transmitting, from a first toll collection facility to the in-vehicle toll processor, as the vehicle passes through the first toll collection facility, a toll-collect signal instructing



the in-vehicle toll processor to debit the calculated toll amount from storage,

debiting the calculated toll amount from storage, and

transmitting, from the in-vehicle toll processor to the first toll facility, an acknowledgement signal to indicate that the calculated toll amount has been debited from storage.

5,144,554

APPARATUS FOR DIAGNOSING AND PROVIDING THERAPY FOR GASTROINTESTINAL DISEASES WITHOUT CAUSING PATIENT DISCOMFORT AND INJURY

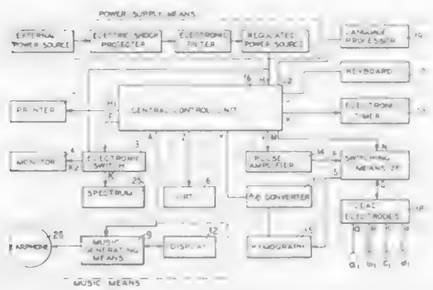
Xueshan Zhang, and Lin Zhou, both of No. 2 Huashanxiang, Wuchenglu, Kunming City, Rep. of Korea

Filed Mar. 2, 1990, Ser. No. 487,265

Claims priority, application Rep. of Korea, Mar. 4, 1989, 89202531

Int. Cl.[5] **G06F** *15/42*

U.S. Cl. 364—413.02 **15 Claims**



1. A diagnostic and therapeutic apparatus for gastrointestinal diseases comprising:

power supply means;

a central control unit consisting of a single chip computer and peripheral devices:

a keyboard;

a set of diagnosis and therapy lead electrodes;

diagnosis and therapy switching means having a first input, a second input, and output and a common input and output terminal, said first input being connected to said central control unit, said common input and output terminal being connected to said set of diagnosis and therapy lead electrodes;

a kymograph with its input connected to said output of said switching means, and its output supplied to said central control unit via an A/D converter;

an acupoint stimulating pulse amplifier with its input connected to said central control unit and its output coupled to said second input of said switching means;

a first display means connected to said central control unit:

a human body spectrum generator;

an adjustable electronic switch having an input, a first and a second output, said input being connected to said central control unit, said first output being coupled to said human body spectrum generator; and

an electronic timer connected to said central control unit.

5,144,555

METHOD AND APPARATUS FOR SUPPORTING OF MAKING FORMATTED DOCUMENT

Masato Takadachi, Kawasaki; Mihoko Iwasaki, Yokohama; Hiroyuki Maezawa, Tama; Yoshimitsu Shindo, Chiba; Ryoji Eguchi, Kawasaki; Hirokazu Mimura, Yokohama; Noriyuki Takahashi, Sakai, and Tetsuo Tanaka, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Keiyo Engineering Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 613,166

Claims priority, application Japan, Nov. 16, 1989, 1-299060; Mar. 16, 1990, 2-64253

Int. Cl.[5] **G06F** *1/00*

U.S. Cl. 364—419 **27 Claims**

1. In a data processing system comprising a processor, an input unit, a display unit and a memory, wherein a document is made in such a manner that a document format having at least one field is displayed on said display unit and information including at least one of text and graphics is generated by said processor and is written into the field of said document format responsive to an editing instruction input via said input unit by a user, a supporting method for making said document, the supporting method comprising the steps of:

designating by the user at least two document formats;

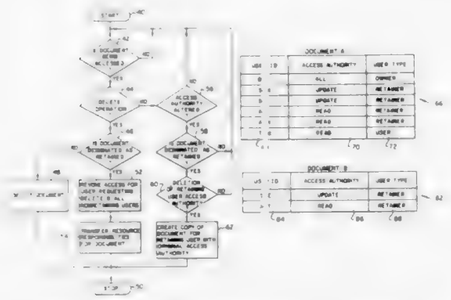
inputting via said input unit into said data processing system a format relation between said at least two document formats designated by the user;

making said document based on one of said at least two document formats;

searching, by using said format relation, another document format which is related to said one document format from which said document was made;

making another document based on said another document format;
generating, by the processor, a document relation between said document and said another document; and,
storing said document relation in said memory.

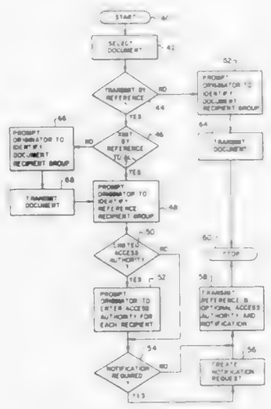
5,144,556
METHOD AND SYSTEM FOR RETAINING ACCESS TO DELETED DOCUMENTS IN A DATA PROCESSING SYSTEM
Diana S. Wang, Trophy Club, and Marvin L. Williams, Lewisville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 7, 1990, Ser. No. 534,814
Int. Cl.[5] G06F *15/38, 15/00*
U.S. Cl. 364—419 10 Claims



1. A method in a data processing system for efficiently managing access to a plurality of documents stored therein which are owned by at least one user and accessible by multiple users within said data processing system said method comprising the steps of:
permitting a user to designate selected documents as retained documents for that user;
determining if a particular document has been designated as a retained document by said user in response to an attempted deletion of that document; and
deleting access authority to said particular document for all users other than those users who have designated said particular document as a retained document in response to said attempted deletion of said particular document.

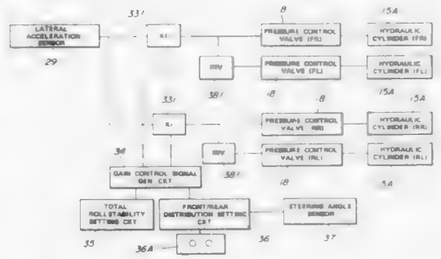
5,144,557
METHOD AND SYSTEM FOR DOCUMENT DISTRIBUTION BY REFERENCE TO A FIRST GROUP AND PARTICULAR DOCUMENT TO A SECOND GROUP OF USER IN A DATA PROCESSING SYSTEM
Diana S. Wang, Trophy Club, and Marvin L. Williams, Lewisville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 13, 1990, Ser. No. 566,734
Int. Cl.[5] G06F *15/38, 15/40*
U.S. Cl. 364—419 12 Claims

1. A method in a data processing system having a plurality of users enrolled therein, and a plurality of documents stored therein, for permitting the efficient access of documents within said data processing system, said method comprising the steps of:
selecting a particular document within said data processing system;
creating an identifying reference for said particular document within said data processing system, said identifying reference including at least a location within said data processing system wherein said particular document is stored;
identifying a first group of users
identifying a second group of users; and,
transmitting said identifying reference to all of said first group of users within said data processing system while transmitting said particular document to all of said second



group of users within said data processing system wherein selected ones of said first group of users may elect to access said particular document in response to receipt of said identifying reference.

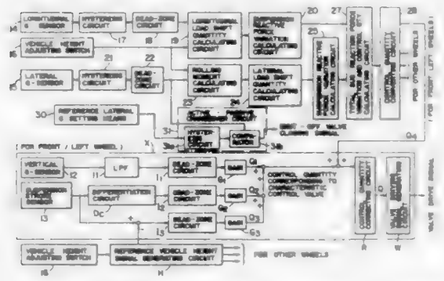
5,144,558
ACTIVELY CONTROLLED AUTOMOTIVE SUSPENSION SYSTEM WITH ADJUSTABLE ROLLING-STABILITY AND/OR PITCHING-STABILITY
Naoto Fukushima; Hirotsugu Yamaguchi; Yohsuke Akatsu, and Sunao Hano, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Continuation of Ser. No. 455,792, Dec. 20, 1989, abandoned, which is a continuation of Ser. No. 61,368, Jun. 15, 1987, abandoned. This application Feb. 21, 1991, Ser. No. 657,946
Claims priority, application Japan, Jun. 13, 1986, 61-137875
Int. Cl.[5] B60G *17/00*
U.S. Cl. 364—424.05 14 Claims



13. An actively controlled suspension system for an automotive vehicle comprising:
front pressure means disposed between a front portion of a vehicle body and a front suspension member supporting a front road wheel, said front pressure means including a variable pressure chamber varying pressure of a working fluid therein for adjusting relative displacement between the vehicle body and the front suspension member;
rear pressure means disposed between a rear portion of the vehicle body and a rear suspension member supporting a rear road wheel, said rear pressure means including a variable pressure chamber varying pressure of a working

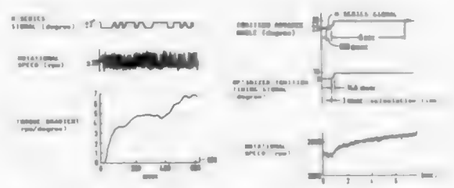
fluid therein for adjusting relative displacement between the vehicle body and the rear suspension member;
longitudinal acceleration determining means which determines longitudinal acceleration acting on the vehicle body to cause pitching motion of the vehicle body and providing a signal indicative thereof;
a controller responsive to the signal from said longitudinal acceleration determining means to amplify it with a preselected gain to provide first and second control signals to said front and rear pressure chambers respectively to adjust the pressure of the working fluid in the variable pressure chambers to suppress the pitching motion of the vehicle body; and
a gain selector which manually changes magnitude of said gain.

5,144,559
SYSTEM FOR CONTROLLING ACTIVE SUSPENSIONS OF A VEHICLE
Katsuyoshi Kamimura, Tochigi; Atsushi Mine, and Yutaka Hiwatashi, both of Gunma, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 18, 1990, Ser. No. 559,748
Claims priority, application Japan, Jun. 22, 1989, 1-160029
Int. Cl.[5] B60G *17/00*
U.S. Cl. 364—424.05 5 Claims



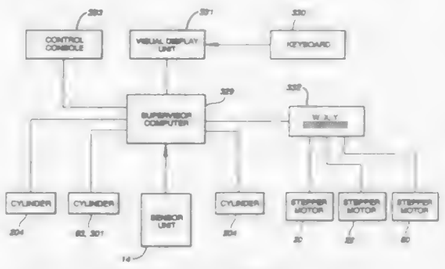
1. A system for controlling active suspensions of a vehicle, having fluid suspensions provided for respective wheels, means for charging and discharging a fluid into and out of the respective fluid suspensions to extend and contract the suspensions independently, a lateral G-sensor provided in the vehicle for detecting lateral acceleration of the vehicle, and a controller responsive to an acceleration signal from the G-sensor for adjusting said charging and discharging means so as to control the amount of the fluid to be charged and discharged to maintain the vehicle attitude in a desired state,
said system comprising:
means for setting a reference lateral acceleration;
changeover means for producing a closing signal when the detected lateral acceleration exceeds the reference lateral acceleration; and
shut-off means responsive to the closing signal for sealing the fluid in the fluid suspensions to change the fluid suspensions from an active state to a passive state.

5,144,560
CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR
Nobuo Kurihara, Hitachiohta; Masayoshi Kaneyasu, Hitachi, and Junichi Ishii, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 12, 1990, Ser. No. 492,596
Claims priority, application Japan, Mar. 10, 1989, 1-056487
Int. Cl.[5] F02P *5/00, 5/15*
U.S. Cl. 364—431.04 20 Claims



18. A method of correcting an internal combustion engine parameter which is susceptible to electrical noise including the steps of combining said parameter with a search signal having a binary amplitude value and an impulse-type self correlation function, digitally filtering the combined signal to provide a correcting signal and controlling said engine with said correcting signal.

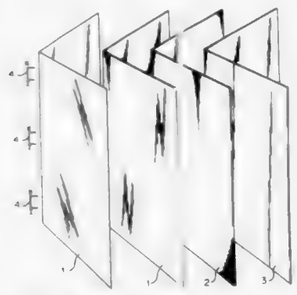
5,144,561
APPARATUS FOR SENSING A LENS BLANK AND A MACHINE INCLUDING SUCH APPARATUS
Peter H. H. Soper, Rugby, England, assignor to S. Jones-Robinson & Co., Gloucester, England
PCT No. PCT/GB88/00284, § 371 Date Nov. 3, 1989, § 102(e) Date Nov. 3, 1989, PCT Pub. No. WO88/08159, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 14, 1988, Ser. No. 424,255
Claims priority, application United Kingdom, Apr. 15, 1987, 8709117
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.35 27 Claims



1. Apparatus for sensing a lens blank, comprising:
a holder for a lens blank;
a carriage;
means for effecting relative movement between the carriage and holder toward and away from one another;
first sensor means, mounted on said carriage, arranged to sense a peripheral edge of a lens blank carried by said holder;
second sensor means, mounted on said carriage, arranged to sense surface portions of the lens blank inboard of said peripheral edge;
said second sensor means including a plurality of probes

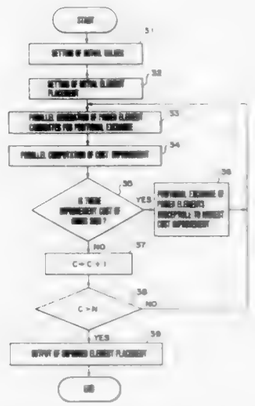
movably mounted on the carriage and engageable with different spaced inboard surface portions of the lens blank;
means for sensing relative displacement between each said probe and said carriage and providing output signals indicative of said displacement and
signal processing means for receiving said output signals.

5,144,562
SYSTEM FOR COLLATING AND BINDING SIGNATURES TO PRODUCE CUSTOMIZED BOOKS OR MAGAZINES
Simon G. Stikkelorum, Roemlaan 21, 5237 EA 's-Hertogenbosch, and Albertus G. C. Jasper, Luthlisingel 28, 4105 GA Culemborg, both of Netherlands
Filed Mar. 28, 1990, Ser. No. 501,921
Claims priority, application Netherlands, Mar. 29, 1989, 8900772
Int. Cl.[5] G06F *15/20*, B65H *39/02*
U.S. Cl. 364—478 **9 Claims**



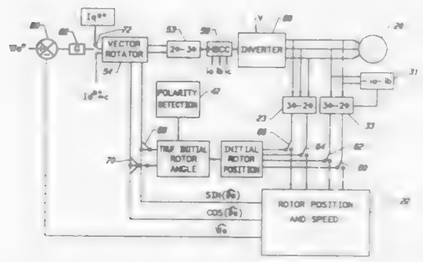
1. System for collating and binding signatures to produce customized versions of books or magazines, comprising a conveyer running along a number of workstations, said workstations including at least one number of the following stations:
a number of feeder stations for feeding one signature to said conveyer to form a collation of signatures,
a number of printer stations for printing a predetermined text on the upper signature of the collation passing the station on said conveyer,
a stitching station for binding the collated signatures on the conveyer to obtain a book or magazine,
a number of checkpoints, one for each of the said stations, for checking the correct functioning of the respective station,
a reject station downstream of said station for removing defective books or magazines
a computer system for receiving data from a source of data relating to the embodiment of each book or magazine to be produced and information relating to the functioning of the various stations and for transferring control messages to said various stations, characterized in that, said computer system comprises
a number of controllers, one for each of said stations, each controller receiving information from the checkpoint assigned to the same station and outputting commands to the respective station to control the functioning thereof,
a central processor for receiving the data from said data source and for generating control messages to each of the controllers,
a communication network to which all controllers as well as the central processor are connected by uniform connecting means to transfer information about the functioning of the various stations from the controllers to the central station,
whereby during operation of the system each controller is loaded with suitable software enabling the controller to control the functioning of the assigned station independent of the other controllers and whereby the transfer of a message indicating the malfunctioning of one of said stations from the respective controller to the central processor will cause the central processor to send a message to the printer stations, feeder stations and stitching station downstream of the station in which the malfunctioning occurred instructing these stations to stop the further production of the book or magazine influenced by said malfunctioning, to send a message to the reject station to reject said non-completed book or magazine and to send messages to all stations to update the data defining the magazines or books to be produced such that a replacement for the rejected non-completed book or magazine will be produced.

5,144,563
METHOD AND APPARATUS FOR OPTIMIZING ELEMENT PLACEMENT AND METHOD AND APPARATUS FOR DECIDING THE OPTIMAL ELEMENT PLACEMENT
Hiroshi Date, and Terumine Hayashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 13, 1990, Ser. No. 492,906
Claims priority, application Japan, Mar. 16, 1989, 1-62215
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—491 **8 Claims**



1. A method of optimizing an element placement including a number of elements which correlate to one another by exchanging appropriately positions of said elements with the aid of a parallel computer system including a plurality of central processing units (CPUs), the method comprising the steps of:
establishing the initial placement for a number of elements;
selecting a number of pairs of elements at random, said number being a number of said CPUs which are employed;
determining a value of cost improvement expected to be brought about by exchange of the paired elements for each of said pairs by said number of CPUs;
exchanging positions of the paired elements only for a pair in which the cost improvement value determined at said determining step is a maximum or exceeds a given threshold value;
executing repeatedly said selecting to said exchanging steps for a predetermined number of times; and
outputting information indicating an optimal element placement of said elements by executing repeatedly said exchanging step while increasing the number of CPUs until a predetermined number of CPUs are employed.

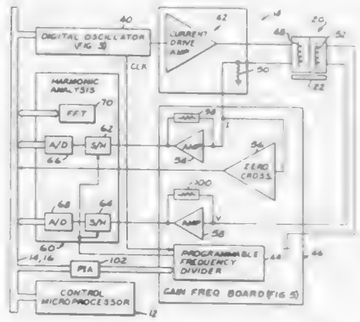
5,144,564
ROTOR POSITION ESTIMATION OF A PERMANENT MAGNET SYNCHRONOUS-MACHINE FOR HIGH PERFORMANCE DRIVE
Malakondaiah Naidu, Utica, Mich., and Bimal K. Bose, Knoxville, Tenn., assignors to University of Tennessee Research Corp., Knoxville, Tenn.
Filed Jan. 8, 1991, Ser. No. 638,691
Int. Cl.[5] H02P *1/04*
U.S. Cl. 364—494 **8 Claims**



5. A controller for a permanent magnet synchronous machine having at least three stator windings, comprising in combination:
a) first means for determining the rotational state of a rotor of said machine to generate a zero rotation state signal;
b) second means responsive to said zero rotation state signal to selectively apply electrical signals to said rotor such that said rotor remains stationary and for measuring the voltage applied to and the currents flowing in said stator windings to produce first voltage and first current signals;
c) third means selectively responsive to said first voltage and first current signals to generate a rotor position signal;
d) fourth means responsive to a second voltage applied to and the currents flowing in said stator winding to generator a rotor velocity signal; and
d) fifth means responsive to said rotor position and rotor velocity signals to control said second voltage applied to said stator windings to cause said rotor to rotate in a desired direction and at a desired velocity.

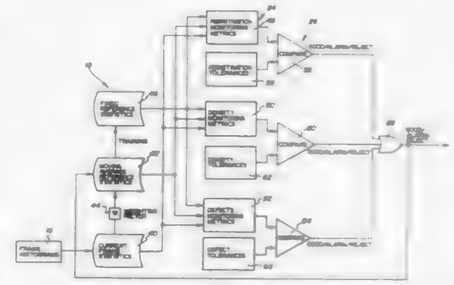
5,144,565
MEASUREMENT OF METALLURGICAL PROPERTIES IN FERROMAGNETIC TEST PARTS
Gordon R. Brown, Livonia, and Thomas C. Targosz, Oak Park, both of Mich., assignors to K. J. Law Engineers, Inc., Novi, Mich.
Filed Mar. 26, 1990, Ser. No. 499,980
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—507 **23 Claims**

1. Apparatus for measuring a preselected property of a test piece that comprises:
oscillator means for providing a periodic signal, including means for selectively varying frequency of said periodic signal,
means for applying said periodic signal to a test piece to generate eddy currents therein,
means responsive to said eddy currents generated in the test piece for providing a test signal, which is indicative of said preselected property, and
digital processing means including means coupled to said oscillator means for generating said periodic signal at said oscillator means at successive first and second differing test frequencies, means responsive to said test signal at each said test frequency for separating at least two harmonic components of said test signal, means responsive to amplitude and phase information of said harmonic components at both said frequencies for determining said preselected property of the test piece, and means for compensating said test signal against variations in said periodic



signal by dividing amplitude of said test signal by amplitude of said periodic signal.

5,144,566
METHOD FOR DETERMINING THE QUALITY OF PRINT USING PIXEL INTENSITY LEVEL FREQUENCY DISTRIBUTIONS
John K. Anderson, Garland; Michael S. Andrews; Robert S. Briggs, Jr., both of Richardson, and David M. Keathly, Dallas, all of Tex., assignors to Comar, Inc., Richardson, Tex.
Filed Jun. 14, 1990, Ser. No. 538,202
Int. Cl.[5] G06F *15/20*; G06K *9/66*
U.S. Cl. 364—552 **6 Claims**



1. A method for determining the quality of print in a printing press operation, the printing press operating to print a plurality of copies of material on a moving web, the method determining the print quality of the plurality of the copies of the material on the moving web, comprising the steps of:
providing an optical scanner having an illumination level for illuminating said moving web;
continuously moving said web past said optical scanner;
optically scanning an area of each of said plurality of copies of the material printed on said moving web as the copies are being printed by said printing press to obtain image data representing picture elements having variable intensity levels;
dividing said optically scanned areas into a plurality of subareas;
counting said number of picture elements at a particular intensity level for each of said plurality of subareas to thereby generate a frequency distribution of the intensity levels for each of said plurality of subareas for each of said plurality of copies of the material printed on said moving web scanned by said scanner within a predetermined time period;

generating a reference frequency distribution based upon one of said plurality of subareas for one of said plurality of copies of the material printed on said moving web within said predetermined time period

storing said reference frequency distribution;

comparing said stored reference frequency distribution to each of said frequency distributions for each of said subareas on each of said plurality of copies of the material printed on said moving web to generate an output determinative of whether each of the plurality of copies is satisfactory when compared to said one of said plurality of copies within said predetermined time period;

generating an average frequency distribution based upon said plurality of copies of the material scanned by said scanner within said predetermined time period;

storing said average frequency distribution; and

comparing said stored average frequency distribution to the frequency distribution of a copy of the material printed on said moving web next scanned by said scanner after said predetermined time period to generate an output determinative of whether said next scanned copy is satisfactory when compared to said plurality of copies of the material printed on said moving web and scanned within said predetermined time period.

5,144,567

PROGRAMMABLE PLUG AND CABLE FOR COMPUTER KEYBOARDS

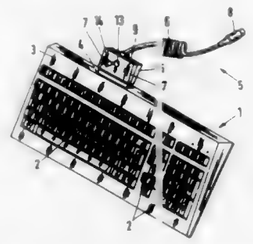
Jürgen Oelsch, Hohenroth; Gerhard Hochgesang, Bad Neustadt-/Saale; Rudolf Limpert, Salz, and Dieter Weber, Stockheim, all of Fed. Rep. of Germany, assignors to Preh-Werke GmbH & Co. KG, Bad Neustadt/saale, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 315,927

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 8802507[U]

Int. Cl.[5] G06F *3/023;* **H03M** *11/00*

U.S. Cl. 364—708 **9 Claims**



1. A data input device for an electronic data processing device comprising:

an input keyboard without keyboard encoder electronics comprising a key field including a plurality of keys, a casing and a plug-in receptacle for a keyboard plug; and

means for connecting the input keyboard to the electronic data processing device, said means for connecting comprising:

the keyboard plug, a circuit connector comprising a connection wire, a plug at an end of the connection wire connecting with the electronic data processing device, and programmable encoder electronics, located within the keyboard plug, for encoding unique signals corresponding to each key in the key field on the keyboard,

said encoder electronics, comprising a reprogrammable program memory in which is encoded a program relating the keyboard and the electronic data processing device.

5,144,568

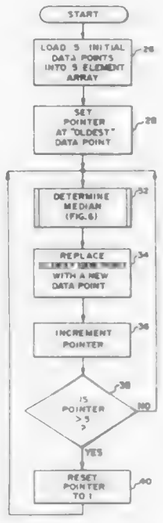
FAST MEDIAN FILTER

J. Howard Glover, Kirkland, Wash., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 53,873, May 26, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,912

Int. Cl.[5] G06F *7/38, 15/31*

U.S. Cl. 364—715.01 **5 Claims**



1. A median filter for continuously determining the median of a time varying signal and providing a time varying signal representative of the media, comprising:

means for continuously received data points representative of said time varying signal;

means including an array having N data positions coupled to said receiving means for serially storing N data points, said storing means including means for identifying the oldest one of the stored data points;

means including a counter coupled to said storing means for successively comparing each one of said N stored data points with each of the other N−1 stored data points and either incrementing or decrementing a counter depending upon whether said one data point is greater than or less than the data point with which it is being compared, wherein said counter is neither incremented nor decremented if the data points being compared are equal, said comparing means including means for initializing said counter prior to comparing each successively compared data point with said other data points;

means responsive to a count in said counter resulting from said incrementation and decrementation thereof for providing an indication that the current one of said N data points being compared with the others is the median when the count indicator indicates that the counter has been incremented and decremented an equal number of times;

means operative when there is no count indicative that the counter has been incremented and decremented an equal number of times responsive to counts produced by each one of said data points for selecting the data point corresponding to a count representative of a smallest difference in the number of times the counter has been incremented as the median; and

means for providing an electrical signal representative of said media.

5,144,569

METHOD FOR FILTERING DIGITIZED SIGNALS EMPLOYING ALL-PASS FILTERS

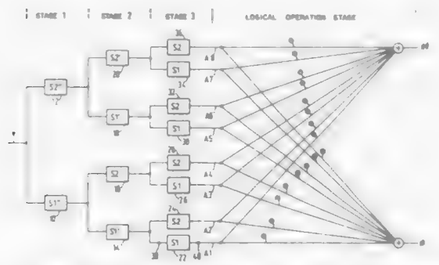
Ingo Kunold, Borchen, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Jul. 5, 1990, Ser. No. 548,124

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922469

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—724.01 **9 Claims**



1. A method for filtering a digitized input signal employing a plurality of all-pass filters of a first class and a plurality of all-pass filters of a second class and including all-pass filters of the first class and of the second class and of a predetermined lowest order and all-pass filters of the first class and of the second class and of at least one higher order derived by frequency transformation from filters of the lowest order, the method comprising the steps of:

feeding the input signal to an all-pass filter of the first class and a highest order and to an all-pass filter of the second class and of the highest order;

feeding the output of each filter of a selected higher order to an all-pass filter of the first class and of a next lower order below the selected higher order and to an all-pass filter of the second class and of the next lower order;

executing the step of feeding the output of each filter of a selected higher order to an all-pass filter of the first class and of a next lower order and to an all-pass filter of the second class of the next lower order until reaching all-pass filters of the predetermined lowest order; and

combining the outputs of the filters of the predetermined lowest order to generate a filter output signal.

5,144,570

NORMALIZATION ESTIMATOR

Robert D. Maher, III, Carrollton, Tex., assignor to Cyrix Corporation, Richardson, Tex.

Division of Ser. No. 388,659, Aug. 2, 1989, Pat. No. 5,040,138. This application Jun. 17, 1991, Ser. No. 716,560

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

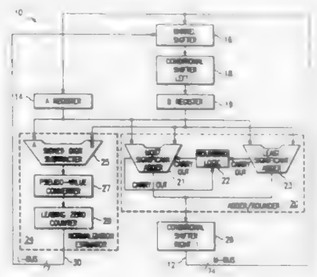
Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—715.04 **11 Claims**

1. A normalization circuit for normalizing a result of an arithmetic operation performed on a first and second operands by a computational circuit, comprising:

a signed digit subtracter operable to subtract the first operand from the second operand, and output a difference;

a pseudovalue converter having an input coupled to said output of said signed digit subtracter, said pseudovalue converter operable to convert said difference into pseudovalue; and



a leading zero counter coupled to receive said pseudovalue and operable to count the number of leading zeroes in said pseudovalue.

5,144,571

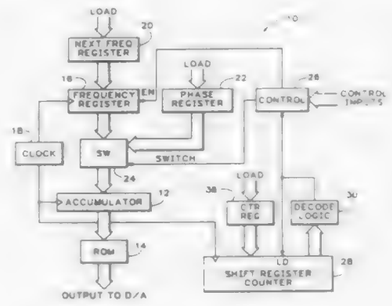
DIRECT DIGITAL SYNTHESIZER WITH FEEDBACK SHIFT REGISTER

Tran Thong, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Continuation of Ser. No. 615,768, Nov. 19, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 841,784

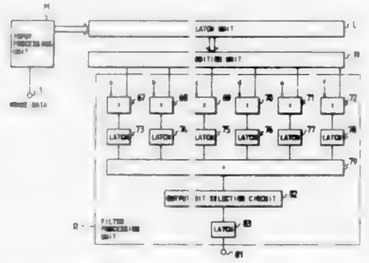
Int. Cl.[5] G06F *1/02*

U.S. Cl. 364—721 **3 Claims**



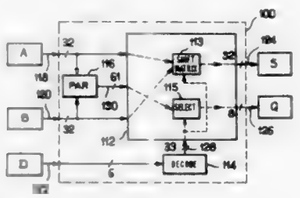
1. A direct digital synthesizer for generating an output waveform from a digital waveform stored in a memory that is addressed by the output of an accumulator adding a programmable index value to the output of the accumulator for each cycle of a reference clock, the output waveform having selected frequency/phase characteristics according to the value of the programmable index value and the programmable index value being derived from one of two selectable index registers, further comprising means for generating from the reference clock a control signal for changing the programmable index value to effect a phase change for the output waveform by selecting the other index register within one cycle of the reference clock and selecting the first index register within the next cycle of the reference clock.

5,144,572
DIGITAL FILTER FOR FILTERING IMAGE DATA
Yoshinori Awata, and Noriaki Tsuchiya, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Sep. 25, 1990, Ser. No. 588,035
Claims priority, application Japan, Oct. 2, 1989, 1-257372
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.05 3 Claims



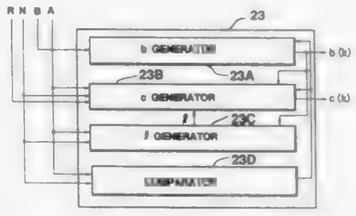
1. A digital filter for filtering digital image data, comprising:
input means for receiving digital image data having a predetermined format;
means for establishing a plurality of digital filter constants having different values, said different values being expressed in a selected common binary format;
processing means employing said digital filter constants for calculating a corresponding binary value of the received digital image data;
selecting means for selecting respective different value for each one of the plurality of digital filter constants and for selecting the common binary format for the digital filter constants; and
output selection means for selecting a desired portion of said corresponding binary value, wherein said desired portion is determined by the selected common binary format for the digital filter constants, and for expressing said desired portion in the predetermined digital image data format.

5,144,573
BARREL SHIFTER WITH PARITY BIT GENERATOR
Alain Greiner, Paris, France, assignor to Bull S.A., Paris, France
Filed Dec. 5, 1990, Ser. No. 622,761
Claims priority, application France, Dec. 7, 1989, 89 16174
Int. Cl.[5] G06F *5/01, 11/10*
U.S. Cl. 364—738 13 Claims



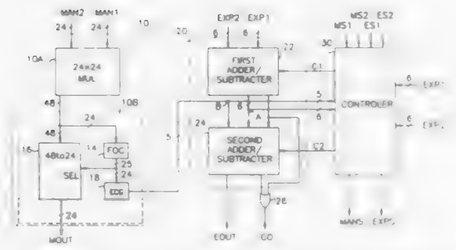
1. A barrel shifter comprising:
a decoding circuit for providing a plurality of selection signals;
means (113) for supplying, responsive to the plurality of selection signals coming from the decoding circuit (114), an output word composed of M consecutive bits extracted from a basic input word of N1 bits;
means (116) for forming a parity word composed of the parity bits corresponding to respective groups of n consecutive bits that can be obtained by partitioning the basic word; and
selection means (115), respective to the means for forming a parity word, and controlled by said selection signals to produce the parity bits of the groups of n consecutive bits that constitute the output word (n being a divisor of M).

5,144,574
MODULAR MULTIPLICATION METHOD AND THE SYSTEM FOR PROCESSING DATA
Hikaru Morita, Hichiohji, Japan, assignor to Nippon Telegraph and Telephone Corp., Japan
Continuation of Ser. No. 471,787, Jan. 29, 1990, Pat. No. 5,073,870. This application Jul. 16, 1991, Ser. No. 730,602
Claims priority, application Japan, Jan. 30, 1989, 1-17700; Jun. 9, 1989, 1-147795; Aug. 11, 1989, 1-206973
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—746 21 Claims



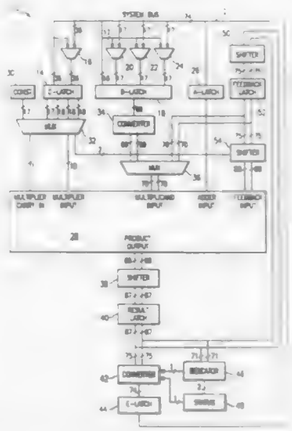
1. A method of executing a modular multiplication of A×B modulo N by a cryptographic data processing computer system provided with registers, an arithmetic unit, and a controller for controlling computational operations of variables stored in the registers by the arithmetic unit, where A denotes a multiplicand stored in a first register, B denotes a multiplier stored in a second register, and N denotes a modulus stored in a third register, which comprises the steps of:
(a) transforming A from A∈[0, N] to A∈[−N/2, N/2] by the arithmetic unit, where ∈ denotes a set of integers obtained by the arithmetic unit;
(b) setting the number of bits n of each variable of A, B or N by the controller;
(c) initializing a remainder R by the controller;
(d) determining the number of repeated processing stages k as k← n/r′ +1 by the controller where r denotes a radix number r=2^r (r′≧1); n/r′ denotes a maximum integer less than n/r′; and ← denotes a substitution;
(e) updating a partial remainder R and forming a partial multiplier b and a partial quotient c both within a range of −r/2≦b, c≦r/2 by a carry save adder in the arithmetic unit;
(f) progressing a present stage (k) as k←k−1 by the controller;
(g) checking whether the present stage (k) is zero by the controller;
(h) if the stage (k) is not zero, returning to the above step (e) by the controller; and
(i) if the stage (k) is zero, transforming a final partial remainder R into a solution of A×B modulo N by a carry propagation adder in the arithmetic unit.

5,144,575
HIGH SPEED FLOATING POINT TYPE MULTIPLIER CIRCUIT
Ho-sun Jeong, and Sang-jin Lee, both of Taegu, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea
Filed Nov. 21, 1990, Ser. No. 617,029
Claims priority, application Rep. of Korea, Apr. 19, 1990, 90-5491
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 8 Claims



1. A high-speed floating point multiplier circuit for multiplying two k(×m+n) bit binary numbers to generate a third k bit binary number, each binary number having an m bit exponent portion consisting of a 1 bit exponent sign portion and an (m−1) bit exponent portion, and an n bit mantissa portion consisting of a 1 bit mantissa sign portion and an (n−1) bit mantissa portion, said circuit comprising:
a multiplier for inputting in parallel the (n−1) bit mantissa portions of each of said two binary numbers and outputting a 2(n−1) bit multiplication result in response thereto;
binary point processing means for sequentially selecting (n−1) bits following a first non-zero most significant bit position, said first non-zero most significant bit position being selected from one of the higher ordered (n−1) bits of said 2(n−1) bit multiplication result, the sequentially selected (n−1) bits defining the mantissa portion of said third binary number, and said binary point processing means generating an exponent value defining an exponent portion of said 2(n−1) bit multiplication result in response to said first non-zero most significant bit position;
a first adder/subtracter for inputting in parallel the (m−1) bit exponent portions of said two binary numbers and outputting an (m−1) bit operation result in response to a first control signal and said (m−1) bit exponent portions;
a second adder/subtracter for receiving the (m−1) bit operation result from said first adder/subtracter, the exponent value generated by said binary point processing means and a second control signal, and outputting an (m−1) bit exponent result defining an exponent portion of said third binary number in response thereto; and
control means for inputting 1 bit exponent sign portions of said two binary numbers for generating said first control signal, and inputting 1 bit mantissa sign portions and (m−1) bit exponent portions of said two binary numbers, the (m−1) bit exponent result from said first adder/subtracter, and the exponent value generated by said binary point processing means, and outputting in response thereto the second control signal, and a 1 bit exponent sign portion and a 1 bit mantissa sign portion defining the respective portions of said third binary number.

5,144,576
SIGNED DIGIT MULTIPLIER
Willard S. Briggs, Carrollton, and David W. Matula, Dallas, both of Tex., assignors to Cyrix Corporation, Richardson, Tex.
Filed Sep. 5, 1989, Ser. No. 402,798
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—754 16 Claims



1. An arithmetic circuit, comprising:
a first register for storing a first operand;
a second register for storing a second operand;
a multiplier circuit having first and second inputs respectively coupled to said first and second registers, said multiplier circuit operable to generate and output a result comprising a product of said first and second operands in signed digit format, said product always being exact;
a data path coupling said output of said multiplier to said second input of said multiplier; and
a multiplexer circuit disposed in said data path, said multiplexer having a first input coupled to said second register, a second input coupled to said output of said multiplier circuit and an output coupled to said second input of said multiplier circuit,
wherein said multiplexer circuit is operable to select one of said signed digit result and said second operand to be input into said multiplier circuit, and said multiplier circuit is operable to use said signed digit result as an operand of a multiplication operation without converting said signed digit result to a non-redundant format; and
a first adder input into said multiplier circuit operable to receive a third operand, said multiplier circuit operable to generate a sum of said product and said third operand in a single pass through said arithmetic circuit.

5,144,577
TWO-SUM COMPARATOR
Gerhard Linnenberg, Mering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Feb. 27, 1991, Ser. No. 661,221
Claims priority, application European Pat. Off., Mar. 20, 1990, 90105265.4
Int. Cl.[5] G06F *7/02, 7/50*
U.S. Cl. 364—769 3 Claims

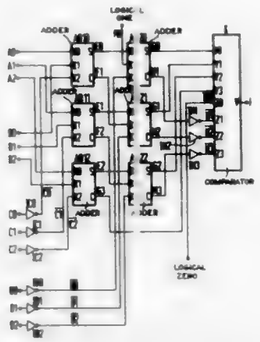
3. A circuit arrangement for comparing a sum of first and second binary numbers to a sum of third and fourth binary numbers, each of said first, second, third and fourth binary numbers having n-places having significances of least significance to most significance, comprising:

means for inverting the third binary number to provide an inverted third binary number;

means for inverting the fourth binary number to provide an inverted fourth binary number;

means for adding corresponding significant places of the first, second and inverted third binary numbers to produce first result and first carry bits of least to most significant places;

means for forming a fifth binary number from the first result and first carry bits by adding respective first result bits, first carry bits, except for a most significant carry bit, that are more significant by one place than associated first result bits, and the inverted fourth binary number, a logical one being provided for a least significant place with the first carry bits, the means for forming the fifth binary number providing second result and second carry bits, the



second result bits being the least through more significant places, that is one place less than a most significant place of the fifth binary number, and the most significant place of the fifth binary number being the most significant first carry bit of the means for adding corresponding significant places of the first, second and inverted third binary numbers;

means for forming a sixth binary number by inverting the second carry bits and a logical one, the inverted logical one being a least significant place of the sixth binary number;

means for comparing respective significant places of the fifth and sixth binary numbers to provide a result indicative of one of a greater-than comparison, a smaller than comparison or an equal-to comparison of a sum of the first and second binary numbers and a sum of the third and fourth binary numbers.

5,144,578

SEMICONDUCTOR DEVICE HAVING MULTIPLE SUPPLY POTENTIAL PATHS FOR REDUCING ELECTRICAL INTERFERENCE BETWEEN CIRCUITS CONTAINED THEREIN

Masahiko Sakagami, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 30, 1989, Ser. No. 358,610

Claims priority, application Japan, May 27, 1988, 63-130690

Int. Cl.[5] G11C *5/06*; H01L *21/00*

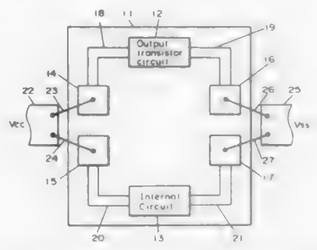
U.S. Cl. 365—63 6 Claims

1. A semiconductor device comprising:

a first wiring and a first wire bonding pad for feeding a supply potential to a first circuit block composed on a semiconductor substrate;

a second wiring and a second wire bonding pad for feeding said supply potential to a second circuit block, excluding said first circuit block composed on said semiconductor substrate;

a third wiring and a third wire bonding pad for feeding a grounding potential to said first circuit block; and



a fourth wiring and a fourth wire bonding pad for feeding said grounding potential to said second circuit block, thereby reducing electrical interference between said first and second circuit blocks.

5,144,579

SEMICONDUCTOR MEMORY DEVICE AND ITS FABRICATING METHOD

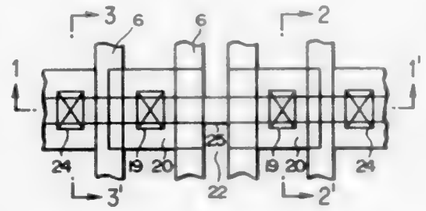
Naoko Okabe, Yokohama; Satoshi Inoue, Kawasaki; Kazumasa Sunouchi, Yokohama; Takashi Yamada, Kawasaki; Akihiro Nitayama, Kawasaki, and Hiroshi Takato, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 7, 1990, Ser. No. 578,608

Claims priority, application Japan, Sep. 8, 1989, 1-233815; Mar. 30, 1990, 2-84372

Int. Cl.[5] G11C *13/00, 11/24*

U.S. Cl. 365—149 9 Claims



1. A semiconductor memory device comprising:

a MOSFET including a gate electrode and source and drain regions of a second electrical conductivity type impurity material formed in a surface of a semiconductor substrate of a first electrical conductivity type material;

a bit line connected to one of the source and drain regions of said MOSFET through a bit line contact hole made in an insulating film covering the surface of said substrate on which the MOSFET is formed; and

a capacitor including a storage node electeode formed over a region where said MOSFET is formed, a capacitor insulating film and a plate electrode sequentially formed on said storage node electrode layer to be connected to another of said source and drain regions through a storage node contact hole made in said insulating film,

wherein at least one of said storage node contact hole and bit line contact hole includes a first contact hole made in a first inter-layer insulating film formed over said gate electrode and a second contact hole made in a second inter-layer insulating film formed over an electrically conductive layer embedded in said first contact hole up to a level higher than the gate electrode such as to be contacted with said electrically conductive layer.

5,144,580

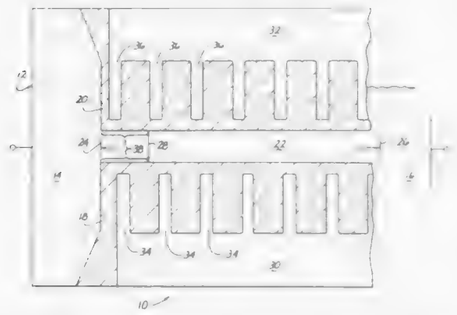
QUANTUM WIRE CCD CHARGE PUMP

Qian Niu, Goleta, and Klaus Ensslin, Santa Barbara, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Aug. 21, 1990, Ser. No. 570,904

Int. Cl.[5] H01L *29/796*

U.S. Cl. 365—149 21 Claims



1. An electrical apparatus including a constant current source for supplying a constant current to an output element, said constant current source comprising:

a semiconductor substrate having defined therein an elongated channel for conduction of charge carriers, said elongated channel being a quantum wire defined by barriers confining the charge carriers to the channel in directions normal to the direction of elongation, and being sufficiently thin as measured between the barriers that, at the temperature of operation of the device, one or more discrete energy levels for the charge carriers in said conductive channel resulting from quantum mechanical size effects are produced and charge carriers in said channel are confined to a group of one or more of the lowest lying such discrete energy levels, so that no more than two charge carriers may occupy each level of said group of lowest lying discrete energy levels;

means for maintaining said substrate at a temperature such that charge carriers in said elongated channel are confined to said group of lowest lying discrete energy levels;

an input terminal at one end of said elongated channel for suppling charge carriers to said channel;

an output terminal at the other end of said elongated channel connected to said output element; and

control conductive elements spaced along the length of said elongated channel, said control conductive elements being connected in two sets so that elements of any one of said two set are spaced from other elements of the same set by one element of said other set, a pair of neighboring elements from said two sets forming a cell, said two sets of elements each being connected to a corresponding periodically varying voltage, said periodic varying voltages applied to each set being out of phase with said corresponding periodically varying voltage of said other set so that charge carriers introduced into said channel at said input end are transferred sequentially along said channel under the influence of said periodically varying voltages to said output end, with the current supplied to said output end equalling one or two electronic charges for each level of said group per cell for each complete cycle of said periodically varying voltages.

5,144,581

APPARATUS INCLUDING ATOMIC PROBES UTILIZING TUNNEL CURRENT TO READ, WRITE AND ERASE DATA

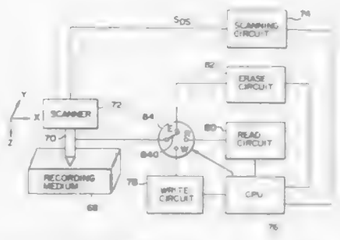
Akitoshi Toda, Kunitachi; Ryouhei Shimizu, Koshigaya; Hiroko Ohta, Hachioji; Hiroshi Kajimura, Tokyo; Yoshiyuki Mimura, Hachioji; Yasuo Isono, Fussa, and Toshihito Kouchi, Tama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1990, Ser. No. 471,854

Claims priority, application Japan, Feb. 9, 1989, 1-30340; Feb. 14, 1989, 1-32760

Int. Cl.[5] G11C *11/00, 13/00*; G11B *9/00*

U.S. Cl. 365—151 7 Claims



1. An apparatus comprising:

a rewritable recording medium having a large capacity recording region for storing information, said recording medium including a small capacity recording region for temporarily storing information;

probe means for writing and reading information to and from said recording medium, respectively;

scanning means for driving said probe means to vary a relative position between said probe means and said recording medium;

an information generator including means for generating information;

information writing means for changing a voltage applied between said probe means and said recording medium in according with said information from said information generator to write the information from said information generator in the small capacity recording region of said recording medium by means of said probe means;

information reading means for changing a voltage applied between said probe means and said recording medium to read out said information from the small capacity recording region of said recording medium by means of said probe means; and

control means for controlling a writing cycle of said information writing means and a reading cycle of said information reading means based on a selected arithmetic operation, and for controlling said scanning means.

5,144,582

SRAM BASED CELL FOR PROGRAMMABLE LOGIC DEVICES

Randy C. Steele, Southlake, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 30, 1990, Ser. No. 502,572

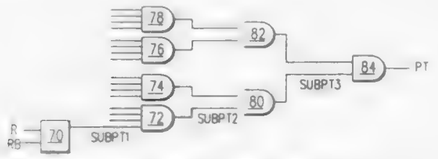
Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—189.08 17 Claims

1. A programmable logic device having a plurality of inputs and a plurality of outputs connected to an AND-OR array for defining logic functions to be performed by the device, comprising:

a plurality of SRAM cells arranged in a regular matrix for storing program information defining connections in the AND-OR array; and

logic gates connecting outputs from selected SRAM cells together to perform logic functions thereon, said logic



gates generating outputs which define product terms of the AND-OR array.

5,144,543

DYNAMIC SEMICONDUCTOR MEMORY DEVICE WITH TWISTED BIT-LINE STRUCTURE

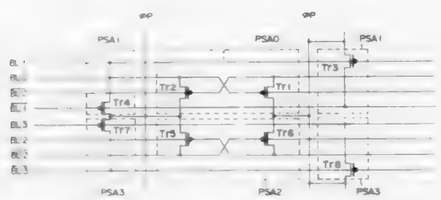
Yukihito Oowaki, Yokohama; Keiji Tsuchida, Kawasaki, and Daisaburo Takashima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 4, 1990, Ser. No. 461,121

Claims priority, application Japan, Jan. 9, 1989, 1-2452; Jan. 9, 1989, 1-2453; Jan. 9, 1989, 1-2454

Int. Cl.[5] G11C *11/00*

U.S. Cl. 365—206 **15 Claims**



1. A dynamic semiconductor memory device comprising:
bit line pairs;
word lines insulatively intersecting said bit lines;
memory cells provided at selected ones of intersecting points between said bit lines and said word lines;
sense amplifiers provide for said bit line pairs and having transistors; and
at least one of two neighboring bit line pairs of said bit line pairs being twisted at at least one position thereof to have a twisted crossing section which is formed using gate electrodes of said transistors included in a sense amplifier of said at least one bit line pair.

5,144,584

SEMICONDUCTOR MEMORY DEVICE

Yasuharu Hoshino, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

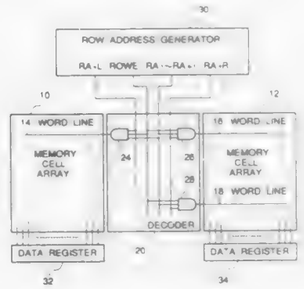
Filed Dec. 4, 1990, Ser. No. 622,067

Claims priority, application Japan, Dec. 4, 1989, 1-315802

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—222 **5 Claims**

1. A semiconductor memory device comprising:
a random memory cell array including a number of memory cells arranged in the form of a matrix and having a plurality of word lines and a plurality of digit lines so that access can be permitted to a selected memory cell by selecting one word line in accordance with a row address and also selecting one digit line in accordance with a column address, said random memory cell array being divided into first and second memory areas in such a manner that each of said word lines is divided into first and second portions and said digit lines are divided into a first group of digit lines and a second group of digit lines;
a data register means coupled to said digit lines of said random memory cell array in parallel for temporarily holding data read out onto the respective digit lines from selected memory cells;
a row address generator receiving an input row address and for generating a first row address signal designating a first row corresponding to said input row address, and a second row address designating a second row different from said first row; and



a controller means coupled to the first and second portions of each of said word lines, and responding to said first and second row address signals so as to cause to transfer to said data register means, data stored in the memory cells which are included in one row designated by said first row address signal and which belong to one of said first and second memory areas, and also so as to cause to refresh the memory cells which are included in one row designated by said second row address signal and which belong to the other of said first and second memory areas.

5,144,585

SUPPLY VOLTAGE CONVERTER FOR HIGH-DENSITY SEMICONDUCTOR MEMORY DEVICE

Dong-Sun Min; Chang-Hyun Kim, and Dae-Je Jin, all of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed May 31, 1989, Ser. No. 359,127

Claims priority, application Rep. of Korea, May 1, 1989, 1989-5792

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—226 **30 Claims**

28. A random access memory device comprising:
bit lines for transporting data signals to a plurality of memory cells;
sense amplifiers for amplifying the data signals transported in the bit lines; and

a supply voltage converter for generating an internal supply voltage lower than an external supply voltage, comprising:
first generating means for generating a constant reference voltage;
conductive output line for transferring said internal supply voltage;
second generating means for generating a first voltage proportional to said internal supply voltage transferred by said output line;
first power supplying part, activated by a given pulse, having a first differential amplifier for comparing said first voltage with said reference voltage and supplying a first amplified output voltage based on the output of the comparison and amplified in value;
first power component providing said internal supply voltage in response to said first output signal from said first differential amplifier;
second power supplying part, in a constant activation state, having a second differential amplifier for comparing said first voltage with said reference voltage and supplying a second output signal based on the output of the comparison and amplified in value; and
second power component providing said internal supply voltage in response to said second output signal of said second differential amplifier.

5,144,586

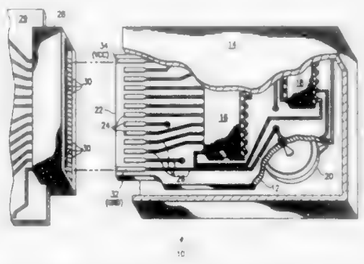
APPARATUS AND METHOD FOR CONNECTING ELECTRONIC MODULES CONTAINING INTEGRATED CIRCUITS AND BACKUP BATTERIES

Anthony B. Faraci, The Colony, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 290,825, Dec. 22, 1988, Pat. No. 4,985,870. This application Aug. 16, 1990, Ser. No. 568,933

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—226 **12 Claims**



12. An electronic module which can store data and which can be disconnected from and reconnected to an external circuit without loss of stored data, comprising:
a battery;
a CMOS integrated circuit memory;
a CMOS integrated circuit memory controller;
a housing which encloses said backup battery, said memory, and said memory controller;
a male connector
which extends outward from said housing, and
which has a plurality of conductive traces thereon,
first ones of said traces being connected to provide power and ground voltages to the module, and
second ones of said traces being connected to provide signal interfaces to and/or from the module, and
which is mechanically shaped to mate with female connectors of a substantially predetermined configuration, in such relation that, when said male connector is inserted, at least some ones of said first traces make contact to corresponding conductive elements of the female connector before any of said second traces make contact;
wherein said memory controller is
connected to receive power from said battery and also from said first ones of said traces, and also
connected to provide power to said memory.

5,144,587

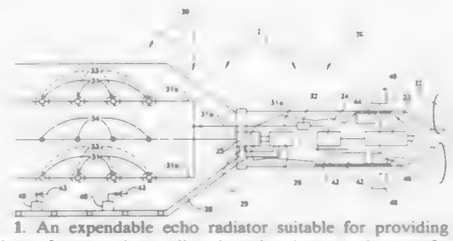
EXPENDABLE MOVING ECHO RADIATOR

Russell I. Mason, Glens Falls, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1991, Ser. No. 722,581

Int. Cl.[5] H04K *3/00*

U.S. Cl. 367—1 **23 Claims**



1. An expendable echo radiator suitable for providing a decoy for attracting or diverting a homing torpedo away from an intended target, comprising:
an expendable curtain having a collapsed configuration and an expanded configuration;
a capsule for housing said curtain in said collapsed configuration;
said curtain in its expanded configuration providing a profile similar to a profile of a marine vessel, thereby providing an echo radiator to decoy a homing torpedo from the intended target;
propulsion means for propelling the echo radiator through the ocean medium, said propulsion means comprising at least one propeller;
an electric motor mounted to said capsule for rotating said at least one propeller; and
an electro-chemical energy source mounted to said capsule and coupled to said motor for providing electrical energy thereto.

5,144,588

APPARATUS AND METHOD FOR USE IN MARINE SEISMIC SURVEYING

Otis A. Johnston, League City, and Rick A. Curto, Friendswood, both of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 568,248, Aug. 15, 1990. This application Jan. 3, 1991, Ser. No. 637,193

Int. Cl.[5] G01V *1/38*

U.S. Cl. 367—16 **5 Claims**

1. A seismic source system for use in marine seismic surveying, comprising:
(a) a seismic transmitter array having a plurality of transmitters placed in a spaced relation to each other, each said

transmitter adapted to produce a pressure pulse in a body of water;

(b) a floatation device having a front end, said floatation device containing a plurality of airtight sections in fluid communication with each other each said airtight section containing therein pressurized fluid, said floatation device pivotally connected to the transmitter array at a plurality of spaced apart locations in a manner such that when the seismic source system is placed in a body of water, the seismic transmitter array is suspended from the floatation device at a predetermined depth below the floatation device in the body of water;

(c) a hose bundle coupled to the seismic transmitter array for supplying a pressurized fluid to the transmitters and the airtight chambers; and

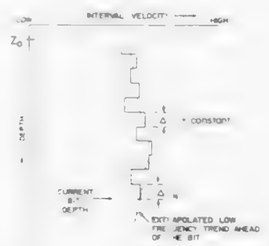
(d) a tow line connected to the front end of the floatation device for towing the seismic source system behind a vessel.

5,144,589

METHOD FOR PREDICTING FORMATION PORE-PRESSURE WHILE DRILLING

Bob A. Hardage, Sugarland, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jan. 22, 1991, Ser. No. 643,352
Int. Cl.[5] G01V *1/00*
U.S. Cl. 367—25 **2 Claims**



1. A method of generating an estimate of acoustic impedance as a function of depth in a formation in the region below a drill bit being utilized for drilling a well comprising,

utilizing seismic signals generated by the drill bit travelling directly from the drill bit to the surface to develop interval velocity data for the region of the formation through which the drill bit has drilled;

updating the interval velocity data as the well is drilled deeper;

estimating slowing varying changes in the formation acoustic impedance below the drill bit on the basis of low frequency changes in the interval velocity data for the formation in the region above the drill bit; and

correcting acoustic impedance data for the formation ahead of the drill bit derived from reflection seismic data by applying said estimated slowly varying changes in acoustic impedance to said acoustic impedance data.

5,144,590

BED CONTINUITY DETECTION AND ANALYSIS USING CROSSWELL SEISMIC DATA

Yu-Taik Chon, Houston, Tex., assignor to B P America, Inc., Cleveland, Ohio

Filed Aug. 8, 1991, Ser. No. 742,356
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—57 **14 Claims**

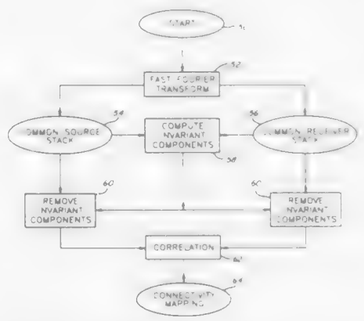
1. A method of determining continuity of subsurface formations between well boreholes, comprising the steps of:

(a) imparting seismic energy into the earth from one of the boreholes at selected depths;

(b) receiving in at least one other borehole at a plurality of selected depths seismic energy sent during said step of imparting;

(c) obtaining a measure of the frequency spectrum of the seismic energy as imparted and received to form a frequency spectrum characteristic at selected depths in the formations;

(d) assembling common source stacks of the obtained measures of the frequency spectrum of the seismic energy received at the selected depths in the formations;



(e) assembling common receiver stacks of the obtained measure of the frequency spectrum of the seismic energy imparted at the selected depths in the formations; and

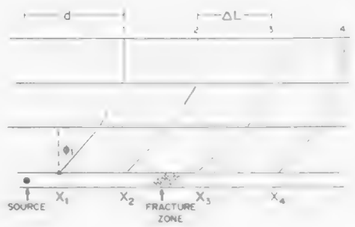
(f) plotting the assembled common source and common receiver stacks of the frequency spectrum of the seismic energy so that formations having related frequency spectra which are indicative of formation continuity between the boreholes may be detected.

5,144,591

METHOD FOR DETERMINING GEOMETRY OF SUBSURFACE FEATURES WHILE DRILLING

Bob A. Hardage, Austin, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jan. 2, 1991, Ser. No. 636,757
Int. Cl.[5] G01V *1/40*; H04L *3/18*
U.S. Cl. 367—75 **3 Claims**



1. A method for determining the location of fractured zones in a subsurface formation having a higher seismic velocity than overlying and underlying formations, comprising:

generating a shear wave signal within the higher velocity formation, said shear wave signal travelling through the formation as a channel wave and being refracted toward the earth's surface as a shear head wave through the interface between the higher velocity formation and the overlying lower velocity formation;

detecting said refracted shear head wave at a plurality of spaced apart locations at the earth's surface; and

determining as a function of the detection location variations in the particle displacement vector of the detected shear head wave resulting from the channel wave travelling through a fractured zone in the higher velocity formation prior to being refracted as a shear head wave toward the earth's surface; and

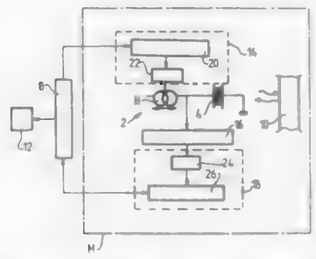
determining the location of a fracture zone in the higher velocity formation on the basis of the pattern variation detected at the earth's surface of the particle displacement vector of the shear head wave.

5,144,592

ULTRASONIC TRANSMISSION-RECEPTION SYSTEM

Marc Bonis, Montlhéry, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Jun. 25, 1991, Ser. No. 721,088
Claims priority, application France, Jun. 27, 1990, 90 08110
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—87 **12 Claims**



1. Ultrasonic transmission-reception system comprising ultrasonic transmission-reception means having a piezoelectric transducer for at least transmitting ultrasonic waves and an electric current generator for exciting said transducer so that said transducer transmits an ultransonic wave, wherein said system also has electronic processing means able to determine in an approximate manner and stored at least one current generator exciting signal, said exciting signal being associated with reference object and leading to a predetermined shape of a detected ultransonic wave from said object following the interaction of said object with said ultrasonic wave produced by said transducer as a result of the excitation of said current generator.

5,144,593

INTEGRATED AUTOMATIC CONTROL FOR ULTRASONIC PROXIMITY SWITCHES

Alfred Forster, Schwandorf, and Robert Schwarz, Freudenberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 5, 1991, Ser. No. 788,037
Claims priority, application European Pat. Off., Nov. 5, 1990, 90121129
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—95 **16 Claims**

1. An ultrasonic proximity switch, comprising: an integrated circuit including:

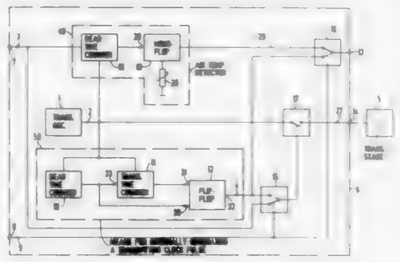
a) a first input receiving a first transmitting clock pulse;

b) a second input receiving a control signal;

c) a means for generating a second transmitting clock pulse;

d) a transmitting oscillator having a transmitting frequency; and

e) means responsive to said control signal, for switching between internal and external clocking of the transmitting frequency with said first transmitting clock pulse and said second transmitting clock pulse respectively, wherein a



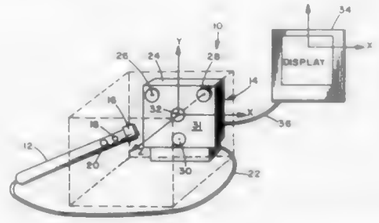
clocking of said transmitting frequency produces an output signal for a transmission stage.

5,144,594

ACOUSTIC MOUSE SYSTEM

Ian R. Gilchrist, Timonium, Md., assignor to Cyber Scientific, Baltimore, Md.

Filed May 29, 1991, Ser. No. 706,755
Int. Cl.[5] G09G *3/02*
U.S. Cl. 367—129 **16 Claims**



1. An acoustic mouse system for controlling indications on an X-Y surface of the face of a display, the system comprising:

support means for holding at least three acoustic receivers in an x-y plane;

hand movable, acoustic transmitter means movable in said x-y plane and in a z direction perpendicular to said x-y plane, for generating a periodic acoustic oscillations in the direction of said support means;

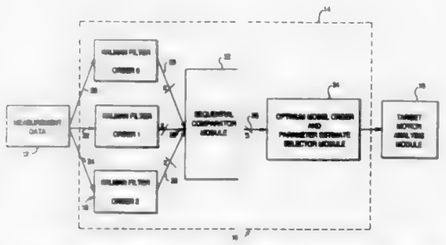
detector means, responsive to outputs from said acoustic receivers, for providing signals indicative of the absolute position of said transmitter means in said x-y plane and in said z direction; and

processor means responsive to said signals from said detector means for providing position signals to said display, whereby said display responds to signals indicative of the absolute position of said transmitter means in said x-y plane by moving a displayed indication to a corresponding position on the X-Y surface of said display face, said display further responding to a z position signal from said processor means by altering an indication on said display.

5,144,575
ADAPTIVE STATISTICAL FILTER PROVIDING IMPROVED PERFORMANCE FOR TARGET MOTION ANALYSIS NOISE DISCRIMINATION

Marcus L. Graham, North Kingstown, and Francis J. O'Brien, Newport, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1992, Ser. No. 825,909
Int. Cl.[5] G01S 15/66
U.S. Cl. 367—135 10 Claims



1. An optimum statistical filter coupled between a data sensor providing noise-corrupted measurement data representative of a target remote from the data sensor and a target motion analysis processing module providing improved performance for target motion analysis noise discrimination, comprising:

plural statistical filter means of different orders coupled in parallel to the data sensor and each responsive to the measurement data for providing first signals having a different predetermined number of coefficients, the number corresponding to the order of respective ones of the adaptive statistical filter means, representative of the fit of predetermined different order polynomials, the order corresponding to the order of respective ones of the adaptive statistical filter means, to the same measurement data, and for providing plural second signals representative of degree of fit of the predetermined different order polynomials to the same measurement data;

sequential comparator means coupled to said plural statistical filter means and responsive to said second signals for providing plural third signals respectively representative of any difference to within a predetermined threshold of corresponding ones of highest and next-to-highest order second signals in accord with a predetermined relation; and

optimum model order and parameter estimator module means coupled to the sequential comparator means and responsive to said plural third signals for selecting as optimum respectively (i) in the event the third signals exhibit a difference beyond the predetermined threshold the higher order first signal of the plural statistical filter means corresponding to that third signal that first exhibits a difference beyond the predetermined threshold, and (ii) in the event that the third signals exhibit no difference beyond the predetermined threshold the lowest order first signal of the plurality of statistical filter means.

5,144,596
MARINE ACOUSTIC SOURCE

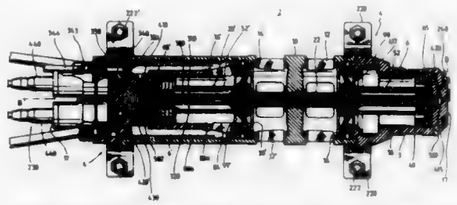
Adrien P. Pascouet, 8925 Lipan, Houston, Tex. 77063

Division of Ser. No. 300,590, Jan. 23, 1989, Pat. No. 5,018,115.
This application Apr. 9, 1991, Ser. No. 682,603
Int. Cl.[5] G01V 1/04
U.S. Cl. 367—144 1 Claim

1. A hydraulic reciprocation system adapted for use in a marine acoustic generator comprising:

a shuttle slidably and sealingly disposed on a shaft, said shaft having a larger diameter section and a smaller diameter section;

a force producing means operatively coupled with said shuttle so as to cause said shuttle to move between a first position and a second position relative to said shaft, where in said first position said shuttle is disposed along said smaller diameter portion of said shaft, and in said second position is disposed along said larger diameter portion of said shaft;

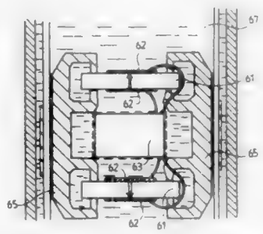


said shuttle comprising a first and a second piston coupled in spaced relation by a hollow connecting element, said hollow connecting element being positioned about said shaft so as to define a pressurizeable sealing chamber therebetween, the pressure of a fluid contained in said chamber being at a lower pressure when said shuttle is at said first position and at a greater pressure when said shuttle is at said second position such that the pressurized fluid acting against the interior of said hollow connecting element in said second position tends to move said shuttle from said second position to said first position.

5,144,597
LOW-FREQUENCY HYDROPHONE AND SONAR ARRAY INCLUDING SUCH HYDROPHONES

Michel Lagier, Le Cannet; Claude Gragnolati, Cannes, and Jena-Pierre Besombes, Corbeil-Essonnes, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 27, 1990, Ser. No. 634,533
Claims priority, application France, Jan. 5, 1990, 90 00077
Int. Cl.[5] H04R 17/00
U.S. Cl. 367—166 10 Claims



1. A hydrophone for detecting signals and for use in a sonar array, comprising:

at least one lacunary ceramics element with an open porosity;

a viscous fluid for saturating said at least one lacunary ceramics element; and

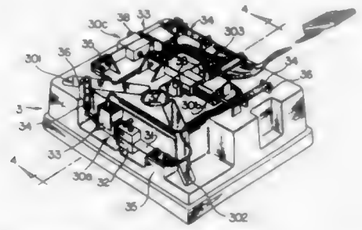
a plurality of metal electrodes, one of said plurality of metal electrodes being deposited on each side of said at least one lacunary ceramics element;

wherein said hydrophone forms a high-pass filter whose cut-off frequency is adjusted based on a proportion of a surface area of said metal electrodes deposited on said lacunary ceramics element, whereby the cut-off frequency can be lowered by increasing the surface area of said metal electrodes deposited on lacunary ceramics element without varying the viscosity of the viscous fluid.

5,144,598
INTERGRATING, INDICATING, AND CONTROLLING SEISMOMETER

Paul D. Engdahl, 3101 Fairview, Space 133, Santa Ana, Calif. 92704; Roland S. McGee, Tujunga, and Roger P. Engdahl, Costa Mesa, both of Calif., assignors to Paul D. Engdahl, Costa Mesa, Calif.

Filed Apr. 10, 1991, Ser. No. 682,973
Int. Cl.[5] H04R 19/00
U.S. Cl. 367—181 17 Claims



1. A seismometer system comprising:

a seismic acceleration sensor having a frame, and a proof mass disposed to execute a mechanical displacement with respect to said frame in response to acceleration of said frame;

a variable capacitor connected mechanically between said mass and said frame, its capacitance varying with said displacement;

an electronic timer connected to said capacitor means and disposed to generate an electrical pulse whose length in time is a function of said capacitance;

a clock oscillator means generating clock cycles at a predetermined frequency;

a gate means connected to said timer and disposed to deliver a string of said clock cycles during the length of said pulse; and

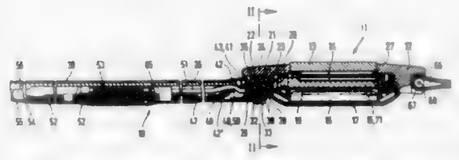
a counter making a raw count of the number of said clockcycles in said string,

the said count being a measure of said acceleration.

5,144,599
AUTONOMOUS RADIO-CONTROLLED TIMEPIECE

Wilfried Blaich, Schramberg; Oskar Flaig, Eschbronn/Locherhof; Wolfgang Ganter; Hans Kaiser, both of Schramberg; Ewald Kussmaul, Freudenstadt; Roland Maurer, Lauterbach, and Peter Riis, Deisslingen, all of Fed. Rep. of Germany, assignors to Junghans Uhren GmbH, Schramberg, Fed. Rep. of Germany

Filed Dec. 28, 1990, Ser. No. 635,692
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 9000899
Int. Cl.[5] G04B 47/00, 37/00
U.S. Cl. 368—10 14 Claims

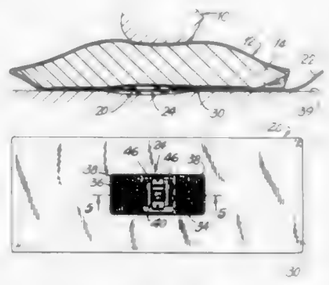


1. An autonomous radio timepiece comprising a wristwatch casing; a clock timekeeping circuit and a receiver disposed in said casing; a wrist bracelet connected to said casing and having an internal channel; an antenna removably disposed in said channel for receiving radio signals; said antenna including a flexible support carrying a core; a coil wound around said core, and an oscillating circuit capacitor, whereby said flexible support, core, coil, and oscillating circuit capacitor are removable as a unit from said channel; said bracelet including a plug connector removably attachable to said casing, said plug connector including means electrically connecting said antenna with said clock timekeeping circuit, whereby said clock timekeeping circuit is controlled in response to radio signals received by said antenna.

5,144,600
ARRANGEMENT FOR AND METHOD OF WAKING A SLEEPER

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Jul. 5, 1992, Ser. No. 726,373
Int. Cl.[5] G04B 47/033
U.S. Cl. 368—12 16 Claims



1. Arrangement for waking a sleeper whose head rests on a pillow, comprising:

(a) settable timer means for generating an electrical alarm signal at a set time;

(b) vibration means electrically connected to the timer means for generating vibrations at said set time;

(c) a housing for containing the vibration means; and

(d) a vibratory plate connected to the housing for vibrating movement during operation of the vibration means, said plate extending outwardly of the housing underneath the pillow over a predetermined surface area sufficient to resist relative displacement between the housing and the pillow and to transmit the vibrations through the pillow to wake the sleeper.

5,144,601
MAGNETO-OPTICAL OVERWRITING METHODS USING ERASING PULSES, EACH OF WHICH HAS A HIGHER FREQUENCY AND NARROWER WIDTH THAN THAT OF THE OVERWRITING PULSES

Miyozo Maeda, Atsugi; Yuji Inouye, Kawasaki; Yasunobu Hashimoto, Sagamihara; Ken-ichi Itoh, Yamato, and Seiya Ogawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

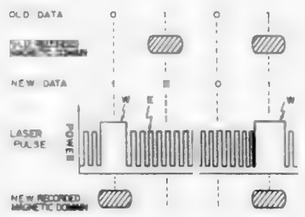
Continuation of Ser. No. 264,906, Dec. 31, 1988, abandoned.
This application Feb. 14, 1991, Ser. No. 655,027
Claims priority, application Japan, Nov. 2, 1987, 62-275637; Nov. 2, 1987, 62-275638; Dec. 28, 1987, 62-330132
Int. Cl.[5] G11B 13/04, 11/10, 11/12
U.S. Cl. 369—13 10 Claims

8. A method of overwriting information in a magneto-optical memory medium which comprises a substrate and a magneto-optical recording layer having a perpendicular magnetization direction characteristic coated on the substrate and having

information tracks each of which carries previously selectively recorded magnetic domains, said method comprising the steps of:

a) irradiating the information tracks with pulse light beams from a single optical head in accordance with information to be overwritten, a first one of the pulse light beams having power sufficient to overwrite recorded magnetic domains and the other ones of the pulse light beams including a series of pulses having a higher frequency than that of the overwriting pulses and having a power sufficient to erase recorded magnetic domains, each of the erasing pulses having a pulse width narrower than that of each of the overwriting pulses and

b) alternately irradiating the overwriting pulses and erasing pulses onto the information tracks during overwriting and erasing, respectively.

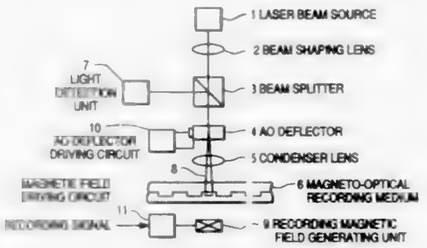


5,144,602

MAGNETO-OPTICAL INFORMATION RECORDING METHOD AND APPARATUS IN WHICH A LASER BEAM OSCILLATES IN A TRACK-WIDTH DIRECTION

Yoshihiko Kudoh, Yawata, and Norio Miyatake, Kobe, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 1, 1990, Ser. No. 473,397
Int. Cl.[5] G11B *13/04, 11/12*
U.S. Cl. 369—13 **8 Claims**



3. A method of recording information on a magneto-optical recording medium with a laser beam and a magnetic field, comprising:

modulating the magnetic field with an information signal to be recorded;

directing the laser beam onto a track of the medium to form on the track a beam spot where the medium is heated to form a heated domain while applying the modulated magnetic field to the heated domain to change the heated domain to a recorded domain corresponding to the information signal;

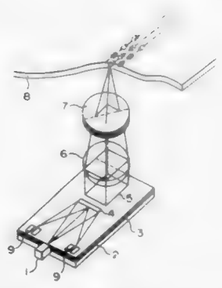
oscillating the laser beam in a direction perpendicular to a direction of the track so as to widen an area of the recorded domain in the direction perpendicular to the direction of the track.

5,144,603

OPTICAL HEAD INCORPORATING REFRACTIVE INDEX DISTRIBUTION CHANGEABLE LENS

Teruo Mozume, Yokohama, and Isao Ohbu, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 663,596
Claims priority, application Japan, Mar. 7, 1990, 2-053611; Mar. 30, 1990, 2-080949
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.14 **15 Claims**



1. An optical head for recording and reproducing information to and from a surface of an optical disc, comprising:

a light source for emitting a first light;

a light path connected to the light source for transmitting said first light;

a beam splitter connected to the light path for directing and reflecting light, said beam splitter directing said first light toward the surface of the optical disc;

an objective lens interposed between the beam splitter and optical disc surface for focusing the first light directed by said beam splitter onto the surface of the optical disc;

a refractive index distribution changeable lens interposed between the objective lens and the optical disc surface for controlling a focus point of the first light on the surface of the optical disc, said refractive index distribution changeable lens being composed of a lens body having first and second surfaces, a patterned electrode formed on said first surface and a common electrode formed on said second surface;

a second light reflected by the surface of the optical disc onto said beam splitter for passing through said refractive index distribution changeable lens;

a photodetector for receiving and converting the second light reflected from said beam splitter into adjustment signals; and

a control means for controlling an electric field applied between said patterned electrode and said common electrode so as to control distribution of said refractive index distribution changeable lens in accordance with adjustment signals from said photodetector.

5,144,604

OPTICAL INFORMATION READING APPARATUS HAVING AN OPTICAL INTEGRATION TYPE PICKUP

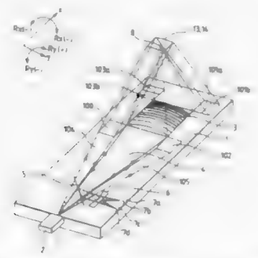
Satoshi Sugiura, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 23, 1990, Ser. No. 527,480
Claims priority, application Japan, Jul. 26, 1989, 1-193350
Int. Cl.[5] G11B *7/095*
U.S. Cl. 369—44.12 **6 Claims**

1. An improvement for an optical information reading apparatus, said improvement comprising:

an optical integration circuit type pickup in which an optical waveguide for guiding light injected from a light source and a condensing coupler for condensing the guided light propagating within said optical waveguide onto an information recording surface of a medium are formed on an optical integration circuit substrate;

sub-couplers for radiating a part of said injected light upon said information recording surface in the vicinity of a light spot formed by said optical pickup; and



subsidiary light detection elements for receiving reflection light of said light radiated from said sub-couplers reflected from said information recording surface;

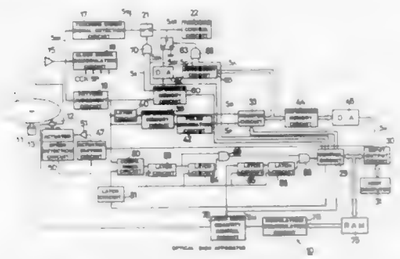
wherein said sub-couplers and said subsidiary light detection elements are formed integrally with said optical pickup on said optical integration circuit substrate.

5,144,605

OPTICAL DISK APPARATUS AND METHOD FOR CONTROLLING MOVEMENT OF LIGHT SPOT THEREOF

Seiji Kobayashi; Norio Nishida; Naoya Eguchi, all of Kanagawa, and Shunji Yoshimura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP89/00414, § 371 Date Dec. 18, 1989, § 102(e) Date Dec. 18, 1989, PCT Pub. No. WO89/10614, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 18, 1989, Ser. No. 449,933
Claims priority, application Japan, Apr. 18, 1988, 63-096510
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.26 **7 Claims**



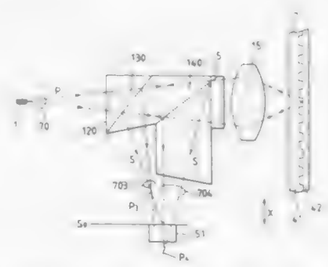
1. An optical disk apparatus comprising an optical disk having a plurality of track groups, each with N tracks, on which recording patterns are recorded in advance, which patterns are different for each track in each said group of tracks, light spot scanning means, record track detection means for detecting said recording patterns for detecting the record tracks traversed by said light spot, tracking signal generating means connected to said record track detection means and responsive thereto for generating tracking signals which change in signal polarity on opposite sides of a target track, and which increase in level as said target track is approached, and light spot scanning means for moving the light spot as far as the target track on the basis of said tracking signals.

5,144,606

FOCUSING-ERROR DETECTING APPARATUS WITH A SIMPLE PHOTODETECTOR UNIT FOR USE IN AN OPTICAL RECORDING/REPRODUCING DEVICE

Shinichi Kadowaki, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 20, 1991, Ser. No. 762,989
Claims priority, application Japan, Sep. 26, 1990, 2-258046
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.41 **3 Claims**



1. A focusing-error detecting apparatus comprising:

a light source emitting a light beam;

a focusing optical system focusing the light beam from the light source on an information recording medium;

a photodetector unit including first and second strip-shape photodetectors approximately extending on a common plane;

means for generating first and second return light beams on the basis of a light beam reflected and diffracted back from the medium, the first and second return light beams having different focal points, wherein centers of the first and second return light beams are received by the first and second photodetectors respectively, wherein the focal points of the first and second return light beams lie at a front side and a rear side of light-receiving surfaces of the first and second photodetectors respectively when sizes of the first and second return light beams on the light-receiving surfaces of the first and second photodetectors are equal; and

means for detecting a difference between output signals from the first and second photodetectors, and generating a focusing-error signal in response to the detected difference;

wherein the first and second photodetectors extend approximately in parallel; the first and second photodetectors have approximately equal widths which agree with a value W_X; a distance "d" between centers of the first and second return light beams on the first and second photodetectors is equal to or smaller than a sum of a value D and the value W_X which is measured along a direction parallel to a line connecting the centers of the first and second return light beams; and the value D is equal to diameters of the first and second return light beams on the first and second photodetectors when the diameters of the first and second return light beams on the first and second photodetectors are equal.

5,144,607

OBJECTIVE LENS DRIVING DEVICE

Tomoyuki Ishida, Tokyo, and Yubei Kobayashi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

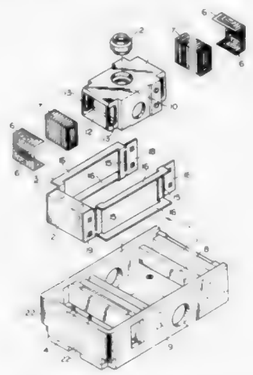
Filed Dec. 7, 1989, Ser. No. 447,082
Claims priority, application Japan, Dec. 29, 1988, 63-334904
Int. Cl.[5] G02B *26/10*
U.S. Cl. 369—44.15 **10 Claims**

1. An objective lens driving device employed in an optical pickup device of a recording and/or reproducing apparatus for

an optical disk adapted for recording an /or reproducing data signals on or from an optical recording medium comprising:

an objective lens bobbin including an objective lens having an optical axis;

first and second objective lens support ng members arranged on either side of said lens bobbin ar d each formed from a respective frame-shaped rectangula plate spring member and each including a pair of upper and lower resiliently deflectable supporting arm section extending parallel to each other and being respectively arranged on an upper side and a lower side of said bobbin each of said first and second objective lens supporting members including a respective pair of connecting plate sections interconnecting respective ends of said upper and lower supporting



arm sections to each other, said co necting plate sections being formed with resiliently defle table sections for deflection only in a direction normal t the optical axis of the objective lens,

said objective lens bobbin further incl ding driving coils and being supported for deflection by said first and second objective lens supporting member in a direction parallel to the optical axis of the objectiv lens by said pairs of upper and lower supporting arm sections and within a plane orthogonal to the optical ax s of the objective lens by said resiliently deflectable sect ons of said connecting plate sections, and

a plurality of magnets supported with n a magnetic yoke and arranged facing the driving coils of said objective lens bobbin.

5,144,608

APPARATUS FOR RECORDING A ND REPRODUCING INFORMATION ON AND FRO A RECORDING MEDIUM HAVING A REFERENC POSITION MARK

Wataru Sakagami, and Yutaka Ogasaw ra, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 549,635, Jul. 6, 19 0, Pat. No. 5,035,332, which is a continuation of Ser. No. 6,557, Apr. 9, 1987, abandoned. This application May 29, 991, Ser. No. 707,083

Claims priority, application Japan, pr. 9, 1986, 61-82930; Apr. 9, 1986, 61-82931; Mar. 31, 1987, 52-78009

Int. Cl.[5] G11B 7/ 0

U.S. Cl. 369—44.26 11 Claims

1. An information recording-repro ucing apparatus comprising:

a light source;

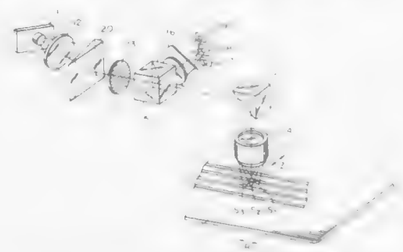
lens means for imaging the light bea n from said light source on an optical information recordi g medium;

photodetector means for receiving he light from said recording medium and outputting a plurality of types of signals;

detector means for detecting a mark ndicative of a reference position on said recording medi m on the basi of the corresponding signal from said photodetector means and outputting a signal;

means for initiating auto-tracking on the basis of the signal from said detector means;

a tracking actuator for moving said lens means; and



means for controlling said tracking actuator to start recording and reproduction of information from a predetermined position on the recording medium after the auto-tracking has been initiated.

5,144,609

APPARATUS FOR TRACKING AN OPTICAL DISC

Katsumi Takeda, Yokohama; Tadashi Saitoh; Takashi Takeuchi, both of Fujisawa, and Junichi Iida, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 275,992

Claims priority, application Japan, Dec. 2, 1987, 62-303413

Int. Cl.[5] G11B 7/00

U.S. Cl. 369—44.41 18 Claims

1. An apparatus for tracking an optical disc performing tracking according to a tracking error signal detected by use of signals reproduced from previously formed pits at regular intervals on the track, wherein

said previously formed pits are made up of at least two pits, of which one is slightly offset from the track to one side and the other is slightly offset from the track to the other side, and wherein

a pit is further formed on the track, comprising:

means for detecting a difference between signal amplitude of a signal reproduced from one of said offset pits and signal amplitude of a signal reproduced from the other of said offset pits, said difference signal being used as the tracking error signal for performing tracking control;

means for comparing a signal reproduced from said pit on the track with a predetermined signal, said predetermined signal is provided by operational means which outputs an average amplitude value of the signal reproduced from one offset pit and the signal reproduced from the other offset pit; and

means for inversing a polarity of said tracking error signal in response to an output of said comparing means when said comparing means detects a positive feedback region of a tracking servo system, said positive feedback region corresponding to a region in a middle of adjoining tracks.

5,144,610

METHOD OF RECORDING DATA ON OPTICAL CARD BY PERFORMING BLANK CHECKING WITHOUT SCANNING AN ENTIRE TRACK

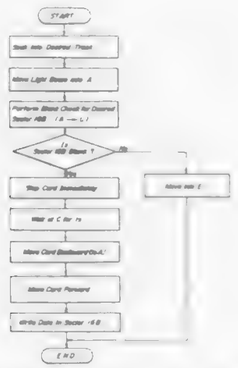
Toshio Horiguchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Filed Feb. 13, 1991, Ser. No. 654,686

Claims priority, application Japan, Feb. 16, 1990, 2-33990

Int. Cl.[5] G11B 3/90

U.S. Cl. 369—58 13 Claims



1. A method of recording data into a desired sector in a desired track on an optical card which comprises a plurality of tracks arranged in parallel with one another in a track direction, each track including a single track ID portion having a track address recorded therein and provided at a first end of the track and a data portion which is divided into a plurality of sectors, said data portion being positioned between said ID portion and a second end of the track, comprising the steps of:

(a) positioning a light beam onto a desired track which includes a desired sector in which the data is to be recorded;

(b) after step (a), determining whether said desired sector is in a written state or in an unwritten state, while said optical card and said light beam undergo relative movement in a forward direction in said track direction;

(c) stopping said relative movement of the optical card and the light beam immediately after said desired sector has been determined to be in the unwritten state such that said relative movement does not result in said light beam being positioned at said second end of said desired track;

(d) thereafter causing the optical card and the light beam to undergo relative movement in a backward direction in the track direction;

(e) after step (d), causing the optical card and the light beam to undergo relative movement in the forward direction; and

(f) recording the data into said desired sector while the light beam is scanning said desired sector in step (e).

5,144,611

OPTICAL DISK DRIVE CLEANER CARTRIDGE

Edward M. Engler, San Jose, Calif.; Timothy S. Gardner; David P. McReynolds, Tuscon, both of Ariz., and Stephen M. Ward, Richfield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1990, Ser. No. 591,158

Int. Cl.[5] G11B 3/58, 5/02

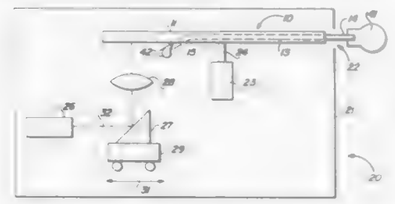
U.S. Cl. 369—71 2 Claims

1. A cartridge for use in cleaning an optical disk drive comprising:

a gas source outside of the optical disk drive;

a housing for insertion into the optical disk drive; and

a tube attached to the housing for directing gas from the gas source therethrough and including a bead for aiming the gas at both an objective lens and a non-focusing beam



directing component of the optical disk drive when the housing is seated in the optical disk drive.

5,144,612

DISC LOADING DEVICE

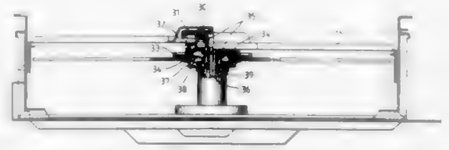
Nobuyuki Isobe, and Isao Watanabe, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,794

Claims priority, application Japan, Jul. 28, 1988, 63-186838

Int. Cl.[5] G11B 17/04

U.S. Cl. 369—77.1 7 Claims



6. A disc loading device for a disc reproducing apparatus of the type having a turntable adapted to support a disc thereon, a carriage positioned so as to transfer a disc to said turntable, and a clamper positioned so as to clamp said disc to said turntable; said disc loading device comprising:

a first disc centering member disposed on said turntable for centering the bottom face of said disc on said turntable and a second disc centering member disposed on said clamper for centering the top face of said disc on said turntable;

a cam plate movable in a backward and forward direction and having cam slots formed therein;

cam follower pins positioned to follow said cam slots; said pins being connected to said carriage and said clamper; and

a driver coupled to said cam plate so as to move said cam plate in specified directions for specified distances to cause said follower pins to move said carriage and said clamper means in an up and down direction to selectively position said disc on said turntable, clamp said disc, and center said disc using said first centering member when said clamp plate is in a first position and second center member when said clamp plate is in a second position.

5,144,613

THERMAL BULK ERASURE METHOD FOR DYE POLYMER OPTICAL MEDIA

Sheryl L. Johnson, and Bryan K. Clark, both of Sunnyvale, Calif., assignors to Tandy Corporation, Fort Worth, Tex.

Filed Jul. 26, 1990, Ser. No. 558,892

Int. Cl.[5] G11B 7/00, 7/30

U.S. Cl. 369—100 6 Claims

1. A method for achieving a bulk erasure of a dye polymer optical storage media including a substrate, an expansion layer and a retention layer, the method comprising the steps:

exposing the entire optical storage media to a controlled

temperature environment at a prescribed temperature exceeding the glass transition temperatures of the retention and expansion layers of the media, said optical storage media being exposed to said prescribed temperature for at least about 1.5 minutes;

transforming the retention layer from a glass-like state to a viscoelastic state while the temperature of said environment is at or above the glass transition temperature of the retention layer;

returning the expansion layer to a relaxed shape while in a visco-elastic state; and

conforming the retention layer shape to the expansion layer while the retention layer is in a viscoelastic state to achieve an unrecorded media configuration.

5,144,614

OPTICAL PICKUP DEVICE

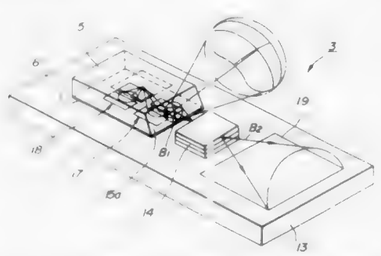
Hidehiro Kume, Tokyo; Etsufumi Yamamoto, Kanagawa, and Kenji Nagashima, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 427,746, Oct. 26, 1989. This application Feb. 14, 1992, Ser. No. 837,547

Claims priority, application Japan, Oct. 29, 1988, 63-274040

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—112 **4 Claims**



1. An optical pickup device for transmitting a light beam having a meridional plane from a laser light source to a signal recording surface of an optical disk, to enable the light beam to follow recording tracks formed on the signal recording surface, including:

an object lens disposed adjacent the optical disk;

a semiconductor laser unit for generating the light beam and directing the light beam onto the object lens, wherein the semiconductor laser unit is object lens, wherein the semiconductor laser unit is oriented relative to the object lens such that the meridional plane of the light beam projected through the object lens onto said optical disk is oriented at an angle substantially equal to 45 degrees with respect to an tangential line drawn to said recording tracks, wherein the semiconductor laser unit is a gain waveguide type unit including:

a semiconductor substrate; and

a light emitting/receiving composite element comprising a beam splitting prism affixed on the semiconductor substrate, and at least a pair of split detectors formed on the semiconductor substrate at an area of the semiconductor substrate at which the beam splitting prism is affixed, wherein each of said split detectors includes a first light receiving element, a second light receiving element separated from the first light receiving element by a first split line, and a third light receiving element separated from the second light receiving element by a second split line, wherein each of the first split line and the second split line is oriented substantially parallel to the meridional plane.

5,144,615

APPARATUS AND METHOD FOR RECORDING AND REPRODUCING MULTI-LEVEL INFORMATION

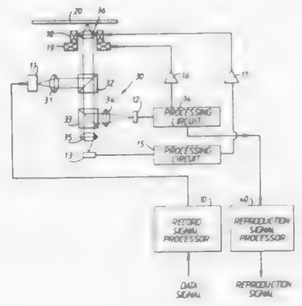
Tadashi Kobayashi, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1989, Ser. No. 455,633

Claims priority, application Japan, Dec. 27, 1988, 63-327578

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **12 Claims**



1. An apparatus for recording and reproducing multi-level information in an information recording medium, wherein said information recording medium comprises an information recording layer from which recorded information can be erased, comprising:

signal processing means for converting an information signal to be recorded into a processed signal having one of at least five possible signal levels;

light beam output means for outputting a light beam, a combination of whose energy and pulse width duration is modulated at multiple levels in accordance with said signal level; and

optical means for directing said light beam onto said information recording medium to form a recording mark, whose state is modulated at multiple levels in accordance with the energy of said light beam and whose length is modulated at multiple levels in accordance with the pulse width duration of said light beam.

5,144,616

LASER DIODE AND MULTIBEAM OPTICAL HEAD USING THE LASER DIODE

Kaoru Yasukawa, and Kiichi Ueyanagi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,453

Claims priority, application Japan, Mar. 14, 1989, 1-059564

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—122 **13 Claims**

1. An optical information system, comprising:

optical recording means having a plurality of circular tracks uniformly spaced one from another in a radial direction of said optical recording means for recording information thereon; and

multibeam optical head means optically coupled to said optical recording means and movable along a movement axis in said radial direction, said multibeam optical head means comprising:

laser diode means having a plurality of lasing means nonuniformly spaced one from another in a straight line for generating a plurality of spaced laser beams, and

image forming optical means, coupled to said laser diode means, for directing each of said plurality of laser beams onto a respective one of said plurality of tracks of the optical recording means simultaneously to make a beam spot thereon,

wherein the spacing between adjacent ones of said beam spots corresponds to the spacing between adjacent ones of said lasing means.

5,144,617

OPTICAL INFORMATION READ/WRITE APPARATUS

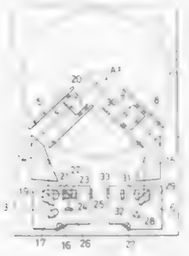
Hiroshi Gotoh, Yokohama; Ikuo Maeda, Kawasaki, and Syuichi Honda, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1990, Ser. No. 610,837

Claims priority, application Japan, Nov. 16, 1989, 1-298267; Jan. 30, 1990, 2-19925; Sep. 17, 1990, 2-246758

Int. Cl.[5] G11B *17/00, 21/16, 7/00*

U.S. Cl. 369—244 **9 Claims**



1. An optical information reading and writing apparatus comprising:

a casing having a longitudinal axis and a lateral axis, said axes crossing at a predetermined point;

an optical disk disposed within said casing and having a center positioned at said predetermined point;

a first fixed unit fixed to said casing and having a first light source means for emitting a first light beam, and a first detection means;

a first movable unit disposed below said optical disk having a first objective lens for converging said emitted first light beam on said optical disk, and adapted such that a center of said first objective lens moves on a radial direction line originating from said center of said optical disk, said first movable unit constituting a reading optical pickup in conjunction with said first fixed unit;

a second fixed unit fixed to said casing and having a second light source means for emitting a second light beam, and a second detection means, said second fixed unit being juxtaposed with said first fixed unit;

a second movable unit disposed below said optical disk having a second objective lens for converging said emitted second light beam on said optical disk, and adapted such that a center of said second objective lens moves on another radial direction line originating from said center of said optical disk, said second movable unit constituting a writing optical pickup in conjunction with said second fixed unit;

both of said first and second units being disposed on the same one-half of one side of said disk;

a first deflection means disposed between said first fixed unit and said first movable unit for deflecting said first light beam toward said first movable unit and for deflecting a first reflection light beam reflected from said optical disk and passing through said first objective lens toward said first detection means; and

a second deflection means disposed between said second fixed unit and said second movable unit for deflecting said second light beam toward said second movable unit and for deflecting a second reflection light beam reflected from said optical disk and passing through said second objective lens toward said second detection means,

said first deflection means comprising a first prism having a first surface which permits said first light beam to enter at a substantially right angle, a second surface disposed so as to cross said first surface at an acute angle for reflecting said entered first light beam, a third surface extending so as to cross perpendicularly to said first surface and disposed opposite said second surface for reflecting a light beam reflected from said second surface, and a fourth surface disposed so as to cross said second surface and said third surface for permitting said reflected light beam from said third surface to be emitted from said fourth surface, said second deflection means comprising a second prism having another first surface which permits said second light beam to enter at a substantially right angle, another second surface disposed so as to cross said another first surface at an acute angle for reflecting said entered second light beam, another third surface extending so as to cross perpendicularly to said another first surface and disposed opposite said another second surface for reflecting a light beam reflected from said another second surface, another fourth surface disposed so as to cross said another second surface and said another third surface for permitting said reflected light beam from said another third surface to be emitted from said another fourth surface

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5,144,618

OPTICAL DISC MEDIUM

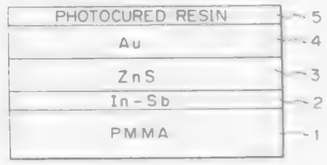
Yasuyuki Goto, Atsugi; Nagaaki Koshino, Yokohama; Kenichi Utsumi, Zama; Iwao Tsugawa, Machida, and Masahiro Nakada, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 18, 1989, Ser. No. 381,321

Claims priority, application Japan, Jul. 22, 1988, 63-181699

Int. Cl.[5] G11B *7/26*

U.S. Cl. 369—284 **9 Claims**



1. An erasable optical disc medium on which information is recorded and read by using a laser beam, said medium comprising:

a phase transition type information recording layer formed on a transparent substrate and comprising at least one material selected from the group consisting of:

$(In_{100-x}Sb_x)_{1200-y}M_y$, wherein $50 \leqq x \leqq 70$ (atomic %), $0 \leqq y \leqq 40$ (atomic %) and M is one of Al, Si, P, Zn, Ga,

Ge, Ce, As, Se, Ag, Cd, Sn, Te, T , Bi, Pb, Mo, Ti, W, Au, and Pt; and

$(Te_{100-x}Ge_x)M'_y$, wherein $20 \leqq x \leqq 50$, $0 \leqq y \leqq 50$, and M' is one of Al, Si, P, Zn, Ge, Ce As, Se, In, Sb, Ag, Cd, Sn, Tl, Bi, Pb, Mo, Ti, W, Au, and Pt;

an optical interference layer formed on said information recording layer, a thickness d (nm) of said optical interference layer is

$$\frac{2.30}{n}(50 + N \times 180) \text{ to } \frac{2.30}{n}(150 + N \times 180),$$

wherein n is a refractive index of an interference layer material and N is 0 or a positive integer; and

an optical reflection layer formed on said optical interference layer, the transparent substrate being in a state such that a reflectance of the medium is higher before information is recorded and a reflectance of the recorded portions of the medium is lower after recording, the reflectance of the medium is an unrecorded state or erased state is 70% or higher; and

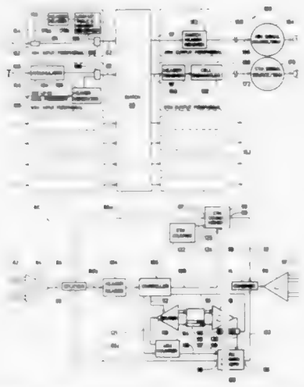
the difference in the reflectance of the recorded portions before and after information is recorded is at least 20%.

5,144,619

COMMON MEMORY SWITCH FOR ROUTING DATA SIGNALS COMPRISING ATM AND STM CELLS

Ernst A. Munter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 11, 1991, Ser. No 638,872
Int. Cl.[5] H04L *12/56;* H04Q *11/04*
U.S. Cl. 370—60.1 10 Claims



1. A common memory switch for routing digital information signals on a plurality of switch input channels to selected ones of a like plurality of switch output channels, said signals comprising fixed length digital data cells, each cell comprising either an ATM cell or STM words, a header having routing information, and a flag which indicates the cell includes an ATM cell or STM words, said switch comprising:

reception means coupled to a plurality of switch input channels for receiving cells on said switch input channels and for outputting received cells to cell handling means, said cells being output one-by-one;

transmission means coupled to a plurality of switch output channels like in number to said plurality of switch input channels and synchronised with said reception means for receiving cells from said cell handling means, one-by-one, and for transmitting each received cell to a switch output channel corresponding with the switch input channel from which said reception means has last output a cell;

said cell handling means comprising

(i) header reader means coupled to the output of said reception means for reading the header from each cell output by said reception means;

(ii) first cell handling means, including:

first common memory means having a data input responsive to the output of said reception means, for storing cells which comprise ATM cells at memory addresses;

a plurality of queue means equal in number to said plurality of switch output channels, each of said plurality of queue means assigned to one of said switch output channels;

means responsive to said header reader means for, whenever the flag of the header of a given cell read by said header reader means indicates said given cell includes an ATM cell, (1) enabling the one of said plurality of queue means which is assigned to the switch output channel indicated by said routing information of the header of said given cell to store an indication of the memory address at which said given cell is stored and (2) interrogating the one of said plurality of queue means which is assigned to the switch output channel to which said transmission means will transmit a cell for a memory address and for reading from said first common memory means at said memory address; and

(iii) second cell handling means, including:

second common memory means having a data input responsive to the output of said reception means for storing each cell which includes STM words at a memory address indicative of the source switch input channel of said each cell;

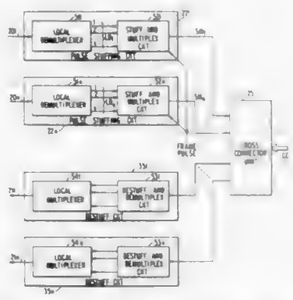
means responsive to said header reader means when the flag of the header of a given cell read by said header reader means indicates said given cell is a cell which includes STM words, for reading from said second common memory means at a memory address indicated by the routing information of the header of said given cell to said transmission means.

5,144,620

CROSS-CONNECTION NETWORK USING TIME SWITCH

Yasutoshi Ishizaki; Rikio Maruta; Yoshinori Rokugo; Hisashi Sakaguchi, and Kuniyasu Hayashi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 99,963, Sep. 23, 1987, Pat. No. 4,935,921.
This application Feb. 8, 1990, Ser. No. 478,879
Claims priority, application Japan, Sep. 30, 1986, 61-233634; May 20, 1987, 62-121070; Jun. 26, 1987, 62-157945; Aug. 18, 1987, 62-203457
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—84 2 Claims



1. An internal frame signal producing circuit for use in a cross connection system for cross connecting n, n being an integer number, digital signals of a first bit rate, each being produced by multiplexing m, m being an integer number, digital signals of a second bit rate lower than said first bit rate by either a stuff synchronization multiplexing or a synchronizing multiplexing technique, at a first or second bit rate digital signal level by use of a time division switch, said second bit rate digital signals being synchronous with each other, said internal frame signal producing circuit comprising:

means for preselecting an internal frame frequency to be equal to a frequency f_h' higher than a first nominal frequency f_h of said first bit rate digital signals by a predetermined value, said frequency f_h' being synchronized with a second nominal frequency fl of said second bit rate digital signals,

means for forming frames in a synchronous state position to have a frame length k at each of said m second bit rate digital signals to produce m formed signals;

means for arranging said m formed signals to thereby make a multiframe length L be equal to (k×m) bits; and

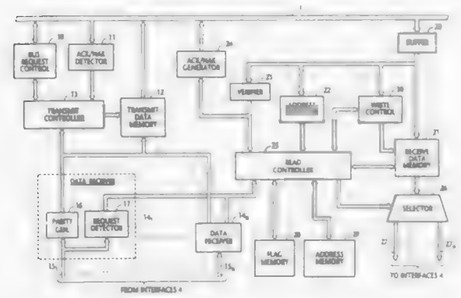
means for assigning vacant slots to all of bits in one frame at predetermined frame intervals in order to compensate a frequency difference between said higher frequency f_h' and said second nominal frequency fl.

5,144,621

COMMON BUS COMMUNICATION SYSTEM WITH REDUCED INTERFACE MEMORIES

Haruhiko Kinashi, Tokyo, and Toshiyuki Watanabe, Yamagata, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 766,178
Claims priority, application Japan, Sep. 28, 1990, 2-261928
Int. Cl.[5] H04J *3/02, 3/08*
U.S. Cl. 370—85.1 3 Claims



1. A communication system for serving a plurality of groups of user terminals, comprising:

a common bus for carrying packets;

a plurality of bus interfaces connected to said common bus, said bus interfaces being associated respectively with said groups of user terminals, each of said bus interfaces forwarding a packet received from one of the user terminals of the associated group onto said common bus and receiving a packet therefrom, and comprising:

a main memory;

an auxiliary memory;

address detector means for detecting a packet destined to at least one of the user terminals of the associated group from packets stored in the data memory; and

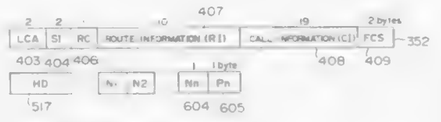
control means responsive to the determination by said address detector means for storing control data into said auxiliary memory in a location corresponding to a destination user terminal and corresponding to a location of said detected packet in said main memory, said control means being responsive to a request from said destination user terminal for fetching control data from the auxiliary memory and accessing a packet in the main memory according to the fetched control data, transmitting a copy of the accessed packet to said destination user terminal, updating said control data following the transmission of the copy, and storing a packet from said common bus into the main memory according to the updated control data.

5,144,622

NETWORK SYSTEM

Yoshihiro Takiyasu, Higashimurayama; Toshiki Tanaka, Ome; Michio Asano, Tokorozawa; Masashi Ohno, Kokubunji, and Takahiko Kozaki, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 308,778, Feb. 9, 1989, Pat. No. 4,975,906. This application Oct. 5, 1990, Ser. No. 593,762
Claims priority, application Japan, Feb. 15, 1988, 63-30738; Jun. 10, 1988, 63-144525; Sep. 30, 1988, 63-244399
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] H04J *3/02, 3/24*
U.S. Cl. 370—85.13 29 Claims



1. A network system comprising:

a plurality of individual LANs each accommodating a plurality of terminals and operating on any LAN protocol; and

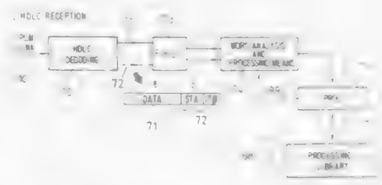
a plurality of LAN interconnection switching units connected between said individual LANs in an interconnection network, each LAN interconnection switching unit including means for receiving from a source terminal in one of said individual LANs data to be transferred to a destination terminal in another one of said individual LANs and sending out before data transfer a call set-up frame including a call number and a sequential address train of relaying LAN interconnection switching units through which the call set-up frame should be delivered to said destination terminal.

5,144,623

SYSTEM FOR RECEIVING AND PROCESSING HDLC FRAMES ON A TIME DIVISION MULTIPLEX PCM TYPE LINK, ESPECIALLY FOR A DATA SWITCH

Fabrice Bernardini, Clamart, France, assignor to Alcatel Cit, Paris, France

Filed Dec. 29, 1989, Ser. No. 458,269
Claims priority, application France, Dec. 30, 1988, 88 17505
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—94.1 11 Claims



1. A system for analyzing and processing HDLC frames transmitted on channels of a time division multiplex PCM link having multiple PCM channels, said system comprising:

receiving means for receiving HDLC frames, said receiving means being common to all the PCM channels of said PCM link and supplying, for each PCM channel of the

PCM link, a receive word comprising a data byte and status information relating to said data byte;

receive word analyzing means, comprising:

a channel information memory storing channel information for each PCM channel said channel information including at least one progress indication which is a function of the number of receive words previously received on said channel;

means for addressing and reading said channel information memory when a receive word is supplied by said receiving means, to thereby obtain the channel information corresponding to said receive word;

transcoding means for combining at least said status information for a receive word and at least said progress indication thereby producing processing information defining processing to be applied to said data byte, said transcoding means also supplying a modification signal to modify said progress indication;

modifying means responsive to said modification signal for modifying said progress indication and wiring the modified progress indication in said channel information memory; and

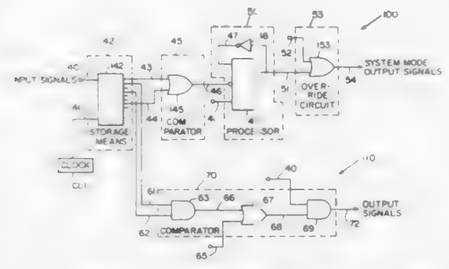
a processor receiving said data byte and at least said processing information for processing said data byte in accordance with said processing information.

5,144,624

DIRECT DIGITAL ACCESS TELECOMMUNICATION SYSTEM WITH SIGNALING BIT DETECTION

Craig A. Sharper, Bridgewater, N.J., and Lynne A. Reamer, West Easton, Pa., assignors to Integrated Network Corporation, Bridgewater, N.J.

Filed Nov. 19, 1990, Ser. No. 615,462
Int. Cl.[5] H04J *3/12, 1/00*
U.S. Cl. 370—110.1 **52 Claims**



1. In a telecommunication system in which a plurality of trunk lines each receive one byte per frame of a digital multiplexed signal from a digital switch, wherein said multiplexed signal is transmitted at a predetermined rate in a set of frames and wherein each frame comprises a predetermined number of bytes of known bit length and wherein when frame alignment is maintained by the digital switch the Xth bit of each byte in every Yth frame corresponds to a signalling bit wherein each signalling bit has a first state corresponding to a first system mode or a second state corresponding to a second system mode; the improvement comprising:

a circuit adapted to be coupled to a trunk line for determining the system mode of said trunk line when frame alignment is not maintained by the digital switch said circuit comprising:

a) storage means for selecting and storing the Xth bit from each byte per frame allocated to said trunk line;

b) comparator means for comparing the stored Xth bits of bytes from frames which are Y frames apart to determine the state of the Xth bit in each frame; and

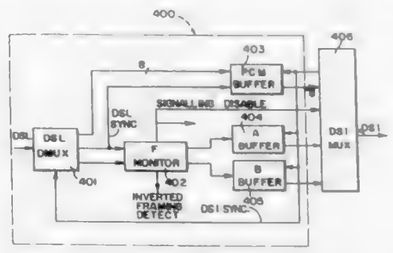
c) processing means coupled to said comparator means for generating a system mode indication signal based upon the comparison of said Xth bits as determined by said comparator means.

5,144,625

DIGITAL SUBSCRIBER LINE TERMINATION WITH SIGNALLING

Roger W. Cain, and Dennis B. McMahan, both of Huntsville, Ala., assignors to Adtran, Huntsville, Ala.

Filed Dec. 27, 1990, Ser. No. 634,435
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.1 **68 Claims**



15. A system for interfacing a digital subscriber line with a digital transmission facility comprising:

a) a demultiplexer for demultiplexing a digital signal from the digital subscriber line having a selected transmission format including communication information and control information into a digital communication signal containing the communication information and a digital input control signal containing the control information, the input control signal selectively having (1) a first digital sequence for a selected non-signalling mode of operation, (2) a second digital sequence for providing signalling identification to indicate signalling capability on the digital subscriber line, and (3) a third digital sequence for providing signalling information from the digital subscriber line;

b) a monitor for monitoring the sequence of the input control signal from the demultiplexer, the monitor producing a signalling-enablement output signal when the third digital sequence is detected; and

c) a multiplexer for selectively multiplexing the communication information from the communication signal from the demultiplexer with the signalling information from the input control signal in a selected format for output to the transmission facility, the multiplexer being responsive to the signalling-enablement output signal to enable output of the signalling information to the transmission facility when the signalling-enablement output signal is produced by the monitor.

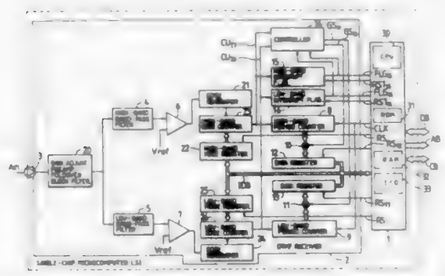
5,144,626

DATA PROCESSOR

Kenzo Funatsu, Musashimurayama; Takashi Ito, Kokubunji; Naoki Yashiki, Kodaira; Chiaki Kubumura, Tokyo, and Keiji Kubuyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 07/311,077, Feb. 14, 1989, abandoned.
This application May 17, 1991, Ser. No. 704,699
Claims priority, application Japan, Feb. 19, 1988, 63-37169
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.3 **20 Claims**

1. A data processor having a multifrequency receiver formed together with a central processor on a semiconductor substrate, said multifrequency receiver comprising means for separating a tone wave from an analog signal including multiple frequencies; means for shaping a waveform of the separated tone wave to form a shaped signal; means for forming digital data representative of a type of tone wave on a basis of the shaped signal in accordance with information provided by said central processor; and data holding means for holding formed digital data so that said digital data is accessible by said central processor.

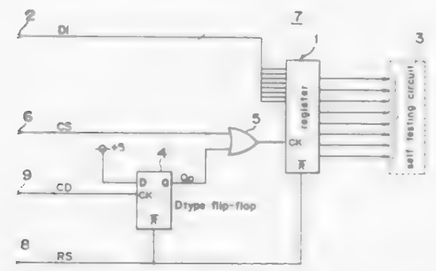


5,144,627

TEST MODE SWITCHING SYSTEM FOR LSI

Nobuyuki Horie, Tenri; Toshihiro Yamanaka, Ikoma; Daiji Yamane, Tenri, and Noriaki Sakamoto, Souraku, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 3, 1990, Ser. No. 460,371
Claims priority, application Japan, Jan. 6, 1989, 1-1520
Int. Cl.[5] G06R *11/00*
U.S. Cl. 371—22.1 **2 Claims**



1. A test mode switching system for a large scale integrated circuit, the large scale integrated circuit including data input terminals for applying data signal used in the large scale integrated circuit, control signal input terminals for receiving a signal by which the large scale integrated circuit can be operated, and an address signal input terminal for applying address data to be used in the large scale integrated circuit, the test mode switching system comprising:

register means for storing test signal data inputted from an external processing unit through the data input terminals of the large scale integrated circuit, and for outputting the stored test signal data to a self-testing circuit for checking whether or not the large sale integrated circuit is operating correctly;

memory means for storing a test inhibiting signal and a test allowing signal received from the an external processing unit through the control signal input terminals of the large scale integrated circuit; and

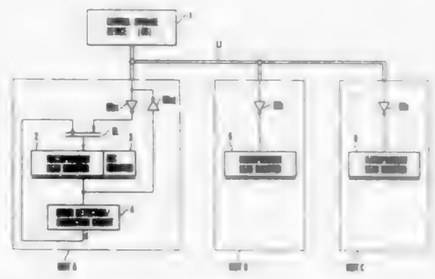
gates means for enabling said register means to output test signals to the self-testing circuit according to a condition of an output of said memory means and a signal applied to the address signal input terminal, thereby allowing the large scale integrated circuit to operate either under a normal operation mode or under a test mode.

5,144,628

MICROPROGRAM CONTROLLER IN DATA PROCESSING APPARATUS

Sunao Sekiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 416,977
Claims priority, application Japan, Oct. 5, 1988, 63-249990; Oct. 12, 1988, 63-256856
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—40.1 **2 Claims**



1. A microprogram controller in a data processing apparatus, comprising:

a control storage device which has ECC data for permitting error detection and correction and tri-state input/output pins;

a first register for holding microprogram data read out from said control storage device and all the bits of the ECC data;

error detection/correction means for performing an ECC check operation on the basis of an output value of said first register and correcting a correctable error;

second to Nth registers for holding a predetermined number of bits of the microprogram data read out from said control storage device; and

a data bus directly connected to said control storage device, and input and an output of said first register, and inputs of said second to Nth registers,

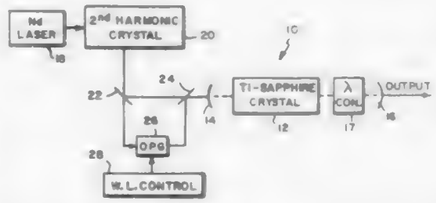
wherein when the correctable error is detected on the basis of the output value of said first register, data corrected by said error detection/correction means is sent onto said data bus, and said second to Nth registers simultaneously fetch the corrected data from said data bus.

5,144,629

METHOD AND APPARATUS FOR LASER TUNING

Santanu Basu, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 30, 1991, Ser. No. 693,551
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—20 **22 Claims**

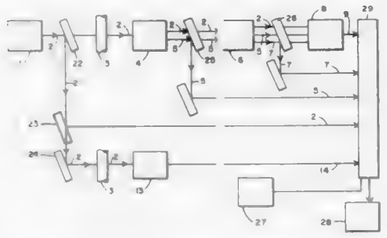


1. A tunable laser system comprising:

a laser medium mounted in a laser cavity, said medium being capable of lasing over a selected wavelength band;

means for pumping said lasing medium;
a selectively tunable optical parametric generator (OPG);
means for driving said OPG with an optical signal at a wavelength such that said OPG, as tuned, generates an output at a selected wavelength within the selected wavelength band of said lasing medium; and
means for injecting the output from said OPG as a seeding input to said lasing medium to adjust the lasing wavelength thereof.

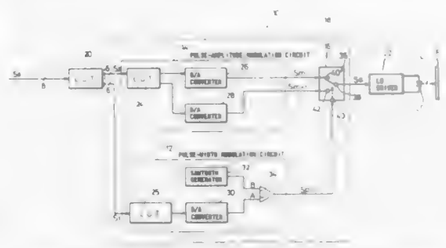
5,144,630
MULTIWAVELENGTH SOLID STATE LASER USING FREQUENCY CONVERSION TECHNIQUES
J. T. Lin, Winter Springs, Fla., assignor to JTT International, Inc., Orlando, Fla.
Filed Jul. 29, 1991, Ser. No. 736,931
Int. Cl.[5] H01S 3/10
U.S. Cl. 372—22 31 Claims



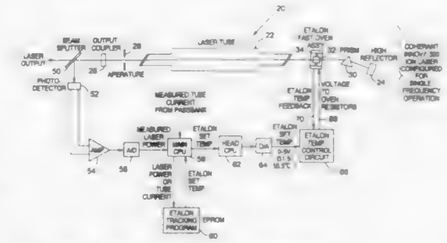
1. A laser apparatus for producing a fifth harmonic generation beam of predetermined wavelength comprising:
a solid state laser;
a first nonlinear crystal for producing a second harmonic beam;
focusing optics for focusing said solid state laser beam into said first nonlinear crystal;
a second nonlinear crystal positioned adjacent said first nonlinear crystal for receiving a beam therefrom and producing a fourth harmonic beam; and
a third nonlinear crystal of beta barium borate positioned adjacent said second nonlinear crystal for receiving a beam therefrom and producing a fifth harmonic beam; whereby a solid state laser produces a fifth harmonic coherent beam of predetermined wavelength.

5,144,631
SEMICONDUCTOR LASER DRIVE DEVICE
Yoshiharu Okino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 18, 1991, Ser. No. 643,241
Claims priority, application Japan, Jan. 22, 1990, 2-13026
Int. Cl.[5] H01S 3/10
U.S. Cl. 372—25 7 Claims

1. A device for driving a semiconductor laser, comprising:
a pulse-width modulation circuit for producing a pulse-width-modulated signal having a first number of gradations in response to a first image signal;
a pulse-amplitude modulation circuit for producing a pulse-amplitude-modulated signal having first and second amplitudes and having a second number of radiations in response to a second image signal, wherein said first and second amplitudes of said pulse-amplitude-modulated signal are zero when the semiconductor laser radiates no emission and sufficient for maintaining a predetermined emission mode from the semiconductor laser when the semiconductor laser radiates the emission; and
a combining circuit for supplying the semiconductor laser with an output signal having a number of gradations determined by the combination of said pulse-width-modulated signal and said pulse-amplitude-modulated signal.



5,144,632
LASER WITH ACTIVELY STABILIZED ETALON FOR SINGLE FREQUENCY OPERATION
Tracy F. Thonn, Sunnyvale, Calif., assignor to Coherent, Inc., Palo Alto, Calif.
Continuation-in-part of Ser. No. 512,846, Apr. 23, 1990, Pat. No. 5,048,031. This application Mar. 15, 1991, Ser. No. 670,254
Int. Cl.[5] H01S 3/00
U.S. Cl. 372—33 7 Claims

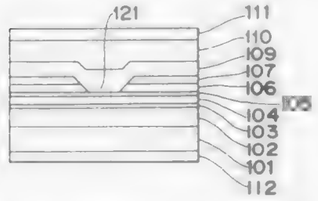


1. A laser having a resonator comprising:
a frequency selective etalon located in the resonator, said etalon having a tunable frequency transmission curve the peak of which varies with temperature;
means for measuring the output power of the laser and generating a control signal; and
means for automatically adjusting the temperature of the etalon and therefore the output frequency of the laser in response to the control signal to maximize the output power of the laser.

5,144,633
SEMICONDUCTOR LASER AND MANUFACTURING METHOD THEREOF
Kiyoshi Ohnaka, Moriguchi; Yuzaburo Ban, Osaka, and Isao Kidoguchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed May 23, 1991, Ser. No. 704,969
Claims priority, application Japan, May 24, 1990, 2-135067
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—45 24 Claims

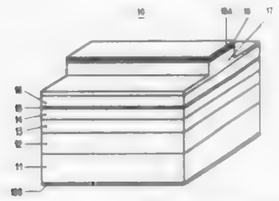
1. A semiconductor laser, comprising:
A GaAs substrate of a first conductivity type;
a first $(Al_xGa_{1-x})_{0.5}In_{0.5}P$ cladding layer of the first conductivity type applied to said GaAs substrate;
an active layer applied to said $(Al_xGa_{1-x})_{0.5}In_{0.5}P$ cladding layer;

a second $(Al_xGa_{1-x})_{0.5}In_{0.5}P$ cladding layer of a second conductivity type different from that of the first conductivity type, said second cladding layer being applied to said active layer;
a confinement layer having a stripe-like opening, which confinement layer has a refractive index lower than that of said second $(Al_xGa_{1-x})_{0.5}In_{0.5}P$ cladding layer. said confinement layer being applied to said second $(Al_xGa_{1-x})_{0.5}In_{0.5}P$ cladding layer; and



an upper cladding layer of second conductivity type, which upper cladding layer has a band gap larger than that of said second cladding layer, and a refractive index lower than that of said second cladding layer, and which upper cladding layer has a refractive index higher than that of said confinement layer, said upper cladding layer being applied to said confinement layer and said second $(Al_xGa_{1-x})_{0.5}In_{0.5}P$ cladding layer.

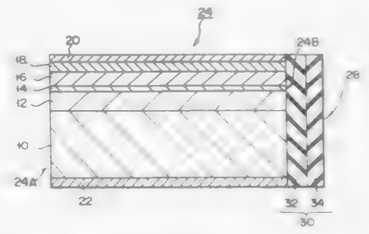
5,144,634
METHOD FOR MIRROR PASSIVATION OF SEMICONDUCTOR LASER DIODES
Marcel Gasser, Zurich, and Ernst E. Latta, Adliswil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 538,626, Jun. 15, 1990, Pat. No. 5,063,173. This application Aug. 21, 1991, Ser. No. 748,317
Claims priority, application European Pat. Off., Oct. 10, 1989, [illegible].7
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—49 8 Claims



1. A semiconductor laser diode, comprised of contamination free mirror facets coated with a continuous, insulating passivation layer, said passivation layer preventing diffusion of substances onto said mirror facets, said passivation layer being inert with respect to said mirror facets and being oxygen free.

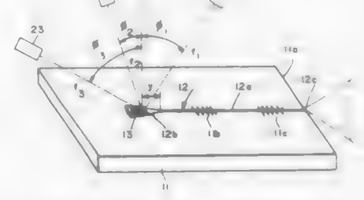
5,144,635
SEMICONDUCTOR LASER DEVICE HAVING REFLECTANCE CONTROL FILM FORMED ON END FACET OF OSCILLATOR
Hajime Suhara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 18, 1991, Ser. No. 717,322
Claims priority, application Japan, Jun. 19, 1990, 2-160929
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—49 7 Claims

1. A semiconductor laser device comprising:
an oscillator for oscillating a laser light;
a first thin film for reflectance control which is formed on the end facet of said oscillator and in which the film thickness is set to be "$\lambda/4n_1$" and $n_1 \leqq 1.8$ where the peak wavelength of said oscillator is λ and the refractive index of said first thin film is n_1; and



a second thin film for reflectance control which is formed on said first thin film and in which the film thickness is set to be "$\lambda/4n_2$" and $1.9 \leqq n_2 \leqq 2.6$ where the peak wavelength of said oscillator is λ and the refractive index of said second thin film is n_2.

5,144,636
LASER BEAM OSCILLATING APPARATUS
Toshihiko Yoshida; Masanori Watanabe, and Osamu Yamamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Jan. 29, 1991, Ser. No. 647,022
Claims priority, application Japan, Jan. 31, 1990, 2-22956
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—50 8 Claims



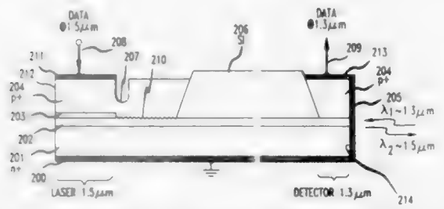
1. A laser beam oscillating apparatus comprising:
a plurality of semiconductor laser beam oscillators each oscillating semiconductor laser beams of a different wavelength,
optical waveguide means formed on a substrate for propagating the semiconductor laser beams oscillated by each of the semiconductor laser beam oscillators and then emitting the semiconductor laser beams in a same direction from an output end thereof,
optical coupler means disposed for introducing the semiconductor laser beams oscillated by each of said semiconductor laser beam oscillators into said optical waveguide means, wherein each of said semiconductor laser beam oscillators is disposed at a predetermined position with respect to said optical coupler means so that the semiconductor laser beams simultaneously oscillated by each of the semiconductor laser beam oscillators are simultaneously introduced into the optical waveguide from the optical coupler, and
wherein the substrate has a non-linear optical effect.

5,144,637

INLINE DIPLEX LIGHTWAVE TRANSCEIVER

Thomas L. Koch, Holmdel; Herwig Kogelnik, Rumson, and Uziel Koren, Fair Haven, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 30, 1990, Ser. No. 517,103
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 8 Claims



1. A semiconductor device for transmitting a first lightwave signal at a first wavelength and for receiving a second lightwave signal at a second wavelength, said semiconductor device comprising,

a waveguide for supporting propagation of said first and second lightwave signals wherein said waveguide includes a semiconductor material layer having a photoluminescence wavelength less than or equal to said second wavelength,

means for generating said first lightwave signal, and

means for detecting said second lightwave signal from a portion of said waveguide, said second wavelength being less than said first wavelength

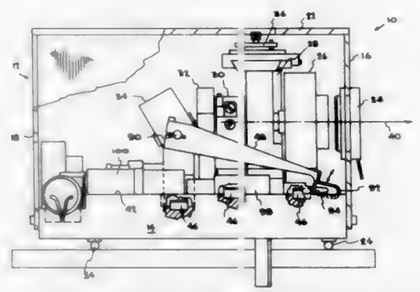
said waveguide being integral with said generating means and said detecting means, said generating means and said detecting means disposed collinearly along a longitudinal axis of said waveguide so that signals from said generating means propagate through said detecting means.

5,144,63[illegible]

MASTER DYE LASER OSCILLATOR INCLUDING A SPECIFIC GRATING ASSEMBLY FOR USE THEREIN

James M. Davin, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 911,192, Sep. 22, 1986, abandoned. This application Jan. 31, 1989, Ser. No. 314,691
Int. Cl.[5] H01S *3/08, 27/02, 3/20*
U.S. Cl. 372—107 9 Claims



1. In a dye laser oscillator including a number of cooperating components for producing along a horizontal path a dye beam which is ultimately tuned to a particular wavelength band before leaving the oscillator, a grating assembly serving as a coarse tuning mechanism in the production of the ultimately tuned beam, said grating assembly comprising:

(a) an optical grating having a main body including an active grating face through which said dye beam is intended to be reflected and dispersed off of before leaving said oscillator;

(b) alignment means for supporting said grating body, said alignment means including adjustment means that allows selected movement of said grating within a plurality of degrees of freedom to precisely and fixedly place said grating face in and at a particular selected initial opening orientation with respect to the horizontal path of said dye beam; and

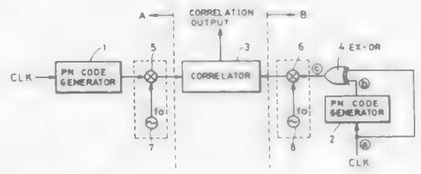
(c) tuning means for supporting said grating body and said alignment means for limited pivotal movement about an axis transverse to said beam path in order to vary the angle at which the dye beam impinges the grating face whereby to vary the wavelength band of said beam.

5,144,639

SPREAD-SPECTRUM COMMUNICATION SYSTEM

Yoshitaka Uchida, and Takeshi Hashimoto, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 578,096
Claims priority, application Japan, Sep. 8, 1989, 1-234240
Int. Cl.[5] G01S *3/16*
U.S. Cl. 375—1 9 Claims



1. A spread-spectrum communication system comprising:

a correlator for correlating a first input with a second input and obtaining a correlation output, one of said first input and said second input being a received signal and the other being a reference signal;

a first code generator responsive to a first clock for generating a first PN code and supplying it as said first input of said correlator;

a second code generator responsive to a second clock for generating a second PN code which is timeinverted with respect to said first PN code;

logic operation means for performing a logical operation on said second PN code and said second cock and supplying a logic operation output as said second input of said correlator.

5,144,640

CORRELATION DEVICE FOR SPECTRUM SPREAD COMMUNICATION

Michio Yamamoto, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jan. 31, 1991, Ser. No. 648,297
Claims priority, application Japan, Jan. 31, 1990, 2-21044
Int. Cl.[5] H04K *1/10*
U.S. Cl. 375—1 4 Claims

1. A correlation device for spectrum spread communication comprising:

a reference signal generator for generating a signal of reference frequency;

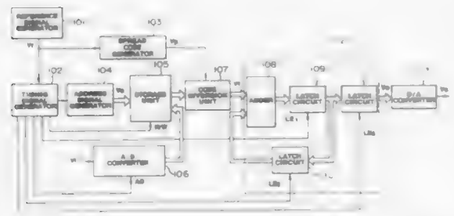
a timing signal generator for generating a first timing signal, a second timing signal, a third read/write timing signal, and a fourth latch control timing signals in response to said signal of said reference signal generator;

an address signal generator for encoding said first timing signal of said timing signal generator to generate an address signal;

an analog/digital converter for converting an input signal

formed by spreading a base band signal by means of a spread code on a transmission side and modulated in a receiving side into a digital signal in response to leading of said second timing signal of said timing signal generator;

a storage unit for storing an output signal of said analog/-digital converter in response to said read/write timing signal of said timing signal generator;



a spread code generator for generating a spread code identical with said spread code on said transmission side in synchronism with said signal of reference signal generator;

means for inverting an output signal of storage unit in response to a voltage level of an output signal of said spread code generator; and

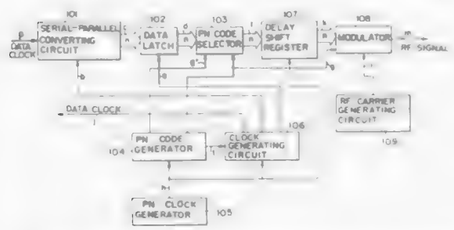
means for cumulatively adding an output signal of said inversion means.

5,144,641

SPREAD SPECTRUM COMMUNICATION DEVICE

Shigeo Akazawa, and Yoshitaka Uchida, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 654,077
Claims priority, application Japan, Feb. 15, 1990, 2-34634
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 7 Claims



1. A spread spectrum communication device provided with a transmitter comprising:

serial-parallel converting means for converting serial data into a plurality of parallel data sets;

first PN code generating means for generating at least a first PN code in response to a PN clock;

spreading modulating means, in which said plurality of parallel data sets are inputted and which outputs said first PN code in the form of a plurality of modulated data sets corresponding to respective said parallel data sets;

delaying means for outputting said plurality of modulated data sets, while delaying them in time; and

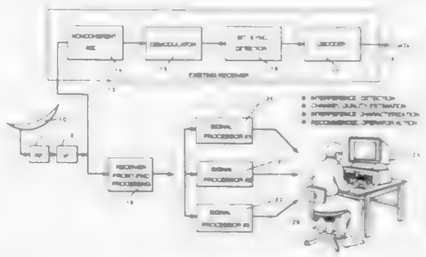
RF modulating means for RF-modulating each of said plurality of delayed modulated data sets and synthesizing a signal to be transmitted by combining them.

5,144,642

INTERFERENCE DETECTION AND CHARACTERIZATION METHOD AND APPARATUS

Aaron Weinberg, Potomac, Md.; Ken Cunninghasm, Sterling, Va.; Daniel Urban, Silver Spring, Md., and Laurence Mailender, Washington, D.C., assignors to Stanford Telecommunications, Inc, Santa Clara, Calif.

Continuation-in-part of Ser. No. 536,930, Jun. 7, 1990, abandoned. This application Oct. 5, 1990, Ser. No. 593,433
Int. Cl.[5] H04B *3/46;* **H04K** *3/00*
U.S. Cl. 375—10 12 Claims



1. An interference detection system comprising:

receiver means for down converting, demodulating and synchronizing a received waveform to produce a signal which may contain a jamming signal,

a plurality of signal processor means coupled to receive the signal from said receiver means, each said signal processor being adapted to analyze said signal to detect a respective one of the following signal signature information

1) amplitude,

2) time,

3) frequency,

and make a record thereof in the absence of jamming,

microprocessor means connected to each of said signal processor means and adapted to compare said record with current received waveform signals, and characterize the type of interference present according to detected variations in:

1) amplitude, and/or

2) time, and/or

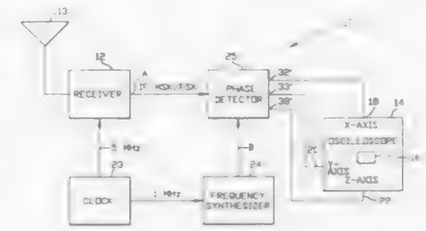
3) frequency.

5,144,643

VISUAL AID FOR VLF MSK SIGNALS

Lynn K. Thomas, and Paul A. Singer, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1990, Ser. No. 543,904
Int. Cl.[5] H04B *03/46, 17/00*
U.S. Cl. 375—10 9 Claims



1. An apparatus for visually aiding a receiving terminal operator in determining the nature and noise environment of

an incoming signal by visually displaying patterns thereof comprising:

means for providing a clock;

a signal receiving means having a first receiver input coupled to the clock providing means and a second receiver input for receiving an incoming signal to provide a signal of interest at a receiver output;

means for providing a display on X, Y and Z axes having an X deflection signal input, a Y deflection signal input and a Z deflection signal input;

synchronization providing means having a synchronization providing means input coupled to said clock providing means and a synchronization providing means output; and

phase detector means each having a first phase detector input and a second phase detector input and a first phase detector output, second phase detector output and third phase detector output, said first phase detector input of said phase detector means being connected to said receiver output of the said signal receiving means and said second phase detector input being connected to said synchronization providing means output, said first phase detector output of said phase detector means being connected to said X deflection signal input of the display providing means and said second phase detector output of said phase detector means being connected to said Y deflection signal input of said display providing means for effecting a display in a lissajous form on said display providing means, said phase detector means also including said third phase detector output being connected to said Z deflection signal input of said display providing means for effecting a timing signal of a preselected time duration to vary the intensity of a preselected part of said display in a said lissajous form on said display providing means, said phase detector means includes a means for digitally delaying to provide a suitable phase shift of one signal with respect to another to assure said effecting said display in said lissajous form.

5,144,644

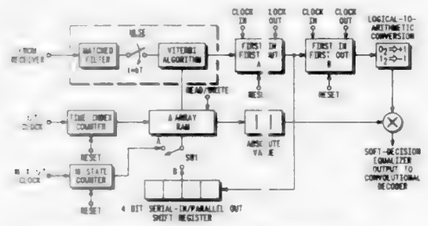
SOFT TRELLIS DECODING

David E. Borth, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 422,177, Oct. 13, 1989. This application Nov. 29, 1989, Ser. No. 442,971

Int. Cl.[5] H04L *1/00*

U.S. Cl. 375—96 **11 Claims**



1. A method of soft trellis decoding comprising:

determining the probable present state from sequences of probable prior states and relative measures of merit related to the transitions from the last previous probable states to the probable present state;

associating with the present state that measure of relative merit

and decoding the information represented by that more probable sequence of states utilizing the measure of merit associated with each state.

5,144,645

CIRCUIT APPARATUS FOR GENERATING A SYMMETRICAL PULSE SEQUENCE OF VARIABLE FREQUENCY

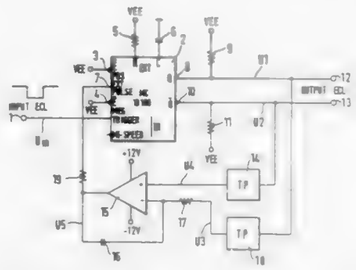
Rolf Schiffmann, Mainz, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jun. 14, 1991, Ser. No. 715,542

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1990, 4020977

Int. Cl.[5] H03B *19/10*

U.S. Cl. 377—47 **4 Claims**



1. Circuit apparatus for producing a symmetrical output pulse signal having a constant keying ratio of 50% and also having twice the pulse sequence frequency of an input pulse signal, said apparatus including a monostable multivibrator capable of being triggered by positive and negative flanks of an input pulse signal and having a time constant which is approximately one-quarter of a pulse period of said input pulse sequence, further comprising:

first and second low pass filters (**14**, **18**) having respective outputs and respectively having inputs connected to the inverting and non-inverting signal outputs (**8**,**10**) of said monostable multivibrator (**2**, **20**);

subtraction means having inputs respectively connected to outputs of said first and second low pass filters and having an output providing a signal representative of the difference between said signals at said outputs of said low pass filters; and

means (**26**) for modifying the time constant of said multivibrator in response to said output of said subtraction device.

5,144,646

X-RAY DIAGNOTICS INSTALLATION WITH BRIGHTNESS CONTROLLED BY A DOMINANT REGION OF THE IMAGE

Hans-Juergen Gerlach, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 9, 1991, Ser. No. 773,539

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1991, 4102445

Int. Cl.[5] H05G *1/64*

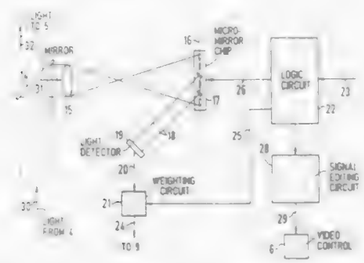
U.S. Cl. 378—99 **2 Claims**

1. A detector circuit for use in an x-ray diagnostics installation, said x-ray diagnostics installation including an image intensifier video chain having an x-ray tube and an image intensifier with an output screen on which an output image is present, said detector circuit comprising:

a chip containing a plurality of individually electrically driveable micromirrors, each micromirror changing its orientation within said chip upon being driven;

means for directing said output image of said x-ray image intensifier onto said micromirrors;

a light detector; and



means for selectively driving said micromirrors individually for directing a selected portion of said output image onto said light detector.

5,144,647

RADIATION EXPOSURE FIELD LIMITING APPARATUS

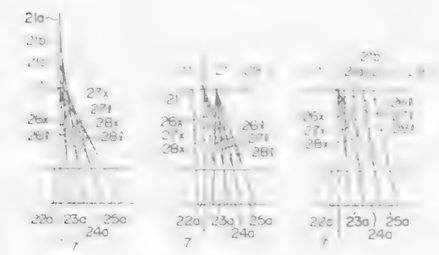
Hiroshi Kikuchi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1991, Ser. No. 683,800

Claims priority, application Japan, Jul. 9, 1990, 2-179455

Int. Cl.[5] G21K *1/04*

U.S. Cl. 378—153 **7 Claims**



1. A radiation exposure field limiting apparatus for limiting an exposure field to be formed by radiations generated from a radiation generating equipment which includes a particle accelerator and a point radiation source, comprising a plurality of radiation shielding members in the form of plates for defining an exposure field of radiations, said radiation shielding members being mounted for individual movement relative to each other with respect to a plane of a center axis of radiations generated from said point radiation source to define an exposure field of radiations having an approximated profile to that of an object to be irradiated by such radiations, a face of each of said radiation shielding members at which the radiation shielding member contacts with an adjacent one of said radiation shielding members making part of a face of a circular cone having the apex at an imaginary radiation source which is imaginarily disposed at a point spaced by a significant distance from said point radiation source.

5,144,648

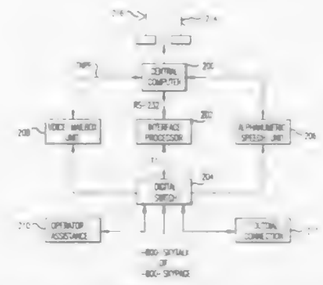
METHOD AND APPARATUS FOR PROCESSING PAGES

Jai P. Bhagat, Jackson, Miss.; Robert L. Vence, Arlington, Va., and William D. Hays, Jackson, Miss., assignors to Mobile Telecommunication Technologies, Jackson, Miss.

Continuation of Ser. No. 400,679, Aug. 30, 1989, abandoned. This application May 16, 1991, Ser. No. 702,121

Int. Cl.[5] H04M *3/50*; **H04Q** *7/04*

U.S. Cl. 379—57 **8 Claims**



4. A method of operating a system for providing numeric and alphanumeric paging services and voice-mail services to callers, which includes a central computer, a voice-mail unit, an alphanumeric speech unit, a digital switch and an interface processor, comprising the steps of:

receiving a telephone call at said digital switch;

forwarding the telephone call to said interface processor;

obtaining, at said interface processor, information for a page from a caller when the caller inputs a function code corresponding to a paging service; and

issuing a first instruction at said interface processor to connect the caller to said voice-mail unit when the caller inputs a function code corresponding to a voice-mail service; or

issuing a second instruction at said interface processor to connect the caller to said alphanumeric speech unit when the caller inputs a function code corresponding to a request to review stored alphanumeric pages.

5,144,649

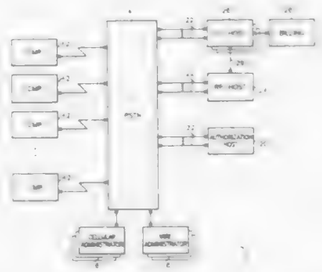
CELLULAR RADIOTELEPHONE CREDIT CARD PAYSTATION METHOD

Robert G. Zicker; Thanh H. Cao, both of Houston; Daniel G. Borkowski, The Woodlands; Donald A. Plouff, The Woodlands, and Phillip D. Brown, Jr., The Woodlands, all of Tex., assignors to GTE Mobile Communications Service Corporation, Houston, Tex.

Filed Oct. 24, 1990, Ser. No. 602,698

Int. Cl.[5] H04M *11/00*

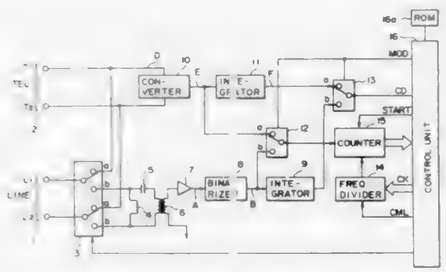
U.S. Cl. 379—59 **22 Claims**



10. A method of operating a remotely programmable cellu-

lar telephone as a credit card pay station, said method comprising the steps of:
disabling operation of said telephone in response to telephone energization;
reading credit card information from a credit card;
performing a local validation of said credit card by processing said credit card information;
enabling operation of said telephone if said local validation step successfully validates said credit card;
recording usage of said telephone;
comparing said recorded usage of said telephone with a predetermined fraud alert usage threshold;
when said predetermined fraud alert usage threshold is exceeded, automatically establishing a data communications session with a credit card authorization system to remotely validate said credit card; and
if said credit card authorization system invalidates said credit card, disabling operation of said telephone.

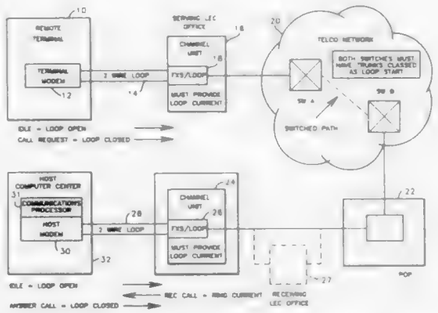
5,144,650
COMMUNICATION APPARATUS HAVING IMPROVED SWITCHING LINE CONNECTION BETWEEN DIFFERENT SIGNAL PATHS
Masao Kiguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 3, 1990, Ser. No. 620,617
Claims priority, application Japan, Dec. 14, 1989, 1-322551
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 **8 Claims**



1. A communication apparatus comprising:
means for selectively connecting a line to a speech communication path or a data communication path;
signal receiving means connected to said two communication paths;
signal detection means for detecting a predetermined signal from an output of said signal receiving means; and
control means for modifying a detection criterion of said signal detection means in accordance with a line connection status of said line connecting means.

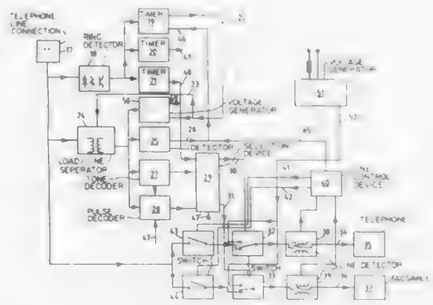
5,144,651
REDUCED TIME REMOTE ACCESS METHOD AND SYSTEM
Christopher K. Cooper, Kingwood, Tex., assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Nov. 19, 1990, Ser. No. 615,931
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—98 **16 Claims**

1. A method of transmitting confidential data between a particular remote modem of a plurality of remote modems and a host computer having a host modem capable of being connected to any of the plurality, comprising the steps of:
the particular remote modem seizing a telephone line;
determining the seizure of the telephone line by the particular remote modem and initiating a ring down sequence to the host modem, said sequence being concluded by providing a ring signal to the host modem;
the host modem seizing the telephone line and providing an answer tone upon receipt of the ring signal;
the particular remote and host modems completing a carrier handshake after the answer tone is provided;
providing indication from the host modem to the host computer that communication has been established and establishing a link between the host modem and the host computer;



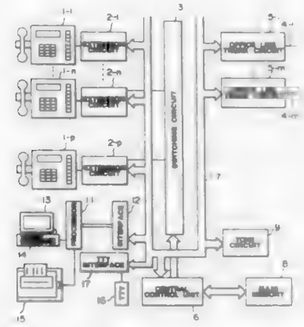
transmitting a transaction commence signal to the particular remote modem, said transaction commence signal being transmitted without a login procedure being performed; and
transmitting confidential data between the particular remote modem and the host modem.

5,144,652
DEVICE FOR CONNECTING A SUBSCRIBER LINE TO A SELECTED INTERNAL LINE
Johannes H. M. Smits, Oranjestraat 82, 6812 CS, Arnhem, Netherlands
Filed Mar. 13, 1990, Ser. No. 492,444
Claims priority, application Netherlands, Mar. 13, 1989, 8900604; Mar. 7, 1990, 9000521
Int. Cl.[5] H04M *11/00, 3/00, 1/00*
U.S. Cl. 379—102 **4 Claims**



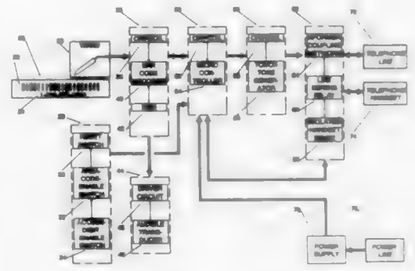
1. A device for connecting an information exchange subscriber line, such as a telephone, facsimile or telex line, to one of a plurality of internal lines, said device comprising a decoding means including discriminator means for recognizing rotary dialing disc pulses which have been distorted by telephone lines and exchanges of a calling apparatus, said discriminator means including timing means for determining a time region after an edge of a rotary dialing disc pulse and a coincidence means for ascertaining coincidence of an edge of a rotary dialing disc pulse and said time region, said device further including, connected to the input of said discrimination means, filter means for emphasizing the most significant portions of the distorted rotary dialing disc pulses, a sample and hold circuit connected to the output of said filter means for retaining said portions of rotary dialing pulses and a comparator means connected to said sample and hold means for comparing a predetermined fraction of the pulse value retained by said sample and hold circuit with an input pulse, said device further including a counter for counting a number of pulses equal to or smaller than the number of pulses of a predetermined initial test cipher and switching means controlled by said counter for setting the sample and hold means.

5,144,653
TELEPHONE SYSTEM CAPABLE OF AUTOMATICALLY DISTRIBUTING TERMINATING CALLS AND METHOD OF PERFORMING COMMUNICATION WITHIN THE TELEPHONE SYSTEM
Norio Masuoka, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 19, 1991, Ser. No. 672,127
Claims priority, application Japan, Mar. 20, 1990, 2-70566
Int. Cl.[5] H04Q *3/64*
U.S. Cl. 379—113 **7 Claims**



1. A telephone system comprising:
a plurality of extension terminals;
switching means, connected to the plurality of extension terminals and to a plurality of office lines, for connecting an extension terminal with one of the office lines in response to call origination from the extension terminal and for connecting an office line with one of the extension terminals in response to a terminating call from the office line;
input means, provided for each of the extension terminals, for inputting data for converting the extension terminal for which the input means is provided into a terminating call dedicated terminal;
terminating call dedicated registering means, included in said switching means, for registering an extension terminal through which data for converting the extension terminal into a terminating call dedicated terminal is input; and
automatic terminating call distributing means for controlling the switching means so as to distribute a terminating call directed to an extension terminal group consisting of extension terminals which are converted into terminating call dedicated terminals, to one of the extension terminals registered in the terminating call dedicated registered means.

5,144,654
AUTOMATIC TELEPHONE DIALER SYSTEM WITH PRINTED STORAGE
James T. Kelley, 968 Kiely Blvd. #E, Santa Clara, Calif. 95051, and Stephen E. Rackman, Jr., 1660 Franky Ct., Santa Cruz, Calif. 95065
Filed Mar. 22, 1991, Ser. No. 673,410
Int. Cl.[5] H04M *1/274*
U.S. Cl. 379—356 **20 Claims**

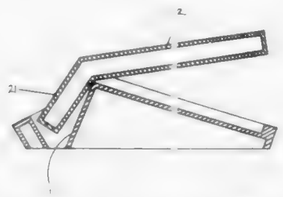


1. An automatic telephone dialer system for use with a telephone which can have an on-hook or off-hook status, comprising:
(a) printed storage means for storing at least one telephone number in a printed format, whereby said printed storage means can be easily filed and duplicated,
(b) reading means for reading said printed storage means and converting said telephone number into a telephone-number-representative electrical signal,
(c) processor means for processing said electrical signal into a signal suitable for dialing a telephone,
(d) interface means for interfacing said processor means to a telephone line,
(e) sensor means for sensing whether said telephone has an on-hook or off-hook status,
(f) means for connecting said sensor means to said processor means so that the phone number read by said reading means is not dialed by said processor means until said sensor means senses that said telephone has an off-hook status,
(g) memory means for storing a plurality of phone numbers in response to said telephone-number-representative electrical signal from said reading means, such that said phone numbers in said memory means have a sequence of storage, and that said telephone-number-representative electrical signal from said reading means has a sequence of reading, such that said sequence of storage and said sequence of reading are identical,
(h) means for connecting said memory means to said processor means so that one of said phone numbers in said memory means is dialed by said processor means each time said telephone makes an on-hook to off-hook transition, such that said phone numbers dialed by said processor means have a sequence of dialing which is identical to said sequence of storage and said sequence of reading, and
(i) reset switch means connected to said processor means so that upon activation of said reset switch means, all phone numbers are deleted from said memory means.

5,144,655
TELEPHONE HANDSET
Berry-Smith Matthew, Australia Post, Canberra City, A.C.T. 2601, Australia
Filed May 24, 1989, Ser. No. 356,214
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—433 **2 Claims**

1. A telephone means comprising:
a handset having an elongated housing including a mouth-

piece section and an earpiece section, the earpiece and the mouthpiece sections being angularly disposed relative to each other with the earpiece section being longer in length than the mouthpiece section; a base means for supporting the telephone handset, the base means having a ramp means, a void and a fulcrum which separates the void and the ramp means; wherein the ramp means is shaped to correspond to the earpiece section such that when the



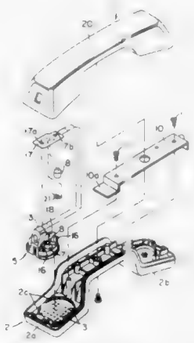
handset is mounted on the base, the longer earpiece section is supported and the mouthpiece section is mounted over the void; and wherein the user can easily detach the handset from the base by pressing down on the mouthpiece portion which (a) causes the mouthpiece section to extend downwardly into the void and (b) causes the earpiece section to extend upwardly, whereby the earpiece portion can then be easily gripped by the user.

5,144,656

TRANSMITTER FOR COMMUNICATION EQUIPMENT

Hidenori Oku, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 5, 1990, Ser. No. 475,003
Claims priority, application Japan, Feb. 6, 1989, 1-12815[U]
Int. Cl.[5] H04M *1/00*; H04R *25/00*
U.S. Cl. 379—433 **3 Claims**



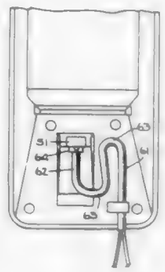
1. A telephone handset, comprising:
a casing, including a transmitter piece of the telephone handset, the transmitter piece having a plurality of outer microphone holes formed therethrough, and including an inner surface and a supporting plate for supporting a microphone;
an air chamber housing arranged on the inner surface of the transmitter piece, including an air chamber communicating with the outer microphone holes, the air chamber housing having an upper surface and an inner microphone hole formed therethrough to open at the upper surface, the air chamber housing having a pair of latches formed integrally with the upper surface thereof, each of the latches including a distal end and adapted to engage with the supporting plate of the microphone for holding the supporting plate;
a microphone holder integrally formed with the upper surface of the air chamber housing, at a position eccentric radially outwardly from the center of the air chamber housing to communicate with the inner microphone hole, the microphone holder receiving the microphone;
a pair of brackets integrally formed with the upper surface of the air chamber housing to project upwards;
a securing plate depressed against the top surfaces of the brackets; and
a jack integrally formed on the upper surface of the air chamber housing.

5,144,657

HAND TEST SET WITH STRAIN RELIEF WIRE CHANNEL

Jean-Francois Depaepe, Asnieres, France, assignor to S.A. Henri Depaepe, Colombes, France

Filed Jul. 31, 1991, Ser. No. 738,450
Int. Cl.[5] H04M *1/03, 1/15*
U.S. Cl. 379—433 **21 Claims**



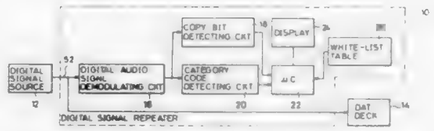
1. In a craft hand test set for testing telephone lines, including a signal transmitter and a signal receiver and line connector receptacle for accepting a line connector through which said signal transmitter and signal receiver can be connected to a telephone line, the improvement comprising:
a channel disposed in said test set, said channel receiving a line connected to the line connector, said channel holding the line when the line connector is connected to said line connector receptacle and having a shape that reduces effects of strain on the connecting line.

5,144,658

REPEATER OF DIGITAL AUDIO INTERFACE SIGNAL

Ryutaro Takahashi, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaku, Japan

Filed Nov. 20, 1990, Ser. No. 616,067
Claims priority, application Japan, Nov. 24, 1989, 1-305648
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—3 **20 Claims**



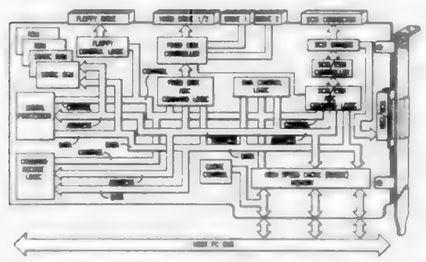
1. A digital audio interface signal repeater comprising:
means for receiving a digital audio interface signal;
means for demodulating predetermined information from the received digital audio interface signal;
means for determining whether the digital signal may be copied and if so, a number of copies which are permitted; and
information displaying means for displaying whether the digital signal may be copied, and if so, the number of copies which are permitted.

5,144,659

COMPUTER FILE PROTECTION SYSTEM

Richard P. Jones, 7930 East Side Dr. NE., Tacoma, Wash. 98422, assignor to Richard P. Jones, Tacoma, Wash.

Filed Apr. 19, 1989, Ser. No. 340,886
Int. Cl.[5] G06F *12/14*
U.S. Cl. 380—4 **10 Claims**



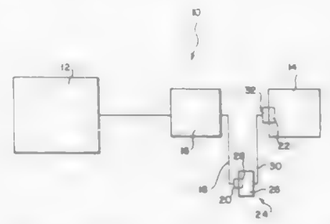
1. A computer file protection method for a digital computer accessible by a user, said computer having a file storage device for storing files and interconnected with a central processing unit by a bus carrying control logic signals, address signals, and data signals, said computer further being supplied with a computer operating system, which comprises:
(a) providing a file security subsystem for said digital computer which comprises a programmable auxiliary memory and a control unit;
(b) attaching said programmable auxiliary memory and said control unit to the bus in a manner so that it resides in the bus between said file storage device and said central processing unit;
(c) allowing access to said file security subsystem by the computer operating system for initialization and modification only during an installation stage of the file security subsystem and disallowing access to said file security subsystem by said computer operating system following said installation stage;
(d) providing the programmable auxiliary memory system with supervisor entered access criteria for access permission for read operations, write operations and execute operations for each one of all of the files stored in said file storage device;
(e) requiring each user to provide to said programmable auxiliary memory a valid user identification, whereupon said programmable auxiliary memory and control unit will indicate to the computer operating system only those of said files which are accessible to that user and whether read operations, write operations and execute operations may be performed upon said accessible files, said auxiliary memory and control unit denying access to users with invalid access criteria and refusing to write data to any of the files stored in said file storage device when operations without valid access criteria have been attempted.

5,144,660

SECURING A COMPUTER AGAINST UNDESIRED WRITE OPERATIONS TO OR READ OPERATIONS FROM A MASS STORAGE DEVICE

Anthony M. Rose, 66 Drumalbyn Road, Bellevue Hill, Sydney, Australia 2023

Filed Aug. 31, 1989, Ser. No. 401,032
Claims priority, application South Africa, Aug. 31, 1988, 88/6480
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—4 **8 Claims**



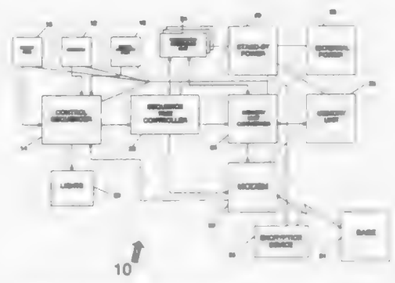
1. A method of securing a computer against unauthorized accessing of a predetermined set of the storage domains, where said computer comprises a mass storage device which includes:
a data storage medium divided into a series of storage domains, and a read-write head for read-write accessing of the data storage medium;
control means for controlling the mass storage device; and
a bus connecting the control means to the mass storage device, which bus includes a stepping line to which stepping signals are applied by the control means for stepping the read-write head from one storage domain to the next, and a direction control line to which direction control signals are applied by the control means for controlling the direction in which the read-write head is stepped,
which method comprises, in counting means connected to the stepping line and the direction control line between the control means and the mass storage device, and in response to the stepping signals and direction control signals, keeping a count corresponding to the position of the read-write head relative to the data storage medium, and in response to the count in the counting means, inhibiting access to said predetermined set of storage domains.

5,144,661

SECURITY PROTECTION SYSTEM AND METHOD

Robert Sharoosh, 486 Salem St., Paramus, N.J. 07652, and Harvey N. Berlent, Closter Dock Rd., Alpine, N.J. 07620

Filed Feb. 11, 1991, Ser. No. 653,181
Int. Cl.[5] H04K *1/02*; G08B *21/00*; H04N *7/18, 5/225*
U.S. Cl. 380—9 **33 Claims**



1. A security and detection system, comprising:

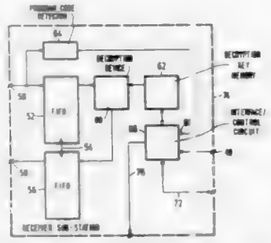
sensor means for sensing an alarm condition and for generating a first signal when an alarm condition is sensed;
manual activation means for generating a second signal upon manual activation by a user;
video and audio recording means responsive to the conditions represented by said first signal and said second signal for recording images and accompanying sound information, and for generating corresponding video and audio signals;
memory converter means for converting said video and audio signals to a format convenient for storage and transmission;
memory means for storing said converted signals; and
transmission means for transmitting said converted signals to a base unit at a remote location.

5,144,662

PUBLIC COMMUNICATION SYSTEM COMPRISING DISTRIBUTED STATIONS, AND STATION AND SUB-STATION FOR USE IN SUCH A COMMUNICATION SYSTEM

Harm J. Welmer, Surrey, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y

Continuation-in-part of Ser. No. 479,96[illegible], Feb. 1, 1990, Pat. No. 4,980,912. This application Dec. 21, 1990, Ser. No. 631,605
Claims priority, application Netherlands, Feb. 8, 1989, [illegible]
The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—10 **7 Claims**



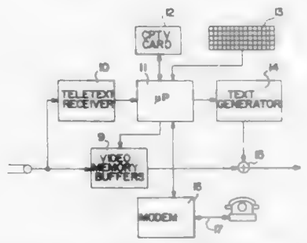
1. A system for broadcasting encrypted information comprising: a plurality of distributed stations for receiving and decrypting this information and for making decrypted information available to a reproduction apparatus, and a governing accounting system/access control system for selectively making one or more decryption keys available to each station, each station comprising at least one decryption key sub-station (CASS) and at least one receiver sub-station, all such sub-stations within each station being interconnected by means of a standard serial bus without a central bus control sub-station, each receiver sub-station comprising means for receiving a current program selection from a user means for obtaining by way of the received current program selection, information identifying a selective accounting system/access control system, and accessing means for via said serial bus accessing a decryption key sub-station and supplying said identifying information thereto, so as to verify an entitlement, for upon verification deriving a decryption key therefrom, and for enabling a further accessing operation in case of non-verification of said entitlement.

5,144,663

METHOD OF INTERACTIVE COMMUNICATION BETWEEN A SUBSCRIBER AND A DECODER OF A SYSTEM OF PAY-TELEVISION AND DECODER THEREOF

André Kudelski, Crissier; Laurent Laffely, Le Mont-sur-Lausanne, and Marco Sasselli, Chardonne, all of Switzerland, assignors to Kudelski S.A. Fabrique D'Engregistreurs Nagra, Cheseaux, Switzerland

Continuation of Ser. No. 488,493, Mar. 6, 1990, abandoned, which is a continuation of Ser. No. 38,727, Apr. 15, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 613,940
Claims priority, application Switzerland, Apr. 18, 1986, 1576/86
Int. Cl.[5] H04N *7/167*; **H04K** *1/00*
U.S. Cl. 380—16 **3 Claims**



1. A decoder for a pay-TV system comprising:
receiver means for receiving a scrambled video signal, which signal comprises information codes relating to performances to be broadcasted, and for separating said scrambled video signal and said information codes;
a separate card connectable to said receiver means;
means for enabling a subscriber to select at least one information code corresponding to a performance which said subscribe desires to purchase; and
wherein said receiver means comprises first microprocessor means for storing a plurality of said information codes, for transmitting to said card information codes selected by said subscriber and for transmitting to said card an enciphered descrambling code;
wherein said card comprises:
an EEPROM for storing at least credit information comprising an available amount of credit and said at least one information code selected by said subscriber; and
wherein said card further comprises:
second microprocessor means for comparing the cost of a performance selected by said subscriber with said available amount of credit when said selected performance is broadcast, and, if said cost is less than said available amount of credit, for deciphering said descrambling code and supplying said deciphered descrambling code to said first microprocessor, to thereby enable said first microprocessor to use said deciphered descrambling code to descramble said scrambled video signal and deliver it to a display unit.

5,144,664

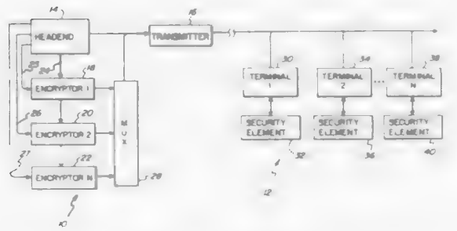
APPARATUS AND METHOD FOR UPGRADING TERMINALS TO MAINTAIN A SECURE COMMUNICATION NETWORK

James N. Esserman, San Diego, and Jerrold A. Heller, Del Mar, both of Calif., assignors to General Instrument Corporation, Hatboro, Pa.

Filed Nov. 16, 1990, Ser. No. 614,940
Int. Cl.[5] H04L *9/14, 9/16*; **H04N** *7/167*
U.S. Cl. 380—20 **22 Claims**

1. A system for revising a set of terminals in a communication network to maintain signal security comprising:
a headend for transmitting signals;

encryption means operatively associated with said headend for encrypting said signals according to a plurality of encryption algorithms, each algorithm associated with a different subset of terminals authorized to receive said signals;
means for selectively terminating the transmission of said signals under a particular algorithm;



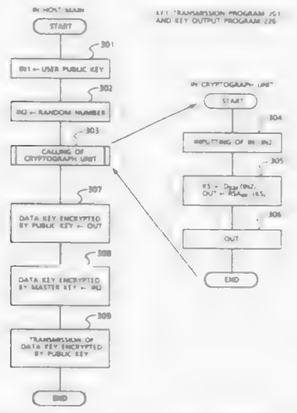
means for providing a replacement algorithm in said encryption means for use instead of the terminated algorithm; and
security means for providing a corresponding replacement algorithm to the subset of terminals associated with the terminated algorithm.

5,144,665

CRYPTOGRAPHIC COMMUNICATION METHOD AND SYSTEM

Kazuo Takaragi, Ebina; Yasuhiro Ishii, Hadano, and Tsutomu Nakamura, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,528
Claims priority, application Japan, Feb. 21, 1990, 2-038221
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—30 **13 Claims**



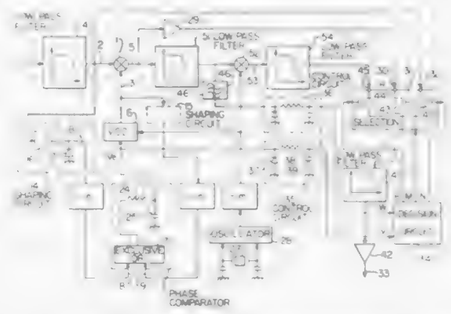
1. A cryptographic communication system, including a plurality of user terminals and a host computer interconnected by way of a communication network, in which cryptographic communication is performed between a given one of said user terminals and said host computer by using a first data key designated by said given user terminal or alternatively by using a second data key designated by said host computer,
said host computer comprising:
cryptographic processing means including a processing part for performing a public key cryptographic processing and a common key cryptographic processing, and an internal memory part for recording a master common key and a master private key;
storage means for recording as user private key information those data that result from the public key cryptographic processing performed by using said master public key on a plurality of first user private keys which are in paired relation to first user public keys held internally of said user terminals, respectively; and
control means for performing input/output control of said cryptographic processing means and said storage mans;
wherein when key designation information is received from a given one of said user terminals upon designation of the data key, the user private key information corresponding to said given user terminal is read out from said storage means, to thereby decrypt said first data key by said cryptographic processing means on the basis of said key designation information and said user private key information and generate first key information from said first data key through the common key cryptographic processing by using said master common key, said first key information being held in said control means;
while upon execution of cryptographic communication, said cryptographic processing means generates said first data key from said first key information through the common cryptographic processing by using said master common key for every encryption or decryption of messages for communication, to thereby encrypt or decrypt said message through the common key cryptographic processing by making use of said first data key.

5,144,666

DECODER TO DECODE AN ENCRYPTED SOUND

Maurice Le Van Suu, Romainville, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Oct. 1, 1990, Ser. No. 591,680
Claims priority, application France, Oct. 2, 1989, 89 12844
Int. Cl.[5] H04K *1/04*; **H04N** *7/167*
U.S. Cl. 380—38 **10 Claims**



1. A decoder to decode an encrypted sound signal, which has been encrypted by modulating said sound signal on an alternating carrier signal at a frequency which is unknown to receiving parties to prevent unauthorized reception, comprising:
a demodulator, receiving a first electrical signal representing the encrypted sound signal and receiving a second alternating electrical signal of the frequency which is that of the alternating carrier signal, said demodulator providing at an output thereof a demodulated electrical signal that represents said sound signal;
an oscillator controlled by a phase locked loop, including a phase comparator, to produce said second alternating electrical signal representing the carrier signal of an unknown frequency;
said phase comparator receiving at a first input an electrical

signal representing the carrier of the encrypted sound and at a second input, an electrical signal from the oscillator, said phase comparator producing a signal for controlling said oscillator frequency to derive the second alternating signal;

the phase comparator including;

an exclusive OR logic gate connected with a sequential circuit means for determining which of said electrical signals reaches said phase comparator first, whereby a relative polarity for said signal controlling said oscillator is determined; and

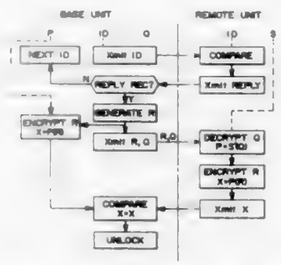
a signal divider connected to said phase comparator first and second inputs for frequency dividing signals applied to said inputs, whereby said phase comparator only compares phases of signals with lower frequencies than said carrier signal frequency and said oscillator frequency.

5,144,667

METHOD OF SECURE REMOTE ACCESS

Russell W. Pogue, Jr., Kokomo, Ind., and Ronald L. Rivest, Arlington, Mass., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 20, 1990, Ser. No. 630,626
Int. Cl.[5] H04L 9/02
U.S. Cl. 380—45 12 Claims



1. In a secure remote access system having a base unit and a remote unit coupled by a communication link, the remote unit containing a private key known only to that particular remote unit, a method of authentication of the remote unit comprising the steps of:

registering the remote unit with the base unit by establishing a randomly selected common key through communication between the base unit and the remote unit in a manner that maintains the privacy of the common key, and storing the common key and an encrypted form of the common key in the base unit;

then authenticating the remote unit by encrypting a random number with the common key in the base unit, passing the encrypted common key and a challenge number from the base unit to the remote unit wherein the challenge number comprises one of the random number and the encrypted random number, decrypting the common key in the remote unit, operating on the challenge number with the common key in the remote unit and passing the result to the base unit, and comparing the results.

5,144,668

SIGNAL OVERLAP DETECTION IN A COMMUNICATION SYSTEM

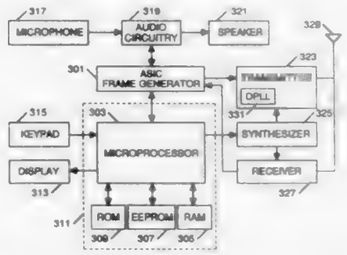
Charles J. Malek, Crystal Lake, and James A. McDonald, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 25, 1991, Ser. No. 646,538
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—48 39 Claims

1. A method of communication in a communication system with a base station and communication unit that communicate digital information messages to each other, comprising the steps of:

transmitting a first message frame of a first digital information message, said first message frame having a format comprising a first boundary, a second boundary, and at least a first signal overlap detection field;

receiving said transmitted first message frame;



transmitting said at least a second signal overlap detection field in a second message frame of a second digital information message;

detecting a signal overlap by comparing said at least a second signal overlap detection field with said at least a first signal overlap detection field; and

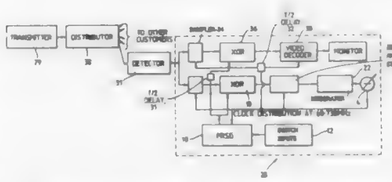
adjusting, responsive to said step of detecting, message frames subsequent to said second message frame in time to eliminate said signal overlap.

5,144,669

METHOD OF COMMUNICATING DIGITAL SIGNALS AND RECEIVER FOR USE WITH SUCH METHOD

David W. Faulkner, and Dianne M. Russ, both of Ipswich, England, assignors to British Telecommunications public limited company, London, England

PCT No. PCT/GB88/00744, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/02681, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 9, 1988, Ser. No. 348,575
Claims priority, application United Kingdom, Sep. 14, 1987, 8721603; Feb. 26, 1988, 8804552
Int. Cl.[5] H04L 9/00, 7/00; H04J 3/06
U.S. Cl. 380—49 16 Claims



1. A receiver for receiving a time division multiplexed signal comprising two or more time division multiplexed channels of digital signals and for selectively extracting a signal constituting one of the two or more time division multiplexed channels of digital signals, the signal constituting said one channel having been scrambled before forming the multiplexed signal using a predetermined digital sequence, said receiver comprising:

a clock means arranged to provide clock pulses having a clock pulse repetition rate dependent on a clock control signal;

a digital sequence generator means for providing a generator signal representative of the predetermined digital sequence at the clock pulse repetition rate;

a first sampling means arranged to provide a sampled signal which is the received multiplexed signal sampled at the clock pulse repetition rate; and

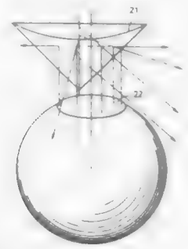
a phase lock means controlling the clock control signal whereby, in use, the generator signal is phase-locked to the sampled signal.

5,144,670

SOUND OUTPUT SYSTEM

Hirokazu Negishi, Epsom, England, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 280,936
Claims priority, application United Kingdom, Dec. 9, 1987, 8728793; Nov. 4, 1988, 8825881
Int. Cl.[5] H04R 5/02
U.S. Cl. 381—24 17 Claims



1. A sound output system comprising:

(a) a pair of right and left speakers; and

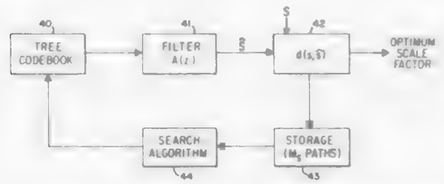
(b) a pair of conical or part-conical audio mirrors for respectively controlling directivities of sounds which are output from said pair of speakers, said pair of audio mirrors being some distance from a listening area, the listening area being arranged along a line which is parallel to a line along which said pair of audio mirrors are arranged, centers of the right and left speakers being shifted from centers of the pair of audio mirrors to a side near the listening area and to a side near to each other, so that at any point in the listening area, a difference between arrival times of the sounds from said pair of speakers to that point in the listening area can be compensated for by a difference in amplitude of the sounds from said pair of speakers at that point in the listening area, in accordance with the Haas effect.

5,144,671

METHOD FOR REDUCING THE SEARCH COMPLEXITY IN ANALYSIS-BY-SYNTHESIS CODING

Baruch Mazor, Newton Centre, and Dale E. Veeneman, Southborough, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 15, 1990, Ser. No. 494,071
Int. Cl.[5] G10L 5/00; A61F 15/38
U.S. Cl. 381—36 9 Claims



1. A method of encoding a frame of input speech signal using a tree-code excitation codebook wherein each branch of said tree-code represents a sequence of codeletters and each full path through said tree-code represents a codeword, comprising the steps of:

partitioning the speech frame into a predetermined number of sample segments of length equal to the length of each branch in a respective stage of said tree-code;

performing a limited search of said tree-code to find a codeword achieving an optimal representation of said input speech signal, said search operating so that at each stage of said tree-code only a limited number of paths are saved from which further searching occurs:

said limited search including at each current stage of said tree-code the steps of

identifying the paths to be currently searched by extending out a predetermined number of branches from the saved paths which lead up to the current stage from a root node,

filtering the respective codeletters of said extended branches with a coloring filter,

minimizing an error distance measurement between a synthetic signal defined by each path being currently searched and the sequence of sample segments up to the current stage by optimizing a scaling factor of said synthetic signal, and

saving those limited number of paths having the lowest distance measurements relative to the measurements of the other currently searched paths;

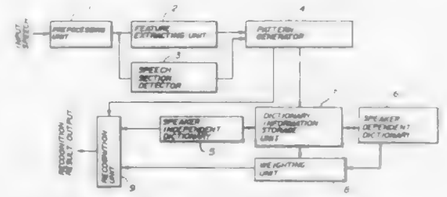
whereby the limited searching continues into the next stage by repeating the steps of path identification, codeletter filtering, error distance minimization by optimal scaling, and path saving so that after reaching the last stage of said tree-code, the single one of the saved full paths having the lowest relative distance measurement represents the codeword achieving an optimal representation of said frame of input speech signal.

5,144,672

SPEECH RECOGNITION APPARATUS INCLUDING SPEAKER-INDEPENDENT DICTIONARY AND SPEAKER-DEPENDENT

Shoji Kuriki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 28, 1990, Ser. No. 589,516
Claims priority, application Japan, Oct. 5, 1989, 1-261097; Oct. 5, 1989, 1-261098; Jul. 27, 1990, 2-200149
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—41 8 Claims



1. A speech recognition apparatus comprising:

input means for receiving an input speech signal and for extracting features from said input speech;

pattern generating means, coupled to said input means, for generating a speech pattern of said input speech from said features extracted by said input means, said speech pattern having a time-spectrum pattern showing frequency elements obtained at predetermined intervals;

a speaker-independent dictionary for storing a first group of reference patterns, each obtained by adding a plurality of time-spectrum patterns of an identical word uttered by different speakers;

a speaker-dependent dictionary for storing a second group of reference patterns, each obtained by adding time-spectrum patterns of an identical word uttered by an identical speaker;

dictionary information storing means, coupled to said speak-

er-independent dictionary and said speaker-dependent dictionary, for storing dictionary information about said first group of reference patterns and said second group of reference patterns, the dictionary information storing means coupled to said pattern generating means so as to receive the speech pattern generated by the pattern generating means;

weighting means, coupled to said speaker-dependent dictionary and said dictionary information storing means, for calculating a weighting factor from said dictionary information and for weighting said second group of reference patterns in said speaker-dependent dictionary by using said weighting factor to thereby output weighted reference patterns; and

recognizing means, coupled to said pattern generating means, said speaker-independent dictionary and said weighting means, for recognizing said speech pattern of said input speech signal generated by said pattern generating means by using said first group of reference patterns in said speaker-independent dictionary and said weighted reference patterns supplied from said weighting means, so that said first group of reference patterns and said weighted reference patterns are equally handled, said recognizing means outputting a recognition result.

5,144,673

REFLECTION SOUND COMPRESSION APPARATUS

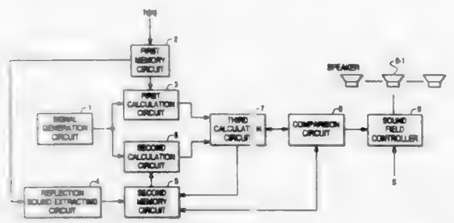
Masaharu Matsumoto, Katano; Mitsuhiko Serikawa, Hirakata; Akihisa Kawamura, Hirakata; Hiroko Yoshida, Hirakata, and Katsuaki Sato, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 7, 1990, Ser. No. 623,619

Claims priority, application Japan, Dec. 12, 1989, 1-322130

Int. Cl.[5] H03G *3/00*

U.S. Cl. 381—61 5 Claims



1. A reflection sound compression apparatus comprising:

signal generating means for generating a random signal;

first memory means having stored therein a predetermined impulse response;

reflection sound extracting means for compressing and extracting a predetermined number of reflection sounds from the impulse response stored in the first memory means;

second memory means for storing the reflection sounds extracted from the reflection sound extracting means;

first calculation means for performing convolution of the impulse response stored in the first memory means and the random signal generated from the signal generating means;

second calculation means for performing convolution of the reflection sounds stored in the second memory means and the random signal generated from the signal generating means;

third calculation means for calculating a difference between output signals from the first and second calculation means and correcting the reflection sounds stored in the second memory means using the calculated difference; and

comparison means for analyzing said difference calculated by the third calculation means, and, when the analyzed result satisfies a predetermined condition, stopping the calculation of the third calculation means and setting the reflection sounds stored in the second memory means to a sound field controller for producing a sound field from the set reflection sounds and a music signal.

5,144,674

DIGITAL PROGRAMMING DEVICE FOR HEARING AIDS

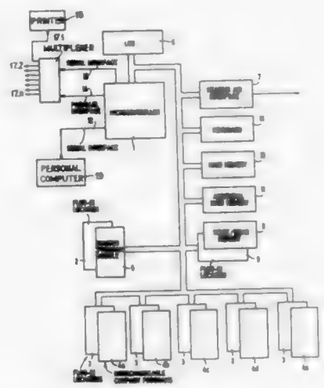
Wolfram Meyer, Moehrendorf; Eduard Kaiser, Forchheim; Ullrich Sigwanz, Erlangen, all of Fed. Rep. of Germany, and Soeren Larsen, Odense, Denmark, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 420,934

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1988, 3834962

Int. Cl.[5] H04R *29/00, 25/00*

U.S. Cl. 381—68 10 Claims



1. A digital programming device for programming a plurality of different hearing aids comprising:

a plurality of module plug-in locations each adapted to receive one of a plurality of interchangeable manufacturer program modules each manufacturer program module having characteristics stored therein for setting a hearing aid uniquely associated with said manufacturer program module;

a master program module having a program stored therein for identifying one or more manufacturer program modules in said module plug-in locations;

control means connected to each of said plug-in location can to said master program module for conducting a read operation, using said program in said master program module, of said module plug-in location thereby identifying which module plug-in locations are respectively occupied by which manufacturer program modules;

hearing aid interface means connected to said module plug-in locations and to said control means and adapted for connection to a hearing aid to be set for supplying the characteristics from one of said manufacturer program modules to the hearing aid;

said hearing aid interface means consisting of software-controlled digital-to-analog converter means for producing variable signal levels, software-controlled analog-to-digital converter means for determining external impedance, software-controlled analog switch-over means for adjusting the half- or full-duplex mode, software-controlled analog switch means for connecting or disconnecting different pull-up or pull-down resistors, and hardware-controlled operational amplifiers connected to an external resistor to produce variable signal levels and polarities; and

means connected to said control means for selecting a manufacturer program module uniquely associated with said hearing aid and thereby connecting said hearing aid to said program module uniquely associated therewith via said hearing aid interface means.

5,144,675

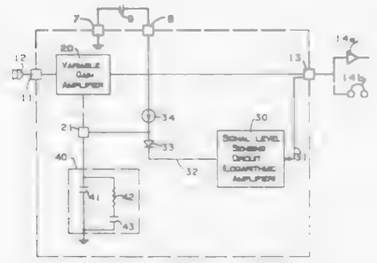
VARIABLE RECOVERY TIME CIRCUIT FOR USE WITH WIDE DYNAMIC RANGE AUTOMATIC GAIN CONTROL FOR HEARING AID

Mead C. Killion, Elk Grove Village, Ill.; Harry Teder, Minneapolis, Minn.; Arthur C. Johnson, Lakeville, Minn., and Steven P. Hanke, Bloomington, Minn., assignors to Etymotic Research, Inc., Elk Grove Village, Ill.

Filed Mar. 30, 1990, Ser. No. 502,433

Int. Cl.[5] H04R *25/00, 29/00;* H03G *3/00;* H03F *3/45*

U.S. Cl. 381—68.4 4 Claims



1. A hearing aid amplifier including an input terminal arranged for receiving an audio input signal such as from a microphone,

an output terminal arranged for delivering an amplified replica of said input signal to further amplifier or reproduction means such as an earphone,

a power source,

a variable gain amplifier circuit arranged for energization from said power source and connected between said input and output terminals,

a control terminal arranged for receiving a control signal and controlling the gain of said variable gain amplifier circuit,

a signal level sensing circuit arranged for sensing a signal voltage level at said output terminal and providing a control voltage signal to said control terminal that is logarithmically related to said signal voltage level at said output terminal whenever said signal voltage level at said output terminal falls below a predetermined threshold value and for thereby providing a wide-dynamic-range logarithmic-compression operation such that gain is increased for weaker signal levels below said predetermined threshold value while signal levels above said predetermined threshold value are amplified transparently without being limited,

an impedance means connected to said control terminal to determine the dynamic characteristics of said variable gain amplifier circuit at signal levels below said predetermined threshold level at which gain is increased for weaker signal levels through said wide-dynamic-range logarithmic-compression operation of said variable gain amplifier circuit, said impedance means including a first capacitor connected in parallel with a series combination of a resistor and a second capacitor, wherein the value of said second capacitor is greater than that of said first capacitor, and said impedance means being operative to determine the dynamic characteristics of said variable gain amplifier circuit at signal levels below said predetermined threshold level while being operative to provide a recovery time which is variable being rapid for recovery from short intense sounds and being much slower for recovery from prolonged intense sounds.

5,144,676

DIGITAL SAMPLING INSTRUMENT

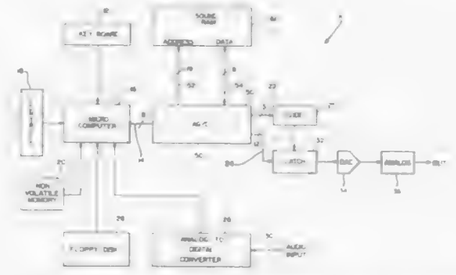
David P. Rossum, LaSelva Beach, Calif., assignor to E-mu Systems, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 390,436, Aug. 3, 1989, Pat. No. 4,987,600, which is a continuation of Ser. No. 874,250, Jun. 13, 1986, abandoned. This application Jan. 16, 1991, Ser. No. 641,693

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] G10H *7/00*

U.S. Cl. 381—118 7 Claims



1. A digital sampling keyboard instrument having a plurality of channels of operation for encoding digital data samples having a certain number of bits representative of a particular musical sound having a first fidelity comprising:

means for approximating said digital data samples for each of said channels of operation, said means for approximating including

means for creating differences between successive ones of said digital data samples,

means for creating the logarithm of said differences to form compressed logarithmic differential data which is compressed to a fewer number of bits than said certain number of bits,

memory means for storing said compressed logarithmic differential data,

means for adding time varying logarithmic encoded volume coefficients to said stored compressed logarithmic differential data to form added compressed logarithmic differential data,

means for creating the anti-logarithm of said added compressed logarithmic differential data, and

means for creating volume scaled data samples from said anti-logarithm which approximate said digital data samples while maintaining fidelity similar to said first fidelity.

5,144,677

HAND-HELD MICROPHONE APPARATUS WITH RESILIENT STABILIZING RING

Michihito Asakura, Tendo, and Satoshi Hasegawa, Tokyo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 607,393

Claims priority, application Japan, Mar. 19, 1990, 2-227240[U]

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—169 2 Claims

1. A hand-held microphone apparatus comprising:

a microphone body (1) having a generally cylindrical housing;

a microphone chip (**2**), fixedly secured to a proximal or speaking end of said microphone body, said microphone chip functioning as a sound pressure-current converting means;

a microphone cover (**4**) formed from a net or screen material having a plurality of interstices, and defining a truncated sphere enclosing and protectively surrounding said microphone chip, said cover having a maximum diameter portion greater than a maximum diameter of said housing; and

a resilient, easily removable, stabilizing ring (**7**) fitted over said microphone cover at said maximum diameter portion thereof and mounted normal to an axis of said microphone body, said resilient ring having an outer circumference in the shape of a regular polygon so as to prevent the microphone from rolling when placed on flat surfaces and including projections (*7a*) circumferentially spaced on an inner circumference thereof, said projections fitting into said interstices to securely and fixedly attach said ring to said cover.

5,144,678

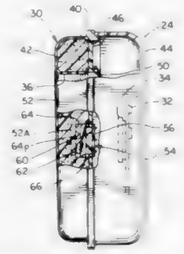
AUTOMATICALLY SWITCHED HEADSET

Vernon C. Lenz, Yakima, Wash., assignor to Golden West Communications Inc., Union Gap, Wash

Filed Feb. 4, 1991, Ser. No. 650,416

Int. Cl.[5] **H04R** *2 /02*

U.S. Cl. 381—183 **6 Claims**



1. An automatically switched headset comprising:

a head band with opposite ends;

first and second earmuff devices each mounted on a different one of said band ends, said first earmuff device having a housing holding an electronic circuit which can be switched between on and off states and which includes an ear speaker, said first earmuff device having a soft resilient cushion with a rear fixedly mounted on said housing to prevent movement of almost all of said rear relative to said housing but with at least one location on said rear being free of fixation to said housing, said earmuff device having a front exposed to press against the head of a wearer, said cushion having an opening for receiving an ear of the wearer and said cushion extending completely around said opening to press against the area at the side of the wearer's head which surrounds his ear, with most of the cushion lying immediately outside said opening being fixedly mounted on said housing;

said circuit including a switch that switches said circuit between said on and off states and that is mounted on said housing of said first earmuff device;

said switch including a switch actuating device having a front end lying against a location on said rear of said cushion which is not fixedly mounted on said housing, to be deflected rearwardly and switch said circuit to said on state, as said cushion is rearwardly deflected when the headset is placed on the wearer's head.

5,144,679

GRAPHIC DATA SEARCHING AND STORAGE METHOD

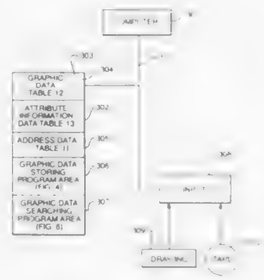
Shigeru Kakumoto, Tokorozawa; Masayasu Kato, Hitachi; Fumitaka Otsu, Funabashi, and Kazuo Watanabe, Isehara, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Seiko, Ltd., Kanagawa, both of, Japan

Continuation of Ser. No. 496,181, Mar. 20, 1990, Pat. No. 5,099,520, which is a continuation of Ser. No. 67,013, Jun. 29, 1987, abandoned. This application Feb. 4, 1991, Ser. No. 650,404

Claims priority, application Japan, Feb. 19, 1990, 2-36038

Int. Cl.[5] **G06K** *9/00*

U.S. Cl. 382—1 **40 Claims**



1. A graphic data handling method, comprising:

dividing a graphic image of figures into a plurality of graphic cells;

providing a graphic data table for storing graphic data for defining the figures within the cells;

providing an address data table which includes plurality of memory spaces of fixed capacity that are respectively assigned one-to one to the cells, for normally storing therein memory address pointers for the graphic data table, which memory address pointers respectively correspond to the figures in the cells; and

when a memory address pointer for the graphic data that corresponds to the figures in a pertinent cell cannot be stored in the memory space assigned to the pertinent cell, substitutionally storing said memory address pointer for the pertinent cell that cannot be so stored, in a memory space, as an overflow memory space, which is assigned to a different cell other than said pertinent cell.

5,144,680

INDIVIDUAL IDENTIFICATION RECOGNITION SYSTEM

Bujirou Kobayashi; Hiroshi Gamo, and Masatoshi Kimura, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 328,804, Mar. 21, 1989, abandoned, which is a continuation of Ser. No. 177,824, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 834,970, Feb. 28, 1986, abandoned. This application Dec. 5, 1990, Ser. No. 622,191

Claims priority, application Japan, Mar. 1, 1985, 60-40621; Jul. 31, 1985, 60-170143

Int. Cl.[5] **G06K** *9/78*

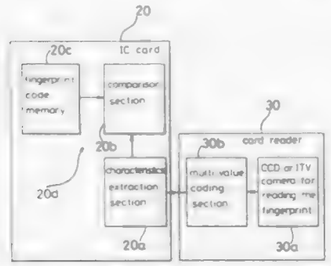
U.S. Cl. 382—4 **19 Claims**

1. A method of individual recognition for identifying an

authorized user, utilizing a memory card and a card reader, comprising the steps of:

storing authorized user data, in a memory of the memory card, representative of specific characteristics of depths and intervals of a stereoscopic fingerprint of a finger of the authorized user and rotational speed of the finger during reading of the stereoscopic fingerprint;

coding a user stereoscopic fingerprint signal read from a fingerprint of a card user from a fingerprint reader located on the card reader, said user stereoscopic fingerprint signal including information indicative of the rotational speed of a corresponding finger of the user during reading;



transmitting said user stereoscopic fingerprint signal from the card reader to the memory card by virtue of manual manipulation of the memory card into the card reader;

extracting, within the memory card, specific characteristics of depths and intervals of the user fingerprint and the rotational speed of the corresponding finger during reading; and

comparing, on the memory card, said authorized user data stored in the memory with said extracted specific characteristics and the rotational speed for developing a signal indicative of correspondence therebetween.

5,144,681

METHOD OF AND APPARATUS FOR INSPECTING CONDUCTIVE PATTERN ON PRINTED BOARD

Ryuji Kitakado; Hironobu Yano; Hiroaki Kakuma; Tetsuo Hoki, and Takao Kanai, all of Kyoto, Japan, assignors to Dainnippon Screen Mfg. Co., Ltd., Japan

Division of Ser. No. 500,294, Mar. 27, 1990, Pat. No. 5,027,417. This application Mar. 22, 1991, Ser. No. 674,546

Claims priority, application Japan, Mar. 31, 1989, 1-82117; May 12, 1989, 1-119056; May 25, 1989, 1-131876; Jun. 27, 1989, 1-164330; Jun. 27, 1989, 1-164331

Int. Cl.[5] **G06K** *9/00*

U.S. Cl. 382—8 **4 Claims**

1. A method of inspecting a printed board for pattern defects, said printed board being provided with an electrically-conductive pattern and a through hole thereon, said method comprising the steps of:

(a) photoelectrically reading an image of said printed board;

(b) dividing said image of said printed board into a pattern image representing said electrically-conductive pattern and a hole image representing said through hole;

(c) obtaining first and second images by selectively performing one of the steps of:

(c-1) obtaining said first image by magnifying said pattern image and defining said second image with said hole image itself;

(c-2) defining said first image with said pattern image itself and obtaining said second image by magnifying said hole image; and

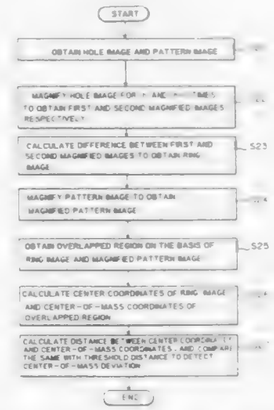
(c-3) obtaining said first and second images by magnifying said pattern image and said hole image, respectively;

(d) obtaining an overlapped region image representing an overlapped region on which said first and second images overlap each other;

(e) defining a two-dimensional radial operator having unit operators which extend from a radiant center point to different directions;

(f) detecting end points of said overlapped region image by applying said radial operator to said overlapped region image while relatively moving said radial operator and said overlapped region image;

(g) detecting a center point of said second image:



(h) calculating an aperture angle of said electrically-conductive pattern as a function of positional relation between said end points and said center point of said second image; and

(i) comparing said aperture angle with a predetermined reference angle and thereby judging whether said electrically-conductive pattern has a non-allowable defect or not.

5,144,682

METHOD AND AN APPARATUS FOR ISOLATING AN AREA CORRESPONDING TO A CHARACTER OR WORD

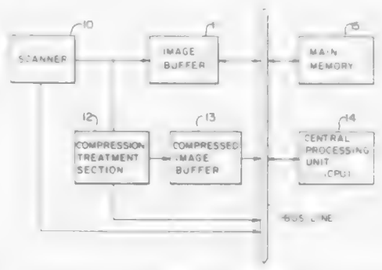
Masahiro Nakamura, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Continuation-in-part of Ser. No. 161,142, Feb. 26, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 441,154

Claims priority, application Japan, Mar. 5, 1987, 62-051025; May 1, 1987, 62-108552

Int. Cl.[5] **G06K** *9/34, 9/48, 9/46, 9/20*

U.S. Cl. 382—9 **27 Claims**



23. An apparatus for isolating a distinct image areas in an original manuscript having characters arranged in a line, the apparatus comprising:

(a) scanning means for reading out the images from the original manuscript;

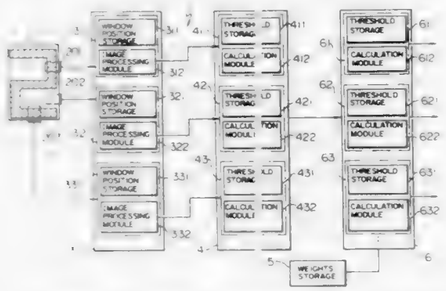
(b) image buffer means for storing the images read out by said scanning means as original manuscript image data;
(c) compression treatment means for proportionally compressing said read-out images from the original manuscript in a direction of scanning corresponding to the direction of the line in which the characters are arranged, to form respectively continuous areas of connected black picture elements corresponding to compressed images;
(d) compressed image buffer means for storing the one or more compressed images as compressed image data;
(e) main memory means for storing programs for controlling a central processing unit, said main memory means also being employed as a work area, and
(f) control means for:
(1) searching the continuous areas of black picture elements to determine coordinates where said black picture elements are connected with each other;
(2) obtaining a minimum coordinate point and a maximum coordinate point in accordance with said determined coordinates;
(3) extracting rectangular areas determined by said minimum coordinate point and said maximum coordinate point; and
(4) isolating the extracted rectangular areas as the distinct image areas.

5,144,683

CHARACTER RECOGNITION EQUIPMENT

Hideaki Suzuki; Kichie Matsuzaki, both of Yokohama; Kazuo Kato, Yamato; Mitsuo Oono, Hadano; Kenzo Takeichi; Ryoichi Hisatomi, both of Tochigi; Mitsunobu Isobe, Machida; Shigeru Fujimori, Hadano, and Kouzou Nemoto, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,608
Claims priority, application Japan, Apr. 28, 1989, 1-107844
Int. Cl.[5] G06K *9/46*
U.S. Cl. 382—16 **44 Claims**



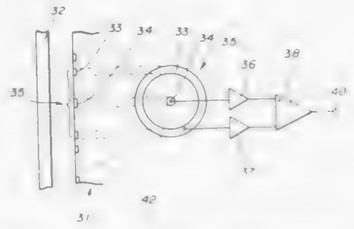
1. A character recognition equipment in which a character image is input and the input image is processed so as to discriminate a character type, comprising:
means for processing an image in a plurality of window regions set on the character image, wherein sizes and positions of the window regions may be set and altered in an interactive manner, said means for processing producing processing outputs said means for processing including a plurality of input units and, performing a processing operation selected from the following group of differential from the left processing, differential from the right processing, differential from the top processing, differential from the bottom processing, and density sum processing, on the windowed image, said types of processing can be designated in an interactive manner;
first means for performing calculations on values obtained by adding thresholds to said processing outputs, and provides calculation results, wherein said first means for performing calculations includes a plurality of feature units; and
second means for performing calculations on values obtained by multiplying the calculation results from respective units of said first means by a respective weight and adding thresholds to the sum total thereof, wherein either one of the thresholds or the weights or both of them are adjustable by using recognition results.

5,144,684

PARALLEL IMAGE PROCESSING APPARATUS USING EDGE DETECTION LAYER

Toshio Inada, Sagamihara; Yukio Ogura, Yokohama, and Junichi Kitabayashi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 30, 1990, Ser. No. 501,806
Claims priority, application Japan, Apr. 3, 1989, 1-84398; May 17, 1989, 1-123363; Jun. 13, 1989, 1-149968; Jul. 11, 1989, 1-178770; Sep. 27, 1989, 1-251268
Int. Cl.[5] G06K *9/48*
U.S. Cl. 382—22 **21 Claims**



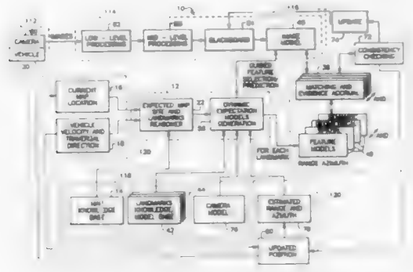
1. A parallel image processing apparatus, comprising:
a) a light diffusing member located at an imaging position;
b) a photoelectric conversion layer including a plurality of photoelectric conversion elements that are arranged for receiving light diffused by the light diffusing member, wherein:
1) the plurality of photoelectric conversion elements include at least one pair of photoelectric conversion elements, each pair including:
i) a center element; and
ii) a peripheral element which surrounds the center element;
2) the photoelectric conversion elements correspond to respective receptive regions on the light diffusing member, wherein points on the light diffusing member are defined as being in the receptive of a particular photoelectric conversion element when light diffused by the points is received by the particular photoelectric conversion element; and
3) the receptive regions are distributed on the light diffusing member; and
c) an edge detection layer which includes a plurality of edge detection elements, wherein:
1) at least some of the edge detection elements differentially amplifying outputs of the at least one pair of photoelectric conversion elements, the result of differential amplification being a signal E; and
2) the edge detection layer generates edge information which is a function of weighted sums of at least one of the conversion element output signals, the edge information describing the edge of the image.

5,144,685

LANDMARK RECOGNITION FOR AUTONOMOUS MOBILE ROBOTS

Hatem N. Nasar, Edina, and Bir Bhanu, New Brighton, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1989, Ser. No. 331,710
Int. Cl.[5] G06K *9/20*
U.S. Cl. 382—48 **8 Claims**



1. A landmark recognition system or autonomous vehicle navigation, comprising:
a camera, mounted on a vehicle, for outputting images of a field of view;
a first processor, connected to said camera, for processing the images into an image model having segmented regions, extracted objects and features;
a second processor, connected to said first processor, for outputting expected site models for each of the extracted objects;
a third processor, connected to said first and second processors, comprising means for matching expected site models and features from said second processor to extracted objects and features from said first processor, means for accruing evidence of the matching, means for determining site uncertainty of the models, and means for checking consistency between approximated range and sizes of the objects resulting in updated ranges of the objects;
a first data base, connected to said second processor, having model information, map information and camera information; and
a second data base, connected to said second and third processors, having current map location, speed and direction of the vehicle, and an updated estimated range and azimuth of the vehicle.

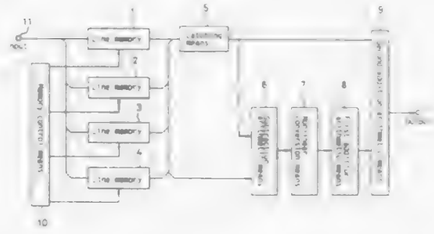
5,144,686

MTF COMPENSATION APPARATUS

Yumiba; Takashi; Haruo Yamashita, both of Osaka; Shinichi Konishi, Hirakata, and Yoshiteru Namoto, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 7, 1991, Ser. No. 652,076
Claims priority, application Japan, Feb. 23, 1990, 2-43026
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—54 **11 Claims**

1. A picture processing apparatus for sharpening a picture image in which a plurality of line memories each store a line of a picture image signal and a latching means stores a relevant pixel in said line memories, said picture processing apparatus comprising:
subtraction means for subtracting from a datum of said relevant pixel, N ($N \geqq 1$) respective data of N pixels which are nearest neighbors of said relevant pixel to produce N subtraction outputs;
nonlinear conversion means for nonlinearly converting said N subtraction outputs to produce N corresponding conversion outputs;
first addition means for adding said N conversion outputs to produce a conversion sum; and



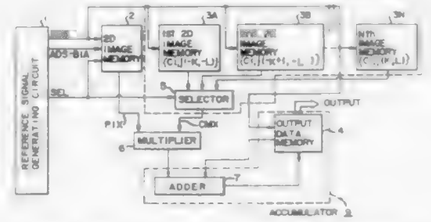
second addition means for adding said datum of said relevant pixel and said conversion sum to produce a sharper image pixel.

5,144,687

IMAGE PROCESSING APPARATUS INCLUDING SPATIAL SHIFT VARIANT FILTER

Michitaka Honda, Tochigi, Japan, assignor to Kabushika Kaisha Toshiba, Kawsaki, Japan

Continuation of Ser. No. 459,425, Dec. 30, 1989, abandoned, which is a continuation of Ser. No. 165,348, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 834,786, Feb. 28, 1986, abandoned. This application Jul. 30, 1991, Ser. No. 737,844
Claims priority, application Japan, Mar. 2, 1985, 60-41484
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—54 **6 Claims**



1. A high speed shift variant image processing apparatus for correcting selected non-uniform image distortion and for enhancing selected portions of an original image, said apparatus comprising:
first means for storing original image data of an object under medical examination in a one frame unit, said original image data being constructed by a plurality of pixel data, each pixel being stored at a designated memory location in said first means;
second means, including a plurality of coefficient memory means, for storing a plurality of independent filtering coefficient matrices, each matrix including a plurality of coefficients and being associated with a neighborhood of a pixel of interest in the original image, each coefficient of a given matrix being stored in a different coefficient memory means at a memory location corresponding to the memory location in said first means of the pixel of interest associated with the given matrix;
selector means, connected to said plurality of coefficient memory means, for selecting a coefficient value output from one of said coefficient memory means corresponding to a desired matrix coefficient;
means for addressing said first and second means for reading out a plurality of pixel data from said first means and the

filtering coefficients from said second means and for controlling said selector means, said addressing means generating an address signal and applying the address signal to said first and second means, said addressing means generating an address bias signal for scanning the neighborhood of an individual pixel and applying the address bias signal to said first means, and said addressing means generating a selection signal for controlling said selector means; and

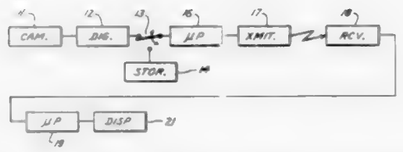
filter processing means for producing an output image, including multiplier means for multiplying the output of said first means with the output of said second means to obtain a plurality of output pixel data, and accumulator means for accumulating said plurality of output pixel data to obtain the output image.

5,144,688

METHOD AND APPARATUS FOR VISUAL PATTERN IMAGE CODING

Alan C. Bovir, Buda, and Dapang Chen, Austin, both of Tex., assignors to Board of Regents The University of Texas System

Filed Mar. 23, 1990, Ser. No. 498,587
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 **2 Claims**



1. A method of processing a digital image, comprising:

partitioning a digital image into a plurality of image blocks;

calculating mean intensity value and image gradient magnitude for each block;

coding blocks having gradient magnitudes less than a predetermined minimum according to the respective mean intensity value;

coding blocks having gradient magnitudes above said predetermined minimum according to the respective mean intensity value, gradient magnitude, and gradient orientation;

transmitting and receiving coded image blocks;

decoding said coded image blocks, including the steps of:

creating a uniform image block for each coded image block according to a respective mean intensity value;

generating a non-uniform image block for each coded image block from a respective visual image code;

multiplying said non-uniform image block by said gradient magnitude to produce a scaled image block;

adding said uniform image block to said scaled image block to produce a decoded image block; and

arranging a plurality of each said decoded image block to substantially reproduce said digital image.

5,144,689

MULTIMODE FIBER SENSOR SYSTEM WITH SENSOR FIBER COUPLED TO A DETECTION FIBER BY SPACER MEANS

Peter S. Lovely, Portland, Oreg., assignor to Fiber Sensys, Inc., Beaverton, Oreg.

Filed Jul. 30, 1991, Ser. No. 738,166
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—12 **10 Claims**

1. A fiber-optic sensor system utilizing modal interference in a multimode sensor fiber comprising:

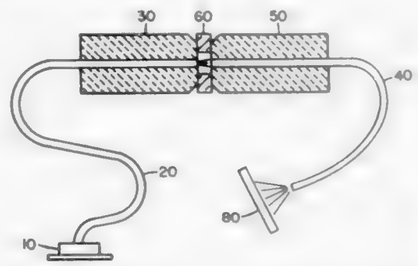
a) coherent source means for launching light into a first end of said multimode sensor fiber;

b) light diverging means for projecting a multimode speckle pattern from a second end of said multimode sensor fiber;

c) detection fiber for collecting a portion of the speckle pattern light projected by said light diverging means onto a first endface of said detection fiber and providing a light output signal at a second end; and,

d) detection means for measuring the intensity of said light output signal and providing an output representative of the parameter being sensed by said multimode sensor fiber;

characterized in that:



said light diverging means comprises a spacer means of a predetermined axial length disposed between said multimode sensor fiber and said detection fiber to provide a pre-selected axial separation between the ends thereof; and,

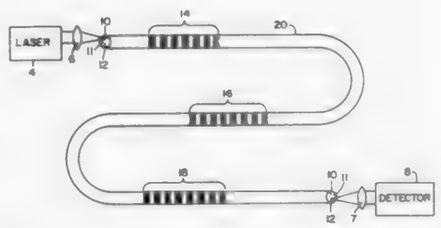
the core diameter of said detection fiber is less than the diameter of said multimode speckle pattern projected by said light diverging means onto the first endface of said detection fiber, thereby enabling the collection of said portion of said projected speckle pattern light.

5,144,690

OPTICAL FIBER SENSOR WITH LOCALIZED SENSING REGIONS

Lawrence H. Domash, Arlington, Mass., assignor to Corning Incorporated, Corning, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,749
Int. Cl.[5] G02B 6/22
U.S. Cl. 385—12 **24 Claims**



19. A multiple cored optic fiber article having at least two single-mode cores in sufficiently close proximity to one another so that they would normally experience evanescent wave coupling had they identical propagation constants, said two cores having different refractive indices with respect to each other such that the two cores have unequal propagation constants, and said cores having mismatched optical phase fields wherein evanescent wave coupling is substantially suppressed, and whereby optical power launched into one of said two cores remains propagating within that core alone over an extended length of said optic fiber article, and

sensitizing means disposed along at least one portion of a length of said optic fiber article for sensitizing said optic fiber article to a predetermined parameter or environmental field and causing said optic fiber article to undergo a physical or mechanical alteration in response to said predetermined parameter or environmental field,

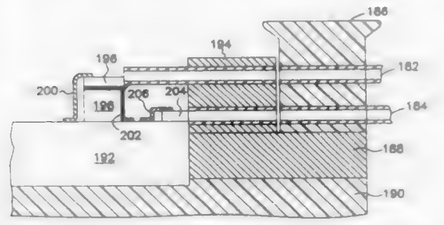
said sensitizing means comprising a given length of coating disposed about said fiber optic article, said coating having a pattern, the spatial frequency of which resonantly matches the difference in core propagation constants, whereby a resonant exchange of optical power is induced between said first and second cores in response to said predetermined parameter or environmental field, said coating having materials chosen from a group consisting of: magnetostrictive material, piezoelectric material, electrostrictive material, heat conductive material, and pressure sensitive material.

5,144,691

COMPUTER SIGNAL INTERCONNECT APPARATUS

Melvin C. August, Chippewa Falls; Daniel Massopust, Eau Claire; Mary Nebel, Chippewa Falls; Eugene F. Neumann, Chippewa Falls, and Gregory W. Pautsch, Chippewa Falls, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Filed Jul. 20, 1990, Ser. No. 556,031
Int. Cl.[5] G02B 6/36
U.S. Cl. 385—88 **3 Claims**



1. An optical backplane for interconnecting logic assemblies with at least one optical fiber, the logic assembly connected to a laser for converting at least one electrical signal from the logic assembly into an equivalent optical signal, the optical signal being transmitted along the optical fiber, the backplane comprising:

(a) a mainframe rail for mounting to one end of the logic assembly;

(b) a connector mated with the mainframe rail;

(c) an optical coupler mated with the connector;

(d) the optical coupler and connector having at least one matching V-groove along a first surface for supporting and aligning the optical fibers; and

(e) pressure means for supporting the connection between the optical coupler and the connector, and the connection between the laser and the optical fiber.

5,144,692

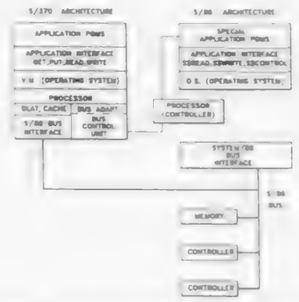
SYSTEM FOR CONTROLLING ACCESS BY FIRST SYSTEM TO PORTION OF MAIN MEMORY DEDICATED EXCLUSIVELY TO SECOND SYSTEM TO FACILITATE INPUT/OUTPUT PROCESSING VIA FIRST SYSTEM

Ernest D. Baker, Boca Raton; John M. Dinwiddie, Jr., West Palm Beach; Lonnie E. Grice, Boca Raton; John M. Loffredo, Deerfield Beach; Kenneth R. Sanderson, West Palm Beach, and Gustavo A. Suarez, Boca Raton, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 17, 1989, Ser. No. 353,113
Int. Cl.[5] G06F 15/16, 13/38
U.S. Cl. 395—425 **25 Claims**

1. In an information processing system, a combination comprising a first data processing system having a main storage unit and operating under a first operating system with virtual addressing in conformance with a first instruction architecture, a second data processing system, alien to the first operating system, operating under a second operating system in conformance with a second instruction architecture and coupled to said main storage unit;

means in said first data processing system for removing from the control of the first operating system a portion of said main storage unit, said removing step being indiscernible to both operating systems, and for transferring the exclusive use of said portion to the second data processing system and its operating system; and



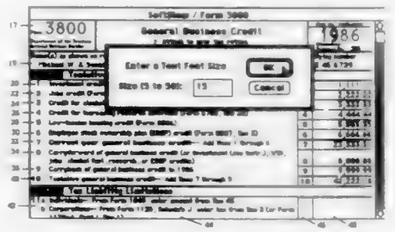
means partly in the first data processing system and partly in the second data processing system, including a register means storing address information defining said removed portion of main storage, for accessing said removed portion in response to instruction execution in second data processing system, and said accessing means further includes an application program in said first processing system for accessing said removed portion of main store pursuant to the execution of second processing system I/O instructions.

5,144,693

METHOD AND APPARATUS FOR GENERIC FORM GENERATION

Michael W. Morgan, Camarillo, Calif., assignor to Chipsoft CA Corp., San Diego, Calif.

Filed Dec. 30, 1988, Ser. No. 292,611
Int. Cl.[5] G06F 15/20
U.S. Cl. 395—158 **40 Claims**



1. In a computer system having a display screen, a method for dynamically altering a generic form characterized as a two-dimensional space partitioned into a plurality of bordered areas, each of said bordered areas having a size represented by an adjustable height and an adjustable width, and one or more of said bordered areas including text, said text including none, one, or more lines of characters, and each said character of said text having adjustable font attributes, said adjustable font attributes including font type, font style, or font size, said method comprising the steps of:

for one of said bordered areas of said generic form, changing said size of said bordered area by adjusting said adjustable height or said adjustable width of said bordered area so that said adjusted bordered area overlaps one or more

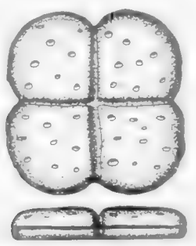
bordered areas of said generic form and said overlapped bordered areas are adjacent to said adjusted bordered area, and

for one or more of said adjacent bordered areas of said generic form for which overlapping by said adjusted bordered area has occurred, dynamically changing said size of said one or more adjacent and overlapped bordered areas by adjusting said adjustable height or said adjustable width and, if necessary said adjustable font attributes of said text of said one or more adjacent and overlapped bordered areas, in order to remove said overlapping.

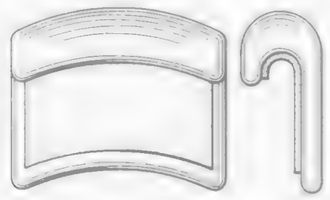
DESIGNS

SEPTEMBER 1, 1992

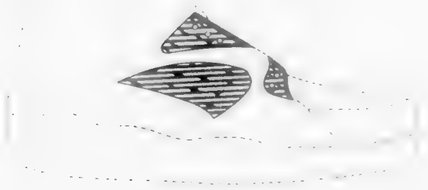
328,964
LOAF OF BREAD
Pirjo Karppinen, Lahti, Finland, assignor to Fazer Leipomont Oy, Lahti, Finland
Filed May 22, 1990, Ser. No. 526,831
Claims priority, application Finland, Jan. 25, 1990, 80/90
Term of patent 14 years
U.S. Cl. D1—129



328,965
HEEL PAD
Hugh J. Ewing, 412 Key West Dr., Charlottesville, Va. 22901
Filed Jul. 10, 1989, Ser. No. 377,308
Term of patent 14 years
U.S. Cl. D2—277

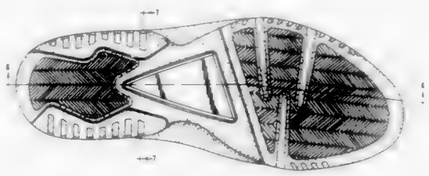


328,966
LACE PANEL FOR A SHOE
Michael A. Aveni, Lake Oswego, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 18, 1991, Ser. No. 642,916
Term of patent 14 years
U.S. Cl. D2—314



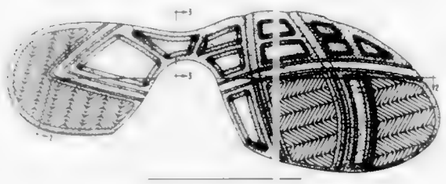
328,967
SHOE INSERT
Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratory, Inc., Blaine, Wash.
Filed Feb. 16, 1990, Ser. No. 482,324
Term of patent 14 years
U.S. Cl. D2—318

328,968
OUTSOLE AND MIDSOLE OF A SHOE
Hatfield L. Tinker, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.
Filed Nov. 27, 1990, Ser. No. 618,831
Term of patent 14 years
U.S. Cl. D2—320

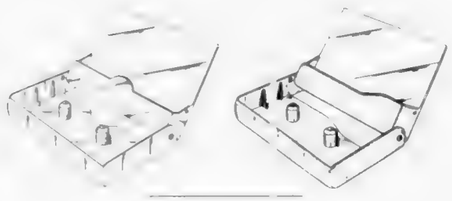


328,969
SHOE SOLE
Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Apr. 4, 1991, Ser. No. 679,681
Claims priority, application Japan, Oct. 17, 1990, 2-34681
Term of patent 14 years
U.S. Cl. D2—320

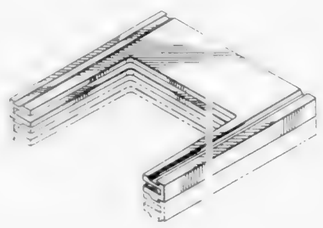
328,970
OUTSOLE OF A SHOE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 13, 1991, Ser. No. 714,737
Term of patent 14 years
U.S. Cl. D2—320



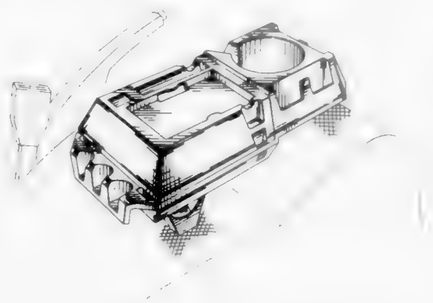
328,971
CASE FOR A CASSETTE TAPE
Ichiro Fujita; Tadao Matsuki, both of Tokyo, and Shin-ichi Kagano, Kyoto, all of Japan, assignors to Hitachi Maxwell, Ltd., Osaka, Japan
Filed Feb. 23, 1989, Ser. No. 313,813
Term of patent 14 years
U.S. Cl. D3—35



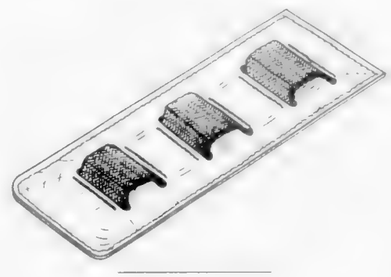
328,972
DISKETTE HOLDER
Michael S. Lunn, 2339 Worthing Dr., Naperville, Ill. 60565
Continuation of Ser. No. 229,482, Aug. 8, 1988, abandoned. This application Jan. 14, 1992, Ser. No. 821,122
Term of patent 14 years
U.S. Cl. D3—35



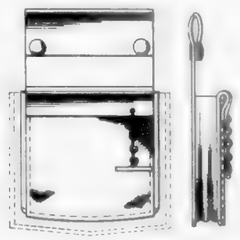
328,973
CAR CONSOLE
Neal N. Mankey, Charlotte, N.C., assignor to Allied Plastics, Inc., Gastonia, N.C.
Filed Dec. 21, 1990, Ser. No. 632,328
Term of patent 14 years
U.S. Cl. D3—40



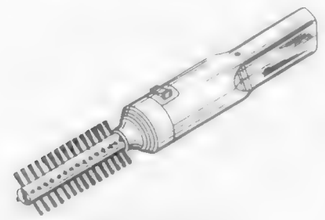
328,974
DOOR HOOK RETAINER LOOP PATCH FOR LUGGAGE
William L. King, Denver, Colo., assignor to Samsonite Cororation, Denver, Colo.
Filed Feb. 14, 1986, Ser. No. 833,453
Term of patent 14 years
U.S. Cl. D3—54



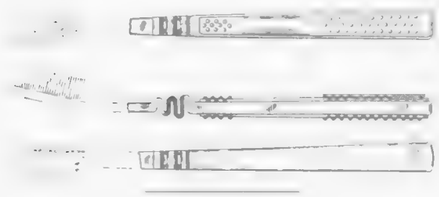
328,975
POCKET INSERT FOR TOOLS
Arnulfo Arredondo, Aco 3rd M.I. Bn. #15218 Box 110, APO AP, S.C. 96271
Filed Jun. 18, 1990, Ser. No. 539,465
Term of patent 14 years
U.S. Cl. D3—105



328,976
ELECTRIC HAIRBRUSH
James T. Herron, No. 9 Old Sterlington Rd., Apartment 1601, Monroe, La. 71203
Filed Mar. 2, 1990, Ser. No. 487,229
Term of patent 14 years
U.S. Cl. D4—102

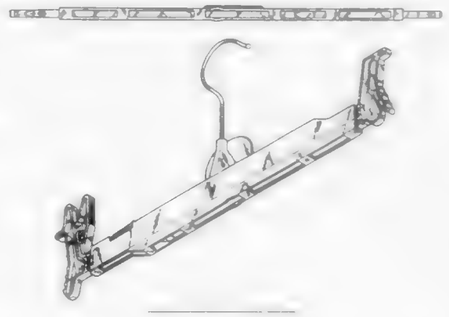


328,977
HANDLE FOR TOOTHBRUSHES
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Lingner & Fischer, GmbH, Fed. Rep. of Germany
Filed Sep. 29, 1988, Ser. No. 251,683
Claims priority, application United Kingdom, Mar. 31, 1988, 1049662; Mar. 31, 1988, 1049663; Mar. 31, 1988, 1049664
Term of patent 14 years
U.S. Cl. D4—104



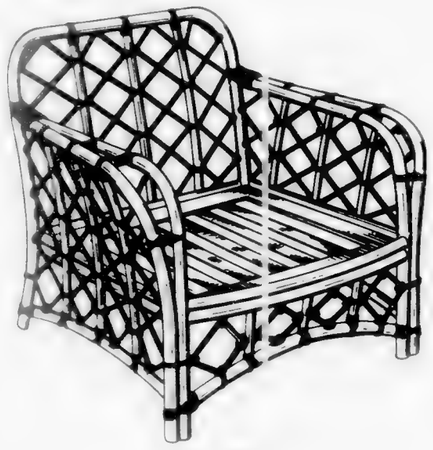
328,978
COMBINED TOOTHBRUSH AND HOLDER WITH INTEGRAL DENTAL FLOSS DISPENSER
Addie A. Hainline, 604 Spring St., Cahokia, Ill. 62206
Filed Dec. 11, 1989, Ser. No. 448,579
Term of patent 14 years
U.S. Cl. D4—108

328,979
GARMENT HANGER
William J. Hunt, 97, Walmington Fold, Finchley, London N12, England
Filed Oct. 30, 1989, Ser. No. 429,189
Claims priority, application United Kingdom, May 2, 1989, 1059145
Term of patent 14 years
U.S. Cl. D6—326

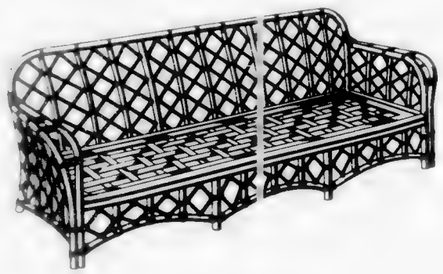


328,980
CHAIR
Jurek Buchacz, "Lovli", 2360 Ringsaker, Norway
Filed Feb. 28, 1989, Ser. No. 317,277
Claims priority, application Norway, Sep. 2, 1988, 69625
The portion of the term of this patent subsequent to May 26, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

328,981
CHAIR FRAME
John B. Wisner, New York, N.Y., assignor to Ficks Reed Company, Cincinnati, Ohio
Filed Nov. 19, 1991, Ser. No. 794,215
Term of patent 14 years
U.S. Cl. D6—369

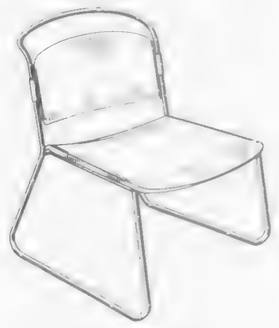


328,982
SOFA FRAME
John B. Wisner, New York, N.Y., assignor to Ficks Reed Company, Cincinnati, Ohio
Filed Nov. 19, 1991, Ser. No. 795,078
Term of patent 14 years
U.S. Cl. D6—369

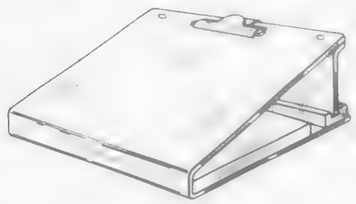


328,983
CHAIR FRAME
Miller Y. Fong, Pasadena, Calif., assignor to Ficks Reed Company, Cincinnati, Ohio
Filed Dec. 2, 1991, Ser. No. 801,727
Term of patent 14 years
U.S. Cl. D6—369

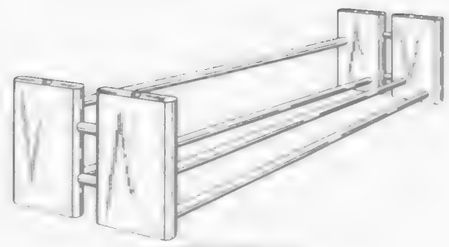
328,984
CHAIR
Conrad Marini, Woodbridge, Canada, assignor to Curtis Products Inc., Cobourg, Canada
Filed Apr. 14, 1989, Ser. No. 338,143
Claims priority, application Switzerland, Dec. 7, 1988, 0712887
Term of patent 14 years
U.S. Cl. D6—373



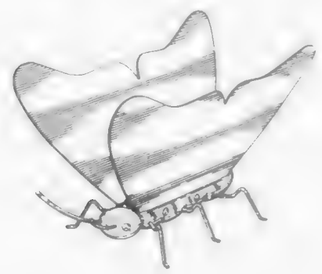
328,985
PORTABLE LAP DESK
Lee Sheldon, 2421 E. 55th Pl., Apt. 36, Tulsa, Okla. 74105
Filed Jan. 18, 1990, Ser. No. 466,749
Term of patent 14 years
U.S. Cl. D6—406



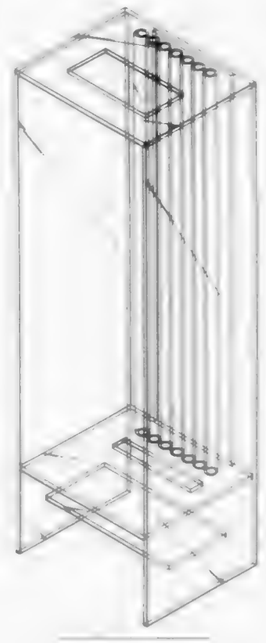
328,986
MODULAR DISPLAY RACK
David H. Lightfoot, London, England, assignor to Techstyle Products Limited, London, England
Filed Sep. 24, 1990, Ser. No. 587,423
Term of patent 14 years
U.S. Cl. D6—407



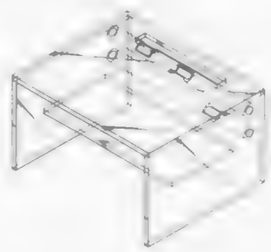
328,987
FLOOR STAND FOR NEWSPAPERS, MAGAZINES, AND THE LIKE
Axel Jürgens, Lisztstrasse 15, 5100 Aachen, Fed. Rep. of Germany
Filed May 30, 1990, Ser. No. 530,732
Term of patent 14 years
U.S. Cl. D6—453



328,988
STEREO STAND
Miranda Leonard, Church Court Condominiums 492 Beacon St., Boston, Mass. 02115
Filed Jun. 4, 1990, Ser. No. 533,042
Term of patent 14 years
U.S. Cl. D6—469



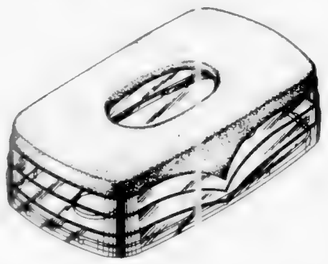
328,989
STEREO STAND
Miranda Leonard, 492 Beacon St., Boston, Mass. 02115
Filed Jun. 4, 1990, Ser. No. 533,046
Term of patent 14 years
U.S. Cl. D6—477



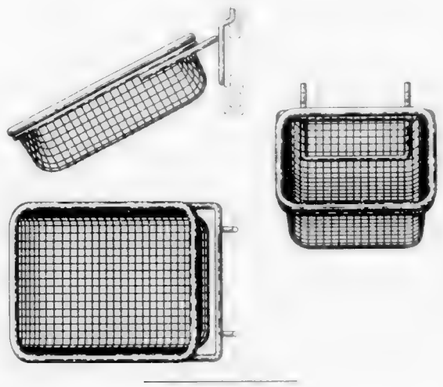
328,990
WORK TABLE
Alfred Kwiecinski, Fairfield, Ohio, assignor to Hamilton Sorter Co., Inc., Fairfield, Ohio
Filed Jul. 17, 1987, Ser. No. 74,519
Term of patent 14 years
U.S. Cl. D6—480

328,991
TABLE
John B. Wisner, New York, N.Y., assignor to Ficks Reed Company, Cincinnati, Ohio
Filed Nov. 21, 1989, Ser. No. 439,924
Term of patent 14 years
U.S. Cl. D6—484

328,992
TISSUE BOX
Fred Hollinger, Kings Park, N.Y., assignor to Creative Bath Products, Inc., Brentwood, N.Y.
Filed Mar. 29, 1990, Ser. No. 502,017
Term of patent 14 years
U.S. Cl. D6—518

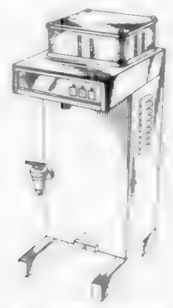


328,993
DISPLAY TRAY
Gunter Rosenthal, St-Benoit, Canada, assignor to 501 G. Rosenthal Import Ltd., Montreal, Canada
Filed Nov. 13, 1990, Ser. No. 612,251
Term of patent 14 years
U.S. Cl. D6—566

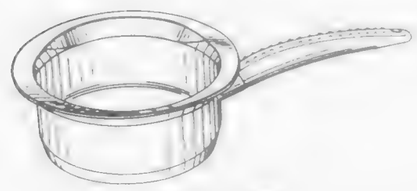


328,994
CORNER WALL BOOK SHELF
Axel Jürgens, Lisztstrasse 15, 5100 Aachen, Fed. Rep. of Germany
Filed May 30, 1990, Ser. No. 530,731
Term of patent 14 years
U.S. Cl. D6—562

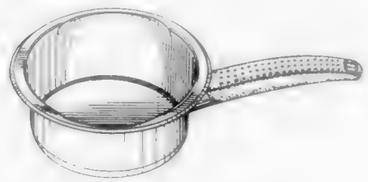
328,995
COFFEE MAKER
Jan J. Verheijen, Heilo, Netherlands, assignor to Verheijen B.V., Heerhugowaard, Netherlands
Filed Aug. 3, 1989, Ser. No. 388,905
Term of patent 14 years
U.S. Cl. D7—309



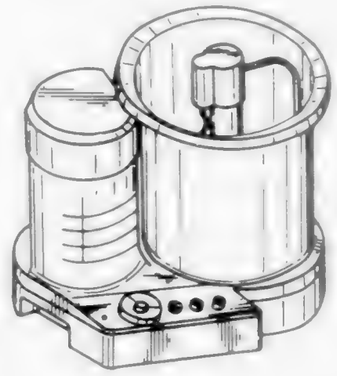
328,996
SAUCE PAN
Thomas Gerlach, Altensteig, Fed. Rep. of Germany, assignor to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany
Filed Aug. 17, 1990, Ser. No. 395,063
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1989, 8901235
Term of patent 14 years
U.S. Cl. D7—361



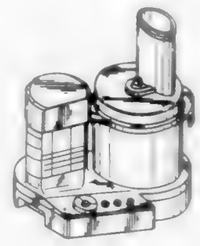
328,997
SAUCE PAN
Thomas Gerlach, Altensteig, Fed. Rep. of Germany, assignor to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany
Filed Feb. 2, 1990, Ser. No. 473,856
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 8905411
The portion of the term of this patent subsequent to Sep. 1, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—361



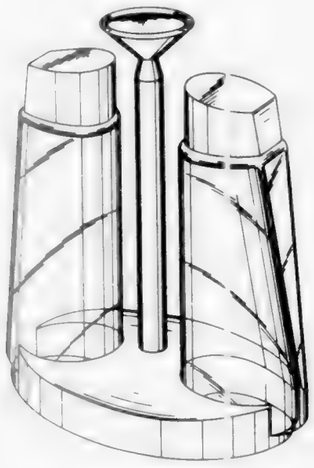
328,998
FOOD PROCESSOR
Rudolf Maass, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Jun. 14, 1989, Ser. No. 366,039
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1988, 8804148
The portion of the term of this patent subsequent to Sep. 10, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—376



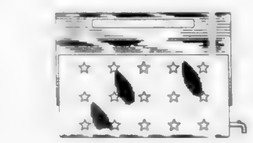
328,999
FOOD PROCESSOR
Rudolf Maass, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Jun. 14, 1989, Ser. No. 366,040
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1988, 8804149
The portion of the term of this patent subsequent to Dec. 17, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—384

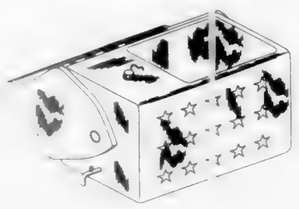


329,000
COMBINED CRUETS AND STAND THEREFOR
Furio Minuti, Macerata, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jan. 29, 1990, Ser. No. 471,806
Claims priority, application Italy, Aug. 23, 1989, 21622/89[U]
Term of patent 14 years
U.S. Cl. D7—592

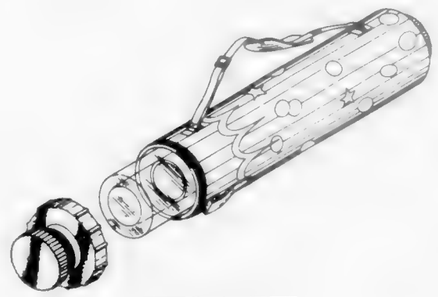


329,001
COOLER
Giuseppe Valentino, 1392 Little Neck Ave., Bellmore, N.Y. 11710
Filed Jul. 27, 1990, Ser. No. 558,381
Term of patent 14 years
U.S. Cl. D7—605



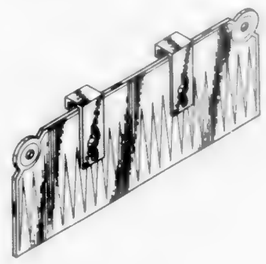


329,002
INSULATED BEVERAGE CAN HOLDER
Richard Fox, Jr., 1210 Broad St., Apt. #8, Whitehall, Pa. 18052
Filed Jan. 5, 1990, Ser. No. 461,446
Term of patent 14 years
U.S. Cl. D7—608

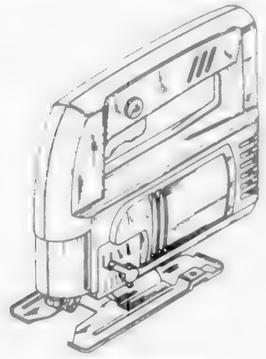


329,003
PANCAKE MOLD
Kerry W. Jones, 17809 NE. Edmunds Rd., Vancouver, Wash. 98682
Continuation-in-part of Ser. No. 128,509, Dec. 3, 1987, abandoned. This application Jul. 20, 1990, Ser. No. 555,159
Term of patent 14 years
U.S. Cl. D7—676

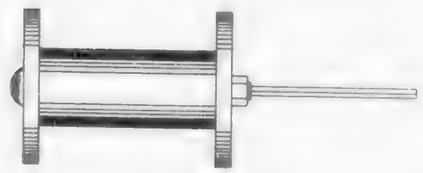
329,004
SNOW MOVING BLADE ATTACHMENT FOR A YARD RAKE
Causby King, 2010 Grand Ave., Middletown, Ohio 45044
Filed Aug. 24, 1990, Ser. No. 572,024
Term of patent 14 years
U.S. Cl. D8—1



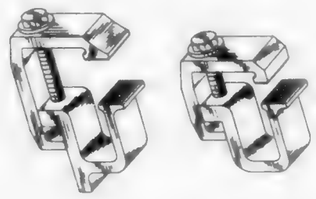
329,005
SABRE SAW OR THE LIKE
Kiyoshi Hoshino, Clemson, and Ronald D. Kunkel, Easley, both of S.C., assignors to Ryobi Motor Products Corp., Easley, S.C.
Filed Feb. 7, 1990, Ser. No. 476,290
Term of patent 14 years
U.S. Cl. D8—69



329,006
THIMBLE ATTACHMENT FOR A DRILL
Darrel E. Standridge, 511 Malibu Ave., Malakoff, Tex. 75148
Filed Jun. 27, 1990, Ser. No. 544,351
Term of patent 14 years
U.S. Cl. D8—70

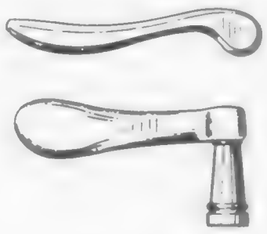


329,007
TRUCK CAP MOUNTING CLAMP
Ronald L. Yoder, Topeka, Ind., assignor to Universal Consolidated Methods, Inc., Topeka, Ind.
Filed May 4, 1990, Ser. No. 518,842
Term of patent 14 years
U.S. Cl. D8—73

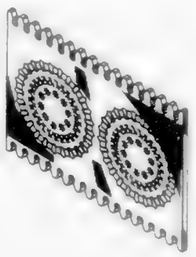


329,008
DOOR LEVER
A. Ludgero Marques, Feira Codex, Portugal, assignor to Broadway Industries, Inc., Kansas City, Mo.
Filed Feb. 22, 1990, Ser. No. 483,420
Term of patent 14 years
U.S. Cl. D8—308

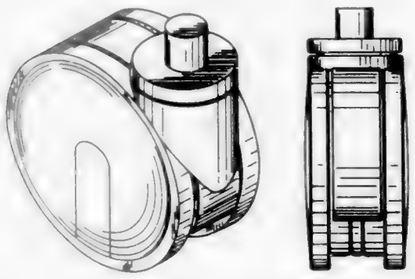
329,009
DOOR LEVER
A. Ludgero Marques, Feira Codex, Portugal, assignor to Broadway Industries, Inc., Kansas City, Mo.
Filed Feb. 23, 1990, Ser. No. 484,194
Term of patent 14 years
U.S. Cl. D8—308



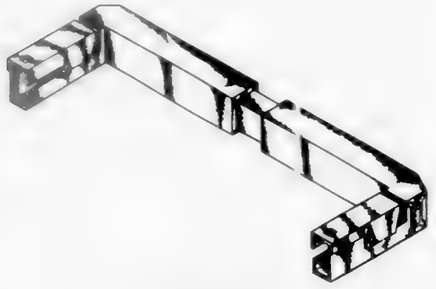
329,010
ELECTRIC LIGHT CORD STORAGE BOARD
William E. Schaeffer, III, 4006 Old Mountain Rd., NE., Roanoke, Va. 24019
Filed Jun. 27, 1990, Ser. No. 544,357
Term of patent 14 years
U.S. Cl. D8—358



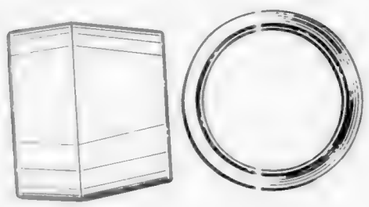
329,011
CASTER WHEEL
Wolfgang Block, Schweim, Fed. Rep. of Germany, assignor to Tente-Rollen GmbH & Co., Wermelskirchen, Fed. Rep. of Germany
Filed Mar. 8, 1990, Ser. No. 491,469
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 8906360
Term of patent 14 years
U.S. Cl. D8—375



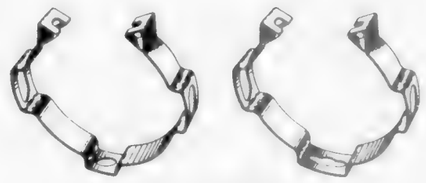
329,012
CURTAIN ROD OR SIMILAR ARTICLE
Shirley A. Stolz, 8105 W. Lake Rd., Fairview, Pa. 16415
Filed Jul. 10, 1990, Ser. No. 550,361
Term of patent 14 years
U.S. Cl. D8—376



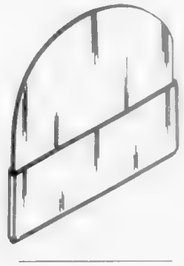
329,013
COLLAR FOR HAND TOOLS
John M. Stoner, Jr., Middletown, Pa., assignor to True Temper Hardware Company, Miamisburg, Ohio
Filed Nov. 4, 1987, Ser. No. 117,104
Term of patent 14 years
U.S. Cl. D8—395



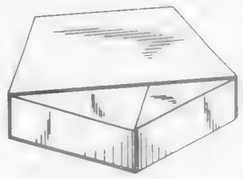
329,014
ATTACHMENT CLAMP
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3
Continuation-in-part of Ser. No. 366,412, Jun. 15, 1989, Pat. No. Des. 323,974. This application Mar. 26, 1990, Ser. No. 498,383
Term of patent 14 years
U.S. Cl. D8—396



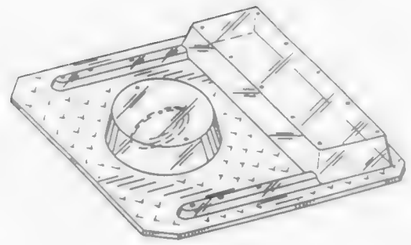
329,015
COMPACT DISK SLEEVE
Louis J. Stoyanoff, Los Angeles County, Calif., assignor to Academic Products, Inc., Pacoima, Calif.
Filed Jul. 30, 1990, Ser. No. 560,307
Term of patent 14 years
U.S. Cl. D9—306



329,016
CONTAINER
Afra B. Scarpa, and Tobia Scarpa, both of Trevignano, Italy, assignors to Benetton Group S.p.A., Ponzano Veneto, Italy
Filed Mar. 3, 1989, Ser. No. 318,354
Claims priority, application Italy, Oct. 27, 1988, 22077/88[U]
Term of patent 14 years
U.S. Cl. D9—346



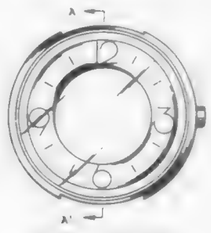
329,017
STACKABLE MEDICINE PACKAGE
Keith Goodale, Park City, Ill., assignor to Baxter International Inc., Deerfield, Ill.
Filed Jan. 3, 1990, Ser. No. 460,225
Term of patent 14 years
U.S. Cl. D9—415



329,018
BOTTLE
David J. Granger, Balmain, Australia, assignor to R & C Products Pty. Limited, Ermington, Australia
Filed Dec. 14, 1990, Ser. No. 627,445
Claims priority, application Australia, Jul. 12, 1990, 2239/90
Term of patent 14 years
U.S. Cl. D9—523

329,019
BOTTLE
Sandra H. Olds, Lilburn, and Clifford R. Wade, Tucker, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed May 9, 1990, Ser. No. 521,472
Term of patent 14 years
U.S. Cl. D9—551

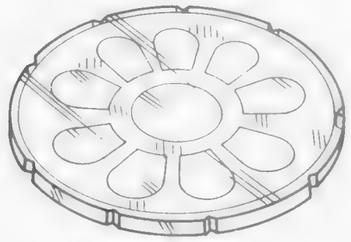
329,020
WATCHCASE
Masanori Iwata, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Feb. 9, 1990, Ser. No. 477,655
Claims priority, application Japan, Aug. 9, 1989, 1-29424
Term of patent 14 years
U.S. Cl. D10—30



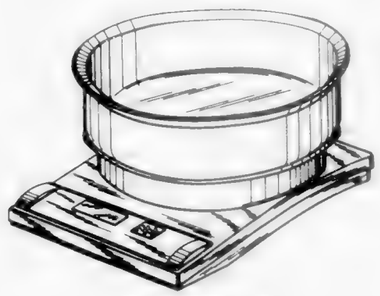
329,021
COMBINED WRISTWATCH AND STRAP WITH POUCH
Linda Robbins, Jericho, N.Y., assignor to Medana Watch Corporation, New York, N.Y.
Filed May 11, 1990, Ser. No. 521,936
Term of patent 14 years
U.S. Cl. D10—31

329,022
WATCH
Paolo Bulgari, Rome, Italy, assignor to Bulgari Time (Switzerland) S.A., Geneva, Switzerland
Filed Mar. 14, 1989, Ser. No. 323,551
Claims priority, application Int'l Bur. Institute, Sep. 22, 1988, DM/011781
The portion of the term of this patent subsequent to Jul. 25, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—39

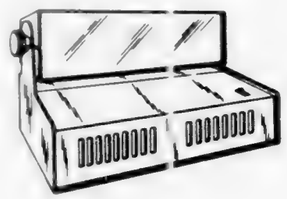
329,024
COLOR DISC FOR AN ANALYTICAL INSTRUMENT
Colin E. Marks, Ryton, England, assignor to Palintest Ltd., Tyne & Wear, England
Filed May 8, 1990, Ser. No. 520,605
Claims priority, application United Kingdom, Nov. 14, 1989, 2002474
Term of patent 14 years
U.S. Cl. D10—80



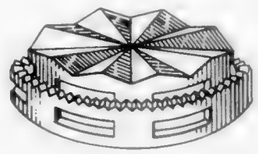
329,025
KITCHEN SCALE
Günter Storsberg, Solingen, Fed. Rep. of Germany, assignor to Robert Krups GmbH & Co. KG., Solingen, Fed. Rep. of Germany
Filed Jan. 7, 1991, Ser. No. 638,408
Term of patent 14 years
U.S. Cl. D10—91



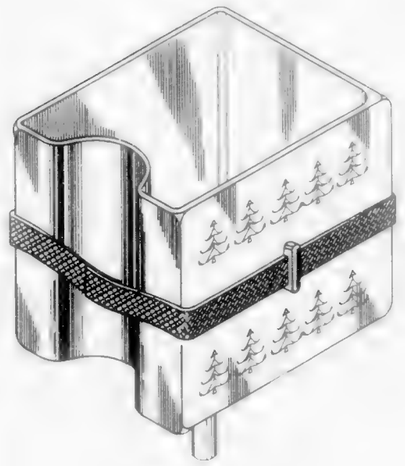
329,027
SNOW-MAKING CONSOLE
Christopher P. Gardner, Lima, N.Y., assignor to Ratnik Industries, Inc., Victor, N.Y.
Filed Jan. 26, 1990, Ser. No. 471,128
Term of patent 14 years
U.S. Cl. D10—53



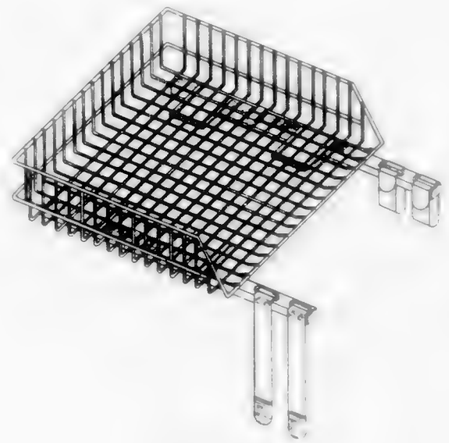
329,026
ORNAMENTAL BRACELET
Meang Chia, and Cheo Chia, both of Rosemead, Calif.
Filed Nov. 24, 1989, Ser. No. 440,741
Term of patent 14 years
U.S. Cl. D11—12



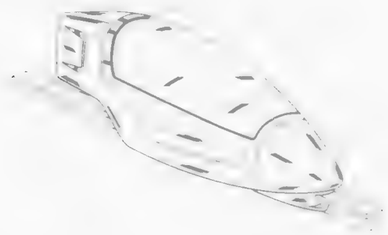
329,027
AUTOMATIC CHRISTMAS TREE FEEDER
Keith R. Kodra, and Cathy L. Kodra, both of R.D. 1 Box 43, East Berne, N.Y. 12059
Filed May 25, 1990, Ser. No. 528,784
Term of patent 14 years
U.S. Cl. D11—130.1



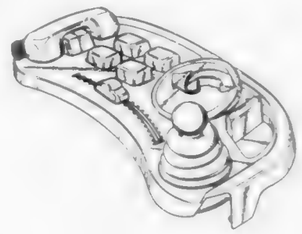
329,029
WHEEL CHAIR SHOPPING BASKET
Gregory J. Chapman II, 6951 Pima La., Chanhassen, Minn. 55317
Filed Feb. 13, 1990, Ser. No. 479,033
Term of patent 14 years
U.S. Cl. D12—133



329,028
MONORAIL VEHICLE
Douglas J. Malewicki, 14962 Merced Cir., Irvine, Calif. 92714
Filed Jun. 12, 1990, Ser. No. 537,099
Term of patent 14 years
U.S. Cl. D12—37

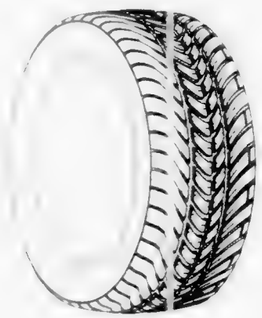


329,030
CHILD'S WALKER PLAY TRAY
Peter Myers, Macedonia, Ohio, assignor to Century Products Company, Macedonia, Ohio
Filed Mar. 19, 1991, Ser. No. 672,210
Term of patent 14 years
U.S. Cl. D12—133



329,031
TIRE
Timothy J. Lassan, Kent, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Apr. 16, 1990, Ser. No. 509,541
Term of patent 14 years
U.S. Cl. D12—146

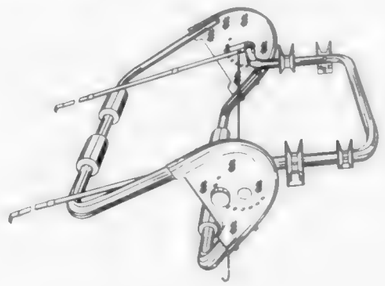
329,032
PNEUMATIC TIRE TREAD AND BUTTRESS
Paul B. Maxwell, Stow, Ohio, and Darrell E. Covert, Strassen, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 4, 1991, Ser. No. 653,440
Term of patent 14 years
U.S. Cl. D12—147



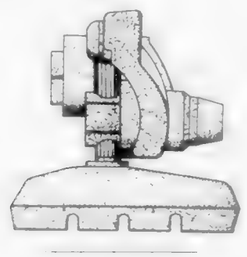
329,033
PNEUMATIC TIRE TREAD AND BUTTRESS
Paul B. Maxwell, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 4, 1991, Ser. No. 637,889
Term of patent 14 years
U.S. Cl. D12—147

329,034
WINDSHIELD WIPER
Pierre Charet, 8337 NW. 156 Ter., Miami, Fla. 33016, and Govelio R. Gonzalez, 1831 SW. 16th Ave., Miami, Fla. 33145
Filed Jun. 22, 1990, Ser. No. 542,089
Term of patent 14 years
U.S. Cl. D12—155

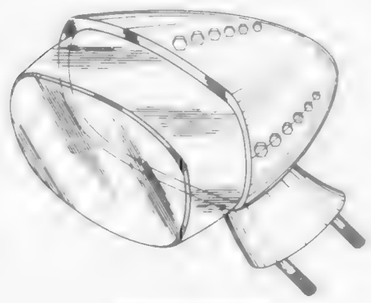
329,035
VEHICLE ATTACHED BICYCLE CARRIER
James R. Blackburn, Los Gatos, and Brandon A. Lee, San Mateo, both of Calif., assignors to Blackburn Designs, Inc., Campbell, Calif.
Filed Sep. 29, 1989, Ser. No. 415,150
Term of patent 14 years
U.S. Cl. D12—158



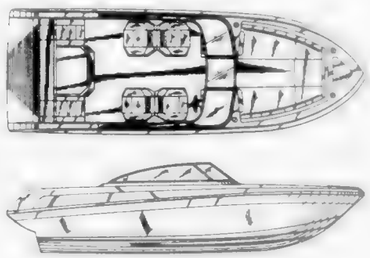
329,036
BICYCLE CANTILEVER BRAKE
Kenichi Yoshigai, Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Co., Ltd., Osaka, Japan
Filed May 2, 1990, Ser. No. 517,600
Claims priority, application Japan, Nov. 20, 1989, 1-42128
Term of patent 14 years
U.S. Cl. D12—179



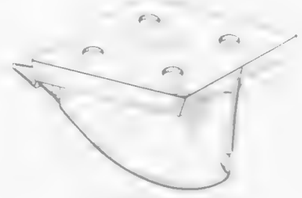
329,037
VEHICLE EXTERIOR REAR VIEW MIRROR
Mark A. Benner, 706 S. Penn St., Westchester, Pa. 19382
Filed May 23, 1990, Ser. No. 527,249
Term of patent 14 years
U.S. Cl. D12—187



329,038
POWER BOAT
Thomas M. Dekker, Cadillac; Michael W. Lathers, Tustin, and Thomas D. Wenstadt, Cadillac, all of Mich., assignors to Outboard Marine Corp., Waukegan, Ill.
Filed Jul. 23, 1990, Ser. No. 555,751
Term of patent 14 years
U.S. Cl. D12—314



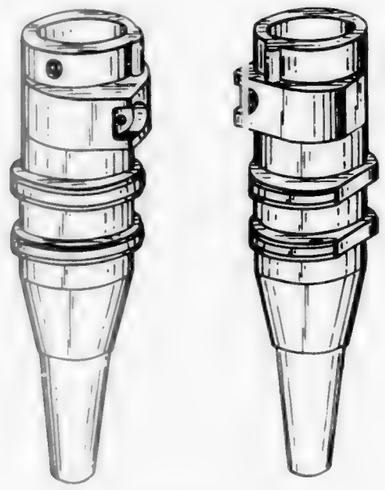
329,039
PERSONAL WATERCRAFT PITOT TUBE
David A. Struyk, 841 Hidden Ln., Excelsior, Minn. 55331
Filed Nov. 19, 1990, Ser. No. 615,632
Term of patent 14 years
U.S. Cl. D12—317



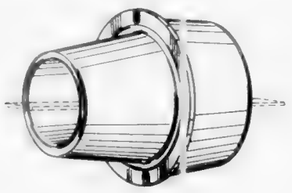
329,040
BATTERY PACK FOR A PORTABLE RADIO TELEPHONE
Naoko Seki, and Katsuhito Watanabe, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1991, Ser. No. 638,424
Claims priority, application Japan, Sep. 10, 1990, 2-30098
Term of patent 14 years
U.S. Cl. D13—103

329,041
INDUCTOR FOR USE IN CIRCUITS FOR DIGITAL COMMUNICATIONS
Yoshiaki Masuda; Tokio Tadano, and Hiraku Imaizumi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Sep. 18, 1989, Ser. No. 408,714
Claims priority, application Japan, Mar. 17, 1989, 1-9681; Mar. 17, 1989, 1-9682; Jul. 31, 1989, 1-28312
Term of patent 14 years
U.S. Cl. D13—117

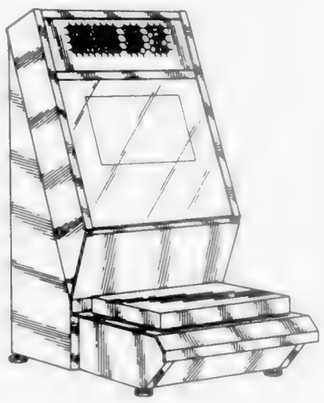
329,042
ELECTRICAL CONNECTOR HOUSING
Petrus van der Burgh, Zoetermeer, Netherlands, assignor to Sensor Nederland B.V., Netherlands
Filed Sep. 1, 1989, Ser. No. 402,241
Claims priority, application Int'l Pat. Institute, May 5, 1989, DM/013531
Term of patent 14 years
U.S. Cl. D13—133



329,043
INSULATING THROUGH-BUSHING FOR AN ELECTRICAL CONDUCTOR
Edward J. Rogers, Chicago, and Leonard V. Chabala, Maywood, both of Ill., assignors to S&C Electric Company, Chicago, Ill.
Continuation-in-part of Ser. No. 111,841, Oct. 23, 1987. This application Oct. 3, 1988, Ser. No. 252,711
Term of patent 14 years
U.S. Cl. D13—155

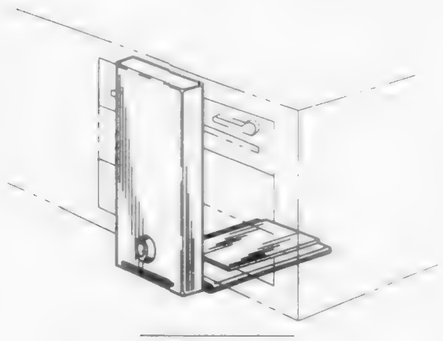


329,044
COMBINED COMPUTER AND SCALE FOR PREPARING MIXTURES OF PAINTS, COLORS AND LACQUERS
Egon Kurth, Neu-Isenburg, and Wolfgang Eyssen, Rödermark, both of Fed. Rep. of Germany, assignors to CONNEX Datasysteme und Beratungsgesellschaft mbH, Griesheim, Fed. Rep. of Germany
Filed Apr. 2, 1990, Ser. No. 503,161
Term of patent 14 years
U.S. Cl. D14—100

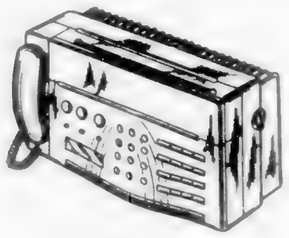


329,045
ELECTRONIC COMPUTER
Makoto Kobayashi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Jun. 25, 1990, Ser. No. 543,294
Claims priority, application Japan, Dec. 26, 1989, 1-047483
Term of patent 14 years
U.S. Cl. D14—106

329,046
FLOPPY DISK DRIVE SECURITY LOCK
Donald R. Westland, 6030 Croft Ave., Los Angeles, Calif. 90056
Filed Oct. 30, 1989, Ser. No. 428,657
Term of patent 14 years
U.S. Cl. D14—114

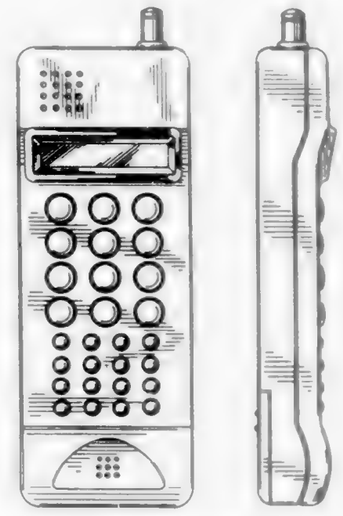


329,047
FACSIMILE
Yoshinori Inukai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 24, 1990, Ser. No. 572,101
Claims priority, application Japan, Mar. 6, 1990, 2-7396
Term of patent 14 years
U.S. Cl. D14—118

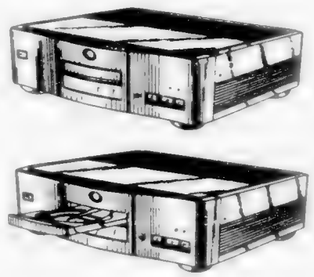


329,048
FACSIMILE
Tsutomu Yoshihara, Ayase, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 24, 1990, Ser. No. 572,107
Claims priority, application Japan, Mar. 6, 1990, 2-7394
Term of patent 14 years
U.S. Cl. D14—118

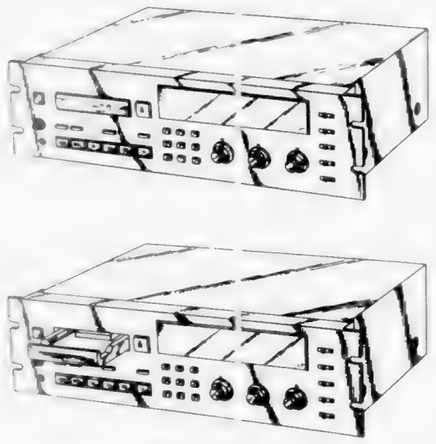
329,049
PORTABLE TELEPHONE TALKING CALCULATOR
Richard F. M. Peersmann, ET Scheveningen, Netherlands, assignor to Polyfiarse International B.V., Netherlands
Filed Dec. 19, 1990, Ser. No. 629,972
Term of patent 14 years
U.S. Cl. D14—148



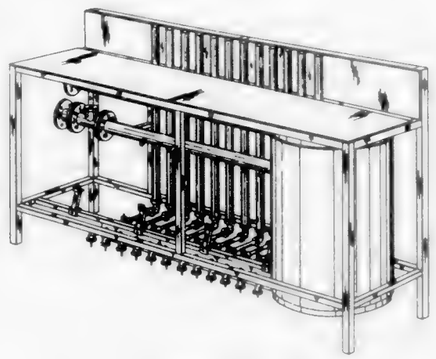
329,050
DIGITAL AUDIO DISK PLAYER
Masafumi Ito, Nakano; Minoru Sube, Hachioji; Haruki Takita, Tokyo, and Hiroyuki Watanabe, Hanno, all of Japan, assignors to TEAC Corporation, Tokyo, Japan
Filed Nov. 5, 1990, Ser. No. 609,463
Claims priority, application Japan, May 11, 1990, 2-15916
Term of patent 14 years
U.S. Cl. D14—156



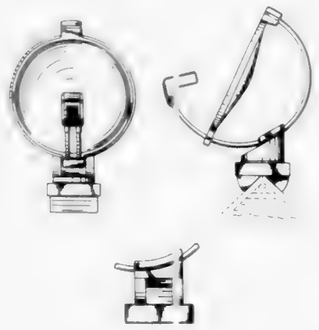
329,05
DIGITAL AUDIO TA ?E RECORDER
Masafumi Ito, Tokyo; Shigeru H segawa, Kodaira; Katsuhiro Takashima, Yokohama, and H ruki Takita, Tokyo, all of Japan, assignors to TEAC Corp ration, Tokyo, Japan
Filed Mar. 30, 1990, ! er. No. 503,365
Claims priority, application Jap n, Oct. 3, 1989, 1-36132
Term of patent 14 years
U.S. Cl. D14—164



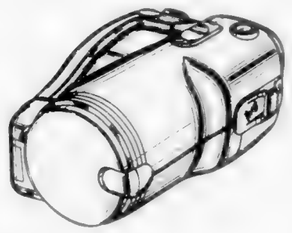
329,053
INJECTOR RACK
William L. Bauerle, Wooster, Ohio, assignor to Bahm, Inc., St. Louis, Mo.
Filed Nov. 15, 1989, Ser. No. 436,673
Term of patent 14 years
U.S. Cl. D15—199



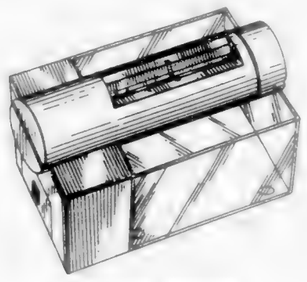
329,0 2
SATELLITE ANTENNA
Charles C. Keane, Weymouth, a d James J. Pagella, Natick, both of Mass., assignors to Gen ral Electric Company, Princeton, N.J.
Filed Mar. 14, 1990, Ser. No. 503,556
Term of paten : 14 years
U.S. Cl. D14—231



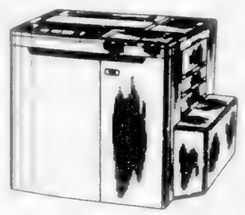
329,054
35 MM CAMERA
Noboru Tanaka, Kawasaki; Michio Hirohata, and Yasuhiro Toyoda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 2, 1990, Ser. No. 591,851
Claims priority, application Japan, Apr. 12, 1990, 2-12846
Term of patent 14 years
U.S. Cl. D16—200



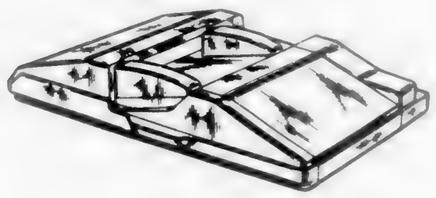
329,055
DOCUMENT SHREDDER
Klaus-Diether Krause, Dietenhofen, and Florian Stolzenberger, Altenthann, both of Fed. Rep. of Germany, assignors to TA Triumph-Adler, Nuremberg, Fed. Rep. of Germany
Filed Nov. 30, 1990, Ser. No. 620,594
Claims priority, application World Int. Prop. O., Jun. 12, 1990, DM/016,896
Term of patent 14 years
U.S. Cl. D18—34



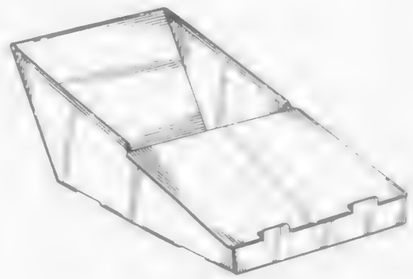
329,056
COPYING MACHINE
Atsushi Mizukami, Yokohama; Minoru Aoyama, Tokyo; Mitsuru Sakurai, Musashino, and Ryoichi Takahashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 22, 1990, Ser. No. 526,615
Claims priority, application Japan, Nov. 22, 1989, 1-42886
Term of patent 14 years
U.S. Cl. D18—39



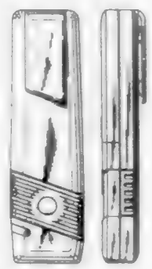
329,057
DOCUMENT FEEDER FOR COPYING MACHINE
Noriyuki Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 24, 1990, Ser. No. 572,106
Claims priority, application Japan, Mar. 6, 1990, 2-7391
Term of patent 14 years
U.S. Cl. D18—49



329,058
PRINTER STAND
Robert V. Sebald, Canton, Ohio, assignor to Vail Industries, Inc., Navarre, Ohio
Filed May 2, 1991, Ser. No. 694,846
Term of patent 14 years
U.S. Cl. D18—59

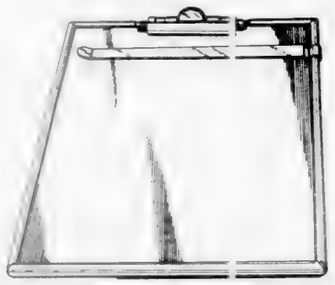


329,059
LASER POINTER
Anthony J. Lee, Surrey, England, assignor to Imatronic Limited, Workingham, United Kingdom
Filed Dec. 21, 1989, Ser. No. 454,867
Claims priority, application United Kingdom, Jun. 22, 1989, [illegible]
Term of patent 14 years
U.S. Cl. D19—59

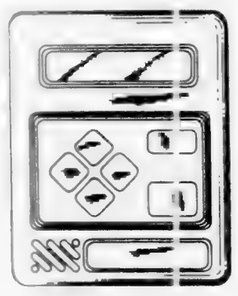


329,060
VERTICALLY-MOUNTABLE TICKET DISPENSER
Tom Ahlström, and Hans Ehrich, both of Stockholm, Sweden, assignors to Turn-O-Matic AB, Sandbyberg, Sweden
Filed Feb. 27, 1990, Ser. No. 486,277
Claims priority, application Sweden, Sep. 1, 1989, 89-1965
Term of patent 14 years
U.S. Cl. D19—69

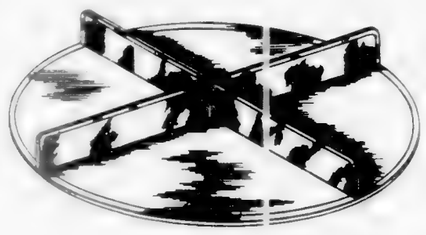
329,061
CLIPBOARD
Michael J. Szablak, Wooster, Ohio, and Glen E. Tomblin, Winchester, Va., assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 13, 1990, Ser. No. 552,211
Term of patent 14 years
U.S. Cl. D19—88



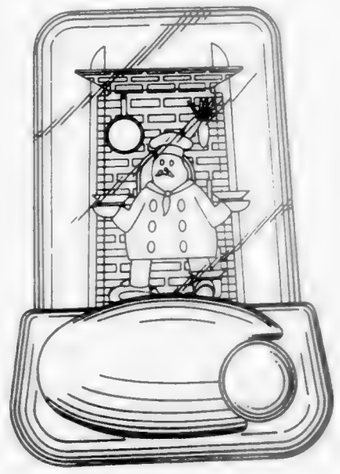
329,062
HOUSING FOR AN ELECTRONIC LEARNING AID OR GAME
Free Chin, Chicago, Ill., assignor to World Book, Inc., Elk Grove Village, Ill.
Filed May 18, 1990, Ser. No. 526,311
Term of patent 14 years
U.S. Cl. D21—13



329,063
GAME TABLE
John Kantor, 16684 130th Ave., Nunica, Mich. 49448
Filed Sep. 26, 1988, Ser. No. 249,435
Term of patent 14 years
U.S. Cl. D21—27

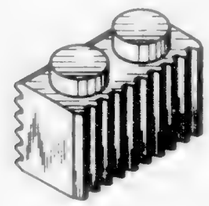


329,064
WATER GAME
Chieko Nakazawa, and Michiaki Tomimatsu, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Feb. 13, 1991, Ser. No. 654,909
Claims priority, application Japan, Aug. 13, 1990, 2-27479
Term of patent 14 years
U.S. Cl. D21—59

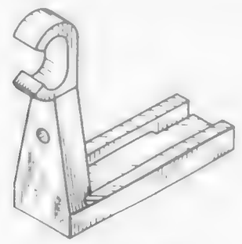


329,065
SIMULATIVE BALLOON TOY
Tung Wing Ng, Hong Kong, Hong Kong, assignor to Veny Plastic Co., Ltd., Hong Kong, Hong Kong
Filed Sep. 28, 1990, Ser. No. 590,071
Claims priority, application United Kingdom, Jun. 13, 1990, 2007550
Term of patent 14 years
U.S. Cl. D21—84

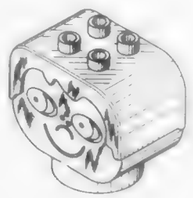
329,066
TOY CONSTRUCTION BLOCK
Claes-Runo A. E. Järnaros, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,932
Term of patent 14 years
U.S. Cl. D21—108



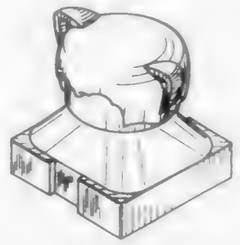
329,067
CANTILEVER FOR A TOY BUILDING SET
Ib T. Skov, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,959
Term of patent 14 years
U.S. Cl. D21—108



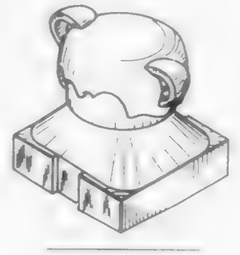
329,068
HEAD FOR A TOY BUILDING SET
Erik H. Rasmussen, Kokkedal, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,938
Term of patent 14 years
U.S. Cl. D21—108



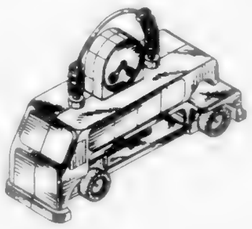
329,069
FIGURE FOR A TOY BUILDING SET
Berit Holmstrom, Roskilde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,935
Term of patent 14 years
U.S. Cl. D21—108



329,070
FIGURE FOR A TOY BUILDING SET
Berit Holmstrom, Roskilde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,934
Term of patent 14 years
U.S. Cl. D21—108

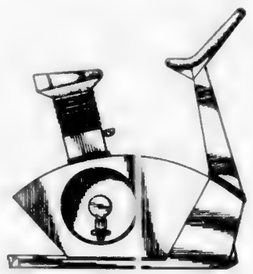


329,071
TOY VEHICLE
Draco Chih, Taipei, Taiwan, assignor to Taiwan Shining Young Trading Co., Ltd., Taipei, Taiwan
Filed May 14, 1991, Ser. No. 699,561
Term of patent 14 years
U.S. Cl. D21—128

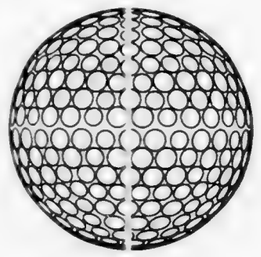


329,072
EYE FOR A TOY ANIMAL OR SIMILAR ARTICLE
Laurie D. Wyeth, 123 Quail Creek Dr., San Marcos, Tex. 78666
Continuation-in-part of Ser. No. 208,408, Jun. 17, 1988, Pat. No. Des. 223,365, which is a continuation-in-part of Ser. No. 65,003, Jun. 19, 1987, Pat. No. Des. 313,825. This application May 13, 1991, Ser. No. 699,796
Term of patent 14 years
U.S. Cl. D21—189

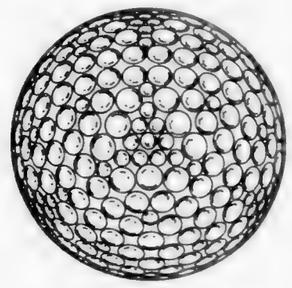
329,073
EXERCISE BICYCLE
Howell Hsiao, Mtn. View, Calif., assignor to Giant Manufacturing Co., Ltd., Taichung, Taiwan
Filed Dec. 20, 1990, Ser. No. 632,738
Term of patent 14 years
U.S. Cl. D21—194



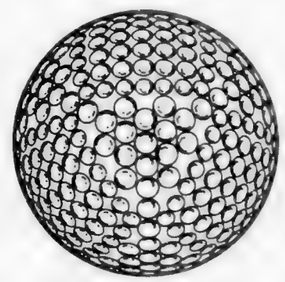
329,074
GOLF BALL
William Gobush, 17 Merrymount Dr., No. Dartmouth, Mass. 02747, and Diane Pelletier, 24 Evergreen St., Fairhaven, Mass. 02719
Continuation-in-part of Ser. No. 145,490, Jan. 19, 1988, which is a continuation-in-part of Ser. No. 885,186, Jul. 14, 1986. This application Jan. 17, 1989, Ser. No. 297,671
Term of patent 14 years
U.S. Cl. D21—205



329,075
GOLF BALL
Seward S. Miller, Avon Lake; Yong L. Nee, Cleveland, and R. Derrell Young, Elyria, all of Ohio, assignors to WPI Acquisition Corporation, Elyria, Ohio
Filed Feb. 26, 1990, Ser. No. 485,362
Term of patent 14 years
U.S. Cl. D21—205

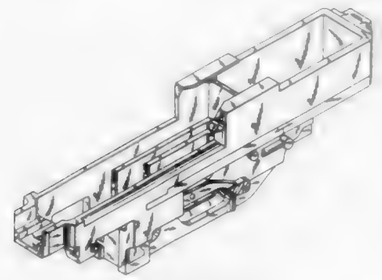


329,076
GOLF BALL
Yong L. Nee, Cleveland, and R. Derrell Young, Elyria, both of Ohio, assignors to WPI Acquisition Corporation, Elyria, Ohio
Filed Feb. 26, 1990, Ser. No. 485,369
Term of patent 14 years
U.S. Cl. D21—205

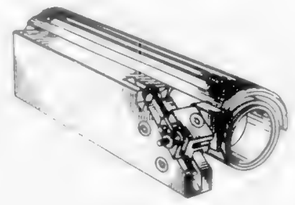


329,077
FLOAT
Peter Burkhalter, Fosana-Vira, Switzerland, assignor to I.H.O. Peter Burkhalter International Handelorganisation, Fosana-Vira, Switzerland
Filed Jan. 25, 1991, Ser. No. 647,585
Term of patent 14 years
U.S. Cl. D21—237

329,078
FIREARM RECEIVER
Harold Hasselbush, 144-21 68th Dr., Flushing, N.Y. 11367
Filed Feb. 20, 1990, Ser. No. 482,327
Term of patent 14 years
U.S. Cl. D22—108

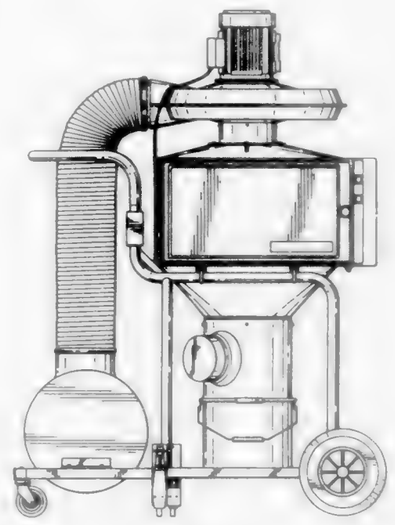


329,079
SIGHT FOR FIREARMS, CROSSBOWS, BOWS, OR THE LIKE
Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736
Filed Jan. 8, 1990, Ser. No. 461,769
Term of patent 14 years
U.S. Cl. D22—109



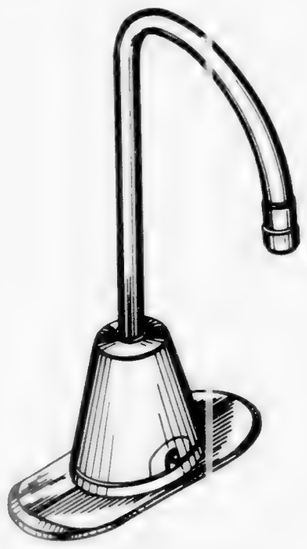
329,080
WORM BAITER
Richard De Santi, 2 De Vausney Pl., Nutley, N.J. 07110-2611
Filed Jun. 27, 1990, Ser. No. 544,488
Term of patent 14 years
U.S. Cl. D22—149

329,081
MOBILE ELECTROSTATIC AIR FILTER FOR USE IN WELDING PROJECTS
Alf I. S. Jonasson, Hyllinge, and Per N. Hedlund, Helsingborg, both of Sweden, assignors to AB Ph. Nederman & Co., Sweden
Filed Oct. 15, 1990, Ser. No. 597,751
Claims priority, application Sweden, Jul. 16, 1990, 90-1545
Term of patent 14 years
U.S. Cl. D23—209

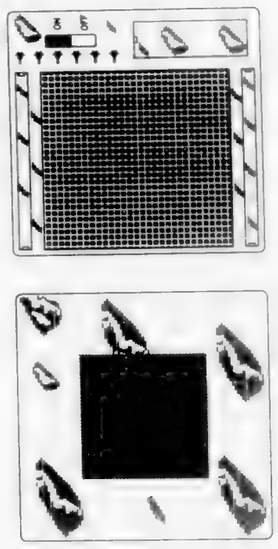


329,082
FAUCET
Alan Rosenberg, 3001 Redhill Bldg. 5 #108/145, Costa Mesa, Calif. 92626
Filed Apr. 11, 1988, Ser. No. 179,917
Term of patent 14 years
U.S. Cl. D23—238

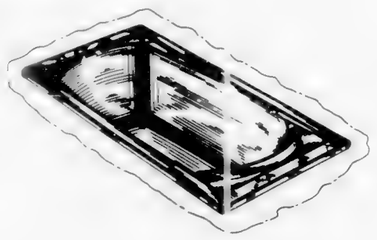
329,083
FAUCET
Todd D. Dannenberg, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Division of Ser. No. 582,029, Sep. 13, 1990, Des. Pat. No. 327,529. This application Apr. 14, 1992, Ser. No. 868,756
Term of patent 14 years
U.S. Cl. D23—238



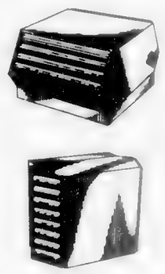
329,085
AIR CLEANING AND FILTERING UNIT TO BE MOUNTED TO UNDERSIDE OF CAR ROOF TO REMOVE SMOKE
Terry L. Lewis, 2628 Beckett Dr., Lebanon, Ohio 45036
Filed Jul. 20, 1990, Ser. No. 555,153
Term of patent 14 years
U.S. Cl. D23—365



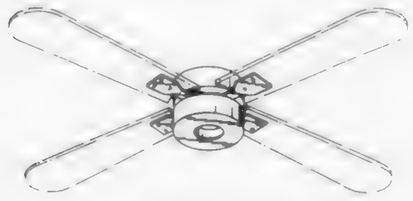
329,084
BATHTUB OR THE LIKE
Todd D. Dannenberg, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1990, Ser. No. 466,573
Term of patent 14 years
U.S. Cl. D23—281



329,086
VENTILATOR
Germain Courchesne, 167, chemin du Golf, Drummondville, Canada J2C 1K9
Filed Jan. 4, 1991, Ser. No. 637,495
Term of patent 14 years
U.S. Cl. D23—371



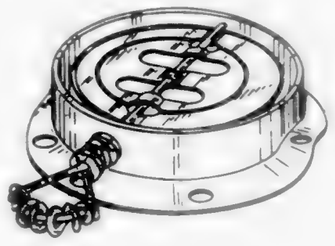
329,087
ELECTRICALLY POWERED CEILING FAN MOTOR HOUSING
Michael A. Markwardt, Fort Worth, Tex., assignor to Encon Industries, Inc., Fort Worth, Tex.
Filed Jul. 1, 1991, Ser. No. 723,527
Term of patent 14 years
U.S. Cl. D23—377



329,088
PORTABLE FAN
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Sep. 30, 1991, Ser. No. 767,207
Claims priority, application United Kingdom, Apr. 4, 1991, 2013930
Term of patent 14 years
U.S. Cl. D23—377

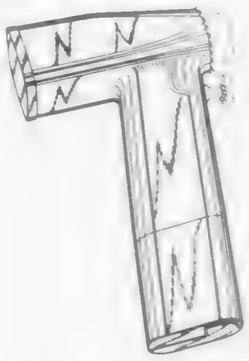
329,089
FAN
Michael C. Coup, Wichita; Glen W. Ediger, Newton; Donald J. Moore, Wichita; Gary P. Israel, Wichita, and Neill E. Bryan, Wichita, all of Kans., assignors to Vornado Air Circulation Systems, Inc., Wichita, Kans.
Filed Sep. 24, 1990, Ser. No. 587,421
Term of patent 14 years
U.S. Cl. D23—382

329,090
EXHAUST COLLAR FOR A WOOD BURNING UNIT
Steven J. Vogelzang, 555 Bay View Ave., Holland, Mich. 49423
Filed Nov. 19, 1990, Ser. No. 615,658
Term of patent 14 years
U.S. Cl. D23—392

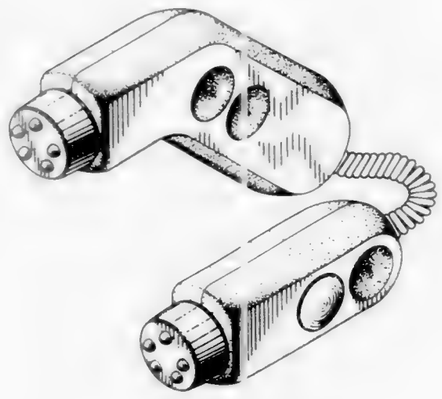


329,091
RADIANT STOVE HEATER
Kevin R. McWilliams, Stratford-Upon-Avon, England, assignor to Ceramaspeed Limited, Droitwich, United Kingdom
Filed Apr. 17, 1989, Ser. No. 339,429
Claims priority, application United Kingdom, Oct. 29, 1988, 1054049
Term of patent 14 years
U.S. Cl. D23—419

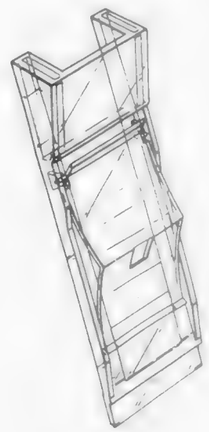
329,092
HANDPIECE HOUSING FOR A SURGICAL DRILL, REAMER, SAGITTAL SAW, OR THE LIKE
Steven J. Carusillo, Kalamazoo; Kris D. Eager, Richland, and David H. Grulke, Battle Creek, all of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.
Filed Feb. 14, 1990, Ser. No. 480,079
Term of patent 14 years
U.S. Cl. D24—146



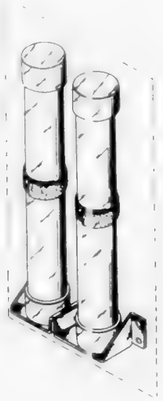
329,094
FACIAL MASSAGE UNIT
Barry J. Marshall, Vancouver; Bruce Hewson, West Vancouver, and Louise St. Pierre, Vancouver, all of Canada, assignors to 314613 B.C. Ltd., Vancouver, Canada
Filed Aug. 2, 1990, Ser. No. 562,076
Term of patent 14 years
U.S. Cl. D24—214



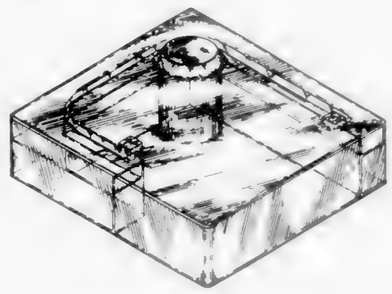
329,095
SLIDE HOLDER FOR AN IMMUNOSTAINING WORKSTATION
Roy A. Crerar, Edinburgh; Martin L. Nelson, Linlithgow, and Joseph C. Manley, South Queensferry, all of Scotland, assignors to Shandon Scientific Limited, Cheshire, England
Filed Jul. 11, 1989, Ser. No. 378,312
Claims priority, application United Kingdom, Jan. 11, 1989, 1056283
Term of patent 14 years
U.S. Cl. D24—225



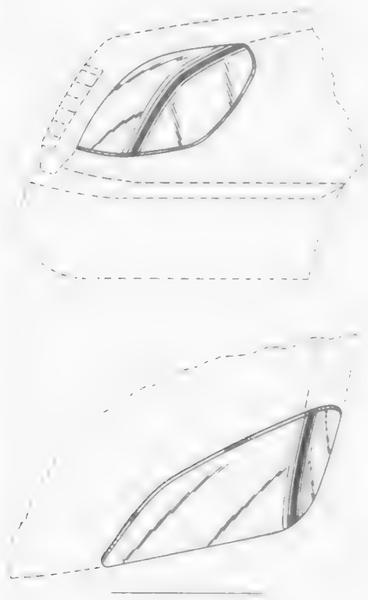
329,094
STERILIZER FOR FLEXIBLE CYSTOSCOPE
Bruce Houman, 1820 Fullerton Ave., Ste. 260, Corona, Calif. 91719
Filed Apr. 9, 1990, Ser. No. 508,402
Term of patent 14 years
U.S. Cl. D24—217



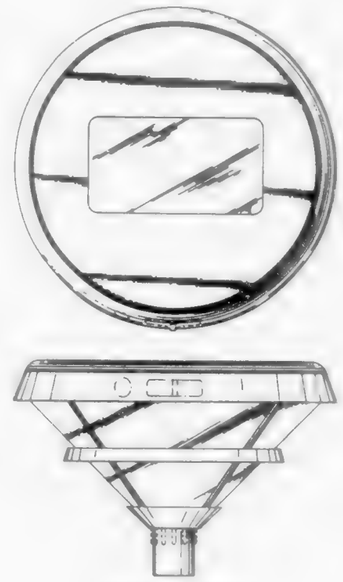
329,096
KIT FOR HARVESTING ENDOTHELIAL CELLS AND INOCULATING A VASCULAR PROSTHESIS
Malcolm B. Herring, 1640 Walden Ct., Zionsville, Ind. 46077
Division of Ser. No. 584,505, Sep. 17, 1990, Pat. No. 5,041,091, which is a continuation of Ser. No. 920,992, Oct. 20, 1986, abandoned. This application Apr. 8, 1991, Ser. No. 671,949
Term of patent 14 years
U.S. Cl. D24—226



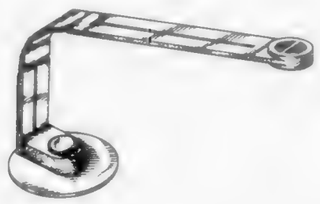
329,097
FRONT HEADLIGHT FOR AN AUTOMOBILE
Bruno Sacco, and Josef Gallitzendörfer, both of Sindelfingen, Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Jul. 27, 1990, Ser. No. 558,854
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1990, M9000651.8
Term of patent 14 years
U.S. Cl. D26—28



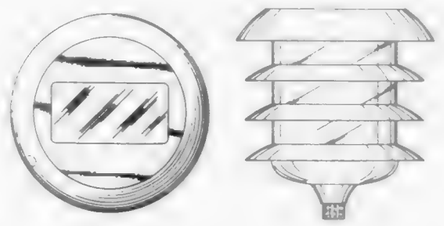
329,099
OUTDOOR LIGHT
Milly S. Hall, Dallas, Tex.; Donald L. Rohrs, Overland Park, Kans., and Kung C. Hung, Tsian Lung Tau, Hong Kong, assignors to The Brinkmann Corporation, Dallas, Tex.
Filed Feb. 5, 1990, Ser. No. 475,427
Term of patent 14 years
U.S. Cl. D26—67



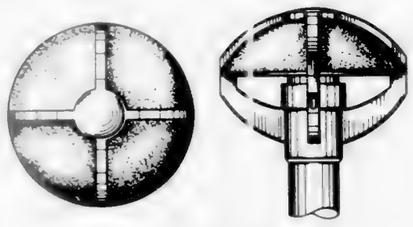
329,098
ADJUSTABLE TABLE LAMP
James Lu, No. 93, Sec. 1, Chungcheng Rd., Hsinchuang, Taipei Hsien, Taiwan
Filed Apr. 9, 1991, Ser. No. 682,712
Term of patent 14 years
U.S. Cl. D26—62



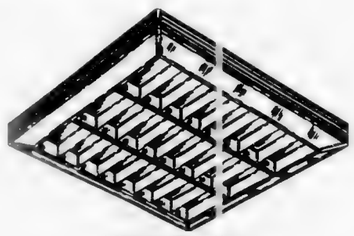
329,100
OUTDOOR LIGHT
Milly S. Hall, Dallas, Tex.; Donald L. Rohrs, Overland Park, Kans., and Kung C. Hung, Tsian Lung Tau, Hong Kong, assignors to The Brinkmann Corporation, Dallas, Tex.
Filed Feb. 9, 1990, Ser. No. 478,170
Term of patent 14 years
U.S. Cl. D26—67



329,101
EXTERIOR LIGHTING FIXTURE
Cory W. Landefeld, Long Beach, Calif., assignor to Kim Lighting, Inc., City of Industry, Calif.
Filed Jan. 25, 1991, Ser. No. 645,686
Term of patent 14 years
U.S. Cl. D26—68

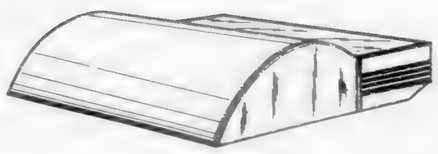


329,102
LUMINAIRE
Menno Dieperink, Amsterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 9, 1990, Ser. No. 506,653
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—77



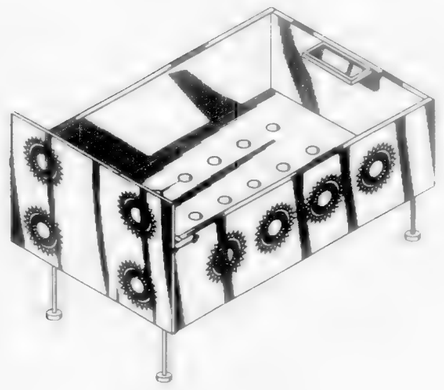
329,103
CHANDELIER
David Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Apr. 18, 1991, Ser. No. 687,424
Term of patent 14 years
U.S. Cl. D26—81

329,104
LUMINAIRE
Menno Dieperink, Amsterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 13, 1990, Ser. No. 509,543
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—87

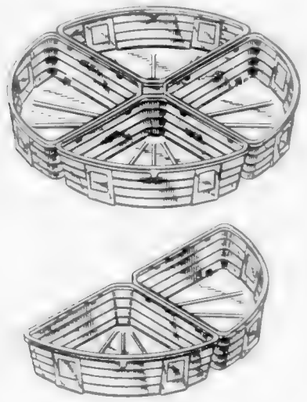


329,105
FLEXIBLE RAZOR CARTRIDGE
Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 10, 1990, Ser. No. 508,397
Term of patent 14 years
U.S. Cl. D28—47

329,106
BOX FOR WASHING DOGS
David Benavides, 577 E. Hillsdale St., Inglewood, Calif. 90302
Filed Sep. 19, 1990, Ser. No. 584,854
Term of patent 14 years
U.S. Cl. D30—108



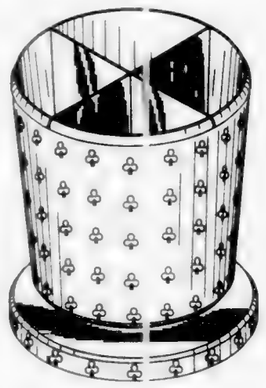
329,107
SECTIONAL LIVESTOCK TANK
Robert E. Hardy, Harrisburg, S. Dak., assignor to Sioux Steel Company, Sioux Falls, S. Dak.
Filed Apr. 12, 1990, Ser. No. 507,891
Term of patent 14 years
U.S. Cl. D30—131



329,108
HORSE BANDAGE
Timothy J. I. Boyd, "Murrabong", via Young New South Wales 2594, Australia
Filed May 9, 1989, Ser. No. 349,134
Term of patent 14 years
U.S. Cl. D30—146

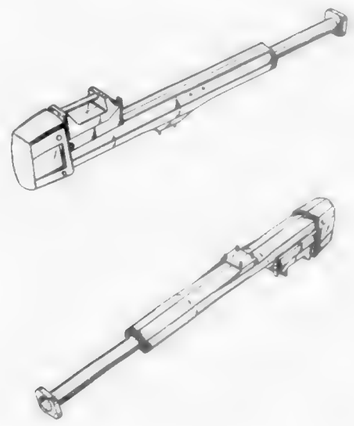
329,109
HORSE LOOPER
Beverly L. Draft, 610 Jasper Ave., Richmond, Va. 23222
Filed Mar. 13, 1991, Ser. No. 668,462
Term of patent 14 years
U.S. Cl. D30—158

329,110
MULTIPLE COMPARTMENT WASTE RECEPTACLE
Joyce L. Haneberg, 46-055 Mehe anu Pl. #3435, Kaneohe, HI. 96744
Filed Oct. 19, 1990, Ser. No. 600,103
Term of patent 14 years
U.S. Cl. D34—5

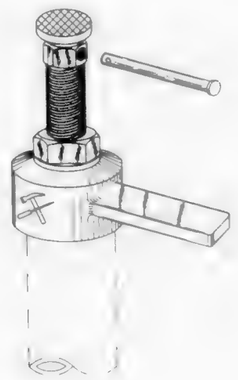


329,111
TRASH RECEPTICLE
Viterbo Urquidi, 9185 Coventry Rd., and Felipe P. Urquidi, 9223 Alameda Ave., both of, El Paso, Tex. 79907
Filed Oct. 18, 1990 Ser. No. 599,375
Term of patent 14 years
U.S. Cl. D34—7

329,112
COLUMN FOR A LIFTING APPLIANCE
Jonnie Silbersky, Malmo, and Leif B. Sonesson, Eslov, both of Sweden, assignors to Arjo Hospital Equipment AB, Eslöv, Sweden
Filed Apr. 13, 1990, Ser. No. 508,413
Claims priority, application Sweden, Oct. 17, 1989, 89 2337
Term of patent 14 years
U.S. Cl. D34—28



329,113
JACK
Kwang E. Kim, 401 E. 6th St., West Liberty, Iowa 52776
Filed Nov. 29, 1990, Ser. No. 620,331
Term of patent 14 years
U.S. Cl. D34—31



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A/S Dumex (Dumex Ltd.): *See*—
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Cappi, Angelo; and Rimondi, Renato, 5,142,841, Cl. 53-384.100.
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AB Volvo, a Swedish Body Corporate: *See*—
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ABB Patent GmbH: *See*—
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ABB Process Automation Inc.: *See*—
Abbott, Ronald E., 5,142,795, Cl. 34-41.000.
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Chacko, Koshy T.; Fitzgerald, Karen L.; and Markese, James J., 5,143,825, Cl. 435-7.900.
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Abe, Koichi: *See*—
Toya, Shigeo; Hiramoto, Yoshiyuki; Sasaki, Koji; Abe, Koichi; Ternaoka, Tatsuo; Shiga, Hirokazu; and Yoshie, Yasunori, 5,142,763, Cl. 29-517.000.
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Hauser, Jeffrey B.; Paspek, Stephen C.; and Adams, Harry A., 5,143,689, Cl. 374-55.000
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Pirrung, Michael C.; Read, J. Leighton; Fodor, Stephen P. A.; and Stryer, Lubert, 5,143,854, Cl. 436-518.000
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Aisin Seiki K. K.: *See*—
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Nakanishi, Eiichi; Onodera, Tetsuo; and Akiyama, Haruhiko, 5,144,258, Cl. 330-129.000.

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Klein, Hans-Christof; and Sievers, Uwe, 5,143,185, Cl. 188-299.000.

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Althofer, Gerd; and Kowal, Richard M. Adjustable active arm support for keyboard operators. 5,143,422, Cl. 297-411.000.

Altikan, Sami I.: *See—*
Alhamad, Shaikh G. M. Y.; and Altikan, Sami I., 5,142,755, Cl. 29-61.000.

AM International, Inc.: *See—*
Kharzo, Joseph S.; Grostick, David W.; Liang, Jiann-Shing; and Swamy, Narasimha, 5,143,364, Cl. 271-108.000.

Amaki, Tsutomu; and Okumoto, Tsutomu, to Matsushita Electric Works, Ltd. Toilet covering hinge assembly. 5,142,740, Cl. 16-381.000.

Amana Refrigeration, Inc.: *See—*
Schuchert, Eugene H., 5,142,895, Cl. 72-150.000.

Amann, Eugen; Baumgarten, Peter; Helh, Thomas; and Schmid, Eckhardt, to SWF Auto-Electric GmbH. Wiper system. 5,142,941, Cl. 74-606.00R.

Amano, Toshiaki, to Alps Electric Co., Ltd. Drive control method for thermal transfer printer. 5,144,331, Cl. 346-1.100.

Amano, Toshinori; and Mori, Susumu, to Murata Manufacturing Co., Ltd. Multilayer capacitor and method of fabricating the same. 5,144,527, Cl. 361-321.000

Amedei, Giuseppe; and Rondelli, Angelo, to Fiatgeotech-Tecnologie per la Terra S.p.A. Device for controlling a gear box of a vehicle, particularly an agricultural tractor. 5,142,927, Cl. 74-335.000.

American Cyanamid Company: *See—*
Doehner, Robert F., Jr., 5,144,041, Cl. 548-531.000
Lawter, James R.; and Lanzilotti, Michael G., 5,143,661, Cl. 264-4.300.
Mueller, Thomas, 5,143,851, Cl. 436-89.000.
Wissner, Allan; Schaub, Robert E.; Green, Kenneth E.; and Hamann, Philip R., 5,144,045, Cl. 549-219.000.

American Extrusion International, Inc.: *See—*
Nordin, Ronnie, 5,143,738, Cl. 426-231.000.

American Fly Ash Company: *See—*
Schumacher, Glenn O.; Weber, LaVerne; Nowicki, Mitchell; Dunbar, Alan; and Douglas, Jeffrey M., 5,143,481, Cl. 405-129.000.

American Home Products Corporation: *See—*
Buzby, George C., Jr.; and Colatsky, Thomas J., 5,144,072, Cl. 564-82.000.

American National Can Company: *See—*
Blemberg, Robert J.; Eckstein, John P.; and Nordness, Mark E., 5,143,677, Cl. 264-173.000.

American Standard Inc.: *See—*
Utter, Robert E.; and Crum, Daniel R., 5,142,885, Cl. 62-498.000.

American Sterilizer Company: *See—*
Shostek, Edward M.; and Zelina, Francis J., 5,143,208, Cl. 200-187.000.

American Vision, Inc.: *See—*
Borovsky, Simcha, 5,144,144, Cl. 250-455.110.

Amimoto, Tomohiko; and Takeuchi, Shoji, to Mitsui Engineering & Shipbuilding Co., Ltd. Aquatic plant cutting apparatus and aquatic plant recovery boat equipped with the apparatus. 5,142,849, Cl. 56-8.000

Amimoto, Yoshio; Hirata, Yuko; Hirai, Masaru; and Ueda, Akihiko, to Daikin Industries Ltd. Copolymer desoiling agent. 5,143,991, Cl. 526-245.000

Amling, Friedel: *See—*
Sebastian, Lothar; Berger, Karl-Heinz; Amling, Friedel; and Hecken, Gerhard, 5,144,275, Cl. 338-67.000

Ammon, Ernst; and Langsch, Robert, to Wifag. Process and device for applying a flexible layer to rollers for graphic machines. 5,143,573, Cl. 156-294.000

Amoco Corporation: *See—*
Graham, Robert J.; Helstrom, John J.; Peck, Lawrence B.; Stone, Richard A.; and Bernier, Edward J., Jr., 5,143,598, Cl. 208-390.000
Maresca, Louis M., 5,144,001, Cl. 528-171.000
Quinga, Elaine M.; and Schaap, Luke A., 5,143,634, Cl. 252-33.000.
Robeson, Lloyd M.; and Harris, James E., 5,143,985, Cl. 525-437.000.

AMP Incorporated: *See—*
Boyer, Raymond D.; Forker, Donald L.; and Parmer, Kenneth R., 5,142,777, Cl. 29-884.000.
Merkt, Steven T.; Schaeffer, Richard L., Jr.; and Stough, Dale E., Jr., 5,142,771, Cl. 29-751.000

Andel, Gregory G. Wire separator apparatus. 5,144,100, Cl. 174-135.000

Anderman, Menahem; Johnson, Steven L.; Saft, Michael C.; and Zuckerbrod, David, to W. R. Grace & Co.-Conn.. Cathodic electrode 5,143,805, Cl. 429-217.000.

Anderson, Denise A.: *See—*
Christenson, Philip A.; Riker, Paul J.; Anderson, Denise A.; and Yurecko, John M., Jr., 5,144,048, Cl. 549-435.000

Anderson, J. W. C.; and Lauyans, Frank G., Jr., to Trident Manufacturing, Inc. Bed sheet with retainer strips to fit and remain securely on bed. 5,142,718, Cl. 5-497.000.

Anderson, John K.; Andrews, Michael S.; Briggs, Robert S., Jr.; and Keathly, David M., to Comar, Inc. Method for determining the quality of print using pixel intensity level frequency distributions. 5,144,566, Cl. 364-552.000.

Anderson, Keith G.: *See—*
Allen, Robert H.; Anderson, Keith G.; Diefenbach, Steven P.; Lin, Ronny W.; Nemec, Larry H., Overstreet, Andrew D.; and Robinson, Gene C., 5,144,053, Cl. 556-190.000

Ando Electric Co., Ltd.: *See—*
Takatsuka, Tomohide, 5,144,307, Cl. 341-120.000

Ando, Masaru: *See—*
Hideshima, Makoto; Tsunoda, Tetsujiro; Kojima, Shinjiro; and Ando, Masaru, 5,143,865, Cl. 437-183.000.

Andres, Walter; Flory, Wilfried; and Mennicke, Stefan, to ABB Patent GmbH. High-temperature storage battery. 5,143,803, Cl. 429-120.000

Andrews, Michael S.: *See—*
Anderson, John K.; Andrews, Michael S.; Briggs, Robert S., Jr.; and Keathly, David M., 5,144,566, Cl. 364-552.000.

Angle, Lonnie L. Hydraulic compressor and fuel fired turbine apparatus. 5,142,870, Cl. 60-668.000

Anguil Environmental Systems, Inc.: *See—*
Anguil, Gene H., 5,143,700, Cl. 422-176.000.

Anguil, Gene H., to Anguil Environmental Systems, Inc. Ceramic filter construction for use in catalytic incineration system. 5,143,700, Cl. 422-176.000

Annaka, Yuji: *See—*
Kawanami, Seiichi; Sugiyama, Tatsuo; Suzuki, Yoshiro; Ito, Yasutaro; and Annaka, Yuji, 5,144,499, Cl. 359-885.000

Annett, Thomas A., to Motorola, Inc. Self-locking housing assembly 5,144,533, Cl. 361-395.000.

Anstock, Thomas: *See—*
Thomas, Juergen; Spahl, Roland; Anstock, Thomas; Eisenbeis, Ansgar; and Schmid, Wolfgang, 5,143,595, Cl. 208-58.000

Anthony, James R.; Wiseman, Michael A.; and Lortz, Allan R., to Indiana Mills and Manufacturing, Inc. Belt buckle with interlocking dual tongue and floating peg. 5,142,748, Cl. 24-573.500.

Anzai, Hisao; Yamamoto, Nobuyuki; Kodama, Youichi; Imai, Yoshitaka; and Daiguuji, Tsutomu, to Mitsubishi Rayon Co., Ltd. Flameresisting apparatus. 5,142,796, Cl. 34-62.000.

Aoai, Toshiaki: *See—*
Mizutani, Kazuyoshi; and Aoai, Toshiaki, 5,143,816, Cl. 430-192.000

Aoki, Hiroshi: *See—*
Nakamura, Yukitsugu; Kohayakawa, Yoshimi; and Aoki, Hiroshi, 5,144,346, Cl. 351-208.000

Aoki, Shinya: *See—*
Gemma, Nobuhiro; Nakayama, Toshio; Egusa, Syun; Miura, Akira; Azuma, Makoto; Aoki, Shinya; and Naito, Katsuyuki, 5,144,473, Cl. 359-270.000

Aoki, Takao: *See—*
Yamada, Shinichi; Sakuma, Isamu; Himeshima, Yoshio; Aoki, Takao; Uemura, Tadahiro; and Shirakura, Akira, 5,143,763, Cl. 428-36.200.

Aoki, Tsutomu: *See—*
Najima, Kozo; Tsuyuguchi, Hirohumi; Aoki, Tsutomu; Wakano, Fukuo; and Ida, Masahiro, 5,143,493, Cl. 409-141.000

Aomori, Kokichi: *See—*
Suzumori, Koichi; and Aomori, Kokichi, 5,142,989, Cl. 104-138.200

AOS Holding Company: *See—*
Spivey, Michael E., 5,143,050, Cl. 126-374.000

Apple Computer, Inc.: *See—*
Carter, Andrew; and Hulick, Troy, 5,144,302, Cl. 341-20.000

Aqualon Company: *See—*
Ahmed, Syed M., 5,143,970, Cl. 524-710.000
Fung, Kwan F., 5,144,020, Cl. 536-35.000

Aquino, Thomas. Multiple flower stem holder. 5,142,820, Cl. 47-41.120.

Arahara, Kohzoh: *See—*
Yuasa, Toshiya; Arahara, Kohzoh; and Kai, Takashi, 5,143,546, Cl. 106-20.000

Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera. 5,144,354, Cl. 354-400.000

Arai, Hiroyuki: *See—*
Sakamoto, Hiroyuki; Miyamoto, Naruyuki; Takahashi, Ichirou; Nagashima, Takashi; and Arai, Hiroyuki, 5,144,366, Cl. 355-208.000

Arai, Mitsuo: *See—*
Kumamura, Masaaki; Inaba, Ryohei; Danmoto, Shojiro; and Arai, Mitsuo, 5,143,736, Cl. 425-567.000

Araki, Kenji: *See—*
Nakaham, Yasumitsu; Araki, Kenji; and Kamio, Hiroshi, 5,143,704, Cl. 422-248.000

Araya, Junji: *See—*
Ohzeki, Yukihiro; Araya, Junji; and Ishiyama, Tatsunori, 5,144,368, Cl. 355-219.000

Arduengo, Anthony J., to Du Pont de Nemours, E. I., and Company. Preparation of tertiary amine borane adducts. 5,144,032, Cl. 544-229.000

Arena, Blaise J.; and Holmgren, Jennifer S., to UOP. 2-ethyl-2-hexenal by aldol condensation of butyraldehyde in a continuous process 5,144,089, Cl. 568-463.000.

Arend, Gunter: *See—*
Hansel, Eduard; Hess, Heinrich; Arend, Gunter; Grogler, Gerhard, and Kopp, Richard, 5,143,987, Cl. 525-458.000
Meckel, Walter; Hansel, Eduard; Ganster, Otto; Arend, Gunter; and Buchner, Jorg, 5,143,995, Cl. 528-59.000

Arens, Kenneth P.; and Murphy, Brian W., to Arens, Kenneth P. Energy efficient alarm system and regulative central control unit. 5,144,283, Cl. 340-506.000

Arie, Ben-Bassat; Bruner, Robert; Shoemaker, Sharon; Aloni, Yehoshua; Wong, Harry; Johnson, Donald C.; and Neogi, Amar, to Weyerhaeuser Company. Reticulated cellulose and methods and microorganisms for the production thereof. 5,144,021, Cl. 536-56.000

Ariga, Yutaka: *See—*
Mochizuki, Hidehiro; Shimada, Masaru; and Ariga, Yutaka, 5,143,893, Cl. 503-227.000

Aristech Chemical Corporation: *See—*
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Arkens, Charles T.; Cluthe, Charles E.; and Smart, Reginald T., to Rohm and Haas Company. Heat-resistant nonwoven fabrics 5,143,582, Cl. 162-135.000

Armer, Thomas A.: *See—*
Chang, Kin-Shiung; Armer, Thomas A.; and Bridges, William G., 5,144,412, Cl. 357-74.000

Armor, John N.: *See—*
Listemann, Mark L.; Pierantozzi, Ronald; and Armor, John N., 5,144,074, Cl. 564-224.000

Arnold, William D., to Lee/Rowan Company. Garden equipment support rack. 5,143,228, Cl. 211-70.600.

Arthur D. Little, Inc.: *See—*
Caron, Richard N.; McFadden, David H.; Collins, John M.; and Dieckmann, John, 5,142,968, Cl. 99-404.000

Arwood, Diane K.: *See—*
Stiffey, Arthur V.; Hart, Kevin R.; and Arwood, Diane K., 5,143,545, Cl. 106-15.050.

Asahi Glass Company Ltd.: *See—*
Endoh, Eiji; and Jinbo, Haruo, 5,143,587, Cl. 204-129.850

Asahi Kasei Kobyo Kabushiki Kaisha: *See—*
Hamanaka, Katsuhiko; and Kanda, Yoshio, 5,143,612, Cl. 210-321.800

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Niino, Masahiko, 5,143,982, Cl. 525-400.000

Asahi Kogaku Kogyo K.K.: *See—*
Ninomiya, Shinji; and Naganuma, Kazuhiro, 5,144,485, Cl. 359-580.000

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Arai, Akihiro, 5,144,354, Cl. 354-400.000
Nomura, Hiroshi, 5,144,493, Cl. 359-700.000
Sekiguchi, Tetsuo, 5,144,494, Cl. 359-700.000
Shono, Tetsuji, 5,144,352, Cl. 354-400.000.

Asaida, Takashi: *See—*
Sudo, Fumihiko; and Asaida, Takashi, 5,144,446, Cl. 358-213.110

Asakura, Michihito; and Hasegawa, Satoshi, to Pioneer Electronic Corporation. Hand-held microphone apparatus with resilient stabilizing ring. 5,144,677, Cl. 381-169.000.

Asakura, Tsutou: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko, Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,415, Cl. 358-43.000

Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,443, Cl. 358-209.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Suzuki, Tetsuji; and Shinonaga, Hirohiko, 5,144,471, Cl. 359-245.000.
Asano, Michio: *See*—
Takiyasu, Yoshihiro; Tanaka, Toshiki; Asano, Michio; Ohno, Masashi; and Kozaki, Takahiko, 5,144,622, Cl. 370-85.130.
Asao, Haruhiko: *See*—
Iwamura, Takuro; Koya, Tsugio; Tsukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000.
Asea Brown Boveri Ltd.: *See*—
Agosti, Giorgio; and Mathews, Hans-Gunter, 5,144,194, Cl. 315-005.000.
Bauer, Friedhelm, 5,144,400, Cl. 357 38.000.
Kluge, Wolfgang; Perkins, Roger; Rossunelli, Marco; and Dawson, William J., 5,143,711, Cl. 423-593.000.
Plangger, Rico, 5,143,119, Cl. 137-557.000.
Ashcraft, Daniel W.; and Romeo, Steve G., to JBL, Incorporated. Speaker mounting assembly. 5,143,339 Cl. 248-343.000.
Ashida, Kenichiro: *See*—
Inoue, Yoshihiro; and Ashida, Kenichiro, 5,143,379, Cl. 273-435.000.
Ashihara, Teruaki; Tone, Shingo; and Orita, Ryozo, to Toyo Kasei Kogyo Company Ltd. Polyolefin resin composites. 5,143,976, Cl. 525-227.000.
Ashland Oil, Inc.: *See*—
Chung, Daniel A.; and Dammann, Laurence G., 5,143,996, Cl. 528-60.000.
Ashok, Sankaranarayanan: *See*—
Melillo, Thomas J.; D'Onofrio, Michael A.; Watson, W. Gary; and Ashok, Sankaranarayanan, 5,143,100, Cl. 164-46.000.
ASM Lithography B.V.: *See*—
Wittekoek, Stefan; Van Den Brink, Marinus A.; and Fahner, Theodorus A., 5,144,363, Cl. 355-53.000.
Asmo Co., Ltd.: *See*—
Imamura, Shinji, 5,142,729, Cl. 15-250.160.
Asselman, George A. A.: *See*—
Megens, Ludovicus; Vriens, Petrus F. A. A.; Asselman, George A. A.; and Notenboom, Gerardus, 5,144,535, Cl. 361-400.000.
Aster, Inc.: *See*—
Gerace, Janet M.; and Gerace, Michael J., 5,143,650, Cl. 252-511.000.
AT&T Bell Laboratories: *See*—
Chin, Melissa C.; Evans, James B.; and Orlando, Denis P., 5,144,324, Cl. 343-702.000.
Gabriel, M. Christina; Houh, Henry Y. I.; and Whitaker, Norman A., 5,144,375, Cl. 356-345.000.
Knauer, Scott C.; Matthews, Kim N.; Netravali, Arun N.; Petajan, Eric D.; Safranek, Robert J.; and Westerink, Peter H., 5,144,423, Cl. 358-133.000.
Knauer, Scott C.; and Netravali, Arun N., 5,144,435, Cl. 358-167.000.
Koch, Thomas L.; Kogelnik, Herwig; and Koren, Uziel, 5,144,637, Cl. 372-50.000.
Norsworthy, Steven R., 5,144,308, Cl. 341-131.000.
Atlas Roll-Lite Door Corporation: *See*—
Beckerman, Howard L., 5,142,822, Cl. 49-27.000.
Atlas, Ronald M.; and Aislabie, Jackie, to Southern Pacific Petroleum. Process for biotechnological upgrading of shale oil. 5,143,827, Cl. 435-30.000.
Atochem: *See*—
Devic, Michel, 5,143,581, Cl. 162-72.000.
Lina, Marie-Jose; and Dessaint, Andre, 5,144,056, Cl. 560-25.000.
Aube, Jean-Yves: *See*—
Giboult, Alain; Aube, Jean-Yves; and Sainte-Foi, Daniel, 5,143,532, Cl. 65-6.000.
Aubert, Veronique: *See*—
Magnin, Guy; Magnin, Marie-Francoise; and Aubert, Veronique, 5,143,653, Cl. 252-628.000.
August, Melvin C.; Massopust, Daniel; Nobel, Mary; Neumann, Eugene F.; and Pautsch, Gregory W., to Cray Research, Inc. Computer signal interconnect apparatus. 5,144,611, Cl. 385-88.000.
Aurtoi, Jean-Marc; and Bornes, Philippe, to Ste. Ateliers de la Haute Garonne-ets Auriol et Cie. Process for distribution of pieces such as rivets, and apparatus for carrying out the process. 5,143,216, Cl. 206-338.000
Ausimont, S.r.L.: *See*—
Marchionni, Giuseppe; and Staccione, Anna, 5,143,589, Cl. 204-157.920.
Marraccini, Antonio; Pasquale, Antonio; Staccione, Anna M.; and Marchionni, Giuseppe, 5,144,092, Cl. 568-615.000.
Austin, Mickey D.; and Keller, Richard J., to Kelrus Corp. System for proportioned liquid dispensing. 5,143, 57, Cl. 222-57.000.
Ausubel, Frederick M.: *See*—
Huala, Eva; and Ausubel, Frederick M., 5,143,846, Cl. 435-252.330.
Automation and Protection Systems, Inc.: *See*—
Scheppmann, Leroy E., II, 5,144,151, Cl. 307-66.000.
Avery Dennison Corporation: *See*—
Freedman, Melvin S., 5,143,570, Cl 156-230.000.
Aviv, Haim: *See*—
Hartman, Jacob R.; Oppenheim, Amos B.; Gorecki, Marian; and Aviv, Haim, 5,143,836, Cl. 435-189.000.
Awai, Takashi: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,144,329, Cl. 346-1.100
Awata, Yoshinori; and Tsuchiya, Noriaki, to Fuji Xerox Co., Ltd Digital filter for filtering image data. 5,144,572, Cl. 364-724.050.
Axxon Corporation: *See*—
Etemad, Mehran; Tavassoli, Farshad; and Marceau, William E., 5,142,999, Cl. 110-235.000.
Azuma, Makoto: *See*—
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B.F. Goodrich Company, The: *See*—
Greenlee, William S.; Kinson, Philip L.; Kline, Sally A.; Rajagopalan, Murali; and Daniels, Charles A., 5,143,975, Cl. 525-205.000.
Pourahmady, Naser, 5,143,953, Cl. 524-104.000.
Stanislawczyk, Vic, 5,143,971, Cl. 524-833.000
B P America, Inc.: *See*—
Chon, Yu-Taik, 5,144,590, Cl. 367-57.000
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, to Hoechst Aktiengesellschaft. Substituted pyridine-2,4-dicarboxylic acid compounds and methods of use thereof. 5,143,926, Cl. 514-354.000.
Baba, Norio: *See*—
Kobayashi, Hiroyuki; Kanaya, Koichi; Baba, Norio; and Ogasawara, Mitsuo, 5,144,129, Cl. 250-307.000
Babbitt, Richard W.: *See*—
Stern, Richard A.; and Babbitt, Richard W., 5,144,320, Cl. 342-374.000.
Babcock & Wilcox Company, The: *See*—
Carter, Hudson R.; and Koksal, Cevdet G., 5,144,125, Cl. 250-227.150.
Babitzka, Rudolf: *See*—
Reiter, Ferdinand; and Babitzka, Rudolf, 5,143,301, Cl. 239-585.400.
Bach, Richard G.: *See*—
Bach, Ronald L.; and Bach, Richard G., 5,143,153, Cl. 166-68.500.
Bach, Ronald L.; and Bach, Richard G. Rotary oil well pump and sucker rod lift. 5,143,153, Cl. 166-68.500.
Bado, Frank M.: *See*—
Kohler, Karl A.; Bado, Frank M.; and Krueger, Richard E., 5,143,288, Cl. 239-1.000.
Baer, Stephen C., to Zomeworks Corporation. Solar collector tube plate. 5,143,053, Cl. 126-446.000.
Bahn, Itsuki, to Kabushikigaisha Sekogiken. Current supply control apparatus for an inductance load. 5,144,215, Cl. 318-701.000.
Baker, Dwight; Baker, James C.; King, Randall;; and Eads, Elton W. Easy-opening, high pressure gate valve. 5,143,348, Cl. 251-158.000.
Baker, Ernest D.; Dinwiddie, John M., Jr.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., to International Business Machines Corp. System for controlling access by first system to portion of main memory dedicated exclusively to second system to facilitate input/output processing via first system. 5,144,692, Cl. 395-425.000.
Baker Hughes Incorporated: *See*—
Mody, Rustom K.; and Halbardier, Floyd A., deceased, 5,143,154, Cl. 166-187.000.
Baker, James C.: *See*—
Baker, Dwight; Baker, James C.; King, Randall;; and Eads, Elton W., 5,143,348, Cl. 251-158.000.
Baker, Leland R.; and Golden, Lewis J., to Hughes Aircraft Company. Optimal television imaging system for guided missile. 5,144,422, Cl. 358-109.000.
Baker, Ross G., Jr.: *See*—
Adkins, Robert A.; and Baker, Ross G., Jr., 5,143,065, Cl. 128-419.0PG.
Bakker, Johan: *See*—
Copenhaver, Gary; Bakker, Johan; and Vala, John, 5,144,457, Cl. 358-474.000.
Balassa, Leslie L. Hydrated fibrous mats for use in curing cement and concrete. 5,143,780, Cl. 428-283.000.
Balazs, Endre A.: *See*—
Leshchiner, Edward; Balazs, Endre A.; Larsen, Nancy E.; and Leshchiner, Adelya, 5,143,724, Cl. 424-78.080.
Baldwin, Sheryl D.: *See*—
Rogers, Robert M.; Bokelman, Gordon H.; Baldwin, Sheryl D.; and Tafur, Susan S., 5,143,098, Cl. 131-365.000.
Ballard, P. Temple, to Infilco Degremont. Method and apparatus for clarifying liquid using a pulsating sludge bed and part of concentrated sludge. 5,143,625, Cl. 210-713.000.
Baltimore Therapeutic Equipment Co.: *See*—
McArthur, James A.; and Short, David C., 5,142,944, Cl. 74-665.00F.
Ban, Yuzaburo: *See*—
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Banaska, John G., to Keithley Instruments, Inc. Range changing using N and P channel FETS. 5,144,154, Cl. 307-242.000
Bannon, John H. Ultrasonic parts cleaning container. 5,143,106, Cl. 134-184.000.
Bar-Shalom, Daniel, to Riemann Trading ApS. Antiperspirant composition. 5,143,718, Cl. 424-47.000.
Barbanell, Joseph S., to DZ Company, The. High contrast-resolution camera. 5,144,460, Cl. 359-29.000.

Bardaville, George A. Electrical junction and switch boxes. 5,143,238, Cl. 220-3.200
Bares, Jan, to Xerox Corporation. Apparatus for detecting the vibration of electrode wires and canceling the vibration thereof. 5,144,370, Cl. 355-247.000.
Barkan, Edward D.: *See*—
Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward D.; Shepard, Howard M.; and Swartz, Jerome, 5,144,120, Cl. 235-472.000.
Barlas, J. Morgan: *See*—
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Barmag AG: *See*—
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Barnes, Josh T.; Barnes, Thomas F.; Smith, Earl E.; and Troppman, Dale A., to Lexalite International Corporation. Lighting fixture with an improved light transmitting film. 5,143,446, Cl. 362-293.000.
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Bitter, Johan G. A.; Futselaar, Harry; and Racz, Imre G., to Shell Oil Company. Counter-current membrane module for liquid separation 5,143,613, Cl. 210-321.800.

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Iwaki, Takashi; Shinjo, Kenji; Yoshida, Akio; Yamashita, Masataka; Katagiri, Kazuharu; Hioki, Chieko; Togano, Takeshi; Yamada, Yoko; and Terada, Masahiro, 5,143,643, Cl. 252-299.610
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Kumamura, Masaaki; Inaba, Ryohei; Danmoto, Shojiro; and Arai, Mitsuo, 5,143,736, Cl. 425-567.000.
Mori, Hiromi; Morimoto, Reiko; and Nakamura, Tatsuya, 5,143,812, Cl. 430-124.000
Morishita, Masakazu, 5,144,398, Cl. 357-34.000
Nakamura, Kenji; Majima, Masao; and Yamamoto, Noboru, 5,144,466, Cl. 359-123.000
Nakamura, Yukitsugu; Kohayakawa, Yoshimi; and Aoki, Hiroshi, 5,144,346, Cl. 351-208.000.
Negishi, Hirokazu, 5,144,670, Cl. 381-24.000.
Nozawa, Keita; and Takagi, Seiichi, 5,143,810, Cl. 430-106.600
Odaka, Yukio; and Ikari, Hideo, 5,144,353, Cl. 354-400.000
Ohnishi, Toshikazu; Kaneko, Shuzo; and Kai, Takashi, 5,144,464, Cl. 359-98.000
Sakagami, Wataru; and Ogasawara, Yutaka, 5,144,608, Cl. 369-44.260.
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Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru, Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,144,329, Cl. 346-1.100
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Yuasa, Toshiya; Arahara, Kohzoh; and Kai, Takashi, 5,143,546, Cl. 106-20.000
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Ohzeki, Yukihiro; Araya, Junji; and Ishiyama, Tatsunori, 5,144,368, Cl. 355-219.000

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Cao, Thanh H.: *See—*
Zicker, Robert G.; Cao, Thanh H Borkowski, Daniel G.; Plouff, Donald A.; and Brown, Philip I., Jr., 5,144,649, Cl. 379-59.000.

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Repp, Richard E., 5,143,235, Cl. 2 5-256.000.

Cappel, James W.; and Rece, Robert D., to Proctor & Gamble Company, The. Psyllium-containing filling compositions and methods. 5,143,728, Cl. 424-195/00.000.

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Gilbert, Ronald E.; and Mordue, George S., 5,143,357, Cl. 266-235.000.

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Schwab, Carl E.; and Goodrich, Fred N. S., 5,144,315, Cl. 342-49.000.

Cardy, Ronald, to JanFlow Ltd. Trim and method of use. 5,144,099, Cl. 174-66.000.

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Luber, George H.; and Mann, Donna B., 5,143,058, Cl. 602-28.000.

Carette, Louis; and Velleret, Gerard, to Rhone-Poulenc Chimie. Compositions for use with chlorinated polymers. 5,143,959, Cl. 524-267.000.

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Malone, Thomas G., 5,143,245, Cl. 220-445.000.

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Sponagel, Stefan; and Wachowitz, Waldemar, 5,143,385, Cl. 277-134.000.
Tinz, Reinhard; and Heinemann, Joachim, 5,143,120, Cl. 137-601.000.

Carl Reudenberg, Firma: *See—*
Langhof, Rolf; and Kohl, Hans-Kurt, 5,143,457, Cl. 384-276.000.

Carl-Zeiss-Stiftung: *See—*
Kurbitz, Gunther; Marx, Dieter; and Heinrich, Harald, 5,144,356, Cl. 354-402.000.

Carlomagno, Michael; Busch, Paul F. and James, Steven, to Metcal, Inc. Desoldering device. 5,143,272, Cl. 228-20.000.

Caron, Richard N.; McFadden, David L.; Collins, John M.; and Dieckmann, John, to Arthur D. Little, Inc. Automated deep fat fryer. 5,142,968, Cl. 99-404.000.

Carpenter, James H., to Pangborn Corporation. Abrasive cleaning machine. 5,142,830, Cl. 51-419.000.

Carr, Clyde E., to Allied-Signal Inc. Parking brake lever cable retainer. 5,142,935, Cl. 74-502.600.

Carr, Duncan R.: *See—*
Kilner, David N.; Humphrey, Keith D.; Little, Lionel M.; Carr, Duncan R.; and Sharp, Lewis C., 5,143,534, Cl. 65-21.300.

Carrard, Michel: *See—*
Pierantoni, Michel; Blank, Eberhard; Carrard, Michel; and Wagniere, Jean-Daniel, 5,143,557, Cl. 428-654.000.

Carraro S.p.A.: *See—*
Tortul, Renzo, 5,143,032, Cl. 123-90.170.

Carter, Andrew; and Hulick, Troy, to Apple Computer, Inc. Modular keyboard. 5,144,302, Cl. 341-20.000.

Carter, Hudson R.; and Koksal, Cevdet G., to Babcock & Wilcox Company, The. Fiber optic based fire detection and tracking system. 5,144,125, Cl. 250-227.150.

Casagrande, Cesare; and Santangelo, Francesco, to Simes Societa Italiana Medicinali E. Sintetici S.A. Catecholamine esters. 5,144,059, Cl. 560-109.000.

Casalnuovo, Albert L.: *See—*
Bryndza, Henry E.; and Casalnuovo, Albert L., 5,143,873, Cl. 502-33.000.

Case, Terry E. Floating solar pool heater. 5,143,052, Cl. 126-415.000.

Cassella Aktiengesellschaft: *See—*
Eckhardt, Georg-Wolfgang; Keil, Karl-Heinz; and Schrod, Manfred, 5,144,040, Cl. 548-352.000

Casserly, Edward W.: *See—*
Venier, Clifford G.; and Casserly, Edward W., 5,144,095, Cl. 585-20.000.

Castleberry, Donald E.: *See—*
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Catelli, Camillo, to Rossi & Catelli S.p.A. Heat exchanger apparatus and method for processing fruits and vegetables. 5,143,152, Cl. 165-154.000.

Caterpillar Inc.: *See—*
Bruning, E. Eugene, 5,142,744, Cl. 24-16.00R.
Chamblin, Robert O., Sr.; Huenefeld, James A.; Hulva, Randal E.; and Menk, John R., 5,142,908, Cl. 73-319.000.

Catterson, Robert K.; Vogl, Norbert M.; and Kendziora, Michael E., to Briggs & Stratton Corp. Internal combustion engine having an integral cylinder head. 5,143,033, Cl. 123-195.00R.

Cauvy, Daniel; Couget, Francis; Slot, Raymond; and Villemin, Bernard, to Elf Atochem S.A. Cooling process associated with a process employing anhydrous hydrofluoric acid. 5,143,147, Cl. 165-1.000.

Caveney, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wiencek, Donald C., to Panduit Corp. Communication box assembly. 5,143,868, Cl. 439-535.000.

Cebal: *See—*
Masse, Christophe; and Philippe, Michel, 5,143,793, Cl. 428-577.000.

Centocor: *See—*
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Cepulis, Darren J., to Compaq Computer Corporation. Computer memory management method utilizing segmentation and protection techniques. 5,144,551, Cl. 395-425.000.

Cesnik, Charles L.: *See—*
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Cetenko, Wiaczeslaw A.; Connor, David T.; Sircar, Jagadish C.; Sorenson, Roderick J.; and Unangst, Paul C., to Warner-Lambert Company. 3,5-di-tertiarybutyl-4-hydroxyphenylmethylene derivatives of 2-substituted thiazolidinones, oxazolidinones, and imidazolidinones as antiinflammatory agents. 5,143,928, Cl. 514-369.000.

Chacko, Koshy T.; Fitzgerald, Karen L.; and Markese, James J., to Abbott Laboratories. Stabilized substrate for use in an immunoassay. 5,143,825, Cl. 435-7.900.

Chacko, Prakash: *See—*
Chong, Thomas C. K.; and Chacko, Prakash, 5,144,264, Cl. 331-117.00R.

Chadima, George E., Jr.; and Laser, Vadim, to Norand Corporation Instant portable bar code reader. 5,144,119, Cl. 235-472.000.

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Chahabadi, Ziaedin: *See—*
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Chahine, John J.: *See—*
Basso, James E.; Bhalla, Parmesh K.; Chahine, John J.; Diddell, Daro; Earle, Gregory J.; Gabriel, Edward P.; and Yaghmaie, Farrokh, 5,143,103, Cl. 134-98.100.

Chalencon, Jean-Pierre L.: *See—*
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Challenge Industries: *See—*
Dongelmans, Anthony A., 5,143,528, Cl. 55-283.000.

Chamberlain, Linda R.: *See—*
Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., 5,143,990, Cl. 526-82.000.

Chamblin, Robert O., Sr.; Huenefeld, James A.; Hulva, Randal E.; and Menk, John R., to Caterpillar Inc. Mounting assembly for fuel level sensor. 5,142,908, Cl. 73-319.000.

Chan, Albert S. C.; and Laneman, Scott A., to Monsanto Company. Ruthenium(II)-BINAP diketonate complexes. 5,144,050, Cl. 556-20.000.

Chandler, Robert S.: *See—*
Sardou, Freeman D.; and Chandler, Robert S., 5,143,334, Cl. 248-184.000.

Chang, Chin-Fong: *See—*
Das, Santosh K.; Chang, Chin-Fong; and Raybould, Derek, 5,143,795, Cl. 428-614.000.

Chang, Clarence D.; and Hellring, Stuart D., to Mobil Oil Corporation. Preparation of hydroxyl-rich zeolites. 5,143,876, Cl. 502-64.000.

Chang, Deugsoo, to Samsung Electronics Co., Ltd. Electrostatic protection circuit for semiconductor chip. 5,144,519, Cl. 361-58.000

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Krueger, Daniel D.; Wessels, Jeffrey F.; and Chang, Keh-Minn, 5,143,563, Cl. 148-410.000.

Chang, Kin-Shiung; Armer, Thomas A.; and Bridges, William G., to Olin Corporation. Process for manufacturing plastic pin grid arrays and the product produced thereby. 5,144,412, Cl. 357-74.000.

Chang, Pairoj: *See—*
Rossi, John J.; Cantin, Edouard M.; Zaia, John A.; and Chang, Pairoj, 5,144,019, Cl. 536-27.000.

Chang, R. J. Prop. 5,143,231, Cl. 211-96.000.

Chapelet, Franck: *See—*
Laupretre, Jean-Jacques; Chapelet, Franck; and Bretheau, Dominique, 5,143,274, Cl. 228-102.000.

Chapman, Derek D., to Eastman Kodak Company. Synthesis of pyrazole dyes. 5,144,015, Cl. 534-752.000

Charbonnages De France: *See—*
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Charles Stark Draper Laboratory, Inc., The: *See—*
Greiff, Paul, 5,144,184, Cl. 310-312.000.

Chekroun, Claude; and Collignon, Gerard, to Thomson-CSF Radant. Source of microwave radiation for an electronic sweeping antenna which absorbs reflected energy. 5,144,327, Cl. 343-731.000.

Chemap AG: *See—*
Sotirianos, Konstantin, 5,143,525, Cl. 55-52.000.

Chen, Chao: *See—*
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roahdy, Constance E.; and Hunter, Alastair W., 5,143,082, Cl. 128-749.000.

Chen, Chin-Te, to Shin Luen Facturing Factory Co., Ltd. Table-top planer. 5,143,128, Cl. 144-117.00R.

Chen, Dapang: *See—*
Bovir, Alan C.; and Chen, Dapang, 5,144,688, Cl. 382-56.000.

Chen, Kun-Yang. Quick release water faucet joint. 5,143,346, Cl. 251-149.500.

Chen, Shien-Chang; Cheng, Wan-Jy; Lin, Fu-Shen; and Huang, Fu-Juh, to Dairen Chemical Corporation. Process for producing methyl formate. 5,144,062, Cl. 560-239.000.

Chen, Ting-Hsing, to Far Great Plastics Industrial Co., Ltd. Integral molded skate truck. 5,143,388, Cl. 280-11.280.

Cheney, Henry H., III, to Consolidated Products and Services, Inc. Disposable infant heel warmer. 5,143,048, Cl. 126-263.000

Cheng, Peter S. C. Arrangement for and method of waking a sleeper. 5,144,600, Cl. 368-12.000.

Cheng, Wan-Jy: *See—*
Chen, Shien-Chang; Cheng, Wan-Jy; Lin, Fu-Shen; and Huang, Fu-Juh, 5,144,062, Cl. 560-239.000

Chermak, Philip J.: *See—*
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Cherry, Craig D.: *See—*
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Chesebrough-Pond's USA Co.: *See—*
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Chesney, Peter F.: *See—*
Leatham, Alan G.; Pratt, Charles R.; and Chesney, Peter F., 5,143,139, Cl. 164-46.000.

Chesterfield, Michael P.; Muth, Ross R.; and Kennedy, John, to United States Surgical Corporation. Process for preparing particles of bioabsorbable polymer. 5,143,662, Cl. 264-8.000.

Chevron Research and Technology Company: *See—*
Hung, Chi-Wen; and Reynolds, Bruce E., 5,143,887, Cl 502-259.000.
Woo, Gar Lok, 5,143,632, Cl. 252-8.554.

Chiang, Shang-yi; Huang, Wen-Ling M.; Drowley, Clifford I.; and Voorde, Paul V., to Hewlett-Packard Company. Bipolar transistor with trench-isolated emitter. 5,144,403, Cl. 357-49.000.

Chicopee: *See—*
Viemeister, Tucker; Formosa, Daniel; and Russak, Steven, 5,142,704, Cl. 2-202.000.

Chikama, Toshio, to Kabushiki Kaisha Machida Seisakusho. Bending device. 5,143,475, Cl. 403-291.000.

Chin, Melissa C.; Evans, James G.; and Orlando, Denis P., to AT&T Bell Laboratories. Antenna arrangement for a portable transceiver 5,144,324, Cl. 343-702.000.

Chino, Koichi: *See—*
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Chiotis, Achilles; and Soni, Pravin, to Raychem Corporation. Thermoplastic fluoropolymer adhesive composition. 5,143,761, Cl 428-35.100.

Chiou, Shean-Yih: *See—*
Lee, Kuang-Lu; and Chiou, Shean-Yih, 5,144,160, Cl. 307-353.000.

Chipsoft CA Corp.: *See—*
Morgan, Michael W., 5,144,693, Cl. 395-158.000.

Chiu, Bernard; Wang, Jui-Shang; and Marino, Frank, to Duracraft Corporation. Efficiently packaged humidifier device. 5,143,655, Cl 261-24.000.

Chiyoshi, Toyoharu: *See—*
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Choji, Shinichiro: *See—*
Matsuno, Yohsio; Choji, Shinichiro; Sasaki, Kenichi; and Tanabe, Yoshinori, 5,143,437, Cl. 362-80.000.

Chon, Yu-Taik, to B P America, Inc. Bed continuity detection and analysis using crosswell seismic data. 5,144,590, Cl. 367-57.000.

Chong, Leslie J.: *See—*
Smith, Robert F.; Pierce, Harold D., Jr.; Borden, John H.; Chong, Leslie J.; and Hay, Nairn W., 5,143,725, Cl. 424-84.000.

Chong, Thomas C. K.; and Chacko, Prakash, to Motorola, Inc. Wideband voltage controlled oscillator having open loop gain compensation. 5,144,264, Cl. 331-117.00R.

Chou, Chong-Ping P.: *See—*
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Chou, Kechia J.; and Hellmut, Kathleen M., to Texaco Inc. Membrane separation process. 5,143,620, Cl. 210-640.000.

Christensen, Steven, to Paccar Inc. Recirculation shield and fan shroud assembly. 5,143,516, Cl. 415-182.100

Christenson, Howard W. Two cycle internal combustion hydrocycle engine. 5,143,029, Cl. 123-65.0VA.

Christenson, Philip A.; Riker, Paul J.; Anderson, Denise A.; and Yurecko, John M., Jr., to L. Givaudan & Cie, S.A. Dicarboalkoxy dioxolane derivatives. 5,144,048, Cl. 549-435.000.

Christenson, Rebecca A.; and Good, Brian K., to Delco Electronics Corporation. Crankshaft angular position voltage developing apparatus having adaptive control and diode control. 5,144,233, Cl 324-207.250.

Christinsin, Alan S. Whip tilt adapter. 5,144,326, Cl. 343-715.000

Chua, Jose A. Fruit harvesting device. 5,142,854, Cl. 56-335.000.

Chun, Jae K., to Samsung Electronics Co., Ltd. Kimchi fermentor and control system thereof using a kimchi curing sensor. 5,142,969, Cl. 99-468.000.

Chung, Daniel A.; and Dammann, Laurence G., to Ashland Oil, Inc Primerless adhesive for fiberglass reinforced polyester substrates. 5,143,996, Cl. 528-60.000.

Ciba-Geigy Corporation: *See—*
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Mizuguchi, Jin; and Rochat, Alain C., 5,144,333, Cl. 346-1.100.
Setiabudi, Frans; and Wolf, Jean-Pierre, 5,143,999, Cl. 528-109.000.
Stingelin, Willy, 5,143,519, Cl. 8-527.000.
Suhadolnik, Joseph, 5,144,075, Cl. 564-301.000
Zink, Rudolf, 5,143,892, Cl. 503-220.000

Cibulsky, Michael J.; Papathomas, Kostas; and Schmitt, George P., to International Business Machines Corporation. Fiber reinforced epoxy prepreg and fabrication thereof. 5,143,756, Cl. 427-386.000

Ciokajlo, John J.; and Maclin, Harvey M., to General Electric Company. Compact flameholder type combustor which is staged to reduce emissions. 5,142,858, Cl. 60-39.330.

Citta, Richard W.; and Lee, Ronald B., to Zenith Electronics Corporation. Television signal transmission system with temporal processing. 5,144,431, Cl. 358-141.000.

City of Hope: *See—*
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Claar, Terry D.; Schiroky, Gerhard H.; and Johnson, Willima B., to Lanxide Technology Company, LP. Method of modifying ceramic composite bodies by a post-treatment process and articles produced thereby. 5,143,870, Cl. 501-87.000.

Clarion Co., Ltd.: *See—*
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Uchida, Yoshitaka; and Hashimoto, Takeshi, 5,144,639, Cl 375-1.000.

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Classen, Hans G.: *See—*
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Clecim: *See—*
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Closset, Bernard: *See—*
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Clubbs, Neville H.; Forster, Hans-Joachim; Kiefer, Ulrich; and Bleh, Jurgen, to Giulini Chemie GmbH. Method of producing molds that can be washed away with water and use of such molds. 5,143,665, Cl 264-221.000.

Cluthe, Charles E.: *See—*
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Cobb, Kelly A.: *See—*
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Cochran, William P. Medical chilling apparatus. 5,143,064, Cl 128-402.000

Code Blue Medical Corporation: *See—*
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Coffinberry, George A., to General Electric Company. Gas turbine engine powered aircraft environmental control system and boundary layer bleed. 5,143,329, Cl. 244-209.000.

Cogent Limited: *See—*
Allyson, Julian D.; Spackman, Ramon; and James, Gwilyn D., 5,144,140, Cl. 250-358.100.

Cohen, Allen L. Diffractive multifocal optical device. 5,144,483, Cl. 359-565.000.

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Cohen, Jacques; Nourry, Daniel; and Thierry, Jean-Pierre, to Telemecanique. Power distributor device for electric installations 5,144,530, Cl. 361-378.000.

Coherent, Inc.: *See—*
Thonn, Tracy F., 5,144,632, Cl. 372-33.000.

Cokeh, Emmet. Pipe coupling with copper sleeve engaging copper lined pipe. 5,143,407, Cl. 285-55.000

Colatsky, Thomas J.: *See—*
Buzby, George C., Jr.; and Colatsky, Thomas J., 5,144,072, Cl. 564-82.000.

Cole, Charles D., III. Shoe employing negative toe rocker for foot muscle intensive sports. 5,142,797, Cl. 36-113.000.

Cole, Leslie A.: *See—*
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Coleman, Philip D.: *See—*
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Collins, David M., to Jones, Donna L., a part interest. Retractable hose system. 5,143,392, Cl. 280-420.000.
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Moore, Dan T., III; Collins, Edward A.; and Wheeler, Maurice E., 5,143,755, Cl. 427-373.000.
Collins, John M.: *See—*
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Columbia University in the City of New York, The Trustees of: *See—*
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Comar, Inc.: *See—*
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Jimenez, Antonio; Combepine, Yves; and Deeplante, Patrice, 5,143,005, Cl. 112-225.000.
Comer, David G.: *See—*
Stephenson, William K.; Mercer, Bradley D.; and Comer, David G., 5,143,594, Cl. 208-48.0AA.
Commissariat A L'Energie Atomique: *See—*
Bonis, Marc, 5,144,592, Cl. 367-87.000.
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Scaysbrook, Frank; and Ly, Nhan C., 5,142,918, Cl. 73-854.000
Compagnie Europeenne De Composants Electroniques LCC: *See—*
Caffin, Jean-Pierre, 5,143,651, Cl. 25[illegible]-518.000.
Pageaud, Michel; and Dautriche, Michel, 5,144,523, Cl. 361-308.000.
Compaq Computer Corporation: *See—*
Cepulis, Darren J., 5,144,551, Cl. 39[illegible]-425.000.
Compugrade, Inc: *See—*
Merton, Henry A.; Diefenthal, James R.; Radigan, William D.; Sengupta, Soumitra; and Lenaz, Emmett J., Jr., 5,144,495, Cl. 359-798.000.
Concorde Tool Corp.: *See—*
MacMillan, Donald M., 5,143,264, Cl. 222-567.000.
Concurrent Logic, Inc.: *See—*
Camarota, Rafael C.; Furtek, Frederick C.; Ho, Walford W.; and Browder, Edward H., 5,144,166, Cl. 307-465.100.
Congdon, Steven P.; and Fawcett, Russell M., to General Electric Company. Fuel-assembly inversion for dual-phase nuclear reactors. 5,143,690, Cl. 376-267.000.
Connor, David T.: *See—*
Belliotti, Thomas R.; Boschelli, Diane H.; Connor, David T.; and Kostlan, Catherine R., 5,143,929, Cl. 514-364.000.
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Cetenko, Wiaczeslaw A.; Connor, David T.; Sircar, Jagadish C.; Sorenson, Roderick J.; and Unangst, Paul C., 5,143,928, Cl. 514-369.000.
Consolidated Products and Services, Inc.: *See—*
Cheney, Henry H., III, 5,143,048, Cl. 126-263.000.
Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno: *See—*
Raspaghesi, Mario; and Medulla, Candido, 5,144,143, Cl. 250-426.000.
Constant Velocity Transmission Lines, Inc.: *See—*
Marsh, Richard N., 5,144,522, Cl. 361-306.000.
Contek Corporation: *See—*
Crane, R. Stephen, 5,142,793, Cl. 33-763.000.
Contour Roll Company: *See—*
Gutowski, Timothy A., 5,142,894, Cl. 72-129.000.
Conzelmann, Gerhard; Kohl, Walter; and Nagel, Karl, to Robert Bosch GmbH. Voltage-regulator for generator. 5,144,219, Cl. 322-25.000.
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DeLong, Ronald B.; Worthington, Michael W.; and Cook, Floyd L., Jr., 5,142,997, Cl. 109-49.500.
Cook, James A.: *See—*
Hall, Henry B.; and Cook, James A., 5,144,113, Cl. 219-549.000
Cook, Norman J.: *See—*
Wood, Richard R.; Cook, Norman J.; and Thorpe, John R., 5,143,340, Cl. 248-354.200.
Cooper, Christophe K., to Exxon Research and Engineering Company Reduced time remote access method and system. 5,144,651, Cl. 379-98.000
Coors Brewing Company: *See—*
Gold, Phillip W.; and Moen, Bruce A., 5,142,769, Cl. 29-621.100.
Copenhaver, Gary; Bakker, Johan; and Viala, John, to Unisys Corporation (Formerly Burroughs Corporation). Integrated imaging assembly. 5,144,457, Cl. 358-474.000.
Core Industries: *See—*
Rapp, Peter J., 5,144,226, Cl. 324-132.000.
Cornelius, Gerd; and Kroll, Stefan, to Deutsche Airbus GmbH. Aircraft cabin stairs. 5,143,324, Cl. 244-129.600.
Corning Incorporated: *See—*
Domash, Lawrence H., 5,144,690, Cl. 385-12.000.
Corsmeier, Donald M.; and Browning, Stephen G., to General Electric Company. Cooled leaf seal. 5,143,292, Cl. 239-127.300.
Corsmeier, Robert J.; Sponseller, Robert L.; Reigel, James R.; and Maclin, Harvey M., to General Electric Company. Turbine rotor disk with integral blade cooling air slots and pumping vanes. 5,143,512, Cl. 415-115.000.
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Braks, Jorma G.; and Corso, Maxime A., 5,142,730, Cl. 15-327.500.
Cosgrove, Raymond F.; Male, Terence P.; and Smalley, Graeme M., to Shandon Scientific Limited. Material and procedure for testing and control of immunostaining techniques. 5,143,714, Cl. 424-3.000.
Costantino, Roger A., Jr; and Gliebe, Ronald J., to United States of America, Energy. Rectifier cabinet static breaker. 5,144,152, Cl. 307-11.000.
Couget, Francis: *See—*
Cauvy, Daniel; Couget, Francis; Slota, Raymond; and Villemin, Bernard, 5,143,147, Cl. 165-1.000.
Couratier, Jean P.: *See—*
Miller, Gerald R.; and Couratier, Jean P., 5,143,400, Cl. 280-661.000.
Courbier, Michel F.: *See—*
Laloi, Maurice R.; Courbier, Michel F.; and Vatant, Robert R., 5,143,144, Cl. 164-306.000.
Vatant, Robert A.; Courbier, Michel F.; and Chalencon, Jean-Pierre L., 5,143,145, Cl. 164-306.000.
Courtin, Claude: *See—*
Roche, Pascal; and Courtin, Claude, 5,143,277, Cl. 228-179.000.
Craggs, Jack L., to Siemens Energy & Automation, Inc. Cooling fan for electric motors. 5,144,175, Cl. 310-63.000.
Cramer, Lloyd; and Cramer, Stephen A. Method of forming a flitch and producing novel sheets of veneer. 5,143,792, Cl. 428-528.000.
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Cramer, Lloyd; and Cramer, Stephen A., 5,143,792, Cl. 428-528.000.
Crane, R. Stephen, to Contek Corporation. Digital linear measuring device. 5,142,793, Cl. 33-763.000.
Crapo, Alan D.: *See—*
Hilal, Mohamed A.; Lloyd, Jerry D.; and Crapo, Alan D., 5,144,179, Cl. 310-178.000.
Craven, Christopher R.; and Pollock, Richard A., to Vendo Company, The. Inner door latch. 5,143,430, Cl. 312-291.000.
Crawley, Michael W.; and Gibson, Andrew W., to Eastman Kodak Company. Color photographic material comprising a 2-alkoxy pyrazolo[1,5-a]benzimidazole color coupler. 5,143,821, Cl. 430-387.000.
Cray Research, Inc.: *See—*
August, Melvin C.; Massopust, Daniel; Nebel, Mary; Neumann, Eugene F.; and Pautsch, Gregory W., 5,144,691, Cl. 385-88.000.
Cray Valley SA: *See—*
Behar, Gilles; Oginski, Jean-Claude; and Martinet, Alain, 5,143,964, Cl. 524-400.000.
Cremer, Heinz P.: *See—*
Voss, Hans W.; Cremer, Heinz P.; Cwiertnia, Harald; and Putsch, Peter-Ulrich, 5,143,421, Cl. 297-338.000.
Creusot-Loire Industrie: *See—*
Laloi, Maurice R.; Courbier, Michel F.; and Vatant, Robert R., 5,143,144, Cl. 164-306.000.
Vatant, Robert A.; Courbier, Michel F.; and Chalencon, Jean-Pierre L., 5,143,145, Cl. 164-306.000.
Crisis Communication, Inc.: *See—*
Mason, Stanley I., Jr.; and Draeger, David S., 5,143,551, Cl. 118-31.500.
Crooijmans, Henricus A. A. R.: *See—*
Peters, Petrus J. M.; and Crooijmans, Henricus A. A. R., 5,144,197, Cl. 313-422.000.
Crown Unlimited Machine, Inc.: *See—*
Stroup, Steven L., Jr., 5,143,268, Cl. 225-2.000.
Crum, Daniel R.: *See—*
Utter, Robert E.; and Crum, Daniel R., 5,142,885, Cl. 62-498.000.
Cselt - Centro Studi e Laboratori Telecommunicazioni S.p.A.: *See—*
Grego, Giorgio, 5,144,374, Cl. 356-326.000.
CTB, Inc.: *See—*
Hoover, Don R., 5,143,206, Cl. 198-810.000.
Cucheran, John S.; and Bott, John A., to Bott, John A. Article carrier. 5,143,267, Cl. 224-321.000.
Culp, Gordon W., to Rockwell International Corporation. Piezoelectric motor. 5,144,187, Cl. 310-328.000
Cummins Engine Company, Inc.: *See—*
Woon, Peter V.; Ghuman, Amarjit; Radovanovic, Rodoljub; Walsham, Brian E.; and Francis, Steven C., 5,142,868, Cl. 60-624.000.
Cundiff, Kevin B.: *See—*
Wyatt, W. Burk; Cundiff, Kevin B.; and Little, Kenneth R., Jr., 5,144,112, Cl. 219-386.000
Cunninghasm, Ken: *See—*
Weinberg, Aaron; Cunninghasm, Ken; Urban, Daniel; and Mailaender, Laurence, 5,144,642, Cl. 375-10.000
Curry, John W., II, to Microelectronics and Computer Technology Corporation. Correcting a defective metallization layer on an electronic component by polishing. 5,142,828, Cl. 51-281.00R.

Curtis, Foner P.: *See—*
Nochumson, Samuel; Curtis, Foner P.; Morgan, Jonathan H.; and Kirkpatrick, Francis H., 5,143,646, Cl. 252-315.300.
Curtis, Harold D. Fluid distributor. 5,143,657, Cl. 261-89.000
Curto, Rick A.: *See—*
Johnston, Otis A.; and Curto, Rick A., 5,144,588, Cl. 367-16.000.
Cury, Brian L. Method and apparatus for producing customized video recordings. 5,144,454, Cl. 358-335.000
Cushman, Michael R.: *See—*
Zoeller, Joseph R.; Cushman, Michael R.; Moncier, Regina M.; and Tennant, Brent A., 5,144,067, Cl. 562-479.000.
Zoeller, Joseph R.; Cushman, Michael R.; and Moncier, Regina M., 5,144,070, Cl. 562-887.000.
Cutler, William. Showerhead. 5,143,300, Cl. 239-562.000.
Cwiertnia, Harald: *See—*
Voss, Hans W.; Cremer, Heinz P.; Cwiertnia, Harald; and Putsch, Peter-Ulrich, 5,143,421, Cl. 297-338.000.
Cyber Scientific: *See—*
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Cyrix Corporation: *See—*
Briggs, Willard S.; and Matula, David W., 5,144,576, Cl. 364-754.000.
Maher, Robert D., III, 5,144,570, Cl. 364-715.040.
Cytyc Corporation: *See—*
Lapidus, Stanley N.; Polk, Lewis T., Jr.; Farber, Fredric L.; Barlas, J. Morgan; and Hurley, Anne A., 5,143,627, Cl. 210-767.000.
Czap, Christine A.: *See—*
Keusch, Preston; Murdock, Keith A.; Czap, Christine A.; and Lennon, Linda, 5,143,071, Cl. 128-640.000.
D.E.A. Digital Electronic Automation SpA: *See—*
Raho, Guglielmo; and Zona, Mauro, 5,142,790, Cl. 33-503.000
Dadisman, Steven R. Means and method for defining a layout. 5,142,787, Cl. 33-1.00G.
Daggett, Kenneth E.; and Onaga, Eimei M., to Staubli International Ag. Multiaxis robot controller having workpoint torque control. 5,144,211, Cl. 318-568.110.
Dahlgren, Jan; and Karlsson, Jan, to AB Volvo, a Swedish Body Corporate. Internal combustion engine with delayed charging. 5,143,038, Cl. 123-403.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Matsumoto, Shusaku; Hatakawa, Yoshio; and Nakajima, Akihiko, 5,144,022, Cl. 536-119.000.
Saheki, Takasi; Matsuda, Hideaki; Yokota, Kinya; and Mayuzumi, Tominobu, 5,143,952, Cl. 524-5.000.
Dai-Ichi Seiko Co., Ltd.: *See—*
Katoh, Hideaki; Noguchi, Nobuhisa; Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Kitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, 5,144,539, Cl. 362-256.000.
Dai, Pei-Shing E.; and Sherwood, David E., Jr., to Texaco Inc. Zeolite treating process. 5,143,878, Cl. 502-66.000.
Dai, Shenghong A.: *See—*
Bodnar, Thomas W.; Cole, Leslie A.; and Dai, Shenghong A., 5,143,945, Cl. 521-130.000.
Daicel Chemical Industries, Ltd.: *See—*
Endo, Toshio; Murai, Takaaki; and Fujii, Tatsumi, 5,143,997, Cl. 528-60.000.
Daido Metal Company Ltd.: *See—*
Kato, Tohru; Tanaka, Tadashi; Sakamoto, Masaaki; and Yamamoto, Koichi, 5,143,565, Cl. 148-434.000.
Daigle, Guy A.: *See—*
Perry, Carl A.; Daigle, Guy A.; Rountree, Steven; Talmadge, George; Grunbeck, John; and Wassell, Mark, 5,144,126, Cl. 250-254.000.
Daiguuji, Tsutomu: *See—*
Anzai, Hisao; Yamamoto, Nobuyuki; Kodama, Youichi; Imai, Yoshitaka; and Daiguuji, Tsutomu, 5,142,796, Cl. 34-62.000
Daikin Industries, Ltd.: *See—*
Adachi, Yasunori, 5,143,514, Cl. 415-150.000.
Amimoto, Yoshio; Hirata, Yuko; Hirai, Masaru; and Ueda, Akihiko, 5,143,991, Cl. 526-245.000.
Shimizu, Tetsuo; and Hosokawa, Kazutaka, 5,143,783, Cl. 428-327.000.
Daimler-Benz AG: *See—*
Bergmann, Horst; Fischer, Gunter; and Buschel, Wolfgang, 5,142,867, Cl. 60-612.000.
Dainichiseika Color & Chemicals Mfg. Co. Ltd.: *See—*
Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu; and Horishi, Nanao, 5,143,548, Cl. 106-459.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Hayashi, Takahisa, 5,144,475, Cl. 359-355.000.
Kitakado, Ryuji, 5,144,132, Cl. 250-208.100.
Nakatsuka, Kimihiro; and Tagaya, Masafumi, 5,144,419, Cl. 358-75.000.
Dainnippon Screen Mfg. Co., Ltd.: *See—*
Kitakado, Ryuji; Yano, Hironobu; Kakuma, Hiroaki; Hoki, Tetsuo; and Kanai, Takao, 5,144,681, Cl. 382-8.000
Dairen Chemical Corporation: *See—*
Chen, Shien-Chang; Cheng, Wan-Jy; Lin, Fu-Shen; and Huang, Fu-Juh, 5,144,062, Cl. 560-239.000.
Dallas Semiconductor Corporation: *See—*
Faraci, Anthony B., 5,144,586, Cl. 365-226.000.
Hui, Titkwan, 5,144,173, Cl. 307-603.000.
Dammann, Laurence G.: *See—*
Chung, Daniel A.; and Dammann, Laurence G., 5,143,996, Cl. 528-60.000.
Daneshvar, Yousef. Bearer medical information booklet. 5,143,405, Cl. 281-31.000
Danfoss A/S: *See—*
Hansen, Henning B.; Maroti, Stefan P.; Frederiksen, Bjarne; and Lykkegaard, Knud, 5,143,286, Cl. 236-42.000.
Daniels, Charles A.: *See—*
Greenlee, William S.; Kinson, Philip L.; Kline, Sally A.; Rajagopalan, Murali; and Daniels, Charles A., 5,143,975, Cl. 525-205.000.
Daniels, Keith E., to GTE Valenite Corporation. Ball valve lockout mechanism. 5,143,114, Cl. 137-385.000
Danielsen, John R.: *See—*
Smolinski, John J.; Draghi, Peter J.; and Danielsen, John R., 5,142,778, Cl. 29-889.100.
Danley, William J.; Kresch, Jeffrey M.; and Kalley, Eugene F., to Square D Company. Scanning radiation sensor with automatic focus control for optimal focus and method. 5,144,122, Cl. 250-201.200
Danmoto, Shojiro: *See—*
Kumamura, Masaaki; Inaba, Ryohei; Danmoto, Shojiro; and Arai, Mitsuo, 5,143,736, Cl. 425-567.000.
Das, Santosh K.; Chang, Chin-Fong; and Raybould, Derek, to Allied-Signal Inc. High strength, high stiffness rapidly solidified magnesium base metal alloy composites. 5,143,795, Cl. 428-614.000.
Data Pure Corporation: *See—*
Gadsby, Larry R.; Pittman, Larry J.; and Chermak, Philip J., 5,144,513, Cl. 360-137.000.
Date, Hiroshi; and Hayashi, Terumine, to Hitachi, Ltd. Method and apparatus for optimizing element placement and method and apparatus for deciding the optimal element placement. 5,144,563, Cl. 364-491.000.
Datta, Rathin. Process for the production of succinic acid by anaerobic fermentation. 5,143,833, Cl. 435-145.000
Datta, Rathin: *See—*
Glassner, David A.; and Datta, Rathin, 5,143,834, Cl. 435-145.000.
Daubenbuchel, Werner; Eiselen, Otto; Friedrichs, Karsten; Kiefer, Erich; and Klusener, Peter, to Krupp Kautex Maschinenbak GmbH. Extrusion blow molding of multilayer hollow bodies with layer disturbances limited to flash. 5,143,681, Cl. 264-515.000.
Dautriche, Michel: *See—*
Pageaud, Michel; and Dautriche, Michel, 5,144,523, Cl. 361-308.000.
Davin, James M., to United States of America, Energy. Master dye laser oscillator including a specific grating assembly for use therein 5,144,638, Cl. 372-107.000.
Davis, Charles E.: *See—*
Schlicher, Rex L.; Rinaldi, Steven M.; Hall, David J.; Ranon, Peter M.; and Davis, Charles E., 5,142,861, Cl. 60-203.100.
Davis, Henry J. Bulk separator for industrial vacuum machine 5,142,732, Cl. 15-352.000.
Davis, Johnny B.: *See—*
Strange, Mark A.; Ledwith, Walter A., Jr.; Davis, Johnny B.; Finger, Stephen N.; and Bracci, Gerald, 5,142,860, Cl. 60-39.281.
Davis, Richard C., to Code Blue Medical Corporation. Burn foam and delivery system. 5,143,717, Cl. 424-45.000.
Davis, Shelby W.: *See—*
Marras, William S.; Davis, Shelby W.; Miller, Robert J.; and Mirka, Gary A., 5,143,088, Cl. 128-781.000.
Davis, William E. Dismountable ladder. 5,143,174, Cl. 182-151.000
Dawson, William J.: *See—*
Kluge, Wolfgang; Perkins, Roger; Rossinelli, Marco; and Dawson, William J., 5,143,711, Cl. 423-593.000
De La Rue Giori, S.A.: *See—*
Sauer, Hartmut K., 5,143,197, Cl. 198-409.000
Dean, Richard T.; Boutin, Raymond H.; and Weber, Robert W., to Centocor. Cleavable bifunctional coupling agents. 5,144,043, Cl. 548-548.000.
DeBerry, Blake T.: *See—*
Watkins, Bruce J.; and DeBerry, Blake T., 5,143,158, Cl. 166-344.000
De Buzzaccarini, Ferdinando, to Massachusetts Institute of Technology. Slab shaped building components and method of forming same. 5,143,670, Cl. 264-113.000.
Deckers, Andreas: *See—*
Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, 5,143,885, Cl. 502-202.000.
Dedmon, George D. Tufting machine having an individual needle control system. 5,143,003, Cl. 112-80.430.
De Doncker, Rik W. A. A., to General Electric Company. High speed flux feedback for tuning a universal field oriented controller capable of operating in direct and indirect field orientation modes. 5,144,216, Cl. 318-807.000.
Deeplante, Patrice: *See—*
Jimenez, Antonio; Combepine, Yves; and Deeplante, Patrice, 5,143,005, Cl. 112-225.000.
Deere & Company: *See—*
Patterson, Jon M.; Hutchison, Wayne R.; and Teal, Richard D., 5,142,850, Cl. 56-17.100.
Deguchi, Hiroyuki: *See—*
Tanaka, Hideyuki; Ichihashi, Takao; and Deguchi, Hiroyuki, 5,144,387, Cl. 355-326.000.
Degussa AG: *See—*
Siegfried, Wolff; Gorl, Udo; and Meier, Karl, 5,143,962, Cl. 524-346.000
DeKeyser, Kathleen S.: *See—*
Steinhardt, Michael D.; DeKeyser, Kathleen S.; and Tempas, Jeffrey F., 5,143,121, Cl. 137-624.130

Delalande S.A.: *See*—
Ward, Mona; Ph. Settembre, Pierre-Andre ; Renaud, Alain; and Langlois, Michel, 5,144,029, Cl 540-610.000.
Delano, Robert G.: *See*—
Strothers, Susan D.; Delano, Robert G.; and Steed, Garold L., 5,143,590, Cl. 204-298.120.
Delatorre, Leroy C., to Panex Corporation. Non-quartz resonating transducer. 5,142,913, Cl. 73-704.000.
Delco Electronics Corporation: *See*—
Christenson, Rebecca A.; and Good, Brian K., 5,144,233, Cl 324-207.250.
Frisch, Anthony E.; and Stringfellow, David W., 5,144,159, Cl. 307-272.300.
Pogue, Russell W., Jr.; and Rivest, Ronald L., 5,144,667, Cl. 380-45.000.
Delhaes, Johannes C. Transport roller for paper sheets. 5,142,758, Cl. 29-117.000.
DeLong, Ronald B.; Worthington, Michael W.; and Cook, Floyd L., Jr., to Westinghouse Electric Corp. Projectile resisting space dividing system. 5,142,997, Cl. 109-49.500.
Delphi Technology, Inc.: *See*—
Keable, John B.; and Bostic, Steve, 5,144,474, Cl. 354-319.000.
Delphia, John B. Water trap for a snorkel. 5,143,059, Cl. 128-201.110.
Delta Power Hydraulic Co.: *See*—
Geyler, Arthur H., Jr., 5,143,115, Cl. 137-493.000.
De Luca, Giovanna: *See*—
Polita, Vincenzo; De Luca, Giovanna; Di Stazio, Giovanni; and Materazzi, Mario, 5,143,903, Cl 514-18.000.
DeLuca, Michael J.; and Nguyen, Tuan K., to Motorola, Inc. Adaptive battery saving controller with signal quality detecting means. 5,144,296, Cl. 340-825.440.
De Michele, Gennaro; and Graziadio, Mario, to Ente Nazionale Per L'Energia Electrica. Atomizer for viscous liquid fuels. 5,143,297, Cl. 239-427.000.
Demuth, Robert; Fritzsche, Peter; Nusli, Eduard; and Staheli, Paul, to Maschinenfabrik Rieter AG. Cardin elements with variably inclined teeth for working textile fibers and method. 5,142,741, Cl. 19-113.000.
Demuth, Robert: *See*—
Faas, Jurg; Staheli, Christoph; Demuth, Robert; and Moser, Robert, 5,143,485, Cl. 406-14.000.
Denay Creek Gold Mining Company. *See*—
Reid, William W.; and Young, Joseph L., 5,143,543, Cl. 75-744.000.
Denison, Edward V.: *See*—
Aboaf, Joseph A.; Denison, Edward V.; Kahwaty, Vincent N.; and Steving, Gerald, 5,142,768, Cl. 29-603.000.
Denny, David S.: *See*—
Glynn, William; Rexroad, John; and Denny, David S., 5,143,171, Cl. 182-3.000.
Depaepe, Jean-Francois, to S.A. Henri Depaepe. Hand test set with strain relief wire channel. 5,144,657 Cl. 379-433.000.
DePasquale, Louis J. Overpressure device for mechanical treatment of the human body. 5,143,057, Cl. 128-61.000.
De Peyer, Jacques: *See*—
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and De Peyer, Jacques, 5,143,924, Cl. 514-337.000.
Deplante, Patrice: *See*—
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Dequin, Roland: *See*—
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Der, Bruce; Beckstrom, Bruce W.; and Guthrie, Elmer F., to A. H. Lundberg Associates, Inc. Two stage white liquor oxidation apparatus. 5,143,702, Cl. 422-185.000.
Derdall, Gary; and Phinney, Robin L. to Kaolin Industries, Ltd. Process for refining kaolin. 5,143,599, Cl. 209-166.000.
DeRosa, Nicholas A.: *See*—
Hillstrom, David U.; and DeRosa, Nicholas A., 5,142,804, Cl 40-603.000.
Derzay, Gregory J.: *See*—
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Design House, Inc.: *See*—
Kearns, David S., 5,142,836, Cl. 52-314.000.
Dessaint, Andre: *See*—
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Dettinger, Dietrich, and Klingler, Horst, to MAN Roland Druckmaschinen AG. Printing speed dependent throw on/off control system for a sheet-fed offset press. 5,142,981, Cl. 101-248.000.
Deul, Maurice. Mine cribbing device and method. 5,143,484, Cl. 405-288.000.
Deutschbein, Ulrich: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,142,843, Cl. 53-493.000.
Deutsche Airbus GmbH. *See*—
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Wilken, Enno; and Eickhorst, Helmut, 5,143,360, Cl. 269-21.000.
Deutschenbaur, Paul: *See*—
Bogner, Werner; Spangenberg, Rolf; and Deutschenbaur, Paul, 5,143,489, Cl. 408-1.00R.
Devic, Michel, to Atochem. Method of peroxide bleaching of pulp pretreated with a sequestering agent then with a sulphite and reducing agent. 5,143,581, Cl. 162-72.000.
Devine, William D., to Eastman Kodak Company. Coating by means of a coating hopper with coating slot where the coating composition has a low slot Reynolds number. 5,143,758, Cl. 427-420.000.
De Virgilio, John J.: *See*—
Narula, Anubhav P. S.; De Virgilio, John J.; and Schreiber, William L., 5,143,899, Cl. 512-6.000.
DeWitt, Jimmie W. Partially redundant air conditioning system. 5,142,883, Cl. 62-298.000.
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Endom, Edward F. Apparatus for conditioning the floor of a poultry rearing area. 5,143,309, Cl. 241-101.700

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Young, John C. O'C.; and Murray, Christopher B., 5,143,635, Cl. 252-34.000.

Engdahl, Paul D.; McGee, Roland S.; and Engdahl, Roger P., to Engdahl, Paul D. Intergrating, indicating, and controlling seismometer. 5,144,598, Cl. 367-181.000.

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Engdahl, Paul D.; McGee, Roland S.; and Engdahl, Roger P., 5,144,598, Cl. 367-181.000

Engler, Edward M.; Gardner, Timothy S.; McReynolds, David P.; and Ward, Stephen M., to International Business Machines Corporation Optical disk drive cleaner cartridge. 5,144,611, Cl. 369-71.000.

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Lockhart, Thomas P.; and Burrafato, Giovanni, 5,143,958, Cl. 524-219.000.

Enoki, Masatoshi: *See*—
Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, 5,143,295, Cl. 239-403.000

Ensslin, Klaus: *See*—
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Ente Nazionale Per L'Energia Electrica: *See*—
De Michele, Gennaro; and Graziadio, Mario, 5,143,297, Cl. 239-427.000.

Enuma Chain Manufacturing Co., Ltd.: *See*—
Fujimoto, Kazutaka, 5,143,205, Cl. 198-779.000.

Eriksson, Sven, to SKF Plasma Technologies. Process and a device for transferring leachable substance in waste material into gas or leach stable compounds. 5,143,001, Cl. 110-345.000.

ErkenBrack, Kenneth B. Apparatus for storing matter out of contact with gas. 5,142,970, Cl. 99-472.000.

Erlanger, Bernard F.; and Cleveland, William L., to Columbia University in the City of New York, The Trustees of. Method of producing monoclonal auto-anti-idiotypic antibodies. 5,144,010, Cl. 530-387.200

Erni, Daniel; and Staheli, Paul, to Maschinenfabrik Rieter AG. Main cylinder casing segment. 5,142,742, Cl. 19-113.000.

Escorp, Inc.: *See*—
Harbers, Henry C., Jr., 5,144,116, Cl. 235-444.000.

Eshita, Takashi; and Inoue, Toshikazu, to Fujitsu Limited. Semiconductor device having a group III-V epitaxial semiconductor layer on a substrate. 5,144,379, Cl. 357-22.000.

Esserman, James N.; and Heller, Jerrold A., to General Instrument Corporation. Apparatus and method for upgrading terminals to maintain a secure communication network. 5,144,664, Cl. 380-20.000.

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Fourezon, Andre , 5,143,771, Cl. 428-91.000.

Estee Lauder, Inc.: *See*—
Calvo, Luis C.; and Peters, David W., 5,143,723, Cl. 424-63.000.

Etemad, Mehran; Tavassoli, Farshad; and Marceau, William E., to Axxon Corporation. Incinerator with fluid-cooled hearth. 5,142,999, Cl. 110-235.000.

Ethicon, Inc.: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., 5,143,082, Cl. 128-749.000.

Ethyl Corporation: *See*—
Allen, Robert H.; Anderson, Keith G.; Diefenbach, Steven P.; Lin, Ronny W.; Nemec, Larry H.; Overstreet, Andrew D.; and Robinson, Gene C., 5,144,053, Cl. 556-190.000
Brown, William R., 5,143,942, Cl. 521-110.000.

Etymotic Research, Inc.: *See*—
Killion, Mead C.; Teder, Harry; Johnson, Arthur C.; and Hanke, Steven P., 5,144,675, Cl. 381-68.400.

Euretal PLV: *See*—
Fauvel, Henri, 5,142,925, Cl. 74-54.000

Evans, David M.: *See*—
Glezer, Boris; and Evans, David M., 5,142,859, Cl. 60-39.750.

Evans, Donald E., to Don Evans and Associates, Inc. Hydrostatic cooker infeed. 5,143,199, Cl. 198-418.100

Evans, James G.: *See*—
Chin, Melissa C.; Evans, James G.; and Orlando, Denis P., 5,144,324, Cl. 343-702.000

Evenson, Rickie A.: *See*—
Lemmer, Jerome J.; O'Malley, Gary B.; and Evenson, Rickie A., 5,144,182, Cl. 310-217.000.

Everard, Lloyd D.; and Wridge, Wilbur S., Jr., to Sustena, Inc. Constant pressure load bearing air chamber. 5,142,717, Cl. 5-450.000.

Eveready Battery Company, Inc.: *See*—
Hartley, William L.; and Allen, John E., 5,143,215, Cl. 206-333.000

Exxon Chemical Patents, Inc.: *See*—
Diehl, Charles F.; Tancrede, Jean M.; and Myers, Michael O., 5,143,968, Cl. 524-534.000.

Exxon Research and Engineering Company: *See*—
Cooper, Christophe K., 5,144,651, Cl. 379-98.000
Say, Geoffrey R.; Taylor, James H.; Long, David C.; and Fiato, Rocco A., 5,143,647, Cl. 252-373.000.

Eyer, Martin, to Lonza Ltd. Process for the production of 3-oxocarboxylic acid esters. 5,144,057, Cl. 560-51.000.

Eziri, Katsushi: *See*—
Kanehira, Koichi; Eziri, Katsushi; Shiono, Manzo; Fujita, Yoshiji; and Yamahara, Johji, 5,143,921, Cl. 514-315.000.

Ezzo, Maureen B.; and Tuttle, David J., to United Technologies Corporation. Overlapped test specimen fixture. 5,142,905, Cl. 73-150.00A

F.H. Maloney Company: *See*—
Lee, Stanley M.; Terry, Jimmy C.; and Mrosko, John A., 5,142,784, Cl. 29-895.210.

Faas, Jurg; Staheli, Christoph; Demuth, Robert; and Moser, Robert, to Maschinenfabrik Rieter AG. Transport air control. 5,143,485, Cl. 406-14.000.

Faber, Thomas: *See*—
Rabindran, K. George; Faber, Thomas; Filicicchia, David; Guenther, Kenneth L.; Kalika, Joseph; Kerstein, Melvin T.; Shah, Girish B.; and Wiley, David, 5,143,225, Cl. 209-584.000.

Fabriques de Tabac Reunies, S.A.: *See*—
Mussini, Gian P.; and Higgins, Charles T., 5,142,917, Cl. 73-821.000

Faccia, Tiziano. Apparatus for screening animal fodder products unloaded from mixing trucks. 5,143,221, Cl. 209-215.000.

Faccia, Tiziano. Fibrous product mixing truck. 5,143,449, Cl. 366-349.000

Fadeguard, Inc.: *See*—
Thompson, Peter B., 5,143,729, Cl. 424-402.000

Faessel, Andre ; Pochon, Claude; Mazzocco, Jean-Pierre; and Valetti, Jean-Claude, to Unimetal. Method and device for forming coils of metal wire. 5,143,315, Cl. 242-83.000

Fahner, Theodorus A.: *See*—
Wittekoek, Stefan; Van Den Brink, Marinus A.; and Fahner, Theodorus A., 5,144,363, Cl. 355-53.000

Faiazza, Raffaele: *See*—
Gertsch, Peter; Imhof, Robert; Miescher, Andreas; and Faiazza, Raffaele, 5,142,977, Cl. 101-148.000.

Fan, Roxy N.: *See*—
Lawton, John A.; and Fan, Roxy N., 5,143,817, Cl. 430-269.000

Fanuc Ltd.: *See*—
Sasaki, Takao; Murakami, Kunihiko; and Sano, Masafumi, 5,144,550, Cl. 364-192.000

Fanuc Ltd: *See*—
Sasaki, Takao; Murakami, Kunihiko; and Hosokawa, Masahiko, 5,144,213, Cl. 318-569.000

Fappas, John N., Jr.; and Harriman, Ronald W., to Mobile Manufacturing Company. Sharpener for circular saws. 5,142,946, Cl. 76-37.000

Far Great Plastics Industrial Co., Ltd.: *See*—
Chen, Ting-Hsing, 5,143,388, Cl. 280-11.280.

Faraci, Anthony B., to Dallas Semiconductor Corporation. Apparatus and method for connecting electronic modules containing integrated circuits and backup batteries. 5,144,586, Cl. 365-226.000.

Farber, Fredric L.: *See*—
Lapidus, Stanley N.; Polk, Lewis T., Jr.; Farber, Fredric L.; Barlas, J. Morgan; and Hurley, Anne A., 5,143,627, Cl. 210-767.000

Farrel Corporation: *See*—
Sardinskas, Stuart A.; Mormino, Mathew, Jr.; and Kearney, Michael R., 5,143,734, Cl. 425-143.000.

Farrell, George J.: *See*—
DiSanzo, Frederick L.; and Farrell, George J., 5,144,348, Cl. 354-108.000

Farrell, James F., to Litton Systems Canada Limited. Night vision backlighting system for liquid crystal displays. 5,143,433, Cl. 362-29.000

Farrenkopf, Jeffrey J., to Kollmorgen Corporation. Flat motor of reduced length. 5,144,183, Cl. 310-268.000.

Fasching, George E.; Smith, Nelson S., Jr.; and Utt, Carroll E., to United States of America, Energy. Three-axis particle impact probe. 5,144,251, Cl. 324-661.000

Fasola, Giancarlo; and Navarra, Pietro, to Industrie Magneti Marelli SpA. Starter device for internal combustion engines and an electromagnetically-operated starter motor provided with the device. 5,142,924, Cl. 74-7.00A

Faulkner, David W.; and Russ, Dianne M., to British Telecommunications public limited company. Method of communicating digital signals and receiver for use with such method. 5,144,669, Cl. 380-49.000

Fauvel, Henri, to Euretal PLV. Device for animating movable parts 5,142,925, Cl. 74-54.000

Fawcett, Russell M.: *See*—
Congdon, Steven P.; and Fawcett, Russell M., 5,143,690, Cl. 376-267.000

Federici, Brian A.: *See*—
Sivasubramanian, Natarajan; and Federici, Brian A., 5,143,905, Cl. 514-21.000

Feitel, Frederick E. Apparatus and method for treating contaminated gas emissions. 5,142,998, Cl. 110-215.000

Feller, Richard L., to Monroe Truck Equipment, Inc. Level lift framework for canister type plow push frame. 5,142,801, Cl. 37-235.000

Fellner, Donald G. Method of removing adipose tissue from the body 5,143,063, Cl. 128-399.000

Felske, Armin; Stoffregen, Bernd; Beeck, Manfred-Andreas; Sauer, Gerd; Hassiepen, Michael; and Rebenstorff, Detlev, to Saint-Gobain Vitrage. Windshield reflector for imaging signals into view of driver. 5,144,459, Cl. 359-13.000

Fena, Ernest J.: *See*—
Molnar, Julius J.; Fena, Ernest J.; Folden, David W.; Schneider, Douglas A.; Becker, Richard A.; Fimmen, Charles L.; Selestak, David M.; and Shlapak, Robert, 5,143,680, Cl. 264-511.000.

Fenk, Josef, to Siemens Aktiengesellschaft. Method for amplitude control of an oscillator output signal, and circuit configuration for performing the method. 5,144,263, Cl. 331-109.000

Ferco International Usine de Ferrures de Batiment: *See*—
Kautt, Jean-Jacques, 5,143,271, Cl. 228-6.100.

Ferrari, Franco; and Migli, Carlo, to Ferrari, Franco. Base with adjustable elements for a hinge wing. 5,142,737, Cl. 16-235.000

Ferris, Frederick G.; and Stehmeier, Lester G., to Husky Oil Operations Ltd. Bacteriogenic mineral plugging. 5,143,155, Cl. 166-246.000

Fertel, Lawrence B.: *See*—
Krishnamurti, Ramesh; Fertel, Lawrence B.; Lin, Henry C.; and Dosi, Mahendra K., 5,144,076, Cl. 564-417.000

Fiat Auto S.p.A.: *See*—
Buti, Luigi B.; and Fubini, Enrica, 5,142,928, Cl. 74-335.000

Fiatgeotech-Tecnologie per la Terra S.p.A.: *See*—
Amedei, Giuseppe; and Rondelli, Angelo, 5,142,927, Cl. 74-335.000.

Fiato, Rocco A.: *See—*
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Fiber Sensys, Inc.: *See—*
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Fiberweb North America, Inc.: *See—*
Newkirk, David D.; and Ostrowski, Henry S., 5,143,779, Cl. 428-218.000.
Fibre Cement Technology Limited: *See—*
Busck, Christopher J., 5,143,674, Cl. 264-145.000.
Fichtel & Sachs AG: *See—*
Meier-Burkamp, Gerhard, 5,143,189, Cl. 192-64.000.
Westendorf, Holger; Krause, Andreas; and Kittel, Friedrich, 5,143,190, Cl. 192-70.270.
Field, Jasper H.; and Lesokhin, Vladimir B., to International Paper Company. Treatment of black liquor with a screw extruder evaporator. 5,143,579, Cl. 162-30.100.
Filicicchia, David: *See—*
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Filtercorp, Inc.: *See—*
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Fimmen, Charles L.: *See—*
Molnar, Julius J.; Fena, Ernest J.; Folden, David W.; Schneider, Douglas A.; Becker, Richard A.; Fimmen, Charles L.; Selestak, David M.; and Shlapak, Robert, 5,143,680, Cl. 264-511.000.
Finchem, Eric P.; Vetanen, William A.; Odekirk, Bruce; and Beers, Irene G., to TriQuint Semiconductor, Inc. Method of fabricating an electronic device with reduced susceptibility to backgating effects. 5,143,857, Cl. 437-22.000.
Finger, Stephen N.: *See—*
Strange, Mark A.; Ledwith, Walter A., Jr.; Davis, Johnny B.; Finger, Stephen N.; and Bracc , Gerald, 5,142,860, Cl. 60-39.281.
Finkenzeller, Ulrich: *See—*
Krause, Joachim; Geelhaar, Thomas; Hittich, Reinhard; Finkenzeller, Ulrich; Rieger, Bernhard; and Weber, Georg, 5,143,642, Cl. 252-299.610.
Fischer, Eberhard: *See—*
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Fischer, Gunter: *See—*
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Fischer, Richard L.: *See—*
Caveney, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wiencek, Donald C., 5,143,868, Cl. 439-535.000.
Fischer, Rolf: *See—*
Hoelderich, Wolfgang; Naeumann, Fritz; and Fischer, Rolf, 5,144,061, Cl. 560-212.000.
Fischerwerke Artur Fischer GmbH & Co. KG.: *See—*
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Fitzgerald, Karen L.: *See—*
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Blaich, Wilfried; Flaig, Oskar; Ganter, Wolfgang; Kaiser, Hans; Kussmaul, Ewald; Maurer, Roland; and Riis, Peter, 5,144,599, Cl. 368-10.000.
Flaugher, Jeffrey R.: *See—*
Herrington, Richard A.; and Flaugher, Jeffrey R., 5,143,535, Cl. 65-106.000.
Fletcher, John H. Apparatus having a pivotable arm for crushing cans. 5,142,974, Cl. 100-137.000.
Flodin, Per; and Zadorecki, Pawel, to Polyrand AB and Polycell Kompositer. Method for treatment of cellulose fibres and production of composite materials of the treated cellulose fibres in combination with resins. 5,143,791, Cl. 428-48 .000.
Flory, Wilfried: *See—*
Andres, Walter; Flory, Wilfried; and Mennicke, Stefan, 5,143,803, Cl. 429-120.000.
Flowers, Richard G., Jr. Note pad. 5,143,404, Cl. 281-21.100.
Flowers, Vivian D. Flexible abdominal flattener. 5,143,092, Cl. 128-875.000.
Floyd, Kenneth R. Hand-held elongated stock material cutter. 5,142,825, Cl. 51-5.00C.
Fluidmaster, Inc.: *See—*
Hennessy, Arnold, 5,142,712, Cl. 4-431.000.
FMC Corporation: *See—*
Nochumson, Samuel; Curtis, Foner P.; Morgan, Jonathan H.; and Kirkpatrick, Francis H., 5,143,646, Cl. 252-315.300.
Focke & Co.: *See—*
Focke, Heinz, 5,143,509, Cl. 414-796.000.
Focke, Heinz, to Focke & Co. Process and apparatus for removing articles from an underlayer with high frictional resistance. 5,143,509, Cl. 414-796.000.
Fodor, Stephen P. A.: *See—*
Pirrung, Michael C.; Read, J. Leighton; Fodor, Stephen P. A.; and Stryer, Lubert, 5,143,854, Cl. 436-518.000.
Fohl, Artur, to TRW Repa GmbH. Safety mechanism for a restraint system in vehicles. 5,143,403, Cl. 280-806.000.
Folden, David W.: *See—*
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Follmer, Godofredo: *See—*
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Fong, Dodd W.; Kinsella, Mary A.; Kneller, James F.; and Sparapany, John W., to Nalco Chemical Company. Phosphinic acid-containing polymers and their use in preventing scale and corrosion. 5,143,622, Cl. 210-700.000.
Foord, Peter M., to Electricity Trust of South Australia, The. Bi-directional multi-frequency ripple control system. 5,144,280, Cl. 340-310.00A.
Forbus, Thomas R.; and Pelrine, Bruce P., to Mobil Oil Corporation Alkylphenol lubricants from alpha-olefin dimer. 5,144,082, Cl 565-785.000.
Ford New Holland, Inc.: *See—*
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Young, Steven C.; Nielsen, Bradley A.; and Miller, Matthew T., 5,143,159, Cl. 172-8.000
Fore, John C. Deer feeder. 5,143,022, Cl. 119-51.030.
Forker, Donald L.: *See—*
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Forma Scientific, Inc.: *See—*
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Forster, Alfred; and Schwarz, Robert, to Siemens Aktiengesellschaft. Integrated automatic control for ultrasonic proximity switches. 5,144,593, Cl. 367-95.000.
Forster, Cornelia: *See—*
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Fouquet, Robert J M. Flooring panels for flat platform trailers 5,143,418, Cl. 296-182.000.
Fourezon, Andre , to Establissements Les Fils D'Auguste Chomarat et Cie. Textile reinforcement which can be used to make various composites and method for its manufacture. 5,143,771, Cl. 428-91.000.
Fournier, Joel, to Societe d'Applications Generales d'Electricite et de Mechanique Sagem. Dial needle with indexed angular position. 5,143,016, Cl. 116-332.000.
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Foy, Jerome: *See—*
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Francis, Steven C.: *See—*
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Francisco, Frank F.: *See—*
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Frankel, Gail B., to Kel-Gan Inc. Handle support assembly. 5,143,335, Cl. 248-215.000.
Franz Hornstein GmbH & Co. KG: *See—*
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Franzke, Klaus, to Robert Bosch GmbH. Venting device for a fuel tank of an internal combustion engine. 5,143,041, Cl. 123-520.000.
Frederiksen, Bjarne: *See—*
Hansen, Henning B.; Maroti, Stefan P.; Frederiksen, Bjarne; and Lykkegaard, Knud, 5,143,286, Cl. 236-42.000
Freedman, Melvin S., to Avery Dennison Corporation. Composite facestocks and liners. 5,143,570, Cl. 156-230.000
Freelander, Robert; and Marzano, Nicholas, to Richards Homewares, Inc. Hanging garment storage bag. 5,143,214, Cl. 206-287.000.
Freeman, Carl W. Fishing lure and lure enhancement kit. 5,142,811, Cl. 43-42.530.
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Freeman, Richard F.: *See—*
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Frei, Ephraim; and Moshitzky, Mordechai, to Yeda Research and Development Company Limited. Apparatus for detection of tumors in tissue. 5,143,079, Cl. 128-734.000.
Freitag, Dieter: *See—*
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Freitag, L. Wayne, to Bates Manufacturing Company, The. Desk caddy for refillably dispensing self-sticking fanfolded notepaper featuring vertically moveable platform on tracking means. 5,143,250, Cl. 221-59.000.
Frew, Duncan W.; and Shadwick, Robert P., to Unisys Corp. Method of coating a carbon coated magnetic recording medium surface with a fluoropolymer lubricant. 5,143,787, Cl. 428-408.000.
Freymuth, Donald C.; Hon, Jeffrey S.; Lange, Dale K.; Paulus, Gerald J.; Petrykowski, Thomas F.; and Turner, Robert L., to Racine Railroad Products, Inc. Automatic anchor applicator. 5,142,987, Cl 104-17.200.
Friedlander, Mordechai: *See—*
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Frisch, Anthony E.; and Stringfellow, David W., to Delco Electronics Corporation. Power-on-reset (POR) circuit having power supply rise time independence. 5,144,159, Cl. 307-272.300.
Frische, Richard H., to Honeywell Inc. Semiconductor pressure sensor. 5,142,912, Cl. 73-702.000.
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Fritzsche, Peter: *See—*
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Froment, Jean-Paul, to S. A. Des Etablissements Staubli (France) Cable wear pad for dobby shedding lever. 5,143,124, Cl. 139-88.000.
Frosch, Henry A. Electrical signal to thermal image converter. 5,144,149, Cl. 250-493.100
Frost, Robert L.: *See—*
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Fruhauf, Serge; and Breugnot, Fred eric, to SCS-Thomson Microelectronics S.A. Detector of fast variation in the supply of integrated circuits. 5,144,515, Cl. 361-18.000
Frulla, Claudio, to TVA Holding S.p.A. Process and apparatus for the controlled-pressure casting of molten metals. 5,143,141, Cl. 164-120.000
Frye, Ronald E., Jr., to VLSI Technology, Inc. TAB magazine loader using a pivot point. 5,142,844, Cl. 53-475.000.
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Weiss, Franz-Josef; and Fuchs, Hugo, 5,143,872, Cl. 502-25.000.
Fueki, Shunsuke; Yasuda, Hiroshi; Sakamoto, Kiichi; and Takahashi, Yasushi, to Fujitsu Limited. Blanking aperture array, method for producing blanking aperture array, charged particle beam exposure apparatus and charged particle beam exposure method. 5,144,142, Cl 250-396.00R.
Fues, Johann-Friedrich; and Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Resorbable bone wax. 5,143,730, Cl 424-426.000.
Fuji Electric Co., Ltd.: *See—*
Onodera, Katsumi; and Tei, Youichi, 5,144,134, Cl. 250-307.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kamimura, Katsuyoshi; Mine, Atsushi; and Hiwatashi, Yutaka, 5,144,559, Cl. 364-424.050.
Fuji Photo Film Co., Ltd.: *See—*
Katagiri, Shingo; Nishiyama, Shigeru; and Tahara, Hiroyuki, 5,144,511, Cl. 360-132.000.
Mizutani, Kazuyoshi; and Aoai, Toshiaki, 5,143,816, Cl. 430-192.000.
Nishiyama, Tomoyuki, 5,144,509, Cl. 360-105.000
Okino, Yoshiharu, 5,144,631, Cl. 372-25.000.
Saito, Hiroki; and Ishizuka, Seiji, 5,143,759, Cl. 427-420.000
Takahashi, Koichi; Okutsu, Kazuo; Takahashi, Hisashi; Hirose, Masuhiko; Ichikawa, Haruo; Kitagawa, Kuniharu; and Kataoka, Hideaki, 5,144,350, Cl. 354-275.000.
Yamakawa, Katsuyoshi; and Tsukahara, Jiro, 5,143,824, Cl. 430-558.000
Fuji Xerox Co., Ltd.: *See—*
Awata, Yoshinori; and Tsuchiya, Noriaki, 5,144,572, Cl. 364-724.050
Yasukawa, Kaoru; and Ueyanagi, Kiichi, 5,144,616, Cl 369-122.000
Fujii, Tatsumi: *See—*
Endo, Toshio; Murai, Takaaki; and Fujii, Tatsumi, 5,143,997, Cl 528-60.000
Fujii, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Magneto-optical recording medium having double magnetic layers including a light rare earth element and satisfying a specified condition involving the product of the thickness and magnetization saturation of said layers. 5,143,798, Cl. 428-694.000.
Fujikawa, Wataru: *See—*
Tanaka, Akiyoshi; Matsuya, Satoshi, deceased; Fujikawa, Wataru; Uwabo, Hiroyuki; Inoue, Ikuo; and Nagata, Atsushi, 5,144,426, Cl. 358-133.000
Fujikin Soft Co., Ltd.: *See—*
Takahashi, Yasunori, 5,144,529, Cl. 361-323.000
Fujimori, Sadao; and Yamamoto, Akira, to Kabushiki Kaisha Meidensha. Twin roller chassis dynamometer. 5,142,902, Cl. 73-117.000
Fujimori, Shigeru: *See—*
Suzuki, Hideaki; Matsuzaki, Kichie; Kato, Kazuo; Oono, Mitsuo; Takeichi, Kenzo; Hisatomi, Ryoichi; Isobe, Mitsunobu; Fujimori, Shigeru; and Nemoto, Kouzou, 5,144,683, Cl. 382-16.000
Fujimoto, Kazutaka, to Enuma Chain Manufacturing Co., Ltd. Free-flow conveyor chain. 5,143,205, Cl. 198-779.000.
Fujino, Noboru: *See—*
Takamura, Tohru; Yamaguchi, Ryuta; and Fujino, Noboru, 5,143,510, Cl. 414-796.700.
Fujirebio Inc.: *See—*
Ikeda, Mikio; Morishita, Shingo; and Matsuda, Ichiro, 5,144,008, Cl. 530-354.000
Fujishiro, Takeshi: *See—*
Higashimata, Akira; Fujishiro, Takeshi; and Yoshioka, Shigeki, 5,143,429, Cl. 303-115.0EC
Fujita, Hiroyuki; Takimoto, Kazushi; and Taguchi, Kenichi, to Mita Industrial Co., Ltd. Automatic sheet feeder having means for resuming continuous copying after power stoppage. 5,144,384, Cl. 355-308.000
Fujita, Nobuhiko: *See—*
Kimoto, Tunenobu; Tomikawa, Tadashi; and Fujita, Nobuhiko, 5,144,380, Cl. 357-22.000
Fujita, Takashi: *See—*
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi; Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, 5,143,930, Cl. 514-369.000
Fujita, Yoshiji: *See—*
Kanehira, Koichi; Eziri, Katsushi; Shiono, Manzo; Fujita, Yoshiji; and Yamahara, Johji, 5,143,921, Cl. 514-315.000.
Fujita, Yuji; and Iwata, Kouzou, to NEC Corporation. Circuit for driving an electric field luminous lamp. 5,144,203, Cl. 315-169.300.
Fujitsu Limited: *See—*
Eshita, Takashi; and Inoue, Toshikazu, 5,144,379, Cl. 357-22.000
Fueki, Shunsuke; Yasuda, Hiroshi; Sakamoto, Kiichi; and Takahashi, Yasushi, 5,144,142, Cl. 250-396.00R
Goto, Yasuyuki; Koshino, Nagaaki; Utsumi, Kenichi; Tsugawa, Iwao; and Nakada, Masahiro, 5,144,618, Cl. 369-284.000
Hikosaka, Kohki, 5,144,378, Cl. 357-22.000
Kanai, Yasunori; Nawata, Kazumasa, Shimizu, Mitsuhisa; Yada, Hiroki; Satoh, Taichi; and Sakai, Toshiaki, 5,144,158, Cl. 307-272.100
Kitazawa, Takamasa, 5,144,504, Cl. 360-78.040
Maeda, Miyozo; Inouye, Yuji; Hashimoto, Yasunobu; Itoh, Kenichi; and Ogawa, Seiya, 5,144,601, Cl. 369-13.000
Matsutani, Takeshi, 5,143,866, Cl. 437-187.000
Ohara, Katsuichi, 5,144,297, Cl. 340-825.790.
Fujiwara, Hiromichi; Ogawa, Akihiko; Sakiyama, Hideyo; and Tamura, Toshiaki, to Teikoku Chemical Industry Co., Ltd. Benzamide derivatives. 5,143,935, Cl. 514-426.000
Fujiwara, Masatoshi: *See—*
Takemoto, Akira; Watanabe, Hitoshi; Fujiwara, Masatoshi; and Kakimoto, Syoichi, 5,143,864, Cl. 437-129.000
Fukaya, Hiroshi, to Hanix Kogyo Kabushiki Kaisha. Conical frictional differential drive steering mechanism. 5,142,942, Cl. 74-650.000
Fukuchi, Masakazu: *See—*
Haneda, Satoshi; Fukuchi, Masakazu; Morita, Shizuo; and Matsuo, Shunji, 5,143,017, Cl. 118-658.000
Fukuda, Masatoshi: *See—*
Matsutani, Kanji; Suzuki, Kimio; Fukuda, Masatoshi; and Sato, Katsutoshi, 5,143,269, Cl. 227-177.000
Fukumoto, Ryoichi: *See—*
Yamamoto, Tokihiko; and Fukumoto, Ryoichi, 5,142,728, Cl. 15-250.130.
Fukuro, Hiroyoshi: *See—*
Nagase, Yu; Takamura, Yuriko; Kohtoh, Noriaki, Fukuro, Hiroyoshi; and Abe, Toyohiko, 5,144,078, Cl. 564-472.000.
Fukushi, Kyosuke: *See—*
Nagai, Kenji; Fukushi, Kyosuke; and Matsuyama, Kazuo, 5,143,974, Cl. 525-92.000.
Fukushima, Naoto; Yamaguchi, Hirotsugu; Akatsu, Yohsuke; and Hano, Sunao, to Nissan Motor Company, Limited. Actively controlled automotive suspension system with adjustable rolling-stability and/or pitching-stability. 5,144,558, Cl. 364-424.050
Fukushima, Nobuo; Maeda, Masaya; and Tezuka, Nobuo, to Canon Kabushiki Kaisha. Process for controlling an access position of a recording head which enables recording at each recording position on a recording medium without double recording and a device therefor. 5,144,503, Cl. 360-69.000.
Fuller, Stuart C. Guide wall module for ordering apparatus having rotator walls. 5,143,200, Cl. 198-453.000
Funabashi, Kiyomi: *See—*
Kikuchi, Makoto; Ohura, Masato; Tamata, Shin; Chino, Koichi, and Funabashi, Kiyomi, 5,143,654, Cl. 252-629.000.
Funada, Hitoshi; and Ojima, Toshi, to Komori Corporation. Safety device for printing machine. 5,142,979, Cl. 101-183.000.
Funahashi, Yoshiki: *See—*
Hibi, Masayuki; Funahashi, Yoshiki; and Goto, Katsuhiro, 5,143,358, Cl. 267-140.130
Funatsu, Kenzo; Ito, Takashi; Yashiki, Naoki; Kubumura, Chiaki; and Kubuyama, Keiji, to Hitachi, Ltd. Data processor. 5,144,626, Cl. 370-110.300

Funayama, Naotaka; Itoh, Ikuo; Kanehige, Masatoshi; and Kurosaka, Toshiyuki, to Sharp Kabushiki Kaisha. Developing device with a scraping unit arranged to form a stirring area. 5,144,382, Cl. 355-253.000

Fung, Kwan F., to Aqualon Company. High productivity spheroid nitrocellulose. 5,144,020, Cl. 536-35.000.

Funk, John G.: *See*—
Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James D.; and McCauley, Robert M., 5,143,615, Cl. 210-350.000.

Funkhouser, Margaret G.: *See*—
Shander, Douglas; and Funkhouser, Margaret G., 5,143,925, Cl. 514-378.000.

Furrer, Hansjorg, to Lonza Ltd. Filtering device, especially for the separation of coarse particles from a lubricant suspension, and process for its use. 5,143,631, Cl. 210-791.000.

Furtek, Frederick C.: *See*—
Camarota, Rafael C.; Furtek, Frederick C.; Ho, Walford W.; and Browder, Edward H., 5,144,160, Cl. 307-465.100.

Furukawa, Takayasu: *See*—
Kobayashi, Toshinori; Tsunoda, Masahiro; Furukawa, Takayasu; and Kobayashi, Isao, 5,142,791, Cl. 33-573.000.

Furuya, Masato: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,415, Cl. 358-43.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,443, Cl. 358-209.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Suzuki, Tetsuji; and Shinonaga, Hirohiko, 5,144,471, Cl. 359-245.000.

Furuyama, Hideto; and Sadamasa, Tetsuo, to Kabushiki Kaisha Toshiba. Semiconductor light detector utilizing an avalanche effect and having an improved guard ring structure. 5,144,381, Cl. 357-30.000.

Futaba Denshi Kogyo K.K.: *See*—
Itoh, Shigeo; Yokoyama, Miko; and Tsuburaya, Kazuhiko, 5,144,198, Cl. 313-422.000.
Yamamoto, Michio, 5,144,640, Cl. 375-1.000.

Futselaar, Harry: *See*—
Bitter, Johan G. A.; Futselaar, Harry; and Racz, Imre G., 5,143,613, Cl. 210-321.800.

G. B. Boucherie N.V.: *See*—
Boucherie, Bart G., 5,143,424, Cl. 300-2.000.
Boucherie, Lionel P., 5,143,425, Cl. 300-2.000.

G. D. Searle & Co.: *See*—
Partis, Richard A.; Koszyk, Francis J.; and Mueller, Richard A., 5,144,037, Cl. 546-116.000.
Wong, Chi-Huey; Durrwachter, John R.; and Pederson, Richard L., 5,143,831, Cl. 435-84.000.

G.I.R.: *See*—
Weynant nee Girones, Renee P. M., 5,143,453, Cl. 374-205.000.

G. Siempelkamp GmbH & Co.: *See*—
Bott, Reinhard; Kern, Robert; Langeloh, Thomas; and Gross, Holger, 5,143,628, Cl. 210-770.000.

Gabel, Detlef, to United States of America. Energy. Boron containing compounds and their preparation and use in neutron capture therapy. 5,144,026, Cl. 540-500.000.

Gabilan Manufacturing, Inc.: *See*—
Alameda, Daniel, 5,142,846, Cl. 73-506.000.

Gabison, Daniel. Tarpaulin drainage system. 5,143,014, Cl. 114-361.000.

Gabriel, Edward P.: *See*—
Basso, James E.; Bhalla, Parmesh K.; Chahine, John J.; Diddell, Daro; Earle, Gregory J.; Gabriel, Edward P.; and Yaghmaie, Farrokh, 5,143,103, Cl. 134-98.100.

Gabriel, M. Christina; Houh, Henry H.; and Whitaker, Norman A., to AT&T Bell Laboratories. Sagnac optical logic gate. 5,144,375, Cl. 356-345.000.

Gabriel, William F., to United States of America, Navy. Large-aperture sparse array detector system for multiple emitter location. 5,144,322, Cl. 342-383.000.

Gadsby, Larry R.; Pittman, Larry J. and Chermak, Philip J., to Data Pure Corporation. Method and apparatus for cleaning magnetic tape having air bearings and vacuum assisted cleaning. 5,144,513, Cl. 360-137.000.

Gaines, Alfred L. Gift card and envelope. 5,143,279, Cl. 229-68.00R.

Gallimore, D. W., to Gallimore, Dennis W.; and Gallimore, Stephen J. Rotary cutter. 5,142,957, Cl. 83-117.000.

Gallimore, Dennis W.: *See*—
Gallimore, D. W., 5,142,957, Cl. 83-117.000.

Gallimore, Stephen J.: *See*—
Gallimore, D. W., 5,142,957, Cl. 83-117.000.

Gallo, Roger; Hoornaert, Pierre; and Roman, Jean-Philippe, to Societe Nationale Elf Aquitaine. Overbased additives for lubricant oils containing a molybdenum complex, process for preparing them and compositions containing the said additives. 5,143,633, Cl. 252-18.000.

Galloway, Robert L., Jr.: *See*—
Allen, George S.; Galloway, Robert L., Jr.; Maciunas, Robert J.; Edwards, Charles A., II; and Zink, Martin R., 5,142,930, Cl. 74-469.000.

Gamo, Hiroshi: *See*—
Kobayashi, Bujirou; Gamo, Hiroshi; and Kimura, Masatoshi, 5,144,680, Cl. 382-4.000.

Ganne, Jean-Pierre: *See*—
Gaucher, Philippe; Ganne, Jean-Pierre; and Dubois, Jean-Claude, 5,143,636, Cl. 252-62.900.

Ganschow, George E.: *See*—
Iranmanesh, Ali A.; and Ganschow, George E., 5,144,404, Cl. 357-51.000.

Ganster, Otto: *See*—
Meckel, Walter; Hansel, Eduard; Ganster, Otto; Arend, Gunter; and Buchner, Jorg, 5,143,995, Cl. 528-59.000.

Ganter, Wolfgang: *See*—
Blaich, Wilfried; Flaig, Oskar; Ganter, Wolfgang; Kaiser, Hans; Kussmaul, Ewald; Maurer, Roland; and Riis, Peter, 5,144,599, Cl. 368-10.000.

Ganz, Jorg, to Matisa Materiel Industriel S.A. Auxiliary railroad track lifting installation. 5,142,988, Cl. 104-7.100.

Garden Way Incorporated: *See*—
Lydy, Bruce S.; Schueller, Dennis R.; Nickel, Dennis J.; and Rauwerdink, James D., 5,142,851, Cl. 56-13.400.

Gardner, Billy J.; Jelovich, Benjamin C.; O'Hara, Frank; and Secoura, Ralph A., to Black & Decker Inc. Cordless tool battery housing and charging system. 5,144,217, Cl. 320-2.000.

Gardner, Ernest A. Fastening system. 5,143,467, Cl. 403-24.000.

Gardner, John G.: *See*—
Bernard, Richard A.; and Gardner, John G., 5,143,604, Cl. 210-168.000.

Gardner, Timothy S.: *See*—
Engler, Edward M.; Gardner, Timothy S.; McReynolds, David P.; and Ward, Stephen M., 5,144,611, Cl. 369-71.000.

Garney, Bruce R.: *See*—
Suhoza, Richard A.; Garney, Bruce R.; and Lauder, Robert B., 5,143,943, Cl. 521-115.000.

Garritano, Mario: *See*—
Topel, Edward C.; and Garritano, Mario, 5,143,273, Cl. 228-56.300.

Garrod, Russell D.: *See*—
Dunham, Paul V.; and Garrod, Russell D., 5,143,305, Cl. 241-24.000.

Gartner, Klaus W.: *See*—
Uyeda, Alan K.; Gartner, Klaus W., Herrmann, John; and Phillips, Peter J., 5,142,890, Cl. 70-277.000.

Gasapardo SpA: *See*—
Gaspardo, Luigi, 5,143,002, Cl. 111-185.000.

Gaspardo, Luigi, to Gasapardo SpA. Device to stir and feed seeds for pneumatic distributors or sowing machines. 5,143,002, Cl. 111-185.000.

Gasser, Marcel; and Latta, Ernst E., to International Business Machines Corporation. Method for mirror passivation of semiconductor laser diodes. 5,144,634, Cl. 372-49.000.

Gates, Cynthia A.: *See*—
Weintraub, Philip M.; Gates, Cynthia A.; and Blohm, Thomas R., 5,143,909, Cl. 514-177.000.

Gaucher, Philippe; Ganne, Jean-Pierre; and Dubois, Jean-Claude, to Thomson-CSF. Controlled-porosity piezoelectric ceramic. 5,143,636, Cl. 252-62.900.

Gavle, Ross. Liquid container stabilizing device. 5,143,247, Cl. 220-630.000.

Gaz De France: *See*—
Blanchard, Michel, 5,144,253, Cl. 324-715.000.

Geelhaar, Thomas: *See*—
Krause, Joachim; Geelhaar, Thomas; Hittich, Reinhard; Finkenzeller, Ulrich; Rieger, Bernhard; and Weber, Georg, 5,143,642, Cl. 252-299.610.

Gegenwart, Rainer; and Ritter, Jochen, to Leybold Aktiengesellschaft. Particle source, especially for reactive ionic etching and plasma-supported CVD processes. 5,144,196, Cl. 315-111.410.

Geibel, Stephen A.: *See*—
Pall, David B.; and Geibel, Stephen A., 5,143,616, Cl. 210-500.380.

Geiger, Richard: *See*—
Robertson, A. Scott; Geiger, Richard; and Lishman, Robert W., 5,143,391, Cl. 280-250.100.

Gelardi, Anthony L.; Lovecky, Craig; Lowery, Alan; and Barstow, Robert, to Shape Inc. Methods of assembling reel leaf spring/cassette cover combinations. 5,142,761, Cl. 29-445.000.

Gemma, Nobuhiro; Nakayama, Toshio; Egusa, Syun; Miura, Akira; Azuma, Makoto; Aoki, Shinya; and Naito, Katsuyuki, to Kabushiki Kaisha Toshiba. Organic thin film display element. 5,144,473, Cl. 359-270.000.

General Electric Company: *See*—
Bateman, Robert L.; and Parham, Thomas G., 5,143,445, Cl. 362-293.000.
Bobo, Melvin; Mueller, Peter W.; and McClure, Thomas F., 5,143,499, Cl. 411-247.000.
Brown, David W.; Rogers, Terrence E.; Sundin, Richard L., Sr.; and Henry, Ralph A., 5,144,418, Cl. 358-60.000.
Ciokajlo, John J.; and Maclin, Harvey M., 5,142,858, Cl. 60-39.330.
Coffinberry, George A., 5,143,329, Cl. 244-209.000.
Congdon, Steven P.; and Fawcett, Russell M., 5,143,690, Cl. 376-267.000.
Corsmeier, Donald M.; and Browning, Stephen G., 5,143,292, Cl. 239-127.300.
Corsmeier, Robert J.; Sponseller, Robert L.; Reigel, James R.; and Maclin, Harvey M., 5,143,512, Cl. 415-115.000.
De Doncker, Rik W. A. A., 5,144,216, Cl. 318-807.000.
Glover, Gary H.; and Schneider, Erika, 5,144,235, Cl. 324-309.000.
Glynn, Christopher C.; Swanson, Byron E.; and Bobo, Melvin, 5,143,383, Cl. 277-53.000.
Joseph, Kuriacose, 5,144,425, Cl. 358-133.000.
Krueger, Daniel D.; Wessels, Jeffrey F.; and Chang, Keh-Minn, 5,143,563, Cl. 148-410.000.

Lampes, Elias H.; and Allen, Clifford E., Jr., 5,142,871, Cl. 60-756.000

Matarrese, Roger R., 5,143,523, Cl. 51-293.000.

Nerone, Louis R.; and Basch, John G., 5,144,204, Cl. 315-209.00R.

Rougeot, Henri M.; and Castleberry, Donald E., 5,144,141, Cl. 250-369.000.

Stelloh, Frank A.; and Derzay, Gregory J., 5,144,246, Cl. 324-405.000.

Wojnarowski, Robert J.; and Eichelberger, Charles W., 5,144,407, Cl. 357-54.000.

General Electric Company, p.l.c., The: *See*—
Meakin, Douglas B., 5,143,018, Cl. 118-715.000.

General Hospital Corporation, The: *See*—
Huala, Eva; and Ausubel, Frederick M., 5,143,846, Cl. 435-252.330.

General Instrument Corporation: *See*—
Esserman, James N.; and Heller, Jerrold A., 5,144,664, Cl. 380-20.000.

General Motors Corporation: *See*—
Matossian, Jesse N.; Wysocki, Joseph A.; Wilson, Robert G.; Yamagishi, Frederick G.; and Ryntz, Edward F., Jr., 5,143,747, Cl. 427-38.000.
Sutterlin, Gregory E.; Lorincz, Samuel; and Vink, Charles E., 5,144,282, Cl. 340-458.000.

General Resource Corporation: *See*—
Pausch, Josef, 5,143,468, Cl. 403-92.000.

Gensheimer, Valentin: *See*—
Melzer, Rudolf; and Gensheimer, Valentin, 5,142,783, Cl. 29-893.200.

Geoffroy, David R., to Riley Stoker Corporation. Flow promoter for fluidized solids. 5,143,486, Cl. 406-90.000.

Georg Fischer AG: *See*—
Mathys, Ernst, 5,142,911, Cl. 73-573.000.

George, Raymond A.; Hoover, Delmer Q.; Shockling, Larry A.; and Reichner, Philip, to Westinghouse Electric Corp. Electrochemical cell apparatus having combusted exhaust gas heat exchange and valving to control the reformable feed fuel composition. 5,143,800, Cl. 429-20.000.

Gerace, Janet M.; and Gerace, Michael J., to Aster, Inc. Electrophoretic coatable sealant compositions comprising polyvinyl chloride and furnace carbon black. 5,143,650, Cl. 252-511.000.

Gerace, Michael J.: *See*—
Gerace, Janet M.; and Gerace, Michael J., 5,143,650, Cl. 252-511.000.

Geraci, Ronald. Automated library article terminal. 5,143,193, Cl. 194-212.000.

Gerber Scientific Products, Inc.: *See*—
Logan, David J., 5,143,576, Cl. 156-353.000.

Gerd und Bernd Vieler KG: *See*—
Vieler, Gerd, 5,143,474, Cl. 403-252.000.

Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and De Peyer, Jacques, to Merck Patent Gesellschaft mit Beschraenkter Haftung. Oxodihydropyridyl chroman derivatives. 5,143,924, Cl. 514-337.000.

Gerlach, Hans-Juergen, to Siemens Aktiengesellschaft. X-ray diagnotics installation with brightness controlled by a dominant region of the image. 5,144,646, Cl. 378-99.000.

Germain, Conrad M., to Minnesota Minning and Manufacturing Company. Abrasive article. 5,142,829, Cl. 51-405.000.

Germain, Robert A.: *See*—
Tomayko, Max J., Jr.; and Germain, Robert A., 5,143,337, Cl. 248-311.200.

Gerth, Dale: *See*—
Reck, Bernd; Laschober, Rita A.; Gerth, Dale; and Boyd, Jack D., 5,143,969, Cl. 524-548.000.

Gertsch, Peter; Imhof, Robert; Miescher, Andreas; and Faiazza, Raffaele, to Maschinenfabrik WIFAG. Device to engage, disengage and adjust the inking rollers or wetting rollers of a printing press. 5,142,977, Cl. 101-148.000.

Geus, John W.; and Boellaard, Eliza, to Shell Oil Company. Process for preparation of a catalyst. 5,143,877, Cl. 502-60.000.

Geyler, Arthur H., Jr., to Delta Power Hydraulic Co. Bi-directional pressure relief valve. 5,143,115, Cl. 137-493.000.

Ghuman, Amarjit: *See*—
Woon, Peter V.; Ghuman, Amarjit; Radovanovic, Rodoljub; Walsham, Brian E.; and Francis, Steven C., 5,142,868, Cl. 60-624.000.

Gibbons, Ian: *See*—
Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., 5,144,139, Cl. 250-341.000.

Gibbs, Paul C., to Mobil Oil Corporation. Apparatus and system for removing low density liquids from oil production water tanks. 5,143,603, Cl. 210-122.000.

Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., to Shell Oil Company. Termination of anionic polymerization using hydrogen. 5,143,990, Cl. 526-82.000.

Giboult, Alain; Aube, Jean-Yves; and Sainte-Foi, Daniel, to Isover Saint-Gobain. Method of forming mineral fibers. 5,143,532, Cl. 65-6.000.

Gibson, Andrew W.: *See*—
Crawley, Michael W.; and Gibson, Andrew W., 5,143,821, Cl. 430-387.000.

Gibson, Brian; and Seider, Robert J., to Washington Mills Electro Minerals Corporation. Abrasive products containing fused alumina zirconia and reduced titania. 5,143,522, Cl. 51-295.000.

Gibson, James D.: *See*—
Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James D.; and McCauley, Robert M., 5,143,615, Cl. 210-350.000.

Gibson, James W.: *See*—
McKnight, Early C.; and Gibson, James W., 5,142,923, Cl. 74-6.000.

Giddens, Len; White, John C.; and Holden, John G., to Thorn EMI plc. Light sources. 5,143,438, Cl. 362-84.000.

Gidman, Claude J.: *See*—
Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, 5,142,798, Cl. 36-117.000.

Gilbert, Ronald E.; and Mordue, George S., to Carborundum Company, The. Melting metal particles and dispersing gas with vaned impeller. 5,143,357, Cl. 266-235.000.

Gilchrist, Ian R., to Cyber Scientific. Acoustic mouse system. 5,144,594, Cl. 367-129.000.

Gillette Company, The: *See*—
Grewal, Manohar S.; and Chou, Chong-Ping P., 5,142,785, Cl. 30-32.000.

Gillingham, Peter B., to Mosaid, Inc. Bandgap voltage generator. 5,144,223, Cl. 323-313.000.

Gillot, Jacques: *See*—
Soria, Raymond; and Gillot, Jacques, 5,143,614, Cl. 210-321.610.

Ginosar, Ran; Hilsenrath, Oliver; and Zeevi, Yehoshua, to Insight, Inc. Wide dynamic range camera. 5,144,442, Cl. 358-209.000.

Girimonte, Vince: *See*—
Schuring, Eric J.; and Girimonte, Vince, 5,143,500, Cl. 411-339.000.

Giulini Chemie GmbH: *See*—
Clubbs, Neville H.; Forster, Hans-Joachim; Kiefer, Ulrich; and Bleh, Jurgen, 5,143,665, Cl. 264-221.000.

Givens, Edward J., to Procter & Gamble Company, The. Tissue laminates having adhesively joined tissue laminae. 5,143,776, Cl. 428-194.000.

Glaser, Charles A.: *See*—
Petrich, William E.; and Glaser, Charles A., 5,143,406, Cl. 285-23.000.

Glassel, Horst; Jaus, Reinhard; and Hellwig, Egbert, to Robert Bosch GmbH. Spiral wound filter and method of making same. 5,143,575, Cl. 156-309.900.

Glassman, Barry S.; Stelts, Philip D.; Hlinka, Joseph W.; Beechan, Charles R.; and Foster, Lester A., Jr., to Bethlehem Steel Corporation. Protective shield having heat conductive properties. 5,143,683, Cl. 266-246.000.

Glassner, David A.; and Datta, Rathin. Process for the production and purification of succinic acid. 5,143,834, Cl. 435-145.000.

Glaxo Inc.: *See*—
Johnson, M. Ross; Peel, Michael R.; and Sternbach, Daniel D., 5,144,034, Cl. 544-276.000.

Gleason, John G.; Hall, Ralph F.; and Uzinskas, Irene, to SmithKline Beecham Corporation. Leukotriene antagonists containing tetrazolyl groups. 5,143,931, Cl. 514-381.000.

Glezer, Boris; and Evans, David M., to Solar Turbines, Incorporated. Turbine cooling system. 5,142,859, Cl. 60-39.750.

Gliebe, Ronald J.: *See*—
Costantino, Roger A., Jr; and Gliebe, Ronald J., 5,144,152, Cl. 307-11.000.

Globe-Union Inc.: *See*—
Bullock, Norma K.; and Kao, Wen-Hong, 5,143,806, Cl. 429-228.000.

Glover, Gary H.; and Schneider, Erika, to General Electric Company. Method of decomposing NMR images by chemical species. 5,144,235, Cl. 324-309.000.

Glover, J. Howard, to Sundstrand Corporation. Fast median filter. 5,144,568, Cl. 364-715.010.

Glycomed Incorporated: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,143,712, Cl. 424-1.100.

Glynn, Christopher C.; Swanson, Byron E.; and Bobo, Melvin, to General Electric Company. Stepped tooth rotating labyrinth seal. 5,143,383, Cl. 277-53.000.

Glynn, William; Rexroad, John; and Denny, David S., to SINCO Incorporated. Roof lifeline safety system and anchor assembly therefor. 5,143,171, Cl. 182-3.000.

Gmelin, Karl, to Robert Bosch GmbH. Fuel distributor for the fuel injection sytems of internal combustion engines. 5,143,039, Cl. 123-470.000.

Go, Hiroshi; Zushi, Shizuo; and Miyamoto, Mitsuo, to Hitachi, Ltd. Electronic apparatus cooling system. 5,144,531, Cl. 361-382.000.

Godse, Rajendra V.: *See*—
Santhanam, Anakkavur T.; Godse, Rajendra V.; Quinto, Dennis T.; Undercoffer, Kenneth E.; and Jindal, Prem C., 5,143,488, Cl. 407-119.000.

Goetz, Charles G.: *See*—
Goetz, Charles R.; and Goetz, Charles G., 5,143,316, Cl. 242-129.500.

Goetz, Charles R.; and Goetz, Charles G., to Advanced Products Incorporated. Spool assembly. 5,143,316, Cl. 242-129.500.

Gold, Phillip W.; and Moen, Bruce A., to Coors Brewing Company. Monitor and control assembly for use with a can end press. 5,142,769, Cl. 29-621.100.

Goldbach, Horst: *See*—
Brandenburg, Rudolf; and Goldbach, Horst, 5,142,823, Cl. 49-118.000.

Goldberg, Eugene P.: *See—*
Sterling, Robert E.; and Goldberg, Eugene P., 5,143,963, Cl. 524-366.000.

Golden, Lewis J.: *See—*
Baker, Leland R.; and Golden, Lewis J., 5,144,422, Cl. 358-109.000.

Golden West Communications Inc.: *See—*
Lenz, Vernon C., 5,144,678, Cl. 381-183.000.

Goldsmith, Patrick M.: Pressurization apparatus for cycle mounted accessories. 5,143,390, Cl. 280-20[illegible].000.

Gonczy, John D.; Niemann, Ralph C.; and Boroski, William N., to Universities Research Association, Inc. Multilayer insulation blanket, fabricating apparatus and method. 5,143,770, Cl. 428-78.000.

Good, Brian K.: *See—*
Christenson, Rebecca A.; and Good, Brian K., 5,144,233, Cl. 324-207.250.

Goodman, Sidney J.: *See—*
Simonetti, Sergio G.; and Goodman, Sidney J., 5,143,299, Cl. 239-526.000.

Goodrich, Fred N. S.: *See—*
Schwab, Carl E.; and Goodrich, Fred N. S., 5,144,315, Cl. 342-49.000.

Goodyear Tire & Rubber Company, The: *See—*
Krishnan, Ram M.; and Sun, China-Li, 5,143,967, Cl. 524-496.000.

Gopalakrishnan, Sankaraiyer: *See—*
Boster, Clark S.; Gopalakrishnan, Sankaraiyer; Reimers, Carl F.; and Vaghasia, Gordhan K., 5,143,515, Cl. 415-179.000.

Gore, Milton W. Pulsed ultra sonic swimming pool alarm apparatus. 5,144,285, Cl. 340-573.000.

Gorecki, Marian: *See—*
Hartman, Jacob R.; Oppenheim, Amos B.; Gorecki, Marian; and Aviv, Haim, 5,143,836, Cl. 4[illegible]5-189.000.

Gorl, Udo: *See—*
Siegfried, Wolff; Gorl, Udo; and Meier, Karl, 5,143,962, Cl. 524-346.000.

Goss, Lee J.: *See—*
Dunbar, Sidney G.; and Goss, Lee J., 5,143,781, Cl. 428-288.000.

Goto, Katsuhiro: *See—*
Hibi, Masayuki; Funahashi, Yoshiki; and Goto, Katsuhiro, 5,143,358, Cl. 267-140.130.

Goto, Takashi: *See—*
Mizushina, Fumio; Goto, Takashi; and Nawa, Michio, 5,142,903, Cl. 73-118.100.

Goto, Yasuyuki; Koshino, Nagaaki; Utsumi, Kenichi; Tsugawa, Iwao; and Nakada, Masahiro, to Fujitsu Limited. Optical disc medium. 5,144,618, Cl. 369-284.000.

Goto, Yoshitaka; and Nakayama, Masaharu, to Nippon Oil and Fats Co., Ltd. Non-linear optical material and non-linear optical device. 5,144,044, Cl. 549-70.000.

Gotoh, Hajime; and Yokoti, Tadashi, to Mitsubishi Rayon Co., Ltd. Method for manufacturing a three dimensional laminate from double pile fabrics. 5,143,569, Cl. 156-148.000.

Gotoh, Hiroshi; Maeda, Ikuo; and Honda, Syuichi, to Ricoh Company, Ltd. Optical information read/write apparatus. 5,144,617, Cl. 369-244.000.

Gotou, Makoto: *See—*
Toshio, Inaji; and Gotou, Makoto, 5,144,209, Cl. 318-254.000.

Gotz, Hans J.; and Hembes, Rainer to U.S. Philips Corporation. Transmission arrangement comprising a block code encoded main channel and an auxiliary channel. 5,144,305, Cl. 341-73.000.

Gould, Dennis R. Three dimensional viewing apparatus including a stack of transparent plates and related method. 5,144,482, Cl. 359-478.000.

Grabenkort, Richard W., to Abbott Laboratories. In-line moisture filter usable in an improved packaging system for a sterilizable calibratable medical device. 5,143,617, Cl. 21[illegible]-502.100.

Gragnolati, Claude: *See—*
Lagier, Michel; Gragnolati, Claude; and Besombes, Jena-Pierre, 5,144,597, Cl. 367-166.000.

Graham, Marcus L.; and O'Brien, Francis J., to United States of America, Navy. Adaptive statistical filter providing improved performance for target motion analysis noise discrimination. 5,144,595, Cl. 367-135.000.

Graham, Robert J.; Helstrom, John J.; Peck, Lawrence B.; Stone, Richard A.; and Bernier, Edward J., Jr., to Amoco Corporation. Methods of tar sand bitumen recovery. 5,143,598, Cl. 208-390.000.

Graham, Timothy W.; and Briggs, Daniel C., to Welch Allyn, Inc. Low watt metal halide lamp. 5,144,20[illegible], Cl. 313-634.000.

Graham, Timothy W.: *See—*
Thomas, Brian J.; Graham, Timothy W.; and Briggs, Daniel C., 5,144,190, Cl. 313-113.000.

Granzer, Ernold: *See—*
Lang, Hans-Jochen; Granzer, Ernold; and Kerekjarto, Bela, 5,143,937, Cl. 514-603.000.

Graymills Corporation: *See—*
Blaul, Ronald L., 5,143,102, C[illegible]134-58.00R.

Graziadio, Mario: *See—*
De Michele, Gennaro; and Graziadio, Mario, 5,143,297, Cl. 239-427.000.

Great Lakes Chemical Corp.: *See—*
Williams, James E.; and Thornburgh, Scott, 5,144,087, Cl. 568-713.000.

Green, Kenneth E.: *See—*
Wissner, Allan; Schaub, Robert E.; Green, Kenneth E.; and Hamann, Philip R., 5,144,045, Cl. 549-219.000.

Green, Ronald J. Paper sheet feeding apparatus. 5,143,365, Cl. 271-121.000.

Greenlee, Mark L.; DiNinno, Frank P.; Cama, Lovji D.; and Heck, James V., to Merck & Co. Inc. 2-(9-fluorenonyl)-carbapenem intermediates. 5,144,028, Cl. 540-302.000.

Greenlee Textron Inc.: *See—*
Nordlin, William F.; and Bauscher, Billy J., 5,142,958, Cl. 83-559.000.

Greenlee, William S.; Kinson, Philip L.; Kline, Sally A.; Rajagopalan, Murali; and Daniels, Charles A., to B.F. Goodrich Company, The. Polyvinyl chloride blends. 5,143,975, Cl. 525-205.000.

Greenway, John M.; and Hughes, Russell H., to International Paper Company. Method for producing textured nonwoven fabric. 5,142,752, Cl. 28-105.000.

Grego, Giorgio, to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Optical spectroscopy system. 5,144,374, Cl. 356-326.000.

Greiff, Paul, to Charles Stark Draper Laboratory, Inc., The. Micromechanical device with a trimmable resonant frequency structure and method of trimming same. 5,144,184, Cl. 310-312.000.

Greiner, Alain, to Bull S.A. Barrel shifter with parity bit generator. 5,144,573, Cl. 364-738.000.

Grendel, Vinzenz: *See—*
Korfgen, Harald; Hirsch, Heinz; and Grendel, Vinzenz, 5,143,349, Cl. 251-314.000.

Gresham, William C.; and Gresham, William H. Apparatus and method for automatically dispersing aggregate material. 5,143,289, Cl. 239-7.000.

Gresham, William H.: *See—*
Gresham, William C.; and Gresham, William H., 5,143,289, Cl. 239-7.000.

Grewal, Manohar S.; and Chou, Chong-Ping P., to Gillette Company, The. Razor technology. 5,142,785, Cl. 30-32.000.

Grice, Lonnie E.: *See—*
Baker, Ernest D.; Dinwiddie, John M., Jr.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,144,692, Cl. 395-425.000.

Griessmeyer, Gabriele: *See—*
Nurnberg, Eberhard; Leonhardt, Uwe; Hornstein, Otto P.; Griessmeyer, Gabriele; and Perschbacher, Harald, 5,143,940, Cl. 514-785.000.

Grimminger, Albert, to Werner & Pfleiderer GmbH. Process and apparatus for underwater granulation of molten thermoplastic material particularly during start-up periods. 5,143,673, Cl. 264-142.000.

Grinsteiner, James J., to Navistar International Transportation Corp. Two-stage hydraulic electrically-controlled unit injector. 5,143,291, Cl. 239-88.000.

Groco Specialty Coatings Company: *See—*
Grogan, George W.; and Boyd, Robert H., 5,143,949, Cl. 523-334.000.

Grogan, George W.; and Boyd, Robert H., to Groco Specialty Coatings Company. Aqueous based, strippable coating composition and method. 5,143,949, Cl. 523-334.000.

Grogler, Gerhard: *See—*
Hansel, Eduard; Hess, Heinrich; Arend, Gunter; Grogler, Gerhard; and Kopp, Richard, 5,143,987, Cl. 525-458.000.

Gros, Pierre: *See—*
Jansen, Franz; and Gros, Pierre, 5,144,009, Cl. 530-363.000.

Gross, Holger: *See—*
Bott, Reinhard; Kern, Robert; Langeloh, Thomas; and Gross, Holger, 5,143,628, Cl. 210-770.000.

Grostick, David W.: *See—*
Kharzo, Joseph S.; Grostick, David W.; Liang, Jiann-Shing; and Swamy, Narasimha, 5,143,364, Cl. 271-108.000.

Grouhel, Agnes: *See—*
Calvet, Alain; Grouhel, Agnes; Jacobelli, Henri; Junien, Jean-Louis; and Pascaud, Xavier, 5,143,938, Cl. 514-653.000.

Groves, James D., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive composition. 5,143,972, Cl. 525-71.000.

Grunbeck, John: *See—*
Perry, Carl A.; Daigle, Guy A.; Rountree, Steven; Talmadge, George; Grunbeck, John; and Wassell, Mark, 5,144,126, Cl. 250-254.000.

Gruzleski, John E.; and Aliravci, Abdulcelil, to McGill University. Low porosity, fine grain sized strontium-treated magnesium alloy castings. 5,143,564, Cl. 148-420.000.

Grzyll, Lawrence R.: *See—*
Scaringe, Robert P.; Parrish, Clyde F.; and Grzyll, Lawrence R., 5,142,884, Cl. 62-324.400.

GTE Laboratories Incorporated: *See—*
Mazor, Baruch; and Veeneman, Dale E., 5,144,671, Cl. 381-36.000.

GTE Mobile Communications Service Corporation: *See—*
Zicker, Robert G.; Cao, Thanh H.; Borkowski, Daniel G.; Plouff, Donald A.; and Brown, Phillip D., Jr., 5,144,649, Cl. 379-59.000.

GTE Products Corporation: *See—*
Butler, Scott J.; Lapatovich, Walter P.; and Bochinski, Jason, 5,144,206, Cl. 315-248.000.

GTE Valenite Corporation: *See—*
Bosek, Ronald P., 5,143,495, Cl. 409-233.000.
Daniels, Keith E., 5,143,114, Cl. 137-385.000.

Guenther, Kenneth L.: *See—*
Rabindran, K. George; Faber, Thomas; Filicicchia, David; Guenther, Kenneth L.; Kalika, Joseph; Kerstein, Melvin T.; Shah, Girish B.; and Wiley, David, 5,143,225, Cl. 209-584.000.

Guenthner, Richard A.: *See—*
Stern, Richard M.; Guenthner, Richard A.; Alm, Roger R.; and Wilkinson, Thomas K., 5,144,069, Cl. 562-556.000.

Gueret, Jean-Louis H., to L'Oreal. Packaging unit for improving preservation of the product during storage. 5,143,236, Cl. 215-311.000.

Guichard, Philippe: *See—*
Haghiri, Mohammad R.; and Guichard, Philippe, 5,144,429, Cl. 358-138.000.

Guidarelli, Joseph A. Push or pull leaf rake. 5,142,855, Cl. 56-400.160.

Guidry, Dean P. Crustacean trap. 5,142,814, Cl. 43-105.000.

Gundel, Bernd, to Diehl GmbH & Co. Mine, particularly an anti-tank mine. 5,142,986, Cl. 102-401.000.

Gunji, Morino: *See—*
Takahiro, Kasuh; and Gunji, Morino, 5,143,889, Cl. 502-427.000.

Gunzler, Volkmar: *See—*
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,143,926, Cl. 514-354.000.

Gupta, Balaram, to Hoechst Celanese Corp. Radiation curable composition based on 4-hydroxystyrene copolymers. 5,143,947, Cl. 522-121.000.

Guthikonda, Ravindra N.: *See—*
DiNinno, Frank P.; Guthikonda, Ravindra N.; and Schmitt, Susan M., 5,143,914, Cl. 514-210.000.

Guthrie, Elmer F.: *See—*
Der, Bruce; Beckstrom, Bruce W.; and Guthrie, Elmer F., 5,143,702, Cl. 422-185.000.

Gutohrlein, Ralf: *See—*
Schiessle, Edmund; Alasafi, Khaldoun; and Gutohrlein, Ralf, 5,144,208, Cl. 318-118.000.

Gutowski, Timothy A., to Contour Roll Company. Roll-forming method. 5,142,894, Cl. 72-129.000.

Gwin, Gary W.: *See—*
Harsch, Franklin D.; and Gwin, Gary W., 5,142,949, Cl. 81-9.420.

H. B. Fuller Company: *See—*
Micek, Lawrence L., 5,143,255, Cl. 222-1.000.

H. B. Fuller Licensing & Financing Inc.: *See—*
Scholl, Steven L.; Simmons, Eugene R.; Knutson, Keith C.; and Bunnelle, William L., 5,143,961, Cl. 524-317.000.

Haag, Anthony P.: *See—*
Brennan, David J.; Haag, Anthony P.; and White, Jerry E., 5,143,998, Cl. 528-99.000.

Haag, Werner O.: *See—*
Harandi, Mohsen N.; Haag, Werner O.; Owen, Hartley; and Bell, Weldon K., 5,144,086, Cl. 568-698.000.

Haage, Manfred, to Fischerwerke Artur Fischer GmbH & Co. KG. Expansible plug for fixing to a solid or hollow building material. 5,143,497, Cl. 411-33.000.

Haas, David; Yoon, Hyun-Nam; and Teng, Chia-Chi, to Hoechst Celanese Corp. Smooth-wall polymeric channel and rib waveguides exhibiting low optical loss. 5,143,577, Cl. 156-625.000.

Haas, Juergen; and Plog, Carsten, to Dornier GmbH. Selective gas sensor. 5,143,696, Cl. 422-90.000.

Haataja, Bruce A.: *See—*
Sandberg, L. Bogue; Haataja, Bruce A.; Jurmu, Douglas C.; Palardy, Robert D.; Story, Frank H.; and Yates, William A., 5,142,994, Cl. 108-53.300.

Habib, Maher: *See—*
Podolski, Joseph S.; and Habib, Maher, 5,143,741, Cl. 426-565.000.

Hackmack, Klaus-Georg: *See—*
Lasch, Manfred; Hackmack, Klaus-Georg; and Liebe, Reinhard, 5,143,095, Cl. 131-290.000.

Haeusler, Dominik: *See—*
Meyer, Urs; Oberhaensli, Rene F.; and Haeusler, Dominik, 5,144,130, Cl. 250-202.000.

Haghiri, Mohammad R.; and Guichard, Philippe, to U.S. Philips Corporation. High definition television transmission and reception system with an improved motion estimator and with reduced data throughput. 5,144,429, Cl. 358-138.000.

Hagiwara, Hideru: *See—*
Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000.

Hahn, Blake S. Adjustable bundling device. 5,142,743, Cl. 24-16.00R.

Hahn, Erwin; Mayer, Udo; Raulfs, Friedrich-Wilhelm; and Schloesser, Ulrike, to BASF Aktiengesellschaft. Preparation of J-acid urea. 5,144,064, Cl. 562-49.000.

Hajzler, Christian: *See—*
Alff, Denis; and Hajzler, Christian, 5,143,458, Cl. 384-448.000.

Halbardier, Anna L., heiress: *See—*
Mody, Rustom K.; and Halbardier, Floyd A., deceased, 5,143,154, Cl. 166-187.000.

Halbardier, Floyd A., deceased: *See—*
Mody, Rustom K.; and Halbardier, Floyd A., deceased, 5,143,154, Cl. 166-187.000.

Haldipur, Gaurang B.; and Dilmore, William J., to Westinghouse Electric Corp. Filtering apparatus. 5,143,530, Cl. 55-341.100.

Hale, Daniel E.; and Johnson, Thomas A., to Industrial Conveyor Company, Inc. Turnable cylinder for a conveyor system. 5,143,198, Cl. 198-414.000.

Hale, James C., to Trienco, Inc. Lumber cutter for removing end defects and sawing to desired lengths. 5,142,955, Cl. 83-75.500.

Hales, Scott J.; and Zollinger, Terry L., to Logan Manufacturing Company. Snow groomer tow frame alignment device. 5,142,800, Cl. 37-220.000.

Hall, David J.: *See—*
Schlicher, Rex L.; Rinaldi, Steven M.; Hall, David J.; Ranon, Peter M.; and Davis, Charles E., 5,142,861, Cl. 60-203.100.

Hall, Henry B.; and Cook, James A., to Safeway Products, Inc. Electrically heated deicer for aircraft blades. 5,144,113, Cl. 219-549.000.

Hall, Iris H.: *See—*
Spielvogel, Bernard F.; Sood, Anup; and Hall, Iris H., 5,143,907, Cl. 514-64.000.

Hall, Joyce B.: *See—*
Pujol, Jean-Marc P.; Hall, Joyce B.; Hogerton, Peter B.; McCormick, Fred B.; and Tingerthal, Jeanne M., 5,143,785, Cl. 428-352.000.

Hall, Larry: *See—*
Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, 5,144,248, Cl. 324-428.000.

Hall, Lawrence W. Sailboard. 5,143,008, Cl. 114-39.200.

Hall, Ralph F.: *See—*
Gleason, John G.; Hall, Ralph F.; and Uzinskas, Irene, 5,143,931, Cl. 514-381.000.

Halliburton Company: *See—*
Harms, Weldon M., 5,143,157, Cl. 166-300.000.
Lubitz, Eric P.; and MacLaughlin, Scott T., 5,143,015, Cl. 166-187.000.

Hally, Nazim S.; Koelsch, Eric J.; and Shields, Joseph M., Jr., to Plastic Recycling Alliance, LP. Recycling system. 5,143,308, Cl. 241-76.000.

Halpaap, Reinhard: *See—*
Laas, Hans J.; Halpaap, Reinhard; Pedain, Josef; and Mosbach, Jurgen, 5,143,994, Cl. 528-45.000.

Ham, Richard G.; and St. Clair, Judith A., to University of Colorado Foundation, Inc., The. Media for normal human muscle satellite cells. 5,143,842, Cl. 435-240.200.

Hamada, Akio; Ohtaki, Keizaburo; Kubo, Takashi; and Sasamoto, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. System for assembling motorcar vehicle body. 5,143,270, Cl. 228-4.100.

Hamada, Hiroshi; Takamatsu, Toshiaki; and Kimura, Naofumi, to Sharp Kabushiki Kaisha. Color liquid-crystal display apparatus using delta configuration of picture elements. 5,144,288, Cl. 340-702.000.

Hamada, Masataka; and Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Camera having automatic focus adjusting apparatus. 5,144,355, Cl. 354-400.000.

Hamada, Masataka: *See—*
Ishida, Tokuji; Norita, Toshio; Hamada, Masataka; and Ootsuka, Hiroshi, 5,144,357, Cl. 354-402.000.

Hamanaka, Katsuhiko; and Kanda, Yoshio, to Asahi Kasei Kobyo Kabushiki Kaisha. Hollow fiber filter module. 5,143,612, Cl. 210-321.800.

Hamann, J. Eric: *See—*
Barry, James V.; Jakubowicz, Raymond F.; and Hamann, J. Eric, 5,143,849, Cl. 436-50.000.

Hamann, Philip R.: *See—*
Wissner, Allan; Schaub, Robert E.; Green, Kenneth E., and Hamann, Philip R., 5,144,045, Cl. 549-219.000.

Hamblen, David P.; and Ravi, Sharma, to Eastman Kodak Company. Method and apparatus for manufacturing aspherically shaped small lenses. 5,143,659, Cl. 264-1.100.

Hamilton, Ronald S.; and Seden, William E., to National Research Development Corporation. Method of casting a contact lens. 5,143,660, Cl. 264-1.400.

Hammer, Klaus-Dieter; Siebrecht, Manfred; and Winter, Hermann, to Hoechst Aktiengesellschaft. Paper and fiber-reinforced packaging film and sausage products produced therefrom, process for producing same. 5,143,584, Cl. 162-175.000.

Hammett, Rawlings H. Patient-monitoring bed covering device. 5,144,284, Cl. 340-573.000.

Hanauske-Abel, Hartmut: *See—*
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,143,926, Cl. 514-354.000.

Haneda, Satoshi; Fukuchi, Masakazu; Morita, Shizuo; and Matsuo, Shunji, to Konica Corporation. Developing device having a baffle plate between plural augers which cleans the developing rollers. 5,143,017, Cl. 118-658.000.

Hanix Kogyo Kabushiki Kaisha: *See—*
Fukaya, Hiroshi, 5,142,942, Cl. 74-650.000.

Hanke, Steven P.: *See—*
Killion, Mead C.; Teder, Harry; Johnson, Arthur C.; and Hanke, Steven P., 5,144,675, Cl. 381-68.400.

Hano, Sunao: *See—*
Fukushima, Naoto; Yamaguchi, Hirotsugu; Akatsu, Yohsuke; and Hano, Sunao, 5,144,558, Cl. 364-424.050.

Hansel, Eduard; Hess, Heinrich; Arend, Gunter; Grogler, Gerhard; and Kopp, Richard, to Bayer Aktiengesellschaft. Polyurethane reactive adhesive compounds containing finely dispersed polymers. 5,143,987, Cl. 525-458.000.

Hansel, Eduard: *See—*
Meckel, Walter; Hansel, Eduard; Ganster, Otto; Arend, Gunter, and Buchner, Jorg, 5,143,995, Cl. 528-59.000.

Hansen, Henning B.; Maroti, Stefan P.; Frederiksen, Bjarne; and Lykkegaard, Knud, to Danfoss A/S. Thermostatic valve. 5,143,286, Cl. 236-42.000.

Hansen, Robert A., to Emhart Industries, Inc. Glass container inspection machine with plot display of container and light intensity. 5,144,124, Cl. 250-223.00B.

Hanson, Charles M.: *See—*
Dudley, Dana; Peterson, Kirk D.; and Hanson, Charles M., 5,144,133, Cl. 250-208.100.

Hanssler, Gerd: *See—*
Jautelat, Manfred; Stroech, Klaus; Hanssler, Gerd; Dutzmann, Stefan; Kuck, Karl-Heinz; and Brandes, Wilhelm, 5,143,932, Cl. 514-383.000.

Happ, Kenneth C.: *See—*
Putney, Gordon A.; Scolaro, Martin S.; and Happ, Kenneth C., 5,142,952, Cl. 81-57.390.

Hara, Hiromu: *See—*
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Hardy, Tyrone L.; and Brynildson, Laura D., to Hardy, Tyrone L. Three-dimensional beam localization microscope apparatus for stereotactic diagnoses or surgery. 5,143,076, Cl. 128-664.000.

Harley, David N., to Titus Tool Company, Limited. Securing device with fastening element having rotation stopping means. 5,143,473, Cl. 403-231.000.

Harms, Weldon M., to Halliburton Company. Catalyst for breaker system for high viscosity fluids. 5,143,157, Cl. 166-300.000.

Harnischfeger Corporation: *See—*
Long, Herbert D., Jr., 5,142,992, Cl. 104-251.000.

Harold Simpson, Inc.: *See—*
Simpson, Harold G.; and Neyer, Leo E., 5,142,838, Cl. 52-640.000.

Harper, Clark N. Load lift truck. 5,143,180, Cl. 187-9.00E.

Harper, James M. E.: *See—*
d'Heurle, Francois M.; and Harper, James M. E., 5,143,867, Cl. 437-188.000.

Harrer, Alois: *See—*
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Harrington, Alan L.: *See—*
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Walsworth, Richard L.; and Siu, Edward K., 5,144,252, Cl. 324-713.000.

Harris, Gary, to Harris, Sanchez & Sandifer. Illuminated tail light handle. 5,144,538, Cl. 362-80.000.

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Harsch, Franklin D.; and Gwin, Gary W., to Boeing Company, The. Hand held pneumatic wire stripper 5,142,949, Cl. 81-9.420.

Hart, Eastman. Video display and imaging devices having liquid crystal scanning. 5,144,416, Cl. 358-56.000

Hart, Edward E., to Spectra-Physics Laserplane, Inc. Laser beam apparatus for providing multiple reference beams. 5,144,486, Cl. 359-629.000.

Hart, Kevin R.: *See—*
Stiffey, Arthur V.; Hart, Kevin R.; and Arwood, Diane K., 5,143,545, Cl. 106-15.050.

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Harvey, James F.; Lux, Robert A Higgins, Thomas P.; Paolella, Arthur; and Sturzebecher, Dana ., to United States of America, Army. Optically injection locked resonant tunnel diode oscillator. 5,144,261, Cl. 331-66.000.

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Saitou, Noboru; Hirota, Koichi Hasebe, Ren; Okuda, Norimasa; and Katsumi, Ikuyo, 5,144,066 Cl. 562-416.000.

Hasegawa, Jun: *See—*
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,144,449, Cl. 358-213.260.

Hasegawa, Kazuo; Murata, Hisashi; and Ouchi, Ikuo, to Alps Electric Co., Ltd. Illumination type optical recorded information reading device. 5,144,117, Cl. 235-455.000.

Hasegawa, Masahiko: *See—*
Satoh, Hiroshi; Utsui, Yoshihiko; Honda, Katsuhiko; and Hasegawa, Masahiko, 5,142,919, Cl. 73-862.333.

Hasegawa, Masashi: *See—*
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Hasegawa, Satoshi: *See—*
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Hasegawa, Tsuyoshi; Hosaka, Sumio; Hosoki, Shigeyuki; Honda, Yukio; and Ichikawa, Masakazu, to Hitachi, Ltd. Surface microscope and surface microscopy. 5,144,128, Cl. 250-306.000.

Hashima, Kazuo; Tsutsumi, Kazuhiko; and Sugahara, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Magneto-optic recording medium. 5,143,797, Cl. 428-694.000.

Hashimoto, Akihiro: *See—*
Tanaka, Toyoaki; Nakamura, Akira; Kamei, Yoshisuke; and Hashimoto, Akihiro, 5,143,786, Cl. 428-357.000.

Hashimoto, Takatsugu; Egashira, Yoshinori; and Kinoshita, Takeshi, to Bridgestone Corporation. Solid golf balls reinforced with anhydrous metal salts of alpha, beta-ethylenically unsaturated carboxylic acids. 5,143,957, Cl. 524-397.000.

Hashimoto, Takeshi: *See—*
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Hashimoto, Yasunobu: *See—*
Maeda, Miyozo; Inouye, Yuji; Hashimoto, Yasunobu; Itoh, Kenichi; and Ogawa, Seiya, 5,144,601, Cl. 369-13.000.

Hassett, John J.; and Harrison, John M. Electronic vehicle toll collection system and method. 5,144,553, Cl. 364-401.000

Hassiepen, Michael: *See—*
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Hast, Michael: *See—*
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Hastings Fiber Glass Products, Inc.: *See—*
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Hata, Koji: *See—*
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Hatakawa, Yoshio: *See—*
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Hatakeyama, Hiroki: *See—*
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Hatano, Hideki; Yokoi, Akira; Iwasaki, Masayuki; and Yamaji, Takashi, to Pioneer Electronic Corporation. Liquid crystal light valve using non-monochromatic writing light. 5,144,463, Cl. 359-72.000.

Hatch, J. Mel. Dowel shooting apparatus. 5,143,572, Cl. 156-293.000.

Haugen, Ronald E.; and Murphy, David T., to Vix Design Products, Inc. Wheel handling apparatus. 5,143,507, Cl. 414-427.000.

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Hawke, Ronald S., to United States of America, Energy. Prevention of breakdown behind railgun projectiles. 5,142,962, Cl. 89-8.000.

Hay, Nairn W.: *See—*
Smith, Robert F.; Pierce, Harold D., Jr.; Borden, John H.; Chong, Leslie J.; and Hay, Nairn W., 5,143,725, Cl. 424-84.000.

Hayashi, Akio: *See—*
Senuma, Akitaka; Nagai, Toshiyuki; Tsukada, Kiroku; and Hayashi, Akio, 5,143,960, Cl. 525-282.000.

Hayashi, Kohtaro; Karasaki, Toshihiko; Yamano, Yasuteru; and Hata, Koji, to Minolta Camera Kabushiki Kaisha. Aperture value determining device for a flash system. 5,144,359, Cl. 354-419.000.

Hayashi, Kuniyasu: *See—*
Ishizaki, Yasutoshi; Maruta, Rikio; Rokugo, Yoshinori; Sakaguchi, Hisashi; and Hayashi, Kuniyasu, 5,144,620, Cl. 370-84.000.

Hayashi, Noriki: *See—*
Takano, Satoshi; and Hayashi, Noriki, 5,143,898, Cl. 505-1.000.

Hayashi, Takahisa, to Dainippon Screen Mfg. Co., Ltd. Objective lens system for use within microscope. 5,144,475, Cl. 359-355.000.

Hayashi, Takamasa: *See—*
Imamura, Tomoatsu; Sato, Masumi; Tanaka, Tomonori; Hayashi, Takamasa; and Senma, Toshitaka, 5,144,337, Cl. 346-108.000

Hayashi, Terumine: *See—*
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Hayashibara, Ken: *See—*
Masaki, Kazumi, 5,144,274, Cl. 338-12.000

Hayden, Kenneth L., to Texas Instruments Incorporated. High limit thermostat apparatus. 5,144,273, Cl. 337-380.000.

Hayes, Lance E. Decorative outdoor light fixture. 5,144,540, Cl. 362-268.000.

Hayes, Orville L., Jr.: *See—*
Hayes, Timothy B.; and Hayes, Orville L., Jr., 5,142,725, Cl. 15-77.000.

Hayes, Timothy B.; and Hayes, Orville L., Jr. Carrousel plate washout unit. 5,142,725, Cl. 15-77.000

Hays, Dan A., to Xerox Corporation. Dual AC/dual frequency scavengeless development. 5,144,371, Cl. 355-249.000.

Hays, William D.: *See—*
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Mayr, Bernhard, 5,143,395, Cl. 280-602.000.

Heat Transfer Pty. Ltd.: *See—*
Pain, Ronald A., 5,143,151, Cl. 165-154.000

Heck, James V.: *See—*
Greenlee, Mark L.; DiNinno, Frank P.; Cama, Lovji D.; and Heck, James V., 5,144,028, Cl. 540-302.000.

Hecken, Gerhard: *See—*
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Heckerman, Brad B.: *See—*
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Heckerman, Willaim L.; and Heckerman, Brad B., to Butler Creek Corporation. Harness. 5,143,266, Cl. 224-150.000.

Hedley Purvis Limited: *See—*
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Heinemann, Joachim: *See—*
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Heinrich, Harald: *See—*
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Heinz, Hans-Detlef: *See—*
Pielartzik, Harald; Heinz, Hans-Detlef; Dhein, Rolf; and Sayed, Aziz E., 5,143,956, Cl. 524-219.000

Helbig, Joachim; and Classen, Hans G., to Verla-Pharm Arzneimittelfabrik Apotheker H.J. V. Ehrlich GmbH & Co. Orally administered pharmaceutical agent for iron and magnesium substitutive therapy 5,143,732, Cl. 424-647.000

Helh, Thomas: *See—*
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Heller, Jerrold A.: *See—*
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Hellgren, Bo: *See—*
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Hellmut, Kathleen M.: *See—*
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Hellring, Stuart D.: *See—*
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Hellwig, Egbert: *See—*
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Helstrom, John J.: *See—*
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Hembes, Rainer: *See—*
Gotz, Hans J.; and Hembes, Rainer, 5,144,305, Cl. 341-73.000

Hemings, Michael C.; and Shannon, John M., to U.S. Philips Corporation. Diode devices and active matrix addressed display devices incorporating them. 5,144,406, Cl. 357-54.000.

Hendrix, Jules; and Lentfer, Arno. Image plate scanner. 5,144,135, Cl. 250-327.200.

Henke, Stephan: *See—*
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,143,926, Cl. 514-354.000.

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Henn, Klaus; Elfgen, Ansgar; Schwartz, Ludwig; and Krumm, Helmut. to Saint Gobain Vitrage International. Production of glazings on a production line comprising several workstations. 5,143,196, Cl 198-345.300

Hennessy, Arnold, to Fluidmaster, Inc. Vacuum assisted toilet 5,142,712, Cl. 4-431.000

Henneuse, Henry, to Societe Nationale Elf Aquitaine (Production) Dynamometric measuring assembly for a drill pipe equipped with means of radiotransmission. 5,144,298, Cl. 340-854.600.

Henry, Ralph A.: *See—*
Brown, David W.; Rogers, Terrence E.; Sundin, Richard L., Sr.; and Henry, Ralph A., 5,144,418, Cl. 358-60.000

Henry, Raymond L.: *See—*
Viegas, Tacey X.; Reeve, Lorraine E.; and Henry, Raymond L., 5,143,731, Cl. 424-486.000.

Herbert, Edward. Apparatus for controlling the input impedance of a power converter. 5,144,222, Cl. 323-271.000.

Herman, Herbert: *See—*
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Herman Miller, Inc.: *See—*
Looman, James A.; and Kane, Thomas I., 5,142,734, Cl. 16-19.000.

Herren, Harold. Reinforced screen rail. 5,143,223, Cl. 209-405.000

Herrington, Richard A.; and Flaugher, Jeffrey R., to Libbey-Owens-Ford Co. Method of and apparatus for bending glass sheets 5,143,535, Cl. 65-106.000

Herrmann, John: *See—*
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Hersey, William H., to Pacific Laser. Portable laser device for alignment tasks. 5,144,487, Cl. 359-629.000

Herter, Rainer, to Werner & Pfleiderer Corp. Mixing apparatus 5,143,699, Cl. 422-163.000

Herting, Heinrich, to Karl Oexmann, Inh. Wolfgang Oexmann, Firma Apparatus for making waffles. 5,142,967, Cl. 99-373.000

Hertz, Alfred S.: *See—*
Leistner, Walter H.; and Hertz, Alfred S., 5,143,501, Cl. 411-442.000

Hess, Heinrich: *See—*
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Hewlett-Packard Company: *See—*
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James, Michael S.; Powell, Melisa A.; Nickerson, Mark A.; and Staats, Louis T., III, 5,142,875, Cl. 62-50.500
Johnsrud, Darrell B.; and Raph, Darvin D., 5,144,229, Cl. 324-158.00R
Kappele, William D., 5,143,547, Cl. 106-22.000
Stein, Irene F.; Webb, Steven L.; and Boyd, David W., 5,144,455, Cl. 358-443.000
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Vincent, Kent D., 5,144,498, Cl. 359-885.000
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Odaka, Kentaro; Ozaki, Shinya; and Milthorp, Brian, 5,144,500, Cl. 362-32.000

Heywang, Ulrich; Martin, Roland; and Stein, Ingeborg, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Dialkoxybenzylidene-camphor derivatives. 5,144,081, Cl. 568-326.000

Hi Tachi, Ltd.: *See—*
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Hibi, Masayuki; Funahashi, Yoshiki; and Goto, Katsuhiro, to Tokai Rubber Industries, Ltd. Fluid-filled mounting device. 5,143,358, Cl 267-140.130.

Hida, George T., to Benchmark Structural Ceramics Corporation Process for making a reaction-sintered carbide-based composite body with controlled combustion synthesis. 5,143,668, Cl. 264-63.000

Hida, Junichi; Tatematsu, Susumu; and Uchida, Naoya, to Hoshizaki Denki Kabushiki Kaisha. Auger type ice making machine. 5,142,878, Cl. 62-137.000.

Hidaka, Hidenori: *See—*
Sakamoto, Masaharu; Yamaguchi, Shigeru; Mukai, Kazuhiko; Matsumoto, Yukio; Suzuki, Shinji; Katsu, Toshiyuki; Iizuka, Tatsushi; Yatsuhashi, Kiyomi; and Hidaka, Hidenori, 5,142,959, Cl. 84-645.000.

Hideshima, Makoto; Tsunoda, Tetsujiro; Kojima, Shinjiro; and Ando, Masaru, to Kabushiki Kaisha Toshiba. Metal bump type semiconductor device and method for manufacturing the same. 5,143,865, Cl 437-183.000

Higashimata, Akira; Fujishiro, Takeshi; and Yoshioka, Shigeki, to Nissan Motor Co., Ltd. Hydraulic modulator with equal, opposing chambers formed by a piston. 5,143,429, Cl. 303-115.0EC.

Higashino, Kiyoharu; Matsumoto, Sakae; and Kihara, Hiroshi, to Nippon Seiko Kabushiki Kaisha. Tilt type steering device. 5,143,402, Cl. 280-775.000

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Higashitsutsumi, Yoshihito, to Sanyo Electric Co., Ltd. Solid-state image pickup apparatus having a plurality of photoelectric transducers arranged in a matrix. 5,144,445, Cl. 358-213.110.

Higgins, Charles T.: *See—*
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Higgins, Thomas P.: *See—*
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Higuchi, Shigemitsu: *See—*
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Hikosaka, Kohki, to Fujitsu Limited. High electron mobility transistor 5,144,378, Cl. 357-22.000.

Hilal, Mohamed A.; Lloyd, Jerry D.; and Crapo, Alan D., to Emerson Electric Co. Superconducting brushless homopolar motor with multiple winding rotor. 5,144,179, Cl. 310-178.000

Hilgers, Lucas A. T.: *See—*
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Hill, John C.: *See—*
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Hillman, Robert S.; Cobb, Michael E.; Allen, Jimmy D.; Gibbons, Ian; Ostoich, Vladimir E.; and Winfrey, Laura J., to Biotrack, Inc. Capillary flow device. 5,144,139, Cl. 250-341.000

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Hilsenrath, Oliver: *See—*
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Himont Incorporated: *See—*
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Hinck, Ernest C.: *See—*
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Hinkle, Luke D., to MKS Instruments, Inc. Constant temperature gradient fluid mass flow transducer. 5,142,907, Cl. 73-204.120.

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Hioki, Chieko: *See—*
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Hirabayashi, Atsushi; Murakami, Kyoichi; Komori, Kenji; and Ishihara, Masaaki, to Sony Corporation Operational amplifier circuit. 5,144,169, Cl. 307-490.000.

Hirabayashi, Terumi: *See—*
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Hirabayashi, Yoshio; Tochikura, Tatsurokuro; Kadowaki, Setsu; and Yamamoto, Kenji, to Toyo Jozo Company, Ltd. Ganglioside ceramidase and process for producing same. 5,143,841, Cl. 435-227.000.

Hirahata, Shinichi: *See—*
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Hirai, Masaru: *See—*
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Hirakawa, Tatsuo: *See—*
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Hirao, Mitsuru; Minami, Masataka; and Shukuri, Shoji, to Hitachi, Ltd. Semiconductor device and method for fabricating same. 5,144,394, Cl. 357-23.110.

Hirasawa, Masahide: *See—*
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Hirata, Yuko: *See—*
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Hirose, Ichiro, to Mazda Motor Corporation. Lubrication system for V-type overhead camshaft engine. 5,143,034, Cl. 123-196.00R.

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Takahashi, Koichi; Okutsu, Kazuo; Takahashi, Hisashi; Hirose, Masuhiko; Ichikawa, Haruo; Kitagawa, Kuniharu; and Kataoka, Hideaki, 5,144,350, Cl. 354-275.000.

Hirota, Eiichi: *See—*
Morita, Hiroshi; Hirota, Eiichi; and Ishizaki, Yasuo, 5,144,060, Cl. 560-170.000.

Hirota, Katsuaki: *See—*
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Fumiaki; and Hirota, Katsuaki, 5,144,450, Cl. 358-227.000.

Hirota, Koichi: *See—*
Saitou, Noboru; Hirota, Koichi; Hasebe, Ren; Okuda, Norimasa; and Katsumi, Ikuyo, 5,144,064, Cl. 562-416.000.

Hirsch, Heinz: *See—*
Korfgen, Harald; Hirsch, Heinz; and Grendel, Vinzenz, 5,143,349, Cl. 251-314.000.

Hisatomi, Ryoichi: *See—*
Suzuki, Hideaki; Matsuzaki, Kiyohie; Kato, Kazuo; Oono, Mitsuo; Takeichi, Kenzo; Hisatomi, Ryoichi; Isobe, Mitsunobu; Fujimori, Shigeru; and Nemoto, Kouzou, 5,144,683, Cl. 382-16.000.

Hishiyama, Sadao: *See—*
Suzuki, Hiroyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Ohno, Tomoyuki; Yahisa, Yotsuo Matsuda, Yoshibumi; Tsumita, Norikazu; Ohura, Masaki; Shirakura, Takaaki; Shige, Noriyuki; and Takagi Kazumasa, 5,143,794, Cl. 428-611.000.

Hitachi Cable, Ltd.: *See—*
Toya, Shigeo; Hiramoto, Yoshiyuki; Sasaki, Koji; Abe, Koichi; Teraoka, Tatsuo; Shiga, Hirokazu; and Yoshie, Yasunori, 5,142,763, Cl. 29-517.000.

Hitachi Keiyo Engineering Co., Ltd.: *See—*
Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, 5,144,555, Cl. 364-419.000.

Hitachi Koki Co., Ltd.: *See—*
Oba, Sayoko; Okuna, Kenji; Muroi, Katsumi; Ouchi, Katsubumi; Iimura, Tsutomu; and Kojima, Ryoji, 5,144,343, Cl. 346-155.000.

Hitachi, Ltd.: *See—*
Akimoto, Hajime; Ohba, Shinya; and Mitsui, Mitsuyuki, 5,144,447, Cl. 358-213.110.
Date, Hiroshi; and Hayashi, Terumine, 5,144,563, Cl. 364-491.000.
Funatsu, Kenzo; Ito, Takashi; Yashiki, Naoki; Kubumura, Chiaki; and Kubuyama, Keiji, 5,144,626, Cl. 370-110.300.
Go, Hiroshi; Zushi, Shizuo; and Miyamoto, Mitsuo, 5,144,531, Cl. 361-382.000.
Hasegawa, Tsuyoshi; Hosaka, Sumio; Hosoki, Shigeyuki; Honda, Yukio; and Ichikawa, Masakazu, 5,144,128, Cl. 250-306.000.
Hirao, Mitsuru; Minami, Masataka; and Shukuri, Shoji, 5,144,394, Cl. 357-23.110.
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, 5,144,505, Cl. 360-85.000.
Kikuchi, Makoto; Ohura, Masato; Tamata, Shin; Chino, Koichi; and Funabashi, Kiyomi, 5,143,654, Cl. 252-629.000.
Kitajima, Shigeki; Yamashita, Kiichi; Sasaki, Shinya; and Tsushima, Hideaki, 5,144,467, Cl. 359-124.000.
Kobayashi, Hiroyuki; Kanaya, Koichi; Baba, Norio; and Ogasawara, Mitsuo, 5,144,129, Cl. 250-307.000.
Kobayashi, Toshinori; Tsunoda, Masahiro; Furukawa, Takayasu; and Kobayashi, Isao, 5,142,791, Cl. 33-573.000.
Kurihara, Nobuo; Kaneyasu, Masayoshi; and Ishii, Junichi, 5,144,560, Cl. 364-431.040.
Mozume, Teruo; and Ohbu, Isao, 5,144,603, Cl. 369-44.140.
Mukaihira, Takashi; Sugiura, Noboru; and Kobayashi, Royoichi, 5,143,553, Cl. 123-609.000.
Oba, Sayoko; Okuna, Kenji; Muroi, Katsumi; Ouchi, Katsubumi; Iimura, Tsutomu; and Kojima, Ryoji, 5,144,343, Cl. 346-155.000.
Suga, Atsuo; and Higuchi, Shigemitsu, 5,144,453, Cl. 358-311.000.
Suzuki, Hideaki; Matsuzaki, Kichie; Kato, Kazuo; Oono, Mitsuo; Takeichi, Kenzo; Hisatomi, Ryoichi; Isobe, Mitsunobu; Fujimori, Shigeru; and Nemoto, Kouzou, 5,144,683, Cl. 382-16.000.
Suzuki, Hiroyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Ohno, Tomoyuki; Yahisa, Yotsuo; Matsuda, Yoshibumi; Tsumita, Norikazu; Ohura, Masaki; Shirakura, Takaaki; Shige, Noriyuki; and Takagi Kazumasa, 5,143,794, Cl. 428-611.000.
Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, 5,144,555, Cl. 364-419.000.
Takaragi, Kazuo; Ishii, Yasuhiro; and Nakamura, Tsutomu, 5,144,665, Cl. 380-30.000.
Takeda, Katsumi; Saitoh, Tadashi; Takeuchi, Takashi; and Iida, Junichi, 5,144,609, Cl. 369-44.410.
Takiyasu, Yoshihiro; Tanaka, Toshiki; Asano, Michio; Ohno, Masashi; and Kozaki, Takahiko, 5,144,622, Cl. 370-85.130.
Yuhara, Akitsuna; Sasaki, Jun; Isomae, Hiromi; Kawakubo, Shozi; and Yamada, Jun, 5,144,185, Cl. 310-313.00B.

Hitachi, Ltd: *See—*
Kakumoto, Shigeru; Kato, Masayasu; Otsu, Fumitaka; and Watanabe, Kazuo, 5,144,679, Cl. 382-1.000.

Hitachi Metals, Inc., Ltd.: *See—*
Doser, Manfred, 5,143,560, Cl. 148-101.000.

Hitachi Metals, Ltd.: *See—*
Oba, Sayoko; Okuna, Kenji; Muroi, Katsumi; Ouchi, Katsubumi; Iimura, Tsutomu; and Kojima, Ryoji, 5,144,343, Cl. 346-155.000.
Watanabe, Junichi; Someji, Takahiro; Watanabe, Yoshiyuki; and Jomura, Shigeru, 5,144,528, Cl. 361-321.000.

Hitachi Seiko, Ltd.: *See—*
Kakumoto, Shigeru; Kato, Masayasu; Otsu, Fumitaka; and Watanabe, Kazuo, 5,144,679, Cl. 382-1.000.

Hittich, Reinhard: *See—*
Krause, Joachim; Geelhaar, Thomas; Hittich, Reinhard; Finkenzeller, Ulrich; Rieger, Bernhard; and Weber, Georg, 5,143,642, Cl. 252-299.610.

Hiwatashi, Yutaka: *See—*
Kamimura, Katsuyoshi; Mine, Atsushi; and Hiwatashi, Yutaka, 5,144,559, Cl. 364-424.050.

Hlinka, Joseph W.: *See—*
Glassman, Barry S.; Stelts, Philip D.; Hlinka, Joseph W.; Beechan, Charles R.; and Foster, Lester A., Jr., 5,143,683, Cl. 266-246.000.

Ho, Jung H. Innovated limb covering. 5,143,762, Cl. 428-35.700.

Ho, Walford W.: *See—*
Camarota, Rafael C.; Furtek, Frederick C.; Ho, Walford W.; and Browder, Edward H., 5,144,166, Cl. 307-465.100.

Hochgesang, Gerhard: *See—*
Oelsch, Jurgen; Hochgesang, Gerhard; Limpert, Rudolf; and Weber, Dieter, 5,144,567, Cl. 364-708.000.

Hochstein, Peter A.: *See—*
Tenenbaum, Jeffrey; Hochstein, Peter A.; and Okuyama, Teiji, 5,144,231, Cl. 324-164.000.

Hodacova, Jana: *See—*
Beer, Paul D.; Hodacova, Jana; and Stokes, Sally, 5,144,052, Cl. 556-144.000.

Hodel, Reinhold: *See—*
Lehmann, Rolf; and Hodel, Reinhold, 5,143,202, Cl. 198-670.000.

Hoechest Celanese Corporation: *See—*
Pampalone, Thomas R., 5,143,814, Cl. 430-165.000.

Hoechst Aktiengesellschaft: *See—*
Baader, Ekkehard; Bickel, Martin; Brocks, Dietrich; Gunzler, Volkmar; Henke, Stephan; and Hanauske-Abel, Hartmut, 5,143,926, Cl. 514-354.000.
Hammer, Klaus-Dieter; Siebrecht, Manfred; and Winter, Hermann, 5,143,584, Cl. 162-175.000.
Joerg, Klaus, 5,143,813, Cl. 430-162.000.
Knieps, Rudolf; Jaenicke, Ottanar; and Schonfeld, Walter, 5,144,033, Cl. 544-273.000.
Lang, Hans-Jochen; Granzer, Ernold; and Kerekjarto, Bela, 5,143,937, Cl. 514-603.000.
Sextro, Gunter; Muck, Karl-Friedrich; Burg, Karlheinz; and Fischer, Eberhard, 5,144,005, Cl. 528-480.000.
Stahlhofen, Paul, 5,143,815, Cl. 430-192.000.
Wenz, Ute; and Beer, Ekkehard, 5,143,766, Cl. 428-40.000.

Hoechst Celanese Corp.: *See—*
Gupta, Balaram, 5,143,947, Cl. 522-121.000.
Haas, David; Yoon, Hyun-Nam; and Teng, Chia-Chi, 5,143,577, Cl. 156-625.000.
Smith, Brad L.; Torrence, G. Paull; Aguilo, Adolfo; and Alder, James S., 5,144,068, Cl. 562-519.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Hrib, Nicholas J.; and Jurcak, John G., 5,143,923, Cl. 514-321.000.

Hoelderich, Wolfgang; Naeumann, Fritz; and Fischer, Rolf, to BASF Aktiengesellschaft. Preparation of alkenecarboxylic esters. 5,144,061, Cl. 560-212.000.

Hoenninger, John, III: *See—*
Zeilenga, Jack H.; and Hoenninger, John, III, 5,144,242, Cl 324-312.000.

Hoesch Metall & Kunststoffwerk GmbH & Co.: *See—*
Klotzbach, Manfred, 5,142,714, Cl. 4-542.000.

Hoffmann-La Roche, Inc.: *See—*
Burner, Serge; and Widmer, Ulrich, 5,143,912, Cl. 514-210.000.

Hogerton, Peter B.: *See—*
Pujol, Jean-Marc P.; Hall, Joyce B.; Hogerton, Peter B.; McCormick, Fred B.; and Tingerthal, Jeanne M., 5,143,785, Cl. 428-352.000.

Hogetsu, Akihiko: *See—*
Hara, Tatsuo; Hogetsu, Akihiko; and Uegaki, Shigeo, 5,143,275, Cl. 228-119.000.

Hogue, Timothy D.: *See—*
Lewis, Edward D.; and Hogue, Timothy D., 5,143,439, Cl. 362-103.000.

Hoki, Tetsuo: *See—*
Kitakado, Ryuji; Yano, Hironobu; Kakuma, Hiroaki; Hoki, Tetsuo; and Kanai, Takao, 5,144,681, Cl. 382-8.000.

Holden, John G.: *See—*
Giddens, Len; White, John C.; and Holden, John G., 5,143,438, Cl. 362-84.000.

Holland, Gregory R.: *See—*
Iba, Wayne S.; Holland, Gregory R.; Moore, Alix A.; and York, Walter A., 5,143,104, Cl. 134-135.000.

Holland, Ian B.; Mackman, Nigel; and Nicaud, Jean-Marc. Process for the production of a polypeptide. 5,143,830, Cl. 435-69.700.

Hollenberg, Jane; Lombardi, Lou A.; and Tietjen, Marlene, to Revlon, Inc. Cosmetic makeup compositions comprising water-in-oil emulsions containing pigment. 5,143,722, Cl. 424-63.000.

Holmgren, Jennifer S.: *See—*
Arena, Blaise J.; and Holmgren, Jennifer S., 5,144,089, Cl. 568-463.000.

Holtinger, Lillemor K.: *See—*
Basta, Jiri J.; Holtinger, Lillemor K.; Samuelsson, Marie R.; and Lundgren, Per G, 5,143,580, Cl. 162-40.000.

Holtsmark, Eric B. Variable size pipe connector. 5,143,408, Cl 285-93.000.

Home Fashions, Inc.: *See—*
John, Julius F., 5,143,136, Cl. 160-173.000.

Hon, Jeffrey S.: *See—*
Freymuth, Donald C.; Hon, Jeffrey S.; Lange, Dale K.; Paulus, Gerald J.; Petrykowski, Thomas F.; and Turner, Robert L., 5,142,987, Cl. 104-17.200.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hamada, Akio; Ohtaki, Keizaburo; Kubo, Takashi; and Sasamoto, Hiroshi, 5,143,270, Cl. 228-4.100.
Ushio, Hideaki; Nishimoto, Seiji; and Tamenori, Koji, 5,142,863, Cl. 60-272.000.

Honda, Katsuhiko: *See—*
Satoh, Hiroshi; Utsui, Yoshihiko; Honda, Katsuhiko; and Hasegawa, Masahiko, 5,142,919, Cl. 73-862.333.

Honda, Masami; and Sato, Youji, to Kabushiki Kaisha Toshiba. Display unit attachment device. 5,144,290, Cl. 340-711.000.

Honda, Michitaka, to Kabushika Kaisha Toshiba. Image processing apparatus including spatial shift variant filter. 5,144,687, Cl. 382-54.000.

Honda, Syuichi: *See—*
Gotoh, Hiroshi; Maeda, Ikuo; and Honda, Syuichi, 5,144,617, Cl. 369-244.000.

Honda, Tadatoshi; Nagayama, Tokio; Horiuchi, Nobuhiko; Kitagawa, Jun; Kawahara, Kazunori; and Murakami, Masami, to Mitsui Toatsu Chemicals, Inc. Method for preparing acrolein or methacrolein. 5,144,090, Cl. 568-476.000.

Honda, Yukio: *See—*
Hasegawa, Tsuyoshi; Hosaka, Sumio; Hosoki, Shigeyuki; Honda, Yukio; and Ichikawa, Masakazu, 5,144,128, Cl. 250-306.000.

Honeywell Inc.: *See—*
Adams, John T.; Tinsley, T. Michael; and Brown, Phyllis L., 5,144,309, Cl. 341-155.000.
Frische, Richard H., 5,142,912, Cl. 73-702.000.
Menahem, Israel, 5,142,931, Cl. 74-471.0XY.
Nasar, Hatem N.; and Bhanu, Bir, 5,144,685, Cl. 382-48.000.
Weverka, Robert T., 5,144,468, Cl. 359-173.000.

Hoogovens Groep BV: *See—*
Wittebrood, Hubertus A. J., 5,143,356, Cl. 266-179.000.

Hoornaert, Pierre. *See—*
Gallo, Roger; Hoornaert, Pierre; and Roman, Jean-Philippe, 5,143,633, Cl. 252-18.000.

Hoover, Delmer Q.: *See—*
George, Raymond A.; Hoover, Delmer Q.; Shockling, Larry A.; and Reichner, Philip, 5,143,800, Cl. 429-20.000.

Hoover, Don R., to CTB, Inc. Rod conveyor switch. 5,143,206, Cl. 198-810.000.

Horan, Ann C.: *See—*
Patel, Mahesh; Horan, Ann C.; Marquez, Joseph A.; and Waitz, J. Allan, 5,143,832, Cl. 435-126.000.

Horan, Philip R. Portable holographic recording apparatus. 5,144,461, Cl. 359-30.000.

Horie, Nobuyuki; Yamanaka, Toshihiro; Yamane, Daiji; and Sakamoto, Noriaki, to Sharp Kabushiki Kaisha. Test mode switching system for LSI. 5,144,627, Cl. 371-22.100.

Horiguchi, Toshio, to Olympus Optical Co., Ltd. Method of recording data on optical card by performing blank checking without scanning an entire track. 5,144,610, Cl. 369-58.000.

Horishi, Nanao: *See—*
Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu, and Horishi, Nanao, 5,143,548, Cl. 106-459.000.

Horikoshi, Hiroyoshi: *See—*
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi; Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, 5,143,930, Cl. 514-369.000.

Horikoshi, Koki: *See—*
Nakatsugawa, Naoki; and Horikoshi, Koki, 5,143,835, Cl. 435-167.000.

Horio, Hirofumi: *See—*
Itakura, Takayuki; Teshima, Takashi; Iida, Tomohide; and Horio, Hirofumi, 5,143,811, Cl. 430-111.000.

Horiuchi, Nobuhiko: *See—*
Honda, Tadatoshi; Nagayama, Tokio; Horiuchi, Nobuhiko, Kitagawa, Jun; Kawahara, Kazunori; and Murakami, Masami, 5,144,090, Cl. 568-476.000.

Hornbaker, Cecil V., III; Driggers, Thomas C.; and Bindon, Edward W., to Vidar Systems Corporation. Scanning apparatus using multiple CCD arrays and related method. 5,144,448, Cl. 358-213.130.

Horne, John N.; and Wolf, Michael A. Cartridge monitoring and display system for a firearm. 5,142,805, Cl. 42-1.020.

Hornstein, Otto P.: *See—*
Nurnberg, Eberhard; Leonhardt, Uwe; Hornstein, Otto P.; Gressmeyer, Gabriele; and Perschbacher, Harald, 5,143,940, Cl 514-785.000.

Hornstein, Roland, to Franz Hornstein GmbH & Co. KG. Lifting hoist for motor vehicles. 5,143,179, Cl 187-8.410.

Horstmann, Matthias: *See—*
Behr, Peter; and Horstmann, Matthias, 5,143,010, Cl. 114-75.000.

Hosaka, Sumio: *See—*
Hasegawa, Tsuyoshi; Hosaka, Sumio; Hosoki, Shigeyuki; Honda, Yukio; and Ichikawa, Masakazu, 5,144,128, Cl. 250-306.000.

Hoshi, Teruo: *See—*
Katoh, Hideaki; Noguchi, Nobuhisa, Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Kitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, 5,144,539, Cl. 362-256.000.

Hoshino, Yasuharu, to NEC Corporation. Semiconductor memory device. 5,144,584, Cl. 365-222.000.

Hoshizaki Denki Kabushiki Kaisha: *See—*
Hida, Junichi; Tatematsu, Susumu; and Uchida, Naoya, 5,142,878, Cl. 62-137.000.

Hosokawa, Kazutaka: *See—*
Shimizu, Tetsuo; and Hosokawa, Kazutaka, 5,143,783, Cl 428-327.000.

Hosokawa, Masahiko: *See—*
Sasaki, Takao; Murakami, Kunihiko; and Hosokawa, Masahiko, 5,144,213, Cl. 318-569.000.

Hosoki, Shigeyuki: *See—*
Hasegawa, Tsuyoshi; Hosaka, Sumio; Hosoki, Shigeyuki; Honda, Yukio; and Ichikawa, Masakazu, 5,144,128, Cl. 250-306.000.

Hotomi, Hideo; and Myochin, Hisashi, to Minolta Camera Kabushiki Kaisha. Inkjet printer with an electric curtain force. 5,144,340, Cl 346-140.00R.

Hotta, Sadayoshi: *See—*
Otsuka, Akira; Ishihara, Shin-Ichiro; Miyatake, Yoshito; and Hotta, Sadayoshi, 5,144,462, Cl. 359-41.000.

Hou, Hsien-Te, to. Flashlight ball-point pen. 5,143,465, Cl. 401-195.000.

Hough International, Inc.: *See—*
Hough, Richard M., 5,143,165, Cl. 177-59.000.

Hough, Richard M., to Hough International, Inc. Liquid weigh system 5,143,165, Cl. 177-59.000.

Hough, Richard M. Micro weighing system. 5,143,166, Cl. 177-128.000.

Houh, Henry H.: *See—*
Gabriel, M. Christina; Houh, Henry H.; and Whitaker, Norman A., 5,144,375, Cl. 356-345.000.

Hovis, Keith W., to Phillips Petroleum Company. Fluid flow control and isolation. 5,143,703, Cl. 422-208.000.

Howard, Carl J.; and Wrobel, Donald ., to Sheffer Collet Company. Rapid change wedge chuck with positive lock. 5,143,687, Cl. 279-123.000
Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Preparation of catalytically active fillers for polyolefin composites. 5,143,549, Cl. 106-499.000.
Howard, Jimmy R.: *See*—
Hunt, Don; and Howard, Jimmy R., 5,143,170, Cl. 182-3.000.
Howie-Meyers, Catherine L.: *See*—
Elliott, David L.; and Howie-Meyers, Catherine L., 5,143,719, Cl. 424-52.000.
Hrib, Nicholas J.; and Jurcak, John G., to Hoechst-Roussel Pharmaceuticals Inc. Benzoisothiazole- and benziosoxazole-3-carboxamides. 5,143,923, Cl. 514-321.000.
Huala, Eva; and Ausubel, Frederick M., to General Hospital Corporation, The. Protease deficient bacterial hosts. 5,143,846, Cl. 435-252.330.
Huang, Ching-Shiang. Variable speed transmission mechanism 5,142,926, Cl. 74-190.000.
Huang, Fu-Juh: *See*—
Chen, Shien-Chang; Cheng, Wan-ay; Lin, Fu-Shen; and Huang, Fu-Juh, 5,144,062, Cl. 560-239.000.
Huang, Wen-Ling M.: *See*—
Chiang, Shang-yi; Huang, Wen-Ling M.; Drowley, Clifford I.; and Voorde, Paul V., 5,144,403, Cl. 357-49.000.
Huard, Jeffrey M., to National Semiconductor Corporation. High-speed differential-feedback cascode sense amplifier. 5,144,171, Cl. 307-530.000.
Hubbs, John C. Process for preparation of dipeptides. 5,144,073, Cl. 564-164.000.
Huck Manufacturing Co.: *See*—
Jeffery, Keith S., 5,142,774, Cl. 29-410.000.
Huebner, Peter B., to Outboard Marine Corporation. Center console including storage locker. 5,143,013, Cl. 114-343.000.
Huels Aktiengesellschaft: *See*—
Kowalczik, Udo; Neugebauer, Wolfgang; and Bartmann, Martin, 5,144,002, Cl. 528-218.000.
Huenefeld, James A.: *See*—
Chamblin, Robert O., Sr.; Huenefeld, James A.; Hulva, Randal E.; and Menk, John R., 5,142,908, Cl. 73-319.000.
Huff, Michael A.: *See*—
Mettner, Michael; Schmidt, Martin A.; Lober, Theresa; and Huff, Michael A., 5,142,781, Cl. 29-890.124.
Hughes Aircraft Company: *See*—
Baker, Leland R.; and Golden, Lewis J., 5,144,422, Cl. 358-109.000
LeCompte, George W., 5,143,319, Cl. 244-3.120.
Matossian, Jesse N.; Wysocki, Joseph A.; Wilson, Robert G.; Yamagishi, Frederick G.; and Rountz, Edward F., Jr., 5,143,747, Cl. 427-38.000.
Vu, Thanh; and Shih, Tsen-Tsou, 5,144,526, Cl. 361-321.000.
Hughes, Leon D. Clutch drive differential system. 5,142,943, Cl. 74-650.000
Hughes, Russell H.: *See*—
Greenway, John M.; and Hughes, Russell H., 5,142,752, Cl. 28-105.000.
Hui, Titkwan, to Dallas Semiconductor Corporation. Programmable delay line integrated circuit having programmable resistor circuit 5,144,173, Cl. 307-603.000.
Hulick, Troy: *See*—
Carter, Andrew; and Hulick, Troy, 5,144,302, Cl. 341-20.000.
Huls Aktiengesellschaft: *See*—
Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, 5,143,885, Cl. 502-202.000.
Hulva, Randal E.: *See*—
Chamblin, Robert O., Sr.; Huenefeld, James A.; Hulva, Randal E.; and Menk, John R., 5,142,908, Cl. 73-319.000.
Humphrey, Keith D.: *See*—
Kilner, David N.; Humphrey, Keith D.; Little, Lionel M.; Carr, Duncan R.; and Sharp, Lewis C., 5,143,534, Cl. 65-21.300.
Hung, Chi-Wen; and Reynolds, Bruce E., to Chevron Research and Technology Company. Catalyst system for removal of calcium from a hydrocarbon feedstock. 5,143,887, Cl. 502-259.000.
Hunsinger, Billy J., to Electronic Decisions Incorporated. Acoustic charge transport selectable delay line and delay line oscillator formed therewith. 5,144,262, Cl. 331-107.00..
Hunt, Don; and Howard, Jimmy R. Safety device for roof work 5,143,170, Cl. 182-3.000.
Hunt Holdings, Inc.: *See*—
Thorn, William M., 5,142,996, Cl. 108-153.000.
Hunter, Alastair W.: *See*—
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., 5,143,082, Cl. 128-749.000.
Hunts, Rick E. Vacuum-drawn hair clipper. 5,142,786, Cl. 30-133.000.
Huntsman, Lewis R.: *See*—
Taylor, Robert D.; and Huntsman, Lewis R., 5,143,567, Cl. 149-35.000.
Hurley, Anne A.: *See*—
Lapidus, Stanley N.; Polk, Lewis T., Jr.; Farber, Fredric L.; Barlas, J. Morgan; and Hurley, Anne A., 5,143,627, Cl. 210-767.000
Husain, Farouk; and Mowforth, Edwin. Airship handling system. 5,143,323, Cl. 244-116.000.
Husky Injection Molding Systems Ltd.: *See*—
Von Buren, Stefan; and Akselrud, Vitaly, 5,143,733, Cl. 425-130.000.
Husky Oil Operations Ltd.: *See*—
Ferris, Frederick G.; and Stehmeier, Lester G., 5,143,155, Cl. 166-246.000.
Hustead, Russell M.: *See*—
Kelso, Jimmie J.; Hustead, Russell M.; and Miller, Walter T., 5,142,720, Cl. 5-630.000.
Hutchens, Douglas R.: *See*—
Sessions, George C.; Mills, Chuck D.; Parrish, Bradford J.; and Hutchens, Douglas R., 5,142,721, Cl. 7-128.000.
Hutchinson, Franklin D.; and Schmidt, William. Vibration dampened dual mirror apparatus for a vehicle. 5,143,342, Cl. 248-476.000
Hutchison, Wayne R.: *See*—
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Integrated Systems Engineering, Inc.: *See*—
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Intermedics, Inc.: *See*—
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Basso, James E., Bhalla, Parmesh K.; Chahine, John J.; Diddell, Daro; Earle, Gregory J.; Gabriel, Edward P.; and Yaghmaie, Farrokh, 5,143,103, Cl. 134-98.100.
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Kotecha, Harish N.; Protschka, Hans A.; Stanasolovich, Dave; and Theisen, Jake, 5,143,820, Cl. 430-314.000
Rouse, Gerlad L., 5,144,293, Cl. 340-825.020
Sorna, Michael A.; and Papac, Donald J., 5,144,228, Cl. 324-158.00P
Wang, Diana S.; and Williams, Marvin L., 5,144,556, Cl. 364-419.000.
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Greenway, John M.; and Hughes, Russell H., 5,142,752, Cl. 28-105.000.
Iranmanesh, Ali A.; and Ganschow, George E., to National Semiconductor Corporation. Polysilicon Schottky clamped transistor and vertical fuse devices. 5,144,404, Cl. 357-51.000
Irie, Yoichiro; Takeda, Yoshiyuki; Nagao, Tsuyoshi; and Kida, Yasuhiko, to Mita Industrial Co., Ltd. Automatic document conveying device. 5,143,363, Cl. 271-6.000
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Ishida, Tomoyuki; and Kobayashi, Yuhei, to Sony Corporation. Objective lens driving device. 5,144,607, Cl. 369-44.150.

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Ishihara, Kanji; and Oka, Tsumoru, to Alps Electric Co., Ltd. Sealing structure for electrical parts. 5,144,27[illegible], Cl. 338-164.000.

Ishihara, Masaaki: *See*—
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Ishii, Yasuhiro: *See*—
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Isobe, Nobuyuki; and Watanabe, Isao, to Pioneer Electronic Corporation. Disc loading device. 5,144,612, Cl. 369-77.100.

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Ito, Shigehiro: *See*—
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Ito, Yasutaro: *See*—
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Ito, Yukihiro; Shigemura, Yutaka; Kondo, Takashi; Umezawa, Hideo; Yoshimoto, Mitsuharu; Yano, Satoshi; and Oura, Junichi, to Mita Industrial Co., Ltd. Image-forming apparatus providing with bookbinding device. 5,143,503, Cl. 412-37.000.

Itoh, Atsushi, to Sanyo Electric Co., Ltd. Dielectric filter having external connection formed on dielectric substrate. 5,144,269, Cl. 333-206.000.

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Itoh, Ken-ichi: *See*—
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Itoh, Shigeo; Yokoyama, Mikio; and Tsuburaya, Kazuhiko, to Futaba Denshi Kogyo K.K. Electron feeder for flat-type luminous device. 5,144,198, Cl. 313-422.000.

Itozaki, Hideo: *See*—
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Iwade, Takashi: *See*—
Nakayama, Takashi; and Iwade, Takashi, 5,142,856, Cl. 57-22.000.

Iwaki, Takashi; Shinjo, Kenji; Yoshida, Akio; Yamashita, Masataka; Katagiri, Kazuharu; Hioki, Chieko; Togano, Takeshi; Yamada, Yoko; and Terada, Masahiro, to Canon Kabushiki Kaisha. Optically active mesomorphic compound. 5,143,643, Cl. 252-299.610.

Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, to Mitsubishi Materials Corporation. Apparatus for manufacturing oxygen-free copper. 5,143,355, Cl. 266-160.000.

Iwasa, Tadanobu, to Toyoda Gosei Co., Ltd. Rubber shaped articles having a finishing layer and a process for production thereof. 5,143,772, Cl. 428-122.000.

Iwasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Method of manufacturing MES FET. 5,143,856, Cl. 437-22.000.

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Iwasaki, Masayuki: *See*—
Hatano, Hideki; Yokoi, Akira; Iwasaki, Masayuki; and Yamaji, Takashi, 5,144,463, Cl. 359-72.000.

Iwasaki, Mihoko: *See*—
Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, 5,144,555, Cl. 364-419.000.

Iwase, Fumio; and Mizuno, Kotaro, to Yamaha Corporation. Electronic musical instrument with automatic control of melody tone in accordance with musical style as well as tone color. 5,142,960, Cl. 84-662.000.

Iwata, Hiroshi; Noguchi, Shigeru; Ishida, Satoshi; Sano, Kenichi; and Nakayama, Shoichiro, to Sanyo Electric Co., Ltd. Semiconductor device which relieves internal stress and prevents cracking. 5,144,391, Cl. 357-23.700.

Iwata, Kouzou: *See*—
Fujita, Yuji; and Iwata, Kouzou, 5,144,203, Cl. 315-169.300.

Iwata, Noriyuki: *See*—
Shiraishi, Toru; Masuda, Shunji; and Iwata, Noriyuki, 5,143,036, Cl. 123-308.000.

Iwatani, Shiro; and Watanabe, Hirofumi, to Mitsubishi Denki K.K. Vehicle AC generator control system. 5,144,220, Cl. 322-28.000.

Iwazaki, Minoru: *See*—
Ohta, Noriaki; Iwazaki, Minoru; and Shiratori, Hiroyasu, 5,143,434, Cl. 362-29.000.

Izawa, Satoru; and Sumita, Mitsutaka, to Mitsubishi Denki K.K. Display processing apparatus. 5,144,212, Cl. 318-569.000.

J. D. Phillips Corporation: *See*—
Phillips, James D., 5,142,827, Cl. 51-281.00R.

J.P. Sheahan & Associates: *See*—
Sheahan, James P., 5,143,568, Cl. 156-64.000.

Jacket, Howard S.: *See*—
Baylor, George A.; and Jacket, Howard S., 5,143,436, Cl. 362-32.000.

Jackson, Michael L.: *See*—
Rossio, Richard C.; Easterle, Mark A.; and Jackson, Michael L., 5,143,941, Cl. 521-51.000.

Jackson, Thomas H., to Jackson, Thomas H. Folding protective cover for turbo-engines. 5,143,321, Cl. 244-536.000.

Jackson, Timothy C.; and Parks, Jeffrey G. School bus locator system. 5,144,301, Cl. 340-994.000.

Jacobelli, Henri: *See*—
Calvet, Alain; Grouhel, Agnes; Jacobelli, Henri; Junien, Jean-Louis; and Pascaud, Xavier, 5,143,938, Cl. 514-653.000.

Jaenicke, Ottanar: *See*—
Knieps, Rudolf; Jaenicke, Ottanar; and Schonfeld, Walter, 5,144,033, Cl. 544-273.000.

Jagers, Hans-Gerd: *See*—
Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, 5,143,885, Cl. 502-202.000.

Jaget, Charles W.: *See*—
Bonander, James; and Jaget, Charles W., 5,142,759, Cl. 29-130.000.

Jakubowicz, Raymond F.: *See*—
Barry, James V.; Jakubowicz, Raymond F.; and Hamann, J. Eric, 5,143,849, Cl. 436-50.000.

James, Gwilyn D.: *See*—
Allyson, Julian D.; Spackman, Ramon; and James, Gwilyn D., 5,144,140, Cl. 250-358.100.

James, Michael S.; Powell, Meliss A.; Nickerson, Mark A.; and Staats, Louis T., III, to Hewlett-Packard Company. Cooled pumping system. 5,142,875, Cl. 62-50.500.

James, Steven: *See*—
Carlomagno, Michael; Busch, Paul F.; and James, Steven, 5,143,272, Cl. 228-20.000.

JanFlow Ltd.: *See*—
Cardy, Ronald, 5,144,099, Cl. 174-66.000.

Jansen, Bernhard: *See*—
Muller, Hanns P.; Jansen, Bernhard; Calaminus, Wolfgang; and Dhein, Rolf, 5,144,055, Cl. 558-281.000.

Jansen, Franz; and Gros, Pierre, to Sanofi. Conjugates in which a monovalent carboxylic ionophore is associated by means of a covalent bond with a macromolecule, their use as immunotoxin potentiators and the intermediate activated inophores. 5,144,009, Cl. 530-363.000.

Jansen, Johannes R.; and Knops, Hans-Joachim, to Bayer Aktiengesellschaft. Process for working up the crystallization mother liquor from the resolution of the racemate of 1-(4-chlorophenyl)-ethylamine. 5,144,077, Cl. 564-438.000.

Jardinier, Pierre, to Societe d'Etude et de Recherche en Ventilation et Aeraulique S.E.R.V.A. Control device for a system regulating the ventilation flow of a controlled-atmosphere room, and functioning cycles thereof. 5,143,287, Cl. 236-493.000.

Jaspers, Albertus G. C.: *See*—
Stikkelorum, Simon G.; and Jaspers, Albertus G. C., 5,144,562, Cl. 364-478.000.

Jaus, Reinhard: *See*—
Glassel, Horst; Jaus, Reinhard; and Hellwig, Egbert, 5,143,575, Cl. 156-309.900.

Jautelat, Manfred; Stroech, Klaus; Hanssler, Gerd; Dutzmann, Stefan; Kuck, Karl-Heinz; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Microbicidal halogenoallyl-azolyl derivatives. 5,143,932, Cl. 514-383.000.

JBL, Incorporated: *See*—
Ashcraft, Daniel W.; and Romeo, Steve G., 5,143,339, Cl. 248-343.000.

Jeffery, Keith S., to Huck Manufacturing Co. Apparatus and method for loading fastener collars onto a mandrel. 5,142,774, Cl. 29-810.000.

Jelovich, Benjamin C.: *See*—
Gardner, Billy J.; Jelovich, Benjamin C.; O'Hara, Frank; and Secoura, Ralph A., 5,144,217, Cl. 320-2.000.

Jemb Rack Systems, Inc.: *See*—
Boudah, Michael, 5,143,415, Cl. 296-3.000.

Jenkins, Waylon L.; Rhodes, Gerry; and Rule, Mark, to Eastman Kodak Company. Process to prepare high molecule weight polyester. 5,143,984, Cl. 525-437.000.

Jenneve, Dany; and Misslin, Gilles, to Alcatel Business Systems. Power feed system for telephone and/or information technology terminals. 5,144,544, Cl. 363-21.000.

Jeon, Seungwon: *See*—
Sawyer, Donald T.; Jeon, Seungwon; and Tsang, Paul K. S., 5,143,710, Cl. 423-581.000.

Jeong, Ho-sun; and Lee, Sang-jin, to Samsung Electronics Co., Ltd. High speed floating point type multiplier circuit. 5,144,575, Cl. 364-748.000.

Jidosha Kiki Co., Ltd.: *See*—
Suzuki, Haruo, 5,142,964, Cl. 91-369.100.

Jimenez, Antonio; Combepine, Yves; and Deeplante, Patrice, to Mefina S.A. Contrivance for passing a grasping device for a thread into the eye of a sewing needle, and application of this contrivance. 5,143,005, Cl. 112-225.000.

Jimenez, Antonio, to Mefina S.A. Assembly for detachably mounting a tool on a driving member. 5,143,006, Cl. 112-226.000.

Jimenez, Antonio; and Deplante, Patrice, to Mefina S.A. Device for pivotable linkage between two levers. 5,143,470, Cl. 403-149.000.

Jin, Dae-Je: *See*—
Min, Dong-Sun; Kim, Chang-Hyun; and Jin, Dae-Je, 5,144,585, Cl. 365-226.000.

Jinbo, Haruo: *See*—
Endoh, Eiji; and Jinbo, Haruo, 5,143,587, Cl. 204-129.850.

Jindal, Prem C.: *See*—
Santhanam, Anakkavur T.; Godse, Rajendra V.; Quinto, Dennis T.; Undercoffer, Kenneth E.; and Jindal, Prem C., 5,143,488, Cl. 407-119.000.

Joel, Deborah L. Health game. 5,143,378, Cl. 273-243.000.

Joerg, Klaus, to Hoechst Aktiengesellschaft. Light-sensitive photopolymerizable and diazonium salt polycondensation product containing composition and recording material including a mixture of binders. 5,143,813, Cl. 430-162.000.

John, Julius F., to Home Fashions, Inc. Clip assembly for vertical louvers. 5,143,136, Cl. 160-173.000.

Johnson, Arthur C.: *See*—
Killion, Mead C.; Teder, Harry; Johnson, Arthur C.; and Hanke, Steven P., 5,144,675, Cl. 381-68.400.

Johnson Brothers Precision Precast Products, Inc: *See*—
Johnson, David L.; and Johnson, Robert A., 5,143,344, Cl. 249-120.000.

Johnson, David A.; Laguzza, Bennett C.; and Scott, William L., to Eli Lilly and Company. Cytotoxic drug conjugates. 5,144,012, Cl. 530-391.900.

Johnson, David A., to Vitesse Semiconductor Corporation. Ohmic contact for III-V semiconductor devices. 5,144,410, Cl. 357-63.000.

Johnson, David L.; and Johnson, Robert A., to Johnson Brothers Precision Precast Products, Inc. Apparatus for manufacturing precast concrete articles. 5,143,344, Cl. 249-120.000.

Johnson, Deborah L.: *See*—
Johnson, Rose A.; Johnson, Deborah L.; Rogers, Barbara J.; and Spain, Kenneth C., Jr., 5,143,246, Cl. 220-524.000.

Johnson, Donald B.: *See*—
Young, Douglas L. G.; and Johnson, Donald B., 5,143,220, Cl. 209-17.000.

Johnson, Donald C.: *See*—
Arie, Ben-Bassat; Bruner, Robert; Shoemaker, Sharon; Aloni, Yehoshua; Wong, Harry; Johnson, Donald C.; and Neogi, Amar, 5,144,021, Cl. 536-56.000.

Johnson, Jeffery W., to Du Pont de Nemours, E. I., and Company. Coating composition of polyesterurethane and multifunctional epoxy compound. 5,143,788, Cl. 428-423.300.

Johnson & Johnson Medical, Inc.: *See*—
Dyer, John; Mathews, Grace; and Major, Matthew M., 5,142,750, Cl. 26-29.00R.

Johnson, Knute. Golf club swinging guide. 5,143,376, Cl. 273-186.200.

Johnson, M. Ross; Peel, Michael R.; and Sternbach, Daniel D., to Glaxo Inc. Process for the synthesis of cyclopentene derivatives of purines. 5,144,034, Cl. 544-276.000.

Johnson Matthey Inc.: *See*—
Strothers, Susan D.; Delano, Robert G.; and Steed, Garold L., 5,143,590, Cl. 204-298.120.

Johnson, Michael J.; and Johnson, Rebecca K. Footflush adapter for urinals. 5,142,708, Cl. 4-249.000.

Johnson, Rebecca K.: *See*—
Johnson, Michael J.; and Johnson, Rebecca K., 5,142,708, Cl. 4-249.000.

Johnson, Robert A.: *See*—
Johnson, David L.; and Johnson, Robert A., 5,143,344, Cl. 249-120.000.

Johnson, Robert H.: *See*—
Stearns, Edward J.; and Johnson, Robert H., 5,142,984, Cl. 102-213.000.
Stearns, Edward J.; and Johnson, Robert H., 5,142,985, Cl. 102-213.000.

Johnson, Rose A.; Johnson, Deborah L.; Rogers, Barbara J.; and Spain, Kenneth C., Jr. Recycling garbage separator. 5,143,246, Cl. 220-524.000.

Johnson, Sheryl L.; and Clark, Bryan K., to Tandy Corporation. Thermal bulk erasure method for dye polymer optical media. 5,144,613, Cl. 369-100.000.

Johnson, Steven L.: *See*—
Anderman, Menahem; Johnson, Steven L.; Saft, Michael C.; and Zuckerbrod, David, 5,143,805, Cl. 429-217.000.

Johnson, Thomas A.: *See*—
Hale, Daniel E.; and Johnson, Thomas A., 5,143,198, Cl. 198-414.000.

Johnson, Willima B.: *See*—
Claar, Terry D.; Schiroky, Gerhard H.; and Johnson, Willima B., 5,143,870, Cl. 501-87.000.

Johnsrud, Darrell B.; and Raph, Darvin D., to Hewlett-Packard Company. Method for selectively conditioning integrated circuit outputs for in-circuit test. 5,144,229, Cl. 324-158.00R.

Johnston, James M. Geothermal heat converter. 5,143,150, Cl. 165-45.000.

Johnston, Otis A.; and Curto, Rick A., to Western Atlas International, Inc. Apparatus and method for use in marine seismic surveying. 5,144,588, Cl. 367-16.000.

Jomura, Shigeru: *See*—
Watanabe, Junichi; Someji, Takahiro; Watanabe, Yoshiyuki; and Jomura, Shigeru, 5,144,528, Cl. 361-321.000.

Jones, Donna L.: *See*—
Collins, David M., 5,143,392, Cl. 280-420.000.

Jones, Gary W.; and Sune, Ching-Tzong, to MCNC. Horizontal microelectronic field emission devices. 5,144,191, Cl. 313-308.000.

Jones, Richard P., to Jones, Richard P. Computer file protection system. 5,144,659, Cl. 380-4.000.

Jonkers, Godefridus H. J., to Wiva Verpakkingen B.V. Wheeled support frame for a removable plastic container having closure and actuating device. 5,143,389, Cl. 280-47.260.

Jordens, Ernst-Gunter; and Kammel, Helmut, to Lemforder Metallwaren AG. Elastic sliding bearing. 5,143,456, Cl. 384-275.000.
Joseph, Kuriacose, to General Electric Company. Apparatus for hierarchically dividing video signals. 5,144,425, Cl. 358-133.000.
Jouveinal S.A.: *See*—
Calvet, Alain; Grouhel, Agnes; Jacobelli, Henri; Junien, Jean-Louis; and Pascaud, Xavier, 5,144,938, Cl. 514-653.000.
JTT International, Inc.: *See*—
Lin, J. T., 5,144,630, Cl. 372-22.000
Junghans Uhren GmbH: *See*—
Blaich, Wilfried; Flaig, Oskar; Ganter, Wolfgang; Kaiser, Hans; Kussmaul, Ewald; Maurer, Roland; and Riis, Peter, 5,144,599, Cl. 368-10.000.
Junien, Jean-Louis: *See*—
Calvet, Alain; Grouhel, Agnes; Jacobelli, Henri; Junien, Jean-Louis; and Pascaud, Xavier, 5,144,938, Cl. 514-653.000.
Jurcak, John G.: *See*—
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Jurell, Scott R.: *See*—
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Jurmu, Douglas C.: *See*—
Sandberg, L. Bogue; Haataja, Bruce A.; Jurmu, Douglas C.; Palardy, Robert D.; Story, Frank H.; and Yates, William A., 5,142,994, Cl. 108-53.300.
Juster, Robert W. Resilient keyboard rest and lap adapter. 5,143,341, Cl. 248-444.000
Jutamulia, Suganda; Storti, George M.; and Lindmayer, Joseph, to Quantex Corporation. Optical image subtraction employing electron trapping materials. 5,144,145, Cl. 250-484.100.
K. G. Roberts & Associates, Inc.: *See*—
Roberts, Kenneth G.; and Roberts, Elaine E., 5,143,212, Cl. 206-223.000.
K. J. Law Engineers, Inc.: *See*—
Brown, Gordon R.; and Targos, Thomas C., 5,144,565, Cl. 364-507.000
K-Tron Technologies, Inc.: *See*—
Lehmann, Rolf; and Hodel, Reinhold, 5,143,202, Cl. 198-670.000.
Kaanta, Carter W.; and Roberts, Stanley, to International Business Machines Corporation. Method and structure for providing improved insulation in VLSI and ULSI circuits. 5,144,411, Cl. 357-68.000
Kabelmetal Electro GmbH: *See*—
Neely, Nicholas H., 5,142,776, Cl. 29-859.000.
Ziemek, Gerhard B.; Peshkov, Dmitrij G.; Svalov, Grigorij; Sytnikov, Victor E.; and Mitrochin, Valerij A., 5,143,897, Cl. 505-1.000
KabiGen AB: *See*—
Abrahmsen, Lars; Moks, Tomas; Nilsson, Bjorn; and Uhlen, Mathias, 5,143,844, Cl. 435-257.30
Kabushika Kaisha Toshiba: *See*—
Honda, Michitaka, 5,144,687, Cl. 382-54.000
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Koizumi, Yukio, 5,143,233, Cl. 212-188.000.
Konishi, Kazunori, 5,142,735, Cl. 1-82.000.
Ueda, Hiroshi; Imuta, Kazuyoshi; Kimura, Hirofumi; Tashiro, Naoyuki; and Yasuda, Syouji, 5,143,448, Cl. 366-77.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ota, Kazuo, 5,144,470, Cl. 359-224.000.
Kabushiki Kaisha Machida Seisakusho: *See*—
Chikama, Toshio, 5,143,475, Cl. 40-291.000.
Kabushiki Kaisha Meidensha: *See*—
Fujimori, Sadao; and Yamamoto, Akira, 5,142,902, Cl. 73-117.000.
Mizushina, Fumio; Goto, Takashi; and Nawa, Michio, 5,142,903, Cl. 73-118.100
Kabushiki Kaisha Okuma Tekkosho: *See*—
Komatsu, Toshiteru; and Miura, Kunio, 5,144,214, Cl. 318-600.000.
Kabushiki Kaisha Shinkawa: *See*—
Takamura, Tohru; Yamaguchi, Ryuta; and Fujino, Noboru, 5,143,510, Cl. 414-796.700
Kabushiki Kaisha Toshiba: *See*—
Abuyama, Yasuo, 5,144,452, Cl. 358-296.000
Furuyama, Hideto; and Sadanaga, Tetsuo, 5,144,381, Cl. 357-30.000
Gemma, Nobuhiro; Nakayama, Toshio; Egusa, Syun; Miura, Akira; Azuma, Makoto; Aoki, Shinya; and Naito, Katsuyuki, 5,144,473, Cl. 359-270.000.
Hideshima, Makoto; Tsunoda, Tetsujiro; Kojima, Shinjiro; and Ando, Masaru, 5,143,865, Cl. 43-183.000.
Honda, Masami; and Sato, Youji, 5,144,290, Cl. 340-711.000.
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Kobayashi, Tadashi, 5,144,615, Cl. 369-116.000.
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Nakabayashi, Kazuto; and Fox, Timothy R., 5,144,243, Cl. 324-318.000
Ogura, Tsuneo; and Nakagawa, Akio, 5,144,401, Cl. 357-38.000
Okabe, Naoko; Inoue, Satoshi; Munouchi, Kazumasa; Yamada, Takashi; Nitayama, Akihiro; and Takato, Hiroshi, 5,144,579, Cl. 365-149.000
Oku, Hidenori, 5,144,656, Cl. 379-33.000.
Oowaki, Yukihito; Tsuchida, Kenji; and Takashima, Daisaburo, 5,144,583, Cl. 365-206.000.
Sawada, Shizuo; and Ogihara, Masaki, 5,144,388, Cl. 357-23.400.
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Shiozaki, Masakazu; and Okumura, Katsuya, 5,144,147, Cl. 250-492.200.
Sugimoto, Yasuhiro; Mizoguchi, Satoshi; and Mafune, Hiromi, 5,144,164, Cl. 307-446.000.
Suhara, Hajime, 5,144,635, Cl. 372-49.000.
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Yokoi, Motohisa, 5,144,237, Cl. 324-309.000.
Yoshida, Yoshihiro, 5,144,259, Cl. 330-255.000.
Yoshizawa, Shuji; and Ikezue, Tatsuya, 5,143,807, Cl. 430-65.000
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Sekigawa, Kazunari; and Tsujimoto, Hirokazu, 5,144,514, Cl. 361-18.000.
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Kaczmarek, Richard, to Reliance Comm/Tec Corporation. Conductive pedestal for use with solid state overvoltage arrester. 5,144,510, Cl. 361-119.000.
Kadokura, Masaki: *See*—
Moriyama, Naomune; Yokouchi, Takahito; Kikuchi, Reiji; Yamamoto, Koichi; Akaboshi, Hideaki; Doi, Ayumu; and Kadokura, Masaki, 5,143,167, Cl. 180-248.000.
Kadowaki, Setsu: *See*—
Hirabayashi, Yoshio; Tochikura, Tatsurokuro; Kadowaki, Setsu; and Yamamoto, Kenji, 5,143,841, Cl. 435-227.000
Kadowaki, Shinichi, to Matsushita Electric Industrial Co., Ltd. Focusing-error detecting apparatus with a simple photodetector unit for use in an optical recording/reproducing device. 5,144,606, Cl. 369-44.410.
Kagawa, Junichi; and Matsutani, Wataru, to NGK Spark Plug Co., Ltd. Spark plug for internal combustion engine. 5,144,188, Cl. 313-11.500.
Kahanek, Allen P.; and Ullman, Ralph J., to Kaspar Wire Works, Inc. Single vend device for a newspaper vending machine. 5,143,251, Cl. 221-152.000.
Kahwaty, Vincent N.: *See*—
Aboaf, Joseph A.; Denison, Edward V.; Kahwaty, Vincent N.; and Steving, Gerald, 5,142,768, Cl. 29-603.000.
Kai, Takashi: *See*—
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Yuasa, Toshiya; Arahara, Kohzoh; and Kai, Takashi, 5,143,546, Cl. 106-20.000
Kaimer, Stephen F. Supplemental seal for oxygen mask. 5,143,061, Cl. 128-206.240.
Kaiser, Eduard: *See*—
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Kaiser, Hans: *See*—
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Kajimura, Hiroshi: *See*—
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Kakegawa, Hisao: *See*—
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Kakimoto, Syoichi: *See*—
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Kakuma, Hiroaki: *See*—
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Kakumoto, Shigeru; Kato, Masayasu; Otsu, Fumitaka; and Watanabe, Kazuo, to Hitachi, Ltd; and Hitachi Seiko, Ltd. Graphic data searching and storage method. 5,144,679, Cl. 382-1.000.
Kalika, Joseph: *See*—
Rabindran, K. George; Faber, Thomas; Filicicchia, David; Guenther, Kenneth L.; Kalika, Joseph; Kerstein, Melvin T.; Shah, Girish B.; and Wiley, David, 5,143,225, Cl. 209-584.000.
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Kamachi, Hajime; Imae, Kiyoto; and Okita, Takaaki, to Bristol-Myers Squibb Company. Antibiotic C-3 di-hydroxyphenyl substituted cephalosporin compounds, compositions and method of use thereof. 5,143,911, Cl. 514-202.000.
Kamei, Yoshisuke: *See*—
Tanaka, Toyoaki; Nakamura, Akira; Kamei, Yoshisuke; and Hashimoto, Akihiro, 5,143,786, Cl. 428-357.000
Kamimura, Katsuyoshi; Mine, Atsushi; and Hiwatashi, Yutaka, to Fuji Jukogyo Kabushiki Kaisha. System for controlling active suspensions of a vehicle. 5,144,559, Cl. 364-424.050.
Kamio, Hiroshi: *See*—
Nakaham, Yasumitsu; Araki, Kenji; and Kamio, Hiroshi, 5,143,704, Cl. 422-248.000.
Kamiya, Masahiro: *See*—
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Kammel, Helmut: *See*—
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Kamon, Kazuya; Myoi, Yasuhito; Miyamoto, Teruo; Noguchi, Yoshie; and Tanaka, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Projection aligner. 5,144,362, Cl. 355-53.000.
Kanai, Takao: *See*—
Kitakado, Ryuji; Yano, Hironobu; Kakuma, Hiroaki; Hoki, Tetsuo; and Kanai, Takao, 5,144,681, Cl. 382-8.000
Kanai, Tsutomu: *See*—
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi; Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, 5,143,930, Cl. 514-369.000
Kanai, Yasunori; Nawata, Kazumasa; Shimizu, Mitsuhisa; Yada, Hiroki; Saitoh, Taichi; and Sakai, Toshiaki, to Fujitsu Limited. ECL latch circuit having a noise resistance circuit in only one feedback path. 5,144,158, Cl. 307-272.100.
Kanaya, Koichi: *See*—
Kobayashi, Hiroyuki; Kanaya, Koichi; Baba, Norio; and Ogasawara, Mitsuo, 5,144,129, Cl. 250-307.000
Kanda, Yoshio: *See*—
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Kane, John M.; and Miller, Francis P., to Merrell Dow Pharmaceuticals Inc. 3-aryl-5-alkylthio-4H-1,2,4-triazoles. 5,143,933, Cl. 514-384.000.
Kane, Thomas I.: *See*—
Looman, James A.; and Kane, Thomas I., 5,142,734, Cl. 16-19.000.
Kaneda, Kitahiro: *See*—
Iijima, Ryunosuke; and Kaneda, Kitahiro, 5,144,492, Cl. 359-698.000
Kaneda, Naoya: *See*—
Ushiro, Tatsuzo; Kaneda, Naoya; Wada, Hiroyuki; and Hirasawa, Masahide, 5,144,491, Cl. 359-697.000
Kanehira, Koichi; Eziri, Katsushi; Shiono, Manzo; Fujita, Yoshiji; and Yamahara, Johji, to Kuraray Co., Ltd. Terpene amino alcohols and medicinal uses thereof. 5,143,921, Cl. 514-315.000
Kanehira, Makoto; Takahashi, Toshio; and Nakagawa, Takerou, to Tsubakimoto Chain Co. Shaft connecting structure. 5,143,477, Cl. 403-341.000.
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, to Hitachi, Ltd. Mechanism for winding a tape from a tape cassette onto a rotatable cylinder of a VCR. 5,144,505, Cl. 360-85.000.
Kaneko, Isamu: *See*—
Katoh, Hideaki; Noguchi, Nobuhisa; Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Kitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, 5,144,539, Cl. 362-256.000
Kaneko, Shuzo: *See*—
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Kaneko, Tadashi; Nakano, Shoichi; Kobayashi, Yoshiaki; and Kasuya, Takahira, to Konica Corporation. Color toner. 5,143,809, Cl. 430-105.000
Kaneshige, Masatoshi: *See*—
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Kaneyasu, Masayoshi: *See*—
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Kang, In C.: *See*—
Hyun, Shin W.; and Kang, In C., 5,143,618, Cl. 210-615.000.
Kanno, Isao, to Sanshin Kogyo Kabushiki Kaisha. Starting evice for marine propulsion engine. 5,144,300, Cl. 340-984.000.
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Kelso, Jimmie J.; Hustead, Russell M.; and Miller, Walter T., 5,142,720, Cl. 5-630.000.
Kansas State Univ. Research Foundation: *See*—
Smith, Joseph E., 5,143,826, Cl. 435-7.250.
Kantorovich, Edward; and Rapoport, Alex, to Medicano Systems Ltd. Apparatus for determining the mechanical properties of a solid. 5,143,072, Cl. 128-660.020.
Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Hasegawa, Toshiyuki, 5,142,940, Cl. 74-606.00R.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Tsuchida, Tetsuo; Abe, Yukihiro; Okimoto, Tomoyuki; and Saito, Toranosuke, 5,143,890, Cl. 503-201.000
Kao Corporation: *See*—
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,144,054, Cl. 556-445.000
Kao, Wen-Hong: *See*—
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Kaolin Industries, Ltd.: *See*—
Derdall, Gary; and Phinney, Robin L., 5,143,599, Cl. 209-166.000.
Kaplan, David L.: *See*—
Akkara, Joseph A.; Kaplan, David L.; Samuelson, Lynne A.; Mandal, Braja K.; Tripathy, Sukant K.; Bruno, Ferdinando F.; and Marx, Kenneth A., 5,143,828, Cl. 435-41.000
Kappele, William D., to Hewlett-Packard Company. Specific dye set for thermal ink-jet printing on plain and coated papers. 5,143,547, Cl. 106-22.000
Karapetian, Vahe. Vehicle body. 5,143,416, Cl. 296-29.000.
Karasaki, Toshihiko: *See*—
Hayashi, Kohtaro; Karasaki, Toshihiko; Yamano, Yasuteru; and Hata, Koji, 5,144,359, Cl. 354-419.000.
Karasawa, Akira: *See*—
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; Ishii, Akio; Ishii, Hidee; and Ohmori, Kenji, 5,143,922, Cl. 514-320.000.
Karl Oexmann, Inh. Wolfgang Oexmann, Firma: *See*—
Herting, Heinrich, 5,142,967, Cl. 99-373.000
Karlsson, Jan: *See*—
Dahlgren, Jan; and Karlsson, Jan, 5,143,038, Cl. 123-403.000
Karsten, Kenneth S., Jr.; and Francisco, Frank F., to ITT Corporation Distributed arrays of microelectronic amplifiers. 5,144,257, Cl. 330-54.000.
Karunaratne, Arjuna: *See*—
Moseley, Robin C.; Barney, Jonathan A.; and Karunaratne, Arjuna, 5,144,278, Cl. 338-198.000
Kasai, Tomohiko: *See*—
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Kashima, Shingo, to Olympus Optical Co., Ltd. Reflecting objective system including a negative optical power second mirror with increasing negative optical power off-axis. 5,144,496, Cl. 359-859.000
Kaspar Wire Works, Inc.: *See*—
Kahanek, Allen P.; and Ullman, Ralph J., 5,143,251, Cl. 221-152.000
Kasten, Arne: *See*—
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Katagiri, Kazuharu: *See*—
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Katagiri, Shingo; Nishiyama, Shigeru; and Tahara, Hiroyuki, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 5,144,511, Cl. 360-132.000
Katamoto, Tsutomu: *See*—
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Kataoka, Hideaki: *See*—
Takahashi, Koichi; Okutsu, Kazuo; Takahashi, Hisashi; Hirose, Masuhiko; Ichikawa, Haruo; Kitagawa, Kuniharu; and Kataoka, Hideaki, 5,144,350, Cl. 354-275.000
Katayama, Shinzou. Cleaning device for tube. 5,143,105, Cl. 134-167.00C
Kato, Fumiaki: *See*—
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi, Kato, Fumiaki; and Hirota, Katsuaki, 5,144,450, Cl. 358-227.000
Kato, Hideto: *See*—
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Kato, Kazuo: *See*—
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Kato, Masaru: *See*—
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Kato, Masayasu: *See*—
Kakumoto, Shigeru; Kato, Masayasu; Otsu, Fumitaka; and Watanabe, Kazuo, 5,144,679, Cl. 382-1.000.
Kato, Mikiko; and Iketaki, Yoshinori, to Olympus Optical Co., Ltd. Swchwarzschild optical system. 5,144,497, Cl. 359-859.000
Kato, Shigeru; and Kawamura, Kazuteru, to Olympus Optical Co., Ltd. Real image mode variable magnification finder optical system. 5,144,349, Cl. 354-222.000
Kato, Tohru; Tanaka, Tadashi; Sakamoto, Masaaki; and Yamamoto, Koichi, to Daido Metal Company Ltd. Copper base alloy superior in resistances to seizure, wear and corrosion suitable for use as material of sliding member. 5,143,565, Cl. 148-434.000
Katoh, Hideaki; Noguchi, Nobuhisa; Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Kitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, to Dai-Ichi Seiko Co., Ltd. Illumination device. 5,144,539, Cl. 362-256.000
Katoozi, Mehdi; and LaRue, George S., to Boeing Company, The. Method and system for testing integrated circuits by cycle stealing 5,144,230, Cl. 324-158.00R
Katsu, Masanori: *See*—
Kurishita, Akiyoshi; Katsu, Masanori; and Kato, Masami, 5,144,249, Cl. 324-439.000
Katsu, Toshiyuki: *See*—
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Katsuji, Hamasaki: *See*—
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Katsumi, Ikuyo: *See*—
Saitou, Noboru; Hirota, Koichi; Hasebe, Ren; Okuda, Norimasa; and Katsumi, Ikuyo, 5,144,066, Cl. 562-416.000
Katz, Daniel P. Automobile radio security system. 5,143,343, Cl. 248-551.000
Katz, J. Lawrence: *See*—
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Kauffman, Donn, to Kauffman, Theresa M.; Boswell, Joseph J.; and Williamson, George L. Multi-walled pipes and storage tanks for toxic and corrosive fluids. 5,143,244, Cl. 220-445.000.

Kauffman, Ira H.: *See*—
Philley, George C.; Ratliff, Homer; and Kauffman, Ira H., 5,143,417, Cl. 296-176.000.

Kauffman, Theresa M.: *See*—
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Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, to William H. Kaufman Inc. Downhill ski boot assembly. 5,142,798, Cl. 36-117.000.

Kaufmann, Rick J.; and Stirling, Loren D., to Taurus Tetraconcepts, Inc. Paper sheets binding apparatus. 5,143,502, Cl. 412-16.000.

Kauschke, Wolfgang; and Thoren, Werner, to Dragerwerk Aktiengesellschaft. Method for operating a measuring arrangement for detecting the component of combustible gases in a gas mixture. 5,142,898, Cl. 73-23.310.

Kautt, Jean-Jacques, to Ferco International Usine de Ferrures de Batiment. Device for assembling the parts intervening on a face-plate corresponding to an espagnolette or bolt lock for a swinging and tilting leaf. 5,143,271, Cl. 228-6.100.

Kawahara, Kazunori: *See*—
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Kawai, Kiyoshi: *See*—
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Kawai, Yutaka: *See*—
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Kawakami, Mikako. Manicure sheet. 5,143,100, Cl. 132-285.000.

Kawakubo, Shozi: *See*—
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Kawamura, Akihisa: *See*—
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Kawamura, Hiroshi: *See*—
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Kawamura, Kazuteru: *See*—
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Kawamura, Toshihiko: *See*—
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Kawana, Masajiro: *See*—
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Kawanami, Seiichi; Sugiyama, Tatsuo; Suzuki, Yoshiro; Ito, Yasutaro; and Annaka, Yuji, to Kuraray Co Ltd. Optical shaped article for CRT and having particular spectral transmittance characteristics. 5,144,499, Cl. 359-885.000.

Kawano, Isao: *See*—
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Kawasaki Steel Corporation: *See*—
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Yamazaki, Masakatsu; Narutani, Tetsu; and Kobiki, Hideaki, 5,143,638, Cl. 252-62.590.

Kawasaki, Takeshi, to Seiko Epson Corporation. Phase synchronizing circuit with feedback to control charge pump. 5,144,156, Cl. 307-262.000

Kawase, Mitsuo; Yoshida, Yasuko; and Yonekawa, Hitoshi, to NGK Insulators, Ltd. Enzyme-fixed bioreactor. 5,143,847, Cl. 435-288.000.

Kayanuma, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Apparatus for detecting malfunction in evaporated fuel purge system. 5,143,035, Cl. 123-198.00D

Kaye, Arthur, to British Aerospace Public Limited Company. Control apparatus. 5,143,330, Cl. 244-234.000.

Kaysersberg, SA: *See*—
Saint Criq, Jean; and Bros, Henriette, 5,143,249, Cl. 221-34.000

KBA-Planeta AG: *See*—
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Ke Kommunications Elektronik GmbH & Co.: *See*—
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Keable, John B.; and Bostic, Steve, to Delphi Technology, Inc. Perforated processing apparatus and method. 5,144,474, Cl. 354-319.000

Kearney, Michael R.: *See*—
Sardinskas, Stuart A.; Mormino, Mathew, Jr.; and Kearney, Michael R., 5,143,734, Cl. 425-14.000.

Kearns, David S., to Design House, Inc. Wall panel unit. 5,142,836, Cl. 52-314.000.

Kearns, Joyce M.; and Scarpellino, Richard, to Kraft General Foods, Inc. Microwave cooking utensil employing two different microwave susceptors. 5,144,106, Cl. 219-10.55 E.

Keathly, David M.: *See*—
Anderson, John K.; Andrews, Michael S.; Briggs, Robert S., Jr.; and Keathly, David M., 5,144,566, Cl. 364-552.000.

Kebo, Reynold S. All-reflective zoom optical system. 5,144,476, Cl. 359-366.000.

Kehl, Ricco: *See*—
Miczka, Lothar; Pauls, Mathias; and Kehl, Ricco, 5,143,211, Cl. 206-221.000.

Keil, Karl-Heinz: *See*—
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Keipinen, Pasi: *See*—
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Keithley Instruments, Inc.: *See*—
Banaska, John G., 5,144,154, Cl. 307-242.000.

Kel-Gan Inc.: *See*—
Frankel, Gail B., 5,143,335, Cl. 248-215.000.

Keller, David A. System for making dovetail joints including acute and obtuse angle dovetails and box joints. 5,143,132, Cl. 144-372.000.

Keller, Richard J.: *See*—
Austin, Mickey D.; and Keller, Richard J., 5,143,257, Cl. 222-57.000.

Kelley, Dixon L., to Teleflex Incorporated. Motion transmitting remote control assembly having conduit length adjuster. 5,142,933, Cl. 74-502.000.

Kelley, James T.; and Ruckman, Stephen E., Jr. Automatic telephone dialer system with printed storage. 5,144,654, Cl. 379-356.000.

Kelley, Jean M. Raining umbrella. 5,143,107, Cl. 135-16.000.

Kelrus Corp.: *See*—
Austin, Mickey D.; and Keller, Richard J., 5,143,257, Cl. 222-57.000.

Kelsey, Donald R., to Shell Oil Company. Methathesis polymerizable adducts of a divinylcyclohydrocarbon and cyclopentadiene. 5,143,992, Cl. 526-283.000.

Kelso, Jimmie J.; Hustead, Russell M.; and Miller, Walter T., to Kansas Creative Device, Inc. Positioning device and method. 5,142,720, Cl. 5-630.000.

Kendall, Karen, executrix: *See*—
Kendall, Ronald, deceased; Place, Ronald H.; and Warren, Renate I., 5,143,955, Cl. 524-151.000.

Kendall, Ronald, deceased (by Kendall, Karen, executrix); Place, Ronald H.; and Warren, Renate I., to Borg-Warner Chemicals, Inc. Polyphenylene ether-high impact polystyrene blends having improved flammability performance. 5,143,955, Cl. 524-151.000.

Kendziora, Michael E.: *See*—
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Kennametal Inc.: *See*—
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Stiffler, Stephen P.; Waite, David J.; Frost, Robert L.; and Beach, Wayne H., 5,143,163, Cl. 175-385.000.

Kennedy, John: *See*—
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Kenney Manufacturing Company: *See*—
McMichael, Dannie L., 5,143,336, Cl. 248-265.000

Kenney, Robert J. Beach umbrella. 5,143,108, Cl. 135-16.000.

Kerekjarto, Bela: *See*—
Lang, Hans-Jochen; Granzer, Ernold; and Kerekjarto, Bela, 5,143,937, Cl. 514-603.000.

Kern, Robert: *See*—
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Kerstein, Melvin T.: *See*—
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Kess, Helmut, to Siemens Aktiengesellschaft. Error-proof decoupling of transmission and reception antennas in a nuclear magnetic resonance apparatus. 5,144,244, Cl. 324-322.000.

Kessel, Carl R.; and Aeling, Ellen O., to Minnesota Mining and Manufacturing Company. Branched alkoxyphenyl iodonium salt photoinitiators. 5,144,051, Cl. 556-64.000.

Kessels, Henricus M. M.: *See*—
Opheij, Willem G.; Kessels, Henricus M. M.; and Velzel, Christiaan H. F., 5,144,131, Cl. 250-202.000

Keusch, Preston; Murdock, Keith A.; Czap, Christine A.; and Lennon, Linda, to Nepera, Inc. Non-stringy adhesive hydrophilic gels. 5,143,071, Cl. 128-640.000.

Keyboard Advances, Inc.: *See*—
Klauber, Robert D., 5,143,462, Cl. 400-486.000.

Khanna, Satish C.: *See*—
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Kharzo, Joseph S.; Grostick, David W.; Liang, Jiann-Shing; and Swamy, Narasimha, to AM International, Inc. Suction control system for printing or duplicating machines. 5,143,364, Cl. 271-108.000.

Khor, Kim H.: *See*—
Maxwell, Ian E.; Muller, Frederik; Khouw, Frank H. H.; Khor, Kim H.; and Lucien, Jacques, 5,143,596, Cl. 208-89.000.

Khouw, Frank H. H.: *See*—
Maxwell, Ian E.; Muller, Frederik; Khouw, Frank H. H.; Khor, Kim H.; and Lucien, Jacques, 5,143,596, Cl. 208-89.000

Kida, Yasuhiko: *See*—
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Kidoguchi, Isao: *See*—
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Kiefer, Erich: *See*—
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Kiefer, Ulrich: *See*—
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Kiekert GmbH: *See*—
Brandenburg, Rudolf; and Goldbach, Horst, 5,142,823, Cl. 49-118.000.

Kiguchi, Masao, to Canon Kabushiki Kaisha. Communication apparatus having improved switching line connection between different signal paths. 5,144,650, Cl. 379-93.000.

Kihara, Hiroshi: *See*—
Higashino, Kiyoharu; Matsumoto, Sakae; and Kihara, Hiroshi, 5,143,402, Cl. 280-775.000.

Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Fumiaki; and Hirota, Katsuaki, to Sony corporation. Auto focus frequency conversion filter for CCD imagers having different numbers of pixels. 5,144,450, Cl. 358-227.000.

Kikuchi, Akira, to Olympus Optical Co., Ltd. Illumination system for endoscopes. 5,143,435, Cl. 362-32.000.

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Kikuchi, Makoto; Ohura, Masato; Tamata, Shin; Chino, Koichi; and Funabashi, Kiyomi, to Hitachi, Ltd. Method and apparatus for solidifying radioactive waste. 5,143,654, Cl. 252-629.000.

Kikuchi, Reiji: *See*—
Moriyama, Naomune; Yokouchi, Takahito; Kikuchi, Reiji; Yamamoto, Koichi; Akaboshi, Hideaki; Doi, Ayumu; and Kadokura, Masaki, 5,143,167, Cl. 180-248.000

Kikuchi, Yutaka: *See*—
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Killion, Mead C.; Teder, Harry; Johnson, Arthur C.; and Hanke, Steven P., to Etymotic Research, Inc. Variable recovery time circuit for use with wide dynamic range automatic gain control for hearing aid 5,144,675, Cl. 381-68.400

Kilner, David N.; Humphrey, Keith D.; Little, Lionel M.; Carr, Duncan R.; and Sharp, Lewis G., to Shell Research Limited. Heat processing of particulate material with a quenching gas which swirls around the processing zone. 5,143,534, Cl. 65-21.300.

Kim, Chang-Hyun: *See*—
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Kim, Dae-il, to Samsung Electron Devices Co., Ltd. Plasma display panel and manufacturing method thereof. 5,144,200, Cl. 313-584.000

Kim, Jin H.: *See*—
Park, Su C.; Kuon, Young M.; and Kim, Jin H., 5,142,899, Cl 73-55.000.

Kim, Yong-san, to Samsung Electronics Co., Ltd. Multichannel scanning method. 5,144,438, Cl. 358-183.000

Kimball, Spencer D.: *See*—
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Mogel, Philip; and Calvert, John, 5,142,733, Cl. 16-8.000.

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Ota, Kiyoshi; Kimura, Kazuhiro; and Yazawa, Kenji, 5,144,512, Cl. 360-135.000.

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Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, 5,144,248, Cl. 324-428.000.

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Vrzalik, John H., 5,142,719, Cl. 5-609.000

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Hashimoto, Takatsugu; Egashira, Yoshinori; and Kinoshita, Takeshi, 5,143,957, Cl. 524-397.000
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Fong, Dodd W.; Kinsella, Mary A.; Kneller, James F.; and Sarapany, John W., 5,143,622, Cl. 210-700.000.

Kinson, Philip L.: *See*—
Greenlee, William S.; Kinson, Philip L.; Kline, Sally A.; Rajagopalan, Murali; and Daniels, Charles A., 5,143,975, Cl. 525-205.000

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Kirby, Alan A.: *See*—
McMahon, Donald H.; Kirby, Alan A.; Schofield, Bruce A.; and Springer, Kent, 5,144,304, Cl. 341-58.000

Kirk, Shane K.: *See*—
Peters, Kimberly T.; Smith, E. Phillip; and Kirk, Shane K., 5,143,671, Cl. 264-117.000

Kirknes, Steffen. Method for processing transmitted and reflected signals for removing unwanted signals and noise from wanted signals 5,144,313, Cl. 342-44.000

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Nochumson, Samuel; Curtis, Foner P.; Morgan, Jonathan H.; and Kirkpatrick, Francis H., 5,143,646, Cl. 252-315.300.

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Katoh, Hideaki; Noguchi, Nobuhisa; Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Kitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, 5,144,539, Cl. 362-256.000.

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Kitaura, Masahiro; and Uchida, Tomoaki, to Victor Company of Japan, Ltd. Television receiver decoder apparatus for bandwidth-compressed high definition television signal. 5,144,427, Cl. 358-136.000

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Kiyota, Hirotaka; and Nakajima, Masaaki, to Komori Corporation. Paper dodging device. 5,143,368, Cl. 271-202.000

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Kuhns, Charles R., 5,143,023, Cl. 119-173.000.

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Klein, Hans-Christof; and Sievers, Uwe, to Alfred Teves GmbH. Controllable hydraulic vibration damper for automotive vehicles. 5,143,185, Cl. 188-299.000.

Klemmer, Wilfried: *See—*
Duddek, Herbert; Klemmer, Wilfried; and Koeppen, Herbert, 5,144,317, Cl. 342-357.000.
Klepinski, Robert J.: *See—*
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Phillips, William T.; Klipper, Robert W.; Timmons, James H.; and Rudolph, Alan S., 5,143,713, Cl. 424-1.100.
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Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,142,843, Cl. 53-4[illegible]3.000.
Knops, Hans-Joachim: *See—*
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Knud Simonsen Industries Limited: *See—*
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Knutson, Keith C.: *See—*
Scholl, Steven L.; Simmons, Eugene R.; Knutson, Keith C.; and Bunnelle, William L., 5,143,96[illegible], Cl. 524-317.000.
Koba, Masayoshi: *See—*
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Kobayashi, Makoto: *See—*
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Kobayashi, Royoichi: *See—*
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Kobayashi, Seiji; Nishida, Norio; Iguchi, Naoya; and Yoshimura, Shunji, to Sony Corporation. Optical disk apparatus and method for controlling movement of light spot thereof. 5,144,605, Cl. 369-44.260.
Kobayashi, Susumu, to Terumo Kabushiki Kaisha. Constant-rate discharge valve, and electronic automatic sphygmomanometer using same. 5,143,077, Cl. 128-677.000.
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Kobayashi, Toshinori; Tsunoda, Masahiro; Furukawa, Takayasu; and Kobayashi, Isao, to Hitachi, Ltd. Apparatus for positioning sample 5,142,791, Cl. 33-573.000.
Kobayashi, Yoshiaki: *See—*
Kaneko, Tadashi; Nakano, Shoichi; Kobayashi, Yoshiaki; and Kasuya, Takahira, 5,143,809, Cl. 430-105.000.
Kobayashi, Yuhei: *See—*
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Kobayashi, Yukio: *See—*
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Kober, Horst. Method for manufacturing rigid-flexible circuit boards and products thereof. 5,144,534, Cl. 361-398.000.
Kobiki, Hideaki: *See—*
Yamazaki, Masakatsu; Narutani, Tetsu; and Kobiki, Hideaki, 5,143,638, Cl. 252-62.590.
Kobler, Ingo; Mathes, Josef; and Ortner, Robert, to Man Roland Druckmaschinen AG. Spring-biased suction transfer actuation system for a multi-color sheet-fed rotary printing press. 5,142,983, Cl. 101-409.000.
Koch, Thomas L.; Kogelnik, Herwig; and Koren, Uziel, to AT&T Bell Laboratories. Inline diplex lightwave transceiver. 5,144,637, Cl. 372-50.000.
Kodama, Youichi: *See—*
Anzai, Hisao; Yamamoto, Nobuyuki; Kodama, Youichi; Imai, Yoshitaka; and Daiguuji, Tsutomu, 5,142,796, Cl. 34-62.000.
Kodera, Toshiyuki: *See—*
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Koelsch, Eric J.: *See—*
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Koeppen, Herbert: *See—*
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Koester, James A. Carpet scrubbing bonnet. 5,142,727, Cl. 15-230.000.
Kogan, Grigory: *See—*
Saxe, Charles L.; Sullivan, Steven K.; and Kogan, Grigory, 5,144,525, Cl. 365-45.000
Kogelnik, Herwig: *See—*
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Kogoma, Masuhiro: *See—*
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Koguchi, Tatsushi: *See—*
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Kohara, Teiji: *See—*
Nishi, Yoshikatsu; Oshima, Masayoshi; Natsuume, Tadao; and Kohara, Teiji, 5,143,979, Cl. 525-332.100.
Kohashi, Takashi: *See—*
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Kohayakawa, Yoshimi: *See—*
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Kohl, Hans-Kurt: *See—*
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Kohl, Walter: *See—*
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Kohler Co.: *See—*
Steinhardt, Michael D.; DeKeyser, Kathleen S.; and Tempas, Jeffrey F., 5,143,121, Cl. 137-624.130.
Kohler, Karl A.; Bado, Frank M.; and Krueger, Richard E., to S. C. Johnson & Son, Inc. Compressed gas aerosol spray system with a dip tube vapor tap hole. 5,143,288, Cl. 239-1.000.
Kohtoh, Noriaki: *See—*
Nagase, Yu; Takamura, Yuriko; Kohtoh, Noriaki; Fukuro, Hiroyoshi; and Abe, Toyohiko, 5,144,078, Cl. 564-472.000.
Koichiro, Otsubo: *See—*
Yokoyama, Tomomitsu; Katsuji, Hamasaki; and Koichiro, Otsubo, 5,143,024, Cl. 122-510.000.
Koizumi, Yukio, to Kabushiki Kaisha Kobe Seiko Sho. Jib stretching and folding device for use in a crane. 5,143,233, Cl. 212-188.000.
Kojima, Ryoji: *See—*
Oba, Sayoko; Okuna, Kenji; Muroi, Katsumi; Ouchi, Katsubumi; Iimura, Tsutomu; and Kojima, Ryoji, 5,144,343, Cl. 346-155.000.
Kojima, Shinjiro: *See—*
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Koksal, Cevdet G.: *See—*
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Kolb, Kenneth W., to Rosalco, Inc. Transfer printing of furniture end pieces. 5,142,722, Cl. 8-471.000.
Kollmorgen Corporation: *See—*
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Komatsu, Toshio: *See—*
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Komatsu, Toshiteru; and Miura, Kunio, to Kabushiki Kaisha Okuma Tekkosho. Numerical control system for moving work or cutter in synchronism with the rotation of a spindle. 5,144,214, Cl. 318-600.000.
Komives, Claire; and Schultz, Jerome S., to University of Pittsburgh. Optical fiber sensors for continuous monitoring of biochemicals and related method. 5,143,066, Cl. 128-634.000.
Komori Corporation: *See—*
Funada, Hitoshi; and Ojima, Toshi, 5,142,979, Cl. 101-183.000.
Kiyota, Hirotaka; and Nakajima, Masaaki, 5,143,368, Cl. 271-202.000.
Okuie, Takayuki, 5,144,332, Cl. 346-1.100

Komori, Kenji: *See—*
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Kondo, Koichi: *See—*
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Kondo, Takashi: *See—*
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Kondo, Toshiharu: *See—*
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Fumiaki; and Hirota, Katsuaki, 5,144,450, Cl. 358-227.000.
Konica Corporation: *See—*
Haneda, Satoshi; Fukuchi, Masakazu; Morita, Shizuo; and Matsuo, Shunji, 5,143,017, Cl. 118-658.000.
Ichikawa, Kazuyoshi; Suzuki, Shinichi; Oyama, Sanae; and Kimura, Hideaki, 5,143,585, Cl. 203-2.000.
Kaneko, Tadashi; Nakano, Shoichi; Kobayashi, Yoshiaki; and Kasuya, Takahira, 5,143,809, Cl. 430-105.000.
Nishio, Shouji, 5,143,822, Cl. 430-522.000.
Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Braakman, Gerleen H., 5,143,504, Cl. 413-6.000.
Konishi, Kazunori, to Kabushiki Kaisha Kobe Seiko Sho. Door open position fixing device. 5,142,735, Cl. 16-82.000.
Konishi, Shinichi: *See—*
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Konishi, Yoshinori: *See—*
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Konoike, Toshiro: *See—*
Onoue, Hiroshi; Konoike, Toshiro; and Ishitobi, Hiroyuki, 5,143,910, Cl. 514-201.000.
Konopka, John G.; and Moisin, Mihail S., to Motorola, Inc. Circuit for driving at least one gas discharge lamp. 5,144,195, Cl. 315-94.000.
Konya, Naoto: *See—*
Yoneyoshi, Yukio; Suzukamo, Gohfu; Konya, Naoto; and Ikeda, Takaharu, 5,144,039, Cl. 548-268.400.
Kopp, Richard: *See—*
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Kopras, Robert K., to Roto Zip Tool Corporation. Bit for cutting sheetrock. 5,143,490, Cl. 408-26.000
Korber AG: *See—*
Lasch, Manfred; Hackmack, Klaus-Georg; and Liebe, Reinhard, 5,143,095, Cl. 131-290.000
Koren, Uziel: *See—*
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Korfgen, Harald; Hirsch, Heinz; and Grendel, Vinzenz, to Friedrich Grohe Armaturenfabrik GmbH & Co. Valve with flow shield. 5,143,349, Cl. 251-314.000
Kosaka, Wataru: *See—*
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Koshino, Nagaaki: *See—*
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Kostlan, Catherine R.: *See—*
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Koszyk, Francis J.: *See—*
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Kotecha, Harish N.; Protschka, Hans A.; Stanasolovich, Dave; and Theisen, Jake, to International Business Machines Corporation. Method for fabricating high circuit density, self-aligned metal linens to contact windows. 5,143,820, Cl. 430-314.000.
Kotter, Michael: *See—*
Martan, Hans; Wegerle, Ulrike; Ruppel, Wilhelm; Riekert, Lothar; Becker, Dieter; and Kotter, Michael, 5,144,091, Cl. 568-479.000.
Kouchi, Toshihito: *See—*
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Koudsi, Antoine J.: *See—*
Al-Sioufi, Habib; and Koudsi, Antoine J., 5,143,083, Cl. 128-763.000.
Koves, William J., to UOP. Apparatus for internal backmix cooling. 5,143,698, Cl. 422-144.000.
Kowal, Richard M.: *See—*
Althofer, Gerd; and Kowal, Richard M., 5,143,422, Cl. 297-411.000
Kowalczik, Udo; Neugebauer, Wolfgang; and Bartmann, Martin, to Huels Aktiengesellschaft. Thermoplastic molding compound based on modified co-polyphenylene ether. 5,144,002, Cl. 528-218.000
Koya, Tsugio: *See—*
Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000
Koyama, Yoshinari; and Shirota, Daigo, to Idemitsu Petrochemical Company Limited. Process for washing powdery and/or granular resins and a washing device therefor. 5,143,554, Cl. 134-25.500.
Kozaki, Takahiko: *See—*
Takiyasu, Yoshihiro; Tanaka, Toshiki; Asano, Michio; Ohno, Masashi; and Kozaki, Takahiko, 5,144,622, Cl. 370-85.130.
Koziol, Walter, to Modern Home Products Corp. Solidified or semisolidified fuel barbecue grill. 5,143,046, Cl. 126-43.000
Kraemer, Robert P. Method for construction of refractory lining for furnace. 5,142,839, Cl. 52-741.000
Kraemer, Wendelin: *See—*
Lippert, Hans-Joachim; and Kraemer, Wendelin, 5,143,691, Cl. 376-443.000
Kraft General Foods, Inc.: *See—*
Kearns, Joyce M.; and Scarpellino, Richard, 5,144,106, Cl. 219-10.55E.
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Brustle, Claus; and Krebs, Winfried, 5,143,026, Cl. 123-52.0MB
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Henn, Klaus; Elfgen, Ansgar; Schwartz, Ludwig; and Krumm, Helmut, 5,143,196, Cl. 198-345.300
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Daubenbuchel, Werner; Eiselen, Otto, Friedrichs, Karsten; Kiefer, Erich; and Klusener, Peter, 5,143,681, Cl. 264-515.000
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Richard, Hans-Gunter; and Wilmer, Gerhard, 5,143,520, Cl. 48-87.000.
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Illy, Alois; and Ruckert, Heinz-Jurgen, 5,143,350, Cl. 251-326.000
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Kudoh, Yoshihiko; and Miyatake, Norio, to Matsushita Electric Industrial Co., Ltd. Magneto-optical information recording method and apparatus in which a laser beam oscillates in a track-width direction. 5,144,602, Cl. 369-13.000.
Kuehn, Paul; and Lansing, Thomas A., to Pinnacle Products, Inc. Disposable sleeve for covering handles of dentist's lights and method of using the same. 5,142,736, Cl. 16-111.001.
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Kumamura, Masaaki; Inaba, Ryohei; Dannoto, Shojiro; and Arai, Mitsuo, to Canon Kabushiki Kaisha. Nozzle touch device in an injection molding apparatus. 5,143,736, Cl. 425-567.000.
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Adachi, Kazuhiko; and Kumano, Masafumi, 5,144,458, Cl. 358-482.000
Kume, Hidehiro; Yamamoto, Etsufumi; and Nagashima, Kenji, to Sony Corporation. Optical pickup device. 5,144,014, Cl. 369-112.000.
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Seido, Nobuo; Okeda, Yoshiki; and Kumobayashi, Hidenori, 5,144,042, Cl. 548-541.000.
Kunimoto, Toshifumi, to Yamaha Corporation. Nonlinear function generation apparatus, and musical tone synthesis apparatus utilizing the same. 5,144,096, Cl. 84-659.000.
Kunitz, Friedrich-Wilhelm, to Agfa Gevaert Aktiengesellschaft. Color photographic recording material containing color couplers. 5,143,823, Cl. 430-556.000
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Kuon, Young M.: *See*—
Park, Su C.; Kuon, Young M.; and Kim, Jin H., 5,142,899, Cl. 73-55.000
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Kanehira, Koichi; Eziri, Katsushi; Shionoya, Manzo; Fujita, Yoshiji; and Yamahara, Johji, 5,143,921, Cl. 514-315.000.
Kawanami, Seiichi; Sugiyama, Tatsuo; Suzuki, Yoshiro; Ito, Yasutaro; and Annaka, Yuji, 5,144,499, Cl. 359-885.000.
Kurbitz, Gunther; Marx, Dieter; and Heinrich, Harald, to Carl-Zeiss-Stiftung. Temperature compensated infrared optical imaging system. 5,144,356, Cl. 354-402.000.
Kurebart, Robert, to Motorola, Inc. Detachable wrist band antenna. 5,144,325, Cl. 343-718.000.
Kurihara, Nobuo; Kaneyasu, Masayoshi; and Ishii, Junichi, to Hitachi, Ltd. Control method for an internal combustion engine and apparatus therefor. 5,144,560, Cl. 364-431.040.
Kuriki, Shoji, to Ricoh Company, Ltd. Speech recognition apparatus including speaker-independent dictionary and speaker-dependent. 5,144,672, Cl. 381-41.000.
Kurishita, Akiyoshi; Katsu, Masanori; and Kato, Masami, to NGK Insulators, Ltd. Oxygen sensor. 5,144,249, Cl. 324-439.000.
Kurita, Kazuhito, to Sony Corporation. Cassette tape recording and/or reproducing apparatus with a single pinch lever assembly. 5,144,507, Cl. 360-96.200
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Funayama, Naotaka; Itoh, Ikuo; Kaneshige, Masatoshi; and Kurosaka, Toshiyuki, 5,144,382, Cl. 355-253.000.
Kusakabe, Hiroki; and Takigawa, Masuo, to Matsushita Electric Industrial Co., Ltd. Piezoelectric pressure sensor. 5,142,914, Cl. 73-723.000.
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Kuwano, Hiroaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Thickness control system for rolling mill. 5,142,891, Cl. 72-11.000.
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Kweon, Ki-young, to Samsung Electronics Co., Ltd. Compound semiconductor device. 5,144,376, Cl. 357-16.000.
Kwon, Seo J.; and Katz, J. Lawrence, to Orthosonics, Inc. Diagnostic method of monitoring skeletal defect by in vivo acoustic measurement of mechanical strength using correlation and spectral analysis 5,143,069, Cl. 128-660.010.
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Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; Ishii, Akio; Ishii, Hidee; and Ohmori, Kenji, 5,143,922, Cl. 514-320.000.
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Christenson, Philip A.; Riker, Paul J.; Anderson, Denise A.; and Yurecko, John M., Jr., 5,144,048, Cl. 549-435.000
L.R.S. Limited: *See*—
Dunham, Paul V.; and Garrod, Russell D., 5,143,305, Cl. 241-24.000.
La Gard, Inc.: *See*—
Uyeda, Alan K.; Gartner, Klaus W.; Herrmann, John; and Phillips, Peter J., 5,142,890, Cl. 70-277.000
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Pfahl, Magnus, 5,144,007, Cl. 530-350.000.
Laas, Hans J.; Halpaap, Reinhard; Pedain, Josef; and Mosbach, Jurgen, to Bayer Aktiengesellschaft. Polyisocyanate mixture, a process for its preparation and its use in polyurethane coating compositions. 5,143,994, Cl. 528-45.000.
LaBella, Frank S.; and Templeton, John F., to University of Manitoba. Compounds that bind to digitalis receptor. 5,144,017, Cl. 536-5.000
Labes, Mortimer M., to Temple University. Process for production of graphite flakes and films via low temperature pyrolysis. 5,143,709, Cl. 423-449.000.
LaBounty Manufacturing, Inc.: *See*—
LaBounty, Roy E., 5,142,779, Cl. 30-134.000.
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Lackner, John R.: *See*—
Inculet, Ion I.; Lackner, John R.; and Murphy, James C., 5,143,524, Cl. 55-2.000.
Laclave, Thomas J.; and Nieboer, Keith A., to Donnelly Corporation. Vehicle trim assembly and fastener therefor. 5,142,834, Cl. 52-208.000.
LaCorte, Richard. Holder for household wrap cartons. 5,143,229, Cl. 211-71.000.
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Lacoste de Prado, Catherine: *See*—
Lacoste, Rene; and Lacoste de Prado, Catherine, 5,143,571, Cl. 156-245.000.
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Lading, Pia; Lundsholm, Yvonne; and Norling, Tomas, to A/S Dumex (Dumex Ltd.). Method and composition for controlled delivery of biologically active agents. 5,143,934, Cl. 514-396.000.
Laffely, Laurent: *See*—
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Lagier, Michel; Gragnolati, Claude; and Besombes, Jena-Pierre, to Thomson-CSF. Low-frequency hydrophone and sonar array including such hydrophones. 5,144,597, Cl. 367-166.000.
Laguzza, Bennett C.: *See*—
Johnson, David A.; Laguzza, Bennett C.; and Scott, William L., 5,144,012, Cl. 530-391.900
Laing, Karsten A.; and Laing, Nikolaus J. Pump for secondary circulation. 5,143,049, Cl. 126-362.000.
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Lalikos, Anthony J., to Titeflex Corporation. Stress relief device. 5,143,409, Cl. 285-116.000
Laloi, Maurice R.; Courbier, Michel F.; and Vatant, Robert R., to Creusot-Loire Industrie; and Clecim. Rear spacer of a mould for pressure casting flat metal products such as slabs. 5,143,144, Cl. 164-306.000.
Lamarre, William M.: *See*—
Podalsky, David J.; Lamarre, William M.; and Stemmler, Heinz W., 5,142,975, Cl. 101-40.100
Lampes, Elias H.; and Allen, Clifford E., Jr., to General Electric Company. Combustor dome plate support having uniform thickness arcuate apex with circumferentially spaced coolant apertures. 5,142,871, Cl. 60-756.000.
Lampman, David A.: *See*—
Mehdizadeh, Mehrdad; Lampman, David A.; and Orlando, Paul T., 5,144,240, Cl. 324-318.000.
Lamson Corporation: *See*—
Verneau, Alain; and Dittler, Barry, 5,143,511, Cl. 415-55.400.
Lancaster, Gary D., to Mead Corporation, The. Reinforced container for large objects. 5,143,283, Cl. 229-199.000.
Land & Sea, Inc.: *See*—
Bergeron, Robert M., 5,143,027, Cl. 123-65.00V
Laneman, Scott A.: *See*—
Chan, Albert S. C.; and Laneman, Scott A., 5,144,050, Cl. 556-20.000.
Lang, Hans-Jochen; Granzer, Ernold; and Kerekjarto, Bela, to Hoechst Aktiengesellschaft. Benzenesulfonamides and a process for their preparation. 5,143,937, Cl. 514-603.000.
Lang, Victor H., to Semborg-Recrob, Corp. Animated character system with real-time contol. 5,142,803, Cl. 40-411.000

Lange, Dale K.: *See*—
Freymuth, Donald C.; Hon, Jeffrey S.; Lange, Dale K.; Paulus, Gerald J.; Petrykowski, Thomas F.; and Turner, Robert L., 5,142,987, Cl. 104-17.200.
Langeloh, Thomas: *See*—
Bott, Reinhard; Kern, Robert; Langeloh, Thomas; and Gross, Holger, 5,143,628, Cl. 210-770.000.
Langhof, Rolf; and Kohl, Hans-Kurt, to Carl Reudenberg, Firma. Elastic pivoting slide bearing. 5,143,457, Cl. 384-276.000.
Langlois, Michel: *See*—
Ward, Mona; Ph. Settembre, Pierre-Andre ; Renaud, Alain; and Langlois, Michel, 5,144,029, Cl. 540-610.000.
Langsch, Robert: *See*—
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Lansing, Thomas A.: *See*—
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Lanxide Technology Company, LP: *See*—
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Lapidus, Stanley N.; Polk, Lewis T., Jr.; Farber, Fredric L.; Barlas, J. Morgan; and Hurley, Anne A., to Cytyc Corporation. Method and apparatus for preparing cells for examination. 5,143,627, Cl. 210-767.000.
Larsen, Lawrence E. Millimeter wave flow cytometer. 5,144,224, Cl. 324-71.400
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Leshchiner, Edward; Balazs, Endre A.; Larsen, Nancy E.; and Leshchiner, Adelya, 5,143,724, Cl. 424-78.080.
Larsen, Soeren: *See*—
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LaRue, George S.: *See*—
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Lasch, Manfred; Hackmack, Klaus-Georg; and Liebe, Reinhard, to Korber AG. Method of cutting tobacco. 5,143,095, Cl. 131-290.000
Laschober, Rita A.: *See*—
Reck, Bernd; Laschober, Rita A.; Gerth, Dale; and Boyd, Jack D., 5,143,969, Cl. 524-548.000
Laser, Vadim: *See*—
Chadima, George E., Jr.; and Laser, Vadim, 5,144,119, Cl. 235-472.000
Chadima, George E., Jr.; and Laser, Vadim, 5,144,121, Cl. 235-472.000.
Laster, James E., to Newman Machine Company, Inc. Wood shavings forming apparatus and cutting roll adapted for use therewith. 5,143,311, Cl. 241-280.000
Latham, Andrew V., Jr. Fluid collection and drainage pan. 5,143,178, Cl. 184-106.000
Latimer, Donald R. Snowmobile lift apparatus. 5,143,352, Cl. 254-131.000.
Latta, Ernst E.: *See*—
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Laubie, Michel: *See*—
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Lauder, Robert B.: *See*—
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Laufenberg, Franz: *See*—
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Laukien, Gunther; and Kasten, Arne, to Laukien, Gunther. Method of operating submerged submarines and subarine. 5,143,007, Cl. 114-15.000.
Laukien, Gunther. Underwater vehicle with a passive optical observation system. 5,143,009, Cl. 114-66.000.
Laupretre, Jean-Jacques; Chapelet, Franck; and Bretheau, Dominique, to Societe Foptica S.A. & Commissariat a l'Energie Atomique. Process and apparatus for the manufacture of optical modules. 5,143,274, Cl. 228-102.000.
Laurel Bank Machines Co., Ltd.: *See*—
Watanabe, Kenkichi; and Sentoku, Hideshi, 5,142,847, Cl. 53-532.000.
Laurent, Daniel, to Sedepro. Device for the metering of granular or powdered products and method of mixing raw rubbers using this device. 5,143,254, Cl. 222-1.000
Lauyans, Frank G., Jr.: *See*—
Anderson, J. W. C.; and Lauyans, Frank G., Jr., 5,142,718, Cl. 5-497.000.
Lavielle, Gilbert; Laubie, Michel; and Colpaert, Francis, to Adir et Compagnie. Naphthylpiperazines useful as 5-HT_{1A} receptor ligands 5,143,916, Cl. 514-255.000.
Lawter, James R.; and Lanzilotti, Michael G., to American Cyanamid Company. Silicone-hardened pharmaceutical microcapsules. 5,143,661, Cl. 264-4.300.
Lawton, John A.; and Fan, Roxy N., to Du Pont de Nemours, E. I., and Company. Solid imaging system. 5,143,817, Cl. 430-269.000
Layhon, Vera F. Dressing gown hood. 5,142,706, Cl. 2-424.000
LDJ Industries, Inc.: *See*—
Alonzi, Louis W.; Smith, David C.; Burlak, Gary J.; and Mirowski, Marion, 5,144,294, Cl. 340-825.490.
Le, Mike. Isothermally measured tire gauge. 5,142,904, Cl. 73-146.800
Leach, Colin A.: *See*—
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Leatham, Alan G.; Pratt, Charles R.; and Chesney, Peter F., to Osprey Metals Limited. Spray deposition method and apparatus thereof. 5,143,139, Cl. 164-46.000
LeBegue, Maurice K.; Blackstock, Jon C.; Woodford, Clarence H., II; and Sanders, Leonard M., to Tamrock World Corporation, N.V. Drum assembly for a continuous miner. 5,143,423, Cl. 299-76.000.
Lec Tec Corporation: *See*—
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Le Compagnon, Gilles; and Rose, David A., to Harvard Industries, The Kingston-Warren Corporation. Four side flush sliding window assembly. 5,142,824, Cl. 49-349.000
LeCompte, George W., to Hughes Aircraft Company. Method and apparatus for dispensing an optical fiber from a powered missile through the motor exhaust. 5,143,319, Cl. 244-3.120.
Ledwith, Walter A., Jr.: *See*—
Strange, Mark A.; Ledwith, Walter A., Jr.; Davis, Johnny B.; Finger, Stephen N.; and Bracci, Gerald, 5,142,860, Cl. 60-39.281.
Lee, Eric K.; Kalyani, Vinay J.; and Matson, Stephen L., to Sepracor, Inc. Process of treating alcoholic beverages by vapor-arbitrated pervaporation. 5,143,526, Cl. 55-158.000
Lee, Hsueh-Chi; and Lenney, William E., to Air Products and Chemicals, Inc. Vinyl acetate/ethylene copolymer emulsions having improved wet tack properties. 5,143,966, Cl. 524-459.000.
Lee, Jong S.: *See*—
Maier, Larry K.; Priebe, Elizabeth K.; Lee, Jong S.; Woodgate, Paul E.; and Smith, Glen C., 5,143,765, Cl. 428-36.500
Lee, Kuang-Lu; and Chiou, Shean-Yih, to Acer Incorporated. Fully differential sample and hold adder circuit. 5,144,160, Cl. 307-353.000
Lee, Ronald B.: *See*—
Citta, Richard W.; and Lee, Ronald B., 5,144,431, Cl. 358-141.000
Lee/Rowan Company: *See*—
Arnold, William D., 5,143,228, Cl. 211-70.600
Camilleri, Charles, 5,143,332, Cl. 248-95.000
Lee, Sang-jin: *See*—
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Lee, Stanley M.; Terry, Jimmy C.; and Mrosko, John A., to F.H Maloney Company. Method for making a roller assembly for grain shellers. 5,142,784, Cl. 29-895.210.
Lee, Woodrow W., to United States of America, Navy. Material and method for fast generation of hydrogen gas and steam. 5,143,047, Cl. 126-263.000
Lee, Yeong D.; and Lee, Yeong H. Revolvable quick coupling 5,143,347, Cl. 251-149.600
Lee, Yeong H.: *See*—
Lee, Yeong D.; and Lee, Yeong H., 5,143,347, Cl. 251-149.600
Leeb, Felix. Device and tool bit for cutting all known types of threads (except buttress thread) in one single work process. 5,143,492, Cl. 409-74.000
Leese, Samuel M.; and Mitchell, Dennis, to Watts Blake Bearne & Co. PLC. Clay bodies of china and ball clays containing heat treated clay combined with raw clay components. 5,143,871, Cl. 501-150.000
Leet, John E., to Bristol-Myers Squibb Company. Kedarcidin antitumor chromophore and pharmaceutical composition containing same 5,143,906, Cl. 514-30.000.
Le Gars, Marcelle; and Baskevitch, Nicolas, to Papeteries de Mauduit. Double wrapped cigarettes with reduced spotting and method of manufacture. 5,143,099, Cl. 131-365.000.
Leggett & Platt, Incorporated: *See*—
Ogle, Steven E.; and Wylie, Danny L., 5,142,715, Cl. 5-247.000
Ogle, Steven E.; and Wylie, Danny L., 5,142,716, Cl. 5-247.000
Lehmann, Rolf; and Hodel, Reinhold, to K-Tron Technologies, Inc. Screw conveyor. 5,143,202, Cl. 198-670.000.
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Lo, Chun Y.; and Lehtinen, Thomas A., 5,143,989, Cl. 525-504.000
Leiponen, Matti O.; Lilja, Launo L.; and Makitalo, Valto J., to Outokumpu Oy. Apparatus for feeding air into a flotation cell. 5,143,600, Cl. 209-169.000
Leistner, Walter H.; and Hertz, Alfred S. Grooved nail and strip 5,143,501, Cl. 411-442.000
Lemberger, Richard R.; and Wyman, Stuart J., to Minnesota Mining and Manufacturing Company. Resealable film cartridge for a laser imager. 5,144,351, Cl. 354-277.000
Lemelson, Jerome H. Methods and apparatus for scanning objects and generating image information. 5,144,421, Cl. 358-101.000.
Lemforder Metallwaren AG: *See*—
Jordens, Ernst-Gunter; and Kammel, Helmut, 5,143,456, Cl. 384-275.000
Lemmer, Jerome J.; O'Malley, Gary B.; and Evenson, Rickie A., to Onan Corporation. Skewed rotor assembly. 5,144,182, Cl. 310-217.000
Lenaz, Emmett J., Jr.: *See*—
Merton, Henry A.; Diefenthal, James R.; Radigan, William D., Sengupta, Soumitra; and Lenaz, Emmett J., Jr., 5,144,495, Cl. 359-798.000
Lenney, William E.: *See*—
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Lennon, Linda: *See—*
Keusch, Preston; Murdock, Keith A.; Czap, Christine A.; and Lennon, Linda, 5,143,071, Cl. 128-740.000.
Lentfer, Arno: *See—*
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Lenth, Jurgen: *See—*
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Lenz, Vernon C., to Golden West Communications Inc. Automatically switched headset. 5,144,678, Cl. 381-181.000.
Leo Schwyter AG: *See—*
Schwyter, Leo, 5,143,304, Cl. 241-19.000.
Leonard, Andre, to Ecole Superieure des Sciences et Technologies de l'Ingenieur de Nancy (ESSTIN). Self-propelled and articulated vehicle with telescopic jacks to carry pipework inspection equipment. 5,142,990, Cl. 104-138.200.
Leonard, Byron P. Launch vehicle with reconfigurable interstage propellant manifolding and solid rocket boosters. 5,143,328, Cl 244-158.00R
Leonhardt, Uwe: *See—*
Nurnberg, Eberhard; Leonhardt, Uwe; Hornstein, Otto P.; Griessmeyer, Gabriele; and Perschbacher, Harald, 5,143,940, Cl. 514-785.000.
Lerner, Allan S.: *See—*
Basinger, Lex L.; Rachel, Jeffery L.; Snider, Jerry E.; and Lerner, Allan S., 5,142,703, Cl. 2-144.000.
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Field, Jasper H.; and Lesokhin, Vladimir B., 5,143,579, Cl. 162-30.100.
Le Van Suu, Maurice, to SGS-Thomson Microelectronics S.A. Decoder to decode an encrypted sound. 5,144,666, Cl. 380-38.000.
Lever Brothers Company, Division of Conopco, Inc.: *See—*
Nunn, Charles C., 5,143,641, Cl. 252-186.380.
Levolor Corporation: *See—*
Kuhar, Otto, 5,143,135, Cl. 160-107.000.
Lewis, Edward D.; and Hogue, Timothy D., to Buztronics, Inc. High efficiency novelty flasher assembly. 5,143,439, Cl. 362-103.000.
Lewis, Mark A.: *See—*
Leyden, Richard N.; Almquist, Thomas A.; Lewis, Mark A.; and Nguyen, Hop D., 5,143,663, Cl. 264-22.000.
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Barnes, Josh T.; Barnes, Thomas F.; Smith, Earl E.; and Troppman, Dale A., 5,143,446, Cl. 362-293.000.
Leybold Aktiengesellschaft: *See—*
Gegenwart, Rainer; and Ritter, Jochen, 5,144,196, Cl. 315-111.410.
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Kharzo, Joseph S.; Grostick, David W.; Liang, Jiann-Shing; and Swamy, Narasimha, 5,143,364, Cl. 271-108.000.
Liaw, H. Ming: *See—*
Tomozane, Mamoru; and Liaw, H. Ming, 5,143,858, Cl. 437-24.000
Libbey-Owens-Ford Co.: *See—*
Herrington, Richard A.; and Flaugher, Jeffrey R., 5,143,535, Cl. 65-106.000.
Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., to Life Resonances, Inc. Techniques for enhancing the permeability of ions through membranes. 5,143,588, Cl. 204-155.000.
Liebe, Reinhard: *See—*
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Liebram, Udo: *See—*
Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,142,843, Cl. 53-453.000.
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Lilly Industrial Coatings, Inc.: *See—*
Sanford, Timothy J.; Soltys, Joseph; and Cesnik, Charles L., 5,143,789, Cl. 428-432.000.
Lim, Mu-gil, to Samsung Electronics Co., Ltd. Method and apparatus for demodulating a GMSK signal. 5,144,256, Cl. 329-302.000.
Limpert, Rudolf: *See—*
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Lin, Chi-Yeh. Ratchet screw driver. 5,142,953, Cl. 81-63.000.
Lin, Fu-Shen: *See—*
Chen, Shien-Chang; Cheng, Wan-Yi; Lin, Fu-Shen; and Huang, Fu-Juh, 5,144,062, Cl. 560-239.000.
Lin, Henry C.: *See—*
Krishnamurti, Ramesh; Fertel, Lawrence B.; Lin, Henry C.; and Doss, Mahendra K., 5,144,076, Cl. 564-417.000.
Lin, J. T., to JTT International, Inc. Multiwavelength solid state laser using frequency conversion techniques. 5,144,630, Cl. 372-22.000.
Lin, Ronny W.: *See—*
Allen, Robert H.; Anderson, Keith G.; Diefenbach, Steven P.; Lin, Ronny W.; Nemec, Larry H.; Overstreet, Andrew D.; and Robinson, Gene C., 5,144,053, Cl. 556-190.000.
Lin, Sung C., to Palhood Industries Corporation. Lockable hinge joint for folding ladders. 5,142,739, Cl. 16-326.000.
Lina, Marie-Jose; and Dessaint, Andre, to Atochem. Fluorinated acrylic monomers as hydrophobic and oleophobic agents. 5,144,056, Cl. 560-25.000.
Lindblad, Hans P.: *See—*
Persson, Magnus T. J.; Lindblad, Hans P.; and Skogward, Kenneth R., 5,142,934, Cl. 74-502.400.
Lindmayer, Joseph: *See—*
Jutamulia, Suganda; Storti, George M.; and Lindmayer, Joseph, 5,144,145, Cl. 250-484.100.
Lindner, Christian: *See—*
Bruggemann, Horst; Freitag, Dieter; Meier, Lothar; Lindner, Christian; and Braese, Hans-Eberhard, 5,143,973, Cl. 525-85.000.
Lindqvist, Per-Olof, to Fixfabriken AB. Locking mechanism for sliding windows and doors. 5,143,412, Cl. 292-200.000.
Lindsey, Lewis K.; and Martin, Douglas S., to AFA Products, Inc. Ratchet cap for mounting a dispensing device onto a container. 5,143,237, Cl. 215-330.000.
Ling, Chong-Kuan. Rotatably unlockable combination lock having removable shackle. 5,142,888, Cl. 70-26.000.
Linnau, Yendra: *See—*
Schwarz, Hans P.; Molinari, Ewald; Linnau, Yendra; and Pfeiler, Susanne, 5,143,901, Cl. 514-2.000.
Linnenberg, Gerhard, to Siemens Aktiengesellschaft. Two-sum comparator. 5,144,577, Cl. 364-769.000.
Lint, Christian L. Apparatus and method for minimizing and recovering fluid cargo spills. 5,143,629, Cl. 210-776.000.
Lintvedt, Arnold M. Pliant container for storage of a liquid and liquid application therefrom. 5,143,294, Cl. 239-328.000.
Lion Corporation: *See—*
Morita, Hiroshi; Hirota, Eiichi; and Ishizaki, Yasuo, 5,144,060, Cl. 560-170.000.
Liou, Mou T. Hammer and method for manufacture the same. 5,142,948, Cl. 76-103.000
Lippert, Hans-Joachim; and Kraemer, Wendelin, to Siemens Aktiengesellschaft. Fuel assembly with flow tripper for a boiling water reactor. 5,143,691, Cl. 376-443.000.
Lipschitz, Abraham, to EG&G Sealol, Inc. Bi-directional, non-contact face seal. 5,143,384, Cl. 277-96.100.
Lishman, Robert W.: *See—*
Robertson, A. Scott; Geiger, Richard; and Lishman, Robert W., 5,143,391, Cl. 280-250.100.
List, Hans: *See—*
Schafer, Dieter; Sattler, Stephan; Scheunert, Peter; Laufenberg, Franz; List, Hans; Steeg, Klaus; and Serrallach, Eugen, 5,143,694, Cl. 422-65.000.
Listemann, Mark L.; Pierantozzi, Ronald; and Armor, John N., to Air Products and Chemicals, Inc. Process for the synthesis of carboxamides. 5,144,074, Cl. 564-224.000.
Listemann, Mark L.: *See—*
Savoca, Ann C. L.; and Listemann, Mark L., 5,143,944, Cl. 521-129.000.
Litchman, Henry M., to Occupational Orthopaedic Systems, Inc. Dynamic physiological function testing apparatus and method. 5,142,910, Cl. 73-379.000.
Little, Brian W., to Rockwell International Corporation. Power amplifier time domain reflectometer. 5,144,250, Cl. 324-533.000.
Little, Kenneth R., Jr.: *See—*
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Little, Lionel M.: *See—*
Kilner, David N.; Humphrey, Keith D.; Little, Lionel M.; Carr, Duncan R.; and Sharp, Lewis G., 5,143,534, Cl. 65-21.300.
Little Tikes Company, The: *See—*
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Litton Systems Canada Limited: *See—*
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Litton Systems, Inc.: *See—*
Stewart, Robert E.; and Warren, Keith O., 5,142,921, Cl. 73-866.100.
Liu, John Son. Golf cart. 5,143,399, Cl. 280-646.000.
Liu, Steve. Automobile steering lock. 5,142,889, Cl. 70-209.000.
Lizell, Magnus B. Method and apparatus for absorbing mechanical shock. 5,143,186, Cl. 188-299.000.
Lloyd, Jerry D.: *See—*
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Lloyd, Kenneth O.: *See—*
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Lo, Chun Y.; and Lehtinen, Thomas A., to Masonite Corporation. Non-leachable fire retardant. 5,143,989, Cl. 525-504.000.
Lober, Theresa: *See—*
Mettner, Michael; Schmidt, Martin A.; Lober, Theresa; and Huff, Michael A., 5,142,781, Cl. 29-890.124.
Lockhart, Thomas P.; and Burrafato, Giovanni, to Enricerche S.p.A and Agip S.p.A. Gellable aqueous composition and its use in enhanced petroleum. 5,143,958, Cl. 524-219.000.

Loffredo, John M.: *See—*
Baker, Ernest D.; Dinwiddie, John M., Jr.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,144,692, Cl. 395-425.000.
Logan, David J., to Gerber Scientific Products, Inc. Automatic weeding system and method of use. 5,143,576, Cl. 156-353.000.
Logan Manufacturing Company: *See—*
Hales, Scott J.; and Zollinger, Terry L., 5,142,800, Cl. 37-220.000.
Lohrman, Richard D.; and Thanisch, Klaus, to Zeller Closures, Inc Single walled dispensing closures with positive alignment means. 5,143,234, Cl. 215-235.000.
Lombardi, Lou A.: *See—*
Hollenberg, Jane; Lombardi, Lou A.; and Tietjen, Marlene, 5,143,722, Cl. 424-63.000
Lonati, Francesco, to Lonati S.p.A. Circular knitting machine with a device for repreating the selection of the needles at least at one thread feed. 5,142,886, Cl. 66-222.000.
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Lonati, Francesco, 5,142,886, Cl. 66-222.000
Long, David C.: *See—*
Say, Geoffrey R.; Taylor, James H.; Long, David C.; and Fiato, Rocco A., 5,143,647, Cl. 252-373.000.
Long, Herbert D., Jr., to Harnischfeger Corporation. Crane securement latch. 5,142,992, Cl. 104-251.000.
Long, Michael E.; VanGalio, David L.; and Weber, Helmut, to Eastman Kodak Company. Solvent fusing of thermal printer dye image. 5,143,754, Cl. 427-335.000.
Lonza Ltd.: *See—*
Duc, Laurent; and McGarrity, John, 5,144,047, Cl. 549-429.000.
Eyer, Martin, 5,144,057, Cl. 560-51.000.
Furrer, Hansjorg, 5,143,631, Cl. 210-791.000.
Worsch, Detlev, 5,144,038, Cl. 546-297.000
Looman, James A.; and Kane, Thomas I., to Herman Miller, Inc. Glide support assembly. 5,142,734, Cl. 16-19.000.
Lopes, John A., to Microcide, Inc. Disinfecting and sanitizing compositions. 5,143,720, Cl. 424-55.000
Loral Aerospace Corp.: *See—*
Moler, Keith E., 5,144,373, Cl. 356-2.000
L'Oreal: *See—*
Gueret, Jean-Louis H., 5,143,236, Cl. 215-311.000.
Madrange, Annie; and Canivet, Patrick, 5,143,518, Cl. 8-405.000.
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Lortz, Allan R.: *See—*
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Lovecky, Craig: *See—*
Gelardi, Anthony L.; Lovecky, Craig; Lowery, Alan; and Barstow, Robert, 5,142,761, Cl. 29-445.000
Lovell, James B. Method and composition for protecting plants against injury from the interaction of an organophosphate insecticide-nematicide and an AHAS inhibiting herbicide. 5,143,539, Cl. 71-92.000.
Lovely, Peter S., to Fiber Sensys, Inc. Multimode fiber sensor system with sensor fiber coupled to a detection fiber by spacer means. 5,144,689, Cl. 385-12.000.
Lowery, Alan: *See—*
Gelardi, Anthony L.; Lovecky, Craig; Lowery, Alan; and Barstow, Robert, 5,142,761, Cl. 29-445.000.
Loychuk, Terrence, to Nozone Dispenser Systems, Inc. Aerosol adapter clamp and power system. 5,143,260, Cl. 222-95.000.
Luber, George H.; and Mann, Donna B., to Care Co. Medical Products, Inc. Foot and leg splint. 5,143,058, Cl. 602-28.000
Lubinski, Ronald. Extruded aluminum plank for scaffold. 5,143,173, Cl. 182-119.000
Lubitz, Eric P.; and MacLaughlin, Scott T., to Halliburton Company. Coiled tubing set inflatable packer, bridge plug and releasing tool therefor. 5,143,015, Cl. 166-187.000
Lubowitz, Hyman R.: *See—*
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O'Brien, James R.; Agha, Mohomed B.; Luce, Roberet E.; Renard, Paul S.; and Sellers, Mark G., 5,142,809, Cl. 43-21.200
Lucien, Jacques: *See—*
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Lundgren, Per G: *See—*
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Lundquist, Lynn C. Secondary cutter apparatus for plastic size reduction equipment. 5,143,307, Cl. 241-60.000.
Lundsholm, Yvonne: *See—*
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Lustig, L. Paul; and Tybinkowski, Andrew, to Lustig, L. Paul. Tooth cleaning apparatus having powered brush and spray. 5,142,723, Cl. 15-22.100.
Luthi, Pierre, to Union Carbide Coatings Service Technology Corporation. Method for engraving solid articles with laser beams. 5,143,578, Cl. 156-643.000
Lutron Electronics Co., Inc.: *See—*
Moseley, Robin C.; Barney, Jonathan A.; and Karunaratne, Arjuna, 5,144,278, Cl. 338-198.000.
Motto, Eric R.; and Jurell, Scott R., 5,144,205, Cl. 315-244.000
Lutz, David E.; and Lutz, David W. Cargo carrying vehicle having a movable bulkhead located therein. 5,143,508, Cl. 414-510.000.
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Lux, Robert A.: *See—*
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Ly, Nhan G.: *See—*
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Lydy, Bruce S.; Schueller, Dennis R.; Nickel, Dennis J.; and Rauwerdink, James D., to Garden Way Incorporated. Post-processing apparatus for lawn mowers and the like. 5,142,851, Cl. 56-13.400.
Lykkegaard, Knud: *See—*
Hansen, Henning B.; Maroti, Stefan P.; Frederiksen, Bjarne; and Lykkegaard, Knud, 5,143,286, Cl. 236-42.000
Lyon, Leland H.; and Hinck, Ernest C., to Ingersoll-Rand Company. Device for removing debris from a drillhole. 5,143,162, Cl. 175-100.000.
Ma, Tso-Ping, to Yale University. Isotopically enriched semiconductor devices. 5,144,409, Cl. 357-61.000.
Mabvchi Motor Co., Ltd.: *See—*
Shibuya, Isao, 5,144,181, Cl. 310-254.000
Macemon, James H.; and Schlosser, Mark S., to SpaceLabs, Inc. Disposable cartridge for sampling and analyzing body fluids. 5,143,084, Cl. 128-771.000
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MacLaughlin, Scott T.: *See—*
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MacLean, Steven D., to Eastman Kodak Company. Method and apparatus for improving the output response of an electronic imaging system. 5,144,444, Cl. 358-209.000
Maclin, Harvey M.: *See—*
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MacMillan Bloedel Limited: *See—*
Vipat, Vasudha S., 5,143,619, Cl. 210-624.000.
MacMillan, Donald M., to Concorde Tool Corp. Flat finishing box apparatus for dispensing material in a variety of swath widths 5,143,264, Cl. 222-567.000.
Madrange, Annie; and Canivet, Patrick, to L'Oreal. Cosmetic compositions for dyeing and for bleaching hair. 5,143,518, Cl. 8-405.000.
Madsen, Brent D., to Integrated Systems Engineering, Inc. Light permeable, color adding, self-securing stressed covers for large display light-emitting devices, and methods. 5,143,443, Cl. 362-255.000.
Maeda, Ikuo: *See—*
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Maeda, Miyozo; Inouye, Yuji; Hashimoto, Yasunobu; Itoh, Ken-ichi; and Ogawa, Seiya, to Fujitsu Limited. Magneto-optical overwriting methods using erasing pulses, each of which has a higher frequency and narrower width than that of the overwriting pulses. 5,144,601, Cl. 369-13.000
Maehara, Toshiyuki: *See—*
Yanagihara, Hiromichi; Ishiyama, Shinobu; Mori, Taichi; and Maehara, Toshiyuki, 5,142,866, Cl. 60-605.200
Maenishi, Kozo; and Watanabe, Makoto, to Omron Tateisi Electronics Co. Power source apparatus using time sensitive switching. 5,144,155, Cl. 307-254.000.
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Mag Instrument, Inc: *See—*
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Maganas, Thomas C.; and Harrington, Alan L. Intermittent film deposition method and system. 5,143,745, Cl. 427-8.000.
Maglica, Anthony, to Mag Instrument, Inc. Miniature flashlight. 5,143,441, Cl. 362-263.000
Magnin, Guy; Magnin, Marie-Francoise; and Aubert, Veronique, to Societe Anonyme: Societe Generale pour les Techniques Nouvelles-SGN. Process for immobilizing radioactive ion exchange resins by a hydraulic binder. 5,143,653, Cl. 252-628.000
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Magnin, Guy; Magnin, Marie-Francoise; and Aubert, Veronique, 5,143,653, Cl. 252-628.000

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MAHO Aktiengesellschaft: *See*—
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Maier, Larry K.; Priebe, Elizabeth K.; Lee, Jong S.; Woodgate, Paul E.; and Smith, Glen C., to Eastman Kodak Company. Shaped articles from orientable polymers and polymer microbeads. 5,143,765, Cl. 428-36.500.

Mailaender, Laurence: *See*—
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Mainstream Engineering Corporation: *See*—
Scaringe, Robert P.; Parrish, Clyde F.; and Grzyll, Lawrence R., 5,142,884, Cl. 62-324.400.

Mainz, Hans-Willi; and Schneider, Lutz, to PKL Verpackungssysteme GmbH. Folding box package of a liquid-tight, heat sealably coated composite cardboard material, more particularly a foil mounted composite cardboard material. 5,143,281, Cl. 229-132.000.

Majima, Masao: *See*—
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Major, Matthew M.: *See*—
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Makitalo, Valto J.: *See*—
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Makool, Jeffrey J. Shower-sauna adapter. 5,142,713, Cl. 4-525.000.

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Malashanko, Karl. X-ray image dissecting intensifier with pinhole aperture anode for image dissection. 5,144,123, Cl. 250-213.0VT.

Male, Terence P.: *See*—
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Malek, Charles J.; and McDonald, James A., to Motorola, Inc. Signal overlap detection in a communication system. 5,144,668, Cl. 380-48.000.

Maleski, Richard. Broadhead for an arrow. 5,143,380, Cl. 273-422.000.

Malka, Jacob H.; and Friedlander, Mordechai, to Allied-Signal Inc. Multiple synchronized agile pulse generator. 5,144,255, Cl. 328-62.000

Mallinckrodt Medical, Inc.: *See*—
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Malmberg, Eric; Tran, Hien; and Siemiatkowski, Zbigniew, to Allen-Bradley Company, Inc. Programmable object identification transponder system. 5,144,314, Cl. 342-44.000.

Malone, Thomas G., to Cargo Technology Corporation. Leak-proof insulating system for freight containers. 5,143,245, Cl. 220-445.000.

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Kobler, Ingo; Mathes, Josef; and Ortner, Robert, 5,142,983, Cl. 101-409.000.
Melzer, Rudolf; and Gensheimer, Valentin, 5,142,783, Cl. 29-893.200
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Mandal, Braja K.: *See*—
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Maroti, Stefan P.: *See*—
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Maroudas, Johann. Process for producing a dairy product usable as a spread. 5,143,742, Cl. 426-585.000.

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Mason, Earl W. Ground handling, altitude control and longitudinal stability of airships. 5,143,322, Cl. 244-96.000

Mason, Russell I., to United States of America, Navy. Expendable moving echo radiator. 5,144,587, Cl. 367-1.000.

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Matsuzawa, Akira; Nakashima, Shota; and Yamada, Haruyasu, to Matsushita Electric Industrial Co., Ltd. Dynamic BiCMOS logic gates. 5,144,163, Cl. 307-446.000.

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Maxedon, Lynn F.; and Olson, Thomas C., to Rockwell International Corporation. System for interfacing a single sensor unit with multiple data processing modules. 5,143,452, Cl. 374-170.000.

Maxwell, Ian E.; Muller, Frederik; Khouw, Frank H. H.; Khor, Kim H.; and Lucien, Jacques, to Shell Oil Company. Process for ugrading a sulphur-containing feedstock. 5,143,596, Cl. 208-89.000.

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McClure, Thomas F.: *See—*
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Moriya, Takehiko; Komatsu, Toshio; and Inoue, Yoshiaki, 5,143,769, Cl. 428-76.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Yokoyama, Tomomitsu; Katsuji, Hamasaki; and Koichiro, Otsubo, 5,143,024, Cl. 122-510.000

Mitsubishi Kasei Corporation: *See—*
Ebina, Takusaburo, 5,143,727, Cl. 424-89.000
Morishima, Takashi; Murata, Yukichi; Okabayashi, Tadashi; and Kawai, Yutaka, 5,143,782, Cl. 428-327.000.

Mitsubishi Kasei Polytec Company: *See—*
Yamagishi, Naomichi; and Hasegawa, Masashi, 5,143,983, Cl. 525-432.000

Mitsubishi Materials Corporation: *See—*
Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000

Mitsubishi Rayon Co., Ltd.: *See—*
Anzai, Hisao; Yamamoto, Nobuyuki; Kodama, Youichi; Imai, Yoshitaka; and Daiguuji, Tsutomu, 5,142,796, Cl. 34-62.000.
Gotoh, Hajime; and Yokoti, Tadasi, 5,143,569, Cl. 156-148.000.
Yamamoto, Naoki; and Hatakeyama, Hiroki, 5,143,675, Cl. 264-171.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Amimoto, Tomohiko; and Takeuchi, Shoji, 5,142,849, Cl. 56-8.000.

Mitsui, Mitsuyuki: *See—*
Akimoto, Hajime; Ohba, Shinya; and Mitsui, Mitsuyuki, 5,144,447, Cl. 358-213.110.

Mitsui Petrochemical Industries, Ltd.: *See—*
Matsuura, Satoshi; Mito, Masayuki; and Shinagawa, Yoshio, 5,143,767, Cl. 428-109.000.
Yagi, Kazuo; and Takeda, Hiroyuki, 5,143,977, Cl. 525-240.000.
Yamaoka, Hideo; Shimizu, Tooji; Matsunaga, Fujihisa; Nishiyama, Shinichi; Yamanaka, Toru; and Miyakoshi, Shoichi, 5,143,644, Cl. 252-299.620.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Akieda, Hideyuki; Sato, Naoki; Morinaga, Koichi; Ide, Yoshinori; Mita, Ryuichi; and Umemoto, Mitsumasa, 5,144,083, Cl. 568-636.000.
Honda, Tadatoshi; Nagayama, Tokio; Horiuchi, Nobuhiko; Kitagawa, Jun; Kawahara, Kazunori; and Murakami, Masami, 5,144,090, Cl. 568-476.000.

Mittermaier, Armin E., to Tokheim Corporation. Pressure relief for vacuum operated valve. 5,143,258, Cl. 222-73.000.

Miura, Akira: *See—*
Gemma, Nobuhiro; Nakayama, Toshio; Egusa, Syun; Miura, Akira; Azuma, Makoto; Aoki, Shinya; and Naito, Katsuyuki, 5,144,473, Cl. 359-270.000.

Miura, Kunio: *See—*
Komatsu, Toshiteru; and Miura, Kunio, 5,144,214, Cl. 318-600.000

Miyajima, Toshiaki; Kioi, Kazumasa; Matunami, Mituo; Doi, Tukasa; Yoshioka, Minoru; and Koba, Masayoshi, to Sharp Kabushiki Kaisha. Optically driven semiconductor device. 5,144,395, Cl. 357-30.000.

Miyakoshi, Shoichi: *See—*
Yamaoka, Hideo; Shimizu, Tooji; Matsunaga, Fujihisa; Nishiyama, Shinichi; Yamanaka, Toru; and Miyakoshi, Shoichi, 5,143,644, Cl. 252-299.620.

Miyamoto, Hirohisa; and Nagata, Kenzo, to Minolta Camera Kabushiki Kaisha. Copying machine operable in simultaneous multi-color mode. 5,144,372, Cl. 355-328.000

Miyamoto, Jun: *See—*
Imamura, Nobuto; and Miyamoto, Jun, 5,143,142, Cl. 164-189.000.

Miyamoto, Mitsuo: *See—*
Go, Hiroshi; Zushi, Shizuo; and Miyamoto, Mitsuo, 5,144,531, Cl. 361-382.000.

Miyamoto, Naruyuki: *See—*
Sakamoto, Hiroyuki; Miyamoto, Naruyuki; Takahashi, Ichirou; Nagashima, Takashi; and Arai, Hiroyuki, 5,144,366, Cl. 355-208.000

Miyamoto, Teruo: *See—*
Kamon, Kazuya; Myoi, Yasuhito; Miyamoto, Teruo; Noguchi, Yoshie; and Tanaka, Masaaki, 5,144,362, Cl. 355-53.000.

Miyata, Hideyasu: *See—*
Toda, Hiroshi; Miyata, Hideyasu; Takeuchi, Hiroaki; Nakanishi, Nobuyasu; and Kondo, Koichi, 5,143,428, Cl. 303-113.0AP.

Miyata, Kazuaki: *See—*
Nakamura, Mitsuyoshi; and Miyata, Kazuaki, 5,144,389, Cl. 357-23.400

Miyatake, Norio: *See—*
Kudoh, Yoshihiko; and Miyatake, Norio, 5,144,602, Cl. 369-13.000.

Miyatake, Yoshito: *See—*
Otsuka, Akira; Ishihara, Shin-Ichiro; Miyatake, Yoshito; and Hotta, Sadayoshi, 5,144,462, Cl. 359-41.000.

Miyauchi, Fumio: *See—*
Matsuura, Ichiro; Sugiura, Takashi; Miyauchi, Fumio; and Chiyoshi, Toyoharu, 5,143,667, Cl. 264-46.600.

Miyauchi, Mayu, to NEC Corporation. Picture reducing apparatus taking averages from line memories for P-I-P. 5,144,437, Cl. 358-183.000

Miyazaki, Yukio, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit. 5,144,518, Cl. 361-56.000.

Miyazawa, Kokichi; Maruo, Masatsuyo; and Kawamura, Toshihiko, to Ishihara Sangyo Kaisha, Ltd. Process for producing magnetic metal powder for magnetic recording. 5,143,542, Cl. 75-349.000.

Mizoguchi, Satoshi: *See—*
Sugimoto, Yasuhiro; Mizoguchi, Satoshi; and Mafune, Hiromi, 5,144,164, Cl. 307-446.000

Mizuguchi, Jin; and Rochat, Alain C., to Ciba-Geigy Corporation. Process for the storage of information in an organic recording layer. 5,144,333, Cl. 346-1.100.

Mizuno, Hiroyuki: *See—*
Okawa, Koji; Norota, Kazuhiko; and Mizuno, Hiroyuki, 5,143,040, Cl. 123-684.000.

Mizuno, Kotaro: *See—*
Iwase, Fumio; and Mizuno, Kotaro, 5,142,960, Cl. 84-662.000.

Mizuno, Masamoto: *See—*
Tawada, Masanori; Mizuno, Masamoto; Hirabayashi, Terumi; and Kodera, Toshiyuki, 5,144,101, Cl. 187-103.000.

Mizusawa Industrial Chemicals, Ltd.: *See—*
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; Suzuki, Kazuhiki; and Suzuki, Jun, 5,143,708, Cl. 423-328.000.

Mizushina, Fumio; Goto, Takashi; and Nawa, Michio, to Kabushiki Kaisha Meidensha. Driving power source unit for automotive power transmisson testing apparatus employing motor. 5,142,903, Cl. 73-118.100

Mizutani, Kazuyoshi; and Aoai, Toshiaki, to Fuji Photo Film Co., Ltd. Light-sensitive composition comprising a polysiloxane and a naphthoquinone. 5,143,816, Cl. 430-192.000.

MKS Instruments, Inc.: *See—*
Hinkle, Luke D., 5,142,907, Cl. 73-204.120

Mobil Oil Corporation: *See—*
Beck, Jeffrey S.; Socha, Richard F.; Shihabi, David S.; and Vartuli, James C., 5,143,707, Cl. 423-239.000
Chang, Clarence D.; and Hellring, Stuart D., 5,143,876, Cl 502-64.000.
Forbus, Thomas R.; and Pelrine, Bruce P., 5,144,082, Cl. 565-785.000.
Gibbs, Paul C., 5,143,603, Cl. 210-122.000
Harandi, Mohsen N.; and Owen, Hartley, 5,144,085, Cl 568-697.000
Harandi, Mohsen N.; Haag, Werner O., Owen, Hartley; and Bell, Weldon K., 5,144,086, Cl. 568-698.000
Owen, Hartley; and Schipper, Paul h., 5,143,875, Cl. 502-43.000
Ross, Mark S., 5,143,874, Cl. 502-42.000
Sorensen, Charles M.; Varghese, Philip; and Marler, David O., 5,144,084, Cl. 568-695.000.
Sparks, Steven W.; Teitman, Gerald J.; and Viscontini, Salvatore T. M., 5,143,597, Cl. 208-131.000.
Whitehurst, D. Duayne, 5,143,879, Cl. 502-85.000

Mobile Manufacturing Company: *See—*
Fappas, John N., Jr.; and Harriman, Ronald W., 5,142,946, Cl. 76-37.000.

Mobile Telecommunication Technologies: *See—*
Bhagat, Jai P.; Vence, Robert L.; and Hays, William D., 5,144,648, Cl. 379-57.000

Mochizuki, Hidehiro; Shimada, Masaru; and Ariga, Yutaka, to Ricoh Company, Ltd. Sublimation-type thermal image transfer recording medium. 5,143,893, Cl. 503-227.000.

Mochizuki, Hidehiro: *See—*
Suzuki, Akira; Mochizuki, Hidehiro; Shimada, Masaru; Uemura, Hiroyuki; and Morohoshi, Naoya, 5,144,334, Cl. 346-1.100

Modern Home Products Corp.: *See—*
Koziol, Walter, 5,143,046, Cl. 126-43.000

Mody, Rustom K.; and Halbardier, Floyd A., deceased (by Halbardier, Anna L., heiress), to Baker Hughes Incorporated. Inflatable packing element. 5,143,154, Cl. 166-187.000.

Moe, Storker: *See—*
Skjak-Braek, Gudmund; and Moe, Storker, 5,144,016, Cl 536-3.000

Moen, Bruce A.: *See—*
Gold, Phillip W.; and Moen, Bruce A., 5,142,769, Cl. 29-621.100

Mogel, Philip; and Calvert, John, to Kimberly-Clark Corporation. Mat holders. 5,142,733, Cl. 16-8.000.

Moisin, Mihail S.: *See—*
Konopka, John G.; and Moisin, Mihail S., 5,144,195, Cl. 315-94.000

Moks, Tomas: *See—*
Abrahmsen, Lars; Moks, Tomas; Nilsson, Bjorn; and Uhlen, Mathias, 5,143,844, Cl. 435-257.300.

Molecular Biosystems, Inc.: *See—*
Barnhart, James L., 5,143,715, Cl. 424-5.000

Moler, Keith E., to Loral Aerospace Corp. Detection of range discontinuities in stereoscopic imagery. 5,144,373, Cl. 356-2.000

Molinari, Ewald: *See—*
Schwarz, Hans P.; Molinari, Ewald; Linnau, Yendra; and Pfeiler, Susanne, 5,143,901, Cl. 514-2.000

Molins PLC: *See—*
Nash, Victor W.; and Oakley, Francis R., 5,143,094, Cl. 131-84.400

Moller, Wolfgang: *See—*
Kraus, Michael; and Moller, Wolfgang, 5,143,838, Cl. 435-214.000

Molnar, Julius J.; Fena, Ernest J.; Folden, David W.; Schneider, Douglas A.; Becker, Richard A.; Fimmen, Charles L.; Selestak, David M., and Shlapak, Robert, to Nordson Corporation. Method and apparatus for depositing moisture-absorbent and thermoplastic material in a substrate. 5,143,680, Cl. 264-511.000

Moncier, Regina M.: *See—*
Zoeller, Joseph R.; Cushman, Michael R.; Moncier, Regina M.; and Tennant, Brent A., 5,144,067, Cl. 562-479.000
Zoeller, Joseph R.; Cushman, Michael R.; and Moncier, Regina M., 5,144,070, Cl. 562-887.000

Moncrieff Baldwin, Judith A.; and Wozniak, Suzanne, to Strategic Financial Communications Corp. Notebook page with pressure-sensitive repositionable labels on both sides thereof. 5,143,466, Cl 402-79.000

Monroe, Bruce M.: *See—*
Weed, Gregory C.; and Monroe, Bruce M., 5,143,818, Cl 430-281.000

Monroe Truck Equipment, Inc.: *See—*
Feller, Richard L., 5,142,801, Cl. 37-235.000

Monsanto Company: *See—*
Chan, Albert S. C.; and Laneman, Scott A., 5,144,050, Cl 556-20.000

Monteith, John, to Russell Finex Limited. Sieving apparatus. 5,143,222, Cl. 209-364.000

Moore, Alix A.: *See—*
Iba, Wayne S.; Holland, Gregory R.; Moore, Alix A.; and York, Walter A., 5,143,104, Cl. 134-135.000

Moore Business Forms, Inc.: *See—*
Doane, I. Gerald; and Burket, Franklin L., 5,143,362, Cl. 270-1.100

Moore, Dan T., III; Collins, Edward A.; and Wheeler, Maurice E., to Soundwich, Inc. Method of using a sound damping composition. 5,143,755, Cl. 427-373.000.

Moore, Pamela D.; Pitt, Linwood L., Jr.; and Vogt, Howard W., Jr., to Philip Morris Incorporated. Multi-pack flip-top cigarette carton. 5,143,213, Cl. 206-273.000.

Mor, Avi. Apparatus for washing lenses. 5,143,101, Cl. 134-58.00R.

Morand, Alfred: *See*—
Blanchard, Claude; Morand, Alfred; and Schmidt, Robert H., 5,143,740, Cl. 426-446.000.

Morandi, Gino; and Santi, Ettore, to Trading Services International S.r.l. Rapid cooking apparatus for food, in particular pasta such as spaghetti. 5,142,966, Cl. 99-352.000.

Mordue, George S.: *See*—
Gilbert, Ronald E.; and Mordue, George S., 5,143,357, Cl. 266-235.000.

Moreland, Margaret: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schwengruber, Hans, 5,143,712, Cl. 424-1.100.

Morf, Inc.: *See*—
Marshall, William M., Sr., 5,143,708, Cl. 210-171.000.

Morgan, Jonathan H.: *See*—
Nochumson, Samuel; Curtis, Foster P.; Morgan, Jonathan H.; and Kirkpatrick, Francis H., 5,143,746, Cl. 252-315.300.

Morgan, Michael W., to Chipsoft CA Corp. Method and apparatus for generic form generation. 5,144,693, Cl. 395-158.000.

Mori, Hiromi; Morimoto, Reiko; and Nakamura, Tatsuya, to Canon Kabushiki Kaisha. Color toner and process for fixing the same. 5,143,812, Cl. 430-124.000.

Mori, Susumu: *See*—
Amano, Toshinori; and Mori, Susumu, 5,144,527, Cl. 361-321.000.

Mori, Taiichi: *See*—
Yanagihara, Hiromichi; Ishiyama, Shinobu; Mori, Taiichi; and Machara, Toshiyuki, 5,142,866, Cl. 60-605.200.

Moriarty, Ann M.: *See*—
Thornton, George B.; Moriarty, Ann M.; Milich, David R.; and McLachlan, Alan, 5,143,726, Cl. 424-88.000.

Morimoto, Reiko: *See*—
Mori, Hiromi; Morimoto, Reiko; and Nakamura, Tatsuya, 5,143,812, Cl. 430-124.000.

Morinaga, Koichi: *See*—
Akieda, Hideyuki; Sato, Naoki; Morinaga, Koichi; Ide, Yoshinori; Mita, Ryuichi; and Umemoto, Mitsumasa, 5,144,083, Cl. 568-636.000.

Morisaki, Hiroshi; and Sakakibara, Kenji, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus capable of detecting medium loading failure. 5,144,361, Cl. 355-7.000.

Morishima, Takashi; Murata, Yukichi; Okabayashi, Tadashi; and Kawai, Yutaka, to Mitsubishi Kasei Corporation. Thermal transfer recording sheet. 5,143,782, Cl. 428-327.000.

Morishita, Masakazu, to Canon Kabushiki Kaisha. Semiconductor device and photoelectric conversion apparatus using the same. 5,144,398, Cl. 357-34.000.

Morishita, Shingo: *See*—
Ikeda, Mikio; Morishita, Shingo; and Matsuda, Ichiro, 5,144,008, Cl. 530-354.000.

Morita, Hikaru, to Nippon Telegraph and Telephone Corp. Modular multiplication method and the system for processing data. 5,144,574, Cl. 364-746.000.

Morita, Hiroshi; Hirota, Eiichi; and Ishizaki, Yasuo, to Lion Corporation. Betaine esters of polyoxyalkylene ether. 5,144,060, Cl. 560-170.000.

Morita, Kunihiko, to Nippon Thompson Co., Ltd. Anti-vibration linear motion guide unit. 5,143,454, Cl. 384-37.000.

Morita, Shizuo: *See*—
Haneda, Satoshi; Fukuchi, Masakazu; Morita, Shizuo; and Matsuo, Shunji, 5,143,017, Cl. 118-658.000.

Morita, Tamao, to Tarmo Co., Ltd. Fastener means. 5,142,746, Cl. 24-303.000.

Moriya, Takehiko; Komatsu, Toshio; and Inoue, Yoshiaki, to Mitsubishi Gas Chemical Company, Inc. Deoxidizer sheet. 5,143,769, Cl. 428-76.000.

Moriyama, Masahi, to Tokyo Electron Limited. Coating equipment. 5,143,552, Cl. 118-666.000.

Moriyama, Naomune; Yokouchi, Takahito; Kikuchi, Reiji; Yamamoto, Koichi; Akaboshi, Hideaki; Doi, Ayumu; and Kadokura, Masaki, to Mazda Motor Corporation. Four-wheel-drive motor vehicle of transversely-disposed engine type. 5,141,167, Cl. 180-248.000.

Mormino, Mathew, Jr.: *See*—
Sardinskas, Stuart A.; Mormino, Mathew, Jr.; and Kearney, Michael R., 5,143,734, Cl. 425-143.000.

Morohoshi, Naoya: *See*—
Suzuki, Akira; Mochizuki, Hidehiro; Shimada, Masaru; Uemura, Hiroyuki; and Morohoshi, Naoya, 5,144,334, Cl. 346-1.100.

Morris, Robert E.: *See*—
Sparks, Bradley A.; and Morris, Robert E., 5,144,441, Cl. 358-190.000.

Morse, Lewis D., to Calgon Corporation. Methods for detackification of paint spray operation wastes. 5,143,624, Cl. 210-712.000.

Morton International, Inc.: *See*—
Taylor, Robert D.; and Hunsman, Lewis R., 5,143,567, Cl. 149-35.000.

Mosaid, Inc.: *See*—
Gillingham, Peter B., 5,144,223, Cl. 323-313.000.

Mosbach, Jurgen: *See*—
Laas, Hans J.; Halpaap, Reinhard; Pedain, Josef; and Mosbach, Jurgen, 5,143,994, Cl. 528-45.000.

Moseley, Robin C.; Barney, Jonathan A.; and Karunaratne, Arjuna, to Lutron Electronics Co., Inc. Variable impedance device and circuit for sensing adjustment thereof. 5,144,278, Cl. 338-198.000.

Moser, Robert: *See*—
Faas, Jurg; Staheli, Christoph; Demuth, Robert; and Moser, Robert, 5,143,485, Cl. 406-14.000.

Moshitzky, Mordechai: *See*—
Frei, Ephraim; and Moshitzky, Mordechai, 5,143,079, Cl. 128-734.000.

Moslehi, Mehrdad M., to Texas Instruments Incorporated. SOI wafer fabrication by selective epitaxial growth. 5,143,862, Cl. 437-62.000.

Motorola, Inc.: *See*—
Annett, Thomas A., 5,144,533, Cl. 361-395.000.
Borth, David E., 5,144,644, Cl. 375-96.000.
Chong, Thomas C. K.; and Chacko, Prakash, 5,144,264, Cl. 331-117.00R.
DeLuca, Michael J.; and Nguyen, Tuan K., 5,144,296, Cl. 340-825.440.
Dougherty, Richard M.; and Boser, Stephen W., 5,144,266, Cl. 333-1.000.
Konopka, John G.; and Moisin, Mihail S., 5,144,195, Cl. 315-94.000.
Kurcbart, Robert, 5,144,325, Cl. 343-718.000.
Malek, Charles J.; and McDonald, James A., 5,144,668, Cl. 380-48.000.
Parker, Lanny L., 5,144,170, Cl. 307-528.000.
Stearns, Edward J.; and Johnson, Robert H., 5,142,984, Cl. 102-213.000.
Stearns, Edward J.; and Johnson, Robert H., 5,142,985, Cl. 102-213.000.
Tomozane, Mamoru; and Liaw, H. Ming, 5,143,858, Cl. 437-24.000.
Weidman, John H., 5,144,268, Cl. 333-204.000.

Mott, Jonathan C., to Diversified Products Corporation. Fiber-reinforced molded racquet frame. 5,143,669, Cl. 264-103.000.

Motto, Eric R.; and Jurell, Scott R., to Lutron Electronics Co., Inc. Compact fluorescent lamp dimming system. 5,144,205, Cl. 315-244.000.

Mowforth, Edwin: *See*—
Husain, Farouk; and Mowforth, Edwin, 5,143,323, Cl. 244-116.000.

Moxey, John R., to BP Chemicals Limited. Polyether lubricants. 5,143,640, Cl. 252-52.00A.

Moya, Israel A.; and Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Flexible robotic arm. 5,142,932, Cl. 74-479.000.

Mozume, Teruo; and Ohbu, Isao, to Hitachi, Ltd. Optical head incorporating refractive index distribution changeable lens. 5,144,603, Cl. 369-44.140.

Mrocca, Mark M., to Taylor Building Products Company. Reaction injection molded door assembly. 5,142,835, Cl. 52-309.120.

Mrosko, John A.: *See*—
Lee, Stanley M.; Terry, Jimmy C.; and Mrosko, John A., 5,142,784, Cl. 29-895.210.

Muck, Karl-Friedrich: *See*—
Sextro, Gunter; Muck, Karl-Friedrich; Burg, Karlheinz; and Fischer, Eberhard, 5,144,005, Cl. 528-480.000.

Mueller, Peter W.: *See*—
Bobo, Melvin; Mueller, Peter W.; and McClure, Thomas F., 5,143,499, Cl. 411-247.000.

Mueller, Richard A.: *See*—
Partus, Richard A.; Koszyk, Francis J.; and Mueller, Richard A., 5,144,037, Cl. 546-116.000.

Mueller, Thomas, to American Cyanamid Company. Method for separating diphenylurea (DPU) and phenylthiohydantoin-tryptophan (PTH-TRP) allowing unambiguous identification of TRP in automatic sequence analysis. 5,143,851, Cl. 436-89.000.

Muennemann, Frank; and Bell, Rodney, to Resonex, Inc. Flexible and curved radio frequency (RF) coil for the human shoulder for magnetic resonance imaging apparatus. 5,143,068, Cl. 128-653.500.

Mukai, Kazuhiko: *See*—
Sakamoto, Masaharu; Yamaguchi, Shigeru; Mukai, Kazuhiko; Matsumoto, Yukio; Suzuki, Shinji; Katsu, Toshiyuki; Iizuka, Tatsushi; Yatsuhashi, Kiyomi; and Hidaka, Hidenori, 5,142,959, Cl. 84-645.000.

Mukaihira, Takashi; Sugiura, Noboru; and Kobayashi, Royoichi, to Hitachi, Ltd. Control apparatus of ignition current conducting time. 5,143,553, Cl. 123-609.000.

Muller, Frederik: *See*—
Maxwell, Ian E.; Muller, Frederik; Khouw, Frank H. H.; Khor, Kim H.; and Lucien, Jacques, 5,143,596, Cl. 208-89.000.

Muller, Hanns P.; Jansen, Bernhard; Calaminus, Wolfgang; and Dhein, Rolf, to Bayer Aktiengesellschaft. Liquid crystalline bis-chlorocarbonic acid esters. 5,144,055, Cl. 558-281.000.

Muller, Josef; and Neudecker, Alfred. Process for production of a film including a silicone layer. 5,143,676, Cl. 264-171.000.

Muller, Peter: *See*—
Striek, Ralf-Jurgen; and Muller, Peter, 5,144,543, Cl. 363-16.000.

Munday, John F. Hydrogen and oxygen system for producing fuel for engines. 5,143,025, Cl. 123-3.000.

Munter, Ernst A., to Northern Telecom Limited. Common memory switch for routing data signals comprising ATM and STM cells. 5,144,619, Cl. 370-60.100.

Munters Corporation: *See*—
Thomas, Patricia T., 5,143,658, Cl. 261-112.200.

Murai, Takaaki: *See*—
Endo, Toshio; Murai, Takaaki; and Fujii, Tatsumi, 5,143,997, Cl. 528-60.000.

Murakami, Daisuke, to Sony Corporation. Programmable delay circuit having a buffer stage connected in cascode between the outputs of a plurality of differential amplifiers and the output terminal. 5,144,174, Cl. 307-608.000.

Murakami, Kunihiko: *See*—
Sasaki, Takao; Murakami, Kunihiko; and Hosokawa, Masahiko, 5,144,213, Cl. 318-569.000.
Sasaki, Takao; Murakami, Kunihiko; and Sano, Masafumi, 5,144,550, Cl. 364-192.000.

Murakami, Kyoichi: *See*—
Hirabayashi, Atsushi; Murakami, Kyoichi; Komori, Kenji; and Ishihara, Masaaki, 5,144,169, Cl. 307-490.000.

Murakami, Masami: *See*—
Honda, Tadatoshi; Nagayama, Tokio; Horiuchi, Nobuhiko; Kitagawa, Jun; Kawahara, Kazunori; and Murakami, Masami, 5,144,090, Cl. 568-476.000.

Muramatsu, Shogo; and Yasuda, Tomotada, to Taiho Kogyo Co., Ltd. Boronized sliding material having high strength and method for producing the same. 5,143,559, Cl. 148-279.000.

Murano, Toshiro; and Sakai, Masato, to Oki Electric Industry Co., Ltd. Transfer assembly of electrophotographic printer. 5,144,383, Cl. 355-274.000.

Murata, Hisashi: *See*—
Hasegawa, Kazuo; Murata, Hisashi; and Ouchi, Ikuo, 5,144,117, Cl. 235-455.000.

Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu, 5,142,857, Cl. 57-281.000.
Ohashi, Kenji, 5,143,313, Cl. 242-18.100.

Murata Manufacturing Co., Ltd.: *See*—
Amano, Toshinori; and Mori, Susumu, 5,144,527, Cl. 361-321.000.

Murata, Shigemi, to Mitsubishi Denki K.K. Hall-effect sensor with integrally molded frame and plate supported Hall element. 5,144,234, Cl. 324-235.000.

Murata, Yukichi: *See*—
Morishima, Takashi; Murata, Yukichi; Okabayashi, Tadashi; and Kawai, Yutaka, 5,143,782, Cl. 428-327.000.

Muratore, Beth A.: *See*—
Norman, John A. T.; and Muratore, Beth A., 5,144,049, Cl. 556-12.000.

Murdock, Keith A.: *See*—
Keusch, Preston; Murdock, Keith A.; Czap, Christine A.; and Lennon, Linda, 5,143,071, Cl. 128-640.000.

Muroi, Katsumi: *See*—
Oba, Sayoko; Okuna, Kenji; Muroi, Katsumi; Ouchi, Katsubumi; Imura, Tsutomu; and Kojima, Ryoji, 5,144,343, Cl. 346-155.000.

Murphy, Brian W.: *See*—
Arens, Kenneth P.; and Murphy, Brian W., 5,144,283, Cl. 340-506.000.

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Haugen, Ronald E.; and Murphy, David T., 5,143,507, Cl. 414-427.000.

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Inculet, Ion I.; Lackner, John R.; and Murphy, James C., 5,143,524, Cl. 55-2.000.

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Chesterfield, Michael P.; Muth, Ross R.; and Kennedy, John, 5,143,662, Cl. 264-8.000.

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Shimizu, Kazutoshi, 5,142,789, Cl. 33-438.000.

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Diehl, Charles F.; Tancrede, Jean M.; and Myers, Michael O., 5,143,968, Cl. 524-534.000.

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Hotomi, Hideo; and Myochin, Hisashi, 5,144,340, Cl. 346-140.00R.

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Kamon, Kazuya; Myoi, Yasuhito; Miyamoto, Teruo; Noguchi, Yoshie; and Tanaka, Masaaki, 5,144,362, Cl. 355-53.000.

Naber, John F., to ITT Corporation. Temperature compensation apparatus for logic gates. 5,144,405, Cl. 357-51.000.

Naeumann, Fritz: *See*—
Hoelderich, Wolfgang; Naeumann, Fritz; and Fischer, Rolf, 5,144,061, Cl. 560-212.000.

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Naganuma, Kazuhiro: *See*—
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Irie, Yoichiro; Takeda, Yoshiyuki; Nagao, Tsuyoshi; and Kida, Yasuhiko, 5,143,363, Cl. 271-6.000.

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Nagashima, Kenji: *See*—
Kume, Hidehiro; Yamamoto, Etsufumi; and Nagashima, Kenji, 5,144,614, Cl. 369-112.000.

Nagashima, Takashi: *See*—
Sakamoto, Hiroyuki; Miyamoto, Naruyuki; Takahashi, Ichirou; Nagashima, Takashi; and Arai, Hiroyuki, 5,144,366, Cl. 355-208.000.

Nagata, Atsushi: *See*—
Tanaka, Akiyoshi; Matsuya, Satoshi, deceased; Fujikawa, Wataru; Uwabo, Hiroyuki; Inoue, Ikuo; and Nagata, Atsushi, 5,144,426, Cl. 358-133.000.

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Miyamoto, Hirohisa; and Nagata, Kenzo, 5,144,372, Cl. 355-328.000.

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Nagayama, Tokio: *See*—
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Nagayama, Yoshiaki, to Mazda Motor Corporation. Automobile air conditioning system. 5,142,881, Cl. 62-228.500.

Nagel, Karl: *See*—
Conzelmann, Gerhard; Kohl, Walter; and Nagel, Karl, 5,144,219, Cl. 322-25.000.

Nahar, Rathindra, to NCR Corporation. Apparatus and method for improving the accuracy of weighing an object. 5,143,164, Cl. 177-50.000.

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Kitamura, Kunio; Suganuma, Namio; and Naito, Tadashi, 5,143,561, Cl. 148-111.000.

Najima, Kozo; Tsuyuguchi, Hirohumi; Aoki, Tsutomu; Wakano, Fukuo; and Ida, Masahiro, to Nippon Pneumatic Manufacturing Co., Ltd. Vibrating cutting tool. 5,143,493, Cl. 409-141.000.

Nakabayashi, Kazuto; and Fox, Timothy R., to Kabushiki Kaisha Toshiba. RF coil system for use in magnetic resonance imaging apparatus. 5,144,243, Cl. 324-318.000.

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Goto, Yasuyuki; Koshino, Nagaaki; Utsumi, Kenichi; Tsugawa, Iwao; and Nakada, Masahiro, 5,144,618, Cl. 369-284.000.

Nakagaki, Shintaro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,415, Cl. 358-43.000.
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Ogura, Tsuneo; and Nakagawa, Akio, 5,144,401, Cl. 357-38.000.

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Kanehira, Makoto; Takahashi, Toshio; and Nakagawa, Takerou, 5,143,477, Cl. 403-341.000.

Nakagawa, Yuji; Suzaki, Satoru; and Terada, Motoharu, to Matsushita Electric Works, Ltd. Interruption processing system in time division multiplex transmission system. 5,144,295, Cl. 340-825.120.

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Nakajima, Hiroshi: *See*—
Yajima, Yasuhito; and Nakajima, Hiroshi, 5,144,279, Cl. 338-270.000.

Nakajima, Masaaki: *See*—
Kiyota, Hirotaka; and Nakajima, Masaaki, 5,143,368, Cl. 271-202.000.

Nakajima, Tohru: *See*—
Yamanaka, Tsutomu; Seki, Toshio; Nakajima, Tohru; and Yaoka, Osamu, 5,143,936, Cl. 514-456.000.

Nakajima, Tooru; and Tsuru, Sumiaki, to Bestex Kabushiki-Kaisha. Filtering material of apatite and glucan used for surgical masks and method of making it. 5,143,752, Cl. 427-244.000.

Nakamaru, Takuya: *See*—
Takahashi, Katsumasa; Nakamaru, Takuya; and Iino, Osamu, 5,144,344, Cl. 351-44.000.

Nakamura, Akira: *See*—
Tanaka, Toyoaki; Nakamura, Akira; Kamei, Yoshisuke; and Hashimoto, Akihiro, 5,143,786, Cl. 428-357.000.

Nakamura, Kanichi: *See—*
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi; Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, 5,143,930, Cl. 414-369.000.

Nakamura, Kenji; Majima, Masao; and Yamamoto, Noboru, to Canon Kabushiki Kaisha. Optical fiber communication method and multimedia optical fiber network using the same. 5,144,466, Cl. 359-123.000.

Nakamura, Masahiro, to Ricoh Company, Ltd. Method and an apparatus for isolating an area corresponding to a character or word. 5,144,682, Cl. 382-9.000.

Nakamura, Mitsuyoshi; and Miyata, Kazuaki, to Mitsubishi Denki Kabushiki Kaisha. Insulated gate field effect transistor with high breakdown voltage. 5,144,389, Cl. 357-23.400.

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Nakamura, Tatsuya: *See—*
Mori, Hiromi; Morimoto, Reiko; and Nakamura, Tatsuya, 5,143,812, Cl. 430-124.000.

Nakamura, Tsutomu: *See—*
Takaragi, Kazuo; Ishii, Yasuhiro; and Nakamura, Tsutomu, 5,144,665, Cl. 380-30.000.

Nakamura, Yukitsugu; Kohayakawa, Yoshimi; and Aoki, Hiroshi, to Canon Kabushiki Kaisha. Ophthalmological apparatus for alignment and refraction. 5,144,346, Cl. 351-208.000.

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Nakanishi, Nobuyasu: *See—*
Toda, Hiroshi; Miyata, Hideyasu; Takeuchi, Hiroaki; Nakanishi, Nobuyasu; and Kondo, Koichi, 5,143,428, Cl. 303-113.0AP.

Nakano, Koji: *See—*
Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, 5,143,295, Cl. 239-403.000.

Nakano, Shoichi: *See—*
Kaneko, Tadashi; Nakano, Shoichi; Kobayashi, Yoshiaki; and Kasuya, Takahira, 5,143,809, Cl. 430-105.000.

Nakano, Tomoaki: *See—*
Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, 5,143,295, Cl. 239-403.000.

Nakashima, Shota: *See—*
Matsuzawa, Akira; Nakashima, Shota; and Yamada, Haruyasu, 5,144,163, Cl. 307-446.000.

Nakatsugawa, Naoki; and Horikoshi, Koki, to Research Development Corporation of Japan; Nakatsugawa, Naoki; and Horikoshi, Koki, a part interest. Alkalophilic methanogen and fast methane fermentation method. 5,143,835, Cl. 435-167.000.

Nakatsuka, Kimihiro; and Tagaya, Masafumi, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for recording color image. 5,144,419, Cl. 358-75.000.

Nakayama, Masaaki; and Kitamura, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Color image pickup apparatus. 5,144,399, Cl. 358-37.000.

Nakayama, Masaharu: *See—*
Goto, Yoshitaka; and Nakayama, Masaharu, 5,144,044, Cl. 549-70.000.

Nakayama, Shoichiro: *See—*
Iwata, Hiroshi; Noguchi, Shigeru; Ishida, Satoshi; Sano, Keiichi; and Nakayama, Shoichiro, 5,144,391, Cl. 357-23.700.

Nakayama, Takashi; and Iwade, Takashi, to Toray Engineering Co., Ltd. Yarn piecing method for yarn spinning machine. 5,142,856, Cl. 57-22.000.

Nakayama, Toshio: *See—*
Gemma, Nobuhiro; Nakayama, Toshio; Egusa, Syun; Miura, Akira; Azuma, Makoto; Aoki, Shinya; and Naito, Katsuyuki, 5,144,473, Cl. 359-270.000.

Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; Suzuki, Kazuhiki; and Suzuki, Jun, to Mizusawa Industrial Chemicals, Ltd. Tetracosahedral siliceous particles and process for preparation thereof. 5,143,708, Cl. 423-328.000.

Nalco Chemical Company: *See—*
Fong, Dodd W.; Kinsella, Mary A.; Kneller, James F.; and Sparapany, John W., 5,143,602, Cl. 210-700.000.
Stephenson, William K.; Mercer, Bradley D.; and Comer, David G., 5,143,594, Cl. 208-48.0AA.

Namoto, Yoshiteru: *See—*
Yumiba, Takashi; Yamashita, Haruo; Konishi, Shinichi; and Namoto, Yoshiteru, 5,144,684, Cl. 382-54.000.

Naoetsu Electronics Company: *See—*
Ibaraki, Tadashi; and Sato, Tsutomu, 5,142,756, Cl. 29-25.010.

Narita, Hirokazu: *See—*
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 5,144,027, Cl. 540-222.000.

Narula, Anubhav P. S.; De Virgilio, John J.; and Schreiber, William L., to International Flavors & Fragrances Inc. Process for preparing phenyl butyronitriles and perfumery use of 2,2-dimethyl-4-phenyl valeronitrile. 5,143,899, Cl. 512-4.000.

Narutani, Tetsu: *See—*
Yamazaki, Masakatsu; Narutani, Tetsu; and Kobiki, Hideaki, 5,143,638, Cl. 252-62.590.

Nasar, Hatem N.; and Bhanu, Bir, to Honeywell Inc. Landmark recognition for autonomous mobile robots. 5,144,685, Cl. 382-48.000.

Nash, Victor W.; and Oakley, Francis R., to Molins PLC. Cigarette machine trimming device. 5,143,094, Cl. 131-84.400.

Nasu, Takeshi: *See—*
Miki, Nobuaki; Sugiura, Kiyohiko; Nasu, Takeshi; Sugiura, Masayuki; and Saito, Masao, 5,143,345, Cl. 251-129.020.

National Research Development Corporation: *See—*
Hamilton, Ronald S.; and Seden, William E., 5,143,660, Cl. 264-1.400.
Mansfield, Peter, 5,143,688, Cl. 324-318.000.

National Semiconductor Corporation: *See—*
Huard, Jeffrey M., 5,144,171, Cl. 307-530.000.
Iranmanesh, Ali A.; and Ganschow, George E., 5,144,404, Cl. 357-51.000.

National Starch and Chemical Investment Holding Corporation: *See—*
Skoultchi, Martin M.; and Merlo, Nicholas V., 5,143,884, Cl. 502-160.000.

Natsuume, Tadao: *See—*
Nishi, Yoshikatsu; Oshima, Masayoshi; Natsuume, Tadao; and Kohara, Teiji, 5,143,979, Cl. 525-332.100.

Navarra, Pietro: *See—*
Fasola, Giancarlo; and Navarra, Pietro, 5,142,924, Cl. 74-7.00A.

Navistar International Transportation Corp.: *See—*
Grinsteiner, James J., 5,143,291, Cl. 239-88.000.
Tausk, Edward F., 5,143,143, Cl. 164-246.000.

Nawa, Michio: *See—*
Mizushina, Fumio; Goto, Takashi; and Nawa, Michio, 5,142,903, Cl. 73-118.100.

Nawata, Kazumasa: *See—*
Kanai, Yasunori; Nawata, Kazumasa; Shimizu, Mitsuhisa; Yada, Hiroki; Saitoh, Taichi; and Sakai, Toshiaki, 5,144,158, Cl. 307-272.100.

NCR Corporation: *See—*
Nahar, Rathindra, 5,143,164, Cl. 177-50.000.
Wittensoldner, Christopher J.; and Blanford, Denis M., 5,144,114, Cl. 235-375.000.

Nebel, Mary: *See—*
August, Melvin C.; Massopust, Daniel; Nebel, Mary; Neumann, Eugene F.; and Pautsch, Gregory W., 5,144,691, Cl. 385-88.000.

NEC Corporation: *See—*
Fujita, Yuji; and Iwata, Kouzou, 5,144,203, Cl. 315-169.300.
Hoshino, Yasuharu, 5,144,584, Cl. 365-222.000.
Ishizaki, Yasutoshi; Maruta, Rikio; Rokugo, Yoshinori; Sakaguchi, Hisashi; and Hayashi, Kuniyasu, 5,144,620, Cl. 370-84.000.
Kinashi, Haruhiko; and Watanabe, Toshiyuki, 5,144,621, Cl. 370-85.100.
Masamoto, Kazuhiko, 5,144,547, Cl. 363-127.000.
Mita, Naoko, 5,143,784, Cl. 428-336.000.
Miyauchi, Mayu, 5,144,437, Cl. 358-183.000
Sekiguchi, Sunao, 5,144,628, Cl. 371-40.100.

Neely, Nicholas H., to Kabelmetal Electro GmbH. Method and apparatus for heat sealing of joints and connections. 5,142,776, Cl. 29-859.000.

Negishi, Hirokazu, to Canon Kabushiki Kaisha. Sound output system. 5,144,670, Cl. 381-24.000.

Neier, Benjamin R., to Roto-Mix Enterprises, Ltd. Combined hay processor and feed mixer. 5,143,310, Cl. 241-101.800.

Nelle, Gunther, to Dr. Johannes Heidenhaim GmbH. Position measuring device. 5,142,792, Cl. 33-702.000.

Nelson, Danny L. Dethatching apparatus. 5,142,852, Cl. 56-16.600.

Nelson, Robert T. Apparatus for treating cornered surfaces. 5,142,831, Cl. 51-424.000.

Nemec, Larry H.: *See—*
Allen, Robert H.; Anderson, Keith G.; Diefenbach, Steven P.; Lin, Ronny W.; Nemec, Larry H.; Overstreet, Andrew D.; and Robinson, Gene C., 5,144,053, Cl. 556-190.000.

Nemoto, Kouzou: *See—*
Suzuki, Hideaki; Matsuzaki, Kichie; Kato, Kazuo; Oono, Mitsuo; Takeichi, Kenzo; Hisatomi, Ryoichi; Isobe, Mitsunobu; Fujimori, Shigeru; and Nemoto, Kouzou, 5,144,683, Cl. 382-16.000.

Neogi, Amar: *See—*
Arie, Ben-Bassat; Bruner, Robert; Shoemaker, Sharon; Aloni, Yehoshua; Wong, Harry; Johnson, Donald C.; and Neogi, Amar, 5,144,021, Cl. 536-56.000.

Nepera, Inc.: *See—*
Keusch, Preston; Murdock, Keith A.; Czap, Christine A.; and Lennon, Linda, 5,143,071, Cl. 128-640.000.

Nerone, Louis R.; and Basch, John G., to General Electric Company. Tapped-inductor boost convertor for operating a gas discharge lamp 5,144,204, Cl. 315-209.00R.

Nestec S.A.: *See—*
Blanchard, Claude; Morand, Alfred; and Schmidt, Robert H., 5,143,740, Cl. 426-446.000.

Netravali, Arun N.: *See—*
Knauer, Scott C.; Matthews, Kim N.; Netravali, Arun N.; Petajan, Eric D.; Safranek, Robert J.; and Westerink, Peter H., 5,144,423, Cl. 358-133.000.
Knauer, Scott C.; and Netravali, Arun N., 5,144,435, Cl. 358-167.000.

Neudecker, Alfred: *See—*
Muller, Josef; and Neudecker, Alfred, 5,143,676, Cl. 264-171.000.

Neugebauer, Wolfgang: *See—*
Kowalczik, Udo; Neugebauer, Wolfgang; and Bartmann, Martin, 5,144,002, Cl. 528-218.000.

Neumann, Eugene F.: *See—*
August, Melvin C.; Massopust, Daniel; Nebel, Mary; Neumann, Eugene F.; and Pautsch, Gregory W., 5,144,691, Cl. 385-88.000

New York University: *See—*
Young, Wise; and Sakatani, Kaoru, 5,143,081, Cl. 128-741.000.

Newell, Arthur E. Spray dispenser having a non-use storage recess for a discharge tube. 5,143,263, Cl. 222-538.000

Newkirk, David D.; and Ostrowski, Henry S., to Fiberweb North America, Inc. Rebulkable nonwoven fabric. 5,143,779, Cl. 428-218.000

Newman Machine Company, Inc.: *See—*
Laster, James E., 5,143,311, Cl. 241-280.000.

Neyer, Leo E.: *See—*
Simpson, Harold G.; and Neyer, Leo E., 5,142,838, Cl. 52-640.000

NGK Insulators, Inc.: *See—*
Yajima, Yasuhito; and Nakajima, Hiroshi, 5,144,279, Cl. 338-270.000

NGK Insulators, Ltd.: *See—*
Kawase, Mitsuo; Yoshida, Yasuko; and Yonekawa, Hitoshi, 5,143,847, Cl. 435-288.000.
Kurishita, Akiyoshi; Katsu, Masanori; and Kato, Masami, 5,144,249, Cl. 324-439.000.

NGK Spark Plug Co., Ltd.: *See—*
Shirai, Makoto; and Sumida, Katsuhiko, 5,143,487, Cl. 407-117.000

NGK Spark Plug Co., Ltd: *See—*
Kagawa, Junichi; and Matsutani, Wataru, 5,144,188, Cl. 313-11.500.

Nguyen, Hop D.: *See—*
Leyden, Richard N.; Almouist, Thomas A.; Lewis, Mark A.; and Nguyen, Hop D., 5,143,663, Cl. 264-22.000.

Nguyen, Tuan K.: *See—*
DeLuca, Michael J.; and Nguyen, Tuan K., 5,144,296, Cl. 340-825.440.

NHK Spring Co., Ltd.: *See—*
Ojima, Juji, 5,142,738, Cl. 16-306.000

Nicaud, Jean-Marc: *See—*
Holland, Ian B.; Mackman, Nigel; and Nicaud, Jean-Marc, 5,143,830, Cl. 435-69.700

Nichols, Khipra: *See—*
Tepper, Sidney; and Nichols, Khipra, 5,143,419, Cl. 297-183.000

Nickel, Dennis J.: *See—*
Lydy, Bruce S.; Schueller, Dennis R.; Nickel, Dennis J.; and Rauwerdink, James D., 5,142,851, Cl. 56-13.400.

Nickerson, Mark A.: *See—*
James, Michael S.; Powell, Melissa A.; Nickerson, Mark A.; and Staats, Louis T., III, 5,142,875, Cl. 62-50.500

Nieboer, Keith A.: *See—*
Laclave, Thomas J.; and Nieboer, Keith A., 5,142,834, Cl. 52-208.000

Nielsen, Bradley A.: *See—*
Young, Steven C.; Nielsen, Bradley A.; and Miller, Matthew T., 5,143,159, Cl. 172-8.000.

Niemann, Ralph C.: *See—*
Gonczy, John D.; Niemann, Ralph C.; and Boroski, William N., 5,143,770, Cl. 428-78.000

Niemi, Jouko, to Oy Finnpulva AB. Method and equipment for processing of particularly finely divided material. 5,143,303, Cl. 241-5.000.

Niida, Yoriaki: *See—*
Tsuchiya, Yoshinobu; Kurabayashi, Ken; and Niida, Yoriaki, 5,144,537, Cl. 361-502.000

Niino, Masahiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyoxymethylene resin composition. 5,143,982, Cl. 525-400.000.

Niiro, Yasunori: *See—*
Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, 5,143,648, Cl. 252-403.000

Nikon Corporation: *See—*
Ohshita, Koichi, 5,144,480, Cl. 359-432.000
Shibayama, Atsushi, 5,144,489, Cl. 359-689.000.
Toshimitsu, Kunio, 5,144,478, Cl. 359-392.000.
Tsuru, Hiroyuki; Otani, Tadashi; and Sato, Shigemasa, 5,144,358, Cl. 354-403.000

Nilssen, Ole K. High-frequency power supply for incandescent lamp 5,144,202, Cl. 315-151.000

Nilsson, Bjorn: *See—*
Abrahmsen, Lars; Moks, Tomas; Nilsson, Bjorn; and Uhlen, Mathias, 5,143,844, Cl. 435-257.300

Nilsson, Nils S., to Aktiebolaget Electrolux. Waste disintegrating device for a dishwasher. 5,143,306, Cl. 241-46.012.

Ninomiya, Shinji; and Naganuma, Kazuhiro, to Asahi Kogaku Kogyo K.K. Lens having a surface treating composition for reflection preventing film. 5,144,485, Cl. 359-580.000.

Nintendo Co., Ltd.: *See—*
Inoue, Yoshuhiro; and Ashida, Kenichiro, 5,143,379, Cl. 273-435.000

Nippon Hypox Laboratories Incorporated: *See—*
Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, 5,143,648, Cl. 252-403.000

Nippon Oil and Fats Co., Ltd.: *See—*
Goto, Yoshitaka; and Nakayama, Masaharu, 5,144,044, Cl. 549-70.000.
Nagai, Kenji; Fukushi, Kyosuke; and Matsuyama, Kazuo, 5,143,974, Cl. 525-92.000

Nippon Pneumatic Manufacturing Co., Ltd.: *See—*
Najima, Kozo; Tsuyuguchi, Hirohumi; Aoki, Tsutomu; Wakano, Fukuo; and Ida, Masahiro, 5,143,493, Cl. 409-141.000

Nippon Seiko Kabushiki Kaisha: *See—*
Higashino, Kiyoharu; Matsumoto, Sakae; and Kihara, Hiroshi, 5,143,402, Cl. 280-775.000
Yokouchi, Atsushi; and Yabe, Toshikazu, 5,143,637, Cl. 252-62.520

Nippon Shokubai Co., Ltd.: *See—*
Saitou, Noboru; Hirota, Koichi; Hasebe, Ren; Okuda, Norimasa; and Katsumi, Ikuyo, 5,144,066, Cl. 562-416.000

Nippon Telegraph and Telephone Corp.: *See—*
Morita, Hikaru, 5,144,574, Cl. 364-746.000
Okuda, Hidenori; and Masaki, Shigeki, 5,144,428, Cl. 358-136.000

Nippon Thompson Co., Ltd.: *See—*
Morita, Kunihiko, 5,143,454, Cl. 384-37.000

Nippon Unicar Company Limited: *See—*
Senuma, Akitaka; Nagai, Toshiyuki; Tsukada, Kiroku; and Hayashi, Akio, 5,143,960, Cl. 525-282.000

Nippon Zeon Co., Ltd: *See—*
Nishi, Yoshikatsu; Oshima, Masayoshi; Natsuume, Tadao; and Kohara, Teiji, 5,143,979, Cl. 525-332.100

Nishi, Yoshikatsu; Oshima, Masayoshi; Natsuume, Tadao; and Kohara, Teiji, to Nippon Zeon Co., Ltd. Molding material. 5,143,979, Cl. 525-332.100

Nishi, Yuji; Ito, Shigehiro; Koguchi, Tatsushi; and Ebihara, Kazuyuki, to Victor Company of Japan, Ltd. Ghost cancelling device with waveform checking circuit. 5,144,414, Cl. 358-36.000

Nishida, Norio: *See—*
Kobayashi, Seiji; Nishida, Norio; Eguchi, Naoya; and Yoshimura, Shunji, 5,144,605, Cl. 369-44.260

Nishii, Michiharu: *See—*
Sakakihara, Yuichiro; and Nishii, Michiharu, 5,142,865, Cl. 60-555.000

Nishikawa, Masahiro: *See—*
Kuzuhara, Hiroyoshi; Kawana, Masajiro; Yamasaki, Noritsugu; and Nishikawa, Masahiro, 5,144,018, Cl. 536-26.000

Nishimae, Junichi: *See—*
Taki, Masakazu; Yoshizawa, Kenji; and Nishimae, Junichi, 5,144,199, Cl. 313-484.000

Nishimoto, Seiji: *See—*
Ushio, Hideaki; Nishimoto, Seiji; and Tamenori, Koji, 5,142,863, Cl. 60-272.000

Nishimura, Atsushi, to International Chemical Consultant, Ltd. Colorless grained alpha-form crystals of tetrakis [3-(3,5-di-t-butyl-4-hydroxyphenyl)propionyloxymethyl]methane and process for its manufacture. 5,144,058, Cl. 560-75.000

Nishimura, Toshihiko, to Mitsubishi Denki K.K. Electromagnetic solenoid for oil hydraulic control valves. 5,144,272, Cl. 335-255.000

Nishio, Shouji, to Konica Corporation. Silver halide photographic light-sensitive material element with antihalation layer containing optical brightener. 5,143,822, Cl. 430-522.000.

Nishioka, Toshio: *See—*
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 5,144,071, Cl. 564-9.000

Nishiyama, Shigeru: *See—*
Katagiri, Shingo; Nishiyama, Shigeru; and Tahara, Hiroyuki, 5,144,511, Cl. 360-132.000

Nishiyama, Shinichi: *See—*
Yamaoka, Hideo; Shimizu, Tooji; Matsunaga, Fujihisa; Nishiyama, Shinichi; Yamanaka, Toru; and Miyakoshi, Shoichi, 5,143,644, Cl. 252-299.620

Nishiyama, Tomoyuki, to Fuji Photo Film Co., Ltd. Double-side magnetic recording-reproducing apparatus with fixed position magnetic heads. 5,144,509, Cl. 360-105.000.

Nishizawa, Teiji, to Matsushita Electric Industrial Co., Ltd. Means for eliminating hidden surface. 5,144,291, Cl. 340-729.000

Nissan Chemical Industries, Ltd.: *See—*
Nagase, Yu; Takamura, Yuriko; Kohtoh, Noriaki; Fukuro, Hiroyoshi; and Abe, Toyohiko, 5,144,078, Cl. 564-472.000

Nissan Motor Company, Limited: *See—*
Fukushima, Naoto; Yamaguchi, Hirotsugu; Akatsu, Yohsuke, and Hano, Sunao, 5,144,558, Cl. 364-424.050.
Higashimata, Akira; Fujishiro, Takeshi; and Yoshioka, Shigeki, 5,143,429, Cl. 303-115.0EC.
Ikeura, Kenji, 5,143,030, Cl. 123-90.160.
Kishi, Hisao, 5,144,318, Cl. 342-357.000
Matsuno, Yohsio; Choji, Shinichiro; Sasaki, Kenichi; and Tanabe, Yoshinori, 5,143,437, Cl. 362-80.000
Sagara, Kiyoshi, 5,143,168, Cl. 180-374.000.
Sawamoto, Kunifumi, 5,143,037, Cl. 123-399.000
Shimanaka, Shigeki, 5,142,945, Cl. 74-866.000.
Yamaguchi, Takuro, 5,142,916, Cl. 73-799.000

Nitayama, Akihiro: *See—*
Okabe, Naoko; Inoue, Satoshi; Sunouchi, Kazumasa; Yamada, Takashi; Nitayama, Akihiro; and Takato, Hiroshi, 5,144,579, Cl. 365-149.000

Niu, Qian; and Ensslin, Klaus, to University of California, Regents of the. Quantum wire CCD charge pump. 5,144,580, Cl. 365-149.000

Nixdorf Computer AG: *See—*
Kunold, Ingo, 5,144,569, Cl. 364-724.010.

NKK Corporation: *See—*
Nakaham, Yasumitsu; Araki, Kenji; and Kamio, Hiroshi, 5,143,704, Cl. 422-248.000
Toya, Shigeo; Hiramoto, Yoshiyuki; Sasaki, Koji; Abe, Koichi; Teraoka, Tatsuo; Shiga, Hirokazu; and Yoshie, Yasunori, 5,142,763, Cl. 29-517.000

Nobori, Kentaro: *See—*
Kimura, Itsuo; Nobori, Kentaro; and Hikasa, Shigeki, 5,143,980, Cl. 525-358.000

Nobumoto, Hidetoshi; and Sakaki, Minoji, to Mazda Motor Corporation. Coupling force control system for fluid coupling. 5,143,191, Cl. 192-76.000.

Nochumson, Samuel; Curtis, Foner [illegible]; Morgan, Jonathan H.; and Kirkpatrick, Francis H., to FMC Corporation. Polysaccharide resolving gels and gel systems for stacking electrophoresis. 5,143,646, Cl. 252-315.300

Noda, Masayuki; and Kobayashi, Yukio, to Sony Corporation. Disc cartridge loading device. 5,144,508, Cl. 360-99.060

Noda, Yukihiro: *See*—
Tsukada, Kiyotaka; and Noda, Yukihiro, 5,144,536, Cl. 361-402.000

Noe, Oskar; and Dotsch, Willi, to EWG Bergwerk-und-Walzwerk-Maschinenbau GmbH. Arrangement for adjusting the roll gap in rolling mill stands, particularly in strip rolling mill stands for hot or cold rolling. 5,142,892, Cl. 72-20.000

Noguchi, Nobuhisa: *See*—
Katoh, Hideaki; Noguchi, Nobuhisa; Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Hitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, 5,144,539, Cl. 362-256.000

Noguchi, Shigeru: *See*—
Iwata, Hiroshi; Noguchi, Shigeru; Ishida, Satoshi; Sano, Kenichi; and Nakayama, Shoichiro, 5,144,391, Cl. 357-23.700

Noguchi, Yoshie: *See*—
Kamon, Kazuya; Myoi, Yasuhiro; Miyamoto, Teruo; Noguchi, Yoshie; and Tanaka, Masaaki, 5,144,362, Cl. 355-53.000

Noguchi, Yoshihiro; Imai, Toshihisa; Takahashi, Yutaka; and Tanaka, Hideharu, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Home Appliance Co., Ltd. Method of preparing a porous structural unit. 5,143,664, Cl. 264-113.000

Nolan, McEdward M. Animal retentive fence attachment. 5,143,354, Cl. 256-12.000

Nomura, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel and camera incorporating such barrel. 5,144,493, Cl. 359-700.000

Norand Corporation: *See*—
Chadima, George E., Jr.; and Laser, Vadim, 5,144,119, Cl. 235-472.000.
Chadima, George E., Jr.; and Laser, Vadim, 5,144,121, Cl. 235-472.000.

Nordin, Ronnie, to American Extrusion International, Inc. Computerized food product extrusion machine and method. 5,143,738, Cl. 426-231.000

Nordlin, William F.; and Bauscher, Billy J., to Greenlee Textron Inc. Cutter for din rail. 5,142,958, Cl. 83-559.000

Nordness, Mark E.: *See*—
Blemberg, Robert J.; Eckstein, John P.; and Nordness, Mark E., 5,143,677, Cl. 264-173.000.

Nordson Corporation: *See*—
Molnar, Julius J.; Fena, Ernest J.; Folden, David W.; Schneider, Douglas A.; Becker, Richard A.; Fimmen, Charles L.; Selestak, David M.; and Shlapak, Robert, 5,143,680, Cl. 264-511.000

Norita, Toshio: *See*—
Ishida, Tokuji; Norita, Toshio; Hamada, Masataka; and Ootsuka, Hiroshi, 5,144,357, Cl. 354-402.000.
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,144,449, Cl. 358-213.260

Norling, Tomas: *See*—
Lading, Pia; Lundsholm, Yvonne; and Norling, Tomas, 5,143,934, Cl. 514-396.000

Norman, John A. T.; and Muratore, Beth A., to Air Products and Chemicals, Inc. Volatile liquid precursors for the chemical vapor deposition of copper. 5,144,049, Cl. 556-12.000

Norota, Kazuhiko: *See*—
Okawa, Koji; Norota, Kazuhiko; and Mizuno, Hiroyuki, 5,143,040, Cl. 123-684.000

Norrie, Lyle W., to Knud Simonsen Industries Limited. Apparatus for injecting suspended meat solids into meats. 5,142,971, Cl. 99-487.000

Norsworthy, Steven R., to AT&T Bell Laboratories. Idle channel tone and periodic noise suppression for sigma-delta modulators using high-level dither. 5,144,308, Cl. 341-131.000.

North American Philips Corporation: *See*—
Boelart, Eduardo I., 5,144,430, Cl. 358-139.000

Northern Telecom Limited: *See*—
Munter, Ernst A., 5,144,619, Cl. 370-60.100.

Norton, John: *See*—
Mansbridge, Martin H.; Stephen, David; and Norton, John, 5,143,276, Cl. 228-157.000

Nortrup, Kevin E.: *See*—
Wignot, Leroy S.; and Nortrup, Kevin E., 5,144,440, Cl. 358-188.000

Notenboom, Gerardus: *See*—
Megens, Ludovicus; Vriens, Petrus H. A. A.; Asselman, George A. A.; and Notenboom, Gerardus, 5,144,535, Cl. 361-400.000

Nourry, Daniel: *See*—
Cohen, Jacques; Nourry, Daniel; and Thierry, Jean-Pierre, 5,144,530, Cl. 361-378.000

Novak, Ronald W.: *See*—
Hutton, Thomas W.; and Novak, Ronald W., 5,143,954, Cl. 524-106.000

Novotny, Milos V.; Cobb, Kelly A.; and Dolnik, Vladislav, to Indiana University Foundation. Suppression of electroosmosis with hydrolytically stable coatings. 5,143,753, Cl. 427-299.000

Nowicki, Mitchell: *See*—
Schumacher, Glenn O.; Weber, LaVerne; Nowicki, Mitchell; Dunbar, Alan; and Douglas, Jeffrey M., 5,143,481, Cl. 405-129.000

Nozawa, Keita; and Takagi, Seiichi, to Canon Kabushiki Kaisha. Magnetic toner for developing electrostatic image. 5,143,810, Cl. 430-106.600

Nozone Dispenser Systems, Inc.: *See*—
Loychuk, Terrence, 5,143,260, Cl. 222-95.000.

Nugent, James E., to Sludge Drying Systems, Inc. Sludge dehydrater having specially designed augers and infrared heater elements. 5,143,626, Cl. 210-748.000.

Nunn, Charles C., to Lever Brothers Company, Division of Conopco, Inc. Ester perhydrolysis by preconcentration of ingredients. 5,143,641. Cl. 252-186.380

Nurnberg, Eberhard; Leonhardt, Uwe; Hornstein, Otto P.; Griessmeyer, Gabriele; and Perschbacher, Harald, to Stada Arzneimittel AG. Ambiphile cream. 5,143,940, Cl. 514-785.000.

Nussli, Eduard: *See*—
Demuth, Robert; Fritzsche, Peter; Nussli, Eduard; and Staheli, Paul, 5,142,741, Cl. 19-113.000

Nyman, Michael S., to Al-Site Corp. Hanger for displaying eyeglasses. 5,144,345, Cl. 351-158.000

Oakley, Francis R.: *See*—
Nash, Victor W.; and Oakley, Francis R., 5,143,094, Cl. 131-84.400.

Oba, Sayoko; Okuna, Kenji; Muroi, Katsumi; Ouchi, Katsubumi; Iimura, Tsutomu; and Kojima, Ryoji, to Hitachi Ltd.; Hitachi Metals, Ltd.; and Hitachi Koki Co., Ltd. Image recording method and apparatus. 5,144,343, Cl. 346-155.000

Oba, Yoshitaka: *See*—
Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, 5,143,295, Cl. 239-403.000.

Obase, Hiroyuki: *See*—
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; Ishii, Akio; Ishii, Hidee; and Ohmori, Kenji, 5,143,922, Cl. 514-320.000.

Oberhaensli, Rene F.: *See*—
Meyer, Urs; Oberhaensli, Rene F.; and Haeusler, Dominik, 5,144,130, Cl. 250-202.000.

O'Brien, Francis J.: *See*—
Graham, Marcus L.; and O'Brien, Francis J., 5,144,595, Cl. 367-135.000

O'Brien, James R.; Agha, Mohomed B.; Luce, Roberet E.; Renard, Paul S.; and Sellers, Mark G. Fishing rod holder including a non-invasive clamp for mounting same to a gunwale or like surface. 5,142,809, Cl. 43-21.200.

Occidental Chemical Corporation: *See*—
Krishnamurti, Ramesh; Fertel, Lawrence B.; Lin, Henry C.; and Dosi, Mahendra K., 5,144,076, Cl. 564-417.000.

Occupational Orthopaedic Systems, Inc.: *See*—
Litchman, Henry M., 5,142,910, Cl. 73-379.000.

Odaka, Kentaro; Ozaki, Shinya; and Milthorp, Brian, to Sony Corporation; and Hewlett-Packard Limited. Method and apparatus for reproducing multiply recorded data. 5,144,500, Cl. 362-32.000.

Odaka, Yukio; and Ikari, Hideo, to Canon Kabushiki Kaisha. Optical system driving device of camera. 5,144,353, Cl. 354-400.000.

Odekirk, Bruce: *See*—
Finchem, Eric P.; Vetanen, William A.; Odekirk, Bruce; and Beers, Irene G., 5,143,857, Cl. 437-22.000.

Oelsch, Jurgen; Hochgesang, Gerhard; Limpert, Rudolf; and Weber, Dieter, to Preh-Werke GmbH & Co. KG. Programmable plug and cable for computer keyboards. 5,144,567, Cl. 364-708.000

Oeuromer S.A.: *See*—
Roulleau, Pierre, 5,142,976, Cl. 101-41.000.

Ogasawara, Mitsuo: *See*—
Kobayashi, Hiroyuki; Kanaya, Koichi; Baba, Norio; and Ogasawara, Mitsuo, 5,144,129, Cl. 250-307.000.

Ogasawara, Yutaka: *See*—
Sakagami, Wataru; and Ogasawara, Yutaka, 5,144,608, Cl. 369-44.260.

Ogawa, Akihiko: *See*—
Fujiwara, Hiromichi; Ogawa, Akihiko; Sakiyama, Hideyo; and Tamura, Toshiaki, 5,143,935, Cl. 514-426.000

Ogawa, Kazufumi: *See*—
Yamagata, Yoshikazu; Mino, Norihisa; Ogawa, Kazufumi; and Soga, Mamoru, 5,143,750, Cl. 427-57.000.

Ogawa, Masahide: *See*—
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; Suzuki, Kazuhiki; and Suzuki, Jun, 5,143,708, Cl. 423-328.000

Ogawa, Seiya: *See*—
Maeda, Miyozo; Inouye, Yuji; Hashimoto, Yasunobu; Itoh, Kenichi; and Ogawa, Seiya, 5,144,601, Cl. 369-13.000.

Ogihara, Masaki: *See*—
Sawada, Shizuo; and Ogihara, Masaki, 5,144,388, Cl. 357-23.400.

Oginski, Jean-Claude: *See*—
Behar, Gilles; Oginski, Jean-Claude; and Martinet, Alain, 5,143,964, Cl. 524-400.000.

Ogle, Steven E.; and Wylie, Danny L., to Leggett & Platt, Incorporated. Foundation unit with snap-fit modular springs. 5,142,715, Cl. 5-247.000

Ogle, Steven E.; and Wylie, Danny L., to Leggett & Platt, Incorporated. Foundation unit with snap-fit modular springs. 5,142,716, Cl. 5-247.000

Ogura, Mototsugu: *See*—
Ohnaka, Kiyoshi; and Ogura, Mototsugu, 5,143,863, Cl. 437-129.000.

Ogura, Tsuneo; and Nakagawa, Akio, to Kabushiki Kaisha Toshiba. Turn-on/off driving technique for insulated gate thyristor. 5,144,401, Cl. 357-38.000.

Ogura, Yukio: *See*—
Inada, Toshio; Ogura, Yukio; and Kitabayashi, Junichi, 5,144,684, Cl. 382-22.000

O'Hara, Frank: *See*—
Gardner, Billy J.; Jelovich, Benjamin C.; O'Hara, Frank; and Secoura, Ralph A., 5,144,217, Cl. 320-2.000.

Ohara, Katsuichi, to Fujitsu Limited. Digital cross connection apparatus. 5,144,297, Cl. 340-825.790.

Ohashi, Kenji, to Murata Kikai Kabushiki Kaisha. Method and apparatus for winding yarn. 5,143,313, Cl. 242-18.100.

Ohashi, Tsuyoshi; and Hirahata, Shinichi, to Brother Kogyo Kabushiki Kaisha. Laser scanner with deflector and photosensitive drum control. 5,144,339, Cl. 346-108.000

Ohba, Shinya: *See*—
Akimoto, Hajime; Ohba, Shinya; and Mitsui, Mitsuyuki, 5,144,447, Cl. 358-213.110.

Ohbu, Isao: *See*—
Mozume, Teruo; and Ohbu, Isao, 5,144,603, Cl. 369-44.140.

Ohdake, Eishu: *See*—
Tagoku, Izumi; and Ohdake, Eishu, 5,144,521, Cl. 361-225.000

Ohio State University, The: *See*—
Wilde, Bryan E.; and Budinski, Michael K., 5,143,743, Cl. 427-8.000

Ohmori, Kenji: *See*—
Oshima, Etsuo; Obase, Hiroyuki; Karasawa, Akira; Kubo, Kazuhiro; Miki, Ichiro; Ishii, Akio; Ishii, Hidee; and Ohmori, Kenji, 5,143,922, Cl. 514-320.000.

Ohnaka, Kiyoshi; and Ogura, Mototsugu, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing semiconductor laser. 5,143,863, Cl. 437-129.000.

Ohnaka, Kiyoshi; Ban, Yuzaburo; and Kidoguchi, Isao, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser and manufacturing method thereof. 5,144,633, Cl. 372-45.000

Ohnishi, Toshikazu; Kaneko, Shuzo; and Kai, Takashi, to Canon Kabushiki Kaisha. Polymer liquid crystal device. 5,144,464, Cl. 359-98.000.

Ohno, Masashi: *See*—
Takiyasu, Yoshihiro; Tanaka, Toshiki; Asano, Michio; Ohno, Masashi; and Kozaki, Takahiko, 5,144,622, Cl. 370-85.130.

Ohno, Tomoyuki: *See*—
Suzuki, Hiroyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Ohno, Tomoyuki; Yahisa, Yotsuo; Matsuda, Yoshibumi; Tsumita, Norikazu; Ohura, Masaki; Shirakura, Takaaki; Shige, Noriyuki; and Takagi Kazumasa, 5,143,794, Cl. 428-611.000.

Ohshima, Kazuyoshi; and Tamura, Seiichiro, to Sugatsune Industrial Co., Ltd. Mechanism for controlling the travel of a structural member. 5,143,432, Cl. 312-319.100.

Ohshima, Shinji: *See*—
Oka, Kengo; and Ohshima, Shinji, 5,143,377, Cl. 273-232.000.

Ohshima, Tsuyoshi, to Yazaki Corporation. Indication display unit for vehicles. 5,144,289, Cl. 340-705.000.

Ohshita, Koichi, to Nikon Corporation. Keplerian zoom finder optical system. 5,144,480, Cl. 359-432.000.

Ohta, Hiroko: *See*—
Toda, Akitoshi; Shimizu, Ryouhei; Ohta, Hiroko; Kajimura, Hiroshi; Mimura, Yoshiyuki; Isono, Yasuo; and Kouchi, Toshihito, 5,144,581, Cl. 365-151.000.

Ohta, Ken; Kosaka, Wataru; and Yanagisawa, Kenichi, to Sumitomo Bakelite Company Limited. Epoxy resin composition for semiconductor sealing. 5,143,951, Cl. 523-435.000.

Ohta, Noriaki; Iwazaki, Minoru; and Shiratori, Hiroyasu, to Yazaki Corporation. Meter for automobiles. 5,143,434, Cl. 362-29.000.

Ohta, Yoshiki: *See*—
Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, 5,143,295, Cl. 239-403.000.

Ohtaki, Keizaburo: *See*—
Hamada, Akio; Ohtaki, Keizaburo; Kubo, Takashi; and Sasamoto, Hiroshi, 5,143,270, Cl. 228-4.100.

Ohura, Masaki: *See*—
Suzuki, Hiroyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Ohno, Tomoyuki; Yahisa, Yotsuo; Matsuda, Yoshibumi; Tsumita, Norikazu; Ohura, Masaki; Shirakura, Takaaki; Shige, Noriyuki; and Takagi Kazumasa, 5,143,794, Cl. 428-611.000.

Ohura, Masato: *See*—
Kikuchi, Makoto; Ohura, Masato; Tamata, Shin; Chino, Koichi; and Funabashi, Kiyomi, 5,143,654, Cl. 252-629.000.

Ohzeki, Yukihiro; Araya, Junji; and Ishiyama, Tatsunori, to Canon Kabushki Kaisha. Charging device and image forming apparatus having same. 5,144,368, Cl. 355-219.000.

Oji Paper Co., Ltd: *See*—
Minato, Toshihiro; Kato, Masaru; Yasuda, Kenji; Yamamura, Norio; and Kamiya, Masahiro, 5,143,904, Cl. 503-227.000.

Ojima, Juji, to NHK Spring Co., Ltd. Hinge device. 5,142,738, Cl. 16-306.000

Ojima, Toshi: *See*—
Funada, Hitoshi; and Ojima, Toshi, 5,142,979, Cl. 101-183.000.

Oka, Kengo; and Ohshima, Shinji, to Sumitomo Rubber Industries, Ltd. Golf ball. 5,143,377, Cl. 273-232.000

Oka, Tsumoru: *See*—
Ishihara, Kanji; and Oka, Tsumoru, 5,144,277, Cl. 338-166.000

Okabayashi, Tadashi: *See*—
Morishima, Takashi; Murata, Yukichi; Okabayashi, Tadashi; and Kawai, Yutaka, 5,143,782, Cl. 428-327.000

Okabe, Naoko; Inoue, Satoshi; Sunouchi, Kazumasa; Yamada, Takashi, Nitayama, Akihiro; and Takato, Hiroshi, to Kabushiki Kaisha Toshiba. Semiconductor memory device and its fabricating method. 5,144,579, Cl. 365-149.000

Okawa, Koji; Norota, Kazuhiko; and Mizuno, Hiroyuki, to Toyota Jidosha Kabushiki Kaisha. Evaporative fuel control apparatus of internal combustion engine. 5,143,040, Cl. 123-684.000

Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, to Toto Ltd. Bubbly water outlet device. 5,143,295, Cl. 239-403.000

Okazai, Satiko: *See*—
Ishikawa, Hiroyuki; Usui, Hiroaki; Sawada, Yasushi; Okazaki, Satiko; and Kogoma, Masuhiro, 5,143,748, Cl. 427-40.000

Okazaki, Kichizaemon: *See*—
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, 5,144,505, Cl. 360-85.000

Okazaki, Satiko: *See*—
Ishikawa, Hiroyuki; Usui, Hiroaki; Sawada, Yasushi; Okazaki, Satiko; and Kogoma, Masuhiro, 5,143,748, Cl. 427-40.000.

Okeda, Yoshiki: *See*—
Seido, Nobuo; Okeda, Yoshiki; and Kumobayashi, Hidenori, 5,144,042, Cl. 548-541.000

Oki Electric Industry Co., Ltd.: *See*—
Inaba, Takeshi, 5,144,161, Cl. 307-443.000
Murano, Toshiro; and Sakai, Masato, 5,144,383, Cl. 355-274.000
Nakanishi, Eiichi; Onodera, Tetsuo; and Akiyama, Haruhiko, 5,144,258, Cl. 330-129.000

Okimoto, Tomoyuki: *See*—
Tsuchida, Tetsuo; Abe, Yukihiro; Okimoto, Tomoyuki; and Saito, Toranosuke, 5,143,890, Cl. 503-201.000

Okino, Yoshiharu, to Fuji Photo Film Co., Ltd. Semiconductor laser drive device. 5,144,631, Cl. 372-25.000

Okinoshima, Hiroshige; and Kato, Hideto, to Shin-Etsu Chemical Co., Ltd. Semiconductor element protecting compositions. 5,143,948, Cl. 523-212.000

Okita, Takaaki: *See*—
Kamachi, Hajime; Imae, Kiyoto; and Okita, Takaaki, 5,143,911, Cl. 514-202.000

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Petersen, William H., to Shell Offshore Inc. Hydraulic stab subassembly for remotely operated vehicle vertical interface tool. 5,143,483, Cl 405-191.000.

Peterson, Kirk D.: *See—*
Dudley, Dana; Peterson, Kirk D.; and Hanson, Charles M., 5,144,133, Cl. 250-208.100.

Peterson, Norman E. Hood ornament theft alarm. 5,144,281, Cl. 340-426.000.

Petrich, William E.; and Glaser, Charles A., to Rosemount Inc. Interchangeable process connection resistant to installation errors. 5,143,406, Cl. 285-23.000.

Petrakis, Paul F.; Wilford, Michael; and Zavodsky, James, to Packaging Systems, Inc. Reinforced bulk material box. 5,143,278, Cl. 229-23.00R.

Petrykowski, Thomas F.: *See—*
Freymuth, Donald C.; Hon, Jeffrey S.; Lange, Dale K.; Paulus, Gerald J.; Petrykowski, Thomas F.; and Turner, Robert L., 5,142,987, Cl. 104-17.200.

Pettito, John J., Sr. Submerged meter reading apparatus. 5,144,481, Cl 359-440.000.

Petzold, Werner P., to Borg-Warner Automotive, Inc. Pulse width modulation technique. 5,144,265, Cl. 332-109.000.

Pfahl, Magnus, to La Jolla Cancer Research Foundation. Thyroid hormone receptor. 5,144,007, Cl. 530-350.000.

Pfeiler, Susanne: *See—*
Schwarz, Hans P.; Molinari, Ewald; Linnau, Yendra; and Pfeiler, Susanne, 5,143,901, Cl. 514-2.000.

Pfitzenmaier, Werner: *See—*
Bauer, Kurt; Dorr, Wilhelm; Eckle, Reinhard; Pfitzenmaier, Werner; Roth, Christian; and Schmid, Eckhardt, 5,142,939, Cl. 74-595.000.

Pflaum, Hermann: *See—*
Vojacek, Herbert; and Pflaum, Hermann, 5,143,192, Cl. 192-107.00M.

Ph. Settembre, Pierre-Andre : *See—*
Ward, Mona; Ph. Settembre, Pierre-Andre ; Renaud, Alain; and Langlois, Michel, 5,144,029, Cl. 540-610.000.

Pham, Xuan M., to Philip Morris Incorporated. Apparatus and method for maintaining closed hinged lid boxes. 5,143,282, Cl. 229-160.100.

Phero Tech Inc.: *See—*
Smith, Robert F.; Pierce, Harold D., Jr.; Borden, John H.; Chong, Leslie J.; and Hay, Nairn W., 5,143,725, Cl. 424-84.000.

Philip Morris Incorporated: *See—*
Maclauchlan, Victor L., 5,142,85[illegible]5, Cl. 53-489.000.
Moore, Pamela D.; Pitt, Linwood L., Jr.; and Vogt, Howard W., Jr., 5,143,213, Cl. 206-273.000.
Pham, Xuan M., 5,143,282, Cl. 229-160.100.
Rogers, Robert M.; Bokelman, Gordon H.; Baldwin, Sheryl D.; and Tafur, Susan S., 5,143,098, Cl. 131-365.000.

Philippe, Michel: *See—*
Masse, Christophe; and Philippe, Michel, 5,143,793, Cl. 428-577.000

Philley, George C.; Ratliff, Homer; and Kauffman, Ira H., to Starcraft RV, Inc. Shelving unit for collapsible campers. 5,143,417, Cl. 296-176.000.

Phillips, James D., to J. D. Phillips Corporation. Crankpin grinder and method. 5,142,827, Cl. 51-281.00R.

Phillips, Peter J.: *See—*
Uyeda, Alan K.; Gartner, Klaus W.; Herrmann, John; and Phillips, Peter J., 5,142,890, Cl. 70-277.000.

Phillips Petroleum Company: *See—*
Bobsein, Rex L., 5,144,004, Cl. 528-388.000.
Hovis, Keith W., 5,143,703, Cl. 422-208.000.
Olbrich, Michael E., 5,143,888, Cl. 502-329.000.
Schubert, Paul F., 5,143,706, Cl. 423-230.000.

Phillips, William T.; Klipper, Robert W.; Timmons, James H.; and Rudolph, Alan S., to Board of Regents, The University of Texas System; and United States of America, Navy. 99MTC labeled liposomes. 5,143,713, Cl. 424-1.100.

Phinney, Robin L.: *See—*
Derdall, Gary; and Phinney, Robin L., 5,143,599, Cl. 209-166.000.

Piana, Angelo, to Tua Ski S.r.l. Ski provided with a vibration damping device. 5,143,394, Cl. 280-602.000

Picker International, Inc.: *See—*
Mehdizadeh, Mehrdad; Lampman, David A.; and Orlando, Paul T., 5,144,240, Cl. 324-318.000

Piekutowski, Richard P., to Spectra-Physics Laserplane, Inc. Load referenced pressure reducing valve. 5,142,963, Cl. 91-31.000.

Pielartzik, Harald; Heinz, Hans-Detlef; Dhein, Rolf; and Sayed, Aziz E., to Bayer Aktiengesellschaft. Free-flowing polyamide molding compounds. 5,143,956, Cl. 524-219.000.

Piepho, Ralf F., to Ralf F. Piepho Abwassertechnick GmbH. Apparatus for the separation of solids from fluids or sediments from emulsions. 5,143,602, Cl. 210-97.000.

Pierantoni, Michel; Blank, Eberhard; Carrard, Michel; and Wagniere, Jean-Daniel, to Sulzer Brothers Limited. Surface coating made from an aluminum-based alloy. 5,143,557, Cl. 428-654.000.

Pierantozzi, Ronald: *See—*
Listemann, Mark L.; Pierantozzi, Ronald; and Armor, John N., 5,144,074, Cl. 564-224.000

Pierburg GmbH: *See—*
Buse, Werner, 5,144,102, Cl. 200-83.00Q.

Pierce, Daniel H. Self-locking valve spring retainer. 5,143,351, Cl. 251-337.000.

Pierce, Harold D., Jr.: *See—*
Smith, Robert F.; Pierce, Harold D., Jr.; Borden, John H.; Chong, Leslie J.; and Hay, Nairn W., 5,143,725, Cl. 424-84.000.

Piloian, Gladys G. Upper body ostomy garment. 5,142,702, Cl. 2-102.000.

Pinnacle Products, Inc.: *See—*
Kuehn, Paul; and Lansing, Thomas A., 5,142,736, Cl. 16-111.00R.

Pioneer Electronic Corporation: *See—*
Asakura, Michihito; and Hasegawa, Satoshi, 5,144,677, Cl. 381-169.000.
Hatano, Hideki; Yokoi, Akira; Iwasaki, Masayuki; and Yamaji, Takashi, 5,144,463, Cl. 359-72.000.
Isobe, Nobuyuki; and Watanabe, Isao, 5,144,612, Cl. 369-77.100.
Sakamoto, Masaharu; Yamaguchi, Shigeru; Mukai, Kazuhiko; Matsumoto, Yukio; Suzuki, Shinji; Katsu, Toshiyuki; Iizuka, Tatsushi; Yatsuhashi, Kiyomi; and Hidaka, Hidenori, 5,142,959, Cl. 84-645.000.
Sugiura, Satoshi, 5,144,604, Cl. 369-44.120.

Pipe Gasket & Supply Co., Inc.: *See—*
Temple, Lowell D., 5,143,381, Cl. 277-1.000.

Pirrung, Michael C.; Read, J. Leighton; Fodor, Stephen P. A.; and Stryer, Lubert, to Affymax Technologies N.V. Large scale photolithographic solid phase synthesis of polypeptides and receptor binding screening thereof. 5,143,854, Cl. 436-518.000.

Pischke, Jurgen; and Tillhon, Engelbert, to Robert Bosch GmbH. Height adjustment in a vehicle fitted with air suspension. 5,142,897, Cl. 73-1.00J.

Pitt, Linwood L., Jr.: *See—*
Moore, Pamela D.; Pitt, Linwood L., Jr.; and Vogt, Howard W., Jr., 5,143,213, Cl. 206-273.000.

Pittman, Larry J.: *See—*
Gadsby, Larry R.; Pittman, Larry J.; and Chermak, Philip J., 5,144,513, Cl. 360-137.000.

PKL Verpackungssysteme GmbH: *See—*
Mainz, Hans-Willi; and Schneider, Lutz, 5,143,281, Cl. 229-132.000

Place, Ronald H.: *See—*
Kendall, Ronald, deceased; Place, Ronald H.; and Warren, Renate I., 5,143,955, Cl. 524-151.000

Plangger, Rico, to Asea Brown Boveri Ltd. Drive for a feed valve. 5,143,119, Cl. 137-557.000

Plasma Energy Corporation: *See—*
Camacho, Salvador L., 5,143,000, Cl. 110-250.000.

Plastic Recycling Alliance, LP: *See—*
Hally, Nazim S.; Koelsch, Eric J.; and Shields, Joseph M., Jr., 5,143,308, Cl. 241-76.000.

Platz, Gerald M., to Brown & Root USA, Inc. Method and apparatus for gas phase polymerization of olefins in vertically stacked reactors. 5,143,705, Cl. 422-311.000

Playskool Baby, Inc.: *See—*
Tepper, Sidney; and Nichols, Khipra, 5,143,419, Cl. 297-183.000.

Pletz-Kirsch, Gerhard; and Lenth, Jurgen, to U.S. Philips Corporation. Interference-free digital synchronizing signal detector for TV. 5,144,433, Cl. 358-155.000.

Plog, Carsten: *See—*
Haas, Juergen; and Plog, Carsten, 5,143,696, Cl. 422-90.000.

Plouff, Donald A.: *See—*
Zicker, Robert G.; Cao, Thanh H.; Borkowski, Daniel G.; Plouff, Donald A.; and Brown, Phillip D., Jr., 5,144,649, Cl. 379-59.000.

Plumbley, Robin A.: *See—*
Seigneur, Christopher D.; and Plumbley, Robin A., 5,143,131, Cl. 144-364.000

Plutt, Daniel J., to Storage Technology Corporation. Bayonet spindle mount and a method therefore. 5,143,459, Cl. 384-537.000.

PMC, Inc.: *See—*
Saurwein, A. G.; and Rivers, Ronald L., 5,143,296, Cl. 239-415.000

Pochon, Claude: *See—*
Faessel, Andre ; Pochon, Claude; Mazzocco, Jean-Pierre; and Valetti, Jean-Claude, 5,143,315, Cl. 242-83.000.

Podalsky, David J.; Lamarre, William M.; and Stemmler, Heinz W. Apparatus suitable for rapid silk-screen printing of plastic containers. 5,142,975, Cl. 101-40.100.

Podolski, Joseph S.; and Habib, Maher. Concentrated, substantially non-aggregated casein micelles as a fat/cream substitute and a method for reducing the fat content in food products. 5,143,741, Cl. 426-565.000.

Pogue, Russell W., Jr.; and Rivest, Ronald L., to Delco Electronics Corporation. Method of secure remote access. 5,144,667, Cl. 380-45.000

Poisel, Hans: *See—*
Buhler, Wolfhardt; Poisel, Hans; and Trommer, Gert, 5,144,311, Cl 341-166.000.

Polaroid Corporation: *See—*
DiSanzo, Frederick L.; and Farrell, George J., 5,144,348, Cl 354-108.000

Polifarma S.p.A.: *See—*
Polita, Vincenzo; De Luca, Giovanna; Di Stazio, Giovanni; and Materazzi, Mario, 5,143,903, Cl. 514-18.000

Polita, Vincenzo; De Luca, Giovanna; Di Stazio, Giovanni; and Materazzi, Mario, to Polifarma S.p.A. Method of treatment with tripeptide pharmaceutical compositions as immunomodulators. 5,143,903, Cl 514-18.000

Polk, Lewis T., Jr.: *See—*
Lapidus, Stanley N.; Polk, Lewis T., Jr.; Farber, Fredric L.; Barlas, J. Morgan; and Hurley, Anne A., 5,143,627, Cl. 210-767.000

Pollock, Richard A.: *See—*
Craven, Christopher R.; and Pollock, Richard A., 5,143,430, Cl. 312-291.000

Polyrand AB and Polycell Kompositer: *See—*
Flodin, Per; and Zadorecki, Pawel, 5,143,791, Cl. 428-481.000

Popper, Boaz, to Ricor Ltd., Cryogenic & Vacuum Systems Three-mass electromagnetic vibrating system. 5,144,176, Cl. 310-81.000.

Portec, Inc.: *See—*
Pruett, David M., 5,143,207, Cl. 198-814.000

Possis Medical, Inc.: *See—*
Dutcher, Robert G.; Hill, John C.; and Scott, Robert J., 5,143,090, Cl. 128-785.000

Potratz, Steve: *See—*
Alexandres, Richard B.; Kindschuh, Dennis P.; Hall, Larry; Peden, Perry B.; Klusman, Larry; and Potratz, Steve, 5,144,248, Cl 324-428.000.

Pottorff, Earl T. Rotary vacuum wicketter with removable split wear-plates. 5,143,367, Cl. 271-196.000.

Pourahmady, Naser, to B. F. Goodrich Company, The. N-alkyl maleimide thermal stabilizers for vinyl halide polymers. 5,143,953, Cl 524-104.000

Powell, Meliss A.: *See—*
James, Michael S.; Powell, Meliss A.; Nickerson, Mark A. and Staats, Louis T., III, 5,142,875, Cl. 62-50.500.

Power Performance, Inc.: *See—*
Wilson, Thomas J., 5,143,372, Cl. 273-55.00R.

Pozil, Richard L.; and Provda, Lois J. Writing aid. 5,143,463, Cl 401-6.000

Pratt, Charles R.: *See—*
Leatham, Alan G.; Pratt, Charles R.; and Chesney, Peter F., 5,143,139, Cl. 164-46.000

Preh-Werke GmbH & Co. KG: *See—*
Oelsch, Jurgen; Hochgesang, Gerhard; Limpert, Rudolf; and Weber, Dieter, 5,144,567, Cl. 364-708.000

Priebe, Elizabeth K.: *See—*
Maier, Larry K.; Priebe, Elizabeth K.; Lee, Jong S.; Woodgate, Paul E.; and Smith, Glen C., 5,143,765, Cl. 428-36.500

Priem, Richard J.; and Wanhainen, John P. Resonant wave-jet agitator washing machine. 5,142,887, Cl. 68-18.0FA.

Prillard, Charles B., to Rockwell ABS - France. Angled support arm for a sun-visor which is electrically powered by conductors. 5,143,678, Cl. 264-255.000

Procter & Gamble Company, The: *See—*
Drobish, James L., 5,143,261, Cl. 222-129.000
Givens, Edward J., 5,143,776, Cl. 428-194.000.
Weber, Gerald M.; and Richardson, James W., 5,143,679, Cl 264-288.800

Proctor & Gamble Company, The: *See—*
Cappel, James W.; and Rece, Robert D., 5,143,728, Cl. 424-195/00.000

Proia, Nicholas M.: *See—*
Tur, Anton; Repisky, Milan; and Proia, Nicholas M., 5,142,973, Cl. 99-538.000

Prokopoff, Alexander S., to MAN Roland Druckmaschinen AG. Spray nozzle assembly with swivel mounted hollow cone spray tip. 5,143,298, Cl. 239-494.000.

Proksa, Ferdinand; Sulzbach, Hans-Michael; Althausen, Ferdinand; Duschanek, Helmut; and Raffel, Reiner, to Maschinenfabrik Hennecke GmbH. Process and apparatus for the production of a flowable reaction mixture from at least two flowable reactive components. 5,143,946, Cl. 521-155.000.

Prolabo: *See—*
Bart, Gilles; Dequin, Roland; and Paturat, Jacques, 5,142,920, Cl. 73-866.000

Prostler, Richard A. Mouse trap apparatus. 5,142,813, Cl. 43-81.000.

Protan Biopolymer A/S: *See—*
Skjak-Braek, Gudmund; and Moe, Storker, 5,144,016, Cl 536-3.000

Protech Automation GmbH: *See—*
Bloecker, Detlef, 5,143,195, Cl. 198-345.300.

Protschka, Hans A.: *See—*
Kotecha, Harish N.; Protschka, Hans A.; Stanasolovich, Dave; and Theisen, Jake, 5,143,820, Cl. 430-314.000.

Provda, Lois J.: *See—*
Pozil, Richard L.; and Provda, Lois J., 5,143,463, Cl. 401-6.000

Provost, Serge: *See—*
Shaanan, Gad; Provost, Serge; and Foy, Jerome, 5,143,396, Cl 280-607.000

Prue, Frederick. Additive injection unit for a marine toilet system. 5,142,707, Cl. 4-222.000

Pruett, David M., to Portec, Inc. Tension controlling and shock absorbing apparatus for an endless conveyor. 5,143,207, Cl. 198-814.000

Pruis, Harry. Snap lock system for tubular parts. 5,143,476, Cl 403-328.000

Pugach, Joseph: *See—*
Salek, Jeffrey S.; and Pugach, Joseph, 5,144,088, Cl. 568-457.000

Puglisi, Daniel G. Retractable light fixture. 5,144,542, Cl. 362-386.000

Pujol, Jean-Marc P.; Hall, Joyce B.; Hogerton, Peter B.; McCormick, Fred B.; and Tingerthal, Jeanne M., to Minnesota Mining & Manufacturing Company. Cyanate ester adhesives for electronic applications. 5,143,785, Cl. 428-352.000

Pullukat, Thomas J.: *See—*
Buehler, Charles K.; Fries, Richard W.; and Pullukat, Thomas J., 5,143,883, Cl. 502-119.000

Purcell, Ronald W. Stacked computer keyboard function key multiple template retainers. 5,144,303, Cl. 341-23.000.

Putney, Gordon A.; Scolaro, Martin S.; and Happ, Kenneth C., to Snap-on Tools Corporation. Ratchet tool. 5,142,952, Cl. 81-57.390.

Putsch, Peter-Ulrich: *See—*
Voss, Hans W.; Cremer, Heinz P.; Cwiertnia, Harald; and Putsch, Peter-Ulrich, 5,143,421, Cl. 297-338.000

Pyzik, Aleksander J.; Snyder, Irving G., Jr.; McDonald, Robert R.; and Pecnenik, Alexander, to Dow Chemical Company, The. Densification of ceramic-metal composites. 5,143,540, Cl. 75-233.000

Quantex Corporation: *See—*
Jutamulia, Suganda; Storti, George M.; and Lindmayer, Joseph, 5,144,145, Cl. 250-484.100

Quantum Chemical Corporation: *See—*
Buehler, Charles K.; Fries, Richard W.; and Pullukat, Thomas J., 5,143,883, Cl. 502-119.000

Quinga, Elaine M.; and Schaap, Luke A., to Amoco Corporation Anti-wear engine and lubricating oil. 5,143,634, Cl 252-33.000

Quinto, Dennis T.: *See—*
Santhanam, Anakkavur T.; Godse, Rajendra V.; Quinto, Dennis T.; Undercoffer, Kenneth E.; and Jindal, Prem C., 5,143,488, Cl. 407-119.000

R. J. Reynolds Tobacco Company: *See—*
Stephen Sohn, Edward J.; Young, Harvey J.; and Bernasek, Edward, 5,143,097, Cl. 131-356.000

R. T. Vanderbilt Company, Inc.: *See—*
Suhoza, Richard A.; Garney, Bruce R.; and Lauder, Robert B., 5,143,943, Cl. 521-115.000

Rabbette, Stephen. Method and apparatus for inhibiting barnacle growth on boats. 5,143,011, Cl. 114-222.000

Rabindran, K. George; Faber, Thomas; Filicicchia, David; Guenther, Kenneth L.; Kalika, Joseph; Kerstein, Melvin T.; Shah, Girish B.; and Wiley, David, to Bell & Howell Company. Carrier sequenced bar code sorter for documents. 5,143,225, Cl. 209-584.000

Rachel, Jeffery L.: *See—*
Basinger, Lex L.; Rachel, Jeffery L.; Snider, Jerry E.; and Lerner, Allan S., 5,142,703, Cl. 2-144.000

Racine Railroad Products, Inc.: *See—*
Freymuth, Donald C.; Hon, Jeffrey S.; Lange, Dale K.; Paulus, Gerald J.; Petrykowski, Thomas F.; and Turner, Robert L., 5,142,987, Cl. 104-17.200

Racz, Imre G.: *See—*
Bitter, Johan G. A.; Futselaar, Harry; and Racz, Imre G., 5,143,613, Cl. 210-321.800

Radigan, William D.: *See—*
Merton, Henry A.; Diefenthal, James R.; Radigan, William D.; Sengupta, Soumitra; and Lenaz, Emmett J., Jr., 5,144,495, Cl 359-798.000

Radovanovic, Rodoljub: *See—*
Woon, Peter V.; Ghuman, Amarjit; Radovanovic, Rodoljub; Walsham, Brian E.; and Francis, Steven C., 5,142,868, Cl. 60-624.000

Radtchenko, Konstantin. Artificial lure. 5,142,810, Cl. 43-42.040

Raes, Maurice: *See—*
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Raffel, Reiner: *See—*
Proksa, Ferdinand; Sulzbach, Hans-Michael; Althausen, Ferdinand; Duschanek, Helmut; and Raffel, Reiner, 5,143,946, Cl 521-155.000

Raho, Guglielmo; and Zona, Mauro, to D.E.A. Digital Electronic Automation SpA. Measuring machine provided with hand grip means for displacement of a measurement head of the machine along three axes. 5,142,790, Cl. 33-503.000

Rajagopalan, Murali: *See—*
Greenlee, William S.; Kinson, Philip L.; Kline, Sally A.; Rajagopalan, Murali; and Daniels, Charles A., 5,143,975, Cl. 525-205.000

Ralf F. Piepho Abwassertechnick GmbH: *See—*
Piepho, Ralf F., 5,143,602, Cl. 210-97.000.

Rammer, Inc.: *See—*
Richards, Loren L., 5,143,370, Cl. 273-26.00B

Ramot Ltd.: *See—*
Blumberg, Shmaryahu; Spungin, Anya; Indig, Fred E.; and Meir, Daniela B., 5,143,839, Cl. 435-220.000.

Ramsey, Robert B., Jr., to Du Pont de Nemours, E. I., and Company Vapor control system for vapor degreasing/defluxing equipment 5,142,873, Cl. 62-11.000

Ranon, Peter M.: *See—*
Schlicher, Rex L.; Rinaldi, Steven M.; Hall, David J.; Ranon, Peter M.; and Davis, Charles E., 5,142,861, Cl. 60-203.100.

Raph, Darvin D.: *See—*
Johnsrud, Darrell B.; and Raph, Darvin D., 5,144,229, Cl. 324-158.00R.

Rapoport, Alex: *See—*
Kantorovich, Edward; and Rapoport, Alex, 5,143,072, Cl. 128-660.020.

Rapp, Peter J., to Core Industries. Multi-mode measuring system. 5,144,226, Cl. 324-132.000.

Rappl, Franz: *See—*
Schedele, Helmut; and Rappl, Franz, 5,144,270, Cl. 335-80.000.

Raspaghesi, Mario; and Medulla, Candido, to Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno. Device for the ionization of metals having a high melting point, which may be used on ion implanters of the type using ion sources of Freeman or similar type. 5,144,143, Cl. 250-426.000.

Rathor Ag: *See—*
Miczka, Lothar; Pauls, Mathias; and Kehl, Ricco, 5,143,211, Cl. 206-221.000.

Ratliff, Homer: *See—*
Philley, George C.; Ratliff, Homer; and Kauffman, Ira H., 5,143,417, Cl. 296-176.000.

Raulfs, Friedrich-Wilhelm: *See—*
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Raute Oy of Vesijarvenkatu: *See—*
Toivio, Juha, 5,143,129, Cl. 144-211.000.

Rautio, Kauko. Sawing machine. 5,143,127, Cl. 144-39.000.

Rauwerdink, James D.: *See—*
Lydy, Bruce S.; Schueller, Dennis R.; Nickel, Dennis J.; and Rauwerdink, James D., 5,142,851, Cl. 56-13.400.

Ravi, Sharma: *See—*
Hamblen, David P.; and Ravi, Sharma, 5,143,659, Cl. 264-1.100.

Raybould, Derek: *See—*
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Raychem Corporation: *See—*
Chiotis, Achilles; and Soni, Pravin, 5,143,761, Cl. 428-35.100.

Raytheon Company: *See—*
Adlerstein, Michael G., 5,144,413, Cl. 357-81.000.
Russell, Mark E.; and Miller, David C., 5,144,157, Cl. 307-270.000.

Read, J. Leighton: *See—*
Pirrung, Michael C.; Read, J. Leighton; Fodor, Stephen P. A.; and Stryer, Lubert, 5,143,854, Cl. 436-518.000.

Reamer, Lynne A.: *See—*
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Rebenstorff, Detlev: *See—*
Felske, Armin; Stoffregen, Bernd; Heeck, Manfred-Andreas; Sauer, Gerd; Hassiepen, Michael; and Rebenstorff, Detlev, 5,144,459, Cl. 359-13.000.

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Rece, Robert D.: *See—*
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Reck, Bernd; Laschober, Rita A.; Gerlach, Dale; and Boyd, Jack D., to BASF Aktiengesellschaft. Heat-curable bismaleimide molding compositions. 5,143,969, Cl. 524-548.000.

Redding, Donald: *See—*
Blake, Dale; and Redding, Donald, 5,144,328, Cl. 346-1.100.

Reed, Robert B.: *See—*
Reed, Robert H.; and Reed, Robert B., 5,143,472, Cl. 403-230.000.

Reed, Robert H.; and Reed, Robert B. Anchor bracket assembly. 5,143,472, Cl. 403-230.000.

Reedrill Inc.: *See—*
Stiffler, Stephen P.; Waite, David J.; Frost, Robert L.; and Beach, Wayne H., 5,143,163, Cl. 175-38[illegible].000.

Reeve, Lorraine E.: *See—*
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Reichner, Philip: *See—*
George, Raymond A.; Hoover, Delmer Q.; Shockling, Larry A.; and Reichner, Philip, 5,143,800, Cl. 429-20.000.

Reid, William W.; and Young, Joseph L., to U.S. Gold Corporation; and Denay Creek Gold Mining Company. Biological conversion method. 5,143,543, Cl. 75-744.000.

Reigel, James R.: *See—*
Corsmeier, Robert J.; Sponseller, Robert L.; Reigel, James R.; and Maclin, Harvey M., 5,143,512, Cl. 415-115.000.

Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, to Tetra Pak Holdings S.A. Method of manufacturing a package for flowable media and the use of a synthetic plastics sheet for the manufacturing process. 5,142,843, Cl. 53-453.000.

Reil, Wilhelm, to Tetra Pak Holdings S.A. Package for flowable contents with an integrally moulded handle having mould-engaging stabilizing means. 5,143,280, Cl. 229 117.230.

Reimers, Carl F.: *See—*
Boster, Clark S.; Gopalakrishnan, Sankaraiyer; Reimers, Carl F.; and Vaghasia, Gordhan K., 5,143,515, Cl. 415-179.000.

Reinthal, Peter: *See—*
Berger, Bernd; and Reinthal, Peter, 5,142,896, Cl. 72-242.400.

Reisch, John W.; Martinez, Michael M.; and Raes, Maurice, to Olin Corporation. Process for purifying and end-capping polyols made using double metal cyanide catalysts. 5,144,093, Cl. 568-621.000.

Reiter, Ferdinand; and Babitzka, Rudolf, to Robert Bosch GmbH. Electromagnetically actuable valve. 5,143,301, Cl. 239-585.400.

Reliance Comm/Tec Corporation: *See—*
Kaczmarek, Richard, 5,144,510, Cl. 361-119.000.

Remson, Joseph D., to ROLM Systems. Current level sensing circuit for use with gyrator circuitry. 5,144,287, Cl. 340-664.000.

Renard, Paul S.: *See—*
O'Brien, James R.; Agha, Mohomed B.; Luce, Roberet E.; Renard, Paul S.; and Sellers, Mark G., 5,142,809, Cl. 43-21.200.

Renaud, Alain: *See—*
Ward, Mona; Ph. Settembre, Pierre-Andre ; Renaud, Alain; and Langlois, Michel, 5,144,029, Cl. 540-610.000.

Repa International Limited: *See—*
Dhuyvetters, Robert, 5,143,682, Cl. 266-216.000.

Repisky, Milan: *See—*
Tur, Anton; Repisky, Milan; and Proia, Nicholas M., 5,142,973, Cl. 99-538.000.

Repp, Richard E., to Cap Snap Co. Bottle neck having means to prevent compression of cap skirt. 5,143,235, Cl. 215-256.000.

RES Development Corp.: *See—*
Sterling, Robert E.; and Goldberg, Eugene P., 5,143,963, Cl. 524-366.000.

Resch, Gerald, to Rowenta-Werke GmbH. Domestic electrical vacuum cleaner with suction tube holder. 5,142,731, Cl. 15-339.000.

Research Development Corporation of Japan: *See—*
Nakatsugawa, Naoki; and Horikoshi, Koki, 5,143,835, Cl. 435-167.000.

Resonex, Inc.: *See—*
Muennemann, Frank; and Bell, Rodney, 5,143,068, Cl. 128-653.500.

Rettenmaier, Hansjoerg; Kreimeyer, Andreas; Perner, Johannes; and Diessel, Paul, to BASF Aktiengesellschaft. Substantially purified proteolytic enzyme from Bacillus spec. USNI 4828 method of making and using it. 5,143,840, Cl. 435-221.000.

Reuter, Knud; Weymans, Gunter; Dhein, Rolf; and Meier, Erich, to Bayer Aktiengesellschaft. Polymer mixtures of an aromatic polyether ketone and a thermoplastic polymer. 5,143,986, Cl. 525-437.000.

Revlon, Inc.: *See—*
Hollenberg, Jane; Lombardi, Lou A.; and Tietjen, Marlene, 5,143,722, Cl. 424-63.000.

Rexroad, John: *See—*
Glynn, William; Rexroad, John; and Denny, David S., 5,143,171, Cl. 182-3.000.

Reynolds, Bruce E.: *See—*
Hung, Chi-Wen; and Reynolds, Bruce E., 5,143,887, Cl. 502-259.000.

Rheinbraun Aktiengesellschaft: *See—*
Duddek, Herbert; Klemmer, Wilfried; and Koeppen, Herbert, 5,144,317, Cl. 342-357.000.

Rheon Automatic Machinery Co., Ltd.: *See—*
Ueno, Sadao; and Tashiro, Yasunori, 5,142,956, Cl. 83-102.000.

Rhoads, Ward E. Slide and seek fire escape. 5,143,172, Cl. 182-100.000.

Rhodes, Gerry: *See—*
Jenkins, Waylon L.; Rhodes, Gerry; and Rule, Mark, 5,143,984, Cl. 525-437.000.

Rhone-Poulenc Chimie: *See—*
Carette, Louis; and Velleret, Gerard, 5,143,959, Cl. 524-267.000.
Slinn, David S. L., 5,143,652, Cl. 252-602.000.

Rhone-Poulenc Inc.: *See—*
Bender, Fredric G.; and Brotsky, Eugene, 5,143,739, Cl. 426-332.000.

Ricard, Serge: *See—*
Marchessault, Robert H.; Rioux, Patrice; and Ricard, Serge, 5,143,583, Cl. 162-138.000.

Rice, Mark; and Klepinski, Robert J., to Medtronic, Inc. Tool for implantable neural electrode. 5,143,067, Cl. 128-642.000.

Richard, Hans-Gunter; and Wilmer, Gerhard, to Krupp Koopers GmbH. Method of and radiant cooler for radiant cooling of product mass stream discharged from a gasification reactor. 5,143,520, Cl. 48-87.000.

Richards Homewares, Inc.: *See—*
Freelander, Robert; and Marzano, Nicholas, 5,143,214, Cl. 206-287.000.

Richards, Loren L., to Rammer, Inc. Ball racket. 5,143,370, Cl. 273-26.00B.

Richards, Marvin K.; and Ryan, James W., to Simula, Inc. Cylindrical armor. 5,143,123, Cl. 138-120.000.

Richards, Von L.; and Singhal, Subhash C., to Westinghouse Electric Corp. Method of making highly sinterable lanthanum chromite powder. 5,143,751, Cl. 427-126.300.

Richardson, James W.: *See—*
Weber, Gerald M.; and Richardson, James W., 5,143,679, Cl. 264-288.800.

Richardson, Neil: *See—*
Talbot, Christopher G.; and Richardson, Neil, 5,144,225, Cl. 324-73.100.

Richardson, Thomas, to University of California, The Regents of the. Method to produce unsaturated milk fat and meat from ruminant animals. 5,143,737, Cl. 426-002.000.

Richardson, William C.: *See—*
Snider, Darrell R.; and Richardson, William C., 5,142,876, Cl. 62-77.000.

Richmond, John R.; and Tahir, Saad F., to UOP. Diaryl ethers by dehydration of phenols. 5,144,094, Cl. 568-635.000.

Ricoh Company, Ltd.: *See—*
Abe, Michiharu, 5,144,552, Cl. 369-275.400.
Adachi, Kazuhiko; and Kumano, Masafumi, 5,144,458, Cl. 358-482.000.
Gotoh, Hiroshi; Maeda, Ituo; and Honda, Syuichi, 5,144,617, Cl. 369-244.000.
Imamura, Tomoatsu; Sato, Masumi; Tanaka, Tomonori; Hayashi, Takamasa; and Senma, Toshitaka, 5,144,337, Cl. 346-108.000.
Inada, Toshio; Ogura, Yukio; and Kitabayashi, Junichi, 5,144,684, Cl. 382-22.000.
Kuriki, Shoji, 5,144,672, Cl. 381-41.000.
Mochizuki, Hidehiro; Shimada, Masaru; and Ariga, Yutaka, 5,143,893, Cl. 503-227.000.
Nakamura, Masahiro, 5,144,682, Cl. 382-9.000.
Sakano, Yukio, 5,144,338, Cl. 346-108.000.
Sakano, Yukio, 5,144,456, Cl. 358-443.000.
Suzuki, Akira; Mochizuki, Hidehiro; Shimada, Masaru; Uemura, Hiroyuki; and Morohoshi, Naoya, 5,144,334, Cl. 346-1.100.
Tagoku, Izumi; and Ohdake, Eishu, 5,144,521, Cl. 361-225.000.
Tani, Tatsuo, 5,144,385, Cl. 355-309.000.

Ricoh Research Institute of General Electronics Co., Ltd.: *See—*
Adachi, Kazuhiko; and Kumano, Masafumi, 5,144,458, Cl. 358-482.000.

Ricor Ltd., Cryogenic & Vacuum Systems: *See—*
Popper, Boaz, 5,144,176, Cl. 310-81.000.

Rieger, Bernhard: *See—*
Krause, Joachim; Geelhaar, Thomas; Hittich, Reinhard; Finkenzeller, Ulrich; Rieger, Bernhard; and Weber, Georg, 5,143,642, Cl. 252-299.610.

Riekert, Lothar: *See—*
Martan, Hans; Wegerle, Ulrike; Ruppel, Wilhelm; Riekert, Lothar; Becker, Dieter; and Kotter, Michael, 5,144,091, Cl. 568-479.000.

Riemann Trading ApS: *See—*
Bar-Shalom, Daniel, 5,143,718, Cl. 424-47.000.

Riemenschneider, Bert R.: *See—*
Mitchell, Allan T.; Riemenschneider, Bert R.; and Tigilaar, Howard L., 5,143,860, Cl. 437-43.000.

Riera, Salvatore J.: *See—*
Thorne, Brent a.; and Riera, Salvatore J., 5,144,151, Cl. 250-571.000.

Rieter Machine Works Limited: *See—*
Meyer, Urs; Oberhaensli, Rene F.; and Haeusler, Dominik, 5,144,130, Cl. 250-202.000.

Riis, Peter: *See—*
Blaich, Wilfried; Flaig, Oskar; Ganter, Wolfgang; Kaiser, Hans; Kussmaul, Ewald; Maurer, Roland; and Riis, Peter, 5,144,599, Cl. 368-10.000.

Rijckaert, Josephus F.: *See—*
Van Heeswijk, Johannes A. A. M.; and Rijckaert, Josephus F., 5,144,189, Cl. 313-51.000.

Rikagaku Kenkyusho: *See—*
Kuzuhara, Hiroyoshi; Kawana, Masajiro; Yamasaki, Noritsugu; and Nishikawa, Masahiro, 5,144,018, Cl. 536-26.000.

Riker, Paul J.: *See—*
Christenson, Philip A.; Riker, Paul J.; Anderson, Denise A.; and Yurecko, John M., Jr., 5,144,048, Cl. 549-435.000.

Riley Stoker Corporation: *See—*
Geoffroy, David R., 5,143,486, Cl. 406-90.000.

Rimondi, Renato: *See—*
Cappi, Angelo; and Rimondi, Renato, 5,142,840, Cl. 53-384.100.
Cappi, Angelo; and Rimondi, Renato, 5,142,841, Cl. 53-384.100.

Rinaldi, Steven M.: *See—*
Schlicher, Rex L.; Rinaldi, Steven M.; Hall, David J.; Ranon, Peter M.; and Davis, Charles E., 5,142,861, Cl. 60-203.100.

Rioux, Patrice: *See—*
Marchessault, Robert H.; Rioux, Patrice; and Ricard, Serge, 5,143,583, Cl. 162-138.000.

Rite-Hite Corporation: *See—*
West, Floyd D., 5,143,137, Cl. 160-199.000.

Ritter, Jochen: *See—*
Gegenwart, Rainer; and Ritter, Jochen, 5,144,196, Cl. 315-111.410.

Ritter, Wolfgang: *See—*
Fues, Johann-Friedrich; and Ritter, Wolfgang, 5,143,730, Cl. 424-426.000.

Rivers, Ronald L.: *See—*
Saurwein, A. G.; and Rivers, Ronald L., 5,143,296, Cl. 239-415.000.

Rivest, Ronald L.: *See—*
Pogue, Russell W., Jr.; and Rivest, Ronald L., 5,144,667, Cl. 380-45.000.

Robec, Inc.: *See—*
Simpson, Glenn R., III, 5,142,929, Cl. 74-459.000.

Robert Bosch GmbH: *See—*
Conzelmann, Gerhard; Kohl, Walter; and Nagel, Karl, 5,144,219, Cl. 322-25.000.
Franzke, Klaus, 5,143,041, Cl. 123-520.000.
Glassel, Horst; Jaus, Reinhard; and Hellwig, Egbert, 5,143,575, Cl. 156-309.900.
Gmelin, Karl, 5,143,039, Cl. 123-470.000.
Mettner, Michael; Schmidt, Martin A.; Lober, Theresa; and Huff, Michael A., 5,142,781, Cl. 29-890.124.
Pischke, Jurgen; and Tillhon, Engelbert, 5,142,897, Cl. 73-1.00J.
Reiter, Ferdinand; and Babitzka, Rudolf, 5,143,301, Cl. 239-585.400.

Robert, Francois, to Valeo Vision. Arrangement and procedure for automatically mounting a unit of equipment on a support, for example a lighting and/or indicating lamp unit on a motor vehicle. 5,143,331. Cl. 248-27.100.

Roberts, C. Grady: *See—*
Kinch, Michael A.; and Roberts, C. Grady, 5,144,138, Cl. 250-332.000.

Roberts, Dennis E.: *See—*
Tipton, Steven M.; and Roberts, Dennis E., 5,143,318, Cl. 242-241.000.

Roberts, Elaine E.: *See—*
Roberts, Kenneth G.; and Roberts, Elaine E., 5,143,212, Cl. 206-223.000.

Roberts, Kenneth G.; and Roberts, Elaine E., to K. G. Roberts & Associates, Inc. Gemstone color communication kits. 5,143,212, Cl. 206-223.000.

Roberts, Roger G., to Electromagnetic Sciences, Inc. Planar substrate ferrite/diode phase shifter for phased array applications. 5,144,319, Cl. 342-372.000.

Roberts, Stanley: *See—*
Kaanta, Carter W.; and Roberts, Stanley, 5,144,411, Cl. 357-68.000.

Robertson, A. Scott; Geiger, Richard; and Lishman, Robert W., to Medical Composite Technology. Modular wheelchair. 5,143,391, Cl. 280-250.100.

Robeson, Lloyd M.; and Harris, James E., to Amoco Corporation. Blends of a poly(aryl ether ketone) and a polyarylate. 5,143,985, Cl. 525-437.000.

Robinet, Jean-Louis, to Francois Marot S.A. Article incorporating at least two compartments intended to contain various objects. 5,143,188, Cl. 190-111.000.

Robinson, Gene C.: *See—*
Allen, Robert H.; Anderson, Keith G.; Diefenbach, Steven P.; Lin, Ronny W.; Nemec, Larry H.; Overstreet, Andrew D.; and Robinson, Gene C., 5,144,053, Cl. 556-190.000.

Robl, Rudolf: *See—*
Robu, Johann; and Robl, Rudolf, 5,142,993, Cl. 105-148.000.

Robu, Johann; and Robl, Rudolf, to RSL Logistik GmbH & Co. Conveying means. 5,142,993, Cl. 105-148.000.

Rochat, Alain C.: *See—*
Mizuguchi, Jin; and Rochat, Alain C., 5,144,333, Cl. 346-1.100.

Roche, Pascal; and Courtin, Claude, to Thomson-CSF. Method for the mounting of miniature electronic beam lead components. 5,143,277, Cl. 228-179.000.

Rockefeller University, The: *See—*
Merrifield, Robert B.; and Unson, Cecilia G., 5,143,902, Cl. 514-12.000.
Tam, James P., 5,144,006, Cl. 530-345.000.

Rockwell ABS - France: *See—*
Prillard, Charles B., 5,143,678, Cl. 264-255.000.

Rockwell International Corporation: *See—*
Culp, Gordon W., 5,144,187, Cl. 310-328.000.
Little, Brian W., 5,144,250, Cl. 324-533.000.
Maxedon, Lynn F.; and Olson, Thomas C., 5,143,452, Cl. 374-170.000.
Sardou, Freeman D.; and Chandler, Robert S., 5,143,334, Cl. 248-184.000.
Southwell, William H., 5,144,484, Cl. 359-565.000.

Roe, Donald C., to Betz Laboratories. Method for suppressing process dust emissions using a salt of a fatty acid as a foaming agent 5,143,645, Cl. 252-313.100.

Rogers, Barbara J.: *See—*
Johnson, Rose A.; Johnson, Deborah L.; Rogers, Barbara J.; and Spain, Kenneth C., Jr., 5,143,246, Cl. 220-524.000.

Rogers, Robert M.; Bokelman, Gordon H.; Baldwin, Sheryl D.; and Tafur, Susan S., to Philip Morris Incorporated. Multiple layer cigarette paper for reducing sidestream smoke. 5,143,098, Cl. 131-365.000.

Rogers, Terrence E.: *See—*
Brown, David W.; Rogers, Terrence E.; Sundin, Richard L., Sr.; and Henry, Ralph A., 5,144,418, Cl. 358-60.000.

Rohm Co., Ltd.: *See—*
Tanaka, Kenji, 5,142,765, Cl. 29-564.600.

Rohm and Haas Company: *See—*
Arkens, Charles T.; Cluthe, Charles E.; and Smart, Reginald T., 5,143,582, Cl. 162-135.000.
Hutton, Thomas W.; and Novak, Ronald W., 5,143,954, Cl. 524-106.000.

Rohrbaugh, Dennis K.: *See—*
Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., 5,143,621, Cl. 210-690.000.

Rokugo, Yoshinori: *See—*
Ishizaki, Yasutoshi; Maruta, Rikio; Rokugo, Yoshinori; Sakaguchi, Hisashi; and Hayashi, Kuniyasu, 5,144,620, Cl. 370-84.000.

Rolchigo, Philip M., to Membrex, Inc. Rotary disc filtration device. 5,143,630, Cl. 210-780.000.

Rolf, David, to Lec Tec Corporation. Protective wrap for trees and other plants. 5,142,817, Cl. 47-24.000.

Rollins, George E., to Allen-Bradley Company, Inc. Photosensitive switch with circuit for indicating malfunction. 5,144,286, Cl. 340-635.000.

Rolls-Royce plc: *See—*
Mills, David, 5,143,777, Cl. 428-212.000.

ROLM Systems: *See—*
Remson, Joseph D., 5,144,287, Cl. 340-664.000.

Roman, Jean-Philippe: *See—*
Gallo, Roger; Hoornaert, Pierre; and Roman, Jean-Philippe, 5,143,633, Cl. 252-18.000.

Romeo, Steve G.: *See—*
Ashcraft, Daniel W., and Romeo, Steve G., 5,143,339, Cl. 248-343.000.

Rondelli, Angelo: *See—*
Amedei, Giuseppe; and Rondelli, Angelo, 5,142,927, Cl. 74-335.000.

Rosalco, Inc.: *See—*
Kolb, Kenneth W., 5,142,722, Cl. 3-471.000.

Rose, Anthony M. Securing a computer against undesired write operations to or read operations from a mass storage device. 5,144,660, Cl 380-4.000.

Rose Communications, Inc.: *See—*
Stribling, Bradley C.; and Elin, Roger J. O., 5,144,260, Cl. 331-10.000.

Rose, David A.: *See—*
Le Compagnon, Gilles; and Rose, David A., 5,142,824, Cl. 49-349.000.

Rosellini, Davey G. Medical device for holding hypodermic syringe needle caps. 5,143,414, Cl. 294-99.2[illegible].

Rosemount Inc.: *See—*
Petrich, William E.; and Glaser, Charles A., 5,143,406, Cl. 285-23.000.

Rosen, Ake, to Tetra Pak Holdings S A. Flexible packing material in sheet or web form. 5,143,764, Cl. 4[illegible]3-36.500.

Roshdy, Constance E.: *See—*
Kindberg, Richard C.; Chen, Chao; Freeman, Lyn; Roshdy, Constance E.; and Hunter, Alastair W., 5,143,082, Cl. 128-749.000.

Ross, Mark S., to Mobil Oil Corporation. Catalyst regenetation in high efficiency regenerator heated by indirect heat exchange. 5,143,874, Cl. 502-42.000.

Rossi & Catelli S.p.A.: *See—*
Catelli, Camillo, 5,143,152, Cl. 16-154.000.

Rossi, John J.; Cantin, Edouard M.; Zaia, John A.; and Chang, Pairoj, to City of Hope. Ribozyme cleavage of HIV-I RNA. 5,144,019, Cl. 536-27.000.

Rossinelli, Marco: *See—*
Kluge, Wolfgang; Perkins, Roger; Rossinelli, Marco; and Dawson, William J., 5,143,711, Cl. 423-5[illegible]3.000.

Rossio, Richard C.; Easterle, Mark A.; and Jackson, Michael L., to BASF Corporation. Energy absorbing, water blown, rigid polyurethane foam. 5,143,941, Cl. 521-51.000.

Rossum, David P., to E-mu Systems, Inc. Digital sampling instrument. 5,144,676, Cl. 381-118.000.

Roth, Christian: *See—*
Bauer, Kurt; Dorr, Wilhelm; Edele, Reinhard; Pfitzenmaier, Werner; Roth, Christian; and Schmid, Eckhardt, 5,142,939, Cl. 74-595.000

Rothschild, Mordechai; Ehrlich, Daniel J.; and Black, Jerry G. Formation and high resolution patterning of superconductors. 5,143,894, Cl. 505-1.000

Roto-Mix Enterprises, Ltd.: *See—*
Neier, Benjamin R., 5,143,310, Cl. 241-101.800.

Roto Zip Tool Corporation: *See—*
Kopras, Robert K., 5,143,490, Cl. 408-26.000.

Rougeot, Henri M.; and Castleberry, Donald E., to General Electric Company. Photodetector scintillator radiation imager. 5,144,141, Cl. 250-369.000

Roulleau, Pierre, to Oeuromer S.A. Machine for printing a poultry egg. 5,142,976, Cl. 101-41.000.

Rountree, Steven: *See—*
Perry, Carl A.; Daigle, Guy A. Rountree, Steven; Talmadge, George; Grunbeck, John; and Wassell, Mark, 5,144,126, Cl. 250-254.000.

Rouse, Gerlad L., to International Business Machines Corporation. Serial link communication system with cascaded switches. 5,144,293, Cl. 340-825.020.

Routery, Edward E. Tool drive assembly and related tool drive linkage, tool work implement assembly and tool. 5,142,853, Cl. 56-242.000.

Rovnyak, George C.; and Kimball, Spencer D., to E. R. Squibb & Sons, Inc. Dihydropyrimidine macrocyclic lactones useful as calcium antagonists and agonists. 5,143,915, Cl. 514-212.000.

Rowe, William M., Jr.: *See—*
Blackledge, Brian D.; and Rowe, William M., Jr., 5,143,649, Cl. 252-511.000

Rowenta-Werke GmbH: *See—*
Resch, Gerald, 5,142,731, Cl. 15-339.000.

Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James L.; and McCauley, Robert M., to Westinghouse Electric Corp. Apparatus and method for removing liquid from a composition and for storing the deliquified composition. 5,143,615, Cl. 210-350.000.

Rozmus, William; and Trbovich, Rudy M., to Italimpianti of America, Inc. Tube mill. 5,142,893, Cl. 72-95.400.

RSL Logistik GmbH & Co.: *See—*
Robu, Johann; and Robl, Rudolf, 5,142,993, Cl. 105-148.000.

RSM Analytiche Instrumente GmbH: *See—*
Kubisiak, Helmut, 5,144,136, Cl. 250-328.000.

Ruckert, Heinz-Jurgen: *See—*
Illy, Alois; and Ruckert, Heinz-Jurgen, 5,143,350, Cl. 251-326.000.

Ruckman, Stephen E., Jr.: *See—*
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Rudolph, Alan S.: *See—*
Phillips, William T.; Klipper, Robert W.; Timmons, James H.; and Rudolph, Alan S., 5,143,713, Cl. 424-1.100.

Rule, Mark: *See—*
Jenkins, Waylon L.; Rhodes, Gerry; and Rule, Mark, 5,143,984, Cl. 525-437.000.

Runkis, Walter H. Gel rooting composition and method. 5,143,536, Cl. 71-77.000.

Ruppel, Wilhelm: *See—*
Marten, Hans; Wegerle, Ulrike; Ruppel, Wilhelm; Riekert, Lothar; Becker, Dieter; and Kotter, Michael, 5,144,091, Cl. 568-479.000.

Rupprecht, Peter, to KSB Aktiengesellschaft. Canned motor pump with heat exchanger in rotor chamber. 5,144,177, Cl. 310-86.000.

Russ, Dianne M.: *See—*
Faulkner, David W.; and Russ, Dianne M., 5,144,669, Cl 380-49.000.

Russak, Steven: *See—*
Viemeister, Tucker; Formosa, Daniel; and Russak, Steven, 5,142,704, Cl. 2-202.000.

Russell Finex Limited: *See—*
Monteith, John, 5,143,222, Cl. 209-364.000.

Russell, Mark E.; and Miller, David C., to Raytheon Company. Pin diode driver circuit for radar system. 5,144,157, Cl. 307-270.000.

Rutgers University: *See—*
Burdea, Grigore C.; and Zhuang, Jiachen, 5,143,505, Cl. 414-5.000

Ryan, James W.: *See—*
Richards, Marvin K.; and Ryan, James W., 5,143,123, Cl 138-120.000.

Ryle, Thomas C.: *See—*
Cancio, Leopoldo; Ryle, Thomas C.; and Wu, Pai-Chuan, 5,143,774, Cl. 428-169.000.

Ryntz, Edward F., Jr.: *See—*
Matossian, Jesse N.; Wysocki, Joseph A.; Wilson, Robert G.; Yamagishi, Frederick G.; and Ryntz, Edward F., Jr., 5,143,747, Cl. 427-38.000.

Ryobi Motor Products Corp.: *See—*
McCurry, Ronald C., 5,143,494, Cl. 409-182.000.

Ryser, Hugues J.-P.: *See—*
Shen, Wei C.; and Ryser, Hugues J.-P., 5,144,011, Cl. 530-391.500.

S. A. Des Etablissements Staubli (France): *See—*
Froment, Jean-Paul, 5,143,124, Cl. 139-88.000.

S. C. Johnson & Son, Inc.: *See—*
Kohler, Karl A.; Bado, Frank M.; and Krueger, Richard E., 5,143,288, Cl. 239-1.000.

S. Jones-Robinson & Co.: *See—*
Soper, Peter H. H., 5,144,561, Cl. 364-474.350

Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, to Toyama Chemical Co., Ltd. Cephalosporins, process for producing the same, intermediates thereof and process for producing the intermediates. 5,144,027, Cl 540-222.000.

Sadamasa, Tetsuo: *See—*
Furuyama, Hideto; and Sadamasa, Tetsuo, 5,144,381, Cl. 357-30.000

Sadeh, Yaacov: *See—*
Mardix, Bar-Cochva; Sadeh, Yaacov; and Makover, Yaacov, 5,143,004, Cl. 112-186.000

Safeway Products, Inc.: *See—*
Hall, Henry B.; and Cook, James A., 5,144,113, Cl. 219-549.000.

Safranek, Robert J.: *See—*
Knauer, Scott C.; Matthews, Kim N.; Netravali, Arun N.; Petajan, Eric D.; Safranek, Robert J.; and Westerink, Peter H., 5,144,423, Cl. 358-133.000.

Saft, Michael C.: *See—*
Anderman, Menahem; Johnson, Steven L.; Saft, Michael C.; and Zuckerbrod, David, 5,143,805, Cl. 429-217.000.

Sagami Chemical Research Center: *See—*
Nagase, Yu; Takamura, Yuriko; Kohtoh, Noriaki; Fukuro, Hiroyoshi; and Abe, Toyohiko, 5,144,078, Cl. 564-472.000.

Sagara, Kiyoshi, to Nissan Motor Co., Ltd. Steering gear rack and transfer pinion arrangement for four-wheel drive vehicle derived from transversely mounted front engine-front drive system. 5,143,168, Cl. 180-374.000.

Saheki, Takasi; Matsuda, Hideaki; Yokota, Kinya; and Mayuzumi, Tominobu, to Okura Industrial Co., Ltd.; and Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for the production of cement-synthetic polymer composite molded bodies. 5,143,952, Cl. 524-5.000.

Sahota, Harvinder. Methods of angioplasty treatment of stenotic regions. 5,143,093, Cl. 128-898.000.

Sahota, Surinder, to Strongfield International plc. Cassette loader having simultaneous pusher and gripper movement. 5,144,506, Cl. 360-92.000.

Saikawa, Isamu: *See—*
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 5,144,027, Cl. 540-222.000.

St. Clair, Judith A.: *See—*
Ham, Richard G.; and St. Clair, Judith A., 5,143,842, Cl. 435-240.200.

Saint Criq, Jean; and Bros, Henriette, to Kaysersberg, SA. Stacked sanitary paper, dispenser, and method for making a stack. 5,143,249, Cl. 221-34.000.

Saint-Gobain Vitrage: *See—*
Felske, Armin; Stoffregen, Bernd; Beeck, Manfred-Andreas; Sauer, Gerd; Hassiepen, Michael; and Rebenstorff, Detlev, 5,144,459, Cl. 359-13.000.

Saint Gobain Vitrage International: *See—*
Henn, Klaus; Elfgen, Ansgar; Schwartz, Ludwig; and Krumm, Helmut, 5,143,196, Cl. 198-345.300.

Sainte-Foi, Daniel: *See—*
Giboult, Alain; Aube, Jean-Yves; and Sainte-Foi, Daniel, 5,143,532, Cl. 65-6.000

Saito, Hiroki; and Ishizuka, Seiji, to Fuji Photo Film Co., Ltd. Method and apparatus for applying an emulsion layer to photographic plates including pivoting conveyance rollers. 5,143,759, Cl. 427-420.000.

Saito, Masao: *See—*
Miki, Nobuaki; Sugiura, Kiyohiko; Nasu, Takeshi; Sugiura, Masayuki; and Saito, Masao, 5,143,345, Cl. 251-129.020.

Saito, Toranosuke: *See—*
Tsuchida, Tetsuo; Abe, Yukihiro; Okimoto, Tomoyuki; and Saito, Toranosuke, 5,143,890, Cl. 503-201.000.

Saitoh, Tadashi: *See—*
Takeda, Katsumi; Saitoh, Tadashi; Takeuchi, Takashi; and Iida, Junichi, 5,144,609, Cl. 369-44.410.

Saitoh, Taichi: *See—*
Kanai, Yasunori; Nawata, Kazumasa; Shimizu, Mitsuhisa; Yada, Hiroki; Saitoh, Taichi; and Sakai, Toshiaki, 5,144,158, Cl 307-272.100.

Saitou, Noboru; Hirota, Koichi; Hasebe, Ren; Okuda, Norimasa; and Katsumi, Ikuyo, to Nippon Shokubai Co., Ltd. Method of producing naphthalenedicarboxylic acids and diarylidcarboxylic acids. 5,144,066, Cl. 562-416.000.

Saive, Roland: *See—*
Bueschges, Ulrich; Saive, Roland; and Follmer, Godofredo, 5,143,881, Cl. 502-113.000.
Bueschges, Ulrich; and Saive, Roland, 5,143,882, Cl. 502-113.000.

Sakagami, Masahiko, to Matsushita Electric Industrial Co., Ltd. Semiconductor device having multiple supply potential paths for reducing electrical interference between circuits contained therein. 5,144,578, Cl. 365-63.000

Sakagami, Wataru; and Ogasawara, Yutaka, to Canon Kabushiki Kaisha. Apparatus for recording and reproducing information on and from a recording medium having a reference position mark. 5,144,608, Cl. 369-44.260.

Sakaguchi, Hisashi: *See—*
Ishizaki, Yasutoshi; Maruta, Rikio; Rokugo, Yoshinori; Sakaguchi, Hisashi; and Hayashi, Kuniyasu, 5,144,620, Cl. 370-84.000

Sakai, Masato: *See—*
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Sakai, Toshiaki: *See—*
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Sakaki, Minzi: *See—*
Nobumoto, Hidetoshi; and Sakaki, Minzi, 5,143,191, Cl. 192-76.000

Sakakibara, Kenji: *See—*
Morisaki, Hiroshi; and Sakakibara, Kenji, 5,144,361, Cl. 355-27.000.

Sakakihara, Yuichiro; and Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic booster. 5,142,865, Cl. 60-555.000.

Sakamoto, Hiroyuki; Miyamoto, Naruyuki; Takahashi, Ichirou; Nagashima, Takashi; and Arai, Hiroyuki, to Mita Industrial Co. Ltd. Cooling system for use in an image forming machine. 5,144,366, Cl. 355-208.000

Sakamoto, Kazunori; and Onoda, Atsushi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Impact sensing apparatus. 5,142,922, Cl. 74-2.000

Sakamoto, Kiichi: *See—*
Fueki, Shunsuke; Yasuda, Hiroshi; Sakamoto, Kiichi; and Takahashi, Yasushi, 5,144,142, Cl. 250-396.00R

Sakamoto, Masaaki: *See—*
Kato, Tohru; Tanaka, Tadashi; Sakamoto, Masaaki; and Yamamoto, Koichi, 5,143,565, Cl. 148-434.000

Sakamoto, Masaharu; Yamaguchi, Shigeru; Mukai, Kazuhiko; Matsumoto, Yukio; Suzuki, Shinji; Katsu, Toshiyuki; Iizuka, Tatsushi; Yatsuhashi, Kiyomi; and Hidaka, Hidenori, to Pioneer Electronic Corporation. Midi control apparatus and midi system. 5,142,959, Cl. 84-645.000.

Sakamoto, Nagayoshi, to Ube Industries, Ltd. Body fluid purifying material and method for purifying body fluid by use thereof. 5,144,013, Cl. 530-415.000.

Sakamoto, Noriaki: *See—*
Horie, Nobuyuki; Yamanaka, Toshihiro; Yamane, Daiji; and Sakamoto, Noriaki, 5,144,627, Cl. 371-22.100.

Sakano, Yukio, to Ricoh Company, Ltd. Image recorder using pulse width modulation. 5,144,338, Cl. 346-108.000.

Sakano, Yukio, to Ricoh Company, Ltd. Image processing apparatus and method. 5,144,456, Cl. 358-443.000

Sakatani, Kaoru: *See—*
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Sakito, Yoji: *See—*
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Sakiyama, Hideyo: *See—*
Fujiwara, Hiromichi; Ogawa, Akihiko; Sakiyama, Hideyo; and Tamura, Toshiaki, 5,143,935, Cl. 514-426.000

Sakuma, Hideo, to Shimon Kabushiki Kaisha. Airless spray nozzle. 5,143,302, Cl. 239-599.000.

Sakuma, Isamu: *See—*
Yamada, Shinichi; Sakuma, Isamu; Himeshima, Yoshio; Aoki, Takao; Uemura, Tadahiro; and Shirakura, Akira, 5,143,763, Cl. 428-36.200.

Salandro, Jerry R., to IRIS Technologies, Inc. Routing switcher. 5,144,548, Cl. 364-138.000

Salek, Jeffrey S.; and Pugach, Joseph, to Aristech Chemical Corporation. Manufacture of neopentyl glycol (I). 5,144,088, Cl. 568-457.000.

Sampson, Eric A., to Sampson Sports, Inc. Bicycle cleat and pedal with adjustable floating relationship. 5,142,938, Cl. 74-594.600

Sampson Sports, Inc.: *See—*
Sampson, Eric A., 5,142,938, Cl. 74-594.600.

Samsung Electron Devices Co., Ltd.: *See—*
Kim, Dae-il, 5,144,200, Cl. 313-584.000

Samsung Electronics Co., Ltd.: *See—*
Chang, Deugsoo, 5,144,519, Cl. 361-58.000
Chun, Jae K., 5,142,969, Cl. 99-468.000
Jeong, Ho-sun; and Lee, Sang-jin, 5,144,575, Cl. 364-748.000
Kim, Yong-san, 5,144,438, Cl. 358-183.000
Kweon, Ki-young, 5,144,376, Cl. 357-16.000.
Lim, Mu-gil, 5,144,256, Cl. 329-302.000.
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Samuelson, Lynne A.: *See—*
Akkara, Joseph A.; Kaplan, David L.; Samuelson, Lynne A.; Mandal, Braja K.; Tripathy, Sukant K.; Bruno, Ferdinando F.; and Marx, Kenneth A., 5,143,828, Cl. 435-41.000.

Samuelsson, Marie R.: *See—*
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Sanada, Takashi: *See—*
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Sandberg, L. Bogue; Haataja, Bruce A.; Jurmu, Douglas C.; Palardy, Robert D.; Story, Frank H.; and Yates, William A., to Michigan Technological University, Board of Control of. Pallet and apparatus for forming a pallet with deep drawn legs. 5,142,994, Cl. 108-53.300

Sanders, Leonard M.: *See—*
LeBegue, Maurice K.; Blackstock, Jon C.; Woodford, Clarence H., II; and Sanders, Leonard M., 5,143,423, Cl. 299-76.000.

Sanderson, Kenneth R.: *See—*
Baker, Ernest D.; Dinwiddie, John M., Jr.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,144,692, Cl. 395-425.000

Sanfilippo, Domenico: *See—*
Iezzi, Rodolfo; Buonomo, Franco; and Sanfilippo, Domenico, 5,143,886, Cl. 502-242.000.

Sanford, Timothy J.; Soltys, Joseph; and Cesnik, Charles L., to Lilly Industrial Coatings, Inc. Mirrorback coating. 5,143,789, Cl. 428-432.000.

Sang, Andy. Safety shut down system for luggage conveyor system. 5,143,194, Cl. 198-301.000

Sang, Henry W., Jr.; Bernstein, Mark S.; and Berkovitz, Michael A., to Xerox Corporation. Electrical contacts for an electro-optic modulator. 5,144,472, Cl. 359-254.000.

Sanko Kaihatsu Kagaku Kenkyusho Corporation: *See—*
Tsuchida, Tetsuo; Abe, Yukihiro; Okimoto, Tomoyuki; and Saito, Toranosuke, 5,143,890, Cl. 503-201.000

Sankyo Company, Limited: *See—*
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi; Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, 5,143,930, Cl. 514-369.000.

Sano, Hiroaki; Terasawa, Yoshiaki; and Tanaka, Shigeru, to Sumitomo Electric Industries, Ltd. Method for laying optical fiber unit and apparatus therefor. 5,143,353, Cl. 254-134.3FT.

Sano, Keiichi: *See—*
Iwata, Hiroshi; Noguchi, Shigeru; Ishida, Satoshi; Sano, Keiichi; and Nakayama, Shoichiro, 5,144,391, Cl. 357-23.700

Sano, Masafumi: *See—*
Sasaki, Takao; Murakami, Kunihiko; and Sano, Masafumi, 5,144,550, Cl. 364-192.000

Sanofi: *See—*
Jansen, Franz; and Gros, Pierre, 5,144,009, Cl. 530-363.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Kanno, Isao, 5,144,300, Cl. 340-984.000.
Takahashi, Masanori, 5,143,028, Cl. 123-65.0BA.

Santangelo, Francesco: *See—*
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Santhanam, Anakkavur T.; Godse, Rajendra V.; Quinto, Dennis T.; Undercoffer, Kenneth E.; and Jindal, Prem C., to Kennametal Inc CVD and PVD coated cutting tools. 5,143,488, Cl. 407-119.000

Santi, Ettore: *See—*
Morandi, Gino; and Santi, Ettore, 5,142,966, Cl. 99-352.000.

Sanyo Electric Co., Ltd.: *See—*
Higashitsutsumi, Yoshihito, 5,144,432, Cl. 358-153.000
Higashitsutsumi, Yoshihito, 5,144,445, Cl. 358-213.110.
Itoh, Atsushi, 5,144,269, Cl. 333-206.000
Iwata, Hiroshi; Noguchi, Shigeru; Ishida, Satoshi; Sano, Keiichi, and Nakayama, Shoichiro, 5,144,391, Cl. 357-23.700.

Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Kimura, Itsuo; Nobori, Kentaro; and Hikasa, Shigeki, 5,143,980, Cl 525-358.000.

Sardinskas, Stuart A.; Mormino, Mathew, Jr.; and Kearney, Michael R., to Farrel Corporation. Adjustable converging extruder hopper 5,143,734, Cl. 425-143.000.

Sardou, Freeman D.; and Chandler, Robert S., to Rockwell International Corporation. Low moving mass two axis gimbal. 5,143,334, Cl 248-184.000

Sargood, Stephen K., to British Telecommunications public limited company. Capping layer fabrication. 5,144,396, Cl. 357-30.000.
Sasahara, Kunihiro: *See—*
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi; Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, 5,143,930, Cl. 514-369.000.
Sasaki, Jun: *See—*
Yuhara, Akitsuna; Sasaki, Jun; Isomae, Hiromi; Kawakubo, Shozi; and Yamada, Jun, 5,144,185, Cl. 310-3 3.00B.
Sasaki, Kenichi: *See—*
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Sasaki, Koji: *See—*
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Sasaki, Shinya: *See—*
Kitajima, Shigeki; Yamashita, Kiichi; Sasaki, Shinya; and Tsushima, Hideaki, 5,144,467, Cl. 359-124.000.
Sasaki, Takao; Murakami, Kunihiko; and Hosokawa, Masahiko, to Fanuc Ltd. Brake control method of gravity axis. 5,144,213, Cl. 318-569.000.
Sasaki, Takao; Murakami, Kunihiko; and Sano, Masafumi, to Fanuc Ltd. Test run control method. 5,144,550, Cl. 364-192.000.
Sasaki, Toshio; Ebara, Takeshi; and Kawai, Kiyoshi, to Sumitomo Chemical Company, Limited. Solid catalyst component for use in polymerization of α-olefins. 5,143,880, Cl. 502-112.000.
Sasamoto, Hiroshi: *See—*
Hamada, Akio; Ohtaki, Keizaburo; Kubo, Takashi; and Sasamoto, Hiroshi, 5,143,270, Cl. 228-4.100.
Sasselli, Marco: *See—*
Kudelski, Andre; Laffely, Laurent; and Sasselli, Marco, 5,144,663, Cl. 380-16.000.
Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko; and Onogi, Yukio, 5,144,180, Cl. 310-212.000.
Satake, Toshihiko; and Onogi, Yukio, to Satake Engineering Co., Ltd. Two-stator induction synchronous motor. 5,144,180, Cl. 310-212.000.
Sato, Fumiki, to Mitsubishi Denki Kabushiki Kaisha. A/D converter utilizing successive approximation. 5,144,30 0, Cl. 341-161.000.
Sato, Hideki: *See—*
Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000.
Sato, Katsuaki: *See—*
Matsumoto, Masaharu; Serikawa, Mitsuhiko; Kawamura, Akihisa; Yoshida, Hiroko; and Sato, Katsuaki, 5,144,673, Cl. 381-61.000.
Sato, Katsutoshi: *See—*
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Sato, Masumi: *See—*
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Sato, Mineo: *See—*
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Sato, Naoki: *See—*
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Sato, Shigemasa: *See—*
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Sato, Tsuguo, to Sony Corporation. Capstan servo device. 5,144,210, Cl. 318-560.000.
Sato, Tsutomu: *See—*
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Sato, Youji: *See—*
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Satoh, Hiroshi; Utsui, Yoshihiko; Honda, Katsuhiko; and Hasegawa, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Magnetostriction type stress detector. 5,142,919, Cl. 73-862..33.
Satoh, Shuichi: *See—*
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Satoh, Toshio; Niiro, Yasunori; Kakegawa, Hisao; and Matsumoto, Hitoshi, to Nippon Hypox Laboratories Incorporated. Ascorbic acid derivative and use as antioxidant. 5,143,64.., Cl. 252-403.000.
Sattinger, Stanley S., to Westinghouse Electric Corp. Integrally-damped steel composite laminated structure and method of attaching same. 5,143,790, Cl. 428-457.000.
Sattler, Stephan: *See—*
Schafer, Dieter; Sattler, Stephan; Scheunert, Peter; Laufenberg, Franz; List, Hans; Steeg, Klaus; and Serrallach, Eugen, 5,143,694, Cl. 422-65.000.
Sauer, Gerd: *See—*
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Sauer, Hartmut K., to De La Rue Giori, S.A. Device for turning flat objects, such as for example bundles of notes. 5,143,197, Cl. 198-409.000.
Saurwein, A. G.; and Rivers, Ronald L., to PMC, Inc. Pneumatic spray gun. 5,143,296, Cl. 239-415.000.
Savatier, Tristan, to Thomson Consumer Electronics, Inc. Apparatus for video data quantization control. 5,144,..24, Cl. 358-133.000.
Savoca, Ann C. L.; and Listemann, Mark L., to Air Products and Chemicals, Inc. 3-quinuclidinol catalyst compositions for making polyurethane foams. 5,143,944, Cl. 521-129.000.
Sawada, Shizuo; and Ogihara, Masaki, to Kabushiki Kaisha Toshiba. Semiconductor device having a plurality of FETs formed in an element area. 5,144,388, Cl. 357-23.400.
Sawada, Yasushi: *See—*
Ishikawa, Hiroyuki; Usui, Hiroaki; Sawada, Yasushi; Okazaki, Satiko; and Kogoma, Masuhiro, 5,143,748, Cl. 427-40.000.
Sawamoto, Kunifumi, to Nissan Motor Co., Ltd. Variable cam engine. 5,143,037, Cl. 123-399.000.
Sawatsky, David P. Recloseable coffee cup cover. 5,143,248, Cl. 220-711.000.
Sawyer, Donald T.; Jeon, Seungwon; and Tsang, Paul K. S., to Texas A & M University System, The. Methods for producing superoxide ion in situ. 5,143,710, Cl. 423-581.000.
Saxe, Charles L.; Sullivan, Steven K.; and Kogan, Grigory, to Tektronix, Inc. Analog acquisition system including a high speed timing generator. 5,144,525, Cl. 365-45.000.
Say, Geoffrey R.; Taylor, James H.; Long, David C.; and Fiato, Rocco A., to Exxon Research and Engineering Company. Synthesis gas generation startup process (C-2556). 5,143,647, Cl. 252-373.000.
Sayed, Aziz E.: *See—*
Pielartzik, Harald; Heinz, Hans-Detlef; Dhein, Rolf; and Sayed, Aziz E., 5,143,956, Cl. 524-219.000.
Scaramucci, John P. Top-entry check valve with cartridge secured by threaded projections. 5,143,112, Cl. 137-315.000.
Scaramucci, John P. Top-entry check valve with cartridge secured by projections. 5,143,113, Cl. 137-315.000.
Scaringe, Robert P.; Parrish, Clyde F.; and Grzyll, Lawrence R., to Mainstream Engineering Corporation. Spacecraft adsorption thermal storage device using a vapor compression heat pump. 5,142,884, Cl. 62-324.400.
Scarpellino, Richard: *See—*
Kearns, Joyce M.; and Scarpellino, Richard, 5,144,106, Cl. 219-10.55E.
Scaysbrook, Frank; and Ly, Nhan G., to Commonwealth Scientific & Industrial Research Organization. Apparatus to measure the bending length and bending rigidity of fabrics. 5,142,918, Cl. 73-854.000.
Schaap, Luke A.: *See—*
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Schaeffer, Richard L., Jr.: *See—*
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Schafer, Dieter; Sattler, Stephan; Scheunert, Peter; Laufenberg, Franz; List, Hans; Steeg, Klaus; and Serrallach, Eugen, to Boehringer Mannheim GmbH. Test strip evaluating instrument for multiple test strips. 5,143,694, Cl. 422-65.000.
Schatz, Oskar. Method and an apparatus for the treatment of exhaust gas from IC engines. 5,143,701, Cl. 422-177.000.
Schaub, Robert E.: *See—*
Wissner, Allan; Schaub, Robert E.; Green, Kenneth E.; and Hamann, Philip R., 5,144,045, Cl. 549-219.000.
Schedele, Helmut; and Rappl, Franz, to Siemens Aktiengesellschaft. Electromagnetic power relay with actuation slide. 5,144,270, Cl. 335-80.000.
Schedele, Helmut, to Siemens Aktiengesellschaft. Electromagnetic power relay. 5,144,271, Cl. 335-83.000.
Scheid, Gunter, to Siemens Aktiengesellschaft. Ignition device for internal combustion engines. 5,143,042, Cl. 123-630.000.
Scheppmann, Leroy E., II, to Automation and Protection Systems, Inc. Method and apparatus for operating motorized gate upon loss of electrical power thereto. 5,144,153, Cl. 307-66.000.
Schering Corporation: *See—*
Patel, Mahesh; Horan, Ann C.; Marquez. Joseph A.; and Waitz, J. Allan, 5,143,832, Cl. 435-126.000.
Scheunert, Peter: *See—*
Schafer, Dieter; Sattler, Stephan; Scheunert, Peter; Laufenberg, Franz; List, Hans; Steeg, Klaus; and Serrallach, Eugen, 5,143,694, Cl. 422-65.000.
Schiessle, Edmund; Alasafi, Khaldoun; and Gutohrlein, Ralf, to Mercedes-Benz AG. Device for adjusting a nominal value of the dimension of an actuator, the longitudinal dimension of which can be changed by applying an external electromagnetic or electrostatic field. 5,144,208, Cl. 318-118.000.
Schiessle, Edmund: *See—*
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Schiffmann, Rolf, to BTS Broadcast Television Systems GmbH. Circuit apparatus for generating a symmetrical pulse sequence of variable frequency. 5,144,645, Cl. 377-47.000.
Schipper, Paul h.: *See—*
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Schirmer, Henry G., to W. R. Grace & Co.-Conn. Method for making a film/foil panel. 5,142,842, Cl. 53-427.000.
Schiroky, Gerhard H.: *See—*
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Schlegel Corporation: *See—*
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Schlicher, Rex L.; Rinaldi, Steven M.; Hall, David J.; Ranon, Peter M.; and Davis, Charles E. Nonlinear electromagnetic propulsion system and method. 5,142,861, Cl. 60-203.100.

Schloesser, Ulrike: *See—*
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Schlosser, Mark S.: *See—*
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Schlumberger Technologies, Inc.: *See—*
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Schmid, Eckhardt: *See—*
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Bauer, Kurt; Dorr, Wilhelm; Edele, Reinhard; Pfitzenmaier, Werner; Roth, Christian; and Schmid, Eckhardt, 5,142,939, Cl. 74-595.000.
Schmid, Wolfgang: *See—*
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Schmidt, Robert H.: *See—*
Blanchard, Claude; Morand, Alfred; and Schmidt, Robert H., 5,143,740, Cl. 426-446.000.
Schmidt, William: *See—*
Hutchinson, Franklin D.; and Schmidt, William, 5,143,342, Cl. 248-476.000.
Schmitt, George P.: *See—*
Cibulsky, Michael J.; Papathomas, Kostas; and Schmitt, George P., 5,143,756, Cl. 427-386.000.
Schmitt, Steven E.: *See—*
Smith, Nathan R.; and Schmitt, Steven E., 5,143,450, Cl. 374-12.000.
Schmitt, Susan M.: *See—*
DiNinno, Frank P.; Guthikonda, Ravindra N.; and Schmitt, Susan M., 5,143,914, Cl. 514-210.000.
Schneider, Douglas A.: *See—*
Molnar, Julius J.; Fena, Ernest J.; Folden, David W.; Schneider, Douglas A.; Becker, Richard A.; Fimmen, Charles L.; Selestak, David M.; and Shlapak, Robert, 5,143,680, Cl. 264-511.000.
Schneider, Erika: *See—*
Glover, Gary H.; and Schneider, Erika, 5,144,235, Cl. 324-309.000.
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Mainz, Hans-Willi; and Schneider, Lutz, 5,143,281, Cl. 229-132.000.
Schoeller & Co. Elektrotechnische Fabrik GmbH & Co.: *See—*
Von Gaisberg, Alexander; and Merz, Klaus-Philipp, 5,144,111, Cl. 219-265.000.
Schoen, William R.: *See—*
Parsons, William H.; Schoen, William R.; Patchett, Arthur A.; and Taniguchi, Masao, 5,143,908, Cl. 514-114.000.
Schofield, Bruce A.: *See—*
McMahon, Donald H.; Kirby, Alan A.; Schofield, Bruce A.; and Springer, Kent, 5,144,304, Cl. 341-58.000.
Scholl, Steven L.; Simmons, Eugene R.; Knutson, Keith C.; and Bunnelle, William L., to H. B. Fuller Licensing & Financing Inc. Hot melt adhesive comprising water soluble polyalkyloxazoline and water insoluble polymer. 5,143,961, Cl. 524-317.000.
Scholten, Rudolf; Hilgers, Lucas A. T.; and Weststrate, Marinus W., to Duphar International Research B.V. Method of stabilizing colostrum for immunochemical examination. 5,143,848, Cl. 436-8.000.
Schonbek, Arnold, to A. Schonbek & Co., Inc. Hookless gallery assemblies for chandeliers. 5,144,541, Cl. 362-405.000.
Schonfeld, Walter: *See—*
Knieps, Rudolf; Jaenicke, Ottanar; and Schonfeld, Walter, 5,144,033, Cl. 544-273.000.
Schreiber, William L.: *See—*
Narula, Anubhav P. S.; De Virgilio, John J.; and Schreiber, William L., 5,143,899, Cl. 512-6.000.
Schrod, Manfred: *See—*
Eckhardt, Georg-Wolfgang; Keil, Karl-Heinz; and Schrod, Manfred, 5,144,040, Cl. 548-352.000.
Schubert, Alan. Display stand for handguns. 5,143,227, Cl. 211-64.000.
Schubert, Paul F., to Phillips Petroleum Company. Sulfur absorbants. 5,143,706, Cl. 423-230.000.
Schuchert, Eugene H., to Amana Refrigeration, Inc. Method for bending tubes. 5,142,895, Cl. 72-150.000.
Schueller, Dennis R.: *See—*
Lydy, Bruce S.; Schueller, Dennis R.; Nickel, Dennis J.; and Rauwerdink, James D., 5,142,851, Cl. 56-13.400.
Schultz, Jerome S.: *See—*
Komives, Claire; and Schultz, Jerome S., 5,143,066, Cl. 128-634.000.
Schultz, Stephen W. Article holder for an open dashboard compartment. 5,143,265, Cl. 224-42.420.
Schumacher, Glenn O.; Weber, LaVerne; Nowicki, Mitchell; Dunbar, Alan; and Douglas, Jeffrey M., to American Fly Ash Company. Method of treating municipal sewage sludge and product produced thereby. 5,143,481, Cl. 405-129.000.
Schumm, Jeffry S.: *See—*
Tour, James M.; Wu, Ruilian; and Schumm, Jeffry S., 5,143,993, Cl. 528-15.000.
Schuring, Eric J.; and Girimonte, Vince, to ITW Plastiglide. Snap engaging fastener system for providing rotary motion. 5,143,500, Cl. 411-339.000.
Schwab, Carl E.; and Goodrich, Fred N. S., to Cardson, Inc. System for accurately monitoring aircraft position during training exercises. 5,144,315, Cl. 342-49.000.
Schwartz, Ludwig: *See—*
Henn, Klaus; Elfgen, Ansgar; Schwartz, Ludwig; and Krumm, Helmut, 5,143,196, Cl. 198-345.300.
Schwarz, Hans P.; Molinari, Ewald; Linnau, Yendra; and Pfeiler, Susanne, to Immuno Aktiengesellschaft. Preparation for treating and preventing thromboses and thromboembolic complications, use of such a preparation and a method of producing the same. 5,143,901, Cl. 514-2.000.
Schwarz, Robert: *See—*
Forster, Alfred; and Schwarz, Robert, 5,144,593, Cl. 367-95.000.
Schweingruber, Hans: *See—*
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,143,712, Cl. 424-1.100.
Schwyter, Leo, to Leo Schwyter AG. Process and device for processing residues from refuse incinerators. 5,143,304, Cl. 241-19.000.
Scientific-Atlanta, Inc.: *See—*
West, Lamar E., Jr., 5,144,267, Cl. 333-28.00R.
Scolaro, Martin S.: *See—*
Putney, Gordon A.; Scolaro, Martin S.; and Happ, Kenneth C., 5,142,952, Cl. 81-57.390.
Scott Fetzer Company, The: *See—*
Inculet, Ion I.; Lackner, John R.; and Murphy, James C., 5,143,524, Cl. 55-2.000.
Scott, Herbert E.: *See—*
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Scott, Robert J.: *See—*
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Scott, William L.: *See—*
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Scripps Research Institute, The: *See—*
Thornton, George B.; Moriarty, Ann M.; Milich, David R.; and McLachlan, Alan, 5,143,726, Cl. 424-88.000.
SCS-Thomson Microelectronics S.A.: *See—*
Fruhauf, Serge; and Breugnot, Fred eric, 5,144,515, Cl. 361-18.000.
Scuero, Alberto, to Sibelon S.r.l. Method for protecting dams, with pressureless dehydration by condensation and drainage of the water in the dam body. 5,143,480, Cl. 405-107.000.
Seagate Technology, Inc.: *See—*
Cain, Michael A.; and Allsup, David S., 5,142,770, Cl. 29-705.000.
Seatec: *See—*
Sova, Vyacheslav; Strongyn, Alexander; Klimova, Olga; and Stadnikov, Vadim, 5,143,837, Cl. 435-212.000.
Sebastian, Lothar; Berger, Karl-Heinz; Amling, Friedel; and Hecken, Gerhard, to Bochumer Eisenhutte Heintzmann GmbH & Co. KG. Positioning cylinder, especially for subterranean mining. 5,144,275, Cl. 338-67.000.
Sebastiano, Francesco; and Massarelli, Liberto, to Societa Italiana Vetro - Siv - S.p.A. Glass windshield for motor vehicles with combined capabilities of sun radiation screen and image combiner. 5,143,796, Cl. 428-623.000.
Secoura, Ralph A.: *See—*
Gardner, Billy J.; Jelovich, Benjamin C.; O'Hara, Frank; and Secoura, Ralph A., 5,144,217, Cl. 320-2.000.
Seden, William E.: *See—*
Hamilton, Ronald S.; and Seden, William E., 5,143,660, Cl. 264-1.400.
Sedepro: *See—*
Laurent, Daniel, 5,143,254, Cl. 222-1.000.
Seider, Robert J.: *See—*
Gibson, Brian; and Seider, Robert J., 5,143,522, Cl. 51-295.000.
Seido, Nobuo; Okeda, Yoshiki; and Kumobayashi, Hidenori, to Takasago International Corporation. Process for preparing optically active 3-hydroxypyrrolidine derivatives. 5,144,042, Cl. 548-541.000.
Seigneur, Christopher D.; and Plumbley, Robin A., to Blount, Inc. Selectable spray pattern chain saw bar system. 5,143,131, Cl. 144-364.000.
Seiko Epson Corporation: *See—*
Kawasaki, Takeshi, 5,144,156, Cl. 307-262.000.
Seki, Toshio: *See—*
Yamanaka, Tsutomu; Seki, Toshio; Nakajima, Tohru; and Yaoka, Osamu, 5,143,936, Cl. 514-456.000.
Sekigawa, Kazunari; and Tsujimoto, Hirokazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Transistor device drive circuit. 5,144,514, Cl. 361-18.000.
Sekiguchi, Sunao, to NEC Corporation. Microprogram controller in data processing apparatus. 5,144,628, Cl. 371-40.100.
Sekiguchi, Tetsuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel. 5,144,494, Cl. 359-700.000.
Selestak, David M.: *See—*
Molnar, Julius J.; Fena, Ernest J.; Folden, David W.; Schneider, Douglas A.; Becker, Richard A.; Fimmen, Charles L.; Selestak, David M.; and Shlapak, Robert, 5,143,680, Cl. 264-511.000.
Sellers, Mark G.: *See—*
O'Brien, James R.; Agha, Mohomed B.; Luce, Roberet E.; Renard, Paul S.; and Sellers, Mark G., 5,142,809, Cl. 43-21.200.
Semborg-Recrob, Corp.: *See—*
Lang, Victor H., 5,142,803, Cl. 40-411.000.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 5,143,808, Cl. 430-66.000.

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Senba, Shozi, to Tsuchiya Machine y Co., Ltd. Weft straightener 5,142,751, Cl. 26-51.300.
Sendai Institute of Microbiology: *See* –
Ebina, Takusaburo, 5,143,727, Cl. 424-89.000
Sengupta, Soumitra: *See*—
Merton, Henry A.; Diefenthal, ames R.; Radigan, William D.; Sengupta, Soumitra; and Lena , Emmett J., Jr., 5,144,495, Cl. 359-798.000
Senma, Toshitaka: *See*—
Imamura, Tomoatsu; Sato, Masu ni; Tanaka, Tomonori; Hayashi, Takamasa; and Senma, Toshita a, 5,144,337, Cl. 346-108.000
Sentoku, Hideshi: *See*—
Watanabe, Kenkichi; and Sentoku, Hideshi, 5,142,847, Cl. 53-532.000
Senuma, Akitaka; Nagai, Toshiyuki; Tsukada, Kiroku; and Hayashi, Akio, to Nippon Unicar Company Limited. Modified ethylene copolymer. 5,143,960, Cl. 525-282.000
Sepracor, Inc.: *See*—
Lee, Eric K.; Kalyani, Vinay J.; and Matson, Stephen L., 5,143,526, Cl. 55-158.000
Serikawa, Mitsuhiko: *See*—
Matsumoto, Masaharu; Serikawa, Mitsuhiko; Kawamura, Akihisa; Yoshida, Hiroko; and Sato, Ka suaki, 5,144,673, Cl. 381-61.000
Serrallach, Eugen: *See*—
Schafer, Dieter; Sattler, Stephan; Scheunert, Peter; Laufenberg, Franz; List, Hans; Steeg, Klaus; and Serrallach, Eugen, 5,143,694, Cl. 422-65.000.
Sessions, George C.; Mills, Chuck D. Parrish, Bradford J.; and Hutchens, Douglas R., to Fiskars OY A B. Pocket tool with retractable jaws. 5,142,721, Cl. 7-128.000.
Setiabudi, Frans; and Wolf, Jean-Pierre, to Ciba-Geigy Corporation. Hardenable mixtures of epoxide resin materials containing polyoxyalkylene-dithiols and polyamines. 5,143,999, Cl. 528-109.000
Setty, Thim; and Coll, Gene, to Diamond Communication Products, Inc. Drop wire clamp. 5,142,745, Cl. 24-136.00R.
Sextant Avionique: *See*—
Bedoya, Claude, 5,144,104, Cl. 210-512.000
Sextro, Gunter; Muck, Karl-Friedrich; Burg, Karlheinz; and Fischer, Eberhard, to Hoechst Aktiengesellschaft. Continuous process for removing unstable components from crude oxymethylene copolymer. 5,144,005, Cl. 528-480.000.
Seymour, Shaun A., to Ford New Holland, Inc. Lightweight conditioning roll. 5,142,848, Cl. 56-1.000.
SGS-Thomson Microelectronics, Inc *See*—
Steele, Randy C., 5,144,582, Cl. 65-189.080
Turner, Timothy E., 5,143,861, Cl. 437-52.000
SGS-Thomson Microelectronics s.r.l *See*—
Palara, Sergio; and Tagliavia, Donato, 5,144,172, Cl. 307-570.000.
SGS-Thomson Microelectronics S.A *See*—
Le Van Suu, Maurice, 5,144,666, Cl. 380-38.000.
Shaanan, Gad; Provost, Serge; and Roy, Jerome. Binding for a snowboard and a snowboard incorporating the bindings. 5,143,396, Cl. 280-607.000.
Shadwick, Robert P.: *See*—
Frew, Duncan W.; and Shadwick, Robert P., 5,143,787, Cl. 428-408.000
Shaffer, Jesse S., to U.S. Philips Corporation. Method of producing ultra stable aluminum oxide for high volt electrolytic capacitors and product thereof. 5,143,591, Cl. 205-50.000.
Shah, Girish B.: *See*—
Rabindran, K. George; Faber, Thomas; Filicicchia, David; Guenther, Kenneth L.; Kalika, Joseph; Kerstein, Melvin T.; Shah, Girish B.; and Wiley, David, 5,143,225, Cl. 209-584.000.
Shaley, Matti. Automatic enclosure test for domestic fowl. 5,143,021, Cl. 119-50.000
Sham, John C. K., to Wing Shing Products Company, Ltd. Leakage current circuit interrupter device. 5,144,516, Cl. 361-49.000
Shamosh, Robert; and Berlent, Harvey N. Security protection system and method. 5,144,661, Cl. 380-9.000
Shander, Douglas; and Funkhouser, Margaret G. Alteration of rate and character of hair growth. 5,143,92[illegible], Cl. 514-378.000.
Shandon Scientific Limited: *See*—
Cosgrove, Raymond F.; Male, Terence P.; and Smalley, Graeme M., 5,143,714, Cl. 424-3.000.
Shannon, John M.: *See*—
Hemings, Michael C.; and Shannon, John M., 5,144,406, Cl. 357-54.000.
Shanton, Kenneth J., to Wiggins Teape Group Limited, The. Divinyl carbinol or carbinol derivative chromogenic compounds and their use in record material. 5,143,891, Cl. 503-218.000.
Shape Inc.: *See*—
Gelardi, Anthony L.; Lovecky, Craig; Lowery, Alan; and Barstow, Robert, 5,142,761, Cl. 29-445.000.
Sharp Kabushiki Kaisha: *See*—
Funayama, Naotaka; Itoh, Ikuo; Kaneshige, Masatoshi; and Kurosaka, Toshiyuki, 5,144,38[illegible], Cl. 355-253.000
Hamada, Hiroshi; Takamatsu, Toshiaki; and Kimura, Naofumi, 5,144,288, Cl. 340-702.000.
Horie, Nobuyuki; Yamanaka, Toshihiro; Yamane, Daiji; and Sakamoto, Noriaki, 5,144,627, Cl. 371-22.100.
Kubota, Hiroshi, 5,144,342, Cl. 346-140.00R.
Miyajima, Toshiaki, Kioi, Kazumasa; Matunami, Mituo; Doi, Tukasa; Yoshioka, Minoru; and Koba, Masayoshi, 5,144,395, Cl. 357-30.000
Shiraishi, Tomikatsu; and Kawano, Isao, 5,144,292, Cl. 340-784.000
Takahashi, Ryutaro, 5,144,658, Cl. 380-3.000
Yoshida, Toshihiko; Watanabe, Masanori; and Yamamoto, Osamu, 5,144,636, Cl. 372-50.000
Sharp, Lewis G.: *See*—
Kilner, David N.; Humphrey, Keith D.; Little, Lionel M.; Carr, Duncan R.; and Sharp, Lewis G., 5,143,534, Cl. 65-21.300.
Sharper, Craig A.; and Reamer, Lynne A., to Integrated Network Corporation. Direct digital access telecommunication system with signaling bit detection. 5,144,624, Cl. 370-110.100.
Shaw, Lewis A., to Hastings Fiber Glass Products, Inc. Digital high-voltage meter for detecting a load to source voltage and a neutral position of a utility voltage regulator. 5,144,227, Cl. 324-149.000.
Sheahan, James P., to J.P. Sheahan & Associates. Method for leak detection and non-destructive quality control testing for roofing seams. 5,143,568, Cl. 156-64.000.
Sheffer Collet Company: *See*—
Howard, Carl J.; and Wrobel, Donald J., 5,143,687, Cl. 279-123.000.
Shell Offshore Inc.: *See*—
Petersen, William H., 5,143,483, Cl. 405-191.000.
Shell Oil Company: *See*—
Bitter, Johan G. A.; Futselaar, Harry; and Racz, Imre G., 5,143,613, Cl. 210-321.800.
Dewitz, Thomas S., 5,143,521, Cl. 48-210.000.
Geus, John W.; and Boellaard, Eliza, 5,143,877, Cl. 502-60.000
Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., 5,143,990, Cl. 526-82.000
Kelsey, Donald R., 5,143,992, Cl. 526-283.000.
Maxwell, Ian E.; Muller, Frederik; Khouw, Frank H. H.; Khor, Kim H.; and Lucien, Jacques, 5,143,596, Cl. 208-89.000.
Shell Research Limited: *See*—
Kilner, David N.; Humphrey, Keith D.; Little, Lionel M.; Carr, Duncan R.; and Sharp, Lewis G., 5,143,534, Cl. 65-21.300.
Shen, Wei C.; and Ryser, Hugues J.-P., to Boston University. Acidity-sensitive spacer molecule to control the release of pharmaceuticals from molecular carriers. 5,144,011, Cl. 530-391.500
Shepard, Howard M.: *See*—
Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward D.; Shepard, Howard M.; and Swartz, Jerome, 5,144,120, Cl. 235-472.000.
Sheppard, Clyde H.; and Lubowitz, Hyman R., to Boeing Company, The. Method for forming crosslinking polyetherimide oligomers. 5,144,000, Cl. 528-170.000
Sherwood, David E., Jr.: *See*—
Dai, Pei-Shing E.; and Sherwood, David E., Jr., 5,143,878, Cl. 502-66.000.
Shi, Zhimin. Portable package and system for storing and dispensing photographic film cartridges. 5,143,252, Cl. 221-185.000.
Shibasaki, Osamu, to Somar Corporation. Golf club shaft and process for manufacturing same. 5,143,374, Cl. 273-80.00B.
Shibayama, Atsushi, to Nikon Corporation. Compact wide-angle zoom lens. 5,144,489, Cl. 359-689.000
Shibuya, Isao, to Mabvchi Motor Co., Ltd. Carbon brush for miniature motors and method of making same. 5,144,181, Cl. 310-254.000.
Shields, Gary A. Computer controlled light with continuously variable color temperature, color, magnification, focus, and position 5,143,444, Cl. 362-293.000.
Shields, Joseph M., Jr.: *See*—
Hally, Nazim S.; Koelsch, Eric J.; and Shields, Joseph M., Jr., 5,143,308, Cl. 241-76.000.
Shiga, Hirokazu: *See*—
Toya, Shigeo; Hiramoto, Yoshiyuki; Sasaki, Koji; Abe, Koichi; Teraoka, Tatsuo; Shiga, Hirokazu; and Yoshie, Yasunori, 5,142,763, Cl. 29-517.000.
Shige, Noriyuki: *See*—
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Shigematsu, Toshiaki: *See*—
Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000.
Shigemura, Yutaka: *See*—
Ito, Yukihiro; Shigemura, Yutaka; Kondo, Takashi; Umezawa, Hideo; Yoshimoto, Mitsuharu; Yano, Satoshi; and Oura, Junichi, 5,143,503, Cl. 412-37.000.
Shih, Tsen-Tsou: *See*—
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Shihabi, David S.: *See*—
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Shimada, Masaru: *See*—
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Suzuki, Akira; Mochizuki, Hidehiro; Shimada, Masaru; Uemura, Hiroyuki; and Morohoshi, Naoya, 5,144,334, Cl. 346-1.100.
Shimanaka, Shigeki, to Nissan Motor Co., Ltd. Power train control sensor malfunction detection and control arrangement. 5,142,945, Cl. 74-866.000.
Shimizu, Kazutoshi, to Mutoh Industries Ltd. Head of universal parallel ruler. 5,142,789, Cl. 33-438.000.
Shimizu, Keiichirou, to Kabushiki Kaisha Toshiba. Multiple type air conditioning system which distributes appropriate amount of refrigerant to a plurality of air conditioning units. 5,142,877, Cl. 62-129.000.
Shimizu, Masahiro: *See*—
Yamaguchi, Takehisa; and Shimizu, Masahiro, 5,144,393, Cl. 357-23.900

Shimizu, Masao: *See*—
Okayama, Kenji; Oba, Yoshitaka; Imazono, Masahiko; Enoki, Masatoshi; Shimizu, Masao; Ohta, Yoshiki; Nakano, Koji; Matsuda, Eiji; Tokunaga, Osamu; Nakano, Tomoaki; Watanabe, Hachihei; and Ushita, Toshihide, 5,143,295, Cl. 239-403.000
Shimizu, Mitsuhisa: *See*—
Kanai, Yasunori; Nawata, Kazumasa; Shimizu, Mitsuhisa; Yada, Hiroki; Saitoh, Taichi; and Sakai, Toshiaki, 5,144,158, Cl. 307-272.100.
Shimizu, Ryouhei: *See*—
Toda, Akitoshi; Shimizu, Ryouhei; Ohta, Hiroko; Kajimura, Hiroshi; Mimura, Yoshiyuki; Isono, Yasuo; and Kouchi, Toshihito, 5,144,581, Cl. 365-151.000
Shimizu, Tetsuo; and Hosokawa, Kazutaka, to Daikin Industries Ltd. Porous film of polytetrafluoroethylene and preparation thereof. 5,143,783, Cl. 428-327.000
Shimizu, Tokichi. Chuck with four differential jaws. 5,143,686, Cl. 279-110.000
Shimizu, Tooji: *See*—
Yamaoka, Hideo; Shimizu, Tooji; Matsunaga, Fujihisa; Nishiyama, Shinichi; Yamanaka, Toru; and Miyakoshi, Shoichi, 5,143,644, Cl. 252-299.620.
Shimon Kabushiki Kaisha: *See*—
Sakuma, Hideo, 5,143,302, Cl. 239-599.000.
Shimosato, Toshiharu: *See*—
Inoue, Teruhisa; and Shimosato, Toshiharu, 5,143,461, Cl. 400-225.000
Shin-Etsu Chemical Co., Ltd.: *See*—
Okinoshima, Hiroshige; and Kato, Hideto, 5,143,948, Cl. 523-212.000.
Shin, Hyun J.: *See*—
Dhong, Sang H.; Hwang, Wei; and Shin, Hyun J., 5,144,165, Cl. 307-451.000
Shin Luen Facturing Factory Co., Ltd.: *See*—
Chen, Chin-Te, 5,143,128, Cl. 144-117.00R
Shinagawa, Yoshio: *See*—
Matsuura, Satoshi; Mito, Masayuki; and Shinagawa, Yoshio, 5,143,767, Cl. 428-109.000
Shindo, Yoshimitsu: *See*—
Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, 5,144,555, Cl. 364-419.000.
Shinjo, Kenji: *See*—
Iwaki, Takashi; Shinjo, Kenji; Yoshida, Akio; Yamashita, Masataka; Katagiri, Kazuharu; Hioki, Chieko; Togano, Takeshi; Yamada, Yoko; and Terada, Masahiro, 5,143,643, Cl. 252-299.610.
Shinko Pantec Co., Ltd.: *See*—
Hara, Tatsuo; Hogetsu, Akihiko; and Uegaki, Shigeo, 5,143,275, Cl. 228-119.000.
Shinonaga, Hirohiko: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,415, Cl. 358-43.000
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,443, Cl. 358-209.000
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Suzuki, Tetsuji; and Shinonaga, Hirohiko, 5,144,471, Cl. 359-245.000
Shinozuka, Akira: *See*—
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Shiono, Manzo: *See*—
Kanehira, Koichi; Eziri, Katsushi; Shiono, Manzo; Fujita, Yoshiji; and Yamahara, Johji, 5,143,921, Cl. 514-315.000.
Shionogi & Co., Ltd.: *See*—
Onoue, Hiroshi; Konoike, Toshiro; and Ishitobi, Hiroyuki, 5,143,910, Cl. 514-201.000
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, to Kao Corporation. Siloxane derivatives, producing method thereof and agents including siloxane derivative. 5,144,054, Cl. 556-445.000.
Shiozaki, Masakazu; and Okumura, Katsuya, to Kabushiki Kaisha Toshiba. Ion implantation apparatus and method of cleaning the same. 5,144,147, Cl. 250-492.200.
Shipley Company Inc.: *See*—
Iantosca, Richard, 5,143,544, Cl. 106-1.220.
Shirai, Makoto; and Sumida, Katsuhiko, to NGK Spark Plug Co., Ltd. Throw away tip. 5,143,487, Cl. 407-117.000.
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Tanaka, Toyoaki; Nakamura, Akira; Kamei, Yoshisuke; and Hashimoto, Akihiro, 5,143,786, Cl. 428-357.000
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Fenk, Josef, 5,144,263, Cl. 331-109.000
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Gerlach, Hans-Juergen, 5,144,646, Cl. 378-99.000.
Kess, Helmut, 5,144,244, Cl. 324-322.000.
Linnenberg, Gerhard, 5,144,577, Cl. 364-769.000
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Siemens Energy & Automation, Inc.: *See*—
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Siemens Nixdorf Informationssystem AG: *See*—
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Simmons, Eugene R.: *See*—
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Simonetti, Sergio G.; and Goodman Sidney J., to Melnor Industries, Inc. Spray gun. 5,143,299, Cl. 239 526.000
Simpson, Ashton E., to EMAC, Inc. Seismic gas shutoff valve. 5,143,110, Cl. 137-38.000.
Simpson, Glenn R., III, to Robec, Inc. Ball nut with tangential no load-guided return path. 5,142,925 Cl. 74-459.000
Simpson, Harold G.; and Neyer, Leo E., to Harold Simpson, Inc. Standing seam roof assembly and support apparatus. 5,142,838, Cl 52-640 000
Simpson, Robert E.: *See—*
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SINCO Incorporated: *See—*
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Singer, Paul A.: *See—*
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Singhal, Subhash C.: *See—*
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Sinterstahl GmbH: *See—*
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Sivasubramanian, Natarajan; and Federici, Brian A., to University of California, The Regents of the. Method and means for extending the host range of insecticidal proteins 5,143,905, Cl. 514-21.000.
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Park, Su C.; Kuon, Young M.; and Kim, Jin H., 5,142,899, Cl. 73-55.000.
SKF Plasma Technologies: *See—*
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Skinner, George. Encapsulating a substrate. 5,143,757, Cl. 427-407.100.
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Skoglund, Paul K. Flow regulating valve and system using the same 5,143,116, Cl. 137-487.000.
Skogward, Kenneth R.: *See—*
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Slinn, David S. L., to Rhone-Poulenc Chimie. Reduced flammability mixture based on isopropanol. 5,143,652, Cl. 252-602.000.
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Slovak, Jack P.; and Slovak, Robert A., to Water Factory Corporation. Fluid purification system. 5,143,6 1, Cl. 210-90.000.
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Smart, Reginald T.: *See—*
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Smith, Brad L.; Torrence, G. Paul; Aguilo, Adolfo; and Alder, James S., to Hoechst Celanese Corporation. Methanol carbonylation process. 5,144,068, Cl. 562-519.000.
Smith, Charles A. Insulated carbon dioxide absorption system. 5,143,060, Cl. 128-205.280.
Smith, Christopher P., to Westinghouse Electric Corp. Apparatus for measuring valve stem loads in a motor operated valve assembly. 5,142,906, Cl. 73-168.000.
Smith, David C., to United Technologies Corporation. Telemetry power carrier pulse encoder. 5,143,299, Cl. 340-870.180.
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Smith, Joseph E., to Kansas State Univ. Research Foundation. Method for identifying feline blood type B. 5,143,826, Cl. 435-7.250.
Smith, Nathan R.; and Schmitt, Steven E., to Aetrium, Inc. Apparatus for handling devices under varying temperatures. 5,143,450, Cl. 374-12.000.
Smith, Nelson S., Jr.: *See—*
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Smith, Stanley D.: *See—*
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Smith, Stephen D.: *See—*
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Smith, Terry B. Tree stand. 5,143,177, Cl. 182-187.000.
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SmithKline Beecham Corporation: *See—*
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Smits, Johannes H. M. Device for connecting a subscriber line to a selected internal line. 5,144,652, Cl. 379-102.000
Smolinski, John J.; Draghi, Peter J.; and Danielsen, John R., to United Technolgies Corporation. Gas turbine engine component repair. 5,142,778, Cl. 29-889.100.
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Socarras, Abelardo. Security mailbox. 5,143,284, Cl. 232-21.000.
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S.A. Henri Depaepe: *See—*
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Societe Anonyme: Societe Generale pour les Techniques Nouvelles-SGN: *See—*
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Societe Des Produits Nestle S.A.: *See—*
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Societe d'Etude et de Recherche en Ventilation et Aeraulique S.E.R.-V.A.: *See—*
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Societe Foptica S.A. & Commissariat a l'Energie Atomique: *See—*
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Societe Nationale D'Etude et de Construction de Moteurs D'Aviation"S.N.E.M.C.A.": *See—*
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Societe Nationale Elf Aquitaine: *See—*
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Societe Nationale Elf Aquitaine (Production): *See—*
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Soga, Mamoru: *See—*
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Solar Turbines, Incorporated: *See—*
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Soria, Raymond; and Gillot, Jacques, to Societe des Ceramiques Techniques. Membrane device for filtration, separation, or catalytic reaction. 5,143,614, Cl. 210-321.610
Sorna, Michael A.; and Papae, Donald J., to International Business Machines Corporation. Probe interface assembly. 5,144,228, Cl 324-158.00P.
Sotirianos, Konstantin, to Chemap AG. Process and apparatus for breaking up foam into its liquid and gaseous components. 5,143,525, Cl. 55-52.000
Soundwich, Inc.: *See—*
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Sova, Vyacheslav; Strongyn, Alexander; Klimova, Olga; and Stadnikov, Vadim, to Seatec. Enzyme complex having collagenolytic activity isolated from crabs. 5,143,837, Cl. 435-212.000
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Spielvogel, Bernard F.; Sood, Anup; and Hall, Iris H., to Boron Biologicals, Inc. Phosphite-borane compounds, and method of making and using the same. 5,143,907, Cl. 514-64.000
Spinner, Samuel. Tubular reinforcement element and method of making same. 5,143,471, Cl. 403-190.000
Spivey, Michael E., to AOS Holding Company. Water heater heat rollout sensor. 5,143,050, Cl. 126-374.000
Sponagel, Stefan; and Wachowitz, Waldemar, to Carl Freudenberg, Firma. Shaft seal. 5,143,385, Cl. 277-134.000
Sponseller, Robert L.: *See—*
Corsmeier, Robert J.; Sponseller, Robert L.; Reigel, James R.; and Maclin, Harvey M., 5,143,512, Cl. 415-115.000
Springer, Kent: *See—*
McMahon, Donald H.; Kirby, Alan A.; Schofield, Bruce A.; and Springer, Kent, 5,144,304, Cl. 341-58.000.
Spungin, Anya: *See—*
Blumberg, Shmaryahu; Spungin, Anya; Indig, Fred E.; and Meir, Daniela B., 5,143,839, Cl. 435-220.000
Square D Company: *See—*
Danley, William J.; Kresch, Jeffrey M.; and Kalley, Eugene F., 5,144,122, Cl. 250-201.200
Squyres, Richard T. Bearing sleeve with notched end. 5,143,455, Cl. 384-97.000
Staats, Louis T., III: *See—*
James, Michael S.; Powell, Meliss A.; Nickerson, Mark A.; and Staats, Louis T., III, 5,142,875, Cl. 62-50.500.
Staccione, Anna: *See—*
Marchionni, Giuseppe; and Staccione, Anna, 5,143,589, Cl. 204-157.920
Staccione, Anna M.: *See—*
Marraccini, Antonio; Pasquale, Antonio; Staccione, Anna M., and Marchionni, Giuseppe, 5,144,092, Cl. 568-615.000
Stada Arzneimittel AG: *See—*
Nurnberg, Eberhard; Leonhardt, Uwe; Hornstein, Otto P.; Griessmeyer, Gabriele; and Perschbacher, Harald, 5,143,940, Cl. 514-785.000.
Stadnikov, Vadim: *See—*
Sova, Vyacheslav; Strongyn, Alexander; Klimova, Olga; and Stadnikov, Vadim, 5,143,837, Cl. 435-212.000.
Staheli, Christoph: *See—*
Faas, Jurg; Staheli, Christoph; Demuth, Robert; and Moser, Robert, 5,143,485, Cl. 406-14.000
Staheli, Paul: *See—*
Demuth, Robert; Fritzsche, Peter; Nussli, Eduard; and Staheli, Paul, 5,142,741, Cl. 19-113.000.
Erni, Daniel; and Staheli, Paul, 5,142,742, Cl. 19-113.000
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive mixture based on 1,2-naphthoquinone-diazides, and reproduction material produced with this mixture. 5,143,815, Cl. 430-192.000.
Stanasolovich, Dave: *See—*
Kotecha, Harish N.; Protschka, Hans A.; Stanasolovich, Dave; and Theisen, Jake, 5,143,820, Cl. 430-314.000
Standard Oil Company, The: *See—*
Hauser, Jeffrey B.; Paspek, Stephen C.; and Adams, Harry A., 5,143,689, Cl. 374-55.000
Standard Products Company, The: *See—*
Mistopoulos, James E., 5,143,760, Cl. 428-31.000

Stanford Telecommunications, Inc.: *See—*
Weinberg, Aaron; Cunninghasm Ken; Urban, Daniel; and Mailaender, Laurence, 5,144,642, C. 375-10.000.

Stanislawczyk, Vic, to B.F. Goodrich Company, The. Rubbery carboxylated acrylate polymer, latex, and preparation thereof. 5,143,971, Cl. 524-833.000.

Stanley-Parker, Inc.: *See—*
Parker, Edward I.; and Weiss, Harold, 5,144,520, Cl. 361-153.000.

Starcraft RV, Inc.: *See—*
Philley, George C.; Ratliff, Homer; and Kauffman, Ira H., 5,143,417, Cl. 296-176.000.

Starke, David E., to Emhart, Inc. Masonry anchor installation tool 5,142,954, Cl. 81-429.000.

Staubli International Ag: *See—*
Daggett, Kenneth E.; and Ouaga, Eimei M., 5,144,211, Cl. 318-568.110.

Ste. Ateliers de la Haute Garonne-et- Auriol et Cie.: *See—*
Aurtoi, Jean-Marc; and Bones, Philippe, 5,143,216, Cl. 206-338.000

Stearns, Edward J.; and Johnson, Robert H., to Motorola, Inc. Optical detection device. 5,142,984, Cl. 10 -213.000.

Stearns, Edward J.; and Johnson, Robert H., to Motorola, Inc. Optical detection device. 5,142,985, Cl. 10 -213.000.

Steed, Garold L.: *See—*
Strothers, Susan D.; Delano, Robert G.; and Steed, Garold L., 5,143,590, Cl. 204-298.120.

Steeg, Klaus: *See—*
Schafer, Dieter; Sattler, Stephan; Scheunert, Peter; Laufenberg, Franz; List, Hans; Steeg, Klaus; and Serrallach, Eugen, 5,143,694, Cl. 422-65.000.

Steele, Randy C., to SGS-Thomson Microelectronics, Inc. SRAM based cell for programmable logic devices. 5,144,582, Cl. 365-189.080.

Steffan, Guido, to Bayer Aktiengesellschaft. Process for the preparation of aminoarylsulphonic acids. 5,144,065, Cl. 562-68.000.

Stehmeier, Lester G.: *See—*
Ferris, Frederick G.; and Stehmeier, Lester G., 5,143,155, Cl. 166-246.000

Stein, Hermann; and Vogel, Alwin, to Didier-Werke. Insulated roller assembly for a roller furnace. 5,144,684, Cl. 266-274.000.

Stein, Ingeborg: *See—*
Heywang, Ulrich; Martin, Roland; and Stein, Ingeborg, 5,144,081, Cl. 568-326.000.

Stein, Irene F.; Webb, Steven L.; and Boyd, David W., to Hewlett-Packard Company. Method and apparatus for locating the document referencing corner in a document scanner. 5,144,455, Cl. 358-443.000.

Steinberg, Ira, to BOC Group, Inc. The. Method and apparatus for expanding cellular materials. 5,143,096, Cl. 131-291.000.

Steinhardt, Michael D.; DeKeyser, Kathleen S.; and Tempas, Jeffrey F., to Kohler Co. Fluid pulse generating apparatus. 5,143,121, Cl. 137-624.130.

Stelloh, Frank A.; and Derzay, Gregory J., to General Electric Company. Vacuum tube characterization apparatus. 5,144,246, Cl. 324-405.000.

Steltenkamp, Robert J.; and Eaton, Craig F., to Colgate-Palmolive Company. Perfumes containing N-lower alkyl neoalkanamide (s) 5,143,900, Cl. 512-26.000.

Stelts, Philip D.: *See—*
Glassman, Barry S.; Stelts, Philip D.; Hlinka, Joseph W.; Beechan, Charles R.; and Foster, Lester A., Jr., 5,143,683, Cl. 266-246.000.

Stemmler, Heinz W.: *See—*
Podalsky, David J.; Lamarre, William M.; and Stemmler, Heinz W., 5,142,975, Cl. 101-40.100.

Stepanek, Fremek; and Wagner, Ludwig, to Marker International. Ski binding. 5,143,397, Cl. 280-633.000

Stephen, David: *See—*
Mansbridge, Martin H.; Stephen, David; and Norton, John, 5,143,276, Cl. 228-157.000.

Stephen Sohn, Edward J.; Young, Harvey J.; and Bernasek, Edward, to R. J. Reynolds Tobacco Company. Tobacco reconstitution process. 5,143,097, Cl. 131-356.000.

Stephenson, William K.; Mercer, Bradley D.; and Comer, David G., to Nalco Chemical Company. Refinery anti-foulant - asphaltene dispersant. 5,143,594, Cl. 208-48.0AA.

Sterling, Robert E.; and Goldberg, Eugene P., to RES Development Corp. Thermoplastic polymers with dispersed fluorocarbon additives. 5,143,963, Cl. 524-366.000.

Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Switchable scan antenna array. 5,144,320, Cl. 342-374.000.

Stern, Richard M.; Guenthner, Richard A.; Alm, Roger R.; and Wilkinson, Thomas K., to Minnesota Mining and Manufacturing Company. Process for the preparation of fluoroaliphatic aminocarboxylate surfactants. 5,144,069, Cl. 562-556.000.

Sternbach, Daniel D.: *See—*
Johnson, M. Ross; Peel, Michael R.; and Sternbach, Daniel D., 5,144,034, Cl. 544-276.000.

Stessl, Peter: *See—*
Doig, Raymond; and Stessl, Peter, 5,143,610, Cl. 210-232.000.

Steving, Gerald: *See—*
Aboaf, Joseph A.; Denison, Edward V.; Kahwaty, Vincent N.; and Steving, Gerald, 5,142,768, Cl. 29-603.000.

Stewart, James T.; and Toalson, David C. Crane load instrument and method therefor. 5,143,232, Cl. 21 -154.000.

Stewart, Robert E.; and Warren, Keith O., to Litton Systems, Inc Force balance instrument with electrostatic charge control. 5,142,921, Cl. 73-866.100.

Sticht, Walter. Apparatus for relatively arranging individual parts. 5,143,506, Cl. 414-421.000.

Stiffey, Arthur V.; Hart, Kevin R.; and Arwood, Diane K., to United States of America, Navy. Antifouling marine coatings. 5,143,545, Cl. 106-15.050.

Stiffler, Stephen P.; Waite, David J.; Frost, Robert L.; and Beach, Wayne H., to Kennametal Inc.; and Reedrill Inc. Digging tooth. 5,143,163, Cl. 175-385.000.

Stikkelorum, Simon G.; and Jaspers, Albertus G. C. System for collating and binding signatures to produce customized books or magazines. 5,144,562, Cl. 364-478.000

Stingelin, Willy, to Ciba-Geigy Corporation. Concentrated acid dye solutions: storage stable aqueous dye concentrate with di-ethyl-amino-propylamine. 5,143,519, Cl. 8-527.000.

Stirling, Loren D.: *See—*
Kaufmann, Rick J.; and Stirling, Loren D., 5,143,502, Cl. 412-16.000.

Stoffregen, Bernd: *See—*
Felske, Armin; Stoffregen, Bernd; Beeck, Manfred-Andreas; Sauer, Gerd; Hassiepen, Michael; and Rebenstorff, Detlev, 5,144,459, Cl. 359-13.000.

Stokes, Sally: *See—*
Beer, Paul D.; Hodacova, Jana; and Stokes, Sally, 5,144,052, Cl 556-144.000.

Stone, Richard A.: *See—*
Graham, Robert J.; Helstrom, John J.; Peck, Lawrence B.; Stone, Richard A.; and Bernier, Edward J., Jr., 5,143,598, Cl. 208-390.000.

Storage Technology Corporation: *See—*
Plutt, Daniel J., 5,143,459, Cl. 384-537.000

Storti, George M.: *See—*
Jutamulia, Suganda; Storti, George M.; and Lindmayer, Joseph, 5,144,145, Cl. 250-484.100.

Story, Frank H.: *See—*
Sandberg, L. Bogue; Haataja, Bruce A.; Jurmu, Douglas C.; Palardy, Robert D.; Story, Frank H.; and Yates, William A., 5,142,994, Cl. 108-53.300.

Stouffer Corporation, The: *See—*
Peleg, Yigal, 5,144,107, Cl. 219-10.55E.

Stough, Dale E., Jr.: *See—*
Merkt, Steven T.; Schaeffer, Richard L., Jr.; and Stough, Dale E., Jr., 5,142,771, Cl. 29-751.000

Strahan, Ronald L. Golfer's aid. 5,143,371, Cl. 273-32.00B.

Strange, Mark A.; Ledwith, Walter A., Jr.; Davis, Johnny B.; Finger, Stephen N.; and Bracci, Gerald, to United Technologies Corporation. Constant thrust retention turbine temperature limit system. 5,142,860, Cl. 60-39.281.

Strategic Financial Communications Corp.: *See—*
Moncrieff Baldwin, Judith A.; and Wozniak, Suzanne, 5,143,466, Cl. 402-79.000.

Strecker, Rudiger; and Harrer, Alois, to Bayern-Chemie GmbH. Composite solid propellant with a metal/inorganic fluoride admixture or a stable burning rate. 5,143,566, Cl. 149-19.900.

Strenk, Lawrence M., to Strenk Scientific Consultants, Inc. Method and apparatus for r.f. tomography. 5,144,236, Cl. 324-309.000.

Strenk Scientific Consultants, Inc.: *See—*
Strenk, Lawrence M., 5,144,236, Cl. 324-309.000.

Stribling, Bradley C.; and Eline, Roger J. O., to Rose Communications, Inc. Method and apparatus for perturbation cancellation of a phase locked oscillator. 5,144,260, Cl. 331-10.000.

Striek, Ralf-Jurgen; and Muller, Peter, to Coca-Cola Company, The; and Bosch-Siemens Hausgerate GmbH. Domestic appliance having electrically isolated input control circuitry. 5,144,543, Cl. 363-16.000.

Stringfellow, David W.: *See—*
Frisch, Anthony E.; and Stringfellow, David W., 5,144,159, Cl. 307-272.300.

Stroech, Klaus: *See—*
Jautelat, Manfred; Stroech, Klaus; Hanssler, Gerd; Dutzmann, Stefan; Kuck, Karl-Heinz; and Brandes, Wilhelm, 5,143,932, Cl. 514-383.000.

Stroede, Andrew J.: *See—*
Caveney, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wiencek, Donald C., 5,143,868, Cl. 439-535.000.

Strongfield International plc: *See—*
Sahota, Surinder, 5,144,506, Cl. 360-92.000.

Strongyn, Alexander: *See—*
Sova, Vyacheslav; Strongyn, Alexander; Klimova, Olga; and Stadnikov, Vadim, 5,143,837, Cl. 435-212.000.

Strothers, Susan D.; Delano, Robert G.; and Steed, Garold L., to Johnson Matthey Inc. Method of manufacturing sputtering target assembly. 5,143,590, Cl. 204-298.120.

Stroup, Steven L., Jr., to Crown Unlimited Machine, Inc. Flat tube cutting techniques. 5,143,268, Cl. 225-2.000

Stryer, Lubert: *See—*
Pirrung, Michael C.; Read, J. Leighton; Fodor, Stephen P. A.; and Stryer, Lubert, 5,143,854, Cl. 436-518.000.

Studer, Philip A.: *See—*
Moya, Israel A.; and Studer, Philip A., 5,142,932, Cl. 74-479.000.

Sturzebecher, Dana J.: *See—*
Harvey, James F.; Lux, Robert A.; Higgins, Thomas P.; Paolella, Arthur; and Sturzebecher, Dana J., 5,144,261, Cl. 331-66.000.

Suarez, Gustavo A.: *See—*
Baker, Ernest D.; Dinwiddie, John M., Jr.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,144,692, Cl. 395-425.000.

Sudo, Fumihiko; and Asaida, Takashi, to Sony Corporation. Image defect correcting circuit for a solid state imager. 5,144,446, Cl 358-213.110.

Suga, Atsuo; and Higuchi, Shigemitsu, to Hitachi, Ltd. Apparatus for delaying longitudinal time code signal for digital video tape recorder. 5,144,453, Cl. 358-311.000.

Sugahara, Hiroshi: *See—*
Hashima, Kazuo; Tsutsumi, Kazuhiko; and Sugahara, Hiroshi, 5,143,797, Cl. 428-694.000.

Sugamo, Hitoshi; Tomiya, Nobuyuki; and Watabe, Yusuke, to Toyo Ink Manufacturing Co., Ltd. Process for production of monoazo lake coated with water-insoluble metal salt of rosin. 5,144,014, Cl. 534-573.000.

Suganuma, Namio: *See—*
Kitamura, Kunio; Suganuma, Namio; and Naito, Tadashi, 5,143,561, Cl. 148-111.000.

Sugatsune Industrial Co., Ltd.: *See—*
Ohshima, Kazuyoshi; and Tamura, Seiichiro, 5,143,432, Cl. 312-319.100.

Sugimoto, Toshiaki: *See—*
Katoh, Hideaki; Noguchi, Nobuhisa; Kikuchi, Yutaka; Kaneko, Isamu; Sugimoto, Toshiaki; Kitahara, Seiki; Hoshi, Teruo; Suzuki, Minoru; and Satoh, Shuichi, 5,144,539, Cl. 362-256.000.

Sugimoto, Yasuhiro; Mizoguchi, Satoshi; and Mafune, Hiromi, to Kabushiki Kaisha Toshiba. BiCMOS current switching circuit having a plurality of resistors of a specified value. 5,144,164, Cl. 307-446.000.

Sugitani Kinzoky Kogyo Kabushiki Kaisha: *See—*
Sugitani, Nobuhiro, 5,143,541, Cl. 75-338.000.

Sugitani, Nobuhiro, to Sugitani Kinzoky Kogyo Kabushiki Kaisha. Process for producing powdered metal spray coating material 5,143,541, Cl. 75-338.000.

Sugiura, Kiyohiko: *See—*
Miki, Nobuaki; Sugiura, Kiyohiko; Nasu, Takeshi; Sugiura, Masayuki; and Saito, Masao, 5,143,345, Cl. 251-129.020

Sugiura, Masayuki: *See—*
Miki, Nobuaki; Sugiura, Kiyohiko; Nasu, Takeshi; Sugiura, Masayuki; and Saito, Masao, 5,143,345, Cl. 251-129.020.

Sugiura, Noboru: *See—*
Makaihira, Takashi; Sugiura, Noboru; and Kobayashi, Royoichi, 5,143,553, Cl. 123-609.000

Sugiura, Satoshi, to Pioneer Electronic Corporation. Optical information reading apparatus having an optical integration type pickup. 5,144,604, Cl. 369-44.120.

Sugiura, Takashi: *See—*
Matsuura, Ichiro; Sugiura, Takashi; Miyauchi, Fumio; and Chiyoshi, Toyoharu, 5,143,667, Cl. 264-46.600

Sugiura, Tsuneo, to Tamagawa Seiki Kabushiki Kaisha. Brushless generator with magnet and claw-tooth dual rotor. 5,144,178, Cl. 310-114.000

Sugiyama, Masanobu, to Sony Corporation. Tape cassette with dual hub lock torsion springs. 5,143,317, Cl. 242-199.000.

Sugiyama, Tatsuo: *See—*
Kawanami, Seiichi; Sugiyama, Tatsuo; Suzuki, Yoshiro; Ito, Yasutaro; and Annaka, Yuji, 5,144,499, Cl. 359-885.000.

Suhadolnik, Joseph, to Ciba-Geigy Corporation. Process for the preparation of N,N-dihydrocarbylhydroxylamines. 5,144,075, Cl. 564-301.000

Suhara, Hajime, to Kabushiki Kaisha Toshiba. Semiconductor laser device having reflectance control film formed on end facet of oscillator. 5,144,635, Cl. 372-49.000.

Suhoza, Richard A.; Garney, Bruce R.; and Lauder, Robert B., to R. T. Vanderbilt Company, Inc. Synergistic stabilizer compositions for polyols and polyurethane foam. 5,143,943, Cl. 521-115.000.

Sukekawa, Izumi: *See—*
Iwamura, Takuro; Koya, Tsugio; Sukekawa, Izumi; Hagiwara, Hideru; Asao, Haruhiko; Shigematsu, Toshiaki; and Sato, Hideki, 5,143,355, Cl. 266-160.000.

Sule, Akos. Solenoid control valve. 5,143,118, Cl. 137-554.000

Sullivan, Jeffrey M. Use of hydroxytriphenylborates to purify waste streams. 5,144,063, Cl. 562-7.000.

Sullivan, Steven K.: *See—*
Saxe, Charles L.; Sullivan, Steven K.; and Kogan, Grigory, 5,144,525, Cl. 365-45.000.

Sulowski, Andrew C.: *See—*
McQuarrie, Raymond H.; and Sulowski, Andrew C., 5,143,187, Cl. 188-376.000

Sulzbach, Hans-Michael: *See—*
Proksa, Ferdinand; Sulzbach, Hans-Michael; Althausen, Ferdinand; Duschanek, Helmut; and Raffel, Reiner, 5,143,946, Cl. 521-155.000

Sulzer Brothers Limited: *See—*
Pierantoni, Michel; Blank, Eberhard; Carrard, Michel; and Wagniere, Jean-Daniel, 5,143,557, Cl. 428-654.000

Sumida, Katsuhiko: *See—*
Shirai, Makoto; and Sumida, Katsuhiko, 5,143,487, Cl. 407-117.000.

Sumita, Mitsutaka: *See—*
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Sumitomo Bakelite Company Limited: *See—*
Ohta, Ken; Kosaka, Wataru; and Yanagisawa, Kenichi, 5,143,951, Cl. 523-435.000.

Sumitomo Chemical Company, Limited: *See—*
Abe, Hiroomi; Nagaoka, Kenji; and Sanada, Takashi, 5,143,981, Cl. 525-391.000
Sasaki, Toshio; Ebara, Takeshi; and Kawai, Kiyoshi, 5,143,880, Cl 502-112.000.

Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 5,144,071, Cl. 564-9.000

Sumitomo Electric Company, Limited: *See—*
Yoneyoshi, Yukio; Suzukamo, Gohfu; Konya, Naoto; and Ikeda, Takaharu, 5,144,039, Cl. 548-268.400

Sumitomo Electric Industries, Ltd.: *See—*
Harada, Keizo; Itozaki, Hideo; and Yazu, Shuji, 5,143,896, Cl 505-1.000
Kimoto, Tunenobu; Tomikawa, Tadashi; and Fujita, Nobuhiko, 5,144,380, Cl. 357-22.000.
Sano, Hiroaki; Terasawa, Yoshiaki; and Tanaka, Shigeru, 5,143,353, Cl. 254-134.3FT.
Takano, Satoshi; and Hayashi, Noriki, 5,143,898, Cl. 505-1.000

Sumitomo Rubber Industries, Ltd.: *See—*
Oka, Kengo; and Ohshima, Shinji, 5,143,377, Cl. 273-232.000.

Summit Oil Company, Inc.: *See—*
Pate, Alfred R., Jr., 5,143,611, Cl. 210-256.000

Sun, Chia-Li: *See—*
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Sunbeam Corporation: *See—*
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Sundeen, Joseph E.: *See—*
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Sundin, Richard L., Sr.: *See—*
Brown, David W.; Rogers, Terrence E.; Sundin, Richard L., Sr.; and Henry, Ralph A., 5,144,418, Cl. 358-60.000

Sundquist, Jarl, to AB Hallde Maskiner. Feeding device for vegetable cutting machines. 5,142,972, Cl. 99-537.000

Sundstrand Corporation: *See—*
Glover, J. Howard, 5,144,568, Cl. 364-715.010

Sundwiger Eisenhutte Maschinenfabrik: *See—*
Berger, Bernd; and Reinthal, Peter, 5,142,896, Cl. 72-242.400

Sune, Ching-Tzong: *See—*
Jones, Gary W.; and Sune, Ching-Tzong, 5,144,191, Cl 313-308.000.

Sung, Hung-Tzu. Greenhouse. 5,142,819, Cl. 47-40.000

Sunouchi, Kazumasa: *See—*
Okabe, Naoko; Inoue, Satoshi; Sunouchi, Kazumasa; Yamada, Takashi; Nitayama, Akihiro; and Takato, Hiroshi, 5,144,579, Cl. 365-149.000

Superior Trailer Works, Inc.: *See—*
Smith, Fred P.; and Smith, Fred T., 5,143,496, Cl. 410-68.000

Susini, Claude; and Mejean, Pascal, to Reboul-SMT. Case with rotary mechanism for substances in stick form. 5,143,464, Cl. 401-78.000

Sustena, Inc.: *See—*
Everard, Lloyd D.; and Wridge, Wilbur S., Jr., 5,142,717, Cl. 5-450.000

Sutterlin, Gregory E.; Lorincz, Samuel; and Vink, Charles E., to General Motors Corporation. Adaptive lamp monitor with first and second comparison rates. 5,144,282, Cl. 340-458.000

Suwa, Kaname, to Canon Kabushiki Kaisha. Key switch. 5,144,103, Cl 200-344.000.

Suzaki, Satoru: *See—*
Nakagawa, Yuji; Suzaki, Satoru; and Terada, Motoharu, 5,144,295, Cl. 340-825.120

Suzukamo, Gohfu: *See—*
Yoneyoshi, Yukio; Suzukamo, Gohfu; Konya, Naoto; and Ikeda, Takaharu, 5,144,039, Cl. 548-268.400.
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, 5,144,071, Cl. 564-9.000.

Suzuki, Akira; Mochizuki, Hidehiro; Shimada, Masaru; Uemura, Hiroyuki; and Morohoshi, Naoya, to Ricoh Company, Ltd. Thermosensitive recording method using sublimation-type thermosensitive image receiving recording medium. 5,144,334, Cl. 346-1.100

Suzuki, Haruo, to Jidosha Kiki Co., Ltd. Negative pressure booster 5,142,964, Cl. 91-369.100

Suzuki, Hideaki; Matsuzaki, Kichie; Kato, Kazuo; Oono, Mitsuo; Takeichi, Kenzo; Hisatomi, Ryoichi; Isobe, Mitsunobu; Fujimori, Shigeru; and Nemoto, Kouzou, to Hitachi, Ltd. Character recognition equipment. 5,144,683, Cl. 382-16.000

Suzuki, Hiroyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Ohno, Tomoyuki; Yahisa, Yotsuo; Matsuda, Yoshibumi; Tsumita, Norikazu; Ohura, Masaki; Shirakura, Takaaki; Shige, Noriyuki; and Takagi Kazumasa, to Hitachi, Ltd. Magnetic recording media for longitudinal recording, process for producing the same and magnetic memory apparatus. 5,143,794, Cl. 428-611.000.

Suzuki, Jun: *See—*
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; Suzuki, Kazuhiki; and Suzuki, Jun, 5,143,708, Cl. 423-328.000

Suzuki, Kazuhiki: *See—*
Nakazawa, Tadahisa; Ogawa, Masahide; Abe, Kiyoshi; Suzuki, Kazuhiki; and Suzuki, Jun, 5,143,708, Cl. 423-328.000

Suzuki, Kimio: *See—*
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Suzuki, Minoru: *See—*
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Suzuki, Shinichi: *See—*
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Suzuki, Shinji: *See—*
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Tatsushi; Yatsuhashi, Kiyomi; and Hidaka, Hidenori, 5,142,959, Cl. 84-645.000.

Suzuki, Tetsuji: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,415, Cl. 358-43.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, 5,144,443, Cl. 358-209.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Suzuki, Tetsuji; and Shinonaga, Hirohiko, 5,144,471, Cl. 359-245.000.

Suzuki, Yoshiro: *See—*
Kawanami, Seiichi; Sugiyama, Tatsuo; Suzuki, Yoshiro; Ito, Yasutaro; and Annaka, Yuji, 5, 44,499, Cl. 359-885.000.

Suzuki, Yuji: *See—*
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,144,054, Cl. 556-445.000.

Suzumori, Koichi; and Aomori, Kokichi, to Kabushiki Kaisha Toshiba. Propelling mechanism and traveling device propelled thereby. 5,142,989, Cl. 104-138.200.

Svalov, Grigorij: *See—*
Ziemek, Gerhard B.; Peshkov, Izyaslav G.; Svalov, Grigorij; Sytnikov, Victor E.; and Mitrokhin, Valerij A., 5,143,897, Cl. 505-1.000.

Svehaug, Oswald C. Camouflage screen. 5,142,833, Cl. 52-71.000.

Svyatsky, Eduard, to Bell & Howell Company. Mail feeder. 5,143,366, Cl. 271-122.000.

Swamy, Narasimha: *See—*
Kharzo, Joseph S.; Grostick, David W.; Liang, Jiann-Shing; and Swamy, Narasimha, 5,143,364, Cl. 271-108.000.

Swan, Richard E. Universal receiver sleeve. 5,142,806, Cl. 42-101.000.

Swanson, Byron E.: *See—*
Glynn, Christopher C.; Swanson, Byron E.; and Bobo, Melvin, 5,143,383, Cl. 277-53.000.

Swartz, Jerome: *See—*
Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward D.; Shepard, Howard M.; and Swartz, Jerome, 5,144,120, Cl. 235-472.000

Sweet, Theodore E. Double-ended gripper device. 5,142,807, Cl. 43-4.000.

SWF Auto-Electric GmbH: *See—*
Amann, Eugen; Baumgarten, Peter; Helh, Thomas; and Schmid, Eckhardt, 5,142,941, Cl. 74-606.00R.
Bauer, Kurt; Dorr, Wilhelm; Edele, Reinhard; Pfitzenmaier, Werner; Roth, Christian; and Schmid, Eckhardt, 5,142,939, Cl. 74-595.000.

Swiedler, Stuart J.: *See—*
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schwengruber, Hans, 5,143,712, Cl 424-1.100.

Switlik, Stanley. Airplane safety seat for lap children. 5,143,420, Cl. 297-250.000.

Symbol Technologies, Inc.: *See—*
Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward D.; Shepard, Howard M.; and Swartz, Jerome, 5,144,120, Cl. 235-472.000.
Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward D.; Shepard, Howard M.; and Swartz, Jerome, 5,144,120, Cl. 235-472.000.

Sytnikov, Victor E.: *See—*
Ziemek, Gerhard B.; Peshkov, Izyaslav G.; Svalov, Grigorij; Sytnikov, Victor E.; and Mitrokhin, Valerij A., 5,143,897, Cl 505-1.000.

Szymanski, John M. Can seal. 5,143,241, Cl. 220-270.000.

Tafur, Susan S.: *See—*
Rogers, Robert M.; Bokelman, Gordon H.; Baldwin, Sheryl D.; and Tafur, Susan S., 5,143,098, Cl. 31-365.000.

Tagaya, Masafumi: *See—*
Nakatsuka, Kimihiro; and Tagaya, Masafumi, 5,144,419, Cl 358-75.000

Tagliavia, Donato: *See—*
Palara, Sergio; and Tagliavia, Donato, 5,144,172, Cl. 307-570.000.

Tagoku, Izumi; and Ohdake, Eishu, to Ricoh Company, Ltd. Discharging member and charging device using the same. 5,144,521, Cl. 361-225.000

Taguchi, Keiichi: *See—*
Fujita, Hiroyuki; Takimoto, Kazushi; and Taguchi, Keiichi, 5,144,384, Cl. 355-308.000.

Tahara, Hiroyuki: *See—*
Katagiri, Shingo; Nishiyama, Shigeru; and Tahara, Hiroyuki, 5,144,511, Cl. 360-132.000.

Tahir, Saad F.: *See—*
Richmond, John R.; and Tahir, Saad F., 5,144,094, Cl. 568-635.000.

Tai, Masaru: *See—*
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 5,144,027, Cl. 540-222.000.

Taiho Kogyo Co., Ltd.: *See—*
Muramatsu, Shogo; and Yasuda, Tomotada, 5,143,559, Cl. 148-279.000

Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Method and apparatus for supporting of making formatted document. 5,144,555, Cl. 364-419.000.

Takagi, Hidenori: *See—*
Uchida, Shinichi; Tokura, Yoshinori; and Takagi, Hidenori, 5,143,895, Cl. 505-1.000.

Takagi Kazumasa: *See—*
Suzuki, Hiroyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Ohno, Tomoyuki; Yahisa, Yotsuo; Matsuda, Yoshibumi; Tsumita, Norikazu; Ohura, Masaki; Shirakura, Takaaki; Shige, Noriyuki; and Takagi Kazumasa, 5,143,794, Cl. 428-611.000.

Takagi, Seiichi: *See—*
Nozawa, Keita; and Takagi, Seiichi, 5,143,810, Cl. 430-106.600.

Takahara, Toshiyuki; and Takami, Akira, to Mitsubishi Denki K.K. Driving apparatus with a speed changer for a bicycle. 5,142,937, Cl. 74-594.300.

Takahashi, Hisashi: *See—*
Takahashi, Koichi; Okutsu, Kazuo; Takahashi, Hisashi; Hirose, Masuhiko; Ichikawa, Haruo; Kitagawa, Kuniharu; and Kataoka, Hideaki, 5,144,350, Cl. 354-275.000.

Takahashi, Ichirou: *See—*
Sakamoto, Hiroyuki; Miyamoto, Naruyuki; Takahashi, Ichirou; Nagashima, Takashi; and Arai, Hiroyuki, 5,144,366, Cl. 355-208.000.

Takahashi, Katsumasa; Nakamaru, Takuya; and Iino, Osamu, to Sony Corporation. Spectacles for stereoscopic pictures. 5,144,344, Cl. 351-44.000.

Takahashi, Koichi; Okutsu, Kazuo; Takahashi, Hisashi; Hirose, Masuhiko; Ichikawa, Haruo; Kitagawa, Kuniharu; and Kataoka, Hideaki, to Fuji Photo Film Co., Ltd. Photographic film cartridge. 5,144,350, Cl. 354-275.000.

Takahashi, Kuniaki; Kudo, Koji; and Takahashi, Tetsuo, to TDK Corporation. Chip packaging means and supply mechanism for supplying chips by using the chip packaging means. 5,143,253, Cl. 221-197.000.

Takahashi, Masanori, to Sanshin Kogyo Kabushiki Kaisha. Supercharged V type two cycle engine. 5,143,028, Cl. 123-65.0BA.

Takahashi, Mineo: *See—*
Takano, Yukinori; and Takahashi, Mineo, 5,142,950, Cl. 81-9.510.

Takahashi, Noriyuki: *See—*
Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, 5,144,555, Cl. 364-419.000.

Takahashi, Ryutaro, to Sharp Kabushiki Kaisha. Repeater of digital audio interface signal. 5,144,658, Cl. 380-3.000.

Takahashi, Sadatoshi: *See—*
Endo, Hiroshi; and Takahashi, Sadatoshi, 5,144,488, Cl. 359-686.000.

Takahashi, Tetsuo: *See—*
Takahashi, Kuniaki; Kudo, Koji; and Takahashi, Tetsuo, 5,143,253, Cl. 221-197.000.

Takahashi, Toshio: *See—*
Kanehira, Makoto; Takahashi, Toshio; and Nakagawa, Takerou, 5,143,477, Cl. 403-341.000.

Takahashi, Yasunori, to Fujikin Soft Co., Ltd. Capacitor and process for producing same. 5,144,529, Cl. 361-323.000.

Takahashi, Yasushi: *See—*
Fueki, Shunsuke; Yasuda, Hiroshi; Sakamoto, Kiichi; and Takahashi, Yasushi, 5,144,142, Cl. 250-396.00R.

Takahashi, Yutaka: *See—*
Noguchi, Yoshihiro; Imai, Toshihisa; Takahashi, Yutaka; and Tanaka, Hideharu, 5,143,664, Cl. 264-113.000.

Takahiro, Kasuh; and Gunji, Morino, to Osaka Gas Company Limited. Active carbon and processes for preparation of same. 5,143,889, Cl. 502-427.000.

Takamatsu, Toshiaki: *See—*
Hamada, Hiroshi; Takamatsu, Toshiaki; and Kimura, Naofumi, 5,144,288, Cl. 340-702.000.

Takami, Akira: *See—*
Takahara, Toshiyuki; and Takami, Akira, 5,142,937, Cl. 74-594.300.

Takamura, Tohru; Yamaguchi, Ryuta; and Fujino, Noboru, to Kabushiki Kaisha Shinkawa. Lead frame separating device. 5,143,510, Cl. 414-796.700.

Takamura, Yuriko: *See—*
Nagase, Yu; Takamura, Yuriko; Kohtoh, Noriaki; Fukuro, Hiroyoshi; and Abe, Toyohiko, 5,144,078, Cl. 564-472.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, to Victor Company of Japan, Ltd. Apparatus for processing information carried by electromagnetic radiation beam. 5,144,415, Cl. 358-43.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Suzuki, Tetsuji, to Victor Company of Japan, Ltd. Apparatus for reproducing charge latent image with vibration of electrode to modulate field generated by image thereby electro-optically modulating a reading light. 5,144,443, Cl. 358-209.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Suzuki, Tetsuji; and Shinonaga, Hirohiko, to Victor Company of Japan, Ltd. Optical scanning system for scanning object with light beam and displaying apparatus. 5,144,471, Cl. 359-245.000

Takano, Satoshi; and Hayashi, Noriki, to Sumitomo Electric Industries, Ltd. Superconducting wire. 5,143,898, Cl. 505-1.000.

Takano, Yukinori; and Takahashi, Mineo, to Yazaki Corporation. Method and apparatus for peeling covering from intermediate portion of covered electric wire. 5,142,950, Cl. 81-9.510

Takaragi, Kazuo; Ishii, Yasuhiro; and Nakamura, Tsutomu, to Hitachi, Ltd. Cryptographic communication method and system. 5,144,665, Cl. 380-30.000.

Takasago International Corporation: *See—*
Seido, Nobuo; Okeda, Yoshiki; and Kumobayashi, Hidenori, 5,144,042, Cl. 548-541.000.

Takashima, Daisaburo: *See—*
Oowaki, Yukihito; Tsuchida, Kenji; and Takashima, Daisaburo, 5,144,583, Cl. 365-206.000.

Takata Corporation: *See—*
Zushi, Takayasu, 5,143,401, Cl. 280-731.000.

Takata, Shigeo: *See—*
Nakamura, Takashi; Kasai, Tomohiko; Tani, Hidekazu; Takata, Shigeo; and Matsuoka, Fumio, 5,142,879, Cl. 62-160.000

Takato, Hiroshi: *See—*
Okabe, Naoko; Inoue, Satoshi; Sunouchi, Kazumasa; Yamada, Takashi; Nitayama, Akihiro; and Takato, Hiroshi, 5,144,579, Cl. 365-149.000

Takatsuka, Tomohide, to Ando Electric Co., Ltd. Method of controlling double integral A-D converter. 5,144,307, Cl. 341-120.000.

Takeda Chemical Industries, Ltd.: *See—*
Meguro, Kanji; Tawada, Hiroyuki; and Ikeda, Hitoshi, 5,143,919, Cl. 514-291.000.

Takeda, Hiroyuki: *See—*
Yagi, Kazuo; and Takeda, Hiroyuki, 5,143,977, Cl. 525-240.000.

Takeda, Katsumi; Saitoh, Tadashi; Takeuchi, Takashi; and Iida, Junichi, to Hitachi, Ltd. Apparatus for tracking an optical disc. 5,144,609, Cl 369-44.410.

Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, to Canon Kabushiki Kaisha. Recording apparatus and method which takes into account image information being recorded. 5,144,329, Cl. 346-1.100

Takeda, Yoshiyuki: *See—*
Irie, Yoichiro; Takeda, Yoshiyuki; Nagao, Tsuyoshi; and Kida, Yasuhiko, 5,143,363, Cl. 271-6.000

Takeichi, Kenzo: *See—*
Suzuki, Hideaki; Matsuzaki, Kichie; Kato, Kazuo; Oono, Mitsuo; Takeichi, Kenzo; Hisatomi, Ryoichi; Isobe, Mitsunobu; Fujimori, Shigeru; and Nemoto, Kouzou, 5,144,683, Cl. 382-16.000.

Takemoto, Akira; Watanabe, Hitoshi; Fujiwara, Masatoshi; and Kakimoto, Syoichi, to Misubishi Denki Kabushiki Kaisha. Method of producing a semiconductor laser. 5,143,864, Cl. 437-129.000.

Takemoto, Mitsutoshi: *See—*
Matsuo, Takeshi; and Takemoto, Mitsutoshi, 5,144,386, Cl. 355-321.000.

Takeuchi, Hiroaki: *See—*
Toda, Hiroshi; Miyata, Hideyasu; Takeuchi, Hiroaki; Nakanishi, Nobuyasu; and Kondo, Koichi, 5,143,428, Cl. 303-113.0AP.

Takeuchi, Ken: *See—*
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,144,054, Cl. 556-445.000.

Takeuchi, Shoji: *See—*
Amimoto, Tomohiko; and Takeuchi, Shoji, 5,142,849, Cl. 56-8.000.

Takeuchi, Takashi: *See—*
Takeda, Katsumi; Saitoh, Tadashi; Takeuchi, Takashi; and Iida, Junichi, 5,144,609, Cl. 369-44.410.

Taki, Hideo: *See—*
Sadaki, Hiroshi; Narita, Hirokazu; Imaizumi, Hiroyuki; Konishi, Yoshinori; Inaba, Takihiro; Hirakawa, Tatsuo; Taki, Hideo; Tai, Masaru; Watanabe, Yasuo; and Saikawa, Isamu, 5,144,027, Cl 540-222.000.

Taki, Masakazu; Yoshizawa, Kenji; and Nishimae, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Microwave discharge light source device. 5,144,199, Cl. 313-484.000.

Takigawa, Masuo: *See—*
Kusakabe, Hiroki; and Takigawa, Masuo, 5,142,914, Cl. 73-723.000

Takikawa, Kazunori, to Usui Kokusai Sangyo Kaisha Ltd. Branch connectors for high-pressure branched fuel pipe. 5,143,410, Cl. 285-197.000

Takimoto, Kazushi: *See—*
Fujita, Hiroyuki; Takimoto, Kazushi; and Taguchi, Keiichi, 5,144,384, Cl. 355-308.000

Takiyasu, Yoshihiro; Tanaka, Toshiki; Asano, Michio; Ohno, Masashi; and Kozaki, Takahiko, to Hitachi, Ltd. Network system. 5,144,622, Cl. 370-85.130.

Takuno, Masami, to Showa Denko K.K. Highly hygroscopic laminate. 5,143,773, Cl. 428-137.000

Talbot, Christopher G.; and Richardson, Neil, to Schlumberger Technologies, Inc. Methods and apparatus for acquiring data from intermittently failing circuits. 5,144,225, Cl. 324-73.100.

Talmadge, George: *See—*
Perry, Carl A.; Daigle, Guy A.; Rountree, Steven; Talmadge, George; Grunbeck, John; and Wassell, Mark, 5,144,126, Cl. 250-254.000.

Tam, James P., to Rockefeller University, The. Oxidative folding of peptide and protein substrates using hydrocarbon sulfoxides. 5,144,006, Cl. 530-345.000.

Tamagawa Seiki Kabushiki Kaisha: *See—*
Sugiura, Tsuneo, 5,144,178, Cl. 310-114.000.

Tamapack Co., Ltd.: *See—*
Ishikawa, Masaaki; and Yamada, Masao, 5,143,442, Cl. 362-253.000.

Tamata, Shin: *See—*
Kikuchi, Makoto; Ohura, Masato; Tamata, Shin; Chino, Koichi; and Funabashi, Kiyomi, 5,143,654, Cl. 252-629.000.

Tamatani, Yasuyuki; and Tsuji, Kanji, to Tsudakoma Kogyo Kabushiki Kaisha. Transfer tail forming apparatus for weft feeders. 5,143,125, Cl. 139-450.000

Tamenori, Koji: *See—*
Ushio, Hideaki; Nishimoto, Seiji; and Tamenori, Koji, 5,142,863, Cl. 60-272.000

Tamrock World Corporation, N.V.: *See—*
LeBegue, Maurice K.; Blackstock, Jon C.; Woodford, Clarence H., II; and Sanders, Leonard M., 5,143,423, Cl. 299-76.000

Tamura, Seiichiro: *See—*
Ohshima, Kazuyoshi; and Tamura, Seiichiro, 5,143,432, Cl 312-319.100.

Tamura, Toshiaki: *See—*
Fujiwara, Hiromichi; Ogawa, Akihiko; Sakiyama, Hideyo; and Tamura, Toshiaki, 5,143,935, Cl. 514-426.000

Tanabe, Yoshinori: *See—*
Matsuno, Yohsio; Choji, Shinichiro; Sasaki, Kenichi; and Tanabe, Yoshinori, 5,143,437, Cl. 362-80.000.

Tanaka, Akiyoshi; Matsuya, Satoshi, deceased (by Matsuya, Yasue, legal heir); Fujikawa, Wataru; Uwabo, Hiroyuki; Inoue, Ikuo; and Nagata, Atsushi, to Matsushita Electric Industrial Co., Ltd. Motion compensated prediction interframe coding system. 5,144,426, Cl. 358-133.000

Tanaka, Hideharu: *See—*
Noguchi, Yoshihiro; Imai, Toshihisa; Takahashi, Yutaka; and Tanaka, Hideharu, 5,143,664, Cl. 264-113.000

Tanaka, Hideyuki; Ichihashi, Takao; and Deguchi, Hiroyuki, to Mita Industrial Co., Ltd. Color image forming apparatus. 5,144,387, Cl. 355-326.000.

Tanaka, Kenji, to Rohm Co., Ltd. Lead mounting apparatus. 5,142,765, Cl. 29-564.600

Tanaka, Masaaki: *See—*
Kamon, Kazuya; Myoi, Yasuhito; Miyamoto, Teruo; Noguchi, Yoshie; and Tanaka, Masaaki, 5,144,362, Cl. 355-53.000.

Tanaka, Mitsugu: *See—*
Yamashita, Shinichi; and Tanaka, Mitsugu, 5,144,434, Cl 358-166.000

Tanaka, Shigeru: *See—*
Sano, Hiroaki; Terasawa, Yoshiaki; and Tanaka, Shigeru, 5,143,353, Cl. 254-134.3FT.

Tanaka, Tadashi: *See—*
Kato, Tohru; Tanaka, Tadashi; Sakamoto, Masaaki; and Yamamoto, Koichi, 5,143,565, Cl. 148-434.000.

Tanaka, Tetsuo: *See—*
Takadachi, Masato; Iwasaki, Mihoko; Maezawa, Hiroyuki; Shindo, Yoshimitsu; Eguchi, Ryoji; Mimura, Hirokazu; Takahashi, Noriyuki; and Tanaka, Tetsuo, 5,144,555, Cl. 364-419.000.

Tanaka, Tomonori: *See—*
Imamura, Tomoatsu; Sato, Masumi; Tanaka, Tomonori; Hayashi, Takamasa; and Senma, Toshitaka, 5,144,337, Cl. 346-108.000

Tanaka, Toshiki: *See—*
Takiyasu, Yoshihiro; Tanaka, Toshiki; Asano, Michio; Ohno, Masashi; and Kozaki, Takahiko, 5,144,622, Cl. 370-85.130.

Tanaka, Toyoaki; Nakamura, Akira; Kamei, Yoshisuke; and Hashimoto, Akihiro, to Showa Denko Kabushiki Kaisha. Composite fibers, water-absorbing material using the composite fibers as a base material and method for producing the same. 5,143,786, Cl. 428-357.000

Tancrede, Jean M.: *See—*
Diehl, Charles F.; Tancrede, Jean M.; and Myers, Michael O., 5,143,968, Cl. 524-534.000

Tandy Corporation: *See—*
Boshek, Ernest D., Jr., 5,143,209, Cl. 206-45.160
Johnson, Sheryl L.; and Clark, Bryan K., 5,144,613, Cl. 369-100.000

Tani, Hidekazu: *See—*
Nakamura, Takashi; Kasai, Tomohiko; Tani, Hidekazu; Takata, Shigeo; and Matsuoka, Fumio, 5,142,879, Cl. 62-160.000.

Tani, Tatsuo, to Ricoh Company, Ltd. Curl removing device for an image recorder. 5,144,385, Cl. 355-309.000.

Taniguchi, Masao: *See—*
Parsons, William H.; Schoen, William R.; Patchett, Arthur A.; and Taniguchi, Masao, 5,143,908, Cl. 514-114.000.

Targosz, Thomas C.: *See—*
Brown, Gordon R.; and Targosz, Thomas C., 5,144,565, Cl. 364-507.000

Tarmo Co., Ltd.: *See—*
Morita, Tamao, 5,142,746, Cl. 24-303.000

Tashiro, Naoyuki: *See—*
Ueda, Hiroshi; Imuta, Kazuyoshi; Kimura, Hirofumi; Tashiro, Naoyuki; and Yasuda, Syouji, 5,143,448, Cl. 366-77.000

Tashiro, Yasunori: *See—*
Ueno, Sadao; and Tashiro, Yasunori, 5,142,956, Cl. 83-102.000

Tatematsu, Susumu: *See—*
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Taurus Tetraconcepts, Inc.: *See—*
Kaufmann, Rick J.; and Stirling, Loren D., 5,143,502, Cl. 412-16.000

Tausk, Edward F., to Navistar International Transportation Corp. Multipiece foam pattern for making hollow casting having an integral hose connection. 5,143,143, Cl. 164-246.000.

Taussig, Andrew P.: *See—*
Actis, Robert J.; Cherry, Craig D.; and Taussig, Andrew P., 5,144,118, Cl. 235-462.000

Tavassoli, Farshad: *See—*
Etemad, Mehran; Tavassoli, Farshad; and Marceau, William E., 5,142,999, Cl. 110-235.000

Tawada, Hiroyuki: *See*—
Meguro, Kanji; Tawada, Hiroyuki; and Ikeda, Hitoshi, 5,143,919, Cl. 514-291.000.
Tawada, Masanori; Mizuno, Masamoto; Hirabayashi, Terumi; and Kodera, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for elevator doors using velocity limiting circuits. 5,144,101, Cl. 187-103.000.
Taylor Building Products Company: *See*—
Mrocca, Mark M., 5,142,835, Cl. 52-309.120.
Taylor, James H.: *See*—
Say, Geoffrey R.; Taylor, James H.; Long, David C.; and Fiato, Rocco A., 5,143,647, Cl. 252-373.000.
Taylor, Robert D.; and Huntsman, Lewis R., to Morton International, Inc. Additive approach to ballistic and slag melting point control of azide-based gas generant compositions. 5,143,567, Cl. 149-35.000.
Taylor, Spencer E., to British Petroleum Company p.l.c., The. Method for breaking emulsions. 5,143,109, Cl. 137-13.000.
TDK Corporation: *See*—
Takahashi, Kunaki; Kudo, Koji; and Takahashi, Tetsuo, 5,143,253, Cl. 221-197.000.
Teal, Richard D.: *See*—
Patterson, Jon M.; Hutchison, Wayne R.; and Teal, Richard D., 5,142,850, Cl. 56-17.100.
Technical Associate Co., Ltd.: *See*—
Iizuka, Souichi; and Yamada, Yasuharu, 5,142,869, Cl. 60-684.000.
Teder, Harry: *See*—
Killion, Mead C.; Teder, Harry; Johnson, Arthur C.; and Hanke, Steven P., 5,144,675, Cl. 381-61.400.
Tei, Youichi: *See*—
Onodera, Katsumi; and Tei, Youichi, 5,144,134, Cl. 250-307.000.
Teikoku Chemical Industry Co., Ltd: *See*—
Fujiwara, Hiromichi; Ogawa, Akihiko; Sakiyama, Hideyo; and Tamura, Toshiaki, 5,143,935, Cl. 514-426.000.
Teitman, Gerald J.: *See*—
Sparks, Steven W.; Teitman, Gerald J.; and Viscontini, Salvatore T. M., 5,143,597, Cl. 208-131.000
Tektronix, Inc.: *See*—
Saxe, Charles L.; Sullivan, Steven K.; and Kogan, Grigory, 5,144,525, Cl. 365-45.000.
Thong, Tran, 5,144,571, Cl. 364-721.000.
Teleco Oilfied Services Inc.: *See*—
Perry, Carl A.; Daigle, Guy A.; Rountree, Steven; Talmadge, George; Grunbeck, John; and Wassell, Mark, 5,144,126, Cl. 250-254.000.
Teleco Oilfield Services Inc.: *See*—
Wisler, Macmillan M., 5,144,245 Cl. 324-338.000.
Teleflex Incorporated: *See*—
Kelley, Dixon L., 5,142,933, Cl. 74-502.000.
Martucci, Norman S., 5,142,782, Cl. 29-890.144.
Telemecanique: *See*—
Cohen, Jacques; Nourry, Daniel; and Thierry, Jean-Pierre, 5,144,530, Cl. 361-378.000.
Tempas, Jeffrey F.: *See*—
Steinhardt, Michael D.; DeKeyser, Kathleen S.; and Tempas, Jeffrey F., 5,143,121, Cl. 137-624.130.
Temple, Lowell D., to Pipe Gasket & Supply Co., Inc. Pipe joint seal. 5,143,381, Cl. 277-1.000.
Temple University: *See*—
Labes, Mortimer M., 5,143,709, Cl. 423-449.000.
Templeton, John F.: *See*—
LaBella, Frank S.; and Templeton, John F., 5,144,017, Cl. 536-5.000.
Tendler Technologies, Inc.: *See*—
Yonkers, E. Hubbard, 5,144,323 Cl. 342-386.000.
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Dudley, Dana; Peterson, Kirk D.; and Hanson, Charles M., 5,144,133, Cl. 250-208.100.
Hayden, Kenneth L., 5,144,273, Cl. 337-380.000.
Kinch, Michael A.; and Roberts, C. Grady, 5,144,138, Cl 250-332.000.
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Mitchell, Allan T.; Riemenschneider, Bert R.; and Tigilaar, Howard L., 5,143,860, Cl. 437-43.000.
Moslehi, Mehrdad M., 5,143,862, Cl. 437-62.000.
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Theis, David L., to Access Mobility Systems, Inc. Inclined rail trolley safety device with lever operated cable shieve for taking up slack in the cable to control trolley drive. 5,142,991, Cl. 104-178.000.
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Kotecha, Harish N.; Protschka, Hans A.; Stanasolovich, Dave; and Theisen, Jake, 5,143,820, Cl. 430-314.000.
Thermo Process Systems Inc.: *See*—
Smith, John W., 5,143,558, Cl. 148-225.000.
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Thomas, Juergen; Spahl, Roland; Anstock, Thomas; Eisenbeis, Ansgar; and Schmid, Wolfgang, to BASF Aktiengesellschaft. Preparation of oxidation-stable and low-temperature-stable base oils and middle distillates. 5,143,595, Cl. 208-58.000.
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Inazawa, Yoshizumi; Ozaki, Shinya; Milthorp, Brian; and Thompson, Bruce, 5,144,501, Cl. 360-48.000.
Thompson, Donald A.: *See*—
McArthur, William J.; and Thompson, Donald A., 5,143,804, Cl. 429-148.000.
Thompson, Peter B., to Fadeguard, Inc. Fade resistant water and soil repellent composition for fabric. 5,143,729, Cl. 424-402.000.
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Savatier, Tristan, 5,144,424, Cl. 358-133.000.
Sparks, Bradley A.; and Morris, Robert E., 5,144,441, Cl. 358-190.000.
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Roche, Pascal; and Courtin, Claude, 5,143,277, Cl. 228-179.000.
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Thonn, Tracy F., to Coherent, Inc. Laser with actively stabilized etalon for single frequency operation. 5,144,632, Cl. 372-33.000.
Thoren, Werner: *See*—
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Thurn, Rudolf; and Burger, Hans-Joachim, to Siemens Aktiengesellschaft. Ultrasonic sandwich transducer with an astigmatic sonic lobe. 5,144,186, Cl. 310-326.000.
Tian-Song, Guo. Waste gas-purifying device. 5,143,527, Cl. 55-222.000.
Tiemeyer, Michael: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,143,712, Cl. 424-1.100
Tietjen, Marlene: *See*—
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Tigilaar, Howard L.: *See*—
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Timson, William J., to Wellesley Research Associates, Inc. Can construction. 5,143,240, Cl. 220-260.000.
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Harley, David N., 5,143,473, Cl. 403-231.000.
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Toda, Akitoshi; Shimizu, Ryouhei; Ohta, Hiroko; Kajimura, Hiroshi; Mimura, Yoshiyuki; Isono, Yasuo; and Kouchi, Toshihito, to Olympus Optical Co., Ltd. Apparatus including atomic probes utilizing tunnel current to read, write and erase data. 5,144,581, Cl 365-151.000.
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Toda Kogyo Corp.: *See*—
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Todd, Kenneth L., to Masco Industries, Inc. Vehicle wheel construction. 5,143,426, Cl. 301-37.00P.
Togano, Takeshi: *See*—
Iwaki, Takashi; Shinjo, Kenji; Yoshida, Akio; Yamashita, Masataka; Katagiri, Kazuharu; Hioki, Chieko; Togano, Takeshi; Yamada, Yoko; and Terada, Masahiro, 5,143,643, Cl. 252-299.610.
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Tokyo Electric Co., Ltd.: *See*—
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Tortul, Renzo, to Carraro S.p.A. Timing variator, particularly for changing the relative timing between a camshaft and the timing drive mechanism of an internal combustion engine. 5,143,032, Cl. 123-90.170.
Toshimitsu, Kunio, to Nikon Corporation. Microscope including first and second stages in conjugate planes. 5,144,478, Cl. 359-392.000
Toshio, Inaji; and Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Brushless DC motor. 5,144,209, Cl. 318-254.000
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Cable, Ltd.; and NKK Corporation: Method for connecting optical fibers sealed in metal pipes. 5,142,763, Cl. 29-517.000.

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Toyo Jozo Company, Ltd.: *See—*
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Toyo Kasei Kogyo Company Ltd.: *See—*
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Toyoda Gosei Co., Ltd.: *See—*
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Okawa, Koji; Norota, Kazuhiko; and Mizuno, Hiroyuki, 5,143,040, Cl. 123-684.000.
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Trampota, Clinton D. Illuminated lunch box. 5,143,440, Cl. 362-156.000.

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Tran, Hiep V., to Texas Instruments Incorporated. High speed signal driving scheme. 5,144,162, Cl. 307-443.000.

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Trienco, Inc.: *See—*
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Tripathy, Sukant K.: *See—*
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Trommer, Gert: *See—*
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Troppman, Dale A.: *See—*
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TRW Repa GmbH: *See—*
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Tsang, Paul K. S.: *See—*
Sawyer, Donald T.; Jeon, Seongwon; and Tsang, Paul K. S., 5,143,710, Cl. 423-581.000.

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Tsuchida, Tetsuo; Abe, Yukihiro; Okimoto, Tomoyuki; and Saito, Toranosuke, to Kanzaki Paper Manufacturing Co., Ltd.; and Sanko Kaihatsu Kagaku Kenkyusho Corporation. Heat sensitive recording material. 5,143,890, Cl. 503-201.000.

Tsuchiya Machinery Co., Ltd.: *See—*
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Tsuchiya, Noriaki: *See—*
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Tsugawa, Iwao: *See—*
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Tsutsumi, Kazuhiko: *See—*
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Walt, David R., 5,143,853, Cl. 436-501.000.

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Tur, Anton; Repisky, Milan; and Proia, Nicholas M. Onion cutter. 5,142,973, Cl. 99-538.000.

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TVA Holding S.p.A.: *See—*
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Tybinkowski, Andrew: *See—*
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Wise, Francis E.; and Coleman, Philip D., 5,143,749, Cl. 427-45.100.

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Udell, Margo W., to Medique Products Co. Portable corrugated cardboard medicine cabinet. 5,143,431, Cl. 312-259.000.

Ueda, Akihiko: *See—*
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Uemura, Tadahiro: *See—*
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Ullman, Ralph J.: *See—*
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Ultraviolet Energy Generators, Inc.: *See—*
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Faessel, Andre ; Pochon, Claude; Mazzocco, Jean-Pierre; and Valetti, Jean-Claude, 5,143,315, Cl. 242-83.000.

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Unisys Corp.: *See—*
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United Kingdom Atomic Energy Authority: *See—*
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Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., 5,143,621, Cl. 210-690.000.
Harvey, James F.; Lux, Robert A.; Higgins, Thomas P.; Paolella, Arthur; and Sturzebecher, Dana J., 5,144,261, Cl. 331-66.000.
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Davin, James M., 5,144,638, Cl. 372-107.000.
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Gabel, Detlef, 5,144,026, Cl. 540-500.000.
Hawke, Ronald S., 5,142,962, Cl. 89-8.000.
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Lee, Woodrow W., 5,143,047, Cl. 126-263.000.
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Phillips, William T.; Klipper, Robert W.; Timmons, James H., and Rudolph, Alan S., 5,143,713, Cl. 424-1.100.
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Thomas, Lynn K.; and Singer, Paul A., 5,144,643, Cl. 375-10.000.
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Brotherton, Stanley D., 5,144,392, Cl. 357-23.700.
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Peters, Petrus J. M.; and Crooijmans, Henricus A. A. R., 5,144,197, Cl. 313-422.000.
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Urtarte, Jorge. Automatic leveling sys em. 5,143,386, Cl. 280-6.100
Ushio, Hideaki; Nishimoto, Seiji; and amenori, Koji, to Honda Giken Kogyo Kabushiki Kaisha. Engine p rt provided with manifold type exhaust passage. 5,142,863, Cl. 60-2 2.000
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van den Burg, Johannes M. E., to Meinhardt B.V. Process and device for the continuous analysis of the composition of gases. 5,143,695, Cl. 422-84.000
Vandenhoek, Vernon. Gate bracket connector with a pair of U-shaped yoke members. 5,143,413, Cl. 292- 02.000
van der Zel, Joseph M., to Elephant Edelmetaal B.V. Method of making a substructure for a dental restoration. 5,143,692, Cl. 419-8.000
VanDeusen, Herbert G., to W. L. Gore & Associates, Inc. Conductively-jacketed electrical cable. 5,144,098, Cl. 174-36.000.
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Vermont, Gerard R. E. R., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation"S.N.E.M.C.A.". Turbofan with dynamic vibration damping. 5,143,517, Cl. 416-190.000.
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Vincent, Kent D., to Hewlett-Packard Company. Variable wavelength light filter and sensor system. 5,144,498, Cl. 359-885.000.
Vindez, Pierre G., to P.V. Tool,'Inc. Right angle positive feed tapper. 5,143,161, Cl. 173-19.000.
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Sutterlin, Gregory E.; Lorincz, Samuel; and Vink, Charles E., 5,144,282, Cl. 340-458.000.
Vipat, Vasudha S., to MacMillan Bloedel Limited. Secondary treatment of an integrated paper mill effluent. 5,143,619, Cl. 210-624.000.
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Wang, Bing; and Wilkes, Garth L., 5,143,988, Cl. 525-471.000.
Visage, Albert B. Device for reproducing images, by contact, on an unexposed photographic film from a transparent original. 5,144,365, Cl. 355-91.000.
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Vogl, Norbert M.: *See—*
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Vogt, Howard W., Jr.: *See—*
Moore, Pamela D.; Pitt, Linwood L., Jr.; and Vogt, Howard W., Jr., 5,143,213, Cl. 206-273.000.
Vojacek, Herbert; and Pflaum, Hermann, to Sinterstahl GmbH. Friction clutch or friction brake. 5,143,192, Cl. 192-107.00M.
Von Buren, Stefan; and Akselrud, Vitaly, to Husky Injection Molding Systems Ltd. Injection molding apparatus. 5,143,733, Cl. 425-130.000
Von Gaisberg, Alexander; and Merz, Klaus-Philipp, to Schoeller & Co. Elektrotechnische Fabrik GmbH & Co. Electric cigar lighter with bimetallic snap active temperature controlled switching off. 5,144,111, Cl. 219-265.000
Voorde, Paul V.: *See—*
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Voss, Hans W.; Cremer, Heinz P.; Cwiertnia, Harald; and Putsch, Peter-Ulrich, to Keiper Recaro GmbH & Co. Vehicle seat having a seat surface which is adjustable both as to height and inclination. 5,143,421, Cl. 297-338.000.
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Vrzalik, John H., to Kinetic Concepts, Inc. Patient supporting method for averting complications of immobility. 5,142,719, Cl. 5-609.000.
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W. L. Gore & Associates, Inc.: *See—*
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Anderman, Menahem; Johnson, Steven L.; Saft, Michael C.; and Zuckerbrod, David, 5,143,805, Cl. 429-217.000.
Mirle, Srinivas K.; and Berrier, Arthur L., 5,143,819, Cl. 430-286.000.
Schirmer, Henry G., 5,142,842, Cl. 53-427.000.
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Wadensten, Theodore S. Gas accumulator and blaster apparatus 5,143,256, Cl. 222-3.000.
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Walters, Roland L.: *See—*
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Walton, John I. Apparatus for sorting articles according to size. 5,143,226, Cl. 209-624.000.
Walton, John N., to Hedley Purvis Limited. Torque wrench. 5,142,951, Cl. 81-57.390
Wang, Bing; and Wilkes, Garth L., to Virginia Tech Intellectual Properties, Inc. High refractive-index hybrid material prepared by titanium alkoxide and a phosphine containing oligomer. 5,143,988, Cl. 525-471.000
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Wang, Diana S.; and Williams, Marvin L., to International Business Machines Corporation. Method and system for document distribution by reference to a first group and particular document to a second group of user in a data processing system. 5,144,557, Cl. 364-419.000
Wang, Jui-Shang, to Duracraft Corporation. Portable humidifier 5,143,460, Cl. 392-405.000
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Chiu, Bernard; Wang, Jui-Shang; and Marino, Frank, 5,143,655, Cl. 261-24.000
Wang, Nai-Yi; Dubler, Robert E.; Ungemach, Frank S.; Walters, Roland L.; and Thacker, Susan A., to Abbott Laboratories Fluorescene polarization immunoassay for tetrahydrocannabinoids. 5,144,030, Cl. 546-89.000
Wang, Po H. Single-sprinkler controller. 5,143,290, Cl. 239-70.000
Wang, Tian-Wang. Adjustable motor-operated circular saw sharpener. 5,142,947, Cl. 76-42.000
Wanhainen, John P.: *See—*
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Ward, Stephen M.: *See—*
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Warden, Hans-Erik, to Siemens Aktiengesellschaft. Weight counterbalance means. 5,143,333, Cl. 248-123.100.
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Belliotti, Thomas R.; Boschelli, Diane H.; Connor, David T., and Kostlan, Catherine R., 5,143,929, Cl. 514-364.000
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Cetenko, Wiaczeslaw A.; Connor, David T.; Sircar, Jagadish C.; Sorenson, Roderick J.; and Unangst, Paul C., 5,143,928, Cl. 514-369.000
Warren, Keith O.: *See—*
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Warren, Renate I.: *See—*
Kendall, Ronald, deceased; Place, Ronald H.; and Warren, Renate I., 5,143,955, Cl. 524-151.000
Warren, Roger W., to United States of America, Energy. High field pulsed microwiggler comprising a conductive tube with periodically space slots. 5,144,193, Cl. 315-4.000.
Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, to Huls Aktiengesellschaft. Catalysts for the metathesis of olefins and functionalized olefins. 5,143,885, Cl. 502-202.000
Warwick, S. John; Williams, Lonna J.; and Eisele, Robert F. Foldable protective package for storing, dispensing, and displaying diagnostic kit components. 5,143,210, Cl. 206-45.130.
Washington Mills Electro Minerals Corporation: *See—*
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Wassell, Mark: *See—*
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Watanabe, Junichi; Someji, Takahiro; Watanabe, Yoshiyuki; and Jomura, Shigeru, to Hitachi Metals, Ltd. Laminate displacement device. 5,144,528, Cl. 361-321.000.
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Watanabe, Masanori: *See—*
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Water Factory Corporation: *See—*
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Watkins, Bruce J.; and DeBerry, Blake T., to Dril-Quip, Inc. Subsea wellhead apparatus. 5,143,158, Cl. 166-344.000.

Watson, W. Gary, to Olin Corporation. Casting of metal strip 5,143,146, Cl. 164-479.000.

Watson, W. Gary: *See—*
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Watts, John D. Threaded tubular connection. 5,143,411, Cl. 285-333.000.

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Weber, Georg: *See—*
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Weber, LaVerne: *See—*
Schumacher, Glenn O.; Weber, LaVerne; Nowicki, Mitchell; Dunbar, Alan; and Douglas, Jeffrey M., 5,143,481, Cl. 405-129.000.

Weber, Robert W.: *See—*
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Weed, Gregory C.; and Monroe, Bruce M., to Du Pont de Nemours, E. I., and Company. Borate cointiator for photopolymerizable compositions. 5,143,818, Cl. 430-281.000.

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Martan, Hans; Wegerle, Ulrike; Rappel, Wilhelm; Riekert, Lothar; Becker, Dieter; and Kotter, Michael, 5,144,091, Cl. 568-479.000.

Wehrenberg, Peter K., to Imperial Chemical Industries Plc. Preparation of trisubstituted benzene intermediates. 5,144,079, Cl. 568-30.000.

Wehrmeister, Gerhard, to MAHO Aktiengesellschaft. Tool exchanger for programmed-controlled machine tools. 5,142,766, Cl. 483-15.000.

Weidman, John H., to Motorola, Inc. Bandpass filter utilizing capacitively coupled stepped impedance resonators. 5,144,268, Cl. 333-204.000.

Weigert, Charles J. Plant feeding and shield apparatus. 5,142,818, Cl. 47-25.000.

Weinberg, Aaron; Cunninghasm, Kerr; Urban, Daniel; and Mailaender, Laurence, to Stanford Telecommunications, Inc. Interference detection and characterization method and apparatus. 5,144,642, Cl. 375-10.000.

Weintraub, Philip M.; Gates, Cynthia A.; and Blohm, Thomas R., to Merrell Dow Pharmaceuticals Inc. Aminosteroids in a method for inhibiting C17-20 lyase. 5,143,909, Cl. 514-177.000.

Weisend, Norbert A., Jr.: *See—*
Adams, Lowell J.; Beard, William A., Jr.; Simshauser, Steven C.; Weisend, Norbert A., Jr.; and Wohlwender, Thomas E., 5,142,767, Cl. 29-602.100.

Weiss, Franz-Josef; and Fuchs, Hugo, to BASF Aktiengesellschaft Method of regenerating inactive and poisoned platinum catalysts. 5,143,872, Cl. 502-25.000.

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Parker, Edward I.; and Weiss, Harold, 5,144,520, Cl. 361-153.000.

Wekhof, Alex, to Ultraviolet Energy Generators, Inc. Method for destruction of toxic substances with ultraviolet radiation. 5,144,146, Cl. 250-492.100.

Welch Allyn, Inc.: *See—*
Graham, Timothy W.; and Briggs, Daniel C., 5,144,201, Cl. 313-634.000.
Thomas, Brian J.; Graham, Timothy W.; and Briggs, Daniel C., 5,144,190, Cl. 313-113.000.

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Welmer, Harm J., to U.S. Philips Corporation. Public communication system comprising distributed stations, and station and sub-station for use in such a communication system. 5,144,662, Cl. 380-10.000.

Wenz, Ute; and Beer, Ekkehard, to Hoechst Aktiengesellschaft. Self-adhesive bituminous roofing and sealing web with cover sheet. 5,143,766, Cl. 428-40.000.

Werner & Pfleiderer Corp.: *See—*
Herter, Rainer, 5,143,699, Cl. 422-163.000.

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Grimminger, Albert, 5,143,673, Cl. 264-142.000.

Wessels, Jeffrey F.: *See—*
Krueger, Daniel D.; Wessels, Jeffrey F.; and Chang, Keh-Minn, 5,143,563, Cl. 148-410.000.

Wessely, Hermann; and Fritz, Otmar, to Siemens Nixdorf Informationssystem AG. Circuit board assembly. 5,144,532, Cl. 361-385.000.

West, Floyd D., to Rite-Hite Corporation. Overlapping seal for insulated folding door. 5,143,137, Cl. 160-199.000.

West, Lamar E., Jr., to Scientific-Atlanta, Inc. Variable slope network for off-premises CATV system. 5,144,267, Cl. 333-28.00R.

Westendorf, Holger; Krause, Andreas; and Kittel, Friedrich, to Fichtel & Sachs AG. Friction clutch unit and method of producing it. 5,143,190, Cl. 192-70.270.

Westerink, Peter H.: *See—*
Knauer, Scott C.; Matthews, Kim N.; Netravali, Arun N.; Petajan, Eric D.; Safranek, Robert J.; and Westerink, Peter H., 5,144,423, Cl. 358-133.000.

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Hardage, Bob A., 5,144,591, Cl. 367-75.000.
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Western Design Corporation: *See—*
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Westinghouse Electric Corp.: *See—*
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George, Raymond A.; Hoover, Delmer Q.; Shockling, Larry A.; and Reichner, Philip, 5,143,800, Cl. 429-20.000.
Haldipur, Gaurang B.; and Dilmore, William J., 5,143,530, Cl. 55-341.100.
Richards, Von L.; and Singhal, Subhash C., 5,143,751, Cl. 427-126.300.
Roy, Bryan A.; Boris, Gregory F.; Campbell, John J.; Funk, John G.; Wozniak, David J.; Gibson, James D.; and McCauley, Robert M., 5,143,615, Cl. 210-350.000.
Sattinger, Stanley S., 5,143,790, Cl. 428-457.000.
Smith, Christopher P., 5,142,906, Cl. 73-168.000.
Speck, Robert M., 5,144,247, Cl. 324-425.000.

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Weymans, Gunter: *See—*
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Weynant nee Girones, Renee P. W., to G.I.R. Temperature monitoring device containing at least one element of an alloy which memorizes its shape. 5,143,453, Cl. 374-205.000.

Wheeler, Maurice E.: *See—*
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Wheeler, Robert L.: *See—*
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Whidden, Malcolm B., Jr. Carrier vessel especially suitable for oil spill containment. 5,143,479, Cl. 405-66.000.

Whitaker, Norman A.: *See—*
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White, John C.: *See—*
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White, John G., to Medical Research Council. Method of operating a scanning confocal imaging system. 5,144,477, Cl. 359-368.000.

Whitehurst, D. Duayne, to Mobil Oil Corporation. Method to recover organic templates from freshly synthesized molecular sieves. 5,143,879, Cl. 502-85.000.

Whiteside, Trevor D., to United States of America, Air Force. Method for tack-free positioning of aircraft components for subsequent fastening. 5,142,764, Cl. 29-559.000.

Whitman, Robert E. Roofing fastening device. 5,143,498, Cl. 411-82.000.

Widmer, Ulrich: *See—*
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Wiggins Teape Group Limited, The: *See—*
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Wignot, Leroy S., to Thomson Consumer Electronics, Inc. Mono FM radio in a television receiver. 5,144,439, Cl. 358-188.000.

Wignot, Leroy S.; and Nortrup, Kevin E., to Thomson Consumer Electronics, Inc. National weather radio reception by synthesizing only center frequency. 5,144,440, Cl. 358-188.000.

Wilde, Bryan E.; and Budinaki, Michael K., to Ohio State University, The. Method of evaluation of alloys for galvanic protection of steel. 5,143,743, Cl. 427-8.000.

Wilderman, Ronald C.; and Park, David W., to Weyerhaeuser Company. Laminated dieboard structure. 5,143,768, Cl. 428-68.000.

Wiley, David: *See—*
Rabindran, K. George; Faber, Thomas; Filicicchia, David; Guenther, Kenneth L.; Kalika, Joseph; Kerstein, Melvin T.; Shah, Girish B.; and Wiley, David, 5,143,225, Cl. 209-584.000.

Wiley, John P., to International Business Machines Corporation. Bondable via. 5,142,775, Cl. 29-852.000.

Wilford, Michael: *See—*
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Wilke, William G. Dual synthesizer including programmable counters which are controlled by means of calculated input controls 5,144,254, Cl. 328-14.000.

Wilken, Enno; and Eickhorst, Helmut, to Deutsche Airbus GmbH. Apparatus for vertical adjustment of a clamping device. 5,143,360, Cl. 269-21.000.

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Wilkins, Judd R. Golf club finger support device. 5,143,375, Cl. 273-81.00D.

Wilkinson, Thomas K.: *See—*
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Willacy, George A. Waste disposal. 5,143,550, Cl. 106-697.000.

Willemse, Gerardus W. M., to Van den Bergh Foods Co., Division of Conopco, Inc. Process for the synthesis of polyol fatty acid esters. 5,144,023, Cl. 536-124.000.

Willetts, Miles D. Laser compass. 5,142,788, Cl. 33-227.000.

William H. Kaufman Inc.: *See—*
Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, 5,142,798, Cl. 36-117.000.

Williams, Evan R.; and Zare, Richard N. Surface induced dissociation with reflectron time-of-flight mass spectrometry. 5,144,127, Cl. 250-287.000.

Williams, James E.; and Thornburgh, Scott, to Great Lakes Chemical Corp. Process for the preparation of dibromonitro-alcohols and blends with dibromonitro-alcohols. 5,144,087, Cl. 568-713.000.

Williams, John E. Non-aerosol dispenser having a manually energizable piston. 5,143,259, Cl. 222-80.000.

Williams, Lonna J.: *See—*
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Yonekawa, Hitoshi: *See—*
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Yoneyoshi, Yukio; Suzukamo, Gohfu; Konya, Naoto; and Ikeda, Takaharu, to Sumitomo Electric Company, Limited. Process for producing optically active alcohol. 5,144,039, Cl. 548-268.400
Yoneyoshi, Yukio; Suzukamo, Gohfu; Sakito, Yoji; and Nishioka, Toshio, to Sumitomo Chemical Company, Limited. Method for producing an optically active azolyl-α,β-unsaturated alcohol 5,144,071, Cl. 564-9.000.
Yonkers, E. Hubbard, to Tendler Technologies, Inc. Protected switch for emergency location system. 5,144,323, Cl. 342-386.000
Yoon, Hyun-Nam: *See—*
Haas, David; Yoon, Hyun-Nam; and Teng, Chia-Chi, 5,143,577, Cl. 156-625.000.
York, Kenneth K. In vivo osmometer. 5,143,080, Cl. 128-736.000
York, Walter A.: *See—*
Iba, Wayne S.; Holland, Gregory R.; Moore, Alix A.; and York, Walter A., 5,143,104, Cl. 134-135.000
Yoshida, Akio: *See—*
Iwaki, Takashi; Shinjo, Kenji; Yoshida, Akio; Yamashita, Masataka; Katagiri, Kazuharu; Hioki, Chieko; Togano, Takeshi; Yamada, Yoko; and Terada, Masahiro, 5,143,643, Cl 252-299.610
Yoshida, Hiroko: *See—*
Matsumoto, Masaharu; Senkawa, Mitsuhiko; Kawamura, Akihisa, Yoshida, Hiroko; and Sato, Katsuaki, 5,144,673, Cl. 381-61.000
Yoshida Kogyo K.K.: *See—*
Ishikawa, Kiichiro, 5,142,772, Cl. 29-768.000
Matsushima, Haruo, 5,142,747, Cl. 24-391.000
Yunoki, Akio, 5,142,773, Cl. 29-768.000
Yoshida, Takehiro: *See—*
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,144,329, Cl. 346-1.100
Yoshida, Toshihiko; Watanabe, Masanori; and Yamamoto, Osamu, to Sharp Kabushiki Kaisha. Laser beam oscillating apparatus. 5,144,636, Cl. 372-50.000.
Yoshida, Yasuhisa, to Hi Tachi, Ltd. Transaction inquiring method and apparatus. 5,144,115, Cl. 235-379.000
Yoshida, Yasuko: *See—*
Kawase, Mitsuo; Yoshida, Yasuko; and Yonekawa, Hitoshi, 5,143,847, Cl. 435-288.000.
Yoshida, Yoshihiro, to Kabushiki Kaisha Toshiba. Amplifier having a push-pull out-put stage. 5,144,259, Cl. 330-255.000
Yoshie, Yasunori: *See—*
Toya, Shigeo; Hiramoto, Yoshiyuki; Sasaki, Koji; Abe, Koichi; Teraoka, Tatsuo; Shiga, Hirokazu; and Yoshie, Yasunori, 5,142,763, Cl. 29-517.000.
Yoshimoto, Mitsuharu: *See—*
Ito, Yukihiro; Shigemura, Yutaka; Kondo, Takashi; Umezawa, Hideo; Yoshimoto, Mitsuharu; Yano, Satoshi; and Oura, Junichi, 5,143,503, Cl. 412-37.000.
Yoshimoto, Setsuo: *See—*
Inoue, Hideo; Yoshimoto, Setsuo; and Ikegami, Sakae, 5,143,746, Cl. 427-34.000.
Yoshimura, Shunji: *See—*
Kobayashi, Seiji; Nishida, Norio; Eguchi, Naoya; and Yoshimura, Shunji, 5,144,605, Cl. 369-44.260.
Yoshino, Koji: *See—*
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,144,054, Cl. 556-445.000
Yoshioka, Minoru: *See—*
Miyajima, Toshiaki; Kioi, Kazumasa; Matunami, Mituo; Doi, Tukasa; Yoshioka, Minoru; and Koba, Masayoshi, 5,144,395, Cl. 357-30.000.
Yoshioka, Shigeki: *See—*
Higashimata, Akira; Fujishiro, Takeshi; and Yoshioka, Shigeki, 5,143,429, Cl. 303-115.0EC
Yoshioka, Takao; Fujita, Takashi; Kanai, Tsutomu; Nakamura, Kanichi, Horikoshi, Hiroyoshi; Sasahara, Kunihiro; and Kinoshita, Takeshi, to Sankyo Company, Limited. Thiazolidine derivatives with anti-diabetic activity, their preparation and their use. 5,143,930, Cl 514-369.000
Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Yamanaka, Tsutomu; Seki, Toshio; Nakajima, Tohru; and Yaoka, Osamu, 5,143,936, Cl. 514-456.000
Yoshizawa, Kenji: *See—*
Taki, Masakazu; Yoshizawa, Kenji; and Nishimae, Junichi, 5,144,199, Cl. 313-484.000

Yoshizawa, Shuji; and Ikezue, Tatsuya, to Kabushiki Kaisha Toshiba. Electrophotographic photoreceptor with superlattic barrier layer. 5,143,807, Cl. 430-65.000.
Yoshizumi, Keiichi; and Kubo, Keishi, to Matsushita Electric Industrial Co., Ltd. Configuration measuring apparatus. 5,144,150, Cl. 250-561.000.
Youcef-Toumi, Kamal, to Massachusetts Institute of Technology. Time delay controlled processes. 5,144,549, Cl. 364-148.000.
Young, Douglas L. G.; and Johnson, Donald B., to Ingersoll-Rand Company. Apparatus for screening to remove knots from a fluid borne slurry of fibers and knots. 5,14 ,220, Cl. 209-17.000.
Young, Harvey J.: *See*—
Stephen Sohn, Edward J.; Young, Harvey J.; and Bernasek, Edward, 5,143,097, Cl. 131-356.000.
Young, John C. O'C.; and Murray, Christopher B., to Energy, Mines & Resources - Canada. Hydraulic drag reducing agents for low temperature applications. 5,143,635, Cl. 252-14.000.
Young, Joseph L.: *See*—
Reid, William W.; and Young, Joseph L., 5,143,543, Cl. 75-744.000.
Young, Steven C.; Nielsen, Bradley A.; and Miller, Matthew T., to Ford New Holland, Inc. Draft control system with dual mode draft sensitivity. 5,143,159, Cl. 172-8.000.
Young, Wise; and Sakatani, Kaoru, to New York University. Randomized double pulse stimulus and paired event analysis. 5,143,081, Cl. 128-741.000.
Yunsa, Toshiya; Arahara, Kohzoh; and Kai, Takashi, to Canon Kabushiki Kaisha. Recording material. 5,143,546, Cl. 106-20.000.
Yuhara, Akitsuna; Sasaki, Jun; Isomae, Hiromi; Kawakubo, Shozi; and Yamada, Jun, to Hitachi, Ltd. SAW device. 5,144,185, Cl. 310-313.00B
Yumiba, Takashi; Yamashita, Haruo; Honishi, Shinichi; and Namoto, Yoshiteru, to Matsushita Electric Industrial Co., Ltd. MTF compensation apparatus. 5,144,686, Cl. 382-51.000.
Yunoki, Akio, to Yoshida Kogyo K.K. Slider holding apparatus. 5,142,773, Cl. 29-768.000.
Yurecko, John M., Jr.: *See*—
Christenson, Philip A.; Riker, Paul J.; Anderson, Denise A.; and Yurecko, John M., Jr., 5,144,048, Cl. 549-435.000.
Zadorecki, Pawel: *See*—
Flodin, Per; and Zadorecki, Pawel, 5,143,791, Cl. 428-481.000.
Zahler, Robert; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. [3S(Z)]-3-[[(2-amino-4-thiazolyl)[[2-(hydroxyamino)-2-oxoethoxy]imino]acetyl]amino]-2,2-dimethyl-4-oxo-1-azetidinyl sulfate. 5,143,913, Cl. 514-210.000.
Zaia, John A.: *See*—
Rossi, John J.; Cantin, Edouard M.; Zaia, John A.; and Chang, Pairoj, 5,144,019, Cl. 536-27.000
Zambon Group S.p.A.: *See*—
Tentorio, Dario, 5,144,025, Cl. 540-491.000.
Zander, Richard A., to Allied-Signal Inc. Master cylinder piston retainer. 5,142,965, Cl. 92-76.000.
Zane, Gino. Apparatus and process for farming shrimp. 5,143,019, Cl. 119-2.000
Zare, Richard N.: *See*—
Pentoney, Stephen L., Jr.; and Zare, Richard N., 5,143,850, Cl. 436-57.000.
Williams, Evan R.; and Zare, Richard N., 5,144,127, Cl. 250-287.000.
Zavodsky, James: *See*—
Petrielis, Paul F.; Wilford, Michael; and Zavodsky, James, 5,143,278, Cl. 229-23.00R.
Zebco Corporation: *See*—
Tipton, Steven M.; and Roberts, Dennis E., 5,143,318, Cl. 242-241.000
Zeevi, Yehoshua: *See*—
Ginosar, Ran; Hilsenrath, Oliver; and Zeevi, Yehoshua, 5,144,442, Cl. 358-209.000.
Zeilenga, Jack H.; and Hoenninger, John, III, to Univeristy of California, The Regents of the. Continually loadable microcode store for MRI control sequencers. 5,144,242, Cl. 324-312.000.
Zelina, Francis J.: *See*—
Shostek, Edward M.; and Zelina, Francis J., 5,143,208, Cl. 200-187.000.
Zeller Closures, Inc.: *See*—
Lohrman, Richard D.; and Thanisch, Klaus, 5,143,234, Cl. 215-235.000.
Zenith Electronics Corporation: *See*—
Citta, Richard W.; and Lee, Ronald B., 5,144,431, Cl. 358-141.000.
Zhang, Chaoyin. Universal abrader. 5,142,826, Cl. 51-170.00R.
Zhang, Xueshan; and Zhou, Lin. Apparatus for diagnosing and providing therapy for gastrointestinal diseases without causing patient discomfort and injury. 5,144,554, Cl. 364-413.020.
Zhou, Lin: *See*—
Zhang, Xueshan; and Zhou, Lin, 5,144,554, Cl. 364-413.020.
Zhuang, Jiachen: *See*—
Burdea, Grigore C.; and Zhuang, Jiachen, 5,143,505, Cl. 414-5.000.
Zicker, Robert G.; Cao, Thanh H.; Borkowski, Daniel G.; Plouff, Donald A.; and Brown, Phillip D., Jr., to GTE Mobile Communications Service Corporation. Cellular radiotelephone credit card paystation method. 5,144,649, Cl. 379-59.000.
Ziegenberg, Alfred; and Schiessle, Edmund, to Mercedes-Benz AG. Loudspeaker diaphragm provided with a rear load. 5,143,169, Cl. 181-144.000.
Ziemek, Gerhard B.; Peshkov, Izyaslav G.; Svalov, Grigorij; Sytnikov, Victor E.; and Mitrochin, Valerij A., to Kabelmetal Electro GmbH. Flexible, high temperature superconductive cables. 5,143,897, Cl. 505-1.000.
Zieve, Peter B.; and Smith, Samuel O., to Electroimpact, Inc. Electromagnetic repulsion system for removing contaminants such as ice from the surfaces of aircraft and other objects. 5,143,325, Cl. 244-134.00D.
Zink, Martin R.: *See*—
Allen, George S.; Galloway, Robert L., Jr.; Maciunas, Robert J.; Edwards, Charles A., II; and Zink, Martin R., 5,142,930, Cl. 74-469.000.
Zink, Rudolf, to Ciba-Geigy Corporation. Chromogenic phthalides. 5,143,892, Cl. 503-220.000.
Zoeller, Joseph R.; Cushman, Michael R.; Moncier, Regina M.; and Tennant, Brent A., to Eastman Kodak Company. Process for the coproduction of alkyl iodides and alpha-iodocarboxylic acids and/or anhydrides thereof. 5,144,067, Cl. 562-479.000.
Zoeller, Joseph R.; Cushman, Michael R.; and Moncier, Regina M., to Eastman Kodak Company. Process for the preparation of α-iodocarbonyl compounds. 5,144,070, Cl. 562-887.000.
Zoeller, Joseph R.: *See*—
Blount, William W., Jr.; and Zoeller, Joseph R., 5,144,003, Cl. 528-272.000.
Zollinger, Terry L.: *See*—
Hales, Scott J.; and Zollinger, Terry L., 5,142,800, Cl. 37-220.000.
Zomeworks Corporation: *See*—
Baer, Stephen C., 5,143,053, Cl. 126-446.000.
Zona, Mauro: *See*—
Raho, Guglielmo; and Zona, Mauro, 5,142,790, Cl. 33-503.000.
Zuckerbrod, David: *See*—
Anderman, Menahem; Johnson, Steven L.; Saft, Michael C.; and Zuckerbrod, David, 5,143,805, Cl. 429-217.000.
Zuliani, Douglas J.; and Closset, Bernard, to Timminco Limited. Magnesium-calcium alloys for debismuthizing lead. 5,143,693, Cl. 420-402.000.
Zuniga, Miguel R.: *See*—
Uhlmann, Jeffrey K.; and Zuniga, Miguel R., 5,144,316, Cl. 342-189.000.
Zushi, Shizuo: *See*—
Go, Hiroshi; Zushi, Shizuo; and Miyamoto, Mitsuo, 5,144,531, Cl. 361-382.000.
Zushi, Takayasu, to Takata Corporation. Cover for accommodating an air bag. 5,143,401, Cl. 280-731.000.
Zvan, Garry R.: *See*—
Barth, Jerry J.; and Zvan, Garry R., 5,143,744, Cl. 427-8.000.
Zwart, Jerry J. Screen molding. 5,143,138, Cl. 160-395.000.
3D Systems, Inc.: *See*—
Leyden, Richard N.; Almouist, Thomas A.; Lewis, Mark A.; and Nguyen, Hop D., 5,143,663, Cl. 264-22.000

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Hoist and Derrick Company: *See*—
Shahan, James B., Re. 34,046, Cl. 59-35.100
Bolin, James A., to I.M.T.E.C. Enterprises, Inc. Cooling system for a glassware forming machine. Re. 34,048, Cl. 65-265.000.
CKD Corporation: *See*—
Taki, Teluomi; and Toyoda, Shigehiro, Re. 34,049, Cl. 92-88.000.
Cremer, Heinz P.: *See*—
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., Re. 34,051, Cl. 297-468.000.
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., to Keiper Recaro GmbH & Co. Vehicle seat with a safety belt system Re. 34,051, Cl. 297-468.000
Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., to Standex International Corporation. Refrigeration system. Re. 34,047, Cl. 62-237.000
Everpure, Inc.: *See*—
Thomsen, Jack W.; and Tadlock, John W., Re. 34,050, Cl. 210-232.000
Hester, Phillip D.; and Johnson, William M., to International Business Machines Corporation. Data processing system with CPU register to register data transfers overlapped with data transfer to and from main storage. Re. 34,052, Cl. 395-375.000.
I.M.T.E.C. Enterprises, Inc.: *See*—
Bolin, James A., Re. 34,048, Cl. 65-265.000.
International Business Machines Corporation: *See*—
Hester, Phillip D.; and Johnson, William M., Re. 34,052, Cl 395-375.000
Jack Kennedy Metal Products and Buildings, Inc.: *See*—
Kennedy, William R.; and Kennedy, John M., Re. 34,053, Cl. 405-132.000
Johnson, William M.: *See*—
Hester, Phillip D.; and Johnson, William M., Re. 34,052, Cl. 395-375.000
Keiper Recaro GmbH & Co.: *See*—
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., Re. 34,051, Cl. 297-468.000
Kennedy, John M.: *See*—
Kennedy, William R.; and Kennedy, John M., Re. 34,053, Cl. 405-132.000
Kennedy, William R.; and Kennedy, John M., to Jack Kennedy Metal Products and Buildings, Inc. Mine door system. Re. 34,053, Cl. 405-132.000
McDonald, Tracy L.: *See*—
Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., Re. 34,047, Cl. 62-237.000.
Shahan, James B., to American Hoist and Derrick Company. Heavy duty shackle. Re. 34,046, Cl. 59-35.100.
Standex International Corporation: *See*—
Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., Re. 34,047, Cl. 62-237.000.
Tadlock, John W.: *See*—
Thomsen, Jack W.; and Tadlock, John W., Re. 34,050, Cl. 210-232.000
Taki, Teluomi; and Toyoda, Shigehiro, to CKD Corporation. Rod-less cylinder. Re. 34,049, Cl. 92-88.000.
Thomsen, Jack W.; and Tadlock, John W., to Everpure, Inc. Filtering system. Re. 34,050, Cl. 210-232.000.
Toyoda, Shigehiro: *See*—
Taki, Teluomi; and Toyoda, Shigehiro, Re. 34,049, Cl. 92-88.000
Westbrooks, John W.: *See*—
Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., Re. 34,047, Cl. 62-237.000.
Wolsiefer, Harald: *See*—
Deegener, Elmar; Wolsiefer, Harald; and Cremer, Heinz P., Re. 34,051, Cl. 297-468.000

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

American Permahedge, Inc.: *See*—
Paradise, Francis M.; and Paradise, James R., B1 4,872,647, Cl. 256-1.000
Brooktree Corporation: *See*—
Colles, Joseph H., B1 4,904,922, Cl. 323-316.000
Colles, Joseph H., to Brooktree Corporation. Apparatus for converting between digital and analog values. B1 4,904,922, 9-1-92, Cl. 323-316.000
Paradise, Francis M.; and Paradise, James R., to American Permahedge, Inc. Decorative attachment for a chain link fence. B1 4,872,647, 9-1-92, Cl. 256-1.000.
Paradise, James R.: *See*—
Paradise, Francis M.; and Paradise, James R., B1 4,872,647, Cl. 256-1.000

LIST OF DESIGN PATENTEES

AB Ph. Nederman & Co.: *See*—
Jonasson, Alf I. S.; and Hedlund, Per N., 329,081, Cl. D23-209.000
Academic Products, Inc.: *See*—
Stoyanoff, Louis J., 329,015, Cl. D9-306.000.
Ahlstrom, Tom; and Ehrich, Hans, to Turn-O-Matic AB. Vertically-mountable ticket dispenser. 329,060, 9-1-92, Cl. D19-69.000.
Allied Plastics, Inc.: *See*—
Mankey, Neal N., 328,973, Cl. D3-40.000.
Aoyama, Minoru: *See*—
Mizukami, Atsushi; Aoyama, Minoru; Sakurai, Mitsuru; and Takahashi, Ryoichi, 329,056, Cl. D18-39.000.
Arjo Hospital Equipment AB: *See*—
Silbersky, Jonnie; and Sonesson, Leif B., 329,112, Cl. D34-28.000
Arredondo, Arnulfo. Pocket insert for tools. 328,975, 9-1-92, Cl. D3-105.000
Asics Corporation: *See*—
Kayano, Toshikazu, 328,969, Cl. D2-320.000.
Aveni, Michael A., to Nike, Inc. Lace panel for a shoe. 328,966, 9-1-92, Cl. D2-314.000
Bahm, Inc.: *See*—
Bauerle, William L., 329,053, Cl. D15-199.000
Bauerle, William L., to Bahm, Inc. Injector rack. 329,053, 9-1-92, Cl. D15-199.000
Baxter International Inc.: *See*—
Goodale, Keith, 329,017, Cl. D9-415.000
Benavides, David. Box for washing dogs. 329,106, 9-1-92, Cl. D30-108.000

Benetton Group S.p.A.: *See—*
Scarpa, Afra B.; and Scarpa, Tobi , 329,016, Cl. D9-346.000.
Benner, Mark A. Vehicle exterior rear iew mirror. 329,037, 9-1-92, Cl. D12-187.000
Blackburn Designs, Inc.: *See—*
Blackburn, James R.; and Lee, I randon A., 329,035, Cl. D12-158.000
Blackburn, James R.; and Lee, Brandon A., to Blackburn Designs, Inc Vehicle attached bicycle carrier. 329,035, 9-1-92, Cl. D12-158.000
Block, Wolfgang, to Tente-Rollen GmbH & Co. Caster wheel. 329,011, 9-1-92, Cl. D8-375.000
Boyd, Timothy J. I. Horse bandage. 329,108, 9-1-92, Cl. D30-146.000.
Bridgestone/Firestone, Inc.: *See—*
Lassan, Timothy J., 329,031, Cl. D12-146.000.
Brinkmann Corporation, The: *See—*
Hall, Milly S.; Rohrs, Donald L.; and Hung, Kung C., 329,099, Cl D26-67.000
Hall, Milly S.; Rohrs, Donald L.; and Hung, Kung C., 329,100, Cl D26-67.000
Broadway Industries, Inc.: *See—*
Marques, A. Ludgero, 329,008, Cl D8-308.000
Marques, A. Ludgero, 329,009, Cl D8-308.000.
Brown, Dennis N., to Northwest Podiatric Laboratory, Inc. Shoe insert. 328,967, 9-1-92, Cl. D2-318.000.
Bryan, Neill E.: *See—*
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 329,089 Cl. D23-382.000.
Buchacz, Jurek. Chair. 328,980, 9-1-92, Cl. D6-366.000.
Bulgari, Paolo, to Bulgari Time (Switzerland) S.A. Watch. 329,022, 9-1-92, Cl. D10-39.000
Bulgari Time (Switzerland) S.A.: *See—*
Bulgari, Paolo, 329,022, Cl. D10-39.000.
Burkhalter, Peter, to I.H.O. Peter Burkhalter International Handelorganisation. Float. 329,077, 9-1-92, Cl D21-237.000.
Canon Kabushiki Kaisha: *See—*
Inukai, Yoshinori, 329,047, Cl. D14-118.000.
Mizukami, Atsushi; Aoyama, Minoru; Sakurai, Mitsuru; and Takahashi, Ryoichi, 329,056, Cl D18-39.000.
Suzuki, Noriyuki, 329,057, Cl. D14-49.000.
Tanaka, Noboru; Hirohata, Michio; and Toyoda, Yasuhiro, 329,054, Cl. D16-200.000
Yoshihara, Tsutomu, 329,048, Cl. D14-118.000.
Carusillo, Steven J.; Eager, Kris D.; and Grulke, David H., to Stryker Corporation. Handpiece housing for a surgical drill, reamer, sagittal saw, or the like. 329,092, 9-1-92, Cl D24-146.000.
Century Products Company: *See—*
Myers, Peter, 329,030, Cl. D12-133.000
Ceramaspeed Limited: *See—*
McWilliams, Kevin R., 329,091, Cl. D23-419.000
Chabala, Leonard V.: *See—*
Rogers, Edward J.; and Chabala Leonard V., 329,043, Cl. D13-155.000
Chapman II, Gregory J. Wheel chair shopping basket. 329,029, 9-1-92, Cl. D12-133.000
Charet, Pierre; and Gonzalez, Govelio R. Windshield wiper. 329,034, 9-1-92, Cl. D12-155.000.
Chen, Evan N., to Warner-Lambert Company. Flexible razor cartridge. 329,105, 9-1-92, Cl. D28-47.000
Chia, Cheo: *See—*
Chia, Meang; and Chia, Cheo, 329,026, Cl. D11-12.000
Chia, Meang; and Chia, Cheo. Ornamental bracelet. 329,026, 9-1-92, Cl. D11-12.000
Chih, Draco, to Taiwan Shining Yourng Trading Co., Ltd. Toy vehicle. 329,071, 9-1-92, Cl. D21-128.000
Chin, Free, to World Book, Inc. Housing for an electronic learning aid or game. 329,062, 9-1-92, Cl. D21-113.000.
Coca-Cola Company, The: *See—*
Olds, Sandra H.; and Wade, Clifford R., 329,019, Cl. D9-551.000.
CONNEX Datasysteme und Beratungsgesellschaft mbH: *See—*
Kurth, Egon; and Eyssen, Wolfgang, 329,044, Cl. D14-100.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., to Vornado Air Circulation Systems, Inc. Fan 329,089, 9-1-92, Cl. D23-382.000
Courchesne, Germain. Ventilator. 329,086, 9-1-92, Cl. D23-371.000.
Covert, Darrell E.: *See—*
Maxwell, Paul B.; and Covert, Darrell E., 329,032, Cl. D12-147.000
Creative Bath Products, Inc.: *See—*
Hollinger, Fred, 328,992, Cl. D6-518.000
Crerar, Roy A.; Nelson, Martin L.; and Manley, Joseph C., to Shandon Scientific Limited. Slide holder for an immunostaining workstation. 329,095, 9-1-92, Cl. D24-225.000
Curtis Products Inc.: *See—*
Marini, Conrad, 328,984, Cl. D6-373.000
Dannenberg, Todd D., to Kohler Co. Faucet. 329,083, 9-1-92, Cl. D23-238.000
Dannenberg, Todd D., to Kohler Co. Bathtub or the like. 329,084, 9-1-92, Cl. D23-281.000.
Dekker, Thomas M.; Lathers, Michael W.; and Wenstadt, Thomas D., to Outboard Marine Corp. Power boat. 329,038, 9-1-92, Cl. D12-314.000
De Santi, Richard. Worm baiter. 329,080, 9-1-92, Cl. D22-149.000.
Dieperink, Menno, to U.S. Philips Corporation. Luminaire. 329,102, 9-1-92, Cl. D26-77.000.
Dieperink, Menno, to U.S. Philips Corporation. Luminaire. 329,104, 9-1-92, Cl. D26-87.000
Draft, Beverly L. Horse looper. 329,109, 9-1-92, Cl. D30-158.000.
Eager, Kris D.: *See—*
Carusillo, Steven J.; Eager, Kris D.; and Grulke, David H., 329,092, Cl. D24-146.000
Ediger, Glen W.: *See—*
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 329,089, Cl. D23-382.000.
Ehrich, Hans: *See—*
Ahlstrom, Tom; and Ehrich, Hans, 329,060, Cl. D19-69.000
Encon Industries, Inc.: *See—*
Markwardt, Michael A., 329,087, Cl. D23-377.000.
Ewing, Hugh J. Heel pad. 328,965, 9-1-92, Cl. D2-277.000.
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Urquidi, Viterbo; and Urquidi, Felipe P. Trash recepticle. 329,111, 9-1-92, Cl. D34-7.000.
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Vogelzang, Steven J. Exhaust collar for a wood burning unit. 329,090, 9-1-92, Cl. D23-392.000
Vornado Air Circulation Systems, Inc.: *See—*
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Nee, Yong L.; and Young, R. Derrell, 329,076, Cl. D21-205.000
Yuen, John S., to John Manufacturing Limited. Portable fan. 329,088, 9-1-92, Cl. D23-377.000
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Marshall, Barry J.; Hewson, Bruce; and St. Pierre, Louise, 329,093, Cl. D24-214.000
501 G. Rosenthal Import Ltd.: *See—*
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Drewlow, Lyndon W., to Mikkelsens, Inc. Streptocarpus plant named Thalia. 7,958, 9-1-92, Cl. 87.130.

Goldsmith Seeds, Inc.: *See*—
Hanes, Mitchell, 7,959, Cl. 87.120.
Hanes, Mitchell, 7,960, Cl. 87.120.

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Millon, Beth L.: *See*—
Millon, David P.; and Millon, Beth L., 7,961, Cl. 88.600.

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LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

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Blue, Mark D. Yarn bobbin. H1100, 9-1-92, Cl. 242-118.300.

Bunch, Phillip C.: *See*—
Jebo, Richard J.; Twombly, Paul W.; Dickerson, Robert E.; and Bunch, Phillip C., H1105, Cl. 430-502.000.

Cavanagh, Richard A., to United States of America, Navy. Air cushion vehicle conductive/semiconductive flexible skirt, and method. H1104, 9-1-92, Cl. 428-256.000.

Decor, Jean-Pierre; and Holm, Robert E., to Rhone-Poulenc Secteur Agrochimie. Post emergence herbicidal compositions and methods for using same. H1103, 9-1-92, Cl. 71-94.000.

Dickerson, Robert E.: *See*—
Jebo, Richard J.; Twombly, Paul W.; Dickerson, Robert E.; and Bunch, Phillip C., H1105, Cl. 430-502.000.

Eastman Kodak Company: *See*—
Jebo, Richard J.; Twombly, Paul W.; Dickerson, Robert E.; and Bunch, Phillip C., H1105, Cl. 430-502.000.

Hallum, Charles E. Integrated valve assembly. H1098, 9-1-92, Cl. 60-229.000.

Holm, Robert E.: *See*—
Decor, Jean-Pierre; and Holm, Robert E., H1103, Cl. 71-94.000.

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Kagawa, Nobuaki: *See*—
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, H1106, Cl. 430-537.000.

McClellan, Gordon R., to United States of America, Navy. Fluidic laser calorimeter. H1102, 9-1-92, Cl. 374-32.000.

Nishizeki, Masato: *See*—
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, H1106, Cl. 430-537.000.

Rhone-Poulenc Secteur Agrochimie: *See*—
Decor, Jean-Pierre; and Holm, Robert E., H1103, Cl. 71-94.000.

Sayler, William M., to United States of America, Army. Liquid-drop generator. H1099, 9-1-92, Cl. 222-420.000.

Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki. Multilayer silver halide photographic element. H1106, 9-1-92, Cl. 430-537.000.

Twombly, Paul W.: *See*—
Jebo, Richard J.; Twombly, Paul W.; Dickerson, Robert E.; and Bunch, Phillip C., H1105, Cl. 430-502.000.

United States of America
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Navy: *See*—
Cavanagh, Richard A., H1104, Cl. 428-256.000
McClellan, Gordon R., H1102, Cl. 374-32.000
Waclawik, Ronald E., H1101, Cl. 285-49.000.
Wehner, Donald R., H1107, Cl. 342-13.000.

Waclawik, Ronald E., to United States of America, Navy. Structural vibration and shock isolation in a high pressure environment. H1101, 9-1-92, Cl. 285-49.000.

Wehner, Donald R., to United States of America, Navy. Low probability of intercept radar using atmospheric loss. H1107, 9-1-92, Cl. 342-13.000

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 1, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

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311 5,143,160

CLASS 173

19 5,143,161

CLASS 174

36 5,144,098
66 5,144,099
135 5,144,100

CLASS 175

100 5,143,162
385 5,143,163

CLASS 177

50 5,143,164
59 5,143,165
128 5,143,166

CLASS 180

248 5,143,167
374 5,143,168

CLASS 181

144 5,143,169

CLASS 182

3 5,143,170
5,143,171
100 5,143,172
119 5,143,173
151 5,143,174
181 5,143,175
187 5,143,176
5,143,177

CLASS 184

106 5,143,178

CLASS 187

8.41 5,143,179
9 E 5,143,180
10 5,143,181
11 5,143,182
103 5,144,101

CLASS 188

158 5,143,183
218 XL 5,143,184
299 5,143,185
5,143,186
376 5,143,187

CLASS 190

111 5,143,188

CLASS 192

64 5,143,189
70.27 5,143,190
76 5,143,191
107 M 5,143,192

CLASS 194

212 5,143,193

CLASS 198

301 5,143,194
345.3 5,143,195
5,143,196
409 5,143,197
414 5,143,198
418 1 5,143,199
453 5,143,200
502 3 5,143,201
670 5,143,202
708 5,143,203
726 5,143,204
779 5,143,205
810 5,143,206
814 5,143,207

CLASS 200

83 Q 5,144,102
187 5,143,208
344 5,144,103
512 5,144,104

CLASS 203

2 5,143,585

CLASS 204

129 43 5,143,586
129 85 5,143,587
155 5,143,588
157 92 5,143,589
298 12 5,143,590

CLASS 205

50 5,143,591
210 5,143,592
291 5,143,593

CLASS 206

45 130 5,143,210
45 16 5,143,209
221 5,143,211
223 5,143,212
273 5,143,213
287 5,143,214
333 5,143,215
338 5,143,216
387 5,143,217
467 5,143,218
508 5,143,219

CLASS 208

48 AA 5,143,594
58 5,143,595
89 5,143,596
131 5,143,597
390 5,143,598

CLASS 209

17 5,143,220
166 5,143,599
169 5,143,600
215 5,143,221
364 5,143,222
405 5,143,223
579 5,143,224
584 5,143,225
624 5,143,226

CLASS 210

90 5,143,601
97 5,143,602
122 5,143,603
168 5,143,604
169 5,143,605
170 5,143,606
5,143,607
171 5,143,608
185 5,143,609
232 Re.34,050
5,143,610
256 5,143,611
321.61 5,143,614
321.8 5,143,612
5,143,613
350 5,143,615
500.38 5,143,616
502.1 5,143,617
615 5,143,618
624 5,143,619
640 5,143,620
690 5,143,621
700 5,143,622
705 5,143,623
712 5,143,624
713 5,143,625
748 5,143,626
767 5,143,627
770 5,143,628
776 5,143,629
780 5,143,630
791 5,143,631

CLASS 211

64 5,143,227
70.6 5,143,228
71 5,143,229
5,143,230
96 5,143,231

CLASS 212

154 5,143,232
188 5,143,233

CLASS 215

235 5,143,234
256 5,143,235
311 5,143,236
330 5,143,237

CLASS 219

10.55 D 5,144,105
10.55 E 5,144,106
5,144,107
10.71 5,144,108
121 48 5,144,110
121 85 5,144,109
265 5,144,111
386 5,144,112
549 5,144,113

CLASS 220

3.2 5,143,238
254 5,143,239
260 5,143,240
270 5,143,241
404 5,143,242
409 5,143,243
445 5,143,244
5,143,245
524 5,143,246
630 5,143,247
711 5,143,248

CLASS 221

34 5,143,249
59 5,143,250
152 5,143,251
185 5,143,252
197 5,143,253

CLASS 222

1 5,143,254
5,143,255
3 5,143,256
57 5,143,257
73 5,143,258
80 5,143,259
95 5,143,260
129 5,143,261
5,143,262
538 5,143,263
567 5,143,264

CLASS 224

42.42 5,143,265
150 5,143,266
321 5,143,267

CLASS 225

2 5,143,268

CLASS 227

177 5,143,269

CLASS 228

4.1 5,143,270
6 1 5,143,271
20 5,143,272
56 3 5,143,273
102 5,143,274
119 5,143,275
157 5,143,276
179 5,143,277

CLASS 229

23 R 5,143,278
68 R 5,143,279
117.23 5,143,280
132 5,143,281
160.1 5,143,282
199 5,143,283

CLASS 232

21 5,143,284
39 5,143,285

CLASS 235

375 5,144,114
379 5,144,115
444 5,144,116
455 5,144,117
462 5,144,118
472 5,144,119
5,144,120
5,144,121

CLASS 236

42 5,143,286
493 5,143,287

CLASS 239

1 5,143,288
7 5,143,289
70 5,143,290
88 5,143,291
127.3 5,143,292
222.17 5,143,293
328 5,143,294
403 5,143,295
415 5,143,296
427 5,143,297
494 5,143,298
526 5,143,299
562 5,143,300
585 4 5,143,301
599 5,143,302

CLASS 241

5 5,143,303
19 5,143,304
24 5,143,305
46 012 5,143,306
60 5,143,307
76 5,143,308
101 7 5,143,309
101 8 5,143,310
280 5,143,311

CLASS 242

7 020 5,143,312
18.1 5,143,313
67.10 R 5,143,314
83 5,143,315
129.5 5,143,316
199 5,143,317
241 5,143,318

CLASS 244

3.12 5,143,319
3 21 5,143,320
96 5,143,322
116 5,143,323
129 6 5,143,324
134 D 5,143,325
137 4 5,143,326
158 R 5,143,327
5,143,328
209 5,143,329
234 5,143,330
536 5,143,321

CLASS 248

27.1 5,143,331
95 5,143,332
123.1 5,143,333
184 5,143,334
215 5,143,335
265 5,143,336
311.2 5,143,337
313 5,143,338
343 5,143,339
354 2 5,143,340
444 5,143,341
476 5,143,342
551 5,143,343

CLASS 249

120 5,143,344

CLASS 250

201 2 5,144,122
202 5,144,130
5,144,131
208 1 5,144,132
5,144,133
213 VT 5,144,123
223 B 5,144,124
227.15 5,144,125
254 5,144,126
287 5,144,127
306 5,144,128
307 5,144,129
5,144,134
327 2 5,144,135
328 5,144,136
332 5,144,138
341 5,144,139
358.1 5,144,140
369 5,144,141
396 R 5,144,142
426 5,144,143
455 11 5,144,144
484 1 5,144,145
492.1 5,144,146
492 2 5,144,147
492.3 5,144,148
493 1 5,144,149
561 5,144,150
571 5,144,151

CLASS 251

129.02 5,143,345
149.5 5,143,346
149 6 5,143,347
158 5,143,348
314 5,143,349
326 5,143,350
337 5,143,351

CLASS 252

8.554 5,143,632
18 5,143,633
33 5,143,634
34 5,143,635
52 A 5,143,640
62 52 5,143,637
62 59 5,143,638
62 9 5,143,636
162 5,143,639
186 38 5,143,641
299.61 5,143,642
5,143,643
299 62 5,143,644
313 1 5,143,645
315 3 5,143,646
373 5,143,647
403 5,143,648
511 5,143,649
5,143,650
518 5,143,651
602 5,143,652
628 5,143,653
629 5,143,654

CLASS 254

131 5,143,352
134 3 FT 5,143,353

CLASS 256

1 B1 4,872,647
12 5,143,354

CLASS 261

24 5,143,655
26 5,143,656
89 5,143,657
112.2 5,143,658

CLASS 264

1.1 5,143,659
1.4 5,143,660
4.3 5,143,661
8 5,143,662
22 5,143,663
26 5,143,666
46 6 5,143,667
63 5,143,668
103 5,143,669
113 5,143,664
5,143,670
117 5,143,671
132 5,143,672
142 5,143,673
145 5,143,674
171 5,143,675
5,143,676
173 5,143,677
221 5,143,665
255 5,143,678
288 8 5,143,679
511 5,143,680
515 5,143,681

CLASS 266

160 5,143,355
179 5,143,356
216 5,143,682
235 5,143,357
246 5,143,683
274 5,143,684

CLASS 267

140.13 5,143,358

CLASS 269

6 5,143,359
21 5,143,360
32 5,143,361

CLASS 270

1.1 5,143,362

CLASS 271

6 5,143,363
108 5,143,364
121 5,143,365
122 5,143,366
196 5,143,367
202 5,143,368
303 5,143,369

CLASS 273

26 B 5,143,370
32 B 5,143,371
55 R 5,143,372
73 R 5,143,373
80 B 5,143,374
81 D 5,143,375
186.2 5,143,376
232 5,143,377
243 5,143,378
422 5,143,380
435 5,143,379

CLASS 277

1 5,143,381
29 5,143,382
5,143,383
96 1 5,143,384
134 5,143,385

CLASS 279

110 5,143,686
123 5,143,687

CLASS 280

6.1 5,143,386
11.2 5,143,387
11.28 5,143,388
47.26 5,143,389

201 5,143,390
250.1 5,143,391
[illegible] 5,143,392
491.1 5,143,393
602 5,143,394
5,143,395
607 5,143,396
633 5,143,397
642 5,143,398
646 5,143,399
661 5,143,400
731 5,143,401
775 5,143,402
[illegible] 5,143,403

CLASS 281

21.1 5,143,404
31 5,143,405

CLASS 285

23 5,143,406
55 5,143,407
93 5,143,408
116 5,143,409
197 5,143,410
333 5,143,411

CLASS 292

200 5,143,412
302 5,143,413

CLASS 294

99.2 5,143,414

CLASS 296

3 5,143,415
29 5,143,416
176 5,143,417
182 5,143,418

CLASS 297

183 5,143,419
250 5,143,420
338 5,143,421
411 5,143,422
468 Re.34,051

CLASS 299

76 5,143,423

CLASS 300

2 5,143,424
5,143,425

CLASS 301

37 P 5,143,426
111 5,143,427

CLASS 303

113 AP 5,143,428
115 EC 5,143,429

CLASS 307

11 5,144,152
66 5,144,153
242 5,144,154
254 5,144,155
262 5,144,156
270 5,144,157
272.1 5,144,158
272.3 5,144,159
353 5,144,160
443 5,144,161
5,144,162
[illegible] 5,144,163
5,144,164
451 5,144,165
465 1 5,144,166
475 5,144,167
5,144,168
490 5,144,169
528 5,144,170
530 5,144,171
570 5,144,172
603 5,144,173
[illegible] 5,144,174

CLASS 310

63 5,144,175
81 5,144,176
86 5,144,177
114 5,144,178
178 5,144,179
212 5,144,180
217 5,144,182
254 5,144,181
268 5,144,183
312 5,144,184
313 B 5,144,185
326 5,144,186
328 5,144,187

CLASS 312

259 5,143,431
291 5,143,430
319.1 5,143,432

CLASS 313

11.5 5,144,188
51 5,144,189
113 5,144,190
308 5,144,191
318 5,144,192
422 5,144,197
5,144,198
484 5,144,199
584 5,144,200
634 5,144,201

CLASS 315

[illegible] 5,144,193
[illegible] 5,144,195
005 5,144,194
111.41 5,144,196
151 5,144,202
169.3 5,144,203
209 R 5,144,204
244 5,144,205
248 5,144,206
291 5,144,207

CLASS 318

118 5,144,208
254 5,144,209
[illegible] 5,144,210
568 11 5,144,211
569 5,144,212
5,144,213
[illegible] 5,144,214
701 5,144,215
[illegible] 5,144,216

CLASS 320

[illegible] 5,144,217
44 5,144,218

CLASS 322

25 5,144,219
28 5,144,220

CLASS 323

271 5,144,222
313 5,144,223
316 B1 4,904,922

CLASS 324

71.4 5,144,224
73.1 5,144,225
132 5,144,226
149 5,144,227
158 P 5,144,228
158 R 5,144,229
5,144,230
166 5,144,231
177 5,144,232
207 25 5,144,233
235 5,144,234
309 5,144,235
5,144,236
5,144,237
312 5,144,242
316 5,144,238
318 5,143,688
5,144,239
5,144,240
5,144,241
322 5,144,243
338 5,144,244
405 5,144,245
425 5,144,246
428 5,144,247
439 5,144,248
533 5,144,249
661 5,144,250
713 5,144,251
715 5,144,252
5,144,253

CLASS 328

14 5,144,254
62 5,144,255

CLASS 329

302 5,144,256

CLASS 330

54 5,144,257
129 5,144,258
255 5,144,259

CLASS 331

10 5,144,260
66 5,144,261
107 A 5,144,262
109 5,144,263
117 R 5,144,264

CLASS 332

109 5,144,265

CLASS 333

1 5,144,266
28 R 5,144,267
204 5,144,268
206 5,144,269

CLASS 335

[illegible] 5,144,270
[illegible] 5,144,271
255 5,144,272

CLASS 337

[illegible] 5,144,273

CLASS [illegible]

12 5,144,274
67 5,144,275
162 5,144,276
164 5,144,277
198 5,144,278
270 5,144,279

CLASS 340

310 A 5,144,280
426 5,144,281
458 5,144,282
[illegible] 5,144,283
573 5,144,284
5,144,285
635 5,144,286
664 5,144,287
[illegible] 5,144,288
705 5,144,289
711 5,144,290
729 5,144,291
784 5,144,292
825 02 5,144,293
825 12 5,144,295
825 44 5,144,296
825 49 5,144,294
825 79 5,144,297
854 6 5,144,298
870 18 5,144,299
[illegible] 5,144,300
994 5,144,301

CLASS 341

[illegible] 5,144,302
23 5,144,303
58 5,144,304
73 5,144,305
76 5,144,306
120 5,144,307
131 5,144,308
155 5,144,309
161 5,144,310
166 5,144,311

CLASS 342

42 5,144,312
44 5,144,313
5,144,314
49 5,144,315
189 5,144,316
357 5,144,317
5,144,318
372 5,144,319
374 5,144,320
375 5,144,321
383 5,144,322
386 5,144,323

CLASS 343

702 5,144,324
715 5,144,326
718 5,144,325
731 5,144,327

CLASS 346

1 1 5,144,328
5,144,329
5,144,330
5,144,331
5,144,332
5,144,333
5,144,334
76 PH 5,144,335
5,144,336
108 5,144,337
5,144,338
5,144,339
140 R 5,144,340
5,144,341
5,144,342
155 5,144,343

CLASS 351

44 5,144,344
158 5,144,345
[illegible] 5,144,346

CLASS 354

108 5,144,348
222 5,144,349
275 5,144,350
277 5,144,351
319 5,144,474
[illegible] 5,144,352
5,144,353
5,144,354
5,144,355
402 5,144,356
5,144,357
403 5,144,358
419 5,144,359

CLASS 355

27 5,144,360
5,144,361
53 5,144,362
5,144,363
[illegible] 5,144,364
91 5,144,365
[illegible] 5,144,366
211 5,144,367
219 5,144,368
245 5,144,369
247 5,144,370
249 5,144,371
253 5,144,382
274 5,144,383
308 5,144,384
309 5,144,385
321 5,144,386
326 5,144,387
328 5,144,372

CLASS 356

2 5,144,373
326 5,144,374
345 5,144,375

CLASS 357

16 5,144,376
17 5,144,377
22 5,144,378
5,144,379
5,144,380
23.11 5,144,394
23 4 5,144,388
5,144,389
23.7 5,144,390
5,144,391
5,144,392
23 9 5,144,393
30 5,144,381
5,144,395
5,144,396
5,144,397
34 5,144,398
38 5,144,400
5,144,401
5,144,402
49 5,144,403
51 5,144,404
5,144,405
54 5,144,406
5,144,407
59 5,144,408
61 5,144,409
63 5,144,410
68 5,144,411
74 5,144,412
[illegible] 5,144,413

CLASS 358

36 5,144,414
37 5,144,399
43 5,144,415
56 5,144,416
60 5,144,417
5,144,418
75 5,144,419
80 5,144,420
101 5,144,421
109 5,144,422
133 5,144,423
5,144,424
5,144,425
5,144,426
136 5,144,427
5,144,428
138 5,144,429
139 5,144,430
141 5,144,431
153 5,144,432
155 5,144,433
166 5,144,434
167 5,144,435
183 5,144,437
5,144,438
188 5,144,439
5,144,440
190 5,144,441
209 5,144,442
5,144,443
5,144,444
213.11 5,144,445
5,144,446
5,144,447
213.13 5,144,448
213.26 5,144,449
227 5,144,450
254 5,144,451
296 5,144,452
311 5,144,453
335 5,144,454
443 5,144,455
5,144,456
474 5,144,457
482 5,144,458

CLASS 359

13 5,144,459
29 5,144,460
30 5,144,461
41 5,144,462
72 5,144,463
[illegible] 5,144,464
117 5,144,465
123 5,144,466
124 5,144,467
173 5,144,468
181 5,144,469
224 5,144,470
245 5,144,471
254 5,144,472
270 5,144,473
355 5,144,475
366 5,144,476
[illegible] 5,144,477
392 5,144,478
424 5,144,479
432 5,144,480
440 5,144,481
478 5,144,482
565 5,144,483
5,144,484
580 5,144,485
629 5,144,486
5,144,487
686 5,144,488
689 5,144,489
[illegible] 5,144,490
[illegible] 5,144,491
698 5,144,492
700 5,144,493
5,144,494
798 5,144,495
859 5,144,496
5,144,497
5,144,498
885 5,144,499

CLASS 360

48 5,144,501
63 5,144,502
69 5,144,503
78 04 5,144,504
85 5,144,505
92 5,144,506
96.2 5,144,507
99 06 5,144,508
105 5,144,509
132 5,144,511
135 5,144,512
137 5,144,513

CLASS 361

18 5,144,514
5,144,515
49 5,144,516
55 5,144,517
56 5,144,518
58 5,144,519
119 5,144,510
153 5,144,520
225 5,144,521
306 5,144,522
[illegible] 5,144,523
321 5,144,526
5,144,527
5,144,528
323 5,144,529
378 5,144,530
382 5,144,531
385 5,144,532
395 5,144,533
398 5,144,534
400 5,144,535
402 5,144,536
502 5,144,537

CLASS 362

29 5,143,433
5,143,434
32 5,143,435
5,143,436
5,144,500
[illegible] 5,143,437
5,144,538
[illegible] 5,143,438
101 5,144,545
103 5,143,439
156 5,143,440
191 5,144,546
253 5,143,442
255 5,143,443
256 5,144,539
263 5,143,441
[illegible] 5,144,540
293 5,143,444
5,143,445
5,143,446
5,144,524
297 5,143,447
386 5,144,542
405 5,144,541

CLASS 363

16 5,144,543
21 5,144,544
127 5,144,547

CLASS 364

138 5,144,548
148 5,144,549
192 5,144,550
401 5,144,553
413 02 5,144,554
419 5,144,555
5,144,556
5,144,557
424 05 5,144,558
5,144,559
431 04 5,144,560
474 35 5,144,561
478 5,144,562
491 5,144,563
494 5,144,564
507 5,144,565
552 5,144,566
[illegible] 5,144,567
715 01 5,144,568
715 04 5,144,570
721 5,144,571
724 01 5,144,569
724 05 5,144,572
738 5,144,573
746 5,144,574
748 5,144,575
754 5,144,576
769 5,144,577

CLASS 365

45 5,144,525
63 5,144,578
149 5,144,579
5,144,580
151 5,144,581
189 08 5,144,582
206 5,144,583
222 5,144,584
226 5,144,585
5,144,586

CLASS 366

77 5,143,448
349 5,143,449

CLASS 367

1 5,144,587
16 5,144,588
25 5,144,589
57 5,144,590
75 5,144,591
87 5,144,592
95 5,144,593
129 5,144,594
135 5,144,595
144 5,144,596
166 5,144,597
181 5,144,598

CLASS 368

10 5,144,599
12 5,144,600

CLASS 369

13 5,144,601
5,144,602
44 12 5,144,604
44 14 5,144,603
44 15 5,144,607
44 26 5,144,605
5,144,608
44 41 5,144,606
5,144,609
58 5,144,610
71 5,144,611
77 1 5,144,612
100 5,144,613
112 5,144,614
116 5,144,615
122 5,144,616
244 5,144,617
275 4 5,144,552
284 5,144,618

CLASS 370

60 1 5,144,619
[illegible] 5,144,620
85 1 5,144,621
85 13 5,144,622
94 1 5,144,623
110 1 5,144,624
5,144,625
110 3 5,144,626

CLASS 371

22.1 5,144,627
40 1 5,144,628

CLASS 372
20 5,144,629
22 5,144,630
25 5,144,631
33 5,144,632
45 5,144,633
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45 : 5,142,842 5,143,015 5,143,020 5,143,050 5,143,107 5,143,114 5,143,149 5,143,400 5,143,494 5,143,591 5,143,779 5,143,993 47 : Re. 34,047 5,142,900 5,142,930 5,143,064 5,143,117 5,143,198 5,143,246 5,143,283 5,143,666 5,143,671 5,143,984 5,144,003 5,144,067 5,144,070 5,144,073 5,144,112 5,144,474 48 : Re. 34,052 5,142,719 5,142,784 5,142,828 5,142,883 5,142,885 5,142,913 5,142,943 5,143,023 5,143,045 5,143,065 5,143,070 5,143,078 5,143,154 5,143,158 5,143,232 5,143,251 5,143,257 5,143,335 5,143,404 5,143,411 5,143,440 5,143,455 5,143,521 5,143,594 5,143,603 5,143,611 5,143,705 5,143,710 5,143,713 5,143,831 5,143,860 5,143,861 5,143,862 5,143,878 5,143,949 5,143,990 5,143,992 5,144,046 5,144,068 5,144,095 5,144,133 5,144,138 5,144,162 5,144,168 5,144,173 5,144,247 5,144,293 5,144,390 5,144,551 5,144,556 5,144,557 5,144,566 5,144,570 5,144,576 5,144,582 5,144,586 5,144,588 5,144,589 5,144,590 5,144,591 5,144,596 5,144,649 5,144,651 5,144,688

	5,143,098		5,144,149		5,143,116		5,144,404		5,142,850		5,143,490
	5,143,108		5,144,316		5,143,182		5,144,568		5,142,851		5,143,677
	5,143,162		5,144,322		5,143,296		5,144,659		5,142,929		5,143,700
	5,143,200		5,144,405		5,143,325		5,144,678		5,142,952		5,143,738
	5,143,213		5,144,483		5,143,590	54 :	5,142,872		5,142,987		5,143,806
	5,143,282		5,144,690		5,143,604		5,143,423		5,142,992		5,143,891
	5,143,327	53 :	5,142,713		5,143,629		5,144,251		5,142,995		5,143,972
	5,143,375		5,142,717		5,143,768		5,144,481		5,143,033		5,144,179
	5,143,608		5,142,726		5,143,801	55 :	5,142,736		5,143,121		5,144,246
	5,143,625		5,142,862		5,144,000		5,142,801		5,143,203		5,144,283
	5,143,820		5,142,949		5,144,171		5,142,809		5,143,288		5,144,691
	5,143,988		5,143,084		5,144,230		5,142,836		5,143,365		

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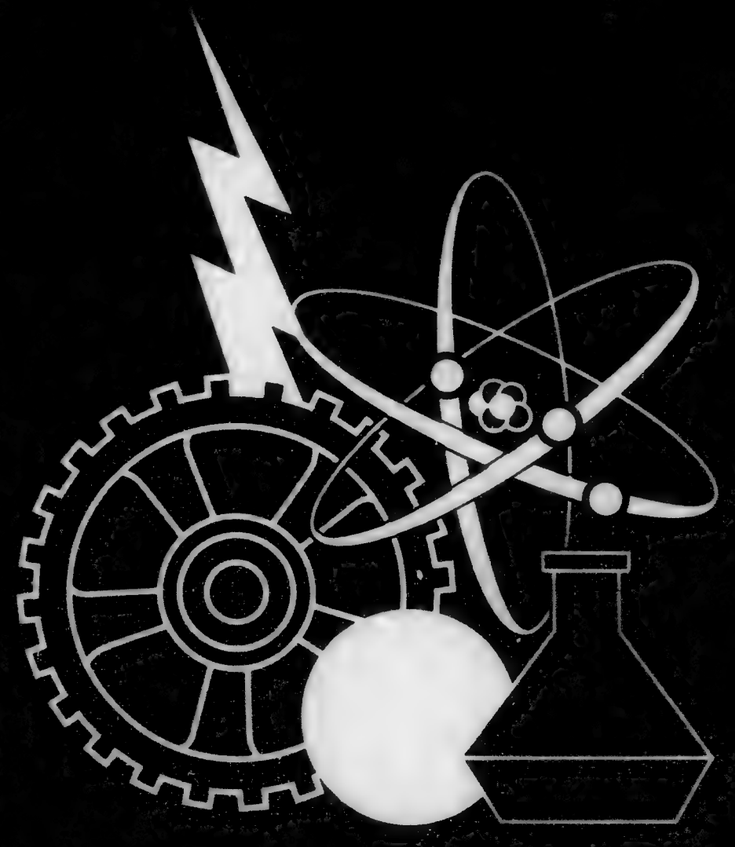
September 8, 1992



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UNITED STATES PATENT AND TRADEMARK OFFICE
September 8, 1992 Volume 1142 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5?, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Patent Cooperation Treaty (PCT) Update
Change in International Search Fee Charged by the European Patent Office Effective Oct. 1, 1992

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, the dollar amount of the international search fee charged by the European Patent Office will be $1,635.00, effective Oct. 1, 1992.

Aug. 17, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 5, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,862,517 through 4,864,652
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 3, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,538,301 through 4,539,712
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 5,1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,503	06/669,576	9/15/87
(4,457,900)	(06/373,476)	(7/03/84)
4,457,023	06/393,465	7/03/84
4,457,027	06/510,280	7/03/84
4,457,028	06/434,306	7/03/84
4,457,029	06/263,402	7/03/84
4,457,031	06/372,841	7/03/84
4,457,032	06/266,090	7/03/84
4,457,033	06/435,561	7/03/84
4,457,034	06/278,468	7/03/84
4,457,035	06/366,356	7/03/84
4,457,036	06/416,655	7/03/84
4,457,037	06/422,364	7/03/84
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NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,633,084	06/691,825	12/30/87	1/16/85	4/29/92
4,691,965	06/906,447	9/08/87	9/12/86	6/30/92
4,706,688	06/545,535	11/17/87	10/26/83	7/15/92

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

5,073,812, Re. S.N. 07/921,551, Filed July 29, 1992, Cl. 357/34, HETEROJUNCTION BIPOLAR TRANSISTOR, Teruyuki Shimura, Owner of Record: *Mitsubishi Denki Kabushiki Kaisha*, Tokyo, Japan, Attorney or Agent: Jeffrey A. Wyand, Ex. Gp.: 2503

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be

obtained by paying the fee therefor estab ished in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,318,964, Reexam. No. 90/002,797, Requested July 27, 1992, Cl. 428/572, AUTOPIN MACHINE, Irwin Zahn, et. al., Owner of Record: *General Staple Co., Inc., New York, N.Y.*, Attorney or Agent: Lerner, David, Littenberg, Krumholz & Mentlik, Westfield, N.J., Ex. Gp.: 1103, Requester: Franklin D. Wolffe, Wegner, Cantor, Mueller & Player, Washington, D.C.

4,920,924, Reexam. No. 90/002,795, Requested July 27, 1992, Cl. 122/04D, FLUIDIZED BED STEAM GENERATING SYSTEM INCLUDING A SYSTEM COOLED CYCLONE SEPARATOR, Iqbal F. Abdulally, et. al., Owner of Record: *Foster Wheeler Corp., Clinton, N.J.*, Attorney or Agent: Marvin A. Naigur, c/o Foster Wheeler Energy Corp., Clinton, N.J., Ex. Gp.: 3404, Requester: Owner

5,050,854, Reexam. No. 90/002,796, Requested July 24, 1992, Cl. 271/122, PAPER FEEDER, Akio Tajima, Owner of Record: *Seikosha Co., Ltd., Tokyo, Japan*, Attorney or Agent: Frank J. Jordan, Jordan & Hamburg, New York, N.Y., Ex. Gp.: 3101, Requester: Owner

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Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Faith C. Whitley d.b.a. Faith Whitley Company, Overland Park, Kans., Reg. No. 1,320,947, for the mark "LOONY" and design", Canc. No. 19,314.

Staffing Solutions, Inc., Altham, Mass., Reg. No. 1,487,745, for the mark "STAFFING SOLUTIONS", Canc. No. 19,779.

The Domain Building Systems Corp., Huntsville, Ala., Reg. No. 1,177,810, for the mark "DOMAIN" and design, Canc. No. 20,276.

White Mountain Down, Inc., Hanson, Mass., Reg. No. 1,216,818, for the mark "WHITE MOUNTAIN DOWN CO.", Canc. No. 20,540.

JEAN BROWN
Administrator, Trademark
Trial and Appeal Baord
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Peter Pan International, Inc., New York, N.Y., Reg. No. 649,358 for the mark, "FEATHERTOUCH", Canc. No. 20,203.

Wa-Ba-Da-Ba, Inc., Miami, Fla., Reg. No. 1,401,324 for the mark "BULLETIN (STYLIZED)", Canc. No. 20,256.

United States Rent A Car System, Inc., Nowell, Mass., Reg. No. 1,459,577, for the mark "USA RENT A CAR SYSTEM AND DESIGN," Canc. No. 20,706.

Whiteworth, Inc., Gardena, Calif., Reg. No. 1,051,589, for the mark "POLISH OFF," Canc. No. 20,381.

Business Computer Solutions, Inc., Miami, Fla., Reg. No. 1,393,919, for the mark "BCSI AND DESIGN", Canc. No. 20,340.

Ruff House, Inc., Atlanta, Ga., Reg. No. 1,484,291, for the mark "RUFF HOUSE", Canc. No. 20,388.

Natures Up Inc., Woodhaven, N.Y., Reg. No. 1,508,496, for the mark "UNI", Canc. No. 20,519.

National Business Communications Network, Inc., Norcross, Ga., Reg. No. 1,539,618, for the mark "SCN", Canc. No. 20,543.

Back Street, Inc., Tustin, Calif., Reg. No. 985,189, for the mark "BACK STREET AND DESIGN", Canc. No. 20,558.

Lens-Tec, Inc., Fort Lauderdale, Fla., Reg. No. 1,066,423. for the mark "LENS-TEC", Canc. No. 20,597.

Chop Sticks Express of Pinellas, Inc., Largo, Fla., Reg. No. 1,458,843, for the mark "CHOP STICKS EXPRESS", Canc. No. 20,604.

A.H. Ross & Sons Co., Chicago, Ill., Reg. No. 636,980, for the mark "HO-BOE", Canc. No. 20,636.

JEAN BROWN
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Trial and Appeal Board
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Assistant Commissioner
for Trademarks

Patents Available For License or Sale

5,132,667"CRANFORD ALERT SYSTEM BURGLAR ALARM" Barbara Cranford, P.O. Box 83-2105, Delray Beach, Fla. 33483

Removal From Register

Pursuant to 37 CFR § 10.11(b), a survey letter was directed on November 29, 1991 to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding had expired.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Agents.

August 10, 1992 CAMERON WEIFFENBACH
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PATENT NOTICES

Certificates of Correction For Week of September 8, 1992

D. 313,688	4,955,600	4,983,740	5,001,976
D. 314,240	4,955,631	4,983,909	5,002,095
D. 320,307	4,955,901	4,983,989	5,002,277
Re. 33,279	4,956,630	4,983,993	5,002,572
Re. 33,449	4,957,268	4,984,360	5,002,765
4,445,158	4,957,523	4,984,643	5,002,931
4,551,026	4,958,193	4,984,878	5,003,098
4,554,243	4,958,271	4,985,297	5,003,807
4,588,292	4,958,413	4,985,327	5,003,932
4,646,287	4,959,950	4,985,530	5,003,948
4,675,808	4,961,954	4,986,195	5,004,220
4,732,302	4,961,986	4,986,240	5,004,507
4,756,019	4,962,115	4,986,309	5,004,615
4,770,852	4,962,885	4,986,477	5,004,839
4,775,207	4,963,971	4,986,745	5,004,857
4,779,266	4,964,950	4,986,840	5,004,979
4,783,353	4,966,724	4,987,381	5,005,046
4,815,446	4,966,769	4,987,384	5,005,141
4,816,990	4,966,842	4,987,541	5,005,223
4,824,740	4,967,080	4,988,131	5,005,605
4,831,316	4,967,303	4,988,265	5,005,768
4,835,763	4,967,627	4,988,494	5,006,173
4,842,551	4,968,454	4,988,534	5,006,258
4,844,833	4,968,660	4,988,575	5,006,314
4,846,288	4,968,663	4,988,921	5,006,603
4,847,056	4,969,194	4,989,022	5,006,873
4,857,051	4,969,795	4,989,039	5,007,193
4,868,166	4,970,025	4,989,044	5,007,480
4,869,824	4,970,329	4,989,337	5,008,208
4,877,170	4,970,533	4,989,504	5,008,300
4,880,008	4,970,638	4,989,519	5,008,560
4,882,282	4,971,030	4,989,619	5,008,598
4,884,389	4,971,033	4,989,621	5,008,639
4,885,145	4,971,444	4,989,641	5,009,389
4,887,359	4,971,451	4,990,000	5,009,563
4,891,751	4,971,546	4,990,173	5,009,720
4,893,596	4,971,699	4,990,777	5,009,822
4,893,783	4,971,700	4,990,948	5,010,053
4,899,241	4,971,728	4,991,598	5,010,206
4,900,752	4,971,758	4,991,942	5,010,434
4,901,619	4,971,964	4,991,983	5,010,633
4,902,149	4,973,264	4,992,200	5,010,971
4,902,180	4,973,542	4,992,269	5,011,112
4,905,041	4,973,581	4,992,410	5,011,125
4,911,024	4,974,366	4,992,523	5,011,513
4,912,128	4,974,427	4,992,588	5,011,616
4,912,562	4,974,530	4,992,663	5,012,605
4,912,941	4,975,106	4,993,122	5,012,653
4,913,045	4,975,376	4,993,233	5,012,713
4,913,603	4,975,806	4,993,295	5,013,042
4,913,718	4,976,122	4,993,929	5,013,111
4,914,068	4,976,686	4,993,956	5,013,215
4,914,093	4,976,743	4,994,367	5,013,336
4,916,048	4,976,953	4,994,932	5,013,425
4,916,169	4,977,096	4,995,634	5,013,763
4,918,747	4,977,442	4,996,469	5,013,812
4,919,802	4,977,641	4,996,746	5,014,280
4,923,300	4,977,892	4,996,898	5,014,388
4,924,811	4,978,307	4,997,234	5,014,436
4,925,596	4,979,000	4,997,659	5,014,545
4,937,245	4,979,092	4,998,148	5,014,625
4,940,239	4,979,399	4,998,294	5,014,729
4,942,604	4,979,664	4,998,399	5,014,778
4,943,204	4,979,838	4,998,613	5,014,853
4,945,047	4,980,256	4,998,824	5,014,955
4,945,105	4,980,445	4,998,920	5,015,100
4,946,769	4,980,730	4,999,378	5,015,232
4,947,060	4,981,145	5,000,459	5,015,239
4,948,596	4,981,241	5,000,777	5,015,416
4,949,901	4,981,664	5,001,140	5,015,584
4,951,848	4,981,688	5,001,292	5,015,832
4,953,420	4,981,788	5,001,295	5,016,350
4,954,196	4,982,239	5,001,316	5,016,399
4,954,513	4,982,466	5,001,348	5,017,560
4,954,577	4,982,947	5,001,374	5,017,739
4,955,587	4,983,193	5,001,594	5,019,382
5,029,291	5,066,107	5,087,314	5,106,556
5,035,335	5,086,248	5,095,143	5,106,604
5,039,791			

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4,232,421—*James I. Tucker*, Manhatten Beach, Calif. ALTERNATIVE DIAMETER GASKET. Patent dated Nov. 11, 1980. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Company.

Hereby enters this disclaimer to the remaining term of said patent.

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	Boston Public Library	(617) 536-5400 Ext. 265
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	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280

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Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	5/16/91
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	11/27/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	7/08/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/02/91
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Acting Director	308-0196	2/19/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	3/06/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	2/20/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	5/19/91
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	7/31/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	308-0962	12/27/90
DESIGN, GROUP 2900 — ROBERT L. GARRETT, Director	308-0511	3/09/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	8/24/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	9/16/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	8/02/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	9/13/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-0651	7/02/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during August 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,897,596 to 3,902,195 inclusive
Plant Patents ..... 3,755 to 3,775

REISSUES

SEPTEMBER 8, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,054

REAMER WITH ANGLED BLADE AND FULL LENGTH CLAMP AND METHOD OF ASSEMBLY

Douglas Millington, Sheffield, and Peter W. W. Yewman, Chesterfield, both of England, assignors to Cogsdill Tool Products, Inc., Camden, S.C.

Original No. 4,547,102, dated Oct. 15, 1985, Ser. No. 643,757, Aug. 23, 1984. Continuation of Ser. No. 417,399, Sep. 13, 1982, abandoned. Application for reissue Jun. 26, 1986, Ser. No. 879,195

Int. Cl.[5] B21K *5/12*; B23B *27/16*

U.S. Cl. 29—525.1 24 Claims

1. A reamer comprising a reamer body, a single adjustable, axially-elongated blade with an axially-elongated front cutting face, an axially-elongated outer cutting edge, and an axially-elongated rear planar face thereon parallel to said front cutting face, said blade having a generally trapezoidal lateral cross-section with its front cutting face being wider than its rear planar face, said blade being clamped by a clamping plate in a generally axially-extending slot in the periphery of said reamer body, said clamping plate extending over substantially the axial length of said blade, said slot having a planar positive rake blade supporting face extending generally axially in said slot in said reamer body and being generally parallel to the longitudinal axis of said reamer body, said planar supporting face in said reamer body being generally flatly engaged directly by said axially-elongated rear planar face of blade for slidable adjusting movement of said blade therealong and being disposed in a non-parallel relationship with a radial plane extending through the longitudinal axis of said reamer body and through said outer cutting edge of said cutting face of said blade so that the radial position of said outer cutting edge of said blade is adjustable along a first plane parallel to said planar supporting face and parallel to a second plane extending through the longitudinal axis of said reamer body and disposed at a positive angular relationship relative to said radial plane, said radial position of said outer cutting edge of said blade being adjustable by a pair of screws spaced apart along the reamer body and in threadable engagement therewith, one of said screws abuttingly bearing on said blade at or adjacent each end of the blade, and said clamping plate wedgingly engaging the front cutting face of the blade and clampingly urging said blade into said generally flat direct engagement of said rear planar face with said planar supporting face in said reamer body in order to maintain said outer cutting edge in an accurate radial position and in an accurate and constant positive rake angular relationship with said reamer body regardless of the radial position of said outer cutting edge.

7. A method of assembling a reamer for reaming a work piece using a reamer blade and a reamer having a reamer body assembly rotatable about a generally longitudinally-extending axis and having a generally axially-elongated slot formed in said reamer body assembly and defined by at least one generally planar supporting face, said reamer blade comprising an axially-elongated front planar face, an axially-elongated radially outer cutting edge, and an axially-elongated rear planar face, said reamer blade being receivable and securable in the slot in the reamer body assembly, said reamer blade being radially adjustable and removable from the slot in the reamer body assembly, at least one of said front planar face and said rear planar face being engageable with the planar supporting face in the reamer body assembly, systematically disposing said front planar face of said blade in a non-parallel relationship with a radial plane extending through the longitudinal axis of the reamer body assembly and through said radially outer cutting edge and in a positive rake angle relationship relative to the radial plane when said reamer blade is received and secured in the slot in the reamer body assembly, and securing said reamer blade to said reamer along its entire length.

Re. 34,055

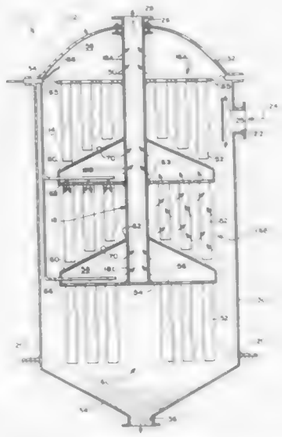
VERTICALLY TIERED PARTICLE FILTERING APPARATUS

Owen J. Tassicker, Cupertino, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Original No. 4,525,184, dated Jun. 25, 1985, Ser. No. 496,520, May 20, 1983. Application for reissue May 16, 1991, Ser. No. 701,474

Int. Cl.[5] B01D *46/02, 29/62*

U.S. Cl. 55—302 24 Claims



24. An apparatus especially suitable for filtering out particulate material of a predetermined minimum size from carrier fluid, said apparatus comprising:

(a) a main vessel defining an interior compartment and having inlet means through which a particular laden carrier fluid can pass in order to enter said compartment and separate outlet means through which said carrier fluid, once filtered, can pass in order to leave said compartment

(i) said vessel including a top end, an opposite bottom end and a circumferential side extending therebetween and wherein said outlet pipe extends substantially vertically within said compartment;

(b) an outlet pipe disposed within said compartment in a specific position out of the way of said inlet means so as not to prevent said particulate laden fluid from passing into said compartment through the inlet means and cooperating with said outlet means so that the entering fluid, once filtered, must first pass into the pipe before it can leave the vessel compartment through said outlet means, said pipe including a plurality of spaced-apart inlet defining pipe sections along its length

having their own inlet means into the pipe for the passage therein of fluid, once the latter has been filtered;

(c) means for supporting said pipe in said specific position within said compartment;

(d) a plurality of filter assemblies, equal in number to said inlet defining pipe sections, connected with and supported substantially solely by said pipe at spaced-apart locations along said pipe, each of said assemblies cooperating with its adjacent inlet defining pipe section for allowing particulate laden fluid within said compartment to enter said pipe through the inlets in said adjacent pipe section while filtering out particulate material of said predetermined minimum size, whereby particulate laden fluid entering the vessels leaves it in a filtered condition;

(i) each of said filter assemblies including means defining a chamber around its adjacent inlet defining pipe section, plate means forming part of said chamber defining means and including through-holes serving as the only openings into said chamber from said vessel compartment, and means cooperating with all of said through-holes for allowing particulate laden fluid within said compartment to pass into said chamber through said through-holes while filtering out said particulate material, whereby the filtered fluid thereafter passes into said outlet pipe and ultimately out of said vessel;

(ii) each of said filtering means of each of said filter assemblies including a plurality of filter tubes, equal in number to said through-holes in the assembly's plate means, each of said filter tubes cooperating with an associated one of the through-holes and being designed such that particulate laden fluid within said vessel compartment must pass through the filter tube before reaching its associated through-hole;

(iii) each of said plate means extending horizontally and wherein each of said filter tubes forming part of each of said assemblies is connected to the underside of that assembly's plate means around its associated through-hole and depends vertically downward therefrom;

(iv) said chamber defining means forming part of each of said filter assemblies below the uppermost one of said outlet pipe includes its own hood separate from said vessel disposed above its plate means.

Re. 34,056

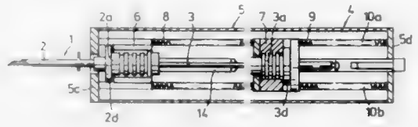
TISSUE SAMPLING DEVICE

Per G. Lindgren and Dan Akerfeldt, both of Upsala, Sweden, assignors to C.R. Bard, Inc., Murray Hill, N.J.

Original No. 4,699,154, dated Oct. 13, 1987, Ser. No. 890,543, Jul. 30, 1986. Continuation of Ser. No. 387,864, Jul. 31, 1989, abandoned. Application for reissue May 3, 1991, Ser. No. 695,451

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—754 **23 Claims**



9. A biopsy needle for use with a tissue sampling device having a housing, a first slide mounted for longitudinal motion within said housing, and a second slide having a transverse recess formed therein and being mounted for longitudinal motion within said housing, said biopsy needle comprising:

a hollow first needle having proximal and distal ends;

a second needle extending through said hollow first needle and freely slidable therewithin, said second needle having proximal and distal ends;

a first head mounted to said proximal end of said first needle, said first head having front and rear flanges formed thereon in spaced-apart relation for receiving said first slide therebetween, such that when said first head is placed on said first slide, said slide is mateingly received between said front and rear flanges to couple said first needle to said first slide; and

a second head mounted to said proximal end of said second needle, said second head having a flange thereon dimensioned to be received within said transverse recess of said second slide such that when said second head is placed on said second slide, said flange on said second head engages said transverse recess in said second slide to couple said second needle to said second slide.

Re. 34,057

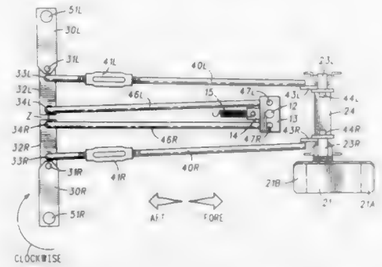
STEERING MECHANISM FOR A ZERO TURNING RADIUS VEHICLE

Tommy A. Middlesworth, Sheboygan Falls, Wis., assignor to Simplicity Manufacturing, Inc., Port Washington, Wis.

Original No. 47,903,992, dated Dec. 13, 1988, Ser. No. 165,760, Mar. 9, 1988. Application for reissue Dec. 12, 1990, Ser. No. 736,853

Int. Cl.[5] B62D *6/00*

U.S. Cl. 180—6.2 **21 Claims**



18. A driving mechanism and an independent steering mechanism for a vehicle having a pair of driving wheels, comprising:

reversible motor means for driving each one of said pair of driving wheels, including control means for controlling the speed and direction of rotation of each one of said pair of driving wheels independently of the other, thereby controlling the actual speed and actual steerage of the vehicle;

a steering mechanism operable by the operator of the vehicle to prescribe a steerage for the vehicle and having a first output representing said prescribed steerage;

an accelerator mechanism operable by the operator of the vehicle to prescribe a speed for the vehicle and having a second output representing said prescribed speed with said accelerator mechanism mechanically independent of said steering mechanism; and

integrator linkage means, disposed between said control means and first and second outputs, for integrating said first and second outputs into a third output, said third output being applied to said control means to coordinate the speed and direction of rotation of each of said reversible motor means in response to said prescribed steerage and said prescribed speed, and including means for reducing said actual vehicle steerage relative to said prescribed steerage as said prescribed speed is increased.

Re. 34,058

MULTILAYER REVERSE OSMOSIS MEMBRANE OF POLYAMIDE-UREA

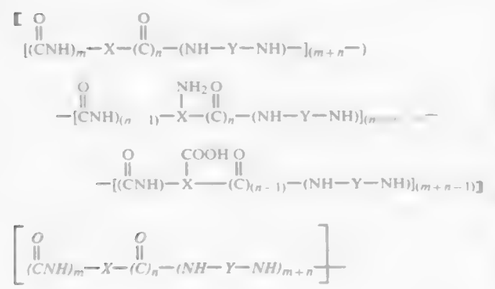
Samuel D. Arthur, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 5,019,264, dated May 28, 1991, Ser. No. 560,512, Jul. 31, 1990. Application for reissue Oct. 29, 1991, Ser. No. 784,245

Int. Cl.[5] B01D *71/54, 71/56, 71/60*

U.S. Cl. 210—500.37 **17 Claims**

1. A reverse osmosis membrane that shows improved salt rejection, flux, and productivity, comprising a polyamideurea separating layer in contact with a [polysulfone] substrate, wherein said polyamideurea comprises the formula:



where

m,n>0,

m+n≧3,

X=a (m+n) valent organic group, and

Y=a divalent organic group.

Re. 34,059

ZOOMING MECHANISM FOR ZOOM LENS

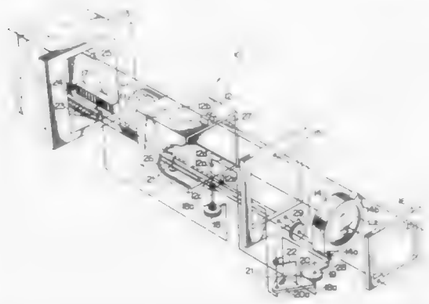
Hiroshi Akitake, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan

Original No. 4,948,235, dated Aug. 14, 1990, Ser. No. 218,701, Jul. 13, 1988. Application for reissue Jul. 15, 1991, Ser. No. 730,109

Claims priority, application Japan, Jul. 13, 1987, 62-175306; Jul. 16, 1987, 62-177784

Int. Cl.[5] G02B *15/00*

U.S. Cl. 359—700 **41 Claims**



40. A zooming system of a zoom lens composed of a plurality of lens groups having a common optical axis comprising:

a zooming frame supporting at least one lens group and movable in back-and-forth directions of the optical axis;

driving means for selectively moving said zooming frame in one of said back-and-forth directions;

a carrier frame supporting another zoom lens group being movably supported for back-and-forth movement along said optical axis;

intermediate driving means responsive to movement of said zooming frame for providing a rotational output; and

means for moving said carrier frame in a non-linear manner responsive to the rotational output of said intermediate driving means.

Re. 34,060

HIGH SPEED SEMICONDUCTOR MEMORY DEVICE HAVING A HIGH GAIN SENSE AMPLIFIER

Nobuyoshi Tanimura, Musashino; Sho Yamamoto; Kazuo Yoshizaki, both of Musashimurayama, and Isao Akima, Fussa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Original No. 4,509,147, dated Apr. 2, 1985, Ser. No. 383,945, Jun. 1, 1982. Application for reissue May 31, 1989, Ser. No. 359,684

Int. Cl.[5] G11C *11/413*

U.S. Cl. 365—208 **14 Claims**

1. A static type semiconductor random access memory comprising:

one or more memory cells each of which delivers a pair of signals complementary to each other;

a first dissymmetric type differential amplifier circuit having a non-inverting input terminal coupled to said memory cells to receive one signal of the pair of complementary signals, and an inverting input terminal coupled to said memory cells to receive the other signal of said pair of complementary signals, said first amplifier circuit including means for forming a first output signal in-phase with said signal received at its non-inverting input terminal;

a second dissymmetric type differential amplifier circuit having an inverting input terminal coupled to said memory cells to receive said one signal, and a non-inverting input terminal coupled to said memory cells to receive said other signal, said second amplifier circuit including means for forming a second output signal in-phase with said signal received at its non-inverting input terminal; and

first means coupled to said first and second amplifier circuits to receive said first output signal and said second output signal, said first means including means for forming a third output signal based on said first output signal and said second output signal,

wherein each of said first and second dissymmetric type differential amplifier circuits is a dissymmetric type differential amplifier which comprises a first insulated-gate field effect transistor of a first conductivity type having its gate coupled to said non-inverting input terminal, a second insulated-gate field effect transistor of said first conductivity type having its gate coupled to said inverting input terminal and having its source coupled to a source of said first insulated-gate field effect transistor, and first active load means connected between respective drains of said first and second insulated-gate field effect transistors and a first power supply, said first and second dissymmetric

type differential amplifier circuits being coupled to at least one constant current source connected between sources of said first and second insulated-gate field effect transistors and a second power supply, and in which the signal in-phase with said signal received at its non-inverting input terminal is derived from said drain of said second insulated-gate field effect transistor, *and wherein said first means comprises:*

a third dissymmetric type differential amplifier circuit having a non-inverting input terminal coupled to said first amplifier to receive said first output signal, and an inverting input terminal coupled to said second amplifier to receive said second output signal, said third amplifier including means for forming a fourth output signal in-phase with said signal received at its non-inverting input terminal; and

output means coupled to said third amplifier to receive said fourth output signal, said output means including means for forming said third output signal.

Re. 34,061

POLYMERS OF TRICYCLO[5.2.1.0^{2,6}]DECA-8-YL (METH)ACRYLATE

Hiromasa Kawai, Ichihara; Takashi Morinaga, Chiba; Hiromu Miyajima, Hitachi; Toshio Akima; Mitsuharu Kato, both of Ichihara, and Yutaka Hosoi, Mito, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

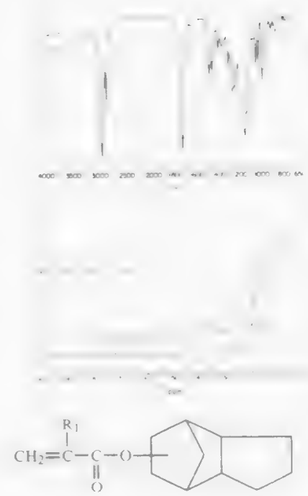
Original No. 4,591,626, dated May 27, 1986, Ser. No. 663,974, Oct. 23, 1984. Application for reissue May 27, 1988, Ser. No. 199,775

Claims priority, application Japan Oct. 24, 1983, 58-198743; Nov. 1, 1983, 58-205601; Sep. 20, 1984, 59-197596

Int. Cl.[5] C08F 12/08

U.S. Cl. 526—282 8 Claims

1. A transparent material for optical elements comprising a polymer produced by polymerizing a compound of the formula:



(I)

wherein R_1 is hydrogen or a methyl group, in an amount of 100 to 5% by weight and one or more unsaturated monomers copolymerizable with the compound of the formula (I) in an amount of 0 to 95% by weight; said material exhibiting a saturated water absorption rate of 1.8% or less, and Abbe number of 45 or more and a glass transition point of 100° C. or higher.

PLANT PATENTS

GRANTED SEPTEMBER 8, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,962

MINIATURE ROSE PLANT NAMED 'YANTAI'

Susan M. O'Brien, 489 Minot Ave., Chula Vista, Calif. 91910, and Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif. by Susan Mae O'Brien, Administrator

Filed Dec. 31, 1990, Ser. No. 636,391

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—8.2 1 Claim

1. A new and distinct variety of miniature rose plant, named 'Yantai', of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by long stems bearing hybrid tea-type pale yellow blooms with a deeper yellow center ranging from near Mimosa Yellow to near Empire Yellow with an occasional pale pink blush on the outer petals ranging from near French Rose to near Venetial Pink; producing a moderate to heavy quantity of blooms; and, as forming blooms in a size range of from substantially 30 mm to 40 mm in diameter.

7,963

MINIATURE ROSE PLANT NAMED 'RUTH STALEY'

Cecelia L. D. Bennett, deceased, late of 489 Minot Ave., Chula Vista, Calif. 91910 executrix Susan Mae O'Brien

Filed Dec. 31, 1990, Ser. No. 636,393

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant, named 'Ruth Staley', of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea form blooms of ranging from near Empire Rose to near Shell Pink with a base of near Orient Pink to near Rose Pink with flowers usually borne one to a stem but occasionally in sprays of 3 to 5 or more.

7,964

CRAPE-MYRTLE NAMED SUMMER DREAM

Kiyoshi Katsuo, Bunsui, Japan, assignor to Hokuetsu Nohji Co., Ltd., Niigata, Japan

Filed May 25, 1990, Ser. No. 528,352

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—67.3 1 Claim

1. A new and distinct variety of crape-myrtle plant, substantially as herein described and illustrated.

7,965

CRAPE-MYRTLE NAMED SUMMER FLASH

Kiyoshi Katsuo, Bunsui, Japan, assignor to Hokuetsu Nohji Co., Ltd., Niigata, Japan

Filed May 25, 1990, Ser. No. 528,353

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—67.3 1 Claim

1. A new and distinct variety of crape-myrtle plant, substantially as herein described and illustrated.

7,966

CRAPE-MYRTLE NAMED SUMMER VENUS

Kiyoshi Katsuo, Bunsui, Japan, assignor to Hokuetsu Nohji Co., Ltd., Niigata, Japan

Filed May 25, 1990, Ser. No. 528,354

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—67.3 1 Claim

1. A new and distinct variety of crape-myrtle plant, substantially as herein described and illustrated.

7,967

CRAPE-MYRTLE NAMED SUMMER FANTASY

Kiyoshi Katsuo, Bunsui, Japan, assignor to Hokuetsu Nohji Co., Ltd., Niigata, Japan

Filed May 25, 1990, Ser. No. 528,355

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—67.3 1 Claim

1. A new and distinct variety of crape-myrtle plant, substantially as herein described and illustrated.

7,968

CRAPE-MYRTLE NAMED WHITE FAIRY

Kiyoshi Katsuo, Bunsui, Japan, assignor to Hokeutsu Nohji Co., Ltd., Niigata, Japan

Filed May 25, 1990, Ser. No. 533,345

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—67.3 1 Claim

1. A new and distinct variety of crape-myrtle plant, substantially as herein described and illustrated.

7,969

GERANIUM NAMED ECLIPSE SALMON ORANGE

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Mar. 8, 1991, Ser. No. 666,887

Int. Cl.[5] A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant substantially as herein shown and described characterized by dark green foliage with faint zonation, salmon orange flower color, and semi-double flowers on large umbels, the plant being fast-rooting and having a vigorous bush-like growth habit.

PATENTS

GRANTED September 8, 1992

ERRATA

72-335	5,144,706
483-004	5,144,740
51-439	5,144,766
99-327	5,144,879
99-342	5,144,880
108-064	5,144,888
602-074	5,144,944
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435-252	5,145,786
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501-021	5,145,804
501-078	5,145,805
501-080	5,145,806
530-324	5,145,962
552-229	5,145,975
556-088	5,145,976
556-437	5,145,977
556-437	5,145,978
556-440	5,145,979
560-035	5,145,980
148-526	5,146,060
290-038	5,146,095
290-044	5,146,096
359-509	5,146,244
356-239	5,146,282
356-246	5,146,283
356-345	5,146,284
357-023	5,146,291
358-100	5,146,311
395-101	5,146,415
364-754	5,138,574

PATENTS

GRANTED SEPTEMBER 8, 1992

GENERAL AND MECHANICAL

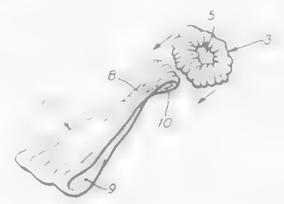
5,144,694
EXERCISE APPAREL AND WEIGHT PACKETS
Emilie Conrad Da'oud, Woodland Hills, and Eleanor Zimmerman, Venice, both of Calif., assignors to Explore Incorporated, Santa Cruz, Calif.
Filed Mar. 9, 1991, Ser. No. 666,525
Int. Cl.[5] A41D *1/08*
U.S. Cl. 2—69 21 Claims

1. Weighted apparel to be worn by a wearer, the apparel comprising:
an upper body garment to be worn above the wearer's waist;
a weight packet;
means for securing the weight packet to the upper body garment; and
the weight packet comprising a plurality of rows and a plurality of columns of weight members inside a pouch.

5,144,695
BASEBALL CAP RETENTION DEVICE
George W. Schweizer, 14 Glenworth Ct., Manchester, Mo. 63011
Filed Nov. 13, 1991, Ser. No. 790,913
Int. Cl.[5] A42C *5/00*
U.S. Cl. 2—189 4 Claims

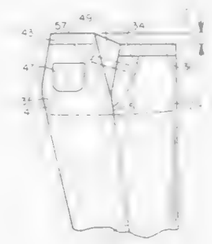
1. A retaining device for holding headwear on the head of a wearer, wherein the retaining device comprises:
a pair of elongated flexible tether members;
a slide member for operatively connecting the tether members together; and
a clip member formed on one end of each of the tether members; wherein the clip members each comprise a pair of jaws pivotally connected to one another for captively yet releasably engaging said headwear at spaced locations.

5,144,696
ARTICLE OF CLOTHING
Judith A. Kahl, 1812 Wilderness Cir., Gibsonia, Pa. 15044
Filed Jul. 3, 1991, Ser. No. 725,640
Int. Cl.[5] A42B *5/00*
U.S. Cl. 2—207 19 Claims



1. An article of clothing comprising a first article part consisting of a flexible material formed in the shape of a hollow tube having a diameter of about 18 to 24 inches and a width of about 9 to 14 inches, and a second article part comprising a circular elastic member having, in a stretched condition an opening having a diameter sufficient to accommodate passage therethrough of the first member in a condition in which the first member is substantially fully folded in a direction along the diameter thereof.

5,144,697
BI-WAISTED TROUSERS
Rick L. Sandbeck, 15 Glacier La., Omro, Wis. 54963
Filed Jun. 7, 1991, Ser. No. 711,890
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—236 3 Claims



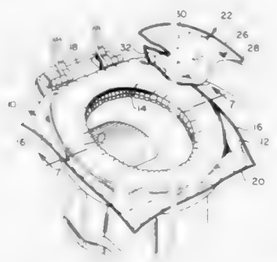
1. An article of clothing worn around a person's legs and hips comprising:
a. a front section of material having two front leg portions, a front panel, and a front waistband that lies generally in a first plane; and
b. a back section of material having two back leg portions, a back panel, and a back waistband that lies generally in a second plane generally parallel to and offset from the first plane, the front and back leg portions being joined to each other to enclose the person's legs, the front and back panels being joined to each other to enclose the person's hips, the front waistband being located and worn around the person at a level closer to the legs than the back waistband.

5,144,693

TOILET SEAT COVER INCLUDING HANDLING MITTS

Clancy D. McKenzie, P.S. Box 34[illegible], Bala Cynwyd, Pa. 19004

Filed Mar. 4, 1991, Ser. No. 663,360
Int. Cl.[5] A47K *13/14*
U.S. Cl. 4—245.5 6 Claims



1. In a toilet seat cover comprising an envelope having at least one open end to permit it to be slipped over a toilet seat to enclose the same and having a removable central portion which when removed forms an opening in the toilet seat cover coincidental with the opening in the toilet seat when installed; the improvement which comprises:

said removable central portion including handling means to receive and enclose at least one of the user's hands, said handling means being in the form of at least one mitten;

whereby

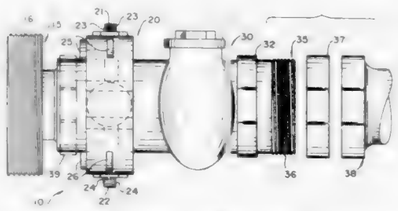
said handling means permits the user to perform all functions attendant to the use of a toilet without bare-hand contact with any unsanitized surface.

5,144,699

PLUMBING DRAINAGE SYSTEM

Kenneth Graham, 1523 Central Park Ave., Yonkers, N.Y. 10710

Filed Jul. 20, 1990, Ser. No. 556,650
Int. Cl.[5] E03D *11/00*
U.S. Cl. 4—256.1 15 Claims



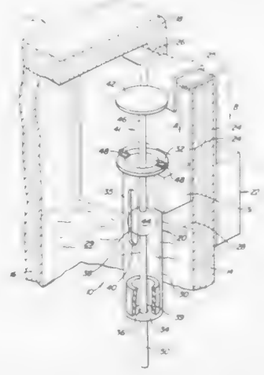
1. In a plumbing drainage system having a plumbing stack with a clean-out hole formed therein, a drainage device for controlled drainage of the plumbing stack, the drainage device comprising first means for connecting the drainage device to a plumbing stack at a clean-out hole formed in the plumbing stack, a shut-off valve connected downstream of said first connecting means, a check valve connected downstream of said shut-off valve, and second connecting means connected downstream of said check valve for connection to a drainage hose.

5,144,700

SELF CLEANING TOILET FLUSH TANK MONITOR WITH A FLEXIBLE MOUNT

Michel M. Martin, 1551 Southgate Ave., #140, Daly City, Calif. 94015

Filed Dec. 3, 1990, Ser. No. 621,306
Int. Cl.[5] E03D *1/00*; G08B *21/00*
U.S. Cl. 4—415 8 Claims



1. In an apparatus for monitoring the level of water in a toilet flush tank, wherein the apparatus includes sensing means and alarm means; said sensing means including a control tube having a top and a base, said control tube being in fluid connection with said flush tank and being normally filled with water; said sensing means further including a float in said control tube responsive to the water level therein, and signal means attached to said float and electrically connected to said alarm means for indicating when said water level reaches a predetermined level; and said base including an aperture for draining water from said control tube; the improvement comprising:

self-cleaning means for preventing a build-up of mineral deposits in said aperture, said self cleaning means including a rod attached to said flat and extending downwards through said aperture, said rod being free to move in said aperture responsive to the water level in said tube, whereby the motion of said rod in said aperture substantially prevents the accumulation of mineral deposits therein; and

flexible mounting means for adjustably suspending the sensing means in said flush tank.

5,144,701

WHEEL CHAIR SHAMPOO APPARATUS

Ralph W. Clark, 3581 NW. Broad, Roseburg, Oreg. 97470

Filed Dec. 5, 1990, Ser. No. 622,543
Int. Cl.[5] A45D *19/00*, *19/04*
U.S. Cl. 4—515 4 Claims

1. A wheel chair shampoo apparatus comprising, in combination,

a housing, the housing including a right side wall and left side wall arranged in a spaced coextensive relationship, and a rear vertical wall mounted coextensively to rear vertical edges of the right and left side walls, and

a floor mounted orthogonally relative to the rear wall and the side walls, and

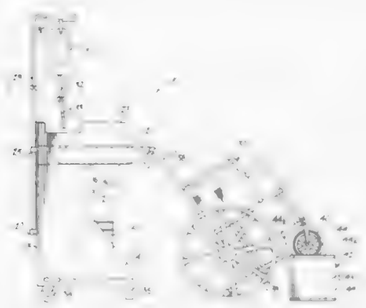
a removable bucket member mounted on the floor, and

a fluid basin assembly mounted overlying the bucket member adjacent upper terminal edges of the right hand and left side walls, the fluid basin assembly including a fluid basin drain positioned overlying the bucket member, and

slider means mounted to the housing adjacent the basin assembly, wherein the slider means is arranged for mounting handle bars of a wheel chair assembly thereon, and

wherein the apparatus further includes a wheel chair support mount spaced from the housing for mounting forward wheels of the wheel chair assembly thereon, and

the slider means includes a right channel and a left channel, the right channel and left channel formed within the housing between the basin assembly and respective right and left side walls of the housing, and each channel including a respective right and left slider bar slidably mounted therewithin, each slider bar including a respective abutment bar orthogonally mounted to a forward terminal end of each slider bar, and a horizontal mounting bar including a central concave portion orthogonally mounted between the abutment bars for receiving the handle bars thereon.

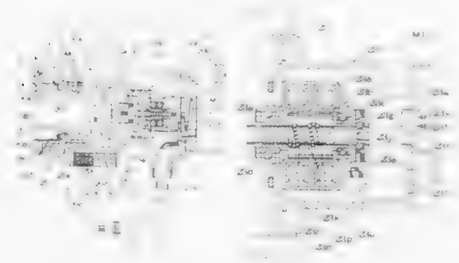


5,144,702

BLOW-OFF NOZZLE STRUCTURE CAPABLE OF AUTOMATICALLY VARYING THE BLOW-OFF VOLUME OF WATER

Hisato Haraga; Yasutoshi Inatomi; Takashi Obata; Mituaki Hashida; Koichi Uchiyama, and Kenji Moriyama, all of Chigasaki, Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Dec. 27, 1989, Ser. No. 457,437
Claims priority, application Japan, Dec. 29, 1988, 63-331772; Feb. 10, 1989, 1-031617; Mar. 24, 1989, 1-073367
Int. Cl.[5] A61H *33/02*, *9/00*
U.S. Cl. 4—541.6 29 Claims



1. A blow-off nozzle structure for a whirlpool bath in a bath body capable of automatically varying a blow-off volume of water into said bathtub body comprising:

a) a tubular nozzle casing defining a blow-off flow forming passage therein, said passage forming a blow-off opening at a front end thereof and a hot water inlet opening at a rear end thereof,

b) a valve seat formed in a mid-portion of said blow-off flow forming passage,

c) a valve element capable of being extended to or retracted from said valve seat so as to adjust the degree of opening of said valve seat,

d) an air mixing portion defined in said blow-off flow forming passage and disposed at a position in front of said valve seat, said air mixing portion communicated with an air intake portion which has one end opened to an air source including the atmosphere,

e) a power-operated linear motor within said nozzle structure and capable of moving said valve element toward or away from said valve seat in response to a controller,

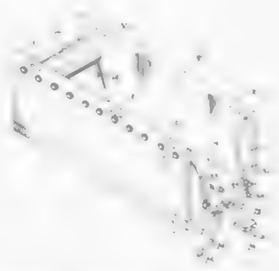
whereby air-mixed water is blown off from said blow-off opening of said tubular nozzle casing and the volume of said blow-off air-mixed hot water is regulated by the degree of opening of said valve seat without manual manipulation of said tubular nozzle.

5,144,703

BATHTUB LINER

Laura M. Maire, 2401 27th St., Dickinson, Tex. 77539

Filed Mar. 4, 1991, Ser. No. 663,683
Int. Cl.[5] A47K *3/02*
U.S. Cl. 4—580 1 Claim



1. A bathtub liner comprising, in combination,

an elongate, generally rectangular floor member, the floor member including a left wall mounted hingedly and coextensively to a left edge of the floor member, and a right wall mounted hingedly and coextensively to a right edge of the floor member, and

a rear wall orthogonally oriented relative to the left wall and right wall hingedly mounted at its lower terminal edge to a top surface of the floor member spaced from a rear terminal edge of the floor member, and the rear wall including a cushion member coextensively mounted to an upper terminal edge of the rear wall, and

the left wall and the right wall each define a chamber therewithin, wherein each chamber is directed coextensively of the left and right wall, and the left wall includes a left wall fill tube and the right wall includes a right wall fill tube each communicating with the respective chambers and the left wall fill tube includes a first valve therein and the right wall fill tube includes a second valve therein, and the left wall fill tube includes a wall fill tube connector block connected to a terminal end thereof, the wall fill tube connector block having a connector plug receiving a free terminal end of the right wall fill tube thereto, and

the first and second valves each include a housing, and each housing includes a rotatable valve member positioned therewithin, each valve member including an axle, wherein the axle projects through the housing, and each axle mounts an adjustment disk orthogonally thereto to permit rotation of the valve member, and the valve member includes a planar wall diametrically directed through the valve member to permit selective blockage and free flow of pneumatic gas or fluid through each valve, and

the floor member includes an upper chamber arranged coextensively with the floor, wherein the upper chamber includes a plurality of floor fill nozzles in fluid communication with the upper chamber, wherein each of the floor fill

nozzles are arranged for reception of fluid filling of the upper chamber, and the floor member further including a lower chamber coextensive with the floor member and underlying the upper chamber, wherein the lower chamber is filled with a granular material effecting stability of the apparatus when positioned within a bathtub, and

the left wall includes a series of left wall suction cups mounted thereto, the right wall includes a series of right wall suction cups mounted thereto, and the floor member includes a series of floor member suction cups mounted thereto for securement of the left wall, right wall, and floor member to interior surfaces of the associated bathtub, and the cushion includes a series of cushion suction cups mounted to the cushion on a rear surface thereof for securement of the cushion to a surface of the associated bathtub, and

the left wall includes a plurality of first magnetic strips mounted within the left wall adjacent an upper terminal end thereof, and the right wall includes a plurality of second magnetic strips mounted within the right wall adjacent an upper terminal end thereof, and

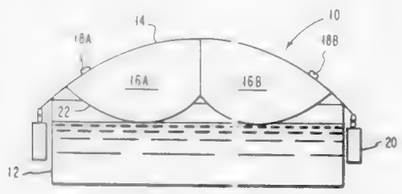
the floor member includes a connector strap mounted medially to a bottom surface of the floor member, and a first hook and loop fastener patch mounted to the bottom surface of the floor member adjacent the rear terminal edge thereof, and the connector strap includes a second hook and loop fastener patch at a free terminal end of the connector strap for securement to the first hook and loop fastener patch when the rear wall, the left wall, and the right wall are in an interfolded relationship relative to the floor member.

5,144,704

SWIMMING POOL COVER WITH MULTIPLE AIR COMPARTMENTS

Charles C. J. Genzel, and Linda Genzel, both of 108 Geymer Dr., Mohopac, N.Y. 10541

Filed Nov. 1, 1990, Ser. No. 607,885
Int. Cl.[5] **E04H** *4/00*
U.S. Cl. 4—499 **17 Claims**



1. An inflatable cover adapted to be used to cover a swimming pool having an arbitrary shape and size at the water surface thereof, said cover including:

a continuous surface sheet which extends at least to all edges of a pool to be covered, the entire surface sheet being above the pool surface,

at least two inflatable endosed compartments defined by lower sheet means attached to said surface sheet for raising said surface sheet to a generally domed shape when said compartments are inflated, said compartments being laterally displaced from one another in the direction of the pool surface and being an integral portion of said surface sheet,

air or gas inlet means attached to each said inflatable compartment independently inflating said compartments, and

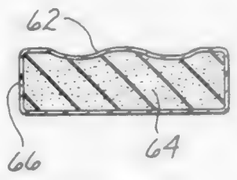
holding means attached to said sheet along the edges thereof for holding the entire cover in a substantially fixed position when said cover is positioned over said pool wherein said sheet and said inflatable compartments rest above the water surface of said pool when said compartments are inflated, there being no portions of said sheet which rest below said water surface.

5,144,705

SEAT CUSHIONS INCLUDING A PLURALITY OF INDIVIDUAL SUPPORT CELLS

John E. Rogers, P.O. Box 1437, Blue Jay, Calif. 92317

Division of Ser. No. 486,690, Mar. 1, 1990, Pat. No. 5,068,504, which is a continuation of Ser. No. 323,672, Mar. 15, 1989, abandoned. This application Jun. 6, 1991, Ser. No. 711,080
Int. Cl.[5] **A47C** *20/02*
U.S. Cl. 5—453 **5 Claims**



1. A seat cushion comprising:

a baseboard having an upper surface bounded by a forward edge, a rear edge, and two sides

a plurality of independently pressurized bladders attached to said upper surface and arranged in rows extending between said forward and rear edges, said bladders being of substantially rectangular shape with four sides and a planar top surface each, each bladder having a base flange attached to said base board, said bladders in each of said rows being spaced from each other at said upper surface by a distance sufficient to prevent mutual deformation under a load acting on said top surface;

said rows being spaced apart at least adjacent to said rear edge by about seven inches from each other to define a central depression between said rows for accommodating the ischial tuberosities of a person seated thereon; and

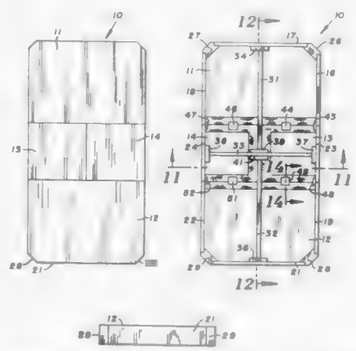
means for independently and selectively pressurizing each of said bladders whereby the combined support characteristics of said bladders is adjustable to a desired support profile.

5,144,706

BED FOUNDATION

Robert A. Walker, 11010 89th Ave., North, Maple Grove, Minn. 55369

Filed Dec. 3, 1990, Ser. No. 620,553
Int. Cl.[5] **A47C** *19/00*
U.S. Cl. 5—400 **21 Claims**



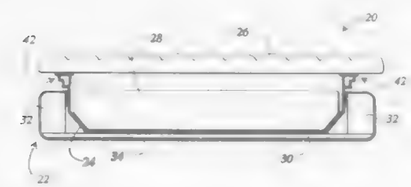
1. A foundation for a bed comprising: a first end member, a second end member, and a pair of center members, each of said members having a generally horizontal support surface providing a support for a mattress, means releasably connecting the end members to the center members to hold the support surfaces aligned with each other, said means being releasable to allow the members to be separated from each other, the means releasably connecting the end members to the center members comprises a plurality of releasable latches mounted on adjacent surfaces of the end members and center members, each latch having a base secured to one adjacent surface, the base having at least one outwardly directed tab, a retainer secured to opposite adjacent surface, the retainer having a groove adapted to accommodate the tab thereby ensuring proper alignment of the end members relative to the center members, and a latching member pivoted on the base and engageable with the retainer to lock the base and the retainer together, longitudinal and transverse support means mounted on the members to support the end members and center members and maintain the alignment of the support surfaces, and bracket means releasably accommodating the support means to mount the support means on the members, said support means being releasable from the bracket means to allow the end members, center members and support means to be separated from each other.

5,144,707

FLOTATION SYSTEM INCLUDING IMPROVED LOCKING FEATURES

Milton A. Callaway, Dahlonega, and Charles E. Steed, Alpharetta, both of Ga., assignors to Simmons Company

Filed Mar. 21, 1991, Ser. No. 673,203
Int. Cl.[5] **A47C** *27/08*
U.S. Cl. 5—451 **9 Claims**



1. A water mattress construction, comprising:

a lower member including a base member including an upwardly-disposed cavity at least partially defined by a perimeter;

a liquid-filled bladder positioned atop said lower member;

an upper member positioned atop said bladder, said upper member combining with said lower member to at least partially define a cavity at least partially containing said bladder;

sliding interconnection means to connect said upper and lower members, said interconnection means itself comprising:

a first elongate channel member defining a channel portion; and

a first elongate flange member having a portion slidably fitting within said channel portion, said first elongate channel member attached to one of said upper and lower members, said first elongate flange member attached to the other of said upper and lower members, and one of said said first elongate channel member and said first elongate flange member being attached to said perimeter, such that a sliding interconnection is provided between said upper and lower members; and

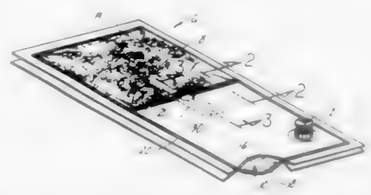
a detachable connection independent of said sliding interconnection means, said detachable connection intermediate said top and bottom members and configured to provide a portion of said top member to be bent out of place to allow access to said bladder without disengaging said sliding interconnection means.

5,144,708

CHECK VALVE FOR FLUID BLADDERS

Robert W. Pekar, Florence, Mass., assignor to Dielectrics Industries, Chicopee, Mass.

Continuation-in-part of Ser. No. 660,549, Feb. 26, 1991, abandoned, and a continuation-in-part of Ser. No. 767,425, Sep. 30, 1991, abandoned. This application Oct. 28, 1991, Ser. No. 783,398
Int. Cl.[5] **F16K** *15/16*
U.S. Cl. 5—454 **8 Claims**



1. Combination of a check valve and inflatable bladder defined by upper and lower sheets of synthetic plastic material having a seal forming one and another fluid chamber with a fluid passage therebetween, the check valve comprises two layers of plastic film of generally the same length which are sealed together at their side edges and to opposed inner surfaces of the sheets in said passage and having a channel throughout the length thereof for permitting the one-way flow of fluid from the one chamber of the bladder into the other chamber thereof, each of said layers being characterized by a matte non-blocking outer surface and a glossy inner surface having a blocking tendency a barrier material disposed between said film to prevent the heat-sealing together of the film layers at the location where the check valve extends through the seal between said two sheets.

5,144,709

FORMATION OF SHAPES IN A METAL WORKPIECE

James F. Rooney, Bethany, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 3, 1991, Ser. No. 695,058
Int. Cl.[5] **B21D** *28/00;* **B23P** *13/04;* **H01R** *43/00;* **H01L** *29/60*
U.S. Cl. 7—335 **18 Claims**

1. A process for forming a shape in an area of a metal workpiece comprising:

removing a portion of the metal of the workpiece in the area which will contain the shape, and causing a portion of the remaining metal to flow into the area vacated by the removed metal as the shape is formed while constraining the remaining metal from flowing in directions away from the vacated area.

5,144,710
COMPOSITE, PRESTRESSED STRUCTURAL MEMBER AND METHOD OF FORMING SAME
Stanley J. Grossman, 10408 Greenbriar Pl., Oklahoma City, Okla. 73159
Filed Feb. 28, 1991, Ser. No. 662,467
Int. Cl.[5] E01D 19/12; E04C 3/02
U.S. Cl. 14—73 17 Claims

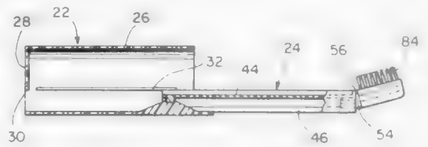
1. A method of constructing a prestressed structural member comprising the steps of:
positioning a plurality of girders in a construction position on a construction support adjacent to a center portion of the girders, such that opposite free ends of said girders cantilever away from said construction support and are free to deflect downwardly due to the weight thereof, said girders extending in a longitudinal direction;
positioning a plurality of composite structural units on upper portions of said girders, each of said composite structural units comprising:
a plurality of transverse beams extending in a transverse direction with respect to said girders and engaging said upper portions thereof; and
a molded deck portion engaged with said transverse beams, a transversely extending side of the molded deck portion of each composite structural unit generally facing a transversely extending side of the molded deck portion of an adjacent composite structural unit; and
attaching said transverse beams to said girders in said construction, position to form a complete structural member;
moving said complete structural member from said construction position to an operating position, wherein said complete structural member is supported adjacent to said opposite ends of said girders, at least some of said molded deck portions are placed in compression in said longitudinal direction.

5,144,711
CLEANING BRUSH FOR SEMICONDUCTOR WAFER
Gerald L. Gill, Jr., Phoenix, Ariz., assignor to Westech Systems, Inc., Phoenix, Ariz.
Filed Mar. 25, 1991, Ser. No. 674,594
Int. Cl.[5] B08B 11/02
U.S. Cl. 15—97.1 9 Claims

1. Apparatus for cleaning a circular semiconductor wafer, said wafer having a peripheral edge and a centerpoint spaced apart from and circumscribed by said peripheral edge, said apparatus including:
(a) a first brush attached to a shaft and including a base and upstanding spaced apart resilient members attached to said base and generally lying in a first plane;
(b) a second brush circumscribing said shaft and having a base and upstanding spaced apart resilient members attached to said base of said second brush and generally lying in a second plane, said first and second planes facing one another and effective for accommodating at any given instant a portion of a semiconductor wafer to be cleaned therebetween, said resilient members in said first and second planes collectively circumscribing said shaft, said shaft extending from said first to said second brush and through said first and second planes, said brushes being shaped and dimensioned such that when said wafer is interposed between said brushes,
(i) only a portion of said wafer lies intermediate said members in said first plane and said members in said second plane, and
(ii) a portion of said wafer extends outwardly away from said members in said first plane,
said members in said second plane, and
said rotating shaft;
(c) support means contacting said peripheral edge of said portion of said wafer extending outwardly away from
(i) said members in said first plane
(ii) said members in said second plane, and
(iii) said rotating shaft; and

(d) means for rotating at least one of said brushes to move said upstanding resilient members in said first plane over said wafer and promote the rotation of said wafer about said centerpoint of said wafer and over said first and second brushes such that a point on said peripheral edge of said rotating wafer continuously repeatedly
(i) contacts said supporting means,
(ii) disengages from said support means and moves between said members in said first and second planes, and
(iii) moves out between said members in said first and second planes and back into contact with said support means.

5,144,712
DISPOSABLE TOOTHBRUSH
Gail W. Hansel, and Phillip D. Fausett, both of 4621 Willow Run Dr., Annandale, Va. 22003
Filed May 6, 1991, Ser. No. 695,892
Int. Cl.[5] A46B 9/04, 5/02, 11/00
U.S. Cl. 15—167.1 13 Claims



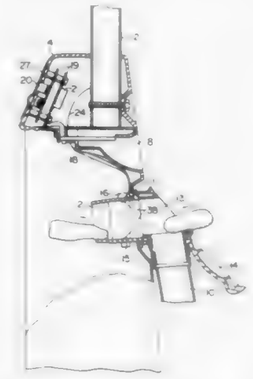
1. A disposable toothbrush comprising a pair of telescopically arranged components with one of the components being in the form of a tubular housing, the other of said components including an elongated brush head carrier slidably received in the tubular housing, a brush head mounted on one end of the brush head carrier for movement from a position adjacent one end of the tubular housing to an extended position remote therefrom, said brush head forming a closure for one end of the tubular housing when the toothbrush is in retracted position, said tubular housing forming a handle for the toothbrush when the brush head carrier and brush head are in their extended position, said tubular housing having a partial closure wall at the opposite end and being of a size to be easily grasped when using the device as a toothbrush and positionable in a pocket without producing a noticeable distortion when the brush head and carrier are telescoped into the housing, said brush head being pivotally mounted on the carrier for pivotal movement between a position perpendicular to the carrier to engage with and close the end of the tubular housing when in retracted position and an angulated position for use as a toothbrush when in extended position.

5,144,713
HAND-OPERATED WIPING INSTRUMENT FOR FLOORS
Henry M. Unger, Weston, Conn., assignor to Unger Licensing Limited, Weston, Conn.
Filed Mar. 25, 1991, Ser. No. 674,659
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1990, 4010197
Int. Cl.[5] A47L 13/11
U.S. Cl. 15—245 8 Claims

1. A hand-operated wiping instrument for floors, comprising a frame, a guide pole extending from said frame, said guide pole including a handle located at an operating level of said wiping instrument, at least one support and guide element which supports said wiping instrument and guides it along a direction of movement, said support and guide element being arranged in a front location of said frame relative to the direction of movement, and a wiping strip arranged in said frame transversely to the direction of movement, said wiping strip being located in said frame at a position which is rearward of said support and guide element and which is separated from said support and guide element so that the closest distance between said wiping strip and said support and guide element is greater than the distance between said wiping strip and a plane which contains said handle and is perpendicular to the direction of movement.

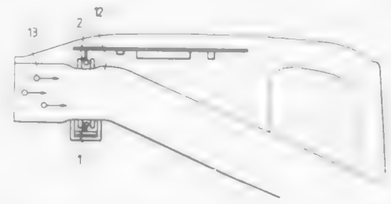
5,144,714
VACUUM CLEANER
Hiroshi Mori, Yokaichi; Seizo Hayashi, Omihachiman; Hiroshi Hayakawa, Shiga, and Tomomi Mitani, Yokaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 19, 1991, Ser. No. 657,059
Claims priority, application Japan, Feb. 22, 1990, 2-41771
Int. Cl.[5] A47L 9/28
U.S. Cl. 15—319 8 Claims

1. A vacuum cleaner comprising: a cleaner body; a dust collecting section provided in said cleaner body; an intake section projecting into said dust collecting section; a hose connecting a nozzle section rotatably disposed on a suction side of said cleaner body with said dust collecting section through said intake section, said intake section comprising a first tubular member having a longitudinal axis extending substantially straight in a first direction, having an inner wall and connected to said dust collecting section, and a second tubular member connected at one end to said hose and at another end to said first tubular member and having a longitudinal axis extending substantially straight in a second direction which is oriented at an angle with respect to said first direction; a detecting means for detecting dust flowing in said hose, said



detecting means comprising a light-emitting element and a light-receiving element which are provided at mutually opposing positions along said inner wall of said first tubular member, wherein a straight line, which passes through both said opposing positions, extends substantially orthogonal to said second direction; and a control section for controlling an output of an electric blower in accordance with a signal from said detecting means and for indicating an amount of said dust flowing in said hose on a display section.

5,144,715
VACUUM CLEANER AND METHOD OF DETERMINING TYPE OF FLOOR SURFACE BEING CLEANED THEREBY
Tadashi Matsuyo, Youkaichi; Masahiro Kimura, Shiga; Hideo Okubo, Youkaichi; Seiji Yamaguchi, Shiga; Hiroshi Kawakami, and Masaru Moro, both of Youkaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 14, 1990, Ser. No. 567,140
Claims priority, application Japan, Aug. 18, 1989, 1-213377; Aug. 18, 1989, 1-213378
Int. Cl.[5] A47L 5/00
U.S. Cl. 15—319 7 Claims



1. A vacuum cleaner, comprising:
(a) a blower motor being provided with input power at a variable level;
(b) dust detection means having a light emitting portion for emitting a light and a light sensitive portion for receiving

the light from said light emitting portion, said light emitting and light sensitive portions being arranged to effect a light path therebetween across a portion of a suction passage of said vacuum cleaner for detecting interception of said light path by at least one dust particle crossing said light path to produce a dust detection signal;

(c) evaluation means responsive to said dust detection signal for equating the amount of dust particles passing through said suction passage as a succession of interception numbers representative of the number of times said light path is intercepted during each of a plurality of first given intervals;

(d) first comparing means for comparing said interception numbers with a first reference number for each of said first given intervals;

(e) counting means for counting the number of times said respective interception numbers are greater than said first reference number during a second given interval, said second given interval being longer than said first given interval;

(f) second comparing means for comparing the counted number of times said interception number is greater than said first reference number with a second reference number; and

(g) power controlling means responsive to an output signal provided by said second comparing means for setting said input power level of said motor to be a first value when said counted number of times of said interception number being greater than said first reference number is equal to or greater than said second reference number, and to a second value when said counted number of times of said interception number is greater than said first reference number is smaller than said second reference number, said first value being different from said second value.

5,144,716

ELECTRIC CLEANER, METHOD FOR PRODUCING SAME AND MOUNT BASE AND BUMPER FOR ELECTRIC CLEANER

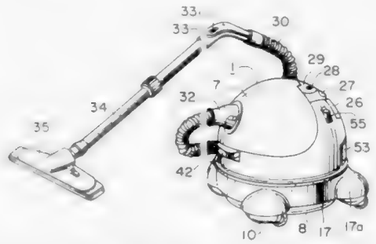
Syuji Watanabe, Ibaraki; Kouiti Sagawa, Hitachi; Gorou Sasai, Hitachi, and Hidetoshi Sakurai Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1989, Ser. No. 417,560

Claims priority, application Japan, Oct. 7, 1988, 63-251828; Jan. 25, 1989, 1-013940; Jan. 25, 1989, 01-013941; Mar. 13, 1989, 01-057757; Mar. 13, 1989 01-057758; Mar. 17, 1989, 01-063740

Int. Cl.[5] **A47L** *5/36*

U.S. Cl. 15—323 **24 Claims**



1. An electrical cleaner comprising:

a cleaner body including an electric blower and a dust collecting portion encasing a filter therein;

a cylindrical mount base for carrying said cleaner body thereon, with a lower portion of said cleaner body being fitted in said cylindrical mount base;

means for enabling a turning and moving of said mount base on a surface to be cleaned;

a suction hose mounted on said cleaner body;

means for supporting said cleaner body in said mount base so as to turnable in a clockwise direction and a counterclockwise direction;

a bumper made of a soft material provided at an outermost peripheral portion of said mount base, and

wherein said mount base and said means for supporting said cleaner body are disposed so that an air layer is formed between the outermost peripheral portion of said mount base and said means for supporting said cleaner body in a vicinity of said bumper.

5,144,717

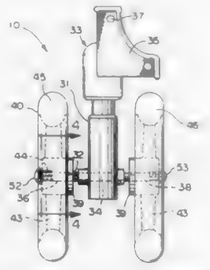
DOUBLE WHEEL CASTER FOR BEING ROTATABLY MOUNTED ON A LEG OF A TRANSPORT CARRIER

Devon T. Siesholtz, Boyertown, and Nathaniel Saint, Morgantown, both of Pa., assignors to Graco Metal Products, Inc., Elverson, Pa.

Filed Apr. 26, 1991, Ser. No. 691,948

Int. Cl.[5] **A47B** *91/00*

U.S. Cl. 16—47 **14 Claims**



1. A double wheel caster for being rotatably mounted on a leg of a transport carrier comprising:

a wheel caster for being mounted on a leg of a transport carrier, said wheel caster including a trailing housing having a generally cylindrical opening extending therethrough at one end thereof;

a support rod having a center portion and opposite first and second end portions, said opening being complementarily sized for rotatably receiving said center portion of said support rod, said center portion of said support rod being rotatably positioned within said opening located in the wheel caster trailing housing;

a first caster wheel having an aperture generally centrally disposed therethrough and rotatably receiving said first end portion of said support rod, said aperture defining a generally cylindrical surface, said first caster wheel being rotatably positioned on said first end portion of said support rod such that a first gap exists between said first end portion of said support rod and said cylindrical surface;

first bushing means positioned within said first gap for frictionally engaging said first end portion of said support rod and said cylindrical surface of said first caster wheel;

a second caster wheel having an aperture generally centrally disposed therethrough and rotatably receiving said second end portion of said support rod, said second caster wheel aperture defining a generally cylindrical surface, said second caster wheel being rotatably positioned on said second end portion of said support rod such that a second gap exists between said second end portion of said support rod and said cylindrical surface; and

second bushing means positioned within said second gap for frictionally engaging said second end portion of said support rod and said cylindrical surface of said second caster wheel, whereby upon movement of said transport carrier said first caster wheel, said second caster wheel and said support rod rotate together with respect to the trailing housing, and upon movement of said transport carrier in a direction which forces one caster wheel to rotate faster than the other, said first and second bushing means frictionally inhibit said one caster wheel from freely rotating with respect to the other to thereby prevent shimmying.

5,144,718

DOOR PULL WITH MOUNTING FITTINGS

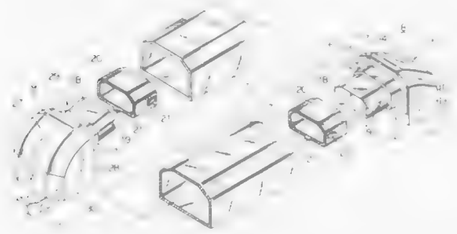
Akio Ozawa, Toyama, Japan, assignor to YKK Architectural Products Inc., Tokyo, Japan

Filed Jun. 21, 1991, Ser. No. 718,992

Claims priority, application Japan, Jun. 22, 1990, 2-65504

Int. Cl.[5] **E05B** *1/00*

U.S. Cl. 16—111 R **2 Claims**



1. A door pull adapted to be attached to a door by using stiles, comprising:

(a) a long hollow pull member;

(b) a first fitting adapted to be coupled with one end of said pull member and adapted to be attached to the door by a stile, said first fitting including a fitting body and a projection extending therefrom;

(c) a second fitting adapted to be coupled with the other end of said hollow long pull member and adapted to be attached to the door by another stile, said second fitting including a fitting body and a projection extending therefrom; and

(d) elastic tubular spacers including wedges and adapted to be fitted around said projections, said spacers are elastically deformed by said wedges between said pull member and said first and second fitting when each end of said pull member is coupled with said first and second fitting to hold each said spacer thereon.

5,144,719

BATTERY LIFT HANDLE

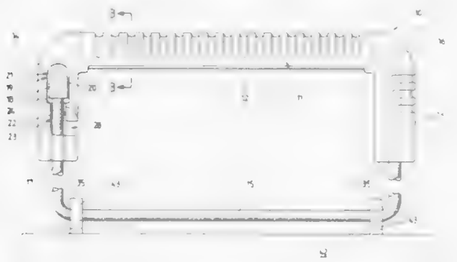
Rodney I. Arthur, Port Adelaide, Australia, assignor to Rope & Marine Supplies Pty. Ltd., Port Adelaide, Australia

Filed Aug. 22, 1991, Ser. No. 748,439

Claims priority, application Australia, Aug. 29, 1990, PK2005

Int. Cl.[5] **A47B** *95/02*; **A45F** *5/10*

U.S. Cl. 16—114 R **6 Claims**



1. A battery lift handle comprising a rigid hand grip of general 'U' shape which, in use, has a horizontal portion flanked by two depending legs,

a lift cord having one end embodied in a first of said legs and extending from the base thereof, and a head on the other end, and

interior surfaces defining three slots positioned along the second of said legs:

said interior surfaces of the uppermost of the three slots including upper widely spaced and lower narrowly spaced downwardly extending surfaces opening to one side of the second leg providing an upper portion of sufficient capacity, and a lower portion of insufficient capacity, to contain said head, a shelf at the lower end of the upper portion of shape and size to retain the lift cord head in said upper portion against downward displacement from said second leg,

the interior surfaces which define the intermediate of said slots including at least one laterally extending surface which extends slot space of the intermediate slot laterally from said lower portion of the uppermost slot on said one side of the second leg to an opposite side thereof,

the interior surfaces which define the lowermost of said slots including a downwardly extending 'U'-shaped surface extending from said intermediate slot to the base of said second leg, and opening to said opposite side thereof.

5,144,720

RELEASABLE DOUBLE-HINGE DEVICE FOR AN AUTOMOBILE CONSOLE BOX

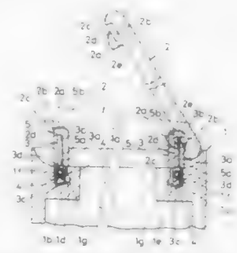
Masahiro Aihara, and Hiroyuki Suzuki, both of Yokohama, Japan, assignors to Kato Hatsujo Kaisha, Ltd., Yokohama, Japan

Filed Jun. 12, 1991, Ser. No. 712,889

Claims priority, application Japan, Jan. 16, 1991, 3-15825

Int. Cl.[5] **E05D** *15/50*

U.S. Cl. 16—232 **3 Claims**



1. A releasable double-hinge device for an automobile console box, the box comprising a box main body having an opening at a top portion thereof and a box lid for removably covering the opening of the box main body, the device comprising:

two sets of an identical number of pivotal pillars arranged along opposite lateral edges of the box main body,

each pivotal pillar including an upright member, a horizontal lock shaft extending perpendicularly from a top of the upright member parallel to the lateral edge, and a base section including an anchor pin to which a bottom of the upright member is attached,

the body lateral edges having cavities formed therein, wherein each base section is disposed and pivotally anchored to the box main body, and each pivotal pillar tilting at least one of left and right from an upright position through given angles;

a recoil spring which returns each pillar to the upright position; and

two sets of the same identical number of lock sections located under and along opposite lateral edges of the box lid at positions corresponding to locations of the pivotal pillars on the box main body; wherein

each lock section has a slot formed therein for removably

receiving a corresponding horizontal lock shaft, the lock section and the lock shaft being released from each other along with the other lock sections and lock shafts on the same lateral edge by lateral movement of the box lid to a position in which the box lid is swung open around the opposite edge,

each lock section further has an inclined edge which presses against the lock shaft and tilts the pivotal pillar so that the lock shaft is guided into the slot, and wherein

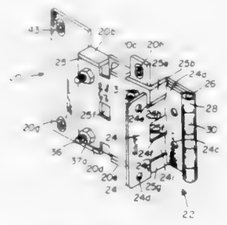
the recoil spring returns the pivotal pillar to the upright position to close and lock the box lid.

5,144,721

ADJUSTABLE HINGE ASSEMBLY

Daniel J. Schade, 30831—13th Place S., Federal Way, Wash. 98003

Filed Jan. 11, 1991 Ser. No. 639,964
Int. Cl.[5] E05D 7/04, 7/06
U.S. Cl. 16—237 4 Claims



1. An adjustable hinge assembly, comprising:

a hinge having a door carrying leaf swingably mounted on a support leaf member to swing about a vertical swing axis between a closed door position and an open door position, said door carrying leaf being adapted to be vertically mounted on a door located at the front of a vertical opening adjoining a support wall which presents a vertical mounting face extending rearwardly from the right or left side of said opening;

a mounting plate member;

fastening elements passing through said mounting plate member for securing it on said support wall to occupy a position between said support leaf member and mounting face;

a fulcrum element between said members and defining a rocking axis parallel to said swing axis whereby the support leaf member may be rocked relative to the mounting plate member to responsively adjust said closed door position in the right or left direction relative to said opening, one of said members having horizontal adjustment slots on opposite sides of said fulcrum and the others of said members having holes registering with said horizontal slots; and

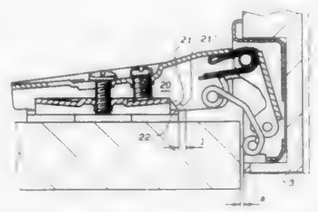
threaded fastening means passing through said horizontal adjustment slots and registering holes and engaging said members for rocking said support leaf member, horizontally adjusting said support leaf member, and securing said members to one another with said fulcrum element therebetween, said threaded fastening means being independent of said fastening elements

5,144,722

FURNITURE HINGE

Luciano Salice, Carimate, Italy, assignor to Arturo Salice S.p.A., Novedrate, Italy

Continuation of Ser. No. 535,711, Jun. 11, 1990, abandoned.
This application May 30, 1991, Ser. No. 707,294
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1989, 3920141
Int. Cl.[5] E05D 7/04
U.S. Cl. 16—240 5 Claims



1. A furniture hinge comprising a hinge member connected to a swinging element, and a hinge bracket connected to a stationary element through a base plate attached to the stationary element, the hinge member being connected to the bracket by link means allowing the swinging element to swing to and from a closed position wherein an inner face of the swinging element is perpendicular to an end face of the stationary element and spaced therefrom at a predetermined distance, a first screw connection between the hinge bracket and the base plate providing lengthwise adjustment of the hinge bracket relative to said end face, a second screw connection between the hinge bracket and the base plate providing pivotal adjustment of the hinge bracket relative to the base plate, first abutment surface means on the hinge bracket and second abutment surface means on the base plate engaging the first abutment surface means, at least one of said abutment surface means having a bevelled or curved profile for maintaining said predetermined distance at a constant value throughout a range of pivotally adjusted positions of the hinge bracket on the base plate by mutual engagement of the respective abutment surfaces wherein the hinge bracket is channel-shaped with opposing lengthwise walls, said walls including stepped portions defining said first abutment surface means for engaging a transversely extending edge on the base plate defining the second abutment surface means.

5,144,723

DEVICE FOR ASSISTING THE TRANSFER OF A FLEECE FROM THE CARD MAIN CYLINDER TO THE DOFFER ROLL

Erich Hohloch, Winterthur, and Hansruedi Fehr, Winterberg, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Dec. 7, 1990, Ser. No. 623,790
Claims priority, application Switzerland, Dec. 11, 1989, 04445/89
Int. Cl.[5] D01G 15/46, 15/34
U.S. Cl. 19—106 R 21 Claims

1. A card comprising:

a main cylinder on which a fleece to be carded is adapted to lie;

a doffer roll with which the carded fiber layer is removed from said main cylinder as a fleece;

a diverging gap between said main cylinder and said doffer roll which extends over the entire width of the main cylinder;

an air guide plate which forms a converging gap having an aperture angle with the surface of the main cylinder such that air flowing into said converging gap is guided by said air guide plate so that the transfer of the fleece to the doffer roll is thereby assisted;

said air guide plate comprising an independently movable element having at least one predetermined degree of freedom of movement; and

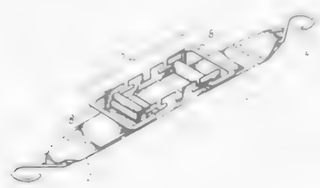
a free space of predetermined size being provided immediately following the air guide plate, in a direction of rotation of the main cylinder.

5,144,724

BUCKLE FOR LOCKING STRAP

Chiang C. Chuan, 4th Fl., No. 23, Alley 1, Lane 285, Sec. 1, Wenhua Rd., Panchiao City, Taipei County, Taiwan

Filed Feb. 21, 1992, Ser. No. 838,690
Int. Cl.[5] A44B 11/00; B60P 7/00
U.S. Cl. 24—68 CD 2 Claims



1. A buckle cooperating with two straps each having a hooked end attached to a different side of a truck and a free end secured in said buckle for fastening goods on the truck, comprising:

a body comprising:

two parallel rectangular walls each defining two slots extending in a length thereof at two ends thereof, two clefts each communicating with one said slot; and a cutoff extending perpendicular to the length between said slots; and

two bars connecting said walls below said slots; and

two rings each comprising a flat straight member having a locking position and an unlocking position in one said slot.

5,144,725

SIDE-RELEASE BUCKLE WITH ACCIDENTAL RELEASE GUARD

Mark J. Krauss, East Greenwich, R.I., assignor to American Cord & Webbing, Inc., Woonsocket, R.I.

Filed Jul. 15, 1991, Ser. No. 729,935
Int. Cl.[5] A44B 11/25
U.S. Cl. 24—625 3 Claims

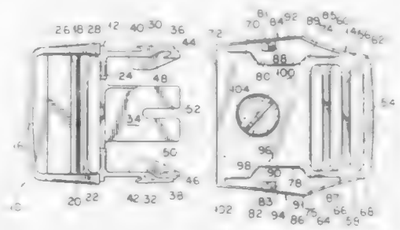
1. A buckle comprising:

a male portion including at least one resilient inwardly deformable spring arm with a detent protuberance at a free end thereof, wherein said male portion includes one of said spring arms at each lateral end thereof and a tongue means proximate between said spring arms;

said tongue means engaging guide means within said female portion;

said guide means including post means comprising a spindle of a rotatable lock means, said spindle being rotatable responsive to a knob on an exterior face of said female portion, said rotatable locking means further comprises arms extending from said spindle which can be rotated from a first position to a second position, wherein said first position allows free flexure of said at least one spring arm and wherein said second position prevents said at least one spring arm from being urged inwardly thereby ensuring that said detent protuberance remains engaged within said at least one detent aperture;

a female portion receptive to said at least one spring arm of said male portion, said female portion including at least one detent aperture formed within corresponding detent recesses on lateral sides of said female portion through which said detent protuberance is exposed when said male portion is engaged within said female portion; and



resilient release guard means extending outwardly from said female portion adjacent to said at least one detent aperture so as to shield said detent protuberances from being inadvertently urged inwardly; and wherein said release guard means is urged inwardly by a user so as to engage and urge inwardly said detent protuberance to disengage said male portion from said female portion;

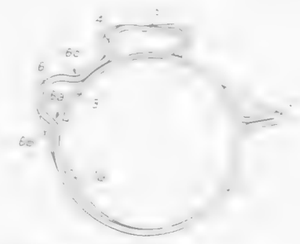
said detent protuberances shaped so as to urge said spring arms inwardly as said male portion is inserted into said female portions, said spring arms flexing outwardly into a detent position when said detent protuberances align with said at least one detent aperture.

5,144,726

CLAMP HAVING A RESERVE OF CAPACITY

Lionel Calmettes, and Michel André, both of Romorantin Lanthenay, France, assignors to Etablissements Caillau, France

Filed May 7, 1991, Ser. No. 696,602
Claims priority, application France, May 23, 1990, 90 06477
Int. Cl.[5] B65D 63/02
U.S. Cl. 24—20 R 5 Claims



1. A clamp comprising:

a) a metal band wound on itself defining an inner end and an outer end and having complementary fastening means on the inner end and the outer end of said metal band, the fastening means engageable by a tightening tool and adapted to be coupled to each other when tightened about an object to be clamped;

b) an undulation in said metal band spaced from the fastening means of the outer end; and

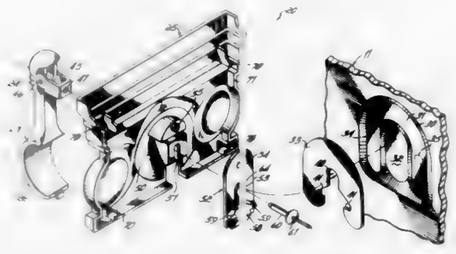
c) a gusset formed adjacent to said undulation on only one side thereof, said gusset including a linear edge extending tangentially from said undulation to said metal band toward the inner end.

5,144,727

NON-INVASIVE HARDWARE FOR METAL CASKET

William K. Craft, North Bend, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Apr. 15, 1991, Ser. No. 685,150
Int. Cl.[5] A61G *17/00*
U.S. Cl. 27—2 6 Claims



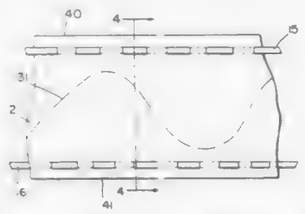
1. A casket and non-invasive hardware combination comprising:
a recess in said casket wall,
a mounting plate welded to said wall over said recess, said plate having a single slot,
a hardware assembly including a fastener having a head,
said hardware assembly overlying said mounting plate with said fastener lodged in said slot and said head underlying said plate,
and means cooperating with said slot for blocking withdrawal of said fastener from said slot.

5,144,728

METHOD FOR MANUFACTURING A SEMIFINISHED MATERIAL FOR FORMING A BLOSSOM-TYPE DECORATION

Ernst Hagenbuch, Breitenbach, Switzerland, assignor to Bandfabrik Breitenbach AG, Breitenbach, Switzerland

Filed Nov. 2, 1990, Ser. No. 608,304
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937348
Int. Cl.[5] D04D *7/10*
U.S. Cl. 28—147 30 Claims



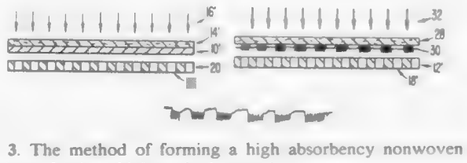
1. A method for manufacturing a semifinished material for the subsequent production of a flower or petal-like decoration, comprising the following steps:
(a) using an elongated flat ribbon material having a flexibility sufficient for a subsequent folding operation to form fold-type pleats having a desired fold and pleat size.
(b) passing at least one flexible drawstring lengthwise through said flat ribbon material in a meandering fashion for establishing spacings along said elongated flat ribbon material between neighboring openings where said drawstring passes through said flat ribbon material, said drawstring running alternately on opposite sides of said flat ribbon material along said spacings (30), said spacings having a length which determines said desired fold and pleat size,
(c) providing a movable connection between said flat ribbon material and said flexible drawstring through said openings and along said spacings, so that said flat ribbon material can later be gathered along said flexible drawstring for forming said fold-type pleats, and
(d) forming at least one edge of said initially flat ribbon material with a curved contour to form distinct lobes which can later be gathered to form said folds as correspondingly distinct petals.

5,144,729

WIPING FABRIC AND METHOD OF MANUFACTURE

Jared A. Austin, Greer, S.C.; Joseph H. Miller, Menasha, and Robert F. Hyslop, De Pere, both of Wis., assignors to Fiberweb North America, Inc., Simpsonville, S.C.

Division of Ser. No. 421,463, Oct. 13, 1989. This application Apr. 8, 1991, Ser. No. 681,897
Int. Cl.[5] D04H *5/00*
U.S. Cl. 28—105 13 Claims



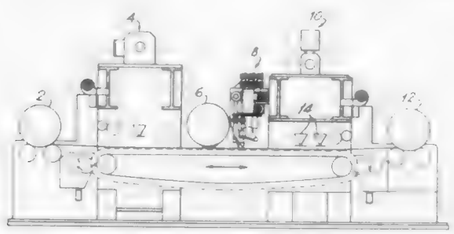
3. The method of forming a high absorbency nonwoven wiping fabric, which method comprises:
(a) supporting a nonwoven reinforcing web of bonded continuous filament synthetic fiber on a first coarse, open apertured forming member;
(b) supporting a first nonwoven surface web of synthetic textile staple fibers and short natural fibers on the supported reinforcing web;
(c) jetting liquid at high pressure onto said first surface web so as to cause said natural fibers and said synthetic textile fibers of said first surface web to become hydroentangled with each other and with said continuous filament fibers and move into the apertures of said forming members to form a pattern of spaced clusters on the surface of the resulting fabric adjacent said forming member;
(d) supporting said resulting fabric on a second coarse, open apertured forming member, the side of said resulting fabric which previously was adjacent to said first forming member being away from said second forming member;
(e) supporting a second surface web of synthetic textile staple fibers and short natural fibers on the surface of said resulting fabric away from said second forming member;
(f) jetting liquid at high pressure onto said second surface web to cause the fibers of said second surface web to hydroentangle with each other and with the fibers and filaments of said resulting fabric and move into the apertures of said second forming member and form spaced clusters, so as to form a finished wiping fabric having on each of its two surfaces a pattern of spaced clusters having a high concentration of said natural fibers.

5,144,730

METHOD OF PRODUCING NEEDLED, STRUCTURED AND TEXTILE WEBS

Johann P. Dilo, Eberbach, Fed. Rep. of Germany, assignor to Oskar Dilo Maschinenfabrik KG, Eberback, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 521,444, May 10, 1990, abandoned. This application Aug. 2, 1990, Ser. No. 562,404
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925757; Jul. 18, 1990, 4022891
Int. Cl.[5] D04H *5/08*
U.S. Cl. 28—109 35 Claims



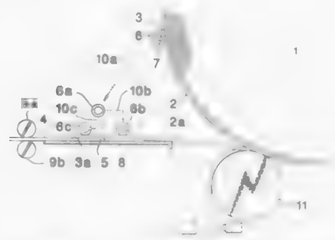
1. A method of producing needled, structured and patterned velour textile web of nonwoven material, comprising applying at least one layer of textile fibers, to a pre-needled nonwoven fleece support web said web having an upper and a lower side, said textile fibers differing from the fibers of said support web by their color, form, material, degree of fineness, orientation or combination thereof, and, finally, subjecting said web to at least one additional needling step wherein the fibers applied to said support web are pushed through said web until they become visible on said lower side of said web and form a substantially upright pile in a plane of the lower side said support web being processed during said method on a brush belt having bristles forming a homogeneous surface comprising the tips of said bristles.

5,144,731

AUTOMATIC LAP PIECING METHOD AND AN APPARATUS FOR CARRYING OUT THE SAME

Tosio Sugie, Ogaki; Yoji Yamada, Ichinomiya; Seiji Kobori, Ogaki; Takaomi Hotta, and Yasuhiro Serizawa, both of Shimada, all of Japan, assignors to Kabushikikaisha Hara Shokki Seisakusho, Gifu and Nisshinbo Industries, Inc., Tokyo, both of Japan

PCT No. PCT/JP89/01016, § 371 Date Jun. 8, 1991, § 102(e) Date Jun. 8, 1991, PCT Pub. No. WO91/05096, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 4, 1989, Ser. No. 476,499
Int. Cl.[5] D04H *1/08;* D01G *15/40*
U.S. Cl. 28—117 8 Claims



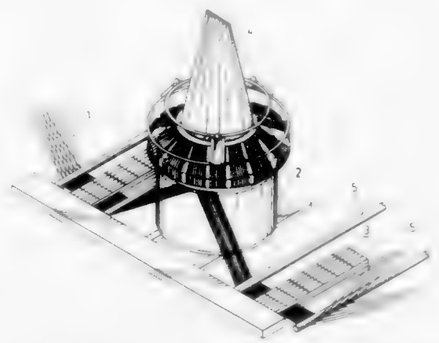
2. An automatic lap piecing apparatus for automatically piecing together a leading end of a lap sheet of a new full lap and a trailing end of a preceding lap sheet on a lap processing textile machine comprising:
a lap feeder having a pair of feed rollers for feeding the lap sheet of a lap supported thereon, and a plate along which the lap sheet is fed to a lap sheet processing mechanism;
a first driving shaft journaled on a frame of the textile machine;
a first driving device for driving the first driving shaft;
a first transmission means mounted on the first driving shaft;
a second transmission means comprising an input means interlocked with the first transmission means, and an output means kinematically with the input means;
a second driving shaft extending parallel to the axes of the feed rollers and movably supporting the input means;
a second driving device for driving the second driving shaft;
a shaft extending parallel to the second driving shaft and supporting the output means;
a second transmission means supporting member having one end movably supporting the shaft supporting the output means so that the shaft supporting the output means can be revolved around the second driving shaft, and the other end fixed to the second driving shaft;
at least one arm having one end fixed to the shaft supporting the output means, and the other end extended toward the circumference of the full lap supported on the lap feeder, the other end of the arm being movable by the shaft from a position near the circumference of the full lap to a position near the plate;
a tubular member fixed to the other end of the arm on the side of the lap so as to extend in parallel to the axes of the feed rollers, and provided with a suction opening extending parallel to the axis of the tubular member; and
a suction device connected to the tubular member to create a suction in the opening of the tubular member.

5,144,732

PE/PP BAG WEAVING MACHINE WITHOUT A POWER LUBRICATION AND COOLING SYSTEM

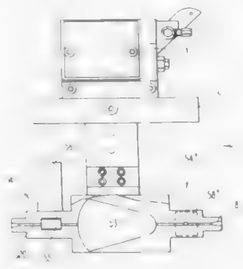
Fan Kuang-Shiung, Chin-Hwa Street, San-Chung, Taiwan 241

Filed Jun. 7, 1991, Ser. No. 711,897
Int. Cl.[5] C08G *63/78;* D03C *13/00*
U.S. Cl. 28—182 2 Claims



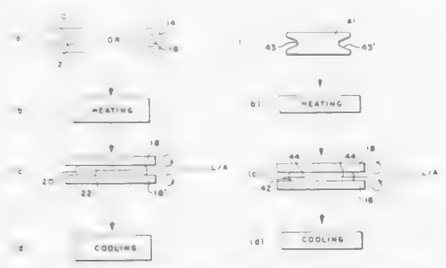
1. In combination with a polyethylene/polypropylene bag weaving machine, a cooling system which includes a slide rod; a water tank in which the slide rod is situated; means for guiding a polyethylene/polypropylene ribbon over the slide rod before the ribbon enters the weaving device; and moistening means on said slide rod for contacting and moistening said ribbon as it passes over the slide rod, whereby brittleness of the ribbon due to high temperature heating in the weaving device is prevented, and whereby printing on the resulting polyethylene/polypropylene bag is facilitated.

5,144,733
APPARATUS FOR BONDING AND LAYING CONDUCTORS
Herbert Emmerich, Waiblingen/Neustadt, Fed. Rep. of Germany, assignor to MERZ Metall-und Kunstatoffverarbeitunge, Frankfurt, Fed. Rep. of Germany
PCT No. PCT/DE89/00400, § 371 Date Dec. 17, 1990, § 102(e) Date Dec. 17, 1990, PCT Pub. No. WO89/12919, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 16, 1989, Ser. No. 623,919
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820636
Int. Cl.[5] H01K 13/06
U.S. Cl. 29—564.2 13 Claims



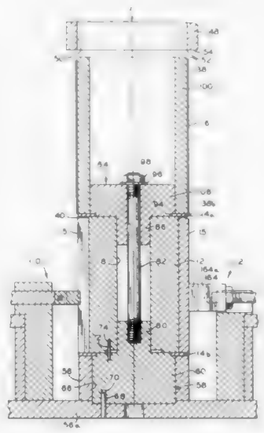
1. An apparatus for the bonding and laying of conductors by means of a multi-axial positioning unit in which the cable is guided in a laying tube and is advanced by a feed unit, characterised by the combination of the following features:
the apparatus comprises a jaw gripper, of which the gripper jaws comprise, extending in the plane of the jaws, recesses which form the laying tube
the feed unit is integrated into the gripper jaws and is reversible;
provided at the ends of the laying tube are shaping elements which centre a contact as the cable is drawn into the laying tube.

5,144,734
METHOD FOR MAKING A VEHICLE SUSPENSION MEMBER
Richard F. Pierman, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Mar. 11, 1991 Ser. No. 666,968
Int. Cl.[5] B23P 13/00
U.S. Cl. 29—173 8 Claims



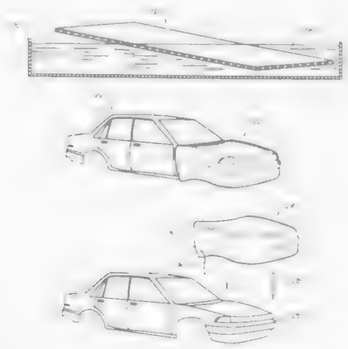
1. A method of making a vehicle suspension member having a longitudinal axis extending therealong between opposite ends thereof and having at least one discontinuity therein that is disposed in a direction generally parallel to the longitudinal axis and effective to divert crack propagation in a direction generally parallel thereto, said method comprising:
(a) providing a member having an enclosed void extending along a central region thereof; and
(b) compressing the member of step (a) so that the surrounding surfaces on opposite sides of the void are compressed together in a manner effective to form the discontinuity therein.
7. A method for making a vehicle suspension member having a longitudinal axis extending therealong between opposite ends thereof and having respective discontinuities extending along opposite edges thereof that are disposed in a direction generally parallel to the longitudinal axis and effective to divert crack propagation in a direction generally parallel thereto, said method comprising:
(a) providing an unfolded member having opposite side walls that are configured substantially concave in cross section; and
(b) compressing the member of step (a) so that the concave side walls are compressed together in a manner effective to form the respective discontinuities extending along opposite edges of the plate.

5,144,735
APPARATUS FOR ASSEMBLING A PERMANENT MAGNET ROTOR
William H. Stark, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Tex.
Division of Ser. No. 459,633, Jan. 1, 1990, Pat. No. 5,040,286, which is a continuation-in-part of Ser. No. 203,942, Jun. 8, 1988, abandoned. This application Jun. 26, 1991, Ser. No. 721,689
Int. Cl.[5] H02K 15/02
U.S. Cl. 29—732 25 Claims



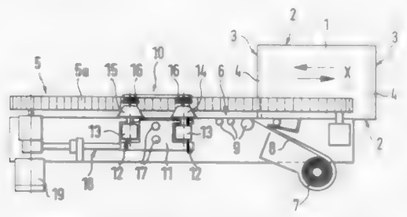
1. Apparatus for making a permanently magnetizable rotor which includes a core, a plurality of magnetizable elements, and a retaining shell, said apparatus comprising:
a. means for positioning and temporarily holding the magnetizable elements in spaced relation around the core;
b. means for axially aligning the core and magnetizable elements with the retaining shell; and
c. means for pressing the retaining shell longitudinally over the core and magnetizable elements to permanently retain the magnetizable elements around the core.

5,144,736
METHOD OF PROTECTING VEHICLE FINISHES
Edward Hanson, 50 Austin Ave., Apt. 412, Hayward, Calif. 94544
Continuation of Ser. No. 571,310, Aug. 23, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 793,194
Int. Cl.[5] B23P 17/04, 25/00
U.S. Cl. 29—403.1 3 Claims



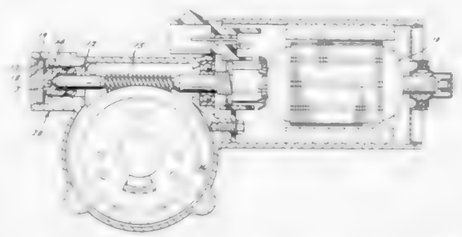
1. A method of protecting the finish of a vehicle during the assembly of the vehicle utilizing waste material
comprising the steps of:
a. immersing a sheet of waste cellulose fiber material in an aqueous bath sufficiently thereby softening said sheet of cellulose fiber material pliable;
b. providing a form having a shape of at least a portion of the vehicle;
c. urging said sheet of a pliable cellulose fiber material onto said form;
d. drying said pliable cellulose fiber material on said form thereby producing a shield of said cellulose fiber material in the shape of said form and with a degree of rigidity; and
e. placing the relatively rigid cellulose fiber material shield on the vehicle to be protected.

5,144,737
APPARATUS FOR APPLYING AND CONTOURING EDGE STRIPS FOR PLATES
Wilhelm Riesmeier, Lübbecke, Fed. Rep. of Germany, assignor to IMA-NORTE Maschinenfabriken Klessmann GmbH & Co., Gutersloh, Fed. Rep. of Germany
Filed Sep. 23, 1991, Ser. No. 764,008
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1990, 4030138
Int. Cl.[5] B23Q 7/14; B23C 3/12
U.S. Cl. 29—564.7 15 Claims



1. A machine for applying and contour milling or cutting of edge strips or laminates at the narrow sides of plate-shaped workpieces, in a continuously travelling manner, with a conveying device on which the plates are transversely arranged such that the respective leading narrow side is arranged perpendicularly with respect to a longitudinal or main axis of travel, and the respective plate overhangingly extends from the conveying device for access, as well as being secured by clamps, the apparatus also including an edge-gluing device and a shaping-milling device both of which, with respect to the longitudinal axis, are sequentially arranged laterally at the conveying device, and with the apparatus further including at least one milling or cutting tool unit, which extends with its axis of rotation transversely with respect to the main axis, as well as parallel, with respect to the plane of the workpiece and means to feed said unit for operatively contacting and contouringly engaging the upper side of the workpiece, the machine having means providing that at the conclusion of travel of the workpiece at the shaping-milling device, the milling unit is lowered, the direction of travel of the conveying device is reversed and during the return thereof, the milling unit engagingly moves along the lower side of the workpiece.

5,144,738
AUTOMATIC RETENTION ADJUSTMENT OF MOTOR ARMATURE ASSEMBLY
Harry H. Oyafuso, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 692,762, Apr. 29, 1991, Pat. No. 5,089,736. This application Oct. 11, 1991, Ser. No. 774,960
Int. Cl.[5] H02K 15/14
U.S. Cl. 29—596 6 Claims

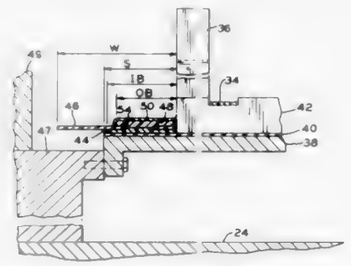


1. A method of assembling a motor having a rotor assembly and a rotor shaft with axial end play including the steps of:
coupling the rotor assembly to a housing having a cavity with an inner diameter;
coupling an axially aligned rotor shaft to the rotor assembly;
slidably mounting a thrust plug within the housing to abut a tapered end tip of the rotor shaft;
forming an axially extending shoulder portion in the thrust plug to establish a predetermined axial distance;
positioning a retaining cap with a disk portion in the housing using an arbor press to align a surface of the disk with the end of the shoulder, the disk portion having a thickness less than the height of the shoulder so that axial movement of the thrust plug is permitted to the extent of the difference between the shoulder height and the thickness of the disk portion.

5,144,739
METHOD OF ESTABLISHING A LEAKAGE CURRENT PATH FOR A COMMUTATOR
Roy L. Balke, and Joseph E. Jack, both of Erie, Pa., assignors to General Electric Company, Fort Wayne, Ind.
Filed Jun. 26, 1991, Ser. No. 721,047
Int. Cl.[5] H01R 43/00
U.S. Cl. 29—597 10 Claims

1. A method of establishing a predetermined desired leakage current path for a dynamoelectric machine commutator, said method comprising the steps of: wrapping an inner band of adherent material about a projecting shell portion of a commutator; wrapping electrically insulative skirt material, having spaced apart openings therein, about the inner band of adher-

ent material with a plurality of such openings positioned over the inner band of adherent material, and arranging the skirt material to project in cantilever fashion as a hoop that projects beyond the projecting shell portion; wrapping an outer band of adherent material about and over the skirt material and estab-



lishing adherent inducing proximity, between the inner and outer bands of adherent material through a plurality of the openings in the skirt material; treating the commutator so as to cause the inner and outer bands of adherent material to bond to one another through said openings and so as to cause the chemical nature of the adherent material to become stabilized.

5,144,740

NUMERICALLY CONTROLLED MACHINE TOOL WITH AUTOMATIC TOOL EXCHANGE DEVICE AND INDEXING DEVICE

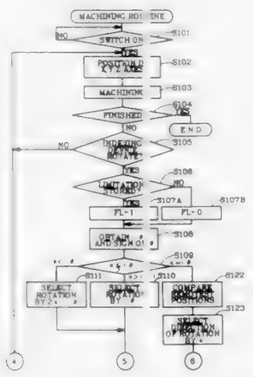
Shoki Yasuda, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 577,256, Sep. 4, 1990, Pat. No. 5,097,587. This application Dec. 4, 1991, Ser. No. 802,211

Claims priority, application Japan, Sep. 4, 1989, 1-228646; Sep. 4, 1989, 1-228647

Int. Cl.[5] B23Q *3/157*

U.S. Cl. 483—4 **7 Claims**



1. A numerically controlled machine tool, comprising:

a spindle head for supporting a spindle such that the spindle is rotatable about a first axis

a tool detachably attached to the spindle such that the tool rotates with the spindle about the first axis;

a table for supporting a work piece such that the tool may contact the work piece;

a frame for supporting the spindle head and table such that the spindle head moves relative to the table along the first axis;

work piece indexing means mounted on the table for holding the work piece and rotating the work piece about a fourth axis orthogonal to a plane including the first axis;

index control means for controlling the work piece indexing means to rotate the work piece from a last position where the tool machined a last surface of the work piece to a next position where the tool will machine a next surface of the work piece by rotating the work piece a rotation angle θ_r in a rotation direction;

selecting means for selecting the rotation direction and the rotation angle θ_r, where

the selecting means calculates a change angle θ representing an angular difference between a last angle at which the tool machined the last surface and a next angle at which the tool may machine the next surface,

the selecting means selects a rotation direction the same as that represented by the change angle θ when an absolute value of the change angle $|\theta|$ is less than π and selects a rotation direction opposite to that represented by the change angle θ when $|\theta|$ is greater than π, and

the selecting means selects a rotation angle θ_r equal to θ when $|\theta|$ is less than π and selects a rotation angle equal to $2\pi - |\theta|$ when $|\theta|$ is greater than π; and

maximum interference amount determination means for determining a maximum interference amount between the spindle head and the table for the rotation angle θ_r and the rotation direction, where the maximum interference amount is a minimum safe distance from the tool in the spindle to the work piece such that contact between the tool in the spindle and the work piece does not occur during rotation of the work piece by the work piece indexing means through the rotation angle in the rotation direction; and

drive means for moving the spindle head along the first axis relative to the table such that the spindle head is the maximum interference amount away from the work piece before the work piece indexing means rotates the work piece about the fourth axis.

5,144,741

METHOD OF MANUFACTURING A MAGNETIC HEAD WITH TWO CANTED GAPS

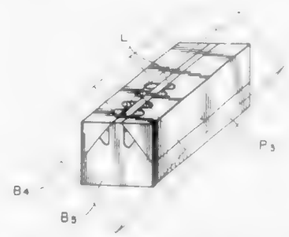
Hiroyuki Ohta, Yamagata, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 539,402, Jun. 18, 1990, Pat. No. 5,084,797. This application Nov. 7, 1991, Ser. No. 789,032

Claims priority, application Japan, Aug. 11, 1989, 1-206832

Int. Cl.[5] G11B *5/42*

U.S. Cl. 29—603 **3 Claims**



1. A method of manufacturing a magnetic head with two canted gaps, comprising the steps of:

cutting winding grooves either in two sides of a core block forming one of its four corners or in joining surfaces of side blocks to be bonded to said two sides of the core block, said core block being almost square in cross section, said two joining surfaces between the core block and the side blocks forming two magnetic gaps;

cutting track grooves either in the core block or in the side blocks such that the cut track grooves will be inclined with respect to said one corner of the core block;

assembling and bonding the side blocks onto said two sides of the core block;

cutting the assembled block such that the distance between the two magnetic gaps is equal to a predetermined value;

slicing the machined assembled block along the slant track grooves into a number of chips; and

winding coils on the side blocks through the winding grooves.

5,144,742

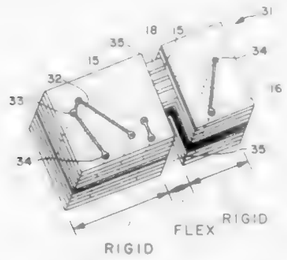
METHOD OF MAKING RIGID-FLEX PRINTED CIRCUIT BOARDS

Gregory L. Lucas, Newark, and Scott K. Bryan, San Jose, both of Calif., assignors to Zycon Corporation, Santa Clara, Calif.

Filed Feb. 27, 1991, Ser. No. 661,983

Int. Cl.[5] H05K *3/36*

U.S. Cl. 29—830 **14 Claims**



1. A method of making a rigid-flex printed circuit board (PCB) having both flexible and rigid sections, comprising the steps of

forming circuitry components on a rigid-flex PCB subassembly including laminated conductive layers on opposite sides of a central insulating layer,

depositing a liquid precursor of flexible insulating layers over the circuitry components in portions of the PCB subassembly corresponding to flexible sections in the rigid-flex PCB,

curing the liquid precursor to form the insulating layers as protective coatings over the circuitry components in the flexible sections, and

finally laminating a plurality of components including at least one rigid-flex PCB subassembly and rigidizing insulating layers to form the rigid-flex PCB.

5,144,743

METHOD OF COMPENSATING FOR TOLERANCES IN A ROTARY MOUNTING HAVING BALL BEARINGS

Hagen Kempas, Illmeusee, Fed. Rep. of Germany, assignor to Bodenseewerk Gerätetechnik GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1990, Ser. No. 630,561

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942335

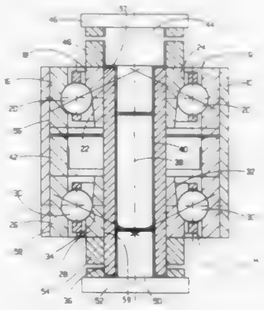
Int. Cl.[5] B21D *53/00*

U.S. Cl. 29—898.09 **7 Claims**

1. A method of compensating for tolerances in a rotary mounting having an axis of rotation and two ball bearings (12, 14) which are located in a bearing member (10) and have inner and outer ball bearing races (16, 26) each, the ball bearings being tensioned against each other, characterized by the method steps:

a) supporting the ball bearing races (16, 26) of a first type on each other through an inner universally movable joint (42), the inner universally movable joint having a pivot point located on the axis of rotation of the rotary mounting,

b) exerting axial forces in opposite directions on the ball bearing races (18, 28) of a second type through outer universally movable joints (48, 54), the outer universally movable joints having pivot points located on the axis of rotation of the rotary mounting,



c) fixing the ball bearing races (16, 26) of the first type in the bearing member (10), while such forces are exerted.

5,144,744

MANUFACTURING METHOD OF A DIAMOND-MESH POLYETHYLENE NETTING SPONGE

Antonio Campagnoli, Via Sidoli 39, Piacenza, Italy

Division of Ser. No. 413,277, Sep. 27, 1989, abandoned. This application Nov. 1, 1991, Ser. No. 785,875

Claims priority, application Italy, Apr. 3, 1989, 44804 A/89

Int. Cl.[5] B23P *11/02*

U.S. Cl. 29—446 **6 Claims**

1. A method of manufacturing a bath sponge, comprising:

stretching a plurality of tubes made of diamond-mesh resilient synthetic netting, in a direction transverse to a longitudinal axis of the tubes;

binding all of the stretched tubes together near a common center of all of the stretched tubes; and

releasing all of the tubes from their stretched condition, whereby the tubes through their resiliency rebound into a rounded sponge shape around the binding of the tubes.

5,144,745

METHOD OF MANUFACTURING ACCELERATION SENSOR

Kazuo Yoshimura; Shigeru Shimozono, and Ryo Satoh, all of Kanagawa, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Jul. 25, 1991, Ser. No. 735,935

Claims priority, application Japan, Aug. 23, 1990, 2-221998

Int. Cl.[5] H01F *7/06*

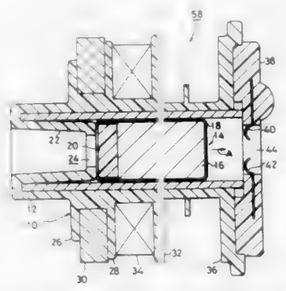
U.S. Cl. 29—602.1 **6 Claims**

1. A method of manufacturing an acceleration sensor, comprising the steps of:

setting, in a mold, a cylindrical body composed of a conductive material and a ring-like attracting body disposed outside an outer periphery of said cylindrical body and composed of a magnetic material;

introducing a resin into said mold, applying the resin along

the outer periphery of said cylindrical body and interposing the resin between said ring-like attracting body and the outer periphery of said cylindrical body to form a molding;
curing the resin in said mold;
taking the molding out of said mold;

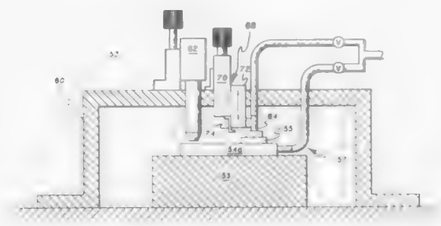


inserting an unmagnetized inertial body into said cylindrical body of said molding;
fitting electrodes to one end of said cylindrical body of said molding; and
magnetizing said inertial body by applying a magnetic field to said inertial body.

5,144,746
METHOD OF ASSEMBLING COMPACT SILICON MODULE FOR HIGH DENSITY INTEGRATED CIRCUITS
James M. McDavid, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 405,088, Sep. 6, 1989, Pat. No. 5,040,052, which is a continuation of Ser. No. 138,227, Dec. 28, 1987, abandoned. This application May 10, 1991, Ser. No. 698,507
Int. Cl.[5] H05K *1/14*
U.S. Cl. 29—830 **11 Claims**

1. A method of assembling a compact integrated circuit module comprising the steps of: flip-chip mounting a plurality of semiconductor devices each having a backside on an interconnection board such that each semiconductor device backside is away from the interconnection board, stacking a plurality of the interconnection boards having semiconductor devices thereon such that the backsides of the semiconductor devices are in contact with an adjacent interconnection board in the stack of interconnecting boards, and interconnecting each interconnection board with an orthogonal connection board at the edge of the stack of interconnection boards.

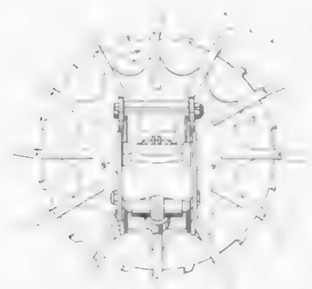
5,144,747
APPARATUS AND METHOD FOR POSITIONING AN INTEGRATED CIRCUIT CHIP WITHIN A MULTICHIP MODULE
Charles W. Eichelberger, Schenectady, N.Y., assignor to Integrated System Assemblies Corporation, Wobourn, Mass.
Filed Mar. 27, 1991, Ser. No. 676,938
Int. Cl.[5] H05K *3/30;* **B23P** *19/00*
U.S. Cl. 29—839 **26 Claims**



1. A method for attaching an integrated circuit chip to an upper surface of a substrate having a fiducial mark thereon, said attaching method utilizing a high accuracy XY table, said table having a first rotational adjustment stage and a second rotational adjustment stage, said first rotational adjustment stage comprising a chip alignment stage for holding and aligning a chip relative to XY table motion, said second rotational adjustment stage comprising a substrate alignment stage, said attaching method further utilizing a chip pickup for removing said chip from said chip alignment stage and for placing said chip on said substrate and a memory means containing desired positional offset information for said chip relative to said substrate fiducial mark, said method comprising the steps of:
(a) placing a substrate on said substrate alignment stage, said substrate having an adhesively coated upper surface;
(b) aligning said substrate relative to XY table motion;
(c) locating and saving in said memory means the position of the fiducial mark on said substrate;
(d) placing a chip on said chip alignment stage;
(e) aligning said chip relative to XY table motion, said chip aligning being accomplished with reference to a characteristic feature of said chip;
(f) energizing said chip pickup to lift said chip from said die alignment stage;
(g) positioning said substrate under said chip by moving said XY table;
(h) recalling from said memory means the stored offset for said chip relative to said fiducial mark on said substrate;
(i) lowering said chip to a desired location on the upper surface of said substrate based on said recalled, chip offset location, and allowing a portion of the weight of said chip pickup to be applied to said chip;
(j) holding said chip pickup against said chip for a period of time to allow said chip to adhesively attach to said substrate; and
(k) releasing said chip from said chip pickup.

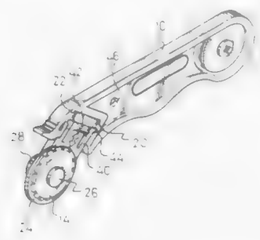
10. Apparatus for accurately positioning a plurality of die on a substrate without reference to a substrate fiducial mark, said apparatus comprising:
first means for positioning a first one of said die relative to a physical feature of said substrate, said first die having a first physical feature to facilitate the subsequent positioning of said plurality of die on said substrate; and
second means operatively associated with and responsive to said first means for accurately positioning the remaining die of said plurality of die on said substrate relative to the physical feature on an upper surface of the first die positioned on said substrate by said first means, wherein said chips are each accurately positioned relative to one another within the tolerances of said second positioning means' capability to recognize said first die's first physical feature.

5,144,748
CLEANING DEVICE
Bror Hult, Flipstad, Sweden, assignor to FMG Timberjack AB, Sweden
PCT No. PCT/SE89/00577, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO90/04502, PCT Pub. Date May 3, 1990
PCT Filed Oct. 19, 1989, Ser. No. 689,911
Claims priority, application Sweden, Oct. 21, 1988, 8803781
Int. Cl.[5] B27G *19/04;* **A01D** *34/84;* **A01G** *23/08*
U.S. Cl. 30—276 **8 Claims**



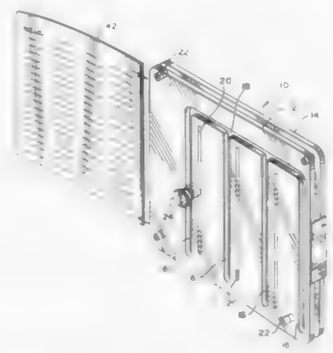
1. A blade protecting device for a cutter assembly having a rotatably blade supported on a shaft mounted in a cutter body, said shaft and said blade being driven by a motor, the blade protecting device comprising: a freely rotatable hub mounted on said cutter body concentrically relative to said shaft and adjacent said blade, and a plurality of blade protecting arms protruding substantially radially from said hub with portions extending beyond an outer periphery of said blade, said protecting arms being equiangularly spaced about said hub.

5,144,749
UTILITY KNIFE
Chien-Tang Chen, No. 93, Hua Tan St., Hua Tan Hsiang, Changhua Hsien, Taiwan
Filed Mar. 30, 1992, Ser. No. 860,456
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—319 **1 Claim**



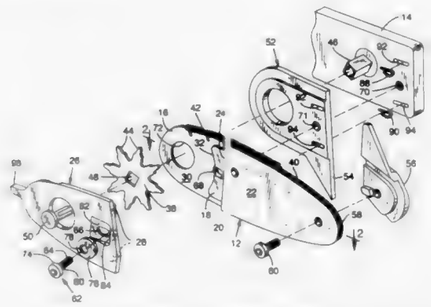
1. A utility knife comprising:
a body which serves as a handle for manipulation;
a bolster protruding from a front portion of said body, extending at an angle downward therefrom;
a channel being formed in said front portion of said body and an angle corresponding to that of said bolster and having an upper pair of notches and a lower pair of notches formed therein, said upper pair of notches being defined as further away from an end of said bolster; and
a blade shield comprising a substantially circular portion and engaging means, said circular porting having a slot formed therein, said engaging means being slidably received in said channel and comprising a pair of resilient arms each having a tab formed on an outside end thereof and a projection, said tabs being engageable with said notches; and
a circular blade having a diameter smaller than that of said circular portion of said blade shield; fastening means such as a screw and a nut fastening said blade shield to said bolster in a slidable manner and fasten said blade to said bolster in a rotatable manner;
whereby when said utility knife is not in use, said tabs are engaged with said lower pair of notches, thereby said circular portion of said blade shield shields said blade; and when it is desired to use said utility knife, a user pushes on said projection, urging said tabs out of said lower pair of notches into said upper pair of notches, thereby moving said blade shield upward and exposing said blade.

5,144,750
LISTING APPARATUS
Linda L. Mandel, 1100 Eckenrode Way, Placentia, Calif. 92670
Filed Oct. 25, 1991, Ser. No. 782,415
Int. Cl.[5] B26F *1/00*
U.S. Cl. 30—368 **6 Claims**



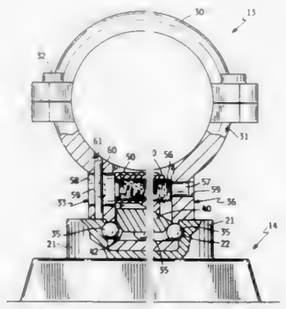
1. A listing apparatus, comprising:
a) a rigid, transparent, plastic coverplate having a coverplate slot system comprising a plurality of interconnected coverplate listing slots being connected by at least one coverplate connecting slot;
b) a rigid backplate having a plurality of backplate slots disposed therein, said rigid backplate being securely disposed in a spaced relationship from said clear plastic coverplate, said backplate slots being aligned with said coverplate listing slots;
c) a spring punch assembly located within said coverplate slot system and slidable therethrough, said spring punch assembly having a punch rod located therein; and,
d) connector means for providing such a spaced relationship between said transparent plastic cover and said rigid backplate so as to accommodate a list to be inserted therebetween,
wherein an operator may insert said list between said rigid backplate and said plastic coverplate, view said list through said plastic coverplate, and selectively indicate items listed on said list, by punching holes in said list.

5,144,751
METHOD AND APPARATUS FOR CONTROLLING SAW CHAIN TENSION
Johann Weber, Estacada, Oreg., assignor to Blount, Inc., Portland, Oreg.
Filed Aug. 9, 1991, Ser. No. 742,902
Int. Cl.[5] B23D 57/02
U.S. Cl. 30—386 12 Claims



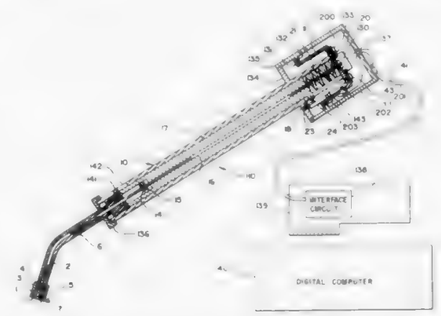
1. A chain saw having a rotatably driven drive shaft, a sprocket mounted on the drive shaft for rotation therewith, a guide bar positioned relative to the sprocket and cooperatively defining an endless guide way, and a saw chain loop mounted on said guide way to be driven by said sprocket around the endless guide way, and mechanism for fitting the saw chain to the guide way comprising:
a mounting member having a fixed relationship to the sprocket, a fastener for fastening the guide bar to the mounting member and being movable between first and second fastening positions, in said first fastening position said guide bar being slidable relative to said sprocket to extend the length of the guide way to the maximum length permitted by the length of the saw chain loop and in the transition of movement of the fastener to said second fastening position said guide bar being urged to a predetermined retraction of said guide bar relative to said sprocket.

5,144,752
SELF CENTERING SIGHT MOUNT
Gregg M. Boeke, 1321 Centennial Dr., No. 301, Farmington, Minn. 55024, and Mark Lee 9901 France Ct., Lakeville, Minn. 55044
Filed Aug. 12, 1991, Ser. No. 743,988
Int. Cl.[5] F41G 1/38
U.S. Cl. 33—247 13 Claims



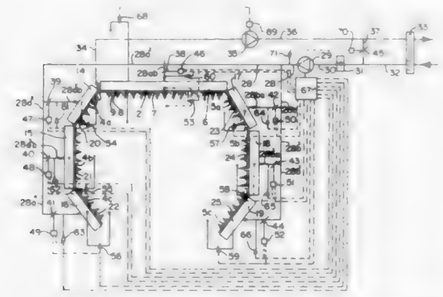
1. A detachable sight mount for vertically and concentrically centering a telescopic sight on a weapon comprising:
a mounting block for attaching to a weapon;
a mounting ring located on said mounting block for receiving a removable mounting post, said mounting ring including an annular socket;
a mounting post for engaging said mounting ring, said mounting post having a central bore with a central axis, said mounting post having a plurality of circumferentially spaced openings;
a stirrup for movement along said central axis;
an anvil located in said stirrup, said anvil having a threaded opening;
a threaded member having a lengthwise direction, said threaded member for rotatable mounting in said mounting post;
means for preventing lengthwise displacement of said threaded member, said threaded member having threads to move said anvil perpendicular to the central axis of said mounting post when said threaded member is restrained from movement along its length by said means for preventing lengthwise displacement of said threaded member; and
a plurality of balls located in said mounting post, each of said balls located proximate one of said openings so that when said stirrup is moved in a first axial direction it forces said balls radially outward from said mounting post until said balls engage said annular socket to thereby vertically and concentrically center said mounting post in said mounting ring to permit the remounting of a telescopic sight without having to realign the scope.

5,144,753
PROBE INSTRUMENT
Gordon J. Murphy, 638 Garden Ct., Glenview, Ill. 60025
Filed Mar. 25, 1991, Ser. No. 674,464
Int. Cl.[5] A61C 19/04
U.S. Cl. 33—514 11 Claims



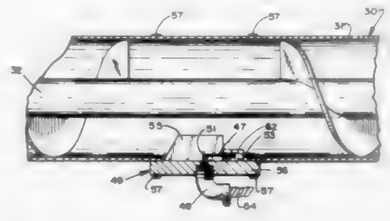
1. A probe instrument for measuring the depth of a pocket in a variety of different kinds of material, including but not restricted to human tissue, said instrument comprising:
a handle having a front end and a rear end;
a first probe member being movably mounted within a first sheath which is movably mounted within said handle, said first probe member terminating externally of said handle in a front end of said first probe member and internally within said handle in a rear end of said first probe member and said first sheath terminating externally of said handle in a front end of said first sheath and internally within said handle in a rear end of said first sheath;
a second probe member being movably mounted within a second sheath which is movably mounted within said handle, said second probe member having a front end so positioned that it is normally in contact with said rear end of said first probe member and said second probe member being so aligned that it can transmit longitudinal force to said rear end of said first probe member and said second sheath so positioned that its front end is normally in contact with said rear end of said first sheath and that it can receive longitudinal force from said rear end of said first sheath;
elastic restraining means mounted within said handle in such a manner as to tend to move said second sheath forward relative to said handle and hold said front end of said second sheath against said rear end of said first sheath, thus tending to move said first sheath forward relative to said handle until a projection on said first sheath inside said handle contacts a stop on said handle, thereby returning said front end of said first sheath to a reference position relative to said handle.
displacement sensing means mechanically connected to said second sheath and to said handle and being responsive to displacement of said second sheath relative to said handle for generating a first output signal indicative of said displacement of said second sheath relative to said handle; and
force sensing means mechanically connected to said handle and to said rear end of said second probe member and being responsive to longitudinal force applied to said front end of said first probe member and transmitted through said first probe member and said second probe member to said force sensing means for generating a second output signal indicative of the magnitude of said force, to indicate when said front end of said first probe member is pressing against the bottom of a pocket, with the result that, if said front end of said first probe member and said front end of said first sheath are initially aligned and then said front end of said first sheath is held in a fixed position against the edge of said pocket and said handle is slid along said second sheath, forcing said first probe member forward out of said first sheath until said front end of said first probe member is pressing against the bottom of said pocket by virtue of force transmitted from said handle to said first probe member via said force sensing means and said second probe member, said first output signal indicates the depth of said pocket at the probe force indicated by said second output signal.

5,144,754
METHOD FOR CONTROLLING THE SUPPLY AND THE DISCHARGE OF HOT AIR TO AND FROM, RESPECTIVELY, A BLOWING TUNNEL
Anders Persson, Växjö, Sweden, assignor to ABB Flakt AB, Sweden
PCT No. PCT/SE89/00237, § 371 Date Dec. 27, 1990, § 102(e) Date Dec. 27, 1990, PCT Pub. No. WO89/11074, PCT Pub. Date Nov. 16, 1989
PCT Filed Apr. 27, 1989, Ser. No. 602,265
Claims priority, application Sweden, May 2, 1988, 8801648
Int. Cl.[5] F26B 3/00
U.S. Cl. 34—29 7 Claims



1. A method for controlling the supply and the discharge of gases to and from, respectively, a funnel-shaped arrangement (1) for treating equipment, said arrangement being divided longitudinally into a number of sections each of which is provided with a plurality of nozzles (7,20,21,22,23,24,25) which are substantially evenly distributed over the curved inner surface of the section and through which the gases are supplied and blown against the equipment passing through said arrangement, characterized by the steps of measuring the pressure drop of the gases across the nozzles (7,20,21,22,23,24,25), measuring the temperature of the gases before the nozzles, comparing the measured pressure drop values with desired values corresponding to the prevailing temperature, and supplying a pressure signal to first pressure changing means (29) for varying as required the supply of gases to said arrangement (1).

5,144,755
GRAIN DRYER CONTROL SYSTEM AND METHOD USING MOISTURE SENSOR
Keith Braun, Northwood; Larry Stille, Rockford, both of Iowa, and Dennis Brumwell, Bloomington, Minn., assignors to David Manufacturing Company, Mason City, Iowa
Continuation of Ser. No. 509,999, Apr. 16, 1990, abandoned, which is a continuation of Ser. No. 936,283, Dec. 1, 1986, Pat. No. 4,916,830. This application Dec. 4, 1991, Ser. No. 803,751
Int. Cl.[5] F26B 13/10
U.S. Cl. 34—52 19 Claims



1. A control system for a drying system of the type which includes a drying bin, means for circulating drying air therethrough, and a discharge auger for removing dried particulate material from the bin, comprising:
(a) discharge particulate material moisture sensing means including a sensor assembly positioned inside of said discharge auger for directly sensing the moisture content of particulate material in said discharge auger, said moisture sensing means including capacitive means; and
(b) control means connected to said discharge particulate material moisture sensing means and said discharge auger for controlling operation of said discharge auger.

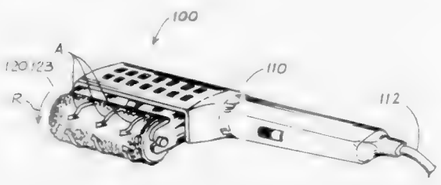
5,144,756
BLOW DRYER APPARATUS WITH HEAT ABSORBING AND LIQUID DISPERSING ACCESSORIES FOR PERSONAL AND INDUSTRIAL USE
Robert B. Miscione, 6311 Barcelona Ct., Unit 1017, Tucson, Ariz. 85704
Filed Jan. 22, 1992, Ser. No. 824,155
Int. Cl.[5] F26B 19/00
U.S. Cl. 34—60 15 Claims

1. A blow dryer appliance apparatus, said apparatus comprising:
a blow dryer member; and
a detachable accessory member, said detachable accessory member comprising a mechanical interface portion and at least one accessory element, said mechanical interface portion having a first attachment means for facilitating detachable securement to said blow dryer member, said at least one accessory element comprising a heat absorbing element portion having a perforated body member for uniformly distributing hot air emanating from said blow dryer member and enhancing performance of a predeter-

mined task involving a combined use of said blow dryer and said heat absorbing element portion,

said at least one accessory element comprises at least one roller accessory element;

said mechanical interface portion further comprises a second attachment means for facilitating rotational securement to said at least one roller accessory element, said second attachment means comprising a plurality of laterally spaced, bearing portions; and



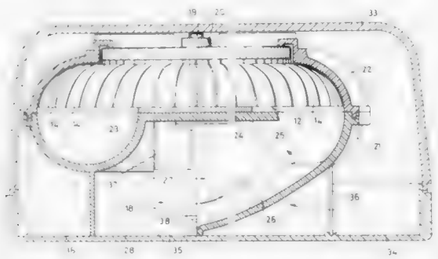
said at least one roller element comprises said heat absorbing element portion and said perforated body member, said perforated body member being formed as a longitudinally flexible body having respective shaft portions protruding at opposing ends, each of said shaft portions being rotationally secured by said bearing portions to facilitate roller action.

5,144,757

HAIR DRYER WITH SPIRAL BLOWER

Pasquale Sasso, Saronno, Italy, assignor to Elite S.r.l., Senago, Italy

Filed Dec. 4, 1990, Ser. No. 621,962
Int. Cl.[5] F26B *21/06*; A45D *20/00*
U.S. Cl. 34—97 13 Claims



1. A hair drying apparatus having an air blower of the type having a scroll, internally provided with a fan having a rotation axis and radial blades with flat lower edges shaped on the upper part to adapt to the scroll the fan being keyed onto the shaft of an electric motor, the scroll defining a spiral path with a substantially radial initial air inlet aperture below the scroll and a final air outlet aperture leading into a tangential extension duct containing electric heating elements, the initial air inlet aperture opening from a chamber disposed below the scroll having a circumferential wall with an air inlet opening, said motor protruding centrally into said chamber so as to be lapped by air moving from said air inlet opening to the initial air inlet aperture, characterized in that the initial air inlet aperture is disposed on a plane substantially parallel to the fan rotation axis, and is connected to the inside of the scroll by an air flow passage having an inclined surface constituting a substantial extension of said spiral path of the scroll.

5,144,758

APPARATUS FOR DRYING A WEB

Borgeir Skaugen, 3669 Oak La. Dr., and Gregory L. Wedel, 761 Morning Glory La., both of Beloit, Wis. 53511

Continuation-in-part of Ser. No. 485,681, Feb. 27, 1990, Pat. No. 5,065,529, and a continuation-in-part of Ser. No. 167,672, Feb. 11, 1988, abandoned, and a continuation-in-part of Ser. No. 201,705, Jun. 2, 1988, abandoned, and a continuation-in-part of Ser. No. 230,627, Aug. 10, 1988, Pat. No. 4,945,655, and a continuation-in-part of Ser. No. 235,394, Aug. 23, 1988, Pat. No. 4,918,836, and a continuation-in-part of Ser. No. 243,742, Sep. 19, 1988, Pat. No. 4,980,979, and a continuation-in-part of Ser. No. 244,774, Sep. 14, 1988, Pat. No. 4,985,379, and a continuation-in-part of Ser. No. 417,978, Oct. 5, 1989, Pat. No. 4,970,805, which is a continuation-in-part of Ser. No. 14,569, Feb. 13, 1987, Pat. No. 4,934,067, which is a continuation-in-part of Ser. No. 431,961, Nov. 3, 1989, Pat. No. 5,101,577, which is a continuation-in-part of Ser. No. 429,730, Oct. 26, 1989, which is a continuation of Ser. No. 14,569, Feb. 13, 1987, Pat. No. 4,934,067. This application Nov. 14, 1991, Ser. No. 792,108
Int. Cl.[5] F26B *13/08*
U.S. Cl. 34—117 10 Claims

1. A single tier drying section for drying a web comprising:

a first plurality of drying cylinders;

a first plurality of vacuum rolls, each vacuum roll of said plurality of vacuum rolls being disposed below and between adjacent drying cylinders of said first plurality of drying cylinders and being disposed in close proximity thereto;

a second plurality of drying cylinders disposed downstream relative to said first plurality of drying cylinders;

a second plurality of vacuum rolls, each of said vacuum rolls of said second plurality of vacuum rolls being disposed above and between adjacent drying cylinders of said second plurality of drying cylinders and being disposed in close proximity thereto;

said first plurality of drying cylinders having axes of rotation which extend generally horizontally in a plane;

said second plurality of drying cylinders having axes of rotation extending generally horizontally in a further plane; and

said plane and further plane being at different elevations.

5,144,759

SHOE-COVERING MEMBERS

Lawrence L. Mascotte, 9106 SE. 82nd, Portland, Oreg. 97266

Continuation of Ser. No. 315,586, Feb. 27, 1989, abandoned.
This application May 31, 1990, Ser. No. 529,774
Int. Cl.[5] A43B *3/16*
U.S. Cl. 36—71 R 6 Claims

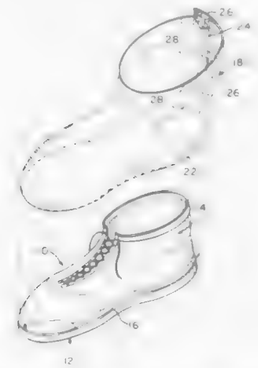
1. A shoe and a shoe-covering member therefor, comprising:

a shoe having a sole section and an upper section, said sole section having a sealing member extending entirely along a side surface thereof;

a covering member of a water-impermeable material having a shape conforming to the upper section of said shoe and being positionable thereover;

a matable sealing member extending entirely along a bottom end of said covering member and being matably and sealingly engageable with said sealing member of said sole section of said shoe to prevent water from passing through

the mated sealing members to the upper section of the shoe; and



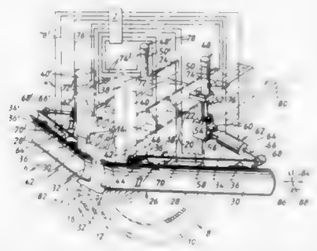
means on said covering member for snugly maintaining the covering member in engagement with the upper section of the shoe.

5,144,760

TRENCHER

Brian E. McGuire, Oldham, England, assignor to British Gas PLC, England

Filed Mar. 18, 1991, Ser. No. 670,896
Claims priority, application United Kingdom, Mar. 26, 1990, 9006710.9
Int. Cl.[5] E02F *5/08*
U.S. Cl. 37—80 A 13 Claims



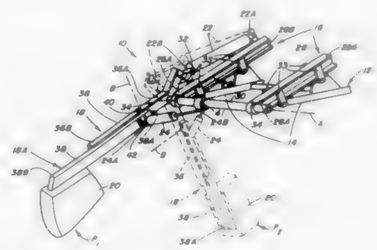
1. A trencher comprising a powered vehicle for driving under power along the ground, said vehicle being provided with powered rotating digging apparatus, said digging apparatus being propelled along the ground by said vehicle and rotated under power for digging in the ground a trench having a length which increases as said vehicle and digging apparatus progress, said vehicle being provided with a plough means, movable with said vehicle so as to encounter spoil newly dug from the trench and lying on the ground surface, for pushing said spoil aside from the trench being dug, said plough means comprising at least one plough blade mounted on said vehicle by mounting means allowing relative movement between said blade and said vehicle, powered vibratory motion producing means for applying vibratory output motion therefrom to said plough blade to cause said plow blade to vibrate on said mounting means relative to said vehicle and the spoil, and, taking the direction of progress of the vehicle as progress along a forward path, said plough blade having in relation to said forward path, a leading end and an opposite trailing end to which said plough blade extends from said leading end along a direction diverging from said path, said vehicle further including a first fluid powered actuating means for raising and lowering said leading end of the plough blade relative to the digging apparatus, and a second fluid powered actuating means for raising and lowering the trailing end of said plough blade relative to the digging apparatus.

5,144,761

FRONT END LOADER-MOUNTED DITCH HOE ATTACHMENT

Garland J. Fitzwater, P.O. Box 126, Protection, Kans. 67127

Filed Oct. 24, 1991, Ser. No. 781,890
Int. Cl.[5] E02F *3/76*
U.S. Cl. 37—117.5 12 Claims



1. A ditch hoe attachment, comprising:

(a) an attaching frame having a mounting structure defining a first rotational axis and having a first member mounted to said mounting structure for rotation about said first rotational axis and a second member attached to said first member and extending therefrom in a radial relation to said first rotational axis;

(b) an elongated arm having separate rear and front portions, said rear portion being rigidly attached to said first member of said attaching frame for rotational movement of said elongated arm with said first member about said first rotational axis, said front portion being mounted to and supported by said rear portion of said elongated arm at an intermediate location along said rear portion between front and rear ends of said rear portion for rotational movement relative to said rear portion about a second rotational axis being oriented generally transverse to said first rotational axis;

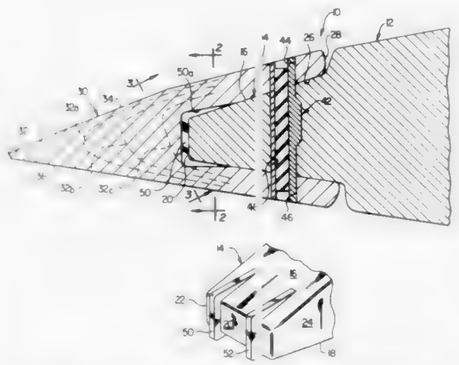
(c) a scoop mounted to an outer end of said front portion of said arm and capable of digging into and filling with earth;

(d) a first actuator mounted to and extending between said mounting structure of said attaching frame and said second member thereof and being operable through respective forward and reverse strokes to rotate said first member, via said second member, and said elongated arm with said first member respectively from a forward position to a rearward position and back to said forward position; and

(e) a second actuator mounted between said first member of said attaching frame and said front portion of said elongated arm and being operable through respective forward and reverse strokes to rotate said front portion of said elongated arm relative to said rear portion thereof respectively from an aligned position relative to said rear portion to a transverse position relative to said rear portion and back to said aligned position;

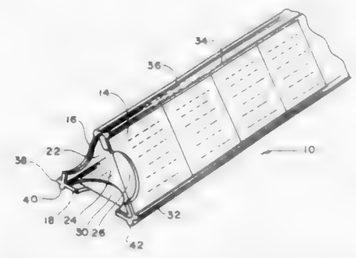
(f) said transverse orientation of said first and second rotational axes relative to one another and said operation of said first and second actuators through said respective forward strokes followed by said respective reverse strokes causing successive movement of said scoop from an initial position along a rearward loading path in which said scoop digs the ground and fills with earth and a forward unloading path, being laterally offset from said rearward loading path, in which said scoop discharges the earth and returns to said initial position.

5,144,76.
WEAR INDICATING AND TOOTH STABILIZING SYSTEMS FOR EXCAVATING TOOTH AND ADAPTER ASSEMBLIES
Howard W. Robinson, Grapevine, Tex., assignor to GH Hensley Industries, Inc., Dallas, Tex.
Filed Apr. 16, 1990, Ser. No. 510,285
Int. Cl.[5] E02F *9/28*
U.S. Cl. 37—141 T 3 Claims



1. A tooth assembly for an earth working implement comprising
a generally elongated adapter attached at one end to the implement and having a wear point supporting nose at the other end,
a generally elongated integrally cast metal wear point having an earth penetrating surface at one end and an interior cavity for receiving the nose of the adapter at the other end,
the nose including primary load bearing surfaces for bearing, during normal operation, thrust loads imposed axially on the earth penetrating surface of the point, upwardly and downwardly directed bending loads imposed on the point, and side loads imposed on the point, the load bearing surfaces substantially defining the exterior surface of the nose,
the wear point including load transmitting surfaces within the cavity mating with each of the load bearing surfaces on the nose during normal earth working operations, these load transmitting surfaces defining a load pocket within the cavity of the wear point corresponding essentially to the exterior surface of the nose,
the tooth assembly being mounted on the implement such that a normal wear surface progresses during use from the earth penetrating surface toward and would eventually intersect the load transmitting surfaces of the load pocket and thereby wear one or more primary load bearing surfaces on the adapter nose if the wear point is not replaced, and
wear indicating means including at least one cavity formed within the metal of the wear point and extending from the load pocket towards the wear surface which is intersected by the progressing wear surface substantially before the wear surface intersects the load pocket and a mating load bearing surface and provides a visual indication of the state of wear point so that the wear point can be replaced before the load bearing surfaces are damaged by further wear.

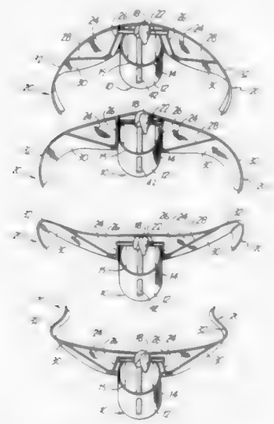
5,144,763
STAND FOR DISPLAYING COMPUTER KEYBOARD FUNCTION KEY GUIDES
William M. Calhoun, 6086 S. Kingston Cir., Englewood, Colo. 80111
Continuation of Ser. No. 527,936, May 24, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 824,730
Int. Cl.[5] G09F *3/18, 11/02*
U.S. Cl. 40—506 19 Claims



9. A stand for displaying three computer keyboard function key guides, each guide comprising a substantially rectangular-shaped sheet having function information designated thereon, the stand comprising:
a tubular sheath having three substantially planar, rectangular-shaped sides, each side being fashioned of transparent material, the sheath having an open longitudinal end through which the guide may be selectively inserted into or removed from the interior of the sheath, the interior surfaces of the sides being shaped so as to receive the guides in substantially abutting contact whereby the function information designated on the guides may be viewed through the side in which the guide on which it is designated is inserted, each side being bounded top and bottom by a longitudinally extending rib along an outside surface of the sheath, the ribs being dimensioned to support the sheath and to support a key guide on an outer surface of each side; and
maintaining means for maintaining search guide in substantially abutting contact with at least one side.

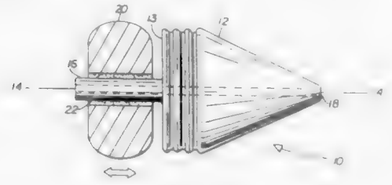
5,144,764
DECOY WITH WIND-ACTUATED WINGS
Timothy D. Peterson, 2071 Carroll Ave., St. Paul, Minn. 55104
Continuation of Ser. No. 561,702, Aug. 2, 1990, abandoned. This application Jun. 6, 1991, Ser. No. 711,593
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—3 11 Claims

1. A decoy having a flapping wing action to attract fowl, comprising:
an elongate body, including means for orienting the body into the wind;
a pair of flexible wings; and
mounting means joining each wing to the body and permitting each wing to move with respect to the body between lower and upper positions such that the wing in its lower position defines an airfoil shape which generates lift as air passes thereover to raise the wing, the air foil shape of the wing being lost as the wing is raised until the wing reaches its upper position, the wing in its upper position being oriented in a stall configuration causing the wing to fall,



whereby said wings oscillate in a flapping motion between the lower and upper positions in response to air flow.

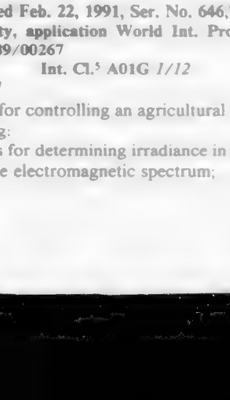
5,144,765
DUAL NOISE MAKING DEVICE FOR LURES
James R. Keeton, Rte. 1 Box 291, Parsons, Tenn. 38363
Filed Jul. 19, 1991, Ser. No. 733,196
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.31 19 Claims



1. A lure type device adapted for use by a fisherman, said device comprising a non-floating body member having a tapered front portion and a central axis, said body member being readily installed upon a fishing line and having an elongate portion of reduced diameter extending rearwardly from said tapered front portion, along such central axis, a collar loosely disposed on said elongate portion, said collar moving with respect to said elongate portion as said device moves through the water, with the movement of said collar along said elongate portion creating a noise attractive to fish.

5,144,766
LIQUID ABRASIVE CUTTING JET CARTRIDGE AND METHOD
Mohamed A. Hashish, Kent; John H. Olsen, Vashon Island; Katherine J. Zarin, Kent, and Glenn A. Erichsen, Everett, all of Wash., assignors to Flow International Corporation, Kent, Wash.
Continuation of Ser. No. 431,617, Nov. 3, 1989, Pat. No. 5,092,085. This application Feb. 26, 1992, Ser. No. 841,717
Int. Cl.[5] B24C *5/04*
U.S. Cl. 51—439 4 Claims

1. A quick disconnect seal assembly having a longitudinal axis, said assembly comprising:
a. a fluid containing first member defining a fluid containing first region having a first interface area, said first member having a contact surface surrounding said fluid region at said first interface area;
b. a fluid containing second member having a side wall defining a seal and fluid containing second region and having a second interface area which, with said second member adjacent to said first member, is adjacent to and communicates with said first interface area;
c. an annular seal housing positioned in said second region adjacent to said side wall and having an annular interface seal surface located to be adjacent to the contact surface of the first member;
d. said seal housing having at said interface seal surface an annular first seal means to provide a low pressure seal at said interface seal surface between the contact surface of

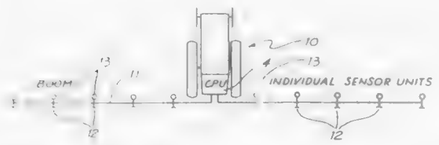


the first member and the interface seal surface of the seal housing;
said seal housing having a circumferential high pressure second seal means surrounding said seal housing at a location spaced from said interface seal surface so as to form a second seal between an annular outer surface of said seal housing and said side wall;
f. said seal housing having a fluid pressure surface generally transverse to said longitudinally axis and facing oppositely to said interface seal surface in a manner that fluid pressure in said second fluid region bears against said pressure surface to push said seal housing toward said contact surface of the first member, thus forming a seal around said interface areas, and with fluid in said second region being contained by said second seal.

5,144,767
CONTROLLER FOR AGRICULTURAL SPRAYS
Keith McCloy, Pasig, Philippines, and Warwick Felton, Tamworth, Australia, assignors to The Minister for Agriculture & Rural Affairs for the State of New South Wales, Sydney, Australia
Filed Feb. 22, 1991, Ser. No. 646,790
Claims priority, application World Int. Prop. O., Jun. 20, 1989, PCT/AU89/00267
Int. Cl.[5] A01G *1/12*
U.S. Cl. 47—1.7 4 Claims

1. Apparatus for controlling an agricultural spray, the apparatus comprising:
sensing means for determining irradiance in first and second bands of the electromagnetic spectrum;

sensing means for determining the radiance of a target area in the first and second bands; and



means for controlling a spray in accordance with a determination of the relationship between the ratios of the radiance to the irradiance in each band respectively.

5,144,768

METHOD AND APPARATUS FOR PLANT CULTURE

Kazuo Hiyama, 8184 E. Adams Ave. Howard K. Hiyama, 8140 E. Adams Ave., and Dean H. Hiyama, 431 E. Curtis Ave., all of Fowler, Calif. 93625

Filed Nov. 29, 1989, Ser. No. 442,733
Int. Cl.[5] A01B *79/28*
U.S. Cl. 47—46 2 Claims

1. A method of seasonally growing and harvesting crops from the canes of vines wherein the canes are grown in a first growing season and the crops are grown from said canes in a second growing season thereafter, the method comprising the steps of:

A. growing the vines in supported relation on a structure having a pair of support portions projecting laterally from the vines in different directions;

B. permitting said canes of the vines to grow in a first growing season;

C. moving the first set of canes grown in the first growing season onto one of said support portions of the structure;

D. permitting a second set of canes of the vines to grow in a second growing season;

E. moving the second set of canes onto the other of said support portions of the structure;

F. permitting said first set of canes to grow a crop in said second growing season; and

G. harvesting the crop grown by said first set of canes in said second growing season.

5,144,769

AUTOMATIC DOOR OPERATING SYSTEM

Soushichi Koura, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Nov. 27, 1990, Ser. No. 618,416
Claims priority, application Japan, Nov. 27, 1989, 1-136085[U]
Int. Cl.[5] E05F *11/00*
U.S. Cl. 49—360 9 Claims

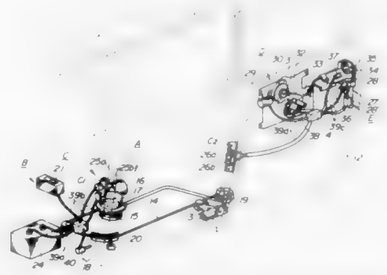
1. An automatic door operating system for use in a motor vehicle having a vehicle body and a sliding door, comprising:

a reversible electric motor for moving said door in one or the other direction upon energization thereof, said motor being connected to said door in such a manner that movement of said door includes rotation of said motor;

a control device for controlling operation of said motor;

a door opening control switch connected to said control device, said door opening control switch, when closed, operating said motor to run in a direction to move said door in a door opening direction;

a door-open detecting switch connected to said control device, said door-open detecting switch, when said door comes to a full-open position, preventing the supply of electricity to said motor even when said door opening control switch is closed, such that no electricity is supplied to said motor when said door reaches the full-open position;



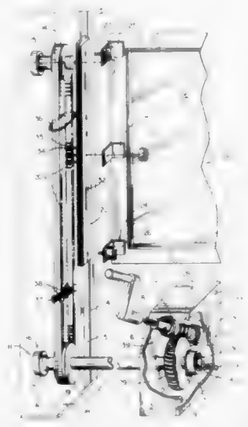
wherein said control device comprises a motor drive circuit which has said motor connected thereto, said motor drive circuit forming an open circuit when said door opening control switch is opened and no electricity is supplied to said motor, but forming a closed circuit when said door opening control switch is closed and said door-open detecting switch detects the full-open condition of said door.

5,144,770

WINDOW OPERATOR

Kenneth Kraus, 17 Elizabeth Pl., Armonk, N.Y. 10504, and Edward J. Page, 454 Crestwood Ave., Hackensack, N.J. 07601

Filed Aug. 21, 1990, Ser. No. 570,929
Int. Cl.[5] E05F *11/00*
U.S. Cl. 49—360 19 Claims



1. A window operator, for a window having an opening filled by one or more slidable sash units characterized by

(a) a track (2) of length similar to that of the window opening, having a generally closed configuration sprocket and belt chamber relieved by a longitudinal gap of defined dimension and smoothly configured gap-defining edges

(4,5), the track having a base end and a distal end opposite said base end;

(b) a traveler (22) of general H-configuration captured slidingly in the defined gap of said track (2) and attachable to a window sash (23);

(c) an idler pulley (14) mounted near the distal end of said track (2), to rotate in a plane generally perpendicular to the sash of said window;

(d) a sprocket and belt set (19,20) mounted within said sprocket and belt chamber of said track (2), said sprocket and belt set (19,20) including a sprocket pulley (19) mounted near the base end of said track (2), to rotate within the sprocket and belt chamber of said track (2) in general alignment with said idler pulley (14), rotationally locked onto a sprocket shaft (21) which is supported for easy rotation by a bearing (17) on the exterior of said track (2) and extends through an assembly opening to the outside of said track (2);

(e) means mounting said traveler (22) to the sash (23) of said window;

(f) a crankshaft housing (3) mounted adjacent said track (2) to form a worm gear mechanism and sprocket chamber for said sprocket shaft (21) and its related gears (19,28,29), being an extrusion section having a base and seven sides, two of which form parallel crankshaft bearing faces (6,7) and have locating holes (31,32) for crankshaft bearings (17), and having a plurality of screw bosses (9);

(g) means mounting a crankshaft (8), with worm gear set (28,29) and one or more thrust bearings (17) holding said crankshaft longitudinally within said worm gear mechanism and sprocket chamber;

(h) crankshaft housing cover (33) providing location and thrust support for sprocket shaft (21) bearing (17), and

(i) means mounting said crankshaft housing (3) to said track (2);

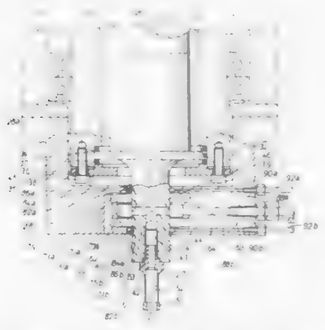
whereupon rotation of said crankshaft (8) provides via said worm gear set (28,29) and sprocket and belt set (19,20) a selective sliding motion to traveler (22) and to sash (23).

5,144,771

LIQUID SUPPLY SYSTEM OF AN ULTRASONIC MACHINE

Yuji Miwa, Chita, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 28, 1991, Ser. No. 646,204
Claims priority, application Japan, Feb. 6, 1990, 2-26777
Int. Cl.[5] B24B *55/02*
U.S. Cl. 51—59 SS 20 Claims



1. In an ultrasonic machine including an ultrasonic horn connected with a piezoelectric transducer and rotatably supported by a machine body, the ultrasonic horn having a cylindrical portion formed on the outside thereof and a machining liquid passage for supplying machining liquid formed on the inside thereof, a tool mounted on the ultrasonic horn and provided with a bore inside thereof that communicates with the machining liquid passage, the improvement for minimizing undesired splattering and leakage of the machining liquid comprising:

a) a fixed side member fixed to the machine body and having a machining liquid supply passage that receives a supply of the machining liquid from a machining liquid supply means and an inner surface that rotatably mates with an outer surface of the cylindrical portion;

b) an annular groove formed in said inner surface of said fixed side member, said annular groove communicating with the machining liquid passage;

c) a horn communication passage provided in the ultrasonic horn and having an opening in said outer surface of the cylindrical portion of the ultrasonic horn disposed so as to be opposed to said annular groove, said horn communication passage communicating with the machining liquid passage;

d) a first thin portion provided near said opening and formed by said outer surface of the cylindrical portion and said inner surface of said fixed side member;

e) a pressure drop chamber provided near said first thin portion and formed between said outer surface of the cylindrical portion and said inner surface of said fixed side member;

f) a drain provided in said fixed side member and communicating between said pressure drop chamber and an outside drain opening;

g) a second thin portion provided near said pressure drop chamber and formed by said outer surface of the cylindrical portion and said inner surface of said fixed side member; and,

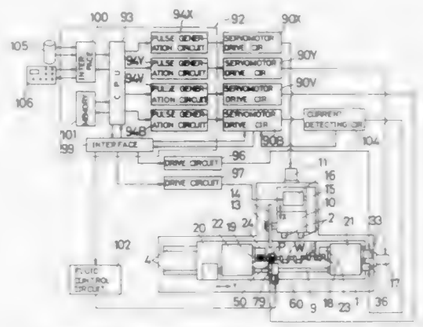
h) an air supply passage provided in said fixed side member and communicating with said second thin portion.

5,144,772

METHOD AND APPARATUS FOR ANGULARLY INDEXING A CRANKSHAFT

Taisuke Kawamata, Okazaki; Toshio Maruyama, Kariya; Hidetaka Irie, Okazaki; Masayoshi Inoue, Nagoya; Shinji Nishio, Kariya, and Koichi Murayama, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 4, 1990, Ser. No. 518,948
Claims priority, application Japan, May 7, 1989, 1-114376
Int. Cl.[5] B24B *5/42, 47/22*
U.S. Cl. 51—105 SP 14 Claims



1. A method for indexing a crankshaft supported by a chucking device of a machine tool, wherein said chucking device is provided with a journal supporting member for supporting a journal portion of said crankshaft at an eccentric position with respect to the rotational axis of a work spindle, an indexing member rotatably supported on said chucking device and having an engaging member engaging with one end of said crankshaft for rotational torque transmission, indexing motor means for generating a rotational torque, a rotational torque

transmission mechanism for transmitting the rotational torque from said indexing motor means to said indexing member and a clamp mechanism for clamping said crankshaft with respect to said chucking device, said method comprising:

a step for placing said crankshaft in a predetermined reference angular position;

a step for clamping said crankshaft with respect to said chucking device by actuating said clamp mechanism;

a step of providing limit means for limiting a rotational angle of said indexing motor means;

a step for rotating said indexing motor means in a predetermined direction until further rotation is limited by said limit means, so that the load of said indexing motor means exceeds a predetermined level and

a step for regarding the present position of said indexing member as the origin of a coordinate system for rotation of said indexing member.

5,144,773

HONING OR GRINDING TOOL AND MEASURING DEVICE FOR MEASURING WEAR

Gerhard Flores, Ostfildern; Helmut Reisser, and Konrad Lex, both of Geretsried, all of Fed. Rep. of Germany, assignors to Kadia-Diamant Maschinen-und Werkzeugfabrik O. Kopp GmbH & Co., Nurtingen, Fed. Rep. of Germany

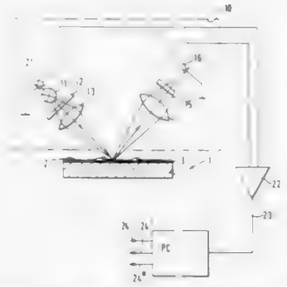
PCT No. PCT/EP88/00682, § 371 Date Mar. 2, 1990, § 102(e) Date Mar. 2, 1990, PCT Pub. No. WO89/00902, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 27, 1988, Ser. No. 460,940

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725652

Int. Cl.[5] B24B *49/12*

U.S. Cl. 51—165.74 11 Claims



1. A cylindrical honing or grinding tool, comprising:

at least one cutting element having an extent in the circumferential direction of the tool;

a steel base cutting element support for each cutting element; and

an adhesive layer disposed between and connecting each cutting element and its respective cutting element support, each said adhesive layer having a fluorescing substance embedded therein which selectively absorbs and/or emits electromagnetic radiation at specific wavelengths, such that the fluorescing substance is exposed when the cutting element is worn off, said fluorescing substance after being excited by a first set wavelength distribution emitting radiation of a second set wavelength distribution.

5,144,774

DRY WALL SANDER

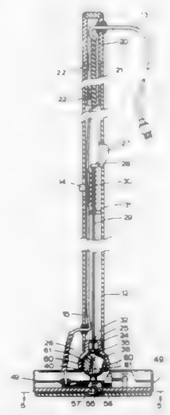
John S. Conboy, 215 Cedar Tree La., Ballwin, Mo. 63011

Division of Ser. No. 369,247, Jun. 21, 1989, Pat. No. 4,974,371.

This application Oct. 16, 1990, Ser. No. 598,049

Int. Cl.[5] B24B *23/00*

U.S. Cl. 51—170 TL 2 Claims



1. A joint for connecting two members so that they can move in two directions but not rotate comprising:

(a) a spherical head,

(b) a hollow pocket having a partly spherical inner surface,

(c) a series of four detents and four longitudinal grooves on the outer surface of the head and the pocket inner surface each spaced 90° from each other with a detent being trapped in an aligned groove thus allowing the head to tilt longitudinally and laterally but restraining it from rotation,

(d) remotely actuated brake means for engaging the outer surface of the head to lock the head and pocket in fixed position, said brake means including a braking member with a segmented braking surface on its working end which is engageable with the spherical head, resilient means normally urging the braking member away from braking engagement with the spherical head, and means for moving the braking member against the resilient means into braking engagement with the spherical head to lock the head and pocket in a predetermined position, and

(e) a working member connecting to the head and controlled by movement of the head.

5,144,775

CLEANING CARTRIDGE FOR COMPUTER AND VIDEO GAMES

Louis J. Bakanowsky, III, Fitchburg, Mass., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Filed Jun. 26, 1991, Ser. No. 721,163

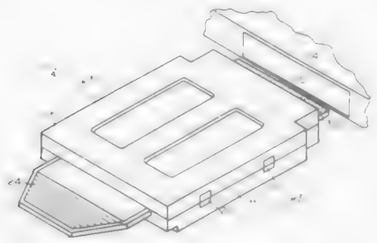
Int. Cl.[5] B08B *11/00*

U.S. Cl. 51—205 WG 14 Claims

1. A cleaning cartridge for cleaning electrical contacts of a connector block within a computer or video game cartridge receptacle, the cleaning cartridge which comprises:

a) a housing configured to be inserted and fitted within said cartridge receptacle;

b) a board means having a one end and an other end; said board means located for slidable movement within the housing, wherein the housing encloses a portion of the board means, the one end extending outwardly from the housing to be grasped by the user for sliding said board means, the other end having at least one surface containing thereon a cleaning material said cleaning material being placed in contact with the electrical contacts of the connector block in a cleaning position to clean said electrical contacts upon sliding of said board means by the user; and



c) means to provide for slidable movement of the board means between a non-cleaning position and a cleaning position.

5,144,776

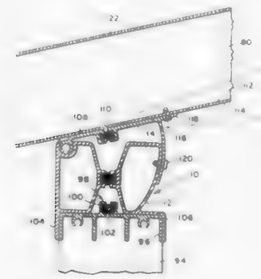
HEADER ASSEMBLY

Joseph R. Hetzel, Macedonia, and Kenneth L. Virgins, Hudson, both of Ohio, assignors to Patio Enclosures, Inc., Macedonia, Ohio

Filed Jan. 14, 1991, Ser. No. 641,123

Int. Cl.[5] E04B *7/06*

U.S. Cl. 52—92 12 Claims



1. Apparatus for attaching a roof panel to a side wall of an enclosure comprising a first elongated member having a base portion, a top portion, a first upright portion joining one end of said top portion to one end of said base portion, and an arcuate portion oppositely disposed to said first upright portion and joining the other end of said top portion to said base portion, said base portion having a configuration that conforms to the top of the side wall permitting the top of the side wall to be received therein for attachment thereto, said first upright portion and said top portion having a first longitudinally extending pocket formed at the approximate junction thereof, said top portion and said base portion being joined at their respective approximate mid-points forming a second longitudinally extending pocket, said second longitudinally extending pocket being defined by a first pair of longitudinally extending surfaces connected to said top portion each of said longitudinal extending surfaces having an inner end a second pair of longitudinally extending surfaces connected to said base portion, and a third pair of longitudinally extending surfaces which interconnect said first pair of longitudinally extending surfaces with said second pair of longitudinally extending surfaces said inner ends of said first pair of longitudinally extending surfaces and said second pair of longitudinally extending surfaces having inwardly directed longitudinally extending projections formed thereon, insulating material received with said second longitudinally extending pocket forming a thermal break in said first elongated member, said inwardly directed longitudinally extending projections on said first pair of longitudinally extending surfaces and said second pair of longitudinally extending surfaces grippingly engaging said insulating material, and a second elongated member for attachment to the roof panel, said second elongated member having a longitudinally extending yoke portion formed therein, said longtidunally extending yoke portion of said second elongated member being slidably receivable and rotatable within said first longitudinally extending pocket in said first elongated member.

5,144,777

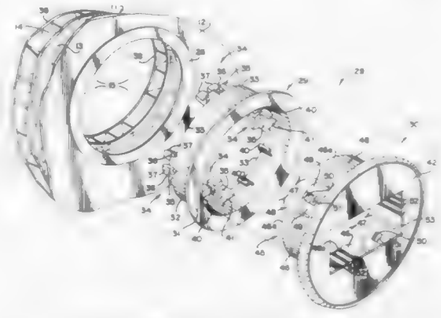
GROMMET ASSEMBLY FOR WALL PANELS

Duane D. Fishel, Oswego, and Nancy K. Rogers, Naperville, both of Ill., assignors to Allsteel Inc., Aurora, Ill.

Filed Apr. 9, 1991, Ser. No. 682,687

Int. Cl.[5] B65D *55/00*; F16L *5/00*; E04B *1/82*; E04F *17/00*

U.S. Cl. 52—144 26 Claims



1. A grommet assembly and wall panel having said grommet assembly inserted therethrough whereby to permit access from a front side of said panel therethrough to a backside thereof comprising:

a composite wall panel having a fibrous acoustical layer, a woven covering material at the front face of said fibrous material layer and a backer support layer at a face of said fibrous layer opposite said woven covering, said wall panel having a circular aperture cut therethrough;

a grommet assembly extending through said wall panel aperture comprising

a retaining ring peripherally circumscribing the aperture and being attached to said wall panel on the woven wall covered front face thereof and retaining said woven covering tensely with respect to aperture-adjoining areas of said woven covering;

a grommet structure inserted through said aperture and having a flange covering said retaining ring and a circular wall integrally formed therewith and extending through said aperture, the circular wall having a diameter substantially the same as said aperture whereby to be in intimate contact therearound, said circular wall including a plurality of pivotal locking arms each having first leg portions extending panel inwardly from said circular wall terminating at a hinge means joining a pivotal second leg portion projecting over the back of said backer support layer in a locked arrangement therewith and said circular wall including engageable wall portions between said pivotal locking arm means;

an insert sleeve means having an outward face plate portion at the covered face of said fibrous layer covering thereover said grommet flange and having integrally extending therefrom a sleeve engageable means for snap engagement to the circular wall of the grommet structure and for providing outwardly radial force to maintain said pivotal locking arms pivoted whereby to lock against a back surface of said backer support layer the

sleeve engageable means comprising a gaped circular wall having wall segments generally corresponding to the locations of the pivotal locking arms of said grommet structure and extending axially of the aperture a distance sufficient to radially outwardly contact said pivotal locking arms whereby to provide radial axially outward force maintaining said second leg portion at the back surface of said backer support layer and wherein within said gaps snap-engageable means are formed to extend for a distance from said face plate and terminating at snap-over barb means snap-engaged to said engageable wall portions of the grommet structure between said pivotal locking arm means.

26. A grommet assembly for providing access through a wall comprising:

a grommet structure for insertion into an aperture through a wall and having a circular flange and extending therefrom a circular wall terminating in a rearward rim edge, the rim edge having extending therefrom, at spaced intervals therearound, pivotal lock means pivotable to overlie back surfaces of a wall; and,

an insert sleeve for securing said pivotal lock means at a back surface of a wall and having a face plate means for extending over the circular flange of the grommet structure, a circular wall extending from the face plate means in a generally axial direction for insertion within the circular wall of the grommet structure, the circular wall having a discontinuous terminus forming a plurality of rim edges, at least one rim edge capable of contacting said pivotal lock means whereby to be capable of securing the pivotal lock means in said overlying position, gaps extend between said rim edges and have located therein and extending from said face plate means, snap engagement means for snap-engaging the rim edge of the circular wall of the grommet structure between the pivotal lock means, said face plate means including access window means, whereby said insert sleeve is snap-engageable to said grommet structure to prevent outward displacement when attached to a wall aperture and the grommet assembly may be locked in a wall aperture by means of the pivotal lock means.

5,144,778

PROFILED STRIP ADAPTED TO BE USED WHEN LAYING TILINGS OR OTHER SURFACE COVERINGS

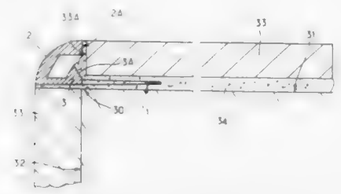
Jean-Jacques Pourtau, and Thierry Pourtau, both of Croissy sur Seine, France, assignors to Societe Anonyme, France

Filed Mar. 18, 1991, Ser. No. 672,692

Claims priority, application France, Mar. 30, 1990, 90 04115

Int. Cl.[5] E04B *1/00*

U.S. Cl. 52—254 **12 Claims**



1. A profiled edge strip to be bonded by mortar to a row of tile or other like surface coverings comprising:

an elongated sole plate including a lower surface, an upper surface and a longitudinal edge;

a quadrantal edge cover integrally formed in and extending along an edge of said sole plate opposite the longitudinal edge, said edge cover including a partial side face in a plane perpendicular to the lower surface of said sole plate, and an arcuate outer surface and

a counter-joint formed between the upper surface of said sole plate and the partial side face of said edge cover, said counter-joint including an inclined surface extending from the upper surface of said sole plate towards the arcuate outer surface of said edge cover, whereby additional mortar is retained in said counter-joint to improve the bond between the profiled strip and the row of tile; and said edge cover includes a longitudinal aperture extending the full length of said edge cover and an opening into said longitudinal aperture, said opening being positioned between the side face of said edge cover and the counter-joint.

5,144,779

JOINING OF A CONCRETE ELEMENT TO A SUPPORT

Henri Vidal, Neuilly-sur-Seine, France, and Santiago Muelas-Medrano, Madrid, Spain, assignors to Societe Civile des Brevets de Henri Vidal, Puteaux Cedex, France

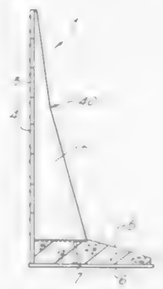
Division of Ser. No. 350,906, May 12, 1989, Pat. No. 4,982,550.

This application Jan. 7, 1991, Ser. No. 637,799

Claims priority, application United Kingdom, May 13, 1988, 8811377

Int. Cl.[5] E02D *27/32*

U.S. Cl. 52—295 **11 Claims**



1. A structure having a footing and prefabricated concrete elements which comprise at least one counterfort and a plurality of facing panels arranged above one another when the counterfort is substantially vertically positioned, said at least one counterfort being located rearwardly of said facing panels so that said facing panels define a front face of the structure during use, each of said facing panels being attached to the at least one counterfort by at least one bolted joint, and each of said bolted joints comprising a bolt cast into the at least one counterfort and projecting from a front side thereof, each of said facing panels having a hole extending therethrough and each of the holes in the facing panels having one of the bolts of the bolted joints passing therethrough, sand fixing means being mounted on a free end of each bolt for substantially fixing the facing panels relative to the at least one counterfort, wherein each bolted joint includes a spacer located between the at least one counterfort and the respective facing panel.

5,144,780

PORTABLE STRUCTURE

Thomas G. Gieling, 2341 Rainbow Valley Blvd., Fallbrook, Calif. 92028; David Behoteguy, 1395 Hazlewood, Brea, Calif. 92621, and Ralph Dillon, 417 Via Del Monte, Oceanside, Calif. 92054

Filed Mar. 25, 1991, Ser. No. 674,596

Int. Cl.[5] E02D *27/42*

U.S. Cl. 52—298 **20 Claims**

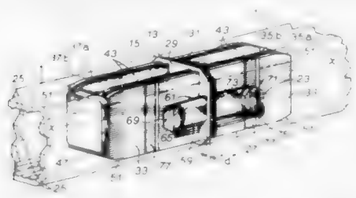
1. A plurality of members for temporary assembly into a rigid branch structure for supporting cover means to form an enclosure, comprising:

(a) a plurality of elongated rigid, hollow posts defined by opposed pairs of flat post walls joined together along their respective marginal edges between spaced-apart terminal ends, said walls having formed therein at least one pair of apertures in spaced-apart, opposed relationship near each said post terminal end and a series of elongated ribs extending inward from said walls and along the lengths of said posts between said apertures;

(b) a coupling for axially joining one said post to another in rigid, axial, end-to-end alignment comprising:

(i) a butt plate for transverse positioning between said terminal ends of said joined posts;

(ii) at least two stems extending outward from said butt plate for insertion a distance into each said hollow post end, each said stem including two pairs of closely-spaced webs arranged in spaced-apart configuration and defined by opposed marginal edges spanning between said opposed walls of said post and having formed



between said closely-spaced webs a slot for sliding receipt therein of a pair of opposed ribs when said stems are inserted into said hollow post ends, a cross-web transversely intersecting said spaced-apart pairs of webs and an end plate arranged parallel to said butt plate and intersecting said terminal edges of said webs and said cross-web to rigidify said stem; and,

(c) a pair of arms of terminal length, extending downward along said stems, exterior thereof, and arranged to slidingly engage the interior surface of said post walls, said arms having formed thereon outwardly disposed inward tabs for securely fitting into said apertures formed in said opposed post walls after said arms are biased and said stems are fully inserted in said terminal ends of said posts.

5,144,781

DOUBLE FLOOR FOR REMOVING AIR FROM ROOMS

Klaus Fitzner, Betzdorf, Fed. Rep. of Germany, assignor to Heinrich Nickel GmbH, Betzdorf, Fed. Rep. of Germany

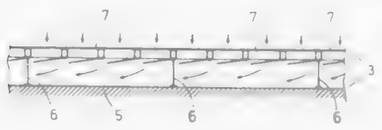
Continuation of Ser. No. 270,956, Nov. 14, 1988, abandoned.

This application Nov. 26, 1990, Ser. No. 618,530

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738444

Int. Cl.[5] F24F *7/007*

U.S. Cl. 52—303 **14 Claims**



1. In a double floor used in a system for removing air from a room which is connected to an air supply system of a ventilating or air-conditioning system, the room having a floor, the double floor being supported by a plurality of support members so that a hollow space is defined between the double floor and the floor of room, the double floor including an upper floor plane and a lower floor plane, the upper floor plane being formed by perforated plates, a stiffening system composed of spaced-apart stiffening members being mounted between the upper and lower floor planes, the improvement comprising the lower floor plane comprising at least one baffle plate in each space between stiffening members, each baffle plate having longitudinal side edges, one of the longitudinal side edges being mounted in the lower floor plane of the double floor, the other of the longitudinal side edges being spaced from the lower floor plane and being located below the lower floor plane and above the floor of the room, so that the baffle plates define with the lower floor plane a plurality of nozzle openings, wherein the nozzle openings open into the hollow space in the same direction, wherein the longitudinal side edges of adjacent baffle plates are arranged so as to overlap each other in a scale-like manner at a stiffening member.

5,144,782

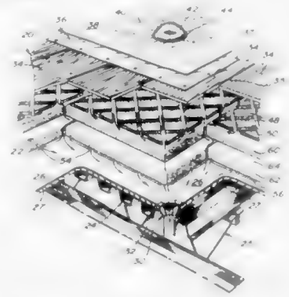
DOUBLE-LEVEL DRAINAGE SYSTEM FOR FLAT ROOFS

Jean-Paul Paquette, 91 Rang des Etangs, St-Jean-Baptiste de Rouveille, Canada J0L 2B0 , and Luc Trudeau, 1161 Dunraven Street, Mt. Royal, Canada H3P 2M2

Filed Aug. 15, 1990, Ser. No. 567,791

Int. Cl.[5] E04B *5/00*

U.S. Cl. 52—408 **19 Claims**



1. In a building roof draining system for a horizontal or slightly sloped flat roof including a heat-insulating layer formed of a plurality of heat-insulating panels joined side by side and having an upper and a lower face, an upper watertight membrane covering said layer, a lower fluid-tight membrane underlying said layer and an upper drain member sealed to and opening above the upper membrane for draining surface water from the roof, the improvement comprising a first water passage means located between said upper membrane and said layer, a second water passage means located between said layer and said lower membrane, and a third water passage means through said layer; and a lower drain member sealed to and opening above the lower membrane and under said layer for draining from the roof water collected between the two membranes, said first, second and third water passage means and said lower drain member being in mutual communication.

5,144,783

Patent Not Issued For This Number

5,144,784

WALL WITH ELONGATE MEMBERS

Werner Marti, Wolfensbergerstrasse 19, CH-9424 Rheineck, Switzerland

PCT No. PCT/CH89/00052, § 371 Date Nov. 17, 1989, § 102(e) Date Jan. 17, 1990, PCT Pub. No. WO89/08759, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 16, 1989, Ser. No. 455,378

Claims priority, application Switzerland, Mar. 18, 1988, 1041/88

Int. Cl.[5] E04H *12/18*

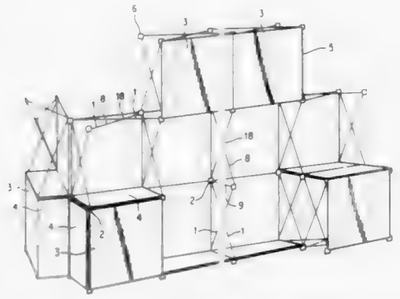
U.S. Cl. 52—646 **9 Claims**

1. A knock-down display wall, said display wall comprising:

a plurality of elongate members, each of said elongate members having a tubular portion and at least one endpiece, a first part of the endpiece being fitted within the tubular portion to form a substantially rigid connection therebetween, and a second part of the endpiece being located outside the tubular portion;

junction pieces for connecting said elongate members to one another to form a framework for said display wall, each junction piece having a base plate with at least one receiving part, said receiving part having plate-shaped cheeks spaced from one another and extending substantially parallel to one another with an axle extending therebetween, said axle being spaced from said base plate, and said base plate having openings for receiving fastening means for fastening auxiliary components to said wall, said auxiliary components being selected from the group consisting of side faces, end faces and hinges;

means for releasably connecting the second part of the end-piece of one of said elongate members and the axle of the

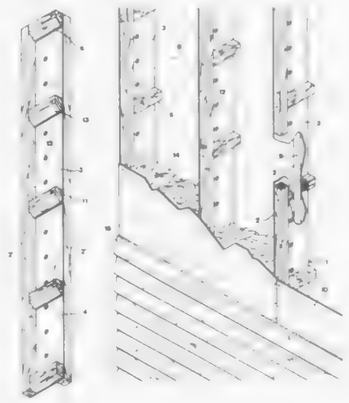


receiving part of a corresponding one of said junction pieces, so that said display wall can be easily constructed and knocked-down; and

wherein each said junction piece further includes a fastening device, said fastening device facilitating attachment of articles perpendicularly to said side faces, said fastening device including a body substantially perpendicularly coupled to said base plate, said body and said baseplate having a continuous opening extending therethrough with a detent spring disposed therein, and a coupling piece adapted to be inserted into said continuous opening from a front side of said body, said coupling piece interacting with said detent spring when inserted to removably hold said coupling piece within said body.

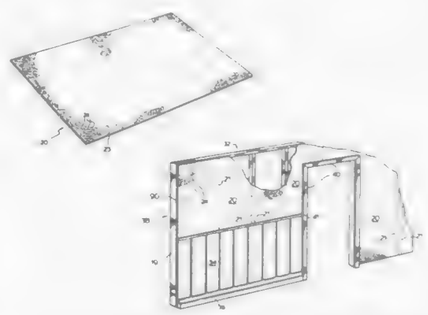
5,144,785
GIRDER
Reidar Berglund, Pl 2678, S-810 78, Järbo, Sweden
PCT No. PCT/SE89/00423, § 371 Date Feb. 1, 1991, § 102(e) Date Feb. 1, 1991, PCT Pub. No. WO90/01599, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 31, 1989, Ser. No. 646,712
Claims priority, application Sweden, Aug. 2, 1988, 8802788
Int. Cl.[5] E04C *3/29, 3/14;* **E04B** *1/76*
U.S. Cl. 52—730 **30 Claims**

1. A girder comprising separate first and second mutually spaced elongated members (2', 2'') extending substantially parallel to each other, a separate sheet-like web (3) having opposite first and second edges and opposite first and second flat sides, first means for securing said first elongated member (2') to said first flat side along said first edge, second means for securing said second elongated member (2'') to said second flat side along said second edge, said sheet-like web (3) being devoid of elongated members along said first edge second flat side and said second edge first flat side, a plurality of separate transverse members (5) spaced from each other and disposed generally normal to said elongated first and second members, and third means for securing each of said transverse members



to at least one of said first and second elongated members and said sheet-like web.

5,144,786
ANCHOR BOARD SYSTEM
Joseph R. Pacione, Thornhill, Canada, assignor to Tac-Fast Systems SA, Switzerland
Division of Ser. No. 381,836, Jul. 19, 1989, Pat. No. 5,060,443, which is a continuation-in-part of Ser. No. 148,711, Jan. 26, 1988, abandoned. This application Mar. 11, 1991, Ser. No. 667,580
Int. Cl.[5] E04B *1/38*
U.S. Cl. 52—747 **7 Claims**



1. A method of finishing an interior wall of a building comprising the steps of:

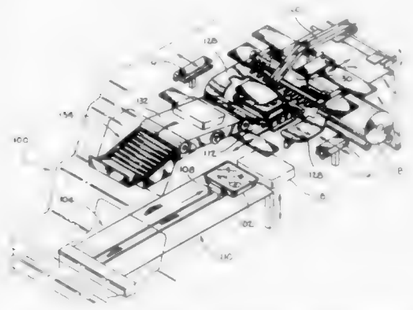
(a) transporting cladding panels to a location to be finished, such cladding panels having one half of a hook distributed at least substantially over the whole of the front face and adapted to be trimmed and fitted as required;

(b) trimming the cladding panels to fit edge to edge with one another and with boundaries of the location to be finished to form interior surfaces;

(c) attaching the cladding panels at the location to be finished with said one face to the interior thereof;

(d) adding surface finish sheet having a complementary one-half of a hook and loop system.

5,144,787
PACKAGE WRAPPING METHOD AND MACHINE
Michael A. Whitby, West Milton; Philip A. Ratermann, Troy, and Kinred Bowling, Dayton, all of Ohio, assignors to Premark FEG Corporation, Wilmington, Del.
Filed Jan. 14, 1991, Ser. No. 641,020
Int. Cl.[5] B65B *11/18, 57/12*
U.S. Cl. 53—66 **3 Claims**



1. Apparatus for wrapping rectangular packages in stretch film comprising:

means for designating the horizontal length of packages;

film supply means for supplying a continuous web of stretch film in roll form;

releasable gripping means for gripping a free end of said web and pulling it to the defined stop position in a wrapping station;

side clamps adjacent the wrapping station for initially clamping and subsequently releasing the two side edges of film when the film is in said defined stop position;

means for elevating a package into the gripped and clamped film between a first infeed level and a second outfeed level and drawing from said film supply means any additional film required by a package having a height above a predetermined minimum;

package infeed means for conveying packages at said first level in a direction opposite to the film pulling direction to a package trailing edge registration position adjacent but beyond said defined stop position whereby to provide for underfolding a predetermined length of film beneath the edge of each package;

film length adjustment means including a vertically movable horizontal bar movable into contact with said film at a position between said film supply means and said elevating means for pulling from said film supply means a loop of additional film corresponding to the designated length of the package being wrapped;

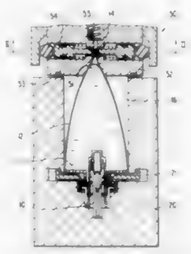
means for severing said film at a cut line between the loop and said supply to create a film trailing edge and thereby produce a film sheet of suitable length for the length and height of each package;

folding means independently operable of said film length adjustment means for folding the side edges and the film trailing edge under said package in synchronism with the releasing of said side edges by said side clamps; and

means for pushing each package essentially horizontally from the wrapping station along said second level in synchronism with releasing of said gripping means to underfold film under the package trailing edge during said pushing;

whereby said elevating means and said film length adjusting means are mechanically interconnected whereby upward motion of said elevating means causes downward movement of said vertically movable horizontal bar.

5,144,788
METHOD OF VACUUM-PACKING A LIQUID OR A PASTE IN A FLEXIBLE TUBE HAVING A DISPENSING PUMP OR VALVE
Jean-Pierre Variet, Le Neubourg, France, assignor to Valois S.A., France
Filed Jun. 28, 1989, Ser. No. 372,742
Claims priority, application France, Jun. 28, 1988, 88 08653
Int. Cl.[5] B65B *31/00, 61/00*
U.S. Cl. 53—434 **11 Claims**



1. A method of packaging a non-gaseous fluid in a flexible tube having a bottom as well as a head which is provided with a dispensing valve, the method comprising at least the following steps:

(1) placing said tube upside down on a support having the form of a topless housing so that a bottom of said tube is on an open side of said support,

(2) inserting said fluid into said tube via said bottom,

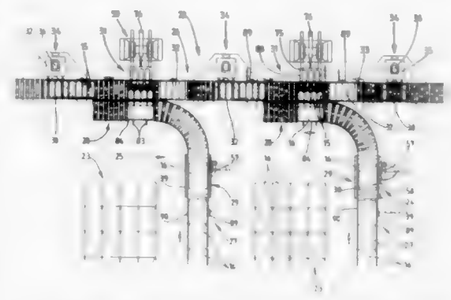
(3) welding the bottom of said filled tube in part,

(4) imperviously closing said support in order to form a sealed chamber therewith,

(5) establishing an air vacuum and consecutively sealing said tube by completing the welding of said bottom of said tube inside said sealed chamber, and

(6) opening said support and releasing said tube.

5,144,789
PROCESS AND APPARATUS FOR TRANSPORTING STACKS OF BLANKS FOR PRODUCING (CIGARETTE) PACKS
Heinz Focke, Verden, and Henry Buse, Visselhövede, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany
Filed Sep. 28, 1990, Ser. No. 589,566
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1989, 3933098
Int. Cl.[5] B65B *69/00*
U.S. Cl. 53—381.2 **15 Claims**



1. In a system comprising a packaging machine for making

hinge-lid type packs and an apparatus for transferring prefabricated blanks (10), made from thin cardboard and used for making packs of the hinge-lid type, to said packaging machine for making the packs, wherein stacks (15) of blanks are packed in cartons (16), the improvement comprising:

a) a cutting unit (39) for opening the cartons (16) in a region of a side wall (30) thereof;

b) an extraction unit (59) for grasping each stack (15) and for simultaneously extracting the stacks from the opened carton (16) and introducing the stacks into transport cassettes (32); and

c) a permanently installed conveying system (17) to which said cassettes (32), filled with the blank stacks (15), are transferred and which feeds said cassettes (32) to said packaging machine.

5,144,790

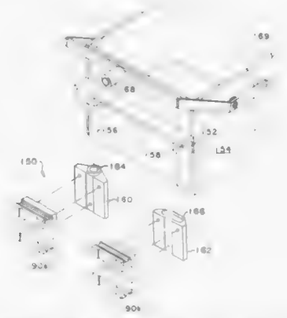
HIGH SPEED AUTOMATIC PACKAGING MACHINE WITH ANTI-CENTRIFUGAL FORCE TRANSPORT MEANS

Stevan Tisma, Chicago, Ill., assignor to Tisma Machinery Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 43 ,378, Nov. 3, 1989, Pat. No. 4,928,556. This application Nov. 13, 1990, Ser. No. 612,419

Int. Cl.[5] B65B *1/06, 37/02, 39/14*

U.S. Cl. 53—251 **9 Claims**



1. An automatic packaging machine including at least one conveyor chain forming a long closed and somewhat oval path for transporting mandrels through said machine; a plurality of mounting blocks attached to said chain at periodic locations along the length thereof, said mounting blocks alternately having a hole or a slot formed therein; each of said mandrels having a pivot pin on one end and a guide pin on the other end; said holes and said slots being oriented to be perpendicular to said conveyor chain; said pins, said holes, and said slots being shaped and sized so that said mandrels may be mounted and dismounted on said chain by sliding said pins into said holes and said slots; said holes receiving said pivot pins in a manner which make a pivoting connection between said one end of said mandrel and said chain said slots receiving said guide pins in a manner which makes a sliding connection between said other end of said mandrel and said chain; and means associated with said chains and mandrels for transferring product from a source to packages for containing said product.

5,144,791

MODULAR BAMBOO RAKE

Han-Ching Sun, No. 43, Ta-An Rd., Tien-Chung Chen, Changhwa Hsien, Taiwan

Filed Aug. 16, 1991, Ser. No. 745,740

Int. Cl.[5] A01D *7/06*

U.S. Cl. 56—400.04 **3 Claims**

1. A modular bamboo rake including a long handle with a truncately conical lower end portion, and a projecting prong section generally shaped in the form of a sector, said projecting prong section having an upper end portion attached to said lower end portion of said handle and including a plurality of prongs and two clamping sheets holding said prongs therebetween, characterized by:

a small fastening plate secured to an upper surface of one of said clamping sheets which is attached to an upper surface of said projecting prong section;

a large fastening plate secured to said upper end portion of said projecting prong section;

a U-shaped small retaining piece mounted pivotally on an upper surface of said small fastening plate at two ends thereof and having two generally longitudinal arms and a connecting portion interconnecting said longitudinal arms of said small retaining piece;

a U-shaped large retaining piece mounted pivotally on an upper surface of said large fastening plate at two ends thereof and having two generally longitudinal arms and a

connecting portion interconnecting said longitudinal arms of said large retaining piece;

an elongated connecting plate connected rotatably to said connecting portion of one of said small and large retaining pieces at an end portion thereof and having a lengthwise extending slide slot formed through the other end portion of said connecting plate, said connecting portion of the other of said small and large retaining pieces being confined in said slide slot, said connecting portions of said small and large retaining pieces being respectively spaced apart from said small and large fastening plates at predetermined distances, so as to clamp said truncately conical lower end portion of said long handle between said small retaining piece and said small fastening plate and between said large retaining piece and said large fastening plate;

whereby said handle can be forced to remove from said projecting prong section, thereby permitting said small and large retaining pieces to lie on said small and large fastening plates.

5,144,792

CAGE-TYPE STRANDING MACHINE

Rüdiger Lange, Neuss, and Helmut Classen, Würselen, both of Fed. Rep. of Germany, assignors to Stolberger Maschinenfabrik GmbH & Co. KG, Stolberg, Fed. Rep. of Germany

Filed Mar. 5, 1990, Ser. No. 488,097

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922862

Int. Cl.[5] D01H *7/02, 7/46*

U.S. Cl. 57—59 **22 Claims**

1. A cage-type stranding machine for use with spools of filaments which are to be stranded, the machine having a standing point where the filaments converge, comprising:

a rotatably mounted supporting pipe having first and second ends and having an axis which runs through the first and second ends, the stranding point of the stranding machine being adjacent the first end of the pipe;

means for providing a first support which is connected to the pipe and which encircles the pipe, the first support being configured so that a cross section taken through the first support, along a plane containing the axis of the pipe, has two straight segments that are symmetrical with respect to the axis of the pipe and that are inclined so as to be oriented at an angle other than 90° to the axis of the pipe;

means for providing a second support which is connected to the pipe and which encircles the pipe, the second support being spaced apart from the first support and being configured so that a cross section taken through the second support, along said plane containing the axis of the pip, has

two straight segments that are symmetrical with respect to the axis of the pipe and that are inclined so as to be oriented at said angle other than 90° to the axis of the pipe;

means for providing a plurality of longitudinal webs which extend in the longitudinal direction of the pipe and which have inner edges abutting the pipe, the webs being oriented radially outwardly from the pipe and being distributed uniformly about the circumference of the pipe, each web being connected to the first support and to the second support; and

a plurality of spool carriers for the spools, each spool carrier being rotatably mounted on the first support at a respective first bearing location and being rotatably mounted on the second support at a respective second bearing location, the first bearing locations being closer than the second bearing locations to the stranding point, each spool carrier having an axis of rotation that is perpendicular to the supports, the spool carriers being disposed circumferentially about the axis of the pipe.

5,144,793

INTEGRATED CONNECTOR/AIRTUBE FOR A TURBOMACHINE'S COMBUSTION CHAMBER WALLS

Edward C. Able, Tolland, and Martin J. Gibler, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1990, Ser. No. 632,849

Int. Cl.[5] F23R *3/08;* **F02C** *3/14*

U.S. Cl. 60—39.32 **3 Claims**

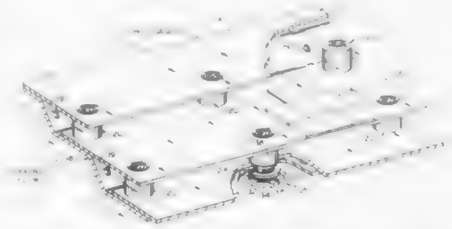
1. A wall arrangement for a combustion chamber having a flow of hot gaseous combustion products therethrough, comprising:

a supporting wall having a staircase-like configuration in the direction of the flow of the products, the supporting wall including a plurality of alternating steps and angularly skewed risers;

a plurality of segmented walls, each segmented wall secured to a corresponding step of the supporting wall and extending downstream therefrom, each segmented wall extending downstream past the downstream adjacent riser and overlapping the next downstream segmented wall secured to the next downstream step; and

an airtube disposed about an axis extending between the overlapping portion of one of the plurality of segmented walls and the next downstream step and corresponding next downstream wall, said airtube having an outer end extending through first and second aligned holes disposed in the next downstream step and next downstream segmented wall, and having an inner end aligned with a third hole disposed in the overlapping portion of the one segmented wall,

said airtube further including:



a shoulder extending radially with respect to the axis and located between the one overlapping segmented wall portion and the next segmented wall, the shoulder having a radial dimension greater than the first, second and third holes,

a longitudinal passage extending axially through the airtube and

means disposed on the side of the supporting wall opposite the corresponding next segmented wall, for releasably secured the outer end of the airtube to the supporting wall.

5,144,794

GAS TURBINE ENGINE WITH COOLING OF TURBINE BLADES

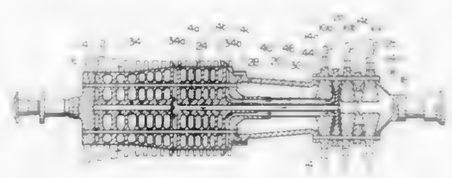
Seiichi Kirikami; Tomo Satoh; Isao Sato, all of Hitachi; Thutomu Gunzi, Ibaraki, and Nobuyuki Iizuka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1990, Ser. No. 561,815

Claims priority, application Japan, Aug. 25, 1989, 1-217361

Int. Cl.[5] F02C *3/00*

U.S. Cl. 60—39.75 **5 Claims**



1. A gas turbine comprising:

a first stage moving blade arranged on a rotating shaft of said gas turbine and adapted to be driven by gas discharged from a combustor, said first stage moving blade having cooling holes formed on a surface thereof;

a rear stage moving blade arranged on a rotating shaft of said gas turbine downstream of said first stage moving blade and having cooling holes formed on the surface thereof, said rear stage moving blade being adapted to be driven by gas discharged from the combustor;

a compressor adapted to be driven by the driving of said first and second stage moving blades to produce compressed air for combustion and cooling;

cooling air supply means having a first port provided on a

rear stage side of said compressor and through which a part of said compressed air from said compressor is withdrawn, and wherein air withdrawn through said first port is supplied to the cooling holes of said first stage moving blade to cool the same;

heat exchange means provided on said cooling air supply means for cooling air supplied to said first stage moving blade; and

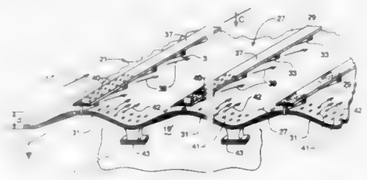
cooling medium supply means having a second port provided on a front stage side of said compressor and through which a part of compressed air from said compressor is withdrawn, and wherein air withdrawn through said second port is supplied to said heat exchange means as a cooling medium for said heat exchange means, and wherein said cooling medium after passing through said heat exchange means, is supplied to the cooling holes of said rear stage moving blade for cooling the same.

5,144,795

FLUID COOLED HOT DUCT LINER STRUCTURE

Robert E. Field, Tequesta, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 14, 1991, Ser. No. 700,369
Int. Cl.[5] F02K *3/02*, **B64D** *33/04*
U.S. Cl. 60—226.1 **8 Claims**



1. A liner structure for a hot gas duct in a gas turbine engine or the like comprising:

(a) a generally tubular shaped wall member defining a duct for conducting hot gas from an upstream end to a downstream end along a central axis thereof;

(b) said wall member having an inner surface of generally corrugated contour defining a first plurality of axially extending ridges defined between a corresponding plurality of axially extending grooves;

(c) a second plurality of axially spaced vee-shaped vanes disposed on each said ridge, each said vane having a pair of legs divergent toward the downstream end of said duct;

(d) an elongated cap disposed along each said ridge atop corresponding said vanes, said cap and corresponding vanes defining a corresponding plurality of slots between said cap and ridge; and

(e) means defining a third plurality of holes through said wall member at each said ridge and between axially adjacent vanes for conducting fluid coolant through said wall member.

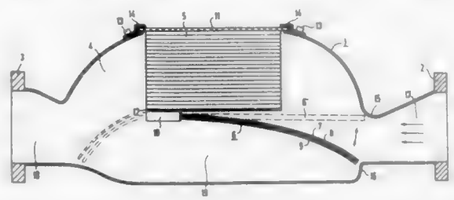
5,144,796

BYPASSABLE CATALYTIC CONVERTER, IN PARTICULAR STARTING CATALYTIC CONVERTER THAT CAN BE CIRCUMVENTED

Helmut Swars, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Filed Feb. 26, 1991, Ser. No. 661,491
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 8810816[U]
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—288 **11 Claims**

1. A catalytic converter assembly for a motor vehicle having an internal combustion engine, comprising a housing being penetrable by exhaust gas and having at least one inlet, at least one outlet and a given cross-sectional area, a catalytic converter disposed in said housing and filling a portion of said given cross-sectional area defining a bypass space remaining free for the exhaust gas traveling past said catalytic converter, and at least one flow baffle in said housing in the form of a bimetallic flap being adjustable under the influence of temperature, said flap occupying a first position directing the exhaust gas through said catalytic converter at relatively low temperatures, and said flap occupying a second position forming a partition wall between said catalytic converter and said bypass space in at least some regions for directing the exhaust gas through said bypass space at relatively high temperatures and for shielding said catalytic converter from the exhaust gas.

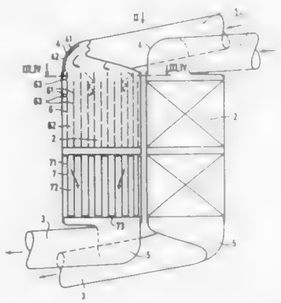


5,144,797

EXHAUST GAS PIPE WITH CATALYST CARRIER BODY EXPOSED TO A HELICAL FLOW

Helmut Swars, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft Fuer Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 24, 1990, Ser. No. 633,300
Int. Cl.[5] F01N *3/02, 3/28*
U.S. Cl. 60—299 **46 Claims**



1. Exhaust gas pipe, comprising a plurality of segments forming at least one angular bend, said segments including a first segment having a given diameter, an adaptor communicating with said first segment, a second segment communicating with said adaptor and having a diameter larger than said given diameter, and a honeycomb body being disposed directly downstream of said adaptor and having a side with an end surface facing towards an exhaust gas flow, said adaptor having a shape forcing exhaust gas to approach said end surface in a curved path having a curvature and pitch reducing contact between exhaust gas having already been deflected and exhaust gas newly flowing into said adaptor.

5,144,798

REGENERATIVE PARTICULATE TRAP SYSTEM FOR EMISSION CONTROL

Akikazu Kojima, Gamagori; Shinji Miyoshi, and Mitsuo Inagaki, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 13, 1991, Ser. No. 792,200
Claims priority, application Japan, Nov. 14, 1990, 2-306084
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—303 **11 Claims**

1. A particulate trap system for an exhaust emission control comprising:

a particulate trap filter disposed within a passage of an exhaust gas of an engine, for trapping particulates carried by the exhaust gas of said engine; and

an electric heater arranged at a part of said particulate trap filter for removing said accumulated particulate by burning same;

said electric heater being arranged in a pattern such that a higher power efficiency is provided at a portion away from said central position of said filter than a power efficiency provided at a central portion thereof.

5,144,799

CROSSFIRE CALIBRATED EXHAUST SYSTEM

Randolph S. Barth, 55 Moreau Ave., Freehold, N.J. 07728

Filed Jul. 18, 1991, Ser. No. 731,988
Int. Cl.[5] F01N *7/10*
U.S. Cl. 60—313 **9 Claims**

1. In a dual-exhaust system for an internal combustion engine having a pair of spaced-apart pipes channeling exhaust gases from the engine towards a muffler, apparatus comprising:

first and second additional pipes connected between said pair of spaced-apart pipes at substantially 45° angles with respect to each of said pair of pipes and at substantially a 90° angle with respect to each other;

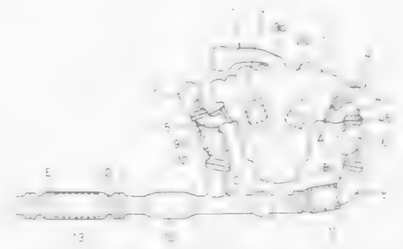
and wherein said first and second additional pipes are also interconnected with each other substantially at the midpoints thereof, measured along their respective lengths, and substantially midway between said pair of spaced-apart pipes.

5,144,800

EXHAUST MANIFOLD SYSTEM FOR A TRANSVERSE V-TYPE ENGINE

Yoshiaki Shioya; Toshiro Shimamoto; Susumu Kawamoto, and Izumi Arai, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1991, Ser. No. 781,726
Claims priority, application Japan, Oct. 24, 1990, 2-111238[U]
Int. Cl.[5] F01N *07/10*
U.S. Cl. 60—323 **4 Claims**



1. An exhaust manifold system for a transverse V-type engine in which an engine output shaft extends in the same direction as a transverse direction of an automotive vehicle and which includes front and rear banks, each having a plurality of cylinders, and an exhaust pipe, comprising:

a front exhaust manifold for conducting an exhaust gas discharged from the cylinders of the front bank to the exhaust pipe; and

a rear exhaust manifold for conducting an exhaust gas discharged from the cylinders of the rear bank to the exhaust pipe;

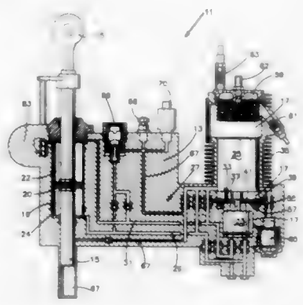
the front exhaust manifold being produced by welding stainless steel pipes, and the rear exhaust manifold being produced of cast iron.

5,144,801

ELECTRO-HYDRAULIC ACTUATOR SYSTEM

Dino Scanderbeg, Laguna Niguel; William D. Wilkerson, Newport Beach; Richard L. Kenyon, Irvine, and Michael E. Nolan, Costa Mesa, all of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Apr. 28, 1989, Ser. No. 345,156
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—475 **2 Claims**



1. An electro-hydraulic actuator, comprising:

a. a housing having a hydraulic reservoir chamber with a

reservoir of hydraulic fluid therein, and having a cylinder chamber therein;

b. an actuator piston and an actuator rod connected thereto, said piston being movable in said cylinder chamber, and said actuator piston dividing said cylinder chamber into a "retract" chamber at the forward end of said cylinder chamber and an "extend" chamber at the rearward end of the cylinder chamber;

c. a hydraulic pump disposed in said hydraulic reservoir for pumping hydraulic fluid to said cylinder chamber to move said actuator rod by hydraulic pressure;

d. an electric motor mechanically connected to said hydraulic pump to drive said hydraulic pump for pumping said hydraulic fluid;

e. hydraulic passages disposed in said housing and connecting said pump to said hydraulic reservoir chamber and said cylinder chamber for moving said actuator piston in said cylinder chamber;

f. a bellows reservoir disposed in said hydraulic reservoir chamber and containing a pressurized gas so as to have a variable displacement of hydraulic fluid in said hydraulic reservoir chamber to compensate for any volumetric changes in the hydraulic fluid therein;

g. a temperature sensor disposed for measuring temperature changes of gas in said bellows reservoir; and

h. a temperature sensor disposed for measuring temperature changes in hydraulic fluid in said hydraulic reservoir chamber.

5,144,802

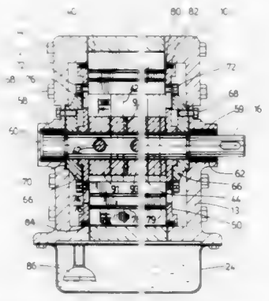
ROTARY FLUID APPARATUS HAVING PAIRS OF CONNECTED VANES

Ivan Ruzic, 5130 Portage Road, Apartment 216, Niagara Falls, Ontario, Canada L2E 6Z4

Filed Jun. 29, 1990 Ser. No. 545,886

Int. Cl.[5] **F16D** *31/06;* **F01C** *1/344;* **F04C** *11/00*

U.S. Cl. 60—484 **16 Claims**



1. A fluid drive or pump apparatus comprising:

a housing defining a substantially circular rotor chamber therein,

drive shaft means extending through said chamber, a circular rotor in said chamber mounted on said drive shaft means to rotate therewith and having a diameter less than the diameter of said chamber, said rotor and drive shaft means being offset from the centre axis of said chamber,

at least one pair of vanes mounted in said rotor and slidable radially in said rotor, one member of each pair being located diametrically opposite to the other member and rigidly connected thereto, the members of each pair having a combined connected length substantially equal to the distance from a specific point on the circumferential wall of the chamber which is closest to the circumference of the rotor and a second point on the wall of said chamber diametrically opposite said specific point,

fluid inlet means extending through said housing and opening into said chamber,

fluid outlet means extending through said housing and in fluid communication with said chamber,

a portion of each of two circumferential wall sections between said specific point and said second point being slightly removed to permit full rotation of said rotor and vanes in said chamber, and

cam followers mounted on sides of said vanes and generally circular cam means mounted on a side of the housing, said cam followers and cam means acting to reduce the outward force of said vanes on the circumferential wall of said chamber, said cam means being contoured to match the contour of said circumferential wall of said rotor chamber.

5,144,803

INTERNAL COMBUSTION ENGINE WITH A DUAL TURBOCHARGER SYSTEM

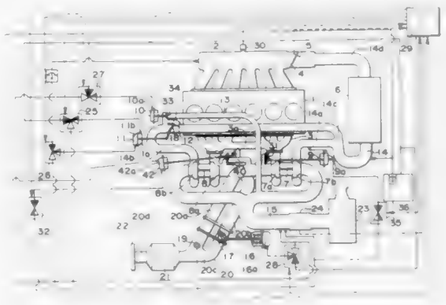
Mamoru Yoshioka, Susono; Toshihisa Sugiyama, Gotenba, and Toru Kidokoro, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 643,588

Claims priority, application Japan, Jan. 22, 1990, 2-10536

Int. Cl.[5] **F02B** *37/12*

U.S. Cl. 60—612 **11 Claims**



1. An internal combustion engine with a dual turbocharger system comprising:

a multi-cylinder internal combustion engine having an air intake and an exhaust outlet;

a first and a second turbocharger arranged in parallel with each other with respect to the engine, each including a turbine and a turbine driven compressor, the turbines being connected with the exhaust outlet of the engine and the compressors being connected with the air intake of the engine;

an intake switching valve installed downstream of the second turbocharger compressor and an exhaust switching valve installed downstream of the second turbocharger turbine;

an exhaust bypass conduit bypassing the exhaust switching valve and an exhaust bypass valve installed in the exhaust bypass conduit;

means for measuring an engine speed;

means for measuring a charging pressure;

means for measuring an intake air quantity;

means for closing the intake switching valve and the exhaust switching valve whenever the intake air quantity is below a first predetermined intake air quantity whereby only the first turbocharger is in operation and for opening the intake switching valve and the exhaust switching valve whenever the intake air quantity is above a first predetermined intake air quantity whereby the first and second turbochargers are in operation;

valve operating means for selectively opening and closing the exhaust bypass valve; and

decision means operatively connected with the engine speed measuring means, the charging pressure measuring means, the intake air quantity measuring means and the exhaust bypass valve and serving to open and close the exhaust bypass valve on the basis of charging pressure whenever the engine speed is equal to or less than a predetermined engine speed and on the basis of intake air quantity at engine speeds higher than the predetermined engine speed.

5,144,804

SMALL AIRBLAST FUEL NOZZLE WITH HIGH EFFICIENCY INNER AIR SWIRLER

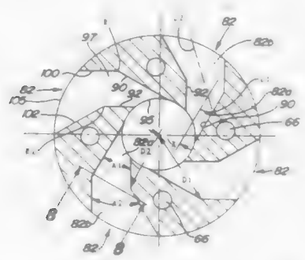
Theodore R. Koblish, Birmingham, and Leonard D. Bell, Ferndale, both of Mich., assignors to Fuel Systems Textron Inc., Zeeland, Mich.

Division of Ser. No. 376,751, Jul. 7, 1989, Pat. No. 5,086,979.

This application May 2, 1991, Ser. No. 694,872

Int. Cl.[5] **F02C** *7/22*

U.S. Cl. 60—740 **3 Claims**



1. A gas turbine engine wherein upon cold ignition a stagnation air pressure of generally about 1 to about 1½ inches of water is supplied by the compressor to airblast fuel nozzles communicating with the combustor, said airblast fuel nozzles each having a nozzle body with an inner wall forming a longitudinal inner air swirl chamber with a downstream discharge orifice, means for introducing fuel into the chamber and a plurality of air inlet passages space apart around the nozzle body upstream of the fuel discharge orifice and extending from the chamber to the exterior of the nozzle body for receiving air at the said stagnation air pressure, each air passage having a plurality of converging sections canted relative to one another effective to provide an air pressure in the inner air swirl chamber of at least about 70% of said stagnation air pressure for enhancing inner air swirl strength for fuel atomization and cold ignition of the engine.

5,144,805

MULTI-STAGE COLD ACCUMULATION TYPE REFRIGERATOR AND COOLING DEVICE INCLUDING THE SAME

Masashi Nagao; Hideto Yoshimura, and Takashi Inaguchi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 430,582, Nov. 1, 1989, Pat. No. 5,092,130.

This application Jun. 26, 1991, Ser. No. 721,816

Claims priority, application Japan, Nov. 9, 1988, 63-284450; Nov. 9, 1988, 63-284452; Nov. 9, 1988, 63-284453; Nov. 9, 1988, 63-284454; Nov. 9, 1988, 63-284455; Nov. 11, 1988, 63-285991

Int. Cl.[5] **F25B** *9/00*

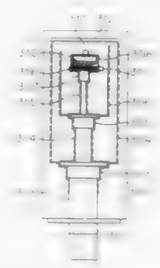
U.S. Cl. 62—6 **12 Claims**

1. In a SQUID cooling device including

(A) a multi-stage cold accumulation type refrigerator comprising a compressor disposed at an ordinary temperature, a helium gas as a common operating fluid to be compressed by said compressor, a plurality of thermal stages, at least one cylinder, and one or more expansion chambers and cold accumulators of different temperature levels, said thermal stages and said cylinders having outer surfaces, and

(B) a high-temperature superconductor mounted on the outer surfaces of the final heat stage and one of said cylinders;

the improvements wherein at least one of said expansion



chambers has a seal to prevent leakage of said helium gas, said seal being capable of sliding, wherein sliding resistance of said seal generates less heat than the theoretical generated refrigeration quantity of said expansion chamber, said theoretical generated refrigeration quantity being based on isothermal expansion in said expansion chamber; and a cold accumulating member of said cold accumulators is formed of an alloy or compound containing a rare earth metal.

5,144,806

PROCESS FOR THE LIQUEFACTION OF GASES

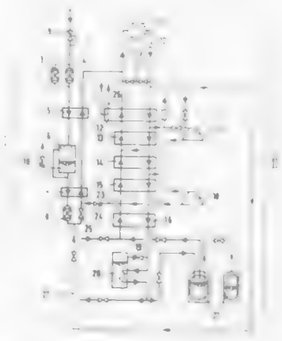
Jochen Frenzel, München; Josef Weber, München, and Horst Gutowski, deceased, late of München, all of Fed. Rep. of Germany by Lieselohe Gutowski, legal representative , assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 707,873

Claims priority, application Fed. Rep. of Germany, May 31, 1990, 4017611

Int. Cl.[5] **F25J** *1/00, 5/00*

U.S. Cl. 62—9 **10 Claims**



1. In a process for liquefying gases, comprising in a freeze purification system having a temperature, removing impurities from an amount of gas to be purified having a degree of impurities, liquefying resultant purified gas, and bringing the freeze purification system in an alternating sequence of purification phases and regeneration phases alternately into thermal contact with cold gas and hot gas from a refrigerating unit, and

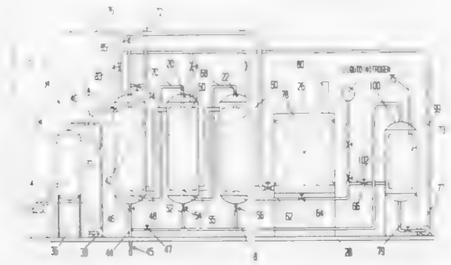
in each purification phase storing a part of resultant purified gas in a medium-pressure buffer vessel at a pressure of P_m, and in each regeneration phase liquefying a part of the gas stored in the medium-pressure buffer vessel, the improvement wherein in medium-pressure buffer vessel, a rate of pressure rise P_M is preset for each purification phase (A), a sequence of purification phases (A) and regeneration phases (B) is continued up to a maximum pressure P_{Mmax}, the freeze purification system is further regenerated, then pressure in the medium-pressure buffer vessel is reduced in phase (C) to a minimum pressure P_{Mmin} by liquefaction of gas stored in the buffer vessel, and the sequence of purification phases (A) and regeneration phases (B) is repeated.

5,144,807

VAPOR TREATMENT FACILITIES FOR PETROLEUM STORAGE TANK CLEANING

Ernest D. Brown, 8001 Cheshire Cir., La Palma, Calif. 90623

Continuation-in-part of Ser. No. 474,514, Feb. 2, 1990, Pat. No. 5,017,240. This application May 17, 1991, Ser. No. 702,045
Int. Cl.[5] F25J 3/00
U.S. Cl. 62—20 11 Claims



1. A portable condensation apparatus for the fractional condensation of volatile hydrocarbons form a large volume of hydrocarbon vapors and air mixture within a confined chamber which comprises:

a. a first condensation stage including a vessel with an inlet nozzle for introduction of said mixture, an inlet nozzle for the introduction of a cooling medium, liquid collection means, an outlet nozzle for the withdrawal of condensed liquid from said vessel, and an outlet nozzle for the withdrawal of said mixture after passage through said vessel;

b. at least one succeeding condensation stage including means to introduce a cooling medium into said succeeding stage for direct mixing and contact with said mixture therein, liquid collection means at the bottom said succeeding condensation stage with liquid withdrawal means for the removal of condensed liquid from said succeeding condensation stage, and an outlet nozzle for the withdrawal of said mixture after passage through said succeeding stage;

c. means to supply liquid nitrogen as the cooling medium to said condensations stages for direct mixing and contact with said mixture therein;

d. at least one blower with means to connect the intake of said blower to said confined chamber and its discharge connected to circulate said vapor and air mixture through said condensation apparatus

e. means to direct the discharge from the last of said condensation stages to an inlet to said confined chamber to thereby provide recirculation of air through said confined chamber; and

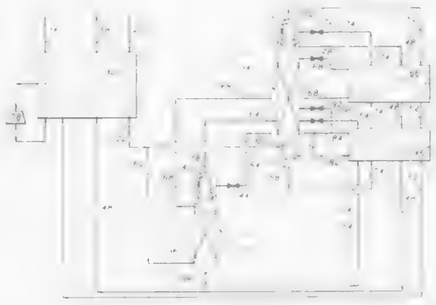
f. an adsorption vessel containing an adsorbent and means to direct a stream of purified air form the last of said condensation stages to said adsorption vessel, and means to discharge air to the atmosphere after passage through said adsorption vessel.

5,144,808

CRYOGENIC AIR SEPARATION PROCESS AND APPARATUS

Bao V. Ha, San Jose, Calif., assignor to Liquid Air Engineering Corporation, Walnut Creek, Calif.

PCT No. PCT/US89/03926, § 371 Date Feb. 12, 1991, § 102(e) Date Feb. 12, 1991, PCT Pub. No. WO86/02148, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 12, 1989, Ser. No. 651,359
Int. Cl.[5] F25J 3/02
U.S. Cl. 62—24 21 Claims



1. In a process for the cryogenic separation of air by rectification in at least one distillation column to produce at least one vapor fraction, at least one liquid fraction, and at least one product nitrogen stream the improvement comprising:

providing a cooled and pressurized feed air stream in vapor form;

condensing at least a portion of said feed air vapor stream by indirect heat exchange contact with at least one of said liquid fractions to vaporize said liquid fraction and condense said feed air stream; and

vaporizing a portion of said condensed feed air stream by indirect heat exchange contact with one of said vapor fractions thereby condensing said vapor fraction.

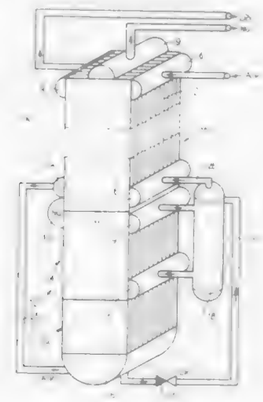
5,144,809

APPARATUS FOR PRODUCTION OF NITROGEN

Gilbert Chevalier, Guyancourt; Christiane Muller, Jouy en Josas; Frédéric Rousseau, Paris; Laurent Savinel, Toul, and Jean-Yves Thonnelier, Voisins le Bretonneux, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 2, 1991, Ser. No. 739,686
Claims priority, application France, Aug. 7, 1990, 90 10077
Int. Cl.[5] F25J 3/00
U.S. Cl. 62—36 10 Claims

1. Apparatus for the production of nitrogen including means for cooling compressed air from which water and carbon dioxide have been removed, rising means in which said air is progressively enriched into nitrogen, and condenser means coupled to an upper part of said rising means for cooling the nitrogen enriched air by vaporization, for forming a rich liquid and to produce a reflux; said rising means comprising first vertically disposed flat ducts disposed as a parallelepipedal plate-type heat exchanger and said condenser means comprising second vertically disposed flat ducts included in the same exchanger and disposed in heat exchange relationship with at least an upper part of the first ducts, a collection box for collecting rich liquid and coupled to the lower end of said first ducts, and a connection duct coupled to said collection box and having an expansion valve therein.

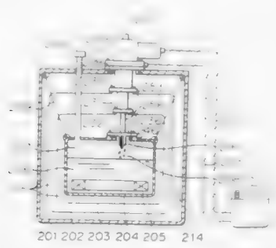


5,144,810

MULTI-STAGE COLD ACCUMULATION TYPE REFRIGERATOR AND COOLING DEVICE INCLUDING THE SAME

Masashi Nagao; Hideto Yoshimura, and Takashi Inaguchi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 430,582, Nov. 1, 1989, Pat. No. 5,092,130. This application Jun. 26, 1991, Ser. No. 721,135
Claims priority, application Japan, Nov. 9, 1988, 63-284450; Nov. 9, 1988, 63-284452; Nov. 9, 1988, 63-284453; Nov. 9, 1988, 63-284454; Nov. 9, 1988, 63-284455; Nov. 11, 1988, 63-285991
Int. Cl.[5] F17C 5/02
U.S. Cl. 62—471 11 Claims



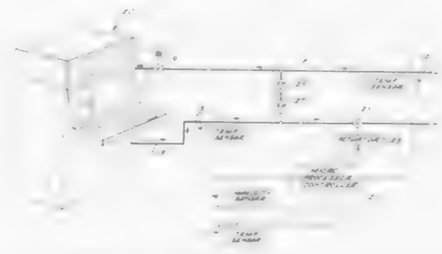
1. In a superconducting magnet cooling device including a helium tank, a radiation heat shield, a vacuum tank, and a helium refrigerator, the improvement wherein said helium refrigerator is a multi-stage cold accumulation type refrigerator comprising a compressor disposed at an ordinary temperature, a helium gas as a common operating fluid to be compressed by said compressor, and one or more expansion chambers and cold accumulators of different temperature levels; wherein at least one of said expansion chambers has a seal to prevent leakage of said helium gas, said seal being capable of sliding, wherein sliding resistance of said seal generates less heat than the theoretical generated refrigeration quantity of said expansion chamber, said theoretical generated refrigeration quantity being based on isothermal expansion in said expansion chamber; and a cold accumulating chamber of said cold accumulators is formed of an alloy or compound containing a rare earth metal.

5,144,811

CONDENSATION CONTROL SYSTEM FOR WATER-COOLED ELECTRONICS

Eugene L. Brodie, Anaheim, and Chris A. Jameson, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 10, 1991, Ser. No. 639,604
Int. Cl.[5] F25B 49/00
U.S. Cl. 62—176.6 6 Claims



1. A condensation control system for a water cooling system that includes an inlet line and a return line connected to electronic equipment being cooled, the condensation control system comprising:

an ambient temperature sensor for sensing the dry bulb temperature of the ambient air in the vicinity of the equipment being cooled;

an ambient humidity sensor for sensing the humidity of the ambient air in the vicinity of the equipment being cooled;

a return water temperature sensor for sensing the temperature of the return water;

flow control means for controlling the amount of return water flow in the return line; and control means responsive to said ambient temperature sensor, said ambient humidity sensor and said return water temperature sensor, said control means calculating the dewpoint of the ambient air in the vicinity of the equipment being cooled from the ambient temperature and the ambient humidity of said ambient air, said control means controlling said flow control means so as to maintain the return water temperature above the dewpoint.

5,144,812

OUTDOOR FAN CONTROL FOR VARIABLE SPEED HEAT PUMP

Eugene L. Mills, Jr.; James P. Sodo, both of Indianapolis, Ind.; John M. Palmer, Syracuse, and Peter G. Pierret, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 3, 1991, Ser. No. 709,514
Int. Cl.[5] F25B 49/00
U.S. Cl. 62—186 7 Claims

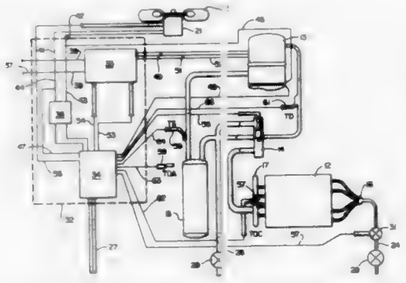
6. A method of controlling the fan speed in the heat pump system of a type having a variable speed compressor, an outdoor coil and a variable speed fan motor comprising the steps of:

sensing the speed of the compressor over a range of operating speeds;

sensing the temperature of the refrigerant in the outdoor coil; and

controlling the speed of the fan in response to the both

sensed compressor speed and the sensed refrigerant temperature so as to optimize the operating efficiency of the



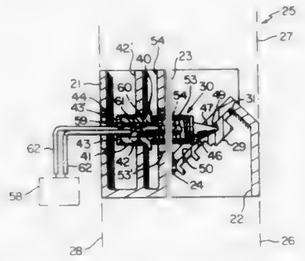
fan operation over the full range of compressor operating speeds.

5,144,813

CONTROL DEVICE HAVING A SHAPE MEMORY WIRE, REFRIGERATOR SYSTEM UTILIZING THE CONTROL DEVICE AND METHODS OF MAKING THE SAME

Robert E. Orner, Stratford; Aurelio V. Cassarino, West Hartford, and Roger P. Sepso, Stratford, all of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 607,239, Oct. 31, 1990, Pat. No. 5,083,439, which is a continuation-in-part of Ser. No. 506,439, Apr. 6, 1990, Pat. No. 5,014,520. This application Nov. 20, 1991, Ser. No. 795,107
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—187 4 Claims



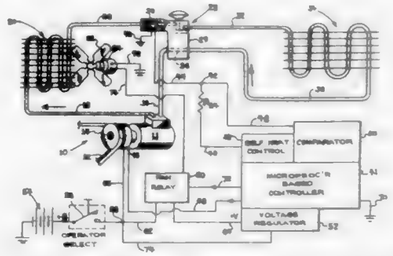
1. In a control device for a refrigerator system having a frozen food compartment and a nonfrozen food compartment interconnected together by an air circulating means that is adapted to direct an air flow from said frozen food compartment to said nonfrozen food compartment when a valve member of said control device is in an open condition thereof, said control device comprising a housing means having a valve seat means and having an inlet means for interconnecting to said frozen food compartment and an outlet means for interconnecting to said nonfrozen food compartment, said valve seat means interconnecting said inlet means and said outlet means together, a movable valve member carried by said housing means and being adapted to open and close said valve seat means by being respectively moved to an open position thereof and a closed position thereof, and actuator means carried by said housing means and being operatively interconnected to said valve member to move said valve member between said positions thereof, the improvement wherein said actuator means comprises a coiled compression shape memory spring means that is adapted to move said valve member to said open position thereof by said spring means axially expanding from a closed coil bound condition thereof upon said spring means sensing a temperature above a first temperature and to move said valve member to said closed position thereof by said spring means axially contracting into said closed coil bound condition thereof upon said spring means sensing a temperature below a second temperature, said actuator means having selector means for selecting said first temperature.

5,144,814

THERMISTOR CALIBRATION

Marvin Gaudette, Rockton, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 26, 1991, Ser. No. 674,988
Int. Cl.[5] G01K *15/00*
U.S. Cl. 62—225 2 Claims



1. A method of calibrating a temperature sensing thermistor comprising the steps of:

(a) flowing a stream of constant temperature fluid over said thermistor;

(b) applying a constant voltage and flowing a current through said thermistor, and permitting the temperature of said thermistor to stabilize;

(c) measuring the resistance of said thermistor as stabilized with said stream of fluid flowing thereover;

(d) comparing said stored resistance with a known standard resistance value of said thermistors; and, storing the comparison in a microcomputer;

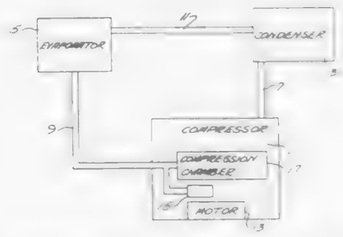
(e) flowing variable temperature fluid over said thermistor and measuring the changing resistance thereof with a microcomputer and applying said comparison as a correction factor to said changing resistance.

5,144,815

THERMAL VALVE FOR COMPRESSOR

Henry Ty, Attleboro; Richard J. Lisauskas, Wrentham, both of Mass.; Matthew L. Behler, Merrimack, N.H., and Narendra R. Zaveri, Attleboro Falls, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 427,163, Oct. 24, 1989, abandoned. This application Mar. 19, 1991, Ser. No. 671,608
Int. Cl.[5] F25B *31/00;* F04B *39/02*
U.S. Cl. 62—196.1 11 Claims



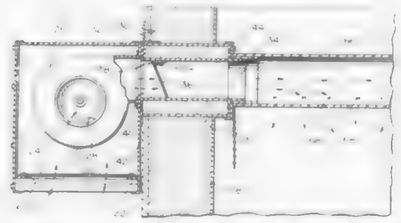
1. A compressor system having an evaporator, condenser and compressor, a motor disposed in the compressor, a line for transmitting refrigerated fluid from the evaporator to the compressor, a thermal valve means disposed within the compressor coupled to the line and responsive to the temperature of the motor to open at a predetermined sensed temperature of the motor to permit refrigerated fluid to flow through the valve into contact with the motor to cool the motor, the thermal valve means comprising a housing having a fluid inlet port coupled to the line and a fluid outlet port adjacent to the motor, a thermostat metal device secured at one end portion thereof within the housing another end portion of the thermostat metal device coupled to a baffle movably responsive to sensed temperatures of the motor to cause the baffle to move into and out of alignment with the fluid inlet port, the baffle being moved out of alignment with the fluid inlet port when the thermostat metal reaches the predetermined sensed temperature to cause refrigerated fluid to alter the temperature of the motor.

5,144,816

OUTSIDE AIR CIRCULATION SYSTEM FOR WALK-IN COOLERS

Rudolph L. Chase, Box 10, Craftsbury, Vt. 05826

Filed Dec. 27, 1990, Ser. No. 634,383
Int. Cl.[5] F25D *17/04, 17/06*
U.S. Cl. 62—408 3 Claims



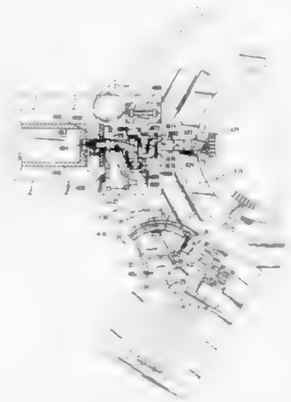
1. An air circulation system for a walk-in or reach-in cooler by which cold outside ambient air can be supplied into the interior of the cooler to maintain the temperature in the cooler within desired parameters without using a refrigeration system normally provided to maintain temperature within the cooler, said air circulation system comprising a housing mounted on the exterior of a wall of a cooler, said housing including a lateral extension extending through an opening in the wall of the cooler, an inlet tubular member extending through said extension, an outlet tubular member extending through said extension, said tubular members communicating said housing with the interior of the cooler, said housing having a peripheral wall including a downwardly facing wall having a cold air inlet opening therein and a vertical wall having a warm air discharge opening therein, a vertical partition in said housing forming an inlet compartment having said air inlet opening therein and a discharge compartment having said discharge opening therein, fan means mounted in said inlet compartment for moving cold air through the air inlet opening and inlet tubular member and fan means mounted in said discharge compartment for moving warm air through said outlet tubular member and said warm air discharge opening thereby supplying cold air to the interior of a cooler and discharging warm air from the interior of the cooler for maintaining predetermined low temperature conditions within the cooler, said inlet tubular member and said outlet tubular member including gravity operated dampers in the form of a flap valve in the interior of each tubular member for automatically closing the tubular members when the fan means are not operating, each of said fan means including a fan with a fan housing and motor with the motors being accustatically controlled to operate only when the walk-in cooler, calls for cooling and ambient outside temperature is below a predetermined low temperature, said fan housing in said inlet compartment including an intake spaced from the peripheral wall and a discharge connected to said wall and in communication with said discharge opening therein.

5,144,817

YARN FEED ASSEMBLY

E. C. Tibbals, Jr., High Point, N.C., assignor to Draper Corporation, Greensboro, N.C.

Division of Ser. No. 228,711, Aug. 5, 1988, which is a division of Ser. No. 901,313, Aug. 28, 1986, Pat. No. 4,796,444, which is a division of Ser. No. 398,303, Jul. 14, 1982, Pat. No. 4,608,839. This application Feb. 6, 1991, Ser. No. 651,590
Int. Cl.[5] D04B *15/60, 15/48*
U.S. Cl. 66—140 R 12 Claims



1. A yarn feed assembly for circular weft knitting machines, comprising

displaceable yarn supply means for tautly positioning a plurality of yarns in spaced apart relation for selective movement of a single one of said yarns to a pickup position,

slotted guide means disposed remote from said yarn supply means and adjacent to a yarn feed location as defined by the path of knitting needle displacement, and

displaceable transfer arm means for engaging said selected one yarn at said yarn supply means and transporting said selected one yarn into operative engagement with said slotted guide means and into the path of knitting needle displacement.

5,144,818

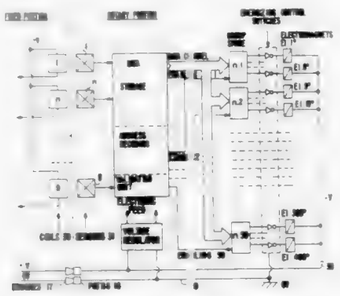
CONTROL DEVICE AND METHOD FOR ELECTROMAGNETIC NEEDLE SELECTION IN CIRCULAR KNITTING MACHINE

Paolo Brandani, Scandicci, Italy, assignor to Savio S.p.A., Pordenone, Italy

Filed Nov. 28, 1990, Ser. No. 619,750
Claims priority, application Italy, Dec. 1, 1989, 22566 A/89
Int. Cl.[5] D04B *15/78*
U.S. Cl. 66—219 8 Claims

1. A device for controlling needle selection in a circular knitting machine by electromagnetic actuators, one per needle, rotating with a needle cylinder, comprising a fixed electronic control system for transmitting digital control information to a rotating needle selection assembly, without any direct contact therebetween, via transmission channels having fixed circular magnetic coils surrounding the needle cylinder and sensors provided in the rotating needle selection assembly, said sensors being positioned for each to correspond with one of said mag-

netic coils and to travel along a circular contour of said magnetic coil to receive magnetic pulses generated by said magnetic coil along the entire path, said sensors consisting of Hall



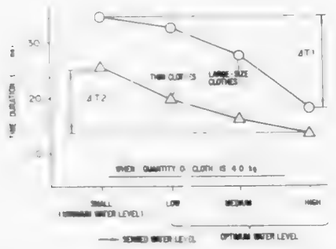
sensors for generating electrical signals proportional to the magnetic pulses received from the magnetic coil along which said sensor travels, and transmit said electrical signals to the rotating needle selection assembly.

5,144,819

CONTROLLER OF A WASHING MACHINE

Isao Hiyama; Yoshio Niwase; Yousuke Nagano; Shigeharu Nakano, all of Hitachi, and Tanotu Shikamori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,678
Claims priority, application Japan, Feb. 28, 1990, 2-045420
Int. Cl.[5] D06F *33/02*
U.S. Cl. 68—12.04 6 Claims



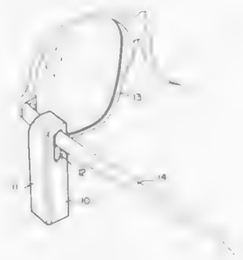
1. An operation controller of a washing machine comprising a washing tub, an agitating blade rotatably disposed in said washing tub, a motor for rotating said agitating blade and control means for controlling operation of said motor in accordance with a kind of clothes, wherein said control means includes measuring means for measuring a value representing a kind of clothes to be washed, said measuring means including rotation means for measuring a rotation of said agitating blade a plurality of times while a water level of the washing tub is changed starting from a low water level, resistance means for measuring resistance values of clothes exerted on said agitating blade from the rotation of said agitating blade as the water level is changed and calculation means for calculating the value representing the kind of clothes from the resistance values of the clothes.

5,144,820

ANTI-THEFT DEVICE FOR SPECTACLE FRAMES

Bertil Holmgren, Vellinge, Sweden, assignor to M W Trading APS, Glyngore, Denmark

PCT No. PCT/SE89/00280, § 371 Date Feb. 18, 1991, § 102(e) Date Feb. 18, 1991, PCT Pub. No. WO90/14649, PCT Pub. Date Nov. 29, 1990
PCT Filed May 19, 1989, Ser. No. 655,404
Int. Cl.[5] G02C *11/00*
U.S. Cl. 70—57.1 7 Claims



1. An anti-theft device for spectacle frames having spaced apart bows which, when unfolded, define a space therebetween, said device comprising:

a) a body having an elongated sleeve open at one end thereof, said sleeve having a transverse aperture therethrough to receive the bow, said aperture being bounded by two sidewalls and an end wall formed at an angle oblique to one of the side walls,

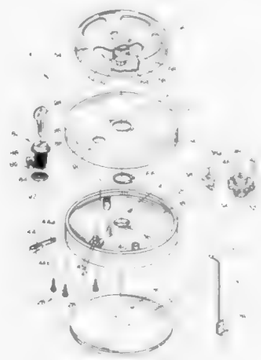
b) means for clamping the sleeve to the bow including a slide displaceable longitudinally within said sleeve and a screw received within the slide, said sleeve leaving the defined space free of obstruction, so that the frame may be worn without removal of the device and so that a bow extending through said aperture will tend to be biased against at least two inner walls of said aperture when said slide engages the bow.

5,144,821

PORTABLE LID LOCK

Robert M. Ernesti, 123 N. Lincoln, and Eugene M. Mueller, 843 N. Lincoln, both of West Point, Nebr. 68788

Filed Mar. 28, 1991, Ser. No. 676,878
Int. Cl.[5] E05B *65/06*
U.S. Cl. 70—159 6 Claims



1. A portable lid lock, comprising:

a base plate;

a cover plate having a depending peripheral wall;

said cover plate connected to said base plate with said peripheral wall continuously contacting said base plate to form a hollow cavity between said base plate and said cover plate;

a handle means rotatably connected to said cover plate, and having a drum portion extending through an aperture in said cover plate for rotation with said handle and projecting into said hollow cavity between said base plate and said cover plate, said handle rotatable in a first direction to rotate the drum in a first direction and rotatable in a second direction to rotate the drum in a second direction;

retractable cable means having a first end connected to said drum portion and a second end extending through an aperture in said base plate to project generally perpendicularly outwardly from said base plate, said cable first end connected to said drum portion such that rotation of the drum in a first direction extends the cable through said base plate aperture, and such that rotation of the drum portion in a second direction retracts said cable through said base plate aperture;

hook means connected to the second end of said cable; and

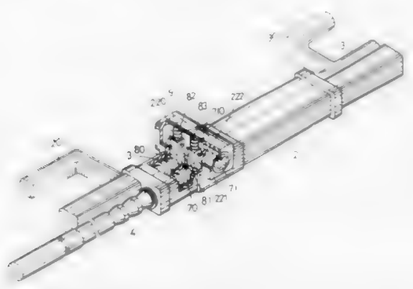
lock means connected to said cover plate for selectively locking said drum portion to selectively prevent rotation of the drum portion in the first direction so as to prevent extension of said cable.

5,144,822

AUTOMOBILE STEERING LOCK

Shwu-Meei Jan, No. 7-2, Alley 13, Lane 54, Sec. 2, Hsing-Nan Road, Jung-Heh, Taipei Hsien, and Hsien-Pao Chen, No. 76, Lane 274, Jung-Jeng S. Road, Yung-Kang Shiang, Tainan Hsien, both of Taiwan

Filed Oct. 15, 1990, Ser. No. 597,045
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 3 Claims



1. An anti-theft device for attachment to a steering wheel of an automobile comprising:

a) a body member defined by a first elongate tubular member having an open end, a closed end and a first passageway extending along its longitudinal axis from the open end to the closed end, and a second elongate tubular member having an open end, a closed end and a second passageway extending along its longitudinal axis from the open end to the closed end, the first and second tubular members being disposed parallel and adjacent to each other, with the open ends of the tubular members facing in opposite directions;

b) the body member including a first hook portion extending from the first tubular member for engaging a first inside portion of a steering wheel and disposing the closed end of the second tubular member at a distance from the periphery of the wheel;

c) a retaining member attached to the open end of each of the first and second tubular members for securing the tubular members together, and the retaining members including openings disposed in alignment with the first and second passageways;

d) a first elongate rod member having an inner end and an outer end, the inner end being receivable within the first passageway to telescopically dispose the first rod member therein and through the opening formed in the corresponding retaining member attached to the open end of the first tubular member, the outer end of the first rod member including a second hook portion for engaging a second inside portion of the wheel opposite to the first inside portion, the first rod member including a plurality of longitudinally spaced annular grooves, each annular groove being defined by a vertical sidewall perpendicular to the longitudinal axis of the first rod member and positioned closer to the outer end thereof and a conical sidewall positioned farther from the outer end thereof;

e) a second elongate rod member having an inner end and an outer end, the inner end being receivable within the second passageway to telescopically dispose the second rod member therein and through the opening formed in the corresponding retainer member secured to the open end of the second tubular member, the second rod member including a plurality of longitudinally spaced annular grooves, each annular groove being defined by a vertical sidewall disposed perpendicular to the longitudinal axis of the second rod member and closer to the outer end thereof and a conical sidewall disposed farther from the outer end thereof;

f) a housing means including a boss provided with a transverse cylindrical passageway extending therethrough and having a longitudinal axis offset with respect to the parallel axes of the first and second elongate passageways, and a pair of vertical passageways interconnecting the cylindrical passageway with the first and second passageways;

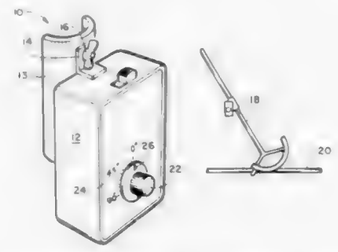
g) a lock disposed in the housing means, the lock including an inner end and a projection formed on the inner end;

h) a locking member having a semicircular cross-section, the locking member including an arcuate outer surface conforming to the cylindrical passageway in the boss, a flat top, an end wall, a recess formed in the end wall for engagement by the projection of the lock, a sidewall, and a pair of spaced notches formed in the sidewall and disposed in alignment with the pair of vertical passageways, whereby the locking member is disposed to swing between an unlocking position wherein the locking member occupies a bottom portion of the cylindrical passageway and the flat top is maintained substantially in a horizontal disposition, and a locking position wherein the locking member occupies a side portion of the cylindrical passageway and the flat top is disposed in a downward slant towards the pair of spaced notches;

i) bearing means including a pair of rod-like bearings slidably received through the vertical passageways and the notches in the locking member, each bearing including a pair of opposed pivots at a top end thereof, the two pairs of opposed pivots being disposed in engagement against the flat top of the locking member, each bearing including a tenon member at a bottom end thereof, the bearings being actuated by the locking member whereby when the locking member is disposed in the locking position, the tenon members engage selected annular grooves in the first and second rod members and, when the locking member is in the unlocking position, the tenon members are withdrawn from the annular grooves; and

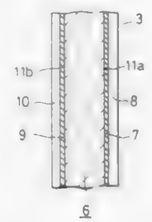
j) spring means for biasing the bearing means toward the first and second rod members.

5,144,823
BEND ANGLE INDICATOR
Gary J. Wood, El Cajon, Calif., assignor to Robert Gene Smith and Johnathan Dean Limpert, both of San Diego, Calif., part interest to each
Continuation of Ser. No. 664,743, Mar. 5, 1991, abandoned. This application Nov. 29, 1991, Ser. No. 798,973
Int. Cl.[5] B21D *7/14*
U.S. Cl. 72—31 11 Claims



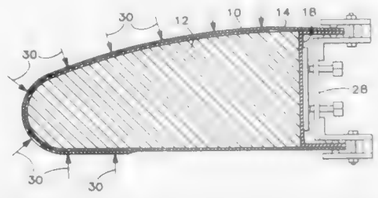
1. A bend angle indicator for indicating a selected bend angle to a conduit or a tube comprising:
a bending tool;
attachment means for removably attaching said end angle indicator to said bending tool;
means for calibrating the bend angle indicator to a true conduit or tube horizontal reference;
means for pre-selecting a desired bend angle to said conduit or tube from said true horizontal reference; and
means for indicating said pre-selected bend angle when achieved.

5,144,824
PROCESS FOR THE PREPARATION OF A THICKNESS-REDUCED DRAW-FORMED CAN
Akira Kobayashi; Katsuhiro Imazu; Masanori Aizawa, and Tomomi Kobayashi, all of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan
Filed Oct. 18, 1990, Ser. No. 599,772
Claims priority, application Japan, Oct. 18, 1989, 1-269013
Int. Cl.[5] B21C *24/00*
U.S. Cl. 72—46 4 Claims



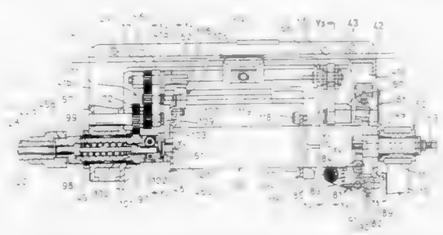
1. A process for the preparation of a thickness-reduced drawn can, which comprises draw-forming a resin-coated metal plate and redrawing the obtained preliminarily drawn cup into a can having a smaller diameter, wherein the resin coated metal plate is a laminated metal plate comprising a metal plate and a coating layer of a thermoplastic copolyester resin comprising ethylene terephthalate having a tension (T) of from 1×10^7 to 8×10^8 dyne/cm² under an elongation of 200% at a temperature of the glass transition temperature plus 20° C. and the redraw-forming is carried out at a temperature at which the dynamic friction coefficient (μk) of the thermoplastic copolyester resin is smaller than 0.5 and which is equal to or higher than the glass transition temperature, while elongating the side wall of the can by bending and pulling to reduce the thickness of the side wall of the can.

5,144,825
ELEVATED TEMPERATURE ENVELOPE FORMING
Bruce M. Burg, Louisville, Colo.; David H. Gane, and Robert M. Starowski, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 27, 1990, Ser. No. 589,058
Int. Cl.[5] B21D *26/02*
U.S. Cl. 72—60 15 Claims



1. A method for forming a sheet metal part comprising the steps of:
placing a part blank against a form tool;
enclosing said part blank and said form tool within a flexible envelope by at least partially wrapping said envelope around said part blank;
sealing said envelope against atmospheric pressure;
providing a vacuum within said envelope for holding said envelope against said part blank in substantially form fitting engagement with said forming tool; and
heating said envelope, said part blank and said form tool for a period of time thereby forming the sheet metal part.

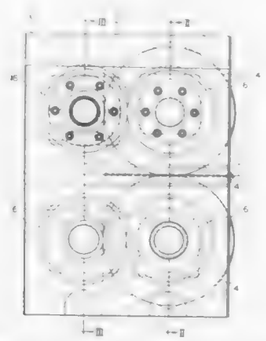
5,144,826
FORMING DEVICE TO BE PRACTICED IN COIL SPRING FORMING MACHINE AND METHOD OF REPLACING SAID DEVICE
Motoo Morita, Komaki, Japan, assignor to Morita Iron Works Co., Ltd., Aichi, Japan
Filed Jul. 9, 1990, Ser. No. 550,165
Int. Cl.[5] B21F *3/02*
U.S. Cl. 72—140 3 Claims



1. A cassette type coil spring forming device to be practiced replaceably in the body of the forming machine for forming a coil spring by winding a heated rod or wire-shaped spring material into a form of spiral,
comprising, a means for forming a major section of a spring in a holder which can be moved along a rail member extended longitudinally in said body such that said holder may be carried in or out of said body, and also can be fixed releaseably thereto;
a rotary shaft member to be rotatably supported horizontally in one arm of said holder and to be separably connected to a rotation system in a driving device provided in said body;

an insertion opening for inserting a mandrel therethrough, formed in the other arm of said holder, which opening is in alignment with and opposed to said rotary shaft member;
a mandrel for winding said material therearound, to be inserted through said insertion opening, wherein one end thereof is to be positioned relative to the inner end portion of said rotary shaft member and linked thereto, and the other end is to be rotatably supported to be separable relative to a bearing member disposed in said body;
a lead screw for guiding said material, to be set at a predetermined position relative to said mandrel by being rotatably supported horizontally between support members provided in said holder at both end portions, and also to be connected to said rotary shaft member through a rotation transmitting mechanism;
a chucking device for securing said material, wherein a chucking piece incorporated at the inner end portion of said rotary shaft member is connected to an operation section provided at an outer end portion of said member through an operation member, whereby the starting end of said spring material is secured at a peripheral starting end portion of said mandrel;
and a tail end regulating device for regulating a wind terminal end of the spring material by positioning or guiding a tail end portion of said spring material to be wound around the mandrel at a predetermined position of said mandrel along the axial direction of said mandrel

5,144,827
ROLLING MILL STAND
Itsushi Iio, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd, Tokyo, Japan
Filed Jul. 11, 1991, Ser. No. 731,172
Claims priority, application Japan, Jul. 12, 1990, 2-184833
Int. Cl.[5] B21B *13/12, 31/26, 35/12*
U.S. Cl. 72—224 6 Claims



1. A rolling mill roll stand having a pass line along which metal bars and rods are driven comprising:
a housing;
a plurality of eccentric shafts mounted to said housing by journals at each end of each eccentric shaft for eccentric rotary movement;
a plurality of bevel gears drivingly connecting one end of each of said eccentric shafts to an end of an adjacent eccentric shaft;
a plurality of grooved rolls arranged radially at substantially equal angle intervals around said pass line, means rotatably supporting each of said grooved rolls on one of said eccentric shafts for rotation about an axis with the rotational axes of said grooved rolls lying in a first plane;
a plurality of driven gears with each driven gear mounted concentric with the rotational axis of one of said grooved rolls to rotate said grooved roll;
a plurality of roll-driving shafts mounted to said housing; each of said roll-driving shafts being rotatable on an axis of rotation which lies in a second plane spaced from said first plane along a length of said pass line;
a second plurality of bevel gears with each bevel gear of said second plurality of bevel gears fixed to the end of one of said roll-driving shafts and engaging a bevel gear fixed to the end of an adjacent roll-driving shaft to drivingly connect each of said roll-driving shafts to an adjacent roll-driving shaft;
a plurality of driving gears, each of said driving gears being mounted for rotation with one of said roll-driving shafts and drivingly engaging one of said driven gears;
means for rotating said eccentric shafts connected by said bevel gears to simultaneously adjust a radial distance between said pass line and said rotational axes of said grooved rolls; and
drive means for rotating said roll-driving shafts connected by said second plurality of bevel gears to simultaneously rotate said plurality of drive gears and said grooved rolls.

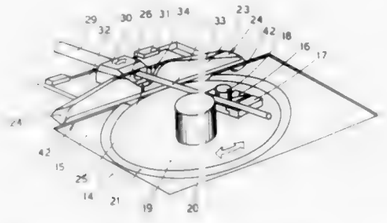
5,144,828
COMBINED LIGHT-SECTION MILL AND WIRE MILL
Johann Grotepass, Ratingen; Konrad Hamraths, Kaarst; Albert Hauck; Karl Keller, both of Hilchenbach, and Hubert Müller, Grevenbroich, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed May 6, 1991, Ser. No. 696,190
Claims priority, application Fed. Rep. of Germany, May 4, 1990, 4014411
Int. Cl.[5] B21B *1/16, 31/10*
U.S. Cl. 72—235 23 Claims

1. In a combined, continuously operating high-speed light-section mill and wire mill with a roughing train, at least one intermediate train and a subsequent finishing train, wherein each of the trains includes several rolling mill stands, the improvement comprising the roughing train and the intermediate train and the finishing train of the rolling mill including CL stands with overhung-mounted collars, and the roughing train and the intermediate train and the finishing train including stands each comprising a modular unit with double-mounted collars.

5,144,829
SHEARS UNIT
Giorgio D. Fabro, Cassacco-Fraz.Montegnacco, and Marcello D. Fabro, Udine, both of Italy, assignors to M. E. P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale, Italy
Filed Mar. 2, 1990, Ser. No. 487,297
Claims priority, application Italy, Mar. 6, 1989, 83349 A/89
Int. Cl.[5] B21D *7/024*
U.S. Cl. 72—294 8 Claims

1. A shears-bending assembly comprising:
a bending assembly comprising a rotatable bending disk having a contrast roll and a bending pin provided in an upper surface thereof, said bending disk being supported on support means for changing the reciprocal positions of said contrast roll and a section or sections to be bent; and
a shears unit provided upstream of said contrast roll with respect to a direction of feed of said section or sections to be bent, said shears unit comprising a stationary blade

support bearing and positioning a laterally shearing stationary blade and being positioned astride and above a part of said bending disk, a laterally displaceable blade



holder, and means for laterally displacing said laterally displaceable blade holder toward said laterally shearing stationary blade for shearing said section or sections.

5,144,830

METHOD FOR PRODUCTION OF NODES FOR TUBULAR TRUSS STRUCTURES

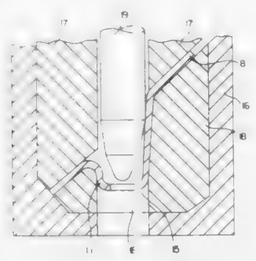
Giannio Ferrotti, and Ferruccio Fabbri, both of Terni, Italy, assignors to Terni Acciai Speciali S.p.A., Rome, Italy

Continuation of Ser. No. 735,183, Jul. 17, 1991, abandoned, which is a continuation of Ser. No. 471,078, Jan. 30, 1990, abandoned, which is a continuation of Ser. No. 208,821, Jun. 17, 1988, abandoned. This application Feb. 6, 1992, Ser. No. 831,668

Claims priority, application Italy, Jun. 15, 1987, 48056 A/87

Int. Cl.[5] B21K *21/06*

U.S. Cl. 72—356 **1 Claim**



1. Method for the production of nodes for tubular truss structures comprised of tubular leg elements connected together by transverse tubular brace elements forming acute angles with said leg elements by means of intermediate joint elements each including at least a connecting stub element between said leg and brace elements, wherein said stub element is prepared by the following steps:

a) bending an imperforate steel plate to a U shape to form a steel piece having a curved portion;

b) subsequently heating to high temperature, from about 950° C. to about 1200° C., said curved portion of said steel piece;

c) forming an imperforate protuberance having an acutely angled centerline on said heated portion of said steel piece by extruding said piece into a female die having an acutely angled recess therein;

d) adjusting the radius of curvature of the thusformed piece to correspond to the radius of curvature of the leg elements;

e) forming an aperture on said thus-formed piece on the acutely angled centerline of said protuberance;

f) subsequently heating to high temperature, from about 950° C. to about 1200° C., said protuberance of said thus-formed piece at its terminal portion; and

g) extruding the thus-formed and pierced and heated protuberance with a male die extending and moving in the direction of said acutely angled centerline, to the desired final shape of said stub element, thereby to produce on said stub a circular end edge disposed in a plane perpendicular to said acutely angled centerline.

5,144,831

METHOD AND APPARATUS FOR MONITORING GAS CONCENTRATIONS

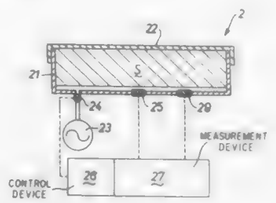
John M. Hale, Meinier, and Eugen Weber, Hinwil, both of Switzerland, assignors to Orbisphere Laboratories Neuchatel SA, Switzerland

Filed Nov. 16, 1990, Ser. No. 614,133

Claims priority, application Switzerland, Nov. 17, 1989, 4145/89

Int. Cl.[5] G01N *7/10*

U.S. Cl. 73—19.05 **10 Claims**



1. A method of monitoring the concentration of a gas in a fluid medium comprising the steps of:

(A) pulsatingly measuring a specific diffusion parameter per unit area and per unit time of said gas through a polymer membrane that is in contact with said fluid medium and is permeable for said gas but substantially impermeable for said fluid medium, said measuring occurring prior to diffusion of said gas reaching equilibrium; and

(B) calculating said concentration from a previously determined general diffusion parameter of said gas through said polymer membrane and said specific diffusion parameter.

5,144,832

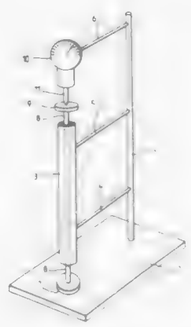
FLOW CHARACTERIZATION APPARATUS AND PROCESS

David L. Drope, Petrolia, Canada, assignor to Polysar Rubber Corporation, Sarnia, Canada

Filed Mar. 25, 1991, Ser. No. 674,156

Int. Cl.[5] G01N *11/12*

U.S. Cl. 73—54.15 **5 Claims**



1. An apparatus for the determination of the flow characteristics of a synthetic rubbery polymer which comprises

a base plate,

attached to said base plate a vertical retaining rod,

a vertical guide of shorter length than said vertical retaining rod and having a centrally located full length aperature,

at least two spaced apart horizontal support rods each attached at one end to said vertical retaining rod and at the opposite end to said vertical guide,

located within the aperture of said vertical guide a vertical contact rod which is freely moveable in the vertical direction within said vertical guide and extends in the upward and downward directions above and below said vertical guide,

a bottom plate located at and having its uppermost surface in contact with the lowermost end of said vertical contact rod,

a disc located at and in contact with the uppermost end of said vertical contact rod and being removeable and replaceable to provide the weight required for the particular synthetic polymer being tested,

a horizontal holding rod attached at one end to an uppermost point of said vertical retaining rod,

a micrometer having a contact point for sensing vertical displacement and being attached to the opposite end of said horizontal holding rod,

the contact point of said micrometer being in direct contact with said disc to sense the vertical displacement of said disc,

the lowermost surface of said bottom plate being in close proximity to the uppermost surface of said base plate, said bottom plate being vertically displaceable from said base plate such that a sample of the synthetic polymer to be tested can be located between and in contact with the lowermost surface of said bottom plate and the uppermost surface of said base plate.

5,144,833

ATOMIC FORCE MICROSCOPY

Nabil M. Amer, Armonk, and Gerhard Meyer, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1990, Ser. No. 588,795

Int. Cl.[5] G01B *11/30*

U.S. Cl. 73—105 **28 Claims**

1. A method for generating a topographical image of a surface of a workpiece comprising the steps of:

moving a tip which is fixed to one end of a front side of a micromachined cantilever beam toward a surface of a workpiece to be inspected at a distance where the forces occurring between the atoms at the tip and on the workpiece surface deflect the cantilever;

transmitting a laser beam onto a back of the cantilever beam;

detecting the laser beam reflected from the cantilever beam with position-sensitive detection means for converting the reflected beam into an output signal indicative of an angular change of the cantilever beam which change is inversely proportional to the length of the cantilever beam;

scanning the tip relative to the surface, and

processing the output signal for providing a topographical image of the workpiece surface.

5,144,834

SYSTEM FOR SIMULATING POWER PLANT OF AUTOMOTIVE VEHICLE UTILIZING ELECTRICALLY POWERED HIGH INERTIA POWER PLANT

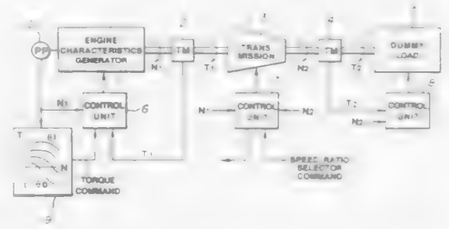
Kaoru Sano; Fumio Mizushina; Takashi Goto; Toshimitsu Maruki, all of Shizuoka, and Yukio Naganuma, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Nov. 28, 1990, Ser. No. 618,952

Claims priority, application Japan, Nov. 30, 1989, 1-310882; Nov. 30, 1989, 1-310887; Nov. 30, 1989, 1-310888

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—118.1 **15 Claims**



1. A simulation system for an automotive internal combustion engine applicable to a testing of a vehicular power transmission, comprising:

a power plant which incorporates a relatively high revolution inertia and having means for compensating said high inertia for achieving a low inertia substantially equivalent to the automotive internal combustion engine;

an engine characteristics generator for receiving predetermined engine operation parameter simulated data and for deriving a control signal for commanding an output torque of said power plant according to a predetermined engine output torque variation characteristic which is set in terms of said engine operation parameter simulated data; and

means responsive to a simulated engine environmental condition indicative data for deriving a correction value based on an environmental condition for correcting said control signal.

5,144,835

LIQUID LEVEL SENSING DEVICE AND METHODS OF MAKING AND OPERATING THE SAME

Charles W. McDonald, Gallatin, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 581,014, Sep. 12, 1990, Pat. No. 5,050,431. This application Jul. 12, 1991, Ser. No. 729,495

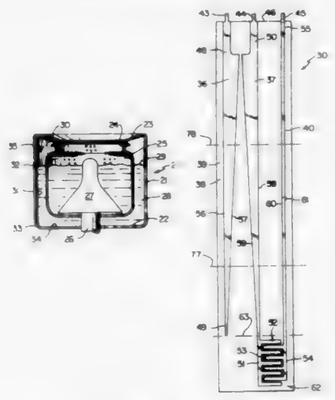
The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.

Int. Cl.[5] G01F *23/26*

U.S. Cl. 73—304 C **18 Claims**

1. In a liquid level sensing device for determining the level of a liquid in a liquid confining means, said device comprising a pair of electrode plate means disposed in spaced apart relation so as to be adapted to be in a certain position relative to said confining means and having opposed ends, electrical means connected to said electrode plate means for creating a voltage signal means therefrom that varies in relation to the level of said liquid in said confining means relative to said electrode plate means, and means for determining the actual level of said liquid from said signal means, the improvement wherein a third electrode plate means is disposed in spaced apart relation to said pair of electrode plate means and is adapted to cooperate with one of said pair of electrode plate means to provide a reference voltage signal to determine the electrolytic base of said liquid, said third electrode plate means having opposed ends one of which is disposed adjacent one of said ends of said one of said pair of electrode plate means, said adjacent ends of

said plate means being adapted to be disposed adjacent the bottom of said liquid confining means with the other ends thereof disposed adjacent the top of said liquid confining means, said pair of electrode plate means each having a pair of opposed side edge means extending between said opposed ends



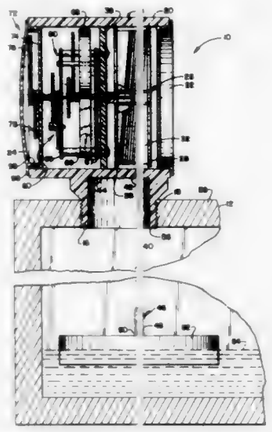
thereof, said pair of electrode plate means having the adjacent side edge means thereof angled relative to each other an converging toward each other as said adjacent side edges extend from said bottom of said liquid confining means toward said top thereof.

5,144,836

LIQUID LEVEL SENSING GAUGE ASSEMBLY AND METHOD OF INSTALLATION

R. Michael Webb, 3108 Sherman Ave., Eau Claire, Wis. 54701

Filed Jul. 18, 1991, Ser. No. 732,051
Int. Cl.[5] G01F *23/32*
U.S. Cl. 73—319 12 Claims



1. A gauge assembly for measuring the level of a liquid in a storage tank or like container, comprising:

an outer housing;

a spool member rotatably mounted within said outer housing;

indicator means on said outer housing for displaying a value which corresponds to the rotary position of said spool member;

spring means for biasing said spool member in a first rotary direction;

a filament secured to and wound about said spool member so as to wind onto said spool member when said spool member is rotated in said first, rotary direction;

an adapter clip means, connected to a second, free end of said filament, which is adapted for securing to a float member, said adapter means being positioned outside of said outer housing; and

means defining an opening in said outer housing through which said filament passes, said opening being sized so as to prevent passage of said adapter means therethrough, whereby a customer can install said assembly by securing a float member to said adapter means and allowing the weight of the float member to pay out filament against the bias of said spring means without fear of said filament retracting into said outer housing.

5,144,837

ACCELERATION DETECTOR

Satosi Komurasaki; Shoiti Katoh, both of Himeji, and Tomohumi Kinugasa, Kako, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 14, 1990, Ser. No. 493,542
Claims priority, application Japan, Mar. 15, 1989, 1-28511; Mar. 29, 1989, 1-34843
Int. Cl.[5] G01P *15/09*
U.S. Cl. 73—517 R 7 Claims

1. An acceleration detector, comprising:

a threaded bushing;

an acceleration transducer assembly disposed on said bushing and including a piezoelectric element, an output terminal and an inertial weight; and

a substantially ring-shaped, thread-engaging stop nut thread-engaging to said threaded bushing for securing said transducer assembly thereon;

said stop nut having an internal thread in the inner circumferential surface thereof and an axial engagement groove extending through said stop nut and formed in an outer circumferential surface thereof for receiving a tool therein for rotating said stop nut about said threaded bushing;

said output terminal having a substantially ring-shaped portion, a connection tab substantially radially outwardly extending from said ring-shaped portion for an external connection, and a transition fillet provided at a transition area between said ring-shaped portion and said tab for distributing the concentration of stress on said transition area during tightening of said stop nut.

5,144,838

DEFECT DETECTING METHOD AND APPARATUS

Kiyoshi Tsuboi, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd. and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 592,247, Oct. 3, 1990. This application Jun. 7, 1991, Ser. No. 711,908
Claims priority, application Japan, Oct. 4, 1989, 1-259183
Int. Cl.[5] G01N *29/12*
U.S. Cl. 73—579 9 Claims

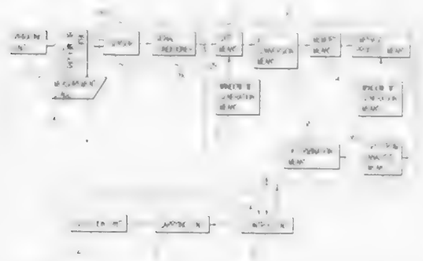
1. A defect detecting method for detecting defects in an object, comprising the steps of:

applying a vibration to said object until a first predetermined time;

recording a vibration wave form from said object after said first predetermined time;

determining a first time after a peak value of said vibration waveform and a second time after said first time,

applying said vibration wave form, an emphasizing window which emphasizes said vibration wave form from between said first time and said second time, thereby defining an emphasized vibration wave form;



transforming the emphasized vibration wave form to frequency domain to form a transformed vibration spectrum, wherein said transformed vibration spectrum has all peaks corresponding to each vibrational order of said object in a limited frequency range;

retransforming a limited frequency range containing all peaks corresponding to a selected vibrational order to time domain, thereby forming a wave form in time series of said selected vibrational order;

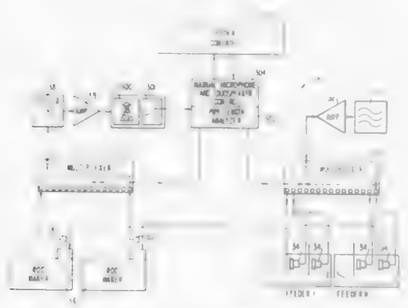
determining an envelope of the wave form in times series of said selected order, wherein oscillations in said envelope indicate defects in said object.

5,144,839

METHOD OF CHECKING THE PRESENCE OF A PIPELINE CONNECTION BETWEEN TWO END POINTS

Peter Lochner, Gröbenzell, Fed. Rep. of Germany, assignor to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Sep. 10, 1990, Ser. No. 580,311
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1989, 3930424
Int. Cl.[5] G01B *17/00*; G01H *3/12*
U.S. Cl. 73—609 11 Claims



1. A method of checking the existence of a connection between two end points of a pipeline, said method comprising:

producing acoustic signals at one end point with a transmitter in the pipeline, the frequency of the acoustic signals being above the frequency of ambient noises and below an upper limit which results from the formula $f=c/2d$, in which f is the frequency, c the acoustic velocity of the material in the tube (gas, fluid), and d the inside diameter of the pipeline;

converting the acoustic signals into an electrical signal by an acoustic sensor at the other end point; and

comparing the electrical signal with a threshold value; wherein:

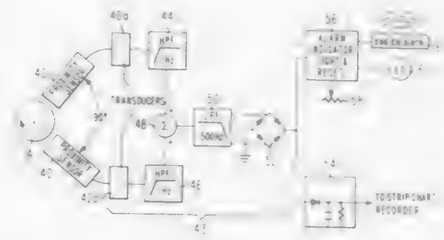
the presence of a pipeline connection is indicated when said electrical signal exceeds said threshold value.

5,144,840

VIBRATION DETECTOR AND METHOD FOR ROTATING SHAFT

Walter Whipple, III, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 370,667, Jun. 23, 1989, abandoned. This application Jul. 30, 1991, Ser. No. 739,775
Int. Cl.[5] G01H *1/10*
U.S. Cl. 73—660 13 Claims



1. Apparatus for detecting vibration of a rotating shaft in a Czochralski type crystal puller said apparatus comprising:

a first non-contacting proximity sensor adapted to be disposed proximate to the rotating shaft in order to detect vibratory movement thereof;

at least a second non-contacting proximity sensor similarly disposed at a predetermined angle with respect to the first sensor in order to detect vibratory movement of said rotating shaft;

high pass filtering means coupled to each of said sensors;

an adder coupled to each of said high pass filtering means;

low pass filtering means coupled to said adder; and

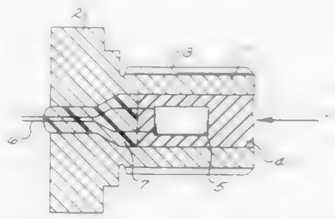
AC detection means coupled to said low pass filtering means

5,144,841

DEVICE FOR MEASURING PRESSURES AND FORCES

Arnoldus M. Brouwers, DN Wierden, Netherlands; Ahmed H. Amin, No. Attleboro, and Francois A. Padovani, Westwood, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 485,117, Feb. 23, 1990, abandoned. This application May 3, 1991, Ser. No. 695,623
Int. Cl.[5] G01L *9/00*
U.S. Cl. 73—706 7 Claims



5. Device for measuring pressures or forces, comprising a pressure or force sensor in the form of a piezoelectric or piezo-

resistive pressure or force transducer having at least one electric cable connected thereto, and an incompressible elastomer mass which transfers the pressure or force to be measured to the transducer characterized in that said transducer is totally embedded in said elastomer mass and is enclosed by said mass on all sides, said mass is accommodated in a housing which is open at one side in such a way that the medium of which the pressure is to be measured can come into direct contact with the mass, and said housing is the hollow shank of a screw-threaded bolt.

5,144,842

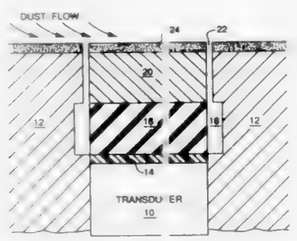
PRESSURE TRANSDUCER PROTECTION APPARATUS

Duane A. Pelkey, Kent, and Patrick J. Schirmer, Seattle, both of Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1991, Ser. No. 676,035

Int. Cl.[5] G01L 7/00

U.S. Cl. 73—706 **11 Claims**



1. A pressure transducer protection apparatus, said pressure transducer protection apparatus being embedded in a surrounding material, and comprising in combination:

a pressure transducer including a sensing element to receive an input pressure,

load distribution means said load distribution means distributing the load from said input pressure evenly to said sensing element, said load distribution means provides a cushion to absorb energy due to external impacts,

a disk is operatively positioned atop said load distribution means, said disk prevents external particles from directly impinging on said sensing element and also provides mass for absorbing the momentum of said external particles,

an air gap formed in said surrounding material and located around the outer periphery of said load distribution means, said air gap provides a radial expansion space for said load distribution means and

a clearance gap provided between the outer periphery of said disk and said surrounding material.

5,144,843

PRESSURE SENSOR

Morio Tamura, Tsutiura; Fujio Saito, Tsukuba; Hisayoshi Hashimoto, Ushiku; Ken Ichiryu; Kazuyoshi Hatano, both of Ibaraki; Kiyoshi Tanaka, Mizukaido, and Nobuyuki Tobita, Mito, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00745, § 371 Date Mar. 21, 1990, § 102(e) Date Mar. 21, 1990, PCT Pub. No. WO90/01153, PCT Pub. Date Feb. 8, 1990

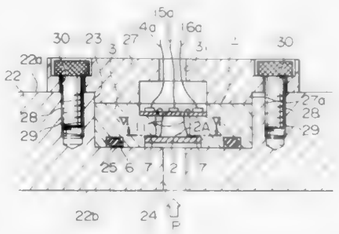
PCT Filed Jul. 26, 1989, Ser. No. 474,765

Claims priority, application Japan, Jul. 26, 1988, 63-98647[U]; Jun. 7, 1989, 1-144388; Jun. 27, 1989, 1-75491[U]

Int. Cl.[5] G01L 9/06

U.S. Cl. 73—727 **7 Claims**

6. A pressure sensor comprising a diaphragm shaped into the form of a rectangular metal thin plate formed by server from a thin plate substrate, having a strain detecting section provided on one surface, and using both one surface and the other surface as pressure receiving surfaces, and a support member having a larger-diameter bore and a smaller-diameter bore formed in continuous and coaxial relation to said larger-diameter bore, wherein said larger-diameter bore receives said diaphragm, the inner wall surface of said larger-diameter bore contacts apexes of said diaphragm to determine an installed position of said diaphragm relative to said smaller-diameter bore thereby limiting a position of the outer edge of said dia-



phragm, said smaller-diameter bore defines a dimension of a strain causing area of said diaphragm, a stepped portion formed between said larger-diameter diameter bore and said smaller-diameter bore provides a bonding surface to be bonded to said diaphragm, and pressure media under different levels of pressure are introduced to one surface and the other surface of said diaphragm placed in said larger-diameter bores, whereby said pressure sensor is constituted as a differential pressure sensor.

5,144,844

CRUCIFORM PLANAR SPECIMEN FOR BIAXIAL MATERIALS TESTING

Friedrich Mathiak; Arnold Krawietz, both of Berlin; Horste Nowack, Siegburg, and Karl-Heinz Trautmann, St. Augustin, all of Fed. Rep. of Germany, assignors to Innovationsgesellschaft fur fortgeschrittene Produktion-ssysteme in der Fahrzeugindustrie MbH, Berlin, Fed. Rep. of Germany

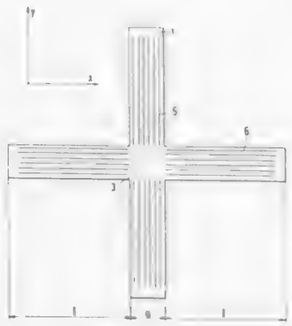
PCT No. PCT/DE90/00298, § 371 Date Mar. 4, 1991, § 102(e) Date Mar. 4, 1991, PCT Pub. No. WO90/13804, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 21, 1990, Ser. No. 635,627

Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914966

Int. Cl.[5] G01N 3/00

U.S. Cl. 73—79.4 **10 Claims**



1. A flat cross-shaped testpiece made of sheet metal for biaxial testing of the material thereof, said test piece including:

a central regin defining an area of measurement;

four load applying arms for applying loads to said central region, each said arm having one end integral with said central region and an opposite end having an end part for connection to a test device for the application of a load,

whereby tensile stresses can be applied to said central region along first and second orthogonal coordinate axes; and

linear slots in said load applying arms extending along said arms parallel to said first or second coordinate axes and extending linearly from said end part as far as and up to said area of measurement;

wherein said load applying arms are reinforced in strength relative to said central region defining said area of measurement.

5,144,845

ADHESIVE TESTING DEVICE

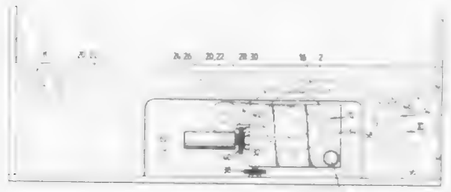
John A. Pyke, Orpington, England, assignor to Molins PLC, Miltin Keynes, Great Britain

Filed Jan. 24, 1991, Ser. No. 645,490

Claims priority, application United Kingdom, Jan. 25, 1990, 9001744

Int. Cl.[5] G01N 3/08

U.S. Cl. 73—827 **19 Claims**



1. An adhesive testing device comprising a movable carriage on which a substrate may be mounted, an anvil member on which another substrate may be mounted, means for applying adhesive to the substrate on the movable carriage, means for moving the carriage to a position in opposition to the anvil, means for urging the carriage and anvil together to bring the substrates and interposed adhesive together under pressure, means for subsequently separating the anvil and the carriage, and means for measuring the force required to separate the anvil and carriage to obtain a measurement of the strength of the adhesive bond between the substrates, wherein the means for separating the anvil and the carriage includes means for imposing a separating force which includes at least a substantial component normal to the substrates, and including a beam on which the anvil is mounted, the beam carrying a strain gauge for producing a measurement of force required to separate the adhesive bond between the substrates.

5,144,846

MINIMAL STRUCTURE MAGNETOSTRICTIVE STRESS AND TORQUE SENSOR

Robert D. Klauber, and Erik B. Vigmostad, both of Fairfield, Iowa, assignors to SensorTech, L.P., Fairfield, Iowa

Continuation-in-part of Ser. No. 222,838, Jul. 21, 1988, Pat. No. 4,939,937. This application May 2, 1990, Ser. No. 518,083

Int. Cl.[5] G01L 3/02

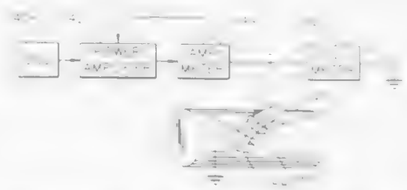
U.S. Cl. 73—862.336 **6 Claims**

1. Apparatus for sensing torque in a torque transmitting member, consisting of:

an electrically conductive coil for inducing a magnetic induction field flux in the torque transmitting member when said coil is energized;

means for supplying constant current through said coil to energize said coil; and

means for sensing the voltage across said coil which is produced by the constant current energization of said coil, to



thereby determine torque in the torque transmitting member.

5,144,847

PRESSURE OR FORCE MEASURING DEVICE

Kurt Furtmayer, Pfaffenhofen, Fed. Rep. of Germany, assignor to Johann Zach, Pfaffenhofen, Fed. Rep. of Germany

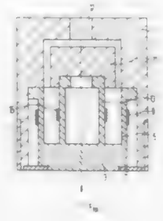
PCT No. PCT/EP89/00302, § 371 Date Aug. 29, 1990, § 102(e) Date Aug. 29, 1990, PCT Pub. No. WO89/09385, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 21, 1989, Ser. No. 549,006

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809974

Int. Cl.[5] G01L 1/22, 19/02

U.S. Cl. 73—862.625 **14 Claims**



1. Pressure of force measuring device comprising a housing (1),

a measuring body (3) subjected to the measured pressure or measured force,

a reference body (11) not subjected directly to the measured pressure or measured force,

a first elastically deformable force measuring element (13) via which the measuring body (3) and the reference body (11) are supported with respect to each other,

a first signal generator (15) for generating a measuring signal corresponding to the deformation of the first force measuring element (13),

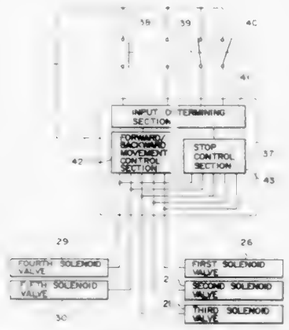
a second elastically deformable force measuring element (5) via which the measuring body or the reference body is supported deflectably with respect to the housing,

a second signal generator (9) for generating a measuring signal corresponding to the deformation of the second force measuring element (5),

and an evaluating circuit processing the measuring signals from the two force measuring elements (5, 13),

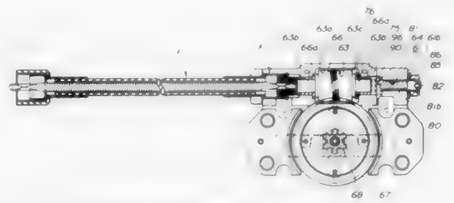
characterized in that the evaluating circuit comprises computing members (21, 23, 17) for forming the second time differential of the measuring signal from the first signal generator (15) and for additively combining of said second time differential with the undifferentiated measuring signals of the first and second signal generators (9, 15).

5,144,848
INTRA-TUBE TRAVELING APPARATUS
Nobuaki Uenishi, Kodaira; Mitsugu Nagayoshi; Hirofumi Miyanaga, both of Hachioji; Tomoaki Sato, Higashiyamato; Katsunori Sakiyama, Hachioji; Yasuhiro Ueda, Kokubunji, and Hideyuki Adachi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Nov. 2, 1990, Ser. No. 608,573
Claims priority, application Japan, Nov. 27, 1989, 1-307325; Nov. 27, 1989, 1-307326; Feb. 28, 1990, 2-47818; Feb. 28, 1990, 2-47819; Oct. 23, 1990, 2-283439
Int. Cl.[5] G02B *23/24*, G01M *19/00*
U.S. Cl. 73—856.5 24 Claims



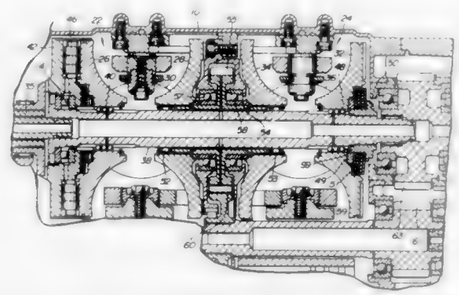
1. An intra-tube traveling apparatus comprising:
a moving unit to which test means for testing an interior portion of a pipe is held, the interior portion of the pipe defining a pipe-path along which the moving unit is movable, the moving unit being self-driven to travel along the pipe path; and
movement control means for controlling movement of said moving unit;
said moving unit including:
elastic actuating means which is elastically deformable in a radial direction of the pipe path and which is extendable and contractible in an axial direction of the pipe along the pipe path upon reception of a pressurized fluid by the elastic actuating means;
first and second lock means respectively attached to first and second end portions of said elastic actuator means, the first and second lock means respectively having balloon-like elastic members;
each of the first and second lock means being expandable and deformable in the radial direction of the pipe path upon reception of the pressurized fluid therein to lock the moving unit to an inner surface of the pipe along the pipe path; and
said movement control means including:
pressurized fluid supplying means for supplying the pressurized fluid to the first and second lock means and to the elastic actuator means of said moving unit;
first and second solenoid valves, the first solenoid valve being connected between the pressurized fluid supplying means and one of the first and second lock means, and the second solenoid valve being connected between the pressurized fluid supplying means and the other of the first and second lock means;
switching control means for switching and controlling a supply state of the pressurized fluid from said pressurized fluid supplying means to said first and second lock means and to the said elastic actuator means, for switching and controlling a discharge state of the pressurized fluid from the first and second lock means and from the elastic actuator means, and for thereby causing said moving unit to move forward or backward;
stop signal output means, connected to the switching control means, for outputting a stop signal for stopping a movement of the moving unit along the pipe path;
a stop control circuit for selectively switching the first and second solenoid valves, thereby to supply the pressurized fluid to at least one of the first and second lock means; and
unit fixing means for supplying the pressurized fluid to at least one of the first and second lock means upon reception of the stop signal from the stop signal output means to expand and deform the first and second lock means to thereby lock the moving unit to the inner surface of the pipe along the pipe path.

5,144,849
REDUCTION GEAR
Tsutomu Aihara, and Akihiro Takeda, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan
Filed Jun. 10, 1991, Ser. No. 712,443
Claims priority, application Japan, Jun. 15, 1990, 2-156938
Int. Cl.[5] B60N *2/06*; F16H *55/22*
U.S. Cl. 74—89.14 12 Claims



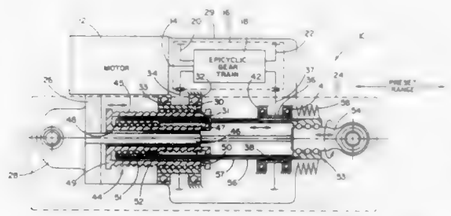
1. A reduction gear comprising:
a worm;
a worm wheel meshed with said worm;
a lower case part having a semicylindrical recess which is shaped and sized to rotatably receive said worm, said semicylindrical recess having an opening which is so sized as to permit insertion of said worm into said semicylindrical recess therethrough, said lower case part further having another recess for rotatably receiving said worm wheel;
an upper case part which is to be mounted on said lower case part to close said semicylindrical recess of said lower case part;
means for defining in said lower case part a threaded bore which is merged and aligned with said semicylindrical recess;
a bolt screwed into said threaded bore, said bolt having an inside end which presses one axial end of said worm for achieving a stable rotation of said worm in said semicylindrical recess;
bearing means disposed between said inside end of said bolt and said one axial end of said worm for assuring the stable rotation of said worm in said semicylindrical recess; and
holding means for stationarily holding said bolt at a given position,
wherein said worm has first and second shaft parts which extend coaxially outwardly in opposite directions from axial terminal ends of the worm, said second shaft part extending toward said inside end of said bolt; and
wherein said bearing means includes a first sleeve coaxially disposed about said first shaft part; a second sleeve coaxially disposed about said second shaft part, and annular ring member having an annular portion which is in contact with an outside end of said second sleeve; and a circular seat member disposed between said inside end of said bolt and said annular ring member.

5,144,850
CONTINUOUSLY VARIABLE TRACTION ROLLER TRANSMISSION
Toshifumi Hibi, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jun. 27, 1991, Ser. No. 722,251
Claims priority, application Japan, Jul. 10, 1990, 2-180576
Int. Cl.[5] F16H *15/08*
U.S. Cl. 74—200 8 Claims



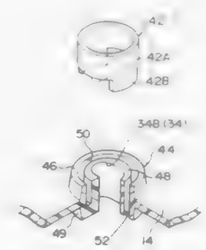
1. A continuously variable traction roller transmission having first and second discs, and a pair of traction rollers which come in frictional contact therewith, comprising:
a rotation shaft;
a ball spline arranged on said rotation shaft for supporting the first disc, said ball spline having one end face;
a loading nut secured to said rotation shaft, said loading nut having one end portion which abuts on said one end face of said ball spline;
spring means for urging the first disc to the second disc, said spring means being arranged between the first disc and said loading nut so as to have a set margin of deformation; and
a preloader arranged in series with said spring means in an axial direction of the rotation shaft, said preloader being arranged between the first disc and said spring means.

5,144,851
JAM TOLERANT LINEAR ACTUATOR
Duane H. Grimm, Rockford, and Teddy L. Jones, Cherry Valley, both of Ill., assignors to Sundstrand Corp., Rockford, Ill.
Filed Aug. 1, 1991, Ser. No. 738,763
Int. Cl.[5] F16H *25/22*
U.S. Cl. 74—424.8 B 13 Claims



1. A jam tolerant ballscrew actuator having a ballscrew actuator output, said ballscrew actuator driven through a differential via plural power paths therein, said ballscrew actuator comprising:
a first differential power path drivingly coupled via a first rotatable means to a reciprocating dual ballscrew means;
a second differential power path coupled to said dual ballscrew means via a second rotatable means that has a reciprocating sleeve means therethrough, said reciprocating sleeve means having a sleeve ballnut portion that drivingly cooperates with said dual ballscrew means, said reciprocating sleeve means providing said ballscrew actuator output.

5,144,852
STRUCTURE FOR MOUNTING A BASE PLATE MADE OF SYNTHETIC RESIN AND HAVING A SHIFT LEVER MECHANISM OF AN AUTOMATIC TRANSMISSION, ON THE FLOOR OF VEHICLE
Yoshinobu Yokoyama, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan
Filed Jul. 22, 1991, Ser. No. 733,670
Claims priority, application Japan, Jul. 26, 1990, 2-79357[U]
Int. Cl.[5] B60K *20/00*
U.S. Cl. 74—473 P 17 Claims

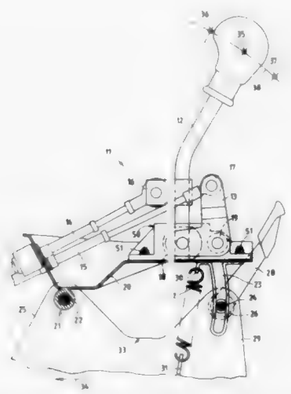


1. A structure for mounting a base plate made of a synthetic resin on the floor of a vehicle, said base plate being used to support thereon a shift lever mechanism capable of selectively changing gear positions of an automatic transmission, said structure comprising:
a plurality of through holes defined in said base plate, at least some of said plurality of through holes being different in size and shape from each other in such a manner that axial members used to fixedly secure said base plate to said floor may be readily passed through said through holes and said base plate can be easily positioned with respect to said floor;
a plurality of metallic cylindrical collars each having a diameter larger than the maximum dimension of any one of said plurality of through holes and having at least one projecting portion at one end thereof; and
a plurality of storage portions disposed around said plurality of through holes on said base plate and each of said storage portions having at least one through cut extending through said base plate, said plurality of storage portions being used to accommodate said collars therein and said at least one through cut being used to accommodate said at least one projecting portion therethrough.

5,144,853
DEVICE FOR ADJUSTING THE POSITION OF A VEHICLE GEAR-SHIFT LEVER
Marino Giudici, Nerviano, Italy, assignor to Fiat Auto S.p.A., Turin, Italy
Filed Jul. 3, 1991, Ser. No. 725,516
Claims priority, application Italy, Jul. 3, 1990, 20844 A/90
Int. Cl.[5] B60K *20/04*; G05G *9/00*
U.S. Cl. 74—473 R 9 Claims

1. A device for adjusting the position of a gear-shift lever in a vehicle in which gear engagement and selection is controlled by a pair of flexible cables, a first of said cables being fixed to said lever and controlling the gear engagement, the second of said cables being fixed to a member associated with said lever via a connection rod and controlling the gear selection, said lever and said member associated therewith being provided with respective ball joints, characterized in that said lever, said

member associated therewith and the respective ball joints are fixed on a mobile support plate, said plate being rotatably pivoted at one end to a sheet meta portion of the vehicle and



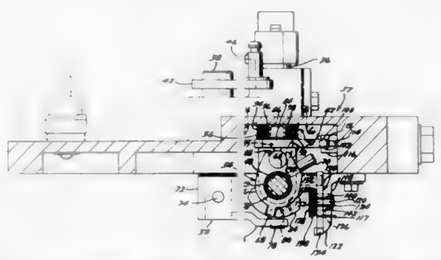
carrying at its opposite end means adapted to infinitely adjust and stably position said plate within a range of motion of said plate.

5,144,854

TRANSMISSION SHIFT CONTROL REVERSE INHIBITOR APPARATUS

David K. Herzog, Sterling Heights; Willem S. Haven, Waterford; Frederick B. Hummer, and Syed T. Razzacki, both of Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 8, 1991, Ser. No. 666,777
Int. Cl.[5] F16H 61/06, 1/12
U.S. Cl. 74—476 5 Claims



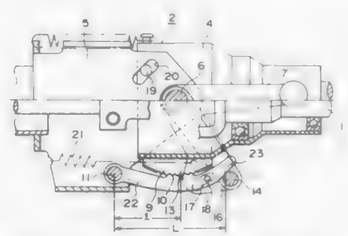
1. In a transmission shift control apparatus including a two-directional moveable shift control lever, a housing, shift finger means rotatably and slidably mounted in said housing, select and shift shafts mounted through a wall of said housing, first linkage means operatively connected between one end of said select shaft and said shift finger means, second linkage means operatively connected between the inner end of said shift shaft and said shift finger means, and dual push-pull cables operatively interconnected between said shift control lever and the other ends of said respective select and shift shafts for rotating said shift finger means in response to movement of said shift control lever in one direction, and for sliding said shift finger means in response to movement of said shift control lever in the other direction, the improvement comprising a pin formed on a side of said shift finger means, and reverse inhibitor means mounted on a surface of said housing for cooperation with said pin to prevent the inadvertent sliding movement of said shift finger means from said FIFTH gear ratio position into said REVERSE gear ratio position and, instead, to cause said shift finger means to rotate from said FIFTH gear ratio position into said FOURTH gear ratio position.

5,144,855

TILTING TYPE STEERING APPARATUS

Mikio Yamaguchi, and Sakae Matsumoto, both of Takasaki, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Aug. 7, 1991, Ser. No. 741,563
Claims priority, application Japan, Aug. 16, 1990, 2-85891[U]
Int. Cl.[5] B62D 1/18
U.S. Cl. 74—493 1 Claim



1. A tilting type steering apparatus, comprising:
a supporting bracket fixed to a vehicle body;
a steering column, one end of which is supported on said supporting bracket for pivotal movement about a first horizontal axis;
a tilt lever mounted to said supporting bracket and rockable about said first horizontal axis;
a first engaging member having first gear teeth formed along a circular arc centered on said first horizontal axis, said first engaging member being fixed to one of said steering column and said supporting bracket;
a second engaging member having one end which is pivotally supported on a second horizontal axis by a shaft mounted to the other of said steering column and said supporting bracket, and having second gear teeth formed toward another end thereof for freely engaging with and disengaging from confronting first gear teeth of said first engaging member with the pivotal movement of said second engaging member; and
a pressing member mounted to said tilt lever and movable, with rocking of said tilt lever, into and out of abutment with an abutment point on said second engaging member to engage and disengage the confronting first and second gear teeth;
wherein a distance between said second horizontal axis and said abutment point is more than 1.5 times as long as a distance between said second horizontal axis and a center of engagement of the collective engaged first and second gear teeth.

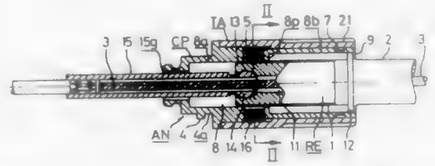
5,144,856

ADJUSTABLE CABLE SHEATH TERMINAL

Agustin Roca, Barcelona, Spain, assignor to Pujol Y Tarrago, S.A., Barcelona, Spain

Filed Dec. 5, 1990, Ser. No. 624,357
Claims priority, application Spain, Dec. 5, 1989, P8904147
Int. Cl.[5] F16C 1/10
U.S. Cl. 74—501.5 R 17 Claims

1. An adjustable cable sheath terminal for a sheathed cable, said cable sheath terminal comprising a substantially cylindrical hollow main body (CP) having an outer surface and a plurality of radial throughgoing openings (5), being provided with an axial throughgoing hole (8) and being provided with mechanical means (AN) for anchoring the hollow main body to a fixed point; an adjusting rod (RE) having two ends and an external screw thread (1), said adjusting rod (RE) being fixed at one of the two ends thereof to a sheath of a sheathed cable and being formed to be slidable over a distance with said sheath in the hollow main body so that the sheathed cable is adjustable in length; a plurality of retaining fingers (GR) with spring-biasing means (18), each of said retaining fingers (GR) being held and movable radially in a different one of said radial throughgoing openings (5) and having means for engagement (17) with said external screw thread (1) of said adjusting rod (RE) so that, when the retaining fingers are engaged with the adjusting rod, the adjusting rod cannot rotate relative to said retaining fingers, said retaining fingers being urged outwardly by said spring-biasing means for disengagement of said means for engagement (17) from said external screw thread (1) so that said adjusting rod (RE) is slidable with said sheath in said



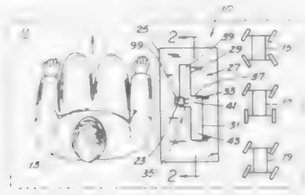
hollow main body (CP); and a rotatable lock nut (TA) surrounding said hollow main body (CP) and having tightening means (19) for engagement in at least one rotational position of the lock nut with the retaining fingers (GR) to overcome the spring-biasing means urging the retaining fingers radially outwardly and to engage the means for engagement of the retaining fingers (GR) with the external screw thread (1) to hold the adjusting rod fixed in position in the hollow main body, and so that in at least one other rotational position of the lock nut the tightening means disengage from retaining fingers (GR) so that the retaining fingers (GR) move radially outwards and the means for engagement of the retaining fingers disengage from the external screw thread (1) so that the adjusting rod (RE) is slidable with the sheath in the hollow main body (CP).

5,144,857

STEERING MODE SELECTOR ASSEMBLY

Philip T. Kemper, Fargo, N. Dak., assignor to Case Corporation, Racine, Wis.

Filed Oct. 12, 1990, Ser. No. 597,449
Int. Cl.[5] G05G 1/04
U.S. Cl. 74—523 16 Claims



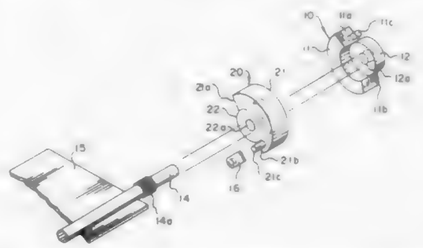
1. An improved steering mode selector assembly including:
a selector assembly having a slot defining three positions, each of which corresponds to a different steering mode;
a selector lever laterally spring-biased in a first direction and freely longitudinally movable along the slot between a first mode position and a second mode position;
movement of the lever to a third mode position requiring manual biasing the lever in a second direction;
whereby such lever is substantially prevented from being inadvertently moved to the third position.

5,144,858

DEVICE FOR LIMITING ROTARY MOVEMENT

Helmut Funk, Remshalden-Grunbach, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1991, Ser. No. 724,396
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1990, 4030026
Int. Cl.[5] G05G 1/04
U.S. Cl. 74—526 5 Claims



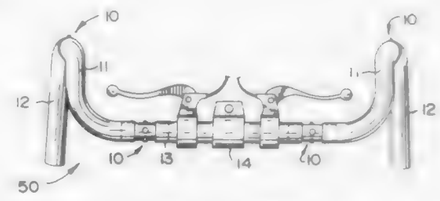
1. Device for limiting rotary movement in two directions, said device comprising:
a housing (18) having a wall (17), a first stationary component (10), attached to said wall (17) of said housing (18), said first stationary component having an arcuate segment (11) defined by lateral surfaces (11a, 11b) limiting the arc length thereof, a shaft (14) rotatably mounted in said first component (10), a second component (20) also having an arcuate segment (21) defined by lateral surfaces (21a, 21b) limiting the arc length thereof, said second compartment attached to said shaft, said first and second components (10, 20), respectively, having the same shapes and sizes and each of them provided with a bearing (12, 22) which defines a bore (12a, 22a) and is molded on the arcuate segment (11, 21), and pins (11c, 21c) positioned, respectively, to extend from oppositely directed faces of said arcuate segments (11, 21), said lateral surfaces (11a, 11b; 21a, 21b) of said first and second components (10, 20) forming abutments acting on both sides.

5,144,859

MULTIPLE POSITION SWIVEL FOR HANDLEBARS

Robert D. Malone, P.O. Box 1115, Willow, Ak. 99688

Filed Feb. 22, 1989, Ser. No. 314,452
Int. Cl.[5] B62K 21/12, 21/16; B25G 3/18
U.S. Cl. 74—551.3 14 Claims



1. A swivel for a handle bar comprising:
a) at least one spring loaded button mounted within, and protruding beyond, an outer circumference of an inner tube;
b) an outer tube having a plurality of holes radially spaced from one another at regular angular intervals, a center of each of said holes lying substantially on a plane normal to an axis of said outer tube, said holes for receiving said button, said outer tube having an insertion end and an abutting end and said inner tube having, on an end corresponding to said insertion end of said outer tube, an outside diameter greater than an inside diameter of said outer

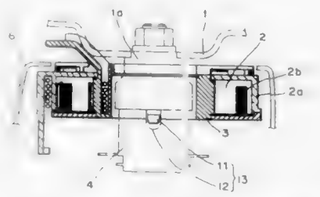
tube, said inner tube rotatably engaged within said outer tube and free to rotate within said outer tube only when said button is depressed, said inner and outer tubes having respective lengths such that said inner tube has a length substantially greater than the length of said outer tube.

5,144,860

ROTATION TRANSMITTING MECHANISM FOR STEERING WHEEL

Kenshi Furuhashi; Yoshinobu Sugiyama, and Hitoshi Taguchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 28, 1991, Ser. No. 676,304
Claims priority, application Japan, Mar. 29, 1990, 2-33257[U]
Int. Cl.[5] B62D *1/04*; H01H *3/16*; B25G *3/28*
U.S. Cl. 74—552 4 Claims



1. A rotation transmitting mechanism for a steering wheel for use in an automobile comprising

a steering column to be fixed on a body of the automobile,

a steering wheel rotatable with respect to the steering column,

a cylindrical cancel cam arranged below the steering wheel so as to rotate along with the steering wheel, and

a coupling device for electrically connecting a member arranged on the steering wheel with power source terminals arranged in the steering column, which includes a rotational member surrounding the cancel cam,

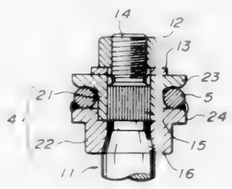
one of the rotational member of the coupling device and the cancel cam having projections extending radially, the other of the rotational member of the coupling device and the cancel cam having corresponding U-shaped cutouts to receive, respectively, the projections, each projection having a tapered section tapering off to a bottom end thereof.

5,144,861

STEERING WHEEL CONSTRUCTION

Kazuyoshi Nishijima; Kazuo Inaba, and Tomokazu Sugiyama, all of Shizuoka, Japan, assignors to Nihon Plast Co., Ltd., Japan

Filed Mar. 11, 1991, Ser. No. 667,660
Claims priority, application Japan, Mar. 19, 1990, 2-68743; Mar. 19, 1990, 2-68744; Aug. 9, 1990, 2-211007
Int. Cl.[5] B62D *1/04*
U.S. Cl. 74—552 19 Claims



1. A connection arrangement for a steering wheel which is to be mounted on a steering shaft, the steering shaft having threaded, serrated and tapered portions, the connection arrangement comprising:

a lower boss member which has a conical bore and which is adapted to seat on the tapered portion of the steering shaft, the lower boss member being rigidly connected to a rim of a steering wheel by way of spoke means;

an upper boss member which has a serrated bore and which is adapted to be received on the serrated portion of the steering shaft and to seat on the top of the lower boss member, said upper boss member being arranged to be forced into contact with the lower boss member and to subsequently force the lower boss member into frictional engagement with the tapered portion of the steering shaft, by tightening a nut which is threadedly received on the threaded portion of the steering shaft, said spoke means being arranged to be gripped between said upper and lower boss members with the nut being tightened; and

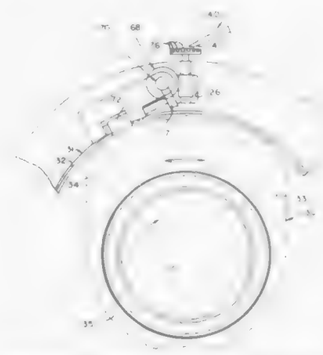
means for limiting the amount of relative rotation between said upper and lower boss members to a predetermined angle greater than 0° while sufficient force to force the lower boss member into frictional engagement with the tapered portion of the steering shaft and to prevent relative rotation therebetween, is absent.

5,144,862

ROTATING SHAFT MOUNTED ACTUATING MECHANISM

Melbourne F. Giberson, 5 Spring Mill La., Haverford, Pa. 19041, and Richard P. Lindgren, P.O. Box 492, Chester Springs, Pa. 19425

Filed Sep. 19, 1990, Ser. No. 585,722
Int. Cl.[5] F16F *15/22*
U.S. Cl. 74—573 R 8 Claims



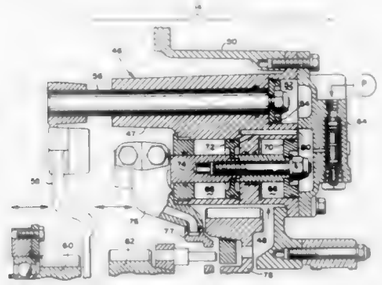
1. An actuating mechanism installed intermediate the ends of a shaft and operative to perform a function requiring motion while the shaft is rotating, comprising a split hub mounted on and around said shaft intermediate the ends thereof, actuating means carried by said hub, and drive means operatively connected to said actuating means for selectively moving said actuating means with respect to said shaft, said drive means comprising pinion means mounted for rotation about an axis, a power train operatively connecting said pinion means to said actuating means to move said actuating means in either of two directions, depending upon the direction of rotation of said pinion, means for preventing rotation of said pinion means by said power train, and pinion rotating means, fixed with respect to said machine against rotation with said actuating means, for selectively rotating said pinion about its axis through a predetermined arc upon each revolution of said shaft when said pinion rotating means is actuated.

5,144,863

COMPOUND CHANGE GEAR TRANSMISSION

Frank R. Wood, Littleborough, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 1, 1991, Ser. No. 739,044
Int. Cl.[5] F16H *3/02*
U.S. Cl. 74—745 3 Claims



1. An improved combined splitter and range type compound change gear transmission comprising a multiple speed main transmission section connected in series with an auxiliary transmission section, said main transmission section having a mainshaft for rotationally driving a splitter gear that is rotationally supported on a main transmission section housing, said auxiliary section having a input shaft and an output shaft that are rotationally supported on a auxiliary section housing that is connectable to the main transmission section housing, said input shaft having a splitter range gear disposed coaxially thereabout and said output shaft having a range gear disposed coaxially thereabout, a splitter clutch assembly fixed for rotation with said input shaft and selectively movable by a fluid position for coupling the splitter gear to the input shaft and a second piston for coupling the splitter range gear to the input shaft, and a range clutch assembly fixed for rotation with the output shaft and selectively movable b a fluid operated range piston assembly between a first position for coupling the splitter range gear to the input shaft and a second position for coupling the range gear to the output shaft, wherein the improvement is characterized by said range piston assembly being protectively enclosed by the auxiliary section housing by reason of having diminished size resulting from the employment of a plurality of individual simultaneously fluid pressurized chambers disposed in tandem therewithin that respectively contain a piston head connected to a common piston rod that is operative to provide the amount of force necessary to move the range clutch assembly between the first and second pistons upon simultaneous delivery of pressurized fluid into the chambers.

5,144,864

HYDRAULIC CONTROL APPARATUS FOR HYDRAULIC TRANSMISSION

Tomoo Sawasaki, Higashihiroshima, and Chitoshi Morishige, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

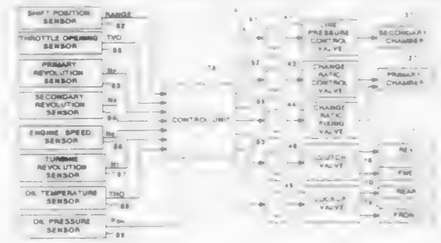
Filed Jun. 13, 1991, Ser. No. 714,721
Claims priority, application Japan, Jun. 15, 1990, 2-155453
Int. Cl.[5] B60K *41/16*
U.S. Cl. 74—866 6 Claims

1. A hydraulic control apparatus for transmission having at least two hydraulic pressure controlling valves for adjusting the hydraulic pressure, comprising:

a hydraulic sensor means for monitoring a hydraulic pressure;

a feedback control means for feedback controlling the pressure of a first hydraulic pressure controlling valve on the basis of an output of said sensor means; and

a feedforward control means for feedforward controlling the pressure of a second hydraulic pressure controlling



valve other than said first hydraulic pressure controlling valve on the basis of the results of the feedback control.

5,144,865

Patent Not Issued For This Number

5,144,866

SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 391,772, Aug. 10, 1989, Pat. No. 5,050,460.
This application Jun. 20, 1991, Ser. No. 719,233
Claims priority, application Japan, Aug. 11, 1988, 63-198937
Int. Cl.[5] F16H *5/60*
U.S. Cl. 74—867 7 Claims

1. A shift control system for an automatic transmission, the automatic transmission having a main gear train and an auxiliary gear train operatively coupled therewith, the main gear train including a forward one-way clutch and an overrunning clutch arranged in parallel therewith, the auxiliary gear train including a first friction element for high gear position and a second friction element for low gear position, the shift control system comprising:

a source of hydraulic fluid;

a first hydraulic passage connected with the second friction element through a one-way valve;

a second hydraulic passage;

shift valve means for supplying the hydraulic fluid from said source of hydraulic fluid selectively to said first hydraulic passage and said second hydraulic passage;

a third hydraulic passage connected with the second friction element;

a fourth hydraulic passage connected with the first friction element and said second hydraulic passage through an orifice;

a fifth hydraulic passage connected with the overrunning clutch;

means for supplying the hydraulic fluid to said fifth hydraulic passage when an engine brake is demanded;

an accumulator including a first pressure chamber and a second pressure chamber, said first pressure chamber being connected with said fourth hydraulic passage; said shift valve means including a spool movable between a first position where the hydraulic fluid is supplied to said first hydraulic passage and hydraulic fluid is discharged from said second passage, and a second position where the hydraulic fluid is supplied to said second hydraulic passage and hydraulic fluid is discharged from said first hydraulic passage; and

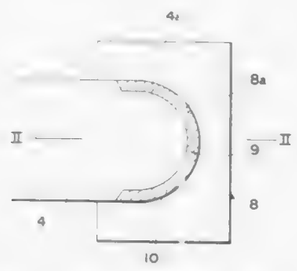
a sequence valve including a spool, a pilot port and an overrule port, said spool being movable between a connecting position where said third hydraulic passage connected with the second friction element communicates with said first hydraulic passage, and a discharge position where the hydraulic fluid of said third hydraulic passage is drained, said pilot port being connected with said fourth hydraulic passage, said overrule port being connected with said fifth hydraulic passage, in the event said overrule port fails to undergo the hydraulic pressure said spool being at said connecting position when the hydraulic pressure of said pilot port is smaller than a predetermined value, and being at said discharge position when the hydraulic pressure of said pilot port is greater than said predetermined value, in the event said overrule port undergoes the hydraulic pressure said spool being at said connecting position regardless of the hydraulic pressure of said pilot port.

5,144,867

METHOD OF MAKING A CHAIN SAW GUIDE BAR

Shoji Yajima, and Kazuo Harada, both of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Aug. 28, 1991, Ser. No. 751,075
Claims priority, application Japan, Sep. 12, 1990, 2-241481
Int. Cl.[5] B23D *63/00*
U.S. Cl. 76—112 2 Claims



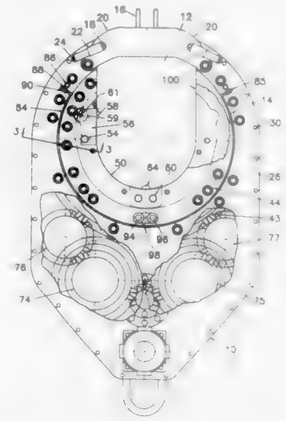
1. A method of making a chain saw guide bar having an improved wear-resistant tip comprising the steps of providing a guide bar incised in advance to have a predetermined set back at its curved tip, placing said guide bar in a mold having a recess forming a space with the curved tip, filling said space with a member formed of a powdery wear-proof member, and heating said guide bar and wear-proof member to the melting temperature thereof to weld said wear-proof material to the tip of said guide bar.

5,144,868

POWER TONGS

Kurt R. Feigel, Jr., 1227 – 110A Street, Edmonton, Alberta, Canada T6J 6N6

Filed May 2, 1991, Ser. No. 694,781
Claims priority, application Canada, May 8, 1990, 2016319
Int. Cl.[5] B25B *17/02, 17/00*
U.S. Cl. 81—57.15 5 Claims



1. A power tong for rotating a pipe, the power tong comprising:

a frame having a pair of arcuate front portions defining a throat for receiving the pipe;

a ring gear rotatably mounted on the frame about a center of rotation, the ring gear having a first opening that is alignable with the throat;

the ring gear including a plurality of cam surfaces disposed circumferentially about the center of rotation;

a cage plate assembly rotatably mounted on the ring gear about the center of rotation, the cage plate assembly having a second opening that is alignable with the throat;

a plurality of die means mounted on the cage plate assembly, at least two of the die means each including a die, a die carrier and a cam follower;

each of the cam followers being positioned to follow at least one of the cam surfaces; and

the front portions of the frame having greater flexibility than the ring gear and the cage plate assembly.

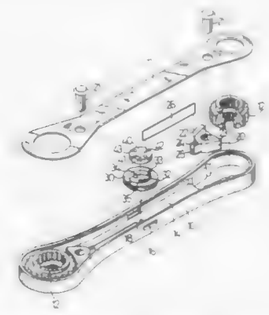
5,144,869

CONTROL DEVICE FOR RATCHET WRENCHES

Jessie Chow, No. 18, Houchuang Rd., Pei Twen District, Taichung, Taiwan

Filed Mar. 9, 1992, Ser. No. 848,241
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—63 3 Claims

1. A ratchet wrench comprising a housing including a hollow interior and including two end portions and including two sides each having a slot formed in a middle portion thereof, a ratchet wheel rotatably disposed in each of said end portions of said housing, a pawl pivotally disposed in said hollow interior of said housing and disposed beside each of said ratchet wheels and including a first tooth and a second tooth for engagement with said ratchet wheels respectively, a knob rotatably disposed in a middle portion of said housing and extended outwards from said slots of said housing such that said knob is reachable and can be rotated from outside of said housing, a depression formed in said knob and a pair of notches oppositely formed in said knob, a disc engaged in said depression of said knob and arranged such that said disc rotates in concert with said knob, said disc including a pair of grooves oppositely formed therein and aligned with said notches of said knob, a pair of resilient members each including a first end engaged with a respective pawl and a second end engaged with said notches of said knob and said grooves of said disc such that either of said first tooth or said second tooth of said pawls is caused to engage with said ratchet wheels when said knob is rotated, whereby, both of said ratchet wheels disposed in both ends of said housing can be operated.

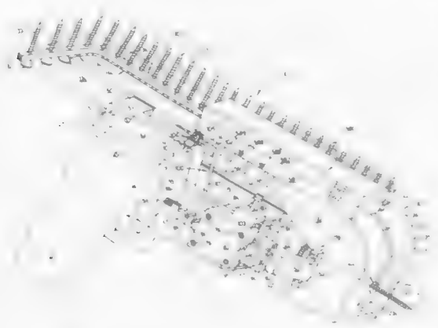


5,144,870

APPARATUS FOR SELECTIVELY INSTALLING FASTENERS

Edward V. Nick, 512 Lexington Ave., Fox River Grove, Ill. 60021

Filed Oct. 18, 1991, Ser. No. 778,774
Int. Cl.[5] B25B *23/06*
U.S. Cl. 81—434 27 Claims



1. An apparatus for selectively installing a plurality of screw type fasteners comprising:

means for imparting rotational movement to the individual screws about their respective longitudinal axes;

a housing borne on the rotation means and defining a path of travel for the individual screws, the screws traveling from a first, ready position to a second, driving position;

a drive assembly borne by the housing and reciprocally moveable relative thereto, the drive assembly engaged by the rotation means;

a screw engagement assembly borne by the housing and engaged by the drive assembly, and wherein the screw engagement assembly is moveable along a path of travel toward the second, driving position and away from the second driving position, and wherein the screw engagement assembly is operable, when moved toward the second driving position, to urge the individual screws into the second driving position;

a brake borne by the housing and which is operable to releasably engage the screw engagement assembly thereby restraining the screw engagement assembly against motion toward the second, driving position, and when released, permitting movement of the screw engagement assembly toward the second, driving position;

a positioning assembly borne by the housing and operable to releasably secure the individual screws in the second, driving position; and

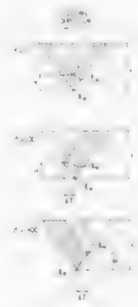
means for releasing the individual screws from the positioning assembly upon engagement of the individual screws with the rotation means.

5,144,871

NUMERICALLY CONTROLLED SCREW CUTTING METHOD FOR FINE SCREW SURFACE FINISHING

Tomomitsu Niwa, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,015
Claims priority, application Japan, Dec. 8, 1989, 1-317750
Int. Cl.[5] B23B *1/00*; B23C *3/32*
U.S. Cl. 82—1.11 11 Claims



1. A method of forming a screw surface in a workpiece subjected to numerically controlled machining, comprising:

inputting screw cutting parameters to define the configuration of said screw surface;

employing said cutting parameters to determine a path for a cutting tool, said path including plural cutting passes along said workpiece in a cutting direction;

with respect to the desired final configuration of said screw surface, cutting said workpiece according to said path, wherein each said cutting pass save a final cutting pass is offset in said cutting direction; and

cutting said final cutting pass into said workpiece according to said path without an offset.

5,144,872

MULTIPLE PUNCHING PRESS

Masakazu Kakimoto, Aichi, Japan, assignor to Ushio Co., Ltd., Aichi, Japan

Continuation of Ser. No. 426,432, Oct. 25, 1989, abandoned.
This application Jul. 29, 1991, Ser. No. 735,770
Claims priority, application Japan, Oct. 28, 1988, 63-274114
Int. Cl.[5] B26F *1/04*
U.S. Cl. 83—13 25 Claims

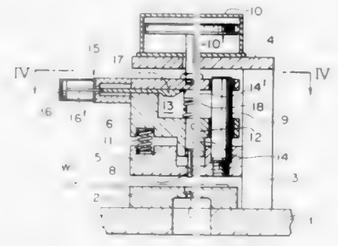
20. A method of piercing a workpiece comprising:

providing a movable punch holder with a plurality of punch pins;

selectively moving any desired combination of more than one of said plurality of said punch pins between a first limit position and a second limit position within said movable punch holder; and

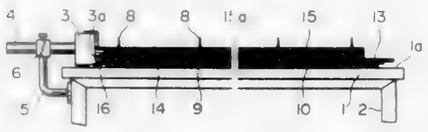
moving said movable punch holder to pierce the workpiece,

whereby said desired combination of said plurality of punch pins are able to pierce said workpiece when in said



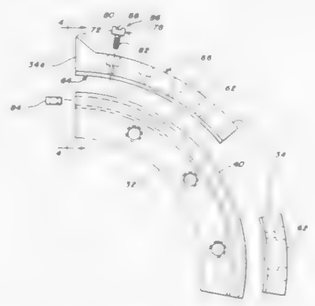
first limit position and are unable to pierce said workpiece when in said second limit position.

5,144,873
METHOD AND APPARATUS FOR CUTTING PATTERNED SHEETS
Nobuo Nasu, Fukuyama, Japan, assignor to Kabushiki Kaisha Kawakami Seisakusho, Hiroshima, Japan
Filed Aug. 15, 1990, Ser. No. 567,804
Claims priority, application Japan, Sep. 19, 1989, 1-240734
Int. Cl.[5] B26D 7/02
U.S. Cl. 83—19 7 Claims



1. A method of cutting patterned sheets comprising the steps of:
positioning a plurality of needle holders having removable needles therein in a base member;
placing said base member on a support surface such that said needles are upwardly directed;
impaling a lower air-impermeable sheet which is larger than said patterned sheets on said needles, said lower air-impermeable sheet being supported by said base member and said support surface;
stacking said patterned sheets on said lower air-impermeable sheet to form a laminate, said stacking being done by impaling said patterned sheets on said needles to match said patterns on each sheet;
covering the upper and all side surfaces of the laminate of said patterned sheets except a side surface that opposes a suction port with an upper air-impermeable sheet that is larger than said patterned sheets, said upper air-impermeable sheet being impaled on said needles, said laminate being substantially enveloped in said upper and lower air-impermeable sheets;
applying suction via said suction port to said laminate and said air-impermeable sheet, said suction acting to compress and hold said laminate and said air-impermeable sheets against said support surface and said suction port;
extracting said needles from said needle holders, said laminate, and said upper and lower air-impermeable sheets while said suction is holding said laminate together;
removing said needle holders and said base member from between said support surface and said lower air-impermeable sheet; and cutting said laminate and said upper and lower air-impermeable sheets held on the suction port by suction, while continuing to apply said suction.

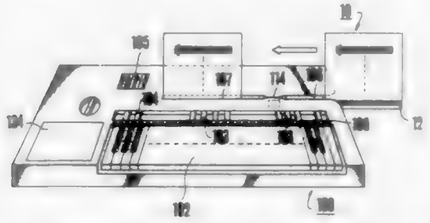
5,144,874
ROTARY CUTTER KNIFE
Jimmy R. Garrett, Route 1, Box 569, Worden, Ill. 62097
Filed May 20, 1991, Ser. No. 702,930
Int. Cl.[5] B26D 1/15
U.S. Cl. 83—332 8 Claims



5. A rotary cutter knife for a slotting or slitting head, said cutter knife comprising
an arc-shaped holder adapted for attachment to the slotting or slitting head, said holder being a flat generally thin arc-shaped plate with an outer rim;
one or more cutting elements, each of which is a generally narrow arc-shaped band with an inner rim and an outer rim;
said inner rim of the arc-shaped band fitting flush against the outer rim of the arc-shaped plate to which it is attached in a common arc;
and a fastening means extending from the inner rim of the one or more cutting elements for attaching the one or more cutting elements to the holder so that the one or more cutting elements are replaceable and circumferentially adjustable, said fastening means comprising a mortise with a base and a T-cross section running along the outer rim of the holder for cooperative fit with a tenon running the length of the inner rim of the band and a bolt with a head, a threaded shank and a nut which is threadedly received on the shank, said bolt passing through the band from the outer rim to the inner rim and said head or nut slidably received and stopped from rotation in the base of the mortise having the T-cross section.

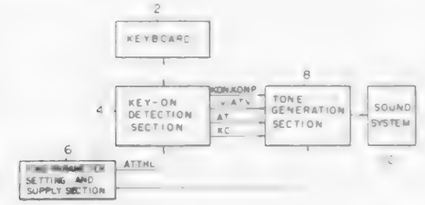
5,144,875
MUSIC SHEET
Akira Nakada, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Division of Ser. No. 421,934, Oct. 16, 1989, abandoned, which is a continuation of Ser. No. 175,580, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 352,684, Feb. 26, 1982, abandoned. This application Aug. 21, 1990, Ser. No. 570,436
Claims priority, application Japan, Nov. 14, 1981, 56-170089
Int. Cl.[5] G10H 1/38, 1/42
U.S. Cl. 84—611 30 Claims

1. An aid system for a person to effect performance of a musical composition, comprising:
an electronic music producing device having a grooved portion;
data reading means in said grooved portion of said electronic music producing device;
a substantially rectangular music sheet having automatic performance data stored thereon, said music sheet further having sides, a front surface and a back surface, said front surface being inscribed with a musical composition, said musical composition comprising a score with musical codes for effecting a full manual performance of said musical composition, said back surface having at least one auxiliary column comprising instructions for effecting said manual performance of said musical composition; and
a data recording section provided on one of said front and back surfaces of said sheet for storing said automatic performance data of said musical composition for performance by said electronic music producing device, said electronic music producing device effecting said automatic performance of said musical composition upon said



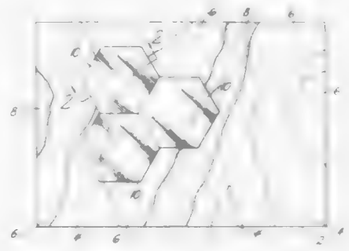
data recording section of said music sheet having been inserted into said grooved portion of said electronic music producing device and having been read by said data reading means, whereby when a person desires to effect a performance of a musical composition on said electronic music producing device, reference to said instructions in said at least one auxiliary column on the back of said music sheet prompts said person to effect a simplified manual performance of said musical composition.

5,144,876
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF PERFORMING A TONE CONTROL RESPONSIVE TO AN AFTER-TOUCH OPERATION
Masashi Hirano, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed May 31, 1990, Ser. No. 531,031
Claims priority, application Japan, Jun. 2, 1989, 1-141552
Int. Cl.[5] G10H 1/18
U.S. Cl. 84—658 6 Claims



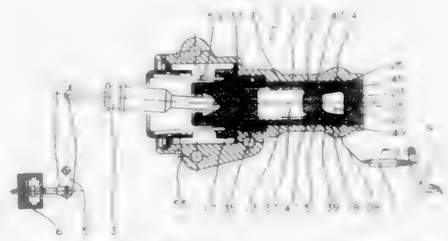
1. An electronic musical instrument comprising:
a plurality of keys;
key-on information generation means associated with said keys for generating key-on information indicating depression of one of said keys;
after-touch information generation means associated with said keys for generating after-touch information representing the state of a key operation subsequent to an initial touch on said key while the key is still depressed;
tone generation mean for generating a tone signal corresponding to said key in response to the key-on information; and
tone generation control means for (a) generating a tone start signal in response to the key-on information for causing the tone generation means to start generation of a tone and (b) subsequently generating at least one additional tone start signal in response to the after touch information for causing the tone generation means to again start generation of a subsequent tone and impart at least one characteristic to the subsequently generated tone in accordance with the after touch information.

5,144,877
PHOTOREACTIVE CAMOUFLAGE
Jeffery S. Parks, 1310 Kingsley, Mt. Clemens, Mich. 48043
Filed Jul. 1, 1991, Ser. No. 724,076
Int. Cl.[5] F41H 3/00
U.S. Cl. 89—36.01 12 Claims



1. A camouflage system on the exterior of a vehicle to lower the contrast between the vehicle and a background against which the vehicle is viewed, comprising:
a first surface on the exterior of the vehicle;
a second surface on the exterior of the vehicle, the second surface faced in a different direction than the first surface;
photoreactive lenses on the exterior surfaces, the average photoreactivity of lenses on on the first surface being approximately equal to the average photoreactivity of the lenses on the second surface;
an anti-reflection film on one side of the lenses;
an adhesive layer between the lenses and the surfaces.

5,144,878
HYDRAULIC ACTUATOR WITH WEAR TAKE-UP
Leonardo Cadeddu, Crema, Italy, assignor to Bendix Italia S.p.A., Crema, Italy
Filed Jun. 25, 1991, Ser. No. 720,291
Claims priority, application Italy, Jul. 17, 1990, 67549 A/90
Int. Cl.[5] F01B 7/20
U.S. Cl. 91—173 2 Claims



1. A hydraulic actuator with automatic wear take-up, comprising a body, in which is formed a blind bore where a first piston slides sealingly under the effect of the pressure of a fluid in a first chamber, a second piston being mounted slidably in a bore made in the first piston and an output rod bearing on said second piston, a second chamber being defined between said first and second pistons, valve means being provided for ensuring hydraulic communication between the first and second chambers when said actuator is at rest and interrupting the communication when the pressure of the fluid in the first chamber is higher than a specific level, a piece having at least one shoulder being fixed, on its side of smaller diameter, to an end of said first piston confronting said first chamber, and in that an annular gasket and an annular stop of a shape comple-

mentary with said piece and movable in axial translational motion being arranged between a part of larger diameter of said piece and the end of said first piston, so as to divide said first chamber into two volumes one being connected to a pressure generator and the other communicating with said second chamber by way of at least one duct made in the end of said first piston, said two volumes communicating with one another, at rest, via a passage provided between said annular gasket, said stop and said piece, while being closed as soon as said shoulder comes to bear on said annular gasket

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5,144,879

AUTOMATIC FOOD DISPENSER

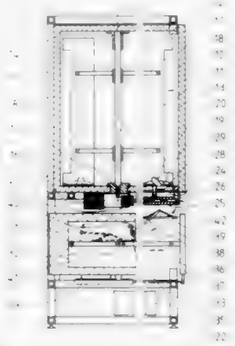
Marion Alessi, Karlsruhe, Fed. Rep. of Germany, assignor to T. A. Tecnologie Alimentari srl, Vigevano, Italy

Filed Oct. 18, 1991, Ser. No. 776,446

Claims priority, application European Pat. Off., Oct. 26, 1990, 90/120582.3

Int. Cl.[5] A47J *37/00;* H05B *6/68, 6/78*

U.S. Cl. 99—327 13 Claims



1. An automatic food dispenser for dispensing hot instant meals, the dispenser comprising:

a housing including a front in which operating elements are provided;

a refrigeration chamber for storing a supply of refrigerated, packaged instant meals;

at least one oven including a cooking chamber disposed underneath the refrigeration chamber for accommodating a refrigerated instant meal, an oven door provided with an opening mechanism and a movable cooking surface coupled mechanically with the oven door;

an electromechanical removal device provided at the underside of the refrigeration chamber which removes a single instant meal from the refrigeration chamber and, with the oven door open, moves it onto the cooking surface;

at least one discharge chamber accessible to the operator for discharge of the hot instant meal; characterized in that;

a drum-type storage container which is rotatable about a vertical rotation axis is provided within the refrigeration chamber and comprises a plurality of tubular magazines arranged on a circle each accommodating a stack of refrigerated instant meals;

the oven includes a horizontally extendable push frame which has a push front forming the oven door:

a cooking tray having a horizontal cooking surface is mounted on the push frame to be raised and lowered in such a manner that, when the push frame is pulled out, the cooking tray is moved upward from a lowered cooking position within the cooking chamber into a loading position outside of the cooking chamber and, once the push frame is pulled out fully, the cooking tray is moved further upward into a discharge position within the discharge chamber;

a movable closing member for the refrigeration chamber is provided below the tubular magazines and above the cooking tray in the loading position;

the discharge chamber is disposed behind a discharge opening in the front of the housing.

5,144,880

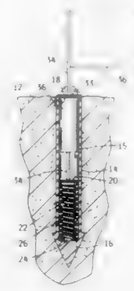
FOOD DECORATING DEVICE AND METHOD

James R. Schmit, 2343 Carter Ave., St. Paul, Minn. 55108

Filed Sep. 23, 1991, Ser. No. 763,993

Int. Cl.[5] G01K *11/08;* A23J *1/00*

U.S. Cl. 99—342 20 Claims



1. A heat actuated decorative device for the ornamentation of a food product that is to be heated comprising,

a hollow decorator support housing adapted to be submerged in said food product at or near an exposed surface of the food,

a heat responsive expandable decorative display body concealed inside the support housing,

means responsive to heating of the decorative device for expelling said decorative display body out of the support housing to a visible deployed position onto or above the surface of the food, and

means expanding the decorative display body outwardly over the surface of the food to provide a visible decorative display for ornamenting the food product.

5,144,881

VALVE ARRANGEMENT, FOR EXAMPLE A PROPORTIONAL VALVE

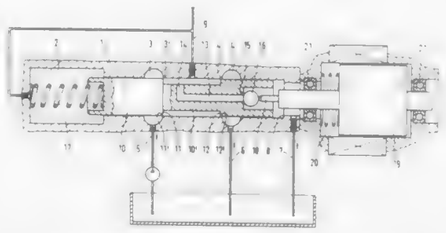
Aydogan Cakmaz, Stuttgart, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Nov. 19, 1990, Ser. No. 615,249

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1989, 3938417

Int. Cl.[5] F15B *11/08, 13/044*

U.S. Cl. 91—451 16 Claims



1. A proportional valve, for controlling the presence of a connected fluid unit, with a control member which is adjustable by means of a servomotor, counter to a restoring force loading the control member, out of an initial position, in which the fluid unit communicates with a low-pressure reservoir, into an operating position, in which the fluid unit communicates with a pressure source via a connection controlled by the control member and/or is isolated from the low-pressure reservoir, wherein a passage, which leads from the fluid unit or from the connection controlled by the control member between the fluid unit and pressure source to the low-pressure reservoir, is controllable by means of a safety relief value, the valve body of which is arranged as a transmission element between the servomotor and control member and is urged into the closing position by the servomotor when the servomotor loads the control member counter to the restoring force,

wherein said safety relief valve member is urged by the fluid pressure at the fluid unit to an open position communicating the fluid unit with the low pressure reservoir when the control member is jammed in a position communicating the high pressure to the fluid unit and the control member is moved away from the safety relief valve member.

5,144,882

SHAFT SEAL SYSTEM FOR A PISTON PUMP SEPARATING IMPURITIES

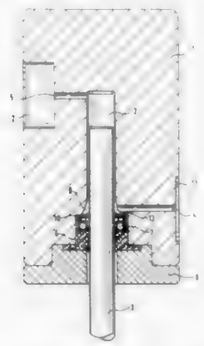
Hans G. Weissgerber, Waldbronn, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 16, 1990, Ser. No. 598,894

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 8912315[U]

Int. Cl.[5] F01B *31/00;* F16L *17/00*

U.S. Cl. 92—87 3 Claims



1. A pump for pumping a fluid, comprising:

(a) a housing having a chamber formed therein;

(b) a shaft movably disposed in said chamber;

(c) a shaft seal disposed in said housing and surrounding said shaft; and

(d) an elastic disc having a centrally formed hole therein, the shape of said hole conforming to the cross-sectional shape of said shaft and the size of said hole being smaller than the cross-sectional size of said shaft when said disc is in an unformed state, whereby said disc is deformed into a conical shape when said shaft extends through said hole, said conical deformation forming a cavity between said disc and said seal for capturing said separated seal particles removed by said disc, thereby preventing said particles from entering said fluid being pumped.

5,144,883

CYLINDER WITHOUT A PISTON ROD

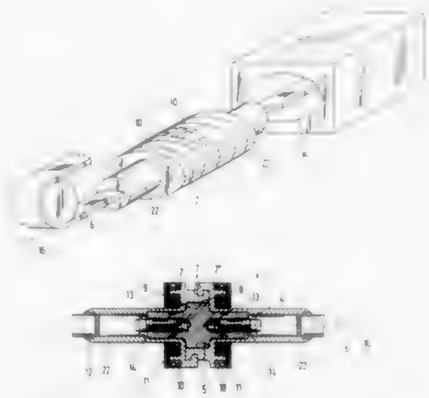
Rudolf Müller, Gehrden; Peter Müller, and Norbert Fortmann, both of Hanover, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 16, 1991, Ser. No. 760,406

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1990, 4029721

Int. Cl.[5] F01B *9/00*

U.S. Cl. 92—137 14 Claims



1. A cylinder without a piston rod, comprising:

cylinder means, said cylinder means having an axial direction therewithin;

a piston for moving along the axial direction within said cylinder means, said piston having an axial direction;

force drive means;

tension belt means for transferring movement of said piston to said force drive means, said tension belt means being connected between said force drive means and said piston;

a plurality of rollers for directing said tension belt means;

said piston comprising two piston portions;

said piston portions comprising interconnecting means, said interconnecting means for interconnecting said piston portions; wherein

said piston portions are piston halves, which piston halves divide said piston transversely, and said piston halves have substantially the same axial cross sections for forming a continuous cross section contour upon interconnecting said piston halves;

said interconnecting means comprises bayonet connection elements which connect said piston halves in the axial direction of said piston; and

wherein said piston comprises:

a passage extending in the axial direction through both piston halves; and

a holding element in said passage of said piston, said holding element for holding said tension belt means positively in said passage.

5,144,884

TWO-PART PISTON ASSEMBLY DEVICE

Eudell L. Kelly, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 295,751, Jan. 11, 1989, abandoned. This application Jul. 17, 1990, Ser. No. 553,349

Int. Cl.[5] F01B *31/08;* F16J *1/04*

U.S. Cl. 92—186 13 Claims

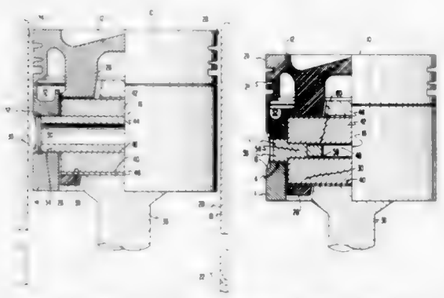
1. A piston assembly for use in a cylinder of a reciprocating expansible chamber device having a crankshaft and a piston rod connecting said piston assembly to the crankshaft, the

piston rod having a pin receiving opening at an upper end, said piston assembly comprising:

a piston head having an upper wall, a depending outer wall and a pair of support portions depending from said upper wall and spaced inwardly from said outer wall, said support portions containing a pair of transverse bores adapted to be aligned with the pin receiving opening of the piston rod;

a piston pin having an outer cylindrical surface with a predetermined diameter, said piston pin being disposed through the pin receiving opening of the piston rod and said transverse bores of said piston head to connect said piston head to the piston rod;

a piston skirt having oil means for retaining lubrication oil supplied to said piston assembly for cooling and lubricating the piston assembly, said oil retaining means including a substantially annular oil reservoir having an oil retaining



portion formed in the upper surface of said piston skirt for retaining oil during an upward stroke of said piston assembly and for discharging oil for splashing against the underside of said upper wall when said piston assembly reverses direction and commences a downward stroke; and

attaching means for connecting said piston skirt to said piston pin in a predetermined fixed axial location, said attaching means including a pair of axial extensions located at opposite ends of said piston pin and oriented in the direction of the central axis of said piston pin, each of said extensions having a radial extent, relative to the central axis of said piston pin which is less than said predetermined diameter of said cylindrical surface of said piston pin, said attaching means engaging said piston pin at locations which position said oil reservoir relative to said piston pin so that a geometrical extension of said cylindrical surface of said piston pin would intersect said oil retaining portion of said oil reservoir.

5,144,885

CERAMIC-METAL FRICTION WELDING MEMBER AND CERAMIC CAST-IN BONDED PISTON MADE THEREOF

Tomio Suzuki, Yokkaichi, and Hiroyuki Ohi, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 423,880, Oct. 19, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,773

Claims priority, application Japan, Oct. 25, 1988, 63-268818; Oct. 25, 1988, 63-268819

Int. Cl.[5] F16J *1/04*

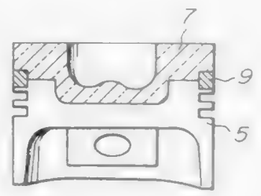
U.S. Cl. 92—222 2 Claims

1. A ceramic cast-in bonded piston, comprising:

a ceramic crown comprising a top surface, a bottom surface, and an annular notch formed in an outermost side peripheral surface thereof;

an aluminum alloy piston main body cast-in bonded in contact with said bottom surface of said ceramic crown; and

at least one metal annular member friction welded in said annular notch of said ceramic crown to seal an interface between said ceramic crown and said piston main body wherein said interface is protected from exposure to an outside environment and said outermost side peripheral surface of said ceramic crown is arranged flush with out-



ermost side surfaces of said piston main body and said annular member, thereby preventing entry of gases between said ceramic crown and said piston main body through said interface.

5,144,886

COFFEE MACHINE

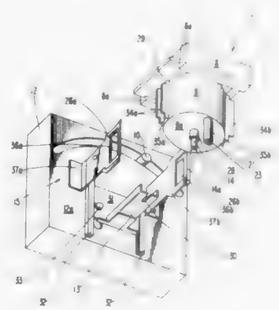
Karl Göckelmann, Gerstetten, and Rudi Geiger, Weissenstein, both of Fed. Rep. of Germany, assignors to WMF Württembergische Metallwarenfabrik Aktiengesellschaft, Geislingen/-Steige, Fed. Rep. of Germany

Filed Feb. 14, 1991, Ser. No. 655,540

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005348

Int. Cl.[5] A23F *5/16*

U.S. Cl. 99—297 11 Claims



1. A coffee making machine comprising: a housing having an internal support structure; brewing means including a brewing vessel disposed in said housing, said brewing means further including a piston movably disposed in the interior of said brewing vessel and a piston rod connected to said piston; and motor drive means disposed in said housing for reciprocating said piston in said brewing vessel, the machine further comprising door means provided in said housing for providing access to said brewing vessel and said piston, said door means also defining a removing and inserting direction with respect to said brewing vessel and said piston, fastening means mountingly connecting said brewing vessel to said housing internal support structure, and first coupling means engagingly connecting said motor drive means and said piston rod, wherein said fastening means is configured to provide selective mounting and dismounting of said brewing vessel by movement in said removing and inserting direction, and wherein said first coupling means is configured to provide engagement and disengagement coincident, respectively, with the mounting and dismounting of said brewing vessel by movement in said removing and inserting direction, whereby said brewing vessel and said piston can be removed and inserted as a unit.

5,144,887

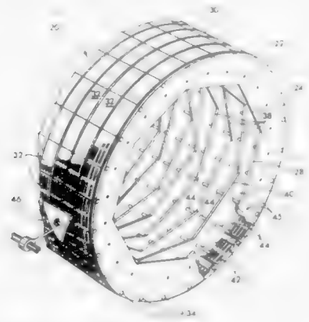
BEAN SNIPPER

Dennis O. Mietzel, Columbus, Wis., assignor to Hughes Company, Inc., Columbus, Wis.

Filed Mar. 8, 1991, Ser. No. 666,389

Int. Cl.[5] A23N *15/12*

U.S. Cl. 99—636 10 Claims



1. A bean snipper, comprising:

a) a rotatable drum having a central passage extending therethrough with an opening adapted to admit beans and an opening adapted to allow the exit of beans, wherein the surface of the drum has portions defining a plurality of slots which extend circumferentially to permit the ends of beans inserted therein to protrude outwardly of the drum;

b) a plurality of planar baffles axially spaced within the drum and having portions defining a central passage for beans therein;

c) a plurality of bean support rods extending between adjacent planar baffles, the rods being spaced radially inwardly from the drum surface and extending substantially perpendicularly to the baffles, the rods adapted to support a bean with its end inserted in a slot; and

d) a snipper knife outside the drum and adapted to snip the end of a bean protruding beyond the surface of the drum.

5,144,888

COMBINED TABLE COMPRISING A PLURALITY OF INDIVIDUAL TABLE SURFACES

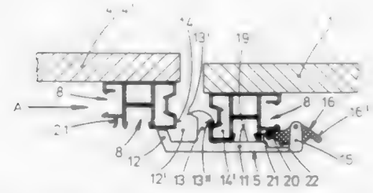
Klaus A. Heine, Frankfurt, and Uwe Fischer, Offenbach, both of Fed. Rep. of Germany, assignors to Protoned B.V., Amsterdam, Netherlands

Filed Sep. 18, 1991, Ser. No. 761,672

Claims priority, application Switzerland, Oct. 10, 1990, 3266/90

Int. Cl.[5] A47B *57/00*

U.S. Cl. 108—64 9 Claims



1. In a combined table comprising a plurality of individual table surfaces having rectilinear side edges, at least a pair of said table surfaces being provided with vertically adjustable legs, and at least a pair of coupling members for connecting one of said pair of table surfaces to an adjacent table surface, each of said coupling members having snap means for detachably connecting each of said coupling members to a first sectional bar mounted in an underside of said one table surface and catch means for detachably connecting each of said coupling members to a second sectional bar mounted on an underside of said adjacent table surface, the improvement wherein each end of said first sectional bar is held in first corner cover means mounted on said underside of said one table surface flush with adjacent side edges thereof and each end of said second sectional bar is held in second corner cover means mounted on said underside of said adjacent table surface flush with adjacent side edges thereof; wherein each of said first and second sectional bars has an outside edge provided with a fitting zone sized and shaped so as to be engageable with an intermediate portion of said coupling members and an inside edge provided with a first channel sized and shaped so as to be engageable with said snap means of said coupling members and a second channel sized and shaped so as to be engageable with wedge locking means for fastening said first and second sectional bars to said first and second corner cover means, respectively; and wherein each of said vertically adjustable legs contains an insert part which is adjustable by means of a spindle and a knurled nut and which includes a foot part guided by a centering pin.

5,144,889

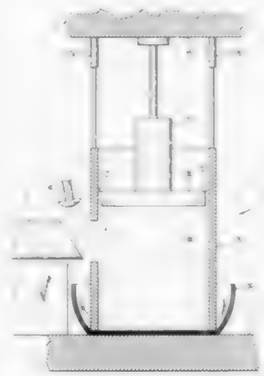
APPARATUS FOR FORMING NEGATIVELY BUOYANT HIGH-DENSITY TRASH SLUGS

Craig S. Alig, Arnold; Peter S. McGraw, Severna Park; Christopher C. Chiodo, Annapolis, and William K. Upton, III, Chester, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1991, Ser. No. 721,076

Int. Cl.[5] B30B *15/30*

U.S. Cl. 100—74 3 Claims



1. A trash compacting apparatus for forming high-density trash slugs of a predetermined height, comprising:

a base

a fixed overhead support

first and second hydraulic lifting cylinders fixedly mounted to said overhead support,

a hollow cylinder connected to said first and second hydraulic lifting cylinders having an open bottom and capable of vertical movement with respect to said base, said cylinder being movable between a first and second position between said base and said support wherein said cylinder's open bottom rests on said base in said first position and wherein said cylinder's open bottom is raised to an ejection height above said base in said second position, said

ejection height being greater than the slug's predetermined height;

a compacting ram slidably fitted within said hollow cylinder and disposed above the trash to be compacted;

a third hydraulic cylinder mounted on said ram between the ram and said overhead support for imparting a downward compaction force to said compacting ram to compact the trash within said hollow cylinder between said compacting ram and said base thereby forming the trash slug, wherein the compaction force is applied when said hollow cylinder is in said first position and when said hollow cylinder is moving to said second position, and wherein the compaction force is removed when said hollow cylinder is in said second position

said hollow cylinder having an opening on its side,

a shear ram positioned so that its is adjacent said opening when the hollow cylinder is in its said first position,

so that trash may be pushed by the ram into the hollow cylinder through said opening,

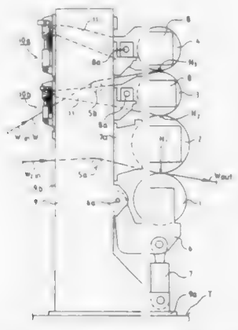
a liquid sprayer positioned externally to said hollow cylinder and adjacent said opening for wetting the trash to be compacted with a liquid.

5,144,890

ACTUATOR OF MODULAR CONSTRUCTION FOR ROLLS OF A MACHINE CALENDER

Osmo Korhonen, Karhula, Finland, assignor to Valmet-Ahlstrom Inc., Karhula, Finland

Filed Oct. 19, 1990, Ser. No. 598,884
Claims priority, application Finland, Oct. 25, 1989, 895069
Int. Cl.[5] B30B *3/04*; D21G *1/00*
U.S. Cl. 100—163 A **7 Claims**



1. An actuator for at least one movable calender roll in a machine calender connected on-line to a paper machine, comprising:

at least a first movable frame connected to one vertical side of a stationary calender frame so that the movable frame can be adjusted along said one vertical side,

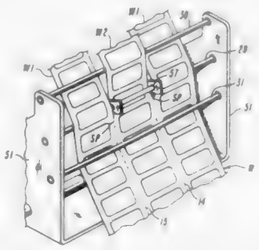
said actuator further provided with a double acting hydraulic cylinder connected between said first movable frame and a first end of a support arm, said support arm pivotally connected at a second end to said at least one calender roll and pivotally connected between said first and second ends to said stationary calender frame, said cylinder operable to move said at least one calender roll to a raised position; wherein said at least one movable frame comprises a pair of substantially identical upper and lower movable frames and associated upper and lower cylinders and upper and lower support arms for supporting upper and lower calender rolls, said upper and lower movable frames connected to said one vertical side of said stationary calendar frame, one above the other, with vertical adjustment means therebetween.

5,144,891

WEB HANDLING METHOD AND APPARATUS

Thomas G. McKenna, Bellbrook, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 590,268, Sep. 28, 1990, Pat. No. 5,092,697. This application May 1, 1991, Ser. No. 694,523
Int. Cl.[5] B41F *13/56*
U.S. Cl. 101—227 **20 Claims**



1. Method of handling multi-portion webs, comprising the steps of: providing a longitudinally extending multi-portion web having longitudinal columns and transverse rows of record members, wherein the web has a plurality of longitudinally extending web portions each having a column of the record members and being connected at a longitudinal line of weakening between each adjacent pair of web portions, printing simultaneously on the record members in the transverse rows using a printer, providing a plurality of cores with each core being adapted to have one of the web portions wound thereon, rotating the cores in a rewinder to draw the web with its printed record members and to wind the web portions onto the cores, causing adjacent web portions to move in different planes in a zone downstream of the printer and upstream of the cores to effect tearing and resultant separation of the web portions at each line of weakening as the web portions are drawn, using a knife between adjacent web portions along the line of weakening to assist in separating the web portions when separation fails to occur readily by tearing alone, and removing the cores and the web portions wound thereon from the rewinder.

5,144,892

PRINTING FLUID CIRCULATOR FOR USE IN A PRINTING PRESS

Garry F. Tupek, Naperville; John W. Manser, Elgin, and James M. Komaniecki, Minooka, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1991, Ser. No. 701,269
Int. Cl.[5] B41F *31/06*
U.S. Cl. 101—363 **18 Claims**

1. A printing fluid circulating means for use in a printing press having a container means for containing printing fluid and having a rotatable pickup roller partially submerged in the printing fluid in the container means and having a surface for picking up the printing fluid, comprising:

at least one outer ribbon having a predetermined diameter and a predetermined surface area;

at least one inner ribbon having a predetermined diameter and a predetermined surface area, said diameter of said at least one inner ribbon being less than said diameter of said at least one outer ribbon and said predetermined surface area of said at least one outer ribbon being a function of said predetermined surface area of said at least one inner ribbon;

each of said at least one outer ribbon and said at least one inner ribbon having a substantially helix configuration, said helix configuration of said inner ribbon being opposite relative to said helix configuration of said outer ribbon; and

rotatable means for supporting said at least one outer ribbon and said at least one inner ribbon about a common axis;

said circulating means being submerged in the printing fluid in said container means in spaced relation to said pickup roller such that rotation of said circulating means causes the printing fluid to flow substantially evenly and substantially continuously past the surface of the pickup roller;

said at least one outer ribbon and said at least one inner ribbon having predetermined pitches P1, P2, respectively, predetermined widths W1, W2, respectively and predetermined diameter D1, D2, respectively; said at least one outer ribbon and said at least one inner ribbon having predetermined helix angles V1, V2, respectively, defined by:

$V1 = TAN^{-1}(P1/(\pi D1))$, and

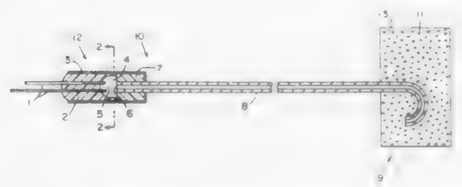
$V2 = TAN^{-1}(P2/(\pi D2))$.

5,144,893

SAFE ORDNANCE INITIATION SYSTEM

Samuel Zeman, and Robert E. Betts, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1991, Ser. No. 741,001
Int. Cl.[5] F42B *3/14*; F42C *19/12*
U.S. Cl. 102—202 **5 Claims**



1. A safe igniter and deflagration initiation system which comprises:

(i) a firing circuit comprising a power source, a capacitor, switching means, and electrical connectings means for charging energy needed for said safe ordnance initiation system, said firing circuit providing a method for charging a storage capacitor to a preselected voltage and a means for rapidly and efficiently switching the charged capacity to an electrical discharge initiation element;

(ii) an electrical discharge initiation element connected to said firing circuit, said electrical discharge initiation element providing the means of rapidly dissipating a capacitor charge and converting said capacitor charge to a shock wave and thermal/plasma energy output that propagates into and through an adjacent transmission line shock tubing, said electrical discharge initiation element comprising several components including a pair of electrical conductors, an insulator for separating said conductors, an air gap, a spark gap, and a case to provide structure support for several components and environmental protection for said air gap and said spark gap within said electrical discharge initiation element;

(iii) a transmission line shock transfer tubing of a predetermined length and having a predetermined inner and outer diameter for receiving said shock and thermal/plasma energy output from said electrical discharge initiation element and transferring same to a target element, said transmission line shock transfer tubing connected to said electrical discharge initiation element at one end thereof and terminating in a target element at the other end thereof; and,

(iv) a target element for interacting with a predetermined output energy level of shock charge and thermal/plasma energy transmitted through said transmission line shock transfer tube to achieve a desired result for igniting said target element .

5,144,894

CONVEYING SYSTEM

Paul Scheuer, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Continuation of Ser. No. 338,973, Apr. 14, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 687,780
Claims priority, application Switzerland, Apr. 14, 1988, 01378/88
Int. Cl.[5] B61L *27/04*
U.S. Cl. 104—127 **15 Claims**

1. A conveying system for a textile building, said system comprising

a vertically movable conveyor for moving products between two stories of the building;

a first transfer station on one story of the building for the transfer of products between said station and said conveyor;

a second transfer station on a second story of the building for the transfer of products between said second station and said conveyor;

a reciprocally mounted element in said conveyor for moving products horizontally between said conveyor and a respective station; and

a control connected to said conveyor, said stations and said element for actuating said conveyor, stations and element in programmed sequence to transfer products therebetween.

5,144,895

HOPPER DOOR APPARATUS FOR A RAILWAY CAR

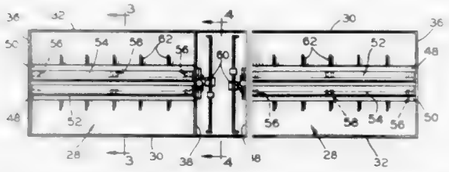
John R. Murray, Findlay, Ohio, assignor to Differential Steel Car Company, Findlay, Ohio

Filed Oct. 31, 1990, Ser. No. 606,422
Int. Cl.[5] B61D *7/24*
U.S. Cl. 105—286 **11 Claims**

1. A door apparatus for use in discharging bulk material from a hopper on a railway car comprising:

an elongated flexible hollow body for closing an elongated material discharge opening formed in a hopper;

a pair of end walls, one of said end walls is constrained from movement, attached to opposite ends of and enclosing an interior of said body, each said end wall having a first pivot point for rotary attachment to the hopper, and said body being rotatable about the first pivot points between an open position and a closed position; and



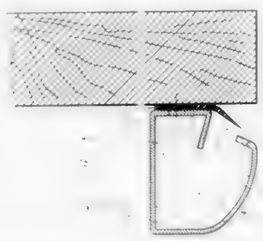
means for attaching at least one of said end walls attached to one end of said body to a means for rotating said body about the first pivot points between the open position and the closed position, whereby when said body is rotated about said first pivot point at said one end and an opposite end of said body is prevented from rotating, said body is twisted about a longitudinal axis to transmit torque from said one end to said opposite end.

5,144,896

DEVICE FOR RECEIVING, GUIDING, PROTECTING, AND CONCEALING THE ELECTRIC POWER LEADS IN A PIECE OF FURNITURE SUPPORTING ELECTRIC AND ELECTRONIC APPLIANCES

Friedrich Fortsch, Strasbourg, France, assignor to Steelcase Strafor (S.A.), France

Filed Dec. 3, 1990, Ser. No. 620,551
Claims priority, application France, Dec. 1, 1989, 89 16085
Int. Cl.[5] A47C *35/00*
U.S. Cl. 108—50 **6 Claims**



1. A frame for a piece of furniture having a generally horizontal furniture top adapted to receive thereon a number of electrical appliances having respective power lines, the frame comprising:

at least one section, each section including a substantially horizontal top face, a substantially vertical rear face and a front face, the top face connected to the rear face and the rear face connected to the front face, the front face extending upward toward the top face to form therebetween a continuous horizontal longitudinal slot for passing the power lines, each section defining an interior channel dimensioned for guiding, protecting and concealing the power lines between the top face, rear face and front face; and

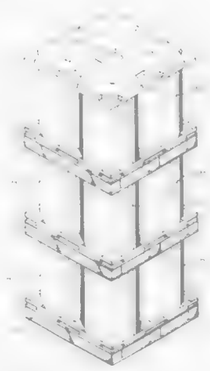
at least one leg, connected to the section and extending downward therefrom, which leg provides support for the frame and furniture top, at least one of the legs including a metallic shaped tube which has a leg front face which forms part of a leg channel extending to the bottom of the frame.

5,144,897

SHIPPING PACKAGE COMBINATION

Ragnar R. Avery, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 654,426, Feb. 12, 1991, abandoned.
This application Sep. 24, 1991, Ser. No. 764,867
Int. Cl.[5] B65D *19/44*
U.S. Cl. 108—55.3 **5 Claims**



1. A shipping combination comprising:

(i) four round liquid-containing barrels, said barrels having vertical outside surfaces;

(ii) a square wooden pallet capable of supporting said barrels; and

(iii) an essentially square tray supported by said pallet and having essentially the same length and width dimensions as said wooden pallet for receiving said barrels, said tray being formed from a single sheet of molded plastic material and having

(a) an interior surface having a center and four outside edges;

(b) an upwardly extending, liquid-retaining, exterior wall portion along said outside edges, said tray further having four interior corners and four midpoints which are located between said corners and at the intersection of said wall portion with said interior surface;

(c) a raised central abutment located at the center of said interior surface and upwardly disposed from said interior surface, said central abutment having four arcuate walls for engaging the vertical outside surfaces of said barrels;

(d) four raised corner abutments located at the interior corners of said tray, each of said corner abutments having one arcuate wall for engaging the vertical outside surfaces of said barrels;

(e) four raised edge abutments located at the midpoints of said tray, each of said edge abutments having arcuate walls for engaging the vertical outside surfaces of said barrels, whereby said barrels are maintained in a substantially fixed relative position and said exterior wall portion retains any of said liquid which inadvertently leaks from said barrels.

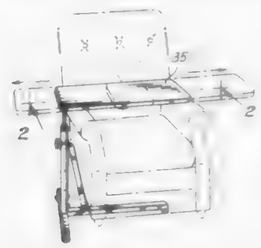
5,144,898

ADJUSTABLE TABLE

Louis M. Posly, 243- Lidy Rd., Dupont, Pa. 18641

Continuation of Ser. No. 426,114, Oct. 24, 1989, abandoned.
This application Apr. 10, 1991, Ser. No. 683,092
Int. Cl.[5] A47B *5/00*
U.S. Cl. 108—148 **8 Claims**

1. An adjustable table comprised of support means, a table top, said table top mounted upon at least one horizontal member, said adjustable table having upper and lower members in telescoping arrangement articulated to the support means and to the horizontal member for the vertical adjustment of the table top relative to the support means and further comprising means for pivotal adjustment of the table top about the support means, said table top being slideably adjustable about the horizontal member for horizontal adjustment about the horizontal member and rotatably adjustable about the horizontal member, the horizontal member also being mounted to flipping means that are also mounted to the support means, said flipping means



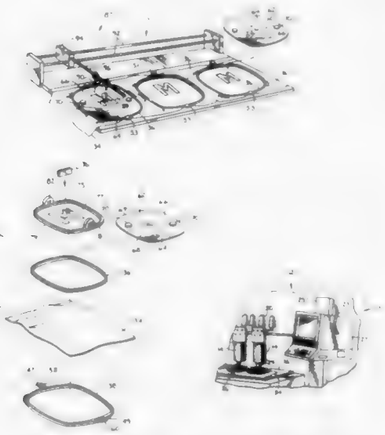
permitting the table top to be flipped and wherein a mounting plate is welded to the top of the vertical support member, said mounting plate having means for the receipt of one or more track members, said mounting plate is comprised of sidewalls having apertures therein, a hinge member fitted within the aperture of the side walls, means for securing said hinge member in place, and said horizontal members are welded to the hinge member, permitting said horizontal members to flip about the hinge, and wherein the table top is positionable over the user's lap or over the user's side.

5,144,899

COMBINATION EMBROIDERY/SCREEN PRINTING APPARATUS AND METHOD

Michael N. Allen, 532 Elizabeth, Kansas City, Kans. 66101

Filed Mar. 14, 1991, Ser. No. 669,190
Int. Cl.[5] D05C *9/04;* **B41F** *15/06*
U.S. Cl. 112—103 **10 Claims**



1. A combination stitching/screen printing apparatus for forming a reproduction of a pattern on a textile substrate, said reproduction having first portions thereof formed by screen printing and second portions thereof formed by stitching, comprising:

(a) clamping means for constraining said substrate as said reproduction is formed thereon;

(b) printing means for forming said printed first portions of said reproduction on said substrate;

(c) stitching means for forming said stitched second portions of said reproduction on said substrate; and

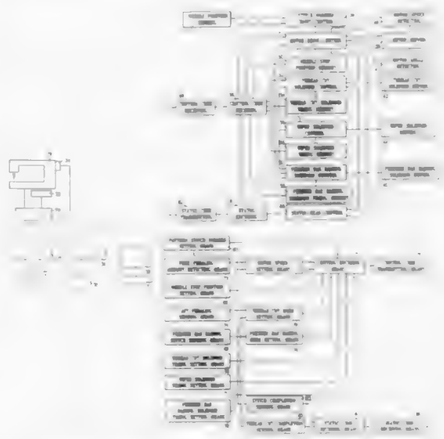
(d) alignment means for aligning said clamping means with respect to stitching in such that registration is obtained between said printed first portions and said stitched second portions of said reproduction.

5,144,900

CONTROL DEVICE FOR SEWING MACHINE

Yoshimi Takahashi, Chofu, Japan, assignor to Juki Corporation, Chofu, Japan

Filed Jan. 19, 1990, Ser. No. 468,858
Claims priority, application Japan, Jan. 20, 1989, 1-11669
Int. Cl.[5] D05B *19/00*
U.S. Cl. 112—121.11 **5 Claims**



1. A sewing system including a driving system provided in a sewing machine, a control system being arranged apart from said sewing machine and an interface for connecting said driving system and said control system;

said driving system comprising

a plurality of mechanisms including a thread cutting mechanism, a wiper mechanism and a presser-foot mechanism,

a motor of variable speed for driving said sewing machine,

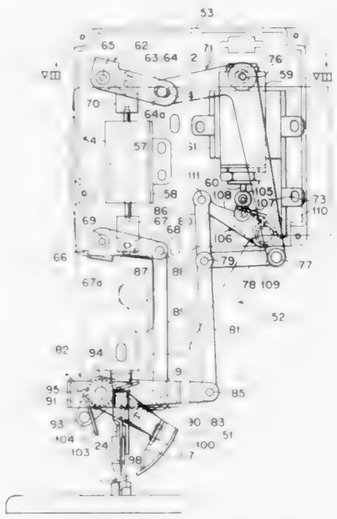
a plurality of driving means for driving respectively each of said mechanisms, and

a speed control means for controlling the speed of said motor;

said control system coding a mode setting command and an operation execution command as a control code and generating said control code, said mode setting command for setting a driving condition for each of said driving means and said speed control means, said operation execution command for sequentially conducting predetermined sewing operations; and

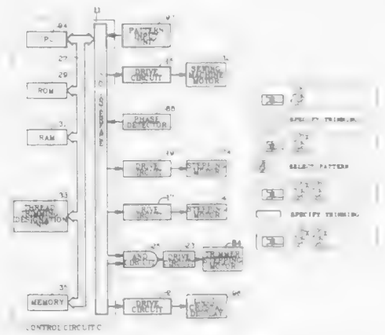
said driving system further having decoding means for decoding said control code and a memory for registering the decoded mode setting command, whereby said driving system drives said driving means and said speed control means according to the decoded mode setting command recorded in said memory and the decoded operation execution command.

5,144,901
NEEDLE THREAD HOLDING DEVICE FOR HOLDING LEADING END PORTION OF THE NEEDLE THREAD IN SEWING MACHINE HAVING THREAD CUTTING MECHANISM
Hajime Suzuki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Sep. 19, 1990, Ser. No. 584,775
Claims priority, application Japan, Oct. 31, 1989, 1-285661
Int. Cl.[5] D05B *53/00*
U.S. Cl. 112—253 7 Claims



1. A thread holding device for holding a leading end portion of a needle thread in a sewing machine, the sewing machine including a machine frame, and a sewing needle reciprocatable in a vertical direction, the holding device comprising:
a thread holding member (**100**) supported on the machine frame (**5**) and pivotable about an axis (**94**), the thread holding member (**100**) having a lower end portion provided with a thread trapping portion (**101**) for trapping the leading end portion of the needle thread (Ns), the thread holding member providing a first angular position where the thread trapping portion (**101**) is positioned closely below the sewing needle (**24**) positioned at its uppermost position, a second angular position positioned higher than the first angular position and where the thread trapping portion (**101**) is positioned closely beside the sewing needle (**24**) positioned at its uppermost position, and a third angular position positioned higher than the second angular position; and
a holding force imparting member (**97**) operatively connected to the thread holding member (**100**) and means for driving the holding force imparting member (**97**) at a speed different from a moving speed of the thread holding member (**100**), the holding force imparting member (**97**) being resiliently engageable with the thread trapping portion (**101**) when the thread holding member (**100**) is in its second angular position for holding the leading end portion of the needle thread (Ns) therebetween, and being disengageable from the thread trapping portion (**101**) when the thread holding member (**100**) is moved from its second angular position to its third angular position for releasing the leading end portion of the needle thread from the thread trapping portion (**101**).

5,144,902
THREAD TRIMMER FOR A PATTERN SEWING MACHINE
Shintaro Hirabayashi, Nagoya, Japan, assignor to Brother Kogyo Kabishiki Kaisha, Nagoya, Japan
Filed Sep. 5, 1991, Ser. No. 755,177
Claims priority, application Japan, Sep. 6, 1990, 2-237998
Int. Cl.[5] D05B *65/02, 3/02*
U.S. Cl. 112—292 16 Claims

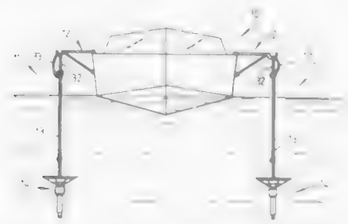


1. A pattern sewing machine comprising:
(a) a needle bar carrying a needle at a lower end and being moved vertically by an arm shaft driven by a sewing machine motor;
(b) a memory means storing pattern data indicative of a pattern;
(c) a phase detection means for detecting a rotary phase of the arm shaft and for sending out a timing signal indicative of lowering of the needle bar;
(d) a thread trimming means for trimming a needle thread and a bobbin thread after stitches are formed on a fabric according to a relative movement of the needle and the fabric;
(e) a trimming designation means for specifying a cut portion of a crossover thread between the respective pattern and a next pattern to be formed according to the pattern data stored in the memory means;
(f) a trimming memory means for storing a trimming signal indicative of the cut portion of the crossover thread specified by the trimming designation means; and
(g) a trimmer drive means for driving the thread trimming means in response to both the trimming signal and the timing signal.

5,144,903
YACHT AND YACHT MODEL
Jiro Ozeki, 15, Senkawa-cho 2-chome, Toshima-ku, Tokyo, Japan
Filed Nov. 9, 1989, Ser. No. 434,065
Claims priority, application Japan, Nov. 2, 1988, 63-278349; Sep. 26, 1989, 1-249729
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—103 13 Claims

1. A yacht structure including a hull, a mast provided on the hull to extend upward from the hull for supporting a main sail, a spinnaker provided in front of the mast, said spinnaker being retained in bulged configuration to possess an appearance of receiving wind even when it is not receiving wind, said spinnaker having a top portion connected to an upper portion of the mast in a manner which allows a turning movement of the spinnaker about the mast, means engaged with a lower portion of said spinnaker at the opposite sides of said spinnaker for maintaining said spinnaker in positions spaced apart from said mast while at the same time allowing said turning movement of said spinnaker about the mast.

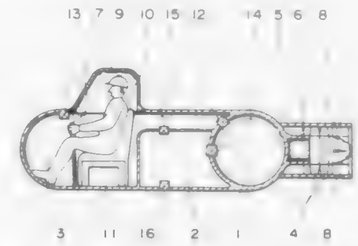
5,144,904
STABILIZING APPARATUS
Jeffrey W. Weldon, Queensland, Australia, assignor to Ocean Torque Patent Pty. Ltd., Paradise Waters, Australia
Filed Feb. 28, 1991, Ser. No. 662,230
Int. Cl.[5] B63B *39/00*
U.S. Cl. 114—311 24 Claims



1. Apparatus for stabilizing a watercraft, said apparatus comprising a submergible body assembly including body means having a plurality of openings therein; a central spindle; weight means at one end of said spindle; means at the opposite end of said spindle for coupling said body assembly to a tether, whereby said body assembly may be suspended from a watercraft; and closure means on the operative upper side of said body means adapted to close said openings to prevent liquid flow through said body means upon movement of said body means in a first direction, whereby to dampen movement of said watercraft, said closure means moving away from said openings to permit flow of liquid through said body means upon movement of said body means in a direction opposite said first direction.

5,144,905
DIVING BOAT
Akio Tanaka, 2174, Ao-Cho, Ono-Shi, Hyogo-Ken, Japan
Continuation of Ser. No. 462,577, Jan. 25, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,281
Claims priority, application Japan, Jan. 25, 1989, 1-17047
Int. Cl.[5] B63G *8/22*
U.S. Cl. 114—333 3 Claims

1. A fully submersible boat for operation under water comprising a hull having internal partitions dividing said hull into a plurality of air tight and water compartments including a cockpit, a first tank containing a source of air under pressure, and a second tank containing water and air, first unidirectional valve means for feeding air from said first tank into said cockpit, second unidirectional valve means for transferring air between said first and second tanks, third unidirectional valve means for feeding air from said second tank into said cockpit, bidirectional valve means for introducing water into said second tank to cause air to be fed into said cockpit from said second tank and to expel water from said second tank, and



automatic relief valve means responsive to a relatively higher air pressure in the cockpit than the pressure of the water exterior of said boat to cause the discharge of excess air from said hull into the water.

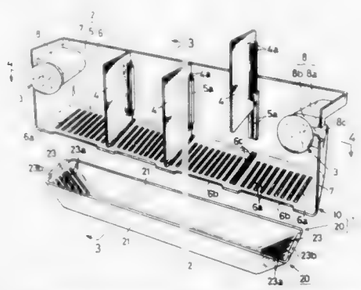
5,144,906
SEA MARKER
Daniel Kraemer, Kirchheimbolanden, Fed. Rep. of Germany, assignor to Piepenbrock Pyrotechnik GmbH, Goellheim, Fed. Rep. of Germany
Filed Apr. 11, 1991, Ser. No. 683,833
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013516
Int. Cl.[5] B63B *45/02;* F42B *4/26*
U.S. Cl. 116—209 16 Claims

1. A sea marker for emergency flights of ship-based planes onto a ship, comprising:
a float,
a tube supported by said float and containing a pyrotechnical charge,
an intermediate charge superimposed on said pyrotechnical charge,
a primer arranged on said intermediate charge, said primer being cast on to a holed disc which is held against an inner wall of the tube with a retaining ring, and
a percussion igniter, wherein the tube comprises a material which does not burn and said charge consists essentially of about 30 to 60% by weight of sodium nitrate, about 3 to 18% by weight of polyolefin resin and about 30 to 60% by weight of magnesium.

5,144,907
SCALLOP AQUACULTURE
Patrick E. Dabinett, P.O. Box 254, Torbay, Newfoundland, Canada A01 3Z0
Filed Apr. 25, 1989, Ser. No. 342,976
Claims priority, application Canada, Oct. 6, 1988, 579526
Int. Cl.[5] A01K 61/00
U.S. Cl. 119—4 19 Claims

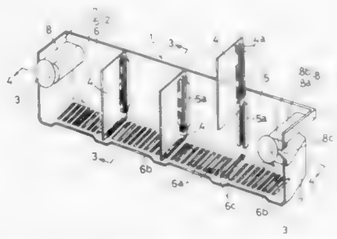
1. A method for culturing giant scallops from the egg stage to the juvenile stage under controlled conditions comprising the steps of: (a) obtaining and feeding native scallops; (b) inducing spawning in said scallops (c) selecting eggs surrounded by sperm in a preselected ratio of sperm/egg; (d) hatching fertilized eggs at a preselected density in shallow dishes of water, thereby providing swimming larvae; (e) removing said larvae after a preselected period of time, and resuspending said larvae in deep larval tanks of selected sea water having selected food therein; (f) periodically removing said larvae, resuspending said removed larvae at a preselected density in larval tanks of the selected sea water and re-feeding said resuspended larvae with selected artifically-grown algae food in the sea water; (g) after a preselected period of time, allowing said larvae to settle on the bottom of said larval tanks in selected lighting conditions, and become spat, while periodically changing the water in said larval tanks and feeding said larvae with artifically-grown algae food provided in the water in said larval tanks; (h) after a preselected period of time, brushing said spat out of said larval tanks, catching said brushed-out spat on screen trays, and replacing said spat contained on said screen trays in a culturing tank of selected water, said screen trays being stacked vertically therein; (i) periodically changing the water in said culturing tank by inflow/outflow of water and monitoring food levels in said culturing tank; and (j) after a preselected period of time, removing juvenile scallops from said culturing tank.

5,144,908
CELL-FORMING ASSEMBLY FOR A HOUSEHOLD AQUARIUM
Kazutoshi Tominaga, Osaka, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Osaka, Japan
Filed Jun. 11, 1991, Ser. No. 713,459
Int. Cl.[5] A01K 63/00
U.S. Cl. 119—5 4 Claims



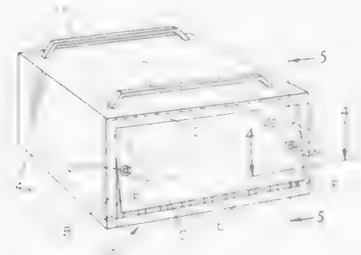
1. A cell-forming assembly for use in combination with a household aquarium and including a first section for forming cells to separately accommodating adult fishes and a second section for forming another cell to rear such fry as may be spawned by the adult fishes, the first section comprising:
an elongated body having an open top and front faces;
the main body comprising a rectangular back wall, a bottom plate extending forwardly from the lower edge of the back wall and having a plurality of openings, a pair of opposite side walls connected to both side edges of the back wall and bottom plate;
fastening members attached to the main body so as to detachably secure it to an aquarium wall so that the open front face of the main body may be disposed substantially in contact with the inner surface of aquarium wall;
at least one partition detachably to be held inside the main body so that an internal space defined by the main body and aquarium wall is divided into a row of cells arranged from side to side;
the second section for forming a cell to rear the fry being a box-like member having an open top and being elongate from side to side, with the open top being detachably secured to the bottom plate of the main body so as to be in contact therewith;
wherein pairs of vertical retaining guides are formed at given intervals to protrude forwardly and inwardly of the main body's back wall, the vertical retaining guides having forward vertical edges facing one another, and each partition has a pair of parallel vertical lugs which protrude respectively from the partitions' right and left surface portions adjacent to the partition's rearward vertical edge so as to be retained by the retaining guides ,whereby the main body detachably keep in place the partitions;
wherein the main body is an integral piece molded of a rigid plastic;
wherein the partitions are of a limited transparency such that the aquarium fishes in the neighboring cells are not likely to irritate one another;
wherein the second section for rearing the fry has at its upper end hooks which are removably engaged with the openings at the ends of the bottom plate constituting the main body of the first section; and said openings permit the eggs or fry to drop or move therethrough; and whereby second section totally encompasses the openings of the bottom plate; and
wherein the second section is an integral piece molded of a rigid plastic.

5,144,909
CELL-FORMING ASSEMBLY FOR A HOUSEHOLD AQUARIUM
Kazutoshi Tominaga, Higashiosakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Osaka, Japan
Filed Apr. 22, 1991, Ser. No. 689,187
Int. Cl.[5] A01K 63/00
U.S. Cl. 119—5 4 Claims



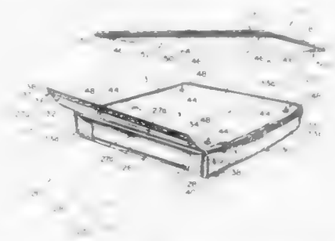
1. A cell-forming assembly for use with a household aquarium, the assembly comprising:
an elongated main body and having an open top and open front faces;
the main body comprising a rectangular back wall, a bottom plate extending forwardly from lower edge of the back wall, a pair of opposite side walls connected to both side edges of the back wall and bottom plate;
fastening members attached to the main body so as to detachably secure it to an aquarium wall so that the open front face of the main body may be disposed substantially in contact with an inner surface of a wall of the aquarium;
at least one partition detachably held inside the main body so that an internal space defined by the main body and aquarium wall is divided into a row of cells arranged from side to side, wherein the partition is made of a plate which is of a transparency limited to such a degree that aquarium fishes in adjacent cells are not caused to irritate one another;
wherein a plurality of slits parallel to each other in each compartment are formed through the bottom plate of the main body to permit the removal of solid wastes from the cell;
wherein pairs of vertical retaining guides are formed at given intervals to protrude forwardly and inwardly of the main body's back wall, the vertical retaining guides having forward vertical edges with the edges facing one another;
each partition has a pair of parallel vertical lugs which protrude respectively from the partitions's right and left surface portions adjacent to the partition's rearward vertical edge so as to be retained by the retaining guides, whereby the main body detachably keeps in place the partitions; and
wherein the main body is an integral piece molded of a rigid plastic.

5,144,910
DOG TRANSPORTATION BOX WITH REMOVABLE SIDE WALL AND METHOD
Steven S. Darby, P. O. Box 73, Anderson, S.C. 29622
Filed Nov. 6, 1990, Ser. No. 609,743
Int. Cl.[5] A01K 1/02
U.S. Cl. 119—17 7 Claims



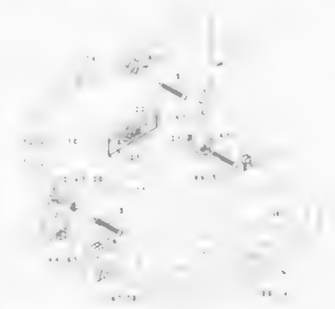
1. A convertible dog transportation box having an upright rectangular ventilated side wall and comprising:
a side frame member carrying said rectangular ventilated side wall in recessed relation thereto, said ventilated side wall being constructed of longitudinally spaced vertical structural members extending from a top to a bottom of said box, each of said members having a web section and legs for providing structural support of said box as well as retention of a dog within said box;
a substantially imperforate outer side wall;
a depending upper frame member having a first flange, carried by said side frame member and receiving a top of said outer side wall behind said first flange thereby aiding in positioning said outer side wall in overlying relation to said ventilated side wall; and
an upright lower frame member having a second flange, carried by said side frame member and receiving a bottom of said outer side wall behind said second flange positioning said outer side wall in overlying relation to said ventilated side wall; a depth dimension of said first flange being greater than a depth dimension of said second flange;
said side frame member including upright frame members extending in alignment with and connecting said upper and lower frame members;
whereby said dog transportation box may be converted from ventilated to imperforate by installing said imperforate outer side wall by first inserting said top of said outer side wall behind said upper frame member and then lowering the bottom of said outer side wall behind said upright lower frame member.

5,144,911
COMPONENT BED SYSTEM FOR A PET
Cheri L. Moore, and Judy L. Hall, both of 2708 Springbrooke, Hurst, Tex. 76054
Filed Nov. 28, 1990, Ser. No. 619,099
Int. Cl.[5] A01K 29/00; A47G 9/06
U.S. Cl. 119—28.5 14 Claims



1. A bed for an animal pet comprising, in combination:
(a) a resilient mattress member having a top surface, a bottom surface and peripheral side wall disposed between said top and bottom surfaces;
(b) a mattress liner comprising a pocket totally surrounding and tightly adhering to said top and bottom surfaces and said peripheral side wall and including a closeable opening through which said mattress member can be inserted and removed, said mattress liner exhibiting moisture repelling properties;
(c) an outer cover member for totally enclosing said mattress member and said mattress liner therein, said cover member being formed from a tear-resistent, water-repellent fabric; and
(d) a mat of soft fabric material releasably secured to said outer cover member overlaying said top surface so as to be easily removable from said outer cover member, said mat of soft fabric material comprising a resting surface for said animal pet.

5,144,912
ANIMAL FEEDING DEVICE
Roy Hammett, and Shirley A. Hammett, both of 16103 Carden Dr., Odessa, Fla. 33556
Filed Nov. 4, 1991, Ser. No. 787,140
Int. Cl.[5] A01K 5/00
U.S. Cl. 119—61 21 Claims



1. An animal feeding device, comprising:
a splash panel adapted to be mounted at a selected elevation upon a vertical surface so as to lie generally parallel to the vertical surface;
a food supporting platform pivotally connected to the splash panel for operative support from the splash panel in a generally horizontal position in spaced relationship above

a floor or other surface, said platform being pivotable upwardly into a stored position lying closely adjacent and generally parallel to the splash panel; and

receptacle means on said platform for holding food and/or water for an animal.

5,144,913

COLLAR AND CLOTHES FOR ANIMALS

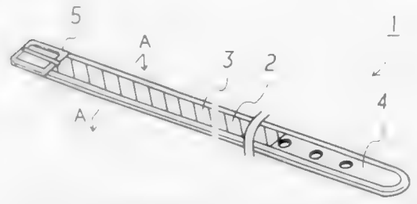
Ryuzaburo Yasui, 11-15, Kouri[illegible]aoka 8-chome, Hirakata City, Osaka, 573, Japan

Filed Jul. 31, 1990 Ser. No. 560,630

Claims priority, application Japan, Dec. 18, 1989, 1-328683

Int. Cl.[5] A01K *27/00*

U.S. Cl. 119—106 **8 Claims**



1. A collar for animals which comprises a base material and cloth made of at least one of an acrylic fiber and a nylon fiber containing absorbed copper sulfide, said cloth being attached to said base material at least on the side thereof which contacts an animal's face, and wherein said cloth has been made by absorbing copper ion thereinto and then treating such with a reducing aqueous solution containing hydrosulfite.

5,144,914

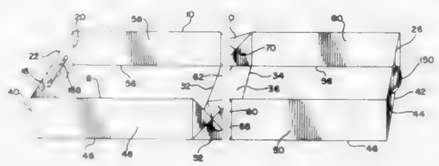
DISPOSABLE KITTY LITTER BOX

Cidell M. Giannakopoulos, 19 Abbeywood Dr., Romeoville, Ill. 60441

Filed Mar. 4, 1991 Ser. No. 663,482

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—168 **17 Claims**



1. A disposable kitty litter assembly, comprising:

a receptacle having a cavity to hold litter therein for use by pets,

including a bottom wall having a first end edge and a second end edge,

upright peripheral wall means integrally joined to said bottom wall throughout its entire periphery and extending upright therefrom, terminating at an upper peripheral edge,

said upright peripheral wall means including

a first longitudinal side portion of said sheet extending perpendicularly from one side of said bottom wall,

a second longitudinal side portion of said sheet extending perpendicularly from the opposite side of said bottom wall,

a first lateral end portion of said sheet extending perpendicularly from said first end edge of said bottom wall, said first lateral end portion having a first frictional locking flap,

a second lateral end portion of said sheet extending perpendicularly from said second end edge of said bottom wall, said second lateral end portion having a second frictional locking flap,

first corner means to foldably connect one end of said first longitudinal side portion of said sheet to one end of said first lateral end portion thereof when in their respective upright positions,

second corner means to foldably connect the opposite end of said first longitudinal side portion of said sheet to one end of said second lateral end portion thereof when in their respective upright positions,

third corner means to foldable connect one end of said second longitudinal side portion of said sheet to the opposite end of said first lateral end portion thereof when in their respective upright positions,

fourth corner means to foldably connect the opposite end of said second longitudinal side portion of said sheet to the opposite end of said second lateral end portion thereof when in their respective upright positions,

said first and third corner means secured between said first lateral end portion and said first frictional locking flap, said frictional locking flap secured by frictionally engaging said first and second longitudinal side portions,

said second and fourth corner means secured between said second lateral end portion and said second frictional locking flap, said frictional locking flap secured by frictionally engaging said first and second longitudinal side portions,

said receptacle having:

a first receptacle portion extending inwardly from said first end edge,

a second receptacle portion extending inwardly from said second end edge,

and pivot means, having a first pivot end disposed on said first longitudinal side portion and extending to a second pivot end disposed on said second longitudinal side portion, said first and second pivot ends each having diagonal slots, said pivot means positioned between said first and second receptacle portions for pivotal movement of said first receptacle portion relative to said second receptacle portion between an open position wherein said cavity of said receptacle is open and a closed position wherein said cavity of said receptacle is closed.

5,144,915

SYSTEM FOR CONTROLLING AN OPERATING PARAMETER OF AN INTERNAL COMBUSTION ENGINE OF A VEHICLE

Manfred Grabs, Wiernsheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

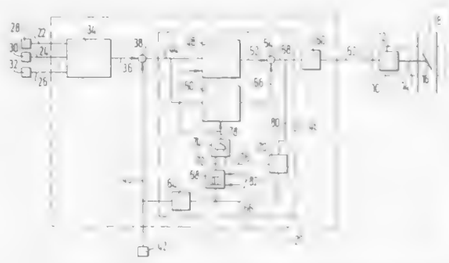
PCT No. PCT/DE90/00882, § 371 Date Aug. 12, 1991, § 102(e) Date Aug. 12, 1991, PCT Pub. No. WO91/09220, PCT Pub. Date Jun. 27, 1991

PCT Filed Nov. 16, 1990, Ser. No. 730,943

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3941000; May 12, 1990, 4015293

Int. Cl.[5] F02D *41/00*

U.S. Cl. 123—683 **16 Claims**



1. A control system for controlling an operating parameter of an internal combustion engine, the control system comprising:

an electrically operated actuator for acting on the operating parameter to be controlled;

a control unit for adjusting said actuator so as to cause said operating parameter to assume a pregiven value;

said control unit including at least one of an integral component for carrying out an integration and a proportional component for carrying out a proportional amplification operation; and,

intervention means for controlling the rate of change of said parameter to a pregiven value when pregiven conditions are present by intervening in at least one of the integral operation and the proportional amplification operation carried out by said control unit.

5,144,916

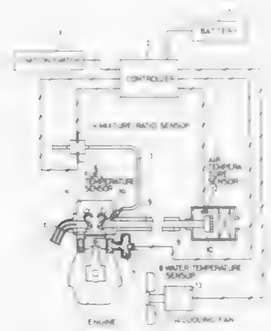
VEHICULAR ENGINE COOLING APPARATUS

Masato Yoshida, Kyoto; Takanao Yokoyama, Kanagawa; Muneyoshi Nanba, Kyoto; Yoshihiko Kato, Novi; Kazumasa Iida, and Katsuhiko Miyamoto, both of Kyoto, all of Japan, assignors to Mitsubishi Jidosho Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1991, Ser. No. 793,143

Int. Cl.[5] F01P *7/02*

U.S. Cl. 123—41.12 **11 Claims**



1. A vehicular engine cooling apparatus, comprising:

cooling fan means for cooling at least one of an engine and an environment of the engine, the engine being operated with use of any of two or more different fuels and a mixed fuel formed of a combination of the different fuels; and

a mixture ratio sensor for detecting the mixture ratio of the two or more different fuels, and

control means for actuating said cooling fan means in accordance with the fuel mixture ratio detected by said mixture ratio sensor, after the engine is stopped.

5,144,917

FREE-PISTON ENGINE

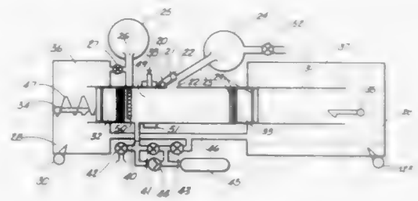
Robert B. Hammett, 107 Riverdale Dr., Covington, La. 70433

Continuation of Ser. No. 489,251, Mar. 5, 1990, abandoned, which is a continuation of Ser. No. 121,066, Oct. 13, 1987, Pat. No. 4,920,928, which is a continuation of Ser. No. 801,423, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 583,665, Feb. 27, 1984, abandoned. This application Jan. 16, 1991, Ser. No. 642,084

Int. Cl.[5] F01B *11/00*

U.S. Cl. 123—46 SC **27 Claims**

1. Apparatus utilizing energy to pump gas comprising: a piston fitted to a using, said piston freely moving in said casing in response to gas pressure differences on said piston; a pressure chamber to one side of said piston comprising means to increase the pressure or volume of gas in said pressure chamber to cause outward acceleration of said piston; a rebounding vole to the other side of said piston opposing the outward movement of said piston by the gas pressure in said rebounding volume; said rebounding volume maintaining a substantially constant pressure opposing said outward movement of said piston; said piston executing a stroke between said pressure chamber and said rebounding volume; an intake means through which gas enters said pressure chamber; and an outlet port in said casing located so as to be uncovered by said piston substantially before said piston has reached the outward end of said stroke of said piston.



5,144,918

INTAKE SYSTEM FOR ENGINE

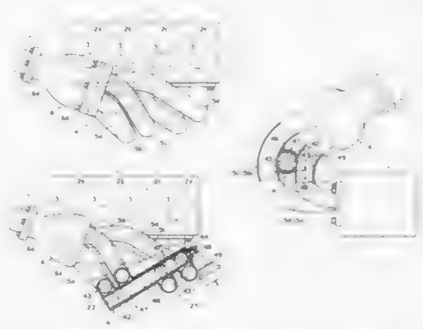
Toshimitsu Tanaka; Naoyuki Yamagata; Mitsuo Hitomi; Toshihiko Hattori; Masashi Marubara, and Mikihito Fujii, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 18, 1991, Ser. No. 732,125

Claims priority, application Japan, Jul. 19, 1990, 2-192120; Sep. 25, 1990, 2-258487; Sep. 26, 1990, 2-99718[U]; Sep. 28, 1990, 2-261092

Int. Cl.[5] F02M *35/10*

U.S. Cl. 123—52 M **11 Claims**



1. An intake system for a multiple-cylinder in-line engine comprising a cylinder row including a plurality of cylinders, a plurality of discrete intake passages which extend from one side of an engine body and communicate with respective cylinders of the engine at their downstream ends and merge into an integrated chamber at their upstream ends, the integrated chamber having a downstream side end face at which the discrete intake passages open to the integrated chamber and an upstream side end face at which a downstream end of a common intake passage opens to the integrated chamber;

wherein said integrated chamber is positioned above the engine body extending substantially horizontally and horizontally offset from a longitudinal midpoint of the cylinder row, and the discrete intake passages which communicate with cylinders relatively near to the integrated chamber open to an upper portion of the downstream side end face of the integrated chamber and the discrete intake passages which communicate with cylin-

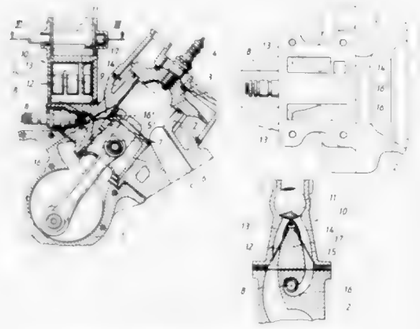
ders relatively far from the integrated chamber open to a lower portion of the downstream side end face.

5,144,919

TWO-STROKE CYCLE REC PROCATING INTERNAL COMBUSTION ENGINE FO R SPARK IGNITION AND CRANKCASE S CAVENGING

Laimböck Franz, Waldsdorfberg 36, A-8051 Graz-Thal, Austria

Filed Aug. 27, 1991, Ser. No. 750,529
Claims priority, application Austria, Sep. 7, 1990, 1828/90
Int. Cl.[5] F01B *75/02*
U.S. Cl. 123—65 W 9 Claims



1. In an internal combustion engine comprising
a cylinder having an exhaust port on one side,
a piston movable in said cylinder and defines a cylinder chamber therein,
a crankcase communicating with the interior of said cylinder,
spark plug means exposed to said cylinder chamber,
means defining a charging passage leading to the interior of said cylinder,
a fuel injection nozzle having an outlet disposed in said charging passage,
a throttle valve,
air intake passage means leading from said throttle valve to said crankcase, and
leaf spring damper means close to said throttle valve controlling the flow area of said air intake passage means and based in a closing sense,
the improvement residing in that
a branch line having a smaller flow area than said air intake passage means leads from said throttle valve and opens into said charging passage adjacent to said outlet of said nozzle,
additional leaf spring damper means close to said throttle valve biased in a closing sense controlling the flow area of said branch line,
said throttle valve is movable to an idle position for an idling of said engine, to a panel of light load positions for an operation of said engine up to a predetermined light load, and to a full load position, and is arranged to open only said branch line in said idle position and any position of said range and to open said branch line and said air intake passage means in any position between said range and said full load position, inclusive

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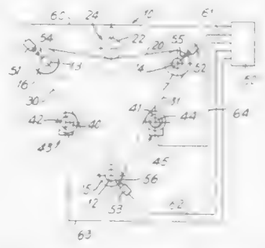
5,144,920

AUTOMATIC TIMING GOVERNOR BETWEEN CRANKSHAFT AND CAMSHAFTS, OPERATING BY MEANS OF ACTUATORS ON THE SHAFT CONNECTING CHAIN

Renzo Imperial, Via Monti, 30, 22070 Cassina Rizzardi (Como), Italy

PCT No. PCT/IT89/00026, § 371 Date Jul. 11, 1991, § 102(e) Date Jul. 11, 1991, PCT Pub. No. WO90/09513, PCT Pub. Date Aug. 23, 1990
PCT Filed Apr. 14, 1989, Ser. No. 720,813
Claims priority, application Italy, Feb. 10, 1989, 19396 A/89
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.15 7 Claims



1. Governor of timing in internal combustion engines between camshafts and crankshaft connected by a continuous belt or chain, characterized in that said governor determines the variation in length of sections (30), (31) of the belt (20) between the crankshaft (12), (73) and the camshafts (13), (14), (70) and between said camshafts, by means of actuators (43), (45), (77) without altering the total length of said belt, it being thus possible both to compensate for any effects of wear, assembly errors, dimensional variations due to changes in temperature and to stresses created by movement, and, when engine speeds change, to set optimum timing values for each running speed, characterized in that each actuator acts on a section of the belt by means of a cam causing a longer or shorter length of said section to correspond to each angular position of said cam.

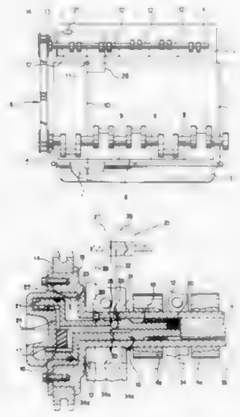
5,144,921

VALVE-CONTROLLED INTERNAL COMBUSTION ENGINE

Richard Clos, Oberstenfeld; Hannibal, Wilhelm, Neckarsulm; Fred Schäfer, Nachrodt, and Norbert Südhaus, Neckarsulm, all of Fed. Rep. of Germany, assignors to Audi, A.G., Ingolstadt, Fed. Rep. of Germany

Filed Nov. 12, 1991, Ser. No. 790,569
Int. Cl.[5] F01L *1/34;* F01M *1/06*
U.S. Cl. 123—90.17 3 Claims

1. Valve-controlled internal combustion engine with a camshaft (4), which is supported on bearings in the cylinder head (2), and a device (13) for rotating the camshaft relative to a coaxial timing gear (14), said device (13) has an operating sleeve (16), which is disposed coaxially with the camshaft (4), can be shifted axially between two end positions, is interlocked by mean of a first gear system (17, 18) with the timing gear (14) and by means of a second gear system (19, 20) with the camshaft (4) and has a double-acting hydraulic adjusting piston (21), which is disposed in a cylindrical space (22) and divides this space into two separate pressure chambers (23, 24), which, depending on the position of a control element (25), can be connected either with an inflow line (26) or an outflow line (27) for the oil under pressure, lubricating oil being supplied to a camshaft bearing (12) by a lubricating oil pump (7) by way of a restrictor, characterized in that the inflow (26) of oil under pressure to the control element (250 is branched off upstream



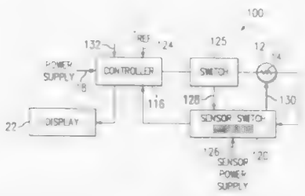
of the restrictor (11) in a pressure line (10) from the lubricating oil pump (7).

5,144,922

FUEL IGNITION SYSTEM FOR COMPRESSION IGNITION ENGINES

Hakchul Kong, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Nov. 1, 1990, Ser. No. 608,010
Int. Cl.[5] F02P *19/02*
U.S. Cl. 123—145 A 7 Claims



1. An improved fuel ignition system for a compression-ignited engine having a fuel combustion chamber, said system comprising:
a glow plug having a body and a resistance heating element located in the combustion chamber;
a power source connected to said heating element for supplying power to said heating element to raise the temperature of said heating element to aid in igniting fuel in said chamber;
sensor means for sensing the heating element temperature and for transmitting a heating element signal proportional thereto;
control means connected to said power source and to said sensor means for receiving said heating element signal to determine an on duty time period for supplying power from said power source to said heating element in proportion to the heating element temperature when the temperature in said chamber differs from a predetermined temperature, said control means includes a pulse width modulator for supplying an on duty cycle signal to said power source based on said on duty time period; and
compensating means connected to said control means for obviating errors due to the effects of resistance changes in the glow plug body and in lead wires connected to said sensor means

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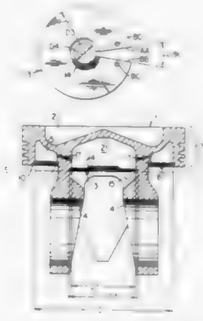
5,144,923

METHOD FOR THE MANUFACTURE OF A TWO PIECE PISTON AND PISTON

Jose M. M. Leites; Jose A. C. Mendes, and Robert R. Banfield, all of Sao Paulo, Brazil, assignors to Metal Leve S/A Industria E Comercio, Sao Paulo, Brazil

Filed Oct. 18, 1991, Ser. No. 781,346
Claims priority, application Brazil, Oct. 18, 1990, PI 9005376
Int. Cl.[5] F02F *3/00*
U.S. Cl. 123—193.6 16 Claims



1. Method for the manufacture of an articulated piston top 1, provided with a combustion chamber 2, ring zone 3, pin bores 4 to wrist pin (not shown) to articulate with a lower skirt portion (not shown) and a cooling chamber 5, characterized by the following essential steps:
a) manufacturing the top portion 1 above a sectional parting plane SS, which divides the uppermost top portion from the pin bores portion 4, providing a peripheral groove 10 surrounding the contour of the chamber 5, situated in the outermost face of the top 1, near the plane 55 and, in another plane nearer the plane SS, providing a notch 11 in the outline of the chamber 5, situated in the innermost face of the top 1;
b) providing a peripheral contouring groove 15 in the lower limit of the undercrown 21;
c) taking a semi-closed member 6 in a resilient material having outermost dimension D1 and innermost D2, preferably in a round shape, corresponding to the contour of the chamber 5 nearer the section plane SS, provided with optional clamps 8 and radial edge A and B having a radial gap 9, besides at least one cooling oil hole passage 7;
d) compressing the member 6 in the diametric direction, nearing the edges A and B, decreasing the gap 9, enough so that the dimension D2 becomes less than the distance D between the outermost limits of the chamber 5, near the plane SS;
e) introducing the member 6 previously compressed in the top portion 1, driving it to the chamber 5 and positioning it in the direction of the groove 10 and notch 11;
f) releasing the compressing tension of the member 6;
g) taking semi-closed member 13 in a resilient material, optionally having an inner contour rim 14 for the oil retention, having a shape which corresponds to the contour of the region 21 near the plane SS, which innermost lower dimension is D4 and outermost higher dimension is D3 and further optional clamp holes 80 thereabout the edges AA and BB between which there is a radial gap 90.
h) compressing the member 13 by nearing the edges AA and BB, decreasing the gap 90, enough to access the region under 21, in the dimension D1, and drive it to the plane of a groove 15 thereabout previously located in the diameter

D5, lower than the diameter D3 of the member **13** before its diametral compression;

i) aligning the member **13** to the plane of the groove **15** and releasing its diametral compression;

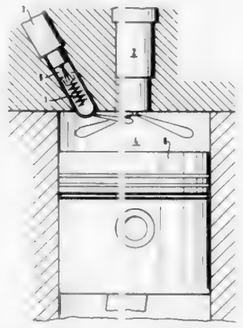
j) joining the uppermost portion of the top **1**, above the sectional plane SS with the pin bores portion **4**, under the sectional plane SS.

5,144,924

INTERNAL COMBUSTION ENGNE, AND METHOD FOR ACHIEVING IGNITION OF FUEL IN AN INTERNAL COMBUSTION ENGINE

Daniel Paro, Kvevlax, Finland, assignor to Oy Wartsila Diesel International Ltd., Helsinki, Finland

Continuation of Ser. No. 621,581, Dec. 3, 1990, abandoned. This application Jan. 24, 1992, Ser. No. 825,825
Claims priority, application Finland, Dec. 4, 1989, 895775
Int. Cl.[5] F02M *19/00*
U.S. Cl. 123—275 **6 Claims**



1. A method for achieving ignition in a reciprocating internal combustion engine provided with at least one cylinder, said method including the following steps:

sucking substantially only air into the cylinder during the suction stroke of the piston, and

injecting gaseous fuel into the cylinder at high pressure at the final phase of the compression stroke by (a) injecting the major part of the fuel through a main injection valve that injects directly into the combustion chamber of the cylinder, and (b) injecting a minor part of the fuel through an auxiliary injection valve positioned to direct fuel toward a hot glow body stationarily arranged within the combustion chamber of the cylinder for determining the moment of ignition.

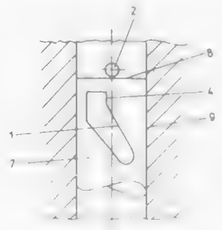
5,144,925

FUEL INJECTION DEVICE FOR FUEL-INJECTED INTERNAL COMBUSTION ENGINES

Gerhard Weiss, Marchtrenk, Austria, assignor to Automotive Diesel Gesellschaft m.b.H., Linz, Austria

PCT No. PCT/AT91/00030, § 371 Date Oct. 21, 1991, § 102(e) Date Oct. 21, 1991, PCT Pub. No. WO91/13252, PCT Pub. Date Sep. 5, 1991
PCT Filed Feb. 20, 1991, Ser. No. 768,446
Claims priority, application Austria, Feb. 21, 1990, 398/90
Int. Cl.[5] F02B *3/00;* **F02M** *37/04*
U.S. Cl. 123—300 **4 Claims**

1. Fuel injection device for fuel-injected internal combustion engines, in which a pump piston and a pump piston bushing or a control sleeve can be turned relative to each other and the end of output is determined by at least one slanted control edge of one part which slides over an overflow hole of the respective other part, and the start of output is determined by another control edge of this part that slides over the overflow hole of the respective other part; whereby to achieve a pre-injection and a main injection, characterized by the fact that the slanted control edge (**1**,**19**,**29**) in the area (c) of zero output exhibits a recess (**4**,**25**,**30**) that runs back in the direction of rotation that corresponds to an increase in the output, and that the distance



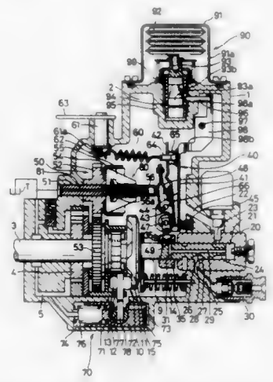
from the point (**28**,**31**) at which the slanted control edge (**1**,**19**,**29**) changes into the recess that runs back (**4**,**25**,**30**) to the control edge (**8**,**37**) that controls the start of output is greater than the diameter of the overflow hole (**2**,**32**).

5,144,926

FUEL INJECTION PUMP OF DISTRIBUTION TYPE

Hiroaki Kato, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Aug. 22, 1991, Ser. No. 748,810
Claims priority, application Japan, Aug. 29, 1990, 2-225129
Int. Cl.[5] F02M *37/04;* **F02D** *7/00*
U.S. Cl. 123—380 **2 Claims**



1. A fuel injection pump of the distribution type comprising:

(a) a housing whose internal space serves as a pump chamber;

(b) a drive shaft extending into said housing and being rotatable in response to rotation of an engine, one end of said drive shaft being disposed within said housing;

(c) a plunger disposed coaxially with said drive shaft, said drive shaft being connected at the one end thereof via a coupling to one end of said plunger so as to rotate said plunger in a manner to allow an axial movement of said plunger, the other end of said plunger cooperating with said housing to form a fuel pressurizing chamber, and said plunger having a cut-off port which is communicated with said fuel pressurizing chamber and is open to an outer peripheral surface of said plunger;

(d) a cam mechanism operable in response to the rotation of said plunger so as to cause said plunger to perform a suction stroke for drawing fuel into said fuel pressurizing chamber and to cause said plunger to perform a pumping stroke for pressurizing the fuel in said fuel pressurizing chamber;

(e) a control sleeve mounted on the outer periphery of said plunger for sliding movement therealong, said cut-off port in said plunger being closed by said control sleeve during the pumping stroke, when said cut-off port is moved away from said control sleeve, the pressurized fuel in said fuel pressurizing chamber escaping to said pump chamber, thereby finishing a fuel injection, and the position of said control sleeve determining the amount of injection of the fuel;

(f) a lever mechanism mounted within said housing so as to adjust the position of said control sleeve, said lever mechanism comprising first lever means mounted on said housing for pivotal movement about a first pivot axis, and second lever means mounted on said first lever means for pivotal movement about a second pivot axis, and one end of said second lever means being engaged with said control sleeve;

(g) governor spring means mounted within said housing, said governor spring means urging said second lever means to pivotally move so as to move said control sleeve in a direction of the pumping stroke of said plunger;

(h) a governor urging said second lever means to pivotally move so as to move said control sleeve in a direction of the suction stroke of said plunger, said governor including a governor shaft fixedly mounted on said housing and extending into said pump chamber, a governor sleeve mounted on an outer periphery of said governor shaft for sliding movement therealong, a rotation member supported on said governor shaft and driven for rotation by said drive shaft, and fly weights supported on said rotation member, and said governor sleeve urging said second lever means to pivotally move under the influence of a centrifugal force exerted on said fly weights by the rotation of said rotation member;

(i) a main timer mounted on said housing, said main timer adjusting said cam mechanism in accordance with the pressure of said pump chamber, so that the higher the pressure of said pump chamber is, the earlier the timing of fuel injection becomes;

(j) a load timer cooperating with said main timer so as to adjust the fuel injection timing in accordance with a load of the engine, said load timer including said governor, said load timer further including a relief hole formed axially in said governor shaft, first communication passage means extending through a peripheral wall of said governor shaft surrounding said relief hole, and second communication passage means extending through a peripheral wall of said governor sleeve, the pressure within said pump chamber escaping to said relief hole via said first and second communication passage means, the condition of communication between said first and second communication passage means being changed when said governor sleeve is moved, so that the pressure of said pump chamber is changed to thereby cause said main timer to adjust the fuel injection timing, and the area of communication between said first and second communication passage means decreasing as said governor sleeve is retracted; and

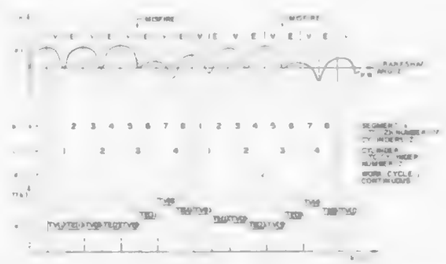
(k) atmospheric pressure compensation means for changing the position of pivotal movement of said first lever means in accordance with the atmospheric pressure, when the atmospheric pressure is low, said atmospheric pressure compensation means pivotally moving said first lever means in one direction so as to move said control sleeve in the direction of the suction stroke of said plunger to decrease the fuel injection amount and also so as to retract said governor sleeve to advance the fuel injection timing.

5,144,927

METHOD FOR DETECTING MISFIRES IN AN INTERNAL COMBUSTION ENGINE

Helmut Denz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,673
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1990, 4028131
Int. Cl.[5] F02P *5/14*
U.S. Cl. 123—425 **10 Claims**



1. A method for detecting misfires in an internal combustion engine having Z cylinders, the method comprising the steps of:

fixing a compression angular segment and an expansion angular segment for each cylinder (i) of the Z cylinders in accordance with an initial crankshaft angle and a crankshaft angle span corresponding to said cylinder so that, with a smooth running of the engine and referred to time, a compression time span TV(i) corresponding to said compression angular segment is essentially equal to an expansion time span TE(i) corresponding to said expansion angular segment, with the compression angular segment lying within that crankshaft angle span for the cylinder (i) in which the engine speed drops because of compression occurrences and with the expansion angular segment lying within that crankshaft angle span for the cylinder (i) in which the engine speed increases because of expansion occurrences; and,

utilizing deviations between compression time span and expansion time span for at least one cylinder to detect misfires.

5,144,928

IGNITION TIMING CONTROL APPARATUS WITH A KNOCK SENSOR FOR AN INTERNAL COMBUSTION ENGINE

Satoshi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,711
Claims priority, application Japan, Aug. 9, 1990, 2-209243
Int. Cl.[5] F02P *5/145*
U.S. Cl. 123—425 **5 Claims**

1. An ignition timing control apparatus for an internal combustion engine comprising:

a first switch for controlling the power supply to an ignition coil;

a signal generator for generating an ignition signal in synchrony with the rotation of the engine so as to open and close said switch;

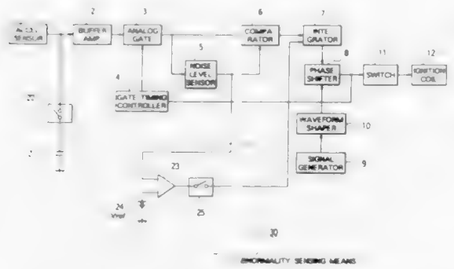
a resonance type acceleration sensor for sensing a vibrational acceleration of the engine and generating a corresponding output signal;

a controller for controlling said first switch based on the output signal of said acceleration sensor so that the engine is properly ignited by means of the ignition coil;

a capacitance load having one end connected through a second switch to the output side of said acceleration sensor and the other end thereof connected to ground;

abnormality sensing means for sensing an abnormality in a

knock sensing system including said acceleration sensor and said controller based on a change in the output of said acceleration sensor in response to the closure of said second switch, whereby said controller controls said first



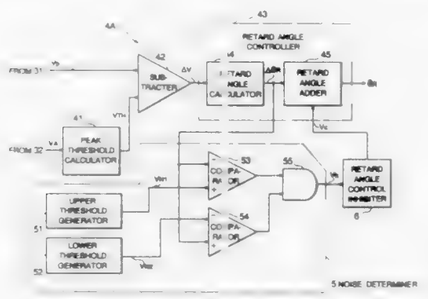
switch based on the output signal from said abnormality sensing means in such a manner that it retards the ignition timing of the engine by a prescribed extent from a normal ignition timing at which ignition takes place when there is no output from said abnormality sensor.

5,144,929

KNOCK SUPPRESSION APPARATUS AND METHOD FOR A MULTI-CYLINDER INTERNAL COMBUSITON ENGINE

Yasuhiko Hosoya, and Toshio Iwata, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,246
Claims priority, application Japan, Oct. 2, 1990, 2-263044
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] F02P *5/14*
U.S. Cl. 123—425 **12 Claims**



1. A knock suppression apparatus for a multi-cylinder internal combustion engine, comprising:

a) knock sensor means for sensing vibrations of cylinders to generate a corresponding output signal;

b) a knock determiner for generating a knock determining signal if it is determined, based on the output signal of said knock sensor means, that a peak level thereof exceeds a peak threshold derived from an average level thereof;

c) a controller for controlling engine operating parameters in a direction to suppress knocking in the cylinder based on the knock determining signal;

d) a noise determiner for determining whether the knock determining signal for each cylinder is erroneous due to noise, and for generating a noise determining signal if the knock determining signal is erroneous; and

e) a knock control inhibiter for inhibiting knock suppression control by the controller based on the knock determining signal on a cylinder for which a noise determining signal is generated.

5,144,930

ELECTRONIC CONTROL TYPE FUEL INJECTION DEVICE

Tsuneo Tanabe, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jun. 24, 1991, Ser. No. 718,175
Claims priority, application Japan, Sep. 20, 1990, 2-252565
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—478 **3 Claims**

1. An electronic control-type fuel injection device adapted for use with an internal combustion engine having an electromagnetic injection valve, comprising:

means for determining a fuel quantity corresponding to a running condition of said internal combustion engine, said fuel quantity being based on a duration of a fuel injection pulse signal having been applied to said electromagnetic injection valve of said internal combustion engine;

wherein a calculated value Q/N of a basic fuel injection pulse width W is determined by an equation of:

$$W=K\times Q/N,$$

where N is an engine revolution number, Q is an intake air quantity, and K is a constant, and wherein said basic fuel injection pulse width W is initialized to a predetermined value, when a key switch of the internal combustion engine is activated, or when the internal combustion engine stops.

5,144,931

AIR-FUEL RATIO CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yukio Miyashita; Hiroshi Mifune; Atsushi Matsubara, and Kunio Noguchi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1991, Ser. No. 770,257
Claims priority, application Japan, Oct. 5, 1990, 2-268097
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—682 **9 Claims**

1. An air-fuel ratio control method for an internal combustion engine having an exhaust passage, and an exhaust gas ingredient concentration sensor arranged in said exhaust passage for detecting the concentration of an ingredient in exhaust gases from said engine, wherein an amount of fuel to be supplied to said engine is calculated by the use of output from said exhaust gas ingredient concentration sensor to thereby feedback-control the air-fuel ratio of a mixture supplied to said engine to a desired air-fuel ratio, and when said engine is in a predetermined accelerating condition, said amount of fuel to be supplied to said engine is increased,

the method comprising the steps of:

(1) determining whether or not said engine is in said predetermined accelerating condition; and

(2) setting a rate of correction of the air-fuel ratio of said

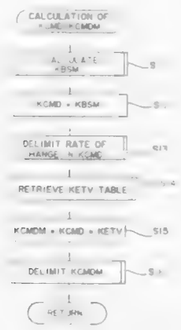
mixture by said feedback control to a smaller value when said engine is in said predetermined accelerating condition, than values to be set when said engine is in operating conditions other than said predetermined accelerating condition.

5,144,932

AIR-FUEL RATIO CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yukio Miyashita; Hiroshi Mifune, and Atsushi Matsubara, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1991, Ser. No. 765,614
Claims priority, application Japan, Sep. 26, 1990, 2-256427
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—695 **6 Claims**



1. An air-fuel ratio control method for an internal combustion engine having an exhaust passage, and an exhaust gas ingredient concentration sensor arranged in said exhaust passage for detecting the concentration of an ingredient in exhaust gases from said engine, wherein the air-fuel ratio of an air-fuel mixture supplied to said engine is feedback-controlled in response to output from said exhaust gas ingredient concentration sensor to a desired air-fuel ratio dependent on operating conditions of said engine,

the method comprising the steps of:

(1) determining whether or not said desired air-fuel ratio is to be changed in a leaning direction from a value equal to or leaner than a stoichiometric air-fuel ratio; and

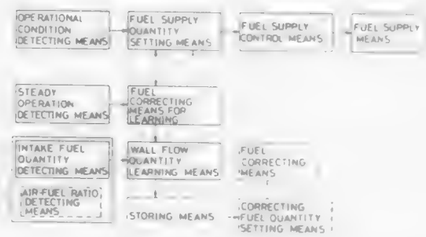
(2) changing said desired air-fuel ratio at a larger rate until said desired air-fuel ratio reaches a predetermined value than after said desired air-fuel ratio has reached said predetermined value, when said desired air-fuel ratio is to be changed in said leaning direction from said value equal to or leaner than said stoichiometric air-fuel ratio.

5,144,933

WALL FLOW LEARNING METHOD AND DEVICE FOR FUEL SUPPLY CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

Shinpei Nakaniwa, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

Filed Feb. 19, 1991, Ser. No. 656,842
Claims priority, application Japan, Feb. 19, 1990, 2-37908
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—675 **8 Claims**



1. A wall flow learning method for a fuel supply control system for an internal combustion engine, said fuel supply control system determining an air-fuel ratio feedback correction coefficient to correct a fuel supply quantity corresponding to an air quantity sucked into said internal combustion engine so that an air-fuel ratio detected through an exhaust emission component concentration of said engine approaches a target air-fuel ratio while computing said fuel supply quantity, comprising the steps of;

correcting, in a compulsory, step-by-step manner, said fuel supply quantity in a steady operating condition of the said engine;

forecasting changes in said fuel supply quantity sucked into cylinders of said engine after said correcting step on the basis of changes in said air-fuel ratio feedback correction coefficient; and

learning parameters for determining a wall flow quantity of fuel which adheres to an intake path wall surface of said engine based on forecast changes in said fuel quantity sucked into said cylinders.

5,144,934

AIR-FUEL RATIO CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yukio Miyashita; Hiroshi Mifune, and Atsushi Matsubara, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1991, Ser. No. 769,704
Claims priority, application Japan, Oct. 5, 1990, 2-268096
Int. Cl.[5] F02D *41/12, 41/14*
U.S. Cl. 123—682 **9 Claims**

1. An air-fuel ratio control method for an internal combustion engine having an exhaust passage, and an exhaust gas ingredient concentration sensor arranged in said exhaust passage for detecting the concentration of an ingredient in exhaust gases from said engine, wherein an amount of fuel to be supplied to said engine is calculated by the use of output from said exhaust gas ingredient concentration sensor to thereby feedback-control the air-fuel ratio of a mixture supplied to said engine to a desired air-fuel ratio, and when said engine is in a predetermined decelerating condition, fuel supply to said engine is cut off,

the method comprising the steps of:

(1) determining whether or not a predetermined time period has elapsed after said engine shifted from said

predetermined decelerating condition to an operating condition other than said predetermined decelerating condition; and

(2) setting a rate of correction of the air-fuel ratio of said mixture by said feedback control to a larger value before said predetermined time period elapses after said

engine shifted from said predetermined decelerating condition to said operating condition other than said predetermined decelerating condition, than values to be set after said predetermined time period has elapsed after said engine shifted from said predetermined decelerating condition to said operating condition other than said predetermined decelerating condition.

5,144,935

IGNITION COIL UNIT FOR AN INTERNAL COMBUSTION ENGINE

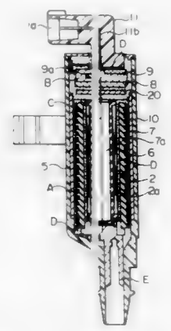
Masaaki Taruya, and Mitsuru Koiwa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1991 Ser. No. 767,752

Claims priority, application Japan, Oct. 3, 1990, 2-103639[U]

Int. Cl.[5] **F02P** *3/055*

U.S. Cl. 123—633 **3 Claims**



1. An ignition coil unit, comprising:

an open-circuit magnetic iron core having a longitudinal axis;

a primary coil wound around said open-circuit magnetic core;

a secondary coil wound around said primary coil;

an outer magnetic iron core disposed around said secondary coil;

a power switching element disposed substantially on said longitudinal axis of said open-circuit magnetic iron core for switching a primary current flowing through said primary coil; and

a magnetic shield disposed between said open-circuit magnetic iron core and said power switching element for preventing the magnetic flux leaked from said open-circuit magnetic core from reaching said power switching element.

5,144,936

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

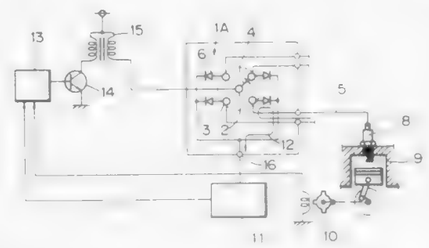
Shigemi Murata, and Masayuki Ikeuchi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1991, Ser. No. 764,594

Claims priority, application Japan, Sep. 27, 1990, 2-255140; Oct. 2, 1990, 2-263046; Oct. 11, 1990, 2-270617

Int. Cl.[5] **F02P** *7/06, 3/055*

U.S. Cl. 123—655 **3 Claims**



1. An ignition apparatus for internal combustion engines having a distributor cap, said distributor cap comprising:

an ignition coil;

a central electrode connected to said ignition coil;

a plurality of side electrodes each connected to an ignition plug of each cylinder of the engine and selectively connected to said central electrode;

a plurality of diodes each connected to said plurality of side electrodes each;

a terminal connected to said diodes for outputting ion detecting signals; and

a resin portion for holding said central electrode, said plurality of side electrodes, said plurality of diodes, and said terminal.

5,144,937

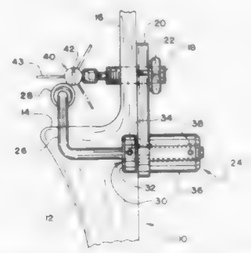
ARCHERY BOW ARROW REST

Richard O. Colvin, Baldwinsville, N.Y., assignor to Kinetronic Industries, Inc., Media, Pa.

Filed May 4, 1990, Ser. No. 524,219

Int. Cl.[5] **F41B** *5/00*

U.S. Cl. 124—44.5 **9 Claims**



1. An archery rest for an archery bow comprising:

a support arm;

adjustable, enclosed spring means; and

attachment means,

said support arm having a free end and a fixed end, and being pivotal in an arc about said fixed end, wherein said fixed end is adapted for attachment to said bow by said attachment means, and said fixed end is connected to said spring means, said spring means exerting an adjustable biasing force on said support arm and serving to dampen the shock imposed by the release of arrows positioned on said rest from said bow.

wherein a tip of said free end comprises a substantially round shape having a diameter greater than the portion of said support arm immediately adjacent thereto, said arrow rest further including rotation means mounted on said free end, said rotation means being rotated by the placement of arrows thereon, wherein said rotation means permits a relatively quiet, low-friction launch of arrows from said rest.

5,144,938

METHOD AND DEVICE FOR RESHARPENING SAWS ESPECIALLY USED FOR MAKING SEMICONDUCTOR WAFERS

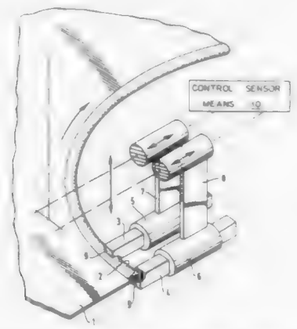
Helmut Seeburger; Peter Lehfeld, and Wolf-Rüdiger Kurtze, all of Burghausen, Fed. Rep. of Germany, assignors to Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Nov. 20, 1990, Ser. No. 616,783

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3941038

Int. Cl.[5] **B24B** *53/07*

U.S. Cl. 125—11.12 **18 Claims**



1. A device for resharpening the cutting edge of a saw blade used in the sawing of wafers from bar-shaped or block-shaped semiconductor workpieces comprising:

sharpening means, movable laterally with respect to the saw blade between an operative and inoperative position, including two elongate sharpening stones, each stone having an end face facing the cutting edge of the saw blade, each said end face having a working surface complementary to a portion of a desired shape of said cutting edge and in overlapping relation such that, during sharpening, said stones can be brought into contact laterally with the cutting edge of the saw blade facing them;

means for moving said sharpening means between said inoperative and operative position, in the latter of which said sharpening means is positioned to sharpen said saw blade without interrupting the sawing of said wafers; and

said sharpening means being applied in a non-rotational manner to said cutting edge to thereby dress the entire edge of the saw blade.

5,144,939

BIOMASS PELLET-BURNING ORCHARD HEATERS

Ernest W. Christopherson, 81595 D.V.R., Dufur, Oreg. 97021

Filed Jun. 3, 1991, Ser. No. 709,315

Int. Cl.[5] **A01G** *13/06;* **F24C** *1/00;* **F23K** *3/16*

U.S. Cl. 126—25 R **14 Claims**

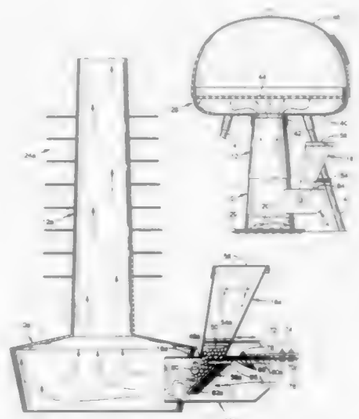
1. A biomass pellet-burning orchard heater comprising:

a) a combustion chamber having a top opening and a side opening,

b) a chimney mounted on the top opening of the combustion chamber,

c) a firebox mounted on the combustion chamber side opening and extending at the inner end thereof into the combustion chamber, the firebox having a draft air opening in the outer end thereof communicating with the atmosphere, a flue gas opening communicating with the firebox at said inner end, and a fuel access opening in the top thereof,

d) hopper means mounted in the fuel access opening of the firebox for containing pelletized biomass fuel and having



an upstream section and a downstream section, the downstream section having a fuel discharge opening communicating with the firebox,

e) and combination air- and fuel-flow control means mounted in the firebox across both the draft air opening and the fuel discharge opening,

f) the flow control means comprising a grate plate and mounting means mounting the plate across both the draft air opening in the firebox and the fuel discharge opening in the hopper means for controlling the delivery of pelletized fuel to the firebox.

5,144,940

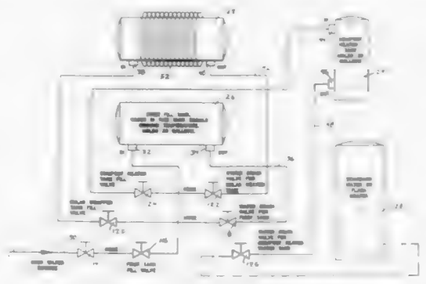
COMPOST WATER HEATER AND METHOD

John E. Fiarkoski, Sr., 3833 S. 24th St., Omaha, Nebr. 68107

Filed Dec. 24, 1990, Ser. No. 633,273

Int. Cl.[5] **F24J** *2/42*

U.S. Cl. 126—427 **14 Claims**



1. A compost water heater, comprising,

a digester housing adapted to be filled with layers of fresh organic mater,

a compost heated water tank in said housing,
means for filling said compost heated water tank with water,
means for drawing heated water from said tank,
an air supply conduit means arranged in said digester and operative to disperse air at spaced apart positions throughout said digester,
means for connecting said air supply conduit means to a source of forced air whereby, upon filling said digester with fresh moist organic matter at least to a level to substantially cover said compost heater water tank and upon filling said water tank and connecting said air supply conduit means to a source of forced air, organic matter in the digester is composted, producing heat which warms the water in said compost heated water tank,
a solar heated water tank adapted to be buried in the ground adjacent said digester housing, said solar heated water tank including inlet means adapted for connection to a source of water and an outlet means connected to said means for filling said compost heated tank with water,
a solar heater including a solar collector, a heat exchanger, pump means and pipe means interconnecting said solar collector, heat exchanger and pump means, a heat exchange fluid within said solar collector, heat exchanger, pump means and pipe means for circulation therethrough by said pump means, and
said heat exchanger contacting said solar heated water tank for direct thermal conduction of heat between the solar heated heat exchanger and the solar heated water tank such that there is no fluid flow therebetween.

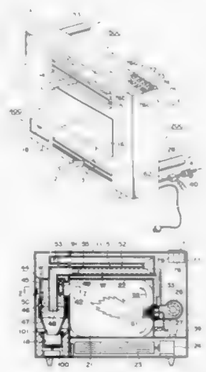
13. A method of heating water by composting, comprising,
providing a digester housing, a compost heated water tank in said digester housing, an air supply conduit extended within said digester housing, a solar heated water tank including inlet means and outlet means, a solar heated including a solar collector, a heat exchanger, pump means and pipe means interconnecting said solar collector, heat exchanger and pump means, and a heat exchange fluid within said solar collector, heat exchanger, pump means and pipe means for circulation therethrough by said pump means,
burying said solar heated water tank adjacent said digester housing,
connecting said inlet means of said solar heated water tank to a source of water,
connecting said outlet means of said solar heated water tank to said compost heated water tank and thereby at least partially filling said compost heated water tank with water,
positioning said solar collector for exposure to the sun,
placing said heat exchanger in contact with said solar heated water tank for direct thermal conduction of heat between said solar heated heat exchanger and said solar heated water tank such that there is no fluid flow therebetween,
at least partially filling said digester housing with moist organic matter to substantially cover said compost heated water tank,
connecting said air supply conduit to a source of pressurized air, thereby dispersing air throughout the compost in said digester housing,
allowing time for said organic material to be composted, thereby generating heat and warming the water in said compost heated water tank.

5,144,941

COMBUSTION SYSTEM FOR SUPPRESSING EMISSION OF GASES BELIEVED TO CAUSE GREEN-HOUSE-EFFECT

Toshihiko Saito, Tokyo, and Kazuo Saito, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1991, Ser. No. 677,464
Int. Cl.[5] F24B *1/191*
U.S. Cl. 126—507 **9 Claims**



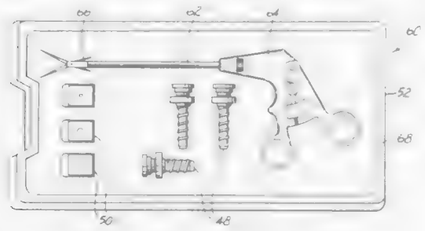
1. A combustion system for burning a hydrocarbon-based fuel, comprising:
means for imperfectly combusting the fuel by supplying a predetermined amount of air;
means, connected to said incomplete combustion means, for removing a solid component in an unburned gas generated by said incomplete combustion means; and
means for perfectly burning a remaining unburned gas by supplying a predetermined amount of air, the remaining unburned gas being obtained by removing the solid component from the unburned gas by flowing the unburned gas through said solid component removing means;
wherein said incomplete combustion means comprises a primary combustion chamber having a predetermined size of space for burning the fuel, fuel supplying means for supplying the hydrocarbon-based fuel into said primary combustion chamber in accordance with a consumption amount thereof, and first air supplying means for continuously supplying to said primary combustion chamber a predetermined amount of air sufficient for realizing incomplete combustion of the fuel;
wherein said solid component removing means comprises soot collecting means for collecting, by converting into a form of dust, soot within the solid component contained in the unburned gas generated by said primary combustion chamber, a soot box, detachably mounted on an opening of a main body of said combustion system, for recovering the soot by accumulating the soot in the form of dust, a soot box driver for selectively moving said soot box with respect to a terminal end of said soot collecting means and to hermetically mount said soot box thereto, and a hermetic seal portion, provided between the terminal end of said soot collecting means and said soot box, for keeping air tightness of a coupled portion upon mounting; and
wherein said complete combustion means comprises a secondary combustion chamber having a predetermined size of space for introducing therein the unburned gas supplied through said solid component removing means and for burning the unburned gas, and second air supplying means for supplying into said secondary combustion chamber air of an amount sufficient for realizing complete combustion, thereby further burning the unburned gas.

5,144,942

ENDOSCOPIC INSTRUMENTATION KIT AND PACKAGE THEREFOR

Andre P. Decarie, Ridgefield; David L. Brown, Wallingford; Stanley J. Malinowski, Ridgefield, and Douglas M. Dunklee, Bridgeport, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Mar. 12, 1991, Ser. No. 673,233
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 **42 Claims**



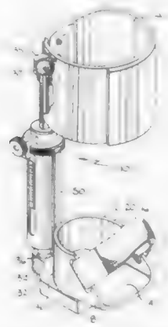
1. An endoscopic instrumentation kit, comprising:
at least one obturator;
at least two sleeve members for use with said at least one obturator, said at least one obturator being insertable into each of said sleeve members; and
an enclosure containing said at least one obturator and said sleeve members.

5,144,943

DYNAMIC ANKLE SPLINT

Tammy C. Luttrell, Elbert, Colo., and Eugene G. Crepeau, Albuquerque, N. Mex., assignors to O-Motus, Inc., Colorado Springs, Colo.

Continuation-in-part of Ser. No. 495,044, Mar. 16, 1990, and a continuation-in-part of Ser. No. 507;212, Apr. 9, 1990. This application Jul. 9, 1990, Ser. No. 550,256
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—25 B **30 Claims**



1. A method of increasing the mobility of an ankle joint, comprising:
(a) attaching one end of a force-applying apparatus to the lower leg;
(b) attaching the other end of the force-applying apparatus to the heel; and
(c) applying a force between the heel and the lower leg to urge the heel away from the lower leg utilizing said force-applying apparatus;
the force-applying apparatus having an expandable cylinder portion, a heel cup attached to the heel and pivotally attached to the lower end of said expandable cylinder portion, and a lower leg cuff attached to the lower leg and pivotally attached with pivotal attachment means to the upper end of the expandable cylinder;
the expandable portion having an outer hollow cylinder with upper and lower ends, a first sleeve slidably engaged in said outer hollow cylinder with a lower end extending out of the lower end of said hollow cylinder, said lower end being attached to said pivotal attachment means, and force-applying means for urging said first sleeve out of said hollow cylinder.

5,144,944

SKIN CLOSURE DRESSING FOR EYELIDS

Charles D. Rice, Little Rock, Ark., assignor to University of Arkansas, Little Rock, Ark.

Filed Apr. 20, 1990, Ser. No. 512,274
Int. Cl.[5] A61F *13/12*
U.S. Cl. 602—74 **10 Claims**

1. A skin closure dressing for eyelids comprising:
a thin backing material with a height dimension substantially smaller than a perpendicular width dimension;
a layer of adhesive on one face of said backing material;
a multi-layer pad covering a portion of said face of said backing material, said multi-layer pad having a width dimension substantially equal to said width dimension of said backing material and a height dimension less than said height dimension of said backing material;
at least one of said layers of said multi-layer pad being an absorbent material; and
an outer layer of said multi-layer pad being a non-adhesive material.

5,144,945

PORTABLE OXYGEN-ENRICHING AIR INHALER

Seigou Nishino; Masato Kawai; Kiyoshi Ohno, all of Kanagawa; Seiichi Ito, Tokyo, and Nobuyoshi Itoh, Kanagawa, all of Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1990, Ser. No. 509,842
Claims priority, application Japan, Apr. 20, 1989, 1-46397[U]; May 18, 1989, 1-57454[U]; Jun. 8, 1989, 1-67169
Int. Cl.[5] A62B *7/10, 19/00, 23/02, 18/02*
U.S. Cl. 128—205.12 **5 Claims**

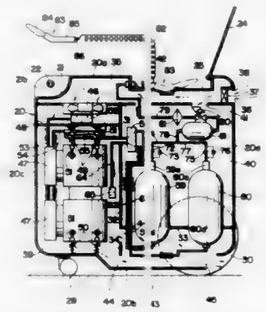
1. An oxygen rich air inhaler comprising:
a casing separated into a compressor chamber and an adsorber chamber by a partition;
an inlet duct having an inlet open to an end wall of said casing on a side of said adsorber chamber and provided at an upper portion of said adsorber chamber so as to communicate with said compressor chamber;
an exhaust duct having an exhaust outlet open to an end wall of said casing on said side of said adsorber chamber and provided at a lower portion of said adsorber chamber so as to communicate with said compressor chamber;
a suction fan disposed in said compressor chamber;
at least one compressor suspended by a spring in said compressor chamber, said compressor chamber including a cooling coil for air compressed by said compressor;
at least two adsorbers, each said adsorber communicating via a selector valve with said compressor;
means for warming lower portions of said adsorbers, said

means for warming further comprising openings in said adsorber chamber to permit a lower portion of each adsorber to extend into said exhaust duct such that each said lower portion of each said adsorber is warmed by air passing through said exhaust duct;

an oxygen rich air tank disposed in said adsorber chamber and communicating with outlets of said adsorbers;

an air inlet for said compressor;

an exhaust outlet for gas desorbed from said adsorbers, said



exhaust outlet and air inlet being disposed downstream of said suction fan in said compressor chamber; and

an inhalation mask communicating with said oxygen rich air tank;

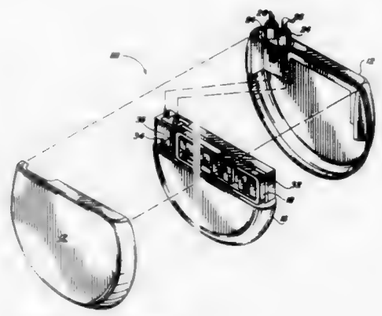
said inlet duct further comprising means for cooling said upper portion of each said adsorber, said means for cooling further comprising an inlet portion and an outlet portion in said inlet duct for permitting part of air introduced from said inlet flow in said adsorber chamber and cool said upper portions.

5,144,946

COMBINED PACEMAKER SUBSTRATE AND ELECTRICAL INTERCONNECT AND METHOD OF ASSEMBLY

Alvin H. Weinberg, Moorpark, and Robert E. Maston, Aptos, both of Calif., assignors to Siemens Pacesetter, Inc., Sylmar, Calif.

Filed Aug. 5, 1991, Ser. No. 740,533
Int. Cl.[5] A61N *1/375*
U.S. Cl. 178—419 P **27 Claims**



1. A pacemaker comprising:

a housing;

at least one electrical feedthrough terminal extending through the housing;

a battery located in the housing, the battery having two terminals extending out of a top of the battery;

an electronic substrate having electronic components mounted thereon; and

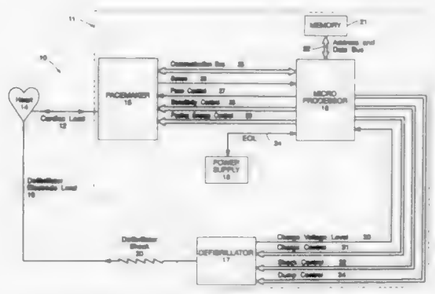
a molded integrated interconnect structure having a lid portion, at least a first, a second and a third through-hole, and conductive means integrally formed therein, the lid portion having means for receiving and protecting the electronic substrate, the first and second through-holes being connected to one each of the battery terminals, the third through-hole being connected to the electrical feedthrough terminal, the conductive means including means for electrically interconnecting the electronic substrate to the battery terminals and to the electrical feedthrough terminal.

5,144,947

APPARATUS AND METHOD FOR ANTITACHYCARDIA PACING IN A ARRHYTHMIA CONTROL SYSTEMS

Stephen G. Wilson, Stanmore, Australia, assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Mar. 22, 1991, Ser. No. 673,900
Claims priority, application Australia, Apr. 3, 1990, PJ9437
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 PG **23 Claims**



1. A method of treating tachycardias comprising the steps of:

A) selecting a range of tachycardia cycle lengths for which antitachycardia pacing treatment is desired;

B) selecting a plurality of sub-ranges of tachycardia cycle lengths from said range of tachycardia cycle lengths;

C) providing a plurality of storage locations corresponding to said tachycardia cycle length sub-ranges;

D) storing, in corresponding ones of said storage locations, corresponding antitachycardia pacing parameters which have been successful in reverting previous tachycardias having cycle lengths that fall in said corresponding tachycardia cycle length sub-ranges; and,

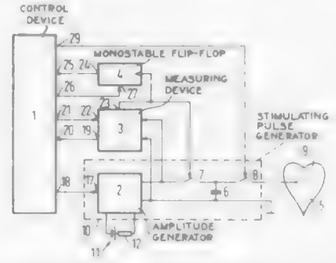
E) treating subsequent tachycardias using antitachycardia pacing parameters selected from storage locations that correspond to, or are closest to correspondence with, tachycardia sub-ranges corresponding to the tachycardias to be treated.

5,144,948

APPARATUS FOR STIMULATING LIVING TISSUE WITH MEANS TO CONTROL STIMULATING PULSE TIME INTERVAL

Peter Andersson, Stockholm; Bo Koepsen, Balsta; Jonas Berglin, Alvsjo, and Josef Vock, Spanga, all of Sweden, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 7, 1991, Ser. No. 711,863
Claims priority, application Sweden, Jun. 15, 1990, 9002129
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 PG **8 Claims**



1. An apparatus for electrically stimulating living tissue comprising:

a battery having an internal resistance which is dependent on the charge of the battery;

a stimulating pulse generator connected to said battery and having an output capacitor, adapted for connection across tissue to be stimulated, which is charged by said battery, said stimulation pulse generator including means for rapidly discharging said output capacitor to deliver a stimulation pulse to said tissue;

means for measuring the voltage across said output capacitor; and

control means, connected to said stimulation pulse generator and to said means for measuring, for enabling discharge of said output capacitor at selected times, said control means including means for setting a selected stimulation pulse amplitude, means for setting a selected minimum time interval between successive stimulation pulses, and means for increasing said minimum time if a time interval, from when the voltage across said output capacitor as measured by said means for measuring reaches said selected stimulation pulse amplitude until the time of discharge of said output capacitor, is shorter than a predetermined safety time interval selected by said control means.

5,144,949

DUAL CHAMBER RATE RESPONSIVE PACEMAKER WITH AUTOMATIC MODE SWITCHING

Walter H. Olson, North Oaks, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 15, 1991, Ser. No. 669,790
Int. Cl.[5] A61N *1/368*
U.S. Cl. 128—419 PG **22 Claims**

12. Apparatus for operating a programmable dual chamber, rate responsive pacemaker capable of operating in more than one pacing mode and provided with atrial and ventricular input and stimulation output circuitry and control logic means for operating said pacemaker in an atrial synchronous mode providing ventricular stimulation output pulses synchronously with sensed atrial depolarizations, and in at least one further rate responsive pacing mode providing atrial and/or ventricular stimulation output pulses on demand at a rate dependent upon a sensor related pacing rate control signal, comprising the steps of:

means for monitoring atrial heart beats;

means for developing an average atrial heart rate/interval from successive atrial heart beats;

means for providing at least one physiologic sensor for sensing a patient's physiologic requirements of cardiac output and providing a sensor output signal in response thereto;

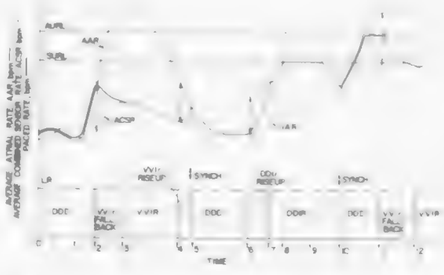
means for developing a sensor related pacing rate/interval from said sensor output signal;

means for establishing a sensor driven upper pacing rate limit for pacing said further pacing mode;

means for establishing an atrial synchronous upper pacing rate limit for pacing in said atrial synchronous pacing mode;

means for establishing a lower pacing rate limit;

means for establishing a first mode switching boundary function defining a first set of correlated sensor related and average atrial pacing rate/interval values, wherein the sensor related rate/interval valves set a pacing rate greater than the average atrial rate, through the range of possible rate/interval values between said lower pacing



rate limit and said atrial synchronous upper pacing rate limit;

means for establishing a second mode switching boundary function defining a second set of correlated sensor related and average atrial pacing rate/interval values, wherein the average atrial rate/interval values set a pacing rate greater than the sensor related rate, through the range of possible rate/interval values between said lower pacing rate limit and said sensor driven upper pacing rate limit;

means for periodically comparing the average atrial and sensor related rate/interval values to the first and second mode switching boundary function values; and

means for operating said pacemaker in said atrial synchronous mode as long as the correlated sensor related and average atrial rate/interval values do not match a value falling outside the first and second mode switching boundary functions.

5,144,950

RATE CONTROLLED PACEMAKER SYSTEM USING AR INTERVAL FOR RATE CONTROL

G. A. P. Stoop, Dieren, and Malcolm J. S. Begemann, Velp, both of Netherlands, assignors to Vitatron Medical B.V., Dieren, Netherlands

Filed Aug. 30, 1990, Ser. No. 575,238
Int. Cl.[5] A61N *1/368*
U.S. Cl. 128—419 PG **19 Claims**

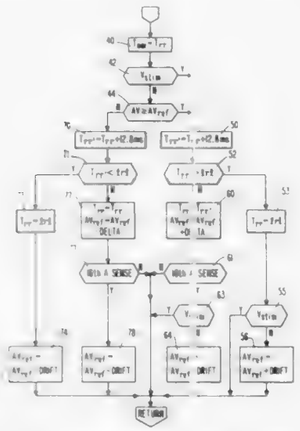
1. A pacing system for rate responsive pacing of a patient's atrium, comprising:

atrial generator means for generating and delivering atrial stimulus pulses at a variable atrial rate, to evoke atrial beats;

senor means for sensing for field ventricular beats responsive to evoked atrial beats, said sensor means comprising an electrode adapted to be positioned in the patient's atrium;

means for setting a reference value corresponding to the AV time delay between an atrial event and a following sensed ventricular event in the patient;

means for determining the AV interval in said patient;
algorithm means for (a) comparing said AV interval to said AV reference value, (b) for determining a change in the atrial pacing interval as a first function of said comparison,



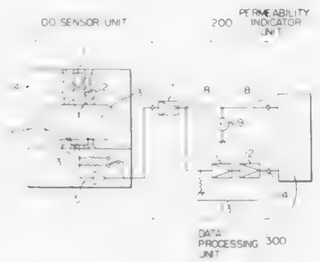
and (c) for adjusting said AV reference value as a second function of said comparison; and
means for adjusting said atrial rate in response to said determined change.

5,144,951

APPARATUS FOR MEASURING BIOPERMEABILITY

Kazuma Uematsu, Tokyo; Shigehiro Kinoshita, No. 628-2, Nishifukai, Nagareyama-shi, Chiba, and Kazuo Tsuji, No. 18-30, Osawa 4-chome, Mitaka-shi, Tokyo, all of Japan, assignors to Macttor Co., Ltd., Tokyo; Shigehiro Kinoshita, Chiba and Kazuo Tsuji, Tokyo, all of Japan

Continuation of Ser. No. 488,895, Mar. 6, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 825,323
Claims priority, application Japan, Mar. 9, 1989, 1-58251
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—633 7 Claims



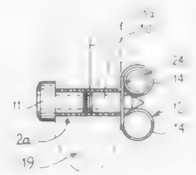
1. An apparatus for measuring biopermeability comprising:
a frame;
light emitting means and light receiving means each secured to said frame to face each other while keeping a gap therebetween such that an organism under measurement can be received in said gap without being urged;
preamplifier means connected to said light receiving means;
amplifier means for zero adjustment and gain adjustment connected to an output of said preamplifier means, said amplifier means having an output for outputting data representing biopermeability;
display means for displaying biopermeability data connected between said output of said amplifier means and ground;
wherein said light emitting means is a light emitting diode; and
wherein said preamplifier means is an operational amplifier having two different selectable gains, one of said selectable gains being unity gain and the other 100 times gain;
an AC inverting amplifier circuit connected to said output of said amplifier means, and including a CR coupler and an amplifier having a fixed amplification factor, said AC inverting amplifier circuit having an output for outputting AC data.

5,144,952

TRANSCUTANEOUS CONNECTION DEVICE

Bruno Frachet, Montmorency, and Michel Y. David, Paris, both of France, assignors to Assistance Publique, Paris, France

Filed Jun. 6, 1990, Ser. No. 533,789
Claims priority, application France, Jun. 7, 1989, 89 07557; Apr. 2, 1990, 90 04191
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—642 29 Claims



1. A transcutaneous connection device for connecting an electrical stimulator to be located exterior of a body of a suer of the device to at least one electrical conductor to be located subcutaneously of the body, said device comprising:
at least one subcutaneous conducting wire adapted to be connected to the electrical conductor, said conducting wire being covered with an insulating sheath;
mounting means having a construction to be mounted on the pinna of an ear of the body;
means for electrically attaching said mounting means to said conducting wire; and
connection means having a construction to be mounted exteriorly of the pinna of the ear for electrically connecting said mounting means to the electric stimulator.

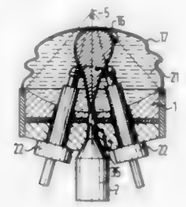
5,144,953

LITHOTRIPTOR WITH X-RAY ALIGNMENT SYSTEM

Helmut Wurster, Oberderdingen, and Werner Krauss, Knittlingen, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Sep. 18, 1989, Ser. No. 408,835
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1988, 38400774
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.
Int. Cl.[5] A61B 17/22
U.S. Cl. 128—660.30 7 Claims

1. A lithotriptor comprising a transducer for generating focused ultrasonic shock waves for destroying an object in a patient's body; means for aligning the focus of the transducer on said object; a frame for supporting said transducer; an image-forming diagnostic X-ray system for locating said object, said X-ray system comprising an X-ray emitter and an image intensifier spaced therefrom, and disposed on said frame, said frame being pivotable about a pivotal axis in a plurality of image planes, for location of said object, wherein the X-ray emitter is connected to said transducer and disposed centrally thereof with the emission axis of said transducer coinciding with that of the X-ray emitter; means containing a liquid coupling medium for the transmission of ultrasonic shock waves generated by said transducer to the patient's body; and a balloon disposed in said coupling medium and which is inflatable by means of a gas to displace said medium in a region encompassing the entire length of the axis of the X-ray emission which passes through said coupling medium.



5,144,954

ULTRASONIC DIAGNOSING APPARATUS

Nozomi Satake, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Asaki, Japan

Filed Jul. 5, 1990, Ser. No. 548,390
Claims priority, application Japan, Jul. 6, 1989, 1-174426
Int. Cl.[5] A61B 8/06
U.S. Cl. 128—661.09 24 Claims

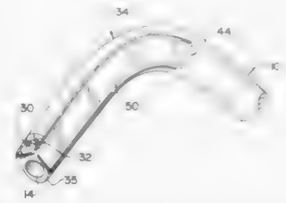
1. An ultrasonic diagnosing apparatus comprising:
an ultrasonic transducer for converting an electrical signal into a sound wave and converting the sound wave into an electrical signal;
transmitting/receiving means for controlling said ultrasonic transducer to transmit an ultrasonic wave to an object to be examined and to receive a reflected ultrasonic wave from the object as an ultrasonic echo;
scanning control means for scanning a predetermined scanning region of the object by transmitting and receiving the ultrasonic wave with respect to a plurality of ultrasonic beam scanning lines by controlling at least one of said ultrasonic transducer and said transmitting/receiving means such that each scanning line is scanned a predetermined number of times, each scanning line being scanned after a first adjacent scanning line, adjacent to the each scanning line in a first direction, is scanned at an initial period of the scanning for the predetermined number, and each scanning line being scanned after a second adjacent scanning line, next to the each scanning line in a second direction opposite to the first direction, is scanned, for the rest of the scanning for the predetermined number of times;
phase detecting means for extracting a Doppler shift signal from a reception signal obtained by said transmitting-/receiving means;
Doppler data processing means for obtaining Doppler data by processing the Doppler shift signal extracted by said phase detecting means, said Doppler data processing means including means for neglecting a predetermined number of initial Doppler data repeatedly sampled at the same sampling point and obtained after the scanning of the first adjacent scanning line; and
display means for displaying an image based on the Doppler data obtained by said Doppler data processor means.

5,144,955

DOPPLER VELOCITY MEASURING MEDICAL UNIT

Michael L. O'Hara, Miami Lakes, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Apr. 15, 1991, Ser. No. 685,444
Int. Cl.[5] A61B 8/06
U.S. Cl. 128—662.06 20 Claims



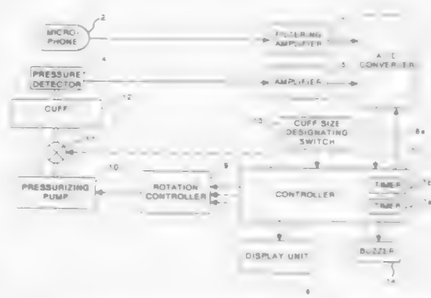
1. A medical probe which comprises a flexible, elongated member having distal and proximal ends, Doppler-type velocity measuring means carried within said flexible, elongated member adjacent said distal end, and electrical wire means carried within said probe and communicating between said measuring means and the proximal probe end for connection to an electronic system, for processing signals from said measuring means, at least a portion of said flexible, elongated member, including said distal end and velocity measuring means, having an ovoid cross-sectional shape comprising a pair of opposed, substantially flattened surfaces, and opposed rounded surfaces connecting said opposed, flattened surfaces to define said ovoid shape, said portion having a maximum cross-sectional dimension and a minimum cross-sectional dimension substantially perpendicular to each other, said minimum cross-sectional dimension being of essentially 0.4 to 0.9 times the distance of the maximum cross-sectional dimension.

5,144,956

ELECTRONIC SPHYGMOMANOMETER

Takahiro Souma, Kanagawa, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,151
Claims priority, application Japan, May 24, 1989, 1-128692
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—682 6 Claims



1. An electronic sphygmomanometer for measuring blood pressure while deflating or inflating a cuff which is attachable to a body part of a user, said electronic sphygmomanometer comprising:
cuff size discriminating means for discriminating the size of the cuff when it is attached to a body part of a user;
measuring means for measuring pressure in the attached cuff; and

inflation control means for controlling a supply of air to the attached cuff, said inflation control means executing inflation control at least in first and second air supply modes;

said inflation control means, in said first air supply mode, supplying air to the attached cuff at a rapid rate, independent of the cuff size discriminated by said cuff size discriminating means, while cuff pressure is being raised to a set pressure level; and

said inflation control means, in said second air supply mode, supplying air to the attached cuff at a plurality of different air flow rates, varying in accordance with the cuff size discriminated by said cuff size discriminating means, up to a predetermined pressure level which is higher than said set pressure level.

5,144,957

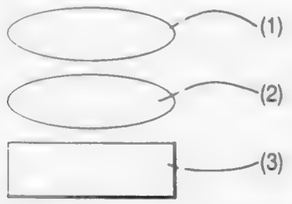
CUTANEOUS THERAPEUTIC DEVICES

Alec D. Keith, Boalsburg, Pa., assignor to Zetachron, State College, Pa.

Continuation of Ser. No. 469,246, Jan. 24, 1990, abandoned. This application Apr. 3, 1991, Ser. No. 682,394

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—743 5 Claims



1. An allergic response indicator which comprises a cutaneous three dimensional polymeric sheet capable of self-adherence to the epidermis of a subject and containing an indicator compound distributed throughout said cutaneous three dimensional polymeric sheet which, when applied to said epidermis, is released thereto over the period of application, whereby upon release of said indicator compound an allergic reaction is manifested by visual signs of skin irritation at the site of application upon the removal of said allergic response indicator, said polymeric sheet being composed of a material that provides said self-adherence.

5,144,958

APPARATUS FOR CONDUCTING MAMMALIAN DERMATOLOGICAL STUDIES

Andrew J. Krueger, Levittown, Pa., and Joseph J. Yang, Warren, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 372,489, Jun. 28, 1989, Pat. No. 4,971,066. This application Aug. 22, 1990, Ser. No. 570,752

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—743 7 Claims

1. A substantially chemically inert protective cell for conducting mammalian dermatological studies of chemically contaminated soil, consisting essentially of:

(a) a non-occlusive shell-like section terminating in a leading edge said shell-like section having an interior and an exterior surface, said shell-like section defining a cavity of a shape and volume sufficient to substantially eliminate contact of said interior surface of said shell-like section with the area of skin used for the dermatological study when the mammal moves about; and

(b) an elliptical rim section contoured to form a surface for contacting a mammal's dorsal region and surrounding an area of skin for use in the dermatological study said rim section integral to said leading edge of said shell-section;

wherein said shell-like section and said rim section are formed from a single piece of material which is chemically inert in relation to the chemically contaminated soil.

5,144,959

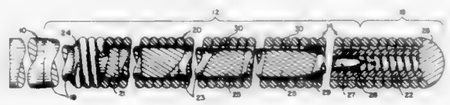
CATHETER GUIDEWIRE WITH VARYING RADIOPACITY

Richard A. Gambale, Tyngsboro, Mass.; James F. Crittenden, Hollis, N.H., and L. Venkata Raman, Framingham, Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Aug. 15, 1989, Ser. No. 394,075

Int. Cl.[5] A61M *10/00*

U.S. Cl. 128—772 6 Claims



1. A guidewire comprising:

an elongate flexible shaft;

an elongate helical outer coil attached to the distal portion of the shaft and receiving a distal region of the shaft within the coil, the distal end of the shaft terminating short of the distal end of the coil;

that portion of the shaft that is contained within the outer coil being plated with a highly radiopaque material;

an inner helical coil having a smaller diameter than the inner diameter of the outer coil, the inner coil being attached at its proximal end to the distal end of the shaft and, at its distal end, to a tip weld, the distal end of the outer coil also being attached to the tip weld;

the inner coil being formed from a highly radiopaque material;

whereby when viewed under fluoroscopy the proximal portion of the distal region will appear moderately radiopaque as compared to the more distal portion of the distal region which will appear highly radiopaque.

5,144,960

TRANSVENOUS DEFIBRILLATION LEAD AND METHOD OF USE

Rahul Mehra, Stillwater; Paul DeGroot, Brooklyn Park, and Marye S. Norenberg, Plymouth, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 20, 1991, Ser. No. 672,285

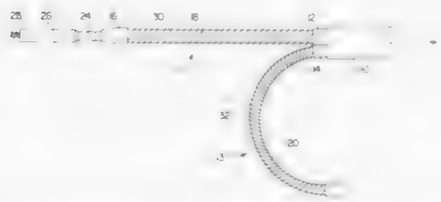
Int. Cl.[5] A61N *1/05, 1/39*

U.S. Cl. 128—786 10 Claims

1. A defibrillation lead for location in a human heart, comprising:

an elongated lead body having proximal and distal ends, having a bifurcation and having first and second legs extending distally from said bifurcation, said first leg having a generally straight configuration, said second leg having a curved configuration and constructed such that when said generally straight leg is located having a distal end at the apex of the right ventricle of said heart, a distal end of said second, curved leg may be located in the outflow tract of said heart;

first and second elongated electrodes extending along said first and second legs, said first and second electrodes terminating proximally adjacent said bifurcation and terminating distally adjacent the distal ends of said first and second legs, respectively;



first and second conductors located within said lead body, coupled to said first and second electrodes, respectively; and

connector means for electrically coupling said first and second conductors to an implantable defibrillator.

5,144,961

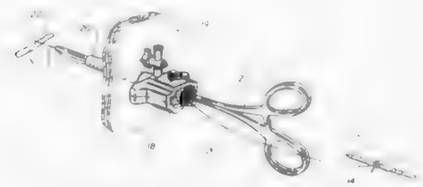
ENDOSCOPIC LIGATING DEVICE

Chao Chien, Edison, and Ralph Spengler, Long Valley, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 11, 1991, Ser. No. 728,443

Int. Cl.[5] A61B *17/00*

U.S. Cl. 128—898 12 Claims



1. A method of ligating a vessel endoscopically, comprising the steps of:

a) providing an endoscopic ligating device, said device having a surgical needle, a tube, and a filamentary strand attached at its distal end to the surgical needle, and slideably engaged at its proximal end about said tube with a partially tightened knot;

b) passing said surgical needle down through a trocar into a body cavity wherein the desired ligation is to occur;

c) looping said needle around said vessel;

d) passing said surgical needle up through said trocar until said needle exits said trocar;

e) removing said needle from said filimentary strand;

f) inserting said strand into the distal end of said tube and passing said strand up through said tube until a portion of said strand protrudes from the proximal end of said tube;

g) sliding said partially tightened knot distally on the tube until said partially tightened knot disengages from said tube and is engaged about said filamentary strand;

h) tightening said partially tightened knot about said strand so as to form a fully tightened knot; and

i) sliding said fully tightened knot distally on said strand until said fully tightened knot firmly engages and ligates said vessel.

5,144,962

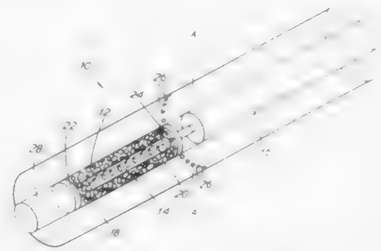
FLAVOR-DELIVERY ARTICLE

Mary E. Counts; Mohammad R. Hajaligol, both of Richmond; Constance H. Morgan; Ulysses Smith, both of Midlothian; Francis M. Sprinkel, Glen Allen, and Francis V. Utsch, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 1, 1989, Ser. No. 444,818

Int. Cl.[5] A24D *1/00*

U.S. Cl. 131—194 146 Claims



1. Apparatus for deriving flavor from a flavor-generating medium comprising:

a positive temperature coefficient thermistor in thermal contact with said flavor-generating medium; and

means for selectively applying an electrical current to said thermistor to raise the temperature of the thermistor and thereby heat said flavor-generating medium and cause said flavor-generating medium to release flavor components.

5,144,963

ASHTRAY, STORAGE COMPARTMENT OR THE LIKE, PARTICULARLY FOR AUTOMOTIVE VEHICLES

Volker Dabringhaus, and Peter Wegel, both of Wuppertal, Fed. Rep. of Germany, assignors to Gebr. Happich Gmbh, Fed. Rep. of Germany

Filed Nov. 18, 1991, Ser. No. 793,820

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1990, 4038324

Int. Cl.[5] A24F *19/00, 19/06*

U.S. Cl. 131—231 12 Claims

1. A container comprising

a housing having a recess defined by a side wall of the recess in the housing, the recess having a front side, a housing insert in the housing recess, and means supporting the

housing insert for selective movement into and out of the front side of the housing recess

detent means at the housing recess side wall and at the housing insert for selectively holding the housing insert in the closed position in the recess and enabling the housing insert to open out of the housing recess, the detent means comprising:

a control curve on the housing insert, the control curve being in the form of a slide and guide groove open toward the housing side wall, the curve including a front side in the direction toward the front side of the housing recess and the front side of the control curve guide groove including a depression inward from the front side of the recess for receiving a pin;

an articulated lever articulatedly connected to the housing side wall at an articulation pivot a pin on the lever located spaced away from the articulation pivot, the pin being received in the groove of the control curve so that as the insert moves with respect to the housing, the pin moves through the control curve groove and the lever articulates around the pivot; the pin and the control curve groove being so shaped that with the pin in the depression at the front side of the control curve guide groove, the pin on the lever engages the control curve guide groove in the housing insert and that engagement blocks opening of the housing insert out of the front side of the housing recess;

the control curve guide groove having a first part into which the pin is moved from the depression when the housing insert is temporarily pushed further into the housing recess, the groove first part being shaped to avoid interference between the pin and the housing insert and to permit the housing insert to be opened out of the front side of the housing recess with the pin moving through the first part of the control curve guide groove;

the control curve guide groove having a second part through which the pin is moved as the housing insert is moved into the housing recess; at the front side of the control curve guide groove, the first and second parts of the control curve guide groove being spaced apart with the depression being between them such that the pin moves from the second part and into the depression upon the insert being closed into the housing recess;

a spring on the articulated lever and resting against the housing side wall which is generally adjacent the lever, the spring comprising a spring tongue defined in the lever and the tongue extending in a direction generally coinciding with the longitudinal axis of the lever, the tongue having a root which is attached to the lever, the root being on the end of the tongue away from the articulation axis of the lever and generally near to the pin on the lever; the tongue having an opposite free end which is toward the articulation axis of the lever, the free end being shaped to rest against and being self biased against the housing side wall for resisting articulating motion of the articulated lever.

5,144,964

SMOKING COMPOSITIONS CONTAINING A FLAVORANT-RELEASE ADDITIVE

Barbu A. Demain, Richmond, Va., assignor to Philip Morris Incorporated, Richmond, Va. and Philip Morris Products Inc., New York, N.Y.

Filed Mar. 14, 1991, Ser. No. 669,571
Int. Cl.[5] A24B *3/12* A23L *2/26*
U.S. Cl. 131—275 18 Claims

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes and (2) between about 0.0001–5 weight percent, based on the total weight of filler, of a flavorant-release additive which is a water-soluble molecular inclusion complex of a β-cyclodextrin derivative and a lipophilic organic flavorant compound

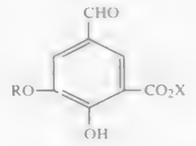
5,144,965

SMOKING COMPOSITIONS CONTAINING A VANILLIN-RELEASE ADDITIVE

Everett W. Southwick, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y. and Philip Morris Products Inc., Richmond, Va.

Filed May 15, 1991, Ser. No. 700,401
Int. Cl.[5] A24B *3/12;* A24D *1/02*
U.S. Cl. 131—276 23 Claims

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.0001–5 weight percent, based on the total weight of filler, of a flavorant-release additive corresponding to the formula:



where R is methyl or ethyl, and X is hydrogen or an alkali or alkaline earth metal.

5,144,966

FILAMENTARY FLAVORANT-RELEASE ADDITIVE FOR SMOKING COMPOSITIONS

James M. Washington, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y. and Philip Morris Products Inc., Richmond, Va.

Division of Ser. No. 625,923, Dec. 11, 1990. This application Aug. 28, 1991, Ser. No. 750,939
Int. Cl.[5] A24B *15/18, 3/12;* B29C *63/00;* D02G *3/00*
U.S. Cl. 131—335 6 Claims

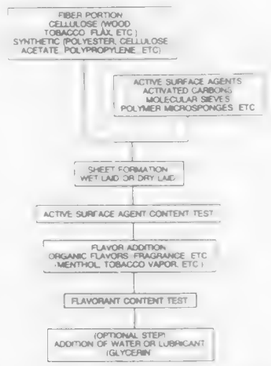
1. A filament consisting of a core matrix and a coextensive sheath coating, wherein the core matrix comprises a mixture of flavorant compound and polysaccharide binder, and the sheath coating comprises a non-porous calcium alginate film.

5,144,967

FLAVOR RELEASE MATERIAL

William F. Cartwright, Norcross; Carmen P. DiGrigoli, Canton, and Loyd G. Kasbo, Norcross, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 22, 1990, Ser. No. 601,160
Int. Cl.[5] A24D *1/02*
U.S. Cl. 131—365 26 Claims



1. A method of manufacturing a flavor release material comprising the steps of:

providing a fiber material having a moisture content selected to avoid mold formation or brittleness;

combining said fiber material with an active surface agent;

forming the material into a desired shape;

testing samples of the material for content of the active surface agent;

adjusting the level of active surface agent as necessary to maintain a content in the range of 0.1 to 40 percent by weight;

adding flavorant to the material;

testing samples of the material for the amount of flavorant added; and

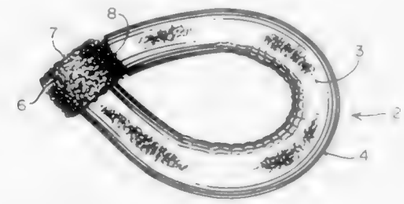
adjusting the amount of flavorant added to maintain the level at or below the amount necessary to saturate the active surface agent present.

5,144,968

PERMANENT WAVE ROD

Ramon P. Rivera, 5123 El Roble Ct., San Jose, Calif. 95118

Filed Sep. 13, 1991, Ser. No. 759,486
Int. Cl.[5] A45D *2/20*
U.S. Cl. 132—247 1 Claim



1. A permanent wave rod, comprising:

a) an elongated, elastically flexible, cylindrical body entirely of closed-cell synthetic resinous material having a moisture impervious, curvilinear side surface and first and second end surfaces perpendicular to said side surface; and

b) mutually engagable connector means for connecting said first end surface to said side surface adjacent said second end surface to form said flexible body into a generally ovate configuration, said mutually engagable connector means including a first connector part disposed on said first end surface and a second, mating connector part attached to said side surface adjacent said second end surface;

said first connector part comprising a layer of hook material adhesively secured to said first end surface and said second connector part comprising a cylindrical band of loop material peripherally and adhesively secured to said side surface adjacent said second end surface.

5,144,969

FULLY AUTOMATIC COLLAPSIBLE UMBRELLA

Luc L. Chou, and Jonathan C. Cheng, both of Taipei, Taiwan, assignors to DAY Sheng-Tong, Taichung, Taiwan

Filed Sep. 12, 1991, Ser. No. 758,699
Int. Cl.[5] A45B *25/14*
U.S. Cl. 135—22 7 Claims

1. A fully automatic collapsible umbrella comprising, in combination,

a hollow shank including

a polygonal upper tube having an opening at upper end and a positioning hole at lower end,

a circular middle tube having an opening at upper end and a positioning hole at middle section,

a circular lower tube having a positioning hole at upper end,

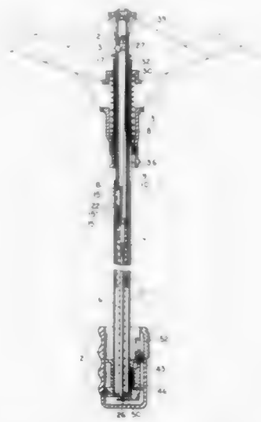
an upper, a middle and a lower rings,

an expansion spring disposed between said upper and lower tubes, and

an umbrella closing spring disposed between said upper and middle tubes;

a grip mounted outside of said lower tube at lower portion, having an actuator for carrying out the umbrella opening and closing operation, said actuator including a retention member for controlling said expansion spring in a compressed state;

a pawl provided at the upper portion of said upper tube for controlling said umbrella closing spring at a compressed state;



an inner tube provided with a positioner to secure said lower tube through engagement with said positioning holes of said upper, middle and lower tubes in alignment to each other;

twin wires movably connected to each other by means of a connector, in which the upper wire provided at upper end with a slidable block for controlling the action of said pawl and the lower wire being operated at lower end by said actuator to carry out the umbrella closing operation;

an umbrella opening spring disposed between said middle and lower rings; and

a ribs structure.

5,144,970

SELF OPENING UMBRELLA

Joachim Seidel, Solingen, and Klaus Stiller, Langenfeld, both of Fed. Rep. of Germany, assignors to Kortenbach Verwaltungs- und Beteiligungsgesellschaft mbH & Co., Solingen, Fed. Rep. of Germany

Filed Oct. 9, 1990, Ser. No. 594,025
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004349
Int. Cl.[5] A45B *25/14*
U.S. Cl. 135—22 12 Claims

1. A self-opening umbrella frame comprising a telescopic stick; a ring fixed on the stick adjacent the upper end of the stick; canopy-supporting rods which are shortenable in at least a two-fold manner, the rods being pivotally connected at inner ends to the ring; a slider displacable along the stick below said ring; lower struts pivotally interconnecting the slider and the rods; a crown above the ring and displacably supported axially of said stick; upper struts pivotally interconnecting the crown and rods; and a compression spring interposed between the crown and an abutmentment fixed relative to the stick; said frame being self-opening primarily as a result of expansion of

the spring from a compressed con lition by applying tension through the upper struts to the rods, and being closable by

manually pulling the slider down the stick for recompressing the compression spring for subsequent automatic reopening.

5,144,97

SHORTENABLE UMBRELLA

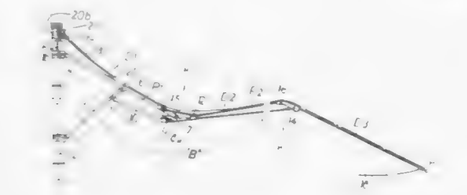
Joachim Seidel, Solingen, and Klaus Stiller, Langenfeld, both of Fed. Rep. of Germany, assignors to Kortenbach Verwaltungs- und Beteiligungsgesellschaft MBH & Co., Solingen, Fed. Rep. of Germany

Filed Oct. 9, 1990, Ser. No. 594,029

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004349.5

Int. Cl.[5] A01G *17/00*

U.S. Cl. 135—22 **11 Claims**



1. A shortenable umbrella comprising canopy rods which radiate from a stick and which are shortenable in at least a three-fold manner, the stick being telescopic in at least two stages, a canopy cover supported by the canopy rods, a slider displaceably-supported on the stick; struts pivotally connected at at one end to the slider and at an outer end at a first joint to a respective canopy rod part which, at an inner end is pivotally connected by a second joint to a ring fixed on the stick and, at its outer end is pivotally connected by a third joint to a respective control link, the control link having a lever arm extending inwardly of the third joint and connected at a fourth joint to an outer end of a respective control rod which is connected at an inner end at a fifth joint to a respective strut; outer canopy rod parts each engaging an outer end of a respective control link at a sixth joint; and a central canopy rod parts each consisting of inner and outer portions which are pivotally connected at their adjacent ends to a respective slide element slidable along a respective one of the control links said inner portion engaging a respective inner canopy rod part at a seventh joint inwardly of the third joint and an outer portion engaging an inner end of a respective outer canopy part at a joint on a lever arm of the outer canopy rod part which extends inwardly of the sixth joint; each control link and the respective central canopy part forming longer links, and a part of the respective inner canopy rod part between the third and seventh joints and the lever arm of the respective outer canopy rod part forming shorter links of a first parallelogram linkage which interacts with a second parallelogram linkage formed by a portion of a respective inner canopy part outwardly of the first joint and the respective control rod as longer links, and by a lever arm of the respective strut between the first and fifth joints and a lever arm of the respective control link as shorter links; the canopy rod parts being secured spread open by an over center catch comprising each fourth joint and including a pin and slot so arranged so that the respective control rod moves effective connection point, with the respective control link, up through a line joining the respective third and fifth joints to a stable over center position maintained by radial tension in the canopy cover; and in that, when closing the canopy, by drawing the slider down the stick, each over center catch is released by the outer end of the strut initially moving outwards, thereby displacing a connection point at the fourth joint, within the slot, outwards and downthrough the respective line joining the third and fifth joint, and beyond the over center position.

5,144,972

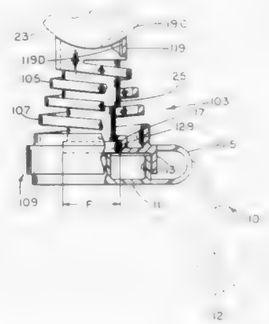
STOPCOCK WITH A PROTECTIVE ASSEMBLY

Gale E. Dryden, 5835 N. Tacoma, Indianapolis, Ind. 46220

Filed Oct. 2, 1991, Ser. No. 769,970

Int. Cl.[5] F16L *55/18*

U.S. Cl. 137—15 **24 Claims**



1. A locking connector protective assembly comprising:

a coil having a proximal end and a distal end, said proximal end having a closure;

said closure including a rim and a lid to cover the rim, and the closure having means for securing said assembly to a female locking connector tip of a fluid handling system;

said closure further including a flexible lid retainer link connected to said rim an said lid, wherein said lid includes means to plug into a lumen of the locking connector tip;

said means for securing said assembly to said locking connector tip comprising four resilient locking tabs having tips that project inward from said rim such that the distance between said tips is less than the diameter of the outer flange of a standard Luer Lok female locking connector tip; and

wherein said proximal coil end has a larger diameter than said coil end and said coil tapers from said proximal coil end toward said distal coil end such that said coil is resiliently compressible into a flat shape.

5,144,973

SAFETY VALVE FOR COMPRESSED GAS CYLINDERS

J. Kenneth Green, Ruidoso; Eugene L. Watson, Placitas, and Paul S. Whalen, Oahu, all of N. Mex., assignors to Safety Assurance Corporation, Albuquerque, N. Mex.

Filed Nov. 29, 1991, Ser. No. 800,046

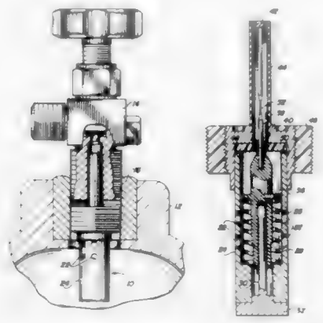
Int. Cl.[5] F16K *17/40*

U.S. Cl. 137—71 **41 Claims**

1. A safety valve for a compressed gas cylinder to terminate gas flow from said cylinder when a primary gas valve attached to a cylinder port of said cylinder is deflected or severed, said safety valve being independently supported below said primary valve in said cylinder port, comprising:

a threaded housing having a channel for the passage of gas adapted to be received in said cylinder port below said primary gas valve, a tubular portion of said threaded housing extending into a gas passage of said primary gas valve;

a cylindrical housing adapted to be received inside said cylinder and attached to said threaded housing having an aperture for the passage of gas from said cylinder to said threaded housing;



a poppet seat furnished in said threaded housing;

a poppet furnished in said cylindrical housing;

bias means furnished in said cylindrical housing to urge said poppet into said poppet seat; and

a frangible element disposed in said threaded housing and holding said poppet off said poppet seat against the urging of said bias means whereby upon the severing or the deflection of said primary gas valve said frangible element will break thereby allowing said poppet to seat in said poppet seat and preventing the flow of gas from said cylinder to said primary valve.

5,144,974

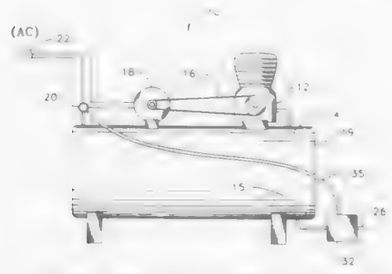
PURGE VALVE ASSEMBLY

Jeffrey Gaudin, 9749 S.W. 1st St., Plantation, Fla. 33324

Filed Apr. 12, 1991, Ser. No. 686,017

Int. Cl.[5] F16T *1/12*

U.S. Cl. 137—204 **7 Claims**



1. An automatic drain valve assembly for draining accumulated moisture from an air compressor, or similar device, having an air storage tank, comprising:

outlet conduit means extending outwardly from an aperture defined by said air storage tank:

a purge valve means located on said conduit means to fluidly communicate, when open, the interior of said tank with the ambient;

activating means, connected to said storage tank and said purge valve, for automatically activating said purge valve upon the presence of a predetermined pressure in said storage tank, wherein said activating means includes a thermal time relay, solenoid means and an air pressure switch means

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5,144,975

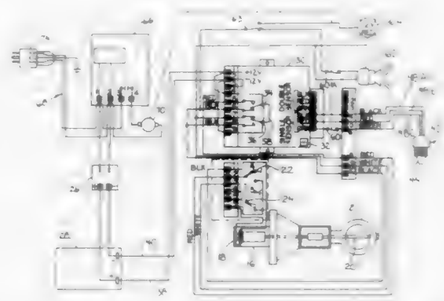
AUTOMATIC ANTIFREEZE BACK-UP VALVE FOR SEWER

Morris Polis, 1028 Rosemary La., South Bend, Ind. 46617

Filed Dec. 10, 1991, Ser. No. 805,471

Int. Cl.[5] E03B *1/12*

U.S. Cl. 137—392 **6 Claims**



1. In a valve device for controlling back-up flow in a sewer line, said device comprising a valve means for including a valve part mounted for movement between a closed position and an open position, means for automatically moving said valve part into said closed position in response to a sewer back-up flow, timing means for automatically opening and closing said valve part periodically absence the back-up flow.

5,144,976

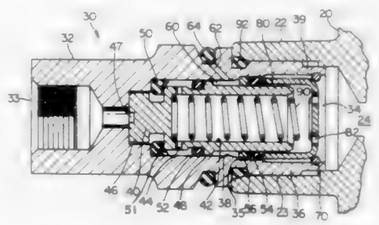
VENTED SCREW-IN PROPORTIONING VALVE

Donald A. Crumb, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 28, 1991, Ser. No. 751,428

Int. Cl.[5] F16K *17/04*

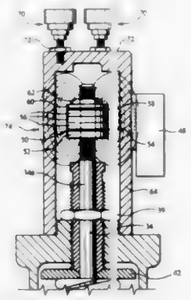
U.S. Cl. 137—509 **12 Claims**



1. A vented screw-in proportioning valve, comprising a proportioning valve body having at one end an outlet and at an opposite end an inlet, threads at the opposite end for mounting said proportioning valve body, a stepped bore extending through said proportioning valve body so said inlet communicates with said outlet, a differential area piston disposed within said bore, the piston being generally U-shaped in cross section and having a plurality of radially extending fluid flow apertures communicating with an interior cavity in said piston, fluid seal means located within said stepped bore and located adjacent an end of said piston, axially spaced-apart seal members located in the stepped bore and disposed about said piston

to define a vented chamber, vent means extending through said proportioning valve body and communicating with said vented chamber, a retainer located within said stepped bore and positioned by abutment means located at said body, and spring means extending within the interior cavity in said piston and engaging the retainer in order to bias said piston toward said outlet, the retainer being biased by said spring into engagement with the abutment means and the abutment means comprising a snap ring.

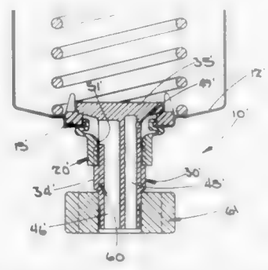
5,144,977
FLUID VALVE WITH ACTUATION SENSOR
Don W. Eggerton, Pineville, and David J. Scallan, Bentley, both of La., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Jun. 20, 1991, Ser. No. 717,912
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—554 15 Claims



1. A valve comprising:
valve housing including a valve seat,
a closure member movable within the valve housing between a closed position in sealing engagement with the valve seat and an open position,
permanent magnet means connected to the closure member and movable therewith, the magnet means establishing a permanent magnetic field which moves with the magnet means,
magnetic detection means coupled to the valve housing the magnetic detection means including switch means having an open switch condition and a closed switch condition and transitioning from one condition to the other in response to a transition through a threshold value of the strength of the magnetic field in which the switch means is disposed,
the magnetic detection means being located at a point within the magnetic field of the magnet means such that the initial movement of the closure member from the seat will result in a change of the condition of the switch means whereby the change and condition can be remotely detected, and
means for selectively adjusting the position of at least a portion of the magnetic detection means axially relative to the magnet means to cause the change of condition of the switch means to occur during the initial movement of the closure member from the seat.

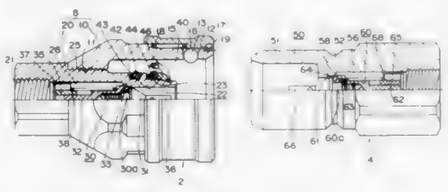
5,144,978
SELF-VENTING DRAIN VALVE
Gene W. Brown, and David A. Hiere, both of Kearney, Nebr., assignors to Baldwin Filters, Inc., Kearney, Nebr.
Filed Jan. 31, 1992, Ser. No. 828,556
Int. Cl.[5] F16K *24/00*
U.S. Cl. 137—588 13 Claims

1. A selectively operable self-venting valve for enabling liquid to be drained from the bottom of a vessel having an opening extending vertically therethrough, said valve comprising an internally threaded tubular body having an upper end portion adapted to be secured to said vessel in coaxial relation with said opening, an annular seal of elastomeric material at the upper end portion of said body, an externally threaded valve member having upper and lower end portions, said valve member being screwed into said body and being movable upwardly and downwardly in said body in response to being rotated in first and second directions, a valve head on the upper end portion of said valve member and normally disposed in a closed position in engagement with said seal to prevent liquid from draining from said vessel and to prevent air from entering said vessel, said valve head moving upwardly away from said seal to an open position when said valve member is



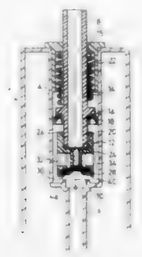
moved upwardly in said body, first and second angularly spaced and generally radially extending ports formed in the upper end portion of said valve member below said head, first and second generally axially extending passages in said valve member and having upper ends communicating with said first and second ports, respectively, said passages being isolated from one another and having lower ends communicating with ambient atmosphere whereby air flows into said vessel via said first passage and said first port while liquid drains from said vessel via said second port and said second passage when said valve head is moved to said open position.

5,144,979
TUBE COUPLER AND A VALVE FOR A TUBE COUPLER
Masaru Shobuzako, and Yoshikazu Ozaki, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Feb. 8, 1991, Ser. No. 652,774
Claims priority, application Japan, Feb. 19, 1990, 2-14804[U]
Int. Cl.[5] F16L *37/28*
U.S. Cl. 137—614.04 4 Claims



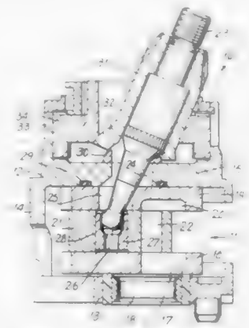
1. A tube coupler comprising:
a socket having a fluid passage, a first valve assembly and a main socket tube body comprising an inner tube and an outer tube separately provided and threadably engaging each other, said inner tube having an outer peripheral surface and said outer tube having an inner peripheral face, said outer peripheral surface and said inner peripheral face defining a space therebetween at one end of said socket;
a plug having a fluid passage, a second valve assembly and a main plug tube body insertable in said one end of said socket between said inner tube and said outer tube;
push means for causing said valves of said socket and said plug to push each other and said fluid passages of said socket and said plug to communicate with each other, when said plug is connected to said socket; and
seal means provided on said outer peripheral surface of said inner tube, for sealing a gap defined by said inner tube and said plug, said seal means having Y-shaped packing located near the inner end portion of the said inner tube and an O-ring located adjacent said Y-shaped packing, said Y-shaped packing having a base portion, and prong-portion facing said one end of said socket;
each of said first and second valve assemblies including a valve body having a valve head portion and a valve rod portion threadably engaging each other and a seal ring inserted between said valve head portion and said valve rod portion, each of said valve head and valve rod portions having a through hole for assembling each of said first and second valve assemblies.

5,144,980
FLUID FLOW CONTROL APPARATUS
Peretz Rosenberg, Moshav Beit Shearim, Israel
Filed Oct. 2, 1990, Ser. No. 591,632
Claims priority, application Israel, Dec. 1, 1989, 92515
The portion of the term of this patent subsequent to Aug. 8, 2008, has been disclaimed.
Int. Cl.[5] F16K *21/16*
U.S. Cl. 137—624.14 19 Claims



1. Fluid flow control apparatus including: a housing having an inlet circumscribed by an inlet valve seat, and an outlet; and a movable valve assembly cooperable with said inlet for controlling the fluid flow therethrough to the outlet; said movable valve assembly comprising:
a displaceable member movable to an open or to a closed position within said housing and defining an inlet chamber therewith communicating with said housing inlet;
a hollow tube assembly passing through said displaceable member and movable therewith;
said hollow tube assembly having, on one side of said displaceable member, an inlet end and a passageway therethrough communicating with said inlet chamber, and an outlet end on the other side of said displaceable member;
and a deformable membrane carried by said inlet end of the hollow tube assembly and engageable with said inlet valve seat;
said membrane being normally flat and spaced from said inlet end of the hollow tube assembly to connect said inlet end to said inlet chamber, but being deformable by the inlet pressure to a curved configuration into engagement with the inlet opening of the hollow tube assembly and thereby to disconnect said inlet end from said inlet chamber.

5,144,981
SANITARY WATER VALVE WITH ACTUATING MECHANISM
Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
PCT No. PCT/DE89/00719, § 371 Date May 14, 1991, § 102(e) Date May 14, 1991, PCT Pub. No. WO90/05868, PCT Pub. Date May 31, 1990
PCT Filed Nov. 16, 1989, Ser. No. 679,041
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1988, 3838765
Int. Cl.[5] F16K *11/06*
U.S. Cl. 137—625.4 11 Claims

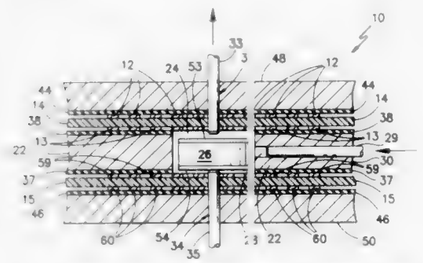


1. A sanitary water valve comprising a casing having an insert portion, said insert portion having an inner surface, an outer surface and an opening therethrough, a control element supported in said casing below said insert portion, said control element including a lower stationary disk, an upper stationary disk spaced from said lower disk positioned proximate the inner surface of said insert portion, said upper stationary disk including a throughhole therethrough, and a control disk disposed intermediate said lower and upper disks and slidable with respect thereto, elongated actuator means having a first end coupled to said control disk and extending through said throughhole in said upper stationary disk and out of said casing through the opening in said insert portion for displacing said control disk laterally between said lower and upper disks upon actuation of said actuator means, said actuator means selectively tilting and swiveling with respect to said casing upon actuation thereof, said actuator means including first bearing means thereon, said casing having an intermediate portion with a coaxial opening adjacent said upper disk for passage of said actuator means therethrough and having an upstanding arcuately shaped second bearing means positioned thereon, and a third bearing means on said insert portion spaced from said second bearing means, said first bearing means of said actuation means having an extending portion defining opposed arcuate bearing surfaces on opposite sides thereof which ride intermediate said second and third bearing means, said actuator means defining a fulcrum disposed along said coaxial opening and said through hole of said upper disk and being positioned below said first, second and third bearing means.

5,144,982
ELECTRO-PNEUMATIC VALVE CARD ASSEMBLIES
Charles E. Willbanks, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 596,803, Oct. 12, 1990, abandoned.
This application Jan. 9, 1992, Ser. No. 819,599
Int. Cl.[5] F16K *11/00, 31/08*
U.S. Cl. 137—625.5 32 Claims

1. An electro-pneumatic valve assembly which comprises:
(a) an electrically conductive substantially flat spiral coil;

(b) a substantially flat substrate having a recess and an outer edge in which said substrate is positioned below said coil;
(d) a magnetic member located within said recess;
(e) a first passage communicating between said recess and said outer edge;



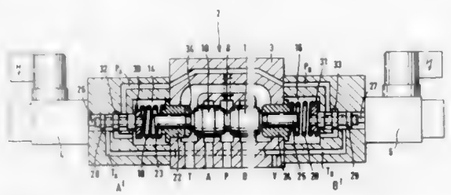
(f) a second passage communicating between said coil through to said recess; and
(g) a means for applying an electric current to said coil to move said magnetic member toward said coil to close said second passage.

5,144,981

POSITION-CONTROLLED PROPORTIONAL DIRECTIONAL VALVE

Hans Schwelm, Luxembourg-Dommeldange, Luxembourg, assignor to Hydrolux S.a.r.l., Luxembourg-Domeldange, Luxembourg

Filed Dec. 3, 1990, Ser. No. 620,419
Claims priority, application Luxembourg, Dec. 13, 1989, 87 [illegible]
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—625.64 **6 Claims**



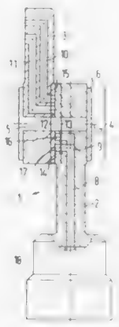
1. A position-controlled proportional directional valve comprising:
a main control piston having spaced ends,
means for centering said main control piston comprising means for supplying pump pressure thereto,
a pair of axially spaced centering flanges mounted for axial movement, each said centering flanges having a first end engaging an end of the main control piston,
a pair of operating pistons each slidable in and extending axially through a said centering flange and each having an end engaging one of the ends of said main control piston,
a pair of pilot control chambers, each having therein the second end of one of said centering flanges, and an end of a said operating piston,
a pair of springs, each said spring being in a said pilot control chamber and engaging the second end of a said centering flange,
means for selectively supplying pressure to or relieving pressure from each of said pilot control chambers comprising a pair of hydraulically controlled pilot control slide values each having an end in a said pilot control chamber and engaging a said spring therein, and passages thereto comprising a pump passage connected to a pump, a tank passage connected to a tank and a passage to a said pilot control chamber,
means for centering said main control piston in the absence of pump pressure,
a pair of control electro-magnet means for exerting a force proportional to electric control current supplied thereto and each engaging a said pilot control slide valve,
means for centering said main control piston in the absence of electric current to said electro-magnet means comprising said pump pressure supplying means,
means for moving said main control piston by relieving pressure in a said pilot control chamber comprising a said electro-magnet, and
means for feeding back the piston of said main control piston to said pilot control slide valves.

5,144,984

ARRANGEMENT FOR FILLING AND TAPPING AN ANESTHETIC CONTAINER

Hans Westerberg, Tyresoe, and Bill Thorsen, Bro, both of Sweden, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,106
Claims priority, application Sweden, Mar. 30, 1990, 9001173
Int. Cl.[5] F16K *3/00*
U.S. Cl. 137—625.18 **4 Claims**



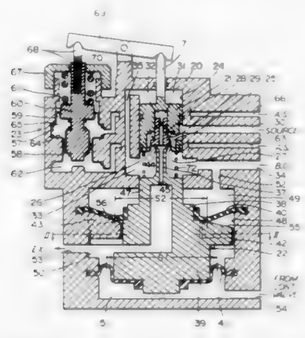
1. A connector for facilitating transfer of anesthetic between an anesthetic gasifying apparatus and an anesthetic container, said connector comprising the following:
a first articulated arm member associated with said anesthetic gasifying apparatus and including a pair of first fluid channels;
a second articulated arm member, associated with said anesthetic container, pivotably connected to said first articulated arm member and including a pair of second fluid channels;
a first seating surface, disposed at an interface position of said first articulated arm, each of said first fluid channels having a terminal opening disposed on said first seating surface:
a second seating surface, disposed at an interface position of said second articulated arm, each of said second fluid channels having a terminal opening disposed on said second seating surface;
securing means for maintaining said first and second seating surfaces in substantially fluid-tight engagement with one another; and
connecting groove means, in one of said interface positions, for providing selective fluid communication between the terminal openings of the respective pairs of fluid channels;
whereby said first and second pairs of channels may be brought into fluid communication with one another by pivoting said first and second arm members into predetermined relative angular positions including a filling position and a decanting position.

5,144,985

VARIABLE LOAD VALVE FOR RAILWAY VEHICLES

Hideo Tamamori, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Sep. 24, 1991, Ser. No. 764,698
Claims priority, application Japan, Sep. 26, 1990, 2-101249[U]
Int. Cl.[5] F16K *31/126*
U.S. Cl. 137—627.5 **17 Claims**



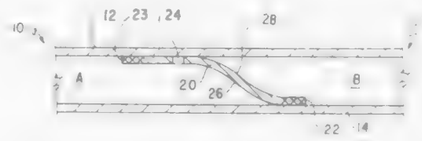
1. A variable load valve device for a railway vehicle comprising:
(a) a supply passage to which a source of fluid under pressure is connected;
(b) an output passage to which a fluid pressure operated brake cylinder device of the vehicle is connected;
(c) an exhaust passage connected to atmosphere;
(d) a valve assembly including:
(i) a valve member;
(ii) a supply valve seat between said supply passage and said output passage with which said valve member coacts to control the supply of fluid under pressure to said brake cylinder device;
(iii) an exhaust valve seat between said output passage and said exhaust passage with which said valve member coacts to control the exhaust of fluid under pressure from said brake cylinder device; and
(iv) means for urging said valve member toward engagement with said supply valve seat;
(e) a balancing chamber to which said output passage is connected;
(f) a piston member including:
(i) said exhaust valve seat;
(ii) a balancing piston having a first pressure area subject to said balancing chamber fluid under pressure to urge said piston member in a first axial direction to effect disengagement of said exhaust valve seat from said valve member; and
(iii) a control piston having a second pressure area subject to a command fluid pressure to urge said piston member in a direction opposite said first axial direction to effect engagement of said exhaust valve seat with said valve member and to effect disengagement of said valve member from said supply valve seat, said valve assembly having a lap condition in which said valve member is engaged with said supply valve seat and said exhaust valve seat when a force balance exists across said piston member;
(j) means for varying said first pressure area of said piston member in accordance with the axial position of said piston member in said lap condition of said valve assembly;
(k) an intermediate member including said supply valve seat, said intermediate member being axially movable to accordingly change the axial position of said piston member in said lap condition of said valve assembly; and
(l) advancing/retracting means for automatically effecting said axial movement of said intermediate member in response to different load conditions of said vehicle.

5,144,986

ONE WAY FLOW DEVICE

Terrence M. Drew, Boulder, Colo., assignor to Alden Laboratories, Inc., Boulder, Colo.

Filed Mar. 27, 1991, Ser. No. 675,699
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—843 **9 Claims**



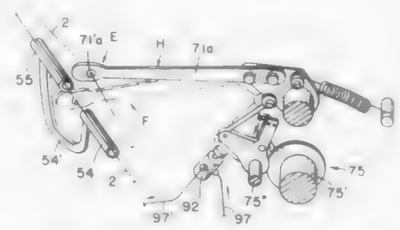
1. A one-way fluid flow device, comprising:
first and second flexible sheets attached together at portions thereof to form a conduit;
a diaphragm which flexes responsive to differential pressure thereacross, the diaphragm having an upstream and a downstream side; and
at least one orifice in said diaphragm positioned so that it is urged against said first sheet when the pressure on said downstream side is greater than the pressure on said upstream side.

5,144,987

WEFT DRAWING-IN DEVICE INCLUDING SLOTTED TUBULAR GUIDE MEMBERS

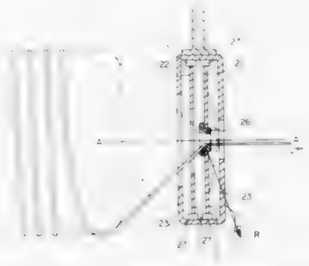
Franz Burer, Kollbrunn; Hans-Jorg Gehrig, Henggart; Josef Kaufmann, Elsau; Heinz Maurer, Ettenhausen, and Hanspeter Muller, Dorf, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

PCT No. PCT/CH90/00052, § 371 Date Oct. 17, 1990, § 102(e) Date Oct. 17, 1990, PCT Pub. No. WO90/11397, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 2, 1990, Ser. No. 598,688
Claims priority, application Switzerland, Mar. 17, 1989, 1007/89
Int. Cl.[5] D03D *47/34*
U.S. Cl. 139—450 **17 Claims**



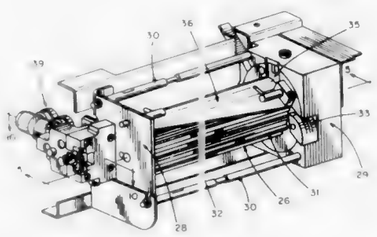
1. A device for drawing a weft yarn into a loom, said device comprising
at least one pair of tubular members disposed in coaxially spaced relation for guiding an air-entrained weft yarn therethrough, each said tubular member having a longitudinally extending slot to permit lateral deflection of a weft yarn from said respective member; and
means for deflecting a weft yarn laterally from said tubular members.

5,144,978
WEFT FEEDER WITH INSTRUMENT FOR MEASURING YARN TENSION
Angelo Del Favero, Crescentino, Italy, assignor to ROJ Electrotex S.P.A., Biella, Italy
Filed May 28, 1991, Ser. No. 706,193
Claims priority, application Italy, May 28, 1990, 20442 A/90
Int. Cl.[5] D03D *47/30*
U.S. Cl. 139—452 17 Claims



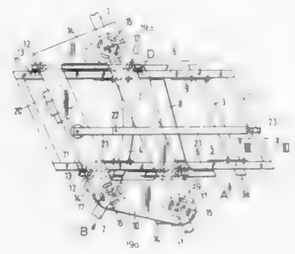
1. In an instrument for measuring the tension of weft yarns which wind or unwind forming a "balloon", of the type using a variable impedance comprising a movable component and at least one fixed component as parts of an electric measuring circuit, the improvement wherein all of the components have a centered symmetry and a passage through their center for the yarn whose tension is to be measured, with a yarn guiding and deviating eyelet positioned in correspondence of the closing vertex of the "balloon" and fixed to the movable component of said variable impedance, a voltage measuring device connected to said movable component for measuring the variable voltage detected on one of the components of said impedance as a function of the tension of the yarn sliding through said eyelet.

5,144,989
PORTABLE CABLE TIE DISPENSER
Anton L. Mika, Downers Grove, and Robert F. Levin, Braceville, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed May 9, 1991, Ser. No. 697,850
Int. Cl.[5] B21F *9/02*
U.S. Cl. 140—93.2 7 Claims



1. A portable cable tie dispenser for providing individual cable ties from a ribbon of cable ties for provision to a cable tie application tool, comprising:
a hollow cylindrical cable tie receiver having a plurality of longitudinal splines that define cable tie positioning grooves disposed parallel to an axis of the cable tie receiver for receiving the ribbon of cable ties;
receiver mounting means for rotatably mounting the cable tie receiver to the dispenser;
motor means mounted to the dispenser and contained within the hollow cable tie receiver and operatively connected to the cable tie receiver for incrementally rotating the cable tie receiver;
separating means mounted on the dispenser adjacent the cable tie receiver for separating individual cable ties from the ribbon of cable ties; and
transfer means mounted to the dispenser for providing the individual cable ties separated from the ribbon by the separating means to the cable tie installation tool.

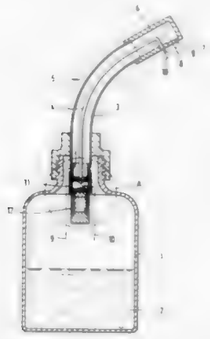
5,144,990
SWITCH IN OVERHUNG RAIL SYSTEMS
Johannes-Gerhard Spoeler, Borken, and Manfred Grapentin, Herdecke, both of Fed. Rep. of Germany, assignors to Mannesmann A.G., Düsseldorf, Fed. Rep. of Germany
Filed Aug. 21, 1984, Ser. No. 628,595
The portion of the term of this patent subsequent to Nov. 8, 2003, has been disclaimed.
Int. Cl.[5] F01B *25/06*
U.S. Cl. 104—130 13 Claims



1. Slide switch for rail systems, there being stationary rails and branch rails to be interconnected by the switch, comprising:
a slide frame on which are mounted a straight rail section and, spaced therefrom in a direction of displacement, a curved rail section;
guide means for said slide frame to provide for a direction of displacement of the slide frame, being oriented in relation to a chord of the curved section by an angle of approximately 90°, so that an angle between said direction of displacement as defined by the guide means, in relation to the straight section is 90° minus half of the angle of said curved section; and
adjustable stationary mounting means for holding complementary guide means, cooperating with the guide means on the slide frame to obtain slide displacement of said slide frame, along said direction and relatively to the adjustable stationary mounting means.

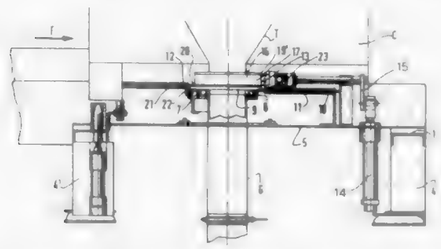
5,144,991
FILLING ARRANGEMENT FOR AN ANESTHETIC VAPORIZER
Carl-Friedrich Wallroth, Lübeck; Wolfgang Falb, Krummesse; Karl-Ludwig Gippert, Lübeck, and Eric Hecker, Stockeldorf, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany
Filed Jul. 5, 1991, Ser. No. 726,050
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1990, 4022492
Int. Cl.[5] A61M *16/18*
U.S. Cl. 141—192 6 Claims

1. An arrangement for filling and emptying an anesthetic vaporizer and has an inlet means for supplying anesthetic liquid and venting gas to and from the vaporizer, the anesthetic liquid having a boiling point and being held in a supply vessel, said arrangement comprising:
a conduit member having first and second end portions and including structure defining a filling channel and a venting channel separate from said filling channel;
an interface piece at said first end for interfacing with the inlet means to removably connect said arrangement to the vaporizer;
vessel connecting means provided on said second end portion for detachably connecting the supply vessel to said conduit member;
a blocking device mounted in said conduit and including: switching means for switching between an open position



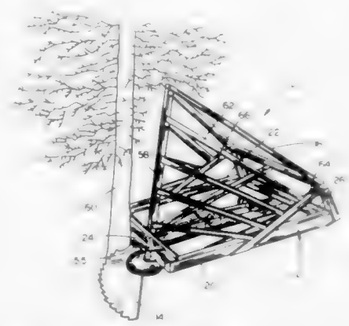
wherein said filling channel is open to the vessel and a close position wherein said filling channel is closed to the vessel; and, temperature-sensitive actuation means for actuating said switching means into said open position when the temperature of the anesthetic liquid is below a preselected limit temperature and into said close position when the temperature of the anesthetic liquid is above said preselected temperature; and,
said preselected temperature being below the boiling point of the anesthetic liquid.

5,144,992
INSTALLATION FOR THE TRANSFER BETWEEN RECEPTACLES OF PRODUCTS THAT FLOW UNDER THE EFFECT OF GRAVITY
Marc Jaerger, Mareil Marly, France, and Willy Lhoest, Brussels, Belgium, assignors to Gallay S.A., Saint-Denis, France and Lhoest Vereeken Concepts Sprl, Brussels, Belgium
Filed Aug. 23, 1990, Ser. No. 571,414
Int. Cl.[5] B65B *1/04*
U.S. Cl. 141—346 4 Claims



1. Installation for transferring product that flows under the effect of gravity, such as powders, granulates or liquids, comprising:
a container in which the product is received and having a base with a sealable discharge opening; receptacle means positioned lower than said container for receiving the product; fixed chute means having an upper opening for receiving the product from said discharge opening, and connected to said receptacle means for transferring the product downwardly to said receptacle means; said container being displaceable to and from a product emptying position above said upper opening of said chute means;
a first plate; fixed first guide means attached to said chute means and supporting said first plate for sliding movement between a first covering position where said first plate covers said upper opening of said chute means and a first uncovering position where said first plate uncovers said upper opening; second guide means; a second plate slidably mounted to said second guide means for sliding movement between a second covering position where said second plate covers said discharge opening of said container and a second uncovering position where said second plate uncovers said discharge opening; and means effective during displacement of said container to and from said product emptying position for causing said first and second plates to slide in synchronism but in opposite directions relative to their respective guide means; and
wherein said first guide means is arranged such that when said first plate is in said first covering position and said container moves to said product emptying position, an external part of said container abuts against an end part of said first plate and pushes said first plate back to said first uncovering position when said container reaches said emptying position; first permanent magnet means is provided for maintaining contact between said abutting parts of said first place and said container during movement of said container in an opposite direction until said first plate returns to said first covering position; said second guide means is arranged such that an end part of said second plate abuts against an external part of said chute means as soon as said container and said first plate come into contact; and second permanent magnet means is provided for maintaining contact between the abutted parts of said second plate and said chute means until said container and said first plate disengage.

5,144,993
SINGLE BLADE TREE CUTTING APPARATUS
Lorry L. Marshall, Box 51, Sargent, Nebr. 68874
Filed Jan. 14, 1992, Ser. No. 820,345
Int. Cl.[5] A01G *23/08*; B27B *5/14*
U.S. Cl. 144—34 R 6 Claims



1. A tree cutting apparatus, comprising:
a frame having a forward cross-member, a rearward cross-member and opposing longitudinal side members;
a single, generally planar blade means operably rotatably connected to the forward cross-member of said frame, said blade means positioned forwardly of said forward cross-member to receive material to be cut between said blade means and said forward cross-member;
said blade means having an arcuate peripheral edge with a cutting edge formed along a portion thereof having a plurality of teeth therealong;

said blade means being rotatably mounted such that rotation of said blade means in a first direction will cause said cutting edge to move transversely with respect to the forward cross-member as the blade rotates, such that said teeth will saw through a tree located between said blade means and forward cross-member;

drive means on said frame operably connected to said blade means, for rotating said blade means;

said arcuate cutting edge being formed with respect to the rotational axis of said blade means and having a forward end and a rearward end;

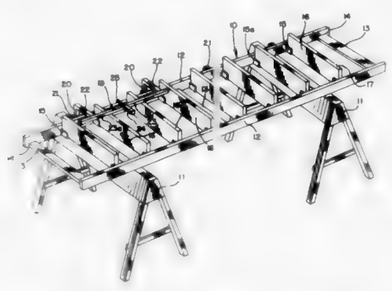
said cutting edge being formed such that the distance between the cutting edge and rotational axis increases from the forward end to the rearward end of said cutting edge, such that rotation of said blade in said first direction will cause the cutting edge of said blade means to move transversely with respect to the forward cross-member so as to engage and cut material located between the blade and forward cross-member.

5,144,994

PORTABLE UNIVERSAL SAW TABLE

David W. Stecker, Sr., 23W540 Bryn Mawr, Roselle, Ill. 60172

Filed Jun. 28, 1991, Ser. No. 723,322
Int. Cl.[5] B27B *5/24*; B25H *1/00*; B27C *9/00*
U.S. Cl. 144—286 A 7 Claims



1. A portable universal saw table comprising:

a pair of spaced apart parallel and extensive support rails;

means for holding said rails in said parallel spaced apart position;

multiple pairs of support means attached to the inner surface of said rails and adapted to position disposable work piece supports therebetween; and a plurality of unconnected, individually removable and disposable work piece supports, each removably supported in said support means and having a vertical height greater than the vertical height of said rails, whereby said work piece supports are adapted to support an elongated work piece for cutting by a power saw and may be individually removed and disposed of.

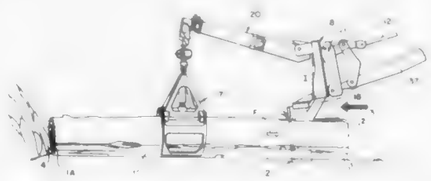
5,144,995

APPARATUS FOR SPLITTING LOOSE OBJECTS SUCH AS TREE TRUNKS

Bo Pettersson, Lillebo Gingri, S 513 00 Fristad, Sweden

Filed Apr. 12, 1991 Ser. No. 685,220
Int. Cl.[5] B27L *7/00*
U.S. Cl. 144—366 9 Claims

8. A method of splitting loose objects, such as large tree trunks, comprising the steps of grabbing a tree trunk, moving the tree trunk, telescopically extensibly supported, and positioning it on the ground with one end of the tree trunk against a backup support, pressing a splitting element releasably mounted on a vehicle, against the other end of said tree trunk,



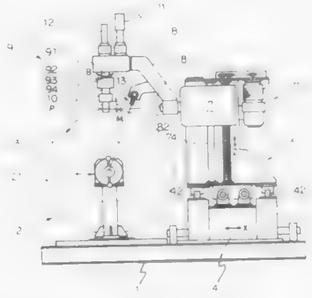
and continuing the pressing in a longitudinal direction of said tree trunk until said tree trunk is split.

5,144,996

TIRE GROOVING APPARATUS AND METHOD

Satoru Kinuhata, Kobe, and Seiki Yamada, Ibaraki, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

PCT No. PCT/JP89/00776, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990, PCT Pub. No. WO90/00965, PCT Pub. Date Aug. 2, 1990
PCT Filed Jul. 27, 1989, Ser. No. 474,760
Claims priority, application Japan, Jul. 28, 1988, 63-189952
Int. Cl.[5] B29D *30/68*
U.S. Cl. 157—13 6 Claims



1. A tire grooving apparatus comprising

(a) a tire support drive for rotatably supporting a tire,

(b) a vertically moveable block member having a standard movement mechanism and disposed in juxtaposition to the tire support device, said vertically moveable block member being disposed on a horizontally moveable block member,

(c) means for moving the vertically moveable block member in the vertical direction,

(d) said horizontally moveable block member having a correction movement mechanism and disposed in juxtaposition to the tire support device,

(e) means for moving the horizontally moveable block in the horizontal direction,

(f) a pivotable arm member rotatably connected at one end thereof to the vertically moveable block member and means operatively associated with said vertically moveable block member for rotating said pivotable arm member,

(g) a cutter support device connected to the other end of said pivotable arm member, said cutter support device having a cutter mounted thereto,

(h) means for detecting lateral runout of the tire,

(i) means for detecting the center deviation of the tire, and

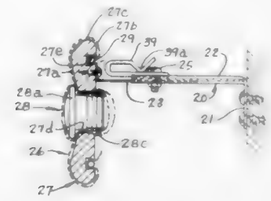
(j) control means containing a central processing unit and memory for controlling the operation of the tire grooving apparatus, said control means comprising a standard movement means which establishes a cutter theoretical cutting position, and a correction movement means which calculates an amount of correction movement in accordance with input signals from the means for detecting the center deviation of the tire and the means for detecting the lateral runout of the tire, and said control means operates the means for correction movement of the block members in accordance with a calculated value.

5,144,997

DRAPERY FIXTURE

Angelo M. Marasco, Madison, Wis.; Dorothy C. Shepherd, Edina, Minn., and Daniel C. Johnson, Madison, Wis., assignors to Graber Industries, Inc., Middleton, Wis.

Filed Aug. 9, 1991, Ser. No. 743,078
Int. Cl.[5] A47H *1/00*
U.S. Cl. 160—349.2 12 Claims



1. A drapery fixture kit for use as a drapery swag holder or a drapery tie-back holder, comprising a mounting bracket having a rear mounting portion and arm means extending forwardly from the rear mounting portion, rosette components for use with a piece of fabric for forming a fabric rosette, the rosette components including a shape retaining rosette body member having a front face, a rear side, an outer periphery and a central opening generally centrally of the outer periphery, the body having an outer diameter in the range from about 3 inches to about 6 inches, the central opening having a diameter in the range from one-quarter to one-half the outer diameter of the body, a plug member dimensioned for insertion into the central opening in the body member form the front face of the latter for retaining a fabric piece adjacent the center of the front face of the body member, rear fabric retaining means for attaching a fabric piece to the rear side of the body member in a locus inwardly of the outer periphery of the body member and outwardly of the central opening, and rosette mounting means for detachably connecting a forward end to the arm means to the rear side of the rosette body member, said rear fabric retaining means including annular fabric receiving groove means at the rear side of the body and strip means receivable in the groove means.

5,144,998

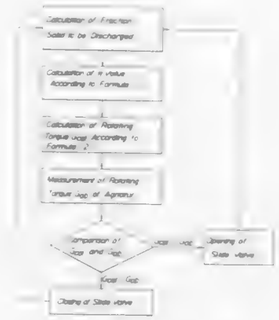
PROCESS FOR THE PRODUCTION OF SEMI-SOLIDIFIED METAL COMPOSITION

Masazumi Hirai; Katsuhiro Takebayashi; Ryuji Yamaguchi, and Yasuo Fujikawa, all of Chiba, Japan, assignors to Rheo-Technology Ltd., Japan

Filed Aug. 20, 1991, Ser. No. 747,637
Claims priority, application Japan, Sep. 11, 1990, 2-2388871; Sep. 12, 1990, 2-240103
Int. Cl.[5] B22D *11/124*, *1/00*
U.S. Cl. 164—71.1 5 Claims

1. A process for stably producing semi-solidified metal compositions by pouring molten metal into a cooling agitation vessel, agitating it while cooling to produce a slurry of semi-solidified metal composition at a solid-liquid coexistent state and discharging out the semi-solidified metal composition from a discharge port of the vessel, characterized in that the cooling agitation is carried out so that a relation of fraction solid, solidification rate and shear rate satisfies the following equation (1)

$$\eta = a/2(1/f_s - 1/f_{scr}) \leqq 10 \quad (1)$$



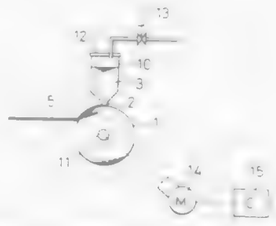
wherein η is an indication value of fluidity, $a = 35000.R^{0.5}.\dot{\gamma}^{-1.7}$, f_s is fraction solid of the slurry of semi-solidified metal composition, $f_{scr} > f_s$, $f_{scr} = 0.65\text{-}1.4.R^{\frac{1}{4}}.\dot{\gamma}^{-\frac{1}{4}}$, R is an average solidification rate in the solidification of molten metal below solidification starting temperature (liquidus temperature) (%.s^{-1}) and $\dot{\gamma}$ is a shear rate (s^{-1}).

5,144,999

APPARATUS FOR MAKING AMORPHOUS METAL STRIPS

Akihiro Makino, and Tomio Takase, both of Nagaoka, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 558,716, Jul. 27, 1990, abandoned. This application Mar. 18, 1992, Ser. No. 855,131
Claims priority, application Japan, Aug. 31, 1989, 1-225557; Mar. 26, 1990, 2-75948; Mar. 26, 1990, 2-75949
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—423 2 Claims



1. An apparatus for making an amorphous metal strip comprising:

a cooling roll having means for rotating the cooling roll in a direction about an axis and having a surface for receiving molten metal, said cooling roll further having means for rapidly cooling and solidifying molten metal on said surface;

a nozzle positioned adjacent to said cooling roll, said nozzle having an opening from which molten metal emanates under a fixed pressure, wherein said means for rotating said cooling roll has means for linearly reducing a rotational speed of said cooling roll from 1,000 rpm to 700 rpm after commencement of manufacture of a metal strip.

2. An apparatus for making an amorphous metal strip comprising:

a cooling roll which rotates in a direction about an axis and has a surface for receiving molten metal; and

a nozzle having an opening facing said surface of said cooling roll for depositing molten metal on said surface while

said cooling roll rotates to form a metal strip, wherein said surface of said cooling roll has a roughness corresponding to a roughness obtained by polishing said surface with a polishing paper having a range of abrasive grain numbers between 600 and 1,000.

5,145,001

HIGH HEAT FLUX COMPACT HEAT EXCHANGER HAVING A PERMEABLE HEAT TRANSFER ELEMENT

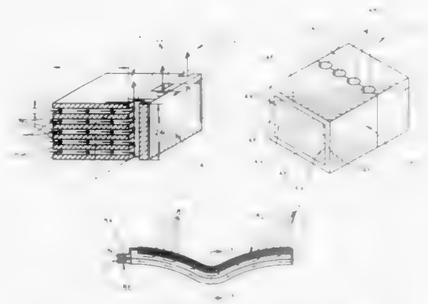
Javier A. Valenzuela, Hanover, N.H., assignor to Creare Inc., Hanover, N.H.

Continuation-in-part of Ser. No. 383,979, Jul. 24, 1989, Pat. No. 5,029,638. This application Apr. 23, 1991, Ser. No. 690,521

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.[5] **F28D** *7/00*

U.S. Cl. 165—164 **39 Claims**



1. A compact heat exchanger module comprising:

an impervious heat transfer element;

a permeable heat transfer element having one or more passages through which a heat transfer fluid passes, said passages being bound by one or more plates;

a permeable/impervious interface where said impervious heat transfer element and said

permeable heat transfer element are joined, said permeable/impervious interface being positioned such that said one or more plates are substantially normal to said permeable/impervious interface;

channels communicating with said passages of said permeable heat transfer element, said channels being essentially at said permeable/impervious interface; and

means for directing the fluid through said passages substantially normal to said permeable/impervious interface.

26. A multi-module compact heat exchanger comprising:

at least two modules, each of said modules having;

an impervious heat transfer element,

a permeable heat transfer element having passages through which a heat transfer fluid passes,

a permeable/impervious interface where said impervious heat transfer element and said permeable heat transfer element are joined,

channels communicating with said passages of said permeable medium essentially at said interface, and

means for directing the fluid passing through said passages substantially normal to said permeable/impervious interface;

wherein said modules have a common impervious heat transfer element, said heat transfer modules being connected in series whereby said channels' output of the heat transfer fluid provides an input of heat transfer fluid for said passages in said permeable heat transfer element;

a first duct enclosing said permeable heat transfer elements for directing the flow of a first heat transfer fluid;

partitions in said duct separating said permeable heat transfer elements; and

a second duct attached to said impervious heat transfer element providing a counter-flow of a second fluid.

5,145,000

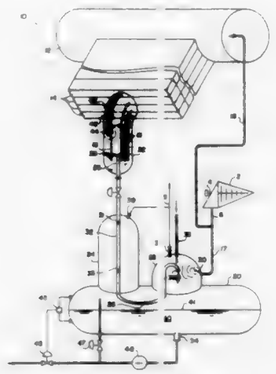
STEAM CONDENSATE STORAGE TANK WITH NON-FREEZING FEATURE

George E. Klappel, Richmond, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Nov. 15, 1991, Ser. No. 792,822

Int. Cl.[5] **F28F** *9/08*

U.S. Cl. 165—113 **20 Claims**



1. A condensate storage tank assembly coupled to a condenser, comprising:

a. a tank section having a condensate outlet at a lower end thereof for draining condensate from the tank section;

b. level control means connected to the tank section for maintaining a selected condensate level in the tank section at an intermediate location between the lower end of the tank section and an upper end of the tank section;

c. a condensate drain line extending into the tank section for supplying condensate thereto from the condenser, the condensate drain line having an operating condensate level therein to which condensate extends during the supply of condensate from the condenser to the tank section, and an isolated condensate level to which condensate rises when the tank section is isolated from the condenser;

d. chamber forming means connected to the tank section for defining an upwardly enlarged steam chamber communicating with the upper end of the tank section, the steam chamber being engaged around the condensate drain line at least up to the isolated condensate level; and

e. a steam line connected to the tank section for supplying steam to the tank section above the selected condensate level in a tank section and within the steam chamber for preventing condensate in the drain line up to the isolated condensate level from freezing.

5,145,002

RECOVERY OF HEAVY CRUDE OIL OR TAR SAND OIL OR BITUMEN FROM UNDERGROUND FORMATIONS

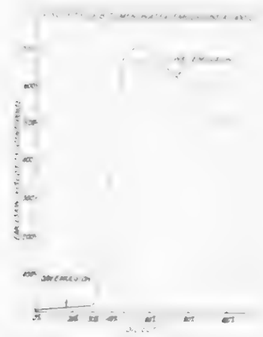
Alex S. McKay, Las Vegas, Nev., assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Continuation of Ser. No. 345,103, Apr. 28, 1989, abandoned, which is a division of Ser. No. 152,933, Feb. 5, 1988, Pat. No. 4,846,275. This application Feb. 19, 1991, Ser. No. 657,434

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] **E21B** *43/24*

U.S. Cl. 166—272 **5 Claims**



1. A method of producing heavy crude oil or tar sand oil or bitumen from an underground formation containing the same which comprises utilizing or establishing an aqueous fluid communication path through said formation between an injection well or conduit and a production well or conduit in fluid communication within said formation by introducing into said formation via said injection well or conduit an aqueous fluid consisting essentially of hot water or low quality steam to establish an aqueous fluid communication path through said formation from said injection well or conduit to said production well or conduit by movement of said introduced aqueous fluid through said formation from said injection well or conduit to said production well or conduit, increasing the temperature of said injected aqueous fluid to bring about the movement or migration or stripping of said heavy crude oil or tar sand oil or bitumen in the form of an oil-in-water emulsion substantially along the interface between said aqueous fluid communication path and said heavy crude oil or tar sand oil or bitumen containing formation into said injected aqueous fluid moving within said formation along said aqueous fluid communication path and into said production well or conduit and recovering the resulting produced heavy crude oil or tar sand oil or bitumen from said formation as an oil-in-water emulsion containing less than about 30% oil or bitumen via said production well or conduit.

5,145,003

METHOD FOR IN-SITU HEATED ANNULUS REFINING PROCESS

John H. Duerksen, Fullerton, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 562,779, Aug. 3, 1990, Pat. No. 5,054,551. This application Jul. 22, 1991, Ser. No. 733,587

Int. Cl.[5] **E21B** *43/24*

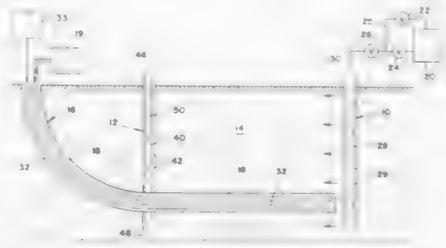
U.S. Cl. 166—272 **24 Claims**

1. A method of assisting the recovery of viscous petroleum from a petroleum-containing formation comprising:

(a) forming a hole through a petroleum-containing formation to provide a flow path in said formation for flow of fluid through at least a portion of said formation;

(b) flowing a hot fluid through said flow path out of contact with said formation to heat viscous petroleum in said formation outside said flow path to reduce viscosity of at least a portion of said petroleum adjacent to the outside of said flow path to provide a potential passage for fluid flow through said formation adjacent the outside of said flow path; and

(c) injecting a drive fluid and a hydrogenizing gas through said passage at a temperature sufficient to promote hydrogenation and thermal cracking of at least a portion of the



petroleum in said formation zone to promote movement of at least a portion of the petroleum through said passage adjacent to the outside of said flow path to a recovery position for recovery from said formation; and

(d) catalyzing said hydrogenation and thermal cracking reactions within the formation zone to enhance said hydrogenation and thermal cracking of at least a portion of the petroleum in said formation zone.

5,145,004

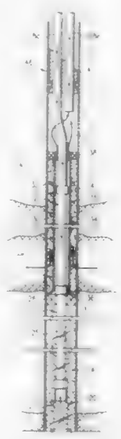
MULTIPLE GRAVEL PACK WELL COMPLETIONS

Holley M. Cornette, Houston, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 12, 1991, Ser. No. 667,938

Int. Cl.[5] **E21B** *43/04, 43/14*

U.S. Cl. 166—278 **13 Claims**



6. A method for forming a multiple gravel pack completion in a wellbore transversing an upper zone and a lower zone, said method comprising:

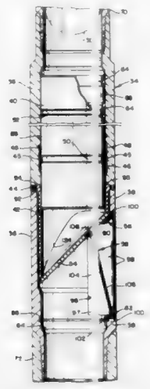
filling said wellbore adjacent said lower zone with a particulate material;

lowering a first fluid-permeable liner having an auger blade about its periphery on a workstring into said wellbore;

rotating said workstring to auger said liner into said particulate material to form a lower gravel pack completion adjacent said lower zone;

setting a packer in said wellbore above said lower gravel pack completion;
placing additional particulate material on said packer to fill said wellbore adjacent said upper zone;
lowering a second fluid-permeable liner having an auger blade about its periphery on a workstring into said wellbore; and
rotating said workstring to auger said second liner into said additional particulate material to form a gravel pack completion adjacent said upper zone.

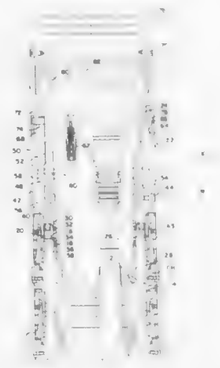
5,145,005
CASING SHUT-IN VALVE SYSTEM
William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.
Filed Apr. 26, 1991, Ser. No. 692,193
Int. Cl.[5] E21B *34/14, 34/12*
U.S. Cl. 166—334 **21 Claims**



1. A valve for use within a conduit in a subterranean well, the valve comprising a valve seat, a valve closure member adapted to rotate reversibly about a hinge point between open and closed positions through an included angle of less than 90 degrees, and means for selectively controlling movement of the valve closure member reversibly between the open and closed positions, said control means comprising means for biasing the valve closure member toward the closed position, said biasing means comprising a plurality of spring strut assemblies rotatably connected to the valve closure member, with at least one strut assembly being rotatably connected to the valve closure member on each side of the hinge point of the valve closure member.

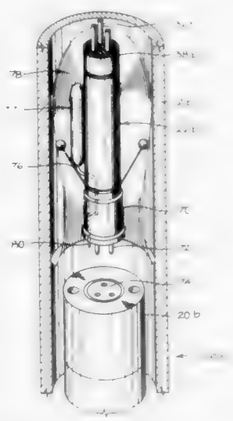
5,145,006
TUBING HANGER AND RUNNING TOOL WITH PRELOADED LOCKDOWN
David R. June, Cypress, Tex., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Jun. 27, 1991, Ser. No. 722,061
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—341 **7 Claims**

1. An improved preloaded lockdown mechanism for a subsea tubing hanger having a running tool latched thereto for use in a subsea wellhead housing having a blowout preventer and a riser above the blowout preventer, comprising:
a landing seat and a locking recess within said wellhead housing,
a landing shoulder on said tubing hanger for landing on said landing seat with said wellhead housing,
a locking means positioned on said tubing hanger for actuation to engage said locking recess and thereby secure said tubing hanger within said wellhead housing, and



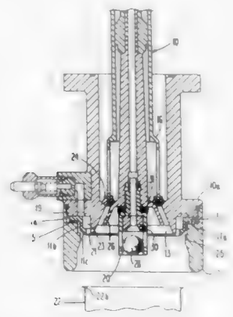
a preloading means positioned on said tubing hanger and cooperating with said locking means to preload said locking means and prevent relative movement between said tubing hanger and said wellhead housing.

5,145,007
WELL OPERATED ELECTRICAL PUMP SUSPENSION METHOD AND SYSTEM
Walter R. Dinkins, Lawrence, Kans., assignor to Camco International Inc., Houston, Tex.
Filed Mar. 28, 1991, Ser. No. 676,993
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—386 **13 Claims**



1. A method of setting an electrical motor operated liquid well pump in a well comprising,
connecting an electrical cable to the motor, said cable being a plurality of insulated electrical conductors enclosed in a low tensile strength corrosion-resistant metal tubing, said metal tubing having the tensile strength to support the tubing and the electrical conductors,
attaching a separate retrievable support means to said motor and pump, said support having the tensile strength to support the motor and pump in the well,
lowering and setting the motor and pump in the well by the support means with the cable attached,
disconnecting the support means from the motor and pump after the pump is set, and
retrieving the support means from the well while leaving the set pump.

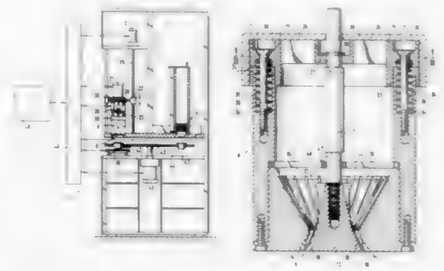
5,145,008
FILLING VALVE FOR COUNTERPRESSURE FILLING OF CANS
Chung J. Yun, Baltimore, Md., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.
Division of Ser. No. 434,565, Nov. 8, 1989, Pat. No. 4,986,318, which is a continuation of Ser. No. 125,232, Jan. 25, 1988, abandoned, which is a continuation of Ser. No. 807,440, Dec. 10, 1985, Pat. No. 4,750,533, which is a continuation-in-part of Ser. No. 574,184, Apr. 5, 1985, abandoned, and a continuation-in-part of Ser. No. 796,892, Nov. 12, 1985, abandoned. This application Dec. 7, 1990, Ser. No. 624,039
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] B67C *3/06*
U.S. Cl. 141—39 **3 Claims**



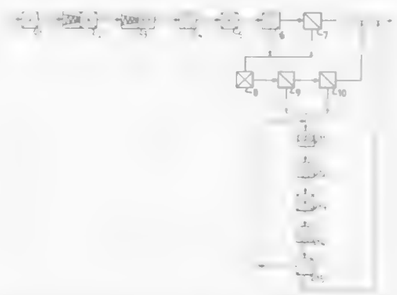
1. A sealing device for use with a filling valve for filling of cans with pressurized fluid, said device comprising:
a flexible member responsive to the entry of the pressurized fluid into the cans such that said flexible member moves to a sealed position with respect to the cans wherein said flexible member comprises:
(a) a first ring in sealable engagement with the filling valve;
(b) a second ring depending from said first ring and spaced from the filling valve thereby forming a chamber between the filling valve and said flexible member; and
(c) a third ring depending from said second ring having at least one notch therein through which the pressurized fluid may enter said chamber such that said flexible member will expand into sealed engagement with the cans when the pressurized fluid is dispensed into the cans.

5,145,009
APPARATUS FOR METERING DRY AND/OR PULVERULENT POURABLE MATERIAL, ESPECIALLY DYE POWDER
Mickael Mheidle, Sausheim, France, and Roland Bauhofer, Böckten, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jun. 25, 1990, Ser. No. 543,254
Claims priority, application Switzerland, Jun. 27, 1989, 2381/89
Int. Cl.[5] B65B *1/30*; G01F *11/20*
U.S. Cl. 141—83 **22 Claims**

1. An apparatus for metering dry or pulverulent pourable material, comprising:
a discharge container having a closable outlet formed through an underside thereof and adapted to have the material discharged therethrough;
weighing means, mounted below said outlet, for metering the material discharged through said outlet of said container;
a valve body mounted in said container for selectively closing said outlet, said valve body being tapered upwardly and inwardly, being displaceable vertically downwardly from a closed position to an open position, and being rotatable at least while in the open position; and
conveying means, disposed on said valve body, for conveying the material toward said outlet and for counteracting agglutination of the material.



5,145,010
METHOD OF MAKING MECHANICAL PULP
K. Ove Danielsson, Stockholm; Bo G. S. Falk, Järfälla, both of Sweden, and Michael Jackson, North Vancouver, Canada, assignors to Sunds Defibrator Industries Aktiebolag, Sweden
PCT No. PCT/SE89/00004, § 371 Date May 15, 1990, § 102(e) Date May 15, 1990, PCT Pub. No. WO89/06717, PCT Pub. Date Jul. 27, 1989
PCT Filed Jan. 11, 1989, Ser. No. 488,037
Claims priority, application Sweden, Jan. 22, 1988, 8800200
Int. Cl.[5] D21B *1/16*
U.S. Cl. 162—26 **14 Claims**



1. A method for producing mechanical pulp from softwood comprising impregnating softwood chips with water and a complexing agent, refining said impregnated chips in a first refining step utilizing a pair of counter-rotating refining discs so as to produce a first refined pulp, fractionating said first refined pulp so as to produce a first accept portion and a first reject portion, said first reject portion comprising between about 15 and 35% of said first refined pulp and including an increased concentration of the long and stiff fibers in said pulp, refining said first reject portion in second and third refining steps so as to produce a second refined pulp, said second refining step utilizing said first reject portion having a consistency of about 20–35% and said third refining step utilizing said first reject portion having a consistency of about 5%, and fraction-

ating said second refined pulp so a to produce a second accept portion and a second reject portion.

5,145,011

SEALING MEMBERS FOR USE IN GAS PREHEATER

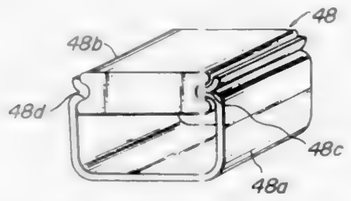
Shoji Seike; Keiichiro Watanabe, both of Nagoya, and Akira Ito, Ama, all of Japan, assignors to NGK Insulations, Ltd., Japan

Filed Jun. 25, 1990, Ser. No. 542,753

Claims priority, application Japan, Jul. 19, 1989, 1-184493; May 25, 1990, 2-133882

Int. Cl.[5] F28D *19/04*

U.S. Cl. 165—9 3 Claims



1. A sealing member for sealing a gap between an outer peripheral portion of a rotor and a housing in a gas preheater or a gap between a side face of a rotor and a radial sealing member in the gas preheater, said gas preheater being adapted to recover heat from exhaust gases emitted from a boiler using coal or heavy oil as a fuel, wherein said sealing member comprises a base body having substantially a U-shaped cross section and a surface member fixed to upper opposite edge portions of said base body such that said surface member projects above upper end faces of said base body and at least a portion of said surface member contacts said rotor, said surface member comprising at least one material selected from the group consisting of:

a) a ceramic selected from the group consisting of alumina-containing porcelain, alumina, silicon carbide, silicon nitride, mullite, sialon and zirconia, said ceramic having a coefficient of thermal expansion of not more than 70×10^{-7}/°C.; and

b) an inorganic glass selected from the group consisting of a glass lining consisting essentially of at least 55 wt% silicic acid, 0–10 wt% boric acid and 10–20 wt% alkali, and an acid-resistant enamel consisting essentially of at least 40 wt% silicic acid, 0–10 wt% boric acid and 10–30 wt% alkali;

wherein said ceramic and said inorganic glass are water insoluble and acid resistant

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5,145,012

METHOD FOR SELECTIVELY REDUCING SUBTERRANEAN WATER PERMEABILITY

Richard D. Hutchins, Placentia; Burton B. Sandiford, Balboa Island, and Hoai T. Dovan, Yorba Linda, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 21, 1990 Ser. No. 631,863

Int. Cl.[5] E21B *33/138, 43/12, 43/22*

U.S. Cl. 166—292 30 Claims

1. A method for selectively reducing the flow of an aqueous fluid with respect to the flow of a nonaqueous fluid in a subterranean formation, the method comprising the steps of:

(a) injecting into at least a portion of a subterranean formation a composition comprising a gas precursor and one or more ingredients capable of reacting to form a gel;

(b) allowing the composition to form the gel; and

(c) subjecting the gas precursor to conditions that convert at least a portion of the gas precursor into a gas during at least a portion of step (b) so that at least a portion of the gel has pathways therein containing the gas.

16. A method for selectively reducing the flow of an aqueous fluid with respect to the flow of a nonaqueous fluid in a subterranean formation, the method comprising the steps of:

(a) injecting into at least a portion of a subterranean formation a composition comprising one or more ingredients capable of reacting to form a gel;

(b) allowing the composition to form the gel; and

(c) injecting a gas into at least a portion of the composition so that at least a portion of the gel has gas-containing pathways therein.

5,145,013

SAND CONTROL WITH RESIN AND EXPLOSIVE

John M. Dees, Richardson; William J. Begnaud, Kingwood, and Nancy L. Sahr, Montgomery, all of Tex., assignors to Oryx Energy Company, Dallas, Tex.

Continuation-in-part of Ser. No. 634,404, Dec. 27, 1990, Pat. No. 5,101,900, which is a continuation of Ser. No. 383,034, Jul. 21, 1989, abandoned. This application Jan. 24, 1992, Ser. No. 825,040

Int. Cl.[5] E21B *33/138*

U.S. Cl. 166—295 22 Claims

1. A method for treating a well having perforated casing to prevent solids movement through the perforations and into the wellbore comprising:

(a) positioning a quantity of liquid resin solution such that the solution occupies the interval of the casing having perforations;

(b) positioning an explosive in proximity with the liquid resin solution;

(c) detonating the explosive;

(d) displacing the liquid resin solution remaining in the wellbore after step (c) through the perforations with a displacing fluid; and

(e) injecting a chemical solution through the perforations to cause the resin to polymerize to form a consolidated permeable matrix.

5,145,014

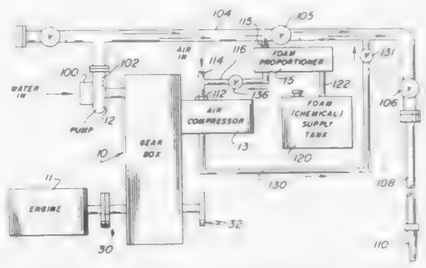
AIR SUPPLY SYSTEM FOR FIREFIGHTING APPARATUS

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Dec. 28, 1990, Ser. No. 636,079

Int. Cl.[5] A62C *5/02, 35/00, 27/00*

U.S. Cl. 169—14 17 Claims



1. An air supply system for firefighting apparatus including means for delivering a fire stream onto a fire, comprising:

a fire pump for delivering water under pressure to the fire stream, said fire pump having a pump shaft means,

a rotary vane compressor for delivering air under pressure to the water delivered to the fire stream, said compressor having a compressor shaft means, a suction and a discharge,

transmission means for driving both said pump and said compressor and including a gear box,

means for mounting said pump adjacent said gear box with said pump shaft means having a shaft portion rotatably mounted in said gear box,

means for mounting said compressor adjacent said gear box with said compressor shaft means having a shaft portion rotatably mounted in said gear box,

said transmission means comprising

an input shaft rotatably mounted in said gear box,

an input gear mounted on said input shaft for rotation therewith,

an intermediate gear rotatably mounted in said gear box to be driven by said input gear,

a pump drive gear for causing rotation of said pump shaft means, said pump drive gear being mounted on said pump shaft portion to be driven by said intermediate gear,

a compressor drive gear for causing rotation of said compressor shaft means, said compressor drive gear being mounted on said compressor shaft portion to be driven by said intermediate gear,

conduit means for connecting said compressor discharge to the fire stream, and

means for supplying a liquid foam to said compressor suction.

5,145,015

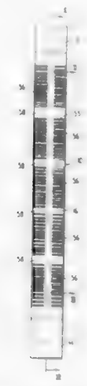
WELL POINT

George A. Thompson, 114 DeMotte Ave., Daytona Beach, Fla. 32019

Filed Jan. 23, 1991, Ser. No. 644,817

Int. Cl.[5] E21B *7/26*

U.S. Cl. 175—21 3 Claims



1. A well point assembly comprising:

a hollow elongated tube having a plurality of slots extending from one end of said tube;

upper and lower end fittings connected to opposite ends of said tube with said slots being partially covered by said lower end fitting;

said lower end fitting having an apertured transverse wall defining a valve seat and including a valve member movable into and out of engagement with said valve seat; and

perforated tubular screen means surrounding said tube with opposite ends thereof connected to said upper and lower end fittings with said screen means and said fittings having the same external diameter to provide a smooth flush connection therebetween;

said tube, said upper and lower end fittings and said screen means each being constructed of plastic material and being rigidly connected with each other by means of a cement;

whereby upon application of a suction to said upper end fitting, said valve member will be disposed in sealed engagement with said valve seat to permit water to be drawn through said screen means and said slots to be pumped upwardly through said tube and said upper end fitting.

5,145,016

ROCK BIT WITH REAMING ROWS

Roy D. Estes, Weatherford, Tex., assignor to Rock Bit International, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 516,728, Apr. 30, 1990, abandoned. This application Jan. 30, 1991, Ser. No. 647,849

Int. Cl.[5] E21B *10/16*

U.S. Cl. 175—331 28 Claims

11. An improved roller cone rock drill bit comprising:

a plurality of cone cutters;

each cone cutter being rotatably mounted on journals with sliding bearing surfaces and being sealed by an elastomeric cone/journal seal;

each cone cutter being further adapted to drill the bottom of a borehole and being characterized by the cooperative operation of primary and secondary cutting structures;

the primary and secondary cutting structures being functionally effective to maintain a full gage borehole during rotary drilling;

the primary cutting structure comprising a circumferential heel row of wear resistant inserts for cutting the corner of a borehole at substantially gage diameter;

a gage surface adjacent to the heel row;

the secondary cutting structure comprising a circumferential gage row of wear resistant gage inserts for cutting the gage diameter in the sidewall of the borehole, the inserts being rigidly secured in apertures in the adjacent gage surface and protruding from the gage surface; and

a clearance area between the gage surface and the gage inserts being functionally effective for chip formation, chip removal and heat dissipation.

5,145,017

KERF-CUTTING APPARATUS FOR INCREASED DRILLING RATES

Jesse L. Holster, Spring; Roy D. Estes, Weatherford; Jack Castle, Crowley, and Paul G. Parys, Ft. Worth, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 7, 1991, Ser. No. 638,234

Int. Cl.[5] E21B *10/04, 10/06, 10/14*

U.S. Cl. 175—333 14 Claims

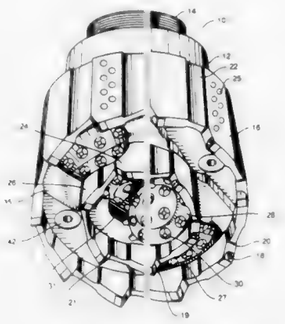
1. A drill bit comprising:

(a) a bit body having an upper end and a lower end, said lower end having an outer kerf cutter with cutting edges for cutting an outer annular kerf on rotation of the drill bit;

(b) an inner drill member positioned concentrically within said bit body having an upper end connected to said bit body and a lower end having an inner kerf cutter with cutting edges for cutting an inner annular kerf positioned within the outer annular kerf on rotation of the drill bit;

(c) at least one rolling cutter attached by mounting means to said bit body in a manner to permit rotation relative to the mounting means and extending from the interior of the

outer kerf cutter to the longitudinal axis of the drill bit, said rolling cutter having cutting edges wherein lowermost cutting edges are positioned above cutting edges of said inner and outer kerf cutters to remove material between said inner kerf cutter and said outer kerf cutter and material within said inner kerf cutter;



(d) a drilling fluid conduit disposed within said drill bit for delivering drilling fluid to said inner and outer kerf cutters and said rolling cutter, said conduit separately discharging fluid to regions bounded between and within said inner and outer kerf cutters; and

(e) means for connecting the upper ends of said bit body and drilling fluid conduit to a string of drill pipe.

5,145,018

DRILL BIT FOR DRILLING ALONG AN ARCUATE PATH

Thomas O. Schimke, and Winfred M. McCord, Jr., both of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.

Continuation of Ser. No. 406,764, Sep. 13, 1989, Pat. No. 5,099,933. This application Aug. 2, 1991, Ser. No. 739,884

Int. Cl.[5] E21B *10/26*

U.S. Cl. 175—385 **12 Claims**

1. A drill bit for drilling along an arcuate path, comprising:

a shank;

a cutting head engagable to the shank, the cutting head having a forward-projecting central point and a main body;

said main body defined by a forward cutting edge substantially perpendicular to the axis of said shank and a side cutting edge, wherein the forward cutting edge and side cutting edge intersect at a rounded corner to form a single, continuous cutting edge.

5,145,019

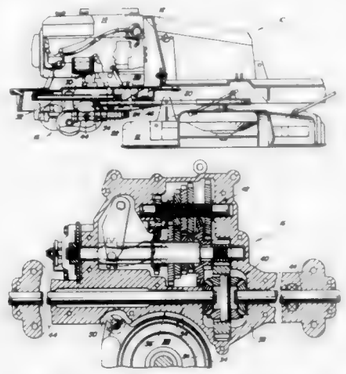
VEHICLE IMPLEMENT DRIVE CONFIGURATION

Daniel A. Sebben, West Bend; Wayne R. Hutchison, Mayville, and Jon M. Patterson, Wauwatosa, all of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jun. 14, 1991, Ser. No. 715,175

Int. Cl.[5] B60K *5/00, 17/02*

U.S. Cl. 180—62 **9 Claims**



1. In a vehicle adapted to propel an implement capable of vertical float relative to said vehicle, the implement having a driven pulley for powering the implement, said vehicle having front and rear wheels, a transaxle for driving the rear wheels, including a differential contained within one side portion of a transaxle housing,

an engine carried at the rear portion of the vehicle and above the transaxle,

the engine including a generally vertically oriented drive shaft projecting downwardly therefrom and having a drive component mounted thereon,

the improvement comprising:

a recessed area in a front portion of the transaxle housing adapted to receive the drive component therein,

and means extending between the drive shaft and the drive pulley for powering the implement.

5,145,020

SUSPENSION FOR SEAT OF POWERED WHEEL CHAIR

Mark J. Quintile, Brunswick, and Neal J. Curran, Lakewood, both of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Filed Nov. 14, 1990, Ser. No. 612,795

Int. Cl.[5] B60K *1/00;* **B60N** *2/54*

U.S. Cl. 180—65.1 **13 Claims**

1. A wheelchair having a suspension system with lateral stability, said wheelchair comprising:

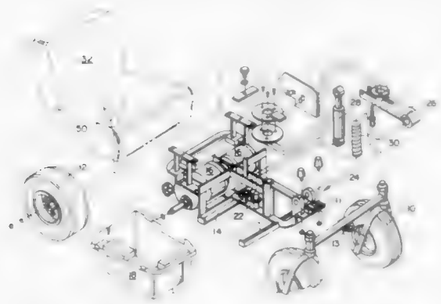
a frame, said frame having front, rear, and side edges;

front and rear wheels rotatably attached to and supporting said frame, said front wheels being at said front edge of said frame and said rear wheels being at said rear edge of said frame, said front wheels being generally axially colinear and said rear wheels being generally axially colinear;

a hinge point mounted on said frame near said front edge of said frame, said hinge point comprising a pair of parallel plates fixedly attached to said frame, each plate having a hole therethrough;

a pivot bar having first and second ends, said first end of said pivot bar rotatably attached to said hinge point and having a hole therethrough, said pivot bar fitting closely between said parallel plates so that a distance between said parallel plates is approximately equal to a diameter of said pivot bar;

a bolt, said bolt received within said holes in said parallel plates and said hole in said first end of said pivot bar; and,



a seat mounted on said pivot bar, said seat constrained to move only in a direction parallel to a plane containing one of said rear wheels.

5,145,021

POWER STEERING APPARATUS

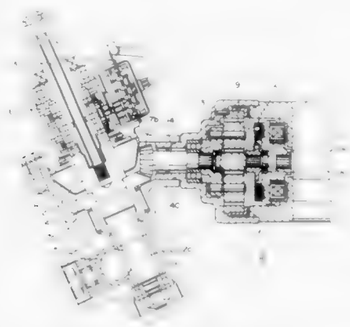
Yasuhiro Nakamura, and Akira Chikamori, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Aug. 1, 1990, Ser. No. 561,539

Claims priority, application Japan, Aug. 4, 1989, 1-203240; Nov. 17, 1989, 1-134220[U]; Mar. 26, 1990, 2-77986

Int. Cl.[5] B62D *5/04*

U.S. Cl. 180—79.1 **20 Claims**



1. A power steering apparatus comprising:

a motor disposed in a steering mechanism, and generating a steering assisting power;

an electromagnetic clutch provided between an output shaft of said motor and a transmission shaft of said steering mechanism, and connecting and disconnecting said output shaft to and from said transmission shaft depending on the action of an armature part thereof;

an intermediate transmission shaft supported by said output shaft and said transmission shaft, and supporting said armature part; and

biasing means for urging said intermediate transmission shaft in the axial direction toward a supporting position on the side of said output shaft.

5,145,022

SYSTEM AND METHOD FOR PIVOTALLY CONTROLLING VEHICLE REAR WHEELS

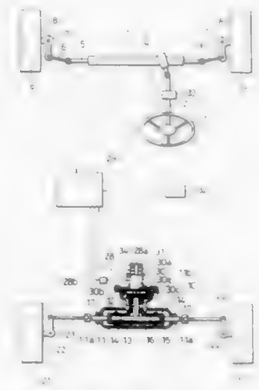
Tomoyuki Kido, Osaka, Japan, assignor to Daihatsu Motor Co., Ltd., Osaka, Japan

Filed Nov. 14, 1990, Ser. No. 612,915

Claims priority, application Japan, Nov. 15, 1989, 1-297132; Nov. 15, 1989, 1-297133; Dec. 26, 1989, 1-339284

Int. Cl.[5] B62D *5/04*

U.S. Cl. 180—79.1 **16 Claims**



1. A rear wheel steering system for a vehicle comprising:

a controller to which driving information is supplied;

a DC electric motor which is rotationally controlled by said controller;

a motor rotation sensor for detecting the rotational amount of said motor from a neutral position and feeding the detected rotational amount to said controller;

a brake controlled by said controller for suitably braking said motor;

a reduction mechanism connected to said motor; and

a rear wheel steering mechanism connected to said reduction mechanism for pivoting the vehicle rear wheels in accordance with the rotational amount of said motor;

wherein said controller comprises means for interrupting drive current to said motor when the detected rotational amount of said motor reaches a first value short of a target rotational amount set by said controller, said controller also comprising means for subsequently actuating said brake when the detected rotational amount of said motor reaches a second value between said first value and said target rotational amount.

5,145,023

MOTORCYCLE FUEL TANK PROVIDING MULTIPLE ENHANCEMENTS

Yashuyuki Tsurumi, and Mamoru Isomura, both of Shiki, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,206

Claims priority, application Japan, Jun. 10, 1988, 63-77130; Jul. 29, 1988, 63-101778; Nov. 18, 1988, 63-150501

Int. Cl.[5] B62C *1/00;* **B62D** *61/00*

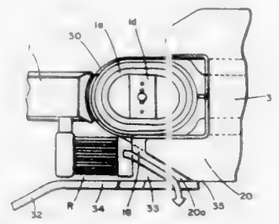
U.S. Cl. 180—68.1 **6 Claims**

1. An air flow exhausting device for a vehicle radiator in which:

a rear portion of a shroud covering an outside portion of a radiator is provided, with said rear portion at least partially overlapping and being connected to an outside surface of a fuel tank; and

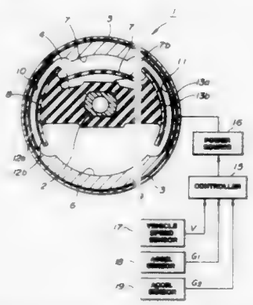
an air exhaust port is formed at a connecting location between said radiator and said outside, fuel tank surface;

said device being characterized in that:
said radiator is provided laterally of a cylinder of an engine associated with said radiator;
said fuel tank is arranged generally rearwardly of said radiator and disposed generally intermediate of a generally lower location of a vehicle seat and a generally upper location of an engine carburator;



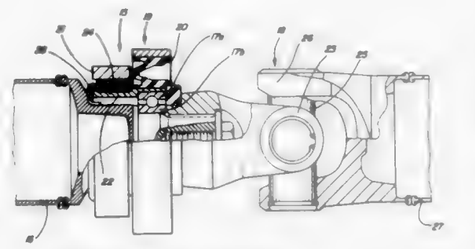
a tapering, laterally diverging fuel tank portion is formed to extend and expand rearwardly from a location at which said fuel tank and said shroud overlap each other; and
said air exhaust port is formed between said tapering, fuel tank portion and said shroud and includes
a laterally outwardly directed exhaust gas exit disposed generally rearwardly of said radiator.

5,145,024
ENGINE SUSPENSION SYSTEM
Kazuhiro Doi, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jun. 18, 1991, Ser. No. 717,197
Claims priority, application Japan, Jun. 18, 1990, 2-159372
Int. Cl.[5] B62D *21/00*
U.S. Cl. 180—312 **5 Claims**



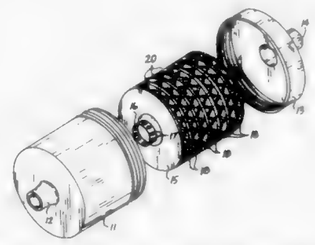
1. In an engine suspension system for supporting an engine on a chassis
a mount having chambers between which an ERF can be pumped through an orifice passage in response to relative displacement between the engine and the chassis;
electrodes disposed in the orifice passage;
means for selectively applying a voltage to said electrodes; and
means for estimating the rate at which the ERF is flowing through said orifice passage and for varying the level of the voltage which is applied to said electrodes.

5,145,025
VIBRATION DAMPER AT A DRIVESHAFT
Karl Damian, Taunusstrasse 52, 6054 Rodgau, Fed. Rep. of Germany 3
Filed Jan. 18, 1991, Ser. No. 643,045
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1990, 4003601
Int. Cl.[5] B60K *17/00*
U.S. Cl. 180—381 **7 Claims**



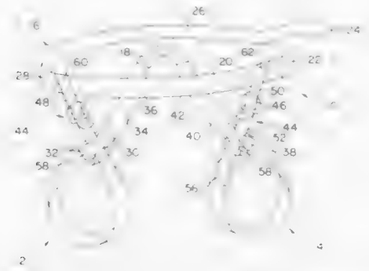
1. A vibration damper comprising:
bearing means for rotatably supporting a shaft, said bearing means including an annular outer race coaxially positioned about the shaft;
annular absorber radially affixed about said outer race and being coaxial with said shaft;
coupling means for flexibly coupling said vibration damper with a vehicle, said coupling means including an annular housing coaxially positioned about the shaft and fixed to the vehicle and a diaphragm coaxially positioned between and secured with said housing and said outer race housing for providing flexibility.

5,145,026
WATER FAUCET SILENCER APPARATUS
Harvey H. Wilder, 36 Catawba Cir., Hagerstown, Md. 21740
Filed Mar. 15, 1991, Ser. No. 670,183
Int. Cl.[5] F16K *47/02*
U.S. Cl. 181—233 **6 Claims**



1. A water faucet silencer apparatus comprising,
a cylindrical housing, the cylindrical housing including a coaxially aligned entrance conduit and a coaxially aligned exit conduit, a forward plate positioned within the housing and adjacent the entrance conduit and a rear plate positioned within the housing adjacent the exit conduit, the entrance conduit is mounted to the forward plate of the housing, with the exit conduit mounted to the rear plate of the housing, and
the cylindrical housing defining a predetermined internal diameter, and
a solid rigid end plate spaced from and parallel the rear plate of the housing, with an apertured directional cylinder coaxially mounted within the housing and the end plate in surrounding relationship relative to the exit conduit, and
a baffling means mounted within the housing between the end plate and the forward plate for directing fluid flow from the entrance conduit to the directional cylinder, and
the baffling means defined by a predetermined external diameter less than the predetermined internal diameter to define a cylindrical channel between the baffling means and the cylindrical housing, and
the baffling means includes a plurality of parallel equally spaced diffuser plates, each diffuser plate includes a coaxially aligned bore, and a diffuser panel member mounted coextensively between the diffuser plates.

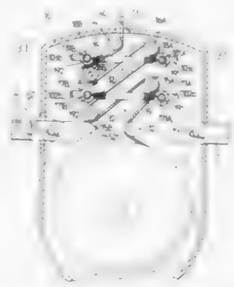
5,145,027
ROPING SIT HARNESS FOR CLIMBING OR CAVING
Paul Petzl, Barraux, and Pierre Petzl, Saint-Nazaire les Eymes, both of France, assignors to Petzl S.A., Crolles, France
Filed Nov. 19, 1991, Ser. No. 794,259
Claims priority, application France, Dec. 4, 1990, 90 15272
Int. Cl.[5] A26B *1/16*; A62B *35/00*
U.S. Cl. 182—3 **4 Claims**



1. A roping sit harness for the safety of persons abseiling along a rope, the sit harness being made up from a strap of flexible material with a high mechanical resistance, and comprising:
a pair of thigh loops, each thigh loop being in the form of a loop closed by a fixing means,
a belt having a first ventral branch, and a second dorsal branch,
a central clasping device arranged in the middle part of the first ventral branch,
a pair of extending ends joining the thigh loops to a first and a second joining points of the first branch, on each side of the clasping device,
an adjustment device associated with each thigh loop to adjust the size according to the morphology of the user,
a pair of clamping buckles fixed to the first branch of the belt by two attachment straps,
an adjustment strap of said adjustment device of each thigh loop having a first free end cooperating with the clamping buckle of the corresponding attachment strap, and a second opposite end securedly affixed to the closed loop of the thigh loop,
said fixing means of each thigh loop being located between the clamping buckle and the second end when the adjustment strap is engaged in the buckle.

5,145,028
LIFE-SAVING DEVICE FOR PEOPLE IN TALL BUILDINGS
Chin-Hua Wu, 4F., No. 7, Alley 28, Hsin-Chien Lane, Chung-Cheng Rd, Hsin-Chuan City, Taipei Hsien, Taiwan
Filed Dec. 2, 1991, Ser. No. 801,370
Int. Cl.[5] A62B *1/00*
U.S. Cl. 182—5 **3 Claims**

1. An improved life-saving device for people in tall buildings, said device comprising:
a housing having plural pairs of first slots and a plurality of second slots, such that each of said second slots is perpendicular to each pair of said first slot, a hooking means provided at the lower portion thereof for supporting a human body, and a hole in the upper portion thereof;
a reel of rope accommodated within said housing, said rope extending from said hole in said housing;
a first roller provided at the periphery of said reel, and a second roller pivotally provided near said hole of said housing;
plural pairs of intermediate rollers provided between said first roller and said second roller, said rope winding round said first roller and around said intermediate rollers to form an angle at least greater than 90 degrees with each of said intermediate rollers in contact, such that said rope forms a continuous S-shape track in the space between said first roller and said second roller;

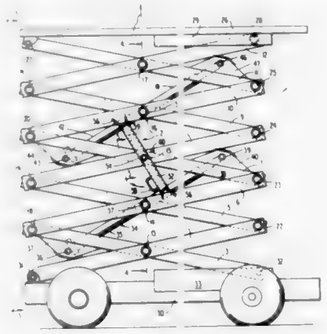


at least one pair of movable pressure rollers capable of being drawn together provided near a pair of said intermediate rollers; said movable pressure rollers being connected by a tension rod disposed therebetween and pivotally provided in one of said first slots, so that each pressure roller is caused to press against its adjacent rope
a pair of connecting rods, the first end of each connecting rod being pivotally coupled to a shaft of one of said pressure rollers, the second end of both connecting rods being commonly pivotally connected to a push rod, wherein when said push rod moves along said one of second slots, said pair of connecting rods are caused to move along one of said first slots.

5,145,029
SELF-STORING MAINTENANCE STAND FOR A SCISSOR LIFT AERIAL WORK PLATFORM
Donald W. Blasdell, Jr., and Raymond H. Wetzel, both of Waynesboro, Pa., assignors to Kidde Industries, Inc., Iselin, N.J.
Filed Sep. 11, 1991, Ser. No. 757,539
Int. Cl.[5] E04G *1/22*
U.S. Cl. 182—63 **19 Claims**

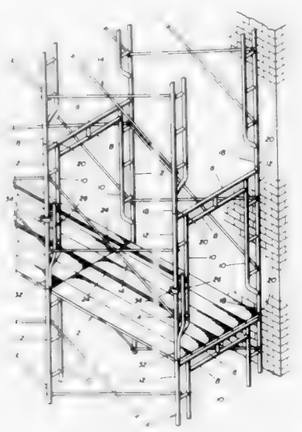
1. A maintenance stand for a scissor lift aerial work platform of the type having a work platform supported by a plurality of pairs of scissor lever arms pivotally connected at their medial portions, with adjacent pairs of scissor arms pivotally connected at their end portions, and at least one actuator operatively connected to the scissor lever arms for raising the lever arms and associated platform from a retracted position to an elevated position; said maintenance stand comprising, an arm, a transversely extending shaft connected to a first medial pivot; connection of a first pair of scissor lever arms, said arm being connected to said shaft and being freely rotatable therewith, first and second transversely extending shaft portions respectively connected to the adjacent medial pivot connection of a second pair of scissor lever arms above said first medial pivot connection, and to the adjacent medial pivot connection of a third pair of scissor lever arms below said first medial pivot connection, and a seat mounted on each end of said freely rotatable arm, whereby when the work platform is raised to an elevated position, the arm is rotatable to a substantially vertical

position to position the seats for supporting said first and second transversely extending shaft portions on the next adjacent



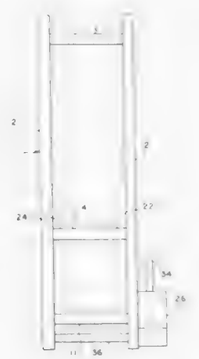
medial pivot connections, to thereby hold the lever arms and associated work platform in an elevated position.

5,145,030
GUARD RAIL POST
Jim J. Pavlescak, Middleburg Heights, and Gary V. Anderson, Cleveland, both of Ohio, assignors to Waco International Corporation, Cleveland, Ohio
Filed Sep. 11, 1991, Ser. No. 757,719
Int. Cl.[5] E04G *1/26, 1/14*
U.S. Cl. 182—113 14 Claims



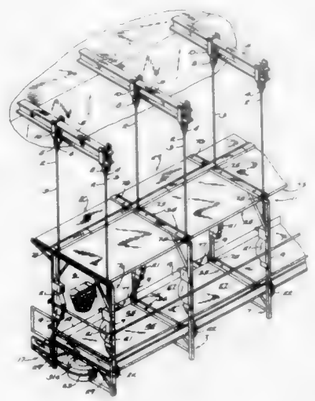
1. A guard rail post for use on a construction scaffold comprising:
a) means for securing the post alongside a vertical scaffold support member;
b) means for positioning the post at a predetermined location relative to a scaffold work platform, wherein the positioning means includes a pin for insertion into an existing hold in a scaffold truss, and;
c) means for connecting a guard rail to the guard rail post in a predetermined position above the scaffold work platform.

5,145,031
ELECTRIC LADDER
Powell L. Sprunger, 63 Gaslight La., Easton, Mass. 02334
Filed Sep. 24, 1990, Ser. No. 586,935
Int. Cl.[5] E06C *7/12*
U.S. Cl. 182—141 12 Claims



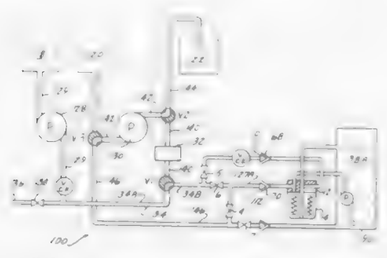
1. An adjustable ladder, comprising:
a pair of spaced side supports;
means for retaining the supports in a spaced relationship; a rung;
means for slidably mounting the rung in the supports;
means on said side supports for moving the rung along the supports for adjusting the position of the rung; and
said means laterally stabilizing the rung for positive control of the rung during both upward and downward movement of the rung by the moving means.

5,145,032
MASON'S SCAFFOLD
Joseph S. Puccinelli, Brown Deer; Peter T. Foseid, Milwaukee, and Stig Karlsen, Burlington, all of Wis., assignors to Figgie International, Inc., Willoughby, Ohio
Filed Nov. 13, 1990, Ser. No. 613,342
Int. Cl.[5] E04G *1/18*
U.S. Cl. 182—142 21 Claims



1. A mason's scaffold suspendable from a building by a plurality of cables comprising:
a. at least two frames, each frame having a pair of vertical members and upper and lower horizontal members extending between and joined to the vertical members to form a generally rectangular frame;
b. at least one standard platform extending between the frames, the standard platform having hooks on the opposite ends thereof that rest on and are supported by the lower horizontal members of the respective frames to thereby create a deck between the frames; and
c. at least two platform fasteners overlying and being unsecured to portions of the standard platform deck adjacent the hooks and overlying and being removably secured to respective frame lower horizontal members with the hooks of the standard platform between the platform fastener and the frame lower horizontal members,
so that the standard platforms are positively retained to the frames by the platform fasteners.

5,145,033
SANDWICH ADAPTER REUSABLE OIL FILTER MOUNTED TO SAME AND PROCESS FOR USING THE SAME
Ram D. Bedi, and Adrianus J. van der Griendt, both of Birmingham, Mich., assignors to K.J. Manufacturing Co., Wixom, Mich.
Filed Jul. 17, 1990, Ser. No. 553,790
Int. Cl.[5] F16N *33/00*
U.S. Cl. 184—1.5 12 Claims



1. An oil filter mounting adapter directly connectable with an internal lube oil passage system and the oil pump discharge passage of the engine block of an internal combustion engine, the mounting adapter comprising:
a sandwich adapter having a first face adapted to sealingly contact the engine block and to overlay associated openings in the internal lube oil passage system and the oil pump discharge passage, a second face adapted to sealingly connect with an associated oil filter unit, said sandwich adapter having at least one engine oil entry opening in proximity to the associated opening in the internal lube oil passage system, at least one engine oil exit opening proximate to said oil filter unit, a central through bore extending laterally through said sandwich adapter from said first face to said second face, and means for introducing and removing fluids through said sandwich adapter, wherein said fluid introduction means comprises a flush fluid inlet opening in fluid communication with a first end of an inlet channel, said inlet channel having said first end and a second end, and wherein said fluid removal means comprises a flush fluid outlet opening in fluid communication with a first end of an exit channel, said inlet channel having said first end and a second end;
an inlet hose having a first end connected to said flush fluid inlet opening and a second end releasably connectable with an external pump device;
an outlet hose having a first end connected to said flush fluid outlet opening and a second end releasably connectable with an external pump device; and
a nipple located in and extending through said central through bore, said nipple comprising:
a) a conduit having a hollow body, said hollow body having first and second opposed ends and at least one aperture centrally located therebetween, said first end adapted to matingly connect with the associated opening in the internal lube oil passage system, and said second end adapted to matingly connect with said oil filter unit;
b) means for releasably and matingly connecting said first conduit end with said filter orifice in the lube oil passage system; and
c) means for releasably and matingly connecting said second conduit end with an exit portal located in said oil filter unit.

5,145,034
LIFT TRUCK FORK CARRIAGE
Kevin L. Miles, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.
Filed Dec. 8, 1988, Ser. No. 281,486
Int. Cl.[5] B66B *9/00, 9/20*
U.S. Cl. 187—1 R 3 Claims

1. In a forklift truck fork carriage having a sideplate and a crossbar arranged to be joined in rectangular direction, an improved means of attaching a sideplate to a crossbar wherein the improvement comprises:
a) a joint insert member, having a seam for attachment to the sideplate and a flange arranged transverse to the stem for attachment to the crossbar and further characterized by the projection of the stem beyond the upper edge of the flange, interposed between the crossbar and sideplate

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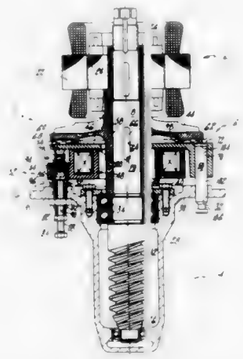
5,145,035
ELEVATOR DISC BRAKE
Alphonso Garrido, Madrid; Antonio Sanchez, Fuenlabrada; Jose M. Sandoval, Leganes, and Jose Sevilleja, Madrid, all of Spain, assignors to Otis Elevator Company, Farmington, Conn.
Filed Apr. 15, 1991, Ser. No. 685,390
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—20 5 Claims

1. An elevator disc brake for use with a shaft which rotates as the elevator is raised or lowered, said elevator disc brake comprising:
a non-rotating housing,
a disc securely fastened to said shaft and rotating therewith,
a non-rotating plate for cooperating with said disc to create sufficient friction to brake the rotation of said shaft,
a guide means for guiding said plate into and out of contact with said disc, said guide means attaching to said housing such that said guide means is free to move coaxially with said shaft,
spring means for urging said plate into contact with said

disc, said spring means bein : attached to said housing; and,



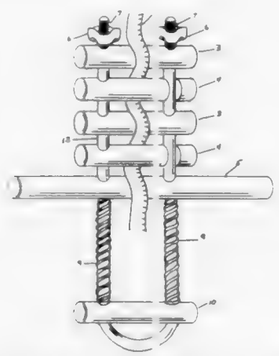
an electromagnet encircling sai d shaft and attaching to said spring means, said electroma gnet urging said plate out of contact with said disc when ctivated.

5,145,0 16

SELF CONTROLLED SAFET / DESCENT RETARDER

Michael Omalia, 1855 Diamond St. #5-122, San Diego, Calif. 92109

Filed Apr. 11, 1991, ‘er. No. 699,306
Int. Cl.[5] A6. B *1/14*
U.S. Cl. 188—65.5 1 Claim



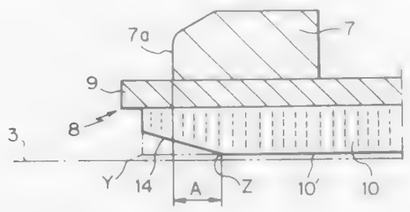
1. A controlled descent retard ng device to allow a user to control their descent by using f iction to either regulate the speed or stop a rope line from p assing through it, comprising:
an elongate U-shaped bar wit two longitudinal side members, one end of the U bei g open and an opposite load bearing end of the U being :losed;
a plurality of movable cross ars, each having a through bore at one end for receivi g one of said two side members, and each cross bar, at second end having a slot for receiving the other of said wo side members;
an elongate cross bar used as handle bar by said user, said elongate bar having two thr ugh bores for receiving both of said two side members;
two coil springs, one on each ide member between the load bearing end and the elonga e cross bar;
wherein, the rope line is guid d through the cross bars in a serpentine manner, and is al o guided between one of said plurality of cross bars and said elongate cross bar such that, the user can one of, nove the elongate cross bar, against a force exerted by th e coil springs, away from said one of the plurality of cross bars to reduce the friction on the rope line thus increasing the speed of descent, or the user can allow the force of the coil springs to move the elongate cross bar closer to said one of the plurality of cross bars to increase the friction on the rope line to one of decreasing the speed of or stopping the descent.

5,145,037

DISK BRAKE

Kinzo Kobayashi, Kanagawa, and Yoshikazu Gamoh, Yamanashi, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Mar. 6, 1991, Ser. No. 665,223
Claims priority, application Japan, Mar. 6, 1990, 2-22377[U]
Int. Cl.[5] F16D *65/00*
U.S. Cl. 188—73.1 4 Claims



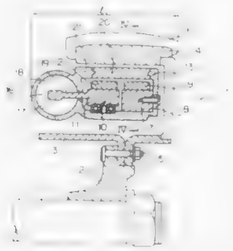
1. A disc brake comprising:
a rotating disc having inner and outer side surfaces;
a carrier fixedly attached to a nonrotating part of a vehicle body, said carrier straddling said rotating disc;
inner and outer friction pads confronting the inner and outer side sufaces, respectively, of said rotating disc, said inner and outer pads being slidably supported in the axial direction of said disc by said carrier;
a caliper slidably supported in the axial direction of said disc by said carrier, said caliper straddling said disc;
a cylinder constituting an integral part of said caliper, said cylinder being disposed to one side of said inner friction pad remote from said disc;
a piston slidably received in said cylinder, said piston forcing said inner friction pad onto the inner said surface of said disc when actuated; and a claw portion formed constituting an integral part of said caliper, said claw portion disposed to one side of said outer friction pad remote from said disc, and said claw portion being adapted to force the outer friction pad onto the outer side surface of said disc when said pistion is actuated;
said outer friction pad comprising a backing plate and a lining rigidly secured to said backing plate, said lining having a friction surface facing said disc so as to be pressed against the outer side surface of said disc by said claw portion when the piston is actuated,
said outer friction pad defining a central portion in a widthwise direction substantially coincident with directions of rotation of said disc, and two side portions extending from and located on opposite sides of said central portion such that said lining of the outer friction pad has side portions constituting the side portions of the outer friction pad;
said claw portion including a pair of claws respectively located at positions adjacent the side portions of said outer friction pad, each of said claws having terminal outer side surfaces;
both side portions of the lining of said outer pad extending outwardly beyond respective ones of said terminal outer side surfaces of the claws of said caliper in said widthwise direction;
the lining of said outer friction pad being chamfered at said side portions thereof so as to form respective inclined surfaces each intersecting said friction surface at a line defining an obtuse-angled corner between the respective inclined surface and the friction surface, such that fine vibration of said outer friction pad is prevented at the side portions thereof when said claw portion forces the outer friction pad onto the outer side surface of said disc; and
each said line intersecting an imaginary line, which extends in said widthwise direction through the central longitudinal axis of said cylinder, at a position whose distance from the terminal outer side surface of the coresponding said claw is in the range of from one third to one fourth of the width of said claw as taken from the terminal outer side surface thereof along said imaginary line, such that vibration of said outer friction pad at each said corner is suppressed by said claw portion when said claw portion forces the outer friction pad onto the outer side surface of said disc.

5,145,038

EDDY CURRENT TYPE RETARDER

Tohru Kuwahara, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 693,987
Claims priority, application Japan, Apr. 28, 1990, 2-112026
Int. Cl.[5] B60L *7/28*; F16D *63/00*
U.S. Cl. 188—158 14 Claims



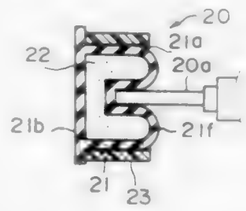
1. A retarder employing eddy current mounted on a shaft rotated by an engine of a vehicle, comprising:
a hollow drum-shaped rotor mounted on the shaft, the rotor having an inner wall defined by a hollow portion of the rotor;
a first stator mounted on a stationary member of the vehicle such that the first stator faces the inner wall of the rotor, the first stator having a circumferential direction and a center axis;
a first group of permanent magnets mounted on the first stator at intervals in the circumferential direction of the first stator with poles of the magnets being reversed alternately in the circumferential direction of the first stator;
a second stator provided near the first stator such that the second stator faces the inner wall of the rotor, the second stator having a circumferential direction and a center axis coinciding with the center axis of the first stator, the second stator being adapted to be movable relative to the first stator by a rotation about its center axis;
a second group of permanent magnets mounted on the second stator at the same intervals as the first group of permanent magnets in the circumferential direction of the second stator with poles of the magnets being reversed alternately in the circumferential direction of the second stator;
a magnetic-passage-forming-ring provided between the rotor and the first and second stators, the ring having ferromagnetic elements which respectively extend over the first group of permanent magnets and the second stator, the ferromagnetic elements being spaced in the circumferential direction of the first stator at the same intervals as the first group of magnets; and
an actuator for moving the second stator such that the poles of the magnets of the second group are indentical with the poles of the adjacent magnets of the first group during a brake applying operation, and for moving the second stator such that the poles of the magnets of the second group are opposite the poles of the adjacent magnets of the first group during a brake releasing operation.

5,145,039

DAMPER FILLED WITH OIL

Kiyoshi Morikawa; Atsushi Kurokawa; Sei Onishi; Kiyohito Kajihara; Kaoru Takemasa, and Osamu Kitazawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 617,129
Claims priority, application Japan, Feb. 16, 1990, 2-35455; Feb. 16, 1990, 2-35456
Int. Cl.[5] F16F *9/00*
U.S. Cl. 188—298 3 Claims



1. A damper comprising:
hollow, sealed cylindrical body of relatively soft, elastic material filled with viscous oil having an integral flexible plate portion at one end of said cylindrical body and an integral base at the other end of said cylindrical body for securing said body to a support member, said flexible plate portion being engageable with a rod for suspending a device;
holding means of relatively hard, rigid material adhesively secured to said cylindrical body intermediate said flexible plate portion and said base to hold the entire cylindrical body;
said flexible plate portion having a recess indented into an inside portion of said cylindrical body;
said rod being engaged with said recess so that lateral movement of the rod is damped by said flexible plate portion.

5,145,040

CABLE WINDING DEVICE

Manfred Fladung, Mömbris, Fed. Rep. of Germany, assignor to Manfred Fladung GmbH, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,115
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1989, 8913225[U]; Dec. 11, 1989, 8914558
Int. Cl.[5] H02G *11/02*
U.S. Cl. 191—12.2 R 14 Claims

1. A cable winding device for stowage of an electrical supply cable provided to connect a central aircraft supply system of an airport to a supply plug connection of an aircraft, said supply cable being windable through a peripheral opening of a drum-type cable winding reel, said device comprising;
a tubular guide element through which a length of said supply cable may slide, said guide element enclosing cross-sections of said supply cable as said supply cable is slid through said guide element, said guide element extending from a holding device surrounding said opening of said cable winding device, said holding device being adjustable in relation to said cable winding device,
a centering element extending from a plug unit connected to a free end of said supply cable, said centering element surrounding a cross-section of said supply cable adjacent said plug unit, said centering element being insertable into

said guide element when said supply cable is wound upon said device, and wherein,

said guide element is divided in o a tubular inner section and a tubular outer section, wh ch each enclose a separate

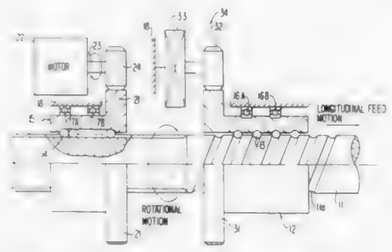
portion of the length enclos d within said guide element, and are flexibly connected to one another by a flexible tubular connecting means which is less rigid than said inner and said outer section.

5,145,041

MOTION CONVERT NG MECHANISM

Masanori Hirai, Gifu, Japan, ass gnor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed May 29, 1991, Ser. No. 707,099
Claims priority, application Japan, Jun. 1, 1990, 2-143808
Int. Cl.[5] F16D 65/14
U.S. Cl. 192—1.22 10 Claims



8. A motion converting mecl anism comprising:

a feed member provided witl a screwed portion;

a screw nut member engagin ; with said screwed portion of said feed member;

a support member rotatably supporting said feed member and said screw nut membe ;

single drive means for impar ing a rotational motion to said feed member and to said s rew nut member; and

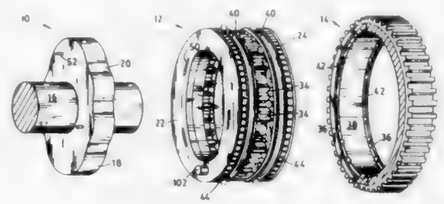
a releasable braking means o eratively connected to one of said screw nut member an said feed member for braking one of said rotational mot on imparted to said screw nut member and said rotational motion imparted to said feed member.

5,145,042

ROLLER CLUTCH

Roger MacPherson, 185 Pleasant Way, Penfield, N.Y. 14526

PCT No. PCT/US90/02962, § 371 Date Nov. 21, 1991, § 102(e) Date Nov. 21, 1991, PCT Pub. No. WO90/14530, PCT Pub. Date Nov. 29, 1990
Division of Ser. No. 357,407, May 26, 1989, Pat. No. 4,958,533.
This PCT application May 25, 1990, Ser. No. 776,283
Int. Cl.[5] F16H 3/08; F16D 41/08
U.S. Cl. 192—44 8 Claims



1. A two-way roller clutch for use in an automotive drive line of the type that is engageable for rotatively coupling a shaft and ring gear and is disengageable for permitting relative rotation between the shaft and ring gear including a camming member having a plurality of recesses formed in its surface and a roller retainer circumferentially supporting a plurality of rollers within respective recess in said camming member, characterized by:

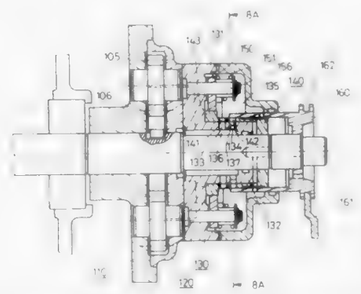
an externally controlled actuator operatively connected to said roller retainer for indexing said roller retainer together with said plurality of rollers between two limit positions within said recesses; one of said limit positions enabling engagement of the roller clutch in response to one direction of relative rotation between the shaft and ring gear and the other of said limit positions enabling engagement of the roller clutch in response to an opposite direction of relative rotation between the shaft and ring gear.

5,145,043

HYDRAULIC CLUTCH

J. F. Kuo, 5F, No.188, Sec.3, Hsin-Yi Road, Taipei, Taiwan

Filed Oct. 18, 1990, Ser. No. 599,523
Int. Cl.[5] F16D 31/04
U.S. Cl. 192—61 4 Claims



3. A hydraulic clutch adapted to be mounted between a power source and an output shaft, comprising:

a pump mechanism driven by the output shaft, said pump mechanism having a first passage for hydraulic oil;

a valve mechanism, comprising a rotatable valve body surrounding said pump mechanism, said valve body being provided with a passage for hydraulic oil and being rotatable between first and second positions for connecting and disconnecting said first and second passages; and a sleeve

member surrounding said valve body, said sleeve member being provided with a third passage for hydraulic oil and being axially slidable for releasing the oil pressure in said first and second passages, said first, second and third passages forming a loop; and

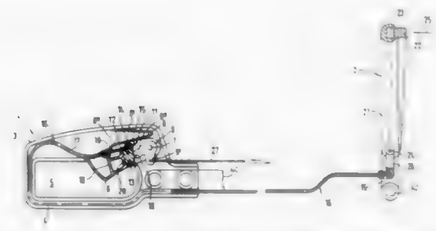
a control mechanism for selectively placing said hydraulic clutch in a first dynamically connected state wherein the output shaft is dynamically connected to the power source by rotating said valve body to establish a sufficiently high oil pressure within said first and second passages, or to become a dynamically disconnected state wherein the output shaft is disconnected from the power source by rotating said valve body to release the established oil pressure within said housing assembly.

5,145,044

TWO-HANDLE ARRANGEMENT FOR A HANDHELD PORTABLE TOOL

Jochen Kramer, Stuttgart, and Hans-Peter Dohse, Kernen/-Rommelshausen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Division of Ser. No. 571,103, Aug. 23, 1990, Pat. No. 5,076,411.
This application Oct. 29, 1991, Ser. No. 783,936
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, 3929441
Int. Cl.[5] F02D 11/02; F16P 3/18
U.S. Cl. 192—131 R 21 Claims



11. A two-handle arrangement for a handheld portable tool having a motor housing for accommodating a motor therein for driving a work tool, the motor being controlled via a throttle pull line and the two-handle arrangement being provided to permit two-handed operation of the tool by an operator, the two-handle arrangement comprising:

a forward handle connected to the housing;

a rearward handle connected to the housing rearward of said forward handle;

actuator means for actuating the drive motor of the portable tool, said actuator means being mounted in said rearward handle so as to be movable between a start position corresponding to a standstill condition of the work tool and an operating condition wherein the drive motor drives the work tool;

throttle redirect means connected directly to the throttle pull line for acting on the motor;

coupling detent means interposed between said throttle redirect means and said actuator means, said coupling detent means being movable between a coupling position wherein said actuator means is coupled to said throttle redirect means and a decoupling position wherein said actuator means is decoupled from said throttle redirect means;

enabling means connected to said coupling detent means and being mounted in said forward handle so as to be movable from a rest position corresponding to said decoupling position into an active position for moving said decoupling detent means into said coupling position; and,

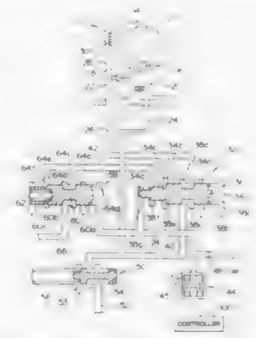
said coupling detent means and said throttle redirect means conjointly defining interface means for permitting a force-transmitting connection to be established between said actuator means and said throttle redirect means via said interface means only when said coupling detent means is in said coupling position and said actuator means in in said start position.

5,145,045

CONTROL SYSTEM FOR LOCK-UP CLUTCH OF AUTOMATIC TRANSMISSION

Tatsuo Wakahara, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 25, 1991, Ser. No. 797,194
Claims priority, application Japan, Nov. 26, 1990, 2-321543
Int. Cl.[5] F16D 33/00
U.S. Cl. 192—3.29 9 Claims



1. A lock-up clutch control system for an automotive transmission which includes a torque converter with a lock-up clutch and apply and release chambers for controlling a degree of engagement of the lock-up clutch according to a difference in hydraulic pressures between the apply and release chambers, comprising:

a first valve, having first and second pilot ports, operable to control a degree of hydraulic pressure difference between the apply and release chambers according to pressure levels of hydraulic pressures input to the first and second pilot ports, said first valve being responsive to a hydraulic pressure input to the first pilot port which is less than a first preselected level to provide a first hydraulic pressure difference between the apply and release chambers for establishing disengagement of the lock-up clutch, said first valve being further responsive to a hydraulic pressure input to the first pilot port which is greater than the first preselected level and less than a second preselected level to vary the hydraulic pressure difference between the apply and release chambers at a first rate to provide a second hydraulic pressure difference between the apply and release chambers for establishing partial engagement of the lock-up clutch, and responsive to a hydraulic pressure input to the first pilot port which is greater than the second preselected level and a hydraulic pressure of a preselected pressure level input to the second pilot port to provide a third hydraulic pressure difference between the apply and release chambers for establishing full engagement of the lock-up clutch; and

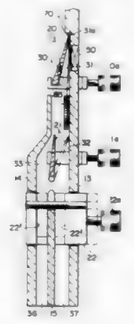
a second valve responsive to a hydraulic pressure input to a pilot port thereof which is greater than said second preselected level to supply the hydraulic pressure to the second pilot port of said first valve for activating the first valve in cooperation with the hydraulic pressure input to the first pilot port for varying the hydraulic pressure difference between the apply and release chambers at a second rate greater than the first rate to establish the third hydraulic pressure difference.

5,145,046

COIN HANDLING MECHANISM FOR VENDING MACHINE

Naoto Satoh, Maebashi, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 253,606, Oct. 5, 1988, abandoned. This application Jul. 20, 1990, Ser. No. 555,368
Claims priority, application Japan, Oct. 8, 1987, 62-154180[U]
Int. Cl.[5] G07F *1/04, 3/04*
U.S. Cl. 194—203 27 Claims



1. A coin handling mechanism for vending machines, said mechanism comprising:

holding means for holding a suspender attached to a deposited coin;

cutting means for cutting the suspender being held by said holding means;

a cash box;

a customer change mechanism; and

guiding means, associated generally with the time of passage of the suspender and attached deposited coin, including the time the suspended coin is held by said holding means, as compared with the shorter time of passage of a coin without an attached suspender, for selectively guiding a coin with an attached suspender portion cut by said cutting means generally from said holding means along a first coin path to said cash box and a coin without an attached suspender along at least a second coin path to said customer change mechanism.

5,145,047

FLEXIBLE PRODUCTION SYSTEM COMPRISING INDIVIDUALLY MOTORIZED MECHANICAL MODULES WHOSE OPERATION IS SELECTED AND SYNCHRONIZED BY ELECTRONIC MEANS

Claude Terracol, Eybens; Kazimir Koch, Meylan, and Gérard Gros, Noyarey, all of France, assignors to Merlin Gerin, France

Continuation of Ser. No. 413,076, Sep. 27, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 666,478
Int. Cl.[5] B65G *43/00*
U.S. Cl. 198—341 3 Claims

1. A production system capable of high speed operation and instantaneous adaptation to produce alternative versions of product being manufactured comprising:

a fixed workstation support plane

a lift-and-carry module defining a linear path along said fixed workstation support plane, for conveying a plurality of products being manufactured along said linear path;

a plurality of working modules disposed along said linear path and having separate cam shafts and drive motors associated therewith, each of said modules being capable of performing an individual operation during a substantially common time period on a corresponding product being manufactured while said product is resting on said fixed workstation support plane in a position along said linear path corresponding to said working module;

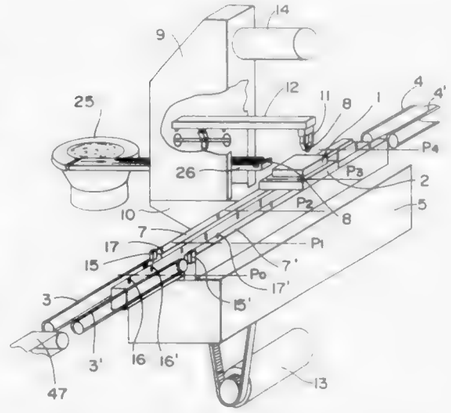
an upline product feed conveyor for providing said products being manufactured to an upline end of said lift-and-carry module;

a downline conveyor for receiving said products being manufactured from a downline end of said lift-and-carry module;

said lift-and-carry module comprising a support rule moveable in a rectangular cycle in a vertical plane, for periodically lifting each of said products being manufactured from its respective resting position on said fixed workstation support plane and for placing each of said products being manufactured in a position corresponding to a next working module, one step downline in said linear path from its previous position;

said lift-and-carry module further comprising means for providing reduced-speed portions of vertical movement of said support rule, at a level corresponding to said fixed workstation support plane, such that vertical impacts harmful to said products are minimized;

and wherein each of said plurality of working modules has two selectable states,



a first of said two selectable states being an active state in which said modules perform operations on said products being manufactured,

and a second of said two selectable states being an inactive state in which said modules do not perform operations on said products being manufactured;

and wherein the production system further comprises an electronic control system for providing independent control of the function performed by each working module and synchronization of all said working modules and for selecting working modules to be rendered active, the providing and selecting operations being carried out through the cam shafts and associated drive motors of the working modules;

such that each of said working modules can be controlled individually permitting high speed treatment of the products being manufactured and such that the production system may adapt instantaneously to processing alternative versions of said products;

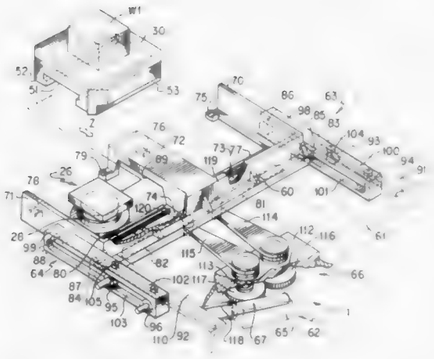
said production system further comprising a sensor, electrically coupled to said electronic control system, for determining which of said alternative versions is being manufactured at a given time and at a given position along said linear path.

5,145,048

PALLET CHANGER

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Japan

PCT No. PCT/JP88/00564, § 371 Date Oct. 27, 1989, § 102(e) Date Oct. 27, 1989, PCT Pub. No. WO88/10169, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 13, 1988, Ser. No. 442,336
Claims priority, application Japan, Jun. 19, 1987, 62-151099
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—346.1 8 Claims



1. A pallet changer for a machine tool, comprising:

a machine tool table;

first drive means for moving said machine tool table along a fist axis;

second drive means for moving said machine tool table along a second axis;

mounting means for mounting a plurality of pallets, each said pallet having a work piece, said mounting means comprising:

guide means arranged along said first axis,

a first mounting part and a second mounting part, and

an intermediate part disposed between said first mounting part and said second mounting part and including means for permitting the machine tool table to pass there through, one of said pallets being supported between said first and intermediate mounting parts and another of said pallets being supported between said second and intermediate parts;

support means or supporting the mounting means; and

moving means for moving the mounting means relative to the machine tool table along a third axis perpendicular to said first axis and said second axis, said moving means comprising:

third drive means mounted on said support means so as to be linearly moveable, and

operating means driven by said third drive means in cooperation with said guide means for moving said mounting means on said support means relative to said machine tool table;

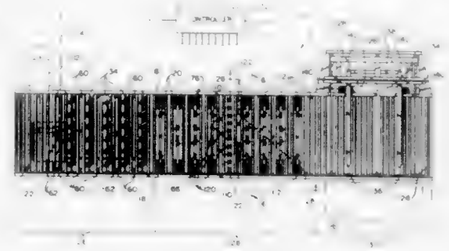
wherein said machine tool table is movable along said first axis so as to detachably engage a pallet with said mounting means, and said machine tool table is movable along said second axis so as to remove a pallet from engagement with said mounting means.

5,145,049

PATTERN FORMING CONVEYOR

Jack McClurkin, 1620 Chesapeake Dr., Hoffman Estates, Ill. 60195

Filed Oct. 12, 1990, Ser. No. 596,524
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—374 32 Claims



1. A pattern forming conveyor for conveying bundles from a manufacturing line to a point of discharge, comprising:

a frame;

an elongated conveying surface disposed in said frame for continuously advancing bundles in a direction of bundle movement;

said conveying surface comprising first, second and third zones further comprising, respectively, means for centering bundles, means for rotating bundles, and means for discharging bundles, wherein:

said means for centering is automatically adjustable to urge a bundle to simultaneously shift laterally to one of a plurality of positions in either direction on said conveying surface and advance in said direction of bundle movement substantially without rotation of said bundle; and

said means for rotating is adapted to urge a bundle to simultaneously rotate and advance a bundle in said direction of bundle movement toward said third zone;

means for controlling said means for centering, rotating and discharging bundles, whereby said means for centering is automatically adjusted; and

power means for operating said conveyor adapted to drive said elongated conveying surface and said means for centering, rotating, discharging and controlling;

whereby bundles may be manipulated and organized into one of a plurality of predetermined bundle patterns in said third zone and discharged therefrom.

5,145,050

REVERSED CAN END EJECTION SYSTEM

Loodie M. Booher and Stanley L. Buchanan, both of Bristol, Tenn., assignors to Reynolds Metal Company, Richmond, Va.

Filed Dec. 20, 1991, Ser. No. 811,343
Int. Cl.[5] B65G *43/08*
U.S. Cl. 198—395 19 Claims

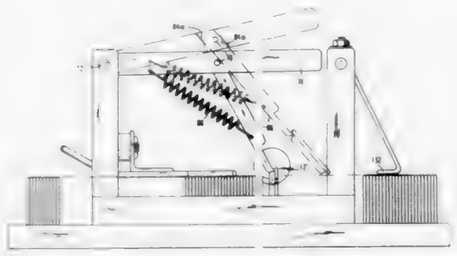
4. A reversed can end ejection system for ejecting a can end in reverse orientation relative to a moving stack of otherwise similarly aligned and nested ends, wherein said ends, when properly nested, each has an outermost peripheral surface which results in a stack having a cylindrical exterior ridged surface and wherein a reversely oriented end has an outermost peripheral surface which results in a peripheral gap with an adjacent end, comprising:

(a) a support frame;

(b) reversed end extraction hook means mounted to said support frame and normally disposed to contact said outermost peripheral surface of generally each said end in said stack during normal conveyance of said stack, including any said peripheral gap; and

(c) means for enabling said hook means to enter said periph-

eral gap and contact a portion of said reversed end in hooked engagement, whereby continued movement of



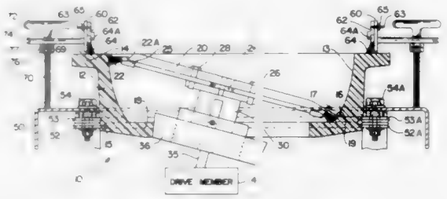
said stack during said hooked engagement causes the hook means to lift and remove the reversed end from the stack.

5,145,05

DISC FOR CENTRIFUGAL FEEDER

Kurt H. Hoppmann, Falls Church, Va., assignor to Hoppmann Corporation, Chantilly, Va.

Filed Jul. 2, 1991, Ser. No. 724,768
Int. Cl.[5] B65G *47/12*
U.S. Cl. 198—396 **7 Claims**



1. A disc for a centrifugal feeder for supplying objects comprising:

a bowl for receiving objects to be fed therefrom;

a rim mounted adjacent to an upper surface of said bowl;

a disc disposed within said bowl and extending at an incline from a lower portion of said bowl upwardly to a point adjacent to said rim for delivering objects from said lower portion of said bowl upwardly to said rim, said disc being spaced a predetermined distance from an interior surface of said bowl to form a gap between said disc and said interior surface of said bowl; and

drive means for rotating said bowl and said disc at predetermined speeds and in a predetermined direction;

the improvement comprising:

means operatively connected to said disc for continuously spanning and accommodating a variation in said gap between said disc and said interior surface of said bowl for ensuring the delivery of objects from within said bowl to said rim and for preventing objects from falling or lodging within said gap.

5,145,05.

APPARATUS FOR SUBSTANTIALLY SIMULTANEOUSLY PROCESSING MULTIPLE ELECTRIC MOTOR PARTS

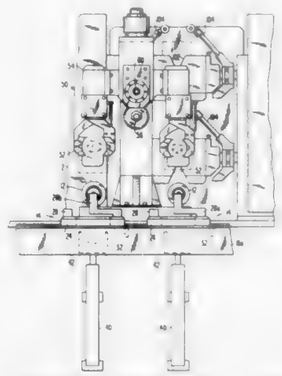
Luciano Santandrea, and Massimo Lombardi, both of Florence, Italy, assignors to Axis USA, Inc., Marlborough, Mass.

Filed Apr. 10, 1991, Ser. No. 683,049
Int. Cl.[5] B65G *47/86*
U.S. Cl. 198—468.2 **20 Claims**

1. Apparatus for processing a plurality of electric motor parts comprising:

means for conveying said motor parts substantially side by side in a substantially horizontal plane;

means for removing at least two of said motor parts from said means for conveying and for rotating said at least two motor parts relative to one another so that they become substantially side by side in a substantially vertical plane, with one of said at least two motor parts being vertically above the other of said at least two motor parts in said substantially vertical plane;



means for substantially simultaneously processing said at least two motor parts while they are substantially side by side in said substantially vertical plane; and

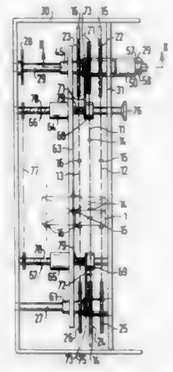
means for returning said at least two motor parts to said means for conveying after processing by said means for processing, said at least two motor parts being returned to said means for conveying so that they are again substantially side by side in a substantially horizontal plane.

5,145,053

CONVEYOR APPARATUS IN PACKAGING MACHINES

Eberhard Krieger, Weinstadt; Walter Dietrich, Weinstadt, and Siegfried Weber, Rudersberg, all of Fed Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 16, 1991, Ser. No. 760,668
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1990, 4036510
Int. Cl.[5] B65G *15/14*
U.S. Cl. 198—626.5 **12 Claims**



1. A system for conveying articles in packaging machines, in particular different sized previously formed boxes in cartoning

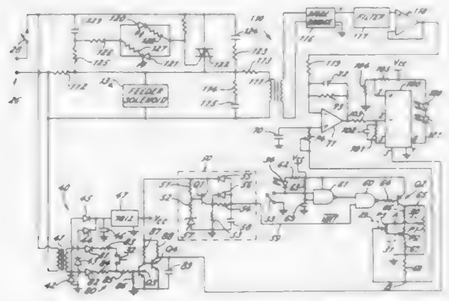
machines, comprising a plurality of endless conveyor chains, each of said endless conveyor chains including a plurality of drivers spaced at equal intervals, of which leading and trailing drivers of one guide unit contact front and back sides of a box in a dimensionally stable manner for movement of boxes with movement of said endless conveyor chains guided on chain wheels driven by a drive shaft over at least one deflection path, said chain wheels are adjustable in terms of rotational angle relative to each other on said drive shaft carrying the chain wheels to set a spacing between the leading drivers and the trailing drivers, said chain wheels include a first and a second axially outer chain wheel (**22, 23**), which guide first and second outer conveyor chains (**12, 13**) with identically aligned drivers (**15, 16**), said first and second chain wheels are joined in a manner fixed against relative rotation to said drive shaft (**29**); a middle chain wheel (**21**) is disposed between the first and second outer chain wheels (**22, 23**) and is firmly joined to a hollow shaft (**36**) that is rotatable o the drive shaft; said hollow shaft (**36**) penetrates the first outer chain wheel (**22**) and has a wide-angle longitudinal aperture (**37**) for a passage of a connecting means (**40**) through said aperture (**37**) to connect the first outer chain wheel to the drive shaft (**29**) and that the drive shaft (**29**) and the hollow shaft (**36**) are joined together adjustably in terms of rotational angle.

5,145,054

VIBRATORY FEEDER VOLTAGE CONTROL

Steven D. Nelson, Rockford, Ill., assignor to Rodix, Inc., Machesney Park, Ill.

Filed Apr. 2, 1991, Ser. No. 679,656
Int. Cl.[5] B65G *43/00*
U.S. Cl. 198—751 **27 Claims**



1. A control for regulating the AC voltage provided to a vibratory feeder by an AC power source, comprising:

first circuit means for utilizing user inputs to generate a demand signal having a DC level indicative of an AC voltage desired to be provided to the feeder;

second circuit means coupled to the feeder for generating a feedback signal having a DC level indicative of the actual AC voltage provided to the feeder;

logic means for receiving and comparing the demand and feedback signals and generating an output signal indicative of the difference between those signals;

a controller for receiving the output signal from the logic means and generating a phase angle controlled drive signal for regulating the AC voltage provided to the feeder; and

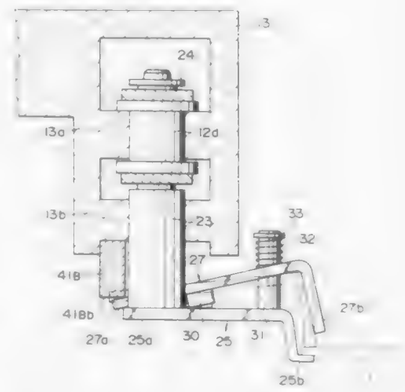
an AC drive circuit including electronic switching means coupled between the AC power source and the feeder to provide AC voltage thereto in accordance with the drive signal, which phase angle controlled drive signal opens and closes the electronic switch so that the desired AC voltage is provided to the feeder, whereby the desired and actual AC voltages are maintained substantially equal.

5,145,055

DEVICE FOR CONVEYING PRINTED CIRCUIT BOARD

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Japan

Filed Sep. 11, 1991, Ser. No. 757,804
Claims priority, application Japan, Oct. 8, 1990, 2-268520
Int. Cl.[5] B65G *29/00*
U.S. Cl. 198—803.9 **4 Claims**



1. A device for conveying printed circuit boards, comprising:

a pair of spaced apart, endless roller chains defining therebetween a printed circuit board transferring path having feed portion at which printed circuit boards are fed to said path and a delivery portion at which the printed circuit boards conveyed along said path are delivered;

a plurality of support members fixed to said chains for movement therewith and each adapted to support thereon a side edge portion of a printed circuit board, so that the printed circuit board can be transferred along said path with opposite side edge portions thereof being supported on the support members;

a clamp plate member rockably supported on each of said support members and adapted to move between a close position where said clamp plate member is engageable with an upper surface of the side edge portion of the printed circuit board supported on the support members and an open position where said clamp plate member is incapable of engaging with the printed circuit board;

means provided on each of said support members for urging the corresponding clamp plate member to rotate in a direction so that the clamp plate member is normally maintained in the closed position; and

engaging means disposed adjacent to each of said feed and delivery portions of said transfer path and having a lower surface engageable with upper surfaces of the clamp plate members to maintain the clamp plate members in the open positions, whereby the printed circuit board can be placed on said support members at said feed portion, clamped between the supporting members and the clamp plate members during the non-engagement of the clamp plate members with the engaging means and delivered at said delivery portion.

5,145,056

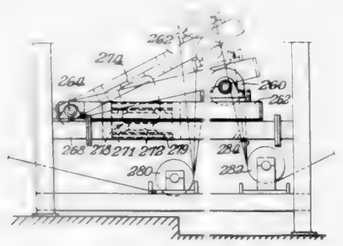
AIR BAG TENSIONING DEVICE

Thomas M. Smith, 1415 Golf Rd., Cinnaminson, N.J. 08077

Continuation of Ser. No. 313,943, Feb. 23, 1989, abandoned, which is a division of Ser. No. 125,001, Jan. 4, 1988, Pat. No. 4,830,651, and a continuation-in-part of Ser. No. 771,722, Sep. 3, 1985, Pat. No. 5,024,696, and Ser. No. 12,723, Feb. 9, 1987, abandoned, said Ser. No. 125,001, is a continuation-in-part of Ser. No. 831,795, Feb. 19, 1986, Pat. No. 4,722,681, said Ser. No. 771,722, is a continuation-in-part of Ser. No. 752,908, Jul. 8, 1985, Pat. No. 4,604,054, Ser. No. 628,989, Jul. 9, 1984, Pat. No. 4,589,843, Ser. No. 592,793, Mar. 23, 1984, Pat. No. 4,654,000, Ser. No. 509,161, Jun. 29, 1983, Pat. No. 4,500,283, Ser. No. 567,270, Dec. 30, 1983, abandoned, and Ser. No. 435,412, Oct. 20, 1982, abandoned, said Ser. No. 12,723, is a continuation-in-part of Ser. No. 831,795, Ser. No. 771,722, and Ser. No. 592,793, said Ser. No. 831,795, is a continuation-in-part of Ser. No. 771,722, Ser. No. 752,908, and Ser. No. 592,793, said Ser. No. 752,908, is a continuation-in-part of Ser. No. 592,793, Ser. No. 567,270, and Ser. No. 435,412, said Ser. No. 628,989, is a continuation-in-part of Ser. No. 592,793, Ser. No. 509,161, Ser. No. 567,270, Ser. No. 435,412, Ser. No. 312,730, Oct. 19, 1982, Pat. No. 4,443,185, and Ser. No. 292,167, Aug. 12, 1981, Pat. No. 4,474,552, said Ser. No. 592,793. This application May 1, 1991, Ser. No. 697,906

Int. Cl.[5] B65G *23/44*

U.S. Cl. 198—814 6 Claims



1. A tensioning device for running wide webs under essentially uniform tension, said device having a tensioning roller at least about as long as the web is wide, the roller being carried by an essentially rigid frame, pivot means connected to said frame remote from said tensioning roller, said pivot means being mounted to a foundation, and said tensioning roller and said frame being urged to pivot in tension-increasing direction by an air bag containing air at a pre-determined super-atmospheric pressure.

5,145,057

AUXILIARY CONTACT UNIT FOR AN ELECTROMAGNETIC SWITCH

Takato Hirota; Kuniyuki Kogawa, and Shigeaki Ohtake, all of Kanagawa, Japan, assignors to Fuji Electric Corporation, Ltd., Kanagawa, Japan

Continuation of Ser. No. 509,767. This application Jun. 18, 1991, Ser. No. 715,387

Claims priority, application Japan Apr. 20, 1989, 1-46604[U]

Int. Cl.[5] H01H *1/32*

U.S. Cl. 200—243 11 Claims

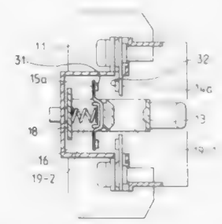
1. A contact assembly, comprising:

frame means for housing the contact assembly;

a first contact, including a first contact element, said first contact fixedly depending from said frame means in a first direction;

a second contact including a second contact element, said second contact being alternately movable within said frame means in an engaging direction, perpendicular to said first direction so as to bring said second contact element into engaged relationship with said first contact element, and a disengaging direction perpendicular to said first direction so as to bring said second contact element out of engaged relationship with said first contact element;

supporting means for supporting said second contact and movable with said second contact within said frame means alternately in said engaging and disengaging directions; and



a projecting portion extending from said supporting means in the first direction spaced from said second contact and movable with said second contact and supporting means, for stopping movement of said second contact and supporting means in the disengaging direction.

5,145,058

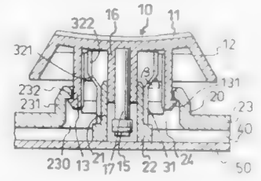
NOTEBOOK COMPUTER KEY

Sam-San Lee, Fl. 12-3, No. 603, Tun-Hwa S. Rd., Taipei City, Taiwan

Filed Jul. 16, 1991, Ser. No. 730,628

Int. Cl.[5] H01H *13/00*

U.S. Cl. 200—517 1 Claim



1. A computer key, comprising:

a push button having a plate portion, a support projection extending downward from an intermediate portion of said plate portion, a hook projection extending downward from said plate portion outwardly of said support projection and having a distal outward hook end, and a conductive member provided on a bottom end of said support projection;

a socket member including an upright hollow confining wall defining a receiving space and having a top end provided with an inwardly extending peripheral flange, said hook projection extending into said receiving space, said peripheral flange hindering movement of said distal hook end out of said receiving space to prevent detachment of said push button from said socket member;

a circuit board provided on a lower end of said socket member;

an upright hollow guide projection extending from said circuit board and into said receiving space of said socket member, said support projection extending into and being in sliding contact with said guide projection; and

a resilient biasing member having a first tubular section tightly sleeved around said guide projection, a second tubular section wider than said first tubular section and abutting said plate portion of said push button, and a gradually expanding inclined section connecting said first tubular section and said second tubular section, said biasing member being disposed between said support projection and said hook projection and biasing said conductive member away from said circuit board;

whereby, pressure applied on said push button compresses said biasing member to produce bending at said gradually expanding inclined section and move said conductive member downward so as to contact said circuit board and achieve electrical connection to indicate a pressed key condition.

5,145,059

SWITCH

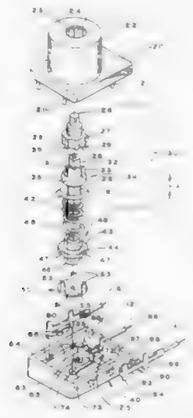
Sung-Taek Park, Inchon, Rep. of Korea, assignor to Prince Corporation, Holland, Mich. and Jae-Il Engineering Company, Incheon, Rep. of Korea, a part interest

Continuation of Ser. No. 373,181. This application Jan. 22, 1991, Ser. No. 644,040

The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.

Int. Cl.[5] H01H *19/62*

U.S. Cl. 200—527 7 Claims



1. In a push-button switch of the type including a housing formed of two halves, at least one half of said housing having side walls and an end wall, an improved push button switch assembly comprising: at least one recess formed in one of said side walls, said at least one recess extending in a direction along said side wall; a push-button plunger located in said housing; a ratchet mechanism located in said housing for converting longitudinal movement of said push-button plunger into a rotary motion;

a contact holder slidably keyed to said plunger for rotation of said holder as said push-button plunger is actuated;

moveable contact means fixedly mounted to said holder for movement therewith and including at least one contact member having a first portion extending from a center of said moveable contact means and a second portion extending from an end of said first portion;

fixed contact means mounted in the housing such that said contact member engages said contact holder and said fixed contact means at predetermined rotational positions of said contact holder, said fixed contact means being generally formed to include a pair of legs one of said legs of said fixed contact means being secured to said housing against at least one of said sides and another of said legs extending from said one leg to selectively engage said contact holder and to selectively engage said contact member of said moveable contact means when aligned therewith, said one leg of said fixed contact means being generally shaped to include at least one tip projecting generally orthogonally to said one leg and extending into said recess for positioning said fixed contact means in said housing; and

means for coupling electrical conductors to said moveable contact means and to said fixed contact means.

5,145,060

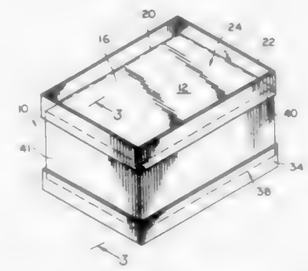
PRE-PACKED MODULAR DISPLAY UNIT

Robert Maye, 6414 Lake Worth Rd., Lake Worth, Fla.

Filed Sep. 27, 1991, Ser. No. 767,235

Int. Cl.[5] B65D *21/02*

U.S. Cl. 206—45.14 7 Claims



1. A ready-to-assemble, modular, pre-shelf stocked vertical merchandise display, which comprises;

a plurality of preshelf stocked units adapted by size and configuration to be stacked together in a vertical array, each unit comprising:

planar surface and a peripheral edge defining the outer boundary of the tray;

(b) a first flange integrally connected to the peripheral edge of the upper tray and extending perpendicular to the top and bottom planar surfaces a pre-determined distance, above the plane of the top planar surface and a pre-determined distance below the plane of the bottom planer surface, said first flange enclosing the peripheral edge of the upper tray;

(c) a lower tray positioned parallel to but spaced apart from the upper tray, said lower tray having a top planar surface, a bottom planar surface and a peripheral edge defining the outer boundary of the lower tray;

(d) a second flange integrally connected to the peripheral edge of the lower tray and extending perpendicular to the top and bottom planar surfaces of the lower tray a pre-determined distance above the plane of the lower tray, top planar surface and a pre-determined distance below the plane of the lower tray bottom planar surface, said second flange enclosing the peripheral edge of the lower tray;

(e) a plurality of container packaged articles for display substantially filling the space between the parallel upper and the lower trays and bounded by the respective first and second flanges; and

(f) removable means for stabilizing the plurality of container packaged articles against movement in a direction parallel to the top and bottom planar surfaces of the upper and lower trays, said means being removably located within the space defined by the upper tray, the lower tray, the first flange and the second flange, said means being free of a fixed attachment to the upper and lower trays.

7. A merchandising display of containerized articles, which comprises;

a plurality of assemblies of the containerized articles, said assemblies forming blocks of loosely associated containerized articles, said blocks including means for stabilizing the block from lateral movement, inserted adjacent to individual containerized articles within the block, said assemblies being arrayed together in a vertical stock; and interposed between each adjacent assemblies a tray, com-

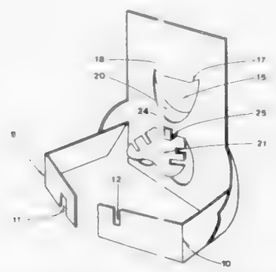
prising a top planar surface, a bottom planar surface and a peripheral edge defining the outer boundary of the tray; an

a first flange integrally connected to the peripheral edge of an uppermost tray and extending perpendicular to the top and bottom planar surfaces a pre-determined distance above the plane of the top planar surface and a pre-determined distance below the plane of the bottom planar surface, said first flange enclosing the peripheral edge of the upper tray.

5,145,061
SAFE-T-SAND
David J. Marceau, 1110 Pleasant Ave., Bremerton, Wash. 98310, assignor to David J. Marceau, Bremerton, Wash.
Filed Mar. 18, 1991, Ser. No. 670,919
Int. Cl.[5] B65D *69/00, 85/00*
U.S. Cl. 206—223 7 Claims

1. A kit including a container with a composition of an absorbent material and an additive mixed with said absorbent material to enhance the visibility of said material when applied to a surface.

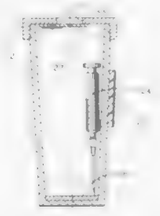
5,145,062
PORTABLE TISSUE BOX HOLDER WITH INCORPORATED DISPOSABLE WASTE RECEPTACLE
James Crispi, P.O. Box 302, Washingtonville, N.Y. 10992
Filed Aug. 13, 1991, Ser. No. 744,304
Int. Cl.[5] B65D *81/00*
U.S. Cl. 206—233 11 Claims



1. A tissue box holder comprising a box-holding frame which encircles the tissue box, three sides of which are shorter than the height of the tissue box and the fourth side is taller than the height of the tissue box and contains an aperture into which a waste receptacle container is affixed and a notched flap which articulates and interlocks with the sides of the opening of the tissue box so as to affix the frame to the box.

2. A tissue box holder formed from a single blank, said holder comprising front and back walls integrated with opposing side walls; the front wall being formed by the interconnection of two oppositely notched arms; with said back wall extending above the top of the tissue box and containing an aperture formed by an upper hinged precut flap, the opposing sides of which contain slits to receive a waste receptacle container, which flap extends backward; and a lower hinged precut flap which extends forward and contains a plurality of notches which articulate and interlock with the sides of the opening in the top of the tissue box.

5,145,063
SHARPS CONTAINER
Angelene M. Lee, Missouri City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 7, 1991, Ser. No. 772,763
Int. Cl.[5] B65D *83/10*
U.S. Cl. 206—364 4 Claims



1. A sharps container for disposal of elongated hypodermic needles comprising:

a hollow waste cup member constructed from a light weight nonmagnetic metal material and having a tapered configuration about a longitudinal axis from a larger open end to a smaller closed end,

a lid member constructed from a light weight nonmagnetic metal material and having a threaded releasable interconnection with said open end of said cup member,

said lid member having a central entrance opening sized to lengthwise receive an elongated hypodermic needle, said cup member having a length dimension greater than the length of the elongated hypodermic needles and said length dimension being greater than the largest transverse dimension of said cup member for preventing re-orientation of elongated hypodermic needles in said cup member after insertion into the cup member,

said lid member having an internally located flap member constructed of impact resistance metal material,

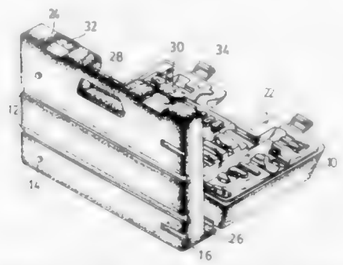
resilient means for biasing said flap member to a closed position on said opening thereby providing a one-way closure for said waste cup member, and

magnetic means attached to the closed end of the cup member providing magnetic attraction to retain the hypodermic needles facing away from the entrance opening.

5,145,064
DOUBLE-MATCHED TOOL BOX
Kuen-Jenn Chen, No. 6, Lane 609, Sec. 1, Chung Shan Rd., Ta Chia Chen, Taichung Hsien, Taiwan
Filed Mar. 19, 1991, Ser. No. 671,320
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—372 2 Claims

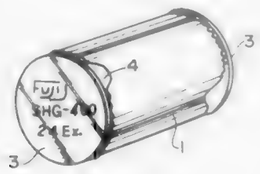
1. A double-matched tool box for keeping tools, the improvement comprising two face-matched unit tool boxes respectively releasably connected through a tongue and groove joint, said unit tool boxes being each comprised of two hinged compartments connected through a unitary triangle connecting bar and defining therein a plurality of tool storage holes, said two hinged compartments including one having a handhold portion for carrying purpose and two retaining notches,

and the other having two fastening means releasably fastened in said two retaining notches to firmly secure said two hinged



compartments in a closed condition, and wherein said two unit tool boxes can be separated from each other for use as an independent tool box each.

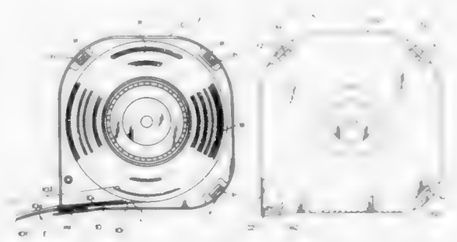
5,145,065
PACKAGE FOR PHOTOGRAPHIC FILM CARTRIDGE
Shigemitsu Mizutani; Yoshihiro Seto; Hiroshi Tanaka, and Yoshihiro Nishiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 26, 1991, Ser. No. 660,900
Claims priority, application Japan, Feb. 26, 1990, 2-45235; May 22, 1990, 2-131737; May 22, 1990, 2-131738; May 22, 1990, 2-131739; Aug. 3, 1990, 2-206068; Sep. 20, 1990, 2-251187; Sep. 20, 1990, 2-251188
Int. Cl.[5] B65D *85/67, 43/14*
U.S. Cl. 206—389 1 Claim



1. A package for a photographic film cartridge which comprises a paper tube treated with moistureproofing treatment, said paper tube having an inner surface that has been dried to a water content of not more than 0.3%, said paper tube containing a photographic film cartridge and having moistureproof caps wherein both end openings of the paper tube are sealed by thermal adhesion of the outside surface of the end of the paper tube and the inside surface of the moistureproof caps.

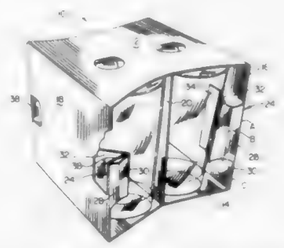
5,145,066
FLEXIBLE LIGHT-SHIELDING ENCLOSURE FOR PHOTOSENSITIVE WEB END
William F. Clark, Honeoye Falls; Robert A. Huber, Churchville; Michael A. Evans, Rochester; Jaime I. Waldman, Hilton, and Thomas C. Healey, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 31, 1991, Ser. No. 738,709
Int. Cl.[5] B65D *85/672*
U.S. Cl. 206—409 10 Claims

1. In combination with a photosensitive web roll rotatably mounted inside a light-tight container having an exit slot through which the photosensitive web is withdrawable from said container, a flexible enclosure for light-shielding a leading end portion of the web extending from said roll through said exit slot and outside said container, said enclosure comprising a flexible, substantially rectangular, opaque sleeve adapted to enclose said web end portion, said sleeve including opposing top and bottom walls disposed in adjacent, registered, facing relationship and extending between front and rear ends and opposite lateral sides thereof, said walls being light-tightly joined together along said front ends and said lateral sides but left unjoined and separable along said rear ends to provide an



opening therebetween through which said web end portion is insertable into said sleeve toward said joined front ends, said sleeve. with said web end portion so inserted therein, extending outwardly from within said container, through said exit slot, and thence outside said container.

5,145,067
CARTON WITH SIDE MOUNTED LOCKING TABS
Robert G. Carver, Ashland, Ohio, assignor to Coburn, Inc., Ashland, Ohio
Filed Dec. 16, 1991, Ser. No. 808,005
Int. Cl.[5] B65D *71/46*
U.S. Cl. 206—426 10 Claims



1. A carton for glassware or similar articles and formed of a flexible sheet material, said carton having

top and bottom panels,

a pair of side panels each connected to the top and bottom panels along fold lines to form a sleeve having two open ends having an interior for receiving the glassware or the like,

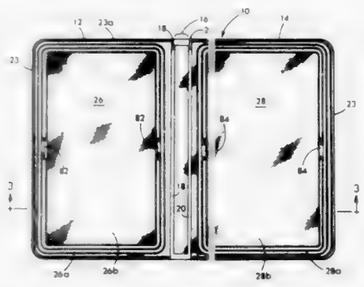
and locking means on one of said side panels for holding the glassware or the like in the carton, said locking means including a flap forming a plurality of panels foldable from a first condition in which the panels of said flap extend from said one of said side panels so as to leave said ends open for loading of articles into the carton, to a second condition in which said panels form a wedge projecting inward from said one of said walls into the interior of the sleeve for retaining an article therein, and a locking tab for holding the panels of said flap in the second, wedge shaped condition.

5,145,063

CASSETTE ALBUM WITH CHANNEL-FORM HINGES AND METHOD

Stephen R. Schmitz, Shakopee; Philip K. Sykes, Shoreview, and Breck J. Johnson, Mankato, all of Minn., assignors to Blackbourn Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 436,453, Nov. 14, 1989, Pat. No. 4,966,283. This application Sept. 20, 1990, Ser. No. 585,605
The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—472 8 Claims



6. A book-style cassette album comprising, front and rear covers connected by a spine, said album including a stiff, self-supporting thermoformed tray sheet extending the height and breadth of both the front and rear covers and across the spine area, both of the covers including a tray comprising a portion of the tray sheet having inwardly deflected first and second side walls at least in part surrounding first and second pockets adapted to receive a cassette to be held in the album, a pair of parallel vertically disposed laterally spaced apart channel-form hinges within the tray sheet, one such hinge at each edge of the spine and extending proximate to the top and bottom edges of the tray sheet to define fold lines between the spine and each of the covers, each of said channel-form hinges being uncompressed such that the tray sheet is of substantially uniform thickness throughout and each channel has substantially the same thickness as the surrounding material of the tray sheet, said tray sheet having an elevated plateau defining a rectangular frame located in a spine portion of the tray sheet to assist in keeping the spine flat, a cover sheet formed from a soft, supple nonself-supporting sheet of plastic material sealed to at least some of the edges of the tray sheet and being unsealed to the tray sheet along the channel-form hinges, the supple cover stock conforming to the underlying hinges which act as a stiff framework over which the cover sheet extends when the album is closed to present an attractive tailored appearance along each hinge, the first side wall has finger-access recesses therein and the second side wall has outwardly projecting tabs that extend into the recesses in said first side wall when the album is in a closed position to strengthen the album against buckling when the covers of the album are pressed toward one another.

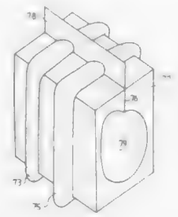
5,145,069

PACKAGING METHOD, PACKAGING BOLSTER, AND PACKAGING LINE

Jean-Claude Vilas Boas, Sannois, and Andre Fromion, L'Hay Les Roses, both of France, assignors to Bull S.A., Paris, France

Division of Ser. No. 433,005. This application Feb. 19, 1991, Ser. No. 656,815
Claims priority, application France, Nov. 14, 1988, 88 14767
Int. Cl.[5] B65D *81/14*
U.S. Cl. 206—497 7 Claims

1. A bolster for holding and protecting a package product comprising a support strip of flexible base material of elongated shape and of indefinite length, said base material being shaped and cut to the dimension required at a packaging site to form said bolster, the base material including at least two spacer elements at predetermined positions for spacing apart a product to be packaged at the packaging site, said base material including two films welded to one another in such a way as to



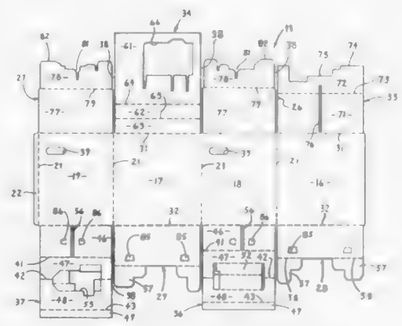
provide at least two linear hollow portions, said linear hollow portions being filled with a swelling agent to form cushions or bulges of elongated shape, said cushions or bulges comprising said at least two spacer elements, said cushions or bulges being separated by flat parts of base material which are adapted to act as hinges, thereby permitting said bolster to largely surround the product to be packaged.

5,145,070

ONE-PIECE CORRUGATED BOX WITH INTERIOR SUPPORTS

William L. Pallett, Plainwell; Scott Speese, Kalamazoo, and Lloyd R. Dixon, Bellevue, all of Mich., assignors to Arvco Container Corporation, Kalamazoo, Mich.

Filed Sep. 4, 1991, Ser. No. 754,759
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—521 16 Claims



1. A one-piece, top-opening, container made entirely from a one-piece blank of corrugated cardboard, comprising:

a pair of opposed end wall panels and a pair of opposed side wall panels foldably joined to each other along parallel transverse fold lines to form an upright tubular container;

top and bottom closure means for respectively closing top and bottom ends of said container;

said bottom closure means comprising at least one object support projecting upwardly into the interior of the container and adapted for supporting an object that is packaged in said container, said object support including foldably joined panel sections and having an upper edge fixed joined to one of said end wall panels so that said panel sections lie substantially flat against the lower portion of said one end wall panel when the container is in a flat knocked-down condition; and

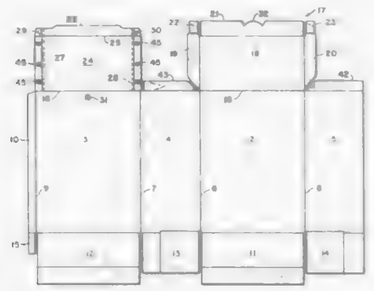
said top closure means comprising at least one restraint wall section extending across the interior of said container at a location spaced downwardly from the top end of the container and having means for engaging the object to restrict movement of the object in the container, said restraint wall section being integral with one of said panels and being foldably joined thereto by a fold line.

5,145,071

PACK MADE FROM BOARD

Jürgen Matzel, Constance; Walter Schrägle; Fritz Breitenauer, both of Kempten, all of Fed. Rep. of Germany, and Richard Harbour, Upton, United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 13, 1990, Ser. No. 626,929
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942445; Jul. 25, 1990, 4023622
Int. Cl.[5] B65D *33/20*
U.S. Cl. 229—200 8 Claims



1. Pack made from board for free-flowing products such as detergent, with two side panels, a front panel, a back panel, a base and a closure flap which is hinged to the back panel and under which further flaps hinged to the other panels are located, where the flap hinged to the front panel extends across the whole cross-section of the pack and has a tab hinged to it that rests against the inside of the closure flap, wherein the flap (24) hinged to the front panel (3) has parallel score lines (27, 28) provided at least to some extent in duplicate and located a short distance from the top edges of the two side panels (4, 5) which also extend across the hinged tab (26) and act as tear lines, and wherein sections (19, 20, 21) that overlap the side panels (4, 5) and the front panel (3) to at least a small extent are provided on the closure flap (17), the section (21) overlapping the front panel (3) being provided with a tab (32), in the area of which this section is glued to the front panel for subsequent separation (31).

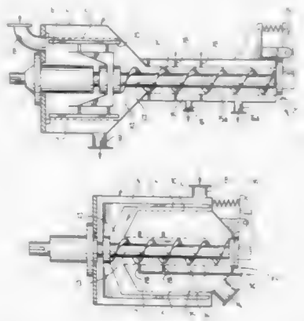
5,145,072

METHOD FOR SCREENING AND TREATING PULP

Jouko Hautala, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Division of Ser. No. 379,998. This application May 30, 1991, Ser. No. 707,644
Claims priority, application Finland, Aug. 4, 1988, 883649
Int. Cl.[5] B07B *1/20*
U.S. Cl. 209—273 2 Claims

1. A method of screening and treating pulp comprising passing the pulp into a screening device for screening and separating the pulp into an accepted fraction and a rejected fraction, direction the rejected fraction into a reject space and directly onto a rotating screwlike means, said screwlike means extending from within said reject space into a filtrate space, advancing the rejected fraction axially along said screwlike means from said reject space into said filtrate space while effecting a radial flow of fine-grained material contained within the rejected fraction outwardly through a perforated wall beginning within said filtrate space and surrounding the screwlike means within said filtrate space for collecting the



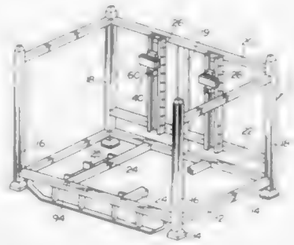
fine-grained material, and collecting the remainder of the rejected fraction advanced along the screwlike means.

5,145,073

PALLET FOR HOLDING GLASS PLATES IN STANDING POSTURE

Katsuhiko Kitagawa, and Miki Yamada, both of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jul. 9, 1991, Ser. No. 734,283
Claims priority, application Japan, Jul. 9, 1990, 2-72851[U]
Int. Cl.[5] A47G *19/08*
U.S. Cl. 211—41 8 Claims



1. A pallet for holding a plurality of glass plates in a standing posture, comprising:

a base frame on which glass plates are to be stood;

a rear frame which stands upright in a rear end region of said base frame;

two uprightly elongate support members which are fixed to the front side of said rear frame and horizontally spaced from each other, each of the support members being a hollow and cross-sectionally rectangular member having a rear wall which is adjacent to said rear frame, two side walls and a front wall and defining therein a cross-sectionally rectangular and vertically elongate channel which opens at the top of the member, said front wall being formed with a slit which extends from the top of the member vertically downward and provides access to said channel, each of said two side walls being formed with a plurality of through-holes at vertical intervals such that each of said through-holes is horizontally in alignment with one of the through-holes in the opposite side wall;

for each of said two support members, a receptacle having a main part which is an elongate and cross-sectionally rectangular part fittable in said channel of the support member and a projection part which is a cross-sectionally rectangular part extending perpendicularly from a front face of said main part and fittable in said channel of the support

member, two opposite side faces of said projection part being grooved in a section adjacent to said front face of said main part such that when said main part is inserted in said channel of the support member the grooved section fits in said slit in the front wall of the support member, the receptacle being formed with a first receptive hole in a top end face of said main part, a second receptive hole in a top end region of the front face of said main part and a third receptive hole in a front end face of said projection part, said first, second and third receptive holes being identical with each other in shape and size, the receptacle being further formed with a first through-hole which extends from a side face of said main part to the opposite side face through said first and second receptive holes, a second through-hole which extends from a side face of said projection part to the opposite side face through said third receptive hole and a third through-hole which extends from a side face of said main part to the opposite side face in a section adjacent to said projection part, each of said first, second and third through-holes conforming with said through-holes in the support member;

for each of said two support members, a stopper comprising a holder and a stopper head which is attached to said holder, said holder being shaped so as to fit in any of said first, second and third receptive holes of said receptacle and formed with a through-hole which becomes in alignment with one of said first, second and third through-holes of said receptacle when the holder is inserted in one of said first, second and third receptive holes; and

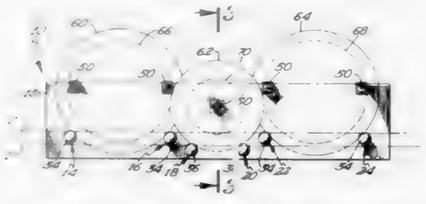
for each of said two support members, at least one pin which can be inserted into any of said through-holes of the support member, said first, second and third through-holes of said receptacle and said through-hole of said holder of said stopper to fasten said holder to said receptacle and fasten said receptacle to the support member.

5,145,074

PLATE DISPLAY APPARATUS

Jerry N. Miley, 5855 Sandy Dr., St. Cloud, Minn. 56303

Filed May 30, 1991, Ser. No. 707,898
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—41 20 Claims



1. Apparatus for displaying a plurality of plates and the like, each plate having an outer periphery, said apparatus comprising:

a generally upright support frame;

a plurality of pairs of support members, each of said support members extending outwardly from said support frame, a first pair of said support members underlying and supporting a first plate along the outer periphery of the plate in an upright plane orientation, said upright support frame engaging the first plate at a position spaced upwardly from said first pair of support members, and a second pair of said support members underlying and supporting a second plate along the outer periphery of the second plate, said second pair of support members supporting the second plate outer periphery such that the second plate outer periphery is spaced forwardly from said support frame a greater distance than is the first plate outer periphery; and

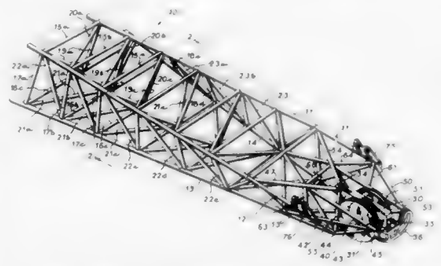
a spacer member fixed to and extending outwardly from said support frame to engage the second plate above said second pair of support members to position the second plate forwardly of the first plate.

5,145,075

BOOM POINT CONSTRUCTION

Kenneth V. Johnson, Oconomowoc; James P. Piper, Oak Creek, and Dale A. Beier, New Berlin, all of Wis., assignors to Bucyrus-Erie, South Milwaukee, Wis.

Filed Oct. 15, 1990, Ser. No. 598,359
Int. Cl.[5] B66C 23/64, 23/683, 23/70; B66D 3/08
U.S. Cl. 212—266 8 Claims



1. A boom point for a dragline boom, said boom including top and bottom pairs of longitudinally extending stringers defining the corners of a quadrilateral cross section for the boom, the boom point comprising:

a boom point swivel mounting cable sheaves;

a front swivel support and a rear swivel support rotatably mounting the front and rear of the swivel along the center line of the boom; and

a framework of separate elongated members joined together to form a truss connecting the swivel supports to the stringers of the boom,

said framework including a longitudinally extending extension for each stringer,

said framework including an assembly of four members joined together at the rear swivel support, and extending therefrom in different directions to each connect to a respective stringer extension,

said framework including a pair of assemblies of three members with the members of each assembly joined together on opposite sides of the front swivel support and extending therefrom in different directions, two of the members of each three member assembly being connected to a top and bottom stringer extension and the third member of the three member assembly being connected to a respective one of the members of the four member assembly, and

said framework also including additional members that triangulate the spaces between the members of the assemblies and the stringer extensions.

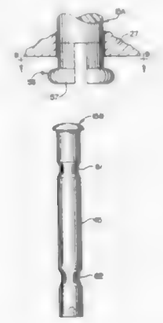
5,145,076

PLASTIC KNUCKLE PIN WITH ANNULAR RELIEF GROOVES FOR PREVENTING PIN FAILURE DUE TO FATIGUE

Richard F. Murphy, Batavia, and Michael K. Burke, Wheaton, both of Ill., assignors to Zeftek, Inc., Batavia, Ill.

Filed Nov. 13, 1990, Ser. No. 612,310
Int. Cl.[5] B61G 3/04
U.S. Cl. 213—155 11 Claims

1. In a coupler for a railway car having a coupler body with a pair of vertically spaced apart pivot lugs with aligned openings, a knuckle with an opening extending therethrough being disposed between the lugs so that the knuckle opening aligns with the pivot lug openings, pulling lugs on the coupler body coacting with the knuckle for receiving draft forces, and a knuckle pin for pivotally connecting the knuckle to the coupler body, the improvement being in the knuckle pin which includes a shaft received in the pivot lug openings and the knuckle opening sized to allow rotation of the knuckle, a head on the top end of the shaft to prevent the pin from falling through the openings, and said pin being of a self-lubricating, high-strength, flexible plastic to absorb bending fatigue without failure resulting from the coupling being subjected to buff and draft forces.

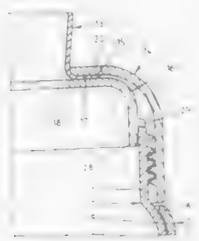


5,145,077

FEEDING BOTTLE INCLUDING A NIPPLE ADAPTER RING FOR SUPPORTING THE NIPPLE

Peter Röhrig, Wien, Austria, assignor to Mam Babyartikel Gesellschaft M.B.M., Wien, Austria

PCT No. PCT/AT88/00075, § 371 Date Mar. 14, 1990, § 102(e) Date Mar. 14, 1990, PCT Pub. No. WO89/03204, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 3, 1988, Ser. No. 477,826
Claims priority, application Austria, Oct. 9, 1987, 2673/87
Int. Cl.[5] A61J 9/00, 9/02, 9/08, 11/04
U.S. Cl. 215—11.1 10 Claims



1. A feeding bottle comprising:

a bottle body including a wide bottle neck having an opening with an inner diameter;

a teat member including at one end thereof a substantially flat radial flange portion surrounding a lower entrance opening of said teat member, and having an outer diameter which is smaller than the inner diameter of said bottle neck;

a substantially rigid upwardly dome-shaped adapter ring member for bridging the space between said bottle neck and said teat member flange portion, said adapter ring member having a peripheral part detachably resting on and snugly fitting within the opening of said bottle neck, and further including on its top side a surface for supporting said teat member, the flat flange portion of the teat member merely resting with its lower surface on said supporting surface in the assembled state, said supporting surface being located around an inner central opening of said adapter ring member which, in the assembled state, is in general alignment with the lower entrance opening of said teat member; and

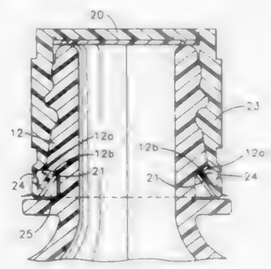
a clamping cap member for mounting said bottle neck thereby with an inner clamping surface clamping the flat flange portion of said teat member against the supporting surface of said adapter ring member, the supporting surface thereby forming a counterclamping surface for this clamping attachment of said teat member flange portion, so that said teat member flange portion is clampingly engaged and secured between said clamping cap member and said adapter ring member, said clamping cap member having a central opening through which said teat member projects outwardly in the assembled state.

5,145,078

PILFER-PROOF BOTTLE CAP

Charles Hannon, 27 Sargent Rd., Scarsdale, N.Y. 10583, and Leonard J. Vallender, 11 Clover Rd., Valhalla, N.Y. 10595

Continuation of Ser. No. 538,383, This application Aug. 20, 1991, Ser. No. 750,446
Int. Cl.[5] B65D 41/34
U.S. Cl. 215—252 7 Claims



1. A plastic pilfer-proof cap for a bottle having an open end, a screw thread adjacent its open end and a circumferential retaining bead below the screw thread, away from the open end of the bottle, said retaining bead having a lower peripheral edge distal to the screw thread and a lower peripheral surface adjacent the lower peripheral edge; the cap comprising a cap section having an open end adapted to be threaded on said screw thread, and a ring section attached to the open end of the cap section by one or more frangible bridges therebetween; the ring section having a free edge distal from the one or more bridges, and a plurality of circumferentially placed hook elements having free ends which extend inwardly and upwardly; the hook elements being integrally molded with the ring section at the edge of the ring section distal from the one or more bridges; the ring section having a portion thereof, adjacent said hook elements, of an inner diameter larger than that of said cap section which thereby provides a recess therein for accommodation of said hook elements; with the hook elements being adapted to adjacently pass over the screw thread and retaining bead of the bottle when the cap is initially threaded on the bottle, and wherein the hook elements are adapted to fold outwardly away from the bottle into said recess, when in adjacent peripheral contact with the retaining bead, whereby the hook elements can pass by the bead; with the hook elements springing back to their original conformation when they pass beyond a lower peripheral edge of the retaining bead, the free ends of the hook elements being adapted to engage a lower peripheral surface of the retaining bead, whereby unscrewing of the cap from the bottle causes the one or more frangible bridges to break, with the ring section remaining on the bottle as an indication of opening of the bottle, characterized in that the one or more bridges are laterally aligned with said bead at a position no higher than the lower peripheral edge of said bead, when the cap is seated on the bottle, and wherein said bead is in contact with a region of said cap section, peripherally adjacent said one or more frangible bridges, whereby

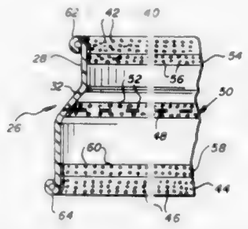
when said ring is compressed at said edge, distal to the one or more bridges, to cause the hook elements to swivel, from engagement with said bead, into said recess, with the ring section and cap being thereby removable from the bottle; the lower peripheral edge of the bead functions as a fulcrum for swiveling breakage of the one or more bridges, upon continued compression of said edge, distal to the one or more bridges, of said ring section, with said swiveling breakage occurring prior to disengagement between the hook elements and the bead and movement of the hook elements into said recess.

5,145,071

TAMPER-EVIDENT OVERCAP

James R. Woodrow, Glenview, and William J. Thomas, Bolingbrook Court, both of Ill., assignors to Continental White Cap, Inc., Downers Grove, Ill.

Filed Feb. 23, 1990, Ser. No. 483,871
Int. Cl.[5] B65D *50/00*
U.S. Cl. 215—232 20 Claims



1. A tamper-evident overcap for application to a closed container including a removable closure, said overcap being in the form of a preshaped collar including an upper portion of a size and shape to be bonded to a closure without change in size or shape, a lower portion of a size and shape to be bonded to a container without change in size or shape, and an intermediate portion integrally joining said upper and lower portion, said intermediate portion having a line of weakening for separating said upper portion from said lower portion when said upper portion is to be removed, and means for irreversibly indicating manipulation of the line of weakening.

5,145,080

POSITIVE ORIENTATION SYSTEM FOR A THREADED CLOSURE AND CONTAINER

Leo R. Imbery, Jr., Crystal Lake, Ill., assignor to Seaquist Closures, Mukwonago, Wis.

Filed Apr. 26, 1991, Ser. No. 692,203
Int. Cl.[5] B65D *41/04*
U.S. Cl. 215—331 16 Claims

13. A container and a non-removable closure assembly comprising:

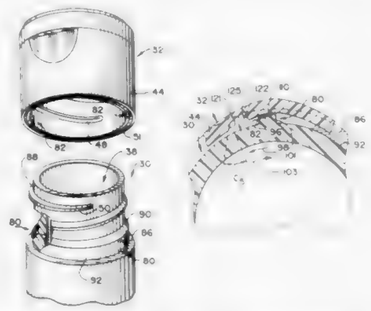
a container having a neck defining an opening to the container interior and an external screw thread;

a closure for being applied to said container neck and having a skirt defining an internal screw thread for engaging the external screw thread;

one of said container of closure having a protuberance with generally oppositely facing abutment surfaces and at least one cam surface extending between said abutment surfaces, said one cam surface being oriented at an oblique angle to the axis of the container thread;

a recess defined in the other one of said container and closure for receiving said protuberance, said recess being defined at opposite ends by spaced-apart engaging surfaces and being defined on one side between said spaced-apart engaging surfaces by a side surface; and

at least one of said skirt and neck being sufficiently resilient to deform as relative threading engagement is effected between said closure and container neck to accommodate the relative movement of said container neck and closure so that said skirt rides against said one cam surface and at least one of said skirt and neck deforms until said protuberance is received in said recess, said one of said skirt and



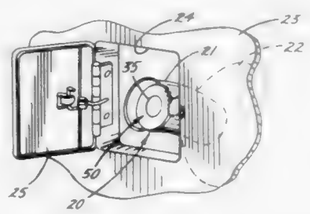
neck being sufficiently stiff to prevent relative rotation between said closure and container after said protuberance is received in said recess for preventing removal of said closure.

5,145,081

CAPLESS CLOSURE FOR A FUEL TANK FILLER PIPE

Marc C. Gravino, Rockford, Ill., assignor to Trilby, Ltd., Rockford, Ill.

Filed Oct. 3, 1990, Ser. No. 592,180
Int. Cl.[5] B65B *31/00*
U.S. Cl. 220—86.2 13 Claims



1. A closure for the outer end portion of the filler pipe of a vehicle fuel tank adapted to be filled by a nozzle inserted into the filler pipe, said closure comprising a base adapted to be fixed to the outer end portion of the filler pipe and having a fill opening therethrough, a valve member mounted on said base and movable between open and closed positions relative to said fill opening, said valve member normally being disposed in said closed position and being moved to said open position by said nozzle as an incident to insertion of said nozzle into the filler pipe, and means for normally locking said valve member in said closed position and selectively movable to release said valve member for movement to said open position by the nozzle.

5,145,082

HANDLE REINFORCEMENT MECHANISM FOR LAUNDRY BASKET

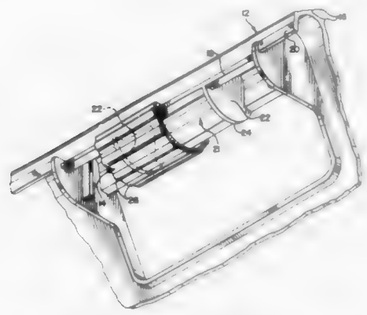
Charles W. Craft, Jr., 58 LeRue St., Apple Creek, Ohio 44606, and John L. Hradisky, 851 Gayer Dr., Medina, Ohio 44256

Filed Sep. 10, 1991, Ser. No. 757,148
Int. Cl.[5] B65D *25/28*
U.S. Cl. 220—755 15 Claims

1. A container having sidewalls and a bottom floor defining an internal chamber, said container further comprising:

a handle opening formed to extend through one said sidewall, proximate an upper rim of said sidewall;

an elongate handle body integrally formed with said one sidewall and spanning said handle opening, substantially parallel to said upper rim, said handle body having a downwardly concave outer surface and inwardly and outwardly disposed flanges extending along inward and outward sides;



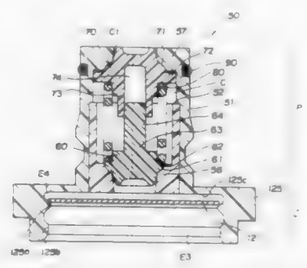
an elongate handle gripping member having an upwardly concave outer surface defined by inwardly and outwardly facing sidewalls extending from a lower bight portion, said gripping member being attachable to an underside of said handle body and having inwardly extending flanges extending from said gripping member sidewalls, for engaging said handle body flanges, whereby attaching said gripping member to said handle body.

5,145,083

CAP DEVICE FOR MOUTHPIECE OF CONTAINER AND METHODS OF SEALING MOUTHPIECE PORTION OF CONTAINER AND OPENING THE SAME

Yutaka Takahashi, Tokyo, Japan, assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1990, Ser. No. 573,625
Claims priority, application Japan, Aug. 28, 1989, 1-228827; Mar. 12, 1990, 2-24537
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—206 10 Claims



1. A cap device to be mounted to a mouthpiece of a container, comprising:

a connecting portion to be connected to the mouthpiece of the container, said connecting portion being provided with an inner hollow portion;

a coupling projecting portion formed integrally with said connecting portion and adapted to be connected to an external connection line, said coupling projecting portion being provided with an axial through hole in communication with the inner hollow portion of said connecting portion; and

a movable valve means disposed in said axial through hole to be axially movable,

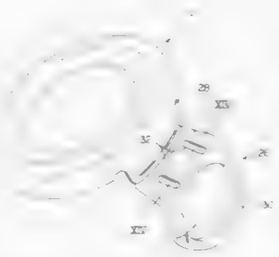
said movable valve means having a first seal member for sealing one end of the axial through hole of said coupling projecting portion, a second seal member for sealing the other end of the axial through hole and a coil spring disposed between said first and second seal members for outwardly urging said first and second seal members, wherein the first seal member and the second seal member are movable in an inward direction of the axial through hole, respectively, when the first seal member and the second seal member receive an external force larger than a force of the coil spring, respectively.

5,145,084

CONTAINER CLOSURE HAVING METALLIC BODY AND PLASTIC GRIP PIECE

Kashiwa Murayama, Fujisawa; Masakazu Tatsuta, Hiratsuka; Yoshiharu Shibata, Hiratsuka, and Hideki Yajima, Hiratsuka, all of Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1990, Ser. No. 628,013
Claims priority, application Japan, Dec. 27, 1989, 1-336316
Int. Cl.[5] B65D *41/32*
U.S. Cl. 220—260 4 Claims



1. A container closure comprising:

a metallic body having a top panel wall, a skirt wall extending down from a peripheral edge of the top panel wall, and a linking protruding piece protruding from a lower end of said skirt wall; and

a plastic grip piece having a linking base portion for covering at least both surfaces of an end portion of the linking protruding piece of said body, and a grip portion extending from said linking base portion,

said plastic grip piece being formed by feeding a plastic material from a side of one surface of the linking protruding piece that is positioned in a mold, said plastic grip piece being linked to the linking protruding piece of said body; wherein

a plastic material inflow groove extends from a free end of the linking protruding piece toward a lower end of said skirt wall formed on a side of another surface of the linking protruding piece of said body, wherein said plastic material inflow groove is provided to allow the plastic material to flow from said one surface to said another surface during molding of the grip piece.

5,145,085

INITIALLY SEALED RECLOSABLE CONTAINER CLOSURE

Charles E. Yost, Menomonie, Wis., assignor to University of Wisconsin, Menomonie, Wis.

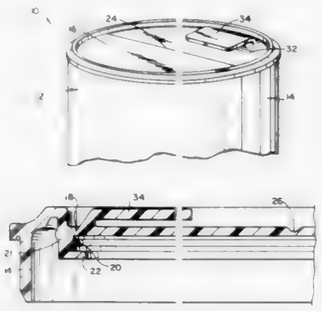
Filed Jan. 29, 1992, Ser. No. 827,323
Int. Cl.[5] B65D *41/32*
U.S. Cl. 220—269 19 Claims

1. A container closure comprising:

a top wall including a flap portion having a peripheral edge

defined by a straight hinge and a frangible membrane, rupture of said frangible membrane defining a free peripheral edge of said flap portion so that the flap portion can be pivoted about said hinge;

a locking wall portion depending downwardly from said top wall along at least a portion of the length of said frangible membrane on a side thereof opposite to said flap portion; and



a flange element projecting from a plane of said locking wall portion toward said flap portion,

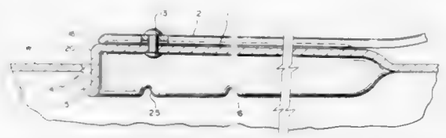
whereby, following rupture of said frangible membrane, said flap portion can be depressed downwardly by pivoting about said hinge to urge the free peripheral edge of the flap portion past said flange element, said flange element thereafter retaining said flap portion thus depressed until the flap portion is positively pulled upwardly to urge said free peripheral edge past said flange element.

5,145,086

CAPTIVE TEAR TAB WITH PROTECTIVE MEANS FOR CONTAINER OPENING

Arthur A. Krause, 20642 Skouras Dr., Canoga Park, Calif. 91306

Filed May 17, 1991, Ser. No. 701,923
Int. Cl.[5] B65D *17/34*
U.S. Cl. 220—270 **15 Claims**



1. In a container closure of the type having a tear tab formed integrally in a container end wall and joined to the container end wall along a frangible score line, with a pull ring attached to the tear tab for separating it from the end wall along the score line to form an opening in the end wall, and wherein the tear tab is permanently joined to the container end wall at one end of the tear tab, and is operated by the pull ring so as to be pulled back from the plane of the end wall and thus not project into the container when opened, the improvement comprising:

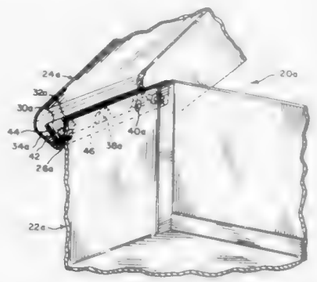
a vertical fold formed in the material of the tear tab along the peripheral edge thereof adjacent the score line and defining at least a downwardly extending bight portion projecting below the plane of the container end wall to form a shield protecting a user from the severed edge of the tear tab when it is separated from the end wall along the score line, said tear tab and container end wall defining substantially smooth, planar surfaces free of recesses which might trap foreign matter.

5,145,087

CLOSURE HINGE MECHANISM

Kenneth F. Weger, Jr., Cary, Ill., assignor to Knaack Manufacturing Company, Crystal Lake, Ill.

Filed Mar. 7, 1991, Ser. No. 665,785
Int. Cl.[5] B65D *43/16*
U.S. Cl. 220—334 **19 Claims**



1. A hinge structure for a storage container having a body and a cover which is movable between open and closed positions, comprising:

a hinge having first and second pivotable arms, the first arm being fastened to a side wall of the container body, the side wall having an outer side wall surface;

an integral, substantially V-shaped member extending inwardly from a side wall of the cover, said member including at least an outer leg extending directly from the cover side wall and an inner leg bent at an angle to the outer leg, the inner leg having an outer surface;

means for fastening the inner leg of the V-shaped member to the second arm of the hinge, the angle between said inner and outer legs being sufficient to accommodate the fastening means; and

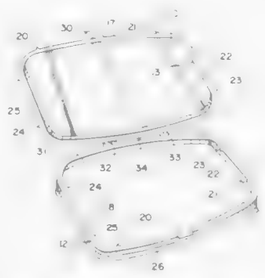
a space defined between the outer side wall surface of the body and the outer surface of the inner leg of the V-shaped member of the cover, whereby the hinge is substantially disposed within the space and sandwiched between the outer side wall surface of the body and the outer surface of the inner leg.

5,145,088

PLASTIC COVER FOR CONTAINER

Daniel Goujon, Chemin du Sécheron, 01460 Brion, France, assignor to Plastiques RG and Daiel Goujon, both of France

Filed Aug. 12, 1991, Ser. No. 743,765
Int. Cl.[5] B65D *43/06, 43/16*
U.S. Cl. 220—355 **5 Claims**



1. A cover for a container, comprising:

a central cover plate;

a peripheral flange disposed substantially at a periphery of said cover, said peripheral flange having a generally U-shaped cross-section at least partially defined by inner and outer arms connected by a joining portion, said inner arm being integral with said central cover plate, said peripheral flange being adapted to snap onto a complimentary rim of a mouth of a container;

inner and outer lip integrally formed with said inner and outer arms, respectively, thereby defining a peripheral slot extending substantially completely around said periphery of said cover;

a plurality of severable tab-spots disposed within said peripheral slot thereby connecting said inner and outer lips;

a gripping tab integral with said inner arm in at least one region of said periphery of said cover; and

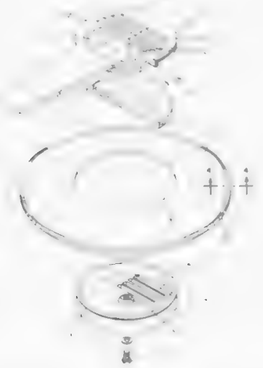
at least two hinge segments joining said inner and outer lips substantially within said peripheral slot, said at least two hinge segments being disposed substantially diametrically opposite said gripping tab to permit rotation of said central cover plate about a rotation axis defined by said hinge segments.

5,145,089

STRUCTURE OF PAN COVER

Kwei T. Chang, No. 14, Lane 54, Luong Chuan St., Panchiao, Taipei Hsien, Taiwan

Filed Jul. 24, 1991, Ser. No. 735,234
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—371 **1 Claim**



1. A cover for a cooking pan, comprising:

a cover plate made of transparent, reinforced fiber glass, having a hole through the center thereof and defining an integral trim extending around the periphery thereof;

an elongated top member having a central circular portion with a flange extending outwardly therefrom, said portion defining a plurality of parallel slots on one side and a hand-hold finger grip on the opposite side, said portion defining also a circular projection vertically extending downwardly from said circular portion and defining therein the upper portion of a receiving chamber beneath said parallel slots, said projection dimensioned to fit within the center hole of said cover plate;

smoke absorber means disposed in said receiving chamber for filtering smoke passing through said chamber;

a cup-shaped, circular bottom member having an upper flange projecting outwardly from the upper edge thereof, and defining a plurality of parallel slots on one side of the lower portion thereof corresponding to the parallel slots on said top member, and a fastening means at the center thereof for securing said bottom member in said top member to form the receiving chamber with smoke absorber means therebetween; and

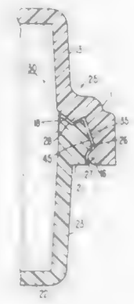
wherein said circular portion of said top member is inserted in said center hole on said cover plate from the top and said bottom member is attached to said top member with the upper flange of said bottom member receiving the circular projection of said top member with said cover plate retained between said top and bottom members by said fastening so that the receiving chamber formed between said top and bottom members with said absorber means therein has parallel slots in the top and bottom thereof.

5,145,090

ARTICLE WITH SNAP-FIT CONNECTION

W. Burk Wyatt, 9545 Inavale Dr., Brentwood, Tenn. 37027

Continuation of Ser. No. 357,269, May 26, 1989, abandoned.
This application Jul. 22, 1991, Ser. No. 734,086
Int. Cl.[5] B65D *7/00*
U.S. Cl. 220—444 **22 Claims**



6. An insulated, plastic food serving unit formed of two interlocking parts and a rigid, expanded foam, said unit comprising:

a top shell made of a material comprising a polyolefin, polyolefin copolymer, halogenated polyolefin, copolymer of halogenated polyolefins, acetal, or nylon and exhibiting a generally planar top surface, top shell sidewalls oriented generally transverse to said top surface, and a top shell rim attached to said to shell sidewalls, said top shell rim exhibiting an interlockable hook-shaped configuration;

a bottom shell made of a material comprising a polyolefin, polyolefin copolymer, halogenated polyolefin, copolymer of halogenated polyolefins, acetal, or nylon and exhibiting a generally planar bottom surface, bottom shell sidewalls oriented generally transverse to said bottom surface, and a bottom shell rim attached to said bottom shell sidewalls and exhibiting an undercut-shaped configuration that is physically interlocked with the top shell rim, said top surface being spaced apart from the bottom surface by a vertical distance and defining an enclosed interior volume bounded by interior surfaces of the top surface, the bottom surface, and the sidewalls of the top and bottom shells that are interlocked at their rims;

whereby at least a portion of the interior top shell surfaces, at least a portion of the interior bottom shell surfaces, or at least a portion of both the top and bottom shell interior surfaces are treated by flame etching, chemical etching, and/or corona discharge to increase the chemical bonding capabilities of the treated interior surfaces; and

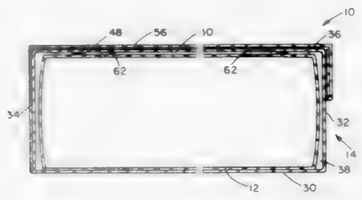
whereby said top shell rim or said bottom shell rim exhibit vent slots;

means for reinforcing the top shell sidewalls, the bottom shell sidewalls, or both the top and bottom shell sidewalls against lateral flexure, said means for reinforcing comprising at least one reinforcement rib that extends away from the top shell sidewall for a predetermined distance as an integral part of said top shell; and

an expanded foam within said enclosed interior volume and chemically bonded to substantially all of said interior surfaces sealing said vent slots, and positioned to force

together the interlockable shape of said top shell and the mating shape of said bottom shell to fix said top shell to said bottom shell in a secure configuration.

5,145,091
RESEALABLE CONTAINER ASSEMBLY
George L. Meyers, Ashland, Ohio, assignor to The Garber Company, Ashland, Ohio
Filed Oct. 15, 1991, Ser. No. 776,840
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—45 7 Claims

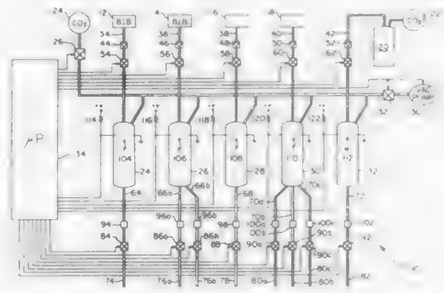


1. A resealable dispensing container assembly for moist products comprising:

a first container of bag-like form constructed of liquid impervious flexible sheet material with the moist products sealed therein, the bag-like container having a weakened tear line encircling a first predetermined area on a first side thereof to permit selective removal of the predetermined area to define a discharge opening for removing moist products from the interior of the bag-like container, an adhesively coated removable flap member adhered to the bag-like container in overlying and adhered relationship to the predetermined area such that pulling the flap from the bag-like container tears the first predetermined area therefrom to open the discharge opening;

a second container of box-like form constructed of relatively rigid sheet material and enclosing the bag-like container, the box-like container having a first wall closely overlying the first predetermined area of the bag-like container, the first wall having a weakened tear line encircling a second predetermined area thereof which overlies and is at least substantially as large as the first predetermined area in the side of the bag-like container, a relatively rigid cover pivoted relative to the first wall and overlying said second predetermined area, said cover being bonded to the second predetermined area of the first wall such that pivoting of the cover causes the second predetermined area to be torn from the first wall to provide access to the first predetermined area of the bag-like container.

5,145,092
SYRUP DISPENSING SYSTEM FOR SOFT DRINK DISPENSER
Joseph W. Shannon, Kent, Ohio, assignor to ABC/TechCorp, Akron, Ohio
Filed Mar. 5, 1991, Ser. No. 664,775
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—61 16 Claims



1. A syrup dispensing assembly for a soft drink dispenser, comprising:

a supply of syrup;

a dispensing head;

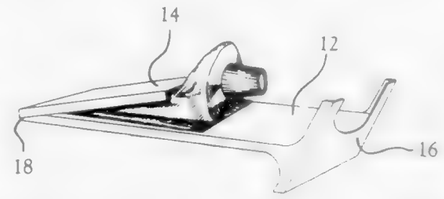
pump means interposed between said supply of syrup and dispensing head for receiving syrup from said supply and passing it to said dispensing head;

vacuum generating means interconnected with said pump means for drawing syrup from said supply to said pump;

control means interconnected with said vacuum generating means for selectively actuating said vacuum generating means to draw said syrup to said pump means; and

pressure generating means interconnected with said pump means for introducing a pressure head to said pump means for passing said syrup to said dispensing head.

5,145,093
TOOTHPASTE DISPENSER
Henry O. Zeller, P.O. Box 13436, Rochester, N.Y. 14613
Filed Oct. 15, 1991, Ser. No. 775,414
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—103 3 Claims



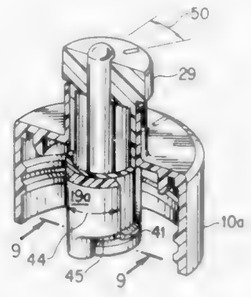
1. A dispenser for dispensing fluid material from a collapsible tubular container, including

a base plate and a partially overlying cover plate foldably connected along the common back end thereof, said cover plate including depending flanges along the sides thereof to straddle said base plate when said cover plate is folded thereover said cover plate being less than half the length of said base plate; and

a front standard supporting the front end of said base plate to elevate the discharge end of said tubular container, said front standard including upright members at each side thereof, forming a central recess between them to cradle the upper portion of said tubular container, the width of said recess being greater than the width of said container;

whereby pressure on said cover plate is effective to expel material from the lower portion of said tubular container until said lower portion is flattened and, when said flattened portion is doubled over and said container repositioned in said dispenser, to seal said flattened portion against reentry of material therein and to expel further material from the next higher portion of said container.

5,145,094
DISPENSING CLOSURE FOR SQUEEZE BOTTLE
Thom M. Perlmutter, Canoga Park, Calif., assignor to Edward M. Bennett, Glendora, Calif.
Continuation-in-part of Ser. No. 569,848, Aug. 20, 1990, abandoned. This application Aug. 9, 1991, Ser. No. 741,601
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—153 25 Claims



1. A liquid dispensing closure for a squeeze bottle, comprising:

a unitary circular plastic cap member having an end wall, an annular skirt extending axially from the end wall for disposition about the neck of a squeeze bottle, a tubular sleeve extending axially from the end wall to define a mouth opening, two arms extending axially from said end wall within the space circumscribed by the skirt, a radial valve disk connected to said arms in axially spaced relation to the said end wall, a cylindrical plug extending axially from said disk to form a cylindrical valve surface, and a cylindrical post extending axially from said plug through said mouth opening defined by said tubular sleeve, and

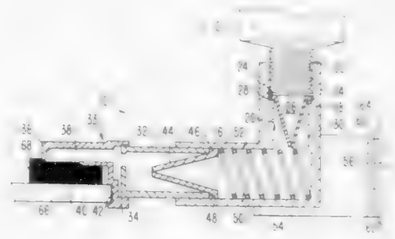
a unitary plastic push-pull closure body including an elongated tubular side wall extending within and through the space defined by the tubular sleeve, and a manually-operable flanged end wall extending transversely of the tubular side wall externally of the cap member, said flanged end wall having a liquid dispenser opening in axial alignment with said post, whereby axial movement of the closure body moves the dispenser opening onto or off of the post, said tubular side wall having a free end area remote from the flanged end wall adapted to telescope onto or off of said cylindrical plug during axial motion of the closure body,

said tubular sleeve having at least one internal annular groove in proximity to its mouth opening, said tubular side wall having an annular detent rib sized to extend into the at least one annular groove to form a liquid seal between the sleeve and tubular side wall, said tubular side wall having an annular sealer bead adapted for slidable engagement with the inner surface of the tubular sleeve, the free end of the tubular side wall having two outwardly radiating flanges adapted to move between said disk and said cap member end wall to limit the motion of the closure body,

said closure body having a closed position wherein said post has a sealed connection with said dispenser opening and said annular detent rib has a sealed fit within said at least one annular groove,

said closure body having an open position wherein said dispenser opening is axially spaced from said post, and said sealer bead is in sealed engagement with the inner surface of the tubular sleeve.

5,145,095
DISPENSER FOR DEFORMABLE TUBE PACKAGED SEMI-SOLID PRODUCTS
James W. Loudon, 3 Pollock Close, Magalliesig, Sandton, Transvaal, South Africa
Filed Aug. 23, 1989, Ser. No. 397,393
Claims priority, application South Africa, Aug. 30, 1988, 88/6426
Int. Cl.[5] B65B *3/00*
U.S. Cl. 222—181 9 Claims

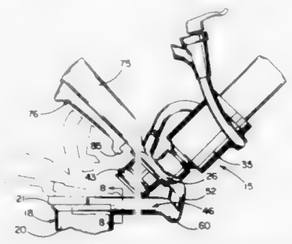


1. A dispenser for dispensing a semi-solid dentifrice material onto a toothbrush, comprising an inlet port to which a throat of a deformable tube containing the dentifrice material can be secured; an outlet port through which the dentifrice material can be dispensed; a chamber between the ports; first one-way valve means at the inlet port to permit flow of the dentifrice material into the chamber and second one-way valve means between the chamber and the outlet port to permit flow of the dentifrice material from the chamber to the outlet port; plunger means displaceable from an initial position for decreasing the volume of the chamber to dispense the dentifrice material through the outlet port; and spring means for returning said plunger means to said initial position for drawing the dentifrice material from the tube into the chamber by increasing the volume of the chamber; said plunger means having a hollow projection of smaller cross-section at an outer end of which the outlet port is located, the outlet port being generally downwardly directed, a passage with an inlet at which said second valve means is provided and passing from the chamber to the outlet port, and a push surface inwardly disposed from the outlet port and against which an end of the toothbrush may be abutted, with bristles thereof disposed beneath the outlet port, to move the plunger means inwardly against the bias of the spring means and thereby dispense the dentifrice material via said passageway downwardly through the outlet port onto the bristles of the toothbrush.

5,145,096
SLIDE-ON TAP FOR A BEVERAGE CONTAINER
Tracy K. Stenger, Rockford, Ill., assignor to Johnson Enterprises, Inc., Rockford, Ill.
Filed Aug. 8, 1991, Ser. No. 742,366
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—400.8 10 Claims

1. A tap for a container having an upstanding tubular neck with a radially outwardly projecting peripheral lip at its upper end, the inside of said neck having normally closed valve means which may be opened to permit pressurized fluid to be introduced into said container and to permit liquid to flow out of said container, said tap comprising a lower body having rib means configured to engage beneath said lip and hold said lower body on said neck, said rib means defining a generally C-shaped retainer permitting said lower body to be slid radially onto said neck with said rib means sliding beneath said lip, said tap further comprising an upper body, pivot means pivotally connecting said upper body to said lower body and supporting said upper body to swing upwardly and downwardly relative to said lower body about a generally horizontal axis between a pretapping position and a tapping position, means extending

downwardly from said upper body for opening said valve means, said valve opening means clearing said neck when said upper body is in said pretapping position and as said lower body is slid radially onto said neck, said valve opening means moving downwardly into said neck and opening said valve



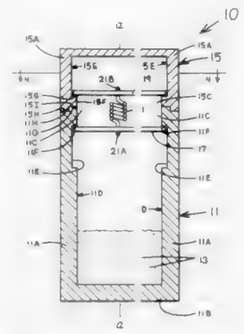
means when said lower body is on said neck and when said upper body is swung downwardly to said tapping position, and latching means on one of said bodies and releasably engaging the other body to hold said upper body downwardly in said tapping position.

5,145,097

SALT SHAKER DEVICE WITH A RESILIENT COVER RETAINING DEVICE

John P. Lowe, 1020 Prospect St., Apartment 303, Lansing, Mich. 48912

Filed Nov. 18, 1991, Ser. No. 793,579
Int. Cl.[5] A47G *19/24*
U.S. Cl. 222—543 **12 Claims**



1. An elongate dispenser for food seasoning which comprises:

(a) a container portion having a sidewall extending along and around a longitudinal axis of the dispenser from a bottom wall to an open end of the container portion;

(b) a cover means for the container portion, the cover means having a perforated end wall and being spaced from the container portion for dispensing food seasoning from the dispenser and with an open end of the cover means, removeably mounted on the open end of the container portion to form a closure for the container portion;

(c) a first, anchor means mounted across the longitudinal axis on an inner annular rim of the cover means;

(d) a second anchor means mounted across the longitudinal axis on an inner annular rim of the container; and

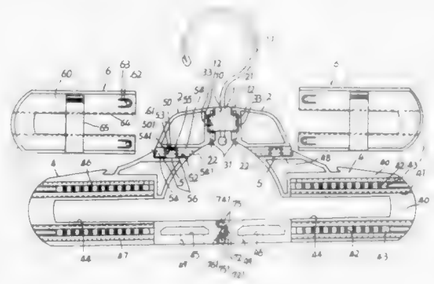
(e) a resilient holding means mounted on and between the first and the second anchor means to hold the cover means on the open end of the container portion as the closure for the container portion, wherein the holding means provides for rotational movement of the cover means relative to the container portion with the first and second anchor means rotating around the longitudinal axis on the respective first and second annular rims and wherein the holding means provides for movement of the cover means and the first anchor means along the longitudinal axis to remove the cover means from the-open end of the container portion so that the cover means is partially separable from the container portion to permit filling the dispenser with food seasoning.

5,145,098

FOLDABLE AND TELESCOPIC GARMENT HANGER

Chen-Jen Tung, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan

Filed Jul. 1, 1991, Ser. No. 723,895
Int. Cl.[5] A47G *25/40, 25/14*
U.S. Cl. 223—94 **11 Claims**



1. A hanger comprising:

a central hook holder having a hook member pivotally held in the hook holder;

a pair of upper holding members each pivotally secured to side portions of said central hook holder by an upper hinge;

a pair of shoulder members each of said shoulder members pivotally secured to an upper holding member by a middle hinge;

a pair of slide members, of which one of said slide members is slidably telescopically mounted on one of said shoulder members, and the other said slide member slidably telescopically mounted on the other said shoulder member for adjustably hanging clothing thereon; and

a lower hinge pivotally connecting two said shoulder members; said two upper holding members and said central hook holder being operatively foldable downwardly to superimpose said two shoulder members about said middle hinge, and all said members being further foldable rearwardly about said upper hinge and said lower hinge to projectively superimpose one of said upper holding members and one of said shoulder members on the other said other upper holding member and the other said shoulder member.

5,145,099

METHOD FOR COMBINING DIE ATTACH AND LEAD BOND IN THE ASSEMBLY OF A SEMICONDUCTOR PACKAGE

Alan G. Wood; Warren M. Farnworth, and George P. McGill, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

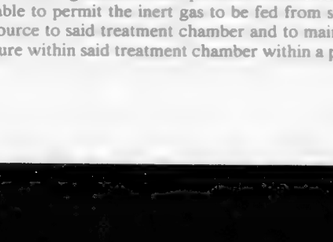
Continuation-in-part of Ser. No. 553,099. This application Nov. 4, 1991, Ser. No. 787,843
The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.
Int. Cl.[5] B23K *3/08*
U.S. Cl. 228—9 **9 Claims**

1. A unified and automatically controlled semiconductor device assembly and inspection system, said system comprising:

a) an existing automated material transport and work holding means, automated die attach means and automated lead bonding means, appropriately and operably and fixedly attached to each other on a common supporting frame means in such a way as to unify and coordinate, in a controlled and continuous manner, mechanical and electrical operations between said material transport and work holding means, said die attach means and said lead bonding means during assembly of said semiconductor devices;

b) said material transport and work holding means being of known design to provide common reference means for positional placement of said devices throughout said die attach and lead bonding operations and final inspection of said completed devices;

c) a common material position indexing means of known design, operably attachable to said common material transport and work holding means, in a known way, to



enable precise and accurate positioning and placement of said semiconductor devices during their assembly and inspection;

d) an automated vision control means operably and independently attached to said die attach means in such a way as to observe and control said die attach operation;

e) an automated vision control means operably and independently attached to said lead bonding means in such a manner as to observe and control said lead bond operation and validate said previous die attach operation;

f) automated vision control means operably and independently attached to said assembly system in such a way as to observe and control completely assembled semiconductor devices; and

g) all of said automated vision control means operably interconnected to each other in such a manner as simultaneously to collect, store, coordinate and utilize all information received by each of said vision control means in order to validate all assembly operations and control, precisely and accurately, the assembly of said semiconductor devices.

5,145,100

SOLDERING APPARATUS

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Japan

Filed Jan. 21, 1992, Ser. No. 823,714
Claims priority, application Japan, Jan. 22, 1991, 3-20278
Int. Cl.[5] B23K *35/38, 20/14*
U.S. Cl. 228—42 **1 Claim**

1. A soldering apparatus comprising:

means for conveying a printed circuit board through a predetermined path;

an air-tight treatment chamber located in said path;

a source of an inert gas;

a supply conduit extending between said treatment chamber and said inert gas source and provided with a feed valve operable to permit the inert gas to be fed from said inert gas source to said treatment chamber and to maintain the pressure within said treatment chamber within a predetermined range; means provided within said treatment chamber for applying a molten solder to a printed circuit board traveling through said path;

a primary chamber disposed upstream of and contiguously to said treatment chamber;

a secondary chamber disposed downstream of and contiguously to said treatment chamber;

evacuating means;

a first conduit extending between said primary chamber and said evacuating means and provided with first valve means operable to permit and prevent the gas communication between said primary chamber and said evacuating means;

a second conduit extending between said secondary chamber and said evacuating means and provided with second valve means operable to permit and prevent the gas communication between said secondary chamber and said evacuating means;

a third conduit extending between said primary chamber and said treatment chamber and provided with third valve means operable to permit and prevent the gas communication between said primary chamber and said treatment chamber;

a fourth conduit extending between said secondary chamber and said treatment chamber and provided with fourth valve means operable to permit and prevent the gas communication between said secondary chamber and said treatment chamber;

a first shutter provided in the upstream end of said primary chamber and movable between open and close positions

so that the printed circuit board can enter said primary chamber when said first shutter is in said open position and ambient air is prevented to flow into said primary chamber therethrough when said first shutter is in said close position;

a second shutter provided between said primary chamber and said treatment chamber and movable between open and close positions so that the printed circuit board in said primary chamber can pass to said treatment chamber therethrough when said second shutter is in said open position and the inert gas within the treatment chamber is prevented to flow into said primary chamber therethrough when said second shutter is in said close position;

a third shutter provided between said secondary chamber and said treatment chamber and movable between open and close positions so that the printed circuit board in said treatment chamber can pass to said secondary chamber therethrough when said third shutter is in said open position and the inert gas within the treatment chamber is prevented to flow into said secondary chamber therethrough when said third shutter is in said close position; and

a fourth shutter provided in the downstream end of said secondary chamber and movable between open and close positions so that the printed circuit board can exit said secondary chamber when said fourth shutter is in said open position and ambient air is prevented to flow into said secondary chamber therethrough when said fourth shutter is in said close position;

whereby the printed circuit board is passed successively

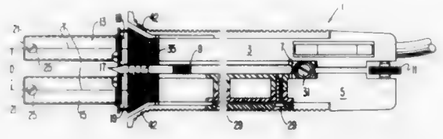
through said primary chamber, treatment chamber and secondary chamber and is soldered during passage through said treatment chamber in the atmosphere of the inert gas with the inert gas within said treatment chamber being discharged therefrom in such an amount as to equalize the pressure within said primary and secondary chambers, evacuated when the printed circuit board is present therewithin, with that within said treatment chamber.

5,145,101

TWEEZER HANDPIECE FOR INSTALLATION AND REMOVAL OF ELECTRONIC COMPONENTS WITH RESPECT TO A SUBSTRATE AND TIPS AND TOOL FOR USE THEREWITH

Robert G. Brown, Annapolis; Edward Faygenblat; Robert S. Quasney, both of Baltimore; Charles M. Cardno, Ellicot City, and William J. Siegel, Silver Spring, all of Md., assignors to Pace Incorporated, Laurel, Md.

Filed Jun. 5, 1991, Ser. No. 710,343
Int. Cl.[5] B23K *3/03*
U.S. Cl. 228—51 32 Claims



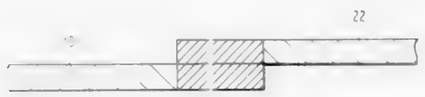
1. A tweezer-type solder reflow, conductive heating device comprising a tweezer handpiece having a pair of tweezer legs, a hinge pivotally connecting said tweezer legs for arcuate movement of front ends of the weezer legs toward and away from each other, a tip element mounting unit mounted on the front end of each tweezer arm, and heating means for heating a tip element mounted to each of the mounting units; wherein an alignment means for longitudinally aligning a tip element mounted on one of said tweezer legs with a tip element mounted on the other of said tweezer legs is provided.

5,145,102

METHOD OF SPLICING METAL WEBS

Shinichiro Minato, Minami-Ashigara; Akio Uesugi, and Tsutomu Kakei, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 445,150, Dec. 5, 1989, Pat. No. 4,325,858, which is a continuation of Ser. No. 221,492, Jul. 19, 1988, abandoned. This application Mar. 20, 1991, Ser. No. 672,493
Claims priority, application Japan, Jul. 20, 1987, 62-181894; Oct. 12, 1987, 62-257990
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—125 4 Claims



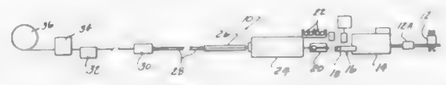
1. A method of splicing together metal webs, comprising the steps of:
positioning together the end portions of said metal webs in a lapped manner such that the end portions of said metal webs are lapped on each other by a length of about 0.5 mm to 1.5 mm, and wherein each of said metal webs has a thickness of about 0.1 mm to 0.5 mm;
welding the lapped portions of said webs to form a welded portion;
after said welding step, rolling said welded portion by moving a roller in the width direction of said metal webs.

5,145,103

PARTIAL ELIMINATION OF COPPER PLATE FROM STEEL STRIP BY MECHANICAL MEANS

Arnold T. Johnson, Davisburg, Mich., assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 525,787, May 18, 1990, Pat. No. 5,069,381. This application Oct. 17, 1990, Ser. No. 599,217
Int. Cl.[5] B23K *1/19*
U.S. Cl. 228—143 19 Claims



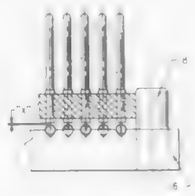
1. A process for producing double-wall tubing comprising the steps of:
sequentially forming an unbrazed, unsealed continuous double-wall tube of a given circumference from a metal sheet of a defined width, said metal sheet composed of a first non-ferritic metal having a first defined surface region of exposed non-ferritic non-ferritic metal and a second defined region of a second metal in overlying relationship to said sheet, said second metal capable of forming fusion bond with said first metal, said exposed non-ferritic metal region having a width less than said defined width and essentially equal to said circumference of said resulting double wall tube; and then
fusing said non-ferritic metal and said overlying metal to one another in a suitable metallurgical process.

5,145,104

SUBSTRATE SOLDERING IN A REDUCING ATMOSPHERE

Joseph A. Apap, Endicott; Mark A. Brown, Whitney Point, both of N.Y.; Alan J. Emerick, Warren Center, Pa.; Thomas L. Miller, Vestal, N.Y.; James R. Murray, Owego, N.Y., and David W. Sissenstein, Jr., Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1991, Ser. No. 672,804
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—179 13 Claims



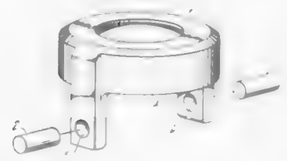
1. A method of soldering, comprising the steps of:
providing a templet, which is itself not solderable, said templet including a plurality of depressions for receiving solder ball preforms;
positioning said templet depression side up and providing a solder ball preform in each of the depressions, each such solder ball preform being essentially free of flux;
aligning said templet provided with solder ball preforms relative to a substrate having a plurality of preselected sites for soldering, and contacting the solder ball preforms to the respective preselected sites;
passing the templet and substrate through a furnace having a reducing gaseous atmosphere at a temperature sufficient to effect oxide removal, melt solder, and effect solder joining;
subsequently cooling the soldered substrate; and
removing the templet from said substrate, placing a surface of said substrate bearing said solder face down onto a flat featureless surface and reflowing said solder in a furnace having a reducing gaseous atmosphere, and cooling the soldered substrate.

5,145,105

DIFFUSION BONDING PROCESS

James M. Floroski, East Hartland, and Eileen A. Bartley, Suffield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 436,299, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 839,237, Mar. 13, 1986, abandoned. This application May 2, 1991, Ser. No. 696,983
Int. Cl.[5] B23K *20/00*
U.S. Cl. 228—194 11 Claims



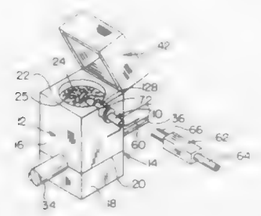
1. A method for solid state diffusion bonding at least two metallic bodies of dissimilar composition comprising:
providing a metallic body having either iron or nickel as a component;
providing a powder metallurgy body composed of a mixture of metal powders including either iron or nickel as one of the metal powders, the mixture of powders being shaped compacted to final form and pre-sintered, the powder metallurgy body having a cobalt base alloy powder blended with the metal powders, the cobalt base alloy being of a composition which promotes solid state diffusion bonding at a temperature below the liquidus temperature of either body;
contacting the bodies with an interference fit; and,
heating the contacted bodies to the sintering temperature of the powder metallurgy body wherein the powder metallurgy body is sintered and solid state diffusion bonding occurs between the bodies at the surface sites where the cobalt base alloy randomly occurs, bonding the bodies together.

5,145,106

WELDING APPARATUS AND METHOD

Dean T. Moore, Strongsville; George F. Kub, Jr., Twinsburg, and Kenneth A. Golonka, Sr., Richmond Heights, all of Ohio, assignors to Erico International Corporation, Cleveland, Ohio

Filed Aug. 3, 1989, Ser. No. 389,261
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—241 26 Claims



1. Exothermic welding apparatus comprising a vessel containing an exothermic material adapted to be converted to molten metal and slag upon ignition, an electrical igniter for igniting said exothermic material comprising a pair of leads extending into said vessel, said leads being connected by a high resistance bridge, said bridge being coated with an ignition material having an ignition temperature in excess of 1000° C., and means to supply a high energy electrical current to said leads to cause said ignition material to ignite and in turn to cause said exothermic material to ignite.

5,145,107

INSULATED PAPER CUP

Virginia K. Silver, Chester, and Robert L. Gordon, Monroe, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Dec. 10, 1991, Ser. No. 804,641
Int. Cl.[5] B65D *3/22*
U.S. Cl. 229—1.5 B 3 Claims

1. An insulated paper cup construction including an outer tapered paper shell having an upper rim around an upper portion thereof and a recessed bottom closure, the upper rim of said outer shell being curled downwardly and radially outwardly, the construction further including an inner tapered paper shell having an upper rim around an upper portion thereof and a bottom closure, the upper rim of said inner shell being curled downwardly and radially outwardly and being curled over and around the upper portion of said outer shell, the taper of said inner shell being greater than the taper of the outer shell to thereby define a tapered air space between said shells, said inner shell having an inner surface which is coated with a plastic film, the caliper of paper of the outer shell being the same as that of the inner shell, said bottom closure of the inner shell resting on said bottom closure of the outer shell.

5,145,108

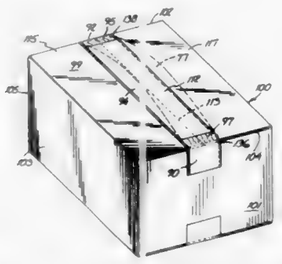
TAPE HANDLE FOR CARRYING BOXES

Keith T. Pinckney; Thomas W. Seabold, and Michael C. Faust, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 588,683, Sep. 26, 1990, Pat. No. 5,079,900. This application Nov. 22, 1991, Ser. No. 796,458
Int. Cl.[5] B65D *5/46*
U.S. Cl. 229—117.26 12 Claims

1. A handle for carrying a box wherein the box has at least one strip of box sealing tape adhered thereto, the handle comprising:
a strip of handle tape having an adhesive side and a back side; and
a strip of deadening material shorter in length than the handle tape which is adhered to the adhesive side of the

handle tape thereby forming a handle assembly having first and second adhesive sections and an intermediate



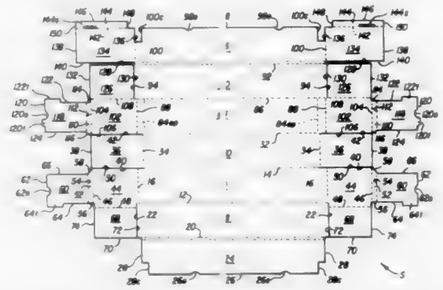
masked section, with the first and second adhesive sections being adhered to the box sealing tape on the box.

5,145,109

UNITARY LIGHT-TIGHT SELF-LOCKING PACKAGE

Luke T. Faulstick, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1991, Ser. No. 796,745
Int. Cl.[5] B65D *81/30, 85/671*
U.S. Cl. 229—145 3 Claims



1. A light-tight package for securely containing light-sensitive material, said package comprising a closable and openable rectanguloid box, said box having a bottom wall, a front wall, a rear wall, and opposite end walls, and a mating lid movably connected to said box rear wall, said lid having a top wall with a front wall and opposite end walls depending therefrom, said box and lid walls all being formed from a single sheet of corrugated paperboard including:

a rectangular box-bottom-wall panel defined by longitudinal box-bottom-wall front and rear fold lines and transverse box-bottom-wall opposite end fold lines;

a rectangular box-front-wall outer panel defined by said box-bottom-wall front fold line, a longitudinal box-front-wall fold line, and transverse box-front-wall outer-panel opposite-end edges;

a box-front-wall inner panel defined by said box-front-wall fold line, a substantially longitudinal box-front-wall inner-panel bottom edge, transverse box-front-wall inner-panel opposite-end edges, and box-front-wall inner-panel opposite-end bottom-corner cutouts;

a rectangular box-rear-wall panel defined by said box-bottom-wall rear fold line, a longitudinal box-rear-wall fold line, and transverse box-rear-wall opposite-end fold lines;

box-opposite-end-wall intermediate panels defined by said box-rear-wall opposite-end fold lines respectively, transverse box-opposite-end-wall intermediate-panel end edges respectively, and longitudinal box-opposite-end-wall intermediate-panel bottom and top edges;

substantially rectangular box-opposite-end-wall outer panels defined by said box-bottom-wall opposite-end fold lines respectively, transverse box-opposite-end-wall outer-panel top fold lines respectively, and longitudinal box-opposite-end-wall outer-panel front fold lines and rear edges;

box-opposite-end-wall top panels defined by said box-opposite-end-wall outer-panel top fold lines respectively, transverse box-opposite-end-wall top-panel fold lines respectively, and substantially longitudinal box-opposite-end-wall top-panel front and rear edges;

box-opposite-end-wall inner panels defined by said box-opposite-end-wall top-panel fold lines respectively, transverse box-opposite-end-wall inner-panel bottom edges respectively, longitudinal box-opposite-end-wall inner-panel front and rear edges, and box-opposite-end-wall inner-panel front-corner tabs respectively;

box-front-wall intermediate partial panels defined by said box-opposite-end-wall outer-panel front fold lines respectively, longitudinal box-front-wall intermediate-partial-panel end edges respectively, and transverse box-front-wall intermediate-partial-panel bottom and top edges;

a rectangular lid-top-wall panel defined by said box-rear-wall fold line, a longitudinal lid-top-wall fold line, and transverse lid-top-wall opposite-end fold lines, said lid-top-wall panel including opposite-end portions thereof extending inwardly from said lid-top-wall opposite-end fold lines;

a rectangular lid-front-wall outer panel defined by said longitudinal lid-top-wall fold line, a longitudinal lid-front-wall fold line, and transverse lid-front-wall outer-panel opposite-end edges;

a lid-front-wall inner panel defined by said lid-front-wall fold line, a substantially longitudinal lid-front-wall inner-panel top edge, transverse lid-front-wall inner-panel opposite-end fold lines, and lid-front-wall inner-panel opposite-end top-corner cutouts;

substantially rectangular lid-opposite-end-wall outer panels defined by said lid-top-wall opposite-end fold lines respectively, transverse lid-opposite-end-wall outer-panel bottom fold lines respectively, and longitudinal lid-opposite-end-wall outer-panel rear edges and front fold lines;

lid-opposite-end-wall bottom panels defined by said lid-opposite-end-wall outer-panel bottom fold lines respectively, transverse lid-opposite-end-wall bottom-panel fold lines respectively, and substantially longitudinal lid-opposite-end-wall bottom-panel front and rear edges;

lid-opposite-end-wall inner panels defined by said lid-opposite-end-wall bottom-panel fold lines respectively, transverse lid-opposite-end-wall inner-panel top edges respectively, lid-opposite-end-wall inner-panel top-edge tabs respectively, longitudinal lid-opposite-end-wall inner-panel front and rear edges, and lid-opposite-end-wall inner-panel front-corner tabs respectively;

lid-front-wall intermediate partial panels defined by said lid-opposite-end-wall outer-panel front fold lines respectively, substantially longitudinal lid-front-wall intermediate-partial-panel end edges respectively, and transverse lid-front-wall intermediate-partial-panel top and bottom edges;

lid-opposite-end-wall intermediate panels defined by said lid-front-wall inner-panel opposite-end fold lines respectively, transverse lid-opposite-end-wall intermediate-panel front and rear edges, and longitudinal lid-opposite-end-wall intermediate-panel bottom edges and top fold lines; and

lid-opposite-end-wall intermediate-panel flaps defined by said lid-opposite-end-wall intermediate-panel top fold lines respectively, substantially longitudinal lid-opposite-end-wall intermediate-panel-flap end edges respectively, and transverse lid-opposite-end-wall intermediate-panel-flap front and rear edges, said flaps including respective slots extending longitudinally therein adjacent to said

lid-opposite-end-wall intermediate-panel top fold lines respectively;

said box-bottom-wall panel, as defined by said box-bottom-wall front and rear fold lines and said box-bottom-wall opposite-end fold lines, forming said box bottom wall;

said box-rear-wall panel being folded upwardly and forwardly about said box-bottom-wall rear fold line into substantially perpendicular relation to said box-bottom-wall panel to form said box rear wall;

said box-opposite-end-wall intermediate panels being folded forwardly and inwardly about said box-rear-wall opposite-end fold lines, respectively, toward and into spaced parallel confronting relation with each other;

said box-opposite-end-wall outer panels being folded upwardly and inwardly about said box-bottom-wall opposite-end fold lines, respectively, toward and into adjacent parallel confronting relation with said folded box-opposite-end-wall intermediate panels respectively;

said box-opposite-end-wall top panels being folded inwardly and downwardly about said box-opposite-end-wall outer-panel top fold lines, respectively, toward and into confronting relation with said folded box-opposite-end-wall intermediate-panel top edges respectively;

said box-opposite-end-wall inner panels being folded downwardly and outwardly about said box-opposite-end-wall top-panel fold lines, respectively, toward and into adjacent parallel confronting relation with said folded box-opposite-end-wall intermediate panels respectively;

said box-opposite-end-wall outer, intermediate, inner, and top panels, so folded, together forming said box opposite end walls respectively;

said box-front-wall intermediate partial panels being folded inwardly and rearwardly about said box-opposite-end-wall outer-panel front fold lines, respectively, toward and into substantial alignment with each other;

said box-front-wall outer panel being folded upwardly and rearwardly about said box-bottom-wall front fold line toward and into adjacent parallel confronting relation with said folded box-front-wall intermediate partial panels;

said box-front-wall inner panel being folded rearwardly and downwardly about said box-front-wall fold line, over said folded box-front-wall intermediate-partial-panel top edges, and then forwardly toward and into adjacent parallel confronting relation with said folded box-front-wall intermediate partial panels;

said box-front-wall outer, intermediate partial, and inner panels, so folded, together forming said box front wall;

said lid-top-wall panel, as defined by said box-rear-wall fold line, said longitudinal lid-top-wall fold line, and said transverse lid-top-wall opposite-end fold lines, forming said lid top wall, but now extending rearwardly from said box rear wall in substantially perpendicular relation thereto;

said lid-opposite-end-wall outer panels being folded upwardly and inwardly about said lid-top-wall opposite-end fold lines, respectively, toward and into spaced parallel confronting relation with each other;

said lid-front-wall intermediate partial panels being folded inwardly and forwardly about said lid-opposite-end-wall outer-panel front fold lines, respectively, toward and into substantial alignment with each other;

said lid-front-wall outer panel being folded upwardly and forwardly about said longitudinal lid-top-wall fold line toward and into adjacent parallel confronting relation with said folded lid-front-wall intermediate partial panels;

said lid-front-wall inner panel being folded forwardly and downwardly about said lid-front-wall fold line, over said folded lid-front-wall intermediate-partial-panel bottom edges, and then rearwardly toward and into adjacent parallel confronting relation with said folded lid-front-wall intermediate partial panels;

said lid-front-wall outer, intermediate partial, and inner panels, so folded, together forming said lid front wall;

said lid-opposite-end-wall intermediate panels being folded rearwardly and inwardly about said lid-front-wall inner-panel opposite-end fold lines, respectively, toward and into spaced parallel confronting relation with each other, and then moved forwardly, downwardly, and rearwardly with said lid-front-wall inner panel toward and into adjacent parallel confronting relation with said folded lid-opposite-end-wall outer panels respectively;

said lid-opposite-end-wall intermediate-panel flaps, when moved with said lid-opposite-end-wall intermediate panels, being folded inwardly and upwardly about said lid-opposite-end-wall intermediate-panel top fold lines, respectively, and then moved downwardly toward and into adjacent parallel confronting relation with said lid-top-wall-panel opposite-end portions respectively;

said lid-opposite-end-wall bottom panels being folded inwardly and downwardly about said lid-opposite-end-wall outer-panel bottom fold lines, respectively, toward and into confronting relation with said folded lid-opposite-end-wall intermediate-panel bottom edges respectively;

said lid-opposite-end-wall inner panels being folded downwardly and outwardly about said lid-opposite-end-wall bottom-panel fold lines, respectively, toward and into adjacent parallel confronting relation with said folded lid-opposite-end-wall intermediate panels respectively;

said lid-opposite-end-wall outer, intermediate, inner, and bottom panels, so folded, together forming said lid opposite end walls respectively; and

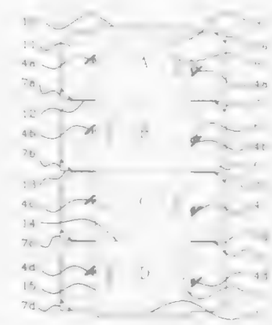
said lid-top-wall panel then being folded upwardly, forwardly, and downwardly about said box-rear-wall fold line so as to move said folded lid-opposite-end-wall intermediate-panel flaps into adjacent parallel confronting relation with said folded box-opposite-end-wall top panels respectively, said folded lid-opposite-end-wall inner panels into adjacent parallel confronting relation with said folded box-opposite-end-wall outer panels respectively, and said folded lid-front-wall inner panel into adjacent parallel confronting relation with said folded box-front-wall outer panel, to move said lid into closing relation with said box and thereby form said light-tight package for securely containing light-sensitive material.

5,145,110

BOX CONSTRUCTION WITH INTERLOCKING TAB FASTENING MEANS

Nicholas Terpstra, 260 Drake La., Ledgewood, N.J. 07852

Filed Sep. 25, 1991, Ser. No. 765,566
Int. Cl.[5] B65D *5/10*
U.S. Cl. 229—155 3 Claims



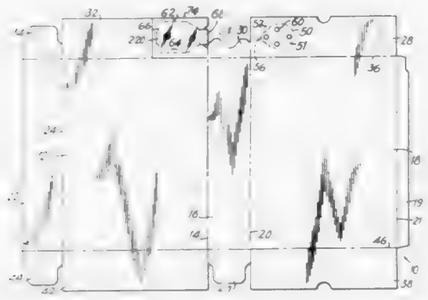
1. A blank which forms a rectangular box when assembled, comprised of four equally sized and shaped panels integrally hinged to each other in series,

each panel having a pair of oppositely disposed end flaps, each such flap being hinged to the panel at the base of the flap and having a pair of corners, one corner being in the form of a pointed tab formed by a pair of notches behind

each such tab and the other corner being beveled, such that the tabs on the oppositely disposed flaps on each panel, are diagonally opposed across the said panel, and the beveled corners are diagonally opposed across the said panel.

each flap further having a slot situated adjacent to the hinge at the base of the flap, said slot being located at a point which aligns and cooperates with the tab from a flap on an adjacent panel when the box is assembled, said box being comprised of four sides and having closed top and bottom surfaces comprised of interlapping and interlocking flaps in the assembled configuration.

5,145,111
CARTON WITH INTEGRAL CLOSURE
Edward J. Giblin, Finksburg, Md., assignor to Lever Brothers Company, Division of Conopco Inc., New York, N.Y.
Filed Dec. 29, 1989, Ser. No. 459,019
Int. Cl.[5] B65D *5/70*
U.S. Cl. 229—219 **20 Claims**



1. A carton blank comprising an inside major closure flap, a first carton panel separated from said inside major closure flap by a score line, an outside major closure flap, a second carton panel separated from said outside major closure flap by a score line, a die cut in said inside major flap defining a removable plug therein, a die cut in said outside major flap defining a cover at least partially detachable from said outside major flap, said plug including debossments suitable for placement of hot melt during sealing of the carton.

5,145,112
AIR CONDITIONER
Matsuei Ueda, Aichi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed Oct. 7, 1991, Ser. No. 772,676
Claims priority, application Japan, Oct. 8, 1990, 2-270874; Jul. 26, 1991, 3-209832
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.3 **20 Claims**

1. An air conditioner comprising:

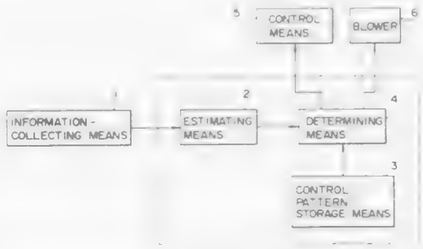
temperature sensation information-collecting means for collecting information about a temperature sensation of a person inside a room or compartment;

temperature sensation-estimating means for estimating a temperature sensation from the hysteresis of the information provided by the temperature sensation information-collecting means within a given period;

control pattern storage means in which a predetermined control pattern for reaching a desired temperature sensation is stored;

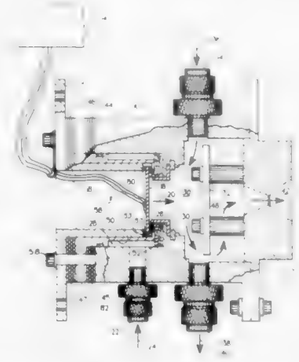
correction amount-determining means for determining amount of corrections of the flow rate and the temperature of air blown into the room or compartment in such a way that the control pattern stored in the control pattern storage means agrees with the temperature sensation estimated by the temperature sensation-estimating means;

conditioning air temperature control means for controlling a temperature of the air blown into the room or compartment according to the output signal from the correction amount-determining means; and



a blower for controlling the flow rate of the air blown into the room or compartment according to the output signal from the correction amount-determining means.

5,145,113
ULTRASONIC GENERATION OF A SUBMICRON AEROSOL MIST
Donald E. Burwell, Wethersfield; James L. Yanosy, Granby; Glen R. Coates, Suffield, and James R. O'Coin, Windsor Locks, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Aug. 30, 1991, Ser. No. 752,751
Int. Cl.[5] B05B *1/08*
U.S. Cl. 239—102.2 **8 Claims**



1. An apparatus for generating a mist comprising:

a nozzle body having an interior cavity and a nozzle outlet opening into the interior cavity;

a piezoelectric crystal disposed within the interior cavity spaced oppositely from said nozzle outlet, said piezoelectric crystal having a surface circumscribed by a periphery for receiving a liquid to be atomized and being vibratible at a selected frequency so as to atomize the liquid received thereon into droplets;

a mixing chamber disposed between said piezoelectric crystal and said nozzle outlet and for receiving the droplets of atomized liquid from the surface of said piezoelectric crystal;

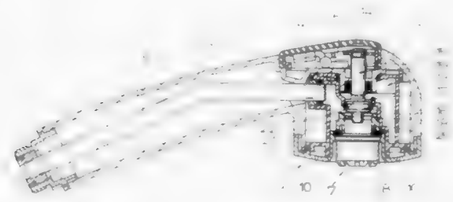
an annular flow control washer disposed adjacent to the periphery of said piezoelectric crystal for distributing the liquid to be atomized over the surface thereof, said control washer comprising a compressible wick-like material;

means for selectively compressing said control washer;

means for delivering the liquid to be atomized through the nozzle body to said control washer; and

means for injecting a low pressure gas into said mixing chamber at a desired rate as a carrier gas for entraining and carrying the droplets of atomized liquid through said nozzle outlet.

5,145,114
SPRAY HEAD FOR A SINK FAUCET OR THE LIKE
Heinrich Mönch, Wie Postanschrift, Fed. Rep. of Germany, assignor to Ideal-Standard GmbH, Bonn, Fed. Rep. of Germany
PCT No. PCT/EP90/00132, § 371 Date Nov. 26, 1990, § 102(e) Date Nov. 26, 1990, PCT Pub. No. WO90/08598, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 24, 1990, Ser. No. 585,116
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1989, 3902588
Int. Cl.[5] B05B *1/18*
U.S. Cl. 239—126 **4 Claims**



1. Spray head (1) for a sink faucet (2) for connection to a low-pressure storage tank, said spray head comprising a water feed (4), a normal jet discharge (7), a spray discharge (9) concentrically surrounding the normal jet discharge (7) and having a multiplicity of small spray holes (10), and a reversing valve (13) wherein, in a normal position, the reversing valve (13) connects the normal jet discharge (7) to the water feed (4) and separates the spray discharge (9) from the water feed (4) and, in a spray position, connects the spray discharge (9) to the water feed (4) and blocks water flow to normal jet discharge (7) from the water feed (4), wherein a bypass pipe (21) that is active in the spray position is provided in the reversing valve for providing a flow path between the water feed (4) and the normal jet discharge (7), and wherein the flow resistance of bypass pipe (21) is greater than the flow resistance of the spray discharge (9) when the spray holes (10) are not clogged for achieving a preferential flow to a spray discharge but which is low enough to permit a flow through the bypass during operation of the spray head when the spray holes are clogged to limit a maximum dynamic pressure occurring upstream from the bypass pipe (21) to a value which is smaller than the bursting pressure of an associated low-pressure storage tank.

5,145,115
AEROSOL DISPERSER ASSEMBLY
Eugene B. Denton, 5540 W. Ontario Ave., Littleton, Colo. 80123
Filed May 22, 1991, Ser. No. 703,890
Int. Cl.[5] B05B *3/04, 3/10*
U.S. Cl. 239—222.17 **16 Claims**

1. An apparatus aerosol spray from a container, said apparatus comprising:

support means adapted for attachment to an aerosol container;

disperser means, rotatably disposed on said support means, for dispersing said aerosol spray in a substantially omnidirectional manner, said disperser means being shaped for rotation by said aerosol spray; and

trigger means adapted for attachment to said container for controlling the release of said aerosol spray from said container.

5,145,116
SPREAD SHIFTER DEVICE FOR BROADCAST SPREADERS
Paul V. Shaver, Harrisburg, Pa., assignor to True Temper Hardware Company, Miamisburg, Ohio
Filed Mar. 6, 1991, Ser. No. 665,336
Int. Cl.[5] A01C *17/00*
U.S. Cl. 239—665 **20 Claims**

2. A broadcast spreader comprising:

a hopper having a feed opening in the bottom thereof;

a supporting frame attached to said hopper;

a wheel and axle assembly rotatably attached to said frame;

an impeller rotatably disposed below said hopper and attached thereto, positioned to receive material from said feed opening;

means for transmitting rotary motion from said wheel and axle assembly to said impeller; and

first means for varying the area of said feed opening comprising a feed gate slidably disposed across said feed opening, said feed gate including a feed gate opening at least as large as said feed opening; and

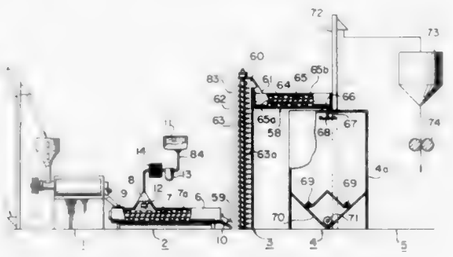
second means for varying the area of said feed opening and for varying the area of said feed gate opening, said second means for varying disposed across an end portion of said feed opening and said feed gate opening, and said second means for varying comprising a spread shift plate having a wide portion and a narrow portion alignable to close and open, respectively, said end portion of said feed gate opening.

5,145,117

PROCESS OF AND SYSTEM FOR FLOURING WHEAT

Toshihiko Satake, Higashihiroshima, and Yukio Hosaka, Hiroshima, both of Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 366,698, Jun. 15, 1989, Pat. No. 5,033,371.
This application Apr. 24, 1991, Ser. No. 690,674
Claims priority, application Japan, Jun. 16, 1988, 63-149828
Int. Cl.[5] B02C 9/04
U.S. Cl. 241—8 6 Claims



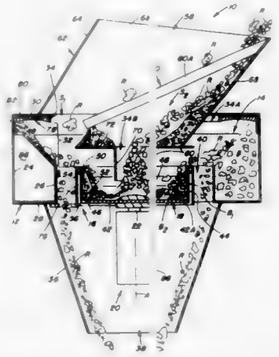
1. A process of flouring wheat comprising the steps of:
polishing wheat grains;
humidifying the polished grains;
transporting the humidified grains and imparting positive independent motion to the humidified grains to agitate the same to thereby prevent the transported humidifed grains from sticking together into lumps of grains;
subjecting the humidified and agitated grains to conditioning; and
milling the conditioned grains to produce a flour.

5,145,118

CENTRIFUGAL IMPACTOR FOR CRUSHING ROCKS

Larry D. Canada, P.O. Box 326, Cascade, Mont. 59421

Continuation-in-part of Ser. No. 698,496, Apr. 23, 1991, abandoned, and Ser. No. 684,462, Apr. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 574,122, Aug. 29, 1990, abandoned. This application Nov. 1, 1991, Ser. No. 786,458
Int. Cl.[5] B02C 23/00
U.S. Cl. 241—81 20 Claims



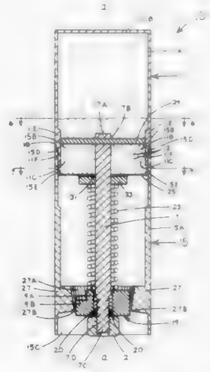
1. A centrifugal impactor for crushing rocks, comprising:
(a) a hollow housing defining a peripheral annular crushing chamber for receiving and holding rocks and a central cavity encompassed by said crushing chamber, said housing having an upper inlet opening above said crushing chamber and said central cavity for entry of rocks into said housing and a lower outlet opening below said crushing chamber and said central cavity for discharge of rocks from said housing; and
(b) a rotor mounted within said central cavity for rotation relative to said housing about a generally vertical axis and being spaced radially inwardly from said crushing chamber relative to said vertical axis so as to define an annular passage between said rotor and said crushing chamber for communicating flow of rocks from said upper housing inlet opening and said crushing chamber to said lower housing outlet opening, said rotor having a horizontal platform and a pair of outer and inner annular barrier members, said outer barrier member being disposed about a peripheral edge of said horizontal platform, said inner barrier member being disposed in concentric relation with said outer barrier member about said rotational axis of said rotor and having a terminal peripheral edge spaced radially inwardly from said outer barrier member and outwardly from said rotational axis, said inner barrier member extending a shorter distance above said horizontal platform than said outer barrier member such that said inner and outer barrier members cooperate to trap and accumulate rocks and form a pair of separate annular beds of accumulated rocks in a substantially symmetrical distribution on said horizontal platform of said rotor which rotate with said rotor and produce an improved internal balance of said rotor and a substantially uniform centrifugal discharge of rocks from said rotor over said inner and outer barrier members thereof over said annular passage toward said crushing chamber.

5,145,119

COMBINED SALT SHAKER AND PEPPER MILL

John P. Lowe, 1020 Prospect St., Apt. 303, Lansing, Mich. 48912

Filed Nov. 18, 1991, Ser. No. 793,480
Int. Cl.[5] B02C 19/00
U.S. Cl. 241—101.2 20 Claims



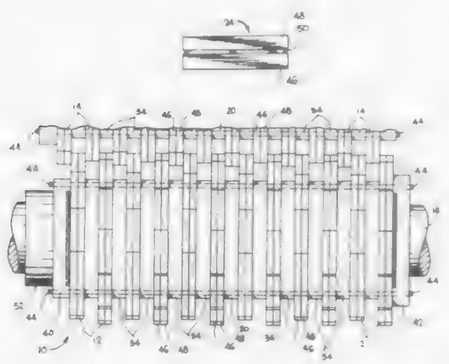
1. A combined food seasoning shaker and pepper mill, which comprises:
(a) a first, pepper dispenser;
(b) a second, food seasoning dispenser having a perforated end wall spaced from the pepper section for dispensing food seasoning therefrom, wherein the food seasoning dispenser and the pepper dispenser are mounted together along a longitudinal axis of the dispensers for rotational movement around the axis relative to each other;
(c) connection means that extends between and is partially mounted in each dispenser with a first end of the connection means mounted on an inner portion of the food seasoning dispenser;
(d) a pepper grinder means mounted at a first, open end of the pepper dispenser, opposite the food seasoning dispenser, the grinder means including a rotor means that is mounted on a second end of the connection means in a closely spaced relationship with a serrated stator portion of the pepper dispenser;
(e) a closure means mounted inside the pepper dispenser, spaced from a second, open end of the pepper dispenser to segregate the pepper dispenser from the food seasoning dispenser, with the connection means mounted through an opening in the closure means to provide for partially mounting the connection means in each dispenser; and
(f) a biasing means biasing the rotor means towards the serrated stator portion of the pepper dispenser, wherein the connection means is rotatable with the food seasoning dispenser to rotate the rotor means and activate the grinder means on relative rotation of the pepper and food seasoning dispensers and wherein the connection means provides for relative movement between the salt dispenser and the pepper dispenser so that the food seasoning dispenser and the connection means with the rotor means are moveable axially away from the pepper dispenser and against the bias of the biasing means to provide a spaced relationship between the grinder element and the serrated stator portion of the pepper dispenser to provide for loading the pepper dispenser and to provide a spaced relationship between the food seasoning and pepper dispensers to permit loading the food seasoning dispenser with food seasoning.

5,145,120

FIXED-WIDTH SHEAR MEMBERS FOR A WASTE REDUCTION APPARATUS

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Filed Jan. 4, 1991, Ser. No. 638,444
Int. Cl.[5] B02C 15/00
U.S. Cl. 241—286 16 Claims



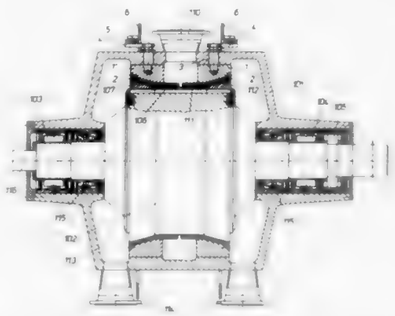
1. A rotary shear apparatus comprising,
parallel first and second rotatable shafts,
a plurality of driving ring means fixed to the circumferences of said first and second shafts for rotation therewith, and
first and second sets of generally annular shear members mounted to said driving ring means so as to be driven by said driving ring means, rotation of said shaft translated to said shear members by said driving ring means, said first set of shear members being mounted to driving ring means of said first shaft and being in meshing relation with said second set of shear members mounted to said driving ring means of said second shaft to form cutting regions along opposed edges of each shear member,
said shear members of said first and second sets each being split to form a pair of abutting blades perpendicular to the axis of said shafts, thereby allowing insertion of a shim member between said abutting blades upon sharpening material-reduction at said opposed edges of shear members, each blade being segmented and having segments individually mounted to said driving ring means.

5,145,121

APPARATUS FOR CRUSHING OR GRINDING OF FIBROUS MATERIAL, IN PARTICULAR DRUM REFINER

Werner Erkinger, No. 26 Dominikanergasse, A-8047 Graz, Austria

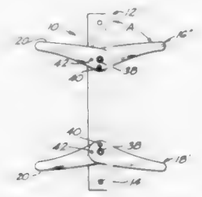
Continuation of Ser. No. 420,743, Oct. 12, 1989, abandoned, which is a continuation of Ser. No. 267,038, Nov. 4, 1988, abandoned. This application Feb. 22, 1991, Ser. No. 660,229
Claims priority, application Austria, Nov. 5, 1987, 2923/87
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.[5] B02C 19/00
U.S. Cl. 241—248 34 Claims



1. A drum refiner for the grinding of wet fibrous material, said drum refiner comprising material feeds, a drumshaped horizontally supported rotor driven by an engine at high rotational speed of up to 3600 rpm, said rotor having at least two frustoconical rotation surfaces inclined to the rotor axis, the diameters of said inclined frustoconical rotation surfaces increasing in the direction away from said material feeds, said rotation surfaces being provided with grinding elements having grinding surfaces inclined to the rotor axis with the diameters of said grinding elements increasing in the direction away from said material feeds; a housing receiving the rotor, said housing having corresponding inner walls opposing each of said at least two rotation surfaces of said rotor and with opposing grinding surfaces arranged thereon, grinding gaps being formed between said grinding elements of said rotor and said grinding surfaces of said housing, said gaps being inclined to the rotor axis, wherein said grinding elements, said grinding surfaces and said grinding gaps are provided continuously increasing in inclination in both directions away from said feeds and away from the axis of the rotor, said gaps being adjustable between said grinding elements of the rotor as well as said corresponding opposing grinding surfaces of the inner walls of the housing, with a cross-axial plane situated medially of said frustoconical surfaces which are located symmetrically to said plane, said material feeds being inwardly directed in said plane; at least two stator rings being disposed within said housing on each of said inner walls and being located one on each side of and symmetrically to said cross-axial plane and the opposing grinding surfaces being disposed on said at least two stator rings, said stator rings being spaced apart, the material feeds being arranged approximately in the center of said housing, evenly distributed over the circumference of the housing and directed approximately radially to the rotor axis; an annular material feed gap being provided approximately in said cross-axial plane directly between said grinding surfaces of said two stator rings, said material feeds emptying into said

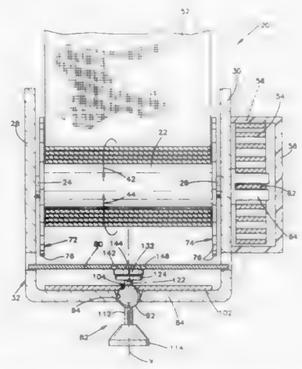
feed gap, said feed gap being connected directly to said grinding gaps, and said at least two spaced apart stator rings being displaceable independently of one another within the housing in a direction approximately parallel to the rotor axis and normal to said plane for adjusting the grinding gaps inclined to the rotor axis, the at least two stator rings being adjustable independently of one another by adjusting means acting directly on their peripheries and piercing the inner wall of the housing, said housing being provided with two front walls on both sides of the rotor, with housing cavities and with shaft bearings for the rotor axis being provided in said walls and in said housing cavities into which the grinding gaps immediately empty, said housing cavities being provided in the area of the two housing front walls close to or in the vicinity of the shaft bearings and on both sides of the rotor, said cavities being sealed steam-tight against said two bearings by special sealing units and placed between said rotor and bearings on the side of the rotor and provided with discharge opening for the ground material.

5,145,122
FLEXIBLE STRAND OR HOSE CADDY
Clarence E. Poister, 1838 S. Laurel, Wichita, Kans. 67207
Filed May 6, 1991, Ser. No. 696,373
Int. Cl.[5] B65H *75/24, 54/02*
U.S. Cl. 242—85.1 **1 Claim**



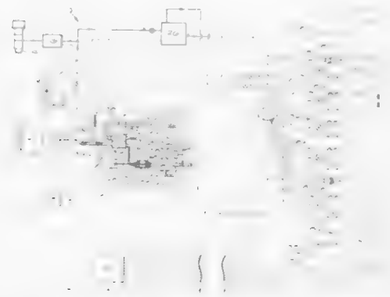
1. A holder for winding an elongated flexible strand thereon, comprising:
an elongated base having first and second planar surfaces and having parallel side and end edge surfaces and parallel first and second end portions;
a first pair of elongated planar arm, each arm of said first pair of arms having arcuately curved end edge surfaces characterized by one arcuate end edge surface being diametrically greater than the other arcuate end edge surface for defining part-circular arm end portions on each arm of said first pair of arms and opposing arm side edge surfaces converging from the diametrically greater part-circular end edge surface, the diametrically greater part-circular end portion of each arm of said first pair of arms disposed in overlapping relation, one upon the other, on and extending transversely from respective side edges of said base adjacent but spaced from one end thereof, said first end portion of said base and the central portion of the diametrically greater part circular end portion of each arm of said first pair of arms having cooperatively aligned first pivot pin receiving apertures therethrough and having a plurality of circumferentially spaced first arm position pin receiving apertures therethrough equally spaced radially with respect to the first pivot pin receiving apertures;
a first pivot pin in the first pivot pin apertures;
an arm positioning pin in selected first position pin apertures for disposing one side edge surface of said converging side edge surfaces of each arm of said first pair of arms on an angle of not less than 80° and not more than 87° with respect to the adjacent side edge surface of said base adjacent said first end portion;
a second pair of elongated planar arms, each arm of said second pair of arms having arcuately curved end edge surfaces characterized by one arcuate end edge surface being diametrically greater than the other arcuate end edge surface for defining part-circular arm end portions on each arm of said second pair of arms and opposing arm side edge surfaces converging from the diametrically greater part-circular end edge surface, the diametrically greater part-circular end portion of each arm of said second pair of arms disposed in overlapping relation, one upon the other, on and extending transversely from respective side edges of said base adjacent but spaced from the other end thereof, said second end portion of said base and the central portion of the diametrically greater part-circular end portion of each arm of said second pair of arms having cooperatively aligned second pivot pin receiving apertures therethrough and having a plurality of circumferentially spaced second arm position pin receiving apertures therethrough equally spaced radially with respect to the second pivot pin receiving apertures;
a second pivot pin in the second pivot pin apertures; and,
an arm positioning pin in selected second position pin apertures for disposing one side edge surface of said converging side edge surfaces of each arm of said second pair of arms on an angle of not less than 180° and not more than 87° with respect to the adjacent side edge surface of said base adjacent said second end portion, whereby a free end portion of a flexible strand when wound around one arm of said first pair of arms and a cooperating arm of said second pair of arms falls by gravity off the last said arms in a flexible strand unwinding action when the longitudinal axis of said base is disposed horizontally and said last arms are vertically disposed downward.

5,145,123
SEAT BELT RETRACTOR WITH VEHICLE SENSITIVE LOCKING MECHANISM
Alexander P. Kotikovsky, Southfield, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed May 17, 1989, Ser. No. 353,077
Int. Cl.[5] B60R *22/40*
U.S. Cl. 242—107.4 A **12 Claims**



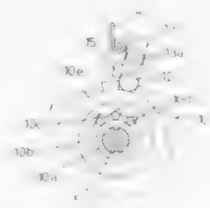
1. A vehicle-sensitive, inertia operated seat belt retractor for use in a vehicle in a selected one of a plurality of different inclined orientations, said retractor comprising:
a spindle on which seat belt webbing can be wound, said spindle being supported for rotation in belt withdrawal and belt retraction directions;
locking means for blocking rotation of the spindle in a belt withdrawal direction, said locking means being movable from a first position to a second position in which rotation of the spindle in the belt withdrawal direction is blocked;
an inertia member supported for pivotal movement from an unactuated position in which said inertia member extends substantially vertically to an actuated position in which said inertia member is pivotally displaced from the unactuated position in response to deceleration of the vehicle at a rate of deceleration above a predetermined rate, said inertia member having a head portion defining an arcuate path of movement during pivotal movement of said inertia member from its unactuated position to its actuated position;
bearing means for supporting said inertia member in said unactuated position when said retractor is in a one of said orientations and also when said retractor is in another of said orientations inclined with respect to said one orientation; and
a sensor interposed between said head portion of said inertia member and said locking means, said sensor including a planar contact surface for engagement with said head portion of said inertia member, said planar contact surface extending in a horizontal plane when said retractor is in one of said inclined orientations, said sensor being adapted to move said locking means to its second position in response to pivotal movement of said inertia member from its unactuated position to its actuated position.

5,145,124
FLUID CONDITIONING SYSTEM AND APPARATUS
Michael R. Brunskill, Rollings Hills Estates, and Wilfred G. McKelvey, Rancho Palos Verdes, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Jul. 12, 1990, Ser. No. 551,334
Int. Cl.[5] B64D *13/00*
U.S. Cl. 244—118.5 **14 Claims**



1. An environmental control system for a passenger aircraft including a passenger cabin receiving a variable passenger load and at least one engine providing a flow of high pressure fresh bleed air, the environmental control system comprising:
means for selectively valving a variable flow of high pressure bleed air from the engine;
cooling pack means for receiving said flow of bleed air and for conditioning said bleed air flow to provide a flow of pressurized, conditioned fresh air for delivery to the aircraft cabin;
recirculation means for extracting a variable flow of recirculation air from the aircraft cabin;
circulation means for mixing the variable flow of recirculation air with said conditioned fresh air, and for distributing the mixed air flow to said aircraft; and
means for controlling both the flow of bleed air from said engine proportionately to said passenger load, and said recirculation air flow inversely proportionate to said passenger load at and above a selected passenger load and at or above a certain minimum recirculation flow for passenger loads less than said selected passenger load, to maintain a desired circulation rate through said aircraft cabin.

5,145,125
FISHING REEL WITH ONE-WAY MECHANISM
Shinichi Morimoto, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan
Filed Jun. 18, 1990, Ser. No. 539,592
Claims priority, application Japan, Jun. 16, 1989, 1-70966[U]
Int. Cl.[5] A01K *89/015*
U.S. Cl. 242—268 **7 Claims**

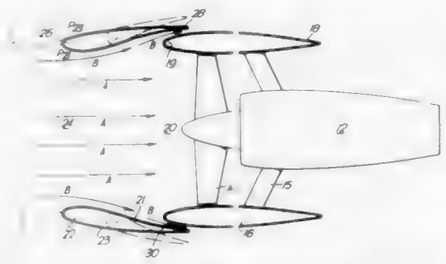


1. A fishing reel comprising:
a reel body;
a handle shaft rotatably mounted on said reel body and having a handle;
a main gear relatively rotatably supported by said handle shaft;
a drag braking mechanism mounted between said main gear and said handle shaft;
an adjusting member for adjusting the braking force of said drag braking mechanism, said adjusting member being mounted on said handle shaft;
one-way clutch means for preventing reverse rotation of said handle shaft, said one-way clutch means having an inner annular member relatively non-rotatably mounted on said handle shaft and an outer annular member surrounding said inner annular member, wherein said one-way clutch means prevents reverse rotation of said handle shaft when said outer annular member is locked against rotation in at least one direction relative to said reel body;
locking means for locking said outer annular member against rotation in at least one direction relative to said reel body, wherein said locking means includes:
at least one engaging portion, said engaging portion being an element of said outer annular member,
at least one engaged portion engageable with said engaging portion, and
an arm for supporting said engaged portion, said arm being supported by said reel body and being displaceable between locked and unlocked positions, wherein said engaged portion is engaged with said engaging portion when said arm is in its locked position, and wherein said engaged portion is released from said engaging portion when said arm is in its unlocked position; and
a control member for displacing said arm between its locked and unlocked positions, said control member being mounted on said reel body facing said handle.

5,145,126
ENGINE NACELLE
Richard G. Patilla, Derby, England, assignor to Rolls-Royce plc, London, United Kingdom
Filed Sep. 9, 1991, Ser. No. 756,554
Claims priority, application United Kingdom, Nov. 16, 1990, 9025023
Int. Cl.[5] B64D *29/00*
U.S. Cl. 244—53 B **9 Claims**

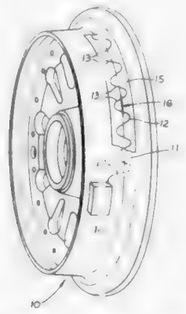
1. A nacelle comprising a first cowling for a gas turbine engine, said first cowling having an air intake forward of said gas turbine engine for directing a flow of air to the gas turbine engine, and a second cowling upstream of said first cowling also having an air intake forward of the gas turbine engine, the

first and second cowlings being arranged so that the air intakes in each of the cowlings are in series flow relationship with one another to allow the passage of flow of air to said gas turbine engine, the second cowling being in a spaced apart relationship



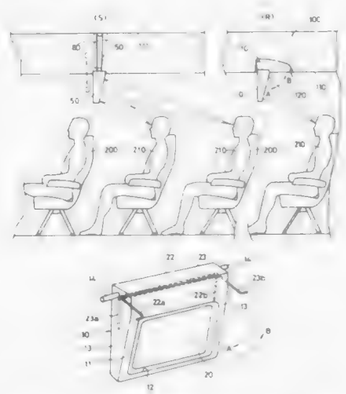
with the first cowling to define an air passage therebetween, the air passage between the first and second cowlings allowing an additional flow of air therethrough at all engine operating conditions to ensure a satisfactory air flow distribution to the engine.

5,145,127
WHEELS
Raymond H. Barnes, Nuneaton; Nicholas R. P. Lee, Coventry, and Trevor C. Wells, Leamington Spa, all of England, assignors to Dunlop Limited a British Company, United Kingdom
Filed Feb. 11, 1991, Ser. No. 653,272
Claims priority, application United Kingdom, Feb. 13, 1990, 9003216
Int. Cl.[5] B60D *45/00*
U.S. Cl. 244—103 R 14 Claims



10. Method of forming a metallic wheel adapted for being subject to a crack detection procedure comprising designing the wheel to have at least one surface region at which cracks will develop preferentially and in a preferential direction in a surface which is obscured when a tire is fitted to the wheel, and forming said wheel with an optical fiber which extends non-rectilinearly on said surface of the wheel at said surface at at least the tire bead seat region, said optical fiber being arranged to extend at least in part in a direction substantially perpendicular to said preferential direction of crack formation.

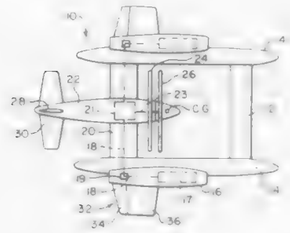
5,145,128
STORAGE DEVICE AND METHOD FOR STORING VIDEO MONITORING EQUIPMENT FOR AIRLINER
Katsuhiko Umeda, Mitaka, Japan, assignor to Jamco Corporation, Tokyo, Japan
Filed Aug. 29, 1991, Ser. No. 751,886
Claims priority, application Japan, Aug. 31, 1990, 2-228379
Int. Cl.[5] B64D *11/00*
U.S. Cl. 244—118.5 14 Claims



1. A storage device for an airliner for storing video monitoring equipment and for moving said video monitoring equipment between a position visible to passengers and a storage section of an airframe for storage, comprising:
a first spring having a first end fixed to the airframe side and a second end fixed to a video monitor between the storage section in a side of the airframe and the video monitoring equipment, said first spring being a long cylindrical spring and being urged in the direction of said airframe side;
a second spring made of a shape-memory alloy which returns to a specific memorized shape when it is heated, a first end of said second spring being fixed to said airframe side and a second end being fixed to said video monitoring equipment;
a first means for moving said video monitoring equipment to said visible position by causing said second spring to return to said memorized shape by heating said second spring; and
a second means for moving said video monitoring equipment to said storage side of said airframe by means of an urging force of said first spring halting said heating of said second spring.

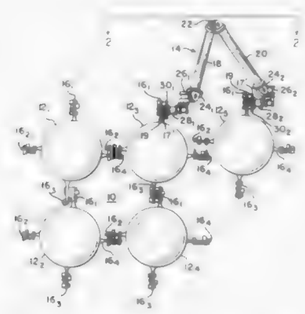
5,145,129
UNMANNED BOOM/CANARD PROPELLER V/STOL AIRCRAFT
David F. Gebhard, Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Jun. 6, 1991, Ser. No. 711,058
Int. Cl.[5] B64C *29/00*
U.S. Cl. 244—12.5 9 Claims

1. An unmanned aircraft comprising:
a fuselage having a pair of propellers mounted to a forward end thereof;
wings extending perpendicularly from a central portion of the fuselage;
a vertical tail section to a rear portion of the fuselage and located in the slipstream generated by the propellers;
a horizontal tail section connected to the rear portion of the fuselage, perpendicular to the vertical tail section and located in the slipstream generated by the propellers;
a pair of booms mounted to the wings and outboard of the propellers extending in parallel spaced relation tot he fuselage and forwardly of the propellers;
a pair of nacelles, each of which is respectively connected to one of the booms and extends in parallel relation thereto;
a wing extension connected to each nacelle and aligned with a respective wing, the extension being perpendicularly foldable with respect to the wing for increasing performance during hover and transition between hover and cruise flight;



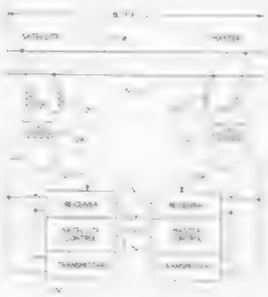
engines located in the nacelles;
a drive train connected between the engines and the propellers for rotating the propellers; and
a bow plane connected between forward portions of the booms, the plane positioned in parallel spaced relation with the wing and forwardly of the propellers thereby being located outside the slipsteam of the propellers and serving to control pitch of the aircraft during aircraft cruising.

5,145,130
ROBOT SERVICED SPACE FACILITY
Lloyd R. Purves, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.
Filed Oct. 23, 1991, Ser. No. 781,625
Int. Cl.[5] B64G *1/10*
U.S. Cl. 244—159 34 Claims



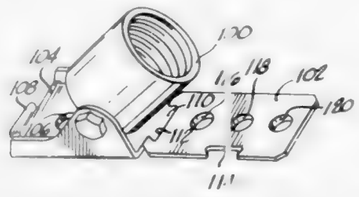
1. A robot serviced space facility capable of self-reconfiguration, comprising:
a plurality of modules for performing predetermined functions at said facility, said modules each having a plurality of attachment means on an outer surface thereof, each said attachment means being comprised of first and second type complementary coupling apparatus whereby said first type apparatus on one of said modules couples to said second type apparatus of another of said modules to provide a transfer path between said modules for all structural loads, electrical power, data, fluids and the like,
wherein said facility is comprised of said modules arranged in multiple interconnection rows to provide redundant critical modules and transfer paths so that any one said module of the facility can be removed without causing the loss of any vital functions of the facility,
at least one robotic type manipulator apparatus comprised of at least first and second articulated members each including outer end sections having coupling apparatus compatible with one of said first and second types coupling apparatus of said modules for selective controlled attachment thereto,
said manipulator apparatus being controlled so as to move in a walking type motion from one said module to another in a succession of alternate end section couplings to perform a predetermined task, said task including reconfiguring the space facility by detaching, transporting and attaching said modules without the need for assistance of control by local or remote human intervention,
said attachment means comprises an outwardly extending flange assembly, and
each said flange assembly comprises a two sided assembly having male type coupling means on one side and female coupling means on the other side.

5,145,131
MASTER-SATELLITE RAILWAY TRACK CIRCUIT
Raymond C. Franke, Glenshaw, Pa., assignor to Union Switch & Signal Inc., Pittsburgh, Pa.
Filed Mar. 27, 1991, Ser. No. 676,093
Int. Cl.[5] B61L *25/02*
U.S. Cl. 246—122 R 40 Claims



1. A railway track circuit for connecting to a track section to detect the presence of a railway vehicle on such track section comprising:
(a) a master transmitter having means for transmitting a master signal onto one end of such track section;
(b) a satellite receiver having means for receiving said mater signal at the opposite end of such track section;
(c) a satellite transmitter having means for transmitting a satellite signal onto said opposite end of such track section only in response to the receipt of said master signal by said satellite receiver;
(d) a master receiver having means for receiving said satellite signal at said one end of such track section;
(e) said transmitters and said receivers each have an impedance less than 0.3 ohms as coupled to the rails of such track section; and
(f) said satellite transmitter transmits a satellite linkup signal in response to said satellite receiver detecting a master link-up signal.

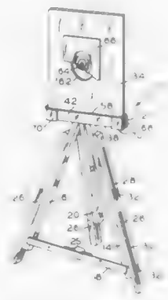
5,145,132
ADJUSTABLE LOAD BOLT ADAPTER BRACKET ASSEMBLY
Kraig A. Kirschner, Corona, Calif., assignor to Automatic Fire Control Incorporated, El Monte, Calif.
Continuation-in-part of Ser. No. 558,077, Jul. 25, 1990, Pat. No. 5,007,603, which is a continuation-in part of Ser. No. 537,907, Jun. 11, 1990, Pat. No. 5,004,193. This application Feb. 12, 1991, Ser. No. 654,277
The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.
Int. Cl.[5] F16L 3/00
U.S. Cl. 248—59 **12 Claims**



1. An adjustable bracket assembly for selective use with a varying number of fasteners to secure a bracing element to a fixed structure, said assembly comprising:
an attachment member having means thereon for engaging a bracing element and defining a flat plate portion extending from said means, said plate portion having at least one fastener receiving apertures therein and a locking tab securing channel formed in opposite sides and one end of said plate portion; and
an adapter plate for cooperation with said attachment member to provide additional fastener receiving apertures for the securement of the bracing element to the structure, said plate defining a plurality of axially aligned fastening receiving apertures therein, a first locking tab extending from one end thereof and a second locking tab extending from one side thereof, one of said tabs being adapted to be received within one of said channels for interlocking said adapter plate with said attachment member in a selected disposition adjacent thereto whereby the number of available fastener receiving apertures for use in securing the bracing element to the fixed structure can be increased by the number of fastener receiving apertures in said adapter plate and the footprint defined by said attachment member and interlocked adapter plate can be varied to fit the available space on a fixed structure.

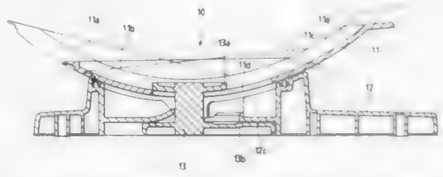
5,145,133
TARGET HOLDER
Robert W. France, 31034 Gowdyville Rd., Cottage Grove, Oreg. 97424
Filed Apr. 29, 1991, Ser. No. 692,622
Int. Cl.[5] F41J 1/00
U.S. Cl. 248—168 **10 Claims**

1. A folding target holder, comprising:
a. a hinge board, having a lower edge;
b. two front legs fixedly attached to the hinge board and diverging downwardly;
c. a rear leg pivotally attached to and between said two front legs;
d. said rear leg folding to a co-planar position between said two front legs;
e. a target board hinged at an edge to the lower edge of the hinge board so that, with the folding target holder in a folded position, the target board lies in the plane of the hinge board against said front and rear legs, and with the folding target holder in an extended, unfolded position, the target board is rotated so that the upwardly extending target board forms an acute angle with the hinge board;
f. means for adjusting the acute angle between the target board and the hinge board; and



g. means for biasing the target board to the acute angle between the target board and the hinge board.

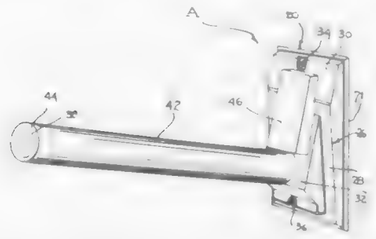
5,145,134
TILTABLE-TURNTABLE FOR DISPLAY MONITOR
Kimio Hashimoto; Katsuyuki Ikoma, both of Fujisawa, and Koji Tsushima, Ayase, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 12, 1991, Ser. No. 714,039
Claims priority, application Japan, Jun. 14, 1990, 2-156014
Int. Cl.[5] F16M 11/12
U.S. Cl. 248—183 **8 Claims**



1. A tiltable turntable for a display monitor, comprising:
a support base;
a monitor base for supporting the display monitor thereon;
a post of a substantially H-shaped cross section, said support base and said monitor base being coupled together by said post for relative tilting and rotational movement;
said monitor base having an oblong hole defined therein, said post being inserted in said oblong hole for limiting relative tilting movement between said support base and said monitor base; and
said support base having a first stopper and a second stopper which are angularly spaced from each other and engageable by said post for limiting relative rotational movement between said support base and said monitor base;
wherein said post has a first retaining member and a second retaining member which are spaced from each other, said first retaining member being held against said monitor base, said second retaining member being held against said support base.

5,145,135
OBJECT SUPPORT RACK
Alex Thompson, Manhattan Beach, Calif., assignor to Russel L. Thompson, Manhatten Beach, Calif.
Filed Feb. 5, 1990, Ser. No. 475,379
The portion of the term of this patent subsequent to Feb. 20, 2004, has been disclaimed.
Int. Cl.[5] A47F 7/00
U.S. Cl. 248—201 **22 Claims**

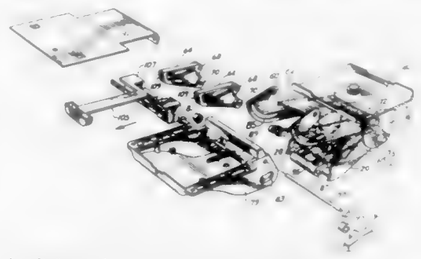
1. A wall mounted object support rack for releasably supporting an a relatively heavy athletic-type elongate object thereon, said object support rack comprising:
(a) a plate having a wall facing wall engaging surface capable of being disposed against a wall so that the entire wall engaging surface is in engagement with a wall such that said plate can be substantially vertically disposed;
(b) a post secured to said plate and extending outwardly therefrom at an angular relationship thereto so that said post is other than in a perpendicular relationship with respect to said plate;
(c) means providing a plurality of fastener receiving apertures in said plate and at least one of which is adjacent an upper end and at least one of which is adjacent a lower end of said plate and which apertures lie in a plane passing through the apertures and the central axis of said post;
(d) said post being at an angle with respect to said plate and located with respect to said apertures where a load in the



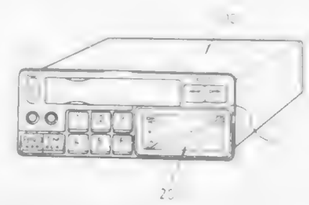
form of a relatively heavy athletic-type elongate object may be carried at the apex of the angle between the post and the plate, said plate having a sufficiently large peripheral dimension and a corresponding sufficiently large wall engaging surface which in combination with the load being carried at the apex of the angle between the post and the plate enables the object support rack to be secured to plaster or plasterboard walls with screws without anchors with sufficient gripping to support the weight of the rack and the load carried thereby, and where a post perpendicularly arranged with respect to a plate would not support an object of equal weight if supported by said screws;
(e) a first foam pad extending entirely over said post; and
(f) a second foam pad on a portion of said plate in a region where an object might otherwise contact said plate so that an object supported on said object support rack will be protected against scratches or abrasions by said pad on said post and the pad on said plate.

5,145,136
ADJUSTABLE SUPPORT MECHANISM FOR A KEYBOARD PLATFORM
Dale K. McConnell, Holland, Mich., assignor to Waterloo Furniture Components Ltd., Kitchener, Canada
Continuation-in-part of Ser. No. 537,422, Jun. 13, 1990, Pat. No. 5,037,054. This application May 17, 1991, Ser. No. 702,060
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] A47F 5/00
U.S. Cl. 248—284 **1 Claim**

1. An improved adjustable support mechanism for a keyboard platform assembly of the type including a platform supported by said support mechanism, said platform associated with a desk, said mechanism comprising in combination:
a mounting plate for attachment to the underside of the desk surface member;
a slide assembly cooperative with the mounting plate and slidable between an extended position and a retracted position;
first bracket means projecting downwardly from the slide assembly, said first bracket means including an upper pivot and a lower pivot;
a forward platform for support of a keyboard;
second bracket means projecting downwardly from the forward platform, said bracket means including an upper pivot and a lower pivot;
a first linkage arm between the upper pivots;
a second linkage arm between the lower pivots whereby the arms and pivots provide a non-parallel unequal connecting linkages between the pivots, said arms defining means for tilting the platform from a first horizontal orientation to a second, not horizontal position as the platform is moved by the pivoting of the arms; and
spring means for biasing the linkage arms about the axes of pivots wherein the spring means comprises a compressible fluid cylinder connected between the pivots of the first and second bracket means.



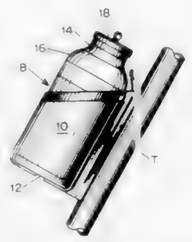
5,145,137
ANGLE ADJUSTING APPARATUS OF AN LCD FOR A CAR STEREO
Heung M. Choi, Kyonggi, Rep. of Korea, assignor to Hyundai Electronics Ind., Co., Ltd., Kyonggi, Rep. of Korea
Filed Nov. 28, 1990, Ser. No. 619,004
Claims priority, application Rep. of Korea, Nov. 30, 1989, 1815489[U]
Int. Cl.[5] A47F 5/00
U.S. Cl. 248—288.5 **8 Claims**



1. An angle adjusting apparatus for a display of a car stereo having a main body to be incorporated in the dashboard of a car and a front panel;
a recessed semi-spherical wall formed in a forwardly facing wall of the front panel and having a circular opening formed in the center of the recessed wall;
a display assembly including a substantially semi-spherical support means, said support means including a first substantially semi-spherical rear wall member and a second substantially semi-spherical rear wall member extending rearward from the first rear wall member, said first rear wall member having a larger radius of curvature than said second rear wall member;
said display assembly further including an LCD attached to a front of the first semi-spherical rear wall member, and a guide shaft extending rearward from the second rear wall member, said guide shaft being movably received in the opening in the recessed wall to movably guide the display assembly so as to adjust the viewing angle of the LCD of the display assembly; and
frictional support means mounted on the guide shaft, said

support means including a frictional contact plate closely attached to the recessed wall adjacent the opening, and means for resiliently urging the contact plate against a rear surface of said recessed wall.

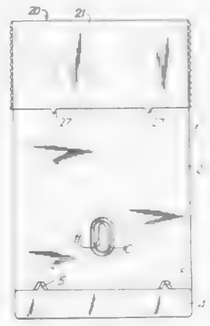
5,145,138
WATER BOTTLE CAGE FOR BICYCLES
Raphael Schlanger, Norwalk, and Robert H. Humphries, New Canaan, both of Conn., assignors to Cannondale Corporation, Georgetown, Conn.
Filed Jun. 25, 1991, Ser. No. 720,942
Int. Cl.[5] A47K *7/08*
U.S. Cl. 248—311.2 **4 Claims**



1. A water bottle cage for bicycles for use with a water bottle of the type having a circular cylindrical side wall, a bottom wall, a neck receiving a cap and a shoulder between the side wall and neck, the cage being molded from a resilient substantially rigid polymeric material and having an elongated base portion having a surface engageable by a lengthwise band along the side wall of the water bottle; a bottom flange portion projecting from the base portion adjacent one end thereof and engageable by a portion of the bottom of the water bottle; a cage portion having a pair of oppositely disposed arcuate segments, each joined at one end to the other end of the base portion and extending laterally therefor for engagement with the side wall of the water bottle generally circumferentially thereof and having its other end disposed generally opposite from the base portion, said other ends of the arcuate segments being spaced apart from each other, a pair of spaced-apart lengthwise segments, each being joined at one end to the other end of a respective arcuate segment and being engageable with the side wall of the water bottle, and an end segment joining the other ends of the lengthwise segments and engageable with a portion of the bottom of the water bottle, the respective arcuate segments and lengthwise segments being deformable relative to each other and to the base portion so as to be adapted to engage resiliently the side walls of the water bottle; and a retainer portion extending from said other end of the base portion engageable with the shoulder of the water bottle.

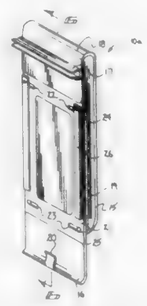
5,145,139
HOLDING DEVICE FOR CONTAINERS WITH TISSUES AND THE LIKE
Peter Holtsch, Taunusstein, Fed. Rep. of Germany, assignor to Holtsch Metallwarenherstellung, Wingsbach, Fed. Rep. of Germany
Filed May 31, 1991, Ser. No. 710,368
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—313 **7 Claims**

1. A holding device for holding containers, comprising a housing having a pin; an insert movable relative to said housing between a proximal position in which the container can be clamped between said insert and said housing and a distal position in which said insert is moved away from said housing so that the container can be removed from the device and a new container can be placed between said insert and said housing, said insert having a transverse web; and means for elastically urging said insert toward said housing to said proximal position, so that said insert can be moved away of said housing toward said distal position by overcoming a resistance of said elastic means, said elastic means including at least one elastic band elastically connecting said insert with said housing, said elastic band including two loop-shaped ends and an



elastic portion extending between said ends, said elastic band being bent over said transverse web of said inert and fitted with its both ends on said pin at two locations which are spaced from one another in an axial direction of said pin.

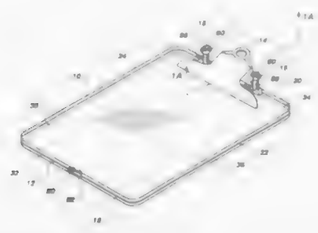
5,145,140
GOLF SCORE CARD SUPPORT BRACKET
Jackie L. Caston, 10420 Cletus Dr., Baton Rouge, La. 70815, and Tracy L. Simoneaux, 21 Park St., Ventress, La. 70783
Filed Jul. 1, 1991, Ser. No. 723,775
Int. Cl.[5] A47B *97/04*
U.S. Cl. 248—447.2 **2 Claims**



1. A golf score card support bracket, comprising,
a "U" shaped spring clip member, the "U" shaped spring clip member including a front planar leg plate spaced from a rear planar leg plate, wherein the front leg plate and the rear leg plate are joined together by a junction web, and the front leg plate includes a lower projecting flange extending below and forwardly of the front leg plate, and
the front leg plate is defined by a first length and the rear leg plate is defined by a second length, wherein the first length is greater than the second length, wherein the second length is arranged to accommodate and secure a score card member between the front leg plate and an associated golf bag wall, and
the rear leg plate includes a hook and loop fastener patch surface mounted fixedly to the rear leg plate in confrontation to the front leg plate, and
the lower projecting flange includes a lower flange projecting leg positioned above the front leg plate in a spaced relationship extending integrally and orthogonally relative to the projecting flange, and

a further "U" shaped spring pencil clip mounted fixedly and orthogonally relative to the front leg plate adjacent the arcuate junction web, and
a plurality of upper slots, wherein the upper slots are aligned relative to one another and are orthogonally aligned relative to opposed side edges of the front leg plate, and a plurality of lower slots, wherein the lower slots are aligned relative to one another and are positioned orthogonally relative to opposed side edges of the front leg and are arranged in a parallel spaced relationship relative to the upper slots spaced apart a predetermined spacing, and each slot includes a pivot pin, and each pivot pin includes a support leg mounted to the pivot pin for pivotally mounting each support leg relative to the front leg plate, and each support leg is defined by a predetermined length less than the predetermined spacing between the lower slots and the upper slots.

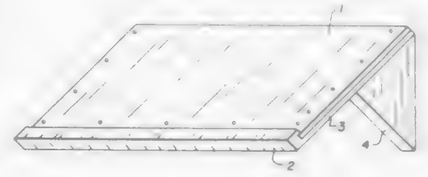
5,145,141
CLIPBOARD
Mark A. Hunter, P.O. Box 1068, Afton, Wyo. 83110
Filed Mar. 11, 1991, Ser. No. 667,454
Int. Cl.[5] A47B *97/04*
U.S. Cl. 248—452 **11 Claims**



1. A clipboard comprising:
a first rigid planar panel having a first end and a second end, said first planar panel being transparent;
a second rigid planar panel, having a first end and a second end;
connection means for detachably connecting said first end of said first planar panel to said first end of said second planar panel, said connection means positioning said first planar panel in parallel with said second planar panel, said planar panels being detachably held in abutment one against another;
a clip means mounted on said first planar panel adapted for releaseably securing sheets of paper on an outwardly oriented face of said first planar panel; and
a sheet having a first face and a second face interposed between said planar panels removably retained therebetween by said connection means operating on said planar panels to abut said first planar panel against the entire surface of said first face and to abut said second planar panel against the entire surface of said second face, said sheet being visible through said first planar panel.

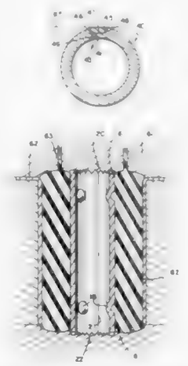
5,145,142
READER'S BOARD
Bela B. Szoke, 409 - 1564 SW. Marine Drive, Vancouver, B.C., Canada V6P 6A6
Filed Jun. 6, 1991, Ser. No. 717,243
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—455 **3 Claims**

1. A reading board to increase clarity of printed material and to allow writing on a tilted surface, the board comprising:
(a) a rectangular flat board having a lower edge, a top edge and a main surface;
(b) a rim perpendicular to said main surface to retain reading material on said surface;
(c) a pair of wire legs, one leg pivotally attached adjacent the lower edge of the board and the other pivotally attached adjacent the top edge of the board, the legs of the pair being of different length so that interchange of the legs allows the angle of tilt to be varied; and



(d) a serrated strip to receive the legs to stabilize the reading board.

5,145,143
VIBRATION DAMPER
Arthur C. Jackson, Carmel, and Raymond P. Chandler, Muncie, both of Ind., assignors to Steel Parts Corporation, Tipton, Ind.
Filed Sep. 10, 1990, Ser. No. 579,609
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—635 **14 Claims**



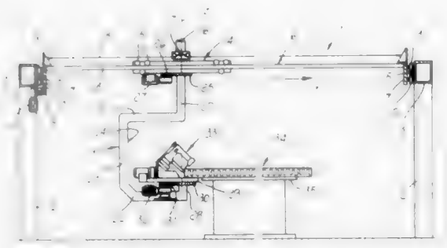
1. An apparatus for damping vibration associated with movable rods comprising,
a bushing formed from a steel blank of relatively uniform thickness and having a first and second reduced thickness edges, wherein the bushing has a longitudinally extending tubular configuration that is bounded by an interior surface that defines an inner cylindrical cavity, an exterior cylindrical surface, and a joint extending between the interior surface and the exterior cylindrical surface, said joint longitudinally extending along the bushing and formed by placement of the first reduced thickness edge of the steel blank in overlapping contact with the reduced thickness second edge of the steel blank to create a zone of contact between the first and second edges in the joint wherein the overlapping reduced edge provides a joint thickness approximately equal to the uniform thickness of the steel blank, and vibration absorbing material placed in contact with the exterior cylindrical surface of the bushing.

5,145,144

APPARATUS FOR MOVING WORKING UNITS ALONG PATHS

Rodolfo Resta; Mario Resta, and Roberto Resta, all of Faenza, Italy, assignors to RESTA S.r.l., Faenza, Italy

Filed Mar. 11, 1991, Ser. No. 666,973
Claims priority, application Italy, Mar. 20, 1990, 3397 A/90
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—637 6 Claims



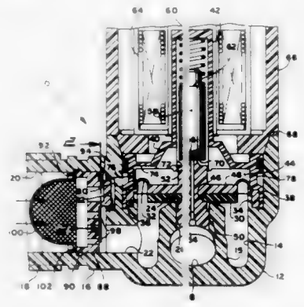
1. Apparatus for moving working units along paths with multiple degrees of freedom, comprising a carriage which can move along an axis X and which supports a trolley guided along said carriage along an axis Y which is orthogonal to said axis X, supporting means being associated with said trolley and supporting a platform, said supporting means being rotatable about an axis Z which is perpendicular to the plane which passes through said axes X and Y, a working unit being mounted on said platform, wherein said supporting means comprise a frame which descends vertically and which comprises a vertical arm which extends with a plurality of portions which are curved so as to form a C-shaped loop the end whereof constitutes a support for said platform, a gearwheel being keyed on said arm, said gearwheel meshing with a pinion which is actuated by a gearmotor mounted on said trolley.

5,145,145

PILOT OPERATED ELECTRICALLY ACTUATED VALUE ASSEMBLY

James Pick, Elk Grove; Robert Cooper, West Dundee, and Richard Donner, Hanover Park, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 11, 1991, Ser. No. 667,138
Int. Cl.[5] F16K *31/06, 51/00*
U.S. Cl. 251—30.03 9 Claims



1. A pilot operated electrically actuated valve assembly comprising:

(a) body means defining a main valving cavity having an inlet and an outlet communicating therewith and a main valve seat disposed between said inlet and outlet;

(b) a movable main valve means including a flexible diaphragm disposed in said cavity for movement between closed position contacting said main valve seat and an open position spaced from said valve seat, said main valve means operable in said closed position to block flow between said inlet and said outlet and in said open position to permit flow between said inlet and outlet;

(c) means defining a pilot valving cavity having said main valve means forming a portion thereof and a rigid insert in said diaphragm having a pilot outlet port therein communicating with said body means outlet;

(d) a pilot valve member disposed in said pilot valving cavity and movable between a first position closing said pilot outlet port and a second position opening said pilot outlet port;

(e) cover means including first guide means forming a portion of the wall of said pilot valving cavity and operative for guiding said movement of said pilot valve member, said cover means defining a bleed port communicating between said inlet and said valving cavity, said bleed port providing a lesser flow area than said pilot outlet port;

(f) electromagnetic means operable upon energization and de-energization to move said pilot valve means to move between said first and second position for effecting consequent opening and closing of said main valve member; and,

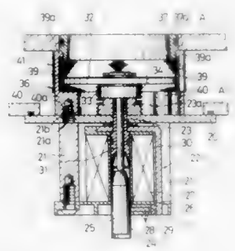
(g) said cover means includes an enlarged diameter portion having second guide means extending inwardly therefrom operable to contact said rigid insert in said diaphragm and provide guidance for said movement of said main valve means.

5,145,146

NOZZLE SUPPORT ARRANGEMENT IN ELECTROMAGNETIC VALVE

Tetsuhiko Matsushima, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Dec. 16, 1991, Ser. No. 807,594
Claims priority, application Japan, Apr. 15, 1991, 3-25057[U]; Jul. 4, 1991, 3-51814[U]
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.02 6 Claims



1. A nozzle support arrangement in an electromagnetic valve, comprising:

a frame;

a solenoid fixedly mounted on the outside of said frame;

a valve element arranged on the inside of said frame, and driven in advancement and retreat by said solenoid;

a nozzle arranged on the inside of said frame and arranged so as to be opposed to said valve element; and

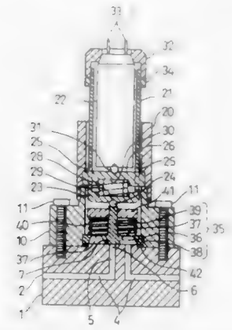
support means by which said nozzle is supported on the inside of said frame, said support means including a plurality of spacer sections fixedly mounted in an upstanding manner on the inside of said frame, and a plurality of latching sections arranged respectively at forward ends of the respective spacer sections and rotatably latching said nozzle.

5,145,147

NORMALLY CLOSED-TYPE FLUID CONTROL VALVE

Akira Nakazawa, Kyoto, and Hiroshi Ohsasa, Miyanohigashi, both of Japan, assignors to Stec Inc., Kyoto, Japan

Filed May 23, 1991, Ser. No. 704,348
Claims priority, application Japan, May 26, 1990, 2-136739
Int. Cl.[5] F16K *31/04*
U.S. Cl. 251—129.06 20 Claims



1. In a normally closed-type fluid control valve, having a guide extending upward from a counter member on an upper surface of a valve base, the improvement comprising:

a cylindrical member having an engaging portion at its lower end and movable up and down within an inner side of the guide,

an actuator mounted within the cylindrical member,

a support member fixed in position by means of said counter member and said guide at a position below a lower end portion of the actuator, a lower end of the actuator being engaged with an upper surface of said support member, and

a pressing spring being interposed between the support member and said engaging portion of the cylindrical member to constantly press a valve body against a valve seat formed in said valve base, whereby closing said valve so that said pressing spring may be compressed by an output of the actuator during the time when the actuator is acting to separate said valve body from said valve seat, thereby opening the valve.

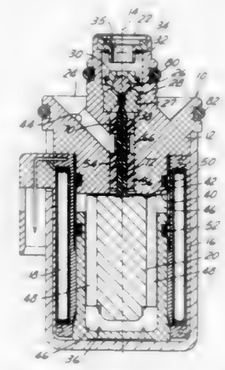
5,145,148

SOLENOID VALVE OPERATING MECHANISM COMPRISING A PIN HAVING A PLASTIC SLEEVE MOLDED ONTO A METAL CORE

Ray V. Laurent, Ortonville, Mich., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Nov. 14, 1991, Ser. No. 792,126
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.14 16 Claims

1. A solenoid valve comprising valve body means having a fluid flow path containing a valve element that is selectively seated on and unseated from a valve seat by means of an electrically operated mechanism to control fluid flow through said flow path, aid electrically operated mechanism comprising an electromagnetic coil, armature means, bias means, and a pin that are organized and arranged to be effective in response to the selective energization and de-energization of said coil to seat and unseat said valve element on and from said seat, said pin being disposed between said armature means and said valve element in a circular cylindrical bore portion of said valve body means which comprises a first portion of said flow path, said flow path comprising a second portion that transversely intersects said bore portion such that one section of said bore portion is to one side of the intersection of said second portion of said flow path with said bore portion and another section of said bore portion is to an opposite side of the intersection of said second portion of said flow path with said bore portion, and said pin being guided by said bore portion for axial reciprocation therein in response to the selective energization and de-energization of said coil, characterized in that said pin comprises a metal core which extends between said armature means and said valve element and which is circumferentially surrounded by a non-metallic means via which both said one and said another sections of said bore portion guide the axial reciprocation of said pin, in that said non-metallic means has in transverse cross section a nominally circular outside diameter, and in that said pin comprises one or more slots which interrupt said nominally circular outside diameter of said non-metallic means and through which fluid flow through said at least a portion of said flow path passes.

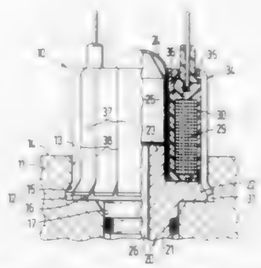


5,145,149

FORM-FITTING CONNECTION OF A MAGNET VALVE TO A HOUSING BLOCK

Martin Moehle, Steinheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 31, 1992, Ser. No. 828,611
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1991, 4104804
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.15 6 Claims

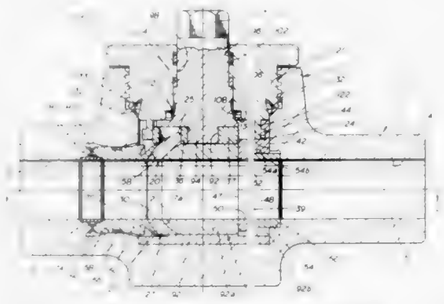


1. A form-fitting connection of a magnet valve (10) that has a housing jacket (34) fitting over a coil (29), having a housing block (11) with a receiving bore (12) for a valve body portion (22) fixed axially and radially in it, said housing block (11) includes a cylindrical bore segment (13) that extends to the receiving bore (12) which changes into an undercut (15) as the bore depth increases and a shoulder (16) that extends radially to a smaller diameter bore (17),

the valve body portion (22) has a shape adapted to be received in the receiving bore (12) with the undercut (15),

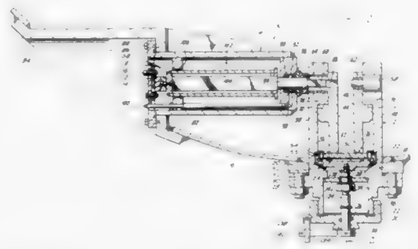
leaving open an encompassing gap (**31**) of constant width with respect to the undercut;
an approximately hollow-cylindrical component is pressed into said encompassing gap filling the gap (**31**) between the receiving bore (**12**) and the valve body portion (**22**) and engaging the region of the undercut (**15**);
the hollow-cylindrical component is embodied by the housing jacket (**34**) of the magnet valve (**10**); and
the housing jacket (**34**) is provided, in the region of the undercut (**15**), with at least approximately axially extending slits (**38**).

5,145,15(
VALVE WITH METAL-TO-METAL SEALING MEANS
Robert T. Brooks, Aberdeen, Scotland, assignor to Robert T. Brooks, Houston, Tex.
Continuation-in-part of Ser. No. 567,737, Aug. 15, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 718,791
Int. Cl.[5] F16K *5/20*
U.S. Cl. 251—188 **29 Claims**



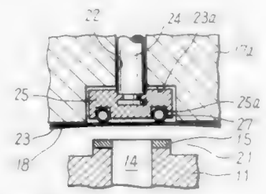
1. A valve for controlling liquid flow comprising:
a valve body having flow passages disposed along a central axis for coupling to pipe members and a central valve portion with a hollow interior disposed intermediate of said passages, said central valve portion being arranged to be closed by a cap member;
a sealing system in said valve body for a spherically shaped metal sealing element and a spherically shaped annular metal seat element where the sealing element can be rotated about a transverse axis between a first position where the sealing element closes off the opening of said seat element and a second position where an opening in said sealing element is in fluid communication with both flow passages;
said seat element being a tubular member slidably mounted in said valve body for axial movement relative to said central axis, said tubular member having a flexible lip portion at one end to provide flexure and a metal-to-metal seal in response to axial force along said central axis and having an annular configured element end surface at its other end in facing relationship to an annular configured body end surface in said valve body,
said configured element end surface and said configured body end surface respectively having beveled portions arranged to define an angular shape in cross section with an apex-to-apex relationship to one another;
resilient annular metal sealing means disposed between said configured end surfaces and adapted to provide flexure and a metal-to-metal seal in response to axial force along said central axis;
said annular metal sealing means being ring members with a V shaped cross section and having outer surface portions to form an angular shape in cross section with an apex-to-apex relationship to one another; and
means cooperating with said valve body and said sealing element for developing an axial force along said central axis for flexing said seat element and said sealing means and for providing metal-to-metal sealing relationships.

5,145,151
INTERNAL TANK VALVE WITH VALVE LOCK
Clyde H. Chronister, 6115 Bermuda Dunes, Houston, Tex. 77069
Filed Jan. 17, 1992, Ser. No. 822,238
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—144 **8 Claims**



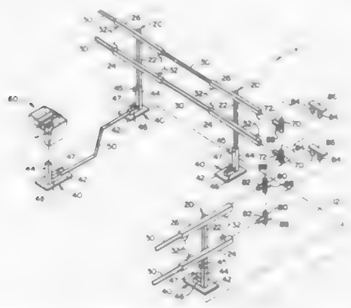
1. An internal valve for a mobile tank car having an opening comprising,
a valve seat having a passageway supported from the tank and positioned in the tank opening;
a sealing valve element positioned in the tank for coacting with the valve seat for opening and closing said passageway,
a valve cap releasably connected about the passageway below the valve element for releasably closing the passageway,
a stem sealingly extending through the cap and threadably engagable with the valve element when the valve element is in the closed position,
coacting engaging means between the stem and the valve seat for allowing the threadably engaged stem to pull the valve element onto the seat in a closed and locked position when the stem is rotated, and
means connected to the stem outside of the cap for rotating the stem and locking the valve element in the closed position.

5,145,152
HIGH-VACUUM VALVES
Hiroshi Komuro, and Tsuneo Ishigaki, both of Soka, Japan, assignors to SMC Corporation, Tokyo, Japan
Filed Jul. 9, 1991, Ser. No. 727,434
Int. Cl.[5] F16K *7/16*
U.S. Cl. 251—331 **4 Claims**



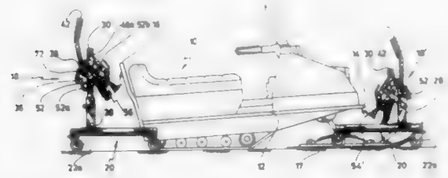
1. In a high-vacuum valve comprising a valve proper having a plurality of ports and a valve seat disposed in a passage communicating therewith, a valve body to open and close the valve seat, and an actuating mechanism to bring the valve body in and out of contact with the valve seat, the improvement which comprises:
a valve chamber defined by the valve proper and a metal diaphragm facing the valve seat therein, the actuating mechanism being disposed on the reverse side of the metal diaphragm and outside the valve chamber; and
a spring to apply a force to press the metal diaphragm against the valve seat and absorb an over-travel disposed in a position corresponding to the position of the valve seat between the actuating mechanism and metal diaphragm, wherein the spring comprises an endless annular coil spring made by closely winding a metal wire into a helical form and disposed in a position corresponding to the position of the valve seat.

5,145,153
PORTABLE HANDRAIL COUNTER-WEIGHT SYSTEM
William Glynn, West Suffield, Conn., assignor to Sinco Incorporated, East Hampton, Conn.
Filed Feb. 5, 1991, Ser. No. 650,930
Int. Cl.[5] E04H *17/22*
U.S. Cl. 256—59 **19 Claims**



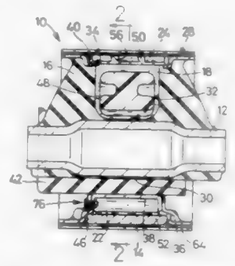
1. A counter-weight system for supporting a portable handrail on an elevated structure comprising:
base means comprising a plate and first and second shoe means disposed in generally mutual orthogonal relationship above said plate;
receptacle means dimensioned to rest on said base means and generally overlie said first and second shoe means for providing a receptacle disposed above said base means; and
locking means for interlocking said receptacle means with said base means.

5,145,154
SELF CONTAINED POWER ASSIST LIFT JACK
Romain Bastille, 2, Mére Anthier Street, Riviére-du-Loup, Québec, Canada G5R 3W9, and Adélard Vaillancourt, 324, Boulevard Thériault, Riviére-du-Loup, Québec, Canada G5R 3X8
Filed Aug. 20, 1991, Ser. No. 747,653
Int. Cl.[5] B60P *1/48*
U.S. Cl. 254—10 B **4 Claims**



1. A vehicle-servicing lift jack for lifting part of a generally ground standing vehicle, comprising:
(a) a ground standing lift jack frame;
(b) bracket means, to be movably connected to said lift jack frame and destined to releasably engage said vehicle part to be lifted;
(c) hand-operated lifting means, for manually progressively lifting said vehicle part from a ground position to a raised position;
(d) lock means, for releasably locking said lifting means at said raised position;
(e) power assist means, for substantially reducing the required manual force to be applied at said hand-operated lifting means during said vehicle lifting, said power assist means comprising:
means for collecting and storing at least a substantial portion of the potential energy differential of said vehicle as said vehicle is lowered from its raised position to its said ground position; and
means for restoring said stored energy, as said vehicle part is subsequently lifted from its said ground position, and for transforming this restored energy into a non-reciprocating, spring-back, upwardly directed, biasing load for aiding in the lifting effort required at said hand-operated lifting means; and
(f) coupling means, operatively interconnecting said power assist means to said lifting for concurrent lifting action thereof, wherein said coupling means includes:
a parallel linkage member;
first mounting means, connecting said hand-operated lifting means to said parallel linkage member for relative movement thereabout;
second mounting means, connecting said parallel linkage member to said lift jack frame for relative movement thereabout;
third mounting means, connecting said parallel linkage member to said bracket means, for relative movement of the latter with respect to said lift jack frame;
fourth mounting means, connecting said power assist means to said first mounting means, for relative motion thereabout;
fifth mounting means, connecting said power assist means to said lift jack frame for relative movement thereabout;
wherein said power assist means is independent of any external source of energy other than the weight of said vehicle.

5,145,155
METHOD OF MANUFACTURING FLUID-FILLED ELASTIC MOUNT HAVING FLUID INJECTION HOLE FOR FILLING PRESSURE-RECEIVING AND EQUILIBRIUM CHAMBERS
Yoshiki Funahashi, Iwakura, and Masayuki Hibi, Komaki, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan
Filed Nov. 2, 1990, Ser. No. 608,393
Claims priority, application Japan, Nov. 2, 1989, 1-286544
Int. Cl.[5] F16M *1/00, 7/00;* **B60G** *13/00;* **F16F** *9/00*
U.S. Cl. 267—140.12 **14 Claims**



1. A method of manufacturing a fluid-filled elastic mount which includes an elastic body flexibly connecting an inner and an outer sleeve which are radially spaced apart from each other, means for defining a pressure-receiving chamber and a

variable-volume equilibrium chamber which are formed between the inner and outer sleeves and which are filled with a non-compressible fluid, and means for defining an orifice passage for fluid connection between the pressure-receiving and equilibrium chambers, said pressure-receiving chamber undergoing pressure changes due to elastic deformation of said elastic body upon application of a vibrational load, said equilibrium chamber being defined partially by a rigid member and partially by a flexible diaphragm which permits volumetric changes of the equilibrium chamber, comprising the steps of:

preparing a mount body having said pressure-receiving chamber, said equilibrium chamber and said orifice passage;

forming at least one injection hole through said rigid member partially defining said equilibrium chamber, such that said at least one injection hole is open on an outer surface of the elastic mount other than an outer circumferential surface of said outer sleeve;

injecting said non-compressible fluid through said at least one injection hole, into said equilibrium chamber, said orifice passage and said pressure-receiving chamber; and

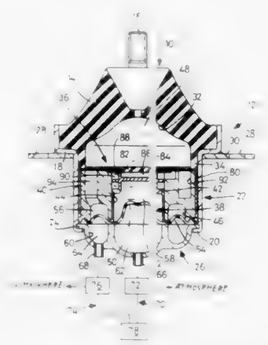
fluid-tightly closing said at least one injection hole upon completion of filling of the equilibrium chamber, the orifice passage and the pressure-receiving chamber with said non-compressible fluid.

5,145,156

FLUID-FILLED ELASTIC MOUNT HAVING TWO DIFFERENTLY TUNED ORIFICES SELECTIVELY UTILIZED FOR DAMPING OR ISOLATING VIBRATIONS IN DIFFERENT FREQUENCY RANGES

Atsushi Muramatsu, Komaki, and Yoshiki Funahashi, Iwakura, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan

Filed Jan. 28, 1991, Ser. No. 646,858
Claims priority, application Japan, Feb. 2, 1990, 2-24984
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.14 **10 Claims**



1. A fluid-filled elastic mount for flexibly connecting two members, comprising:

a first support structure and a second support structure which are respectively fixed to the two members to be flexibly connected, and which are spaced apart from each other in a load-receiving direction in which vibrations are applied to the elastic mount, said load-receiving direction being in a axial direction of the elastic mount;

an elastic body interposed between said first and second support structures for elastically connecting the first and second support structures;

a partition structure supported by said second support structure so as to extend in a direction substantially perpendicular to said load-receiving direction;

said elastic body at least partially defining a pressure-receiving chamber disposed on one side of opposite sides of said partition structure on the side of said first support structure, said pressure-receiving chamber being filled with a non-compressible fluid, a pressure of said fluid in said pressure-receiving chamber changing due to elastic deformation of said elastic body upon application of the vibrations of said load-receiving direction;

a first flexible diaphragm cooperating with said partition structure to define a first variable-volume equilibrium chamber disposed on the other side of said partition structure remote from said pressure-receiving chamber, said first equilibrium chamber being filled with said non-compressible fluid, said first flexible diaphragm being elastically deformable so as to absorb a change in a pressure on said fluid within said first equilibrium chamber;

said second support structure and said first flexible diaphragm cooperating with each other to define a first air chamber which is separated from said first equilibrium chamber by said first flexible diaphragm, for permitting the first flexible diaphragm to elastically deform;

said partition structure at least partially defining a first orifice passage for fluid communication between said pressure-receiving and first equilibrium chambers to permit flow of said fluid therebetween;

a second flexible diaphragm cooperating with said partition structure to define a second variable-volume equilibrium chamber disposed on the other side of said partition structure remote from said pressure-receiving chamber, said second equilibrium chamber being filled with said non-compressible fluid, said second flexible diaphragm being elastically deformable so as to absorb a change in a pressure of said fluid within said second equilibrium chamber;

said second support structure and said second flexible diaphragm cooperating with each other to define a second air chamber which is separated from said second equilibrium chamber by said second flexible diaphragm, for permitting the second flexible diaphragm to elastically deform;

said partition structure at least partially defining a second orifice passage for fluid communication between said pressure-receiving and second equilibrium chambers to permit flow of said fluid therebetween, said second orifice passage have a ratio of a cross sectional area thereof to a length thereof, which ratio is higher than that of said first orifice passage;

means for structurally separating said first and second equilibrium chambers from each other; and

pressure control means connected to said second air chamber for changing a pressure in said second air chamber, said pressure control means comprising switching means operable between a first position for communication of said second air chamber with a first pressure, and a second position for communication of said second air chamber with a second pressure higher than said first pressure, said non-compressible fluid flowing substantially exclusively through said first orifice passage when said switching means is placed in said first position, and through said second orifice passage when said switching means is placed in said second position.

5,145,157

ADJUSTABLE WORKPIECE-HOLDING SYSTEM

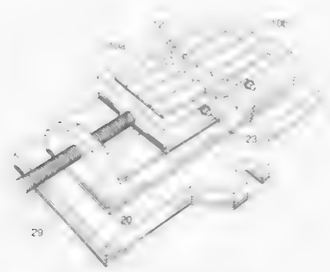
James D. Polk, 720 Monroe St., Hoboken, N.J. 07030

Filed Mar. 25, 1991, Ser. No. 675,085
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—266 **14 Claims**

1. An adjustable workpiece-holding system comprising:

at least one jaw member for applying pressure against a workpiece, said jaw member holding a plurality of finger elements extending lengthwise in parallel in a longitudinal direction of said jaw member, said finger elements having front ends thereof facing toward the workpiece and side surfaces thereof abutting in contact with those of respective, adjacent finger elements,

wherein the side surfaces of the finger elements have serrations extending in parallel in a direction transverse to the longitudinal direction and being formed over a given length in the longitudinal direction of the side surfaces of said finger elements, said serrations being substantially uniform and symmetric with each other such that each finger element is selectively adjustable in lengthwise posi-



tion relative to adjacent finger elements and is securely held in its lengthwise position by positive engagement of the serrations of its side surfaces with those of the adjacent finger elements to create an exact predetermined contour shape for retention of a workpiece,

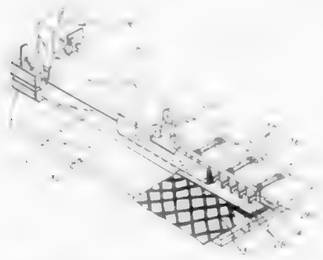
and wherein said serrations provide fast and easy reproduction of said exact contour shape.

5,145,158

METHOD AND APPARATUS FOR ATTACHING BINDING TO EXTENSIBLE MATERIAL

Ricky J. Frye, Miamisburg, Ohio, assignor to MIM Industries, Inc., Miamisburg, Ohio

Filed Sep. 7, 1990, Ser. No. 579,438
Int. Cl.[5] B42C *1/00*
U.S. Cl. 270—45 **17 Claims**



1. A method of combining a first substantially pliable length of material with a second substantially pliable length of material comprising the steps of:

folding said first length of material to define a fold line and opposing faces of said first length of material,

clamping said first length of material adjacent to said fold line to define a clamped portion and a pair of free lip portions extending from said clamped portion to respective longitudinal edges of said opposing faces,

progressively inserting said second length of material between said lip portions to define a combined structure of said first and second lengths of material, and

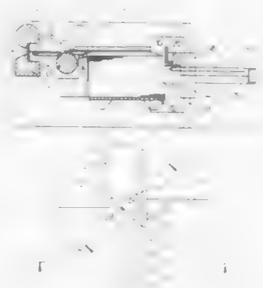
providing a progressive clamp and moving said progressive clamp over said first length of material in a direction substantially parallel to said fold line while progressively clamping said second length of material between said lip portions during said step of progressively inserting said second length of material.

5,145,159

APPARATUS FOR CHANGING A STACK IN A SHEET DELIVERER

Hilmar Vits, Leichlingen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jul. 8, 1991, Ser. No. 726,874
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1990, 4021676
Int. Cl.[5] B65H *41/00*
U.S. Cl. 270—52 **18 Claims**



1. An apparatus for changing a stack of sheets, comprising:

a conveying member for conveying a stack of sheets;

a first separating member including a separating edge for being driven into a corner of the stack between two sheets of the stack for separating the stack into a first stack located on one side of the separating edge and a second stack located on the other side of the separating edge;

an air unit for directing at least one stream of air relative to at least one side of the separating edge for facilitating the separation of the sheets by the separating edge;

a second separating member for being driven between the first and second stacks for supporting the first stack to permit removal of the second stack by the conveying member; and

wherein the separating edge is driven into a front edge of the stack in a direction substantially transverse to the direction of conveyance of the sheets by the conveying member, and in a direction substantially perpendicular to the direction that the second separating member is driven into the stack.

5,145,160

SHEET SENDING APPARATUS

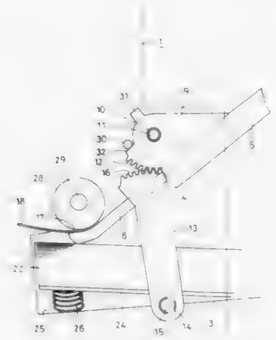
Takashi Nagashima, Habikino; Toshiyuki Nakamura, Shiga; Hideo Fukuda, Nishinomiya; Masanori Toyoda, Osaka; Naoki Nakashima, Kyoto; Ichiro Takahashi, Moriguchi; Munetaka Mukainishi, Osaka; Shouichi Kitagawa, Neyagawa, and Masayoshi Okada, Shijo-nawate, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 431,938, Nov. 6, 1989, abandoned. This application Feb. 28, 1990, Ser. No. 486,380
Claims priority, application Japan, Nov. 30, 1988, 63-303089; Nov. 30, 1988, 63-303090
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—9 **14 Claims**

1. An apparatus for sending a sheet to a sheet feeder with the sheet feeder supported by a housing, comprising:

an upper chute plate with a first gear and a lower chute plate with a second gear in engagement with said first gear such that said upper and lower chute plates are articulated to each other, each chute plate having a first and a second end and each chute plate being pivotably supported by the housing such that each chute plate has an axis of rotation different from that of the other, and said chute plates being

dimensioned and arranged for movement between a first and second position, the first position being an operable position wherein the upper chute plate and the lower chute plate make a substantially flat angle and the first end of the lower chute plate is in a feeding position with re-



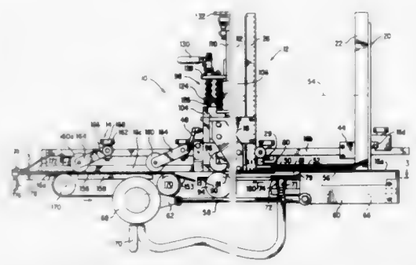
spect to the sheet feeder, and the second position being a retired position wherein the upper chute plate and the lower chute plate make an angle different from the substantially flat angle and the first end of the lower chute plate is in a non-feeding position with respect to the sheet feeder.

5,145,161

SHEET FEEDER

David Bowser, and Gerald D. Warren, both of Bethlehem, Pa., assignors to Bell & Howell Phillipsburg Co., Sokie, Ill.

Filed May 3, 1990, Ser. No. 518,440
Int. Cl.[5] B65H *5/10*
U.S. Cl. 271—12 **15 Claims**



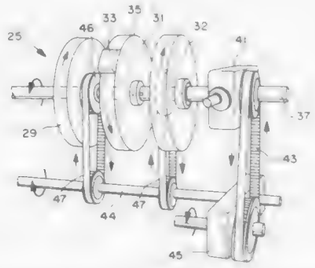
1. A sheet feeding device for feeding a forward-most sheet from a stack of flat sheets, said device comprising:
a hopper for holding said stack of sheets;
a movable shuttle means having a sheet-engaging surface on which said stack rests for gripping said forward-most sheet and pulling said forward-most sheet out of the sheet stack, said movable shuttle means having a motion in a separating direction substantially parallel to a plane of said flat sheets, said movable shuttle means defining a vacuum opening therethrough to said sheet-engaging surface;
a suction means for synchronously applying suction to said sheet-engaging surface through said vacuum opening for gripping said forward-most sheet to said sheet-engaging surface so that the shuttle means carries said forward-most sheet with it when it moves in said separating direction to deliver said forward-most sheet to an additional conveyor;
said additional conveyor being positioned downstream from said stack of flat sheets in said sheet-separating direction for receiving said forward-most sheet from said shuttle means and further pulling said sheet from said stack;
a first blocking means positioned adjacent said stack of said flat sheets and being spaced adjacent a path of said shuttle means in said separating direction downstream of said stack of flat sheets but upstream of said additional conveyor for contacting non-fed sheets in said stack other than said forward-most sheet and thereby preventing said non-fed sheets from following said forward-most sheet when it is fed in said separating direction;
a second blocking means positioned in said separating direction downstream of said first blocking means but upstream of said additional conveyor for contacting a double sheet, that is a sheet other than said forward-most sheet carried by said shuttle means in said separating direction, thereby preventing said double sheet from being fed to said additional conveyor;
whereby the shuttle means carries said forward-most sheet past the first and second blocking means to said additional conveyor, but a double sheet following said shuttle means past said first blocking member is stripped from said forward-most sheet and not allowed to follow said forward-most sheet to said additional conveyor by said second blocking means;
wherein said first blocking means is an elongated knife gate and said shuttle means is a reciprocating shuttle plate including a vacuum groove which is positioned immediately below a separating lower end of said elongated knife gate and wherein said second blocking means comprises two singulator separators positioned on opposite sides of said vacuum groove, for forming singulator gaps between them and shoulders formed on said shuttle plate on opposite sides of said vacuum groove.

5,145,162

BLANK DISPENSING APPARATUS HAVING OPPOSITELY ROTATING SEPARATOR ELEMENTS AND METHOD FOR USE

Philip S. Lachapelle, Tega Cay, and Ralph S. Goldstein, Lake Wylie, both of S.C., assignors to Roberts Systems, Inc., Charlotte, N.C.

Filed Nov. 6, 1991, Ser. No. 788,535
Int. Cl.[5] B65H *3/52*
U.S. Cl. 271—119 **9 Claims**



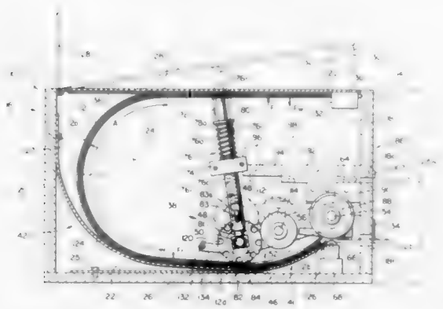
6. The process of feeding carton blank stock to an adjacent conveyor comprising the steps of:
loading a magazine having retaining means with a supply of stacked carton blank stock;
positioning said carton blank stock so that one end of said stack is supported by a multiple wheeled roller;
raising said carton blank stock by the rotation of a cleated wheel of said wheeled roller;
biasing a single piece of carton blank stock of the bottom of said stack to an adjacent conveyor by the further engagement of said cleated wheel to said carton blank stock piece;
lowering said remaining carton blank stock to said multiple wheeled roller;
engaging a sequential bottom piece of said carton blank stock with a second wheel of said roller, said second wheel rotating in a direction opposite of said cleated wheel;
securing said sequential carton blank piece with a frictional force supplied by said second wheel;
repeating the above steps.

5,145,163

FILM SHEET LOAD MAGAZINE

Kevin P. Cowan, Allison Park; Stanley R. Lewandowski, Cheswick; David M. Reilly, Glenshaw, and Arthur E. Uber, III, Pittsburgh, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1989, Ser. No. 441,004
Int. Cl.[5] B65H *1/00*
U.S. Cl. 271—161 **75 Claims**



1. A sheet feeding magazine, which comprises:
an enclosure adapted to receive a plurality of superimposed sheets, the enclosure including a wall having a sheet feed-out slot;
means in the enclosure for retaining at least central portions of the superimposed sheets in a curved essentially semi-circular configuration within the enclosure, with first end portions of the sheets adjacent the feed-out slot, and with a radius of curvature of the curved portions of the sheets and the length of an arc encompassed by the curved portions of the sheets being such that the sheets retain themselves in desired positions in the magazine independently of the orientation of the magazine with respect to gravity; and
means in the enclosure for engaging and feeding an innermost one of the curved sheets, each subsequent innermost sheet and a last sheet from the enclosure through the feed-out slot.

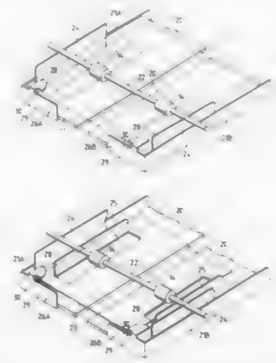
5,145,164

SHEET FEEDING APPARATUS

Shoichi Kan, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 479,153, Feb. 13, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 825,326
Claims priority, application Japan, Feb. 14, 1989, 1-034574; Mar. 8, 1989, 1-057309; May 31, 1989, 1-135841; May 31, 1989, 1-135846; May 31, 1989, 1-135847
Int. Cl.[5] B65H *7/12, 3/54*
U.S. Cl. 271—170 **23 Claims**

23. A sheet feeding apparatus comprising:
support means on which sheets are supported in a sheet stack;
at least one separating claw arranged adjacent a corner of a front end of the sheet stack supported on said support means and having a pawl portion for abutting an upper surface of the sheet stack and an abutment portion against which the front end of the sheet stack is abutted;
a slit provided between said pawl portion and said abutment portion of said separating claw for permitting the passage of only one sheet having a predetermined thickness; and



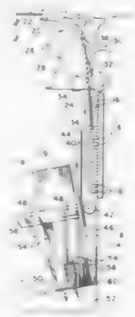
guide means for selectively positioning lateral edges of the sheet stack supported on said support means between a first position where an uppermost sheet on the sheet stack can pass through said slit and a second position where the uppermost sheet is blocked by said separating claw.

5,145,165

DEVICE FOR SEQUENTIALLY STACKING DOCUMENTS IN A PAPER DOCUMENT POCKET

George A. Sarinopoulos, Oklahoma City, Okla., and Charles K. Eaton, Lewisville, Tex., assignors to BancTec, Inc., Dallas, Tex.

Filed Apr. 24, 1990, Ser. No. 513,988
Int. Cl.[5] B65H *31/06*
U.S. Cl. 271—177 **17 Claims**



1. A device for sequentially stacking documents in a document sorter, said document sorter having at least one document receiving pocket, said device comprising:
an elongated base member having a plurality of ridges at spaced intervals thereon to define a plurality of recesses between adjacent ridges, said ridges and said recesses extending transversely with respect to a major axis of said base member;
an elongated cover member having a plurality of teeth at spaced intervals thereon in mating engagement with the respective recesses to define a casing; and
a plurality of discrete bundles of flexible elements, respective first portions of which are received within the respective

recesses and respective second portions of which project outwardly from said casing, said device being positionable in said at least one document receiving pocket such that said discrete bundles of flexible elements are engageable with the documents to urge the document into a stacked configuration in said at least one document receiving pocket according to the sequence in which the document enter said at least one document receiving pocket.

5,145,166

SUPPLY MAGAZAINE FOR X-RAY SHEET FILM STACK IN LIGHT-TIGHT ENVELOPE

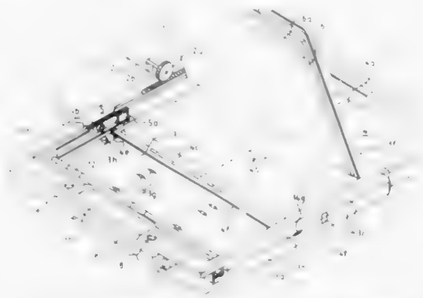
Karl Neudecker, Munich; Hans-Joachim Reuter, Neufahrn; Manfred Schmidt, Kirchheim, and Johann Zanner, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 14, 1991, Ser. No. 715,799

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1990, 4021111

Int. Cl.[5] B65H *1/22*

U.S. Cl. 271—164 **9 Claims**



1. A supply magazine, comprising a drawer-shaped, upwardly open box for introducing a sheet film stack in a light-tight envelope and for withdrawing individual sheet films after removal of the envelope; a cover part movable relative to said box; and means for winding the envelope in a closed condition of the magazine, said cover part being formed as a flat parallelepiped which is open at its front small side and such that said box which is open at its upper side can be moved in and out of said cover part; a locking mechanism operative for locking said cover part and said box when said box is moved in; a lockable and swingable flap cover provided on a flat side of said cover part corresponding to the upper side of said box so that when said box is moved in said cover part a sheet film stack can be inserted in said box through said flap cover; and means for locking said flap cover so that when said flap cover is closed and locked it cooperates with the supply magazine so that the sheet film stack in the supply magazine is enclosed in a light-tight manner

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5,145,167

DISK STACKER INCLUDING TRAIL EDGE TRANSPORT BELT FOR STACKING SHORT AND LONG SHEETS

Thomas C. McGraw, Macedon; Randall E. Van Ryne, Rochester; Jose J. Soler, Fairport, and Paul D. Keller, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1990, Ser. No. 569,003

Int. Cl.[5] B65H *29/54*

U.S. Cl. 271—186 **16 Claims**

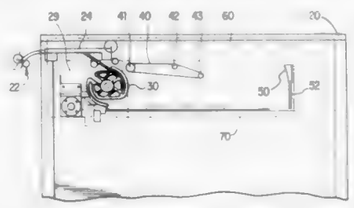
1. A disk stacker for receiving and inverting short and long sheets comprising:

a rotatable disk including at least one slot for receiving a sheet therein;

rotating means for rotating said rotatable disk;

feeding means for feeding a sheet from a sheet supply directly into said slot of said rotatable disk at a first velocity, said rotatable disk being capable of receiving a sheet in said slot when located at an input position, and inverting a sheet inserted into said slot by rotating;

receiving means for receiving the sheet from said slot of said disk after said disk has been rotated to invert the sheet; and



a transport belt, located above said receiving means on a side of said rotatable disk opposite and spaced from said feeding means, for engaging and driving a trailing portion of the sheet as it is inverted by said disk to ensure inversion of said sheet;

wherein said transport belt rotates at a peripheral velocity which is greater than said first velocity.

5,145,168

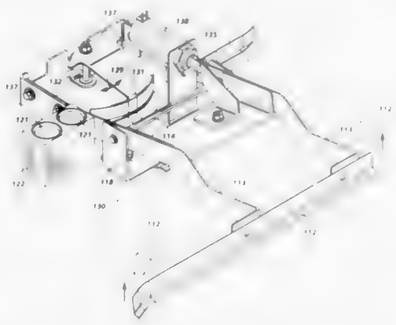
COUNTER-CLOCKWISE SINGLE SHEET ROTATOR

Robert R. Jonas, Penfield, and Robert F. Rubscha, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1990, Ser. No. 608,402

Int. Cl.[5] B65H *9/00*

U.S. Cl. 271—234 **11 Claims**



1. A device for rotating sheets counter clockwise while they are en transit within a predetermined plane, comprising:

sheet transport drive means for transporting a sheet in a predetermined direction within said predetermined plane;

pivoting drag brake means for selectively retarding transport of the sheet while simultaneously allowing the sheets to rotate counter clockwise about said brake means while being driven by said sheet transport drive means;

pivotally supported dual positioning registration means for registering the sheet thereagainst, said dual positioning registration means including first, second and third registration edges; and

means for pivoting said dual positioning registration means depending on whether the sheet is to be rotated or not rotated, said dual positioning registration means being adapted when pivoted by said means for pivoting into a first position to register the sheet against said first registration edge thereof without rotation and when pivoted into a second position by said means for pivoting to register the sheet with said second and third registration edges, respectively, while the sheet is held by said drag brake means and driven by said drive means.

5,145,169

ROLL FEED DEVICE

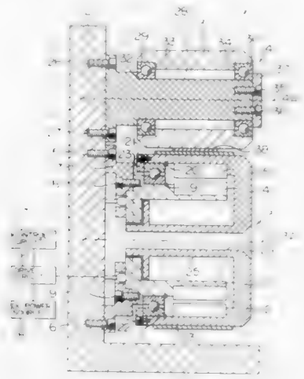
Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 597,340, Oct. 11, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 758,197

Claims priority, application Japan, Oct. 11, 1989, 1-119076[U]

Int. Cl.[5] B65H *5/06*

U.S. Cl. 271—272 **4 Claims**



4. A roll feed device for feeding a sheet-like material comprising:

(a) a supporting frame;

(b) a first feeding roll composed of an annular stator fixedly mounted on said supporting frame and an annular rotor rotatably mounted on an outer periphery of said annular stator, said annular stator and rotor forming a drive motor, said annular rotor also defining an outer surface of said first feeding roll; and

(c) a second feeding roll composed of a support shaft fixedly mounted on said supporting frame and an annular roll rotatably mounted on said support shaft and having an outer surface, said annular roll being disposed opposite to said annular rotor with the axes of rotation of said annular roll and said annular rotor being substantially parallel to each other; and

wherein the sheet-like material is supplied and fed between said outer surface of said first feeding roll and said outer surface of said annular roll of said second feeding roll.

5,145,170

DRUM FOR IMAGE RECORDING APPARATUS HAVING A GUIDE MEMBER WITH A SHEET RETAINING MEMBER

Naoyuki Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 396,207, Aug. 21, 1989, Pat. No. 5,060,931. This application Feb. 13, 1991, Ser. No. 654,470

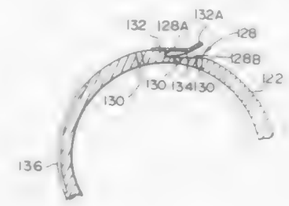
Int. Cl.[5] B65H *5/02*

U.S. Cl. 271—276 **7 Claims**

1. A drum for an image recording apparatus, wherein said drum has an outer surface with a cutout portion formed therein, said drum comprising:

guiding means, stationarily fixed to said drum, for guiding a front portion of a recording material to said cutout portion of the outer surface of said drum; and

retaining means, connected to said guiding means, for pressing and retaining said front portion of said recording material against said cutout portion of the outer surface of said drum, wherein said retaining means is disposed so as



to project inward toward said cutout portion and is in contact with a bottom portion of said cutout portion.

5,145,171

GRIPS FOR HANDLES

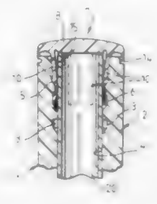
Robert W. Head, Melksham, and James S. Aldridge, Devizes, both of England, assignors to Avon Industrial Polymers Limited, Melksham, England

Continuation of Ser. No. 467,339, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 266,692, Nov. 3, 1988, abandoned. This application Apr. 10, 1991, Ser. No. 683,578

Claims priority, application United Kingdom, Nov. 4, 1987, 8725836

Int. Cl.[5] A63B *59/00, 53/14, 49/00*

U.S. Cl. 273—67 R **11 Claims**

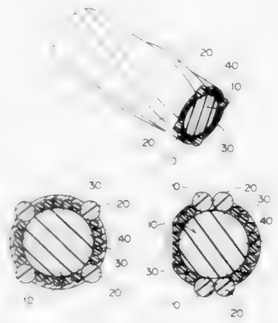


1. A handle assembly for a sporting games implement comprising in combination: a hollow rigid handle having a longitudinal axis and an end portion;

a handle grip, said handle grip comprising a pre-formed open ended sleeve of elastomeric material having an exterior surface and a first pre-formed internal surface for gripping engagement with said rigid handle, and having a second pre-formed internal surface at one axial end thereof and in annular coplanar relation with said first internal surface for engagement with an end cap for said handle, said second pre-formed internal surface having pre-formed recesses extending outwardly away from the annular plane containing said second internal surface toward said exterior surface, said sleeve being adapted to fit tightly around said end portion of said handle so as to be retained thereon; and said end cap comprising an axially extending part to be entrapped between said sleeve and said handle, and having radially outwardly extending enlargements of complementary configuration to the configuration of said pre-formed recesses in said sleeve on said axially extending part of said end cap, said enlargements projecting outwardly and away from said handle when said end cap is assembled on said handle end;

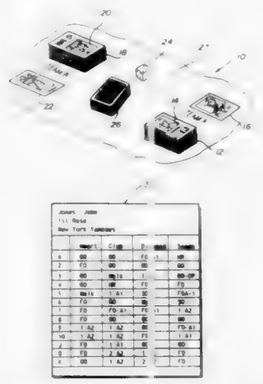
wherein, in the assembled condition of said handle and said end cap, said enlargements engage within said recesses, thereby to retain said end cap against axial displacement within said sleeve without imposing forces causing radially outward bulging of the exterior surface of said handle grip in the proximity of said enlargements on said axially extending part of said end cap.

5,145,17-
STRING FOR R ACKET
Yutaka Takashima, Hyogo, Japan, ssignor to Gosen Co., Ltd., Osaka, Japan
Filed May 5, 1989, Se -. No. 347,646
Int. Cl.[5] A63B *51/02*
U.S. Cl. 273—73 R 4 Claims



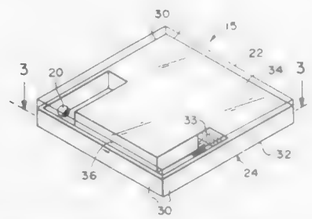
1. In a string for rackets comprising a winding of mixed wrapping monofilaments, of a larg diameter and a small diameter, around the periphery of a mc nofilament center core, the improvement which comprises sa d large diameter monofilament being substantially transpar nt, the exposed surface of said small diameter wrapping mo ofilament and a portion of the exposed surface of said large liameter wrapping filament being covered with a coating resin whereby a part of the large diameter wrapping filament is expc sed, and wherein said wrapping filaments have an elongatio to break which is greater than the elongation to break of sai monofilament center core.

5,145,173
BASEBALL GAME
Michael A. Crowder, Flint, Mich., assignor to The Pent Corporation, Flint, Mich.
Filed Apr. 15, 1991, Ser. No. 684,856
Int. Cl.[5] A63 *1/04*
U.S. Cl. 273—93 C 7 Claims



1. A baseball game comprising
a plurality of baseball player cards representing batters and pitchers;
a deck of standard playing cards having suits and numerically sequential values;
a means of chance for selecting either a batter card or pitcher card from said plurality of baseball playing cards for use in determining a play;
each of said baseball player cards having a front side bearing the indicia of an individual baseball player and a back side having a matrix of play information correlated to said suits and sequential values of said standard deck of cards; and
wherein one of said standard playing cards having a suit and a value is exposed and said next play is determined from said suit and said value of one of said standard playing cards in accordance with said matrix of play information of said selected batter card or pitcher card.

5,145,174
NON-VISUAL LABYRINTH PUZZLE "HIDDEN CRAZY MAZE"
George C. Caramanoff, 18037 Barlow, Detroit, Mich. 48205
Filed Feb. 6, 1991, Ser. No. 651,524
Int. Cl.[5] A63F *7/04*
U.S. Cl. 273—109 2 Claims

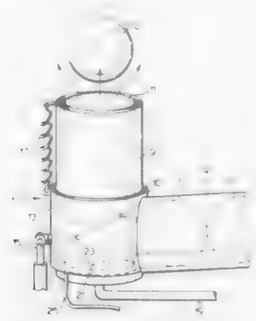


1. A child's recreational device comprising:
a) a labyrinth path defined by opposite walls of a passageway of substantially constant width;
b) a moveable spherical member constrained to, and moveable along, said path by tilting said recreational device;
c) a substantially opaque screen, said screen obscuring a view of a portion of said path, whereby said moveable member cannot be guided through said obscured portion using visual information; and
d) the obscured portion of the path having blind-ended traps defined between further wall portions and communicating with said passageway, and wall portions being cushioned for suppressing sound of the spherical member impacting therewith.

5,145,175
SYMMETRICAL DICE WITH CARD INDICIA
Richard W. Gathman, 42 N. 4th St., and Jeffrey M. Breed, 1611 St. Mary St., both of Lewisburg, Pa. 17837
Continuation of Ser. No. 454,403, Dec. 21, 1989, abandoned.
This application May 21, 1991, Ser. No. 704,859
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—146 5 Claims

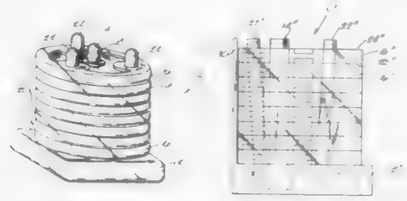
1. A set of plural identical dice wherein each die has twelve identically shaped flat surfaces, and wherein each surface of each die bears a first symbol selected from a first set of four symbols and a second symbol selected from a second set of three symbols, said first symbol and said second symbol being combined together to indicate all twelve possible different values, with each surface on said die indicating one of said twelve values.

5,145,176
PNEUMATICALLY OPERATED GOLF BALL TEE
Earl Lipson, 164 Lyndhurst Ave., Toronto, Ontario, M5R 2Z9, Canada
Filed Jul. 31, 1991, Ser. No. 738,566
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—201 6 Claims



1. A pneumatically operated golf ball tee system comprising an upwardly opening ball and air guide through which a ball passes and above which the ball is pneumatically supported when in a teed position, a source of golf balls, a supply line from said source to said guide, means for controlling ball entry from said source to said guide and air supply means providing pressurized air upwardly through said guide, said system including ball sensing means interiorly of said guide, said means for controlling ball entry being responsive to said ball sensing means to open said guide to said source when no ball is sensed within said guide and to close said guide to said source when a ball is sensed in said guide.

5,145,177
STACKING PIECE PUZZLE
Loren B. Wells, 4795 Redrock Dr., Larkspur, Colo. 80110
Filed Nov. 15, 1991, Ser. No. 792,783
Int. Cl.[5] A63F *9/12*
U.S. Cl. 273—157 R 16 Claims



1. A puzzle comprising:
a plurality of game pieces stackable atop each other, each of said game pieces including an aperture extending obliquely therethrough, said apertures being located in said game pieces so as to be aligned with one another only when said game pieces are stacked in a unique order and positioned to a unique orientation relative to one another; and
an elongated rigid member dimensioned to be received in said aligned apertures of said game pieces only when said game pieces are stacked in said unique order and positioned to said unique orientation;
the object of said puzzle being to arrange said game pieces so as to align said apertures to allow the passage of said elongate rigid member obliquely therethrough.

5,145,178
GOLF GAME APPARATUS
William J. Ropars, Dover Post Office 133 Washington St., Dover, N.H. 03820
Filed Apr. 19, 1991, Ser. No. 698,581
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—184 A 3 Claims

1. A recreational golf game comprising:
(a) a means for supporting a first ringing device above the ground such that it can be struck by a rolling ball and
(b) a means for supporting a second ringing device above the first ring device, such that the second ringing device can be struck by a ball in the air.

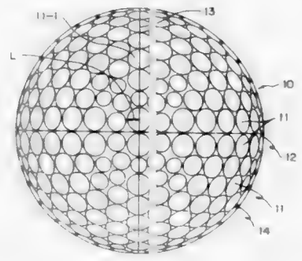
5,145,179
GOLF PUTTING TRAINING DEVICE
Michael S. Breed, 1310 Bon Air Dr., Augusta, Ga. 30907
Filed Nov. 4, 1991, Ser. No. 787,242
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—189 R 6 Claims

1. A golf putting training device comprising:
a lateral spacing member having opposite disposed ends, said spacing member including means for adjustably locating said ends in selected spaced apart positions nd further including means for locking said ends in said selected spaced apart positions;
a pair of forearm cracking members each of which is joined to an end of said spacing member for engagement with a forearm of the user, wherein the forearms of the user are located in a spaced apart relation, and are prevented from relative movement thereof during a putting stroke; means

for pivotally adjusting said cracking members around a horizontally disposed axis and further including means for locking said cracking members in a plurality of angular adjustments relative to said spacing member and said forearms, and

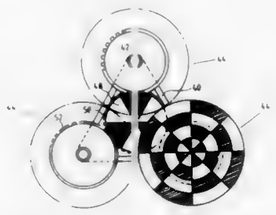
means for releasably attaching said training device to one of the forearms of the user.

5,145,180
GOLF BALL
Kengo Oka, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 12, 1991, Ser. No. 668,109
Claims priority, application Japan, Oct. 12, 1990, 2-273529
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 2 Claims



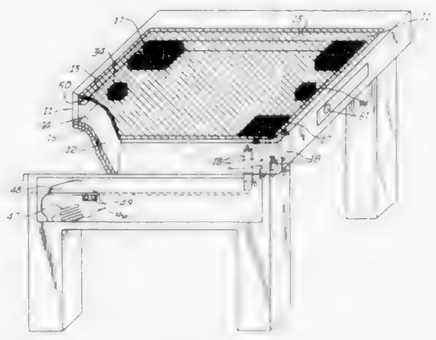
1. A golf ball comprising dimples arranged in eight spherical equilateral triangles obtained by projecting, on an imaginary spherical surface of said golf ball, the ridge lines of a regular octahedron inscribing said imaginary spherical surface, between 300 to 550 dimples being provided on the golf ball, three great circles corresponding to said ridge lines being projected on said spherical surface, one great circle coinciding with a mold seam being formed as a sole great circle unintersecting dimples and the other two great circles intersect dimples, the dimples being equivalently arranged in each of said eight spherical equilateral triangles.

5,145,181
BOARD GAME APPARATUS
David M. Welman; Antonie C. F. Welman, both of 205 Hazelmere Court, CNR Landsdowne & Markham Roads, Claremont, Cape Town, Cape Town Province, and Peter H. G. Wilson, 44 Kenwood Road, Hish-Hoek, Cape Province, all of South Africa
Filed Nov. 1, 1989, Ser. No. 430,159
Claims priority, application South Africa, Nov. 1, 1988, 88/8177
Int. Cl.[5] A63F *3/02*
U.S. Cl. 273—237 8 Claims



1. Game apparatus for simulating a spherical playing surface, comprising at least two substantially coplanar discs each defining a portion of a playing surface, the portion of the playing surface defined by each disc comprising a plurality of ranks disposed concentrically about a central pole and a plurality of files extending radially from the pole, so that the portion of the playing surface defined by each disc constitutes a projection of a hemispherical portion of a playing surface, two said hemispherical portions together simulating a spherical playing surface comprised of longitudinally aligned blocks and latitudinally aligned blocks, the poles of the hemispherical portions being mutually parallel, and the discs being disposed adjacent one another so that a block on one disc can be disposed in radially opposite relationship to a block on another disc with the two radially opposing blocks constituting longitudinally adjacent blocks of the simulated spherical playing surface, each disc being rotatable about its respective pole, and the discs being constrained for synchronous rotation in order to enable longitudinally adjacent blocks of the simulated spherical playing surface to be selectively positioned in said radially opposite relationship.

5,145,182
BOARD GAME WITH LASER BEAM PATHS
Philip Swift; Eric Swift, both of Moorestown, N.J., and Terrence L. Glatt, Oakland Park, Fla., assignors to Entercon Technologies, Inc., Moorestown, N.J.
Filed Nov. 15, 1990, Ser. No. 613,356
Int. Cl.[5] A63F *3/00, 9/24*
U.S. Cl. 273—238 33 Claims



1. A game comprising:

(a) a playing area having a substantially orthogonal, substantially planar matrix including parallel rows and parallel columns, each intersecting row and column defining a square, said matrix having four major sides;

(b) a plurality of means for projecting visually discernible paths down a row or column of said matrix;

(c) means for angularly diverting said paths from a row to a column or a column to a row;

(d) a plurality of scoring modules, corresponding in number to the number of players, each scoring module having means for detecting contact with said visually discernible path; and

(e) a plurality of home bases, each comprising a square, each of said home bases adjacent to said scoring module.

5,145,183
METHOD OF PLAYING A WORD FORMING GAME
John Gates, 904 Winterbury Dr., Fayetteville, N.C. 28314
Filed Dec. 5, 1991, Ser. No. 802,619
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—240 3 Claims

1. A method of playing a word forming game for two or more players comprising the steps of:

a) providing a plurality of cards representing a plurality of different base words wherein each card having only one base word inscribed thereon;

b) providing each player with a paper and a writing instrument;

c) providing a timing means for setting a predetermined time limit;

d) starting a round by drawing a card and positioning the card such that the base word on the card is in clear view of all the players;

e) starting the timing means;

f) each player, as quickly as possible, writing on their paper as many different words as possible wherein the letters used in forming the written words are only the letters in the base word, and using these letters as many times on a written word as it appears on the base word;

g) at the end of the predetermined time limit, players stop writing;

h) players comparing their written words wherein if two or more players share the same written word, all players having the shared written word crossing out the shared written word from their papers;

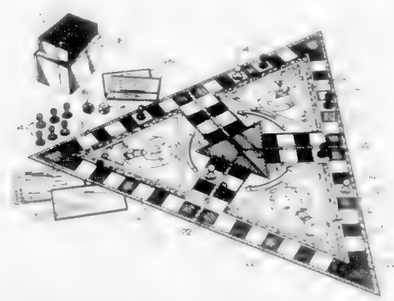
i) providing point values to the written words wherein a written word having one syllable is worth one point, a written word having two syllables is worth three points and a written word having three syllables is worth four points;

j) each player determining the points awarded to them for the round by placing point values to each of their written, non-crossed out words as recited in step i) and totalling the point values;

k) repeating steps d)–j) until a predetermined number of rounds have been played;

l) totalling the point values of each round, wherein the player having the most total points wins.

5,145,184
BOARD GAME
David J. Yearick, Freeville, N.Y.; Timothy W. Walsh, Sarasota, Fla., and Edward J. Muccini, Douglaston, N.Y., assignors to Big Fun A Go Go, Inc., Freeville, N.Y.
Filed Feb. 15, 1991, Ser. No. 657,061
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—248 15 Claims



1. Apparatus for playing a board game in which players move respective transit pieces on a board and are asked to solve cluesets pertaining to several categories, and whose object is for the players to correctly bond clues of the cluesets; the board game apparatus comprising:

a game board in the form of a triangle divided into three separate quadrilateral playing areas of similar shape and which each extend from a center of the game board to a respective corner, with three respective separate loop pathways thereon each formed of a succession of playing stations that proceed around the periphery of the respective playing area from a respective start of an end, including boundary means segregating each of the playing areas from each of the other playing areas;

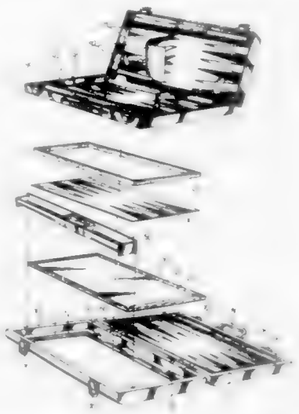
a plurality of transit pieces equal to the number of players times the number of said playing areas, assigned three to each player, each of the three transit pieces of each player being moved along a respective one of the three pathways from start to end thereof;

an advancement randomizer device for generating, as a random number, the number of stations a player is to move a selected one of his or her transit pieces;

a plurality of clueset cards each with a front side and a reverse side, with the front side of each card containing a plurality of cluesets with one clueset for each of a predetermined number of categories, each clueset being a set of three bonded terms which have a common bonding characteristic, and with the reverse side thereof containing as answers the bonding characteristics for the respective cluesets; and

a category randomizer device for randomly determining a category of cluesets to be answered by the player during his or her turn, with each category being represented by a respective symbol on a respective face of the randomizer device, the latter being the sole means to select the category, such that the category is selected independent of the stations occupied by the player's transit pieces, an including also an additional symbol on a respective face of the device not corresponding to a category but instead representing a free turn.

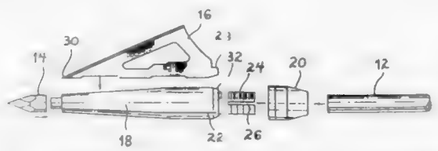
5,145,185
BOARD GAME BOX
Wan-Chuan Yu, No. 6-3, Kuan Hou 1st St., Tao Yuan, and Jung-Chi Cheng, No. 46, Lane 214, Sec. 1, Yen Ping Rd., Hsin Chu, both of Taiwan
Filed Aug. 21, 1991, Ser. No. 748,018
Int. Cl.[5] A63F *3/00*; B65D *85/00*
U.S. Cl. 273—287 3 Claims



1. A board game box, comprising two base frames made from a plastic material through the process of injection molding and pivotably connected with each other by hinges, two veneered panels respectively fastened in said two pivoted base

frames, two lining sheets respectively glued to the surface of said two veneered panels, and locking devices for locking said two pivoted base frames in a closed position, wherein said two pivoted base frames each has an opening at the middle, a groove around said opening on which one of said veneered panels is supported, and a plurality of projecting strips transversely projecting inwards from an inner side of the respective frame over the respective veneered panel to secure said veneered panel on said groove.

5,145,186
BROADHEAD FOR AN ARROW AND METHOD OF SECURIMENT
Richard Maleski, 4 South St., Plymouth, Conn. 06782
Filed Jan. 4, 1991, Ser. No. 637,452
Int. Cl.[5] F42B *6/08*
U.S. Cl. 273—422 **21 Claims**

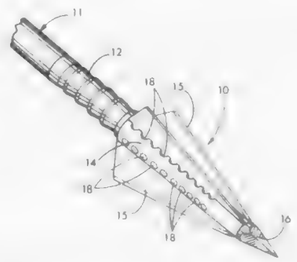


16. A broadhead for an arrow having a plurality of blades comprising:
- a cylindrical body member having a first and second end, said body member having a longitudinal bore extending a portion of its length from said second end, said second end having at least one axial slot in communication with said longitudinal bore, said second end further having a threaded portion;
- a pointed tip attached to said first end of said body member; and
- a locking member for attaching a shaft of said arrow to said body member;
- wherein said arrow shaft passes through said locking member and into said longitudinal bore, said locking member having interval threads which cooperate with said threaded portion of said body member, such that rotation of said locking member on to said body member collapses said second end at said axial slot to frictionally engage said body member about said shaft to secure said broadhead to said shaft.

18. A method of securing a broadhead to a shaft of an arrow, said broadhead having a longitudinal bore at a first end and a pointed tip at a second end, said first end having external threads for engaging internal threads of a locking nut, said method comprising:
- passing said shaft through said locking nut and sliding said shaft into said bore; and
- rotating said nut to tighten said broadhead about said shaft by collapsing said first end of said broadhead about said shaft to frictionally secure said broadhead to said shaft.

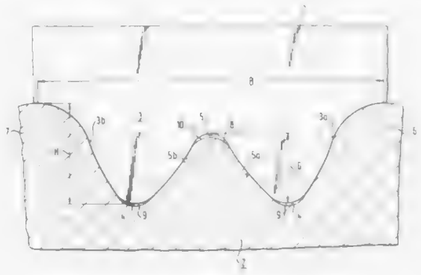
5,145,187
LIGHT WEIGHT STABILIZED BROADHEAD ARROWHEAD WITH REPLACEABLE BLADES
Roger D. Lewis, 1019 County Hwy. AA, Nekoosa, Wis. 54457
Filed Feb. 18, 1992, Ser. No. 837,851
Int. Cl.[5] F42B *6/08*
U.S. Cl. 273—422 **8 Claims**

1. A lightweight broadhead arrowhead comprising:
- a central body of substantially circular periphery having a front and a back, a plurality of slots formed in the periphery of the central body extending from the front to the back axially, and a plurality of sets of holes formed in the central body extending radially through the body, each set of holes comprising a plurality of holes extending in a line axially along the length of the central body, each line of holes in a set spaced from the line of holes in an adjacent set by solid segments of the central body, each hole in each set in the central body separated by solid metal of the body from the holes at the next higher or lower elevation to provide a solid metal wall through the cross-section of the central body between each of the holes at adjacent elevational levels;



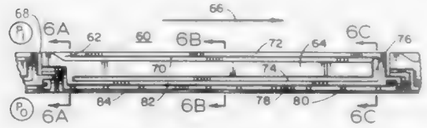
- a plurality of blades mounted in the slots in the central body;
- a penetrating tip attached to the front end of the central body; and
- means on the back of the central body for attaching the body to an arrow shaft.

5,145,188
TOOTHED-BELT DRIVE
Dietrich Bartelt, Garbsen, Fed. Rep. of Germany; Valery Guskov; Gennadiy Kozachevskiy, both of Minsk, U.S.S.R.; Janusz Rak, Byolgoszcz/Polen, Poland, and Walter Schneck, Stuhr, Fed. Rep. of Germany, assignors to Wilhelm Herm. Muller GmbH & Co. KG, Hanover, Fed. Rep. of Germany
Filed May 10, 1991, Ser. No. 697,993
Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016174
Int. Cl.[5] F16H *7/02*
U.S. Cl. 474—153 **10 Claims**



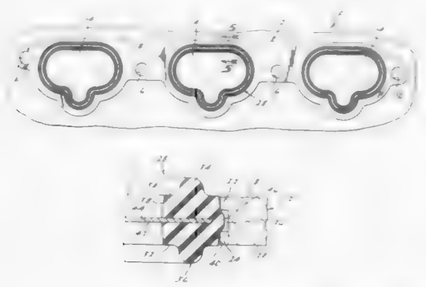
1. A toothed-belt drive combination comprising:
- a toothed-belt including a plurality of belt teeth extending from said toothed-belt, each of said belt teeth having a pair of external faces such that adjacent external faces on successive belt teeth from a notch between said successive belt teeth, each of said belt teeth further having a pair of internal walls such that said pair of internal walls form a recess in each of said belt teeth, each said notch is deeper than each said recess; and
- a spur-gear including a plurality of spur-gear teeth and a plurality of spur gear projections, said spur-gear projections and said spur-gear teeth are arranged to alternately extend radially outward from said spur-gear such that each of said spur-gear projections is interposed between successive spur-gear teeth and each of said spur-gear teeth is interposed between successive spur-gear projections, each said spur-gear teeth extends further from said spur-gear than said spur-gear projections;
- whereby said belt teeth, notches and recesses on said toothed belt are adapted to approximately complement and engage said spur-gear projections and spur-gear teeth on said spur-gear.

5,145,189
HYDRO-LIFT DYNAMIC CIRCUMFERENTIAL SEAL
Adam N. Pope, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Sep. 11, 1991, Ser. No. 757,774
Int. Cl.[5] F16J *15/30, 15/34*
U.S. Cl. 277—3 **9 Claims**



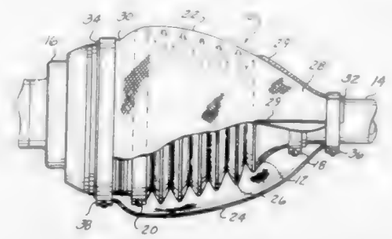
1. A seal segment for a circumferential seal having a high pressure side and a low pressure side, said seal segment having a bore region extending circumferentially from a leading end to a trailing end of the segment, said bore region comprising:
- a relatively shallow groove inlet located on a high pressure edge of the bore region and opening onto the high pressure side of the seal segment;
- a relatively shallow groove aerodynamically coupled to said shallow groove inlet and extending generally parallel to and spaced generally adjacent the high pressure edge of the bore region; and
- a relatively deep groove aerodynamically coupled to said shallow groove at a location adjacent the trailing end of the seal segment, said deep groove extending generally parallel to said shallow groove and adjacent the low pressure side of the seal segment, said shallow groove and said deep groove establishing a land therebetween extending substantially from the leading end to the trailing end of the seal segment.

5,145,190
GASKET ASSEMBLY
Thomas A. Boardman, Belmont, N.H., assignor to Freudenberg-NOK, Plymouth, Mich.
Filed Mar. 27, 1991, Ser. No. 675,695
Int. Cl.[5] F16J *15/12*
U.S. Cl. 277—166 **18 Claims**



1. A gasket for sealing a gap between adjacent surfaces of mating components, comprising:
- a core member having a first and second outer surface and means forming at least one opening extending therethrough;
- at least one seal member disposed in and circumscribing said at least one opening; and
- means extending alternatingly into said at least one opening for supporting said seal member;
- wherein said supporting means comprises a plurality of tab members disposed circumferentially about said at least one opening and extending coplanar from said first and second outer surface, respectively, alternatingly into said at least one opening such that either one of said tab members of said first and second outer surface is disposed between a spaced pair of said tab members from the other said outer surface for supporting said seal member between said tab members and within said at least one opening.

5,145,191
HEAT-RESISTANT PROTECTIVE COVER FOR A DRIVE AXLE JOINT SEAL
Todd B. Stewart, Troy, and Daniel G. Yurgaites, Auburn, both of Mich., assignors to International Sales & Engineering, Inc., Southfield, Mich.
Filed Apr. 10, 1991, Ser. No. 683,239
Int. Cl.[5] F16J *15/52;* **F16D** *3/84*
U.S. Cl. 277—212 FB **7 Claims**

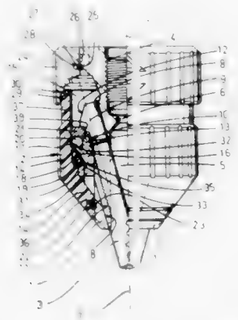


1. A heat-resistant sock for enclosing a mechanical joint connecting first and second elongated members, wherein said first and second members are moveable relative to one another and said joint is enclosed within an elongated boot connected at one end to the first member and connected at another end to the second member, the sock comprising:
- an elongated enclosure generally complementary to a shape of the boot and enclosing the boot, the enclosure having first and second surfaces defining apertures at first and second ends respectively engaging the first and second members, the enclosure having an outer insulating layer, a central fiber layer capable of withstanding exposure to temperatures up to 500° F. and an inner lubricating layer facing the boot; and
- releasable attaching means for clamping the first and second ends of the enclosure to the first and second members respectively.

5,145,192
LOCKABLE DRILL CHUCK
Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Sontheim. Fed. Rep. of Germany
Filed Jul. 22, 1991, Ser. No. 734,138
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1990, 4023303; Dec. 6, 1990, 9016578[U]; European Pat. Off., Jan. 29, 1991, 91101106.2
Int. Cl.[5] B23B *31/12*
U.S. Cl. 279—62 **14 Claims**

1. A drill chuck comprising:
- a chuck body centered on and adapted to be rotated about a longitudinal axis and unitarily formed with
  - a plurality of forwardly open angled guides angularly spaced about the axis and
  - an axially forwardly directed shoulder;

respective jaws displaceable along the guides in the chuck body and each formed with a row of teeth;
a tightening sleeve rotatably surrounding the body and having an axially rearwardly directed shoulder;
an inner ring rotatable on the body about the axis and formed internally with a screwthread meshing with the teeth of the jaws, whereby rotation of the inner ring in one direction moves the jaws radially together and opposite rotation moves them radially apart, the inner ring bearing axially forward directly on the shoulder of the sleeve and axially backward directly on the shoulder of the body;
interengaging formations rotationally coupling the inner ring to the sleeve; and
a retaining element axially fixed on the chuck body forward of the inner ring and bearing axially backward directly on the sleeve.

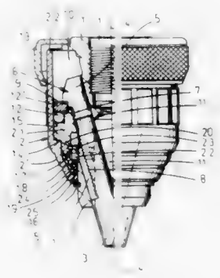


5,145,193

LOCKABLE DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Jul. 22, 1991, Ser. No. 733,228
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1990, 4023303
Int. Cl.[5] B23B *31/12*
U.S. Cl. 279—62 **16 Claims**



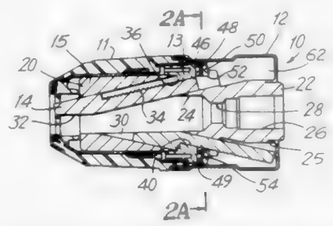
1. A drill chuck comprising:
a chuck body centered on an adapted to be rotated about a longitudinal axis and formed with a plurality of forwardly open angled guides angularly spaced about the axis;
respective jaws displaceable generally axially along the guides in the chuck body and each formed with a row of teeth;
a tightening collar rotatably surrounding the body, formed internally with a screwthread meshing with the teeth of the jaws and axially substantially nondisplaceable on the body, and forming with the chuck body an annular space axially forward of the screwthread, whereby rotation of the collar in one direction moves the jaws radially together and opposite rotation moves them radially apart;
a locking element axially displaceable in the space and nonrotatable on the chuck body; and
spring means for urging the element into axial engagement with the tightening collar and thereby braking rotation of same.

5,145,194

IMPACT TOOL CHUCK

Robert O. Huff, Piedmont; Paul T. Jordan, Seneca, and Valerie Owens, Townville, all of S.C., assignors to Jacobs Chuck Technology Corporation, Wilmington, Del.

Filed Jun. 21, 1991, Ser. No. 719,177
Int. Cl.[5] B23B *31/12*
U.S. Cl. 279—62 **36 Claims**



1. A tool chuck for gripping a tool shank, said chuck comprising:
(a) a body member having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore;
(b) a plurality of jaws, each of said jaws being slidably positioned in a respective one of said angularly disposed passageways, said jaws being reciprocable relative to said body member;
(c) a nut rotatable relative to said body member and threadedly engaged with said jaws for reciprocating said jaws relative to said body member when said nut is rotated relative to said body member, said nut being axially reciprocable relative to said body member such that said nut moves axially away from said tool in reaction to said jaws gripping said tool shank;
(d) spring means acting between said nut and said body member so that said spring is stressed by an increasing amount as a result of said nut moving axially away from said tool in reaction to said jaws gripping said tool shank, the increased stress in said spring means increasing the resistance of said nut to rotating relative to said body member in the direction opposite the direction required to grip said tool shank, said spring means being substantially the sole means for resisting axial motion of said nut away from said tool; and
(e) an anti-friction bearing assembly interposed between said nut and said spring means.

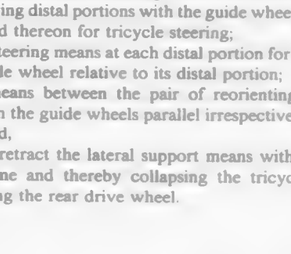
5,145,195

STEERING SKIS FOR SNOWMOBILES AND SIMILAR VEHICLES

Norman A. Campbell, Box 452, New Liskeard, Ontario P0J 1P0, and Donald G. Campbell, R.R. #1, Callander, Ontario P0H 1H0, both of Canada

Filed Nov. 19, 1990, Ser. No. 615,265
Claims priority, application Canada, Oct. 24, 1990, 2028471
Int. Cl.[5] B62B *17/02*
U.S. Cl. 280—28 **12 Claims**

1. A steering ski for a vehicle intended for travel over snow and requiring a pair of steering skis arranged generally in parallel, said ski comprising:
a lower surface for contacting the snow; and
an upwardly curved lateral edge on each side of the ski in a region of the ski used for support of the vehicle;
wherein said curved lateral edge on each side of the side defines a convex curved snow-engaging surface which merges smoothly with said lower surface of the ski; and
wherein said curved lateral edge on one side of the ski has a curve which generates lift when in a turn acting as a leading edge of a leading ski of said pair and said curved lateral edge on an opposite side of said ski has a curve which generates neither substantial drag nor substantial lift when in a turn acting as a leading edge of a trailing ski of said pair, said curve on said opposite side of said ski being shallower than said curve on said one side, said ski being asymmetrical about a transverse axis.

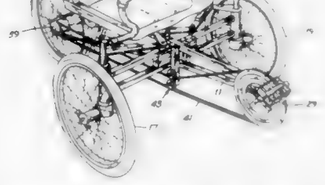


5,145,196

COLLAPSIBLE TRICYCLE

Dennis J. Langkamp, 8396 S. Chicago Rd., #106, Oak Creek, Wis. 53154

Filed Apr. 2, 1991, Ser. No. 679,328
Int. Cl.[5] B62K *15/00*
U.S. Cl. 280—278 **19 Claims**



1. In a tricycle having a rear drive wheel and a pair of forward guide wheels, the improvement including:
a rigid frame extending along a central axis with the rear drive wheel mounted thereon;
lateral support means extending from either side of the frame and having distal portions with the guide wheels pivotably mounted thereon for tricycle steering;
separate steering means at each distal portion for reorienting the guide wheel relative to its distal portion;
linkage means between the pair of reorienting means to maintain the guide wheels parallel irrespective of orientation; and,
means to retract the lateral support means with respect to the frame and thereby collapsing the tricycle without removing the rear drive wheel.

5,145,197

FOLDING WHEELCHAIR WITH RIGID SEAT

Armand Gatti, New Rochelle, N.Y., assignor to Contemporary Medical Equipment Corp., Mamaroneck, N.Y.

Filed Sep. 14, 1987, Ser. No. 97,959
Int. Cl.[5] A47C *4/12*
U.S. Cl. 280—304.1 **24 Claims**

1. In a folding wheelchair comprising a collapsible carriage having normally vertical opposed first and second sides, a normally horizontal seat having front, rear and side portions carried between said sides, and folding means for collapsing said carriage from an in-use unfolded position and an in-storage folded position in which said sides are closely adjacent and said seat is transverse to the horizontal position, the improvement which comprises:
a. a rigid seat assembly carried by said carriage, said rigid seat assembly having a normally horizontal upper surface for supporting a person and a normally horizontally extending compartment below said upper surface and opening at said front portion of said rigid seat;
b. said folding means including hinge means for connecting one side portion of said normally horizontal seat to said first side of said carriage and means for as automatically folding and unfolding said carriages said rigid seat is swung about said hinge means between said horizontal and transverse positions;
c. a pair of leg support members stored side-by-side in said compartment and being independently movable out of said compartment via said opening to a desired in-use position; and
d. said rigid seat assembly further comprises a normally horizontal rigid seat support member secured to said carriage, said compartment being provided in said seat support member, a movable rigid seat member mounted above said seat support member for movement relative to said seat support member between a lowered position closely adjacent said seat support member and a raised position remote from said seat support member, locking means for locking said movable seat member in each said position, and operating means for unlocking said locking means to enable said movable seat member to be moved from one position to the other.

5,145,198

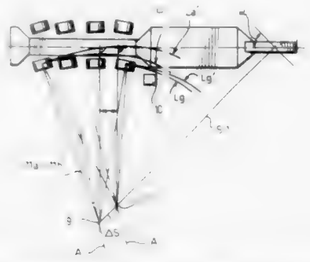
METHOD OF CONTROLLING A TRANSPORT MEANS AND A TRANSPORT MEANS

Pekka Vänninmaja, Tervakoski, Finland, assignor to Teco-Systems Oy, Tervakoski, Finland

Filed Sep. 25, 1990, Ser. No. 587,675
Int. Cl.[5] B62D *53/06*
U.S. Cl. 280—426 **6 Claims**

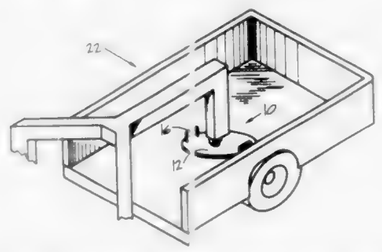
1. A method of controlling a transport means comprising a body having a longitudinal axis and a plurality of wheels attached to the body on each side thereof one after another in the longitudinal direction of the body, the method comprising the

steps of turning all the wheels about vertical axes of turning through an angle with respect to the longitudinal direction of the body during the turning of the transport means so that rotation axes of all of the wheels intersect substantially at a same vertical axis of turning, and, at least when the angle of turning of the transport means is greater than a predetermined angle, turning all of the wheels with respect to one another so that a position of the axis of turning in the longitudinal direc-



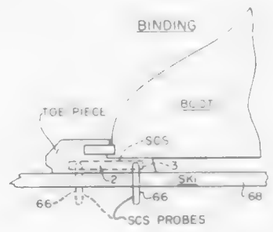
tion of the transport means shifts in proportion to the magnitude of the angle of turning, wherein the all of the wheels are turned so that the axis of turning follows one selected curve of several curves, relative to the body of the transport means, for controlling the transport means whereby, if required by the driving conditions, the axis of turning is arranged to temporarily follow another curve, and then again returned to follow said selected curve when the driving conditions are substantially normalized.

5,145,199
CLEAR BED GOOSENECK TRAILER HITCH
James P. Howard, 822 Cari Ann Dr., Jefferson City, Mo. 65109
Filed Feb. 26, 1991 Ser. No. 661,405
Int. Cl.[5] B60D *1/06, 1/52*; B62D *53/06*
U.S. Cl. 280—495 **9 Claims**



1. A trailer hitch for mounting on the bed of a truck, said hitch comprising a metal disc, said disc fixedly receiving a ball hitch and shank perpendicularly therethrough, said shank being threaded at a free end thereof for attachment to a threaded receptacle provided in a frame member underneath said truck bed whereby said hitch may be mounted to said bed, said disc having handle means whereby said hitch may be tightened to said bed by manipulation of said disc, said metal disc extending radially substantially beyond said shank and said threaded receptacle to bear against said bed to provide stability and force distribution against stress encountered in towing.

5,145,200
UNIVERSAL INTEGRAL SKI CONTROL SYSTEM
John M. Humphrey, Monte Sereno, Calif., assignor to Humphrey Engineering, Inc., Monte Sereno, Calif.
Filed Jan. 2, 1990, Ser. No. 459,464
Int. Cl.[5] A63C *7/10*
U.S. Cl. 280—605 **20 Claims**



1. As an article of manufacture, a universal integral ski control system for application to the skier support surface of a downhill snow ski having a "running" surface adapted to slide over the snow in a downhill run, comprising:

a) a base member adapted to be mounted on the skier support surface of a downhill snow ski and having right and left side edges correlated to the right and left side edges of the downhill snow ski when mounted thereon;

b) a drag probe assembly operatively mounted on said base member and including right and left side drag probes correlated to the right and left side edges of said base member and resiliently retained and selectively displaceable between a retracted position in which said drag probes are resiliently retained to not project below the running surface of the ski on which said base member is mounted to an extended position in which said drag probes are resiliently retained to project below the running surface of the ski on which said base member is mounted so that when said ski is in use in a downhill run said drag probes extend into the snow supporting the ski so as to impose both a drag force and a rotational torque on said ski so that the drag force and torque may be separately controlled by the skier through execution of natural and conventional body movements; and

c) drag probe assembly actuation and automatic resilient retention means mounted on the base member operatively connected to said drag probe assembly and selectively initially actuable by a skier to shift said drag probes between retracted or extended positions and thereafter automatically shiftable toward a probe retracted equilibrium position when the drag force imposed on the drag probes increases and approaches the resilient retention force, and are automatically shiftable toward a fully extended equilibrium position when the drag force imposed on the drag probes is reduced below the resilient retention force imposed on the drag probes.

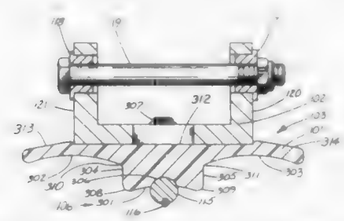
5,145,201
VEHICULAR SNOW SKI
Kevin W. Metheny, Tippecanoe County, Ind., assignor to Ultimate Sports Incorporated, West Lafayette, Ind.
Continuation-in-part of Ser. No. 462,826, Jan. 10, 1990, Pat. No. 5,040,818. This application Aug. 19, 1991, Ser. No. 746,936
Int. Cl.[5] A63C *5/044*
U.S. Cl. 280—609 **20 Claims**

1. A vehicular snow ski comprising:

a first under surface facing downwardly and extending longitudinally therealong; and

a first steering surface facing laterally to one side of said ski, extending adjacently and longitudinally along said first under surface, and forming with said first under surface a first corner curved inwardly for compacting snow there-

about and turning said ski in a first direction, at least one of said under and steering surfaces being curved inwardly,



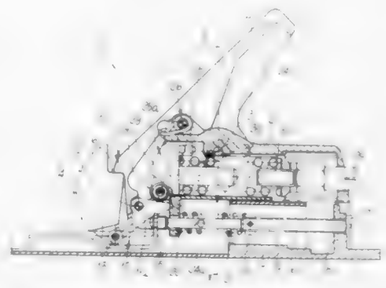
said first under surface being at least partially recessed from said first steering surface.

5,145,202
SNOWBOARD RELEASE BINDING
Earl A. Miller, P.O. Box 400, Orem, Utah 84057
Filed Mar. 7, 1990, Ser. No. 490,093
Int. Cl.[5] A63C *9/086*
U.S. Cl. 280—613 **4 Claims**

1. A release binding comprising: (a) a boot holding plate having a toe and a heel area; and (b) at least one release unit which engages said boot holding plate at said heel area and at said toe area to removably secure said boot holding plate to the snowboard, each said heel area and each said toe area having a vallate indent which engages said release unit, wherein each said vallate indent has wall extensions, wherein said wall extensions are higher in one area of the peripheral edge of said vallate indents and taper to the mean surface on each side of said wall extensions, so as to provide differing release forces.

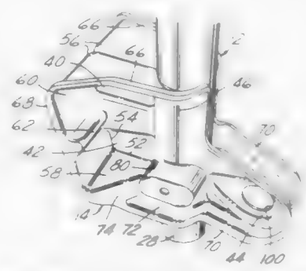
5,145,203
SAFETY FASTENING, PARTICULARLY FOR SKIS
Roberto Gorza, Feltre, Italy, assignor to Nordica S.p.A., Montebelluna, Italy
Filed Mar. 14, 1991, Ser. No. 669,547
Claims priority, application Italy, Mar. 21, 1990, 82542 A/90
Int. Cl.[5] A63C *9/084*
U.S. Cl. 280—632 **4 Claims**

1. Safety fastening, particularly for a ski, comprising a rear engagement means provided with a lever, a jaw for engaging a heel of an item of footwear being associated with said lever, said rear engagement means further comprising a first body and a base element, said base element being rigidly connectable to said ski and said first body being slidably supported by said base element, said lever being transversely pivoted to said base element, said first body comprising at least one inclined plane connected thereto and arranged above said base element, said rear engagement means further comprising at least one pedal element which is pivotally connected to said lever at a first end thereof and which is provided with a second end for slidably interacting with said at least one inclined plane, said at least one pedal comprising means for sliding at said second end thereof which comprise a first roller elements, said at least one inclined plane being connected by means of a first tab element



thereof to a first adjustment screw, said first adjustment screw being rotatably associated in a threaded hole defined on a wall of said base which protrudes rearwardly therefrom, and thereby an actuation of said first adjustment screw imparts an equal movement to said at least one inclined plane and to said first body of said rear engagement means.

5,145,204
STAMPED WHEEL SUPPORT BRACKET FOR VEHICLE SUSPENSION
David J. Perkins, Ann Arbor, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Dec. 26, 1991, Ser. No. 813,640
Int. Cl.[5] B60G *15/00, 15/12*; B62D *7/06*
U.S. Cl. 280—668 **5 Claims**



1. An independent suspension system for a vehicle body rear wheel wherein a resiliently telescoping strut assembly, having a cylindrical tubular member defining a principal axis, is interposed between a wheel spindle and a portion of the vehicle body at the wheel, a longitudinally extending arm member pivotally mounted to the vehicle body forwardly of the wheel and a pair of laterally extending control link members pivotally mounted to the vehicle body inboard of the wheel, a composite wheel support bracket for supporting the arm member, the pair of control link members, and the strut assembly for the wheel comprising:

a light weight two-piece bracket being made of sheet metal stock and being composed of forward and aft stamped half body units which units are mirror images of each other, said units connected together at mutually facing outboard and inboard planar portions secured in flatwise abutment whereby said planar portions defining a plane of symmetry of said bracket;

each said unit outboard and inboard planar portion separated by a semi-cylindrical pathway portion, said pathway portions in mutually facing relation defining a cylindrical

pathway snugly envelopin g and connecting the tubular member therein such that said tubular member principal axis is aligned with a principal axis of said cylindrical pathway and inclined inboard from a vertical plane of the wheel at a slight acute angle;

each said unit outboard planar area having a rigid open box structure defined by opposed upper and lower tread flanges, an outboard mounting edge flange portion and its associated pathway portion; and

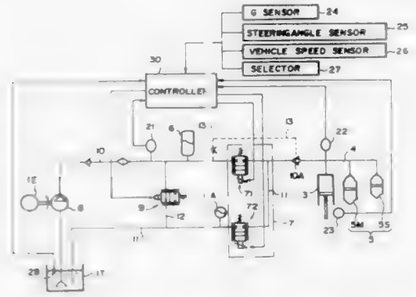
each said unit outboard mounting flange portion disposed in a common longitudinally extending vertically disposed plane providing a composite bracket mounting flange whereby a portion of the spindle is in flatwise abutment with said composite mounting flange.

5,145,205

VEHICLE SUSPENSION SYSTEM

Shin Takehara, and Toshiki Morita, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 13, 1990, Ser. No. 552,004
Claims priority, application Japan, Jul. 14, 1989, 1-181688
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 **7 Claims**



1. A vehicle suspension system which comprises liquid pressure cylinder devices provided between the respective wheels and the vehicle body, a vehicle level sensor means which detects the vehicle height on each wheel and an attitude control system which controls supply and discharge of hydraulic liquid to and from the liquid pressure cylinder devices on the basis of a detecting signal of the vehicle level sensor means so that the attitude of the vehicle body during running is stabilized, the attitude control by the attitude control system being interrupted in a particular running condition wherein each of the liquid pressure cylinder devices communicates with a pair of gas springs, each having a gas chamber and a liquid chamber parted from each other by a movable member, the liquid chamber communicating with a liquid pressure chamber of an associated liquid pressure cylinder device by way of a communicating passage, the gas chamber being filled with gas, and the initial pressure of one of the gas springs being higher than that of the other and the initial pressure of said one gas spring is lower than a minimum value of the pressure attained in the liquid pressure cylinder device during the attitude control by the attitude control system.

5,145,206

SEMI-ACTIVE SUSPENSION SYSTEM WITH ENERGY SAVING ACTUATOR

Daniel E. Williams, Stuart, Fla., assignor to TRW Inc., Lyndhurst, Ohio

Filed Mar. 7, 1991, Ser. No. 665,679
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 **11 Claims**

1. An actuator for a vehicle suspension system comprising:

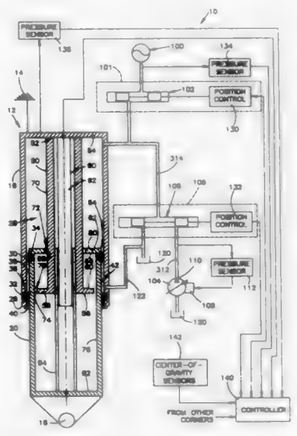
a first member connectable to one of a sprung mass and an unsprung mass of the vehicle, said first member having an opening with an inside wall of predetermined dimension;

a second member connectable to the other the sprung mass and the unsprung mass of the vehicle, said second member having an outside wall of a predetermined dimension;

said dimension of said outside wall of said second member being adapted so as to be telescopically received within said opening of said first member thereby defining a fluid chamber;

means for connecting a source of pressurized fluid to said fluid chamber;

fluid seal means located near an end of said first member for forming a fluid seal between said first member and said second member;



bearing means operatively mounted between said inside wall of said first member and said outside wall of said second member for maintaining said inside wall of said first member spaced form said outside wall of said second member thereby defining a fluid manifold between said inside wall of said first member, said outside wall of said second member, said bearing means, and said fluid seal means, said bearing means permitting fluid pressure in said fluid chamber to communicate with said fluid manifold;

means for connecting said fluid manifold to reservoir, so as to maintain continuous fluid communication between said fluid manifold and said reservoir, and

means for providing a continuous flow of fluid into said fluid chamber, around said bearing means, into said fluid manifold, and to said reservoir and maintaining fluid pressure in said fluid chamber at a predetermined value.

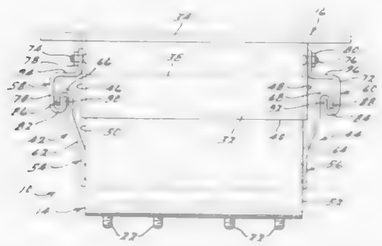
5,145,207

MOUNTING MEANS FOR A VEHICLE PASSENGER SIDE AIR BAG STRUCTURE

John M. Bederka, Madison Heights; Michael J. Suran, Clarkston, and Ahmed El-Bohy, Oak Park, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 15, 1991, Ser. No. 731,177
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 **5 Claims**

1. Mounting means for a vehicle passenger side air bag structure comprising an air bag structure including an air bag housing for containing an uninflated air bag, an air bag housing bracket secured between the air bag housing and support structure of a vehicle, an air bag deployment chute mounted in an opening provided in a vehicle instrument panel on the passenger side thereof, a portion of the air bag housing slidably received in the air bag deployment chute in a portion of the air bag deployment chute extending forwardly of the instrument panel, the air bag housing and air bag deployment chute each having left and right end portions, a connector bracket extending between each pair of left and right end portions of the air bag housing and air bag deployment chute, each connector bracket comprising a first hook element secured to the air bag housing and a second hook element secured to the air bag deployment chute, each hook element terminating in a substantially U-shaped hook having an open mouth, the mouths of the



hooks of the first hook elements facing away from the instrument panel and the mouths of the hooks of the second hook elements facing towards the instrument panel, each hook having a free end portion, the free end portion of the hook of each first hook element being received within the hook of a second hook element and the free end portion of the hook of each second hook element being received within the hook of a first hook element.

5,145,208

AIR BAG DEVICE FOR VEHICLES

Larry D. Hoagland, and Stephen J. Brockman, both of Noblesville, Ind., assignors to Ideatech, Inc., Fishers, Ind.

Filed Feb. 5, 1991, Ser. No. 650,679
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—734 **6 Claims**

4. A safety device for use with a vehicle, comprising:

(a) inflation means for protecting an occupant of the vehicle from a collision involving said vehicle, said inflation means including:

(i) a first piston,

(ii) a cutting tool,

(iii) a seal separating a source of pressurized fluid from an air bag,

(b) a sensor which senses collisions, comprising:

(i) a fluid cylinder having an actuating orifice,

(ii) a second piston movable within said fluid cylinder,

(iii) a spring contained with said cylinder and connected to said second piston,

(c) said sensor being attached to said vehicle so that contact made with said vehicle causes relative movement between said second piston and said cylinder,

(d) wherein said relative movement encompasses a range of second piston positions within said cylinder including an initial position, a damping position, and an actuating position,

(i) said initial position normally occurring when no contact is made with said vehicle,

(ii) said damping position occurring when incidental contact is made with said vehicle, said spring absorbing energy from said incidental contact to prevent pressurizing said cylinder above a predetermined pressure at which said first piston would be advanced to break said seal and cause said air bag to inflate,

(iii) said actuating position occurring when substantial contact, such as a collision, is made with said vehicle, said contact pressurizing said cylinder above said predetermined pressure causing said first piston to be advanced to break said seal and cause said air bag to inflate,

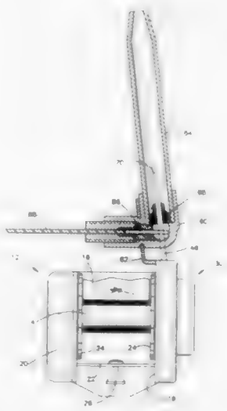
(e) said fluid cylinder comprising a bleed orifice so that when said incidental contact occurs, fluid communicates across said bleed orifice.

5,145,209

SEAT BELT PRETENSIONER

Reiner Lenzen, Almont, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Continuation of Ser. No. 479,394, Feb. 13, 1990, abandoned. This application Apr. 30, 1991, Ser. No. 693,060
Int. Cl.[5] B60R *22/46*
U.S. Cl. 280—806 **13 Claims**



1. A pretensioner for a vehicle seat belt retractor having a rotatable take-up spool on which seat belt webbing is wound, said pretensioner comprising:

a pressure chamber;

a drive member movable in said chamber by a high pressure gas;

means responsive to movement of said drive member for rotating said take-up spool in a belt retraction direction to pull the seat belt webbing against a vehicle occupant and eliminate slack in the seat belt webbing;

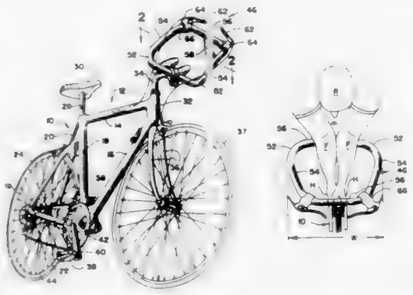
a gas generating means for generating at least a substantial portion of said high pressure gas consisting of an elongated frangible sheath and pyrotechnic material disposed within said sheath, said pyrotechnic material comprising at least one elongated gas generating pyrotechnic cord disposed within said sheath;

means for igniting said pyrotechnic cord;

means for holding said frangible sheath so that a high pressure gas is released from said frangible sheath on ignition of the pyrotechnic cord; and

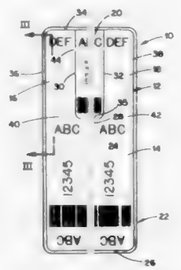
means whereby said high pressure gas is released into said pressure chamber.

5,145,210
BICYCLE, HANDLEBAR AND ADAPTER SYSTEM
Dan C. Lennon, Box 1177, Hailey, Id. 83333
Continuation of Ser. No. 428,373, Oct. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 173,765, Mar. 28, 1988, Pat. No. 4,878,397, which is a continuation-in-part of Ser. No. 1,616, Jan. 9, 1987, Pat. No. 4,750,754. This application Nov. 1, 1991, Ser. No. 787,698
Int. Cl.[5] B62K *21/12, 21/26*
U.S. Cl. 280—281.1 36 Claims



1. A bicycle comprising a frame, a rear wheel journaled to the frame, a steering post journaled to the frame, a front fork attached to the steering post, a front wheel journaled to the fork, a saddle affixed to the frame at a predetermined position above the frame, and a handlebar connected to the steering post, the handlebar including a rear portion connected to the steering post, a central forward portion providing a substantially vertical handgrip for a rider's hands and an intermediate portion extending forwardly from the rear portion and connecting the rear portion with the forward portion, said handgrip portion being located substantially along the longitudinal centerline of the bicycle and above the horizontal plane of the crosspiece to define a rider position in which the rider's elbows are located close together near the central rear portion and the rider's arms extend forwardly when the rider's hands are grasping the substantially vertical handgrip portion.

5,145,211
AIR BAGGAGE TAG
Barron G. McKillip, Grand Rapids, Mich., assignor to CCL Label, Inc., Grand Rapids, Mich.
Filed Apr. 25, 1991, Ser. No. 691,145
Int. Cl.[5] G09F *3/20*
U.S. Cl. 283—80 15 Claims



1. An improved baggage tag of the type including a strip of flexible material having front and back surfaces, first and second longitudinally spaced apart ends and laterally spaced apart sides, a tag body at the first end of the strip adapted to be folded against itself along a longitudinal fold line, a pair of laterally spaced apart tongues extending longitudinally from a base portion thereof adjacent said tag body to the second end of the strip and adapted to encircle the handle of a piece of baggage, and a detachable claim ticket disposed between said tongues, the back surface of said strip being adhesive except in two zones on said tongues, said zones extending from adjacent the base portions of said tongues to positions adjacent to but spaced apart from said second end, wherein the improvement comprises an adhesive material coated on substantially the entirety of the back surface of said strip except in said zones, said zones being uncoated and free of adhesive material.

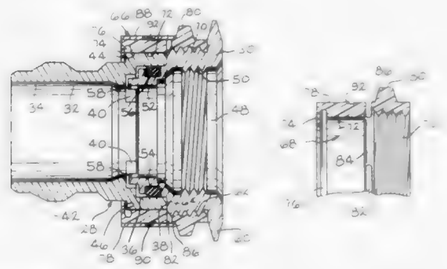
5,145,212
NON-CONTINUOUS HOLOGRAMS, METHODS OF MAKING THEM AND ARTICLES INCORPORATING THEM
Donald W. Mallik, North Tarrytown, N.Y., assignor to American BankNote Holographics, Inc., Elmsford, N.Y.
Continuation-in-part of Ser. No. 160,641, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 156,305, Feb. 12, 1988, abandoned. This application Dec. 23, 1988, Ser. No. 291,247
Int. Cl.[5] B42D *15/00*; G03H *1/02*
U.S. Cl. 283—86 35 Claims

1. In an article having a substrate with visual information carried on at least a portion of one surface area thereof, and a holographic diffractive device attached to said one surface, the improvement comprising said device being attached to said at least one substrate surface area over at least a portion of said visual information, said device being substantially transparent across said at least a portion of said visual information except for a plurality of discontinuous reflective portions across an area thereof that, when illuminated with light, reflect at least a portion of such light to form a reconstruction of a light pattern recorded on said device, said discontinuous reflective device portions having a spacing in excess of 25 such portions per inch in at least one direction across said device area, thereby to both render said visual information visible through the device and allow viewing of the light pattern reconstructed from the device.

5,145,213
FRANGIBLE FITTING ASSEMBLY
William C. Marrison, Jackson, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Nov. 30, 1990, Ser. No. 620,964
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—2 13 Claims

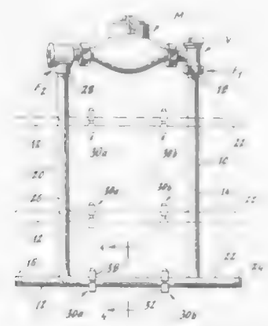
1. A frangible conduit fitting assembly comprising, in combination, a body having first and second tubular parts each having a longitudinal axis and conduit connector means, each of said parts having an axial flow passage defined therein, interengaging orientation means defined on said parts coaxially aligning said flow passages thereof to align said parts in an operative relationship, sealing means interposed between said parts establishing a fluid-tight interrelationship therebetween, a connector engaging and interconnecting said parts and maintaining said parts in said operative relationship, first frangible means defined on said connector adapted to fracture upon predetermined bending forces being relatively imposed on said parts transversely to said parts' axes releasing said parts from each other comprising circumferential extending slots defined in said connector and axially extending ribs circumferentially located intermediate and axially aligned with said slots, and

second frangible means defined on said connector adapted to fracture upon predetermined axial tension forces being relatively imposed on said parts releasing said parts from each other, said second frangible means comprising first and second radially extending axially spaced shoulders defined of said connector, a third radial shoulder defined on said first part



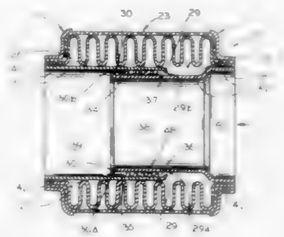
engageable by said first shoulder under tension forces and a fourth radial shoulder defined on said second part engageable by said second shoulder under tension forces, said second shoulder adapted to fracture upon said predetermined tension forces being applied to said parts, said first and third radial shoulders comprising mating threads formed on said connector and said first part.

5,145,214
ADJUSTABLE METER SETTER
Mitchell Hunt, 1165 Park Ave., Murfreesboro, Tenn. 37130
Filed Jul. 15, 1991, Ser. No. 729,589
Int. Cl.[5] F16L *9/00*
U.S. Cl. 285—30 4 Claims



1. A setter for a water meter which comprises:
a first substantially L-shaped pipe having a first leg connectable to a water supply line and a second leg connectable to the input port of a water meter;
a second substantially L-shaped pipe having a first leg connectable to a water distribution line and a second leg connectable to the discharge port of said water meter;
the first legs of said first and second pipes being in substantially parallel side by side relationship;
the second legs of said first and second pipes being in substantially parallel, spaced relationship to support said water meter therebetween; and
at least one clamp means engaging the first legs of both of said pipes to selectively vary the distance between the second legs of said first and second pipes to match the dimensions of said water meter.

5,145,215
FLEXIBLE COUPLER APPARATUS
Randal R. Udell, Lemont, Ill., assignor to Senior Engineering Investments, B.V., Amsterdam, Netherlands
Filed Apr. 26, 1991, Ser. No. 692,120
Int. Cl.[5] F16L *21/00, 27/12*
U.S. Cl. 285—49 8 Claims



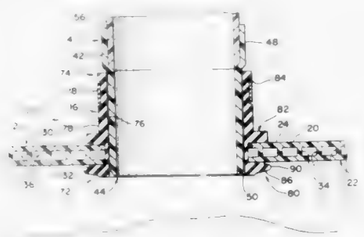
1. A flexible coupler apparatus for connecting adjacent ends of successive pipes to direct fluid flow from one of said two pipes to the other of said two pipes, while precluding transmission of vibration between said two pipes, said flexible coupler apparatus comprising:
an inner sleeve member having an end operably affixable to one of said two pipes, and a free end;
an outer sleeve member having an end operably affixable to the other of said two pipes, and a free end;
said inner and outer sleeve members separated by an annular space to permit angular displacement therebetween,
said free end of said outer sleeve member operably arranged to slidingly receive said free end of said inner sleeve member, a portion of said outer sleeve member thereby concentrically overlapping a portion of said inner sleeve member, said outer and inner sleeve members further operably arranged for axial and angular movement relative to each other to, in turn, accommodate axial and angular movement of said two pipes relative to each other;
a substantially porous, vibration absorbing spacer member positioned between said inner and outer sleeve members, within said annular space, for maintaining said inner sleeve member and said outer sleeve member in spaced relation to each other along said overlapping portions of said outer and inner sleeve members, and for precluding transmission of vibrations from said inner and outer sleeve members to each other; and
a resilient sealing member affixed to said outer sleeve member and said inner sleeve member for maintaining said two pipes in flexibly joined relation to each other to accommodate and enable substantial compressive and extensive axial movement as well as angular movement of the outer and inner sleeve members relative to each other, preclude transmission of vibrations of said outer and inner sleeve members to each other and preclude escape of fluid from said flexible coupler apparatus.

5,145,216
PIPE CONNECTION ASSEMBLY
Jose E. Valls, Jr., Ponce, P.R., assignor to Vassallo Research and Development Corporation, Coto Laurel, P.R.
Filed Jul. 23, 1991, Ser. No. 734,757
Int. Cl.[5] F16L *3/04*
U.S. Cl. 285—162 26 Claims

1. A pipe connection assembly, the combination comprising:
a first pipe having an inner cylindrical wall, an outer cylindrical wall, rib means for concentrically connecting said inner and outer walls together about a first longitudinal axis, and an aperture with an inner diameter extending through said inner and outer walls, said inner and outer

walls and said rib means defining at least one peripheral channel being intersected by said aperture;

an elastomeric, tubular gasket having a substantially cylindrical body, a first end, a second end, a predetermined inner diameter and a predetermined outer diameter, said first end of said gasket being positioned in said aperture; and



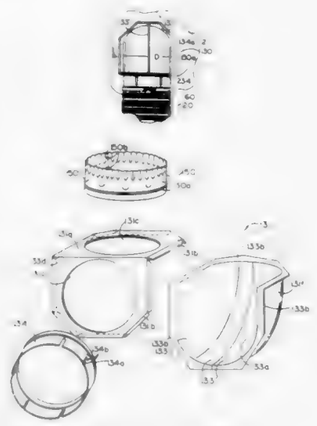
a second pipe having a substantially cylindrical side wall with an outer diameter slightly larger than said inner diameter of said aperture minus the thickness of said cylindrical body of said gasket, said second pipe being positioned in said gasket to compress said gasket against said inner and outer walls defining said aperture for sealing between said first and second pipes and said peripheral channel intersecting said aperture.

5,145,217

UNIVERSAL DRYER DUCT AND VENT

Charles E. Anderson, Jacksonville, Tex., and Charles R. Kenrick, Spring Lake, Mich., assignors to Builder's Pride, Inc., Jacksonville, Tex.

Filed Dec. 4, 1990, Ser. No. 621,774
Int. Cl.[5] F16L *27/00*
U.S. Cl. 285—179 **6 Claims**



1. An air flow duct assembly comprising:

a flexible, metal, corrugated conduit having first and second ends;

said flexible conduit being axially extendible and contractible, and laterally flexible;

a pair of elbow connectors on said ends;

each elbow connector having a body and a pair of openings, and first and second cylindrical, flow-through, swivel sleeves in said openings, each sleeve being rotational on said body about its cylindrical axis;

said body having a radially outer portion which is like the outer portion of a quarter-toroid, having an L-shaped plate forming a pair of legs, each of which legs has one of said openings therethrough, and having an outer curvilinear surface semicircular in cross section and extending between said legs; and

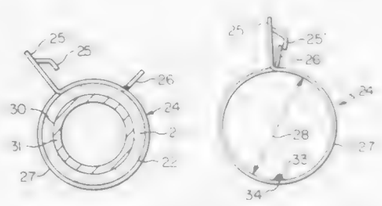
each of said sleeves being male or female, one of said sleeves in each elbow connector telescopically interfitting with said flexible conduit.

5,145,218

HOSE CONSTRUCTION AND METHOD OF MAKING THE SAME WITH ADHESIVELY BONDED CLAMP

Joe C. Worley, Canton; Dale K. Parker, Sylva; Manuel Campo, Hazelwood, and Jerry W. Camden, Waynesville, all of N.C., assignors to Dayco Products, Inc., Dayton, Ohio

Filed May 30, 1990, Ser. No. 529,986
Int. Cl.[5] F16L *21/06*
U.S. Cl. 285—243 **5 Claims**



1. In a method of making a hose construction comprising a tubular flexible hose having opposite ends, fastening means, and a clamping means fastened to one of said ends of said hose with said fastening means for substantially circumferentially and radially inwardly clamping said one end onto a member that has been inserted into said one end, said clamping means having end projections for being toggled together to circumferentially enlarge said clamping means and hold said clamping means out of its clamping condition and for being released from each other so as to be circumferentially moved apart from each other as said clamping means circumferentially shrinks into its said clamping condition by the natural spring force of said clamping means, the improvement comprising the steps of forming said fastening means to comprise a single spot of adhesive means disposed between and against said clamping means and said hose at a point on said hose that is located substantially diametrically opposite the point on said hose where said end projections of said clamping means are adapted to be toggled together, forming said adhesive means to initially comprise a spot disposed on one of said clamping means and said hose before said clamping means and said hose are assembled together, then assembling said hose and said clamping means together while said end projections of said clamping means are toggled together, and then placing said hose and said clamping means under pressure at said spot of adhesive means during the time said adhesive means sets by releasing said end projections of said clamping means from said toggled condition thereof.

5,145,219

TUBE COUPLING WITH GASKET RETAINER

Gerald A. Babuder, Mentor, Ohio, assignor to Cajon Company, Macedonia, Ohio

Filed Aug. 1, 1990, Ser. No. 561,689
Int. Cl.[5] F16L *19/00*
U.S. Cl. 285—330 **18 Claims**

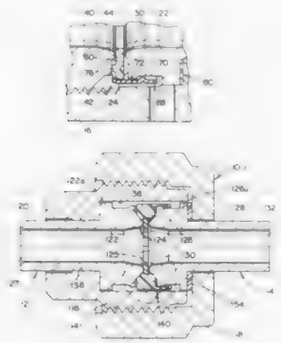
1. A coupling comprising:

first and second annular coupling components each having an axis and first and second ends, said first ends each including an end face disposed generally transverse to said axis and defining a seal surface;

said first and second annular coupling components being positioned with said end faces and said seal surfaces in aligned face-to-face relationship;

first and second annular coupling nut means for causing said seal surfaces of said first and second annular coupling components to be driven toward each other; and,

means extending axially outwardly in both directions beyond said seal surface for engaging said first and second annular coupling components and producing driving engagement between said first and second annular coupling components as said seal surfaces are driven toward one another to prevent relative rotational movement between said sealing surfaces as said first and second annular coupling nut means acts to drive said first and second annular coupling components toward each other, said means comprising an annular sealing gasket having opposed sealing faces and a plurality of circumferentially spaced protrusions extending axially outwardly from both said opposed sealing faces for frictionally engaging said end faces radially outwardly of said seal surfaces.



7. A sealing gasket for use between mating coupling components of a type including aligned end faces positioned in opposed relationship and having axially extending annular ribs which are adapted to engage directly opposite one another on opposite sides of said sealing gasket, said sealing gasket comprising:

a relatively rigid metal body having a flat annular configuration having a circular outer peripheral area and a circular inner peripheral area located about a central opening, said circular inner peripheral area constituting a seal surface and being smooth and flat and having a radial extent greater than the radial extent of said annular ribs for engagement therewith; and,

a plurality of oppositely directed protrusions extending axially outwardly from said rigid metal body in the circular outer peripheral area radially outwardly of the seal surface, total axial extent of said protrusions being greater than an axial extent of said annular ribs so that engagement of said annular ribs with said sealing gasket cannot take place until after said protrusions have engaged said coupling components.

5,145,220

PIPE FITTING

Jack Burkholder, 7948 E. 59 Place South, Apartment 55-3, Tulsa, Okla. 74145

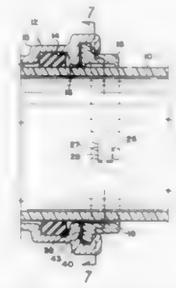
Filed Jun. 10, 1991, Ser. No. 712,466
Int. Cl.[5] F16L *19/08*
U.S. Cl. 285—374 **3 Claims**

1. An assembly for joining a section of pipe to a pipe fitting which comprises:

first and second locking clamp elements adapted to surround the section of pipe, each element being an annular one-half with a prong at one end and a cavity at an opposite end, the size of the cavity of each one-half ring being such that it snugly receives the prong of the other one-half ring to form a closed ring when the locking clamp elements are positioned to surround the section of pipe, each said one-half ring having a locking lug extending outwardly from the periphery thereof;

a pipe fitting having an open end into which said section of pipe may be inserted, said pipe fitting having a plurality of lock members on its open end, each lock member being provided with a lock recess for receiving one of said locking lugs;

forcing means to force said two one-half rings toward each other comprising a tab extending radially outward from each end of each one-half ring with holes therethrough and positioned so that when the two one-half rings are shaped to form a ring that the hole on each tab of one-half ring is aligned with a corresponding hole in each tab on



the other one-half ring and bolts extending through said aligned holes;

blade means on the inner periphery of each one-half ring for embedding into the said section of pipe when the bolts are fully tightened;

whereby, the locking clamp elements are first placed in surrounding relationship with respect to the section of pipe, the bolts are loosely tightened, the assembly of locking clamp elements is thereafter rotated around the pipe section until the locking lugs are received in the lock recesses of the locks on the pipe fitting, after which the bolts are fully tightened to cause the blade means to become imbedded in the section of pipe; and

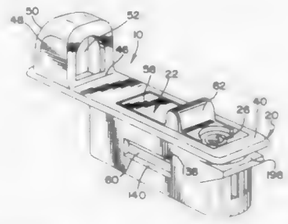
whereby the prongs are fully received in the cavities to prevent any side forces from being exerted against the bolts.

5,145,221

SLIDING LATCH LOCK

Ashley Pennebaker, Aurora; Duane R. Picht, and Emerson Purkapile, both of Chicago, all of Ill., assignors to Chicago Electrical Tool Company, Inc., Norcross, Ga.

Filed Jul. 17, 1990, Ser. No. 554,260
Int. Cl.[5] E05C *1/10*
U.S. Cl. 292—175 **15 Claims**



1. A sliding latch lock constructed from self-fastening mem-

bers, designed for reversible utility allowing the sliding latch lock to be mounted on either a right hand side or a left hand side of a case having a first shell and a second shell, the sliding latch lock comprising:

a slide housing mounted to the first shell of the case;

a slide latch slidably self-fastened into the slide housing and movable to a latched position and an unlatched position;

a spring mounted between the slide housing and the slide latch to bias the slide latch to the latched position,

a lock self-fastened into the slide housing and which interacts with the slide latch to provide indexed rotational movement of the lock,

a catch which is mounted to the second shell of the case so when the catch is engaged by the slide latch in the slide housing the case will not open,

wherein the slide latch is symmetrical about a longitudinal axis, the slide latch comprises a slide latch body, means for slidably securing the slide latch into the slide housing, means for rotationally securing the lock and means for engaging and disengaging the catch, said engaging and disengaging means being integral to the slide latch and comprises at least one slide latch engaging surface and at least one slide latch disengaging surface arranged so that when the slide latch engages the catch, the slide latch engaging surface contacts a catch engaging surface, when the slide latch is moved to disengage the catch, the slide latch engaging surface is withdrawn from contact with a catch engaging surface and the slide latch disengaging surface is brought into contact with a catch disengaging surface so as to force the catch out from the slide housing, and further when the slide latch is moved back to its engaged position after disengaging the catch, the slide latch disengaging surface is withdrawn from contact with a catch and the slide latch engaging surface is brought into contact with the catch disengaging surface to further force the catch out from the slide housing.

5,145,222

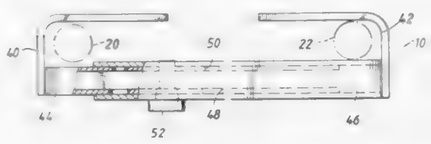
DEVICE FOR LOCKING TRACTOR TRAILER AND SEA-RAIL CONTAINER DOORS

Lester E. Meyer, Rte. #1 Box 3', Damon, Tex. 77430

Filed Aug. 1, 1991, Ser. No. 739,083

Int. Cl.[5] **E05C** *19/18*

U.S. Cl. 292—258 **9 Claims**



1. An apparatus for locking the rear doors of a tractor trailer or ship container by grasping the two large parallel rods used to secure the rear doors, said apparatus comprising:

(a) a first hollow elongate rectangular tubular member;

(b) a second elongate rectangular member sized to axially fit within said first member;

(c) first and second clasping hooks of flat metal stock secured to the distal ends of said first and second members respectively to enable said hooks to lock around the door rods;

(d) lock mounting holes formed in said first member in the walls thereof wherein said first member has an exposed front wall and a back wall and said holes define a lock mounting location on said first member;

(e) multiple holes along the length of said second member aligned selectively with said lock mounting holes to enable telescoping movement for locking on variation of spacing of said clasping hooks;

(f) lock means insertable into said lock mounting holes to a recessed locking position and also extending through a selected hole in said second member to lock said second member and said hooks in location; and

(g) wherein said lock mounting holes mount said lock means in a recessed locking position to thereby protect said lock means within said first and second members.

5,145,223

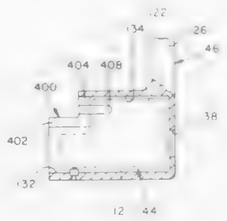
CYLINDRICAL LOCK ASSEMBLY

James E. Robida, Cobalt, and Kenneth W. Strickland, South Windsor, both of Conn., assignors to Emhart Inc., Newark, Del.

Filed Oct. 12, 1990, Ser. No. 596,890

Int. Cl.[5] **E05B** *29/02*

U.S. Cl. 292—347 **8 Claims**



1. A cylindrical lock assembly, which comprises:

a latchbolt;

a mechanism for moving the latchbolt between a latched position and an unlatched position;

a sleeve extending from the mechanism and attached thereto for operation of the mechanism upon rotation of the sleeve;

an operator mounted on the sleeve for facilitating selective rotation of the sleeve;

means for attaching the operator to the sleeve;

the operator formed with a cavity and with an opening to the cavity;

an insert means for covering the opening of the cavity independently of the attaching means; and

friction engaging and guiding means formed on the insert means for engaging complementary structure within the cavity to frictionally retain the insert means within the opening independently of the attaching means and to guide the insert means into the appropriate location for covering the opening.

5,145,224

DEER DRAGGING AND HANGING DEVICE

Richard Welk, 150 Spur Cir., Wayzata, Minn. 55391

Filed Mar. 8, 1991, Ser. No. 666,844

Int. Cl.[5] **A22C** *15/00;* **B65G** *7/12*

U.S. Cl. 294—2 **1 Claim**

1. A deer dragging and hanging device comprising:

a. a cylindrical member of a finite length;

b. a yoke secured to a mid-portion of said cylindrical member;

c. conforming handles on opposing ends of said cylindrical member;

d. nuts secured within opposing ends of said cylindrical member; and,

e. V-screws with threaded ends for threadingly engaging within said nuts at opposing ends of said cylindrical member.

5,145,225

CARPET STRETCHER

George M. Muller, 11 Verdun St., Tingalpa, Queensland 4173, and Gordon H. Stuart, 10 Sterculia Avenue, Holland Park, Queensland, 4121, both of Australia

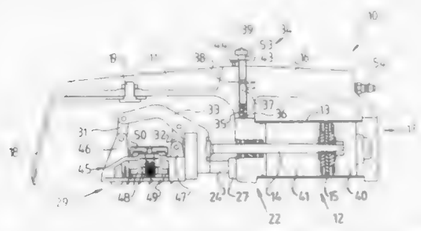
PCT No. PCT/AU89/00317, § 371 Date Mar. 18, 1991, § 102(e) Date Mar. 18, 1991, PCT Pub. No. WO90/00877, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 27, 1989, Ser. No. 646,799

Claims priority, application Australia, Jul. 27, 1988, PI9488

Int. Cl.[5] **A47G** *27/04*

U.S. Cl. 294—8.6 **11 Claims**



1. A carpet stretcher comprising a retractable carpet engaging head, a pneumatic cylinder assembly for extending and retracting the head and control means for controlling flow of air through the cylinder assembly, the cylinder assembly having a cylinder, a movable piston within the cylinder and a piston rod connected to the piston, the piston rod having a protruding portion extending from the cylinder, connecting means providing a flexible connection between the carpet engaging head and the protruding portion of the piston rod such that on operation of the control means to retract the carpet engaging head, the carpet engaging head automatically moves to an elevated position relative to a carpet being stretched, the connecting means including an arm having opposed ends, one end of the arm being connected to the piston rod and the other end of the arm being connected to the carpet engaging head via a pivotal linkage, a push plate engageable by the arm to move in concert with the arm and the carpet engaging head along only part of the travel of the carpet engaging head such that there is lost motion between the push plate and the carpet engaging head to effect elevation or lowering of the carpet engaging head, and a frame on which the cylinder assembly is mounted, the frame having a pair of spaced guideways, the push plate being coupled to the frame via a pair of spaced guide rods slidingly moveable in the guideways in response to engagement of the push plate by the arm.

5,145,226

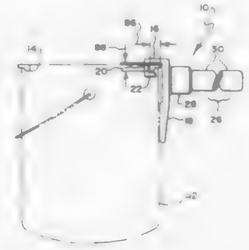
PAINT CAN HOLDER SECURABLE AGAINST ACCIDENTAL DETACHMENT

Roy A. LaFontaine, Port Colborne, Canada, assignor to Inventures Niagara Inc., Welland, Canada

Filed Dec. 17, 1990, Ser. No. 628,602

Int. Cl.[5] **B65D** *25/28;* **E06C** *7/14*

U.S. Cl. 294—27.1 **20 Claims**



1. A paint can holder comprising a rigid member including an elongate first portion for engaging an upper surface of an upper lid engaging annular inwardly projecting rim of a paint can, an elongate second portion substantially normal to said first portion and extending in a direction therefrom to engage a side surface of the paint can, an elongate third portion substantially normal to said first portion and extending therefrom in substantially said direction that said second portion extends therefrom to engage an inner surface of the rim, an elongate fourth portion substantially normal to said third portion and extending therefrom in a direction toward said second portion to engage a lower surface of the rim and terminating at an end which is spaced from said second portion to define between said first, second, third, and fourth portions a containment for the rim and to define between said fourth portion end and said second portion means for receiving the rim within the containment, and a fifth portion comprising handle means connected to said second portion, said second portion being parallel to said third portion, and said fourth portion end being spaced from said second portion a distance with is equal to about 7/16 inch.

5,145,227

ELECTROMAGNETIC ATTACHMENT MECHANISM

Leo G. Monford, Jr., Dickinson, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 31, 1990, Ser. No. 636,531

Int. Cl.[5] **B25J** *15/06;* **B64G** *1/64;* **B66C** *1/04*

U.S. Cl. 294—65.5 **22 Claims**

1. An electromagnetic attachment mechanism adapted for interfacing with a manipulator arm of a remote manipulator system, said attachment mechanism comprising:

a housing with a base plate at one end thereof;

at least one electromagnet mounted in said housing, said electromagnet comprising a U-shaped magnetic core with pole pieces at the ends thereof and a plurality of coils wound about said magnetic core between said pole pieces, said base plate having openings therethrough which are sized to accommodate said pole pieces; a spring suspension system

having a bias mounting said electro-magnet in said housing with the pole pieces exposed by the openings in said base plate and adapted for movement through said openings when attracted to a magnetic strike plate included in a grapple fixture affixed to a target object in proximity to the attachment mechanism; means on said housing for maintaining

said pole pieces in spaced relation to said strike plate when said base plate of the housing is directed into engagement with said grapple fixture to thereby establish a gap between said pole pieces and said strike plate;

means for energizing said coils whereby said electromagnet exerts an attractive force on said strike plate when in proximity thereto to cause said pole pieces to move through said base plate openings to contact and grip said strike plate and thereby impose a preload force of predetermined magnitude between said pole pieces and said strike plate; and

preload sensor means for detecting the movement of said pole pieces in establishing the preload force and generating an electrical output signal indicative thereof.

5,145,228

RUNNING AND PULLING TOOL

Colin S. Boyle, Montrose, Scotland, assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 11, 1990, Ser. No. 625,889

Claims priority, application United Kingdom, Mar. 29, 1990, 9007030

Int. Cl.[5] E21B *31/20*

U.S. Cl. 294—86.25 4 Claims

1. A running and pulling tool for releasably connecting to a fishing neck on a well tool comprising:

(a) an elongate mandrel;

(b) connector means slidably mounted on said mandrel for connecting to and releasing from the fishing neck, said connector means movable from a first position connectible to the fishing neck to a second position releasing from said fishing neck;

(c) means releasably positioning said connector means in said first position on said mandrel;

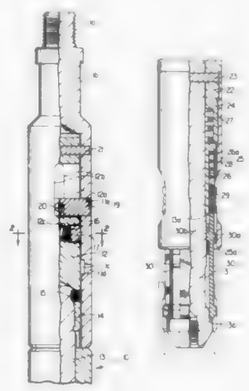
(d) retaining means for retaining said connector means in said first position, said retaining means movable to a latched position permitting release and movement of said connector means to said second position, said retaining means including,

a body slidably mounted around said mandrel and retractable latch means on said mandrel engageable with said retaining means body for latching said body to said mandrel, said retractable latch means including:

a recess around said mandrel,

a retractable ring in said recess, said ring having a camming surface,

upper and lower internal grooves in said retaining means body, said upper groove having a camming



surface engageable with said retractable ring camming surface; and

(e) means releasably positioning said retaining means on said mandrel.

5,145,229

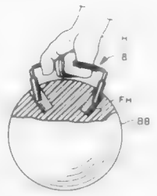
BOWLING BALL HOLDER

Romain Metzger, 15559 Brookridge Blvd., Brooksville, Fla. 34613

Filed Oct. 15, 1991, Ser. No. 774,096

Int. Cl.[5] A63B *69/00*

U.S. Cl. 294—158 4 Claims



1. A device for lifting, holding, carrying, and swinging a bowling ball to practice the movement required for bowling, said device being arranged and disposed for rapid attachment to and removal from a conventional bowling ball, having a pair of laterally spaced finger holes, and comprising:

(a) a pair of similar finger hole engaging members adapted for detachable, adjustable interconnection to form a handle-like structure;

(b) each of said members including:

(i) a body having a generally cylindrical solid post, formed of a relatively rigid material, and a generally cylindrical hollow sleeve, formed of a relatively soft material, enclosing a lower end portion of said post;

(ii) a connecting strap having one end secured to an upper end portion of said post and having another end presenting adjustable touch and close type fastening means;

(c) said member bodies having outer diameters less that the inner diameters of said bowling ball finger holes and being adapted for insertion therein, with their respective connecting straps drawn tightly together and detachably secured to each other to maintain said bodies in said finger holes and thereby form said handle-like structure for holding said bowling ball.

5,145,230

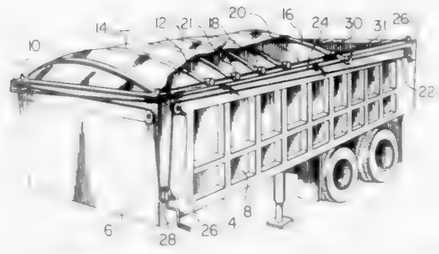
TARPAULIN COVER

Vito Biancale, #461, Hwy. #5, R.R. #2, Dundas, Ontario, Canada L9H 5E2

Continuation-in-part of Ser. No. 152,623, Feb. 5, 1988, Pat. No. 5,067,767. This application Aug. 9, 1991, Ser. No. 742,912

Int. Cl.[5] B60J *7/02*

U.S. Cl. 296—100 5 Claims



1. A tarpaulin cover system for an open-top truck or trailer bodies having a body front, the system comprising:

(a) a tarpaulin having a front end and anchored to said body front, and a rear end;

(b) a plurality of intermediate bows extending transversely across said body and secured at spaced locations to said tarpaulin for supporting said tarpaulin, said intermediate bows having intermediate bow ends;

(c) a lead bow secured to said rear end and having lead bow ends; and

(d) bow support means for supporting said intermediate bows and lead bow, said bow support means reciprocating said lead bow thereby moving said tarpaulin and said intermediate bows between a covered position wherein said body is covered by said tarpaulin and an open position wherein said body is open, said bow support system including:

(i) a pair of linear, semi-rigid cable members secured immovably to said body and extending longitudinally along said body, with said intermediate bow ends being slidably mounted and supported on said cable members for longitudinal movement; and

(ii) separate, movable drive cable means for supporting said lead bow ends and having drive portions extending longitudinally along said body in parallel to said immovable cable member, said lead bow being fixedly secured to said movable drive cable means, wherein the drive cable means consists of a single cable having a horizontal reach extending along each side of the body, the cable having the form of an endless loop with a path of travel defined by a series of elongated runs, said bow support means including a plurality of pulleys attached to the body to support said runs, with a pair of said runs crossing over each other from one side of the body to the other so that the movement of the drive cable along its path causes each of said pair of horizontal reaches to move in the same direction relative to the body to effect movement of the tarpaulin;

whereby longitudinal movement of said movable drive cable means causes the lead bow to move for opening or closing said tarpaulin.

5,145,231

ROOF STRUCTURE OF AN AUTOMOTIVE VEHICLE

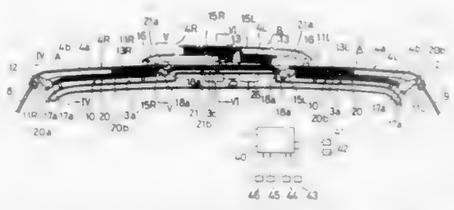
Yasuo Gotomyo, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Continuation-in-part of Ser. No. 674,117, Mar. 25, 1991, abandoned. This application Nov. 9, 1991, Ser. No. 794,530

Claims priority, application Japan, Mar. 31, 1990, 2-86498; Feb. 27, 1991, 3-56055

Int. Cl.[5] B60J *7/047*

U.S. Cl. 296—220 16 Claims



1. A roof structure of an automotive vehicle, comprising:

a roof body covering a vehicle compartment, said roof body comprising a front roof section, a rear roof section and a central roof section, said front roof section being disposed at a front portion of said roof body, said rear roof section being disposed at a rear portion thereof, and said central roof section being interposed between said front roof section and said rear roof section and extending longitudinally in a middle position between left-hand and right-hand roof sides, wherein said roof body is provided with a first roof aperture on the left-hand roof side and a second roof aperture on the right-hand roof side of said roof body;

an outer side of said first roof aperture being continuous with an aperture for a first side door, a front side thereof being bounded by said front roof section, a rear side thereof being bounded by said rear roof section, an inner side thereof being bounded by one side of said central roof section;

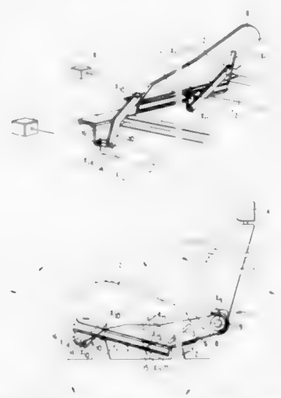
an outer side of said second roof aperture being continuous with an aperture for a second side door, a front side thereof being bounded by said front roof section, a rear side thereof being bounded by said rear roof section, and an inner side thereof being bounded by the other side of said central roof section;

said roof aperture having a first roof plate panel movable between a closed position wherein said first roof aperture is closed with said first roof plate panel and an open position wherein said first roof aperture is opened over its entire longitudinal length and said first roof plate panel is located over said central roof section; and

said second roof aperture having a second roof plate panel movable between a closed position wherein said second roof aperture is closed with said second roof plate panel and said open position wherein said second roof aperture is opened over its entire longitudinal length and said second roof plate panel is located over said central roof section;

wherein said first roof plate panel is superimposed on said second roof plate panel when each of said first roof plate panel and said second roof plate panel is located in said open position.

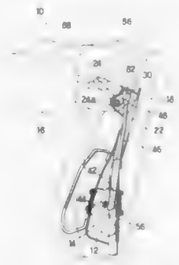
5,145,232
SEAT FOR VEHICLES, PARTICULARLY MOTOR CARS
Antonio Dal Monte, Rome, Italy, assignor to Fiat Auto SpA, Italy
Continuation of Ser. No. 537,728, Jun. 14, 1990, abandoned.
This application Oct. 16, 1991, Ser. No. 776,859
Claims priority, application Italy, Jun. 14, 1989, 67482 A/89
Int. Cl.[5] B60N *2/02*
U.S. Cl. 297—329 6 Claims



1. A vehicle seat comprising a squab with a front region and a rear region, a backrest which rises above the rear region of the squab, and respective associated, selectively-pivotable support arms having upper ends and lower ends, the support arms being articulated at the upper ends to the squab and at the lower ends to respective adjustment elements which can be pivoted selectively in order to selectively vary the position of the lower articulation of the support arms; wherein the backrest is provided at its lower end with support means which can perform a generally translational movement forwards and backwards relative to the vehicle the support means being disposed between the rear region of the squab and at least one of the support arms and having an elongated, inclined slot formed therein, further wherein the at least one support arm includes a pin at the upper end and which passes through the slot provided in the support means and is connected to the rear region of the squab, the pin and slot cooperating to form a ramp coupling means, such that the forward-rearward movement of the support means of the backrest causes a vertical translation of the rear region of the squab as well as a corresponding forward-rearward movement of the squab.

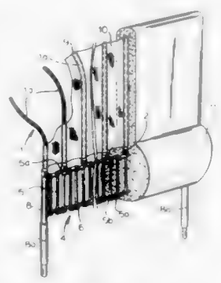
5,145,233
ARRANGEMENT OF HEADREST IN SEAT
Hideo Nagashima, Akishima, Japan, assignor to Tachi S Co., Ltd., Japan
Filed Oct. 22, 1991, Ser. No. 780,368
Int. Cl.[5] A47C *7/36*
U.S. Cl. 297—408 4 Claims

1. An arrangement of a headrest in a seat, comprising:
a crank-like shaft which extends transversely of a seat back of said seat and is disposed at an upper part of said seat back, such that both ends of said shaft are rotatably secured to a seat back frame provided within said seat back;
a drive mechainsm for causing said shaft to be rotated so as to displace said headrest between a vertical use position and a horizontal non-use position, said drive mechanism being disposed at one lateral side of said seat back frame and being operatively connected with a one end part of said shaft;
a stopper means provided fixedly at another free end part of said shaft which is disposed at another lateral side of said back frame without said drive mechanism being provided thereat;
a bearing bracket fixed on said another lateral side of said seat back frame, on which bearing bracket is rotatably supported said another free end part of said shaft; and
an elastic means provided fixedly in said bearing bracket in such a manner as to resiliently receive one side surface of



said stopper means when said headrest is located at said non-use position;
wherein said headrest at said non-use position is supported stably by virtue of said drive mechanism at said one lateral side of said seat back frame and both said stopper and elastic means at said another lateral side of said seat back frame.

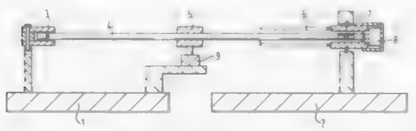
5,145,234
REVERSIBLY DEFORMABLE FRAME WITH UPPER MEMBERS FLEXIBLE IN ANY DIRECTION AND A LOWER HORIZONTALLY DEFORMABLE BAND FOR THE BACKS OF CHAIRS AND THE LIKE
Gianfranco Gualtierotti, Piazza, and Alessandro M. D. Stelle, Florence, both of Italy, assignors to Cassina S.p.A., Meda, Italy
Filed Jun. 26, 1990, Ser. No. 543,955
Claims priority, application Italy, Jun. 28, 1989, 21013 A/89
Int. Cl.[5] A47C *7/46*
U.S. Cl. 297—460 2 Claims



1. A reversibly deformable frame for the backs of upholstered furniture comprising:
a support member;
a plurality of uprights mounted on said support member;
a plurality of deformable rod-shaped members flanked by said uprights and operatively connected therewith, each of said deformable members having a vertical axis in a rest position and being individually deformable in any direction along said axis upon a load;
a band formed of units extending between and connected to said uprights and comprising a plurality of parallel rigid members oriented in a vertical direction and operatively connected with said plurality of rod-shaped members;

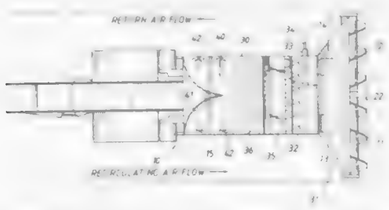
a plurality of chain links mounted on and connecting said rigid members with one another; and
a plurality of hinges provided with frictional material for connecting said chain links with one another, so that said rigid members are capable of maintaining a position corresponding to one chosen by a user and different from said rest position.

5,145,235
MEASUREMENT OF THE ALIGNMENT OF AN ARTICULATED MINE CONVEYOR
Brian G. D. Smart, Falkirk, Great Britain, assignor to Gullick Dobson Limited, Lancashire, Great Britain
Filed Feb. 13, 1991, Ser. No. 654,737
Claims priority, application United Kingdom, Feb. 13, 1990, 9003214
Int. Cl.[5] E21C *35/20*; B65G *45/00*
U.S. Cl. 299—1.9 12 Claims



1. Mining apparatus having two rigid elongate members and a joint joining the members together in an articulated manner, said members comprising adjacent pans of an articulated mine conveyor, and a signalling device for assisting in the measurement of the alignment of the conveyor, the signalling device producing a signal the magnitude of which varies with the angular displacement between the adjacent pans.

5,145,236
METHOD AND APPARATUS FOR CONTROLLING DUST PRODUCED BY A CONTINUOUS MINER
Chung F. Liao, Kingwood, Tex., and George W. Graham, Wilkinson, W. Va., assignors to Shell Oil Company, Houston, Tex.
Filed May 6, 1991, Ser. No. 695,875
Int. Cl.[5] F21C *35/22*
U.S. Cl. 299—12 5 Claims



5. A method for reducing the concentration of dust particles produced by continuous mining apparatus, comprising:
removing the dust-laden air from the vicinity of the cutting head of said continuous mining apparatus;
treating said dust-laden air with a wet scrubber using twin fluid atomizers to produce a liquid mist having droplets ranging from a few microns to 50 microns, one of said fluids being water and the other fluid being compressed air; and
discharging the water and entrained dust particles into the mine while recirculating clean air back to the vicinity of the cutting head.

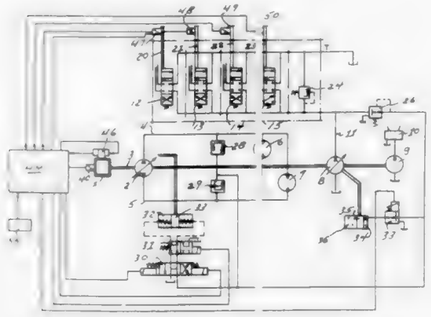
5,145,237
CUTTER BIT WITH OPTIMIZED SHANK
Reinhard Schulz; Axel Neukirchen, both of München, and Josef Obermeier, Peiting, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum
Filed Jul. 26, 1991, Ser. No. 736,713
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1990, 4024650
Int. Cl.[5] E21B *10/36*
U.S. Cl. 299—94 8 Claims

1. An axially extending cutter bit comprising a trailing end for insertion into a drilling tool chuck and a leading end for effecting a cutting or chiseling operation, a shank extending axially between the trailing end and the leading end, said shank has a first axially extending section extending from the trailing end to a second axially extending section terminating at the leading end, the first section has a constant cross-section and the second section has a diminishing corss-section and the second section has a diminishing corss-section toward said leding end, wherein the improvement comprises that the cross-section of the second section diminishes in steps toward the leading end, and said second section comprises at least two partial axially extending sections formed by steps and each partial section has a constant corss-section.

5,145,238
METHOD OF BRAKING A VEHICLE
Hilmar Strenzke, Aschaffenburg, and Erwin Hartung, Stockstadt, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Fed. Rep. of Germany
Filed Feb. 12, 1990, Ser. No. 478,480
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905794
Int. Cl.[5] F16H *39/50*
U.S. Cl. 303—10 19 Claims

1. A method for automatically controlling braking of a wheeled vehicle having at least on adjustable hydrostatic drive unit with a variable displacement pump, a motor and a driving engine, said method comprising:
a) absorbing a drag moment by said engine; and
b) hydraulically reducing the kinetic energy of said vehicle by positive hydraulic braking when a maximum drag moment absorbable by said driving engine is exceeded, wherein said positive hydraulic braking comprises deter-

mining when a limiting rpm of said driving engine is exceeded, and



hydraulic braking said vehicle to a speed at which an incline output power is less than or equal to the drag power absorbable by said driving engine.

5,145,239

BRAKE CIRCUIT WITH PRIMARY ELECTRICAL BRAKE PRESSURE CONTROL AND SECONDARY FAILURE RESPONSIVE MECHANICAL BRAKE PRESSURE CONTROL

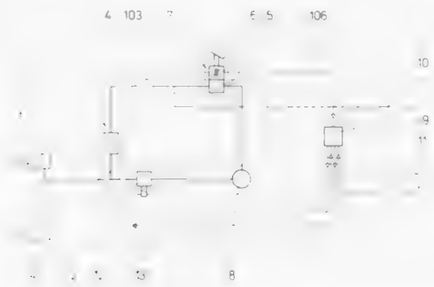
Gunther Meise, Langenhagen; Günter Seegers, Barsinghausen, and Manfred Schult, Garbsen, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed May 22, 1990, Ser. No. 527,105

Claims priority, application Fed. Rep. of Germany, May 22, 1989, 3916642

Int. Cl.[5] B60T *13/70, 8/18*

U.S. Cl. 303—14 23 Claims



1. A brake circuit with at least one actuator, operated by a feeding of brake pressure, as well as

with a mechanical brake-pressure control device and an electrical brake-pressure control device, wherein the mechanical brake-pressure control device comprises a pressure part of a brake-value transmitter and a restraining device blocking a pressure line extending from said pressure part of said brake-value transmitter to said actuator at least essentially for such a time as the electrical brake-pressure control device transmits a brake pressure, said restraining device being actuated by the brake pressure transmitted by said electrical brake-pressure control device.

5,145,240

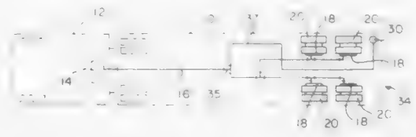
AIR BRAKE SAFETY AND ANTI-THEFT VALVE ASSEMBLY

Ronald L. Harless, 750 N. Main St., Franklin, Ind. 46131; Robert T. Buehl, 7994 W. Road 75 North, Bargersville, Ind. 46106, and Steven R. Musgrave, R.R. #8, Box 83, Shelbyville, Ind. 46176

Filed Feb. 22, 1991, Ser. No. 660,300

Int. Cl.[5] B60T *17/18*

U.S. Cl. 303—89 25 Claims



1. An assembly for use with a trailer for holding cargo, a plurality of wheels, normally engaged air brakes coupled to the wheels, and an air supply line coupled to the air brakes for supplying air to release the air brakes, the assembly comprising

valve means for selectively venting the air supply line to the atmosphere to prevent the release of the air brakes from their normally engaged position, the valve means including an exhaust port,

means for coupling the valve means to the air supply line, the valve means being adjustable between a first position to seal the air supply line and a second position to vent the air supply line to the atmosphere, and

an alarm coupled to the valve means for providing an audible indication when air is vented through the valve means to the atmosphere, the alarm including a whistle coupled to the exhaust port of the valve means.

5,145,241

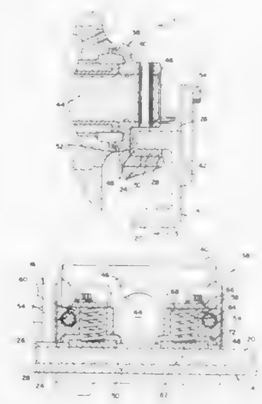
IDLER SPROCKET MOUNT FOR A CRAWLER TRACTOR

John M. Baylor, Rothschild, Wis., assignor to Case Corporation, Racine, Wis.

Filed Apr. 22, 1991, Ser. No. 690,161

Int. Cl.[5] B62D *55/30*

U.S. Cl. 305—31 11 Claims



1. An idler sprocket mount for a crawler tractor operable over uneven terrain conditions and having a track frame with a bifurcated end section, an idler sprocket recoil assembly including a yoke for exerting a tensioning force against an endless track and having a pair of spaced legs extending generally parallel to the frame, an idler sprocket mounted between said legs and the bifurcated end section of said track frame, said idler sprocket mount comprising:

a pair of idler sprocket block assemblies secured to said pair of legs of the recoil assembly yoke for mounting the idler sprocket on the track frame, each idler sprocket block assembly comprising a unitary block structure defining a bore which supports a shaft about which the idler sprocket rotates and a horizontally elongated open sided channel including at least one bearing surface along which a first wear surface of said frame endwise slides to permit the idler sprocket to recoil parallel to the frame, clamp means secured to said block structure for inhibiting lateral movement of said frame relative to said block structure, and resiliently biased means including compressible spring structure carried by each block structure for applying a vertically directed force against a second wear surface on said frame to maintain engagement between the bearing surface of said channel and said first bearing surface of said frame thereby inhibiting relative vertical movement between a respective block assembly and the track frame and for dampening impact forces applied to said frame as said sprocket forcibly moves as the tractor moves over the uneven terrain.

5,145,242

ELASTIC ENDLESS CRAWLER

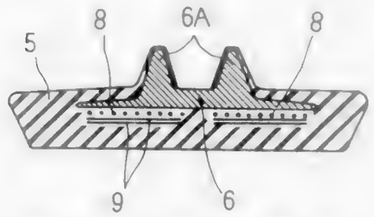
Sumio Togashi, Kanagawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 481,483, Feb. 16, 1990, abandoned. This application Jul. 8, 1991, Ser. No. 728,014

Claims priority, application Japan, Feb. 23, 1989, 1-20735[U]

Int. Cl.[5] B62D *55/24*

U.S. Cl. 305—35 EB 3 Claims



1. An elastic endless crawler for use with motor vehicles such as earth-moving vehicles having lower rollers for rolling on the crawler comprising, a crawler body of elastic material, said crawler body having a longitudinal direction and a transverse direction and also having an inner surface and an outer surface for engaging the ground and comprising an endless belt extending in said longitudinal direction;

a pair of main cord layers embedded in said crawler body beneath said inner surface and comprising cords extending in said longitudinal direction of said crawler body to prevent elongation of said crawler body in said longitudinal direction, said layers being located at respective opposite side portions of said crawler body and being laterally spaced from a central portion of said crawler body, said central portion being free of said longitudinally extending cords;

a plurality of cores embedded in said crawler body between said inner surface and said main cord layers, said cores having protrusions for engaging said lower rollers thereby to prevent said lower rollers from running off said crawler, said cores being arranged in parallel spaced relation at a right angle to said longitudinal direction of said crawler body; and

a pair of sets of bias cord layers embedded in said crawler body between said main cord layers and said outer surface, each of said sets consisting of a plurality of bias cord layers, said bias cord layers of each of said sets comprising bias cords arranged in reciprocal mutually-opposite directions in relation to an imaginary straight line extending transversely of said crawler body, said imaginary straight line intersecting the longitudinal direction of said crawler body at a right angle, said sets being located at said respective opposite side portions of said crawler body and being laterally spaced from said central portion of said crawler body, said central portion being free of said bias cord layers;

wherein said bias cords are arranged in reciprocal mutually-opposite directions in relation to said imaginary straight line at an angle of inclination θ of $5° \leqq \theta \leqq 45°$; and wherein said cords constituting a pair of main cord layers and said cords constituting a pair of sets of bias cord layers are made of steel.

5,145,243

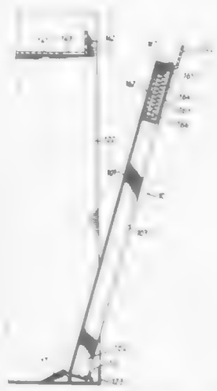
UPSTANDING MOTHER BOARD STRUCTURE FOR A PERSONAL COMPUTER

Morgan C. Liu, Taoyuan, Taiwan, assignor to Enlight Corporation, Taoyuan, Taiwan

Filed Aug. 22, 1991, Ser. No. 748,444

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—265.1 6 Claims



1. In a personal computer comprising a casing inside which is a base frame constituted by a front plate and a rear plate with a bottom plate and a support bracket secured between said front plate and said rear plate, an upstanding mother board structure comprising:

a rectangular pan-like mounting plate for mounting a mother board thereon, said mounting plate comprising a plate body having a top edge member, a bottom edge member and two lateral edge members in a normal direction to said plate body, said top edge member having a stopping strip extending therealong perpendicularly to said top edge member;

a slidable U-shaped fastener comprising a linear section, two sections perpendicular to said linear section for said U-shape, each of said perpendicular sections having a pair of protruding lugs on an end thereof, a pair of guiding members on said plate body respectively for slidably guiding said perpendicular sections on said mounting plate, and extension springs for urging said protruding lugs to extend out of said top edge member, each extension spring having a first end attached to said mounting plate and a second end attached to a respective one of said perpendicular sections of said fastener; and

at least one combination of gripper and positioning block opposite to each other on said bottom plate of said base frame in proximity to an edge of said bottom plate such

that, when said mounting plate is being installed, the bottom edge member thereof is gripped and guided by said combination of gripper and positioning block and said protruding lugs of said fastener are received in slots in said support bracket with said stopping strip contacting and abutting against a flange formed on said support bracket, whereby said mounting plate is secured between said bottom plate and said support bracket in an upstanding position.

5,145,244

EASILY DISASSEMBLED FURNITURE

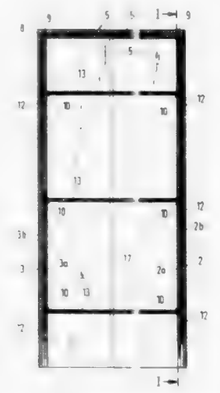
Rüdiger Kersting, and Rolf Heidenreier, both of Lübbecke, Fed. Rep. of Germany, assignors to Wellcarton R. Kersting GmbH und Co., Löhne, Fed. Rep. of Germany

Filed Jan. 18, 1991, Ser. No. 643,402

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1990, 9000543[U]

Int. Cl.[5] A47B 43/00

U.S. Cl. 312—259 **18 Claims**



1. Cardboard furniture comprising upright side walls and a rear wall, each of said side walls comprising at least three layers of cardboard including a middle layer disposed between inside and outside layers, an accommodating space between said inside and outside layer, said accommodating space being devoid of said middle layer, said inside layer having an opening communicating with said accommodating space, cardboard transverse mounting elements having side edges juxtaposed to said side walls, said transverse mounting elements having tab sections extending from said side edges, said tab sections passing through said opening in said inside layer and extending into said accommodating space between said inside and outside layers to thereby effect a supporting connection between said transverse mounting element and said side walls.

5,145,245

CABINET FOR STORAGE OF VIDEO CASSETTES

Frederick Fierthaler, Perch Pond Ind., R.D. #1, Box 133, Nineveh, N.Y. 13813

Filed Aug. 31, 1989, Ser. No. 401,334

Int. Cl.[5] A47B 88/00

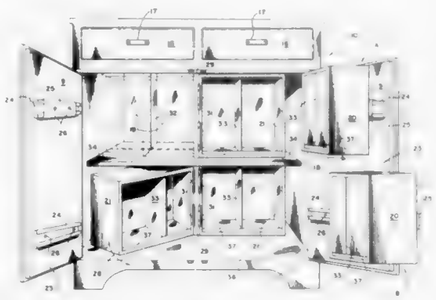
U.S. Cl. 312—321.5 **16 Claims**

1. A storage cabinet having movable containers for ease of access to stored articles, comprising:

a rectilinear housing having shelving within a hollow portion thereof defining a plurality of adjacent storage pockets;

a pair of oppositely articulated doors swingably attached to front distal corner sections of said rectilinear housing, each of said doors having an inside surface supporting at least one fixed curvilinear track for slidably supporting a storage container;

at least one storage box removably disposed on each door and fixed to a curvilinear jaw for slidably engaging with said fixed curvilinear track;



means defining a center support; and

a set of oppositely articulated storage containers swingably attached to said center support and movably disposed thereabout.

5,145,246

ARRANGEMENT FOR COLLECTING AND EMITTING LIGHT VIA DEFINED SURFACE AREAS

Ragnar Ruth, Södertpe, Sweden, assignor to Moagon AG, Zurich, Switzerland

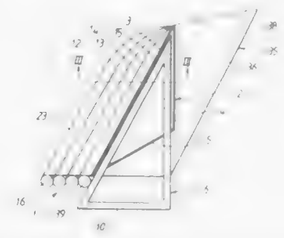
PCT No. PCT/SE89/00736, § 371 Date Jul. 25, 1991, § 102(e) Date Jul. 25, 1991, PCT Pub. No. WO90/07175, PCT Pub. Date Jun. 28, 1990

PCT Filed Dec. 19, 1989, Ser. No. 730,812

Claims priority, application Sweden, Dec. 19, 1988, 8804575

Int. Cl.[5] F21V 7/04

U.S. Cl. 362—31 **6 Claims**



1. Arrangement for collecting and emitting light via defined surface areas (**25**) in order to create a slide and comprising a number of transparent plate elements, collector plates (**12–15**), which are designed to receive incident light at one or more of their surfaces, collector surfaces (**17–22**), and to emit the received light at one or more of their other surfaces, emission surfaces (**28**), in which respect the collector plates consist of fluorescent material designed to convert received ultraviolet light to visible light, characterized in that the arrangement comprises a plate (**3**) which forms a carrier for the slide which is to be presented, and in that the said plate elements (**12–15**) are set transverse to the said carrier plate with their light-emitting surfaces (**28**) bearing against the rear side (**29**) of the carrier plate, and in that the said light-emitting surfaces (**28**) are situated in strip-shaped intermediate spaces between opaque parts (**24**) of the carrier plate.

5,145,247

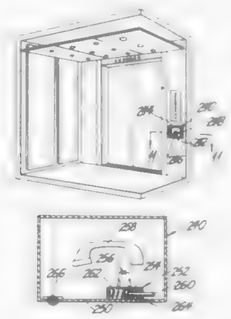
DOWN LIGHTING SYSTEMS AND FIXTURES THEREFOR

Robert R. Mandy, 32750 Bingham La., Birmingham, Mich. 48010

Filed Mar. 20, 1991, Ser. No. 672,415

Int. Cl.[5] F21S 1/02

U.S. Cl. 362—148 **4 Claims**



1. An emergency lighting system in an elevator having a 110 volt power source comprising:

an emergency battery power source normally disconnected from the emergency lighting system when the 110 volt power source is operative;

an emergency light and a locking latch having a solenoid connected in parallel to said emergency light;

a telecommunication box having a phone therein and a door on said box to control access to said phone; said locking latch locking said door to said telecommunication box when said 110 volt power source is operative;

means for selectively connecting said emergency light and said locking latch to said battery power source when said 110 volt power system fails; and

said locking latch operative on failure of the 110 volt source to unlock said door from said box to provide access to said phone.

5,145,248

STRUCTURE OF DECORATIVE NEON LIGHT

Chen W. Chuan, No. 32, Lane 169, Le Yeh Road, Taipei, Taiwan

Filed Mar. 29, 1991, Ser. No. 677,559

Int. Cl.[5] F21S 3/00

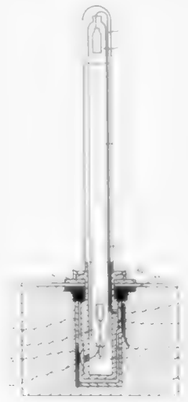
U.S. Cl. 362—217 **2 Claims**

1. A decorative neon light comprising a sealed glass tube, an electrode mounted at either end of the tube and conductive threads extending outwardly from the electrodes through sealed ends of the tube;

a plastic cylinder surrounding the tube, said threads received within the cylinder and a plastic cap mounted on an end of the cylinder surrounding one electrode in the tube;

a mounting sleeve receiving the end of the tube opposite the end adjacent said cap, said sleeve having opposed outwardly extending electrodes, each coupled to one of the threads, an end of said sleeve mounting an end of the cylinder opposite the end mounting said cap and an external flange surrounding at least a portion of the end of said sleeve adjacent the mounted end of said cylinder;

a socket dimensioned to releasably receive said sleeve electrode means within said socket for engaging the electrodes on said sleeve and said socket defining opposed slots for



receiving said sleeve electrodes and means on said socket for releasably engaging the flange on said sleeve.

5,145,249

VARIABLE-POSITION RECESSED LIGHT FIXTURE

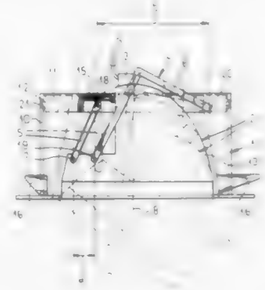
Attila A. Bruckner, Ratingen, Fed. Rep. of Germany, assignor to Ansorg Lichttechnik Gesellschaft Mit Beschrankter Haftung, Mulheim/Ruhr, Fed. Rep. of Germany

Filed Nov. 8, 1991, Ser. No. 791,657

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1990, 4036229

Int. Cl.[5] F21S 1/06

U.S. Cl. 362—365 **9 Claims**



1. A recessed light fixture comprising:

an outer housing adapted to be fixedly mounted in a hole in a wall or ceiling and centered on an axis;

an inner lamp holder provided with a socket for a light bulb and centered on an axis; and

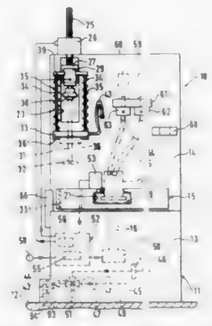
means including a pair of two stiff links of different lengths each having an inner end pivoted on the housing and an outer end pivoted on the holder for movement of the holder between an inner position recessed in the housing with the holder and housing axes generally coaxial and an outer position outside the housing with the axes inclined to each other and through intermediate positions such that as the holder moves outward the angle its axis forms with the housing axis increases and as it moves inward the angle its axis forms with the housing axis decreases, each intermediate position corresponding to a particular angular orientation of the holder axis to the housing axis.

5,145,250

PROCESS FOR THE PREPARATION OF BONE CEMENT

Heinrich Planck, Nürtingen; Christoph Elser, Plochingen; Albrecht Grieben, Darmstadt, and Werner Ege, Frankfurt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung Darmstadt, Fed. Rep. of Germany

Filed Jun. 15, 1990, Ser. No. 538,816
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 3919534
Int. Cl.[5] B28C *7/04*; B01F *13/06*
U.S. Cl. 366—8 13 Claims



1. A process for the preparation of bone cement for subsequent introduction into a cavity of a bone of a patient prepared to receive a prosthesis, wherein the bone cement is prepared in an apparatus including a sterile cartridge, stirrer and automatic controller, from components including at least one fluid material and a pulverized material, the process comprising the steps of:

incorporating, with a data carrier associated with the cartridge, data specifying the type and amount of bone cement to be produced;

reading the data into the automatic controller by inserting the sterile cartridge and associated data carrier into a holding apparatus of a receiver in the apparatus provided for receiving the sterile cartridge and being connected to the automatic controller;

charging the sterile cartridge with the components in the amount and type specified by the data incorporated in the data carrier;

under automatic control, beginning polymerization of the components into bone cement by stirring the components in the sterile cartridge with a stirrer during a mixing phase;

under automatic control, allowing the mixed components to rest in a resting phase for a selected duration of time to achieve a selected state of polymerization; and

reducing the pressure in the cartridge while the components are in at least one of the phases to produce bone cement available for introduction into the cavity.

5,145,251

EXTRUDER HAVING DEGREE-OF-KNEADING ADJUSTING DEVICE

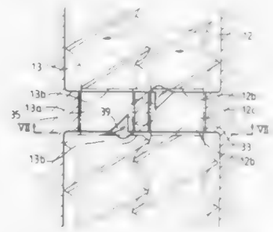
Toru Shirato; Hideki Mizuguchi, and Minoru Yoshida, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Continuation of Ser. No. 349,552, May 9, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 607,799
Claims priority, application Japan, May 17, 1988, 63-118122; Aug. 4, 1988, 63-193450; Sep. 30, 1988, 63-243925
Int. Cl.[5] B29B *7/48*, B01F *7/08*
U.S. Cl. 366—80 1 Claim

1. In a co-rotating twin-screw unidirectional-rotation type extruder including a barrel having a degree-of-kneading adjusting section and a kneading section disposed therein, said adjusting section being disposed downstream of said kneading section, said extruder having a pair of screws with flights respectively mounted in twin screw holes axially provided in said barrel, in which raw material to be extruded as a resin and fed via said twin screw hole in the barrel is heated and kneaded while being conveyed by the two screws, which are rotated in the same direction while being engaged with each other, so as to extrude said resin, the improvement wherein:

each of said screws has a cylindrical portion in said adjusting section adjacent to a downstream side of said kneading section, which cylindrical portion is smaller in diameter than flights of said screws;

blocking walls circumscribing said cylindrical portions of said screws with small gaps therebetween are provided in said screw holes at positions, in an axial direction of said screws, corresponding to said cylindrical portions, and are arranged in such a manner as to divide said twin screw holes into upstream and downstream sides;



said blocking walls extending over the entire length of said cylindrical portions of said screws;

communicating paths are formed in the upper and lower sides of said blocking walls in such a manner that one of said communicating paths communicates the upstream side of said blocking wall on the side of one of said twin screw holes with the downstream side of said blocking wall on the side of the other of said twin screw holes, and the other of said communicating paths communicates the upstream side of said blocking wall on the side of the other of said twin screw holes with the downstream side of said blocking wall on the side of the one of said twin screw holes; and

valve means for controlling cross-sectional areas of said communicating paths are provided in each of said communicating paths.

5,145,252

KNEADING WING SENSING APPARATUS OF MICROWAVE OVEN FOR BAKING A BREAD

Keun-Yeong Oh, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Sep. 14, 1990, Ser. No. 582,385
Claims priority, application Rep. of Korea, Oct. 17, 1989, 89-14927
Int. Cl.[5] A21C *1/14*; B01F *13/04*; H05B *6/64*; A47J *27/00*
U.S. Cl. 366—98 15 Claims

1. A kneading wing sensing apparatus for baking bread, comprising:

control means having selected data in a memory for comparing input data with said selected data, and for transmitting a control signal based on the compared result;

driving means for rotating a motor upon reception of the control signal;

sensing means for detecting a number of rotations of the motor, for generating pulse signals corresponding to the number of rotations and for transmitting the pulse signals to the control means; and

alarm means for generating an alarm signal when the control signal indicates one of either that the motor does not

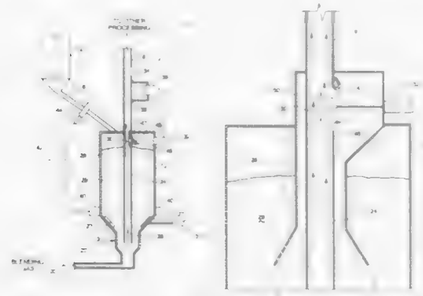
rotate entirely and that a kneading wing is not installed into a container.

5,145,253

BLENDER FOR PARTICULATE MATERIAL

Kermit D. Paul; Leslie C. Bartholomew; John S. Szazdi, Jr., all of Bethlehem, and Gerald J. Labelle, Allentown, all of Pa., assignors to Fuller Company, Bethlehem, Pa.

Filed May 21, 1990, Ser. No. 526,198
Int. Cl.[5] B01F *13/02, 15/02*
U.S. Cl. 366—101 4 Claims



1. In a particulate material blender of the type which includes a vertically oriented vessel with a top and bottom, the vessel being constructed with an upper section which includes the top of the vessel, a source of pressurized gas attached to the vessel at a gas entry near the bottom of the vessel, and a lift pipe supported within the vessel and extending from a location near the top of the vessel to a location above the gas entry, the improvement comprising:

a. an exit pipe attached to and extending above the lift pipe and out of the vessel;

b. a first opening in the lift pipe located near the top of the vessel and above the top surface of the material within the vessel through which a portion of the gas and material moving within the lift pipe exits the lift pipe;

c. an adjustable deflector located within the lift pipe and adjacent to the first opening in the lift pipe and shaped to divert a portion of the gas and material moving in the lift pipe into the exit pipe and allow a portion of the material moving in the lift pipe to exit out of the lift pipe through the adjacent first opening into the vessel above the top surface of the material within the vessel;

d. a second opening in the lift pipe located to permit gas to re-enter the lift pipe from the region of the vessel which is above the top surface of the material within the vessel;

e. positioner means for adjusting the position of the deflector within the lift pipe to thereby vary the amount of gas and material that will exit the lift pipe through the opening specified in (b); and

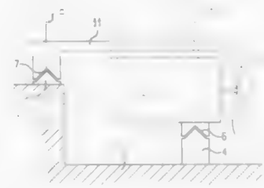
f. a hood structure located near the top of the blander and enclosing within it the adjustable deflector and the upper portion of the lift pipe including the first onening and the second opening, the hood structure being open at its bottom and extending downward within the blender so that, under normal operating conditions, the bottom opening of the hood structure is covered by the material within the blender.

5,145,254

MIXER DEVICE

Gunnar Hovstadius, Sigtuna, Sweden, assignor to ITT Flygt AB, Solna, Sweden

Filed Sep. 24, 1991, Ser. No. 766,235
Claims priority, application Sweden, Oct. 5, 1990, 9003188
Int. Cl.[5] B01F *7/06*
U.S. Cl. 366—286 1 Claim



1. Apparatus for an easily releasable mounting of a submersible mixer on a tank bottom comprising in combination:

an electric motor having a frame and a propeller on a substantially horizontal driving shaft, the frame of said motor having a cone-formed shell which extends from the bottom of the motor adjacent the propeller end;

a rack being connected to the top of the frame of the motor, said rack extending downward near the end opposite of the propeller and having another cone-formed shell;

a cone-formed support being positioned on the tank bottom to engage corresponding surfaces in said cone-formed shell;

another cone-formed support being positioned on the tank bottom at a level higher than said cone-formed support and said shaft, said other cone-formed support to engage corresponding surfaces in said other cone-formed shell, thereby preventing the reaction force from the propeller to raise the front end of the mixer during operation; and

a wire being connected to each said cone-formed and other cone-formed supports to permit said mixer to be lowered and raised.

5,145,255

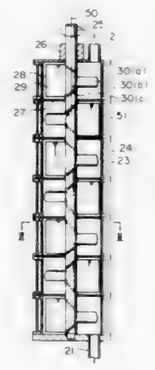
STIRRING APPARATUS AND STIRRING TOWER TYPE APPARATUS FOR POLMERIZATION REACTIONS

Takafumi Shimada; Hiroaki Ogasawara; Hidetaro Mori; Setsuo Omoto; Kazuto Kobayashi, all of Kanonshin, and Takao Yamazaki, Yokohama, all of Japan, assignors to Mitsubishi Jukogoyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 195,767, May 18, 1988, abandoned.
This application Dec. 13, 1990, Ser. No. 627,880
Claims priority, application Japan, May 19, 1987, 62-120084; May 27, 1987, 62-128460
Int. Cl.[5] B01F *7/02*
U.S. Cl. 366—329 7 Claims

1. A stirring apparatus comprising: a container having inner walls; a rotational shaft inserted in said container substantially in the center of said container, said rotational shaft having a central rotational axis, said rotational shaft and the inner walls of said container defining a stirring space substantially fully filled with material to be stirred, said rotational shaft, lower and side inner walls of said container and a container upper end level cooperating to define a stirring cross-sectional area; a flat

impeller connected to said rotational shaft extending substantially parallel to said rotational axis of said rotational shaft, said flat impeller having a continuous uninterrupted surface with a surface area which is more than 80 percent of said stirring cross-sectional area; and a slanted impeller connected to said rotational shaft at a slanting angle with respect to said center axis of said rotational shaft, said slanted impeller cooperating



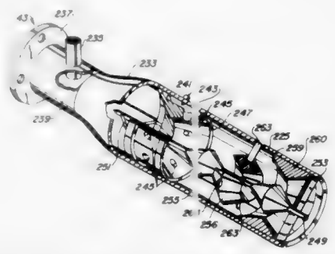
with said flat impeller to form impeller sets, including at least first impeller set and a second impeller set; and partitioning means disposed between said first impeller set and said second impeller set to divide said container in a longitudinal direction and to allow fluid to flow therethrough, said partitioning means including a plate including a shell connecting stirring spaces above said plate and below said plate.

5,145,256

APPARATUS FOR TREATING EFFLUENTS

Reginald A. Wiemers, Denver, Colo., and Alfred R. Simmons, Los Angeles, Calif., assignors to Environmental Equipment Corporation, Denver, Colo.

Filed Apr. 30, 1990, Ser. No. 516,759
Int. Cl.[5] B01F *5/06*
U.S. Cl. 366—336 16 Claims



1. A device for mixing shear-sensitive fluid including an effluent and a treating material, said device comprising:

housing means having an inlet for receiving the effluent, input means for separately receiving the treating material, and an outlet; and

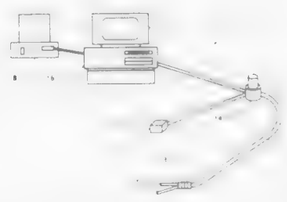
a plurality of longitudinally spaced, differently configured flow altering elements positioned in said housing means adjacent to said input means between said inlet and said outlet for repeatedly altering flow of the shear-sensitive fluid to induce blending of the effluent with the treating material, each of said elements having a face positioned at an angle relative to overall flow direction of the fluid, said angle selected for limiting back pressure in said housing means, and one of said flow altering elements being a double taper ring connected to said housing means so that a manifold is defined for receiving the material from said input means and distributing the material to the interior of said housing means through a plurality of injection ports defined radially around a downstream side of said double taper ring.

5,145,257

INFRARED FIBER-OPTICAL TEMPERATURE SENSOR

James E. Bryant, Dahlgren, Va.; John E. Bennett, Clemson, S.C., and William H. Pinkston, Berwyn, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 501,996, Mar. 29, 1990, abandoned.
This application Aug. 12, 1991, Ser. No. 744,046
Int. Cl.[5] G01J *5/00*
U.S. Cl. 374—131 5 Claims



1. A device for monitoring temperature by measurement of infrared radiation emitted from a source of heat generated by induced current, wherein radiation energy from the source of heat is on the order of several hundred microwatts, comprising:

probe means for separately collecting the emitted infrared radiation from the source and collecting a reference radiation from ambient temperature near the source, wherein said probe means comprises a first infrared cable having one end thereof disposed to face the source in order to collect the emitted infrared radiation and a second infrared cable having one end thereof disposed to face substantially away from the source in order to collect the reference radiation from ambient temperature near the source;

cable means connected at its proximal end to said probe means for separately transmitting the source radiation and the reference radiation collected therein;

electronic detector means connected at a distal end of said cable means for separately converting the source radiation and the reference radiation transmitted by the cable means into two separate groups of output signals;

means for differencing the two separate groups of output signals to provide a plurality of enhanced output signals;

signal processor means, operatively connected to said means for differencing, for processing the plurality of enhanced output signals;

status indicating means connected to said signal processor means for extracting data from the plurality of enhanced output signals and indicating the induced current in the source; and

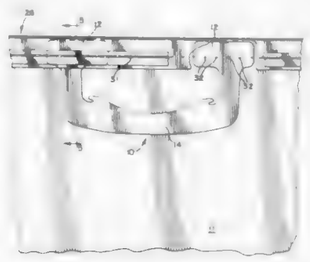
recorder means connected to said signal processor means for recording the monitored temperature of the source determined from the plurality of enhanced output signals.

5,145,258

HINGED HANDLE FOR MULTIPLE PLY BAG

Gene D. Schneck, Vancouver, and John W. Wagner, Battle Ground, both of Wash., assignors to Bemis Company Inc., Vancouver, Wash.

Filed Dec. 6, 1991, Ser. No. 804,087
Int. Cl.[5] B65D *33/06*
U.S. Cl. 383—14 22 Claims



1. A substantially planar flat flexible handle for packages comprising: a pair of attachment bases;

legs extending from said attachment bases and having a width less than the width of said attachment bases;

a pivot grip member extending between said legs;

a hinged-action notch formed in said pivot grip member to each side thereof and positioned at a location where said pivot grip member joins said legs whereby to allow said pivoting grip member to pivot relative to said legs;

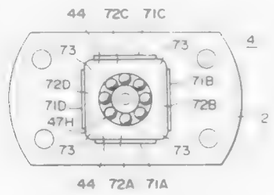
whereby said handle provides multiple flexure joints such that said pivot grip member and said legs flex as a unit about and with respect to said attachment bases and such that said pivot grip member flexes about and with respect to said legs.

5,145,259

BEARING SYSTEM

Kanji Murano, Tokyo; Tetsuo Sekiya, Kanagawa; Akihiko Ohashi, Shizuoka, and Takehisa Ishida, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 587,041
Claims priority, application Japan, Sep. 25, 1989, 1-249507
Int. Cl.[5] F16C *19/06*
U.S. Cl. 384—1 3 Claims



1. A rotational bearing system incorporating a ball bearing to support for relative rotation a shaft and a housing through rolling contact with said ball bearing, said housing being fixed, said bearing system comprising:

a plurality of vibratory elements for exciting in resonance the housing in contact with said ball bearing to lower the frictional rolling resistance of said ball bearing;

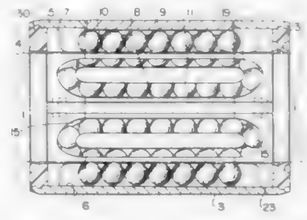
wherein said housing includes a bore formed axially therethrough to receive the rotatable shaft, and said vibratory elements are mounted on outer wall surfaces of said fixed housing, thereby creating nodes of resonant vibration of said outer wall surfaces.

5,145,260

ROLLING BEARING FOR LONGITUDINAL MOVEMENT

Ludwig Edelmann, Sulzthal; Hermann Glöckner; Zoltan Laszlofalvi, both of Schweinfurt; Uwe Mayer, Münnerstadt, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Linearsysteme GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 698,662
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015124
Int. Cl.[5] F16C *29/06*
U.S. Cl. 384—43 11 Claims



1. In a rolling bearing for lengthwise movement along a shaft, comprising a cage mounted in the bore of a housing and having an inner surface adapted to at least partially encircling a shaft, the cage having at least one axially extending race for guiding balls rolling between the shaft and outer race elements, and at least one axially extending return race for guiding unloaded balls, the bearing further having an end cover mounted on each end thereof and having a turning around race connected to a respective end of a race for loaded balls and a return race, to thereby guide an endless row of balls, the races for loaded balls and the return races having a slit extending therealong and opening to the shaft,

the improvement wherein the turn around races of the two covers each have a slit opening toward the shaft and joining the slits of the races for loaded balls and the return race, the turn around races being bounded by curved shoulder sections on the inner surface of the cage extending along the turn around race and curved inside wall sections parallel to the shoulder sections and extending in the respective end cover.

5,145,261

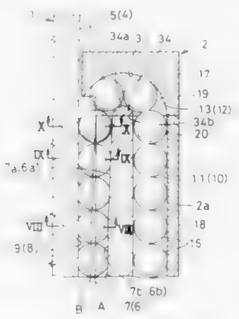
LINEAR GUIDE DEVICE

Hisayoshi Narumiya, Kobe, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Aug. 13, 1991, Ser. No. 744,101
Claims priority, application Japan, Aug. 14, 1990, 2-215264; Aug. 14, 1990, 2-215266
Int. Cl.[5] F16C *29/06*
U.S. Cl. 384—45 6 Claims

1. A linear guide device comprising a straight guide rail, and a movable body having an approximately inverted U-shaped cross section and movable as fitted over the guide rail, each of opposite side surfaces of the guide rail and a surface of each of opposite legs of the movable body which surface is opposed to the rail side surface being each formed with a ball guide groove having a circular-arc portion, the ball guide grooves being equal in the curvature of the circular-arc portion over the entire length thereof, the ball guide grooves providing a forward ball passage, each of opposite legs of the movable body being formed with a return ball passage, each end of the forward ball passage being in communication with the corresponding end of the return ball passage through a reverse passage fromed in each end of the movable body to form a circulation ball channel, a plurality of balls being enclosed in the circulation ball channel and rollable between the movable body and the guide rail, the balls being in point contact with

the circular-arc portions of the ball guide grooves when in the forward ball passage of the circulation ball channel, the ball guide groove of the movable body having at each end thereof a load reducing region gradually decreasing the load on the ball toward the reverse passage, a line through the center of curvature of the circular-arc portion of the movable body ball guide groove to be in point contact with the ball in the load reducing region being shifted, when seen in cross section, on a



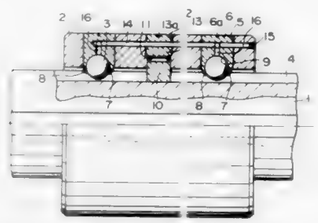
line extending from said line and extending through a point away from a straight line through the points of contact of the ball with the circular-arc portions of the ball guide grooves in a maximum loading region, within a range closer to the guide rail than a line through the center of curvature of the circular-arc portion of the guide rail ball guide groove to be in point contact with the ball, and being thereby made to gradually approach the line of the guide rail through the center toward the reverse passage.

5,145,262

COMPACT BALL SPLINE BEARING ASSEMBLY

Kunihiko Morita, Koganei, Japan, assignor to Nippon Thompson Co., Ltd., Japan

Filed Jun. 3, 1991, Ser. No. 709,536
Claims priority, application Japan, Jun. 4, 1990, 2-58419[U]
Int. Cl.[5] F16C *29/04, 21/00*
U.S. Cl. 384—49 12 Claims



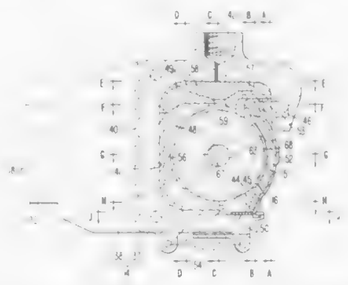
1. A ball spline bearing assembly, comprising:
a spline shaft having a peripheral surface formed with at least one spline groove extending in a longitudinal direction;
an outer sleeve fitted onto said spline shaft with a predetermined gap therebetween;
holding means provided in said outer sleeve for holding a plurality of balls in position and in engagement with said spline groove; and
pressurized fluid supplying means provided in said outer sleeve for supplying pressurized fluid to each of said plurality of balls such that a fluidic cushion is formed between said holding means and each of said plurality of balls at least partly.

5,145,263

BACKLASH ABSORBING SYSTEM FOR BEARINGS

Junichi Yokoi, 11-20 Wakae-honmachi 2-chome, Higashi-Osaka City, Osaka-Fu, Japan

Filed Feb. 7, 1991, Ser. No. 651,625
Int. Cl.[5] F16C *27/02, 25/04, 33/10*
U.S. Cl. 384—219 13 Claims



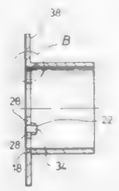
1. A backlash absorbing system in a bearing system for a shaft, comprising:
an attaching member defining a bearing inserting aperture therein;
a fixed bushing fixed within said bearing inserting aperture;
a moveable bushing movably mounted within said bearing inserting aperture and cooperating with said fixed bushing to hold the shaft therebetween; and
at least one spring mounted between said moveable bushing and said attaching member biasing said moveable bushing toward the shaft;
wherein each of said fixed and moveable bushings has an inner circumferential surface for engagement with the shaft, each said inner circumferential surface having opposite circumferentially spaced ends and a lubricant guiding groove therein beginning at one said end and ending before reaching the opposite said end of its respective said inner circumferential surface; and
wherein said attaching member has means for supplying a lubricant to said lubricant guiding grooves.

5,145,264

BEARINGS

Donald J. S. Bryden, Stewarton; Peter T. Work; Hugh Mair, both of Kilmarnock; Roy K. McCulloch, Kilbirnie, and Hugh M. Ross, Kilmarnock, all of Scotland, assignors to The Glacier Metal Company Limited, Northwood Hills, England

Filed Feb. 27, 1991, Ser. No. 661,183
Claims priority, application United Kingdom, Mar. 2, 1990, 9004716
Int. Cl.[5] F16C *17/10*
U.S. Cl. 384—275 7 Claims



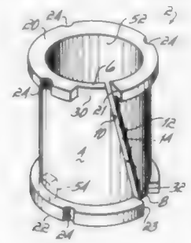
1. A flanged bearing bush, the bearing bush comprising a cylindrical journal bearing and a thrust flange bearing on one end face of the journal bearing, said one end face of said journal bearing having at least two axially directed recesses which receive generally axially directed tabs formed from thrust flange material and having inner surfaces extending generally axially along the bore of said thrust flange, and which tabs are fixed in position in said recesses by deformation of journal bearing material adjacent said axially directed recesses, the outer diameter of said journal bearing being greater than the inner diameter of the bore of said flange bearing and the inner axial surfaces of said tabs.

5,145,265

DOUBLE FLANGE POP-IN BEARING

Per E. Flem, Cincinnati, Ohio, assignor to Performance Plastics, Cincinnati, Ohio

Filed Oct. 18, 1991, Ser. No. 778,705
Int. Cl.[5] F16C *33/08, 33/20*
U.S. Cl. 384—296 8 Claims



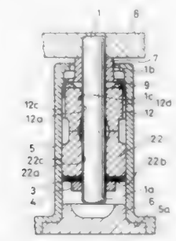
1. A double-flange pop-in bearing, comprising:
a substantially cylindrical sidewall having top and bottom edges and facing first and second longitudinal edges extending from said top edge to said bottom edge, said longitudinal edges defining a longitudinal gap therebetween;
an upper flange extending outwardly along a major portion of the circumference of said top edge, a minor portion thereof defining an upper flange gap;
and a lower flange extending outwardly along a major portion of the circumference of said bottom edge, a minor portion thereof defining a lower flange gap.

5,145,266

BEARING APPARATUS

Ryoji Saneshige, and Shigeru Ootsuka, both of Yonago, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 16, 1991, Ser. No. 730,179
Claims priority, application Japan, Jul. 17, 1990, 2-188959
Int. Cl.[5] F16C *33/10, 33/74*
U.S. Cl. 384—322 2 Claims



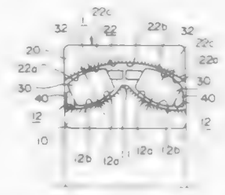
1. A bearing apparatus comprising:
a rotation shaft of a rotor;
a cylindrical bearing holder made of insulative material;
at least one oilless bearing for bearing said rotation shaft, having plural grooves on outer periphery in a direction parallel to the rotation shaft for holding lubricant oil impregnated in the oilless bearing by surface tension;
an oil thrower mounted on said rotation shaft facing to said rotor; and
a sealing cap closely fixed on an opening of said bearing holder which is opposite to said oil thrower for sealing said lubricant oil in a manner not to leak out from said bearing holder.

5,145,267

AUTOMATIC CENTER ADJUSTING ROLLER BEARING

Hirotoshi Takata, Yokohama, and Susumu Suzuki, Minamiashigara, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1991, Ser. No. 711,161
Claims priority, application Japan, Jun. 6, 1990, 2-147656
Int. Cl.[5] F16C *33/58*
U.S. Cl. 384—558 4 Claims



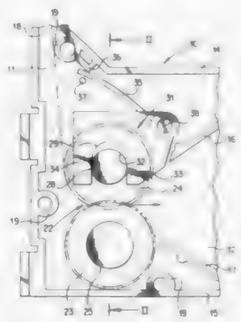
1. In an automatic center adjusting roller bearing comprising an inner race, an outer race, and rollers rollably assembled between the inner race and the outer race in a double row, the improvement comprising:
a contact surface portion of an inner raceway surface of the inner race disposed in contact with the rollers at a bearing center side having a surface roughness smaller than the surface roughness of the rest of the inner raceway surface including a contact surface portion which is in contact with the rollers at a bearing side surface side.

5,145,268

CASSETTE CONTAINING AN INKED RIBBON

Alberto Cavallini, Assago, Italy, assignor to Incas Holding S.p.A., Milan, Italy

Filed Nov. 14, 1990, Ser. No. 612,490
Claims priority, application Italy, Nov. 16, 1989, 22106/89[U]
Int. Cl.[5] B41J *32/02, 33/10*
U.S. Cl. 400—196.1 4 Claims



1. A cassette containing an endless inked ribbon zig-zag accumulated in a chamber and provided with a ribbon feed mechanism, comprising: a pulling drive roller and a pulling driven roller, wherein at least one pulling roller is partly supported, in a rotatable manner, in at least one slot provided in a wall of a cassette, and is at least partly supported in a rotatable

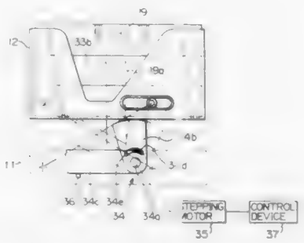
manner in a carriage secured by a pin to the wall of the cassette, the carriage being rotatable about the pin to be mobile relative to the wall of the cassette, the carriage being engaged with elastic means for urging said at least one pulling roller against abutment means on said at least one slot, said elastic means being formed integrally with said carriage and engaging a second wall of the cassette.

5,145,269

PRINTER WITH A PLURALITY OF INK RIBBON CASSETTES HAVING A CAM LIFT MECHANISM CONTROLLED BY A STEPPER MOTOR

Shinji Matsuda, Uji; Kenji Sugimura, Yamato-Koriyama, and Youichi Nakanishi, Gose, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1990, Ser. No. 588,135
Claims priority, application Japan, Oct. 3, 1989, 1-259423
Int. Cl.[5] B41J *35/22*
U.S. Cl. 400—216.2 14 Claims



1. A printer with a plurality of ink ribbon cassettes, using a selected one of said ink ribbon cassettes, said printer comprising:
a vertically movable cassette table for mounting, in a stacked relationship, the plurality of ink ribbon cassettes;
a stepping motor;
a rotary cam mechanism connected to said stepping motor and to said cassette table, and rotated by said stepping motor, for moving said cassette table up and down;
storage means for pre-storing rotational speed data of said stepping motor at each rotational angle of said rotary cam mechanism, said data being arranged to depend on a load variation caused by the rotation of said rotary cam mechanism so that a rotational speed of said stepping motor is decreased when the load applied to said stepping motor increases, and that the rotational speed is increased when the load applied to said stepping motor decreases; and
means for controlling a rotational speed of said stepping motor according to the rotational speed data corresponding to each rotational angle of said rotary cam mechanism, read out from said storage means.

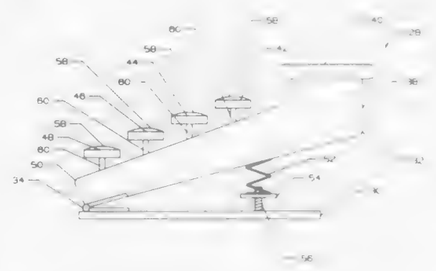
5,145,270

REVERSE SLOPE KEYBOARD

Jody J. Darden, Box 231363, San Diego, Calif. 92194

Filed Jul. 22, 1991, Ser. No. 733,604
Int. Cl.[5] B41J *29/00*; B43L *15/00*
U.S. Cl. 400—488 13 Claims

1. A keyboard comprising:
a member having a raised forward edge, a lower rear edge, and an upper surface having a plurality of keys arranged in tiers descending in stepwise fashion toward said lower rear edge of said member,
a base hingedly attached to said rear edge of said member, and



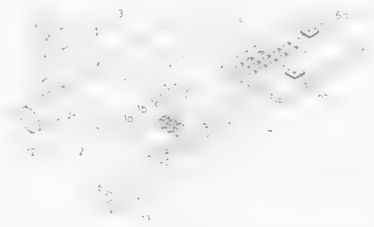
resilient means interposed between said base and said member to normally urge said member upward.

5,145,271

SERIAL PRINTER

Koichi Sugino, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,441
Claims priority, application Japan, Jun. 29, 1990, 2-171633
Int. Cl.[5] B41J *29/42, 25/304*
U.S. Cl. 400—711 16 Claims



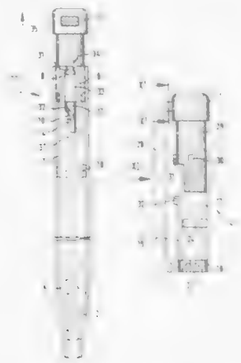
1. A serial printer comprising:
a moveable carrier and a printing head mounted on said carrier;
a display means attached to and moveable with said carrier;
a stationary panel formed with a plurality of indicating windows arranged in a plurality of lines extending in a moving direction of said carrier so that said display means is visible through a specific indicating window when said carrier is disposed in a predetermined position;
a carrying means for moving said carrier;
a printing mode storage means for storing printing modes;
an operating switch for selecting said printing modes; and
a printing mode setting means for causing said carrying means to selectively move said carrier to said predetermined position in response to operation of said operating switch and changing said printing mode stored in said printing mode storage means in accordance with the position of said carrier.

5,145,272

PROJECTABLE AND RETRACTABLE, PUSH BUTTON WRITING INSTRUMENT

Georg Keil, Gross-Bieberau, Fed. Rep. of Germany, assignor to Merz & Krell GmbH & Co., Gross-Bieberau, Fed. Rep. of Germany

Continuation of Ser. No. 497,355, Mar. 22, 1990, abandoned.
This application Aug. 2, 1991, Ser. No. 739,812
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3909377
Int. Cl.[5] B43K *5/16, 7/12, 24/08*
U.S. Cl. 401—112 3 Claims



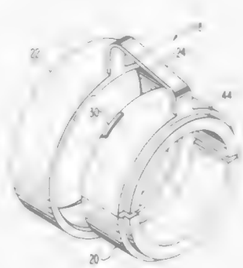
1. A writing instrument comprising:
a reservoir (2);
a barrel (1) in which said reservoir (2) is received longitudinally displaceable into and between a retracted position and a writing position; and
means for shifting said reservoir between said retracted and said writing positions; wherein said means for shifting includes an actuating device (4) axially movable in and relative to said barrel (1) and a controlling curved portion (10) fixed in said barrel (1), said controlling curved portion (10) being provided in a slot (34) opening onto an end of said barrel (1) and being engagable with said actuating device;
said actuating device including a push button (3) axially movable relative to said barrel (1), a receiving device (18) engagable with said reservoir (2), a connecting rod (17) connecting said receiving device to said push button and a shift rod (19) connected to said receiving device and said shift rod having a shift tooth (32) at an end remote from said receiving device, said shift rod being movable in two planes perpendicular to one another, said actuating device being formed in one piece; wherein said reservoir is latchable in each of said retractable and said writing positions by action of said actuating device (4) and said actuating device is nonrotatably movable in said barrel and is provided with a protruberance (31) extending into said slot of said barrel (1), said protruberance being movable in said slot with the reservoir in the retracted position, said slot having a narrowed portion for retaining said actuating device in said barrel under spring biassing; and wherein said shift rod (19) is elastically deflectable in one of said planes;
and wherein said controlling curved portion (10) has an undercut (14) defining a latched position of said shift tooth (32) in which said shift tooth (32) is held under action of the spring biassing, said latched position being defined by abutment of said shift tooth (32) in said undercut (14) and, when said shift tooth (32) is in said latched position, said actuating device holds said reservoir in said writing position; and wherein said shift rod (19) is deflectable into the other of said two planes perpendicular to said one plane to move said reservoir (2) from said writing position to said retracted position for releasing said shift tooth (32) from said undercut (14), and
wherein said actuating device also includes a component (24) connected to said connecting rod for guiding said shift rod (19) in said one plane during displacement of said reservoir from said retracted position to said writing position and for guiding said shift rod (19) in said other plane during displacement of said reservoir (2) from said writing position to said retracted position, said component extending substantially parallel to an additional plane passing through the connecting rod (17) and the shift rod (19).

5,145,273

LOCKING MEMBER AND STABILIZER BAR/LOCKING MEMBER COMBINATION

Keith Hellon, Libertyville, Ill., and Gerald D. Nickerson, Gilbralter, Mich., assignors to Mac Lean Fogg Company, Mundelein, Ill.

Filed Feb. 22, 1991, Ser. No. 660,132
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 27 Claims



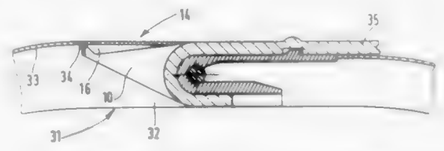
1. A locking member comprising:
an inner element;
an outer element comprising a unitary annular ring; and
a strap interconnecting the inner and outer elements;
the inner element comprising at least two portions joined to each other by at least one hinge at one end of each of the portions, each of said portions comprising a first tapered surface, tapered along an axis of the inner element;
the outer element comprising a second tapered surface, tapered along an axis of the outer element;
said second tapered surface positioned to contact the inner element, and said first and second tapered surfaces oriented to allow insertion of the inner element into the outer element.

5,145,274

CONNECTOR FOR FASTENING A WINDSHIELD WIPER BLADE TO A WINDSHIELD WIPER ARM

Wilfrid Schon, Saint-Etienne/Usson, France, assignor to Valeo Systemes D'Essuyage, Montigny-le-Bretonneux, France

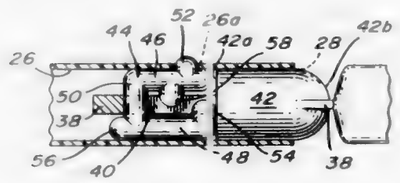
Filed Mar. 18, 1991, Ser. No. 670,970
Claims priority, application France, Mar. 19, 1990, 90 03473
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—79 13 Claims



1. An insertable connector securing a windshield wiper

blade to a windshield wiper arm, comprising a body having two longitudinal side walls, a transverse wall joining the two side walls to define a free space within the connector body, the side walls together defining two branches whereby the connector has a generally U-shaped longitudinal profile, the connector further comprising edge portions extending by the said side walls, and the connector also including a hood carried on the connector body integral therewith and means mounting the hood for pivotal movement with respect to the body of the connector, so as to close the said free space defined between the said walls.

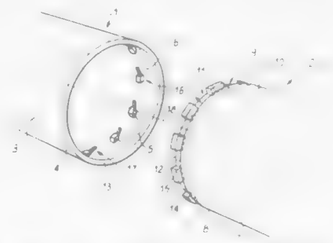
5,145,275
TRUSS BEAM COUPLER
Claude Alain, 2800 Dalton, Sainte-Foy, Quebec, Canada G1P 3S4
Filed Dec. 31, 1991, Ser. No. 815,036
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—171 **7 Claims**



1. The combination of a truss beam and coupler assembly, comprising:
(a) an elongated arm member defining a cylindrical body portion at one end and a thin body portion at the other end, a lengthwise slit made into said thin body portion;
(b) a spring-loaded clip member of generally U-shape, defining first and second lateral legs and a base leg joining said lateral legs, a short finger projecting transversely from the free end portion of said first leg away from said second leg, said clip freely engaged into said arm slit with said lateral legs extending axially of said arm member toward said cylindrical body portion; and
(c) an elongated tubular truss beam, open at both ends and defining a cylindrical wall with a transverse bore proximate each open end thereof, the hollow of said cylindrical wall having a diameter substantially equal to the length of said clip base leg and to the diameter of said clip cylindrical body portion, said bore and finger being of identical cross-section, said arm member releasably engaged into said truss beam hollow with said thin body portion as the leading edge thereof;
wherein as said clip finger is brought in register with said truss bore, the spring load of said clip first leg will bias said finger into said bore, to releasably interlock said arm member to said truss beam.

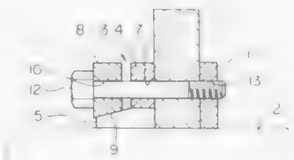
5,145,276
SYSTEM FOR COAXIAL ASSEMBLY OF TWO BODIES OF REVOLUTION
Claude Demange, Poissy, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France
Filed Nov. 27, 1990, Ser. No. 618,690
Claims priority, application France, Dec. 27, 1989, 89 17266
Int. Cl.[5] F16B *7/20*
U.S. Cl. 403—349 **12 Claims**

1. System for assembling and immobilizing, radially and axially, a first part and a second part each having the form of a body of revolution, said system comprising:
radially projecting members on the first part;
housings on the second part, adapted to receive said radial members of said first part;
respective cooperating wedging means integral with said radial members and said receiving housings adapted to center said first and second part coaxially with respect to



each other and to hold said first and second parts radially in position; and
elastically deformable means integral with one of said first and second parts and adapted to compress said wedging means axially by wedging said radial members against said wedging means on said receiving housings.

5,145,277
FASTENING A WHEEL OR WHEEL-LIKE BODY TO A SHAFT
Norihisa Fujita, Takatsuki; Hiroaki Nagasawa, Nagaokakyo, and Shinsuke Sahara, Takatsuki, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan
Filed May 30, 1991, Ser. No. 707,349
Claims priority, application Japan, Jul. 2, 1990, 2-69583[U]
Int. Cl.[5] F16B *2/14*
U.S. Cl. 403—374 **20 Claims**



1. A device for fastening a wheel or wheel-like body to a shaft comprising:
a shaft clamping ring having means providing a substantially cylindrical central opening capable of receiving a shaft, said shaft clamping ring including a radially extending portion having means providing a first face on one side of the radially extending portion for engaging one side of the wheel or wheel-like body in a first axial direction, and a boss extending axially from the other side of said radially extending portion, said substantially cylindrical central opening extending axially through said radially extending portion and through said boss so that said boss has a substantially cylindrical inner surface, and said boss having an outer surface tapered down in a direction opposite to said first axial direction;
means providing a surface for engaging the opposite side of the wheel or wheel-like body in an axial direction opposite to said first axial direction;
a pressing ring having an inner surface engageable with said tapered outer surface of the boss of said first ring while said pressing ring is spaced from said radially extending portion of said first ring; and
means, connectable to said surface-providing means and said pressing ring, for urging said surface-providing means and said pressing ring axially toward each other; whereby said surface-providing means is urged against said opposite side of the wheel or wheel-like body so that said wheel or wheel-like body is axially pressed between said surface-providing means and said clamping ring, and the substantially cylindrical inner surface of said boss is radially pressed against the shaft by the action of said inner surface of the pressing ring against the tapered outer surface of said boss.

5,145,278
MODULAR STEEL BRIDGE AND TRAFFIC BARRIER AND METHODS OF FABRICATION AND APPLICATION THEREFOR
Manfred Lohrmann, 141 Ardmore St., Wexford, Pa. 15090
Filed Jun. 27, 1991, Ser. No. 722,346
Int. Cl.[5] E01F *13/00*
U.S. Cl. 404—6 **38 Claims**

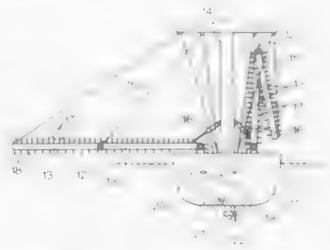
1. A barrier element comprising:
a webbing plate;
stiffening plates affixed along opposite edges of and substantially perpendicular to said webbing plate, said stiffening plates and said webbing plate presenting on at least one side of said barrier element a profile having a plurality of inclined surfaces; and
cover plate means spanning said webbing plate and affixed to said stiffening plates for defining at least one of said inclined surfaces.

5,145,279
PUBLIC WORKS MACHINE USABLE MORE PARTICULARLY FOR LAYING VERTICAL DRAINS
Gérard Larcheron, Ferrieres, and Yves Legendre, Balloy/-Bazoches-les-Bray, France, assignors to Enterprises Morillon Corvol Courbot S.A., Villeneuve-le-Roi, France
PCT No. PCT/FR89/00658, § 371 Date Aug. 24, 1990, § 102(e) Date Aug. 24, 1990, PCT Pub. No. WO90/07611, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 18, 1989, Ser. No. 566,444
Claims priority, application France, Dec. 26, 1988, 88 17171
Int. Cl.[5] E02B *11/02*; E02D *3/10*
U.S. Cl. 405—50 **15 Claims**

1. Public works machine usable particularly for laying vertical artificial drains, said machine comprising a carrier frame including a platform (14) carrying a pivoting lifting jib (16) provided with a free end, a tool-carrying mobile assembly (28) comprising a plurality of separate penetrating tools (34, 134, 234, 334) in particular for simultaneously laying several separate drains spaced by an elementary drain spacing, and guide means for vertically guiding the mobile assembly, said guide means comprising two spacing structures, a top spacing structure (42) fixed to the free end of the jib and a bottom spacing structure (25) fixed to a projection end of the platform, and a plurality of guide paths with vertical extension (38, 138, 238, 338) disposed for at least two of said guide paths with a spacing therebetween at least equal to the half of the elementary drain spacing, said guide paths being formed with cables or thin

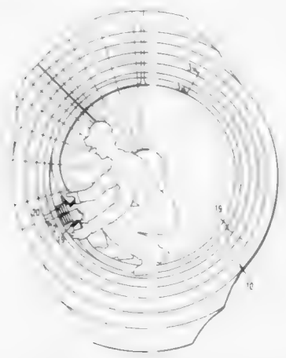
profiles, particularly rods, suitably stretched between the said spacing structures (25, 42).

5,145,280
WATER DISASTER PREVENTION WATER CURTAIN FORMING APPARATUS
Toshimitsu Araki, Musashino; Fumihiko Kawamata, Chiba; Hitoshi Miyagawa, Kanagawa; Masahito Yoshida, and Naotaka Masuda, both of Tokyo, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd. and The Tokyo Electric Power Co., Inc., both of Tokyo, Japan
Continuation of Ser. No. 358,237, May 26, 1989, abandoned.
This application Mar. 7, 1991, Ser. No. 668,805
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—62 **11 Claims**



1. An aquatic disaster prevention water curtain forming apparatus comprising:
at least one aquatic body floatable on a body of water near an object at which a disaster is occurring;
water curtain forming means for ejecting water above the surface of the body of water to form a vertical curtain of water separates from and disposed above the surface of the body of water, the curtain extending substantially above the water surface with a height sufficient to intercept and disperse gas flowing from said object above the water surface; and
pressurized water supply means for continuously supplying pressurized water to said water curtain forming means in order to form the water curtain.

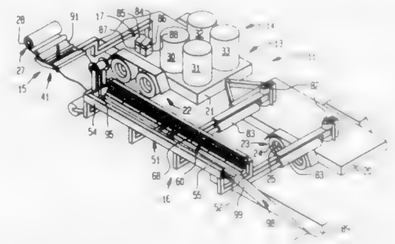
5,145,281
METHOD OF RENOVATING AND/OR PROTECTING SEWERS OR PIPES
Sydney Molyneux, Macgregor, Australia, assignor to Danby of North America, Inc., Cary, N.C.
Filed Feb. 26, 1991, Ser. No. 660,953
Claims priority, application Australia, Mar. 29, 1990, PJ9374; Jun. 4, 1990, PK0425; European Pat. Off., Jul. 19, 1990, 90307906.9
Int. Cl.[5] F16L 1/00
U.S. Cl. 405—154 1 Claim



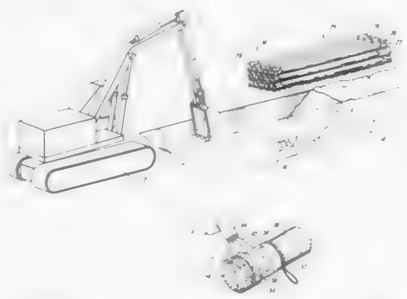
1. A method of lining sewers or pipes comprising the steps of:
spirally winding an elongated strip within said sewer or pipe; said strip having respective joint formations along each side, a smooth inner face, and a plurality of outwardly directed formations;
maintaining the outer diameter of said winding so as to substantially conform to the inner diameter of said sewer or pipe with said outwardly directed formations facing the inner surface of said sewer or pipe;
arranging said respective joint formations such that the joint formation on one side of said strip butts against the joint formation along the other side of an adjacent winding of said strip;
spirally winding an elongated joining strip within said sewer or pipe in a position where said joint formation on one side of said strip butts against said joint formation along said other side of said adjacent winding of said strip; and
forcing said respective adjacent joint formations of said elongated strip and said elongated joining strip into engagement so as to lock said windings of said strip together.

5,145,282
CONTINUOUS TUBULAR STRUCTURE FORMING AND PLACING APPARATUS AND METHOD
LeRoy Payne, 3300 Nicholas Ln., Molt, Mont. 59057
Continuation-in-part of Ser. No. 521,442, May 10, 1990, Pat. No. 5,049,006, which is a continuation-in-part of Ser. No. 417,501, Oct. 5, 1989, Pat. No. 4,955,760, which is a continuation-in-part of Ser. No. 35,205, Aug. 23, 1988, Pat. No. 4,872,784. This application Aug. 30, 1991, Ser. No. 753,344
Int. Cl.[5] F16L 1/00
U.S. Cl. 405—155 30 Claims

1. Mobile continuous tubular structure forming and placing apparatus including a support portion, a raw material supplying portion, a matrix forming portion, a tubular structure forming portion and a control portion; said support portion including a base section with wheeled carriage means depending therefrom; said raw material supplying portion including a plurality of reservoirs connected independently with said matrix forming portion through conduit means; said matrix forming portion including mixing and applying means; said tubular structure forming portion including a frame section, arcuate blanket support means associated with said frame section, blanket support means and aligned therewith, said blanket transporting means being movable from one end of said arcuate blanket support means to an opposite end thereof, a plurality of spaced movable finger members disposed along each longitudinal edge of said arcuate blanket support means, interconnecting means joining adjacent finger members; said control portion including blanket advancing means, finger moving means and coordinating means for said blanket advance, mixture delivery and finger movement in a preselected sequence to form a continuous tubular structure.

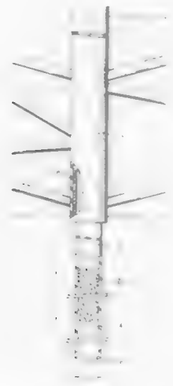


5,145,283
EFFICIENCY OF LAYING PIPE
Richard T. Gowen, R.F.D. Goves La., Wentworth, N.H. 03282
Filed Jun. 17, 1991, Ser. No. 716,088
Int. Cl.[5] B65D 59/06
U.S. Cl. 405—157 7 Claims



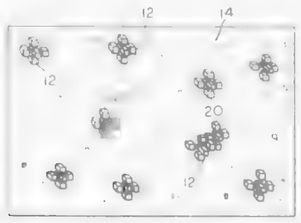
1. Apparatus for improving the efficiency of joining pipe sections in a gasketed slip joint application in which a portion of the pipe sealing means is left in place after joining two mating sections comprising:
a section of pipe having two ends;
shrink wrap closure means including material having a distal edge and positioned at each of the ends of said pipe section such that each end of said pipe section is sealed against contamination by virtue of the shrinking of said shrink wrap means about each end of the pipe; and
means for providing a circumferential circular slit in said shrink wrap closure means at or adjacent an end of said pipe section to expose the interior of the pipe such that the end of a mating pipe section can be inserted therein without removal of shrink wrap from said pipe adjacent said circumferential slit, said circumferential slitting means including circumferential scoring means, wherein said circumferential scoring means including a band adhered to said shrink wrap closure means removed from said distal edge.

5,145,284
METHOD FOR INCREASING THE END-BEARING CAPACITY OF OPEN-ENDED PILES
Jeffrey M. Hulett, Surrey, England; James D. Murff, and Richard D. Raines, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Feb. 23, 1990, Ser. No. 484,039
Int. Cl.[5] E02D 5/22, 5/66
U.S. Cl. 405—232 6 Claims



1. A method for insuring full mobilization of the end-bearing capacity of an open-ended pile, said pile being substantially vertical and being driven into the earth such that a soil column is formed in the lower end of said pile, said method comprising the steps of:
(a) determining the quantity of a loose, unagglutinated, granular material which will lock-up, without cementation, within said pile during loading of said pile and thereby insure full mobilization of the available capacity of the soil at the tip of said pile; and
(b) inserting at least said quantity of said granular material into said pile on top of said soil column.

5,145,285
DISCONTINUOUS STRUCTURAL REINFORCING ELEMENTS AND METHOD OF REINFORCING AND IMPROVING SOILS AND OTHER CONSTRUCTION MATERIALS
Nathaniel S. Fox, 4635 Riveredge Cove, Lithonia, Ga. 30058, and Evert C. Lawton, 7955 S.W. 198 Terrace, Miami, Fla. 33189
Continuation of Ser. No. 523,366, May 15, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 826,656
Int. Cl.[5] E02D 3/00
U.S. Cl. 405—258 17 Claims



1. A three-dimensional structural reinforcing element for inclusion on or within a soil matrix, said reinforcing element being a unitary, substantially rigid member and comprising a hub, a plurality of arms radiating from said hub, each arm having a proximal end and a distal end, the proximal end of all of said arms being connected to said hub, said arms radiating outwardly from said hub, cubic gripping means respectively associated with and integrally joined to the distal ends of said arms, each of said gripping means having a larger transverse area than the cross-sectional area of its associated arm and said hub protruding outwardly of said gripping means on both sides of said arms.

5,145,286
EARTH ANCHOR DRIVING AND REMOVING APPARATUS AND METHOD THEREFORE
Eugene R. Summers, Rte. 3, Box 190, Roodhouse, Ill. 62087
Division of Ser. No. 581,055, Sep. 12, 1990, Pat. No. 4,998,849. This application Feb. 19, 1991, Ser. No. 657,408
Int. Cl.[5] E02D 7/22
U.S. Cl. 405—258 6 Claims

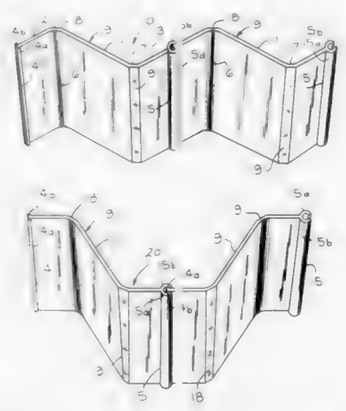
1. An earth anchor driving or removal tool for during an earth anchor further into the earth, or for removing an earth anchor or earth anchor shaft from the earth, using conventional earth anchor driving machinery, the later comprising a truck-mounted boom, a hydraulic drive motor suspended from the boom, and a Kelly bar driven by said motor, said boom being selectively movable so as to properly position said motor for doing a task, said earth anchor having an eyelet, and an earth anchor shaft, and adapter carried by said Kelly bar, said tool comprising an elongate hollow cylindrical tube for receiving said earth anchor eyelet, and an elongate drive rod which received within and secured to said tube, said rod extending from the upper end of said tube and being connected to said adapter, said tube including means below said rod for securing said earth anchor thereto.

5,145,287
PLASTIC PANEL EROSION BARRIER
Jefferson E. Hooper, Lake Arthur, La., and John E. Irvine, Granger, Ind., assignors to Materials International, Inc., Lake Charles, La.
Filed Mar. 11, 1991, Ser. No. 667,273
Int. Cl.[5] E02D 7/20, 5/00
U.S. Cl. 405—242 13 Claims

1. A structural panel for construction of ground erosion barriers for seawalls and the like formed of synthetic resin material selected for its ability to withstand soil shifts, weather changes, and wave action to which it is to be subjected in a barrier installation,
said panel being relatively narrow compared to its length and comprising in cross section a central body section with two parallel side sections extending therefrom in the opposite directions,
said side sections extending in opposite but parallel directions with equal obtuse angles between said side sections and said central body section thereby forming a generally "V" shaped configuration in opposite faces said panel,
one of said oppositely extending side sections having a male interlocking edge and the other having a matching female

interlocking edge, whereby adjacent such panels can be interlocked to form a continuous barrier wall of a series of said panels,

said male and female interlock edges being shaped to form a straight-line aligned relationship between adjacent side sections of adjacent interlocked panels of such a series



both when adjacent panels are interconnected with all similar ends designated as top ends located in the upper region of the barrier providing one cross sectional profile as well as when alternate panels in such a series are inverted with their top ends at the bottom of the barrier providing a different cross sectional profile.

5,145,288

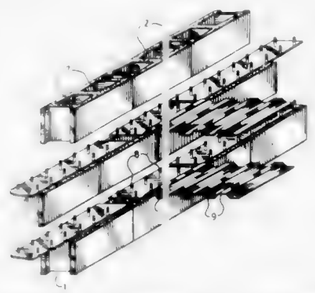
MORTARLESS RETAINING WALL

D. Thomas Borcherdt, Box 39D R.R. 1, Tusket, Nova Scotia, Canada B0W 3M0

Filed Sep. 13, 1990 Ser. No. 582,658

Int. Cl.[5] E02D *29/02*

U.S. Cl. 405—284 **4 Claims**



1. A device for use in building a wall from hollow-core concrete blocks, where said hollow cores in said blocks are defined by generally upright front, back and side inner surfaces and where said blocks have substantially co-planar flat front and rear bottom surfaces, said device comprising a thin metal planar member placed between horizontal rows of aid concrete blocks with said front and rear bottom surfaces of said concrete blocks resting thereon, and having integral placement projections means from either side thereof for engaging one or more of said upright inner surfaces of said hollow cores of said blocks so as to prevent said blocks from moving with respect to each other in a direction away from the plane of said wall, in which said placement projections means are tabs defined by a generally U-shaped cut made in said metal planar member, with the metal within said U-shape being bent away from said planar member at a substantial angle from said planar member, and an integral extension of said thin planar member comprising ground engaging projection means extending from said extension, to assist in anchoring said extension in a backfilled area.

5,145,289

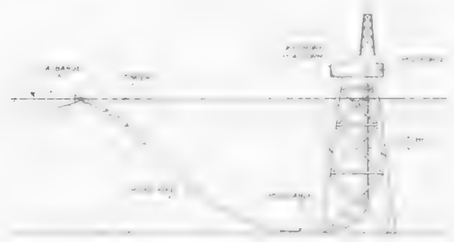
REDUCED J-TUBE RISER PULL FORCE

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 101,042, Sep. 25, 1987, Pat. No. 5,035,922, which is a continuation-in-part of Ser. No. 876,152, Jun. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 876,153, Jun. 19, 1986, abandoned. This application May 9, 1991, Ser. No. 697,546

Int. Cl.[5] F16L *1/04*

U.S. Cl. 405—169 **31 Claims**



1. A method for reducing the force required to move a pipe through a J-tube attached to an offshore platform, comprising:

coating at least part of the contacting surfaces between the pipe and the J-tube with a hydrophilic polymer selected from the group consisting of carboxymethyl cellulose and polyacrylamide; and

moving the pipe through the J-tube.

5,145,290

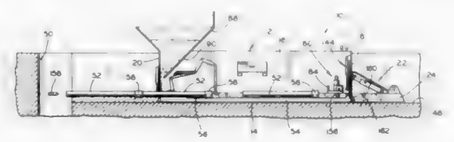
PIPE-LAYING APPARATUS

Eugene E. Wise, Bellville, Ohio, assignor to Kokosing Construction Company Inc., Fredericktown, Ohio

Filed Jun. 27, 1990, Ser. No. 544,640

Int. Cl.[5] F16L *1/02*

U.S. Cl. 405—179 **18 Claims**



13. Apparatus for laying pipe, said apparatus comprising an elongate housing having a leading end and a trailing end, a trough in said housing extending longitudinally thereof, track means on each side of said trough and extending parallel thereto, a cart having wheel means engageable with said track means for moving said cart along said trough when said wheel means are driven, and drive means on said cart for driving said wheel means.

5,145,291

METHOD FOR FORMING A PILING BENEATH A STRUCTURE

Roger A. Bullivant, Newton Solney, England, assignor to Roger Bullivant of Texas, Inc., Grand Prairie, Tex.

Filed Aug. 13, 1990, Ser. No. 566,555

Int. Cl.[5] E02D *27/48*

U.S. Cl. 405—230 **13 Claims**

1. A method for supporting a building with at least one pile formed by a hollow pile casing, said casing having an open proximal end, an enlarged head at or near its distal end, and at least one aperture formed on the proximal side of said enlarged head, comprising:

(a) forming a passage through the building at an angle close to vertical;

(b) rupturably sealing said at least one aperture with closure means;

(c) driving through said passage to a desired depth the hollow pile casing, said enlarged head forming a hole in the ground of greater cross-sectional area than the cross-sectional area of said casing;

(d) supplying a fluent settable mixture under pressure to the open proximal end of said casing, said mixture passing through the casing to the apertures;

(e) rupturing the closing means with said fluent settable mixture;

(f) continuing to supply mixture to the casing so that it flows into the annulus outside the casing to a predetermined height; and

(g) cutting off the proximal end of said casing at ground level.

5,145,292

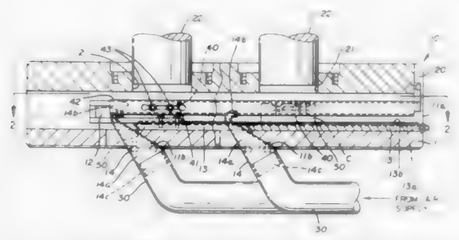
AIR CONVEYING SYSTEM

Joseph D. Bulso, Jr., Canton; James A. McClung, North Canton, and Alexander P. Dottavio, Canton, all of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Mar. 4, 1991, Ser. No. 663,558

Int. Cl.[5] B65G *51/03*

U.S. Cl. 406—88 **5 Claims**



1. A conveyor assembly secured to a lower die member of a forming press for moving objects from an object discharge point in the lower die member to a transfer point by air from an air supply source, the conveyor assembly comprising:

a) a substantially imperforate support plate disposed beneath the object discharge point and extending toward the transfer point; and

b) at least one air directing nozzle

1) connected to the air supply source and

2) projecting above said support plate adjacent the object discharge point and

3) directed toward the transfer point to direct air from the air supply source along said support plate;

c) wherein said support plate has at least one longitudinally extending, raised rib extending from adjacent the object discharge point toward the transfer point

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5,145,293

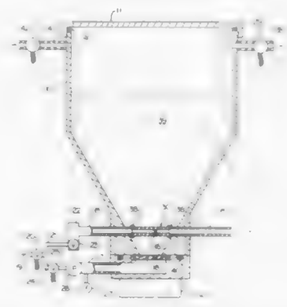
POWDER PICKUP DEVICE WITH EXTENDED LIFE

James J. Savino, Ridge; Anthony J. Rotolico, Hauppauge; Mark F. Spaulding, Northport, and Richard A. Goering, Huntington, all of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 7, 1990, Ser. No. 610,484

Int. Cl.[5] B65G *53/04*

U.S. Cl. 406—193 **9 Claims**



1. A powder pickup device with extended life, comprising a tubular shell with an aperture therein, and an elastomeric tube having an axial passage therethrough for channelling a carrier gas from an outer end thereof, the elastomeric tube being fitted through the shell with the orifice aligned with the aperture so that the orifice is receptive of the powder via the aperture, the elastomeric tube having a tube wall with an orifice therein receptive of powder from a powder vessel so as to direct powder into the passage for conveyance by the carrier gas toward a point of powder utilization, and the elastomeric tube further having an elastomeric section positioned opposite the orifice so that powder directed through the orifice impinges on the elastomeric section, wherein the aperture is larger in diameter than the orifice, and the tube wall has a protrusion centered over the orifice, the protrusion fitting into the aperture to position the elastomeric tube in the shell.

5,145,294

MILLING CUTTER CAPABLE OF USING INDEXABLE INSERTS OF VARIOUS SHAPES

Rudolph H. Flueckiger, Fort Myers, Fla., assignor to National Carbide Outlet, Inc., Fort Myers, Fla.

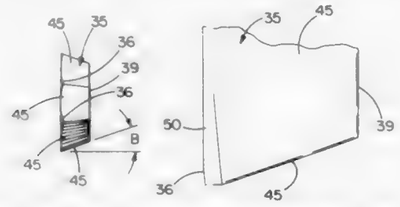
Filed Mar. 15, 1991, Ser. No. 669,766

Int. Cl.[5] B26D *1/25*

U.S. Cl. 407—42 **4 Claims**

1. A milling cutter comprising a generally cylindrical cutter body having a central axis and adapted to be rotated in a predetermined direction about said axis, said body having an outer periphery and a working end and having a plurality of circumferentially spaced pockets around the outer periphery of the

working end, an indexable cutting insert within each of said pockets and having a plurality of alternately usable cutting edges around its periphery, screw means extending through each insert to secure each insert in its respective pocket and selectively releasable to permit indexing of the insert in the pocket in order to bring a selected one of said cutting edges into active cutting position, each of said inserts having a leading and circumferentially facing cutting face and a trailing and oppositely facing back face, and each having clearance faces extending between said cutting face and said back face, said screw means leaving said cutting face unobstructed, the cutting edges of each insert being defined at the junction of the cutting face of the insert with the clearance faces thereof, the cutting face of each insert defining a single shallow frustoconical surface adjacent the junction of the cutting face with the cutting edges whereby each cutting edge has a curved configu-



ration when viewed from the respective clearance face, the clearance face of each cutting edge facing generally axially and in the direction of the working end of the body when such cutting edge is in said active cutting position, the clearance face of each cutting edge being inclined such that the clearance face of each active cutting edge progresses away from the working end of said body as such clearance face proceeds from the cutting face of the insert toward the back face thereof, each of said pockets being positioned so as to locate the active cutting edge of each insert at a positive axial rake angle and at a negative radial rake angle, and each of said pockets having a generally radially extending locating surface engageable with the clearance face diametrically opposite the clearance face of the active cutting edge of the respective insert, said locating surface being inclined and progressing toward the working end of the body as such surface proceeds generally radially outwardly.

5,145,295

MILLING CUTTING INSERT

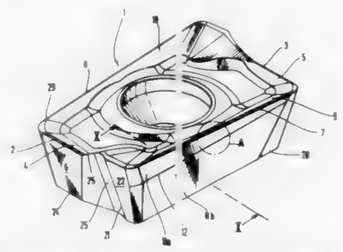
Amir Satran, Kfar Havradim, Israel, assignor to Iscar Ltd., Tefen, Israel

Filed May 13, 1991 Ser. No. 699,975

Claims priority, application United Kingdom, May 14, 1990, 9010769

Int. Cl.[5] B 3C *5/20*

U.S. Cl. 407—113 **17 Claims**



1. A cutting insert of substantially parallelipipedal shape and comprising a first pair of opposite cutting edges respectively defined between first pairs of cutting rake surfaces and relief flank surfaces, a second pair of opposite cutting edges respectively defined between second pairs of cutting rake surfaces and relief flank surfaces; each relief flank surface of said first pair of relief flank surfaces comprising a first portion defined between a cutting edge and an intermediate portion of said relief flank surface and a second portion defined between said intermediate portion and a base of the insert, said first portion presenting a first relief flank angle, said second portion presenting a second relief flank angle, said first relief flank angle being significantly greater than said second relief flank angle, said intermediate portion bridging said first and second portions and being directed transversely with respect to said first and second portions.

5,145,296

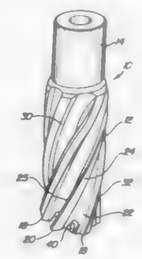
APPARATUS AND METHOD FOR CUTTING HOLES

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Continuation of Ser. No. 326,137, Mar. 20, 1989, Pat. No. 4,952,102, which is a continuation of Ser. No. 178,829, Apr. 1, 1988, Pat. No. 4,813,819, which is a continuation of Ser. No. 909,398, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 787,039, Oct. 15, 1985, Pat. No. 4,632,610, which is a continuation of Ser. No. 522,181, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 423,704, Sep. 27, 1982, abandoned. This application Aug. 28, 1990, Ser. No. 573,948

Int. Cl.[5] B23B *51/04*

U.S. Cl. 408—1 R **11 Claims**



1. A method for cutting holes in a workpiece with an annular hole cutter which has a plurality of cutting teeth spaced circumferentially around one end of the cutter, the cutting teeth are divided into a first set of teeth and a second set of teeth with each of the teeth having at least one radially extending cutting edge and with the teeth in the first set having the same configuration and the teeth in the second set having the same configuration but different than the configuration of the teeth in the first set;

a plurality of chip passages extending along the side of the cutter away from the teeth with each of the cutting edges having a chip passage adjacent thereto;

the method including the steps of:

(1) rotating the annular hole cutter and engaging the workpiece with the annular hole cutter;

(2) cutting into the workpiece with the annular cutter with at least one of the cutting edges on each of the teeth cutting a chip from the workpiece with each chip having a width measured generally radially which is less than the radial depth of the adjacent chip passage;

(3) continuing step (2) until the annular cutter cuts to the desired depth.

5,145,297

SYSTEM AND METHOD FOR PARTICULATE MATTER REMOVAL

Patrick J. McGrath, Jr., Fullerton, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Nov. 7, 1990, Ser. No. 610,185

Int. Cl.[5] B23C *9/00;* **B23Q** *11/02*

U.S. Cl. 409—132 **14 Claims**

12. A method of removing particulate matter from a machined workpiece, comprising the steps of:

positioning an intake cone connected to a vacuum tube in contact with the machined workpiece, the vacuum tube being connected to a vacuum source at a first end of the vacuum tube away from the machined workpiece, the intake cone being connected to the vacuum tube at a second end thereof adjacent to the machined workpiece, the intake cone having a venturi shape, a gas discharge tube projecting into the intake cone, a leading edge, and standoff buttons on the leading edge such that air can flow between the machined workpiece and the leading edge;

directing a stream of ionized gas through the gas discharge tube into honeycomb cavities of the machined workpiece, the stream of ionized gas neutralizing static charges of the particulate matter in the honeycomb cavities;

vibrating the machined workpiece, the vibrating means being in contact with an upper surface of the machined workpiece opposite from the intake cone, the vibration dislodging the particulate matter from the honeycomb cavities; and

catching and vacuum pulling the particulate matter from the machined workpiece into the intake cone to thereby remove the particulate matter from the machined workpiece.

5,145,298

HIGH SPEED DRILL SPINDLE

William F. Marantette, Torrance, Calif., assignor to Optima Industries, Inc., Torrance, Calif.

Filed Sep. 11, 1989, Ser. No. 405,128

Int. Cl.[5] B23B *19/02*

U.S. Cl. 409—135 **53 Claims**

1. A spindle comprising

a housing,

a stator within said housing,

a rotor rotatable within said stator,

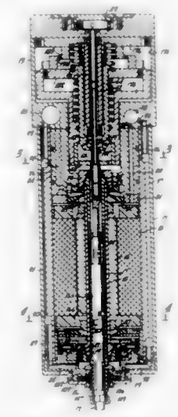
a collet rotatable by said rotor,

a frustoconical journal at each end of said rotor, said journals tapering outwardly away from said rotor,

a rubber bearing substantially complementarily receiving each of said journals,

mounting means for each of said bearings for supporting the same,

a source of water under pressure, and means for connecting said water to a location within said rotor,



each of said journals having an opening therethrough for receiving said water and conducting the same to said bearings for lubricating said bearings.

5,145,299

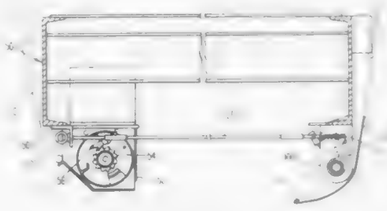
REMOTE RELEASE DEVICE FOR LOAD BINDERS

Everett H. Stephenson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Feb. 26, 1991, Ser. No. 661,923

Int. Cl.[5] B60P *7/08*

U.S. Cl. 410—100 **13 Claims**



1. Apparatus for releasing a load restraint comprising an elongated flexible restraint member having a hook at a free end thereof, the restraint being placed in tension by a winch and surrounding a load on a load supporting body, said apparatus comprising:

a housing attached to said load supporting body;

a drum rotatably attached to the housing;

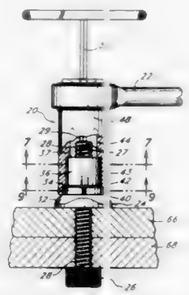
a hook bar for receiving the hook in releasable engagement, said hook bar affixed to said drum;

ratchet means operatively connected between said drum and said housing for selectively preventing the rotation of said drum in one direction; and

release means for releasing said ratchet means, said release means disposed proximate the winch and operatively connected to said ratchet means,

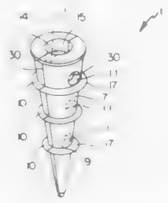
whereby upon operation of said release means said drum is permitted to rotate in either of two directions and rotates so as to cause said hook bar to be angularly displaced, thereby releasing said hook therefrom.

5,145,300
DEFORMABLE LOCKING FASTENER AND METHOD OF USE
John Wallace, Huntington Beach, Calif., assignor to Air Industries, Inc., Garden Grove, Calif.
Filed Feb. 15, 1990, Ser. No. 481,373
Int. Cl.[5] F16B 31/00
U.S. Cl. 411—1 13 Claims



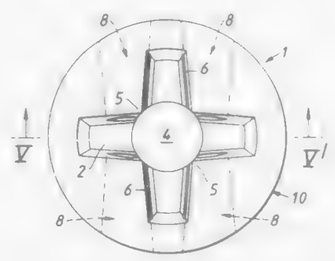
1. A locking fastener system comprising:
a fastener having a threaded portion with recesses in the threaded portion; and
a collar having a threaded bore for engagement with the threaded portion of the fastener, the collar further comprising:
a head portion the exterior of which is substantially elliptical in shape, the exterior of the head portion sized to be deformable radially inward to lock the collar to the fastener by deforming into the recesses in the fastener; and
a central portion the exterior of which is substantially elliptical in shape, the central portion being sized larger than the head portion to deform at a higher load than that required to deform the head portion, which higher load provides a predetermined preload between said collar and said fastener, the major axes of the ellipses of the head portion and the central portion being substantially aligned.

5,145,301
NAIL SUSTAINER
Akio Yamamoto, 1602-banchi, Ieiden, Fukui-shi, Fukui-ken, Japan
Filed Feb. 11, 1991, Ser. No. 653,325
Int. Cl.[5] F16B 39/02, 13/06
U.S. Cl. 411—82 12 Claims



1. A nail sustainer which is to be inserted into a hole (3) formed within a board which has poor sustaining force against a nail, comprising:
said nail sustainer includes a tapered tube means (7) including an outer base end and a forward smaller end, for insertion of a nail in said outer base end, said tapered tube means is tapered from said outer base end toward said forward smaller end and constructed to be inserted into the hole (3) of the board (2) and having a tapered chamber (30) which opens at the outer base end and tapers toward the forward smaller end,
at least one radial flow opening (11) in said tapered tube means (7), said at least one flow opening faces an inner surface portion (3a) of the hole (3) and communicates with the chamber (30) of said tube means (7) for reception of an adhesive agent via said outer base end,
axially aligned slits (33) in said tube means (7) that form split portions along substantially a whole length of the tube means (7) which divide said nail sustainer into equal parts, and
at least one flexible ring-like radial projection (10) formed to project from a peripheral surface of said tube means (7) juxtaposed and forwardly of the at least one flow opening (11) to surround the periphery of said tube means (7), said ring-like projection (10) having an outer edge portion (17) which contacts an inner surface portion (3a) of the hole (3) to prevent a flow of the adhesive agent forwardly of the at least one flow opening along the outer periphery of the tapered tube means.

5,145,302
SCREWS
David N. Harley, Dorset, England, assignor to Titus Tool Company Limited, Buckinghamshire, England
Filed May 22, 1991, Ser. No. 704,253
Claims priority, application United Kingdom, Jun. 5, 1990, 9012540
Int. Cl.[5] F16B 23/00
U.S. Cl. 411—404 10 Claims

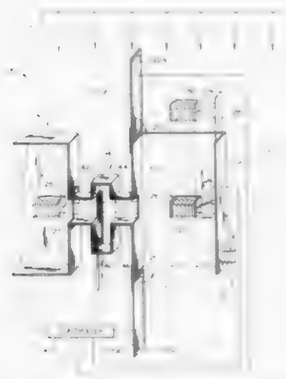


1. An angle-drive screw having a head provided with a generally cross-shaped screwdriver recess, the side-walls of the recess being provided with undercuts by means of a plurality of bores extending transversely through the screw head and connecting with said recess.

5,145,303
METHOD AND APPARATUS FOR REDUCING PARTICULATE CONTAMINATION IN PROCESSING CHAMBERS
John R. Clarke, Cary, N.C., assignor to MCNC, Research Triangle Park, N.C.
Filed Feb. 28, 1991, Ser. No. 662,236
Int. Cl.[5] H01L 21/68
U.S. Cl. 414—217 13 Claims

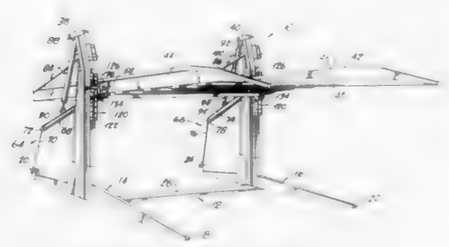
1. An apparatus for transferring objects to and from a processing chamber comprising:
a load lock chamber, adapted for connection to a processing chamber;
means for moving an object from said load lock chamber to a processing chamber;
first and second sealing means mounted on said load lock chamber, said first and second sealing means being movable between open and closed positions, for sealing said load lock chamber in the closed position and for defining a passageway through said chamber in the open position; and

means for generating a laminar gas flow through the passageway;



whereby particulate contamination is removed from the passageway by the laminar gas flow.

5,145,304
HEIGHT ADJUSTABLE VEHICLE PARKING APPARATUS
Arnold M. Rosen, Roslyn, N.Y., assignor to Park Plus Corporation, New York, N.Y.
Filed Nov. 14, 1990, Ser. No. 613,121
Int. Cl.[5] B66F 7/04
U.S. Cl. 414—228 6 Claims



1. A vehicle parking apparatus comprising:
a base;
a pair of spaced apart upstanding stanchions rigidly connected to said base;
a vehicle parking platform disposed intermediate said stanchions and movable along said stanchions between a first position substantially adjacent said base and a second position remote from said base;
means for raising and lowering said vehicle parking platform comprising a pair of piston and cylinder assemblies;
flange members rigidly connected to each of said stanchions at locations intermediate said first and second positions;
a rigid support member comprising a pair of parallel legs connected at one end by an engaging beam, said parallel legs being connectable to said flange members at any of a plurality of locations intermediate said first and second positions along said flange member; and
latch means connected to said vehicle parking platform and being dimensioned to be detachably engaged with said engaging beam, whereby said vehicle parking platform may be elevated to a selected height along said flange member intermediate said first and second positions and thereafter support at said selected height by the engagement of said latch means and said rigid support member such that said latch means detachably engages with said engaging beam when said parking platform is raised to the level at which said engaging beam is connected to said flange member.

5,145,305
COLLECTION VEHICLE, APPARATUS FOR USE IN THE VEHICLE AND METHOD OF COLLECTING MATERIAL
Peter Green, Worcester, United Kingdom, assignor to Waste Hoists Limited, United Kingdom
Filed Oct. 10, 1990, Ser. No. 595,089
Claims priority, application United Kingdom, Oct. 18, 1989, 8923501
Int. Cl.[5] B65F 3/04
U.S. Cl. 414—406 8 Claims

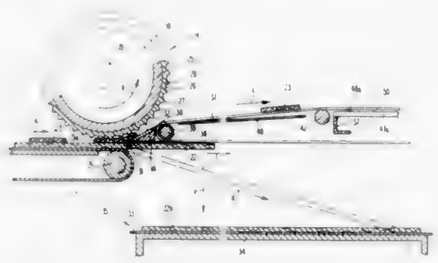
1. A collection vehicle having a load-receiving body and a pair of hoists mounted on the vehicle for raising respective containers and tipping the raised containers to discharge any contents thereof into the load-receiving body, wherein each hoist includes at least one hydraulic fluid-operated actuating device for actuating the hoist, the vehicle includes supply means for supplying hydraulic fluid under pressure to said actuating devices, there is provided for each hoist a respective control valve for controlling the supply of hydraulic fluid from the hydraulic fluid supply means to the actuating device of the hoist, each control valve having an inlet duct for leading hydraulic fluid under pressure to the control valve, and wherein the respective inlet ducts of the control valves are interconnected via a flow restrictor which provides for flow of hydraulic fluid from either inlet duct to the other inlet duct, said flow being restricted to a rate which is small, relative to a rate of supply of hydraulic fluid to each actuating device through a control valve which controls the hydraulic fluid supply to a respective actuating device.

5,145,306
METHOD AND APPARATUS FOR HANDLING CONFECTIONS
James P. Foster, Lebanon; C. Thomas Mullen, Hummelstown; Bruce A. Rambacher, East Earl; Herman P. Rhoads, Elizabethtown; Larry R. Fittery, Newmanstown, and Michael C. Schiavone, Jr., Lancaster, all of Pa., assignors to Hershey Corp., Hershey, Pa.
Filed Nov. 28, 1990, Ser. No. 619,892
Int. Cl.[5] B65G 65/04
U.S. Cl. 414—417 56 Claims

1. In an apparatus for handling food products that are provided arranged on boards in which a plurality of the products are to be separated from the boards and subsequently arranged in a predetermined manner;
(a) first transport means for receiving boards having a plurality of food products thereon that are arranged transverse of the apparatus and in longitudinally serial rows of product, and for serially conveying the boards longitudinally of the apparatus to a separation zone;
(b) a product separation zone including means for engaging

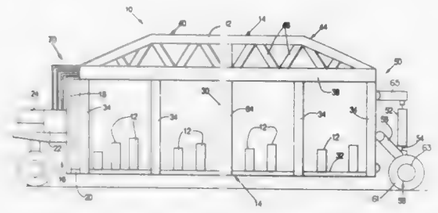
a plurality of products transversely of the apparatus and separating the products from the boards; and

(c) second transport means for receiving products from said separation zone, such that a plurality of products are arranged transverse of the apparatus and in serial transverse rows of product longitudinally of the apparatus, for serially conveying transverse rows of product longitudinally of the apparatus; and



(d) wherein the means for engaging and separating products from the boards comprises a transverse roller for engaging the products and a blade for scraping the products from the board while the products are directly engaged by the roller, said roller being disposed a distance from said blade to define a space therebetween through which said engaged products travel in contacting relation to said roller.

5,145,307
CARGO VEHICLE
Edward P. Smethwick, Wilmington; James D. Smith, Fairborn; Joseph C. Martin, Oregonia, and Thomas R. Ross, Sabina, all of Ohio, assignors to Airborne Express, Inc., Wilmington, Ohio
Filed Dec. 27, 1990, Ser. No. 634,569
Int. Cl.[5] B60P 1/02
U.S. Cl. 414—458 **7 Claims**



1. A wheeled cargo vehicle for facilitating the loading and unloading of cargo containers from one location to another location, said apparatus comprising:

a wheeled frame means;

a chassis assembly having a first end and a second end supported by and for vertical movement relative to said frame means between at least a lower ground engaging position, at which the containers are easily loaded/unloaded onto and from, and an upper transporting position at which the containers are supported off the ground for transportation by said vehicle;

said frame means including reciprocal fork lifting means connected to said first end of said chassis assembly and being operable for raising and lowering said chassis assembly in a straight line path between said positions; and,

support means pivotally attached to said second end of said chassis assembly and including a rear axle wheel assembly, said support means being operable in one position for supporting said chassis assembly in said upper position and movable to a second position for allowing said chassis assembly to move to said lower position, whereby the containers can be easily loaded onto and unloaded therefrom; wherein,

said rear axle wheel assembly is pivotally connected to said chassis assembly and said support means includes a pivoting arm which is movable between a first position which corresponds to said upper transporting position of said chassis assembly and a second position which corresponds to said lower ground engaging position of said chassis assembly; and motor means connected to said pivoting arm and said chassis assembly and being operable to selectively drive said pivoting arm between said first and second positions.

5,145,308
MOTORCYCLE TOWING DEVICE
E. Lanny Vaughn, 4334 Heights Ave., and Richard J. Nannini, 26 Zion Ave., both of Pittsburg, Calif. 94565
Continuation-in-part of Ser. No. 471,606, Jan. 29, 1990, abandoned. This application Feb. 1, 1991, Ser. No. 649,554
Int. Cl.[5] B60D 7/00
U.S. Cl. 414—462 **3 Claims**

1. A motorcycle towing apparatus for use with a towing vehicle comprising:

a support bar adapted to slidably engage and rigidly connect to a hitch receiver carried by the towing vehicle, said support bar extending rearwardly from said hitch receiver in a direction parallel with the direction of forward motion of said towing vehicle,

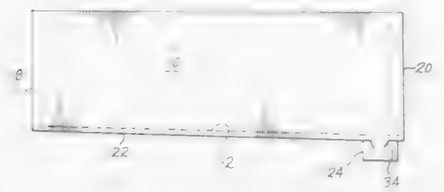
a ramp connected to the rear end of said support bar, said ramp movable between a first position in which said ramp is inclined downwardly from said support bar to the ground and a second position in which said ramp is elevated a sufficient height off the ground to provide clearance during towing, and wherein in both positions said ramp is parallel with said support bar,

a wheel cradle carried by said support bar, said wheel cradle adapted to support only the front wheel of said motorcycle above the ground, and the rear wheel of said motorcycle rides on the ground, said wheel cradle holding said front wheel in a fully upright position where its axis of rotation is parallel with the axes of rotation of the wheels of said towing vehicle, said wheel cradle extending around at least one-fourth of the circumference of the front wheel of said motorcycle,

releasable catch means carried by said support bar for securing said cradle to said support bar, and

release means connected to said catch means whereby a single user may release said catch means and when unload a motorcycle from the towing apparatus.

5,145,309
CONTAINER FOR LIQUID BEARING MATERIAL
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741
Filed Apr. 30, 1990, Ser. No. 516,972
Int. Cl.[5] B65G 25/04
U.S. Cl. 414—525.1 **15 Claims**



1. A container for holding a material which may include a drainable liquid, comprising:

sidewalls, endwalls, and a bottom;

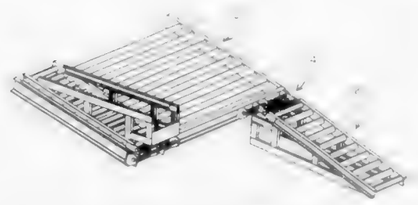
said bottom including a reciprocating floor conveyor comprising a plurality of elongated floor members which in use are driven in one direction for advancing a load and are retracted in an opposite direction;

said container including a transverse liquid collection trough positioned to collect liquid drainage from the material, said trough including an outlet; and

a liquid collecting and holding tank positioned below said outlet,

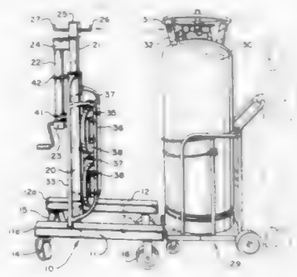
whereby liquid within the material drains down to the bottom of the container and flows to and into the collection trough and out from the outlet of the collection trough into the liquid collecting and holding tank.

5,145,310
REVERSE SPRING ASSIST FOR TRAILER RAMPS
Ronald J. Galzone, HCR60, Box 296 Dixon, Mo., 65459
Filed May 6, 1991, Ser. No. 695,948
Int. Cl.[5] B65G 69/28
U.S. Cl. 414—537 **19 Claims**



1. A trailer ramp reverse spring assist apparatus, said apparatus comprising a pivot shaft, a spring, and means for engaging a first end of said spring, said pivot shaft being positioned at and parallel with an edge of a rear end of a trailer, said shaft receiving an end of a trailer ramp in pivoting relationship such that said ramp is moveable between positions of transport and loading about said shaft, said spring being mounted concentrically around said pivot shaft, said means for engaging a first end of said spring being comprised of an arcuate member being positioned in proximity to and partially concentric with said shaft, said arcuate member having a plurality of cicumferentially arrayed holes for receiving a retaining pin in one of said holes, whereby said first end of said spring is braced under and against said retaining pin as a second end of said spring is compressed by and is biased against a contact portion of said ramp as said ramp is placed in said position of transport, whereby said spring imparts a lifting force to said ramp as an aid in moving said ramp from said transport position to said loading position, said first end of said spring being freed from engagement with said retaining pin as said ramp is placed in said loading position.

5,145,311
CYLINDRICAL TANK LIFT WITH FOUR WHEELS FOR MOBILITY AND STABILITY
Frank S. Salvucci, Pearland, Tex., assignor to Anthony Welded Products, Inc., Calif.
Filed Nov. 13, 1990, Ser. No. 611,770
Int. Cl.[5] B65G 9/00
U.S. Cl. 414—592 **4 Claims**



1. A lift on a base having four wheels for raising a cylindrical tank having a vertical axis of the type having at least one upwardly extending strap secured to an upper end thereof offset from said vertical axis, said strap having an eye for receiving a hook or rod, comprising

two parallel beams, each beam having a wheel at each end, and a cross beam between said parallel beams and perpendicular thereto at a position closer to one pair of wheels than to the other pair of wheels, thereby forming an H-shaped base and leaving a forward major open part of said two parallel beams to straddle said cylindrical tank and a rearward minor part to prevent said lift from tipping backward while transporting said cylindrical tank,

an upright hollow beam secured to said cross beam at the center thereof, and a telescoping beam inserted into said hollow beam,

a jack oriented to extend said telescoping beam, said jack having one end secured to said upright beam and the other end secured to said telescoping beam, whereby operation of said jack extends said telescoping beam in said hollow beam for raising a cylindrical tank and contracts said telescoping beam for lowering said cylindrical tank,

a hook or rod protruding horizontally from an upper end of said telescoping beam in a vertical plane between said two parallel beams, said hook or rod being adapted to engage said eye in said upwardly extending strap secured to said upper end of said cylindrical tank,

a pair of struts, one on each side of said upright hollow beam, each strut extending out horizontally from said upright hollow beam and then down vertically to a parallel beam on each side of said H-shaped base, and

a pair of bumper rods extending from a vertical portion of each of said struts approximately toward said vertical axis of said cylindrical tank, each bumper rod being positioned in a plane that approximately bisects the right angle between one of said two parallel beams and said cross beam, thereby extending approximately toward said vertical axis of said cylindrical tank, whereby the bottom of said cylindrical tank is prevented from swinging into said hollow upright beam and from rolling to one side or the other as said cylindrical tank is raised or lowered, and from rolling to one side or the other as said lift on said base having four wheels is rolled to transport said cylindrical tank while said cylindrical tank is in a raised position,

whereby upon inserting said hook or rod into said eye in said

strap secured to an upper end of said cylindrical tank and operating said jack to extend said telescoping beam, said cylindrical tank is raised, and having been raised, said cylindrical tank may be lowered by operating said jack oppositely.

5,145,312

INDUSTRIAL ROBOT

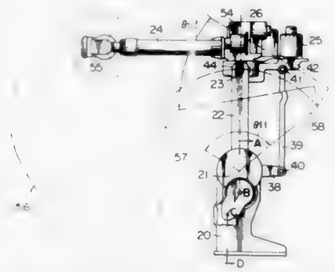
Akikazu Sonoda, Akashi; Shinji Fujita, Kobe; Masahiro Takigawa, Akashi; Katsunori Fukuda, and Hisanori Nakamura, both of Toyota, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo and Toyota Jidosha Kabushiki Kaisha, Aichi, both of, Japan

Continuation of Ser. No. 401,873, Sep. 1, 1989, abandoned. This application Apr. 4, 1991 Ser. No. 681,404

Claims priority, application Japan, Sep. 8, 1988, 63-226157

Int. Cl.[5] **B25J** *9/10*

U.S. Cl. 414—719 **6 Claims**



1. An industrial robot including a base, a lower arm mounted at a lower end on said base for a swingable movement about a substantially horizontal first axis, first motor means provided on said base for driving said lower arm to produce the swingable movement of said lower arm about said first axis, a swingable member mounted on said lower arm at an upper end portion of said lower arm for a swingable movement about a second axis which is parallel with said first axis, second motor means provided on said base for driving said swingable member to produce the swingable movement of said swingable member about said second axis, an upper arm mounted at one end portion on said swingable member for a swingable movement about a third axis which is perpendicular to said second axis, said upper arm projecting in one direction from said upper end portion of said lower arm and provided at the other end portion with a robot hand, said swingable member having a portion extending in a direction opposite to said one direction beyond said one end portion of said upper arm, third motor means mounted on said portion of said swingable member for driving said upper arm to produce the swingable movement of said upper arm about said third axis.

5,145,313

QUICK DISCONNECT BUCKET ACTUATOR

Paul P. Weyer, P.O. Box 398, Enumclaw, Wash. 98022

Filed Jun. 28, 1991, Ser. No. 722,865

Int. Cl.[5] **E02F** *3/36*

U.S. Cl. 414—723 **23 Claims**

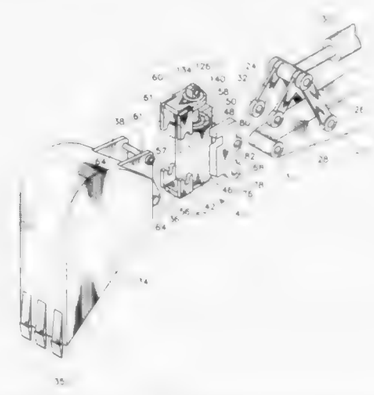
1. A fluid-powered laterally tiltable bucket assembly, usable with a vehicle having an arm and a rotation link associated therewith for rotation of the bucket assembly in a first plane defined by movement of the rotation link relative to the arm, each of the arm and rotation link having an attachment member located toward a free end thereof, the bucket assembly comprising:

a bucket having a working edge extending laterally, generally transverse to the first plane, a first bucket attachment member and a second bucket attachment member located away from said first bucket attachment member, said first and second bucket attachment members being arranged in general parallel alignment with the first plane;

a body having a longitudinal axis and first and second ends;

an attachment bracket rigidly attached to said body and having an external first bracket attachment member located generally along said body axis for pivotal attachment to the vehicle arm by the arm attachment member and an external second bracket attachment member located generally along said body axis away from said first bracket attachment member for pivotal attachment to the rotation link by the rotation link attachment member, said first and second bracket attachment members being selectively detachable from the arm and rotation link attachment members, wherein with said first and second bracket attachment members attached tot he arm and rotation link attachment members, movement of the rotation link causes said body to rotate about the vehicle arm with movement of said longitudinal axis of said body in generally parallel alignment with the first plane, and wherein the bucket assembly is selectively detachable from the vehicle arm and rotation link;

an output shaft rotatably disposed within said body in general coaxial arrangement with said body and having a first shaft end portion extending at least to said first body end and a second shaft end portion extending toward said



second body end, said first shaft end portion having a first shaft attachment member attached thereto which is releasably attachable to said first bucket attachment member;

a member longitudinally extendable relative to said second shaft end portion, said extendable member having a second shaft attachment member attached thereto which is releasably attachable to said second bucket attachment member, said extendable member being selectively longitudinally movable between a locking position with said first and second shaft attachment members positioned to attach said bucket to said shaft for rotation with said shaft through a second plane extending laterally, generally transverse to the first plane and a release position with said first and second shaft attachment members positioned to allow disconnection of said bucket from said shaft;

an actuator engaging said extendable member for selectively moving said extendable member between said locking and release positions; and

a linear-to-rotary torque transmitting member mounted for longitudinal movement within said body in response to selective application of pressurized fluid thereto, said torque-transmitting member engaging said body and said shaft to translate longitudinal movement of said shaft relative to said body, whereby said bucket is rotatable in the first plane and laterally tiltable in the second plane.

5,145,314

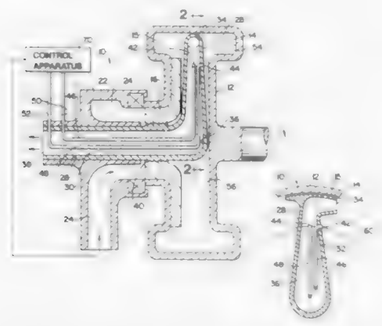
LOW DRAG PITOT PUMP AND METHOD OF OPERATING SAME

Paul E. Westhoff, Jr., Chana, and Kent Weber, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 18, 1991, Ser. No. 687,046

Int. Cl.[5] **F01D** *0/00;* **F04D** *1/12*

U.S. Cl. 415—1 **10 Claims**



1. A method of operating a pitot pump which pressurizes a first fluid of a first viscosity and first density wherein the pump includes a rotatable housing having an inner annular chamber containing the first fluid and a quantity of a second fluid having a second viscosity and second density less than the first viscosity and first density, respectively, a stationary probe disposed within the housing and having a radially extending body terminating at an open tip disposed at a first radial position within the chamber and a channel therethrough providing fluid communication between the open tip and a pump outlet, comprising the steps of:

detecting a physical condition in the housing as the housing is rotating indicative of the presence of the first fluid at a second radial position inside the first radial position wherein the second radial position intercepts the probe body at an intermediate portion thereof, wherein the step of detecting includes the step of sensing pressure in the housing at the second radial position and wherein the step of sensing includes the steps of developing first and second pressure signals representing total pressure and static pressure, respectively, at the second radial position; and

controlling the quantity of second fluid in the inner annular chamber in response to the detected physical condition whereby the first fluid occupies a space in the chamber outside of the second radial position and the second fluid occupies a space in the chamber inside of the second radial position.

5,145,315

GAS TURBINE VANE COOLING AIR INSERT

William E. North, Winter Springs; Kent G. Hultgren, Winter Park; Christopher D. Dishman, Geneva, and Gary S. Van Heusden, Oviedo, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 27, 1991, Ser. No. 766,934

Int. Cl.[5] **F01D** *5/20*

U.S. Cl. 415—115 **17 Claims**

1. A gas turbine comprising a plurality of turbine vanes, each of said vanes supplied with cooling air and having:

a) an airfoil portion forming a first cavity having an insert disposed therein for directing the flow of said cooling air, said insert having first and second insert ends;

b) a shroud portion from which said airfoil portion extends, said insert attached to said shroud portion at said first insert end;

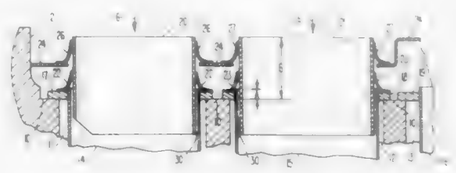
c) an insert extension extending through a portion of said insert and extending beyond said first insert end, said insert extension and said insert forming an annular gap therebetween separating said insert from said insert extension;

d) a plate covering at least a portion of said shroud, said plate having a first hole formed therein through which said insert extension extends; and

e) at least a first seal extending between said insert extension and said insert, and sealing said annular gap therebetween.

15. A method of making a gas turbine, comprising the steps of:

a) welding a first tubular insert adjacent its first end to a vane outer shroud;



b) partially inserting a second tubular insert into said first tubular member and attaching said second tubular insert thereto;

c) placing a plate having a hole formed therein on said outer shroud so that said hole surrounds said second tubular insert; and

d) attaching said second tubular insert to said plate by placing a first seal between said first and second tubular inserts and attaching said first seal to each of said first and second tubular inserts, and placing a second seal between said second tubular insert and said plate and welding said second seal to said second tubular insert and said plate

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5,145,316

GAS TURBINE ENGINE BLADE SHROUD ASSEMBLY

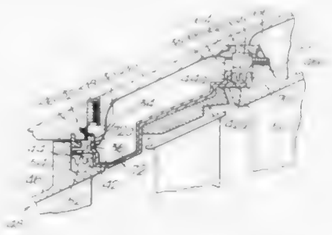
Kenneth W. Birch, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Nov. 5, 1990, Ser. No. 608,708

Claims priority, application United Kingdom, Dec. 8, 1989, 8927865

Int. Cl.[5] **F01D** *5/20*

U.S. Cl. 415—173.1 **9 Claims**

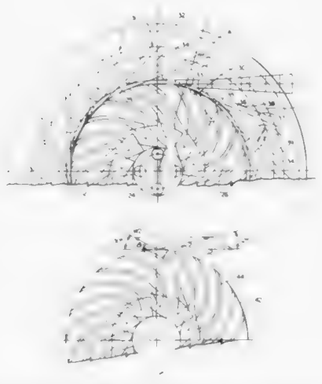


1. A blade shroud assembly comprising an annular array of shroud segments supported via their upstream and downstream ends on fixed structure and including radially outwardly turned flanges adjacent said ends, a turbine casing surrounding the shroud segments and a plurality of headed pins affixed in the turbine casing with their heads protruding radially inwardly therefrom and between the flanges and wherein at least some of the flanges at common ends of the shroud segments are engaged by the heads of respective pins so as to prevent bodily movement of each shroud segment in one common direction axially of the casing; and

further comprising another headed pin which is fixed in fixed structure at that end of a shroud segment remote from the radially aligned headed pins, the head of which further pin locates in radially aligned slots in the adjacent

shroud segment flange and the adjacent portion of the engine casing when the heads of the radially aligned headed pins engage respective dogs, so as to prevent relative rotation between the shroud segments and fixed structure.

5,145,317
CENTRIFUGAL COMPRESSOR WITH HIGH EFFICIENCY AND WIDE OPERATING RANGE
Joost J. Brasz, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 1, 1991, Ser. No. 739,006
Int. Cl.[5] F01D *1/06*
U.S. Cl. 415—224.5 11 Claims



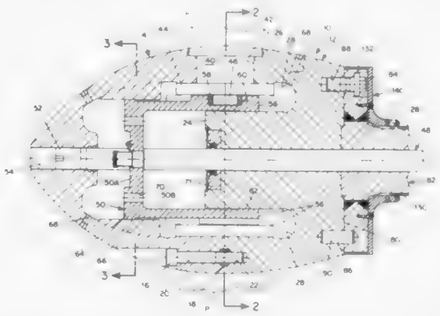
7. An improved centrifugal compressor of the type having in serial flow combination, a variable geometry inlet, an impeller and a fixed geometry diffuser, wherein the improvement comprises:

an impeller having a plurality of circumferentially spaced blades for discharging fluid in a generally radial direction, said blades being so disposed as to impart motion to said fluid at a flow exit angle of less than 20 degrees; and

a diffuser structure with a plurality of circumferentially spaced channels formed therein, said channels having center lines which extend substantially tangentially through the periphery of said impeller and the number of said channels being limited such that the angle between adjacent channel center lines is greater than 18 degrees.

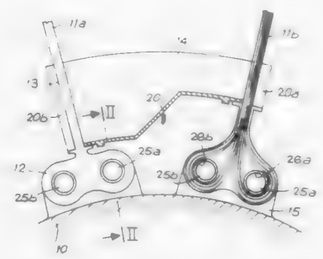
5,145,318
FLANGE-MOUNTED CONTROLLABLE PITCH MARINE PROPELLER
Stephen C. Olson, Norfolk, Mass., assignor to Bird-Johnson Company, Walpole, Mass.
Continuation of Ser. No. 437,936, Nov. 16, 1989, abandoned.
This application Oct. 2, 1991, Ser. No. 769,575
Int. Cl.[5] B63H *3/04, 23/34*
U.S. Cl. 416—167 15 Claims

1. A propeller shaft and hub flange assembly for a marine propeller, the assembly including a hub flange portion having a forward face and a shaft portion having an external circular cylindrical surface adjacent the hub flange portion, characterized in that a tubular shaft member and a flange member are separate and are joined by at least one weldment, which weldment is a body of weld metal formed in a cavity defined by surfaces of the shaft member and flange member that face each other such that the cavity enlarges toward the external surface of the weldment, in that the assembly has a fillet between the forward face of the flange portion and the external surface of the shaft portion and in that the propeller shaft and hub flange assembly is adapted to be joined to a marine propeller solely by



bolts and locating and torque pins received in holes in the flange member that do not transect the weldment.

5,145,319
AXIAL FLOW TURBOMACHINE ROTOR
Pierre A. Glowacki, Fontaine le Port, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs d'Aviations S.N.E.M.C.A., Paris, France
Filed Nov. 21, 1990, Ser. No. 616,594
Claims priority, application France, Nov. 22, 1989, 89 15301
Int. Cl.[5] F01D *5/22, 5/30*
U.S. Cl. 416—193 A 9 Claims



1. An axial flow turbomachine rotor comprising:

a disc having an axis, a circumferentially extending periphery, and a plurality of annular flanges extending outward from said periphery to define a plurality of annular grooves between said flanges, said flanges including front and rear annular flanges respectively positioned upstream and downstream with respect to the direction of fluid flow through said rotor;

a plurality of blades mounted on the periphery of said disc, said blades being arranged evenly around said periphery and extending radially outward therefrom, each of said blades having a root at its radially inner end, said root being notched so as to define heels which are received by respective ones of said annular grooves;

fixing means securing said blades to said disc; and

a plurality of separate platforms fixed to said disc so that each platform is disposed between two adjacent blades to delimit the disc side of the fluid flow path through said rotor;

wherein said fixing means comprises, for each of said blades:

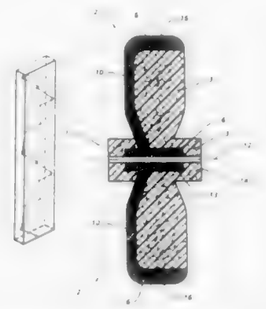
a pair of substantially parallel pins equidistant from the periphery of said disc said pins being the radially innermost connection of the blades to said disc, and

corresponding bores passing right through said annular flanges of said disc and said heels of the blade,

said pins extending through said bores at least between said front and rear annular flanges, and each of said pins having a head at one end of said pin;

and wherein each of said platforms has front and rear end plates projecting radially inwardly towards said disc axis at the upstream and downstream ends respectively of said platform, and said front and rear end plates of each platform are provided with apertures for the passage of two adjacent pins belonging to said fixing means of the neighboring blades.

5,145,320
MASS LOADED COMPOSITE ROTOR FOR VIBRO-ACOUSTIC APPLICATION
William K. Blake, Bethesda; Aleksander B. Macander, Rockville, and Jonathan Gershfeld, Kensington, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 28, 1990, Ser. No. 573,769
Int. Cl.[5] B63H *1/26*
U.S. Cl. 416—230 11 Claims



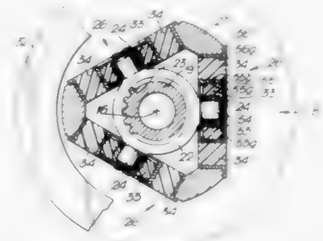
1. A high damping light weight mass loaded composite rotor comprising:

a. a hub having an axis and adapted for rotation about the axis;

b. at least one blade extending from said hub, said blade having a composite portion being made of a multidimensionally braided multiple fiber reinforcement wherein the individual fiber yarns of said multidimensionally braided multiple fiber reinforcement interact in a through-the-thickness helical type entanglement of individual fiber yarns to form a multidimensionally braided composite skeletal shape such that said multidimensionally braided multiple fiber reinforcement lacks planes of delamination, a rubber material insert portion totally encompassed by said multidimensionally braided multiple fiber reinforcement, and a high density material portion wherein said high density material is utilized and located in localized high vibration active regions of said blade; and

c. a matrix resin to impregnate said multidimensionally braided multiple fiber reinforcement and to rigidly bind the multidimensionally braided multiple fiber reinforcement, the rubber material insert and the high density material, whereby the mass distribution with the high damping lightweight mass loaded composite rotor is tailored to reduce vibratory response of said blade to flow excitation.

5,145,321
HELICOPTER ROTORS WITH ELASTOMERIC BEARINGS
Peter J. Flux, and Gerald H. Martyn, both of Yeovil, England, assignors to Westland Helicopters Limited, England
Filed Mar. 20, 1991, Ser. No. 672,630
Claims priority, application United Kingdom, Mar. 24, 1990, 9006966
Int. Cl.[5] B64C *27/14*
U.S. Cl. 416—244 R 12 Claims

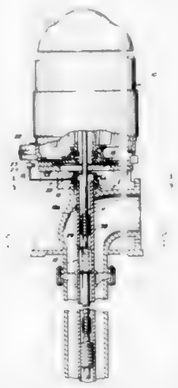


1. A rotor having a rotor head supporting a plurality of radially extending rotor blades for rotation about an axis and comprising a driving member rotationally fixed adjacent one end of a drive shaft, and having at least three equi-spaced drive pins extending radially of the axis of rotation and in a plane of rotation perpendicular to said axis, each drive pin locating in an elastomeric bearing assembly having a spherical elastomeric bearing centered on the drive pin and an elastomeric shear bearing located in the plane of rotation and oriented parallel to the axis of rotation, a gimbal housing attached to the elastomeric shear bearings and supporting a rotor yoke for attachment of the rotor blades, a spherical elastomeric thrust bearing attached to the gimbal housing with its geometral center located at an intersection of the axis of rotation and the plane of rotation of the driving member, whereby in operation the rotor can be tilted in any direction about said center.

5,145,322
PUMP BEARING OVERHEATING DETECTION DEVICE AND METHOD
Roy F. Senior, Jr., 3736 E. Montecito, Phoenix, Ariz. 85018, and Charles T. Lyon, Phoenix, Ariz., assignors to Roy F. Senior, Jr., Phoenix, Ariz.
Filed Jul. 3, 1991, Ser. No. 725,199
Int. Cl.[5] F04B *49/02*
U.S. Cl. 417—32 20 Claims

1. In combination with a deep well water pump system having: a column pipe for water flow; an oil tube concentrically disposed within the pipe; a pump shaft concentrically disposed within the tube; bearings around said shaft whereby an air space which communicates with an oil inlet chamber having an air space therein is maintained around said shaft; and a motor to operate said pump shaft between said bearings; a warning device for detecting the overheating of a bearing, comprising:

a temperature probe disposed in the air space above the first bearing in said oil tube for indirectly detecting a rise in



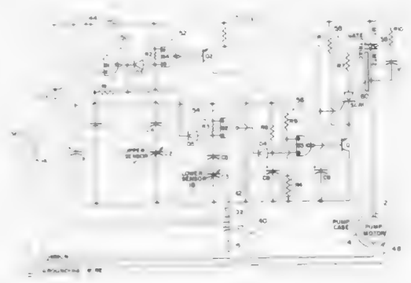
temperature in the bearings, and means for signalling a rise in temperature to a predetermined maximum value.

5,145,32

LIQUID LEVEL CONTROL WITH CAPACITIVE SENSORS

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 26, 1990, Ser. No. 618,164
Int. Cl.[5] F04D *27/00*
U.S. Cl. 417—36 19 Claims



1. An apparatus for controlling liquid levels, said apparatus comprising:

a pump including an outer case

a motor drivingly connected to said pump;

first sensor means for detecting the presence of liquid and mounted at a first vertical position, said first sensor means producing a first signal indicative of the presence of liquid at said first position;

second sensor means for detecting the presence of liquid and mounted at a second vertical position, which is different than said first vertical position, said second sensor means producing a second signal indicative of the presence of liquid at said second position and

means for activating said motor said activating means operably coupled to said first and second sensor means, said activating means starting said motor to drive said pump when both of said first and second signals are produced by said first and second sensors, said activating means for continuing operation of said motor while at least one of said first and second signals are being produced, and said activating means stopping said motor when both said first and second signals are no longer produced;

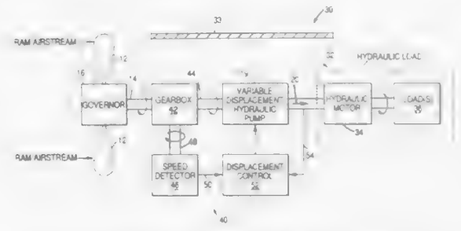
said first and second sensor means each including a capacitive circuit having two capacitive electrodes, one of said electrodes of said first and second sensor means including said pump outer case.

5,145,324

RAM AIR TURBINE DRIVING A VARIABLE DISPLACEMENT HYDRAULIC PUMP

Gary E. Dickes; Roger D. Brekhus, and William E. Seidel, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 18, 1990, Ser. No. 539,579
Int. Cl.[5] F04B *17/02, 1/26*
U.S. Cl. 417—222.1 20 Claims



1. A ram air turbine for use in generating power for an aircraft by driving a load with an airstream intercepting blades of the turbine as the aircraft moves through the air with the turbine applying power to the load during rotation of the blades in a first rotational velocity range and during rotation of the blades in a second rotational velocity range which is lower than the first rotational velocity comprising:

a variable displacement hydraulic pump which is driven by rotation of the blades, including a displacement control having an anti-stall piston which is responsive to a second hydraulic control signal for varying the displacement of the variable displacement hydraulic pump for rotational velocities of the blades in the second rotational velocity range and a stroking piston which is responsive to a first hydraulic control signal for varying displacement of the variable displacement hydraulic pump in the first rotational velocity range, for producing pressurized hydraulic fluid to drive a hydraulic load during rotational velocities in the first and second rotational velocity ranges; and wherein

a reduced power output in the second rotational velocity range is produced when compared to power output which may be outputted in the first rotational velocity range with the driven load generating power for controlling the aircraft in the first and second rotational velocity ranges.

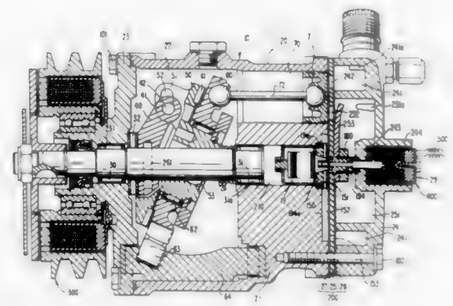
5,145,325

SLANT PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jun. 27, 1990, Ser. No. 544,430
Claims priority, application Japan, Jun. 28, 1989, 1-163694
Int. Cl.[5] F04B *1/28*
U.S. Cl. 417—222.2 26 Claims

1. In a slant plate type refrigerant compressor including a compressor housing enclosing a crank chamber, a suction chamber and a discharge chamber therein, said compressor housing comprising a cylinder block having a plurality of cylinders formed therethrough, a piston slidably fitted within each of said cylinders, a drive means coupled to said pistons for reciprocating said pistons within said cylinders, said drive means including a drive shaft rotatably supported in said housing and coupling means for drivingly coupling said drive shaft to said pistons such that rotary motion of said drive shaft is converted into reciprocating motion of said pistons, said coupling means including a slant plate having a surface disposed at an adjustable inclined angle relative to a plane perpendicular to said drive shaft, the inclined angle of said slant plate adjustable to vary the stroke length of said pistons in said cylinders to vary the capacity of the compressor, a passageway formed in said housing and linking said crank chamber and said suction chamber in fluid communication, and capacity control means for varying the capacity of the compressor by adjusting the inclined angle, said capacity control means including a valve control means and a response pressure adjusting means, said valve control means for controlling the opening and closing of said passageway in response to changes in refrigerant pressure in said compressor to control the link between said crank and said suction chambers to thereby control the capacity of the compressor, said valve control means responsive at a predetermined pressure, said response pressure adjusting means for controllably changing the predetermined pressure at which said valve control means responds, said response pressure adjusting means responding to an external signal, the improvement comprising:



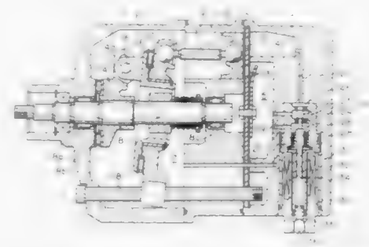
said response pressure adjusting means comprising an actuating rod and a solenoid actuator, said solenoid actuator including an electromagnetic coil, an iron core disposed within said coil, a conduit, and an interior chamber formed at one end of said iron core, said conduit linking said interior chamber with said discharge chamber, said actuating rod having one end disposed adjacent said iron core, said conduit linking said discharge chamber to said interior chamber to thereby adjust the position of said iron core within said coil, said valve control means comprising a longitudinally expanding and contracting bellows and a valve element attached at one end of said bellows, said bellows expanding and contracting to control the opening and closing of said passageway, said actuating rod linked to said valve element by an elastic element, said iron core applying a force to said actuating rod to cause said actuating rod to adjust the predetermined pressure at which said bellows responds to expand and contract, the pressure in said interior chamber acting to urge said iron core towards said actuating rod to lower the predetermined pressure at which said bellows responds.

5,145,326

VARIABLE CAPACITY WOBBLE PLATE TYPE COMPRESSOR WITH CAPACITY REGULATING VALVE

Kazuya Kimura, and Kenji Takenaka, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jun. 13, 1990, Ser. No. 537,434
Claims priority, application Japan, Jun. 16, 1989, 1-155541
Int. Cl.[5] F04B *1/28*
U.S. Cl. 417—222.2 2 Claims



1. A variable capacity wobble plate type compressor adapted for use in an air-conditioning circuit of a car comprising:

a housing element having therein a suction chamber for a refrigerant gas before compression and a discharge chamber for a refrigerant gas after compression;

a cylinder block defining therein a plurality of cylinder bores arranged so as to surround an axial shaft and having therein associated reciprocatory pistons disposed so as to draw the refrigerant gas from the suction chamber and to then discharge the refrigerant gas after compression into the discharge chamber;

a crankcase having defined therein a drive plate mounted in such a manner that it is capable of rotating with the drive shaft as well as changing an inclination thereof with respect to the drive shaft and a non-rotatable inclinable wobble plate held by the drive plate in response to a difference between pressures in the chamber of the crankcase and the suction chamber;

a plurality of connecting rods connected between the wobble plate and the pistons;

a gas supply passageway means for fluidly communicating said chamber of said crankcase with said discharge chamber of said housing element to thereby supply said chamber of said crankcase with said refrigerant gas from said discharge chamber;

a gas evacuation passageway means for fluidly communicating said chamber of said crankcase with said suction chamber of said housing element to thereby permit an evacuation of said refrigerant gas from said chamber of said crankcase to said suction chamber;

a capacity regulating valve means for controlling the supply of said refrigerant gas from said discharge chamber to said chamber of said crankcase, said capacity regulating valve means comprising a casing, a regulating valve element arranged in said gas supply passageway means for regulating a communication between said discharge chamber and said chamber of said crankcase via said gas supply passageway, and a pressure sensing means connected to said regulating valve element for moving said regulating valve element in response to a change in one of pressures in said suction chamber, said discharge chamber, and said chamber of said crankcase with respect to a given set pressure, said regulating valve element comprising a valve element moved toward and away from a valve port of a valve seat fixedly arranged in a gas supply passageway means, and a valve support rod connecting said valve element to said pressure sensing means, said pressure sensing means being arranged in a pressure sensing chamber defined in said casing of said capacity regulating valve means and com-

municated with said discharge chamber and said valve element moved toward and away from said valve port of said valve seat being arranged to be moved toward and away from a different valve port of an additional valve seat fixedly arranged in said evacuation passageway means, said valve port and said different valve port being arranged to oppose one another along an axis of movement of said valve element whereby, when a valve port in said gas supply passageway means is opened by said valve element, another valve port in said gas evacuation passageway means is closed by said valve element; and

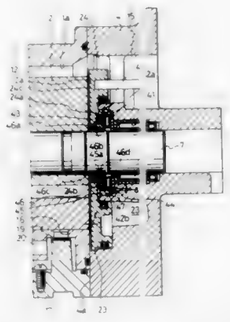
an external force applying means connected to said pressure sensing means of said capacity regulating valve means to apply an external force to said pressure sensing means in response to an externally provided signal, to thereby variably adjust said given set pressure.

5,145,327

VARIABLE CAPACITY VANE COMPRESSOR HAVING AN IMPROVED BEARING FOR A CAPACITY CONTROL ELEMENT

Nobuyuki Nakajima, and Tatsuo Nakaya, both of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,414
Claims priority, application Japan, Apr. 11, 1990, 2-95333
Int. Cl.[5] F04B *49/00* **417** *295, 310*
U.S. Cl. 417—295 **4 Claims**



1. In a variable capacity vane compressor including a drive shaft, a rotor rigidly mounted on said drive shaft, a cylinder in which said rotor is rotatably received, said cylinder having a pair of side blocks, said side blocks each having formed therein a hole through which said drive shaft extends, a radial bearing mounted in said hole for supporting said drive shaft, one of said side blocks having an end face facing said rotor and having a first annular recess formed therein, a capacity control element rotatably fitted in said first annular recess for controlling timing of start of compression of a refrigerant gas in said compressor, said capacity control element having an end face remote from said rotor, and a hole through which said drive shaft extends, said hole of said one side block having a second annular recess formed in an inner peripheral surface thereof, said second annular recess having a first wall facing toward said rotor and a second wall facing toward said drive shaft, and bearing means comprising a thrust bearing received in said second annular recess and interposed between said end face of said control element remote from said rotor and said first wall of said second annular recess, said thrust bearing having first and second races, the improvement comprising:

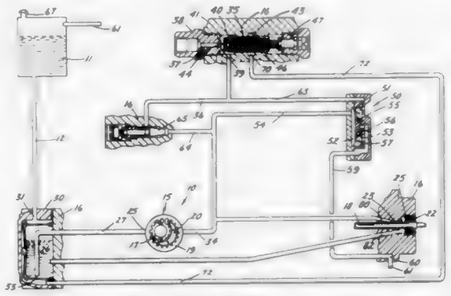
an annular member force-fitted in said second wall of said second annular recess to urge said first race of said thrust bearing against said first wall of said second annular recess, said annular member having an inner peripheral surface in which said second race of said thrust bearing is slidably fitted, said second race being force-fitted in said hole of said capacity control element, said first and second races having respective inner peripheral surfaces thereof spaced from an outer peripheral surface of said drive shaft.

5,145,328

FUEL SUPPLY UNIT FOR AN OIL BURNER

Frank L. Harwath, Rockford, Ill., assignor to Suntec Industries Incorporated, Rockford, Ill.

Filed Oct. 11, 1991, Ser. No. 774,845
Int. Cl.[5] F04B *49/02*
U.S. Cl. 417—299 **3 Claims**



1. A fuel supply unit for an oil burner and comprising a pump having an intake line adapted to communicate with a fuel storage tank, said pump having a reservoir for receiving fuel from said intake line, said pump having fuel supply passage means and being operable to pressurize fuel from said reservoir and to deliver pressurized fuel to said supply passage means, burner passage means, a main regulating valve normally closing said burner passage means and operable when opened to permit fuel to flow from said supply passage means to said burner passage means, said regulating valve being opened automatically when the flow in said supply passage means reaches a predetermined value, control valve means responsive to flow in said supply passage means and operable to vent fuel and air from said supply passage means until the flow in said supply passage means reaches a predetermined value, means communicating with said control valve means and operable to return fluid vented from said supply passage means to the tank, and bypass passage means adapted to communicate with said supply passage means and operable, when said regulating valve is open, to receive excess fuel from said supply passage means, said bypass passage means communicating with said reservoir downstream of said intake line whereby excess fuel is returned directly to said reservoir without passing through the tank.

5,145,329

HOMOPLANAR BRUSHLESS ELECTRIC GEROTOR

Steven J. Zumbusch, Eden Prairie, Minn., and Walter K. O'Neil, Birmingham, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 29, 1990, Ser. No. 546,625
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—356 **16 Claims**

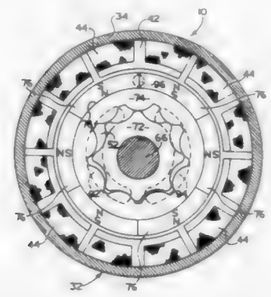
3. A gerotor pump comprising:

a housing defining a substantially closed cavity, a fluid inlet port and a fluid outlet port,

inner and outer gerotor pump gears eccentrically disposed for relative rotation within said cavity whereupon a working fluid received at said inlet port at low pressure is discharged from said outlet port at a high pressure;

a plurality of circumferentially aligned permanent magnets carried by said outer gear for rotation therewith;

stator means including windings circumferentially encompassing and radially spaced from said permanent magnets for electromagnetic interaction therewith to effect said rotation upon the electrical energization of said windings; and



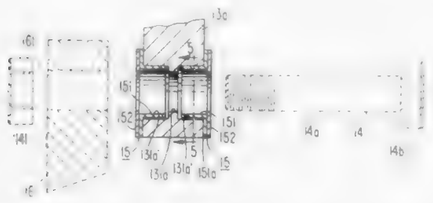
said inner and outer gerotor gears being formed of non-ferrous material, said outer gerotor gear including a ferrous material band disposed between said outer gear and said permanent magnets.

5,145,330

COMPRESSOR HOUSING HAVING A STRUCTURE FOR PREVENTING THE SLIPPAGE OF VIBROISOLATING MEMBERS

Yuji Uchiyama, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 400,002, Aug. 29, 1989. This application Sep. 24, 1991, Ser. No. 764,064
Claims priority, application Japan, Sep. 13, 1988, 63-119379[U]
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—363 **21 Claims**



1. A compressor mount for mounting a compressor in a motor vehicle engine compartment, said compressor including a compressor housing and said engine compartment including a mounting member, said compressor mount comprising:

fastening means for fastening said compressor housing to said mounting member;

at least one bracket formed as an integral part of said compressor housing, said at least one bracket including a first opening;

a bushing disposed in the first opening of said at least one bracket, a flange portion formed at a first end of said bushing and disposed adjacent an outer surface of said at least one bracket so as to define a second opening through which said fastening means may be received therethrough; and

a vibration isolating member affixed to said flange portion of said bushing such that compressor vibrations are isolated to said compressor when said fastening means is disposed within said second opening so as to fasten said compressor housing to said motor vehicle engine compartment;

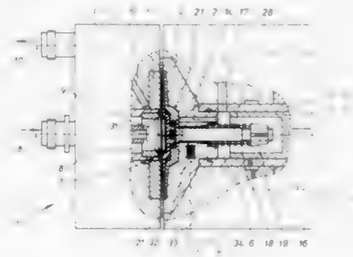
wherein said fastening means comprises a bolt means, said bushing including at least one axial ridge formed at an outer peripheral surface, said at least one axial ridge allowing said bushing to rotate with said bolt means when the torque of said bolt means exceeds a predetermined value.

5,145,331

DIAPHRAGM PUMP

Wilfried Goes, Meersburg, and Gerhard Gebauer, Bermatingen, both of Fed. Rep. of Germany, assignors to J. Wagner GmbH, Fed. Rep. of Germany

Filed Jul. 29, 1991, Ser. No. 737,426
Int. Cl.[5] F04B *43/06;* **F01B** *25/26*
U.S. Cl. 417—383 **13 Claims**



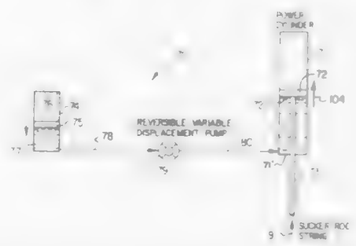
1. A diaphragm pump comprising a diaphragm that has its outer edge region clamped in a pump housing and that can be driven in oscillating fashion by a hydraulic medium, a conveying chamber of the diaphragm pump being separated by said diaphragm from a drive chamber that accepts the hydraulic medium, whereby the diaphragm is composed of two diaphragm disks arranged at an axial distance from one another and enclosing an interior space whose size is variable given damage to one of the diaphragm disks, comprising a signal generator arranged in that diaphragm disk facing toward the conveying chamber and a signal pick-up arranged in the pump housing in the region of the drive chamber, said signal pick-up being connected to a means for the electronic evaluation and amplification of signals output by said signal pick-up.

5,145,332

WELL PUMPING

William M. Bohon, Frisco, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

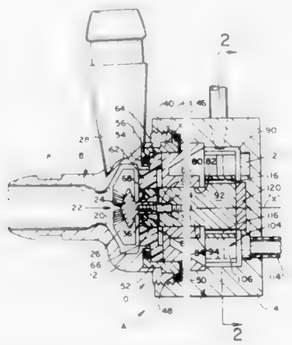
Filed Mar. 1, 1991, Ser. No. 662,594
Int. Cl.[5] F04B *9/08, 17/00*
U.S. Cl. 417—390 **13 Claims**



1. In apparatus for pumping a fluid from at least one geologic zone below the earth's surface through a wellbore that extends from at least said geologic zone to the earth's surface using at least one reciprocating downhole pump means in said wellbore, said downhole pump means being carried by elongate means which extends in said wellbore from said downhole pump means to the earth's surface, said downhole pump means and elongate means being reciprocated by a pumping unit located at or near the earth's surface, the improvement com-

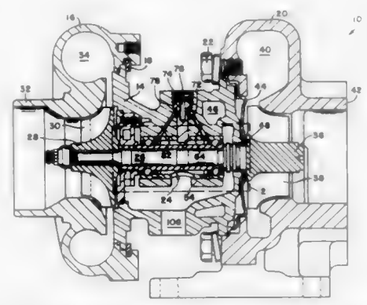
prising at least one hydraulic pump means in said pumping unit to reciprocate said elongate means and downhole pump means in said wellbore, said hydraulic pump means comprising at least one hydraulically actuated power cylinder means having first and second ends and a piston means therein, said piston means having first and second sides and being connected to said elongate means at the opposite end of said elongate means from said downhole pump means, at least one variable displacement hydraulic pump operably connected to said power cylinder means to pump hydraulic fluid into and out of said power cylinder means and move said piston means thereby to reciprocate said elongate means and downhole pump means in said wellbore.

5,145,333
FLUID MOTOR DRIVEN BLOOD PUMP
William A. Smith, Lyndhurst, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio
Filed Mar. 1, 1990, Ser. No. 486,953
Int. Cl.[5] F04D 7/00
U.S. Cl. 417—405 11 Claims



1. A rotary blood pump comprising
a housing having an inlet and outlet in fluid communication with a pump chamber;
an impeller operatively received in said chamber for rotation about a first axis, said impeller conveying blood from said inlet to said outlet;
a fluid motor means operatively associated with the impeller for imparting rotary movement thereto about the first axis;
a first fluid line adapted to convey pressurized fluid from an associated source to said fluid motor means;
a second fluid line adapted to convey fluid from said fluid motor means;
said fluid motor means including a rotary member having a plurality of cupped surfaces disposed along the periphery thereof and disposed adjacent said first fluid line for rotation in response to the pressurized fluid from the associated source, said cupped surfaces directing pressurized fluid toward axially opposite sides of the rotary member; and
means for conveying fluid flow in directions generally parallel to the first axis from one side of the rotary member to the other, said conveying means being defined by passages extending through said rotary member.

5,145,334
TURBOCHARGER BEARING RETENTION AND LUBRICATION SYSTEM
Daniel A. Gutknecht, Torrance, Calif., assignor to Allied-Signal Inc., Morristown, N.J.
Division of Ser. No. 449,279, Dec. 12, 1989, Pat. No. 5,076,766.
This application Oct. 18, 1991, Ser. No. 781,527
Int. Cl.[5] F04B 17/00
U.S. Cl. 417—407 5 Claims

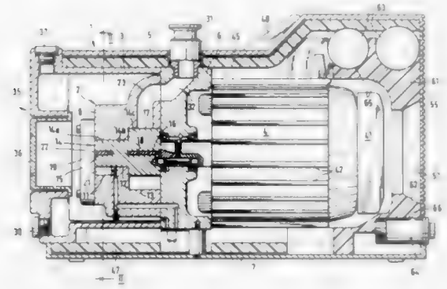


1. Exhaust gas driven turbocharger comprising a housing, a shaft within said housing having an axis and a pair of ends, a compressor wheel mounted within said housing on one end of the shaft for rotation therewith, a turbine wheel mounted within said housing on the other end of the shaft for rotation therewith, means for communicating air to said compressor wheel, means for communicating exhaust gas to the turbine wheel to cause the latter to rotate the shaft and the compressor wheel mounted thereon to compress the air communicated to the compressor wheel, and bearing means mounting said shaft for rotation relative to the housing, said bearing means including a bearing outer ring, a bearing inner ring, and ball bearing elements supporting the bearing outer ring on the bearing inner ring, lubrication passage means for supplying lubricating fluid to said bearing elements, said lubrication passage means including a circumferentially extending groove in said outer bearing ring circumscribing the latter, said bearing outer ring cooperating with said housing to define a circumferentially extending intersticial space about said bearing outer race receiving a film of lubricating fluid from said groove to dampen movement of said bearing means, said outer ring engaging axially spaced sets of said bearing elements and includes a pair of said grooves and a pair of said feed passages for feeding lubricating fluid from a corresponding groove to a corresponding set of said bearing elements, each of said grooves being located between its corresponding set of bearing elements and the other groove, said bearing outer ring extending between said grooves and including means cooperating with the housing to inhibit communication of lubricating fluid from one groove to another.

5,145,335
LOW-NOISE VACUUM PUMP
Thomas Abelen; Hans-Peter Berges; Gustav Boley, and Winfried Kaiser, all of Cologne, Fed. Rep. of Germany, assignors to Leybold AG, Hanau, Fed. Rep. of Germany
Filed May 24, 1991, Ser. No. 704,524
Claims priority, application Fed. Rep. of Germany, May 29, 1990, 4017193
Int. Cl.[5] F04B 17/00
U.S. Cl. 417—410 7 Claims

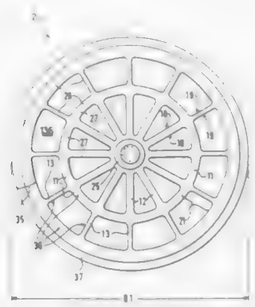
1. A vacuum pump comprising
(a) a first pump housing defining a pumping chamber;
(b) a pump rotor received in the pumping chamber;
(c) a drive motor operatively connected to said pump rotor and having an outer surface;

(d) an oil casing receiving said first pump housing and having an outer surface;
(e) a second pump housing surrounding said first pump housing and said drive motor; said second pump housing having inner wall faces and an air inlet opening;
(f) a blower operatively connected to said drive motor and being arranged at a side thereof facing away from said first pump housing; said air inlet opening of said second pump housing facing said blower;
(g) cooling ribs provided on said outer surfaces of said drive motor and said oil casing; said cooling ribs forming, with said inner wall faces of said second pump housing, channels for guiding cooling air drawn in through said inlet opening by said blower; and



(h) a shaped component disposed about said blower and surrounded by said second pump housing; said shaped component including means for positively guiding cooling air drawn in through said inlet opening by said blower; said shaped component being of an electrically insulating material and comprising cutouts for accommodating electric components; said cutouts, together with said inner wall faces of said second pump housing, defining cavities for form-fittingly receiving and supporting electric components therein.

5,145,336
DIAPHRAGM PUMP WITH REINFORCED DIAPHRAGM
Erich Becker, and Heinz Riedlinger, both of Bad Krozingen, Fed. Rep. of Germany, assignors to KNF Neuberger GmbH, Freiburg-Munzingen, Fed. Rep. of Germany
Filed Mar. 4, 1991, Ser. No. 664,536
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4007932
Int. Cl.[5] F04B 45/04
U.S. Cl. 417—413 39 Claims



20. A pump comprising a housing including a first section and a second section, said first section having an inner side facing said second section, a fluid-admitting inlet and a fluid-discharging outlet; a contoured deformable diaphragm including an annular marginal portion which is sealingly received between said sections, a central portion and an annular intermediate portion between said central and marginal portions, said diaphragm having a first side defining with said inner side a pumping chamber which communicates with said inlet and said outlet and a second side facing away from said first section; and means for moving said central portion between a first position in which said first side is closely adjacent and at least substantially conforms to said inner side is remote from said inner side, said intermediate portion including an annular flexure zone where said diaphragm is flexed during movement of said central portion between said positions and stabilizing means provided at said second side and including a portion disposed between said flexure zone and at least one of said central and marginal portions, said flexure zone including an annular protuberance at the second side of said diaphragm

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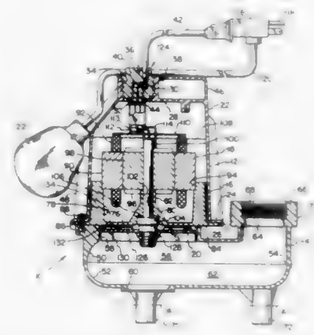
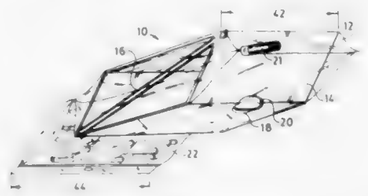
5,145,337
SEWAGE PUMP
Dan R. Kirkland, Fort Wayne, Ind., assignor to Wayne/Scott Fetzer Company, Fort Wayne, Ind.
Filed Aug. 10, 1990, Ser. No. 566,050
Int. Cl.[5] F04B 17/00, 35/04
U.S. Cl. 417—423.3 18 Claims



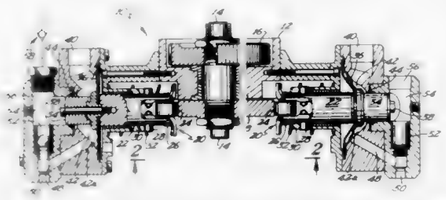
1. A sewage pump comprising:
an upper housing;
an electric motor mounted in said upper housing and having a rotary shaft extending therefrom;
a volume mounted to said upper housing, said volute including an inlet aperture and a pump outlet;
said pump outlet terminating in an annular threaded connection, said annular threaded connection having internal threads and external threads, whereby said annular threaded connection can be engaged with one of two alternatively selectable outlet pipes of different sizes, wherein one of said outlet pipes has external threads corresponding to the internal threads of said annular threaded connection and the other of said outlet pipes has internal threads corresponding to the external threads of said annular threaded connection;
said pump volute, including said annular threaded connection, being constructed of plastic; and
an impeller rotatably mounted in said volute and connected to said rotary shaft of said electric motor for rotation therewith, said impeller generating a flow in said volute to draw sewage in through said inlet aperture and expel sewage through said pump outlet.

5,145,338
LOW PRESSURE FLUID PUMP
Robert H. Murray, 52 Manor Hill Dr., Fairport, N.Y. 14450
Filed Dec. 12, 1990, Ser. No. 626,183
Int. Cl.[5] F04B *43/00*
U.S. Cl. 417—480 11 Claims



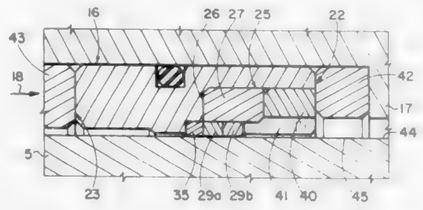
1. A low pressure fluid pump, including:
a flexible envelope having top and bottom faces defining a pump chamber therebetween;
an articulate frame disposed within said envelope and responsive to external pressure applied to said envelope to move from an expanded configuration and a maximum volume of said pump chamber, to a collapsed configuration and a minimum volume of said pump chamber; and
elastic means to return said frame to said expanded configuration;
said envelope defining an intake aperture in the bottom face thereof;
said envelope, in cooperation with a smooth supporting surface, effective to seal said aperture when pressure is applied to the top of said envelope, and to unseal said aperture to admit fluid into said chamber when said pressure is removed.

5,145,339
PULSELESS PISTON PUMP
Kenneth E. Lehrke, Maple Grove, and Bruce A. McFadden, Orono, both of Minn., assignors to Graco Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 391,097, Aug. 8, 1989. This application Nov. 8, 1990, Ser. No. 610,841
Int. Cl.[5] F04B *21/00, 23/04, 39/10*; F01B *31/00*
U.S. Cl. 417—521 16 Claims



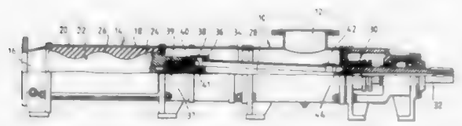
1. A fluid pump for providing substantially pulseless output comprising;
a plurality of piston-cylinder combinations;
cam means for driving each said piston in each said cylinder, said cam means driving each said piston in each said cylinder in a reciprocating motion alternating between intake strokes and pumping strokes, said intake strokes and said pumping strokes being divided by a changeover point, said cam means driving said pistons such that at least one said piston is in said pumping stroke at all times and the sum of the velocities of said pistons in said pumping strokes is substantially constant at any given speed of said cam means;
a housing;
a high-pressure seal between said piston and said cylinder for sealing material to be pumped, said piston remaining in contact with said seal at all times;
a sealing diaphragm attached to said housing and said piston intermediate said high pressure seal and said cam means and forming a chamber therebetween and constructed to contain any material that might leak past said high pressure seal and as a barrier between the material to be pumped and the environment, said chamber being sealed from the environment; and
inlet check valves, said cam means increasing said velocity sum relative to said constant prior to said changeover point to create a compensating motion overlap so as to compensate for the nonlinearity of pump output during seating of said check valves.

5,145,340
PACKING FOR PISTON AND VALVE MACHINE
Pierre-Yves Allard, Fonsorbes, France, assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Jun. 21, 1991, Ser. No. 718,486
Claims priority, application France, Jun. 25, 1990, 90 08197
Int. Cl.[5] F04B *21/00*; B65D *53/00*; B67D *5/378*
U.S. Cl. 417—568 15 Claims



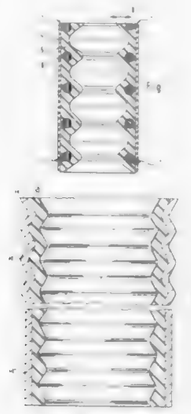
7. Piston and valve machine, of the pump or compressor type, comprising a body defining, on the one hand, a pressurization chamber (**4**) equipped with an inlet valve (**12**) and a delivery valve (**13**) and, on the other hand, a cylinder (**3**) communicating with the chamber and containing a sliding piston (**5**), said cylinder comprising, on a part of its length, a first recess (**16**) of larger diameter adapted to contain, bearing against a shoulder (**17**) which it defines in its connection zone with the cylinder, a packing (**15**) clamped by a nut (**18**) and adapted to cooperate locally with the peripheral surface of the piston, characterized in that said packing comprises:
an annular metal body (**20**) immobilized in the recess (**16**) against the shoulder (**17**) by a clamping nut (**18**) and comprising, in its internal peripheral face, an annular second recess formed from the transverse face (**22**) of the ring directed towards the pressurization chamber (**4**),
a gasket holding an stress ring (**27**) disposed in the second recess while being immobilized against the bottom (**26**) thereof and having a radial thickness (e) less than the depth (p) of the second recess,
a gasket (**28**) formed by at least two packing rings (**29**) side by side, deformable radially, immobilized angularly in the gasket holding ring and whose slits (**30**) are offset angularly and whose thickness (e') is greater than that complementary to the thickness of the gasket holding ring to equal the depth of the second recess, so as to cooperate alone with the external peripheral face of the piston,
and a stop ring (**35**) bearing against the bottom of the second recess on which the basket (**28**) bears and whose internal diameter is greater than that of said gasket.

5,145,341
PROTECTIVE SHROUD FOR THE SHAFT OF A HELICAL GEAR PUMP
John Drane, Cheshire, United Kingdom, assignor to Mono Pumps Limited, Audenshaw, United Kingdom
Filed May 31, 1991, Ser. No. 707,128
Claims priority, application United Kingdom, May 31, 1990, 9012158
Int. Cl.[5] F04C *18/22*
U.S. Cl. 418—48 3 Claims



1. A helical gear pump comprising a fixed pump housing, an inlet or outlet port to or from said pump housing, a stator associated with one end of said pump housing and having a female helical gear formation having n starts, an outlet or inlet port at the end of the stator remote from the fixed pump housing, a rotor rotatable and orbital within said female helical gear formation and having n±1 starts, a drive shaft connected to drive said rotor, said drive shaft passing through said fixed pump housing, a rigid tubular shroud surrounding said drive shaft, first and second ends to said rigid tubular shroud, means mounting said shroud at said first end thereof remote from said stator and rotor, an annular seal between said rotor and said tubular shroud at said second end, said annular seal bearing on the outer or inner surface of said second end portion of the tubular shroud, and an annular connection between said first end of the shroud and said pump housing to accommodate the resulting orbiting motion of the tubular shroud, said annular connection surrounding the drive shaft and being sealingly affixed to both the shroud and the pump housing so as to constrain the shroud against rotation.

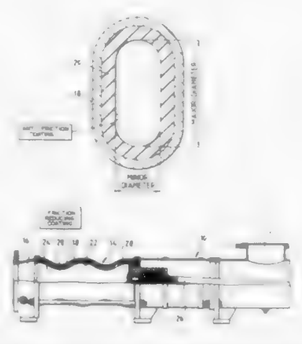
5,145,342
STATOR FOR ECCENTRIC SPIRAL PUMP
Heinz Gruber, Seesen/Rhüden, Fed. Rep. of Germany, assignor to Go-Anker GmbH, Seesen/Rhüden, Fed. Rep. of Germany
Filed Feb. 27, 1991, Ser. No. 662,108
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 40063399
Int. Cl.[5] F04C *2/107, 5/00*
U.S. Cl. 418—48 13 Claims



1. A stator for an eccentric spiral pump, comprising a metallic casing; an insert located inside said metallic casing, said insert being formed as a coating of a rubber-elastic material and having an inner surface with a thread-like profile; and a plurality of windings which are embedded in said insert and reproduce said thread-like profile of said insert.

9. A stator for an eccentric spiral pump, comprising a metallic casing; an insert located inside said metallic casing, said insert being formed as a coating of a rubber-elastic material and having an inner surface with a thread-like profile, said casing having an inner surface with one surface part provided with a thread-like profile and another surface part having a cylindrical inner surface.

5,145,343
HELICAL GEAR PUMP AND STATOR WITH CONSTANT RUBBER WALL THICKNESS
Ian R. Belcher, Cheshire, United Kingdom, assignor to Mono Pumps Limited, Audenshaw-Manchester, United Kingdom
Filed May 31, 1991, Ser. No. 707,125
Claims priority, application United Kingdom, May 31, 1990, 9012134
Int. Cl.[5] F04C *2/107, 5/00*
U.S. Cl. 418—48 5 Claims



1. A helical gear pump stator comprising a rigid metal barrel having an inner surface defining a female helical gear formation thereon; a resilient stator body having a corresponding female helical gear formation thereon to that of said barrel and defining major and minor diameters, said stator body being formed of a synthetic rubber and being molded into said metal barrel, effective to produce a substantially constant wall thickness of said synthetic rubber and the surface of said female helical gear formation being subjected to an integrally formed anti-friction coating.

5,145,344
SCROLL-TYPE FLUID MACHINERY WITH OFFSET PASSAGE TO THE EXHAUST PORT
Shuji Haga, and Masatomo Tanuma, both of Yokohama, Japan, assignors to Iwata Air Compressor Manufacturing Co. Ltd., Tokyo, Japan
Filed Feb. 13, 1991, Ser. No. 654,184
Claims priority, application Japan, Feb. 13, 1990, 2-29428; Mar. 23, 1990, 2-72040
Int. Cl.[5] F04C *18/04*
U.S. Cl. 418—55.2 1 Claim

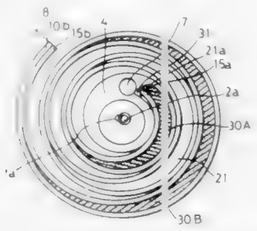
1. A scroll-type fluid machine comprising:
an orbiting scroll with first and second involute wraps projecting axially on each of opposite sides thereof;
first and second stationary scrolls each with an involute wrap which mates with a respective one of said first and second wraps of said orbiting scroll, said stationary scroll wraps having internal ends which extend to an outer peripheral wall of a central land part of the respective

stationary scrolls, and said land parts having a central axis hole formed therein; and

a main shaft disposed in said central axis hole for driving said orbiting scroll in orbital movement;

wherein said stationary scroll wraps are extended about a half turn longer than the wraps of the orbiting scroll;

wherein ends of said orbiting scroll wraps are almost in end to end contact with corresponding ends of the mating



stationary scroll wraps at a desired phase during the orbital movement of said orbiting scroll, and

wherein the outer peripheral wall of the land part and the involute wrap of each stationary scroll define a scroll groove with an inner dead end, and an exhaust port is formed in said land part connected to said scroll groove dead end through a passage opening at a position on said land part outer periphery disposed inwardly of a central involute line in said scroll groove.

5,145,345

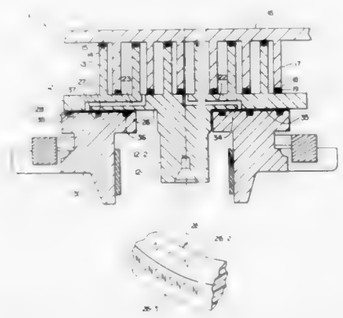
MAGNETICALLY ACTUATED SEAL FOR SCROLL COMPRESSOR

Thomas R. Barito, East Syracuse, and Howard H. Fraser, Jr., Lafayette, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 452,287, Dec. 18, 1989, Pat. No. 5,040,956. This application Mar. 4, 1991, Ser. No. 664,193

Int. Cl.[5] F04C *18/04, 27/00;* **F16J** *15/20*

U.S. Cl. 418—55.4 **17 Claims**



1. Magnetically actuated seal structure for continuously providing a fluid seal between two relatively axially displaceable members which have a contacting position and a separated position where a first one of said two members is of a magnetic material comprising:

groove means in a second one of said two members having vertical walls and having a depth;

seal means in said groove means having a shape conformable to said groove means;

said seal means having opposing first and second sides with only said first one of said first and second sides being magnetized and said first side defining a first magnetized surface defined by a plurality of alternating north and south poles on said first surface facing said first one of said two members whereby said first magnetized surface of said seal means remains in engagement with said first one of said two members even when they are axially displaced to provide a continuous fluid seal.

5,145,346

SCROLL TYPE FLUID MACHINERY HAVING A TILT REGULATING MEMBER

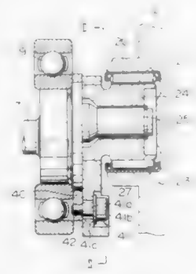
Takayuki Iio, and Ryuhei Tanigaki, both of Nishikasugai, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1991, Ser. No. 713,057

Claims priority, application Japan, Dec. 6, 1990, 2-401481[U]

Int. Cl.[5] F01C *1/04, 17/06*

U.S. Cl. 418—55.5 **4 Claims**



1. A scroll type fluid machinery comprising a stationary scroll and a revolving scroll both having end plates with inner and outer surfaces, spiral wraps being provided on the inner surfaces of the end plates of both the stationary scroll and the revolving scroll, the spiral wraps being engaged with each other, a boss of said end plate on said revolving scroll, a drive bushing being inserted rotatably into said boss which is projected at a central part of the outer surface of the end plate of said revolving scroll, an eccentric driving pin projected at an end of a rotary shaft being fitted slidably into a slide groove which is bored in said drive bushing, and a balance weight for balancing dynamic unbalance caused by revolution in a solar motion of said revolving scroll being provided on said drive bushing, a tilted rotation regulating member projecting from the end of said rotary shaft penetrates through a hole which is bored in said balance weight, the hole having a size which allows sliding of said drive bushing, and a regulating surface being in slidable contact with an end surface of said balance weight being provided at a tip of said tilted rotation regulating member.

5,145,347

GEROTOR PUMP WITH BLIND-END GROOVE ON EACH LOBE OF THE ANNULUS

Richard R. Freeman, Alcester, England, assignor to Concentric Pumps Limited, England

Filed Jun. 26, 1991, Ser. No. 721,274

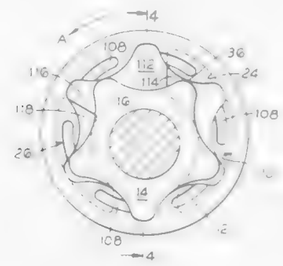
Claims priority, application United Kingdom, Jun. 30, 1990, 9014601

Int. Cl.[5] F04C *2/10*

U.S. Cl. 418—77 **9 Claims**

1. A gerotor pump comprising an annulus having n+1 female lobes mounted for rotation in one direction about a first axis in a pump body with an outlet port formed in a face adjacent to an axial end of the annulus and an inlet port formed in a face adjacent to an axial end of the annulus, a male rotor having n lobes mounted for rotation about a second axis parallel to the said first axis, said rotor being meshed with said annulus so as to form a series of n working chambers between the lobes which chambers increase and decrease in volume as

the parts rotate through successive half revolutions, each chamber being bounded by lines of contact between the lobes, and characterized in that the end face of the annulus adjacent the pump body face which is provided with one of said ports



has a blind-end groove extending in a circumferencial direction part-way across each lobe, and wherein each of the blind-end grooves is positioned in the annulus to allow fluid to flow between a working chamber and one of said ports when the working chamber is not registered with the port.

5,145,348

GEROTOR PUMP HAVING AN IMPROVED DRIVE MECHANISM

Steven J. Zumbusch, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 15, 1991, Ser. No. 700,295

Int. Cl.[5] F04C *15/02*

U.S. Cl. 418—171 **9 Claims**

1. A pump of the type including housing means defining a fluid inlet, a fluid outlet, and a pumping chamber; said pump further including a pumping element disposed in said pumping chamber and motor means adapted to transmit drive torque to said pumping element by means of a drive shaft; said pumping element comprising an internally-toothed rotor having a first axis of rotation and a plurality of internal teeth, and an externally-toothed rotor having a second axis of rotation and a plurality of external teeth, said externally-toothed rotor being eccentrically disposed within said internally-toothed rotor to define a plurality of expanding and contracting fluid volume chambers as each of said internally-and externally-toothed rotors rotates about its respective axis of rotation; said housing means defining a passage means communicating between said fluid inlet and said expanding fluid volume chambers and passage means communicating between said contracting fluid volume chambers and said fluid outlet; said drive shaft defining a third axis of rotation disposed to coincide substantially with said second axis of rotation of said externally-toothed rotor; characterized by:

(a) said drive shaft including a pair of axially-extending drive members disposed diametrically about said third axis of rotation of said drive shaft, each of said drive members including a drive surface;

(b) said externally-toothed rotor including a pair of driven recesses disposed diametrically about said second axis of rotation of said externally-toothed rotor, each of said driven recesses including a driven surface;

(c) one of said drive surface and said driven surface defining a portion of a cylinder having its axis extending substantially parallel to said axes of rotation, and the other of said drive surface and said driven surface defining a flat plane being substantially coincident with one of said second and third axes of rotation.

5,145,349

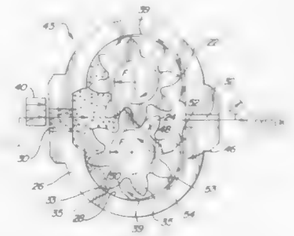
GEAR PUMP WITH PRESSURE BALANCING STRUCTURE

James R. McBurnett, Greer, S.C., assignor to Dana Corporation, Toledo, Ohio

Filed Apr. 12, 1991, Ser. No. 684,618

Int. Cl.[5] F04C *2/08*

U.S. Cl. 418—206 **4 Claims**



1. A gear pump comprising:

a casing having an internal surface defining a pump chamber, said pump chamber being formed of two pump chamber halves, each of said pump chamber halves defined by generally cylindrical surface portions on said internal surface centered about respective axes at a radial distance;

a pair of gears, with one of said gears being mounted in each of said pump chamber halves, said gears being rotatable about said respective axes, said gears having gear teeth at their outer peripheries and said gear teeth of said respective gears meshing at locations between said axes;

an inlet extending into said pump chamber on one side of a plane defined by said axes, an outlet extending out of said pump chamber on the opposed side of said plane, said plane intersecting said casing to define center lines, said pump chamber halves being configured such that said internal surface is non-cylindrical having a groove at a distance away from said axes greater than said radial distance in a region beginning near said center line and slightly toward said inlet, and moving in a direction towards said outlet, said grooves extending over at least half of the axial length of said gears to define a clearance; and

said internal surfaces both extend inwardly from said grooves at positions axially beyond each end of said gears, and define support surface approximately at said radial distance from said axes.

5,145,350

OZONE GENERATOR

James L. Dawson, Portland, and Bruce R. Searle, Amity, both of Oreg., assignors to CleanTech International, Inc., Portland, Oreg.

Filed Jan. 25, 1991, Ser. No. 646,162

Int. Cl.[5] B01J *19/08, 19/12*

U.S. Cl. 422—186.15 **11 Claims**

1. An ozone generator comprising:

a power supply having first and second line terminals for connection to a source of alternating current and also having first, second and third d.c. output terminals,

a transformer comprising a primary winding having a first

end connected to the first d.c. output terminal and also having a second end, and the transformer also comprising a second winding having two opposite ends,

a controllable switch defining a current path between first and second electrodes, one of which is an anode and the other of which is a cathode, the first electrode of the switch being connected to the second d.c. output terminal and the second electrode of the switch being connected to the second end of the primary winding, the switch having a control electrode for controlling the state of the current path,

a relaxation oscillator connected to the control electrode of the switch for periodically supplying charge to the control electrode for placing the current path in a conductive state,

a conversion cell having first and second electrodes connected to the opposite ends respectively of the secondary winding of the transformer,

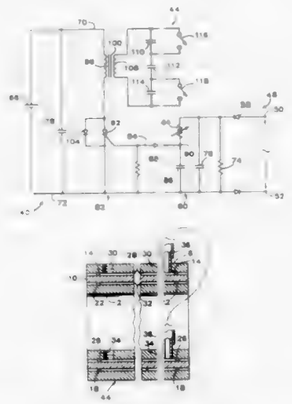
a diode whose cathode is connected to the third d.c. output terminal, and

a relay having a switched path connected between the first line terminal and the anode of the diode.

5. An ozone generator comprising:

a power supply having first and second d.c. output terminals,

a transformer comprising a primary winding having a first



end connected to the first d.c. output terminal and also having a second end, and the transformer also comprising a secondary winding having two opposite ends,

a controllable switch defining a current path between first and second electrodes, one of which is an anode and the other of which is a cathode, the first electrode of the switch being connected to the second d.c. output terminal and the second electrode of the switch being connected to the second end of the primary winding, and

a conversion cell comprising a first annular electrode connected to one of the two opposite ends of the secondary winding of the transformer and having a right cylindrical internal surface, a second annular electrode connected to the other end of the secondary winding and having a right cylindrical external surface of smaller radius than the internal surface of the first annular electrode and substantially coaxial therewith, and an insulator sleeve having coaxial right cylindrical internal and external surfaces, the radius of the internal surface of the insulator sleeve being slightly greater than the radius of the external surface of the second annular electrode and the radius of the external surface of the insulator sleeve being slightly less than the radius of the internal surface of the first annular electrode, the insulator sleeve being disposed within the first annular electrode and the second annular electrode being disposed within the insulator sleeve whereby a first gas space is defined between the external surface of the insulator sleeve and the internal surface of the first annular electrode and a second gas space is defined between the internal surface of the insulator sleeve and the external surface of the second annular electrode, one of the first and second gas spaces receiving feed gas that contains oxygen and the firs gas space being in communication with the second gas space, and wherein the first annular electrode is formed in its internal surface with an annular groove at each end, the second annular electrode is formed in its external surface with an annular groove at each end, and the conversion cell further comprises O-rings fitted in the grooves respectively for sealing the gas spaces at opposite respective ends of the conversion cell.

5,145,351

APPARATUS FOR THE SHAPING OF ARTICLES OF HYGIENE

Guido Rossi, Zurich, Switzerland, assignor to Progesan SRL, Italy

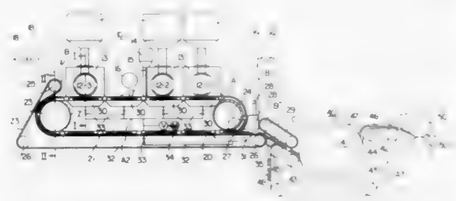
PCT No. PCT/EP90/00673, § 371 Date Feb. 8, 1991, § 102(e) Date Feb. 8, 1991, PCT Pub. No. WO90/13278, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 26, 1990, Ser. No. 651,341

Claims priority, application Switzerland, May 5, 1989, 1706/89; Jul. 24, 1989, 2757/89

Int. Cl.[5] B29C *43/02, 43/06*

U.S. Cl. 425—80.1 **22 Claims**



1. Apparatus for the shaping and thermal compacting of absorbent pads for absorbing body fluid, intended for articles of hygiene, which comprises:

at least one rotary belt having a conveying direction and including receptacles for at least one absorbent-pad layer;

trough-shaped molds over the length of the rotary belt spaced from one another;

shaping inserts which fit into said molds;

production devices along said at least one rotary belt arranged in succession in the conveying direction;

a thermal compacting device with at least one of a following calender and a following compacting device, said thermal compacting device including a heating cylinder with a pressure band engaging said cylinder and arranged in the conveying direction.

5,145,352

PIN TRANSFER EXTRUDER

Gerd Capelle, Langenhagen, and Gunther Meier, Hanover, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau, Hanover, Fed. Rep. of Germany

Filed Apr. 29, 1991, Ser. No. 693,221

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1990, 4039942

Int. Cl.[5] B01F *7/00*; B29C *47/00*

U.S. Cl. 425—205 **7 Claims**

1. An extruder for processing thermoplastic material, comprising:

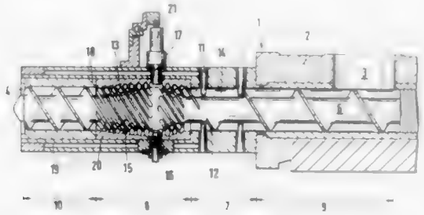
an elongated extruder housing defining a feed section in which a feed inlet is provided for feeding material to the extruder, and an outlet section having a material outlet

opening for discharging molten material under pressure from the extruder,

an extruder screw having a screw core and a helical flight, said screw being mounted for rotation in said housing about the longitudinal axis of said screw, said housing and said screw core defining therebetween a processing chamber, and means for driving said screw,

said housing further defining a pin-barrel section in which at least one row of pins extend radially inwardly to the housing through the processing chamber toward the core of said screw, said helical flight of said screw being interrupted in the regions of said pins so as to accommodate rotation of said screw in such region,

a transfer section defined by said housing and longitudinally adjacent to said pin-barrel section, the helical flight of said screw in said transfer section being constructed so that thread depth of the areas between adjacent flight sections first decreases toward zero and then increases from a feed side of the transfer section to an outlet side, and wherein



said housing in said transfer section is also formed with a helical flight generally aligned with the helical flight of said screw, said helical flight of said housing defining between adjacent flight sections thereof grooves which vary in depth and which are radially aligned with the areas between adjacent flight sections of said screw, the depth of said grooves between adjacent flight sections of said housing first increasing in the feed side of the transfer section to a region of maximum volume between flights, and then decreasing from such region of maximum volume to the outlet side, and being generally inversely proportional to the thread depth between radially adjacent flight sections of said screw, and

radially adjustable throttle pins mounted in said transfer section in the region of maximum thread volume and protruding through said housing into said processing chamber, and means for radially adjusting said throttle pins to vary the radial penetration thereof thereby varying the plasticizing effect in the transfer section.

5,145,353

DUAL ACTION MOLDING PRESS

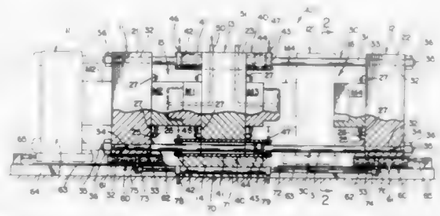
Paul Zakich, Akron, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 10, 1991, Ser. No. 712,782

Int. Cl.[5] B29C *45/04, 45/28*

U.S. Cl. 425—588 **21 Claims**

1. A molding press for simultaneously operating a pair of molds, each having a pair of mold sections, comprising, a single base means for mounting two horizontally displaced mold sections, each constituting one section of one of the pair of molds, first bolster means for mounting a mold section in alignment for mating engagement with one mold section on said base means, second bolster means for mounting a mold section in alignment for mating engagement with the other mold section on said base means, rod means for interconnecting said first bolster means and said second bolster means in fixed spaced relation, for guiding relative movement between said base means and said bolster means during opening and closing of the pair of molds, and for mounting piston means operatively interrelated with cylinder means on said base means, and means for effecting relative movement between said base means and said bolster means for opening of one of the pair of molds while closing the other of the pair of molds



and vice versa, said base means being fixedly mounted, and said bolster means being movably mounted.

5,145,354

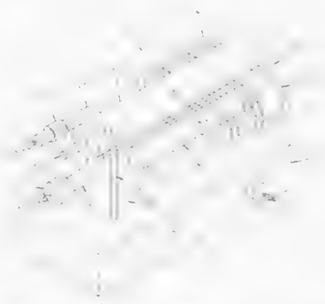
METHOD AND APPARATUS FOR RECIRCULATING FLUE GAS IN A PULSE COMBUSTOR

R. Bramley Palm, Jr., Oswego, N.Y., assignor to Fulton Thermatec Corporation, Pulaski, N.Y.

Filed Jun. 25, 1991, Ser. No. 720,633

Int. Cl.[5] F23C *11/04*

U.S. Cl. 431—1 **19 Claims**



1. A method for recirculating flue gas in a pulse combustor dedicated to deliberate one-stage pulse combustion, said method comprising the steps of:

introducing fuel into a single stage mixing zone of a single stage combustion chamber of the pulse combustor;

introducing air into the single stage mixing zone forming an air/fuel mixture in the single stage mixing zone;

generating pulse combustion in said single stage combustion chamber of the pulse combustor and thereby producing the flue gas;

exhausting the flue gas from the single stage combustion chamber; and

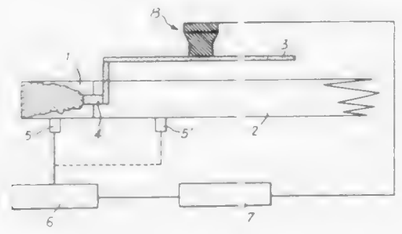
recirculating a portion of the flue gas from the single stage combustion chamber into the single stage mixing zone.

5,145,355

APPARATUS FOR ACTIVE MONITORING OF COMBUSTION INSTABILITY

Thierry Poinsot, Guyancourt; Francois Lacas, Antony; Jean Chambon, Massy; Denis Veynante, Antony, and Arnaud-Christophe Trouve, Paris, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Continuation of Ser. No. 370,004, Jun. 22, 1989, abandoned.
This application Apr. 17, 1991, Ser. No. 686,881
Claims priority, application France, Jun. 22, 1988, 88 08383; Mar. 6, 1989, 89 02902
Int. Cl.[5] F23N *5/16*
U.S. Cl. 431—1 8 Claims



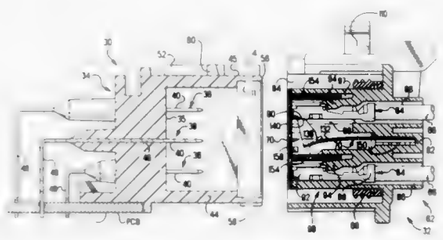
1. A pressure controlling apparatus in combination with a burner which comprises a combustion chamber and a fuel supply line, said apparatus comprising:
detection means in said combustion chamber for issuing a signal representative of pressure instabilities in the combustion chamber,
a pressure chamber means having an inlet opening connected to an upper portion of said fuel supply line and an outlet opening connected to a lower portion of said fuel supply line, the lower portion of said fuel supply line supplying fuel to said burner, the pressure chamber means also having a pressurizing means for varying the pressure in said lower portion of said fuel supply line, and
control means for controlling the pressurizing means by delaying the signal issued from said detection means by a selectable period of time to generate a delayed signal, and by outputting said delayed signal to the pressurizing means.

5,145,356

ELECTRICAL CONNECTOR HOUSINGS

Alan J. Minnis, London, United Kingdom, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 29, 1991, Ser. No. 706,829
Claims priority, application United Kingdom, May 30, 1990, 9012060
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 11 Claims



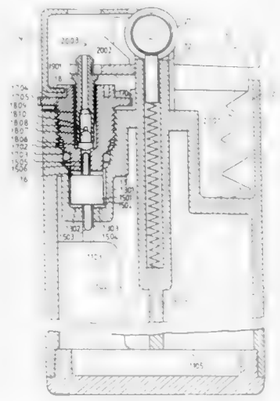
1. A pair of matable electrical connector housings having means for locking them together in fully mated relationship, where said means for locking them together comprises a pair of longitudinally spaced locking ribs on one housing and a channel member on the other housing for receiving the locking ribs as the housings are being mated, the locking ribs projecting externally of a wall of a hood extending from a mating face of said one housing, the channel member being supported in spaced relationship with an external wall of said other housing so that the hood wall is receivable between the channel member and said external wall, the channel member having an opening for receiving a locking member flexibly connected to said other housing externally thereof, for snug reception between said locking ribs only in the fully mated condition of the housings, to lock them in their fully mated relationship, the channel member being joined to a yoke and supported by a gantry connected to a rear end of the housing, and by an outer wall partially surrounding the housing.

5,145,357

PLASTIC LIGHTER

Pi Shan Chou, No. 1, Lane 103, Fu Kuo Road, Hsin Chuang City, Taipei Hsien, Taiwan

Filed Feb. 20, 1991, Ser. No. 657,849
Int. Cl.[5] F23Q *2/00*
U.S. Cl. 431—143 5 Claims



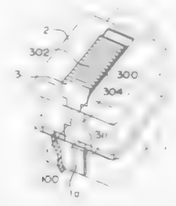
1. A lighter comprising:
a) a gas reservoir molded from plastic material having an inner wall, spaced apart, opposite sub-walls extending from the inner wall to form a capillary groove to cause the upward flow of gas, a gas outlet communicating with the capillary groove, and a valve seat having internal threads and defining a groove intersecting the gas outlet;
b) a gas flow control valve having a threaded portion engaging the internal threads of the valve seat and defining a valve hole therein;
c) a gas nozzle located in the valve hole and defining a gas nozzle outlet;
d) a bi-nail member located in the valve seat and having protruding portions extending from opposite sides into the valve hole of the gas flow control valve and into the gas outlet respectively;
e) a sponge pad member operatively interposed between the bi-nail member and the gas flow control valve;
f) an adjusting member operatively associated with the gas flow control device, at least a portion of which extends exteriorly of the gas reservoir, such that rotational movement of the member rotates the gas flow control valve relative to the valve seat which thereby increases or decreases the force on the sponge pad member to thereby control the flow of gas through the gas nozzle;
g) a pressing plate member pivotally attached to the gas reservoir and operatively associated with the gas nozzle such that movement of the pressure plate member from a normal position opens the gas nozzle to allow gas to flow out of the gas nozzle; and,
h) means operatively associated with the reservoir to generate a spark to ignite gas flowing out of the gas nozzle.

5,145,358

SAFETY DEVICE FOR PIEZOELECTRIC GAS LIGHTER

Tsutomu Shike; Toshihiko Eguchi, and Nobuo Yamazaki, all of Shizuoka, Japan, assignors to Tokai Corporation, Kanagawa, Japan

Filed Nov. 25, 1991, Ser. No. 797,300
Claims priority, application Japan, Nov. 30, 1990, 2-130581
Int. Cl.[5] F23D *11/36*
U.S. Cl. 431—153 5 Claims



1. A safety device for a piezoelectric gas lighter having an actuator cap which is mounted on an upper part of a lighter body to be movable up and down between upper and lower positions relative to the lighter body and is urged to the upper position, the actuator cap being depressed toward the lower position to discharge fuel gas stored in a reservoir provided in the lighter body and to actuate an ignition mechanism to ignite the fuel gas, said safety device comprising
a projection which is provided on said upper part of the lighter body and extends inwardly of said lighter body;
a stopper member which is slidably mounted on said actuator cap in an elongated cut-out portion intermediate opposite sides of said cap so that it can be movable relative to the actuator cap along a linear path between a locking position where a part of the stopper member is aligned with the projection and interferes with the projection to prevent downward movement of the actuator cap and a releasing position where said part of the stopper member is out of alignment with said projection and permits downward movement of the actuator cap and so that the actuator cap can be depressed by pushing downward the stopper member,
an urging means which urges the stopper member to the locking position, and
a holding means which holds the stopper member in the releasing position when the actuator cap is below said upper position.

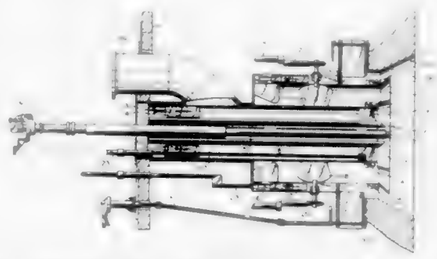
5,145,359

BURNER FOR THERMIC GENERATORS

Giuseppe Ancona, Sesto San Giovanni; Giancarlo Benelli, Empoli; Gennaro De Michele, Pisa; Sergio Ligasacchi, San Giuliano Terme; Gianni Mascalzi, Como; Giancarlo Scavizzi, Milan; Giuliano Trebbi, Pisa, and Aldo Zennaro, Milan, all of Italy, assignors to Ente Nazionale Per l'Energia Elettrica, Rome and Ansaldo Componenti s.r.l., Genova, both of Italy

Filed Apr. 22, 1991, Ser. No. 688,409
Claims priority, application Italy, Apr. 20, 1990, 9370 A/90
Int. Cl.[5] F23M *9/00*
U.S. Cl. 431—184 10 Claims

1. Improved burner for fuel oil and fuel gas with low NO_x production comprising primary, secondary and tertiary air ducts coaxially arranged about a longitudinal axis for feeding combustion air to a combustion chamber and having respective outlet sections connected to said combustion chamber, fuel duct means coaxial to said air ducts, swirler means for controlling the vorticity of the combustion air arranged in said primary, secondary and tertiary ducts, the primary duct swirler comprising an array of radially sized tabs in correspondence with said outlet section, the secondary and tertiary duct swirlers further comprising tabs turnable around axes disposed perpendicular to and, respectively, parallel to said longitudinal



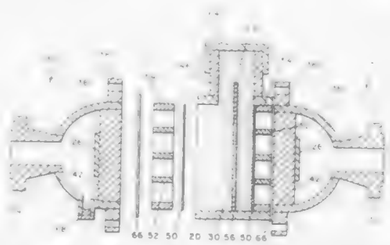
axis, said primary and secondary air ducts comprising air inlet means with continuously variable and adjustable cross sections, mass rate meters being further provided near the outlet sections of said secondary and tertiary ducts substantially unaffected by the vorticity induced by said swirler means.

5,145,360

DETONATION ARRESTOR

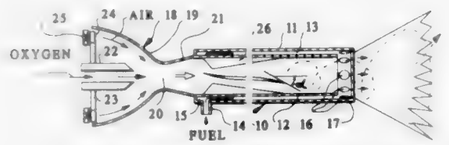
Robert K. Rajewski, P.O. Box 2247, Stettler, Alberta, Canada T0C 2L0

Filed Feb. 22, 1991, Ser. No. 659,272
Claims priority, application Canada, Dec. 20, 1990, 2032791
Int. Cl.[5] F23D *14/82*
U.S. Cl. 431—346 17 Claims



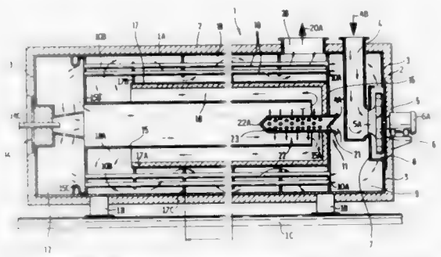
1. A detonation arrestor for connection to a flare line, the flare line having inflow and outflow ends, comprising:
a cell housing defining an interior cavity in fluid connection with the flare line;
first means attached to the cell housing for securing the detonation arrestor to the outflow end of the flare line;
a first flame front diffusor disposed in the first means in line with the flare line, having a diameter slightly greater than the flare line and spaced from the cell housing, whereby flame fronts colliding with the first flame front diffusor are deflected around the first flame front diffusor;
the cell housing including a particulate quenching medium substantially filling the interior cavity; and
second means attached to the cell housing for securing the detonation arrestor to the inflow end of the flare line.

5,145,361
BURNER AND METHOD FOR METALLURGICAL HEATING AND MELTING
Edward F. Kurzinski, Pittsburgh, Pa., assignor to Combustion Research, Inc., New York, N.Y.
Filed Dec. 4, 1984, Ser. No. 677,983
Int. Cl.[5] F27D 7/06; F23M 3/04
U.S. Cl. 432—19 16 Claims



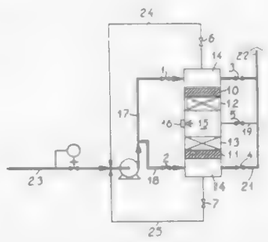
1. In a process for heating and treating charged materials in a furnace, wherein fuel and substantially pure oxygen are introduced under pressure, mixed and combusted in a burner to produce a flame, and the flame is directed onto the charged material to heat and treat it, the improvement comprising the steps of:
using at least one of the fuel and substantially pure oxygen to aspirate a gas containing oxygen and nitrogen into the burner, and mixing the gas with the fuel and substantially pure oxygen prior to combustion, wherein the oxygen in the aspirated gas replaces a quantity of substantially pure oxygen that would otherwise have to be commercially obtained;
heating the aspirated nitrogen to an elevated temperature by contacting it with said flame
imparting a swirling motion to the mixture of fuel, aspirated gas and substantially pure oxygen in a swirl chamber in the burner to obtain a short, swirling, bushy flame having a high velocity; and
directing the flame and heated nitrogen into the charged material to heat and treat it by convection heating, said heated nitrogen facilitating heating of the charged material in a reduced amount of time, and said swirling, bushy, high velocity flame and heated nitrogen contacting the charged material over a broad area and at high velocity, enhancing the rate of heating of the material due at least in part to the scrubbing action of the flame and heated nitrogen on the material.

5,145,362
APPARATUS FOR BURNING POLLUTANTS CONTAINED IN A CARRIER FLOW
Herbert Obermueller, Linsengericht, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany
Filed Mar. 11, 1991, Ser. No. 667,513
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1990, 4007628
Int. Cl.[5] F23J 15/00
U.S. Cl. 432—72 8 Claims



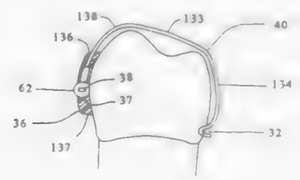
1 An apparatus for burning pollutants out of a carrier gas flow, comprising a housing having a heat insulated wall with an inlet port (4) for said carrier gas flow (4B) and an outlet port (20) for cleaned gas (20A), gas flow path means arranged in the following sequence in said housing and including an inlet chamber (9) enclosed by said heat insulating wall at one end of said housing, heat exchange pipes having open ends for receiving gas to be cleaned from said inlet chamber, a first combustion chamber (12) also enclosed by said heat insulating housing wall at an opposite end of said housing for receiving preheated gas through said heat exchange pipes (10), a burner (14) in said first combustion chamber opposite said inlet chamber (9), a flue gas mixing pipe (15) arranged coaxially with said burner, said flue gas mixing pipe having an open inlet end facing said burner, a second combustion chamber (18) surrounding said flue gas mixing pipe, said second combustion chamber (18) having an inlet communication with an open outlet end of said flue gas mixing pipe opposite said burner, a heat exchange space wherein said heat exchange pipes are arranged, said heat exchange space surrounding said second combustion chamber (18) and communicating with said second combustion chamber and with said outlet port (20) for discharging cleaned gas, blower means (5) centrally mounted in said inlet chamber, said blower means (5) having a central suction inlet and a radial compression outlet, inlet duct means (4A) connecting said inlet port through said heat insulated wall centrally to said suction inlet (5A) of said blower means (5), whereby said inlet duct means operate under reduced pressure, said compression outlet of said blower means leading a compressed carrier gas flow radially outwardly into said inlet chamber which diverts said carrier gas flow axially for supplying carrier gas to be cleaned under compression uniformly into said receiving open ends of said heat exchange pipes (10) having outlet ends leading into said first combustion chamber (12).

5,145,363
METHOD AND AN APPARATUS FOR CONTINUOUSLY PURIFYING AN OXYGEN-CONTAINING GAS FOR COMBUSTIBLE CONTAMINANTS
Kai H. Nielsen, Greve Strand, and Frands E. Jensen, Ganlose, both of Denmark, assignors to Haldor Topsoe A/S, Denmark
PCT No. PCT/DK89/00242, § 371 Date Apr. 17, 1991, § 102(e) Date Apr. 17, 1991, PCT Pub. No. WO90/04742, PCT Pub. Date May 3, 1990
PCT Filed Oct. 16, 1989, Ser. No. 678,951
Claims priority, application Denmark, Oct. 17, 1988, 5770/88
Int. Cl.[5] F27D 17/00; C03B 5/16
U.S. Cl. 432—180 9 Claims



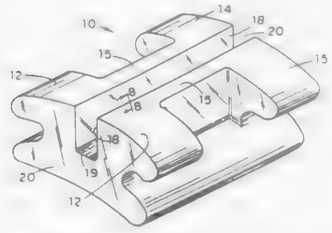
1. In a method for the substantially continuous purification of an oxygen-containing gas containing combustible contaminants by thermal and/or catalytic combustion in a combustion zone situated between two stationary substantial identical heat exchange zones containing solid heat exchange material during which at least part of the heat of combustion is recovered by regenerative heat exchange in said heat exchange zones, in which method the gas to be purified flows through both heat exchange zones and the direction of flow through said heat exchange zones is reversed periodically such that the two zones are alternately heated and cooled in periods of 0.1 to 60 minutes,
the improvement comprising dividing the purified gas stream in the first 1% to 50% of each period into two portions, passing one portion directly from the combustion chamber to a recipient and passing the other portion through the heat exchange zone being heated and recycling it by combining it with the untreated gas being conducted to the heat exchange zone being cooled.

5,145,364
REMOVABLE ORTHODONTIC APPLIANCE
Martin G. Martz, Bakersfield, Calif., and Robert D. Brining, Aspen, Colo., assignors to M-B Orthodontics, Inc., Aspen, Colo.
Filed May 15, 1991, Ser. No. 700,775
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—6 46 Claims



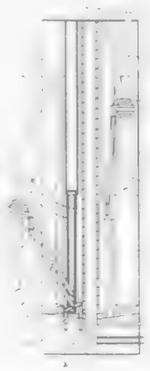
1. In an orthodontic appliance,
at least one clasp formed of spring wire comprising, in order, engagement means to engage a first surface of a tooth formed with an undercut, an upward extending first generally vertical stretch, a generally horizontal stretch across the occlusal surface of said tooth and a downward extending second generally vertical stretch and first attachment means on a second surface of said tooth opposite said first surface, said engagement means comprising a bent wire ear shaped to engage said undercut,
a button adhered to said second surface of said tooth, said button being formed with second attachment means to detachably engage said first attachment means,
said first attachment means further comprising means to receive archwire.

5,145,365
GLASS ORTHODONTIC BRACKET
Farrokh Farzin-Nia, Inglewood, Calif., and Richard W. Petticrew, Odessa, Fla., assignors to Ormco Corporation, Glendora, Calif.
Continuation of Ser. No. 358,715, May 26, 1989, Pat. No. 5,032,081. This application Dec. 14, 1990, Ser. No. 627,507
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—8 4 Claims



1. An orthodontic bracket including a base portion having a tooth contacting surface and a body member including walls defining an archwire slot, said bracket being made of an amorphous glass material and having an outer crystalline strengthening layer.

5,145,366
RACK FOR INSTRUMENTS
Timo Janhunen, Leankuja 4, SF-07230 Monninkylä, Finland
PCT No. PCT/FI90/00098, § 371 Date Oct. 28, 1991, § 102(e) Date Oct. 28, 1991, PCT Pub. No. WO90/13269, PCT Pub. Date Nov. 15, 1990
PCT Filed Apr. 10, 1990, Ser. No. 775,958
Claims priority, application Finland, May 8, 1989, 892202
Int. Cl.[5] A61G 15/00
U.S. Cl. 433—77 4 Claims



1. A rack for instruments, especially for dental instruments (1), comprising
a drum (2) mounted so as to revolve about a shaft (4), compartments (5) being provided on the periphery of the drum for at least one instrument (1) and its holder (3);
an instrument supply line (6) arranged to be connected to one instrument (1) at a time; and
a stationary outer casing (7) surrounding the drum (2) and provided with at least one opening for pulling out at least the instrument connected to the supply line, characterized in that
walls (8) separating the compartments (5) of the drum (2) are sealed (9) relative to the outer casing (7); and that
the outer casing (7) is provided with means (10, 11, 12) for sterilizing the instruments (1) when they are not being used.

5,145,367
VACUUM INSTRUMENT FOR DENTAL HYGIENE AND DENTAL TREATMENT
Werner Kasten, Belt-Schutsloot, Netherlands, assignor to Durr Dental GmbH & Co KG, Fed. Rep. of Germany
PCT No. PCT/EP88/00692, § 371 Date Feb. 12, 1990, § 102(e) Date Feb. 12, 1990, PCT Pub. No. WO89/01319, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 1, 1988, Ser. No. 460,912
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3738811
Int. Cl.[5] A61C 1/10, 1/12, 17/02, 17/06, 17/14
U.S. Cl. 433—84 13 Claims

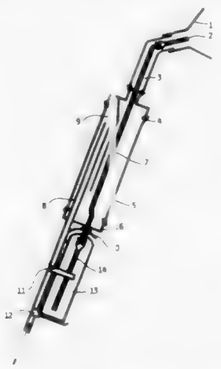
1. An apparatus for vacuum dental treatment comprising
(a) a cap-shaped suction member (1) having elastic edges which are adapted to be applied to the teeth and gum area, the geometry and the material of said suction member (1) being such that said elastic suction member overlies the

juncture of the gums and teeth to form a closed treatment chamber, said treatment chamber including the gum pocket defined between a tooth and the adjacent gum,

(b) a feed line (7) for intermittently supplying a plurality of increments of treatment liquid into said treatment chamber, the outer end of said cap-shaped suction member (1) extending beyond the outlet end of said feed line (7),

(c) a vacuum source connected to said suction member (1),

(d) means for adjusting the suction force exerted on the contents of said gum pocket by adjusting the vacuum within the suction member (1) to a value which exceeds the capillary adhesion force that exists in the gum pocket, and



(e) control means for the vacuum source and the liquid feed line (7) for setting up a pumping action in the gum pocket which both effects suckin ; liquid out of the gum pocket and the introduction of treatment liquid to the base of the gum pocket, said control means being constructed to

(a) establish a first treatment phase which causes the suction member (1) to operate under vacuum alone,

(b) establish a sequential second treatment phase which causes the suction member (1) to operate under vacuum at the same time that a treatment liquid is supplied via said feed line (7) and

(c) consecutively repeat the above sequence of first and second treatment phases a plurality of times whereby a repetitive pumping of treatment liquid both into and out of the gum pocket is achieved.

5,145,368

SUCTION ROOT ELEVATOR AND SUCTION DENTAL CURETTE

Dobrivoje Tomic, Fasangartenstrasse 159, 8000 Munich 90, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 346,959, May 2, 1989, abandoned. This application Feb. 13, 1991, Ser. No. 654,878

Int. Cl.[5] A61 *17/06, 3/00*

U.S. Cl. 433—91 10 Claims

1. A root elevator for the extraction of teeth, roots or fragments thereof which consists of a handle (2), said handle having a proximal end and a distal end and a working part (3) located adjacent to said proximal end, said working part having a tip (5), a channel (4) extending through both said handle and said working part from said tip of the working part to the distal end of said handle, said root elevator having a first opening at said tip of the working part and a second opening at said distal end of said handle, a first flexible connecting means (22)

connected to said second opening of said distal end, suction means connected to said flexible connecting means.

5,145,369

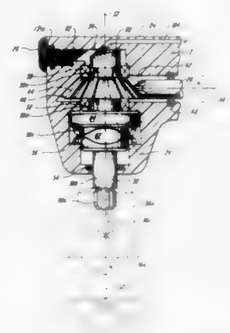
DENTAL TOOL DRIVING APPARATUS HAVING ROTATING AND ROTO-RECIPROCATING MOTIONS

L. Paul Lustig, 304 Greenwood St., Newton, Mass. 02159, and Andrew Tybinkowski, Boxford, Mass., assignors to L. Paul Lustig, Newton Centre, Mass.

Filed Apr. 23, 1990, Ser. No. 512,836

Int. Cl.[5] A61C *1/07, 3/03, 3/08*

U.S. Cl. 433—118 25 Claims



1. Manually deployable tool apparatus for driving a tool implement with rotating motion about a first axis combined with axial reciprocation of adjustable stroke length, said apparatus comprising

A. means forming a manually deployable housing,

B. output shaft means mounted with said housing for rotation about and reciprocation along said first axis,

(i) said output shaft means having opposed first and second ends,

(ii) said first end being arranged for removably and replaceably mounting a tool implement,

C. input means mounted with said housing for driven rotation and engaged with said output shaft means for rotating said output shaft means about said first axis,

D. cam means drivingly engaged with said output shaft means for imparting to said output shaft means axial movement in a first direction during driven rotation of said output shaft, and

E. cam follower means mounted with said housing and including a cam engaging surface for selective adjustable engagement with said cam means for moving said cam means to impart said axial movement and to adjust said stroke length.

5,145,370

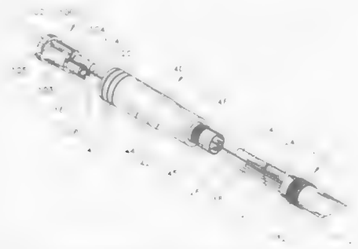
DENTAL FIBEROPTIC HANDPIECE HOSE ASSEMBLY

Gary Woodward, 9301 S.W. Sagert, Apt. 29, Tualatin, Oreg. 97062

Continuation-in-part of Ser. No. 317,833, Mar. 1, 1989, Pat. No. 4,975,058. This application Aug. 31, 1990, Ser. No. 576,266

Int. Cl.[5] A61C *1/08*

U.S. Cl. 433—126 57 Claims



1. A dental handpiece hose assembly comprising

(a) an outer tubing,

(b) a plurality of inner tubings carried within the outer tubing, said inner tubings providing conduits for drive air, chip air and coolant water as well as an air exhaust conduit,

(c) a fiberoptic bundle carried within the outer tubing,

(d) a sensing cable carried within the outer tubing,

(e) an adapter for connecting an end of each inner tubing and the fiberoptic bundle to a dental handpiece, and

(f) a generally hollow swivel member having a front section, a center section attached to the front section and a rear section swivelably attached to the center section, the rear section being attached to the outer tubing,

(g) the adapter slidably mounted into the front section of the swivel member to permit the adapter to be accessible for repairs.

5,145,371

DISTANCE MEMBER

Lars Jörnéus, Göteborg, Sweden, assignor to Nobelpharma AB, Goteborg, Sweden

Filed Sep. 14, 1990, Ser. No. 581,711

Claims priority, application Sweden, Sep. 15, 1989, 8903038

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—173 7 Claims

1. A two-part distance member for a tooth implant including a fixture having a lower end anchored in the jaw and an upper portion, said distance member comprising:

a sleeve-shaped element which has a lower portion connectable to the upper portion of the fixture and an upper portion having an end surface; and

a distance screw provided with

a) an externally threaded forward part for engaging into a threaded bore of the fixture;

a proximal portion having a bore therein for receiving means for securing a prosthesis construction onto the distance member; and

an outwardly projecting collar provided intermediate said forward part and proximal portion, said collar having a lower end surface adapted to rest onto the end surface of the upper portion of said sleeve-shaped element to secure said sleeve-shaped element on the fixture upon screwing of said threaded forward part of said distance screw into said bore of the fixture; and

wherein the upper portion of said sleeve-shaped element includes a first conical outer surface and said proximal

portion of said distance screw includes a second conical outer surface forming an extension of said first conical outer surface of said sleeve-shaped element such that said distance member is adapted to be accommodated into a conical upwardly converging delimiting surface.

5,145,372

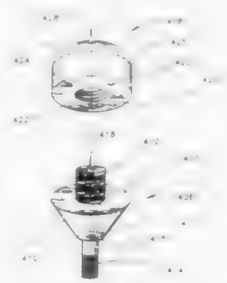
ANATOMICAL RESTORATION DENTAL IMPLANT SYSTEM WITH REINFORCED HEALING CAP AND ABUTMENT

Fereidoun Daftary, 50 N. La Cienega Blvd., No. 206, Beverly Hills, Calif. 90211 and Jack D. Preston, 4936½ McConnell Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 424,901, Oct. 20, 1989, Pat. No. 5,073,111. This application Oct. 24, 1991, Ser. No. 782,091

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—173 20 Claims



1. A dental implant system implantable in the gingival tissue and the alveolus of the jaw bone comprising:

a. an implantable fixture having proximal and distal end portions, the proximal end portion having means for being embedded in opened gingival tissue and the alveolus of the jaw bone, the distal end portion being accessible from the outer surface of the jaw bone, the fixture being made of a substance permitting healing of the opened gingival tissue and growth of the jaw bone about the fixture, the fixture further including a hollow extending from an opening in the distal end portion towards the proximal end portion, the hollow having threads along at least a portion of its length;

b. means for sealing the hollow of the fixture during a period after implantation in which the jaw bone is growing about the proximal portion of the fixture;

c. means for providing a predetermined contour to the gingival tissue adjacent the distal end of the fixture, such that

the gingival tissue re-heals in a contour reverse to that of the contour of said means;
d. a tooth analogue;
e. reinforced abutment means for supporting the tooth analogue;
f. means for releasibly attaching the tooth analogue to the reinforced abutment means
g. said contour means being a two part reinforced healing cap further comprising,
(i) a first part including a proximal stem having proximal and distal end portions, the proximal portion of the proximal stem having threads which are threadable within the hollow of the implantable fixture, a frusto-conical segment, the smaller end of the segment being attached to the distal end of the proximal stem, with the axis of the segment being in alignment with the axis of the proximal stem, and a distal stem having proximal and distal ends and extending from the larger end of the frusto-conical segment, the axis of the distal stem aligned with the axis of the frusto-conical segment, the distal stem having a threaded surface,
(ii) a second part including a cylindrical segment having proximal and distal ends, the cylindrical segment further including a hollow extending from an opening in the proximal end of the segment towards the distal end of the segment, the hollow having threads along at least a portion of its length such that the distal stem of the first part is threadable within the hollow, and a screwhead segment having a proximal end and a driven end, the driven end cooperable with a driving tool, the proximal end being attached to the distal end of the cylindrical segment, with the axis of the screwhead segment being in alignment with the axis of the cylindrical segment; and
h. said reinforced abutment means further comprising a head segment having a frusto-conical shape, the head segment further including a hollow extending from an opening in the larger end of the segment towards the smaller end of the segment, the hollow having threads along at least a portion of its length such that the distal stem of the first part of the reinforced healing cap is threadable within the hollow;
i. whereby the stem of said reinforced healing cap is threaded into the hollow of said fixture and the gingival tissue re-heals in a contour reverse to that of the contour of the frusto-conical portion of the reinforced healing cap, and thereafter the second part of the reinforced healing cap is unscrewed from the first part of the reinforced healing cap and the reinforced abutment means is screwed onto said first part of said reinforced healing cap and the tooth analogue is attached to the reinforced abutment means.

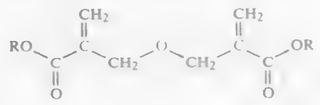
5,145,373
ENDODONTIC POST
James B. Roane, 707 Southwest 24th St., Norman, Okla. 73069
Continuation-in-part of Ser. No. 308,046, Feb. 9, 1989, Pat. No. 5,035,620. This application May 16, 1991, Ser. No. 701,671
The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.
Int. Cl.[5] A61C *5/08*
U.S. Cl. 433—221 **15 Claims**

1. An endodontic post constructed to be inserted into a prepared post space in a tooth root and cemented in place therein for anchoring a tooth restoration, comprising:
a graduated post having at least two stages of decreasing diameter, said stages having a generally cylindrical outer surface over substantially an entire length of said post;
one and only one spiral groove defined in said cylindrical outer surface of said post, said groove having a pitch angle in a range of from about 35° to about 55° so that said groove provides:
a vent means for venting air and/or cement as said post is placed in said prepared post space;
a retention means for aiding retention of said post when said post is cemented in said prepared post space; and

a thread means for threading said post out of said prepared post space in the event of removal of said post; and
wherein an ungrooved area of said cylindrical outer surface of said post is substantially greater than a grooved area of said cylindrical outer surface.

5,145,374
SYNTHETIC DENTAL COMPOSITIONS FORMED FROM CYCLOPOLYMERIZABLE BIS-ACRYLATE AND MULTI-FUNCTIONAL OLIGOMER AND BONDING METHOD
Jeffrey W. Stansbury, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.
Filed Oct. 3, 1989, Ser. No. 416,760
Int. Cl.[5] A61K *5/01*
U.S. Cl. 433—228.1 **18 Claims**

1. A synthetic dental composition, comprising
(a) a resin formed by polymerization of at least one bis-acrylate monomer of the formula

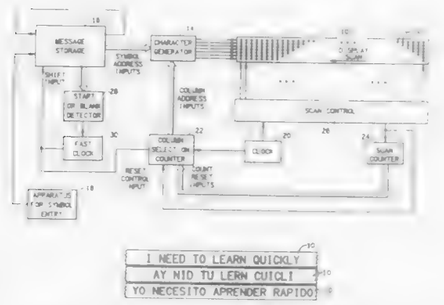


(I)

wherein R is selected from the group consisting of alkyl groups having 1 to 6 carbon atoms and aryl substituted alkyl groups in which the alkyl portion has 1 to 6 carbon atoms; and
(b) an inorganic filler.

5,145,375
MOVING MESSAGE LEARNING SYSTEM AND METHOD
Rafael R. Rubio, 5134 Pendleton St., San Diego, Calif. 92109
Filed Feb. 20, 1990, Ser. No. 481,633
Int. Cl.[5] G09B *19/06*
U.S. Cl. 434—157 **6 Claims**

1. A method of learning a subject comprising the steps of:
selecting stationary apparatus having moving message display means comprising a matrix of light generating elements capable of forming a plurality of alpha-numeric characters for displaying a plurality of continuously moving, selectively repetitive messages with no externally visible moving parts comprised in the moving message, and programmable mans for selectively generating changeable continuously moving messages by means of said light generating elements;
programming said programmable means for generating and causing the continuously moving display of at least three

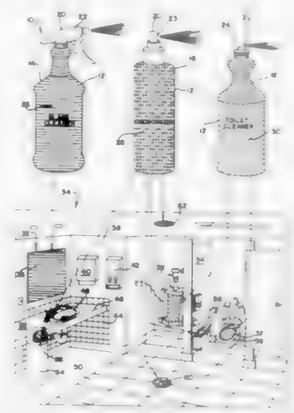


versions of a subject to be learned on said moving message display means;
establishing a graphic display of at least said three versions of a subject to be learned on said moving message display means, the versions of said subject comprising a foreign language and a student's language, for teaching the foreign language; and
moving said versions along said display means at a selected velocity while observing same.

5,145,376
TEACHING AID FOR FOREIGN LANGUAGE
Jennifer M. Krass, 1318 E. Indian Mound, Birmingham, Mich. 48010
Filed Mar. 4, 1991, Ser. No. 664,127
Int. Cl.[5] G09B *19/06*
U.S. Cl. 434—157 **5 Claims**

1. Apparatus for assisting the learning of foreign language to a reader having fluency in a familiar language, comprising:
a media imprinted with a plurality of lines of text in the foreign language with ink of a first color, and a plurality of lines of text constituting a translation of the foreign text in the familiar language imprinted on the media with each line of the familiar language translation associated with an equivalent line in the foreign text; and
eyeglasses adapted to be worn by the reader incorporating lenses having two sections, a first section adapted to pass electro-magnetic radiation reflected from the ink in which the foreign language is imprinted and to block radiation reflected from the ink in which the familiar language is imprinted and a second section adapted to pass radiation reflected from the ink in which the familiar language is imprinted,
whereby the user may shift his gaze relative to the media so as to view either the foreign language text or the familiar language text.

5,145,377
COLOR-CODED TRAINING METHOD
Diana J. Tarvin, Bloomington, and Ronald E. Goerne, Normal, both of Ill., assignors to 1-2-3 Training Systems, Ltd., Bloomington, Ill.
Filed Oct. 9, 1990, Ser. No. 594,726
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—219 **13 Claims**



1. A method of training an individual in the use of several objects, each such object being used in the performance of at least one of a plurality of distinct operations, comprising:
identifying each of said distinct operations with a different one of a plurality of different colors;
designating each of said objects used in performing a respective one of said operations with the one of said colors which identifies said operation; and
providing associating means for visually associating each of said colors with each of said corresponding operations and each of said corresponding objects, so that an individual may associate a particular one of said colors with a particular one of said objects, as well as with a corresponding one of said operations to learn the proper object for performing a designated operation, as well as the physical location in which said operations are to be performed.

5,145,378
PENDULUM PRINCIPLE DEMONSTRATION APPARATUS
Dainuri P. Rott, Palo Alto, and James C. Smith, Hayward, both of Calif., assignors to Hands on Instruments, Palo Alto, Calif.
Filed Nov. 29, 1990, Ser. No. 620,369
Int. Cl.[5] G09B *23/08*
U.S. Cl. 434—302 **3 Claims**

1. An apparatus for demonstrating the physical principle of the pendulum, comprising:
a base for supporting a dynamical load, the base having a top surface;
an elongated pivot arm vertically disposed and having a proximal and a distal ends, the proximal end rigidly mounted to said top surface, the distal end supporting a means for pivotal rotation about a horizontal axis;
a rotation support housing having rotational mounting means for free rotation of said rotation support housing about the horizontal axis, in cooperation with said means for pivotal rotation, said rotation support housing having at least one radial connector socket therein; and

a set of pendulum arms having various pendulous masses, lengths, and sizes, and having one or more portions with all sections jointed by pivots to a first portion to form an articulated arm; and

said pendulum arms being inserted for interchangeable configuration assembly into said rotational support housing

by attaching a first of each pendulum arm said first end having a connector plug for insertion into one said radial connector socket, whereby each configuration demonstrates a pendulous activity relating to the set of pendulums in use including the single, double, triple and quadruple compound pendulum.

5,145,379

DEVICE FOR THE ELECTRICAL CONNECTION OF SENSORS ON BEARINGS

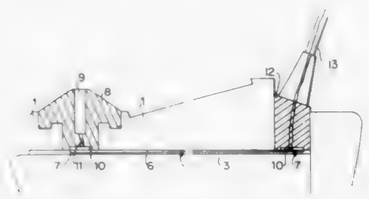
Sven Benktander, Gothenburg, Sweden; Heinz Kiener, Waigolshausen, and Jürgen Kober, Schwebheim, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 439,709, Nov. 21, 1989, abandoned. This application Mar. 21, 1991, Ser. No. 672,744

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839558

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—34 **13 Claims**



1. In a device for the electrical connection of a sensor on a bearing, wherein said bearing includes first and second axially spaced inner bearing rings supported by a bearing seat of a carrier element, the improvement wherein said device comprises a sensor located on one side of one of said inner bearing rings, a seat casing located between said one inner bearing ring and said bearing seat, at least one signal conductor extending along said seat casing and being electrically insulated from said one inner bearing ring, and means connecting said conductor to said sensor, said connecting means extending axially past the end of said one inner bearing ring opposite said one side thereof to permit external electric connection to said sensor.

5,145,380

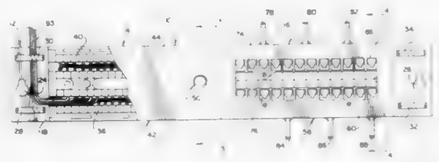
PATCH PANEL

Bruce D. Holcomb, Glencoe, and Franklin D. Lantz, Chicago, both of Ill., assignors to Homaco, Inc., Chicago, Ill.

Filed Jun. 17, 1991, Ser. No. 716,238

Int. Cl.[5] H01R *9/24*

U.S. Cl. 439—49 **20 Claims**



1. A patch panel having a front side and an access on its front side for use in selectively interconnecting a selected portion of a communication network with a selected terminal including; a mounting plate, a plurality of connector blocks mounted on one side of the mounting plate, each of said connector blocks being adapted to be connected to a selected portion of a communication system, a second plurality of second connector blocks mounted on the one side of the mounting plate, each of said second connector blocks being adapted to be connected to a selected portion of a communication system, a jack connected to each of the first mentioned connector blocks, the jacks mounted on the one side of the mounting plate on the front side of the patch panel, and a second jack connected to each of the second connector blocks, the second jacks mounted on the one side of the mounting plate on the front side of the patch panel, the first mentioned and second connector blocks all mounted adjacent one another at one end of the mounting plate and the first mentioned and the second jacks all mounted adjacent one another at the other end of the mounting plate.

5,145,381

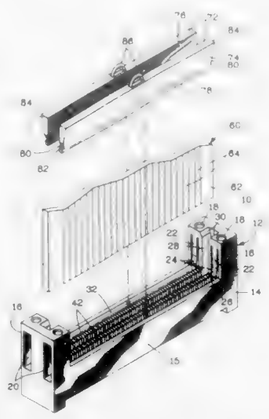
WEDGE DRIVEN ELASTOMERIC CONNECTOR

Keith L. Volz, Jamestown, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 22, 1991, Ser. No. 748,992

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—62 **7 Claims**



1. An electrical connector for interconnecting the conductive traces of printed circuit boards or the like including a plastic housing having an opening adapted to receive and guide a first circuit board inserted therein and means to clamp the

said housing to a second board, at least one insert comprised of an elastomeric insulating material having conductive traces therein and fitted in said opening, the said insert including a side aligned with and proximate to the surface of the said first board as inserted in said housing and a second side positioned to engage the second board and be compressed by said housing as clamped to said second board, wedge means having a cross section to fit into said opening proximate to said insert and engaging the inner walls of said housing so as to wedgingly compress the said insert as said wedge means is driven in said housing, first means to hold said wedge means in said housing in a first position to provide an interconnection of the traces of the said boards and second means to hold the said wedge means in a second position in said housing to facilitate a low force insertion and withdraw of said first board relative to said housing.

5,145,382

MOLDED PLASTIC SURFACE-MOUNTABLE COAXIAL CONNECTOR

David M. Dickirson, Deerfield Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 29, 1991, Ser. No. 800,299

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—63 **10 Claims**

1. An electrical socket for interconnecting a printed circuit surface and a coaxial connector, the socket comprising:

a molded plateable dielectric body having

a plated center contact portion for selectively receiving the coaxial connector and surface mounting with the printed circuit surface; and

a plated ground contact portion for selectively receiving the coaxial connector and surface mounting with the printed circuit surface;

wherein the portions are integrally formed as a single piece.

5,145,383

MALE ELECTRICAL CONTACT AND CONNECTOR EMBODYING SAME

David C. Bowen, Downers Grove, and Russell J. Leonard, Naperville, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 26, 1991, Ser. No. 736,531

Int. Cl.[5] H01R *4/09*

U.S. Cl. 439—78 **13 Claims**

1. A male electrical contact stamped and formed from generally planar smooth metal material for mating with a female contact having a contact-engaging surface, the male contact including a generally planar body portion, which, when the male contact is mated with the female contact, is oriented generally perpendicular to said contact-engaging surface, and a pin portion projecting from the body portion for engaging the contact-engaging surface of the female contact, the pin portion being twisted approximately 90° relative to and in the plane of the body portion to present a smooth side of the pin

portion for engaging the contact-engaging surface of the female contact.

5,145,384

ELECTRICAL CONNECTOR AND TERMINAL THEREFOR

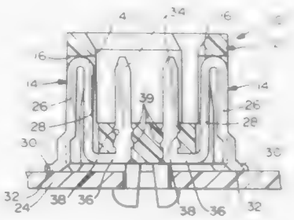
Kazushige Asakawa; Minoru Fukushima, both of Yokohama, and Mitsuo Fujikura, Zama, all of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 29, 1991, Ser. No. 736,885

Claims priority, application Japan, Sep. 10, 1990, 2-095026[U]

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—78 **22 Claims**



1. For use in an electrical connector to be surface mounted to a printed circuit board, an electrical contact comprising an inverted U-shaped portion defining a pair of depending legs, one of the legs having a foot portion for surface mount electrical connection to an appropriate circuit trace on the printed circuit board, and a terminal portion turned upwardly from a distal end of the other leg for termination with an appropriate mating terminal, said terminal portion including a terminal pin for mating with a complementary terminal receptacle.

5,145,385

ELECTRICAL CONNECTOR DEVICE

Tsunesuke Takano, Tokyo, Japan, assignor to Kabushiki Kaisha T AN T, Tokyo, Japan

Filed May 29, 1991, Ser. No. 707,106

Claims priority, application Japan, Jun. 14, 1990, 2-63040; Jun. 20, 1990, 2-65316; Jul. 24, 1990, 2-78298; Jul. 24, 1990, 2-78299; Aug. 6, 1990, 2-83198; Aug. 6, 1990, 2-83199; Aug. 20, 1990, 2-87165; Aug. 20, 1990, 2-87166

Int. Cl.[5] H01R *23/68*

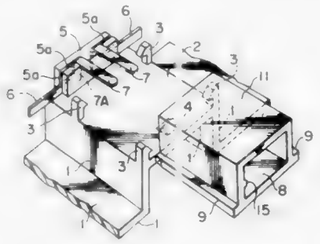
U.S. Cl. 439—79 **11 Claims**

1. An electrical connector device to allow interconnection between a male connector piece and a female connector plug, said device comprising:

an insulating base having a planar mounting region and including a restraining wall which projects upwardly within a transverse plane relative to said planar mounting region of said insulating base, said restraining wall defining at least one open-ended slit oriented parallel to said transverse plane within which said restraining wall projects;

a tubular housing establishing an interior space which is sized and configured to accept the female connector plug therewithin, said housing being coupled to the mounting region of said insulating base and having a forward end which is engaged with said restraining wall and a rearward end for receiving the female connector plug; and

at least one electrically conductive strip having a leg portion



which is positioned within said at least one slit of said restraining wall, and a terminal end portion which forms the male connector piece, said terminal end portion being bent so as to be disposed within a plane which is parallel to but spaced from said planar mounting region to thereby extend outwardly from said restraining wall and into said interior space of said tubular housing to thereby be mateable with said female connector plug inserted therewithin.

5,145,386

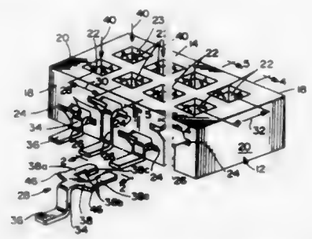
LOW PROFILE ELECTRICAL CONNECTOR

B. Alan Berg, Mount Prospect, Ill., and Jerry D. Kachlic, Singapore, Singapore, assignors to Molex Incorporated, Lisle, Ill.

Filed Nov. 18, 1991, Ser. No. 793,771

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—83 **20 Claims**



1. In an electrical connector which includes a dielectric housing having a terminal-receiving passage defining a terminal-insertion axis for receiving a mating terminal member and a stamped and formed sheet metal contact member having a contact end disposed in the passage and a terminal end projecting from the housing, the improvement comprising said housing having top and bottom walls, with the terminal-receiving passage extending in a direction therebetween, and with a slot in a side wall of the housing communicating with the passage, and said contact end of the contact member being inserted into the slot and being generally planar and having a terminal-receiving slot, with the plane of the contact end and the slot being disposed generally transverse to said terminal-insertion axis.

5,145,387

HIGH-FREQUENCY MULTI-PIN CONNECTOR

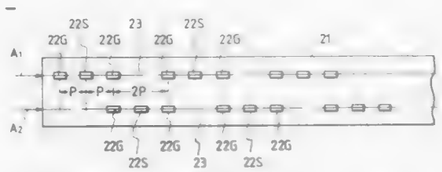
Toshihiro Ichihashi, Kumagaya, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Jul. 29, 1991, Ser. No. 737,259

Claims priority, application Japan, Jul. 30, 1990, 2-80809[U]

Int. Cl.[5] H01R *13/652*

U.S. Cl. 439—108 **11 Claims**



1. A high-frequency multi-pin connector, comprising:

a connector socket including

a socket body formed of an insulating material, and

first and second groups of triads of female contacts arranged in parallel in first and second plane, respectively, in contact receiving chambers in said connector socket, each triad of female contacts composed of elastic band-shaped female contacts as center and side contacts arranged in parallel the respective one of the first and second planes, the center contact being a signal contact and both side contacts being grounding contacts, each said triad of female contacts constituting a signal transmission line having a characteristic impedance set to a predetermined value by selecting widths and pitch of said triad of female contacts, said plurality of triads of female contacts in each of said first and second planes being spaced apart by a distance twice the pitch of said female contacts within each triad, and the signal contact in each triad in said second plane disposed opposite a space between a respective pair of said triads of female contacts in said first plane; and

a connector plug including

a plug body formed of an insulating material, and

first and second groups of triads of male pin contacts arranged in parallel in third and fourth planes, respectively, mounted on said connector plug, each triad of male pin contacts mounted on said plug body and composed of three long and narrow male pin contacts as center and side contacts arranged in parallel in the respective one of the third and fourth planes, the center contact being a signal contact and the side contacts being grounding contacts, each said triad of male pin contacts constituting a signal transmission line with a characteristic impedance set to the predetermined value by selecting widths and pitch of said triad of male pin contacts, said triads of male pin contacts arranged in correspondence to said triads of female contacts and the signal contact in each triad in said fourth plane is disposed opposite a space between a respective pair of said triads of male pin contacts in said third plane, each corresponding pair of male and female contacts having a single area of contact when said connector plug is inserted into said connector socket.

5,145,388

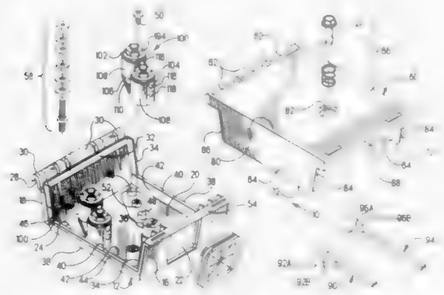
ENCLOSURE FOR CROSSCONNECT TERMINAL BLOCK

Alan W. Brownlie, Skaneateles, N.Y.; John W. Derr, New Cumberland, Pa.; Scott A. Keener, Harrisburg, Pa.; James W. Robertson, Oberlin, Pa., and Francis J. Shay, Palmyra, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1991, Ser. No. 708,407

Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—142 **6 Claims**



1. An enclosure for terminal blocks for connecting to and splicing a pair of wires, comprising:

a body section having a floor, front wall and rear wall and defining opposed open sides between said front and rear walls, said body section adapted to contain in an interior region terminal blocks for interconnecting pairs of wires, and including a cable exit;

a lid having a transverse section and opposed side walls, each said side wall shaped and dimensioned to complement said open sides between said front and rear walls of said body section to define an enclosure completely surrounding said interior region when said lid is positioned in a closed position;

means for pivotably securing said lid to said body section defining an assembly and enabling rotating said lid between open and closed positions with respect to said body section; and

means for securing said lid to said body section in said closed position;

said pivoting means being defined along one of said front and rear walls enabling pivoting of said lid to said closed position with said opposed side walls extending into said open sides between said front and rear walls of said body section.

5,145,389

CARD CONNECTOR WITH EJECTOR

Isao Okubo, Kawasaki, Japan, assignor to ITT Corporation, Secaucus, N.J.

Filed Mar. 4, 1991, Ser. No. 663,353

Claims priority, application Japan, Apr. 17, 1990, 2-99434

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—159 **4 Claims**

1. A card connector for use with a card having a rear edge and opposite side edges comprising:

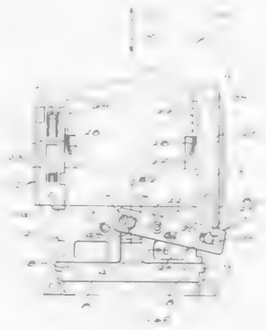
a frame which includes a cavity for receiving said card and walls for closely guiding said card in movement rearwardly into said cavity and forwardly out of said cavity;

an ejector movably mounted on said frame and having card engaging portions positioned to engage said rear edge of said card when said card is fully inserted into said cavity;

a depressible ejector button movably mounted on said frame;

a lever pivotally mounted on said frame and having first and second parts pivotally coupled respectively to said button and to said ejector, so depression of said button causes movement of said ejector in a forward direction to eject said card;

said ejector having first and second spaced locations that are each slidably mounted directly on said frame to move accurately in said rearward and forward directions, and said card engaging parts include two spaced parts located to abut said card rear edge at locations thereon lying adjacent to the opposite side edges of the card;



said first and second locations being spaced apart by more than half the width of said card;

said spaced parts which engage said card rear edge are each slidably mounted on said frame to form said first and second locations that are each slidably mounted on said frame.

5,145,390

APPARATUS HAVING A MECHANISM FOR THE ACCEPTANCE OF AN ELECTRICAL CONDUCTOR

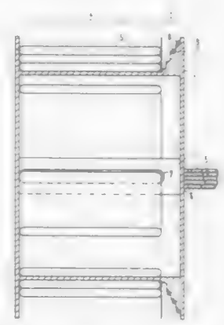
Karlheinz Kaul, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,468

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1990, 4019513

Int. Cl.[5] H01R *39/02*

U.S. Cl. 439—164 **8 Claims**



1. An apparatus comprising:

an electrical conductor having one end mechanically attached at a first apparatus location;

a cable, separate from said conductor, having one end mechanically attached at a second apparatus location;

rotatable drum means entraining said conductor and said cable for respectively simultaneously winding said conductor and unwinding said cable in opposite directions

and for simultaneously unwinding said conductor and winding said cable in opposite directions; and

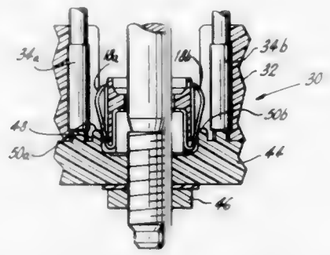
said cable having a diameter which is less than the height of a turn of said conductor on said drum means, and a first region of said drum means having a helix onto which said cable is wound having a pitch corresponding to said height of a turn of said conductor.

5,145,391

SWITCHING CONNECTOR ASSEMBLY

K. Troy Alwine, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 29, 1991, Ser. No. 693,257
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—188 **2 Claims**



1. In a connector assembly having a first housing containing a plurality of male electrical contacts; a second housing containing a plurality of female contacts for mating with said contacts in said first housing; holding means for maintaining said housings in a mated condition; and normally open switch means between said housings; the improvement wherein said normally open switch means comprises an annular body having oppositely disposed, transversely projecting arms each including a reentrant portion and a terminal portion; said body further including retention means whereby said body is fixed in said second housing, said retention means comprising a plurality of projections formed on said body; and switch opening means formed on said first housing and in engagement with said terminal portions whereby said switch remains open while said housing are mated but closes if said housings become un-mated and said arms make electrical engagement with said female contacts.

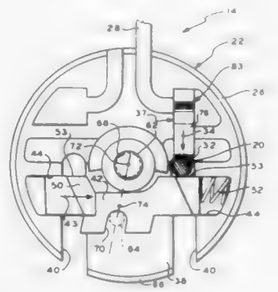
5,145,392

SELF-LOCKING BIPIN LAMP HOLDER

Richard R. Kemp, Urbana, Ohio, assignor to F. L. Aerospace Corp., Urbana, Ohio

Filed Sep. 5, 1991, Ser. No. 755,285
Int. Cl.[5] H01R *33/02*
U.S. Cl. 439—232 **15 Claims**

1. A self-locking holder for a bipin lamp comprising:
a housing;
blind slots in the housing for receiving the pins for movement in a first direction along the slots and perpendicular to the pins;
contacts within the housing respectively associated with the slots;
first means for biasing the contacts to a first position relative to the slots whereat the contacts are abuttable by the pins, sufficient movement of the pins in the first direction along the slots effecting, first, abutment of the pins against the contacts, and then, movement of the contacts and the pins against the biasing means to a second position;
a movable slide within the housing normally held in a first location by the contacts in their first position;
second means for biasing the slide toward a second location;
latches on the slide, the latches being away from the slots in the first location of the slide, movement of the contacts and the pins to the second position permitting the second biasing means to move the slide to its second location whereat the latches block movement of the pins and the contacts by the first biasing means out of the second position in a second direction opposite to the first direction; and



means for selectively moving the slide against the second biasing means and from the second location to the first location so that the first biasing means and the contacts move the pins out of the slots in the second direction and so that the contacts thereafter hold the slide in the first location.

5,145,393

ELECTRICAL PLUG DEVICE

Leslie R. Schoon, Box 66, Rockton, Ill. 61072

Continuation-in-part of Ser. No. 609,710, Nov. 6, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 770,230
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—269 **5 Claims**

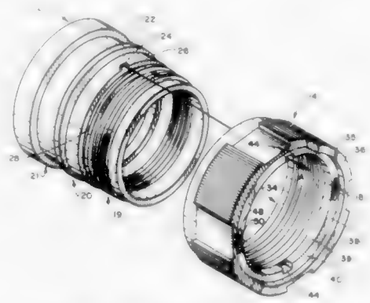
1. An electrical plug device for establishing an electrical connection when the device is inserted within an electrical outlet socket, said device comprising:
a housing;
first blade means extending from said for establishing a first electrical connection with the outlet socket;
a second blade means electrically insulated from said first blade means, said second blade means extending from said housing for establishing a second electrical connection with the outlet socket;
biasing means cooperating with at least one of said blades for biasing said first and second blade means relative to each other such that said blade means establish an interference fit within the outlet socket so that inadvertent removal of said blade means from with the outlet socket is inhibited;
manual release means connected to at least one of said blade means for selectively counteracting said biasing means such that when said release means is in a first disposition thereof, said blade means are locked within the outlet socket and when said release means is in a second disposition thereof, said blade means are released from engagement within the outlet socket so that removal of the plug device from the outlet socket is permitted;
said housing including:
a holder for holding said first and second blade means, said holder defining a U-shaped channel;
said U-shaped channel having a first and a second portion for the reeption therein of said first and second blade means respectively;
said first and said second portions eacch having a first and a second end, said first end of said first portion extending through said holder such that said first blade means extends through and protrudes from said first end of said first portion, said first end of said second portion extending through said holder such that said blade means extends through and protrudes from said first end of said second portion;
cover for covering said channel;
said second ends of said portions being adjacent to each other;
said holder further including:
a partition for partitioning said first and second portions from each other, said partition defining a first and second step disposed respectively within said first and second portions, said first step being disposed between said second end of said first portion and said first recess, said second step being disposed between said second end of said second portion and said second recess, said steps being formed integrally with said partition such that said steps slidably cooperate with said blade means for permitting said biasing of said blade means relative to each other;
said electrical plug device further including:
securing means extending through said cover and threadably engaging a bore defined by said partition such that said cover is removably secured to said holder;
said first and second blade means are each of springy, electrically conductive material, said blade means each having a first and a second end, said first ends of said blade means being disposed outside said housing, said second ends of said blade means being disposed within said second ends of said first and second portions respectively;
said first ends of said blade means being offset such that frictional engagement between said first ends of said blade means and the outlet socket is increased when said release means is in said first disposition thereof;
said biasing means including:
a first and a second comperssion spring, said first and second springs being disposed respectively within said first and second portions and adjacent to said first ends respectively of said portions, said first spring being disposed between said partition and said first blade means, said second spring being disposed between said partition and said second blade means such that said springs urge said blade means away from each other to lock the plug device within the outlet socket;
said partition defining a first and a second recess for the reception therein of said first and second springs respectively;
said housing defining a first and second bore, said bores being disposed adjacent to said first and second blade means respectively, said bores slidably receiving therein said manual release means;
said release means including:
a first and a second button slidably disposed within said first and second bore respectively of said housing, said buttons each having a blade engaging end and a finger engaging end, said blade engaging ends of said buttons being disposed on the opposite side of said respective blade means relative to said biasing means such that when said release means is disposed in said second disposition, said blade means are urged by said buttons towards each other against said biasing means such that said first and second blade means are released from the outlet socket; and
said blade engaging ends of said buttons including:
a first and second head respectively for limiting the outward travel of said buttons within said first and second bores.

5,145,394

ANTI-ROTATION ASSEMBLY FOR INTERCONNECT DEVICES

Jeffrey J. Hager, Camarillo, Calif., assignor to G & H Technology, Inc., Camarillo, Calif.

Filed Oct. 3, 1991, Ser. No. 770,319
Int. Cl.[5] H01R *13/623*
U.S. Cl. 439—321 **30 Claims**



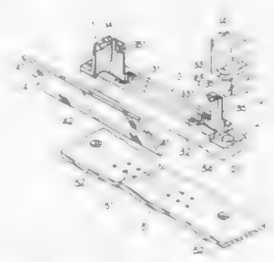
1. In a decoupling resistant electrical connector comprising:
a cylindrical plug housing having a flange about its outer periphery;
a coupling ring rotatably overlying said housing with an abutment rib about the ring inner periphery, said rib having an axially inwardly facing wall in abutment with said housing flange and an axially outwardly facing shoulder;
a detent means connected to said shoulder and extending axially outward therefrom;
a cover part connected against rotational movement to said housing having a serrated surface impressed against said detent means, said detent means providing resistance to movement across said serrated surface when said coupling ring is rotated.

5,145,395

ELECTRICAL CONNECTOR EMBEDDED WITH PLASTIC LATCHES

Lee C. Kuei Lai, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan

Filed Sep. 3, 1991, Ser. No. 753,938
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—326 **11 Claims**



1. An electrical connector comprising:
a longitudinal socket longitudinally formed in the connector for inserting a daughter printed circuit board therein, a plurality of slots transversely formed in the connector each said slot generally perpendicular to the longitudinal

socket for embedding a spring contact element having a supporting leg member protruding downwardly from the connector to be inserted into a leg hole formed in a mother board, and two stop members formed on two opposite end portions of the connector each stop member generally parallel to the longitudinal socket, and formed with an alignment protrusion on a top portion of each stop member;

said connector recessed from a vertical side wall portion formed on each end portion of said connector to form a latch holding base having a connector peg hole formed through the latch holding base;

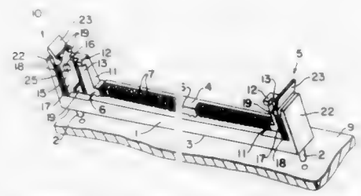
at least two plastic latches made of resilient plastic material each said plastic latch embedded on each said latch holding base of said connector, each said plastic latch having a peg member formed under said latch insertable through the connector peg hole of said connector and through a board peg hole formed in one end portion of a mother printed circuit board projectively corresponding to said connector peg hole for combinably securing each said latch with said connector and said mother board for an electrical connection between said daughter and mother boards.

5,145,396

COMBO SIMM CONNECTOR

Tak-Kin Yeung, City One, Hong Kong, assignor to Amphenol Corporation, Wallingford, Conn.

Filed Nov. 13, 1991, Ser. No. 791,164
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—326 12 Claims



1. In a connector of the type including a molded plastic main body portion, a groove in the main body portion for receiving a daughter board, means for electrically connecting contact surfaces on the daughter board with contact areas on a printed circuit board, means for mounting the main body portion on the printed circuit board, an alignment post for supporting one surface of the daughter board, and a latching mechanism including a latching member and a latching projection extending from the latching member for engaging an opposite surface of the daughter board to secure the daughter board between the alignment surface and the latching projection, wherein the latching member is flexed outwardly to permit the daughter board to pass the latching projection during removal of the daughter board from the connector and during insertion of the daughter board into the connector, the improvement wherein:

the latching member and latching projection are integrally molded with the plastic main body portion of the connector, and wherein the latching mechanism further includes a metal reinforcing member secured to the latching member to provide reinforcement and increased resilience for the latching member.

5,145,397

BOARD TO BOARD ELECTRICAL CONNECTOR WITH HEIGHT ADJUSTMENT

Tomoo Yamada; Yoshihisa Yamamoto, both of Yokohama, and Masanori Yagi, Sagamihara, all of Japan, assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 667,723, Mar. 11, 1991, abandoned. This application Mar. 3, 1992, Ser. No. 845,880
Claims priority, application Japan, Mar. 14, 1990, 2-26084
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—328 3 Claims

1. A surface mountable electrical connector adapted for mounting on the surface of a printed circuit board, said circuit board having contact elements on the surface thereof, comprising,

a connector housing having a plurality of terminals arranged at regular intervals for electrically and mechanically securing to contact elements on the surface of the printed circuit board, the terminals defining a slot to receive an edge of a printed circuit card,

the housing having insulative guide posts positioned at opposite ends of the housing adjacent said slot, each post adapted to receive a side of the printed circuit card inserted into the slot, each post further including a lower section integrally formed with said housing and an upper section pivotally mounted on said lower section, and

said upper section of each guide post being movable between a first operative position at which said connector is configured to receive and retain said printed circuit card and a second inoperative position at which said connector is unable to retain said printed circuit card during a portion of the process of mechanically and electrically mounting said connector to said printed circuit board.

5,145,398

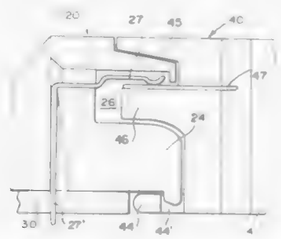
TURNING INSERTION TYPE ELECTRICAL CONNECTOR SYSTEM

Sakae Manabe, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 578,988, Sep. 6, 1990, abandoned. This application Jul. 3, 1991, Ser. No. 726,134
Claims priority, application Japan, Sep. 6, 1989, 1-230851
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—341 8 Claims

1. For use in mechanically and electrically interconnecting an electronic package to a computer having a body including a wall with a relief receiving the package fitted therewithin, a connector system including a first connector half having a dielectric housing and an array of contacts with the housing fixed to the body of the computer within said relief, the first connector housing further including a series of integral first projections extending across the face thereof and at right angles to such face and a recess proximate each end of the first connector housing extending into said face, a second connector half having a dielectric housing affixed to said package with said second connector half housing including a series of holes extending across a face of the housing positioned to receive the first projections of the first connector half housing with the second connector half housing further including

second projections extending from the ends of such housing in a position to enter recesses of the first connector half housing with the second projections and recesses of the first and second connector half housings each having arcuate top and bottom surfaces dimensioned to provide an arcuate movement of said



connectors upon insertion of said projections within said recesses to move the said package into said relief and provide a blind entry and engagement of connector halves for the mechanical and electrical mounting thereof and the package within the body of the connector.

5,145,399

CABLE LOCK APPARATUS

Kenneth S. Davenport, 4009 Red Coat La., Greensboro, N.C. 27410

Filed Aug. 15, 1991, Ser. No. 745,142
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—371 6 Claims

1. A cable lock apparatus for mounting a cable plug within a cable socket, the cable plug including a cable boss mounted to the cable plug, with a cable extending rearwardly of the cable boss, the apparatus comprising,

an attachment plate, the attachment plate including an attachment plate bore, the attachment plate bore receiving the cable socket therethrough, and

a support leg mounted to the attachment plate, the support leg including an abutment sleeve mounted to the support leg, and the abutment sleeve positioned along the support leg above the attachment plate bore and in abutment with the cable boss when the cable plug is positioned within the cable socket, and

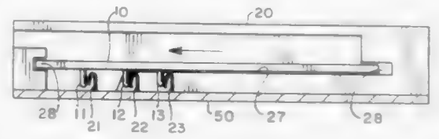
the attachment plate includes a plurality of spaced flanges orthogonally and fixedly mounted to a top surface of the attachment plate adjacent the attachment plate bore, wherein the support leg is pivotally mounted between the spaced flanges, the support leg including a plurality of support leg bores spaced along the support leg, and the abutment sleeve including an abutment sleeve boss member, the abutment sleeve boss member including at least one boss bore directed therethrough, and a fastener directed through the at least one boss bore, and one of said support leg bores to secure the abutment sleeve to the support leg.

5,145,400

SPRING CONTACTS FOR SUBSTRATE CONNECTION

Thomas D. Belanger, Jr., Saline, Mich., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 30, 1991, Ser. No. 814,151
Int. Cl.[5] H01R *13/629*
U.S. Cl. 439—376 6 Claims



1. A substrate connector arrangement for mounting and electrically connecting an electrical substrate to a carrier substrate comprising:

at least a first electrical connecting device mounted along a bottom surface of said electrical substrate, electrically connected to said electrical substrate;

first and second separate substrate guides mounted to a top surface of said carrier substrate in a spaced and parallel relationship to each other, each of said substrate guides including a channel extending longitudinally along an inner side thereof;

each of said channels including a first end including an opening and retention means;

each of said channels further including a second end;

at least a second electrical connecting device electrically connected and mounted to said carrier substrate between said first and second substrate guides;

said second electrical connecting device including a compliant section facing in the direction of said first and second substrate guide first ends;

said electrical substrate inserted in said first and second guide channels with said first electrical connecting device in contact with said second electrical connecting device;

said electrical substrate in response to said compliant section of said second electrical connecting device resiliently engaging said first electrical connecting device, being positioned into said retention means in said substrate guide first end, thus aligning and registering said first electrical connecting device to said second electrical connecting device whereby said first electrical connecting device mates with said second electrical connecting device, electrically connecting said electrical substrate to said carrier substrate.

5,145,401

ELECTRICAL CONNECTOR HAVING IMPROVED SPRING CONTACTS

Lee A. Archer, Asheville, N.C., assignor to Superior Modular Products, Inc., Swannanoa, N.C.

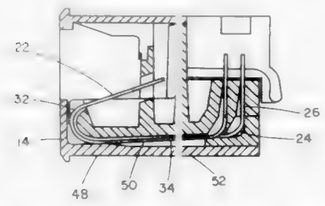
Filed May 28, 1991, Ser. No. 706,388
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—395 29 Claims

1. An electrical connector comprising:

a housing;

at least one elongated contact received in said housing; said contact having an arcuate portion for providing spring action to said contact; said contact having a bearing por-

tion for engaging a corresponding mating contact; said arcuate portion being wider than said bearing portion,



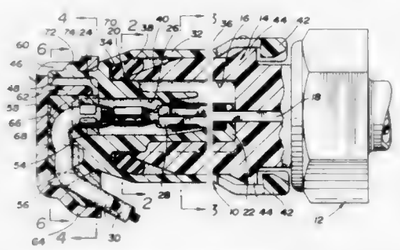
thereby allowing increased deflection of said contact without overstressing said contact.

5,145,402

ELECTRICAL CONNECTOR

Robert G. Plyler, Vienna, and Joseph M. Senk, Cortland, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 534,586 Jun. 6, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 794,323
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—459 18 Claims



1. An electrical connector comprising:
a connector body having a cable end and a plurality of terminal cavities which open into a common cavity at the cable end of the connector body,
a plurality of electric terminals attached to electric cables that are disposed in the respective terminal cavities with trailing portions of the electric cables disposed in the common cavity, and
an end cap which is secured to the connector body for sealing the cable end of the connector body,
the end cap having a hood and a lip cooperatively forming a seal chamber with an end wall of the end cap,
the seal chamber communicating with the common cavity of the connector body and containing a compliant sealing material which seals the cable end of the electrical connector when the end cap is secured to the connector body, and
the lip of the end cap being spaced from the connector body to permit the trailing portions of the electric cables to pass out of the common cavity between the lip and the cable end of the connector body

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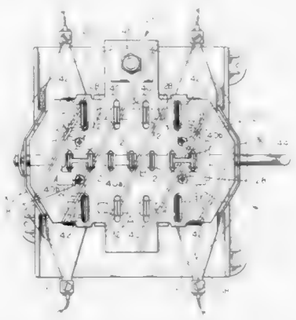
5,145,403

SAFETY COVER FOR METER SOCKET

Gary C. Schaffert, North Canton; Thomas J. Archer, Canton; Timothy M. Chilton, Seven Hills, and John T. Shincovich, North Canton, all of Ohio, assignors to Meter Devices Company, Inc., Canton, Ohio

Filed Jun. 26, 1991, Ser. No. 721,413
Int. Cl.[5] H01R *31/08, 13/44*
U.S. Cl. 439—508 13 Claims

1. A safety cover assembly for a meter socket to prevent outward exposure of electrically-energized contacts of said socket aligned to receive a plurality of rearwardly-projecting contact terminals of an electrical meter for electrical testing and the like, said safety cover assembly comprising a base member, an outer plate having a plurality of spaced-apart apertures therein for passage of said meter contact terminals therethrough, an inner plate having a plurality of electrical contact elements fixedly mounted thereon between said inner



and outer plates in alignment with the apertures of said outer plate, said plates and said base member being joined in spaced-apart relation by transverse rigid interconnecting members, said plates and interconnecting members being formed of plastic insulating material, said meter contact terminals adapted to electrically contact said contact elements mounted within said cover assembly to complete one or more electrical circuits between said meter and said meter socket.

5,145,404

SWITCH TERMINAL BOARD COVER WITH ELECTRICAL LEAD ISOLATION

Glen H. Beattie, and Dale R. Jesselson, both of Livonia, Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Continuation of Ser. No. 591,314, Oct. 1, 1990, abandoned. This application Aug. 14, 1991, Ser. No. 746,169
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—521 2 Claims

1. A switch of the type having a terminal board adapted to permit variability of electrical lead termination locations for variable switch applications, a terminal board cover which extends longitudinally and vertically in a direction perpendicular to the longitudinal direction, the terminal board cover adapted to extend over the terminal board and thereby define a cavity therebetween, and a plurality of electrical leads which longitudinally extend into the cavity in a longitudinal direction to a location at which each lead is independently hardwired to the terminal board, the hardwire locations being in communication, the terminal board cover including the base adapted to extend over the terminal board of the switch, the base extending in the longitudinal direction, a spacing wall around the

edge of the base, which extends vertically from the base, and which has at least one opening to allow for passage of electrical leads, and means for attaching the terminal board cover to the switch, the electrical leads including exposed portions, the exposed portions having mobility which permits contact between the exposed portions in an unassembled condition of the switch, and wherein the improvement comprises:
a plurality of non-conductive projections extending vertically from the base, wherein in an assembled condition said projections extend vertically through the cavity and longitudinally between the openings and the hardwire locations to form a plurality of slots, said projections extending between exposed, adjacent electrical leads of the switch in close proximity to the terminal board, said projections not extending into the region defined by the hardwire locations thereby permitting variability in the hardwire locations, said projections adapted to prevent short circuits between the electrical leads by separating and isolating exposed portions which are disposed within adjacent slots and by restricting the motion of exposed portions extending between the slots and the hardwire locations to prevent contact between such adjacent portions.

5,145,405

CHIP CONNECTOR STRUCTURE

Koichi Akiyama, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1991, Ser. No. 666,613
Claims priority, application Japan, May 15, 1990, 2-49882[U]
Int. Cl.[5] B65D *73/02*
U.S. Cl. 439—525 1 Claim

1. An electronic connector comprising:
a connector body; and
a pair of L-shaped reinforcing brackets, with a vertical leg attached to either side of said connector body and a horizontal leg provided with an abutment face, said horizontal leg extending in parallel to a major surface of said connector body; and
said abutment face being made by bending a front portion of said horizontal leg upwardly in a direction perpendicular to said major surface and parallel to said vertical leg.

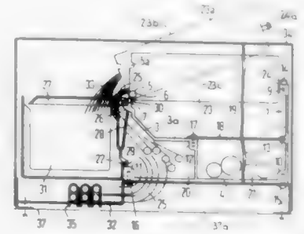
5,145,406

ATTACHMENT UNIT FOR ATTACHING AND CONNECTING ELECTRICAL LINES

Rudolf Knoll, Berg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1990, Ser. No. 587,036
Claims priority, application European Pat. Off., Sep. 29, 1989, 89118076
Int. Cl.[5] H01R *9/24*
U.S. Cl. 439—532 20 Claims

1. An attachment unit comprising: a carrier part having:
a bottom surface,
a first side wall including a first screw channel,
a second side wall, said second side wall having a free edge portion having a first continuous cross sectional shape;
at least one plug strip mounted to said carrier part for the attachment and connection of incoming and outgoing electrical lines, a first end of said plug strip fastened to said screw channel, a second end of said plug strip having a cooperating form which engages said first cross sectional shape forming a hinge-like connection of the plug strip to said second side wall, said continuous first cross sectional shape having a lateral length sufficient for arbitrary lateral



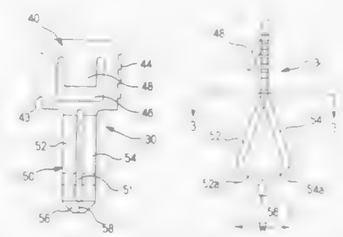
placement of said plug strip at different positions along said length; and
wherein at least one of said first and second side walls is shaped to form at least one space suitable for the acceptance of electrical lines, said space open at one side and defined by said one of said first and second side walls and said bottom surface.

5,145,407

MOUNTING DEVICE FOR COMPONENTS

Hiroyuki Obata, and Sakae Manabe, both of Kawasaki, Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 25, 1991, Ser. No. 797,647
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—567 5 Claims



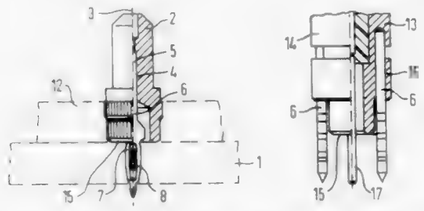
1. A mounting device for locking a component on a printed circuit board or the like, including a sheet metal member having a profile extending in the plane of the sheet metal member, the member including a head portion having a substantially flat section lying in said plane and having a series of barbs, said head portion fitting within a slot in the component with said barbs locking said device to said component by engaging the side walls of said slot, said member including a pair of resilient legs extending from said flat section of said head portion downwardly, separated by a slot and formed outwardly on opposite sides of said plane of the head portion to include oppositely oriented beveled portions operable to drive said legs inwardly in compression upon insertion of the legs in the hole of a board on which the component is to be mounted.

5,145,418

CONNECTOR FOR SOLDERLESS ATTACHMENT TO A PRINTED CIRCUIT BOARD

Bernard Houtteman, Oostkamp, and Michel Mussen, Gent, both of Belgium, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 543,380, Jun. 15, 1990, abandoned. This application Jan. 17, 1992, Ser. No. 824,753
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1989, 8907785[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—581 4 Claims



1. A coaxial plug connector half for connection to printed circuit board, comprising:
a one-piece metallic outer conductor housing which is cylindrical and hollow and having an outer peripheral wall and a narrower cylindrical projecting end part at a circuit board end of the connector which has a diameter which is narrower than an outermost peripheral cylindrical surface of the outer peripheral wall
a central conductor pin arranged coaxially and insulated in the outer conductor housing
at least one peripheral terminal pin arranged within the outer conductor housing;
the central conductor pin and the peripheral terminal pin each being pluggable into a respective allocated bore of the printed circuit board and provided with a press-in zone formed by splitting a region of the pin which is pluggable into the printed circuit board in the respective allocated bore; and
the peripheral terminal pin having a section designed nail-like which faces away from the press-in zone, said nail-like section being plugged into a longitudinal bore within the outer peripheral wall of the one-piece outer conductor housing such that the peripheral terminal pin lies inwardly of said outermost peripheral cylindrical surface of the wall of the cylindrical one-piece housing and lies outwardly of and alongside the narrower cylindrical projecting end part.

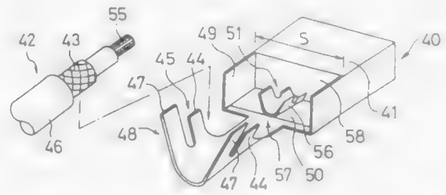
5,145,409

MINIATURE ELECTRICAL CONNECTOR

Kensaku Sato; Hitoshi Miyahira, and Tadayasu Iwasawa, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 712,908
Claims priority, application Japan, Oct. 9, 1990, 2-93964[U]
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—585 2 Claims

1. A miniature electrical contact terminal comprising:
a shield jacket having a contact support section, a shield braid crimping section with a pair of crimping tabs to be crimped to a shield braid of a shielded cable, and an outer sheath crimping section with a pair of crimping tabs to be crimped to an outer sheath of said shielded cable;
an insulator block to be fitted in said contact support section; and
a signal line contact fitted through said insulator block such that a terminal section project from a rear end of said insulator block into a rear space which is defined by four side walls of said contact support section and said rear end of said insulator block;



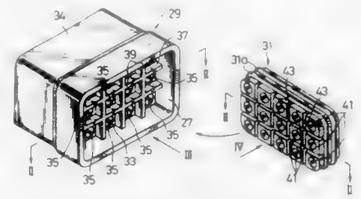
said contact support section sufficiently long to completely cover said terminal section.

5,145,410

WATERPROOF CONNECTOR

Toshiro Maejima; Kazuaki Sakurai; Seiji Kozono; Mitsuhiko Totsuka, and Toshiharu Kudo, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 10, 1991, Ser. No. 727,928
Claims priority, application Japan, Aug. 6, 1990, 2-82727[U]
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—587 5 Claims



1. A waterproofing connector comprising:
a housing having a grid consisting of a plurality of interconnected cross plates defining a plurality of chambers in which wiring harnesses are fixed, each of said cross plates including a transverse edge extending therefrom;
a seal for sealing an end of said housing, said seal having a plurality of holes in which said wiring harnesses are passed through to said chambers and interconnected cross grooves formed on a surface thereof for separating said holes from one another; and
wherein said transversely extending edges of said cross plates of said grid are securely engaged in respective cross grooves of said seal when said seal is inserted in said end of said housing, thereby preventing said holes from deforming and shifting relative to said chambers when said wiring harnesses are passed sequentially through said holes into said chambers.

5,145,411

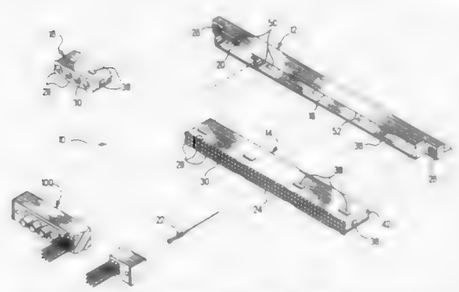
CONNECTOR INSERT RETENTION SYSTEM

Michael E. Pastal, Lebanon, and Patrick F. Yeager, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 14, 1991, Ser. No. 745,026
Int. Cl.[5] H01R *13/516*
U.S. Cl. 439—598 9 Claims

1. An electrical connector assembly, comprising:
a shell member and a dielectric insert member at least including passageways extending axially between first and second end faces for receipt of contacts thereinto, said insert member including outwardly facing surfaces extending axially between said first and second end faces, and said shell member including inside surfaces extending axially between leading and trailing ends and defining a cavity

therewithin, said inside shell surfaces opposing and closely adjacent said outwardly facing insert surfaces upon assembly, said insert first end face insertable into said leading end of said shell member to be disposed within said cavity of said shell member,
said insert member being molded of plastic material having only limited compressibility, and
said insert member being retained in said shell member by first retention means comprising an array of latching projections integrally molded therewith and extending laterally outwardly from said outwardly facing surfaces of said insert member and spaced about the periphery of said insert member, each said latching projection being integrally supported along the length thereof by material of said insert member against laterally inward deflection and including a latching ledge facing said second end face, and cooperating latching means of said shell member comprising a corresponding array of stop surfaces along said inside surfaces of said shell member facing said trailing end of said shell member and being latchingly engageable by said latching ledges of said insert member upon full insertion of said insert member into said shell member, and second retention means comprising a lip extending laterally outwardly from the periphery of said second end face of said insert member and generally continuously thereabout and engageable with said leading edge of said shell member upon full insert insertion.

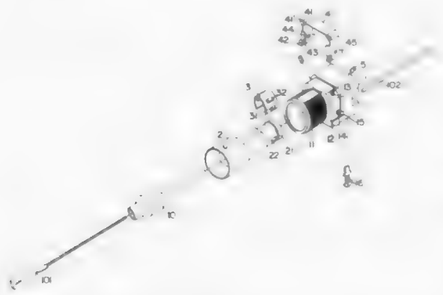


5,145,412

FILTER CONNECTOR

Haw-Chan Tan, Diamond Bar; Nobbert Yu, Culver; Yuan-Chieh Lin, El Toro, and Vincent Chen, Walnut, all of Calif., assignors to Foxconn International, Inc., Sunnyvale, Calif.

Filed Oct. 18, 1991, Ser. No. 779,538
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 16 Claims



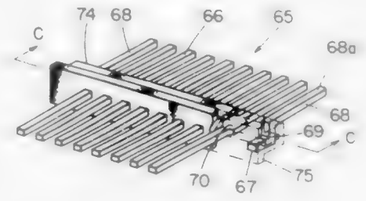
1. A filter connector comprising:
a hollow housing defining a plurality of cavities therethrough radially; an electrically conductive ferrule surrounding an insulator and an inner contact therein, said ferrule including a support member thereon having a plurality of resilient fingers extending outwardly therefrom and positioned within the hollow housing;
an electrical element selectively positioned within each of the plurality of cavities in electrically conductive contact with one of said resilient fingers; and
a shell closely mounted on the housing to completely shield and conductively contact the electrical elements.

5,145,413

NOISE SUPPRESSING CONNECTOR

Hiroyuki Okamoto; Kunio Hoshino; Masakazu Umemura, and Sayoko Kitahara, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 16, 1991, Ser. No. 730,741
Claims priority, application Japan, Jul. 24, 1990, 2-193820; May 23, 1991, 3-118562
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 5 Claims



1. A noise suppressing connector comprising:
a capacitor array having a plurality of individual electrodes arranged on the surface of a dielectric material and an earth electrode attached to the back of the dielectric material;
a plurality of lead terminals each having output and input portions and also an intermediate portion, the intermediate portions being in electrical contact with the individual electrodes of said capacitor array;
a molded insulating resin block enclosing said plurality of lead terminals at the intermediate portions in electrical contact with the individual electrodes of said capacitor array, the earth electrode being positioned outside of said molded insulating resin block; and
a metal housing connected to the earth electrode of said capacitor array and adapted to accommodate and hold said molded insulating resin block.

5,145,414

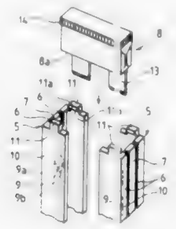
FUSE HOLDER CONSTRUCTION

Ryuetsu Oikawa, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 625,199
Claims priority, application Japan, Dec. 11, 1989, 1-142065[U]; Aug. 31, 1990, 2-90695[U]
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—621 8 Claims

1. A fuse holder for holding a fuse, said fuse holder comprising:
a fuse connecting portion having electrical contacts;
upstanding fuse guide walls each having a flexible portion provided around said fuse connecting portion; and
retainer portions formed respectively on each said flexible portion intermediate opposite ends of said flexible portion, said retainer portions retaining said fuse in one of a first position in which said fuse is inserted in said fuse connect-

ing portion to engage said electrical contacts and a second position in which said fuse is kept out of contact with said



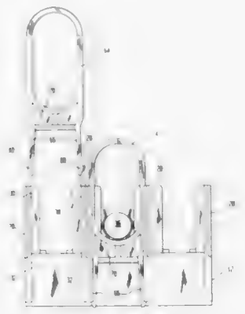
fuse connecting portion while said fuse holder is in a completely assembled state.

5,145,415

LOAD BASE WITH INTEGRAL WIRE LUG AND WIRE LUG RETAINER

Robert Doudon, Drummondville, Canada, assignor to Siemens Electric Limited, Pointe Claire, Canada

Filed Mar. 18, 1991, Ser. No. 670,675
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—621 **6 Claims**



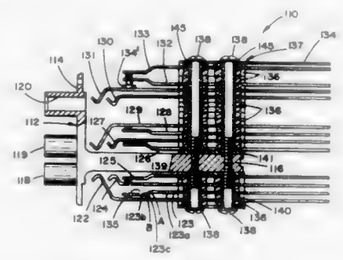
1. A load base comprising:
a wire lug having a unitary lug body with a wire aperture for receipt of a cable and a platform;
a housing having at least one channel for slidable insertion and capture of the wire lug, the housing having sidewalls projecting from opposite sides of the channel for formation of a fuse clip chamber, where each sidewall has at least one track with a detent rib and the load base has a reciprocable fuse puller which rides in the tracks;
a translatable tongue attached to the housing proximal the channel having a first position which permits slidable insertion of the lug into the channel and a second position which blocks removal of the lug from the channel, where the tongue is a cantilever attached at one end thereof to the housing and is translatable by biasing the tongue; and
a fuse clip directly attached to the wire lug platform;
where the fuse puller includes two legs which ride in the tracks, a cross member between the legs for abutment against a fuse in the fuse clip when removing the fuse puller, and a ramped nib projecting outwardly from at least one of the fuse puller legs toward the track for self-biased abutment against the track detent rib when the fuse puller is reciprocated to a desired end position, but which is inwardly biasable by exertion of additional reciprocation pressure on the fuse puller, so that the puller is selectively removable from the load base.

5,145,416

JACK ASSEMBLY

Thomas W. Cruise, Batavia, Ill., and Wayne A. Johnson, Rosemount, Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 452,597, Dec. 19, 1989, abandoned. This application Jul. 10, 1991, Ser. No. 729,793
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—668 **9 Claims**



1. A telephone jack assembly comprising:
a frame;
a spring contact connected to said frame to assume a predetermined rest position with a contact end disposed to engage a plug and with said spring contact urged by insertion of a plug into said frame to be moved from said predetermined rest position to a predetermined displaced position;
a normal contact having a body portion connected to said frame and having a pre-formed offset portion connected to said body portion, said offset portion spaced from and generally parallel to said body portion, said normal contact disposed on said frame to have a rest position selected for said offset portion to oppose and physically abut said spring contact at a point of contact and space said spring contact, against its bias, from said predetermined rest position, said normal contact further disposed for said offset portion to be spaced from and out of electrical signal transmitting contact with said spring contact when said spring contact is in said predetermined displaced position;
said frame including a dielectric spacer having a predetermined dimension, said spring contact and said normal contact connected to said spacer with a resulting compression force with said spacer disposed between said spring contact and said body portion and with said spacer maintaining a separation between said spring contact and body portion equal to said dimension, said spacer formed from a material non-compressible in response to said compression force upon connection of said spring contact and normal contact to said spacer; and
said spring contact connected to said frame in a cantilevered connection and unsupported by said frame at said point of contact when said spring contact is in said displaced position.

5,145,417

TERMINAL BLOCK ASSEMBLY FOR HERMETIC TERMINAL STRUCTURE

Glenn A. Honkomp, Warren County; Thomas O. McNay, Clermont County; Larry G. Burrows, Hamilton County, all of Ohio, and H. Howard Heimbrock, Dearborn County, Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 503,232, Apr. 2, 1990, Pat. No. 5,035,653. This application Dec. 24, 1990, Ser. No. 633,323
Int. Cl.[5] H01R *21/08*
U.S. Cl. 439—685 **51 Claims**

35. A current and heat resistive power lead block having spaced open-ended channels linearly alignable and intermeshably engageable with linearly aligned open-ended channel-like members of an external structure, electrical connectors disposed in said spaced channels of said power lead block, each electrical connector in said power lead block having part of a male-female electrical connection disposed at a corresponding end thereof linearly engageable through aligned open ends

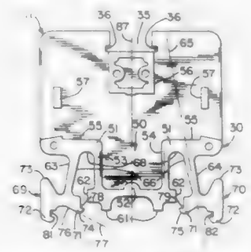
with the other part of said male-female electrical connection at the end of an electrical connector in said external structure, each of said electrical connectors in said power lead block having the other end connected to one end of an outside lead wire electrically connected at the opposite end to a power sources.

5,145,418

TERMINAL BLOCK SEGMENT WITH FEET FOR MOUNTING ON TRACKS OF TWO DIFFERENT WIDTHS

Jeffrey A. Moranski, New Berlin; Ronald J. Malecki, Brown Deer; Mark E. Davidsz, Greenfield, and Arthur J. Felber, Muskego, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 7, 1991, Ser. No. 712,013
Int. Cl.[5] H01R *9/26*
U.S. Cl. 439—716 **7 Claims**



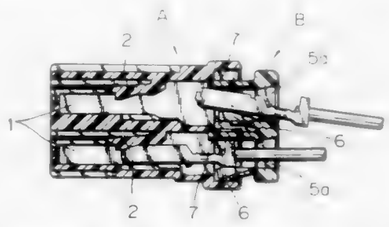
1. A modular segment for attachment to either a first mounting track or a second mounting track, the segment comprising:
a base having a central portion, having pedestal portions extending laterally from the central portion, having a transverse barrier rising upwardly from a back side of the central portion and pedestal portions to separate one terminal compartment from another terminal compartment on a neighboring segment, and having legs depending from the respective pedestal portions so as to be spaced laterally from the central portion and from each other;
a pair of guides running longitudinally along a bottom of the central portion and spaced apart from one another for locating the segment on opposite inside edges of spaced apart rails of the first mounting track;
a pair of feet, each foot being disposed on a lower portion of a respective one of the legs, each foot including two toes, the two toes including
a first toe with a first, inwardly opening groove that is spaced from the central portion of the base for receiving an outside edge of a respective rail on the first mounting track and cooperating with a respective one of the guides to hold the segment on a rail of the first mounting track; and
the foot also including a second toe with a second, inwardly opening groove that is spaced further from the central portion than the first groove for receiving an outside edge of a respective rail on the second mounting track that is wider than the first mounting track.

5,145,419

CONNECTOR WITH A TERMINAL LOCK

Makoto Yamanashi, and Isao Kameyama, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 653,326
Claims priority, application Japan, Feb. 19, 1990, 2-14759[U]
Int. Cl.[5] H01R *13/436*
U.S. Cl. 439—752 **5 Claims**



1. A connector with a terminal lock comprising:
a connector housing having terminal chamber means including at least one terminal chamber having therein a first terminal holding means, an abutment surface being formed at a rear opening of said chamber;
a terminal lock coupled to a rear portion of the connector housing by coupling means engaged through a two-step coupling process involving a first partial coupling state and a second full coupling state, said terminal lock having at least a pair of second terminal holding means and terminal guiding means facing each other at an insertion opening means positioned corresponding to said at least one terminal chamber, said terminal guiding means being partially inserted into said at least one terminal chamber in the connector housing when the terminal lock is partially coupled to the connector housing in said first coupling state;
such that when the terminal lock is partially coupled to the connector housing in the first coupling state, a terminal lug, as it is inserted into said insertion opening means, is guided by the terminal guiding means past said abutment surface into the at least one terminal chamber in the connector housing to engage said first terminal holding means;
and subsequent movement of said terminal lock to the second full coupled state engages said second terminal holding means to lock said terminal lug in said at least one terminal chamber.

5,145,420

ELECTRICAL WIRE CONNECTOR

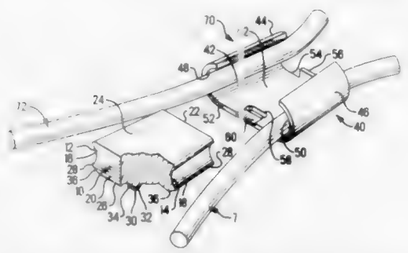
Eugene F. Counsel, 2946 Deer Run S., Clearwater, Fla. 34621, and Gino Menechella, 1 Topham Crescent, Richmond Hill, Ontario L4C 9G2, Canada

Filed May 31, 1991, Ser. No. 708,406
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—783 **4 Claims**

1. An improved electrical wire connector for electrically commoning and mechanically securing a pair of electrical wires, of the type utilizing a C-shaped member having a bight section extending to opposing arcuate ears along lateral edges defining outer boundaries of wire channels and converging

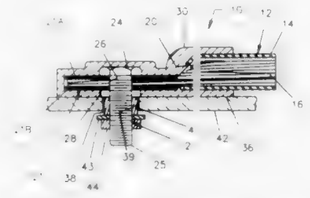
from a forward end to a rearward end, and a wedge forceable between the ears and converging from a forward end to a rearward end and having concave side surfaces opposed from inner surfaces of the ears defining inner boundaries of the wire channels, for wires to be disposed along respective ones of the wire channels and be clamped and commoned upon the forcing of the wedge into the C-shaped member and between the wires, and locked in place, the improvement comprising:

said wedge being solid and having a bight-remote surface and a bight-proximate surface, the bight-proximate surface extends outwardly from a plane extending between the centerlines of the concave side surfaces substantially to



the same extent as the inner surface of the bight section of the C-shaped member extends from the plane between the centerlines of the arcuate ears thereof, the bight-proximate surface is spaced from the plane extending between the centerlines of the concave side surfaces a greater distance than the bight-remote surface, whereby said bight-proximate wedge surface is closely adjacent said inner surface of said bight section when being forced into said C-shaped member during application to said two wires and minimizes bowing inwardly of said bight section under stress and allows greater compressive force against the wires to be attained by the connector.

5,145,421
CABLE CONNECTOR
Kenneth A. Julian, 409 Suffolk La., Oak Brook, Ill. 60521
Filed Jul. 23, 1991, Ser. No. 734,438
Int. Cl.[5] H01R *4/30*
U.S. Cl. 439—801 **6 Claims**



1. An electrical connector for attaching a cable of stranded wires surrounded by an insulating material to an electrically conductive member having an aperture therein having a first given length comprising in combination:

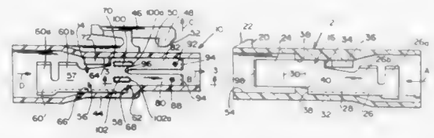
a threaded stud having an outer diameter which is less than the diameter of said aperture and two ends separated by a second given length which is longer than said first given length,

attachment means for attaching one of said ends of said threaded stud to said strands of wire,

an insulating covering material which covers said one of said ends, said attachment means and a portion of said insulating material, and

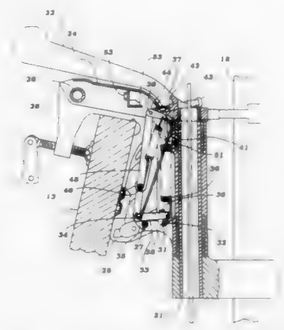
an electrically conductive sleeve of malleable material fitted over said stud and having an outer diameter less than the diameter of said aperture and a length less than said length of said stud and greater than said length of said aperture.

5,145,422
FEMALE ELECTRICAL TERMINAL WITH IMPROVED CONTACT FORCE
Rupert J. Fry, Des Plaines, Ill., assignor to Molex Incorporated, Lisle, Ill.
Filed Dec. 30, 1991, Ser. No. 814,130
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—856 **10 Claims**



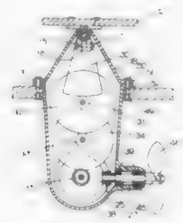
1. In a female electrical terminal for mating with a male electrical terminal, including a forward mating end for receiving the male terminal along a front-to-rear axis and a rear terminating end for connection to another electrical element, the forward mating end including two pair of opposing spring contact arms each extending from the rear terminating end and having a dimple projecting transversely of the axis for engaging the male terminal, wherein the improvement comprises the dimple on one opposing pair of spring contact arms being offset axially of the dimple on the other pair of spring contact arms to reduce the resultant insertion force on the male terminal, reinforcing means on each spring contact arm, and the distances between the reinforcing means and the dimples on the respective spring contact arms being substantially equal whereby the normal force on the male terminal by each dimple is substantially equal.

5,145,423
TILTING MECHANISM FOR OUTBOARD DRIVE UNIT
Takaji Kawai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Apr. 12, 1991, Ser. No. 685,124
Claims priority, application Japan, Apr. 12, 1990, 2-97079
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—63 **16 Claims**



1. A tilting mechanism for an outboard drive unit comprising a clamp bracket having a holder portion and adapted to be affixed to the transom of an associated watercraft, a tilt shaft, a swivel bracket pivotally connected to said clamp bracket for tilting movement about said tilt shaft between a tilted down position and a tilted up position, a stop member secured to said clamp bracket and engageable with said swivel bracket for setting a tilted down position of said swivel bracket, locking means pivotally mounted on said swivel bracket for selectively engaging said stop member for releasably retaining said swivel bracket in a tilted down position, holding means pivotally supported on said swivel bracket for selectively engaging the holder portion of said clamp bracket for releasably holding said swivel bracket in a tilted up position, a single operating lever pivotally supported on said swivel bracket for controlling said locking means and said holding means, means for connecting said single operating lever with said locking means, and means for connecting said single operating lever with said holding means, said single operating lever being movable between a first position wherein said locking means is engaged with said stop member and said holding means is urged away from the holder portion of said clamp bracket, a second position wherein said locking means is disengaged from said stop member, and a third position wherein said holding means is urged toward the holder portion of said clamp bracket and adapted for engagement with the holder portion when said swivel bracket is tilted up.

5,145,424
HUMAN-POWERED BOAT PROPELLING EQUIPMENTS
Sihui Han, 3800 Pepperell Pkwy., Opelika, Ala. 36801
Filed Aug. 19, 1991, Ser. No. 747,721
Int. Cl.[5] B63H *16/18*
U.S. Cl. 440—13 **5 Claims**



1. A human-powered propelling drive for propelling a boat, said human-powered propelling drive comprising:

a platform for supporting an occupant and for operation by the occupant, said platform including a board, said board having a bottom side, two hangers fixed to said bottom side, said hangers each having a square slot, an input gear shaft, said input gear shaft having two end sections, each of said end sections having a square head, each said square head being received in an associated one of said square slots;

a support for said platform;

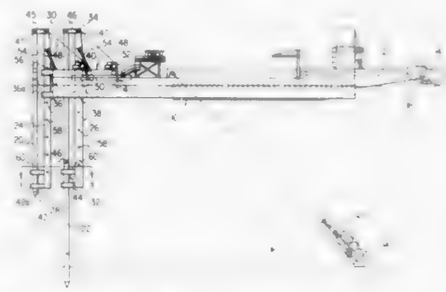
a first gear train for power transmission and increasing drive ratio, said gear train comprising a first gear sector, a first transmission gear shaft, a first transmission gear mounted on said first gear shaft, a second transmission gear shaft, a second transmission gear mounted on said second gear shaft, a bevel gear shaft, at least one bevel gear mounted on said bevel gear shaft, a first one-way clutch, said first one-way clutch connected to said at least one bevel gear, and a second bevel gear;

an output shaft, said output shaft having a free end, a plurality of bearings, said bearings rotatably supporting said output shaft, and a propeller fixed upon said free end of said output shaft;

a gear box, said gear box rotatably supporting said first gear shaft, said second gear shaft, said bevel gear shaft, said plurality of bearings, and said output shaft;

wherein said board drives said propeller through said gear sector, said first gear shaft, said first transmission gear, said second gear shaft, said second transmission gear, said bevel gear shaft, said one-way clutch, said at least one bevel gear, said second bevel gear, and said output shaft so as to propel said boat.

5,145,425
SPUD ASSEMBLY FOR DREDGES
Charles D. Little, Graceland Park, Md., assignor to Ellicott Machine Corporation, Baltimore, Md.
Filed May 21, 1991, Ser. No. 703,821
Int. Cl.[5] B63H *19/08*
U.S. Cl. 440—36 **7 Claims**

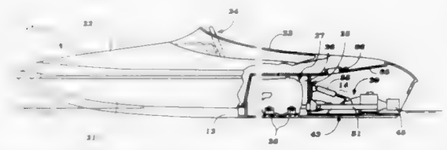


1. In combination with a barge carrying a dredge, a spud assembly comprising an elongated substantially rigid pole having upper and lower ends, a non-reciprocal guide carried by said barge and slideably receiving said pole, a spud well adjacent the lower end of said pole and extending laterally from said pole below and beyond said guide, spud hoist means carried by said pole above said guide, a spud received in said well and operatively connected to said hoist means whereby said spud may be raised and lowered with respect to said well and said pole, elevating means for raising and lowering said pole in said guide with respect to said barge, said elevating means being operable to maintain said pole and said well at all times during use clear of the bottom of a waterway, said well providing the sole guide and lateral support for said spud when it is in anchoring position in the bottom of a waterway, wherein said spud assembly is constructed and arranged for use in anchoring said barge on the bottom of a waterway having a depth greater than the length of said spud but not greater than the combined length of said pole and spud when lowered to their maximum extents, said elevating means being operable to lower said pole to a position such that the distance between said well and said bottom is not in excess of the length of said spud, said hoist means being operable to lower said spud in said well until its lower end is in anchoring condition with said bottom and at least its extreme upper end is entirely within said well means.

5,145,426
MULTI JET PROPELLED WATERCRAFT
Noboru Kobayashi, and Hirofumi Imaeda, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan
Filed Jun. 27, 1991, Ser. No. 722,119
Claims priority, application Japan, Jul. 6, 1990, 2-180339
Int. Cl.[5] B63H *11/00, 11/107, 25/46, 25/00*
U.S. Cl. 440—38 **27 Claims**

1. A jet propelled watercraft comprising a V bottom hull defined by a pair of downwardly converging lower side surfaces and having tunnel means disposed at the rear end thereof, a pair of jet propulsion units, each mounted in substantial part in said tunnel means in side by side relationship, said jet propulsion units each having a generally downwardly facing inlet opening through which water is drawn from the body of water in which said watercraft is operating and extending in a plane generally parallel to the respective lower side surface of said V

bottom hull, and means for pivotally supporting each of said jet propulsion units for pivotal movement about a generally horizontally disposed transverse axis for raising said water inlet openings relative to the body of water in which said watercraft is operating.

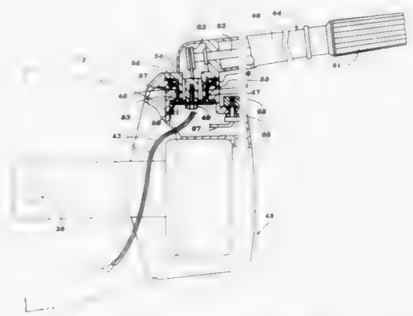


5,145,427

STEERING MECHANISM FOR OUTBOARD MOTOR

Takaji Kawai, and Kouji Abe, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabu hiki Kaisha, Hamamatsu, Japan

Filed Mar. 5, 1991, Ser. No. 665,328
Claims priority, application Japan, Mar. 6, 1990, 2-54695
Int. Cl.[5] B63H *21/30*
U.S. Cl. 440—52 14 Claims



1. A steering mechanism for an outboard motor comprising a steering bracket having a mounting bore, a steering handle having a mounting shaft at one end which is received for pivotal rotation within the mounting bore of said steering bracket for adjustment of said steering handle in a generally vertical direction, means for dampening vibration transmission between said steering bracket and said steering handle and for holding said steering handle at one of a plurality of vertically adjusted pivot positions, and an area of rigid contact between said steering handle and said steering bracket located adjacent to and surrounding said vibration dampening means.

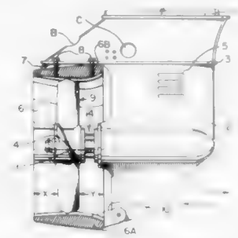
5,145,428

SHROUDED PROPELLER SYSTEM FOR A SAILBOAT

Serge Harrison, 344 Olivier Avenue, Montreal, Quebec H3Z 2C9, Canada

Filed Aug. 27, 1990, Ser. No. 572,605
Int. Cl.[5] B63H *21/32*
U.S. Cl. 440—89 16 Claims

1. An outboard motor unit comprising in combination:
(i) an engine means adapted to drive a propeller in either an ahead or astern direction, and including a housing incorporating means whereby the outboard motor unit is attachable to the hull of a boat;
(ii) a first casing means extending generally downwardly from the housing and including a first propeller drive shaft means; engine coolant water passages, and at least one first engine exhaust passage;
(iii) a second casing means attached to the first casing means and including a second propeller drive shaft driven by the first shaft and extending substantially aft therefrom, engine coolant water passages, and at least one second exhaust passage connected to each first exhaust passage;
(iv) a substantially symmetrical accelerating nozzle attached to the second casing concentric about the axis of the second shaft;
(v) a reversible propeller including blades and a boss attached to the second drive shaft and rotatable in a plane substantially perpendicular to the axis of the Kort nozzle at the mid-point thereof, wherein
(a) the blade pitch decreases outwardly along the length of the blade;
(b) the blade width increases outwardly along the length of the blade; and



(c) each blade is curved symmetrically in a plane parallel to the axis of rotation so that both the leading and the trailing edges serve to accelerate water passing over the propeller regardless of the direction of rotation of the propeller;
(vi) at least one first exhaust gas exit port communicating with the second exhaust passage and adapted to vent exhaust gas aft of the nozzle; and
(vii) at least one second exhaust gas exit port communicating with the second exhaust passage and adapted to vent exhaust gas forward of the nozzle, said at least one first exhaust gas exit port and passage venting substantially all exhaust gasses into the turbulence downstream of the propeller for forward direction of rotation of the propeller, and said at least one second exhaust gas exit port and passage venting substantially all exhaust gasses into the turbulence downstream of the propeller for reverse direction of rotation of the propeller; whereby substantially none of the exhaust gasses are introduced into the relatively undisturbed water upstream of the propeller.

5,145,429

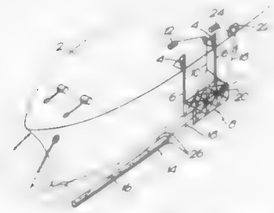
FLUID AND MATERIAL TRANSFER AT SEA

John S. Stoddart, Horsham, and William E. Abraham, Hindhead, both of Great Britain, assignors to Foster Wheeler Energy Limited, Reading, United Kingdom

Filed May 1, 1990, Ser. No. 517,008
Claims priority, application United Kingdom, May 2, 1989, 8909994
Int. Cl.[5] B67D *5/68*
U.S. Cl. 441—4 33 Claims

1. A system for receiving and securing an object an sea, the object being an end of a hose, the system comprising:
a framework installed on a ship and having a track;
a cradle mounted on the track for movement between two positions thereon, of which one position is a position for receiving an end of a hose and is substantially at or below the water line of the ship, the cradle including guides for directing a said object in the form of an end of a hose while the object is within the cradle;

a locking mechanism for securing a said object in the cradle; and



means for moving the cradle between said two positions on the track.

5,145,430

SURF CRAFT

Gary Keys, Lot 43, Ashton Street, Margaret River, Western Australia; Terry Keys, 5 Lakes Boulevard, Yamba, New South Wales, and George Hamilton-Greenough, 4 Seven Mile Beach Road, Lennox Head, New South Wales, all of Australia

Filed Mar. 14, 1991, Ser. No. 669,494
Claims priority, application Australia, Sep. 13, 1989, PJ6335
Int. Cl.[5] B63B *35/79*
U.S. Cl. 441—74 9 Claims

1. A surf craft comprising a planing plank forming the complete lower surface of the craft, a central stiffening spine constructed to have a maximum strength against bending in the direction normal to the planning plank at a location spaced from each end of the craft and such that said strength decreases from said maximum toward each end of the craft, said spine upstanding from and extending substantially the length of the planning plank, said spine being integral with the planing plank to form a structural unit with the planing plank projecting laterally from either side of the central spine, said lateral projections of the planing plank being independently resiliently deflectable in use relative to the central stiffening spine, and filler pads on either side of the spine resting on the planing plank and forming with the spine a platform for a rider of the craft to stand and move about on, said filler pads being resiliently flexible with the planing plank.

5,145,431

AQUATIC VIEWING APPARATUS

M. Richard Dowdeswell, 356 Pimlico Rd., Greenville, S.C. 29607

Filed Apr. 10, 1991, Ser. No. 682,984
Int. Cl.[5] B63C *11/48*
U.S. Cl. 441—135 3 Claims

1. An aquatic viewing apparatus comprising:
an annular structure formed of closed cell plastic foam having an open end for receiving the face of a user;
said annular structure having an inside cylindrical wall and an outside cylindrical wall generally parallel to said inside cylindrical wall and displaced therefrom about a radius of said annular structure, said inside cylindrical wall and said outside cylindrical wall connected by transverse end walls at either end thereof;
said transverse end walls being substantially perpendicular to said inside cylindrical wall and said outside cylindrical wall;
said inside cylindrical wall having a groove at one end thereof opposite said open end generally proximate to one of said end walls and extending annularly around the entire inside cylindrical wall of said annular structure;

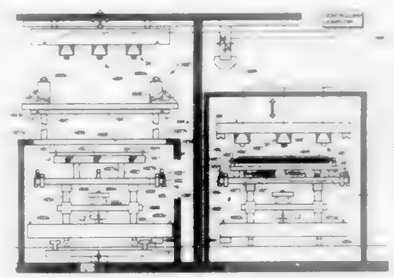
a transparent member in said groove of said inside cylindrical wall;
means in gaseous communication between said inside and said outside walls to supply air to the user;
said apparatus being buoyant and capable of supporting the head of a user while in water.

5,145,432

OPTICAL INTERPROGATION SYSTEM FOR USE IN CONSTRUCTING FLAT TENSION SHADOW MASK CRTS

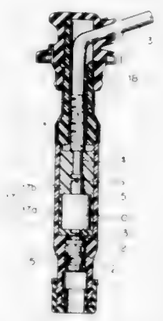
Richard W. Midland, Inverness; Boris Rozansky, Buffalo Grove, and Thomas W. Tepe, Oak Park, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 27, 1991, Ser. No. 799,590
Int. Cl.[5] H01J *9/00, 9/42*
U.S. Cl. 445—3 23 Claims



1. An apparatus for interrogating at least one CRT workpiece, comprising;
a) a plurality of video cameras placed in known locations, the cameras each having a field of view on at least one CRT workpiece;
b) means for representing each field of view as a series of pixels;
c) means for valuing each pixel in a single-bit image value;
d) processor means for serially comparing each camera's series of pixel image values in parallel to determine where transitions take place between pixel image values for each camera;
e) means for filtering the transition locations to determine where desired features in the fields of view occur.

5,145,433
HIGH TENSION CABLE DEVICE AND PROCESS OF PRODUCING THE SAME
Kiyoshi Yagi, and Seiichi Wakabayashi, both of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 5, 1990, Ser. No. 548,532
Claims priority, application Japan, Jul. 14, 1989, 1-082244[U]; Jul. 14, 1989, 1-180489; Jul. 14, 1989, 1-180490; Jul. 25, 1989, 1-086514[U]; Aug. 2, 1989, 1-090420[U]; Aug. 4, 1989, 1-201285
Int. Cl.[5] H01T 13/04
U.S. Cl. 445—7 7 Claims



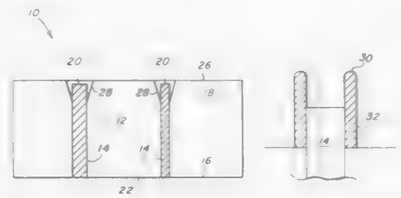
1. A high tension cable device comprising an electrically insulating tubular casing, a connecting terminal for the connection to a terminal of an ignition plug, said connecting terminal being fixedly fitted in the inside of an end portion of said casing, a high tension cable fitted in the other end portion of said casing, an additional function part mounted in the inside of said casing and coupled at one end thereof to said connecting terminal and at the other end thereof to said high tension cable, and an electrically insulating resin material filled in a spacing in the inside of said casing, said cable device further comprising a head cap mounted at the other end of said casing, and a check valve disposed intermediately in a hollow axial hole of said connecting terminal for allowing, when said electrically insulating resin material is to be fed into the inside of said casing by way of said hollow axial hole of said connecting terminal, such feeding of the resin material but preventing the resin material from coming out of the inside of said casing by way of said hollow axial hole of said connecting terminal, said electrically insulating resin material being filled fully in a spacing formed between said casing and head cap and said connecting terminal and additional function part.

5,145,434
VIDEO DISPLAY DEVICE AND METHOD OF MOUNTING A CATHODE RAY TUBE IN A CABINET OF A VIDEO DISPLAY DEVICE
William J. Pauplis, Hudson; Victor M. Samarov, Carlisle, and George A. Doumani, Andover, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 26, 1991, Ser. No. 721,264
Int. Cl.[5] H04N 5/645
U.S. Cl. 445—23 6 Claims

1. A video display device comprising:
a cabinet having a bezel portion and a rear enclosure portion, said bezel portion having an inside surface and a screen delimiting opening;
a cathode ray tube having a front surface portion; and with said inside surface of said bezel portion and said front

surface portion of said cathode ray tube for coupling said cabinet to said cathode ray tube.

5,145,435
METHOD OF MAKING COMPOSITE FIELD-EMITTING ARRAYS
Jack D. Ayers, Oakton, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 1, 1990, Ser. No. 607,955
Int. Cl.[5] H01J 9/02
U.S. Cl. 445—24 3 Claims

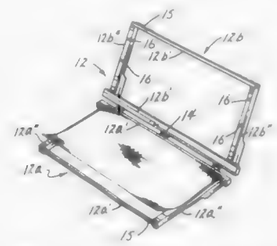


1. A method of fabricating a field-emitting array from a stock, field emitting array made of a material selected from the group consisting of glass, pyro-ceramic, or fine-grained polycrystalline oxide, wherein said wafer has a first and second substantially parallel surfaces, and wherein electrically conducting filaments extend between said parallel surfaces, said method comprising the steps of:
(a) removing insulating material from said first surface until said filaments extend from that surface a distance of from about 0.1 to 5 μm;
(b) depositing a thin layer of electron-emitting material on the exposed surfaces of said filaments at said first surface;
(c) removing any electron-emitting material which may have been deposited in step (b) on the end of said filament or on said first surface between said filaments;
(d) removing from about 5 to 500 nm from the exposed end of said filament extending beyond said first surface, thereby leaving a short ring of electron-emitting material extending beyond said end of said filament.

5,145,436
FOLDABLE BEEHIVE FOUNDATION FRAME
Robert W. Little, Rte. 1, Box 76, New Harmony, Ind. 47631
Filed Jan. 29, 1991, Ser. No. 647,240
Int. Cl.[5] A01K 47/02
U.S. Cl. 449—43 2 Claims

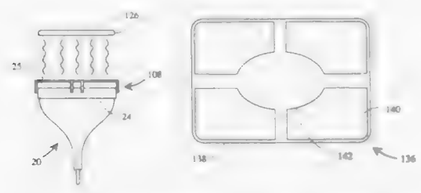
1. A beehive foundation frame comprising a first framework and a second framework hinged together along one side, and foldable spring wire latch member selectively fastening together other of the sides, where each of said frameworks is

defined by frame sections, each presenting a surface bearing against an edge of said foundation, where foundation securement is achieved through tension-pressure exerted upon closing said frameworks against edges of said foundation at an



operative position, and where pins on the inner surfaces of frame sections project into corresponding openings in the inner surfaces of opposing frame sections and through said foundation.

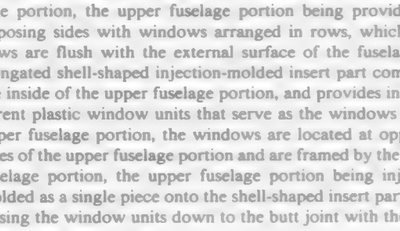
5,145,437
FACEPLATE STRESS-RELIEF IN TENSION MASK COLOR CATHODE RAY TUBE MANUFACTURE
Jay D. Ondra, Forest Park, and Paul R. Riopel, Elk Grove, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Aug. 5, 1991, Ser. No. 740,751
Int. Cl.[5] H01J 9/26
U.S. Cl. 445—45 5 Claims



1. For use in the manufacture of a color cathode ray tube including a faceplate with a screen embraced by rails supporting a tensioned shadow mask, wherein the faceplate of the tube is subjected to a radiant heat source for heating said faceplate, an apparatus comprising:
shielding means for reducing stress on said cathode ray tube including a heat shield for shielding a central area of said faceplate from said radiant heat source; and
a frame for overlapping said faceplate and enclosing and shielding the sides of said faceplate from heat, said frame having a plurality of arms for spacing the heat shield apart from the front surface of said faceplate;
whereby stresses induced in the corners of said faceplate by said rails during thermal cycling of the tube are dispersed in a shielded, cooler central area of said faceplate.

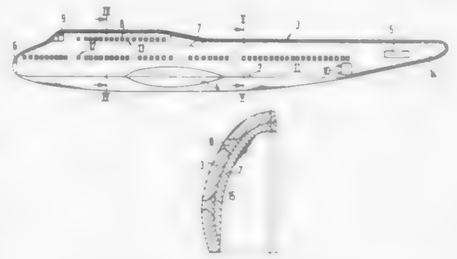
5,145,438
METHOD OF MANUFACTURING A PLANAR MICROELECTRONIC DEVICE
Igor I. Bol, Sherman Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 15, 1991, Ser. No. 730,322
Int. Cl.[5] H01J 9/02
U.S. Cl. 445—49 9 Claims

1. A method of fabricating a microelectronic device, comprising the steps of:
(a) forming a cathode and an anode on a surface of a substrate;
(b) forming a first sacrificial layer over the substrate, cathode and anode;
(c) forming a second sacrificial layer over the first sacrificial layer;
(d) removing a portion of the second sacrificial layer to expose a part of said first sacrificial layer and form a wall positioned between the cathode and the anode;



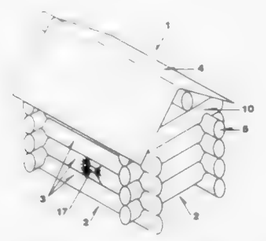
(e) forming a first conductive layer against the wall and over the second second sacrificial layer and the exposed portions of the first sacrificial layer; and
(f) forming a conductive sidewall spacer against the wall by anisotropically etching the first conductive layer.

5,145,439
FUSELAGE OF A MODEL AIRPLANE INJECTION MOLDED FROM PLASTIC AND HAVE WINDOWS
Claus W. Wagener, Dietenhofen, Fed. Rep. of Germany, assignor to Herpa Miniaturmodelle GmbH, Dietenhofen, Fed. Rep. of Germany
Filed Jul. 23, 1991, Ser. No. 734,524
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 4023888
Int. Cl.[5] A63H 27/00, 33/22; F21V 7/04
U.S. Cl. 446—34 8 Claims



1. A fuselage of a model airplane, the fuselage consisting of plastic and comprising a fuselage external surface which is horizontally subdivided along a longitudinally extended butt joint into a fuselage lower part and a shell-shaped upper fuselage portion, the upper fuselage portion being provided on opposing sides with windows arranged in rows, which windows are flush with the external surface of the fuselage, an elongated shell-shaped injection-molded insert part comprises the inside of the upper fuselage portion, and provides in transparent plastic window units that serve as the windows of the upper fuselage portion, the windows are located at opposing sides of the upper fuselage portion and are framed by the upper fuselage portion, the upper fuselage portion being injection molded as a single piece onto the shell-shaped insert part comprising the window units down to the butt joint with the fuselage lower part.

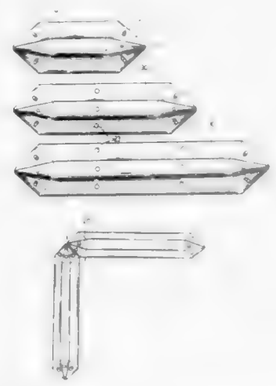
5,145,440
INFLATABLE LIFESIZE TOY STRUCTURE WITH INTERLOCKING ELEMENTS
Sherri M. Boris, 290 W. 2nd Ave., Sun Valley, Nev. 89434, and Joseph F. Boris, Sr., 10297 Peninsula Dr., Stanwood, Mich. 49346
Filed Sep. 24, 1990, Ser. No. 588,579
Int. Cl.[5] A63H *33/03*
U.S. Cl. 446—106 1 Claim



1. A toy construction kit for erecting structures large enough to be played in by children comprising:
a plurality of inflatable elements, said elements forming a cylindrical shape in the elongated direction, said elements being generally round in cross section, said elements constructed of flexible walls and having two sealed ends forming an enclosed gas chamber within;
said elements having at least one air valve as a means of inflation and deflation of said elements;
said elements having at least one convex recess thereof inclined inwardly from said flexible exterior of said element toward the interior of said enclosed gas chamber whereby a symmetrical half circle is formed of an approximate diameter of said element, said recess having an axis that is perpendicular to the axis of said element, said recess being a means of the perpendicular coupling of one said element with another said element;
said elements stacked vertically one with another in a perpendicular alternating pattern whereby each stacked element is seated into said recess of an adjacent perpendicular element thereby interlocking each perpendicular adjacent element, one with another;
a ring element, said ring element being less in diameter than the diameter of the cross section of said element, is a means for forming a window in a wall of said toy structure.

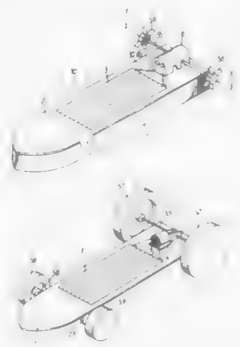
5,145,441
CONSTRUCTIONAL KIT
Yan J. Hsun, 58, Ma Yuan West St., Taichung, Taiwan
Filed Aug. 30, 1991, Ser. No. 753,614
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—126 2 Claims

1. A constructional kit comprising a plurality of members each being an elongated body and having a substantially uniform cross section, each of said members including two ends each having a conical and tapered shape, at least one stub and at least one recess being formed on each of said ends of each of



said members, said stubs being engageable with said recesses so that said members can be assembled in a spatial configuration.

5,145,442
MULTI-PURPOSE SOLAR ENERGY OPERATED TOY VEHICLE
Ja D. Zan, 5Fl., No. 190, Sec. 2, Kee Lung Rd., Taipei, Taiwan
Filed May 21, 1991, Ser. No. 703,754
Int. Cl.[5] A63H *23/04, 17/00*
U.S. Cl. 446—163 10 Claims

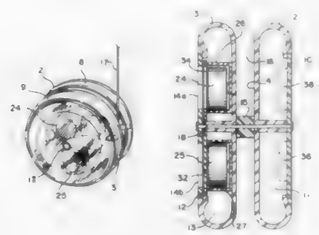


1. A multi-purpose solar energy operated toy vehicle, comprising:
(a) a body, resembling a ship shape floatable on water;
(b) a plate secured on said body;
(c) a base, defining a bottom plate, a recess and a transmission box;
(d) a motor, snapfitting in said recess of said base, the motor having a pair of electric conductive terminals, an output shaft with a first gear mounted thereon extending into said transmission box;
(e) a driven shaft, transversely supported by said transmission box with a second gear fixedly attached thereon engaged with said first gear;
(f) paddle driving elements mounted on both ends of said driven shaft; and,
(g) a solar cells panel capable of converting solar energy into electric energy by way of photoelectric effect secured to said plate, the panel having a pair of outputting wires with terminals electrically connected with said motor through said conductive wires thereof; so that said toy vehicle can be operated on water by the provision of solar energy which is converted into electric energy to drive said motor, so as to drive the driving elements through said first gear and said second gear incorporated with said output shaft and said driven shaft respectively.

5,145,443
MUSICAL TOY HOOP
Gintaras A. Vaisnys; Philip C. Black, both of North Haven; Barry Y. Piels, Fairfield, and Robert S. McDarren, Ridgefield, all of Conn., assignors to Cygnet, Inc., Woodbridge and Link Group International, Ridgefield, both of Conn.
Filed Aug. 6, 1991, Ser. No. 740,951
Int. Cl.[5] A63H *1/24, 5/00, 1/28*
U.S. Cl. 446—242 7 Claims

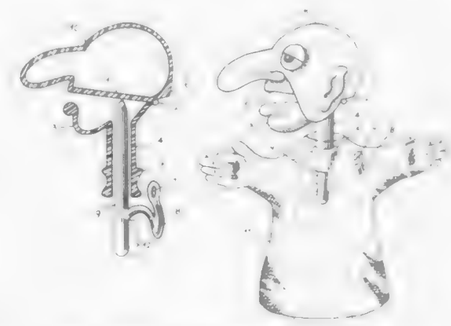
1. A sound emitting hoop toy comprising:
(a) a hollow tube having first and second ends;
(b) a plug for engagement with the first and second ends to form a closed loop having a substantially continuous inner periphery, said plug (i) including openings to allow sound to radiate form the plug and (ii) comprising two mating sections which form an internal cavity; and
(c) sound generating means carried by the plug and located within the internal cavity comprising a speaker, a signal generator, a power source, and a motion detection switch.

5,145,444
STROBE LIGHT EFFECT YO-YO
Jack C. VanKuiken, 419 Lincoln Ave., Downers Grove, Ill. 60515
Filed Jun. 27, 1991, Ser. No. 721,937
Int. Cl.[5] A63H *1/24, 1/30*
U.S. Cl. 446—242 17 Claims



1. A return top toy including a pair of spaced body halves having inner surfaces facing each other and outer surfaces facing away from each other; a rim surface disposed between and connecting said inner and outer surfaces and forming the periphery of each of said body halves; an axle disposed between and spacing apart said body halves; at least one light emitting diode carried by at least one of said body halves; a solid state control circuit carried by said body halves and connected to said light emitting diode, said circuit effective to cause said diode to flash on and off so as to produce a stroboscopic effect; and, a power source carried by one of said body halves and connected to said control circuit to power said light emitting diode, means for securing said power source in one of said body halves, said means including a cover member which forms a portion of said outer surface of one of said body halves and encloses a chamber in said body half, said cover member including at least one aperture for allowing access to said power source.

5,145,445
HEAD AND JAW ACTUATION DEVICE
William Northey, P.O. Box 38, Topsfield, Mass. 01983
Filed Aug. 12, 1991, Ser. No. 743,984
Int. Cl.[5] A63H *3/14*
U.S. Cl. 446—329 15 Claims

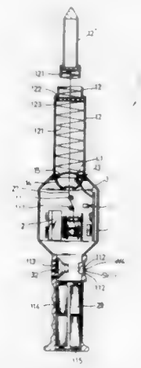


1. A hand puppet device consisting of:
an exchangeable head having an upper portion containing a mouthplate,
a hinge movably attaching said upper portion to a jaw section,
said jaw section affixed to a cylindrical tube, said cylindrical tube slidably and rotatably receiving a rod, said rod being freely removable from said tube, and an accommodating means affixed to said rod providing a means of supporting said device on the hand of an operator, whereby manual movement of said tube relative to said rod causes said upper portion of said head with said mouthplate to move relative to said jaw section to simulate mouth movement.

5,145,446
RETRACTABLE TOY SWORD WITH VIDEO AND SOUND EFFECT
Yi-Yu Kuo, 14, Lane 616, Chengteh Rd., Taipei, Taiwan
Filed Sep. 23, 1991, Ser. No. 764,173
Int. Cl.[5] A63H *5/04, 33/30, 33/26, 33/00*
U.S. Cl. 446—405 5 Claims

1. A retractable toy sword with visual and sound effects comprising:
a sword, including: a hilt defining a hollow front section having two guide posts in a middle portion, two openings for slide switches at a side and an opening for a speaker at an opposite side, a battery chamber with a cover and a rear section; and a blade composed of at least two telescopic sections, each section defining a hollow interior space for holding a spring, and means for mutual engagement during extension and retraction;
a retraction driver located within the hilt to control the at least two telescopic sections of the blade for extension and

retraction, wherein the retraction driver comprises: a reduction gear box, a motor, a pulley, two transmission gears, a roller , a motor cover, a steel cable, a timing gear train, two micro switches, a slide switch, such that the slide switch is placed in an opening for a slide switch defined by the hilt; wherein: the reduction gear box contains a reduction gear; the motor has a shaft and is fixed to the back of the reduction gear box; a pinion is installed on the shaft of the motor for engaging the reduction gear in the reduction gear box; a pulley having a substantially U-like left side, a gear at its right side, and a circular hollow center adapted to accommodate the motor, and it is engaged with a transmission gear at a back of the reduction gear box and driven by another transmission gear



engaged with the reduction gear in the reduction gear box; a roller is operatively associated with the back of the reduction gear box; an end of a cable is fixed on the pulley and passes over the roller, the guide posts of the hilt, and another end is fixed to a last blade section; a timing gear train is installed on a front side of the reduction gear box with a first micro switch at the left side and a second micro switch at the right side so that the motor can be controlled for normal or reverse rotation, and consequently the blade can be controlled for extending or retracting by sliding the slide switch, while the corresponding micro switch serves to control its position and turn off a power source; and

a visual and sound effects driving circuit located within the hilt for generation of a variety of visual and sound effects.

5,145,447

MULTIPLE CHOICE VERBAL SOUND TOY

Adolph E. Goldfarb, 1432 S. Eastwind Cir., Westlake Village, Calif. 91361

Filed Feb. 7, 1991, Ser. No. 652,934
Int. Cl.[5] A63H *3/52, 33/30, 5/00, 29/22*
U.S. Cl. 446—408 14 Claims

1. An electronic singing or poetry-reciting toy for children, said toy comprising:

primary memory means for storing information representing vocal rendition of a song or poem that has at least one position reserved for a selectable vocal segment;

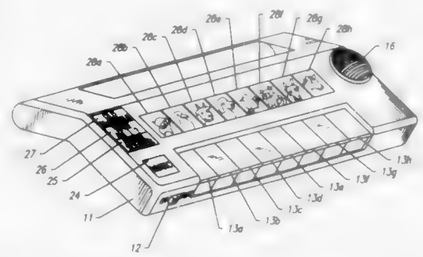
multiple secondary memory means for storing information representing, respectively, a multiplicity of preestablished selectable vocal segments for insertion into the song or poem at the reserved position each selectable segment being correct for insertion into the song or poem at the reserved position;

first control means actuable by a child to initiate electronic vocal rendition of the song or poem;

second control means actuable by a child for choosing a particular selectable segment;

first information-identifying means for responding to the first control means by identifying information from the primary memory means, corresponding to the sounds of the song or poem, for extraction from the primary memory means;

second information-identifying means for responding to the second control means by identifying information from the secondary memory means, corresponding to the sounds of a particular selectable segment chosen, for extraction from the second memory means;



signal-developing means for extracting information identified by the first and second information-identifying means from the primary and secondary memory means respectively and for developing therefrom electrical signals corresponding to the sounds of the song or poem with the sounds of a particular chosen selectable segment at said position;

tone-sounding means for receiving the electrical signals and for responding thereto by sounding said song or poem with a chosen selectable segment inserted thereinto at the reserved position to amuse children.

5,145,448

METHOD FOR REMOVING OYSTERS FROM OYSTER SHELLS

Susumu Ebisuzaki, 3-3-903, 2-chome, Tookaichi-cho, Naka-ku, Hiroshima-shi, Japan

Filed Dec. 28, 1990, Ser. No. 635,925
Claims priority, application Japan, Dec. 29, 1989, 1-343827; Apr. 28, 1990, 2-114308; May 2, 1990, 2-116052; Oct. 23, 1990, 2-286259
Int. Cl.[5] A22C *29/04*
U.S. Cl. 452—18 10 Claims

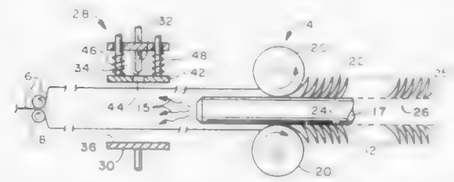
1. A method for automatically removing oysters from the shell characterized in that an oyster still in its shell is positioned with a flat surface of the shell downward, a length of oyster and an angle of the oyster fixed in place are measured so that the stroke and angle of insertion of cutting blades can be determined, the oyster is then turned over and fixed in place so that the convex surface of the shell faces downward, and the body of the oyster is then removed from the shell by using two cutting blades to cut a portion of adductor muscle connecting the body of the oyster to the flat surface of the shell and a portion of adductor muscle connecting the body of the oyster to the convex surface of the shell.

5,145,449

METHOD AND APPARATUS FOR SEVERING SHIRRED TUBULAR FOOD CASING

Michael P. Kazaitis, Chicago; John Farkonas, Glenview, and Raymond A. Feldt, Dolton, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Oct. 15, 1991, Ser. No. 775,861
Int. Cl.[5] A22C *13/02*
U.S. Cl. 452—29 17 Claims



1. A method of separating a length of shirred casing from a length of feed stock casing comprising the steps of:

a) weakening a flattened section of feed stock casing prior to shirring to form a frangible band of casing extending transverse the casing longitudinal axis and around its circumference;

b) moving feed stock casing including the frangible band in the direction of the casing longitudinal axis towards and through a shirring zone;

c) shirring, in the zone, at least a length of the feed stock casing preceding the frangible band; and thereafter

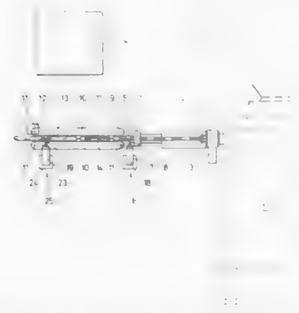
d) tensioning the casing across the frangible band and tearing apart the casing along the frangible band thereby separating the shirred length from the feed stock casing.

5,145,450

METHOD AND APPARATUS FOR SEPARATING A CONTINUOUS STRING OF SAUSAGE MEAT INTO INDIVIDUAL SAUSAGES

Georg Staudenrausch, Biberach, and Gerhard Müller, Schlemmerhofen, both of Fed. Rep. of Germany, assignors to Albert Handtmann Maschinenfabrik GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 30, 1991, Ser. No. 648,519
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1990, 9001075[U]
Int. Cl.[5] A22B *3/08*
U.S. Cl. 452—47 18 Claims



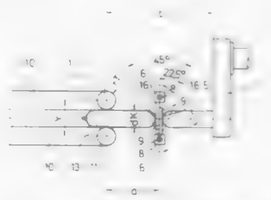
1. A method for separating a continuous sausage strand exiting from a sausage stuffing machine into individual sausages or groups of interconnected sausages, comprising discharging continuously a stuffed sausage strand from a stuffing machine, dividing said strand as it moves downstream from the machine into a string of interconnected sausages by periodically twisting the strand about its axis to form constrictions between the sausages, continuously conveying the thus divided sausage string at a conveying speed away from said dividing step while preventing the sausages from being rotated and maintaining them in longitudinal alignment, separating said string at preselected constrictions between said sausages with a pair of separator elements that rotate periodically into cooperation with each other to engage and cut the string, said elements rotating in synchronism about an axis on either side of the string in opposite circular paths in the conveying direction, the rotating speed of the separator elements being variable between an operative speed compatible with said conveying speed when they are in engagement with the string and a non-operative speed when they are disengaged from the string to thereby permit the separation of the string to be adjusted to sausages or group of sausages of different lengths.

5,145,451

APPARATUS FOR SEPARATING A CONTINUOUS SAUSAGE SKEIN COMING FROM A STUFFING MACHINE INTO INDIVIDUAL SAUSAGES

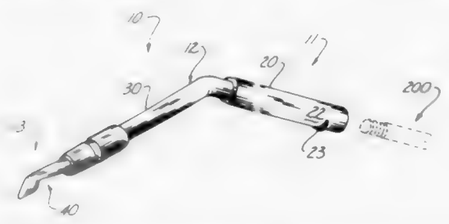
Georg Staudenrausch, Biberachan der Riss, Fed. Rep. of Germany, assignor to Albert Handtmann Maschinenfabrik GmbH & Co., KG, Fed. Rep. of Germany

Filed Jun. 28, 1991, Ser. No. 723,415
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1990, 9012381
Int. Cl.[5] A27C *11/00*
U.S. Cl. 452—48 8 Claims



1. Apparatus for dividing a continuous sausage skein exiting from a stuffing machine into individual sausages comprising twisting means for rotating the sausage skein, a separating device for dividing the skein into individual sausages and a conveyor means located downstream of the separating device for conveying the thus divided sausages away from the separating device, said separating device comprising at least two displacement elements mounted for rotation in opposite directions about an axis on either side of said skein and adapted to be rotated into closely spaced position relative to one another to periodically engage and thereby constrict and divide said sausage skein into individual sausages and means for rotating said elements, each of said elements having a skein engaging portion comprising a plate having a V-shaped cutout therein opening outwardly, said plates being disposed obliquely in opposite directions relative to one another as they engage the skein so that the V-shaped cutouts therein staggeredly interlock as they constrict the sausage skein and wherein the thickness of the plates in the area of the root of the V-shaped cutouts is relatively thin compared to the remaining wall thickness of the plates.

5,145,45
FISH SLIMING AND SCRAPING TOOL
Robert L. Chevalier, 333 Katlian St., Sitka, Ak. 99835
Filed Aug. 8, 1991, Ser. No. 741,916
Int. Cl.[5] A23C *1/00*
U.S. Cl. 452—118 5 Claims



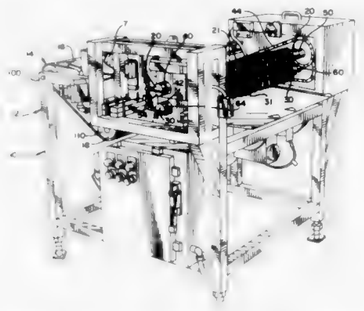
1. A fish scraping and sliming tool for removing the membrane and bloodline from the body cavity of a fish; wherein the tool comprises

a handle unit comprising an elongated handle member aligned along a first axis

an extension unit comprising an elongated handle extension member substantially aligned along a second axis; wherein, said first axis is angularly offset from said second axis by an angle of approximately 45°; and,

a scraper head unit having a generally tapered outboard end dimensioned to be received in the body cavity surrounding said bloodline; wherein, said tapered outboard end is provided with a generally smooth continuous curvilinear scraping edge surface transversely aligned along an axial plane; wherein, said axial plane is angularly offset from said second axis by an angle of approximately 45°; such that, when the users curled hand grasps the handle unit, the users wrist is disposed in a neutral position, and the users forearm is aligned along a fourth axis which is angularly offset from said first axis by an angle of approximately 40°; so that the users wrist and forearm are ergonomically aligned for the push-pull motion of the tool which will sequentially rupture and then remove the membrane and bloodline from the body cavity of the fish.

5,145,45
APPARATUS FOR MACERATING MEAT
James E. Anderson, Madison; Gary R. Skaar, Marshall; Paul H. Bernthal, Sun Prairie, and Larry C. Gundlach, Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.
Filed Sep. 26, 1990, Ser. No. 588,237
Int. Cl.[5] A22C *9/00*
U.S. Cl. 452—142 28 Claims



1. An apparatus for crushing the tissue of a meat product having improved characteristics for cleaning purposes and the like, the apparatus comprising:

a first rotatable arbor being of one-piece construction and having a series of spaced-apart circumferential ring portions separated by intervening spacer portions, the first arbor ring portions having a first arbor first diameter and the intervening spacer portions having a first arbor second diameter which is less than the first arbor first diameter, whereby an axially extending face of an intervening spacer member and a radially extending face of each of two adjacent ring portions define a plurality of open channels substantially equally spaced along the longitudinal axis of said first rotatable arbor, said circumferential ring portions each including a plurality of outwardly projecting radial ring teeth, each of said first arbor radial ring teeth having a peripheral, axially extending meat contacting edge having a preselected axial length which is disposed generally parallel to the longitudinal axis of said first shaft, said first arbor one-piece construction being characterized by the absence of any opposing radially extending surfaces between said first arbor ring portions and said spacer portions, whereby meat tissue remnants are prevented from entering between said ring portions and said spacer portions;

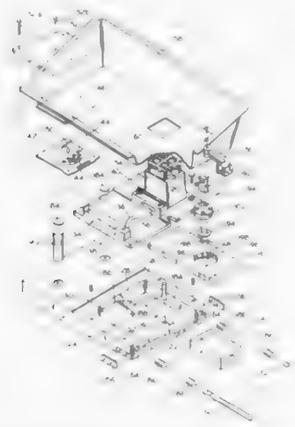
a second rotatable arbor being of one-piece construction and having a series of spaced-apart circumferential ring portions separated by intervening spacer portions, the second arbor ring portions having a second arbor first diameter, the intervening spacer portions having a second arbor second diameter which is less than the second arbor first diameter, whereby an axially extending face of said intervening spacer portions and a radially extending face of each of two adjacent ring portions define a plurality of open channels in said second arbor substantially equally spaced along the longitudinal axis of said second rotatable arbor, said second arbor circumferential ring portions each including a plurality of outwardly projecting radial ring teeth each of said second arbor radial ring teeth having a peripheral axially extending meat contacting edge having a preselected axial length which is disposed generally parallel to the longitudinal axis of said second shaft, said second arbor one-piece construction being characterized by the absence of any opposing radially extending surfaces between said second arbor ring portion and said spacer portions, whereby meat tissue remnants are prevented from entering between said ring portions and said spacer portions;

said first and second arbors being disposed on a frame generally parallel to, spaced-apart from and in alignment with each other such that said first arbor radial ring teeth respectively project into respective open channels of said second arbor and said second arbor radial ring teeth respectively project into respective open channels of said first arbor; and,

means for rotating said first and second arbors in opposite directions.

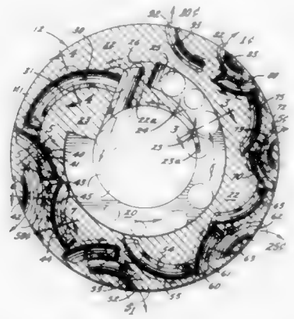
5,145,454
PATTY MACHINE
Kenneth F. Sandberg, Lockport, and Jeffrey A. Mullikin, Bourbonnais, both of Ill., assignors to Nutec Manufacturing, Inc., New Lenox, Ill.
Filed Jul. 26, 1990, Ser. No. 558,634
Int. Cl.[5] A47J *43/20*
U.S. Cl. 452—174 62 Claims

1. A patty machine, comprising: a casting having a cavity for receiving a material to be formed into a patty; an inlet for directing said material into said cavity at a point intermediate opposite ends thereof; a ram reciprocally disposed within said cavity at a point upstream of said inlet; a mold plate reciprocably disposed relative to said cavity at a point downstream of said inlet; and means for imparting simultaneous reciprocating movement to said ram and said mold plate; said cavity in said casting having a first portion extending generally in the direction of reciprocating movement of said ram and said mold plate and a second portion extending generally perpendicular to the direction of movement of said ram and said mold plate; said second portion of said cavity including a restricted passage leading from said first portion of said cavity to a mold-filling



chamber axially offset from said ram and having a reduced cross-sectional area in comparison with said first portion of said cavity; said mold plate reciprocating into and out of communication with said mold filling chamber as said ram reciprocates toward and away from said restricted passage for forcing said material from said inlet through said cavity and into said mold plate.

5,145,455
WAVE-TYPE COIN SORTER
William M. Todd, Tullahoma, Tenn., assignor to Cummins-Allison Corp., Mt. Prospect, Ill.
Filed May 15, 1991, Ser. No. 701,447
Int. Cl.[5] G07D *3/00*
U.S. Cl. 453—6 3 Claims



1. A coin sorting apparatus for receiving and sorting mixed coins by denomination, said apparatus comprising:

a rotatable disc having a resilient surface for receiving said coins and imparting rotational movement to said coins; and

a stationary sorting head having a contoured surface spaced slightly away from and generally parallel to said resilient surface of said rotatable disc, said stationary sorting head including

a recess for guiding said coins on said rotatable disc into a single file of coins,

referencing means for guiding one edge of said coins in said single file along a prescribed path,

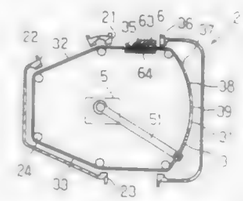
a first exit channel for receiving the largest-diameter coins from the end of said referencing means and guiding those coins to a first exit station on the periphery of said sorting head,

bypass guide means for intercepting all the other coins from the end of said referencing means and guiding the intercepted coins inwardly around said first exit channel, said bypass guide means comprising a bypass guide wall for engaging and guiding the outer edges of the respective coins inwardly beyond the innermost edge of said first exit channel,

a re-gaging guide wall for intercepting the coins from the end of the bypass guide wall and guiding the inner edges of those coins outwardly to a prescribed radius, and

multiple exit channels for receiving and guiding successive denominations of said intercepted coins to successive exit stations on the periphery of said sorting head.

5,145,456
AUTOMOTIVE AIR-CONDITIONER
Koichi Ito, Kariya; Hideo Asano, Gifu, and Akihito Higashihara, Chirya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed May 28, 1991, Ser. No. 705,808
Claims priority, application Japan, May 29, 1990, 2-139239; Dec. 19, 1990, 2-403718
Int. Cl.[5] F16K *31/02*
U.S. Cl. 454—75 6 Claims



1. An automotive air-conditioner comprising:

a casing forming an air passage through which an air passes;

a film damper slidably disposed in said casing in such a manner to face to said air passage and having an opening thereon so that said film damper opens and closes said air passage;

a detected object disposed on said film damper for indicating a position of said opening;

detecting means for detecting said detected object and outputting a detecting signal; and

driving means for driving said film damper so as to displace said opening to a target position based on said detecting signal.

5,145,457
VENTILATION AIR INTAKE STRUCTURE OF MOTOR VEHICLE
Yasushi Tanigaito, and Ryoji Maeda, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jan. 15, 1991, Ser. No. 641,518
Claims priority, application Japan, Jan. 22, 1990, 2-12378
Int. Cl.[5] B60H *1/28*
U.S. Cl. 454—147 7 Claims

1. A ventilation air intake structure for a motor vehicle, said ventilation air intake structure comprising:

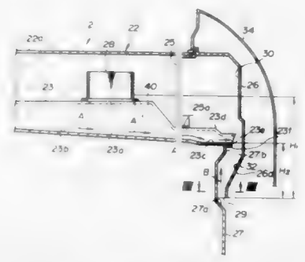
a cowl top panel having an opening therein;

a dash upper panel having an opening therein, said dash

upper panel opening being in communication with a passenger cabin of said motor vehicle;

two side panels incorporated with both said cowl top panel and said dash upper panel to define an air box which extends along a rear upper edge portion of an engine room of the motor vehicle; and

a hood ridge reinforcing member, said hood ridge reinforcing member and one of said side panels defining a drain chamber having a downwardly extending narrower passage which is opposed to the open air at a terminal open end thereof;



wherein said dash upper panel has a laterally extending channel which has a shallower end portion, said shallower end portion passing under said one side panel and being exposed at its terminal end to said narrower passage at a position above said terminal open end of said downwardly extending narrower passage,

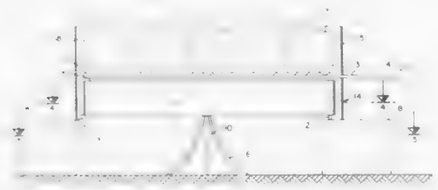
wherein said opening of said dash upper panel is positioned higher than said extreme end of said shallower end portion of said channel with respect to the vehicle body.

5,145,458

METHOD AND APPARATUS FOR LIFTING GAS STREAMS TO A GREAT ELEVATION IN THE ATMOSPHERE

Pablo Girault, and Nicolas Grijalva, both of Av. Volcan 120, Mexico City, Mexico

Filed Jul. 5, 1990, Ser. No. 548,089
Claims priority, application Mexico, Jul. 5, 1989, 16697
Int. Cl.[5] F23J *11/00*
U.S. Cl. 454—189 **16 Claims**



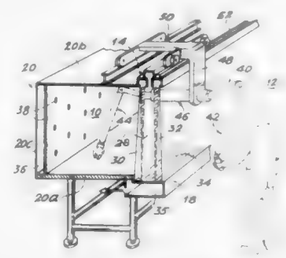
6. An apparatus for lifting gases to a high elevation in the atmosphere, which comprises a plurality of atmospheric heaters arranged in a suitable array for covering a substantially circular horizontally projected surface having an area sufficient to create a shaft effect; and a driving assembly arranged such that it imparts a rotational movement to said column of air and/or gases, capable of forming a vortex or ascending whirl of the heated air and /or gases within said column.

5,145,459

PROCESS AND APPARATUS FOR THE DYNAMIC SEPARATION OF TWO ZONES

François Meline, Paris, and Robert Guetron, Antony, both of France, assignors to SGN-SocieteGeneral Pour Les Techniques Nouvelles, Le Bretonneux, France

Filed Mar. 12, 1991, Ser. No. 668,019
Claims priority, application France, Mar. 14, 1990, 90 03255
Int. Cl.[5] F24F *9/00*
U.S. Cl. 454—190 **4 Claims**



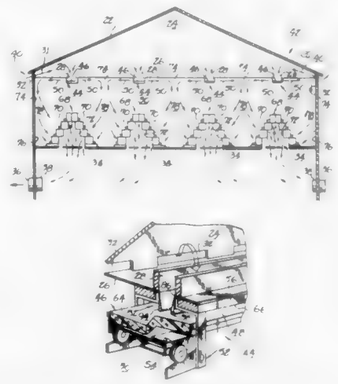
1. A process for dynamically separating and protecting first and second adjacent zones from each other, comprising the steps of forming a gas curtain between said zones, providing said curtain with a relatively fast stream and first and second relatively slow streams, locating said first slow stream located between said fast stream and said first zone, locating said second slow stream located between said fast stream and said second zone, forming a tongue (**30***a*, **32***a*) with each said first and second slow streams which completely separates the two zones, and injecting each said first and second slow streams at a flow rate substantially equal to that induced by faces of the relatively fast stream in contact with said slow streams.

5,145,460

ROLLING RAMP GASKET ASSEMBLY

William M. Smith, Jr., Corunna, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Jan. 25, 1991, Ser. No. 645,615
Int. Cl.[5] F24F *7/007*
U.S. Cl. 454—253 **17 Claims**



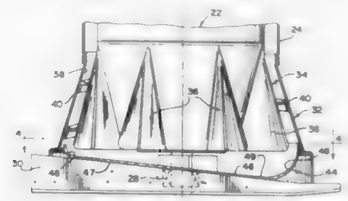
1. A gasket assembly for use with a ventilation control apparatus of a building ventilation system in a building; said building ventilation system including inlet and outlet vents and a fan means for moving air therethrough, at least one generally narrow elongated opening formed through a ceiling of said building for introducing ventilating air flow into said building from said inlet vent through said opening and out through said outlet vent; said ventilation control apparatus including controllable baffle means for regulating air flow through said opening, a controllable horizontal gap being formed between said baffle means and said ceiling for controllably directing air flow into said building; said gasket assembly including at least one dam portion and at least two curtain portions, said dam portion being attached to said ceiling between a ceiling facing surface of said baffle means and a baffle facing surface of said ceiling, said curtain portions being attached proximate to said opening and hanging downwardly towards said baffle means a predetermined distance from said opening, each curtain portion being spaced apart at opposite ends of said dam portion at least partially overlapping said dam portion, a reduced horizontal gap formed between said curtains, said dam, and said baffle means when said baffle means are positioned a distance from said dam and abutting said curtain portion, said reduced horizontal gap providing a minimum opening for controllably regulating air flow through said ventilation control apparatus.

5,145,461

DOOR ASSEMBLY FOR AN AXIAL-FLOW COMBINE

Dale R. Tanis, Naperville, Ill., assignor to Case Corporation, Racine, Wis.

Filed Mar. 21, 1991, Ser. No. 673,776
Int. Cl.[5] A01F *12/10*
U.S. Cl. 460—67 **10 Claims**



1. An axial-flow combine comprising:

a frame having ground engaging wheels for allowing the combine to move over a field;

a generally tubular rotor casing mounted on said frame along an elongated axis and provided with an outwardly flared funnel like frusto-conical transition section designed for endwise reception of crop material;

a rotor disposed within said casing in coaxial relationship therewith, said rotor and casing having cooperating threshing instrumentalities arranged thereon;

a vaned impeller arranged at a forward end of said rotor and within said frusto-conical transition section; and

a door assembly extending across and at least partially closing a forward open end of said transition section, a portion of said door assembly defining a ramped surface configuration extending at least partially about the impeller to direct crop material over a leading edge of the impeller plan of rotation and positively move crop material axially rearwardly through the transition section of the rotor casing.

5,145,462

INFEED ASSEMBLY FOR AN AXIAL-FLOW COMBINE

Dale R. Tanis, Naperville; Robert A. Matousek, Minooka, and Richard E. McMillen, Plainfield, all of Ill., assignors to Case Corporation, Racine, Wis.

Filed Jun. 10, 1991, Ser. No. 713,055
Int. Cl.[5] A01F *12/10*
U.S. Cl. 460—68 **7 Claims**

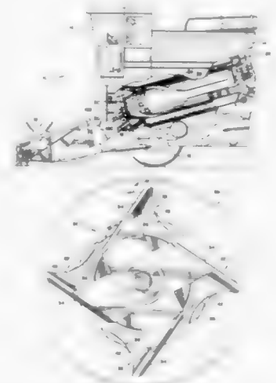
1. An axial-flow combine comprising:

an elongated generally cylindrical rotor casing provided at a forward end with a transition section designed for endwise reception of crop material;

a series of transport vanes provided on an inner surface of said transition section;

a rotor coaxially mounted within said casing for rotation about an elongated axis in a given direction; and

an infeed assembly arranged at a forward end of and for rotation with said rotor, said infeed assembly comprising a series of equally spaced blades, with each blade having a leading edge lying in a plane extending normal to the axis of the rotor and swept back relative to said given direction of rotor rotation, a rearwardly extending outer edge that



angles relative to the transport vanes in varying degrees as the blade extends rearwardly from its leading edge and extends diagonally rearward relative to the elongated axis of the rotor, and a material engaging surface having a generally concave shaped section extending axially rearward from the leading edge of the blade to provide minimal resistance to the crop material introduced to the transition section of the rotor casing and which blends into a flatter shaped section extending to a terminal end of the blade and which is incrementally swept back at substantially the same angle of crop deflection as the leading edge of the blade to induce radially outward crop material movement toward the transition section.

5,145,463

THREE PART TORSIONAL DAMPER ASSEMBLY WITH FACING MEANS FOR SETTING CORRECT CIRCUMFERENTIAL RELATIONSHIP OF THE PARTS

Michel Bacher, Andilly, and Michel Graton, Paris, both of France, assignors to Valeo, Paris, France

Filed Jun. 14, 1989, Ser. No. 367,465
Claims priority, application France, Jun. 22, 1988, 88 08362
The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.
Int. Cl.[5] F16D *13/68*; **F16F** *15/12*
U.S. Cl. 464—63 **6 Claims**

1. A torsion damper assembly comprising:

a first part including a hub;

a second part including at least a first hub plate and a second hub plate, each of said hub plates extending transversely around the hub, said first an second parts further comprising loose coupling means directly coupling the hub with each of said hub plates;

a third part comprising at least one annular face plate disposed parallel with said hub plates, means directly coupling said third part with the hub being absent; and

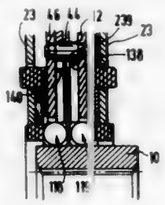
first resilient means engaged with said second and third parts,

with the hub mounting said parts coaxially whereby each part can rotate relative to the others within the limits of a predetermined angular displacement and against the action of said first resilient means, said first resilient means being adapted to act between said parts over at least a portion of such angular displacement,

the hub having hub slots and each hub plate having hub plate slots facing the hub slots adjacent to the loose coupling means, the assembly further comprising:

second resilient means each mounted in a said hub slot and a said slot of the first hub plate;

third resilient means, separate from said second resilient means and each mounted in a said hub slot and a said slot of the second hub plate, whereby said second and third



resilient means act circumferentially between the hub and the first and second hub plates respectively; and

rotational coupling means securing said hub plates together for simultaneous rotation, and being separate from the loose coupling means,

wherein said second and third resilient means extend into zones which are axially offset from each other and wherein the slots of the hub and first hub plate define a clearance for the second resilient means and the slots of the hub and second hub plate define a clearance for the third resilient means, the clearances for the second and third resilient means being different from each other, said rotational coupling means constituting phasing means for setting the loose coupling means in correct circumferential relationship.

5,145,464

CENTRIFUGAL CVT OIL PRESSURE CONTROL DEVICE

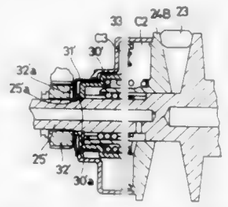
Masanori Mori, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 10, 1991 Ser. No. 639,539

Claims priority, application Japan, Jan. 10, 1990, 2-1590

Int. Cl.[5] F16H *61/00*

U.S. Cl. 474—16 **5 Claims**



1. A centrifugal oil pressure control device for a continuously variable transmission, comprising:

a shaft;

a first sheave fixedly connected to said shaft;

a second sheave slidably connected to said shaft and rotatable together therewith;

a power transmitting member held by said first and said second sheaves;

an oil pressure chamber connected to said second sheave;

a centrifugal oil pressure correction chamber connected to an opposite side of said oil pressure chamber with respect to said second sheave;

a sub-cylinder fixedly connected to said shaft;

a main cylinder fixedly connected to said second sheave and slidably movable on said sub-cylinder;

a piston fixedly connected to said shaft and slidably connected to the inner surface of said main cylinder and defining said oil pressure chamber and said centrifugal oil pressure correction chamber thereby; and

a first opening formed in said piston, said oil pressure chamber communicating with said centrifugal oil pressure correction chamber by said first opening, said sub-cylinder having a second opening communicated between said centrifugal oil pressure correction chamber and a transmission casing, said second opening being radially positioned to equal to or slightly less than the inner radius of said second sheave.

5,145,465

METHOD OF CONTROLLING THE TENSION IN A DRIVING BELT OF A CONTINUOUSLY VARIABLE TRANSMISSION

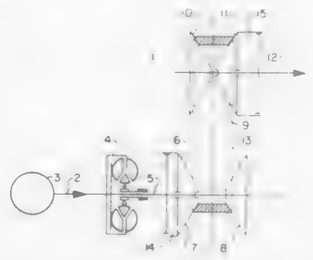
Emery F. M. Hendriks, Heeze, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Jan. 11, 1991, Ser. No. 640,441

Claims priority, application Netherlands, Jan. 11, 1990, 9000075

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—101 **5 Claims**



1. In a method of controlling the tension in a driving belt of a continuously variable transmission, in particular for a motor vehicle having a rotating drive shaft, in which said driving belt has a maximally allowable tension corresponding with the statistic average of the expected number of revolutions at the end of the statistical finite life of the driving belt and in which said driving belt is disposed between a primary pulley and a secondary pulley, which are each provided with two conical discs, at least one of said conical discs being axially movable, and which transmission incorporates a torque converter which is coupled to the engine and to said primary pulley, by means of which torque converter the torque to be generated from a stationary position of the rotating drive shaft of said motor is controllable, the improvement comprising the step of temporarily increasing the torque during the time span during which acceleration of the drive of said motor from a stationary position takes place, to such a level that the increased tension in the driving belt corresponding therewith is momentarily brought to a level above said predetermined maximally allowable tension.

5,145,466

LIMITED SLIP DIFFERENTIAL AND POWER DEVICE

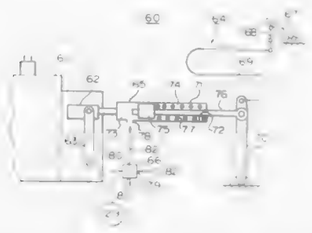
Fujio Momiyama; Kenichi Ohmori; Shinichi Oku, and Junichi Katoh, all of Hino, Japan, assignors to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1991, Ser. No. 694,397

Claims priority, application Japan, May 7, 1990, 2-117402

Int. Cl.[5] F16H *1/445*

U.S. Cl. 475—86 **15 Claims**



1. A limited slip differential for a vehicle comprising:

a friction clutch disposed between a differential case of a differential gear mechanism and a drive wheel axle;

a clutch control cylinder disposed in the differential case and for coupling and decoupling said friction clutch by connecting to a pressure air source through a pressure air line;

a normally closed type solenoid valve disposed in the pressure air line;

a normally opened type solenoid valve disposed in the pressure air line downstream of said normally closed type solenoid valve and being opened to the air in the normal condition; and

a control unit, having input terminals electrically connected to vehicle wheel revolution sensors for right and left front and rear wheels and a pressure sensor for said clutch control cylinder, and having output terminals electrically connected to said normally closed type solenoid valve and said normally opened type solenoid valve, which selectively open and close, said control unit controlling said normally closed type solenoid valve and said normally opened type solenoid valve into a state where the air pressure of said clutch control cylinder is decreased when the number of revolutions of both the right and left rear wheels exceeds that of the front wheels by a predetermined value during running on a low μ road, into a state where the air pressure of said clutch control cylinder is raised in accordance with the increase of vehicle speed during running on a straight road.

5,145,467

GEARED MOTOR FOR THE DRIVE OF COMPONENTS, SUCH AS MOTOR-VEHICLE ACCESSORIES, PARTICULARLY AN OPENING ROOF

Pierre Periou, Cergy Pontoise, and Francois Bardet, Clermont Ferrand, both of France, assignors to Rockwell Automotive Body Systems, Paris, France

Filed Jul. 1, 1991, Ser. No. 723,864

Claims priority, application France, Jul. 6, 1990, 90 08634

Int. Cl.[5] F16H *1/16, 1/20, 1/28*

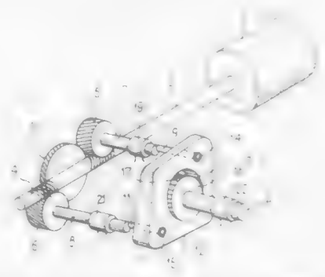
U.S. Cl. 475—162 **5 Claims**

1. Geared motor for the drive of components, such as motor-vehicle accessories, comprising a motor (2), characterised in that it comprises:

an output shaft (2) of the motor, driving a first reduction stage including endless first and second screws (3, 4) engaging respective first and second gearwheels (5, 6) driven in synchronism,

first and second axles (7, 8) fastened to respective first and second gearwheels, oriented perpendicularly to the output shaft (2) of the motor and connected to respective first and second crankpins (9, 11) which provide eccentric motion relative to the corresponding first and second axles (7, 8),

a second reduction stage comprising an element (12, 23) equipped with a toothing (13, 24) and linked to the first and second crankpins in such a way as to drive said element in a circular translational movement upon rotation of the first and second crankpins,



an output member (16, 26) equipped with an output shaft (18, 27) connectable to the component to be driven and carrying a toothing (17, 25) interacting with that of the said element, the numbers of teeth of the toothings of the element and of the said member being different so as to bring about a rotation of the member (16, 26) in a ratio determined by the difference in the numbers of teeth of the two toothings.

5,145,468

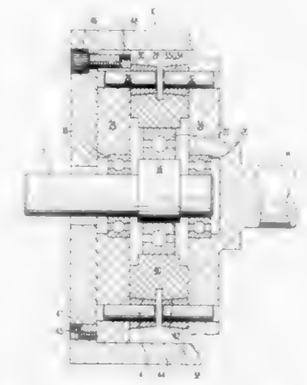
ADJUSTABLE CYCLOIDAL SPEED REDUCER

Prabhakar Nagabhusan, Marlboro, Mass., assignor to Compudrive Corporation, Maynard, Mass.

Filed Jan. 7, 1991, Ser. No. 637,784

Int. Cl.[5] F16H *1/28*

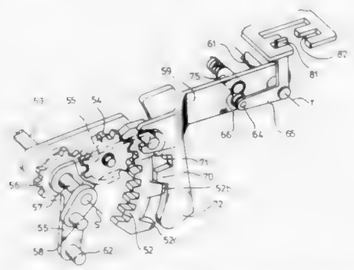
U.S. Cl. 475—170 **11 Claims**



1. A drive mechanism comprising an input shaft having eccentric means mounted thereon and an output shaft with said input and output shafts being rotatable at relatively different speeds, a movable member adapted for orbital movement imparted by said eccentric means and connected to said output shaft for imparting movement thereto, a plurality of rotatable, tapered concentric bearings each having a tapered bearing surface adapted for bearing contact with a peripheral surface of said movable member, each said bearings having a longitudinal axis parallel to a main common axis of said input shaft and said output shaft, means for moving said bearings axially relative to said peripheral surface of said movable member to

achieve contact between said bearing surfaces and said peripheral surface, and selectively adjustable means for rigidly maintaining said contact.

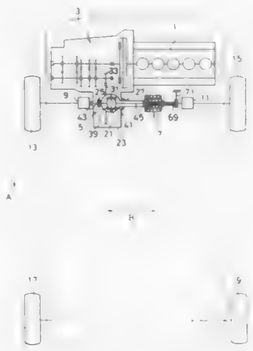
5,145,469
TRANSMISSION RATIO SELECTOR MECHANISM
Jean J. Lasoen, Villepreux, France, assignor to Massey-Ferguson Services N.V., Netherlands
Filed Mar. 14, 1991, Ser. No. 669,046
Claims priority, application United Kingdom, Mar. 15, 1990, 9005817
Int. Cl.[5] F16H *61/00*
U.S. Cl. 475—209 **6 Claims**



1. A transmission ratio selector mechanism including two selector members connected with two coupling members, each coupling member being axially slidable to either side of a respective neutral position to couple a selected one of a respective pair of gears to a respective associated shaft, the coupling members being connected with the selector members via an epicyclic gear train comprising first, second and third elements, said first element of the epicyclic gear train being operatively connected with one selector member, said second element of the epicyclic gear train being operatively connected with one coupling member, and said third element of the epicyclic gear train being operatively connected with the other selector member and the other coupling member, the arrangement being such that by appropriate movement of the two selector members, the coupling members can be positioned to provide four different combinations of positions, these being:
(i) both coupling members to the right of their respective neutral positions,
(ii) both coupling members to the left of their respective neutral positions,
(iii) the one coupling member to the right of its neutral position and the other coupling member to the left of its neutral position, and
(iv) the one coupling member to the left of its neutral position and the other coupling member to the right of its neutral position,
each combination providing a respective gear ratio.

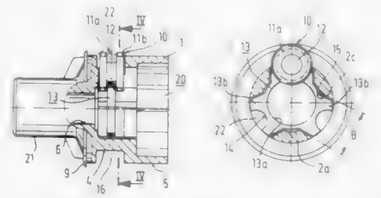
5,145,470
POWER DELIVERING APPARATUS
Makoto Hagiwara, Utsunomiya, Japan, assignor to Viscodrive Japan Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1991, Ser. No. 648,300
Claims priority, application Japan, Feb. 8, 1990, 2-011049[U]
Int. Cl.[5] F16H *1/44*
U.S. Cl. 475—230 **3 Claims**

1. A transmission device comprising:
a differential gear;
a pair of wheel axles coupled with said differential gear, said wheel axles and differential gear driven by an engine;
a viscous coupling coupled with said differential gear and first one of said axles, said viscous coupling including a plurality of rotary members which are coaxially positioned about said first axle, a first rotary member coupling said viscous coupling with said differential gear and said first rotary member being rotatably supported in a first bearing, a second of said rotary members which surrounds



said axle, said second rotary member being rotatably supported in a second bearing, said second bearing supported by a stationary member of a vehicle.

5,145,471
PLANET GEAR SUBUNIT OF A PLANET GEAR UNIT
Gerhard Meier-Burkamp, Bergrheinfeld, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany
Filed Jul. 29, 1991, Ser. No. 737,243
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1990, 4024201
Int. Cl.[5] F16H *57/00*
U.S. Cl. 475—331 **24 Claims**



1. A planet gear subunit comprising a planet wheel carrier member (**1**) and at least two planet wheel units (**10**) rotatably accommodated within said planet wheel carrier member (**1**),
said planet wheel carrier member (**1**) having an axis (A—A), an external circumferential face (**5**) and two ends and being provided with a cavity (**20**) surrounded by an internal circumferential face (**2,3**) of said planet wheel carrier member (**1**) and being axially open at least at one of said two ends,
said planet wheel units (**10**) being received by radially extending windows (**22**),
a planet wheel support member (**13**) being accommodated within said cavity (**20**) and being circumferentially supported by said planet wheel carrier member (**1**) about said axis (A—A),
said planet wheel support member (**13**) having a shape permitting introduction of said planet wheel support member (**13**) into said cavity (**20**) through said at least one open end of said cavity (**20**), said planet wheel units (**10**) being circumferentially supported within said respective windows (**22**) by said planet wheel support member (**13**).

5,145,472
PHYSICAL FITNESS EXERCISE MACHINE
David S. Johnson, III, 2215 Calle Culebra, Summerland, Calif. 93067, and Louis A. Brown, 11396 Gold County Blvd., Gold River, Calif. 95670
Filed May 3, 1991, Ser. No. 696,561
Int. Cl.[5] A63B *7/00*
U.S. Cl. 482—37 **10 Claims**

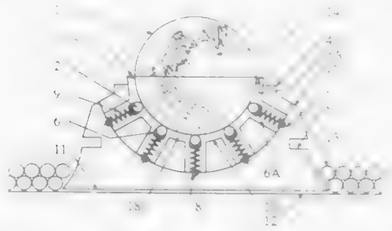
1. An exerciser that stimulates a horizontal ladder comprising:
a rotatable head having a horizontal axis of rotation comprising:
an axle, a pair of plates mounted on each end of said axle, a plurality of radial slots in said pair of plates, and a cross bar mounted in each of said radial slots;
support means rotatably mounting said rotatable head;
a plurality of radially displacable cross-rods mounted on said head;
track means mounted to said support means displacing at least some of said cross bars radially as said head rotates;
said track means displacing said cross-bar having a neutral point below the axis of rotation of said head and having a sloped angle;
whereby application of weight to a cross-bar immediately adjacent said neutral point on said track means causes said reel and said cross-bar to rotate toward said neutral point, said cross-rods being radially displaced during said movement.

5,145,473
POLYURETHANE FOAM EXERCISE DEVICE FOR UPPER BODY DEVELOPMENT
James R. Henry, 10964 W. 69th Ave., Arvada, Colo. 80004
Continuation of Ser. No. 497,880, Mar. 23, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 785,411
Int. Cl.[5] A63B *5/00, 37/00*
U.S. Cl. 482—49 **5 Claims**

1. A muscle exerciser comprising:
a ball having an outside surface and an inner hollow cavity:
a spring operated switch having a single push rod wherein said spring operated switch is positioned within said cavity, said push rod extending into said cavity;

a switch receptacle positioned within said cavity, whereby when said ball is compressed, the push rod contacts said receptacle.

5,145,474
CHILDREN'S APPARATUS FOR RECREATION AND FOR LEARNING WORLD GEOGRAPHY
Joseph L. Moore, 918 Green Valley Dr., Abilene, Tex. 79601
Filed Mar. 12, 1991, Ser. No. 668,223
Int. Cl.[5] A63B *22/00*
U.S. Cl. 482—51 **1 Claim**



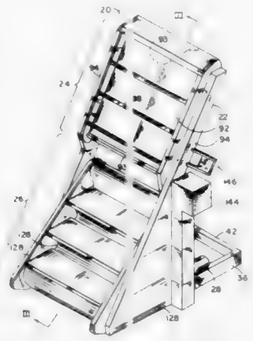
1. A children's apparatus for recreation and for learning world geography comprising:
a stationary base having a planar ground engaging surface, said base including a hemispherical socket;
a universally rotatable world map globe housed in said socket;
means for supporting said globe in said socket and for limiting the rotational speed of said globe, said support and rotational speed limitation means being located between the peripheral surface of said globe and the peripheral surface of said socket;
means for facilitating access to the top of said globe;
means for cushioning a user's fall from said globe and wherein the peripheral surface of said globe is uniformly and universally textured to augment frictional drag against said globe support means and rotational speed limitation means during globe rotation and also to provide a slip resistant surface for user engagement;
wherein upon application of torque to the peripheral surface of the globe through the feet of a child erect atop the globe, the globe is caused to rotate.

5,145,475
EXERCISER
Paul Cares, Holland, Mich., assignor to P and L Partnership, Grand Rapids, Mich.
Filed Apr. 25, 1991, Ser. No. 691,460
Int. Cl.[5] A63B *22/04*
U.S. Cl. 482—52 **32 Claims**

1. An exerciser comprising:
a first mechanism for exercising the upper body of an opera-

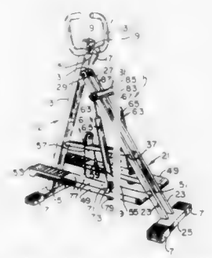
tor, said first mechanism including hand support means which move in a first path for, simulating a hand-over-hand motion;

a second mechanism rigidly connected to said first mecha-



nism for exercising the lower body of the operator, said second mechanism including foot support means which move in a second path for simulating a stair-like climbing motion; and means for powering said first and second mechanisms.

5,145,476
FOLDING STEPPER
Matt Chiarello, Browns, Ill., assignor to Roadmaster Corporation, Olney, Ill.
Filed Dec. 13, 1991, Ser. No. 806,644
Int. Cl.[5] A63B *22/04*
U.S. Cl. 482—53 **11 Claims**



1. A foldable exercise stair climbing machine comprising:

a support frame having

first support means including a lower end portion adapted to rest upon a horizontal surface;

second support means having a lower end portion adapted to rest upon such surface at a point spaced from said first support means, said second support means having an upper end portion pivotally connected to said first support means;

cross-member means communicating between said first and second support means for holding a set position between said first and second support means, said cross-member means being removably connected to one of said first and second support means;

first and second step members pivotally connected to said second support means and positioned on opposite sides of said first and second support means;

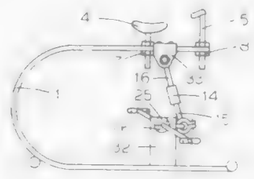
flexible linkage means communicating between said first and second step members for producing equal and opposite pivotal movement of said first and second step members; and

motion inhibiting means connected between said support frame and said step member means for inhibiting downward motion of said step members;

said first support means being pivotally moveable toward said second support means upon disconnection of said cross member means from at least one of said first and second support means;

whereby said first and second support means, said cross member means, said step members and said motion inhibiting means can all be folded together into a flattened assemblage.

5,145,477
SPRING SADDLE CYCLE
Sihui Han, 3800 Pepperell Pkwy., Opelika, Ala. 36801
Filed Jan. 9, 1992, Ser. No. 818,558
Int. Cl.[5] A63B *22/06*
U.S. Cl. 482—57 **9 Claims**



1. A spring saddle cycle as a fitness and amusement equipment, said spring saddle cycle comprising:

at least one spring saddle for supporting at least one occupant and for operation by the occupant(s), said spring saddle including a spring, a seat and a base, said seat mounted on the top of said spring, said base mounted on the bottom of said spring;

at least one pedal drive for producing the movement of said seat for the occupant(s), said pedal drive including a crankshaft, a connecting rod, a bearing bracket and a bushing bracket:

wherein said crankshaft having two rotatable pedals at each end of said crankshaft, a crank at the middle portion of said crankshaft, said crank fitted to two half-split crank bearings, two main journals by each side of said crank, each said main journal fitted to two half-split main bearings;

wherein said connecting rod having a bearing holder, said bearing holder inserted into with said crank bearings and fixed to a rod cap for connecting to said crank, an adjustable pipe, said adjustable pipe having threads inside and fitting with said bearing holder and a bushing rod for adjusting the length of said pedal drive;

wherein said bearing bracket has two vertical portions which each has a bearing slot, said bearing slot each received in and fixed with two half-slit said main bearings, said bearing bracket mounted on said spring;

wherein said bushing bracket has two vertical portions which each has a pin hole, said bushing rod connected to said bushing bracket with a pin through said pin hole and said bushing rod.

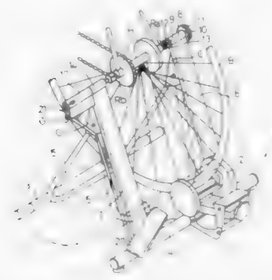
5,145,478
BICYCLE EXERCISING STAND
Chihiro Minoura, Gifu, Japan, assignor to Minoura Carrier & Stand Works, Co., Ltd., Gifu, Japan
Filed Oct. 18, 1991, Ser. No. 779,077
Claims priority, application Japan, Aug. 27, 1991, 3-215530
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—61 **17 Claims**

1. A bicycle exercise stand for supporting a drive wheel of a bicycle, the drive wheel having a pair of hubs, the bicycle exercise stand comprising:

a frame;

positioning means provided on said frame for engaging and positioning a first one of said drive wheel hubs;

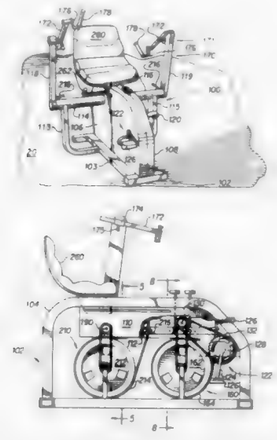
holding means arranged substantially opposite to said positioning means, the holding means being moveable be-



tween extended and contracted positions wherein the holding means is arranged to engage a second one of said drive wheel hubs in the extended position to cooperate with the positioning means to rotatably hold the drive wheel; and

pedal means mounted to a lower portion of the frame and coupled to holding means for moving the holding means between the extended and contracted positions.

5,145,479
TOTAL BODY EXERCISING APPARATUS
Brad Olschansky, 1900 Rambling Ridge La., #202, Baltimore, Md. 21209; Scott Olschansky, 8415 Bellona La., #404, Towson, Md. 21204, and Raymond H. Lee, Jr., 11737 Greenspring Ave., Lutherville, Md. 21093
Filed Apr. 3, 1991, Ser. No. 679,958
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—62 **18 Claims**



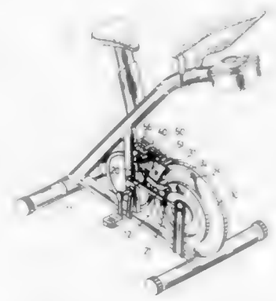
1. A total body exercising apparatus, comprising:

a. a frame including a central frame member having an inverted substantially U-shaped contour, said frame further including (1) a pair of tubular support members coupled to said central frame member, each of said pair of tubular support members extending transversely from opposing sides of said central frame member, and (2) a pair of opposing frame arm members, each of said pair of frame arm members being coupled in a predetermined angular position to a respective one of said pair of tubular support members;

b. means for exercising a lower body portion of a user coupled to said frame, said lower body exercise means including (1) first rotary crank means for rotation in either of two opposite directions, and (2) first resistance means coupled to said first rotary crank means for providing a selectively adjustable force resistive to rotation of said first rotary crank means; and,

c. means for exercising an upper body portion of said user coupled to said frame, said upper body exercise means including (1) second rotary crank means for rotation in either of two opposite directions, and (2) second resistance means coupled to said second rotary crank means for providing a selectively adjustable force resistive to rotation of said second rotary crank means.

5,145,480
MAGNETIC RETARDING APPARATUS FOR AN EXERCISER
Kuo-Liang Wang, 58, Ma Yuan West St., Taichung, Taiwan
Filed Aug. 7, 1991, Ser. No. 741,551
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—63 **3 Claims**



1. A magnetic retarding apparatus for an exerciser, said exerciser comprising a wheel rotatably supported on a frame thereof, said frame including a bar laterally disposed therein; said magnetic retarding apparatus comprising a pair of links each having a lower end pivotally coupled to said bar of said frame and each including an upper end; a bracket pivotally coupled between said upper ends of said links which are arranged such that said bracket moves substantially radially inward and outward of said wheel; a support fixed to said bracket and including a pair of end wall portions each having at least one magnet disposed therein, said end wall portions being located on both sides of an outer peripheral edge of said wheel; and a driving means disposed on said frame of said exerciser and coupled to said bracket for driving said bracket to move substantially radially inward and outward of said wheel, said driving means including a housing fixed on said frame of said exerciser; a bolt rotatably supported in said housing; a pinion fixed on one end of said bolt; a motor disposed in said housing and having a gear fixed to a spindle thereof, said gear being engaged with said pinion of said bolt; a guide threadedly engaged on said bolt and including an extension; and a follower coupled to said bracket and having a groove formed therein for receiving said extension of said guide; said guide will be caused to move longitudinally along said bolt when said bolt is driven by said motor so that said bracket can be caused to move; such that said magnets are caused to move substantially radially inward and outward of said wheel when said bracket moves.

5,145,4?1
SKI EXERCISE MACHINE
Adolph H. Friedebach, Chanhassen, Minn., assignor to Fitness Master, Inc., Waconia, Minn.
Filed Jul. 10, 1990, Ser. No. 550,861
Int. Cl.[5] A63B *21/00, 69/18*
U.S. Cl. 482—70 6 Claims

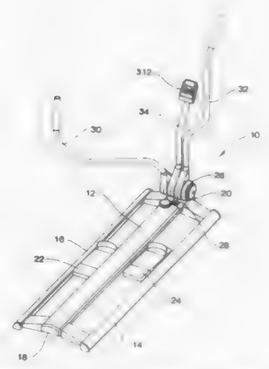
1. An exercise machine for providing exercise for a user by simulating cross-country skiing, said machine comprising:

two generally parallel, spaced outer tracks;

a center track having a longitudinal axis, said center track disposed generally between and parallel to said outer tracks;

a pair of reciprocating skate means for receiving said user's feet, said pair of skate means each operably coupled to said center track and a respective outer track;

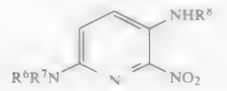
right and left arm pole means for said user to grasp and move, each of said arm pole means pivotally coupled to said center track, each extending from said center track in respective vertical planes parallel to said longitudinal axis of said center track, each diverging from said center track, and each terminating in respective vertical planes in the vicinity of said outer tracks, whereby said arm pole means do not interfere with said user's body while exercising; and



skate resistance means for adjustably varying the resistance of said skate means to movement.

5,145,482
HAIR DYE COMPOSITIONS BASED ON 2,5-DIAMINO-6-NITROPYRIDINE DERIVATIVES
Thomas Clausen, Alsbach, and Eugen Konrad, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
Continuation of Ser. No. 348,660, Apr. 6, 1989, Pat. No. 4,950,302. This application Apr. 20, 1990, Ser. No. 512,665
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727297
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] A61K *7/13*; C07D *211/84, 213/73*
U.S. Cl. 8—409 11 Claims

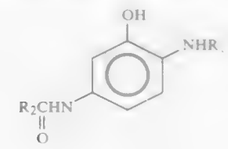
1. A composition for dyeing hair consisting essentially of a 2,5-diamino-6-nitropyridine derivative having the formula (VI):


(VI)

or a physiologically compatible water-soluble salt thereof, wherein, independently of each other, R^6, R^7 and R^8, are selected from the group consisting of hydrogen and alkyl radicals containing one to four carbon atoms, provided at least two of R^6, R^7 and R^8 are hydrogen at least one solvent, at least one surfactant selected from the group consisting of anionic, cationic, amphoteric and nonionogenic surfactants and at least one cosmetic additive selected from the group consisting of thickeners, care agents, perfume oils, complexing agents, oxidation hair dyes, additional direct hair dyes, perservatives, a pH-adjusting member selected from the group consisting of ammonia, monoethanol amine and triethanol amine; and a polymer selected form the group consisting of chitosan, chitosan derivatives, polyvinyl alcohol, polyacrylic acid, polymethacrylic acid, polyacrylonitrile, polyvinyl lactam and copolymers thereof.

5,145,483
SUBSTITUTED ORTHO-AMINOPHENOLS, PROCESS FOR PREPARING THEM AND THEIR USE FOR THE OXIDATIN DYEING OF KERATINOUS FIBRES
Alex Junino, Livry-Gargan; Hervé Andrean, Paris, and Gérard Lang, Saint-Gratien, all of France, assignors to L'Oreal, Paris, France
Filed Oct. 27, 1989, Ser. No. 427,474
Claims priority, application France, Oct. 28, 1988, 88 14204
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—412 20 Claims

1. A composition for dyeing keratinous fibers, especially human hair, comprising an effective concentration of a 5-substituted ortho-aminophenol of formula (I):


(I)

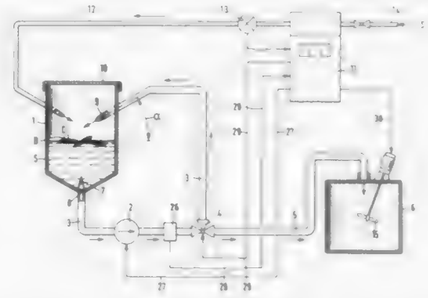
or an addition salt with an acid or a phenate of said 5-substituted ortho-aminophenols of formula (I), wherein:

R_1 is selected from the group consisting of a hydrogen atom, an alkyl radical having 1 to 4 carbon atoms and a hydroxyalkyl radical having 1 to 4 carbon atoms; and

R_2, independently of R_1, is selected from the group consisting of an alkyl radical having 1 to 4 carbon atoms, an alkoxy radical having 1 to 4 carbon atoms and a benzyl radical;

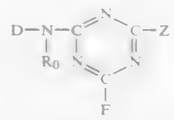
said concentration is sufficient for dyeing said fibers; and further comprising an effective amount of at least one adjuvant selected from the group consisting of anionic, cationic, nonionic, and amphoteric surfactants, mixtures of anionic, cationic, nonionic, and amphoteric surfactants, organic solvents, thickeners, antioxidants, sequestering agents, buffers, and fragrances.

5,145,484
POLYVINYL ALCOHOL ENVELOPES OF LOW AIR CONTENT AS PACKING MATERIAL FOR FIBRE-REACTIVE DYES
Roger Lacroix, Village-Neuf, France, and Ulrich Strahm, Aesch, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Mar. 29, 1991, Ser. No. 677,723
Claims priority, application Switzerland, Apr. 3, 1990, 1103/90; Aug. 17, 1990, 2683/90
Int. Cl.[5] C09B *67/02*
U.S. Cl. 8—524 13 Claims



1. A commercial package comprising a water-soluble polyvinyl alcohol envelope which is sealed on all sides, having enclosed therein a stable, dust-free, water-soluble reactive dye selected from the group consisting of

(1) monoreactive dyes of formula


(1)

in which D is the radical of an organic dye from the monoazo or polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, nitroaryl, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, naphthoquinone, pyrenequinone or perylenetetracarbimide series, R_0 is hydrogen or substituted or unsubstituted C_1–C_4alkyl, and Z is a substituted or unsubstituted amino group, a substituted or unsubstituted mercapto group, a substituted or unsubstituted hydroxyl group, or a substituted or unsubstituted hydrocarbon radical and

(2) polyreactive dyes of formula

$$D—X)_{2\text{-}4} \quad (2)$$

in which D is the radical of an organic dye from the monoazo or polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, nitroaryl, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, naphthoquinone, pyrenequinone or

perylenetetracarbimide series, and -$(X)_{2-4}$ is 2,3 or 4 fiber-reactive radicals X, which can be identical to or different from one another, from the aliphatic, aromatic or heterocyclic series, which are bound to D directly or via a bridging member, the air content of the package being kept low by means of suction before sealing.

5,145,485

PROCESS FOR THE PREPARATION OF STABLE DYESTUFF SOLUTIONS: PRESSURE PERMEATION IN PRESENCE OF BORIC ACID OR BORATE

Martin Michna, Pulheim; Werner Zillger, Hennef-Stein, and Dietrich Tegtmeyer, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,630

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008262

Int. Cl.[5] C09B *57/26, 67/54*

U.S. Cl. 8—527 **7 Claims**

1. Process for the preparation of storage-stable aqueous solutions of anionic reactive dyestuffs and fluorescent whitening agents, by pressure permeation of solutions or suspensions of the crude dyestuff, characterized in that boric acid or salts thereof are added to the solution or suspension before or during the pressure permeation, which comprises the steps desalination and, where appropriate, concentration.

5,145,486

PROCESS FOR DYEING WOOL WITH REACTIVE DYES

Klaus Hannemann, Lörrach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

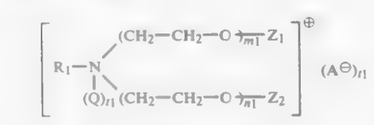
Filed Feb. 11, 1991, Ser. No. 654,139

Claims priority, application Switzerland, Feb. 14, 1990, 477/90

Int. Cl.[5] C09B *62/00*

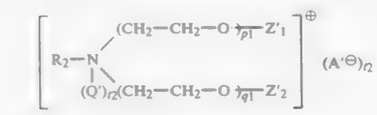
U.S. Cl. 8—543 **16 Claims**

1. A process for producing non-skittery and level dyeings on wool with reactive dyes in the presence of an auxiliary combination, which process comprises dyeing wool with an aqueous liquor consisting of at least one reactive dye and an auxiliary combination comprising, as component (a), at least one compound of formula



(1a)

and, as component (b), at least one compound of formula

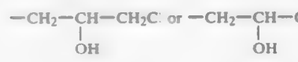


(1b)

wherein

R_1 and R_2 are each independently of the other an alkyl or alkenyl radical of 12 to 24 carbon atoms,

Q and Q' are each independently of the other C_1–C_4alkyl, $—CH_2—CO—NH_2$,



$A^{\ominus}$ and $A'^{\ominus}$ are an anion,

Z_1, Z_2, Z'_1 and Z'_2 are each independently of one another hydrogen, SO_3M or PO_3M,

wherein M is hydrogen, alkali metal or ammonium, t_1 and t_2 are 1 or 0, when t_1 and t_2 are 0, Z_1, Z_2, Z'_1 and Z'_2 are hydrogen or one of Z_1, Z_2, Z'_1 and Z'_2 is hydrogen and the other is SO_3M or PO_3M, m_1, n_1, p_1 and q_1 are integers, the sum of (m_1+n_1) being 2 to 15 and that of (p_1+q_1) being 25 to 200, and finishing the dyeing, irrespective of the depth of shade, in the pH range from 4.0 to 5.0.

5,145,487

METHODS AND COMPOSITIONS TO ENHANCE STAIN RESISTANCE OF CARPET FIBERS USING SULFONATED AROMATIC CONDENSATES

Dale A. Hangey, Midlothian; Paul W. Harris; Charles J. Cole, both of Chester, and Daniel J. Corcoran, Jr., Richmond, all of Va., assignors to Allied-Signal Inc., Morris Township, N.J.

Continuation of Ser. No. 399,106, Aug. 28, 1989, abandoned, which is a division of Ser. No. 361,671, Jun. 1, 1989, which is a continuation of Ser. No. 101,652, Sep. 28, 1987, abandoned. This application Jan. 6, 1992, Ser. No. 818,475

Int. Cl.[5] C09B *67/00;* **D06M** *15/41, 101/34*

U.S. Cl. 8—557 **8 Claims**

1. A two-step method to continuously treat dyed nylon carpet fabric with a sulfonated aromatic condensate to impart resistance to staining comprising:

adding a first portion of said sulfonated aromatic condensate during dyeing of said carpet fabric in an amount of at least 0.05% sulfonated aromatic condensate based on the weight of the nylon fiber in said carpet fabric,

preheating said dyed carpet fabric with water at a temperature between about 140° and 212° F. (60° and 100° C.) to a wet pick-up of above about 75% by weight, and a carpet temperature of between about 130° and 210° F. (54.4° and 99° C.), then

extracting said water from said carpet fabric to a wet pick-up of between about 30 to 190% by weight, then

applying an aqueous solution of a second portion of said sulfonated aromatic condensate, in an amount of at least 0.05% sulfonated aromatic condensate based on the weight of the nylon fiber in said carpet fabric, to said carpet fabric at a pH of between about 1.5 to 5.5, at a concentration of between about 0.25 and 40 grams of solids of said condensate per liter of aqueous solution, at a wet pick-up of between 200 and 650% by weight, at an aqueous solution liquor temperature of between about 140° and 212° F. (60° and 100° C.), to achieve a carpet fabric temperature between about 130° and 210° F. (54.4° and 99° C.), then

holding said carpet in said aqueous solution for between about 0.5 to 90 seconds at a temperature above 130° F. (54.4° C.), so that the portion of sulfonated aromated condensate added during dyeing and the portion of sulfonated aromatic condensate added after dyeing combined make an amount effective to impart to said carpet fabric resistance to staining.

5,145,488

PROCESS FOR THE PREPARATION OF MIXTURES OF OIL-SOLUBLE IRON AND MAGNESIUM SALTS OF SATURATED ALIPHATIC MONOCARBOXYLIC ACIDS AND THEIR USE

Jürgen Weber, Oberhausen; Peter Lappe; Werner De Win, both of Dinslaken, and Wolfgang Nierhaus, Moers, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 589,375

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1989, 3932322

Int. Cl.[5] C10L *10/00*

U.S. Cl. 44—363 **16 Claims**

15. A process for the preparation of a mixture of iron (III) and magnesium salts of saturated aliphatic monocarboxylic acids having 6 to 8 carbon atoms comprising adding as first amount of an alkali metal aliphatic monocarboxylate and a second amount of an aliphatic saturated monocarboxylic acid to an aqueous solution of an iron (III) salt to form a mixture, extracting said mixture with an organic solvent whereby an aqueous phase and an organic phase are formed, separating said aqueous phase from said organic phase, adding magnesium oxide to said organic phase, and heating said organic phase until said magnesium oxide is dissolved, said first amount being approximately equivalent to said iron (III) salt and said second amount is that required for conversion of said magnesium oxide to said magnesium salts.

5,145,489

METHOD FOR COPROCESSING COAL AND OIL

Donald D. Dunlop, Miami, Fla., assignor to Fuels Management Inc., Miami, Fla.

Filed Nov. 28, 1990, Ser. No. 619,031

Int. Cl.[5] C10L *9/08, 9/10*

U.S. Cl. 44—626 **7 Claims**

1. A process for simultaneously improving the fuel properties of coal and oil, comprising the steps of:

(a) providing a heated fluidized bed reactor, wherein said reactor has a fluidized density of from about 20 to about 50 pounds per cubic foot, is comprised of at least about 80 weight percent of carbonaceous material, is at a temperature of from about 850 to about 1,000 degrees Fahrenheit, and is at a pressure no greater than about 15 pounds per square inch gauge;

(b) providing a second heated fluidized bed burner, wherein said burner has a fluidized density of from about 20 to about 50 pounds per cubic foot, is comprised of at least about 80 weight percent of carbonaceous material, is at a pressure of no greater than about 15 pounds per square inch gauge, and is at a temperature of from about 850 to about 1,050 degrees Fahrenheit, providing that the temperature in said burner is at least 25 degrees greater than the temperature in said reactor;

(c) after each of said reactor and said burner has been provided in a steady state condition, coal and oil is fed into said reactor, wherein the feed rate of said coal, in pounds per hour, is from about 0.05 to about 20 times as great as the feed rate of said oil, thereby producing a mixture of solid carbonaceous material and petroleum material wherein said oil has an A.P.I. gravity of less than about 15;

(d) withdrawing at least a portion of said solid carbonaceous material from said reactor and feeding it into said burner;

(e) partially combusting solid carbonaceous material in said burner, thereby producing partially combusted carbonaceous material;

(f) returning a portion of said combusted carbonaceous material from said burner to provide the heat for reaction to said; and

(g) continuously removing carbonaceous material at another point from said burner to maintain a constant unit inventory.

5,145,490

PROCESS FOR FIXED BED COAL GASIFICATION

Richard S. Sadowski, Greenville, S.C., assignor to CRS Sirrine Engineers, Inc., Houston, Tex.

Division of Ser. No. 565,039, Aug. 9, 1990. This application Dec. 26, 1991, Ser. No. 814,102

Int. Cl.[5] C10J *3/14*

U.S. Cl. 48—197 R **2 Claims**

1. A method of gasifying solid carbonaceous fuel, comprising the steps of:

(a) introducing solid carbonaceous fuel, an oxidant, and a combustible gas under pressure into a first end of an open-ended entrained bed pyrolyzer tube, said tube housed within a fixed bed pressure vessel with the tube extending through the fixed bed;

(b) igniting the combustible gas in order to devolatilize the fuel within the pyrolyzer tube and form ash, char, and volatiles;

(c) discharging the devolatilized fuel comprising char, ash, and volatiles from a second end of the pyrolyzer tube directly into the pressure vessel at a location above the fixed bed and passing the char, ash, and volatiles downwardly through a high temperature region of the fixed bed pressure vessel;

(d) introducing gasifying agents into the pressure vessel at a point adjacent to the second end of the pyrolyzer tube to crack any tar present;

(e) allowing said pressure vessel to heat to a temperature sufficient to oxidize the ash and char to carbonaceous gases, the ash and char descending by gravity;

(f) allowing unreacted char and ash to cool;

(g) removing ash, char, and volatiles from the pressure vessel.

5,145,491

PROCESS OF CONTROLLING THE STARTING UP OF THE GASIFICATION OF SOLID FUELS IN A FLUIDIZED STATE

Gerhard Schmitt, Schmitten; Horst Mielke, Neu-Isenburg, and Peter Herbert, Frankfurt am Main, all of Fed. Rep. of Germany

Filed Oct. 15, 1991, Ser. No. 777,815

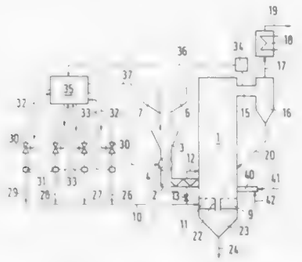
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1990, 4035293

Int. Cl.[5] C10J *3/54*

U.S. Cl. 48—197 R **6 Claims**

1. A process of controlling the starting up of the gasification of fine-grained solid fuels, which are treated in a fluidized state with oxygen-containing gas and water vapor in a gasifying reactor, which is provided at its top end with a duct for discharging product gas and at its bottom portion with means for withdrawing ash, which comprises (a) during a heating-up phase preceding the gasification combusting a mixture of solids comprising ash and fine-grained fuels in a fluidized state in the

reactor with a supply of oxygen containing gas to provide a hyperstoichiometric supply of oxygen, thereby increasing the temperature in the reactor approximately to the temperature desired for the gasification, (b) immediately succeeding the heating-up phase by an inertizing phase, in which the supply rate of oxygen-containing gas is decreased and an inert gas is supplied to the reactor and the content of free oxygen in the product gas is decreased virtually to zero whereas the temperature is maintained virtually constant, and (c) succeeding the



inertizing phase by the gasification, in which oxygen or oxygen-containing gas are fed to the reactor with or without steam, the fuel supply rate is increased and the temperature desired for the gasification, which when measured in the top portion of the reactor or in the discharge duct lies in the range from 600° to 1500° C., is maintained virtually constant after a time for temperature adjustment, and in which the supply rate of solid fuel is decreased when the temperature is too low and the supply rate of fuel is increased when the temperature is too high.

5,145,492

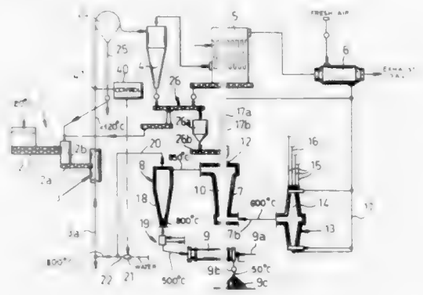
APPARATUS FOR THE TREATMENT OF FILTER SLUDGE CONSISTING PREDOMINANTLY OF DIATOMITE AND METHOD OF OPERATING SAME

Peter Weiergräber, Erkrath, Fed. Rep. of Germany, assignor to Tremonis Gesellschaft Mit Beschrankter Haftung Brauerei-Nebennerzeugnisse, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 585,317, Sep. 19, 1990. This application Dec. 6, 1991, Ser. No. 804,115

Int. Cl.[5] **B01D** *5/16, 46/04*

U.S. Cl. 55—17 4 Claims



1. A method comprising treating diatomite in a manner which minimizes the formation of crystalline silicic acid by:

(a) introducing diatomite into a high-temperature treatment chamber having a vertical axis and a circular cross section and formed as a fluidized-flow reactor;

(b) forming a treating gas by combusting a fuel in air and introducing said treating gas at a temperature of about 600° C. into said high-temperature treatment chamber while generating a rising vortex flow of said treating gas within said chamber to entrain solids therefrom while combusting organic components on said solids;

(c) cyclonically separating from the gas entraining said solids from said chamber substantially 80% of the solids;

(d) quenching the solids separated from the gas entraining the solids from said chamber from a temperature of substantially 800° C. to a temperature of substantially 550° C.; and

(e) thereafter further cooling the quenched solids.

5,145,493

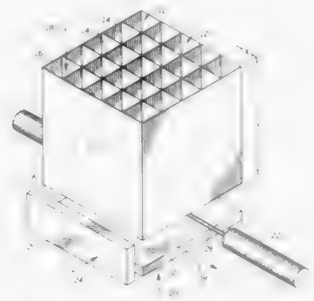
MOLECULAR RESTRICTER

Hoang K. Nguyen, and Joseph M. Draina, both of Austin, Tex., assignors to IBM Corporation, Armonk, N.Y. and Motorola Inc., Schaumburg, Ill.

Filed Jun. 27, 1991, Ser. No. 722,452

Int. Cl.[5] **B01D** *57/00*

U.S. Cl. 55—17 9 Claims



1. In a system having a mixed flow of gas molecules and particles, a method for restricting the flow of gas molecules without substantially restricting the flow of particles therethrough comprising:

providing a means for flowing gas molecules and particles in a first direction along a pathway;

providing means for observing the particles in a second direction, where the second direction is not parallel to the first direction;

installing a molecular restricter in the pathway upstream from the means for observing, for substantially restricting the flow of molecules therethrough, the molecular restricter comprising:

a plurality of elongated cells having parallel walls and open ends where the cells has a characteristic width, x, representing the distance between the walls within the cell and a length, l;

where l is equal to or greater than x;

where x is less than or equal to λ, where λ is the means free path of the molecules; and

where the elongated cells are oriented in parallel and adjacent to each other.

4. A molecular restricter for substantially restricting the flow of molecules therethrough comprising:

at least one elongated cell having parallel walls and open ends where the cell has a characteristic width, x, representing the distance between the walls within the cell and a length, l;

where l is equal to or greater than x;

where x is less than or equal to λ, where λ is the mean free pathway of the molecules; and

where each of the at least one elongated cells are oriented in parallel and adjacent to each other when more than one cell is present.

5,145,494

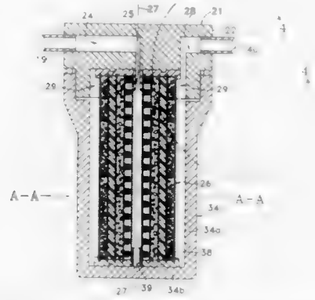
METHOD AND MEANS FOR FILTERING POLYCHLORINATED BIPHENYLS FROM A GAS STREAM

Richard F. Sowinski, 996 Arnold Dr., Martinez, Calif. 94553

Filed Feb. 22, 1991, Ser. No. 660,345

Int. Cl.[5] **B01D** *53/04, 27/04, 39/08*

U.S. Cl. 55—74 26 Claims



1. A method of filtering, adjacent to an end user-customer's residence or business in which at least a single gas appliance is located, a natural gas stream in which polychlorinated biphenyls (PCB's) and degraded PCB products have been concentrated at sufficient levels to be a health threat in a natural gas gathering and distributing network, comprising the steps of:

(a) introducing the natural gas stream to a filter selected from a group that includes impingement, absorbing and adsorbing media whereby PCB's and degraded PCB products concentrated in the gas stream at sufficient levels to be a health threat by aperiodic loading of the natural gas within the gathering and distributing network, are filtered from the gas stream and captured irrespective of mode of transport,

(b) passing the filtered natural gas stream to the customer's gas appliance wherein safe use of the energy associated with the stream occurs,

(c) periodically and safely removing the filter of step (a) for disposing of captured PCB's and degraded PCB products,

(d) inserting a new filter in place of the removed filter of step (c).

5,145,495

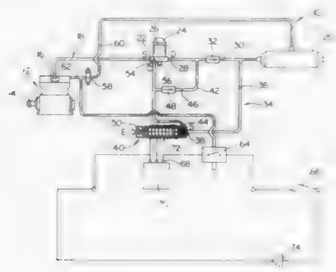
AIR DRYER PURGE CYCLE TIMING CONTROL

Naman A. Elamin, Avon, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 13, 1991, Ser. No. 715,062

Int. Cl.[5] **B01D** *53/02*

U.S. Cl. 55—162 15 Claims



1. Compressed air system comprising an air compressor, an air storage reservoir for storing compressed air, an air dryer having a supply port communicated with said air compressor for receiving compressed air from said air compressor, a delivery port for delivering compressed air to said air storage reservoir, a desiccant bed between said supply and delivery ports for drying compressed air communicated from said air compressor to said air storage reservoir through said air dryer, an exhaust port, and control means for causing flow of regeneration air from said delivery port through said desiccant bed to said exhaust port for regenerating said desiccant and for permitting flow of compressed air from said delivery port to said reservoir but preventing flow of compressed air in the reverse direction, a first conduit branch connected between said delivery port and said air storage reservoir for delivering compressed air from the air dryer to said air storage reservoir, a second conduit branch connected to said first conduit branch between said air storage reservoir and said delivery port for communicating regeneration air from said air storage reservoir to said delivery port, said control means including means normally closing said second conduit branch but opening the latter to permit communication of regeneration air from said air storage reservoir to said delivery port for communication through said desiccant bed to said exhaust port during regeneration of said desiccant bed.

5,145,496

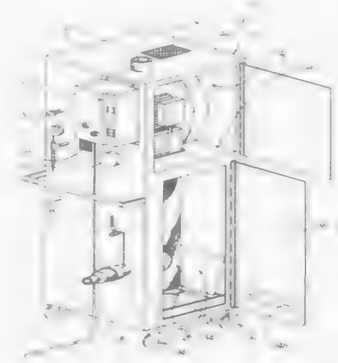
CENTRIFUGAL AIR CLEANER

Floyd F. Mellen, 8417 Pacific St., Omaha, Nebr. 68114

Filed Oct. 16, 1991, Ser. No. 778,306

Int. Cl.[5] **B01D** *46/04*

U.S. Cl. 55—188 33 Claims



1. A centrifugal air cleaning apparatus, comprising,

a housing defining a filter compartment including opposite end walls, and peripheral side walls connected to and extending between said opposite end walls, one end wall having an air outlet opening generally centered thereon,

a vacuum source,

fluid passage means establishing communication between said vacuum source and air outlet opening,

a generally tubular filter cartridge having a closed bottom end and an open upper end,

means for mounting said filter cartridge in said filter compartment with said open upper end connected to said air outlet opening so that air flow from said open upper end of the filter is directed through said air outlet opening,

an air inlet opening through one of said peripheral side walls, and

a flame arrestor operatively associated with said air inlet opening, such that air flow through said air inlet opening is directed through said flame arrestor,

said flame arrestor including a plurality of flow diverting

surfaces for extinguishing sparks in air passing therethrough,

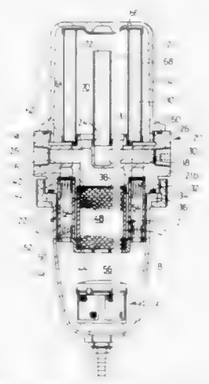
said flame arrestor being operative to direct air into said filter compartment generally tangentially of said filter cartridge thereby to effect centrifugal air flow within said filter compartment.

5,145,497

IN-LINE FILTER DEVICE FOR COMPRESSED AIR HAVING MIST FILTER AND AIR COLLECTOR

Sadao Maeda, Okazaki, Japan, assignor to Maeda Shell Service Co., Ltd., Aichi, Japan

Filed Sep. 24, 1991, Ser. No. 764,831
Claims priority, application Japan, Mar. 13, 1991, 3-22333[U]
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—219 10 Claims



1. An in-line filter device connected in an air line through which compressed air flows, comprising:

a partition member having an inlet passage open on a central part of a lower surface thereof, for introducing a flow of the compressed air, at least one intermediate passage formed through a thickness thereof between a central portion and a peripheral portion thereof, and an outlet passage open on a central part of an upper surface thereof, for delivering the compressed air;

a lower housing which is closed at one of opposite ends thereof and open at the other end, said lower housing being fluid-tightly attached at said other end thereof to a lower portion of said partition member, and cooperating with said partition member to define a lower enclosed space whose lower part provides a sump for storing a liquid which is separated from the compressed air as a result of condensation or coalescence of vapor or liquid particles contained in the compressed air;

first filter means disposed in a central portion of an upper part of said enclosed space and including a sleeve and a first packing filling an interior of said sleeve, said first packing receiving the compressed air coalescing said vapor or liquid particles into said liquid;

second filter means including an annular member disposed radially outwardly of said sleeve of said first filter means, and a second packing filling an interior of said annular member, said second packing receiving the compressed air from said lower part of said enclosed space and directing the compressed air into said at least one intermediate passage;

draining means disposed in a bottom portion of said sump, for discharging said liquid from said sump to an outside of the in-line filter device;

an upper housing which is closed at one of opposite ends thereof and open at the other end, said upper housing being fluid-tightly attached at said other end thereof to an upper portion of said partition member, and cooperating with said partition member to define an upper enclosed space which communicates with said lower enclosed space through said at least one intermediate passage;

a mist filter having an annular porous structure and being disposed within said upper enclosed space so as to cause the compressed air from said at least one intermediate passage to flow through said annular porous structure in a direction from an outside to an inside of said porous structure, for separation of remaining vapor or liquid particles from the compressed air while the compressed air is flowing through said porous structure; and

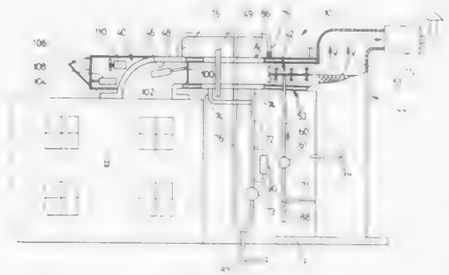
an air collector disposed inside said annular porous structure of said mist filter, and communicating with said outlet passage for delivering the compressed air after being filtered.

5,145,498

SMOKE STACK EXHAUST SYSTEM

Clarence H. Houston, 92 Barrie Rd. South, Box 38, Orillia, Ontario, Canada L3V 2T9

Filed Sep. 5, 1991, Ser. No. 755,181
Claims priority, application Canada, Oct. 3, 1990, 2026833
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—222 8 Claims



1. A water-spray gas-scrubbing device of water-cooled metallic construction for use in association with a processing means producing waste gases at an elevated temperature containing particulate matter and comprising:

gas conduit means adapted to be connected to said processing means for carrying gases therefrom at an elevated temperature, said conduit means comprising inner walls and outer walls spaced apart from one another and defining a conduit cooling jacket;

water circulation means for circulating cooling water through said conduit cooling jacket;

a gas-scrubbing chamber connected to said conduit means for receiving waste gases therefrom, said gas-scrubbing chamber in turn comprising inner and outer walls spaced apart from one another and defining a chamber cooling jacket and defining a roof portion, side walls and a floor portion, said floor portion at least being arranged at an angle relative to the horizontal, with a higher portion at an upstream end of said gas-scrubbing chamber adjacent to said gas conduit means, and a lower portion at a downstream end of said gas-scrubbing chamber;

water circulation means adapted to circulate water through said gas-scrubbing chamber cooling jacket;

water spray means in said gas-scrubbing chamber for spraying water through said gases passing through said gas-scrubbing chamber;

scrubbing water supply means associated with said water spray means for supplying gas-scrubbing water thereto;

filter tower means connected to said downstream end of said gas-scrubbing chamber for receiving both scrubbed gases and scrubbing water from said gas-scrubbing chamber at an upper end of said filter tower means;

gas discharge means at an elevated position in said filter tower means for the discharge of scrubbed gases from said filter tower means;

filter means in said filter tower means for filtering scrubbing water flowing downwardly therethrough;

scrubbing water discharge means in said filter tower means for the discharge of filtered scrubbing water therefrom;

re-circulating means connecting said scrubbing water discharge means in said filter tower means to said scrubbing water supply means for transporting filtered scrubbing water to said water spray means;

flushing means associated with said filter means for discharging water to said filter means to dislodge particulate material therefrom, and,

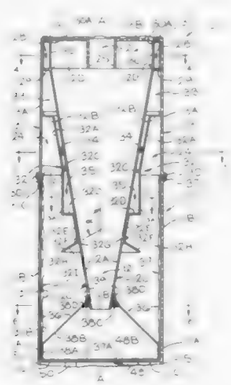
waste water discharge means in said filter tower for discharging waste water containing particulate material therefrom.

5,145,499

DISPOSABLE BIN FOR CYCLONIC VACUUM

James Dyson, Bath-Avon, England, assignor to Notetry Limited, Bristol, England

Continuation-in-part of Ser. No. 585,975, Sep. 21, 1990, Pat. No. 5,090,976. This application Feb. 21, 1992, Ser. No. 838,860
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—337 57 Claims



1. In a cleaning apparatus including a container comprising a bottom and a sidewall extending to and meeting the bottom, the sidewall having an interior surface, a dirty air inlet at an upper portion of the container spaced from the bottom which is oriented for supplying dirt laden air into the container tangentially to the interior surface of the container which has a circular cross-section and an air outlet from the container at the upper portion of the container; a circular cross-sectioned cyclone having a longitudinal axis and mounted inside the container, the cyclone comprising a cyclone air inlet at an upper end having a first diameter of the cyclone in air communication with the air outlet of the container, an interior dirt rotational surface of frusto-conical shape for receiving an airflow from the air inlet and for maintaining its velocity to a cone opening smaller in diameter than the diameter of the upper end of the cyclone, the air inlet being oriented for supplying air tangentially to the surface and a cyclone air outlet communicating with the interior of the cyclone adjacent the upper end of the cyclone; a dirt collecting receiver means extending from the cone opening; and means for generating an airflow which passes through the dirty air inlet, the container, the cyclone air inlet, the cyclone, the receiver means and the cyclone air outlet, the airflow rotating around the frusto-conical interior surface of the cyclone and depositing the dirt in the receiver means, the improvement which comprises:

(a) a cover means providing a closure for an upper end of the container, wherein the cover means removeably supports the container for disposing of dirt separated from the airflow by the container; and

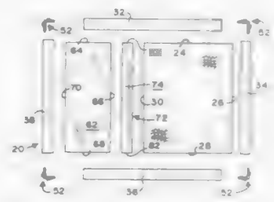
(b) a liner means having a first, rigid portion providing the receiver and a second portion wherein the receiver portion has a first sidewall between opposed ends, one of which is open and sealed to the cyclone to provide for the dirt separated from the airflow by the cyclone to accumulate in the receiver portion and wherein the second portion of the liner means has opposed ends defining a second sidewall between the ends, the second sidewall mounted along and around the longitudinal axis, inside of the interior surface of the container so that the second portion of the liner means collects dirt separated from the airflow by the container and extends to an open end of the second portion sealed at the upper end of the container, wherein the container holding the second portion is removeable from the cover means and the receiver portion is removeable from the sealed relationship with the cyclone for disposing of accumulated dirt separated from the airflow by the container and the cyclone.

5,145,500

TRIMMABLE RANGE HOOD FILTER

Edward F. Nolen, Jr., Memphis, Tenn., assignor to Air Kontrol, Inc., Batesville, Miss.

Filed Apr. 28, 1992, Ser. No. 874,854
Int. Cl.[5] B01D *46/10*
U.S. Cl. 55—501 4 Claims



1. A trimmable range hood filter for covering both an inlet opening of a range hood and a light on said range hood adjacent said inlet opening, said range hood filter comprising:

(a) a rectangular filter element selectively trimmed to have compatible dimensions with said inlet opening, said filter element having, in clockwise sequence, a first, a second, a third, and a fourth side;

(b) a first, a second, a third, and a fourth non-telescoping frame member sequentially arranged to form a rectangle, wherein each said frame member constitutes a different side of said rectangle, said first and said third frame members being of substantially the same length and being parallel to one another, and said second and said fourth frame members being of substantially the same length and being parallel to one another and perpendicular to said first and said third frame members, each said frame member having a longitudinal channel facing inwardly into said rectangle, with said first, second, and third sides of said filter element respectively being inserted into the longitudinal channels of said first, second, and third frame members but not that of said fourth frame member;

(c) four attachment means, one at each corner of said rectangle, for fixedly joining adjacent frame members to form said each corner;

(d) a selectively trimmed plastic pane capable of passing illumination from said light therethrough, said pane having, in clockwise sequence, a first, a second, a third, and a fourth side, with said first, third, and fourth sides of said pane respectively being inserted into the longitudinal

channels of said first, third, and fourth frame members but not that of said second frame member; and

(e) means for sealingly joining said fourth side of said filter element to said second side of said pane.

5,145,501

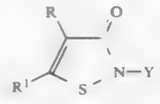
BROMATE STABILIZERS FOR 3-ISOTHIAZOLONES

Edward S. Lashen, Furlong, and Ramesh B. Petigara, Hatfield, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 12, 1991, Ser. No. 790,943
Int. Cl.[5] A01N *43/80*; C07D *275/01, 275/03*
U.S. Cl. 71—67 16 Claims

1. A composition comprising

(a) a 3-isothiazolone compound of the formula



wherein R and R^1 are independently selected from hydrogen, halogen or R is a (C_1–C_4) alkyl group and R^1 is a halogen or R and R^1 may be joined to form an unsaturated 5- or 6-membered carbocyclic ring; Y is hydrogen, a (C_1–C_{18}) alkyl group, an unsubstitued or halo-substituted alkenyl or alkynyl of 2 to 8 carbon atoms, a cycloalkyl or substituted cycloalkyl of 3 to 12 carbon atoms, an aralkyl or halo-, (C_1–C_4) alkyl-, or (C_1–C_4) alkoxy-substituted aralkyl of up to 10 carbon atoms, or an aryl or halo-, (C_1–C_4) alkyl-, or (C_1–C_4) alkoxy-substituted aryl group of up to 10 carbon atoms; and

(b) an amount of a metal bromate salt sufficient to stabilize said composition;

wherein said composition is free of metal nitrate salt.

5,145,502

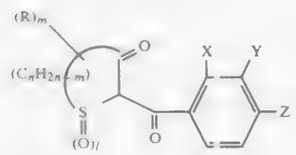
SUBSTITUTED BENZOYL DERIVATIVES AND HERBICIDAL COMPOSITIONS

Junichi Watanabe; Yasuo Kondo, both of Funabashi; Masataka Hatanaka, Shiraoka; Takashi Imai, Shirsoka; Koichi Suzuki, Shiraoka; Tsutomu Nawamaki, Shiraoka, and Shigeomi Watanabe, Shirsoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 460,631, Feb. 8, 1991. This application Jan. 14, 1991, Ser. No. 640,808
Int. Cl.[5] A01N *43/02*
U.S. Cl. 71—90 6 Claims

1. A herbicidal composition, comprising:

a) a herbicidally effective amount of one or more benzoyl derivatives of the formula (I):



(I)

wherein

R is a lower alkyl group, or a phenyl group which is unsubstituted or substituted by a lower alkyl group, halogen atom or a lower alkoxy group;

n is an integer of 3;

m is an integer of from 0 to 6, and when m is an integer of from 2 to 6, the plurality of R is the same or different from one another;

l is an integer of 0, 1 or 2;

X is a halogen atom, a nitro group, a cyano group, a lower alkyl group, a lower alkoxy group, or a lower haloalkyl group;

Y is a hydrogen atom, halogen atom, a nitro group, a lower alkyl group which is unsubstituted or substituted by a halogen atom or a lower alkoxy group, a lower alkoxy group, or a lower alkoxycarbonyl group; and

Z is a halogen atom, a nitro group, a cyano group, a trifluoromethyl group, a lower alkoxy group, a lower alkylthio group, a lower haloalkylthio group, a lower alkylsulfinyl group, a lower haloalkylsulfinyl group, a lower alkylsulfonyl group or a lower haloalkylsulfonyl group; and

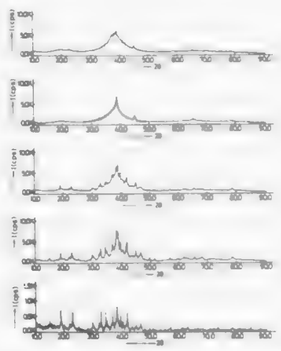
b) an agriculturally acceptable carrier.

5,145,503

PROCESS PRODUCT, AND POWDER FOR PRODUCING HIGH STRENGTH STRUCTURAL MEMBER

Hiroyuki Horimura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,182
Claims priority, application Japan, May 31, 1990, 2-141837; May 31, 1990, 2-141838
Int. Cl.[5] B22F *1/00*
U.S. Cl. 75—228 13 Claims



1. A process for producing a high strength structural member by sintering a starting powder material, wherein

a powder mixture of a basic powder and an additional powder is used as the starting powder material,

said basic powder being comprised of at least one of an amorphous single-phase alloy powder and at least one kind of a mixed-phase alloy powder which contains a crystalline phase and an amorphous phase and has a crystalline phase volume fraction C (Vf) less than 30%,

said additional powder being comprised of a mixed-phase alloy powder which contains a crystalline phase and an amorphous phase and has a crystalline phase volume fraction C (Vf) of at least 30% to less than 80%, and

a relationship between a minimum volume fraction Pm (Vf) of said additional powder in said starting powder material and the crystalline phase volume fraction C (Vf) in said additional powder being established such that $Pm(Vf) = -0.7\,C(Vf) + 61$.

5,145,504

BORON CARBIDE-COPPER CERMETS AND METHOD FOR MAKING SAME

Aleksander J. Pyzik, Midland, and Robert T. Nilsson, Cedar, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1991, Ser. No. 726,448
Int. Cl.[5] C22C *29/00, 29/02, 29/14, 5/00*
U.S. Cl. 75—230 10 Claims

1. A densified ceramic-metal composition, comprising:

a ceramic phase comprising at least 60 percent by volume of said composition; and

a copper metal phase permeating said ceramic phase,

wherein said composition is substantially fully densified and said copper metal is non-reactive and non-wetting of said ceramic phase.

5,145,505

HIGH TOUGHNESS CERMET AND PROCESS FOR PREPARING THE SAME

Takeshi Saito; Kozo Kitamura, and Mitsuo Ueki, all of Kawasaki, Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan

Filed Feb. 7, 1992, Ser. No. 832,316
Claims priority, application Japan, Feb. 13, 1991, 3-41268
Int. Cl.[5] C22C *29/04*
U.S. Cl. 75—236 6 Claims

1. A high toughness cermet which comprises a sintered alloy comprising 75 to 95% by weight of a hard phase of carbide, nitride or carbonitride containing Ti (titanium), at least one of W (tungsten), Mo (molybdenum) and Cr (chromium), and N (nitrogen) and C (carbon), and the balance of a binder phase composed mainly of an iron group metal, and inevitable impurities,

wherein the content of Ti in said sintered alloy is 35 to 85% by weight calculated on TiN or TiN and TiC, and the contents of W, Mo and Cr are 10 to 40% by weight in total calculated on WC, Mo_2C and/or Cr_3C_2,

the relative concentration of said binder phase at the 0.01 mm-inner portion from the surface of said sintered alloy is 5 to 50% of the average binder phase concentration of the inner portion, and the relative concentration of said binder phase at the 0.1 mm-inner portion from the surface of said sintered alloy is 70 to 100% of the average binder phase concentration of the inner portion, and

a compression stress of 30 kgf/mm^2 or more remains at the surface of said sintered alloy.

5,145,506

METHOD OF BONDING METAL CARBIDES IN NON-MAGNETIC ALLOY MATRIX

David Goldstein, Adelphi, and Scott M. Hoover, Laruel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Wasington, D.C.

Filed Jul. 5, 1984, Ser. No. 627,937
Int. Cl.[5] C22C *29/08*; B22F *3/16*
U.S. Cl. 75—240 16 Claims

1. A non-magnetic, wear resistant composite comprising:

(1) from about 10 to about 45 volume percent of particles of a metal carbide selected from the group consisting of titanium carbide and tungsten carbide wherein the particles are from more than 0.045 to less than 1.0 mm in size when the metal carbide is titanium carbide and from greater than 0.300 mm to less than 2.00 mm in size when the metal carbide is tungsten carbide; with

(2) the remainder of the composite being a single matrix of a nickel-titanium alloy which is composed of from 53 to 62 weight percent of nickel with the remainder being essentially titanium;

wherein the particles of metal carbide are uniformly distributed throughout the nickel-titanium alloy matrix and wherein the composite is formed by sintering and hot working until the density of the composite is more than 99 percent of the theoretical density of the composite.

7. A process for preparing a non-magnetic, wear resistant composite comprising the following steps in order:

(1) blending a mixture of

(a) from 10 to 45 volume percent of a metal carbide powder selected from the group consisting of titanium carbide and tungsten carbide wherein when titanium carbide is used the particles are from more than 0.045 mm to less than 1.00 mm in size but when tungsten carbide is used the particles are from more than 0.300 mm to less than 2.00 mm in size; with the remainder of the mixture being

(b) a nickel-titanium alloy powder wherein the alloy comprises from 53 to 62 weight percent of nickel with the remainder being essentially titanium, wherein when the metal carbide is titanium carbide the nickel-titanium alloy particles are less than 0.250 mm in size, but when the metal carbide is tungsten carbide the nickel-titanium alloy particles are a mixture of from 50 to 70 volume percent of small particles of less than 0.250 mm in size with the remainder being flakes of up to 0.25 inches long but less than 0.002 inches thick;

(2) isostatically pressing the mixture of metal carbide and nickel titanium alloy particles formed in step (1) at a pressure of 100,000 psi or more to form a green preform;

(3) sealing the green perform in a steel container which has been evacuated to a vacuum of less than 100 microns, wherein the walls are of a thickness to permit hot working;

(4) sintering the green perform at a temperature of from 900° to 1195° C.;

(5) hot working the sintered composite from step (4) until the cross-sectional area has been reduced by at least 25% percent and the composite is at near theoretical density; and

(6) cooling the titanium carbide/nickel-titanium alloy composite to room temperature and removing it from the steel container.

5,145,507

METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Michihisa Kyoto; Yoichi Ishiguro; Akira Urano, and Hideo Kakuzen, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 221,432, Jul. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 839,336, Mar. 13, 1986, abandoned. This application Jan. 14, 1991, Ser. No. 640,556
Claims priority, application Japan, Mar. 18, 1985, 60-52180; Oct. 3, 1985, 60-219090
Int. Cl.[5] C03B *37/00*
U.S. Cl. 65—2 6 Claims

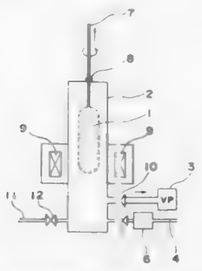
1. A method for producing a glass preform for use in fabrication of an optical fiber, which comprises the steps of:

forming a porous glass soot body from a glass-forming raw material,

adding fluorine to the soot body by heating it in an atmosphere comprising SiF_4 a partial pressure of which is controlled according to the formula:

Specific difference of refractive index = 0.75 × (partial pressure of SiF_4)$^{\frac{1}{2}}$

between 0.01 atm. and 0.5 atm. for a sufficient time to add fluorine to the soot body,



vitrifying the fluorine-added soot body into a transparent glass body,

boring said transparent glass body to form a bore therein and inserting a highly pure quartz rod in said bore to form a glass preform.

5,145,508

METHOD OF MAKING FLUORIDE GLASS USING BARIUM β-DIKETONES

Kazuo Fujiura; Yasutake Ohishi, Michiya Fujiki; Terutoshi Kanamori, and Shiro Takahashi, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

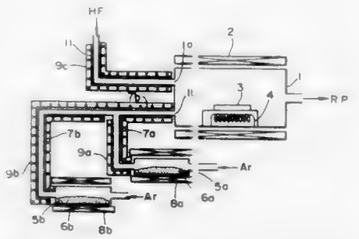
Continuation of Ser. No. 317,679, Mar. 1, 1989, Pat. No. 5,071,460. This application Mar. 11, 1991, Ser. No. 684,070

Claims priority, application Japan, Mar. 4, 1988, 63-49797; Nov. 2, 1988, 63-276007; Jan. 27, 1989, 1-16403; Mar. 1, 1989, 1-49277

The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.

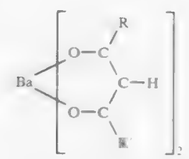
Int. Cl.[5] **C03C** *25/02*

U.S. Cl. 65—3.12 **17 Claims**



11. A process for preparing a fluoride glass containing barium and at least one other glass forming metal element comprising providing a gaseous mixture in a reaction vessel containing a rod-like glass substrate reacting the ingredients of said gaseous mixture in a gaseous phase or on the surface of said substrate to deposit a layer or fine particles of fluoride glass on the surface of said substrate, said gaseous mixture comprising:

a barium β-diketone complex consisting of barium and β-diketone serving as a first starting material and represented by the following formula (1):



(1)

wherein (i) R and R′ are each $—C(CH_3)_3$; or (ii) R is $—CH_2CH_2CH_3$ and R′ is $—C(CH_3)_3$; or (iii) R and R′ are each $—CF_3$;

a gaseous compound of said at least one other metal comprising at least one member selected from the group consisting of metal halide, trimethyl aluminum, triethyl aluminum, and metal β-diketonate other than a barium β-diketonate; and

a fluorine-containing gas serving as a fluorinating agent; and

heating said rod-like glass substrate containing thereon said deposited layer or deposited fine particles of a fluoride glass to solidify the same to form a pre-form for optical fibers.

5,145,509

METHOD OF MANUFACTURING OPTICAL FIBRES

Peter K. Bachmann; Hans-Jürgen E. Hagemann, both of Aachen, Fed. Rep. of Germany; Jacques P. M. Warnier, Eijsden, Netherlands, and Howard J. C. Wilson, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

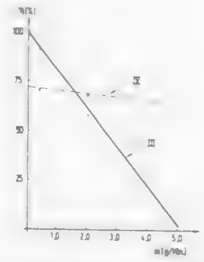
Continuation of Ser. No. 528,289, Apr. 25, 1990, abandoned, which is a continuation of Ser. No. 206,557, Jun. 14, 1988, abandoned. This application Oct. 15, 1991, Ser. No. 779,117

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720030

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[5] **C03B** *37/018*

U.S. Cl. 65—3.12 **2 Claims**



1. A method of manufacturing an optical fiber, comprising providing a glass tube having an inner tube wall and having a central longitudinal axis, arranging a solid glass rod having a central longitudinal axis inside the glass tube, depositing glass from a gas phase by the nonisothermal PCVD method of plasma chemical vapor deposition without the formation of glass soot in the gas phase, the glass being deposited in layers (a) on the inner wall of the glass tube which is heated to a temperature between 1100° and 1300° C., and (b) simultaneously on the solid glass rod which is arranged inside the glass tube, by passing a reactive gas mixture at a pressure between 1 and 30 hPa, through the glass tube while inside the glass tube a plasma is made to reciprocate strokewise between two reversal points, collapsing the glass tube following the deposition of the glass layers to thereby form a solid preform; and drawing the solid preform into an optical fiber; wherein said rod is a solid glass rod having a circular cross-section over the entire length of the rod, the solid glass rod being arranged so that its

longitudinal central axis coincides with the longitudinal central axis of the glass tube, the radius of the glass rod being uniform over the entire length of the rod and at most 0.67 times and at least 0.2 times the radius from the central axis of the glass tube to the inner wall of the glass tube, and wherein the glass rod is removed from the glass tube upon completion of the glass deposition process whereby there is obtained a reduction in geometrical taper of the preform when compared to the geometrical taper of the preform which would be present when the solid glass rod is not present during said deposition.

5,145,510

SILICA GLASS POWDER AND A METHOD FOR ITS PRODUCTION AND A SILICA GLASS BODY PRODUCT MADE THEREOF

Shun Saito; Kazumi Kimura, and Akira Utsunomiya, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Sep. 4, 1991, Ser. No. 754,963

Claims priority, application Japan, Sep. 7, 1990, 2-238637

Int. Cl.[5] **C03B** *19/06*

U.S. Cl. 65—18.1 **17 Claims**

1. In a method for producing a silica glass powder suitable for the production of a silica glass body product of a low silanol content, which comprises baking a dried silica gel powder obtained by a sol-gel method, at a temperature of from 1,000° to 1,400° C., the improvement wherein during the baking period, the silica gel powder is baked in a gas atmosphere containing from 10 to 100% by volume of steam for at least 5 hours.

5,145,511

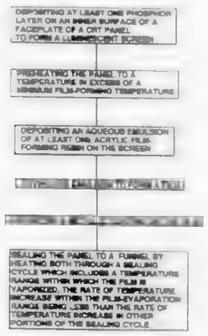
METHOD FOR MANUFACTURING A METALLIZED LUMINESCENT SCREEN FOR A CATHODE-RAY TUBE

Himanshu M. Patel, Rome, and Antimo Pezzulo, Anagni, both of Italy, assignors to Videocolor SpA, Anagni, Italy

Filed Nov. 8, 1991, Ser. No. 789,709

Int. Cl.[5] **C03B** *23/20;* **C03C** *17/38*

U.S. Cl. 65—42 **9 Claims**



1. A method for manufacturing a metallized luminescent screen for a cathode-ray tube including the steps of

depositing at least one phosphor layer on an inner surface of a faceplate of a panel to form said luminescent screen,

preheating said panel containing said screen to a temperature in excess of a minimum film-forming temperature,

depositing an aqueous emulsion of at least one acrylic film-forming resin onto said screen;

drying said emulsion to form said film,

depositing a metallic coating onto said film,

sealing said panel to a funnel by heating said panel and funnel through a sealing cycle having predetermined rates of temperature increase, said sealing-cycle including a temperature range within which said film is vaporized, the rate of temperature increase within the film vaporizing range being less than the rate of temperature increase in other portions of said sealing cycle, and

cooling said sealed panel and funnel.

5,145,512

TUNGSTEN NICKEL IRON ALLOYS

James R. Spencer, Sayre, and James A. Mullendore, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 293,031

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[5] **C22C** *27/04;* **B22F** *3/24, 3/16;* **C21D** *8/06*

U.S. Cl. 75—248 **11 Claims**

1. A relatively ductile consolidated tungsten heavy alloy body consisting essentially of from about 88% to about 98% by weight of tungsten, balance nickel and iron in a weight ratio of from about 6:4 to about 9:1 containing a continuous tungsten, nickel and iron alloy phase and a discontinuous phase of elongated grains of tungsten having an aspect ratio of at least 4:1 relatively uniformly distributed throughout the continuous phase and wherein the body has a recrystallization temperature of from about 1000° C. to about 1200° C.

5,145,513

PROCESS FOR THE PREPARING VIA THE IN SITU REDUCTION OF THEIR COMPONENTS AND GRINDING OXIDE/METAL COMPOSITE MATERIALS

Paolo Matteazzi, Trevise, Italy; Gérard Le Caer, Villers-lés-Nancy, and Elizabeth Grosse-Bauer, Vandoeuvre, both of France, assignors to Centre National de le Recherche Scientifique, Paris, France

Filed Apr. 12, 1991, Ser. No. 685,089

Claims priority, application France, Apr. 13, 1990, 90 04820

Int. Cl.[5] **B23K** *9/00;* **B22F** *1/00*

U.S. Cl. 75—255 **10 Claims**

1. A process for the preparation of composite materials consisting essentially of an oxide phase and a metal phase, said process comprising the step of:

grinding a mixture of at least one oxide precursor of said metal phase of said composite with at least one reducing agent, said reducing agent being a precursor of said oxide phase of said composite, to yield a mixture wherein the amount of said reducing agent is in the stoichiometric range of 90 percent to 110 percent of the amount necessary to reduce said oxide precursor to said metal phase,

in a high energy mechanical grinder for a sufficient length of time so that at least 80 percent of said oxide precursor is reduced to said metal phase or to a metal alloy phase, wherein no external heat is applied to said grinder during said grinding step.

5,145,514

TREATING ALUMINIUM WITH CHLORINE

Bruno Gariepy, Chicoutimi, and Ghyslain Dube, Jonquiere, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 463,919, Jan. 10, 1990, abandoned, which is a continuation of Ser. No. 40,602, Apr. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 795,635, Nov. 6, 1985, abandoned. This application Feb. 19, 1991, Ser. No. 657,876

Claims priority, application United Kingdom, Nov. 8, 1984, 8428251

Int. Cl.[5] **C22B** *21/06*

U.S. Cl. 75—681 **6 Claims**

1. In a method of treating a molten aluminium alloy in which magnesium is present in a concentration of at least 1% and is the principal alloying element by continuous in-line fluxing with chlorine gas to remove hydrogen and/or alkaline metal impurities from the molten alloy wherein the said fluxing of the

molten alloy with chlorine gas also causes the formation of magnesium chloride in the molten alloy, the improvement wherein the said fluxing is carried out using chlorine gas premixed prior to said fluxing with a gaseous compound of fluorine other than a halogenated hydrocarbon whereby surface oxidation of said magnesium chloride formed during said fluxing is substantially eliminated during subsequent transfer and/or casting of said alloy, the proportion by volume of the gaseous fluoride compound to chlorine gas used being from 0.01 to 1.0.

5,145,515

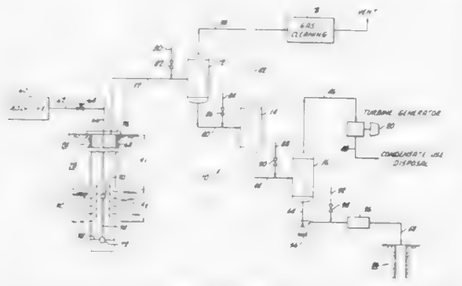
TREATMENT OF BRINE

Darrell L. Gallup, Chino; John L. Featherstone; Jessie P. Reverente, both of El Centro; Philip H. Messer, Palm Desert, and Allen W. Doty, Pomona, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 345,167, May 1, 1989, Pat. No. 5,082,492. This application Dec. 29, 1989, Ser. No. 458,886

Int. Cl.[5] C22B *3/44*

U.S. Cl. 75—712 **92 Claims**



1. A method for extending the useful life of a brine injection well comprising treating a brine to reduce its scale forming potential, said brine containing suspended solids and dissolved scale forming constituents at least some of which comprise silicon-containing components, by passing the brine containing scale forming constituents at a pH below about 5.0 through a conduit packed with at least one metal higher in the electromotive series than copper for a time sufficient to stabilize the scale forming constituents in the brine, discharging the brine of potentially reduced scale forming potential and injecting the brine into the injection well.

5,145,516

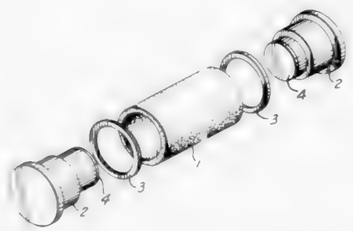
COMPOSITION FOR COATING ELECTRODES OF A SURGE ARRESTER

Riad Khodr, Lille, France, assignor to Pendar Industries, Proville, France

Filed Mar. 22, 1988, Ser. No. 171,633

Int. Cl.[5] C23C *24/00*

U.S. Cl. 106—1.12 **9 Claims**



1. A composition for coating the electrodes of a surge arrestor comprising aluminum, titanium and a product of the type MA or $(M^{n+}A^{2-})$ in which M represents an alkaline earth or alkali metal, A a sulphate or carbonate of this metal and n is equal to 1 or 2.

5,145,517

COMPOSITE ELECTROLESS PLATING-SOLUTIONS, PROCESSES, AND ARTICLES THEREOF

Nathan Feldstein, and Deborah J. Lindsay, both of Princeton, N.J., assignors to Surface Technology, Inc., Trenton, N.J.

Continuation of Ser. No. 510,770, Apr. 16, 1990, abandoned, which is a division of Ser. No. 137,270, Dec. 23, 1987, abandoned, which is a division of Ser. No. 822,335, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 598,483, Apr. 9, 1984, abandoned, which is a continuation of Ser. No. 408,433, Aug. 16, 1982, abandoned, which is a division of Ser. No. 249,773, Apr. 1, 1981, abandoned. This application Mar. 11, 1991, Ser. No. 701,291

Int. Cl.[5] C09D *5/10;* **B22F** *7/00;* **B05D** *3/04, 3/10*

U.S. Cl. 106—1.05 **37 Claims**

1. An electroless plating composition which comprises a source for a metal ion, an electroless plating reducing agent, insoluble particulate matter dispersed therein and a quantity of particulate matter stabilizer, and wherein said particulate matter stabilizer is an admixture of a nonionic compound along with a member selected from the group consisting of anionics, cationics, and amphoterics, and mixtures thereof.

5,145,518

INKS CONTAINING BLOCK COPOLYMER MICELLES

Francoise M. Winnik; Anthony R. Davidson, both of Toronto, Canada; John W-P. Lin, Webster, N.Y., and Melvin D. Croucher, Oakville, Canada, assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 544,564, Jun. 27, 1990. This application May 30, 1991, Ser. No. 708,649

The portion of the term of this patent subsequent to Aug. 18, 2009, has been disclaimed.

Int. Cl.[5] C09D *11/00*

U.S. Cl. 106—21 **56 Claims**

1. An ink composition which comprises an aqueous liquid vehicle and particles of an average diameter of 100 nanometers or less which comprise micelles of block copolymers of the formula ABA, wherein A represents a hydrophilic segment and B represents a hydrophobic segment, and wherein dye molecules are convalently attached to the micelles, said dye molecules being detectable when exposed to radiation outside the visible wavelength range, wherein the A segments exhibit a solubility in water of at least about 0.2 gram per milliliter and the B segment exhibits a solubility in water of no more than about 0.01 gram per milliliter.

5,145,519

SPECIFIC DYE SET FOR THERMAL INK-JET PRINTING

William D. Kappele, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1991, Ser. No. 807,924

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 **5 Claims**

4. A set of inks containing yellow, magenta, and cyan dyes for thermal ink-jet printers having at least 300 dpi print capability, said yellow ink having the formula

Direct Yellow 86	about 0.5 to 5 wt %
diethylene glycol	about 30 to 60 wt %
water	balance.

said magenta ink having the formula

Acid Red 52	about 1 to 5 wt %
diethylene glycol	about 30 to 60 wt %
water	balance, and

said cyan ink having the formula

Acid Blue 9	about 1 to 5 wt %
diethylene glycol	about 30 to 60 wt %
water	balance.

5,145,520

BIOACTIVE CEMENT

Tadashi Kokubo, Nagaokayo; Takao Yamamuro, Muko, and Satoshi Yoshihara, Ohtsu, all of Japan, assignors to Kyoto University, Kyoto, Japan

Filed Aug. 22, 1990, Ser. No. 570,637

Claims priority, application Japan, Aug. 29, 1989, 1-220186

Int. Cl.[5] A61C *5/04;* **C09K** *3/00*

U.S. Cl. 106—35 **7 Claims**

1. A bioactive cement, consisting of glass powder having CaO and SiO_2 as essential constituents; and an aqueous solution of ammonium phosphate as a hardening liquid for the glass powder.

5,145,521

SULFURIC ACID/POLYAMIDE COMPOSITIONS

James A. Green, II, Chino, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 7, 1991, Ser. No. 712,913

Int. Cl.[5] C08K *3/24;* **C08L** *89/00;* **C09D** *189/00*

U.S. Cl. 106—161 **31 Claims**

1. A composition comprising a protein dissolved in at least about 50 weight percent concentration sulfuric acid.

5,145,522

KETENE DIMER SIZING AGENT FOR PAPER MAKING

Hiroshi Nakagawa, Higashiosaka; Atsushi Ikeda, Osaka; Itsuo Sakai, Osaka, and Nobuyuki Tani, Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP90/00546, § 371 Date Feb. 4, 1991, § 102(e) Date Feb. 4, 1991, PCT Pub. No. WO90/13707, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 25, 1990, Ser. No. 655,417

Int. Cl.[5] C09D *1/00;* **D21H** *71/16, 17/76*

U.S. Cl. 106—287.17 **6 Claims**

1. A stabilized ketene dimer sizing agent for paper making consisting essentially of a dispersion of a ketene dimer in an aqueous phase containing a dispersing agent and a polymeric aluminum compound selected from the group consisting of polymeric aluminum hydroxide, polymeric aluminum chloride and mixtures thereof.

5,145,523

SOLUTIONS FOR CLEANING PLASTIC AND METALLIC SURFACES

John M. Halpin, Bellevue, and David J. Quam, Seattle, both of Wash., assignors to Van Waters and Rogers, Inc., Seattle, Wash.

Filed Jan. 22, 1991, Ser. No. 641,619

Int. Cl.[5] C11D *7/26*

U.S. Cl. 106—287.24 **20 Claims**

1. A liquid solution, consisting essentially of:

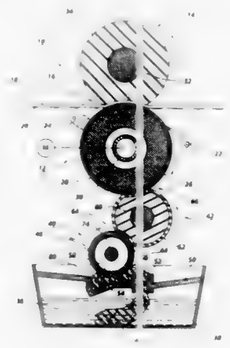
(a) at least one isoparaffinic hydrocarbon solvent having a boiling point of from about 300° to 405° F. and a flash point above about 100° F.; and

(b) at least one glycol ether;

wherein said glycol ether has the following formula:

$$R{-}O{-}((C{-}H)_X{-}O)_Y{-}R$$
$$\quad\quad\quad

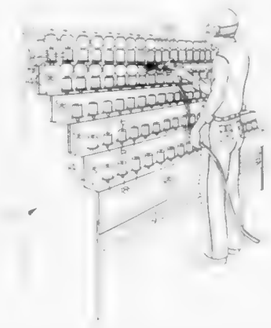
5,145,525
OIL HANDLING AROUND A METERING ROLL
Paul M. Fromm, Rochester; Alvin D. Kromm, Jr., Webster, and Jeffrey B. Levy, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 9, 1990, Ser. No. 594,759
Int. Cl.[5] B05C 1/06
U.S. Cl. 118—260 22 Claims



1. Release Agent Management system for use a in roll fuser apparatus system comprising:
a container of release agent fluid;
a lid adhered to the top of said container such that release agent fluid cannot pass directly between said lid and said container, said lid having an elongated opening therein and a depression;
an elongated wick extending through said opening and having one end thereof immersed in said release agent fluid and the other end supported by said lid said other end being supported in contact with said lid in said depression; and
means contacting said other end of said wick for transporting release agent fluid from said wick, said depression serving to contain any release agent material not transported by said means contacting said wick and not retained in said wick to thereby maintain contact of said other end and release agent contained in said depression.

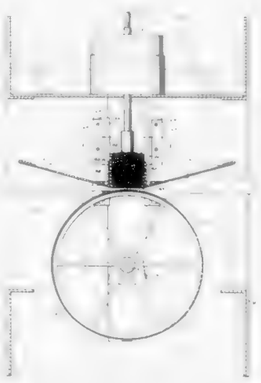
5,145,526
APPARATUS FOR FACILITATING THE SPRAYING OF ARTICLES
Terry L. Oldham, Hickory, N.C., assignor to Hammer Metals Company, Inc., Conover, N.C.
Filed Nov. 7, 1990, Ser. No. 610,054
Int. Cl.[5] B05C 13/00
U.S. Cl. 118—319 11 Claims

1. Apparatus for facilitating the spraying of a plurality of discrete articles, comprising:
a plurality of tiered rows of article holders extending in generally parallel and laterally offset relationship to each other at different elevations, each of said rows of article holders including a plurality of spaced apart article holders adapted to support respective articles during spraying thereof;
mounting means supporting said article holders for rotative movement; and
driving means for imparting said rotative movement to said article holders, said drive means including a plurality of endless-loop drive members each of said endless-loop drive members having a flight operatively associated with and extending in generally parallel relationship to an associated one of said tiered rows of said article holders,



and said drive means including a drive motor drivably connected to each of said endless-loop drive members.

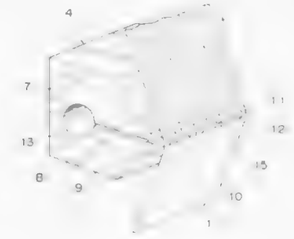
5,145,527
APPARATUS FOR APPLYING FOAMED TREATING LIQUOR
Graham F. Clifford, Stanley; James K. Turner, Lincolnton, both of N.C., and Mack W. Spurrier, Clover, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Apr. 9, 1982, Ser. No. 366,869
The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.
Int. Cl.[5] B05C 5/02
U.S. Cl. 118—411 21 Claims



1. Apparatus for applying foamed treating liquor to a flat width of traveling substrate, such as a fibrous non-woven batting, comprising an applicator nozzle having a substantially flat longitudinal substrate engaging surface disposed to extend transversely across said width of said traveling substrate in direct surface contact compressively with one side thereof, said nozzle having internally thereof a foam distribution chamber communicating with a means for supplying foamed treating liquor under pressure and said nozzle having a plurality of closely spaced apertures extending between said chamber and said engaging surface along the length thereof for emitting said foamed treating liquor for application to said one side of said substrate, a rotatably mounted cylindrical drum axially disposed substantially parallel and in opposition to said engaging surface of said nozzle transversely across the width of the opposite side of said substrate in peripheral surface contact

therewith, and means for driving said drum said nozzle and said drum being relatively compressively disposed for substantial compressing of said substrate therebetween sufficient for driving engagement of said substrate by said drum to impart movement thereto in its direction of travel and for compressing said substrate against said substrate engaging surface in covering relation to said apertures sufficiently to substantially prevent escape of said foamed treating liquor laterally across said substrate engaging surface between it and said substrate and to substantially confine the emission of said foamed treating liquor through said apertures to said substrate for controlled application of said foamed treating liquor to said one side of said substrate, whereby said foamed treating liquor is applied to said one side of said substrate uniformly across its width and along its length as it travels past said nozzle.

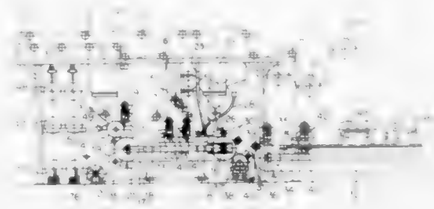
5,145,528
COATING APPARATUS
Keigo Watanabe, Neyagawa; Hiroyuki Naka, Osaka, and Takashi Ichiyanagi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 6, 1991, Ser. No. 665,225
Claims priority, application Japan, Mar. 7, 1990, 2-55323
Int. Cl.[5] B05C 5/02
U.S. Cl. 118—411 3 Claims



1. An apparatus for applying coating material in stripe form onto a film traveling in a predetermined direction, which comprises:
film conveying means for conveying a film in a predetermined direction;
a coating material discharge nozzle for discharging a coating material and adapted to be contacted by the film traveling in the predetermined direction so as to support the film, said coating material discharge nozzle having a curved support surface for contacting the film and allowing the film to travel therealong, said nozzle having a plurality of applicator grooves in said support surface having a substantially constant depth and extending in the film traveling direction, said grooves being spaced in the width direction of the traveling film at substantially equal intervals, said nozzle having coating material discharge ports in the bottom of each of said applicator grooves to allow coating material to be discharged therethrough, said nozzle having gas discharge ports opening out of said support surface between each two applicator grooves; and
means for supplying gas to said gas discharge ports of said coating material discharge nozzle.

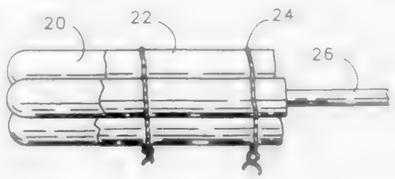
5,145,529
SYSTEM FOR COATING STRIPS OF BACKING
Jürgen Rümmer, 8, Industriestr., D-8609 Bischberg, Fed. Rep. of Germany
Filed Oct. 19, 1990, Ser. No. 600,408
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3935059
Int. Cl.[5] B05C 3/02
U.S. Cl. 118—413 27 Claims

1. An arrangement for applying at least one layer of coating to strips of backing material or for producing strips without said strips backing material comprising: a water-cooled belt for carrying said strips of backing material to be coated, said strips of backing material having upper and lower surfaces at least one separate first coater adjacent said belt for coating said upper and lower surface; separate sprinklers spaced from said belt for sprinkling said upper and lower surfaces after being



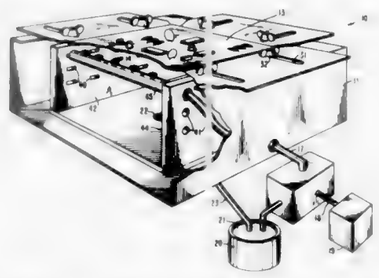
coated; suctioning elements adjacent said belt for suctioning up dust from said belt; and at least one second coater with a water-cooled roller for coating said strips of backing material or for producing strips without said strips of backing material one of said sprinklers having at least two variable-slope screens for selectively passing coarse and fine sprinkling particles, and baffles and channels for directing said particles.

5,145,530
METHOD OF SURFACE HARDENING TITANIUM AND OTHER METALS
William E. Cassady, P.O. Box 723, San Anselmo, Calif. 94960
Filed May 18, 1989, Ser. No. 353,905
Int. Cl.[5] C21D 9/00
U.S. Cl. 148—565 10 Claims



1. A process for increasing the surface hardness of structural metals which are comprised of, or contain, elements which form hard carbides, comprising the steps of:
connecting an electric current source to an electrode comprised substantially of carbon, and a piece of said metal so that there is a difference of electric potential between them, and,
moving said carbon electrode or said metal relative to each other, and in such proximity or contact that a multiplicity of discontinuous electric arcs is discharged between said carbon electrode and said metal, and causing a corresponding multiplicity of discrete craters to be produced in the surface of said metal, and
whereby the regions of said craters in said metal are increased in hardness thereby, and,
whereby the progressive accumulation and superimposition of said regions of said craters thereby result in a useful increase in the hardness and durability of the surface of said metal

5,145,531
FLUXING APPARATUS AND METHOD
Raymond L. Turner, La Habra; Randall L. Mays, Fullerton, and Billy L. Montgomery, Whittier, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Oct. 31, 1990, Ser. No. 608,042
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 23 Claims

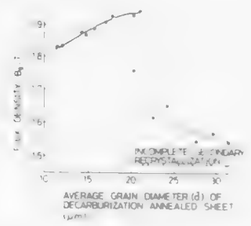


1. Apparatus for applying water soluble flux to a circuit card assembly comprising:
an enclosure having an opening therein adapted to provide a means for exposing a surface of the circuit card assembly to the interior thereof;
flux misting means coupled to the enclosure for providing a flux mist that is sufficient to wet the exposed surface of the circuit card assembly;
a container adapted to store water soluble flux therein;
transferring means coupled to the flux misting means and the container for transferring flux from the container to the flux misting means.

5,145,532
SOLDER PRECIPITATING COMPOSITION
Takao Fukunaga; Hisao Nakajima, both of Hiratsuka; Kenzo Kobayashi, Ichihara; Masanao Kono, Kakogawa; Hisao Irie, Takasago, and Ryo Inoue, Himeji, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Harima Chemicals, Inc., Kakogawa, both of Japan
Filed Sep. 14, 1988, Ser. No. 244,791
Claims priority, application Japan, Sep. 14, 1987, 62-228298; Jun. 27, 1988, 63-156688
Int. Cl.[5] B23K *35/24*
U.S. Cl. 148—23 28 Claims

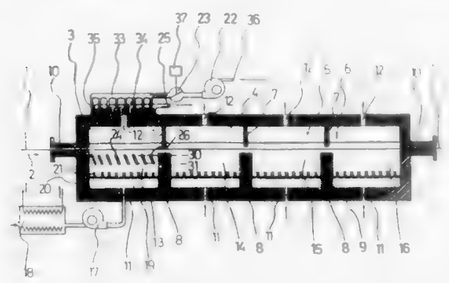
21. A solder precipitating composition for precipitating a solder alloy comprising at least two metals, said alloy for achieving an electrical connection of parts, comprising:
a powder of a metal which is not contained in said solder alloy and having an ionization level higher than that of any of the metals constituting said solder alloy; and
carboxylates of the metals constituting the solder alloy;
wherein the solder alloy comprising the metals contained in said carboxylates is precipitated as a result of a substitution reaction between the powdery metal and metal ions in the carboxylates.

5,145,533
PROCESS FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING EXCELLENT MAGNETIC CHARACTERISTIC
Yasunari Yoshitomi; Yozo Suga; Nobuyuki Takahashi; Yoshiyuki Ushigami, and Tadashi Nakayama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Continuation of Ser. No. 502,420, Mar. 30, 1990, abandoned.
This application Oct. 2, 1991, Ser. No. 769,586
Claims priority, application Japan, Mar. 31, 1989, 1-82393
Int. Cl.[5] C21D *8/12*
U.S. Cl. 148—111 5 Claims



1. A process for producing a grain-oriented electrical steel sheet having an excellent magnetic characteristic, comprising the steps of:
heating to a temperature lower than 1280° C. a steel slab comprising 0.025 to 0.075 wt % C, 2.5 to 4.5 wt % Si, 0.010 to 0.060 wt % acid-soluble Al, 0.0030 to 0.0130 wt % N, 0.014 wt % or less (S+0.405 Se), 0.05 to 0.8 wt % Mn, and the balance consisting of Fe and unavoidable impurities;
hot-rolling the thus heated slab to form a hot-rolled strip;
cold-rolling the hot-rolled strip to form a cold-rolled strip having a thickness of a final product sheet;
decarburization-annealing the cold-rolled strip;
applying an annealing separator on the strip;
final-annealing the strip;
measuring a primary-recrystallized grain size in the stage after completion of primary recrystallization during said decarburization annealing and before completion of secondary recrystallization during said final annealing;
controlling in said stage subsequent grain growth of primary-recrystallized grains by increasing nitrogen absorption into said steel strip thereby increasing nitrides in said steel strip to suppress primary recrystallized grain growth when said measured primary recrystallized grain size is greater than a first value, and by decreasing nitrogen absorption in said steel strip thereby decreasing formation of nitrides caused by nitrogen absorption in said steel strip to enhance primary recrystallized grain growth when the measured primary recrystallized grain size is smaller than a second value;
said first value being a minimum primary-recrystallized grain size above which an incomplete secondary recrystallization occurs, and being determined from a relationship between the primary-recrystallized grain size and the magnetic flux density of a final product sheet;
said second value being a primary-recrystallized grain size at which a complete secondary recrystallization is achieved and the magnetic flux density of a final product sheet has a B_8 value of about 1.88 Tesla;
said increasing and decreasing of nitrogen absorption into said steel strip for controlling a subsequent growth of primary recrystallized grains being affected by at least one of the following operations (1) to (8);
(1) measuring a primary-recrystallized grain size in the decarburization annealing step and increasing or decreasing a nitrogen partial pressure in an atmosphere used for the rest of said decarburization annealing period;
(2) measuring a primary-recrystallization grain size after completion of said decarburization annealing and then nitriding said steel sheet in an atmosphere containing ammonia gas while controlling the ammonia gas concentration thereof;
(3) measuring a primary-recrystallization grain size after completion of said decarburization annealing and then nitriding said steel sheet by a plasma, controlling the plasma concentration;
(4) increasing or decreasing a nitrogen partial pressure of an atmosphere used for said final annealing;
(5) nitriding said steel strip by controlling a staying time of the strip in a temperature region in said final annealing step, in which temperature region nitrogen absorption into said steel strip easily occurs;
(6) nitriding said steel strip in said final annealing step by controlling the nitride content of said annealing separator which is mainly composed of MgO;
(7) controlling a nitriding of said steel strip by controlling an oxygen partial pressure in said decarburization annealing step; and
(8) controlling a nitriding of said steel strip by controlling an amount of an oxidized layer removed from the surface of said steel strip by pickling after completion of said decarburization annealing.

5,145,534
FLUIDIZED BED FOR QUENCHING STEEL WIRE AND PROCESS THEREOF
Jozef Weedaeghe, Zwevegem, and Marcel Corteville, Izegem-Kachtem, both of Belgium, assignors to N.V. Bekaert S.A., Belgium
Filed Jul. 26, 1990, Ser. No. 557,717
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1989, 8906809
Int. Cl.[5] C21D *9/567*
U.S. Cl. 148—596 17 Claims



12. A process for continuously patenting steel wires comprising the steps of:
(A) passing said wires through an austenitizing furnace; and then
(B) quenching said wires in a fluidized bed wherein said wires undergo a sorbitic transformation, said quenching step comprising the steps of
(i) fluidizing a bed with a carrying gas comprising exhaust gas taken form a furnace, said bed having a convection cooler immersed therein,
(ii) guiding said wires through said fluidized bed,
(iii) sending an air stream through said convection cooler which drains away at least three times the heat drained away by said carrying gas, and
(iv) maintaining the temperature of said fluidized bed constant by controlling the specific heat flow H of cooling air flowing through said fluidized bed.

5,145,535
METHOD FOR INTERMOLECULAR EXPLOSIVE WITH VISCOSITY MODIFIER
Michael A. Patrick, Shalimar, Fla., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 25, 1991, Ser. No. 660,307
Int. Cl.[5] D03D *23/00*
U.S. Cl. 149—109.6 10 Claims

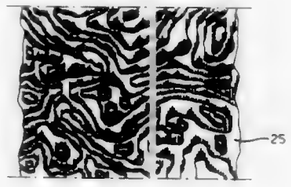
1. A method for improving the dispersion of particulate materials in intermolecular explosive compositions which comprises dry blending at least one fuel compound and at least one oxidizer compound, a viscosity modifier and a dispersible particulate material, melt blending the resulting dry blend, and thereafter casting the melt, wherein said dispersible particulate material is at least one other fuel or oxidizer-rich component different from said fuel compound and said oxidizer compound.

5,145,536
RADIAL TIRE WHICH RUNS SAFE AFTER A LOSS OF TIRE PRESSURE
Hiroyuki Noma, and Saneto Saitou, both of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Division of Ser. No. 430,935, Nov. 2, 1989, Pat. No. 5,044,413, which is a continuation of Ser. No. 144,924, Feb. 10, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 662,024
Claims priority, application Japan, May 16, 1986, 61-113200
The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.
Int. Cl.[5] B60C *3/04, 15/06, 17/08*
U.S. Cl. 152—209 WT 7 Claims

1. A radial tire having an aspect ratio of no more than 60% comprising
a pair of bead cores disposed one in each bead of the tire,
a carcass extending between the beads and turned up around said bead cores to be secured thereto,
a bead apex disposed between each of the carcass turned up parts and the carcass main part and extending radially outward from the bead core,
a tread with a curved surface disposed radially outside the carcass, and
a belt having cords arranged between the carcass and the tread at a small angle to the circumferential direction of the tire,
said tread extended axially of the tire so that the axial width thereof is wider than the maximum axial section width of the carcass, and so that the tread edges are positioned at a height in the range of 50 to 100% of the maximum cross-section height of the carcass,
said tread having extended edge portions, each having a width of 5 to 20% of the tread width measured along the curved tread surface, and provided with sipings or fine

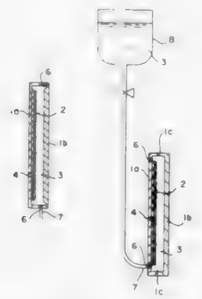
grooves having a width of 0.1 to 5 mm arranged circumferentially of the tire at intervals of 5 to 20 mm.

5,145,537
PRODUCTION OF ARTIFICIAL VENEER
Giovanna Senzani, Modigliana, Italy, assignor to ALPI S.p.A., Modigliana, Italy
Filed Sep. 25, 1990, Ser. No. 587,798
Claims priority, application Italy, Sep. 29, 1989, 21893 A/89
Int. Cl.[5] B44C *1/00*; B32B *31/18*
U.S. Cl. 156—61 **11 Claims**



1. Method for producing b iar imitating wood veneer, whereby sheets of natural wooc obtained by rotary slicing a log are glued for forming a bloc of sheets from which veneer sheets with an imitation-brair pa tern are then cut, comprising the steps of:
preparing basic sheets of natur l wood having homogeneous surface areas,
spot staining at least one face of said basic sheets,
forming a block by overlapping said spot stained sheets provided with an adhesive substance by exerting pressure on the block, and
slicing final imitation-briar pattern veneer sheets from said block in a direction paralle to a predetermined cutting plane.

5,145,538
MANUFACTURING PROCESSES FOR INTEGRATED ARTICLE BEARING INDICIA
Takashi Yamaguchi, Fujisawa, Japan, assignor to Kabushiki Kaisha Sebun Shiizu, Fujisawa, Japan
Continuation of Ser. No. 352,58[illegible], May 16, 1989, abandoned, which is a division of Ser. No. 228,782, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 850,187, Apr. 10, 1986, abandoned. This application Jun. 12, 1991, Ser. No. 714,366
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—69 **6 Claims**

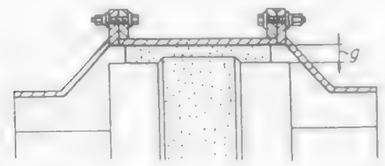


1. A manufacturing process of an integrated article bearing indicia comprising the steps of:
forming a lower container with two small openings in opposite side walls thereof;
adhering a pressure sensitive adhesive double coated sheet member to an inner bottom surface of said lower container;
adhering a metallic plate bearing the indicia to an upper surface of the pressure sensitive adhesive coated sheet member leaving a circumferential space between the metallic plate and a circumferential side wall of the lower container;
joining a transparent hard cover member to the lower container air-tightly to form a sealed enclosure container;
vertically arranging said sealed enclosure container such that the side walls containing the small openings are positioned one above the other;
charging a two-component system liquid agent through a charging tube into the sealed enclosure container, to fill the circumferential space and covering the upper surface of the metallic plate, from one of said small openings made in one of the side walls of the sealed enclosure container located at a lower position while discharging any internal air from the other of said small openings made in the opposite side wall of the sealed enclosure container located at an upper position so that any space in the enclosure container may be filled with the two component system liquid agent; and
forming the liquid agent into a transparent visco-elastic gel covering the upper surface of the metallic plate and surrounding the circumferential side thereof.

4. A manufacturing process of an integrated article bearing indicia comprising the steps of:
forming a lower container with two small openings formed in a bottom surface thereof;
adhering a pressure sensitive adhesive double coated sheet member to an inner bottom surface between said small openings of said lower container;
adhering a metallic plate bearing the indicia to an upper surface of the pressure sensitive adhesive coated sheet member leaving a space between the metallic plate and a circumferential side wall of the lower container;
joining a transparent hard cover member to the lower container air-tightly to form a sealed enclosure container;
arranging said sealed enclosure container in a vacuum device such that said bottom surface is vertically arranged and said small openings are positioned one above the other;
charging a two component system liquid agent through a charging tube into the sealed enclosure container, to fill the space and covering an upper surface of the metallic plate, from said small opening made in the enclosure container which is at a lower position while evacuating any internal air from said small opening which is located in an upper position of the enclosure container by said vacuum device so that any space in the enclosure container may be filled with the two component system liquid agent; and
forming the liquid agent into a transparent visco-elastic gel covering the upper surface of the metallic plate and surrounding the circumferential side thereof.

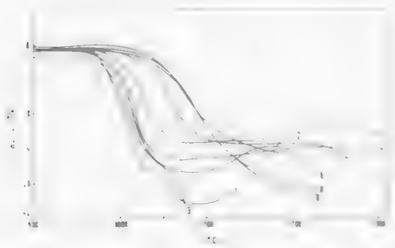
5,145,539
METHOD OF PRODUCING A HONEYCOMB STRUCTURAL BODY HAVING AT LEAST ONE STEP PROTRUDED FROM OR RECESSED IN AT LEAST ONE PORTION OF AN OUTER CIRCUMFERENTIAL SURFACE THEREOF
Osamu Horikawa, Toyoake, and Koichi Ikeshima, Okazaki, both of Japan, assignors to NGK Insulators, Inc., Japan
Division of Ser. No. 406,048, Sep. 12, 1989, Pat. No. 5,080,953. This application Sep. 16, 1991, Ser. No. 760,146
Claims priority, application Japan, Sep. 22, 1988, 63-236595
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—89 **9 Claims**

1. A method of forming a ceramic honeycomb structural body having at least one step protruded from at least one portion of an outer circumferential surface thereof, said method comprising:
forming a ceramic honeycomb structural body; and



sand blasting at least one portion of an outer circumferential surface of said honeycomb structural body to form at least one step protruded from said outer surface and extending substantially circumferentially around said outer surface.

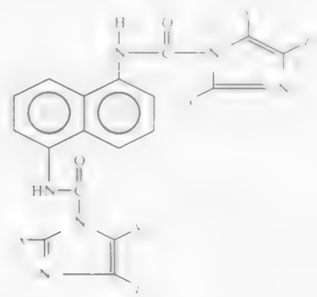
5,145,540
CERAMIC COMPOSITION OF MATTER AND ITS USE
Paul Foley, Oldwick, N.J., and Rainer Buckpesch, Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 23, 1990, Ser. No. 601,861
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935471
Int. Cl.[5] C03C *3/89, 3/91*; B32B *9/00*
U.S. Cl. 156—89 **9 Claims**



1. A ceramic composition of matter, which is sinterable at low temperatures, comprising
a) 40 to 90% by weight of a finely dispersed, high-melting oxidic material and
b) 10 to 60% by weight of a finely dispersed glass having a softening point of 500° to 850° C., a coefficient of thermal expansion of 2 to $5\times10^{-6}\,K^{-1}$ measured in the interval from 0° to 400° C., and a dielectric constant of less than 5 measured at 10^6 Hz and 20° C.,
wherein the finely dispersed oxidic material comprises MgO, Al_2O_3 and SiO_2 in an Al_2O_3/MgO weight ratio of 1.8–4 with an SiO_2 weight fraction of 42–65% by weight, or an equivalent quantity of corresponding oxide precursors which, on heating, decompose to give these oxides, and the MgO or the MgO precursor has a mean grain size of 0.05 to 3 μm, and the SiO_2 or the SiO_2 precursor has a mean grain size of 2 to 20 μm.

5,145,541
LOW ENERGY CURED COMPOSITE REPAIR SYSTEM BASED ON IMIDAZOLE-BLOCKED NAPHTHYL-DIISOCYANATES
Kenneth S. Baron, San Ramon; Susan M. Brinkerhoff, San Lorenzo; Frank W. Lee, San Ramon, and Stella M. McKinney, Livermore, all of Calif., assignors to Hexcel Corporation, Dublin, Calif.
Division of Ser. No. 377,087, Jul. 7, 1989, Pat. No. 5,086,149. This application Jun. 13, 1991, Ser. No. 714,827
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—98 **4 Claims**

1. A method of making on-site repairs of a structure comprised of oriented fiber/resin matrix composite material, which material has been damaged, said method comprising:
a) removing the damaged portion from said structure,
b) smoothing those portions of said structure surrounding said excised damaged portion which exhibit rough edges, and applying an epoxy adhesive thereto,
c) applying a patch of epoxy resin system impregnated fiber material over that portion of said structure previously occupied by said damaged portion and adhering it to said smooth edges, the resin system having a shelf life in excess of one year, and comprising at least one multifunctional epoxy resin and a catalyst of the formula:

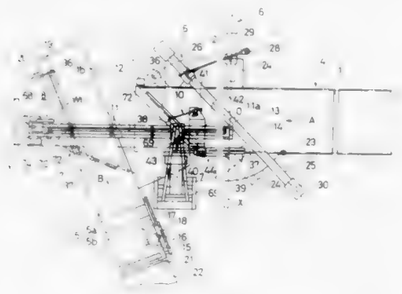

(I)

wherein x, y, and z may be the same or different, and each may be hydrogen, a lower alkyl or aryl of C_{1-12}, halo or nitro, in an amount of 5–15 pph,
d) applying pressure to said patch to adhere it to said structure and heating said patch to a temperature not more than the boiling point of water for a time sufficient to cure said resin system.

5,145,542
METHOD AND APPARATUS FOR PRODUCING A BIASED BELT SHEET
Yukihisa Tanaka; Kouji Tsukamoto, and Katsuaki Shinoda, all of Toyota, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Dec. 13, 1990, Ser. No. 626,834
Claims priority, application Japan, Dec. 21, 1989, 1-333127
Int. Cl.[5] B29D *30/38*; B32B *31/10, 31/18*
U.S. Cl. 156—159 **6 Claims**

1. A method for producing a continuous sheet of biased cord material comprising the steps:
cutting a longitudinally-extending rubber strip having a number of cords embedded therein extending parallel to the longitudinal direction of the strip at a desired angle with respect to the longitudinal direction into unit sheets of a desired length each being in the form of a parallelogram, on a cutting conveyor, the cutting conveyor having a first direction of movement parallel to the longitudinal direction, by cutting means, said cutting means being inclinable at a biasing angle with respect to the first direction of movement of the cutting conveyor;

holding in turn each unit sheet with holding means and transferring in turn each unit sheet from the cutting conveyor to a sheet joining conveyor by moving said holding means with transfer means, said holding means including a first holding member, a second holding member, the first holding member and the second holding member having an included angle therebetween, and an angle changing means for changing the included angle between the first holding member and the second holding member, the angle changing means changing the included angle in



accordance with a change in the biasing angle, the sheet joining conveyor having a second direction of movement, the first direction of movement and the second direction of movement lying on horizontal planes, and spatially intersecting each other;

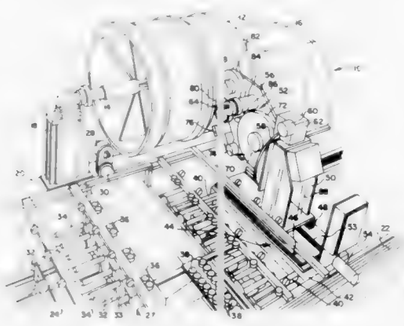
positioning the unit sheet so that the cut edges of the unit sheet become parallel to the second direction of movement of the sheet joining conveyor, and adhering the forward end of the unit sheet to the rearward end of the preceding unit sheet to form a continuous sheet of biased cord material.

5,145,543

COMBINATION FILAMENT WINDING AND TAPE LAYING APPARATUS AND METHOD FOR MAKING AND USING THE SAME

Bryan Redd, North Logan; Marc L. Enders, North Ogden; Michael H. Young, and William T. Dolling, both of Brigham City, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Continuation of Ser. No. 338,602, Apr. 14, 1989, abandoned.
This application Nov. 16, 1990, Ser. No. 616,756
Int. Cl.[5] B65H *81/00*; B31C *13/00*
U.S. Cl. 156—171 6 Claims



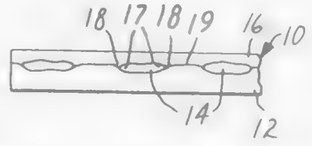
6. A method for converting a filament winding machine wherein filaments of matrix impregnated fibrous material are applied to an elongate rotating stationary horizontal mandrel generally over the entirety of the length thereof from a filament winding head and wherein the filament winding machine including the filament winding head is mounted on a carriage which is movable on tracks horizontally along the length of the mandrel for movement of the filament winding head along the length of the mandrel to a combination filament winding and tape laying apparatus, the method comprising: attaching a platform to the carriage for movement therewith along the tracks; providing a tape laying machine including an assembly of a tape laying head, cross-feed tracks for the tape laying head, a motor for moving the tape laying head along the cross-feed tracks, a compaction roller, a gear for orienting the compaction roller relative to the mandrel, a motor for operating the gear, means for applying a force to the compaction roller for compacting a tape on the mandrel, means for mounting a tape spool, apparatus for guiding the tape from a tape spool to the tape laying head, a mechanism for cutting the tape, means for mounting a tape backing take-up spool, and a motor for the take-up spool; and removably mounting the tape laying machine as a single assembled unit onto the platform for movement with the carriage of the tape laying head along the length of the mandrel and so that the tape laying machine is portable, without assembling or disassembling said tape laying machine, for use with another filament winding machine whereby fibrous material may be filament wound on the mandrel and tape of fibrous material may be laid on the mandrel alternately without repositioning the mandrel between separate filament winding and tape laying machines.

5,145,544

METHOD FOR PREPARING TAPE HAVING IMPROVED TEAR STRENGTH

Ronald P. Leseman, Newport, and Thomas L. Wood, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 386,202, Aug. 1, 1989, Pat. No. 5,080,957.
This application May 31, 1991, Ser. No. 708,239
Int. Cl.[5] B29C *47/02*
U.S. Cl. 156—229 8 Claims



1. Method of preparing a tape, which tape comprises a backing bearing a plurality of ribs disposed longitudinally on at least one major surface thereof, said ribs being at least partially embedded in recesses in the surface of said backing such that no more than about 50% of the cross-section of any rib protrudes beyond the rib-bearing surface of said backing, each end of any rib separated from the rib-bearing surface of said backing by a notch, comprising the steps of:

(1) transporting a first molten resin to a first extrusion die inlet,

(2) causing said first resin to flow from said first inlet to a first narrow outlet, comprising an elongated slot,

(3) transporting a second molten resin to a second extrusion die inlet,

(4) causing said second resin to flow from said second inlet to a second outlet, comprising a plurality of orifices,

(5) causing said first resin to flow from said first outlet to form said backing,

(6) causing said second resin to flow from said second outlet to form said ribs,

(7) causing said ribs to fuse with said backing to form a rib-bearing article,

(8) softening said backing of said rib-bearing article, and

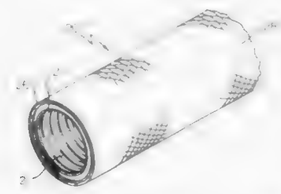
(9) at least partially embedding said ribs in said backing such that no more than about 50% of the cross-section of any rib protrudes beyond the rib-bearing surface of said backing, each end of any rib separated from the rib-bearing surface of said backing by a notch.

5,145,545

FLEXIBLE HOSE CONSTRUCTION AND METHOD OF MAKING THE SAME

Jeffrey J. Winter, Ocala, Fla.; Homer N. Holden, Sylva, N.C., and James L. Lawrence, Ocala, Fla., assignors to Dayco Products, Inc., Dayton, Ohio

Continuation of Ser. No. 405,487, Sep. 11, 1989, Pat. No. 5,089,074. This application Sep. 13, 1991, Ser. No. 759,023
The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.
Int. Cl.[5] B29C *47/06, 47/20*
U.S. Cl. 156—244.13 3 Claims



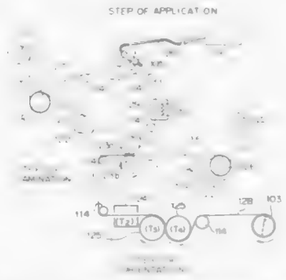
1. In a method of making a flexible hose construction comprising the steps of forming an inner corrugated hose of polymeric material to have a plurality of outwardly convex projections with recesses therebetween, disposing an outer sleeve of reinforcing material in telescoping relation on said inner hose, and disposing an outer sleeve of polymeric material in telescoping relation on said sleeve of reinforcing material, the improvement comprising the steps of disposing a tube of polymeric material between said sleeve of reinforcing material and said inner hose by extruding said tube onto said inner hose before disposing said sleeve of reinforcing material thereon, the step of extruding causing said tube to have substantially constant inner and outer diameters whereby said tube extends in a generally straight-line manner form projection to projection of said inner hose so as to prevent said sleeve of reinforcing material from thereafter entering into said recesses of said inner hose an amount that would tend to substantially reduce the flexibility characteristics of said inner hose, forming said inner hose with an outer layer of one thermoplastic material, the flexibility characteristics of said inner hose, forming said inner hose with an outer layer of one thermoplastic material, forming said tube of polymeric material from the same thermoplastic material that forms said outer layer of said inner hose, forming said outer sleeve of polymeric material of the same thermoplastic material that forms said tube of polymeric material, the step of extruding causing said tube of polymeric material to be bonded to said projections of said inner hose, and bonding said sleeve of polymeric material to said tube of polymeric material through said sleeve of reinforcing material by extruding said sleeve of polymeric material onto said sleeve of reinforcing material whereby said tube of polymeric material holds said sleeves and said hose together.

5,145,546

METHOD OF PRODUCING A SUBSTRATE COATED WITH A FILM OF LIQUID CRYSTAL MATERIAL AND METHOD OF PRODUCING A LIQUID CRYSTAL OPTICAL DEVICE

Kimihiro Yuasa; Tetsuo Fujimoto, and Kenji Hashimoto, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 508,588, Apr. 13, 1990, abandoned.
This application Oct. 24, 1991, Ser. No. 781,678
Claims priority, application Japan, Apr. 21, 1989, 1-99945; May 23, 1989, 1-127891
Int. Cl.[5] B32B *31/12*; B05D *1/28*; G02F *1/13*
U.S. Cl. 156—324 15 Claims



1. A method of producing a flexible substrate coated with a film of a ferroelectric liquid crystal material, wherein the substrate bears an electrode structure on its surface and a side of the substrate bearing the electrode structure is coated with the film of the ferroelectric liquid crystal material, comprising: applying the ferroelectric liquid crystal material directly to the electrode-bearing side of the substrate by pressing an impregnating matter impregnated with the ferroelectric liquid crystal material to the electrode-bearing side of the substrate to form the film of the liquid crystal material on said electrode-bearing side while the area in the electrode-bearing side of the flexible substrate in which the electrode-bearing side of the flexible substrate is in contact with the impregnating matter is being moved; said flexible substrate coated with the film of the ferroelectric liquid crystal material being adapted to be laminated with another flexible substrate bearing an electrode structure on its surface so that the film is located between the electrode-bearing sides of the substrates, with the film of the ferroelectric liquid crystal material being in contact with the electrode-bearing sides of the substrates, and said film of the ferroelectric liquid crystal material being adapted to be oriented by bending of the laminate, and the bending of the laminate being conducted by bending the laminate along a cylindrical surface of a roll having an axis so that the ferroelectric liquid crystal material is oriented along a direction in which the axis of the roll extends.

5,145,547

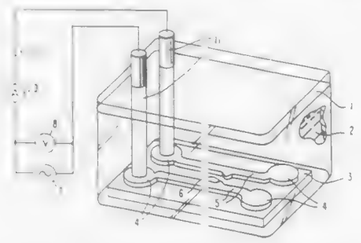
APPARATUS FOR SELF-INDUCED REPAIR OF CIRCUIT SHORT AND NEAR-SHORTS

Chengjun J. Chen, Yorktown Heights, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 475,583, Feb. 6, 1990, Pat. No. 5,024,725. This application Mar. 14, 1991, Ser. No. 621,763
Int. Cl.[5] B44C *1/22*; C23F *1/02*
U.S. Cl. 156—345 16 Claims

1. An apparatus for repairing circuit shorts and near-shorts present in narrow bridges or remnants of bridges between circuit lines comprising: chamber means capable of retaining a fluid therein, a fluid within said chamber capable of maintaining a heterolocalized etching of a metal, a pair of probes, each having one end thereof in said fluid, and each having the other end interconnected by electrical power means; and means for

positioning said probes so that w ien a substrate having conductor lines that are connected b / at least one bridge defect



disposed thereon is placed in said c hamber in contact with said fluid, each of said probes is connec ted to one of said conductor lines and said narrow bridges or r emnants are etched away.

5,145,548

LAMINATING DEVICE FOR USE IN LAMINATING A CONTINUOUS ID CARD MATERIAL

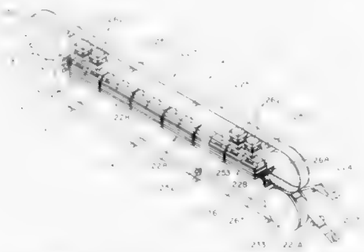
Ryoichi Yamamoto, Yao, Japan, assignor to NATEC Incorporated, Osaka, Japan

Filed Sep. 13, 1990, Ser. No. 581,753

Claims priority, application Japan, Sep. 16, 1989, 1-240326; Sep. 16, 1989, 1-240327; Sep. 29, 1989, 1-255393; Jan. 31, 1990, 2-22873

Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—350 3 Claims



1. A laminating device for use in laminating a continuous ID card material by heating and pres ing, the card material being formed of a material plate includ ng a plurality of core units each corresponding to an ID carc and sandwiched between a continuous band-shaped heat seal ble front overlay which is to form a front surface of an ID c rd and a continuous band-shaped heat sealable rear overlay which is to form a rear surface of an ID card, said laminatir g device comprising:

a belt conveyor having a pair c f endless stainless steel belts having outer surfaces therec f mirror finished, said belts each running in a path havin g a straight portion opposed to the corresponding straight portion of the other belt for transferring the card materia by grasping the card material from front and back;

at least two pulleys around wh ch each corresponding belt runs, one at each end of the straight path portion of the belt, bearing means in whic i the respective pulleys are mounted, and a belt tensionin g fluid pressure piston-cylinder means connected betwee n bearing means for pulleys at the ends of each straight ath portion for urging said pulleys away from each othe · for maintaining the tension of said endless belts;

drive means connected to one pulley for each belt for intermittently driving the belt a d stance corresponding to the pitch of the ID card units al ong the card material in the direction of movement of the belts along said straight path portions;

a rotary encoder positioned along one of said belts for sensing the distance of movement of the belt and connected to said drive means for controlling said drive means for keeping the amount of movement of said belts equal to the pitch of the ID card units along the card material;

a press mechanism provided in parallel to the direction of movement of each of said belts along said straight path portions of said belts and each having a plurality of pressure plates along an inner peripheral surface of each of said belts and a pressure applying fluid pressure piston-cylinder means connected to each of said pressure plates for urging the corresponding pressure plate toward the corresponding belt for urging the straight path portions of said belt along straight path portions toward the other belt, and having the pressure thereof adjustable independently of the other pressure applying piston-cylinder means for adjusting the pressure on the card material between the straight path portions of the belts, and heating means in each of said pressure plates adjustable independently of the heating means in the other pressure plates for adjusting the temperature on the card material between the straight portions of the belts; and

a heat proof resin sheet means of a lubricating-type resin between said pressure plates and the inner surfaces of said belts for making the pressure applied to the card material uniform.

5,145,549

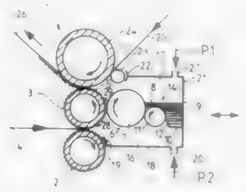
APPARATUS FOR PRODUCING ONE-SIDED CORRUGATED PAPERBOARD

Hans Mosburger, Weiherhammer, Fed. Rep. of Germany, assignor to BHS-Bayerische Berg-, Hutten-und Salzwerke AG, Fed. Rep. of Germany

Filed Aug. 19, 1991, Ser. No. 747,791

Int. Cl.[5] B31F *1/28*

U.S. Cl. 156—382 9 Claims



1. A device for the production of one-sided corrugated paperboard comprising, two corrugated rollers and a paper sheet passing therebetween to be corrugated, a glue mechanism for the application of glue onto the corrugated paper sheet, the glue mechanism including a glue applying roller cooperating with one corrugated roller, a glue dosing roller and a glue container, a pressing roller arranged to press a covering sheet against the glued corrugated paper sheet, two chambers disposed on different sides of the glue applying roller and sealed off, said chambers having first edges disposed respectively against one corrugated roller and said pressing roller, said chambers having second edges sealed off against the glue mechanism, connections in said chambers for pressure sources to press by means of pressure the corrugated sheet against the corrugated roller, said second edges of the chambers being in cooperative engagement with surfaces of the glue mechanism, but not in cooperative engagement with surfaces of the glue mechanism conveying glue from the dosing roller to the corrugated sheet against the corrugated roller

5,145,550

PROCESS AND APPARATUS FOR GROWING SINGLE CRYSTALS OF III-V COMPOUND SEMICONDUCTOR

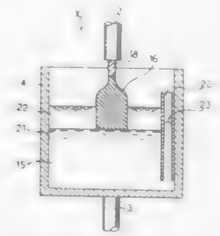
Koji Tada, and Masami Tatsumi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 703,740, Feb. 21, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,447

Claims priority, application Japan, Feb. 21, 1984, 59-31146

Int. Cl.[5] C30B *27/02*

U.S. Cl. 156—605 1 Claim



1. A method for growing single crystal of a dissociative compound, comprising the steps of:

pulling a single crystal of a dissociative compound upwardly from a central portion of an upper surface of a first melt of said dissociative compound in a crucible under the conditions that a first, central, fractional part of an area of said upper surface of said first melt is covered by and is in direct surface-to-surface contact with a second melt of B_2O_3 and said second melt surrounds and contacts the periphery of the single crystal that is being pulled from said first melt, a second, peripheral, functional part of the area of said upper surface of said first melt is free of direct contact with said second melt, the zone of said first melt below said second fractional part of the area of said upper surface is to contact with pressurized gas of a volatile component of said dissociative compound and the zone of said first melt that is below said second fractional part of said upper surface is in fluid flow communicatioin with the zone of said first melt that is below said first fractional part of said upper surface.

5,145,551

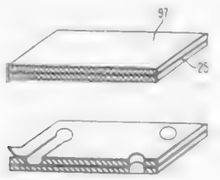
HIGH ACCURACY, HIGH FLEXIBILITY ENERGY BEAM MACHINING SYSTEM

Michael A. Booke, Poughkeepsie, N.Y.; Michael H. W. Kallmeyer, Boeblingen, Fed. Rep. of Germany; Nabil A. Rizk, Hopewell Junction, and You-Wen Yau, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 557,444, Jul. 23, 1990, Pat. No. 5,124,522. This application Sep. 13, 1991, Ser. No. 759,307

Int. Cl.[5] B44C *1/22*

U.S. Cl. 156—626 2 Claims



1. A method of personalizing electronic substrates comprising the steps of:

a) applying a laminate to the surface of a substrate;

b) positioning the substrate on an x-y table;

c) detecting the position of the substrate;

d) forming an electron beam opposite to the substrate;

e) directing the beam at a predetermined angle to the substrate, within a predetermined field of the substrate, thereby machining the substrate in a predetermined manner;

f) controlling at least the forming, directing, positioning, and detecting with real-time digital signal processor control;

g) translating the x-y table to a next field of the substrate;

h) repeating steps c) through g) until all substrate fields have been machined; and

i) screening metallization onto the substrate over the laminate.

5,145,552

PROCESS FOR PREPARING ELECTRICAL CONNECTING MEMBER

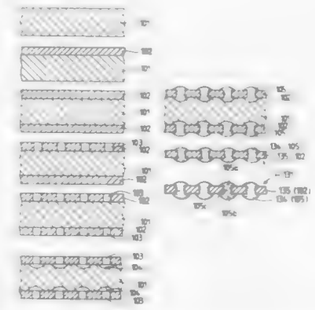
Tetsuo Yoshizawa, Yokohama; Toyohide Miyazaki, Inashiki; Hiroshi Kondo, Osaka; Takashi Sakaki, Tokyo; Yoshimi Terayama, Odawara; Yoichi Tamura, Tokyo; Takahiro Okabayashi, Tokyo; Kazuo Kondo, Tokyo; Yasuo Nakatsuka, Tokyo, and Yuichi Ikegami, Osaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 630,881

Claims priority, application Japan, Dec. 21, 1989, 1-334100; Dec. 22, 1989, 1-333055; Dec. 26, 1989, 1-338941; Mar. 16, 1990, 2-67812; Mar. 16, 1990, 2-67813; Mar. 16, 1990, 2-67814; Mar. 16, 1990, 2-67815; Mar. 16, 1990, 2-67816; Mar. 16, 1990, 2-67817; Mar. 16, 1990, 2-67819; Apr. 6, 1990, 2-92731; Aug. 2, 1990, 2-206387; Aug. 3, 1990, 2-207467; Aug. 3, 1990, 2-207468

Int. Cl.[5] B44C *1/22*; B29C *37/00*

U.S. Cl. 156—638 100 Claims



1. A process for preparing an electrical connecting member having a holding member comprising an electrically insulating material, a plurality of electroconductive members equipped in said holding member under the state mutually insulated from each other, one end of said each electroconductive member being exposed at one surface of said holding member, and the other end of said each electroconductive member being exposed at the other surface of said holding member, said process comprising the steps of:

(A) constituting a matrix member by providing a photosensitive resin which becomes said holding member on both surfaces of a base member, respectively;

(B) exposing and developing said respective photosensitive resins to form a plurality of holes through said photosensitive resins, thereby having said base member exposed;

(C) curing said photosensitive resins;

(D) etching away a part of said base member exposed;

(E) filling an electroconductive member into said holes formed in said holding members coplanar with or protruded from said holding members; and

(F) removing said base member which remains.

5,145,553

METHOD OF MAKING A FLEXIBLE CIRCUIT MEMBER

Stanley M. Albrechta; Robert J. Clementi, both of Binghamton, and Thomas E. Kindl, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1991, Ser. No. 696,435
Int. Cl.[5] B44C *1/22*; B23C *37/00*; C23F *1/00*
U.S. Cl. 156—640 15 Claims

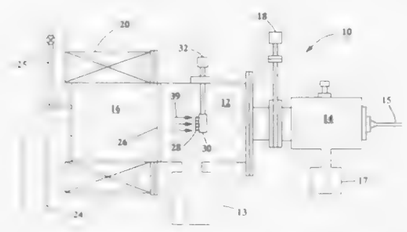
1. A method of making a flexible circuit member, said method comprising:
providing a base member including at least in part stainless steel and having a first predetermined thickness;
providing a dielectric material on said base member, said dielectric material having a second predetermined thickness;
providing a layer of conductive material including at least in part copper on said dielectric material, said conductive material having a third predetermined thickness;
simultaneously etching said base member and said conductive material using an etchant solution including cupric chloride for a predetermined time period to provide an etched subassembly; and thereafter
rinsing said etched subassembly to substantially remove said etchant solution therefrom.

5,145,554

METHOD OF ANISOTROPIC DRY ETCHING OF THIN FILM SEMICONDUCTORS

Tetsuya Seki; Tatsuya Asaka, and Takashi Takamura, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Filed Feb. 22, 1990 Ser. No. 484,786
Claims priority, application Japan, Feb. 23, 1989, 1-43476; Apr. 10, 1989, 1-90308; May 12, 1989, 1-119720; May 12, 1989, 1-119721; May 12, 1989, 1-119728; May 12, 1989, 1-119732; May 15, 1989, 1-120713; May 30, 1989, 1-136802; Jul. 4, 1989, 1-172340; Feb. 19, 1990, 2-37935; Feb. 19, 1990, 2-379341
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 29 Claims



1. In a method of reactive ion beam etching of Group II-VI compound semiconductors comprising the steps of
forming a patterned mask on the surface a Group II-VI compound semiconductor,
positioning the Group II-VI compound semiconductor in a treatment chamber, dry etching the Group II-VI compound semiconductor,
activating chlorine gas in a microwave excitation ECR plasma chamber coupled to said treatment chamber for said Group II-VI compound semiconductor forming a reactive gas plasma containing reactive ion species or radial species or a combination thereof and
irradiating said sample with a beam of said species formed from said reactive gas plasma.

5,145,555

METHOD OF MANUFACTURING A MAGNETIC HEAD

Tatsushi Yamamoto, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1991, Ser. No. 671,418
Claims priority, application Japan, Mar. 19, 1990, 2-70962
Int. Cl.[5] B44C *1/22*; C03C *15/00*; C23F *1/00*
U.S. Cl. 156—643 13 Claims

1. A method of manufacturing a magnetic head comprising the steps of:
forming a plurality of parallel grooves in a surface of a substrate, each groove including two groove walls, each wall extending from a top portion to a bottom of the groove;
forming a soft magnetic thin film larger in thickness than that required for a track width on one wall of each of said grooves;
processing said soft magnetic film at the top portion of the groove walls to a thickness required for the track width by ion milling utilizing a self-shadowing effect of the top portion of the groove walls;
filling said grooves with nonmagnetic substance; and
performing a finishing process for completing a magnetic head.

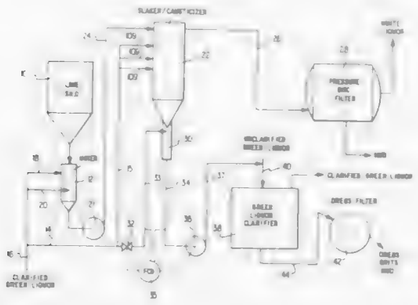
5,145,556

SINGLE-STAGE SLAKING AND CAUSTICIZING METHOD

J. Lennart Westerberg, Mobile, Ala.; Alex K. Bonsu, Greeley, Pa., and Fred J. Perrett, Demopolis, Ala., assignors to International Paper Company, Purchase, N.Y.

Filed Jul. 31, 1991, Ser. No. 738,651
Int. Cl.[5] D21C *11/00*
U.S. Cl. 162—29 8 Claims

1. A one-step slaking/causticizing method for producing white liquor from unslaked lime and clarified green liquor comprising introducing a feed slurry of unslaked lime and clarified green liquor into a pressurized slaker/causticizer reaction zone and maintaining said mixture of unslaked lime and clarified green liquor in said zone at a temperature, under sufficient pressure and for a time sufficient, in one step to slake said unslaked lime and to convert said slaked lime by reaction with said clarified green liquor to a white liquor containing product slurry; withdrawing grits and a portion of the white liquor containing product slurry from said slaker/causticizer reaction zone and admixing said grits and a portion of the white liquor containing product slurry withdrawn from said slaker/causticizer reaction zone with clarified green liquor, blending said admixture with unclarified green liquor in a green liquor clarifying zone wherein clarified green liquor is separated from particulate matter contained therein substantially comprising dregs, mud and grits.

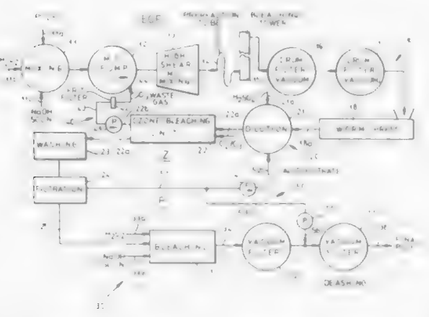


5,145,557

CHLORINE-FREE BLEACHING METHOD FOR DISSOLVING-GRADE PULPS USING AN OP-Z-P SEQUENCE

Walter Peter, Vocklabruck; Anton Hruschka, Vienna, and Oskar Höglinger, Timelkam, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Feb. 7, 1991, Ser. No. 652,027
Claims priority, application Austria, Feb. 7, 1990, 261/90
Int. Cl.[5] D21C *9/153*, *9/16*
U.S. Cl. 162—40 9 Claims



1. A chlorine-free method of bleaching dissolving-grade pulp, comprising the steps of:
(a) in an OP-stage, subjecting dissolving-grade pulp to alkaline oxygen bleaching in the presence of hydrogen peroxide, and filtering the alkaline oxygen-peroxide bleached pulp from a filtrate, said alkaline oxygen-peroxide bleached pulp having a kappa value of a maximum of 3.0;
(b) in a Z-stage, subjecting said alkaline oxygen-peroxide bleached pulp from step (a) to a single ozone bleaching and recovering a Z-stage bleached pulp, an off gas containing residual oxygen and a waste water having a pH of less than 3;
(c) subjecting said Z-stage bleached pulp to peroxide bleaching in a P-stage and recovering a final bleached pulp therefrom;
(d) feeding said off gas from said Z-stage of step (b) directly to said bleaching stage of step (a) and fully reacting said residual oxygen therein; and
(e) selectively feeding said waste water recovered from said Z stage in step (b) as a diluent to said alkaline oxygen-peroxide bleached pulp prior to step (b) and to peroxide-bleached pulp following P-stage bleaching in step (c) for de-ashing of said peroxide-bleached pulp.

5,145,558

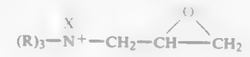
COMPOSITION FOR ALKALINE PEROXIDE BLEACHING OF WOOD PULP USING A QUATERNARY AMINE AS ADDITIVE

Steven H. Christiansen, Richwood; Teresa Littleton, and Robert T. Patton, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 437,482, Nov. 15, 1989, Pat. No. 5,013,404. This application Feb. 15, 1991, Ser. No. 656,398
Int. Cl.[5] D21C *9/12*, *9/14*
U.S. Cl. 162—72 25 Claims

1. An alkaline composition for bleaching wood pulp comprising water, hydrogen peroxide, at least one stabilizer for the hydrogen peroxide and at least one quaternary amine represented by Formula I or Formula 2 wherein Formula I is:

wherein
R is an alkyl group containing 1–3 carbon atoms and R′ is hydrogen, a halogen, hydroxyl, R or $-N^+(R)_3$, together with X^-, and X^- is a negatively charged counter-ion;
and Formula 2 is:



wherein
R is an alkyl group containing 1–3 carbon atoms and X^- is a negatively charged counter-ion wherein the water, stabilizer, and at least one quaternary amine are present in amounts to provide an alkaline composition.

5,145,559

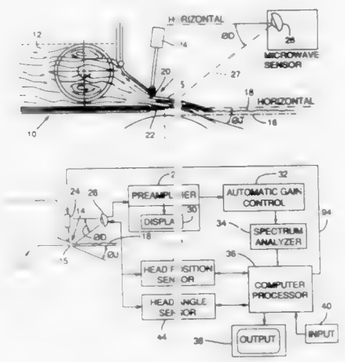
PRODUCTION OF PAPER, BOARD AND CARDBOARD

Werner Auhorn, Frankenthal; Friedrich Linhart, Heidelberg; Primoz Lorencak, Ludwigshafen; Michael Kroener, Mannheim; Norbert Sendhoff, Gruenstadt; Walter Denzinger, Speyer, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 16, 1991, Ser. No. 641,852
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1990, 4001045
Int. Cl.[5] D21H *17/45*
U.S. Cl. 162—168.2 6 Claims

1. A process for the production of paper, board and cardboard, comprising draining a paper stock containing undesirable substances in the presence of both a fixing agent and a polymeric cationic retention aid other than said fixing agent, wherein said fixing agent is a hydrolyzed homo- and/or copolymer of N-vinylformamide having a degree of hydrolysis of not less than 60%, said fixing agent being present in an amount of 0.02–2% by weight, based on dry paper stock, and said polymeric cationic retention aid being present in an amount of 0.01–0.2% by weight, based on dry paper stock.

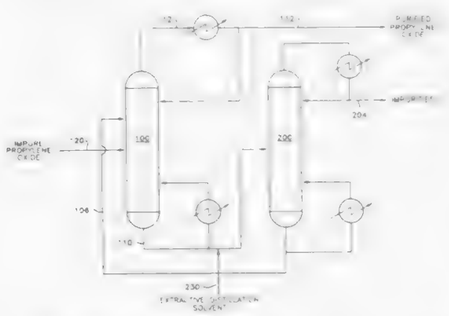
5,145,560
METHOD AND APPARATUS FOR MONITORING AND CONTROLLING THE VELOCITY OF A JET ALONG THE SLICE OPENING OF A PAPERMAKING MACHINE
Wesley E. Grenlund, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Dec. 29, 1989, Ser. No. 459,070
Int. Cl.[5] D. 1F *1/06*
U.S. Cl. 162—198 19 Claims



1. A method comprising:
providing a jet of liquid and paper forming fibers from an elongated slice opening of a paper making machine;
measuring the velocity of the jet at plural locations along the slice opening to generate a velocity profile corresponding to the jet velocity along the slice opening;
the measuring step comprising the steps of directing microwave signals from a microwave velocity sensor toward the jet at plural locations along the slice opening, receiving reflected microwave signals from the jet and producing sensor output signals shifted in frequency in accordance with the velocity of the jet at the plural locations;
sensing the position of the microwave velocity sensor and producing an electrical position signal output corresponding to the sensed position of the microwave velocity sensor;
processing the sensor output signals to produce velocity output signals corresponding to the jet velocity at the plural locations;
receiving the electrical position signal output and associating the computed jet velocity with the sensed position of the microwave velocity sensor; and
displaying the velocity profile of the jet along the slice opening.

5,145,561
REMOVAL OF WATER AND METHANOL FROM PROPYLENE OXIDE BY EXTRACTIVE DISTILLATION
Edward T. Marquis; George P. Speranza; Yu-Hwa E. Sheu; William K. Culbreth, III, and David G. Pottratz, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Nov. 1, 1991, Ser. No. 786,855
Int. Cl.[5] B01D *3/40*; C07D *301/32*
U.S. Cl. 203—51 10 Claims

1. An extractive distillation process for the distillation of an impure propylene oxide feedstock contaminated with water and methanol in a distillation column to remove oxygenated contaminants, including water and some of the methanol from the impure propylene oxide feedstock which comprises the steps of:
introducing said impure propylene oxide feedstock into said distillation column at a feed point in the lower half of said distillation column,
introducing an extractive distillation agent consisting essentially of ethylene carbonate, propylene carbonate or a mixture thereof into said distillation column at a feed point above the same impure propylene oxide feed point, said extractive distillation agent being introduced into said distillation column in the ratio of said impure propylene oxide feedstock to said extractive distillation agent of from about 1:1 to about 20:1,



withdrawings a lighter distillate fraction from said distillation column consisting essentially of essentially anhydrous propylene oxide contaminated with a reduced quantity of methanol,
withdrawing a heavier distillation fraction from said distillation column containing substantially all of the ethylene carbonate, propylene carbonate or a mixture thereof, substantially all of the water, introduced into said distillation column and some of the methanol introduced into said distillation column.

5,145,562
EXTRACTIVE DISTILLATION OF MIXTURES CONTAINING AROMATIC AND OLEFINIC HYDROCARBONS
Ronald E. Brown, and Fu-Ming Lee, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jul. 1, 1991, Ser. No. 724,049
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.[5] B01D *3/40*
U.S. Cl. 203—51 20 Claims

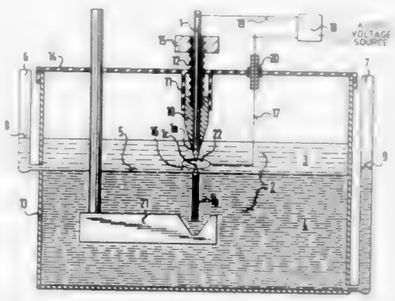
1. A process for separating at least one aromatic hydrocarbon containing 6–10 atoms per molecule from at least one olefinic hydrocarbon containing 5–10 carbon atoms per molecule selected from the group consisting of alkenes, alkadienes, cycloalkenes and cycloalkadienes which comprises extractive distillation of a feed consisting essentially of said at least one aromatic hydrocarbon and said at least one olefinic hydrocarbon employing a solvent consisting essentially of N-methyl-2-thiopyrrolidone;
wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one aromatic hydrocarbon and a larger volume percentage of said at least one olefinic hydrocarbon than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one aromatic hydrocarbon and a smaller volume percentage of said at least one olefinic hydrocarbon than said feed.

7. A process for separating at least one aromatic hydrocarbon containing 6–10 carbon atoms per molecule from at least one olefinic hydrocarbon containing 5–10 carbon atoms per molecule selected from the group consisting of alkenes, alkadienes, cycloalkenes and cycloalkadienes which comprises extractive distillation of a feed consisting essentially of said at least one aromatic hydrocarbon and said at least one olefinic hydrocarbon employing a solvent consisting essentially of a mixture of N-(β-mercaptoethyl)-2-pyrrolidone and N-methyl-2-thiopyrrolidone;
wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one aromatic hydrocarbon and a larger volume percentage of said at least one olefinic hydrocarbon than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one aromatic hydrocarbon and a smaller volume percentage of said at least one olefinic hydrocarbon than said feed.

5,145,563
DEHYDRATION OF PROPYLENE OXIDE BY EXTRACTING DISTILLATION
William K. Culbreth, III; David G. Pottratz; Wei-Yang Su; Yu-Hwa E. Sheu, and Carter G. Naylor, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Nov. 1, 1991, Ser. No. 786,687
Int. Cl.[5] B01D *3/40*; C07D *301/32*
U.S. Cl. 203—64 4 Claims

1. An extractive distillation process for the distillation of an impure propylene oxide feedstock in a distillation column to remove contaminating quantities of water and methanol from the said impure propylene oxide feedstock which comprise the steps of:
introducing said impure propylene oxide feedstock into said distillation column at a feed point in the lower half of said distillation column,
introducing an extractive distillation agent consisting essentially of glycerol-1,3-di-t-butylether into said distillation column at a feed point above the said impure propylene oxide feed point, said extractive distillation agent introduced into said distillation column in the ratio of said impure propylene oxide feedstock to said extractive distillation agent of from about 1:1 to about 20:1,
withdrawing a lighter distillate fraction from said distillation column consisting essentially of essentially anhydrous propylene oxide contaminated with a reduced quantity of methanol,
withdrawing a heavier distillation fraction from said distillation column containing substantially all of the glycerol-1,3-di-t-butylether and water and a portion of the methanol introduced into said distillation column.

5,145,564
METHOD OF AND APPARATUS FOR PRODUCING ELECTRICALLY-CONDUCTIVE PROBE TIPS
Heiko Lemke, Hungen; Thomas Göddenhenrich; Hans-Peter Bochem, both of Jülich, and Uwe Hartmann, Niederzier, all of Fed. Rep. of Germany, assignors to Forschungszentrum Julich GmbH, Julich, Fed. Rep. of Germany
Filed Mar. 7, 1991, Ser. No. 665,768
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1990, 4007291
Int. Cl.[5] C25F *3/02, 7/00*
U.S. Cl. 204—129.55 10 Claims



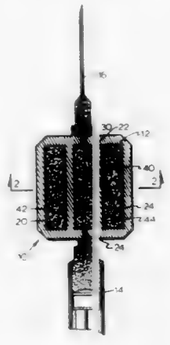
1. A method of making an electrically conductive probe tip, comprising the steps of:
(a) inserting a wire of electrically conductive and electrolytically erodible material into an electrolytically effective liquid layer formed by an electrolyte solution and flanked by electrically insulating layers so that a zone on said wire is exposed to said liquid layer, said wire is guided in a region of said wire adjacent said zone, and a portion of said wire on an opposite side of said zone from said region forms a free end of said wire extending into one of said electrically insulating layers; and
(b) electrolytically eroding said zone of said wire to progressively reduce a cross section of said wire in said zone until said free end is separated by the electrolytic eroding of said zone from said region, thereby forming a probe tip on said region, said wire being inserted in step (a) from above into a bath in which said liquid layer overlies an insulating liquid layer of greater specific gravity than said electrolyte solution, said free end extending downwardly into said insulating liquid layer.

5,145,565

CONTAMINATION-FREE METHOD AND APPARATUS FOR MEASURING BODY FLUID CHEMICAL PARAMETERS

John Kater, Santa Ana, Calif., and Glenn Pelikan, Portland, Oreg., assignors to SpaceLabs, Inc., Redmond, Wash.

Filed May 1, 1989, Ser. No. 346,138
Int. Cl.[5] G01N 27/00
U.S. Cl. 204—153.1 55 Claims



1. An apparatus for obtaining a body fluid sample and allowing said sample to be analyzing comprising:

a generally cylindrical cartridge having at least two calibrating fluid chambers and a sample chamber, each of said chambers communicating with a respective fluid port opening on a common end wall of said cartridge at locations that are symmetrically positioned about the axis of said cylindrical cartridge; and

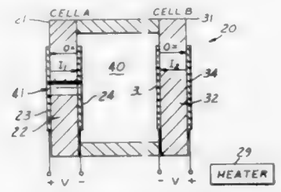
respective calibrating fluids contained in said calibrating fluid chambers.

5,145,566

METHOD FOR DETERMINING RELATIVE AMOUNT OF OXYGEN CONTAINING GAS IN A GAS MIXTURE

Eleftherios M. Logothetis, Birmingham, and Richard E. Soltis, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 251,622 Sep. 30, 1988, abandoned. This application Jan. 18, 1990, Ser. No. 465,592
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] G01N 27/419
U.S. Cl. 204—153.18 11 Claims



1. A method employing an electrochemical oxygen pumping device for measuring the relative amount of a measurement gas consisting essentially of at least one oxygen containing gas in a gas mixture comprising in addition at least a second oxygen containing gas which is capable of being pumped out of said device or disassociated at a voltage less than that which is capable of disassociating said measurement gas, said method comprising the steps of:

providing communication between said gas mixture and a single restricted volume of an electrochemical device, which device comprises:

a first solid electrochemical oxygen pump cell having a first pair of opposed electrodes;

a second solid electrochemical oxygen pump cell having a second pair of opposed electrodes;

a supporting structure coupled to said first and second pump cells to form with them said single restricted volume;

at least one aperture for providing communication between said single restricted volume and said gas mixture;

applying and maintaining a first voltage across said first pump cell to negatively bias a first pump cell electrode of said first pair of opposed electrodes inside said single restricted volume (i) sufficiently to cause substantially all said second oxygen containing gas molecules inside said single restricted volume to be pumped out from said single restricted volume or disassociated by a current flowing through said first pump cell and (ii) insufficiently to disassociate the measurement gas;

applying and maintaining simultaneously with the maintaining of said first voltage, a second voltage across said second pump cell to negatively bias a second pump cell electrode of said second pair of opposed electrodes inside said single restricted volume sufficiently to disassociate only substantially all said measurement gas inside said single restricted volume by a current flowing through said second pump cell; and

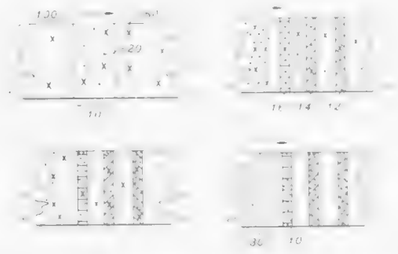
measuring said current flowing through said second pump cell, said second pump cell current being proportional to the relative amount of said measurement gas in said gas mixture.

5,145,567

CAPILLARY ZONE ELECTROPHORETIC ANALYSIS OF ISOENZYMES

You-Zung Hsieh, Taipei, Taiwan; Fu-Tai A. Chen, Brea, Calif.; James C. Sternberg, Fullerton, Calif.; Gerald Klein, Orange, Calif., and Cheng-Ming Liu, Yorba Linda, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 14, 1991, Ser. No. 792,313
Int. Cl.[5] G01N 27/26; B01D 57/02
U.S. Cl. 204—180.1 10 Claims



1. A capillary zone electrophoresis method for the determination of isoenzyme constituents comprising the steps of:

a) introducing an isoenzyme-containing sample and substrate which is capable of being catalyzed by said isoenzymes into a reaction product into a capillary tube including therein a buffer;

b) subjecting said sample to capillary zone electrophoresis techniques by applying an electric field to said capillary tube of sufficient voltage to allow for separation of said isoenzymes into discrete zones within said capillary tube;

c) terminating the application of said electric field;

d) allowing a sufficient period of time to transpire for said isoenzymes to catalytically convert said substrate to said reaction product within said discrete zones;

e) moving said reaction product through said capillary tube to a product detection region; and

f) detecting said product wherein the distribution of said detected product is determinative of said isoenzyme constituents in said sample.

5,145,568

NONAQUEOUS CATHODIC ELECTROCOAT PIGMENT PASTE

Ding Y. Chung, Rochester Hills; Tapan K. Debroy, Shelby Township, and Sioe-Heng A. Tjoe, Troy, all of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 599,285, Oct. 18, 1990. This application Dec. 18, 1990, Ser. No. 629,476
Int. Cl.[5] C25D 13/10
U.S. Cl. 204—181.7 14 Claims

10. A method of preparing a nonaqueous pigment paste to be incorporated into a cathodic electrocoat composition comprising the following steps:

a) mixing in any order pigment, water soluble pigment dispersant resin consisting essentially of an ethoxylated styrenated phenol and organic solvent so that the mixture is substantially nonaqueous and the weight ratio of pigment to pigment dispersant resin is 0.2:1.0 to 5.0:1.0 and the viscosity of the mixture is 500 to 3000 centipoise;

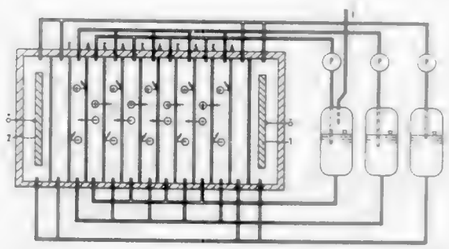
b) grinding the mixture from a) so that the pigment has a particle size represented by a Hegman grinding gauge of about 6 to 8.

5,145,569

PROCESS FOR DESALTING SOLVENT-CONTAINING ELECTROLYTE SOLUTIONS BY ELECTRODIALYSIS

Michael Schneider, Griesheim, and Georg E. Miess, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 31, 1990, Ser. No. 472,762
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903024
Int. Cl.[5] B01D 61/00
U.S. Cl. 204—182.4 13 Claims



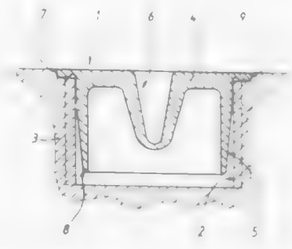
1. A process for desalting mixtures of water and water-soluble highly active organic solvents, which contain metal salts, which comprises subjecting mixtures of water and 20% to 80% by weight water-soluble highly active organic solvents selected from the group consisting of tetramethylurea, dimethylacetamide and N-methylpyrrolidone to electrodialysis employing commercially available ion exchanger membranes.

5,145,570

PLUG TO SEAL RECESSES FOR ANODE RODS IN ANODE BLOCKS DURING CALCINATION PROCESS

Sukrija Jusufbegovic, Mainzer Landstrasse 25 A, D-6257 Elbtal-Elbgrund, Fed. Rep. of Germany

Filed Dec. 27, 1990, Ser. No. 634,306
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1989, 8915209[U]; Jul. 27, 1990, 4023913
Int. Cl.[5] C25C 3/12, 7/00; B65D 39/00, 43/04
U.S. Cl. 204—279 26 Claims



1. An apparatus for sealing a recess formed in an anode block to receive an anode rod during electrolytic extraction of base metals in a calcination treatment, said apparatus comprising:

a plug formed of a material containing cellulose; and

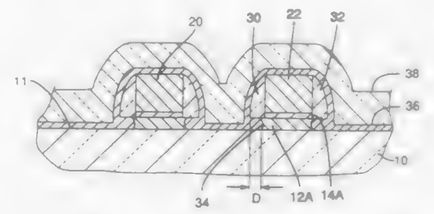
wherein said material includes shaved or chopped sugar cane residue.

5,145,571

GOLD INTERCONNECT WITH SIDEWALL-SPACERS

Richard H. Lane, Hillsboro, and Timothy M. Ebel, Aloha, both of Oreg., assignors to Bipolar Integrated Technology, Inc., Beaverton, Oreg.

Filed Aug. 3, 1990, Ser. No. 562,265
Int. Cl.[5] C25D 5/02
U.S. Cl. 205—123 18 Claims



1. A metallization process for interconnecting integrated circuit elements on a substrate surface, the process comprising:

forming a contiguous metal barrier layer on the substrate surface;

forming and patterning discrete, spaced apart metal conductor lines on the barrier layer, the metal conductor lines being formed of a metal which is subject to deformation when heat treated;

forming sidewall spacers on opposite sides of each of the metal conductor lines;

selectively removing portions of the barrier layer exposed between the metal conductor lines so as to electrically isolate the metal conductor lines from one another, the sidewall spacers being sized to a thickness sufficient to prevent lateral undercutting of the metal conductor lines; and

annealing the substrate after forming the metal conductor lines and sidewall spacers so that the sidewall spacers stabilize the sides of the metal conductor lines.

5,145,572

PROCESS FOR MANUFACTURING THROUGH-HOLE CONTACTING PLATED PRINTED CIRCUIT

Jurgen Hupe, Langenfeld, and Herbert Iwan, Solingen, both of Fed. Rep. of Germany, assignors to Blasberg Oberflachentechnik GmbH, Solingen-Mersheid, Fed. Rep. of Germany

Continuation of Ser. No. 530,27 , May 30, 1990, abandoned, which is a continuation-in-part of PCT/EP88/01112, Dec. 7, 988

This application Dec. 9, 1991, Ser. No. 803,899

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741459

Int. Cl.[5] C2 D *5/34*

U.S. Cl. 205—219 9 Claims

1. A process for manufacturing through-hole plated printed circuit boards by direct metal electrodeposition on catalytically activated surfaces of the substrate material, wherein the catalytically activated surfaces are pre-treated prior to electrodepositing the metal with a solution containing one or more nitrogen-containing organic compounds, hydroquinone or ethoxylated alkylphenols and wherein the surfaces are wired as an anode or cathode during or after the pre-treatment, but prior to electrodepositing the metal.

5,145,573

MARKED MINERAL OILS AND METHOD OF MARKING MINERAL OILS WITH BASIC DYES

Guenther Riedel, Heidelberg, and Christos Vamvakaris, Kallstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen Fed. Rep. of Germany

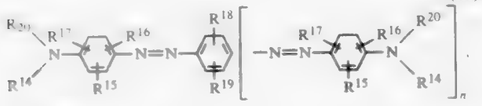
Filed Jan. 9, 1991, Ser. No. 639,594

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1990, 4001662

Int. Cl.[5] C10L *1/00*

U.S. Cl. 208—14 2 Claims

1. A marked mineral oil composition comprising a mineral oil and, as a marking substance, a basic dye having the formula (III)



(III)

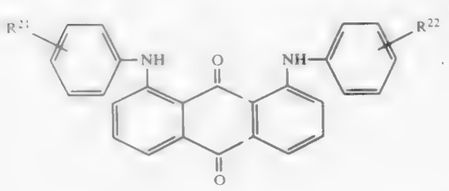
in which

n is equal to 0 or 1,

R^{14} and R^{20} are the same or different and independently are hydrogen or C_1–C_8-alkyl optionally substituted by hydroxy and optionally interrupted by one or two oxygen atoms,

R^{15} and R^{18} are the same or different and independently are hydrogen, C_1–C_4-alkyl or the radical $NR^{13}R^{14}$, in which R^{13} is hydrogen or C_1–C_4-alkyl and R^{14} has the above meaning, and

R^{16}, R^{17} and R^{19} are the same or different and independently are hydrogen or C_1–C_4-alkyl, and formula (IV)



(IV)

in which

R^{21} and R^{22} are the same or different or are independently hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, said basic dye, on addition of a protogenic acid and, optionally, a halide of zinc, aluminum or tin, experiencing a bathochromic shift of its absorption maximum and an increase in absorbance, wherein said composition contains an amount of said basic dye such that the composition is substantially colorless prior to treatment by addition of a protogenic acid and, optionally, a halide of zinc, aluminum, or tin, whereupon said basic dye experiences a bathochromic shift of its absorption maximum and an increase in absorbance, and wherein the amount of said basic dye is from about 0.1 to about 100 parts per million.

5,145,574

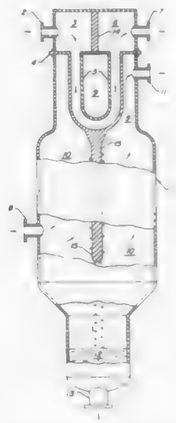
PROCESS FOR SEPARATING A RESIN PHASE FROM A SOLVENT SOLUTION CONTAINING A SOLVENT, DEMETALLIZED OIL AND A RESIN

Brian W. Hedrick, Rolling Meadows, Ill., assignor to UOP, Des Plaines, Ill.

Filed Feb. 12, 1991, Ser. No. 653,918

Int. Cl.[5] B01D *11/04;* C01G *21/14*

U.S. Cl. 208—45 4 Claims



1. A process for separating a resin phase from a solvent solution containing a solvent, demetallized oil and resin which process comprises:

(a) passing the solvent solution over a portion of a generally vertically positioned heat-exchange surface thereby heating said solvent solution to precipitate a resin phase;

(b) heating an upper portion of said vertically positioned heat-exchange surface with a circulating hot heat-exchange fluid;

(c) passing at least a portion of said resin phase which is precipitated on said upper portion of said vertically positioned downwardly over a lower portion of said vertically positioned heat-exchange surface which lower portion is maintained at a lower temperature than the temperature of said upper portion;

(d) recovering said solvent solution having a reduced concentration of resin; and

(e) recovering a resin phase.

5,145,575

WATER QUALITY MONITOR FOR A WATER PURIFICATION SYSTEM

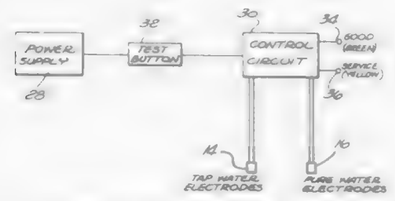
Bruce D. Burrows, 25581 Via Paladar, Valencia, Calif. 91355

Continuation-in-part of Ser. No. 491,310, Mar. 9, 1990, Pat. No. 5,057,212. This application Oct. 2, 1991, Ser. No. 770,663

The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.

Int. Cl.[5] B01D *35/143;* G01N *27/06*

U.S. Cl. 210—85 19 Claims



1. A water quality monitor adapted for use in a water purification system adapted to produce a relatively purified water supply from a tap water supply, said water quality monitor comprising:

electrode means for contacting the tap water supply and the relatively purified water supply produced from the tap water supply by a purification system and obtaining respective conductivities of said supplies;

circuit means having a switch movable between first and second positions and including means activated upon movement of said switch to said first position for generating a short duration pulse of one polarity and for connecting said pulse to said electrode means, said circuit means further including means for determining relative ratios of the conductivities of the tap and purified water supplies and for comparing said ratios with a selected threshold representing satisfactory operating performance of the purification system and for generating one of first and second outputs respectively representing satisfactory and unsatisfactory system performance;

indicator means responsive to said one of said first and second outputs to indicate system performance;

said circuit means further including means for maintaining said indicator means in an operative state to indicate system performance while said switch is in said first position, and for a duration independent of and potentially longer than the duration of said pulse; and

faucet valve means for dispensing purified water from the purification system, said faucet valve means including means for moving said switch between said first and second positions.

5,145,576

DEVICES FOR TREATING HUMAN OR ANIMAL DEJECTIONS BY MEANS OF MICROWAVES

Maurice Lataillade, Domaine Bellevue, F- 33370 Tresses, France

PCT No. PCT/FR90/00161, § 371 Date Nov. 2, 1990, § 102(e) Date Nov. 2, 1990, PCT Pub. No. WO90/10760, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 9, 1990, Ser. No. 601,814

Claims priority, application France, Mar. 9, 1989, 89 03267

Int. Cl.[5] B01D *5/00, 53/00*

U.S. Cl. 210—180 13 Claims

1. A device for treating human and animal dejecta with microwaves, comprising:

a duct for conveying dejecta material therethrough;

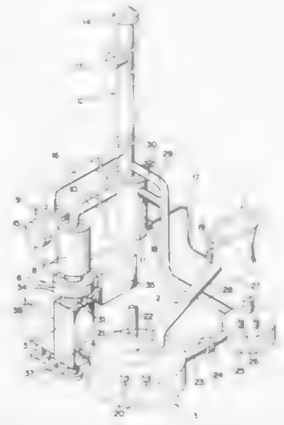
at least one microwave applicator surrounding said duct in an irradiation zone;

at least one microwave generator coupled to said microwave applicator;

transporter screw means, provided in said duct upstream of said microwave applicator, for moving the dejecta material through said duct;

inlet means, coupled to an upstream zone of said duct, for feeding dejecta material to be treated into said duct adjacent said screw means;

drive means, coupled to said screw means, for driving said screw means;



a vapor extractor coupled to said duct immediately downstream of said irradiation zone to receive treated dejecta material immediately on leaving said irradiation zone; and

a condensation vat connected to said extractor and vented through a chimney having a filter.

5,145,577

PULSED COLUMN WITH BASKET LINING

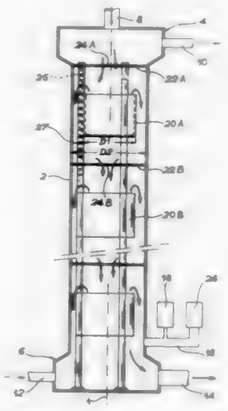
Alain Hanssens, Tresques, and Michel Morin, L'Isle Sur Sorgue, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jun. 11, 1991, Ser. No. 713,975

Claims priority, application France, Jun. 21, 1990, 90 07789

Int. Cl.[5] B01D *24/28*

U.S. Cl. 210—189 5 Claims



1. Exchange pulsed column functioning with one liquid phase and one solid phase and including:

a column shaft inside which a lining is placed to favor exchange between the liquid phase and the solid phase;

a first means for pulsation of both the liquid phase and the solid phase, said first pulsation means supplying a low energy, high frequency pulsation, wherein the lining is an alternate stacking of baskets and horizontal rings so that the solid phase successively fills the baskets and gradually passes through the rings as it descends inside the shaft, a second pulsation means for producing high energy, low frequency pulsations for removing at specific moments the elements of the solid phase from a basket so that they fall back into the basket situated immediately below.

5,145,578

PACKING MATERIAL FOR LIQUID CHROMATOGRAPHY

Kazo Tokubo; Michihiro Yamaguchi; Yutaka Ohtsu; Kiyoshi Nakamura; Satoshi Matsumoto, all of Yokohama, and Akihiko Yamagishi, Chiba, all of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Continuation of Ser. No. 465,557 Jan. 16, 1990, abandoned, which is a continuation of Ser. No. 213,654, Jun. 30, 1988, abandoned. This application Sep. 24, 1990, Ser. No. 588,519

Claims priority, application Japan, Jul. 3, 1987, 62-166622; Oct. 31, 1987, 62-276668; Feb. 8, 1988, 63-26761; Jun. 22, 1988, 63-152110

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 7 Claims

1. A vessel containing a spherical adsorbent sized and dimensioned for chromatographic separation comprising a natural or synthetic layered silicate mineral which upon swelling in water becomes a uniform gel, the adsorbent having been produced by dispersing the mineral in an aqueous medium, and then spray drying the resulting dispersion, the mineral having a specific surface area of at least about 100 m^2/g and having foreign cations substituted for interlayer ions.

5,145,579

METHOD OF MANUFACTURING A SEPARATION COLUMN

Shuji Eguchi, Hitachi, Japan; Johan G. Kloosterboer, Eindhoven, Netherlands, and Dirk J. Broer, Wilmington, Del., assignors to U.S. Philips Corporation, New York, N.Y.

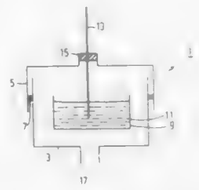
Division of Ser. No. 557,760, Jul 18, 1990, Pat. No. 5,082,559. This application Sep. 16, 1991, Ser. No. 760,557

Claims priority, application Netherlands, Aug. 25, 1989, 8902151

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 4 Claims

1. A method of manufacturing a separation column which comprises a glass capillary which is coated with a polymer film on the inside having an internal diameter of maximally 10 p and having a ratio between the volume of the polymer film and the internal volume of the capillary after the film has been applied larger than 0.14, comprising silylating the inside of the capillary, then filling the capillary with a solution of a photo initiator and/or thermal initiator and acrylate monomers and/acrylate oligomers in a solvent, polymerizing the monomers in situ by means of UV or visible light or by heating, evaporating the



solvent while forming the resultant polymer film and thermally postcuring said polymer film.

5,145,580

APPARATUS COMPRISING A TUBE BUNDLE MOUNTED IN A SHELL AND UNDERGOING DIFFERENTIAL THERMAL EXPANSION THEREWITH

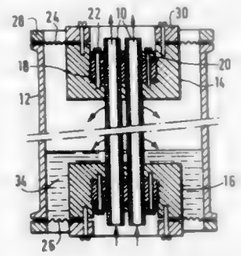
Marc Durrieu, Sainte Adresse, France, assignor to Total Raffinage Distribution S.A, Levallois Perret Cedex, France

Filed Aug. 6, 1991, Ser. No. 740,810

Claims priority, application France, Aug. 7, 1990, 90 10070

Int. Cl.[5] B01D *63/00*

U.S. Cl. 210—321.61 15 Claims



1. An apparatus comprising a plurality of tubes made of a first material, a shell body made of a second material which second material undergoes differential thermal expansion in relation to the first material of the tubes, two end members each being rigidly secured to a respective end of each of said tubes, at least one of the end members being a floating member, at least one flexible ring gasket having inner and outer edges which are affixed to the floating member and to the shell body, respectively.

5,145,581

COMPOSTING SYSTEM UTILIZING AIR RECIRCULATION

Vladimir A. Novy, San Pedro, and Ross C. Caballero, Pacific Palisades, both of Calif., assignors to County Sanitation Districts of Los Angeles County, Whittier, Calif.

Continuation-in-part of Ser. No. 474,968, Feb. 2, 1990, abandoned. This application Apr. 16, 1991, Ser. No. 687,548

Int. Cl.[5] B01J *8/00*

U.S. Cl. 210—609 15 Claims

1. A method for reducing exhaust gas emissions into the atmosphere from compost feed material having a first oxygen level in an in-vessel composter, comprising the steps of:

aerating the feed material;

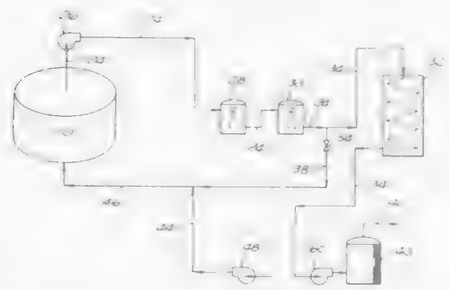
removing moisture and ammonia from the exhaust gas that has passed through the feed material;

venting a first portion of the gas that has passed through the feed material after moisture and ammonia have been removed from it;

recirculating a second portion of the gas that has passed through the feed material after moisture and ammonia have been removed from it and using said second portion of gas to aerate the feed material;

supplementing the second portion of gas used to aerate the feed material with make-up air containing oxygen in amounts insufficient to sustain the first oxygen level in the compost feed material;

periodically stopping recirculation when the oxygen level in



the feed material decreased to a predetermined level, venting a third portion of the second portion of gas that has been recirculated and replacing this vented third portion with recharging air containing oxygen in amounts sufficient to increase the oxygen level in the feed material above the predetermined level; and

treating the first portion of gas and the third portion of gas by passing them through an inert porous material that removes volatile organic compounds.

5,145,582

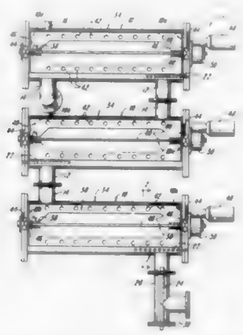
METHOD FOR STABILIZING SLUDGE

Milos Krofta, Lenox, assignor to Lenox Institute for Research, Inc., Lenox, Mass.

Division of Ser. No. 320,400, Mar. 8, 1989, Pat. No. 5,013,429. This application Nov. 21, 1990, Ser. No. 616,789

Int. Cl.[5] C02F *11/12*

U.S. Cl. 210—609 7 Claims



1. A method for stabilizing sludge such as that produced in a municipal waste water treatment plant comprising the steps of:

prethickening the sludge to a solid content in the range of approximately 3% to 8%.

continuously feeding the sludge to fill substantially at least one hollow reactor tank;

introducing microscopic bubbles of O_2 and/or O_3 directly into the sludge in the tank,

mechanically mixing the sludge and bubbles within the tank until the sludge is fully stabilized,

said mixing carrying said sludge to the upper portion of the interior of said tank where said bubbles tend to accumulate, and

withdrawing stabilized sludge from the tank at a controlled rate.

5,145,583

ASYMMETRIC SEMIPERMEABLE MEMBRANE FOR THE TREATMENT OF BIOLOGICAL FLUIDS

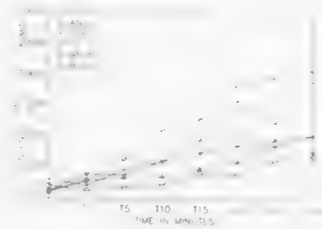
René Angleraud, Feyzin, and Claude Brun, Lyon, both of France, assignors to Hospal Industrie, Meyzieu, France

Filed Dec. 21, 1990, Ser. No. 632,388

Claims priority, application France, Dec. 22, 1989, 89 17397

Int. Cl.[5] B01D *71/42*

U.S. Cl. 210—646 45 Claims



1. An asymmetric semipermeable membrane suitable for the treatment of biological liquids, comprising a support layer and at least one dense, mesoporous or microporous surface layer defining a separating layer,

said membrane containing at least one hydrophobic polymer and at least one water-insoluble copolymer;

said copolymer comprising acrylonitrile and at least one sulphonic monomer,

wherein the concentration of copolymer in the outer surface of said separating layer is higher than the mean copolymer concentration in the membrane as a whole;

said membrane being water-wettable in the dry state; and

wherein said copolymer and said hydrophobic polymer are present in said membrane in relative proportions such that the dimensional change of said membrane when unsupported does not exceed +3% when it changes from the dry state to the wet state at 40° C.

5,145,584

PROCESSES FOR USING A THIN FILM COMPOSITE ULTRAFILTRATION MEMBRANE

A. Xavier Swamikannu, Mt. Prospect, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 622,564, Dec. 5, 1990, Pat. No. 5,085,775. This application Oct. 31, 1991, Ser. No. 785,847

Int. Cl.[5] B01D *61/00*

U.S. Cl. 210—650 21 Claims

1. A process for the separation of molecules based upon small differences in size comprising passing a mixture of molecules of varying size across a composite membrane and collecting a permeate and a retentate, said membrane prepared by the steps comprising:

(a) preparing a solution comprising a polyelectrolyte complex composed of a polyanion and a polycation;

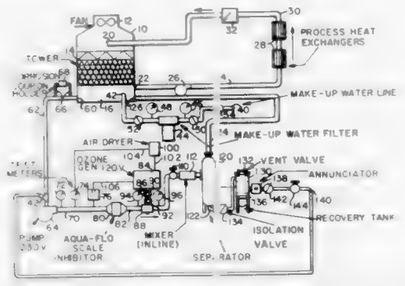
(b) casting the solution on a microporous support to form a thin film on the support;

(c) draining the excess solution;

(d) curing the thin film-coated support; and,

(e) recovering the resultant composite membrane.

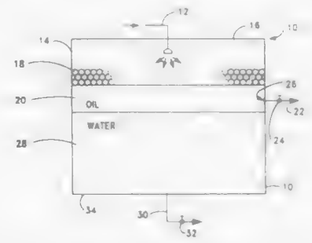
5,145,535
METHOD AND APPARATUS FOR TREATING WATER IN A COOLING SYSTEM
Alden L. Coke, 9413 Old Harford Rd., Baltimore, Md. 21234
Continuation of Ser. No. 478,835, Feb. 9, 1990, abandoned. This application Jul. 10, 1991, Ser. No. 727,955
Int. Cl.[5] C02F 1/48, 1/78
U.S. Cl. 210—695 14 Claims



1. The method of treating water in a cooling system comprising circulating water through a main water circuit including heat exchanger means and a cooling tower in which air contacts water to cool the water within the cooling tower, removing water from the main water circuit at a rate of about 10 to 20 percent of the flow of water through the main water circuit, circulating the water removed from the main water circuit through a closed by-pass water circuit, subjecting all of the water in the by-pass water circuit to a magnetic field to polarize solids in the water to allow more solids to stay in solution in the water as the water circulates through the cooling system to descale the cooling system, injecting ozone into all of the water in the by-pass circuit to oxidize and kill algae, slime and bacteria and enhance the descaling of the cooling system, removing solids of a certain size from all of the water in the by-pass water circuit to form clarified water and water containing separated solids, returning said clarified water to the main water circuit, removing from the by-pass water circuit said water containing solids at a rate of about 10 percent of the flow of water through the by pass water circuit, circulating the water removed from the by pass circuit through a closed recovery water circuit, removing solids from the water in the recovery water circuit of a smaller size than the solids removed in the by-pass water circuit, and returning the water in the recovery water circuit to mix with water in the by-pass water circuit upstream of the point where water in the by-pass water circuit is subjected to a magnetic field.

5,145,586
METHOD OF OIL/WATER SEPARATION UTILIZING COALESCING BODIES
Davis L. Taggart, Tulsa, Okla.; Russell L. McGalliard, Lenoir, N.C.; Ralph R. Eguren, Tulsa, and David G. Hild, Broken Arrow, both of Okla., assignors to Amoco Corporation, Chicago, Ill.
Filed Jul. 17, 1990 Ser. No. 554,306
Int. Cl.[5] B01D 17/022
U.S. Cl. 210—708 7 Claims

1. A method of separating droplets of a first liquid having a first density from a continuous phase of a second liquid having a second density, which method comprises the steps of:
(a) introducing an emulsion comprised of the droplets and the continuous phase downwardly onto a plurality of coalescing bodies in a gravity separation device, the coalescing bodies having an affinity for the first liquid and having a third density which is lower than the first and second densities;
(b) partitioning the droplets from the continuous phase within the gravity separation device for forming first and second liquid layers below the coalescing bodies; and
(c) removing from the gravity separation device the partitioned droplets within the first liquid layer through a first outlet below the coalescing bodies and the partitioned continuous phase within the second liquid layer through a second outlet below the coalescing bodies.

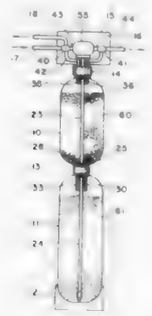


5,145,587
METHOD FOR TREATMENT OF WASTE WATER
Tooru Ishii, Himeji; Kiichiro Mitsui, Akashi; Kunio Sano, Ako, all of Japan, and Akira Inoue, Hirakata, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
Filed Dec. 5, 1990, Ser. No. 622,599
Claims priority, application Japan, Dec. 6, 1989, 1-315164
Int. Cl.[5] C02F 1/72, 1/78
U.S. Cl. 210—759 15 Claims

1. A method for the treatment of waste water, which comprises wet oxidizing said waste water with a molecular oxygen-containing gas of an amount 1.0 to 1.5 times the amount thereof theoretically necessary for decomposing at least one substance selected from the group consisting of organic substances and inorganic substances present in said waste water to nitrogen, carbon dioxide, and water at a temperature not exceeding 370° C. under a pressure enough for said waste water to retain a liquid phase in the presence of a solid catalyst comprising a first catalytic component formed of titanium dioxide, a second catalytic component formed of the oxide of an element of the lanthanide series, wherein said first catalytic component and said second catalytic component are mixed by a coprecipitation technique, and the resulting mixture is calcined, and a third catalytic component containing at least one metal selected from the group consisting of manganese, iron, cobalt, nickel, tungsten, copper, silver, gold, platinum, palladium, rhodium, ruthenium, and iridium or a water-insoluble or sparingly water-soluble compound of said metal is added to said calcined mixture.

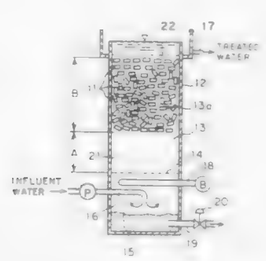
5,145,588
HIGH BACKWASH FLOW RATE PURIFICATION SYSTEM
Paul M. Pedersen, Upper Marlboro, Md., assignor to Western Water International, Inc., Forestville, Md.
Filed Feb. 19, 1991, Ser. No. 656,700
Int. Cl.[5] B01D 24/46
U.S. Cl. 210—793 20 Claims

18. A method of flowing a liquid through a multiple tank liquid filtration system comprising:
(a) flowing said liquid through an inlet valve into a first tank which contains a substance to remove contaminants from said liquid;
(b) removing the liquid from said first tank through a plurality of projections having at least a partial pervious surface and on a distributor;
(c) flowing the liquid into a second tank through a plurality of projections extending from said distributor, said projections on said distributor extending into said second tank being of a greater length than those extending into said first tank;
(d) removing a liquid decreased in contaminants through a liquid conduit which extends through said first and second tanks; and



(e) intermittently backflushing said second tank and said first tank by flowing liquid in the reverse direction through said second tank and said first tank at a rate that is at least 33 percent of the rate of flow of liquid during the step of removing contaminants from said liquid.

5,145,589
SOLID-LIQUID SEPARATOR AND PROCESS FOR WASHING THE SAME
Yasuhiro Okubo, and Takashi Itoh, both of Tokyo, Japan, assignors to Nishihara Environmental Sanitation Research Corporation Limited, Tokyo, Japan
Filed Apr. 29, 1991, Ser. No. 697,528
Int. Cl.[5] B01D 24/46
U.S. Cl. 210—795 3 Claims



1. A method of separating suspended solids from a liquid comprising the steps:
introducing said liquid into a tank so that said liquid flows upwardly toward the top of said tank and passes through a filter bed comprised of filter medium pieces having a high void ratio and a specific gravity of one or less so that said bed floats in said liquid with the bed occupying only a portion of said tank,
periodically washing said tank to remove suspended solids trapped by said floating filter bed including the steps;
first injecting sufficient air into said liquid to agitate said filter medium pieces and disperse said pieces throughout the liquid in said tank; and
next draining said liquid from said tank at a rate of at least 0.3 m/min while continuing to inject air into said liquid to agitate said filter medium pieces until all or substantially all of said filter medium pieces are exposed above the surface of said liquid.

5,145,590
METHOD FOR IMPROVING THE HIGH TEMPERATURE GEL STABILITY OF BORATED GALACTOMANNANS
Jeffrey C. Dawson, Spring, Tex., assignor to BJ Services Company, Houston, Tex.
Continuation-in-part of Ser. No. 465,903, Jan. 16, 1990, Pat. No. 5,082,579. This application Apr. 8, 1991, Ser. No. 681,756
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] E21B 43/26
U.S. Cl. 252—8.551 6 Claims

1. A method of fracturing a subterranean formation comprising the steps of:
blending together an aqueous fluid and a hydratable polymer capable of gelling in the presence of borate ions, thereby forming a base fluid;
allowing the polymer to hydrate to form a hydrated base fluid;
forming a complexor solution for the base fluid by combining a cross-linking additive capable of furnishing borate ions in solution with a delay additive, the delay additive being effective to chemically bond with the borate ions produced by the cross-linking additive to thereby limit the number of borate ions available in solution for subsequent cross-linking of the base fluid;
adding the complexor solution to the base fluid to cross-link the fluid; and
chemically masking at least a portion of the borate ions at low temperature while simultaneously providing a reserve of borate ions for cross-linking the fluid at higher temperatures.

5,145,591
DIUREA GREASE COMPOSITION
Hirotugu Kinoshita, Kawasaki; Makoto Sekiya, Takarazuka, and Masaru Mishima, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan
Filed Jul. 3, 1990, Ser. No. 547,880
Claims priority, application Japan, Jul. 7, 1989, 1-174084
Int. Cl.[5] C10M 115/08, 133/20
U.S. Cl. 252—51.5 R 19 Claims

1. A diurea grease composition comprising a base oil and 2 to 25 wt.%, based on the total weight of the composition, of a diurea compound as an essential ingredient, said diurea grease compound being produced by reacting a mixed system of two or more different diisocyanates selected from the group consisting of diphenylmethane-4,4'-diisocyanate, tolylene diisocyanate, hexamethylene diisocyanate, 2,2,4-trimethylhexamethylene diisocyanate, p-phenylene diisocyanate, 4,4'-dicyclohexylmethane diisocyante, 3,3'-dimethyldiphenyl-4,4'-diisocyanate, m-xylene diisocyanate, m-tetramethylxylene diisocyanate, p-tetramethylxylene diisocyanate, diisophorone diisocyange, 1,5-naphthalene diisocyanate, trans-1,4-cyclohexyl diisocyanate, and mixture thereof, with an amine compound selected from the group consisting of a primary amine represented by the formula (II)

$$R_1—NH_2 \quad (II)$$

wherein R_1 stands for a hydrocarbon residue having 6 to 20 carbon atoms, a secondary amine represented by the formula (III)

(III)

wherein R_2 and R_3 may be the same or different and each stand for hydrocarbon residues having 6 to 20 carbon atoms, and mixture thereof,

wherein said grease composition has a reduced tendency to separate relative to a comparison composition derived from the same diisocyanate compounds and the same amine compounds as said grease composition, the comparison composition having the same proportion of the groups derived from the diisocyanate and amine compounds as said grease composition, but wherein the individual diurea compounds are separately admixed into the comparison composition.

5,145,592

NEUTRAL HYDROGEN-FREE FLUOROCARBON COTELOMERS

Gerardo Caporiccio, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 17, 1990, Ser. No. 628,053
Int. Cl.[5] C10M *1/10, 131/04*
U.S. Cl. 252—54 8 Claims

1. An unreactive, neutral and hydrogen-free cotelomer in the form of a liquid or a wax, said cotelomer consisting essentially of perfluorinated carbon atoms at the terminal positions and repeating units derived from chlorotrifluoroethylene and a member selected from the group consisting of

(a) one perfluorinated olefin containing from two to six carbon atoms,

(b) one perfluorinated alkylvinyl ether where the alkyl portion of said ether contains from one to six carbon atoms,

(c) one perfluorinated polyoxaalkylvinyl ether, wherein the said polyoxaalkyl portion of said ether contains from two to ten carbon atoms and from one to three oxygen atoms excluding the oxygen linking the vinyl radical of said ether,

(d) mixtures of two perfluorinated olefins containing from two to six carbon atoms with the proviso that one of said two olefins is tetrafluoroethylene, and

(e) mixtures of tetrafluoroethylene and one of said perfluorinated alkyl- or polyoxaalkyl vinyl ethers,

where units derived from chlorotrifluoroethylene constitute up to 95 percent of the units present in said cotelomer and said cotelomer is substantially free of chlorine atoms located on adjacent carbon atoms.

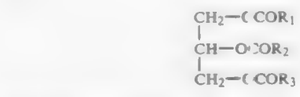
5,145,593

LUBRICATING OIL COMPOSITIONS CONTAINING A GLYCERIDE FROM A SATURATED FATTY ACID AND A FATTY ACID

Hiroyuki Takashima, Yamato, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1991 Ser. No. 717,269
Claims priority, application Japan, Jun. 29, 1990, 2-169867
The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.
Int. Cl.[5] C10M *105/36*
U.S. Cl. 252—56 S 8 Claims

1. A lubricating oil composition other than that for food processing machines, which consists of (I) as the base oil, a saturated fatty acid glyceride represented by the general formula



wherein R_1, R_2 and R_3 may be identical with, or different from, each other, and are each a straight-chain alkyl group having 5 to 21 carbon atoms, and (II) as an essential component, a fatty acid having 12 to 22 carbon atoms in an amount of 0.001 to 5.0% by weight, based on the total composition.

5,145,594

CYANOCARBON COMPOUNDS AS LUBRICANTS IN REFRIGERATION COMPOSITIONS

Douglas R. Anton, Claymont, and Joe D. Druliner, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 20, 1990, Ser. No. 570,309
Int. Cl.[5] C09K *5/04*
U.S. Cl. 252—68 7 Claims

1. In the process of compression refrigeration wherein a blend of refrigerant and lubricant is circulated cyclically through a system of compression and expansion to remove heat from the surroundings, the temperature range for the blend being from 100° C. to −45° C., the improvement which comprises using a blend consisting essentially of

(a) as refrigerant, at least one compound selected from the group consisting of 1,1,2,2-tetrafluoroethane, 1,1,1,2-tetrafluoroethane and pentafluoroethane; and

(b) as lubricant, at least one compound selected from the group consisting of adiponitrile, 2-methyl glutaronitrile, a blend of adiponitrile and dicyanotricyclododecane, and a blend of dicyanocyclooctane and dicyanotricyclodecane or 2-methyl glutaronitrile.

5,145,595

ANTI-STATIC FABRIC SOFTENING ARTICLE FOR USE IN AN AUTOMATIC CLOTHES DRYER

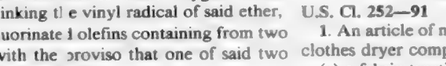
Patricia A. Morris; Donald L. Wharry, and John R. Roheim, all of Austin, Tex., assignors to Vista Chemical Company, Austin, Tex.

Filed Oct. 3, 1990, Ser. No. 592,280
Int. Cl.[5] C11D *17/06, 17/00*
U.S. Cl. 252—91 8 Claims

1. An article of manufacture adapted for use in an automatic clothes dryer comprising:

(a) a fabric treating composition comprising

(i) a surfactant having the formula



wherein R is an aliphatic group containing from about 16 to about 30 carbon atoms and x is an integer of at least about 20;

(ii) a fatty alcohol containing from about 16 to about 30 carbon atoms;

the weight ratio of said surfactant to said alcohol being from about 3 to 1 to about 1 to 3, the value of x being such that the groups (C_2H_4O) constitute at least about 80% by weight of said surfactant, and

(iii) from about 2 to about 10 percent by weight of the mixture of said surfactant and said fatty alcohol of a storage stabilizer,

(b) a flexible substrate in releasable combination with said fabric treating composition

said stabilizer being a particulate solid which prevents any substantial release of said composition from said substrate at temperatures up to about 45° C.; said stabilizer being selected from the group consisting of clays, carbohydrate polymers and mixtures thereof.

5,145,596

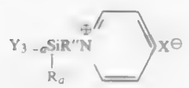
ANTIMICROBIAL RINSE CYCLE ADDITIVE

Lynne M. B. Blank, Brighton, N.Y., and William C. White, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 7, 1989, Ser. No. 390,050
Int. Cl.[5] C11D *3/48;* D06M *10/08*
U.S. Cl. 252—106 7 Claims

1. A rinse cycle fabric laundering additive composition comprising a mixture of at least one nonsilicon organic quaternary ammonium compound, and at least one organosilicon quaternary ammonium compound, the organosilicon quaternary ammonium compound being an organosilane having the formula selected from the group consisting of

and



wherein, in each formula,

Y is R or RO where each R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;

a has a value of 0, 1 or 2; R′ is a methyl or ethyl radical;

R″ is an alkylene group of 1 to 4 carbon atoms;

R‴, R⁗ and R⁗′ are each independently selected from a group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{IV}$, wherein x has a value of from 2 to 10 and R^{IV} is a perfluoroalkyl radical having from 1 to 12 carbon atoms; and

X is chloride, bromide, fluoride, iodide, acetate or tosylate.

5,145,597

CLEANING COMPOSITION AND METHOD OF USE

Manual S. Rodriguez, Houston, and Nelson E. Prieto, Richmond, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 576,039, Aug. 31, 1990, abandoned. This application Sep. 18, 1991, Ser. No. 762,527
Int. Cl.[5] C11D *1/66, 3/06*
U.S. Cl. 252—135 20 Claims

1. An aqueous cleaning solution consisting essentially of:

a) from about 1% by weight to about 12% by weight of caustic based on total solution;

b) from about 0.1% by weight to about 1% by weight of phosphate builder on total solution;

c) from about 0.05% by weight to about 3% by weight of chelating agent based on total solution;

d) from about 0.1% by weight to about 6% by weight of solubilizer based on total solution;

e) from about 1% by weight to about 7% by weight of nonionic surfactant based on total solution; and

f) the balance of the total solution being water to 100%.

6. An aqueous cleaning solution consisting essentially of:

a) from about 6% by weight to about 10% by weight of caustic based on the total solution;

b) from about 0.1% by weight to about 1% by weight of phosphate builder based on total solution;

c) from about 0.5% by weight to about 3% by weight of solubilizer based on total solution;

d) from about 0.1% by weight to about 1% by weight of chelating agent based on total solution;

e) from about 2% by weight to about 7% by weight of nonionic surfactant based on total solution; and

f) the balance of the total solution being water to 100%.

12. The method of removing polymeric residues from mechanical equipment used in the production or processing of polymers, which comprises soaking said equipment at ambient temperatures in an aqueous cleaning solution consisting essentially of:

a) from about 1% by weight to about 12% by weight of caustic based on total solution;

b) from about 0.1% by weight to about 1% by weight of phosphate builder based on total solution;

c) from about 0.05% by weight to about 3% by weight of chelating agent based on total solution;

d) from about 0.1% by weight to about 6% by weight of solubilizer based on total solution;

e) from about 1% by weight to about 7% by weight of nonionic surfactant based on total solution; and

f) the balance of the total solution being water to 100%.

5,145,598

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE, NITROMETHANE AND METHANOL OR ETHANOL

Eilen L. Swan, Ransomville, and Rajat S. Basu, Williamsville, both of N.Y., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation of Ser. No. 345,732, May 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 297,467, Sep. 17, 1989, Pat. No. 4,894,176, which is a continuation-in-part of Ser. No. 290,124, Dec. 27, 1988, abandoned. This application Apr. 15, 1991, Ser. No. 686,272
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] C11D *7/30, 7/50;* C23G *5/028*
U.S. Cl. 252—171 20 Claims

1. Azeotrope-like compositions consisting essentially of from about 62.5 to about 97.9 weight percent 1,1-dichloro-1-fluoroethane, from about 2.0 to about 35.5 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2-dichloro-1,2,2-trifluoroethane, and mixtures thereof, from about 0.02 to about 0.3 weight percent nitromethane, and from about 0.1 to about 3.0 weight percent ethanol wherein said azeotrope-like components consist of said 1,1-dichloro-1-fluoroethane, said dichlorotrifluoroethane, said nitromethane, and said ethanol and said azeotrope-like compositions boil at about 33.0° C. at 760 mm Hg.

10. Azeotrope-like compositions consisting essentially of about 60 to about 97 weight percent 1,1-dichloro-1-fluoroethane, about 2 to about 35.5 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2-dichloro-1,2,2-trifluoroethane, and mixtures thereof, about 0.01 to about 1.0 weight percent nitromethane, and about 1 to about 4.7 weight percent methanol wherein said azeotrope-like components consist of said 1,1-dichloro-1-fluorethane, said dichlorotrifluoroethane, said nitromethane, and said methanol and said azeotrope-like compositions boil at about 30.2° C. at 760 mm Hg.

5,145,599

USE OF CATIONIC NON-SILICATE LAYER COMPOUNDS IN DETERGENTS

Helmut Endres, Duesseldorf, and Horst Upadek, Ratingen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP89/00594, § 371 Date Jun. 6, 1990, § 102(e) Date Jun. 6, 1990, PCT Pub. No. WO89/12088, PCT Pub. Date Dec. 14, 1989
PCT Filed May 29, 1989, Ser. No. 623,947
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1988, 3819191
Int. Cl.[5] C11D *3/12, 9/18;* D06L *1/12*
U.S. Cl. 252—174.25 8 Claims

1. The process of reducing the incrustation of laundered fabrics, comprising laundering fabrics with a laundry detergent composition containing from about 1 to about 15% by weight, based on the weight of said composition, of a cationic non-silicate layer compound corresponding to formula (I)

(I)

wherein A represents an equivalent of a non-silicate anion and $1<X<5$, $y>z$, $(y+z)=2x+3$, $0<n<10$, said cationic non-silicate layer compound having a hydrotalcite structure with a lattice distance for the most intensive line in the X-ray diffractogram of from about 7.4 to about 8 Å when dried at 110° C.

5,145,600

LOW VISCOSITY HYDROCARBON SOLUTION OF DIALKYLMAGNESIUM COMPOUNDS

Conrad W. Kamienski, Gastonia, and B. Troy Dover, Kings Mountain, both of N.C., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 160,425, Feb. 25, 1988, abandoned. This application Aug. 9, 1989, Ser. No. 391,811
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—182.3 3 Claims

1. A low viscosity dialkylmagnesium composition consisting essentially of a compound of the formula

$$MgR_aR^1_bR^2_cR^3_dR^4_e$$

wherein

a=0.5 to 1.9; b, c, d, and e=0.1 to 1.5; and a+b+c+d+e=2

R is a 2-alkyl substituted primary alkyl group and R^1, R^2, R^3, and R^4 are C_2–C_{18} hydrocarbyl groups which may be the same or different, said dialkylmagnesium being in the form of a solution in a liquid aliphatic and/or cycloaliphatic solvent.

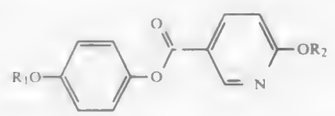
5,145,601

FERROELECTRIC LIQUID CRYSTALS WITH NICOTINIC ACID CORES

Bengt Otterholm, Goteborg, Sweden, and David M. Walba, Boulder, Colo., assignors to The University of Colorado Foundation Inc., Boulder, Colo.

Filed Jun. 25, 1990, Ser. No. 542,838
Int. Cl.[5] C09K *19/34*; C07D *211/72, 211/82*
U.S. Cl. 252—299.61 37 Claims

1. A liquid crystal compound of the formula:



wherein R_1 and R_2, independently of one another, are straight chain or branched alkyl groups having from 1 to 20 carbon atoms.

5,145,602

SOL/GELS CONTAINING NONIONIC SURFACTANTS AND PREPARATION METHODS

Charles L. Kissel, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 305,451, Feb. 1, 1989, Pat. No. 5,004,562. This application Dec. 21, 1990, Ser. No. 632,113
Int. Cl.[5] B01J *13/00*; H01B *1/20*
U.S. Cl. 252—309 45 Claims

1. A process for preparing a sol or gel useful for addition to a composition containing at least one starting latex polymer, said process comprising:

(1) admixing (a) at least one nonaqueous solvent, (b) at least one stabilizer comprising a nonionic surfactant and (c) at least one salt, and

(2) heating the admixture at a temperature sufficient to produce a sol or gel composition having a pH of less than about 6.0 and containing said salt in the form of anions and cations or colloidal salt particulates.

27. A sol or gel composition comprising:

(1) at least one nonaqueous solvent,

(2) at least one salt in the form of cations and anions or colloidal salt particulates, and

(3) a stabilizer comprising a nonionic surfactant, and wherein said composition has a pH less than about 6.0.

5,145,603

FREE-FLOWING, NONIONIC FAT DISPERSION

Stefan Paasch, Wolfenbuettel; Holger Tesmann, Duesseldorf, and Rolf Kawa, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP90/00013, § 371 Date Jul. 11, 1991, § 102(e) Date Jul. 11, 1991, PCT Pub. No. WO90/07976, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 4, 1990, Ser. No. 720,811
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1989, 3900701
Int. Cl.[5] B01F *17/42*; A61K *7/00, 9/10*
U.S. Cl. 252—311 16 Claims

1. An aqueous dispersion, comprising:

(A) 25 to 60% by weight of material selected from the group consisting of water-insoluble fats which melt at a temperature in the range from 30° to 100° C. and do not form any mixed phases with water at temperatures in that range, and mixtures thereof;

(B) 0.1 to 1% by weight of material selected from the group consisting of nonionic surface-active ethylene oxide adducts having an HLB value of 12–19.6, and mixtures thereof, as emulsifier; and

(C) 39 to 74.9% by weight of water, said dispersion being flowable at 20° C.

5,145,604

AQUEOUS EMULSION AND AEROSOL DELIVERY SYSTEM USING SAME

Phillip J. Neumiller, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 584,963, Sep. 19, 1990, Pat. No. 5,091,711. This application Feb. 6, 1992, Ser. No. 832,168
The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.
Int. Cl.[5] C09K *3/00*; B01J *13/00*
U.S. Cl. 252—312 31 Claims

1. An aqueous emulsion system comprising a mixture of a non-ionic surfactant, a C_2–C_{18} primary alcohol, a compound selected from the group consisting of polyhydroxy alcohols, polyhydroxy alcohol esters and mixtures thereof, and active ingredient and water, this mixture being processed so as to produce an aqueous emulsion system containing vesicular structures of an average size of 10–300 nm.

5,145,605

SOL-FORMING CERIUM MATERIAL

Jean-Yves Chane-Ching, Paris, France, assignor to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Continuation of Ser. No. 346,293, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 876,800, Jun. 20, 1986, abandoned. This application Sep. 16, 1991, Ser. No. 759,870
Claims priority, application France, Jun. 20, 1985, 85 09375
Int. Cl.[5] B01J *13/00*
U.S. Cl. 252—313.1 4 Claims

1. A cerium (IV) material having the general formula (I):

$$Ce\,(M)_t\,(CH_3{-}CH_2]_n\,COO^-)_x\,(OH^-)_y\,(NO3^-)_z \qquad (I)$$

wherein M is an alkali metal or a quaternary ammonium radical; t is a value from the range of 0.1 to 0.3; n is 0 or 1; x is a value from the range of 0.1 to 0.7; y is a number such that y=4+t−x−z; and z is a value from the range of 0.3 to 0.6.

5,145,606

BLOWING COMPOSITIONS

Yukio Omure, Takatsuki; Keisuke Kitano, Osaka, and Naoyoshi Hanatani, Settsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 573,980, Aug. 28, 1990, abandoned. This application Jun. 17, 1991, Ser. No. 716,391
Claims priority, application Japan, Aug. 28, 1989, 1-220641; Aug. 28, 1989, 1-220642; Aug. 28, 1989, 1-220643; Aug. 28, 1989, 1-220644; Aug. 28, 1989, 1-220645; Aug. 28, 1989, 1-220646; Aug. 28, 1989, 1-220647; Aug. 28, 1989, 1-220648; Aug. 28, 1989, 1-220649; Aug. 28, 1989, 1-220650; Aug. 28, 1989, 1-220651
Int. Cl.[5] C08J *9/12*
U.S. Cl. 252—350 2 Claims

1. A blowing composition for producing foam of thermoplastics which comprises about 80 to about 20% of difluoroethane and about 20 to about 80% of chlorodifluoromethane.

5,145,607

OPTICALLY CLEAR CONDITIONING SHAMPOO COMPRISING ANIONIC AND CATIONIC SURFACTANTS

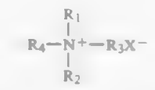
Arthur G. Rich, Spring Valley, N.Y., assignor to Takasago International Corporation (U.S.A.), Rockleigh, N.J.

Continuation of Ser. No. 540,190, Jun. 19, 1990, abandoned. This application Aug. 6, 1991, Ser. No. 741,977
Int. Cl.[5] C11D *1/18*
U.S. Cl. 252—547 16 Claims

1. An optically clear aqueous conditioning shampoo which comprises the combination of:

a. an anionic shampoo base detergent compound selected from the group consisting of sodium lauryl sulfate, sodium lauryl ether sulfate, potassium lauryl sulfate, ammonium lauryl sulfate, ammonium lauryl ether sulfate and mixtures thereof; and

b. a cationic surface active conditioning agent wherein the cationic active agent comprises a hydrophilic cationic quaternary ammonium salt having the following formula:



wherein R_1 and R_2 represent a lower alkyl group having 1 to 3 carbon atoms; R_3 represents a hydrogen or a lower hydroxyalkyl group having 1 to 4 carbon atoms; R_4 represents a 8 to 20 carbon atom hydroxyalky, hydroxyaryl or amido group, and X represents a halogen group, wherein the weight ratio of the active ingredients in the cationic active surface active agent to the anionic shampoo base detergent is controlled between about 1:11,5 to 1:6.8.

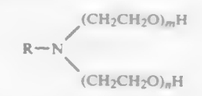
5,145,608

ETHOXYLATED AMINES AS SOLUTION PROMOTERS

Thomas Wershofen, Möchengladbach, Fed. Rep. of Germany, assignor to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 275,808, Nov. 23, 1988, abandoned, which is a continuation of Ser. No. 12,102, Feb. 6, 1987, Pat. No. 4,803,012. This application Jan. 7, 1991, Ser. No. 636,563
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603579
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[5] C11D *3/30*; B08B *101/08, 9/20*
U.S. Cl. 252—544 7 Claims

1. In a method for promoting the water solubility of components of a bottle washing composition formulated for addition to the process water of a bottle washing machine comprising the step of incorporating a solution promoter in said bottle washing composition, the improvement wherein said aqueous bottle washing composition has a pH of 1–7 and said solution promoter is incorporated in an amount of about 1–15% by weight and is an ethoxylated fatty amine of the formula:



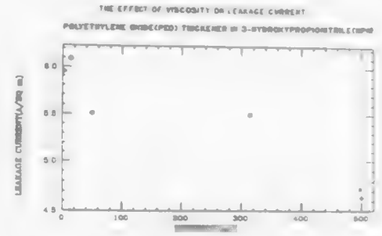
where n is an integer of from 2–30, R^1 is a C_{8-24} straight or branched chain, saturated or unsaturated alkyl and m is an integer of from 0 to 30.

5,145,609

LINEAR POLYETHER-CONTAINING ELECTROCHEMICHROMIC SOLUTIONS AND RELATED DEVICES

Desaraju V. Varaprasad; Niall R. Lynam; Hamid R. Habibi, and Padma Desaraju, all of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Nov. 7, 1990, Ser. No. 610,409
Int. Cl.[5] G02F *1/00, 1/01*; G02B *5/23*
U.S. Cl. 252—583 25 Claims



21. An electrochemichromic cell comprising:

spaced plates, each having an inwardly facing conductive surface;

an electrochemichromic solution located in said cell between said inwardly facing conductive surfaces, said solution comprising:

a solvent;

a redox chemical pair in solution in said solvent which colors in the presence of an applied voltage and which bleaches to a colorless condition in the absence of an applied voltage;

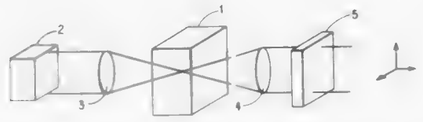
said solvent thickened by addition of at least one linear polyether having a molecular weight in the range from 100,000 to 4,000,000.

5,145,611

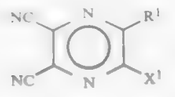
ORGANIC OPTICAL ELEMENTS AND NONLINEAR OPTICAL DEVICES

Dennis S. Donald, Mendenhall, Pa., and Gerald R. Meredith, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

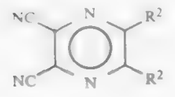
Filed Nov. 27, 1989, Ser. No. 441,590
Int. Cl.[5] **G02F** *1/00* **F21V** *9/04*
U.S. Cl. 252—583 **36 Claims**



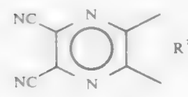
1. An optical element comprising a noncentrosymmetric crystalline organic compound selected from the group consisting of



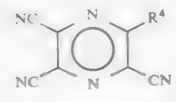
(1)



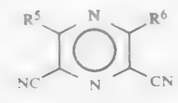
(2)



(3)



(4)

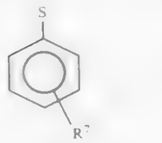


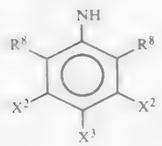
(5)

wherein

X^1 is a halogen selected from the group consisting of Cl and Br;

R^1 is selected from the group consisting of halogen, with the proviso that R^1 is the same as X^1, and





wherein

R^7 is selected from the group consisting of H, CH_3, CH_2CH_3, $C(CH_3)_3$, Cl, Br, OCH_3, and $NHC(O)CH_3$;

R^8 is selected from H and CH_2CH_3;

X^2 is selected from H, Cl, Br and CN;

X^3 is selected from H, Cl, Br and CN;

n=1–4;

R^2 is selected from the group consisting of

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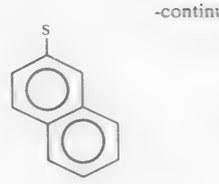
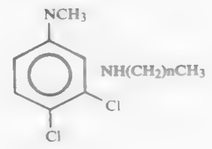
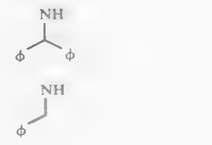
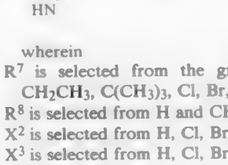
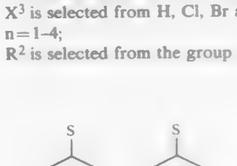
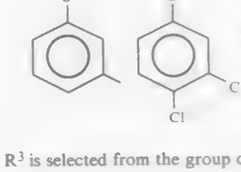




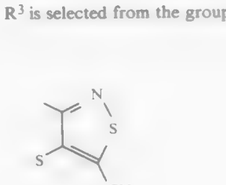








R^3 is selected from the group consisting of



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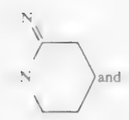
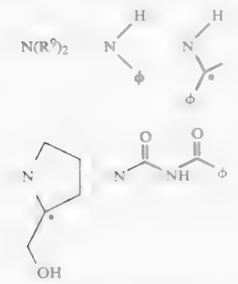


R^4 is an amine selected from the group consisting of



wherein R^9 is selected from H, CH_3 and CH_2CH_3; and R^5 and R^6 are independently chosen from the group consisting of NH_2, OCl_3, $O(CH_2)_2CH_3$ and morpholino.

5,145,611

CARBOXYLIC ACID DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hans P. Wolff, Hirschberg-Grossachsen; Ernst-Christian Witte, Mannheim, and Hans-Frieder Kuehnle, Weinheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 143,456
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, 3700729
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] **C07C** *313/00, 309/00, 317/44, 321/02*
U.S. Cl. 514—532 **25 Claims**

1. Carboxylic acid derivatives of the formula

wherein

R_1 is phenyl or phenoxy optionally substituted by halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, or trifluoromethyl;

R_2 is phenyl optionally substituted by halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, or trifluoromethyl, or, when B is alkylene, also a hydrogen atom;

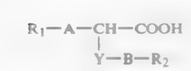
A is a straight-chained or branched, saturated or unsaturated C_3–C_{10} alkylene which is optionally interrupted by oxygen, sulphur, or —NH— attached to saturated carbon atoms, and has a chain length of at least 3 atoms, with the proviso that, where R_1 is phenyl, the chain length of saturated or ethylenically unsaturated alkylene is at least 4;

Y is an $S(O)_n$ group or an oxygen atom, n being 0, 1 or 2; and

B is a valency bond or a straight-chained or branched, saturated or unsaturated alkylene containing up to 5 carbon atoms;

and the physiologically acceptable salts, esters and amides thereof.

5. Carboxylic acid derivatives of the formula



wherein

R_1 is C_6–C_{14} aryl optionally substituted by hydroxyl, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, cyano, nitro or amino optionally substituted by C_1–C_6 alkyl;

R_2 is C_6–C_{14} aryl optionally substituted by hydroxyl, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, cyano, nitro or amino optionally substituted by C_1–C_6 alkyl; or , when B is alkylene also a hydrogen atom;

A is $—CH_2—X—(CH_2)_q—$, $—CH═CHCH_2—$, $—C≡CCH_2—$, $C≡C(CH_2)_p—$, $—CH═CHCH_2—X—(CH_2)_g—$ or $—C≡CCH_2—X—(CH_2)_q—$, in which p is an integer from 2 to 8, q is an integer from 1 to 6, and X is oxygen, sulphur or —NH—, with the proviso that, where R_1 is phenyl, A cannot be $—CH═CHCH_2—$;

Y is an $S(O)_n$ group or an oxygen atom, n being 0, 1 or 2; and

B is a valency bond or a straight-chained or branched, saturated or unsaturated alkylene containing 1 to 18 carbon atoms;

and the physiologically acceptable salts, esters and amides thereof.

9. Carboxylic acid derivatives of the formula

wherein

R_1 is C_1–C_8 alkoxy, alkylthio, or alkylamino; C_5 or C_6 cycloalkyl or cycloalkoxy optionally substituted by methyl; phenyl, phenoxy, phenylthio, phenylsulphinyl, phenylsulphonyl, or phenylamino, optionally substituted by halogen, C_1–C_4 alkyl or trifluoromethyl;

R_2 is phenyl optionally substituted by halogen, C_1–C_4 alkyl, methoxy, trifluoromethyl, methylamino or dimethylamino, or, when B is an alkylene radical, also a hydrogen atom;

A is: C_4–C_8 alkylene with at least 4 carbon atoms in a straight chain; C_4–C_6 alkenylene or C_3–C_6 alkynylene with at least 3 carbon atoms in a straight chain;

alkylene-X-alkylene

in which each alkylene has from 1 to 4 carbon atoms and X is oxygen, sulphur or —Nh—;

alkenylene-O-alkylene

in which the alkenylene has from 3 to 5 carbon atoms, the oxygen atom is not attached to an unsaturated carbon atoms and the alkylene has from 1 to 3 carbon atoms;

alkynylene-O-alkylene

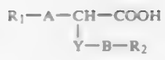
in which the alkynylene has 3 or 4 carbon atoms, the oxygen atom is not attached to an unsaturated carbon atom and the alkylene has from 1 to 3 carbon atoms;

Y is $S(O)_n$ or oxygen in which n is 0, 1, or 2; and

B is a valency bond, C_1–C_8 alkyl or C_2–C_8 alkenyl;

and the physiologically acceptable salts, esters, and amides thereof.

20. A method for the treatment of diabetic and fat-metabolic diseases which comprises administering an effective amount of a compound of the formula



wherein

R_1 is: C_1–C_8 alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, or alkylamino; C_3–C_{10} cycloalkyl or cycloalkoxy optionally substituted by halogen or C_1–C_6 alkyl; or C_6–C_{14} aryl, aryloxy, arylthio, arylsulphinyl, arylsulphonyl or arylamino optionally substituted by hydroxyl, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, cyano, nitro or amino optionally substituted by C_1–C_6 alkyl;

R_2 is an C_6–C_{14} aryl optionally substituted by hydroxyl, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, cyano, nitro or amino optionally substituted by C_1–C_6 alkyl; or, when B is alkylene, also a hydrogen atom;

A is a straight-chained or branched, saturated or unsaturated C_3–C_{10} alkylene which is optionally interrupted by oxygen, sulphur, or —NH— attached to saturated carbon atoms, and has a chain length of at least 3 atoms;

Y is an $S(O)_n$ group or an oxygen atom, n being O, 1 or 2; and

B is a valency bond or a straigh-chained or branched, saturated or unsaturated alkylene containing 1 to 18 carbon atoms;

and the physiologically acceptable salts, esters and amides thereof.

5,145,612

APPARATUS FOR MIXING VAPOR IN A COUNTERCURRENT COLUMN

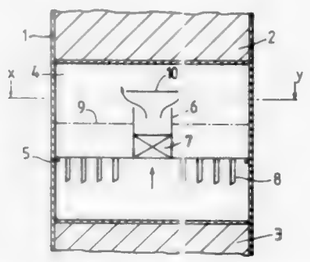
Derek W. Reay; Stuart Fraser, both of Berkshire, and Richard G. Heddle, Camberley, all of England, assignors to The British Petroleum Company p.l.c., London, United Kingdom

Continuation of Ser. No. 417,959, Oct. 5, 1989, abandoned. This application May 21, 1991, Ser. No. 704,903

Claims priority, application United Kingdom, Oct. 8, 1988, 8823671

Int. Cl.[5] B01F 3/04

U.S. Cl. 261—79.2 **7 Claims**



1. A method for mixing of vapor in a column that provides countercurrent contact between said liquid and said vapor, comprising passing the vapor received from an exchange zone below a distributor tray through one or more risers situated in the base of the tray, each riser being fitted with cover means and incorporating mix imparting means, said mix imparting means providing mixing of said vapor within the riser, and allowing the vapor to pass into an exchange zone above the tray.

5,145,613

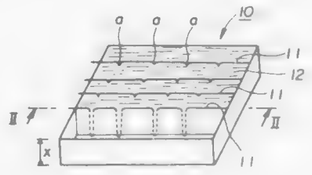
PROCESS FOR PRODUCING A HEAT-RESISTANT ALUMINA FILBER MAT

Noriyuki Arano, and Michiyo Tsuchiya, both of Oumimachi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 463,010, Jan. 9, 1990, Pat. No. 5,047,289, which is a continuation of Ser. No. 137,427, Dec. 23, 1987, abandoned. This application Jan. 18, 1991, Ser. No. 643,522

Int. Cl.[5] B29D 28/00; B29B 9/00; B32B 7/08

U.S. Cl. 264—8 **9 Claims**



1. A process for producing a heat-resistant alumina fiber mat comprising accumulating a precursor of alumina staple fibers to obtain an accumulated mass, sewing said accumulated mass with a precursor of continuous alumina filaments to form a sewn mass and then sintering the sewn mass to convert said precursor of alumina staple fibers and said precursor of continuous alumina filaments into alumina staple fibers and continuous alumina filaments.

5,145,614

PROCESS FOR PREPARING MAGNET MADE OF RESIN

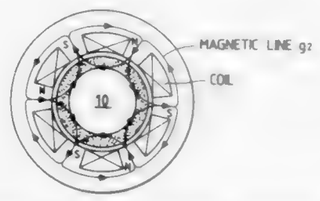
Masaaki Kuroda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 655,142

Claims priority, application Japan, Feb. 14, 1990, 2-31529; Feb. 14, 1990, 2-31530; Jan. 29, 1991, 3-9152

Int. Cl.[5] B29C 45/17

U.S. Cl. 264—24 **9 Claims**



1. A process for preparing a multi-polar anisotropic resinous magnet by injecting a liquid reaction curable resin containing magnetic powder into a mold for molding and applying a magnetic field for multiple-pole orientation thereon, comprising:

(a) injecting said reaction curable resin into a mold for molding provided between a large number of magnetic poles arranged at predetermined intervals including magnetic poles with freely convertible magnetism and back yokes opposed to these magnetic poles;

(b) permitting a magnetic flux to flow in one direction to the back yokes with the respective magnetic poles being made the same polarity, while maintaining the resin under uncured state injected in said magnetic flux, to localize and orient the magnetic powder in said resin corresponding to said magnetic flux: and

(c) after completion of the step (b), completing the reaction curing of the resin while applying a magnetic field obtained by converting the magnetism of said magnetic poles to the desired multi-polar anisotropy of the resinous magnet, thereby to magnetize the magnetic powder within the resin corresponding to said magnetic field.

5,145,615

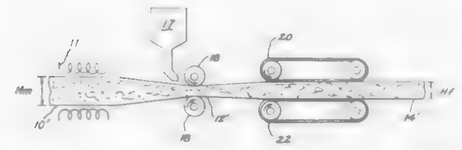
PROCESS FOR MAKING AN EXPANDED FIBER COMPOSITE STRUCTURE

Bang M. Kim, and Donald E. Woodmansee, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 299,571, Jan. 19, 1989, abandoned. This application Jun. 13, 1991, Ser. No. 715,283

Int. Cl.[5] B29C 43/18

U.S. Cl. 264—25 **20 Claims**



1. A process for manufacturing an expanded fiber composite structure comprising:

(a) placing a fiber mat in a mold between two opposing mold surfaces;

(b) introducing a molten plastic material into said mat;

(c) compressing the fiber mat between said opposing mold surfaces to produce a void-free, plastic-impregnated, intermediate fiber composite structure;

(d) increasing the distance separating said opposing mold surfaces while said plastic material is in a softened state so as to allow said fibers in said mat to relax and rebound creating interstitial voids in said structure;

(e) maintaining a predetermined distance between said opposing mold surfaces until said plastic-impregnated composite structure reaches a temperature which is substantially lower than the softening temperature of said plastic material; and

(f) removing said composite structure from said mold.

5,145,616

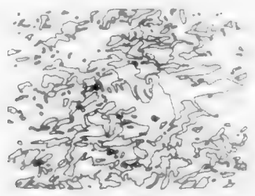
PROCESS FOR THE PREPARATION OF PITCH-BASED CARBON FIBER

Jiro Sadanobu; Akihiro Ohba, both of Iwakuni, Japan, and Tsutomu Nakamura, Kuga, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 281,245, Dec. 7, 1988, Pat. No. 5,047,292. This application Jan. 23, 1991, Ser. No. 644,983

Int. Cl.[5] D01D 9/145

U.S. Cl. 264—29.2 **18 Claims**



1. A process for the preparation of a pitch-based carbon fiber having a micro-structure comprising strip-like structural units extended in the longitudinal direction of the fiber, wherein the fractal dimension D of the arrangement of the strip like structural units in the cross-section of the fiber has a fractal structure satisfying the requirement of the following formula (2) relative to the observation scale r satisfying the requirement of the following formula (1) with respect to the cross-section of the fiber

$$E/2.5\ r\ E/25 \tag{1}$$

$$2.0\ D\ 1.05 \tag{2}$$

wherein E in the formula (1) stands for a smallest principal radius of gyration of cross-sectioned area of the fiber, which comprises melt-spinning a pitch having an optically anisotropic region occupancy ratio of at least 50% by using a spinneret apparatus comprising a spinning nozzle including an introduction hole portion and a fine hole portion and at least one stationary element selected from the group consisting of a stationary dividing element and a stationary kneading element, arranged upstream of the introduction hole portion of the nozzle, and simultaneously satisfying the requirements of the following formulae (5), (6) and (7), and rendering the spun fiber infusible and carbonizing the fiber:

$$\int_0^{-l_c} \eta \cdot S(l)^{-1/2} dl < 6 \times 10^4 \tag{5}$$

$$150° \leqq \Theta \leqq 180° \tag{6}$$

$$L_c \eta / W > 20 \tag{7}$$

wherein n stands for the viscosity (poise) of the spun pitch in the spinning nozzle, S(l) stands for the cross-sectional area (mm^2) of the nozzle hole at a distance l (mm) measured in the direction toward the outlet of the spinning nozzle from the most downstream position of the stationary element as the origin, l_O stands for a distance (mm) between the most downstream point of said element and the outlet of the spinning nozzle, l_c stands for the length (mm) of the fine hole portion, O stands for the angle (degree) of introduction to the fine hole portion from the introduction hole portion, and Q stands for the quantity (g/min) of the pitch extruded per hole of the spinning nozzle.

5,145,617

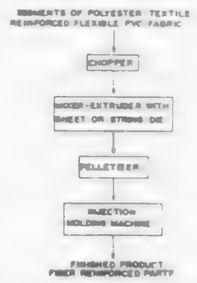
METHOD OF PROCESSING SCRAP ROOF-MEMBRANE SHEET MATERIAL COMPRISING A FLEXIBLE SYNTHETIC FABRIC SUBSTRATE ENVELOPED IN A THERMOPLASTIC PLASTIC ENVELOPE

Harry Hermanson, Caseville, Mich.; Robert C. Hultz, Toledo, Ohio, and David R. Grussing, Bay City, Mich., assignors to Duro-Last, Inc., Saginaw, Mich.

Filed Oct. 15, 1990, Ser. No. 598,917

Int. Cl.[5] B29B 17/00

U.S. Cl. 264—37 **19 Claims**



1. In a method of processing scrap, roof-membrane, sheet material of a thickness in the general range of 30 to 60 miles and comprising a perforate, flexible, fabric having warp and weft strands with openings between strands, the strands being composed of bundles of elongate, synthetic plastic fibers, and

the fabric being encased in a flexible polyvinyl chloride resin envelope, with the envelope material extending through the openings and coating the strands, the steps of:

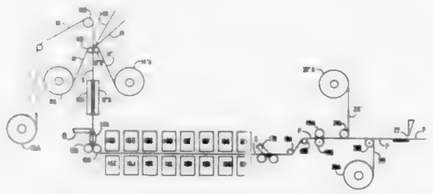
a. comminuting the sheet material to pieces substantially in the range of ¼ to 1¼ inch pieces in width and length dimension;
b. without further comminuting the material, stuffing the comminuted pieces into a hea applying, continuous mixer-extruder having screw mechanism within an elongate barrel chamber for receiving the pieces, and advancing them continuously while progressively compressing them;
c. heating the pieces to the plasticizing temperature of the envelope material while maintaining the temperature well below the melting temperature of the fibers and a temperature which would deteriorate the envelope material, and subjecting the fabric to repetitive high shear and low shear forces as the fabric immersed in the melting viscous, liquid, polyvinyl chloride resin moves along the barrel chamber as a mix of material to a die discharge;
d. maintaining the barrel chamber full of the melted envelope material and fabric while applying said progressive compressive forces thereto;
e. separating the immersed warp strands from the immersed weft strands via said shear force application while substantially maintaining the lengths of the strands in said range;
f. disembodying warp and weft strands via said shear forces to separate immersed fibers in such strands while substantially maintaining the lengths of the fibers in said range and provide separated fibers in the mix of material;
g. randomly dispersing said fibers in the mix of material; and
h. extruding and cooling said material to solidify it in a form in which said discrete separated fibers are randomly dispersed in a polyvinyl chloride matrix.

5,145,61[illegible]

PROCESS FOR MANUFACTURING CONTINUOUS SUPPORTED ION SELECTIVE MEMBRANES USING NON-POLYMERIZABLE HIGH BOILING POINT SOLVENTS

Russell J. MacDonald, Watertown, Russell B. Hodgdon, Sudbury, and Samuel S. Alexander, Concord, all of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 404,939, Sep. 8, 1989, abandoned. This application Aug. 23, 1990, Ser. No. 571,478
Int. Cl.[5] B01D *69/12*
U.S. Cl. 264—46.3 11 Claims



1. A process for manufacturing supported ion exchange membranes from: (I) a liquid characterized by having a viscosity less than about 10 poise at shear rates in excess of about 1 cm/sec and containing at least in part components polymerizable into said membranes and comprising no nonpolymerizable solvents other than water which have a boiling point of less than about 185° C.; and from: (II) at least one quasi-continuous, pliable, support substrate having a multiplicity of apertures extending through said substrate from one face thereof to the other; said process comprising:

(a) forming a quasi-continuous sandwich comprising said support substrate or a pack of facially continguous support substrates and juxtaposed to each face of said substrate or pack, pliable foil extending beyond the lateral edges of said support substrate or pack, said foil characterized by not being substantially swollen by nor substantially permeable to said liquid at temperatures and times pertaining during said manufacturing;
(b) maintaining the average plane of said sandwich within an angle of not more than about 45 degrees from the vertical direction;
(c) passing said sandwich between a pair of substantially horizontal, rotatable squeeze rolls;
(d) joining the juxtaposed lateral edges of said pliable foil extending beyond the lateral edges of said support substrate or pack before passing through said squeeze rolls, thereby forming a pocket in said sandwich bounded on the bottom thereof by said squeeze rolls;
(e) controlling the aperture between said squeeze rolls to approximately the thickness of the sum of the nominal thickness of said foils and support substrate or pack of support substrates;
(f) introducing said liquid into said pocket to form a laterally extending shallow pool of said liquid on at least one side of said support substrate;
(g) controlling the level of liquid in said pool;
(h) pulling said sandwich between said squeeze rolls thereby at least partially filling with said liquid substantially all the apertures of said support substrate or pack passing between said rolls;
(i) thereafter causing said components-polymerizable-to-said-membranes to polymerize thereby resulting in the formation of a supported, solid, polymer sheet subsequently separating said supported, solid, polymer sheet from said pliable foil.

5,145,619

COMBUSTION-SYNTHESIS PROCESS FOR MAKING FRICTION MATERIALS

Rudolf Abramovici, Depew, N.Y., assignor to Benchmark Structural Ceramics Corporation, Amherst, N.Y.

Filed Mar. 26, 1990, Ser. No. 499,169
Int. Cl.[5] C04B *33/32*
U.S. Cl. 264—60 20 Claims

1. A self-propagating, aluminothermic process for producing a friction material, comprising the steps of sequentially:

(a) providing a composition comprised of a mixture of aluminum, iron, and at least one metal oxide, wherein:
1. said metal oxide is selected from the group consisting of the oxides of iron, copper, chromium, nickel, molybdenum, cobalt, manganese, lead, tin, silicon, bismuth, aluminum, and mixtures thereof;
2. at least 80 weight percent of said composition is comprised of said mixture of said aluminum, said iron, and said metal oxide(s);
3. said aluminum and said iron comprise from about 20 to about 80 weight percent of said mixture;
4. said metal oxide(s) comprise from about 80 to about 15 weight percent of said mixture;
5. the weight of said aluminum in said mixture represents from about 5 to about 35 weight percent of the combined weight of aluminum and iron in the mixture; and
6. the weight of said iron in said mixture represents from about 65 to about 95 weight percent of the combined weight of the aluminum and iron in the mixture;

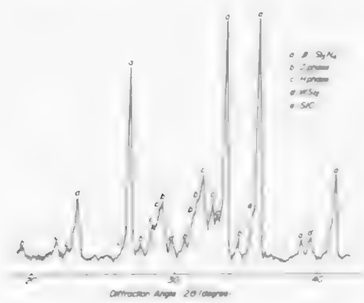
(b) forming said composition into a green body;
(c) preheating said green body to a temperature of from about 50 to about 400 degrees centigrade;
(d) igniting said preheating green body by contacting it with a heat source at a temperature of at least about 700 degrees centigrade; and
(e) reacting said aluminum with said metal oxide(s), thereby densifying said green body.

5,145,620

METHOD OF PRODUCING A SILICON NITRIDE SINTERED BODY

Hiroaki Sakai, and Manabu Isomura, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 649,770, Jan. 25, 1991, Pat. No. 5,096,859. This application Dec. 4, 1991, Ser. No. 802,373
Claims priority, application Japan, Feb. 9, 1990, 2-28170; Nov. 30, 1990, 2-330599
Int. Cl.[5] C04B *35/58*
U.S. Cl. 264—65 4 Claims



1. A method of producing a silicon nitride sintered body containing Si_3N_4 grains comprising the steps of:
preparing a raw material consisting essentially of
a) Si_3N_4 powder as a main component,
b) 2.7–10 mol % of a rare earth element compound powder, calculated as an oxide of the rare earth element relative to a sum of mol % of Si_3N_4 and mol % of the rare earth element compound calculated as an oxide of the rare earth element,
c) 0.5–11 wt. % SiC powder relative to a sum of Si_3N_4 and the rare earth element compound calculated as an oxide of the rare earth element, and
d) 0.5–3 wt. % of at least one of a W compound powder or metallic W and a Mo compound powder 14 or metallic Mo relative to a sum of Si_3N_4 and the rare earth element compound calculated as an oxide of the rare earth element;
forming the raw material into a shaped body; and
firing the shaped body at 1,700°–2,100° C. in N_2 atmosphere to substantially crystallize a grain boundary phase of the Si_3N_4 grains.

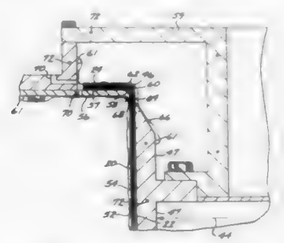
5,145,621

CROSSOVER MOLD TOOL FOR CONSOLIDATING COMPOSITE MATERIAL

Richard D. Pratt, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 20, 1990, Ser. No. 512,225
Int. Cl.[5] B32B *31/00*
U.S. Cl. 264—102 18 Claims

1. A process for consolidating a composite material body, comprising the steps of:
furnishing a composite material body having a structure formed of unconsolidated plies of reinforcement fibers embedded in a matrix, the body having a first side and an opposed second side; then,
placing a first rigid tool against the first side of the composite body in a first region;
placing a second rigid tool against the second side of the composite body in a second region;
placing a first consolidation pressure membrane having at least two faces against the second side of the composite body in the first region;
placing a second consolidation pressure membrane having at least two faces against the first side of the composite body in the second region; and



applying a pressure to the first consolidation pressure membrane and the second consolidation pressure membrane, thereby applying a pressure to the composite body to cause it to consolidate.

5,145,622

PROCESS FOR PREPARING WATER-DISPERSIBLE POLYESTER FIBER

Donald A. Shiffler, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 228,803, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 934,216, Nov. 21, 1986, abandoned. This application Oct. 12, 1989, Ser. No. 420,455
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] D01F *6/62, 11/04*
U.S. Cl. 264—103 10 Claims

1. An improvement in a process for preparing water-dispersible fiber, comprising the steps of melt-spinning polyester into filaments that are quenched as they are withdrawn from the spinneret at a speed termed the withdrawal speed, coating the freshly-extruded filaments with a spin-finish and collecting them in the form of a bundle, and further processing such bundle in the form of a tow, applying a water-dispersing coating, drawing and possible annealing to increase orientation and crystallinity, and converting such drawn filaments into cut fiber, wherein the improvement consists in treating the freshly-extruded polyester filaments with a spin-finish containing an amount of caustic selected and at a location selected such that, in combination with the withdrawal speed and quenching conditions, the caustic treatment is sufficiently soon so as to modify the surface of the polyester, so as to become hydrophilic, when washed, as indicated by the polyester having at least 0.2 surface carboxyl equivalents per million grams of drawn fiber.

5,145,623

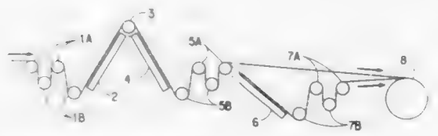
METHOD OF MAKING IMPROVED POLYESTER FILAMENTS, YARNS AND TOWS

John P. Hendrix, Jr., Kinston, N.C.; Benjamin H. Knox, Wilmington, Del.; Joe F. London, Jr., Greenville, and James B. Noe, Wilmington, both of N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 338,251, Apr. 14, 1989, Pat. No. 5,066,447, which is a continuation-in-part of Ser. No. 53,309, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 824,363, Jan. 30, 1986, abandoned. This application Nov. 1, 1991, Ser. No. 786,583
Int. Cl.[5] D02J *1/00*
U.S. Cl. 264—103 13 Claims

1. A process for preparing a continuous filament yarn of deniers per filament less than about 1, wherein a feed yarn of spin-oriented polyester filaments is partially drawn to a uniform yarn of said deniers by hot-drawing or by cold-drawing, with or without heat-setting, said feed yarn being of elonga-

tion-to-break (E_B) about 40 to about 120%, tenacity at 7% elongation (T_7) at least about 0.7 grams/denier, boil-off shrinkage (S_1) less than about 10%, thermal stability as shown by an S_2 value less than about +1%, net shrinkage (S_{12}) less than



about 8%, maximum shrinkage tension (ST) less than about 0.3 grams/denier, density (ρ) about 1.35 to about 1.39 grams/cubic centimeter, and crystal size (CS) about 55 to about 90 Angstroms and also at least about (2.0 ρ–282.5) Angstroms.

5,145,624

PRESSING OF WHITEWARE CERAMIC ARTICLES

Alan P. Croft, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 7, 1989, Ser. No. 390,323
Int. Cl.[5] C04B *33/20*
U.S. Cl. 264—109 **11 Claims**

1. A process for the preparation of whiteware ceramic articles having increased green strength comprising:

(a) preparing a slurry by mixing an additive, selected from the group consisting of (1) an alkylenediamine and (2) a mixture of an alkylenediamine and a latex, in an amount effective to increase the green strength of articles prepared from the slurry composition, with a slurry medium, a clay particulate material comprising ball clays and kaolin clays, and a dispersant;

(b) removing the slurry medium from the slurry of step (a) to form a powder; and

(c) pressing the powder using uniaxial or isostatic pressing techniques.

5,145,625

METHOD OF PREPARING SHAPED ARTICLES FROM A MINERAL AGGREGATE AND A POLYACRYLATE BINDER

Bernhard Dotzauer, Maxdorf; Wilhelm F. Beckerle, Bobenheim-Roxheim; Hans-Juergen Denu, Heidesheim; Kurt Wendel, and Manfred Schwartz, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 417,468, Oct. 5, 1989, abandoned. This application Jun. 12, 1991, Ser. No. 714,346
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 3836433
Int. Cl.[5] D21J *1/08*; D04H *1/12*
U.S. Cl. 264—109 **5 Claims**

1. A process for preparing a stiff mineral fiber board from mineral fibers as an aggregate and an aqueous binder solution at a pH of not less than 7 which contains from 10–25 wt. % of an acrylate polymer, in which the aggregate is moistened with the binder solution, formed into the desired shape and then dried with or without heating, said binder being an acrylate polymer composition whose glass transition temperature is not less than 60° C. and which is formed from: (A) 60–75 percent by weight of methyl methacrylate, (B) 25–35 percent by weight of (meth)acrylic acid, (C) 0–20 percent by weight of a C_1–C_8-alkyl acrylate, and (D) 0–1 percent by weight of another polymerizable compound.

5,145,626

PROCESS FOR THE CONTINUOUS MANUFACTURE OF THERMOMOLDABLE THERMOPLASTIC COMPOSITE MATERIALS

Catia Bastioli, Novara, and Gianfranco Del Tredici, Sesto Calende, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 307,163, Feb. 6, 1989, abandoned, which is a continuation of Ser. No. 18,450, Feb. 25, 1987, abandoned. This application Mar. 13, 1991, Ser. No. 670,466
Claims priority, application Italy, Mar. 3, 1986, 19610 A/86
Int. Cl.[5] B29C *43/28, 43/22*
U.S. Cl. 264—112 **14 Claims**

1. A process for the continuous manufacture of thermomoldable thermoplastic polyester composite materials comprising:

(a) feeding on a conveyor belt a granular thermoplastic polyester, having a cylindrical shape and a diameter or height which varies from 0.1 to 10 mm, contemporaneously with a reinforcement selected from the class consisting of organic and inorganic fibers having lengths greater than 1 cm and fed in free fall from a height higher than 80 cm;

(b) beating the thus-obtained continuous felt to reduce its thickness;

(c) compressing and gradually heating under pressure the continuous felt to melt the polymeric matrix; and

(d) cooling under pressure the thus-obtained product.

14. A process for the continuous manufacture of thermomoldable thermoplastic polyester composite materials consisting essentially of:

(a) feeding on a conveyor belt a granular thermoplastic polyester, having a cylindrical shape and a diameter or height which varies from 0.1 to 10 mm, contemporaneously with a reinforcement selected from the class consisting of organic and inorganic fibers having lengths greater than 1 cm and fed in free fall from a height greater than 80 cm;

(b) beating or compressing or both the thus-obtained continuous felt to reduce its thickness;

(c) compressing and gradually heating under pressure the continuous felt to melt the polymeric matrix; and

(d) cooling under pressure the thus-obtained product; whereby during heating step (c) having the fibers free to move one against the other and able to uniformly distribute themselves without hindrance from resin creep.

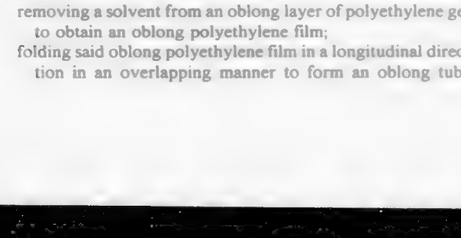
5,145,627

PROCESS FOR PRODUCING COLORED DECORATIVE PANELS BASED ON EXFOLIATED ROCK PARTICLES

Roland Berion, Nods; Mile D. Garnier, Poissy, and Claude Menard, Pont Sainte-Marie, all of France, assignors to Efisol, Paris, France

Filed Nov. 16, 1990, Ser. No. 617,035
Claims priority, application France, Nov. 20, 1989, 89 15171
Int. Cl.[5] B29C *43/30*; B32B *19/04*
U.S. Cl. 264—113 **9 Claims**

1. A process for producing colored panels of mineral particulate or granular exfoliated rock-based material agglomerated by a binder, wherein a material resulting from the blending of measured amounts of said particulate matter and an inorganic binder in the liquid or viscous state is continuously deposited onto a movable forming and shaping surface and is then rendered even and slightly compacted in order to form at least one base layer, and at least one further upper layer formed by a mass of particles of the same nature as the first and previously divided into small pieces and which has been thoroughly impregnated with a colored binder is continuously deposited onto said base layer, the combination of said layers moving along said forming and shaping surface and after flattening off at least the upper layer, undergoing pre-compression and then being cut into panels which, after passing through a press, are subjected to thermal treatment in a kiln, wherein said movable forming and shaping surface is constituted by conveyer-belt means which operate in association with at least two distributors for impregnated particles, the first of said distributors feeding non-colored particles and being made up by a hopper with a base having two diverging surfaces originating from a common line located transversely with respect to the direction



of advance of said conveyer-belt with the spacings between the walls of said hopper and said diverging surfaces respectively constituting first and second pouring means, the lower edge of one of said surfaces which is located in advance, with respect to said direction of travel, of said common line constituting a limiting means determining the height of a first layer being dispensed from the first pouring means of said hopper while a variable-height sliding gate means located after, in said direction of travel, said first distributor determines the thickness of a second layer being provided by the second pouring means of said hopper, a compression roller being located after each of said first and second pouring means, the second of said distributors feeding colored particles and being located, in the direction of travel, after said first distributor and being provided with means for breaking up said impregnated colored particulate matter into small pieces and for flattening the layer deposited.

5,145,628

PROCESS FOR MANUFACTURING A HOSE CLAD WITH ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE

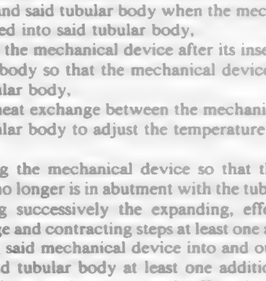
Rudolph Karg, 3039 Woodland Ridge Blvd., Baton Rouge, La. 70816, and Robert Kirschbaum, Vriendenkringstraat 55, 6141 LH Sittard, Netherlands

Continuation of Ser. No. 470,650, Jan. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 456,786, Dec. 29, 1989, abandoned. This application Oct. 3, 1991, Ser. No. 770,145
Int. Cl.[5] B29C *63/06*; B32B *1/08*
U.S. Cl. 264—248 **3 Claims**

1. Process for manufacturing a hose having at least the inside or the outside clad with a layer of polyethylene having an intrinsic viscosity in decalin at 135° C. of at least 5.1 dl/g, which layer is directly bonded to an elastomeric layer, comprising the following steps:

removing a solvent from an oblong layer of polyethylene gel to obtain an oblong polyethylene film;

folding said oblong polyethylene film in a longitudinal direction in an overlapping manner to form an oblong tube with an overlapping seam in the longitudinal direction; and



bonding said polyethylene film directly to the elastomeric layer with no surface treatment or adhesive, to form said hose.

5,145,629

PROCESS AND APPARATUS FOR TEMPERATURE CONDITIONING A THERMOPLASTIC BLANK

Torsten Nilsson, Löddeköpinge, Sweden, assignor to PLM AB, Malmo, Sweden

PCT No. PCT/SE89/00654, § 371 Date Jul. 3, 1990, § 102(e) Date Jul. 3, 1990, PCT Pub. No. WO90/05625, PCT Pub. Date May 31, 1990
PCT Filed Nov. 14, 1989, Ser. No. 536,585
Claims priority, application Sweden, Nov. 14, 1988, 8804102
Int. Cl.[5] B29C *35/02, 55/22, 49/64*
U.S. Cl. 264—292 **19 Claims**

1. A method of adjusting the temperature of a tubular body of plastic material, comprising

inserting an expandable mechanical device into the tubular body of plastic material,

dimensioning the mechanical device in relation to said tubular body so that a gap is formed between the mechanical device and said tubular body when the mechanical device is inserted into said tubular body,

expanding the mechanical device after its insertion into said tubular body so that the mechanical device abuts against the tubular body,

effecting heat exchange between the mechanical device and the tubular body to adjust the temperature of the tubular body,

contracting the mechanical device so that the mechanical device no longer is in abutment with the tubular body, and

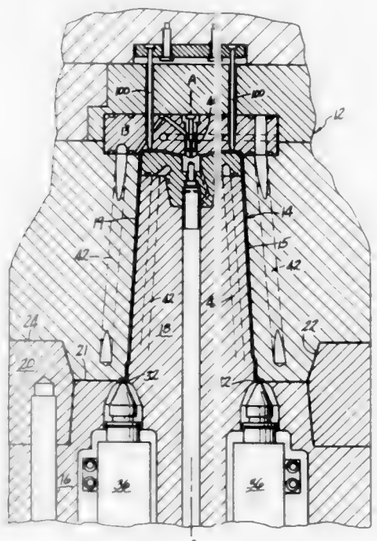
performing successively the expanding, effecting of heat exchange and contracting steps at least one additional time to bring said mechanical device into and out of abutment with said tubular body at least one additional time such that each successive abutment is affected after a temperature change from the previous abutment has taken place over a predetermined distance through the wall thickness of the tubular body.

5,145,630

DIRECT GATING INTO THE LIP OF THIN WALLED CONTAINER

Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Continuation of Ser. No. 221,026, Jul. 18, 1988, abandoned. This application Mar. 1, 1991 Ser. No. 662,729
Int. Cl.[5] B29C 45/22 45/36, 45/43
U.S. Cl. 264—328.8 3 Claims



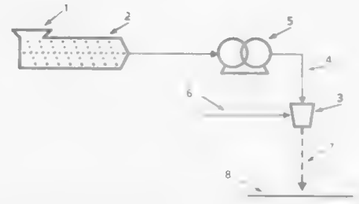
1. A process for injection molding a thin-walled plastic article with a comparatively thick lip portion which comprises:
providing an injection mold comprising a first mold half having a plurality of walls defining a mold cavity and a second mold half comprising a mold core;
moving said mold core into a position where it is centered within the mold cavity and defines with the mold cavity a cavity space in the shape of said plastic article;
injecting a flowable plastic material into said space without creating any significant side load whereby said mold core remains substantially centered within said mold cavity and said molded plastic article has sidewalls with substantially equal thicknesses;
said injecting step comprising providing at least two gates for injecting plastic material into said space, positioning each said gate adjacent a respective portion of said space defining said thick lip portion and substantially simultaneously injecting plastic material into said space through said gates;
cooling said mold halves so as to solidify said plastic material in said cavity space into said plastic article;
moving said mold halves into a mold open position;
ejecting said plastic article from said mold core; and
said ejecting step comprising providing at least one vent communicating with both a vacuum source and an air source and at least one vent pin communicating with said air source, maintaining said article in a position against the mold cavity by applying a vacuum through said at least one vent as to the mold core moves toward the mold open position, and thereafter blowing air through said at least one vent and said at least one vent pin to eject said article from said mold core.

5,145,631

MELT BLOWING PROCESS FOR PRODUCING MICROFIBERS OF SYNDIOTACTIC VINYL AROMATIC POLYMERS

Zdravko P. Jezic, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 460,701, Jan. 4, 1990, Pat. No. 5,021,288. This application Apr. 19, 1991, Ser. No. 688,647
Int. Cl.[5] B29C 47/00
U.S. Cl. 264—518 7 Claims



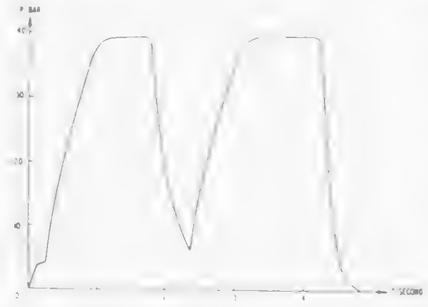
1. A melt-blowing process for producing a fiber of a syndiotactic vinyl aromatic polymer, which comprises supplying a vinyl aromatic polymer having a high degree of syndiotacticity and crystalline structure in a molten form from at least one orifice of a nozzle into a gas stream supplied to an area adjacent to the orifice which attenuates the molten polymer into fibers.

5,145,632

PROCESS FOR THE MANUFACTURE OF PET CONTAINERS DESIGNED TO BE FILLED WITH A HOT LIQUID

Gerard Denis, Turretot; Jean-Michel Ruis, Maneglise, and Paul La Barre, Sainte Adresse, all of France, assignors to Sidel, La Havre, France

Filed Jun. 28, 1990, Ser. No. 545,179
Claims priority, application France, Jun. 29, 1989, 89 08865
Int. Cl.[5] B29C 49/18
U.S. Cl. 264—521 9 Claims



1. A process for the manufacture of a substantially non-biaxially oriented polyethylene terephthalate (PET) container from a hollow amorphous PET preform comprising an open end and a closed end, the open end forming a neck section having dimensions already conformed to its final size and shape, said container having a volume shrinkage of not more than 1% when filled with a hot liquid which reaches or exceeds a temperature of 85° C., comprising:
(a) rapidly heating in an infrared radiating oven only the body of said PET preform for less than one minute, exclusive of the neck section, to a temperature of from 120° C. to 140° C. at which subsequent longitudinal and transverse stretching cause substantially no stresses in the PET;

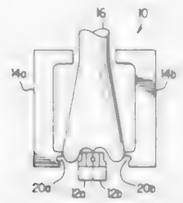
(b) transferring said hot preform from step (a) which is at a temperature of 120° C. to 140° C. to a mold whose walls are at a temperature of from 70° C. to 120° C.;
(c) longitudinally stretching the preform body while simultaneously transversely expanding it by blow-molding using a pressurized fluid so as to mold the preform body to the shape of the mold cavity, wherein the longitudinal stretching rate is less than 500 mm/sec so as to induce minimal stresses in the body during molding and, during said blow-molding, the body is prevented from cooling below its glass transition temperature Tg;
(d) rapidly evacuating the pressurized fluid from the molded container of step (c) by arresting circulation of the pressurized fluid and by drawing off the pressurized fluid within the container until pressure reaches atmospheric pressure; and
(e) removing said container from the mold.

5,145,633

BLOW MOLDING A CONTAINER HAVING THREE HANDLES

George W. Hawkins, III, Whitakers, N.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Jan. 30, 1991, Ser. No. 647,874
Int. Cl.[5] B29C 49/04, 49/30
U.S. Cl. 264—531 1 Claim



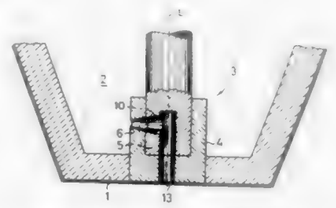
1. A method of blow-molding a container with three handles comprising:
a) extruding a parison;
b) closing a first portion of the parison between a first mold half and a second mold half, each mold half having a recess disposed therein such that when the first and second mold halves are closed together, the two recesses form a first cavity in which the first portion of the parison is formed into a first handle;
c) while gripping the first portion of the parison between the first and second mold halves, draping
i) a second portion of the parison between the first mold half and a lower section of a third mold half, each mold half having a recess disposed therein such that, when the first and third mold halves are closed together, the two recesses form a second cavity in which the second portion of the parison is formed into a second handle, and
ii) a third portion of the parison between the second mold half and a lower section of a fourth mold half, each mold half having a recess disposed therein such that, when the second and fourth mold halves are closed together, the two recesses form a third cavity in which the third portion of the parison is formed into a third handle;
d) after draping the second portion of the parison between the first and third mold halves and the third portion of the parison between the second and fourth mold halves, trapping
i) the second portion of the parison in the second cavity by closing the first and third mold halves, and
ii) the third portion of the parison in the third cavity by closing the second and fourth mold halves;
e) trapping a fourth portion of the parison by closing an upper section of the third and fourth mold halves; and
f) blow-molding the parison into the container having three handles.

5,145,634

CLOSING OR REGULATING APPARATUS FOR A METALLURGICAL VESSEL

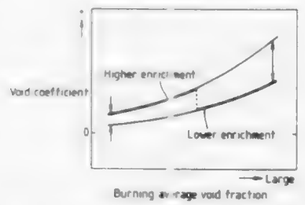
Ullrich Hintzen, Taunusstein-Watzhahn, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 19, 1990, Ser. No. 631,058
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1990, 4001095
Int. Cl.[5] B22D 41/08
U.S. Cl. 266—236 20 Claims



1. An apparatus for closing and/or regulating the discharge or tapping of molten metal from a metallurgical vessel, said apparatus comprising:
a refractory outer pipe member having therethrough a discharge passage defining outer and inner openings;
a refractory inner pipe member positioned within said outer pipe member, said inner pipe member having therethrough a discharge passage defining outer and inner openings;
a first said pipe member being movable with respect to a second said pipe member between an open position, whereat said discharge passages of said pipe members are aligned with said inner opening of said outer pipe member confronting said outer opening of said inner pipe member, thereby defining a molten metal discharge channel enabling flow of molten metal through said pipe members in a flow direction from an inlet opening to receive molten metal to an outlet opening to discharge molten metal, and a closed position, whereat said discharge passages of said pipe members are out of alignment and said inner opening of said outer pipe member and said outer opening of said inner pipe member are isolated and closed, thereby interrupting said discharge channel;
whereby, when said first pipe member is in said closed position, molten metal in said discharge passage of said outer pipe member may become solidified to form a solid metal plug; and
means for ensuring that, when said first pipe member is moved from said closed position to said open position, any metal plug solidified in said discharge passage of said outer pipe member automatically and positively will be discharged in said flow direction through said discharge channel, said means comprising the cross-sectional area of said discharge channel being a minimum at said inlet opening and being increased between said inlet opening and said outlet opening.

5,145,635
FUEL ASSEMBLY AND NUCLEAR REACTOR
Kazuya Ishii, Hitachi; Motoo Aoyama, Mito; Yoshihiko Ishii, Hitachioota; Sadao Uchikawa, Katsuta; Renzo Takeda, Kawasaki, and Osamu Yokomizo, Tokai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 14, 1991, Ser. No. 669,378
Claims priority, application Japan, Mar. 14, 1990, 2-61013
Int. Cl.[5] G21G *1/06*
U.S. Cl. 376—173 22 Claims

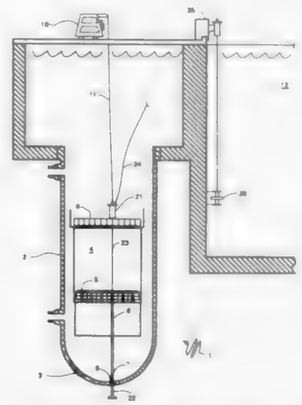


1. A high conversion water reactor fuel assembly having a coolant inlet end and a coolant outlet end, comprising
fuel rod housing means;
an array of uranium-plutonium mixed fuel rods supported in said housing means, the fuel rods extending axially to define an effective fuel region of the fuel assembly of axially-varying plutonium enrichment, in which the fuel rods are closely spaced side-by-side to provide a high fissile material conversion ratio in operation with water coolant flowing from the upstream end to the downstream end, and
the effective fuel region comprising
(a) an axially upstream half having a first average fissile plutonium enrichment value and
(b) an axially downstream half having a second average fissile plutonium enrichment value lower than said first average fissile plutonium enrichment value of the upstream half.

5,145,636
SOLUBLE IRRADIATION TARGETS AND METHODS FOR THE PRODUCTION OF RADIORHENIUM
Jean-Luc E. Vanderheyden; Fu-Min Su, both of Seattle, Wash., and Gary J. Ehrhardt, Columbia, Mo., assignors to NeoRx Corporation, Seattle, Wash. and Curators of the University of Missouri, Columbia, Mo.
Division of Ser. No. 416,243, Oct. 2, 1989, Pat. No. 5,053,186.
This application Jun. 18, 1991, Ser. No. 717,021
Int. Cl.[5] G21G *1/00*
U.S. Cl. 376—189 4 Claims

1. A method of producing a rhenium-188 radionuclide generator, comprising:
irradiating a water soluble irradiation target selected from the group consisting of sodium tungstate and lithium tungstate, reacting the irradiated target with an aqueous zirconium solution to obtain an insoluble zirconium tungstate gel, and disposing the zirconium tungstate in an elutable container to obtain the rhenium-188 radionuclide generator.

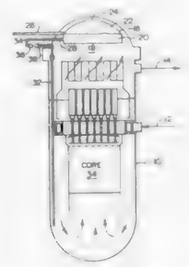
5,145,637
INCORE HOUSING EXAMINATION SYSTEM
David L. Richardson, Los Gatos; David C. Berg; Balasubramanian S. Kowdley, both of San Jose; Jack T. Matsumoto, Sunnyvale; Thurman D. Smith, and Jack P. Clark, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.
Continuation of Ser. No. 527,927, May 24, 1990, abandoned.
This application Aug. 19, 1991, Ser. No. 747,404
Int. Cl.[5] G21C *17/003*
U.S. Cl. 376—249 16 Claims



1. A maintenance procedure for a nuclear reactor, said reactor including a vessel having a top, a bottom, and a wall, said reactor having a core within said vessel, said reactor having an instrumentation guide assembly, said instrumentation guide assembly including an incore housing extending through said bottom, said incore housing being bonded to said vessel by a weld, said instrumentation guide assembly also including a guide tube above, coaxial to and bonded to said incore housing, said guide tube extending at least partially through said core, said reactor having an instrumentation module which can be inserted into said core through said guide tube for monitoring said core, said procedure comprising the steps of:
shutting down said reactor;
removing said top;
removing said instrumentation module from said vessel;
inserting an ultrasonic probe and an attached shaft from above so that said shaft extends through said core and is at least partially immersed in water and through said guide tube and so that said probe extends at least partially into said incore housing;
mounting a drive unit above said core, said drive unit being coupled to said probe via said shaft;
operating said drive unit so that it moves said ultrasonic probe vertically and circumferentially in alternation within said incore housing while said ultrasonic probe is activated to detect defects in said weld;
removing said probe from said vessel;
inserting a new instrumentation module into said guide tube;
replacing said top; and
restarting the reactor.

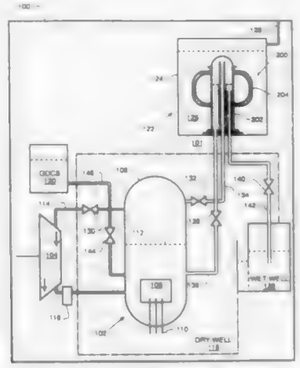
5,145,638
RPV HOUSED ATWS POISON TANK
Willem J. Oosterkamp, Los Gatos, Calif., assignor to General Electric Company, San Jose, Calif.
Filed Dec. 20, 1990, Ser. No. 634,277
Int. Cl.[5] G21C *7/22*
U.S. Cl. 376—282 6 Claims

1. In a boiling water reactor (BWR) wherein housed within a reactor pressure vessel (RPV) is a nuclear core and an upper steam dome connected to a steam outlet in said RPV, the improvement which comprises:
a pressurized vessel disposed in said steam dome containing a neutron poison effective for inactivating said core and a first line for assaying said poison which first line runs to



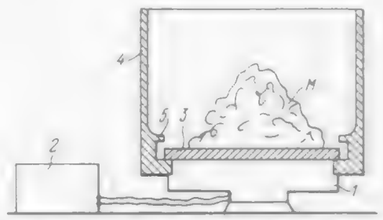
the outside of said RPV, said vessel being vented to said steam dome to pressurize said poison contained therein, said vessel being connected by a second line terminating beneath said core, said second line containing a valve which is actuatable to release the poison through said line upon its actuation.

5,145,639
DUAL-PHASE REACTOR PLANT WITH PARTITIONED ISOLATION CONDENSER
Marvin M. Hui, Cupertino, Calif., assignor to General Electric Company, San Jose, Calif.
Filed Jul. 22, 1991, Ser. No. 733,902
Int. Cl.[5] G21C *15/18*
U.S. Cl. 376—283 3 Claims



1. A reactor plant comprising:
a containment structure defining a wet well, a dry well, and a condenser well, said wet well being in fluid communication with said dry well, said dry well containing a noncondensible gas, said wet well and said condenser well containing condenser coolant during normal operation, said condenser well being vented to an external environment, said wet well and said dry well being in fluid isolation relative to said external environment;
a dual-phase reactor, said reactor having a reactor pressure vessel located within said dry well, said vessel containing a heat-transfer fluid during normal operation, said heat-transfer fluid including heat-transfer liquid and heat-transfer vapor, said vessel having a core for converting heat-transfer liquid to heat-transfer vapor, said reactor having a nominal liquid level;
a turbine;
turbine conduit means for conveying heat-transfer vapor to said turbine from said reactor;
a condenser disposed within said condenser well, said condenser having
a condenser chamber defining a contiguous condenser volume, said condenser chamber isolating said condenser volume from fluid exchange with said condenser coolant so that said condenser coolant is disposed outside said condenser chamber, said condenser chamber having
a base,
a vertically extending sidewall disposed on said base, said sidewall having an open top,
a dome-shaped cover disposed on said sidewall to seal said top,
a partition dividing said condenser volume into a distributor plenum and a collector plenum so that there is no fluid path entirely within said condenser chamber between said distributor plenum and said collector plenum, and
a manifold including a plurality of tubes, each of said tubes extending from said distributor plenum, through said condenser coolant, and through said sidewall to said collector plenum;
pressure relief means for relieving excessive pressure within said reactor vessel by conveying heat-transfer fluid, primarily heat-transfer vapor, from said vessel to said collector plenum in the event of said excessive pressure, said pressure relief means being coupled to said reactor via a relief conduit mating with said reactor above said nominal liquid level and communicating with said distributor plenum through said base; and
condensate return means for conveying heat-transfer liquid from said collector section to said reactor vessel through a condensate return conduit that mates with said reactor at a level below said nominal liquid level, said condensate return conduit communicating with said collector plenum through said base.

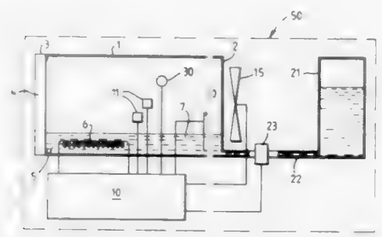
5,145,640
METHOD FOR ACCELERATION OF LIQUID AND BULK MATERIALS AND APPARATUS FOR REALIZATION THEREOF
Igor A. Levin, Petro-zavodskaya ulitsa, 15, korpus 1, kv. 113, Moscow, U.S.S.R.
PCT No. PCT/SU90/00042, § 371 Date Dec. 26, 1990, § 102(e) Date Dec. 26, 1990, PCT Pub. No. WO90/11840, PCT Pub. Date Oct. 18, 1990
PCT Filed Feb. 14, 1990, Ser. No. 635,562
Claims priority, application U.S.S.R., Apr. 4, 1989, 4666633
Int. Cl.[5] A61L *2/00*; B01F *11/02*; F26B *9/00*; B08B *7/02*
U.S. Cl. 422—22 9 Claims



1. A method for treating liquid and solid material by acceleration by mechanical energy applied to the material to be treated which comprises: placing a material to be treated in contact with a first surface of a plate element formed from an electric conducting material, the plate element having at least one degree of freedom in a present direction of the acceleration; and contacting a second surface of the plate element,

opposite to the first surface of the plate element, with a radiator; and applying an electromagnetic pulse to the radiator, whereby the plate element is accelerated in the preset direction.

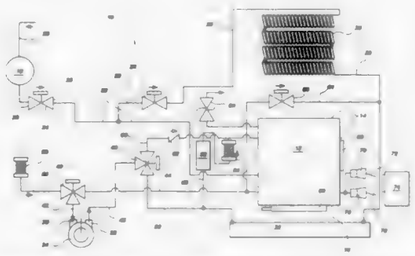
5,145,641
AUTOCLAVES
Richard M. Shelley, Pontypridd Wales, assignor to Smiths Industries Public Limited Company, London, England
Filed Oct. 22, 1990, Ser. No. 600,698
Claims priority, application United Kingdom, Oct. 20, 1989, 8923673
Int. Cl.[5] A61L 2/06
U.S. Cl. 422—26 5 Claims



1. A method of operating an autoclave of the kind having a pressure vessel, a liquid reservoir opening into the pressure vessel and a liquid level sensor that provides an output indication of the level of the liquid in the reservoir, comprising the steps of: either (a) supplying liquid to the reservoir in response to an output from the sensor indicative that the level of liquid is below a predetermined level and subsequently initiating a pressure cycle in response to an output from the sensor indicative that the level of liquid is above said predetermined level; or (b) causing the sensor to be heated in response to an output from the sensor indicative that the level of liquid is above said predetermined level so as to drive off any liquid clinging to any part of the sensor not immersed in the liquid, checking whether the sensor continues to indicate that the level of liquid is above said predetermined level, and subsequently either initiating a pressure cycle in response to an indication that the level of liquid is above said predetermined level or supplying liquid to the reservoir in response to an indication that the level of liquid is below said predetermined level.

5,145,642
LOAD COMPENSATED WATER FILL FOR A TABLE TOP STERILIZER
Charles H. Feathers, III, Hilton; Bhabesh K. Thakur, West Henrietta, and Charles O. Hancock, Fairport, all of N.Y., assignors to MDT Corporation, Torrance, Calif.
Filed Jan. 31, 1991, Ser. No. 648,901
Int. Cl.[5] A61L 2/00; G05D 7/00
U.S. Cl. 422—26 20 Claims

1. A method for producing a vaporized sterilant from a liquid in a sterilizer, aid method comprising:
providing a sterilizer having a chamber with walls and floor, said floor having controllably heatable heat sink structure associated therewith having a heat transfer surface for heating and vaporizing a liquid sterilant;
heating said sink structure to a temperature exceeding the boiling point of said liquid sterilant;
evacuating said chamber for a time to attain a predetermined subatmospheric pressure within said chamber;
introducing into said chamber a quantity of liquid sterilant by opening a valve to said chamber over a time period, said time period being terminated upon the first occurring of alternative conditions, said alternative conditions being (a) said sterilizer pressure obtaining a predetermined value higher than said predetermined subatmospheric pressure and (b) expiration of a preset elapsed time from said expiration of a preset elapsed time from said opening of said valve; and



controllably continuing heating said heat sink structure to produce a vaporized sterilant atmosphere at a predetermined sterilizing temperature for a controlled sterilization time period.

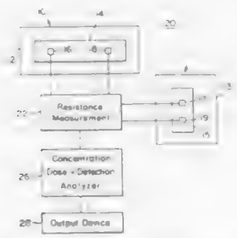
5,145,643
NONOXIDATIVE OPHTHALMIC COMPOSITIONS AND METHODS FOR PRESERVING AND USING SAME
Anthony J. Dziabo, El Toro; Michelle P. Wong, Tustin, and Peter Gyulai, Santa Ana, all of Calif., assignors to Allergan, Inc., Irvine, Calif.
Filed Jan. 5, 1990, Ser. No. 461,181
Int. Cl.[5] A61K 37/50, 31/14; A61L 2/00; A01N 33/12
U.S. Cl. 422—28 38 Claims

1. A method for disinfecting a contact lens comprising:
contacting a contact lens with a substantially non-oxidative composition including an effective disinfecting amount of an ophthalmically acceptable, quaternary ammonium polymer selected from the group consisting of ionene polymers containing an oxygen atom covalently bonded to two carbon atoms and mixtures thereof, at conditions to effectively disinfect said contact lens.

5,145,644
HYDROGEN PEROXIDE DESTROYING COMPOSITIONS AND METHODS OF MAKING AND USING SAME
John Y. Park, Santa Ana, and James N. Cook, Mission Viejo, both of Calif., assignors to Allergan, Inc., Irvine, Calif.
Filed Dec. 20, 1990, Ser. No. 631,621
Int. Cl.[5] A61L 2/00; A61K 33/40; A01N 25/00, 37/50
U.S. Cl. 422—28 30 Claims

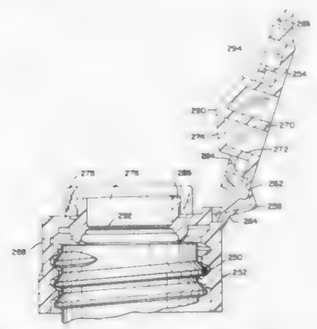
1. A method for producing a hydrogen peroxide destroying composition useful for destroying residual hydrogen peroxide in a hydrogen peroxide-containing liquid aqueous medium comprising:
providing an item containing a hydrogen peroxide destroying component effective when released in a hydrogen peroxide-containing liquid aqueous medium to destroy or cause the destruction of hydrogen peroxide present in the hydrogen peroxide-containing liquid aqueous medium; and
applying to said item a mixture comprising water, a ketone component and a water soluble coating component in an amount sufficient to coat substantially all of said item with said mixture and form a precoated item; and
removing water and said ketone component from said precoated item and forming a coated item which includes a coating containing said water soluble coating component and is structured to delay the release of said hydrogen peroxide destroying component in the hydrogen peroxide-containing liquid aqueous medium for a period of time after said coated item is introduced into the hydrogen peroxide-containing liquid aqueous medium.

5,145,645
CONDUCTIVE POLYMER SELECTIVE SPECIES SENSOR
Mitchell R. Zakin, Bradford; Lawrence S. Bernstein, Lexington, both of Mass., and Richard A. Moody, Nashua, N.H., assignors to Spectral Sciences, Inc., Burlington, Mass.
Continuation of Ser. No. 539,030, Jun. 15, 1990, abandoned.
This application Jun. 3, 1991, Ser. No. 710,240
Int. Cl.[5] G01N 27/04; H01C 7/00
U.S. Cl. 422—98 15 Claims



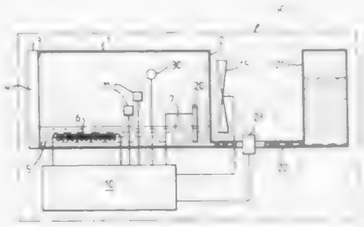
1. A fast response selective chemical species dosimeter, comprising:
a sensor with a first conductive polymer based sensing element having its resistivity permanently altered on exposure to at least a first chemical species in a first group of species and not permanently altered on exposure to at least a first chemical species in a second group of species;
means for detecting and quantifying any permanent change in the resistivity of said first conductive polymer based sensing element; and
means, responsive to said means for detecting and quantifying, for resolving from the permanent change in element resistivity the dose of a chemical species of said first group.

5,145,646
REAGENT BOTTLE AND CAP
James T. Tyranski, Oakwood Hills, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed Jun. 3, 1991, Ser. No. 709,725
Int. Cl.[5] B01L 3/00; B65D 39/00
U.S. Cl. 422—102 10 Claims



1. A container for a reagent, comprising a container having a neck with an open top and a removable cap for selectively closing the top, said cap including
a. an outer portion having a central aperture receiving said neck;
b. an integral inner portion movable between opened and closed positions and disposed in the open top when in the closed position;
said inner portion including a cylindrical core substantially concentric with the neck of the container when the cap is placed thereon, and
a conical tip depending from the core and extending into the neck; and
c. an annular wiper blade on said outer portion and in communication with the conical tip at the intersection of the tip and the core when said inner portion is in the closed position.

5,145,647
AUTOCLAVES
Richard Murray-Shelley, Pontypridd, Wales, assignor to Smiths Industries Public Limited Co., London, England
Filed Oct. 22, 1990, Ser. No. 600,696
Claims priority, application United Kingdom, Oct. 20, 1989, 8923673
Int. Cl.[5] G05B 19/00
U.S. Cl. 422—116 10 Claims



1. A method of timing operation of an autoclave comprising the steps of: generating a first clock signal from a first oscillator; controlling with the first clock signal the duration of a pressurization period of the autoclave; counting in a microprocessor having its own clock separate from the first oscillator a first count of the number of times a portion of a program of the microprocessor has been executed during the pressurization period such that the first count is representative of the duration of the pressurization period; generating separately a second count representative of the desired duration of the pressurization period; and generating a fault signal when the first count differs by more than a predetermined amount from the second count.

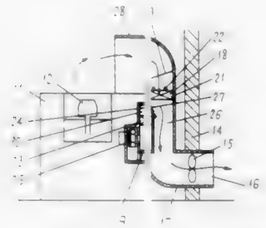
5,145,648
EXHAUST SMOKE PURIFIER APPARATUS
Shinjirou Miyahara, Yamatokouriyama; Ikuo Matsumoto; Kenji Tabata, both of Ikoma, and Hiroshi Fukuda, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
PCT No. PCT/JP89/00632, § 371 Date Feb. 23, 1990, § 102(e) Date Feb. 23, 1990, PCT Pub. No. WO90/00081, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 26, 1989, Ser. No. 465,174
Claims priority, application Japan, Jun. 28, 1988, 63-159981; Jul. 13, 1988, 63-174510
Int. Cl.[5] A62B 15/00
U.S. Cl. 422—124 2 Claims

1. A kitchen exhaust smoke purifier apparatus comprising:
an exhaust smoke duct, one end of said exhaust smoke duct being an inlet port in a vicinity of a range and the other end being an exhaust port which is provided with an exhaust blower;
a reservoir part, said reservoir part being in said exhaust

smoke duct and facing said inlet port, said reservoir part temporarily holding oil smoke and the like, said reservoir part including an adsorbent and a heater, said heater being upstream of said absorbent for heating said adsorbent;

a main path and a bypass path being provided in parallel and between said reservoir part and said exhaust blower;

a purifier part being in said bypass path, said purifier part



including an oxidation catalyst and a reheating heater, said reheating heater being upstream of said oxidation catalyst for reheating air flow introduced in said purifier part, said purifier part further including an auxiliary blower, said auxiliary blower being downstream of said oxidation catalyst; and

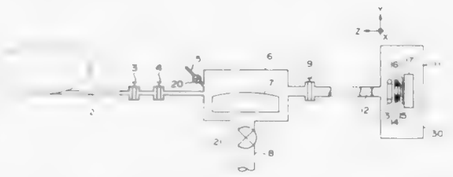
a damper for selectively closing an inlet of said bypass path and said main path.

5,145,649

APPARATUS FOR CLEANING AN OPTICAL ELEMENT FOR USE WITH A RADIATION BEAM

Takashi Iizuka, Atsugi; Yasuaki Fukuda, Hadano; Masami Hayashida, and Masahito Niibe, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1990, Ser. No. 592,302
Claims priority, application Japan, Oct. 3, 1989, 1-257079
Int. Cl.[5] B08B 7/00
U.S. Cl. 422—129 11 Claims



1. A projecting device for projecting a radiation beam to an article along a projection path, said device comprising:

a holder for holding an article

an optical element disposed before said holder along a radiation beam projection path;

a chamber for accommodating said optical element therein;

gas supplying means for supplying, into said chamber, gas effective to remove impurities adhered to said optical element;

vacuum evaculating means for evacuating said chamber; and

valve means disposed between said optical element and said holder along the radiation beam projection path,

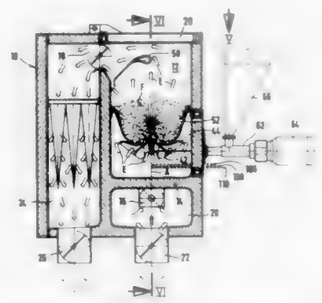
wherein said valve means is opened when a radiation beam is projected to the optical element and to the article, and is closed when the gas is supplied into said chamber.

5,145,650

FLUIDIZED BED APPARATUS FOR MAKING AND/OR PROCESSING POURABLE MATERIAL

Herbert Huttlin, Daimlerstrasse 7, 7853 Steinen, Fed. Rep. of Germany

Filed Nov. 8, 1990, Ser. No. 611,987
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000572
Int. Cl.[5] B01J 8/18; F27B 15/08; F26B 17/00; B05D 7/00
U.S. Cl. 422—143 18 Claims



1. A fluidized bed apparatus for making and/or processing pourable material of solid particles, comprising:

at least one treatment chamber (12) which has a gas inlet means (16) and a gas outlet means (18) said gas inlet means connected to blower means for generating in said treatment chamber (12) an upwardly directed general gas flow (E);

at least one hollow row member (40) extending horizontally in said treatment chamber (12), said rod member (40) having an external profile which is symmetrical with respect to a vertical center plane (A);

a longitudinal conveyor channel (60) formed in said rod member (40);

pump means (62) for supplying fluid material to said conveyor channel (60);

a plurality of discharge nozzles (80) for discharging a fluid material being arranged on said rod member (40) and connected to said conveyor channel (60);

at least one pair of elongated guide vanes (42, 44) extending through said treatment chamber (12) the said rod member (40), the rod member being arranged between the guide vanes (42, 44) such that said general gas flow (E) is directed upwardly around said rod profile; and

a pair of elongated side wall members (52) in parallel with said guide vanes (42, 44) having an upper edge region and lower edge region, said lower edge region, disposed above said guide vanes such as to form, together with the guide vanes (42, 44), a straight elongated trough (53) which is substantially symmetrical with respect to said vertical center plane (A);

wherein said blower means produces, in said general gas flow (E) between said gas inlet (16) and said gas outlet (18), a fluidized bed (F) within said trough (53).

5,145,651

SYSTEM TO MITIGATE THE EFFECT OF AN ENVIRONMENTAL RELEASE OF A CONTAMINANT GAS

Robin B. Lake, Cleveland Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 176,431, Apr. 1, 1988, abandoned. This application Feb. 7, 1991, Ser. No. 652,466
Int. Cl.[5] B01D 51/00
U.S. Cl. 422—168 5 Claims

1. A system to mitigate the effect of an environmental release

of a contaminant gas cloud from an industrial operation comprising:

an industrial operation; a plurality of first fluid effect devices positioned in the vicinity of the industrial operation so as to encounter an environmental release of a contaminant gas cloud from the industrial operation;

each of said first fluid effect devices having a top and a bottom portion and an outer and an inner surface, said outer surface being positioned such that a substantial portion thereof is caused to be exposed to the contaminant gas;

means proximate each said bottom portion of said first fluid effect devices to discharge selectively and transversely across said outer surface and in proximity to the contaminant gas, a first fluid stream from said first fluid effect devices;

means to discharge a second fluid from said first fluid effect devices, within said inner surface and separate from said first fluid stream, whereby said first and second fluid streams intermix above said first fluid effect devices and with the contaminant gas; and

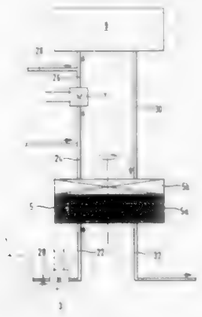
means for igniting a flame from at least one of said first fluid effect devices in conjunction with said first fluid stream discharged therefrom.

5,145,652

APPARATUS FOR THE REMOVAL OF NITROGEN BURNER EXHAUST

Kurt Veser, Heidelberg, and Hermann-Eugen Müller-Odenwald, Mannheim, both of Fed. Rep. of Germany, assignors to Kraftanlagen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 399,499, filed as PCT/EP89/00043, Jan. 18, 1989, abandoned.
This application Jun. 28, 1991, Ser. No. 725,385
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805791
Int. Cl.[5] B01D 50/00
U.S. Cl. 422—171 2 Claims



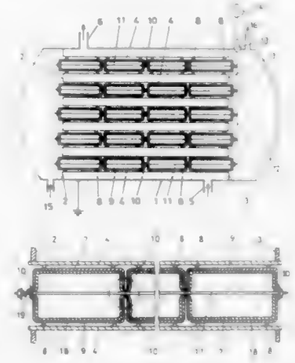
1. An apparatus for removing nitrogen from exhaust gases of a furnace installation comprising: means for removing particles selected from the group consisting of dust and sulfur from exhaust gases generated by a furnace installation; a gas heat exchanger connected to said removing means downstream thereof, said heat exchanger being a rotating regenerative heat exchanger having first heat exchange storage masses on a relatively cold side adjacent said removing means and having second heat exchanging storage masses with catalytically active compounds which are capable of removing nitrogen oxides and adsorbing reducing agent on a relatively hot side following the first storage masses, a second heater downstream and in fluid communication with of said second storage masses, means for introducing reducing agent downstream of said heater, a second catalytic converter downstream of said reducing agent introducing means and provided with denitration static catalytically active surfaces, conduit means upstream of said static catalytic converter for providing fluid communication between the static catalytic converter and said second heater, said conduit means being in fluid communication with said means for introducing reducing agent, means downstream of said second catalytic converter for connecting said second catalytic converter with said second storage masses for removing residual nitrogen oxides and adsorbing residual reducing agent in said exhaust gases, and means for removing cleaned gas from said first storage masses.

5,145,653

DEVICE FOR GENERATING OZONE

Melchior Fischer, Lieli, and Helmut Lang, Wettingen, both of Switzerland, assignors to Ozonia AG, Zurich, Switzerland

Filed Mar. 15, 1991, Ser. No. 669,995
Claims priority, application Switzerland, Mar. 29, 1990, 1042/90
Int. Cl.[5] B01J 19/08
U.S. Cl. 422—186.18 11 Claims



1. A device for generating ozone from oxygen or an oxygen containing gas, comprising:

a plurality of tubular inner electrodes having adjoining ends arranged end-to-end;

an electrical contact area formed at each adjoining end of said plurality of inner electrodes;

a dielectric layer coating an outer periphery of each of said plurality of inner electrodes;

a tubular outer electrode concentrically surrounding said plurality of inner electrodes;

means for spacing said outer electrode from said inner electrodes to form a discharge gap between said outer electrode and said dielectric layer; and

a clamping means for axially compressing said plurality of inner electrodes toward one another to provide electrical and mechanical connection of said inner electrodes at said adjoining ends.

5,145,654

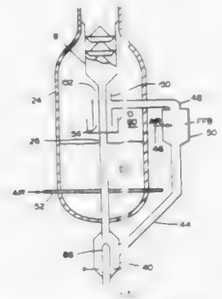
APPARATUS FOR MULTI-STAGE REGENERATION OF CATALYST IN A BUBBLING BED CATALYST REGENERATOR AND SIDE MOUNTED FAST FLUIDIZED BED REGENERATOR

Hartley Owen, Belle Mead, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 515,943, Apr. 27, 1990, Pat. No. 5,047,140. This application Aug. 30, 1991, Ser. No. 752,806

Int. Cl.[5] F27B *15/08, 15/14;* B01J *8/04*

U.S. Cl. 422—190 8 Claims



8. An apparatus for the fluidized catalytic cracking of a heavy feed to lighter, more valuable products comprising:

a regenerator vessel,

a riser reactor having an inlet in a base thereof for a heavy crackable feed, and an inlet for regenerated catalyst from said regenerator vessel, and an outlet in an upper portion thereof for cracked vapor products and spent catalyst;

a reactor vessel, connected to said riser reactor, receiving said cracked vapor products and spent catalyst discharged from said riser reactor, for separating cracked products from spent catalyst, and having an outlet for cracked product vapors and a spent catalyst outlet in a lower portion thereof for spent catalyst;

a catalyst stripper, beneath said reactor vessel and supported by said regenerator vessel, having an inlet in an upper portion thereof for spent catalyst discharged from and connected to said spent catalyst outlet of said reactor vessel, an inlet for stripping gas in a lower portion of said stripper, and an outlet in a lower portion thereof for stripped catalyst;

a vertical, stripped catalyst standpipe having a vertical axis beneath said catalyst stripper having a stripped catalyst inlet in an upper portion thereof for stripped catalyst discharged from said catalyst stripper outlet and a standpipe outlet in a lower portion thereof;

said catalyst regenerator vessel contiguous with and beneath and supporting said stripper, containing said vertical stripped catalyst standpipe;

a catalyst transfer vessel with an elevation at least partially below said regenerator vessel, said catalyst transfer vessel having a spent catalyst inlet connective with said vertical standpipe outlet and further having a fluidization gas inlet, and a transfer vessel outlet for catalyst and fluidizing gas;

a spent catalyst transfer line having an inlet connective with said transfer vessel outlet and having a transfer line outlet;

a coke combustor at an elevation above said transfer vessel having an inlet connective with said spent catalyst transfer line outlet, an inlet for regeneration air in a lower portion thereof, and an outlet in an upper portion thereof for partially regenerated catalyst and flue gas;

a coke combustor transfer line having an inlet for partially regenerated catalyst and flue gas discharged via said coke combustor outlet and having an outlet within said regenerator vessel;

a catalyst/flue gas disengaging means within said renegerator vessel and comprising a vertical cylinder having a vertical axis and axially aligned with and at least partially enclosing said vertical spent catalyst standpipe, said disengaging means having an inlet connective with said coke combustor transfer line outlet, and having upper and lower annular outlets within said regenerator vessel.

5,145,655

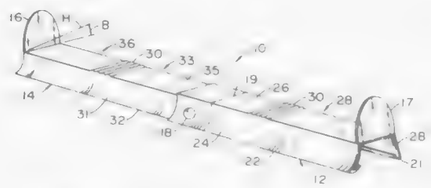
SURGICAL INSTRUMENT RACK AND FACILITATOR

Mariann Darlak, 6 Concord Creek Rd., Glen Mills, Pa. 19342

Filed Dec. 4, 1989, Ser. No. 445,268

Int. Cl.[5] A61L *2/26;* B01L *9/00*

U.S. Cl. 422—300 1 Claim



1. A support rack with an exposed top surface for the purpose of holding upright at least one ring handled surgical instrument comprising:

a polymer base member comprising:

a first section with a solid planar top surface oriented in a plane which is located in the range of 5 to 20 degrees from a horizontal plane, the top surface having a first edge, and a second edge parallel to the first edge, and a third edge and fourth edge transverse to the first and second edges; the top surface being corrugated; the first and second edges being the longest edges of the top surface; a solid planar first side surface attached to the top surface at the first edge of the top surface and extending from the plane of the top surface only on one side of the plane of the top surface; a solid curved second side surface attached to the top surface at the second edge of the top surface and extending from the plane of the top surface only on the same side of the plane of the top surface as the first side surface; and a solid planar protrusion permanently attached to the third edge of the top surface and extending from the plane of the top surface on the opposite side of the plane of the top surface as the first and second side surfaces;

a second section with a solid planar top surface oriented in a plane which is located in the range of 5 to 20 degrees from a horizontal plane, the top surface having a first edge, and a second edge parallel to the first edge, and a third edge and fourth edge transverse to the first and second edges; the top surface being corrugated; the first and second edges being the longest edges of the top surface; a solid planar first side surface attached to the top surface at the first edge of the top surface and extending from the plane of the top surface only on one side of the plane of the top surface; a solid curved second side surface attached to the top surface at the second edge of the top surface and extending from the plane of the top surface only on the same side of the plane of the top surface as the first side surface; and a solid planar protrusion permanently attached to the third edge of the top surface and extending from the plane of the top surface on the opposite side of the plane of the top surface as the first and second side surfaces;

and the first and second sections being interconnected adjacent to the fourth edge of the top surface of each section and the first and second sections being constructed of slightly different dimensions one from the other such that the first section slides over the second section enabling the solid planar protrusion of the first section to be moved closer to and further from the solid planar protrusion of the second section; and the top surfaces of the first and second interconnected sections forming an essentially continuous combined top surface;

and the first side surfaces of the first and second interconnected sections forming an essentially continuous solid first combined surface; and the second side surfaces of the first and second interconnected sections forming an essentially continuous solid second combined surface which is concave and essentially vertical and which is of such curvature as to approximate the shape of a part of a ring of a ring handled surgical instrument;

and the first and second interconnected sections having a stop means to prevent the first and second sections from being disconnected, which stop means is composed of a detent with a bubble in the second section which snaps into a window in the first section when the first section is slid over the second section,

and the first and second sections further having an interconnection means comprising a groove on each first side surface and each second side surface of each section formed by curling bottom edge of each side surface of each section into a semispring.

5,145,656

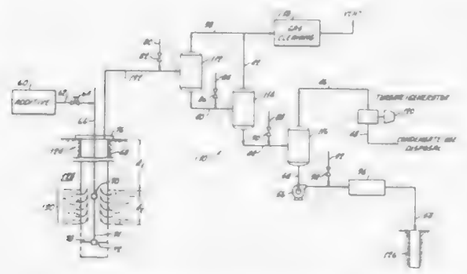
BRINE TREATMENT

Darrell L. Gallup, Chino Hills; Allen W. Doty, Pomona; Morton M. Wong, Placentia; Charles F. Wong, Yorba Linda; John L. Featherstone; Jessie P. Reverente, both of El Centro, and Philip H. Messer, Palm Desert, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 213,770, Jun. 30, 1988, abandoned, which is a continuation of Ser. No. 761,183, Jul. 31, 1985, abandoned, and a continuation-in-part of Ser. No. 458,886, Dec. 29, 1989, which is a continuation-in-part of Ser. No. 345,167, May 1, 1989, Pat. No. 5,082,492. This application Jul. 26, 1990, Ser. No. 559,042

Int. Cl.[5] C22B *3/44, 3/02;* C01G *5/00, 7/00*

U.S. Cl. 423—42 40 Claims



1. A method for recovering at least a portion of one or more metals selected from the group consisting of Ag, Sb, Au and combinations thereof, wherein said metals are recovered from a feed geothermal brine also comprising at least one salt essentially free of said metals, said method comprising:

(1) flowing said feed geothermal brine through a containing means, said means containing pieces of turbulence-producing, iron-bearing packing material, so that scale bearing said metals forms on said packing material and said flowed brine after contacting said material is less corrosive than said feed geothermal brine, and

(2) recovering the scale from the packing material.

5,145,657

METHOD FOR PURIFICATION OF GAS

Motonobu Kobayashi; Kiichiro Mitsui, both of Hyogo; Yoku Nanba, Osaka; Toshihide Kanzaki; Kunio Sano, both of Hyogo; Takehiko Suzuki, Shiga, and Akira Inoue, Osaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 549,828, Aug. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 181,449, Apr. 14, 1988, abandoned. This application Apr. 15, 1991, Ser. No. 684,983

Claims priority, application Japan, Jan. 21, 1987, 62-10008; Jan. 22, 1987, 62-11247

Int. Cl.[5] C01B *13/00, 17/16;* C01C *3/00;* C10H *23/00*

U.S. Cl. 423—219 10 Claims

1. A method for the purification of an ozone-containing gas, which comprises passing said ozone-containing gas through a bed of a catalyst consisting of a component A composed of 95 to 10% by weight of a composite oxide and between 5 and 90% by weight of activated carbon said composite oxide comprising 20 to 95 mol% of (a) TiO_2 and 5 to 80 mol% of (b) at least one oxide selected from the group consisting of SiO_2, ZrO_2 and P_2O_5.

5,145,658

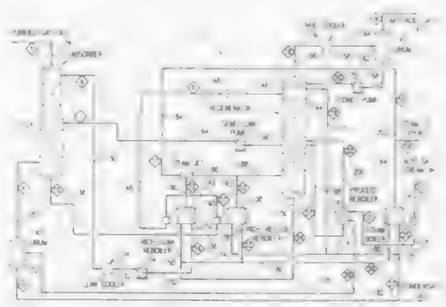
RECLAIMING OF HEAT OF REACTION ENERGY FROM AN ALKALINE SCRUBBING SOLUTION USED IN ACID GAS REMOVAL PROCESSES AND APPARATUS THEREFOR

I-Meen Chao, Overland Park, Kans., assignor to Eickmeyer & Associates, Inc., Overland Park, Kans.

Continuation-in-part of Ser. No. 619,246, Nov. 28, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 755,689

Int. Cl.[5] C01B *17/16, 31/20;* B01D *50/00*

U.S. Cl. 423—232 21 Claims



1. A process for removal of an acid gas from a gaseous mixture comprising the steps of:

bringing the mixture into contact with a sufficient amount of a lean aqueous solution of an alkaline scrubbing agent under an elevated absorption pressure to effect absorption of the acid gas by the agent to produce a rich scrubbing solution and which also results in raising of the temperature of the rich scrubbing solution to a temperature of at least about 180° F. by virtue of the exothermic reaction between the acid gas and the alkaline agent;

regenerating the rich scrubbing solution at a regeneration pressure substantially less than said absorption pressure by subjecting the rich solution to sufficient stripping steam to remove acid gas therefrom so that the resulting lean scrubbing solution may be reused for acid gas absorption;

bringing the rich scrubbing solution at said temperature of at least about 180° F. into indirect heat exchange relationship with condensate at a lower temperature than the rich scrubbing solution and at a pressure above said regeneration pressure,

the temperature approach between the rich scrubbing solution and the condensate being maintained at a value no less than about +2° F.;

maintaining the rich scrubbing solution in heat exchange relationship with said condensate for a time period sufficient to lower the temperature of the scrubbing solution and effect heating of at least a part of the condensate to a level to produce secondary steam; and

collecting the secondary steam and adding such secondary steam to the stripping steam used for regeneration of the rich scrubbing solution.

5,145,659

PREFORMED MATRICES CONTAINING ZEOLITES

John P. McWilliams, Woodbury, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 124,636, Nov. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 905,102, Sep. 8, 1986, abandoned. This application Nov. 20, 1989, Ser. No. 439,007

Claims priority, application European Pat. Off., Apr. 24, 1986, 86303223

Int. Cl.[5] **C01B** *33/34*

U.S. Cl. 423—328 **22 Claims**

1. A process for making a zeolite supported on a matrix comprising

providing preformed particles of a zeolite catalyst matrix material, wherein said matrix material contains at least one source selected from the group consisting of silica, alumina, and alkali metal;

increasing the silica content of a matrix material by contacting the matrix material with a solution of a solicate source,

precipitating said silicate by treating the matrix of increased silicate content with a solution containing a reagent effective to precipitate silicate to provide a source of silicon oxide for zeolite synthesis

wherein said source of silicon oxide is formed by providing a precipitating reagent which is effective to precipitate said silicate from said solution; and

continuously contacting said solution with said precipitating reagent to effect formation of insoluble precipitate;

providing a zeolite synthesis reaction mixture, containing said source of silicon oxide or said source of silicon oxide admixed with a source of alumina, and water, wherein the pH of the reaction mixture is greater than 7, wherein the reaction contains seed crystals in an amount ranging from 0 to 10 weight percent of the matrix;

maintaining said reaction mixture at a temperature of 60° C. to 250° C. until the matrix contains zeolite product in an amount which exceeds that of the seed crystals; and

recovering said matrix containing zeolite product.

5,145,660

PROCEDURE FOR PRODUCTION OF CHLORINE DIOXIDE

Peter Wickström, Bromölla, Sweden, assignor to Eka Nobel AB, Bohus, Sweden

PCT No. PCT/SE89/00679, § 371 Date May 22, 1901, § 102(e) Date May 22, 1991, PCT Pub. No. WO90/05698, PCT Pub. Date May 31, 1990

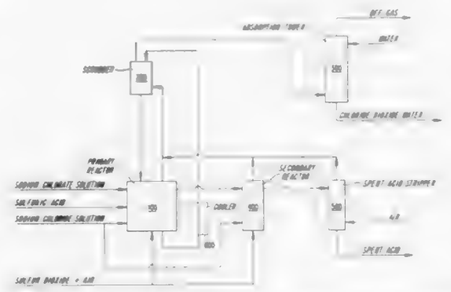
PCT Filed Nov. 21, 1989, Ser. No. 689,846

Claims priority, application Sweden, Nov. 24, 1988, 8804251

Int. Cl.[5] **C01B** *11/02*

U.S. Cl. 423—480 **15 Claims**

1. In a process for producing chlorine dioxide by reacting in a primary reactor a reaction medium comprising sodium chlorate, sulfuric acid and sulfur dioxide as a reducing agent, thereby forming a gaseous mixture containing chlorine dioxide, chlorine byproduct and water, the improvement comprising contacting the gaseous mixture with reaction medium from the primary reactor in a scrubber to thereby remove at least a portion of the chlorine from the gaseous mixture via reaction with the reaction medium in the scrubber, and thereafter recycling the reaction medium from the scrubber to the primary reactor.



5,145,661

METHOD AND CONTRAST AGENT FOR USE IN MAGNETIC RESONANCE IMAGING OF ABSCESS

David R. Schneider, Birmingham, and Kostaki G. Bis, Troy, both of Mich., assignors to Wayne State University, Detroit, Mich.

Division of Ser. No. 238,870, Aug. 31, 1988, Pat. No. 5,045,304. This application Jul. 15, 1991, Ser. No. 730,353

Int. Cl.[5] **G01N** *24/00, 31/00;* **A01N** *1/02;* **A61K** *33/26*

U.S. Cl. 424—9 **5 Claims**

1. A method of preparing and using a contrast agent in magnetic resonance imaging of abscesses in a patient comprising the steps of:

mixing a specific number of viable granulocytes with an aqueous solution of a polymer-coated metallic imaging agent in which said imaging agent binds to and is subsequently incorporated into the granulocytes incubating said aqueous solution to encapsulate said imaging agent in said granulocytes to form labeled granulocytes;

separating said labeled granulocytes from said solution;

suspending said labeled granulocytes in an intravascularly administerable carrier to form said contrast agent;

administering a diagnostically effective amount of said contrast agent by intravenous infusion to said patient; and

subjecting said patient to examination by magnetic resonance imaging.

5,145,662

COSMETIC USE OF DIBENZOYLMETHANE DIORGANOPOLYSILOXANES AND NOVEL COSMETIC COMPOSITIONS CONTAINING SUCH COMPOUNDS FOR THE PROTECTION OF SKIN AND HAIR

Serge Forestier, Claye-Souilly; Gerard Lang, Saint-Gratien, and Herve Richard, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Feb. 13, 1990, Ser. No. 479,524

Claims priority, application France, Feb. 15, 1989, 89 01991

Int. Cl.[5] **A61K** *9/12, 7/025, 7/06, 7/04*

U.S. Cl. 424—45 **13 Claims**

1. A cosmetic composition which comprises in a cosmetically acceptable medium an effective quantity for filtering UV radiation of wavelengths between 280 nm and 360 nm of at least one dibenzoylmethane diorganopolysiloxane having the formula:

(1)

wherein

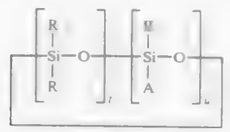
R may be the same for each occurrence or different and is selected from linear or branched C_1–C_{10} alkyl radicals, phenyl radicals and 3,3,3-trifluoropropyl radicals, at least 80% by number of the R radicals being methyl radicals,

B may be the same for each occurrence or different and is selected from radicals R and A,

r is a number between 0 and 200 inclusive,

s is a number between 0 and 50 inclusive and if s is 0 at least one of the two B radicals is A;

and from those having the formula:



(2)

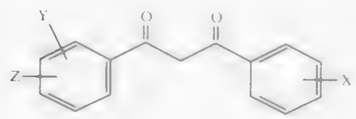
wherein:

R has the meaning defined for formula (1),

u is a number between 1 and 20 inclusive,

t is a number between 0 and 20 inclusive,

t+u is greater than or equal to 3; and wherein in both formulae the symbol A denotes a radical having the formula:



(3)

wherein:

X is selected from a hydrogen atom, a linear or branched C_1–C_8 alkyl radical and a linear or branched C_1–C_8 alkoxy radical,

Y is selected from a hydrogen atom, a hydroxyl group and a linear or branched C_1–C_4 alkoxy radical,

Z is a divalent moiety with the formula:

wherein m is 0 or 1, p is a whole number between 1 and 10 inclusive and W is selected from a hydrogen atom and a C_1–C_4 alkyl radical, provided that when m equals 0, Y represents an alkoxy radical or hydroxy and is ortho to Z.

5,145,663

BIODEGRADABLE DISINFECTANT CONTAINING ANHYDROUS ALCOHOL AND PROPYLENE GLYCOL

Paul L. Simmons, 17819 Simmons Rd., Lutz, Fla. 33549

Continuation of Ser. No. 304,312, Jan. 31, 1989, abandoned. This application Jan. 17, 1991, Ser. No. 642,709

Int. Cl.[5] **A61L** *2/18, 9/14;* **A61K** *31/045, 9/12*

U.S. Cl. 424—47 **7 Claims**

1. A non-toxic, non-corrosive, biodegradable disinfectant and antiseptic for use against various pathogenic organisms, said disinfectant and antiseptic consisting essentially of about 65 to 75% by weight isopropyl alcohol and about 8 to 12% by weight propylene glycol, mixed homogeneously and performing interactively in a proportion by weight such that said propylene glycol reduces the surface glaze formed by said isopropyl alcohol and surface tension formed by water or water-based body fluids enabling said disinfectant to rapidly contact the pathogenic organisms and act equally effective on a patient or inanimate surface without deleterious effect.

5,145,664

MOUTHWASH

William J. Thompson, Ancaster, Canada, assignor to Thompson McKay Pharmaceuticals, Ltd., Ancaster, Canada

Filed Jun. 25, 1991, Ser. No. 720,669

Claims priority, application Canada, Jun. 25, 1990, 2019719

Int. Cl.[5] **A61K** *7/16, 7/22*

U.S. Cl. 424—49 **10 Claims**

1. An alcohol free mouthwash consisting essentially of:

i) sodium chloride:

ii) sodium bicarbonate;

iii) a flavoring agent and as a solubilizing agent herefor, polysorbate 20, being a mixture of partial lauric esters of sorbitol and its mono- and di-anhydrides copolymerized with approximately 20 mols of ethylene oxide for each mol of sorbitol and its anhydrides; and

iv) water, said sodium chloride and sodium bicarbonate being dissolved in said water and present in a suitable quantity to produce a solution substantially isotonic with human oral mucosa.

5,145,665

PREPARATION FOR DENTAL AND ORAL HYGIENE CONTAINING POLYSACCHARIDE SPLITTING ENZYMES

Hans-Juergen Klueppel, Duesseldorf, and Franz Foerg, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP90/00144, § 371 Date Aug. 1, 1991, § 102(e) Date Aug. 1, 1991, PCT Pub. No. WO90/08532, PCT Pub. Date Aug. 9, 1990

PCT Filed Jan. 26, 1990, Ser. No. 730,941

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903348

Int. Cl.[5] **A61K** *7/28, 37/48, 37/54*

U.S. Cl. 424—50 **13 Claims**

1. Oral and dental care preparations containing (A) polysaccharide-splitting enzymes and (B) surfactants in an aqueous carrier, wherein the improvement comprises the presence of alkylglycosides as the surfactants.

5,145,666

METHODS OF REDUCING PLAQUE AND GINGIVITIS WITH REDUCED STAINING

Michael F. Lukacovic, West Chester, and Satyanarayana Majeti, Cincinnati, both of Ohio, assignors to The Proctor & Gamble Co., Cincinnati, Ohio

Filed Oct. 23, 1991, Ser. No. 781,443

Int. Cl.[5] **A61K** *7/16, 7/18*

U.S. Cl. 424—52 **16 Claims**

1. An oral composition effective in treating plaque/gingivitis with reduced staining having a first composition comprising:

(a) a safe and effective amount of stannous fluoride;

(b) a safe and effective amount of stannous gluconate; and

(c) a pharmaceutically acceptable carrier

wherein the pH of said composition is from about 3.0 to about 5.0 and said composition is substantially free of a calcium ion source(s); and a second composition comprising:

(a) a safe and effective amount of a pyrophosphate ion source;

(b) a pharmaceutically acceptable carrier.

wherein said compositions are packaged as a kit of separate containers.

5,145,667
COMPOSITIONS
Nader Ibrahim, and Jeanette L. Sodano, both of Parsippany, N.J., assignors to Beecham Inc., Philadelphia, Pa.
Continuation-in-part of Ser. No. 407,336, Sep. 14, 1989, Pat. No. 4,985,236, which is a continuation-in-part of Ser. No. 348,805, May 18, 1989, Pat. No. 4,923,688. This application May 8, 1990, Ser. No. 520,793
Claims priority, application United Kingdom, Mar. 29, 1990, 9007074
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] A61K 7/16, 7/18
U.S. Cl. 424—52 15 Claims

1. A storage-stable toothpaste, which consists essentially of at least about 4% of a water soluble alkali metal tripolyphosphate salt, from 0.05 to 1.0% by weight of a substantially water insoluble non-cationic anti-bacterial agent, a phosphatase enzyme inhibitor consisting of a fluoride ion source in an amount sufficient to supply about 25 ppm to about 3500 ppm of fluoride, from about 5 to about 60% by weight of a dental abrasive, and an orally acceptable vehicle, the composition having a pH of from about 8 to about 10.

5,145,668
FLUORIDE CONTAINING MOUTH RINSES, DENTIFRICES, AND GELS
Laurence C. Chow, Germantown, and Shozo Takagi, Gaithersburg, both of Md., assignors to American Dental Association Health Foundation, Chicago, Ill.
Continuation-in-part of Ser. No. 322,700, Mar. 3, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 633,628
Int. Cl.[5] A61K 7/18, 33/16
U.S. Cl. 424—52 7 Claims

1. A method for fluoridating teeth with a reactive, multi-component composition comprising:
(a) mixing in an aqueous environment, a first component comprising calcium chloride, with a second component comprising sodium fluorosilicate, an acetate salt, and a sufficient quantity of soluble, non-toxic phosphorous salt to maintain the phosphorous concentration of the multi-component compound at no more than about 1×10^{-3} mol/L the mixture defining a reactive, multi-component composition having a pH of from about 4.5 to about 5.5, wherein the sodium fluorosilicate of the reactive multi-component composition is hydrolyzed, and calcium fluoride is precipitated from the reactive multi-component composition; and
(b) applying the reactive multi-component composition to tooth surfaces for a period of time ranging from about 10 seconds to about 4 minutes.

5,145,669
SUNSCREEN COMPOSITION
Yoon T. Kwak, Brooklyn, N.Y.; Stephen L. Kopolow, Plainsboro, N.J.; Michael W. Pellioff, Westfield, N.J., and Mohammed Tazi, Wayne, N.J., assignors to ISP Investments Inc., Wilmington, Del.
Continuation-in-part of Ser. No. 564,920, Aug. 9, 1990. This application Jul. 19, 1991, Ser. No. 732,847
The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.
Int. Cl.[5] C08F 255/08, 261/06, 267/04, 222/06, 216/12; A61K 7/42
U.S. Cl. 525—313 14 Claims

1. A thickened sunscreen composition having waterproofing properties consisting essentially of a crosslinked, neutralized terpolymer of maleic anhydride, a C_1–C_5 alkyl vinyl ether and a C_{12}–C_{14} alpha-olefin in the molar ratio of about 1:0.90–0.99:0.01–0.10, an ultraviolet sunscreening agent, an emulsifier and water.

5,145,670
NAIL ENAMELS CONTAINING GLYCERYL, GLYCOL OR CITRATE ESTERS
Anthony Castrogiovanni, Belford; Robert W. Sandewicz, Spotswood, and Steven W. Amato, Fanwood, all of N.J., assignors to Revlon, Inc., New York, N.Y.
Division of Ser. No. 516,495, Apr. 30, 1990, Pat. No. 5,066,484. This application Aug. 30, 1991, Ser. No. 753,127
Int. Cl.[5] A61K 7/04
U.S. Cl. 424—61 8 Claims

1. A formaldehyde free nail enamel comprising a film forming component, a solvent component, and a plasticizer component, where the plasticizer component comprises one or more compounds of the formula:

$$R_1—C(O)—OCH_2—C(CH_3)_2—CH_2O—C(O)R_2 \quad (III)$$

wherein R_1 and R_2 are the same or different and represent
(i) linear or branched alkyl having 1 to 35 carbon atoms, cyclic alkyl having 3 to 8 carbon atoms, or linear or branched alkenyl having 2 to 35 carbon atoms, any of the foregoing being unsubstituted or substituted with one, two or three groups selected from the group consisting of

—CN, —SCN, —OH, —SH, $—NH_2$, $—CONH_2$, and $—NO_2$;

(ii) —X—C(O)O—A or —X—O—C(O)—A in which X is a straight or branched alkyl or alkenyl bridge containing up to 8 carbon atoms or is a phenyl ring $—C_6H_4—$, and A is phenyl, straight or branched alkyl having 1 to 35 carbon atoms, or straight or branched alkylene having 2 to 35 carbon atoms, wherein when X or A is alkenyl or alkenyl it is optionally substituted with —CN, —SCN, $—NO_2$, —OH, —SH, $—NH_2$ or $—CONH_2$ and wherein when X or A is phenyl it is optionally substituted with one, two or three substituents selected from the group consisting of —CN, —SCN, —Cl, —Br, —F, $—OCH_3$, $—OC_2H_5$, OC_6H_5, $—CH=CH_2$, C_{1-6}alkyl, $—CH_2CH=CH_2$, $—NO_2$, $—NH_2$, —OH, —SH, and $—SO_2NH_2$;
is a phenyl ring $—CH_6H_4—$, and A is phenyl straight or branched alkyl having 1 to 35 carbon atoms, or straight or branched alkylene having 2 to 35 carbon atoms,
(iii) a dimer or trimer acyl group; or
(iv) BZ;
wherein BZ is a phenyl ring which is unsubstituted; or substituted with one or two groups of the formula —C(O)OR_5 wherein R_5 is phenyl, straight or branched alkyl containing 1 to 35 carbon atoms, or straight or branched alkenyl containing 2 to 35 carbon atoms, the alkyl and alkenyl optionally substituted with —CN, —SCN, $—NO_2$, —OH, —SH, $—NH_2$ or $—CONH_2$; or substituted with one, two or three substituents selected from the group consisting of
—CN, —SCN, —Cl, —Br, —F, $—OCH_3$, $—OC_2H_5$, $—OC_6H_5$,
$—CH=CH_2$, C_{1-6}alkyl $—CH_2CH=CH_2$, $—NO_2$, NH_2, —OH, —SH, and $—SO_2NH_2$.

5,145,671
NAIL ENAMELS CONTAINING GLYCERYL, GLYCOL OR CITRATE ESTERS
Anthony Castrogiovanni, Belford; Robert W. Sandewicz, Spotswood, and Steven W. Amato, Fanwood, all of N.J., assignors to Revlon, Inc., New York, N.Y.
Division of Ser. No. 516,495, Apr. 30, 1990, Pat. No. 5,066,484. This application Aug. 30, 1991, Ser. No. 751,832
Int. Cl.[5] A61K 7/04
U.S. Cl. 424—61 8 Claims

1. A nail enamel comprising a film forming component, a solvent component, and a plasticizer component, wherein the plasticizer component comprises one or more compounds of the formula:

$$R_1—C(O)—O(Y)_d—C(O)R_2 \quad IV$$

wherein R_1 and R_2 are the same or different and represent
(i) linear or branched alkyl having 1 to 35 carbon atoms, cyclic alkyl having 3 to 8 carbon atoms, or linear or branched alkenyl having 2 to 35 carbon atoms, any of the foregoing being unsubstituted or substituted with one, two or three groups selected from the group consisting of —CN, —SCN, —OH, —SH, $—NH_2$, $—CONH_2$, and $—NO_2$;
(ii) —X—C(O)O—A or —X—O—C(O)—A in which X is a straight or branched alkyl or alkenyl bridge containing up to 8 carbon atoms or is a phenyl ring $—C_6H_4—$, and A is phenyl, straight or branched alkyl having 1 to 35 carbon atoms, or straight or branched alkylene having 2 to 35 carbon atoms, wherein when X or A is alkenyl or alkenyl it is optionally substituted with —CN, —SCN, $—NO_2$, —OH, —SH, $—NH_2$ or $—CONH_2$ and wherein when X or A is phenyl it is optionally substituted with one, two or three substituents selected from the group consisting of —CN, —SCN, —Cl, —Br, —F, $—OCH_3$, $—OC_2H_5$, OC_6H_5, $—CH=CH_2$, C_{1-6}alkyl, $—CH_2CH=CH_2$, $—NO_2$, $—NH_2$, —OH, —SH, and $—SO_2NH_2$, is a phenyl ring $—C_6H_4—$, and A is phenyl, straight or branched alkyl having 1 to 35 carbon atoms, or straight or branched alkylene having 2 to 35 carbon atoms,
(iii) a dimer or trimer acyl group; or
(iv) BZ;
wherein BZ is a phenyl ring which is unsubstituted; or substituted with one or two groups of the formula —C(O)OR_5 wherein R_5 is phenyl, straight or branched alkyl containing 1 to 35 carbon atoms, the alkyl and alkenyl optionally substituted with —CN, —SCN, $—NO_2$, —OH, —SH, $—NH_2$ or $—CONH_2$; or substituted with one, two or three substituents selected from the group consisting of —CN, —SCN, —Cl, —Br, —F, $—OCH_3$, $—OC_2H_5$, $—OC_6H_5$, $—CH=CH_2$, C_{1-6}alkyl, $—CH_2CH=CH_2$, $—NO_2$, NH_2, —OH, —SH, and $—SO_2NH_2$. and wherein d is 1 to 1,000;
each Y is ethoxy, isopropoxy or propoxy.

5,145,672
Patent Not Issued For This Number

5,145,673
QUENCHING AND DEODORIZING COMPOSITIONS
Kazuo Koizumi, Kobe, Japan, assignor to Ork Corporation, Osaka, Japan
Filed Jan. 25, 1991, Ser. No. 645,736
Claims priority, application Japan, Feb. 14, 1990, 2-34956; Nov. 22, 1990, 2-319940
Int. Cl.[5] A61L 9/00
U.S. Cl. 424—76.1 7 Claims

1. A method for quenching and deodorizing cigarettes, which comprises quenching and deodorizing cigarettes with a gel liquid containing water, a deodorizing agent, said deodorizing agent being an extract with an organic solvent of a water-extract of roasted plant fiber substances and wherein said viscosity-imparting agent is selected from the group consisting of propylene glycol, ethylene glycol and glycerol a water-absorbing polymer or thickener, and a viscosity-imparting agent.

5,145,674
BIOLOGICALLY-ACTIVE COMPOUNDS COMPRISING A BIOLOGICALLY-ACTIVE ANIONIC PORTION AND A WATER-INSOLUBLE, INORGANIC CATIONIC PORTION
George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 30, 1991, Ser. No. 693,838
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[5] A61K 31/74, 31/60, 31/19
U.S. Cl. 424—78.06 8 Claims

2. A biologically-active compound having the chemical formula:

$$M^1_{1-z}Q^{a+1}{}_zO_y(OH)_bA^{-1}{}_dA^{-2}{}_eA^{-3}{}_fA^{-4}{}_g \cdot nH_2O$$

wherein M is a metal element having a positive valence of a,
Q is a metal element having a positive valence of a+1,
A^{-1}, A^{-2}, A^{-3}, A^{-4}, are each exchangeable anions having a valence of −1, −2, −3, and −4, respectively, at least one of the exchangeable anions being an analgesic anion,
a is 2, 3, 4, or 5,
x is greater than zero and less than or equal to about 0.5,
Y, z, d, e, f, and g are each greater than or equal to zero,
2Y+z is equal to a,
d+2e+3F+4g is grater than zero and less than or equal to x, and
n is greater than or equal to zero and less than or equal to about 10.

5,145,675
TWO STEP METHOD FOR PREPARATION OF CONTROLLED RELEASE FORMULATIONS
Richard Won, Palo Alto, Calif., assignor to Advanced Polymer Systems, Inc., Redwood City, Calif.
Continuation of Ser. No. 334,051, Apr. 5, 1989, abandoned, which is a division of Ser. No. 91,641, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 810,478, Dec. 18, 1985, abandoned, and a continuation-in-part of Ser. No. 846,321, Mar. 31, 1986, abandoned, and a continuation-in-part of Ser. No. 896,956, Aug. 15, 1986, abandoned, and a continuation-in-part of Ser. No. 925,081, Oct. 30, 1986, abandoned, and a continuation-in-part of Ser. No. 925,082, Oct. 30, 1986, abandoned, and a continuation-in-part of Ser. No. 932,613, Nov. 11, 1986, abandoned, and a continuation-in-part of Ser. No. 933,243, Nov. 21, 1986, abandoned, and a continuation-in-part of Ser. No. 936,520, Dec. 1, 1986, abandoned, Division of Ser. No. 940,754, Dec. 10, 1986, abandoned. This application Jan. 23, 1991, Ser. No. 644,869
Int. Cl.[5] C08J 9/28
U.S. Cl. 424—78.31 18 Claims

1. A method for preparing a delivery system for an active substance, said method comprising:
polymerizing monomers suspended in an immiscible phase in the presence of a porogen to form a plurality of rigid cross-linked polymer beads each defining a substantially non-collapsible internal pore network having residual porogen therein, wherein the beads have a cross-linking density in the range from 20% to 80% and the pore network is open to the exterior of the beads;
extracting substantially all residual porogen from the internal pore network; and
introducing the active substance into the internal pore network after the porogen has been substantially completely extracted, whereby the porogen and polymerization conditions may be selected to provide pore dimensions which result in desired release characteristics for an active substance from the beads.

5,145,576

METHOD AND AGENTS FOR PROMOTING WOUND HEALING

Thomas J. Fahey, III; Barbara A. Sherry, both of New York, and Anthony Cerami, Shelter Island, all of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 399,971, Sep. 1, 1989, which is a continuation-in-part of Ser. No. 240,078, Sep. 2, 1988, and Ser. No. 377,937, Jul. 10, 1989, and a continuation-in-part of Ser. No. 238,937, Sep. 2, 1988, each is a continuation-in-part of Ser. No. 104,827, Oct. 2, 1987, which is a continuation-in-part of Ser. No. 766,852, Aug. 16, 1985, which is a continuation-in-part of Ser. No. 414,098, Sep. 7, 1982, Pat. No. 4,603,106, which is a continuation-in-part of Ser. No. 351,290, Feb. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 299,932, Sep. 8, 1981, abandoned. This application Feb. 7, 1991, Ser. No. 652,198

Int. Cl.[5] A61K *37/00*

U.S. Cl. 424—85.1 16 Claims

1. A method of treating wound healing dysfunction in mammals including humans, comprising administering to a mammal a therapeutically effective amount of a wound healing modulator comprising a material selected from the group consisting of an agent for enhancing wound healing, binding partners thereto, and muteins and fragments thereof, wherein said agent possesses the following characteristics:

(a) capable of modulating colony stimulating factor (CSF)-dependent hematopoiesis;

(b) capable of binding to heparin; and

(c) capable of inducing localized inflammation characterized by polymorphonuclear cell infiltration when administered subcutaneously.

5,145,677

PROCESS FOR TREATMENT OF DISEASES

Johann-Friedrich von Eichborn, Huttisheim; Hans-Joachim Obert, and Josef Brzoska, both of Laupheim, all of Fed. Rep. of Germany, assignors to Biferon Biochemische Substanzen GmbH & Co., Laupheim, Fed. Rep. of Germany

Continuation of Ser. No. 784,419, Oct. 4, 1985, abandoned. This application Apr. 18, 1990, Ser. No. 510,714

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436637; Oct. 5, 1984, 3436638; Jun. 18, 1985, 3521733

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] A61K *37/66*

U.S. Cl. 424—85.5 26 Claims

1. A process for treating diseases characterized by tumorigenic or neoplastic cell growth, malignant hematological systemic diseases, viral diseases, asthma, carcinomas, sarcomas, myelomas, lymphomas, papillomas, Chrohn's disease, degenerative diseases, allergic diseases psoriasis and pain comprising the step of systemically administering to a mammal a pharmaceutically effective low dosage of gamma interferon of between about 0.1 million International Units (10 μg) and 2 million International Units (200 μg) per day per 1.7M^2 of body surface.

5,145,678

METHOD OF REDUCING BLOOD SERUM CHOLESTEROL

Dusko Gakic, and Mileva Gakic, both of 15139 Leadwell St., Van Nuys, Calif. 91405

Filed Jan. 22, 1991, Ser. No. 643,608

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.1 5 Claims

1. An improved method of treating hypercholesterolemia in humans in need of instant treatment to reduce human serum cholesterol, said method comprising:

a) ingesting orally a mixture of beet juice, lemon juice, and bee honey once daily for a period of time sufficient to reduce serum cholesterol, and

b) wherein said mixture weighs about 3.5 fluid ounces and has the proportions of about 1 part by volume of beet juice, about 1 part by volume of lemon juice, and about 0.4 parts by volume of bee honey.

5,145,679

TOPICAL EMOLLIENT FOR PREVENTION AND TREATMENT OF CIRCULATORY INDUCED LESIONS

Joan B. Hinson, 2145 Third Creek Church Rd., Cleveland, N.C. 27013

Continuation-in-part of Ser. No. 417,239, Oct. 5, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 594,286

Int. Cl.[5] A61K *9/06, 31/70, 37/26, 31/715*

U.S. Cl. 424—401 5 Claims

1. A topical emollient for the treatment of skin lesions and disorders consisting essentially of:

a mixture of an effective amount of a glucose solution containing insulin sufficient to treat skin disorders.

5,145,680

EYE DROP FORMULATION USEFUL FOR TREATING LESIONS OF CORNEAL EPITHELIUM

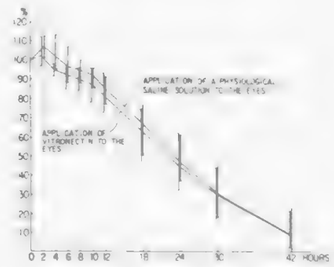
Masao Hayashi, 3-23-7-202, Otsuka, Bunkyo-ku, Tokyo 112, Japan, assignor to Masao Hayashi and Nisshin Flour Milling Co., Ltd., both of Tokyo, Japan, a part interest

Filed Oct. 9, 1990, Ser. No. 594,094

Claims priority, application Japan, Feb. 13, 1989, 1-31098; PCT Int'l Appl., Feb. 13, 1990, PCT/JP90/00173

Int. Cl.[5] C07K *1/02, 15/06*

U.S. Cl. 424—427 2 Claims



1. An eye drop formulation for treating lesions of the corneal epithelium comprising a Vitronectin solution having a concentration of 0.1 μg/ml–500 μg/ml.

5,145,681

COMPOSITIONS CONTAINING PROTEASE PRODUCED BY VIBRIO AND METHOD OF USE IN DEBRIDEMENT AND WOUND HEALING

Donald Z. Fortney, Baltimore, and Donald R. Durham, Gaithersburg, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Aug. 15, 1990, Ser. No. 567,884

Int. Cl.[5] A61K *37/54*

U.S. Cl. 424—94.63 27 Claims

1. A composition comprising at least one pharmaceutically acceptable carrier admixed with a protease in an effective amount for treating wounds, said protease selected from the group consisting of:

(a) an extracellular neutral protease produced by cultivation of *Vibrio proteolyticus* ATCC 53559, said protease characterized by the following properties:

i. hydrolyzes components of necrotic tissue including denatured collagen, elastin, and fibrin;

ii. does not substantially hydrolyze native tissue in vivo; and

iii. exhibits about 80% to about 95% activity when stored at 25° C. in a topical formulation for at least sixty days; and

(b) a protease expressed by recombinant host cells which have been transformed or transfected with an expression vector for said protease (a).

5,145,682

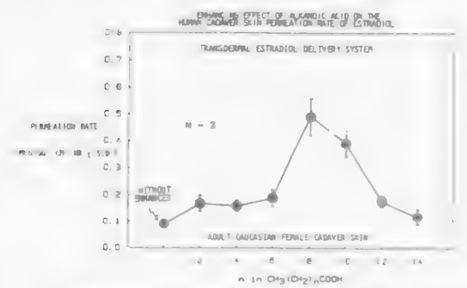
TRANSDERMAL ABSORPTION DOSAGE UNIT FOR POSTMENOPAUSAL SYNDROME TREATMENT AND PROCESS FOR ADMINISTRATION

Yie W. Chien, North Brunswick, and Te-Yen Chien, Branchburg, both of N.J., assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.

Continuation-in-part of Ser. No. 868,709, May 30, 1986, Pat. No. 4,883,669. This application Mar. 8, 1989, Ser. No. 320,570

Int. Cl.[5] A61F *13/02*

U.S. Cl. 424—448 20 Claims



1. A transdermal dosage unit for treatment of postmenopausal syndrome having the following backing layer and adhesive polymer layer:

a) a backing layer which is substantially impervious to an effective estrogen to be delivered transdermally from the adhesive polymer layer and transdermal absorption agent components of the adhesive polymer layer; and

b) an adhesive polymer layer which is adhered to said backing layer and which has dispersed therein within microreservoirs an effective daily dosage amount of an estrogen effective in treatment of postmenopausal syndrome, said adhesive polymer being biocompatible, compatible with said estrogen and permitting said estrogen to be transdermally absorbed; said adhesive polymer layer having one or more transdermal absorption enhancing agents microdispersed therein predominantly on a weight basis in the form of microreservoirs having diameters within the range of about 1 to about 150 microns, said transdermal absorption agent or agents selected from biocompatible compounds having at least six carbon atoms and which are capable of forming microreservoirs during microdispersion with said adhesive polymer and estrogen to encapsulate said estrogen in said adhesive polymer used to encapsulate said estrogen in said adhesive polymer used to make said adhesive polymer layer and being substantially insoluble or insoluble in water;

said dosage unit capable of delivering to the subject being treated a daily estrogen dosage for at least a term of one day to about seven successive days.

5,145,683

NIFEDIPINE-CONTAINING PHARMACEUTICAL COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

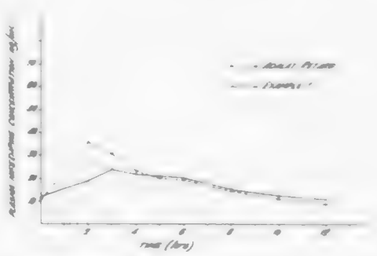
Alan Rhodes, Ely, United Kingdom, assignor to Ethical Pharmaceuticals, Ltd., Cambridgeshire, United Kingdom

Filed Jan. 30, 1990, Ser. No. 472,659

Claims priority, application United Kingdom, Feb. 14, 1989, [redacted]

Int. Cl.[5] A61K *9/14, 9/22, 9/52*

U.S. Cl. 424—451 18 Claims



1. A pharmaceutical composition which has a decreased dissolution rate of nifedipine and which consists essentially of particles of a pharmaceutically acceptable water soluble diluent coated with microcrystalline particles of nifedipine in the presence of polyvinylpyrrolidone, the majority of the particles of nifedipine having a particle size of at most 100 micrometers and the polyvinylpyrrolidone being present in an amount of from 10 to 90% by weight based on the weight of the nifedipine, wherein the ratio of the polyvinylpyrrolidone to the nifedipine decreases the dissolution rate of nifedipine.

5,145,684

SURFACE MODIFIED DRUG NANOPARTICLES

Gary G. Liversidge, West Chester; Kenneth C. Cundy, Pottstown, both of Pa.; John F. Bishop, Rochester, and David A. Czekai, Honeoye Falls, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 25, 1991, Ser. No. 647,105

Int. Cl.[5] A61K *9/14*

U.S. Cl. 424—489 20 Claims

1. Particles consisting essentially of 99.9–10% by weight of a crystalline drug substance having a solubility in water of less than 10 mg/ml, said drug substance having a non-crosslinked surface modifier adsorbed on the surface thereof in an amount of 0.1–90% by weight and sufficient to maintain an effective average particle size of less than about 400 nm.

5,145,685

SKIN TREATMENT METHOD AND COMPOSITION

Walter J. Carmody, Port Jervis, N.Y., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 8, 1991, Ser. No. 682,056

Int. Cl.[5] A61K *9/50, 7/35*

U.S. Cl. 424—501 20 Claims

1. A method of treating skin disorders comprising (I) apply-

ing topically to the skin a mixture of an antimicrobial agent and a volatile low viscosity organosilicon compound, the mixture being entrapped within and dispersed uniformly throughout discrete particles of a hydrophobic macroporous highly crosslinked polymer, (II) spreading the particles on the skin in order to release the mixture, (III) allowing the volatile low viscosity organosilicon compound to evaporate and, (IV) adsorbing oil from the skin into the macroporous polymer, the mixture of the antimicrobial agent and the volatile low viscosity organosilicon compound being in the weight ratio of 50:50 to 70:30 antimicrobial agent to organosilicon compound.

5,145,686

TOPICAL PHARMACEUTICAL COMPOSITIONS

David F. Horrobin, Montreal, Canada, and Julian Lieb, Bethany, Conn., assignors to Efamol Limited, London, United Kingdom

Continuation of Ser. No. 312,730, Feb. 17, 1989, abandoned, which is a continuation of Ser. No. 89,035, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 786,517, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 458,466, Jan. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 345,204, Feb. 3, 1982, abandoned. This application Jan. 8, 1992, Ser. No. 818,501

Int. Cl.[5] A61K *33/14, 33/04, 33/00, 31/61*

U.S. Cl. 424—677 **4 Claims**

1. A pharmaceutical composition for topical application which comprises (a) at least one physiologically acceptable lithium salt in an amount sufficient to provide about 8% by weight of lithium ions in said composition, and (b) about 3% by weight of evening primrose oil.

5,145,687

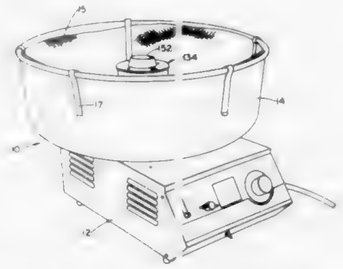
COTTON CANDY MACHINE

Donald A. Parker, Springfield Township, Hamilton County, Ohio, assignor to Gold Medal Products Co., Cincinnati, Ohio

Filed Sep. 28, 1987, Ser. No. 101,568

Int. Cl.[5] A23G *3/00*

U.S. Cl. 425—9 **3 Claims**



1. A spinner assembly for a cotton candy machine which comprises a tubular wall member having an upright wall provided with a plurality of slots, a tubular heater element supported by the wall member in close proximity with the slots, the wall member being of steel, and a dialectical flame sprayed coating on the wall member to insulate the wall member from the heater element.

5,145,688

APPARATUS FOR VULCANIZING PNEUMATIC TIRES

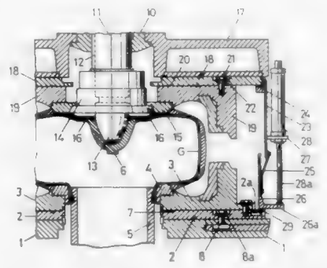
Yasuhide Ohtake, Miyagi, Japan, assignor to Toyo Tire & Rubber Co., Ltd.

Filed Oct. 3, 1990, Ser. No. 592,143

Int. Cl.[5] B29C *35/02*

U.S. Cl. 425—28.1 **2 Claims**

1. A vulcanizing apparatus of the two-piece mold type for pneumatic tires comprising an upper mold section for molding one side carcass and one half of the tread of a pneumatic tire, a lower mold section for molding the opposite side carcass and the other half of the tread, said upper mold being liftable with respect to the lower mold section, an upper sealing plate disposed between said upper mold section and an upper platen for fixing said upper mold section, said upper sealing plate covering the upper surface of said upper mold section and having a greater outer diameter than that of the upper mold section, a lower sealing plate disposed between said lower mold section and a lower platen for fixing said lower mold section, said lower sealing plate covering the lower surface of said lower mold section and having a greater outer diameter than that of the lower mold section, the contact region between the upper mold section and the upper sealing plate and the contact region between the lower mold section and the lower sealing plate being airtightly defined, a cylindrical upper cover surrounding



said upper mold section, said cylindrical upper cover being airtightly fixed at its upper end to the outer periphery of the lower surface of the upper sealing plate, a cylindrical lower cover loosely fitted to the upper cover and surrounding the lower mold section, said cylindrical lower cover being connected to the lower end of said upper cover through a flexible seal tube so as to hang therefrom, a plurality of air cylinders fixed at equal intervals to the outer surface of the upper cover with their piston rods directed downward, the front ends of said piston rods being connected to the lower end of the lower cover to urge the latter downward, the urging providing airtight contact surfaces when the lower edge of the lower cover contacts the lower sealing plate, said upper cover, seal tube, lower cover and upper and lower sealing plates forming an expansible cover, the latter being provided with an exhaust port for connecting the inner space to a low pressure source.

5,145,689

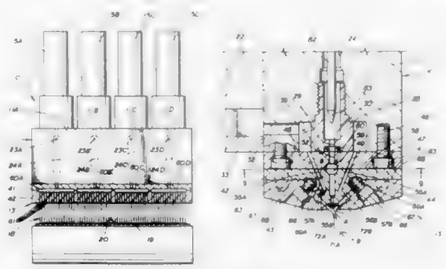
MELTBLOWING DIE

Martin A. Allen, and John T. Fetcko, both of Dawsonville, Ga., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Oct. 17, 1990, Ser. No. 599,006

Int. Cl.[5] B29C *47/12;* D01D *5/14*

U.S. Cl. 425—72.2 **5 Claims**



1. A meltblowing die assembly comprising

(a) a die body having a polymer flow passage formed therein;

(b) a meltblowing die secured to the die body and comprising (i) a die tip having a nosepiece terminating in an elongate apex, (ii) a plurality of orifices formed in the nosepiece, (iii) air plates mounted on the die tip and in combination with the nosepiece defining converging air channels which meet at the apex, and (iv) means for conducting polymer from the die body flow passage to the orifices;

(c) a valve mounted in the polymer flow passage and comprising (i) a valve insert having a port formed therein and disposed in the polymer flow passage, (ii) a cylindrical opening immediately upstream of said port, and (iii) a stem extending into said polymer flow passage and having one end shaped to fit in close conformity in said cylindrical opening and seat on said port and an opposite end positioned outside of said polymer flow passage; and

(d) means operative on said opposite end of the stem for moving said stem between a closed position and an open position in relation to said port whereby movement to the closed position causes said one end of the stem to enter the cylindrical opening creating a fluid surge through the port and the orifices downstream thereof.

2. A meltblowing die comprising

(a) a die body having a mounting surface and plurality of separate polymer flow passages formed side-by-side therein in spaced apart relation, each flow passage having (i) an inlet and (ii) a circular outlet formed in the mounting surface of the die body, said outlets having axes which lie in the same plane;

(b) a die tip assembly having

(i) a base mounted on said mounting surface and having formed therein a plurality of elongate polymer header channels arranged in end-to-end relation, said base further including means for conducting polymer from each outlet through an associated die base polymer flow passage to an associated one of the header channels;

(ii) a die tip having a nosepiece extending outwardly from said base and terminating in an elongate apex and having polymer orifices arranged in side-by-side relation along the apex, and means interconnecting each polymer header channel with a longitudinal portion of the orifices; and

(iii) air plates mounted on the die tip and having surfaces which in combination with the nosepiece define converging air channels which meet at the apex of the nosepiece;

(c) means for delivering a polymer melt to each inlet of the die body whereby the polymer melt flows through the die in parallel side-by-streams comprising a polymer flow passage, a header channel and a longitudinal portion of the orifices;

(d) a valve seat mounted in each die body polymer flow passage outlet; and

(e) a valve actuator assembly for each valve seat and including (i) a valve actuator mounted on the die body, (ii) a valve stem having one end connected to the valve actuator and the opposite end adapted to seat on the valve seat, and (iii) means for activating the valve actuator to selectively move the valve stem to an open or closed position on the valve seat.

5,145,690

HAMBURGER MAKING MACHINE

Narcis G. Riubrugent, Gerona, Spain, assignor to Industrias Gaser, S.L., Gerona, Spain

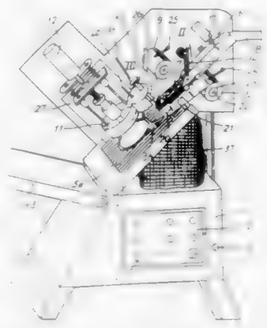
Filed Jul. 8, 1991, Ser. No. 726,568

Claims priority, application Spain, Jul. 27, 1990, 9002030

Int. Cl.[5] A22C *7/00*

U.S. Cl. 425—89 **8 Claims**

1. A hamburger making machine, comprising: a bench structure including a cabinet for supporting electrical and control elements, said bench structure including a platform with an upper part; chopped meat inlet channel means positioned on said bench structure upper part for receiving and transporting a supply of chopped meat and means for cutting off said supply of chopped meat at intervals; regulation means for regulating the passage of said chopped meat supply through said chopped meat inlet channel means; roller means for supporting rolls of flexible sheet material and for dispensing said flexible sheet material, said roller means including inertial brakes for regulating the dispensing of said flexible sheet material and end of roll detection means for detecting when said flexible sheet material has been consumed; press means, positioned and supported adjacent said bench structure, adjacent an outlet of said roller means and adjacent an outlet of said chopped meat inlet channel means, said outlet of said chopped meat inlet channel means and said outlet of said roller means being arranged such that said flexible sheet material is disposed above and below chopped meat exiting from said outlet of said chopped meat inlet channel means, said press means including a hamburger shaper element and a die press mechanism for cutting and shaping chopped meat into hamburger elements with said sheet material above and below the chopped meat; indicator marks positioned at intervals on said sheet material on one of said



rolls; photoelectric cell means positioned between said roller means outlet and said press means for detecting said indicator marks and activating said press means responsive to detected indicator marks for forming individual hamburgers; rod means positioned adjacent said outlet of said chopped meat inlet channel means for acting on said chopped meat for restricting movement of said chopped meat for assisting separation of said chopped meat from meat being acted on by said press means, in conjunction with movement of said press means; antiblocking means, positioned adjacent with said chopped meat inlet channel means for detecting an obstruction in the form of an accumulation of chopped meat adjacent said outlet of said chopped meat inlet channel means and shutting off said press means in response to a detected obstruction; apertures formed in said platform; an air line positioned above said apertures for driving scraps of said sheet material through said apertures; serrations formed on said platform at a location below said press means, said serrations providing grooves for preventing a shaped hamburger from adhering to said platform; and endless conveyor means positioned adjacent a lower part of said platform for carrying away shaped hamburgers.

5,145,691

APPARATUS FOR PACKING FILLER INTO THROUGH-HOLES OR THE LIKE IN A PRINTED CIRCUIT BOARD

Shin Kawakami; Satoshi Haruyama, and Hirotaka Okonogi, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Mar. 22, 1991, Ser. No. 674,680

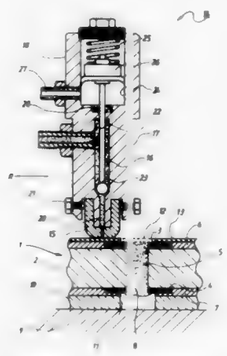
Claims priority, application Japan, Jul. 18, 1990, 2-190155

Int. Cl.[5] B29C *47/08, 47/10*

U.S. Cl. 425—110 **11 Claims**

1. An apparatus for packing filler of conductive material into through-holes or the like in a printed circuit board, comprising:

a packing nozzle having a packing means for delivering filler of conductive material or the like through a delivery opening integrated with said packing means, a delivery valve mounted to said delivery opening, a manipulating means on the upper part of said nozzle for manipulating said delivery valve, and a nozzle tip attachable to and detachable from said delivery opening;



a mask having packing holes disposed in positions corresponding to those of through-holes on said printed circuit board, said mask being mountable on the upper side of said printed circuit board; and

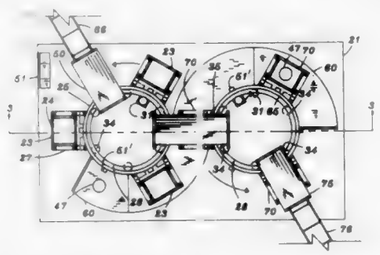
a covering plate having escape holes in positions corresponding to those of through-holes on said printed circuit board, said covering plate being disposable on the lower side of said printed circuit board.

5,145,692

BRICK MAKING APPARATUS

Judson A. Hereford, Rt. 2, Box 3144, Nacogdoches, Tex. 75961

Filed Jan. 2, 1991, Ser. No. 636,726
Int. Cl.[5] B28C *43/00*
U.S. Cl. 425—139 5 Claims



1. A portable brick manufacturing apparatus, said apparatus comprising a readily transportable support member providing a floor support surface;

a first brick making system comprising a ring member;

means for mounting said ring member on said floor support surface for rotation about a substantially vertical axis through the center of said ring member, said ring member having an external periphery and at least three mold boxes removably attached to said ring member at spaced intervals about the external periphery thereof, each said mold box including a bottomless frame member which is open at a top end and having side walls defining a mold enclosing area;

indexing control means for rotating said ring member about its central axis in intermittent steps wherein said mold boxes are sequentially moved in intermittent steps of arcuate movement along a circular path to a soil receiving fill station, a soil compacting station, and a brick ejection station, said stations being equiangularly spaced with respect to the axis of rotation of said ring member;

a slide plate mounted on said support surface in substantially parallel relation thereto and extending from said soil receiving station to said compacting station along the circular path traveled by said mold boxes, said slide plate being supported in abutting engagement with the frame members of the mold boxes when at the fill station and compacting station to provide a bottom for the mold boxes at said fill and compacting stations and when in movement therebetween;

a blender device positioned over said soil receiving fill station;

first conveyor means for delivering soil to said blender device;

second conveyor means for delivering chemical additives to said blender device at a predetermined rate, said blender device being operative to blend said soil and chemical additives and deliver the blended soil and chemical additives to a mold box located at said soil receiving station;

a weight sensor mounted in said slide plate at the soil receiving station for signaling when a predetermined weight of soil and additives are deposited in a mold box at the soil receiving station, said indexing control means being responsive to a signal from the weight sensor for controlling the weight of soil and additives which are deposited in the mold box at the soil receiving station;

a first ram means located at said compacting station for compacting the soil and additives in the mold box located at said compacting station to form a brick;

a second ram means located at said ejection station for ejecting a brick from a mold box located at said ejection station;

a second brick making system identical to said first brick making system wherein the ring member of said second system is mounted on said floor surface in substantially co-planar relationship with the ring member of said first brick making system; and wherein

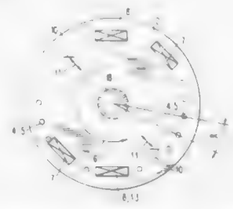
the slide plate of said second brick making system is a co-planar continuous extension of the slide plate of said first brick making system and the soil compacting station of said second brick making system is coincident with the soil compacting station of said first brick making system.

5,145,693

ARRANGEMENT FOR MONITORING PRESSING FORCES IN A PELLETIZING MACHINE

Jürgen Hinzpeter; Ingo Schmidt; Heinrich Behrmann, all of Schwarzenbek; Jörg Reitberger, Hamburg, and Klaus-Peter Preuss, Mölln, all of Fed. Rep. of Germany, assignors to Firma Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Nov. 8, 1990, Ser. No. 611,176
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1989, 3939956
Int. Cl.[5] B29C *43/08*
U.S. Cl. 425—149 8 Claims



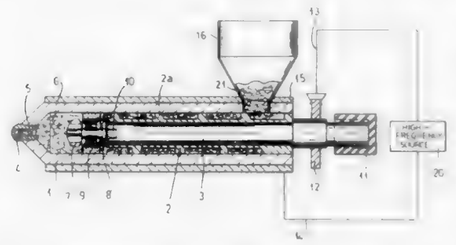
1. A pelletizing machine, comprising a rotatable matrix disc; plungers whose maximum pressing forces are supplied for evaluation; and a computer to which the maximum pressing forces of the plungers are supplied for evaluation; and angle pulse transmitter supplying pulses released by the matrix disc during its rotation into said computer for an association to measured maximum pressing forces, said matrix disc being provided with a drive, said drive being provided with a coded signal transmitter for said angle pulse transmitter.

5,145,694

APPARATUS FOR THE PLASTIFYING OF THERMOPLASTIC SYNTHETIC RESINS

Peter Brams, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,722
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1990, 4024070
Int. Cl.[5] B29C *45/74, 47/80*
U.S. Cl. 425—174.8 R 13 Claims



1. An apparatus for plastifying a thermoplastic synthetic resin, said apparatus comprising:

an extruder having a worm cylinder formed with an inlet for receiving a thermoplastic synthetic resin to be plastified and, spaced from said inlet, an outlet for discharging plastified thermoplastic synthetic resin;

a worm receiver in said cylinder and rotatable therein to plastify said thermoplastic synthetic resin and displace said thermoplastic synthetic resin from said inlet to said inlet, said worm comprising a metal worm shaft and fitted therearound with at least one helical rib; and

means for high-frequency heating of said thermoplastic synthetic resin between said inlet and said outlet, said heating means including a high-frequency source connected across at least a portion of said worm shaft and of said helical rib thereby together forming a first electrode and said worm cylinder forming a second electrode.

5,145,695

COMPOSITION AND METHOD THEREOF FOR INCREASING MILK PRODUCTION IN DAIRY CATTLE

Steven I. Smith, Zimmerman, and John A. Foley, Jr., Minneapolis, both of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Aug. 24, 1990, Ser. No. 572,755
Int. Cl.[5] A23K *1/04, 1/06, 1/00*
U.S. Cl. 426—2 39 Claims

1. A complete dairy cattle feed composition comprising: about 7 to about 56 weight percent corn; about 20 to about 50 weight percent wheat middlings; about 0.25 to about 2.5 weight percent soybean meal; about 2.0 to about 5.1 weight percent macro-minerals; about 5 to about 19 weight percent distillers grains or distillers grains with solubles; about 5.0 to about 8.0 weight percent blood meal; about 0.5 to about 0.10 weight percent trace minerals; and about 2.0 to about 7.0 weight percent corn gluten meal, which composition provides rumen bypass protein and microbial protein balanced in essential amino acids post-ruminally.

5,145,696

CHEWING GUM WITH GUM BASE IN ROLLING COMPOUND

Mansukh M. Patel, Downers Grove, and Edward S. Dubina, Evergreen Park, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed May 15, 1991, Ser. No. 702,172
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—5 13 Claims

1. A chewing gum composition having improved flavor impact and extended flavor duration comprising chewable gum base, sweetner and flavoring and having deposited on the surface of said chewing gum a rolling compound comprised of a mixture of 20 to 90 percent by weight gum base, 1 to 15 percent by weight flavoring and 5 to 75 percent by weight sweetner.

5,145,697

INSTANT YOGURT COMPOSITION AND PROCESS

Stanley Cajigas, Toms River, N.J., assignor to MPY Foods, Inc., Pine Brook, N.J.

Continuation-in-part of Ser. No. 721,716, Jun. 26, 1991, which is a continuation of Ser. No. 571,115, Aug. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 344,361, Apr. 26, 1989, Pat. No. 4,956,185. This application Aug. 8, 1991, Ser. No. 742,023
Int. Cl.[5] A23K *1/08*
U.S. Cl. 426—43 16 Claims

1. A powdered yogurt formulation consisting essentially of an amount of bactobacillus yogurt culture effective to provide a desired yogurt flavor;

up to 45 weight % of yogurt solids;

from about 0.1% to about 20% by weight of a mixture of highly purified locust bean gum and xanthan gum in approximately equal weight fractions as a first gel system; and

at least one additional gel system selected from:

i) from about 0.5% to about 5% by weight of carrageenan and a calcium containing dairy product present in an amount of from about 1% to 20% by weight;

ii) at least 6 wt. % of an active protein; and

iii) from about 10% to about 40% by weight of maltodextrin having a low dextrose equivalent and less than 6 wt. % of an active protein.

5,145,698

INSTANT YOGURT COMPOSITION AND PROCESS

Stanley Cajigas, Toms River, N.J., assignor to MPY Foods, Inc., Pine Brook, N.J.

Continuation of Ser. No. 571,115, Aug. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 344,361, Apr. 26, 1989, Pat. No. 4,956,185. This application Jun. 26, 1991, Ser. No. 721,716
The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.
Int. Cl.[5] A23K *1/08*
U.S. Cl. 426—43 15 Claims

1. A powdered yogurt formulation consisting essentially of:

about 0.001–2.0% by weight of a Lactobacillus culture;

about 0.1–20% by weight of one or more hydrocolloid gums;

up to about 45% by weight of dehydrated yogurt powder; and,

10–30% by weight of a dairy product selected from the group consisting of whey, delactose whey, powdered milk and powdered cultured milk, said formulation reconstitutable into either a yogurt meal on a yogurt liquid drink.

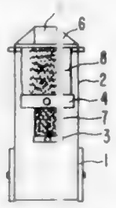
5,145,699
FOOD PRODUCT
Jacobus Dijkshoorn, Vlaardingen, and Ebo J. Holscher, Fijnaart, both of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco Inc., New York, N.Y.
Filed Sep. 19, 1990, Ser. No. 585,859
Claims priority, application European Pat. Off., Oct. 2, 1989, 89202461.3
Int. Cl.[5] A23D 1/08
U.S. Cl. 426—94 26 Claims

1. A food product comprising a moisture-containing filling enclosed in a bread casing and an intermediate layer separating the filling from the bread casing, wherein the intermediate layer is of a cake batter or cake dough which upon baking of the food product results in a cake material having a specific volume of from 1.5 to 4.0 m^3/kg.

5,145,700
PROCESS FOR PREPARING A SOYA FOOD PRODUCT
Frederick E. Von Lempke, 170 Derby Road, Kensington, Johannesburg, Transvaal, South Africa
Filed May 29, 1991, Ser. No. 709,576
Claims priority, application South Africa, May 30, 1990, 90/4158
Int. Cl.[5] A23L 1/00
U.S. Cl. 426—240 17 Claims

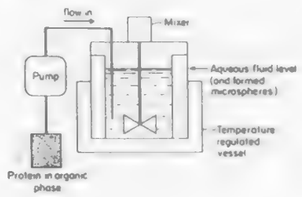
1. A process for preparing a soya food product including the steps of;
(a) providing a soya concentrate,
(b) pre-mixing the soya concentrate with a composition including organic flavourants, an amino acid supplementation, an extract of a spice and vitamins,
(c) mixing the product of step (b) with water at a temperature below 15° C., and
(d) soaking the product of step (c) for a period of time sufficient to allow the soya concentrate substantially to absorb the composition.

5,145,701
METHOD OF PRODUCING A FISH MEAT PASTE PRODUCT SIMULATING CRAB LEG MEAT
Yoshito Sugino, Nanao, Japan, assignor to Sugiyo Co., Ltd., Ishikawa, Japan
Filed Feb. 14, 1991, Ser. No. 655,069
Claims priority, application Japan, Feb. 19, 1990, 2-39280
Int. Cl.[5] A23L 1/275, 1/325
U.S. Cl. 426—249 10 Claims



1. A method of producing an edible product of fish meat paste simulating natural crab leg meat, comprising:
a first step of continuously applying a first type of fish meat paste onto a portion of a continuous length of plastic film supplied longitudinally from a roll so as to form on said plastic film a stripe of said first type of fish meat paste having a width smaller than the width of said plastic film;
a second step of continuously applying with a predetermined pressure a second type of fish meat paste being colored differently than said first type of fish meat paste onto said stripe of said first type of fish meat paste over an area of a width smaller than the width of said plastic film and different from the width of said stripe, so that said two types of fish meat paste are partially intermingled to form on said plastic film a membrane closely resembling the membrane covering real crab leg meat;
a third step of placing a length of core material on said membrane and wrapping said core material in said plastic film thereby to wrap said core material in said membrane; and
a fourth step of heating said membrane to coagulate it thereby to form said membrane and core into an integral body.

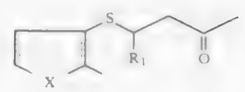
5,145,702
HYDROPHOBIC PROTEIN MICROPARTICLES AND PREPARATION THEREOF
Leonard E. Stark, Naperville, Ill., and Akiva T. Gross, Newton, Mass., assignors to Opta Food Ingredients, Inc., Cambridge, Mass.
Division of Ser. No. 403,111, Sep. 1, 1989, Pat. No. 5,021,248, which is a continuation-in-part of Ser. No. 246,435, Sep. 19, 1988, abandoned. This application May 20, 1991, Ser. No. 702,828
Int. Cl.[5] A23J 1/14
U.S. Cl. 426—531 31 Claims



1. A method of producing water-dispersible microparticles consisting essentially of hydrophobic water-insoluble protein, said microparticles having a generally spherical shape having a median particle size of less than about 200 microns, comprising the steps of:
a. dissolving the water-insoluble hydrophobic protein in a solvent therefore, to form a solution of said protein;
b. contacting an aqueous medium with said protein solution under agitating conditions, at a temperature of from about 40° C. to about 70° C., sufficient to rapidly disperse the protein solution into the aqueous medium to thereby cause the dispersed hydrophobic protein to solidify and form a substantially homogeneous non-aggregated suspension of water-dispersible microparticles of said protein in the aqueous medium, wherein the microparticles are generally spherical in shape and have a median particle size of less than about 200 microns.

5,145,703
THIO-ALKANONES, PROCESS FOR THEIR PREPARATION AND THEIR USE
Roland Emberger; Matthias Günter; Rudolf Hopp; Manfred Köpsel; Walter Kuhn, all of Holzminden, and Peter Werkhoff, Hoexter, all of Fed. Rep. of Germany, assignors to Haarmann & Reimer, Holzminden, Fed. Rep. of Germany
Filed May 16, 1991, Ser. No. 701,545
Claims priority, application Fed. Rep. of Germany, May 23, 1990, 4016536
Int. Cl.[5] A23L 2/26; A61K 31/38
U.S. Cl. 426—535 1 Claim

1. A process of enhancing the flavor of foodstuffs for humans and animals by addition of an effective flavor enhancing amount of a thio-alkanone of the formula



(I)

in which
X represents an oxygen or sulphur atom,
R_1 represents hydrogen or a C_1–C_2-alkyl group and the broken lines represent a single bond or no bond.

5,145,704
METHOD OF PREPARING AN EMULSION SPREAD USING A WET GELATINE RETENTATE
Bart Barmentlo, Delft, and Nigel K. Slater, Maasdam, both of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.
Continuation of Ser. No. 381,333, Jul. 18, 1989, abandoned. This application Mar. 19, 1991, Ser. No. 671,633
Claims priority, application United Kingdom, Jul. 18, 1988, 8817092
Int. Cl.[5] A23D 7/00
U.S. Cl. 426—576 7 Claims

1. A process for preparing an edible emulsion spread including an aqueous phase comprising:
a) dissolving dry gelatine in water, wherein the gelatine comprises impurities selected from the group consisting of aldehydes, ketones, 2-propanon, toluene, hexanol, octanol, nonanol, 4 and 5-methyl indane and mixtures thereof;
b) removing the impurities by subjecting the gelatine solution obtained in step (a) to membrane filtration until the volume of the gelatine solution is reduced by at least 10% wt, wherein a membrane permeate and a wet retentate are obtained;
c) recovering the wet retentate obtained in step (b); and
d) adding a fat phase to the wet retentate to obtain the edible spread.

5,145,705
FRIED FLAVOR ROUX BASE
W. R. Seeds, Waxahachie, Tex., assignor to Country Flavor, Dallas, Tex.
Filed Nov. 14, 1990, Ser. No. 613,253
Int. Cl.[5] A23L 1/39
U.S. Cl. 426—589 25 Claims

1. A process for producing a roux base having a fried flavor which adjusts the flavor intensity through a combination of heating, timing and quenching comprising:
heating a mixture of predried flour with a liquified shortening, the mixture having a ratio of from about 75:25 to about 25:75% by weight flour to shortening;
continuously mixing and stirring the mixture from about two minutes to about sixty minutes while elevating the mixture temperature through various stages of caramelization and corresponding colors with the process and color change occurring at a more rapid rate as the temperature of the mixture increases; and
quenching the caramelizing mixture upon reaching a predetermined color in a color range wherein L ranges from about 20 to about 75; a ranges from about 5 to about 10; and b ranges from about 6 to about 20 in order to halt the caramelization reaction which results in a particular fried flavor roux base.

5,145,706
METHOD FOR PREPARATION OF PLASMA POWDER AND PRODUCT THEREOF
Takashi Hagi, Yokkaichi; Kouichi Misawa, Yokohama; Shuji Saito, Fujisawa; Yuji Sakamoto, Yokkaichi; Noriaki Kadota, Mie; Yoshiro Toda, Suzuka, and Nagatuka Yamazaki, Yokkaichi, all of Japan, assignors to Taiyo Kagaku Co., Ltd., Mie, Japan
Filed Mar. 28, 1991, Ser. No. 676,303
Int. Cl.[5] A23L 1/311, 1/313
U.S. Cl. 426—647 10 Claims

1. A method for producing plasma powder that is substantially free of malodorous substances comprising:
catalytically treating plasma with colloidal silica selected from the group consisting of silica gel, light silicic anhydride, and combinations thereof; and
powdering said treated plasma.

5,145,707
SALT ENHANCER
Thomas D. Lee, Scarsdale, N.Y., assignor to Kraft General Foods, Inc., Northfield, Ill.
Filed Dec. 12, 1991, Ser. No. 807,038
Int. Cl.[5] A23L 1/237
U.S. Cl. 426—649 4 Claims

1. An edible salt enhancing composition comprising a combination of L-aspartic acid and L-arginine and sodium chloride wherein the mole ratio of L-aspartic acid to L-arginine is between about 0.8:1 to about 1:1.2 and wherein the weight ratio of the combination of L-aspartic acid and L-arginine to sodium chlorine is 0.5:1 to 1:1.5.

5,145,708
METHOD OF PREPARING LECITHIN COMPOSITION FOR CHEWING GUM
Mansukh M. Patel, Downers Grove, and Edward S. Dubina, Evergreen Park, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.
Division of Ser. No. 457,410, Dec. 28, 1989, Pat. No. 5,041,293. This application Mar. 22, 1991, Ser. No. 673,968
Int. Cl.[5] A23G 3/30; A23L 1/035
U.S. Cl. 426—662 5 Claims

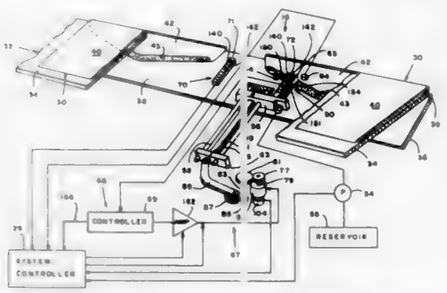
1. A method of manufacturing a lecithin composition comprising the following steps:
providing lecithin;
providing water;
mixing from about 20 parts to about 70 parts by weight of the lecithin with from about 30 parts to about 80 parts by weight of the water;
allowing the resulting aqueous lecithin solution to stand until a gelatinous lecithin forms;
providing mannitol; and
mixing until homogenous the gelatinous lecithin with mannitol so that mannitol comprises from about 50 parts to about 75 parts by weight of the resulting lecithin mixture.

5,145,709
METHOD OF AUTOMATICALLY APPLYING LIQUID
Norman J. Bergman, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Feb. 20, 1990, Ser. No. 481,545
Int. Cl.[5] B05D 5/00
U.S. Cl. 427—8 5 Claims

1. A method of automatically applying liquid from the outlet of a liquid applicator to a region of an object, said region varying with respect to a given path of motion; said method comprising:
relatively moving said applicator outlet and said object region towards each other along said path at a selected speed of greater than about 65 inches per second;
sensing at a selected sampling rate said region a short dis-

tance before said region and said outlet are adjacent each other;

relatively positioning said region and said applicator outlet so that said outlet tracks said region as said region and said outlet are relatively moved past each other along said path;



causing said liquid applicator to discharge said liquid from said applicator outlet to said region of an object;

said short distance and said sampling rate being selected to substantially eliminate errors in applying liquid to said region at said selected speed resulting from relative movement of said object and said outlet towards each other.

5,145,710

METHOD AND APPARATUS FOR APPLYING A METALLIC COATING TO THREADED END SECTIONS OF PLASTIC PIPES AND RESULTING PIPE

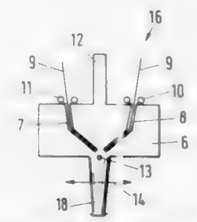
Erich Quadflieg, Krefeld, and Heestermans, Martinus C. J., RA Zwolle, Netherlands, assignors to Mannesmann Aktiengesellschaft Wavin B.V., Düsseldorf, Fed. Rep. of Germany

Filed Nov. 15, 1990, Ser. No. 613,392

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1989, 3938362; Netherlands, Nov. 16, 1989, 8902840

Int. Cl.[5] B05D *100, 1/08*

U.S. Cl. 427—34 16 Claims



1. A method of applying a metallic coating to the threaded sections on the ends of plastic pipes that are to be forcefully screwed together, comprising the steps of:

spraying droplets of one of a metal and metal-alloy against the threaded sections, said spraying being done at a high velocity, at an angle of impingement and within a zone of impingement; and

during the spraying, turning the pipe and also moving the pipe relative to said zone of impingement along a longitudinal axis of the pipe.

5,145,711

CYCLOTRON RESONANCE CHEMICAL VAPOR DEPOSITION METHOD OF FORMING A HALOGEN-CONTAINING DIAMOND ON A SUBSTRATE

Shunpei Yamazaki, Tokyo, and Shigenori Hayashi, Atsugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

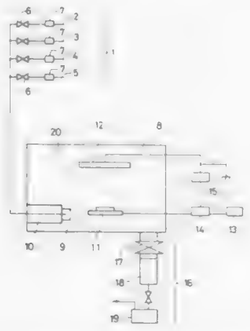
Continuation of Ser. No. 225,860, Jul. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 178,362, Apr. 6, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 481,720

Claims priority, application Japan, Aug. 10, 1987, 62-200351; Jul. 17, 1988, 63-177847; Jul. 17, 1988, 63-177848; Jul. 17, 1988, 63-177849

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—38 10 Claims



1. A cyclotron resonance chemical vapor deposition method of forming a halogen containing diamond on a substrate comprising:

inputting at least one reactive gas comprising carbon and a halogen into a reaction chamber;

emitting a microwave into said reaction chamber at a predetermined frequency and in a predetermined direction;

establishing a magnetic field in said reaction chamber where the direction of the magnetic field is substantially parallel to the direction of the microwave and the strength of the magnetic field is such as to cause cyclotron resonance at a predetermined position in the reaction chamber;

exhausting the reaction chamber to establish in the chamber a pressure range of 0.1 to 300 Torr;

holding the substrate approximately at said predetermined, cyclotron resonance position in the reaction chamber; and

depositing said halogen containing carbon layer containing a diamond structure at least locally on a surface of the substrate.

5,145,712

CHEMICAL DEPOSITION OF DIAMOND

William A. Jesser, Charlottesville, and Fred P. Doty, Albemarle County, both of Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Feb. 8, 1991, Ser. No. 652,106

Int. Cl.[5] B05D *3/06;* C23C *16/26*

U.S. Cl. 427—38 23 Claims

1. A method for depositing patterns of diamond on a substrate, comprising the steps of:

providing a diamond deposition apparatus having a first and a second chamber separated by a grid having a pattern which allows the passage of atoms and/or molecules between said first and second chambers;

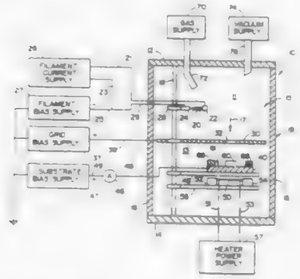
evacuating said diamond deposition apparatus to subatmospheric pressure;

introducing a gas containing a diamond forming species into said first chamber said diamond deposition apparatus;

positioning a substrate in said second chamber proximate to said grid;

maintaining said substrate at a temperature suitable for diamond formation from said diamond forming species in said gas;

creating an electric field in said diamond deposition apparatus by impressing a first electrical bias on an electrode positioned in said first chamber of said diamond deposition



apparatus, impressing a second electrical bias on said grid, and impressing a third electrical bias on said substrate in said second chamber of said diamond deposition apparatus; and

controlling said first, second, and third electrical biases to allow activated species in said first chamber of said diamond deposition apparatus to pass from said first chamber to said second chamber and be deposited on selected regions of said substrate which reflect said pattern of said grid.

5,145,713

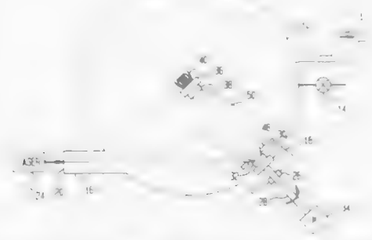
STOICHIOMETRIC GROWTH OF COMPOUNDS WITH VOLATILE COMPONENTS

Thirumalai Venkatesan, Washington, D.C., and Sukru Yilmaz, Atlantic Highlands, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J. and Heinrich-Hertz-Institut, Berlin, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 633,407

Int. Cl.[5] B05D *3/06;* C23C *14/00*

U.S. Cl. 427—53.1 23 Claims



1. A method of forming a thin film of a composition having components of different volatility, comprising the steps of:

providing a first target having a first composition containing stoichiometric amounts of first and second components that are stoichiometric with respect to a desired uniform composition;

providing a second target having a second composition of a multi-species compound containing a third component of said desired composition, wherein said third component is more volatile than said first and second components and wherein all components excluding oxygen contained in said desired composition are contained in said first and second targets;

a first step of irradiating said first target with a type of energy to evaporate said first composition and cause at least a portion of said first composition to form a first portion of said thin film on a substrate adjacent to said first target; and

a second step of irradiating said second target with said type of energy to evaporate said second composition and cause at least a portion of said second composition to form a second portion of said thin film on said substrate.

5,145,714

METAL-ORGANIC CHEMICAL VAPOR DEPOSITION FOR REPAIRING BROKEN LINES IN MICROELECTRONIC PACKAGES

Arnold Reisman; Dorota Temple, and Iwona Turlik, all of Raleigh, N.C., assignors to MCNC, Research Triangle Park, N.C. and Northern Telecom Limited, Montreal, Canada

Filed Oct. 30, 1990, Ser. No. 605,688

Int. Cl.[5] B05D *3/06;* B32B *35/00*

U.S. Cl. 427—53.1 19 Claims

1. A thermally activated method of depositing a metal on a localized microscopic portion of a substrate, that can be carried out at relatively low process temperatures, and that is particularly useful for depositing metals in an amount and purity sufficient for electrical conductivity on substrates containing microelectronic circuits and devices or their respective precursors, the method comprising:

heating a substrate in the presence of vaporized copper (II) hexafluoroacetylacetonate to a first temperature that is just below the temperature at which the vaporized copper (II) hexafluoroacetylacetonate will dissociate into metallic copper and hexafluoroacetylacetonate for a time sufficient for the substrate to reach the first temperature; and thereafter

maintaining the substrate at the first temperature while raising the temperature of a smaller localized portion of the heated substrate from the first temperature to a second, higher temperature at which the vaporized copper (II) hexafluoroacetylacetonate will dissociate into metallic copper and hexafluoroacetylacetonate but below the temperature at which the hexafluoroacetylacetonate will decompose and until an amount of the dissociated metallic copper sufficient for electrical conductivity deposits upon the localized portion.

5,145,715

LIGHT TRANSMISSION PASTE AND METALLIC COPPER DEPOSITION METHOD USING SAME

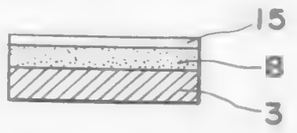
Takahiro Asano, Moriguchi, and Shinichi Mizuguchi, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 17, 1990, Ser. No. 569,288

Claims priority, application Japan, Aug. 22, 1989, 1-216449

Int. Cl.[5] B05D *3/06, 5/12, 1/18, 3/04*

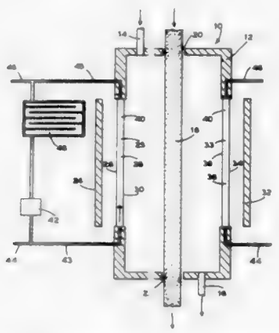
U.S. Cl. 427—54.1 4 Claims



1. A circuit pattern forming method comprising the steps of applying a light transmission paste upon cuprous oxide formed on a substrate, wherein the light transmission paste contains an acidic material selected from the group consisting of hydrochloric acid, nitric acid, sulfuric acid and

p-toluene sulfonic acid and is transparent to light of a wavelength of 280 nm through 640 nm,
thereafter irradiating light of a wavelength of 280 nm through 640 nm onto the cuprous oxide through a mask having an opening portion corresponding to a pattern to be formed so as to educe metallic copper on the irradiated portion,
then removing the light transmission paste and the mask, and forming the desired circuit pattern on the substrate.

5,145,716
INFRARED WINDOW
Vladimiri Paserin; Juraj Babjak; Victor A. Ettel, all of Mississauga, and Richard S. Adams, Burlington, all of Canada, assignors to Inco Limited, Toronto, Canada
Filed Jul. 27, 1990, Ser. No. 560,859
Claims priority, application Canada, Oct. 19, 1989, 2001009
Int. Cl.[5] B05D *3/06*; C23C *16/40*; G02B *26/02*; B05B *5/00*
U.S. Cl. 427—55 14 Claims



8. A method of decomposing metal carbonyl gas onto a substrate comprising:
introducing the substrate into a chamber, said chamber containing the metal carbonyl gas and having an infrared transparent window to allow infrared radiation into said chamber to heat the substrate, and said infrared transparent window having a cooling passage,
sending infrared radiation through said infrared transparent window an said cooling passage of said infrared transparent window to heat the substrate to a temperature at which decomposition of the metal carbonyl gas occurs,
cooling said infrared transparent window with a liquid coolant selected from the group consisting of tetrachloroethane and tetrachloroethylene inside of said cooling passage to prevent decomposition of carbonyl gas on said infrared transparent window, said liquid coolant being substantially transparent to infrared radiation to allow infrared radiation through said cooling passage to heat the substrate, and
maintaining said liquid coolant at a temperature below which the metal carbonyl gas decomposes.

5,145,717
STRIPPING METHOD FOR REMOVING RESIST FROM A PRINTED CIRCUIT BOARD
Robert F. Drury, East Windsor, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 472,996, Jan. 31, 1990, abandoned. This application Jun. 20, 1990, Ser. No. 541,009
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—96 20 Claims

1. A method of resist removal from a processed printed circuit substrate comprising the steps of:
a) forming a resist image on a substrate, whereby portions of the substrate on its surface are protected by the resist,
b) modifying the substrate unprotected by the resist image by removing material from the substrate or depositing material on the surface of the substrate in formation of a processed printed circuit substrate, and
c) removing the resist by projecting media particles having a Moh hardness in a range from 2.0 to 4.0 onto substrate to uncover unmodified substrate areas.

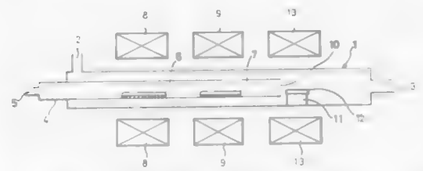
5,145,718
PROCESSS FOR PRODUCING PRESSURE-SENSITIVE ADHESIVE TAPE
James J. Pedginski, Stillwater, and Ronald B. Birkholz, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 675,993, Mar. 26, 1991. This application Nov. 22, 1991, Ser. No. 797,466
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—171 20 Claims

1. A process for preparing a pressure-sensitive adhesive tape comprising the steps of:
(1) providing a backing made from a polymeric film;
(2) orienting said backing in the machine direction;
(3) applying a layer of low-adhesion backsize composition to one major surface of said oriented backing;
(4) applying a layer of pressure-sensitive adhesive to the major surface of said oriented backing not bearing the layer of low-adhesion backsize composition, the amount of said adhesive being sufficient to allow intermixing of said layer of pressure-sensitive adhesive and said backing upon cross-stretching of said layer-bearing backing;
(5) orienting said layer-bearing backing in the transverse direction by heating and cross-stretching the layer-bearing backing in the transverse direction, provided that said layer-bearing backing is heated sufficiently to allow sufficient softening thereof so that said backing and said layer of pressure-sensitive adhesive can intermix during cross-stretching, further provided that said layer-bearing backing is not heated so excessively that said backing melts or loses its orientation in the machine direction during cross-stretching; and
(6) winding the machine direction oriented, transverse direction oriented, layer-bearing backing onto a roll.

5,145,719
METHOD FOR COATING SURFACE OF FINE PARTICLES WITH A LAYER OF FINE METAL OXIDE POWDER
Atsuya Towata, Nagoya, and Mutsuo Sando, Narukomachi, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan
Filed Mar. 22, 1991, Ser. No. 673,409
Claims priority, application Japan, Jun. 13, 1990, 2-154341
Int. Cl.[5] B05D *7/24*
U.S. Cl. 427—215 12 Claims

1. A method for coating fine particles, which comprises:
dispersing fine particles having water absorbed in advance on the surface thereof in a first hydrophobic organic solvent (a) which incorporates therein 2.5–10% by weight of an alcohol of 2–4 carbon atoms; and
adding to the resultant dispersion of said fine particles a second hydrophobic organic solvent (b) having a metal alkoxide dissolved therein thereby forming on the surface of said fine particles a dense layer of extremely fine particles of a metal oxide as the metal alkoxide is hydrolyzed by the surface water on the fine particles.

5,145,720
CHEMICAL VAPOR DEPOSITION OF DENSE AND TRANSPARENT ZIRCONIA FILMS
Toshio Hirai, Izumi, and Hisanori Yamane, Sendai, both of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan
Division of Ser. No. 161,101, Feb. 26, 1988, Pat. No. 4,920,014. This application Feb. 9, 1990, Ser. No. 477,425
Claims priority, application Japan, Feb. 27, 1987, 62-44687; Feb. 27, 1987, 62-44688; Feb. 27, 1987, 62-44689; Sep. 18, 1987, 62-235896
Int. Cl.[5] C23C *16/08, 16/40*
U.S. Cl. 427—255.3 6 Claims



1. A process for preparing a dense and transparent or semi-transparent zirconia film formed on a substrate, having substantially (111) planes only oriented parallel to the surface of said substrate, and consisting of substantially pure zirconia, said process comprising:
separately feeding an oxygen gas and a zirconium halide without mixing the reactants to a reaction zone which is up to 20 mm from the surface of said substrate kept at 700° to 1,400° C. under a pressure of 100 to 800 Torr.

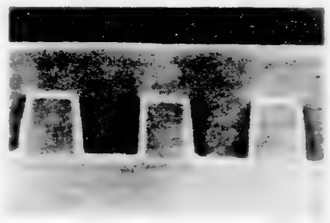
5,145,721
METHOD OF COATING AN ARTICLE WITH A POLYTETRAFLUOROETHYLENE COATING MATERIAL
Takeshi Kojima, Kyoto, and Taketoshi Nakajima, Kawagoe, both of Japan, assignors to Haruhiko Murakami, Okegawa, Japan
PCT No. PCT/JP89/01188, § 371 Date Sep. 21, 1990, § 102(e) Date Sep. 21, 1990, PCT Pub. No. WO90/05593, PCT Pub. Date May 31, 1990
PCT Filed Nov. 22, 1989, Ser. No. 548,881
Claims priority, application Japan, Nov. 22, 1988, 63-295436
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—379 12 Claims

1. A method of coating an article, comprising the steps of:
(a) diluting a two-liquid hardening type polyurethane resin coating material which includes a polyol (solution A) and a polyisocyanate (solution B) mixed together in the ratio of Solution A:Solution B=4:1, with thinner until the viscosity is 23 seconds as measured by a Ford cup (room temperature 20° C.),
(b) stirring the diluted coating material uniformly and pouring it into a coater while filtering with a 150-mesh filter net, followed by coating an article with the filtered material to form a base coat on the article,
(c) naturally drying of the base coat until the solvent on the surface of the base coat is evaporated, then drying at 50° C. by means of a dryer, and then cooling the surface of the base coat to 20° C. or less,
(d) adding 2–10 wt % of a polytetrafluoroethylene or polytetrafluoroethylene-perfluoroalkylvinylether copolymer resin to a polyester polyol or acrylic polyol, followed by stirring to obtain a solution C,
(e) mixing a polyisocyanate with the solution C in a ratio of 1:1–4:1, stirring the mixture, and then coating the stirred mixture onto the cooled surface of the base coat to form a top coat on the base coat, and
(f) initially drying the top coat at 60° C. or less and then naturally drying the top coat.

5,145,722
METHOD AND COMPOSITION FOR PROTECTING AND ENHANCING THE SOLDERABILITY OF METALLIC SURFACES
Alfred F. Kaspaul, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Continuation of Ser. No. 336,178, Apr. 11, 1989, Pat. No. 4,963,401. This application Oct. 5, 1990, Ser. No. 607,201
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—388.1 26 Claims

1. A method for protecting and enhancing the solderability of a metallic surface comprising the steps of:
(a) providing a mixture of an unsubstituted or alkyl-substituted aliphatic dicarboxylic acid fluxing agent and a chosen protective material which is unreactive with said dicarboxylic acid and which forms a film with said dicarboxylic acid that alters at a chosen soldering temperature within the range of 260° to 371° C. to release said dicarboxylic acid, wherein said chosen protective material is selected to from the group consisting of a cellulose ester, a vinyl chloride copolymer, an acrylic copolymer and a polyether glycol; and
(b) forming a film from said mixture on said metallic surface wherein said film provides protection of said metallic surface from contamination during storage prior to a soldering process, and, upon subsequent exposure to said chosen soldering temperature, releases said fluxing agent to thereby enhance the solderability of said metallic surface.

5,145,723
PROCESS FOR COATING A SUBSTRATE WITH SILICA
David S. Ballance; Robert C. Camilletti, and Theresa E. Gentle, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Jun. 5, 1991, Ser. No. 710,627
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—397.7 10 Claims



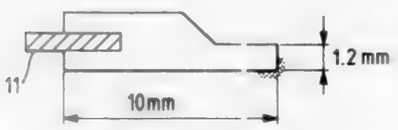
1. A method of forming a silica coating on a substrate comprising:
forming a coating on a substrate where the coating comprises a silica precursor having a melting point between about 50° and about 450° C.;
heating the coating to a temperature above the melting point of the silica precursor in an inert environment for a time sufficient to allow the coating to flow; and
after the coating has flowed, exposing the coating to a reactive environment for a time and at a temperature sufficient to convert the coating to silica.

5,145,724

METHOD OF MAKING A CLEANING BLADE COATED WITH GRAPHITE FLUORIDE

Noriyuki Yanai, and Masahiro Watabe, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 480,910, Feb. 16, 1990, abandoned.
This application Feb. 3, 1992, Ser. No. 829,593
Claims priority, application Japan, Feb. 20, 1989, 1-41357; Apr. 28, 1989, 1-109516
Int. Cl.[5] B05D 1/18
U.S. Cl. 427—430.1 6 Claims



4. A method of making a cleaning blade comprising the steps of:

fabricating an elastomeric blade having a cleaning portion;

applying a dispersion of graphite fluoride powder in a suitable solvent containing no resin to the cleaning portion of the elastomeric blade; and

evaporating the solvent from the cleaning portion.

5,145,725

DECORATIVE RIBBON AND METHOD OF MANUFACTURING SAME

R. Thurman Johnson, Blowing Rock, and Hal G. Johnson, Boone, both of N.C., assignors to Ribbon Textiles, Inc., Boone, N.C.

Filed Feb. 25, 1991, Ser. No. 660,700
Int. Cl.[5] D04D 9/00
U.S. Cl. 428—102 20 Claims

12. A decorative ribbon, comprising an elongate gathered ribbon wherein the gathers of the ribbon are held in place by stitches applied to the ribbon while in its gathered condition and by heat setting the ribbon after stitching and while in a gathered condition to permanently set the ribbon into the gathered condition to thereby provide a decorative ribbon which will substantially retain the gathers even if the stitching is thereafter pulled loose or broken

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5,145,726

SHEET FOR FORMATION OF BURNED PATTERN AND BURNING LABEL

Takafumi Sakuramoto; Takashi Tomonaga; Itsuroh Takenoshita, and Megumi Ashida, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Apr. 2, 1991, Ser. No. 679,481
Int. Cl.[5] B32B 9/00
U.S. Cl. 428—195 6 Claims

1. A sheet for formation of a burned pattern, which comprises a laminate structure comprising

a glass powder-containing layer comprising glass powder and a resin binder

an adhesive layer, and

a combustible substrate layer, said glass powder containing layer is above the said adhesive layer,

above the said glass powder containing layer;

within the said glass powder containing layer;

wherein the location of the combustible substrate layer is in a position selected from the group consisting of:

between the said glass powder containing layer and the said adhesive layer;

above the said glass powder containing layer and within the said glass powder containing layer;

above the said glass powder containing layer and between the said glass powder containing layer and the said adhesive layer;

above the said glass powder containing layer, within the said glass powder containing layer and between the said glass powder containing layer and the said adhesive layer; or

within the said glass powder containing layer and between the said glass powder containing layer and the said adhesive layer.

5,145,727

MULTILAYER NONWOVEN COMPOSITE STRUCTURE

David C. Potts, Dunwoody; George A. Young, Atlanta; Dennis S. Everhart, Alpharetta; J. Gavin MacDonald, Decatur, and Ronald S. Nohr, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 26, 1990, Ser. No. 618,352
Int. Cl.[5] B32B 5/24, 31/20, 33/00; D04H 3/14, 3/16
U.S. Cl. 428—198 29 Claims

1. A nonwoven composite structure having at least two melt-extruded nonwoven layers which comprises:

(A) a first layer which comprises at least a portion of a first nonwoven web; and

(B) a second layer adjacent to said first layer which comprises at least a portion of a second nonwoven web;

in which,

(1) the boundary between any two adjacent melt-extruded nonwoven layers is indistinct in that fibers at or near the surfaces of such adjacent layers are significantly intermingled;

(2) the fibers of at least one of said first and second layers are prepared by melt extrusion through a die at a shear rate of from about 50 to about 30,000 sec^{-1} and a throughput of no more than about 5.4 kg/cm/hour of a mixture of an additive and a thermoplastic polymer, which additive imparts to the surfaces of said fibers, as a consequence of the preferential migration of said additive to the surfaces of said fibers as they are formed, at least one characteristic which is different from the surface characteristics of fibers prepared from said thermoplastic polymer alone, said preferential migration taking place spontaneously upon the formation of said fibers without the need for a post-formation treatment of any kind;

(3) the additive present in any melt-extruded nonwoven layer does not migrate to an adjacent layer to a significant degree in use, so that the surface characteristics of each layer remain substantially as originally prepared;

(4) said thermoplastic polymer is selected from the group consisting of polyolefins, polyesters, polyetheresters, and polyamides; and

(5) said composite has been pattern bonded by the application of heat and pressure.

5,145,728

ORIENTED POLYETHYLENE FILM

Yasushi Itaba, Tokyo; Yutaka Yoshifuji, Saitama; Takayoshi Kondo, Tokyo; Keichiro Saitoh, Kanagawa; Tadao Yoshino, Saitama; Minoru Izawa, Saitama, and Ichiro Sakamoto, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 278,201, Nov. 30, 1988, Pat. No. 5,043,204.
This application Jun. 12, 1991, Ser. No. 713,831
Claims priority, application Japan, Nov. 30, 1987, 62-300071; Dec. 22, 1987, 62-322954; Dec. 25, 1987, 62-327408
Int. Cl.[5] B32B 27/16, 27/32; C08L 23/06
U.S. Cl. 428—213 10 Claims

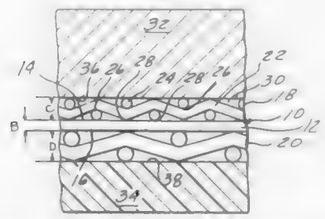
1. A film for a shrink label, consisting of a composition comprising 50 to 85% by weight of high density polyethylene having a density of at least 0.935 g/cm^3 and high load melt index to melt index ratio or at most 50, and 15 to 50% by weight of a linear low density polyethylene and a petroleum resin, the quantity of the petroleum resin being at most 25% by weight, and being crosslinked in such a manner that the degree of crosslinking inwardly decreases across the thickness of the film or an uncrosslinked portion is formed, and oriented at least in one direction.

5,145,729

COMPOSITE INTERMEDIATE BONDING STRUCTURES

James B. Padden, West Bloomfield, Mich., assignor to Purolator Products Company, Tulsa, Okla.

Division of Ser. No. 457,304, Jan. 11, 1983, Pat. No. 5,076,875.
This application May 2, 1991, Ser. No. 694,764
Int. Cl.[5] B32B 15/01, 15/08, 15/14
U.S. Cl. 428—220 22 Claims



1. A composite bonding structure comprising:

a non-porous metallic sheet having a first bonding face and a second bonding face;

a first porous metallic mesh member bonded to said first bonding face of said non-porous metallic sheet;

a second porous metallic mesh member bonded to said second bonding face of said non-porous metallic sheet;

means for bonding all contact points between said first bonding face of said non-porous metallic sheet and said first porous metallic mesh member; and

means for bonding all contact points between said second bonding face of said non-porous metallic sheet and said second porous metallic mesh member.

5,145,730

STEMMED FLOWER-LIKE DECORATION AND METHOD OF MAKING SAME

Peter S. C. Cheng, 5 Roes Street, Toronto, Ontario, Canada M5T 1Z8

Filed Nov. 4, 1991, Ser. No. 787,603
Int. Cl.[5] A41G 1/00
U.S. Cl. 428—24 9 Claims

6. A stemmed, artificial flower decoration, comprising:

(a) a self-standing, concave petal of flexible material, said petal having an upper pointed end and a plurality of integral strip regions foldable about fold lines that intersect each other and extending away from the upper pointed end, said strip regions being movable from a mutually parallel state to a partly overlapping state by which the petal is shaped with a self-standing, concave configuration;

(b) a stem; and

(c) means for attaching the petal to the stem.

5,145,731

COMPOSITE FILMS FREE FROM METAL LAYERS

Klaus Lund, Walsrode, and Holger Preiss, Visselhoevede, both of Fed. Rep. of Germany, assignors to Wolff Walsrode AG, Walsrode, Fed. Rep. of Germany

Filed Mar. 19, 1990, Ser. No. 495,557
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1989, 3910103
Int. Cl.[5] B29D 22/00
U.S. Cl. 482—35.4 7 Claims

1. A multilayer film having no metal layer, but containing a barrier layer and showing an improved barrier effect against gas and water vapour, wherein it consists essentially of the following layers:

A) a polyvinyl alcohol layer coated with a protective lacquer,

B1) optionally a coupling or adhesive layer,

C1) a polyolefin layer,

B2) optionally a coupling or adhesive layer,

D) an ethylene/vinyl alcohol layer provided on at least one side with a polyamide layer,

B3) optionally a coupling or adhesive layer,

C2) a polyolefin layer.

5,145,732

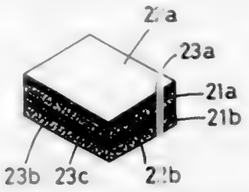
HIGH BULK DENSITY CARBON FIBER FELT AND THERMAL INSULATOR

Hirofumi Kyutoku, Ikoma; Kouichi Yamamoto, Amagasaki, and Yoshihisa Otani, Himeji, all of Japan, assignors to Osaka Gas Company Limited, Osaka and Japan Felt Industrial Company Limited, Himeji, both of Japan

Filed Feb. 26, 1990, Ser. No. 484,407
Claims priority, application Japan, Mar. 1, 1989, 1-49233; Mar. 23, 1989, 1-73662; Jun. 12, 1989, 1-148653
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—36.1 47 Claims

1. High bulk density carbon fiber felt having average bulk

density of 0.1 g/cm^3 or more and in which carbon fibers obtained by carbonizing and/or graphitizing phenol resin type



fibers longitudinally shrinkable by calcination are entangled with other carbon fibers.

5,145,733

ELECTRO-DEPOSITION COATED MEMBER

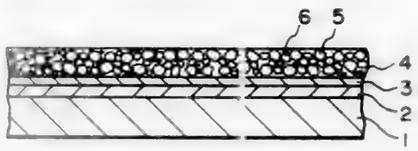
Susumu Kadokura, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1991, Ser. No. 670,274

Claims priority, application Japan, Mar. 16, 1990, 2-064025; Mar. 19, 1990, 2-066871; Mar. 20, 1990, 2-068361; Mar. 20, 1990, 2-068362; Mar. 22, 1990, 2-075149; Mar. 24, 1990, 2-074205

Int. Cl.^{5} G22F *3/00*

U.S. Cl. 428—551 22 Claims



1. An electro-deposition coated member comprising a metal substrate or a non-metal substrate having been subjected to metal plating, a chemically colored film provided on said substrate, and a conductive electro-deposition coating film formed on said chemically colored film.

5,145,734

WOVEN FABRIC HIGH-PURITY ALUMINA CONTINUOUS FILAMENT, HIGH-PURITY ALUMINA FILAMENT FOR PRODUCTION THEREOF, AND PROCESSES FOR PRODUCTION OF WOVEN FABRIC AND CONTINUOUS FILAMENT

Takashi Ito, Nara; Osamu Iwasaki, Daito; Akimicu Obuchi, Gunma; Koichiro Otomo, Moriguchi, and Yoshiaki Saito, Tochigi, all of Japan, assignors to Kanebo Limited and Mitsui Mining Company, Limited, both of Tokyo, Japan

PCT No. PCT/JP90/00751, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO90/15175, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 8, 1990, Ser. No. 651,412

Claims priority, application Japan, Jun. 8, 1989, 1-145863; Jun. 8, 1989, 1-145864; Jun. 8, 1989, 1-145865; Jun. 12, 1989, 1-148666

Int. Cl.^{5} D03D *3/00*

U.S. Cl. 428—229 34 Claims

1. A high-purity alumina continuous filament woven fabric comprising a high-purity alumina continuous filament having an alumina content of at least 95% by weight and a filament diameter of 5 to 20 μm, having been woven from high-purity alumina continuous filament to which an epoxy resin sizing agent has been applied before weaving and which has been removed after weaving.

5,145,735

LAYERED FABRIC

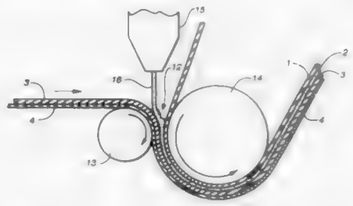
Paul N. Deller, North Eltham, and Peter R. Terry, Berwick, both of Australia, assignors to Rheem Australia Limited, Rydalmere, Australia

Continuation-in-part of Ser. No. 897,397, Jul. 7, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,353

Claims priority, application Australia, Nov. 5, 1984, PG7983

Int. Cl.^{5} B32B *7/00*

U.S. Cl. 428—246 14 Claims



1. A layer fabric comprising a substrate layer formed by coating a filamentary plastics material with molten thermoplastic polymer which, after solidification, forms said substrate layer of thermoplastic polymer, said substrate layer comprising one exterior surface of the fabric when finished; and said substrate layer being subsequently laminated to a separately extruded second layer of solidified thermoplastic polymer, said second layer forming the other exterior surface of the finished fabric, said substrate layer and said second layer being secured together by solidification of a melt extruded thermoplastic polymer interposed between said substrate layer and said second layer.

5,145,736

CELLULOSE-DERIVED SPONGE AND PROCESS FOR MANUFACTURING SAME

Minoru Kishi, Tokyo; Yukihiro Kaneko, and Hiro Itoh, both of Funabashi, all of Japan, assignors to Lion Corporation, Japan

Filed Oct. 24, 1991, Ser. No. 782,317

Claims priority, application Japan, Nov. 29, 1990, 2-331155

Int. Cl.^{5} B32B *5/16*; C08J *9/30*

U.S. Cl. 428—332 1 Claim

1. A sponge comprising a matrix of a cellulose having an open-cell structure, said sponge showing mechanical properties satisfying at least one of the following conditions (I) and (II):

$$Y \leqq 0.07X^3 + 0.39X^2 - 0.04X + 0.04 \quad (I)$$

$$Z \leqq 0.24X^3 + 1.17X^2 - 0.78X + 0.08 \quad (II)$$

wherein X, Y and Z stand for the thickness (mm), the bending rigidity (gf cm^2/cm) and the hysteresis of bending moment (gf cm/cm), respectively, of said sponge having a bulk density of 0.8 g/cm^3 or less and a water content of 25% by weight or less.

5,145,737

SYSTEM FOR CLOSURE AND SUBSEQUENT OPENING OF STERILIZABLE CONTAINERS

Guy F. V. Boiron, Wintzenheim, and Laurent Kretz, Selestat, both of France, assignors to Societe Alsacienne D'Aluminium, France

Continuation of Ser. No. 316,813, Feb. 28, 1989, abandoned. This application Jul. 18, 1991, Ser. No. 732,447

Claims priority, application France, Mar. 4, 1988, 88 02774

Int. Cl.^{5} B32B *15/08*

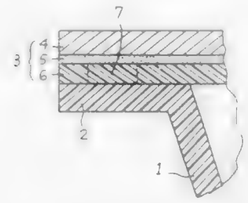
U.S. Cl. 428—334 10 Claims

1. A system for forming a sealed container wherein said sealed container can be sterilized, said system comprising:

(a) a cover for sealing a container so as to form said sealed container which can be sterilized, said cover comprising:

(aI) an outer layer which forms a barrier between the inside of the container and the outside of the container, said outer layer capable of withstanding sterilization of the sealed container;

(aII) a sealing layer for forming a seal by means of deep soldering between said outer layer and the container, said sealing layer comprising a polymeric material, and about 15% to about 50% by weight of an inert filler, said polymeric material being identical to a material from which the container is made of at the point where the seal is formed between said sealing layer and said container, said



inert filler being such that when the cover is pulled off of the container the sealing layer splits leaving a protion of the sealing layer as continuous while neither the container nor the outer layer break during the opening, said sealing layer having a thickness of about 20 microns to about 100 microns; and

(aIII) a bonding layer which adheres to both the outer layer and the sealing layer and bonds the sealing layer to the outer layer such that the sealing layer internally splits during opening of the sealed container thereby learing a continuous portion of the sealing layer attached to the outer layer.

2. The cover of claim 1 wherein the outer layer has a thickness of about 20 microns to about 200 microns.

5,145,738

MAGNETIC RECORDING MEDIUM

Mikihiko Kato; Yasushi Endo; Toshio Kawamata, and Yasuo Nishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 31, 1989, Ser. No. 331,205

Claims priority, application Japan, Apr. 1, 1988, 63-80278

Int. Cl.^{5} G11B *23/00*

U.S. Cl. 428—336 7 Claims

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer comprising ferromagnetic metal powder and a binder, said magnetic layer further comprising carbon black having an average particle diameter of 250 mμ or more in an amount of from 1 to 10 parts by weight per 100 parts by weight of said ferromagnetic metal powder, and an ester of tridecyl alcohol with stearic acid and an ester of tridecyl alcohol with palmitic acid in an amount of from 5 to 20 parts be weight per 100 parts by weight of said ferromagnetic metal powder, and wherein the molar ratio of said ester of tridecyl alcohol with stearic acid to said ester of tridecyl alcohol with palmitic acid is from 80/20 to 20/80.

5,145,739

ABRASION RESISTANT COATED ARTICLES

Vinod K. Sarin, 7 Diamond Rd., Lexington, Mass. 02173

Filed Jul. 12, 1990, Ser. No. 553,248

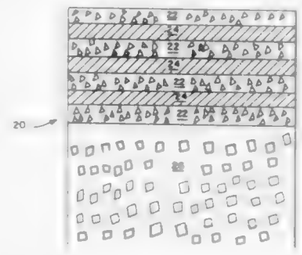
Int. Cl.^{5} B32B *7/02*

U.S. Cl. 428—336 17 Claims

1. A coated article comprising:

a substrate selected from the group consisting of cemented carbide, ceramic or metal to which at least one laminar unit is applied, said laminar unit comprising a refractory metal carbide composite layer and a metal or metal alloy binder layer,

said laminar unit deposited such that the refractory metal carbide composite layer and the binder layer are in alternating layers, and



wherein said coated article possesses good shape retention at high machining speeds and provides improved wear-resistance and chemical inertness.

5,145,740

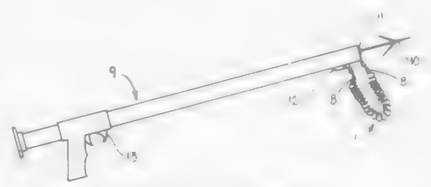
RETRACTILE SPEARGUN LINE

Michael A. Boykin, 5039 Greenway Dr. N., Jacksonville, Fla. 32244, assignor to Michael A. Boykin and Dorothy M. Boykin, both of Jacksonville, Fla.

Filed Aug. 30, 1990, Ser. No. 575,290

Int. Cl.^{5} F41B *7/04*

U.S. Cl. 428—371 4 Claims



1. A retractile speargun line comprising:

a line of flexible linear material having a first end adapted for connection to a speargun and a second end adapted for connection to a speargun spear by having attached at each such end a clip of the type used for leader lines in fishing, said length of flexible linear material being formed in such a manner as to be biased to assume a compact, springlike helical configuration when its first end and its second end are not subjected to forces tending to distance them from each other, but not being biased toward its compact, springlike helical configuration to such an extent as to substantially impede the movement of a spear to which it may be attached upon firing from a speargun to which it also may be attached.

5,145,741

CONVERTING CERAMIC MATERIALS TO ELECTRICAL CONDUCTORS AND SEMICONDUCTORS

Nathaniel R. Quick, 44 Center Grove Rd., H15, Randolph, N.J. [illegible]

Continuation-in-part of Ser. No. 361,506, Jun. 5, 1989. This application Feb. 28, 1991, Ser. No. 665,574

Int. Cl.^{5} B05D *3/06*, *5/12*, *3/02*

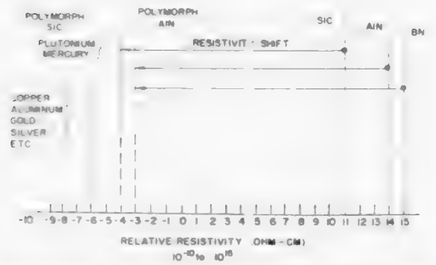
U.S. Cl. 428—402 22 Claims

4. A method for directly converting at least a surface portion of a substrate of an insulative crystalline ceramic compound of nitride or carbide having a hexagonal crystalline structure to ceramic electroconductive or semiconductive surface,

said method comprising a step of directing a focussed ther-

mal energy laser beam onto said surface portion for selected thermal exposure thereof and causing relative motion between said beam and substrate so as to delineate pattern traces into said substrate in an oxygen containing atmosphere,

said motion being controlled so as to cause rapidly controlled oxidation and decomposition of said surface portion of said ceramic compound substrate to a selected penetration depth into and beneath said surface portion of said substrate,



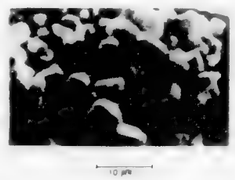
whereby said oxidation and decomposition of said surface portion of said ceramic compound, produced by said beam exposure and rapid solidification of said surface portion, causes direct conversion of said traces of said surface portion of said substrate into said ceramic electroconductive or semiconductive surface having non-hexagonal crystalline structure and being operable at non-cryogenic temperatures.

5,145,743

X-RAY INTENSIFYING SCREENS WITH IMPROVED SHARPNESS

Jacob Beutel, Hockessin, Del., and Lothar H. Brixner, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 25, 1990, Ser. No. 603,276
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—403 **21 Claims**



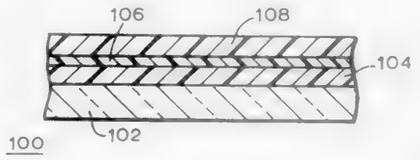
1. An X-ray intensifying screen comprising a support having coated thereon an active layer comprising phosphor crystals dispersed in a binder, said phosphor crystals containing small particles of light scattering particulate material adhered thereto, said particles of particulate material being present in an amount of 0.05 to 0.45 weight percent based on the weight of said phosphor.

5,145,744

BILAYER GLAZING PANEL

George E. Cartier, Springfield, Mass.; Carl P. Piretti, Collinsville, Conn., and Robert H. M. Simon, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 26, 1990, Ser. No. 617,835
Int. Cl.[5] B32B *17/10, 27/40*
U.S. Cl. 428—423.7 **3 Claims**



1. A wrinkle-free bilayer glazing panel comprising sequentially:

a) a sheet of glass;

b) a layer of plasticized partial polyvinyl butyral;

c) a transparent polyethylene terephthalate layer; and

d) a layer of cross-linked, self-healing polyurethane wherein cross-linking is through the presence of ethoxylated trimethylol propane or ethoxylated trimethylol propane triacrylate.

5,145,745

MAGNETIC RECORDING MEDIUM COMPRISING PLURAL MAGNETIC LAYERS WHEREIN EACH LAYER HAS SPECIFIED LOSS-MODULUS PROPERTIES

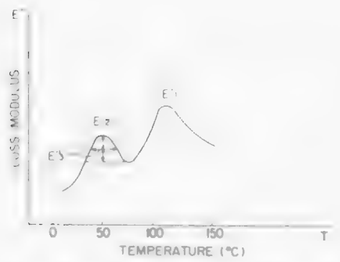
Atsuko Matsuda, and Tsutomu Kenpo, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,690
Claims priority, application Japan, Oct. 3, 1989, 1-258606
Int. Cl.[5] G11B *5/00*
U.S. Cl. 428—425.9 **5 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a plurality of magnetic layers thereon, each of said magnetic layers comprising a ferromagnetic powder and a binder, wherein

each of said magnetic layers shows a peak in its loss modulus-temperature curve at a peak temperature of at least 50° C., and said peak having a half-width not larger than 20° C.; and

said peak of an outermost of said magnetic layers is at a higher said peak temperature than that of a magnetic layer other than said outermost magnetic layer.



5,145,746

LAMINATING MATERIAL FOR SAFETY GLASS

Kotani Tomoyuki, Yokohama, Japan, assignor to Diafoil Company, Ltd., Tokyo, Japan

Filed Oct. 25, 1991, Ser. No. 781,306
Claims priority, application Japan, Oct. 26, 1990, 2-289864
Int. Cl.[5] B32B *15/08*
U.S. Cl. 428—458 **4 Claims**

1. A laminating material for safety glass comprising a substrate of a polyester film satisfying the following conditions (1) to (4), on one side of which a heat ray shielding layer consisting of a metal and/or a metallic compound:

$$R \geqq 8000 \quad (1)$$

$$H \leqq 5 \quad (2)$$

$$\alpha_{MD}+\alpha_{TD} \leqq 10 \quad (3)$$

$$F_B \geqq 8 \quad (4)$$

wherein R stands for retardation (nm), H stands for film haze (%), α_{MD} and α_{TD} respectively stand for shrinkage of the film in the longitudinal (machine) direction and in the direction perpendicular to said direction and F_B stands for the strength at break point (kg/mm^2) in the longitudinal direction.

5,145,747

FILM AND POLYMER COMPOSITION FOR FILM

Egon Jottier, Mol, Belgium, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 12, 1990, Ser. No. 478,800
Claims priority, application United Kingdom, Feb. 13, 1989, 8903207; Mar. 31, 1989, 8907300
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—484 **12 Claims**

1. A film having at least two layers, a first layer being a polymer composition comprising a mixture of:

a) a film-forming polymer of ethylene and up to about 40 wt % of a comonomer selected from the group consisting of vinyl acetate, methyl acrylate and butyl acrylate, said polymer having a melt index of from 0.1 to 10 and

b) from about 2 to 50% by weight of a crystalline wax having a drop melting point of from about 80 to 150° C., a penetration value up to 5.0 dmms and a number average molecular weight of from 500 to 5000;

and a second layer substantially devoid of wax adhered to said first layer, said second layer being a film-forming polymer composition as defined by (a).

5,145,748

WATERPROOFING SYSTEM FOR WATER-PENETRABLE CONSTRUCTION SURFACES

James M. Gaidis, Ellicott City, Md.; Robert A. Wiercinski, Somerville, Mass., and Susan G. Ehrlich, Baltimore, Md., assignors to W.R. Grace & Co. -Conn., New York, N.Y.

Continuation-in-part of Ser. No. 368,640, Jun. 20, 1989, abandoned. This application Feb. 16, 1990, Ser. No. 481,004
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Int. Cl.[5] B32B *11/04*
U.S. Cl. 428—489 **8 Claims**

1. A waterproofing package, comprising:

an aqueous-based waterproofing pretreatment composition operative to strengthen adhesion between a water penetrable surface having dust particles thereon and the pressure sensitive adhesives of a sheet-like waterproofing laminates, said composition including SBR latex, SBS latex, natural rubber latex, polybutadiene latex, polyvinyl acetate latex, or a combination thereof, and further including from 1% to 70% by weight solids and a surfactant; and

a sheet-like waterproofing laminate comprised of a support film and pressure sensitive adhesive, said laminate operative to adhere to a surface pretreated with said composition.

2. The waterproofing package of claim 1 wherein said waterproofing laminate has a bituminous layer including about 0–20% by weight asphalt, about 25–50% by weight process oil, and about 10–35% by weight of a thermoplastic block polymer of styrene and butadiene monomers or random styrene and butadiene rubber polymer.

5,145,749

COATING COMPOSITION AND COATED PAPER

Michael K. Matthew, Canterbury, England, assignor to James River Graphics Limited, London, England

Filed Jun. 7, 1989, Ser. No. 362,507
Claims priority, application United Kingdom, Jun. 8, 1988, 8813557
Int. Cl.[5] C08L *91/06;* **C08K** *3/34, 3/26;* **B32B** *27/10*
U.S. Cl. 428—511 **12 Claims**

1. Electrophotographic paper comprising a coating composition adhered to a substrate, said coating composition being erasable by local breakage of adhesion of said coating composition to said substrate, said coating composition comprising a synthetic polymeric elastomeric binder and a wax, said synthetic polymeric elastomeric binder being selected from the group consisting of an aqueous emulsion of an acrylic polymer and polymethylmethacrylate and wherein said wax is selected from the group consisting of polyalkane and polyalkene waxes and is present in an amount of at least 15 wt % of the elastomeric binder, said coating composition being adapted to receive an image at the top free surface thereof and resist penetration through the coating, of substances which define said images.

5,145,750

RUBBER PRODUCT IDENTIFICATION BY TAGGING

James A. Davis, Uniontown, and Kenneth R. Lucas, Copley, both of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 24, 1990, Ser. No. 602,543
Int. Cl.[5] B27K *1/00*
U.S. Cl. 428—690 **14 Claims**

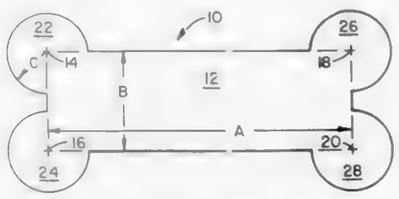
1. An identifiable rubber roofing membrane or material comprised of said rubber roofing membrane or material and an X-ray fluorescable material.

5,145,74.

POLYMER PELLET CONFIGURATION FOR SOLID-STATE POLYMERIZATION

Cheuk C. Yau, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1990, Ser. No. 563,024
Int. Cl.[5] B32F *5/16*
U.S. Cl. 428—402 **6 Claims**



1. A polymer pellet having improved reactivity for solid-state polymerization, and less tendency to stick during processing with heat, said pellet having opposite faces lying generally in parallel planes, and in cross-section in a plane parallel to said faces, said pellet having a generally rectangular central section, the corners thereof forming lobes which protrude from the rectangular central section in both parallel and perpendicular directions with respect to said generally rectangular central section, said generally rectangular central section having length and width dimensions A and B wherein the ratio of A to B is about 1.2 to 6 and the ratio of B to the average radius of said lobes C is about 0.3 to 5.

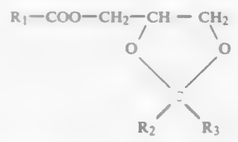
5,145,751

MAGNETIC RECORDING MEDIUM COMPRISING MAGNETIC PARTICLES AND A BINDER AND A DIOXOLANE ESTER LUBRICANT

Hiroyuki Kanai, Tochigi, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 535,481
Claims priority, application Japan, Jun. 26, 1989, 1-162882
Int. Cl.[5] G11B 5/00
U.S. Cl. 428—694 3 Claims

1. A magnetic recording medium, which comprises a non-magnetic substrate and a magnetic recording layer comprising magnetic particles and a binder, coated on said substrate, said magnetic recording layer comprising a compound having the formula (1):



(1)

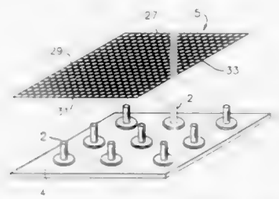
wherein R_1 is an alkyl having 11 to 31 carbon atoms; R_2 and R_3 each are hydrogen, an alkyl having 1 to 8 carbon atoms, or an aryl.

5,145,752

ELECTRODES FOR METAL/AIR BATTERIES AND BIPOLAR METAL/AIR BATTERIES INCORPORATING THE SAME

Jonathan Goldstein; Menachem Kordill, and Avner Brokman, all of Jerusalem, Israel, assignors to Luz Electric Fuel Israel Limited, Jerusalem, Israel

Filed Dec. 31, 1990, Ser. No. 633,514
Int. Cl.[5] H01M 4/86
U.S. Cl. 429—27 16 Claims



1. A bipolar electrode for use in a primary metal/air battery having a metallic slurry anode, said electrode comprising:

a) a current-collecting, electrolyte-imprevious metallic structure having a first surface for collecting current from said metallic slurry anode, and

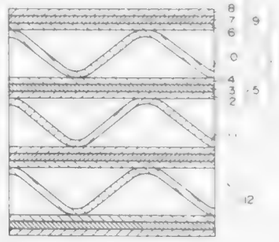
b) a metallic air cathode spaced from said structure and having a plurality of electrically-conductive protrusions extending at least from a central area of a first surface of said air cathode and attached to a second surface of said current-collecting structure, said protrusions being in the form of an array of pins, which centrally positioned array enables said pins to tap the current from the central parts of the electrode and to form a structural brace for said central sections to prevent said central sections from building under pressure from electrolyte slurry in contact therewith, and to define and limit the space therebetween, a second surface of said air cathode being provided with an inner hydrophobic waterproof barrier layer which is impermeable to electrolyte but permeable to oxygen gas and coated with an outer active catalytic layer.

5,145,753

SOLID ELECTROLYTE FUEL CELL

Mitsuhiro Irino; Tetsuo Gora; Masaharu Minami; Hitoshi Miyamoto; Masao Sumi, all of Takasago; Nobuyoshi Tomita, Kobe; Kiyoshi Watanabe, Kobe; Kazumi Ogura, Kobe; Masanori Nishiura, Kobe; Masayuki Funatsu, Kobe; Kazuhiro Yoshimoto, Kobe; Koichi Takenobu, Kobe, and Tokuji Satake, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,499
Claims priority, application Japan, Sep. 12, 1989, 1-236459; Nov. 13, 1989, 1-294483
Int. Cl.[5] H01M 8/12, 4/86
U.S. Cl. 429—32 19 Claims



1. A solid electrolyte fuel cell comprising a generating layer, an interconnector layer, and a support layer disposed between the generating layer and the interconnector layer wherein:

the generating layer comprises a solid electrolyte sandwiched between a fuel electrode and an oxygen electrode;

the interconnector layer comprises a fuel electrode and an interconnector material and an oxygen electrode;

the support layer forms a fuel passage and an oxidizer passage above and below the generating layer; and

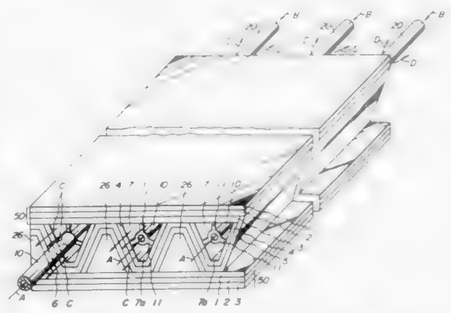
supporting rods for gas sealing are disposed at both ends of the support layer.

5,145,754

SOLID OXIDE FUEL CELL

Hidenobu Misawa, Toyoake, and Hirotake Yamada, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Feb. 7, 1991, Ser. No. 651,973
Claims priority, application Japan, Feb. 15, 1990, 2-32382
Int. Cl.[5] H01M 8/10
U.S. Cl. 429—32 9 Claims



1. A solid oxide fuel cell comprising a plurality of flat plate laminates spaced substantially parallel to one another, each of the laminates having one surface covered with a flat plate air electrode film and another surface covered with a flat plate fuel electrode film, a plurality of oxidizing gas flow passages each arranged between the adjacent flat plate laminates and facing said flat plate air electrode film, a plurality of fuel gas flow passages each arranged between the adjacent flat plate laminates and facing said flat plate-like fuel electrode film, and at least air electrode films, solid electrolyte films and fuel electrode films interposed between said oxidizing gas flow passages and said fuel gas flow passages, wherein oxidizing gas supply pipes are each extended from an opening at one end of each of said oxidizing gas flow passages into the oxidizing gas flow passage, closure members are provided to each close the other end of the oxidizing gas flow passage, fuel gas supply pipes are each extended from an opening at one end of each of said fuel gas flow passages into the fuel gas flow passage, and closure members are provided to each close the other end of the fuel gas flow passage.

5,145,755

METHOD OF MAKING TETRACHLOROALUMINATE + SULFUR DIOXIDE ELECTROLYTES IN WHICH HYDROLYSIS PRODUCTS ARE REMOVED

Carl R. Schlaikjer, Concord, Mass., and Melinda D. Jones, Pawtucket, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1991, Ser. No. 751,851
Int. Cl.[5] H01M 6/14
U.S. Cl. 429—196 17 Claims

1. Process for making a sulfur dioxide electrolyte for a lithium electrochemical cell, comprising the steps of

providing a tetrachloroaluminate salt mixture containing an alkali metal tetrachloroaluminate and a member selected from the group consisting of another alkali metal tetrachloroaluminate and an alkaline earth metal tetrachloroaluminate,

adding sulfuryl chloride to the mixture,

heating the mixture to purify the mixture of hydrolysis products,

removing the sulfuryl chloride, and

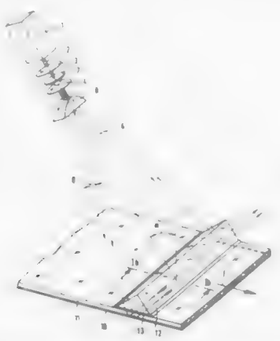
adding sulfur dioxide to the mixture.

5,145,756

METHOD FOR MAKING A HOLOGRAPHIC MIRROR

Wilbert Windeln, Heinsberg; Manfred-Andreas Beeck, Gifhorn, and Norbert Bartonitscheck, Stolberg, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 255,685, Oct. 11, 1988, abandoned. This application Jul. 15, 1991, Ser. No. 731,351
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734438
Int. Cl.[5] G03H 1/04
U.S. Cl. 430—1 11 Claims



1. A process of forming a holographic mirror comprising the steps of:

exposing a photosensitive layer having first and second major surfaces to first and second elongated beams of coherent electromagnetic radiation that interfere within a corresponding strip of the photosensitive layer to produce an array of fringes spaced at a distance that is a function of the wavelength of the interfering radiation, the first and second elongated beams extending the width of the photosensitive layer, the photosensitive layer being illuminated along a line in a first direction on the first major surface by at least said first and second elongated beams and the second elongated beam being produced by reflection of the first elongated beam after it passes through the photosensitive layer; and

continuously moving one of the photosensitive layer and the first and second elongated beams relative to the other in a second direction at a speed such that said photosensitive layer receives sufficient illumination over the entire first major surface for the array of fringes to record a homogeneous interference structure throughout the photosensitive layer.

5,145,757

METHOD OF FORMING STABLE IMAGES IN ELECTRON BEAM WRITABLE GLASS COMPOSITIONS

Stephen W. Smoot, Wilkes-Barre, and Joseph S. Hayden, Clarks Summit, both of Pa., assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Filed Jun. 23, 1989, Ser. No. 369,997
Int. Cl.[5] G03G 5/00; G11B 7/00
U.S. Cl. 430—5 20 Claims

1. A method of forming an image readable by UV radiation comprising writing said image in a silicate glass article by electron beam irradiation thereof, the glass article comprising the following composition in mole %:

SiO_2	30–95
P_2O_5	0–20
B_2O_3	0–30
Al_2O_3	0–40
RO	0–40
R_2O	1–35
halide	0–10

and essentially no transition metals having 1–4 d-electrons in the atomic state,

wherein RO is MgO, CaO, SrO, BaO, ZnO and/or PbO,

R_2O is Li_2O, Na_2O, K_2O, Rb_2O and/or Cs_2O,

halide is Cl, F, Br and/or I,

at least one surface of said article having a substantially continuous silver and hydration content over its area, effective to render said surface darkenable upon exposure to electron beam radiation but substantially not thermoplastic,

said article being capable of being substantially darkened by electron beam irradiation over at least a portion of at least one surface thereof,

and said article having geometric characteristics suitable for functioning as a photomask reticle, optical disk or similar archival storage medium.

20. A method of forming an image readable by UV radiation comprising writing said image in a silicate glass article by electron beam irradiation thereof, the glass article comprising an amount of SiO_2 effective as a network former and essentially no transition metals having 1–4 d-electrons in the atomic state, and

at least one surface of said article having a substantially continuous silver and hydration content over its area, effective to render said surface darkenable upon exposure to electron beam radiation but substantially not thermoplastic,

said article substantially not exhibiting alterable photo-anisotropic effects inducible by actinic UV radiation,

and said article having geometric characteristics suitable for

functioning as either a photomask reticle or an archival storage medium.

5,145,754

METHOD OF PRODUCING A PRINTING IMAGE CARRIER

Gerhard Koosmehl; Matthias Nieraitz, and Detlef Kabbeck-Kupijai, all of Berlin, Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach-am-Main, Fed. Rep. of Germany

Filed Jul. 17, 1989, Ser. No. 380,878

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825850

Int. Cl.[5] **G03G** *13/26* **C25D** *17/00*

U.S. Cl. 430—49 **26 Claims**

1. A method for producing a printing image carrier for use in a printing press, comprising

providing a first electrode in form of an electrically conductive printing image carrier (**14, 21, 51**);

providing a second electrode in form of a counter electrode (**22, 52, 53**) and positioning said electrodes with respect to each other to define a gap (**29**) therebetween;

transporting an electrolyte into said gap,

wherein said electrolyte includes an electrically conductive monomer material which has the characteristic that said electrically conductive material can change between monomer and polymer state under the influence of electric potential applied thereto, and said electrically conductive material has the further characteristic that, when in polymer form, it adheres to said carrier (**14, 21, 51**); and

selectively, in accordance with the printing image (**31**), applying an electrical potential between said electrodes formed by said printing image carrier and the counter electrode to deposit said material from the electrolyte by change, under influence of said electrical potential, on conditions or state of said material in the electrolyte, from a monomer to a polymer,

said thus generated polymer adhering to the image carrier (**14, 21, 51**), selectively, in accordance with the printing image (**31**).

5,145,759

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

David R. Terrell, Lint; Stefaan K. De Meutter, Zandhoven, and Marcel J. Monbaliu, Mortsel, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

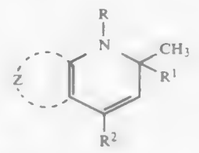
Filed Apr. 16, 1990, Ser. No. 509,248

Claims priority, application Belgium, Apr. 21, 1989, 89201035.6

Int. Cl.[5] **G03G** *5 047, 5/09*

U.S. Cl. 430—58 **17 Claims**

1. An electrophotographic recording material comprising on an electrically conductive support a negatively chargeable photoconductive recording layer which contains in an electrically insulating organic polymeric binder material at least one photoconductive n-type pigment substance and one or more p-type photoconductive charge transport substances, wherein said layer has a thickness in the range of 4 to 40 μm and comprises 8 to 80% by weight of said n type pigment substance and 0.01 to 40% by weight of said p type charge transport substance that is molecularly distributed in said electrically insulating organic polymeric binder material that has a volume resistivity of at least 10^{14} Ohm-m, and wherein said recording layer in electrostatically charged state requires for 10% and 90% discharge respectively exposures to conductivity increasing electromagnetic radiation that differ by a factor 4.5 or less, and wherein at least one p-type charge transport substance corresponds to a following general formula (**I**):

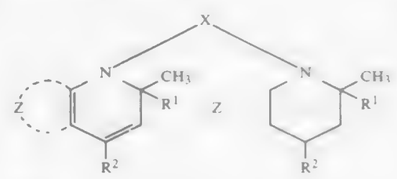


(I)

wherein:

R is a member selected from the group consisting of hydrogen, an aliphatic group, and a cycloaliphatic group including these groups substituted by non-ionic substituents, each of R^1 and R^2 (same or different) is a member selected from the group consisting of a C_1–C_6 alkyl group, and an aryl group, and

Z are the atoms selected from the group consisting of those necessary to close an adjacent aromatic nucleus, and an aromatic ring system including such nucleus or ring system substituted with one or more substituents of non-ionic character; and formula (II):



(II)

wherein:

X is a member selected from the group consisting of a bivalent aliphatic, a cycloaliphatic group, an alkylene chain interrupted by a bivalent aromatic group, and a bivalent aliphatic group wherein at least two carbon atoms are linked through a hetero-atom selected from the group consisting of oxygen, sulphur and nitrogen wherein nitrogen is substituted with a monovalent hydrocarbon group, and R^1, R^2 and Z have the same significance as described for general formula (**I**).

5. An electrophotographic recording material according to claim **1**, wherein said recording material has an outermost binder layer containing at least one p-type transport substance being not admixed with said photoconductive n-type pigment(s).

5,145,760

POSITIVE-WORKING PHOTOSENSITIVE ELECTROSTATIC MASTER WITH IMPROVED INVIRONMENTAL LATITUDE

Graciela B. Blanchet-Fincher; Catherine T. Chang, both of Wilmington, Del., and Richard J. Kempf, Towanda, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1990, Ser. No. 603,939

Int. Cl.[5] **G03F** *5/06*

U.S. Cl. 430—73 **35 Claims**

1. An improved photosensitive electrostatic master having reduced temperature and humidity sensitivity comprising

(1) an electrically conductive substrate, and

(2) a layer of photosensitive composition consisting essentially of

(a) at least two organic polymeric binders, at least one binder having a Tg greater than 80° C. and at least one binder having a Tg of 70° C. or less such that the shift in transit time (a_T) of the photosensitive layer in the range 30% ≦ relative humidity ≦60% and 65° F. (18.3° C.)≦temperature <80° F. (26.7° C.) is 10 or less;

(b) a hexaarylbiimidazole photooxidant,

(c) a leuoo dye that is oxidizable to an ionic species by the photooxidant,

(d) a nonionic halogenated compound, and

(e) at least one compatible plasticizer.

5,145,761

CARRIERS FOR DEVELOPING ELECTROSTATIC IMAGES

Motonobu Kubo, Minoo; Hiroshi Inukai, Takatsuki, and Takahiro Kitahara, Suita, all of Japan, assignors to Daikin Industries, Ltd., Japan

Filed Oct. 11, 1989, Ser. No. 420,009

Claims priority, application Japan, Oct. 13, 1988, 63-258907; Oct. 13, 1988, 63-258908; Dec. 21, 1988, 63-324487; Jan. 31, 1989, 63-23564; Jun. 16, 1989, 1-155529; Jun. 16, 1989, 1-155530

Int. Cl.[5] **G03G** *9/00;* **B32B** *23/02, 27/02*

U.S. Cl. 430—108 **1 Claim**

1. A carrier for developing electrostatic images, the carrier comprising a particulate core and a coating on the core, the coating being formed from a copolymer or a composition containing the copolymer, the copolymer consisting essentially of (a) about 45 to about 90 mole % of at least one monomer selected from the group consisting of chlorotrifluoroethylene, tetrafluoroethylene, trifluoroethylene and hexafluoropropylene and (b) about 10 to about 55 mole % of at least one of the monomers represented by the formula

$$CH_2{=}CHOOCR$$

wherein R is an alkyl, cycloalkyl or an aromatic group.

5,145,762

PROCESSES FOR THE PREPARATION OF TONERS

Bernard Grushkin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1991, Ser. No. 677,076

Int. Cl.[5] **G03G** *13/20, 9/14*

U.S. Cl. 430—137 **20 Claims**

1. A process for the preparation of toner compositions consisting essentially of melt blending toner resin particles, magnetite particles, wax, and charge additives; subsequently adding the prepared said toner to an extruder; adding to the aforementioned toner as it enters the extruder a coupling component; subsequently injecting water therein; cooling; and micronizing.

5,145,763

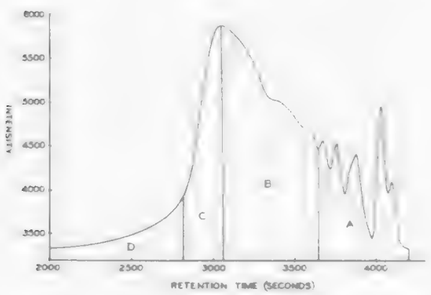
POSITIVE PHOTORESIST COMPOSITION

David R. Bassett, Charleston, W. Va., and Gary A. Amstutz, San Jose, Calif., assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.

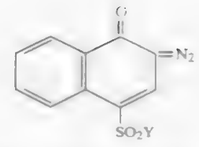
Filed Jun. 29, 1990, Ser. No. 545,702

Int. Cl.[5] **G03C** *1/54;* **G03F** *7/022*

U.S. Cl. 430—169 **37 Claims**



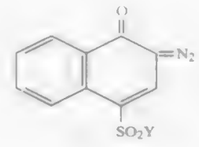
1. A photosensitive resin comprising a reaction product of a cresol-formaldehyde novolac resin and a naphthoquinonediazide sensitizer represented by the following formula:



wherein Y constitutes a removable group which is eliminated upon reaction between the naphthoquinonediazide sensitizer and a hydroxyl group of the novolac resin, wherein said novolac resin is produced by condensing cresol with formaldehyde in the presence of an acid catalyst and reacting said condensate with hexamethylenetetramine.

7. A positive photoresist composition, comprising a mixture of

(a) about 95 to 80 percent by weight of a photosensitive resin comprising a reaction product of a cresol-formaldehyde novolac resin and a naphthoquinonediazide sensitizer represented by the following formula:

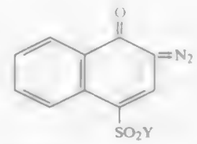


wherein Y constitutes a removable group which is eliminated upon reaction between the naphthoquinonediazide sensitizer and a hydroxyl group of the novolac resin, wherein said novolac resin is produced by condensing a cresol with formaldehyde in the presence of an acid catalyst and reacting said condensate with hexamethylenetetramine, and

(b) about 5 to 20 percent by weight of a primary or secondary sulfonamide development enhancement agent.

14. A composition suitable for forming a positive photoresist coating, said composition comprising a mixture of

(a) about 1 to 40 percent by weight of a photosensitive resin comprising a reaction product of a cresol-formaldehyde novolac resin and a naphthoquinonediazide sensitizer, represented by the following formula:



wherein Y constitutes a removable group which is eliminated upon reaction between the naphthoquinonediazide sensitizer and a hydroxyl group of the novolac resin, wherein said novolac resin is produced by condensing cresol with formaldehyde in the presence of an acid catalyst and reacting said condensate with hexamethylentetramine,

(b) about 0.05 to 10 percent by weight of a primary or secondary sulfonamide development enhancement agent and

(c) a solvent for (a) and (b).

5,145,764

POSITIVE WORKING RESIST COMPOSITIONS PROCESS OF EXPOSING,STRIPPING DEVELOPING

Richard D. Bauer, Kennett Square, Pa.; Gwendyline Y. Y. Chen, Wilmington, Del.; Walter R. Hertler, Kennett Square, Pa., and Robert C. Wheland, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

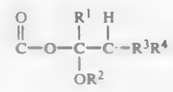
Division of Ser. No. 507,337, Apr. 10, 1990, Pat. No. 5,077,174. This application Sep. 10, 1991, Ser. No. 757,081

Int. Cl.[5] G03C 1/90

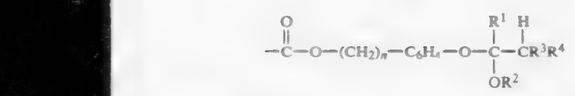
U.S. Cl. 430—260 **28 Claims**

1. A process for forming a positive photoresist on a surface which comprises:

a. applying to said surface the surface of a solid, unexposed, photosensitive layer having a thickness of at least 8 microns, said layer comprised of (a) a polymer chosen from the group consisting of compositions having a polymer backbone and pendant acid-labile groups which are bound directly or indirectly to the polymer backbone, said pendant acid-labile groups represented by the formula:



or



where n=0–4; R^1 is hydrogen or lower alkyl; R^2 is lower alkyl; and R^3 and R^4 independently are hydrogen or lower alkyl where the definition of lower alkyl includes the joining of R^1 and R^2 or R^1 and either R^3 or R^4, or R^2 and either R^3 or R^4 to form a 5-, 6-, or 7-membered ring (b) an initiator system that forms a catalytic amount of strong acid upon exposure to actinic radiation having a wavelength between about 3000 Å and about 9000 Å; and the other surface of the layer having adhered thereto with low to moderate adherence a thin, flexible, polymeric film support; then

b. exposing the layer, imagewise to actinic radiation to form an image,

c. stripping the film support from the resulting image-bearing layer; and then,

d. washing away the exposed areas of the layer to form a positive resist image,

e. permanently modifying the adjacent areas on the substrate surface which are unprotected by the resist image by using a reagent capable of etching said areas or depositing a material on said areas; and

f. blank exposing the resist image and stripping it from the resist in aqueous alkali.

5,145,765

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okamura, and Kazunobu Katoh, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 520,479, May 8, 1990, abandoned. This application Aug. 14, 1991, Ser. No. 746,810

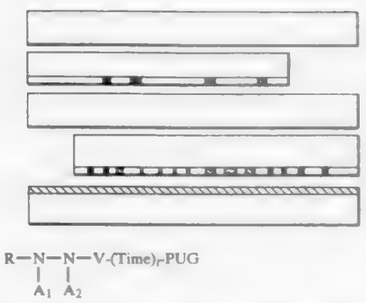
Claims priority, application Japan, May 8, 1989, 1-114455

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] G03C 1/06

U.S. Cl. 430—264 **1 Claim**

1. A silver halide photographic material which contains (a) at least one redox compound represented by the following general formula (II):



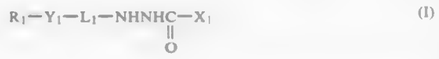
(II)

wherein both A_1 and A_2 represents hydrogen atoms, or one of them represents a hydrogen atom and the other represents a sulfinic acid residual group or

wherein R_0 represents an alkyl group, an alkenyl group, an aryl group, an alkoxy group, or an aryloxy group, and l represents 1 or 2; TIME represents a divalent group which contains a hetero atom and which is bonded to the V group through the hetero atom; t represents 0 or 1; PUG represents a development inhibitor group which contains a hetero atom and which is bonded to either the TIME group or the V group through a hetero atom in the PUG; V represents a carbonyl group,

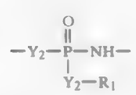
a sulfonyl group, a sulfoxy group,

wherein R_1 represents an alkoxy group or an aryloxy group, an iminomethylene group, or a thiocarbonyl group; and R represents an aliphatic group, an aromatic group, or a heterocyclic group; and (b) at least one compound represented by the following formula (I):



(I)

wherein R_1 represents an aliphatic group, an aromatic group, or a heterocyclic group; L_1 represents an arylene group; X_1 represents a hydrogen atom, an aliphatic group, an aromatic group, or a heterocyclic group; and Y_1 represents —O—, —SO_2NH— or



wherein Y_2 represents —O—, —NH—, or

5,145,766

PROCESS FOR STABILIZING MAGENTA COUPLERS AND THE CORRESPONDING IMAGE DYES IN PHOTOGRAPHIC MATERIALS

David G. Leppard, Marly, Switzerland; David H. Steinberg, Bronx, N.Y., and Henri Dubas, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

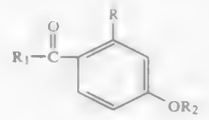
Filed May 13, 1991, Ser. No. 699,102

Claims priority, application Switzerland, May 16, 1990, 1653/90

Int. Cl.[5] G03C 1/34, 7/38, 7/384

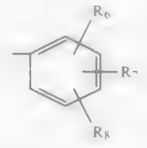
U.S. Cl. 430—372 **8 Claims**

1. A process for stabilising magenta couplers and the corresponding image dyes in silver halide photographic materials, which comprises incorporating at least one compound of the formula

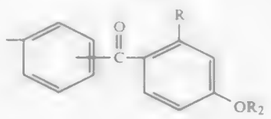


(1)

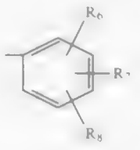
in which R is hydrogen or hydroxyl, R_1 is alkyl or alkoxy, in each case having 1 to 18 carbon atoms or R_1 is —NR_4R_5 in which R_4 and R_5, independently of one another, are hydrogen or alkyl having 1 to 18 carbon atoms, or R_1 is a radical of the formula



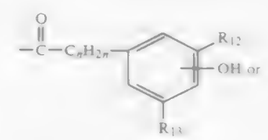
in which R_6, R_7 and R_8, independently of one another, are hydrogen, hydroxyl or alkyl, in each case having 1 to 8 carbon atoms, or R_1 is a radical of the formula

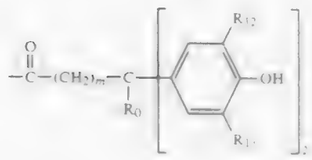


in which R is as defined above, and R_2 is —COR_{11} or —SO_2R_{11} in which R_{11} is alkyl having 1 to 18 carbon atoms, alkenyl having 2 to 18 carbon atoms, phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety or a radical of the formula



in which R_6, R_7 and R_8 are as defined above, or R_2 is —CO_2R_{10} or —CO_2R_{10} in which R_{10} is as defined above, or R_2 is a radical of the formula





in which m is 1 to 6, and R_0 is hydrogen or methyl, and n is 0 to 14, and R_{12} and R_{13}, independently of one another, are hydrogen, alkyl, in each case having 1 to 8 carbon atoms, cyclopentyl, cyclohexyl, alkylphenyl having 1 to 8 carbon atoms in the alkyl moiety, or phenyl, into the layer containing the magenta couplers or into a layer adjacent thereto.

7. A silver halide photographic material containing at least one compound of the formula (1) defined in claim 1 and containing at least one magenta coupler.

5,145,767

THERMALLY SENSITIVE COMPOSITIONS COMPRISED OF SALTS OF OXIDIZING ACIDS AND LEUCO DYES

David R. Whitcomb, and Frank T. Sher, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 16, 1990, Ser. No. 552,886

Int. Cl.[5] G03C 1/72

U.S. Cl. 430—338 **25 Claims**

1. A thermally sensitive composition capable of undergoing a visible change upon the application of heat without decomposition of the composition comprising the product of an oxidatively triggerable leuco dye and a stable oxidizing acid, wherein said acid comprises a Group V, VI, or VII element, hydrogen and oxygen.

5,145,768

PROCESS OF FORMING SILVER HALIDE GRAINS

Yasunori Ichikawa; Hiroshi Ohnishi; Shigeharu Urabe; Akira Kojima, and Akira Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 21, 1989, Ser. No. 454,243

Claims priority, application Japan, Dec. 22, 1988, 63-322170

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] G03C 1/015

U.S. Cl. 430—569 **3 Claims**

1. A process of forming silver halide grains comprising the steps of:

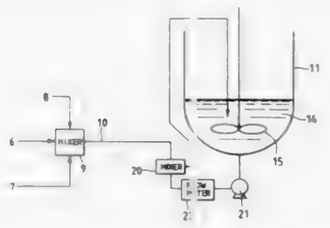
disposing a mixer outside of a reaction vessel containing an aqueous protective colloid solution and causing at least one of a nucleus formation and a crystal growth of silver halide grains in the reaction vessel, said mixer including a rotatable stirring blade;

supplying at various flow rates an aqueous solution of a water-soluble silver salt, an aqueous solution of a water-soluble halide, and an aqueous protective colloid solution to the mixer while controlling the flow rates of said aqueous solutions;

mixing the aqueous solutions while controlling the rotational

speed of said stirring blade to form fine, silver halide grains; and

immediately supplying the fine grains to the reaction vessel to perform said at least one of the nucleus formation and the crystal growth in the reaction vessel, wherein the fine



grains formed in the mixer are quickly mixed and diluted with a liquid drawn from the reaction vessel in an additional mixer disposed in a conduit connecting the mixer for forming the fine grains and the reaction vessel to form a diluted mixture, and then the diluted mixture is supplied to the reaction vessel.

5,145,769

METHOD FOR CRYOPRESERVING BLOOD VESSELS

Robert T. McNally; Cameron McCrea; Kelvin G. M. Brockbank; Albert E. Heacox, all of Marietta, Ga., and Harvey L. Bank, Charleston, S.C., assignors to CryoLife Inc. and Medical Univ. of South Carolina, both of Marietta, Ga.

Filed Aug. 21, 1987, Ser. No. 88,092

Int. Cl.[5] A01N *1/02*

U.S. Cl. 435—1 **1 Claim**

1. A composition comprising:

i) a tissue storage medium comprising a cryoprotectively effective concentration of a cell penetrating cryoprotectant and a cryoprotectively effective concentration of a glycosaminoglycan, and

ii) a segment of a blood vessel,

wherein said segment of said blood vessel is submerged in said medium.

5,145,770

CRYOPRESERVATION OF CULTURED EPITHELIAL SHEETS

Ross A. Tubo, Quincy; Susan F. Schaeffer, Wayland; Alexander Schermer, Belmont, and Richard Odessey, Newton Lower Falls, all of Mass., assignors to BioSurface Technology, Inc., Cambridge, Mass.

Filed Jun. 4, 1990, Ser. No. 533,385

Int. Cl.[5] C12N *5/00;* **A61K** *35/36;* **A01N** *1/02*

U.S. Cl. 435—1 **28 Claims**

1. An improved method for maintaining a cohesive sheet of living epithelial cells in a cryopreserved state, comprising the steps of:

A. providing a cultured, stratified sheet of epithelial cells separated from its substratum

B. immersing said cultured sheet for greater than 15 minutes in a cryoprotective solution comprising a non-cell-penetrating, glass-forming agent which is removable by dilution and rinsing upon thawing, in combination with a cell-penetrating, glass-forming agent;

C. cooling said sheet in the cryoprotective solution to a temperature of or below approximately −65° C.;

D. storing the cooled sheet at a temperature at or below −65° C.; and

E. thawing the cryopreserved sheet to produce an intact, mitotically competent sheet of viable cells capable of stratified differentiation, wherein said intact sheet is useful as a skin wound dressing.

5,145,771

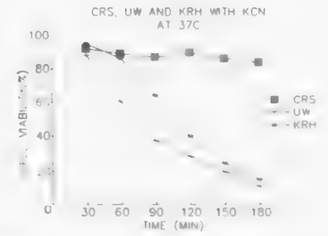
RINSE SOLUTION FOR ORGANS AND TISSUES

John J. Lemasters, and Ronald G. Thurman, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation-in-part of Ser. No. 509,061, Apr. 12, 1990, abandoned. This application Oct. 10, 1990, Ser. No. 596,115

Int. Cl.[5] A01N *1/02;* **A61K** *37/02*

U.S. Cl. 435—1 **31 Claims**



1. A solution for the preservation and storage of organs and tissues, at temperatures of 0° C. to 37° C. intended for implantation in a patient requiring such implantation, and for rinsing other preservation and storage solution from an organ prior to implantation, said solution comprising, in one liter of solution:

from about 0.12 to about 1.2 mM adenosine; sodium, potassium, calcium and magnesium ions in a physiologically acceptable amount; and water for injection sufficient to make a liter of solution; said solution having a pH of about 6.0 to 7.5, and a concentration of potassium of less than 6 MEQ/L.

5,145,772

CHEMILUMINESCENCE ENHANCEMENT OF ENZYME-ACTIVATED DECOMPOSITION OF ENZYMATICALLY CLEAVABLE CHEMILUMINESCENT 1,2-DIOXETANES

John C. Voyta, North Reading; Brooks Edwards, Cambridge; Irena Y. Bronstein, Newton, and Patricia McGrath, Cambridge, all of Mass., assignors to Tropix, Inc., Bedford, Mass.

Continuation of Ser. No. 203,263, Jun. 1, 1988, Pat. No.

Int. Cl.[5] C12Q *1/00*

U.S. Cl. 435—4 **36 Claims**

1. In a process carried out in an aqueous medium in which electromagnetic energy released by the enzyme-activated decomposition of an enzymatically cleavable chemiluminescent 1,2-dioxetane to produce an anionic electromagnetic energy-emitting fluorophore is detected to determine the presence, concentration or structure of an analyte, the improvement comprising carrying out the process in the presence of an amount of an admixed water soluble macromolecular enhancer substance sufficient to enhance the intensity of any released detectable electromagnetic energy over the intensity of any detectable electromagnetic energy released in the absence of the enhancer substance, wherein the enhancer substance is itself incapable of energy transfer.

5,145,773

METHOD TO DETECT SENSITIVITY TO ALPHA-INTERFERON THERAPY

Anthony P. Albino, New York; David M. Nanus, New Rochelle; Neil H. Bander, and Lawrence M. Pfeffer, both of New York, all of N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed May 25, 1989, Ser. No. 357,075

Int. Cl.[5] G01N *33/574*

U.S. Cl. 435—7.23 **5 Claims**

1. A method of screening malignant renal cells or malignant renal tissues for sensitivity to alpha-interferon therapy which comprises contacting a sample of the malignant renal cells or malignant renal tissues with monoclonal antibody F33 produced by hybridoma ATCC No. HB 10155 under suitable conditions, such that the monoclonal antibody specifically binds to a gp 160 cell-surface antigen to form an antigen-antibody complex, detecting the presence of any complex so formed, the presence of any complex being predictive that the sample of malignant renal cells or malignant renal tissues will not be sensitive to alpha-interferon therapy.

5,145,774

FLUORESCENT DYES

Thomas L. Tarnowski, South San Francisco; Mae W. L. Hu, Los Altos Hills; Maureen Laney, Palo Alto; John S. Pease, Los Altos, and Vartan Ghazarossian, Menlo Park, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 234,361, Aug. 19, 1988, Pat. No. 5,026,905, which is a continuation-in-part of Ser. No. 645,458, Aug. 28, 1984, Pat. No. 4,748,129. This application Apr. 1, 1991, Ser. No. 680,635

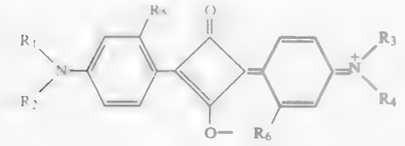
Int. Cl.[5] C01N *33/555;* **C12N** *5/08*

U.S. Cl. 435—7.25 **7 Claims**

1. A method for determining in an aqueous sample the presence of a member of a specific binding pair ("spb member"), which comprises:

(a) combining in an aqueous medium (1) a sample, (2) a complimentary sbp member wherein at least one sbp member of the complimentary spb member is bound to the surface of a cell, and (3) a fluorescent agent capable of being incorporated into the cells; and

(b) determining a change in fluorescence as an indication of the presence of the sbp member, wherein the fluorescent agent is a compound of the formula:



wherein:

R_1 and R_2 are independently selected from the group consisting of lower alkyl (1–5 carbon atoms) with the proviso that at least one of the R_1 and R_2 groups has a substituent selected from the group consisting of $—SO_3H$, $—OSO_3H$, $—PO_3H_2$, $—OPO_3H_2$, —COOH and $—NHSO_3H$;

R_3 and R_4 are independently selected from the group consisting of alkyl (5–15 carbon atoms); and

R_5 and R_6 are independently selected from the group consisting of hydrogen, hydroxyl, and lower alkoxyl (1–5 carbon atoms.

5,145,775

POLYHEDRIN GENE AND GENETIC ENGINEERING THEREOF

Nobutoshi Yamada; Norifusa Matsuo, and Takaaki Araki, all of Kusatsu, Japan, assignors to Research Association for Biotechnology of Agricultural Chemicals, Tokyo, Japan

Filed Feb. 23, 1990, Ser. No. 483,823

Claims priority, application Japan, Feb. 28, 1989, 1-46736

Int. Cl.[5] C12P *21/02;* **C12N** *15/34, 15/86, 15/00*

U.S. Cl. 435—69.1 **16 Claims**

14. A method of producing a polypeptide, which comprises:

(a) preparing a recombinant *Spodoptera litura* nuclear polyhedrosis virus wherein the DNA contains a heterologous DNA sequence which is ligated downstream of a 5'-upstream polyhedrin promoter and which is ligated upstream of a 3'-downstream DNA fragment of the polyhedrin gene; and

(b) culturing a cell infected with said recombinant virus.

5,145,776

METHOD OF USING T7 DNA POLYMERASE TO MUTAGENIZE AND FILL-IN DNA

Stanley Tabor, Cambridge, and Charles C. Richardson, Chestnut Hill, both of Mass., assignors to President & Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 132,569, Dec. 14, 1987, Pat. No. 4,942,130, which is a continuation-in-part of Ser. No. 3,227, Jan. 14, 1987, Pat. No. 4,795,699. This application Mar. 7, 1990, Ser. No. 490,156

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] C12P *19/34;* **C12N** *15/10, 9/12*

U.S. Cl. 435—91 **9 Claims**

1. A method for in vitro mutagenesis of a cloned DNA fragment comprising providing said cloned fragment and a T7-type DNA polymerase, contacting said cloned fragment with said polymerase under conditions suitable for synthesizing a DNA strand from said fragment, wherein said T7-type DNA polymerase has less than 500 units of exonuclease activity per mg of polymerase and is produced from recombinant DNA, and wherein said conditions cause formation of said DNA strand by incorporation of a plurality of individual contiguous bases able to base-pair with said fragment and incorporation of a nucleotide base unable to base-pair with said fragment.

5,145,777

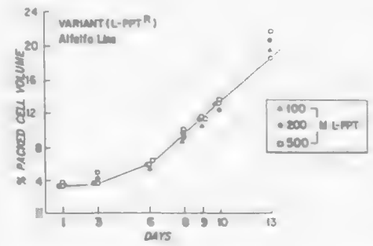
PLANT CELLS RESISTANT TO HERBICIDAL GLUTAMINE SYNTHETASE INHIBITORS

Howard M. Goodman, Newton Centre, Mass., and Gunter Donn, Hofheim, Fed. Rep. of Germany, assignors to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 399,420, Aug. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 81,455, Aug. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 833,156, Feb. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 742,846, Jun. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 656,488, Oct. 1, 1984, abandoned. This application May 9, 1991, Ser. No. 700,116

Int. Cl.[5] C12N *5/04, 15/00;* **A01H** *4/00, 1/06*

U.S. Cl. 435—172.3 **24 Claims**



1. A plant cell which is stably resistant to a herbicidal glutamine synthetase (GS) inhibitor, wherein said resistance is retained in the absence of said inhibitor, wherein said resistance is caused by plant cell levels of GS activity which, when present in an otherwise herbicidal GS-inhibitor sensitive plant cell, render said cell substantially resistant to said herbicidal GS-inhibitor.

5,145,778
HEPARINASE PRODUCED BY MICROORGANISM BELONGING TO THE GENUS BACILLUS

Robert W. Bellamy, Zama, and Kouki Horikoshi, Tokyo, both of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,061
Claims priority, application Japan, Nov. 25, 1988, 62-297807
Int. Cl.[5] C12N *9/88, 1/20;* C12P *21/00*
U.S. Cl. 435—232 1 Claim

1. An essentially pure heparinase prepared by culturing the microorganism Bacillus sp. strain SH100, FERM BP-2613, in an aqueous nutrient culture medium, and recovering the heparinase from the culture medium, said heparinase having a MW of about 120,000 daltons as determined by SDS PAGE, and the physiochemical properties of optimum activities in the pH range of 7.2–7.8 and the temperature range of 45°–50° C., a pI of 6.6 and stability for at least 30 minutes at 45° C. in the presence of calcium ions.

5,145,779
PROCESS OF BIODEGRADATION OF HIGH MOLECULAR WEIGHT POLYETHYLENE BY AEROBIC LIGNOLYTIC MICROORGANISMS

Anthony L. Pometto, III, and Byungtae Lee, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 3, 1991, Ser. No. 695,546
Int. Cl.[5] C12R *1/03, 1/465;* C12P *1/04*
U.S. Cl. 435—262 10 Claims

1. A method for degrading high molecular weight copolymers of alpha-olefins and a starch polymer having a weight average molecular weight at least within the range of 50,000 to 90,000, said method comprising:

(a) reacting said high molecular weight alpha-olefin starch copolymers with lignin degrading microorganisms selected from the group consisting of *Streptomyces viridosporus* T7A, *Streptomyces badius* 252, *Streptomyces setonii* 75Vi2, *Streptomyces chromofuscus* A2, *Streptomyces diastaticus* A3, *Streptomyces rochei* A4, *Streptomyces chromofuscus* A6, *Streptomyces cyaneus* A7, *Streptomyces chromofuscus* A8, *Streptomyces rochei* A10, *Streptomyces chromofuscus* A20, *Streptomyces flaveolariens* 28, *Streptomyces cyaneus* MT 813, *Thermomonospora mesophila, Actinomadura* sp MT809, and

(b) allowing the reaction to continue until said polymers are converted to a biologically degraded polymeric material.

5,145,780
METHOD OF DECOMPOSING NUCLEIC ACIDS WITH A HEAT STABLE NUCLEASE FROM *TRICHODERMA* OR *FUSARIUM*

Kunio Oishi, and Shuichi Aoi, both of Tokyo, Japan, assignors to Kabushikikaisha Kibun & Kabushikikaisha Kibun Fudokemifa, Tokyo, Japan

Continuation of Ser. No. 382,589, Jul. 20, 1989, abandoned. This application Dec. 16, 1991, Ser. No. 807,816
Claims priority, application Japan, Jan. 31, 1989, 1-21865; Jan. 31, 1989, 1-21866
Int. Cl.[5] C12P *19/30, 19/28;* C12N *9/16, 1/00*
U.S. Cl. 435—262 4 Claims

1. A method of decomposing nucleic acids comprising subjecting a nucleic acid to a heat stable nuclease which remains active after heating at 100° C. for 30 minutes, produced by Trichoderma or Fusarium.

5,145,781
PREPARATION AND USES OF ALPHA-GLYCOSYL RUTIN

Yukio Suzuki; Kei Suzuki; Masaru Yoneyama; Hiromi Hijiya, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Mar. 7, 1990, Ser. No. 489,566
Claims priority, application Japan, Mar. 8, 1989, 1-57299; Apr. 15, 1989, 1-95999; Jun. 6, 1989, 1-142205; Aug. 24, 1989, 1-217893
Int. Cl.[5] C12P *19/14, 19/20, 19/18, 19/44*
U.S. Cl. 435—99 23 Claims

1. In the method of preparing alpha-glycosyl rutin by allowing a saccharide-transferring enzyme to act on a liquid which contains rutin together with an amylaceous substance, said enzyme being capable of transferring equimolar or more glucose residues from the amylaceous substance to the rutin, under conditions sufficient to form alpha-glycosyl rutin, and then recovering the alpha-glycosyl rutin, the improvement wherein:

said liquid containing rutin and amylaceous substance includes at least about 0.5 w/v % rutin.

5,145,782
DNA EXPRESSION VECTOR SUITABLE FOR DIRECT EXPRESSION OF A FOREIGN GENE

Robert A. Hallewell, San Francisco; Jeffrey C. Edman, Davis; William J. Rutter, and Howard M. Goodman, both of San Francisco, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 894,458, Aug. 4, 1986, abandoned, which is a continuation of Ser. No. 518,613, Jul. 29, 1983, abandoned, which is a continuation of Ser. No. 213,879, Dec. 8, 1980, abandoned. This application Nov. 17, 1987, Ser. No. 121,901
Int. Cl.[5] C12P *15/71, 15/00;* C12N *21/00*
U.S. Cl. 435—320.1 4 Claims

1. A recombinant DNA transfer vector suitable for the direct expression of a foreign DNA sequence having a start codon, which vector comprises (a) a portion of the trp operon consisting essentially of the promoter, operator, leader ribosome binding site, and (b) a restriction site providing the insertion site for said foreign DNA sequence wherein said restriction site is a ClaI site and is located within 50 nucleotides 3' of the ribosome binding site.

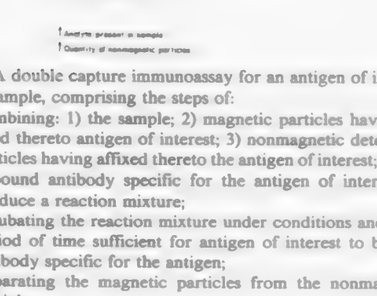
5,145,783
GLYPHOSATE-TOLERANT 5-ENDOLPYRUVYL-3-PHOSPHOSHIKIMATE SYNTHASE

Ganesh M. Kishore, Chesterfield, and Dilip M. Shah, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 179,245, Apr. 22, 1988, Pat. No. 4,971,908, which is a continuation-in-part of Ser. No. 54,337, May 26, 1987, abandoned. This application Jul. 9, 1990, Ser. No. 550,276
Int. Cl.[5] C12N *15/00, 5/04, 15/11, 9/00;* A01H *1/04, 5/10;* C12P *21/00*
U.S. Cl. 435—320.1 31 Claims

1. A plant transformation vector comprising a gene encoding a glyphosate-tolerant 5-enolpyruvyl-3-phosphoshikimate (EPSP) synthase, said EPSP synthase having the sequence:

—L—G—N—A—A—T—A—

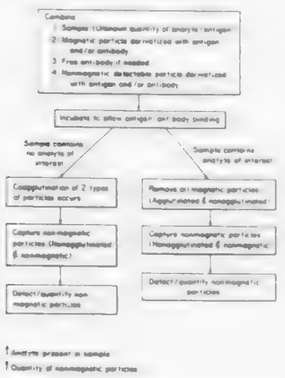


between positions 80 and 120 of the mature EPSP synthase sequence.

5,145,784
DOUBLE CAPTURE ASSAY METHOD EMPLOYING A CAPILLARY FLOW DEVICE

Daniel E. Cox, Franklin; Obsidiana Abril, Cambridge; Sara Bauminger, Newton; Bruce P. Neri, N. Andover, and Lisa Shinefeld, Lexington, all of Mass., assignors to Cambridge Biotech Corporation, Worcester, Mass.

Continuation of Ser. No. 311,122, Feb. 14, 1989, abandoned, which is a division of Ser. No. 189,983, May 4, 1988, abandoned. This application Jan. 2, 1992, Ser. No. 816,772
Int. Cl.[5] G01N *33/553*
U.S. Cl. 436—526 23 Claims



1. A double capture immunoassay for an antigen of interest in a sample, comprising the steps of:

a. combining: 1) the sample; 2) magnetic particles having affixed thereto antigen of interest; 3) nonmagnetic detectable particles having affixed thereto the antigen of interest; and 4) unbound antibody specific for the antigen of interest, to produce a reaction mixture;

b. incubating the reaction mixture under conditions and for a period of time sufficient for antigen of interest to bind to antibody specific for the antigen;

c. separating the magnetic particles from the nonmagnetic particles;

d. capturing the nonmagnetic particles on a solid material; and

e. determining the presence or absence of captured nonmagnetic particles on the solid material.

f. determining the presence or absence of the antigen of interest in the sample by relating the presence or absence of captured nonmagnetic particles to a relationship between captured nonmagnetic detectable particles having affixed thereto the antigen of interest and the antigen of interest.

5,145,785
DETERMINATION OF AROMATICS IN HYDROCARBONS BY NEAR INFRARED SPECTROSCOPY AND CALIBRATION THEREFOR

Steven M. Maggard, Huntington, W. Va., and William T. Welch, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 11, 1990, Ser. No. 626,132
Int. Cl.[5] G01N *21/00, 33/26*
U.S. Cl. 436—8 17 Claims

1. A process for measuring the aromatics content of hydrocarbons using a near infrared spectrophotometer comprising in combination the steps of:

a. selecting a sample generally representative of said hydrocarbons;

b. separating out a non-aromatic hydrocarbon portion from an aromatics portion of said sample;

c. measuring the absorbance of said aromatics portion and said non-aromatics portion or a portion containing known mixed proportions of aromatics, and/or saturates, and/or olefins, in the range of 1650–1700 or 2120–2256 nm;

d. by Beer-Lambert's Law or other methods of data resolution, calibrating said near infrared spectrophotometer or a related computer receiving a signal from the spectrophotometer to provide a signal indicative of the concentration of aromatics, or non-aromatics, in at least one additional hydrocarbon sample;

e. thereafter measuring the absorbance of the same or a different hydrocarbon sample with said calibrated spectrophotometer in at least one of said ranges; and

f. determining the aromatics content of said same or different sample from its absorbance.

17. A process of calibrating or recalibrating a near infrared spectrophotometer for measurement of aromatics content of hydrocarbons comprising in combination the steps of:

a. selecting a first sample generally representative of said hydrocarbons;

b. separating out the non-aromatic hydrocarbon portion from the aromatic portion of said first sample;

c. measuring in a first spectrophotometer the absorbance of said aromatics portion and said non-aromatics portion or a portion containing known mixed proportions of aromatics, and/or saturates, and/or olefins, in the range of 1650–1700 or 2120–2256 nm;

d. by Beer-Lambert's Law or other methods of data resolution, calibrating said first near infrared spectrophotometer or related computer receiving a signal from the spectrophotometer;

e. calibrating a second spectrophotometer or related computer or re-calibrating said first spectrophotometer or related computer, referencing such instrument to a sample measured in steps c. and d., and adjusting said instrument to provide a value equal to the value obtained in steps c. and d.

5,145,786

PREENRICHED BROTH MEDIUM FOR THE SIMULTANEOUS SAMPLING OF FOODS FOR SALMONELLA AND LISTERIA

Joseph S. Bailey, and Nelson A. Cox, both of Athens, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 21, 1990, Ser. No. 586,116
Int. Cl.[5] C12N *1/20*
U.S. Cl. 435—252.4 7 Claims

1. A preenrichment media comprising:
Tryptone...1 to 10 g/L
Proteose peptone...1 to 10 g/L
Glucose...0.2 to 1.0 g/L
Sodium pyruvate...0.2 to 1.0 g/L
Ferric ammonium citrate...0.1 to 2.5 g/L
Sodium chloride...1 to 5 g/L
$MgSO_47H_2O$...0.1 to 0.5 g/L
buffer salts and 1L distilled water.

5,145,787

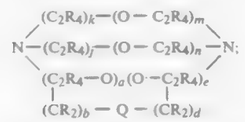
METHOD FOR DETERMINING THE CONCENTRATION OF CATIONS IN A SAMPLE

Eddy Chapoteau, Brooklyn; Bronislaw P. Czech, Peekskill; Carl R. Gebauer, Crompond; Koon-Wah Leong, Ossining, and Anand Kumar, Southfields, all of N.Y., assignors to Miles, Inc., Tarrytown, N.Y.

Division of Ser. No. 304,356, Jan. 30, 1989, Pat. No. 5,073,501, which is a division of Ser. No. 38,843, Apr. 15, 1987, Pat. No. 4,808,539. This application Dec. 5, 1991, Ser. No. 803,134
Int. Cl.[5] G01N *21/78, 33/20*
U.S. Cl. 436—79 30 Claims

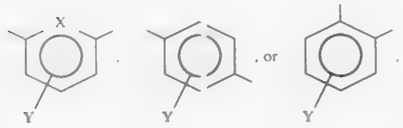
1. A method for determining the concentration of cations present in a test sample containing interfering cations, comprising the steps of:

(a) providing a 3.2.2 or 3.2.2 chromogenic cryptand reagent comprising a compound having the general formula I:

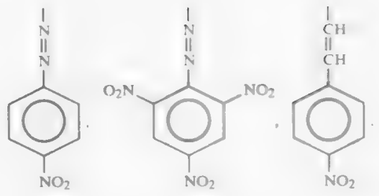


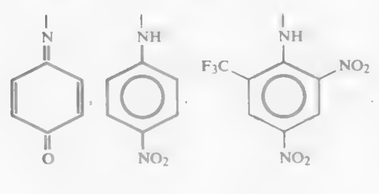
I

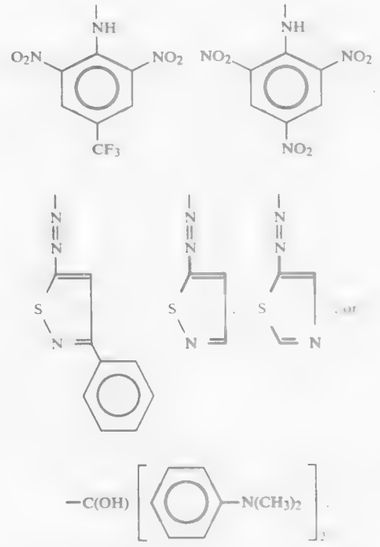
wherein,
k and j, either same or different, are equal to 1 to about 5;
m and n, either same or different, are equal to 0 to about 4;
a and e, either same or different, are equal to 0 to about 2;
b and d, either same or different, are equal to 0 to about 5;
R, either same or different, is hydrogen, lower alkyl, lower alkylidene, lower alkenyl, allyl, or aryl; and
Q is



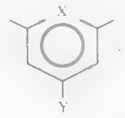
wherein X is CH, N, or COH; and Y includes







except that when Q is



wherein Y is selected from the group consisting of p-nitrophenylazo, 3-[phenylisothiazalyl]phenylisothiazolyl -5-azo, isothiazolyl-5-azo, thiazolyl-5-azo, 2,4,6-trinitrophenylazo, p-nitrostyryl, p-benzoquinonemonoimino, and bis-(p-dimethylaminophenyl) hydroxymethyl, then the following conditions cannot be present: that simultaneously b is equal to 0 or 1, d is equal to 0 or 1, j is equal to 1, n is equal to 1 or 2, a is equal to 1, e is equal to 1, k is equal to 1, and m is equal to 2;

(b) combining said reagent with said sample to form a solution;

(c) measuring the absorbance of the solution; and
(d) comparing the absorbance so measured in step (c) with the absorbance of standard compositions containing known concentrations of cations being determined.

5,145,788

ASSAY

Martyn W. Hill, Essex, and Dennis F. Sharman, Cambridge, both of Great Britain, assignors to CTS Biocides, Limited, Cambridge, England

Continuation-in-part of PCT/GB89/00507. This application Oct. 30, 1990, Ser. No. 605,485
Filed Oct. 30, 1990, Ser. No. 605,485
Claims priority, application United Kingdom, May 17, 1988, 8811617
Int. Cl.[5] G01N *21/75*
U.S. Cl. 436—106 10 Claims

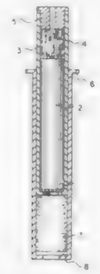
1. A method for assaying a compound or its derivatives formed by hydrolysis, in a sample, wherein the compound is selected from the group consisting of 2-bromo-2-nitro-1,3-propanediol, 2,2-dibromo-2-nitroethanol, which comprises adding to the sample a diazo compound which reacts with the compound or derivative formed by hydrolysis to be assayed to form a colored species, and determining the presence of the species colorimetrically.

5,145,789

DEVICE AND METHOD FOR PREGNANCY DETECTION

Angelo Corti; Paola Piro; Emanuela Carta; Cesare Rovelli; Rosangela Bassi; Sandro Lamponi; Nicola Morgese; Carlo Rurali, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy

Filed Oct. 5, 1989, Ser. No. 416,786
Claims priority, application Italy, Oct. 6, 1988, 22206 A/88
Int. Cl.[5] G01N *33/548*
U.S. Cl. 436—530 9 Claims



9. A method of detecting human chorionic gonadotropin (hCG) in urine, comprising the steps of:

(a) providing a capillary device, wherein said capillary device contains therein:
a first longitudinal container having distal and proximal ends, said distal end of said first container containing a hydrophilic pore septum which covers an entrance in said distal end through which urine is capable of being drawn;
a second longitudinal container having distal and proximal ends, said second container being telescopically housed within and capable of being removed from said first container;
a first material contained within an area defined between said hydrophilic pore septum and said distal end of said second container, said first material capable of drawing urine by capillarity and on which a color labeled first protein capable of specifically binding to hCG is diffusively adsorbed;
a second material comprising a reading area contained within the distal end of said second container and in contact with said first material to allow movement of urine from said first material through said second material and on which is bound (i) a second protein capable of specifically binding to hCG, wherein at least one of said first or second protein is an antibody, (ii) immobilized hCG, and (iii) an inert protein, wherein (i), (ii), and (iii) are disposed on said second material so as to form, after reaction with said first color labeled protein, at least one of two figures which can be visually detected according to the positivity of the reaction when the second container is removed from the first container;
a third material capable of drawing urine by capillarity contained within the proximal end of said container and contacting said second material to allow movement of urine through said second material to said third material; and
a flow indicator means contained within said third material at the proximal end of said second container, said means capable of indicating the passage of urine through said device;

(b) contacting the distal end of said capillary device with a urine sample suspected of containing hCG, and allowing said sample to migrate into said capillary device by capillary action, thereby subjecting any hCG present in said sample to immunoreaction with said color labeled first protein capable of specifically binding to hCG in said first material to form a labeled immunocomplex, followed by further migration of said immunocomplex onto said second material, wherein any immunocomplex is bound to said second protein capable of specifically binding to hCG;

(c) removing said second container from said first container; and

(d) visually detecting said at least one of two figures to determine if hCG is present in said urine sample.

5,145,790

REAGENTS AND METHOD FOR DETECTING POLYCHLORINATED BIPHENYLS

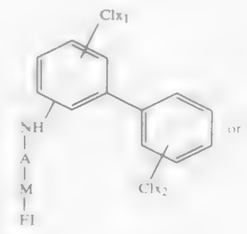
Phillip G. Mattingly, Grayslake, and R. Jeffrey Brashear, Mundelein, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed May 4, 1990, Ser. No. 519,039
Int. Cl.[5] G01N *33/536*
U.S. Cl. 436—536 13 Claims

1. A method for detecting the presence or amount of an analyte comprising polychlorinated biphenyl in a test sample, which method comprises the steps of:

(a) adding a known concentration of a tracer labeled with a detectable moiety and a known concentration of an analyte-specific antibody to the test sample to form a mixture,

wherein the tracer has the general structure of



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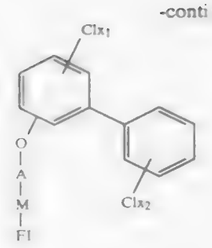


wherein

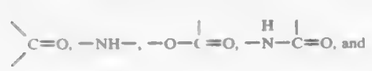
A is a spacer group consisting of from 0 to 50 carbon atoms and heteroatoms, including not more than ten heteroatoms, arranged in a straight or branched chain, saturated or unsaturated, wherein

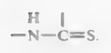
(i) not more than two heteroatoms are linked in the sequence —NH—A—M—Fl or —O—A—M—Fl,

(ii) A is not a single heteroatom, and

(iii) branching occurs only on carbon atoms;

M is a linking group selected from the group consisting of





Fl is a detectable moiety; and wherein independently $x_1=0$–4 and $x_2=0$–5, with the proviso that together x_1 and $x_2 \geq 1$;

(b) incubating said mixture for a time and under conditions sufficient to form labeled tracer-antibody and analyte-antibody complexes; and

(c) determining the presence or amount of tracer-antibody complexesformed as a measure of the presence or amount of analyte in the test sample.

5,145,791

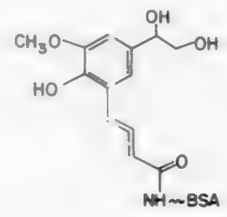
3-METHOXY-4-HYDROXYPHENYLGLYCOL FLUORESCENCE POLARIZATION IMMUNOASSAY

Christine H. Zeitvogel, Wildwood; Maciej B. Adamczyk, Lindenhurst; David A. Betebenner, Vernon Hills, all of Ill., and Kenward S. Vaughan, Carlsbad, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

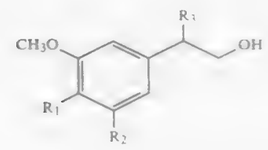
Continuation of Ser. No. 554,111, Jul. 18, 1990, abandoned, which is a continuation of Ser. No. 346,509, May 2, 1989, abandoned, which is a continuation of Ser. No. 883,898, Jul. 9, 1986, abandoned. This application Sep. 30, 1991, Ser. No. 768,096

Int. Cl.[5] **G01N** *33/533* **A61K** *39/385, 39/395*

U.S. Cl. 436—546 4 Claims



1. A compound having the structure:



wherein R_1 is OH, R_2 is R—Z—Q wherein R is $CH_2CH=CH$, Z is CO and Q is bovine serum albumin or 4'-aminomethylfluorescein and R_3 is OH.

5,145,792

METHOD OF FABRICATING A SEMICONDUCTOR OPTICAL DEVICE

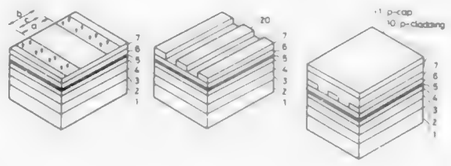
Takaaki Hirata, Tokyo, Japan, assignor to Optical Measurement Technology Development Co., Ltd., Musashino, Japan

Continuation of Ser. No. 451,971, Dec. 20, 1989, abandoned. This application Nov. 27, 1991, Ser. No. 799,779

Claims priority, application Japan, May 23, 1988, 1-129343; Dec. 21, 1988, 63-32467

Int. Cl.[5] **H01L** *21/20*

U.S. Cl. 437—129 3 Claims



1. A manufacturing process for a semiconductor optical device comprising the steps of:

node of said second NAND gate coupled to a second input of said first NAND gate;

whereby logic signals present at said chip pad are represented at said output nodes of said first and second NAND gates when said chip select signal selects said chip and alternately, said logic signals present at said chip pad are prevented from being represented at said output nodes of said first and second NAND gates when said chip select signal deselects said chip.

forming semiconductor layers including at least a quantum well structure layer and a rib waveguide layer, on a substrate by a first epitaxy step;

removing portions of the waveguide layer to form a rib waveguide;

disordering said quantum well over an area larger than a wavelength of light of a laser, the remaining area being used as an active region; and

subsequent to said disordering step, embedding said rib waveguide with a layer formed by a second epitaxy step.

5,145,793

MANUFACTURING A GALLIUM ARSENIDE SOLAR CELL ON A SILICON SUBSTRATE

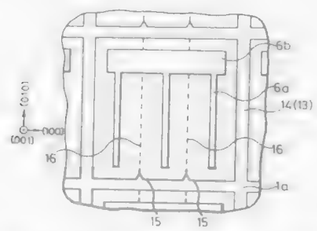
Takahiko Oohara, Higashimurayama; Yoshiro Ohmachi, Higashiyamato; Yoshiaki Kadota, Ebina; Kotaro Mitsui, Itami; Nobuyoshi Ogasawara, Itami, and Takashi Nishimura, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Apr. 12, 1991, Ser. No. 684,338

Claims priority, application Japan, Apr. 13, 1990, 2-98802

Int. Cl.[5] **H01L** *31/18, 31/0328*

U.S. Cl. 437—5 17 Claims



1. A method for manufacturing a solar cell, comprising:

depositing a GaAs buffer layer containing a high concentration of a dopant impurity producing a first conductivity type on a first main surface of a Si substrate;

etching a groove through said buffer layer to said Si substrate, thereby forming a side wall of said buffer layer;

forming at least one wedge-shaped notch in said side wall of said buffer layer;

depositing an active layer comprising a first conductivity type GaAs layer and a second conductivity type GaAs layer on said buffer layer, thereby forming a pn junction, said active layer having at least one crack extending from the at least one wedge-shaped notch, thereby exposing part of said pn junction; and

forming at least one current collecting electrode having a plurality of spaced apart grid fingers on said active layer.

5,145,794

FORMATION OF SHALLOW JUNCTION BY IMPLANTATION OF DOPANT INTO PARTIALLY CRYSTALLINE DISORDERED REGION

Masataka Kase, Kawasaki; Nami Kimura, Yokohama, and Yoshio Kikuchi, Yashio, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 6, 1990, Ser. No. 578,117

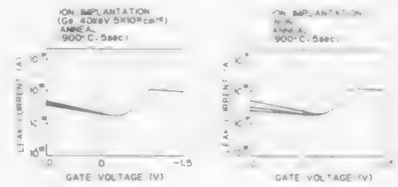
Claims priority, application Japan, Sep. 8, 1989, 1-231710; Jun. 19, 1990, 2-158779

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—24 29 Claims

1. A process for producing a semiconductor device, in which a first conductivity type dopant is implanted into a semiconductor substrate, said process comprising the steps of:

prior to said implantation of the first conductivity type dopant, implanting a second conductivity type dopant into the semiconductor substrate having a crystalline structure to form a disordered region having a degree of disorder such that microchanneling of the later implanted fist conductivity type dopant does not substantially occur and that said disordered region includes a plurality of amorphous regions interspersed with crystalline regions



on a common plane defined substantially parallel between upper and lower boundary surfaces of the disordered region and

implanting said first conductivity type dopant into said disordered region.

5,145,795

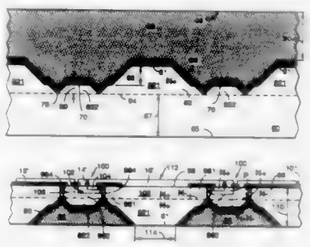
SEMICONDUCTOR DEVICE AND METHOD THEREFORE

Paul W. Sanders, and Bernard W. Boland, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 25, 1990, Ser. No. 543,233

Int. Cl.[5] **H01L** *21/302*

U.S. Cl. 437—33 4 Claims



1. A method for providing a dielectrically isolated semiconductor device, comprising:

providing a single crystal semiconductor substrate having first and second principal surfaces;

forming in either order, a first cavity adjacent a first portion of the first surface and extending into the substrate a predetermined first distance from the first surface, and a second cavity at least partly within the first cavity extending into the substrate a predetermined second distance from a bottom portion of the first cavity;

forming an insulated support having a first surface in contact with the first portion of the first surface of the substrate and with exposed surfaces of the first and second cavities and having an opposed second surface;

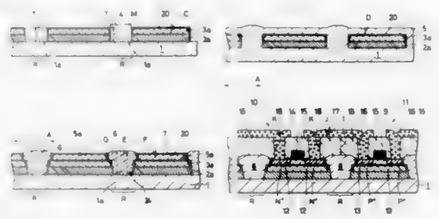
removing material from the second surface of the substrate until part of the insulated support and a further part of the substrate are exposed;

forming an epitaxial layer on the further part of the substrate which is lightly doped compared to the substrate and of the same conductivity type;

forming a highly doped region in a first portion of the epitaxial layer in contact with a first portion of the substrate adjacent the first portion of the substrate surface; and

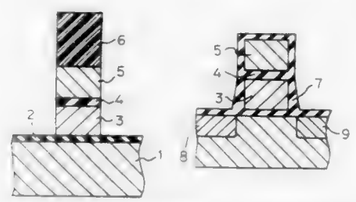
removing part of the insulating support to expose the first portion of the first surface of the substrate.

5,145,796
METHOD FOR MANUFACTURING A SEMICONDUCTOR APPARATUS
Alberto Adan, Tenri, and Masayoshi Horita, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Aug. 26, 1991, Ser. No. 749,558
Claims priority, application Japan, Aug. 27, 1990, 2-227068
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—40 2 Claims



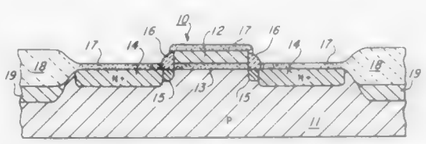
1. A method for manufacturing a semiconductor apparatus, comprising steps of
(i) laminating a first polysilicon layer on a whole surface of a semiconductor substrate through a first oxide layer,
(ii) removing the first polysilicon layer and first oxide layer in element separation regions so as to form trenches therein and to treat the residual first polysilicon layer and first oxide layer as a bottom gate electrode and an insulating film respectively,
(iii) forming a monocrystalline silicon layer by epitaxial growth on a whole surface of the semiconductor substrate including the trenches,
(iv) removing the monocrystalline silicon layer in the element separation regions so as to form openings, laminating a second oxide layer on a whole surface of the semiconductor substrate including the openings, and making the second oxide layer remain as element separation films in only the element separation regions, and
(v) forming a gate oxide film and a top gate electrode on the residual monocrystalline silicon film, and forming source/drain regions in the residual monocrystalline silcion film.

5,145,797
METHOD OF MAKING SEMICONDUCTOR DEVICES HAVING AN IMPLANT DAMAGE PROTECTION FILM ON THE GATE ELECTRODE SIDEWALLS
Shoji Nakanishi, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan
Filed Jan. 30, 1991, Ser. No. 648,516
Claims priority, application Japan, Jan. 30, 1990, 2-19651
Int. Cl.[5] H01L 21/266
U.S. Cl. 437—43 2 Claims



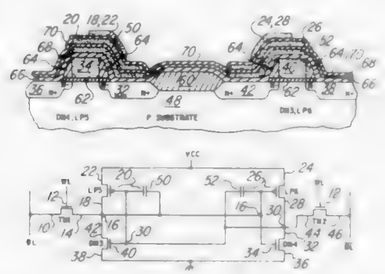
1. In a method of manufacturing a semiconductor device, which method includes forming a gate insulating film having a thickness of about 10 nm over the surface of a semiconductor substrate, forming a polysilicon gate electrode on the gate insulating film, the gate electrode having an edge and side walls, and implanting impurities into the semiconductor substrate near its surface by an ion implantation method to form source and drain regions in the substrate, the improvement wherein said method comprises the step of providing an ion implantation-induced damage protection film having a thickness of the order of 500 Å on the side walls of the polysilicon gate electrode to minimize flaws induced by ion implantation damage in the gate insulation film directly under the polysilicon gate electrode edge.

5,145,798
METHOD OF FABRICATING AN INSULATED GATE FIELD EFFECT TRANSISTOR HAVING LIGHTLY-DOPED SOURCE AND DRAIN EXTENSIONS USING AN OXIDE SIDEWALL SPACER METHOD
Michael C. Smayling, Missouri City, and Michael P. Duane, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 119,888, Nov. 13, 1987, abandoned, which is a continuation of Ser. No. 785,117, Aug. 30, 1985, abandoned, which is a division of Ser. No. 412,753, Aug. 30, 1984, Pat. No. 4,566,175. This application Mar. 18, 1991, Ser. No. 671,185
Int. Cl.[5] H01L 21/336
U.S. Cl. 437—44 8 Claims



1. A method of making an insulated gate field effect P channel transistor with a lightly-doped drain comprising the steps of:
a) applying a conductive gate layer to a face of a semiconductor body, the gate layer being insulated from the face by a gate insulator, and patterning said gate layer to leave a conductive gate on said face.
b) creating an oxide layer on said face extending over the top of the gate and over a sidewall of the gate,
c) selectively removing the oxide layer from the face and from the top of the gate but leaving the oxide at said sidewall to produce a sidewall spacer, and thereafter
d) implanting a selected P-type impurity material into said face using the gate and sidewall spacer as masking to create a lightly-doped drain region in the face laterally spaced from the gate by a gap, the semiconductor body being of the opposite type,
e) laterally diffusing at least some of the selected impurity material to create a lightly-doped drain region beneath said sidewall spacer to bridge said gap, producing a graded junction,
f) implanting additional material of said selected P-type impurity using the gate and sidewall spacer as masking to create a heavily-doped drain region, the impurity material not penetrating through said gate during said steps of implanting;
g) wherein said steps of applying said gate layer, patterning said gate layer, creating said oxide layer, and selectively removing said oxide layer to leave said sidewall spacer, are all performed prior to said steps of introducing said impurity material and laterally diffusing, and wherein said laterally diffusing step occurs after implanting step (d) and before implanting step (f).

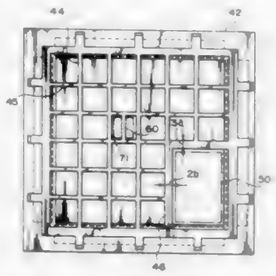
5,145,799
STACKED CAPACITOR SRAM CELL
Mark S. Rodder, University Park, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 30, 1991, Ser. No. 647,579
Int. Cl.[5] H01L 21/265, 21/70
U.S. Cl. 437—47 9 Claims



1. A method of forming an SRAM cell, the cell having first and second NMOS drive transistors, and first and second PMOS load transistors; said method comprising:
a. forming a first bottom capacitor plate over a gate of said second drive transistor and second bottom capacitor plate over a gate of said first drive transistor;
b. electrically connecting said first bottom capacitor plate to said second drive transistors gate;
c. electrically connecting said second bottom capacitor plate to said first drive transistor gate;
d. forming dielectric layer over said first and second bottom capacitor plates;
e. forming first and second top capacitor plates over said dielectric layer, with said first top capacitor plate forming a gate of said first load transistor and being over said first bottom capacitor plate, and said second top capacitor plate forming a gate of said second load transistor and being over said second bottom capacitor plate;
f. electrically connecting said first top capacitor plate to said first drive transistor gate;
g. electrically connecting said second top capacitor plate to said second drive transistor gate; and
h. forming PMOS channel films over said first and second top capacitor plates.

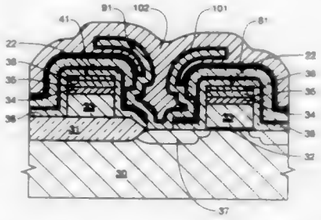
5,145,800
METHOD OF WIRING FOR POWER SUPPLY TO LARGE-SCALE INTEGRATED CIRCUIT
Kiyokazu Arai, Hadano; Masatoshi Kawashima, Tokyo; Akira Yamagiwa, and Toshihiro Okabe, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 17, 1991, Ser. No. 731,616
Claims priority, application Japan, Jul. 17, 1990, 2-189237
Int. Cl.[5] H01L 21/70
U.S. Cl. 437—51 8 Claims

1. A method of wiring a power supply for a large-scale integrated circuit including a plurality of function circuits, signal wires interconnecting the function circuits, and power supply wires for providing electrical power to the function circuits, and having an integrated circuit chip size dependent upon the scale of integration of the function circuits, the power supply wires to include a plurality of longitudinally extending power supply wires extending across the integrated circuit chip and a plurality of transversely extending power supply wires extending across the integrated circuit chip to define a power supply grid surrounding lattice openings with fixed longitudinal and transverse lattice dimensions between adjacent parallel-extending wires, said method comprising:
(a) determining a power supply wire width based on the integrated circuit chip size, the number of function circuits to be on the integrated circuit, the electrical power requirements of the function circuits, and the fixed longitudinal and transverse lattice dimensions;
(b) determining longitudinal and transverse locations of the power supply wires on the integrated circuit chip based



on the determined wire width and the fixed longitudinal and transverse dimensions of the lattice openings; and
(c) forming longitudinally extending and transversely extending power supply wires on the integrated circuit chip at the determined locations and with the determined power supply wire width.

5,145,801
METHOD OF INCREASING THE SURFACE AREA OF A MINI-STACKED CAPACITOR
Navjot Chhabra, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Feb. 7, 1992, Ser. No. 832,264
Int. Cl.[5] H01L 21/70
U.S. Cl. 437—52 11 Claims



1. A process for fabricating a DRAM storage capacitor on a silicon substrate having active areas, word lines and digit lines, said process comprising the steps of:
a) forming a first dielectric layer on existing surface of said silicon substrate;
b) forming a second dielectric layer adjacent and coextensive said first dielectric layer;
c) forming a third dielectric layer adjacent and coextensive said second dielectric layer;
d) placing and patterning a masking layer to provide a storage node location opening, said opening thereby exposing a portion of said third dielectric between two adjacent digit lines;
e) etching said exposed portion of third dielectric through said opening thereby exposing the underlying second dielectric;
f) removing said masking layer thereby exposing the remaining third dielectric layer;
g) forming a fourth dielectric layer superjacent and coextensive said remaining third dielectric layer and said exposed portion of said second dielectric;

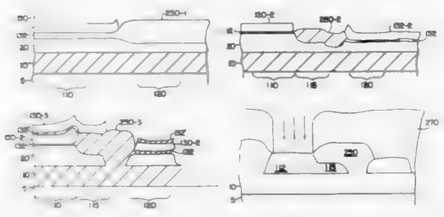
h) forming a fifth dielectric layer superjacent and coextensive said fourth dielectric layer;
i) placing and patterning a second masking layer at said storage node location opening, said opening thereby exposing a portion of said fifth dielectric between two adjacent digit lines;
j) etching said exposed portion of said fifth dielectric through said opening thereby exposing the underlying fourth dielectric;
k) etching fourth, second and first dielectrics through said opening thereby exposing said active areas;
l) removing said masking thereby exposing the remaining third dielectric layer;
m) placing a conformal first conductive layer adjacent and coextensive said exposed active areas, said remaining exposed fifth dielectric and the patterned edges of said first, second, third and fourth dielectrics, said first conductive layer making physical contact to said active areas;
n) masking and etching said first conductive layer thereby forming a storage node plate;
o) etching said remaining fifth dielectric layer thereby exposing underside portions of said storage node plate;
p) forming a cell dielectric layer superjacent and coextensive said exposed portions of said storage node plate; and
q) depositing a second conductive layer superjacent and coextensive said cell dielectric layer, thereby forming a top cell plate, said top cell plate being common to the entire memory array.

5,145,802

METHOD OF MAKING SOI CIRCUIT WITH BURIED CONNECTORS

Scott M. Tyson, and Richard L. Woodruff, both of Colorado Springs, Colo., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 12, 1991, Ser. No. 790,796
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—63 **18 Claims**



1. A method of manufacturing a CMOS integrated circuit having a plurality of N-channel and P-channel transistors formed in a silicon device layer, having a silicon device layer thickness and positioned above an underlying insulating layer, comprising the steps of:
defining a set of mesa areas having a mesa top surface in said silicon layer;
isolating said set of mesa areas from one another to form a set of mesas separated by a field area;
forming said plurality of N-channel and P-channel transistors in said set of mesas; and
connecting said plurality of N-channel and P-channel transistors to form an integrated circuit, characterized in that:
a first silicon removal step removes a predetermined thickness of silicon from a first removal area;
said first silicon removal step is followed by a step of performing a second silicon removal step in said field area overlapping said first silicon removal area, said second silicon removal step forming an isolation area in said silicon layer extending down toward said underlying insulator layer in said isolation area and extending down to a buried silicon connector in a buried connector area within said field area, thereby forming a buried silicon connector layer having a connector top surface below said mesa top surface in said buried connector area that is within said field area and outside said isolation area;
covering said buried connector area with a field insulation layer; and
doping said buried connection layer with a predetermined dopant to establish a predetermined buried layer conductivity in at least one connector area between at least two elements or said integrated circuit.

5,145,803

GLASS SEALANT CONTAINING LEAD BORATE GLASS AND FILLERS OF MULLITE AND CORDIERITE

Johann Daimer, Oberahrain, and Hartmut Paschke, Ergolding, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Oct. 22, 1990, Ser. No. 600,510
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934971
Int. Cl.[5] C03C *8/24, 8/14*
U.S. Cl. 501—15 **22 Claims**

1. A glass sealant formed from a mixture consisting essentially of from about 70–90% by weight of a solder glass powder of a low-melting lead-borate glass having a transformation temperature smaller than or equal to about 330° C., 1–20% by weight of cordierite powder, and 1–25% by weight of mullite powder, the combined content of the cordierite and mullite powder being about 10–30% by weight, said cordierite being a synthetic cordierite having a coefficient of thermal expansion of less than about $3 \cdot 10^{-6} K^{-1}$.

5,145,804

ENAMEL POWDER FOR ELECTROSTATIC APPLICATION

Hans-Joachim Schittenhelm, Leverkusen, and Werner Joseph, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 842,901, Mar. 24, 1986, abandoned. This application Dec. 15, 1987, Ser. No. 132,976
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512336
Int. Cl.[5] C03C *8/02, 8/06, 8/08*
U.S. Cl. 501—21 **2 Claims**

1. Enamel frit powder for electrostatic application with a surface electrical resistance greater than 10^{16} ohms containing alkaline oxides and alkaline earth oxides wherein the weight ratio of the alkaline oxides $Na_2O:K_2O$ and the weight ratio of the alkaline earth oxides CaO:BaO is each about 1:1 containing:

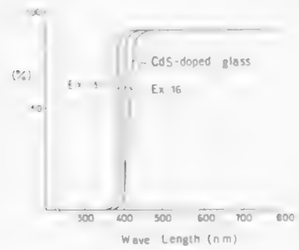
	% by weight
SiO_2	36–40
Al_2O_3	0–4
B_2O_3	12–16
Na_2O	7–9
K_2O	7–9
ZrO_2	5–10
CaO	4–6
BaO	4–6
P_2O_5	0–1
CoO	1
NiO	2
MnO	0–2
CuO	0–2
F	0–1.

5,145,805

GLASS COMPOSITIONS

Takashi Tarumi, Kawachinagano, and Toshihiko Einishi, Ikoma, both of Japan, assignors to Isuzu Glass Co., Ltd., Osaka, Japan

Division of Ser. No. 680,965, Apr. 5, 1991. This application Aug. 13, 1991, Ser. No. 744,143
Claims priority, application Japan, Apr. 10, 1990, 2-95917; Aug. 20, 1990, 2-219630; Mar. 4, 1991, 3-123243
Int. Cl.[5] C03C *3/64*
U.S. Cl. 501—78 **4 Claims**



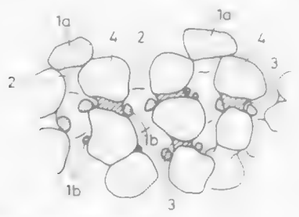
1. A glass composition consisting essentially of about 8 to about 25% of SiO_2, about 5 to about 35% of P_2O_5, about 30% or less of B_2O_3, about 10 to about 35% of Al_2O_3, about 5 to about 20% of at least one of Li_2O, Na_2O, K_2O, Rb_2O and Cs_2O, about 20% or less of at least one of MgO, CaO, ZnO, BaO, SrO and PbO, about 10% or less of at least one of ZrO_2, La_2O_3, Y_2O_3, Ta_2O_3 and Gd_2O_3, and about 0.05 to about 15% of at least one copper halide.

5,145,806

FILTER FOR METAL HOT MELT

Hiroshi Shirakawa, Kagamihara, and Osamu Yamakawa, Kani, both of Japan, assignors to NGK Insulators, Ltd. and NGK Adrec Co., Ltd., both of, Japan

Filed Mar. 7, 1991, Ser. No. 666,080
Claims priority, application Japan, Mar. 30, 1990, 2-83249
Int. Cl.[5] C04B *38/00;* C21B *3/04*
U.S. Cl. 501—80 **4 Claims**



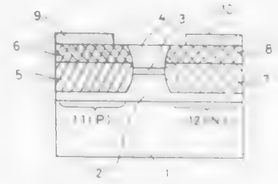
1. A porous filter comprising:
aggregate particles; and
an inorganic binder for binding said aggregate particles;
wherein said aggregate particles comprise not less than 50 weight % of aggregate particles with a shape factor in the range of 100–130, and said inorganic binder has needle shaped crystals of the binder on the surface thereof, wherein 4–20 parts by weight of said inorganic binder is mixed with 100 parts by weight of said aggregate particles.

5,145,807

METHOD OF MAKING SEMICONDUCTOR LASER DEVICES

Kenji Shimoyama, and Hideki Gotoh, both of Ushiku, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 349,614, May 10, 1989, Pat. No. 4,969,151. This application Jun. 29, 1990, Ser. No. 545,794
Claims priority, application Japan, May 11, 1988, 63-113898
Int. Cl.[5] H01L *21/18*
U.S. Cl. 437—129 **4 Claims**



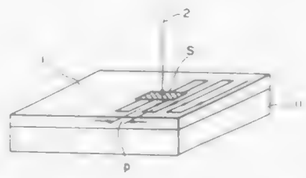
1. A process for making an embedded semiconductor laser comprising the following steps:
a step for sequentially forming an $Al_xGa_{1-x}As$ lower cladding layer, an $Al_yGa_{1-y}As$ active layer, and an $Al_xGa_{1-x}As$ upper cladding layer (wherein $0.3 \leqq x \leqq 0.85$, $0 \leqq y \leqq 0.45$, $0 \leqq y \leqq x$);
a step for forming one embedded area by mesa etching to the middle of said lower cladding layer;
a step for growing one of an n-type or a p-type $Al_zGa_{1-z}As$ ($y < z \leqq x$) carrier injection layer in said one embedded area using a crystal growth method selected from the group consisting of MO-VPE or MO-MBE in which all raw material supply sources are gas sources;
a step for forming another embedded area by mesa etching up to the middle of said lower cladding layer;
a step for growing the other of a p-type or an n-type $Al_zGa_{1-z}As$ carrier injection layer (wherein $y < z \leqq x$) in said another embedded area using a crystal growth method selected from the group consisting of MO-VPE or MO-MBE, in which all raw material supply sources are gas sources; and
a step for forming an electrode on the surface of the n-type and the p-type carrier injection layer.

5,145,808

METHOD OF CRYSTALLIZING A SEMICONDUCTOR THIN FILM

Toshiyuki Sameshima; Masaki Hara, both of Kanagawa; Naoki Sano, Tokyo, and Setsuo Usui, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 747,708
Claims priority, application Japan, Aug. 22, 1990, 2-220604
Int. Cl.[5] H01L *21/268;* C30B *13/24*
U.S. Cl. 437—173 **3 Claims**



1. A method of melt growth system of crystallizing a semiconductor thin film by irradiating the semiconductor thin film with a laser beam emitted by a pulse laser, characterized in that:
the laser beam emitted by the pulse laser is moved in irradiat-

ing the semiconductor thin film in a first direction for scanning and in a second direction for step feed;

the laser beam emitted by the pulse laser is split into a plurality of secondary laser beams of a width smaller than the pitch of step feed, respectively having energy densities forming a stepped energy density distribution decreasing from the middle toward the opposite ends thereof with respect to the second direction;

the energy density E_{D1} of the first secondary laser beam corresponding to the middle of the energy density distribution is higher than a threshold energy density E_{Dth}, that is, the minimum energy density that will melt the semiconductor thin film to make the semiconductor thin film amorphous, and lower than a roughening energy density E_{DR}, that is, the minimum energy density that will roughen the surface of the semiconductor thin film;

the energy density of each of the secondary laser beams on the front side of the first secondary laser beam with respect to the second direction is lower than a melting energy density E_{DM}, that is, the minimum energy density that will melt the semiconductor thin film; and

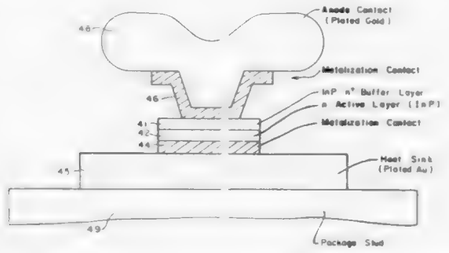
the energy density of each of the secondary laser beams on the back side of the first secondary laser beam with respect to the second direction is higher than the melting energy density E_{DM} and lower than and nearly equal to the threshold energy density E_{Dth}.

5,145,809

FABRICATION OF GUNN DIODE SEMICONDUCTOR DEVICES

David K. Walker, Greenfield, Mass., assignor to Millitech Corporation, South Deerfield, Mass.

Filed Dec. 4, 1990, Ser. No. 622,057
Int. Cl.[5] H01L *21/302, 21/329*
U.S. Cl. 437—203 **24 Claims**



13. A method of forming a Gunn diode, comprising the steps of:

applying an n+ doped buffer layer of a first semiconductor material to a first side of a planar substrate of a second semiconductor material of similar crystalline dimensions using an epitaxial deposition technique to create a heterojunction, the substrate and the first semiconductor material having different etch rates with respect to an etchant material;

applying an n doped active layer of the first semiconductor material over the buffer layer, using an epitaxial deposition technique;

applying a masking material to a second side of the planar substrate, the masking material having at least one aperture therein;

etching away the substrate beneath the aperture in the masking material, to create a via extending through the second material to a surface of the buffer layer;

metallizing the second side of the substrate, so as to create a first metallization layer on the second side of the substrate that extends inwardly along the walls of the via and contacts the buffer layer; and

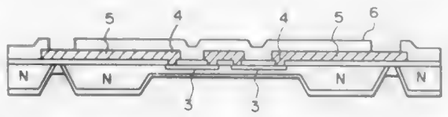
etching away the substrate material external to the via.

5,145,810

FABRICATION PROCESS OF SEMICONDUCTOR PRESSURE SENSOR FOR SENSING PRESSURE APPLIED

Koji Matsumi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1991, Ser. No. 722,558
Claims priority, application Japan, Jun. 25, 1990, 2-164161
Int. Cl.[5] H01L *21/265;* **G01L** *9/06*
U.S. Cl. 437—228 **22 Claims**



1. A process for the fabrication of a semiconductor pressure sensor, which process comprises:

i) forming a first recess having a first width and a second recess having a second width which is wider than the first width, in a first surface of a semiconductor substrate having the first surface and a second surface;

ii) deepening the first recess so as to be deeper than the depth of the second recess, the depth of said first recess being determined by the first width;

iii) forming a reinforcement layer for the semiconductor substrate on the first surface in which the first and second recesses are contained;

iv) polishing the second surface until a part of the first recess appears on a side of the second surface; and

v) forming a resistance element on a polished surface at a region opposing the second recess.

5,145,811

INORGANIC CERAMIC PAPERS

Timothy S. Lintz, Grand Island, N.Y., and Julie A. Golebiewski, Farmington, Mich., assignors to The Carborundum Company, Cleveland, Ohio

Filed Jul. 10, 1991, Ser. No. 727,715
Int. Cl.[5] C03C *13/00, 13/06;* **C04B** *35/02, 35/08*
U.S. Cl. 501—95 **30 Claims**

1. An inorganic ceramic paper comprising an inorganic binder system having at least one metal oxide with an average particle size in a range from about 7 to about 200 nm and a mixture of heterogeneous grades of inorganic ceramic fibers comprising high surface area fibers having lengths ranging from about 50 to 250μ and a diameter distribution ranging from about 0.10 to about 2.00μ, and at least one grade of larger, lower surface area fibers having lengths ranging from about 100μ to about 3.0 inches and a diameter distribution ranging from about 0.50 to about 15.0μ, the relative proportions of said fibers in said mixture being sufficient to impart a minimum flexibility of at least 1.75 percent elongation and a minimum strength of at least 1000 grams/inch when said paper is from about 0.025 to about 0.140 inches in thickness.

5,145,812

MOLDED ARTICLES FORMED OF SILICON NITRIDE BASED CERAMIC AND PROCESS FOR PRODUCING SAME

Mikiro Arai; Osamu Funayama; Hayato Nishii; Tamio Ishiyama, all of Iruma; Hiroshi Kaya; Takeshi Isoda, both of Niiza; Kouichi Yasuda, Yokohama; Atsuro Takazawa, Omiya; Tadashi Suzuki, Iruma; Ichiro Kohshi, Kamifukuoka; Masaaki Ichiyama, Kamifukuoka, and Tomohiro Kato, Kamifukuoka, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 501,969, Mar. 29, 1990, abandoned, which is a continuation of Ser. No. 316,397, Feb. 27, 1989, abandoned. This application Aug. 19, 1991, Ser. No. 747,488
Claims priority, application Japan, Feb. 29, 1988, 63-46966; Feb. 29, 1988, 63-46967; Mar. 3, 1988, 63-48713
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—97 **43 Claims**

9. A composite, molded body formed of an substantially amorphous silicon nitride-based ceramic containing Si, C and N in amounts providing an atomic ratio N/Si of 0.3 to 1.3 and an atomic ratio C/Si of 0.1 or less and a reinforcing material, said ceramic being formed by solidifying and calcining a polysilazane having a number average molecular weight of 100–500,000 and a main skeletal structure having the recurring unit —SiH_2—NH—.

5,145,813

PROCESS FOR MANUFACTURING ORGANIC SILAZANE POLYMERS AND CERAMICS THEREFROM

Yoshifumi Takeda; Minoru Takamizawa; Tsutomu Takeno, and Akira Hayashida, all of Kubikimura, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 283,316, Dec. 12, 1988, Pat. No. 4,954,596. This application May 22, 1990, Ser. No. 527,109
Claims priority, application Japan, Dec. 11, 1987, 62-313264
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—97 **21 Claims**

1. A method for manufacturing SiC-Si_3N_4 ceramics comprising: mixing 20 to 90 mol. % of at least one organosilicic compound having the formula (I),

(I)

in which R is the same or different and represents a methyl group, an ethyl group or a phenyl group, and X represents a chlorine or a bromine atom;

and 80 to 10 mol. % of at least one organosilicic compound having the formula:

(II)

in which R represents a methyl group, an ethyl group or a phenyl group, and R_1 represents a hydrogen atom or a vinyl group, and X represents a chlorine or a bromine atom;

reacting this mixture with ammonia to produce silazane compounds;

polymerizing the silazane compounds in the presence of an alkali catalyst to obtain organic silazane polymers;

melting, molding, and then infusibilizing the thus obtained organic silazane polymers; and

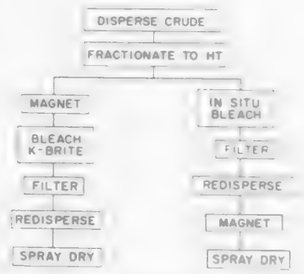
sintering the infusibilized polymer to obtain a ceramic.

5,145,814

IN SITU METHOD FOR PRODUCING HYDROSULFITE BEACH AND USE THEREOF

Mitchell J. Willis; Raymond H. Young, both of Macon; Ellen S. Forbus, Jones, and Larry W. Donaldson, Macon, all of Ga., assignors to Engelhard Corporation, Iselin, N.J.

Filed Oct. 11, 1991, Ser. No. 776,507
Int. Cl.[5] C04B *33/02*
U.S. Cl. 501—146 **7 Claims**



1. A continuous method for bleaching particulate material which comprises:

(a) providing a flocculated aqueous suspension of particulate iron;

(b) continuously introducing said suspension into a mixer provided with means therein for internal recirculation while simultaneously continuously introducing into said mixer both an aqueous suspension of particulate matter to be bleached and sulfur dioxide gas under vacuum, the relative proportion of sulfur dioxide to particulate iron being introduced into the mixer being at least sufficient for all of the iron to react with the sulfur dioxide and the amounts of iron and sulfur dioxide being sufficient to bleach bleachable matter in said aqueous suspension of particulate matter to be bleached;

(c) continuously withdrawing an aqueous suspension of bleached particulate matter from said mixer; and

(d) separating said bleached particulate matter from the aqueous phase of said suspension.

5,145,815

REGENERATION OF ZEOLITIC MOLECULAR SIEVES WITH SULFUR OXIDE ABSORPTION ON SODA-LIME BED

Andrew S. Zarchy, Amawalk, N.Y., assignor to UOP, Des Plaines, Ill.

Division of Ser. No. 391,894, Aug. 10, 1989, Pat. No. 5,041,693. This application Aug. 19, 1991, Ser. No. 746,837
Int. Cl.[5] B01J *20/34*
U.S. Cl. 502—52 **10 Claims**

1. A method for regenerating a zeolitic molecular sieve having a sulfur-containing carbonaceous material deposited thereon, said method comprising:

(a) contacting the zeolitic molecular sieve with an oxygen-containing regeneration feed gas to remove at least a portion of said carbonaceous deposit material and withdrawing a first regeneration effluent gas depleted in oxygen and comprising at least one sulfur oxide and H_2O;

(b) contacting said first regeneration effluent gas in an absorbent bed with a solid particulate absorbent material comprising soda-lime, containing from 2 to 4 wt. % sodium hyhroxide, wherein prior to said contacting with said absorbent material said first regeneration effluent gas is admixed with an oxygen containing gas to raise the oxygen content of said first regeneration effluent gas to 0.1 to 3 mol. % which is sufficient to cause the absorption of at least a portion of said at least one sulfur oxide in said absorber bed and withdrawing a second regeneration

effluent gas depleted in sulfur oxide from said absorber bed; and,

(c) recycling at least a portion of said second regeneration effluent gas to provide at least a portion of said oxygen-containing regeneration feed gas.

5,145,816

METHOD FOR FUNCTIONALIZING SYNTHETIC MESOPOROUS CRYSTALLINE MATERIAL

Jeffrey S. Beck, Princeton; David C. Calabro, Somerset; Sharon B. McCullen, Newtown; Bruce P. Pelrine, Trenton; Kirk D. Schmitt, Pennington, all of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 725,245, Dec. 10, 1990, Pat. No. 5,098,684, which is a continuation-in-part of Ser. No. 470,008, Jan. 19, 1990, which is a continuation-in-part of Ser. No. 625,171, Dec. 10, 1990, Pat. No. 5,057,296. This application Jun. 20, 1991, Ser. No. 718,056

The portion of the term of this patent subsequent to Apr. 17, 2009, has been disclaimed.

Int. Cl.[5] B01J *29/04*

U.S. Cl. 502—60 20 Claims

1. A method for modifying a composition of matter which comprises an inorganic, porous non-layered crystalline phase material exhibiting, calcination and/or functionalization, an X-ray diffraction pattern with at least one peak at a d-spacing greater than about 18 Angstrom Units with a relative intensity of 100 and having a benzene adsorption capacity of greater than 15 grams benzene per 100 grams benzene per 100 grams anhydrous crystal at 50 torr and 25° C., comprising:

contacting with a treatment composition comprising $M'X'Y'_n$ wherein

M' is selected from a group consisting of Periodic Table Groups IIA, IIIA, IVA, VA, VIA, VIIIA, IB, IIB, IIIB, IVB, VB and VIB;

X' is selected from a group consisting of halides, hydrides, alkoxyides of 1 to about 6 carbon atoms, alkyl of C_{1-18}, alkenyl of C_{1-18}, aryl of C_{1-18}, aryloxide of C_{1-18}, sulfonates, nitrates and acetates;

Y' is selected from a group consisting of X', amines, phosphines, sulfides, carbonyls and cyanos; and

n=1–5; said contacting occurring under sufficient conditions so that the crystalline phase material is functionalized.

5,145,817

ALKYLATION PROCESS USING DUAL METAL ULTRASTABLE Y ZEOLITE

Fred A. Sherrod, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 24, 1991, Ser. No. 705,450

Int. Cl.[5] B01J *29/08*

U.S. Cl. 502—65 9 Claims

8. A dual metal ultrastable alkali metal Y zeolite prepared by a method comprising the following steps:

(a) contacting a Y zeolite with an ammonium salt to replace from about 40 percent to about 90 percent of the alkali metal ions with ammonium ions:

(b) calcining the zeolite resulting from step (a) in steam under conditions sufficient to reduce the unit cell size to about 24.48 to about 24.60 angstroms:

(c) contacting the calcined zeolite of step (b) with a rare earth salt under conditions sufficient to result in the zeolite containing from about 2 to about 5 weight percent of the rare earth:

(d) calcining the zeolite a second time in the absence of steam following step (c): and

(e) contacting the zeolite a second time with an aluminum salt to further reduce the alkali metal content to below about 0.3 weight percent

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5,145,818

OLEFIN POLYMERIZATION CATALYST AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Toshiyuki Tsutsui; Kenji Sugimura, and Takashi Ueda, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,428

Claims priority, application Japan, Dec. 29, 1989, 1-340912; Dec. 29, 1989, 1-340915; Dec. 29, 1989, 1-340918

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] C08F *4/653, 4/646*

U.S. Cl. 502—113 6 Claims

1. An olefin polymerization catalyst formed by prepolymerization of olefin in a suspension in an amount of 0.1–500 g per 1 g of a catalyst containing

(A) a solid titanium catalyst component prepared by contacting titanium compound with halogen containing magnesium compound,

(B-1) a transition metal compound having formula MLx wherein M is a transition metal selected from the group consisting of zirconium, titanium, hafnium, chromium and vanadium, L is a ligand coordinating to the transition metal, at least one of L is a ligand having a cycloalkadienyl skeleton, and when at least two or more ligands having a cycloalkadienyl skeleton are contained, at least two ligands having cycloalkadienyl skeleton may be linked together via lower alkylene, substituted alkylene, silylene or substituted silylene, L other than the ligand having a cycloalkadienyl skeleton is hydrocarbon group of 1–12 carbon atoms, alkoxy of 1–12 carbon atoms, aryloxy, halogen or hydrogen, and x is a valence of the transition metal, and

(C) an aluminoxane.

5,145,819

2-SUBSTITUTED DISINDENYLMETALLOCENES, PROCESS FOR THEIR PREPARATION, AND THEIR USE AS CATALYSTS IN THE POLYMERIZATION OF OLEFINS

Andreas Winter, Glashütten; Martin Antberg, Hofheim am Taunus; Walter Spaleck; Jürgen Rohrmann, both of Liederbach, and Volker Dolle, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

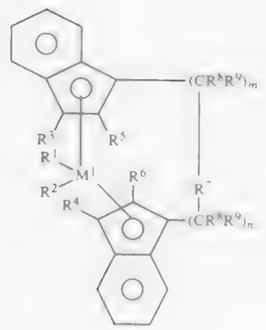
Filed Nov. 8, 1991, Ser. No. 790,234

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1990, 4035883

Int. Cl.[5] C08F *4/64*

U.S. Cl. 502—117 19 Claims

1. A compound of the formula I



(I)

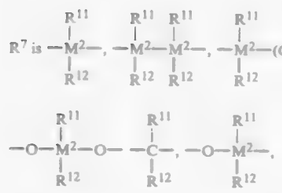
in which

M^1 is a metal from group IVb, Vb or VIb of the Periodic Table,

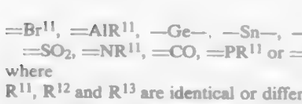
R^1 and R^2 are identical or different and are a hydrogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}-alkoxy group, a C_6–Ch_{10}-aryl group, a C_6–C_{10}-aryloxy group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group or a halogen atom,

R^3 and R^4 are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{10}-alkyl group, which is optionally halogenated, a C_6–C_{10}-aryl group, an $—NR_2^{10}$, $—SR^{10}$, $—OSiR_3^{10}$, $—SiR_3^{10}$ or $—PR_2^{10}$ radical in which R^{10} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group,

R^5 and R^6 are identical or different and are as defined for R^3 and R^4, with the proviso that R^5 and R^6 are not hydrogen,



R^7 is



$=BR^{11}$, $=AlR^{11}$, —Ge—, —Sn—, —O—, —S—, =SO, $=SO_2$, $=NR^{11}$, =CO, $=PR^{11}$ or $=P(O)R^{11}$,

where

R^{11}, R^{12} and R^{13} are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}-fluoroalkyl group, a C_6–C_{10}-aryl group, a C_6–C_{10}-fluoroaryl group, a C_1–C_{10}-alkoxy group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_8–C_{40}-arylalkenyl group or a C_7–C_{40}-alkylaryl group, or R^{11} and R^{12} or R^{11} and R^{13}, in each case with the atoms connecting them, form a ring,

M^2 is silicon, germanium or tin,

R^8 and R^9 are identical or different and are as defined for R^{11}, and

m and n are identical or different and are zero, 1 or 2, m plus n being zero, 1 or 2.

7. A catalyst composition which comprises: a compound of the formula I as claimed in claim 1 and an aluminoxane.

5,145,820

REDUCED PRESSURE SUBLIMATION OF AMINE COMPOUNDS ON ACTIVATED CARBONS

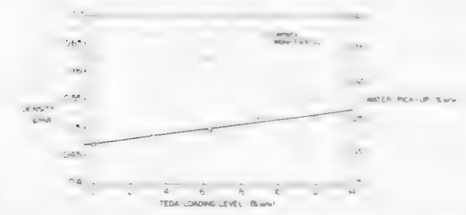
Septimus H. Liang; Brian H. Harrison, both of Ottawa, and Jack G. Pagotto, Nepean, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by Minister of National Defence of Her Majesty's Canadian Government, Ontario, Canada

Filed Apr. 26, 1991, Ser. No. 691,323

Claims priority, application Canada, May 1, 1990, 2015810

Int. Cl.[5] B01J *20/22*; B01D *53/04*

U.S. Cl. 502—401 5 Claims



1. A process for impregnating activated carbon with triethylenediamine, said process comprising the steps of placing the triethylenediamine on dried activated carbon; subjecting the activated carbon and the triethylenediamine to a vacuum; and then heating the carbon and the triethylenediamine for an extended period of time while under vacuum.

5,145,821

SILICA SUPPORTED POLYMERIZATION CATALYST SYSTEM

Charles K. Buehler, and Albert P. Masino, both of Naperville, Ill., assignors to Quantum Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 521,302, May 9, 1990, Pat. No. 5,034,365. This application Jan. 20, 1991, Ser. No. 717,956

Int. Cl.[5] C08F *4/651, 4/655, 4/656*

U.S. Cl. 502—119 43 Claims

1. A catalyst component comprising the product prepared by the steps of:

(a) contacting silica with components

(1) at least one hydrocarbon soluble magnesium-containing compound; and

(2) a first modifying compound selected from the group consisting of silicon halide; boron halides, aluminum halides and mixtures thereof followed by a second modifying compound selected from the group consisting of a silane of the formula $SiH_rX^2_s$, where X^2 is halogen; r is an integer of 1 to 3; and s is an integer of 1 to 3, with the proviso that the sum of r and s is 4, hydrogen halides having the structural formula HX^3, where X^3 is halogen, and mixtures thereof, said sequence of contact of silica with said components (1) and (2) being random; and

(b) contacting the product of step (a) with a titanium-containing compound having the structural formula $TiX^1_p(OR^1)_q$, where X^1 is halogen; R^1 is hydrocarbyl; p is an integer of 1 to 4; q is 0 or an integer of 1 to 3, with the provisos that the sum of p and q is 4 and that a second titanium-containing compound having the structural formula $Ti(OR)_mX_n$, where R is hydrocarbyl; X is halogen; m is an integer of 1 to 4; n is 0 or an integer of 1 to 3; and the sum of m and n is 4, is not utilized in the formation of said catalyst component.

5,145,822

METAL FOIL SUPPORTED CATALYST

Holger Falke, Hemmingen, and Guenther Strauss, Hanover, both of Fed. Rep. of Germany, assignors to Solvay Catalysts GmbH, Hanover, Fed. Rep. of Germany

Filed May 23, 1991, Ser. No. 704,934

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1990, 4017892

Int. Cl.[5] B01J 27/20, 23/42, 23/44, 23/74

U.S. Cl. 502—150 14 Claims

1. A supported catalyst for catalytically treating gaseous media at temperatures below about 100 ® C., comprising:

a) a support body made of metal foil having a thickness of at most 0.5 mm, said support body being provided with at least two channels permeable to the gaseous medium to be treated, said channels having a height of less than about 10 mm,

b) a catalytic material having a particle size between about 0.05 mm and 0.3 mm, said material being catalytically active at a temperature below about 100° C., and

c) a permanently elastic organic adhesive on said metal foil, said coating adhering said catalytic material to said support body.

5,145,823

POLYMERIZATION PROCESS

Petrus W. N. M. Van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 466,559, Jan. 17, 1990, Pat. No. 5,025,091. This application Apr. 4, 1991, Ser. No. 680,443

Claims priority, application Netherlands, Jan. 26, 1989, 8900154

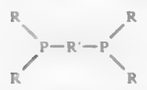
Int. Cl.[5] B01J 31/22, 31/24

U.S. Cl. 502—155 7 Claims

1. An equimolar complex of a hydrocarbylpalladium halide, wherein the hydrocarbylpalladium halide is of the formula

R''—PdX

wherein R'' is alkyl of up to 10 carbon atoms inclusive and X is halide, and a bidentate ligand of phosphorus wherein the bidentate ligand of phosphorus is of the formula



wherein R independently is an aromatic group of up to 12 carbon atoms inclusive and R' is a divalent linking group of up to 10 carbon atoms inclusive and 3 atoms in the bridge connecting the phosphorus-containing moieties.

5,145,824

ETHYLENE OXIDE CATALYST

John E. Buffum; Ruth M. Kowaleski, both of Houston, Tex., and William H. Gerdes, Hudson, Ohio, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 643,606 Jan. 2, 1991, abandoned. This application Dec. 9, 1991, Ser. No. 804,494

Int. Cl.[5] B01J 21/04, 23/04, 23/36, 23/50

U.S. Cl. 502—216 33 Claims

1. An ethylene oxide catalyst for the vapor phase production of ethylene oxide from ethylene and oxygen comprising a catalytically effective amount of silver, a promoting amount of alkali metal and a promoting amount of rhenium supported on a carrier comprising at least 8 percent by weight of alpha alumina, from about 0.05 to about 4 percent by weight (measured as the oxide, MO) of an alkaline earth metal in the form of an oxide, from about 0.01 to about 5 percent by weight (measured as the dioxide) of silicon in the form of an oxide and from zero to about 10 percent by weight (measured as the dioxide) of zirconium in the form of an oxide.

5,145,825

OXIDATION CATALYST RESISTANT TO SULFATION

Michel Deeba, North Brunswick; James M. Chen, Edison; Yiu K. Lui, Parlin, and Barry K. Speronello, Belle Mead, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Apr. 8, 1991, Ser. No. 682,032

Int. Cl.[5] B01J 21/06

U.S. Cl. 502—242 14 Claims

1. A sulfur-resistant oxidation catalyst comprising silica, a coating of titania or zirconia or a mixture thereof or precursors of said oxides on said silica and at least one precious metal supported on said coated silica.

9. A sulfur-resistant oxidation catalyst comprising a ceramic honeycomb coated with a catalytic washcoat containing particles of silica coated with titania or zirconia or a mixture thereof or a precursor of said oxides and at least one precious metal supported on said coated silica particles.

5,145,826

FLUID BED INCINERATION CATALYST

Eugene H. Hirschberg, Park Forest, and George A. Huff, Jr., Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 621,865, Dec. 4, 1990, Pat. No. 5,101,743. This application Sep. 5, 1991, Ser. No. 755,554

Int. Cl.[5] B01J 21/04, 21/06, 21/08, 21/12

U.S. Cl. 502—262 9 Claims

1. A combustion promoter catalyst comprising:

a promoter support component comprising at least one member selected from the group consisting of mullite, spinel, alpha alumina, gamma alumina, delta alumina, eta alumina, silica, alumina, silica alumina, titania, zirconia, and sand;

a promoter metal carried by said promoter support component wherein said promoter metal comprises at least one member selected from the group consisting of the Group VIII metals and present in an amount of from about 10 ppm by weight to about 5000 ppm by weight of said combustion promoter catalyst;

said combustion promoter catalyst consisting essentially of particulate having a particle size of greater than 150 microns and having a Group B Geldart characterization.

5,145,827

DYE-RECEIVING SHEETS FOR DYE TRANSFER TYPE THERMAL PRINTING

Akihiro Imai, Ikoma; Tetsuji Kawakami; Hiromu Matsuda, both of Katano; Keiichi Yubakami, Suita, and Nobuyoshi Taguchi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

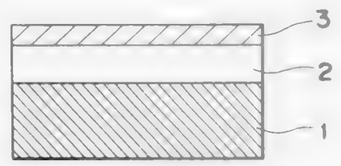
Filed Jun. 12, 1990, Ser. No. 537,232

Claims priority, application Japan, Jun. 14, 1989, 1-151799

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] B41M 5/035, 5/26

U.S. Cl. 503—227 8 Claims



1. A dye-receiving sheet for a dye transfer type thermal printing which comprises a cured resin dyeable layer of a moisture-curable resin on a polymer layer which is formed on a substrate.

5,145,828

TRANSFER OF AZO DYES

Karl-Heinz Etzbach, Frankenthal; Ruediger Sens, Mannheim, and Matthias Wiesenfeldt, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

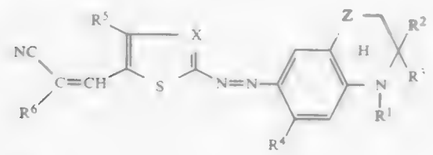
Filed Feb. 5, 1991, Ser. No. 651,455

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1990, 4004600

Int. Cl.[5] B41M 5/035, 5/26

U.S. Cl. 503—227 3 Claims

1. A process comprising transferring azo dyes from a transfer to a sheet of plastic-coated paper by diffusion by means of an energy source, on which transfer there is one or more azo dyes of the formula I



where

X is nitrogen or the radical C—CN,

Z is oxygen or the radical —CH(R[7])—, and R[7] is hydrogen or C_1–C_4-alkyl,

R^1 is alkyl, alkanoyloxyalkyl, alkoxycarbonyloxyalkyl or alkoxycarbonylalkyl, which each have up to 15 carbon atoms and may be substituted by phenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, halophenyl, benzyloxy, C_1–C_4-alkylbenzyloxy, C_1–C_4-alkoxybenzyloxy, halogen, hydroxyl or cyano; hydrogen, unsubstituted or C_1–C_{15}-alkyl-, C_1–C_{15}-alkoxy- or halogen-substituted phenyl; or a radical of the formula II

$$(-Y-O)_m-R^8 \quad \text{(II)}$$

where

Y is C_2–C_6-alkylene,

m is 1, 2, 3, 4, 5 or 6, and

R^8 is C_1–C_4-alkyl or unsubstituted or C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenyl,

R^2 and R^3 are identical or different and each is independently of the other hydrogen or C_1–C_4-alkyl,

R^4 is hydrogen, C_1–C_{10}-alkyl, C_1–C_{10}-alkoxy or the radical —NH—COR^2 or —$NHSO_2R^8$, where R^2 and R^8 are each as defined above,

R^5 is hydrogen, chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or unsubstituted or C_1–C_4-alkyl-, C_1–C_4-alkoxy- or halogen-substituted phenyl, and

R^6 is cyano or the radical —CO—OR^1, —CO—NHR^1 or —CO—$N(R^1)_2$, in each of which R^1 is as defined above.

5,145,829

METHOD FOR MANUFACTURING OXIDE HIGH-TEMPERATURE SUPERCONDUCTOR

Toshihisa Asano; Yoshiaki Tanaka; Masao Fukutomi, and Hiroshi Maeda, all of Tsukuba, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

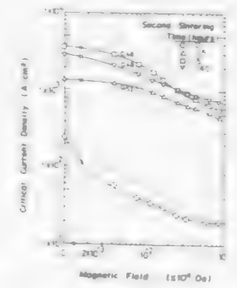
Filed Aug. 22, 1989, Ser. No. 396,620

Claims priority, application Japan, Aug. 26, 1988, 63-210583

Int. Cl.[5] H01L 39/12

U.S. Cl. 505—1 13 Claims

1. A method for manufacturing an oxide high-temperature superconductor having a highly oriented microstructure comprising the steps of adding lead to a raw material powder containing bismuth, strontium, calcium, oxygen and copper; mixing said lead and raw powder material, calcining and forming the thus-produced mixture; sintering a resultant formed product; cooling said thus-sintered resultant formed product; working said sintered resultant formed product under pressure



to compress said sintered resultant formed product into highly oriented crystalline grains in the direction of the c-axis thereof, and again sintering said thus worked sintered resultant formed product.

5,145,830

METHOD FOR MANUFACTURING THIN FILM OXIDE SUPERCONDUCTORS AND SUPERCONDUCTOR DEVICES BY X-RAY IRRADIATION

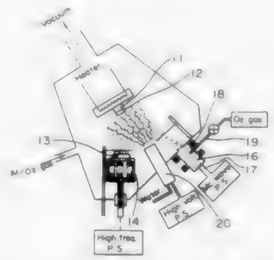
Shigemi Kohiki, Osaka; Akira Enokihara, Ikoma; Hidetaka Higashino, Matsubara; Shinichiro Hatta, Hirakata; Kentaro Setsune, Sakai; Kiyotaka Wasa, Nara; Takeshi Kamada, Ikeda, and Shigenori Hayashi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 21, 1991, Ser. No. 571,095

Claims priority, application Japan, Aug. 21, 1989, 1-214496; Aug. 21, 1989, 1-214498; Apr. 16, 1990, 2-99702; Apr. 16, 1990, 2-99704; Apr. 17, 1990, 2-101301; May 31, 1990, 2-143104

Int. Cl.[5] B05D 3/06, 5/12

U.S. Cl. 505—1 9 Claims



1. A method for manufacturing a thin film P-type oxide superconductor element which comprises:

providing an oxide superconductor thin film in which a critical current density obtained from a magnitude of diamagnetization measured at 48 K. in an outer magnetic field of 150 Oe is more than 3 mill.A/cm^2 and the critical current density obtained from a transport current measured at 48 K. in a null magnetic field is more than 3 mill.A/cm^2 by forming an oxide superconductor thin film on a substrate and irradiating said oxide superconductor thin film with photons having energies larger than that of ultraviolet rays and

forming a weak coupling portion on said thin film oxide superconductor by irradiating photons having energies larger than that of ultraviolet rays onto a minute portion of said thin film to form a structure wherein said thin film

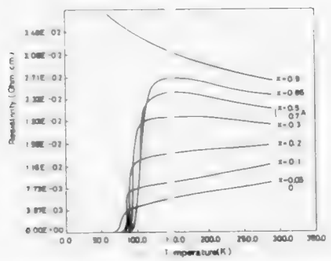
oxide superconductor is divided into at least two regions by said weak coupling portion.

5,145,831

HIGH-TC OXIDE SUPERCONDUCTOR AND METHOD FOR PRODUCING THE SAME

Yutaka Yamada, Kawasaki, and Satoru Murase, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1989, Ser. No. 313,786
Claims priority, application Japan, Feb. 24, 1988, 63-39554
Int. Cl.[5] H01B *12/06*, H01L *39/02, 39/12*
U.S. Cl. 505—1 6 Claims



1. A method for producing a superconductor, comprising the steps of:

mixing stoichiometric amounts of Bi_2O_3, $SrCO_3$, $CaCO_3$, CuO and at least one of PbO or Al_2O_3 to obtain a mixture;

calcining the mixture;

melting the calcined mixture to obtain a melted material having a melting point; and

annealing the melted material at a temperature below the melting point of the melted material.

5,145,832

SUPERCONDUCTING FILM ON A FLEXIBLE TWO-LAYER ZIRCONIA SUBSTRATE

Kolagani S. Harshavardhan; Samuel M. Sampere, both of Eatontown; Timothy D. Sands, Cranbury, all of N.J., and Thirumalai Venkatesan, Washington, D.C., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed May 22, 1991, Ser. No. 703,895
Int. Cl.[5] H32B *9/00*
U.S. Cl. 505—1 6 Claims

1. A flexible ceramic heterostructure, comprising:

a substrate comprising partially stabilized yttria-stabilized zirconia having between 2 and 5 mole % yttria;

a buffer layer comprising fully stabilized yttria-stabilized zirconia having between 8 and 18 mole % yttria and deposited on said substrate; and

a thin film comprising a high-temperature ceramic superconductor deposited on said buffer layer.

5,145,833

METHOD FOR PRODUCING CERAMIC BODIES

Arthur R. Prunier, Jr.; Stanley F. Spangenberg, and Sunil Wijeyesekera, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 242,934, Sep. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 828,802, Feb. 12, 1986, abandoned. This application Mar. 14, 1990, Ser. No. 494,938
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 18 Claims

1. A method for preparing a superconducting ceramic article comprising:

a heating a powdered admixture comprising (1) a source of yttria (Y_2O_3), (2) a source of barium monoxide and (3) a source of cupric oxide to a temperature of from about 800° Centigrade to 900° Centigrade to allow the admixture to be densified under pressure to more than about 65 percent of the admixture's theoretical density but low enough to substantially preclude melting of the admixture;

b. applying to said heated admixture isostatic pressure of between about 80,000 psi (5.5×10^2 MPa) and about the fracture stress of said heated admixture, for a period of time of from about 0.1 second to about ten minutes to form a densified article with a density of more than about 65 percent of the admixture's theoretical density; and

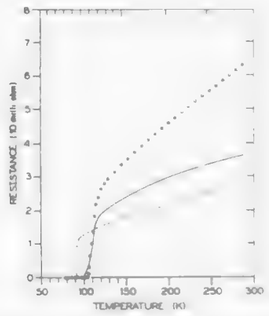
c. Annealing the densified article in the presence of gaseous oxygen under conditions sufficient to convert said densified article to a superconducting ceramic article having a composition comprising $YBa_2Cu_3O_{7-x}$ where $0<\times<0.6$.

5,145,834

PROCESSES FOR MAKING TL-CA-BA-CU-O, TL-SR-BA-CU-O AND TL-SR-CU-O SUPERCONDUCTORS BY SOLID STATE SYNTHESIS

Allen M. Hermann, and Zhengzhi Sheng, both of Fayetteville, Ark., assignors to University of Arkansas, Little Rock, Ark.

Division of Ser. No. 308,895, Feb. 9, 1989, Pat. No. 5,066,635, which is a continuation-in-part of Ser. No. 155,247, Feb. 12, 1988, Pat. No. 4,962,083. This application Aug. 26, 1991, Ser. No. 749,712
Int. Cl.[5] C01F *11/06*; C01G *3/02, 15/00*; C04B *35/64*
U.S. Cl. 505—1 18 Claims



1. A method for making a high temperature superconductor comprising the steps of:

a) mixing $BaCO_3$ with CuO;

b) grinding the resultant mixture to obtain a first mixture;

c) heating the first mixture to obtain a uniform black $BaCu_3O_4$ powder;

d) mixing the resultant $BaCu_3O_4$ powder with Tl_2O_3 and CaO;

e) regrinding the mixture to create a second mixture; and

f) heating the second mixture in flowing oxygen.

5,145,835

PROCESS FOR FABRICATING SUPERCONDUCTING CERAMIC MATERIALS BY HIP TREATMENT

Takuo Takeshita, Omiya; Sadaaki Hagino; Tatsuro Ajima, both of Urawa, and Motokazu Suzuki, Omiya, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Continuation of Ser. No. 234,650, Aug. 28, 1988, abandoned. This application Apr. 22, 1991, Ser. No. 688,702
Claims priority, application Japan, Aug. 21, 1987, 62-207694; Aug. 26, 1987, 62-212252; Aug. 26, 1987, 62-212254; Aug. 28, 1987, 62-212962; Aug. 28, 1987, 62-212964; Aug. 28, 1987, 62-212966; Aug. 28, 1987, 62-212972; Aug. 31, 1987, 62-217189; Aug. 31, 1987, 62-217190
Int. Cl.[5] H01L *39/24*; B22F *7/00*
U.S. Cl. 505—1 10 Claims

1. A process for fabricating worked superconducting ceramic material of a mean grain size not more than 10 μm, said process comprising the steps of:

(a) preparing a metal casing containing a starting powder material having a composition for forming an oxide superconductor, comprising:
an oxide of a yttrium-including rare earth element,
an oxide of an alkaline metal, and copper oxide,;

(b) calcining the starting powder material contained in the casing at a temperature in the range of 850° to 950° C.;

(c) subjecting said casing to hot deformation processing at a pressure in the range of 1600 to 1700 atmospheres and at a temperature in the range of 750° to 850° C. for about one hour;

(d) subjecting said casing containing hot deformed material to cold deformation processing, including wire drawing; and

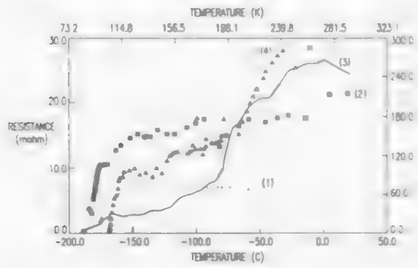
(e) subjecting said casing to stress relief treatment by annealing in the presence of oxygen.

5,145,836

METHOD FOR PRODUCING SHAPED PARTS FROM HIGH TEMPERATURE OXIDE METAL SUPERCONDUCTIVE COMPOSITES

In-Gann Chen, Northport; Doru M. Stefanescu, Tuscaloosa; Subhayu Sen, Tuscaloosa, and Joel Betts, Tuscaloosa, all of Ala., assignors to The University of Alabama, Tuscaloosa, Ala.

Filed Nov. 2, 1987, Ser. No. 115,410
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 5 Claims



1. A process for producing a superconductor material from high temperature oxide-metal superconductive composites with high mechanical properties, comprising the steps of;

mixing together the appropriate portions of a superconductive powder, a metal and a compound selected from the group consisting of an oxygen donor, a fluorine donor and mixtures thereof; and

sintering under pressure said mixed together portion to thereby form said superconductive element which is macroscopically uniform and which contains from 20 to 90% by volume of said metal, 80 to 10% by volume of said superconductive powder and 1 to 20% by volume of said compound, wherein said step of sintering involves sintering at approximately 600° C. for approximately five hours under flowing oxygen.

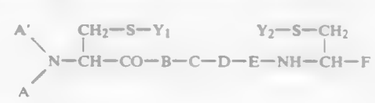
5,145,837

TREATMENT OF ARTHRITIS

Jean H. M. Feyen, Oberwil, and Janos Pless, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 360,503, Jun. 2, 1989, abandoned. This application Jun. 14, 1991, Ser. No. 715,937
Claims priority, application United Kingdom, Jun. 6, 1988, 8813392
Int. Cl.[5] C07K *7/26*; A61K *37/02*
U.S. Cl. 514—16 11 Claims

1. A method of treating degenerative and inflammatory processes in bone or cartilage in a subject in need thereof, which comprises administering to said subject an effective amount of a somatostatin analogue or derivative the formula



wherein

A is C_{1-12} alkyl, C_{7-10} phenylalkyl or a group of formula RCO-, whereby

i) R is hydrogen, C_{1-11} alkyl, phenyl or C_{7-10} phenylalkyl, or

ii) RCO-is

a) an L- or D-phenylalanine residue optionally ring-substituted by halogen, NO_2, NH_2, OH, C_{1-3} alkyl and-/or C_{1-3} alkoxy

b) the residue of a natural or a synthetic α-amino acid other than defined under a) above or of a corresponding D-amino acid, or

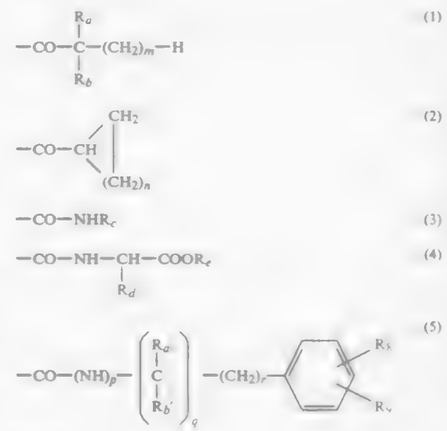
c) a dipeptide residue in which the individual amino acid residues are the same or different and are selected from those defined under a) and/or b) above,

the α-amino group of amino acid residues a) and b) and the N-terminal amino group of dipeptide residues c) being optionally mono-or di-C_{1-12} alkylated,

A' is hydrogen or, when A is C_{1-12} alkyl or C_{7-10} phenylalkyl, also C_{1-12} alkyl or C_{7-10} phenylalkyl,

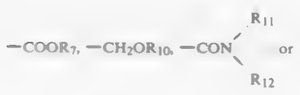
Y_1 and Y_2 represent together a direct bond or

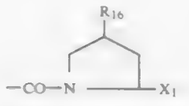
each of Y_1 and Y_2 is independently hydrogen or a radical of formulae (1) to (5)



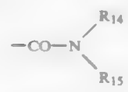
wherein

R_a is methyl or ethyl
R_b is hydrogen, methyl or ethyl
m is a whole number from 1 to 3
n is a whole number from 1 to 5
R_e is (C_{1-6})alkyl
R_d represents the substituent attached to the α-carbon atom of a natural or synthetic α-amino acid (including hydrogen)
R_e is (C_{1-5})alkyl
R_6' and R_b' are independently hydrogen, methyl or ethyl,
R_8 and R_9 are independently hydrogen, halogen, (C_{1-3})alkyl or (C_{1-3})alkoxy,
p is 0 or 1,
q is 0 or 1, and
r is 0, 1 or 2,
B is —Phe— optionally ring-substituted by halogen, NO_2, NH_2, OH, C_{1-3}alkyl and/or C_{1-3}alkoxy, or 3-(2-naphthyl)-alanine
C is (L)-Trp- or (D)-Trp- optionally α-N-methylated and optionally benzene-ring-substituted by halogen, NO_2, NH_2, OH, C_{1-3} alkyl and/or C_{1-3} alkoxy
D is Lys, Lys in which the side chain contains O or S in β-position, γF-Lys, δF-Lys or Orn, optionally α-N-methylated, or a 4-aminocyclohexylAla or 4-aminocyclohexylGly residue
E is Thr, Ser, Val, Phe, Tyr, Ile or an aminoisobutyric or aminobutyric acid residue
F is





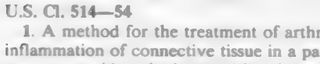
wherein
R_7 is hydrogen or C_{1-3}alkyl,
R_{10} is hydrogen or the residue of a physiologically acceptable, physiologically hydrolysable ester,
R_{11} is hydrogen, C_{1-3}alkyl, phenyl or C_{7-10}phenyl-alkyl,
R_{12} is hydrogen, C_{1-3}alkyl or a group of formula $-CH(R_{13})-X_1$,
R_{13} is CH_2OH, $-(CH_2)_2-OH$, $-(CH_2)_3-OH$, or $-CH(CH_3)OH$ or represents the substituent attached to the α-carbon atom of a natural or synthetic α-amino acid (including hydrogen) and
X_1 is a group of formula $-COOR_7$, $-CH_2OR_{10}$ or



wherein
R_7 and R_{10} have the meanings given above,
R_{14} is hydrogen or C_{1-3}alkyl and
R_{15} is hydrogen, C_{1-3}alkyl, phenyl or C_{7-10}phenylalkyl, and
R_{16} is hydrogen or hydroxy,
with the proviso that when R_{12} is $-CH(R_{13})-X_1$ then R_{11} is hydrogen or methyl,
wherein the residues B, D and E have the L-configuration, and the residues in the 2-and 7-position and any residues Y_1 4) and Y_2 4) each independently have the (L)- or (D)-configuration,
in free form or in pharmaceutically acceptable salt or complex form.

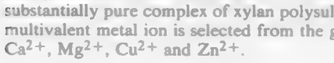
5,145,838
METHODS AND COMPOSITIONS FOR HEALING ULCERS
Loren R. Pickart, Bellevue, Wash., assignor to ProCyte Corporation, Redmond, Wash.
Continuation of Ser. No. 401,312, Aug. 30, 1989, Pat. No. 5,023,237. This application Jun. 10, 1991, Ser. No. 714,144
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] A61K *37/02, 37/14*
U.S. Cl. 514—18 6 Claims

1. A method for healing intestinal ulcers in warm-blooded animals, comprising:
administering to the animal a therapeutically effective amount of a composition comprising a compound selected from the group consisting of:
glycyl-L-histidyl-L-lysine,
glycyl-L-histidyl-L-lysine:copper(II),
glycyl-L-histidyl(1-methyl)-L-lysine:copper(II),
a derivative of GHL-Cu having the general formula:



[glycyl-L-histidyl-L-lysine-C(=O)—R]:copper(II)

wherein R is selected from the group consisting of alkyl moieties containing from 1 to 18 carbon atoms, aryl moieties containing from 6 to 12 carbon atoms, alkoxy moieties containing from 1 to 18 carbon atoms, and aryloxy moieties containing from 6 to 12 carbon atoms, or where R is L-proplyl-L-valyl-L-phenylalanyl-L-valine or L-valyl-L-phenylalanyl-L-valine, and
a derivative of GHL-Cu having the general formula:



[X-L-histidyl-L-lysine-C(=O)—R]:copper(II)

wherein X is glycyl-L-alanyl, glycyl-L-seryl, or glycyl-L-valyl, and wherein R is selected from the group consisting of alkyl moieties containing from 1 to 18 carbon atoms, aryl moieties containing from 6 to 12 carbon atoms, alkoxy moieties containing from 1 to 18 carbon atoms, and aryloxy moieties containing from 6 to 12 carbon atoms, or where R is L-prolyl-L-valyl-L-phenylalanyl-L-valine or L-valyl-L-phenylalanyl-L-valine.

5,145,839
PHARMACEUTICAL COMPOSITION AND METHOD OF USE
Mirko Beljanski, 46, Boulevard de Port Royal, 75005 Paris, France
Filed Jun. 9, 1989, Ser. No. 365,047
Claims priority, application France, Jun. 23, 1988, 88 08434
Int. Cl.[5] A61K *31/35, 31/70*
U.S. Cl. 514—27 8 Claims

1. A method of inhibiting the growth of cancer cells sensitive to naringin which comprises contacting such cells with an effective concentration of naringin.
2. A method of inhibiting the growth of cancer cells sensitive to naringenin which comprises contacting such cells with an effective concentration of naringenin.

5,145,840
TREATMENT OF IDIOPATHIC THROMBOCYTOPAENIC PURPURA
Leone E. Kirk, III; Dannie H. King, both of Raleigh; Richard H. Clemons, Cary; Sandra N. Lehrman, Durham, and David W. Barry, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Continuation of Ser. No. 877,284, Jun. 23, 1986, abandoned.
This application Apr. 2, 1991, Ser. No. 679,236
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—49 5 Claims

1. A method of treating idiopathic thrombocytopaenia purpura in a human in need thereof, which comprises administering to said human an effective thrombocytopaenia purpura treatment amount of a compound 3'-azido-3'-deoxythmidine.

5,145,841
ANTI-INFLAMMATORY COMPOUNDS AND COMPOSITIONS
David Cullis-Hill, Bondi Junction, and Peter Ghosh, Fairlight, both of Australia, assignors to Arthropharm PTY. Limited, NSW, Australia
PCT No. PCT/AU88/00077, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/07060, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 21, 1988, Ser. No. 423,455
Claims priority, application Australia, Mar. 19, 1987, P10951; Jun. 15, 1987, PI2478; Dec. 9, 1987, PI5819
Int. Cl.[5] A61K *31/715, 31/72*
U.S. Cl. 514—54 3 Claims

1. A method for the treatment of arthritis, rheumatism and inflammation of connective tissue in a patient in need of such treatment, said method comprising the step of administering to said patient an effective amount of a multivalent metal ion substantially pure complex of xylan polysulphate, wherein the multivalent metal ion is selected from the group consisting of Ca^{2+}, Mg^{2+}, Cu^{2+} and Zn^{2+}.

5,145,842
PROTEIN KINASE C. MODULATORS. D.
Paul E. Driedger, Winchester, and James Quick, Lexington, both of Mass., assignors to Alder Research Center Limited Partnership, Woburn, Mass.
Continuation-in-part of Ser. No. 322,881, Mar. 13, 1989, abandoned, which is a division of Ser. No. 61,299, Jun. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 872,812, Jun. 11, 1986, abandoned. This application Jul. 30, 1990, Ser. No. 559,701
Int. Cl.[5] A61K *31/695, 31/675;* C07D *487/00*
U.S. Cl. 514—63 36 Claims

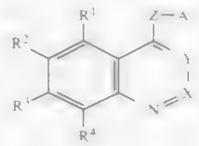
1. A compound, in the form of an individual isomer, an isomer mixture, a racemate or optical antipode, or a pharmaceutically acceptable salt thereof, of the formula:

P-G

wherein P represents a radical, formally derived from a parent aromatic heterocyclic compound of the indole, indene, benzofuran or benzothiophene class, which compound:
a. →binds reversibly or irreversibly to a diacylglycerol-type receptor; and/or
b. →activates any form of the enzyme protein kinase C; and
c. →contains an hydroxymethyl or 1-hydroxyethyl group bonded to a carbon atom; and
wherein G is any group of 55 or fewer atoms selected from carbon, hydrogen, oxygen, nitrogen, halogen, sulfur, phosphorus, silicon, arsenic, boron and selenium either i) singly or doubly bonded to the carbon atom of the parent compound in place of the hydroxymethyl or 1-hydroxyethyl group; or ii) singly or doubly bonded to a carbon atom immediately adjacent to the carbon atom to which the hydroxymethyl or 1-hydroxyethyl group is bound in the parent compound; and wherein the hydroxymethyl or 1-hydroxyethyl group of the parent compound is absent or has been replaced by G; provided that if P is a substituted or unsubstituted indolactam radical and G is bonded to carbon 9, then G may not comprise —COOMe, —COOEt or $-CH_2-R_e$, in which R_e is hydrogen, chloro, bromo, C_1–C_{12} saturated or unsaturated linear or branched alkoxy, CH_3OCH_2O—, C_1–C_{12} linear or branched alkanoyloxy, bromoacetoxy, benzoyloxy, azidobenzoyloxy, 3,5-$(CH_3)_2$-C_6H_3COO—, methanesulfonyloxy, toluenesulfonyloxy, dansyloxy, (tetrahydro-2H-pyran-2-yl)oxy, or (C_1–C_6 linear or branched alkyl)$_n$(phenyl)$_{3-n}$silyloxy, wherein n is 0–3.

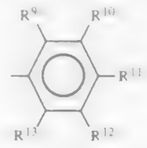
5,145,843
QUINOLINE AND CINNOLINE FUNGICIDES
Wendell R. Arnold, Carmel; Michael J. Coghlan, Indianapolis; Glen P. Jourdan, Morristown; Eriks V. Krumkalns, Indianapolis, and Robert G. Suhr, Greenfield, all of Ind., assignors to DowElanco, Indianapolis, Ind.
Continuation-in-part of Ser. No. 150,266, Jan. 29, 1988. This application Apr. 7, 1989, Ser. No. 334,422
Int. Cl.[5] A01N *43/54;* C07D *215/22, 215/42, 239/94*
U.S. Cl. 514—63 26 Claims

1. A fungicidal method which comprises applying to the locus to be protected from fungus a fungicidally effective amount of a compound of formula (1)



(1)

wherein
X is CR^5 or N, where R^5 is H, Cl or CH_3;
Y is $CR^{5'}$ where $R^{5'}$ is H, Cl, or Br;
Z is O, S, SO, SO_2, NR^6, where R^6 is H, (C_1–C_4) alkyl, or (C_1–C_4) alkanoyl, or CR^7R^8, where R^7 and R^8 are independently H, (C_1–C_4) alkanoyl, (C_1–C_4) alkyl, (C_1–C_4) alkenyl, (C_2–C_4) alkynyl, CN, or OH, or R^7 and R^8 combine to form a carbocyclic ring containing four to six carbon atoms;
R^1 and R^3 are independently halo or CH_3 and R^2 and R^4 are H; or R^3 is halo, R^1 is halo or H, and R^2 and R^4 are H; or R^4 is halo and R^1 to R^3 are H;
A is
(a) a C_1–C_{18} saturated or unsaturated hydrocarbon chain, straight chain or branched, optionally including a heteroatom selected from O, S, SO, or SO_2, and optionally substituted with halo, halo(C_1–C_4) alkoxy, hydroxy, or (C_1–C_4) alkanoyl;
(b) (C_3–C_8) cycloalkyl or cycloalkenyl;
(c) a phenyl group of the formula (2)

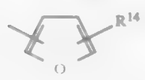


(2)

wherein R^9 to R^{13} are independently
H,
CN,
NO_2,
OH,
halo,
(C_1–C_4) alkyl,
(C_3–C_4) branched alkyl,

(C_2–C_4) alkanoyl,
halo (C_1–C_7) alkyl,
hydroxy (C_1–C_7) alkyl,
(C_1–C_7) alkoxy,
halo (C_1–C_7) alkoxy,
(C_1–C_7) alkylthio,
halo (C_1–C_7) alkylthio,
phenyl,
substituted phenyl,
phenoxy,
substituted phenoxy,
phenylthio,
substituted phenylthio,
phenyl (C_1–C_4) alkyl,
substituted phenyl (C_1–C_4) alkyl,
benzoyl,
$SiR^{20}R^{21}R^{22}$ or $OSiR^{20}R^{21}R^{22}$ where R^{20}, R^{21}, and R^{22} are H, a C_1–C_6 alkyl group, straight chain or branched, phenyl, or substituted phenyl, provided that at least one of R^{20}, R^{21}, and R^{22} is other than H, or R^{11} and R^{12} or R^{12} and R^{13} combine to form a carbocyclic ring, provided that unless all of R^9 to R^{13} are H or F, then at least two of R^9 to R^{13} are H;

(d) a furyl group of formula (3)



(3)

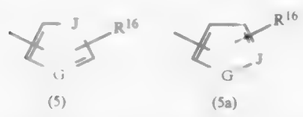
wherein R^{14} is H, halo, halomethyl, CN, NO_2, (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or (C_1–C_4) alkoxy,

(e) a thienyl group of formula (4)

(4)

wherein R^{15} is H, halo, halomethyl, CN, NO_2, (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or (C_1–C_4) alkoxy;

(f) a group of formula (5) or (5a)



(5) (5a)

wherein R^{16} is H, halo, halomethyl, CN, NO_2, (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, substituted phenyl, or (C_1–C_4) alkoxy, and J is N or CH and G is O, NR^{19} or CH, provided that either J is N or G is NR^{19}, where R^{19} is H, (C_1–C_4) alkyl, (C_1–C_4) alkanoyl, phenylsulfonyl, or substituted phenylsulfonyl;

(g) a group selected from
1-naphthyl,
4-pyrazolyl,
3-methyl-4-pyrazolyl,
1,3-benzodioxolyl,
tricyclo[3.3.1.1(3,7)dec-2-yl,
1-(3-chlorophenyl)-1H-tetrazol-5-yl,
pyridyl, and
pyridazinyl;

where, in the foregoing definitions, the term substituted phenyl refers to phenyl substituted with up to three groups selected from halo, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7)alkyl, (C_1–C_7) alkoxy, halo (C_1–C_7) alkoxy, phenoxy, phenyl, NO_2, OH, CN (C_1–C_4) alkanoyloxy or benzyloxy;

the term substituted phenoxy refers to a phenoxy group substituted with up to three groups selected from halo, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7)alkyl, (C_1–C_7) alkoxy, halo (C_1–C_7) alkoxy, phenoxy, phenyl, NO_2, OH, CN (C_1–C_4) alkanoyloxy, or benzyloxy;

the term substituted phenylthio refers to a phenylthio group substituted with up to three groups selected from halo, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7)alkyl, (C_1–C_7) alkoxy, halo (C_1–C_7) alkoxy, phenoxy, phenyl, NO_2, OH, CN (C_1–C_4) alkanoyloxy, or benzyloxy; and

the term substituted phenylsulfonyl refers to a phenylsulfonyl group substituted with up to three groups selected from halo, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7)alkyl, (C_1–C_7)alkoxy, halo (C_1–C_7) alkoxy, phenoxy, phenyl, NO_2, OH, CN (C_1–C_4) alkanoyloxy, or benzyloxy;

or an acid addition salt of a compound of formula (1), or an N-oxide of a compound of formula (1) where Y is CH; provided Z is CR^7R^8 if A is a group described in paragraph (d), (e), or (f); and provided that Z is S, SO, or SO_2 if A is a group described in paragraph (a).

5,145,844

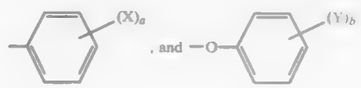
METHODS OF USING HYDROXY-, ALKOXY- AND BENZYLOXY-SUBSTITUTED PHOSPHOLIPIDS TO TREAT PHOSPHOLIPASE A_2-MEDIATED CONDITIONS AND TO ALLEVIATE PAIN

John J. Tegeler, Bridgewater, N.J., and Kirk D. Shoger, Minneapolis, Minn., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

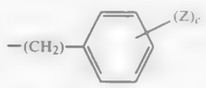
Division of Ser. No. 367,926, Jun. 15, 1989, Pat. No. 5,030,783, which is a continuation-in-part of Ser. No. 76,966, Jul. 23, 1987, abandoned. This application Mar. 5, 1991, Ser. No. 664,695
Int. Cl.[5] A61K *31/685*
U.S. Cl. 514—77 **3 Claims**

1. A method of treating a patient having a phospholipase A_2 mediated condition comprising administering to said patient an effective amount of phospholipase A_2 inhibiting compound of the formula

wherein R^1 is selected from the group consisting of hydrogen,

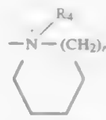


wherein a is an integer having a value of 0 to 2, inclusive, X is selected from the group consisting of alkyl radicals having 1 to 6 carbon atoms, inclusive, alkoxy radicals having 1 to 6 carbon atoms, inclusive, halogen, hydroxy and trifluoromethyl radicals, b is an integer having a value from 0 to 2, inclusive, and Y is selected from the group consisting of alkyl radicals having 1 to 6 carbon atoms, inclusive, alkoxy radicals having 1 to 6 carbon atoms, inclusive, halogen, hydroxy and trifluoromethyl radicals; R^2 is selected from the group consisting of hydrogen, alkyl radicals having up to 6 carbon atoms inclusive, and



wherein c is an integer having a value of 0 to 1 and Z is an alkoxy radical having 1 to 6 carbon atoms; R^3 is

wherein R^4 is an alkyl radical having up to 6 carbon atoms, inclusive, R^5 and R^6 are independently alkyl radicals having up to 6 carbon atoms, inclusive, or, taken together with the nitrogen atom to which they are attached form a group of the formula



wherein r is 0 or 1; A is a bivalent radical of the formula $—C_nH_{2n}—$ wherein n is an integer having a value from 1 to 20, inclusive, and m is an integer is an integer having a value of 3 or 4; and A^1 is a bivalent radical of the formula $—C_pH_{2p}$ wherein p is an integer having a value from 2 to 10, inclusive, with the proviso that the sum of n and p does not exceed 25; the geometrical isomers, or optical antipodes thereof.

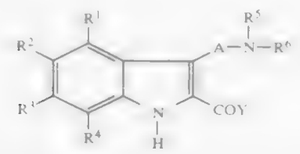
5,145,845

SUBSTITUTED 2-CARBOXYLINDOLES HAVING PHARMACEUTICAL ACTIVITY

Graham Johnson, Ann Arbor; Thomas C. Malone, Canton, and Po-Wai Yuen, Ann Arbor, all of Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

Filed May 14, 1991, Ser. No. 699,875
Int. Cl.[5] A61K *31/40, 31/415;* **C07D** *209/18, 403/04*
U.S. Cl. 514—80 **16 Claims**

1. A compound of the formula

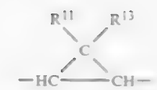


or a pharmaceutically acceptable base or acid addition salt thereof; wherein

(1) Y is (a) OH; (b) OR_{30} wherein R_{30} is lower alkyl, phenyl, phenylalkyl wherein the alkyl is an alkylene of from one to four carbons and the phenyl is unsubstituted or substituted by from one to three substituents selected from lower alkyl, halogen, trifluoromethyl, nitro, amino, mono- or di-lower alkylamino, hydroxy, lower alkoxy, C(O)OH, and $NHCOR^5$ wherein R^5 is lower alkyl, lower alkenyl, phenyl, phenylloweralkyl, phenylloweralkenyl or where the phenyl is substituted as defined above; (c) $NR_{40}R_{50}$ wherein R_{40} and R_{50} are independently hydrogen or lower alkyl; or (d) OCH_2OR_{30} wherein R_{30} is as defined above;

(2) R^1, R^2, R^3, and R^4 are independently hydrogen, lower alkyl, halogen, trifluoromethyl, cyano, nitro, methylthio, lower alkenyl, lower alkynyl, SO_2NH_2, $S(O)_{1-2}R$ wherein R is hydrogen or lower alkyl, OCF_3;

(3) A is $—(CH_2)_n—$, $—(CH_2)_qCH{=}CH(CH_2)_p—$,



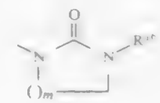
wherein R^{11} and R^{13} are independently as defined below and n is an integer of 0 through 4, q is an integer of 0 or 1, p is an integer of 1 or 2;

(4) R^5 is hydrogen, alkyl of from one to twenty carbons, phenyl or phenyl substituted as defined above;

(5) R^6 is
(a) $CONR^8R^9$,
(b) $COOR^8$,
(c) CSR^8,
(d) $S(O)_{1-2}R^8$,
(e) $S(O)_{1-2}NR^8R^9$, or
(f) $CONR^8S(O)_{1-2}R^9$, wherein R^8 and R^9 are independently

(i) hydrogen; (ii) alkyl of from one to twenty carbons, or alkenyl of from one to twenty carbons; (iii) (C_3–C_6) cycloalkyl or (C_3–C_6) cycloalkylloweralkyl; (iv) phenyl or phenyl substituted by one to three of lower alkyl, halogen, trifluoromethyl, nitro, amino, mono- or di-lower alkylamino, hydroxy, lower alkoxy, C(O)OH, $NHCOR^{10}$ wherein R^{10} is lower alkyl, lower alkenyl, phenyl, phenylloweralkyl, phenylloweralkenyl, or where the phenyl is substituted as defined above, $NHSO_2R^{10}$ wherein R^{10} is as defined above, CN, $CONR^{10}R^{11}$ wherein R^{10} is as defined above and R^{11} is hydrogen or lower alkyl, or $S(O)_{0-2}R^{10}$ wherein R^{10} is as defined herein; (v) phenylloweralkyl or where the phenyl is substituted as defined above; (vi) phenylloweralkenyl or where the phenyl is substituted as defined above; (vii) $(CH_2)_qR^{12}$ wherein q is an integer of one to four and R^{12} is (A) SO_3R^{13} wherein R^{13} is hydrogen or lower alkyl, (B) PO_3R^{13} wherein R^{13} is as defined above, (C) CO_2R^{13} wherein R^{13} is as defined above, or (D) $NR^{14}R^{15}$ wherein R^{14} and R^{15} are independently hydrogen or alkyl; or

(6) R^5 and R^6 are taken together with N which form



wherein m is an integer one or two and R^{16} is lower alkyl, phenyl, phenylloweralkyl or where the phenyl is substituted as defined above.

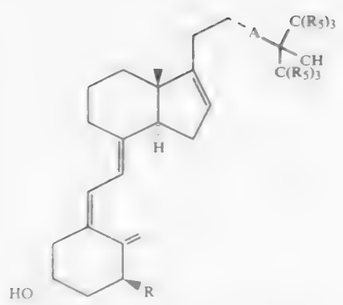
5,145,846

VITAMIN D3 ANALOGS

Enrico G. Baggiolini, deceased, late of North Caldwell by Barbara J. Baggiolini, executrix ; Bernard M. Hennessy; Shiaw-Jan Shiuey, both of Nutley; Gary A. Truitt, Bloomfield, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

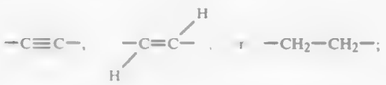
Continuation of Ser. No. 498,062, Mar. 23, 1990, Pat. No. 5,087,619, which is a continuation-in-part of Ser. No. 353,716, May 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 160,798, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 145,932, Jan. 20, 1988, abandoned. This application Apr. 10, 1991, Ser. No. 683,389
Int. Cl.[5] A01N *45/00;* **C07J** *172/00*
U.S. Cl. 514—167 **39 Claims**

1. A compound of the formula



I

wherein R is hydroxy; R_5 is hydrogen and A is



with the proviso that when A is —C≡C—, R_5 may also be deuterium.

5,145,847

14,17α-ETHENO- AND -ETHANOESTRATRIENES, PROCESSES FOR THE PREPARATION OF THESE COMPOUNDS, AS WELL AS THEIR USE FOR THE PRODUCTION OF MEDICINAL AGENTS

Rolf Bohlmann; Hermann Künzer; Rudolf Wiechert; David Henderson; Martin Schneider, and Yukishige Nishino, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

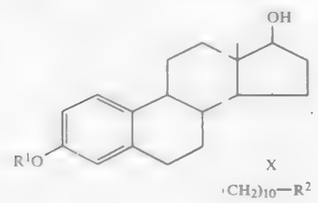
Filed Jul. 27, 1990, Ser. No. 558,340

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3925507

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—182 **11 Claims**

1. A 14,17α-Etheno- or -ethanoestratriene of Formula I



(I)

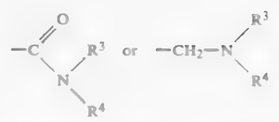
wherein

X is a —CH_2—CH_2 or

bridge.

R^1 is hydrogen, a C_{1-15}-acyl, benzoyl, C_{1-15}-alkyl, C_{3-9}-cycloalkyl or C_{3-5}-alkylcycloalkyl, and

R^2 is



and R^3 and R^4 each independently are hydrogen, C_{1-8}-alkyl, or fluorinated C_{1-8}-alkyl.

5,145,848

AMINO ANTHRACENEDIONES-BIS PLATINUM COMPLEXES, USEFUL AS ANTITUMORAL AGENTS

Alessandro Pasini; Franco Zunino; Odoardo Tofanetti; Carmelo A. Gandolfi; Sergio Tognella, and Silvano Spinelli, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy

PCT No. PCT/EP88/01110, § 371 Date Jun. 14, 1990, § 102(e) Date Jun. 14, 1990, PCT Pub. No. WO89/05815, PCT Pub. Date Jun. 29, 1989

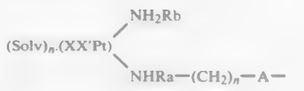
PCT Filed Dec. 7, 1988, Ser. No. 499,405

Claims priority, application Italy, Dec. 18, 1987, 23094 A/87; Oct. 26, 1988, 48492 A/88

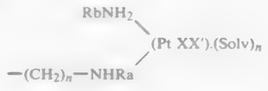
Int. Cl.[5] A01N *55/02;* **A61K** *31/555*

U.S. Cl. 514—185 **10 Claims**

1. Compounds of formula I:



(I)



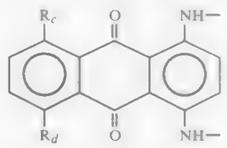
wherein

X, X', that can be the same or different, are ligands selected from the group consisting of Cl, Br, OH, CH_3SOCH_3·Cl, CH_3SOCH_3·Br, CH_3SOCH_3·OH or, taken together, form the anion of a linear or cyclic, optionally substituted, dicarboxylic acid;

n is zero, 0.5 or an integer from 1 to 5;

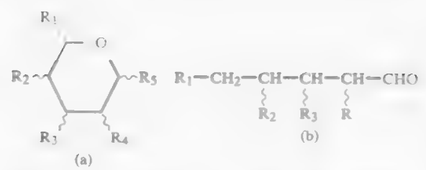
Solv is a solvent of crystallization selected from the group consisting of water, C_1–C_5-alcohols, acetonitrile and ethylacetate;

A is a disubstituted 1,4-anthracenedione of formula:

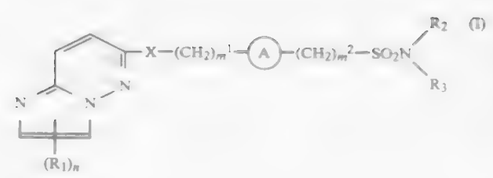


wherein each of Rc and Rd, that can be the same or different, are hydrogen or hydroxy;

Rb is either a linear or branched C_1–C_6alkyl residue optionally substituted by hydroxy, C_1—C_3-alkoxy, C_2–C_8-polyalkoxy or sulphonic groups, or it represents a residue of a mono-amino-sugar, in acetalic or linear form of formulae a and b respectively:



(a) (b)



(I)

wherein R_1 is hydrogen, C_1–C_3-alkyl, hydroxymethyl or aminomethyl group, R_2, R_3 and R_4 are amino, hydroxy or hydrogen with the proviso that at least one of them is hydrogen and only one of R_1, R_2 or R_3 be an amino group, R_5 is hydroxy, C_1–C_3-alkoxy or benzlyoxy;

when R_5 is hydroxy, the formulae a and b represent the same structure wherein the cyclic hemiacetalic form and the opened aldehydic form are in equilibrium, whereas when R_5 is alkoxy or benzlyoxy, it may be either an α or a β-oloside;

Ra is hydrogen, C_1–C_5-alkyl, —$(CH_2CH_2O)_pH$, $(CH_2CH_2O)_pOCH_3$, $(CH_2CH_2O)_pCH_2H_5$;

n is an integer from 2 to 3 and p is an integer from 1 to 6;

and salts of said complexes with non-toxic and pharmaceutically acceptable acids.

5,145,849

INDOLYLPROPANOLS AND PREPARATIONS CONTAINING THE COMPOUNDS

Wolfgang Stenzel, Reinbek, and Ben Armah, Hamburg, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

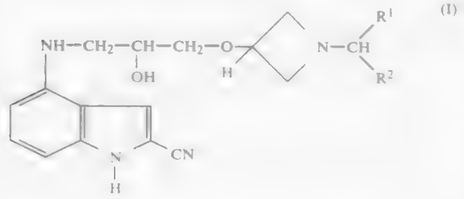
Filed Jan. 3, 1991, Ser. No. 637,385

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002391

Int. Cl.[5] A61K *31/44;* **C07D** *401/14, 403/12*

U.S. Cl. 514—210 **10 Claims**

1. A substituted indolylpropanol of the formula



(I)

in which

R^1 and R^2 each independently is a 2-, 3- or 4-pyridinyl radical, a 2- or 3-thienyl radical, phenyl or phenyl mono- or di-substituted by a radical independently selected from the group consisting of halogen, C_{1-6}-alkyl, C_{3-7}-cycloalkyl and C_{1-6}-alkoxy, or a salt, acid addition salt, tautomer or optical isomer thereof.

5,145,850

IMIDAZOPYRIDAZINES, THEIR PRODUCTION AND USE

Akio Miyake, Hirakata, and Yasuko Ashida, Takatsuki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 25, 1991, Ser. No. 659,704

Claims priority, application Japan, Mar. 1, 1990, 2-051072; Dec. 28, 1990, 2-418682

Int. Cl.[5] A61K *31/50, 31/535, 31/55;* **C07D** *487/04*

U.S. Cl. 514—248 **16 Claims**

1. An imidazo [1,2-b]pyridazine compound of the formula (I):

(I)

or a pharmaceutically acceptable salt thereof, wherein:

R_1 is halogen or a lower alkyl group optionally substituted with one to four substituents selected from the group consisting of hydroxy, amino, mono-lower alkylamino, lower alkoxy and halogen;

R_2 and R_3 are independently selected from the group consisting of hydrogen; a lower alkyl group optionally substituted with one to four substituents selected from the group consisting of hydroxy, amino, mono-lower alkylamino, lower alkoxy and halogen; a cycloalkyl group; and a phenyl group optionally substituted with one to five substituents selected from the group consisting of amino, mono-lower alkylamino, di-lower alkylamino, lower alkoxy and halogen; or R_2 and R_3 together with the adjacent nitrogen atom to which they are bonded form a four to seven membered heterocyclic ring having carbon atoms, at least one nitrogen atom and optionally oxygen or sulfur atoms as constituent atoms of the heterocyclic ring, said heterocyclic ring being unsubstituted or substituted with one to five substituents selected from the group consisting of hydroxy, amino, mono-lower alkylamino, di-lower alkylamino, lower alkoxy and halogen;

X is an oxygen atom or $S(O)_k$ wherein k is 0 to 2;

group —A— is a bivalent three to seven membered carbocyclic or heterocyclic group, said heterocyclic group having carbon atoms and at least one oxygen, sulfur or nitrogen atoms as constituent atoms of the ring, wherein said carbocyclic or heterocyclic group is unsubstituted or substituted with one to five substituents selected from the group consisting of a lower alkyl group optionally substituted with one to four substituents selected from the group consisting of hydroxy, an amino group, mono-lower alkylamino, lower alkoxy and halogen; an amino group; a mono-C_{1-4} alkylamino group; a di-C_{1-4} alkylamino group; a five- to seven-membered cyclic amino group having carbon atoms and at least one nitrogen atom as constituent ring atoms; an amido group; a C_{1-4} acylamido group; hydroxy; a lower alkoxy group; and halogen;

m^1 and m^2 are independently an integer of 0 to 4; and

n is 0 or 1.

5,145,851

METHOD FOR TREATING URINARY OBSTRUCTION

Masayuki Ishikawa, Tokyo; Hiroshi Azuma, Asaka; Shigeru Ito, Yokohama, and Tomohiro Yamaguchi, Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

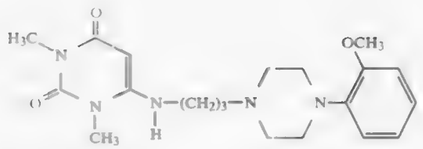
Continuation of Ser. No. 577,635, Sep. 4, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 780,405

Claims priority, application Japan, Sep. 6, 1989, 1-230750

Int. Cl.[5] A61K *31/495*

U.S. Cl. 514—252 **1 Claim**

1. A method for treating urinary obstruction with limited associated reduction in blood pressure which comprises administering a therapeutically effective amount of 6-[[3-[4-(2-methoxyphenyl)-1-piperazinyl]propyl]amino]-1,3-dimethyluracil represented by formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof to a mammal including a human being afflicted with urinary obstruction.

5,145,852

VASO-ACTIVE MEDICAMENT TO TREAT IMPOTENCE

Ronald Virag, 5, avenue Clodoald, F-92210 Saint-Cloud, France

Filed Jul. 10, 1990, Ser. No. 550,779

Int. Cl.[5] **A01N** *43/58, 43/40, 43/42, 43/50*

U.S. Cl. 514—253 **7 Claims**

1. A pharmaceutical composition applicable to the treatment of impotence in men, composed of a combination of main active ingredients with papaverine, wherein said main active ingredients comprise

an alpha blocker selected from the group consisting of phentolamine, ifenprodil, yohimbine and mixtures thereof; dipyridamol as a phosphodiasterase inhibitor; atropine as an anticholinergic; and

piribedil as a dopaminergic, or a prostaglandin selected from the group consisting of PGE_1 and alprostil, or both said piribedil and said prostaglandin

all of said main active ingredients representing a total of 5 to 20% by weight of the papaverine.

5,145,853

BACTERICIDAL FORMULATIONS FOR USE IN VETERINARY MEDICINE

Karl G. Metzger, Wuppertal; Hans-Joachim Zeiler, Velbert; Martin Scheer, Wuppertal; Herbert Voege, Leverkusen, and Klaus Grohe, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

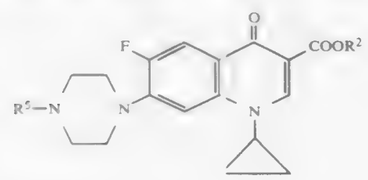
Continuation of Ser. No. 884,708, Jul. 11, 1986, abandoned. This application Jan. 2, 1991, Ser. No. 635,817

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526445; Mar. 15, 1986, 3608745

Int. Cl.[5] **A61K** *31/495, 31/50*

U.S. Cl. 514—254 **6 Claims**

1. A method of treating mycoplasmotic and bacterial infections in fowl which comprises administering drinking water to said fowl, said drinking water containing an antimycoplasmotically or antibacterially effective amount of a quinolonecarboxylic acid and/or derivative of a compound of the formula



in which

R^2 represents hydrogen or C_{1-4}-alkyl and

R^5 represents hydrogen, methyl or ethyl.

5,145,854

10-FORMYL-5,8,10-TRIDEAZAFOLATES

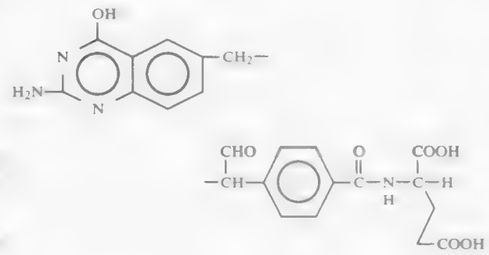
Madhavan G. Nair, 7005 Charleston Oaks Dr. North, Mobile, Ala. 36695, and Shu W. Li, 5811 Old Shell Road, Apt. B, Mobile, Ala. 36608

Filed Nov. 27, 1991, Ser. No. 799,166

Int. Cl.[5] **C07D** *401/02;* **A61K** *31/505*

U.S. Cl. 514—259 **6 Claims**

1. 10-Formyl-5,8,10-trideazafolic acid having the formula:



5,145,855

6- AND 7-DEOXYFORSKOLIN AND DERIVATIVES THEREOF

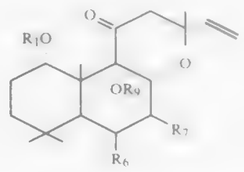
Raymond W. Kosley, Jr., Bridgewater, and Bettina Spahl, Edison, both of N.J., assignors to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 376,383, Jul. 6, 1989, Pat. No. 5,093,336. This application Nov. 15, 1991, Ser. No. 792,884

Int. Cl.[5] **A61K** *31/505, 31/52, 31/54, 31/50;* **C07D** *311/92*

U.S. Cl. 514—269 **28 Claims**

1. A method for treating hypertension in mammals comprising administering to a mammal requiring treatment for hypertension a hypertension treating effective amount of a composition comprising an inert adjuvant and a pharmaceutically effective amount of a compound of formula

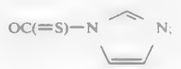


wherein

R_1 is hydrogen, loweralkyl arylloweralkyl, a group of formula $R_2R_3R_4Si$, a group of formula R_5CO, a group of formula $R_8R_{10}N(CHR_{11})_nCO$ wherein n is 0 or 1, or Ar';

R_6 is hydrogen, hydroxyl, a group of formula OR_{12}, a group of formula $OCOR_{13}$, a group of formula $OCONR_{14}R_{15}$, or a group of formula OAr;

R_7 is defined as R_6, or is a group of formula $OCOR_{16}$, a group of formula $OCONR_{17}Z$, a group of formula OAr', a group of formula OCOAr', a group of formula $OCONR_{17}Ar'$, or a group of formula



R_6 and R_7 taken together form a group of formula O—C(=S)—O;

R_9 is hydrogen;

or R_1 and R_9 may be taken together to form a group of

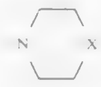
formula CO, or a group of formula SO or a group of formula $CHNR_{18}R_{19}$;

R_2, R_3, and R_4 are the same or not all the same and each is loweralkyl;

R_5 is hydrogen or loweralkyl;

R_8, R_{10} and R_{11} are the same or not all the same and each is hydrogen, loweralkyl or arylloweralkyl;

R_8 and R_{10} taken together with the nitrogen atom to which they are attached form a group of formula



wherein

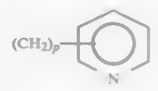
X is CO, O, S, a group of formula CHR_{20} or a group of formula NR_{21};

R_{12} is loweralkyl or alkylaminoloweralkyl;

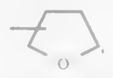
R_{13} is hydrogen, straight or branched chain alkyl containing from 1 to 20 carbon atoms, —$CH(OH)CH_2OH$,

R_{14} is hydrogen, loweralkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, or a group of formula $HOCH_2C-H(OH)CH_2$;

R_{15} is hydrogen, hydroxyl, loweralkoxy, loweralkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, loweralkanoyl, loweralkanoyloweralkyl, a group of formula

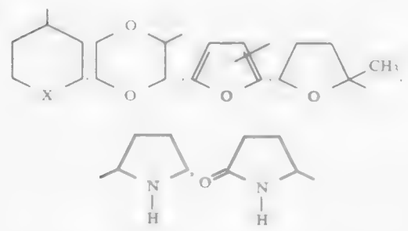


wherein p is 1 or 2, a group of formula



a group of formula $HOCH_2(OH)CH_2$, a group of formula $(CH_2)_qNR_{22}R_{23}$ wherein q is an integer equalling 0 or from 2 to 6, a group of formula OR_{24} or a group of formula $OCOR_{25}$;

R_{16} is hydroxyloweralkyl,



wherein X is as defined above, a group of formula $R_{26}OCR_{27}R_{28}(CH_2)_r$ wherein r is 0, 1, 2 or 3, a group of formula $R_{29}R_{30}N(CH_2)_s(CHR_{31})(CH_2)_{s'}$, wherein s and s' are the same or different and each is 0, 1 or 2, or a group of formula $(CH_2)_fCO_2H$, wherein f is an integer from 0 through 5;

R_{17} is hydrogen or loweralkyl;

R_{18} and R_{19} are the same or different and each is loweralkyl;

R_{18} and R_{19} taken together with the nitrogen atom to which they are attached form a group of formula

wherein L is O, S or CHR_{20};

R_{20} is hydrogen or loweralkyl;

R_{21} is hydrogen or loweralkyl;

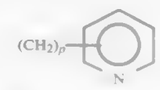
R_{22} and R_{23} are the same or different and each is loweralkyl;

R_{22} and R_{23} taken together with the nitrogen atom to which they are attached form a group of formula

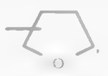
wherein X is defined as above;

R_{24} is hydrogen, loweralkyl a group of formula $(CH_2)_qNR_{22}R_{23}$ wherein R_{22}, R_{23} and q are as defined above;

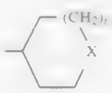
R_{25} is hydrogen, loweralkyl, lowercycloalkyl of 3 to 6 carbon atoms, haloloweralkenyl, loweralkanoyloweralkyl, loweralkoxyloweralkyl, loweralkoxycarbonylloweralkyl, loweralkylamino, lowerdialkylamino, a group of formula



wherein p is defined as above, a group of formula



a group of the formula $(CH_2)_qNR_{22}R_{23}$ wherein R_{22}, R_{23} and q are as defined above, a group of formula



wherein x is as defined above and t is 0 or 1, or a group of formula $(CH_2)_uN(R_{33})COR_{34}$ wherein u is 1, 2 or 3;

R_{26}, R_{27} and R_{28} are the same or not all the same and each is hydrogen or loweralkyl;

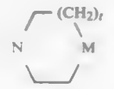
R_{29} is hydrogen, loweralkyl, or a group of formula $R_{35}CO$;

R_{30} is hydrogen or loweralkyl;

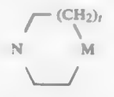
R_{29} and R_{30} taken together with the nitrogen atom to which they are attached form a group of formula

wherein X is defined above;

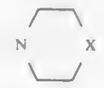
R_{31} is hydrogen, loweralkyl, aryllo veralkyl or hydroxyl;
R_{33}, R_{34} and R_{35} are the same or n t all the same and each is hydrogen or loweralkyl;
Ar is phenyl, naphthyl, pyridinyl, pyridazinyl or pyrimidinyl, each of which is unsubstit ted or mono- or polysubstituted by loweralkyl, halogen or nitro;
Ar' is phenyl, naphthyl, pyridinyl, pyridazinyl, pyrimidinyl, furanyl, oxazolyl, purinyl or thiazolyl, each of which is unsubstituted or mono- or poly-substituted by loweralkyl, halogen, nitro, or a group of formula $NR_{34'}R_{35'}$, or phenyl, naphthyl, pyridinyl or pyrimidinyl, each of which is mono- or poly-substituted by a group of formula $NR_{34'}R_{35'}$;
$R_{34'}$ and $R_{35'}$ are the same or different and each is hydrogen, loweralkyl or alkylaminoloweralkyl;
$R_{34'}$ and $R_{35'}$ taken together with the nitrogen atom to which they are attached form a group of formula



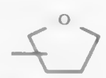
wherein M is NR_{47}, O or CH_2 and y is 0, 1 or 2;
Z is a group of formula $(CH_2)_vNR_{37}R_{38}$ wherein v is 0 or an integer from 2 to 5, a group of formula $N{=}CR_{39}R_{40}$ or a group of formula $(CH_2)_gCO_2H$ wherein g is an integer from 0 to 5;
Z and R_{17} and the nitrogen to which they are attached form a group



wherein M is NR_{47}, O or CH_2 and y is 0, 1 or 2;
R_{37} and R_{38} are the same or different and each is hydrogen, loweralkyl or a group of formula COR_{41};
R_{37} and R_{38} taken together with a nitrogen atom to which they are attached form a group of formula



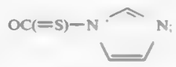
wherein X is defined as above;
R_{39} is loweralkyl;
R_{40} is loweralkyl, loweralkenyl, a group of formula



or a group of formula

R_{39} and R_{40} taken together with the carbon atom to which they are attached form a group of formula

wherein W is O, a group of the formula NR_{42}, or a group of formula CHR_{43};
R_{41} is loweralkyl or a group of formula $(CH_2)_xNR_{44}R_{45}$ wherein x is an integer from 0 to 5;
R_{42} is loweralkyl;
R_{43} is hydrogen, loweralkyl or a group of formula OR_{46};
R_{44} and R_{45} are the same or different and each is loweralkyl;
R_{46} is loweralkyl;
R_{47} is hydrogen, loweralkyl or (C═O) loweralkyl; and
the optical and geometric isomers thereof, or a pharmaceutically acceptable salt thereof, provided:
(a) if R_6 is hydrogen, then R_7 is not hydrogen;
(b) if R_7 is hydrogen, then R_6 is not hydrogen; and
(c) if neither R_6 nor R_7 is hydrogen, then R_6 is OH, $R_{13}(C{=}O)O$, a group of formula OR_{12}, a group of formula $OCONR_{14}R_{15}$ or a group of formula OAr, and R_7 is



or, R_6 and R_7 taken together form a group of formula O—C(═S)—O.

5,145,856

FUNGICIDES

John M. Clough, Marlow; Christopher R. A. Godfrey, Bracknell; Ian T. Streeting, Wokingham, and Rex Cheetham, Bracknell, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

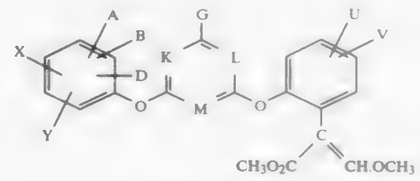
Continuation of Ser. No. 478,403, Feb. 12, 1990, abandoned. This application Dec. 27, 1991, Ser. No. 818,431

Claims priority, application United Kingdom, Feb. 10, 1989, 8903019.1

Int. Cl.[5] A01N *43/54;* **C07D** *239/52*

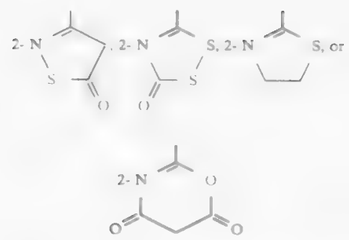
U.S. Cl. 514—274 **7 Claims**

1. A compound having the formula (I):



(I)

in which any two of K, L and M are nitrogen and the other is CE; X and Y are independently hydrogen, halogen, C_{1-4} alkyl, C_{3-6} cycloalyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{2-4} alkynyloxy, phenyl, benzyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, NR^1R^2, NR^1OR^2, N_3, $NHCOR^1$, $NR^1CO_2R^2$, $NHCONR^7{}^1R^2$, $N{=}CHNR^1R^2$, $NHSO_2R^1$, OR^1, $OCOR^1$, OSO_2R^1, SR^1, SOR^1, SO_2R^1, SO_2OR^1, $SO_2NR^1R^2$, COR^1, $CR^1{=}NOR^2$, $CHR^1CO_2R^2$, CO_2R^1, $CONR^1R^2$, $CSNR^1R^2$, $CH_3O_2C.C{:}CH.OCH_3$, 1-(imidazol-1-yl)vinyl,



or X and Y, when ortho to one another, together form methylenedioxy, or together with the phenyl ring to which they are attached form a naphthalene, quinoline, benzimidazole or benzothienyl ring A, B, D, E, G, U and V are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, cyano, nitro or trifluoromethyl; and R^1 and R^2 are independently hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl or phenyl; the aliphatic moieties of any of the foregoing being optionally substituted with one or more of halogen, cyano OR^1, SR^1, NR^1R^2, $SiR^1{}_3$, or $OCOR^1$and the phenyl moieties of any of the foregoing being optionally substituted with one or more halogen, C_{1-4} alkyl, C_{1-4} alkoxy, nitro or cyano.

5,145,857

HMG-COA REDUCTASE-INHIBITING SUBSTITUTED AMINO-PYRIDINES

Peter Fey; Rolf Angerbauer; Walter Hübsch, all of Wuppertal; Thomas Philipps, Cologne; Hilmar Bischoff, Wuppertal; Dieter Petzinna, Duesseldorf, and Delf Schmidt, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

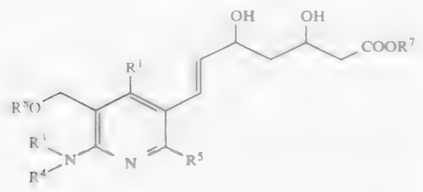
Filed Aug. 15, 1990, Ser. No. 568,442

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929507

Int. Cl.[5] C07D *213/75, 401/04;* **A61K** *31/445, 31/44*

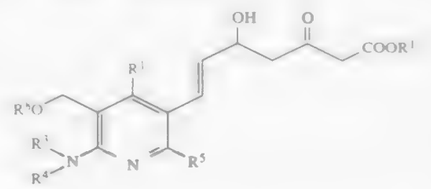
U.S. Cl. 514—318 **11 Claims**

1. A substituted amino-pyridine of the formula



in which
R^1 represents aryl having 6 to 10 carbon atoms, which is optionally monosubstituted to tetrasubstituted by identical or different substituents from the group consisting of (a) straight-chain or branched alkyl, alkylthio, alkylsulphonyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, which may in turn be substituted by hydroxyl or phenyl, and (b) aryl, aryloxy, arylthio having 6 to 10 carbon atoms, benzyloxy, halogen, nitro, cyano, trifluoromethyl or trifluoromethoxy,
R^3 and R^4 are identical or different and represent hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms, phenyl or a group of the formula A—R^{10}, in which
A denotes carbonyl or sulphonyl and
R^{10}
denotes amino or alkoxy having up to 8 carbon atoms, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl, which may in turn be substituted by hydroxyl, alkoxy having up to 8 carbon atoms or halogen, or
denotes trifluoromethyl, or
R^3 and R^4, together with the nitrogen atom, form a piperidine or pyrrolidine ring,
R^5
represents straight-chain or branched alkyl having up to 10 carbon atoms, or
represents cycloalkyl having 3 to 8 carbon atoms,
R^7
denotes hydrogen or straight-chain or branched alkyl having up to 10 carbon atoms, which may be substituted by phenyl, or
denotes aryl having 6 to 10 carbon atoms, or a sodium, potassium, calcium, magnesium or ammonium ion, and
R^8
denotes hydrogen, straight-chain or branches alkyl having up to 10 carbon atoms, which is optionally substituted by hydroxyl, halogen or phenyl,
denotes aryl having 6 to 10 carbon atoms, or
denotes a group of the formula —COR^9,
in which
R^9 denotes straight-chain or branched alkyl having up to 8 carbon atoms or phenyl,
or a pharmaceutically acceptable salt thereof.

11. A ketone of the formula



in which
R^1 represents aryl having 6 to 10 carbon atoms, which is optionally monosubstituted to tetrasubstituted by identical or different substituents from the group consisting of (a) straight-chain or branched alkyl, alkylthio, alkylsulphonyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, which may in turn be substituted by hydroxyl or phenyl, and (b) aryl, aryloxy, arylthio having 6 to 10 carbon atoms, benzyloxy, halogen, nitro, cyano, trifluoromethyl or trifluoromethoxy,
R^8
denotes hydrogen, straight-chain or branched alkyl having up to 10 carbon atoms, which is optionally substitute by hydroxyl, halogen or phenyl,
denotes aryl having 6 to 10 carbon atoms, or
denotes a group of the formula —COR^9,
in which
R^9 denotes straight-chain or branched alkyl having up to 8 carbon atoms or phenyl,
R^{11}
denotes straight-chain or branched alkyl having up to 10 carbon atoms, which may be substituted by phenyl, or
denotes aryl having 6 to 10 carbon atoms,
R^3 and R^4 are identical or different and represent hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms, phenyl or a group of the formula A—R^{10}, in which
A denotes carbonyl or sulphonyl and
R^{10}
denotes amino or alkoxy having up to 8 carbon atoms, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl, which may in turn be substituted by hydroxyl, nitro, cyano or halogen, or
denotes trifluoromethyl, or
R^3 and R^4, together with the nitrogen atom, form a piperidine or pyrrolidine ring, and
R^5
represents straight-chain or branched alkyl having up to 10 carbon atoms, or
represents cycloalkyl having 3 to 8 carbon atoms.

5,145,85

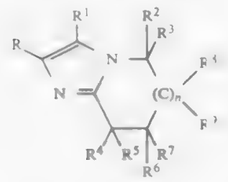
PYRROLO [1,2-A] IMIDAZOLI AND IMIDAZO [1,2-A] PYRIDINE DERIVATIVES ND THEIR USE AS 5-LIPOXYGENASE PATH VAY INHIBITORS

Jerry L. Adams, Wayne, Pa.; Paul E. Bender, Cherry Hill, N.J.; Pa.; John F. Newton, Jr., West Chester, Pa., and Carl D. Perchonock, Bethesda, Md., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

assignors to SmithKline Beecham Corp., Philadelphia, Pa.
Continuation of Ser. No. 624,005 Dec. 7, 1990, which is a division of Ser. No. 255,816, Oct. 1 , 1988, Pat. No. 5,002,941, which is a continuation of Ser. No. 92,258, Sep. 2, 1987, abandoned, which is a continuation- n-part of Ser. No. 856,928, Apr. 28, 1986, Pat. No. 4,719,218, which is a continuation-in-part of Ser. No. 808,407, Dec. 12, 1985, abandoned. This application Dec. 6, 1991, Ser. No. 815,543
Int. Cl.[5] A61K *31/40;* **C07D** *471/04, 413/04*
U.S. Cl. 514—318 **15 Claims**

1. A compound of the formula

FORMULA (I)



wherein

1) one of R or R^1 must be alkyl substituted pyridyl and the other is selected from:
   (a) monosubstituted phenyl wherein said substituent is selected from H, halo, hydroxy C_{1-3} alkoxy, C_{1-3} alkylthio, C_{1-4} alkyl, C_{1-3} alkylsulfinyl, C_{1-3} alkylsulfonyl, C_{1-3} alkylamino, C_{1-3} dialkylamino, CF_3, N-(C_{1-3} alkyl)-N-(C_{1-3}alkanamido), N-pyrrolidino, N-piperidino, prop-2-ene-1-oxy or 2,2,2-trihaloethoxy;
   (b) disubstituted phenyl wherein said substituents are the same and are selected from halo, C_{1-3} alkoxy, C_{1-3} alkylamino, C_{1-3} dialkylamino, N-pyrrolidino, N-piperidino, 2,2,2-trihaloethoxy, prop-2-ene-1-oxy, or hydroxy, or the disubstituents together form a methylene dioxy group;
   (c) disubstituted phenyl wherein said substituents are not the same and are independently selected from halo, C_{1-3} alkylamino, nitro, N-(C_{1-3} alkyl)-N-(C_{1-3} alkanamido, C_{1-3} dialkylamino, amino, N-pyrrolidino or N-piperidino;
   (d) disubstituted phenyl wherein one of said substituents must be C_{1-3} alkoxy, hydroxy, 2,2,2-trihaloethoxy or prop-2-ene-1-oxy and the other substituent is independently selected from halo, C_{1-3} alkylamino, N-(C_{1-3}alkyl)-N-C_{1-3} alkanamido), C_{1-3}dialkylamino, amino, N-pyrrolidino or N-piperidino or
   (e) disubstituted phenyl wherein one substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, and C_{1-3} alkylsulfonyl and the other is selected from C_{1-3} alkoxy, nitro, halo, amino, C_{1-3} alkylamino, or C_{1-3} dialkylamino; or
2) one of R or R^1 is 2-pyridyl or 3-pyridyl and the other is selected from:
   (a) monosubstituted phenyl wherein said substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, C_{1-3} alkylsulfonyl, C_{1-3}alkoxy or hydroxy; or
   (b) disubstituted phenyl wherein one substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, or C_{1-3} alkylsulfonyl and the other is selected from C_{1-3} alkoxy, nitro, halo, amino, C_{1-3} alkylamino, or C_{1-3} dialkylamino; or
3) R is 4-pyridyl and R^1 is selected from:
   (a) monosubstituted phenyl wherein said substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, C_{1-3} alkylsulfonyl or hydroxy; or
   (b) disubstituted phenyl wherein one substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, or C_{1-3} alkylsulfonyl and the other is selected from C_{2-3} alkoxy, nitro, halo, amino, C_{1-3} alkylamino, or C_{1-3} dialkylamino; or
4) R^1 is 4-pyridyl and R selected from:
   (a) monosubstituted phenyl wherein said substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, C_{1-3} alkylsulfonyl, hydroxy, C_{2-3} alkoxy, or a branched or unbranched C_{2-5}alkenylthio or C_{2-5}alkenylsulfinyl; or
   (b) disubstituted phenyl wherein one substituent is selected from C_{1-3} alkylthio, C_{1-3} alkylsulfinyl, or C_{1-3} alkylsulfonyl and the other is selected from C_{2-3} alkoxy, nitro, halo, amino, C_{1-3} alkylamino, C_{1-3} dialkylamino, or a branched or unbranched C_{2-5} alkenylthio or C_{2-5} alkenylsulfinyl; or R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are H, or one or two of R^2, R^3, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are independently selected from H or C_{1-2} alkyl; n is 0 or 1;

or a pharmaceutically acceptable salt thereof.

5,145,859

METHODS OF TREATING INTERSTITIAL CYSTITIS AND URETHRAL SYNDROME

Jonathan D. Fleischmann, Cleveland Heights, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Filed Mar. 20, 1991, Ser. No. 672,393
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—356 **2 Claims**

1. A method for treating interstitial cystitis comprising the steps of administering to a living subject exhibiting the pathological conditions asociated with interstitial cystitis produced by autonomic nerve-mediated ischemia of the bladder a sufficient amount of Nifedipine to interrupt the abnormal autonomic reflex loop affecting the subject's bladder vasculature, thereby reversing the ischemia, wherein the administered amount of Nifedipine is from about 10 to about 80 mg which is administered daily for a period of time greater than four weeks.

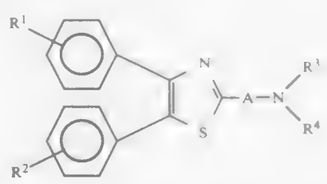
5,145,860

THIAZOLE COMPOUNDS AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Hisashi Takasugi; Shigetaka Nishino, both of Osaka, and Akito Tanaka, Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 451,935, Dec. 18, 1989, abandoned. This application Mar. 19, 1990, Ser. No. 495,622
Claims priority, application United Kingdom, Jan. 5, 1989, 8900191; Mar. 22, 1989, 8906575; Dec. 4, 1989, 8927351
Int. Cl.[5] A61K *31/425;* **C07D** *277/24*
U.S. Cl. 514—365 **5 Claims**

1. A compound of the formula:



wherein A is lower alkylene or carbonyl,

R^1 and R^2 are each halogen, lower alkyloxy, lower alkylthio or lower alkylsulfinyl;

R^3 is an acyl moiety of an aliphatic carboxylic or carbamic acid; and

R^4 is hydrogen, lower alkyl, amidino or an acyl moiety of an aliphatic carboxylic or carbamic acid, or a pharmaceutically acceptable salt thereof.

5,145,861

FLUORINATED ARACHIDONIC ACID DERIVATIVES

Jean B. Ducep, Sundhoffen, and Jean-Francois Nave, Strasbourg, both of France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 512,633, Apr. 18, 1990, abandoned, which is a continuation of Ser. No. 376,915, Jul. 5, 1989, abandoned, which is a continuation of Ser. No. 117,165, Nov. 4, 1987, abandoned. This application Aug. 5, 1991, Ser. No. 742,459
Int. Cl.[5] A61K *31/41, 31/22;* **C07D** *257/04;* **C07C** *67/36*
U.S. Cl. 514—381 **27 Claims**

1. A fluorinated arachidonic acid derivative of the formula

wherein

R_1 is a fluoro group and R_2 is hydrogen or R_1 and R_2 are each independently a fluoro group;

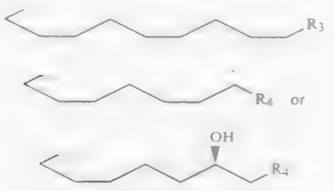
X is a C(O)OR′ group wherein R′ is hydrogen, a straight chain (C_1–C_6)alkyl group, or

X is a group of the formula —C(O)OCH$_2$CH(OR″)CH$_2$(OR‴) wherein R″ is an acyl residue or a long chain, fatty acid and wherein R‴ is hydrogen or an acyl residue of a long chain, fatty acid,

X is a —C(O)NH$_2$ or —C(O)NH(OH) group, or

X is a 1H-tetrazol-5-yl group; and

R is a group of one of the structural formulae



wherein R_3 is a hydrogen or a straight chain (C_1–C_4)alkyl and R_4 is hydrogen or a straight chain (C_1–C_6)alkyl and wherein the dotted line indicates an optional double or triple bond

as well as where X is (C(O)OR′ and R′ is hydrogen, or the pharmaceutically acceptable salt thereof.

5,145,862

METHOD OF RESISTING NEURODEGENERATIVE DISORDERS

Elias Aizenman, Pittsburgh, Pa.; Paul A. Rosenberg, Newton, and Paul M. Gallop, Chestnut Hill, both of Mass., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Division of Ser. No. 568,301, Aug. 16, 1990, Pat. No. 5,091,391. This application Sep. 12, 1991, Ser. No. 758,576
Int. Cl.[5] A61K *31/415*
U.S. Cl. 514—398 **15 Claims**

1. A method of resisting neurological damage in a subject caused by overstimulation of the NMDA receptors of nerve cells by glutamate comprising,

administering to said subject an effective dose of the oxidizing agent topa hydantoin to thereby diminish the activity of NMDA receptors after activation by glutamate.

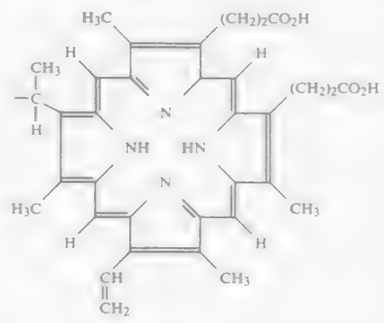
5,145,863

METHOD TO DESTROY OR IMPAIR TARGET CELLS

Thomas J. Dougherty; William R. Potter, both of Grand Island, and Kenneth R. Weishaupt, Sloan, all of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Division of Ser. No. 352,774, May 16, 1989, Pat. No. 5,028,681, which is a continuation-in-part of Ser. No. 889,829, Jul. 24, 1986, Pat. No. 4,866,168, which is a continuation-in-part of Ser. No. 889,917, Jul. 24, 1986, abandoned, which is a division of Ser. No. 609,991, May 19, 1984, Pat. No. 4,649,151, which is a continuation-in-part of Ser. No. 481,345, Apr. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 424,647, Sep. 27, 1982, abandoned. This application Dec. 4, 1990, Ser. No. 624,410
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—410 **15 Claims**

1. A method to destroy or impair the function of target biological materials which comprises contacting said target materials with an effective amount of a biologically active composition, said composition being fluorescent, photosensitizing, and having the capability of localizing in and being retained in tumor tissue as compared to normal tissues which composition comprises conjugates containing two or more covalently-linked porphyrin molecules wherein at least one porphyrin has the formula



wherein the bond shown attaches said porphyrin to the conjugate

or the pharmaceutically acceptable salts thereof;

which conjugates form aggregates of >10 kd in aqueous environments but are sufficiently lipophilic so that said aggregates dissociate in tissue, said conjugates having triplet energy of >37.5 kcal/mol, being not readily oxidized, and not capable of physically quenching any required energy state.

5,145,864

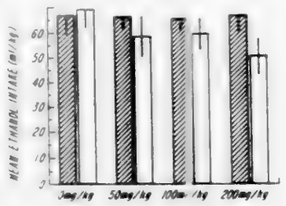
REDUCTION OF VOLUNTARY ALCOHOL CONSUMPTION BY TREATMENT WITH ANGIOTENSIN CONVERTING ENZYME INHIBITORS

Larry A. Grupp, Downsview; Edward Perlanski, Burlington, and Robert B. Stewart, Toronto, all of Canada, assignors to Alcoholism and Drug Addiction Research Foundation, Toronto, Canada

Filed Sep. 15, 1987, Ser. No. 96,951
Int. Cl.[5] A01N *43/36;* **A61K** *31/40*
U.S. Cl. 514—423 **5 Claims**

1. A method for the treatment of alcoholism comprising

administering to warm-blooded animals in need of such treatment a therapeutically effective amount of an angiotensin



converting enzyme inhibitor selected from the group consisting of captopril and enalapril.

5,145,865

PHENYLCARBOXYLIC ACID DERIVATIVES HAVING HETERO RING

Setsuro Fujii, deceased, late of Kyoto, Japan by Keiko Fujii, administrator; by Shinichiro Fujii administrator, Uji, Japan; by Kaoruko Takada, administrator, Ehime, Japan; Hiroyuki Kawamura, and Shinichi Watanabe, both of Otsu, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,344

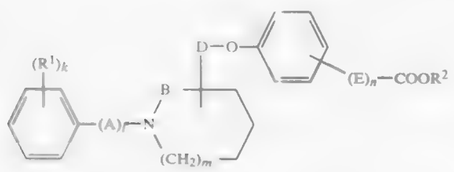
Claims priority, application Japan, Apr. 19, 1989, 1-10439; Feb. 9, 1990, 2-30839

Int. Cl.[5] **C07D** *207/26, 211/10;* **A61K** *31/40, 31/445*

U.S. Cl. 514—424 24 Claims

1. A compound having the following formula:

(I)



wherein

R^1 is a halogen atom, a C_1–C_6 alkyl group, a C_3–C_8 cycloalkyl group, a hydroxy group, a C_1–C_6 alkoxy group, a phenoxy group which has a substituent selected from a halogen atom and a C_1–C_6 alkyl group, a carboxyl group, a C_1–C_6 alkylsulfonyloxy group, a phenylsulfonyloxy group which may optionally be substituted by a halogen atom, a C_1–C_6 alkylsulfonyloxy(C_1–C_6) alkoxy group, an amino group, a C_2–C_6 alkanoylamino group, a benzoylamino group, a C_2–C_6 alkenyloxy group, a phenyl(C_1–C_6)alkoxy(C_1–C_6)alkoxy group, a hydroxy-substituted C_1–C_6 alkoxy group, a phenyl(C_1–C_6)alkoxy group which may optionally have one to three substituents selected from a halogen atom, a C_1–C_6 alkyl group and a C_1–C_6 alkoxy group on the phenyl ring, a halogen-substituted C_1–C_6 alkyl group, a C_3–C_8 cycloalkyloxy group which may optionally be substituted by a hydroxy group, a C_1–C_6 alkoxy group substituted by a C_3–C_8 cycloalkyl group having optionally a hydroxy substituent, an imidazolyl(C_1–C_6) alkyl group, or an imidazolyl(C_1–C_6)alkoxy group; k is 0 or an integer of 1 to 3; or $(R^1)_k$ may be a C_1–C_4 alkylenedioxy group;

A is a C_1–C_6 alkylene group or a C_1–C_6 alkylenoxy group; is 0 or 1;

B is a methylene group or a carbonyl group;

m is 0 or 1;

D is a C_1–C_6 alkylene group;

E is a C_1–6 alkylene group or a C_2–C_6 alkenylene group;

n is 0 or 1; and

R^2 is a hydrogen atom or a C_1–C_6 alkyl group; or a pharmaceutically acceptable salt thereof.

5,145,866

METHOD OF TREATING ANXIETY WITH THE AID OF R(+)-3-AMINO-1-HYDROXY-PYRROLIDIN-2-ONE

Robert W. Dunn, Warren, and Roy Corbett, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Filed Apr. 22, 1991, Ser. No. 688,232

Int. Cl.[5] **A61K** *31/40*

U.S. Cl. 514—425 2 Claims

1. A method of treating anxiety in a patient requiring said treatment which comprises administering to said patient an effective anxiety treating amount of R(+)-3-amino-1-hydroxy-pyrrolidin-2-one.

5,145,867

NAPHTHYLALKYLAMINO-SUBSTITUTED SULFAMOYLBENZOIC ACID DERIVATIVES, AND THE USE THEREOF AS MEDICINES

John C. Ellory, Oxford, United Kingdom; Heinrich C. Englert; Hans-Jochen Lang, both of Hofheim am Taunus, Fed. Rep. of Germany; Dieter Mania, Königstein, and Wulf Merkel, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

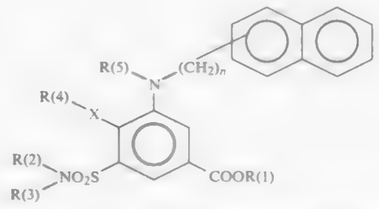
Filed Apr. 6, 1990, Ser. No. 505,466

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911549

Int. Cl.[5] **A61K** *31/38, 31/235;* **C07D** *333/34;* **C07C** *323/22*

U.S. Cl. 514—445 4 Claims

1. A compound I



in which the following substituents have the following meaning:

R(1) is hydrogen, (C_1–C_4)-alkyl, Na, K, NH_4, Ca or Mg,

R(2) and R(3) are hydrogen, or identical or different (C_1–C_4)-alkyl groups,

X is oxygen or a bond,

R(4) is phenyl or thienyl

R(5) is hydrogen or (C_1–C_4)-alkyl, and

n is 1, 2, 3 or 4,

where X and R(4) together can also be Cl.

5,145,868

ALKANOPHENONES USEFUL FOR TREATING ALLERGIES

Andreas von Sprecher, Oberwil, Switzerland, and Andreas Beck, Freiburg, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 583,783, Sep. 14, 1990, abandoned. This application Nov. 15, 1991, Ser. No. 794,608

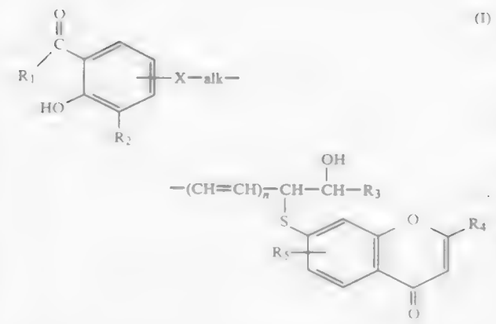
Claims priority, application Switzerland, Sep. 19, 1989, 3401/89

Int. Cl.[5] **A61K** *31/35, 31/41;* **C07D** *311/24, 257/04*

U.S. Cl. 514—456 20 Claims

1. A substituted alkanophenone of the general formula

(I)



in which R_1 is unsubstituted or fluorinated lower alkyl; R_2 is hydrogen, unsubstituted or fluorinated lower alkyl, or lower alkenyl; n is 1 or 2; X is lower alkylene, oxy, thio or a direct bond; alk is lower alkylene; R_3 is a 5-membered heteroaryl radical that contains 1N, O or S atom as hetero atom and said heteroaryl is unsubstituted or is substituted by at least one of unsubstituted lower alkyl, fluorinated lower alkyl, lower alkoxy, halogen, unsubstituted amino, lower alkylated amino, and by free carboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, and N,N-di-lower alkylcarbamoyl; or R_3 is said 5-membered heteroaryl radical substituted by N-(benzenesulfonyl)-carbamoyl that is unsubstituted or is substituted by at least one of lower alkyl, lower alkoxy, and halogen; R_4 is free carboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, or 5-tetrazolyl; or R_4 is N-(benzenesulfonyl)-carbamoyl that is unsubstituted or is substituted in the phenyl moiety by at least one of lower alkyl, lower alkoxy, halogen and trifluoromethyl; and R_5 is hydrogen or lower alkyl; or a salt thereof.

20. A method of treating an allergic disease in an animal in need thereof which comprises administering a therapeutically effective amount of a compound according to claim 1.

5,145,869

PHENYLSULFONYLALKANOIC ACID COMPOUNDS AND PHARMACEUTICALS THEREOF

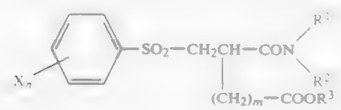
Makio Kitazawa; Masuo Akahane, both of Matsumoto; Yasushi Nakano, Shiojiri; Atsushi Tsubaki, Matsumoto; Kazuaki Sato, Matsumoto; Masaaki Ban, Matsumoto, and Michihiro Kobayashi, Akashina, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Japan

Filed Apr. 11, 1991, Ser. No. 683,247

Int. Cl.[5] **A61K** *31/215;* **C07C** *317/14, 321/28*

U.S. Cl. 514—510 10 Claims

1. A compound represented by the formula:



wherein R^1 represents an alkyl group having 1 to 10 carbon atoms, an alkoxyalkyl group having 3 to 7 carbon atoms or an aralkyl group having 7 to 12 carbon atoms; R^2 represents an alkyl group having 1 to 10 carbon atoms or an aralkyl group having 7 to 12 carbon atoms; R^3 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; X represents a halogen atom, an alkyl group having 1 to 3 carbon atoms, a nitro group or an acetyl group; m is an integer of from 1 to 3; n is 1 or 2; and pharmaceutically acceptable salts thereof.

5,145,870

ARYLOXYPHENYLPROPYLAMINES THEIR PREPARATION AND USE

Palle Jakobsen, and Jorgen Drejer, both of Vaerlose, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed May 24, 1990, Ser. No. 529,004

Claims priority, application Denmark, May 26, 1989, 2583/89

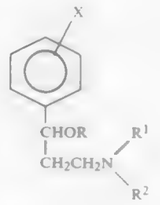
The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.[5] **A61K** *31/135, 31/275, 31/34*

U.S. Cl. 514—524 5 Claims

1. A method of treating calcium overload in brain cells of mammals comprising administering an effective amount of a compound of formula I

(I)



wherein

X is H, cyano, halogen, C_{1-6}-alkoxy, C_{1-6}alkyl or C_{3-5}-alkylidene;

R is 3,4-methylenedioxyphenyl and phenyl which are optionally substituted with cyano, halogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{2-6}-alkenyl, trifluoromethyl or C_{3-5}-alkylidene; and

R^1 and R^2 independently are C_{1-10}-alkyl, C_{3-7}-cycloalkyl, C_{2-10}-alkenyl or C_{3-6}-cycloalkyl-C_{1-5}-alkyl which are optionally substituted with C_{1-5}-alkoxy or cyano;

provided that R^1 is not C_{3-7}-cycloalkyl, C_{1-10}-alkyl or C_{2-10}-alkenyl which are optionally substituted with C_{1-4}-alkoxy, when X is H and R^2 is a methyl group; or a pharmaceutically acceptable salt thereof.

5,145,871

USE OF ACETYL D-CARNITINE IN THE THERAPEUTIC TREATMENT OF GLAUCOMA, AND PHARMACEUTICAL COMPOSITIONS USEFUL IN SUCH TREATMENT

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Nov. 28, 1989, Ser. No. 442,702

Claims priority, application Italy, Dec. 1, 1988, 48614 A/88

Int. Cl.[5] **A61K** *31/22*

U.S. Cl. 514—546 6 Claims

1. A method of treating glaucoma which comprises administering a pharmaceutically effective amount of acetyl D-carnitine or pharmacologically acceptable salts and a pharmacologically acceptable carrier to one in need of treatment.

5,145,872

PEPTIDES WITH PHARMACEUTICAL ACTIVITY

Dario Chiarino, Monza; Angelo Carenzi, Busto Arsizio; Davide Della Bella, Milan, and Franco Pellacini, Sesto S. Giovanni, all of Italy, assignors to Zambon Group, S.p.A., Vicenza, Italy

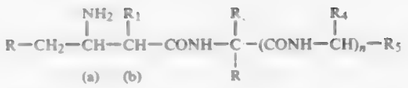
Filed Mar. 15, 1989, Ser. No. 323,814

Claims priority, application Italy, Mar. 16, 1988, 19791 A/88

Int. Cl.[5] **C07C** *233/25*

U.S. Cl. 514—620 9 Claims

1. A compound of formula I



wherein:

R represents phenyl optionally substituted by a substituent selected from the group consisting of hydroxy, chlorine, bromine, fluorine, methoxy, ethoxy, ethyl, methyl, isopropyl, isobutyl, isopropoxy, isobutoxy, amino, nitro, phenyl, mercapto, methylthio, methylsulfinyl and methylsulfonyl;

R_1 represents hydroxy;

R_2 represents methyl, ethyl, propyl, isopropyl, butyl, isobutyl, or sec.butyl;

R_3 represents methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec.butyl, hydroxymethyl, hydroxyethyl, mercaptomethyl, or methylthioethyl or

R_2 and R_3, together with the carbon atom to which they are bonded, are a cyclopropylidene, cyclobutylidene, cyclopentylidene, or cyclohexylidene;

R_4 represents hydrogen or a linear or branched C_1–C_6 alkyl optionally substituted by hydroxy, mercapto, C_1–C_3 alkythio, amino, carboxy or ureido;

n is 0;

R_5 represents carboxy; and the carbon atoms marked by (a) and (b) are in R or S configuration.

5,145,873

SPECIFICALLY SUBSTITUTED CYCLOPROPANECARBOXAMIDES AND THEIR USE FOR CONTROLLING PESTS

Uwe Kardorff, Mannheim; Hans-Juergen Neubauer, Muenster-Hiltrup; Joachim Leyendecker, Ladenburg; Christoph Kuenast, Otterstadt; Peter Hofmeister, Neustadt; Wolfgang Krieg, Weingarten, and Rainer Buerstinghaus, Telgte, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 14, 1989, Ser. No. 435,670

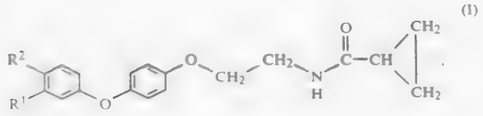
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841433

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/16; 5;* **C07C** *233/60*

U.S. Cl. 514—624 **10 Claims**

1. A substituted cyclopropanecarboxamide of the formula I



where R^1 is fluorine, chlorine, bromine and C_1–C_3-haloalkyl, R^2 is hydrogen, fluorine, chlorine or bromine, with the proviso that R^1 is not fluorine if R^2 is H

4. An insecticidal, miticidal and nematodicidal composition comprising an effective amount of a cyclopropanecarboxamide of the formula I as set forth in claim 1 and solid or liquid carriers.

5,145,874

CYCLIC HYDROCARBONS WITH AN AMINOALKYL SIDECHAIN

Roy A. Johnson, Kalamazoo; Gordon L. Bundy, Portage; Gilbert A. Youngdale, Portage; Douglas R. Morton, Portage; Donald P. Wallach, deceased, late of Kalamazoo, and by Vera M. Wallach, legal representative, Richland, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

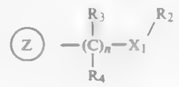
Continuation of Ser. No. 394,396, Aug. 15, 1989, abandoned, which is a division of Ser. No. 117,851, Jun. 16, 1987, Pat. No. 4,917,826, which is a continuation-in-part of Ser. No. 843,120, Mar. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,995, Oct. 18, 1985, abandoned. This application Feb. 25, 1991, Ser. No. 663,037

Int. Cl.[5] A61K *31/16, 31/165, 31/13, 31/135;* **C07C** *211/13, 211/21*

U.S. Cl. 514—650 **8 Claims**

1. A compound of the formula

Formula I



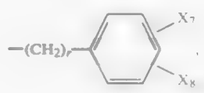
I. wherein Z is C8–C20 cycloalkyl, 2- or 4-cyclohexylcyclohexyl, 4-bicyclohexylcyclohexyl, 4-bicyclohexenylcyclohexyl, 3-cyclopentylcyclopentyl, 1-, 3- or 4-(2-decahydronaphthyl)cyclohexyl, 1- or 2-tetradecahydroanthracenyl, 2- or 3-tetradecahydrophenanthrenyl, 1- or 2-dodecahydro-1H-phenallyl, 1- or 2 hexadecahydropyrenyl, 1- or 2-octadecahydrotriphenylenyl, 1- or 2-octadecahydrochrysenyl, 1- or 2-octadecahydronaphthacenyl, phenylcyclohexyl, adamantyl, pyrenyl, or 3-fluorobiphenylyl[, or 1- or 2- decalinyl];

II. wherein X_1 is O, NR_1, $[NR_1R_{13},]$ $[N^+.R_1.R_1.R_{13}X^-,]$ or —O—C(O)—CH((CH$_2$)$_3$—NH$_2$)(NH$_2$);

A. wherein X^- is a pharmaceutically acceptable anion;

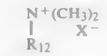
[B. wherein R_{13} is methyl, or →O;]

C. wherein R_1 is H, CHO, —COCH$_3$, C1–C6 alkyl, —(CH$_2$)$_r$—CO$_2$R$_4$, —CH$_2$CH=CH$_2$, —(CH$_2$)$_p$—X$_4$, —(CH$_2$)$_m$—N(R$_6$)(R$_7$), —(CH$_2$)$_p$—O—(CH$_2$)$_p$—N(R$_6$)(R$_7$), —(CH$_2$)$_p$—Y—C(=NH)—NH$_2$, —(CH$_2$)$_q$—CH(NH$_2$)—COOR$_{16}$, —(CH$_2$)$_p$—N=(R$_{14}$)(R$_{15}$), —(CH$_2$)$_p$—NH—C(CH$_3$)$_2$—CH$_2$—C(O)—CH$_3$,



III. wherein R_4 is H, or C1–C2 alkyl;

A. wherein X_4 is OH, OCH$_3$, OC$_2$H$_5$, OCH$_2$CH$_2$OH, OTs, OMs, Cl, Br, N, or

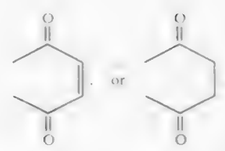


1. wherein R_{12} is C1–C2 alkyl, benzyl, CH$_2$Cl, →O, CH$_2$COOC$_2$H$_5$, or C3–C18 straight chain alkyl;

B. wherein R_6 is H, C1–C13 alkyl, benzyl, phenyl, C(O)CH$_3$, —(CH$_2$)$_3$OH, OH, —C(O)—O—C$_2$H$_5$, C(O)CH(OCH3)CH$_2$C(O)—OCH$_3$, C(O)CH$_2$CH(OCH$_3$)C(O)—OCH3, 2,5-dioxo-1H-pyrrole-1-acetyl, (CH$_2$)$_3$—O—(CH$_2$)$_3$—OH, or (CH$_2$)$_p$—N(R$_{10}$)(R$_{11}$);

1. wherein R_{10} and R_{11} are H, C1–C2 alkyl, (CH$_2$)$_3$—NH$_2$, or C(O)CH=CH—COOH;

2. wherein R_{10} and R_{11} together are



C. wherein R_7 is H, C1–C2 alkyl, —(CH$_2$)$_p$—N(R$_{10}$)(R$_{11}$), CHO, CO—(CH$_2$)$_2$—CO—NH—(CH$_2$)$_5$—NOH—CO—(CH$_2$)$_2$—CO—NH—(CH$_2$)$_5$—NOH—CO—CH$_3$, 5-fluoro-2,4-dinitrophenyl, or 2,4-dinitrophenyl;

E. wherein Y is NH, or S;

F. wherein R_8 is H, C1–C2 alkyl, OCH$_3$, NO$_2$, NH$_2$, NHCOCH$_3$, CN, CH$_2$NH$_2$, CONH$_2$, Cl, Br, or COOCH$_3$;

G. wherein R_9 is H, methyl, benzyl, or —(CH$_2$)$_p$N(R$_{10}$)(R$_{11}$);

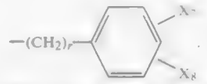
H. wherein R_{14} is H, or C1–C6 alkyl;

I. wherein R_{15} is C1–C6 alkyl;

J. wherein R_{16} is H, or C1–C4 alkyl;

K. wherein X_7 and X_8 are the same or different and are H, CH$_3$, CF$_3$, halogen, OH, OCH$_3$, NO$_2$, NH$_2$, NHR$_4$, NR$_4$R$_4$, —CH$_2$NH$_2$, —CH$_2$NHR$_2$, —SO$_2$N(R$_3$)(R$_4$), —CO$_2$R$_4$, CON(R$_3$)(R$_4$), or CH$_2$N(R$_3$)(R$_4$),

IV. wherein R_2 is H, C1–C4 alkyl, benzyl, —(CH$_2$)$_p$—N(R$_6$)(R$_7$),



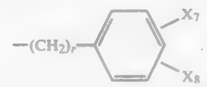
—(CH$_2$)$_p$—N(→O)(R$_6$)(R$_7$), —(CH$_2$)$_p$N$^+$(CH$_2$—Ph)(R$_6$)(R$_7$), —(CH$_2$)$_p$N$^+$(CH$_3$)(R$_6$)(R$_7$), (CH$_2$)$_3$—O—C$_2$H$_5$, (CH)$_2$—O—(CH$_2$)$_2$OH, CH(CH$_3$)—(CH$_2$)$_3$—N—(C$_2$H$_5$)$_2$, or C(O)CH((CH$_2$)3NH$_2$)NH$_2$;

V. wherein R_3 is H, C1–C2 alkyl, or CH$_2$OH; wherein m is 1–10; wherein n is 0–4; wherein p is 1–8; wherein q is 2–4; wherein r is 1–8; wherein s is 1–8; or

pharmacologically acceptable salts thereof;

with the proviso that when Z is adamantyl, n is 0, X_1 is NR_1 and R_1 is H, C1–C6 alkyl, —CHO, CHO, —CH$_2$CH=CH$_2$, —(CH$_2$)$_m$—(R$_6$)(R$_7$) wherein R_6 and R_7 are C1–C4 alkyl or —(CH$_2$)$_p$—X$_4$ wherein p is 2–4 and X_4 is N, OH, OCH$_3$, OC$_2$H$_5$ or OCH$_2$CH$_2$OH, then R_2 cannot be H or C1–C4 alkyl;

with the proviso that when Z is C8–C12 cycloalkyl, n is 0, X_1 is NR_1 wherein R_1 is H, C1–C6 alkyl, CH$_2$CH=CH$_2$, —CHO, —COCH$_3$, —(CH$_2$)$_p$—X$_4$ wherein X_4 is OH, (CH$_2$)$_m$—N(R$_6$)(R$_7$) wherein R_6 and R_7 are H or CH$_3$,



wherein X_7 and X_8 are H or —(CH$_2$)$_p$—Y—C(=N-H)—NH$_2$, then R_2 cannot be H or C1–C4 alkyl;

with the proviso that when Z is C12 cycloalkyl, n is 0, X_1 is NR_1 and R_1 is CH$_3$ or —(CH$_2$)$_3$—N(R$_6$)(R$_7$) wherein R_6 and R_7 are C2 alkyl, then R_2 cannot be H; with the proviso that when Z is C12 cycloalkyl, n is 0, X_1 is NR_1R_{13} wherein R_1 and R_{13} are CH$_3$, then R_2 cannot be CH$_3$; and

with the proviso that when Z is phenylcyclohexyl, n is 0, X_1 is NR_1 wherein either of R_1 or R_2 is —(CH$_2$)$_3$N(CH$_3$)$_2$, then the other cannot be H;

and with the proviso that the compound is not cis-N'-[1,1'-bicyclohexyl]-2-yl-N,N-dimethyl-1,3-propanediamine(2 1) butanedioic acid.

5,145,875

GLYCEROXYFUNCTIONAL SILANES AND SILOXANES

Andrew H. Ward, Sanford; Stefan F. Rentsch, Midland, both of Mich., and Alfred J. DiSapio, Greenwich, Conn., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 489,117, Mar. 5, 1990, Pat. No. 5,043,359. This application Apr. 8, 1991, Ser. No. 681,584

Int. Cl.[5] A61K *47/00*

U.S. Cl. 514—772 **4 Claims**

1. A method of delivering a humectant to skin comprising applying to the skin a reaction product of a humectant and an organosilicon compound, the reaction product having a formula selected from the group consisting of

$$R_zSi(Q)_{4-z} \quad \text{and} \quad R_3SiO(R_2SiO)_y(RSiO)_zSiR_3$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad Q$$

wherein R is an alkyl radical of one to six carbon atoms or phenyl; Q is the glyceroxy radical —OCH$_2$CH(OH)CH$_2$OH; x has a value of zero to three; y has a value of zero to about one thousand; and z has a value of one to about twenty.

5,145,876

CATALYST FOR USE IN A FISCHER-TROPSCH PROCESS

Eric Shutt, Benson, United Kingdom, assignor to Johnson Matthey Public Limited Company, United Kingdom

Division of Ser. No. 683,573, Apr. 10, 1991, Pat. No. 5,070,063, which is a continuation of Ser. No. 361,372, Jun. 5, 1989, abandoned. This application Sep. 4, 1991, Ser. No. 754,593

Claims priority, application United Kingdom, Jun. 15, 1989, 8814229

Int. Cl.[5] C07C *1/04*

U.S. Cl. 518—715 **12 Claims**

1. In a Fischer-Tropsch synthesis process for making hydrocarbons which comprises reacting hydrogen and carbon monoxide in the presence of a catalyst having a first component of ruthenium supported on a second component which is a high surface area catalyst support, the improvement comprising the presence in the catalyst of a third and promoting component of bromine moieties and of the first component being in the form of metallic ruthenium.

5,145,877

POLYPHENYLENE OXIDE-RECYCLED POLYSTYRENE COMPOSITION AND METHOD

Richard C. Bopp, West Coxsackie, and Daniel L. Roberts, Albany, both of N.Y., assignors to General Electric Co., Selkirk, N.Y.

Division of Ser. No. 478,099, Feb. 12, 1990. This application Dec. 27, 1990, Ser. No. 634,236

Int. Cl.[5] C08J *11/04*

U.S. Cl. 521—40 **14 Claims**

1. A foamable polymer composition which comprises a melt-compounded product of (a) a polyphenylene oxide polymer; and (b) a recycled polystyrene material, wherein the recycled polystyrene material comprises bromine-modified polystyrene foam which exhibits a melt flow index greater than about 25 when devolatized by heating above its glass transition temperature; said composition further including (c) a blowing agent.

5,145,878

DRYING OF FINELY DIVIDED, EXPANDABLE STYRENE POLYMERS

Klaus Hahn, 9 Im Buegen, 6719 Kirchheim, and Matthias Dietrich, 1 Duerrestrasse, 6940 Weinheim, both of Fed. Rep. of Germany

Filed Feb. 10, 1992, Ser. No. 833,179
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1991, 4104418
Int. Cl.[5] C08J 9/22, 9/224
U.S. Cl. 521—60 6 Claims

1. A process for the drying of a finely divided, expandable styrene polymer having a particle size of from 0.02 to 0.3 mm, in which the bead polymer, in the form of a slurry in water, is freed from the majority of the water and dried with the aid of a gaseous medium, which comprises jointly conveying the bead polymer and a first gas stream, warmed to from about 45° to 120° C., through a flow dryer, the ratio between the gas and the bead polymer being from 2 to 40 kg/kg, separating the bead polymer from the first gas stream, immediately transferring the bead polymer into a fluidized bed, and, with the aid of a second gas stream, cooling the polymer to from about 0° to 75° C. and drying the polymer.

5,145,879

SURFACTANTS FOR MANUFACTURE OF URETHANE FOAMS

Richard A. Budnik, Mount Kisco N.Y.; Charles H. Blevins, II, San Jose, Calif.; Gerald J. Murphy, Wappingers Falls, N.Y.; Wojciech Grabowski, Versoix, Switzerland, and Raymond L. Cobb, Buda, Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 31, 1990, Ser. No. 636,638
Int. Cl.[5] C08G 18/00
U.S. Cl. 521—112 13 Claims

1. A composition of matter having the generalized average formula

$$M^*D_xD''_yM^*$$

wherein
M^* represents $(CH_3)_3SiO_{1/2}$ or $R(CH_3)_2SiO_{1/2}$;
D represents $(CH_3)_2SiO_{2/2}$;
D″represents $(CH_3)(R)SiO_{2/2}$
x is 40–80;
y is 5–20; and
in the above formulae for M^* and D″,
R is a polyether-containing substituent derived from a C_nH_{2n}—1-started polyether and is selected from the group consisting of:
(1) $—C_nH_{2n}O(C_2H_4O)_a(C_3H_6O)_bR''$ moieties having average atomic masses in the range 1500–6000, and wherein
n is 3–4;
a is a number such that ethylene oxide residues constitute 30–50% by weight of the alkylene oxide residues of the polyether;
b is a number such that propylene oxide residues constitute 70–50% by weight of the alkylene oxide residues of the polyether;
R″ represents H, an alkyl group of 1–4 carbon atoms, or $—C(O)CH_3$; and
(2) $—C_{n'}H_{2n'}O(C_2H_4O)_{a'}(C_3H_6O)_{b'}R''$ moieties having average atomic masses in the range 300–750, and wherein
n′ is 3–4;
a′ is 0 to a number such that ethylene oxide residues constitute 100% by weight of the alkylene oxide residues of the polyether; and
b′ is 0 to a number such that propylene oxide residues constitute 100% by weight of the alkylene oxide residues of the polyether;
with the proviso that at least one of a′ and b′ must be finite; and
R″ is as defined above; and
with the further provisos that the composition $M^*D_xD''_yM^*$ contains polyether-containing substituents R having average atomic masses in the range 1500–6000 and polyether-containing substituents R having average atomic masses in the range 300–750, and that
the overall average atomic mass of the C_nH_{2n-1}-started polyethers from which the polyether-containing substituents R in the composition $M^*D_xD''_yM^*$ are derived is in the range 1000–1800.

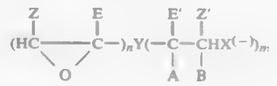
5,145,880

LIQUID, REACTIVE COMPOSITIONS ENDOWED WITH HIGH POLYMERIZATION SPEED, CONTAINING POLYISOCYANATES AND COMPOUNDS WITH ONE OR MORE EPOXY GROUPS

Fabrizio Parodi, Genoa, and Carlo Belgiovine, Quiliano, both of Italy, assignors to Enichem S.p.A., Milan, Italy

Filed Apr. 12, 1991, Ser. No. 685,455
Claims priority, application Italy, Apr. 24, 1990, 20125 A/90
Int. Cl.[5] C08G 18/14
U.S. Cl. 521—115 15 Claims

1. Liquid composition, rapidly polymerizable by starting at a temperature lower than 60° C., comprising:
(A) at least one organic polyisocyanate;
(B) at least one organic compound containing at least one epoxy group and constituted by a monoepoxide or a polyepoxide or a mixture of different mono- and/or polyepoxides, or by an epoxy-group(s) containing compound selected from among the catalyst compounds (C);
(C) at least one catalyst which is liquid at temperatures lower than 60° C. and is comprised of at least one compound containing epoxy groups and quaternary ammonium halide groups and falling within the scope of the general formula



in which:
A and B which are different from each other, are —OH or an $(+)NR_1R_2R_3$ group;
n is either equal to, or higher than, 1;
m is either equal to, or higher than, 1;
Y is a divalent organic radical deriving from aliphatic, cycloaliphatic, aromatic, heterocyclic, or mixed, compounds, which radical can optionally contain heteroatoms not belonging to cyclic structures and/or functional or bonding groups containing, or not containing, heteroatoms;
E and E′ which can be either equal to, or different from, each other, are hydrogen or aliphatic or cycloaliphatic radicals;
Z and Z′ which can be either equal to, or different from, each other, can be hydrogen, or organic radicals selected from among monovalent organic radicals as listed for Y, or can constitute a simple chemical bond with this same Y radical;
R_1, R_2 and R_3 which can be either equal to, or different from, one another, are organic radicals selected from among monovalent organic radical as listed for Y; and R_2 and R_3 can also constitute a heterocyclic structure including the quaternary nitrogen atom;
$X^{(-)}$ is the anion of a halogen selected from among chlorine, bromine or iodine.

5,145,881

CATALYST SYSTEMS USEFUL FOR FORMING ISOCYANURATE, AMIDE AND/OR OXAZOLIDINONE GROUPS AND A METHOD FOR THEIR USE

Shenghong A. Dai, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1992, Ser. No. 816,914
Int. Cl.[5] C08G 18/14
U.S. Cl. 521—129 20 Claims

1. A catalyst system comprising:
(A) an N,N′,N″-tris(N,N-dialkylaminoalkyl)-s-triazine component; and
(B) a monocarboxylic acid component; wherein the monocarboxylic acid component is a monocarboxylic acid or a mixture of monocarboxylic acids having from 4 to 18 carbons, and the molar ratio of the monocarboxylic acid component to the N,N′,N″-tris(N,N-dialkylaminoalkyl)-s-triazine component is from about 2:1 to about 25:1.

5,145,881

Patent Not Issued For This Number

5,145,882

PROCESS FOR THE PREPARATION OF LOW-DENSITY FLEXIBLE POLYURETHANE FOAMS

Reinhard Samaritter, Leverkusen; Peter Gansen, and Klaus Seel, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 463,715, Jan. 11, 1990, abandoned. This application May 28, 1991, Ser. No. 705,850
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1989, 3901189
Int. Cl.[5] C08G 18/06; C08J 9/00
U.S. Cl. 521—155 12 Claims

1. A process for the preparation of a low-density flexible polyurethane foam comprising reacting, in a closed mold, a mixture comprising
(a) a polyisocyanate;
(b) a compound containing at least two isocyanate-reactive hydrogen atoms and having a molecular weight in the range from about 400 to about 10,000;
(c) water as blowing agent;
(d) optionally, a compound containing at least two isocyanate-reactive hydrogen atoms and having a molecular weight in the range from 32 to 399 as chain-extending and crosslinking agents; and
(e) optionally, one or more known auxiliaries and additives;
wherein one or more of the components of the mixture are heated before foaming to a temperature of at least 40° C.

5,145,883

METHODS FOR PRODUCING POLYETHER ESTER POLYOLS AND POLYURETHANES

Joichi Saito; Sigeyuki Kozawa; Nobuaki Kunii; Hirotsugu Yamamoto, all of Yokohama, and Hiromitsu Takeyasu, Tokyo, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 3, 1991, Ser. No. 635,499
Claims priority, application Japan, May 12, 1989, 1-117513; PCT Int'l Appl., May 2, 1990, PCT/JP90/00579
Int. Cl.[5] C08G 18/14
U.S. Cl. 521—172 10 Claims

1. A method for producing a polyether ester polyol, characterized by reacting a polyether polyol having a hydroxyl value of at most 400, a polycarboxylic anhydride and a monoepoxide by means of a double metal cyanide complex as a catalyst.

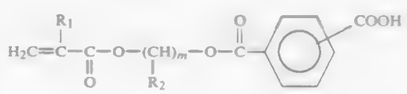
5,145,884

ULTRAVIOLET-HARDENABLE ADHESIVE

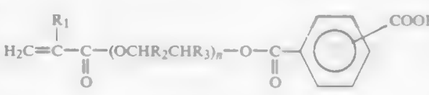
Yasuyoshi Yamamoto, Komaki; Yuzo Kaga; Toshiharu Yoshikawa, both of Nagoya, and Akira Moribe, Inazawa, all of Japan, assignors to Menicon Co., Ltd., Aichi, Japan

Division of Ser. No. 426,203, Oct. 25, 1989, Pat. No. 5,007,975. This application Aug. 16, 1990, Ser. No. 568,020
Int. Cl.[5] C08F 18/02
U.S. Cl. 522—14 6 Claims

1. An ultraviolet-hardenable adhesive used for bonding a non-water swellable, ophthalmic-lens blank to a support member, in producing a non-water swellable ophthalmic lens, the adhesive consisting essentially of:
at least one photopolymerizing monomer;
at least one separation-promoting monomer for promoting separation of the bonded lens and support member from each other; and
at least one photoinitiator;
said at least one photopolymerizing monomer being selected from the group consisting of acrylates or methacrylates represented by following general formulas (I) and (II):

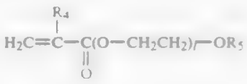


(I)



(II)

wherein
R_1 is hydrogen or methyl,
R_2 is hydrogen or methyl,
R_3 is hydrogen or methyl,
m is a positive integer from 2 to 10, and
n is a positive integer from 1 to 5;
said at least one separation-promoting monomer being selected from the group consisting of ethylenically unsaturated compounds represented by a following general formula (III):



(III)

wherein
R_4 is hydrogen or methyl,
R_5 is hydrogen or methyl, and
l is a positive integer from 4 to 20;
the adhesive containing 40 to 80 parts by weight of said at least one photopolymerizing monomer and 60 to 20 parts by weight of said at least one separation-promoting monomer, per 100 parts by weight of the sum of said at least one photopolymerizing monomer and said at least one separation-promoting monomer; and
the adhesive containing 0.1 to 4 parts by weight of said at least one photoinitiator per 100 parts by weight of the sum of said at least one photopolymerizing monomer and said at least one separation promoting monomer.

5,145,885

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING AMINOARYL KETONE PHOTOINITIATORS

Godwin Berner, Rheinfelden; Kurt Meier, Allschwil; Kurt Dietliker, and Rinaldo Hüsler, both of Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 207,036, Jun. 14, 1988, Pat. No. 4,992,547, which is a continuation of Ser. No. 802,899, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 638,933, Aug. 9, 1984, abandoned. This application Nov. 13, 1990, Ser. No. 612,782

Claims priority, application Switzerland, Aug. 15, 1983, 4430/83; Aug. 29, 1983, 4722/83

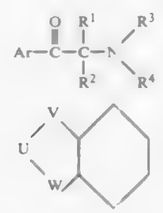
Int. Cl.[5] C08F 2/50, 226/00, 283/01

U.S. Cl. 522—39 7 Claims

1. A photopolymerizable composition which comprises

(a) at least one ethylenically unsaturated photopolymerizable compound, and

(b) an effective photoinitiating amount of a compound of formula I



I

in which

Ar is phenyl substituted in the 4-position by di(C_1–C_4-alkyl-)amino or morpholino,

R^1 and R^2 are independently C_1–C_4-alkyl, and

R^3 and R^4 are each C_1–C_4-alkyl or 2-methoxyethyl, or

R^3 and R^4 together with the N-atom to which they are attached are morpholino.

5,145,886

RADIATION ACTIVATED HYDROSILATION REACTION

Joel D. Oxman, St. Louis Park, and Larry D. Boardman, Shoreview, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 354,629, May 19, 1988, abandoned. This application Oct. 22, 1990, Ser. No. 602,411

Int. Cl.[5] C08F 2/50, 4/80; G08G 77/06, 77/12

U.S. Cl. 522—66 6 Claims

1. A hydrosilation process which comprises reacting a composition comprising a compound having aliphatic unsaturation and a compound containing at least one silicon-bonded hydrogen atom and not having more than three hydrogen atoms attached to any one silicon atom in the presence of a platinum (II) β-diketonate complex catalyst, wherein said reaction is carried out by means of exposing said composition to actinic radiation having a wavelength of about 200 nm to about 800 nm.

5,145,887

HIGH SURFACE AREA MAGNESIA AS HARDENER FOR PHENOLIC RESINS

John G. Taylor, and Arthur H. Gerber, both of Louisville, Ky., assignors to Borden, Inc., Columbus, Ohio

Filed Apr. 4, 1991, Ser. No. 680,568

Int. Cl.[5] B22C 1/22

U.S. Cl. 523—145 18 Claims

1. A raw batch composition comprising a mixture of:

A. an aggregate;

B. a curable phenol-formaldehyde resole resin having about 15% to 25% by weight of free phenol, a formaldehyde to phenol molar ratio of from about 1 to 1.5 moles of formaldehyde bound with each mole of phenol, a pH of about 4.5 to 9, a solids content of about 40% to 80% and a viscosity of about 150 to 1,500 cps at 25° C., the quantity of said resin being sufficient on hardening at room temperature to bind the composition;

c. from about 15% to 45%, by weight of the resin, of light-burned magnesium oxide hardener having a surface area of at least 20 square meters per gram; and

D. from about 5% to 40% by weight, based on the weight of the resin, of an ester functional hardening agent selected from the group consisting of a carboxylic acid ester, a lactone, a cyclic organic carbonate, and mixtures thereof.

5,145,888

NON ASBESTOS ION-POLYER COMPOSITE FRICTION MATERIALS

Ke-Cheng Gong; Yang-Meng Ou, both of Guang Ming Science & Technology, Guang Dong Co., Guangzhou, China, and Gregory S. Yeh, 2824 Indian Trail, Pinckney, Mich. 48169

Filed Oct. 26, 1989, Ser. No. 427,144

Int. Cl.[5] C08J 5/14

U.S. Cl. 523—156 22 Claims

1. A non-asbestos ion-polymer composite friction material comprising a polyacrylonitrile (PAN) fiber and an ion-polymer binder matrix polymerized together with a divalent metal compound.

5,145,889

ACID ANHYDRIDE-CURED EPOXY RESIN ENCAPSULANT WITH TRIORGANOTHIOPHOSPHITE

Yusuke Wada, Tokyo, and Michiya Higashi, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 28, 1989, Ser. No. 442,551

Claims priority, application Japan, Dec. 23, 1988, 63-323391

Int. Cl.[5] C08K 5/49, 5/50

U.S. Cl. 523—451 5 Claims

1. An encapsulating epoxy resin composition consisting essentially of:

100 parts by weight of an epoxy resin;

70 to 140 parts by weight of a curing agent including an acid anhydride;

0.5 to 4.0 parts by weight of a curing accelerator including an onium or diazabicycloalkene salt;

0.5 to 5.0 parts by weight of a phosphorus triphosphite; and

0.5 to 5.0 parts by weight of a silane coupling agent represented by one of the following formulas:

$$HS—R—Si(R_l^5R_m^6R_n^7)$$

or

$$(HS—R)_3SiR^5$$

wherein R represents an alkylene group, an alkyleneoxy group, a phenylene group, a phenyleneoxy group, a benzylidene group, or a benzylene group; each of R^5, R^6, and R^7 independently represents an alkyl group, an alkoxy group, a phenyl group, a phenoxy group or a benzyl group; and each of l, m, and n independently represents an integer of 0 to 3, provided that l+m+n=3.

5,145,890

METHOD FOR REDUCING THE CARBOXYLESTER CONTENT OF AN EMULSION POLYMER

Clay B. Frederick, Dresher, and John R. Udinsky, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 30, 1991, Ser. No. 753,293

Int. Cl.[5] C08L 89/00

U.S. Cl. 524—21 24 Claims

1. A method for reducing the organic carboxylester content of an aqueous emulsion-polymerized addition polymer comprising contacting said emulsion-polymerized addition polymer with an amount of a carboxylesterase effective to reduce said organic carboxylester content.

5,145,891

POLYPROPYLENE RESIN COMPOSITION

Yoshiaki Yasukawa; Hiroyoshi Asakuno, both of Ichiharashi; Kinya Mori, Chibashi, and Kenji Iwai, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 939,744, Dec. 9, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 236,853

Claims priority, application Japan, Dec. 19, 1985, 286532; Dec. 19, 1985, 286533

Int. Cl.[5] C08K 3/34

U.S. Cl. 524—34 5 Claims

1. A polypropylene resin composition consisting essentially of a blend of

(i) a modified propylene-ethylene block copolymer, obtained by modifying the specified P-E block copolymer having a 3–16% by weight of ethylene content based on the entire block copolymer, with an unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, itaconic acid, fumaric acid, citraconic acid, or an unsaturated carboxylic acid derivative selected from the group consisting of an ester of foregoing acids, maleic anhydride, citraconic anhydride and itaconic anhydride, said specified P-E block copolymer being obtained by polymerizing in a first polymerization stage to give 70–95% by weight of propylene homopolymer and having the relation between isotactic pentad ratio (P) and melt flow rate (MFR) of $1.00 \geqq P \geqq 0.015 \log MFR + 0.955$, and then further polymerizing in at least one subsequent stage to obtain 30–5% by weight of propylene-ethylene copolymer(based on the entire copolymer), and

(ii) 20–50% by weight based on the resin composition of an organic fiber selected from the group consisting of aliphatic polyamide fibers, polyester fibers, polyvinyl alcohol fibers, polyimide fibers, polyvinylidene-chloride fibers polyacrylontrile fibers, polyurethane fibers, polyethylene fibers, alkylene paraoxybenzoate fibers phenol fibers, rayon fibers, acetate fibers, cotton fibers, flax fibers, ramie fibers, jute fibers, wool fibers, silk fibers, and a mixture of at least two of foregoing fibers, and

(iii) 5–50% by weight (based on the weight of the resin composition of an inorganic filler selected from the group consisting of talc, mica, wollastonite and a mixture of at least two of the foregoing members.

5,145,892

POLYPROPYLENE RESIN COMPOSITION

Yoshiaki Yasukawa; Hiroyoshi Asakuno, both of Ichiharashi; Kinya Mori, Chibashi, and Kenji Iwai, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 939,742, Dec. 9, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 237,139

Claims priority, application Japan, Dec. 19, 1985, 286531

Int. Cl.[5] C08K 3/34

U.S. Cl. 524—34 2 Claims

1. A resin composition consisting essentially of a blend of a propylene-ethylene block copolymer containing 3–20% by weight of ethylene, modified with an unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, itaconic acid, fumaric acid, and citraconic acid, or an unsaturated carboxylic acid derivative selected from the group consisting of esters of the foregoing acids, maleic anhydride, citraconic anhydride and itaconic anhydride, an 20–5-% by weight based on the total weight of the composition of an organic fiber selected from the group consisting of polyester fibers, cotton fibers and a mixture of these two fibers, and 5–30% by weight of an inorganic filler selected from the group consisting of talc, mica, wollastonite and a mixture of two or more of the foregoing members.

5,145,893

NON-MIGRATING 1-HYDROCARBYLOXY HINDERED AMINE DERIVATIVES AS POLYMER STABILIZERS

James P. Galbo, Hartsdale; Ramanathan Ravichandran, Nanuet, both of N.Y.; Peter J. Schirmann, Fairfield, and Andrew Mar, Norwalk, both of Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 326,702, Mar. 21, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 480,173

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

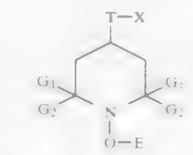
Int. Cl.[5] C08K 5/34

U.S. Cl. 524—99 17 Claims

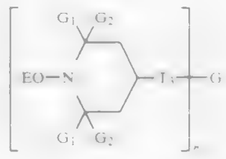
1. A coating composition which comprises

(a) a synthetic polymer which is a resin selected from the group consisting of polyester urethanes, thermoset acrylic resins, acrylic urethanes, alkyds, crosslinked epoxy resins, polysiloxanes, polyketimines, epoxymelamines, polyester acrylic resins, epoxy acrylic resins, polyester melamines, acrylic melamines, acrylic alkyds, acrylic resins and polyester epoxy resins, and

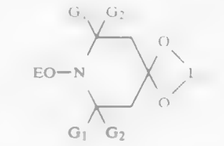
(b) an effective stabilizing amount of a compound having the formula I, II, III, IV or V



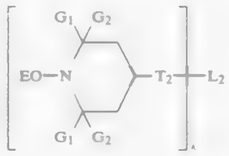
(I)



(II)



(III)



(IV)

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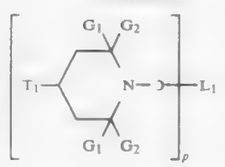


(V)

where

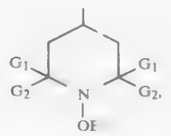
p is 2 to 10,

L_1 is a p-valent radical of an alkane or alkene of 1 to 18 carbon atoms, a p-valent radical of a cycloalkane or cycloalkene of 5 to 12 carbon atoms, a p-valent radical of a saturated or unsaturated bicyclic or tricyclic hydrocarbon of 7 to 12 carbon atoms or a p-valent radical of an aryl, alkyl substituted aryl or aralkyl hydrocarbon of 6 to 15 carbon atoms, with the proviso that the N—O groups are not necessarily attached to the same carbon atom in L_1,

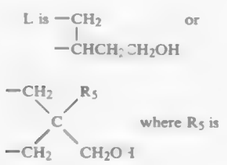
T_1 is —OH, —NCO, —O-glycidyl or $Si(OR_1)_3$, G_1 and G_2 are independently alkyl of 1 to 4 carbon atoms, or G_1 and G_2 together are pentamethylene,

T is a direct bond, $—CO(CH_2)_m—$, $—COO(CH_2)_m—$, $—NR_1CO(CH_2)_m—$, $—(OCH_2CH_2)_y—$, $—[OCH_2CH(CH_3)]_y—$, alkylene of 1 to 6 carbon atoms, said alkylene interrupted by one or more oxygen atoms, —NHCO—, $—NH_1CO(CONR_1—$, —OCO—, $—O-CO(CH_2)_m—$, $—NR_1CO(CONR_1CH_2CH_2—$ or $—NR-_1COCONR_1CH_2CH(CH_3)—$ where R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, m is 2 or 3, y is 1 to 10, and the hetero oxygen or nitrogen atom is attached to the piperidyl ring,

X is —OH, —COOH, —NCO, —O-gylcidyl or $Si(OR_1)_3$ where R_2 is hydrogen, alkyl of 1 to 12 carbon atoms, or



E is alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkenyl of 2 to 18 carbon atoms, cycloalkenyl of 5 to 12 carbon atoms, aralkyl of 7 to 15 carbon atoms, a radical of a saturated or unsaturated bicyclic or tricyclic hydrocarbon of 7 to 12 carbon atoms or aryl of 6 to 10 carbon atoms or said aryl substituted by alkyl,

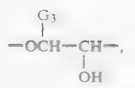


methyl, ethyl or $—CH_2OH$;

with the proviso that E is not benzyl, when T is a direct bond and X is —OH,

n is 1 to 4,

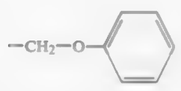
T_3 is



G_3 is hydrogen or G_4,

G_4 is alkyl having 1 to 36 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, phenyl or naphthyl which is unsubstituted or substituted by alkyl of 1 to 36 carbon atoms or aralkyl having 7 to 9 carbon atoms which is unsubstituted or substituted by alkyl having 1 to 36 carbon atoms,

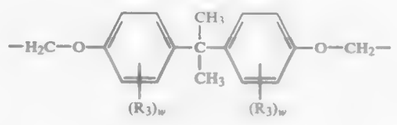
when n is 1, G is G_4 or



or G

and G_3 together with the carbon atoms to which they are attached form a ring containing 5 to 12 carbon atoms;

when n is 2, G is alkylene having 2 to 12 carbon atoms or

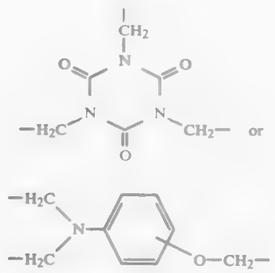


wherein w is 1 or 2 and R_3 is hydrogen, alkyl or alkoxy each having 1 to 4 carbon atoms, hydroxyl, halogen, cyano, or nitro or

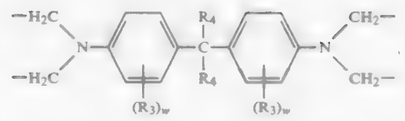
or G is —CHOH— or $—CH_2CH(CH_2OH)—$,

or G is —T—CO—O—CO—T—,

when n is 3, G is



and, when n is 4, G is



wherein R_4 is hydrogen or methyl and R_3 and w are as previously defined,

k is 1 to 100,

L_2 is an oligomeric or polymeric backbone derived from poly(vinyl alcohol), poly(acrylic acid), poly(methacrylic acid) or poly(maleic acid) having at least one free —OH or —COOH group present; or

L_2 is a residue of a monosaccharide, a disaccharide or a polysaccharide having one or more free —OH group present; or

L_2 is a residue of an oligomeric or polymeric structure derived from an ethylenically unsaturated material which has been epoxidized, having one or more free —OH group present, and

T_2 is —O—, $—OCH_2CHOHCH_2—$, —OCONH—R_6—NHCO— or $—NR_2COONH—R_6—NHCO—$, where R_6 is the aliphatic, cycloalkyphatic or aromatic divalent radical obtained by removing two —NCO moieties from an aliphatic, cycloaliphatic or aromatic diisocyanate of 4 to 15 carbon atoms.

5,145,894

STABILIZED POLYARYL ETHER KETONE MOLDING COMPOSITIONS CONTAINING A PHOSPHORUS COMPOUND

Juergen Koch, 5 Mainstrasse, 6708 Neuhofen; Gregor Schuermann, 40 Werderstrasse, 6900 Heidelberg, and Gerhard Heinz, 2 Im Vogelsang, 6719 Weisenheim, all of Fed. Rep. of Germany

Filed Jul. 10, 1991, Ser. No. 726,405

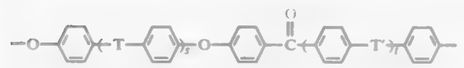
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1990, 4022213; Jul. 12, 1990, 4022214

Int. Cl.[5] C08K *5/52, 5/53*

U.S. Cl. 524—129 **4 Claims**

1. A stabilized polyaryl ether ketone molding composition, containing as essential substituents

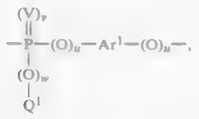
A: from 50 to 99.99% by weight of a polyaryl ether ketone A prepared by electrophilic polycondensation and at least 50 mol % of which is made up of units of the formula I



I

where s and t are each 0, 1, 2 or 3 and T and T' are each —O— or —CO—, or a ring-substituted C_1–C_8-alkyl, C_6–C_{20}-aryl or halogen derivative thereof,

B: from 0.01 to 4% by weight of a phosphorus compound B containing units of the general formula IIa



(IIa)

in which the substituents and indices have the following meanings:

V is oxygen or sulfur,

Q^1 is C_1–C_{25}-alkyl or aryl of from 6 to 25 carbon atoms in which the aromatic rings can be monosubstituted, disubstituted or trisubstituted by alkyl of from 1 to 4 carbon atoms,

Ar^1 is meta-phenylene, para-phenylene or from 2 to 6 aromatic rings which are linked together meta- or para via a chemical bond or via oxygen, sulfur, a —CO— group, an $—SO_2—$ group or a $—C(CH_3)_2—$ group, it being possible for each aromatic ring to be monosubstituted, disubstituted or trisubstituted by alkyl of from 1 to 4 carbon atoms,

u, v, and w are each 0 or 1, and

C: up to 50% by weight of a further thermoplastic which differs from A),

D: up to 45% by weight of fibrous or particulate fillers or mixtures thereof.

5,145,895

BLENDS OF MODIFIED POLYARYLENE SULFIDES AND POLYCARBONATES

Burkhard Köhler, Krefeld, and Klaus Reinking, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 29, 1991, Ser. No. 737,320

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1990, 4025561

Int. Cl.[5] C08L *69/00, 81/00;* **C08K** *5/42*

U.S. Cl. 524—160 **5 Claims**

1. Blends of

A) 1 to 99% by weight modified polyarylene sulfides prepared by mixing 100 parts PAS in the melt with 0.1 to 10 parts sulfo-group-containing phenols corresponding to formula (I)

$$(HO)_n—Ar—(SO_3H)_m \qquad (I),$$

in which

n and m=1 or 2 and Ar is an (n+m)-functional aromatic radical containing to 6 to 14 carbon atoms,

B) 1 to 99% by weight polymers containing carbonate ester groups and

C) 0 to 300% by weight, based on the sum of (A+B), mineral fillers.

5,145,896

PROCESS FOR THE REDUCTION OF DIENE POLYMER HOT MELT ADHESIVE COLOR

Jeffrey G. Southwick, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 9, 1991, Ser. No. 756,666

Int. Cl.[5] C08K *5/58, 5/57*

U.S. Cl. 524—180 **10 Claims**

1. A method of reducing the color of a hot melt adhesive formulation comprising a polymer of a conjugated diene which contains residual LiBr, LiCl or LiI salts which comprises adding to the formulation an amount of an alkyltin compound selected from the group consisting of dialkyltin mercaptides, dialkyltin mercaptocarbooxylates, and dialkyltin carboxylates sufficient to reduce color formation.

5,145,897

RUBBERY COMPOSITION AND POLYNORBORNENE-BASED THERMOPLASTIC ELASTOMER WITH IMPROVED HEAT STABILITY

Gabriel Levif, Nogent sur Oise, and Frederic Coupe, Verneiul en Halatte, both of France, assignors to Atochem, Paris, France

PCT No. PCT/FR90/00503, § 371 Date May 1, 1991, § 102(e) Date May 1, 1991, PCT Pub. No. WO91/00311, PCT Pub. Date Jan. 10, 1991

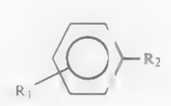
PCT Filed Jul. 3, 1990, Ser. No. 635,545

Claims priority, application France, Jul. 4, 1989, 89 08985; May 18, 1990, 90 06265

Int. Cl.[5] C08L *23/28, 45/00*

U.S. Cl. 524—296 10 Claims

1. Polynorbornene-based rubbery composition with improved thermal behavior, comprising at least 50% by weight of polynorbornene and not more than 50% by weight of another rubber, said composition having been vulcanized by means of an effective quantity of at least one compound of formula:



(I)

in which R_1 and R_2, which are identical or different, are chosen from radicals CH_nX_{3-n}, X being a halogen atom chosen from fluorine, chlorine and bromine, and n being an integer ranging from 1 or 2, said R_1 radical occupying a position ortho, meta or para to said R_2 radical

5,145,898

AQUEOUS SILICONE-ORGANIC HYBRIDS

Dipak Narula; Shedric O. Glover, and Arthur J. Tselepis, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 31, 1990, Ser. No. 608,048

Int. Cl.[5] C08K *50/07;* C09D *183/06;* C09K *3/00*

U.S. Cl. 524—310 18 Claims

1. An aqueous silicone-organic composition prepared by a two-step process consisting essentially of:

(A) forming an aqueous silicone emulsion consisting essentially of

(I) 100 parts by weight of silicone resin;

(II) up to 50 parts by weight of a water-immiscible solvent system;

(III) one non-ionic surfactant selected from the group consisting of

(a) sorbitan monoesters of carboxylic acids having 8–12 carbon atoms,

(b) polyethylene alkyl ethers having the formula

$$CH_3(CH_2)_m(OCH_2CH_2)_nOH$$

in which m is 7 to 15 and n is 2 to 50, and

(c) alkylphenoxy polyethoxy ethanols having the formula

$$C_rH_{2r+1}(C_6H_4)O(CH_2CH_2O)_sCH_2CH_2OH$$

in which r is 4 to 8 and s is 7 to 40;

(IV) poly(vinyl alcohol), the weight ratio of said poly(vinyl alcohol) (IV) to said non-ionic surfactant (III) being 0.01 to 10; and

(V) at least 10 parts by weight of water, wherein the total content of said non-ionic surfactant (III) and said poly(vinyl alcohol) (IV) is sufficient to produce a uniform oil-in-water dispersion of components (I) through (IV), and wherein said silicone resin (I) comprises at least two units selected from the group consisting of $MeSiO_{3/2}$ units, $Me_2SiO_{2/2}$ units, $PhMeSiO_{2/2}$ units, $PhSiO_{3/2}$ units, $Ph_2SiO_{2/2}$ units and $PrSiO_{3/2}$ units, in which Me denotes a methyl radical, Ph denotes a phenyl radical and Pr denotes a propyl radical, and said silicone resin contains up to 25% by weight of silicon-bonded moieties selected from the group consisting of hydroxyl groups and alkoxy groups having 1 to 3 carbon atoms, and

(B) mixing said aqueous silicone emulsion with an aqueous organic polymer solution comprising

(VI) 100 parts by weight of a water-soluble organic polymer;

(VII) up to 15 parts by weight of a water-miscible coalescing solvent; and

(VIII) at least 50 parts by weight of water, the weight ratio of said silicone polymer (I) to said water-soluble organic polymer (VI) in said aqueous silicone-organic composition being in the range of 15:1 to 1:1.

5,145,899

POLYMERS MODIFIED BY KETONIC AND ETHER-KETONIC COMPOUNDS

Brian C. Auman, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1991, Ser. No. 662,523

Int. Cl.[5] C08K *5/07*

U.S. Cl. 524—357 6 Claims

1. A composition of matter comprising:

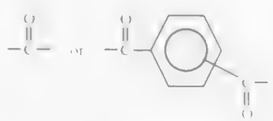
(a) a condensation polymer selected from the group consisting of polyester and polyimide, and

(b) a modifier consisting essentially of a compound having a formula

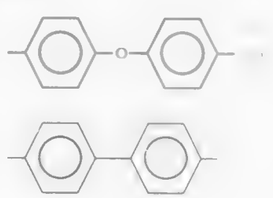
$$R^2—R^1—R^0—R^1—R^2$$

wherein

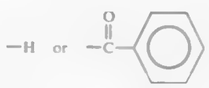
R^0 is



R^1 is



R^2 is



—H or

5,145,900

THERMOPLASTIC MATERIALS FOR THE PRODUCTION OF CERAMIC MOLDINGS

Hans-Josef Sterzel, Dannstadt-Schauernheim; Johan H. H. Ter Maat, Mannheim; Johan Ebenhoech, Ludwigshafen, and Marion Meyer, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 652,600, Feb. 8, 1991, abandoned. This application Jan. 17, 1992, Ser. No. 823,607

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005374; Jul. 7, 1990, 4021741

Int. Cl.[5] C08K *3/38, 3/10, 3/28, 3/18*

U.S. Cl. 524—404 8 Claims

1. A thermoplastic material for the production of ceramic moldings, consisting essentially of:

A) 40–65% by volume of a sinterable inorganic non-metallic powder,

B) 35–60% by volume of a mixture of

B1) 70–90% by weight of a polyoxymethylene homo- or copolymer having up to 10 mol% of comonomer units and

B2) 12–30% by weight of

(b_1) a polyoxymethylene copolymer with a comonomer content of 20–99 mol%, poly-1,3-dioxolane, poly-1,3-dioxane or poly-1,3-dioxepan, or

(b_2) an aliphatic polyurethane, an aliphatic uncrosslinked polyepoxide, a poly-(C_2–C_6-alkylene oxide), an aliphatic polyamide or a polyacrylate or a mixture thereof which is homogeneously dissolved or is dispersed with a mean particle size of less than 1 μm in B1), or

a mixture thereof, as a binder, and

C) 0–5% by volume of a dispersant.

5,145,901

AQUEOUS DISPERSIONS OF CROSSLINKABLE SILICONES/ALKENYLOXYSILANES

Michel Feder, Illfurth, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 11, 1989, Ser. No. 419,719

Claims priority, application France, Oct. 11, 1988, 88 13618

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] C08K *3/26, 3/22*

U.S. Cl. 524—424 13 Claims

1. A composition of matter which comprises an aqueous dispersion of a silicone crosslinkable into elastomeric state by elimination of water therefrom under ambient conditions, said silicone dispersion comprising:

(A) 100 parts by weight of an oil-in-water emulsion of an α,ω-(dihydroxy)polydiorganosiloxane, stabilized with at least one anionic or nonionic surface-active agent, or admixture thereof;

(B) 0.1 to 20 parts by weight of an alkenyloxysilane of the formula:

$$(R_1)_{4-a}Si(OC{=}CHR_2)_a \quad (I)$$

in which R_1, R_2 and R_3, which may be identical or different, are each a monovalent hydrocarbon radical containing from 1 to 12 carbon atoms, with the proviso that R_2 may be a hydrogen atom:

(C) 0.01 to 3 parts by weight of a metal curing catalyst compound; and

(D) 0 to 250 parts by weight of a nonsiliceous inorganic filler material;

and said dispersion having a pH higher than 7 and a solids content of at least 40%.

5,145,902

APPLICATION TO AQUEOUS CALCIUM CARBONATE PIGMENT SUSPENSIONS OF A POLYCARBOXYLIC AGENT WITH PHOSPHORIC OR PHOSPHONIC GROUPS WHICH INHIBIT THE SHOCK EFFECT CAUSED BY THE INTRODUCTION OF AN ELECTROLYTE AT HIGH CONCENTRATION

Georges Ravet, Saint-Genis-Les-Ollieres; Jacques Mongoin, Champagne Au Mont D'Or, and Jean-Marc Suau, Lyons, all of France, assignors to Coatex S.A., Caluire, France

Filed Aug. 1, 1990, Ser. No. 561,004

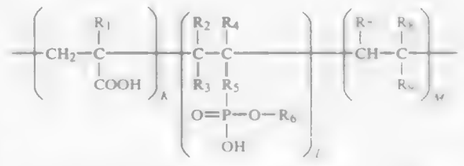
Claims priority, application France, Aug. 4, 1989, 89 10745

Int. Cl.[5] C08J *3/00;* C08K *3/26;* C08L *41/00;* C08F *30/02*

U.S. Cl. 524—425 25 Claims

1. A method of preventing the viscosity increase of aqueous calcium carbonate pigment suspensions having high concentrations of dry substance, comprising:

adding as a compatibility, dispersing, and/or grinding agent to an aqueous calcium carbonate suspension a copolymer of the formula:



wherein R_4 is H or methyl, R_2 and R_3 is H, C_{1-4} alkyl or a carboxylic acid group, R_4 is H or C_{1-4} alkyl, R_5 is a bridging group, R_6 is H, a cation, an amino group, C_{1-3} alkyl, C_{1-4} ester or substituted amide and R_7 to R_2 each is hydrogen, a carboxylic acid containing group; K has a value between 30 and 65% by weight relative to the total weight; L has a value between 20 and 60% by weight relative to the total weight; M has a value between 10 and 45% by weight relative to the total weight; and the sum of L and M is equal to at least 35% by weight relative to the total weight, thereby preventing the shock effect when a concentrated alkaline electrolyte is added to the suspension.

5,145,903

ACRYLIC COMPOSITE MATERIALS

Helen Duncan, Bolton, England, assignor to Imperial Chemical Industries PLC, England

Filed Mar. 29, 1990, Ser. No. 501,036

Claims priority, application United Kingdom, Mar. 30, 1989, 8907211

Int. Cl.[5] C08K *3/12*

U.S. Cl. 524—437 8 Claims

1. A fluid, filled, curable composition comprising an organic liquid which is polymerisable to form a solid polymer without the formation of elimination products, said organic liquid being selected from methyl methacrylate and mixtures of methyl methacrylate with reactive or non-reactive polymers and from 20 to 70% by volume of alumina trihydrate filler, said filler having a median particle size of between 5 and 30 microns and an average aspect ratio of less than 2.5:1, the viscosity of the composition being less than 5 poise at ambient temperature and the filler being capable of being substantially uniformly dispersed in the organic liquid while the composition is cured.

5,145,904

REINFORCED COLORED THERMOPLASTIC MOLDING MATERIALS BASED ON POLYPHENYLENE ETHERS AND POLYAMIDES

Klaus Muehlbach, Heppenheim; Peter Steiert, Ludwigshafen, and Klaus Benker, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 21, 1990, Ser. No. 541,784
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1989, 3922739
Int. Cl.[5] C08J 5/08; C08K 3/40; C08L 71/02
U.S. Cl. 524—494 7 Claims

1. A filler-containing thermoplastic molding material containing, as essential components,

A) from 10 to 84.8% by weight of a thermoplastic polyamide,

B) from 10 to 84.4% by weight of a modified polyphenylene ether,

C) from 5 to 50% by weight of glass fibers or carbon fibers or a mixture thereof, having a median fiber length l_{50} of from 150 to 400 μm, and

D) from 0.2 to 4% by weight of a pigment

and in addition

E) from 0 to 4% by weight of a rubber impact modifier,

F) from 0 to 20% by weight of a particulate filler which differs from D) and

G) from 0 to 20% by weight of a flameproofing agent.

5,145,905

VULCANIZATES COMPRISED OF DIFFERENT DIENE RUBBER COMPONENTS, AND NOVOLAK

Richard Sattelmeyer, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst AG, Fed. Rep. of Germany

Continuation of Ser. No. 265,251, Oct. 31, 1988, abandoned, which is a division of Ser. No. 137,483, Dec. 1, 1987, Pat. No. 4,837,266. This application Oct. 15, 1990, Ser. No. 597,898
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641344
Int. Cl.[5] C08K 3/04, 3/36
U.S. Cl. 524—511 9 Claims

1. A rubber vulcanizate prepared from vulcanizable rubber mixtures containing at least one rubber and conventional compounding ingredients, wherein the rubber mixtures are comprised of different vulcanizable rubber component units, which units were prepared by mixing at least two rubber mixtures A and B of different compositions, the first mixture A containing 50 to 95 parts by weight of rubber and 30 to 150 parts by weight of filler, and a further mixture B containing 50 to 5 parts by weight of rubber and 80 to 5 parts by weight of filler, relative to 100 parts by weight of the total amount of rubber employed in the final mixture, and at least one of the base mixtures A and B containing 2 to 30 parts by weight of a reinforcing novolak resin system, the distribution of rubber, filler and reinforcing resin being homogeneous in the vulcanizate and the vulcanizate having a reduced temperature rise after exposure to stress in a flexural rolling test apparatus in which a test cylinder of diameter 20 mm and length 100 mm is subjected to dynamic deformation at an angle of deflection of 45° at one end at a speed of approximately 1,400 revolutions per minute.

5,145,906

SUPER-ABSORBENT POLYMER HAVING IMPROVED ABSORBENCY PROPERTIES

Douglas R. Chambers; Hubert H. Fowler, Jr., both of Chesapeake, Va.; Yoji Fujiura, and Fusayoshi Masuda, both of Kyoto, Japan, assignors to Hoechst Celanese Corporation, Portsmouth, Va.

Continuation of Ser. No. 413,760, Sep. 28, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,974
Int. Cl.[5] C08K 5/04
U.S. Cl. 524—732 7 Claims

1. A process of preparing a super-absorbent polymer which comprises:

(a) forming an aqueous solution of acrylic acid, a water soluble polysaccharide, and a multifunctional monomer, wherein said multifunctional monomer has at least two polymerizable ethylenically unsaturated double bonds per molecule, wherein said acrylic acid and said polysaccharide are present in the amount of about 90 to about 100 weight percent acrylic acid and about 0 to about 10 weight percent polysaccharide wherein said weight percents are based on the weight of the acrylic acid and the polysaccharide,

wherein said multifunctional monomer is present in the amount of about 0.075 to about 1 mole percent based on the moles of acrylic acid, and wherein the acrylic acid and the polysaccharide are present in the aqueous solution in the amount of about 5 to about 30 weight percent wherein the weight percent is based on the weight of acrylic acid, polysaccharide and water;

(b) adding to the aqueous solution at a temperature of about 5° to about 20° C., a redox catalyst system and a thermal free radical initiator wherein the reducing agent part of the redox catalyst is present in the amount of about 6×10^{-5} to about 2.5×10^{-3} mole percent based the moles of acrylic acid,

wherein the oxidizing agent part of the redox catalyst is present in the amount of about 3.4×10^{-3} to about 0.42 mole percent based on the moles of acrylic acid and wherein the thermal free radical initiator is present in the amount of about 0.1 to about 0.4 weight percent based on the weight of acrylic acid,

(c) allowing the exothermic temperature to rise under adiabatic conditions to a peak temperature not to exceed 90° C., thereby forming a polymer gel

(d) holding the temperature within 10° C. of the peak temperature for a time sufficient to reduce residual monomer content below 1000 ppm;

(e) neutralizing about 50 to about 100 percent of the carboxylic acid groups in the polymer with an aqueous base;

(f) adding a multifunctional compound having at least two groups capable of forming ionic or covalent bonds with carboxylic acid groups wherein said multifunctional compound is added in the amount of about 0.05 to about 15 mole percent based on the moles of acrylic acid;

(g) heating at a temperature of about 20° C. to about 200° C. to dry the polymer to a moisture content below about 10 percent by weight;

(h) and grinding the polymer to a particle size of about 20 to 400 mesh (U.S. Standard Sieve).

5,145,907

PRECURED SILICONE EMULSION

Robert E. Kalinowski, Auburn; Donald T. Liles, Midland, and Nick E. Shephard, Rhodes, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 411,800, Sep. 25, 1989. This application Aug. 31, 1990, Ser. No. 576,570
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] C08K 3/36
U.S. Cl. 524—789 24 Claims

1. An aqueous silicone emulsion stabilized cationically or nonionically or by a combination of both which yields an elastomer upon removal of the water comprising

(1) 100 parts by weight of cationically or nonionically stabilized polydiorganosiloxane emulsion, the polydiorganosiloxane having at least two reactive groups per molecule, the organo radicals being monovalent hydrocarbon radicals containing less than 7 carbon atoms per radical or 2-(perfluoroalkyl)ethyl radicals having less than 7 carbon atoms per radical, the reactive groups selected from the atoms or radicals consisting of (a) hydrogen, (b) OR, where R is hydrogen, monovalent hydrocarbon radical or substituted hydrocarbon radical having less than 7 carbon atoms, functionalized hydrocarbon radicals, nitrogen compounds of the formula —N=CR′$_2$ or —NR′COR′ or —NR′$_2$, where R′ is either hydrogen or monovalent hydrocarbon radicals having less than 7 carbon atoms, (c) groups of the formula —NR$_2$ or —NCOR, where R is as defined above, and (d) halogen,

(2) from 0.1 to 10 parts by weight of tin (II) catalyst, and,

when (1) has only 2 reactive groups per molecule,

(3) sufficient crosslinker on a stoichiometric basis selected from the group consisting of (e) silane of the formula R_xSiY_{4-x} where Y is selected from the group consisting of hydrogen, halogen, and OR′, and R and R′ are as defined above, and x is either 0 or 1; and (f) silazane of the formula $R_xSi(NR'_2)_{4-x}$, where R, R′ and x are as defined above;

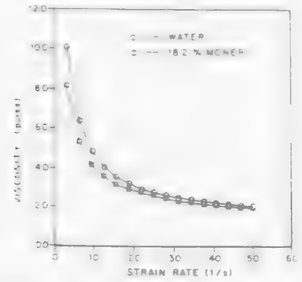
the emulsion being able to be filled with either reinforcing or extending fillers or pigments or combinations thereof, the emulsion yielding an elastomer upon evaporation of the water.

5,145,908

METHOD FOR MOLDING CERAMIC POWDERS USING A WATER-BASED GEL CASTING PROCESS

Mark A. Jenny, Knoxville, Tenn., and Ogbemi O. Omatete, Lagos, Nigeria, assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Division of Ser. No. 207,813, Jun. 17, 1988, Pat. No. 5,028,362, and Ser. No. 158,485, Feb. 22, 1988, Pat. No. 4,894,194. This application Oct. 26, 1989, Ser. No. 427,542
Int. Cl.[5] C08L 33/00
U.S. Cl. 524—827 3 Claims



1. A ceramic product made by the process comprising:

(a) forming a slurry mixture comprising ceramic powder, a dispersant for said powder, and a monomer solution including at least one water soluble monofunctional monomer and at least one water soluble difunctional monomer, the functional group of said monofunctional and difunctional monomers selected from vinyl and allyl groups, a free radical initiator compound and an aqueous solvent;

(b) transferring said slurry mixture to a mold; and

(c) heating said mold containing said slurry mixture at a temperature and for a time sufficient for said monomers to polymerize and crosslink to form a firm polymer-solvent gel matrix, whereby said slurry mixture is formed into a solid shaped product.

5,145,909

HALOGEN-CONTAINING THERMOPLASTIC RESIN COMPOSITION

Hiroshi Takida, Takatsuki, and Teruo Iwanami, Ibaraki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 381,558, Jul. 18, 1989, abandoned. This application Sep. 4, 1991, Ser. No. 758,395
Claims priority, application Japan, Jul. 19, 1988, 63-179396
Int. Cl.[5] C08G 63/48
U.S. Cl. 525—57 1 Claim

1. A thermoplastic resin blend comprising a halogen-containing thermoplastic resin (A) consisting of 100 to 0.1 weight percent of a thermoplastic polyurethane-vinyl chloride graft polymer (a1) with polyurethane content of 10 to 90 weight percent which is produced by polymerizing vinyl chloride in the presence of a thermoplastic polyurethane, and 0 to 99.9 weight percent of another halogen-containing polymer (a2) and a low-ash alkali metal hydrolyzed ethylene-vinyl acetate copolymer with an ethylene content of 20 to 75 mole percent, a degrees of saponification of vinyl acetate not less than 50 mole percent, a melting point not exceeding 200° C., an ash content not exceeding 300 ppm and an alkali metal content not exceeding 200 pm (B), the proportion of said hydrolyzed ethylene-vinyl acetate copolymer (B) being in the range of 0.1 to 100 parts by weight to 100 parts by weight of said halogen-containing thermoplastic resin (A).

5,145,910

KETOCARBOXYLATED POLYMERS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 27, 1990, Ser. No. 558,368
Int. Cl.[5] C08F 8/00
U.S. Cl. 525—61 13 Claims

1. A ketodiacid ester of the hydroxy or thiol groups of a polymer having one or more pendant hydroxy or thiol groups.

5,145,911

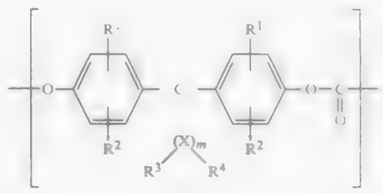
POLYCARBONATE MOLDING COMPOSITION

Thomas Eckel, Dormagen; Dieter Freitag, Krefeld; Uwe Westeppe, Mettmann, and Dieter Wittmann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Japan

Filed Jun. 6, 1990, Ser. No. 534,094
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919043
The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.
Int. Cl.[5] C08L 69/00
U.S. Cl. 525—67 3 Claims

1. A thermoplastic molding composition comprising:

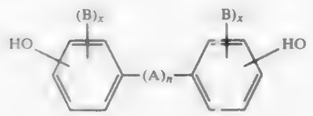
A) 5 to 99 parts by weight, relative to the weight of the molding composition, of an aromatic polycarbonate which contains bifunctional structural units of formula (I)


(I)

wherein

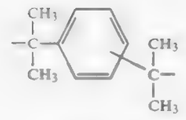
R^1 and R^2 independently of one another denote hydrogen, halogen, C_1–C_8-alkyl, C_5–C_6-cycloalkyl, C_6–C_{10}-aryl or C_7–C_{12}-aralkyl,

m denotes a whole number from 4 to 7,
R^3 and R^4 are selected individually for each X and independently of one another denote hydrogen or C_1-C_6 alkyl and
X denotes carbon,
with the proviso that R^3 and R^4 simultaneously denote alkyl at at least one atom X,
and
B) 5 to 99 parts by weight, relative to the weight of the molding composition, of an aromatic polycarbonate based on diphenols of formula (VI



(VI)

wherein
A is a single bond, C_1–C_5-alkylene, C_2–C_5-alkylidene, a C_5–C_6-cycloalkylidene, —S—, —SO_2— or a radical of the formula (VII)



(VII)

B is hydrogen, linear C_1–C_{10}-alkyl, branched C_3–C_{20}-alkyl, C_6–C_{20}-aryl or a halogen atom,
x is 0, 1 or 2, and
n is 1 or 0,
and
C) 1 to 95 parts by weight relative to the weight of the molding composition, of a graft polymer of
C.1 which denotes 5 to 90 parts by weight of (i) (ii) or (iii) on
C.2 which denotes 10 to 95 parts by weight of diene rubber having an average particle diameter d50 of 0.09 to 1 μm, and a gel content of more than 50 wt. % relative to C.2 and wherein said
(i) is a mixture of 50 to 95% by weight of at least one member selected from the group consisting of styrene, α-methylstyrene, styrene which ring is substituted by halogen or by C_1–C_4-alkyl, and
50 to 5% by weight of at least one member selected from the group consisting of acrylonitrile, methacrylonitrile, methacrylate, acrylate, maleic imide, C_1–C_4-alkyl substituted maleic imide, and phenyl-N-substituted maleic imide, and where
(ii) is a mixture of 50 to 95% by weight of at least one member selected from the group consisting of styrene, α-methylstyrene, styrene which ring is substituted by halogen or by C_1–C_4-alkyl, methacrylate and acrylate and
50 to 5% by weight of at least one member selected from the group consisting of acrylonitrile, methacrylonitrile, maleic imide, C_1–C_4-alkyl substituted maleic imide, phenyl-N-substituted maleic imide, and where
(iii) is at least one member selected from the group consisting of methacrylates and acrylates.

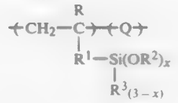
5,145,912

METHOD FOR PREPARING OXIMOSILANE-FUNCTIONAL VINYLIC COPOLYMERS

Dale E. Hauenstein, and Harold L. Vincent, both of Midland County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 17, 1990, Ser. No. 628,530
Int. Cl.[5] C08F *30/08*
U.S. Cl. 525—326.5 **16 Claims**

1. A method for preparing an oximosilane-functional vinylic copolymer comprising:
reacting an alkoxysilane-functional vinylic copolymer (I) with an organoketoxime (II), said alkoxysilane-functional vinylic copolymer having recurring units represented by the formula



wherein R is selected from the group consisting of hydrogen and alkyl radicals having 1 to 3 carbon atoms, R^1 is a divalent organic radical, R^2 is an alkyl radical having 1 to 6 carbon atoms, R^3 is selected from the group consisting of alkyl radicals having 1 to 6 carbon atoms, a phenyl radical, a styryl radical and an alpha-methylstyryl radical, x is an integer having a value of 1 to 3 and —Q— represents a residue of an ethylenically unsaturated organic monomer, said reaction being carried out in a dry environment.

5,145,913

RETARDERS FOR CURING PHENOLIC RESOLE RESINS

Arthur H. Gerber, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 562,206, Aug. 2, 1990, Pat. No. 5,096,983.
This application Dec. 9, 1991, Ser. No. 804,218
Int. Cl.[5] C08F *283/00;* **C08G** *8/28;* **C08L** *61/00, 85/04*
U.S. Cl. 525—506 **20 Claims**

1. A binder composition comprising a mixture of:
a. a hardenable phenolic resole resin having a pH of from about 4.5 to 9.5, a resin solids content of about 50% to 90% by weight of said resin, and a viscosity of about 100 to 4,000 cps at 25° C.;
b. a magnesium hardening agent selected from the group consisting of magnesium hydroxide and lightburned magnesium oxide having a surface area of at least 10 square meters per gram, in an amount sufficient to increase the hardening rate of said resin;
c. an ester functional hardening agent in an amount sufficient to increase the hardening rate of said composition; and
d. from about 0.1% to 5% by weight based on the weight of resin of a retarder compound which decreases the solubility of magnesium in the composition, said compound being one which increases the time required to gel the composition at 25° C. by at least 35% when mixed therein at a concentration of 2% based on the weight of resin.

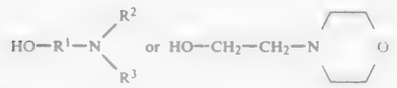
5,145,914

POLYACRYLATE ESTERS WITH AMMONIUM SALT GROUPS

Eberhard Esselborn, Essen; Jürgen Fock, Düsseldorf, and Helmut Lammerting, Herbede, all of Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1990, 4008761
Int. Cl.[5] C08F *8/32*
U.S. Cl. 525—329.5 **10 Claims**

1. Polyacrylate esters with ammonium salt groups obtained by the transesterification of alkyl polyacrylates produced by free radical polymerization, wherein the alkyl groups of the acrylate esters have 1 to 8 carbon atoms, up to 50% of the acrylate ester may be replaced by the corresponding methacrylate ester and the transesterification is carried out in the presence of a transesterification catalyst, at a temperature of 70° to 140° C., optionally in the presence of a solvent, with
a) a component which is a compound of the formula



wherein
R^1 is a divalent group of the formula —$(CH_2)_q$—, —CH(R^4)—CH_2— or —$(C_nH_{2n}O)_m$—C_pH_{2p}—, in which
R^4 is an alkyl group with 1 to 16 carbon atoms,
q=2, 3 or 4,
n=2, 3 or 4,
m=1 to 20,
p=2, 3 or 4 and
R^2 and R^3 are alkyl groups with 1 to 18 carbon atoms and
b) a component which is a saturated or unsaturated aliphatic alcohols with 8 to 22 carbon atoms or alkoxylated alkylphenols with 9 to 27 carbon atoms in the alkylphenol group, wherein the molar ratio of component a) to component b) is 1:9 to 9:1, in such amounts that 5 to 70% of the ester groups are transesterified, and
subsequently the transesterification product is transformed into the corresponding salt by reaction with an organic carboxylic acid having 1 to 6 carbon atoms or an inorganic acid.

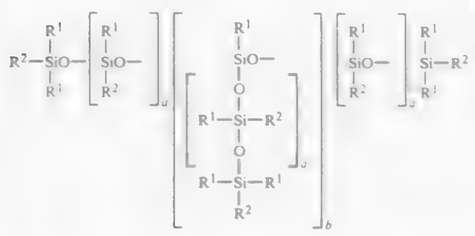
5,145,915

CURABLE ORGANOPOLYSILOXANES HAVING OXYALKYLENE ETHER GROUPS ETHER GROUPS LINKED THROUGH SIC GROUPS, A METHOD FOR THEIR PREPARATION AND THEIR USE

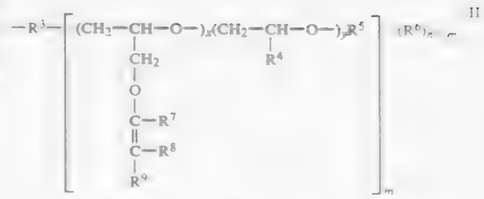
Christian Weitemeyer, and Hardi Döhler, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Feb. 6, 1991, Ser. No. 651,580
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1990, 4009889
Int. Cl.[5] C08G *65/32, 77/06*
U.S. Cl. 525—403 **20 Claims**

1. A curable organopolysiloxane having oxyalkylene ether groups linked through SiC-groups and having the general average formula

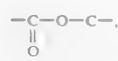


wherein
R^1 are the same or different and represent alkyl of 1 to 4 carbon atoms or phenyl, with the proviso that at least 90% of the R^1 groups are methyl;
R^2 are the same or different and are represented by:
(a) alkyl with 1 to 20 carbon atoms, aryl or aralkyl,
(b) oxyalkylene ether groups of the general formula



II

wherein R^3 is a (n+1) valent group which is linked with a silicon atom of the organopolysiloxane through a —SiC— linkage and with m polyether groups through —C—C—,



—C—O—C—, or —C—N—C— bonds;
R^4 is hydrogen, alkyl or R^5OCH_2;
R^5 and R^6 are hydrogen, alkyl or acyl with the groups R^4, R^5 and R^6 being the same or different in the molecule;
R^7, R^8 and R^9 are hydrogen or alkyl with 1 to 8 carbon atoms, or wherein the groups R^7 and R^8 or R^8 and R^9 jointly form a component of a cyclic, non-aromatic hydrocarbon group with 5 or 6 carbon atoms;
n has a value of 1 through 5;
m has a value of 1 through 5 but is not larger than n;
x in the average molecule has a value of 1 to 100; and
y in the average molecule has a value of 0 to 100, with the proviso that $1 \leqq x+y < 150$;
a has a value of 1 to 1000; and
b has a value of 0 to 10, with the proviso that in the average organopolysiloxane molecule, at least one R^2 group is an oxyalkylene ether group of formula II.

5,145,916

TERMINAL-MODIFIED IMIDE OLIGOMER COMPOSITION

Shinji Yamamoto; Hideho Tanaka, and Kazuyoshi Fujii, all of Oosaka, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 24, 1990, Ser. No. 513,905
Claims priority, application Japan, Apr. 26, 1989, 1-104735
Int. Cl.[5] C08L *79/08*
U.S. Cl. 525—421 **9 Claims**

1. A composition of terminal-modified imide oligomers which comprises a flexible terminal-modified imide oligomer and a rigid terminal-modified imide oligomer,
wherein the flexible terminal-modified imide oligomer is formed from biphenyltetracarboxylic acid or its derivative, an aromatic diamine compound having two or more aromatic rings which are combined with each other directly or by a divalent group consisting of one, two or three atoms and an unsaturated monoamine compound or an unsaturated carboxylic acid or its derivative, and
wherein the rigid terminal-modified imide oligomer is formed from biphenyltetra-carboxylic acid or its derivative, an aromatic diamine compound having only one aromatic ring or condensed ring and an unsaturated monoamine compound or an unsaturated carboxylic acid or its derivative.

5,145,917
BORON/NITROGEN/SILICON PRECERAMIC POLYMERS AND BORON NITRIDE CERAMIC MATERIALS PRODUCED THEREFROM

Pierre Ardaud, Sainte-Foys-Les-Lyon, and Gerard Mignani, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Aug. 10, 1990, Ser. No. 565,455
Claims priority, application France, Aug. 10, 1989, 89 10939
Int. Cl.[5] C08F *283/00*
U.S. Cl. 525—474 24 Claims

1. An organometallic preceramic boron/nitrogen/silicon polymer comprising the copolymerizate of at least one trihaloborane A with at least one disilazane B and at least one B-trichloroborazine C.

5,145,918
BONDING POLYSULPHIDE SEALANT TO SILICONE

Kent R. Larson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 18, 1991, Ser. No. 642,760
Int. Cl.[5] C08F *283/00*
U.S. Cl. 525—474 2 Claims

1. A composition consisting essentially of 1 part by weight of silicone sealant comprising a hydroxyl endblocked polydiorganosiloxane, a silane or silane mixture having an average of from 2.01 to 4 inclusive alkoxy radicals, and a titanium catalyst which cures at room temperature upon exposure to moisture and from 0.1 to 40 parts by weight of polysulfide sealant.

5,145,919
EPOXY RESIN COMPOSITIONS BASED ON ALKOXYLATED PHENOLS

Michael B. Cavitt, Lake Jackson; Dennis L. Steele, and David J. Duncan, both of Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 643,865, Jan. 18, 1991, which is a division of Ser. No. 439,211, Nov. 20, 1989, Pat. No. 5,011,904. This application Oct. 8, 1991, Ser. No. 773,180
Int. Cl.[5] C08G *59/06, 59/08*
U.S. Cl. 525—481 10 Claims

1. A product having an average of more than one vicinal epoxide group per molecule which resuts from dehydrohalogenating the product resulting from reacting

(A) a mixture of

(1) the product resulting from reacting

(a) at least one compound having an average of more than one aromatic hydroxyl group per molecule; with

(b) at least one alkylene oxide having from 2 to about 4 carbons atoms per molecule in an amount which provides a ratio of moles of component (b) to aromatic hydroxyl groups contained in component (a) of from about 1:1 to about 8:1; and

(2) at least one compound having an average of more than 1 aliphatic hydroxyl group per molecule which compound is free of aromatic rings, wherein components (1) and (2) are present in amounts such that from about 40 to about 70 percent of the hydroxyl groups are contributed by component (1) and from about 60 to about 30 percent of the hydroxyl groups are contributed by component (2) the percentages being based on the total amount of hydroxyl groups present in components (1) and (2): with

(B) at least one epihalohydrin wherein the ratio of moles of epihalohydrin per hydroxyl group contained in components (A1) and (A2) is from about 1.08:1 to about 1.7:1.

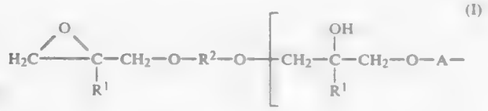
5,145,920
OLIGOMER EPOXY RESINS BASED ON CYCLOHEXYLDIPHENOL DERIVATIVES AND REACTION PRODUCTS THEREOF WITH (METH)ACRYLIC ACID AND DIISOCYANATES

Bernhard Hess, Moers; Dieter Freitag, and Karsten-Josef Idel, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiegesellschaft, Leverkusen, Fed. Rep. of Germany

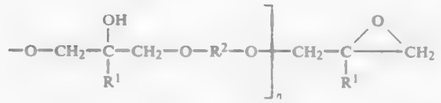
Division of Ser. No. 536,321, Jun. 11, 1990, Pat. No. 5,081,269. This application Dec. 10, 1990, Ser. No. 625,114
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920410
Int. Cl.[5] C08G *59/00*
U.S. Cl. 525—528 19 Claims

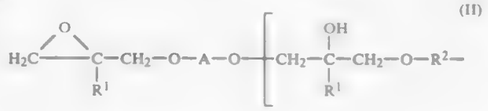
1. Curable mixtures comprising

a) at least one compound of the formulae (I) or (II)



(I)





(II)

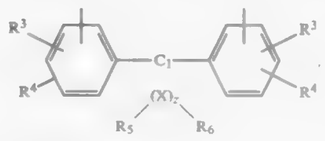
in which

R^1 represents hydrogen or C_1–C_{10}-alkyl,

R^2 represents C_1–C_{20}-aliphatic, C_5–C_{14}-cycloaliphatic, C_6–C_{24}-aromatic or C_7–C_{30} araliphatic divalent radicals with the proviso that R^2 is not the same as A,

n represents a number from 1 to 20, and

A represents a radical of the formula (III)



(III)

in which

R^3 and R^4 independently of one another denote hydrogen, halogen, C_1–C_8-alkyl, C_5–C_6-cycloalkyl, C_6–C_{10}-aryl, or C_7–C_{12}-aralkyl,

z represents the number 4, 5, 6 or 7,

R^5 and R^6 can be selected individually for each X and independently of one another represent methyl or ethyl and

X represents carbon,

b) an amount of an epoxy resin curing agent sufficient to cure the mixture, and

c) optionally a curing accelerator.

5,145,921
PROCESS FOR REDUCING THE FORMATION OF BUILDUP IN REACTORS DURING POLYMERIZATION OF VINYLIDENE FLUORIDE IN AN AQUEOUS SUSPENDING MEDIUM

Pierre Lasson, Brussels, Belgium, assignor to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Oct. 9, 1990, Ser. No. 594,735
Claims priority, application France, Oct. 9, 1989, 89 13247
Int. Cl.[5] C08F *2/20*
U.S. Cl. 526—74 10 Claims

1. A process for reducing the formation of buildup in reactors during polymerization of vinylidene fluoride in an aqueous suspending medium with an oil-soluble radical polymerization initiator and a suspending agent consisting essentially of a methyl hydroxyethyl cellulose.

5,145,922
OLEFIN POLYMERIZATION CATALYSTS

Alan Villena; Ronald P. C. van Gaalen; John C. Chadwick, all of Amsterdam, and Theodorus K. Jurriens, Zaltbommel, all of Netherlands, assignors to Shell Research Limited, United Kingdom

Division of Ser. No. 599,031, Oct. 17, 1990, Pat. No. 5,081,087. This application Jul. 26, 1991, Ser. No. 736,214
Claims priority, application United Kingdom, Nov. 16, 1989, [redacted]
Int. Cl.[5] C08F *4/654*
U.S. Cl. 526—124 5 Claims

1. A process for the polymerization of an olefin comprising polymerizing said olefin under olefin polymerization conditions in the presence of a polymerization catalyst prepared by the method comprising halogenating a magnesium-di-(3-halo- or 3-C_1 to C_8 alkoxy-phenoxide) with a halide of tetravalent titanium in the presence of a halohydrocarbon, recovering the solid reaction product from the reaction mixture and combining the solid reaction product with an organo aluminum compound and an electron donor.

5,145,923
PROCESS FOR THE PREPARATION OF ETHYLENE/VINYL ESTER COPOLYMERS

John V. Hobes, Dinslaken; Wolfgang Payer, Wesel, and Werner Reimann, Duisburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 18, 1991, Ser. No. 716,958
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020639
Int. Cl.[5] C08F *218/02*
U.S. Cl. 526—193 23 Claims

1. A process for the polymerization of monomers ethylene with esters of vinyl alcohol in the absence of solvents and emulsifiers for said monomers at pressures of at least 100 MPa and temperatures between 150° C. and 350° C. in the presence of a molecular weight regulator, catalysts forming free radicals and/or oxygen, there being at least one free radical acceptor present during the polymerization.

5,145,924
FREE RADICAL POLYMERIZATION OF STYRENE MONOMER

Eric J. Shero, Scottsvale, Ariz.; James J. O'Brien, and Duane B. Priddy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 651,072, Feb. 6, 1991, abandoned. This application Oct. 31, 1991, Ser. No. 786,160
Int. Cl.[5] C08F *112/08*
U.S. Cl. 526—225 4 Claims

1. A process for free radical polymerization of styrene to prepare high molecular weight polystyrene comprising conducting the polymerization in the presence of from 5 to 5000 ppm of a soluble organic acid having pKa from 0.5 to 2.5 at 25° C.

5,145,925
CHLOROTRIFLUOROETHYLENE/PERFLUORO(ALKYL VINYL ETHER) COPOLYMER

Kiyohiko Ihara, and Fumihiko Yamaguchi, both of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Apr. 3, 1991, Ser. No. 680,112
Claims priority, application Japan, Apr. 4, 1990, 2-90894
Int. Cl.[5] C08F *16/24*
U.S. Cl. 526—247 4 Claims

1. A copolymer which comprises chlorotrifluoroethylene and 0.01 to 1% by mole of perfluoro(alkyl vinyl ether) of the formula:

$$R_f\text{—}O\text{—}CF{=}CF_2 \qquad (I)$$

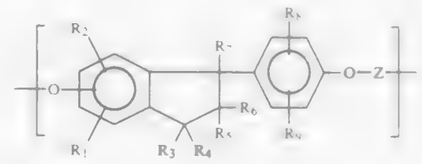
wherein R_f is a C_3–C_6 perfluoroalkyl group, and has a melt flow rate of 0.01 to 200 × 10^{-3} cc/sec.

5,145,926
POLY(INDANE ETHERS)

Kundan M. Patel, Landing, and Frank Mares, Whippany, both of N.J., assignors to Allied-Signal Inc., Morristown, N.J.

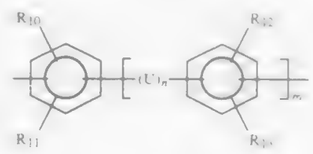
Filed Mar. 26, 1990, Ser. No. 499,247
Int. Cl.[5] C08F *136/00, 116/12;* C08G *65/34*
U.S. Cl. 526—284 20 Claims

1. A polyether indane polymer having recurring units of the formula:

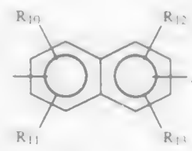


wherein:

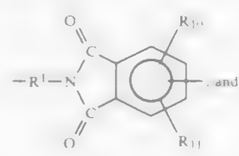
Z is the same or different at each occurrence and is a divalent linking group which comprises one or more moieties selected from the group consisting of:



(a)



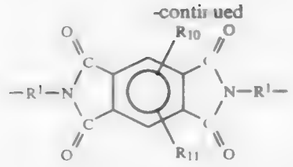
(b)



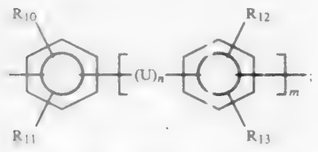
(c)

and

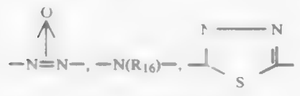
-continued

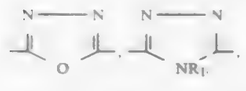


—R^1— is the same or different at each occurrence and is a moiety of the formula:



m is 0 or a whole number;
n is 0 or 1;
U is the same or different at each occurrence and is —O—, —S—, —S—S—, —SO_2,





—N=N—, —N(R_{16}), —N(R_{16})C(O)—, —C(O)N(R_{16})—, —S(O)—, —C(O)—, —C(O)O—, —OC(O)— or —C(R_{14})(R_{15})—; and

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14} and R_{15} are the same or different at each occurrence and are hydrogen, alkyl, aryl, alkoxyaryl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, nitro, cycloalkenyl, halogen, cyano, cycloalkyl, or aryloxy; or R_{14} and R_{15} together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, 7, 8, or 9 membered alicyclic or aromatic fused or bridged ring system, which system may optionally include one or more divalent carbonyl, sulfonyl, oxa, aza, alkylaza or arylaza groups; and

R_{16} is hydrogen, alkyl or phenyl.

5,145,927

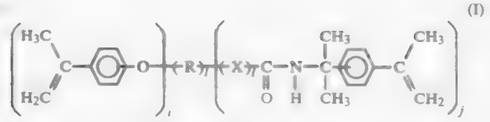
HIGH SURFACE HARDNESS TRANSPARENT RESIN PREPARED FROM A COMPOUND HAVING TERMINAL ISOPROPENYL PHENYL GROUPS

Toshiyuki Suzuki; Katsuyoshi Sasagawa; Masao Imai, and Yoshinobu Kanemura, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc. Tokyo, Japan

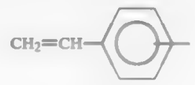
Filed Mar. 1, 1990, Ser. No. 487,212
Claims priority, application Japan, Mar. 1, 1989, 1-48919; Mar. 20, 1989, 1-66240; May 26, 1989, 1-131559
Int. Cl.[5] C08F *226/02*
U.S. Cl. 526—301 **19 Claims**

1. A high surface hardness transparent resin comprising a crosslinked polymer prepared by copolymerizing a monomer (A) represented by the formula (I)

(d) (I)



wherein R is an aliphatic residue having or not having an oxygen atom, an alicyclic ring, a heterocyclic ring or an aromatic ring, or an alicyclic residue, l is 0 or 1, each of i and j is an integer of 1 or more, and when l=0, i=j=1, when l=1, (i+j) is 4 or less, when j=1, X is oxygen or sulfur, when J≧2, all X's are oxygen or sulfur, or one X is oxygen and the other X's are sulfur, or one X is sulfur and the other X's are oxygen, and a monomer (B) having one or more functional groups of at least one kind selected from the group consisting of CH_2=CH—C(O)—O—, CH_2=C(CH_3)—C(O)—O— and



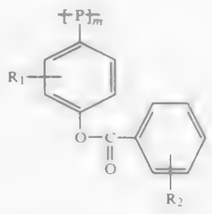
5,145,928

SIDE CHAIN POLYMERS AS ULTRAVIOLET PROTECTING AGENTS

Gunilla E. Gillberg-LaForce, Summit, and Josefina L. Pruksarnukul, Montclair, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Jan. 28, 1991, Ser. No. 646,965
Int. Cl.[5] C08F *12/08*
U.S. Cl. 526—313 **9 Claims**

1. A polymer composition to protect polyester materials from ultraviolet radiation, comprising 4-benzoyloxyphenyl moieties, and having recurring units of:



wherein P is the polymer main chain unit, R_1 numbers from 1 to 4 substituents which could be the same or different, and are selected from the group consisting of H, alkyl containing from 1 to 6 carbon atoms, cycloalkyl containing from 4 to 6 carbon atoms, and aralkyl containing from 7 to 10 carbon atoms; and R_2 numbers from 1 to 5 substituents which could be the same or different, and are selected from the group consisting of OH, SO_3H, H, alkyl containing from 1 to 6 carbon atoms, cycloalkyl containing from 4 to 6 carbon atoms, and aralkyl containing from 7 to 10 carbon atoms and m ranges from about 50 to 500.

5,145,929

PRESSURE-ACTIVATED ADHESIVES

David T. Ou-Yang, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 305,155, Feb. 1, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 722,362
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] C08F *236/06, 236/12*
U.S. Cl. 526—338 **8 Claims**

1. An adhesive composition comprising an amorphous butadiene-nitrile random copolymer having a single glass transition temperature no higher than about −25° C., a nitrile content no higher than about 31% by weight, a Mooney viscosity of at least 95 (measured according to ASTM D1646-87 at 100° C. for 4 minutes), a vinyl content of no greater than 10% by weight, said composition being substantially free of cross-links, provided that said composition is free of any additive that provides more than little or no finger tack or that adversely affects the cohesive and adhesive strength of the adhesive composition.

5,145,930

PREPARATION OF HYPERBRANCHED POLYARYLENES

Young H. Kim, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 341,072, Apr. 20, 1989, Pat. No. 5,070,183, which is a division of Ser. No. 129,151, Dec. 7, 1987, Pat. No. 4,857,630. This application Aug. 15, 1991, Ser. No. 745,300
Int. Cl.[5] C08G *61/00*
U.S. Cl. 528—4 **9 Claims**

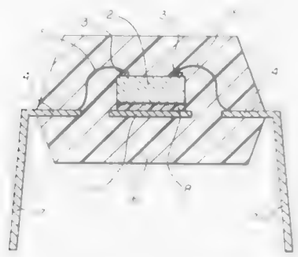
1. A process for preparing soluble hyperbranched polyarylenes comprising dissolving in a solvent an arylene monomer of the formula $Ar(X)_nM$ wherein:
Ar is an (n+1) valent arylene radical containing at least one aromatic ring:
X is Br, Cl or I;
M is —$B(OH)_2$, —MgX or —SnR_3 where R is a hydrocarbyl group containing 1 to 10 carbon atoms; and
n is the number of halogen atoms in the monomer;
adding a catalyst which is an organopalladium(0) compound or an organonickel(II) compound; refluxing the mixture at the solvent reflux temperature for a time sufficient to convert the monomer to polyarylene, and isolating the polyarylene.

5,145,931

SEMICONDUCTOR PELLET ADHESIVE AND ARTICLE MADE THEREWITH

Kazumi Nakayoshi, and Katsutoshi Mine, both of Chiba, Japan, assignors to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 604,843
Claims priority, application Japan, Nov. 15, 1989, 1-297161
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—15 **3 Claims**



1. An adhesive for bonding a semiconductor pellet to the material at said pellet's attachment site, wherein said adhesive comprises an addition reaction-curing silicone rubber composition which contains ≦500 ppm of low-molecular-weight siloxane which has a vapor pressure ≧10 mmHg at 200° C.

5,145,932

ORGANOPOLYSILOXANE COMPOSITION FOR THE FORMATION OF A RELEASE FILM

Shosaku Sasaki, Chiba, and Hiroshi Masaoka, Saitama, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 21, 1989, Ser. No. 439,913
Claims priority, application Japan, Nov. 25, 1988, 63-299302
Int. Cl.[5] C08G *77/04*
U.S. Cl. 528—15 **9 Claims**

1. An organopolysiloxane composition for the formation of a release film, said composition consisting essentially of
(A) 100 weight parts organopolysiloxane which contains in each molecule at least two higher alkenyl groups as represented by the general formula

H_2C=$CH(CH_2-)_a$

wherein the subscript a has a value of from 2 to 8,
(B) 0.3 to 40 weight parts organohydrogenpolysiloxane having at least two silicon-bonded hydrogen atoms in each molecule,
(C) 4 to 100 weight parts organopolysiloxane having the average formula $R^1_dSiO_{(4-d)/2}$ whose molecule may contain small quantities of the hydroxyl group or alkoxy groups but does not contain silicon-bonded alkenyl groups or silicon-bonded hydrogen atoms, wherein R^1 is a substituted or unsubstituted monovalent hydrocarbon group free of an alkenyl moiety and the subscript d has a vaule of from 1.95 to 2.05,
(D) addition-reaction inhibitor in an effective amount, and
(E) a platinum group metal-containing compound in a catalytic quantity.

5,145,933

ORGANOSILOXANE GEL-FORMING COMPOSITIONS AND USE THEREOF

Bernard F. R. Grisoni, El Toro, Calif., and David Pocknell, Antibes, France, assignors to Dow Corning France S.A., Valbonne, France

Continuation-in-part of Ser. No. 277,364, Nov. 19, 1988, abandoned. This application Mar. 7, 1991, Ser. No. 665,855
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—15 **12 Claims**

1. A siloxane gel-forming composition comprising the product obtained by mixing (A) a polydiorganosiloxane having on average two silicon-bonded alkenyl groups per molecule, said alkenyl group having from 2 to 6 carbon atoms and no silicon atom having more than one alkenyl group bonded thereto, the remaining silicon-bonded organic groups being selected from alkyl and aryl groups, said polydiorganosiloxane having a viscosity at 25° C. of from 50 to 10,000 mm^2/s, (B) a hydrosilicon compound having at least 3 silicon-bonded hydrogen atoms per molecule and consisting essentially of RHSiO— groups, $R_2XSiO_{\frac{1}{2}}$ groups and optionally R_2SiO— groups and having a viscosity at 25° C. of no more than 1000 mm^2/s, wherein R is selected from the group consisting of alkyl and aryl groups having no more than 8 carbon atoms, and X is selected from H and R, (C) a diorganohydrogensiloxy-terminated polydiorganosiloxane, having a viscosity of from 1 to 200 mm^2/s, wherein the organic substituents are selected from alkyl and aryl groups having no more than 8 carbon atoms and (D) a catalyst for the reaction of ≡SiH groups with ≡SiAlkenyl groups, the proportion of (A), (B) and (C) being such that for every alkenyl group in (A), there are present from 3 to about 20 silicon-bonded hydrogen atoms provided by (B) and (C) combined, the percentage of silicon-bonded hydrogen

atoms provided by (C) (RH(C)) not being less than the value given by the formula

$$RH(C)=81.36-(3.6\times RHAlk)$$

wherein RHAlk is the ratio of the number of SiH groups in (B) and (C) combined to the number of Si-Alkenyl groups in (A) provided RH(C) is within the range of from 10% to 90%.

5,145,934

METHOD FOR NEUTRALIZING ACIDS IN ORGANOPOLYSILOXANES

Kazuo Kobayashi, and Yokichi Yamamoto, both of Chiba, Japan, assignors to Dow Corning Toray Silicone Company, Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 613,029
Claims priority, application Japan. Nov. 30, 1989, 1-311012
Int. Cl.[5] C08G *7/06*
U.S. Cl. 528—23 **2 Claims**

1. A method for neutralizing strong acids in an organopolysiloxane, the method comprising addition an ammonium compound selected form the group consisting essentially of

(i) ammonium carbonate and,

(ii) ammonium bicarbonate

to the organopolysiloxane and heating the organopolysiloxane to at least the decomposition temperature of the ammonium compound.

5,145,935

SHAPE MEMORY POLYURETHANE ELASTOMER MOLDED ARTICLE

Shunichi Hayashi, Takamichi, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,771
Claims priority, application Japan Sep. 30, 1988, 63-244341
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] C08G *18/10*
U.S. Cl. 528—65 **2 Claims**

1. A shape memory polyurethane elastomer molded article formed from a polyurethane elastomer which has a degree of crystallinity of 3～50 wt %, a glass transition point in the range of −50°～60° C., a ratio of the tensile modulus at temperatures 10° C. lower than the glass transition point to the tensile modulus at temperatures 10° C. higher than the glass transition point of 50～250, and contains approximately equal amount of [NCO] groups and [OH] groups at the terminals of the polymer, and is polymerized by the prepolymer method from a difunctional diisocyanate, a difunctional polyol, and a difunctional chain extender containing active hydrogen groups, which are formulated in a molar ratio of diisocyanate:polyol:chain extender=2.00～1.10:1.00:1.00～0.10.

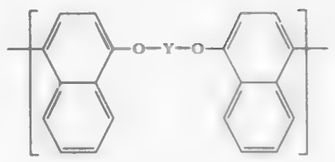
5,145,936

FLUORINATED POLY (NAPHTHYL ETHER)

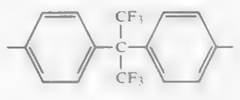
Frank Mercer, Belmont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

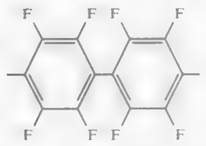
Division of Ser. No. 447,771, Dec. 8. 1989. This application Sep. 6, 1991, Ser. No. 756,003
Int. Cl.[5] C08G *65/00*
U.S. Cl. 528—86 **6 Claims**

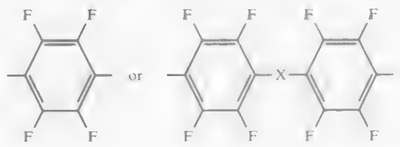
1. A fluorinated poly(naphthyl ether) comprising a repeat unit of the formula



wherein Y is $(CF_2)_m$,







m is an integer from 1 to 4, inclusive, and X is S, CO, SO_2, O, $P(C_6H_5)$, or C(OH)H.

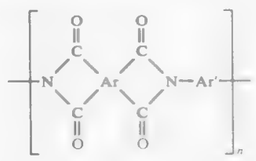
5,145,937

POLYIMIDES WITH CARBONYL AND ETHER CONNECTING GROUPS BETWEEN THE AROMATIC RINGS

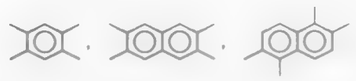
Paul M. Hergenrother, Yorktown, and Stephen J. Havens, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 9, 1989, Ser. No. 433,812
Int. Cl.[5] C08G *8/02, 14/00, 69/26*
U.S. Cl. 528—125 **5 Claims**

1. A high molecular weight linear polyimide having high strength, modulus, toughness, and solvent resistance, and having the general structural formula:



(a) wherein Ar is a radical selected from the group consisting of:



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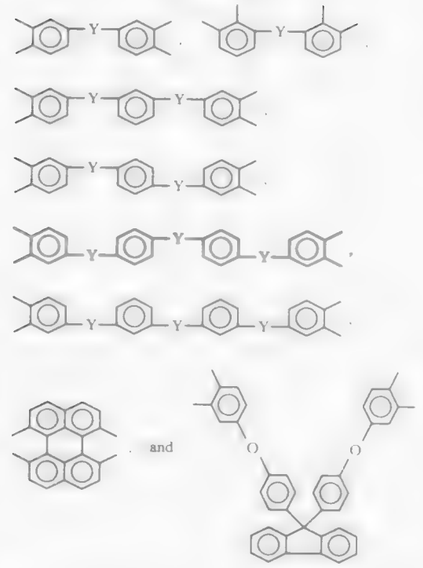
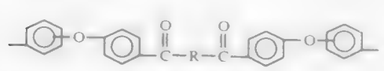


wherein Y is a band or is a substituent selected from the group consisting of:

O, S, C═O, SO_2, CH_2, $C(CH_3)_2$, $C(CF_3l)_2$ and $Si(CH_3)_2$;

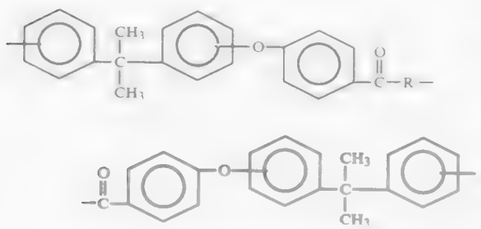
(b) wherein Ar' is a radical selected from a group consisting of:
(1) a radical having the structural formula:



wherein R is a radical selected from the group consisting of:

$-(CH_2)_z-$ and $-(CF_2)_z-$,

wherein z is an integer between 1 and 10;
(2) a radical having the structural formula:



wherein R' is selected from the group consisting of

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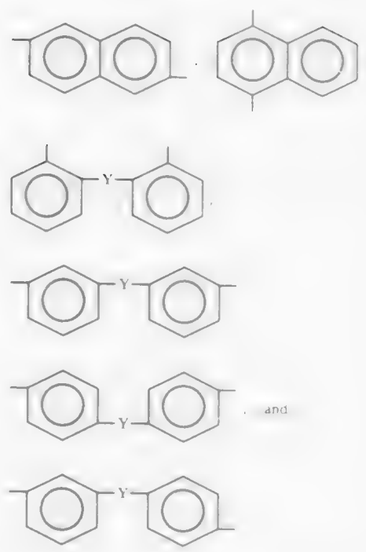
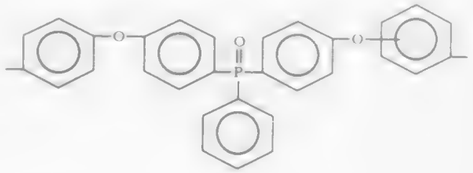


wherein Y is a bond or is a substituent selected from the group consisting of:

O, S, C═O, SO_2, CH_2, $C(CH_3)_2$, and $C(CF_3)_2$;

(3) a radical having the structural formula:



(c) wherein n is an integer between 4 and 100.

5,145,938

PREPARATION OF POLY(ARYLENE ETHER KETONES)

Ian D. H. Towle, Stratton, United Kingdom, assignor to Raychem Limited, London, England

PCT No. PCT/GB88/01012, § 371 Date Jun. 29, 1990, § 102(e) Date Jun. 29, 1990, PCT Pub. No. WO89/04848, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 17, 1988, Ser. No. 476,373
Claims priority, application United Kingdom, Nov. 17, 1987, [illegible]
Int. Cl.[5] C08G *8/02, 14/00*
U.S. Cl. 528—125 **10 Claims**

1. An arylene ether ketone copolymer comprising
(a) 99 to 10 mol % of repeat units selected from the group consisting of

(I)

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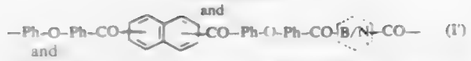
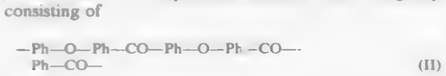


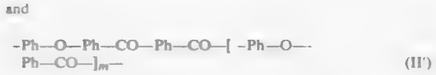
and

(b) 1 to 90 mol % of repeat units selected from the group consisting of



(II)

and



(II')

wherein m is 0 or 1, the B/N structure is a benzene or naphthalene ring moiety, and each Ph independently is m- or p-phenylene; provided that when the repeat unit (a) is (I), then the repeat unit (b) is (II) and that when the repeat unit (a) is (I'), then the repeat unit (b) is (II').

5,145,939

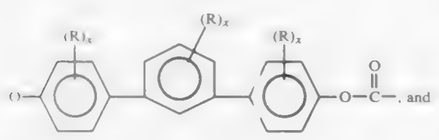
DIHYDROXY-META-TERPHENYL POLYCARBONATE

Susan A. Nye, Feura Bush, N.Y., assignor to General Electric Company, Schenectady, N.Y.

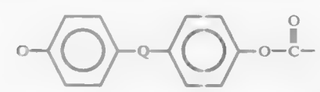
Filed Jul. 17, 1991, Ser. No. 731,603
Int. Cl.[5] C08G *64/04*
U.S. Cl. 528—196 **3 Claims**

1. An aromatic polycarbonate consisting essentially of,

(A) from 25 to 100 mol % of random or alternating meta-terphenyl carbonate units having the formula,



(B) from 0 to 75 mol % of diaryl carbonate units of the formula,



based on the total moles of (A) plus (B), where R is the same or different monovalent radical and a member selected from the class consisting of nitro, $C_{(1-8)}$ alkoxy and $C_{(1-13)}$ monovalent hydrocarbon, x is a whole number equal to 0 to 4 inclusive, and Q is a divalent $C_{(6-30)}$ aromatic organic radical.

5,145,940

COPOLYIMIDES, THEIR PREPARATION AND THE USE THEREOF

Wolfgang Wernet, Kobe, Japan, and Joseph Berger, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 12, 1991, Ser. No. 744,620
Claims priority, application Switzerland, Aug. 17, 1990, 2674/90
Int. Cl.[5] C08G *8/02*
U.S. Cl. 528—226 **18 Claims**

1. A copolyimide having an inherent viscosity of 0.2 to 3.0 dl/g, measured at 25° C. in a solution of 0.5% by weight of said copolyimide in N-methylpyrrolidone, and comprising

A) at least one structural repeating unit of aromatic tetracarboxylic acid radicals (a) which contain 10 to 30 carbon atoms and which are unsubstituted or substituted by halogen, nitro, C_1–C_4alkyl, C_1–C_4alkoxy or phenacyl, and aromatic diamine radicals (b) which contain 6 to 30 carbon atoms and which are unsubstituted or substituted by C_1–C_4alkyl or halogen; and at least one additional optional structural repeating unit of aromatic tricarboxylic acid radicals (c) of 9 to 30 carbon atoms, which radicals are unsubstituted or substituted as for (a), and of identical or different diamine radicals (b), and

B) at least one structural repeating unit of identical or different tetracarboxylic acid radicals (a) and aromatic diamines (d) which contain 6 to 30 carbon atoms and which are unsubstituted or substituted by C_1–C_4alkyl, and which contain at least one —SO_3M group attached to the aromatic nucleus, wherein M is $H^{\oplus}$, a mono- to trivalent metal cation, $NH_4^{\oplus}$ or an organic ammonium cation of 1 to 30 carbon atoms; and additional optional structural repeating units of identical or different aromatic tricarboxylic acid radicals (c) and identical or different diamine radicals (d), with the proviso that at least one of said diamine radicals (b) or (d) is substituted by C_1–C_4alkyl in both ortho-positions to at least one N atom.

5,145,941

FLAME RESISTANT, LOW PILLING POLYESTER FIBER

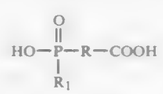
Jerry T. Munday, Charlotte, and Theodore D. Meiss, Matthews, both of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 640,132, Jan. 4, 1991. This application Nov. 22, 1991, Ser. No. 796,280
Int. Cl.[5] C08G *63/68, 79/02*
U.S. Cl. 528—287 **16 Claims**

1. A flame resistant, low pilling polyester comprising the blended product of the following two polymers

a) a first polymer consisting essentially of a dicarboxylic acid or a lower alkyl ester thereof, a diol, and an oxysilicon compound; and

b) a second polymer consisting essentially of a dicarboxylic acid or a lower alkyl ester thereof, a diol, pentaerythritol in the amount from 100 to about 1,000 ppm of the dicarboxylic acid or a lower alkyl ester thereof, and a carboxyphosphinic acid monomer, said monomer being used in an amount of from 0.55 to 20 mole percent based on the total amount of dicarboxylic acid or lower alkyl ester thereof and monomer, said monomer of the general formula



or a lower alkyl ester or cyclic anhydride of said monomer; wherein R is a saturated, open-chain or cyclic alkylene, arylene or aralkyl having one to 15 carbon atoms, and R_1 is an alkyl having up to 6 carbon atoms, aryl or aralkyl; wherein the polycondensation product has an intrinsic viscosity of less than about 0.55 deciliters/gm in the solvent base dichloroacetic acid at 25° C.

5,145,942

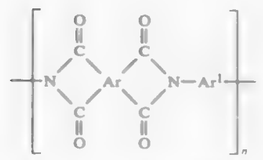
METHYL SUBSTITUTED POLYIMIDES CONTAINING CARBONYL AND ETHER CONNECTING GROUPS

Paul M. Hergenrother, Yorktown, and Stephen J. Havens, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

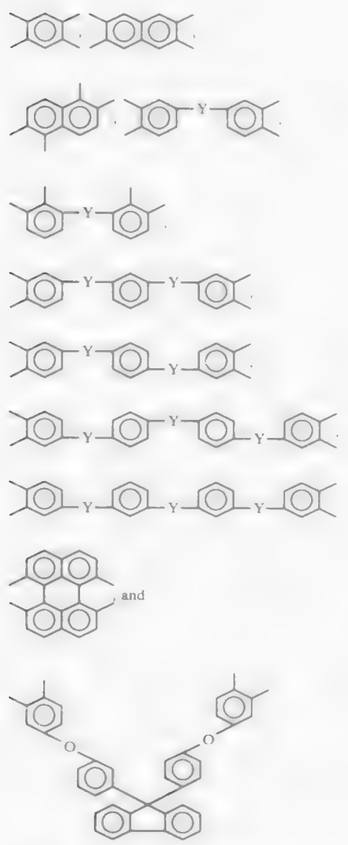
Filed Sep. 28, 1990, Ser. No. 589,571
Int. Cl.[5] C08G *69/26, 8/02, 79/02*
U.S. Cl. 528—353 **7 Claims**

1. A high molecular weight linear polyimide having high strength and toughness and a degree of solubility in organic solvents, which polyimide can be induced to crosslink or chain

extend to form an insoluble polymer network, the polyimide having the general structural formula:



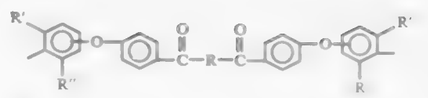
(a) wherein Ar is a radical selected from the group consisting of:



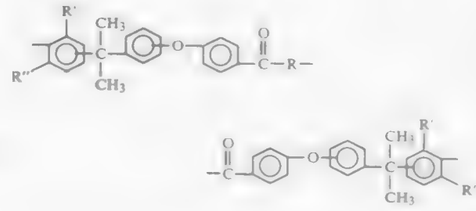
wherein Y is a bond or is a substituent selected from the group consisting of:

$O,S,C{=}O,SO_2,CH_2,C(CH_3)_2,C(CF_3)_2$, and $Si(CH_3)_2$;

(b) wherein Ar' is a radical having the structural formula selected from the group consisting of:

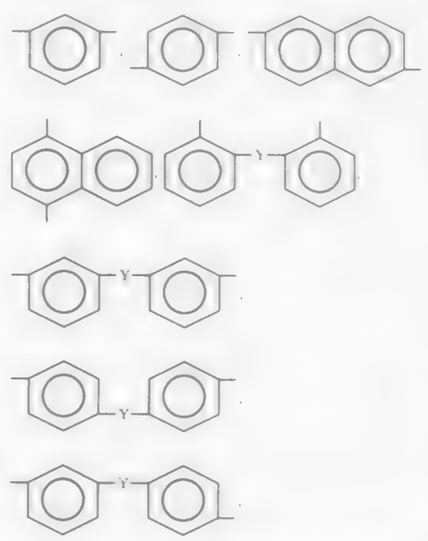


and



wherein R is a radical selected from the group consisting of:

$-(CH_2)_x-$, $-(CF_2)_x-$,



wherein Y is a bond or is a substituent selected from the group consisting of:

$O,S,C{=}O,SO_2,CH_2,C(CH_3)_2,C(CF_3)_2$, and $Si(CH_3)_2$;

wherein x is an integer between 1 and 10;
wherein R' is CH_3;
wherein R'' is either H or CH_3; and
wherein n is an integer between 4 and 100.

5,145,943

PRODUCTION OF PARTICULATE AMIDE/IMIDE PREPOLYMERS

Hsueh M. Li, and John Y. Lee, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 17, 1990, Ser. No. 628,647
Int. Cl.[5] C08G *73/14, 69/28;* **C08L** *77/10, 79/08*
U.S. Cl. 528—353 **13 Claims**

1. A process for the production of aromatic polyimide fus-

ible powders derived from a bis(aminophenyl)methane, said process comprising

a) treating a solution of

i) n moles of a bis(aminophenyl)methane,

ii) n moles of an aromatic tetracarboxylic dianhydride;

b) admixing the product produced in step a) with an unsaturated carbocyclic monoanhydride selected from the group maleic anhydride, maleic anhydride substituted with halogen or C_1 to C_6 linear or branched alkyl group, nadic anhydride or nadic anhydride substituted with at least one halogen or C_1 to C_6 linear or branched alkyl group or mixtures thereof and forming a prepolymer;

c) partially imidizing the prepolymer of step b) by heating;

d) the solution of step c) is gradually poured into water or organic non-solvent to precipitate the partially imidized prepolymer;

e) separating said partially imidized prepolymer as a powder.

5,145,944

POLYETHER-POLYESTER BLOCK COPOLYMERS AND THEIR USE AS DISPERSANTS

Bettina Steinmann, Praroman, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y

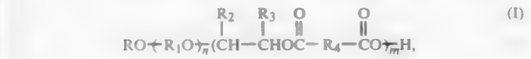
Filed Mar. 25, 1991, Ser. No. 674,630

Claims priority, application Switzerland, Mar. 29, 1990, 1036/90

Int. Cl.[5] **C08G** *63/00;* **B05D** *3/02,* **C08L** *51/00;* **C08F** *20/00*

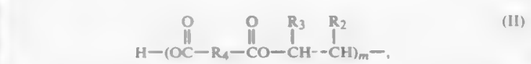
U.S. Cl. 528—366 **11 Claims**

1. A polyether-polyester block copolymer of the formula I



(I)

wherein R is C_1–C_4alkyl or a radical of formula II



(II)

R_1 is C_2–C_{10}alkylene, R_2 is hydrogen and R_3 is C_1–C_{12}alkyl, C_5–C_{10}cycloalkyl, C_6–C_{10}aryl or a radical $—CH_2OR_5$ in which R_5 is C_4–C_{10}alkyl, C_5–C_6cycloalkyl or C_6–C_{10}aryl, or R_2 and R_3 together with the carbon atoms to which they are bonded are a cyclopentylene or cyclohexylene radical, R_4 is phenylene or naphthylene and n is an integer from 2 to 5000 and m is an integer from 2 to 1000 obtained by anionic copolymerization of a monoepoxy compound with a cyclic anhydride of an aromatic dicarboxylic acid, using an alkali metal salt of a polyalkylene glycol or of a polyalkylene glycol monoalkyl ether as initiator.

5,145,945

HOMOPOLYMERS AND COPOLYMERS HAVING RECURRING CARBONATE UNITS

Reginald Ting-Hong Tang, Warren; Frank Mares, Whippany; William J. Boyle, Jr., Parsippany; Tin-Ho Chiu, Millburn, and Kundanbhai Patel, Landing both of N.J., assignors to Allied-Signal Inc., Morris, N.J.

Division of Ser. No. 227,386, Aug. 2, 1988, Pat. No. 4,920,203, which is a continuation-in-part of Ser. No. 134,290, Dec. 17, 1987, abandoned, and a continuation-in-part of Ser. No. 134,321, Dec. 17, 1987, Pat. No. 4,891,263, and a continuation-in-part of Ser. No. 134,339, Dec. 17, 1987. This application Jan. 16, 1990, Ser. No. 465,109

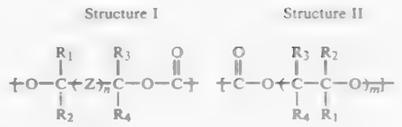
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.

Int. Cl.[5] **C08G** *63/91 64/00, 63/08*

U.S. Cl. 528—370 **43 Claims**

1. A random copolymer comprising at least one type of recurring monomeric unit of the following General Structures I and II:

Structure I Structure II



wherein:

Z is $—C(R_5R_6)—$, $—NR_5—$, $—O—$ or a combination thereof, where Z is selected such that there are no adjacent heteroatoms;

n is from 1 to about 8;

m is from 1 to about 8;

R_1, R_2, R_3, and R_4 are the same or different at each occurrence and are hydrogen, aryloxyalkyl, alkyoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, alkyl, aryl, alkylcarbonyalkyl, cycloalkyl, arylcarbonylaryl, alkylcarbonylarly, alkoxyalkyl, or aryl or alkyl substituted with one or more biologically compatible substituents; and

R_5 and R_6 are the same or different and are R_1, R_2, R_3, R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl, or any two of R_1 to R_6 together may form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic fused, spiro, bicyclic or tricyclic ring system or a combination thereof, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or arylaza groups;

With the proviso that when said copolymers have recurring units of the Structure I derived from trimethylene carbonate, the other recurring monomeric units of copolymer are not derived from gylcolide or glycolic acid.

5,145,946

PROCESS FOR PREPARING POLYARYLENE SULFIDE WITH ALKALI METAL SALT OF PHENOLIC AROMATIC CARBOXYLIC ACID

Tsuguo Fujii; Katsumasa Yamamoto, and Junji Uda, all of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1987, Ser. No. 81,783

Claims priority, application Japan, Aug. 6, 1986, 61-185435

Int. Cl.[5] **C08G** *75/14*

U.S. Cl. 528—388 **8 Claims**

1. A process for preparing a polyarylene sulfide which comprises reacting an alkali metal sulfide compound and a polyhalo-substituted aromatic compound in an organic polar solvent in the presence of

(A) an alkali metal salt of a phenolic aromatic carboxylic acid of the formula:

$(HO)_m—Ar—(COOM)_n$

wherein Ar is a di- to tetravalent aromatic group having 6 to 24 carbon atoms; M is an alkali metal; and m and n are each 1 or 2, and

(B) an alkali metal hydroxide or an alkali metal alcoholate.

5,145,947

COPOLYMERIZATION OF CO/OLEFIN BY TRANSMITTING POWER TO POLYMER SLURRY

Barend Mastenbroek; Leonardus Petrus, and Gerrit G. Rosenbrand, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1991, Ser. No. 676,159

Int. Cl.[5] **C08G** *67/02*

U.S. Cl. 528—392 **9 Claims**

1. In the process of producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and the hydrocarbon, in a reactor having a volume above about 10 liters and equipped with a stirring device, under polymerization conditions in the presence of liquid reaction diluent and in the presence of a catalyst composition formed from a compound of palladium, the anion of a strong non-hydrohalogenic acid and a bidentate ligand of phosphorus, the improvement of producing a polymer product with increased bulk density by transmitting power from the stirring device to the polymer slurry in the reactor at a rate of at least about 1.5 kilowatts per cubic meter of polymer slurry.

5,145,948

PREPARATION OF HIGHLY VISCOUS ADDUCTS OF BUTYLENE OXIDE WITH ALCOHOLS

Knut Oppenlaender, 23 Otto-Dillstrasse, 6700 Ludwigshafen; Roland Schwen, 7 Im Schlossgarten, 6701 Friedelsheim; Richard Baur, 1 Neikenstrasse, 6704 Mutterstadt; Charalampos Gousetis, 98 Carl-Bosch-Strasse, 6700 Ludwigshafen; Juergen Mohr, 48 Hochgewanne, 6719 Gruenstadt, and Helmut Mach, 43 Kaiserstrasse, 6900 Heidelberg, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 449,010, Dec. 12, 1984, Pat. No. 5,053,154. This application Jun. 26, 1991, Ser. No. 731,216

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1988, 3844222

Int. Cl.[5] **C08G** *59/00*

U.S. Cl. 528—409 **5 Claims**

1. A process for the preparation of a highly viscous adduct of 1,2-butylene oxide with a secondary or primary alcohol, wherein the alcohol, as an initiator, is reacted with 1,2-butylene oxide in the presence of an alkali, as a catalyst, at elevated temperatures in a molar ratio of 1,2-butylene oxide to initiator alcohol of more than 55:1, so that an adduct having a molecular weight of >4,000 is formed.

5,145,949

PRODUCTION PROCESS FOR MAKING AROMATIC AMINE RESINS

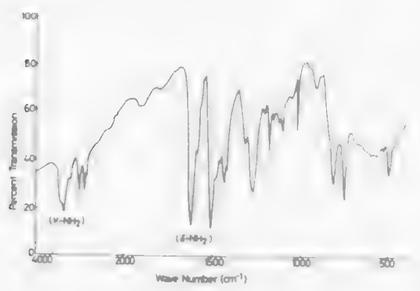
Keizaburo Yamaguchi, Kawasaki; Yoshimitsu Tanabe; Tatsuhiro Urakami, both of Yokohama; Akihiro Yamaguchi, Kamakura; Norimasa Yamaya, and Masahiro Ohta, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 511,235, Apr. 19, 1990, Pat. No. 5,051,494, which is a division of Ser. No. 254,701, Oct. 7, 1988, Pat. No. 4,937,318. This application Jan. 22, 1992, Ser. No. 823,478

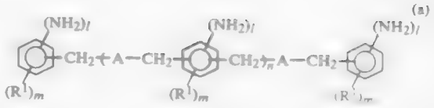
Claims priority, application Japan, Oct. 8, 1987, 62-252517; Nov. 10, 1987, 62-282048; Dec. 9, 1987, 62-309426

Int. Cl.[5] **C08G** *73/00, 73/02*

U.S. Cl. 528—422 **11 Claims**



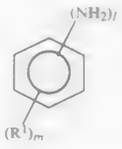
1. A process for producing an aromatic amine resin comprising a mixture of aromatic amine compounds represented by the formula (a):



(a)

wherein A represents a phenylene, alkyl-substituted phenylene, diphenylene, diphenyl ether or naphthylenyl group, R^1 represents a halogen atom, a hydroxyl group, a C_1–C_4 alkoxy or a C_1–C_5alkyl group, l is 1 or 2, m is 0, 1, 2 or 3, n is an integer form 0 to 300 and when m is 2 or 3 said R^1 groups may be the same or different and two R^1 groups may join to form a 5- or 6-membered alicyclic moiety comprising reacting in the presence of an acid catalyst

(a) an aromatic amine compound represented by the formula (b):



(b)

wherein R^1, l and m are defined above and

(b) an aralkyl alcohol derivative represented by the formula (c):

$R^2OCH_2—A—CH_2OR^2$(c)

wherein A is defined above, and R^2 represents a hydrogen atom, an acyl group or a C_1–C_4 alkyl group.

5,145,950

METHOD OF STORING FOOD OR PLANT MATERIALS BY WRAPPING WITH A STRETCHED SYNDIOTACTIC POLYSTYRENE FILM

Keisuke Funaki, Ichihara, and Komei Yamasaki, Sodegaura, both of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 390,298, Aug. 7, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 651,043

Claims priority, application Japan, Aug. 31, 1988, 63-215096

Int. Cl.[5] **B65B** *55/00;* **C08J** *5/18*

U.S. Cl. 528—481 **15 Claims**

1. A method of storing food materials including fruits or vegetables for an extended time comprising enclosing the fruit or vegetable with a wrapping material obtained by stretching a styrene polymer with a syndiotactic configuration, said polymer having a syndiotacticity in racemic pentad of at least 30%, and thereafter subjecting the polymer to heat treatment at a temperature ranging from about 120° C. to 270° C. for about 2 to 600 seconds, while holding the polymer in a tensed state.

5,145,951

PEPTIDES RETROVIRAL PROTEASE INHIBITORS COMPRISING 2-AMINO-2-METHYLPROPIONIC ACID

Klaus-Peter Voges; Dieter Häbich; Jutta Hansen, and Arnold Paessens, all c/o Bayer Aktiengesellschaft, D 5090 Leverkusen, Bayerwerk, Fed. Rep. of Germany

Filed Jan. 10, 1991, Ser. No. 639,627

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1990, 4001236

Int. Cl.[5] **C07K** *5/04, 5/06;* **A61K** *37/64, 37/02*

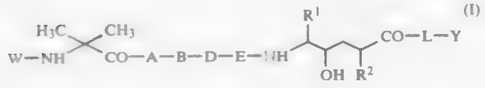
U.S. Cl. 530—330 **8 Claims**

1. A peptide, wherein

W is Boc or $—C(O)R^3$;

R^3 is straight-chain or branched-chain alkyl having up to 8 carbon atoms;

A, B, D, and E are identical or different and represent a direct bond, or a group of having the formula



(I)

in which

p is O;

R^4 is H;

R^5 is the side chain of Asn, Phe, Ser, Or Val;

R^1 is cyclohexylalkyl; and

R^2 is lower alkyl;

L is Ile; and

Y is pyridylmethylamino.

5,145,952

THIOPHENEAZO DYES WITH A COUPLING COMPONENT BASED ON M PHENYLENEDIAMINE

Heinz Ellingsfeld; Karl-Heinz Etzbach, both of Frankenthal; Guenter Hansen, Ludwigshafen Helmut Reichelt, Neustadt, and Ernst Schefczik, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

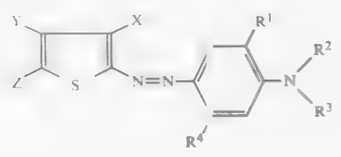
Filed Dec. 29, 1989, Ser. No. 459,255

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902005

Int. Cl.[5] C09B *29/033, 29/09;* **D06P** *1/18, 3/36*

U.S. Cl. 534—753 2 Claims

1. A thiopheneazo dye of formula I



(I)

wherein

X is cyano,

Y is halogen, hydroxyl, mercapto, unsubstituted or phenyl-substituted C_1–C_6-alkoxy, C_5–C_7-cycloalkoxy, substituted or unsubstituted phenoxy, unsubstituted or phenyl-substituted C_1–C_6-alkylthio, C_5–C_7-cycloalkylthio, phenylthio, chlorophenylthio, C_1–C_6-alkylsulfonyl, phenylsulfonyl or methylphenylsulfonyl, is nitro, cyano, C_1–C_4-alkanoyl, benzoyl, C_1–C_4-alkylsulfonyl, phenylsulfonyl or a radical of the formula $—CB^1=CB^1B^2$ or $—CH=N—B^3$, in which B^1 and B^2 are identical or different and each independently of the other is cyano, C_1–C_6-alkoxycarbonyl whose alkyl chain may be interrupted by one or two oxygen atoms, or C_3–C_6-alkenyloxycarbonyl or one of B^1 and B^2 is cyano and the other is C_1–C_4-alkylsulfonyl, substituted or unsubstituted phenyl, benzoyl, phenylsulfonyl or carbamoyl and B^3 is hydroxyl, C_1–C_4-alkoxy, phenoxy or phenylamino

R^1 is C_1–C_4-alkoxy,

R^2 is hydrogen, C_1–C_{10}-alkyl which may be interrupted by one or two oxygen atoms, or R^3,

R^3 is radical of the formula $CH_2—CH(OR^5)—CH_2R^6$ and

R^4 is unsubstituted or hydroxyl-, C_1–C_4-alkoxy-, phenoxy-, chlorine- or C_1–C_4-alkanoyloxy-substituted C_1–C_6-alkanoylamino, benzoylamino, or benzoylamino substituted by methoxy, methyl or chloro,

R^5 is hydrogen, C_1–C_{10}-alkanoyl, C_1–C_{10}-alkoxycarbonyl or C_1–C_{10}-mono- or dialkyl-carbamoyl, the alkyl groups of said substituents being uninterrupted or interrupted by one or two oxygen atoms, and

R^6 is chlorine, bromine, hydroxyl, phenoxy, allyloxy, C_1–C_{10}-alkoxy which may be interrupted by one or two oxygen atoms or substituted by hydroxyl, phenoxy, phenyl, C_1–C_8-alkanoyloxy, chlorine, bromine or cyano, C_1–C_6-alkanoyloxy, C_1–C_6-mono- or -dialkyl- aminocarbonyloxy or phenylaminocarbonyloxy and the substituents on substituted phenyl are independently selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy and halogen, and the substituents on substituted phenoxy are methyl, isopropyl, methoxy or bromo.

5,145,953

MONOMERS OF BISCYCLOBUTARENES BRIDGED BY AT LEAST ONE AZO LINKAGE

Robert A. Kirchhoff, Midland, Mich., and Alan K. Schrock, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1988, Ser. No. 151,682

Int. Cl.[5] C07C *245/08, 245/10;* **C09B** *29/01*

U.S. Cl. 534—851 6 Claims

1. A biscyclobutarene monomer having two cyclobutarene moieties bridged by a divalent radical having at least one azo linkage.

5,145,954

DERIVATIVES OF ALPHAPHENYLACRYLIC ACID AND THEIR USE IN AGRICULTURE

Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow; Paul DeFraine, Wokingham; Christopher R. A. Godfrey, Bracknell; Thomas E. Wiggins, Bracknell, and David J. Tapolczay, Bracknell, all of England, assignors to Imperial Chemical Industries PLC, London, England

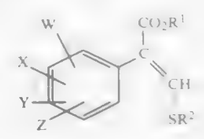
Filed Apr. 17, 1989, Ser. No. 39,458

Claims priority, application United Kingdom, Apr. 17, 1986, 8609455

Int. Cl.[5] C09B *29/01, 29/02, 29/34;* **C07C** *149/40*

U.S. Cl. 534—852 5 Claims

1. A compound of the formula (I):



(I)

or stereoisomers thereof, wherein R^1 and R^2, which are the same or different, are methyl or methyl substituted with fluorine; W, X, Y and Z, which are the same or different, are hydrogen, halogen, hydroxy, alkyl, alkyl substituted with alkylthio, phenylthio or tetrahydropyranyl, cycloalkyl, cycloalkylalkyl, aralkyl, aryloxyalkyl, alkenyl, aryl, alkynyl, $—NR'R''$, arylazo, heteroarylalkyl, heteroaryloxyalkyl, $—NHCOR'$, nitro, cyano, $—OR^3$, $—SR^3$, $—CO_2R^4$, $—CONR^5R^6$, $—COR^7$, $—CR^8=NR^9$, $—N=CR^{10}R^{11}$, $—SOR^{12}$ or $—SO_2R^{13}$, or any two or W, X, Y and Z in adjacent positions on the phenyl ring, a fused benzene, naphthalene or benzofuran ring; R' and R'' have the meanings given below; R^3 is alkyl, alkyl substituted with alkylthio or phenylthio, cycloalkyl, cycloalkyl containing a hetero atom in the cycloalkyl ring, alkenyl, aryl, aralkyl, —COR', or heteroaryl; R^4, R^5, R^6, R^7, R^8, R^{10} and R^{11}, which are the same or different, are hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, alkenyl, alkynyl, aryl, heteroaryl, aralkyl, or cycloalkylalkyl; and R^9, R^{12} and R^{13} are aryl or heteroaryl; wherein any of the foregoing alkyl groups and the alkyl moieties of alkoxy groups is unsubstituted or substituted with hydroxy, halogen or alkoxycarbonyl, any of the foregoing alkyl moieties of aralkyl and aryloxyalkyl groups is unsubstituted or substituted with hydroxy,

any of the foregoing alkenyl groups is unsubstituted or substituted with aryl or heteroaryl or the terminal carbon atom of such groups forms part of a 5- or 6-membered cycloalkyl group, any of the foregoing alkynyl groups is unsubstituted or substituted with aryl, and wherein the aryl or heteroaryl moieties of any of the foregoing are unsubstituted or substituted with one or more of the following; halogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, halo(C_{1-4}) alkyl, halo(C_{1-4}) alkoxy, C_{1-4} alkylthio, C_{1-4} alkoxy (C_{1-4}) alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl (C_{1-4})alkyl, aryl, aryloxy, aryl(C_{1-4}) alkyl, aryl(C_{1-4}) alkoxy, aryloxy(C_{1-4}) alkyl, carbacyl, cyano, thiocyanato, nitro, $—NR'R''$, $—NHCOR'$, $—NHCONR''$, $—CONR'R''$, $—COOR''$, $—OSO_2R'$, $—SO_2R'$, $—COR'$, $—CR'=NR''$ or $—N=CR'R''$ in which R' and R'' are independently hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl (C_{1-4}) alkyl, phenyl or benzyl, the phenyl and benzyl groups being unsubstituted or substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy.

5,145,955

PROCESS FOR THE PREPARATION AND COMPOSITION OF A FRACTION CONTAINING PICROSIDE I AND KUTKOSIDE

Bacchan S. Aswal; Ramesh Chander; Sunil K. Chatterji; Bhola N. Dhawan; Yogesh Dwivedi; Narendra K. Garg; Poonam Jain; Narinder K. Kapoor; Dinesh K. Kulshreshtha; Bishan N. Mehrotra; Gyanendra K. Patnaik; Ravi Rastogi; Jagat P. S. Sarin; Krishna C. Saxena; Shekhar C. Sharma; Shri K. Sharma; Binduja Shukla, and Pradeep K. S. Visen, all of Lucknow, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Filed Oct. 28, 1991, Ser. No. 783,410

Int. Cl.[5] A01N *65/00;* **A65K** *35/78*

U.S. Cl. 536—124 10 Claims

1. A process for the preparation of a fraction of *Picrorhiza kurrooa* consisting essentially of (a) 1a,1b,2,5a,6,6a-hexahydro-6hydroxy 1a (hydroxymethyl)-oxireno[4,5]cyclopenta (1,2-c) pyran-2-yl-6-(3-phenyl-2-propanoate),[1aS-(1aα-1bβ,2β(E),-5aβ,6β,6,aα)]-β-D-glcopyranoside (Picroside I); (b) 1a,1b,2-,5a,6,6a-hexahydro-6-hydroxy-1a [(4-hydroxy-3-methoxybenzoyl)oxy]oxy]methyl]oxireno[4,5]-cylopenta (1,2-c) pyran-2-yl-β-D-glucopyranoside (kutkoside) and (c) a fraction desiganated as F006 containing curcurbitacin glycosides, the total amount of (a) and (b) ranging from 50–70%, the ratio of (a) and (b) being 1:1.5 to 1:2 weight, the amount of (c) being 4–5% by weight said process comprising:

i) extracting the root and/or rhizome powder of the plant *P. kurrooa* with a polar solvent and partitioning with a mixture of polar solvent and water to form a solvent and an aqueous layer;

ii) treating the aqueous layer with the polar solvent or a mixture of polar solvents to form an aqueous layer and a solvent layer;

iii) washing the solvent layer with water; and

iv) treating the washed layer with a decolorizing agent.

5,145,956

METHOD FOR SEPARATION OF ANIONIC OLIGOSACCHARIDES

Lun H. Lam, Cupertino, and David Tyrrell, Redwood Shores, both of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Filed Dec. 11, 1991, Ser. No. 805,501

Int. Cl.[5] C07H *1/06, 3/10, 19/00;* **C12N** *11/08*

U.S. Cl. 536—124 10 Claims

1. A method to separate components of a mixture of anionic oligosaccharides lacking carbonyl groups, which method comprises:

applying said mixture to a chromatographic column wherein said chromatographic column contains a solid support coated with polyethyleneimine (PEI) under conditions where said anionic oligosaccharides are adsorbed to the column;

followed by eluting said column with a salt gradient to obtain a multiplicity of fractions so as to separate said anionic oligosaccharide components.

5,145,957

STEREOSELECTIVE SYNTHESIS OF A CHIRAL CIS 3-BETA HYDROGEN (3R) 4-AROYLOXY AZETIDINONE

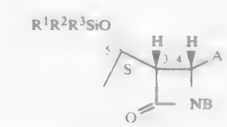
David M. Tschaen, Aberdeen; Joseph E. Lynch, Plainfield; William L. Laswell, Bridgewater; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 644,866, Jan. 23, 1991, abandoned, which is a continuation of Ser. No. 522,416, May 10, 1990, abandoned, which is a continuation of Ser. No. 169,650, Mar. 18, 1988, abandoned. This application Jan. 9, 1992, Ser. No. 819,601

Int. Cl.[5] C07B *37/10;* **C07D** *205/08;* **C07F** *7/18*

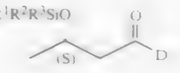
U.S. Cl. 540—200 10 Claims

1. A process for preparing the chiral azetidinone compound:



III

in at least a 60:40 ratio to its 3-α-hydrogen diastereomer, comprising the step of contacting the chiral butyryl compound:



I

with the imine:

II

in an organic solvent therefor and in the presence of an organic amine capable of generating a ketene from the butyryl compound; in the temperature range of −60° C. to +120° C., for a sufficient time to yield the desired azetidinone III; where R^1, R^2 and R^3 are independently selected from C_1–C_5 alkyl or aryl, optionally substituted with groups inert under the reaction conditions with the proviso that at least one of R^1, R^2 or R^3 is t-butyl or a bulkier group; D is halo, or an effective organic leaving group under the reaction conditions; B is an imine-nitrogen protecting group removable by oxidation, acid hydrolysis, or catlytic hydrogenation under mild conditions; A is C_1–C_5 linear or branched acyl or acyloxy, C_6–C_8 aroyl or aryloxy which can optionally be substituted by groups inert under the reaction conditions.

5,145,958

PROCESS FOR THE PREPARATION OF 2,4- OR 2,6-DIHALOGENO-ANILINE

Wolfram Kissener, Bergisch-Gladbach, and Helmut Fiege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

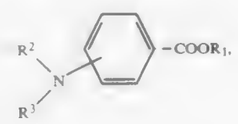
Continuation of Ser. No. 581,837, Sep. 12, 1990, abandoned. This application Nov. 26, 1991, Ser. No. 799,918

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1989, 3933093

Int. Cl.[5] C07C *09/78*

U.S. Cl. 544—106 **18 Claims**

1. A process for the preparation of 2,4- or 2,6-dichloro aniline, wherein an amino-benzoic acid ester of the formula



in which

R^1 denotes straight-chain or branched C_1–C_8-alkyl, benzyl or phenyl and

R^2 and R^3, independently of one another, represent hydrogen, straight-chain or branched C_1–C_8-alkyl or benzyl, where R^2 and R^3 together may denote —(—CH_2—)$_4$, —(—CH_2—)$_5$, —C_2—H_4—O—C_2H_4—, —C_2H_4—NH—C_2H_4—, or —C_2H_4—NCH_3—C_2H_4—,

is reacted with 2–2.5 moles of elementary chlorine in an aromatic halogeno hydrocarbon at a temperature of 40°–160° C. thereafter distilling off the aromatic halogeno hydrocarbon and subsequently hydrolyzing and decarboxylating the dichlorinated amino-benzoic acid ester which is obtained.

5,145,959

SUBSTITUTED PYRIDO (2,3-d) PYRIMIDINES AS INTERMEDIATES

Walter Hübsch; Rolf Angerbauer; Peter Fey, all of Wuppertal; Thomas Philipps, Cologne; Hilmar Bischoff, Wuppertal; Dieter Petzinna, Duesseldorf; Delf Schmidt, Wuppertal, all of Fed. Rep. of Germany, and Günter Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

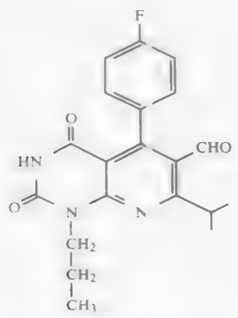
Division of Ser. No. 460,212, Jan. 2, 1990, Pat. No. 5,075,311. This application Jun. 19, 1991, Ser. No. 717,738

Claims priority, application Italy Jul. 18, 1989, 21215 A/89

Int. Cl.[5] C07D *471/04*

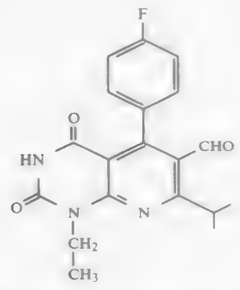
U.S. Cl. 544—279 **3 Claims**

1. The compound 1-propyl-5-(4-fluorophenyl)-6-formyl-7-isopropyl-2,4-dioxo-1,2,3,4-tetrahydro-pyrido(2,3-d)pyrimidine of the formula



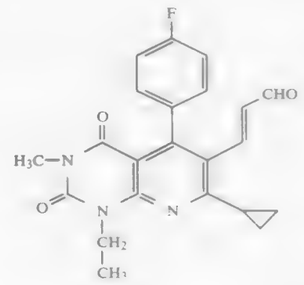
or a pharmaceutically acceptable salt thereof.

2. The compound 1-ethyl-5-(4-fluorophenyl)-6-formyl-7-isopropyl-2,4-dioxo-1,2,3,4-tetrahydro-pyrido(2,3-d)pyrimidine of the formula



or a pharmaceutically acceptable salt thereof.

3. The compound E-3-[7-cyclopropyl-1-ethyl-5-(4-fluorophenyl)-3-methyl-2,4-dioxo-1,2,3,4-tetrahydro-pyrido(2,3-d)pyrimidin-6-yl]prop-2-enal of the formula



or a pharmaceutically acceptable salt thereof.

5,145,960

PYRIMIDINYL TETRAHYDROFURANS

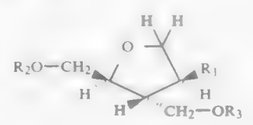
Robert Zahler, Princeton, and Joseph A. Tino, Robbinsville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 486,988, Mar. 1, 1990, Pat. No. 5,059,690, which is a continuation-in-part of Ser. No. 342,048, Apr. 24, 1989, abandoned. This application Aug. 7, 1991, Ser. No. 741,861

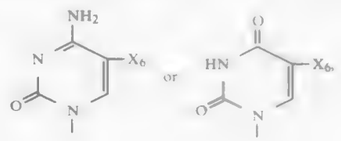
Int. Cl.[5] A61K *31/505;* C07D *239/02, 405/04*

U.S. Cl. 544—310 **23 Claims**

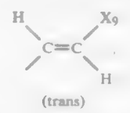
1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein R_1 is



X_6 is fluoro, chloro, bromo, iodo, hydrogen, methyl, trifluoromethyl, ethyl, n-propyl, 2-fluoroethyl, 2-chloroethyl, or



(trans)

X_7 is hydrogen, alkyl, substituted alkyl, phenyl or substituted phenyl,

X_9 is chloro, bromo, iodo, hydrogen, methyl, or trifluoromethyl,

R_2 and R_3 are independently hydrogen, —PO_3H_2, or

the term "alkyl" refers to straight and branched chained groups of 1 to 10 carbons,

the term "substituted alkyl" refers to alkyl groups having one or more substituents selected from the group consisting of halogen, amino, azido, hydroxy, cyano, trialkylammonium (wherein each alkyl group has 1 to 6 carbons), alkoxy of 1 to 6 carbons, phenyl, substituted phenyl, and carboxy, and

the term "substituted phenyl" refers to a phenyl substituted with one, two, or three groups selected from the group consisting of alkyl of 1 to 6 carbons, alkoxy of 1 to 6 carbons, halogen, trifluoromethyl, amino, alkylamino of 1 to 6 carbons, dialkylamino (wherein each alkyl group has 1 to 6 carbons), nitro, cyano, alkanoyloxy of 2 to 11 carbons, carboxy, carbonyl, and hydroxy.

5,145,961

PROCESS FOR THE PREPARATION OF 5-FLUOROPYRIMIDINES

Dietmar Bielefeldt, Ratingen, and Rudolf Braden, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

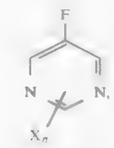
Filed Feb. 13, 1992, Ser. No. 834,906

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1991, 4105553

Int. Cl.[5] C07D *239/30*

U.S. Cl. 544—334 **8 Claims**

1. A process for the preparation of 5-fluoropyrimidines of the formula (I)



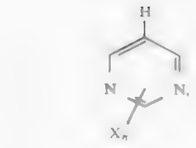
(I)

in which

X represents independently of each other, fluorine or chlorine and

n is 1, 2 or 3,

in which a halogenated pyrimidine of the formula (II)



(II)

in which

X and n have the meanings defined as for formula (I),

is reacted with elemental fluorine in the presence of a solvent.

5,145,962

HUMAN PRO RELAXIN POLYPEPTIDES

Peter J. Hudson, Bulleen; John Shine, Swinger Hill; Hugh D. Niall, Elwood, and Geoffrey W. Tregear, Hawthorn, all of Australia, assignors to Howard Florey Institute of Experimental Physiology and Medicine, Melbourne, Australia

Division of Ser. No. 549,668, Jul. 6, 1990, Pat. No. 5,053,488, which is a continuation of Ser. No. 21,878, Mar. 4, 1987, abandoned, which is a division of Ser. No. 863,819, May 12, 1986, Pat. No. 4,758,516, which is a continuation of Ser. No. 522,956, Aug. 12, 1983, abandoned. This application Apr. 8, 1991, Ser. No. 681,828

Claims priority, application Australia, Aug. 12, 1982, 5352/82

Int. Cl.[5] C07K *7/10*

U.S. Cl. 530—324 **10 Claims**

1. Essentially pure human H1-preprorelaxin, which is free of other human proteins.

5,145,963

OPTICAL INFORMATION RECORDING MEDIUM AND NICKEL DITHIOLATE COMPLEX COMPOUNDS EMPLOYED IN THE SAME

Kazukiyo Nagai, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

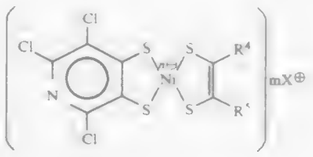
Division of Ser. No. 420,020, Oct. 11, 1989, Pat. No. 5,013,634. This application Sep. 18, 1990, Ser. No. 584,917

Claims priority, application Japan, Oct. 12, 1988, 63-258170; Nov. 16, 1988, 63-289353

Int. Cl.[5] C07D *213/70;* G01D *9/00;* B32B *13/02;* G03C *1/00*

U.S. Cl. 546—6 **5 Claims**

1. A dithiolate nickel complex compound having the formula (II):



(II)

wherein R^4 and R^5 each independently represent hydrogen, an alkyl group having 1 to 6 carbon atoms, an aryl group or a cyano group, or R^4 and R^5, together with the carbons to which they are attached form a pyridinyl ring; X represents a cation; wherein n and m both equal 1.

5,145,964

PROCESS FOR THE PREPARATION OF PERYLENE-3,4,9,10-TETRACARBOXYDIIMIDES IN A COLORISTICALLY VALUABLE PIGMENT FORM

Detlef-Ingo Schütze, and Dietmar Müller, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1991, Ser. No. 662,053
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1990, 4007728
Int. Cl.[5] C07D *471/06*
U.S. Cl. 546—37 7 Claims

1. Process for the preparation of brilliant and easily dispersible perylene-3,4,9,10-tetracarboxydiimides of high color strength and N-alkyl derivative thereof having 1 to 4 carbon atoms per alkyl group, characterized in that the crude pigments are first brought into a finely divided form by milling in the absence of organic solvents with or without the addition of salt, by kneading in the presence of salt or reprecipitation from sulphuric acid, and then, after removal of salt or sulphuric acid, subjected to a treatment by means of a mixture of water and an organic solvent selected from the group consisting of alcohols, aliphatic or cycloaliphatic ketones, carboxylic acids and carboxylic esters.

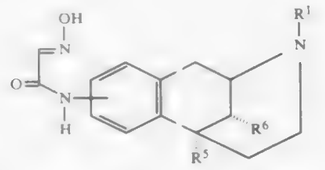
5,145,965

2,6-METHANOPYRROLO-3-BENZAZOCINES

Richard C. Allen, Flemington, and David G. Wettlaufer, Phillipsburg, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 483,474, Feb. 22, 1990, Pat. No. 5,037,985, which is a division of Ser. No. 272,045, Nov. 16, 1988, Pat. No. 4,929,622, which is a continuation-in-part of Ser. No. 101,716, Sep. 24, 1987, abandoned. This application Mar. 11, 1991, Ser. No. 666,194
Int. Cl.[5] C07D *471/08, 221/22*
U.S. Cl. 546—63 1 Claim

1. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen, loweralkyl, loweralkenyl, cycloalkylloweralkyl, arylloweralkyl, where the term aryl signifies a phenyl group optionally substituted by up to 3 substituents each of which is independently loweralkyl, loweralkoxy, halogen, trifluoromethyl, nitro or cyano, and —C(O)R^9 wherein R^9 is hydrogen, loweralkyl or loweralkoxy; and R^5 and R^6 are independently hydrogen or loweralkyl, or taken together are a bivalent radical of the formula —$(CH_2)_4$—.

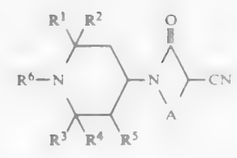
5,145,966

CYCLIC AMIDES

Alexander Aumueller, Deidesheim, and Hubert Trauth, Dudenhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 12, 1990, Ser. No. 597,876
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934176
Int. Cl.[5] C07D *211/80*
U.S. Cl. 546—193 6 Claims

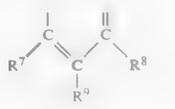
1. A cyclic amide of the formula I



(I)

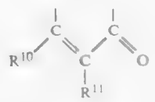
where

A is a group of the formula



(a)

or



(b)

where in each case the left-hand free bond is linked to the amide nitrogen and the right-hand free bond, depending on the group, is a single or double bond, and where R^7 to R^{11} are hydrogen, C_1–C_4-alkyl or phenyl,

R^1 to R^4 are C_1–C_4-alkyl, where R^1 and R^2 and/or R^3 and R^4 may in each case be linked to form a 5- or 6-membered ring,

R^5 is hydrogen or C_1–C_3-alkyl, and

R^6 is hydrogen, C_1–C_4-alkyl which may additionally be substituted by cyano, hydroxyl, amino or phenyl, or is C_1–C_4-acyl.

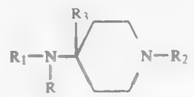
5,145,967

METHOD FOR PREPARING 4-ALKOXYALKYL-4-PHENYLAMINOPIPERDINES AND DERIVATIVES THEREOF

Bor-Sheng Lin, Berkeley Heights; H. Kenneth Spencer, Chatham, and Joseph W. Schebiein, Flemington, all of N.J., assignors to Anaquest, Inc., Libery Corner, N.J.

Continuation-in-part of Ser. No. 340,976, Apr. 20, 1989, abandoned. This application Nov. 2, 1990, Ser. No. 608,427
Int. Cl.[5] C07D *401/04*
U.S. Cl. 546—208 6 Claims

1. A method for preparing a 4-alkoxyalkyl-4-phenylaminopiperidine compound having the general formula:



(I)

wherein

R is selected from the group consisting of phenyl and substituted phenyl wherein the substituents are one or more members selected from the group consisting of halo, lower-alkyl and lower-alkoxy;

R_1 is selected from the group consisting of hydrogens, lower-alkyl carbonyl, lower-alkenyl carbonyl, lower-alkoxy lower-alkyl carbonyl and cycloalkyl carbonyl;

R_2 is selected from the group consisting of hydrogen, lower-alkyl, cycloalkylmethyl, phenyl lower-alkyl, pyrrolyl lower-alkyl, pyrazolyl lower-alkyl, imidazolyl lower-alkyl, imidazinyl lower-alkyl, imidazolyl lower-thioalkyl, triazolyl lower-alkyl, triazolyl lower-thioalkyl, tetrazolyl lower-alkyl, tetrazolyl lower-thioalkyl, thienyl lower-alkyl, thienyl lower-oxyalkyl, thienyl lower-hydroxyalkyl, furnayl lower-hydroxyalkyl, thaizolyl lower-alkyl, oxazolyl lower-alkyl, thiadiazolyl lower alkyl, oxadiazolyl lower-alkyl, pyridin-1-yl lower-alkyl, pyridin-3-yl lower alkyl, pyridin-4-yl lower alkyl, piperidinyl lower-alkyl, pyrimidinyl lower-alkyl, pyridazinyl lower-alkyl, triazinyl lower-alkyl, indolyl lower-alkyl, isoidolyl lower-alkyl, benzimidazolyl lower-alkyl, benzopyrazolyl lower-alkyl, benzoxazolyl lower-alkyl, benzopyranyl lower-alkyl, benzodioxanyl lower-alkyl, benzothiazinyl lower-alkyl, quinazolinyl lower-alkyl, purinyl lower-alkyl, phthalimidyl lower-alkyl, napthalenecarboxamidyl lower-alkyl, and napthalenesulfamidyl lower-alkyl wherein the heterocyclic groups can be unsubstituted or substituted with one or more substituents selected from the group consisting of halo, oxo, hydroxyl, nitro, amino, lower-alkoxy carbonyl, lower-alkyl, lower-cycloalkyl, lower-alkoxy, mercaptolower alkyl, halogenated lower-alkyl, aryl, halogenated aryl, and a heterocyclic group;

and R_3 is methoxymethyl, which comprises:

(a) reacting an N-R_2-substituted-4-piperidone compound with an aniline compound to form a Schiff base compound;

(b) reacting the Schiff base compound with the alphalithium derivative of methoxymethyl phenyl sulfide to form an amine compound; and

(c) reducing the amine compound.

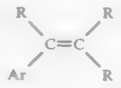
5,145,968

SELECTIVE MONOEPOXIDATION OF STYRENE, STYRENE ANALOGS, AND STYRENE DERIVATIVES TO THE CORRESPONDING OXIDE WITH MOLECULAR OXYGEN

John R. Monnier, Fairport, and Peter J. Muehlbauer, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 270,332, Nov. 14, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 394,023
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] C07D *403/04, 301/10*
U.S. Cl. 546—268 6 Claims

1. Process for the selective monoepoxidation of aryl-vinyl compounds having the structure:



wherein Ar is phenyl; phenyl substituted with methyl, methoxy, halogen, vinyl, or phenyl; naphthyl; or pyridyl; and each R is independently selected from hydrogen and alkyl having in the range of 1 up to 20 carbon atoms, with the proviso that there are no hydrogen atoms allylic to a double bond in said structure;

said process comprising contacting said aryl-vinyl compound with a sufficient quantity of an oxygen-containing gas so as to maintain the molar ratio of aryl-vinyl compound to oxygen in the range of 0.01 to up to 30, in the presence of a silver-containing catalyst containing in the range of 0.01 to 2 weight %, based on the total weight of catalyst, including support, of at least one promoter selected from the salts and oxides of cesium and rubidium; wherein said contacting is carried out at a pressure in the range of 0.1 up to 100 atmospheres, at a temperature in the range of 100° up to 325° C. for a time sufficient to obtain aryl-vinyl compound conversions in the range of 0.5 up to 75%.

5,145,969

Patent Not Issued For This Number

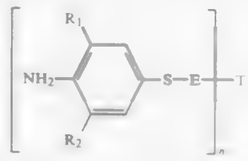
5,145,970

STABILIZERS DERIVED FROM 3,5-DIALKYL-4-AMINOBENZENETHIOL

Stephen D. Pastor, Danbury, Conn., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 24, 1990, Ser. No. 602,968
Int. Cl.[5] C07D *207/40;* C07C *219/28, 219/32*
U.S. Cl. 548—546 15 Claims

1. A compound of formula I



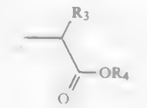
(I)

wherein

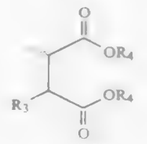
R_1 and R_2 are independently alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 9 carbon atoms or said phenylalkyl substituted on the phenyl ring by alkyl of 1 to 4 carbon atoms,

n is an integer from 1 to 4,

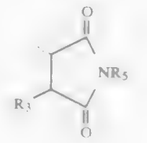
when n is 1, E is a direct bond, and T is a group of formula II, III, or IV



II



III



IV

where

R_3 is hydrogen or methyl,

R_4 is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, phenyl or said phenylalkyl or said phenyl substituted on the phenyl ring by one or two alkyl of 1 to 4 carbon atoms,

R_5 is alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 or 12 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, phenyl or said phenylalkyl or said phenyl substituted on the phenyl ring by one or two alkyl of 1 to 4 carbon atoms,

when n is 2–4; E is —$CH_2CH(R_3)COO$— where the oxygen atom is attached to T, and

T is an n-valent radical of an alkanepolyol of 3 to 12 carbon atoms after removal of the OH groups.

5,145,971

PROCESS FOR THE PREPARATION OF OXYDIPHTHALIC ACID AND PURIFIED OXYDIPHTHALIC ANHYDRIDE FROM CRUDE OXYDIPHTHALIC ANHYDRIDE

Viesturs Lesins, Buffalo, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 25, 1991, Ser. No. 783,026
Int. Cl.[5] C07D *307/89, 307/77*
U.S. Cl. 549—250 13 Claims

1. A process for the production of purified oxydiphthalic acid from impure oxydiphthalic anhydride comprising the steps of
1) mixing the impure oxydiphthalic anhydride with an aqueous solvent containing 25–75 wt % of a carboxylic acid selected from the group consisting of propionic acid and butyric acid to form a mixture;
2) warming said mixture until the ODPA has been substantially hydrolyzed to oxydiphthalic acid;
3) cooling said mixture; and
4) separating the solid oxydiphthalic acid from the aqueous phase.

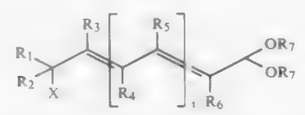
5,145,972

PROCESS FOR PREPARING HALO ACETALS FROM ENAMINES

Pierre Chabardes, Sainte Foy Les Lyon; Lucette Duhamel; Pierre Duhamel, both of Mont Saint Aignan; Jerome Guillemont, Beuzeville, and Jean-Marie Poirier, Saint Martin du Vivier, all of France, assignors to Rhone-Poulenc Nutrition Animale, Commentry, France

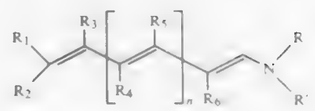
Filed Dec. 3, 1990, Ser. No. 620,610
Claims priority, application France, Dec. 1, 1989, 89 15868
Int. Cl.[5] C07D *317/16, 43/30*
U.S. Cl. 549—221 2 Claims

1. A process for preparing halo acetals of ethylenic aldehydes of formula (I):



(I)

wherein:
X represents a halogen atom selected from chlorine, bromine and iodine atoms;
R_1, R_2, R_3, R_4, R_5 and R_6, which may be identical or different, represent a hydrogen atom or an alkyl radical containing 1 to 6 carbon atoms in a straight or branched chain, or an alkenyl radical containing 3 to 6 carbon atoms in a straight or branched chain, and in which the double bond is in a position other than 1-2;
n is equal to 0, 1, 2, 3 or 4, with the understanding that, when n is greater than 1, each R_4 and each R_5 may be identical or different; and
R_7 each represent an alkyl radical containing 1 to 6 carbon atoms in a straight or branched chain or, together, form an alkylene radical R'_7 containing 2 to 6 carbon atoms in a straight or branched chain and optionally substituted with a hydroxyl radical or an alkoxy radical containing 1 to 6 carbon atoms, which comprises the steps of 1) reacting a halogen cation selected from Cl^+, Br^+ and I^+ with an enamine of formula:



(II)

wherein
R_1, R_2, R_3, R_4, R_5, R_6 and n are defined as above and
R and R′ represent alkyl radicals containing 1 to 6 carbon atoms in a straight or branched chain or an alkylene or alkenylene radical optionally containing hetero atoms selected from oxygen, sulphur and nitrogen, and 2) wherein the product obtained after hydrolysis is reacted with a primary or secondary alcohol of formula R_7OH, or a glycol of formula HO-R'_7-OH, or an orthoformate of formula $HC(OR_7)_3$ or a mixed orthoformate of formula $(O_2R'_7)CH\text{-}(OR_7)_3$, wherein $R_7$and R'_7 are defined as above.

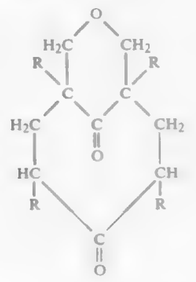
5,145,973

OXA-BICYCLIC POLYFUNCTIONAL COMPOUNDS AND PREPARATION THEREOF

Ronald S. Newman, North Brunswick, N.J., and St. Clair W. Greenidge, Brooklyn, N.Y., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 30, 1991, Ser. No. 767,800
Int. Cl.[5] C07D *311/94*
U.S. Cl. 549—397 3 Claims

1. A 1,3,5,7-tetraalkyl-9-oxa-bicyclo[5.3.1.]undecane-4,11-dione having the formula:



where R is an alkyl group having from one to 12 carbon atoms.

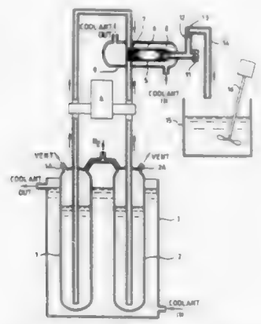
5,145,974

PREPARATION OF NITRATOALKYL-SUBSTITUTED CYCLIC ESTERS

Norman C. Paul, Hertfordshire; Ross W. Millar, Essex, and Peter Golding, Hertfordshire, all of United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

PCT No. PCT/GB89/00812, § 371 Date Mar. 22, 1991, § 102(e) Date Mar. 22, 1991, PCT Pub. No. WO90/01028, PCT Pub. Date Feb. 8, 1990
PCT Filed Jul. 14, 1989, Ser. No. 669,405
Claims priority, application United Kingdom, Jul. 22, 1988, 8817545; Apr. 7, 1989, 8907852
Int. Cl.[5] C07D *301/00, 305/06, 305/04*
U.S. Cl. 549—510 14 Claims

1. A process for the preparation of a nitratoalkyl-substituted cyclic ether by the nitration of an hydroxyalkyl-substituted cyclic ether, characterised by the steps of
(a) cocurrently mixing a first stream of the hydroxyalkyl-substituted cyclic ether with a second stream of N_2O_5 to form a reaction mixture as a product stream in which said nitratoalkyl-substituted cyclic ether and nitric acid are formed as co-products, the second stream containing a molar excess of N_2O_5 with respect to the hydroxyl groups present in the hydroxyalkyl-substituted cyclic ether in the first stream, and



(b) rapidly separating said nitric acid from the reaction mixture.

5,145,975

NAPHTHOQUINONE DERIVATIVES

Graeme B. Henderson; Peter C. Ulrich, both of New York, and Anthony Cerami, Shelter Island, all of N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 199,664, May 27, 1988, Pat. No. 4,942,170. This application Jul. 6, 1990, Ser. No. 549,410
Int. Cl.[5] C07C *129/12, 50/12*
U.S. Cl. 552—299 2 Claims

1. The compound which is 2,3-bis(3-(2-amidinohydrazono)-butyl)-1,4-naphthoquinone dihydrochloride.

5,145,976

POLYMERIC DIORGANOTIN CATALYSTS FOR USE IN POLYURETHANE SYSTEMS

James D. Nichols, and John B. Dickenson, both of Fogelsville, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 424,855, Oct. 20, 1989, Pat. No. 5,089,584. This application Sep. 6, 1991, Ser. No. 756,014
Int. Cl.[5] C07F *7/22*
U.S. Cl. 556—88 8 Claims

1. A composition prepared by reacting about 0.5 to 1 moles $HSCH_2CH(OH)CH_2XH$, where X is —S— or —O—, per mole diorganotin oxide or diorganotin dichloride.

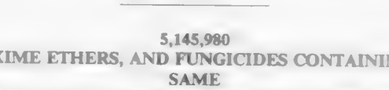
5,145,977

POSTEMERGENT HERBICIDE COMPOSITIONS CONTAINING ACETOXY-TERMINATED SILICONE GLYCOL AND DISPERSANT

Lenin J. Petroff, Bay County; David J. Romenesko, and Bradley C. Bahr, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 439,906, Nov. 21, 1989, Pat. No. 4,933,002. This application Feb. 26, 1990, Ser. No. 484,604
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—437 1 Claim

1. A silicone glycol having the structure



wherein Me denotes a methyl radical.

5,145,978

POSTEMERGENT HERBICIDE COMPOSITIONS CONTAINING SILICONE GLYCOL ADJUVANTS

Lenin J. Petroff, Bay County; David J. Romenesko, and Robert A. Ekeland, both of Midland County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 508,029, Apr. 11, 1990, Pat. No. 5,017,216, which is a continuation-in-part of Ser. No. 274,067, Nov. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 232,737, Aug. 15, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 653,373
Int. Cl.[5] C07F *7/02, 7/04*
U.S. Cl. 556—437 5 Claims

1. A silicone glycol having the structure

wherein Me denotes a methyl radical, R is a divalent alkylene group having 2 to 6 carbon atoms and Z is selected from the group consisting of hydrogen and an acetyl group.

5,145,979

PROCESSES FOR THE PREPARATION OF γ-METHACRYLOXYPROPYLSILANE COMPOUNDS

Kazutoshi Takatsuna; Masaaki Ishii, both of Yokohama; Hideaki Ogawa, Chigasaki; Akihito Shinohara, Kamifukuoka; Kouji Shiozawa, Saitama; Yoshiharu Okumura, Shinjuku, and Masako Ishikawa, Saitama, all of Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Aug. 22, 1991, Ser. No. 748,557
Claims priority, application Japan, Aug. 23, 1990, 2-222151; Sep. 19, 1990, 2-249283; Sep. 19, 1990, 2-249284
Int. Cl.[5] C07F *7/08, 7/18*
U.S. Cl. 556—440 6 Claims

1. A process for the preparation of γ-methacryloxypropylsilane compounds which comprises carrying out the reaction of allyl methacrylate with a hydrosilane compound in the presence of a platinum catalyst, while allowing at least one of a hindered phenol compound and an aromatic amine compound to coexist in the reaction system with an alkylamine compound.

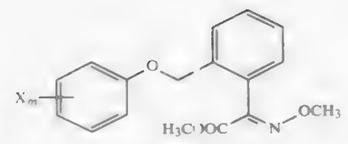
5,145,980

OXIME ETHERS, AND FUNGICIDES CONTAINING SAME

Bernd Wenderoth, Lampertheim; Hubert Sauter; Horst Wingert, both of Mannheim; Michael Hepp, Ladenburg; Siegbert Brand, Weinheim; Thomas Kuekenhoehner, Frankenthal; Franz Roehl; Eberhard Ammermann, both of Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 16, 1990, Ser. No. 509,588
Claims priority, application Fed. Rep. of Germany, May 27, 1989, 3917352
Int. Cl.[5] C07C *229/36*
U.S. Cl. 560—35 7 Claims

1. A compound of the formula



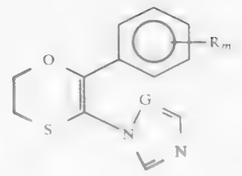
wherein X_m is selected from the group consisting of:
C_3–C_6-alkenyl;
C_1–C_2-haloalkoxy;
C_3–C_6-cycloalkyl;
phenyl;
3-methyl;
2,3-dimethyl;
2,4-dimethyl;
2,5-dimethyl;
2,6-dimethyl;
3,4-dimethyl;
2,3,5-trimethyl;
2,4,5-trimethyl;
3,4,5-trimethyl;
3-t-butyl;
2-methyl-4-t-butyl;
3,5-diethyl;
4n-nonyl;
2-methyl-4-cyclohexyl;
2-benzyl-4-methyl;
2-chloro-4-phenyl;
hexyloxy;
2-methyl-5-isopropyl;
3-methyl-5-isopropyl;
3,4-cyclohexano;
2,3- or 3,4-benzo; and
2-allyl-6-methyl.

5,145,981
USE OF ANTIMONY SALT STABILIZERS FOR 3-ISOTHIAZOLONES
Gary L. Willingham, Glenside, Pa., assignor to Rohm and Haas, Philadelphia, Pa.
Filed Dec. 10, 1990, Ser. No. 625,279
Int. Cl.[5] A01N *43/80*
U.S. Cl. 548—213 **12 Claims**

1. A method of stabilizing a 3-isothiazolone antimicrobial compound against chemical degradation in antagonistic environments comprising combining with said 3-isothiazolone compound an amount of a second compound selected from the group consisting of antimony salts sufficient to stabilize said 3-isothiazolone compound.

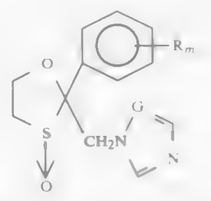
5,145,982
FUNGICIDAL OXATHIN AZOLES
Hoi K. Lai, Guelph, Canada, and Robert A. Davis, Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd./Ltee, Elmira, Canada
Division of Ser. No. 566,012, Aug. 10, 1990, Pat. No. 5,081,143, which is a division of Ser. No. 443,821, Oct. 18, 1989, Pat. No. 4,966,910. This application Oct. 25, 1991, Ser. No. 782,959
Int. Cl.[5] C07D *411/04*
U.S. Cl. 548—266.2 **3 Claims**

1. The process of preparing a compound of formula VII:



(VII)

wherein:
R is each independently halogen; trifluoromethyl; C_1–C_8 alkyl; C_3–C_6 cycloalkyl; C_1–C_8 alkoxy; C_1–C_8 alkoxycarbonyl; amino; aminocarbonyl; aminosulfonyl; C_1–C_8 alkoxysulfonyl; phenyl; phenoxy; phenyl or phenoxy mono-, di- or tri-substituted independently with halogen, trifluoromethyl, C_1–C_8 alkyl or C_1–C_8 alkoxy; or benzyl;
G is CH or N; and
m is 0,1 or 2:
comprising
i) reactively rearranging a compound of formula II



(II)

wherein: R, G and m are as defined above in the presence of an inert chlorinated hydrocarbon solvent and an organic acid at from 20° C. to 80° C.; and
ii) isolating the compound of formula VII from the reaction mixture.

5,145,983
PREPARATION OF N-ACYLIMIDAZOLES
Michael West, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 3, 1991, Ser. No. 695,157
Int. Cl.[5] C07D *233/60*
U.S. Cl. 548—341 **19 Claims**

1. A process for the production of N-acylimidazoles, comprising, contacting a carboxylic anhydride with a carbonyldiimidazole.

5,145,984
BIS-SUCCINIMIDE DERIVATIVES
Stephen J. Cook, Burton Pidsea, England, assignor to BP Chemicals (Additives) Limited, London, England
Filed Sep. 17, 1990, Ser. No. 583,451
Claims priority, application United Kingdom, Sep. 21, 1989, 8921382
Int. Cl.[5] C07D *403/10, 403/12*
U.S. Cl. 548—522 **3 Claims**

1. A compound of formula (IV)

(IV)

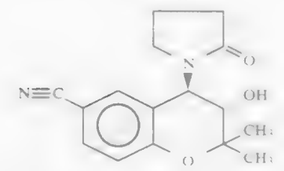
wherein Q is a group of formula (V)

(V)

wherein one of R^1 and R^2 is hydrogen and the other is hydrogen or a lower alkyl group and n is an integer from 1 to 10 and one of R^3 and R^4 is hydrogen and the other is hydrogen or a lower alkyl group, R^5 is a divalent radical selected from the group consisting of alkylene, aralkylene, cycloalkylene, arylene, alkarylene, alkenylene and alkynylene, and R^6 is a hydrocarbyl or substituted hydrocarbyl group, each group Q being the same or different, and each of the units—(CHR^1CHR^2O) being independently defined.

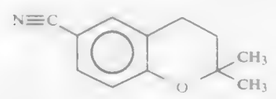
5,145,985
PROCESS FOR THE PREPARATION OF ANTI-HYPERTENSIVE BENZOPYRAN DERIVATIVE
Tibor Timár; Tibor Eszenyi; Péter Sebók; Vilmos Galamb; Julia Fazekas née Kozák; Terézia István née Katona; Éva Kovách née Lakatos, all of Tiszavasvári, and Erika Nagy née Csáki, Tiszalök, all of Hungary, assignors to Alkaloida Vegyeszeti Gyar, Tiszavasvari, Hungary
Filed Jun. 25, 1990, Ser. No. 543,142
Claims priority, application Hungary, Jul. 21, 1989, 3699/89
Int. Cl.[5] C07D *405/04*
U.S. Cl. 548—525 **6 Claims**

1. A process for preparing a compound of the Formula (VI)



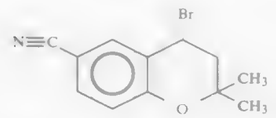
(VI)

which comprises the steps of:
(a) reacting 4-cyanophenol with isoprene at 30° to 120° C. in a water-immiscible solvent in the presence of an acid catalyst selected from the group which consists of hydrochloric acid, sulfuric acid, orthophosphoric acid, perchloric acid, methane sulfonic acid, and p-toluene sulfonic acid to yield a compound of the Formula (II)



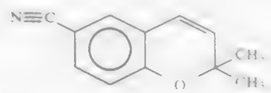
(II)

(b) brominating a compound of the Formula (II) with N-bromosuccinimide in a haloalkane solvent with a trace of peroxide to yield a compound of the Formula (X)



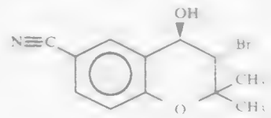
(X)

(c) dehydrobrominating the compound of the Formula (X) with an alkali alcoholate to yield a compound of the Formula (III)



(III)

(d) reacting the compound of the Formula (III) with N-bromosuccinimide in tetrahydroforan at 20° to 120° C. to produce a compound of the Formula (IV)

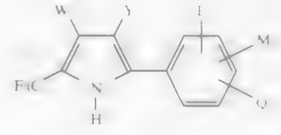


(IV)

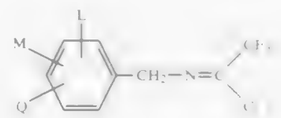
and
(e) reacting the compound of the Formula (IV) with 2-pyrrolidone in the presence of an alkali metal or an alkali metal alcoholate at 20° to 100° C. to obtain the compound of the Formula (VI).

5,145,986
PROCESS FOR THE MANUFACTURE OF INSECTICIDAL, NEMATICIDAL AND ACARICIDAL 2-ARYL-3-SUBSTITUTED-5-(TRIFLUOROMETHYL)PYRROLE COMPOUNDS FROM N-(SUBSTITUTED BENZYL)-2,2,2-TRIFLUORO-ACETIMIDOYL CHLORIDE COMPOUNDS
Venkataraman Kameswaran, Princton Junction, N.J., and David G. Kuhn, Newtown, Pa., assignors to American Cyanamid Company, Stamford, Conn.
Filed Sep. 9, 1991, Ser. No. 756,639
Int. Cl.[5] C07D *207/323, 207/337*
U.S. Cl. 548—531 **14 Claims**

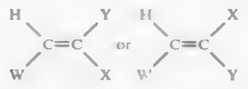
1. A process for the preparation of a 2-aryl-3-substituted-5-(trifluoromethyl)pyrrole compound having the structural formula



wherein
W is H or CF_3;
Y is CN, NO_2 or CO_2R;
R is C_1–C_4 alkyl;
L is H, F, Cl or Br;
M and Q are each independently H, F, Cl, Br, I, CN, NO_2, CF_3, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylsulfonyl, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylthio or R_1CF_2Z;
Z is $S(O)_n$ or O;
n is an integer of 1 or 2; and
R_1 is H, F, CHF_2, CHFCl or CF_3 which comprises reacting an N-(substituted benzyl)-2,2,2-trifluoroacetimidoyl chloride compound having the structural formula



wherein L, M and Q are as described above with at least about one molar equivalent of an α-halo-α,β-unsaturated nitrile, ester or nitro compound having the structural formula



wherein W and Y are as described above, X is Cl, Br or I and at least one molar equivalent of a base in the presence of a solvent to form the 2-aryl-3-substituted-5-(trifluoromethyl)-pyrrole compound.

5,145,987

PROCESS FOR THE PREPARATION OF CIS-1,2-TRANS-4-CYCLOHEXANE TRICARBOXYLIC ACID AND ESTERS

David C. Molzahn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1991, Ser. No. 703,981
Int. Cl.[5] C07C 67/36
U.S. Cl. 560—114 **6 Claims**

1. A process for preparing cis-1,2-trans-4-cyclohexane tricarboxylic acids and esters thereof comprising contacting carbon monoxide, a first reagent selected from the group consisting of cis-1,2,3,6-tetrahydrophthalic acid, cis-1,2,3,6-tetrahydrophthalic acid ester, cis-1,2,3,6-tetrahydrophthalic acid anhydride and mixtures thereof, and a second reagent selected from the group consisting of water, lower alkanols and mixtures thereof in the presence of a palladium complex and an ether solvent at elevated pressure and temperature and such other reaction conditions necessary to result in the formation of the desired cis-trans isomer.

5,145,988

PROCESS FOR PRODUCING HYDRAZONE DERIVATIVES

Makoto Ishizuka, and Takashi Wakasugi, both of Iwaki, Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1991, Ser. No. 734,170
Claims priority, application Japan, Jul. 24, 1990, 2-195505
Int. Cl.[5] C07C 261/00
U.S. Cl. 560—159 **7 Claims**

1. A process for producing a monochloroacetaldehyde alkoxycarbonylhydrazone represented by the formula (II), which comprises depolymerizing monochloroacetaldehyde trimer into monochloroacetaldehyde monomer and then reacting the monomer with an alkyl carbazate represented by the formula (I) in an organic solvent

(I)

(II)

(In the above formulas, R represents an alkyl group).

5,145,989

RECOVERY OF ACRYLIC ACID AND/OR ETHYL ACRYLATE FROM BLACK ACID

Edward F. Dougherty, League City, Tex., and Paul James L., Summit, N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 14, 1987, Ser. No. 73,782
Int. Cl.[5] C07C 57/04, 67/04, 67/11, 69/54
U.S. Cl. 560—205 **6 Claims**

1. In a method for producing ethyl arcylate by reacting ethylene and acrylic acid in the presence of sulfuric acid to obtain ethyl acrylate an a sulfuric acid residue containing sulfuric acid, ethyl hydrogen sulfate, diethyl sulfate, acrylic acid, ethyl acrylate and lactone polyesters of acrylic acid, the improvement comprising forming a mixture of said sulfuric acid residue with a solvent selected from the group consisting of water, a lower alkanol having 1 to 4 carbon atoms, or an aqueous mixture of said alkanol; heating and distilling said mixture at temperatures within the range of about 50° C. to 250° C. at pressures of about 30 mm Hg absolute up to 3 atmospheres to vaporize acrylic acid and ethyl acrylate, and thereafter recovering acrylic acid and ethyl acrylate.

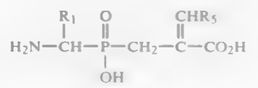
5,145,990

PHOSPHOROUS CONTAINING DHP ENZYME INHIBITORS

William H. Parsons, Rahway; William R. Schoen, Edison, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 264,241, Oct. 28, 1988, abandoned. This application Jan. 9, 1991, Ser. No. 642,692
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[5] C07F 9/30; A61K 31/13, 31/185, 31/66
U.S. Cl. 562—16 **5 Claims**

1. A DHP inhibiting compound of Formula II:



(II)

wherein

R_1 is

(a) C_2–C_{12} linear or branched unsubstituted alkyl;
(b) C_2–C_{12} linear or branched substituted alkyl;
(c) C_2–C_{12} linear or branched monoalkenyl;
(d) C_2–C_{12} linear or branched alkynyl;
(e) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 where N is 1 or 2 and the aryl moiety is C_6–C_{12};
(f) C_3–C_7 cycloalkyl;
(g) C_4–C_{10} cycloalkylalkyl;

wherein said above values for R_1, excluding (a), can be substituted by one or more: C_1–C_4 alkoxy, C_3–C_6 cycloalkyloxy, C_3–C_6 cycloalkylthio, C_6–C_{12} aryloxy, C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{10} aralkyloxy, C_7–C_{16} aralkylthio;

R_5 is

(a) H or C_1–C_{12} linear or branched alkyl;
(b) C_2–C_{12} linear or branched monoalkenyl;
(c) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the aryl moiety is C_6–C_{12};
(d) heterocyclic alkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the heterocyclic ring is 5–6 membered, aromatic, and containing 1–2 heteroatoms selected from the group consisting of O, N and S;
(e) heterocyclic alkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the heterocyclic ring is 5–6 membered, aromatic, containing 1–2 heteroatoms selected from the group consisting of O, N and S, and the heterocyclic ring is fused with a benzene ring;

wherein said above values for R_5 can be substituted by one or more: halo, hydroxy, carboxy, C_1–C_4 alkoxycarbonyl, C_7–C_{16} arylalkoxycarbonyl, C_3–C_7 cycloalkyl, C_1–C_4 alkoxy, C_3–C_6 cycloalkyloxy, C_3–C_6 cycloalkylthio, C_6–C_{12} aryloxy, amino, mono or di-C_1–C_8 alkylamino, thio C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{16} aralkylthio, or the radical $-S-(CH_2)_n-CH(NH_2)COOH$.

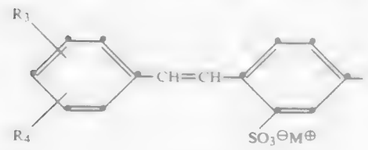
5,145,991

DISTYRYLBIPHENYL COMPOUNDS

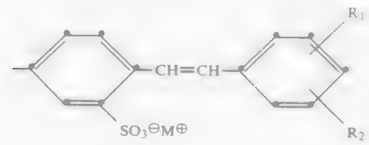
Kurt Weber, Basel, Switzerland, and Claude Eckhardt, Riedisheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 418,046, Oct. 6, 1989, abandoned. This application May 13, 1991, Ser. No. 701,299
Claims priority, application Switzerland, Oct. 13, 1988, 3829/88
Int. Cl.[5] C07C 309/32, 604/46
U.S. Cl. 562—87 **8 Claims**

1. A distyrylbiphenyl compound of formula



(I)



wherein

R_1 and R_3 are each independently of the other hydrogen, C_1–C_4-alkyl or cyano,

R_2 and R_4 are each independently of the other C_1–C_4alkyl or cyano, and

$M^{\oplus}$ is a salt-forming cation.

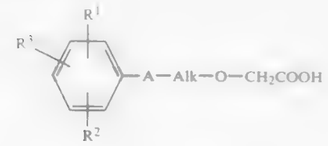
5,145,992

PROCESS AND PREPARATION OF α-ALKOXY ACETIC ACIDS AND THEIR SALTS

Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 6, 1991, Ser. No. 695,676
Int. Cl.[5] C07C 319/20, 51/09
U.S. Cl. 562—431 **21 Claims**

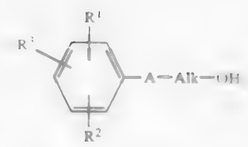
1. A process for preparing a compound of the formula



(I)

or a salt thereof, wherein R^1, R^2 and R^3 are the same or different and are hydrogen, alkyl of 1 to 10 carbon atoms, lower alkoxy, halo phenyl, substituted phenyl having one or more substituents selected from the group consiting of halo, hydroxy, phenyl, lower alkyl and lower alkoxy, or hydroxy; A is sulfur, oxygen, or $—CH_2—$; and Alk is straight or branched chain lower alkylene; which comprises:

(a) reacting a compound of the formula



wherein R^1, R^2, R^3, A, and Alk are defined as hereinbefore with a base in an aprotic organic solvent;

(b) reacting the resulting alkoxide with a tert-alkyl monohaloacetic acid ester to form an alkoxyacetate; and

(c) reacting the alkoxyacetate with hydrogen chloride in nitromethane to given an α-alkoxyacetic acid; and

(d) optionally reacting the α-alkoxyacetic acid with a base to give an α-alkoxyacetic acid salt.

5,145,993

PROCESS FOR PREPARING D-2-(6-METHOXY-2-NAPHTHYL)-PROPIONIC ACID AND INTERMEDIATE THEREOF

In O. Kim; Choong E. Song, and Jae K. Lee, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

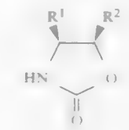
Filed Jan. 25, 1991, Ser. No. 645,607
Claims priority, application Rep. of Korea, Oct. 19, 1990, 16699/1990
Int. Cl.[5] C07C 62/06
U.S. Cl. 562—466 **7 Claims**

1. A process for preparing d-2-(6-methoxy-2-naphthyl)-propionic acid of formula (I) comprising the steps of:

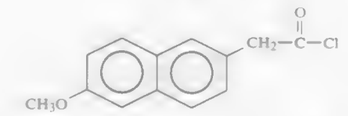
(a) preparing (N-(6-methoxy-2-naphthyl)acetyl)-oxazolidinone of formula (V) by reacting a metal salt of the oxazolidinone of formula (II) with 6-methoxy-2-naphthylacetyl-chloride of formula (IV) in tetrahydrofuran solvent under a nitrogen atmosphere,

(b) preparing (N-(2S)-2-(6-methoxy-2-naphthyl-propionyl)-oxazolidinone of formula (VI) by alkylating (N-(6-methoxy-2-naphthyl)acetyl)-oxazolidinone of formula (V) in the presence of a base, and

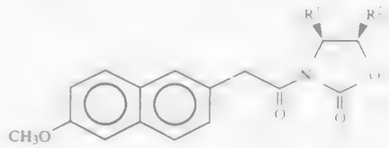
(c) reacting (N-(2S)-2-(6-methoxy-2-naphthyl-propionyl-oxazolidinone of formula (IV) in an alkali metal hydroxy and alcohol aqueous solution, wherein formulas (I)–(II) and (IV)–(VI) are as follows:



(II)

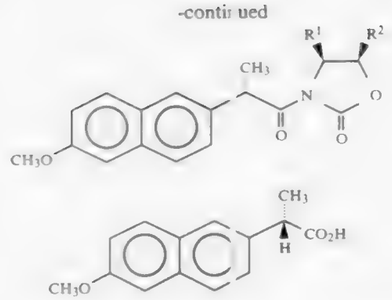


(IV)



(V)

-continued



(VI)

(I)

wherein R^1 is methyl, isopropyl, secondary-butyl, tert-butyl, benzyl, or phenyl group, and R^2 is hydrogen or phenyl group.

5,145,994

4-HYDROXYPHENYL ACETIC ACID

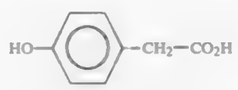
Arun K. Mandal, Thane; Satish V. Mahajan, New Bombay, and Damodar G. Jawalkar, Taluka Haveli, all of India, assignors to ICI India Limited, West Bengal, India

Filed Jul. 29, 1991, Ser. No. 737,042

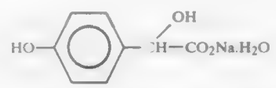
Int. Cl.[5] C07C *65/01*

U.S. Cl. 562—478 2 Claims

1. A process for the preparation of 4-hydroxyphenyl acetic acid of the formula:



from sodium-4-hydroxy-mandalate monohydrate of the formula:



comprising reducing the sodium-4-hydroxy-mandalate monohydrate with a reducing agent consisting of stoichiometric quantity of a phosphorus (III) compound and a catalytic or stoichiometric quantity of sulphur dioxide or equivalent salt thereof in the presence of a solvent at 60°–120° C. and at ambient to 5 atmospheres pressures.

5,145,995

PROCESS FOR THE MANUFACTURE OF 3-PENTENOIC ACID

Patrick M. Burke, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 26, 1985, Ser. No. 371,185

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[5] C07C *51/14*

U.S. Cl. 562—522 20 Claims

1. A process for the preparation of 3-pentenoic acid which comprises reacting in a solvent consisting essentially of at least one carboxylic acid selected from the group of aliphatic C_2–C_{20} carboxylic acids, benzoic acid, and alkyl-substituted benzoic acid wherein the total number of carbon atoms in the alkyl group(s) is not more than 8 butadiene, carbon monoxide, and water with a rhodium catalyst and a promoter selected from the class consisting of bromide and iodide, at a temperature in the range of about 40° C. to about 200° C. and at a carbon monoxide partial pressure in the range of about 75 to about 3000 psig, wherein the concentration of rhodium is in the range of about 0.005% to about 0.50% by weight of the total weight of the reaction mixture, and the molar ratio of promoter to rhodium is between about 1:1 and about 20:1.

5,145,996

HETEROATOM CONTAINING PERFLUOROALKYL TERMINATED NEOPENTYL MERCAPTO-ALCOHOLS AND COMPOSITIONS THEREFROM

Michael Jacobson, Haworth, N.J., and Kirtland P. Clark, Bethel, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 620,232, Nov. 29, 1990, Pat. No. 5,099,067, which is a continuation-in-part of Ser. No. 444,073, Nov. 30, 1989, Pat. No. 5,097,048. This application Feb. 25, 1991, Ser. No. 660,603

Int. Cl.[5] C07C *311/04, 323/03*

U.S. Cl. 564—98 12 Claims

1. A heteroatom containing R_f-neopentyl mercapto-alcohol compound of formula I or II

$$HS—CH_2C(CH_2—X—E—R_f)_2CH_2—OH \quad \text{(I) or}$$

$$HS—CH_2C(CH_2—X_1—R_f)_2CH_2—OH \quad \text{(II)}$$

wherein

R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

E is branched or straight chain alkylene of 1 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —O—, —S—, SO_2—, —SO_2NR—, and —$NRSO_2$—, or terminated at the R_f end with —CONR— or —SO_2NR—, where R_f is attached to the carbon or sulfur atom,

X is —S—, —O— or —SO_2—,

X_1 is —SO_2NR—, where R_f is attached to sulfur atom, and where R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 2 to 6 carbon atoms.

5,145,997

POLY (ALKYLENE OXIDE) SUBSTITUTED ACETOACETANILIDES

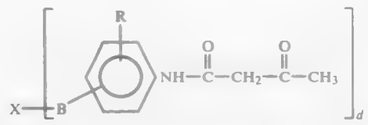
Russell J. Schwartz, Cincinnati; Anthony C. Zwirgzdas, Butler, and Terence R. Chamberlain, Cincinnati, all of Ohio, assignors to Sun Chemical Corporation, Fort Lee, N.J.

Filed Feb. 12, 1991, Ser. No. 654,163

Int. Cl.[5] C07C *235/84, 311/37*

U.S. Cl. 564—158 8 Claims

1. A poly (alkylene oxide) substituted acetoacetanilide having the general formula:



wherein B comprises a divalent bridging moiety selected from the group consisting of C_1–C_6 alkylene, —$NHSO_2$—, —O—, —CO—, —COO—, and —NCHO—; X comprises a poly (alkylene oxide) having a number average molecular weight of about 200 to 10,000; R comprises 0 to 4 moieties independently selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, and halogen; and d is an integer of 1 to 3.

5,145,998

METHOD FOR PRODUCING OPTICALLY ACTIVE AMINES

Yoji Sakito, Takarazuka; Gohfu Suzukamo, Ibaraki, and Yukio Yoneyoshi, Otsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

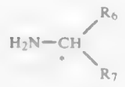
Continuation of Ser. No. 284,817, Dec. 14, 1988, abandoned, which is a continuation of Ser. No. 21,501, Mar. 4, 1987, abandoned. This application Oct. 2, 1990, Ser. No. 593,384

Claims priority, application Japan, Mar. 14, 1986, 61-57926; Jun. 10, 1986, 61-134003

Int. Cl.[5] C07C *209/40, 249/04;* C07B *57/00;* C07F *5/02*

U.S. Cl. 564—321 4 Claims

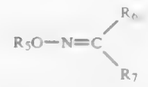
1. In a process for producing an optically active amine represented by the formula (III)



(III)

wherein R_6 and R_7, which are different from each other, represent C_6–C_{10} aryl, alkyl substituted C_6–C_{10} aryl, C_7–C_{10} aralkyl, alkyl substituted C_7–C_{10} aralkyl, or C_1–C_6 akyl and * represents an asymmetric carbon atom,

by reaction an asymmetric reducing agent with an oxime derivative represented by the formula (II)

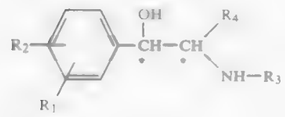


(II)

wherein R_5 represents C_1–C_{10} alkyl, C_7–C_{11} aralkyl or C_3–C_{12} alkyl silyl, and R_6 and R_7 are as defined above,

the improvement comprising

reacting a boron hydride compound and an optically active aminoalcohol represented by the formula (I),



(I)

wherein R_1 and R_2 represent hydrogen, C_1–C_6 alkyl or C_1–C_8 alkoxyl, R_3 represents hydrogen or C_1–C_6 alkyl, R_4 represents C_1–C_6 alkyl, and * is as defined above, to produce said asymmetric reducing agent, and

selecting the syn-form or a syn-form rich mixture of the oxime derivative of formula (II) for reaction with said reducing agent when the absolute steric configuration of the desired amine of formula (III) is opposite to the absolute steric configuration of the amino group-substituted atom int he aminoalcohol of formula (I), or alternatively

selecting the anti-form or an anti-form rich mixture of the oxime derivative of formula (II) for reaction with said reducing agent when the absolute steric configuration of the desired amine of the formula (III) is the same as that in the amino alcohol of formula (I).

5,145,999

PERFLUOROALKYLATED AMINES, AND POLYMERS MADE THEREFROM

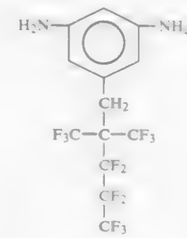
Brian C. Auman, Newark; David P. Higley, Wilmington, and Kirby V. Scherer, Hockessin, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1991, Ser. No. 680,486

Int. Cl.[5] C07C *211/45, 211/56*

U.S. Cl. 564—442 2 Claims

1. A perfluorinated amine of the formula:



5,146,000

PRODUCTION OF DIHYDROCARBYL POLYSULFIDES

Nubar Ozbalik, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 25, 1991, Ser. No. 674,148

Int. Cl.[5] C07C *321/20*

U.S. Cl. 568—26 23 Claims

1. A process for forming a mixture of dihydrocarbyl polysulfides which comprises reacting hydrocarbyl mercaptan with sulfur in the presence of added alumina catalyst at a temperature and for a period of time which are sufficient to form said dihydrocarbyl polysulfide, wherein said temperature is about 25° C. to about 110° C.

5,146,001

PREPARATION OF BENZYL KETONES AND AN OXIRANE

Thomas Himmler, Cologne; Udo Kraatz, Leverkusen; Wolfgang Krämer, Burscheid, and Klaus Stroech, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

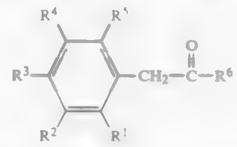
Filed Jun. 3, 1991, Ser. No. 709,679

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018926; Sep. 22, 1990, 4030061

Int. Cl.[5] C07C *45/45, 45/69, 67/343;* C07D *305/06*

U.S. Cl. 568—323 13 Claims

1. In the preparation of a benzyl ketone of the formula



(I)

in which

R^1, R^2, R^3, R^4 and R^5 independently of one another represent hydrogen, halogen, alkyl having 1 to 6 carbon atoms, halogenoalkyl having 1 to 6 carbon atoms and 1 to 13 halogen atoms, alkoxy having 1 to 6 carbon atoms, halogenoalkoxy having 1 to 6 carbon atoms and 1 to 13 halogen atoms, cyano or optionally halogen-substituted phenoxy, or represent aryl having 6 to 10 carbon atoms, it being possible for each of the aryl radicals to be substituted by

halogen, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 5 halogen atoms, alkoxy having 1 to 4 carbon atoms and/or halogenoalkoxy having 1 to 4 carbon atoms and 1 to 5 halogen atoms, or R^1, R^2, R^3, R^4 and R^5 independently of one another represent a radical of the formula

$$-COOR^7$$

wherein

R^7 represents alkyl having 1 to 6 carbon atoms, phenyl or benzyl,

and

R^6 represents alkyl having 1 to 18 carbon atoms, halogenoalkyl having 1 to 18 carbon atoms and 1 to 12 halogen atoms, alkoxycarbonylalkyl with 1 to 6 carbon atoms in the alkyl part and 1 to 6 carbon atoms in the alkoxy part, alkenyl having 2 to 18 carbon atoms or halogenoalkenyl having 2 to 18 carbon atoms and 1 to 12 halogen atoms, or represents cycloalkyl having 3 to 8 carbon atoms, or represents cycloalkenyl having 5 to 8 carbon atoms, it being possible for each of the cycloalkyl and cycloalkenyl radicals to be substituted by halogen, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 7 halogen atoms, alkoxy having 1 to 4 carbon atoms, halogenoalkoxy having 1 to 4 carbon atoms and 1 to 7 halogen atoms, alkenyl having 2 to 6 carbon atoms and/or phenyl which is optionally substituted by halogen and/or alkyl having 1 to 4 carbon atoms, or

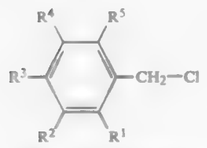
R^6 represents aryl having 6 to 10 carbon atoms, or represents aralkyl having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, or represents aralkenyl having 6 to 10 carbon atoms in the aryl part and 2 to 4 carbon atoms in the alkenyl part, or represents aroxyalkyl having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, it being possible for each of these radicals to be substituted in the aryl part by halogen, alkyl having 1 to 6 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 5 halogen atoms, alkoxy having 1 to 4 carbon atoms and/or halogenoalkoxy having 1 to 4 carbon atoms and 1 to 5 halogen atoms, or

R^6 represents a heteroaromatic radical which has 5 or 6 ring members and 1 or 2 heteroatoms and is optionally substituted by halogen and/or alkyl having 1 to 4 carbon atoms, or

R^6 represents a radical of the formula

wherein

R^8 represents alkyl having 1 to 4 carbon atoms, or represents halogen, by reacting a benzyl chloride of the formula



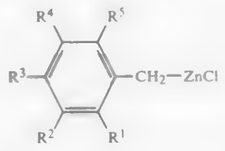
(II)

with an acid chloride of the formula

$$R^6—CO—Cl \quad (III)$$

in the presence of zinc powder and a palladium catalyst and in the presence of a diluent, the improvement which comprises

a) in a first stage reacting the benzyl chloride of the formula (II) with an excess of the zinc powder in the presence of a diluent at a temperature between 80° C. and 200° C. under an inert gas atmosphere, and separating off the excess zinc powder, thereby to obtain a benzyl derivative of the formula

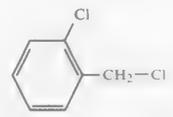


(IV)

and

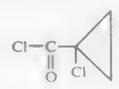
b) in a second stage reacting the benzyl derivative of the formula (IV) with an acid chloride of the formula (III) in the presence of a palladium catalyst and in the presence of a diluent at a temperature between 0° C. and 150° C. under an inert gas atmosphere.

4. A process according to claim 1, wherein the benzyl chloride of the formula (II) is 2-chloro-benzyl chloride of the formula



(II-1)

and the acid chloride of the formula (III) is 1-chlorocyclopropane-carbonyl chloride of the formula



(III-1)

5,146,002

AROYL KETONE DERIVATIVE, UV RAY ABSORBER COMPRISING THE SAME, AND COSMETIC COMPOSITION CONTAINING THE SAME

Shinji Yamada, Ichikai; Akira Kawamata, Utsunomiya; Genji Imokawa, Utsunomiya; Shinichi Masuda, Utsunomiya; Masakazu Yamaguchi; Koichi Niinaka, both of Ichikai, and Hiroko Joukura, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,567

Claims priority, application Japan, Sep. 5, 1989, 1-229708; Jan. 22, 1990, 2-12196

Int. Cl.[5] C07C *49/225*

U.S. Cl. 568—337 **3 Claims**

1. An aroyl ketone derivative represented by formula (I):

$$Ar(COCH_2COR^1)_n \quad (I)$$

wherein R^1 is tertiary butyl or n-heptyl; n is 1, 2 or 3; and Ar is a di- or tri-methoxy substituted benzene ring.

5,146,003

3-AMINO-2-HYDROXYBORNANE DERIVATIVES, ASYMMETRIC MICHAEL REACTION USING THE SAME, AND PROCESS FOR PREPARING OPTICALLY ACTIVE MUSCONE UTILIZING MICHAEL REACTION

Kazuhiko Tanaka, Kyota, Japan, assignor to Nippon Mining Co., Ltd., Tokyo, Japan

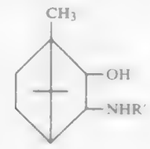
Filed Dec. 6, 1990, Ser. No. 623,296

Claims priority, application Japan, Dec. 8, 1989, 1-317527; Jun. 6, 1990, 2-146190

Int. Cl.[5] C07C *45/69*

U.S. Cl. 568—350 **16 Claims**

1. A process for carrying out an asymmetric Michael addition reaction which comprises an asymmetric 1,4-addition reaction of an achiral organometallic reagent to a prochiral α,β-unsaturated ketone in the presence of a compound of exo or endo form represented by formula (II):



(II)

wherein R′ represents a methyl group, a thienyl group, a furfuryl group, a 1-methylpyrrolylmethyl group, a benzyl group, or a 1-methylpyrrolidinylmethyl group.

5,146,004

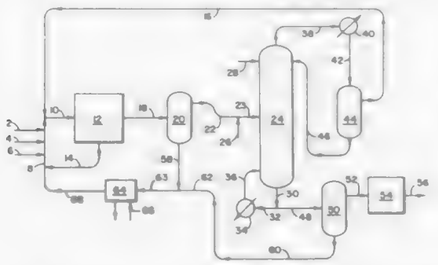
CONTINUOUS PROCESS FOR THE PREPARATION OF 2-ETHYL-2-(HYDROXYMETHYL) HEXANAL AND 2-BUTYL-2-THEYL-1,3-PROPANEDIOL

Don L. Morris; William A. Beavers, and William E. Choate, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1991, Ser. No. 735,575

Int. Cl.[5] C07C *45/75, 45/73*

U.S. Cl. 568—463 **5 Claims**



1. Continuous process for the preparation of 2-ethyl-2-(hydroxymethyl)hexanal by the condensation of 2-ethylhexanal and formaldehyde in the presence of a tertiary amine by the steps comprising:

(1) continuously feeding to a reaction zone 2-ethylhexanal, aqueous formaldehyde and a tertiary amine, wherein (i) a stoichiometric excess of 2-ethylhexanal is fed and (ii) the feed rates of tertiary amine and 2-ethylhexanal maintain in the reaction zone a tertiary amine:2-ethylhexanal weight ratio of about 0.2 to 0.5; and

(2) continuously removing from the reaction zone a crude product mixture comprising (i) an aqueous phase and (ii) an organic phase containing 2-ethyl-2-(hydroxymethyl)-hexanal and 2-ethylhexanal;

5,146,005

CATIONICALLY CURABLE OXALKYLENE ETHERS, METHOD FOR THEIR SYNTHESIS AND THEIR USE AS CASTING COMPOUNDS, COATING COMPOSITIONS OR AS REACTIVE DILUENTS FOR EPOXIDE RESINS

Christian Weitemeyer, and Hardi Döhler, both of Essen, Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

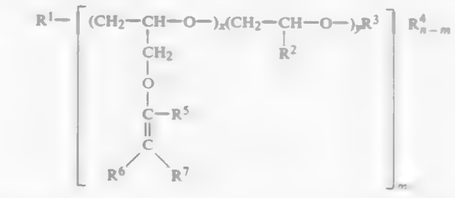
Filed Sep. 13, 1990, Ser. No. 582,680

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 8933420[U]

Int. Cl.[5] C07C *43/16*

U.S. Cl. 568—616 **17 Claims**

1. A cationically curable oxyalkylene ether having the average formula



wherein

R^1 is an n-valent residual group derived from a compound $(R^1)H_n$ from which n active hydrogen atoms have been split off and is capable of entering into an addition reaction with oxiranes, or a univalent alkyl or aryl group, and $n \geqq 1$;

R^2 is a hydrogen, hydrocarbon or R^3OCH_2— group;

R^3 and R^4 are each hydrogen, hydrocarbon or acyl groups, and R^1, R^2, R^3 and R^4 are the same or different in the ether;

R^5, R^6 and R^7 are each hydrogen or alkyl groups with 1 to 8 carbon atoms, or R^5 and R^7, or R^6 and R^7 together are a constituent of a cyclic, non-aromatic hydrocarbon group with 5 or 6 carbon atoms;

m is at least 1 and at most n;

x in the average molecule=3 to 100, and

y in the average molecule=0 to 100, provided that $3 \leqq x+y<150$.

5,146,006

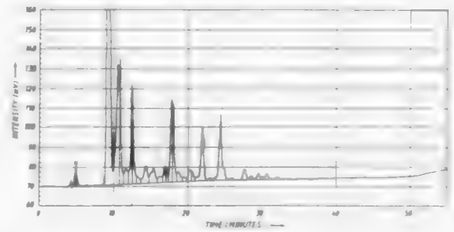
PROCESS FOR PREPARING TETRAPHENOIC COMPOUNDS

Simon M. Li, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 28, 1991, Ser. No. 722,983

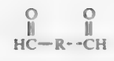
Int. Cl.[5] C07C *39/12, 37/20*

U.S. Cl. 568—720 **16 Claims**

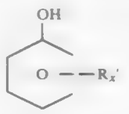


1. A process comprising:

(a) contacting, in a reaction mixture at a temperature within the range of about 30° to about 110° C., a dialdehyde of the formula



in which R is a direct bond or substituted or unsubstituted C_{1-20} hydrocarbyl, and a stoichiometric excess of a phenolic compound which can be represented by the formula



in which R' is selected from halide, C_{1-6} alkyl and C_{1-6} alkoxy, in the presence of a catalytic amount of an acid-functional ion exchange resin catalyst, to produce a mixed phenolic condensation product at least a portion of which is dissolved in the phenolic compound and by-product water;

(b) evaporating a major portion of the water; and

(c) reducing the temperature of the phenolic compound to effect crystallization of a fraction of the mixed polyphenolic product relatively rich in tetrakisphenolic species.

5,146,007

PROCESS FOR PREPARING BISPHENOL-A

Michael J. Cipullo, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jun. 17, 1991, Ser. No. 715,954
Int. Cl.[5] C07C *7/20, 39/14*
U.S. Cl. 568—727 **3 Claims**

1. A process for the preparation of bisphenol-A, which comprises;

providing a hydrated acidic ion-exchange resin catalyst for catalyzing the condensation of phenol with acetone;

vaporizing a portion of the water associated with the hydrated catalyst;

separating sufficient of the water vapor from the catalyst to remove from 25 to 90 percent by weight of said water, whereby a partially dehydrated catalyst is obtained; and

contacting the partially dehydrated catalyst with phenol so as to remove additional water from the catalyst until the water content of the effluent phenol contains less than about 4 weight percent water; and

condensing phenol and acetone in a reaction zone at a temperature within the range of from 40° to 95° C., in the presence of the dehydrated catalyst.

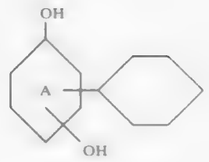
5,146,008

PROCESS FOR THE SYNTHESIS OF AROMATIC PHENYL SUBSTITUTED DIOLS

Andrea Gardano, Vercelli; Alfredo Coassolo, Novara; Francesco Casagrande, San Nazzaro Sesia; Marco Foà, and Larry L. Chapoy, both of Novara, all of Italy, assignors to Himont Italia S.r.l., Milan, Italy

Continuation-in-part of Ser. No. 569,215, Aug. 16, 1990, abandoned, which is a continuation of Ser. No. 367,548, Jun. 16, 1989, abandoned. This application Mar. 19, 1991, Ser. No. 672,092
Claims priority, application Italy, Jun. 16, 1988, 20983 A/88
Int. Cl.[5] C07C *39/17*
U.S. Cl. 568—743 **22 Claims**

1. A process for the synthesis of phenyl substituted aromatic diols comprising dehydrogenating products having the general formula I:



(I)

wherein A means a single, double, triple or fused C_6–C_{18} aromatic radical, either unsubstituted or substituted with C_1–C_4 alkyl radicals, in a solvent medium in the presence of a supported palladium catalyst, wherein said supported palladium catalyst is prepared by a process comprising:

a) adding an acid solution of a palladium compound selected among palladium halide or palladite to an alkaline suspension of a carrier selected from the group consisting of activated carbons, activated aluminas, silicas, TiO_2 and MgO, thereby forming a slurry;

b) treating the slurry of a) at 20°–100° C. with sodium hypophosphite or sodium formate to turn said palladium compound into palladium metal;

c) recovering the solid product of the slurry of b) by filtration, rinsing said solid product with water at 20°–100° C. until halide ions are removed;

d) optionally, drying the solid at 100°–120° C. and wherein the dehydrogenation reaction is carried out at 220°–350° C., at atmospheric pressures under nitrogen flow or under vacuum.

5,146,009

PROCESS FOR THE RECOVERY OF ALCOHOLS USING AN ORGANIC ACID-MODIFIED POLYMER MEMBRANE

Abraham D. Cohen, Sarnia, Canada; William D. Diana, Belle Mead, and James J. Baiel, Morris Plains, both of N.J., assignors to Exxon Chemicals Patents Inc., Linden, N.J.

Continuation of Ser. No. 9,795, Feb. 2, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,081
Int. Cl.[5] C07C *29/12, 31/10, 31/12, 31/125*
U.S. Cl. 568—889 **22 Claims**

1. In the process for preparing a saturated mono-alcohol having from 2 to 8 carbon atoms per molecule by the conventional steps of absorbing the corresponding olefin into an aqueous concentrated strong inorganic acid thereby forming an alkyl ester of said acid corresponding to said olefin, recovering a liquid phase containing said acid alkyl ester, and contacting said recovered liquid phase with water thereby liberating said alcohol in the resulting product solution; the improvement comprising the steps of: (a) contacting the product solution containing said liberated alcohol against a first side of an organic acid-modified polymer membrane, and (b) withdrawing at a second side of the membrane a permeate of said alcohol solution having an increased concentration of alcohol relative to said product solution, thereby recovering at the first side of the membrane a diluted strong inorganic acid solution, said diluted acid solution being substantially depleted of said alcohol.

5,146,010

PYROLYSIS OF NATURALLY OCCURRING CRESYLIC ACID MIXTURES

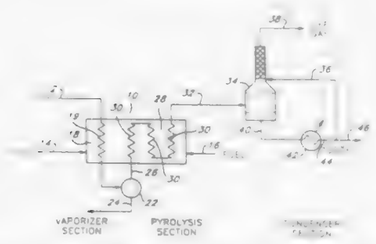
James A. Brient, Missouri City, and Marvin H. Strunk, Jr., Houston, both of Tex., assignors to Merichem Company, Houston, Tex.

Filed Aug. 9, 1991, Ser. No. 743,077
Int. Cl.[5] C07C *37/68, 41/34, 39/07*
U.S. Cl. 568—761 **8 Claims**

1. A process for removing methoxyaromatic impurities from a vaporized feed stream of naturally occurring cresylic acid mixtures which comprises:

passing the vaporized feed stream through a heated tubular reactor at a temperature of at least about 450° C. at pyrolysis conditions to form a pyrolysis product stream;

quenching the pyrolysis product stream to halt byproduct formation and condense cresylic acid;



removing non-condensible gaseous compounds from the quenched pyrolysis product stream; and

recovering the cresylic acid from such product stream.

5,146,011

PREPARATION OF CHLOROHYDRINS

Ming Shen, Guilford, and John A. Wojtowicz, Cheshire, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 487,723, Mar. 5, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 718,737
Int. Cl.[5] C07C *31/44, 31/42*
U.S. Cl. 568—844 **24 Claims**

1. A process for the preparation of a chlorohydrin which comprises reacting at least one unsaturated organic compound containing from 2 to about 10 carbon atoms and selected from the group consisting of substituted and unsubstituted olefins and cyclic olefins, the substituents being selected from the group consisting of an alkyl radical, a phenyl radical and an alkylphenyl radical, each of said radicals being itself unsubstituted or substituted with a halide or a hydroxide, with an aqueous hypochlorous acid solution containing more than 10% by weight of hypochlorous acid and being substantially free of chloride, chlorate, and alkali metal ions, said process being conducted in an essentially aqueous medium.

5,146,012

MANUFACTURE OF NEOPENTYL GLYCOL (III)

Jeffrey S. Salek, Oakdale Boro; Joseph Pugach, Monroeville Boro; Carole L. Elias, Allegheny County, and Leonard A. Cullo, Greensburg, all of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 691,927, Apr. 26, 1991, and Ser. No. 716,177, Jun. 17, 1991. This application Jun. 28, 1991, Ser. No. 723,097
The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.
Int. Cl.[5] C07C *29/14, 31/20, 45/45*
U.S. Cl. 568—881 **12 Claims**

1. Method of making neopentyl glycol comprising reacting isobutyraldehyde with paraformaldehyde to obtain a reaction product comprising hydroxypivaldehyde, forming a mixture of said reaction product with an alcohol of the formula RR'CHOH wherein R and R' are selected from the group consisting of hydrogen and alkyl groups having from one to five carbon atoms, said mixture comprising about 40% to about 90% alcohol, contacting said mixture with hydrogen in the presence of a hydrogenation catalyst, and recovering neopentyl glycol of at least about 99% purity.

5,146,013

PROCESS FOR THE PRODUCTION OF CHLOROFORM FROM CARBON TETRACHLORIDE, CATALYTIC COMPOSITIONS AND PROCESS FOR OBTAINING THEM

Charles Dogimont; James Franklin, both of Brussels; Francine Janssens, Vilvoorde, and Jean-Paul Schoebrechts, Grez-Doiceau, all of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Mar. 14, 1991, Ser. No. 669,618
Claims priority, application Belgium, Nov. 16, 1990, 09001086
Int. Cl.[5] C07C *17/00*
U.S. Cl. 570—101 **15 Claims**

1. A process for the production of chloroform from carbon tetrachloride, in the gas phase in the presence of molecular hydrogen, comprising dechlorinating carbon tetrachloride in the presence of a catalytic composition comprising at least one hydrogenation catalyst deposited on a support comprising at least one alkali metal aluminate or alkaline earth metal aluminate.

5,146,014

PERFLUOROETHYLDIMETHYL CYCLOHEXANE

John K. Graybill, Macungie, and Gregory B. George, New Ringgold, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 2, 1991, Ser. No. 724,613
Int. Cl.[5] C07C *22/00, 23/10, 17/02, 17/10*
U.S. Cl. 570—131 **6 Claims**

1. The perfluorinated compound having the following structure wherein the ring carbons are fully fluorinated.

5,146,015

HYDROCHLOROFLUOROCARBONS HAVING A TERTIARY STRUCTURE AND OH RATE CONSTANTS WHICH DO NOT CONTRIBUTE SUBSTANTIALLY TO OZONE DEPLETION AND GLOBAL WARMING

Chen C. Li, East Aurora, N.Y., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 27, 1991, Ser. No. 767,004
Int. Cl.[5] C07C *19/02*
U.S. Cl. 570—134 **16 Claims**

1. A class of hydrochlorofluorocarbons having a tertiary structure, 5 carbon atoms, 1 chlorine atom, 6 to 8 fluorine atoms, and OH rate constants between about 8 and about 15 $cm^3/molecule/sec \times 10^{-14}$ wherein said hydrochlorofluorocarbons are $CF_3C(CF_3)(H)CFClCH_3$; $CF_2HC(CH_3)(Cl)CF_2CF_3$; $CF_3C(CH_3(Cl)CFHCF_3$; $CF_2HC(CH_3)(F)CF_2CF_2Cl$; $CFClHC(CH_3)(F)CF_2CF_3$; $CF_2HC(CH_3)(F)CFClCF_3$; $CF_3C(CH_3)F)CFHCF_2Cl$; $CF_2ClC(CH_3)(F)CFHCF_3$; $CF_2ClC(CF_2H)(F)CF_2CH_3$; $CF_3C(CF_3)(Cl)CH_2CFH_2$; $CF_3C(CF_2Cl)(F)CH_2CF_2H$; $CF_3C(CF_3C(CF_3)(H)CHClCH_3$; and $CF_3C(CF_3)(F)CH_2CClH_2$.

5,146,006
FILLER FOR SENSOR SYSTEMS OF TEMPERATURE-SENSITIVE DISPLACEMENT PICKUPS
Ewald Preisegger, Nauheim; Wolfgang Scholten, Hofheim am Taunus, and Thomas Müller, Bad Homburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
PCT No. PCT/EP90/00429, § 371 Date Sep. 16, 1991, § 102(e) Date Sep. 16, 1991, PCT Pub. No. WO90/10853, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 16, 1990, Ser. No. 761,756
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1989, 3908551
Int. Cl.[5] C07C 19/02; F03C 5/00; F01B 19/00
U.S. Cl. 570—134 1 Claim
1. Use of 2H-heptafluoropropane as filler for sensor systems of temperature-sensitive displacement pickups.

5,146,007
PROCESS FOR THE METATHESIS OF PARTLY FLUORINATED HYDROCARBONS
Konrad V. Werner, Garching, and Karin Weiss, Bayreuth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 15, 1991, Ser. No. 776,553
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1990, 4032896
Int. Cl.[5] C07C 17/25, 17/28, 21/18
U.S. Cl. 570—143 12 Claims
1. A process for the reaction of a substituted hydrocarbon which contains at least one double bond using a tungsten-containing catalyst on a solid support ethylene or an alkene being split off, to form a longer-chain substituted hydrocarbon which contains at least one central double bond, at 10° to 200° C., if necessary in the presence of an inert solvent, under normal atmospheric pressure, reduced pressure or the autogenous pressure of the reaction mixture, which comprises using, for the reaction, at least one alkene of the formula

$$X—R_f—(CH_2)_m—CH=CH—Z \quad (I)$$

or

$$CH_2F—(CH_2)_m—CH=CH—Z \quad (II)$$

in which
R_f is a straight-chain, branched or cyclic perfluoroalkylene radical having 1 to 18 carbon atoms,
m and n are each an integer from 1 to 10,
X is F, H, Cl, alkyl having 1 to 6 carbon atoms, or aryl having 6 to 10 carbon atoms and
Z is H, alkyl having 1 to 10 carbon atoms, arylalkyl having 7 to 11 carbon atoms, the radical $—(CH_2)_nR_fX$ or the radical $—(CH_2)_m—CH_2F$, in which, if only one compound is employed, this must have different substituents on the two sides of the —CH=CH— group.

5,146,018
HYDROGENOLYSIS/DEHYDROHALOGENATION PROCESS
Carl S. Kellner; V. N. Mallikarjuna Rao, and Frank J. Weigert, all of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 596,551, Oct. 17, 1990, Pat. No. 5,068,473, which is a continuation of Ser. No. 305,698, Feb. 3, 1989, abandoned. This application Jun. 26, 1991, Ser. No. 721,785
The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.
Int. Cl.[5] C07C 17/24, 17/34, 19/08, 21/13
U.S. Cl. 570—156 17 Claims
1. In a process for the dehydrohalogenation of fluorohalohydrocarbons which contain at least one halo group selected from chloro and bromo by reacting the fluorohalohydrocarbons with a source of hydrogen in the presence of a catalyst, the improvement comprising utilizing a rhenium-containing catalyst selected form the group consisting of (i) catalysts consisting essentially of rhenium, (ii) unsupported catalysts containing at least about 50 percent by weight rhenium with the balance being one or more Group VIII metals, (iii) catalysts consisting essentially of rhenium supported on carbon or calcium fluoride, and (iv) supported catalysts consisting essentially of one or more Group VIII metals and from 0.1 to 20 percent by weight of rhenium supported on carbon or calcium fluoride, wherein said one or more Group VIII metals total up to 10 percent by weight and rhenium is the major component on said support.

10. In a process for the combined hydrogenolysis and dehydrohalogenation of fluorohalocarbons which contain halogen substituents selected from the group consisting of chlorine and bromine by reacting the fluorohalocarbons with a source of hydrogen in the presence of a catalyst, the improvement comprising utilizing a rhenium-containing catalyst selected from the group consisting of (i) catalysts consisting essentially of rhenium, (ii) unsupported catalysts containing at least about 50 percent by weight rhenium with the balance being one or more Group VIII metals, (iii) catalysts consisting essentially of rhenium supported on carbon or calcium fluoride, and (iv) supported catalysts consisting essentially of one or more Group VIII metals and from 0.1 to 20 percent by weight of rhenium supported on carbon or calcium fluoride, wherein said one or more Group VIII metals total up to 10 percent by weight and rhenium is the major component on said support.

5,146,019
PREPARATION OF POLYFLUOROBUTENES
Dietmar Bielefeldt, Ratingen, and Albrecht Marhold, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 529,770, May 30, 1990, abandoned, which is a continuation of Ser. No. 405,101, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 218,735, Jul. 13, 1988, abandoned. This application Jan. 21, 1992, Ser. No. 824,691
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725213
Int. Cl.[5] C07C 17/20
U.S. Cl. 570—160 10 Claims
1. A process for the simultaneous preparation of 1,1,1,2,4,4,4-heptafluoro-2-butene and 2-chloro-1,1,1,4,4,4-hexafluoro-2-butene consisting essentially of reacting hexachlorobutadiene with a reaction mixture consisting of essentially of hydrogen fluoride and a catalyst selected from the group consisting of an antimony trihalide and an antimony pentahalide, said catalyst being in an amount of 0.1 to 6.3 vol 2.5, relative to said hexachlorobutadiene.

5,146,020
DISPROPORTIONATION OF SELECTED CHLOROFLUOROMETHANES
Charles G. Rudershausen, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 432,314, Nov. 3, 1989, abandoned, which is a continuation of Ser. No. 211,103, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 85,256, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 841,949, Mar. 20, 1986, abandoned. This application Aug. 8, 1990, Ser. No. 564,690
Int. Cl.[5] C07C 17/10, 17/20, 19/08, 17/24
U.S. Cl. 570—163 5 Claims
1. A process for producing trichloromonofluoromethane, dichlorodifluoromethane and chloroform comprising the steps of:
(a) reacting, in the vapor phase, trifluoromethane or monochlorodifluoromethane and carbon tetrachloride in the presence of an effective amount of a catalyst consisting essentially of activated aluminum and magnesium oxides at a temperature of about 150° to 350° C., a pressure of about 0.1 to 25 atmospheres, a molar feed ratio of chlorofluorocarbon to carbon tetrachloride of about 0.1 to 10.0 and a contact time of about 0.2 to 20 seconds to produce trichloromono-, dichlorodifluoromethane and chloroform as the primary reaction products, and
(b) separating the trichloromonofluoromethane, difluorodichloromethane and chloroform from the reaction product of step (a).

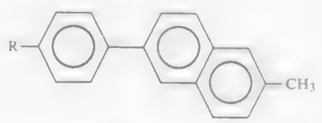
5,146,021
VI ENHANCING COMPOSITIONS AND NEWTONIAN LUBE BLENDS
Andrew Jackson, Princeton; Margaret M. Wu, Belle Mead; Alice S. Chu, Spotswood, and Bruce P. Pelrine, Trenton, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Apr. 17, 1991, Ser. No. 686,470
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[5] C07C 2/08
U.S. Cl. 585—10 23 Claims
1. A lubricant mixture having enhanced viscosity index and shear stability, comprising;
branched C_{30}–C_{10000} hydrocarbons having a branch ratio of less than 0.19 and viscosity at 100° C. between 725 cS and 20,000 cS; and liquid lubricant taken from the group consisting of mineral oil, polyolefins and hydrogenated polyolefins and mixtures thereof.

5,146,022
HIGH VI SYNTHETIC LUBRICANTS FROM CRACKED SLACK WAX
J. Scott Buchanan, Hamilton Square, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Aug. 23, 1990, Ser. No. 571,345
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.[5] C10L 1/16, 5/00; C07C 2/02
U.S. Cl. 585—12 17 Claims
1. A process for the production of high VI synthetic lubricants, comprising;
contacting the C_5–C_{18} portion of the alpha-olefinic hydrocarbon product mixture from the thermal cracking of slack wax or recycled slack wax with an aluminum chloride oligomerization catalyst under oligomerizing conditions and separating a product comprising synthetic lubricant having a kinematic viscosity greater than about 20 cS at 100° C., pour point less than −15° C. and VI greater than 120, said cracking being carried out under conditions sufficient to provide a crackate containing at least 60 weight percent linear alpha-olefins.

5,146,023
PROCESS FOR OLIGOMERIZING OLEFINS TO PREPARE SYNTHETIC LUBRICANT BASE STOCKS HAVING IMPROVED PROPERTIES
John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Apr. 30, 1990, Ser. No. 516,931
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] C07C 2/74, 2/02
U.S. Cl. 585—255 39 Claims
1. A process for the preparation of oligomers, comprising contacting a mixture of alpha and internal-olefins having from 10 to 24 carbon atoms with a catalytically effective amount of an acidic calcium montmorillonite clay having a moisture content ranging up to about 20 wt. %, a residual acidity in the range of about 3 to about 30 mg KOH/g, and a surface area of about 300 M^2/g or greater, and in which the mixture of olefins is comprised of up to about 50 wt. % internal-olefin.

5,146,024
HYDROALKYLATION OF AROMATIC HYDROCARBONS
Larry E. Reed, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 20, 1991, Ser. No. 703,071
Int. Cl.[5] C07C 2/66
U.S. Cl. 585—270 11 Claims
1. In a process of at least partially converting at least one aromatic hydrocarbon-containing 6–9 carbon atoms per molecule and free hydrogen to at least one monocycloalkyl-substituted aromatic hydrocarbon in the presence of a catalyst comprising (a) at least one Group VIII metal promoter selected from the group consisting of palladium metal and palladium compounds and (b) an acidic, nickel- and rare earth-exchanged crystalline zeolite as support,
the improvement which comprises the presence of carbon monoxide at a molar ratio of carbon monoxide to free hydrogen which does not exceed about 0.5:1.

5,146,025
NAPHTHALENE COMPOUNDS
Takeshi Koyama, Kanagawa, and Takefumi Abe, Niigata, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Filed Feb. 12, 1990, Ser. No. 478,869
Claims priority, application Japan, Feb. 28, 1989, 1-45430; Feb. 28, 1989, 1-45431
Int. Cl.[5] C07C 15/00, 41/00
U.S. Cl. 585—412 12 Claims
1. A compound represented by the formula:


(2)

wherein R is C_1–C_3 alkyl or C_1–C_3 alkoxy.

5,146,026
ALKYLATION OF AROMATIC HYDROCARBONS IN FIXED BED CATALYTIC PROCESS
Jose L. Berna Tejero, Boadilla de Monte, and Alfonso Moreno Danvila, Algeciras, both of Spain, assignors to Petroquimica Espanola, S.A. Petresa, Madrid, Spain
Filed Jul. 28, 1989, Ser. No. 387,289
Claims priority, application Spain, Aug. 3, 1988, 8802428
Int. Cl.[5] C07C 2/58, 2/62
U.S. Cl. 585—467 29 Claims
1. A continuous process for alkylating aromatic hydrocarbons comprising:
(a) reacting in a fixed-bed catalytic reactor and in the liquid phase a mixture of (i) at least one aromatic hydrocarbon and (ii) an alkylation agent, to obtain a product stream comprising at least one alkylated aromatic hydrocarbon, said reacting taking place:
at a molar ratio of (i) to (ii) within the range of about 30:1 to 1:1;
at a temperature within the range of about 100° to about 300° C.;
at a pressure within the range of about 5 to 50 kg/cm^2 and a liquid hourly space velocity within the range of about 0.5 to about 20 hr^{-1};
in the presence of an alkylation catalyst comprising at least one solid selected from the group consisting of natural zeolites, synthetic zeolites, and clays, said solid comprising at least one of aluminum silicate and magnesium silicate and having:
a surface area higher than about 80 m^2/g;
a microporosity higher than about 0.2 cm^3/g;

pores at least a majority of which have a diameter of less than about 60 A and an average diameter of about 50 A; a percentage of meso and macropores within the range of about 10 to about 25% of total pores; said meso and macropores having a diameter higher than 60 A;

said solid having been dried at a temperature within the range of about 60 to about 120° C. and calcined at a temperature within the range of about 200° and about 600° C.;

(b) subjecting said product stream to a separation step to obtain (i) a fraction containing said at least one aromatic hydrocarbon; (ii) a fraction containing said at least one alkylated aromatic hydrocarbon in substantially pure form; (iii) a heavy alkylaromatic hydrocarbon fraction; and (iv) a paraffin fraction.

5,146,027

METHANE CONVERSION PROCESS

Anne M. Gaffney, West Chester, Pa., assignor to Atlantic Richfield Co., Los Angeles, Calif. and Phillips Petroleum Co., Bartlesville, Okla.

Filed May 24, 1985, Ser. No. 738,114

Int. Cl.[5] C07C *2/00*

U.S. Cl. 585—500 **13 Claims**

1. A method for converting methane to higher hydrocarbon products and coproduct water which comprises contacting a gas comprising methane and a gaseous oxidant with solid La_2O_3 at a temperature within the range of about 700° to 1200° C. in the presence of at least one gaseous promoter selected from the group consisting of halogens and compounds thereof, said contacting being conducted in the substantial absence of alkali metals and compounds thereof and in the substantial absence of reducible metal oxides.

5,146,028

OLEFIN POLYMERIZATION CATALYST AND PROCESS OF POLYMERIZATION

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 599,610, Oct. 18, 1990, Pat. No. 5,106,806. This application Feb. 10, 1992, Ser. No. 833,185

Int. Cl.[5] C07C *2/30*; C08F *4/02*

U.S. Cl. 585—512 **5 Claims**

1. A process of producing a lower α-olefin polymer which comprises contacting under polymerization conditions one or more lower α-olefins with an olefin polymerization catalyst obtained by contacting (A) a catalyst component obtained by contacting a magnesium dialkoxide wherein each alkoxide independently has up to 4 carbon atoms conclusive, titanium tetraalkoxide wherein each alkoxide independently has up to 4 carbon atoms inclusive, and a phenolic compound selected from phenol and activating group-substituted phenol, at elevated temperature, with a tetravalent titanium halide and an electron donor, with (B) an organoaluminum cocatalyst and (c) a selectivity control agent.

5,146,029

OLEFIN INTERCONVERSION BY SHAPE SELECTIVE CATALYSIS

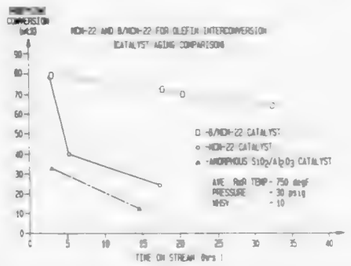
Robert G. Bundens, Mullica Hill; Kathleen M. Keville, Woodbury, both of N.J.; Albin Huss, Jr., Chadds Ford, Pa.; Cynthia T-W Chu, Princeton Junction, and Altaf Husain, Marlton, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 461,896, Jan. 8, 1990, Pat. No. 4,956,514, which is a continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, Pat. No. 4,954,325, and a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Sep. 10, 1990, Ser. No. 579,766

Int. Cl.[5] C07C *2/02*

U.S. Cl. 585—533 **39 Claims**

1. A process for converting olefin to isoalkene-rich hydrocarbon product which comprises contacting a feedstock containing at least one olefin with an olefin interconversion catalyst composition in an olefin interconversion reaction zone under olefin interconversion conditions to provide isoalkene-rich hydrocarbon product containing at least 6 wt% total



tertiary C_4–C_5 olefin, said catalyst comprising a synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table I of the specification.

5,146,030

PROCESS FOR OLIGOMERIZING OLEFINS USING HALOGEN-FREE TITANIUM SALTS OR HALOGEN-FREE ZIRCONIUM SALTS ON CLAYS

John R. Sanderson, Leander; John F. Knifton, and Edward T. Marquis, both of Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,794

Int. Cl.[5] C07C *2/08, 2/12*

U.S. Cl. 585—533 **18 Claims**

1. A process for the preparation of oligomers, comprising contacting at elevated temperature (1) linear olefins containing from 10 to 24 carbon atoms with (2) a catalyst comprising a cation-exchangeable layered clay having deposited thereon a compound selected from the group consisting of titanium sulfate, titanium citrate, titanium nitrate, titanium phosphate, zirconium sulfate, zirconium citrate, zirconium nitrate, and zirconium phosphate.

5,146,031

PROCESS OF OXIDIZING ALIPHATIC HYDROCARBONS EMPLOYING A MOLYBDATE CATALYST COMPOSITION

Bijan Khazai; G. Edwin Vrieland; Craig B. Murchison; Ravi S. Dixit, all of Midland, and Edwin D. Weihl, Coleman, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 383,107, Jul. 20, 1989, Pat. No. 4,973,791. This application Apr. 6, 1990, Ser. No. 505,751

Int. Cl.[5] C07C *5/09*

U.S. Cl. 585—624 **33 Claims**

1. A process of preparing an unsaturated aliphatic hydrocarbon and water as a by-product comprising contacting an aliphatic hydrocarbon having at least three carbon atoms with a solid heterogeneous catalyst composition having reactive oxygen under conditions such that an unsaturated aliphatic hydrocarbon is produced in a productivity of at least about 0.2 g/g cat-hr and water is produced as a by-product, the catalyst composition comprising (a) a support component containing magnesia and at least one aluminum oxide selected from the group consisting of Al_2O_3 and $MgAl_2O_4$, the support having a MgO/Al_2O_3 weight ratio in the range from about 0.30 to about 4.0, and a surface area of at least about 25 m^2/g; and (b) a catalyst component consisting essentially of an oxide of magnesium, an oxide of molybdenum wherein the molybdenum is in the +6 oxidation state, and a promoting amount of an alkali metal promoter.

5,146,032

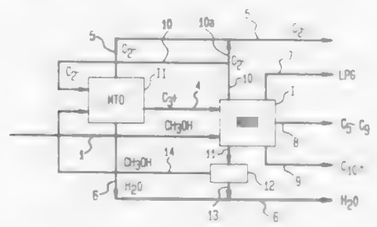
INTEGRATED PROCESS FOR CONVERTING METHANOL TO GASOLINE AND DISTILLATES

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 658,491, Feb. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 601,955, Oct. 23, 1990, abandoned. This application Dec. 12, 1991, Ser. No. 806,780

Int. Cl.[5] C07C *1/20*

U.S. Cl. 585—640 **21 Claims**



1. An integrated process for converting an oxygenate feed to gasoline and distillate range liquid hydrocarbons comprising the steps of

contacting the oxygenate feed, and at least a portion of a C_3+ olefin hydrocarbon stream from a second reactor, in a first reactor with an oligomerization zeolite catalyst under oligomerization reaction conditions to convert the oxygenate feed and C_3+ hydrocarbons to heavier hydrocarbons comprising olefinic gasoline and distillate range hydrocarbons, water containing unreacted oxygenated feed, and C_2− light hydrocarbons,

separating a C_2− light hydrocarbon stream, separating hydrocarbons containing gasoline and distillate range liquid hydrocarbons from unreacted oxygenated feed and water, and separating the unreacted oxygenated feed from the water,

and contacting the unreacted oxygenate feed and C_2− light hydrocarbons with a zeolite catalyst in a second reactor at elevated temperature of 500 to 1000° F. and moderate pressure of 0 to 100 psig to convert at least a portion of the unconverted oxygenate feed to C_2+ olefin hydrocarbons and recovering an effluent comprising C_2− light hydrocarbons and C_3+ olefin hydrocarbons and water,

cooling the effluent from the second reactor and separating a C_2− olefin hydrocarbon stream, a C_3+ olefin hydrocarbon stream and water, and feeding the C_3+ olefin hydrocarbon stream to the first reactor.

5,146,033

HOMOGENEOUS RHENIUM CATALYSTS FOR METATHESIS OF OLEFINS

Richard R. Schrock, Winchester, Mass., and Robert Toreki, Morrisville, Pa., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 461,040, Jan. 4, 1990, Pat. No. 5,087,710. This application Dec. 19, 1991, Ser. No. 810,377

Int. Cl.[5] C07C *6/00*

U.S. Cl. 585—647 **17 Claims**

1. A process for metathesizing an olefin, comprising the steps of:

a. contacting an olefin in a solvent with a homogeneous metathesis catalyst under conditions sufficient for metathesis, the metathesis catalyst comprising a rhenium (VII) atom centrally linked to an alkylidene ligand, an alkylidyne ligand, and two other ligands of which at least one ligand is an electron withdrawing ligand in which its corresponding free ligand in protinated form has a pKa below about 9; wherein the catalyst has significant metathesis activity that can effect the metathesis of an ordinary, cyclic or functionalized olefin at room temperature at a rate of at least one turnover per hour, whereby the olefin is metathesized; and

b. recovering one or more metathesis products.

5,146,034

CONVERSION OF PARAFFINS TO OLEFINS

Edrick Morales; Anne M. Gaffney, and John A. Sofranko, all of West Chester, Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Nov. 18, 1991, Ser. No. 793,756

Int. Cl.[5] C07C *5/333*

U.S. Cl. 585—654 **5 Claims**

1. The process for the dehydrogenation of a paraffin hydrocarbon having 2 to 20 carbon atoms to the corresponding olefin which comprises contacting the said paraffin with a solid zeolite catalyst consisting essentially of ZSM-5 modified with a Group I A modifier and containing 1–20 wt. % Zn, wherein the dehydrogenation is carried out at a temperature of 500°–700° C. and at a pressure of from atmospheric to 1,000 psig.

5,146,035

BUTENE ISOMERIZATION PROCESS

Benjamin C. Spehlmann, Glenview; Gail L. Gray, Lisle, both of Ill.; Lawrence D. Vail, Tappan, N.Y., and Gregory J. Gajda, Mt. Prospect, Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 442,879, Nov. 29, 1989, abandoned. This application Dec. 24, 1990, Ser. No. 632,699

Int. Cl.[5] C07C *5/23*

U.S. Cl. 585—667 **4 Claims**

1. In a process for the skeletal isomerization of butenes which comprises contacting a feedstock containing linear butenes at isomerization conditions with a catalyst containing at least one non-zeolitic molecular sieve (NZMS) selected from the group consisting of SAPOs. FAPOs. CoAPSOs. MnAPSOs. MgAPSOs and mixtures thereof to provide a product containing a greater concentration of isobutene than in the feed stream, the improvement comprising the addition of a quantity of water which amounts to about 0.1 to 5 mass % of the feedstock to the reaction zone.

5,146,036

TRANSFER OF CATALYST

Keith W. Hovis, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 464,263, Jan. 12, 1990, Pat. No. 5,021,223. This application Jan. 22, 1991, Ser. No. 648,301

Int. Cl.[5] C07C *2/58*

U.S. Cl. 585—723 **4 Claims**

1. A method of performing an alkylation reaction including

settling an admixture of a liquid hydrocarbon and a liquid catalyst in a settler vessel to separate said liquid hydrocarbon from said liquid catalyst; cooling the thus separated liquid catalyst; mixing the thus cooled separated liquid catalyst with a hydrocarbon feed to produce a mixture thereof; reacting the thus produced mixture of the cooled separated liquid catalyst and the hydrocarbon feed; and circulating the thus reacted mixture of liquid catalyst and hydrocarbon feed to said settler vessel, the improvement comprising:

providing first conduit means connected in fluid flow communication between said settler vessel and a storage vessel for transferring the separated liquid catalyst to said storage vessel with said first conduit means having interposed therein, at a relative elevation above said storage vessel and below said settler vessel, first valve means for blocking passage of fluid through said first conduit means and, alternatively, for allowing passage of fluid through said first conduit means;

opening said first valve means to thereby transfer the separated liquid catalyst via said first conduit means from said settler vessel to said storage vessel by gravitational means;

providing second conduit means connected in fluid flow communication between said storage vessel and said settler vessel for venting the vapor space of said storage vessel to the vapor space of said settler vessel and having interposed therein, at a relative elevation above said storage vessel, second valve means for blocking passage of fluid therethrough and, alternatively, for allowing passage of fluid through said second conduit means; and

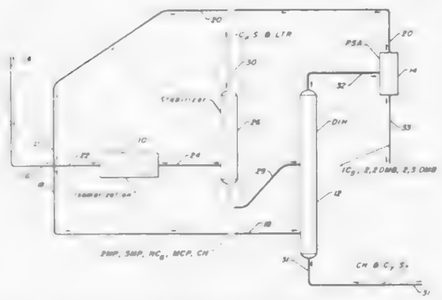
opening said second valve means to thereby equalize the pressure between the vapor space of said storage vessel and the vapor space of said settler vessel to thereby allow for further draining of said separated liquid catalyst via first conduit means from said settler vessel to said storage vessel by gravitational means.

5,146,037

ISOMERIZATION WITH DISTILLATION AND PSA RECYCLE STREAMS

Andrew S. Zarchy, Amawalk, and Martin F. Symoniak, Mahopac, both of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Nov. 29, 1990. Ser. No. 619,556
Int. Cl.[5] C07C 5/13
U.S. Cl. 585—738 **20 Claims**



20. A process for the isomerization of a feedstream comprising C_5–C_7 hydrocarbons said process comprising:

(a) combining a fresh feedstream, comprising C_5, C_6 and C_7 hydrocarbons, a first recycle stream and a second recycle stream to form a combined feedstream and charging said combined feedstream to an isomerization zone and contacting said combined feedstream with an isomerization catalyst comprising alumina having from 0.01 to 0.25 wt. % platinum and from 2 to 10 wt. % of a chloride component, wherein the wt. % is based on the total catalyst weight, at isomerization conditions to increase the branching of the combined feedstream hydrocarbons and produce an isomerization effluent stream comprising normal pentane, normal hexane, methylbutane, dimethylbutane, monomethyl-pentane, methylcyclopentane, cyclohexane, and higher boiling hydrocarbons;

(b) passing said isomerization zone effluent directly to a stabilizer column and withdrawing C_4 and lighter hydrocarbons from said stabilizer;

(c) passing the remainder of said isomerization effluent directly from said stabilizer to an inlet located at an intermediate point in a deisohexanizer column to distill said effluent stream and produce an overhead stream comprising methylbutane, normal pentane, and dimethylbutane, and a bottoms stream comprising cyclohexane and higher boiling hydrocarbons;

(d) passing said overhead stream to a pressure swing adsorption zone and separating isoparaffins from normal paraffins by:

i) contacting said overhead stream at a temperature of from 400°–600° F. with a 5A molecular sieve at a pressure of from 80 to 120 psia in a first adsorbent bed and recovering a product stream from the effluent end of said bed,

ii) cocurrently venting non-adsorbed gas components from and reducing the pressure in a second adsorbent bed that just has undergone adsorption to a pressure of from 30 to 15 psia,

iii) reducing the pressure in a third adsorbent bed that has just undergone cocurrent venting to a pressure of from 10 to 0.5 psia by countercurrent desorption and recovering said first recycle stream comprising normal hydrocarbons, and

iv) countercurrently repressurizing a fourth adsorbent bed that has just undergone desorption to a pressure of from 80 to 120 psia and passing at least a portion of said non-adsorbed gas components to said fourth adsorbent bed to provide at least a part of said repressurization;

(e) withdrawing said second recycle stream comprising normal hexane, methylpentane and methylcyclohexane from said deisohexanizer column as a sidecut stream at a location below said inlet point; and

(f) recovering said isomerization zone product comprising methylpentane and dimethylbutane.

5,146,038

PROCESS FOR TREATING A MIXTURE CONTAINING DEWAXED OIL AND DEWAXING SOLVENT

Mordechai Pasternak, Spring Valley, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 16, 1990, Ser. No. 553,512
Int. Cl.[5] C07C 7/144
U.S. Cl. 585—818 **12 Claims**

1. The process for treating a charge containing ketone-containing dewaxing solvent and dewaxed oil which comprises

passing said charge containing dewaxing solvent and dewaxed oil into contact with, as separating membrane barrier, a non-porous separating polyurea layer;

maintaining a pressure drop across said membrane thereby forming a high pressure retentate containing increased content of dewaxed oil and decreased content of dewaxing solvent and a low pressure permeate containing increased content of dewaxing solvent and decreased content of dewaxed oil;

maintaining the pressure on the low pressure discharge side of said membrane above the vapor pressure of said permeate thereby maintaining said permeate in liquid phase;

maintaining the pressure on the high pressure retentate side of said membrane above the vapor pressure of said charge containing dewaxing solvent and dewaxed oil and sufficient to drive permeate across said membrane thereby maintaining said charge dewaxing solvent and dewaxed oil and said retentate in liquid phase;

recovering said permeate containing increased content of dewaxed oil and decreased content of dewaxing solvent; and

recovering said retentate containing increased content of dewaxed oil and decreased content of dewaxing solvent.

5,146,039

PROCESS FOR LOW LEVEL DESULFURIZATION OF HYDROCARBONS

Thomas Wildt, Essen; Franz Nierlich, Marl; Wilhelm Droste, Marl; Joachim Neumeister, Marl, and Bernhard Scholz, Marl-Polsum, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 376,616, Jul. 7, 1989, abandoned. This application Nov. 6, 1990, Ser. No. 608,623
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825169
Int. Cl.[5] C07C 7/13
U.S. Cl. 585—820 **9 Claims**

1. A method of desulfurization of hydrocarbons which contain organic sulfides, disulfides, trisulfides, tetrasulfides, or mixtures of such sulfides in amounts such that the sulfur content of the hydrocarbons is less than 20 ppm by weight of sulfur, said method comprising:

contacting said hydrocarbons containing less than 20 ppm by weight of sulfur with a zeolite containing exchangeable cations in which the exchangeable cations of the zeolites have been completely or partially exchanged with cations of copper, silver, zinc or mixtures thereof.

5,146,040

PROCESS FOR SEPARATING DIMETHYLNAPHTHALENE ISOMERS WITH ZEOLITE L AGGLOMERATES

Johannes P. Verduijn; Mechilium J. G. Janssen, both of Spijkenisse; Cornelis B. De Gruijter, Hoeck van Holland; Wicher T. Koetsier, Mijnsheerenland, and Cornelis W. M. Van Oorschot, Rozenburg, all of Netherlands, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 292,704, Jan. 3, 1989, Pat. No. 5,064,630. This application May 10, 1991, Ser. No. 681,812
Claims priority, application United Kingdom, Jan. 4, 1988, [redacted]
Int. Cl.[5] C07C 7/12
U.S. Cl. 585—825 **2 Claims**

1. A process for the separation of the 1,5; 2,6 and 2,7 isomers of dimethyl naphthalene (DMN) from one another by passing a stream comprising said isomers through an agglomerate of crystals of zeolite L, said crystals being 30 to 70 nm long and of diameter 5 to 25 nm with pores between the crystals of 3 to 20 nm diameter and obtaining substantially pure 2,7 DMN, followed by substantially pure 2,6 DMN and thereafter substantially pure 1,5 DMN.

5,146,041

METHOD OF SEPARATING ISOBUTYLENE FROM A C-4 HYDROCARBON FRACTION USING MONTMORILLONITE CATALYSTS

John F. Knifton, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Sep. 3, 1991, Ser. No. 753,502
Int. Cl.[5] C07C 7/00, 43/00
U.S. Cl. 585—864 **10 Claims**

1. A two-step method for separating isobutylene from a C-4 hydrocarbon fraction comprising:

a) Contacting the C-4 fraction containing isobutylene with a glycol in the presence of an acidic montmorillonite catalyst at a temperature of about 60° to 160° C., thereby reacting the isobutylene with the glycol to yield a glycol mono-t-butyl ether, and subsequently

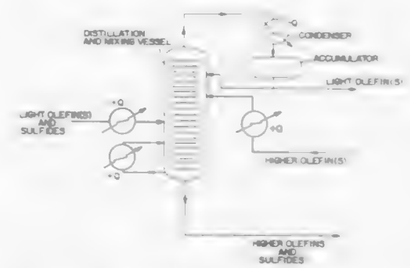
b) reacting the glycol mono-t-butyl ether over the acidic montmorillonite catalyst at a temperature between 100° to 220° C. to produce the separated isobutylene.

5,146,042

DESULFURIZATION OF LIGHT OLEFINS

Nur R. Gurak, Sarnia, Canada, and Jacques M. Hamard, Rixensart, Belgium, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 8, 1991, Ser. No. 742,257
Int. Cl.[5] C07C 7/00; C01B 17/00
U.S. Cl. 585—867 **11 Claims**



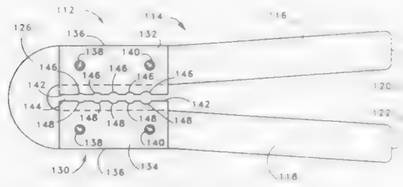
1. A process for reducing the sulfide content present in lower C_2 to C_4 olefin feedstocks comprising contacting said lower olefin which contains an organo sulfide contaminant with a liquid C_6 or higher olefin in which said sulfide contaminant is soluble for a period of time sufficient to extract a substantial portion of the sulfide contaminant, and separating said lower olefin from the liquid C_6 or higher olefin solution.

5,146,043

BULLET EXTRACTOR

Jeffrey Means, R.D. 5, Box 291; Robert A. Haag, Jr., R.D. 5, Box 300, and Richard D. Steffy, 708 Pine St., all of Punxsutawney, Pa. 15767

Filed Dec. 31, 1990, Ser. No. 636,506
Int. Cl.[5] F42B *33/00, 33/02, 35/02*
U.S. Cl. 86—24 13 Claims



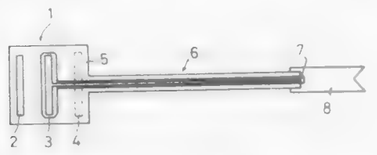
1. A bullet cartridge holder comprising,
a bifurcated elongated body portion having a pair of pincer-type arm members integrally connected to and extending from an end portion,
an intermediate portion provided on each of said arm members,
said pair of arm members being adjacently positioned in spaced relation to move toward and away from each other in a pincer-type action in response to a compressive force applied to said arm members,
a bullet retention plate extending longitudinally on said intermediate portion of each of said arm members, each of said retention plates including a longitudinal edge portion having a plurality of recesses positioned in spaced relation on said edge portion,
said recesses of said retention plates being positioned oppositely of one another to form holes for receiving and retaining bullet cartridges in a selected range of caliber sizes,
means for releasably connecting said retention plates to said arm members to provide on said arm members means for retaining bullet cartridges of a preselected range of caliber sizes where a first set of retention plates forming holes for a first range of caliber sizes is replaced on said arm members by a second set of said retention plates forming holes for a second range of caliber sizes, and
said arm members being movable urged in a first direction toward one another when said arm members are compressed together to frictionally retain the bullet cartridge selectively positioned in one of said holes formed by said retention plates and said arm members movable in a second direction away from one another upon release of a compressive force to permit insertion and removal of a bullet cartridge from said retention plates.

5,146,044

WIRELESS DETONATOR

Koichi Kurokawa, and Kenji Hashimoto, both of Chita, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1991, Ser. No. 773,125
Claims priority, application Japan, Oct. 9, 1990, 2-271182
Int. Cl.[5] F42C *19/08*
U.S. Cl. 102—202.5 6 Claims



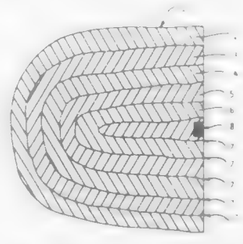
1. A wireless detonator comprising:
an antenna for receiving microwaves, the antenna having a relative gain of 0 to 20 dB in a frequency band of microwaves;
a detonator including a heating element; and
a transmission circuit for connecting the antenna to the heating element to directly transmit the microwave energy from the antenna to the heating element;
wherein an absolute value of a reactance component in a radiation impedance of the antenna is at most 50% of a pure resistance component of the radiation impedance,
an absolute value of a reactance component in an impedance of the heating element is at most 50% of a pure resistance component of the impedance, and
the pure resistance components of the radiation impedance of the antenna and of the impedance of the heating element are in a range of 70 to 130% of a characteristic impedance of the transmission circuit.

5,146,045

UNDERWATER MINE

Steve Cordell, 3317 Cardiff Ave., Los Angeles, Calif. 90034

Continuation-in-part of Ser. No. 537,128, Jun. 13, 1990, abandoned. This application Mar. 20, 1991, Ser. No. 671,427
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1989, 3920187
Int. Cl.[5] F42B *1/00, 22/00*
U.S. Cl. 102—406 13 Claims



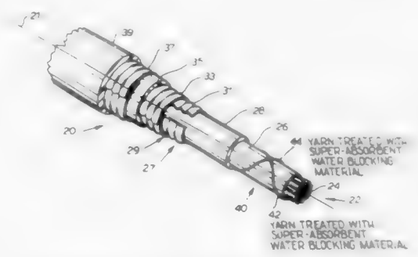
1. Underwater mine decoy, characterized by an expandable material and an outer shell formed by a webbed foldable material, the final shape of the mine decoy being determined by the limitations imposed by the outer shell.

5,146,046

CABLE HAVING WATERBLOCKING PROVISIONS BETWEEN LAYERS OF RELATIVELY RIGID AND SUPPLE MATERIALS

Candido J. Arroyo, Lithonia; Stanley R. Boguan, Duluth, and David S. Hancock, Roswell, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1991, Ser. No. 662,054
Int. Cl.[5] H01B *7/18, 7/28*
U.S. Cl. 174—23 R 8 Claims



1. A communications cable which comprises:

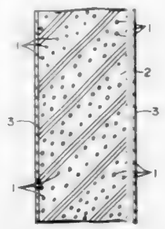
a core having a longitudinal axis and comprising at least one transmission medium;
a layer of a relatively supple plastic material which is disposed about said core;
a relatively rigid jacket which comprises a plastic material, which is disposed about said layer of plastic material and which is characterized by a relatively uniform thickness; and
first and second longitudinally extending strand-like water-blockable members which are disposed and wrapped helically in opposite directions in engagement with an outer surface of said layer of relatively supple plastic material and with an inner surface of said jacket.

5,146,047

ELECTRIC-WAVE ABSORBING MATERIAL FOR CONSTRUCTION

Kouji Nagata; Minoru Sugita, both of Tokyo; Keisuke Kida, Aichi; Toru Watanabe, and Ken'yo Matsushita, both of Shizuoka, all of Japan, assignors to Shimizu Construction Co., Ltd. and Nippon Light Metal Company, Ltd., both of Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 665,964
Claims priority, application Japan, Mar. 16, 1990, 2-66612; Mar. 16, 1990, 2-66613
Int. Cl.[5] H05K 9/00
U.S. Cl. 174—35 MS **22 Claims**



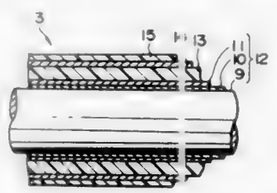
1. An electric-wave absorbing material for construction, comprising a medium and a plurality of electric wave absorbing particles dispersed in said medium, said electric-wave absorbing particles being capsules filled with water.

5,146,048

COAXIAL CABLE HAVING THIN STRONG NOBLE METAL PLATED INNER CONDUCTOR

Toshiaki Yutori, Takasago, and Shigenobu Ohtsu, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 24, 1991, Ser. No. 719,629
Claims priority, application Japan, Jun. 26, 1990, 2-167304; Jun. 26, 1990, 2-167305; Jun. 26, 1990, 2-167306
Int. Cl.[5] H01B 7/34
U.S. Cl. 174—36 **2 Claims**



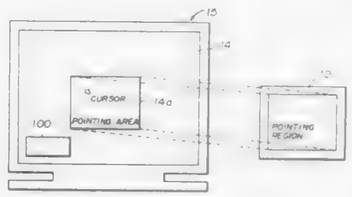
1. A coaxial cable comprising:
an inner conductor including a very fine metal wire having a diameter of 120 μm or below and a tensile strength of 100 kg/mm² or above, and a plated noble metal layer coating the very fine metal wire, said inner conductor formed by subjecting a metal wire coated with a layer of the noble metal formed by plating to plastic working to strain the layer of the noble metal;
an insulating layer of an insulating material coating the inner conductor; and
an outer conductor of a metal coating the insulating layer.

5,146,049

METHOD AND SYSTEM FOR INPUTTING COORDINATES USING DIGITIZER

Toshinori Shima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 22, 1991, Ser. No. 644,253
Claims priority, application Japan, Jan. 22, 1990, 2-12367
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—18 **19 Claims**



1. A system for inputting coordinates using a digitizer, comprising:
a display device provided with a display which has a first area;
a digitizer coupled to said display device and provided with a pointing region which has a second area smaller than the first area;
a pointing device coupled to said digitizer for pointing an arbitrary dot position on the pointing region of said digitizer; and
control means coupled to said display device and said digitizer for controlling display information on the display of said display device so that a pointing area which is displayed on the display is smaller than the first area and corresponds to the pointing region of said digitizer and a dot pointed by said pointing device on the pointing region of said digitizer is displayed within the pointing area, said pointing region of the digitizer including a number of dots which is greater than or equal to a number of dots included in the pointing area of the display,
said control means including means for moving the pointing area on the display in an arbitrary direction depending on a specific part of the pointing region which is pointed by said pointing device.

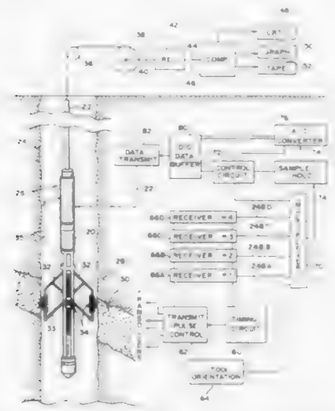
5,146,050

METHOD AND APPARATUS FOR ACOUSTIC FORMATION DIP LOGGING

Bernard B. Strozeski; Roger R. Steinsiek, and James O. Guy, all of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 617,290, Nov. 16, 1990, abandoned, which is a continuation of Ser. No. 343,501, Apr. 25, 1989, abandoned. This application Apr. 25, 1991, Ser. No. 691,661
Int. Cl.[5] G01V 1/40
U.S. Cl. 181—102 **23 Claims**

1. Apparatus for acoustically logging earth formations surrounding a borehole containing a known fluid, comprising:
a downhole sonde adapted for longitudinal movement through the borehole:
an acoustic transducer for generating acoustic pulse energy of a predetermined magnitude directed along the axis of said acoustic transducer substantially normal to the borehole wall surface and for receiving reflected acoustic pulse energy from said borehole formation;
backing means having an impedance approximately one-half the impedance of said transducer and cooperatively mounted radially inwardly thereof along said transducer axis and having an internal geometry aligned with said transducer axis for first receiving acoustic pulse energy generated by said transducer as directed along and parallel to said axis and absorbing, reflecting and reabsorbing substantially all of said first received acoustic pulse energy;
said acoustic transducer directing acoustic pulse energy substantially free of acoustic ringing along said axis toward the borehole wall surface;
a face plate member bonded to the surface of said acoustic transducer facing said borehole wall and in contact with the known borehole fluid and constructed of a material selected for coupling said transducer acoustic pulse energy directed toward the borehole wall surface into said fluid/face plate interface with substantially zero transmission loss;
housing means cooperating with said acoustic transducer, said backing means and said face plate member and sealing said acoustic transducer and backing means from said borehole fluid;



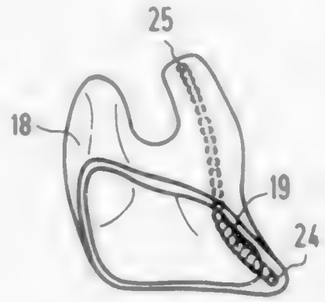
pressure compensating means cooperating with said housing means, said acoustic transducer and backing means mounted therein for equalizing the pressure exerted on said acoustic transducer and backing means within said housing means with the fluid exerted on said face plate member by said borehole fluid pressure;
transducer pad means cooperating with said housing means for carrying said acoustic transducer, said backing means and said face plate member and adapted for contacting the borehole wall surface and positioning said acoustic transducer in a predetermined closely-spaced offset relationship to the borehole wall surface;
arm means cooperating with said transducer pad means and said sonde for mounting said transducer pad means thereon and adapted for lateral extension therefrom for positioning said transducer pad means into contact with said borehole wall surface;
said acoustic transducer receiving said acoustic pulse energy reflected from the earth formation/borehole wall interface; and
circuit means cooperating with said acoustic transducer for determining from said received reflected acoustic pulse energy an indication correlating to the acoustic impedance of the earth formation reflecting said acoustic pulse energy at said formation/borehole wall interface.

5,146,051

HOUSING SHELL FOR AN IN-THE-EAR HEARING AID

Dietmar Hermann, Schienfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 16, 1990, Ser. No. 552,525
Claims priority, application European Pat. Off., Jul. 26, 1989, 89113792.9
Int. Cl.[5] H04R 25/02; B29C 33/40
U.S. Cl. 181—130 **9 Claims**



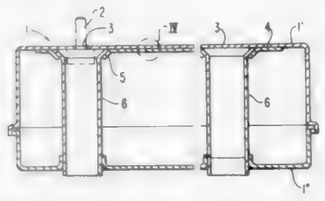
1. A housing shell for an in-the-ear hearing aid and manufactured by the process comprising the steps of:
(a) forming a positive ear mold from the ear of a patient from a predetermined material;
(b) adjusting the size of the positive ear mold to the desired size of the housing shell to be manufactured and to include a proximal end and a distal end;
(c) applying a core to extend from the positive ear mold at the proximal end thereof to the distal end thereof which is to communicate with the auditory canal of the patient;
(d) applying a separating layer over the outer surface of the positive ear mold;
(e) forming a negative form with the positive ear mold and the core;
(f) removing the positive ear mold and the core form the negative form to form a cavity and a passageway communicating the cavity with the exterior of the negative form and removing the core to provide a passageway from the exterior to the interior of the negative form;
(g) applying a conduit through the passageway, including a sleeve of said predetermined material and a removable strand of a predetermined diameter extending therethrough, to the inner surface of the negative form extending from the passageway at the proximal end to the distal end against the inner surface of the negative form and with the strand including two ends each projecting from the respective proximal end and the distal end;
(h) filling the negative form with a polymerizable, hardenable plastic material;
(i) after a short polymerization time to bond the sleeve to the said inner surface of said negative form and pouring excess plastic material from the negative form to leave a layer of plastic therein to provide the having desired thickness of the housing shell;
(j) curing to harden the housing shell in the negative form;
(k) removing the hardened housing shell from the negative form; and
(l) pulling the strand form the conduit to leave a vent passageway through the housing shell.

5,146,052

MUFFLER FOR INTERNAL-COMBUSTION ENGINE EXHAUST GASES AND METHOD OF ASSEMBLY THEREOF

Karl-Heinz Dümmel, Egenhausen, Fed. Rep. of Germany, assignor to Friedrich Boysen GmbH & Co. KG, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 525,645
Claims priority, application Fed. Rep. of Germany, May 24, 1989, 3916872
Int. Cl.[5] F01N 7/10, 7/18
U.S. Cl. 181—240 8 Claims



1. A muffler for internal combustion engine exhaust gases, comprising a housing adapted to be mounted at the engine and having two shell parts with one shell part forming an engine side and the other shell part facing away from the engine side; passage bores located in said one shell part and adapted for insertion of fastening screws for attachment of said one shell part to the engine; and pipes penetrating the housing, each pipe being operatively associated with a respective one of said passage bores, one end of each pipe being held at the one shell part in coaxial arrangement to the respective passage bore, the other end of each pipe penetrating the other shell part and forming an access to the respective passage bore for insertion of the respective fastening screw in said passage bore, wherein a reinforcing bottom having openings arranged concentrically with respect to the passage bores is arranged on an interior side of the engine-side shell part, the openings of the reinforcing bottom each have an edge directed toward the interior of the housing, said edge wrapping with pressure the adjacent end of the respective pipe whereby the pipes are held at the reinforcing bottom in at least one of a force-locking and form-fitting manner, wherein the openings of the reinforcing bottom each have an edge directed toward an interior space of the housing in the shape of a funnel tapering in the direction toward the interior, and the ends of the pipes adjacent to the reinforcing bottom each have a widened portion fitting into the funnel shape of the reinforcing bottom such that the widened portions of the pipe ends are form-fittingly held between the engine-side shell part and the funnel-shaped edges of the openings of the reinforcing bottom.

5,146,053

ELEVATOR DISPATCHING BASED ON REMAINING RESPONSE TIME

Bruce A. Powell, Canton, and John N. Williams, Coventry, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

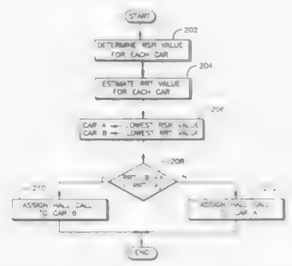
Filed Feb. 28, 1991, Ser. No. 661,966
Int. Cl.[5] B66B 1/18
U.S. Cl. 187—127 9 Claims

1. In a building having a predetermined number of floors, a predetermined floor having a hall call button for requesting service in a predetermined direction, an elevator control system controlling the assignment of elevator cars in response to a hall call registered at the predetermined floor, a method of assigning an elevator car to service the call based on the response time of an elevator to reach the predetermined floor, said method comprising the steps of:

determining, for each elevator car, a relative system response (RSR) value based on a plurality of predetermined bonuses and penalties;

determining which elevator car has the most favorable RSR value;

estimating, for each elevator car, a remaining response time (RRT) value based on the amount of time required for the elevator to reach the predetermined floor given car calls and hall calls to which the elevator car is committed;



determining which elevator car has the lowest RRT value;

comparing the RRT value of the car determined to have the most favorable RSR value to the RRT value of the car determined to have the lowest RRT value; and

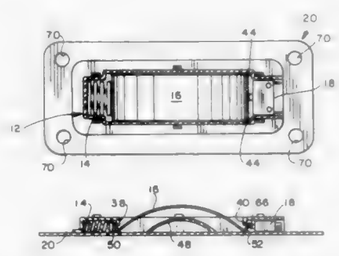
assigning an elevator car to respond to the hall call based on said comparison.

5,146,054

MOTION TRANSLATION MECHANISM FOR A VEHICLE SEAT SWITCH

Harry N. Etters, Downers Grove, Ill., assignor to Illinois Tool Work Inc., Glenview, Ill.

Filed Sep. 4, 1991, Ser. No. 754,680
Int. Cl.[5] H01H 3/02
U.S. Cl. 200—85 A 20 Claims



1. In a motion translation mechanism which is selectively responsive to the presence and absence of a downward vertical force, said mechanism comprising:

a switch assembly having a plunger which is movable laterally between extended and retracted positions for electrically closing an opening said switch assembly;

a leaf spring having a first end portion, a second end portion, and an upwardly convexed central portion, said first end portion being connected to said second end portion by said upwardly convexed central portion, said upwardly convexed central portion being vertically movable in response to the movement of the vertical force;

a mounting bracket having first and second stop means for engaging said respective first and second end portions of said leaf spring;

a coil spring for resiliently biasing said first end portion of said leaf spring against said first stop means; and

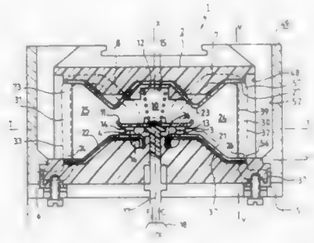
said second end portion of said leaf spring being operatively connected between said second stop means and said plunger for moving laterally said plunger to the retracted position in response to the downward movement of said upwardly convexed central portion so as to electrically close or open said switch assembly.

5,146,055

CURRENT LIMITING SWITCH DEVICE

Thierry Boucheron, Maurecourt; Blanchard Christian, Rueil Malmaison, and Michel Lauraire, Courbevoie, all of France, assignors to Telemecanique, France

Filed Sep. 19, 1990, Ser. No. 584,824
Claims priority, application France, Sep. 20, 1989, 89 12391
Int. Cl.[5] H01H 9/36, 33/10
U.S. Cl. 200—144 R 6 Claims



1. A current limiting switch device comprising in an insulating case:

at least one cut-off chamber housing a fixed piece and a switching piece movable in a predetermined direction in a plane, said pieces being equipped with contact studs and a movable control member acting on the switching piece for making and breaking an electric circuit;

a conducting deflector which is connected electrically to the fixed piece and which extends into the chamber so that one of the feet of the arc appearing on opening of the electric circuit may move in said chamber;

the chamber having two opposite walls converging towards an elongate narrow slit which communicates with the outside of the insulating case and which is placed substantially in said plane so that a considerable portion of the length of the arc is driven therein during development thereof, wherein:

the deflector has an end situated in the vicinity of one end of the slit or in the slit,

the width of the chamber and the dimensions of the slit cause narrowing of the section of the arc,

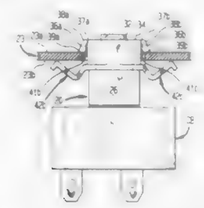
at least one conductor forming a loop placed outside the chamber is connected to the fixed piece and passes in front of the slit.

5,146,056

SNAP-IN BRACKET FOR CIRCUIT BREAKER

Robert A. Kuczynski, 520 Springfield Ave., Westfield, N.J. 07090

Filed Apr. 29, 1991, Ser. No. 692,712
Int. Cl.[5] H01H 9/02; G12B 9/00
U.S. Cl. 200—296 13 Claims



1. A molded unitary snap-in bracket for supporting a circuit breaker in a support panel having an inner face and an outer face and a sized and shaped opening defining a cylindrical wall therein comprising:

a a generally cylindrical body having an outer wall and a sized bore extending end to end therethrough forming an inner wall in said cylindrical body, said sized bore having, a top opening at one end of the cylindrical body and a bottom opening at the opposite end remote from said top opening,

b spaced resilient holding members hingedly connected on opposite sides of said cylindrical body disposed to fit into the sized and shaped opening in said support panel and having a surface engaging face disposed in assembled position to engage and exert a force against the outer face of the support panel about the sized and shaped opening therein,

c locking tab means disposed continuous with the surface engaging face of the respective resilient holding member disposed to engage the cylindrical wall defined by said sized and shaped opening in the support panel to prevent deformation of the respective resilient holding members when the snap-in bracket is in assembled position therein, and

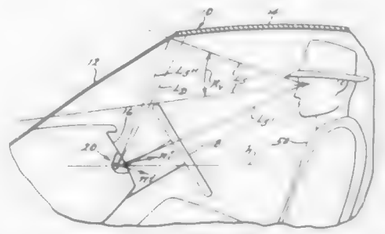
d resilient sized and shaped arms connected medially along said cylindrical body a predetermined spaced distance from the spaced resilient holding members disposed to engage the inner face of the support panel about the opening therein so as exert a force against the inner face of the support panel opposite to that of the resilient holding members for operative co-action therewith to hold and maintain the snap-in bracket in assembled position in the support panel.

5,146,057

ANTIREFLECTIVE SWITCH

Charles G. Hellebuyck, Troy, and Syed M. Khalid, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 579,011, Sep. 7, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 787,703
Int. Cl.[5] H01H 9/02
U.S. Cl. 200—313 3 Claims



1. A manually actuatable backlighted pushbutton switch for use by an operator in an automotive vehicle having an instrument panel and a windshield forward of a vehicle operator seating position comprising:

an opaque switch housing mounted on said instrument panel and having a flanged opening formed therein;

a planar light transmitting lens element positioned on said flanged opening of said switch housing for movement in response to manual depression contact during switch actuation and viewing by an operator seated in said operator seating position;

a light pipe element within said switch housing for transmitting light from a remote light source through said lens element;

a planar light diffusing indicia element between said light pipe element and said lens element movable with said lens element during said manual depression by said operator;

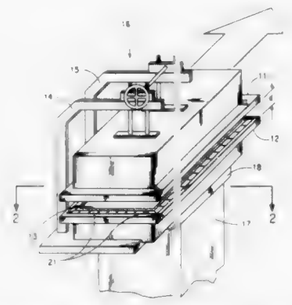
said light diffusing indicia element being angularly oriented with respect to said lens element within said switch housing so that light transmitted from said remote light source, through said diffusing indicia element and said lens element is directed toward said operator for viewing and prevented by said housing and the flange of said flanged opening from being directed towards said windshield.

5,146,058

MICROWAVE RESONANT CAVITY APPLICATOR FOR HEATING ARTICLES OF INDEFINITE LENGTH

Dean R. Herfindahl, Wilmington, Del.; Hua-Feng Huang, Chadds Ford, Pa.; Richard W. Lewis, and Walter A. Wallace, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1990, Ser. No. 634,795
Int. Cl.[5] B23K *15/10*; H05B *6/64*
U.S. Cl. 219—10.55 A 8 Claims



1. A rectangular microwave resonant cavity applicator having a pair of opposing hollow cavity sections with peripheries and with edges which are uniformly spaced apart by a distance "d" around the peripheries of the hollow cavity sections, the periphery of each of said hollow cavity sections having a planar lip surface with an inner edge and an outer edge and each of said planar lip surfaces facing the other, each of said planar lip surfaces having mounted thereon non-contacting electromagnetic field containment means, one of said hollow cavity sections having a central part of its cavity fitted with a source of microwave energy which travels through a waveguide to said hollow cavity section and is coupled by means of an iris, and means adapted to move articles of indefinite length between said hollow cavity sections.

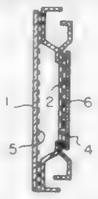
5,146,059

MICROWAVE LEAKAGE SHIELDING DEVICE FOR A MICROWAVE OVEN DOOR

Kim Seog Tae, Kyongsangnam-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 20, 1990, Ser. No. 616,090
Claims priority, application Rep. of Korea, Dec. 15, 1989, 89-19025[U]
Int. Cl.[5] H05B *6/76*
U.S. Cl. 219—10.55 D 4 Claims

1. In a microwave oven door, a microwave leakage shielding device comprising:
- a door frame,
- a front transparent member attached to the front of said door frame,
- a front aluminum layer attached to the inside surface of said front transparent member,
- a rear transparent member attached to the back of said door frame,
- a rear aluminum layer attached to the inside surface of said rear transparent member, and
- a seal plate adjacent to said rear aluminum layer of rear transparent member, said seal plate having a plurality of large size holes, each of said large size holes having a diameter of over 3 mm, whereby the user can easily look at the food in the microwave oven through the large size



holes and microwave energy and radiant heat can be prevented from leaking by early reflecting through the front and rear aluminum layers.

5,146,060

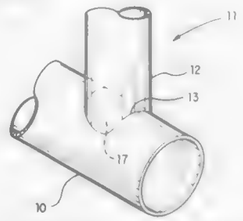
Patent Not Issued For This Number

5,146,061

ELECTRODE FOR AN ELECTRIC DISCHARGE MACHINING APPARATUS

James E. Huebler, Brookfield, Ill.; John M. Arnold, Brighton, Mich., and Narayan C. Saha, Lake Villa, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Oct. 7, 1991, Ser. No. 772,686
Int. Cl.[5] B23H *1/00, 1/04*
U.S. Cl. 219—69.15 6 Claims



1. In an electric discharge machining apparatus for chipless cutting in hot-tapping pipe having an electrode, electrode control means for controlling a position of said electrode, a dielectric fluid, coupon removal means for holding and removing a pipe coupon, and a power source, the improvement comprising:
- at least one wall of said electrode forming a hollow body open on at least one end, said open end having a shape of an opening to be cut in said pipe;
- a cutting edge of said electrode formed by said wall at said open end of said electrode, said cutting edge having a cutting edge contour which is complementary to an inside surface contour of said pipe; and
- said cutting edge having a thickness of about 0.005 inches to about 0.125 inches.

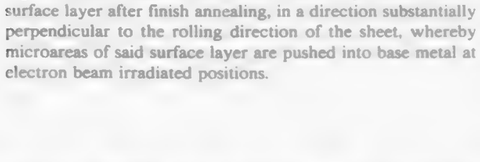
5,146,062

FEEDING DEVICE FOR A WELDING BOLT

Nobuji Koda, Kasugai; Yasuhiro Kanaishi, Iwakura, and Yokichi Samizo, Nagoya, all of Japan, assignors to Yajima Kogyo, Inc., Nagoya, Japan

Filed Apr. 4, 1990, Ser. No. 504,228
Claims priority, application Japan, Apr. 26, 1989, 1-049460[U]
Int. Cl.[5] B23K *9/28, 11/00*
U.S. Cl. 219—93 4 Claims

1. A device for feeding a welding bolt in a welder wherein the welding bolt is fed to a welding section formed by a pair of opposed and separable electrodes, said feeding device comprising:
- a feed device body disposed at a lateral side of said welding section for holding an end portion of a welding bolt feed pipe;
- a feed rod mounted for forward and rearward movement relative to said feed device body between an advance position and a retreat position;
- a bolt grasping section having a bolt receptacle and mounted to said feed rod for positioning the bolt receptacle corresponding to forward and rearward movement of the feed rod, so that when the feed rod is at the retreat position the



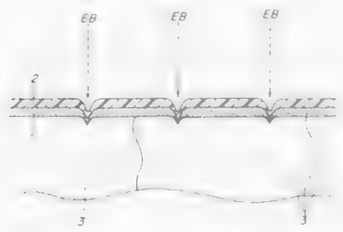
bolt receptacle is positioned adjacent a lower end portion of said feed pipe, and when the feed rod is at the advance position the bolt receptacle is positioned at said welding section; and
- an inserting device having a welding bolt inserting cylinder and mounted to said feed rod for positioning the welding bolt inserting cylinder corresponding to forward and rearward movement of the feed rod, so that when the feed rod is at the retreat position the welding bolt inserting cylinder is positioned at a lateral side of said feed pipe, and when the feed rod is at the advance position the welding bolt inserting cylinder is positioned on the bolt receptacle of said bolt grasping section.

5,146,063

LOW IRON LOSS GRAIN ORIENTED SILICON STEEL SHEETS AND METHOD OF PRODUCING THE SAME

Yukio Inokuti, Chiba, Japan, assignor to Kawasaki Steel Corporation, Japan

Filed Oct. 18, 1989, Ser. No. 423,851
Claims priority, application Japan, Oct. 26, 1988, 63-268316; Feb. 8, 1989, 1-27578
Int. Cl.[5] B23K *15/00*
U.S. Cl. 219—121.35 6 Claims



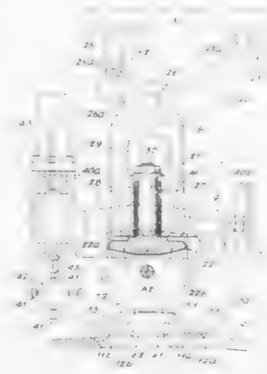
1. A method of producing a low iron loss grain oriented silicon steel sheet, which comprises locally irradiating an electron beam generated at an acceleration voltage of 65–500 kV and an acceleration current of 0.001–5 mA to a front surface of a grain oriented silicon steel sheet, which is provided with a surface layer after finish annealing, in a direction substantially perpendicular to the rolling direction of the sheet, whereby microareas of said surface layer are pushed into base metal at electron beam irradiated positions.

5,146,064

MECHANICAL SYSTEM FOR AUTOMATICALLY GUIDING ONE OR MORE ELECTRODES IN AN ARC-WELDING UNIT

Norbert Poirier, Nanterre, France, assignor to Serimer, Societe a Responsabilite Limitee, Nanterre, France

Filed Dec. 27, 1990, Ser. No. 634,434
Claims priority, application France, Dec. 29, 1989, 89 17412
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—124.34 8 Claims



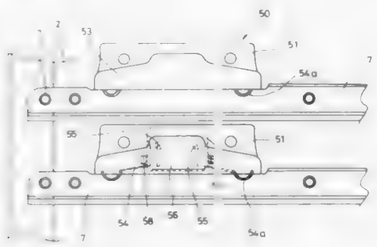
1. A mechanical guidance system for automatically guiding one or more electrodes of an arc welding unit in and along a groove delimited by mutually facing, chamfered end surfaces of two metal parts to be welded together, said guidance system comprising a main carriage which is movable along a fixed guide extending parallel to the groove, a secondary carriage provided with an electrode support block having at least one welding electrode mounted thereon, hinged connection means pivotally connecting said secondary carriage to said main carriage, and guide means comprising running members in contact with outer surfaces of the metal parts adjacent said groove and feeler members, which penetrate into the groove and are in contact with the chamfered end surfaces of said metal parts delimiting said groove, wherein said guide means comprises a first set of said feeler and running members, which is mounted at a front end of said secondary carriage and which includes a front feeler member engaging a first one of said two chamfered end surfaces and a front running member engaging the outer surface of a first one of the two metal parts on one side of said groove, and a second set of said feeler and running members, which is mounted at a rear end of said secondary carriage and which includes a rear feeler member engaging a second one of said two chamfered end surfaces and a rear running member engaging the outer surface of a second one of the two metal parts on a second side of said groove, and wherein said electrode support block is mounted on said secondary carriage between said first and second sets of feeler and running members, and wherein said hinged connection means comprises a first pivot axis which extends perpendicularly to a moving direction of the main carriage and lies in a plane parallel to the longitudinal midplane of said groove, and a second pivot axis which extends perpendicularly to said moving direction and to said midplane, said first and second pivot axis being located between said first and second sets of feeler and running members, and wherein said guidance system further comprises lateral thrust means acting on the secondary carriage to urge said secondary carriage to swivel about said first axis so as to maintain said front and rear feeler members in contact with said first and second chamfered end surfaces, respectively, and further thrust means urging said front and rear running members to bear against the outer surface of said first and second metal parts, respectively, while causing the secondary carriage

to pivot about said second axis by the engagement of said front and rear running members with the respective outer surfaces of said metal parts.

5,146,06
CART

Shigeru Motoki, Mitaka, Japan, assignor to Jamco Corporation, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,237
Claims priority, application Japan, Jul. 25, 1990, 2-195003
Int. Cl.[5] F27D *11/02*
U.S. Cl. 219—386 5 Claims



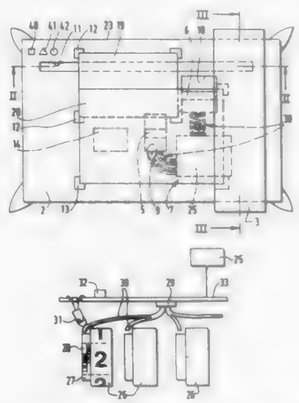
1. A cart comprising:
a body formed with a receiving chamber for receiving trays on which flatware is placed;
support members for supporting and guiding trays formed in plural stages on both side walls of said receiving chamber;
an electricity supply device connected to a power source provided at an upper part of said support member, said trays each having a heater placed thereon and having an electric contact connected to said electricity supply device, said electricity supply device including
a casing formed integral with
a conductive member receiving recess, and
a mounting plate, which mounts said electricity supply device to said side wall of the receiving chamber,
a plastic mold formed from an insulating member fitted in said conductive member receiving recess, and
a conductive member including
a conductive pin connected to a power source, said conductive member being embedded in said plastic mold, and
a conductive plate spring having one end connected to said conductive pin and another end formed into a curved portion as a curved surface.

5,146,065
BILL PUBLISHING APPARATUS

Jean-Paul Brun; Jean-Louis Sarrazin, both of Argenteuil, and Christian Dol, Gyf s/Yvette, all of France, assignors to Societe d'Applications Generales d Elecricite et de Mecanique Sagem, Paris, France

Filed Dec. 27, 1990, Ser. No. 634,996
Claims priority, application France, Dec. 27, 1989, 89 17248
Int. Cl.[5] G06K *5/0*; B41F *3/04*
U.S. Cl. 235—380 8 Claims

1. Apparatus for publishing bills for payment by bank card at a place of transaction, comprising
a frame;
on the frame, an apertured plate with characters in relief representing constant data, means for receiving a bank card and means for receiving a bill, at least one printing drum with rotary selection wheels projecting from apertures formed in the plate, each of said rotary selection wheels carrying a series of characters in relief representing variable data, the rotary selection wheels being manually driven in rotation by a user for selecting their angular positions and thus variable data values, and a carriage carrying at least one printing roller,
said carriage being mounted for movement along the plate for printing the bill by cooperation between the plate, a printing face of the bank card and the roller,
wherein each rotary selection wheel is locked for rotation with a corresponding coding disk carrying a series of

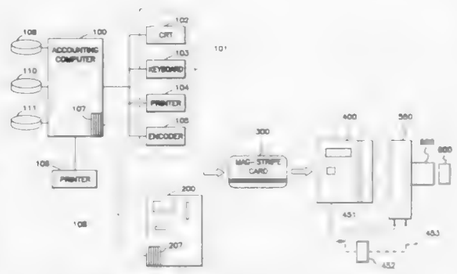


codes associated respectively with the characters of the wheel,
means are provided for reading the codes of the coding disks, and
means, controlled by the reading means are provided for recording the angular positions of the wheels and hence the values of the corresponding user-entered variable data.

5,146,067
PREPAYMENT METERING SYSTEM USING ENCODED PURCHASE CARDS FROM MULTIPLE LOCATIONS

Joseph W. Sloan, Nashville; Harry P. Snyder, Brentwood; Joseph W. Foster; Mark C. Day, both of Nashville; Timothy G. Berg; Michael Jarreau, both of Brentwood; Mark P. Miller, and A. Michael Bush, both of Nashville, all of Tenn., assignors to CIC Systems, Inc., Brentwood, Tenn.

Filed Jan. 12, 1990, Ser. No. 464,328
Int. Cl.[5] G06F *7/08*
U.S. Cl. 235—381 8 Claims

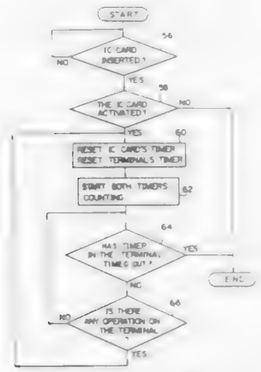


1. A prepaid utility dispensing system, comprising:
(a) at least one card dispensing station comprising means for encoding a mag-stripe card with value and account information arising from a purchase of prepaid utility services, the value and account information comprising a present rate, at least one future rate and a date when the conversion to the future rates are to occur; and
(b) a utility dispensing device resident at a customer site for dispensing utility services in accordance with the value and account information encoded on the mag-stripe card, wherein the present rate and the future rates determine how the utility dispensing device is to value the utility service dispensed, and the date determines when the future rates are to be placed into effect by the utility dispensing device, regardless of when the customer buys the mag-stripe cards.

5,146,068
SYSTEM FOR AUTHENTICATING AN AUTHORIZED USER OF AN IC CARD

Akira Ugawa, and Toshio Takizawa, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1990, Ser. No. 618,287
Claims priority, application Japan, Dec. 1, 1989, 1-310533
Int. Cl.[5] G06K *7/06*
U.S. Cl. 235—441 4 Claims

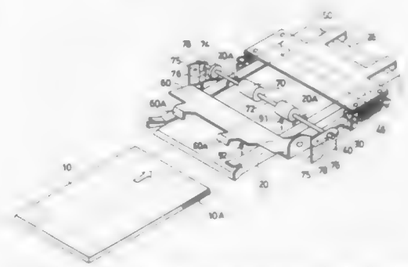


1. An authentication system comprising a combination of:
(a) an IC card which includes
(a-1) memory means for storing ID data,
(a-2) first signal exchange means for exchanging signals with a terminal unit,
(a-3) first timer means for measuring a first time interval and generating a first control signal if the first time interval expires, the first timer means including means for clearing the first timer means in response to a first reset signal,
(a-4) a keypad having a plurality of keys, and
(a-5) first control means, electrically coupled to the memory means, the first signal exchange means, the first timer means, and the keypad, for activating the IC card when the ID data stored in the memory means is identical to ID data manually entered on the keypad, and for deactivating the IC card in response to the first control signal; and
(b) a terminal unit which includes
(b-1) IC card receiving means for accepting the IC card, the IC card receiving means including second signal exchange means for providing electrical coupling with the first signal exchange means of the IC card,
(b-2) second timer means for measuring a second time interval and generating a second control signal if the second time interval expires, the second timer means including means for clearing the second timer means in response to a second reset signal, and
(b-3) second control means, electrically coupled to the second timer means and to the second signal exchange means, for communicating with the first control means in the IC card, for generating the second reset signal in response to any terminal operations, the second reset signal being conveyed to the IC card and to the second timer means in the terminal unit, and for terminating a transaction at the terminal unit if the IC card is deactivated or the second timer means generates the second control signal.

5,146,069
DEVICE FOR LOADING AND UNLOADING A MEMORY CARTRIDGE USING A SLIDING MEMBER

Masaaki Orimoto, and Toshikatsu Harase, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 31, 1989, Ser. No. 401,606
Claims priority, application Japan, Sep. 19, 1988, 63-232673; Sep. 19, 1988, 63-232674; Sep. 19, 1988, 63-232675; Sep. 19, 1988, 63-232676
Int. Cl.[5] G06K *13/00, 13/04, 13/063, 13/067*
U.S. Cl. 235—475 6 Claims



1. A memory cartridge loading/unloading device, comprising:
a roller for pressing against a memory cartridge inserted into a given position within a main body of an apparatus for using said memory cartridge in such a manner that a given frictional force is produced with respect to said memory cartridge;
roller drive means for driving said roller in a cartridge insertion direction by use of a motor so that said memory cartridge is moved by said frictional force;
a slide member movably disposed in a cartridge insertion/discharge direction;
a claw-shaped engagement member disposed in said slide member, movable apart from said memory cartridge during the movement of said memory cartridge by said roller and engageable with said memory cartridge when said memory cartridge is moved by a given amount; and
slide member drive means for driving said slide member in said cartridge insertion direction using a motor to thereby push said memory cartridge into a connector within said main body.

5,146,070
DRIVE DEVICE FOR USE WITH THE INFORMATION RECORDING/REPRODUCING APPARATUS

Tomohide Toma, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 654,082
Int. Cl.[5] G06K *13/00*
U.S. Cl. 235—475 9 Claims

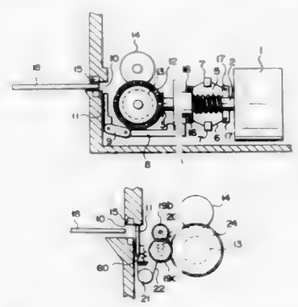
1. A driving device for an information recording/reproducing apparatus which comprises a housing provided with an opening through which an information recording medium is inserted into the housing; shutter means located at the opening of the housing to selectively move between a position where the shutter means opens the opening to allow the information recording medium to be inserted into the housing through the opening thus opened and another position where the shutter

means closes the opening to prevent the information recording medium from being inserted into the housing; and conveying means housed in the housing and made ready or not ready for carrying the information recording medium which has been inserted into the housing,

the drive device comprising

drive source means;

control means for controlling the drive source means; and



transmitting means for connecting the drive source means to the shutter means and to the conveying means in action and to moving the shutter means to the opening-opened position while making the conveying means ready for carrying the information recording medium in response to the drive source means when the drive source means is driven by the control means.

5,146,071

OPTICAL LENS SYSTEM-DRIVING CONTROL APPARATUS FOR MICROSCOPICALLY DRIVING A PLURALITY OF LENS GROUPS

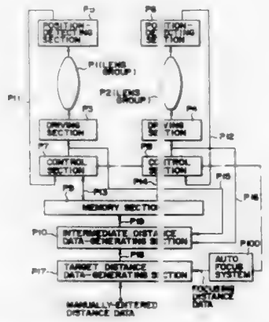
Mitsumasa Ookubo; Tsuyoshi Yagi; Yasushi Toizumi; Toyoji Sasaki; Shigeru Kato, all of Hachioji; Tetsuo Miyasaka, Kanagawa; Yasushi Odanaka, Tokyo; Masafumi Yamashaki, Hachioji, and Shinichi Kodama, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1991, Ser. No. 691,064

Claims priority, application Japan, Apr. 24, 1990, 2-106393; Jun. 5, 1990, 2-146794

Int. Cl.[5] G03B *3/00*; G01J *1/20*

U.S. Cl. 250—201.2 **24 Claims**



19. An optical lens-driving control apparatus, comprising:

a plurality of lens groups movably provided along in a direction of an optical axis therebetween;

a plurality of motors provided in order to drive the plurality of lens group, respectively;

driving circuit means for driving the plurality of motors by applying power to the plurality of motors;

final target position data-outputting means for outputting final target position data which represents a final target position;

intermediate target position data-outputting means for outputting intermediate target position data which represents an intermediate target position, said intermediate target position being intermediate between a present position and the final target position; and

control means for supplying a control signal to the driving circuit means, so as to move the plurality of lens groups to the final target position by way of the intermediate target position.

5,146,072

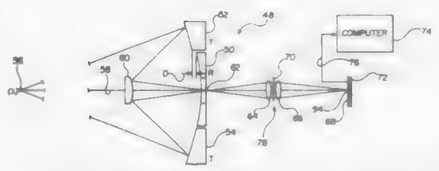
METHOD FOR DETERMINING LARGE PETAL PISTON IN A SEGMENTED IMAGING ASSEMBLY

Thomas W. Dey, Springwater, and Alan L. Wertheimer, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,781

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.9 **5 Claims**



1. A method suitable for determining piston in a segmented imaging assembly, the assembly comprising

(a) a polychromatic source of radiation that can output a polychromatic radiation beam; and

(b) a segmented imaging system comprising a reference component and a test component, which components can be used to form an imaged radiation beam;

the steps of the method comprising:

1) intercepting preselected portions of the imaged radiation beam with a mask comprising two apertures, so that one aperture is dedicated to radiation imaged by the reference component, and the second aperture is dedicated to radiation imaged by the test component, thereby creating a real time masked image; and

2) interrogating an envelope and a fine structure spacing of the real time masked image, as a measure of a large amount of petal piston of the test component relative to the reference component of the segmented imaging system.

5,146,073

LINEAR WAVEFRONT SENSOR CAMERA WITH DEFORMABLE MIRROR FOR RECORDING VELOCITY COMPENSATED IMAGES

Allan Wirth, Bedford, and Andris Jankevics, Acton, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 23, 1991, Ser. No. 704,472

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.9 **4 Claims**

1. An optical system for recording compensated images from a moving platform travelling with a predetermined velocity along a platform axis, comprising:

input aperture determining means positioned along a first optic axis having a predetermined relationship to said platform axis for passing optical radiation from an exterior scene through a system aperture into said optical system;

means for focussing radiation from a predetermined linear portion of said scene through a linear array of subapertures of said system aperture onto a linear array of wavefront sensing subdetectors, each wavefront sensing subdetector corresponding to one of said subapertures and comprising a set of individual pixel detectors for measuring radiation impinging on individual pixels within said one of said subdetectors and generating a set of pixel subdetector electrical signals responsive thereto;

beamsplitter means positioned along said first optic axis for deflecting a portion of said radiation from said linear portion of said scene onto a deformable mirror positioned along a second optical axis passing through said beamsplitter means;

mirror control means, connected to said linear array of wavefront sensing subdetectors and to said deformable

mirror, for generating deformable mirror array control signals for controlling a linear array of deformable mirror actuators corresponding optically to said linear array of wavefront sensing subdetectors in response to said pixel subdetector electrical signals;

image detecting means positioned in an image plane disposed to receive corrected radiation reflected and corrected by said deformable mirror in response to said mirror control means for detecting said corrected radiation and generating image detector electrical signals in response thereto; and

signal storage means for storing at least one set of stored deformable mirror control signals from said mirror control means and applying said set of stored deformable mirror control signals to said deformable mirror under control of system control means.

5,146,074

SOLID STATE IMAGING DEVICE

Yukito Kawahara; Satoshi Machida; Hiroshi Mukainakano, and Masahiro Yokomichi, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Aug. 8, 1991, Ser. No. 741,997

Claims priority, application Japan, Aug. 18, 1990, 2-217898

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **3 Claims**

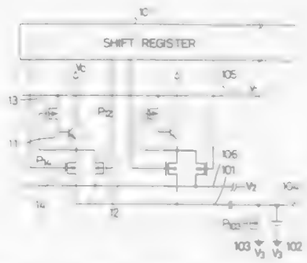
1. A solid state imaging device having an array of bit units formed in a semiconductor substrate, each bit unit comprising:

a phototransistor having a collector, an emitter and a base formed of the semiconductor substrate;

a switching transistor of the MOS type having a drain connected to the emitter of the phototransistor;

an initializing transistor of the MOS type having a drain connected to the base of the phototransistor, a source receptive of a first reference voltage, and a gate connected to the emitter of the phototransistor; and

a resetting transistor of the MOS type having a drain connected to the emitter of the phototransistor, a source



receptive of a second reference voltage, and a gate receptive of a reset signal.

5,146,075

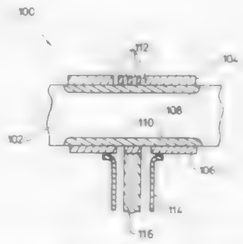
LIGH ACTIVATED HIGH POWER INTEGRATED PULSER

Anderson H. Kim, Toms River; Maurice Weiner; Stephen Levy, both of Ocean, and Robert J. Zeto, Estontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 8, 1991, Ser. No. 681,253

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—211 J **20 Claims**



1. A high power integrated pulser comprising:

a light activated means for switching; and

means for storing charge;

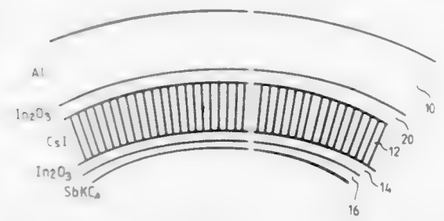
said light activated means for switching and said means for storing charge integrally formed on a semiconductor substrate having at least two surfaces with metallic layers formed on at least two of the surfaces, said metallic layers forming a step-up voltage transformer over a distance between a center point of said metallic layers to an outer point of said metallic layers so that an output voltage of the high energy integrated pulser is equal to or greater than a corresponding voltage used to charge said high energy integrated pulser.

5,146,075

INPUT SCREEN FOR RADIOLOGICAL IMAGE INTENSIFIER TUBE UTILIZING AN ANTI-REFLECTING LAYER

Yvan Raverdy, Bas Bernin; Francois Chareyre, St. Egreve, and Paul De Grott, St. Ismier, all of France, assignors to Thomson Tubes Electroniques, Boulogne Billancourt, France

PCT No. PCT/FR90/00340, § 371 Date Jan. 23, 1991, § 102(e) Date Jan. 23, 1991, PCT Pub. No. WO90/15432, PCT Pub. Date Dec. 13, 1990
PCT Filed May 15, 1990 Ser. No. 640,386
Claims priority, application France, May 30, 1989, 89 07086
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 VT 9 Claims



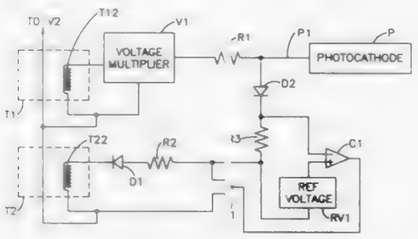
1. Input screen for radiological image intensifier tube, comprising a support (**10**) carrying a scintillation layer (**12**), characterised in that a thin anti-reflecting layer (**20**), transparent or slightly absorbent to the wavelength emitted by the scintillation layer, is interposed between the support and the scintillation layer.

5,146,077

GATED VOLTAGE APPARATUS FOR HIGH LIGHT RESOLUTION AND BRIGHT SOURCE PROTECTION OF IMAGE INTENSIFIER TUBE

Joseph N. Caserta; William D. Means, and David A. Crenshaw, all of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 19, 1991, Ser. No. 671,344
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 VT 15 Claims



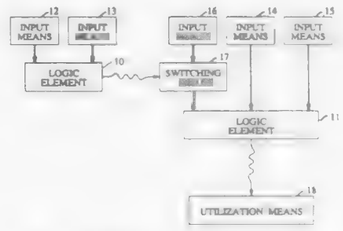
1. In an image intensifier tube having a photocathode, which draws a current in response to the brightness of input light, the improvement therewith comprising pulsing means, responsive to the magnitude current flowing through said photocathode, for pulsing said photocathode on and off only when said current drawn by said photocathode exceeds a predetermined value, indicative of a clamp level for said tube.

5,146,078

ARTICLES AND SYSTEMS COMPRISING OPTICALLY COMMUNICATING LOGIC ELEMENTS INCLUDING AN ELECTRO-OPTICAL LOGIC ELEMENT

Sergey Luryi, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 10, 1991, Ser. No. 639,634
Int. Cl.[5] H01J *31/50, 40/14*
U.S. Cl. 250—213 A 12 Claims



1. An article comprising

a) at least a first and second logic element, associated with each of said two logic elements being a multiplicity of input channel means adapted for receiving electrical input signals and output channel means adapted for providing an output signal responsive to the input signals;

b) means for providing electrical input signals to the input channel means of the first logic element;

c) means responsive to the output signal of the second logic element; and

d) means adapted for causing the input signal to at least one of the input channel means of the second logic element to be a function of the output signal of the first logic element;

characterized in that

e) the output singal of at least the first logic element is an optical signal; and

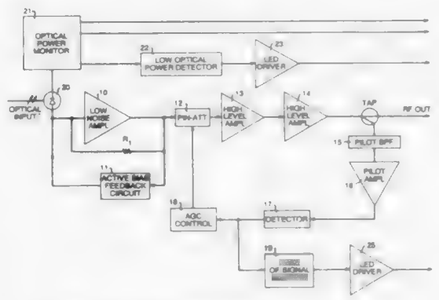
f) the means of d) comprise first means whose electrical state is responsive to an optical signal that impinges on the first means, and the first means are located such that at least a part of the optical output signal of the first logic element can impinge on the first means.

5,146,079

BROADBAND OPTICAL RECEIVER WITH ACTIVE BIAS FEEDBACK CIRCUIT

Richard J. Lisco, Township of Hanover, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 1, 1990, Ser. No. 608,085
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 AG 9 Claims



1. An optical receiver comprising:

a photodetector device having an output;

an amplifier having an input coupled to the output of the photodetector device, and having an output, the amplifier comprising a field effect transistor coupled to a bipolar transistor; and

an active feedback bias control circuit coupled between the input and output of the amplifier,

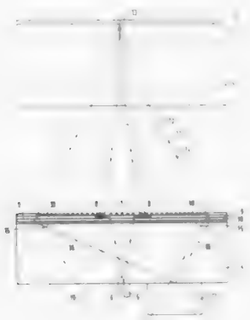
said bias control circuit comprising means for sensing current through the bipolar transistor and means in response thereto for adjusting the bias to the gate of the field effect transistor to keep the current through the bipolar transistor constant.

5,146,080

PLANAR OPTICAL SCANNING HEAD WITH CONCENTRIC DIFFRACTION GRATINGS

Willem G. Opheij, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1991, Ser. No. 728,439
Claims priority, application European Pat. Off., Apr. 23, 1991, 91200971
Int. Cl.[5] E04G *17/06*
U.S. Cl. 250—216 20 Claims



1. An optical head for scanning a surface, which head is provided with a radiation source, an element comprising a substrate on which an input grating is arranged for coupling the radiation from the source into a waveguide of the element, an output grating arranged on the substrate around the input grating for coupling radiation out of the waveguide and for directing said radiation in the form of a scanning beam onto the surface, and a detection system, characterized in that the optical head is provided with a detector grating arranged around the input grating for deflecting the radiation reflected by the record carrier towards the detection system.

5,146,081

SWITCHING CIRCUIT FOR A CONTACT DISPLAY PANEL

Kari Heikkinen, Äänekoski, and Juha Savolainen, Hankasalmi, both of Finland, assignors to Heikki Marttila Oy, Jyvaskyla, Finland

Filed Oct. 30, 1990, Ser. No. 605,311
Claims priority, application Finland, Mar. 11, 1989, 895242
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 2 Claims

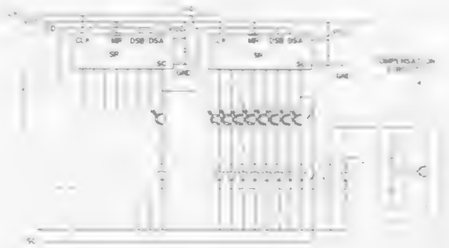
1. A contact display panel circuit for a contact display panel, comprising:

a plurality of phototransistors on two adjacent sides of the contact display panel;

a plurality of first diodes arranged on opposite sides of the contact display panel from respective oppositely disposed ones of said plurality of phototransistors, said plurality of first diodes emitting infrared radiation to oppositely disposed ones of said plurality of phototransistors;

at least one shift register for controlling each of said plurality of phototransistors;

each of said plurality of phototransistors being electrically connected in series with one end of one of a plurality of second diodes;



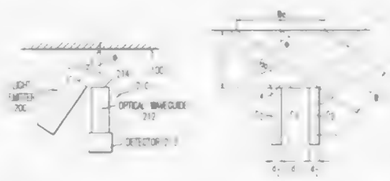
a common line connecting the other end of each of said second diodes, wherein each of said plurality of second diodes is coupled in series with a corresponding one of said plurality of phototransistors in such a manner that the collector of each of said plurality of phototransistors is coupled to said at least one shift register, and the emitter of each of said plurality of phototransistors is coupled via a respective one of said plurality of second diodes to said common line.

5,146,082

IMAGE DETECTING UNIT HAVING EMITTING MEANS AND LIGHT RECEIVING MEANS AND METHOD FOR ARRANGING THE LIGHT EMITTING MEANS AND THE LIGHT RECEIVING MEANS

Hiroyuki Abe, Sendai, Japan, assignor to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics Co., Ltd., Natori, both of, Japan

Filed Oct. 29, 1990, Ser. No. 604,461
Claims priority, application Japan, Oct. 30, 1989, 1-282649
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.20 7 Claims



4. A method for arranging light emitting means for emitting a light beam and light receiving means, operatively coupled to said light emitting means, for receiving a light beam so that said light emitting means and said light receiving means face a medium, said light receiving means comprising,

optical waveguide means, having a core layer, a clad layer surrounding said core layer and an end surface opposite to a surface of said medium, the light incident to said end surface being transmitted through said optical waveguide, and

photoelectric conversion means, coupled to said optical waveguide, for converting the light transmitted through said optical waveguide to said photoelectric conversion means into an image signal,

said method comprising the steps of:

(a) facing the end surface of said optical waveguide to an area on a surface of said medium;

(b) adjusting an incident angle 0 of the light beam incident

onto the area on the surface of said medium so that the following formula is established;

$$\phi_0 - 25° < \phi < \phi_0 + 10°$$

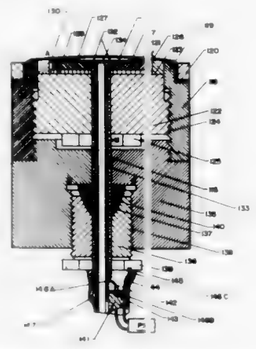
where said incident angle is an angle between the light beam emitted from said light emitting means and a normal direction of the surface of said medium and ϕ_0 represents an optimum incident angle, said optimum incident angle being an incident angle in which an amount of light transmitted through said optical waveguide means to said photoelectric conversion means becomes approximately maximum.

5,146,083

HIGH TEMPERATURE FIBER OPTIC MICROPHONE HAVING A PRESSURE-SENSING REFLECTIVE MEMBRANE UNDER TENSILE STRESS

Allan J. Zuckerwar, Newport News, Va.; Frank W. Cuomo, East Providence, R.I.; William E. Robbins, Achilles, and Purnell Hopson, Jr., Seaford, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 21, 1990, Ser. No. 586,369
Int. Cl.[5] H01L *40/14*
U.S. Cl. 250—227.21 24 Claims



1. An apparatus for measuring pressure fluctuations, comprising:

an optical fiber probe comprising a single optical fiber for transmitting light from a light source and a plurality of optical fibers for receiving and transmitting reflected light;

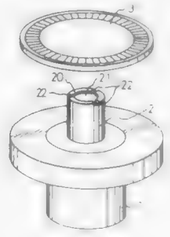
a pressure-sensing membrane having a reflecting surface for reflecting said light, wherein said reflecting surface undergoes deflections in relation to the pressure fluctuations to be measured, said membrane is under tensile stress while at rest, wherein said optical fiber probe is arranged such that said single optic fiber transmits light to the approximate center of the reflecting surface and the plurality of optical fibers receives and transmits the reflected light, whereby the light reflected by center displacement of the membrane is indicative of the sound pressure incident on the membrane.

5,146,084

ROTARY CODE DISK MOUNTING STRUCTURE FOR AN OPTICAL ENCODER WITH AN ADHESIVE SUBSTANCE FILLING THE CIRCULAR RECESS OF THE SPINDLE FOR ADHERENCE TO SAID DISK

Eiki Asaba, and Yoshihito Tanabe, both of Yamanashi, Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

PCT No. PCT/JP89/00894, § 371 Date Apr. 20, 1990, § 102(e) Date Apr. 20, 1990, PCT Pub. No. WO90/02316, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 31, 1989, Ser. No. 474,081
Claims priority, application Japan, Aug. 31, 1988, 63-214936
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.14 5 Claims



1. A rotary code disk mounting structure for an optical encoder, comprising:

a flange;

a spindle mounted on a top surface of said flange, said spindle having defined on a top end thereof a central circular recess; and

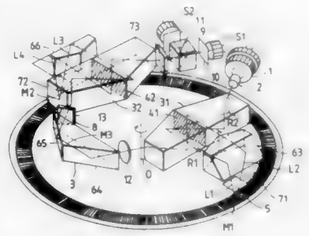
a rotary code disk adhesively mounted on said spindle, said rotary code disk having an adhesive substance filling the circular recess for adhering said rotary code disk to said spindle.

5,146,085

ENCODER WITH HIGH RESOLVING POWER AND ACCURACY

Koh Ishizuka, Urawa, and Tetsuharu Nishimura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1990, Ser. No. 522,051
Claims priority, application Japan, May 12, 1989, 1-120046; May 12, 1989, 1-120047
Int. Cl.[5] G01D *5/34*; H01J *3/14*
U.S. Cl. 250—231.16 10 Claims



1. A rotary encoder, comprising:

light beam incidence means for emitting a light beam and directing it to a first position M1 on a rotary scale to be diffracted, with the rotary scale having a reflecting type diffraction grating formed along a direction of rotation;

optical means for directing first and second diffracted lights reflected from said first position M1 along a substantially common optical path, and causing the first and second diffracted lights to be incident on a second position M2 on the rotary scale to be rediffracted, said second position M2 being a position substantially point-symmetrical with said first position M1 with respect to a center of rotation of the rotary scale, with said optical means including an optical system for allowing said first position M1 and said second position M2 to be optically conjugate to each other with respect to said optical system;

light detecting means for detecting an interference light formed by rediffracted lights reflected from said second position M2 and outputting a signal; and

rotation detecting means for detecting a rotated state of the rotary scale on the basis of the output signal of said light detecting means.

5,146,086

METHOD AND APPARATUS FOR IMAGING POROUS MEDIA AND METHOD FOR FABRICATING NOVEL OPTICAL MATERIALS

Bibhas R. De, Laguna Beach; Michael A. Nelson, Glen Avon, and Kiran K. Pande, Laguna Hills, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Mar. 19, 1991, Ser. No. 672,194
Int. Cl.[5] G01N *21/35*
U.S. Cl. 250—253 19 Claims

1. A permeability mapping apparatus comprising:

(a) a matrix medium of closely packed particles;

(b) a pore filling medium symbiotically interposed within said matrix medium;

(c) a means for generating a coherent collimated beam of electromagnetic radiation, said beam of electromagnetic radiation vectored to transpierce a series of locations defining said matrix medium;

(d) a means for successively generating an attenuation signal for each of the vectored beams of electromagnetic radiation at each location transpierced by said beam of electromagnetic radiation, and assigning a weighted value based on a correlation function of known permeability to each of the attenuation signals so as to compensate each beam attenuation signal for attenuations at other than one of said matrix locations;

(e) a means for reconstructing all said weighted values over said series of locations defining said matrix so as to reconstruct said matrix in terms of each attenuation signal at each of said locations;

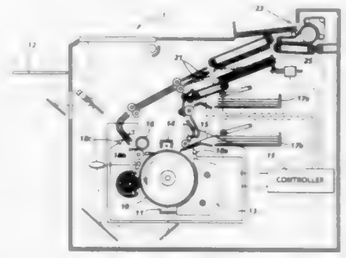
(f) a means for displaying each reconstructed value to image said matrix medium.

5,146,087

IMAGING PROCESS WITH INFRARED SENSITIVE TRANSPARENT RECEIVER SHEETS

John G. VanDusen, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 23, 1991, Ser. No. 734,709
Int. Cl.[5] G06K *7/10*
U.S. Cl. 250—271 14 Claims



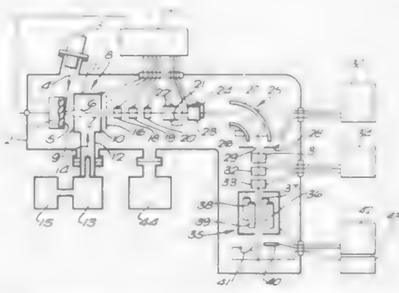
1. A process which comprises providing an imaging apparatus equipped with a path for moving receiver sheets through the apparatus and having infrared sensors situated along said path, incorporating into the imaging apparatus a substantially transparent receiver sheet having coated on at least a portion thereof an infrared absorbing material contained in a polymeric binder, passing the substantially transparent receiver sheet along the path, wherein the infrared sensors detect the presence of the infrared absorbing material on the substantially transparent receiver sheet, and generating an image on the substantially transparent receiver sheet.

5,146,088

METHOD AND APPARATUS FOR SURFACE ANALYSIS

David R. Kingham, Oxford, and Alan R. Waugh, Burgess Hill, West Sussex, both of United Kingdom, assignors to VG Instruments Group Limited, Uxbridge, England

Filed Dec. 20, 1990, Ser. No. 630,531
Claims priority, application United Kingdom, Dec. 21, 1989, 8928917
Int. Cl.[5] B01D *50/44*; H01J *49/00*
U.S. Cl. 250—288 10 Claims



6. An apparatus for analyzing organic material/molecules present in a surface region of a sample, said apparatus comprising: an evacuable sample receiving chamber; means for generating an energetic beam of particles or photons and for directing said beam onto a sample disposed in said chamber whereby to cause the removal therefrom of at least some of said organic material into a spatial region proximate to said surface region; means for generating continuous non-coherent ultra-violet radiation; means for directing said radiation into said spatial region to photoionize organic molecules therein; means for mass analyzing resultant ionized species; and means for con-

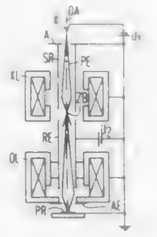
ducting ions from said spatial region to said means for mass analyzing.

5,146,089
ION BEAM DEVICE AND METHOD FOR CARRYING OUT POTENTIAL MEASUREMENTS BY MEANS OF AN ION BEAM
Jürgen Rosien, Riemerling, Fed. Rep. of Germany, assignor to ICT Integrated Circuit Testing Gesellschaft fur Halbleiterpruftechnik mbH, Fed. Rep. of Germany
Filed Dec. 20, 1990, Ser. No. 631,472
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000579
Int. Cl.[5] H01J 37/28
U.S. Cl. 250—309 4 Claims

1. An ion beam device comprising:
a) means for producing a pulsed ion beam,
b) means for deflecting the ion beam,
c) an electrostatic objective lens for focussing the ion beam onto a testpiece, said lens having three rotationally symmetrical electrodes arranged one behind the other in the beam direction, the axis of the objective lens coinciding with the axis of the ion beam, characterised by the further features:
d) a secondary electron spectrometer having an extraction electrode, a filter electrode, a scintillator and a control circuit connecting the scintillator to the filter electrode integrated into the ion beam device; and
e) the scintillator is formed by the central electrode of the objective lens.

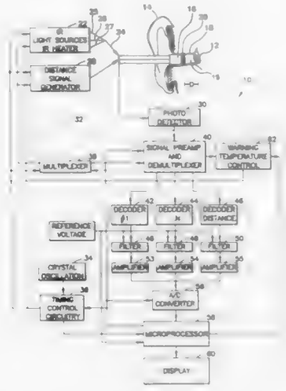
5,146,090
PARTICLE BEAM APPARATUS HAVING AN IMMERSION LENS ARRANGED IN AN INTERMEDIATE IMAGE OF THE BEAM
Erich Plies, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 25, 1991, Ser. No. 691,238
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1990, 4018690
Int. Cl.[5] H01J 37/04
U.S. Cl. 250—310 19 Claims

1. A particle beam apparatus comprising: a particle beam generator for producing a beam of particles, a first lens system for focusing the particle beam and a second lens system for imaging an intermediate image of the particle beam produced by the first lens system onto a specimen, and a first immersion lens for accelerating the particles from a first energy level to a



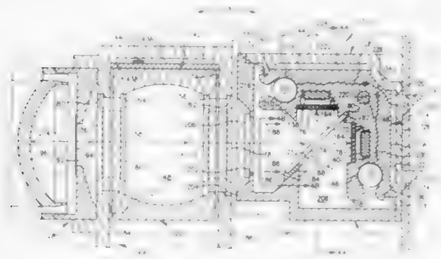
higher, second energy level, the first immersion lens for accelerating arranged in the intermediate image.

5,146,091
BODY FLUID CONSTITUENT MEASUREMENT UTILIZING AN INTERFERENCE PATTERN
Mark B. Knudson, Shoreview, Minn., assignor to Inomet, Inc., Roseville, Minn.
Continuation-in-part of Ser. No. 510,935, Apr. 19, 1990. This application Dec. 4, 1990, Ser. No. 621,771
Int. Cl.[5] G01N 33/48
U.S. Cl. 250—341 12 Claims



1. An apparatus for determining a level of a constituent in a body fluid contained within a body tissue, said apparatus comprising:
light generating means for generating a beam of a source light including at least one wavelength absorbable by said constituents;
light detecting means for receiving light and measuring an intensity of said light;
beam splitting and directing means for splitting said source beam into at least a reference beam and a test beam with said reference beam directed toward said light detecting means and with said test beam directed toward said tissue for said test beam to be modified by at least partial absorption of said at least one wavelength by said constituent within said tissue and with said modified light reflected off said tissue toward said light detecting means, said modified light and said reference light at said light detecting means cooperating to generate an interference pattern corresponding at least in part to a level of said constituent within said tissue;
processing means for receiving an output of said light detecting means and calculating said level of said constituent in response to said output.

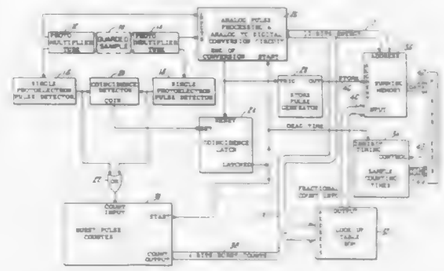
5,146,092
GAS ANALYSIS TRANSDUCERS WITH ELECTROMAGNETIC ENERGY DETECTOR UNITS
Jerry R. Apperson; Daniel W. Knodle, both of Seattle; Lawrence L. Labuda, Issaquah; James T. Russell, Bellevue, and Gary M. Bang, Edmonds, all of Wash., assignors to NTC Technology, Inc., Wilmington, Del.
Division of Ser. No. 528,059, May 23, 1990. This application Apr. 16, 1991, Ser. No. 687,012
Int. Cl.[5] G01N 21/61
U.S. Cl. 250—343 24 Claims



1. A transducer for non-dispersive infrared radiation gas analysis which comprises:
a detector unit which includes a detector for outputting a signal indicative of the concentration of a designated gas flowing through an airway adapter physically associated with the transducer;
means for so heating the detector as to keep it at a selected temperature and thereby eliminate detector temperature-related changes in the signal outputted by the detector;
means for heating the casing of an airway adapter associated with the transducer to a temperature high enough to keep condensation from forming and interfering with the operation of the detector; and
means for independently controlling the operation of the detector heating means and the airway adapter casing heating means so that the heating of said casing will not interfere with the temperature regulating supply of power to the detector.

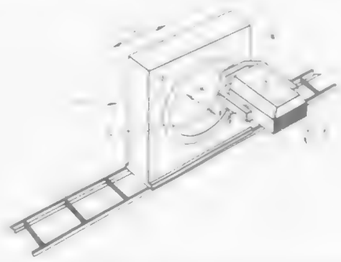
5,146,093
LIQUID SCINTILLATION MEASUREMENT SYSTEM WITH ACTIVE GUARD SHIELD
Robert J. Valenta, Berkeley, Ill., and John E. Noakes, Athens, Ga., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.
Continuation-in-part of Ser. No. 167,407, Mar. 14, 1988, Pat. No. 4,833,326, which is a continuation-in-part of Ser. No. 887,067, Jul. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 721,266, Apr. 8, 1985, Pat. No. 4,651,006. This application May 22, 1989, Ser. No. 355,761
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] G01T 1/178
U.S. Cl. 250—362 3 Claims

1. A low-level liquid scintillation measurement system for counting sample optical events resulting from the radioactive decay of a constituent of a sample to be measured while reducing the counting of background optical events which are optical events produced by background radiation and which create electrical pulses other than pulses representing a sample optical event, said system comprising:
a plurality of detection means located adjacent the sample for detecting optical events and for converting optical events into electrical pulses,
coincidence sensing means for receiving said electrical pulses from said plurality of detection means and producing a trigger pulse when said electrical pulses from said plurality of detection means coincide with each other,
burst detection means for receiving said trigger pulses from said coincidence sensing means and said electrical pulses from said plurality of detection means for determining the number of electrical pulses present in a selected interval following each of said trigger pulses,
evaluation means connected to the burst detection means for determining, in response to the number of pulses detected in said selected interval, the extent to which the optical event represented by the corresponding trigger pulse



should be treated as a sample optical event or a background event, and
an active guard shield arrangement comprising an auxiliary scintillator optically coupled to said plurality of detection means, said shield being adapted to be excited by background radiation and to effectively increase the number of electrical pulses present in said selected interval following a trigger pulse generated as a result of said coincident pulses produced due to the background radiation, so as to allow said measurement system to accurately evaluate the number of pulses detected in the selected interval and determine the extent to which a trigger pulse is to be treated as a sample optical event, said auxiliary scintillator comprising a glass including lithium, magnesium, silicon and cerium.

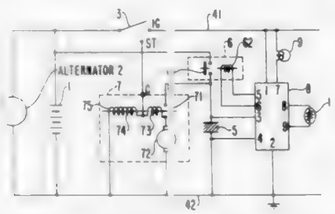
5,146,094
MEDICAL DIAGNOSTIC NUCLEAR CAMERA SYSTEM
Iain E. Stark, Dollard des Ormeaux, Canada, assignor to Isis Inc., Quebec, Canada
Filed Jun. 7, 1991, Ser. No. 712,352
Int. Cl.[5] G01T 1/166; A61B 6/03
U.S. Cl. 250—363.08 14 Claims



1. A medical diagnostic nuclear camera mechanical positioner comprising:

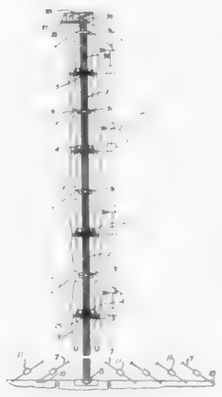
track means providing an elongated linear path of travel;
a main frame unit rotatably supporting a cylindrical shell drum and mobile on the track means along said path, the drum having an axis which is horizontal and perpendicular to said path;
mounting means connected to one end of the drum for supporting the camera, the mounting means able to rotate the camera about an axis parallel to said axis of the drum;
counterweight means connected to an opposite end of the drum diametrically opposite the mounting means for substantially balancing a weight of the camera such that a center of gravity of the main frame unit lies stably over the track means;
frame drive means for moving the main frame unit along said path on the track means;
drum drive means for rotating the drum; and
mounting drive means for causing the mounting means to rotate the camera.

5,146,095
LOW DISCHARGE CAPACITOR MOTOR STARTER SYSTEM
Yoshinobu Tsuchiya, Fujisawa; Akihiro Shirata, and Hiroyoshi Moroboshi, both of Yokohama, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan
Filed Mar. 30, 1990, Ser. No. 501,775
Claims priority, application Japan, Jun. 14, 1989, 1-151234
Int. Cl.[5] F02N *11/00*
U.S. Cl. 290—38 R **5 Claims**



5. A starter system for an automotive engine including a starter motor operatively coupled to the engine to deliver a starting force to the engine, said system comprising:
a battery having a stored supply of electric energy;
an electrical circuit electrically coupled to the battery and the starter motor and including a large-capacitance capacitor chargeable by the electric energy of the battery, said capacitor being normally disconnected from the battery and the starter motor;
a manual switch movable between first and second positions;
a first switch disposed in the electrical circuit and being operable to normally disconnect the capacitor from the battery and to connect the battery to the capacitor when the manual switch is in the first position, thereby charging the capacitor with electric energy to a predetermined voltage level; and
a second switch disposed in the electrical circuit and being operable to normally disconnect the capacitor from the battery and to connect the capacitor to the starter motor when the predetermined voltage level has been achieved when the manual switch is in the second position, thereby discharging the electric energy stored in the capacitor to the starter motor.

5,146,096
EFFICIENT HIGH TOWER WIND GENERATING SYSTEM
Harry R. McConachy, 2/9 David St. Balaclava, Melbourne, Vic, Australia 3183
Continuation-in-part of Ser. No. 542,578, Jun. 25, 1990, Pat. No. 5,062,765. This application Jul. 24, 1991, Ser. No. 735,319
Int. Cl.[5] F03D *7/02, 1/02, 7/04*
U.S. Cl. 290—44 **16 Claims**

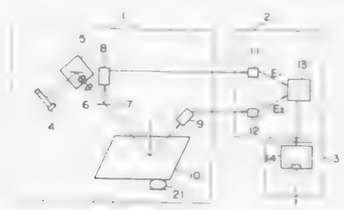


1. An electric power generating system, comprising in combination:
a series of vertically disposed interconnected mast sections depending from an initial ground contact mast member forming a single-masted, vertically-disposed tower of a height of at least two hundred meters above ground level,
articulated means interconnecting the mast sections so that each section can tilt over an angular departure from vertical independently from the posture of any other section in response to lateral forces on that section,
vertical alignment means for holding the adjacent mast sections in substantial vertical alignment with each other while responding to said lateral forces,
a plurality of rotor driven electric generators that produce power as a function of the wind energy driving the propeller, each supported by one of at least a plurality of uppermost mast sections of the tower, with rotors of adjacent electric generators being spaced apart from each other at gaps coinciding with the articulated joint means, and further comprising direction finding means for said rotors and means responsive to the direction finding means to align said rotors with the wind,
thereby to encounter greater wind energy at said uppermost regions of the tower for more efficient power generation, and to dynamically respond to counteract variable wind force loading reaction on individual tower sections at various heights by way of the rotors and generators.

5,146,097
METHOD FOR MEASURING GLOSS PROFILE
Hideki Fujiwara; Chizuru Kaga, and Isao Kano, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan
Filed May 14, 1991, Ser. No. 699,641
Claims priority, application Japan, May 15, 1990, 2-124440
Int. Cl.[5] G01N *21/57*
U.S. Cl. 250—372 **3 Claims**

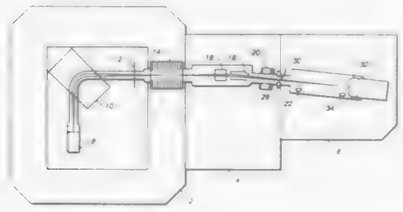
1. A method for measuring a gloss profile comprising the steps of applying a spot of a monochromatic ultraviolet light to the surface of a sample to be measured; regularly moving said spot on the surface of a predetermined area of the sample;

photoelectrically converting a reflected light of each spot, obtained with a same reflective angle as an incident angle, and



comparing and calculating the reflectance to determine the gloss profile.

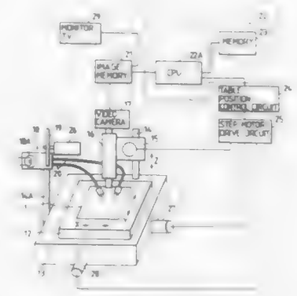
5,146,098
ION BEAM CONTAMINATION SENSOR
Andrew P. Stack, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.
Filed Apr. 5, 1991, Ser. No. 681,807
Int. Cl.[5] H01J *37/244*
U.S. Cl. 250—492.2 **21 Claims**



1. Apparatus for detecting particles present during ion beam implantation of a wafer comprising:
first means for sensing energy in a vicinity of the wafer surface;
means for spectrally analyzing said sensed energy to provide a detected spectrum; and
means for comparing said detected spectrum with a predetermined baseline spectrum representing characteristics of an ion beam used for wafer implantation, said comparison producing a resultant spectrum for identifying contaminants and residual gases present at or near the wafer surface during processing.

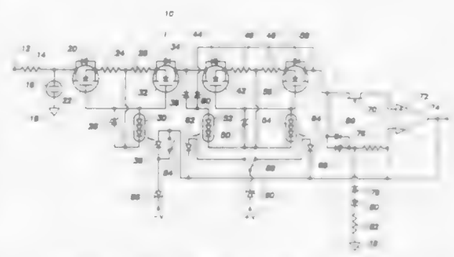
5,146,099
APPARATUS FOR MEASURING AMOUNT OF POSITIONAL DEVIATION OF A RECORDING SHEET
Atsuko Miyoshi, Hiroshima, and Hiroshi Miwa, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Jun. 25, 1991, Ser. No. 720,690
Claims priority, application Japan, Jun. 27, 1990, 2-171919
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 **8 Claims**

1. An apparatus for measuring an amount of positional deviation of a recording sheet, comprising:
illuminating light selecting means for selecting an illuminating light beam suitable for the color of a predetermined pattern on a recording sheet;
video image pickup means for forming a video image of a recording sheet on which a plurality of patterns are printed;
means for converting said vide image into binary signal data which are stored in an image memory;
border coordinate data generating means for producing border coordinate data representing the coordinates of a border where said image data changes greatly in signal level;
means for setting data of an approximate straight line which approximates a line connecting the borders of said patterns;
means for obtaining a first sum of squares of the differences between said approximate straight line and said border coordinate data;
means for solving a function with the constants of said approximate straight line as variables, which is to obtain said first sum of squares, with respect to said variables, to obtain an equation for a straight line;



means for calculating a typical position of said pattern which is the intersection of at least two approximate straight lines;
means for establishing a curvilinear function for a curve connecting the typical positions of said plurality of patterns;
means for obtaining a second sum of squares of the differences between said curvilinear function and the typical positions of said plurality of patterns; and
means for solving an equation with the constants of said curvilinear function as variables to obtain second sum of squares with respect to said variables, to obtain an equation for a curvilinear function.

5,146,100
HIGH VOLTAGE SOLID-STATE SWITCH WITH CURRENT LIMIT
John G. Banaska, Brunswick, Ohio, assignor to Keithley Instruments, Inc., Cleveland, Ohio
Filed May 21, 1991, Ser. No. 703,505
Int. Cl.[5] G02B *27/00*
U.S. Cl. 250—551 **6 Claims**



1. A current-limiting solid-state switch operable to connect an input to an output comprising:
a first enhancement mode MOSFET having a first drain, a first source and a first channel, said first drain being connected in series relationship with said input;
a second enhancement mode MOSFET having a second

drain, a second source and a second channel, said second drain being connected in series relationship with said output;

a first and a second current-sensing resistor, said resistors being connected in series relationship between said first source and said second source, there being a common point between said resistors

a first photovoltaic source having a first terminal and a second terminal, said first terminal being connected to said first and second gates and said second terminal being connected to said common point; and

selectable illumination means, wherein said input and output are disconnected when said first photovoltaic source is not illuminated and said input and output being bi-polarly connected but current-limited when said first photovoltaic source is illuminated.

5,146,101

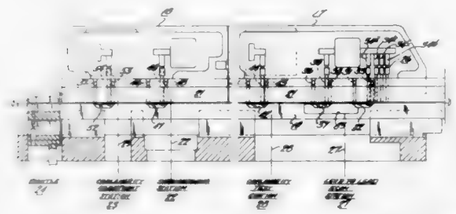
LEAD INSPECTION AND STRAIGHTENER APPARATUS AND METHOD WITH SCANNING

Frank V. Linker, Sr., Springfield; Frank V. Linker, Jr., Broomall, and Edward T. Claffey, Aston, all of Pa., assignors to American Tech Manufacturing Corp., Glenolden, Pa.

Filed Nov. 5, 1990 Ser. No. 609,370

Int. Cl.[5] G01N *21/86;* **B07C** *5/00*

U.S. Cl. 250—561 **19 Claims**



1. Lead scanning apparatus for scanning the lead to lead integrity of electronic devices having a body portion and a plurality of leads extending from opposite sides thereof, comprising:

track means for moving individual electronic devices axially along a path;

a scanning station on said path, including stop means for stopping each of said devices to align each device at a predetermined fixed location on said path and also including holding means for positioning and maintaining said device in a scanning orientation at said predetermined location to prevent lateral shift errors;

scanning means movably positioned at said station for scanning axially along the length without a velocity variation between individual electronic devices and providing a signal relative to a fixed point with respect to said stop means upon intersection with each lead extending from said device; and

comparator means for comparing actual signals from said scanning means with predetermined signals based on said fixed point to determine the existence and spacing of each lead with respect to a predetermined pattern, said comparator means providing a signal based on said comparison for each device.

5,146,102

FINGERPRINT IMAGE INPUT APPARATUS INCLUDING A CYLINDRICAL LENS

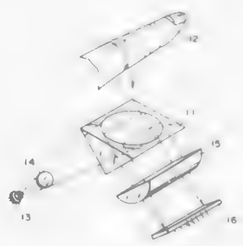
Yoshinori Higuchi, Yokohama, and Jun Hanari, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1990, Ser. No. 586,215

Claims priority, application Japan, Feb. 22, 1990, 2-39858; Feb. 26, 1990, 2-42438

Int. Cl.[5] G06K *5/00*

U.S. Cl. 250—556 **9 Claims**



1. A fingerprint image input apparatus for optically detecting ridges of a skin surface of a finger and inputting a detected signal to various control units, comprising:

a transparent member having a lower surface and an upper surface on which the finger subjected to fingerprint detection is pressed;

a light source for emitting light from said lower surface to said upper surface of said transparent member;

a photosensor for detecting light reflected or scattered from said upper surface of said transparent member; and

a focusing means, inserted midway along an optical path from said light source to said photosensor, for linearly focusing light incident on said photosensor.

5,146,103

CRUISE CONTROL APPARATUS FOR A VEHICLE

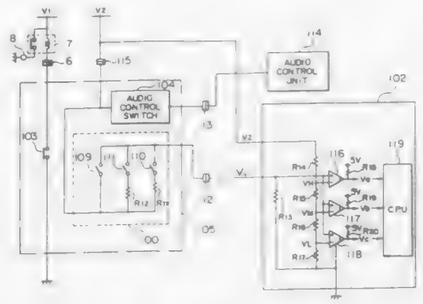
Yoshiyuki Utsumi, and Kazuyori Katayama, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1990, Ser. No. 605,329

Claims priority, application Japan, Nov. 28, 1989, 1-138311

Int. Cl.[5] B60K *31/00*

U.S. Cl. 307—10.1 **2 Claims**



1. A cruise control apparatus for a vehicle, comprising:

cruise control switch means (100) incorporated in a steering wheel of the vehicle and having a plurality of switch elements connected in parallel with each other, said cruise control switch means having an output terminal and an input terminal, said switch elements being selectively

operated to change an output voltage at the output terminal of said cruise control switch means so as to provide a plurality of command signals for cruise control;

a control unit (102) disposed externally of the steering wheel and connected to the output terminal of said cruise control switch means through the intermediary of a first slip ring (112) for performing a cruise control operation in response to the cruise control command signals; and

a power supply (V2) disposed externally of the steering wheel and commonly connected to the input terminal of said cruise control switch means through the intermediary of a second slip ring (115) and directly to said control unit such that the output voltage of the cruise control switch means is free from adverse influences due to variations in a ground potential.

5,146,104

ELECTRONIC DEVICE FOR TRIGGERING A SAFETY DEVICE

Hartmut Schumacher, Freiberg; Norbert Crispin, Markgroeningen, and Bernhard Mattes, Sachsenheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

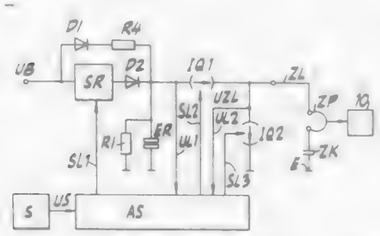
PCT No. PCT/EP89/00996, § 371 Date Apr. 25, 1990, § 102(e) Date Apr. 25, 1990, PCT Pub. No. WO90/02062, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 22, 1989, Ser. No. 466,393

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3828950; PCT Int'l Appl., Sep. 9, 1988, PCT/EP88/00820; Fed. Rep. of Germany, Aug. 2, 1989, 3925594

Int. Cl.[5] B60R *21/32;* **F23Q** *7/00*

U.S. Cl. 307—10.1 **30 Claims**



20. An electronic device for triggering a safety device, which comprises:

a firing element; and

a control circuit including two current sources coupled to said firing element and operated in a push-pull operation to control triggering of said firing element through a series of time cycles of predetermined duration so that current flow through said firing element during each time cycle supplies a predetermined amount of energy to said firing element that is below a minimum amount required to trigger said firing element for triggering said firing element after a predetermined number of time cycles when the cumulative amount of energy supplied to said firing element exceeds said minimum amount.

5,146,105

INTERNAL PRESSURE EXPLOSION-PROOF SYSTEM

Mitsuyoshi Obata, and Noboru Takagi, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 27, 1990, Ser. No. 588,850

Claims priority, application Japan, Oct. 6, 1989, 1-262630

Int. Cl.[5] H02B *13/055*

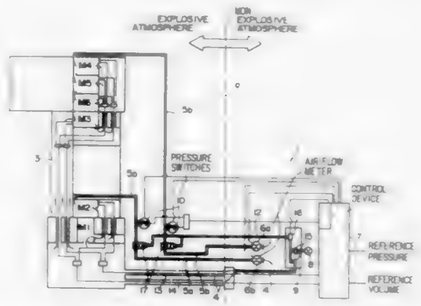
U.S. Cl. 307—118 **3 Claims**

1. An internal pressure explosion-proof system comprising:

an airtight vessel having therein an electric appliance capable of producing a spark;

means for introducing a protective gas into said airtight vessel;

an exhaust pipe connected to said airtight vessel for exhausting a gas from said airtight vessel;



means for measuring a gas flow volume and a pressure at the exhaust pipe of said airtight vessel; and

control means for controlling said electric appliance to operate only when the detected flow volume teaches a predetermined level and the pressure in said gastight vessel reaches another predetermined level.

5,146,106

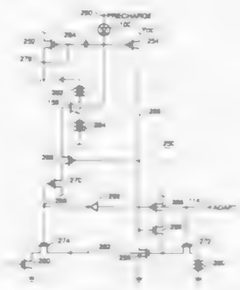
CMOS WINNER-TAKE ALL CIRCUIT WITH OFFSET ADAPTATION

Janeen D. W. Anderson, Fremont; Carver A. Mead, Pasadena; Timothy P. Allen, Los Gatos, and Michael F. Wall, Sunnyvale, all of Calif., assignors to Synaptics, Incorporated, San Jose, Calif.

Division of Ser. No. 525,764, May 18, 1990, which is a continuation-in-part of Ser. No. 486,336, Feb. 28, 1990, which is a continuation-in-part of Ser. No. 282,176, Dec. 9, 1988, Pat. No. 4,935,702. This application Feb. 5, 1991, Ser. No. 650,959

Int. Cl.[5] H03K *17/56, 17/60*

U.S. Cl. 307—246 **14 Claims**



1. An adaptable circuit, communicating with a plurality of current-carrying lines, for indicating the output of the one of said plurality of current-carrying lines through which the most current is flowing, including:

a plurality of MOS current mirrors, each of said current mirrors including an input node, an output node, a driving MOS current mirror transistor of a first conductivity type and a driven MOS current mirror transistor of said first conductivity type, the sources of said driving MOS current mirror transistor and said driven MOS current mirror transistor connected to a first voltage rail, the gate and drain of each of said driving MOS current mirror transistors comprising said input node and connected to a differ-

ent one of said current carrying lines and to a first electrode of a capacitor, the gate of said driven MOS current mirror transistor connected to a floating node, a second electrode of said capacitor comprising a portion of said floating node, the drain of said driven MOS current mirror transistor comprising said output node;

a pulldown transistor of a second conductivity type opposite to said first conductivity type associated with each of said current mirrors, each of said pulldown transistors having its source connected to a second voltage rail, and its gate connected to a common pulldown gate line;

a pulldown gate bias transistor of said second conductivity type, having its source connected to said second voltage rail, its gate connected to a source of bias voltage;

a follower transistor of said second conductivity type associated with each of said current mirrors, having its gate connected to the output of the current mirror with which it is associated, and having a source-drain path connected between a source of fixed voltage and said common pulldown gate line;

means for selectively connecting the drain of said pulldown gate bias transistor to said common pulldown gate line, and for enabling said source-drain path of said follower transistor to conduct during an operating mode of said circuit, and for connecting said common pulldown gate line to a source of fixed voltage, and for disabling said source-drain path of said follower transistor during an adapting mode of said circuit; and

means for adjusting the charge on said floating node in response to the output current of said current mirror during said adapting mode of said circuit;

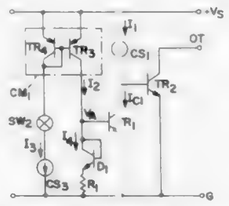
whereby the offset voltages of said circuit can be adapted during said adapting mode of said circuit.

5,146,107

TRANSISTOR SWITCHING CIRCUIT HAVING DIODE-RESISTOR IN BASE OF TRANSISTOR FOR FAST DISCHARGE

Yasushi Matsuoka; Akio Matsumoto, both of Takatsuki; Yoshimi Kanda; Hirofumi Endo, both of Nagaokakyo; Tsutomu Ajioka, Takatsuki, and Satoshi Motouji, Kyoto, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Continuation of Ser. No. 451,991, Dec. 19, 1989, abandoned.
This application Aug. 7, 1991, Ser. No. 741,566
Claims priority, application Japan, Dec. 22, 1988, 63-322034
Int. Cl.[5] H03K *17/60*
U.S. Cl. 307—253 **6 Claims**



1. A switching circuit, comprising:

a first circuit comprising a switching device having an on state and an off state and a first current source connected in series, said first current source producing a first output current;

a current mirror circuit comprising a plurality of transistors and driven by said first circuit, said current mirror circuit outputting a current when said switching device is in the on state;

a second circuit comprising a second current source producing a second output current and a first switching transistor connected in series, said first switching transistor having a base, a collector, and an emitter, wherein the output current of said current mirror circuit is applied to the base of said first switching transistor so that the first switching transistor is turned on when said switching device is in the on state;

an output stage comprising a second switching transistor controlled by said first switching transistor and having a base, wherein said second output current is connected to said base of said second switching transistor, and wherein said second switching transistor is turned off when said first switching transistor is turned on so that the output current of said second current source flows in said first switching transistor;

a third circuit comprising a diode functional device and a resistor connected in series, wherein said third circuit is connected between the base of said first switching transistor and one of the emitter and the collector thereof;

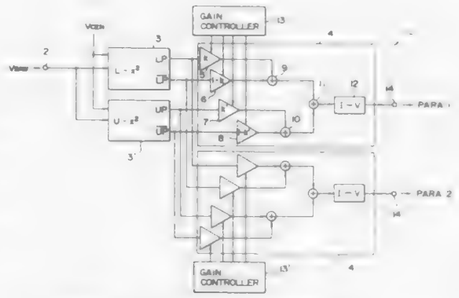
wherein said third circuit causes a collector leakage current in certain of the transistors of the current mirror circuit to flow therethrough when said first switching transistor is turned off.

5,146,108

PARABOLIC WAVE GENERATOR

Takahiko Tamura, and Jun Ueshima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 4, 1991, Ser. No. 754,570
Claims priority, application Japan, Sep. 5, 1990, 2-235012
Int. Cl.[5] H03K *5/00, 4/08*
U.S. Cl. 307—261 **2 Claims**



1. A parabolic wave generator comprising:

a first squared current calculating means for calculating, when the amplitude level of a sawtooth input signal is higher than the center level thereof, two squared currents of mutually reverse polarities each proportional to the square of the difference voltage between said two levels;

a second squared current calculating means for calculating, when the amplitude level of the sawtooth input signal is lower than the center level thereof, two squared currents of mutually reverse polarities each proportional to the square of the difference voltage between said two levels;

a first weighting-adding means for determining the waveform of the partial parabolic current by adding, at an adequate rate, the two squared currents of mutually reverse polarities obtained from said first squared current calculating means;

a second weighting-adding means for determining the waveform of the other partial parabolic current by adding, at an adequate rate, the two squared currents of mutually reverse polarities obtained from said second squared current calculating means; and

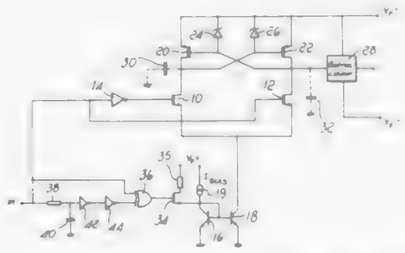
a current adding means for forming a combined parabolic wave by adding the output currents of said first and second weighting-adding means.

5,146,109

CIRCUIT FOR DRIVING A FLOATING CIRCUIT IN RESPONSE TO A DIGITAL SIGNAL

Fabrizio Martignoni, Morazzone; Claudio Diazzi, Milan; Albino Pidutti, Udine, and Fabio Vio, Milan, all of Italy, assignors to SGS-Thomsan Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jul. 25, 1991, Ser. No. 736,003
Claims priority, application Italy, Jul. 27, 1990, 21087 A/90
Int. Cl.[5] H03K *3/037*
U.S. Cl. 307—270 **21 Claims**



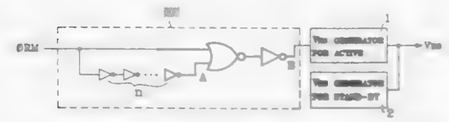
1. A driving circuit for driving a floating circuit in response to a digital signal, comprising a digital signal source which produces said digital signal; first, second, third and fourth transistors; a current source; and a voltage source; each of said first and second transistors being a MOS transistor having a source, a drain and a gate; each of said third and fourth transistors being a MOS transistor having a source, a drain and a gate; said first and third transistors being connected in series between said current source and said voltage source; said second and fourth transistors being connected in series between said current source and said voltage source; said first and second transistors being driven in opposite phase on their respective gates starting froms aid digital signal; the gate of said third transistor being connected to the connection of said fourth transistor to said second transistor; the gate of said fourth transistor being connected to the connection of said third transistor to said first transistor; an auxiliary circuit connected to receive said digital signal and connected to said current source to produce an increased current flow through said current source for a limited time immediately following a transition of said digital signal; and a driving output of said driving circuit being the connection of said second transistor to said fourth transistor.

5,146,110

SEMICONDUCTOR MEMORY WITH SUBSTRATE VOLTAGE GENERATING CIRCUIT FOR REMOVING UNWANTED SUBSTRATE CURRENT DURING PRECHARGE CYCLE MEMORY MODE OF OPERATION

Tae-Jin Kim, Seoul, and Kyu-Chan Lee, Ansan, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Jul. 26, 1991, Ser. No. 736,577
Claims priority, application Rep. of Korea, May 22, 1991, 91-8266[U]
Int. Cl.[5] H03K *5/01*
U.S. Cl. 307—296.2 **3 Claims**



1. A substrate voltage generating circuit in a semiconductor memory device having at least one clock period comprising a memory active cycle and a memory precharge cycle, said substrate voltage generating circuit comprising:

time delay circuit means having a plurality of inverters connected in series, a NOR gate and an inverter for generating a delay signal in response to an active cycle of said at least one clock period;

active mode substrate voltage generating means for generating an active voltage signal, in response to said delay signal, to remove a substrate current I_{SUB} from a memory array portion, said delay signal generating said active voltage signal during at least a portion of a memory precharge cycle;

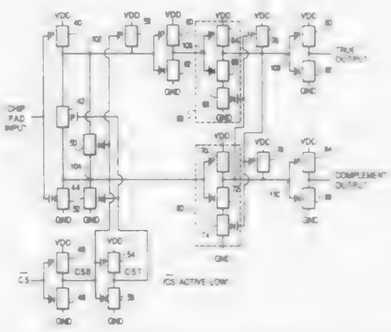
stand-by substrate voltage generating means for generating a stand-by signal to said memory array portion, said stand-by signal being active at least during a portion of the memory precharge cycle when said active voltage signal is disabled.

5,146,111

GLITCH-PROOF POWERED-DOWN ON CHIP RECEIVER WITH NON-OVERLAPPING OUTPUTS

Michael K. Ciraula; Christopher M. Durham, both of Manassas, and Derwin L. Jallice, Reston, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1991, Ser. No. 683,236
Int. Cl.[5] H03K *5/13*
U.S. Cl. 307—296.3 **1 Claim**



1. A circuit for glitch-proof, power inactivation for an on-chip receiver in an integrated circuit chip, comprising:

a chip pad input circuit having an input node connected to a chip pad for receiving logic signal inputs and having a first output node and a second output node selectively connected together through a pass gate;

a chip select input circuit having an input connected to receive a chip select signal and an output coupled to said chip pad input circuit, for selectively turning off said pass gate when said chip select signal deselects the integrated circuit chip and applying a first voltage to said first output node and a second output voltage to said second output node of said chip pad input circuit;

said chip select input circuit selectively turning on said pass gate when said chip select signal selects said integrated circuit chip and enabling logic signals present on said chip pad to be represented on said first and second output nodes of said chip pad input circuit;

a first, two input NAND gate having an output node and an input coupled through an inverter to said first output node of said chip pad input circuit;

a second, two input NAND gate having an output node and an input coupled to said second output node of said chip pad input circuit;

said output node of said first NAND gate coupled to a second input of said second NAND gate and said output

5,146,112

SEMICONDUCTOR INTEGRATED CIRCUIT WITH ANALOGUE SIGNAL PROCESSING CIRCUIT AND DIGITAL SIGNAL PROCESSING CIRCUIT FORMED ON SINGLE SEMICONDUCTOR SUBSTRATE

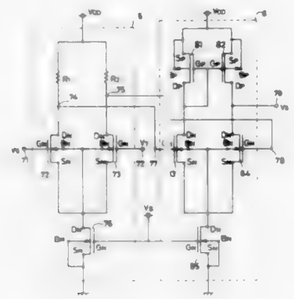
Masao Ito, and Shiro Hosotani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,019

Claims priority, application Japan, Jun. 4, 1990, 2-146972; Nov. 19, 1990, 2-314543

Int. Cl.[5] H03K 3/013

U.S. Cl. 307—303 11 Claims



1. A semiconductor integrated circuit device including an analogue signal processing circuit and a digital signal processing circuit formed on a single semiconductor substrate of a first conductivity type,

said analogue signal processing circuit comprising device coupled only through an impurity region formed adjacent to the main surface of said substrate and of a second conductivity type opposite to the first conductivity type.

5,146,113

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING AN ORIENTED RESISTANCE PATTERN

Masaki Okada, Nagoya, Japan, assignor to Fujitsu Limited, Kanagawa and Fujitsu VLSI Limited, Aichi, both of, Japan

Filed Mar. 8, 1991, Ser. No. 666,765

Claims priority, application Japan, Mar. 9, 1990, 2-58924

Int. Cl.[5] H01L 25/00

U.S. Cl. 307—303.1 6 Claims

2. An integrated circuit including a plurality of circuits assembled to form a unitary body, said integrated circuit comprising:

one or more circuits provided on a circuit chip for carrying out a predetermined operation;

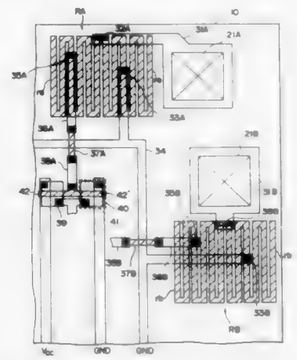
an input circuit or output circuit provided on the circuit chip in electrical connection to said one or more circuits, said input or output circuit transmitting and/or receiving an information signal to and from an external circuit;

a plurality of resistance areas provided in said input or output circuit for electrical connection with a plurality of conductor patterns, said plurality of resistance areas providing a predetermined input and/or output impedance of the integrated circuit; and

a plurality of connection pads provided in the plurality of resistance areas for electrical connection therewith, said plurality of connection pads being provided for electrical connection to the external circuit and adapted therefore;

said plurality of resistance areas including a plurality of elongated resistance strips connected in series and extending parallel with each other,

said circuit chip having a lateral boundary including first and second opposing edges extending in a first direction, and



third and fourth opposing edges extending in a second direction, said plurality of resistance areas including a first group of resistance areas wherein the resistance area is provided adjacent to one or both of the first and second edges and a second group of resistance areas wherein the resistance area is provided adjacent to one or both of the third and second edges.

5,146,114

COMPARATOR CIRCUIT

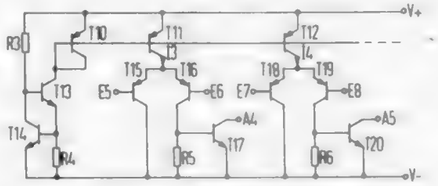
Martin Feldtkeller, München, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 13, 1991, Ser. No. 654,739

Claims priority, application European Pat. Off., Feb. 13, 1990, 90102815.9

Int. Cl.[5] H03K 5/24

U.S. Cl. 307—355 4 Claims



1. A comparator circuit, comprising:

first and second transistors of one conductivity type having bases receiving input signals, collectors with leads being connected to a first pole of a supply voltage source, and coupled emitters;

a resistor connected into the collector lead of one of said first and second transistors of the one conductivity type;

a transistor of another conductivity type having a base-to-emitter path connected parallel to said resistor and a collector issuing an output signal; and

current impressing means connected between the coupled emitters of said first and second transistors of the one conductivity type and a second pole of the supply voltage source, said current impressing means impressing a current at every operating temperature being equal to twice

the quotient of the base-to-emitter voltage of said transistor of the other conductivity type and said resistor;

wherein said resistor is a first resistor, said transistor of the other conductivity type is a first transistor of the other conductivity type, and including:

a second resistor having the same resistance and the same temperature response as said first resistor and being connected into the collector lead of the other of said first and second transistors of the one conductivity type; and a second transistor of the other conductivity type having the same base-to-emitter voltage and the same temperature response as said first transistor of the other conductivity type, having a base-to-emitter path connected parallel to the second resistor, and having a collector issuing another output signal.

5,146,115

DOMINO-LOGIC DECODER

Boubekeur Benhamida, Boise, Id., assignor to Zilog, Inc., Campbell, Calif.

Filed Jul. 26, 1991, Ser. No. 736,403

Int. Cl.[5] H03K 19/00

U.S. Cl. 307—452 8 Claims

1. In a circuit for use with a decoder, said circuit having a first node and a second node and a stack of transistors connected in series between the first node and the second node, the transistors being individually gated, the improvement comprising:

a strobe transistor being positioned at the top of the stack and being coupled to the first node and a third node, said strobe transistor discharging the first node in response to the strobe signal; and

a charge restoring transistor coupled to the third node and being gated by the strobing signal, said charge restoring transistor connecting said third node to a power supply, such that said charge restoring transistor charges the third node when said strobe transistor is nonconductive.

5,146,116

ECL CIRCUIT WITH A REDUCED POWER ACTIVE PULLDOWN

Yasuhiro Sugimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshida, Kanagawa, Japan

Filed Nov. 30, 1990, Ser. No. 619,981

Claims priority, application Japan, Nov. 30, 1989, 1-311335

Int. Cl.[5] H03K 17/04

U.S. Cl. 307—455 19 Claims

1. An ECL circuit comprising;

an output terminal of a whole circuit;

a differential type switching circuit having first and second output terminals;

a first transistor having a base connected to the first output terminal of said switching circuit, a collector connected to a first power source and an emitter connected to said output terminal of the whole circuit;

a second transistor having a collector connected to said output terminal of the whole circuit and an emitter connected to a second power source;

a capacitor connected between said second output terminal of said switching circuit and the base of said second transistor;

a constant current source directly connected between said

first power source and the base of said second transistor; and

an impedance directly connected between the base of said second transistor and said second power source.

5,146,117

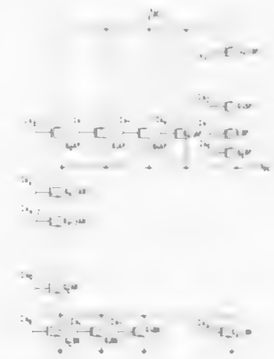
CONVERTIBLE MULTI-FUNCTION MICROELECTRONIC LOGIC GATE STRUCTURE AND METHOD OF FABRICATING THE SAME

Lawrence E. Larson, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 1, 1991, Ser. No. 678,489

Int. Cl.[5] H03K 19/094

U.S. Cl. 307—465 17 Claims



1. A logic gate structure comprising:

a substrate; and

a plurality of field effect transistors (FETs) formed on the substrate, each FET having a gate electrode and a channel region, the FETs being arranged such that said structure will perform a selected one of a plurality of logic functions;

a first logic function of said plurality of logic functions, wherein the plurality of FETs are connected in series and the channel region of a FET of the plurality of FETs is doped to cause the structure to have a first logic state which varies in accordance with a logical value of applied gate voltage;

a second logic function of said plurality of logic functions, wherein the plurality of FETs is further arranged into a parallel connected portion which is connected in series to the series connected portion and the channel regions of the series connected FETs are doped to cause the structure to have a second logic state which varies in accordance with the logical values of applied gate voltage;

a third logic function of said plurality of logic functions, wherein the plurality of FETs is further arranged into the series and the parallel connected portions and the channel

region of a series connected FET is doped to cause the structure to have a constant third logic state for all logical values of applied gate voltage; and

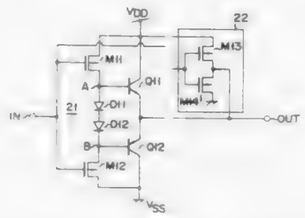
a fourth logic function of said plurality of logic functions, wherein the plurality of FETs is further arranged into the series and the parallel connected portions and the channel regions of all of the series connected FETs and a parallel connected FET of the plurality of FETs are doped to cause the structure to have a constant fourth logic state for all logical values of applied gate voltage.

5,146,118

BI-CMOS LOGIC GATE CIRCUITS FOR LOW-VOLTAGE SEMICONDUCTOR INTEGRATED CIRCUITS

Michinori Nakamura, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 1, 1991, Ser. No. 649,901
Claims priority, application Japan, Feb. 7, 1990, 2-27941
Int. Cl.[5] H03K *19/092, 19/02*
U.S. Cl. 307—475 **8 Claims**



1. A Bi-CMOS logic gate circuit for semiconductor integrated circuits, comprising:

a Bi-CMOS output circuit, having an input terminal and an output terminal, for performing logic operations between a first potential and a second potential, complementarily arranged MOS transistors of a first conductivity type and a second conductivity type, each having a current path and having a gate connected to the input terminal, and complementarily arranged bipolar transistors of a first polarity and a second polarity, each having a base and having an emitter connected to the output terminal;

a first node connecting one end of the current path of the MOS transistor of the first conductivity type and the base of the bipolar transistor of the first polarity;

a second node connecting one end of the current path of the MOS transistor of the second conductivity type and the base of the bipolar transistor of the second polarity;

means for transmitting current between said first node and said second node; and

output circuit means, provided between said input and output terminals, for compensating for a voltage drop between each base and emitter of the complementarily arranged bipolar transistors when said bipolar transistors are rendered conductive.

5,146,119

SWITCHING CIRCUIT AND ITS SIGNAL TRANSMISSION METHOD

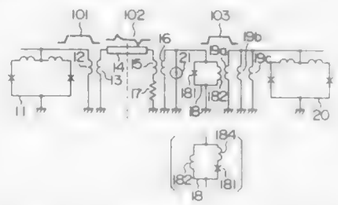
Ryotaro Kamikawai, Nishitama, and Akira Masaki, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,161
Claims priority, application Japan, Jan. 13, 1989, 1-004997
Int. Cl.[5] H03K *3/36, 17/92, 19/195*
U.S. Cl. 307—476 **37 Claims**

1. A switching circuit comprising:

a quantum flux parametron; and,

a transmission line including a matched terminator wherein an output signal of said quantum flux parametron is supplied to said transmission line through a magnetic coupling and wherein a signal from said transmission line is supplied through a first circuit to another quantum flux parametron in a succeeding stage, said first circuit including means for outputting a first level in response to a first input signal of a first polarity, outputting a second level in response to a second input signal of a second polarity and maintaining one of the first level and the second level in response to a third input signal.



5,146,120

LOW-NOISE OUTPUT BUFFER CIRCUIT

Masahiro Kimura; Kenji Matsuo; Ikuo Tsuchiya, all of Yokohama, and Masayo Fukuda, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1991, Ser. No. 735,951
Claims priority, application Japan, Jul. 31, 1990, 2-203564
Int. Cl.[5] H03K *5/00*
U.S. Cl. 307—570 **13 Claims**

1. A low-noise output buffer circuit comprising:

a first MOSFET having a source connected to a power source potential, a gate for receiving a first input signal and a second input signal, and a drain, said first MOSFET for outputting the power source potential according to said first input signal;

a second MOSFET having a source connected to a ground potential, a gate for receiving said first input signal and said second input signal, and a drain, said second MOSFET for outputting the ground potential according to said second input signal;

a bipolar transistor having a collector connected to said power source potential, an emitter connected to an output terminal and a base connected to the drain of said first MOSFET; and

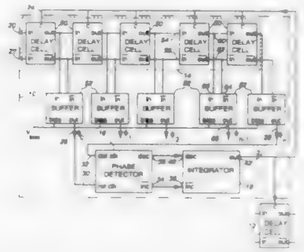
a diode having a cathode connected to the drain of said second MOSFET and an anode connected to the base of said bipolar transistor.

5,146,121

SIGNAL DELAY APPARATUS EMPLOYING A PHASE LOCKED LOOP

Shawn Searles, Ottawa, and Richard G. Kusyk, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 24, 1991, Ser. No. 782,353
Int. Cl.[5] H03K *5/13, 5/159*
U.S. Cl. 307—603 **5 Claims**



1. A circuit for providing an on-chip substantially constant delay in a signal path, comprising:

a delay cell within the signal path requiring a substantially constant delay, the delay cell including a CMOS differential amplifier having pullup and pulldown currents being controlled by first and second control signals, respectively; and

a delay lock loop for maintaining the substantially constant delay through the delay cell;

the delay lock loop including:

a delay line comprising a plurality of serially connected delay cells identical to the delay cell within the signal path, an input for receiving a reference clock signal, and an output for providing a delayed clock signal; a phase detector connected to receive the delayed clock signal and the reference clock signal and having outputs indicative of a phase difference between the delayed clock signal relative to the reference clock signal;

a charge pump connected to the outputs of the phase detector and having a capacitor for providing an output signal therefrom; and

a bias generator having an input connected to receive the output signal of the charge pump for providing the first and second control signals.

5,146,122

VOICE COIL ACTUATOR WITH RESILIENTLY MOUNTED SHORTED TURN

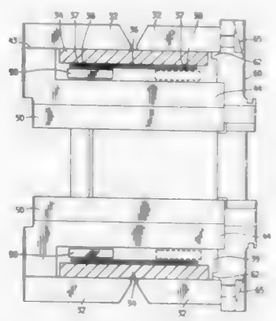
Anthony R. Hearn, South Wonston, and Robert D. Commander, Twyford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/GB89/00268, § 371 Date Nov. 14, 1990, § 102(e) Date Nov. 14, 1990, PCT Pub. No. WO90/10931, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 15, 1989, Ser. No. 603,719
Int. Cl.[5] H02K *41/02;* **G11B** *5/55*
U.S. Cl. 310—13 **4 Claims**

1. An actuator of the voice coil type comprising a coil (90), a magnet assembly (20) defining an air gap (39) in which the coil is movable on application of a current thereto, a shorted turn (36), and mounting means for locating the shorted turn in the air gap, characterized in that:

the shorted turn is located in the air gap clear of the magnet assembly, and is resiliently mounted for movement in a direction parallel to the movement of the coil;

said mounting means comprising a plurality of resilient bands in contact with the shorted turn and the surface of the magnet assembly facing the shorted turn, so that the shorted turn is supported away from said surface; and



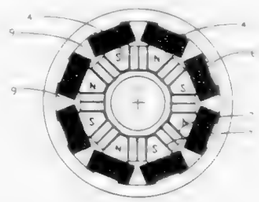
retaining means for retaining the resilient bands in position further comprising grooves in one surface of the shorted turn in which the resilient bands are located.

5,146,123

LINEAR RECIPROCATING ALTERNATOR

George A. Yarr, 215 Paisley Rd., Ballston Spa, N.Y. 12020

Filed Nov. 6, 1990, Ser. No. 610,170
Int. Cl.[5] H02K *33/00*
U.S. Cl. 310—15 **13 Claims**



1. An alternator for the conversion of mechanical energy to electrical energy comprising a magnetic flux generator reciprocatingly mounted within a magnetically conductive stator ring assembly wherein said flux generator comprises a plunger assembly with an even plurality of substantially radially-extending permanent magnets, said magnets mounted to a central structural core, and which magnets align interdigitally with an equal plurality of poles of said stator ring assembly and where a plurality of electrically conductive coils are positioned around portions of said stator ring.

5,146,124

LINEAR DRIVE MOTOR WITH FLEXIBLE COUPLING

Graham Higham, Scottsdale, Ariz.; Niels Young, Boise, Id.; Alan Weeks, Lunenburg, Mass.; Steven A. Michaud, Haverhill, Mass., and William Sand, Lexington, Mass., assignors to Helix Technology Corporation, Mansfield, Mass.

Continuation-in-part of Ser. No. 487,945, Apr. 6, 1990, Pat. No. 5,040,372, which is a continuation-in-part of Ser. No. 106,428, Oct. 8, 1987, Pat. No. 4,798,054. This application Mar. 29, 1991, Ser. No. 677,715
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] H02K *33/16*
U.S. Cl. 310—17 **37 Claims**

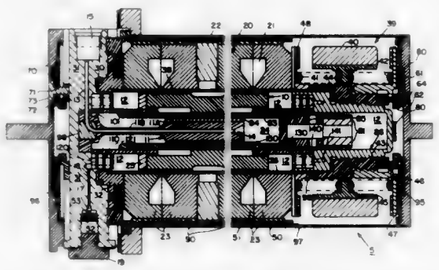
1. A cryogenic refrigerator comprising a gaseous working fluid which is alternately compressed and expanded to cool a

portion of the working fluid to cryogenic temperatures, the refrigerator having a linear drive motor comprising:

a housing that seals the working fluid within a volume;

a piston positioned within the housing along a longitudinal axis thereof, the piston having a clearance seal with, and having a linear reciprocating motion relative to, a clearance seal element;

a flexible piston coupling secured at one end to the piston



such that the piston coupling can undergo universal radial displacement relative to the longitudinal axis to maintain alignment of the piston with the clearance seal;

a magnetic armature secured to a second end of the piston coupling;

the armature extending concentrically about the coupling, the piston, and the clearance seal element; and

a coil assembly concentric about the armature to drive the armature and the piston.

5,146,125

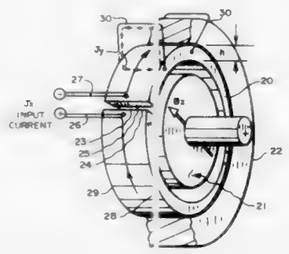
DC ELECTRIC ROTATING MACHINE USING HALL EFFECT MATERIAL

Jack H. Kerlin, 984 E. 80 North, Springville, Utah 84663

Continuation-in-part of Ser. No. 386,286, Jul. 27, 1989. This application Jul. 29, 1991, Ser. No. 737,221

Int. Cl.[5] H02K *11/00*

U.S. Cl. 310—68 R **28 Claims**



1. An electric rotating machine, comprising a rotor mounted for rotation, said rotor adapted to create a rotor magnetic field; means to produce torque on the rotor; material exhibiting a Hall effect positioned within the rotor magnetic field; means for causing a primary current to flow through the material exhibiting the Hall effect in a primary direction normal to the rotor magnetic field; and conductor means coupled to the material exhibiting the Hall effect, said conductor means, together with the Hall effect material to which it is coupled, forming a plurality of loops to carry Hall effect current generated in the material exhibiting the Hall effect through the material exhibiting the Hall effect in a direction normal to the primary direction of primary current flow and also normal to the rotor magnetic field without said Hall effect current passing through separate stator coils, wherein said Hall effect current flowing in the material exhibiting the Hall effect interacting with the rotor magnetic field is the means to produce torque on the rotor and cause operation of the machine as a rotor.

5,146,126

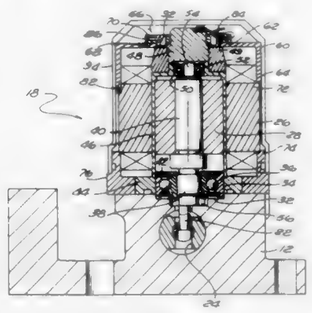
ADJUSTABLE ROTOR ASSEMBLY

Curtis J. Hutchins, Saugus, Calif., assignor to HR Textron Inc., Valencia, Calif.

Filed Sep. 5, 1991, Ser. No. 755,396

Int. Cl.[5] H02K *21/12*; F16K *31/02*

U.S. Cl. 310—156 **13 Claims**



1. A rotary force motor comprising:

(A) an isolation tube having a closed end portion;

(B) a rotor assembly having first permanent magnet means disposed upon a shaft rotatably disposed within said isolation tube;

(C) a stator assembly for receiving electrical signals to rotate said rotor assembly, said stator assembly surrounding said isolation tube; and

(D) a second permanent magnet means disposed adjacent said closed end portion of said isolation tube for magnetically interacting with said rotor to provide a rotary force acting on said rotor to return said rotor to a predetermined position in the absence of electrical signals applied to said stator assembly.

5,146,127

WINDINGLESS ROTOR, FIELD EXCITED, VARIABLE RELUCTANCE, SYNCHRONOUS-TYPE MACHINES

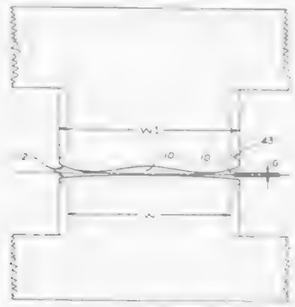
Larry L. Smith, 1015 Smith Road, Xenia, Ohio 45385

Continuation-in-part of Ser. No. 390,381, Aug. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 256,996, Oct. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 32,542, Apr. 1, 1987, abandoned. This application Dec. 6, 1990, Ser. No. 623,231

Int. Cl.[5] H02K *1/08*

U.S. Cl. 310—166 **18 Claims**

1. A set of salient magnetic poles in an electromechanical machine; said set consisting of a stator pole and an opposing rotor pole, working in a complementary relationship, with said salient magnetic poles having an interdependent working relationship between the effective working pole circumferential width and the working surface and pole tip contouring; said salient magnetic poles having complementary contouring such that one magnetic pole of said set has primarily and substantially a single-apex contouring, while the opposing magnetic pole has primarily and substantially a double-apex contouring;



said salient magnetic poles in said set having substantially equivalent widths.

5,146,128

Patent Not Issued For This Number

5,146,129

VIBRATION WAVE MOTOR

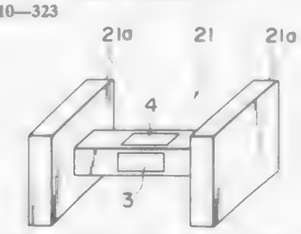
Masahisa Tamura, and Ichiro Okumura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 368,168, Jun. 16, 1989, abandoned, which is a continuation of Ser. No. 125,988, Nov. 27, 1987, abandoned. This application Feb. 13, 1991, Ser. No. 655,243

Claims priority, application Japan, Dec. 1, 1986, 61-286242

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 **12 Claims**



1. A vibration wave driven motor comprising:

(a) a vibration member having a middle portion and end portions provided to sandwich said middle portion, at least one of said end portions serving as a driving element and each said end portion being greater in mass than said middle portion; and

(b) an electromechanical energy conversion member functionally contacting said vibration member, said conversion member comprising a first electromechanical energy conversion element and a second electromechanical energy conversion element, said first electromechanical energy conversion element generating in said vibration member a bending vibration in a first direction in response to a first electrical signal applied and said second electromechanical energy conversion element generating in said vibration member a bending vibration in a second direction in response to a second electrical signal applied, said first electrical signal having an electrical phase different from said second electrical signal and said first direction being substantially perpendicular to said second direction,

wherein vibration for moving a friction member contacting said vibration member is generated in said vibration member.

5,146,130

INCANDESCENT LAMP HAVING GOOD COLOR RENDERING PROPERTIES AT A HIGH COLOR TEMPERATURE

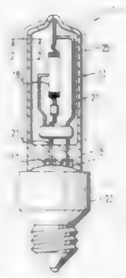
Akira Kawakatsu, Yokohama, Japan, assignor to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Jun. 15, 1990, Ser. No. 538,328

Claims priority, application Japan, Jun. 17, 1989, 1-155221

Int. Cl.[5] H01K *1/32*

U.S. Cl. 313—112 **5 Claims**



1. An incandescent lamp comprising:

a transparent bulb;

a filament supported in the bulb;

a first optical interference film formed on one of inner and outer surfaces of the bulb, the first optical interference film including a first refractive index layer having a prescribed refractive index and a second refractive index layer having a predetermined refractive index lower than that of the first refractive index layer alternately stacked one on another, the total number of first and second refractive index layers being n (where n is an odd number greater than five), the optical thickness d of each refractive index layer being 0.12~0.17 μm;

a second optical interference film including another second refractive index layer, formed on the first optical interference film, the optical thickness of the second refractive index layer of the second optical interference film being indicated by the expression $(K+1)\times d/2$ (where K is 1.2~1.5);

a third optical interference film formed on the second optical interference film, the third optical interference film including at least the first refractive index layer, the total number of first and second refractive index layers being an odd number of 1~(n−4), the optical thickness of each refractive index layer of the third optical interference film being indicated by the expression $K\times d$; and

a fourth optical interference film including another second refractive index layer, formed on the third optical interference film, the optical thickness of the second refractive index layer of the fourth optical interference film being indicated by the expression $K\times d/2$.

5,146,131

ALKALINE EARTH METAL OXIDE CATHODE CONTAINING RARE EARTH METAL OXIDE

Petrus J. A. M. Derks, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 221,809, Jul. 20, 1988, abandoned. This application Sep. 11, 1991, Ser. No. 759,723

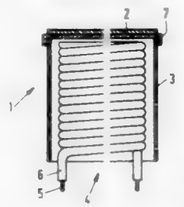
Claims priority, application Netherlands, Jul. 23, 1987, 8701739

Int. Cl.[5] H01J *1/14, 1/20*

U.S. Cl. 313—346 R **6 Claims**

1. A cathode comprising a support of an alloy comprising mainly nickel and a layer of electron-emissive material on the support, the layer comprising alkaline earth metal oxides and at

least comprising barium, characterized in that the electron-emissive material further comprises about 0.2–5% by weight of at least one of the rare earth oxides selected from the group consisting of europium oxide and ytterbium oxide.

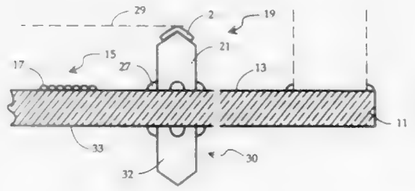


5,146,132

CRT FRONT PANEL WITH CONTROLLED CONFIGURATION

Raymond G. Capek, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 26, 1990, Ser. No. 634,270
Int. Cl.[5] H01J *29/07, 29/86*
U.S. Cl. 313—407 10 Claims



1. In a CRT glass front panel, the improvement comprising a body for controlling the panel curvature so as to achieve a desired predetermined panel configuration, the body being affixed to the glass panel; the body being shaped and composed of a material so as to induce strain to the panel sufficient to conform the panel to the desired configuration.

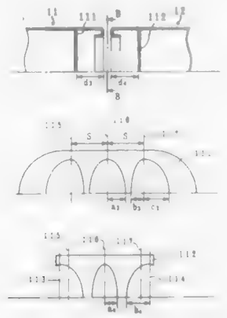
5,146,133

ELECTRON GUN FOR COLOR CATHODE RAY TUBE

Shoji Shirai; Satoru Miyamoto, both of Mobara; Kazunari Noguchi, Chiba, and Masahiro Miyazaki, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,719
Claims priority, application Japan, Jul. 4, 1989, 64-171202; Jul. 14, 1989, 64-180310
Int. Cl.[5] H01J *29/56*
U.S. Cl. 313—414 5 Claims

1. An electron gun for color cathode ray tube comprising three means arranged almost in parallel toward the phosphor surface to generate three electron beams and a main lens for focusing the three electron beams to the phosphor surface, wherein said main lens is formed by a focusing electrode to which at least a pair of low voltages are applied and an acceleration electrode to which a high voltage is applied, the opposed end surfaces of said focusing electrode and said acceleration electrode are provided with a hollow aperture which allows the three electron beams to pass, a plate electrode forming three apertures for surrounding the three electron beams is provided within said focusing electrode, and a plate electrode forming only one aperture which surrounds the path of the center electron beam among said three electron beams is provided within said acceleration electrode.

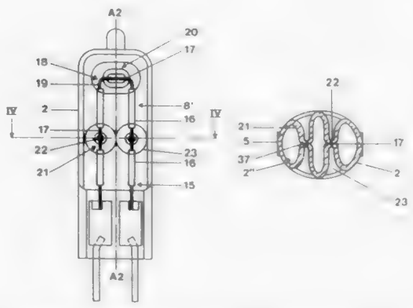


5,146,134

HALOGEN INCANDESCENT LAMP, PARTICULARLY FOR OPERATION FROM POWER NETWORKS, AND METHOD OF ITS MANUFACTURE

Karl Stadler, Adelschlag; Roland Stark, Wellheim; Ruediger Klam, Eichstaett; Rupert Muehlberger, Ingolstadt, and Michael Brinkhoff, Wipperfuerth, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur Elektrische Gluhlampen m.b.H., Munich, Fed. Rep. of Germany

Filed Feb. 26, 1991, Ser. No. 661,593
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008334; Mar. 15, 1990, 4008365; Mar. 15, 1990, 4008367; Japan, Mar. 15, 1990, 4008337; Fed. Rep. of Germany, Sep. 24, 1990, 9013457[U]
Int. Cl.[5] H01K *1/50, 1/18*
U.S. Cl. 313—579 47 Claims



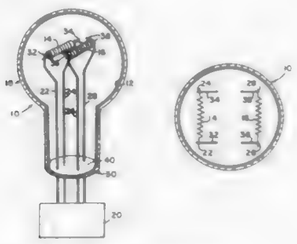
1. A halogen incandescent lamp (1), particularly for connection to a network voltage supply of 80–250 V, 50–60 Hz, having
a bulb (2) of transparent material defining a lamp axis,
said bulb having two end portions (3, 4, 5) and bulb walls (2'),
said bulb being closed at said end portions,
wherein at least one of said end portions is closed by a pinch seal;
current supply means passing through at least one of said end portions;
a filament coupled to said current supply means, and positioned in said bulb in a predetermined location therein;
a fill including an inert gas with a halide additive within said bulb; and
a positioning means for said filament, wherein said positioning means comprises at least one protuberance means (9, 20, 21, 27, 30; 722, 824, 924, 1019, 1224, 1412, 1509*a*, 1509*b*, 1609, 1714, 1815, 1916, 2026) of said material extending transversely with respect to a plane passing through the lamp axis, from two spaced regions of the wall of the bulb (2) toward said plane passing through the lamp axis and positioning or helping to position said filament within said bulb.

5,146,135

GLOW DISCHARGE LAMP HAVING ANODE PROBES

Radomir Lagushenko, Brookline, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 17, 1990, Ser. No. 599,216
Int. Cl.[5] H01J *61/64, 61/16*
U.S. Cl. 313—619 5 Claims



1. A glow discharge lamp comprising:
a light transmitting envelope containing a noble gas fill material;
a pair of electrically spaced electrodes disposed in a parallel relationship within said envelope and having an emissive material disposed thereon, each of said pair of spaced electrodes having a pair of ends;
a pair of lead-in wires coupled to each of said pair of spaced electrodes and extending through and hermetically sealed in said envelope; and
a pair of wire probes associated with each of said pair of spaced electrodes, each of said pair of ends having one of said pair of wire probes extending beyond one of said pair of spaced electrodes associated therewith and toward the other pair of wire probes of the other electrode, wherein said one of said pair of wire probes is separated from said other pair of wire probes by an approximate distance of 1 to 10 millimeters.

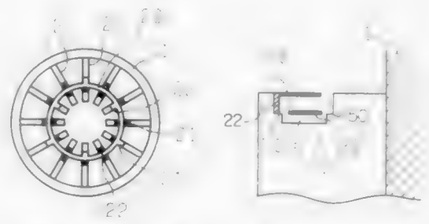
5,146,136

MAGNETRON HAVING IDENTICALLY SHAPED STRAP RINGS SEPARATED BY A GAP AND CONNECTING ALTERNATE ANODE VANE GROUPS

Toshio Ogura, Mobara, and Masumi Kuga, Mutsusawamachi, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Nisshin Electronics Co., Ltd., Chiba, both of, Japan

Filed Dec. 7, 1989, Ser. No. 447,580
Claims priority, application Japan, Dec. 19, 1988, 63-318420
Int. Cl.[5] H01J *25/50*
U.S. Cl. 315—39.69 6 Claims

1. A magnetron comprising:
a cathode;
a cylindrical anode having an axis, the anode having an inner wall;
a plurality of anode vanes disposed on the inner wall of the anode and extending towards the axis of the anode, the anode vanes having respective edges and being provided with respective cutouts in the edges, the anode vanes being grouped into first alternate anode vanes and second alternate anode vanes, the first alternate anode vanes alternating with the second alternate anode vanes;
a first strap ring connecting together the first alternate anode vanes at the cutouts of the first alternate anode vanes; and
a second strap ring connecting together the second alternate anode vanes at the cutouts of the second alternate anode vanes;
wherein the first and second strap rings each lie in a respective plane oriented transverse to the axis of the anode; each strap ring having an inner surface facing towards the axis of the anode and an outer surface facing away from the axis of the anode; and each strap ring is provided with a plurality of inner tongues protruding from the inner surface of the strap ring and extending in a direction away from the respective plane of the strap ring, and a plurality of outer tongues protruding from the outer surface of the strap ring and extending away from the respective plane of the strap ring in the direction in which the inner tongues extend, the inner tongues alternating with the outer tongues; and
wherein the first and second strap rings are disposed in the cutouts of the anode vanes such that the first and second strap rings oppose each other with a gap therebetween, and such that the inner and outer tongues of the first strap ring contact respective ones of the first alternate anode vanes at the cutouts of the respective first alternate anode vanes, and the inner and outer tongues of the second strap ring contact respective ones of the second alternate anode vanes at the cutouts of the respective second alternate anode vanes.

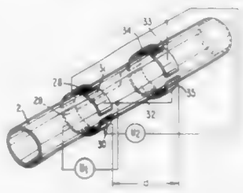


5,146,137

DEVICE FOR THE GENERATION OF A PLASMA

Roland Gesche, Seligenstadt, and Karl-Heinz Kretschmer, Langen, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 501,094
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942964
Int. Cl.[5] H05H *1/46*
U.S. Cl. 315—111.21 17 Claims



1. An apparatus for generating a plasma inside a first container using circularly polarized high frequency waves by coupling electromagnetic energy into the plasma through the container wall from the outside, said apparatus comprising:
a first pair of field generating means connected to a first voltage;
a second pair of field generating means connected to a second voltage, wherein the first voltage is 90° phase shifted relative to the second voltage, said first and second pairs

of field generating means being mounted on a first region of the container; and

a third pair of field generating means and a fourth pair of field generating means mounted on a second region of the container a predetermined distance along the longitudinal axis of the container from the first region of the container, said third and fourth pairs of field generating means being connected to sources of voltage phase shifted with respect to each other.

5,146,138

PLASMA PROCESSOR

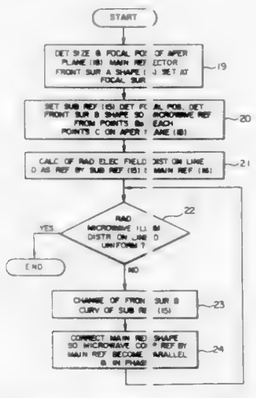
Hiroki Ootera, and Mutsumi Tsuda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 333,042, Apr. 4, 1989. This application Jan. 7, 1992, Ser. No. 817,650

Claims priority, application Japan, Apr. 5, 1988, 63-82276; Nov. 17, 1988, 63-292995

Int. Cl.[5] H05H *1/46*

U.S. Cl. 315—111.21 **1 Claim**



1. A method of determining the shapes of reflecting surfaces of a sub reflector and a main reflector in a plasma processor the plasma processor including a plasma generation portion in which an electron cyclotron resonance plasma is generated, means for producing a magnetic field in the plasma generation portion for establishing the electron cyclotron resonance plasma, means for supplying gas to the plasma generation portion, means for producing microwave energy and for supplying the microwave energy to the plasma generation portion, the plasma generation portion including an inlet part for receiving microwave energy in a vacuum vessel part, the inlet part including expansion means for expanding the microwave energy received from the means for producing microwave energy, means for transmitting the microwave energy from the expansion means to the vacuum vessel part, and means for making substantially uniform the microwave energy density distribution along a radial direction in the vacuum vessel part, the expansion means and the means for making substantially uniform including the sub reflector for reflecting microwave energy from the means for producing microwave energy and the main reflector disposed in the inlet part for reflecting microwave energy into the vacuum vessel part that has been reflected by the sub reflector, the method comprising:

choosing a parabolic surface as a front reflecting surface of the main reflector and determining the size of an aperture plane and a focal position of the main reflector for the chosen parabolic surface;

disposing the sub reflector at the focal position of the main reflector and choosing a parabolic surface as a front reflecting surface of the sub reflector so that microwave energy reflected from an edge of the sub reflector impinges on an edge of the aperture plane;

the distribution of radiant electric fields reflected by the sub reflector and the main reflector along a line perpendicular to incident microwave of examining if an energy to determine whether the distribution of microwave energy is uniform;

if the distribution of microwave energy along the lien is determined not to be uniform, changing the curvature of the front surface of said sub reflector to change the parabolic shape thereof; and

changing the shape of the front surface of the main reflector so that components of the microwave energy are parallel and in phase

a step of repeating said fourth step through said sixth step until the radiant electrical fields become parallel and uniform.

5,146,139

CONTROLLABLE GAS DISCHARGE LIGHTING SYSTEM

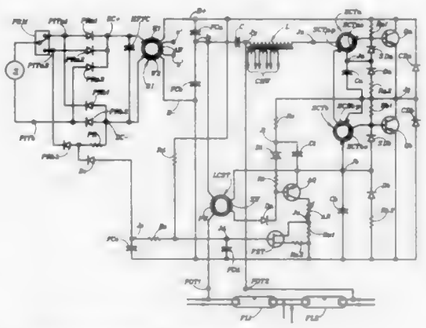
Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 317,906, Mar. 2, 1989, which is a continuation-in-part of Ser. No. 300,579, Jan. 23, 1989. This application Feb. 20, 1990, Ser. No. 481,186

The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

Int. Cl.[5] H05B *41/23*

U.S. Cl. 315—205 **17 Claims**



1. A lighting system comprising:

a source providing a power line voltage at a pair of power line terminals;

a set of power distribution conductors, including: (i) a common power distribution conductor; (ii) a first power distribution conductor; and (iii) a second power distribution conductor;

plural ballast-lighting means positioned at spaced-apart locations along the power distribution conductors; each ballast-lighting means having: (i) a set of power output terminals connected with a gas discharge lamp means and operative to supply a lamp current thereto, the frequency of the lamp current being substantially higher than the frequency of the power line voltage; (ii) a common power input terminal connected with the common power distribution conductor; (ii) a first power input terminal connected with the first distribution conductor; and (iv) a second power input terminal connected with the second power distribution conductor; and

control means connected in circuit between the power line terminals and the power distribution conductors; the control means being operative to control the amount of light being provided by the gas discharge lamp means;

the lighting system being operative as stated without requiring more than three power distribution conductors.

5,146,140

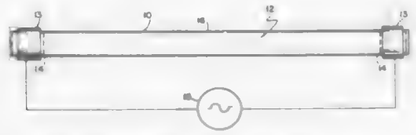
METHOD AND APPARATUS TO REDUCE HG LOSS IN RF CAPACITIVELY COUPLED GAS DISCHARGES

Robert B. Piejak, Wayland; Valery A. Godyak, Brookline, and Benjamin M. Alexandrovich, Watertown, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jun. 18, 1991, Ser. No. 717,137

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—248 **10 Claims**



1. A capacitively coupled lamp comprising

a lamp envelope made of a light transmitting material, said envelope having an outer surface and an inner surface, said inner surface enclosing a fill material which forms during discharge a plasma which emits ultraviolet radiation;

a phosphor layer covering the inner surface of said lamp envelope and emitting visible light when excited by ultraviolet radiation;

a pair of outer conductors positioned on the outer surface of said lamp envelope;

a pair of inner conductors positioned on the inner surface of said lamp envelope and aligned with said pair of outer conductors and electrically insulated therefrom;

an rf source coupled to said outer conductors capable of producing low frequency power below 100 MHz;

wherein low frequency power below 100 MHz applied to said outer conductors induces an electric field in said lamp and discharge therein without loss of said fill material.

5,146,141

HOLLOW-ELECTRODE SWITCH

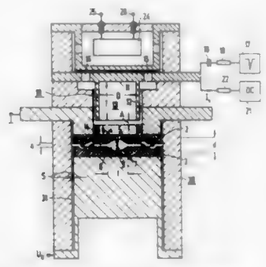
Klaus-Dieter Rohde, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 30, 1991, Ser. No. 752,843

Claims priority, application European Pat. Off., Sep. 3, 1990, 90116902.9

Int. Cl.[5] H01J *17/04, 19/42*

U.S. Cl. 315—326 **38 Claims**



1. A hollow-electrode switch comprising:

a) first electrode coupled to a high voltage source;

b) a second electrode coupled to a high voltage source, disposed opposite said first electrode at a predetermined space (a) from said first electrode outside of a central discharge region, and having an opening disposed outside of the central discharge region;

c) the second electrode is a reference electrode for a glow discharge;

d) a trigger device comprising a control electrode in the form of a hollow electrode, which is an anode for said glow discharge and is disposed so that its opening is turned toward the reference electrode and its lower edge is disposed at a distance (A) from said reference electrode and it is electrically connected to a trigger-voltage source;

e) a discharge chamber formed between said first and second electrode in the discharge region, having a discharge gap of a predetermined distance (d) disposed in a central discharge region between the anode and cathode for a low-pressure gas discharge, having a maximum inside height determining the predetermined distance (d) and decreasing in a radial direction in the discharge region;

f) an ionizable gas filling a volume inside the discharge chamber, having a discharge path and having a predetermined pressure (p) such that a breakdown voltage of the low-pressure gas discharge decreases when a product (pd) of predetermined pressure (p) and predetermined distance (d) increases.

5,146,142

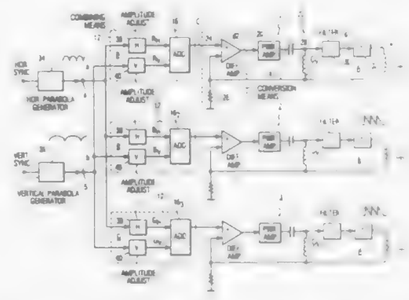
DYNAMIC FOCUSSING SIGNAL POWER AMPLIFIER FOR MAGNETICALLY FOCUSSED RASTER SCAN CATHODE RAY TUBE

Willem C. Van Tol, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jan. 28, 1992, Ser. No. 827,194

Int. Cl.[5] H01J *29/58*

U.S. Cl. 315—382 **24 Claims**



1. Dynamic focussing signal power amplifier circuit for a magnetically focussed raster scan cathode ray tube (CRT), said CRT having a first horizontal scan line frequency and a second vertical rate frequency, said circuit comprising:

means for receiving a horizontal parabolic dynamic focussing voltage at said first frequency, said horizontal voltage for controlling an electron beam horizontal scan focussing coil of said CRT;

means for receiving a vertical parabolic dynamic focussing voltage at said second frequency, said vertical voltage for controlling an electron beam vertical focussing coil of said CRT;

means for combining said received horizontal and vertical parabolic dynamic focussing voltages into a combined signal comprising a horizontal parabolic voltage superimposed on the vertical parabolic voltage; and

first amplifying means responsive to said combined voltages for forming amplified horizontal and vertical magnetic focussing coil voltages adapted to drive said horizontal and vertical focussing coils.

5,146,143

VIBRATION WAVE DRIVEN MOTOR

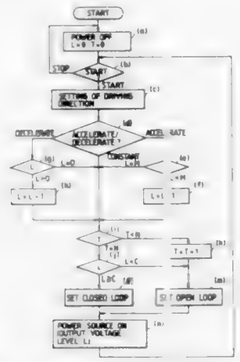
Etsuro Furutsu, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 382,487, Jul. 21, 1989, abandoned. This application Aug. 29, 1991, Ser. No. 752,966

Claims priority, application Japan, Jul. 26, 1988, 63-186439

Int. Cl.[5] H01L *41/08*

U.S. Cl. 318—116 **21 Claims**



1. A vibration wave driven actuator, comprising:

(a) a vibration member;

(b) an electro-mechanical energy conversion element provided on said vibration member;

(c) an application means for applying first and second alternating signals to said energy conversion element, thereby generating a travelling wave in said vibration member as a driving force; and

(d) a circuit for adjusting the alternating signals applied by said application means, said adjusting circuit having a first mode and a second mode, in the first mode, the frequency of said first and second alternating signals being adjusted on the basis of a driving state of said actuator when a magnitude of the alternating signals exceeds a predetermined level, and in the second mode, the magnitude of the alternating signals being adjusted irrespective of the driving state of said actuator when the magnitude of the alternating signals is below the predetermined level.

5,146,144

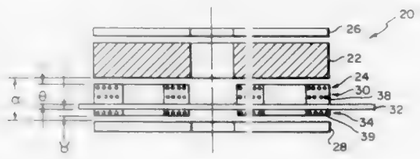
ELECTRIC MOTOR

James K. Lee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1990, Ser. No. 534,998

Int. Cl.[5] H02K *17/08*

U.S. Cl. 318—138 **9 Claims**



1. An electric motor comprising:

a generally planar rotor adapted to be rotated about an axis, said rotor being in a multipolar permanent magnet, said rotor being operable at a first condition of high torque and low speed encountered at startup and at a second condition of low torque and high speed encountered after startup;

a generally planar stator having a support member with first and second axial sides and being axially spaced from said rotor;

a first coil on said first axial side of said support member, said first coil having a number of windings sufficient for operating said rotor at said first condition;

a second coil on said second axial side of said support member, said second coil having a number of windings sufficient for operating said rotor at said second condition; and

means for driving said coils, said driving means including a first control circuit for driving said first coil and a second control circuit for driving said second coil, and means for actuating a selected one of said control circuits.

5,146,145

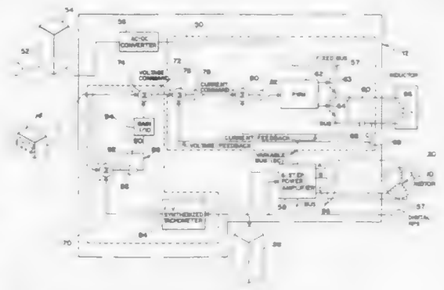
ELECTRIC DRIVE SYSTEM FOR SUBMARINE MACHINERY

Edwin H. Wood, North Franklin, and Russell D. Calasant, Old Lyme, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 10, 1991, Ser. No. 712,785

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—254 **6 Claims**



1. An electric drive system which comprises:

at least one brushless direct current motor;

a control and indicator unit connected to provide control signals that determine the output of said brushless direct current motor;

a motor controller for monitoring and controlling said brushless direct current motor and including a servomechanism having correction means connected to said control and indicator unit for receiving said control signals, said correction means further having a feedback loop receiving output signals from said motor, said correction means comparing said motor output signals with said control signals for providing correction to said motor to drive said motor in compliance with said control signals;

said motor controller further comprising; a rotation position sensor mechanically connected to sense the relative position of the magnets on the rotor with respect to the stator windings and providing said output signals in response to the mechanical sensing;;

a velocity feedback system connected to receive and compare said output signals from said rotation position sensor and said control signals from said control and indicator unit, said velocity feedback system providing an error comparison signal for operation of said motor, said velocity feedback system including a synthesized tachometer connected to receive said output signals from said rotational position sensor, said synthesized tachometer smoothing out said received output signals, a first summation translator receiving and operating on said smoothed out signals from said synthesized tachometer and said control signals from said control and indicator unit, and providing output error signals, a velocity servo integrator and an amplifier serially connected to receive and operate on said output error signals and providing a correction signal, and a second translator receiving and operating on said velocity servo integrator correction signal and said control signals from said control and indicator unit and providing said error comparison signal.

5,146,146

METHOD AND DEVICE FOR OPERATING ELECTRIC DRIVES

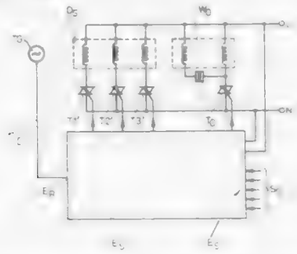
Rudolf Sämann, Balingen-Ostdorf, Fed. Rep. of Germany, assignor to BSG-Schalttechnik GmbH & Co. KG, Balingem, Fed. Rep. of Germany

Filed Dec. 26, 1990, Ser. No. 633,678

Claims priority, application European Pat. Off., Dec. 14, 1990, 90124280.0

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—768 **12 Claims**



1. A device for operating an asynchronous induction motor, comprising:

a multi-pole, multi-phase asynchronous induction motor having windings, the windings of said motor being subject to connection at one end of each said winding to a first line of a single phase power supply;

a plurality of controlled semiconductor switches, said controlled semiconductor switches being connected respectively to the other ends of said motor windings, and being subject to connection in series with the associated winding to a second line of said single phase power supply;

circuit means for rendering conductive said controlled semiconductor switches only during a half of a voltage wave of said power supply, said controlled semiconductor switches being rendered conductive one at a time in a successive sequence to produce a rotary magnetic field in said multi-phase motor with a frequency which is less than the frequency of the single phase power supply, said rotating field frequency being related to the number of said windings;

a respective control switch in series with each one of said controlled semiconductor switches;

a respective relay controlling the opening and closing of each one of said control switches, each one of said relays opening said associated control switch when said associated controlled semiconductor switch becomes short circuited; and

respective sensing means for detecting a short circuited condition of each one of said controlled semiconductor switches and for operating the associated relay to open the associated control switch when a short circuit state of said controlled semiconductor switch is detected.

5,146,147

AC MOTOR DRIVE SYSTEM

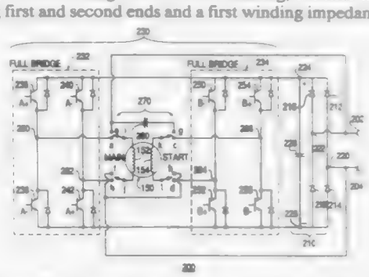
Frank E. Wills, York; Harold R. Schnetzka, II, Spring Grove, and Roy D. Hoffer, Lancaster, all of Pa., assignors to York International Corporation, York, Pa.

Filed Feb. 28, 1991, Ser. No. 662,011

Int. Cl.[5] H02M *3/22*

U.S. Cl. 318—797 **25 Claims**

1. An AC motor drive system for driving an AC motor having a first winding and a second winding, the first winding having first and second ends and a first winding impedance, the



second winding having first and second ends and a second winding impedance that is greater than the first impedance, the first and second windings being conductively isolated from each other, said drive system comprising:

two-phase power supply means for converting an inputted power supply voltage into a first phase AC voltage and a second phase AC voltage of a two-phase AC output voltage, said two-phase power supply means having a first pair of output terminals across which the first phase voltage is provided, and a second pair of output terminals across which the second phase voltage is provided;

said first pair of output terminals for connection to the first and second ends of the first winding; and

said second pair of output terminals for connection to the first and second ends of the second winding;

whereby said two-phase power supply means converts the inputted power supply voltage to first and second phase AC voltages respectively provided on said first and second pairs of output terminals to drive the motor.

5,146,148

PROCESS AND A DEVICE FOR CHANGING THE EFFECTIVE SPEED OF A POLYPHASE ASYNCHRONOUS MOTOR AND A SUITABLE MOTOR SYSTEM FOR THE APPLICATION OF THE PROCESS

Eduard J. Voet, Carasso, Switzerland, assignor to Europe Patent Ltd., Dublin, Ireland

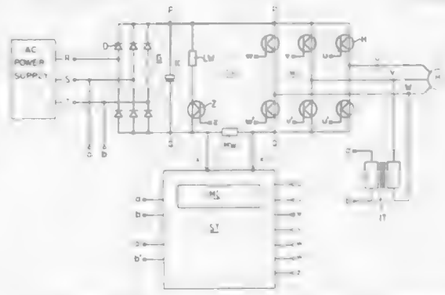
PCT No. PCT/CH89/00188, § 371 Date Aug. 30, 1990, § 102(e) Date Aug. 30, 1990, PCT Pub. No. WO90/05407, PCT Pub. Date May 17, 1990

PCT Filed Oct. 30, 1989, Ser. No. 536,690

Claims priority, application Switzerland, Nov. 4, 1988, 4096/88; Feb. 22, 1989, 725/89

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—803 **17 Claims**



1. A process for changing the effective speed of a polyphase asynchronous motor until reaching a set-point speed, the polyphase stator current of the motor having a variable frequency and an effective value which is determined by a current control variable, comprising the steps of:

adjusting the frequency of the stator current at a predetermined frequency change rate corresponding to a desired speed increase or decrease;

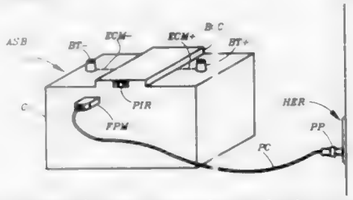
measuring the effective value of the stator current which changes as a result of said change of frequency;
comparing said effective value of the stator current to the current control variable to determine if the effective value is greater than the control variable;
maintaining the frequency of the stator current at an attained value if the effective value is greater than the control variable;
comparing the attained value of the frequency with the set-point speed to determine if the attained value of the frequency corresponds to the set-point speed, and
maintaining the frequency at the attained value if the attained value corresponds to the set-point speed when a motor slip value corresponds to the current control variable.

5,146,149

AUTOMOTIVE-TYPE STORAGE BATTERY WITH BUILT-IN CHARGER

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Dec. 5, 1985, Ser. No. 804,780
Int. Cl.[5] H02J *7/00*; H01M *10/46, 14/00*
U.S. Cl. 320—2 **18 Claims**



1. In an automotive-type storage battery having a casing and a pair of battery terminals operative to permit connection with a load, the improvement comprising:
inverter means including isolation means; and
charging input terminals means: (i) fastened onto the casing, (ii) physically separated from the battery terminals, (iii) connected in circuit with the battery terminals by way of the inverter means including its isolation means providing for electrical isolation between the charging input terminals means and the battery terminals, and (iv) adapted to receive power from a power source for charging the battery;
thereby permitting the battery to be charged from the power source without having to make direct electrical connection between the power source and the battery terminals; thereby, in turn, preventing a person from getting an electric shock from the power source by touching one of the battery terminals, even though the person may at the same time be in electrical connection with the power source.

18. A storage battery having a casing and a pair of battery terminals operative to permit connection with a load, comprising:
inverter means; and
charging input terminal means being: (i) mounted in substantially rigid relationship with the casing; (ii) separate of and located away from the battery terminals; (iii) connected with the battery terminals by way of the inverter means; and (iv) operative to receive charging current for charging the storage battery.

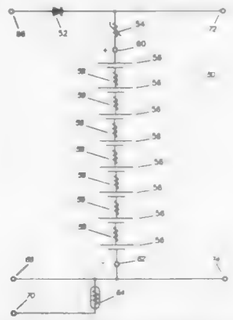
5,146,150

SAFE BATTERY CELL INTERCONNECTS

Russell E. Gyenes, and Raymond J. Kleinert, III, both of Sunrise, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 6, 1990, Ser. No. 563,581
Int. Cl.[5] H02J *7/00*; H01M *10/44*
U.S. Cl. 320—17 **11 Claims**

1. A battery comprising:
a plurality of interconnected cells, each cell having a positive and negative terminal; and
a plurality of resistive fusible links directly connected between the positive and negative terminals of said plurality of interconnected cells for providing interlinking current limiting, and current interrupting between cells;
a diode coupled to one of said positive terminal of said plurality of interconnected cells; and



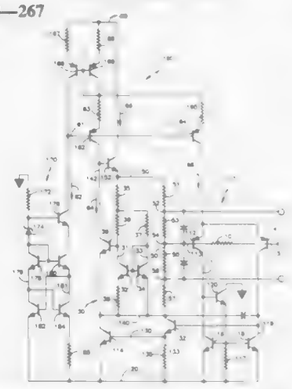
a thermistor coupled to one of said negative terminal of said plurality of interconnected cells.

5,146,151

FLOATING VOLTAGE REFERENCE HAVING DUAL OUTPUT VOLTAGE

Thomas Korn, San Jose, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 535,262, Jun. 8, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 844,906
Int. Cl.[5] G05F *1/585*
U.S. Cl. 323—267 **10 Claims**



1. A circuit for maintaining first and second predetermined voltage values on a pair of circuit output terminals (**52,54**), respectively, in a known relationship with respect to an arbitrary reference voltage (**115**) applied to the circuit, the circuit comprising:
differential amplifier means (**110**), having a first input (**114**) connected to the reference voltage (**115**), and having a second input (**112**);
voltage divider means (**50**), having a plurality of series electrically connected elements (**51,53,55,57**), each of said elements having a voltage drop thereacross when an electrical current is passed therethrough, a first end (**140**) and a second end (**150**) of said plurality of elements each having a voltage applied thereto, said voltage divider means having a divider reference location (**54**) at a location within said series electrically connected elements, said divider reference location (**54**) being connected to said second input (**112**) of said differential amplifier means,

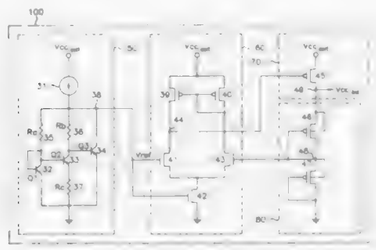
each of said pair of circuit output terminals (**52,54**) being located at a predetermined location within said plurality of elements;
floating reference means (**30**), for maintaining a predetermined constant voltage between said first end (**140**) of said plurality of elements and said second end (**150**) of said plurality of elements; and
wherein said differential amplifier means (**110**) comprises means, responsive to said reference voltage (**115**) and a voltage at said divider reference location (**54**), for maintaining a constant voltage at said divider reference location (**54**) in the event of a change in the voltage value applied at either said first end (**140**) or said second end (**150**), or in the event of a change in the voltage value at said divider reference location (**54**), said voltage changes being caused in part by a change in the parametric value of one or more elements in said plurality of elements, said change in voltage value being an asymmetric change when it occurs only at either said first end (**140**) or said second end (**150**).

5,146,152

CIRCUIT FOR GENERATING INTERNAL SUPPLY VOLTAGE

Tae-Je Jin, and Joon-Young Jeon, both of Seoul, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Rep. of Korea

Filed Jul. 2, 1991, Ser. No. 724,796
Claims priority, application Rep. of Korea, Jun. 12, 1991, 1991-9659
Int. Cl.[5] G05F *1/56, 3/20*
U.S. Cl. 323—280 **11 Claims**



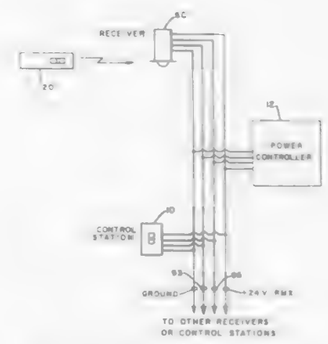
1. An internal voltage generating circuit having a comparator for generating internal supply voltage at an internal power supply terminal of a memory device by comparing a reference voltage with a feedback voltage, said circuit comprising:
voltage sharing means coupled to receive said internal supply voltage at said internal power supply terminal, for increasing said internal supply voltage in response to increase of temperature of said memory device by variably increasing resistance to lower voltage of said feedback voltage, said voltage sharing means comprising:
first and second variable resistor means coupled in series to each other to form an output node between said first and second variable resistor means to generate said feedback voltage, and interposed between said power supply terminal and ground, said first and second variable resistor means further having a channel resistance ratio increasing in response to the increase of temperature of said memory device, wherein said channel resistance ratio provides a channel resistance of said first variable resistor means higher than a channel resistance of said second variable resistor means.

5,146,153

WIRELESS CONTROL SYSTEM

David G. Lachaco, 1362 Heather Clr., Macungie, Pa. 18062; Stephen J. Yuhasz, Box 248, Rte. 1, Zionsville, Pa. 18092; David Buehler, Spring Valley Rd., Bethlehem, Pa. 18015; Raphael K. T. Tang, 11 Frost Rd., Belmont, Mass. 02178, and Joel S. Spira, RD #1, Box 405A, Coopersburg, Pa. 18036

Continuation of Ser. No. 79,847, Jul. 30, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,922
Int. Cl.[5] G05F *3/02*
U.S. Cl. 323—324 **90 Claims**



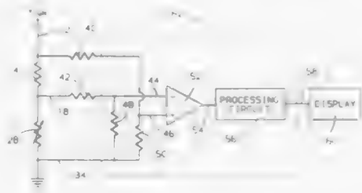
1. A remotely controlled power control system comprising, in combination:
(a) means for transmitting a radiant control signal, including actuator means, manually movable through a range of positions, information contained in said control signal depending upon the position of said actuator means;
(b) means for detecting said control signal and for providing an output signal that is determined by said information contained in said control signal; and
(c) means responsive to said output signal for controlling power delivered to an AC load,
whereby the power to said load is adjustable through a range of values that are immediately determined upon the positioning of said actuator means.

5,146,154

CIRCUIT WITH RATIOMETRIC ANALOG INPUTS

Raymond Lippmann, Ann Arbor; James E. Nelson, Union Lake; Michael J. Schnars, Clarkston; James R. Chintyan, Davison, all of Mich.; James M. Aralis, Mission Viejo, and Frank J. Bohac, Jr., Laguna Hills, both of Calif., assignors to Delco Electronics Corp., Kokomo, Ind. and Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 27, 1991, Ser. No. 750,082
Int. Cl.[5] G01L *1/18*; G01R *17/10*
U.S. Cl. 323—367 **6 Claims**



1. A circuit comprising:
a first voltage divider including a load resistor having resistance RL and a sender having a variable resistance Rs connected in series between a voltage supply and a

ground, the first voltage divider having an output line at the connection between the load resistor and the sender;

a second voltage divider including a first resistor having resistance R1 and a second resistor having resistance R2 connected in series between the output line of the first voltage divider and ground, the second voltage divider having a signal line containing a signal Vin at the connection between said first and second resistors;

a third voltage divider including a third resistor having impedance R3 and a fourth resistor having impedance R4 connected in series between the voltage supply and ground, the third voltage divider including a reference line carrying a signal kVref connected to said fourth resistor, wherein

R1=R3, R2=R4, said first and third resistors are external resistors and said second and fourth resistors are fabricated on an integrated circuit, and wherein Vin/(kVref) is proportional to Rs/(RL+Rs).

5,146,155

DIGITAL MEASURING CIRCUIT FOR MEASURING AN ELECTRICAL SIGNAL

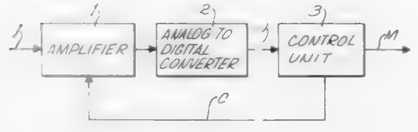
Christian Trinh Van, Brunoy, and Lydie Desperben, Bois Colombes, both of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 27, 1990, Ser. No. 633,503

Claims priority, application France Jan. 5, 1990, 90 00088

Int. Cl.[5] G01R *17/06, 15/08;* **H03M** *1/18*

U.S. Cl. 324—99 D **4 Claims**



1. A digital measurement circuit for measuring an analog electrical signal and producing a measurement signal, the measurement circuit comprising

an amplifier for amplifying the analog electrical signal with a gain corresponding to the state of a control signal having at least two states, the amplifier being followed by

at least one analog-to-digital converter for converting the amplifier analog signal output by the amplifier into digital data the converter being followed by

a control unit having an input for receiving said digital data, a first output for providing said control signal and a second output for providing said measurement signal,

wherein said control unit

produces during a signal measurement cycle said control signal in its at least two states, thereby causing the gain of the amplifier to successively assume each of said at least two states during the single measurement cycle,

stores the values of said digital data output by the converter during the single measurement cycle that correspond to said at least two states, and calculates said measurement signal from said stored digital data values.

5,146,156

CURRENT INTENSITY TRANSFORMER DEVICE FOR MEASURING A VARIABLE ELECTRIC CURRENT

Etter Marcel, Troinex, Switzerland, assignor to Liaisons Electroniques Mecaniques Lem S.A., Switzerland

Filed Apr. 9, 1990, Ser. No. 506,697

Claims priority, application Switzerland, Apr. 13, 1989, 13399/89

Int. Cl.[5] G01R *9/00*

U.S. Cl. 324—127 **5 Claims**

1. A current measuring device for measuring a variable electric current, comprising a current transformer with a magnetic circuit having at least one air-gap provided with a Hall effect device having an input supply terminal for connection to an energizing current generator and an output supply terminal, and having first and second measuring terminals, said output supply terminal of the Hall effect device being connected to an output terminal of an operational amplifier having first and second inputs, said first input being connected to a reference potential, and said second input being connected to said first measuring terminal of the Hall effect device, so that said first measuring terminal is maintained at said reference potential and the measuring voltage provided by the Hall effect device

appears at said second measuring terminal with respect to said reference potential, said magnetic circuit being arranged so that it can be magnetically coupled with a primary conductor for the current to be measured, and bearing at least one secondary winding magnetically coupled with said magnetic circuit, said device further comprising an electric measuring circuit arranged for adding together the measuring voltage provided by the Hall effect device and a measuring voltage appearing at the terminals of a measuring resistor connected in series with said secondary winding, to provide an output voltage representing a measure of the current in the primary conductor.

5,146,157

CALCULATION APPARATUS FOR AN ELECTRONIC METER

David J. Clarke, Bramford, and Michael D. Hutchinson, Ipswich, both of England, assignors to Schlumberger Industries Limited, Farnborough, England

Filed Dec. 28, 1990, Ser. No. 635,033

Claims priority, application United Kingdom, Jan. 4, 1990, 9000179

Int. Cl.[5] G01R *11/16, 19/00*

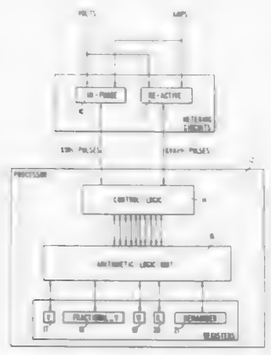
U.S. Cl. 324—142 **3 Claims**

1. Calculation apparatus for an electronic power meter comprising:

(a) first means for receiving input pulses representing a reactive component, R from a first metering circuit;

(b) second means for receiving input pulses representing an in-phase power component, W, from a second metering circuit;

(c) means for processing said input pulses representing said reactive component, R, and said input pulses representing said in-phase power component, W, into a pulse output, V, representative of the vector sum of said input pulses, said means for processing comprising a first register for accumulating said input pulses R, a second register for accumulating said input pulses W, and a third register for retaining said output pulses V, and a fourth register which stores the remainder $(W^2+R^2)-(V+1)^2$, said means for processing further comprising incrementing means for incrementing said remainder value by 2W+1 for each increment of W and 2R+1 for each increment of R, said incrementing means incrementing V whenever said remainder value is zero or positive and reducing the value of said remainder value by $2V_1+1$, where V_1 is the incremented value of V.



5,146,158

EXTERNALLY ADJUSTABLE STOPPER PLATE IN A CROSS-COIL TYPE METER

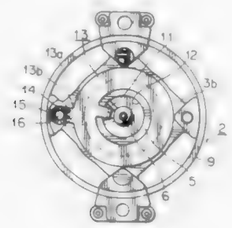
Yukio Ooike, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 664,687

Claims priority, application Japan, Mar. 12, 1990, 2-23736[U]; Aug. 6, 1990, 2-82766[U]

Int. Cl.[5] G01R *1/20*

U.S. Cl. 324—146 **8 Claims**



1. A cross coil type meter comprising:

a coil bobbin;

a cross coil consisting of two perpendiularly aranged coils wound on said coil bobbin;

a magnet rotor installed inside the coil bobbin in such a manner that the magnet rotor can be rotated on a rotating shaft thereof;

a zero-return means for returning the rotating shaft toa zero position when the cross coil isnot energized;

a movement comprising said coilbobin, said cross coil, said magnet rotor, and said zero-return means;

a dial plate attached to the movement;

a point attached to the end of the rotating shaft of the magnet rotor, said pointer together with the dial plate being adapted to indicate a measured value; and

a stopper plate installed in the coil bobbin, said stopper plate being adapted to engage with the magnet rotor;

means for adjusting the position of the stopper plate relative to the coil bobbin from outside the movement;

whereby said magnet rotor is driven to rotate through a specified angle according to a combined magnetic field generated by said two coils of the cross coil when they are energized in order to indicate a measured value by the pointer on the dial plate, said magnet rotor is freed for rotation when the cross coil is deenergized so that the pointer is reset to the zero position by the zero-return means, and said zero position of said pointer being accurately set by adjustment of said stopper plate from outside the movement by said means for adjusting.

5,146,159

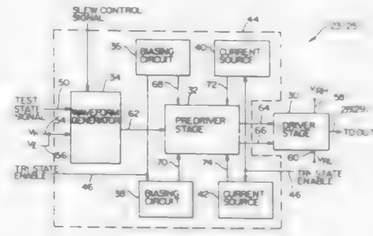
PIN DRIVER FOR IN-CIRCUIT TEST APPARATUS

Jack Lau, San Francisco; Armagan A. Akar, San Jose, and Hung-Wah A. Lau, Los Altos, all of Calif., assignors to Schlumberger Technologies, Inc., San Jose, Calif.

Filed Feb. 1, 1991, Ser. No. 649,081

Int. Cl.[5] G01R *31/28;* **H03F** *3/26*

U.S. Cl. 324—158 R **15 Claims**



1. A tri-state pin driver for generating at an output node either one of a test signal or a tri-state condition, said test signal having either one of a logic high or a logic low voltage level, said test signal driving a device under test and backdriving another circuit to which the device under test is coupled, the pin driver having a driver stage and a pre-driver stage;

the driver stage comprising a first and a second power transistor, respective emitter terminals of said power transistors coupled to form said output node;

the pre-driver stage comprising a first and a second pre-driver transistor, said first power transistor coupled to said first pre-driver transistor in an emitter follower configuration, said second power transistor coupled to said second pre-driver transistor in an emitter follower configuration, said pre-driver stage receiving a current signal and a biasing signal, said biasing signal having an active state and an inactive state, during said active state said biasing signal turning off said first and second pre-driver transistors to put said first and second power transistors at high impedance and generate said tri-state condition, during said inactive state said current signal controlling a base current of said first and second pre-driver transistors for driving said first and second power transistors within respective active regions to generate either one of said test signal logic high or logic low voltage levels at a current driving the device under test and backdriving said another device.

5,146,160

AUXILIARY POWER UNIT TEST KIT

Rodney G. Pinkston, HHC 1/68 Armor, APO, N.Y. 09026

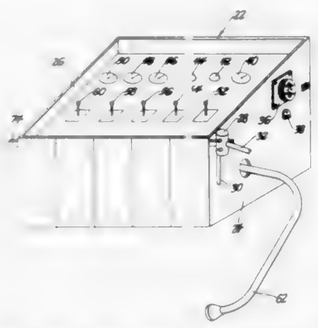
Filed Sep. 4, 1990, Ser. No. 576,828

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—158 R **1 Claim**

1. A test and repair test kit for an auxiliary power unit, the auxiliary power unit having first and second cables to provide electrical out put comprising: a housing; a first cannon plug mounted on the housing to receive the first cable to provide electrical signals from the auxiliary power unit representing the load percent current generated, oil pressure, direct current voltage generated, low oil pressure warning, time total signal, high temperature warning signal, and battery charging amper-

age, to individual monitoring gages relating to the various monitored engine functions; a second cannon plug mounted on the housing to receive the second electrical cable which provides electrical connections to the auxiliary power unit for the operating functions necessary to start and operate the auxiliary power unit the operating controls including a fuel pump



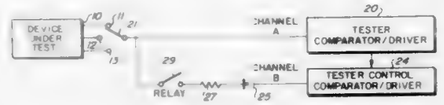
switch, a glow plug switch, and a generator switch and each of the operating functions passing individually through one of the operating controls in the test kit which controls the function; an auxiliary fuel pump connected to a source of fuel and the auxiliary power unit fuel pump; a voltage regulator connected to an external source of power to provide starting and operating power to the APU.

5,146,161

INTEGRATED CIRCUIT TEST SYSTEM

Timothy J. Kiser, Tempe, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 5, 1991, Ser. No. 681,803
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **8 Claims**



1. A system for testing the switching characteristics of bi-directional input/output pins of an integrated circuit device including in combination:

test circuit means operating in a drive mode in which said test circuit means applies signals to the input/output pin of a circuit device undergoing test, and operating in a comparing mode for receiving signals from the input/output pin of the device undergoing test, said test circuit means switching to a floating mode of operation between the drive mode and comparing mode of operation;

first connecting means for connecting said test circuit means to an input/output pin of a circuit to be tested; and

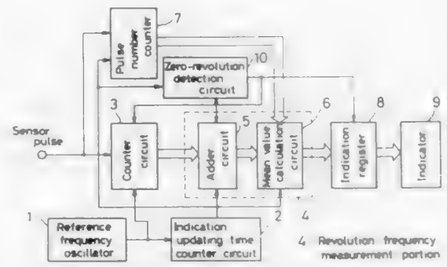
clamping circuit means controlled by said test circuit means and connected with said first connecting means for clamping the input/output pin of a circuit undergoing test to a pre-determined voltage level during the floating mode of operation of said test circuit means, said clamping circuit means being turned off by said test circuit means during either said drive mode or said comparing mode of operation of said test circuit means, and said clamping circuit means being rendered operative to supply a pre-determined clamping voltage to the input/output pin of a circuit undergoing test when said test circuit means is in its floating mode of operation.

5,146,162

ENGINE SPEED MEASURING DEVICE WITH PLURAL COUNTERS FOR AVERAGING ANGULAR VELOCITY

Hideyuki Kamiyama, Yamato; Masahiro Sasaki, Yokohama, and Youji Oki, Fuchu, all of Japan, assignors to Stanley Electric Company, Ltd., Japan

Filed Oct. 26, 1990, Ser. No. 604,704
Claims priority, application Japan, Nov. 27, 1989, 1-304726
Int. Cl.[5] G01P *3/481, 3/489;* **G01R** *23/10*
U.S. Cl. 324—166 **2 Claims**



1. A frequency indicator adapted to receive revolution sensor output pulse signals indicative of the angular velocity a revolving object and to use the signals to indicate the frequency of revolution of the revolving object, said frequency indicator comprising

a) a time based frequency oscillator effective to generate a sequence of time based signals;

b) first counter circuit means coupled to said time based frequency oscillator and to said revolution sensor output pulse signals, for

receiving a first one of said revolution sensor output pulse signals, and thereafter for

receiving and counting a number of said sequence of time based signals, and for

receiving a second one of said revolution sensor output pulse signals, and thereafter for

outputting a signal indicative of the received number of said sequence of signals occurring between every pair of said first and said second sensor output pulse signals;

c) pulse number counter means coupled to said revolution sensor output signals for receiving said revolution sensor output pulse signals and for outputting a signal indicative of the sum of said revolution sensor output pulse signals received by said pulse number counter means;

d) second counter circuit means coupled to said time based frequency oscillator for receiving said sequence of time based signals and for outputting a trigger signal after receiving a predetermined number of said sequence of time based signals and;

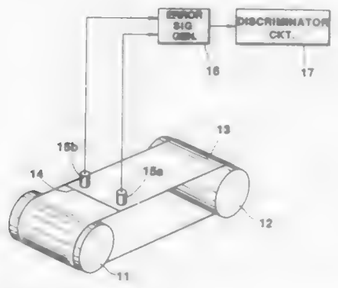
e) revolution means coupled to said first counter means, to said pulse number counter means, and to said second counter circuit means, for receiving said trigger signals and in response to said trigger signal determining said frequency of revolution of said revolving object by mathematically combining said output signal from said pulse number means with said output signal from said first counter means, and for outputting and displaying a signal indicative of said determined frequency of revolution.

5,146,163

METHOD AND APPARATUS HAVING TRANSVERSELY OFFSET EDDY CURRENT SENSORS FOR DETECTING DEFECT IN ELONGATED METAL STRIP JOINED BY WAY OF WELDING

Michio Nawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jan. 29, 1990, Ser. No. 471,372
Claims priority, application Japan, Jan. 30, 1989, 1-10310
Int. Cl.[5] G01N *27/82, 27/90;* **G01R** *33/12*
U.S. Cl. 324—232 **8 Claims**



1. A defect or crack detecting apparatus for detecting a defect or crack in or on an endless belt form metal strip and for discriminating said defect or crack from a transverse welded portion having adjoining ends welded to each other, comprising:

a first sensor of a type which generates a predetermined high frequency magnetic flux toward a detecting region and detecting an eddy current generated in or on the detecting region and outputting a signal according to an electrical resistance of the eddy current generating region placed within a path of said endless belt form strip for monitoring whether said defect or crack is formed in or on a first transverse position of said endless belt form strip to produce a first sensor signal variable of signal level according to a result of monitoring whether said defect or crack is formed in or on said first transverse position of said endless belt form strip;

a second sensor electrically independent of said first sensor and of the same type as the first sensor, said second sensor being placed within a path of said endless belt form strip for monitoring whether said defect or crack is formed in or on a second transverse position of said endless belt form strip, which second transverse position is so oriented at an orientation transversely off-set from said first transverse position and at the same axial position to said first transverse position so that a presence or absence at the same transverse position can be monitored simultaneously with that of said first sensor to produce a second sensor signal variable of signal level according to a result of monitoring whether said defect or crack is formed in or on said second transverse position of said endless belt form strip;

an error signal generator for receiving said first and second sensor signals and deriving an error signal representative of a difference of said first and second sensory signals, said error signal having a substantially small signal level when said welded ends pass under said sensors and a larger signal level when said defect or crack passes under one of said sensors; and

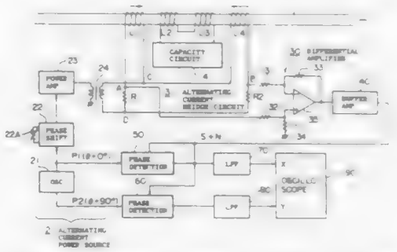
a discriminator circuit for comparing said error signal with a predetermined threshold value so that a judgement that a defect or crack occurs in said endless belt form strip is made when said error signal level is greater than said threshold value.

5,146,164

EDDY CURRENT FLAW DETECTION APPARATUS EMPLOYING A RESONANCE CIRCUIT

Tsutomu Masui; Kazumasa Hori, both of Sakai, and Akio Ueno, Ikeda, all of Japan, assignors to Mitsubishi Materials Corporation, Japan

Filed Jul. 3, 1991, Ser. No. 725,553
Claims priority, application Japan, Jul. 4, 1990, 2-176972
Int. Cl.[5] G01N *27/82;* **G01R** *33/12*
U.S. Cl. 324—233 **5 Claims**



1. An eddy current flaw detection apparatus comprising:

an altenating current bridge circuit having a pair of detecting coils disposed in a separated manner along a transit path of a conductor and coaxial with said transit path of the conductor, said detecting coils being connected to form said alternating current bridge circuit in a manner wherein when the same variations of magnetic fields are generated in said detecting coils, the induction voltages generated by said detecting coils cancel each other in said alternating current bridge circuit, and when a relative change occurs in the magnetic fields in said detecting coils, the equilibrium of said alternating current bridge circuit is disturbed, and an abnormality detection signal indicating the relative change is obtained from said alternating current bridge circuit;

a pair of resonance coils, which are disposed between said detecting coils, and coaxial with said detecting coils such that magnetic fields generated in said detecting coils pass through the adjacent resonance coils, said resonance coils being connected such that when no relative change occurs in the magnetic fields in said detecting coils, said resonance coils generate induction currents due to the corresponding magnetic fields which cancel each other, and when a relative change occurs in the magnetic fields in said detecting coils, said resonance coils generate different induction currents; and

a capacity circuit connected to said resonance coils to form a resonance circuit.

5,146,165

PRESSURE MEASURING DEVICE RESPONSIBLE TO A MAGNETIC FLUX FIELD

Rork S. Brown, 1174 Carmona Ave., Los Angeles, Calif. 90019

Filed Jan. 9, 1991, Ser. No. 639,186
Int. Cl.[5] G01R *33/00;* **G01N** *27/72*
U.S. Cl. 324—260 **7 Claims**

1. A pressure sensing device responsive to a magnetic flux field comprising:

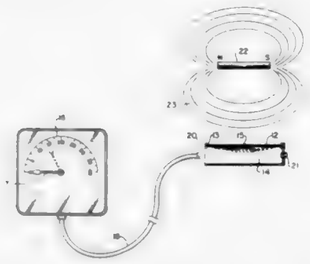
a housing having a continuous sidewall, a common bottom and a flexible diaphragm defining a common top;

a single internal cavity defined between opposing surfaces of said diaphragm and said bottom occupied by air;

an outlet carried on said housing having a check valve releasing said air exteriorly of said housing in response to movement of said diaphragm;

said diaphragm having embedded magnetic device materials

producing a centrally located magnetic flux to move said diaphragm; and



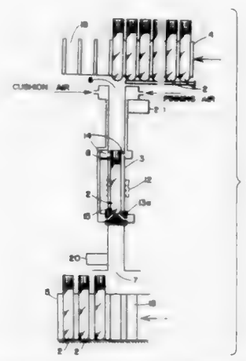
a display device coupled to said internal cavity via check valve for directly indicating a pressure valve.

5,146,165

METHOD AND APPARATUS FOR ENHANCING SAMPLE ANALYSIS RATE IN MAGNETIC RESONANCE SPECTROSCOPY

Victor J. Bartuska, Fort Collins, Colo., assignor to Chemagnetics, Inc., Fort Collins, Colo.

Filed Aug. 6, 1990, Ser. No. 563,410
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—321 25 Claims



1. An apparatus for automatically handling multiple samples in a magnetic resonance spectrometer comprising:

a. a plurality of sample containers capable of retaining a material to be tested, said containers having an open end and a closed end;

b. a sample container guide tube which creates a pathway for said sample containers, and having a length, upper and lower openings, and further having a magnetic field area;

c. a first storage means capable of retaining said sample containers situated in the vicinity of said upper opening of said guide tube;

d. a means for progressively moving said first storage means;

e. a means for sequentially inserting each of said sample containers into said magnetic field area;

f. a means for supporting a portion of said sample container in said magnetic field area during magnetic resonance analysis;

g. a means for spinning one of said sample containers to perform magnetic resonance analysis;

h. a means for removing each of said sequentially inserted sample containers from said magnetic field area;

i. a second storage means capable of retaining said sample containers situated in the vicinity of said lower opening of said sample container guide tube;

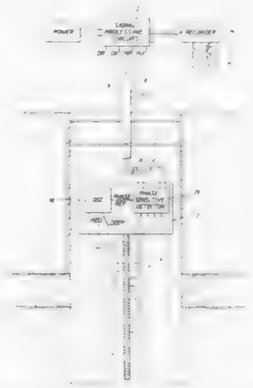
j. a means for progressively moving said second storage means.

5,146,167

METHOD AND APPARATUS FOR DETERMINING THE CONDUCTIVITY OF SUBSURFACE EARTH FORMATIONS BY FILTERING AND SUMMING IN-PHASE AND QUADRATURE CONDUCTIVITY SIGNALS WITH CORRECTION VALUES

Robert W. Strickland, Austin, and Paul L. Sinclair, Clear Lake Shores, both of Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Filed May 30, 1991, Ser. No. 708,142
Int. Cl.[5] G01V *3/18, 3/38*
U.S. Cl. 324—339 28 Claims



15. An apparatus for investigating the conductivity of subsurface earth formations with an induction well logging tool in a borehole, comprising

means for detecting an in-phase conductivity value and a quadrature conductivity value, said in-phase conductivity value and said quadrature conductivity value relating to the conductivity of the earth formation around said borehole;

a first non-linear, spatial filter for filtering said in-phase conductivity value to obtain a first filtered conductivity value;

a second non-linear, spatial filter for filtering said quadrature conductivity signal to obtain a first correction value;

a third non-linear, spatial filter for filtering said in-phase conductivity value to obtain a second filtered conductivity value;

function forming means for forming a mathematical function of said in phase conductivity value;

a fourth nonlinear, spatial filter for filtering said formed mathematical function of said in-phase conductivity value to obtain a second correction value;

means for summing said first filtered conductivity value and said first correction value to obtain a first processed conductivity value;

means for summing said filtered conductivity value and said second correction value to obtain a second processed conductivity value; and

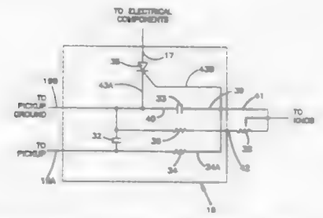
means for determining an output conductivity value as a function of said first processed conductivity value, said second processed conductivity value and said in-phase conductivity value.

5,146,168

VARIABLE SENSITIVITY TIMING ANALYZER

Alexander Shaland, Lyndhurst, Ohio, assignor to Actron Manufacturing Company, Cleveland, Ohio

Filed Oct. 1, 1990, Ser. No. 591,619
Int. Cl.[5] F02P *17/00*
U.S. Cl. 324—392 14 Claims



1. A timing analyzer for testing ignition timing in a conventional four stroke and a DIS four stroke engine, comprising:

a pickup having means for sensing the current level on a spark plug lead in the vehicle;

means for producing a pulse of light when the current level increases above a pre-selected threshold level; and

a variable sensitivity device having means to variably increase or decrease said threshold level in accordance with the characteristics of the engine being tested, such that the means for producing provides a pulse of light only when a pre-selected current threshold level is met for that engine.

5,146,169

REFERENCE ELECTRODE AND A PAIR OF ELECTRODES FOR DETECTING THE ACIDITY OR BASICITY OF OIL

Shinya Morishita; Kenichi Suzuki; Masae Oohori, and Masshiko Nakada, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 13, 1990, Ser. No. 582,425
Claims priority, application Japan, Sep. 13, 1989, 1-237758; Dec. 28, 1989, 1-340856
Int. Cl.[5] G01N *27/416*
U.S. Cl. 324—438 8 Claims

1. A pair of electrodes for detecting the acidity or basicity of oil in which a potential difference varies in response to the acidity or basicity of oil, comprising a reference electrode exhibiting no or little potential change in response to the acidity or basicity of oil and a responding electrode exhibiting potential change in response to the acidity or basicity of oil, said reference electrode being a metallic electrode formed of a base metal material selected from the group consisting of lead, zinc, tin, indium, cadmium, magnesium and an alloy thereof, and said responding electrode being a conductive solid electrode of a base metal material which is different from that of said reference electrode.

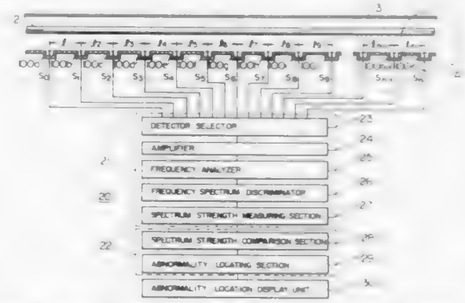
5,146,170

METHOD AND APPARATUS FOR LOCATING AN ABNORMALITY IN A GAS-INSULATED ELECTRIC DEVICE.

Toshio Ishikawa; Shuzuo Iwasaa; Tomoaki Utsumi, and Fumihiro Endo, all of Hitachi, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,069
Claims priority, application Japan, Jun. 14, 1989, 1-149428
Int. Cl.[5] G01R *31/11*
U.S. Cl. 324—536 16 Claims

1. A method of locating an abnormality in a gas-insulated electric device, in which a high-voltage conductor is supported by an insulation support member inside a metallic container filled with insulation gas, operative to locate the spot of a partial discharge emerging in said metallic container by means of a plurality of detectors (S_0–S_n) installed at positions within said metallic container and which detect the partial discharge, wherein said detectors detect an electromagnetic wave caused by the partial discharge, the frequency spectrum of the electromagnetic wave is analyzed to evaluate the spectrum strength (YH), a position (x) which renders a maximum spectrum strength is determined from the relation between spectrum strengths of said detectors and installation positions of said detectors and an attenuation factor (α) of said electromagnetic wave generated and traveling within said metallic container, and said position (x) is determined in a longitudinal direction of said metallic container to be the spot of the partial discharge.

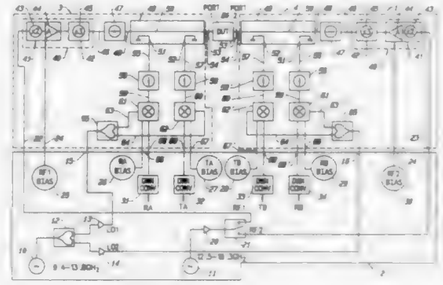


5,146,171

FULL REVERSING MILLIMETER TEST SET

Donald A. Bradley, Morgan Hill, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Mar. 13, 1990, Ser. No. 492,775
Int. Cl.[5] G01R *27/04*
U.S. Cl. 324—639 19 Claims



1. For use in a full reversing millimeter test set having a pair of identical test head assemblies wherein a first one of said test head assemblies is used for processing a test signal transmitted to and reflected from a device under test (DUT) and a second one of said test head assemblies is used for processing a signal transmitted through said DUT, a test head assembly comprising:

isolator means for isolating a source of said test signal from a test signal reflected from said DUT when said test head assembly is processing a test signal transmitted to and reflected from said DUT and for terminating said DUT when said test head assembly is processing a test signal transmitted through said DUT;

means for sampling said test signal and a signal reflected

from or transmitted through said DUT in response to said test signal;

means coupled to said sampling means for providing a first intermediate frequency signal comprising characteristics of said test signal and a second intermediate frequency signal comprising characteristics of said signal reflected from or transmitted through said DUT in response to said test signal; and

means for transmitting said first and said second intermediate frequency signals to an analyzer for analyzing said intermediate signals.

5,146,102

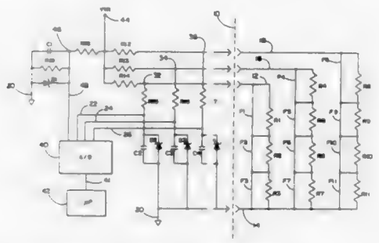
ENGINE IDENTIFICATION SYSTEM

Kourosh Mehr-Ayin, Vista; William Conn, Spring Valley; Luis M. Rivera; Andrew L. Gale, both of San Diego, and Phillip A. Marsh, Lakeside, all of Calif., assignors to Sundstrand Corp., Rockford, Ill.

Filed Aug. 15, 1990, Ser. No. 567,876

Int. Cl.[5] G01R *19/00*; **G08C** *15/00*

U.S. Cl. 324—691 **23 Claims**



1. An identification system, comprising:

a first resistor of known magnitude;

first means for connecting said first resistor of known magnitude electrically in series with a first resistive identification circuit between an input voltage and electrical ground;

first means for measuring a first voltage magnitude at a point between said first resistor of known magnitude and said first resistive identification circuit;

a second resistor of known magnitude and a third resistor of known magnitude, said second and third resistors being connected electrically in series between said input voltage and said electrical ground;

second means for measuring a second voltage magnitude at a point between said second and third resistors; and

first means for determining the resistance magnitude of said first resistive identification circuit as a function of said first voltage magnitude and second voltage magnitude;

second means for connecting a fourth resistor of known magnitude electrically in series with a second resistive identification circuit between said input voltage and said electrical ground; and

third means for measuring a third voltage magnitude between said fourth resistor of known magnitude and said second resistive identification circuit

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5,146,173

POSITION DETERMINING DEVICE

Manfred Jurkewitz, Wiesloch, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

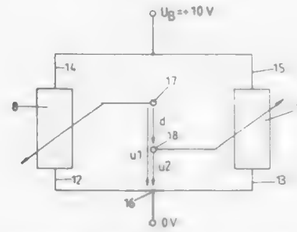
Filed Jan. 8, 1990, Ser. No. 461,620

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1989, 3900270

Int. Cl.[5] G08C *13/06*; **G01R** *27/02*

U.S. Cl. 324—714 **8 Claims**

1. Position determining device for an adjustment device comprising two continuous potentiometers having sliders movable to respective positions determining respective resistance values of said potentiometers, said sliders being drivingly coupled with the adjustment drive so that the respective resistance values determined by the positions of said sliders correspond to a set position of the adjustment drive, means for driving each of said sliders with a respective transmission ratio different from each other so that said potentiometers have respective resistance values different from each other for a given set position of the adjustment drive, and means for determining a differential value between said different resistance values as a measure of the set position of the adjustment drive, said potentiometers, respectively, having connection regions at a starting location and at an end location of respective full measurement ranges thereof, both of said potentiometers having respective drive ratios operative so that only one of said sliders at any time is located in a respective connection region of the respective potentiometer except at a start and an end of the entire measurement range.



5,146,174

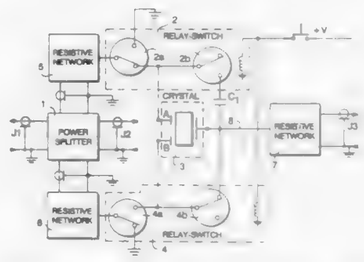
SWITCHING ARRANGEMENT METHOD AND APPARATUS FOR MAKING PARAMETER MEASUREMENT AND ADJUSTMENT OF COUPLED DUAL RESONATOR CRYSTALS USING BOTH RESONATOR PORTS

Samuel Toliver, Rustburg; Gerald E. Roberts, and Myron A. Turner, Jr., both of Lynchburg, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Continuation-in-part of Ser. No. 480,773, Feb. 16, 1990, Pat. No. 5,049,828, and a continuation-in-part of Ser. No. 480,774, Feb. 16, 1990, Pat. No. 5,047,726. This application Mar. 25, 1991, Ser. No. 677,321

Int. Cl.[5] G01R *27/00*

U.S. Cl. 324—727 **16 Claims**



1. An improved apparatus for measuring selected parameters of coupled-dual resonator crystals using both resonator ports, which includes a parameter measuring device connected to receive the resonator outputs and a variable frequency signal generator connected in a first mode to one of the resonator ports and connected in a second mode to the other resonator port, the improvement comprising:

first switch means connected to said variable frequency signal generator and to said one resonator port;

second switch means connected to said variable frequency signal generator and to said other resonator port;

said first and second switch means operable in said first mode to apply an output from said variable frequency signal generator to said one resonator port and further operable in said first mode to short-circuit said other resonator port;

said first and second switch means operable in said second mode to apply an output from said variable frequency signal generator to said other resonator port and further operable in said second mode to effectively open-circuit said one resonator port: and

means for causing said first and second switch means to operate in said first mode or said second mode,

whereby said parameter measuring device sequentially measures said selected parameters in said first and second modes.

5,146,175

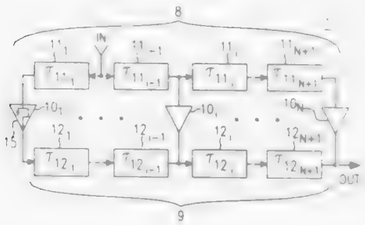
COMBINING TECHNIQUE FOR A MULTISTAGE, PARALLEL AMPLIFIER

Donald R. Green, Jr., Spring Township, Berks County, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 21, 1991, Ser. No. 748,988

Int. Cl.[5] H03F *3/60*

U.S. Cl. 330—54 **12 Claims**



1. An amplifier having an input port and an output port and having a plurality of parallel gain-stages interconnected with first and second transmission lines;

characterized by:

the input port of the amplifier connecting to a point along the first transmission line and the output port of the amplifier connecting to a point along the second transmission line, at least one of the ports being disposed asymmetrically along its corresponding transmission line and at least one of the ports connecting to its corresponding transmission line between the ends thereof;

wherein the points of connection for the input and output ports are chosen to provide a predetermined phase mismatch between signal paths through all of the plurality of gain-stages as measured from the input port to the output port.

5,146,176

AMPLIFIER CIRCUIT WITH INPUT ERROR COMPENSATION

Thomas G. Evans, Limbury, United Kingdom, assignor to E. C. Audio Limited, Daneshill, England

PCT No. PCT/GB89/00415, § 371 Date Dec. 17, 1990, § 102(e) Date Dec. 17, 1990, PCT Pub. No. WO89/10656, PCT Pub. Date Nov. 2, 1989

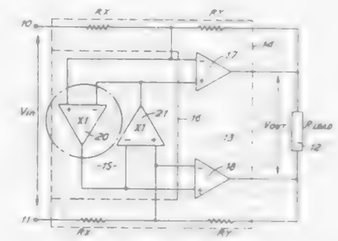
PCT Filed Apr. 19, 1989, Ser. No. 623,984

Claims priority, application United Kingdom, Apr. 19, 1988, 8809206

Int. Cl.[5] H03F *3/45, 3/68*

U.S. Cl. 330—69 **10 Claims**

1. An analogue amplifier circuit having a gain stage including two operational amplifiers, each amplifier providing an output which is substantially a linear function of an input and wherein the input error of at least one of the operational amplifiers is compensated by an error correction stage for producing at least a first error correcting signal, the error correction stage comprising at least one operational amplifier the inputs of



which are connected across the inputs of the said one operational amplifier of the gain stage and the output of which provides the first error correcting signal, and is connected to the input of the other operational amplifier of the gain stage.

5,146,177

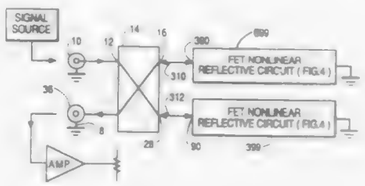
BALANCED REFLECTIVE NONLINEAR PROCESSOR USING FETS

Allen Katz, Robbinsville, and Shabbir S. Moochalla, Kendall Park, both of N.J., assignors to General Electric Co., East Windsor, N.J.

Filed Aug. 30, 1991, Ser. No. 753,164

int. Cl.[5] H03F *1/32, 3/60*

U.S. Cl. 330—149 **13 Claims**



1. A nonlinear signal translation arrangement for operation about a center frequency, comprising:

a 3 dB, quadrature directional coupler including first, second, third and fourth ports;

first and second field-effect transistors, each of said field-effect transistors including a controllable source-to-drain conductive path, and a gate electrode by which said source-to-drain conductive path may be controlled;

means for coupling said source-to-drain conductive path of said first field-effect transistor in series with said second port of said directional coupler, at least at frequencies about said center frequency;

means for coupling said source-to-drain conductive path of said second field-effect transistor in series with said third port of said directional coupler, at least at frequencies about said center frequency;

first reactance means coupled between said gate electrode of said first field-effect transistor and a source of reference potential;

second reactance means coupled between said gate electrode of said second field-effect transistor and a source of a reference potential;

bias means coupled to said gate electrodes of said first and second field-effect transistor means for applying first and second direct voltages to said gate electrodes of said first and second field-effect transistors, respectively; and

means for coupling said first and fourth ports of said directional coupler in a path of signal flow at a frequency about

said center frequency, whereby said signal flow is nonlinearly modified

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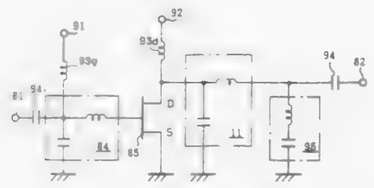
5,146,178

IMPEDANCE-MATCHED, CLASS F HIGH-FREQUENCY AMPLIFIER

Toshio Nojima, Yokosuka, and Sadayuki Nishiki, Yokohama, both of Japan, assignors to Nippon Telegraph and Telephone Company, Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 759,565
Claims priority, application Japan, Nov. 16, 1990, 2-312503
Int. Cl.[5] H03F *3/193*
U.S. Cl. 330—251 **20 Claims**



1. A high frequency amplifier for amplifying an input high frequency signal which has a fundamental frequency, comprising:

an active device which amplifies in power the fundamental frequency of the input high frequency signal; and

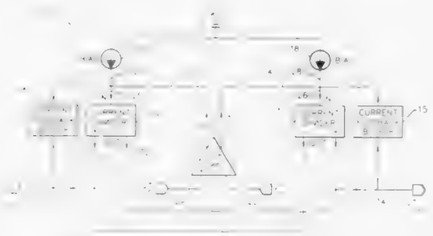
an output circuit which is coupled between an output terminal of the active device and an output transmission line, the output circuit including an output matching circuit which matches an output from said active device with said output transmission line for the fundamental frequency and also for a second harmonic frequency thereof, and an even harmonic terminating circuit, connected to an output side of the output matching circuit, which has a high input impedance at the fundamental frequency and a low input impedance at least at the second harmonic frequency thereof.

5,146,179

FULLY DIFFERENTIAL OPERATIONAL AMPLIFIER HAVING FREQUENCY DEPENDENT IMPEDANCE DIVISION

L. Richard Carley, Murrysville, and Katsufumi Nakamura, Pittsburgh, both of Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.

Filed Nov. 29, 1991, Ser. No. 800,845
Int. Cl.[5] H03F *3/45, 3/16*
U.S. Cl. 330—253 **21 Claims**



20. An amplifier comprising:

a transconductance amplifier having an input and an output, for receiving an input voltage at the input thereof and for converting said input voltage to an input current at the output thereof;

frequency dependent current dividing means having an input, a noninverting output and an inverting output, the output of said transconductance amplifier being electrically connected to the input of said frequency dependent current dividing means, the noninverting output forming an amplifier output terminal, and the inverting output being connected to a reference voltage; and

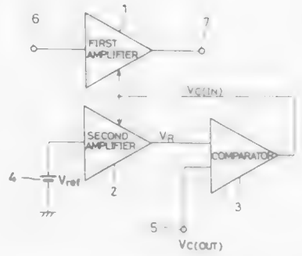
current feedback buffer means, the input of which is electrically connected to said amplifier output terminal, and the output of which is electrically connected to said input of said frequency dependent current dividing means.

5,146,180

VARIABLE GAIN AMPLIFIER

Junichi Hyakutake, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 663,308
Claims priority, application Japan, Mar. 13, 1990, 2-63061
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—254 **19 Claims**



1. A variable gain amplifier, comprising:

first input means for receiving an input signal to be amplified;

second input means for receiving an external control voltage;

signal applying means for applying a reference signal;

a first amplifier, including a first variable gain portion for providing a gain corresponding to an internal control voltage, for amplifying said input signal from said first input means in accordance with the gain of said first variable gain portion to output as an output signal said input signal amplified;

a second amplifier, including e second variable gain portion for providing a gain corresponding to said internal control voltage, the second variable gain portion having the same variable gain characteristic as said first variable gain portion, for amplifying said reference signal from said signal applying means in accordance with the gain of said second variable gain portion to output said reference signal amplified; and

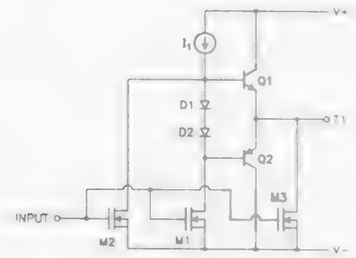
a voltage comparator, one input thereof receiving said external control voltage from said second input means, the other input thereof receiving an output from said second amplifier and an output voltage thereof being applied as said internal control voltage to said first and second variable gain portions of said first and second amplifiers, thereby for forming a negative feedback loop with said second amplifier.

5,146,181

BICMOS OUTPUT STAGE WITH IMPROVED OUTPUT VOLTAGE SIGNAL

Derek F. Bowers, Sunnyvale, and Peter S. Henry, Fremont, both of Calif., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 24, 1991, Ser. No. 764,537
Int. Cl.[5] H03F *3/30*
U.S. Cl. 330—268 **14 Claims**



1. In a feedback amplifier output stage having high and low voltage buses, first and second output transistors connected between said voltage buses, an output terminal connected between said output transistors, a current source connected to supply quiescent current to said first transistor, a diode circuit connected to supply quiescent current from said current source to said second transistor, and an input transistor connected to said first transistor through said diode circuit and to said second transistor to set said transistors in opposite conductive states in response to an input signal applied to said input transistor, the improvement comprising:

a diode turnoff circuit means connected to render said diode circuit non-conductive in response to a first input signal that turns said first transistor OFF and said second transistor ON, and conductive in response to a second input signal that turns said first transistor ON and said second transistor OFF, thereby preventing said diode circuit from limiting the voltage swing at said output terminal when said first input signal is applied,

a swing transistor connected between said output terminal and said low voltage bus, and

a control circuit for said swing transistor connected to render said swing transistor conductive in response to said first input signal and non-conductive in response to said second input signal, thereby driving said output terminal substantially to the voltage level of said low voltage bus in response to said first input signal.

5,146,182

MICROWAVE DEVICE

Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

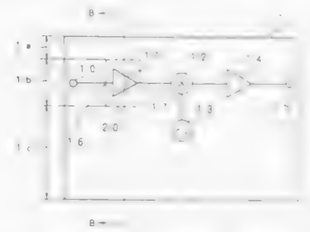
Filed May 22, 1991, Ser. No. 704,090
Claims priority, application Japan, May 25, 1990, 2-136837
Int. Cl.[5] H04B *1/26*
U.S. Cl. 330—307 **8 Claims**

1. A microwave device comprising:

a substrate made of a dielectric material; and

a frequency conversion circuit formed on a front surface of said substrate and having a microstrip line for input and a radio frequency amplifier and having a microstrip line for output;

said substrate being partially thinned in a portion of a rear surface thereof which faces said radio frequency amplifier, the width of said microstrip for output being selected so that a change in the characteristic impedance of said microstrip line for output which crosses said front surface



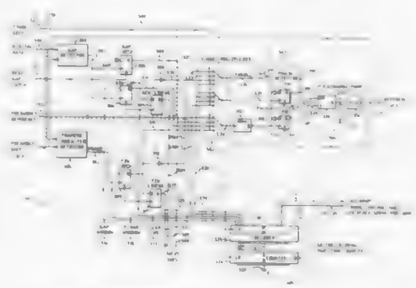
of the substrate, the thickness of which is changed by said thinned portion, is smaller than 10%.

5,146,183

PHASE LOCK LOOP FOR SECTOR SERVO SYSTEM

Rosser S. Wilson, Menlo Park, Calif., assignor to Maxtor Corporation, San Jose, Calif.

Filed Sep. 27, 1991, Ser. No. 767,073
Int. Cl.[5] G11B *5/596, 21/10;* **H03L** *7/08*
U.S. Cl. 331—1 A **18 Claims**



1. A circuit comprising:

receiving means coupled to a clock signal for receiving an external input signal and generating a plurality of detection and status signals;

switching means coupled to said receiving means for selecting a plurality of selected signals from a plurality of detection and reference signals according to a plurality of staging signals;

phase detecting means receiving said selected signals from said switching means for detecting a phase difference and providing a plurality of phase control signals;

controlled oscillation means coupled to said phase detecting means, receiving said phase control signals and generating said clock signal;

controlling means coupled to said switching means for providing a plurality of staging signals; and

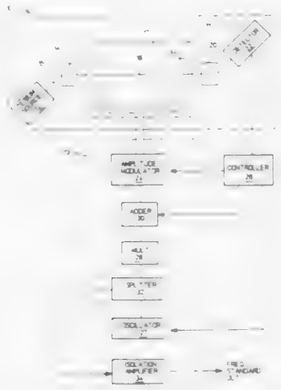
interval partitioning means coupled to said receiving means, said switching means, said controlled oscillation means, and said controlling means; said interval partitioning means receiving said clock signal, and providing a plurality of timing and reference signals.

5,146,184

ATOMIC CLOCK SYSTEM WITH IMPROVED SERVO SYSTEM

Len Cutler, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 1, 1991, Ser. No. 739,276
Int. Cl.[5] H03B 9/00 H03L 7/26
U.S. Cl. 331—3 **12 Claims**



1. An atomic clock comprising

source means for generating an atomic beam;

first selection means for receiving atoms from said atomic beam selecting atoms in a predetermined state;

microwave injection means responsive to a frequency control signal for applying microwave radiation of a frequency determined by said control signal to said selected atoms;

second selection means for selecting atoms in a second predetermined state;

detection means for receiving said atoms selected by said second selection means for generating and outputing a signal related to the number of atoms in said predetermined second state; and

control means for generating said frequency control signal and for causing said microwave injection means to apply microwave radiation at four predetermined frequencies, said control means further comprising means for measuring the steady-state output of said detection means at each of said four predetermined frequencies and means for determining a frequency correction from said measured outputs, said frequency control signal being responsive to said frequency correction.

5,146,185

COMPACT OPTICALLY PUMPED RESONANCE SYSTEM AND APPARATUS

Lindon L. Lewis, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jun. 14, 1991, Ser. No. 715,252
Int. Cl.[5] H01L 7/26
U.S. Cl. 331—3 **35 Claims**

1. A frequency standard comprising:

a source of cesium atoms;

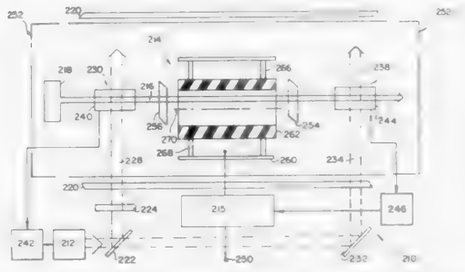
TE_{011} microwave resonance cavity means for altering the state of said atoms;

cesium state select means for causing cesium atoms in a selected energy state to interact with the microwave resonance in said cavity means;

dielectric means within said resonance cavity means for altering the electromagnetic characteristics of said cavity means so that the interaction between said cesium atoms and the microwave energy in said cavity means is more effective;

frequency generator means for generating a frequency for driving said microwave resonance cavity means;

detector means for detecting fluorescence from said cesium



atoms and for producing a signal representative of the amount of cesium atoms that have had their state altered by said microwave resonance cavity means; and

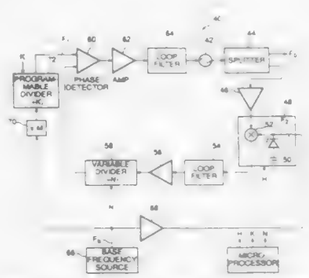
lock means responsive to said detecting means signal for locking said frequency generator means to a frequency characteristic of said cesium atoms.

5,146,186

PROGRAMMABLE-STEP, HIGH-RESOLUTION FREQUENCY SYNTHESIZER WHICH SUBSTANTIALLY ELIMINATES SPURIOUS FREQUENCIES WITHOUT ADVERSELY AFFECTING PHASE NOISE

Paul L. Vella, Santa Rosa, Calif., assignor to Microsource, Inc., Santa Rose, Calif.

Filed May 13, 1991, Ser. No. 699,625
Int. Cl.[5] H03L 7/07, 7/16, 7/22
U.S. Cl. 331—16 **19 Claims**



1. A frequency synthesizer for generating an output signal of a desired frequency, comprising:

a tunable oscillation means for generating an output signal;

means for deriving a stable base frequency signal from a fixed frequency reference standard;

means coupled to the base frequency deriving means for generating a first reference frequency signal from said base frequency signal, the frequency of said first reference frequency signal being a programmable integral fraction of an integral multiple of said stable base frequency;

means coupled to said base frequency deriving means for generating a second reference frequency signal from said stable base frequency, the frequency of said second reference frequency signal being a harmonic of said stable base frequency;

means coupled to said tunable oscillator means and to said second reference frequency generating means for mixing said output signal with said second reference frequency signal to generate a mixed signal; and

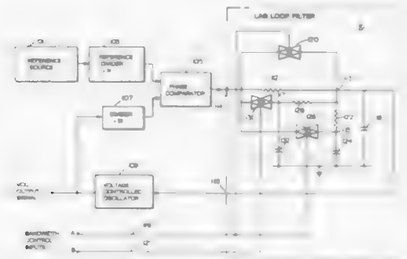
means for phase locking the mixed signal to said first reference frequency signal by producing an error signal for controlling said tunable oscillation means, the error signal being coupled to said tunable oscillation means for tuning said tunable oscillation means to generate said output signal at the desired frequency.

5,146,187

SYNTHESIZER LOOP FILTER FOR SCANNING RECEIVERS

Johannes J. Vandegraaf, Lynchburg, Va., assignor to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Filed Jul. 1, 1991, Ser. No. 723,956
Int. Cl.[5] H03L 7/107
U.S. Cl. 331—17 **17 Claims**



1. In a phase locked loop frequency synthesizer, a bandwidth alterable lag filter network having an input and an output, comprising:

a bandwidth alterable RC filter means for restricting inputted signals to either a broad bandwidth or a narrow bandwidth coupled between the input and the output;

a bandwidth reduction means for reducing the bandwidth of said RC filter to an intermediate bandwidth, said intermediate bandwidth being narrower than said broad bandwidth but broader than said narrow bandwidth, coupled between the input and the output and across said bandwidth alterable filter; and

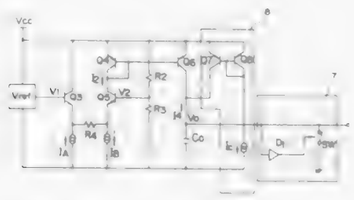
switch means for selectively coupling and decoupling said bandwidth reduction means from said input to alter the bandwidth of said alterable filter.

5,146,188

CONSTANT CURRENT CIRCUIT AND AN OSCILLATING CIRCUIT CONTROLLED BY THE SAME

Makoto Suwada; Shuichi Inoue, and Yuzo Usui, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 25, 1991, Ser. No. 765,272
Claims priority, application Japan, Sep. 26, 1990, 2-256294
Int. Cl.[5] G05F 3/16; H03K 3/282
U.S. Cl. 331—111 **5 Claims**



1. A constant current circuit comprising:

a source for supplying power voltage;

two constant current supplying sources;

a first transistor having a gate means and connected between said power voltage supplying source and one said constant current supplying source, said gate means being provided with a reference voltage;

a voltage divider providing a divided voltage of said power voltage;

a second transistor having a gate means and connected between said power voltage supplying source and another said constant current supplying source, said gate means being provided with the divided voltage;

a resistor connected between respective nodes of said first transistor and second transistor and said constant current supplying sources;

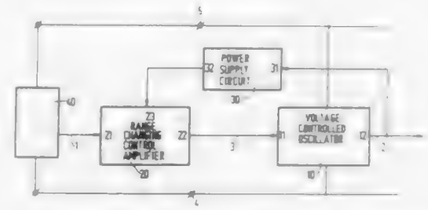
whereby the current flowing through said second transistor is controlled according to the magnitude of said power voltage and the rate of change of the current with respect to the change of the power voltage depends on the resistance of said resistor.

5,146,189

OSCILLATOR CIRCUIT WITH VOLATGE CONTROLLED FREQUENCY

Eduard Van Keulen, and Jan Ooijman, both of Doetinchem, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1991, Ser. No. 748,495
Int. Cl.[5] H03B 5/36
U.S. Cl. 331—158 **9 Claims**



1. An oscillator circuit comprising

power supply terminals for receiving supply voltages at first and second voltage levels;

a voltage controlled oscillator (VCO) coupled to said power supply terminals, and having an input for applying thereto a d.c. signal and an oscillator output for an oscillator output signal of a frequency related to said d.c. signal;

a control amplifier for generating a d.c. signal at a d.c. output thereof, which d.c. output is coupled to said input of the VCO, further having a control input for receiving a control signal and a supply input for receiving an additional supply voltage; and

a power supply circuit for generating said additional supply voltage at an output coupled to said supply input of the control amplifier, the power supply circuit having an input coupled to the oscillator output of the VCO.

5,146,190

CIRCUIT FOR THE SWITCHING OF A MICROWAVE OUTPUT SIGNAL TOWARDS A FIRST OR SECOND OUTPUT

Gérard Firmain, Bruyeres le Chatel, France, assignor to Thomson Tubes Electroniques, Boulogne Billancourt, France

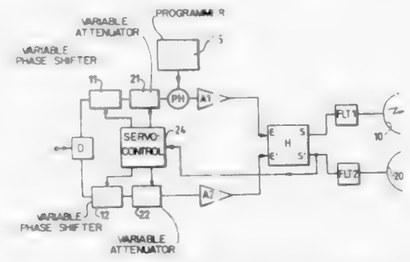
Filed Jan. 31, 1991, Ser. No. 648,273
Claims priority, application France, Feb. 16, 1990, 90 01878
Int. Cl.[5] H01P 5/12
U.S. Cl. 333—117 **11 Claims**

1. A switching device with one input and 2^{n+1} outputs for receiving an input signal on said input, and for switching an output signal, corresponding to said input signal after amplification, to one output selected from among said 2^{n+1} outputs comprising:

a first cascade of dividers and controllable phase-shifters,

with n stages, having one input receiving said input signal and 2^{n+1} outputs, for dividing said input signal,

2^n switching circuits, each comprising: a coupler with two inputs and two outputs, two amplifiers, each amplifier supplying one input of the coupler, a divider between an output of said first cascade and the amplifiers, and at least



a phase-shifter connected between the divider and one amplifier and used to set up signals present at input of said coupler in phase or in phase opposition,

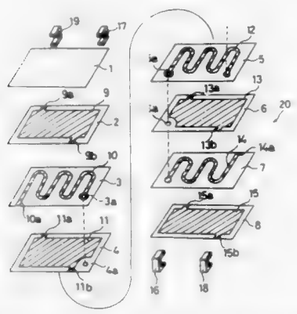
a second cascade of couplers with n stages, having 2^{n+1} inputs connected to the outputs of the couplers of said 2^n switching circuits, and 2^{n+1} outputs corresponding to the outputs of the switching device.

5,146,191

DELAY LINE DEVICE AND A METHOD FOR PRODUCING THE SAME

Harufumi Mandai; Yoshikazu Chigodo, and Atsushi Tojo, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 10, 199 , Ser. No. 712,546
Claims priority, application Japan, Jun. 13, 1990, 2-156288
Int. Cl.[5] H01P *1/18*
U.S. Cl. 333—161 15 Claims



1. A delay line device for delaying signal transmission comprising:

a lamination comprising an uppermost grounding electrode, a lowermost grounding electrode, a plurality of strip-line conductors and a plurality of intermediate grounding electrodes which are accumulated alternately and are interposed between the uppermost and the lowermost grounding electrodes, dielectric layers each interposed between each adjacent pair of the strip-line conductor and the intermediate grounding electrode, and protective layers respectively provided on outer surfaces of the uppermost and the lowermost grounding electrodes, the strip-line conductors being connected a via a through hole to form a strip-line conductor series, and both ends of the strip-line conductor series being extended onto a side surface of said lamination;

an external input electrode connected to one of the ends of the strip-line conductor series on the side surface of said lamination;

an external output electrode connected to the other end of the strip-line conductor series on the side surface of said lamination; and

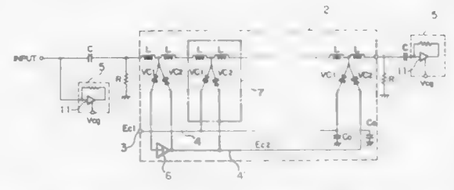
an external grounding electrode connected to connecting portions of the uppermost, lowermost and said intermediate grounding electrodes on the side surface of said lamination.

5,146,192

DELAY CIRCUIT OF ULTRASONIC DIAGNOSTIC APPARATUS USING DELAY LINE COMPRISING VARIABLE CAPACITANCE DIODE AND INDUCTOR

Toshio Kondo, Kunitachi; Toshio Ogawa, Chiba; Kazunari Ishida, Kashiwa, and Akihiro Ueyama, Tama, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 727,053
Claims priority, application Japan, Jul. 6, 1990, 2-177430; Aug. 31, 1990, 2-228141; Nov. 13, 1990, 2-304080; Jan. 28, 1991, 3-25145; Feb. 18, 1991, 3-43977
Int. Cl.[5] H01P *3/00*
U.S. Cl. 333—164 23 Claims



1. A delay circuit of ultrasonic diagnostic apparatus comprising:

(a) delaying means consisting of a plurality of unit portions connected in cascade, in each of which at least an anode of a first variable capacitance diode and a cathode of a second variable capacitance diode are connected with a connecting point of two inductors connected in series;

(b) means for applying a reverse bias voltage to each of said first and said second variable capacitance diode; and

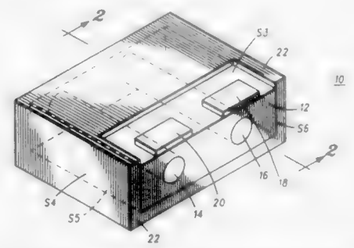
(c) matching means for said delaying means.

5,146,193

MONOLITHIC CERAMIC FILTER OR DUPLEXER HAVING SURFACE MOUNT CORRECTIONS AND TRANSMISSION ZEROES

Raymond L. Sokola, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1991, Ser. No. 661,025
Int. Cl.[5] H01P *1/202;* **H04B** *1/50*
U.S. Cl. 333—206 49 Claims



1. A filter including a passband and at least one transmission

zero for passing desired frequency electrical signals comprising:

a filter body comprised of a block of dielectric material having a first predetermined physical length, said first predetermined length being substantially equal to one-fourth the wave length of said desired frequency signals, substantially planar top and bottom surfaces and having at least one planar side surface, said planar side surface having a predetermined physical length substantially equal to one-fourth the wave length of said desired frequency signals, said filter body having at least first and second holes extending through the top and bottom surfaces, having center axes, and having substantially constant predetermined cross-sectional shapes between said top and bottom surfaces said holes spatially disposed at a predetermined distance from one another;

first input-output pad comprised of an area of conductive material disposed on said side surface;

second input-output pad comprised of an area of conductive material disposed on said side surface;

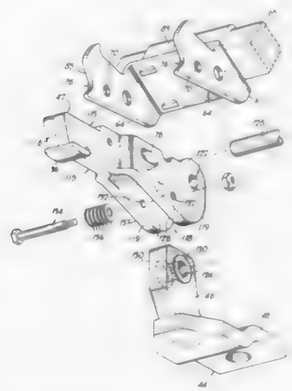
said filter body and interior surfaces of said first and second holes being substantially covered with a conductive material with the exception of a predetermined first uncoated area on said side surface surrounding said first and said second input-output pads on said side surface and with the additional exception of said top surface, said coated interior surfaces of said first and second holes and said coated filter body forming first and second shorted coaxial resonators respectively having first and second electrical lengths, said first and second input-output pads being capacitively coupled to said first and said second shortened coaxial resonators.

5,146,194

SCREW ADJUSTABLE CLINCH JOINT WITH BOSSES

Altenhof, Jr. James N., West Bridgewater Boro.; Ronald W. Crookston, Trafford; Walter V. Bratkowski, McKeesport; James W. Barkell, Jr., Harrison City, and Marvin D. Fisher, Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 256,881, Oct. 12, 1988, abandoned. This application Sep. 26, 1989, Ser. No. 414,627
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—16 12 Claims



1. A circuit breaker having a housing, an operating mechanism carried by said housing and a pair of separable main contacts including a first main contact, electrically connected to a first stationary conductor and a second movable main contact, carried by a contact arm assembly, electrically connected to a second stationary conductor, said contact arm assembly comprising:

a contact arm for carrying said second movable main contact;

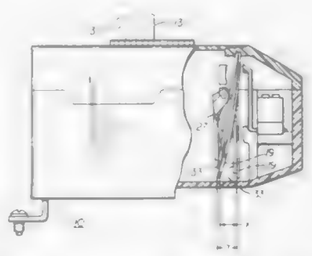
pivotal means for pivotally connecting said contact arm to said second stationary conductor about a pivot axis for movement between a first position and a second position; and boss means disposed on said pivotal means in the region of said pivot axis for controlling the dynamic friction between said connecting means and said contact arm when said contact arm is moved between said first position and said second position.

5,146,195

MOLDED CASE CIRCUIT BREAKER WITH LINEAR RESPONSIVE UNIT

Roger N. Castonguay, Terryville, and David Arnold, Chester, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 16, 1991, Ser. No. 700,820
Int. Cl.[5] H01H *75/12*
U.S. Cl. 335—35 8 Claims



1. A molded case circuit breaker having a linearly responsive trip unit comprising:

a molded plastic case and cover;

a pair of contacts within said case arranged for separation both manually and upon occurrence of an overcurrent condition of predetermined magnitude and duration;

an operating mechanism within said case arranged for automatically separating said contacts, said operating mechanism being restrained from operation by means of a latch assembly;

a trip bar within said case proximate said latch assembly, said trip bar arranged for contacting said latch assembly and releasing said operating mechanism;

a bi-metal within said case proximate said trip bar, said bi-metal responding to circuit current to contact said trip bar and cause said trip bar to contact said latch assembly; and

a trip lever intermediate said bi-metal and said trip bar, said bi-metal being fixedly positioned at a first end and free to move at a second end opposite said first end and said trip lever being fixedly positioned at a first end and free to move at a second end opposite said first end, whereby said trip lever becomes driven into contact with said trip bar under the urgence of said bi-metal.

5,146,196

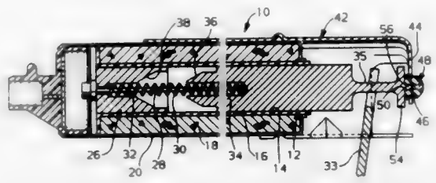
ANTI-RATTLE FEATURE FOR SOLENOID

James C. Frank, Mesa, Ariz., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1991, Ser. No. 692,428
Int. Cl.[5] H01F *7/08, 3/00, 1/00*
U.S. Cl. 335—271 3 Claims

1. In a solenoid having a coil energizeable to displace an armature in one direction and a spring urging return of the armature in the other direction to a rest position in which an end of the armature engages a fixedly mounted stop stop, the improvement comprising:

said stop being a resilient stop fixedly mounted in the solenoid engageable by the end of the armature to define a fixed rest position;
and one of said resilient stop and said armature having a conical projection projecting from the end thereof and the



other having a conical bore therein so that the rest position of the armature is defined by the spring urging a conical seating relationship between the conical projection and the conical bore to restrain the armature against rattling in the coil.

5,146,197

SELF-SHIELDING HOMOGENEOUS SPHERICAL GRADIENT COILS

Irving J. Lowe, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Jan. 25, 1991, Ser. No. 469,970
Int. Cl.[5] H01F *5/00, 7/00, 27/28*
U.S. Cl. 335—299 **17 Claims**

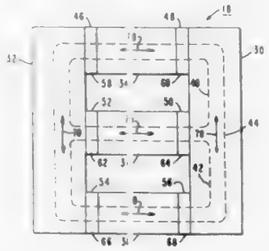
1. A device for generating magnetic fields comprising: a first set of elliptically shaped coils for generating a linear gradient magnetic field inside thereof, the first set of coils comprising a plurality of coils, each coil generating a magnetic field in a different direction; a second set of elliptically shaped coils in close proximity thereto and surrounding the first set of coils such that any fringing field outside the second set of coils is substantially zero, the second set of coils comprising a plurality of coils, each coil generating a magnetic field in a direction corresponding to one of the directions of the magnetic field generated by the first set of coils; and wherein the first and second sets of coils can be separated at an equator.

5,146,198

SEGMENTED CORE INDUCTOR

David D. Pollard, Fairfield Glade, Tenn., and Mark W. Bailey, Lima, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 28, 1991, Ser. No. 723,040
Int. Cl.[5] H01F *27/24, 27/30*
U.S. Cl. 336—178 **4 Claims**



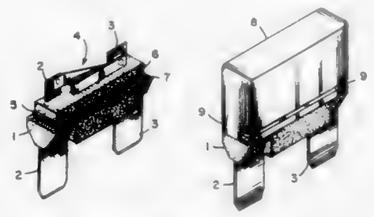
1. A multiple phase inductor comprising:
a magnetic core having two end pieces, each of said end pieces including a stack of "I" shaped end piece laminations, and a plurality of legs extending between said end pieces, said magnetic core forming a plurality of flux paths passing through said end pieces and said legs;
a plurality of single layer coils, each of said coils being wound around a corresponding one of said legs;
wherein each of said legs includes a stack of "I" shaped leg laminations positioned between said end pieces to form only two gaps, said gaps being located at opposite ends of each of said legs; and
wherein each of said coils includes a plurality of turns of a rectangular cross section, edge wound conductor, said turns being spaced apart form each other.

5,146,199

CIRCUIT BREAKER HAVING CRIMPED METAL COVER

John L. Schneider, N. Waterboro, and Timothy R. Walker, Poland, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 17, 1992, Ser. No. 822,222
Int. Cl.[5] H01H *37/04, 37/52*
U.S. Cl. 337—380 **4 Claims**



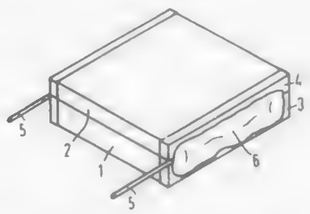
1. A circuit breaker comprising: an insulative rigid base having two terminals protruding externally and internally therefrom, the base having two long sides with narrow grooves extending the full lengths of the long sides; a bimetal circuit breaker assembly supported on the internal portions of the two terminals; and a metal cover enclosing the circuit breaker assembly, the metal cover being crimped to the two long sides of the base at and along the full lengths of the narrow grooves.

5,146,200

HIGH-CAPACITANCE VARISTOR

Joachim Heilmann, Haar, Fed. Rep. of Germany, and Heinrich Zoedl, Deutschlandsberg, Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 7, 1990, Ser. No. 624,133
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940557
Int. Cl.[5] H01C *7/10*
U.S. Cl. 338—21 **6 Claims**



1. High-capacitance varistor having two electronic chip components, such as a multi-layer varistor and a multi-layer capacitor, having respectively two end faces lying opposite one another fashioned as a metallized terminal surface, comprising the two components being arranged one above the other and having adjacent lateral surfaces glued to one another

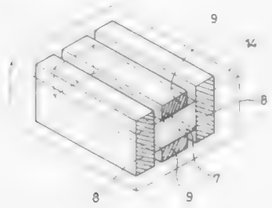
such that their respective metallized terminal surfaces lie parallel to one another and are electrically connected to one another with solder, the two components being attached to one another only by means of glueing and soldering.

5,146,201

MAGNETIC SENSOR SYSTEM INCLUDING STACKED HALL EFFECT DEVICES DETECTING ORTHOGONAL MAGNETIC FIELDS

Masatoshi Kimura, and Toshio Kumamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 461,145, Jan. 4, 1990, Pat. No. 5,055,820. This application Jun. 26, 1991, Ser. No. 721,865
Claims priority, application Japan, Jan. 20, 1989, 1-12916
Int. Cl.[5] H01L *43/00*
U.S. Cl. 338—32 H **12 Claims**



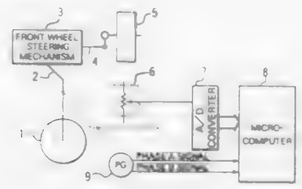
1. A magnetic sensor system comprising:
a first substrate;
a second substrate provided on the first substrate;
said first substrate comprising a first Hall device which detects a magnetic flux component in the direction vertical to the first substrate;
said second substrate comprising a second Hall device which detects a magnetic flux component in the direction vertical to the magnetic field direction of the magnetic flux component detected by said first Hall device.

5,146,202

VEHICULAR STEERING CONDITION DETECTING APPARATUS

Masanobu Kashihara, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP90/00732, § 371 Date Jan. 14, 1991, § 102(e) Date Jan. 14, 1991, PCT Pub. No. WO90/15304, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 5, 1990, Ser. No. 655,416
Claims priority, application Japan, Jun. 6, 1989, 1-144786
Int. Cl.[5] C08B *21/00*
U.S. Cl. 340—438 **1 Claim**



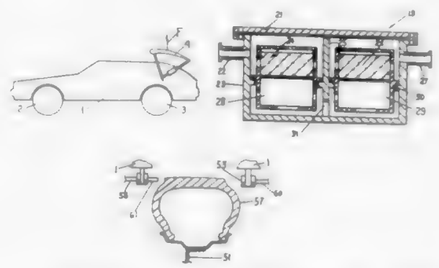
1. A vehicular steering condition detecting apparatus comprising a position sensor for generating, in conjunction with an operation of a steering wheel of a vehicle, an output signal which is proportional to the steering angle of the steering wheel, a pulse generator for generating pulses in conjunction with an operation of the steering wheel for sensing the angular velocity of the steering wheel, an analog/digital converter for converting the output signal of the position sensor into a digital value, and a microcomputer for comparing between a change in the output of the position sensor due to the operation of the steering wheel by the driver and the number of pulses generated by the pulse generator for every sampling period of a predetermined length, the microcomputer being operable to determine that a failure in the position sensor or the pulse generator occurred if there exists no proportional relationship therebetween.

5,146,203

AUTOMOBILE FOR RACING

Leonid Simuni, 1056 Neilson St., Apt. 6 A, Far Rockaway, N.Y. 11691

Filed Oct. 15, 1990, Ser. No. 598,058
Int. Cl.[5] B60C *23/00;* **F02M** *27/00;* **B60J** *1/00;* **F01N** *1/08*
U.S. Cl. 340—443 **6 Claims**



1. An automobile for racing comprising a body, an internal combustion engine having a fuel system, an exhaust system, tires, wings having an adjustable angle of attack, and a tire inflation detection system for said tires, said tire inflation detection system comprising:
a source of electro-light having electro-feeding, a photo-electric sensor for producing an electrical current, an electrical transmitting device for providing information regarding the inflation of each of said tires, said source of electro-light and said photo-electric sensor are attached to the body near the top of each tire and are arranged on opposite sides of each tire, said photo-electric sensor adapted to provide information to the electrical transmitting device regarding the inflation of a said tire by means of interaction with said source of electro-light when the inflation pressure of a said tire is reduced, and said electrical transmitting device adapted to inform an occupant of the automobile when the inflation pressure of a said tire is reduced.

5,146,204

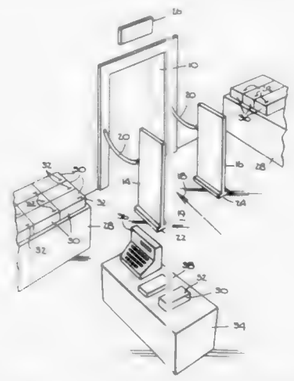
THEFT DETECTION APPARATUS AND FLATTENED WIRE TARGET AND METHOD OF MAKING SAME

Peter Y. Zhou, Ronkonkoma, and Thomas P. Solaski, Hicksville, both of N.Y., assignors to Knogo Corporation, Hauppauge, N.Y.

Continuation-in-part of Ser. No. 492,785, Mar. 13, 1990, abandoned. This application Dec. 20, 1990, Ser. No. 630,855
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—551 **57 Claims**

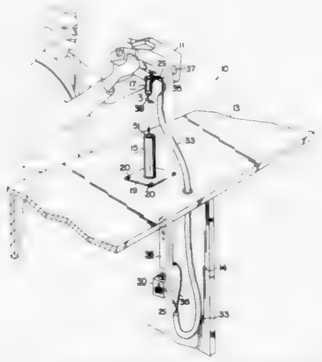
1. A magnetic type electronic theft detection apparatus comprising means for generating an alternating magnetic interrogation field in an interrogation zone, means for detecting magnetic response fields having predetermined characteristics in said interrogation zone and responder targets mounted on protected items which must be carried through said interrogation zone when taken from a protected area, said responder targets each comprising a drawn wire of a magnetic material

which is easily saturable by said magnetic interrogation field in said interrogation zone and which has been rolled to change its



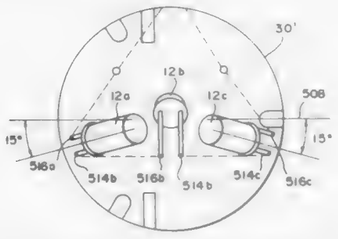
cross-sectional shape and heat treated thereafter to substantially increase its magnetic permeability.

5,146,205
SECURITY AND DISPLAY SYSTEM
Terry A. Keifer, and Larry R. Yeager, both of Reading, Pa., assignors to Protex International Corp., Bohemia, N.Y.
Filed Mar. 28, 1991 Ser. No. 676,424
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—568 **5 Claims**



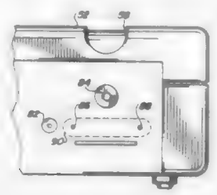
1. A security and display system for use with a retail item having a threaded bore, comprising:
- a base for supporting said item in a display area and having an upwardly extending pedestal having a central bore;
- mounting means including a shaft member sized to fit said central bore for removably mounting said item cooperatively in said central bore of said pedestal to permit inspection of said item;
- fastening means for locking said shaft member to said item;
- said fastening means including an elongated bolt member having a threaded end engageable in said threaded bore in said retail item;
- means defining a socket with an elongated pin centered in said socket generally centrally thereof whereby the fastening means may be rotated to assemble and disassemble by means of a tool having an exterior surface complementing said socket and said pin;
- a pair of security cables attached to said item and mounting means at one end and securely mounted at its other end at a point remote from the display area, one of said cables being a mechanical security cable attached at one end to said item by said mounting means and the other of said cables being an electronic security cable attached to said item, whereby potential customers have access to relatively free movement of the retail item with the item removed from said pedestal.

5,146,206
PATIENT AMBULATION MOTION DETECTOR WITH MULTIPLE SWITCH MOTION DETECTION
James J. Callaway, 1577 Moran Rd., Franklin, Tenn. 37064
Continuation-in-part of Ser. No. 432,867, Nov. 7, 1989, Pat. No. 5,008,654. This application Apr. 12, 1991, Ser. No. 683,958
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—573 **8 Claims**



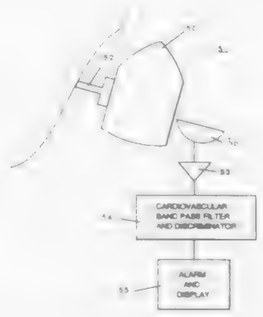
1. A motion detector to be attached to a portion of a patient's body so as to signal impending ambulation of the patient, the motion detector comprising:
- motion sensor circuit means including at least first, second and third switch means;
- each switch means comprising portions defining an elongated chamber having first and second spaced ends and a longitudinal axis extending therebetween, a mercury ball contained within said chamber for gravitational movement between said first and second ends, and spaced electrical contacts disposed at said first end of said chamber, each switch means being closed when said first end of said chamber is below said second end such that said mercury ball conductively connects said contacts, and otherwise being open;
- said first, second and third switch means being electrically connected in series whereby said motion sensor circuit means is completed to provide a signal of impending ambulation only when all of said first, second and third switch means are closed;
- support means defining a first reference plane, and having a proximal end and a distal end, a first reference line on said first reference plane extending between said proximal and distal ends, and side portions laterally spaced from said first reference line;
- attachment means for securing the motion detector to a portion of a patient's body with said proximal end of said support means proximal the patient's head relative to said distal end;
- said first, second and third switch means being carried by said support means in a fixed three-dimensional configuration with respect to each other and with respect to said first reference plane;
- said first switch means being fixedly carried by said support means with its longitudinal axis aligned with said first reference line and inclined with respect to said first reference plane, said second end of said first switch means being lower than said first end when said motion detector is in a first position wherein said first reference plane is generally horizontal, whereby said first switch means is open in said first position, and closed only when the motion detector is pivoted about said distal end of said support means from said generally horizontal first position to a second position wherein said proximal end of said support means is raised above said distal end past a predetermined threshold indicative of impending ambulation of the patient;
- said second and third switch means being fixedly carried by said support means on opposite sides of said first reference line with their longitudinal axes inclined toward said first reference line, each of said second and third switch means having its first end lower than its second end when the motion detector is in said second position, one or the other of said second and third switch means having its second end lower than its first end when the motion detector is rotated about said first reference line to raise one side of said support means substantially above the other.

5,146,207
SECURE FIELD MONITORING DEVICE FOR USE IN ELECTRONIC HOUSE ARREST MONITORING SYSTEM
Daniel L. Henry, Boulder; Gregory A. Muir, Lyons, and Joseph P. Desimone, Boulder, all of Colo., assignors to BI, Incorporated, Boulder, Colo.
Filed Jul. 1, 1991, Ser. No. 723,481
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—573 **20 Claims**



18. A method of restricting access to the operating parameters of a field monitoring device (FMD) used with an electronic house arrest monitoring (EHAM) system, said FMD including a microprocessor for controlling the operation of said FMD as controlled by said operating parameters, said FMD further including an electrically erasable programmable read only memory (EEPROM) device wherein said operating parameters are stored, said method comprsiing the steps of:
- (a) concealing a data communications port on a housing of said FMD, said concealed data communications port being visible only upon the removal of a protective plate, said protective plate being removable only through the use of a specially configured tool;
- (b) removing said protective plate using said specially configured tool;
- (c) detachably securing to said data communications port a coupling head attached to an external programming device, said coupling head requiring the use of said specially configured tool in order to be secured to said data communications port, said external programming device having keyboard means for manually keying in data into said FMD through said data communications ports, and display means for displaying data stored in said EEPROM device;
- (d) inhibiting data access through said data communications port until a plurality of prescribed conditions have been established;
- whereby only personnel having knowledge of the existence and location of said data communications port, and having said specially configured tool and said external programming device, and further having knowledge of said pluraltiy of prescribed conditions, are able to have access to the operating parameters store din said EEPROM device for the purpose of examining or reprogramming said operating parameters.

5,146,208
METHOD AND APPARATUS FOR DETECTING INTRUSION INTO A BODY OF WATER
Jorge M. Parra, 7332 Grand Blvd., New Port Richey, Fla. 34652
Continuation-in-part of Ser. No. 569,121, Aug. 17, 1990, Pat. No. 5,031,637. This application Mar. 26, 1991, Ser. No. 675,199
Int. Cl.[5] G08B *13/00*
U.S. Cl. 340—573 **8 Claims**



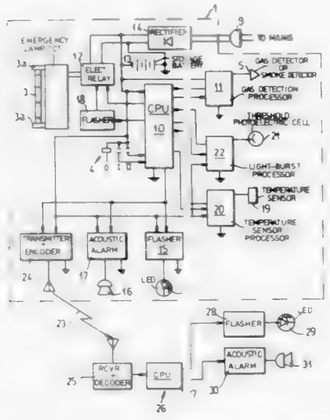
1. A method of providing surveillance of a body of water to detect surreptitious intrusion thereto by humans comprising:
- immersing a sonic transducer in said body of water to convert sonic energy received thereby to electrical signals,
- passing said electrical signals through a bandpass filter having its passband in the infrasonic range to produce bandpass filtered signals in the infrasonic range, and passing electrical signals from said bandpass filter through a discriminator having a phase lock loop which is programmed to pass a discrete pattern of electrical signals constituting a sonic profile of the human cardiovascular system.

5,146,209
SELF-CONTAINED APPARATUS FOR EMERGENCY LIGHTING INCORPORATING ALARM SYSTEMS FOR FIRE, GAS AND THE LIKE
Gian P. Beghelli, Monteveglio, Italy, assignor to G.P.B. Beghelli S.R.L., Monteveglio, Italy
Filed Mar. 5, 1991, Ser. No. 664,590
Claims priority, application Italy, Nov. 5, 1990, 4935/90[U]
Int. Cl.[5] G08B *17/10*
U.S. Cl. 340—693 **13 Claims**

1. A portable emergency lighting and alarm apparatus, comprising:
- a portable housing;
- a rechargeable battery in said housing provided with means connectable to an electrical supply source for recharging said battery from said source, said apparatus being disconnected from said source for portable use;
- a lamp in said housing connectable with said battery and provided with circuit means for illuminating said lamp upon failure of said supply and disconnection of said apparatus therefrom for said portable use;
- at least one sensor on said housing responsive to an emer-

gency situation in a vicinity of said housing and producing an output;

processing means for responding to said output; and



alarm means connected to said processing means for generating an alert signal in response to said output.

5,146,210

WIRELESS REMOTE CONTROL SYSTEM FOR A TELEVISION RECEIVER

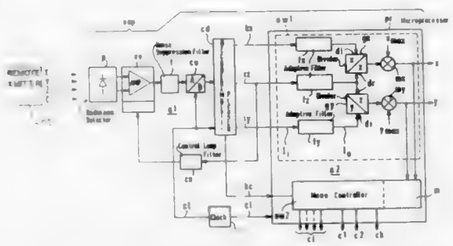
Klaus Heberle, Reute, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jul. 26, 1990, Ser. No. 558,261

Claims priority, application European Pat. Off., Aug. 22, 1989, 89115455.1

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—709 **16 Claims**



1. A system for remotely controlling a video display apparatus having a screen for displaying at least one video signal, said system comprising:

transmitter means for transmitting a plurality of electromagnetic positional signals having radiation intensities indicative of the motion of said transmitter means, and for transmitting an electromagnetic command signal containing at least one coded command, wherein an unsteady motion of said transmitter means creates a high frequency component in each one of said plurality of positional signals; and

electrooptical means responsive to said transmitted electromagnetic positional signals for controlling said video apparatus by moving a cursor on the screen in response to the motion of said transmitter means, said electrooptical means including:

receiving means for receiving said command signal and said plurality of positional signals;

digitizing means, responsive to said receiving means, for digitizing said command signal and each one of said positional signals, the digital value of each one of said digitized positional signals being indicative of the radiation intensities of said correspondign one positional signal;

adaptive filter means, responsive to said digitizing means, for filtering out said high frequency component from each one of said digitized positional signals;

resolving means, responsive to said adaptive filter means, for resolving said plurality of filtered digitized positional signals into coordinate values indicative of the position fo the cursor on the screen; and

menu controller means for processing said command signal and, in accordance with said coordinate values determined by said resolving means, for displaying the position of the cursor on the screen and for controlling said video display apparatus.

5,146,211

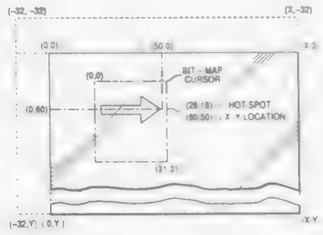
BIT MAPPED COLOR CURSOR

John M. Adams; Brian K. Herbert; Stephen M. Johnson, and Jamey L. Robbins, all of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 10, 1990, Ser. No. 566,014

Int. Cl.[5] G09G *1/00*

U.S. Cl. 340—709 **15 Claims**



1. A system for displaying a bit mapped cursor within an array of display pixels, said bit mapped cursor having a plurality of pixels arranged in a rectangular block and one of said plurality of pixels is pre-determined to be a reference pixel, comprising:

means for providing a vertical non-displayed pixel space logically located above and adjoining said array of display pixels;

said vertical non-displayed pixel space means includes means for providing a cursor vertical frame that begins a period of time that is equivalent to a period of at least one horizontal scan line before a vertical frame of said display pixels begins;

means for providing a horizontal non-displayed pixel space logically located before and adjoining said array of display pixels;

said horizontal non-displayed pixel space means includes means for providing a cursor horizontal frame that begins a period of time that is equivalent to a period to horizontally scan at least one pixel before a horizontal scan line of said display pixels begins;

means for storing a pre-determined vertical location that is located within said array of display pixels as a horizontal location of said reference pixel;

means responsive to said vertical location storage means and said horizontal location storage means for determining those cursor pixels of said plurality of pixels that will be displayed because they are overlying said array of display pixels and those cursor pixels that will not be displayed because they are located in said non-displayed pixel spaces; and

means for controlling the display of said array of display pixels if there are no overlying cursor pixels, and the display of cursor pixels if there are overlying cursor pixels.

5,146,212

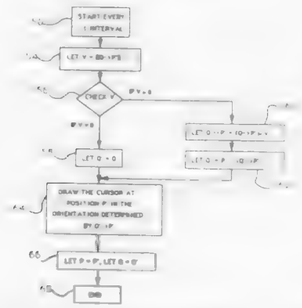
MANIPULATABLE ORIENTATION FOR A TRANSLATABLE GRAPHIC OBJECT

Daniel S. Venolia, Soquel, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 4, 1990, Ser. No. 460,774

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—709 **12 Claims**



1. A method for changing the orientation of a graphic object having a variable position on a display of a computer, the graphic object including a control point having a fixed position with respect to the graphic object and having a variable position with respect to the display, the control point being operative to change its variable position in response to signals from a controller, the computer being operative to display the graphic object at a specific orientation on the display in response to changes in the variable position of the control point; comprising the steps of:

selecting a following point having a fixed position with respect to the graphic object and having a variable position with respect to the display;

changing the variable position of the following point in response to changes in the variable position of the control point in such a manner so as to cause the variable position of the following point to track a path of varying orientation behind the motion of the control point, said step of changing including the steps of

determining the direction and magnitude of change in the variable position of the control point by measuring the direction and normalized magnitude of a first vector between a first variable position of the control point and a first variable position of the following point and by measuring the direction and magnitude of a new vector between a new variable position of the control point and the first variable position of the following point, and

moving the variable position of the following point to match the direction and magnitude of change in the variable position of the control point; and

displaying the graphic object at a new orientation on the display that matches the variable positions of the control point and the following point.

5,146,213

ELECTROLUMINESCENT DISPLAY WITH MEMORY EFFECT AND HALF-TONES

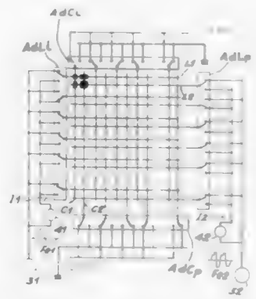
Christian Brunel, 17 rue Carle-Hebert, 92400 Courbevoie, and Pascal Thioulouse, 19 rue Nélaton, 75015 Paris, both of France

Continuation of Ser. No. 195,669, May 17, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 569,528

Claims priority, application France, May 18, 1987, 87 06914

Int. Cl.[5] G09G *3/30*

U.S. Cl. 340—781 **1 Claim**



1. An electroluminescent display device with a memory effect and half-tone capabilities comprising:

a first group of row electrodes;

a second group of column electrodes intersecting said first group of electrodes so as to form a matrix;

an electroluminescent material placed between the two groups of electrodes such that eldims are formed and such that there are the same number of eldims as there are overlap points of the electrodes;

a holding voltage supply means which comprises a plurality of holding voltage sources for supplying an a.c. holding voltage to the electrodes;

a plurality of row addressing circuit means and column addressing circuit means each being able to superimpose a voltage pulse on the holding voltage, supplied by said holding supply means, on given set of row-column electrodes so as to illuminate the corresponding eldim at the intersection of said row and column;

a sub-dividing means for subdividing at least one of the group of electrodes into several subelectrodes such that each eldim is subdivided into a plurality of subeldims one of which has at least a different square area than the other subeldims of the same eldim;

wherein the number of said holding voltage sources is equal to the number of subelectrodes in one of the groups wherein each of said holding voltage sources supply a different frequency holding voltages to the subelectrodes;

wherein the luminance of a given subeldim is controlled by both its surface area and the holding frequency applied thereto, such that a half-tone is displayed by a given eldim, by controlling which of the subeldims that are illuminated along the frequency of the holding voltage used to illuminate the given subeldim; and further

wherein each row electrode is comprised of a first row subelectrode and a second row subelectrode, said two row subelectrodes have different widths such that the first row subelectrode has half the width of the second row subelectrode with a first one of said holding voltage sources is connected to all of the first row subelectrode and a second of said holding voltage sources is connected to all of the second row subelectrodes; and

wherein each column electrode is comprised of a first column subelectrode and a second column subelectrode which are provided such that where said first column subelectrode has half the width of the second column

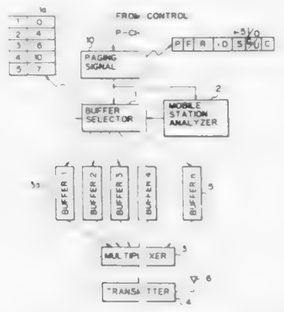
subelectrode and wherein the frequency of the first holding voltage source is half that of the second voltage source and each eldim therefore constitutes four subeldims thereby being capable of producing 16 different half-tones corresponding to 16 possible combinations of four luminances of the four subeldims.

5,146,214

PAGING SIGNAL CONTROL SYSTEM WITH REDUCED POWER CONSUMPTION IN A MOBILE COMMUNICATION SYSTEM

Tomoyuki Yamada, and Seizo Onoe, both of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,571
Claims priority, application Japan, Nov. 13, 1989, 1-292164
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.03 3 Claims



1. A paging control system in a mobile communication system comprising:

a communication network;

a plurality of mobile stations; and

a plurality of base stations coupled with said communication network,

said plurality of base stations each having a transmitter means and a plurality of buffer cells, content of each of said buffer cells is transmitted by said transmitter means in related time slots in a paging channel, said paging channel having a plurality of time slots therein,

said plurality of mobile stations classified by said communication network into first grouped stations having means which receive only said time slots relating to itself while in a standby mode, and second ungrouped stations having means which receive all the time slots in the standby mode,

each mobile station and each base station having means for storing information about whether the mobile station is said first grouped station or said second ungrouped station, and the group to which the mobile station belongs, and

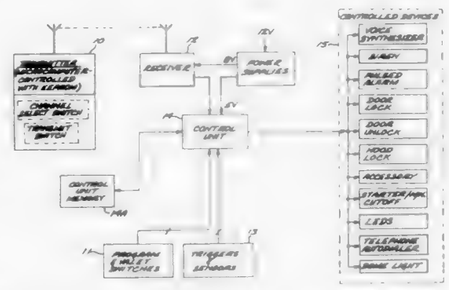
each base station having buffer selector means for storing a paging signal to said first grouped station in a related buffer cell, and for storing said paging signal to said second ungrouped station in the buffer cell which has a shortest queue.

5,146,215

ELECTRONICALLY PROGRAMMABLE REMOTE CONTROL FOR VEHICLE SECURITY SYSTEM

Ze'ev Drori, Chatsworth, Calif., assignor to Clifford Electronics, Inc., Chatsworth, Calif.

Continuation-in-part of Ser. No. 94,395, Sep. 8, 1987, abandoned, and a continuation-in-part of Ser. No. 231,159, Aug. 11, 1988, Pat. No. 4,922,224. This application Nov. 30, 1988, Ser. No. 277,959
Int. Cl.[5] G06F *7/04*
U.S. Cl. 340—825.32 10 Claims



1. An electronically programmable remote control vehicle security system, comprising:

a precoded portable hand-held transmitter comprising means for generating and transmitting a predetermined fixed, digitally encoded, radio frequency, receiver-responsive signal representative of a predetermined fixed transmitter code, and actuating means for actuating said generating and transmitting means so that said signal is automatically generated and transmitted upon actuation;

vehicle antitheft means;

a system control unit disposed within said vehicle, comprising:

(i) receiving means operable during a system program mode and a system operating-receiving mode for receiving said transmitted encoded signal and generating an electrical signal representative of the encoded signal;

(ii) a digital memory for storing data representative of signature code signals;

(iii) programming means for recording in said digital memory received signals for arming or disarming said vehicle antitheft means, said means activated only during said system program mode for automatically storing in said memory received signals representative of said predetermined transmitter code as a signature control signal for arming or disarming said vehicle antitheft means; further characterized in that said program mode is automatically terminated after a predetermined time delay from receipt of the last transmitted encoded signal during said program mode;

(iv) operating means activated during said operating-receiving mode for comparing received electrical signals with said signature control signal stored in said memory means to determine if said electrical signals correspond to said recorded signature code signal, and means for arming or disarming said vehicle antitheft means in response to received signals corresponding to said signature code signal stored in said memory; further characterized in that said system control unit comprises a user-accessible switch disposed in said vehicle, and said access control unit is responsive to the position of said switch for entering said program mode; and

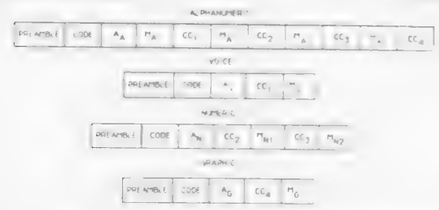
wherein said transmitter and said receiving means cooperate to form a one-way radio frequency signal transmission link for communicating signals only from said transmitter to said receiving means, said transmission link being employed by said system during said programming mode for transmitting said encoded signals from said transmitter to said access control unit to be stored in said memory as said code signals, said link further employed during said operating receiving mode for transmitting said encoded signals from said transmitter to said control unit.

5,146,216

MULTIPLE MESSAGE SIGNALLING PROTOCOL FOR A SELECTIVE CALL RECEIVER

Michael J. DeLuca, and Joan S. DeLuca, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 450,798, Dec. 14, 1989, abandoned. This application May 3, 1991, Ser. No. 697,508
Int. Cl.[5] H04B *7/00*
U.S. Cl. 340—825.52 21 Claims



1. A selective call receiver capable of presenting a plurality of messages, comprising:

receiver means for receiving a first signal having a first address and a first information packet including first message information, the first message information packet in accordance with a first information format, and a second signal having a second address and a second information packet including second message information, the second information packet in accordance with a second information format; and

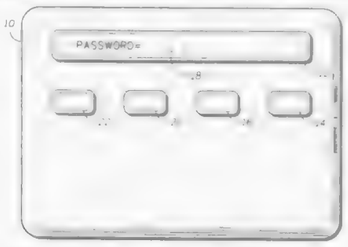
presentation means for presenting a message comprising at least a portion of the first information and at least a portion of the second information.

5,146,217

SELECTIVE CALL RECEIVER HAVING CONFIDENTIAL MESSAGE READ PROTECTION

Thomas F. Holmes, and Karen M. Leonard, both of Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 356,486, May 25, 1989, abandoned. This application Sep. 5, 1990, Ser. No. 579,228
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.44 13 Claims



1. A selective call receiver having a selective call address assigned thereto, the selective call receiver comprising:

means for receiving a message comprising an address portion, a message portion, and a control portion, the address portion corresponding to the selective call address assigned to the selective call receiver;

means for storing at least said message portion of the message;

means for determining in response to said control portion whether the stored portion of the message requires access authorization; and

access authorization means coupled to said determining means and said storing means for requiring access authorization before retrieving the stored portion of the message from the storing means if the determining means determines the stored portion of the message requires access authorization, and for not requiring access authorization before retrieving the stored portion of the message from the storing means if the determining means determines the stored portion of the message does not require access authorization.

5,146,218

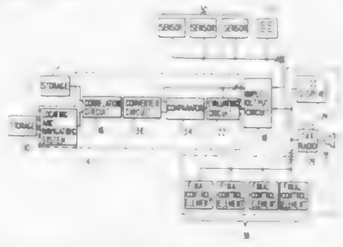
Patent Not Issued For This Number

5,146,219

DEVICE FOR THE OUTPUT OF SAFETY-RELATED ROAD INFORMATION IN LOCATING AND NAVIGATING SYSTEMS OF LAND VEHICLES

Wolf Zechnall, Hildesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 392,926, Jul. 7, 1989, abandoned. This application Jan. 3, 1991, Ser. No. 637,060
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700552
Int. Cl.[5] G08G *1/123*
U.S. Cl. 340—995 5 Claims



1. A computerized locating and navigating system of land vehicles including an electronic road map data storage, an entry terminal for starting position data, destination data and vehicle type data, sensors for delivering driving data of an operating vehicle, particularly driving direction and speed, said system comprising a device for selectively outputting safety-related information produced in the vehicle in dependency on driving conditions of the vehicle, the device comprising an additional storage for the safety-related information about determined sections of the road map, a correlation circuit for correlating the safety-related information from the additional storage with the output data from the locating and navigating system; a safety-related information selecting circuit coupled to an output of the correlation circuit and to the sensors to output in dependency on the driving data and signals of the output of the correlation circuit those of the safety-related signals from said additional storage which are relevant to the momentary driving conditions of the vehicle, and to suppress the output of irrelevant ones of the safety-related signals and to release a warning signal when the actual driving data of the operating vehicle deviates from the relevant safety-related signals from said additional storage, said information selecting circuit including a route information input-output circuit having an input connected to the sensors, a comparator having an input connected via a converter to an output of the correlation circuit and another input connected to an output of the route information input-output circuit, and an evaluation circuit having an input connected to said output of the route

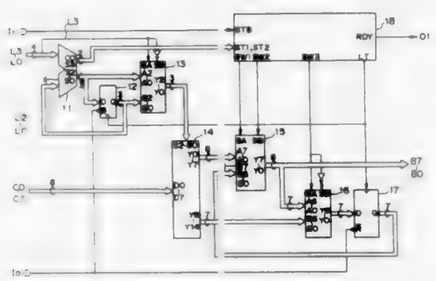
information input-output circuit, another input connected to an output of the comparator, and an output connected to another input of the route information input-output circuit for controlling the delivery of the safety-related information at another output of the route information input-output circuit; and final control elements for cruise control, transmission range selection, brakes and lights controlled by the output of the safety-related information.

5,146,220

DATA CONVERSION METHOD AND APPARATUS FOR CONVERTING UNDEFINED LENGTH DATA TO FIXED LENGTH DATA

Yuji Ishikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1991 Ser. No. 679,320
Claims priority, application Japan, Apr. 5, 1990, 2-89233
Int. Cl.[5] H03M *7/40*
U.S. Cl. 341—67 **9 Claims**



1. A data conversion apparatus for converting undefined-length codes into fixed-length data, wherein all codes of the undefined-length codes having a code length greater than or equal to n+1 bits have all of the bits thereof except n bits from the least significant bit (LSB) the same, comprising:

first input means for directly inputting the undefined-length code in which the code length is less than or equal to n bits, and for inputting only n bits from the LSB of the undefined-length code in which the code length is more than or equal to n+1 bits;

second input means for inputting code length data representing the code length of the undefined-length code inputted from said first input means and for shifting and outputting a bit position of the output undefined-length code;

first hold means for holding residual data which could not be converted into fixed-length data by a previous conversion;

second hold means for holding residual length data of the residual data held by said first hold means;

conversion means for converting the undefined-length code into fixed-length data by packing the undefined-length code outputted from said shift-output means and the residual data held at said first hold means; and

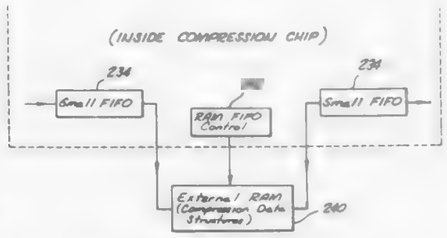
control means for controlling a shift-number of the bit position shifted by said shift-output means in accordance with the code length data inputted from said second input means and the residual length data held at said second hold means.

5,146,221

DATA COMPRESSION APPARATUS AND METHOD

Douglas L. Whiting, South Pasadena; Glen A. George, and Glen E. Ivey, both of Pasadena, all of Calif., assignors to Stac, Inc., Carlsbad, Calif.

Division of Ser. No. 297,152, Jan. 13, 1989. This application Nov. 27, 1990, Ser. No. 619,291
Int. Cl.[5] H03M *7/42*; G06F *12/00*
U.S. Cl. 341—67 **2 Claims**



1. An apparatus for converting an input data stream into a variable length encoded data stream, said apparatus comprising:

a single RAM configuration comprising:

a history array having a plurality of entries, each of said plurality of entries for storing previously processed segments of said input data stream, and

a FIFO data buffer for buffering data transfers to and/or from said apparatus;

a single address bus for addressing said history array and said FIFO data buffer, said single address bus coupled to said single RAM configuration; and

a data compression system, said data compression system coupled to said single address bus, said data compression system comprising:

means for performing a search of said history array for a string of said previously processed segments of said input data stream which matches said input data stream, and

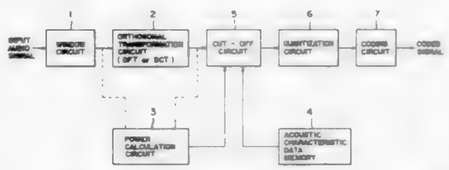
encoding means for encoding said matching string found in said history array.

5,146,222

METHOD OF CODING AN AUDIO SIGNAL BY USING CODING UNIT AND AN ADAPTIVE ORTHOGONAL TRANSFORMATION

Tokuhiko Fuchigami, Yokohama; Masaya Konishi, Yokosuka; Sadahiro Yasura, Ota, and Yasuhiro Yamada, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 17, 1990, Ser. No. 597,700
Claims priority, application Japan, Oct. 18, 1989, 1-271011
Int. Cl.[5] H03M *7/36*
U.S. Cl. 341—76 **3 Claims**



1. A method of coding an audio signal by using an orthogonal transformation, comprising the steps of:

performing an orthogonal transformation on an input audio signal having a predetermined transform length;

calculating a sum total of a power of transformed coefficients in a range of or over the transform length;

adaptively controlling a minimum audible level which is defined in an audible frequency range corresponding to said sum total of the power;

excepting coefficients having a power value under the minimum audible level determined from orthogonally transformed coefficients; and

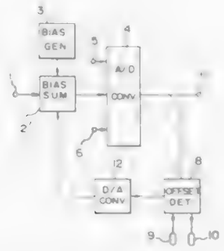
quantizing remaining coefficients.

5,146,223

ANALOG-TO-DIGITAL CONVERTER CIRCUIT

Hiroyasu Muto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 1, 1991, Ser. No. 786,540
Claims priority, application Japan, Nov. 2, 1990, 2-297620
Int. Cl.[5] H03M *1/06, 1/12*
U.S. Cl. 341—118 **8 Claims**



1. An A/D converter circuit comprising:

bias voltage summing means for adding a bias voltage to an analog signal;

A/D converter means for digitizing the output analog signal from said bias voltage summing means in the range between the low and high reference voltages;

offset detection means for detecting the offset by subtracting the ideal average voltage of the analog signal and the ideal value of the bias voltage from the average value of output samples from said A/D converter means; and

subtraction means for deriving the output by subtracting the output data of said offset detection circuit from the output data of said A/D converter means.

5,146,224

AC SIGNAL GENERATING APPARATUS FOR VOLTAGE AND CURRENT STANDARD

Hitoshi Kitayoshi, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,742
Claims priority, application Japan, Dec. 20, 1989, 1-330479
Int. Cl.[5] H03M *1/66*
U.S. Cl. 341—147 **4 Claims**

1. An AC signal generating apparatus comprising:

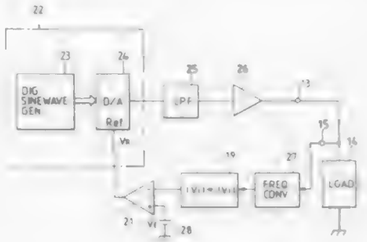
a digital direct synthesizer comprising:

a digital sine wave generating part for generating a digital sine wave signal of a set frequency; and

D/A converting means for converting the digital sine wave signal to an analog sine wave signal based on a reference voltage applied to said D/A converting means;

frequency converting means connected to said digital direct synthesizer for converting the analog sine wave signal to a lower frequency sine wave signal, said frequency converting means including sample pulse generating means for generating sampling pulses and sample-and-hold means for, upon each application thereto of the sampling pulses, sampling and holding the analog sine wave signal from said digital direct synthesizer;

output detecting means for detecting the magnitude of the lower frequency sine wave signal from said frequency converting means; and



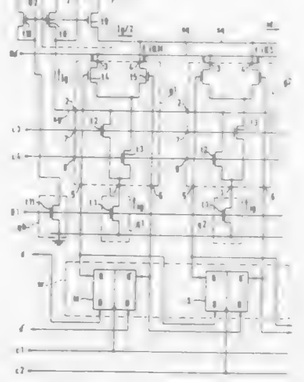
comparing means for comparing the detected output of said output detecting means with a reference value, the difference therebetween being negatively fed back, as the reference voltage, to said D/A converting means to control a conversion gain of the D/A converting means so that the difference approaches zero.

5,146,225

CMOS CIRCUIT FOR AVERAGING DIGITAL-TO-ANALOG CONVERTERS

Ulrich Theus, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 28, 1991, Ser. No. 706,494
Claims priority, application European Pat. Off., Jul. 13, 1990, 90113417.1
Int. Cl.[5] H03M *1/82*
U.S. Cl. 341—152 **9 Claims**



1. A CMOS circuit for averaging digital-to-analog converters that receives a pulse-density modulated data signal and provides an averaged output signal, comprising:

a shift register comprising alternately series-connected master and slave cells, each cell having a true data output and a complementary data output, said shift register controlled by a shift clock, said shift register having a serial input that receives said pulse-density-modulated data signal, each master cell and each slave cell having associated therewith

a respective constant-current source; and

a respective gate circuit, each gate circuit having an input, a true output, a complement output, a neutral output, a data-dependent control input and a clock-dependent control input, said constant-current source being electrically connected through said gate circuit from said input to a selected one of said three outputs depending on a signal applied to said data-dependent control input, said data-dependent control input of said gate circuit being connected to the true and complement outputs of the respective master or slave cell, said clock-dependent control input of said gate circuit being supplied with a gate clock,

a true bus connected to the true outputs of said gate circuits;

a complement bus connected to the complement outputs of said gate circuits;

a gate bus connected to the neutral outputs of said gate circuits; and

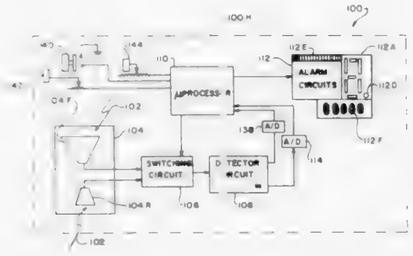
a current mirror having an input and an output, said input connected to said gate bus, and said output connected to one of said true bus and said complement bus, said input and said output forming a differential current as said output signal of said CMOS circuit, said current mirror having a defined current scaling factor such that the value of the differential current is zero at the data reference level of the data signal.

5,146,226

MOTOR VEHICLE POLICE RADAR DETECTOR FOR DETECTING MULTIPLE RADAR SOURCES

Michael D. Valentine; Stephen R. Scholl, and Clarence R. Groth, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Filed Apr. 18, 1991, Ser. No. 687,282
Int. Cl.[5] G01S *7/285*
U.S. Cl. 342—20 **21 Claims**



1. A motor vehicle police radar signal detector for alerting an operator of a motor vehicle to incoming radar signals from more than one radar signal source, said radar signal detector comprising:

receiver means for receiving incoming radar signals;

detector means coupled to said receiver means for detecting said incoming radar signals

signal processing means coupled to said detector means for identifying detected radar signals, storing identification signals representative of detected radar signals, and determining the number of stored identification signals which correspond to incoming radar signals generated by different radar signal sources; and

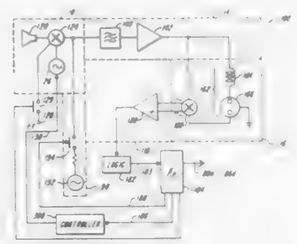
alarm means for alerting an operator of a motor vehicle using said radar signal detector of the number of different radar signal sources which are directing radar signals toward said motor vehicle

5,146,227

SWEEPING RECEIVER

Costas Papadopoulos, Acton, Mass., assignor to Whistler Corporation, Westford, Mass.

Filed May 3, 1991, Ser. No. 695,590
Int. Cl.[5] G01S *7/285; G01R 23/14*
U.S. Cl. 342—20 **31 Claims**



1. A radar detector comprising:

a tunable local oscillator for sweeping a first frequency band of interest between a first frequency and a second frequency and for sweeping second frequency band of intersect between a fourth frequency and a fifth frequency; and

a sweep controller for setting said tunable local oscillator to a third frequency, subsequent to said sweeping of said fist frequency band of interest and prior to said sweeping of said second frequency band of interest,

wherein said first frequency band and said second frequency band are non-overlapping, and

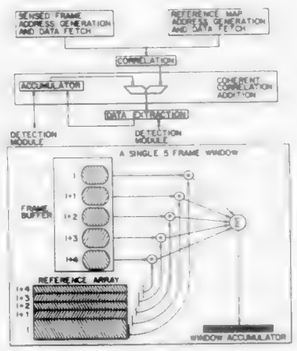
wherein said third frequency is a frequency outside the range of frequencies between said list frequency and said fifth frequency.

5,146,228

COHERENT CORRELATION ADDITION FOR INCREASING MATCH INFORMATION IN SCENE MATCHING NAVIGATION SYSTEMS

Geoffrey B. Irani, Columbia; Kim T. Constantikes, Ellicott City, and Gary D. Shiflett, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jan. 24, 1990, Ser. No. 469,875
Int. Cl.[5] G01C *11/12*
U.S. Cl. 342—64 **26 Claims**



1. A method for increasing match area in an image matching system comprising the step of combining at least two correlation surfaces to form a composite correlation surface, wherein each correlation surface is formed by;

comparing a sensed image to a reference image at every location in said reference image at which said sensed image is entirely within said reference image; and

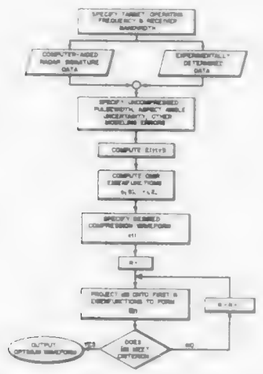
computing a correlation amplitude for each location of said sensed image in said reference image, said correlation amplitudes forming said correlation surface.

5,146,229

CONSTRAINED OPTIMUM MATCHED ILLUMINATION-RECEPTION RADAR

Joseph R. Guerci, Astoria; Robert W. Schutz, Lindenhurst, and John D. Hulsmann, Miller Place, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 25, 1991, Ser. No. 720,671
Int. Cl.[5] G01S *13/28*
U.S. Cl. 342—204 **6 Claims**



1. A method for designing a pulse compression compatible modified OMIR waveform, comprising the steps of:

specifying a target, operating frequency, and receiver bandwidth;

computing an autocorrelation function for an impulse response of the specified target, operating frequency and receiver bandwidth;

computing OMIR eigenfunctions ϕ_i, i=1, 2, . . . , ∞ for the autocorrelation function;

specifying a waveform c(t) having a desired pulse compression characteristic;

projecting c(t) onto one of said eigenfunctions to generate a waveform $s_N(t)$ which possesses the desired pulse compression characteristic.

5,146,230

ELECTROMAGNETIC BEAM SYSTEM WITH SWITCHABLE ACTIVE TRANSMIT/RECEIVE MODULES

Joseph C. Hules, Agoura, Calif., assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 654,265, Feb. 11, 1991, abandoned.
This application Mar. 31, 1992, Ser. No. 863,350
Int. Cl.[5] H01Q *3/22*
U.S. Cl. 342—374 **19 Claims**

1. An electromagnetic beam formation and transmission reception system, comprising:

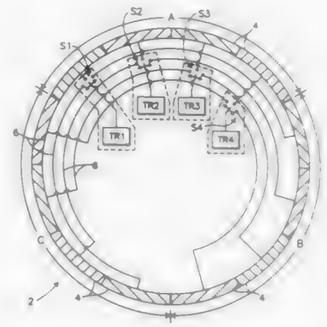
an array of passive radiating/reception elements,

a plurality of active transmission/reception (T/R) modules for generating and receiving signals within a desired portion of the electromagnetic spectrum,

means for connecting each of said active T/R modules to respective pluralities of mutually spaced passive radiating-/reception elements within said array.

switch means controlling the connection of said active T/R modules to their respective passive radiating/reception elements so that at any given time said plurality of T/R modules are collectively connected to a subarray of said radiating/reception elements,

switch control means controlling said switch means to sequentially alter the connections between said active T/R modules and their respective passive radiating/reception elements, said switch control means scanning said alteration of connections among said active T/R modules so



that successive subarrays of said radiating/reception elements are connected to said T/R modules with each subarray overlapping the next successive subarray by a predetermined number of radiating/reception elements, and

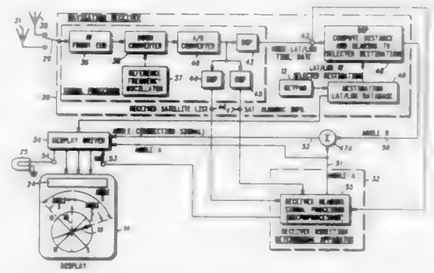
means for varying the number of radiating/reception elements in the overlap between said subarrays and thereby vary the subarray scanning rate.

5,146,231

ELECTRONIC DIRECTION FINDER

Sanjar Ghaem, Palatine; George L. Lauro, Lake Zurich, and Michael Barnes, Highland Park, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 4, 1991, Ser. No. 770,850
Int. Cl.[5] G01S *5/02*
U.S. Cl. 342—419 **20 Claims**



1. Electronic direction finder comprising:

a housing having a major axis;

an omnidirectional antenna for receiving signals from at least three satellites;

navigation receiver fixed within said housing and coupled to said omnidirectional antenna for receiving said satellite signals from said omnidirectional antenna and in response thereto determining the position of the receiver and also determining the position of at least one of the satellites;

directional antenna means, having a directional antenna pattern, fixed to and rotatable with said navigation re-

ceiver for also providing said satellite signals to said receiver;

direction means for determining when said directional antenna pattern is oriented at a predetermined direction with respect to said at least one satellite; and

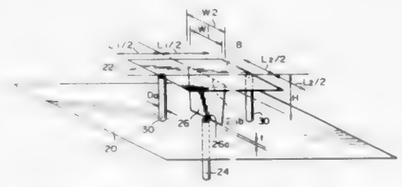
means for providing an electrical signal indicative of the direction of said housing axis with respect to at least one predetermined compass heading when said directional antenna pattern is oriented at said predetermined direction by using the determined positions of said at least one satellite and of said receiver to calculate a bearing from said receiver to said at least one satellite.

5,146,23

LOW PROFILE ANTENNA FOR LAND MOBILE COMMUNICATIONS

Kunitoshi Nishikawa, Nagoya, and Kazuo Sato, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Feb. 28, 1991, Ser. No. 662,638
Claims priority, application Japan, Mar. 1, 1990, 2-51500
Int. Cl.[5] H01Q *1/32*
U.S. Cl. 343—713 **18 Claims**



1. A mobile antenna comprising a ground plate and a radiating element placed above the ground plate, wherein

said radiating element comprises:

a vertical feeding plate disposed above said ground plate in such a manner that the surface thereof is vertical to the plane of said ground plate with a narrow space therebetween and a signal is fed to a central part of a lower edge thereof;

a plate, parallel to said ground plate, connected to an upper edge of said vertical feeding plate, said vertical feeding plate being connected to a central part of said parallel plate in such a manner as to divide said parallel plate in two parts; and

a pair or conductors with one end of each connected to a central part of each end of said parallel plate which is parallel to said vertical feeding plate and an other end thereof connected to said ground plate, said pair of conductors being parallel to said vertical feeding plate.

5,146,23

ROTATING ANTENNA WITH DIPOLES FOR HF WAVES

Francois Ursenbach, Eaubonne, France, assignor to Thomson-CSF, Puteaux, France

Filed Jun. 6, 1990, Ser. No. 533,793
Claims priority, application France, Jun. 13, 1989, 89 07786
Int. Cl.[5] H01Q . *02, 21/12*
U.S. Cl. 343—815 **5 Claims**

1. A rotating HF antenna for transmitting in a HF wave mode comprising:

a rotating support including:

a vertical central mast;

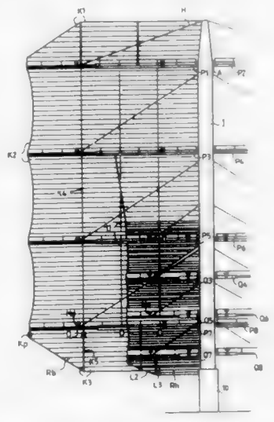
a plurality of substantially horizontal lateral beams, each of the beams having a free end and a further end for attachment to the central mast;

means for attaching each of the further ends of the lateral beams to the central mast;

a plurality of stays each having one end attached at one of the lateral beams and a further end attached to the central mast; and

a plurality of substantially horizontal arms extending perpendicular to an associated one of the lateral beams, each arm having a first end attached to one of the plurality of lateral beams and a second end for attachment to an array of rigid, half-wave dipoles;

n arrays of rigid half-wave dipoles, wherein n is a whole number, each dipole of a given one of the n arrays of rigid,



half-wave dipoles being individually connected to the second end of one of the plurality of substantially horizontal arms at a connection point, each dipole having at least one feeding point;

s vertical plane reflectors, formed by horizontal wires, each of the plane reflectors being associated with at least one of the n arrays of dipoles, wherein s is not more than n; and

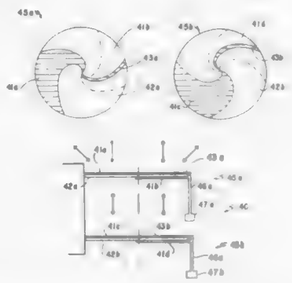
means for attaching the vertical plane reflectors to at least some of the lateral beams;

5,146,234

DUAL POLARIZED SPIRAL ANTENNA

Farzin Lalezari, Louisville, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Sep. 8, 1989, Ser. No. 404,676
Int. Cl.[5] H01Q *1/36, 9/27, 21/00*
U.S. Cl. 343—895 **16 Claims**



1. An antenna comprising;

a first spiral antenna arm including coaxial first and second equiangular spirals, each spiraling in a clockwise manner about a central axis when viewed from a top side;

a second spiral antenna arm including coaxial third and fourth equiangular spirals, each spiraling in a counter-

clockwise manner about the central axis when viewed from said top side;

a first dielectric sheet having the first spiral formed on a first side thereof and the second spiral formed on a second side thereof;

a first balun formed on the first side of said first dielectric sheet extending from an edge of said first dielectric sheet to the center of said first spiral in opposing relation to the second spiral;

first feed means for feeding said first balun and an end of the second spiral;

a second dielectric sheet having the third spiral formed on a first side thereof and the fourth spiral formed on a second side thereof;

a second balun formed on the first side of said second dielectric sheet extending from an edge of said second dielectric sheet to the center of the third spiral in opposing relation to the fourth spiral; and

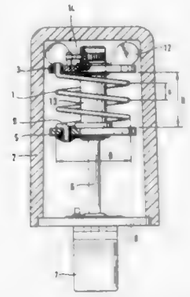
second feed means for feeding said second balun and an end of the fourth spiral.

5,146,235

HELICAL UHF TRANSMITTING AND/OR RECEIVING ANTENNA

Stefan Frese, Bockfliess, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H., Vienna, Austria

Filed Dec. 13, 1990, Ser. No. 627,036
Claims priority, application Austria, Dec. 18, 1989, 2871/89
Int. Cl.[5] H01Q *1/36*
U.S. Cl. 343—895 **2 Claims**



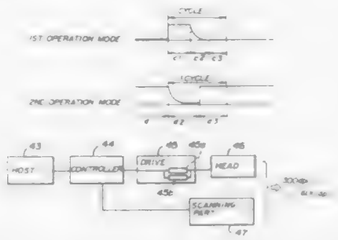
1. A helical UHF transmitting and/or receiving antenna for electromagnetic waves in the frequency range of between 400 MHz and 1000 MHz, the waves having wave lengths, the antenna including a wire having the shape of a helix, the helix having an axis and a height, the helical wire being mounted within a closed housing which is permeable to HF radiation, a coaxial connector for supplying a UHF signal to an end of the helical wire, the helix having between one and a half of ten turns, the helical wire having a diameter, a height and a total length which are substantially smaller than the wave lengths, means for continuously changing the height of the helix by at most onethird of its height, the means for continuously changing the height of the helix comprising a rod having a fine thread extending in the axis of the helix, and a cap-shaped trimming disk having a fine thread and being rotatable on the rod, the trimming disk being movable on the rod in axial direction of the rod, further comprising a wing nut rotatably mounted on the rod and rigidly connected to the trimming disk, means for locking the trimming disk against torsion force of the helical wire, the helical wire having two ends, a base plate fixedly attached to one of the ends of the helical wire remote from the trimming disk, the base plate and the trimming disk having solder sleeves, the helical wire being attached by means of solder connections to the solder sleeve of the base plate and the trimming disk, wherein rotation of the wing nut results in continuous change of the diameter of the helical wire, wherein the trimming disk and the rod are of high-grade HF insulating material.

5,146,236

INK JET RECORD APPARATUS

Tositaka Hirata, Tokyo; Minoru Ameyama, Yokohama; Hiromichi Komai, Yokohama; Osamu Naruse, Yokohama; Syuzo Matsumoto, Yokohama, and Tomoaki Nakano, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 624,619
Claims priority, application Japan, Dec. 14, 1989, 1-324772
Int. Cl.[5] B41J *2/07, 2/045*
U.S. Cl. 346—1.1 **11 Claims**



1. An ink jet recording apparatus for printing image data on record paper by using a drop-on-demand ink jet head, said ink jet recording apparatus comprising:

a multiple-nozzle ink jet head including a plurality of nozzles, a respective pressure chamber for each nozzle and a respective piezoelectric element provided adjacent to a surface of each pressure chamber, the plurality of nozzles being aligned on the multiple-nozzle ink jet head along a sub scan direction to cover a plurality of main scan lines of ink dots printed on the record paper extending in a main scan direction;

selection means for selecting an operation mode of said ink jet head from a first mode and a second mode in accordance with input image information;

control means for supplying a first drive signal to each of said piezoelectric elements of said ink jet head when the first mode is selected by said selection means and for supplying a second drive signal to each of said piezoelectric elements of said ink jet head when the second mode is selected by said selection means, the operation mode of said ink jet recording head being changeable from the first mode to the second mode or vice versa;

first drive means for driving and operating said ink jet head in the first mode so that rows of ink dots of relatively small dot density are printed along the main scan direction on the record paper; and

second drive means for driving and operating said ink jet head in the second mode so that row of ink dots of relatively great dot density are printed along the main scan direction on the record paper.

said control means allowing ink dots at a first dot density P (dpi) to be printed in the main scan direction on the record paper by said ink jet head when the selection means selects the first mode, and allowing ink dots at a second dot density 2P (dpi) to be printed in the main scan direction on the record paper when the selection means selects the second mode, said first dot density being equal to half said second dot density,

said ink jet recording apparatus further comprising paper feed means for feeding the record paper in the sub scanning direction by a length equal to a dot pitch 1(2P) when the selection means selects the second mode, said second drive means driving and operating the ink jet head in the second mode so that first rows of ink dots are printed on the record paper at the second dot density 2P (dpi) by a first scan in said main scan direction, then said paper feed

means feeding the record paper by a length equal to 1/(2P), and said second drive means again driving and operating the ink jet head in the second mode so that second rows of ink dots are printed on the record paper at the second dot density 2P (dpi) by a second scan in said main scan direction.

5,146,227

RESISTIVE SHEET TRANSFER PRINTING AND ELECTRODE HEAD

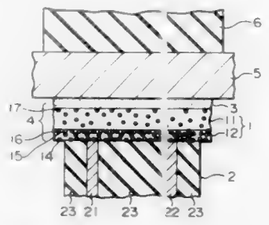
Nobuyoshi Taguchi; Akihiro Imai, Both of Ikoma; Hiromu Matsuda; Tetsuji Kawakami, both of Katano, and Keiichi Yubakami, Suita, all of Japan, assignors to Matushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 11, 1990, Ser. No. 463,481

Claims priority, application Japan, Jan. 17, 1989, 1-008211; May 8, 1989, 1-114726; Sep. 28, 1989, 1-253358

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—1.1 8 Claims



8. An electrode head, comprising:

an insulating support structure; and

a train of electrode pairs embedded in said insulating support structure, each of said electrode pairs comprising two electrodes including a first electrode disposed on an entrance side of a recording medium relative to a given direction of movement between said recording medium and said electrode head during a printing operation and a second electrode disposed on an exit side of said recording member relative to said given direction of movement between said recording medium and said electrode head during a printing operation; and

said first electrode having a smaller cross-sectional area than that of said second electrode viewed in a plane parallel to a recording plane defined by said recording head.

5,146,238

LINE-TYPE THERMAL PRINTING APPARATUS FOR PRINTING ON A SHEET HAVING DIFFERENT THICKNESSES

Hideo Numabe, Miyagi, and Genji Oshino, Shibata, both of Japan, assignors to Tohoku Ricoh Co., Ltd., Oaza Shibata and Nitto Denko Corporation, Ibaraki, both of, Japan

Filed Jun. 3, 1991, Ser. No. 709,230

Claims priority, application Japan, Jun. 8, 1990, 2-150332

Int. Cl.[5] G01D *15/10*; B41J *2/325, 11/04*

U.S. Cl. 346—76 PH 8 Claims

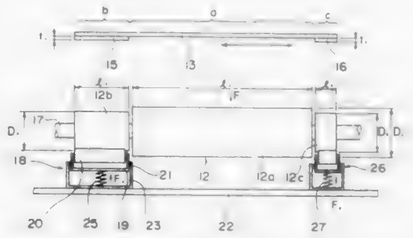
1. A line-type thermal printing apparatus for recording on a sheet while moving the sheet in a feeding direction, the sheet having a first portion which extends in the feeding direction and a second portion which extends in the feeding direction, the first and second portions of the sheet having different thicknesses, comprising:

a thermal head;

a platen which includes

a platen body portion which rotates integrally with the platen shaft to feed the sheet, the first portion of the sheet being pinched between the thermal head and the platen body portion, and

a separate platen portion with a center hole through which the platen shaft extends, the center hole being dimensioned to loosely fit the separate platen portion on the platen shaft, the separate platen portion having a periphery which faces the second portion of the sheet; and



urging means for urging the separate platen portion so that the second portion of the sheet is pinched between the thermal head and the periphery of the separate platen portion.

5,146,239

TAG PRINTER

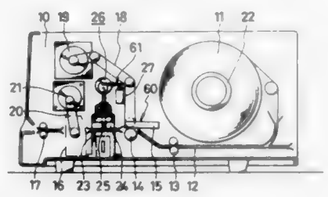
Yoshiaki Ono, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 619,998

Claims priority, application Japan, Dec. 8, 1989, 1-319811; Oct. 19, 1990, 2-282325

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH 10 Claims



1. A tag printer for producing a tag from heat-sensitive paper, comprising:

heat-sensitive paper having obverse and reverse sides, said paper being advanced in a longitudinal direction and having an adhesive face and plural kinds of identification portions arranged in the longitudinal direction on the reverse side thereof;

a thermal printing for making a predetermined print on the observe side of said heat-sensitive paper while a relative motion is made between the thermal printing portion and said heat-sensitive paper;

a punch driven by a drive portion for making a perforation in said heat-sensitive paper;

a feed portion for setting up a relative motion between said punch and said thermal printing portion and said heat-sensitive paper; and

drive timing changing means for changing drive timing of said drive portion so that a position of said perforation can be changed in order to produce tags displaying one of a variety of different designations.

5,146,240

IMAGE FORMING APPARATUS WITH PLURAL DOT DENSITIES

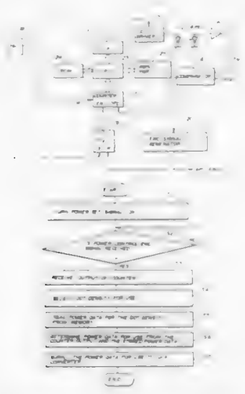
Takamasa Hayashi, Yokohama; Goro Mori, Tokyo; Shigeyuki Araki, Sagamihara; Masahiro Yamamoto, Hino; Masaru Takahashi, Kawasaki; Toshitaka Senma, Yokohama; Masami Miyajima, and Takundo Isobe, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 5, 1991, Ser. No. 650,952

Claims priority, application Japan, Feb. 8, 1990, 2-27103

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 12 Claims



1. An image forming apparatus comprising:

light source means for emitting a light beam;

light detection means for detecting a light beam from the light source means and for supplying a signal indicative of a power of the detected light beam when a voltage obtained by the detected light beam is approximately equal to a reference voltage corresponding to a reference dot density;

memory means for storing a number of power data corresponding to a plurality of dot densities including said reference dot density, and which are each prepared for use with the image forming apparatus each sad power data stored in the memory means being predetermined with respect to each of said plurality of dot densities;

input means for inputting a first dot density which is selected from said plurality of dot densities;

power data control means for supplying a signal indicative of a changed power data which is changed from a value of said power of the detected light beam indicated by said signal from the light detection means with a power data stored in the memory means which is located by the selected first dot density; and

driving means for controlling the power of the light beam emitted by the light source means on the basis of the signal supplied from the power data control means, allowing the light source means to supply a light beam with said changed power which is appropriate for an image being formed on the recording medium at the selected first dot density.

5,146,241

AUTOMATIC CUT-OUT FOR AUTO-FOCUS DEVICE

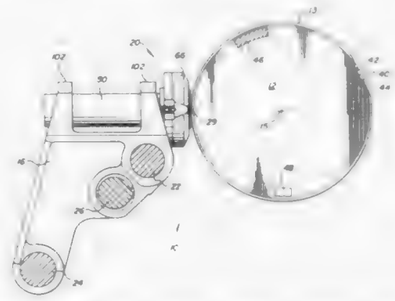
Michael S. Ferschl, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1991, Ser. No. 670,089

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 13 Claims

1. In an imaging apparatus utilizing a carriage member arranged to carry a writing element, said carriage member and said writing element each having at least one surface, at least one of said writing element and said carriage member having a discontinuity in the surface thereof, means for generating a light beam movable with respect to said writing element and projectable thereon to generate an image, means for focusing said light beam with respect to said writing element, said focusing means including means for sensing at least one of said



surfaces of said writing member and said carriage member to control said focusing means, means for indicating when said discontinuity in said surface is proximate said surface sensing means, and means responsive to said indicating means to inhibit the output of said sensing means when said discontinuity is within its range to prevent said focusing means from focusing on said discontinuity.

5,146,242

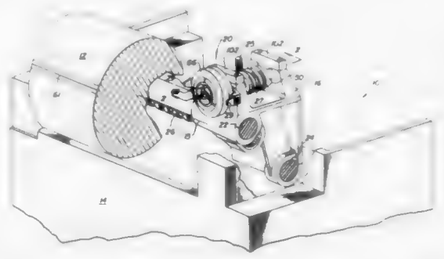
WRITING BEAM ANGULAR ALIGNMENT DEVICE

Erich Zielinski, Bergen, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1991, Ser. No. 670,088

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 11 Claims



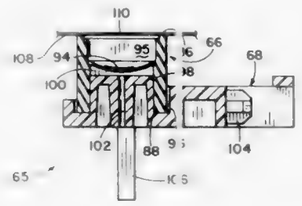
1. In an imaging apparatus comprising a rotating carrier member arranged to carry a writing element, said carrier member having axially extending indicia on the surface thereof, light means movable with respect to said writing element and projectable thereon to generate an image, said light means arranged as a linear array in a housing member, said housing member having an axis disposed substantially perpendicular to the axis of said carrier member, the improvement comprising means for selectively angularly positioning said housing member and said linear array with respect to said carrier member, said positioning means comprising light sensing means disposed on opposite sides of the axis of said housing member in a predetermined relationship with respect to said linear array and facing said carrier member, said light- sensing means arranged to cooperate with said indicia to generate a signal to indicate that said linear array is disposed in a predetermined relationship with respect to the axis of said carrier member as said housing means is selectively rotated about said axis.

5,146,213

DIAPHRAGM CAP SYSTEM FOR INK-JET PRINTERS

Kris M. English; J. P. Harmon, both of Vancouver, and Jefferson P. Ward, Brush Prairie, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 29, 1991, Ser. No. 737,943
Int. Cl.[5] B41J 2/165
U.S. Cl. 346—140 R 13 Claims



8. Apparatus for minimizing drying of ink in nozzles formed on an ink-jet printhead, said apparatus comprising:

a cap being urgeable against said printhead for covering said nozzles, at least a portion of said cap being sufficiently flexible to deflect in response to a pressure increase interior of said cap caused when said cap is urged against the printhead;

a vapor diffusion barrier formed adjacent said flexible portion and defining a diaphragm deflection chamber between said barrier and said cap, said vapor diffusion barrier limiting vapor diffusion from said diaphragm deflection chamber; and

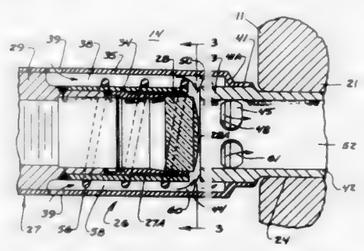
a vent having two ends forming in said vapor diffusion barrier in which one of said ends is in communication with said diaphragm deflection chamber and the other end of said ends vented to ambient pressure for permitting cap flexing when said cap moves toward or away from said printhead.

5,146,214

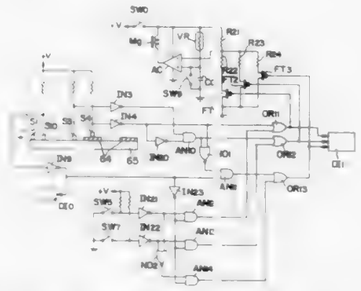
WINDOW PURGING SYSTEM FOR A COMBUSTION INSTRUMENT

Douglas C. Myhre, Eden Prairie; Richard J. O'Brien, Burnsville; David Y. H. Pui, Plymouth, and Chuen-Jinn Tsai, St. Paul, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Jan. 23, 1990, Ser. No. 468,650
Int. Cl.[5] G01J 5/02, 5/08
U.S. Cl. 359—509 15 Claims



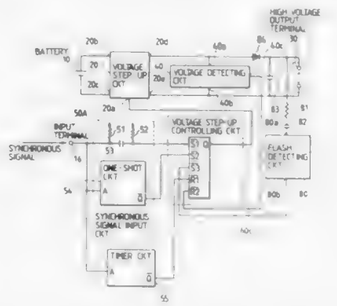
5,146,249
FILM CARTRIDGES, FILMS AND CAMERAS ADAPTED FOR USE THEREWITH
Takeo Hoda, Sakai; Nobuyuki Taniguchi, Tondabayashi, and Kiyoshi Seigenji, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 127,839, Dec. 2, 1987, which is a continuation of Ser. No. 15,677, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 546,517, Oct. 28, 1983, Pat. No. 4,588,272, which is a continuation of Ser. No. 385,311, Jun. 4, 1982, Pat. No. 4,431,283. This application Jan. 24, 1991, Ser. No. 645,459
Claims priority, application Japan, Jun. 8, 1981, 56-88625
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—21 4 Claims



1. In a camera adapted for use with a film cartridge having a code pattern in accordance with the APEX values Sv of film speed of a film contained in said film cartridge, a code detection device comprising:
means for reading the code pattern to generate a first signal indicative of the film speed represented by said code pattern;
means for detecting whether or not the film cartridge has a code pattern in response to said first signal;
means for manually setting a film speed to generate a second signal indicative of the manually set film speed;
means for changing the operation mode by a manual operation between a first operation mode in which said first signal is to be used and a second operation mode in which said second signal is to be used;
means for displaying the film speed corresponding to the signal which is to be used in response to the operation mode changed by said changing means; and
indicating means controlled in the first operation mode to be in a first indication condition when it is detected that a film cartridge loaded in the camera has the code pattern and controlled to be in a second indication condition when it is detected that the film cartridge loaded in the camera does not have the code pattern in the first operation mode to indicate that the loaded film does not have this code pattern although the operating mode is selected to be the first operation mode.

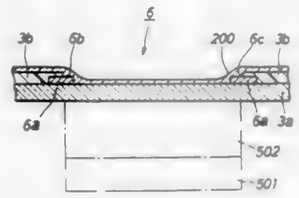
5,146,250
EXTERNAL POWER SOURCE FOR ELECTRONIC FLASH
Hiroshi Sakamoto, Kawasaki, and Nobuyoshi Hagiuda, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Feb. 5, 1991, Ser. No. 650,873
Claims priority, application Japan, Feb. 14, 1990, 2-33511
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—145.1 6 Claims

1. An external power source to be detachably connected to an electronic flash unit which has a main capacitor for storing charge therein and flash means for emitting light on the basis of charge stored in said main capacitor, comprising:
a battery;
voltage step-up means for elevating voltage from said battery to apply the elevated voltage to said main capacitor;
flash detecting means for detecting flash emission of said flash means and producing a flash detection signal;
voltage detecting means for detecting that the output voltage of said voltage step-up means has reached a predetermined value and producing a voltage detection signal; and



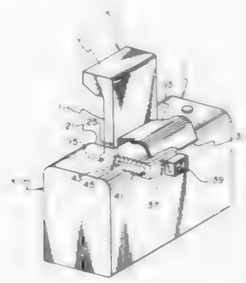
voltage step-up control means for releasing a start signal in response to said flash detection signal, and releasing a stop signal in response to said voltage detection signal, said voltage step-up means starting a voltage step-up operation for elevating the voltage of said battery in response to said start signal and terminating said step-up operation in response to said stop signal.

5,146,251
CAMERA WITH ELECTRONIC FLASH UNIT
Shizuo Ishii, and Masao Yokoyama, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Division of Ser. No. 470,354, Jan. 25, 1990, Pat. No. 5,028,943.
This application Mar. 11, 1991, Ser. No. 667,338
Claims priority, application Japan, Jan. 27, 1989, 1-18357; Jan. 27, 1989, 1-18358
Int. Cl.[5] G03B *00/00*
U.S. Cl. 354—145.1 15 Claims



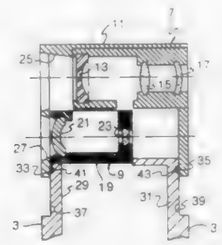
1. A camera, comprising:
a main body;
a front cover covering the main body, the front cover including a first transparent portion, and a second portion including an opening disposed adjacent to said first transparent portion, said second portion being in contact with the first transparent portion;
a flash unit disposed adjacent the front cover for producing a flash of light through the opening; and
reflecting means positioned adjacent the opening for preventing the flash of light from impinging on the second portion.

5,146,252
POP-OUT VIEWFINDER FOR COMPACT CAMERA WITH FLIP-UP FLASH UNIT
William L. Burnham, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 5, 1991, Ser. No. 726,100
Int. Cl.[5] G03B *15/03*
U.S. Cl. 354—149.11 4 Claims



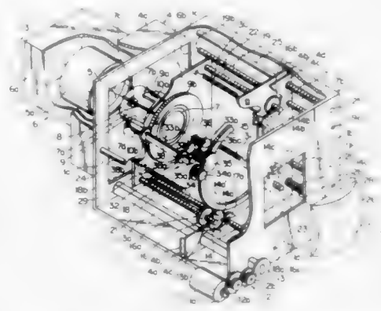
1. A photographic camera comprising a camera body with an integral viewfinder tunnel through which a subject to be photographed is viewed, and an electronic flash unit connected to said camera body for movement to an operative position in which said flash unit is extended from the camera body, is characterized in that:
a lens carrier for a finder lens is supported for translation along said viewfinder tunnel between a storage position in which said finder lens is retracted inside the viewfinder tunnel and an operative position in which the finder lens is extended outside the viewfinder tunnel; and
motion-transmitting means associates said flash unit and said lens carrier for moving the lens carrier from its storage position to its operative position in response to movement of the flash unit to its operative position.

5,146,253
PHOTOGRAPHIC CAMERA WITH COLLAPSIBLE OPTICAL DEVICES
Samuel F. Swayze, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 7, 1991, Ser. No. 637,855
Int. Cl.[5] G03B *17/04, 13/10*
U.S. Cl. 354—187 4 Claims



1. A photographic apparatus comprising a first optical device including two optical elements separated by a space, and a second optical device including two optical elements separated by a space, is characterized in that:
supporting means supports said first optical device for movement relative to said second optical device to a storage position in which at least one of said optical elements of the first optical device is received in the space between said optical elements of the second optical device and to a use position in which said one of the optical elements of the first optical device is removed from the space between the optical elements of the second optical device; and
housing means contains said first and second optical devices when the first optical device is in its storage position and contain the second optical device but not the first optical device when the first optical device is in its use position.

5,146,254
APPARATUS FOR DRIVING VARIFOCAL LENS
Ikuya Tsurukawa, Yokohama, and Kunihisa Yamaguchi, Ichikawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 509,793, Apr. 17, 1990, abandoned.
This application Jun. 5, 1991, Ser. No. 711,408
Claims priority, application Japan, Apr. 19, 1989, 1-97265; Apr. 20, 1989, 1-98774; Feb. 13, 1990, 2-29703
Int. Cl.[5] G03B *3/10*
U.S. Cl. 354—195.12 3 Claims



1. An apparatus for driving a photographic zoom lens comprising;
at least first and second lens groups disposed on the same optical axis;
a fixed frame fixed to a fixed section of an optical device;
a body tube frame movably supported within said fixed frame along said optical axis;
a first group frame supporting said first lens group in such a manner that a focusing operation with respect to said first lens group can be performed, and supported within said body tube frame so as to be capable of moving in parallel to said optical axis;
a zooming cam rotatably supported by said first group frame around said optical axis;
a second group frame fixedly supporting said second lens group, restricted and driven by said zooming cam, and movable along said optical axis;
a drive means including a driving section and a series of gears receiving a driving force from said driving section and outputting said received driving force so an to perform a zooming operation which changes a focal length of said zoom lens composed of a varifocal optical system with said first lens group as a focusing lens;
a first transmission mechanical section including a plurality of gears receiving said outputted driving force from said drive means, and a transmission wheel meshing with one of a plurality of said gears to thereby rotate around a first axis along an optical axis of said apparatus;
a first driving means including at least one body tube drive screw adapted to be driven by a plurality of said gears in said first transmission mechanical section to thereby move said body tube frame in parallel to a direction of said optical axis;
a second driving means including at least one first group drive screw adapted to be driven by a plurality of said gears in said first transmission mechanical section to

thereby move said first group frame in parallel to said direction of said optical axis; and

a second transmission mechanical section including an output gear fixedly connected to one end portion of a transmission shaft and meshing with a second group frame cam gear fixed to one end of said zooming cam, an input gear attached to the other end portion of said transmission shaft in such a manner as to rotate together with said output gear, and a reduction gear group disposed between said transmission wheel and said input gear, said reduction gear group being so adapted as to rotate said input gear in an opposite direction to a rotational direction of said transmission wheel, and having a predetermined reduction gear ratio, respective rotating axes of said output gear, said input gear and respective gears which constitute said reduction gear group being in parallel with said first axis.

5,146,255

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE AND METHOD OF FILM RELOADING THEREFOR

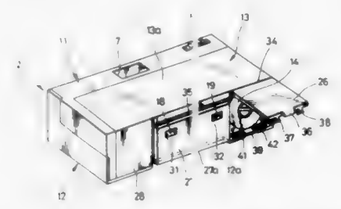
Norihiro Nakai, and Tatsuya Mochizuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 711,050, Jun. 6, 1991. This application Dec. 12, 1991, Ser. No. 804,718

Claims priority, application Japan, Jun. 6, 1990, 2-60070; Jul. 2, 1990, 2-70410

Int. Cl.[5] G03B *17/02*

U.S. Cl. 354—288 7 Claims



1. A film reloading method for a lens-fitted photographic film package, wherein said film package comprises a main body and a light-shielding cover attached to a rear side of said main body for closing said main body in light-tight fashion, said main body having an exposure opening, a cassette chamber disposed on one side of said exposure opening for receiving a film cassette, and a film roll chamber disposed on the opposite side of said exposure opening for receiving an unexposed photographic film pulled out from said film cassette and wound into a roll, wherein the photographic film is progressively wound back into said film cassette frame by frame as the film is exposed, said method comprising:

opening a bottom portion of said cassette chamber for taking out said film cassette with exposed film therein so as to develop the exposed film;

moving a part of said light-shielding cover relative to another part of said light-shielding cover thereby to disengage said light-shielding cover from said main body and removing said light-shielding cover from said main body;

loading said main body with a new photographic film in a darkroom after removal of said light-shielding cover from said main body; and

attaching a new light-shielding cover to the rear side of said main body in a darkroom for closing said main body in light-tight fashion after said film loading step.

5,146,256

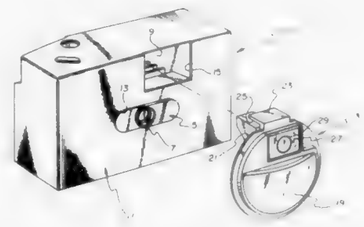
CLOSE-UP ATTACHMENT FOR SINGLE-USE CAMERA

Peter A. Frosig, and Roman Lucyszyn, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1991, Ser. No. 656,917

Int. Cl.[5] G03B *11/00*

U.S. Cl. 354—295 6 Claims



1. An accessory attachment for use during picture-taking with a camera which has an open viewfinder tunnel, is characterized in that:

attachment means is configured to be manually inserted into the open viewfinder tunnel for securing itself substantially immovably to the camera; and

accessory means is connected to said attachment means for use during picture-taking when the attachment means is secured to the camera.

5,146,257

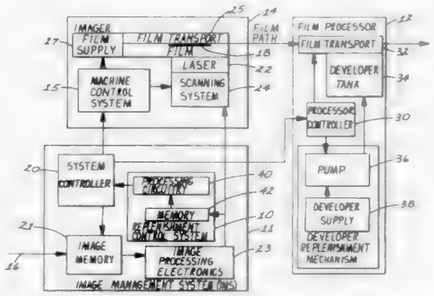
DEVELOPER SOLUTION REPLENISHMENT CONTROL SYSTEM FOR A DIGITAL IMAGING SYSTEM

Richard R. Lemberger, Forest Lake, and Paul C. Schubert, Marine, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1991, Ser. No. 656,743

Int. Cl.[5] G03D *13/00*

U.S. Cl. 354—298 14 Claims



1. A developer replenishment control system for a continuous tone digital imaging system of the type including a laser for exposing pixels of photographic film as a function of digital values representative of an image, the replenishment control system comprising:

memory for storing developer replenishment data characterizing the relationship between the digital values and incremental developer replenishment values representative of the amount of developer required to develop associated exposed pixels on the film; and

processing circuitry for accessing the memory as a function of the digital values to determine associated incremental developer replenishment values, and for generating replenishment control signals as a function of a sum of the incremental developer replenishment values.

5,146,258

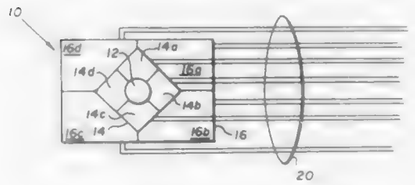
MULTIPLE PHOTODIODE ARRAY FOR LIGHT METERING

Cynthia S. Bell, Webster; Constantine N. Anagnostopoulos, Mendon; Paul M. Williams, Rochester; Michael J. Gaboury, Spencerport, and James R. Koudelka, Williamson, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,704

Int. Cl.[5] G03B *7/099*; H01J *40/14*; G01J *1/42*

U.S. Cl. 354—432 16 Claims



1. An improved multiple photosensitive element array particularly adapted for use in a camera for metering the light from a scene comprising:

a central photosensitive means defining a central light-sensing area and having at least one photosensitive element;

a first plurality of photosensitive elements substantially surrounding the central photosensitive area wherein selected elements of the first plurality define a first set of light-sensing quadrants;

a second plurality of photosensitive elements substantially surrounding the first plurality of photosensitive elements wherein selected elements of the second plurality define a second set of light-sensing quadrants;

wherein the quadrants of the first set being rotated half-orthogonally with respect to the quadrants of the second set, said first and second sets being concentric with the central light-sensing area, and

each of said photosensitive elements provides an output signal as a function of the light impinging thereon.

5,146,259

ELECTRONICALLY CONTROLLED CAMERA INCLUDING AUTOMATIC SHUTTER SPEED CHANGING APPARATUS

Takeo Kobayashi; Takao Nishida; Yasushi Tabata; Norio Numako, and Katsutoshi Nagai, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 374,346, Jun. 30, 1989, abandoned. This application Feb. 12, 1990, Ser. No. 478,350

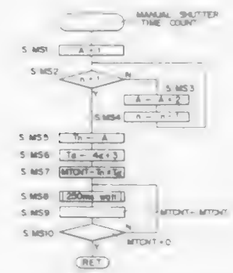
Claims priority, application Japan, Jun. 30, 1988, 63-87118; Jun. 30, 1988, 63-87119; Jun. 30, 1988, 63-87120; Jun. 30, 1988, 63-163895; Jun. 30, 1988, 63-163896; Jun. 30, 1988, 63-163897; Jun. 30, 1988, 63-163898; Jun. 30, 1988, 63-163899; Feb. 10, 1989, 1-31315; Feb. 10, 1989, 1-31319

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—456 10 Claims

1. An electronically controlled camera having a zoom function for changing a focal length of a taking lens and a manual function able to select a shutter speed by a manual operation when said camera is in a manual mode,

said electronically controlled camera further having a shutter speed automatic changing apparatus for automatically changing said shutter speed in a direction for reducing a changing amount of a Full-open Aperture F-number which is changed in accordance with the change of the focal length of said lens so that an exposure value becomes equal to a predetermined value in accordance with a reference shutter speed at a time when said reference



shutter speed is selected in said manual mode and said focal length of said lens is changed by said zoom function.

5,146,260

LENS BARREL

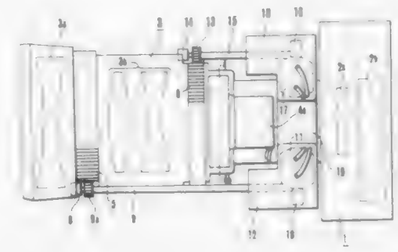
Hiroshi Yamamoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 612,809, Nov. 9, 1990, abandoned. This application May 13, 1991, Ser. No. 701,371

Claims priority, application Japan, Nov. 14, 1989, 1-296784

Int. Cl.[5] G03B *3/00*

U.S. Cl. 354—400 55 Claims



34. A lens barrel having a focusing lens and a zooming lens comprising:

a) a focusing motor arranged to serve as a drive source for moving said focusing lens;

b) a zooming motor arranged to serve as a drive source for moving said zooming lens;

c) output shafts of said two motors extending perpendicularly to an optical axis,

said two motors being arranged at an almost same position in the direction of the optical axis, and

said output shafts of said two motors transmitting the rotation to transmission members having a rotation axis line parallel to the optical axis by means of a gear mechanism having a worm gear.

5,146,261

AUTOMATIC FOCUSING CAMERA

Isao Soshi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1990, Ser. No. 570,790

Claims priority, application Japan, Aug. 28, 1989, 1-220952

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—402 13 Claims

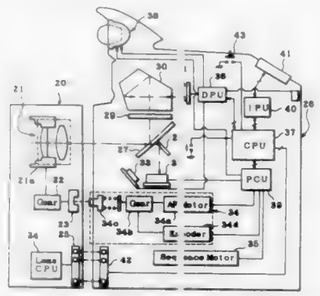
1. An automatic focusing camera for carrying out photographing according to a photographing mode, and having a

view finder provided with a plurality of distance measuring zones, said camera comprising:

a photographing lens;

means for measuring distances of objects corresponding to said distance measuring zones, respectively, and to output distance measuring data denoting the object distances;

means for selecting, in accordance with the photographing mode and the distance measuring data, one of a plurality of automatic focusing modes in which an automatic focusing operation is carried out based on one or a plurality of the distance measuring data which correspond to said distance measuring zones, respectively, and are obtained by said measuring means;



means for calculating, based on lens information of said photographing lens and the distance measuring data, a depth of field in accordance with the selected automatic focusing mode;

means for determining whether or not a respective object distance measured by said measuring means is within the calculated depth of field; and

means for controlling a focusing of said photographing lens in accordance with a result determined by said determining means, to thereby cause said photographing lens to be moved into the depth of field.

5,146,202

AUTO FOCUS CAMERA

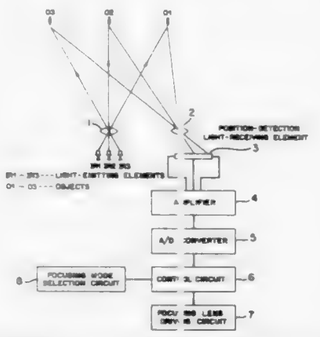
Shinji Nagaoka; Koji Sato, and Michio Kawai, all of Yotsukaido, Japan, assignors to Seikosha Co Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 392,204

Claims priority, application Japan, Aug. 10, 1988, 63-199368

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—403 **2 Claims**



1. An auto focus camera including a light-emitting element for emitting light toward an object, a position detection light-receiving element for receiving light reflected from said object, and an A/D converter for converting the output of said position detection light-receiving element into a distance signal, wherein a lens extension amount is determined on the basis of said distance signal, said auto focus camera comprising:

a first storage circuit in which a plurality of comparative data to be compared with said distance signal are stored in advance;

a comparator circuit for comparing said distance signal with said comparative data stored in said first storage circuit;

a second storage circuit in which a plurality of lens extension amounts corresponding to said comparative data are stored in advance and which is operative to output a lens extension amount corresponding to a specific comparative data selected by said comparator circuit; and

a focussing lens driving device operative on the basis of an output of said second storage circuit.

5,146,263

CAMERA PROVIDED WITH IMAGE-SHAKE PREVENTING FUNCTION

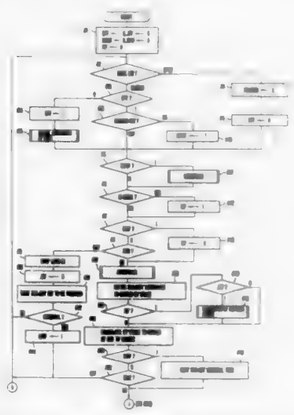
Hiroyuki Kataoka, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1991, Ser. No. 654,763

Claims priority, application Japan, Jan. 31, 1990, 2-18859; Jan. 31, 1990, 2-18860

Int. Cl.[5] G03B *7/08, 15/00*

U.S. Cl. 354—430 **4 Claims**



1. A camera provided with an image-shake preventing function, comprising:

(A) image-shake preventing means for preventing an image shake; and

(B) restricting means for restricting an operation of said image-shake preventing means in response to setting of an interval shooting mode or a remote-controlled shooting mode.

5,146,264

RECORDING SYSTEM

Masahiro Shirai, Tokyo, and Yoshihiko Yoshihara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 586,134

Claims priority, application Japan, Sep. 26, 1989, 1-248186; Sep. 26, 1989, 1-248188

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **13 Claims**

1. A recording system, comprising:

a recording means for recording images on a film;

a storage chamber for storing in a loop the film on which the images have been recorded by said recording means;

a first transport means for transporting the film from said recording means into said storage chamber;

a second transport means for transporting the film from said storage chamber into a next processing step;

a first guide member movable between a first position for guiding a leading end of the film from said first transport means to said second transport means and a second position so that the film may be looped between said first transport means and said second transport means;

a second guide member movable to form a first path, when said first guide member is in the first position, where the

film is transported between said first guide member and said second guide member, and to form a second path, when said first guide member is in the second position, where the film is transported between said second guide member and a third guide member;

drive means for moving said first and second guide members; and

means for controlling said drive means to move said second guide member to the position where the second path is formed in a state where the film is loosened between said first and said second transport means after said first guide member has been moved to the second position.

5,146,265

APPARATUS AND METHOD FOR THE REPRODUCTION OF A COLORED MASTER

Friedrich Jacob, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

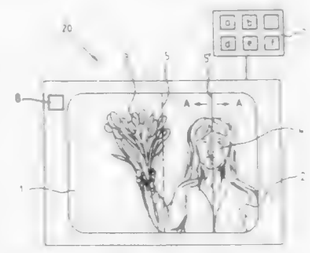
Filed Jul. 19, 1991, Ser. No. 733,097

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1990, 4025625

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—32 **16 Claims**

1. An apparatus for the reproduction of a master, comprising a color monitor having a screen for forming a color image of the master, means for adjusting the color image, and means for



making a portion of said screen black-and-white while the color image is exhibited on said screen.

5,146,266

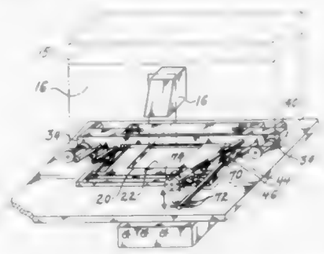
PIVOTING FILM DRIVE MOUNT

Ray Hicks, 2605 Corunna Rd., Flint, Mich. 48503

Filed Dec. 31, 1991, Ser. No. 815,398

Int. Cl.[5] G03B *27/48, 27/50*

U.S. Cl. 355—50 **20 Claims**



1. A mounting assembly for a film drive unit used with photographic film printers, comprising:

a mount base having a central aperture therein and adapted to be secured proximate the optical stage of a photographic printer;

a pair of substantially parallel rails attached to said mount base on opposite sides of said central aperture and oriented so as to lie substantially in the plane of said mount base;

a pair of carrier blocks, each of said blocks being mounted for sliding movement on a respective one of said rails, each block having an upwardly projecting cradle portion; and

a brace member adapted to support a film drive assembly proximate said central aperture, said brace member having a pair of pins positioned on opposite sides of said brace member and oriented so that the axes of the pins are substantially co-linear, said pins being further positioned a sufficient distance apart so as to engage the cradle portions of corresponding carrier blocks,

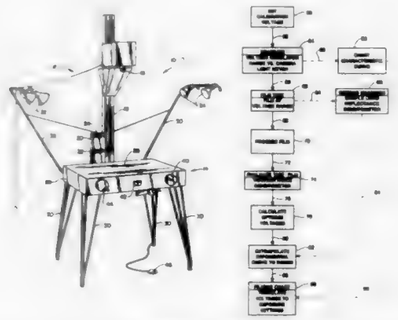
whereby a film drive mounted on said brace member may be moved linearly as said carrier blocks slide along said rails and pivoted about the pins of said brace member releasably secured within said cradle portions.

5,146,267

REFLECTANCE BASED MICROFILMING PROCESS

Michael H. Riley, Hellertown, Pa., assignor to OCLC Online Computer Library Center, Incorporated, Dublin, Ohio

Filed Nov. 15, 1991, Ser. No. 792,599
Int. Cl.[5] G03B *27/74, 27/80*
U.S. Cl. 355—68 19 Claims



1. A process for recording the image on film of a sheet carrying characters on a background exhibiting a given hue, said process employing a camera arrangement having a filming position at which said sheet is located for filming, an exposure meter having an output corresponding with light reflectance at said filming position, and at least one variable exposure control parameter including light from a light source directing spectral illumination output at said filming position, comprising the steps of:

providing a pseudo background target having a select uniform hue;

positioning said pseudo background target at said filming position and varying said illumination output by a predetermined sequence of light values;

simultaneously deriving said exposure meter output for each one of said light values and providing a characteristic relationship of each said derived meter output with said light values;

removing said pseudo background target from said filming position;

providing a test assemblage of a plurality of discrete test regions, each exhibiting a predetermined different hue;

determining a reflectance value for each said discrete planar test region;

positioning said assemblage at said filming position;

filming said assemblage with a test sequence of exposures corresponding with said predetermined sequence of light values to derive test film carrying a sequence of images of said assemblage;

deriving the density values of each image of said test regions on said test film;

correlating said density values with respect to a target density value, said predetermined sequence of light values and said determined reflectance values to derive a calculated light value corresponding with each one of a predetermined regular sequence of reflectance values;

deriving an exposure setting compilation as said exposure meter output for each said reflection value of said predetermined regular sequence thereof from said characteristic relationship;

determining the reflectance value of said sheet background; and

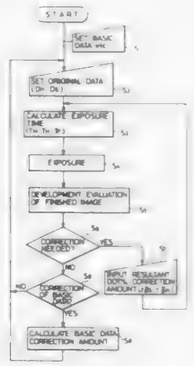
photographing said sheet employing a said exposure control parameter representing an exposure setting of said compilation substantially corresponding with said determined reflectance value of said sheet background.

5,146,268

METHOD OF CONTROLLING EXPOSURE OF PROCESS CAMERA

Hiroshi Kagosaki, and Shoji Komatsubara, both of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 20, 1991, Ser. No. 811,375
Claims priority, application Japan, Dec. 28, 1990, 2-417583
Int. Cl.[5] G03B *27/54, 27/32*
U.S. Cl. 355—70 24 Claims



1. A method of controlling exposure in a process camera, for obtaining dot image by exposing image of an original onto a photosensitive material through a screen, comprising the steps of:

preparing basic data obtained with respect to a predetermined reference original and the screen, and original data,

preparing data for correction for determining a correction amount of said original data in order to obtain dot image having desired contrast,

obtaining first dot image of said original by the exposure of an amount determined based on said basic data and said original data,

obtaining a dot percentage difference δ_H between a dot percentage of a highlight region of said first dot image and a desired dot percentage of a highlight region, and a dot percentage difference δ_S between a dot percentage of a shadow region and a desired dot percentage of a shadow region,

updating said basic data by obtaining a correction amount of said original data for acquiring second dot image having desired contrast based on said dot percentage differences δ_H and δ_S and said data for correction, and by said basic data being updated based on said obtained correction amount of the original data, and

acquiring an exposure amount for obtaining said second dot image based on said updated basic data and said original data.

5,146,269

IMAGE FORMING APPARATUS HAVING SELF-DIAGNOSTIC FUNCTION

Tadafumi Shimizu, and Masahide Ueda, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1990, Ser. No. 541,750
Claims priority, application Japan, Jun. 23, 1989, 1-161850; Jun. 23, 1989, 1-161851; Jun. 23, 1989, 1-161852; Jun. 23, 1989, 1-161853; Jun. 23, 1989, 1-161854; Jun. 23, 1989, 1-161855; Jun. 23, 1989, 1-161856
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—200 74 Claims

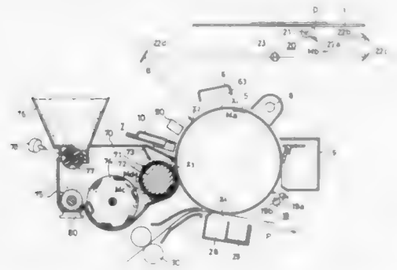
1. An image forming apparatus comprising:

a photoreceptor;

electrostatic latent image forming means for forming an electrostatic latent image on said photoreceptor;

developing means for developing said electrostatic latent image formed on said photoreceptor and forming a toner image;

transfer means for transferring said toner image formed on said photoreceptor onto a recording paper;



measuring means for measuring density of said toner image formed on said photoreceptor and outputting a measured density data;

estimation means for estimating density of said image transferred onto said recording paper on the basis of said measured density data and outputting an estimated image density data; and

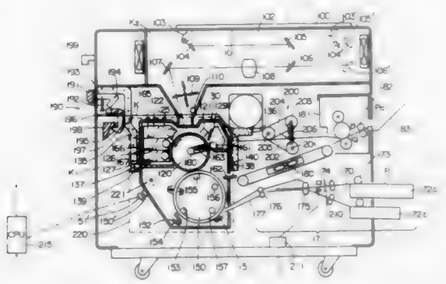
display means for displaying said estimated image density data.

5,146,270

COLOR IMAGE FORMING APPARATUS HAVING INTERCHANGEABLE IMAGE FORMING PROCESS CARTRIDGES

Shunji Matsuo; Sizuo Morita; Satoshi Haneda; Masakazu Fukuchi, and Hisashi Shoji, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 453,815, Dec. 19, 1989, abandoned.
This application Apr. 16, 1991, Ser. No. 686,877
Claims priority, application Japan, Dec. 27, 1988, 63-332040; Jan. 17, 1989, 1-9540
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—200 9 Claims



1. A color image forming apparatus comprising:

a plurality of developing devices, a cleaning device and a transfer member, all of which are provided around an image retainer;

at least the image retainer, the cleaning device and the transfer member being arranged unitarily in a process cartridge, and the process cartridge being formed so that it can be inserted into and withdrawn from an apparatus body; and

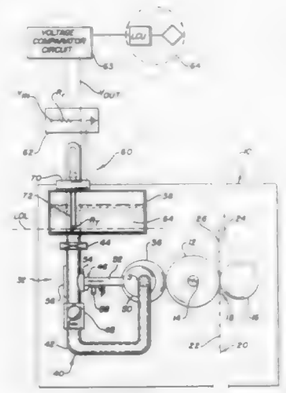
a means for recovering waste toner, which is scraped off from a surface of the image retainer by the cleaning device, into a hollow in the transfer member.

5,146,271

FUSING STATION HAVING RELEASE-OIL LEVEL DETECTOR

Linn C. Hoover, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1991, Ser. No. 706,488
Int. Cl.[5] G06G *15/20*
U.S. Cl. 355—206 11 Claims



1. In a release oil supply system, of an electrostatographic fusing station, including a release oil reservoir, a level detecting apparatus for detecting a low oil level condition in such reservoir, the level detecting apparatus comprising:

(a) first means constituting a voltage divider circuit and including a power source having an input voltage V_{IN}, and output voltage V_{OUT}, a reference resistance R_r, and a temperature responsive variable resistance means R_T;

(b) means including a siphon tube having an electrically conductive trace embedded therein for supporting said temperature responsive resistance means R_T within the reservoir such that said means R_T is above the level of release oil therein when a low oil level condition exists in the reservoir;

(c) voltage comparator circuit means connected to said electrically conductive trace and to said voltage divider circuit means for sensing a sudden change in the output voltage V_{OUT} of said voltage divider circuit; and

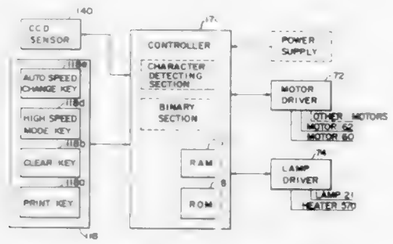
(d) alerting means connected to said voltage comparator circuit means for signaling the existence of such a low oil level condition in response to such a sensed change in the output voltage V_{OUT} of said divider circuit.

5,146,272

IMAGE FORMING APPARATUS HAVING ADJUSTABLE SPEED DOCUMENT SCANNING MEANS WHICH CONVERTS PRINTED IMAGE INFORMATION INTO AN ELECTRONIC IMAGE

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1991, Ser. No. 674,090
Claims priority, application Japan, Mar. 30, 1990, 2-84620
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 7 Claims



1. An image forming apparatus comprising:
means for moving an image bearing member in a pre-determined direction;
means for scanning an original image to form an latent image corresponding to the original image on said image bearing member moved by said moving means;
means for developing the latent image by supplying a developing agent onto said image bearing member;
means for detecting an image density of the original image;
means for setting, in accordance with the image density detected by said detecting means, a first image forming mode in which said moving means and said scanning means are driven at a first speed or a second image forming mode in which said moving means and said scanning means are driven at a second speed different from the first speed; and
means for controlling said moving means and said scanning means so as to drive at the speed corresponding to the mode set by said setting means, wherein said controlling means controls such that said developing means supplies substantially constant quantity of the developing agent per unit time onto said image bearing member irrespective of the set mode.

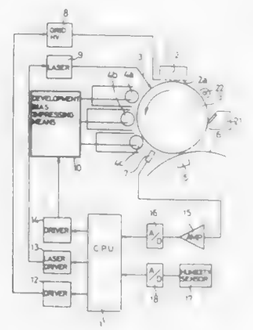
5,146,273

METHOD AND APPARATUS FOR PREVENTING ERRONEOUS IMAGE DENSITY DETECTION IN AN IMAGE FORMING APPARATUS

Takanobu Yamada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1991, Ser. No. 699,965
Claims priority, application Japan, May 15, 1990, 2-125825
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 14 Claims

1. An image forming apparatus comprising:
a photoconductor;
means for charging the photoconductor;
an exposure means for forming a latent image of an objective image on the photoconductor;
means for forming a standard latent image on the photoconductor;
means for developing a latent image on the photoconductor;
means for detecting a density of a developed standard visualized image by the standard latent image;
means for detecting a humidity
means for storing the detected density and humidity;
means for making a comparison between a detected preceding humidity which is stored and a humidity which has just been detected;
means for preestimating a density of the present standard visualized image basing on the result of the comparison; and



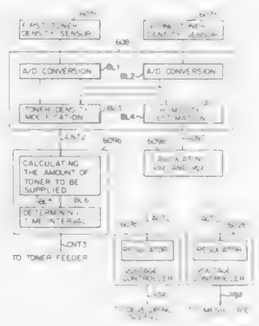
means for judging as defective when the density of a detected standard visualized image differs from the density preestimated.

5,146,274

TONER DENSITY MEASUREMENT APPARATUS HAVING OUTPUT CHARACTERISTICS VARIABLE WITH HUMIDITY

Yoshihiro Hattori; Kazuyuki Fukui, and Yoshinobu Hada, all of Osaka, Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Jun. 22, 1990, Ser. No. 542,574
Claims priority, application Japan, Jun. 23, 1989, 1-161099
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 4 Claims



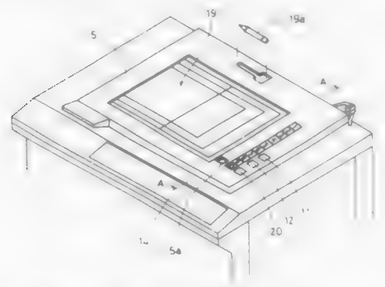
1. A photoelectric image forming apparatus for reproducing an image on the basis of an electrostatic latent image produced on a photo-sensitive member by using a developer unit containing a toner and a carrier, comprising:
a) a plurality of toner density measuring means for respectively producing signal outputs, each indicative of a toner density of said developer as affected by humidity conditions;
b) means for calculating humidity in the developer unit on the basis of said output signals from said plurality of toner density measuring means, and
c) toner density determining means, responsive to said signal outputs, for determining an actual toner density for said developer unit.

5,146,275

COMPOSITE IMAGE FORMING APPARATUS

Eiichi Tone; Yosuke Ohata, and Kazuto Hori, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Dec. 11, 1990, Ser. No. 625,850
Claims priority, application Japan, Dec. 13, 1989, 1-323581; Dec. 13, 1989, 1-323582; May 25, 1990, 2-135812; May 25, 1990, 2-135813
Int. Cl.[5] G03G *15/04, 21/00*
U.S. Cl. 355—244 33 Claims



1. An analog image forming apparatus in which an optical system moves relatively to a document, thereby causing an image of the document to be scanned by the optical system and to be transferred to a sheet of image transferring paper, comprising:
a belt-like recording medium in which a plurality of optional marks can be physically described,
mark selecting means for selecting an appointed mark or two or more consecutive marks of a plurality of marks described in the recording medium,
a mark travelling mechanism for driving and travelling the belt-like recording medium so that a mark selected by the mark selecting means can be moved,
first control means for controlling the mark travelling mechanism and for driving the recording medium to an optional position,
paper feed timing adjusting means for adjusting the timing of paper feed for the exposure scanning and for feeding paper when making an image transfer, and
first mark extracting means for extracting an image of the portion of a mark selected by the mark selecting means according to the timing adjustment amount by the paper feed timing adjusting means and the position of a mark positioned in the main scanning direction by the first controlling means.

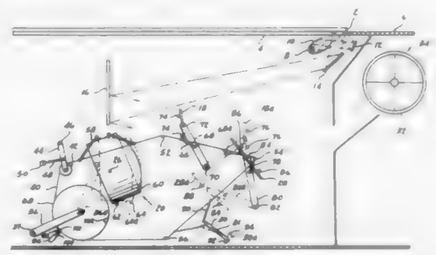
5,146,276

ROTATABLE FOCUSING MEANS AND VARIABLE MAGNIFICATION ELECTROPHOTOCOPIER

Benzion Landa, Edmonton, Canada, assignor to Spectrum Sciences B.V., Wassenaar, Netherlands

Continuation of Ser. No. 398,841, Jul. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 205,638, Nov. 10, 1980, abandoned, which is a continuation of Ser. No. 959,303, Nov. 9, 1978, abandoned. This application Nov. 19, 1987, Ser. No. 122,530
Int. Cl.[5] G03G *15/04;* G03B *27/48, 27/70*
U.S. Cl. 355—243 10 Claims

1. An electrophotographic copying apparatus, comprising:
a photoconductive surface;
means for receiving an object;
a lens for focusing said object onto said photoconductive surface, said lens having an optical axis and first and second refractive surfaces;
means for defining a first discrete angular position of said focusing means such that said focusing means focuses said object on said photoconductive surface at a first magnification;
means for defining a second discrete angular position of said focusing means such that said focusing means focuses said object on said photoconductive surface at a second magnification; and
means for reversibly rotating said focusing means between said first and second discrete angular positions about an optical axis that is perpendicular to said optical axis, said rotating means causing said first refractive surface to face said photoconductive surface in said first discrete angular position and said second refractive surface to face said photoconductive surface in said second discrete angular position, the orientation of said refractive surfaces relative to said photoconductive surface being determined with respect to light traveling from said object to said photoconductive surface.

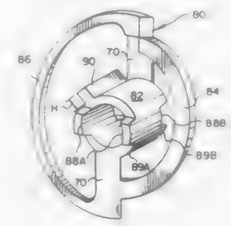


5,146,277

DUAL-FLOW RIBBON BLENDER HAVING INTERSTREAM MIXING MEMBER

Richard S. Fox, Rochester, and Frederick J. Case, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 20, 1991, Ser. No. 763,386
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 7 Claims



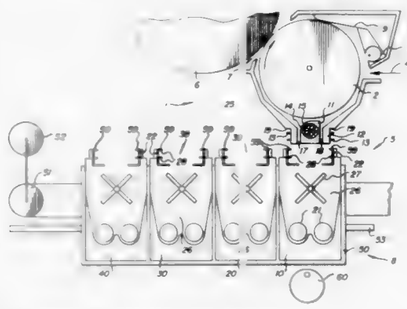
1. In a development apparatus of an electrostatographic reproduction machine, a mixing device for moving and mixing developer material, the mixing device comprising:
(a) a rotatable shaft;
(b) a first helical ribbon rotatable with said shaft;
(c) a second helical ribbon also rotatable with said shaft; and
(d) a plurality of interstream mixing members located axially along said shaft for causing developer material to move from a first developer material flow stream associated with said first helical ribbon to a second developer material flow stream associated with said second helical ribbon, said plurality of interstream mixing members comprising axial ribs spaced axially on said shaft for rotation therewith, each said axial rib having a height from said shaft less than the radial distance of said first and said second helical ribbons from said shaft

5,146,27[illegible]

APPARATUS FOR APPLYING TONER TO AN ELECTROSTATIC IMAGE

Arthur S. Kroll, Rochester; Michael L. DeCecca, Fairport, and Arthur E. Dunn, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y

Filed Mar. 15, 1991, Ser. No. 669,702
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—253 17 Claims



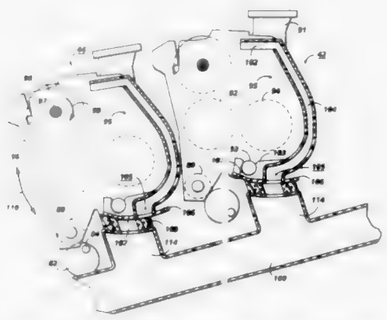
1. An image-forming apparatus including:
an image member,
a developer applicator permanently mounted with respect to said image member, said applicator having means for moving developer into developing relation with said image member, and
a plurality of development units, each of said units being movable one at a time into operative relation with said applicator from a position out of operative relation with said applicator, and each of said units including a developer including at least a toner of a color different from the toner of the other units and each of said units including means for supplying said developer to said applicator when said unit is in operative relation with said applicator.

5,146,27[illegible]

ACTIVE AIRFLOW SYSTEM FOR DEVELOPMENT APPARATUS

Joseph A. Seyfried, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 10, 1991, Ser. No. 758,993
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—215 24 Claims



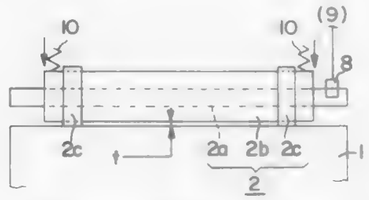
1. An apparatus for developing a latent image recorded on a member, comprising:
means for developing a latent image with toner, said developing means being movable between a nonoperative position remote from the member and an operative position adjacent the member; and
means, responsive to said movement of said developing means from said non-operative position, to said operative position, for generating air pressure less than atmospheric pressure in said developing means to effect transport of airborne particles therefrom.

5,146,280

CHARGING DEVICE

Hiroki Kisu, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 656,968
Claims priority, application Japan, Feb. 17, 1990, 2-37060
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—219 12 Claims



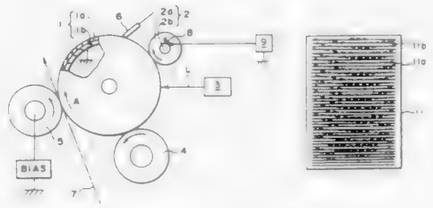
1. A charging device comprising:
a charging member for electrically charging a member to be charged;
means for maintaining a clearance of not less than 5 microns and not more than 300 microns between said charging member and the member to be charged; and
voltage application means for applying a vibratory voltage between the charging member and the member to be charged.

5,146,281

IMAGE FORMING APPARATUS HAVING CHARGING MEANS

Hiroki Kisu, Ichikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,469
Claims priority, application Japan, Sep. 14, 1989, 1-239562
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—219 20 Claims



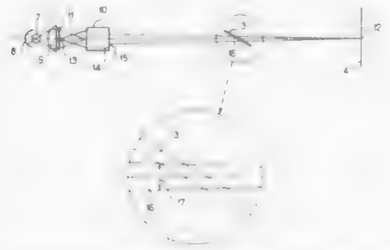
1. An image forming apparatus, comprising:
a movable image bearing member;
charging means for charging said image bearing member while it is moving, said charging means including a contact member contactable to said image bearing member and voltage application means for applying a vibratory voltage between said contact member and said image bearing member;
latent image forming means for forming a latent image along a scanning line on said image bearing member charged by said charging means, the latent image being developed and transferred onto a transfer material,
wherein a frequency f of the vibratory voltage and a speed Vp of the movement of said image bearing member are so selected that an interval between adjacent scanning lines multiplied by N or 1/N does not fall within a variation range of a spatial wavelength λsp where λsp=Vp/f.

5,146,282

PROCESS AND DEVICE FOR MEASURING THE OPTICAL QUALITY OF A GLAZING

Paul Guering, Paris; Patrick Gayout, Gagny, both of France, and Philippe Vizet, Aachen, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Jun. 25, 1991, Ser. No. 720,696
Claims priority, application France, Jun. 25, 1990, 90 07924
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—239 15 Claims



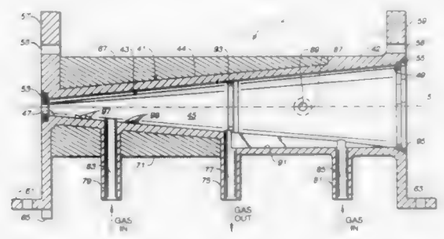
1. A process for measuring and inspecting the optical quality of a glazing, comprising the steps of:
illuminating a point on a glazing with light from a localized light source which passes through said glazing so that an illumination value E_M according to the shadowgraphic image of the point is obtained at a point on a screen;
recording the value E_M; and
illuminating said point on the screen with a light beam from said localized light source which does not pass through said glazing to produce an illumination value E_o;
calculating a deformation value of the glazing at said point on said screen as a function of the recorded value E_M, as a function of the value E_o, and as a function of the geometric position of said image on said screen.

5,146,283

SPECTROPHOTOMETER SAMPLE CELL

George K. Parnoff, Walnut Creek, and Emery Major, Pt. Richmond, both of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Filed Mar. 26, 1991, Ser. No. 675,151
Int. Cl.[5] G01N *21/05*
U.S. Cl. 356—246 3 Claims



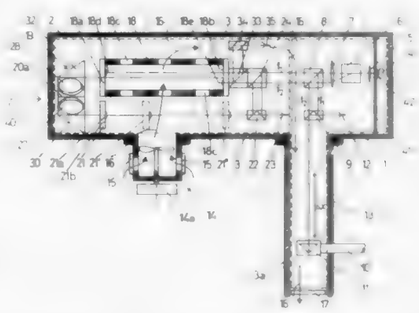
1. In a spectrophotometer wherein a beam of energy from a source is passed through a gaseous mixture to a detector for detecting the absorption of energy by the gaseous mixture in a selected wavelength band, a sample cell for containing a selected volume and path length of gaseous material for analysis on a continuing basis, said sample cell comprising:
a housing having an interior surface defining a frusto-conical chamber of preselected volume, a pair of windows each disposed at a respective end of said chamber and a trough disposed between said windows in the lowermost portion of said chamber for conveying condensate from said chamber;
said windows being positioned toward said source and said detector to define a path length for the beam of energy substantially aligned with the axis of said frusto-conical chamber;
a pair of inlet passages communicating with said chamber through said interior surface of said housing for introducing the gaseous mixture into said chamber, said inlet passages being disposed on the bottom of and toward respective ends of said chamber; and
an outlet passage communicating with said chamber through said interior surface of said housing for removing the gaseous mixture from said chamber, said outlet passage being in communication with said trough and disposed in the lowermost portion of said chamber.

5,146,284

INTERFEROMETER GAS FLOW SYSTEM

Werner Tabarelli, IM Garsill 33, FL-9494 Schaan, and Ernst Löbach, Eschen, both of Liechtenstein, assignors to Werner Tabarelli, Schaan, Liechtenstein

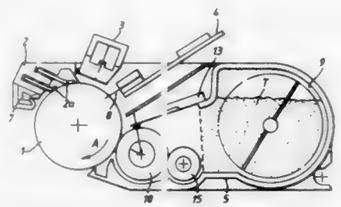
PCT No. PCT/EP89/00289, § 371 Date Jan. 16, 1991, § 102(e) Date Jan. 16, 1991, PCT Pub. No. WO90/11492, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 17, 1989, Ser. No. 623,390
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—345 13 Claims



1. Interferometer for measuring displacements of a movable structural component, comprising a light source for emission of a light beam, providing a beam splitting device for separation of this light beam into two partial beams, of which at least a part of one of the partial beams traverses a set reference path and at least one part of the other partial beam traverses a measuring path of variable optical length whereby said other partial beam is guided by an adjustable reflector system connected to a movable structural component, and with a photoelectric detector device that analyzes the intensity of the interfering partial beams which interfere after respective traversal of the reference and measuring paths, whereby the optical components are arranged together with measuring and reference paths in a sealed housing which also contains a wavelength measuring device for measuring the wavelength of the partial beam which travels through the measurement path in a gaseous medium, characterized in that there is provided a device for creating a gas-flow which reaches the interferometer as well as the measuring section of the wavelength determi-

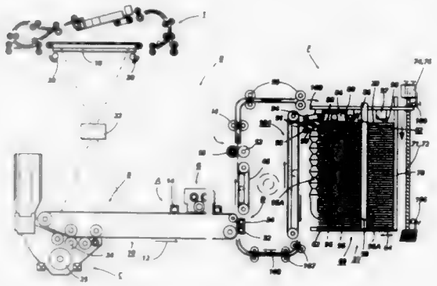
nation device which is turned on when equal medium conditions are desired.

5,146,285
IMAGE FORMING APPARATUS
Kazuhiko Kikuchi, and Naruhito Yoshida, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 12, 1991, Ser. No. 729,153
Claims priority, application Japan, Jul. 31, 1990, 2-203120
Int. Cl.[5] G03G 15/06
U.S. Cl. 355—270 13 Claims



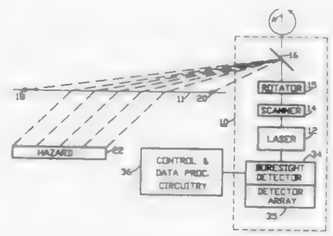
1. An image forming apparatus comprising:
means for forming a latent image on a movable image bearing member;
developing and cleaning means for developing the latent image with a developing agent, and for removing the developing agent remaining on the image bearing member from an earlier image therefrom while the latent image is developed;
means for transferring the developed image on the image bearing member to a recording medium;
means for disordering the developing agent remaining on the image bearing member after transfer of the developed image by the transferring means to render the developed image nonpatterned, the disordering means including a contact member having projections and depressions formed with a prescribed inclined angle relative to the direction intersecting at right angles the moving direction of the image bearing member; and
means for applying a bias voltage to the disordering means.

5,146,286
COMPACT COPY SHEET INPUT/OUTPUT APPARATUS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE
James D. Rees, Pittsford, and Thomas Acquaviva, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 17, 1991, Ser. No. 701,949
Int. Cl.[5] G03G 15/00; B65H 1/04, 31/00
U.S. Cl. 355—309 6 Claims



1. An apparatus for feeding sheets of paper from a loading station into a processing station, and from the processing station into a sheet receiving station the loading station including:
a fixed surface for supporting a supply of copy sheets to be fed,
means for feeding successive sheets from the top of said paper supply into said processing station, and
means for incrementally lowering said paper feeding means during said paper feed operation, and wherein said sheet receiving station includes a sheet stacker tray overlying said sheet loading station, said sheets being outputted to said stacker tray from said processing station and wherein said sheet feeding means is attached to the bottom of said sheet stacker tray.

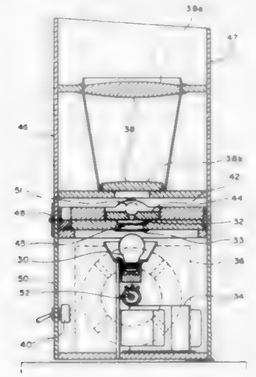
5,146,287
SLANT ANGLE LASER SCANNER
Bruce M. Carder, Rancho Palos Verdes, Calif., assignor to Northrop Corporation, Hawthorne, Calif.
Filed Oct. 20, 1989, Ser. No. 424,859
Int. Cl.[5] G01C 3/08; G01B 11/26; G08B 23/00
U.S. Cl. 356—5 10 Claims



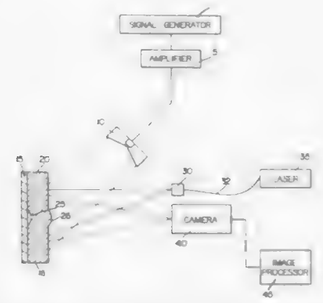
1. A slant angle laser scanner for detecting underwater objects from an ocean platform, comprising
means forming a collimated laser beam,
electro-optical means positioned to receive said laser beam and for scanning the beam along a series of radial paths centered at the platform, each of which proceeds from a location removed from the platform and works toward a location nearer the platform,
means for moving the direction of scan progressively in azimuth after each radial scan, and
means for gating the imaging signals to discriminate against sea surface echo and to determine the depth of said underwater objects.

5,146,288
PEARL LOUPE
Kenneth M. Russell, 4512 Avamere St., Bethesda, Md. 20814
Filed Jun. 19, 1991, Ser. No. 717,663
Int. Cl.[5] G01N 21/87
U.S. Cl. 356—30 8 Claims

1. An apparatus for determining whether a pearl is natural, comprising:
a light source;
eyepiece means for magnifying and for receiving light from said light source;
pearl support means for holding a pearl under observation between said light source and said eyepiece means; and
housing means, encompassing said light source and said pearl support means, for creating a substantially darkened viewing chamber and for eliminating extraneous light from entering said substantially darkened viewing chamber, said pearl support means having a relatively small aperture positioned so as to allow light from said light source to illuminate said pearl, whereby luminescence throughout said pearl is stimulated only when said pearl is natural.

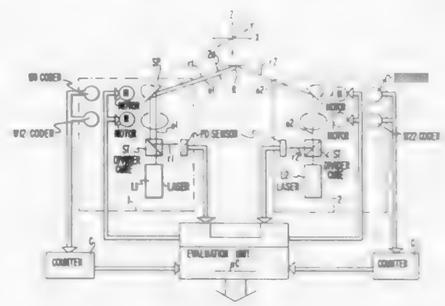


5,146,289
NONDESTRUCTIVE TESTING USING AIR-COUPLED ACOUSTIC EXCITATION
John W. Newman, Berwyn, Pa., assignor to Laser Technology, Inc., Norristown, Pa.
Filed Dec. 21, 1990, Ser. No. 631,985
Int. Cl.[5] G01B 9/02
U.S. Cl. 356—35.5 8 Claims



1. An apparatus for nondestructively testing an object, comprising:
a) means for reflecting coherent radiation from the object, and for forming an image of the object with the reflected radiation,
b) means for perturbing the object with acoustic energy, the perturbing means comprising means for generating acoustic energy having a frequency which changes continuously from a first value to a second value, the first and second values being different, the perturbing means being operable while the coherent radiation continues to be reflected from the object, wherein a plurality of images of the object can be formed by the image-forming means while the object is being perturbed,
c) means for generating a series of composite patterns representing comparisons of images formed while the object is perturbed, with an image formed while the object is not perturbed, wherein each of said composite patterns is stored in a video buffer having a plurality of pixels, and
d) means for generating an image representing the maximum of all the composite patterns in said series, the latter generating means comprising means for forming a pattern each pixel of which is the pixel of greatest intensity of all corresponding pixels obtained from said composite patterns of said series.

5,146,290
PROCESS AND APPARATUS FOR DETERMINING THE POSITION OF AN OBJECT
Matthias Hartrumpf, Karlsruhe, Fed. Rep. of Germany, assignor to Fraunhofer Gesellschaft zur Forderung der Angewandten for Schung E. V., Fed. Rep. of Germany
Filed Jul. 2, 1990, Ser. No. 547,047
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921661
Int. Cl.[5] G01B 11/26; G01C 3/00
U.S. Cl. 356—152 13 Claims



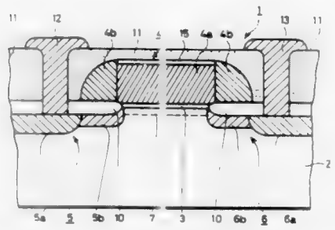
1. A process for determining a rotation position and orientation position of an object, comprising the steps of aiming two illumination light beams coming from different directions at a partially-mirrored reflector attached to said object, detecting the orientation position of said object by detecting reflected beams from said partially-mirrored reflector via respective location-sensitive sensors, and detecting the rotation position of said object by passing a part of the illumination light beams striking said partially-mirrored reflector through said partially-mirrored reflector and detecting the beams passing through said partially-mirrored reflector in a sensor plane which is spaced from a center of said partially mirrored reflector.

5,146,291
MIS DEVICE HAVING LIGHTLY DOPED DRAIN STRUCTURE
Kiyoto Watabe; Katsuyoshi Mitsui, and Masahide Inuishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 31, 1989, Ser. No. 399,947
Claims priority, application Japan, Aug. 31, 1988, 63-217623; Sep. 16, 1988, 63-233218; Oct. 5, 1988, 63-251113; Dec. 5, 1988, 63-305072
Int. Cl.[5] H01L 29/10, 29/06, 29/34
U.S. Cl. 357—23.4 3 Claims

1. A metal oxide semiconductor (MOS) device comprising:
a semiconductor substrate of a first conductivity type and having a major surface;
a gate insulating layer formed on the major surface of said semiconductor substrate;
a gate electrode on said gate insulating layer and formed with central portion and opposite sidewall portions; and
source and drain impurity regions, having a second conductivity type opposite that of the first conductivity type, formed in said substrate, said source and drain impurity regions spaced from apart from each other at opposite sides of said gate electrode with a channel region therebetween, each source and drain impurity region having

contiguous relatively high impurity concentration and relatively low impurity concentration regions, substantially only said relatively low impurity concentration regions of said source and drain impurity regions extending beneath said sidewall portions of said gate electrode; wherein

a first portion of said gate insulating layer beneath said central portion of said gate electrode has a first thickness;



a second portion of said gate insulating layer beneath said sidewall portions of said gate electrode has a second thickness greater than said first thickness; and

an interface between said relatively low impurity concentration regions of said source and drain impurity regions and said channel region is positioned beneath said first portion of said gate insulating layer.

5,146,292

METHOD FOR SELF-CORRECTION OF A FIBER GYROSCOPE WITH A 3×3-COUPLER

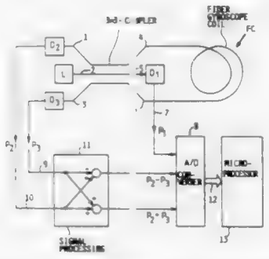
Wolfhardt Buehler, Munich; Hans Poisel, Dachau, and Gert Trommer, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 508,294, Apr. 10, 1990. This application Jun. 8, 1990, Ser. No. 535,768

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919060

Int. Cl.[5] G01C *19/72*

U.S. Cl. 356—350 **3 Claims**



1. A method for self-correction of a fiber gyroscope with a 3×3-coupler including three photo-diodes, wherein a Sagnac-phase, a contrast, and an intensity of alight source are determined by evaluating the signal current values of said photo-diodes in a microprocessor connected through said 3×3-coupler to said fiber gyroscope, comprising the following steps:

(a) measuring three photo-currents of said photo-diodes (D_1, D_2, D_3) when said fiber gyroscope is at a rest position to produce corresponding first signal values (P_{1R}, P_{2R}, P_{3R}),

(b) storing said first signal values (P_{1R}, P_{2R}, P_{3R}) in a memory of said microprocessor,

(c) rotating said fiber gyroscope at any desired rotational speed,

(d) measuring three new photo-currents as second signal values (P_{1D}, P_{2D}, P_{3D}) of said photo-diodes while said fiber gyroscope is rotating,

(e) storing said second signal values (P_{1d}, P_{2d}, P_{3D}) in a memory of said microprocessor, and

(f) determining, in a recurrent operation in said microprocessor, a new damping coefficient (ds_{new}) for a fiber coil of said fiber gyroscope by using a known old damping coefficient (ds_{old}) and said first and second stored signal values for self-calibrating said fiber gyroscope, whereby said recurrent operation is continued until a new damping coefficient converges to a constant value.

5,146,293

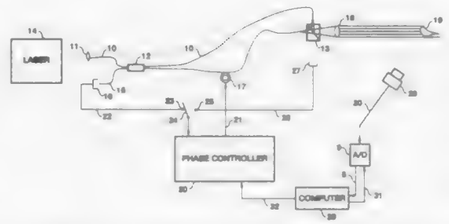
PHASE-STEPPING FIBER-OPTIC PROJECTED FRINGE SYSTEM FOR SURFACE TOPOGRAPHY MEASUREMENTS

Carolyn R. Mercer, Cleveland, and Glenn Beheim, Hiram, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 13, 1991, Ser. No. 703,435

Int. Cl.[5] G01B *11/02*

U.S. Cl. 356—356 **5 Claims**



1. Apparatus for measuring the topography of an object and comprising:

source means for generating a monochromatic, coherent beam of light;

a beam splitter disposed such that said object is illuminated by said light;

a first optical fiber for coupling light from said source means to said beam splitter, said optical fiber having an end face adjacent to said beam splitter;

a second optical fiber having first and second ends, the second end being positioned at the beam splitter such that interference fringes are formed;

an optical coupler disposed between said first and second optical fibers;

a first detector located adjacent to first end of said second fiber, for receiving light reflected off the ends of the fibers, the detected light being an indicator of twice the relative phase between the beams emitted from the fibers;

a second detector for receiving light emitted from the ends of the fibers and transmitted through the beam splitter, the detected light being a direct indicator of the relative phase between the beams emitted from the fibers;

a phase modulator disposed in said second optical fiber;

phase controller means connected to said phase modulator to provide a controlling signal thereto, said phase controller means receiving a signal selectively from either said first or said second detector;

computer means connected to said phase controller means to provide stepping information thereto such that the phase modulator periodically causes the phase angle θ between the first and second light beams to be 0°, 90°, 180° and 270°; and

a camera connected to said computer means, said camera recording an image of the fringes on the object at each 90° stepped phase change, said images being stored and used for calculation in said computer means.

5,146,294

PROCESS AND DEVICE FOR MEASURING ISOTOPE RATIOS

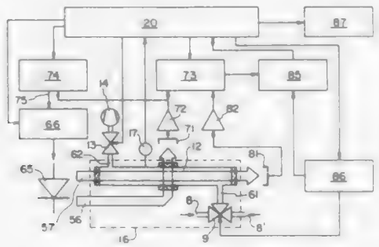
Roland Grisar, Freiburg, and Wolfgang Riedel, Neuenburg, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Apr. 1, 1991, Ser. No. 678,118

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1990, 4012454

Int. Cl.[5] G01N *21/35*

U.S. Cl. 356—435 **13 Claims**



1. A process for measuring the isotope ratio, specifically of stable isotopes, of chemical substances in a gas to be examined, the process featuring the following steps:

alternately charging a sample cell with a reference gas and a measuring gas containing the gas to be examined, and determining the isotope content of the substance contained in the alternately present gases,

characterized by the following further process steps:

addition of a metrologically neutral gas to the gas to be examined, generating a measuring gas by mixing these two gases;

variation of the mixing ratio of the measuring gas by changing the share of neutral gas to be added, in such a way that the determined contents of the substance of the one isotope 1 in the reference gas R_1 and in the measuring gas M_1 are essentially equal; and

computation of the isotope ratio V_P of the substance from the alternately determined content of the substance on the other isotope 2 in the reference gas R_2 and in the measuring gas M_2, under inclusion of the known isotope ratio V_R of the reference gas according to the equation:

$$V_P = V_R \cdot \left(1 + \frac{M_2 - R_2}{R_2}\right) \cdot \left(1 + \frac{M_1 - R_1}{R_1}\right)$$

5,146,295

SEMICONDUCTOR LIGHT EMITTING DEVICE HAVING A SUPERLATTICE BUFFER LAYER

Koichi Imanaka, Kyoto, and Fumihiko Sato, Nagaokakyo, both of Japan, assignors to Omron Tateisi Electronic Co., Kyoto, Japan

Continuation of Ser. No. 329,353, Mar. 27, 1989, abandoned. This application Dec. 5, 1990, Ser. No. 625,628

Claims priority, application Japan, Mar. 29, 1988, 63-73430

Int. Cl.[5] H01L *27/12*

U.S. Cl. 357—4 **1 Claim**

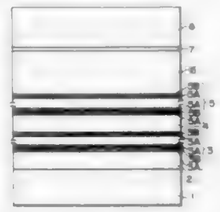
1. A semiconductor device comprising:

an n-type GaAs semiconductor substrate layer;

a semiconductor device active GaAs layer disposed on said substrate layer;

a first superlattice buffer layer comprising a plurality of pairs of layers each pair having, an InGaAs layer, which has a lattice mismatching quality with respect to said substrate layer, and a GaAs layer;

a second superlattice buffer layer having a plurality of pairs of layers, each pair comprising a GaAs layer paired with an AlGaAs layer, each of said paired layers having a



lattice matching quality with respect to said substrate layer; and

where said first and second superlattice buffer layers being formed between said substrate layer and said semiconductor device active layer.

5,146,296

DEVICES FOR DETECTING AND/OR IMAGING SINGLE PHOTOELECTRON

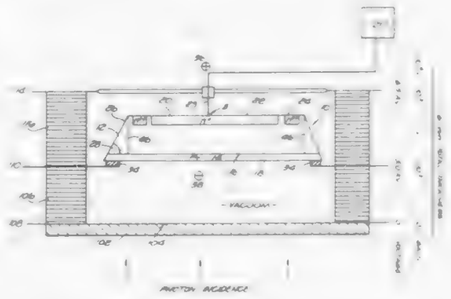
Gerald C. Huth, Hermosa Beach, Calif., assignor to Xsirius Photonics, Inc., Marina Del Rey, Calif.

Continuation-in-part of Ser. No. 128,368, Dec. 3, 1987, abandoned. This application Mar. 20, 1990, Ser. No. 496,490

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] H01L *31/12, 29/90, 27/14*

U.S. Cl. 357—19 **12 Claims**



1. An avalanche photodiode detector, comprising:

photocathode means for receiving radiation and emitting photoelectrons:

avalanche photodiode means comprising:

a body of n-type silicon semiconductor material having phosphorous uniformly distributed therein obtained by neutron transmutation doping, whereby the resistivity is about 30–50 ohm-cm and throughout at least an active region varies less than plus or minus 0.5%,

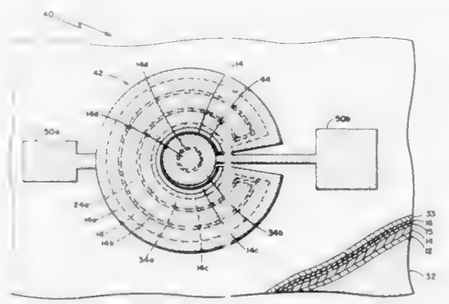
said body having first and second opposite surfaces, an edge surface, and a p-n junction between said first and second opposite surfaces,

said second surface comprising an entrance surface, said edge surface being contoured such that then cross-sectional area of said body is decreased from said first to said second surface so that premature avalanche breakdown is prevented;

signal contact means disposed on one of said first and second surfaces;

electrical contact means for reverse biasing said signal contact means;
means for obtaining a vacuum between said photocathode means and the entrance surface of said photodiode means; and
means for applying a voltage between said photocathode means and said photodiode means whereby said photoelectrons are accelerated across said vacuum onto said entrance surface.

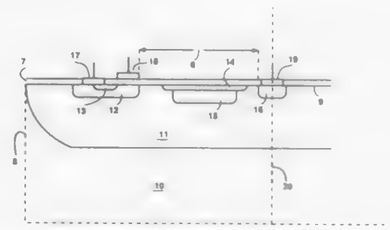
5,146,297
PRECISION VOLTAGE REFERENCE WITH LATTICE DAMAGE
Steven R. Collins, Lexington, and Robert B. Johnson, Marlborough, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Oct. 25, 1991 Ser. No. 783,432
Int. Cl.[5] H01L *29/90*
U.S. Cl. 357—13 **18 Claims**



1. A precision voltage reference comprising:
a substrate;
a first pn junction region disposed on said substrate said first pn junction region comprising a first layer of p-type doped material and a first layer of n-type doped material disposed with the p-type doped material to provide said first pn junction with said pn junction having selectively non-dopant atoms or species provided to induce a predetermined lattice damage at said first pn junction;
a second pn junction disposed on said substrate adjacent to said first pn junction comprising a second layer of p-type material and a second layer of n-type material disposed with said p-type material to provide said second pn junction with a first one of said second p-type and second n-type layers of said second junction electrically coupled to the corresponding layers of said first pn junction through said substrate.

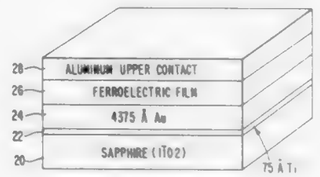
5,146,298
DEVICE WHICH FUNCTIONS AS A LATERAL DOUBLE-DIFFUSED INSULATED GATE FIELD EFFECT TRANSISTOR OR AS A BIPOLAR TRANSISTOR
Klas H. Eklund, 103 Los Patios Los Gatos, Calif. 95030
Filed Aug. 16, 1991 Ser. No. 747,657
Int. Cl.[5] H01L *29/80, 29/10, 29/72, 27/04*
U.S. Cl. 357—22 **22 Claims**

1. A semiconductor device comprising:
a substrate of first conductivity type;
a pocket of semiconductor material of second conductivity type which adjoins a surface of the substrate;
a body region of semiconductor material of the first conductivity type which is within the pocket of semiconductor material and which adjoins the surface of the substrate;
a source region of semiconductor material of the second conductivity type, the source region being within the body region and adjoining the surface of the substrate;
a drain contact region of semiconductor material of the second conductivity type within the pocket of semiconductor material which adjoins the surface of the substrate;
a first intermediate region of semiconductor material of the first conductivity type which adjoins the surface of the substrate and which is located within the pocket of semiconductor material between the body region and the drain contact region; and,



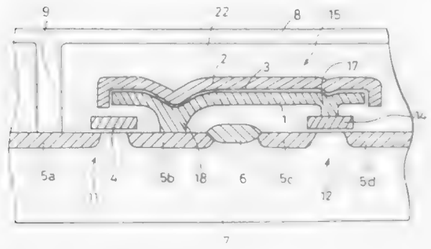
a second intermediate region of semiconductor material of the second conductivity type which adjoins the surface of the substrate and which is located within the pocket of semiconductor material between the body region and the drain contact region, wherein a portion of the second intermediate region extends between the first intermediate region and the surface of the substrate.

5,146,299
FERROELECTRIC THIN FILM MATERIAL, METHOD OF DEPOSITION, AND DEVICES USING SAME
Donald R. Lampe, Ellicott City, Md.; Samar Sinharoy, Monroeville, Pa.; Shu Y. Wu, Artesia, Calif.; Harry Buhay, Allison Park, Pa.; Maurice H. Francombe, Penn Hills, Pa., and S. Visvanathan Krishnaswamy, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 2, 1990, Ser. No. 487,056
Int. Cl.[5] H01L *29/68, 27/02;* **H01G** *4/10*
U.S. Cl. 357—23.5 **41 Claims**



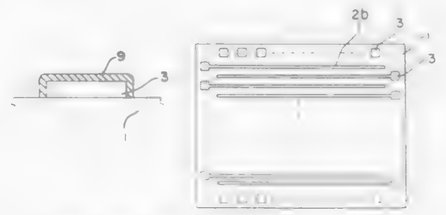
1. A ferroelectric non-volatile storage device, comprising:
a semiconductor substrate;
a thin film of a ferroelectric solid solution of metal halides composed of a mixture of divalent salts deposited on the substrate, the thin film exhibiting ferroelectric hysteresis in the range of about −55 degrees C. to 150 degrees C.; and
means electrically coupled to the thin film and the substrate for applying a predetermined voltage for reversing polarization of the thin film.

5,146,300
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING IMPROVED STACKED CAPACITOR AND MANUFACTURING METHOD THEREFOR
Takeshi Hamamoto; Toshifumi Kobayashi; Tadato Yamagata, and Massaki Mihara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 616,953, Nov. 21, 1990, abandoned. This application Feb. 10, 1992, Ser. No. 830,971
Claims priority, application Japan, Nov. 27, 1989, 1-308003
Int. Cl.[5] H01L *29/68, 21/70*
U.S. Cl. 357—23.6 **11 Claims**



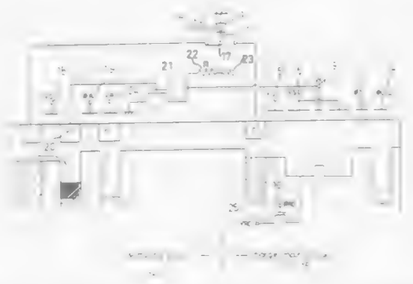
1. A memory cell comprising:
first, second, third and fourth signal lines;
two pairs of MOS transistors, each pair capable of acting independent of the other;
first and second capacitors; and
another MOS transistor; wherein
a first pair of said MOS transistors includes
a first MOS transistor being controlled by said first signal line and having two electrodes, one of said electrodes being connected to said second signal line, and
a second MOS transistor having the gate thereof connected to the other electrode of said first MOS transistor, and having two electrodes, one of said electrodes being connected to said second signal line;
said first capacitor includes
a first electrode layer and a second electrode layer with a dielectric film therebetween, said first electrode layer interconnecting an impurity region of said first MOS transistor and the gate of said second MOS transistor and said first and second electrode layers being formed of different layers than the gate of said second MOS transistor;
a second pair of said MOS transistors includes
a third MOS transistor being controlled by said first signal line and having two electrodes, one of said electrodes being connected to said third signal line, and
a fourth MOS transistor having the gate connected to the other electrode of said third MOS transistor and having two electrodes, one of said electrodes being connected to the third signal line;
said second capacitor includes
a first electrode layer and a second electrode layer with a dielectric film therebetween, said first electrode layer interconnecting an impurity region of said third MOS transistor and the gate of said fourth MOS transistor, and said first and second electrode layers being formed of different layers than the gate of said fourth MOS transistor; and
said another transistor connects said third and fourth MOS transistors to said fourth signal line and has the gate connected to said fourth signal line.

5,146,301
TERMINAL ELECTRODE STRUCTURE OF A LIQUID CRYSTAL PANEL DISPLAY
Keiji Yamamura, Miwa; Takashi Nukii, Suzaku, and Shigeo Nakabu, Nara Heights, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 14, 1988, Ser. No. 257,865
Claims priority, application Japan, Oct. 15, 1987, 62-260693
Int. Cl.[5] H01L *27/01;* **G02F** *1/13*
U.S. Cl. 357—23.7 **3 Claims**



1. A liquid-crystal panel comprising:
a plurality of rows of thin-film transistors each of said thin-film transistors having a gate electrode associated therewith;
a plurality of gate bus lines corresponding to said plurality of rows, the gate electrodes of said thin-film transistors in each of said plurality of rows electrically connected to a gate bus line;
a plurality of terminal electrodes connected to the terminating ends of each of said plurality of gate bus lines;
a transparent conductive coating disposed over in direct contact with said plurality of terminal electrodes;
said thin-film transistors having a gate insulator film and an amorphous semiconductor layer formed thereon;
wherein said gate insulator film comprises an anodic oxidation film disposed on said gate electrodes and a protective insulator film disposed on said anodic oxidation film.

5,146,302
CHARGE SKIMMING SOLID-STATE IMAGING DEVICE INCLUDING SAMPLING CIRCUITS
Norimasa Kumada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed May 3, 1991, Ser. No. 695,344
Claims priority, application Japan, Nov. 5, 1990, 2-301280
Int. Cl.[5] H01L *29/78, 27/14, 31/00*
U.S. Cl. 357—24 **6 Claims**



1. A solid-state imaging device utilizing a charge skimming transfer technique comprising:
a plurality of photodiodes for converting incident light into electrical charges, each photodiode corresponding to a pixel;
a respective sampling circuit for each pixel for detecting the

charges produced by the photodiode for the corresponding pixel in response to incident background light and for outputting a voltage level in response thereto;

a charge input circuit for each pixel for transferring charges produced by the respective photodiodes in response to incident background light and incident signal light after skimming charges produced by the background light, receiving the voltage level from the corresponding sampling circuit and utilizing the voltage level output by the respective sampling circuit as a skimming voltage to skim background charges; and

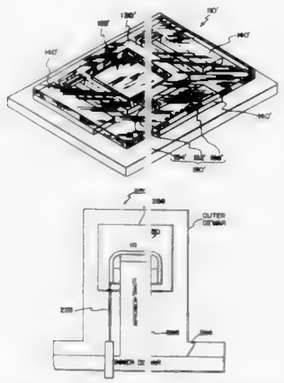
switching means for selectively, alternatively connecting, for each pixel, the respective photodiode to the corresponding charge input circuit and the corresponding sampling circuit.

5,146,303

COMPACT, THERMALLY EFFICIENT FOCAL PLANE ARRAY AND TESTING AND REPAIR THEREOF

William P. Kornrumpf, Albany; Walter M. Marcinkiewicz, Schenectady; William E. Dawson, Syracuse; Herbert C. Zieger, Baldwinsville, and Jonathan R. Miles, Liverpool, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1990, Ser. No. 504,751
Int. Cl.[5] H01L *27/14, 31/00*
U.S. Cl. 357—30 23 Claims



1. A focal plane array sensor hybrid comprising:

a focal plane array incorporated in a first chip having a major surface, an optically active portion on said major surface of said first chip, and contact pads on said major surface of said first chip;

a readout circuit comprising a second chip having a major surface and contact pads on said major surface of said second chip; and

a high density interconnection structure comprising:

a layer of dielectric material bonded to at least portions of said major surfaces of said first and second chips,

a set of interconnecting conductors disposed on said layer of dielectric material and connected between the contact pads of said first and second chips,

said first and second chips being disposed in nonparallel planes,

a flexible portion disposed between said first and second chips, and

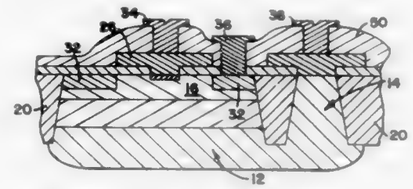
a window in said layer of dielectric material in alignment with said optically active portion of said first chip.

5,146,304

SELF-ALIGNED SEMICONDUCTOR DEVICE

Jerry Yue, Roseville, and Michael S. T. Liu, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 587,175, Sep. 20, 1990, Pat. No. 5,061,644, which is a continuation of Ser. No. 288,475, Dec. 22, 1988, abandoned. This application Jun. 21, 1991, Ser. No. 718,625
Int. Cl.[5] H01L *29/72, 29/04, 23/48*
U.S. Cl. 357—34 5 Claims



1. A bipolar transistor, comprising:

(a) A semiconductor substrate comprising an active base region, a collector, and a sinker, the sinker being electrically isolated from the active base region, and further being electrically coupled to the collector, wherein the active base region's upper surface comprises a (100) silicon crystal surface;

(b) a silicon oxide mask layer overlying the active base region;

(c) an emitter opening located in the mask layer;

(d) an emitter located in the active base region at the emitter opening, wherein the emitter comprises an edge which is aligned with a <100> silicon crystal direction;

(e) an emitter contact electrically coupled to the emitter and extending laterally over the mask layer, wherein the emitter contact is formed of monocrystalline silicon; and

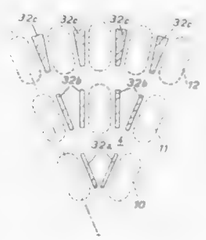
(f) an inactive base region which surrounds the emitter and has an inner periphery aligned with the outer periphery of the emitter contact.

5,146,305

ASYMMETRIC GATE TURN OFF THYRISTOR WITH ANODE SHORT-CIRCUITS AND REDUCED TURN ON CURRENT

Eric Bernier, Tours, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France

Filed Oct. 13, 1989, Ser. No. 421,597
Claims priority, application France, Oct. 14, 1988, 88 13573
Int. Cl.[5] H01L *29/74, 29/747*
U.S. Cl. 357—38 5 Claims



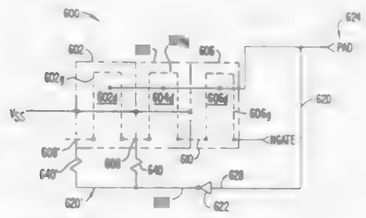
1. Gate turn off thyristor comprising a pellet of semiconductor material incorporating an N type cathode layer divided into separate oblong domains with major and minor principal axes intersecting at a center and defining respective unit cells, a P type gate layer which has a free surface between the cathode domains, a base layer comprising a lightly doped N type first sublayer forming a junction with the gate layer and a heavily doped N type second sublayer forming a junction with a P type anode layer, this latter being separated from said first sublayer by said second sublayer, and respective metal contact layers deposited on the free surfaces of the cathode domains, of the gate layer round the cathode domains and of the anode layer, the heavily doped N type second sublayer passing in a localized way through the anode layer to form anode short-circuit areas in contact with the anode metal layer, in which said anode short-circuit areas are in the form of elongate strips disposed in marginal areas of said cells and symmetrical relative to the centers of said cells, said strips corresponding to two separate adjacent cells.

5,146,306

SEMICONDUCTOR FET STRUCTURES WITH SLEW-RATE CONTROL

Thomas V. Ferry, San Jose; Jamil Kawa, Santa Clara; Kerry M. Pierce, Fremont; William G. Walker, Saratoga, and James S. Hsue, San Francisco, all of Calif., assignors to VLSI Technology, Inc, San Jose, Calif.

Continuation-in-part of Ser. No. 316,894, Feb. 28, 1989, abandoned. This application Jan. 8, 1991, Ser. No. 638,629
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—41 20 Claims



1. A semiconductor structure comprising:

means for applying a signal to switch the structure;

a plurality of MOS field effect transistors whose drains are connected to an output pad, wherein the gate of each of the transistors is elongated and has a near end and a far end;

electrically conductive means for connecting the far end of the gate of at least one transistor to the near end of the gate of each succeeding transistor thereby forming a continuous chain of transistor gates with one or more nodes between adjacent gates in the chain, the transistors with gates in the chain forming a sequence, so that when a signal is applied to the near end of the gate of a transistor in the sequence, the applied signal will propagate along the length of the gates of the transistors in the chain in the order of the sequence, so that a transistor in the sequence is switched on by the signal before a succeeding transistor in the sequence; and

feedback means connected between said output pad and one or more nodes on said chain of transistor gates to affect the timing of the switching of the transistors.

5,146,307

FUSE HAVING A DIELECTRIC LAYER BETWEEN SLOPED INSULATOR SIDEWALLS

Cetin Kaya, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 587,508, Sep. 21, 1990, Pat. No. 5,019,532, which is a continuation of Ser. No. 457,443, Dec. 27, 1989, abandoned. This application May 15, 1991, Ser. No. 700,746
Int. Cl.[5] H01L *27/02, 29/34*
U.S. Cl. 357—51 6 Claims

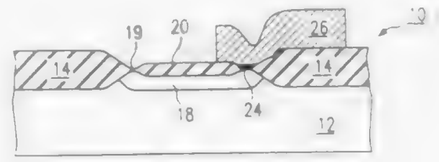
1. A fuse formed on a face of a semiconductor layer of a first conductivity type, comprising:

a first insulator layer extending over said face, said first insulator layer having a first sloped sidewall;

a region of a second conductivity type opposite said first conductivity type formed in said face adjacent said first sloped sidewall, said region having a dopant concentration which decreases as the thickness of said first insulator layer over said region increases;

a second insulator layer extending over a portion of said region, said second insulator layer having a second sloped sidewall, said first and second sloped sidewalls spaced apart by a gap on said region, said second insulator layer having a thickness which increases as the dopant concentration of said region under said second insulator layer increases;

a dielectric layer formed between said first and second sloped sidewalls and over said gap; and a conductor adjacent said dielectric layer.

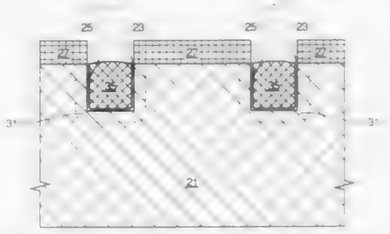


5,146,308

SEMICONDUCTOR PACKAGE UTILIZING EDGE CONNECTED SEMICONDUCTOR DICE

Randal W. Chance, and Eugene H. Cloud, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 5, 1990, Ser. No. 593,177
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—55 15 Claims



1. Semiconductor integrated circuit apparatus comprising:

a) a supporting substrate having a top surface;

b) a plurality of semiconductor dies mounted to said supporting substrate, each of the plurality of semiconductor dies having at least one exposed edge, the plurality of semiconductor dies being mounted to said supporting substrate such that said exposed edge on each die abuts the top surface of the supporting substrate;

c) the semiconductor dies each having a semiconductor substrate and circuitry within the die;

d) a plurality of depressions in said semiconductor dies, the depressions extending to the exposed edge;

e) the semiconductor substrate being a first conductivity type;

f) one or more wells in said substrate of a second conductivity type, said depressions being within said wells;

g) bond pads disposed within said depressions, the bond pads being connected to said circuitry within the die to form bond pad locations for external electrical connection to the semiconductor dies;

h) a first group of contacts on said supporting substrate,

contacting said bond pads, and thereby establishing connections to said circuitry within the die; and

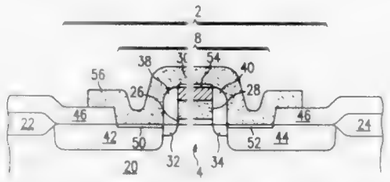
i) the supporting substrate establishing electrical contact with the bond locations formed along said exposed edge.

5,146,309

METHOD FOR FORMING POLYCRYSTALLINE SILICON CONTACTS

Charles R. Spinner; Fusen E. Chen, both of Dallas, and Fu-Tai Liou, Carrollton, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 370,615, Jun. 23, 1989, Pat. No. 5,059,554.
This application May 24, 1991, Ser. No. 705,775
Int. Cl.[5] H01L *27/11, 23/532*
U.S. Cl. 357—59 **7 Claims**



1. A semiconductor integrated circuit structure, comprising:

a gate oxide layer over a silicon substrate;

a first polycrystalline silicon layer over the gate oxide layer;

a first metal silicide layer over the first polycrystalline silicon layer;

an insulating layer having an opening exposing portions of the substrate and the first metal silicide layer;

a second metal silicide layer over the exposed substrate portion and over the exposed first metal silicide layer portion; and

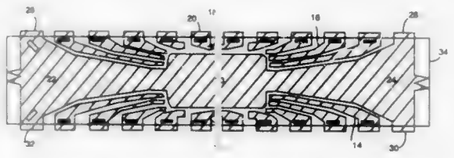
a second polycrystalline silicon layer extending into the opening and making contact with the second metal silicide layer, wherein the first polycrystalline silicon layer is electrically connected to the substrate to form a common node.

5,146,310

THERMALLY ENHANCED LEADFRAME

Jaime A. Bayan; Jeffrey C. Demmin, both of Palo Alto; Mark L. DiOrio, Cupertino, and Young I. Kwon, Santa Clara, all of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Continuation of Ser. No. 422,344, Oct. 16, 1989, abandoned.
This application Jul. 15, 1991, Ser. No. 731,970
Int. Cl.[5] H01L *21/34, 23/36, 23/12*
U.S. Cl. 357—70 **6 Claims**



1. A leadframe for an integrated circuit package comprising:

a die attach pad;

a plurality of electrically conductive paths leading from wire bond attach pads located adjacent said die attach pad to external connection points; and

at least two heat conduction paths which make thermal contact with said die attach pad, said heat conduction paths leading from said die attach pad to thermal connection points for thermal connection to an external support structure;

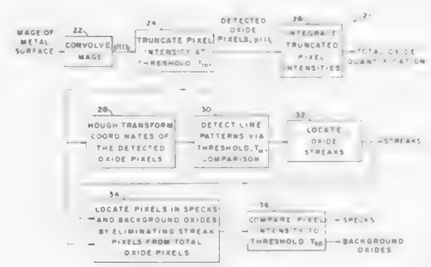
wherein said package is four sided and wherein said thermal connection points are located at or near the corners of said package.

5,146,311

METHOD OF INDENTIFYING AND QUANTIFYING OXIDES ON ROLLED METAL STRIP

Robert C. Chang, Export, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 21, 1991, Ser. No. 718,434
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—100 **7 Claims**



1. A method of determining the severity of oxide formations on a rolled metal strip, comprising:

illuminating said strip with light,

acquiring and digitizing an image of a surface of the strip in a manner that orients oxides in a fixed direction and contrasts the oxides in the acquired image with the background of the bare metal of the strip, as it is appears in the acquired image,

removing the average value of pixel intensities of the images to provide a filtered image of the strip surface, thereby enhancing elongated features in the image that represent surface oxides,

identifying oxides in the pixels of the filtered image having intensities above a predetermined threshold, and

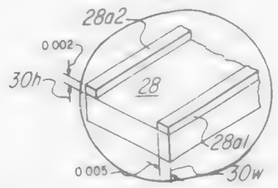
quantifying the amount of such identified oxides by summing the intensities of their pixels.

5,146,312

INSULATED LEAD FRAME FOR SEMICONDUCTOR PACKAGED DEVICES

Thiam B. Lim, 39 Elias Road, #02-04 Pasir Ris Gardens, Singapore

Filed Feb. 28, 1991, Ser. No. 662,085
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—70 **4 Claims**



1. A semiconductor chip, comprising:

a semiconductor die having a plurality of bonding pads centrally disposed along a face thereof;

a lead frame having lead fingers extending over the face of the semiconductor die and having two power supply buses adjacent to the bonding pads, each having a top face disposed opposite the face of the semiconductor die;

a plurality of wire bonds, some that cross over the top face of a power supply bus for connecting some of the centrally disposed bonding pads to some of the plurality of lead fingers, and some that connect other of the centrally disposed bonding pads to the top faces of the power supply busses;

an encapsulated, encapsulating the semiconductor die, the wire bonds, and the lead frame such that portions of the lead fingers extend through the encapsulant; and

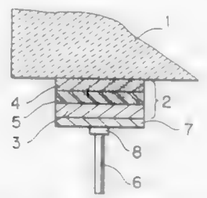
dielectric strips disposed along opposite edges of the top face of the power supply busses, leaving a portion of the top face of the power supply busses uncovered so that connections from some of the wire bonds may be made, to reduce the possibility of a crossing wire bond from collapsing against a power supply bus.

5,146,313

METALLIZED CERAMIC STRUCTURE COMPRISING ALUMINUM NITRIDE AND TUNGSTEN LAYERS

Takeyuki Kato, Aichi; Yasunobu Yoneda, and Yukio Sakabe, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 17, 1989, Ser. No. 395,343
Claims priority, application Japan, Aug. 18, 1988, 63-204954
Int. Cl.[5] H01L *23/15;* **H05B** *3/12;* **B32B** *15/04*
U.S. Cl. 357—74 **15 Claims**



10. An integrated circuit package comprising:

a ceramic substrate consisting essentially of aluminum nitride including first and second opposite surfaces;

a first metallic layer consisting essentially of tungsten bonded to said first surface;

a second metallic layer consisting essentially of tungsten bonded to said second surface;

a first mixture layer and a second mixture layer formed between said first and second metallic layers and said respective first and second surfaces of said ceramic substrate to bond said first and second surfaces of said ceramic substrate and said respective first and second metallic layers, said first mixture layers being in contact with said first and second surfaces of said ceramic substrate and said second mixture layers being in contact with said first and second metallic layers, each of said mixture layers including a mixture of said ceramic of said respective ceramic substrate and said metal of said respective metallic layer, with said second mixture layer having a lower percentage of said ceramic than said first mixture layer, said first mixture layer including approximately 67–83% by weight of aluminum nitride and 17–33% by weight of tungsten;

first and second electrolyte plating films formed on said respective first and second metallic layers;

an integrated circuit brazed to said first electrolyte plating film; and

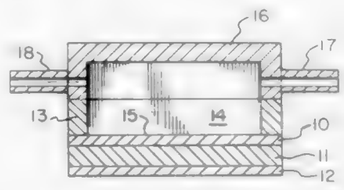
a terminal pin electrically connected to said integrated circuit and brazed to said second electrolyte plating film.

5,146,314

APPARATUS FOR SEMICONDUCTOR CIRCUIT CHIP COOLING USING A DIAMOND LAYER

Jacques I. Pankove, Boulder, Colo., assignor to The University of Colorado Foundation, Inc., Boulder, Colo.

Division of Ser. No. 490,878, Mar. 9, 1990, Pat. No. 5,070,040.
This application Oct. 23, 1990, Ser. No. 602,022
Int. Cl.[5] H01L *23/02, 25/04*
U.S. Cl. 357—82 **3 Claims**



1. A semiconductor integrated device having improved heat removal capability, comprising;

a first semiconductor layer having integrated device means formed on one surface thereof, and having a second surface located opposite said one surface,

a thin diamond layer bonded directly to said second surface of said first semiconductor layer by synthetically depositing said diamond layer on said second surface, said diamond layer having an exposed surface,

a second semiconductor layer on the exposed surface of said diamond layer, said second semiconductor layer having an aperture therein through which a portion of said diamond layer is exposed,

a capping member surrounding and enclosing the aperture in said second semiconductor layer, to thereby form a cavity whose inner surfaces comprise the exposed portion of said diamond layer, said second semiconductor layer, and said capping member, and

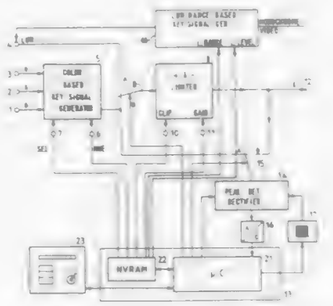
a cooling medium within said cavity in heat transfer contact with said exposed portion of said diamond layer.

5,146,315

METHOD AND APPARATUS FOR AUTOMATICALLY SETTING PARAMETERS IN THE DERIVATION OF A MIXER KEYING SIGNAL FROM VIDEO SIGNALS

Klaus-Dieter Müller, Weiterstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 12, 1990, Ser. No. 581,280
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932758
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—22 **13 Claims**



1. A method of automatically determining and storing set-

ting values for a video mixer control signal generator having an output connected to a control input of a video mixer which also has at least one input connected to a source of a video signal, said control signal generator including a first unit and a second unit, both said units having an output automatically connectable to an input of a detector of a characteristic signal magnitude which is a measure of signal amplitude, said detector having an output, said second unit being a limiter having an input connected to said output of said first unit, said first unit having at least one input connected to said source of said video signal and said second unit having an output connected to said control input of said video mixer, each of said units having two inputs for first and second setting values for controlling the operation of the respective unit, said method comprising the steps of:

varying a setting value supplied to a selected one of said units of said video mixer control signal generator at a first of said setting value inputs of said selected unit and at the same time measuring a characteristic magnitude signal at said output of said selected unit by said magnitude detector in response to a signal derived from a video signal of said video signal source, said varying of said setting value extending over a predetermined range of usable values of said setting at least until said characteristic magnitude of the signal at said selected unit output is measured, and

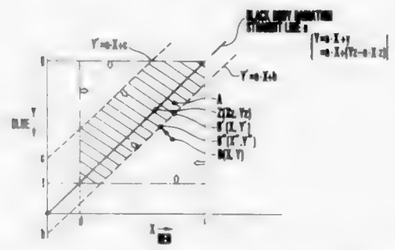
when a suitable characteristic magnitude of a signal at the output of said selected unit is reached, then, while the characteristic magnitude of said signal at said output of said selected unit is being obtained, storing said previously varied setting value which is then present, for use in subsequent control of said video mixer.

5,146,316

WHITE BALANCE ADJUSTING DEVICE

Masao Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 635,816, Jan. 2, 1991, abandoned, which is a continuation of Ser. No. 192,948, May 12, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 742,508
Claims priority, application Japan, May 15, 1987, 62-116778
Int. Cl.[5] H04N 9/73
U.S. Cl. 358—29 29 Claims



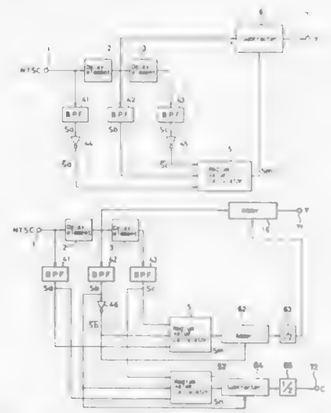
1. An image sensing apparatus comprising image sensing means for converting object light to an electrical signal, amplifier means for amplifying the electrical signal obtained from said image sensing means, control voltage forming means for forming a control voltage to control said amplifier means, said control voltage forming means including limiting means for limiting the control voltage within a limitative range, said amplifier means being controlled by the control signal limited by said limiting means, detecting means for detecting an amount of the object light, and setting means for variably setting the limitative range on the basis of an output of said detecting means.

5,146,317

SIGNAL SEPARATING APPARATUS

Atsushi Ishizu; Kenta Sokawa, both of Takatsuki, and Kiyoshi Imai, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 3, 1990, Ser. No. 562,858
Claims priority, application Japan, Aug. 4, 1989, 1-203264
Int. Cl.[5] H04N 9/78
U.S. Cl. 358—31 12 Claims



1. A signal separating apparatus comprising:

a first delay element for delaying a composite video signal by one horizontal scanning period,

a second delay element for delaying an output signal of the first delay element by one horizontal scanning period,

plural band pass filters for selectively passing a band of a color sub-carrier frequency from the composite video signal, the output signal of the first delay element and an output signal of the second delay element, respectively,

inverter circuits for inverting output signals of the band pass filters filtering the composite video signal and the output signal of the second delay element, respectively,

a medium value calculator for outputting a signal having a medium value from among the inverted output signal of the band pass filter filtering the composite video signal, output signal of the ban pass filter filtering an output signal of the first delay element, and the inverted output signal of the band pass filter filtering the output signal of the second delay element, and

a subtracter for outputting a luminance signal by subtracting the medium value signal from the output signal of the first delay element.

11. A signal separating apparatus comprising:

a first delay element for delaying a composite video signal by one horizontal scanning period;

a second delay element for delaying an output signal of the first delay element by one horizontal scanning period,

plural band pass filters for selectively passing a band of a color sub-carrier frequency from the composite video signal, the output signal of the first delay element and an output signal of the second delay element, respectively,

inverter circuits for inverting output signals of the band pass filters filtering the composite video signal and the output signal of the second delay element, respectively,

a first medium value calculator for outputting a signal having a first medium value from among the inverted output signal of the band pass filter filtering the composite video signal, output signal of the band pass filter filtering an output signal of the first delay element, and the inverted output signal of the band pass filter filtering the output signal of the second delay element,

a first adder for adding the output signal of the first medium value calculator and the output signal of the band pass filter filtering the output signal of said first delay element,

a first coefficient multiplier for reducing by half an amplitude of an output signal of the adder,

a first subtracter for outputting a luminance signal by subtracting an output signal of the first coefficient multiplier from the output signal of the first delay element;

a second medium value calculator for outputting a signal having a second medium value from among the output signal of the band pass filter filtering the composite video signal, the output signal of the band pass filter filtering an output signal of the first delay element, and the output signal of the band pass filter filtering the output signal of the second delay element,

a second subtracter for subtracting the second medium value signal from the output signal of the first delay element, and

a second coefficient multiplier for reducing by half an amplitude of an output signal of the subtract to output a chrominance signal.

5,146,318

MOTION ADAPTIVE LUMINANCE SIGNAL AND COLOR SIGNAL SEPARATING FILTER

Mitsuru Ishizuka, and Noriyuki Yamaguchi, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1990, Ser. No. 597,670
Claims priority, application Japan, Oct. 14, 1989, 1-267132; Oct. 19, 1989, 1-274391
Int. Cl.[5] H04N 9/78
U.S. Cl. 358—31 10 Claims

1. A motion adaptive luminance signal and color signal separating filter for separating a color signal and a luminance signal from a color television signal in which the frequency of the color signal is multiplexed in the frequency of the luminance signal in response to movement of a picture, the motion adaptive luminance signal and color signal separating filter comprising:

(A) an interframe luminance signal and color signal separating circuit for separating and subsequently outputting said luminance signal and said color signal by utilizing interframe correlation;

(B) an inframe luminance signal and color signal separating circuit, including

three kinds of interfield luminance signal has been color signal separating means for separating said luminance signal and said color signal by utilizing interfield correlation, and

infield luminance signal and color signal separating means for separating said luminance signal and said color signal by utilizing infield correlation;

(C) mixing means for mixing luminance and color signal outputs of said interframe luminance signal and color signal separating circuit and a selected luminance and color signal output of said inframe luminance signal and color signal separating circuit;

(D) movement detecting means for detecting movement of said picture; and

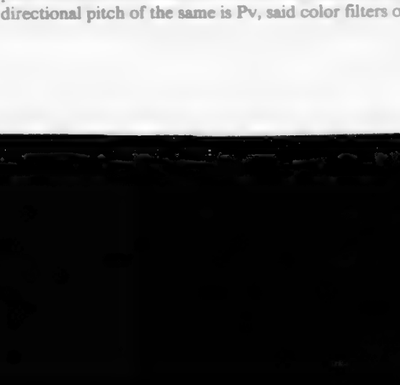
(E) means for changing the mixing ratio of the luminance and color signal output of said interframe luminance signal and color signal separating circuit and the selected luminance and color signal output of said inframe luminance signal and color signal separating circuit in accordance with a result obtained by said movement detecting means, to produce a motion adaptive separated luminance and chrominance signal.

5,146,319

DIGITAL LUMINANCE SIGNAL TRANSIENT IMPROVER AND PEAKER

Christopher M. Engel, and Khosro M. Rabii, both of Arlington Heights, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 13, 1989, Ser. No. 379,510
Int. Cl.[5] H04N 5/14, 9/64
U.S. Cl. 358—39 8 Claims



1. A digital luminance signal processor comprising:

a luminance signal;

means for developing a first difference signal and a second difference signal representative of detail in said luminance signal

means for developing a threshold control signal in response to said second difference signal;

means for deriving the absolute value of said first difference signal;

means for modifying the output of said deriving means with said threshold control signal to develop a transient improved component; and

means for combining said transient improved component, said luminance signal and said second difference signal to form a processed luminance signal.

5,146,320

COLOR IMAGE PICKUP APPARATUS

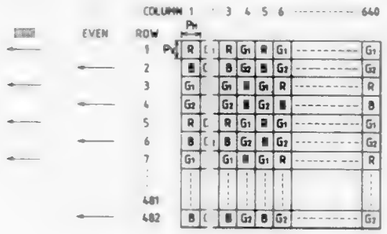
Akihiko Shiraishi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1991, Ser. No. 741,065
Claims priority, application Japan, Aug. 8, 1990, 2-208241; Oct. 30, 1990, 2-290814
Int. Cl.[5] H04N 9/07
U.S. Cl. 358—44 8 Claims

1. A color image pickup apparatus comprising:

an image pickup device in which a color filter array is provided, said color filter array being composed of color filters of three or more colors disposed in such a manner that, assuming that the horizontal scanning directional pitch of said color filters is PH and the vertical scanning directional pitch of the same is Pv, said color filters of the

same color are disposed at a horizontal scanning directional pitch of 2PH and a vertical scanning directional



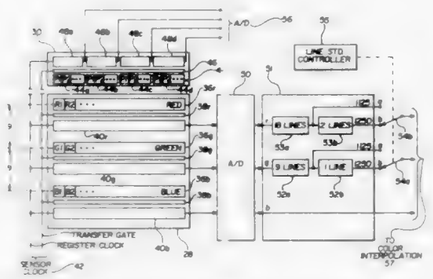
pitch of 2PV while being offset by PH in the horizontal scanning direction.

5,146,121

LINEAR FILM SCANNER OPERABLE AT DIFFERENT LINE RATES

Roger T. Lees, Rickmansworth; Walter R. Godden, Chorleywood; Ronald W. J. Mumford deceased, late of Hitchin by Shaiagh Mary Mumford, personal representative, and John D. Millward, Hitchin, all of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1991, Ser. No. 713,925
Int. Cl.[5] H04N 9/11
U.S. Cl. 358—54 15 Claims



13. Line sensing apparatus including plural linear arrays for linear scanning of a transparent original according to either of two television standards, each standard defining a television line spacing appropriate for that standard, the transparent original being driven at a uniform rate between the linear arrays and a light source in a page scanning direction Perpendicular to the linear dimension of the linear arrays, the improvement wherein the plural linear arrays are supported in the page scanning direction by a predetermined spacing that constitutes substantially integral multiples of the line spacing of both standards.

5,146,122

PROJECTION TELEVISION APPARATUS FOR REDUCING RED-EMPHASIZED PERIPHERAL SCREEN PORTIONS

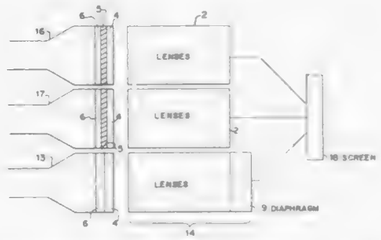
Hiroshi Tetsuda, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 592,458
Claims priority, application Japan, Oct. 11, 1989, 1-264163
Int. Cl.[5] H04N 9/31
U.S. Cl. 358—60 7 Claims

1. A projection television apparatus including red, green and blue cathode ray tubes for displaying light on a screen, emitted from each of the red, green and blue cathode ray tubes, further comprising;

(a) a multilayered interference filter, inserted between a display face plate pane and a fluorescent material layer of said blue and green cathode ray tubes, for varying a luminous intensity of light emitted from said fluoresecent material layer;

(b) a series of projection lenses, located in front of said blue and green cathode ray tubes, for projecting onto a screen,



the luminous intensity which is varied by said multilayered interference filter refracting said light; and

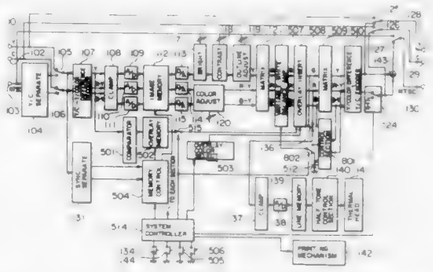
(c) a series of projection lenses, including a diaphragm, disposed in front of said red cathode ray tube, for refracting light from a fluorescent material layer of said red cathode ray tube and for decreasing luminous intensity at peripheral portions relatives to a center of said screen, thereby projecting an image onto said screen without need for a multilayered interference filter for the red cathode ray tube.

5,146,323

SIGNAL PROCESSING CIRCUIT INCLUDING A WHITE BALANCE ADJUSTING CIRCUIT IN A COLOR VIDEO PRINTER APPARATUS

Yasunori Kobori, Yokohama; Kentaro Hamma, Katsuta, and Yoshiaki Mochimaru, Yamato, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitchi Video Engineering Incorporated, Kanagawa, both of, Japan

Filed Sep. 28, 1989, Ser. No. 413,774
Claims priority, application Japan, Oct. 3, 1988, 63-247361
Int. Cl.[5] G03F 3/10
U.S. Cl. 358—76 10 Claims



5. A color video printer apparatus comprising:

first A/D converting means for A/D converting input video signals;

first memory means for storing outputs of the first A/D converting means;

D/A converting means for D/A converting the signals read out of the first memory means;

RGB converting means for converting outputs of the D/A converting means into RGB video signals;

comparator means for converting the input video signals into binary digital signals;

second memory means for storing outputs of the comparator means;

color selecting means for determining respective levels among R, G, and B of the RGB video signals to be overlaid;

automatic white balance adjusting means which is connected to the RGB converting means and detects a white balance from the RGB video signals and automatically changes amplification factors among the RGB video signals;

overlay inserting means for switching between outputs of the automatic white balance adjusting means and an output of the color selecting means in accordance with outputs of the second memory means;

blanking means connected to the overlay inserting means for blanking an overlaid signal from input video signals to the blanking means in accordance with outputs of the second memory menas, thereby to produce a white balance control signal which is supplied to the automatic white balance adjusting means;

second A/D converting means for A/D converting outputs of the overlay inserting means; and

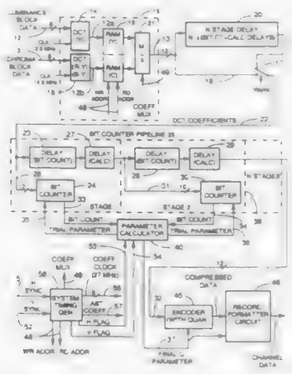
means for color printing outputs of the second A/D converting means.

5,146,324

DATA COMPRESSION USING A FEEDFORWARD QUANTIZATION ESTIMATOR

Sidney D. Miller, Mt. View; Peter Smidth, Menlo Park, and Charles H. Coleman, Redwood City, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jul. 31, 1990, Ser. No. 560,606
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—133 16 Claims



1. A method of preparing a digital video signal, having a data rate, D_{in}, for transmission as an encoded output signal, said encoded output signal to be transmitted over a channel having a preselected constant data rate capacity, D_{out}, which is less than the data rate D_{in}, said method comprising the steps of:

(a) transforming said video signal to a spatial-frequency domain digital signal formatted in groups of transform coefficients of generally varying information content;

(a1) estimating trial quantizing parameters from one of the groups;

(b) selecting in response to said trial quantizing parameters values of final quantizing parameters Q_f for the groups of transform coefficients in accordance with their respective generally varying information content, which parameters Q_f when applied to quantize the coefficients would generate respective encoded output signals with a predetermined number of encoded bits corresponding to said constant data rate D_{out};

(c) quantizing said groups of transform coefficients of generally varying information content to integral values in response to respective said quantizing parameters, Q_f, to generate therewith groups of quantized coefficients of essentially constant information content; and

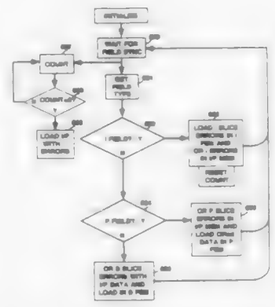
(d) encoding said groups of quantized coefficients of essentially constant information content to produce said encoded output signal of said predetermined number of encoded bits corresponding to said constant data rate D_{out}.

5,146,325

VIDEO SIGNAL DECOMPRESSION APPARATUS FOR INDEPENDENTLY COMPRESSED EVEN AND ODD FIELD DATA

Sheau-Bao Ng, Plainsboro, N.J., assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Apr. 29, 1991, Ser. No. 692,868
Int. Cl.[5] H04N 7/13
U.S. Cl. 358—135 9 Claims



1. Apparatus for receiving and decompressing compressed image data of the type wherein odd and even fields of image data are independently compressed according to respective sequences of interframe and intraframe encoding modes, said apparatus comprising means for independently decompressing said compressed odd and even fields of image data; and means for substituting odd field data for even field data when valid even field data is not available.

5,146,326

CODED PICTURE INFORMATION DECODING APPARATUS HAVING MEANS FOR IMPROVING PICTURE DISTORTION

Makoto Hasegawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1990, Ser. No. 611,638
Claims priority, application Japan, Nov. 14, 1989, 1-293845; Nov. 28, 1989, 1-306605
Int. Cl.[5] H04N 7/12, 9/64
U.S. Cl. 358—135 14 Claims

1. A coded picture information decoding apparatus comprising:

decoder means for decoding a code word corresponding to a series of transfer coefficients obtained by carrying out a discrete cosine transform for picture information to be transmitted in a block unit obtained by dividing said picture information on a coder side and for reproducing said series of transfer coefficients;

inverse transform means, coupled to said decoder means, for carrying out an inverse discrete cosine transform for said series of transfer coefficients reproduced by said decoder

means in the block unit and for outputting reproduced picture information;

prediction means, coupled to inverse transform means, for predicting, in the block unit, whether or not a picture distortion will occur on the basis of said transfer coefficients obtained in the block unit and for outputting a prediction result obtained in the block unit; and

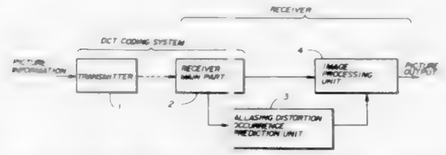


image processing means, coupled to said inverse transform means and said prediction means, for carrying out a predetermined image process of preventing the occurrence of said picture distortion for said reproduced picture information related to a block indicated by said prediction result showing that the occurrence of the picture distortion is predicted.

5,146,327

ADDITION SIGNAL MULTIPLEXING APPARATUS FOR A TELEVISION SYSTEM

Yoshio Sugimori, Tokyo; Yoshihide Kimata, Machida; Yoshihiko Ogawa, Yokohama, and Kiyoyuki Kawai, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Nippon Television Network Corporation, Tokyo, both of, Japan

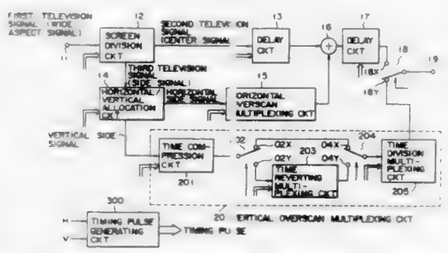
PCT No. PCT/JP90/00136, § 371 Date Oct. 11, 1990, § 102(e) Date Oct. 11, 1990, PCT Pub. No. WO90/09719, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 5, 1990, Ser. No. 598,626

Claims priority, application Japan, Feb. 14, 1989, 1-34427

Int. Cl.[5] H04N *7/04, 11/06, 7/00*

U.S. Cl. 358—141 4 Claims



1. An addition signal multiplexing apparatus for a television system, characterized by comprising:

screen division means for allowing a first television signal representing a first screen of a first aspect ratio to be divided into a second television signal representing a second screen of a second aspect ratio smaller than the first aspect ratio and a third television signal representing a third screen which is obtained by subtracting the second screen from the first screen;

time division arranging means supplied with the third television signal intermittently taken by the screen division means from each line of the first television signal, for time reversing the third television signal for each line to time division arrange into a continuous form; and

means, supplied with the time division third television signal and second television signal, for achieving the multiplexing of the time division arranged third television signal on vertical overscan areas of the second television signal.

5,146,328

COLOR SIGNAL NETWORK SYSTEM

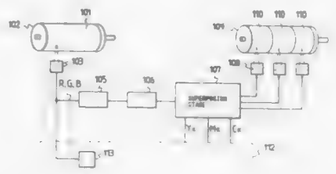
Toru Yamasaki; Hiroaki Ikegami; Noriaki Seki; Yoshiharu Hibi, and Yoshihiro Terada, all of Kanagawa, Japan, assignors to Fuji Xerox Corporation, Ltd., Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 729,591

Claims priority, application Japan, Jul. 18, 1990, 2-189740

Int. Cl.[5] H04N *5/202*

U.S. Cl. 358—164 10 Claims



1. A color recording apparatus comprising a first matrix computing means for performing matrix operations on input color signals, a gamma transforming means for subjecting the results of computation with said first matrix computing means to gamma-transformation, a second matrix computing means for performing matrix operations on the output of said gamma transforming means, a recording means for performing recording on a recording sheet on the basis of the results of computation with said second matrix computing means, and a rewriting means for rewriting the coefficients of matrices in said first and second matrix computing means and the constants used in said gamma transforming means.

5,146,329

APPARATUS AND METHOD FOR REDUCING LINE FLICKER IN A TELEVISION PICTURE

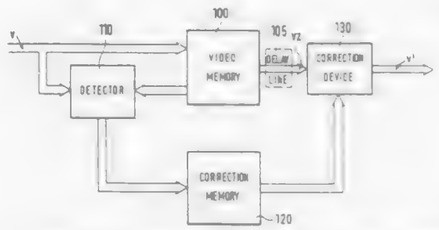
Peter M. Flamm, March-Buchheim, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Mar. 1, 1991, Ser. No. 662,647

Claims priority, application European Pat. Off., Mar. 9, 1990, 90104483.4

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—166 18 Claims



1. A method of reducing line flicker in a television picture reproduced from a plurality of frames supplied by an interlaced video signal, each frame in said vide signal consisting of a first field, which contains all odd-numbered lines of said frame, and a second field, which contains all even-numbered lines of said frame, each one of said lines containing luminance values, said first and second fields being transmitted via said video signal at a given repetition rate, said first and second fields being reproduced on a television screen at twice the given repetition rate in a vertically-temporal scanning sequence consisting of a primary first field, secondary first field, secondary second field and primary second field, said method comprising the steps of:

(a) determining whether a step change in luminance value occurs between a line of a field and a vertically-following line in a temporally-following field;

(b) converting said step change to a correction factor; and

(c) applying said correction factor to said video signal when one of said fields in said scanning sequence is reproduced, wherein a line of either said first field or said second field is signal-adaptively corrected in said one of said fields, whereby if a step change occurs in a line of said first field, said correction factor is applied to said line to cause a signal-adaptive delay of said line during the reproduction of said first field as said secondary first field and said line flicker in said picture is reduced.

5,146,330

APPARATUS AND METHOD FOR REDUCING NOISE IN A VIDEO SIGNAL

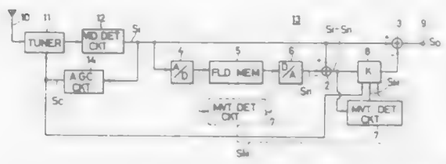
Takashi Okada; Masumi Ogawa, both of Kanagawa; Mitsuyasu Asano, Tokyo, and Masaru Nonogaki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 294,662, filed as PCT/JP88/00287, Mar. 18, 1988, abandoned. This application Jun. 10, 1991, Ser. No. 713,641

Claims priority, application Japan, Mar. 19, 1987, 62-65066

Int. Cl.[5] H04N *5/21, 5/52*

U.S. Cl. 358—167 16 Claims



1. A noise reduction circuit for a video signal comprising:

a tuner and video detector for receiving and selecting an input television video signal;

movement detection means connected to the video detector for detecting movement in the input video signal and generating a first control signal depending upon such movement;

an automatic gain control circuit which receives the input video signal and controls the gain of the tuner and outputs a second control signal depending upon the strength of the input video signal;

difference detecting means including a field or frame delay circuit, connected to the video detector for detecting the difference between the input video signal and a delayed input video signal from the field or frame delay circuit, and generating a field or frame difference signal;

a gain controlled amplifier, the gain of which is responsive to both the first and second control signals, connected to the difference detecting means for receiving the difference signal and controlling its amplitude, and outputting an amplified signal; and

a signal composing circuit for subtracting the amplified signal from the input video signal.

5,146,331

APPARATUS FOR ADJUSTING PICTURE QUALITY OF HIGH DEFINITION TELEVISION SIGNALS OF EITHER STANDARD OR WIDE ASPECT RATIOS DISPLAYED ON A WIDE ASPECT RATIO DISPLAY

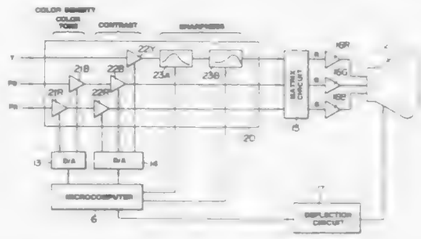
Susumu Tsuchida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 8, 1991, Ser. No. 666,600

Claims priority, application Japan, Mar. 13, 1990, 2-59969

Int. Cl.[5] H04N *5/262, 5/46, 7/01, 5/57*

U.S. Cl. 359—169 8 Claims



1. An image display device for displaying television signals received in different aspect ratio formats comprising;

first receiving means for receiving a first television signal of a standard aspect ratio,

second receiving means for receiving a second television signal of a wide aspect ratio,

detecting means for detecting a type of said received first and second television signals,

display means having a screen of the wide aspect ratio for displaying an image in the standard aspect ratio or the wide aspect ratio in response to the received television signal, and

picture quality adjustment means for adjusting picture quality of the displayed image differently dependent upon the detected type of received television signal, said picture quality adjustment means including a sharpness adjustment means for adjusting the sharpness of the displayed image.

5,146,332

VIDEO SIGNAL DELAY CIRCUIT HAVING SELF ADJUSTING GAIN

Kenji Hara, and Yoshio Wada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

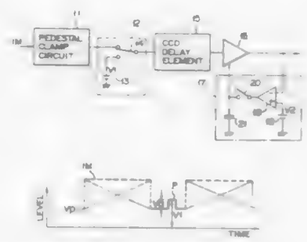
PCT No. PCT/JP90/01143, § 371 Date Apr. 26, 1991, § 102(e) Date Apr. 26, 1991

PCT Filed Sep. 6, 1990, Ser. No. 678,311

Claims priority, application Japan, Sep. 7, 1989, 1-230535

Int. Cl.[5] H04N *5/18*

U.S. Cl. 358—172 14 Claims



1. A video signal delay circuit comprising:

a first circuit for fixing a pedestal level of a video signal to a predetermined level;

an inserting circuit for inserting a pulse signal in a signal period of the video signal partially corresponding to a blanking period thereof, the pulse signal having a predetermined level with respect to the pedestal level;

a delay element for receiving the video signal in which the pulse signal is inserted by said inserting circuit, and for delaying the video signal by a predetermined period of time;

a variable gain amplifier for receiving an output signal from said semiconductor delay element, and for amplifying the output signal to generate an amplified signal having a pulse corresponding to the pulse inserted by the inserting circuit; and

a gain control circuit, responsive to the amplified signal, for controlling the gain of said variable gain amplifier such that the pulse in the amplified signal is set at a predetermined level with respect to the pedestal level.

5,146,333

SELF KEYER WITH PRE-EMPHASIZED FILL VIDEO

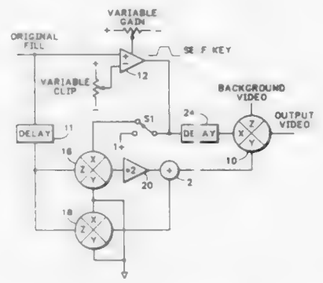
Daniel J. Chaplin, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Oct. 6, 1989, Ser. No. 418,353

The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.

Int. Cl.[5] H04N *5/275*

U.S. Cl. 358—182 4 Claims



1. An improved self keyer for combining a fill video signal with a background video signal comprising:

means for modifying the fill video signal during a transition to produce a pre-emphasized fill video signal that compensates for multiplication when the fill video signal is multiplied by a self key signal derived from the fill video signal; and

means for combining the pre-emphasized fill video signal with the background video signal under control of the self key signal.

5,146,334

VIDEO SIGNAL PROCESSING DEVICE FOR IMAGE EDITING USING MEMORY

Tsutomu Fukatsu, Kanagawa; Tadayoshi Nakayama, Tokyo; Yoshihiro Nakatani, Kanagawa; Hisataka Hirose, Kanagawa; Chikara Sato, Kanagawa, and Keiichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 481,982

Claims priority, application Japan, Feb. 27, 1989, 1-45794; Feb. 28, 1989, 1-48903; Feb. 28, 1989, 1-48911

Int. Cl.[5] H04N *5/262 5/272, 9/74*

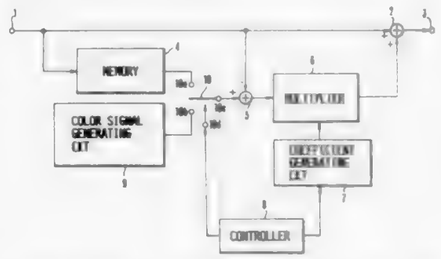
U.S. Cl. 358—183 19 Claims

1. A video signal processing device comprising:

a) memory means having a memory arranged to receive a first video signal and to be capable of storing at least one picture of a video signal;

b) subtracting means for forming a video signal representing a difference between a video signal output from said memory means and a second video signal;

c) multiplying means arranged to receive the video signal output from said subtracting means and to multiply the video signal by a variable coefficient;



d) adding means for adding together a video signal output from said multiplying means and said second video signal; and

e) switching means for selectively supplying said second video signal or a video signal output from said adding means to said memory means as said first video signal.

5,146,335

SIMULTANEOUS, MULTI-ASPECT RATIO TELEVISION DISPLAY

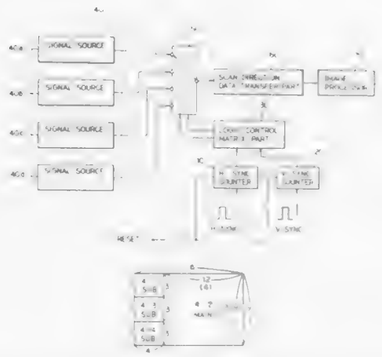
Jihn K. Kim, and Chang W. Hong, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Dec. 19, 1990, Ser. No. 630,203

Claims priority, application Rep. of Korea, Dec. 21, 1989, 89-19424

Int. Cl.[5] H04N *5/45*

U.S. Cl. 358—183 3 Claims



1. In an HDTV system having apparatus and a video display means for providing a display of video signals having a 9:16 aspect ratio, a device for selectively simultaneously providing on said video display means a plurality of 3:4 aspect ratio displays of video signals, each constituting a respective image, and all said images being substantially completely non-overlappingly tiled,

said device comprising:

a horizontal synchronizing counter for counting horizontal synchronizing signals associated with said first display of video signals having a 9:16 aspect ratio;

a vertical synchronizing counter for counting vertical synchronizing signals associated with said first display of video signals having a 9:16 aspect ratio;

a logic control matrix part operatively connected with said horizontal and vertical synchronizing counters, for providing control signals related to counts respectively provided by said counters;

a plurality of signal sources each arranged to provide, when selected, a respective set of video signals for a respective video display of a respective image having a 3:4 aspect ratio;

a switching block effectively connected to said logic matrix part and to said logic control matrix part, for switching among said plurality of signal sources, depending upon said control signals, and thereby providing successively switched-to signal sources successively to an output means of said switching block;

a scan position data transfer part effectively connected to said output means of said switching block for transferring scan position data for said 3:4 aspect ratio images to be displayed on said video display means of said HDTV system; and

an image processor effectively connected to said scan position data transfer part for processing said 3:4 aspect ratio images, so that each is displayed on a distinct portion of said video display means with none of said 3:4 aspect ratio images substantially overlapping one another.

5,146,336

SYNC CONTROL FOR VIDEO OVERLAY

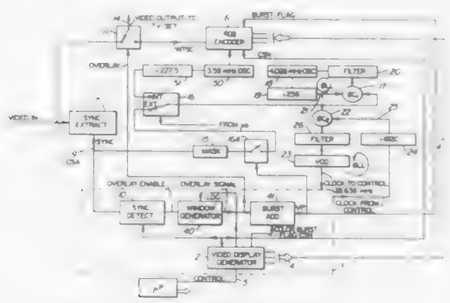
Alain Tessier, Piedmont; Jean P. Champagne, Brossard; Maurice Milot, Anjou; Albert Belanger, St-Philippe de Laprairie, and Yves Tardif, Montreal, all of Canada, assignors to Le Groupe Videotron LTEE, Montreal, Canada

Filed Sep. 14, 1990, Ser. No. 582,356

Claims priority, application Canada, Sep. 25, 1989, 612741

Int. Cl.[5] H04N *5/262*

U.S. Cl. 358—183 9 Claims



1. A video sync control circuit comprising:

(a) means for receiving an video input signal,

(b) means for detecting the presence of an input sync signal which is part of the video input signal, and the absence of said sync signal during all or part of a sync interval of said video input signal,

(c) means for locally generating a replacement video signal containing a video display which extends over a predetermined time interval, which is in sync with a local clock,

(d) means for phase locking the local clock with the input sync signal,

(e) means for switching the input video signal to an output line during time other than during said time interval, and switching the replacement composite video signal to the output line during said time interval.

5,146,337

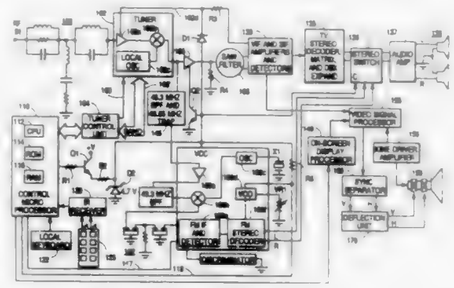
USING A FIRST IF OF 43.5 MHZ OR LESS IN AN FM RADIO IN A TELEVISION TUNER

Gary D. Grubbs, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc, Indianapolis, Ind.

Filed Aug. 6, 1990, Ser. No. 561,585

Int. Cl.[5] H04N *5/50*

U.S. Cl. 358—191.1 2 Claims



1. A television receiver, comprising:

tuner means for operating in a first mode for receiving television RF signals, said tuner means selecting a particular television RF signal from a plurality of television RF signals in response to a control signal;

control means for generating said control signal for causing said tuner means to select said particular RF signal;

said tuner means also operating in a second mode as a first frequency conversion stage for a double conversion broadcast FM radio signal receiver, for receiving broadcast FM radio RF signals, said tuner means selecting a particular broadcast FM radio RF signal from a plurality of broadcast FM radio RF signals in response to said control signal for converting said broadcast FM radio RF signal to a first intermediate frequency;

a second frequency conversion stage of said double conversion broadcast FM radio signal receiver, said second frequency conversion stage receiving said broadcast FM radio signal at said first intermediate frequency and converting said broadcast FM radio signal to a second intermediate frequency; and

means for demodulating audio signals from said broadcast FM radio signal at said second intermediate frequency; and wherein

said first intermediate frequency is 43.3 MHz.

5,146,338

FIXED RF AGC OF A TELEVISION TUNER FOR FM RECEPTION IN A TELEVISION RECEIVER

William L. Lehmann, and Leroy S. Wignot, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 6, 1990, Ser. No. 561,583

Int. Cl.[5] H04N *5/50*

U.S. Cl. 358—191.1 8 Claims

1. A television receiver, comprising:

tuner means for operating in a first mode for receiving television RF signals, said tuner means selecting a particular television RF signal from a plurality of television RF signals in response to a control signal;

said tuner means also operating in a second mode as a first frequency conversion stage for a double conversion broadcast FM radio signal receiver, for receiving broadcast FM radio RF signals, said tuner means selecting a particular broadcast FM radio RF signal from a plurality of broadcast FM radio RF signals in response to said control signal, and for converting said particular broadcast FM radio RF signal to a first intermediate frequency;

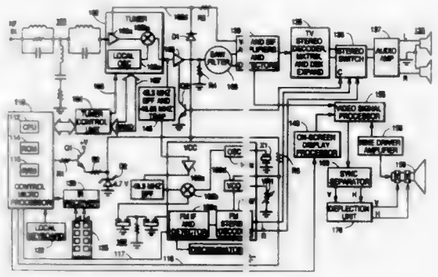
control means for generating said control signal for causing

said tuner means to select one of said particular television RF signal and said particular broadcast FM radio RF signal;

a second frequency conversion stage of said double conversion broadcast FM radio signal receiver, said second frequency conversion stage receiving said broadcast FM radio signal at said first intermediate frequency and converting said broadcast FM radio signal at said first intermediate frequency to a second intermediate frequency;

means for demodulating audio signals from said broadcast FM radio signal at said second intermediate frequency; and

means for providing a fixed AGC signal to fix the gain of said tuner means to a predetermined value when said tuner means is operating in said second mode.

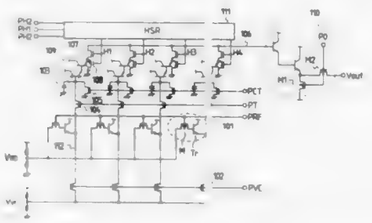


5,146,339

PHOTOELECTRIC CONVERTING APPARATUS EMPLOYING DARLINGTON TRANSISTOR READOUT

Mahito Shinohara, Tokyo, and Seiji Hashimoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 618,361
Claims priority, application Japan, Nov. 21, 1989, 1-300717; Nov. 13, 1990, 2-303957
Int. Cl.[5] H04N 3/12 3/14, 5/335
U.S. Cl. 358—212 16 Claims



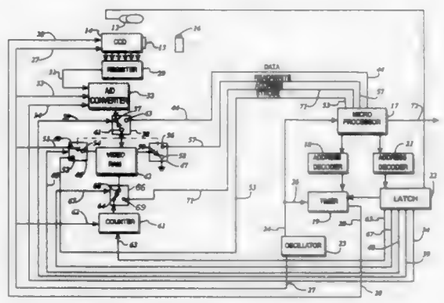
1. A photoelectric converting apparatus, wherein a control electrode of a Darlington type transistor is connected to a signal output side of photoelectric conversion elements which can accumulate charges that are photo-electrically converted and a load means is electrically connected to one main electrode of said Darlington type transistor so that said Darlington type transistor operates as an emitter-follower circuit and a signal is read out from said main electrode.

5,146,340

IMAGE DATA READING AND PROCESSING APPARATUS

Stephen L. Dickerson, Atlanta, and Kok-Meng Lee, Marietta, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jun. 17, 1991, Ser. No. 716,266
Int. Cl.[5] H04N 5/225
U.S. Cl. 358—213.27 17 Claims



1. An image reading system comprising;

an imaging array comprising rows and columns of light sensitive solid state elements;

focusing means for focusing an image containing field of view onto said array;

timer means for generating and applying row reading signals to said array;

synchronizing means for applying column reading signals to said array;

converter means for converting the read-out of said array to a digital signal and applying the digital signal to a storage device;

counter means for applying address information signals to said storage device concurrently with the digital signal from said converter means for identifying and locating the digital signals relative to the total field focused on said array;

a signal processor member;

means for applying the stored signals in said storage device to said processor member for analyzing the read image and determining the location of an object or objects within the field, and identifying the particular area of the array in which the object is located, said processor member being adapted to alter the row reading rate of said timer means row reading signals to a first rate in those portions of the array outside the particular area, and to read only the partial rows defining the particular area after the first row of the particular area is reached during the reading process at a rate different from said first rate; and

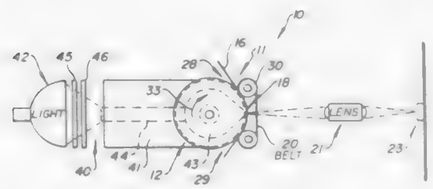
latch means for switching said storage device between a data receiving condition and a data output condition under control of said processor member, said latch means being adapted to actuate switching means to switch said storage device from a write mode wherein signals from said converter means are applied to said storage device to a read mode wherein data contained in said storage device is applied to said signal processing member.

5,146,341

FILM SCANNER HAVING A DYNAMIC FILM GATE AND AN INTEGRATING CYLINDER INCORPORATED THEREIN

Gary L. Erck, Webster, and Richard J. Federico, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1990, Ser. No. 559,247
Int. Cl.[5] H04N 5/235
U.S. Cl. 358—214 19 Claims



1. A film scanner comprising:

means for supporting a film at an imaging station said supporting means being movable with the film;

means for urging said film directly in contact against said supporting means, said urging means contacting said film along an edge portion thereof and being movable therewith;

illumination means for producing a line of light on said film as it is contacted by said supporting means, said line of light contacting said film at a location adjacent said edge portion where said urging means contacts said film, said illumination means including an integrating cylinder having a cavity therein; and

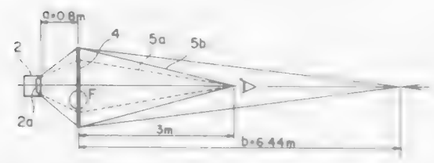
means for driving said supporting means to advance the film relative to said illumination means, said driving means having a portion thereof located in said cavity.

5,146,342

REAR PROJECTION TELEVISION SET WITH LENTICULAR SHEET AND FRESNEL LENS

Toru Yokoo, and Takashi Nagashima, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 625,197
Claims priority, application Japan, Apr. 20, 1990, 2-103138; Apr. 25, 1990, 2-107521
Int. Cl.[5] H04N 9/31, 5/74
U.S. Cl. 358—231 6 Claims



1. A rear projection television set comprising:

a light transmissive screen 4 formed of a lenticular sheet superposed to a Fresnel lens;

at least one projector for projecting an image onto said Fresnel lens so that the image through the lenticular is viewed by a viewer; and

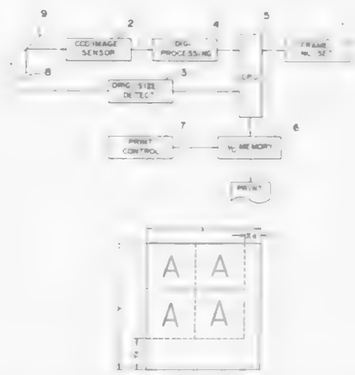
a projector lens 2 mounted to said projector, said projector lens having an exit pupil so as to project the image from said projector onto the Fresnel lens; wherein said image through the lenticular sheet is viewed at a distance from the lenticular lens, wherein there is a relation $a \times b < 5.5$ where a is a distance between said exit pupil of the projector lens 2 and said Fresnel lens 1, and b is a condensing distance for a maximum radius equal to the vertical dimension of said screen.

5,146,343

IMAGE PROCESSING DEVICE FOR DETERMINING AND PRINTING A MAXIMUM NUMBER OF IMAGE FRAMES IN DESIRED SIZE AND LAYOUT

Yoshiharu Fujii, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1990, Ser. No. 613,053
Claims priority, application Japan, Nov. 20, 1989, 1-302748
Int. Cl.[5] H04N 1/23, 1/387, 1/393
U.S. Cl. 358—296 10 Claims



1. An image processing device for printing a required number of frames of an image of an original (9) on one or more printing material frames comprising:

an original size detecting means (3) for detecting frame dimensional information (x, y) of said original (9);

a dimension detecting means for detecting frame dimensional information (X, Y) of said printing materials;

a setting means (1) for setting said required number of said original frames; and

a data processing means (5) for processing said dimensional information (X, Y; x, y) of said original (9) and said printing materials to determine a maximum number of said original frames which can be printed within a single printing material frame,

said data processing means including means for determining whether said maximum number is obtained with said original frames to be printed aligned in a vertical orientation with respect to said printing material frame or aligned in a lateral orientation with respect to said printing material frame and for selecting the one of the orientations producing said maximum number, whereby a minimum number of said printing material frames are used to print said required number of said original frames.

5,146,344

PRINTING SYSTEM WITH AUTOMATIC STATISTICAL COMPILATION AND BILLING

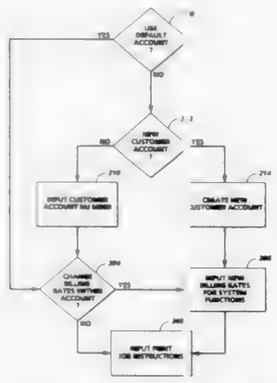
Elizabeth A. Bennett, Penfield; Claudia Raven, Rochester, and John L. Rourke, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1990, Ser. No. 590,125
Int. Cl.[5] H04N 1/21, 1/23
U.S. Cl. 358—296 20 Claims

1. An electronic reprographic printing system comprising:

means for electronically storing in memory a plurality of customer accounts;

means for scanning a set of origina documents which comprise a print job;
means for electronically storing i memory images of the scanned documents;
means for converting the images to electronic pages for printing;
means for specifying by an operato r which of a plurality of reprographic system functions ar : to be performed for the print job, said operator specified reprographic system functions being any number of said plurality of reprographic system functions;
means for printing pages corresp nding to said electronic pages in accordance with said operator specified reprographic system functions for sa d print job, said system functions being performed withi a length of time;



means for counting a number of p inted pages under corresponding system functions of s id print job to arrive at count totals;
means for storing the count total of the system functions performed for the print job under an account number, the account number having billing rates for corresponding reprographic system functions; nd
means for determining a total cost for the print job by calculating a system function cost bas d on the count totals and the billing rates of respective sy tem functions, and calculating a time cost by assigning a billing rate per unit time and multiplying the billing rate per unit time by the length of time taken for printing the electronic pages in accordance with the operator specifie l system functions for the print job.

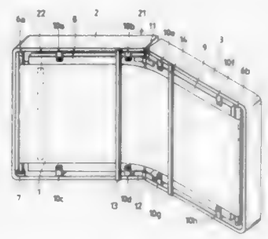
5,146,345

FOLDABLE ELECTRONIC PRINT BOARD WITH CENTRALLY LOCATED PRINTER FOR STABILITY

Atsushi Yamashita, and Takeshi Nakayama, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1991, Ser. No. 784,535
Claims priority, application Japan, Oct. 29, 1990, 2-292300
Int. Cl.[5] H04N *1/10*
U.S. Cl. 358—297 **12 Claims**

1. A foldable electronic print board comprising:
a writing sheet for bearing handwritten information thereon;
a board casing, said writing sheet being housed in said casing, said board casing being foldable about an axis located substantially at a center of said writing sheet;
reading means, disposed in said board casing, for reading the handwritten information on said writing sheet; and
printing means for printing the information read by said reading means on printing paper, said printing means being mounted on said board casing across said axis while



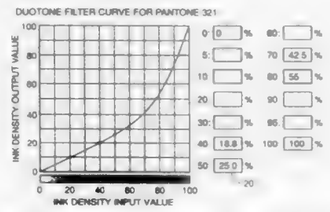
the board casing is being unfolded, to prevent said board casing from being folded.

5,146,346

METHOD FOR DISPLAYING AND PRINTING MULTITONE IMAGES DERIVED FROM GRAYSCALE IMAGES

Thomas Knoll, Ann Arbor, Mich., assignor to Adobe Systems Incorporated, Mountain View, Calif.

Filed Jun. 14, 1991, Ser. No. 715,502
Int. Cl.[5] H04N *1/23, 1/46*
U.S. Cl. 358—298 **3 Claims**



1. A method for displaying multitone images derived from a grayscale image having a predetermined number of shades of gray, comprising:
selecting a plurality of ink colors for said image, one for each of said multitones, each of said ink colors having an ink color value;
selecting a plurality of ink transfer, functions, one for each of said plurality of selected ink colors;
converting each of said shades of gray, using said respective ink color values and said ink transfer functions, into a new ink color value; and
displaying said image on a video display terminal using said new ink color values in place of said shades of gray.

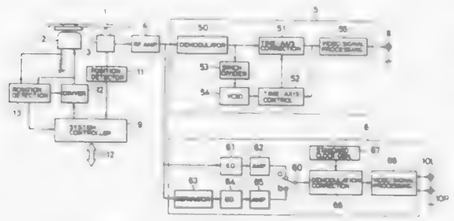
5,146,347

DISC PLAYER CONTROL SYSTEM FOR QUICKLY PLACING DISC PLAYER IN COMMAND READY STATE

Akira Kawakami, and Shoichi Katagiri, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 178,944, Apr. 7, 1988, abandoned. This application Feb. 9, 1990, Ser. No. 478,031
Claims priority, application Japan, May 29, 1987, 62-137532
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—342 **8 Claims**

1. A control method for a disc player for playing a disc having a first region in which digital signals are recorded and a second region on which frequency modulated video signals and pulse code modulated audio signals are recorded, which method comprises the steps of:
compulsorily stopping a spindle motor for rotating said disc when said spindle motor is rotating and a power source of said disc player is turned from an OFF state to an ON state; and then



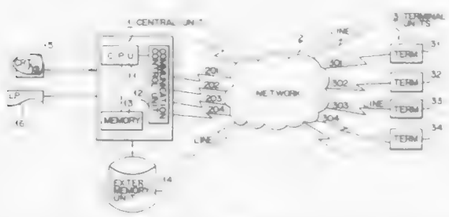
moving an information detection point of a pickup to an innermost circumferential position of said first region when said information detection point is not at the innermost circumferential position of said first region.

5,146,348

STORE-AND-FORWARD SWITCHING SYSTEM

Yoshinobu Kaneyama, Yono, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 19, 1991, Ser. No. 746,978
Claims priority, application Japan, Aug. 20, 1990, 2-217169; Aug. 24, 1990, 2-221193
Int. Cl.[5] H04N *1/32, 1/23;* **H04M** *11/00*
U.S. Cl. 358—407 **12 Claims**



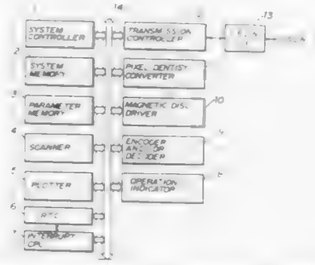
1. In a store-and-forward switching system which comprises a plurality of terminal units and a store-and-forward switching unit coupled to said terminals units through a network for loading data into said terminals and which temporarily stores a communication service request and data on which the communication service is to be performed which are sent from a terminal, reads the data in accordance with the communication service and performs a process specified by the communication service on the data,
said store-and-forward switching unit comprises:
data producing means for producing data for defining types of services which are granted to each of said terminal units upon request and control data needed for said terminal units to perform the granted services as loading data; and
loading means for transmitting the data produced by said data producing means to load said data into said terminal units,
each of said terminal units comprises:
display means responsive to the loading data loaded by said store-and-forward switching unit for displaying types of services which are granted to said terminal units; and
control means responsive to the loading data loaded by said store-and-forward switching unit for making a request to said store-and-forward switching unit for a communication service.

5,146,349

FACSIMILE APPARATUS WHICH CAN COORDINATE COMMUNICATION WITH MORE THAN ONE EXTERNAL APPARATUS

Yukikazu Mori, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1991, Ser. No. 684,276
Claims priority, application Japan, Apr. 27, 1990, 2-110649
Int. Cl.[5] H04N *1/32*
U.S. Cl. 358—407 **16 Claims**



1. A facsimile apparatus for transmitting information to an external apparatus and/or receiving information therefrom via a transmission line, the information comprising first and second information, the first information comprising image data representing a predetermined image, the second information comprising control information by which said facsimile apparatus and the external apparatus are connected and/or disconnected with each other, the second information including identification information by which said facsimile apparatus and the external apparatus identify each other, the transmission line comprising a plurality of first channels through one of which the first information is transmitted, and at least one second channel through which the second information is transmitted, each of the first channels being operatively interconnectable to said facsimile apparatus and/or the external apparatus, the first information being transmitted simultaneously via no more than two of the first channels to which said facsimile apparatus is simultaneously operatively interconnectable, and the second channel being operatively interconnectable to said facsimile apparatus and/or the external apparatus, said facsimile apparatus comprising:
scanning means for scanning the predetermined image so as to generate the image data;
an interface operatively interconnectable to the transmission line;
a memory, coupled to said scanning means and interface, to store the first and/or second information therein;
first control means, operatively interconnected to said interface and memory, for controlling transmitting and/or receiving of the first and/or second information via said interface;
second control means, operatively interconnected to said first control means, for controlling said first control means,
said second control means instructing the first control means, if first or second information is being transmitted between said first control means and a first external apparatus when said first control means receives the second information from a second external apparatus, not to connect said facsimile apparatus to the second external apparatus via one of the first channels, and to store first identification information representing the second external apparatus included in the second information from the second external apparatus in said memory, and
said second control means instructing said first control means, after the transmission of the first information between said first control means and the first external apparatus, to transmit the second information to the second

external apparatus by means of the first identification information stored in said memory in order to ask the second external apparatus to transmit the first information to said facsimile apparatus so that said first control means can receive the first information to be transmitted from the second external apparatus and the second external apparatus can be prevented from transmitting the second information more than twice to said facsimile apparatus; and

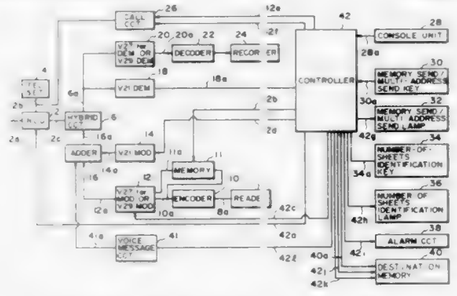
plotter means, responsive to said first control means, for plotting the predetermined image appropriate to the image data which said first control means receives from the external apparatus.

5,146,350

IMAGE TRANSMISSION APPARATUS WITH SHEET NUMBER CHECKING

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1991, Ser. No. 696,177
Claims priority, application Japan, May 10, 1990, 2-118668
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—441 **6 Claims**



1. An image transmission apparatus, comprising:

reading means for reading a document sheet;

feeding means for sequentially and automatically feeding a plurality of document sheets to said reading means;

a memory for storing therein image data of the document sheets read by said reading means;

transmitting means for transmitting the image data when said memory after completion of reading of a plurality of document sheets;

manual entry means for manually entering a number document sheets;

count means for counting the number of document sheets of which images are stored in said memory; and

means for comparing the number of document sheets entered through said manual entry means and the count of said count means and for generating an alarm in accordance with the comparison result.

5,146,351

Patent Not Issued For This Number

5,146,352

IMAGE READER

Yoshiaki Maehara, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 593,326, Oct. 2, 1990, abandoned, which is a continuation of Ser. No. 396,079, Aug. 21, 1989, abandoned. This application Aug. 21, 1991, Ser. No. 750,736
Claims priority, application Japan, Aug. 22, 1988, 63-207650
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 **4 Claims**

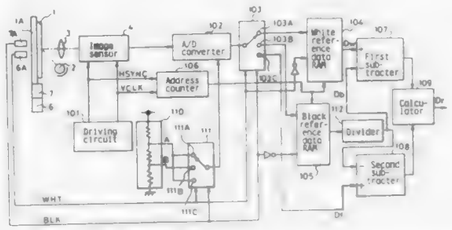
1. An image reader for reading a manuscript arranged on a manuscript plane, comprising:

a black reference object having a minimum reflection coefficient also arranged on said manuscript plane,

an image sensor for issuing image signals of multi-gradation images of an object on said manuscript plane,

an A/D converter for converting said image signals detected by said image sensor into digital data based on a reference voltage wherein a range of said converting depends on a value of said reference voltage,

a voltage selector means for supplying said reference voltage to said A/D converter, supplying a first reference voltage for detecting said black reference object to said A/D converter, which is lower than a second reference voltage supplied for detecting said manuscript so that said black



reference object is A/D converted with a higher dynamic range,

a dividing means for dividing said digital data of the black reference object from said A/D converter to another digital data,

a subtracter for subtracting the another digital data of said black reference object from the digital data of the manuscript to obtain a difference therebetween, and issuing digital data indicative of said difference, and

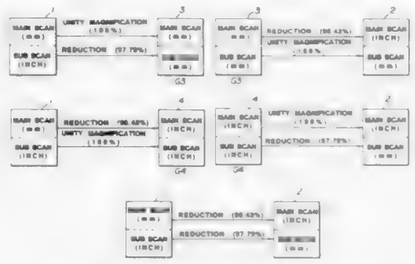
a calculator for converting the digital data of said difference into digital data having a same number of bits as said A/D converter.

5,146,352

READER/RECORDER IN A FACSIMILE MACHINE

Toshihiko Nannichi, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 487,035, Mar. 2, 1990, abandoned. This application Feb. 5, 1992, Ser. No. 829,567
Claims priority, application Japan, Mar. 6, 1989, 1-53482
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—451 **4 Claims**



2. A recorder for use in a first facsimile machine, the recorder comprising:

means for receiving a picture signal from a second facsimile machine, the picture signal having a main-scanning direction component and a sub-scanning direction component; and

means for performing a reduction processing on the main-scanning direction component of the picture signal produced by the second facsimile machine when the main-scanning direction component of the picture signal is expressed in terms of G3 pixels/mm based on a metric unit system,

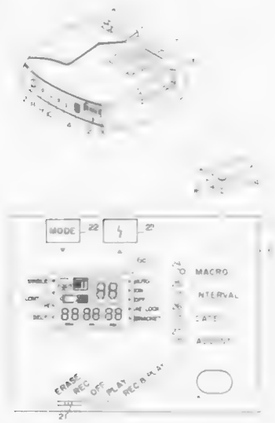
and for performing a reduction processing on the sub-scanning direction component of the picture signal produced by the second facsimile machine when the sub-scanning direction component of the picture signal is expressed in terms of G4 lines/inch based on an inch unit system.

5,146,353

STILL VIDEO CAMERA WITH A PLAYBACK FUNCTION AND SOUND RECORDING FEATURE

Seiichi Isoguchi, Machida; Masaaki Tsuchida, Hachioji; Yoshitaka Ohta, Hachioji, and Tomoaki Tamura, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 20, 1990, Ser. No. 616,100
Claims priority, application Japan, Nov. 29, 1989, 1-307734
Int. Cl.[5] H04N *5/225, 5/30*
U.S. Cl. 358—909 **12 Claims**



1. A still video camera, comprising:

selecting means for selecting an operation mode from a plurality of operation modes including a record-play mode;

trigger means for generating a trigger signal which automatically repeats at selected predetermined time intervals; and

video means responsive to each trigger signal for recording a frame of a subject image and playing back the recorded frame of the subject image subsequent to each recording at times when the record-play mode is selected.

5,146,354

LCD SYSTEM WITH A BACKLIGHT HAVING A LIGHT SOURCE AT A LIGHT PIPE'S EDGE AND WITH THE LCD ENFRAMED

Boris Plesinger, Tomball, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

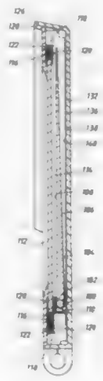
Filed May 7, 1991, Ser. No. 696,779
Int. Cl.[5] G02F *1/1335, 1/1333*; F21V *7/04*
U.S. Cl. 359—49 **10 Claims**

1. A backlighted liquid crystal display system, comprising:

a liquid crystal display panel having a back surface for receiving light;

a metal frame having an inner border, wherein said metal frame enframes said liquid crystal display panel, said inner border defining the exposed area of said back surface of said liquid crystal display panel;

a light pipe having a planar front surface for providing light to said liquid crystal display panel back surface, having at least one end surface for receiving light to be transmitted through said front surface, and having a back surface, said front surface being aligned generally parallel with and separated from said liquid crystal display panel back surface, and wherein said light pipe planar front surface



extends in a plane beyond said metal frame inner border; and

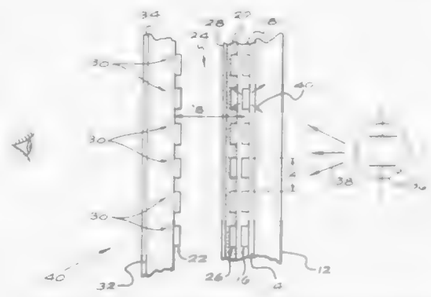
light source means for providing light to said light pipe, a light source located adjacent each said end surface for receiving light of said light pipe.

5,146,355

TRANSFLECTIVE MODE LIQUID CRYSTAL DISPLAY WITH PHOSPHOR ILLUMINATION

John C. Prince, Kettleby, and James F. Farrell, Pickering, both of Canada, assignors to Litton Systems Canada Limited, Etobicoke, Canada

Continuation-in-part of Ser. No. 270,074, Nov. 14, 1988, Pat. No. 5,019,808, which is a continuation-in-part of Ser. No. 922,186, Oct. 23, 1986, Pat. No. 4,799,050. This application Mar. 18, 1991, Ser. No. 671,024
Int. Cl.[5] G02F *1/1335*
U.S. Cl. 359—50 **7 Claims**



1. A transflective mode liquid crystal display comprising in combination:

(a) a layer of liquid crystal material;

(b) an active planar array of transparent control electrodes on a first side of said layer of liquid crystal material for forming a corresponding array of adjacent, modulated light-conducting cells within said layer of liquid crystal material;

(c) a planar matrix layer of discrete phosphor elements of predetermined dot pitch, said layer being located on the opposed, second side of said layer of liquid crystal material;

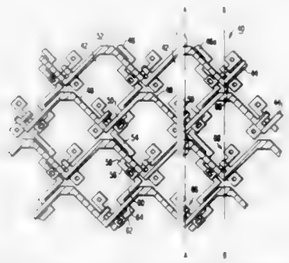
(d) an ultraviolet light source located behind said second side of said layer of liquid crystal material and behind said planar matrix of discrete phosphor elements for irradiating said phosphor elements with ultraviolet light;
(e) a dilute color filter comprising a planar matrix of light-absorbing, wide-passband dye elements, each of said dye elements being in alignment with a like color emitting one of said phosphor elements located between said phosphor layer and said layer of liquid crystal material and adjacent a transparent counterelectrode and
(f) the spacing between said layer of discrete phosphor elements and said planar array of transparent control electrodes does not exceed one-tenth of said dot pitch.

5,146,356

ACTIVE MATRIX ELECTRO-OPTIC DISPLAY DEVICE WITH CLOSE-PACKED ARRANGEMENT OF DIAMOND-LIKE SHAPED

Allan I. Carlson, Briarcliff Manor, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Feb. 4, 1991, Ser. No. 650,147
Int. Cl.[5] G02F *1/1343, 1/1335*
U.S. Cl. 359—59 **13 Claims**



1. An active matrix electro-optic display device comprising an electro-optic material sandwiched between opposing walls, at least one of which is transparent, on one of the walls: an array of pixel electrodes; a switch associated with each pixel electrode, and an array of row and column electrodes interconnecting the pixel electrodes via the switches, the pixel electrodes being diamond-like shaped and arrayed in a close-packed arrangement;

characterized in that: each column electrode extends between and is common to two columns of pixels and their associated switches; and the column electrode-switch connections alternate sequentially between pixel columns.

5,146,357

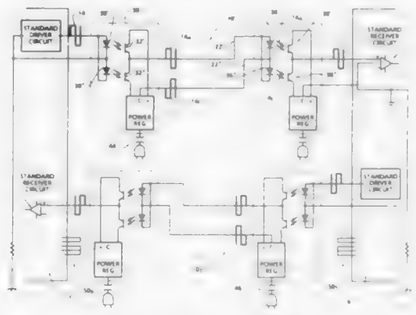
DATA COMMUNICATIONS SYSTEM THAT PREVENTS UNDESIRED COUPLING BETWEEN DATA STATIONS

Barry M. Epstein, Richardson, Tex., assignor to Buffton Corporation, Ft. Worth, Tex.

Filed May 4, 1990, Ser. No. 519,442
Int. Cl.[5] H04E *10/00*
U.S. Cl. 359—152 **37 Claims**

1. A data communication transceiver that prevents undesired coupling between data stations comprising:

A) a transmitting station which generates and transmits data signals, and which includes a ground circuit means and a power source;
B) a receiving station which receives said data signals and which includes a ground circuit means and a power source;
C) a plurality of metallic line conductors located between said transmitting station and said receiving station and which carries said data signals;
D) optical coupling means optically coupling each of said metallic line conductors to said transmitting station to transfer said data signal to each of said metallic line conductors and optically coupling each of said metallic line conductors to said receiving station to transfer said data signals to said receiving station, said optical coupling means including a power source means which is separate from said transmitting station power source and separate from said receiving station power source, a first transmitter optical source connected to said transmitting station and generating a first optical data signal, a second transmitter optical source connected to said transmitting station and generating a second optical data signal, said second optical data signal being a mirror image of said first optical data signal, a first transmitter photodetector located to receive said first optical data signal and coupled to a first metallic line conductor, a second transmitter photodetector located to receive said second optical data



signal and coupled to a second metallic line conductor, a first receiver optical source connected to said first metallic line conductor to receive and transmit said first optical data signal, a second receiver optical source connected to said second metallic line conductor to receive and transmit said second optical data signal, a first receiver photodetector located to receive said first optical data signal from said first receiver optical source, a second receiver photodetector located to receive said second optical data signal from said second receiver optical source, said first and second receiver photodetectors being coupled together and algebraically combining said first and second optical data signals; and
E) said transmitting station ground circuit means being separate from said receiving station ground circuit.

5,146,358

OPTICAL COMMUNICATIONS SYSTEM AND METHOD FOR TRANSMITTING INFORMATION THROUGH A SINGLE OPTICAL WAVEGUIDE

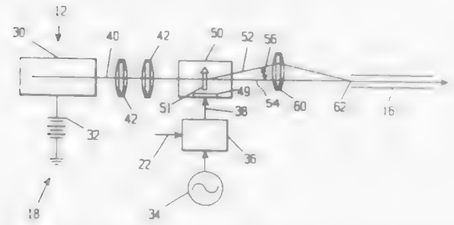
William M. Brooks, Scotts Valley, Calif., assignor to PYR Systems, Inc., San Jose, Calif.

Filed Jan. 25, 1990, Ser. No. 470,965
Int. Cl.[5] H04B *10/04*
U.S. Cl. 359—181 **72 Claims**

1. An optical communication system for communicating information from a first location to a second location, comprising:

input means for producing an acoustic beam modulated by the information and having an acoustic beam frequency;
light source means for producing a continuous wave laser light beam at a substantially fixed optical frequency;
modulation means for receiving the acoustic beam and the laser light beam and producing an undiffracted laser light beam and a diffracted laser light beam, the diffracted laser light beam being frequency-shifted from the frequency of the undiffracted laser light beam by the acoustic beam frequency and being diffracted through an angle that is dependent on the acoustic beam frequency;

means, at the first location, for spatially combining the undiffracted and diffracted laser light beams to produce a combined laser light beam;
a single optical waveguide connected between the first location and the second location, receiving at the first location the combined laser light beam and transmitting the combined laser light beam to the second location; and



output means, at the second location, for receiving the combined laser light beam from the optical waveguide and demodulating the diffracted laser light beam to produce a demodulated signal having the acoustic beam frequency and containing the information content of the acoustic beam.

5,146,359

DOUBLE-STAGE PHASE-DIVERSITY RECEIVER

Takanori Okoshi, 3-7-7, Sengoku, Bunkyo-ku, Tokyo, and Shinji Yamashita, 1-32-20, Daizawa, Setagaya-ku, Tokyo, both of Japan, assignors to The Furukawa Electric Co., Ltd.; Takanori Okoshi and Shinji Yamashita, all of Tokyo, Japan

Continuation of Ser. No. 449,987, Dec. 12, 1989, abandoned.
This application Sep. 5, 1991, Ser. No. 759,036
Claims priority, application Japan, Jan. 26, 1989, 1-17019
Int. Cl.[5] H04B *10/06*
U.S. Cl. 359—189 **6 Claims**

1. A double-stage phase diversity receiver comprising:
an optical fiber, through which an optical signal is transmitted and which has a predetermined propagation function;
signal dividing means for dividing the optical signal transmitted through said optical fiber into a plurality of divided optical signals;
a first-stage local oscillator signal generating means for generating a plurality of optical first-stage local oscillator signals each having a predetermined phase difference with respect to another of said first-stage local oscillator signals;
signal mixing means for mixing each of said plurality of first-stage local oscillator signals with a respective one of said plurality of divided optical signals to generate a plurality of electrical signals;
second-stage local oscillator signal generating means for generating a plurality of electrical second-stage local oscillator signals each having a predetermined phase difference with respect to another of said electrical second stage local oscillator signals;
up-converting means for multiplying each of said plurality of electrical signals by a respective one of said plurality of electrical second-stage local oscillator signals to generate a plurality of up-converted signals;
adding means for adding said plurality of up-converted signals to generate an output signal;
equalizing means for compensating for a distortion due to delay in the optical signal transmitted through said optical fiber and contained in the output signal of said adding means, so as to provide an equalized output signal, said equalizing means having a characteristic $H_d(\omega)$ which is expressed by

$$|H_d(\omega)| = \text{a constant}$$

$$arg H_d(\omega) = -arg H(\omega)$$

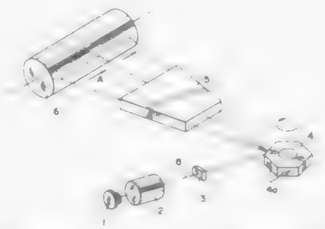
when the propagation function of said optical fiber is $H(\omega)$; and
heterodyne demodulation means for demodulating said equalized output signal.

5,146,360

LIGHT BEAM SCANNING OPTICAL SYSTEM

Kazuo Yamakawa, Osaka, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan

Filed Jul. 31, 1991, Ser. No. 738,328
Claims priority, application Japan, Aug. 1, 1990, 2-205896
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—216 **11 Claims**



11. A light beam scanning optical system comprising:
a plurality of light source emitting laser beams respectively;
a linear image forming optical system for forming linear images with said plurality of laser beams respectively;
beam combining means for combining said plurality of linear images to form one linear images; and
a scanning image forming optical system for causing the beam reflected from deflecting means to form images on the object to be scanned, the scanning image forming optical system including, at least one toric surface and at least one compound lens unit composed of a positive lens and a negative lens.

5,146,361

APPARATUS COMPRISING A MAGNETO-OPTIC ISOLATOR UTILIZING A GARNET LAYER

Steven J. Licht, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

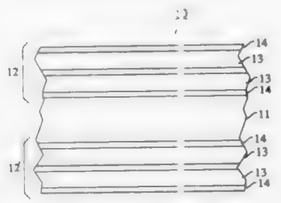
Continuation of Ser. No. 380,580, Jul. 14, 1989, abandoned. This application Mar. 12, 1992, Ser. No. 850,148
Int. Cl.[5] G02F *1/09*
U.S. Cl. 359—280 **8 Claims**

1. Apparatus comprising a source of electromagnetic radiation, radiation utilization means, and magneto-optic isolator means between the source and the utilization means, the isolator means comprising polarizing means, magnet means and a magneto-optic member that comprises a single crystal magneto-optic garnet layer on a single crystal substrate;

CHARACTERIZED IN THAT

the garnet layer comprises at least a first and a second stratum of garnet material; the first stratum having a first composition selected such that the lattice constant of the

first stratum is, at a first temperature, substantially equal to the lattice constant of the substrate, and such that the lattice constant of the first stratum is, at a second temperature that is higher than the first temperature, larger than the lattice constant of the substrate; the second stratum having a second composition selected such that the lattice constant of the second stratum is, at the first temperature, less than the lattice constant of the substrate, and such that



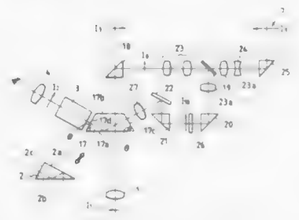
the lattice constant of the second stratum is, at the second temperature, less than the lattice constant of the first stratum, wherein the first composition is $(Bi_xB_{3-x})(Fe_{5-z}C_z)O_{12}$ and the second composition is $(Bi_{x'}B_{3-x'})(Fe_{5-z}C_z)O_{12}$, B being one or more rare earth elements (atomic number 57–71), optional C is chosen from the group consisting of Ga, Al, and combinations thereof, $1 \leqq x \leqq 2.5$, $0 \leqq z \leqq 1$, and $0 < x' < x$.

5,146,363

MICROSCOPE OPTICAL SYSTEM

Chikara Nagano, Hachiouji, Japan, assignor to Olympus Optical Co., Inc., Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 655,772
Claims priority, application Japan, Feb. 19, 1990, 2-38035
Int. Cl.[5] G02B *21/36*
U.S. Cl. 359—363 **8 Claims**



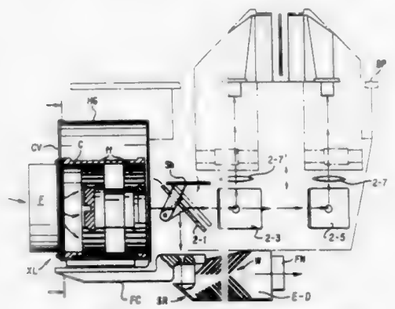
1. A microscope optical system, comprising:
an objective lens;
an observing direction converting prism removably arranged in an optical path of said objective lens for bending a beam of light transmitted by said objective lens in a predetermined direction through an even number of times of internal reflections;
an eyepiece arranged in an optical path of the beam of light bent by said observing direction converting prism;
a second prism having a first surface perpendicular to an optical axis of said objective lens, a second surface opposite to the first surface, a third surface defining a bottom angle with said first surface, said bottom angle being equal to an angle of a surface of said observing direction converting prism directed toward said eyepiece with the first surface, and a fourth surface opposite to the third surface, removably disposed alternatively at a position substantially equivalent to that of said observing direction converting prism;
an odd number of reflecting members comprised of a first reflecting member directing laterally the beam of light transmitted by the first surface and the second surface of said second prism in a plane including the optical axis of said objective lens and a second reflecting member disposed in an optical path of the beam of light bent by the first reflecting member to direct downward the optical path, for forming a loop optical path introducing the beam of light so that after the downward directed optical path is once raised above the fourth surface of said second prism in the plane including the optical axis of said objective lens, the beam of light is obliquely downward incident through the fourth surface on said second prism,
one of said odd number of reflecting members being a semi-transmissive reflecting member and image recording means being disposed in an optical path of the beam of light transmitted through said semi-transmissive reflecting member,
an image of an object through said objective lens being formed in front of said semi-transmissive reflecting member,
said object image being reformed in an optical path bent behind said semi-transmissive reflecting member by a relay lens, and
a photographic lens in an optical path from said second prism to said image recording means,
the beam of light emerging from the loop optical path being reflected an odd number of times in said second prism for introduction into said eyepiece.

5,146,364

INFRA-RED EXTRACTION FROM ILLUMINATION SOURCE

Gary Copenhaver, Canton; Johan Bakker, Union Lake, and John Vala, Plymouth, all of Mich., assignors to Unisys Corporation, Detroit, Mich.

Filed Oct. 10, 1989, Ser. No. 419,560
Int. Cl.[5] F21V *29/00*; G02B *5/26, 27/14*; G03B *21/16*
U.S. Cl. 359—353 **10 Claims**



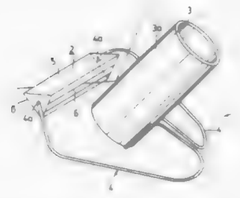
1. Infra-red extraction means arranged and adapted to remove a substantial part of the infra-red energy projected along a prescribed beam-path from a high-intensity spectral source means;
said extraction means comprising: selective reflector means interrupting said beam path and adapted to divert infra-red energy as an infra-red beam along a second path; and associated infra-red dissipation means including multi-blade surface means disposed within enclosure means, adapted to receive said infra-red beams and to trap them and convert them to surface heat; this surface means being arranged in an infra-red trap configuration to receive infra-red energy beams at an input portion and allow essentially none thereof to re-emerge therefrom; the reflector means being interposed across said beam path and adapted to divert only infra-red energy to said dissipation means;
said surface means comprising a pair of opposed sets of parallel blades, disposed obliquely to the direction of said infra-red beams, said blades arrayed to converge upon said infra-red beams and block them, to form a convergent, infra-red trap preventing reflection back of any significant portion of an entering infra-red beam.

5,146,364

OPTICAL INSTRUMENT FOR PRODUCING ARTIFICIAL RAINBOWS

Kimio Oku, 12-10, Kumata 7-chome, Sumiyoshi-ku, Osaka, Japan

Filed Mar. 8, 1991, Ser. No. 666,304
Claims priority, application Japan, Mar. 9, 1990, 2-59133
Int. Cl.[5] G02B *5/04, 7/18, 27/00*
U.S. Cl. 359—615 **3 Claims**



1. An optical instrument for producing artificial rainbows which comprises an elongated, equilateral prism having a left and right side and a convex mirror supported by the same supporting device with the convex mirror supported on the right side of said prism so that the convex mirror is positioned at a 45 degree angle relative to a vertical line with the prism, a predetermined distance from the convex mirror, said prism is positioned such that a light incident on one face of the prism from said left side along a horizontal plane passes through the prism and is refracted by an opposite face onto the mirror surface which reflects the incident light in the form of an artificial rainbow on a surface spaced from said convex mirror.

5,146,365

SCREEN AND IMAGE DISPLAY APPARATUS WHICH MINIMIZES THE EFFECTS OF RE-REFLECTED INCIDENT LIGHT

Nobuo Minoura; Haruyuki Yanagi; Hideaki Mitsutake, all of Yokohama, and Katsumi Kurematsu, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,722
Claims priority, application Japan, Nov. 29, 1988, 63-301356
Int. Cl.[5] G02B *3/08, 27/00*; G03B *21/60*
U.S. Cl. 359—619 **14 Claims**

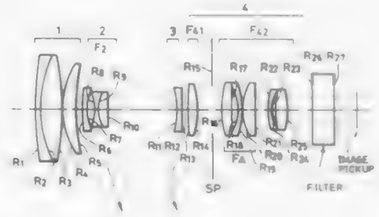
1. An image displaying apparatus, comprising:
an image generator for generating an image;
a projection optical system for projecting the image with a light beam from said image generator, said projection optical system including a reflecting mirror for reflecting the light beam; and
a screen for receiving the image, said screen including a first sheet having a first surface facing said reflecting mirror, with diffusing means being formed on said first surface so as to diffuse a portion of the light beam incident thereon a first time, which light beam is reflected by said first surface and reflected again by said reflecting mirror to be incident on said first surface a second time.

5,146,366

FOUR-GROUP ZOOM LENS

Hitoshi Mukaiya, Toda, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 717,062
Claims priority, application Japan, Jun. 29, 1990, 2-173209
Int. Cl.[5] G02B *15/16*
U.S. Cl. 359—683 **2 Claims**



1. A zoom lens comprising:
a first lens group having a positive refractive power;
a second lens group having a negative refractive power and capable of being moved along the optical axis for zooming;
a third lens group movable to correct the movement of an image surface caused by zooming; and
a fourth lens group having a positive refractive power that is stationary during zooming, said first to fourth lens groups being successively arranged from the object side in this order;
wherein said fourth lens group consists of a first lens at a positive refractive power for reducing, in a step-by-step fashion, divergence of a light beam caused by the third lens group, and also a second lens having a positive refractive power, a third lens having a negative refractive power, a fourth lens having a positive refractive power, a fifth lens having a negative refractive power, and a sixth lens having a positive refractive power;
wherein if the overall focal length of the system at the wide-angle end is F_W, the focal length of the second lens group is F_2, the focal length of the combination of said second lens to said sixth lens of said fourth lens group is F_{42}, and the focal length of the combination of said second lens to said fourth lens is F_A, then the conditions:

$$0.85 < |F_2/F_W| < 1.0$$
$$2.50 < F_{42}/F_W < 3.0$$
$$0.80 < F_A/F_{42} < 1.0$$

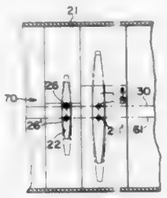
are satisfied.

5,146,36[illegible]

ARRANGEMENTS FOR, METHOD OF, AND LENSES CONFIGURED TO PROVIDE THERMAL COMPENSATION IN LENS ELEMENT MOUNTS

Peter A. Newman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 30, 1991, Ser. No. 738,412
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—820 30 Claims



1. A lens mounting arrangement for mounting at least a first lens element and a second lens element, the second lens element having a different rate of thermal expansion from the first lens element, each lens element having a center point wherein the center points are intersected by an optical axis which is substantially perpendicular to both lens elements over a selected temperature range, the arrangement comprising:

a first supporting member for supporting the first lens element, the first supporting member having first and second supporting surfaces which engage the first lens element at first and second points thereon and wherein tangents to those points converge toward one another at a first selected angle; and

a second supporting member for supporting the second lens element, the second supporting element having first and second surfaces which engage the second lens element at first and second points on the second lens element, wherein tangents to the first and second points on the second lens element converge toward one another at a second angle different from the first angle, the first and second angles being selected such that upon thermal expansion of the lens elements within the selected temperature range, the centers of the lens elements remain aligned with a single optical axis extending substantially perpendicular to both lens elements.

5,146,36[illegible]

OPTICAL PATH LENGTH MULTIPLICATION SYSTEM

David Fink, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 546,494, Jun. 29, 1990, abandoned.
This application May 6, 1991, Ser. No. 696,379
Int. Cl.[5] G02B 5/08
U.S. Cl. 359—861 1 Claim

1. An optical system comprising

an optical input comprising a spatially fixed input mirror and an optical output comprising a spatially fixed output mirror;

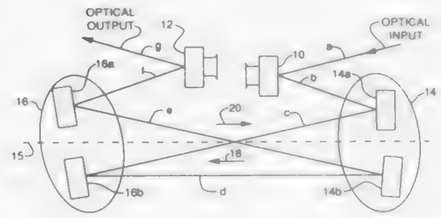
first and second assemblies of first and second mirrors, said assemblies being oppositely translatable with respect to each other along parallel lines;

an optical path between said input and output mirrors, said optical path comprising a plurality of path segments, said path segments extending between said input and output mirrors and said assemblies, each segment of said optical path being between mirrors which are relatively displaced as said assemblies are oppositely translated, whereby each segment is increased or decreased as said assemblies are oppositely translated; and

wherein said optical path comprises:

a first segment from said input mirror to the first mirror of said first assembly;

a second segment from the first mirror of said first assembly to the second mirror of said second assembly;



a third segment from the second mirror of said second assembly to the second mirror of said first assembly;

a fourth segment from the second mirror of said first assembly to the first mirror of said second assembly; and

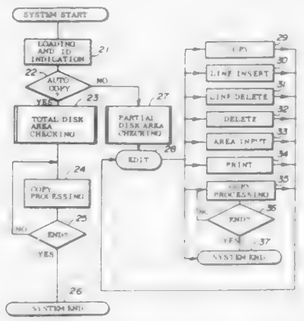
a fifth segment from the first mirror of said second assembly to said output mirror, each of said segment lengths being increased or decreased as said first and second assemblies of mirrors are oppositely translated.

5,146,369

DATA COPYING METHOD FOR DISK STORAGE MEDIUM

Hirohisa Yamaguchi, Tokyo, Japan, assignor to TEAC Corporation, Japan

Filed Apr. 3, 1991, Ser. No. 679,938
Claims priority, application Japan, Apr. 4, 1990, 2-89459
Int. Cl.[5] G11B 5/86
U.S. Cl. 360—15 8 Claims



1. A method of copying data from a master disk storage medium having plural sets of recorded tracks and plural sets of unrecorded tracks in a mixed manner onto a slave disk storage medium having unrecorded tracks only, said method comprising the steps of:

checking a starting track address and an end track address of each set of the recorded tracks in the master disk storage medium, said starting and end track addresses being used to control a copying or recording of data from each set of the recorded tracks in the master disk storage medium, and storing said starting and end track addresses of each set of the recorded tracks;

reproducing data from each set of the recorded tracks in the master disk storage medium from said starting track address to said end track address so that a reproduced signal is generated from said data for each set of the recorded tracks; and

recording said reproduced signal onto the slave disk storage medium at its track addresses corresponding to said each starting and end addresses of the recorded tracks in the master disk storage medium for each set of the recorded tracks in the master disk storage medium,

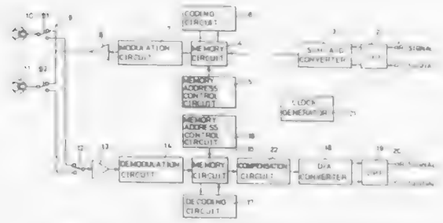
said recording of said reproduced signal being stopped at track addresses of the slave disk storage medium corresponding to addresses of the unrecorded tracks in the master disk storage medium, and tracks in the slave disk storage medium corresponding to the unrecorded tracks of master disk storage medium being skipped to a following track corresponding to a following recorded track in the master disk storage medium.

5,146,370

MAGNETIC RECORDER/REPRODUCER

Kazuhito Endo; Masayuki Ishida, and Yoshinobu Ishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 619,625, Nov. 29, 1990, which is a continuation of Ser. No. 486,499, Feb. 27, 1990, which is a continuation of Ser. No. 214,275, Jun. 30, 1988, Pat. No. 4,905,100, which is a continuation of Ser. No. 19,612, Feb. 27, 1987, Pat. No. 4,835,627, which is a continuation of Ser. No. 696,051, Jan. 29, 1985, Pat. No. 4,675,754. This application Jul. 18, 1991, Ser. No. 732,020
Claims priority, application Japan, Feb. 21, 1984, 59-32130; Mar. 16, 1984, 59-51866; Mar. 30, 1984, 59-64584
The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.
Int. Cl.[5] G11B 5/09
U.S. Cl. 360—32 11 Claims



1. A method of performing a magnetic recording/reproducing operation with a rotary head forming/scanning diagonal tracks on a recording medium, comprising the steps of:

(a) writing inputted digital signals in a predetermined area of a memory;

(b) selecting digital signals stored in the memory to be used for generating redundant signals;

(c) generating redundant signals for error correction or error detection of the selected digital signals for recording on the same track as the selected digital signals;

(d) dividing digital signals representative of a plurality of words into first and second channels;

(e) further dividing the digital signals representative of said plurality of words into even numbered word groups and odd numbered word groups for each channel;

(f) reading even numbered and odd numbered word groups of said digital signals stored in the memory;

(g) recording digital signals from one of said even numbered and odd numbered word groups of said first channel on a first portion of a first track on the medium;

(h) recording digital signals from the other of said even numbered and odd numbered word groups of said first channel on a second portion of a second track of the medium;

(i) recording digital signals from one of said even numbered and odd numbered word groups of said second channel on the second portion of the first track;

(j) recording digital signals from the other of said even numbered and odd numbered word signals of said second channel on the first portion of the second track of the medium;

(k) recording on said first track the redundant signals generated for word groups to be recorded on said first track and recording on said second track the redundant signals generated for word groups to be recorded on said second track;

(l) writing digital signals and redundant signals reproduced from the medium in a predetermined area of the memory;

(m) correcting erroneous signals from a track of the medium stored in the predetermined area of the memory in accordance with the redundant signals stored in the predetermined are of the memory for that track;

(n) reading the word groups of each channel from the memory; and

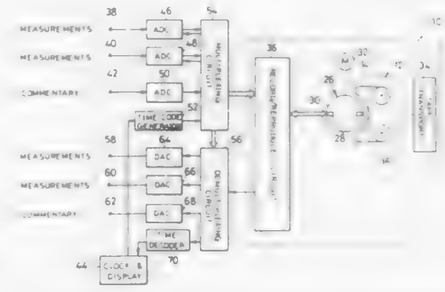
(o) outputting the digital signals in the same order as they were inputted into the recording/reproducing apparatus for recording.

5,146,371

SYSTEM INCLUDING A DIGITAL AUDIO TAPE RECORDER OR EQUIVALENT DEVICE FOR RECORDING NON-AUDIO SIGNALS

Toshihiko Hamada, Kodaira; Keizo Ihara, Musashino, and Masato Iijima, Tokyo, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Continuation of Ser. No. 273,349, Nov. 18, 1988, abandoned.
This application Apr. 11, 1991, Ser. No. 684,439
Claims priority, application Japan, Nov. 28, 1987, 62-301080
Int. Cl.[5] G11B 5/09
U.S. Cl. 360—32 2 Claims



1. A digital recording system for use with a magnetic tape assembly including a magnetic tape, comprising:

a magnetic head assembly for data transfer with the magnetic tape of the magnetic tape assembly;

a tape transport for moving the magnetic tape past the magnetic head assembly;

a first input terminal for inputting a primary data signal of analog form representative of measurements;

a second input terminal for inputting a complementary data signal of analog form representative of vocal commentary on the measurements;

a first analog to digital converter coupled to the first input terminal for translating the primary data signal from analog to digital form;

a second analog to digital converter coupled to the second input terminal for translating the complementary data signal from analog to digital form;

multiplexing circuit means coupled to the first and second analog to digital converters for combining the digital primary and complementary data signals into a series of composite data words each having a series of a predetermined number of bits, the bits of each composite data

word being assigned to the primary and complementary data signals at a ratio predetermined by the expected relative amounts of the primary and complementary data signals to be recorded, the primary data signal having a predetermined number of bits greater than the number of bits of the complementary data signal; and

a recording circuit connected between the multiplexing circuit and the magnetic head assembly for causing the latter to record the composite data words on the magnetic tape in accordance with a prescribed format;

wherein the multiplexing circuit means comprises:

(a) a multiplexer having at least two data inputs coupled one to each analog to digital converter for inputting the digital primary and complementary data signals, and an output coupled to the recording circuit for supplying the series of composite data words thereto; and

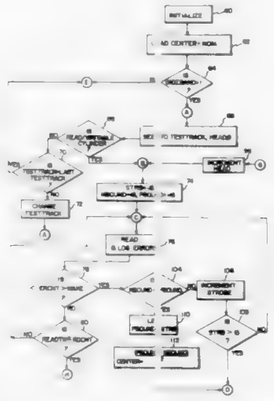
(b) a control signal generator circuit coupled to the multiplexer for supplying thereto a set of control signals, the multiplexer being responsive to the status of the control signals for selectively passing the digital primary and complementary data signals therethrough so as to form the series of composite data words.

5,146,372

ADAPTIVE WINDOW CENTERING

Robert Cronch; Mark D. Hertz, and Hieu V. Nguyen, all of Oklahoma City, Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 19, 1990, Ser. No. 540,099
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—51 34 Claims



1. A method of adjusting a window center setting in a read channel of a magnetic disk drive suitable for reading data from a magnetic disk, the method comprising:

reading data from the magnetic disk by performing a number of read operations;

detecting a number of first read errors made while reading the data;

detecting a number of second read errors made while reading the data; and

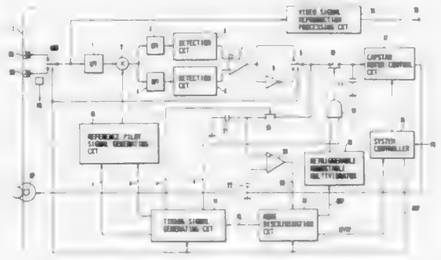
adjusting the window center setting based on the number of first read errors detected and the number of second read errors detected.

5,146,373

INFORMATION SIGNAL REPRODUCING APPARATUS WITH FUNCTION OF DETECTING TRACK PITCH

Tetsuya Wakui, Chiba; Nobutoshi Takayama, Kanagawa; Katsuji Yoshimura, Kanagawa, and Kenichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 223,565, Jul. 25, 1988, abandoned. This application Jan. 10, 1991, Ser. No. 639,417
Claims priority, application Japan, Jul. 31, 1987, 62-191866; Jul. 31, 1987, 62-191867; Jul. 31, 1987, 62-191868; Jul. 31, 1987, 62-191870; D.P.R. of Korea, Jul. 31, 1987, 62-191869
Int. Cl.[5] G11B *5/584*
U.S. Cl. 360—77.01 7 Claims



1. An apparatus for reproducing an information signal from a recording medium on which many tracks are formed, comprising:

(a) reproducing means for reproducing the information signal from the recording medium, said reproducing means including a reproducing head which is arranged to periodically trace said recording medium;

(b) finding means for finding a tracking error of said reproducing head by using signals reproduced by said reproducing head;

(c) tracking control means for controlling the position of said reproducing head relative to said recording medium on the basis of the tracking error currently found by said finding means;

(d) detecting means for detecting whether the tracking error is within a predetermined range and for generating a binary signal indicative of the result of the detection;

(e) discrimination means for discriminating a track pitch in said tracks by using the binary signal; and

(f) inhibiting means for inhibiting said tracking control means from operating in response to the binary signal.

5,146,374

METHOD AND APPARATUS FOR DETERMINING TRACK POSITION OF A HEAD ON A RECORDING MEDIUM

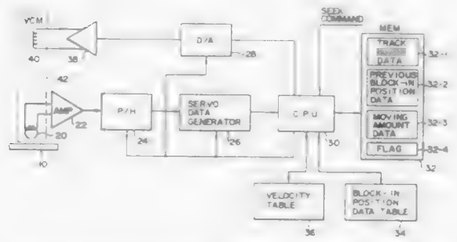
Tetsuji Sakurai, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 12, 1989, Ser. No. 337,100
Claims priority, application Japan, Apr. 12, 1988, 63-90072
Int. Cl.[5] G11B *5/55, 21/08*
U.S. Cl. 360—78.14 18 Claims

10. A method of determining a track position of a head on a recording medium including a plurality of track blocks, each of which includes a plurality of tracks, comprising:

generating servo data from the servo patterns recorded on the recording medium;

selectively determining current block-in position data from at least one of the servo data, previous block-in position data and movement amount data, the previous block-in position data representing a previous track position of said head in tracks included in a current track block of the track blocks, the movement amount data representing a number of tracks between the previous track position and a track position previous to the previous track position,



and the current block-in position data representing a current track position of said head; and

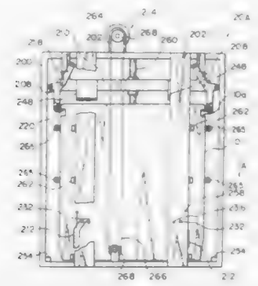
calculating a difference between the previous and current block-in position data, and using data representing the difference as the movement amount data.

5,146,375

CARTRIDGE LOADING AND UNLOADING DEVICE FOR LOADING AND UNLOADING CARTRIDGE TO AND FROM INFORMATION PROCESSOR

Koichi Satoh, and Shinichi Nakazato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 414,185, Sep. 28, 1989, abandoned. This application Oct. 23, 1991, Ser. No. 780,398
Claims priority, application Japan, Sep. 30, 1988, 63-128883[U]
Int. Cl.[5] G11B *15/68, 17/08*
U.S. Cl. 360—92 9 Claims



1. A device for loading and unloading a cartridge to and from a processor which is operable with said cartridge when said cartridge is inserted into said processor, said cartridge being configured in a rectangular parallelepiped and provided with a pair of aligned recesses at opposite sides and adjacent to either one of a front end and a rear end of said cartridge with respect to an insertion direction of said cartridge into the processor, said device comprising:

a mounting member;

a support plate mounted on said mounting member and reciprocatingly movable in said insertion direction, said support plate comprising a push member for pushing said cartridge to move the same toward said processor;

a pair of latch mechanisms each comprising a latch body rotatable about a latch shaft substantially at the center of said latch body, said latch shaft being studded on said support plate, said latch body comprising a hook rotatable about a hook shaft studded rigidly on one end of said latch body for latching said cartridge by engaging one end of said hook with one of said recesses of said cartridge, a guide roller provided on the other end of said latch body, and an abutment roller provided on a protion of said latch body, in which each of said latch mechanisms further comprises a latch spring for constantly biasing said respective latch body such that said respective latch body is rotated about said respective latch shaft in an engagement direction of said respective hook into one of said recesses of said cartridge;

release means mounted on said mounting member and having a rigid surface for releasing engagement of said one ends of said hooks with said recesses of said cartridge when said cartridge is being loaded into said processor, said rigid surface being engageable with said abutment roller of said latch body of the respective latch mechanism;

a drive mechanism for reciprocatingly moving said support plate in said insertion direction; and

a pair of guide mechanisms each being associated with respect to a corresponding one of said latch mechanisms for controlling rotation of said corresponding latch mechanism, each of said guide mechanisms comprising a guide body rotatable about a shaft studded on said mounting member, said guide body having a guide wall for guiding said guide roller of said corresponding latch mechanism while said guide roller is pressed against said guide wall of said guide body;

whereby during loading of said cartridge into said processor, each of said latch mechanisms and said push member move from an initial position toward said processor so as to urge the cartridge into said processor, while said abutment rollers abut against a corresponding said rigid surface so as to rotate each of said latch bodies a predetermined angle in a direction to thereby release each of said hooks from said recesses of said cartridge, and further when each of said latch mechanisms and said push member move away from said processor toward said initial position, each of said guide rollers is pressed against a corresponding guide wall to thereby prevent each of said hooks from contacting said cartridge; and

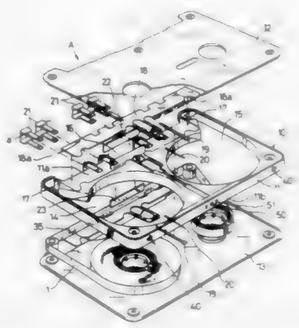
whereby during unloading of said cartridge from said processor, when each of said latch mechanisms is carried by said support plate away from said processor, each of said latch bodies is rotated by a corresponding said latch spring so that said hooks enter said recesses of said cartridge and said cartridge is thereby pulled from said processor.

5,146,376

TAPE CASSETTE

Eisuke Imanaga, Tokyo, and Hirokazu Maeda, Osaka, both of Japan, assignors to Metarex Research Institute Corp., Osaka, Japan

Filed Dec. 27, 1990, Ser. No. 634,731
Int. Cl.[5] G11B *15/66, 23/087*
U.S. Cl. 360—94 7 Claims



1. A tape cassette comprising: a pair of reel hubs; magnetic

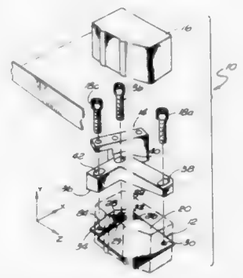
tape connected at ends thereof to said reel hubs, respectively, and wound thereon; and a case accommodating said pair of reels hubs and the magnetic tape wound thereon and having a front portion defining a front recess therein through which the magnetic tape is guided between the reel hubs; said case comprising a solid plate-like base portion and top and bottom plates respectively covering top and bottom surfaces of said base portion; said base portion defining winding openings therein in a thickness direction thereof extending between said top and said bottom surfaces, and feed path openings therein in said thickness direction at both ends of said front portion of the case, respectively, each of said feed path surfaces extending from a respective one of said winding openings to said front recess; said base portion having a solid front part defining a recess therein constituting said front recess of the case, a solid rear part, a solid bridge extending between and integrally connecting said front and said rear parts such that said front and said rear parts are contiguous to one another, and guide means at said front part for guiding the magnetic tape through said front recess; and said top and said bottom plates each defining cut-outs in respective front parts thereof corresponding to said front recess.

5,146,377

ADJUSTABLE MAGNETIC HEAD MOUNTING SYSTEM

Hamid Baheri, Sherman Oaks, Calif., assignor to Wangtek, Simi Valley, Calif.

Filed Nov. 9, 1989, Ser. No. 433,618
Int. Cl.[5] G 1B 5/56
U.S. Cl. 360—109 15 Claims



11. A system for adjustably mounting a magnetic head having an X, Y and Z axis, each one of said axes being orthogonal to both of the other axes, said system comprising:

a bracket;

a resilient tray having an upper surface including first, second and third substantially planar portions that are oriented in different planes, said first portion adapted to support said magnetic head, said second portion intersecting said first portion along a first line that forms a juncture therebetween, and said third portion intersection said second portion along a second line that forms a juncture between said second and third portions; and

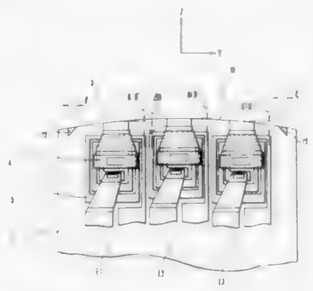
means for independently coupling each planar portion to said bracket, said coupling means including means for adjusting the position of said first portion relative to said bracket such that the position of a magnetic head placed on said first portion can be adjusted relative to said bracket.

5,146,378

MULTI-TRACK HEAD

Kenji Makino; Tohoru Matuda; Shinichi Inoue, all of Kanagawa; Fujihiro Itoh, Saitama, and Yutaka Kusano, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 416,029, Oct. 2, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 806,858
Claims priority, application Japan, Oct. 6, 1988, 63-250940
Int. Cl.[5] G11B 5/265, 5/29
U.S. Cl. 360—121 5 Claims



1. A multi-track head comprising:

a) a substrate having a curved sliding face for sliding over a recording medium; and

b) an n number of conversion elements formed on said substrate, "n" being an even number which is at least 4, positions of said n number of conversion elements being shifted from each other in a direction which is perpendicular to said curved sliding face, wherein said n number of conversion elements are aligned at a predetermined pitch W, and wherein, among said n number of conversion elements, the position of an element located in an i-th position relative to a center line of the head is shifted as much as a distance Di from another element located in an (i+1)-th position, where "i" represents an integer which is at least 1 and, with the radius of curvature of said sliding face expressed as R, the following relation being satisfied:

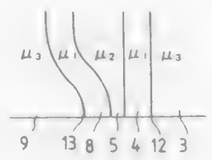
$$Di=[R^2-\{(i-1)W+W/2\}^2]^{\frac{1}{2}}-(R^2-\{iW+W/2\}^2]^{\frac{1}{2}}.$$

5,146,379

THIN FILM MAGNETIC HEAD

Tetsuya Iwata, and Yutaka Sakurai, both of Nagaoka, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,730
Claims priority, application Japan, May 30, 1990, 2-140719; Jun. 13, 1990, 2-154452
Int. Cl.[5] G11B 5/147
U.S. Cl. 360—126 4 Claims



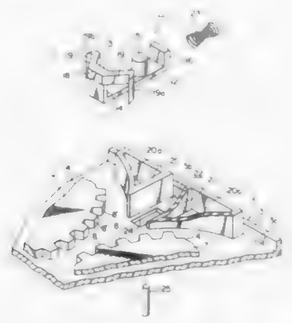
1. A thin film magnetic head comprising an insulating layer, a lower magnetic layer, a gap layer, an upper magnetic layer and a protective layer, all of which are laminated in turn on the surface of a substrate, wherein said insulating layer and said protective layer are made of a magnetic material or a nonmagnetic material containing a magnetic material.

5,146,380

REEL LOCK MECHANISM FOR TAPE CASSETTE

Hiroshi Fujii, and Keitaro Yamashita, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 3, 1991, Ser. No. 680,051
Claims priority, application Japan, Apr. 9, 1990, 2-093694
Int. Cl.[5] G11B 23/087
U.S. Cl. 360—132 5 Claims



1. A reel lock mechanism for a tape cassette including a cassette case, a pair of tape reels accommodated in said cassette case, each of said tape reels having a flange formed with a plurality of outer circumferential teeth, and a tape having opposite ends connected to said tape reels so as to be wound therearound;

said reel lock mechanism for restraining rotation of said tape reels to prevent slacking of said tape, comprising a reel lock member adapted to slide between a lock position where the rotation of said tape reels is restrained and an unlock position where restraint of the rotation of said tape reels is released;

said reel lock member comprising a slide portion slidably supported to said cassette case, a lock portion having a pair of pawls adapted to engage said outer circumferential teeth of said flanges of said tape reels, and a twistable connecting portion integrally connecting said slide portion with said lock portion;

wherein when one of said tape reels is moved in a slacking direction of said tape to thereby urge one of said pawls, said connecting portion is twisted to rotate said lock portion and thereby move the other pawl so that the other tape reel is rotated in a direction increasing a tension of said tape.

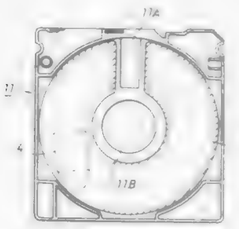
5,146,381

MAGNETIC DISK JACKET

Hiroshi Ikeda; Nobuyuki Kishine; Tsuyoshi Otani, and Mashahiko Niinomi, all of Ichikai, Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 676,071
Claims priority, application Japan, Mar. 28, 1990, 2-80489
Int. Cl.[5] G11B 23/033, 5/41
U.S. Cl. 366—133 1 Claim

1. A magnetic disk jacket including a liner partly welded to the inner surface of a case and adapted to clean the surface of a magnetic disk, said liner containing 0.001 to 0.05 g of a polydimethylsiloxane derivative having a viscosity of from 50 to



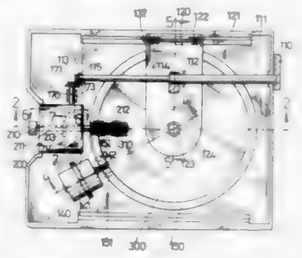
3000 cSt at 25° C. and having a polyether group or both polyether group and epoxy group in a molecule per 1 g of the liner.

5,146,382

FLOPPY DISK CLEANING MACHINE

Chen Yao-Ko, 1st Fl., No. 132, I An Rd., Chung Ho City, Taipei Hsien, Taiwan

Filed Jan. 3, 1991, Ser. No. 637,264
Int. Cl.[5] G11B 23/50
U.S. Cl. 360—137 4 Claims



1. A floppy disk cleaning machine comprising

a rectangular body with a diskette insertion slot and a locker extending into the body to connect to a cam an appropriate with a link at an appropriate position above a positioning plate, which is fixed by a frame and supported by torsion spring, with a seat surrounded by tension spring in the middle, and a hole for passing through of a shaft fixed thereto by means of a U-shaped fastener, and the shaft driven by a motor via a rubber shaft to drive a turn plate to support a floppy disk;

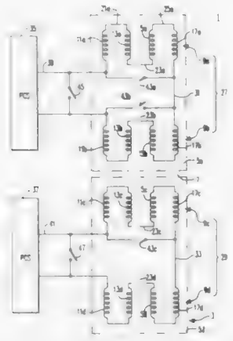
a cleaner head assembly located in the body, composed of mainly two knobs, two rolling shafts controlled by the knobs, two cleaning rods with rotatable cleaning sides on the rolling shafts in a manner that the rolling shafts are incorporated with shaft blocks and a second tension spring to cause two driving rods to control opening and closing of the rolling shafts so that the cleaning rods at their ends can release or hold a floppy disk; and

a control circuit to count cycle of cleaning by detection with magnetic means or other sensor, light a completion indicator, cut off power source, and stop the motor at end of a present number of cleaning cycles; and

assembled in a way so that the locking action of the locker can cause the torsion spring to cause the positioning plate to hold the floppy disk in place, and rotate the cam incorporating to the link, and cause the second tension spring to cause the cleaning rod to hold the floppy disk at its read/write slots, and start the motor to clean the floppy disk; the control circuit can stop the motor at end of cleaning process, and unlocking of the locker can cause the cleaning rod to move away from the read and write slots, the

positioning plate to release the floppy disk, and permit removal of the floppy disk out of the cleaning machine.

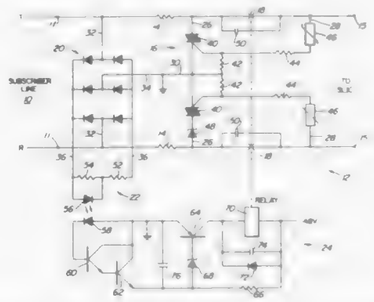
5,146,383
MODULAR SUPERCONDUCTING MAGNETIC ENERGY STORAGE INDUCTOR
James R. Logan, Hampton Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 20, 1990, Ser. No. 540,959
Int. Cl.[5] H01B *12/00*
U.S. Cl. 361—19 22 Claims



1. A modular superconducting magnetic energy storage inductor apparatus comprising:
an annular dewar structure oriented in a substantially horizontal plane and containing a cryogenic fluid;
a plurality of winding modules each comprising a multilayer, layer wound winding of superconducting material, said winding modules stacked one on top of another in said annular dewar and immersed in said cryogenic fluid;
means interconnecting said plurality of winding modules in at least one electrical circuit; and
shorting switch means comprising for each winding module a single shorting switch connected across the winding of the winding module and selectively shorting the winding during an emergency dump of said cryogenic fluid from said dewar.

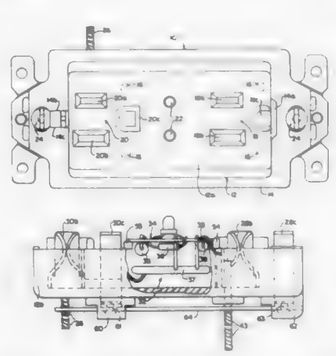
5,146,384
AUTOMATICALLY RESETTING PROTECTION ARRANGEMENT FOR A TELEPHONE SUBSCRIBER LINE INTERFACE CIRCUIT
Milan Markovic, Stone Mountain, and Alexander Shtulman, Tucker, both of Ga., assignors to Northern Telecom Limited, Montreal, Canada
Filed Apr. 28, 1989, Ser. No. 344,380
Int. Cl.[5] H02H *9/04, 3/20*
U.S. Cl. 361—55 17 Claims

1. A protection arrangement for coupling telecommunications equipment to a telecommunications line, comprising:
a first terminal for connection to the telecommunications line;
a second terminal for connection to the telecommunications equipment;
switching means closed in normal operation for coupling the first terminal to the second terminal;
triggerable surge protection means coupled between the first terminal and a ground terminal;
means responsive to surge voltage between the switching means and the second terminal for triggering the surge protection means into conduction; and



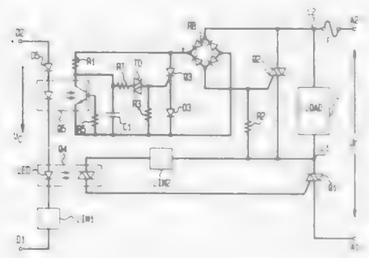
means responsive to excessive voltage at the first terminal for opening the switching means.

5,146,385
SHALLOW ELECTRICAL RECEPTACLE WITH SURGE SUPPRESSOR AND ISOLATED GROUND
John J. Misencik, Shelton, Conn., assignor to Hubbell Incorporated, Orange, Conn.
Filed Jan. 16, 1990, Ser. No. 465,857
Int. Cl.[5] H02B *1/26;* H01R *13/60;* H02H *1/04*
U.S. Cl. 361—56 16 Claims



1. An electrical receptacle characterized by a housing configuration including an insulating base enclosing electrical contacts and an insulating front cover therefore and further comprising:
a surge suppressor circuit, and an insulating circuit board on which a plurality of components of said circuit are mounted, said components including an indicator device located on a first side of said circuit board facing the receptacle cover, at least one varistor connected between a pair of said electrical contacts of the receptacle, and a fuse, said varistor and said fuse being located on a second side of said circuit board facing away from the receptacle cover; and
said board having portions that fit in close relation to insulating walls of the receptacle base to support and resist lateral movement of said board, said board being secured between an upper end of said wall portions and said cover when the base and front cover are assembled.

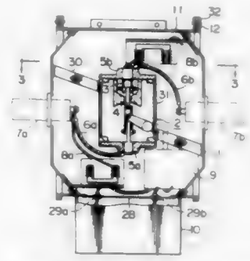
5,146,386
ELECTRONIC MONITORING AND REDUNDANT CONTROL CIRCUIT FOR A POWER SWITCH
Edward B. Learned, Fort Branch, Ind., assignor to Potter & Brumfield, Inc., Princeton, Ind.
Filed Dec. 5, 1990, Ser. No. 622,881
Int. Cl.[5] H02H *3/24*
U.S. Cl. 361—91 21 Claims



17. A monitoring and redundant control circuit for a load carrying power switch comprising:
a pair of power supply terminals;
a pair of load terminals;
a load connected across the load terminals;
a power switch connected in series with the load terminals and a redundant switch means across the power supply terminals;
a pair of control input terminals;
first and second optocouplers having input LEDs which are connected in series across the control input terminals, the first optocoupler having an output light receiving semiconductor means for switching the power switch in response to the presence of a control signal at the control input terminals, and the second optocoupler having an output light receiving semiconductor means connected across a capacitor for discharging the capacitor in response to the presence of the control signal at the control input terminals;
a rectifier bridge having a pair of input terminals connected to the load terminals and a pair of output terminals connected across a series connection of the capacitor and a resistor;
a trigger diode having a trigger input connected to a junction between the capacitor and the resistor; and
detector output switch means having an input connected to the rectifier bridge and the trigger diode for short-circuiting the load terminals in response to a voltage on the capacitor exceeding a trigger voltage of the trigger diode.

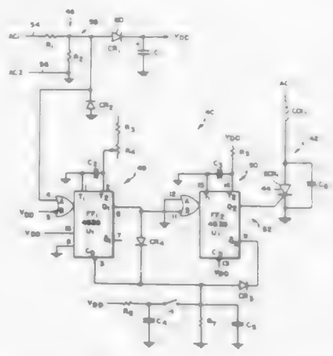
5,146,387
INTERRUPTER HAVING GROUNDED INTERRUPTER CONTAINER WITHIN A GROUNDED COVER
Syunji Itoh; Takahide Seki, and Haruo Honda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 11, 1990, Ser. No. 507,510
Claims priority, application Japan, Apr. 24, 1989, 1-101715
Int. Cl.[5] H01H *73/06, 9/02, 13/04*
U.S. Cl. 361—115 5 Claims

1. An interrupter unit comprising:
an interrupter including at least two pairs of contacts and an interrupter container surrounding the pairs of contacts and being prevented from electrically communicating with the pairs of contacts, each of the pairs of contacts having a first contact and a second contact which contacts the first contact or is positioned away from the first contact so that electricity flows between the first contact and the second contact or is prevented from flowing between the first contact and the second contact;
electric actuator means for driving the pairs of contacts so that the second contacts contact the first contacts or are positioned away from the first contacts; and
at least one voltage-transformer which transforms an input voltage and supplies a suitably transformed voltage to the electric actuator means so that the electric actuator means drives the pairs of contacts;
wherein the interrupter unit further comprises:
an electrically grounded cover surrounding the interrupter and having first cover terminals which are electrically connected to the first contacts, respectively, and which are prevented from electrically communicating with the



grounded cover, and second cover terminals which are electrically connected to the second contacts, respectively, and which are prevented from electrically communicating with the grounded cover;
wherein the electric actuator means and the voltage-transformer are located in a space formed between the electrically grounded cover and the interrupter, the voltage-transformer being electrically connected to at least one of the cover terminals of the electrically grounded cover to receive the input voltage; and
wherein the interrupter container is electrically grounded.

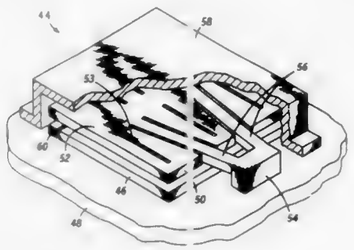
5,146,388
VARIABLE POWER DRIVE CIRCUIT
Edward I. Parker, Holden; Vincent A. Pucci, Jr., Spencer, and Harold Weiss, Marlborough, all of Mass., assignors to The Stanley Works, New Britain, Conn.
Continuation-in-part of Ser. No. 451,862, Dec. 18, 1989, abandoned. This application Dec. 13, 1990, Ser. No. 627,040
Int. Cl.[5] H01H *47/00*
U.S. Cl. 361—153 16 Claims



1. A driver circuit which is responsive to an input AC line voltage for providing a variable power drive signal to a load circuit, said driver circuit comprising:
a) means for receiving the input AC voltage;
b) switch actuated timing circuit means for producing a

variable timing delay signal that is synchronized to the AC voltage cycle and that can be started at the beginning of the positive half-cycle of the AC voltage cycle;
c) control signal generating means responsive to said timing delay signal for generating a control signal for a selected period of time within one cycle of the AC input voltage, said selected time period occurring only during the time that the input AC voltage is in the positive portion of its cycle;
d) first switch means for activating said timing circuit means to produce said timing signal;
e) means for applying said timing delay signal to said control signal generating means; and
f) firing means responsive to said control signal for providing a drive signal to the load circuit during the time period that the control signal is applied to the firing means.

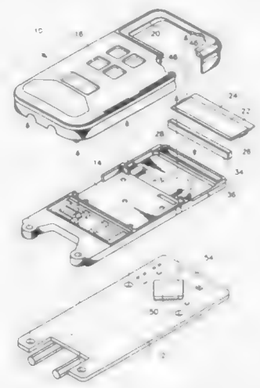
5,146,389
DIFFERENTIAL CAPACITOR STRUCTURE AND METHOD
Ljubisa Ristic, Phoenix, and William C. Dunn, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 22, 1991, Ser. No. 733,920
Int. Cl.[5] H10G 7/00; G01P 15/125
U.S. Cl. 361—283 **39 Claims**



1. A differential capacitor structure comprising:
a first static semiconductive layer;
a second static semiconductive layer not electrically coupled to said first layer; and
a dynamic semiconductive layer suspended between and not electrically coupled to said first and second layers.

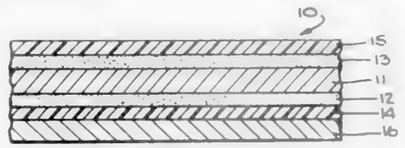
5,146,390
LCD SUPPORT BRACKET
Heiman Wong, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Mar. 8, 1991, Ser. No. 666,226
Int. Cl.[5] H05K 5/00
U.S. Cl. 361—427 **17 Claims**

1. A bracket supporting a substantially planar liquid crystal display ("LCD") panel in a cutout formed in a generally planar support, said bracket comprising:
a plurality of spaced apart resilient cantilever beams extending from a location of said support that is substantially coplanar with said LCD panel into said cutout and contacting a surface of said LCD panel to support said panel within said cutout, a major portion of said resilient beams extending along a longitudinal axis that is generally parallel to the plane of said LCD panel;
support means supporting said LCD panel in at least one other location; and
retaining means contacting a surface of said LCD panel that is opposite a surface of said LCD panel that is contacted by said resilient cantilever beams, said retaining means displacing said LCD panel against said cantilever beams with sufficient force to bend said beams so that they are preloaded against said LCD panel thereby shock mounting said LCD panel in said support without preempting an



area beneath said LCD panel and the area beneath said cantilever beams.

5,146,391
CROSSLINKED ELECTROLYTE CAPACITORS AND METHODS OF MAKING THE SAME
Douglas R. MacFarlane, Elsternwick; Arthur K. Philpott, Neerim South, and John R. Tetaz, Templestowe, all of Australia, assignors to Specialised Conductives Pty. Ltd., Neerim South, Victoria, Australia
Continuation-in-part of Ser. No. 187,239, Apr. 29, 1988, Pat. No. 4,942,501. This application Nov. 3, 1989, Ser. No. 431,600
Int. Cl.[5] H01G 3/06; C08G 65/32; H01B 7/18
U.S. Cl. 361—525 **84 Claims**

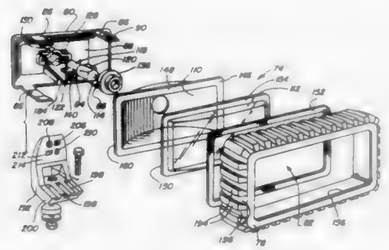


75. A capacitor comprising:
an anode;
a cathode
a crosslinked polymer electrolyte disposed between said anode and said cathode;
a sealed housing for containing said anode, said cathode and said polymer electrolyte, substantially all space in said housing being occupied by said anode, said cathode and said electrolyte.

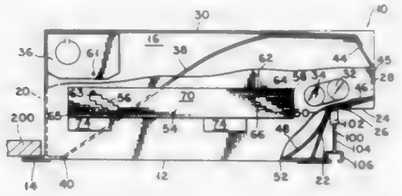
5,146,392
VEHICLE LAMP WITH UNIVERSAL MOUNTING CAPABILITY
George C. Kasboske, 2820 N. Whipple, Chicago, Ill. 60618
Division of Ser. No. 297,265, Jan. 18, 1989, Pat. No. 4,972,301. This application Nov. 19, 1990, Ser. No. 615,446
Int. Cl.[5] B60Q 1/04
U.S. Cl. 362—61 **17 Claims**

1. A vehicle lamp comprising:
an illumination source;
a reflector for focusing light from the illumination source;
a casing having first and second joinable parts,
said illumination source, reflector and casing being separable, each from the other;

means on the first and second casing parts for placing the first and second casing parts into assembled relationship by relatively moving the first and second casing parts one against the other along a line; and
cooperating means on the illumination source, reflector and first and second casing parts for maintaining the illumination source, reflector and casing in operative relationship as an incident of the first and second casing parts being placed into assembled relationship and for permitting separation of the illumination source, reflector and casing upon the first and second casing parts being disassembled from each other.

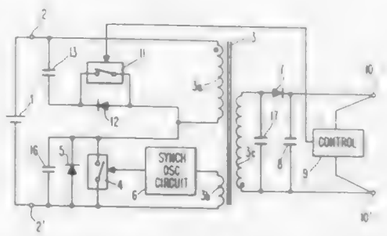


5,146,393
FLUORESCENT FIXTURE WITH WALL WASH FEATURE
Roy B. Crane, Wilmington, Mass., assignor to Genlyte, Inc., Wilmington, Mass.
Filed Mar. 6, 1991, Ser. No. 665,283
Int. Cl.[5] F21V 7/00; F21S 3/02
U.S. Cl. 362—260 **18 Claims**



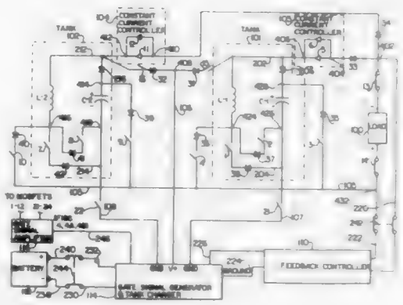
1. A fluorescent light fixture for illuminating an upper area of an adjacent vertical surface, comprising:
a body including a longitudinal axis;
a fluorescent light means including a fluorescent light bulb means;
an upper reflector including at least a portion above said fluorescent light means oriented to reflect light emanating from said fluorescent light bulb means in principally a preselected downwardly oblique direction whereby said upper reflector illuminates a lower area of the adjacent vertical surface;
a lower reflector including at least a portion below said fluorescent light means, said lower reflector including an upper edge directed substantially toward an interior section of said fluorescent light bulb means, whereby said lower reflector reflects substantially horizontally a first portion of light emanating directly from said fluorescent light bulb means in a plane perpendicular to said adjacent vertical surface and a second portion of light reflected from said upper reflector to illuminate the upper area of the adjacent vertical surface.

5,146,394
FLY BACK CONVERTER SWITCHING POWER SUPPLY DEVICE
Takuya Ishii, Suita, and Tatsuo Maeoka, Kobe, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 22, 1990, Ser. No. 542,864
Claims priority, application Japan, Jun. 23, 1989, 1-161648; Jan. 18, 1990, 2-8623
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—16 **6 Claims**



1. In a switching power supply device comprising a DC power source, and a transformer having at least primary and secondary windings, said device further comprises:
a first switching means which is connected in series with said primary winding, the series circuit being connected to the terminals of said DC power source;
a second switching means;
a capacitor which is connected in series with said second switching means, the series circuit being connected to the terminals of said primary winding;
a rectifying and smoothing circuit of the capacitor input type for rectifying and smoothing a flyback voltage which generates in said secondary winding and for outputting a resulting low DC voltage; and
drive means for detecting the DC output voltage from said rectifying and smoothing circuit and for driving alternately said first and second switching means with predetermined ON-OFF periods to stabilize the DC output voltage.

5,146,395
POWER SUPPLY INCLUDING TWO TANK CIRCUITS
Richard L. McKie, 4618 3rd Ave., N.W., Seattle, Wash. 98107
Filed Aug. 9, 1991, Ser. No. 742,761
Int. Cl.[5] H02M 3/07
U.S. Cl. 363—13 **15 Claims**



1. A power supply for supplying power to a load, the power supply comprising:
a) a first tank circuit having a resonant frequency; and

b) a second tank circuit having a resonant frequency substantially identical to the resonant frequency of the first tank circuit;

wherein the two tank circuits are constructed and adapted to function repetitively in two major periods,

A) in the first major period, the first tank is disconnected from powering the load and the second tank supplies power to the load and charges the first tank; and

B) in the second major period, the second tank is disconnected from powering the load, and the first tank supplies power to the load and charges the second tank.

5,146,396

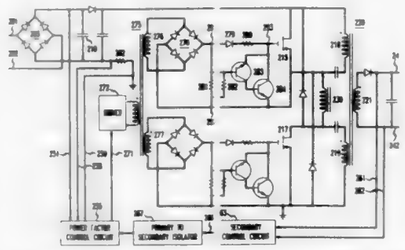
SINGLE STAGE POWER FACTOR CORRECTED CONVERTER HAVING ISOLATED OUTPUT

Wing K. Eng, Dallas, and William F. Slack, Garland, both of Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 17, 1991, Ser. No. 716,464

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—16 **9 Claims**



1. A power converter adapted to be energized by an AC line voltage source;

comprising:

means for accepting the AC line voltage and supplying a unipolar voltage derived from the AC line voltage;

a voltage transient sink capacitor;

an output circuit for coupling energy to a load and including a transformer having first and second primary windings each having an inductive impedance at its energy receiving input;

an energy storage inductance;

first and second power switches connected to opposite terminals of the inductor, and each connected substantially in parallel with the first and second primary windings respectively and operative when in a conducting mode to complete a continuous current path including the voltage storage capacitor and the energy storage inductance;

first and second unidirectional conduction paths operative when the first and second power switches are in a non-conducting mode to connect the energy storage inductance to the voltage transient sink capacitor.

5,146,397

POWER SUPPLY DEVICE WITH UNBALANCE MONITORING CIRCUIT

Gerhard Fruhling, Nurnberg, Fed. Rep. of Germany, assignor to U. S. Philips Corporation, New York, N.Y.

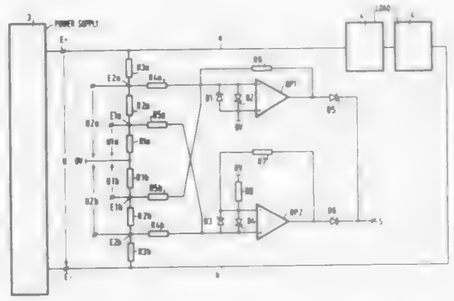
Filed Dec. 13, 1990 Ser. No. 626,654

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1989, 3941885

Int. Cl.[5] G01R *31/14*

U.S. Cl. 363—74 **20 Claims**

1. A power supply device with an unbalance monitoring circuit for a direct voltage transmitted between two line conductors, which voltage normally is balanced with respect to ground potential, comprising: a voltage divider circuit connected between the two line conductors and which includes components which are in each case identical in pairs, a centre tap of the voltage divider circuit being connected to the ground potential and at further taps thereof positive and negative part-voltages referred to ground potential are produced,



and comparator means for comparing a first positive part-voltage with a second negative part-voltage and a second positive part-voltage with a first negative part-voltage.

5,146,398

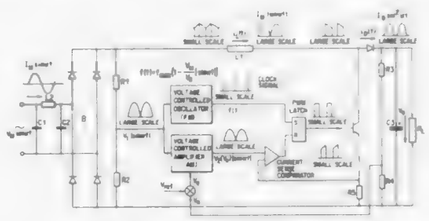
POWER FACTOR CORRECTION DEVICE PROVIDED WITH A FREQUENCY AND AMPLITUDE MODULATED BOOST CONVERTER

Oscar Vila-Masot, Puerto La Cruz, Venezuela, and Janos Melis, Miami, Fla., assignors to LED Corporation N.V., St. Maarten, Netherlands Antilles

Filed Aug. 20, 1991, Ser. No. 747,651

Int. Cl.[5] H02M *7/06;* **G05F** *1/70*

U.S. Cl. 363—89 **3 Claims**



1. A pulse width modulated current mode boost converter to provide power factor correction between an input sinusoidal AC voltage source and a load, comprising:

a first full-bridge rectifier provided across the AC source producing a DC output voltage;

a boost converter connected to said full-bridge rectifier;

a pulse width modulated latch;

a main switch and a shunt resistor connected to said pulse width modulated latch;

a current sense comparator connected to said pulse modulated latch and said shunt resistor;

a continuously modulated voltage controlled oscillator connected between said first full bridge rectifier and said pulse width modulated latch, wherein the frequency of said oscillator is continuously modulated by the absolute value of the sinusoidal voltage source such that the frequency of the oscillation is at a maximal level when the absolute value of the sinusoidal voltage source is zero, and is at a minimal level when the absolute value of the sinusoidal input voltage is at a maximal level; and

a voltage controlled amplifier connected between said boost converter and said current sense comparator, said voltage controlled amplifier also provided with a DC voltage reference source, wherein the amplitude of the output signal of said voltage controlled amplifier varies with respect to the absolute value of the input sinusoidal voltage and is in phase therewith, and wherein the amplitude of said signal is controlled by the difference of the DC output voltage of said boost converter and said DC reference voltage.

5,146,399

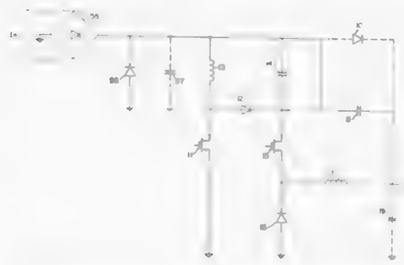
SWITCHING POWER APPARATUS HAVING HIGH FACTOR AND COMPRISING PAIR OF CONVERTER FOR OBTAINING FIXED OR VARIABLE OUTPUT VOLTAGE

Jeff Gucyski, P.O. Box 11633, Costa Mesa, Calif. 92627

Division of Ser. No. 393,392, Aug. 14, 1989, Pat. No. 4,999,568. This application Mar. 11, 1991, Ser. No. 665,950

Int. Cl.[5] H02M *3/155*

U.S. Cl. 363—89 **20 Claims**



1. Switching power supply converting pulsating DC input voltage applied to an input into output voltage, comprising:

a first converter means having a first output for converting the DC input voltage into a base voltage;

a first capacitive means coupled between the input and first output for storing the base voltage;

a second converter means having a second output for converting a voltage appearing at the first output into the output voltage appearing at the second output; and

a second capacitive means coupled between the first output and second output for filtering the output voltage.

5,146,400

CIRCUIT ARRANGEMENT FOR PRODUCING CURRENT PULSES OF A GIVEN SHAPE IN AN INDUCTIVE LOAD

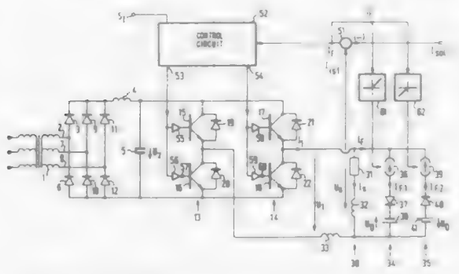
Heinz von der Broeck, Zulpich, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Aug. 27, 1990, Ser. No. 573,438

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928281

Int. Cl.[5] H02M *7/537*

U.S. Cl. 363—98 **10 Claims**



1. Apparatus for driving a magnetic field coil with a current pulse having a desired current in a leading edge portion and in a trailing edge portion, said apparatus comprising:

a controllable current drain means having a pair of terminals for coupling said field coil in a parallel arrangement with said current drain means;

an inductor coupled at one end to one of said terminals, so as to be in series with said parallel arrangement when the field coil is coupled to said terminals, said inductor, current drain means and field coil thereby comprising a series-parallel arrangement;

means for applying a plurality of temporarily spaced voltage pulses across said series-parallel arrangement in a first polarity during the leading edge portion of said current pulse in a manner to produce a current through said inductor of a greater magnitude than a desired current of said current pulse in said leading edge portion and in a second polarity, opposite to the first polarity, during the trailing edge portion of said current pulse in a manner to produce a current through said inductor of a lesser magnitude than a desired current of said current pulse in said trailing edge portion; and

current drain control means for controlling the current drain means to draw the difference between the current through said inductor and the desired current of said current pulse.

5,146,401

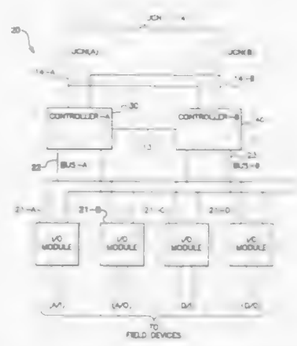
APPARATUS FOR PROVIDING A UNIVERSAL INTERFACE IN A PROCESS CONTROL SYSTEM

Ravinder M. Bansal, Horsham, and Amand J. Hahn, Lansdale, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 402,954, Sep. 5, 1989, abandoned. This application Aug. 7, 1991, Ser. No. 742,263

Int. Cl.[5] G06F *3/00*

U.S. Cl. 364—138 **5 Claims**



1. In a process control system, having a plant control network for performing an overall supervision of a process being controlled, said plant control network having at least one external bus for operatively connecting a corresponding interface apparatus to said plant control network, and wherein each interface apparatus interfaces with at least one field device, each field device being a predetermined type, each interface apparatus comprising:

a) controller means, operatively connected to the external bus, for providing an interface between said plant control network and the field devices operatively connected to said interface apparatus, such that a control function of the field devices is provided, and commands are accepted from the plant control network and responded to, and status and history of the control function are reported on a predetermined basis to the plant control network, permitting the plant control network to perform its overall supervisory function said controller means including:

i) first interface means, operatively connected to said

external bus, for interfacing with the external bus to provide a communication link with the external bus in accordance with a first predetermined protocol;

ii) communication means, operatively connected to said first interface means, for communicating with said plant control network via said first interface means;

iii) control unit means, operatively connected to said communication means for performing control processing of the field devices connected to said interface apparatus based on data inputted from the input type field devices, the results of the control processing being outputted to predetermined ones of said output type field devices thereby achieving the control function of the process being controlled, the control unit mean further accepting commands from said plant control network and responds thereto, and reports status and history data of the process being controlled;

iv) second interface means, operatively connected to said communication means and to said control unit means, for interfacing with an internal bus to provide a communication link with the internal bus in accordance with a second predetermined protocol; and

v) global memory means, operatively connected to said first and second interface means, to said communication means and to said control unit means, for storing information common to said control unit means and to said communication means, and further providing communications between said control unit means and said communication means; and

b) at least one input/output (I/O) module means, each I/O module means operatively connected to said controller means via the internal bus, and wherein each I/O module means interfaces with at least one field device, each I/O module means being of a first predetermined type including analog input (A/I) type, analog output (A/O) type, digital input (D/I) type, or digital output (D/O) type, each field device having associated therewith a second predetermined type including A/I, A/O, D/I, or D/O types, and wherein each field device having the second predetermined type is operatively connected to one of said I/O module means having a first predetermined type, such that the first predetermined type of said I/O module means and the second predetermined type of said field device are corresponding for obtaining data from or outputting data to input type field devices or output type field devices, respectively, thereby permitting data to flow between the controller means and the field devices thereby permitting said controller means to perform its control function.

5,146,402

PROFILE DEFINITION METHOD

Masaki Seki; Takashi Takegahara, both of Tokyo, and Takeshi Arakaki, Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP89/00605, § 371 Date Feb. 15, 1990, § 102(e) Date Feb. 15, 1990, PCT Pub. No. WO89/12855, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 16, 1989, Ser. No. 465,224

Claims priority, application Japan, Jun. 17, 1988, 63-149300

Int. Cl.[5] G06F *15/46*; G05B *19/18*

U.S. Cl. 364—191 **11 Claims**

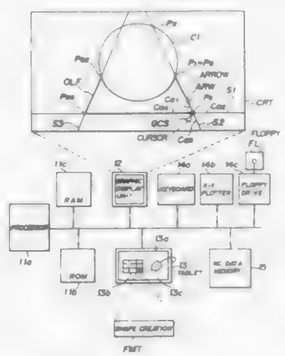
1. A profile destination method for defining a profile by displaying defined figure elements on a display screen, designating a starting point of the profile, and designating said figure elements in an order starting from said starting point, characterized by:

(a) obtaining, when the starting point of the profile has been designated, the figure elements which share said starting point as an extremal point;

(b) obtaining a first element of the profile by designating a forward direction of the profile from said starting point along one of said figure elements obtained in step (a);

(c) obtaining a point of intersection between said first element and one of the figure elements that intersects said first element along the forward direction designated in step (b);

(d) deciding that this point of intersection is one in point of the first element of the profile if the point of intersection obtained in step (c) is one in number;



(e) deciding the end point of the first element of the profile by selecting one point of intersection from the intersections if more than one point of intersection is obtained in step (c); and

(f) assigning the end point of the first element of the profile as a new starting point and successively obtaining subsequent elements of the profile by performing steps (a) through (f).

5,146,403

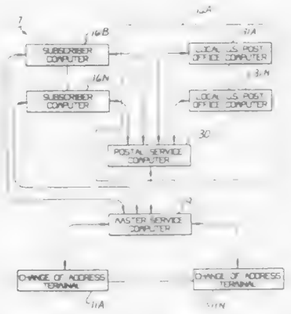
CHANGE OF ADDRESS SYSTEM AND METHOD OF USING SAME

Sidney R. Goodman, La Jolla, Calif., assignor to Postal Buddy Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 284,065, Dec. 13, 1988, Pat. No. 5,029,099, Ser. No. 428,864, Oct. 30, 1989, and Ser. No. 729,948, Jul. 15, 1991, which is a continuation of Ser. No. 429,658, Oct. 30, 1989, abandoned. This application Oct. 30, 1989, Ser. No. 429,790

Int. Cl.[5] G06F *15/21*

U.S. Cl. 364—401 **20 Claims**



1. A system for communicating change of mailing address information, comprising:

a group of terminals for gathering change of mailing address information from individual members of the general public;

subscriber computer means for supplying subscriber information

each one of said terminals including memory means for storing subscriber information and user change of address information to facilitate notification of changes in mailing addresses;

each one of said terminals further including input means for entering by individual members of the general public change of address information and for designating that the change of address information be supplied to selected subscribers;

master service computer means for communicating with said terminals to receive said change of address information therefrom;

said master service computer means including mail distribution memory means for storing subscriber information;

said maser service computer means further including communication means for facilitating the transfer of information between said master computer means and said subscriber computer means and said group of terminals;

said master service computer means having means for compiling said change of address information for user selected subscribers;

said master service computer means further having means for supplying said compiled change of address information to said subscriber computer means;

each one of said terminals further including means for operating independently of said master computer means in a stand alone manner of operation; and

each one of said terminals further including means for transferring periodically gathered change of mailing address information to said master computer means for use thereby.

5,146,404

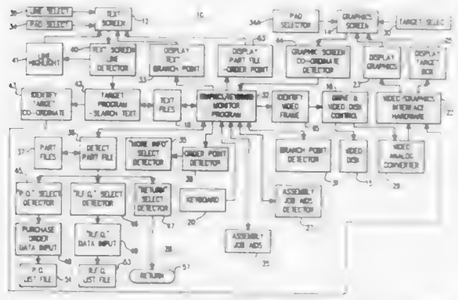
ELECTRONIC MAINTENANCE SUPPORT WORK STATION

Jack D. Calloway, Orlando, Fla.; Raymond F. Holzer, Pittsburgh, Pa.; Stephen E. Matheny, Altamonte Springs, and Gary W. Orwig, Winter Park, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sep. 19, 1986, Ser. No. 909,346

Int. Cl.[5] G06F *15/21, 15/24*

U.S. Cl. 364—401 **21 Claims**



1. An electronic maintenance support (EMS) work station comprising:

a first monitor screen for displaying text information related to a product having a plurality of parts, subassemblies, and assemblies;

a second monitor screen for displaying graphic illustrations of the assemblies, subassemblies, and parts of the product;

means for storing a plurality of text files, each text file containing predetermined data associated with an assembly, subassembly, or part of the product, the text files being arranged in an hierarchical organization of parts, subassemblies, and assemblies of the product;

means for storing a plurality of graphics, each graphic containing an illustration of an assembly, subassembly, or part within the hierarchical organization;

means for storing coordinate data defining areas overlying at least one portion of at least some of the graphics which may be selected for display of assemblies, subassemblies, and parts in the hierarchical organization;

means for linking each text file with a corresponding graphic;

means for selecting text files relative to said first monitor screen;

means for selecting one of the areas overlying a portion of a graphic relative to said second monitor screen for displaying a different graphic in the hierarchical organization;

means for detecting each of the text files or areas of the graphics selected by said means for selecting and for controlling said means for storing to retrieve each of the selected text files or graphics and the graphic or text file linked to each of the selected text files or graphics, respectively, by said means for linking;

means for displaying on said screens each of the text files or graphics selected by said means for selecting and the graphic or text file linked to each of the selected text files or graphics, thereby enabling searching through the hierarchical organization for an assembly, subassembly, or part needed for maintenance purposes wherein said means for controlling responds to said means for selecting text to identify selected text; and

means for graphically indicating on said second monitor screen the assembly, subassembly, or part corresponding to the selected text.

5,146,405

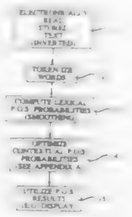
METHODS FOR PART-OF-SPEECH DETERMINATION AND USAGE

Kenneth W. Church, Chatham, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 5, 1988, Ser. No. 152,740

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 **6 Claims**



1. An automated method for assigning parts of speech to words in a message, of the type comprising the steps of:

storing data in a computer system which is relevant to words likely to be in the message and usages of said words as various parts of speech, and

employing processing means in the computer system to select for each word in the message a likely part of speech responsive to a likely part of speech for at least an adjacent word in the message and responsive to said stored data,

said method being characterized in that:

the storing step comprises storing statistical data relating to: (1) the actual likelihood of occurrence of each one of said likely words as a particular part of speech (hereinafter, the lexical likelihood), and (2) the actual likelihoods of occurrence of each of said words as a particular part of speech when occurring adjacent to words that are particular parts of speech (hereinafter, the contextual likelihood), and

the selecting step comprises maximizing, for each word in the message, its overall likelihood of being a particular part of speech by a finite-state optimization technique

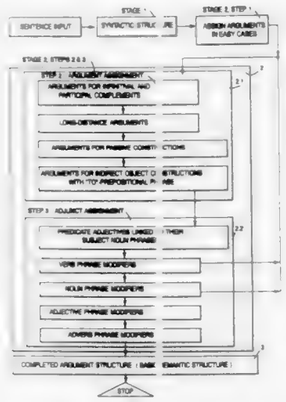
commonly known as the "Viterbi" optimization technique, said technique being responsive to both the stored lexical likelihoods for each said word and the stores contextual likelihoods for at least said adjacent word.

5,146,406

COMPUTER METHOD FOR IDENTIFYING PREDICATE-ARGUMENT STRUCTURES IN NATURAL LANGUAGE TEXT

Karen Jensen, Rockville, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1989, Ser. No. 395,118
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 2 Claims



1. In a computer method for determining basic semantic structures for natural language word strings, including inputting a string consisting of a plurality of words forming a linguistic expression in a natural language and parsing the input string with a syntactic set of rules to derive a syntactic structure for the string, identifying syntactic arguments for said words, the method comprising the steps of:

identifying a first group of words in said string as semantic arguments, when said semantic arguments correspond exactly to said syntactic arguments;

identifying semantic arguments in a second group of words in said string, which are not in said first group, by the following steps:

assigning missing arguments of infinitive clauses and participle clauses;

assigning long distance arguments;

assigning missing or displaced arguments in passive constructions;

assigning arguments for indirect object construction;

linking predicate adjectives to their subject noun phrases;

linking verb phrase modifiers to their verbs;

linking noun phrase modifiers to their nouns;

linking adjective phrase modifiers to their adjectives;

linking adverb phrase modifiers to their adverbs;

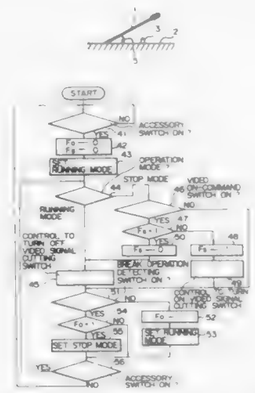
outputting said assigned arguments in a record which provides a normalized semantic structure for said input word string.

5,146,407

APPARATUS RESPONSIVE TO A VEHICLE'S PARKING BRAKE SWITCH TO ENABLE OPERATION OF OTHER APPARATUS

Minoru Motohashi, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 565,040
Claims priority, application Japan, Oct. 18, 1989, 1-271199
Int. Cl.[5] B60L *1/00, 3/00*
U.S. Cl. 364—424.05 1 Claim



1. A vehicle stop detecting apparatus for enabling operation of other apparatus in response to a vehicle stop signal, comprising: detecting means for detection an operative or inoperative parking brake condition in a vehicle;

signal generating means for generating a vehicle stop signal when a parking brake operative condition is detected after detection of a parking brake inoperative condition by said detecting means; and

reset means responsive to operation of a vehicle accessory switch, to cause the resetting of said signal generating means, wherein said signal generating means includes means for inhibiting said signal generating means from generating said vehicle stop signal if a parking brake operative condition is present when said signal generating means is reset.

5,146,408

ELECTRICAL BRAKE PRESSURE LIMITER AND CONTROLLER

James M. Valentic, Akron, Ohio, assignor to Aircraft Braking Systems Corp., Akron, Ohio

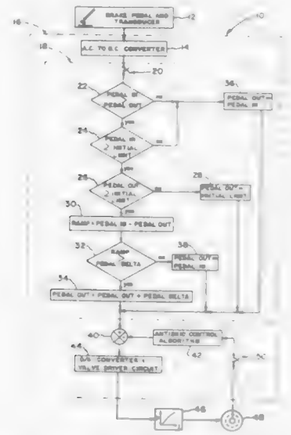
Filed Sep. 21, 1987, Ser. No. 99,189
Int. Cl.[5] B60T *8/60*
U.S. Cl. 364—426.02 6 Claims

1. An electrical brake pressure limiter and controller, comprising:

a brake pedal;

first means connected to said brake pedal for producing a first signal corresponding to a position of depression of said brake pedal;

second means connected to said first means, receiving said first signal and generating therefrom a second signal, said second signal being limited as to both initial amplitude and rate of increase in amplitude, said second means including means for comparing said first signal with said second signal and setting said second signal to equal said first signal if said first signal is less than said second signal, said second means including means for comparing said first signal with an initial limit and setting said second signal to equal said first signal if said first signal is less than said initial limit, said second means including means for comparing said second signal with said initial limit and setting said second signal to equal said initial limit if said second signal is less than said initial limit;



a valve driver receiving said second signal and generating a brake control signal therefrom; and

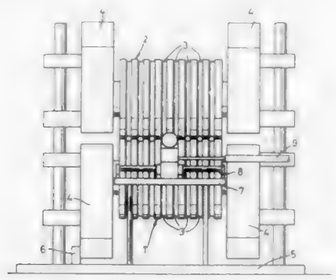
a brake valve receiving said brake control signal and controlling application and release of brake pressure to a brake as a function thereof.

5,146,409

MILL ROLL ADJUSTMENT

Craig Atkinson, The Beeches, Barlow, Derbyshire S18 5ST, England

Filed Mar. 8, 1990, Ser. No. 491,320
Claims priority, application United Kingdom, Mar. 11, 1989, [illegible]
Int. Cl.[5] G06F *15/46;* B21B *31/18*
U.S. Cl. 364—472 12 Claims



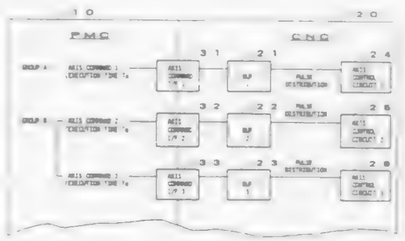
1. A method of setting the position of rolls for the accurate alignment of co-operating rolling grooves with each other and with the pass line of products to be rolled characterised by establishing a fixed datum point (13) on a base or support plate (12) for the stand or the chocks (10) of the rolls (1, 2), establishing the distance of a first rolling groove (3) in each roll from said fixed datum, locating said stand or said chocks (10) on said base (12) in relation to said fixed datum (13) such that a first reference roll (1) has its rolling groove (3) in line with the pass line, effecting any required powered axial adjustment of the second roll (2) in accordance with the predetermined distance as between its first rolling groove (3) and the fixed datum (13), to ensure alignment of the first rolling groove in the second roll with the first rolling groove in the reference roll, and to reposition the rolls, effecting a powered movement of the roll stand or chocks to the predetermined required degree to bring a further rolling groove of the reference roll into alignment with the product pass line with, and effecting a powered axial adjustment of the second roll to bring its co-operating further rolling groove into alignment with the second or subsequent groove in the reference roll and the pass line of the product to be rolled, as determined by the pre-established distance of the further rolling groove of the second roll from the fixed datum.

5,146,410

SELECTIVELY GROUPED AXES LINEAR INTERPOLATION NUMERICAL CONTROL SYSTEM

Hideaki Kawamura, Hachioji; Kentaro Fujibayashi, Musashino, and Yosata Hidaka, Tokyo, all of Japan, assignors to Fanuc Limited, Minamitsuru, Japan

PCT No. PCT/JP88/01095, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO89/05482, PCT Pub. Date Jun. 15, 1989
Continuation of Ser. No. 391,563, Jul. 21, 1989, abandoned. This PCT application Oct. 27, 1988, Ser. No. 747,503
Claims priority, application Japan, Dec. 10, 1987, 62-312480
Int. Cl.[5] G05B *19/403*
U.S. Cl. 364—474.31 1 Claim



1. A computerized numerical control system for controlling selected groups of axes of a computerized numerical control apparatus from a programmable machine controller coupled to the computerized numerical control apparatus, said computerized numerical control system comprising:

means, positioned in the programmable machine controller, for sending moving commands including corresponding command values and execution times specifying various ones of the axes as being in respective ones of the groups and for specifying the execution times for the axes in the respective groups, from the programmable machine controller to the computerized numerical control apparatus, and

means, positioned in the computerized numerical control apparatus, for distributing pulses to the axes when all moving commands for the axes in the respective groups are received by the computerized numerical control apparatus and for distributing the pulses within said execution times to effect linear interpolation with respect to said axes.

5,146,411

COMPUTER-AIDED PROCESS FOR PLACEMENT OF CRT TRIM MAGNETS

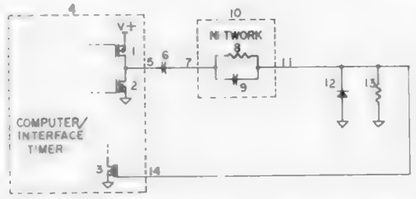
Brenda G. Faber, Loveland, Colo., and Louis A. Jansen, Chapel Hill, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1990, Ser. No. 529,289
Int. Cl.[5] H01J *9/44, 29/70*
U.S. Cl. 364—480 6 Claims

1. A method achieving compensation for image distortion during the manufacture of a cathode ray tube display having a yoke member, said method comprising the steps of:

connecting the cathode ray tube to an energy source before trim magnets are installed on the yoke member;
energizing the cathode ray tube to produce a video raster;
detecting edge distortions in the produced video raster;
employing a distortion correction algorithm and the detected edge distortions to calculate the strength and orientation of one or more trim magnetic fields, which fields, when taken in combination, will minimize the edge distortions; and
mounting one or more trim magnets on the yoke member, each of said magnets being of a sufficient strength and being oriented on the yoke member in such a way as to produce one of the trim magnetic fields.

5,146,412
METHOD AND MEANS FOR SENSING A CHANGE IN CAPACITANCE BY A COMPUTER
Thad M. Jones, 1302 High St., South Bend, Ind. 46618
Filed May 17, 1990, Ser. No. 524,746
Int. Cl.[5] G01R *27/00*
U.S. Cl. 364—482 **2 Claims**



1. A device for indicating change in a capacitive value in a load comprising, a means for outputting a periodic waveform having a high voltage portion and a low voltage portion to said load, a capacitance connected between said output means and said load, said load connected between said output means and a means for monitoring the voltage of said load, a diode and a resistor being connected between said monitoring means and ground potential, wherein said load includes a capacitive component and a resistive component, said capacitive component charges through said resistor during said high voltage portion of said waveform, wherein said monitoring means indicates when said charging capacitive component is at a predetermined voltage, said capacitive component discharging during said low voltage portion of said waveform, said monitoring means further constituting means for timing the time for said capacitance to charge to said predetermined voltage, wherein a change in charge time indicates a change in said capacitance value.

5,146,413
METHOD FOR THE DETERMINATE EVALUATION OF A CHEMISTRY ANALYZER'S COMBINED DILUTING AND ANALYZING SYSTEMS
Gary W. Shires, 124 E. Harvard Dr., Tempe, Ariz. 85283
Filed Apr. 24, 1987, Ser. No. 42,864
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—497 **1 Claim**

1. A method for determining the actual volume of a liquid dispensed from a liquid dispensing system through a sequence of evaluations whereby first, (i), a spectrophotometer is evaluated through the absorbance analysis of at least five different concentrations of a liquid chromophore, whose absorbance values will be calculated to fall within the absorbance detection limits for the spectrophotometer through the application of Beer's Law for the chromophore, (A=abc, where A=absorbance, a=molar extinction coefficient, b=sample pathlength, and c=molar concentration), and will be used in step two, (2), as the X values in the plot of a linear regression comparison curve, which is accomplished by using least squares analysis of X and Y data pairs expressing a line described by the equation Y=ao+alX, (where ao=intercept

$$a0 = \frac{(\Sigma Y)(\Sigma X^2) - (\Sigma X)(\Sigma XY)}{N\Sigma X^2 - (\Sigma X)^2}$$

and a1=slope),

$$a1 = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$$

and comparing to the Y values of the linear regression comparison that are the absorbance values obtained from the spectrophotometer absorbance analysis of each of the five known liquid chromophore concentrations, and producing a linear relationship of the known absorbance values of the five liquid chromophores to the absorbance values of the five liquid chromophore assays from the spectrophotometer that will be characterized by linear regression curve constants of slope, intercept, coefficient of correlation:

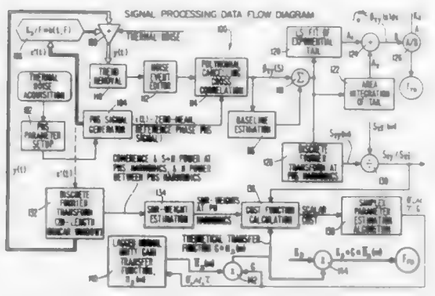
$$r^2 = +/- \sqrt{\frac{\Sigma(Y\,est. - \bar{Y})^2}{\Sigma(Y - \bar{Y})^2}}$$

and standard error of estimate:

$$Sy.x \sqrt{\frac{\Sigma Y^2 - a_0\Sigma Y - a_1\Sigma XY}{N - 2}}$$

of which the slope and intercept constants will be used to adjust the spectrophotometer absorbance values obtained for use in step four (4), r will describe the one to the one relationship of the X and Y data pairs, and Sy.x will describe the proximity of the X and Y data points to the regression line, where in step three (3), a liquid chromophore of the same molecular type used to evaluate the spectrophotometer in steps one (1) and two (2), but of increased known concentration and whose absorbance value is calculated through application of Beer's Law, as in step one (1), (identified as AULC-absorbance of undiluted liquid chromophore), is diluted by the liquid dispensing system producing a solution of diluted liquid chromophore to be place into the spectrophotometer, previously characterized through linear regression by the five levels of known liquid chromophore absorbance values, and analyzed for the absorbance of the diluted liquid chromophore, (identified by the symbol ADLC), where in step four (4), the intercept obtained from the linear regression comparison in step two (2) will be subtracted from the absorbance value of the diluted liquid chromophore obtained in step three (3), (identified by the symbol ADLCi), (ADLC-ao=ADLC1), where in step five (5), the absorbance result from step four (4) will be divided by the slope value obtained from step two (2): (identified by the symbol ADLC2), (ACLC1/si=ADLC2), producing an absorbance value of the diluted liquid chromophore, as analyzed in step three (3) that has been adjusted by the linear regression constants of the spectrophotometer found in step two (2) to reflect the absorbance of the diluted liquid chromophore, as diluted by the dispensing system in step three (3), without absorbance response bias from the spectrophotometer used in step three (3), where in step six (6), a calculated total volume dilution absorbance value of the undiluted liquid chromophore, used in step three (3), (identified by the symbol TVDA), will be computed by dividing the known absorbance of the undiluted liquid chromophore used in step three (3), (identified by the symbol AULC), by the total volume of the dilution requested in step three (3), (identified by the symbol TV), (AULC/TV=TVDA), where in step seven (7), the adjusted absorbance value of the diluted liquid chromophore found in step five (5) will be divided by the calculated total volume dilution absorbance of the undiluted liquid chromophore found in step six (6), producing a result that represents the volume of undiluted liquid chromophore delivered for dilution in step three (3) by the dispensing system in volume units, (ADLC2/TVDA=Volume units delivered).

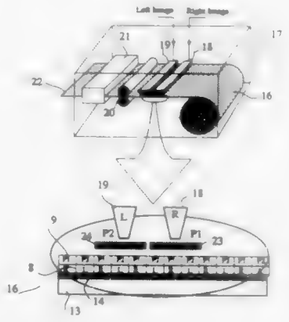
5,146,414
METHOD AND APPARATUS FOR CONTINUOUSLY MEASURING VOLUMETRIC FLOW
Russel McKown, Dallas; Mark Yelderman, and Michael Quinn, both of Plano, all of Tex., assignors to Interflo Medical, Inc., Plano, Tex.
Filed Apr. 18, 1990, Ser. No. 510,897
Int. Cl.[5] G01F *1/68*
U.S. Cl. 364—510 **79 Claims**



1. A method of directly measuring volumetric flow of a fluid between a system entry point and a system exit point, comprising the steps of:
applying to said fluid, at said system entry point, a quantity of indicator under control of an excitation signal having a plurality of frequencies;
sensing a time-dependent response of said fluid to said excitation signal at said system exit point to obtain a response signal having a plurality of data points;
cross-correlating said excitation signal with said response signal to obtain a cross-correlation function signal representing cross-correlation data;
selecting a distribution function model which mathematically models the distribution of said indicator in said system;
comparing said cross-correlation data to said distribution function model;
adjusting said distribution function model to fit said cross-correlation data; and
calculating a signal representative of volumetric flow of said fluid from said quantity of said indicator applied under control of said excitation signal and from said adjusted distribution function model.

34. A method of directly measuring volumetric flow of a fluid between a system entry point and a system exit point, comprising the steps of:
applying to said fluid, at said system entry point, a quantity of indicator under control of an excitation signal having a plurality of frequencies;
sensing a time-dependent response of said fluid to said excitation signal at said system exit point to obtain a response signal having a plurality of data points;
removing from said response signal data representing an aberrant noise event so as to obtain a noise event edited response signal, said aberrant noise event data including a spike in said response signal having an abnormally large amplitude over a short time interval with respect to the remainder of said response signal;
cross-correlation said excitation signal with said noise event edited response signal to obtain a cross-correlation function signal representing cross-correlation data; and
calculating a signal representative of volumetric flow of said liquid from said cross-correlation data and from said quantity of said indicator applied under control of said excitation signal.

5,146,415
SELF-ALIGNED STEREO PRINTER
Sades M. Faris, 24 Pocantico River Rd., Pleasantville, N.Y. 10570
Filed Feb. 15, 1991, Ser. No. 655,821
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—101 **14 Claims**



1. A self-aligned printing system for producing 3-D stereo hard copy computer outputs of graphic images in response to applying the left and right perspectives of an imaged object to its input, comprising:
a. Photo-sensitive printing medium comprising at least one component;
b. Left and right print heads which produce left and right images having two polarization states P1 and P2. The polarized images are used to expose simultaneously the printing medium and to record said images on said printing medium;
c. Micro-polarizer array (μPol) sheets in direct contact with and laminated to the printing medium are used to carry

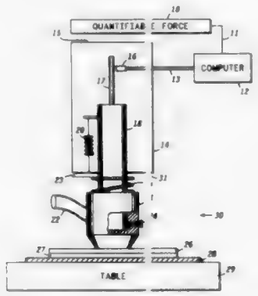
out the spatial multiplexing and the spatial demultiplexing functions;
d. means for feeding, transporting, and combining components of printing medium;
e. means for developing the exposed printing medium and
f. means for decoding and viewing 3-D stereo images.

5,146,406

METHOD AND APPARATUS FOR ACCURATELY MEASURING THICKNESS OF A SEMICONDUCTOR DIE BOND MATERIAL

Shun-Meen Kuo, Chandler, Ariz. assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1991, Ser. No. 663,508
Int. Cl.[5] G01B 5/06
U.S. Cl. 364—563 **12 Claims**



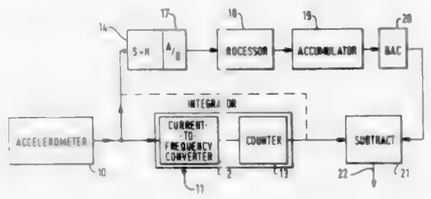
11. A method for measuring height of die bonding material used to bond a semiconductor die to a lead frame comprising:
measuring height of the semiconductor die on the lead frame;
placing die bonding material on the lead frame;
pressing the semiconductor die down on the die bonding material; and
measuring height of the semiconductor die on the die bonding material.

5,146,417

SIGNAL PROCESSING APPARATUS AND METHOD

Norman F. Watson, Edinburgh, Scotland, assignor to Gec-Ferranti Defence Systems Limited, Middlesex, United Kingdom

Filed Mar. 7, 1990, Ser. No. 489,708
Claims priority, application United Kingdom, Mar. 22, 1989, 8906670
Int. Cl.[5] G01P 21/00
U.S. Cl. 364—571.01 **14 Claims**



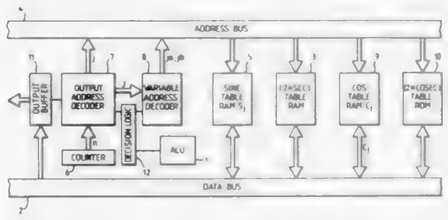
1. Apparatus for processing an analog input signal by integrating the analog input signal with respect to time thereof for an integration period and correcting errors in the integrated signal due to errors in the analog input signal comprising control means (26) for defining the integration period and generating a plurality of control signals the number of control signals generated being smaller than that required by the Nyquist sampling theorem for a predetermined highest frequency component of the input signal, a sampling circuit for sampling the input signal, a gate for applying the control signals to the sampling means such that said sampling circuit derives sampled signals in response to said control signals that bear a functional relationship with errors in the input signal, means for processing the sampled signals and subjecting the sampled signals to an algorithmic process representative of said functional relationship to quantify the error in the input signal represented by the sampled signals, means for integrating the processed sample results, means for applying the control signals to the means for integrating the processed sample results to quantity the effect of errors on the integrated analog input signal and means for modifying the integrated input signal in accordance with the quantified effect to correct errors in the integrated input signal.

5,146,418

TRIGONOMETERIC FUNCTION GENERATION FOR USE IN DIGITAL SIGNAL PROCESSING

Larry F. Lind, Colchester, England, assignor to British Telecommunications public limited company, London, England

Filed Aug. 9, 1990, Ser. No. 564,467
Claims priority, application United Kingdom, Aug. 11, 1989, 8918337
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—729 **9 Claims**



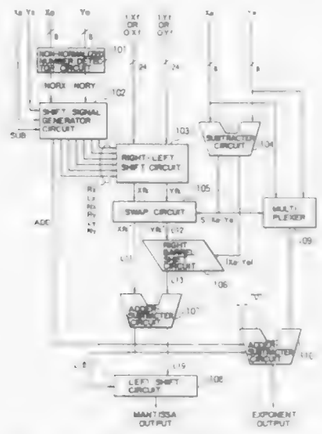
1. A digital signal processing device comprising an input for receiving an input electrical signal, an output for making an output electrical signal available, and electrical processing circuits for processing the input signal to produce said output signal, the processing circuits including an electrical trigonometric function generator for generating a value of a trigonometric function in response to an input argument provided by said electrical processing circuits, said trigonometric function generator comprising: electrical input elements for receiving an input argument; first electrical storage elements for storing digital values of the function corresponding to spaced argument values; and arithmetic circuitry associated with said first electrical storage elements for interpolatively calculating, using a first algorithm, values of the function corresponding to arguments lying in the spaces between said spaced argument values;
second electrical storage elements for storing digital values of a second, complementary function corresponding to spaced argument values;
said arithmetic circuitry also being associated with said second electrical storage elements for interpolatively calculating, using a second algorithm, values of said function corresponding to arguments lying in the spaces between said spaced argument values from values of the second complementary function corresponding to the neighbouring predetermined argument values; and
electrical logic control elements for selectively employing the second storage elements and algorithm for an input argument if use with said first store and said first algorithm gives rise to a substantial round-off error.

5,146,419

FLOATING POINT ADDITION-SUBTRACTION APPARATUS

Akira Miyoshi, Neyagawa, and Takashi Taniguchi, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1990, Ser. No. 617,610
Claims priority, application Japan, Nov. 28, 1989, 1-308687
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—748 **4 Claims**



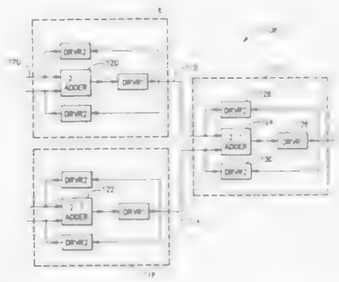
1. A floating point addition-subtraction apparatus for adding or subtracting two floating point number operands each including a mantissa part operand, an exponent part operand and a sign part operand, said apparatus comprising:
first means for receiving two exponent part operands and a signal indicating whether an operation to be performed is an addition or a subtraction, for performing a detection operation by detecting from the two exponent part operands whether the floating point number operands are of normalized numbers or non-normalized numbers, and for generating shift signals based upon a result of the detection operation and on the basis of said two exponent part operands and the signal indicating whether the operation is an addition or a subtraction;
second means for not shifting or right or left shifting said mantissa part operands based upon the shift signals from said first means and for delivering outputs based upon shifting or not shifting said mantissa part operands;
third means for performing a subtraction of said two exponent part operands and for outputting a signal value and an absolute value based upon a result of the subtraction;
fourth means for swapping output values of said second means based upon the sign value from said third means, and for delivering outputs based upon the swapped output values;
fifth means for right shifting an output value which has a smaller exponent part operand among values of said outputs of said fourth means, said right shifting by said fifth means being carried out by an amount corresponding to the absolute value outputted from said third means; and
sixth means for performing an addition-subtraction operation by adding-subtracting to and from said output value right shifted by said fifth means an output value which has a larger exponent part operand among values of said outputs of said fourth means, and for rounding a result of the addition-subtraction operation to deliver a rounded output.

5,146,420

COMMUNICATING ADDER TREE SYSTEM FOR NEURAL ARRAY PROCESSOR

Stamatis Vassiliadis, Vestal, and Gerald G. Pechanek, Endwell, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 526,866, May 22, 1990, Pat. No. 5,065,339.
This application Aug. 5, 1991, Ser. No. 740,556
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—757 **4 Claims**



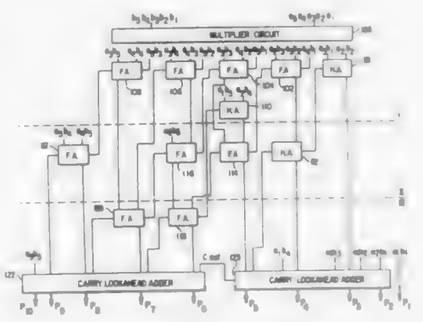
1. For use in a neural array processor including a connectivity network, an adder tree comprising:
state means for defining a compute state and a communication state;
adder means responsive to said compute state for combining at least two inputs to generate an adder output;
first driver means responsive to said compute state for communicating said adder output to a data path; and
second driver means responsive to said communication state for connecting said data path to said inputs.

5,146,421

HIGH SPEED PARALLEL MULTIPLIER CIRCUIT

Matthew J. Adiletta, Worcester, and Stephen C. Root, Westboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 124,926, Nov. 24, 1987. This application Jun. 28, 1989, Ser. No. 373,083
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—758 **8 Claims**



1. A binary multiplier circuit for obtaining a product of an M-bit multiplier and an N-bit multiplicand, comprising:
binary multiplier means, having inputs connected to receive said multiplier and said multiplicand, for producing a summand matrix having M x N original summand matrix bits and having M rows and M+N columns, the columns each representing a different bit position in said product

and being arranged in significance according to increasing bit positions of said product;

reduction circuit means, coupled to said binary multiplier means, for producing two addends from said summand matrix bits, said reduction circuit means including

a first level adder circuit coupled to receive said original summand matrix bits, said first level adder circuit including

a first set of full adders each corresponding to a selected one of the columns of said summand matrix having three or more original summand matrix bits, except for the one of said columns representing the least significant bit position with only three original summand matrix bits, each of the first set of full adders being connected to receive three different original summand matrix bits from the corresponding column and including means for producing a sum bit for that column and a carry bit for the column representing the next most significant bit position, and

a first set of half adders each corresponding to a selected one of the columns of said summand matrix initially having more than three original summand matrix bits and having exactly two original summand matrix bits not connected to one of said full adders in said first set of full adders, and for the one of said columns representing the least significant bit position with only three original summand matrix bits, each of the first set of half adders being connected to receive two different original summand matrix bits from the corresponding column and including means for producing a sum bit for that column and a carry bit for the column representing the next most significant bit position, and

a second level adder circuit coupled to receive either original summand matrix bits not received by said first sets of half adders or full adders, or sum and carry bits from said first sets of full adders and half adders, said second level adder circuit being organized into one or more different levels and receiving column bits including, for a corresponding column and level, the original summand matrix bits not received by the first sets of half or full adders and sum and carry bits which were not inputs at a prior level, said second level adder circuit including

a second set of full adders each corresponding to one of said levels and to a selected one of said columns having three or more column bits, except for the one of said columns at the corresponding level representing the least significant bit position for which only three column bits remain, each of the second set of full adders at each of said levels being connected to receive three column bits for the corresponding column and including means for producing a sum bit for that column and a carry bit for the column representing the next most significant bit position, and

a second set of half adders each corresponding to one of said levels and to a selected one of the columns for which, at each of said levels, at least one of said full adders from said first or second set of full adders corresponds to that column and exactly two bits remain unconnected to any of said full adders, and also corresponding to the one of said columns at each level representing the least significant bit position for which only three column bits remain, each of the second set of half adders being connected to receive two column bits for the corresponding column and including means for producing a sum bit for that column and a carry bit for the column representing the next most significant bit position,

a third level adder circuit coupled to receive sum and carry bits from said first sets of full adders and half adders and from said second sets of full adders and half adders, said third level adder circuit including a third set of full adders each corresponding to a selected one of said columns having three column bits, each of the third set of full adders being connected to receive three column bits for the corresponding column and including means for producing a sum bit for that column and a carry bit for the column representing the next most significant bit position;

first full carry-propagating adder means, receiving as inputs the addends which are output from said first and second level adder circuits corresponding to the M least significant column bits, for producing the M least significant bits of said product and a carry output; and

second full carry-propagating adder means, receiving as inputs the addends which are output from said third level output circuit corresponding to the N most significant column bits and the carry output from said first full carry-propagating adder means, for producing the N most significant bits of said product.

5,146,422

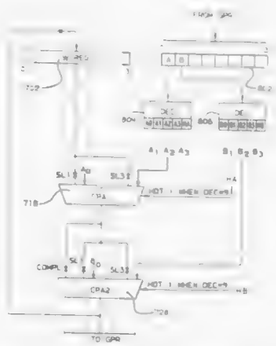
REDUCED EXECUTION TIME CONVERT TO BINARY CIRCUIT

Klaus K. Maass, and David T. Shen, both of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 532,729, Jun. 4, 1990, Pat. No. 5,031,138. This application Jun. 27, 1991, Ser. No. 722,588

Int. Cl.[5] G06F *7/50*; **H03M** *7/04*

U.S. Cl. 364—768 **7 Claims**



1. An apparatus for converting a multidigit decimal number into a binary number, comprising:

storage means for holding said multidigit decimal number;

first conversion means, coupled to said storage means, for simultaneously converting a first pair of decimal digits in said multidigit decimal number, into a first binary representation, said first conversion means comprising first decoder logic, connected to receive said first pair of decimal digits from said storage means, for producing a first decoded digit and a second decoded digit; and, a first adder, connected to receive said first decoded digit and said second decoded digit, for producing said first binary representation therefrom;

second conversion means, coupled to said first conversion means and said storage means, for simultaneously converting a second pair of decimal digits in said multidigit decimal number and said first binary representation into a second binary representation of a decimal number defined by said first and second pair of decimal digits, said second conversion means comprising second decoder logic, connected to receive said second pair of decimal digits from said storage means, for producing a third decoded digit and a fourth decoded digit; and, a second adder, connected to receive a result from said first adder and to receive said third decoded digit and said fourth decoded digit from said second decoder logic, for producing said first binary representation therefrom.

5,146,423

CIRCUIT ARRANGEMENT FOR ADDING OR SUBTRACTING OPERANDS CODED IN BCD-CODE OR BINARY-CODE

Horst Fischer, Haar, and Wolfgang Rohsaint, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

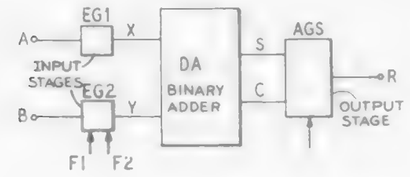
PCT No. PCT/DE89/00569, § 371 Date Dec. 7, 1990, § 102(e) Date Dec. 7, 1990, PCT Pub. No. WO90/02994, PCT Pub. Date Mar. 22, 1990

PCT Filed Aug. 31, 1989, Ser. No. 613,889

Claims priority, application European Pat. Off., Sep. 9, 1988, 88114781.3

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—771 **11 Claims**



1. A circuit arrangement for adding or subtracting 4-bit first and second operands coded in one of binary coded decimal or binary code upon employment of a binary adder, comprising:

(a) a first input stage having an output connected to a first input of the binary adder, said first input stage receiving the first operand, said first input stage having means for adding the number 6 to said first operand given operations of binary coded decimal operands with positive operands;

means for adding the number 6 to said first operand given negative operands and negating the result of the addition;

means for not modifying said operand given different operational signs of the two operands and a positive operational sign of said first operand;

means for negating said first operand given different operational signals of the two operands given negative operational signal of said first operand;

means for negating said first operand but not otherwise modifying said first operand given operations of operands in the binary code with a negative said first operand;

(b) a second input stage for receiving the second operand, said second input stage having, when receiving a negative, second operand, means for negating the second operand but otherwise leaving the second operand unmodified, said second input stage having an output connected to a second input of the binary adder;

(c) an output stage connected to a sum output of the binary adder, said output stage having, given binary coded decimal operations of the first and second operands and an absence of a carry on a carry output of the binary adder, means for subtracting the number 6 from a sum result on the sum output of the binary adder in order to generate a corrected sum but otherwise said output stage through-connecting the sum result.

5,146,424

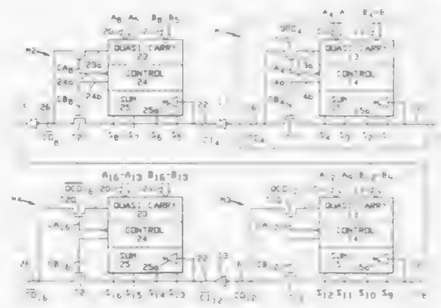
DIGITAL ADDER HAVING A HIGH-SPEED LOW-CAPACITANCE CARRY BYPASS SIGNAL PATH

LuVerne R. Peterson, San Diego, and Laurence P. Flora, Valley Center, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 21, 1991, Ser. No. 796,105

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—786 **17 Claims**



1. A digital adder module comprising:

data input terminals for receiving N pairs of data bit signals A_N and B_N thru A_1 and B_1, and a carry-in terminal for receiving a carry-in signal;

a quasi carry means for generating a quasi carry-out signal that is valid only when the data bits of at least one of said N pairs are equal, and which presents no load to said carry-in signal;

a control means, for generating a first control signal indicating when the data bits of at least one of said N pairs are equal, for generating a second control signal which is the inverse of said first control signal, and which presents no load to said carry-in signal;

a first transistor having a source connected to receive said quasi carry-out signal, a drain connected to a carry-out terminal, and a gate which receives said first control signal;

a second transistor having a source connected to said carry-in terminal, a drain connected to said carry-out terminal, and a gate which receives said second control signal; and,

a summing means for generating N sum bits from said data bits and said carry-in signal, and which presents a load of only a single logic gate to said carry-in signal.

5,146,425

MIST TYPE DYNAMIC RANDOM ACCESS MEMORY CELL AND FORMATION PROCESS THEREOF

Youngtae Kang, and Laeku Kang, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 635,728, Dec. 28, 1990. This application Jun. 25, 1991, Ser. No. 720,947

Claims priority, application Rep. of Korea, Oct. 11, 1990, 90-16121[U]

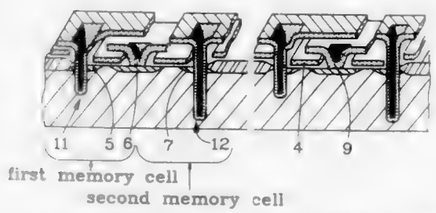
Int. Cl.[5] G11C *11/24*

U.S. Cl. 365—149 **2 Claims**

1. A dynamic random access memory cell (DRAM) in an array of cells, said DRAM having a single transistor and a single capacitor,

said capacitor comprising a trenched capacitor formed in the shape of a trench and a stacked capacitor having a vertical differential in relation to said trenched capacitor and formed at the place where said transistor is to be formed, the depth of said trenched capacitor being different than the

depth of the trenched capacitor of an adjacent memory cell, and



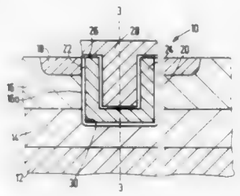
said cell having a stacked capacitor with a shallower trench depth and being provided with a larger electrode area than that of the capacitor of an adjacent memory cell.

5,146,426

ELECTRICALLY ERASABLE AND PROGRAMMABLE READ ONLY MEMORY WITH TRENCH STRUCTURE

Satyendranath Mukherjee, Yorktown Heights; Len-Yuan Tsou, and Di-Son Kuo, both of New York, all of N.Y., assignors to North American Philips Corp., New York, N.Y.

Filed Nov. 8, 1990, Ser. No. 610,598
Int. Cl.[5] G11C *13/00, 11/24*
U.S. Cl. 365—149 **10 Claims**



1. An Electrically Erasable and Programmable Read Only Memory (EEPROM) cell, which comprises:

a first semiconductor layer of a first conductivity type and having a high doping level;

a second semiconductor layer of said first conductivity type on said first layer and having a lower doping level than that of said first layer, said first and second layers together forming a source region of said EEPROM cell;

a third semiconductor layer of a second conductivity type opposite to that of said first type on said second layer and extending to a surface of said EEPROM cell;

A fourth surface-adjoining highly-doped semiconductor layer of said first conductivity type provided locally in said third layer and forming a drain region of said EEPROM cell;

a trench extending through said third and fourth layers and partially into but not through said second layer;

a channel region located in a portion of said third layer adjacent the sidewall portion of said trench and extending from said second region to said fourth region;

a gate dielectric covering a sidewall and floor of said trench;

a floating gate on said gate dielectric and extending adjacent the sidewall and floor of said trench;

an intergate dielectric covering at least an inner sidewall and floor of said floating gate;

a control gate located on said intergate dielectric and separated from said channel region by said floating gate;

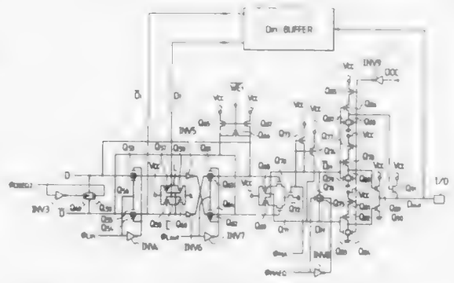
means for causing a localized high electric field density during an erase portion of an operating cycle of said cell across a corner region of said gate dielectric in the area adjacent the intersection of said trench sidewall and floor.

5,146,427

HIGH SPEED SEMICONDUCTOR MEMORY HAVING A DIRECT-BYPASS SIGNAL PATH

Katsuro Sasaki, Fuchu; Nobuyuki Moriwaki, Kodaira; Shigeru Honjo, Otsuki, and Hideaki Nakamura, Kodaira, all of Japan, assignors to Hitachi Ltd., Tokyo and Hitachi Vlsi Engineering Corp., Kodaira, both of, Japan

Continuation of Ser. No. 567,099, Aug. 14, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 825,782
Claims priority, application Japan, Aug. 30, 1989, 1-221456
Int. Cl.[5] G11C *7/00, 8/00*
U.S. Cl. 365—189.05 **10 Claims**



1. A semiconductor integrated circuit device comprising:

a plurality of memory cells;

a first sense amplifier which amplifies complementary signals read out from a selected one of said plurality of memory cells and provides at complementary outputs thereof complementary output signals;

a latch circuit which has complementary signal lines for receiving data of said complementary output signals from said first sense amplifier and stores said data therein;

a circuit having complementary inputs coupled to receive the data on said complementary signals of said latch circuit, said circuit including a second sense amplifier and an output buffer, said second sense amplifier having complementary inputs connected to the complementary inputs of said circuit, said output buffer having complementary inputs connected to complementary outputs of said second sense amplifier, and said output buffer outputting an output signal from an output terminal thereof;

first pass-gates which are connected between the complementary outputs of said first sense amplifier and the complementary signal lines of said latch circuit;

second pass-gates which are connected between the complementary signal lines of said latch circuit and the complementary inputs of said circuit; and

signal paths which directly transmit the complementary output signals from said first sense amplifier to the complementary inputs of said circuit and which bypass said first pass-gates, said latch circuit and said second pass-gates,

wherein said signal paths effect a direct connection, without any intervening elements, from the complementary outputs of said first sense amplifier to the complementary inputs of said second sense amplifier, and

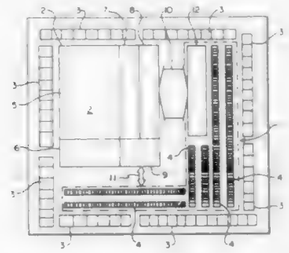
wherein the complementary output signals of said first sense amplifier are at first directly transmitted to the complementary inputs of said circuit through said signal paths, whereby said output buffer generates the output signal in response to the complementary output signals of said first sense amplifier, as transmitted to said circuit from said signal paths, and thereafter said first pass-gates and said second pass-gates are respectively brought into a signal-through condition, and said first sense amplifier is controllably brought to a non-activated condition or to a low gain-low power consumption operating state.

5,146,428

SINGLE CHIP GATE ARRAY

Nobuyoshi Tanimura, Mitaka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 473,601, Feb. 1, 1990, abandoned. This application Dec. 10, 1991, Ser. No. 804,637
Claims priority, application Japan, Feb. 7, 1989, 1-27835
Int. Cl.[5] G11C *5/06*
U.S. Cl. 365—189.08 **18 Claims**



1. A gate array semiconductor single chip integrated circuit, comprising:

a memory cell array having a plurality of word lines and a plurality of bit lines in matrix form;

an x-address decoder for the word lines of said memory cell array and functioning as x-select means;

a data register coupled to said memory cell array;

a gate array unit having basic cells and being coupled to said data register;

application specific mask pattern layer means for wiring said basic cells in a specific application manner, including forming a part of y select means for providing selective signals;

sense amplifier means coupled between said memory cell array and said data register for detecting and amplifying particular signal levels on said bit lines of said memory cell array and passing amplified signals to said data register;

coupling means between said data register and said gate array unit, and said coupling means having a group of data signal lines corresponding to said bit lines;

switch circuit means coupled between basic cells of said gate array unit and said data register and responsive to the selective signals for selecting particular ones of said signal data lines to be used in the transfer of data between said data register and said gate array; and

said switch circuit means and said gate array unit functioning as a y select circuit.

5,146,429

SEMICONDUCTOR MEMORY DEVICE INCLUDING A REDUNDANCY CIRCUITRY FOR REPAIRING A DEFECTIVE MEMORY CELL AND A METHOD FOR REPAIRING A DEFECTIVE MEMORY CELL

Shinji Kawai; Shigeru Mori, and Shigeru Kikuda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1990, Ser. No. 617,737
Claims priority, application Japan, Aug. 2, 1990, 2-206157
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—200 **12 Claims**

1. A semiconductor memory device comprising:

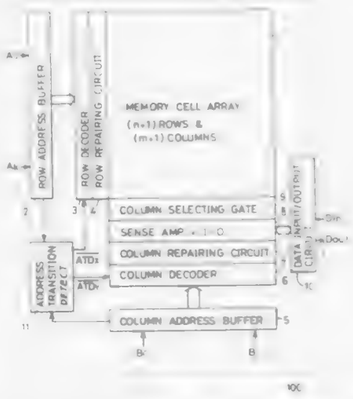
a memory cell array having a plurality of memory cells arranged in a matrix manner of rows and columns, said row including at least (n+1) lines, where n is an integer,

row selecting signal generating means responsive to externally applied row address signals for generating a signal selecting the corresponding row of said memory cell array, said row selecting signal generating means including n row selecting signal output nodes,

column selecting means responsive to externally applied column address signals for selecting the corresponding column of said memory cell array,

row selecting signal transmitting means provided between said row selecting signal output nodes and said rows of said memory cell array for transmitting the row selecting signal generated from said row selecting signal generating means to the corresponding row, said row selecting signal transmitting means including a plurality of row selecting signal transmission device means provided corresponding to each of said row selecting signal output node, each of said plurality of row selecting signal transmission device means being connected so as to selectively transmit the signal on the corresponding row selecting signal output node to either of the two adjacent rows in succession, whereby a row selecting signal is selectively transmittable to one row from two adjacent row selecting signal transmission device means,

connection path defining means for defining the connection path of said row selecting signal transmitting means, said connection path defining means dividing said row selecting signal output nodes into a first group including the row selecting signal output node corresponding to the i-th row and a second group formed of the remaining row selecting signal output nodes, to define the connection



path of said row selecting signal transmission device means so that the connection manner of the row selecting signal transmission device means provided corresponding to the row selecting signal output nodes of said first group and the connection manner of the row selecting signal transmission device means provided corresponding to the row selecting signal output nodes of said second group differ from each other, for electrically disconnecting said i-th row from said row selecting signal generating means, in the case a defective memory cell exists in the i-th row of said memory cell array, each of said first and second groups including continuously adjacent row selecting signal output nodes,

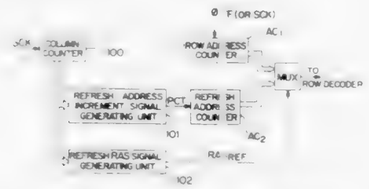
a plurality of selective connecting devices provided corresponding to each said row of said memory cell array for selectively connecting the corresponding row to a first reference potential, and

connection manner defining means responsive to the output of said connection path defining means for defining the connection manner of said plurality of selective connecting devices, said connection manner defining means defining the connection manner of said selective connecting devices so as to connect only the row having said defective memory cell to said reference potential.

5,146,43
SELF-REFRESH SYSTEM F OR USE IN A FIELD MEMORY DI VICE

Yasuo Torimaru, Nara, and Kouji I oue, Osaka, both of Japan, assignors to Sharp Kabushiki Kai ha, Osaka, Japan

Continuation-in-part of Ser. No. 268 499, Nov. 8, 1988, Pat. No. 4,972,376. This application Nov. 20, 1990, Ser. No. 615,876
Claims priority, application Japa , Nov. 9, 1987, 62-282732
Int. Cl.[5] G11C *11/406, 11/408*
U.S. Cl. 365—222 6 Claims



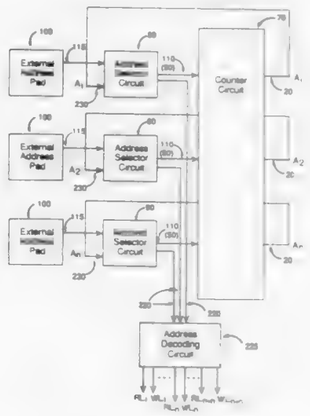
1. A field memory self-refresh system comprising:
control means for generating a shift clock signal and a transfer signal;
row address means for generating a first address to be utilized during read and write operations and being incremented in response to an address clock signal; and
an integrated dynamic random access memory including,
dynamic memory means for storing data according to said first address during said write operation and for outputting data according to said first address during said read operation,
column counter means for generating a column count signal in response to said shift clock signal,
refresh address incrementing means, responsive to said column count signal, for producing an incrementing signal according to a decoding of said column count signal,
refresh select signal generating means, responsive to said column count signal, for producing a refresh select signal according to a decoding of said column count signal,
refresh address means, responsive to said incrementing signal, for generating a second address to be utilized in a refresh operation, said second address being not equal to said first address,
selecting means, responsive to said refresh select signal, for applying a selected one of said first address and said second address to said dynamic memory means according to said refresh select signal,
latch means for latching data read from said dynamic memory means during a read operation, and
output means for serially outputting data from said latch means in response to said transfer signal.

5,146,431
METHOD AND APPARATUS FOR PAGE RECALL OF DATA IN AN NONVOLATILE DRAM MEMORY DEVICE

Michael D. Eby, Battle Gound, Wash.; Katsumi Fukumoto, Nara, Japan; Michael J. Griffus, and Giao N. Pham, both of Vancouver, Wash., assignors to Sharp Kabushiki Kaisha, Japan

Filed Sep. 20, 1990, Ser. No. 585,771
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—238.5 9 Claims

6. An NVDRAM memory device having a plurality of NVDRAM cells, each NVDRAM cell including a DRAM cell and a corresponding EEPROM cell, said NVDRAM memory device comprising:
means for reading and writing data to said DRAM cells;
store mode means for transferring data in said DRAM cells to said corresponding EEPROM cells; and
recall mode means for transferring data in said corresponding EEPROM cells to said DRAM cells, wherein said recall mode means comprises means for simultaneously

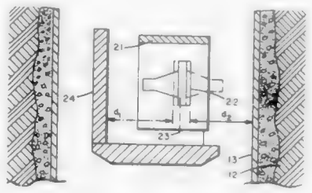


transferring data in a plurality of said corresponding EEPROM cells to a plurality of said DRAM cells.

5,146,432
METHOD FOR MAKING CEMENT IMPEDANCE MEASUREMENTS WITH CHARACTERIZED TRANSDUCER

Christopher V. Kimball, West Redding, Conn., and Sevig Ayter, Cupertino, Calif., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 5, 1991, Ser. No. 740,530
Int. Cl.[5] H04B *17/00*
U.S. Cl. 367—13 57 Claims

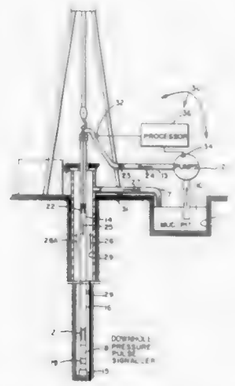


1. A method of characterizing an acoustic transducer, comprising:
a) arranging said acoustic transducer a predetermined distance from a calibration target, wherein said calibration target is of known thickness, and said calibration target is in contact with matter of known impedance along its inner surface and outer surface;
b) transmitting a pulse from said acoustic transducer toward said calibration target and measuring a return signal received therefrom; and
c) fitting a return signal calculation generated by a model of said return signal to said return signal, said model having a limited number of parameters, to determine a value for at least one of said parameters and thereby characterizing said transducer, by substantially minimizing the difference between said return signal calculation and said measured return signal.

5,146,433
MUD PUMP NOISE CANCELLATION SYSTEM AND METHOD

Alexandre Kosmala, Aberdeen, Scotland; David Malone, Sugar Land, and Peter Masak, Katy, both of Tex., assignors to Anadrill, Inc., Sugar Land, Tex.

Filed Oct. 2, 1991, Ser. No. 770,198
Int. Cl.[5] G01J *1/40*
U.S. Cl. 367—83 20 Claims

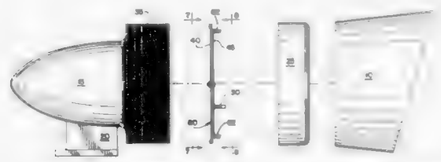


3. A method for filtering a mud pressure signal being transmitted in mud to remove portions of said mud pressure signal generated by a mud pump means, comprising:
(a) running said mud pump means in the absence of a data signal being generated in said mud;
(b) recording first mud pressure signals as a function of mud pump piston position for said mud pump means in the absence of said data signal;
(c) running said mud pump means while said data signal is generated in said mud;
(d) recording over a given time period second mud pressure signals as a function of mud pump piston position for said mud pump means in the presence of said data signal;
(e) for each sampling point in time of said given time period relating to given pump piston positions, taking the difference between indications of the second mud pressure signal and indications of said first mud pressure signal recorded for an identical pump piston position to provide an indication of said data signal.

5,146,434
SOUND FOCUSING DEVICE

Daniel Bromley, 18242 Highland Ave., Homewood, Ill. 60430

Filed Apr. 22, 1991, Ser. No. 688,982
Int. Cl.[5] G10K *11/00*
U.S. Cl. 367—140 18 Claims

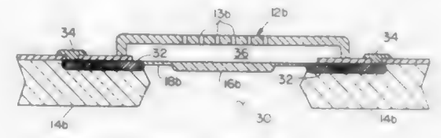


1. A sound focusing device for use with a sound emitting device, comprising:
a baffle means for controlling the air supply to said sound emitting device to control the resultant sound from said sound emitting device, said baffle means positioned internal to said sound emitting device, where said baffle means comprises two relatively movable elements containing an aperture; and
conical sound focusing means positioned co-axially and external to the sound emitting device.

5,146,435
ACOUSTIC TRANSDUCER

Jonathan J. Bernstein, Medfield, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Dec. 4, 1989, Ser. No. 444,996
Int. Cl.[5] H04R *19/00*
U.S. Cl. 367—181 30 Claims

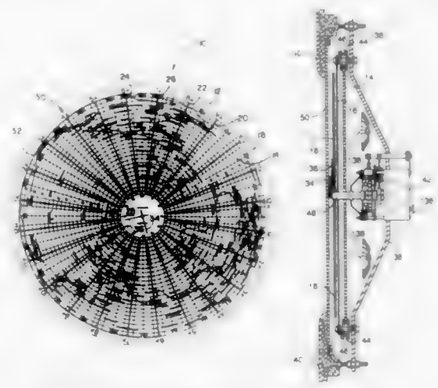


1. An acoustic transducer comprising:
perforated plate means;
movable capacitor plate spaced from said perforated plate means;
spring means interconnecting said movable plate means and said perforated plate means for movably supporting said movable capacitor plate means relative to said perforated plate means;
said perforated plate, movable plate and spring means made from a silicon wafer, and said perforated plate, movable plate, and spring means forming a unified monolithic structure;
a dielectric fluid in the space between said movable and perforated plate means; and
means for applying an electric field across said movable and perforated plate means for producing an output signal representative of the variation in capacitance induced by the variation of the space between the plates in response to an incident acoustic signal.

5,146,436
UNIVERSAL WORLD CLOCK

James B. Wright, 400 Hiram Page Rd., #102, Yreka, Calif. 96097

Filed Aug. 9, 1991, Ser. No. 743,082
Int. Cl.[5] G04B *19/22*
U.S. Cl. 368—21 20 Claims



1. A universal world clock apparatus, comprising:

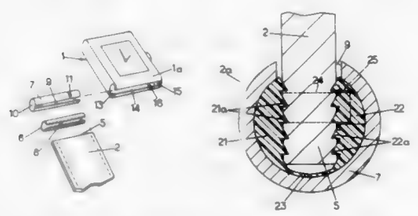
(a) a timing mechanism, said timing mechanism including a first rotatable shaft and a second rotatable shaft, said first rotatable shaft making one complete revolution every twenty-four hours, said second rotatable shaft making one complete revolution every sixty minutes;
(b) a frame, said frame supporting said timing mechanism;
(c) a substantially translucent first disk, said first disk having a projection of the world covering substantially the entire front surface of said first disk, said projection of the world being centered at the south pole with the land masses of the world being geographically presented with accurate longitude and latitude, said first disk including a plurality of time zone indicators projecting radially from the central portion of said first disk in increments of fifteen degrees, said first disk rotatably coupled to said frame;
(d) a substantially transparent second disk, said second disk positioned over said front surface of said first disk, said second disk including a plurality of time zone pointers, said time zone pointers positioned around the periphery of said second disk in increments of fifteen degrees, said time zone pointers positioned over said time zone indicators, said second disk fixedly attached to said frame;
(e) a substantially transparent third disk, said third disk positioned over said second disk, said third disk including hour indicators positioned around the periphery of said third disk in fifteen degree increments, said hour indicators depicting hours of day and night, said third disk being shaded over approximately one-half of its surface to indicate night, said third disk coupled to said first rotatable shaft;
(f) said timing mechanism rotating said third disk in steps of fifteen degrees each, each said step corresponding to one time zone, said third disk rotating one complete revolution in twenty-four hours, each said step positioning said hour indicators over said time zone indicators; and
(g) a minutes indicator, said minutes indicator positioned in the central portion of said disks, said minutes indicator including a minutes pointer coupled to said second rotatable shaft, said minutes pointer rotating one complete revolution in sixty minutes.

5,146,43

WATCH WITH REMOVABLE BRACELET

Alain Boucheron, Paris, France, assignor to Boucheron, Paris, France

PCT No. PCT/FR91/00204, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO91/14212, PCT Pub. Date Sep. 19, 1991
PCT Filed Mar. 13, 1991 Ser. No. 772,370
Claims priority, application France, Mar. 14, 1990, 90 03277
Int. Cl.[5] G04B *37/00*; A44C *5/14*
U.S. Cl. 368—282 **10 Claims**



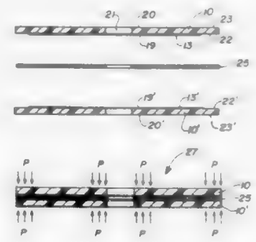
1. Bracelet watch comprising a watch having a case (**1**) with at least two parallel opposite sides (*1a, 1b*) each provided with assembly means removably fitting into a rigid element (*2a, 2b*) reinforcing a free end (**5**) of a flexible bracelet (**2**), the assembly means of the case of the watch comprising a drilling (**13**) whose wall has an axial slot (**14**) passing through it of a width greater than the thickness of the bracelet, characterized in that the rigid element comprises an elastic tubular blade (**6**) and a sleeve (*7*), one end (**10**) of which is closed, the tubular blade having a toother axial slot (**8**) in which the free end (**5**) of the flexible bracelet is inserted, the sleeve having an axial slot (**9**) emerging at the open end of the sleeve and the opening of which is larger than the thickness of the bracelet, the external diameter of the sleeve being substantially identical to that of the one of the drillings (**13**) of the case, the internal diameter of the sleeve being smaller than the external diameter of the tubular blade, such that the axial insertion of the tubular blade into the sleeve requires an elastic deformation of the blade, giving rise to blocking of the free end of the bracelet by pinching of the toothed slot.

5,146,438

METHOD OF MAKING DOUBLE-SIDED MAGNETO-OPTICAL DISKS HAVING REDUCED BIREFRINGENCE

Fred J. Harper, Shelby, N.C., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 30, 1990, Ser. No. 530,350
Int. Cl.[5] G11B *11/00, 3/70, 7/26*
U.S. Cl. 369—13 **7 Claims**



7. A two-sided magneto-optic recording disk having reduced birefringence comprising a pair of single-sided magneto-optic recording disks each comprising a flat dimensionally stable transparent substrate having a center hole, a recording side of which contains a central non-information area, an intermediate information area coated with magnetic recording material and a peripheral non-information area, the entire recording side of the single-sided recording disks being adhered together by means of a continuous layer of polymeric adhesive applied by the imposition of mechanical laminating pressure in a vacuum of 0.03–0.7 kg/cm^2 only upon the non-information areas of the disks.

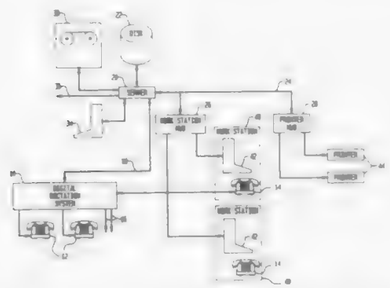
5,146,439

RECORDS MANAGEMENT SYSTEM HAVING DICTATION/TRANSCRIPTION CAPABILITY

Emil F. Jachmann, and Alan F. Sweet, both of Stratford, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 4, 1989, Ser. No. 293,895
Int. Cl.[5] G11B *27/00*
U.S. Cl. 369—25 **11 Claims**

1. A system comprising:
a) a dictation means for input, storage, and output of dictation jobs corresponding to selected report types relating to selected subjects;
b) transcription means including a display for transcription of said dictation jobs into documents, said documents comprising reports on said selected subjects;
c) means for storing information defining formats corresponding to said report types;
d) first communications means for transmitting information identifying said report types corresponding to said dictation jobs from said dictation means to said storing means; and,
e) second communication means for transmitting said information defining formats from said storing means to said display; wherein
f) said storing means responds to said information identifying said report types to select particular ones of said formats and information defining said selected formats is transmitted to said display through said second communications means; and,



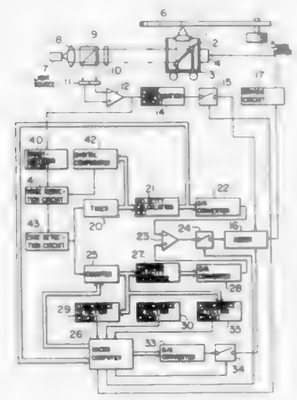
g) said display responds to said information defining said selected formats to display said defined formats; whereby a transcriptionist can transcribe said dictation jobs into said documents, said documents having said selected formats.

5,146,440

TRACK SEARCH APPARATUS

Hiroyuki Yamaguchi, Hirakata; Mitsuro Moriya, Neyagawa, and Shin-ich Yamada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 24, 1989, Ser. No. 397,860
Claims priority, application Japan, Aug. 29, 1988, 63-213971; Dec. 26, 1988, 63-328239
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 **18 Claims**



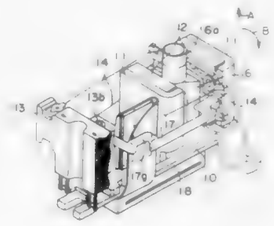
1. A track search apparatus for moving a signal conversion means for reproducing signals recorded on a recording medium toward a selected target track to position it at said target track, said apparatus comprising:
shifting means for shifting said conversion means to traverse tracks toward the target track;
velocity detection means, for detecting the shifting velocity of said conversion means and providing a velocity signal representing said shifting velocity;
velocity control means, operatively connected to said shifting means and said velocity detection means, for controlling the shifting velocity of said conversion means in order to move said conversion means toward the target track by driving said shifting means in accordance with the velocity signal from said velocity detection means;
position detection means for detecting that said conversion means has arrived at a predetermined position in front of the target track and outputting a position arrival signal indicating arrival of the conversion means at said predetermined position; and
pulse generation means, operatively connected to said shifting means, said velocity detection means, said velocity control means and said position detection means, for disabling said velocity control means and applying a driving pulse to said shifting means according to said velocity signal from said velocity detection means in response to said position arrival signal from said position detection means, said drive pulse being applied for a selected one of acceleration and deceleration of said conversion means toward said target track according to said velocity signal.

5,146,441

SUPPORTING DEVICE OF AN OPTICAL PICKUP

Taichi Akiba; Yoshitsugu Araki, and Toshihiko Kurihara, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,654
Claims priority, application Japan, May 26, 1990, 2-135726; Dec. 17, 1990, 2-417870
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.15 **2 Claims**



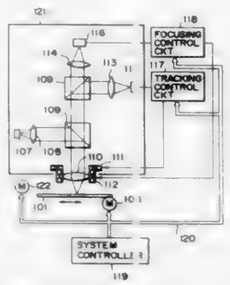
1. A supporting device of an optical pickup for reproducing data on an optical disk, the optical pickup having a suspension base, a holder suspended from the suspension base by wires in a form of a cantilever, an optical system provided in the holder, and focusing means for moving the holder so as to focus the optical system with respect to the optical disk, comprising:
a guide shaft slidably mounting the optical pickup;
a rotating shaft provided adjacent a center of the optical disk and supporting the guide shaft;
driving means for pivoting the rotating shaft to move the guide shaft so that an optical axis of the optical system becomes perpendicular to the optical disk;
tilting means for tilting the holder in a vertical and radial plane with respect to the optical disk when the holder is moved for focusing the optical system.

5,146,412

METHOD AND APPARATUS FOR EFFECTING AT LEAST ONE OF TRACKING AND SERVO CONTROL WHEN AN ERROR SIGNAL PASSES A ZERO-CROSS POINT AND REACHES A PREDETERMINED NON-ZERO VALUE

Satoshi Shikichi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 469,068
Claims priority, application Japan, Jan. 25, 1989, 1-14052
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.29 8 Claims



1. An optical information recording/reproducing apparatus in which a light beam from a light source is converged into a spot-like shape by an objective lens onto a recording medium to thereby effect at least one of recording of information on and reproducing of information from the recording medium by using the spot, said apparatus comprising:

detecting means for detecting a tracking error signal indicative of positional deviation between the light spot and a track on the recording medium by using light reflected from the medium caused when the light spot irradiates the medium;

an actuator for driving the objective lens to move the light spot relative to the track;

a tracking servo circuit for controlling said actuator on the basis of the tracking error signal detected by said detecting means so as to correct the positional deviation; and

a tracking servo pull-in circuit for causing said actuator to be driven while opening said tracking servo circuit and closing said tracking servo circuit when the tracking error signal passes a zero cross-point and reaches a predetermined, non-zero value.

5,146,443

SERVO APPARATUS FOR OPTICAL DISK PLAYER HAVING BOTH OPEN LOOP COARSE GAIN CONTROL AND CLOSED LOOP FINE GAIN CONTROL

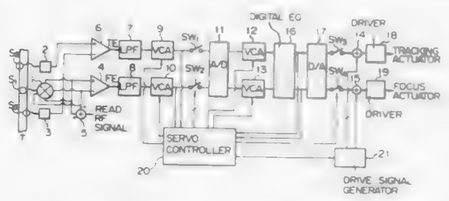
Munehiko Iwase, and Noriyoshi Takeya, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 592,527
Claims priority, application Japan, Mar. 13, 1990, 2-62423
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.29 7 Claims

1. A servo apparatus for an optical disk player, having a signal generator means for generating a predetermined error signal based on an output signal of a pickup that reads recorded information from an information-recorded disk and including a servo loop with amplifier means, said servo loop controllable to be selectively rendered operative for inoperative and, in an operative state, driving the pickup based on the error signal, the servo apparatus comprising:

a loop gain coarse adjustment means connected within said servo loop for coarsely adjusting a loop gain of the servo loop, said loop gain coarse adjustment means rendering inoperative said servo loop and providing feedback for coarsely adjusting a gain of said amplifier means in response to generated error signals; and

a loop gain fine adjustment means connected within said servo loop for finely adjusting the loop gain when said



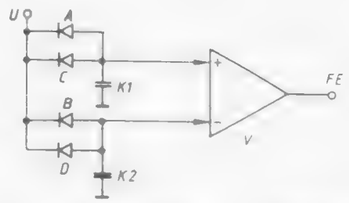
servo loop is operative, said loop gain fine adjustment means receiving output from said amplifier means in said coarse adjustment means and including means for providing feedback for fine adjustment of gain of said servo loop.

5,146,444

SERVO CONTROL LOOP

Günter Gleim, Villingen; Friedrich Füldner, Villingen-Schwenningen, and Bernd Rekla, Villingen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Hanover, Fed. Rep. of Germany

Filed May 22, 1991, Ser. No. 703,899
Claims priority, application Fed. Rep. of Germany, May 31, 1990, 4017487
Int. Cl.[5] G11B 7/085
U.S. Cl. 369—44.41 6 Claims



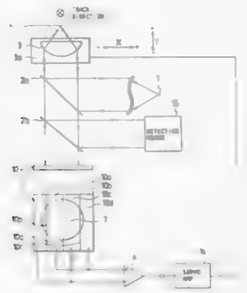
1. A servo control arrangement in combination with an optical scanner for focusing a light beam onto a recording medium or for guiding the light beam along data tracks of said recording medium, comprising: a plurality of photodetectors having photodiodes receiving light reflected from said recording medium; a differential amplifier with inputs connected to said photodiodes for taking differences of output signals from said photodiodes to generate a servo signal having superimposed high frequency oscillation components from data recorded on said recording medium, said high frequency oscillation components being noise components on said output signals from said photodiodes; and capacitor means connected between said inputs of said differential amplifier for eliminating by short-circuiting said noise components on said output signals from said photodiodes, so that said inputs of said differential amplifier are free of said high frequency oscillation components.

5,146,445

OPTICAL HEAD WITH TRACKING ERROR DETECTING SYSTEM

Tohru Nakamura; Hideki Aikoh; Masayuki Shinoda, and Noboru Kikuchi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1990, Ser. No. 559,912
Claims priority, application Japan, Aug. 4, 1989, 1-203282
Int. Cl.[5] G11B 7/13
U.S. Cl. 369—44.41 4 Claims



1. An optical head for optically reproducing information from a recording medium, said optical head comprising:

light source means for emitting a light beam;

objective lens means for converging the light beam from said light source means so as to apply a microscopic light spot to an information track formed on said recording medium;

actuator means for moving said objective lens means in predetermined focusing and tracking directions in accordance with focusing and tracking control signals;

focus error signal detecting means responsive to a light beam reflected from said recording medium so as to obtain a focus error signal which is in turn supplied as said focusing control signal to said actuator means so that said objective lens means is moved in the focusing directions, which is substantially parallel to an optical axis direction of said objective lens means, in accordance with said focusing control signal so as to perform a focus servo; and

tracking error detecting means responsive to a light beam reflected from said recording medium so as to obtain a tracking error signal which is in turn supplied as said tracking control signal to said actuator means so that said objective lens means is moved in the tracking directions, which is substantially perpendicular to the optical axis direction of said objective lens means, in accordance with said tracking control signal so as to perform a tracking servo, said tracking error detecting means including:

photodetector means having a light-detecting region on which a light spot with a predetermined diameter is formed by the reflected light beam from said recording medium and which is divided by a first division line, which is provided in correspondence with said information track on said recording medium, into two which are respectively divided by second and third division lines, substantially parallel to said first division line, so as to form first to fourth light-detecting subregions, said first and second light-detecting subregions being adjacent to each other with said first division line being interposed therebetween, and said third light-detecting subregion being adjacent to said first light-detecting subregion with said second division line being interposed therebetween and said fourth light-detecting subregion being adjacent to said second light-detecting subregion with said third division line being interposed therebetween, said first and second light-detecting subregions being arranged so that their light receiving quantities are equal to each other when said objective lens means enters into the focus servo state and is at a neutral position in its movable range under the tracking servo, and a separation between said second and third division lines being determined so that the sum of the light receiving quantities of said first and fourth light-detecting subregions is substantially equal to the sum of the light receiving quantities of said second and third light-detecting subregions when said objective lens means is shifted from the neutral position; and

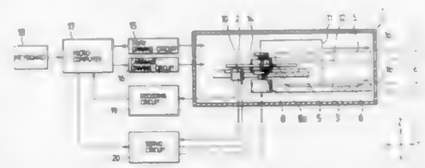
differential amplifier means responsive to electric signal produced by said first to fourth light-detecting subregions for calculating a difference between a sum signal of the electric signals due to said first and fourth light-detecting subregions and a sum signal of the electric signals due to said second and third light-detecting subregions, said differential amplifier means supplying said actuator means with a difference signal representing the calculated difference as said tracking control signal so that said objective lens means is moved in the tracking directions in accordance with said difference signal, wherein said photodetector means is arranged such that, when the diameter of the light spot formed thereon is D and the separation between said second and third division lines is W, W/D is between 0.7 and 0.9.

5,146,446

DISC PLAYER HAVING AUTOMATIC DISC EJECTION, AND METHOD OF PROVIDING SAME

Miho Ota, and Naoki Masaki, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 340,821, Apr. 20, 1989, abandoned.
This application Apr. 8, 1992, Ser. No. 865,668
Claims priority, application Japan, Oct. 29, 1988, 63-274116
Int. Cl.[5] G11B 33/02
U.S. Cl. 369—77.2 13 Claims



1. A disc player with automatic disc ejection, said player having a disc playing position for individually playing each of a plurality of discs, a plurality of loading/unloading positions outside a player housing to provide separate removal of each of said plurality of discs by a user, and an equal plurality of waiting positions for holding the plurality of disc inside said player housing between said loading/unloading and playing positions, said player comprising:

means for moving each of said plurality of discs between said loading/unloading, waiting and playing positions;

means for playing a selected disc from among said plurality of discs;

means for determining whether an automatic ejection mode is selected;

means for determining, during times when said automatic ejection mode is selected, whether a scheduled play of a first disc positioned at the playing position is completed; and

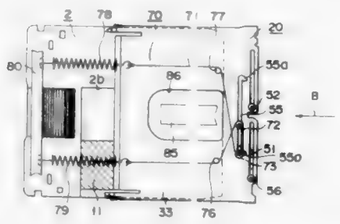
means for automatically ejecting, at a time when said automatic ejection mode is selected and said scheduled play is completed, said first disc from said player housing, wherein a second disc is played while said first disc is ejected to one of said loading/unloading positions for removal by a user, said automatic ejection means preventing an erroneous ejection of said first disc.

5,146,447

OPTICAL/OPTOMAGNETIC DISK APPARATUS

Makoto Nagasato, and Masasuni Yana, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 26, 1989, Ser. No. 343,293
Claims priority, application Japan, Sep. 28, 1987, 62-243126; Dec. 11, 1987, 62-311880; Mar. 3, 1989, 1-51702
Int. Cl.[5] G11B 33/02
U.S. Cl. 369—77.2 18 Claims



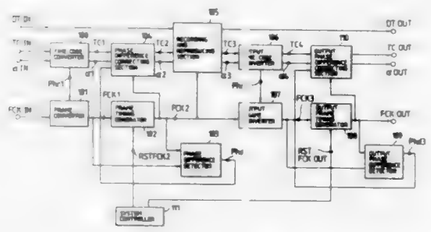
1. A disk apparatus for performing write or read access of information of a disk stored in a cartridge having an openable shutter, comprising:
a frame;
a cartridge holder for holding said cartridge, said cartridge holder being movable with respect to said frame;
means for moving said cartridge holder;
a shutter opener for opening or closing the shutter mounted on said cartridge holder and movable in a direction for opening/closing the shutter of said cartridge held in said cartridge holder, said shutter opener being provided with engaging means which are engaged with said shutter;
wire guiding means arranged on said shutter opener; and
a wire looped between said wire guiding means such that at least part of said wire is mounted on said frame, said wire being kept in a path which extends around that portion of said disk which is exposed when said shutter is opened,
wherein a tension of said wire is increased upon movement of said cartridge holder, said shutter opener being moved by the tension of said wire, and then said shutter is opened/closed.

5,146,448

TIME CODE RECORDING OR REPRODUCING APPARATUS AND TIME CODE CONVERTER

Tatsuya Adachi; Kiyotaka Nagai; Yasushi Nakajima, all of Osaka; Takafumi Ueno, Nara; Naoki Ejima, and Masataka Nikaido, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 415,222, Sep. 11, 1989, Pat. No. 5,091,899.
This application Jun. 17, 1991, Ser. No. 716,498
Int. Cl.[5] G11B 27/00, 3/64, 27/02, 5/78
U.S. Cl. 369—83 3 Claims



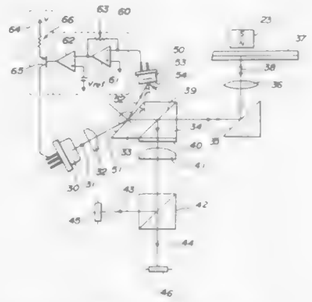
1. A time code converter of a time code recording and reproducing apparatus comprising a time code conversion table having conversion data for a period of a least common multiple of a first frame period and a second frame period; a phase information conversion table having conversion data for said period of the least-common-multiple of the first frame period and the second frame period; a phase information detector detecting phase information of a reference signal having the second frame period and a reference signal having the first frame period; and converting means for converting a time code having the first frame period and the phase information detected by the phase information detector into a time code having the second frame period and a phase difference by referring to the time code conversion table and the phase information conversion table.

5,146,449

OPTICAL DISC APPARATUS

Kenji Shimozawa, Sagamihara, Japan, assignor to TEAC Corporation, Japan

Filed Jan. 8, 1990, Ser. No. 462,004
Claims priority, application Japan, Jan. 18, 1989, 1-3940
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—106 14 Claims



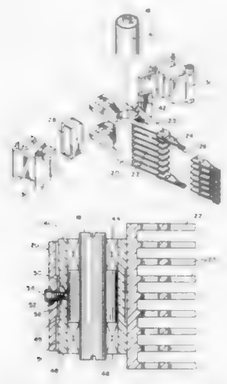
1. An optical disc apparatus, comprising:
a light source emitting a light beam;
an optical disc on which information is recorded;
beam splitting means for splitting the light beam from said light source into a first beam to reproduce the information recorded on said optical disc and a second beam to control said light source, said beam splitting means including a prism having a surface reflecting a part of the light beam from said light source as said second beam, the remainder of said light beam passing through said surface as said first beam;
light detection means for detecting said second beam and outputting a detection signal dependent on an intensity of said second beam;
control means for controlling an intensity of the light beam from said light source on the basis of said detection signal from said light detection means, so that an intensity of the light beam from said light source is uniform; and
an optical system through which said first beam passes, to reproduce the information recorded on said optical disc,
wherein said prism of said beam splitting means and said optical system are arranged so that said first beam does not reach to said light detection means.

5,146,450

METHOD AND APPARATUS FOR BEARING TO COMB ATTACHMENT

Peter E. Brooks; John R. Reidenbach, and Mark E. Troutman, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1990, Ser. No. 532,307
Int. Cl.[5] G11B 17/00, 21/16, 17/02, 5/54
U.S. Cl. 369—244 16 Claims



1. A data storage device which comprises:
an actuator arm assembly having a bore therein;
a bearing cartridge which further includes:
a shaft;
an outer sleeve; and
bearing sets positioned between the shaft and the outer sleeve, said bearing cartridge inserted within the bore of the actuator arm assembly; and
means for anchoring the bearing cartridge to the actuator arm at a single location.

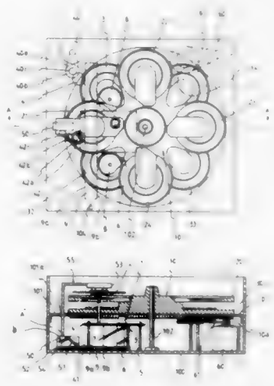
5,146,451

COMPACT DISK PLAYER WITH TWO STACKED, ROTARY, ROTATIONALLY OFFSET CARRYING PLATES FOR PLURAL DISKS

Sin W. Kang, Pusan, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Dec. 31, 1990, Ser. No. 633,525
Claims priority, application Rep. of Korea, Dec. 30, 1989, [illegible]
Int. Cl.[5] G11B 23/00, 25/00, 17/22, 17/04
U.S. Cl. 369—270 5 Claims

1. A compact disk player, for selectively playing any one of a plurality of compact disks simultaneous disposed therein, said compact disk player comprising:
a case;
a disk-setting means comprising an upper disk-setting plate coaxially superimposed upon a lower disk-setting plate with vertical spacing therebetween each said disk-setting plate being generally horizontally arranged at a respective level and having provided thereon, as viewed in plan, a plurality of compact disk support sites separated by regularly alternating vertical gaps, circumferentially of the respective said disk-setting plate; said lower disk-setting plate being arranged to be rotationally offset relative to said upper disk-setting plate, so that, as viewed in plan, each disk support site on said upper disk-setting plate is exposed from below through a respective said gap of said lower disk-setting plate and each disk support site on said lower disk-setting plate is exposed from above through a respective said gap of said upper disk-setting plate; and
means mounting said disk-setting plates with respect to said case for coordinated rotation about a vertical axis located centrally of said disk-setting plates so as to dispose said disk-setting plates with said lower disk-setting plate rotationally offset relative to said upper disk-setting plate;
a disk reading means mounted in said case for reading a selected compact disk when said selected compact disk is disposed at a respective one of either of two disk-reading sites, which sites are disposed in vertical alignment with one another on a disk playing axis, one such site being associated with said upper disk-setting plate and another such site being associated with said lower disk setting plate; and
a disk chuck and a disk clamp mounted in said case so as to both be effectively centered in use on said disk playing axis, by respective means for coordinately moving and disposing said disk chuck and said disk clamp into each of three sets of positions, including:



a first set of positions, in which said disk chuck and disk clamp are withdrawn so as to be removed from interference with rotation of said upper and lower disk-setting plates about said vertical axis so as to dispose a selected compact disk support site on a respective said disk-setting plate centered on said disk playing axis,
a second set of positions, in which said disk chuck and said disk clamp vertically temporarily displace a selected compact disk centered on said disk playing axis, from said upper disk-setting plate, to said one disk-reading site, and
a third set of positions, in which said disk chuck and said disk clamp vertically temporarily displace a selected compact disk centered on said disk-playing axis, from said lower disk-setting plate, to said other disk-reading site.

5,146,452

METHOD AND APPARATUS FOR RAPIDLY RESTORING A COMMUNICATION NETWORK

Robert J. Pekarske, Plano, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Oct. 26, 1990, Ser. No. 604,846
Int. Cl.[5] H04J 3/14
U.S. Cl. 370—16 15 Claims

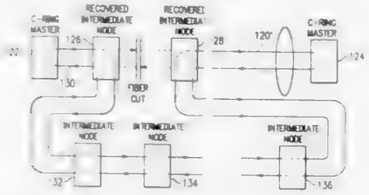
12. The method of restoring communications between any given pair of nodes of a network having an arbitrary number of nodes and an arbitrary number of spans interconnecting said nodes, each said span having working circuits between nodes designated for transmitting actual communications traffic and at least some of said spans having spare circuits between nodes capable of, but not designated for, transmitting actual communications traffic, each node being able to managerially commu-

nicate with all other nodes in the network, said method comprising the steps of:

a) establishing a set of preneed alternate interconnecting routes for a span of working circuit between said given pair of nodes to be protected as part of a preneed plan;

b) implementing said preneed plan upon detection of loss of direct communications between said pair of nodes.

15. The method of communicating between intelligent nodes in a DS3 type traffic signal communication network comprising the steps of:



interconnecting all nodes using spare capacity DS3 channels to form a communications loop;

transmitting idle format signals around the loop as an indication of loop integrity;

intermixing control signal bits with said idle format signals to provide broadcast communications with all nodes connected to loop in the form of continuously circulating messages; and

detecting the control signal bits of the circulating messages at each node.

5,146,453

CIRCUIT CONFIGURATION FOR CLOCK-CONTROLLED TIME DIVISION MULTIPLEX TELECOMMUNICATIONS SWITCHING INSTALLATIONS

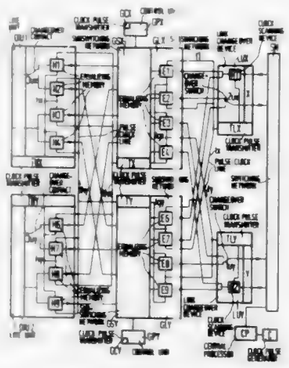
Werner Nagler, Hohenschaeftlarn; Fritz Hlawa, Deisenhofen, and Lothar Schmidt, Fuerstenfeldbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1989, Ser. No. 410,688

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832242; Sep. 23, 1988, 3832425; Sep. 29, 1988, 3833074; Sep. 29, 1988, 3833078

Int. Cl.[5] H04J *1/16, 3/14;* **H04Q** *11/04*

U.S. Cl. 370—16 5 Claims



1. A circuit configuration for clock-controlled time division multiplex telecommunication switching installations, including PCM telephone switching installations, with hierarchical structure with a central switching network, a central processor, with subswitching networks coupled thereto via link connections, functioning to connect subscriber lines and/or interexchange trunk lines or channels and with intermediate-level control units assigned thereto, and with a clock supply system wherein from a central clock pulse generator, assigned to the processor and governing the clock-controlled completion of functions, clock pulse transmitters, individually assigned to the control units, functioning for the regeneration of a clock pulse, and governing the clock pulse-controlled completion of functions in each of the control units, receive their master clock int hat they derive the latter respectively from the message stream transmitted in a pulse clock-controlled manner of the connections extending via the switching network and via the subswitching networks and regenerate said latter, and with a pairwise mutual assignment of the subswitching networks, where in normal operation separately via connection paths respectively leading via the one and the other of the two, can be switched over upon changing to standby switching operation from one of the two subswitching networks to the other subswitching network by way of which all connection paths then lead, characterized in that subscriber lines and/or interexchange trunk lines or channels assigned in each instance to a subswitching network and connectable thereto to link connections connected thereto, are equipped with first and second clock-controlled duplicate equalizing memories functioning for the acquisition and time-delayed routing of messages transmitted via individually established connections, in that for each subswitching network the first of said equalizing memories are connected with the network itself and the second equalizing memories with the particular partner subswitching network, that the acquisition and write processes of the different equalizing memories which are in the message flow in a first direction of transmission from the particular subswitching network to the subscriber lines and/or interexchange trunk liens or channels, are controlled by a pulse clock governing the particular subswitching network, in particular by a clock pulse transmitter assigned thereto, and are in the message flow in a second direction of transmission, the reverse of said first direction, are controlled by a pulse clock which governs a line connection device of the subscriber lines and/or interexchange trunk lines or channels connected to the same subswitching networks, in particular from a clock pulse transmitter assigned to said line connection device, and that read and routing processes of the first and second equalizing memories with respect to the message flow in the second, and thus reverse, direction of transmission are controlled differently, and specifically in such a manner that hereby the particular first equalizing memory is thereby controlled by a pulse clock governing the particular own subswitching network, in particular by a clock pulse transmitter assigned thereto, and the particular second equalizing memory by a pulse clock governing the partner subswitching network, in particular by a clock pulse transmitter assigned thereto.

5,146,454

SYSTEM AND METHOD FOR CONTROLLING THE ACCESS RATES OF PACKET SWITCHING NETWORK STATIONS

Pierre-Jacques F. C. Courtois; Guy F. J. Scheys, and Pierre N. W. Semal, all of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1990, Ser. No. 621,108

Claims priority, application European Pat. Off., Dec. 14, 1989, 89203188.1

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 17 Claims

1. A communications station for use in a data packet switching network, said network comprising a plurality of transmitting/receiving stations interconnected by communication channels, said data packages being tansferable between stations of the network through said channels according to a routing scheme, said communications station comprising:

communicating means for receiving data packets from, and transmitting data packets to, respective other stations of said network which are in transmission range of said station, said communicating means communicating with said channels at an access rate,

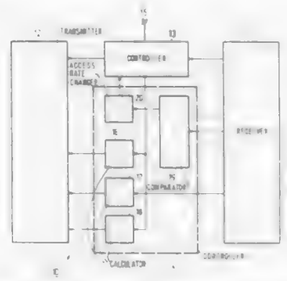
first calculating means for calculating a first parameter which is mathematically related to output flow of said station, output flow being the number of packets successfully transmitted per unit of time,

second calculating means for calculating a second parameter which is mathematically related to input flow of said station, input flow being a measure of output flows of said other stations, said second parameter increasing as said output flows decrease,

third calculating means for calculating a third parameter indicative of a total load of said station,

means for transmitting said first, second and third parameters to said other stations, and for receiving from said other stations

(a) first other station parameter information which is mathematically related to output flow of the respective other station station, said output flow being the number



of packets successfully transmitted by the respective other station per unit of time,

(b) second other station parameter information which is mathematically related to input flow of said respective other station, and

(c) third other station parameter information indicative of total load of said respective other station,

altering means for altering said access rate of said station,

means for controlling said transmitting means to transmit said first parameter at regular intervals,

comparison means for comparing second parameter information and said third parameter information received from at least two said other stations to determine which said other station is a heaviest loaded station having the largest input flow increase tendency, and

control means for causing said altering means to update said access rate with respect to said heaviest loaded station responsive to said third parameter information, in such manner as to bring said total load of said heaviest loaded station closer to a nominal channel load.

5,146,455

WIDE RANGE MIXED RATE TDM BUS USING A MULTIPLE OF TIME SLOT INTERCHANGE CIRCUIT SWITCHES

Louis R. Goke, Austin, Tex., and Gary J. Grimes, Thornton, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1990, Ser. No. 628,780

Int. Cl.[5] H04L *27/04*

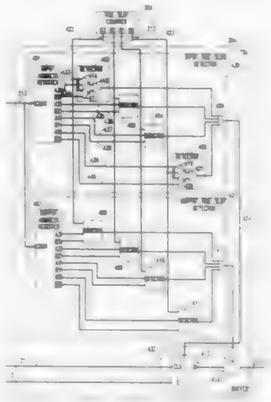
U.S. Cl. 370—68 66 Claims

65. A method for switching channels received by a switching unit via a plurality of input links to an output link and each of said channels communicated to said by a switching unit via said plurality of input links by input time slots of a single time frame and each of said channels communicated from said switching unit via said output link by output time slots of said single time frame and said switching unit having a plurality of switch elements each having an input port interconnected to an individual one of said input links and an output port interconnected to said output link, said method comprising the steps of:

generating time slots numbers to identify said input time slots and said output time slots;

designating a subset of said input time slots communicating one of said channels by each of said plurality of switch elements in response to an input address word to said time slot numbers where one of said plurality of switch elements responds to a different number of input time slots than a subset of another one of said plurality of switch elements;

buffering data of each time slot of said designated subset of said input time slots where said buffering means only has



the capacity to retain data from only one input time slot at a time;

designating in response to an output address word and to said time slot numbers a subset of said output time slots to communicate said data from said buffering means to said output link connected to said output port of each of said plurality of switch elements whereby the number of output time slots in said subset of said output time slots equals the number of input time slots in said subset of input time slots for each of said plurality of switch elements; and

communicating said data from said buffering means to said output link connected to said output port of each of said plurality of switch elements in each time slot of said designated subset of said output time slots thereby communicating one of said channels on said connected output link.

5,146,456

COMPUTER SYSTEM WITH DISTRIBUTED CONTENT-ADDRESSABLE MEMORY MODULES COMPATIBLE WITH CITO TRANSMISSION

Semyon Berkovich, Rockville, Md., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 179464, Apr. 8, 1988, abandoned. This application Aug. 21, 1990, Ser. No. 571,339

Int. Cl.[5] H04J *3/12*

U.S. Cl. 370—110.4 17 Claims

1. An apparatus for distributed associative computing, comprising:

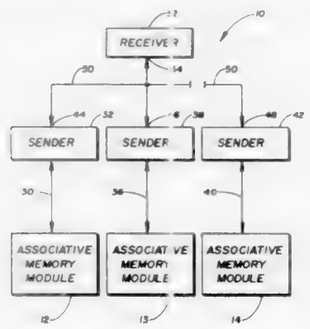
a first serial communication bus;

a receiver connected to said first communication bus for receiving serial data transmitted thereon;

a plurality of associative memory modules for storing data words and for sensing an information content of said stored data words and generating and storing a code indicative of said information content;

a plurality of second serial communication busses each connected to a corresponding one of said content addressable memories;

a corresponding plurality of senders each coupled to one of said second serial communication busses for reading said code from said corresponding associative memory module, each sender being connected to said first serial communication bus for bi-directional communication over said serial communication line of content induced transaction overlap (CITO) composed data derived from said code, said communication being in accordance with a CITO protocol.



5,146,457

DEVICE FOR TRANSMITTING DATA WORDS REPRESENTING A DIGITALIZED ANALOG SIGNAL AND DEVICE FOR RECEIVING THE TRANSMITTED DATA WORDS

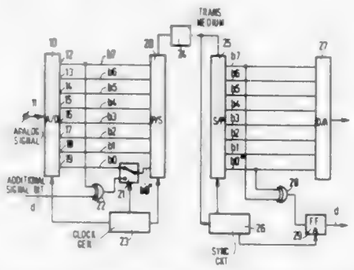
Raymond N. J. Veldhuis, and Gerrit J. Keesman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 327,19', Mar. 22, 1989, abandoned. This application Nov. 14, 1991, Ser. No. 794,319

Claims priority, application Netherlands, Sep. 16, 1988, [illegible]291

Int. Cl.[5] H04J *3/12, 15/00*

U.S. Cl. 370—111 **9 Claims**



1. A device for transmitting a series of data words representing digitized signal samples, each data word having a plurality of bits of respective orders of significance, said device comprises means for modifying selected data words in said series prior to transmission by replacing one or more least significant bits of each selected data word with substitute bits derived in accordance with an additional digital information signal, so that such signal is represented by the substitute bits of the transmitted modified data words the least significant bits of a selected data word being bits the eof of lesser significance than the remaining unreplaced bits thereof; characterized in that said modifying means comprises

means for producing a series of other bits which are substantially non-correlated with said additional information signal; and

means for deriving the substitute bits of each selected data word in accordance with logical combinations of respective bits of the additional information signal and one or more of said series of other substantially non-correlated bits.

5,146,458

DATA TRANSFER CHECKING SYSTEM

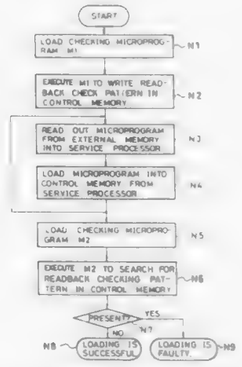
Akihiko Ono, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 13, 1990, Ser. No. 537,329

Claims priority, application Japan, Jun. 14, 1989, 1-151716

Int. Cl.[5] G06F *11/00;* **G11C** *29/00*

U.S. Cl. 371—21.2 **23 Claims**



10. A data transfer checking method for checking whether transfer of data from a first memory to a second memory is successful, comprising the steps of:

(a) storing a checking pattern in said second memory;

(b) transferring data from said first memory to said second memory to overwrite said data on said checking pattern;

(c) checking said second memory to search for said checking pattern therein.

5,146,459

ELECTRONIC EQUIPMENT WITH CHECK-SUM FUNCTION

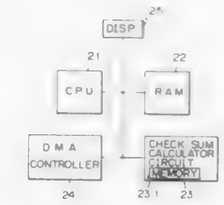
Yutaka Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 124,929, Nov. 24, 1987, abandoned. This application Jun. 17, 1991, Ser. No. 715,703

Claims priority, application Japan, Nov. 28, 1986, 61-282117

Int. Cl.[5] G06F *11/08*

U.S. Cl. 371—21.5 **6 Claims**



4. An electronic apparatus with a check-sum function, said apparatus comprising:

processing means for processing data;

first memory means for storing data to be processed by said processing means;

calculating means, independent of said processing means, for calculating a first check-sum value and a second check-sum value of the data stored in said first memory means;

direct memory access means for transferring the date from said first memory means to said calculating means;

instruction means for instructing that power to said apparatus be turned off;

first control means for activating said direct memory access means in response to the instruction that power be turned off, to calculate the first check-sum value;

second memory means for storing the first check-sum value;

second control means for activating said direct memory access means whenever power is turned on, to calculate the second check-sum value;

comparator means for comparing the first check-sum value stored in said second memory means with the second check-sum value; and

discrimination means for determining whether or not the data stored in said first memory means is correct when the first and second check-sum values are compared.

5,146,460

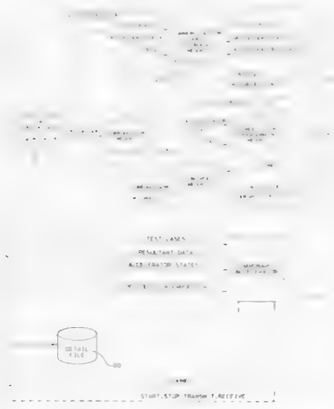
LOGIC SIMULATION USING A HARDWARE ACCELERATOR TOGETHER WITH AN AUTOMATED ERROR EVENT ISOLATION AND TRACE FACILITY

Dennis F. Ackerman, Beacon; David R. Bender; Salina S. Chu, both of Poughkeepsie; George R. Deibert, Staatsburg; Gary G. Hallock, Pleasant Valley; David E. Lackey, Poughkeepsie; Robert G. Sheldon, Pleasant Valley, and Thomas A. Stranko, Poughkeepsie, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Feb. 16, 1990, Ser. No. 481,145

Int. Cl.[5] G06G *7/48*

U.S. Cl. 371—23 **15 Claims**



7. A method for operating a hardware accelerator and software simulator in conjunction with one another in such a way that periodically saved hardware accelerator states are used to restart said accelerator after interruption of said accelerator as a result of a mismatch between desired resultant states and actual accelerator states, said hardware accelerator being allowed to run after said restart for a time sufficient to correspond to a state existing prior to said mismatch where upon accelerator state data is transferred to said software simulator for detailed trace data generation, said hardware accelerator and said software simulator operating to simulate the same model.

5,146,461

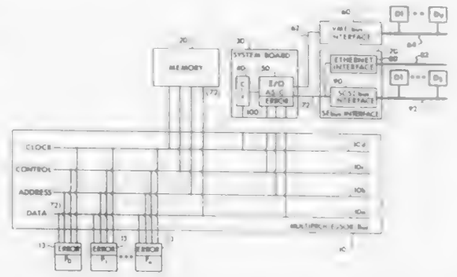
MEMORY ERROR CORRECTION SYSTEM DISTRIBUTED ON A HIGH PERFORMANCE MULTIPROCESSOR BUS AND METHOD THEREFOR

Douglas E. Duschatko, Boulder; Nicholas P. Mati, Loveland, and Richard A. Herrington, Fort Collins, all of Colo., assignors to Solbourne Computer, Inc., Longmont, Colo.

Continuation-in-part of Ser. No. 435,931, Nov. 13, 1989, abandoned. This application Dec. 22, 1989, Ser. No. 455,640

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.1 **13 Claims**



1. A memory error correction system for a multiprocessor system, said system having a system bus, a memory directly connected to said bus, said memory containing lines of data and a plurality of bus data circuits connected to said system bus, said bus data circuits selected from the group consisting of one or a plurality of processors or one or a plurality of input-/output bus interface circuits, said memory error correction system comprising:

means connected to each of said plurality of bus data circuits and to said system bus for selectively receiving a line of data with an error field from said memory over said system bus at the bandwidth of the bus,

means in said receiving means and receptive of said memory line of data for detecting errors originating either in said memory of during transfer on said system bus in said memory line of data as said memory line of data is being received from said system bus, said detecting means also automatically correcting any detected errors in said memory line of data after said memory line of data is received,

means connected to said detecting means for storing said corrected memory line of data, said receiving means comprising:

a first register having a bit width equal to the bit width of said line of data,

means for detecting errors in a line of data resident in said first register during the transfer time interval for said line of data from said first register to said second register,

means for correcting said errors in said line of data during the time interval when said data is transferred from said second register to said storing means.

5,146,462

SYSTEM AND DEVICES FOR TRANSMITTING SIGNALS CONSISTING OF DATA BLOCKS

Silvio Cucchi, Gaggiano, Italy, assignor to Telettra-Telefonia Elettronica, Italy

Filed Nov. 22, 1989, Ser. No. 440,889

Claims priority, application Italy, Nov. 23, 1988, 22702 A/88

Int. Cl.[5] G06F *11/00;* **H04L** *12/00*

U.S. Cl. 371—47.1 **1 Claim**

1. A method for transmitting digital signals including data blocks, each of said data blocks being delimited by a DDi word, where i is an integer, that is introduced in a system transmission side and is recognized in a system reception side,

said data blocks being located in transmission according to an order that must be constructed in reception from the digital signals received even when transmission line errors result from a destruction of at least one of said data blocks delimiting word and even when transmission line errors introduce untransmitted delimiting words, comprising the steps of:

at the transmission side:

a) producing a sequence of pseudo-random signals using a generator, said sequence comprising symbols having a periodicity equal to an enumeration period of the delimited data blocks, each symbol of the sequence being selected from "q" possible symbols;

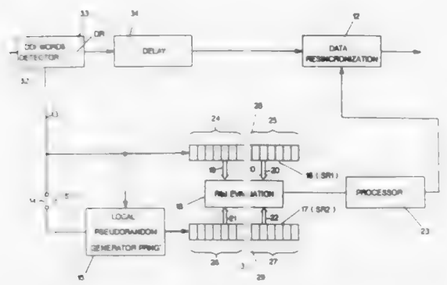
b) correlating q words delimiting the data blocks with said q symbols that are emitted in the pseudo-random sequence;

c) advancing by one step the sequence of pseudo-random signals each time a new data block is transmitted.

d) for each advance, supplying a symbol from said generator that indicates the words delimiting the data blocks;

and at the reception side;

e) generating the same pseudo-random sequence of symbols used at the transmission side using a local generator on the reception side;



f) advancing by one step the sequence of symbols each time a word delimiting a block is detected in the signal received;

g) recognizing and transforming the data block delimiting words into the corresponding symbols of the pseudo-random sequence, forming a sequence of symbols that, in absence of errors, is equal to the pseudo-random sequence generated by said local generator on the reception side;

h) locally generating a first series of symbols comprising an adequate number of symbols of the said pseudo-random sequence as in step e);

i) storing a second series of symbols comprising an adequate number of symbols associated with the words delimiting the data blocks as in step g);

j) comparing the symbols of steps h) and i);

k) detecting possible lack of coincidences between said first and second series of symbols

l) calculating correlations of said first and second series of symbols to determine an error type; and

m) recovering the ordering of data blocks emitted in transmission in accordance with the error type determined in step l).

5,146,463

POINTER BEAM FOR HAND-HELD LASER SCANNER

Joseph F. Rando, Los Altos Hills, Calif., assignor to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

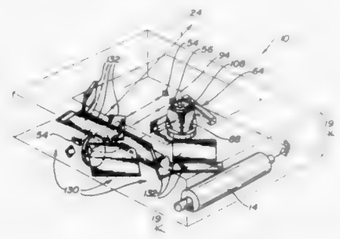
Filed May 20, 1991, Ser. No. 703,476

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—24 **52 Claims**

1. In a laser scanner, an optical arrangement for multiplexing and redirecting a laser beam to simultaneously produce both a laser beam scan pattern and a pointer beam comprising:

means for multiplexing a laser beam between at least one pointer beam path producing a pointer beam and at least one scanning beam path; and



means for redirecting said laser beam from said at least one scanning beam path to produce a laser beam scan pattern.

5,146,464

SEMICONDUCTOR LASER DRIVER CIRCUIT

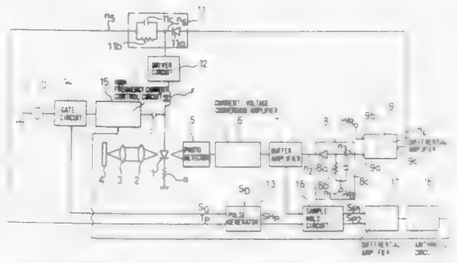
Masaru Uemura, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 6, 1991, Ser. No. 651,136

Claims priority, application Japan, Mar. 31, 1989, 1-81864

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—38 **4 Claims**



1. A semiconductor laser driver circuit comprising:

means for generating a direct current of variable magnitude for driving a semiconductor laser having a variable differential quantization efficiency and producing variable power laser light in response to the magnitude of the direct current;

means for generating a high frequency current of variable magnitude for superposition on the direct current for driving the semiconductor laser;

means for controlling the magnitude of the direct current in response to the power of the laser light produced by the semiconductor laser in response to the direct current and superposed high frequency current;

means for determining the differential quantization efficiency of the semiconductor laser driven by the direct current and superposed high frequency current; and

means for controlling the magnitude of the high frequency current in response to the differential quantization efficiency of the semiconductor laser driven by the direct current and superposed high frequency current whereby variations in operation of the semiconductor laser in response to reflected laser light incident on the laser are reduced.

5,146,465

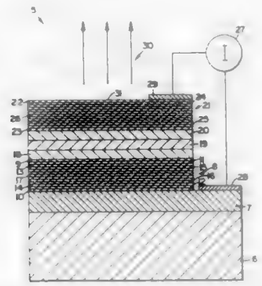
ALUMINUM GALLIUM NITRIDE LASER

Muhammad A. Khan, White Bear Lake; James M. VanHove, Eagan, and Donald T. Olson, Circle Pines, all of Minn., assignors to APA Optics, Inc., Blaine, Minn.

Filed Feb. 1, 1991, Ser. No. 649,670

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **14 Claims**



1. A visible/ultraviolet light laser comprising:

(a) a first mirror;

(b) a second mirror; and

(c) an active region, the active region having a first surface and a second surface, said first surface abutting said first mirror and said second surface abutting said second mirror;

wherein said first mirror, said second mirror and said active region are composed substantially of an aluminum gallium nitride material.

5,146,466

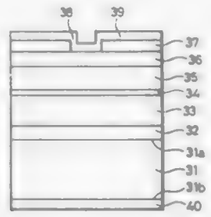
SEMICONDUCTOR LASER DEVICE

Hiroki Hamada; Shoji Honda; Masayuki Shono, and Takao Yamaguchi, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 412,786, Sep. 26, 1989, Pat. No. 5,016,252. This application Apr. 11, 1991, Ser. No. 664,866

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **22 Claims**



1. In a semiconductor laser device comprising:

a GaAs substrate of a first conductivity type having a main surface inclined by at least about 5° from a {100} plane of said substrate in a <011> direction,

a clad layer of the first conductivity type containing Al, Ga, In and P, formed on said main surface,

an active layer containing Ga, In and P, formed on said clad layer of the first conductivity type, and

a clad layer of a second conductivity type containing Al, Ga, In and P, formed on said active layer.

5,146,467

SEMICONDUCTOR LASER DEVICE

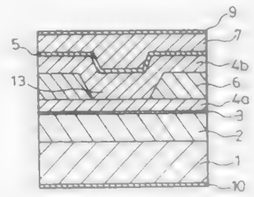
Tomoko Kadowaki, and Takashi Murakami, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,450

Claims priority, application Japan, Oct. 4, 1990, 2-268883

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 **14 Claims**



1. A semiconductor laser device producing visible light comprising:

a semiconductor substrate;

a double heterojunction structure disposed on said semiconductor substrate and comprising a first conductivity type lower cladding layer, an active layer, and a second conductivity type upper cladding layer, said second cladding layer including a ridge having an upper surface and side walls;

a first conductivity type semiconductor current blocking layer disposed on said upper cladding layer adjacent and contacting said side walls of said ridge for confining current flow to a portion of said active layer;

a second conductivity type contact layer in electrical contact with said upper surface of said ridge of said second cladding layer comprising $In_xGa_{1-x}P$; and

first and second electrodes contacting said semiconductor substrate and said contact layer, respectively.

5,146,468

GAS DOPING OF SOLIDS BY CRYSTAL GROWTH

Hiroshi Kimura, Northridge, and Ricardo C. Pastor, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 14, 1990, Ser. No. 627,796

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—59 **27 Claims**

1. A process for introducing a high concentration of a neutral diatomic molecule into a host crystal, comprising melting said host crystal in an atmosphere of a gas of said neutral diatomic molecule under high pressure sufficient to achieve a doping concentration of about 10^{19} to 10^{22} cm^{-3}.

5,146,469

METHOD AND MEANS FOR CONTINUOUS PRODUCTION OF CARBON BODIES

Erik Svana, Oslo, Norway, assignor to Elkem Technology a/s, Norway

Filed Nov. 9, 1990, Ser. No. 611,930

Claims priority, application Norway, Nov. 14, 1989, 894526; Nov. 14, 1989, 894527

Int. Cl.[5] H05B *7/09*

U.S. Cl. 373—89 **13 Claims**

5. A system for producing an elongated carbon body of baked carbon from unbaked carbon paste using a casing which is removed after formation of the elongated carbon body of baked carbon comprising:

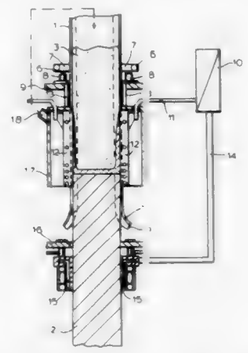
(a) a vertically oriented removable casing containing unbaked carbon paste, said casing having a plurality of permanent, vertically oriented ribs extending radially out-

ward from said casing, said ribs being made from a current conducting material;

(b) a first terminal slidably connected to at least one of said plurality of ribs for conducting electricity to said casing;

(c) a second terminal positioned below said first terminal, said second terminal being in electrical contact with a baked part of the elongated carbon body;

(d) a means for slipping and holding said casing so as to



allow said casing to move vertically downward, said means for slipping and holding said casing being positioned above said first terminal; and

(e) direct current means connected to both said first and second terminals and providing direct current through the first and second terminals to said carbon paste to bake said carbon paste and form said elongated carbon body wherein said casing is removed after baking but prior to use of the elongated carbon body of baked carbon.

5,146,470

ADAPTIVE DIGITAL FILTER INCLUDING LOW-PASS FILTER

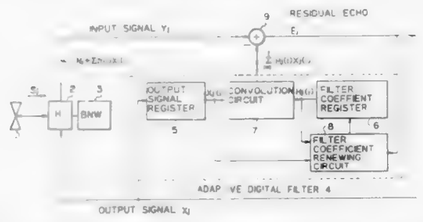
Kensaku Fujii, Yamato; Juro Ohga, Kamakura, and Hiroyuki Masuda, Sano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 28, 1990, Ser. No. 590,376

Claims priority, application Japan, Sep. 28, 1989, 1-253004; Nov. 29, 1989, 1-307423

Int. Cl.[5] H04B *1/10*

U.S. Cl. 375—103 **76 Claims**



1. An adaptive digital filter for estimating a response characteristic of a signal path by monitoring a sampled output signal of said signal path, estimating a predetermined number of filter coefficients which represent the response characteristic of the signal path, and generating an estimated output signal of said signal path using a plurality of successive sampled input signals of the signal path and estimated filter coefficients, wherein an estimation is carried out so that a difference between said output signal and said estimated output signal is reduced, the filter comprising:

an input signal register for holding a plurality of sampled input signals which have been sampled since a predetermined number of cycles before the current time;

a filter coefficient register for holding said predetermined number of filter coefficients which respectively correspond to the plurality of sampled input signals;

a convolution calculating means for calculating a convolution between said input signal and said estimated response characteristic using said plurality of successive sampled input signals which are held in said input signal register, and said estimated filter coefficients which are held in said filter coefficient register;

an error obtaining means for obtaining a difference between said sampled output signal of said signal path and said convolution as an error in said estimation; and

a filter coefficient estimating means for estimating said predetermined number of filter coefficients so that said error is reduced;

said filter coefficient estimating means comprising a filter coefficient renewing means for each of said predetermined number of filter coefficients, for renewing the corresponding filter coefficient in each cycle of sampling, and wherein

said filter coefficient renewing means comprises

a multiplier for obtaining a product of one of said sampled output signals corresponding to the filter coefficient renewing means, and said sampled input signal,

an integrating means for integrating an output of said multiplier to extract a component of said filter coefficient corresponding to the filter coefficient renewing means,

a power calculating means for calculating a power of said one of said sampled output signals corresponding to the filter coefficient renewing means, and

a divider for dividing an output of the integrating means by an output of the power calculating means.

5,146,471

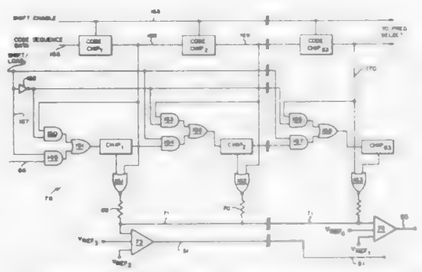
CORRELATOR FOR SPREAD SPECTRUM COMMUNICATIONS SYSTEMS

Brooks E. Cowart, Mountain View, Calif., assignor to Echelon Systems Corporation, Palo Alto, Calif.

Continuation of Ser. No. 567,232, Aug. 13, 1990, Pat. No. 5,029,180, which is a continuation-in-part of Ser. No. 328,058, Mar. 23, 1989, Pat. No. 4,979,183. This application Apr. 11, 1991, Ser. No. 684,038

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **5 Claims**



1. In a communications system wherein data is recovered by correlating a received spread spectrum signal with a known predetermined chip sequence, an improved correlator comprising:

a correlation register having N stages, where N is an integer greater than zero, with each stage corresponding to a signal chip in said sequence, said correlation register being coupled to receive said spread spectrum signal;

means for autocorrelating each of said N stages with the corresponding chips of said sequence; and

means for modifying said sequence to accommodate multiple communication channels.

5,146,472

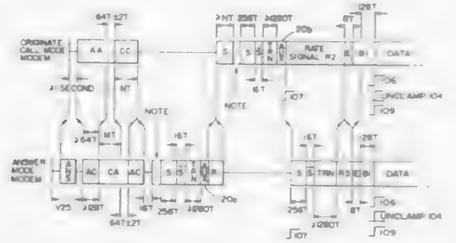
METHOD FOR IMBEDDING INFORMATION IN MODEM HANDSHAKE PROCEDURE AND MODEMS INCORPORATING THE SAME

Edward H. Hallman, Brookfield, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Mar. 28, 1990, Ser. No. 502,161

Int. Cl.[5] H04L *29/08*

U.S. Cl. 375—8 **43 Claims**



26. A method for embedding information in a handshake procedure of a communicating originating and an answering modem, said answering modem including an adaptive equalizer which is trained, said method comprising:

a) in an originating modem, generating an auxiliary packet containing the information to be embedded in the handshake procedure such that the auxiliary packet is in a form other than the formats of the handshake signals which are required by the handshake procedure to be sent from the originating modem to the answering modem and cannot be interpreted by the answering modem as one of the handshake signals; and

b) placing said generated auxiliary packet among the handshake signals required to be sent from said originating modem to said answering modem after said adaptive equalizer of said answering modem has been trained on originating modem handshake signals and before said answering modem and said originating modem have agreed to communicate data.

5,146,473

SUBSCRIBER UNIT FOR WIRELESS DIGITAL SUBSCRIBER COMMUNICATION SYSTEM

David N. Critchlow; Moshe Yehushua; Graham M. Avis, all of San Diego; Wade L. Heimbigner, Poway, and Karle J. Johnson, Carlsbad, all of Calif., assignors to International Mobile Machines Corporation, King of Prussia, Pa.

Continuation of Ser. No. 394,497, Aug. 14, 1989, Pat. No. 5,008,900. This application Feb. 20, 1991, Ser. No. 658,065

Int. Cl.[5] H04B *1/38*

U.S. Cl. 375—8 **8 Claims**

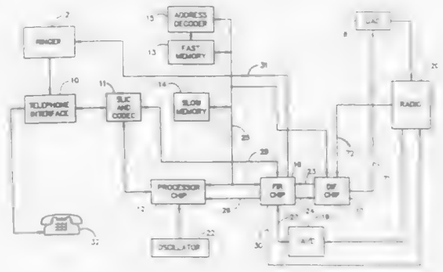
1. An FIR chip for use in a subscriber unit for a wireless digital telephone system wherein the subscriber unit includes a processing means for transcoding an input signal to provide digital input symbols, for demodulating an output signal received from a second unit within the system and for synthesizing digital output symbols from the demodulated output signal, means responsive to the processing means for providing filtered digital input symbols, means for modulating an intermediate frequency signal with the filtered input symbols, and means for transmitting the modulated intermediate frequency signal to the second unit and for receiving an output signal from the second unit, the FIR chip comprising:

means for internal address decoding to allow the processing means to access internal functions of the FIR chip;

a control and status register which allows the processing means to read the status of and control internal functions of the FIR chip;

means for FIR filtering to filter the digital input symbols;

means for control timing which allows the processing means to control the FIR filtering means; and



means for generating timing signals for timing transcoding operations and synthesizing operations connected to the processing means.

5,146,474

CIRCUIT ARRANGEMENT FOR THE ROUTINE TESTING OF AN INTERFACE BETWEEN LINE TERMINATOR GROUPS AND THE SWITCHING MATRIX NETWORK OF A PCM TELECOMMUNICATION SWITCHING SYSTEM

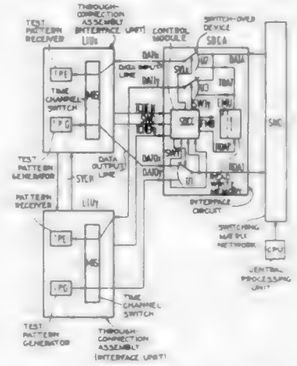
Werner Nagler, Hohenschaeftlarn, and Rudolf Krumenacker, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 8, 1991, Ser. No. 652,610

Claims priority, application European Pat. Off., Mar. 23, 1990, 90105564.0

Int. Cl.[5] H04J *3/14*

U.S. Cl. 375—10 **2 Claims**



1. In a circuit arrangement for the routine testing of the interface between the connector modules of pairs of connector modules for the connection of telecommunication lines to a pulse-code modulation (PCM) exchange and the switching network of this PCM exchange, each of said interfaces comprising an interface circuit, each of said each of said interface circuits connected between line terminator groups of pairs of line terminator groups for the connection of telecommunication lines to the switching center of the pulse-code modulation switching system and to the switching matrix network of the pulse-code modulation switching system, in which the pairs of line terminator groups form a unit such that, given outage of

central parts of one of the line terminator groups of a pair of line terminator groups, the telecommunication traffic pertaining to the total of the telecommunication lines connected to that one line terminator group can be sequenced via redundant parts of the other line terminator group of the pair of line terminator groups in an alternate routing mode and in which, for this purpose, the interface circuits include switch-over devices that, in the alternate routing mode, forward telecommunication information coming from the switching matrix network and destined for the line terminator groups to which such interface circuits are assigned, do not transmit to that assigned line terminator group, but transmit to the redundant central parts of the other line terminator group of the respective pair of line terminator groups, and, respectively, conduct telecommunication information coming from the redundant central switching parts of the other line terminator group to the switching matrix network terminals assigned to this other line terminator group, the improvement wherein each of said interface circuits comprises:

a write-read memory operable on a time channel basis to accept information coming from the line terminator groups for transmission, after a predetermined time delay, back to the line terminator groups instead of telecommunication information deriving from the switching matrix network;

a first switching element for forwarding telecommunication information coming either from the line terminator group assigned to the interface circuit or from another line terminator group, and second and third switching elements each assigned to a respective line terminator group and, dependent on their switch positions, forward telecommunication information coming from the switching matrix network or information read from said write-read memory to the respectively-assigned line terminator group; and

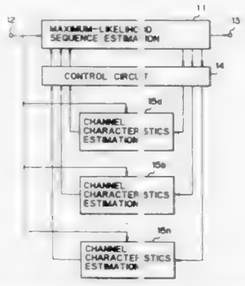
a controller connected to said write-read memory and to said first, second and third switching elements for providing control signals thereto for operating said switching elements and said write-read memory.

5,146,475

MAXIMUM-LIKLIHOOD SEQUENCE ESTIMATION APPARATUS

Hiroshi Kubo, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 19, 1990, Ser. No. 615,236
Claims priority, application Japan, Nov. 24, 1989, 1-305907
Int. Cl.[5] H04L *27/06*
U.S. Cl. 375—94 **6 Claims**



1. A maximum-likelihood sequence estimation apparatus supplied with a received signal and outputting data in accordance with a state selected on the basis of an estimated maximum-likelihood sequence, comprising:

first means supplied with a received signal and previous estimated values of channel characteristics for respective states which are a combination of possibly occurring data of a presently received signal so as to estimate a maximum-likelihood sequence using the previous estimated values of channel characteristics to output survivor sequences for the respective states; and

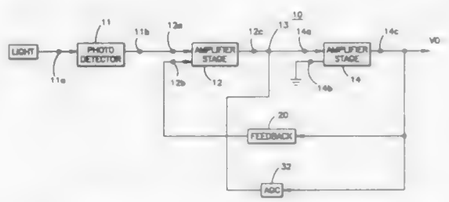
second means responsive to the received signal and the survivor sequences for the respective states output from the first means for outputting the present estimated values of channel characteristics for the respective states.

5,146,476

HIGH GAIN AMPLIFIER FOR RECEPTION OF LOW LEVEL PULSE CODE MODULATION NONRETURN-TO-ZERO SIGNALS

Joseph L. Whitehead, Decatur, and Philip L. Dillon, Arlington, both of Tex., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Dec. 3, 1990, Ser. No. 621,536
Int. Cl.[5] H04L *27/08*
U.S. Cl. 375—98 **17 Claims**



1. An amplifier for received pulse code modulation non-return-to-zero (PCM NRZ) signals comprising:

a) means having a controllable gain for amplifying said received PCM NRZ signals;

b) first means responsive to the amplified received PCM NRZ signals for:

i) operating in a first mode when zeroes bits are in said received PCM NRZ signals to control the DC drift of the amplifying means; and

ii) operating in a second mode when ones bits are in said received PCM NRZ signals for controlling the amplifying means to have minimal DC shift for said received ones bits; and

c) second means responsive to the amplified received PCM NRZ signals for decreasing the amplifying means controllable gain so that said amplified received PCM NRZ signals have essentially a constant output level when ones bits having an amplitude above a predetermined threshold are in said received PCM NRZ signals.

5,146,477

JITTER CONTROL IN DIGITAL COMMUNICATION LINKS

Antonio Cantoni, 44 Emmerson Street, North Perth, Western Australia; Zigmantas L. Budrikis, 7 Hotchin Road, Dalkeith, Western Australia; Robert M. Newman, 52 Davallia Road, Duncraig, Western Australia, and John L. Hullett, 75 Selby Street, Daglish, Western Australia, all of Australia

Continuation of Ser. No. 283,363, Apr. 28, 1989, abandoned.
This application Jan. 18, 1991, Ser. No. 644,472
Claims priority, application Australia, Mar. 17, 1987, PI0883
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—112 **17 Claims**

9. Apparatus for transmitting digital signals (DI) on a network having nodes (N), said digital signals (DI) being in frames each of which includes a stuffing field and stuffing control field, said apparatus including:

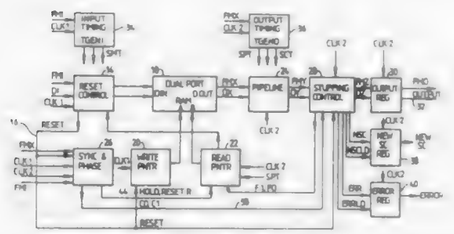
a buffer;

a local clock for producing local clock signals (CLK2);

means for extracting clock signals (CLK1) from the digital signals (DI) received at a node;

means for generating phase difference signals from frame markers (FMI, FMX) in said frames upstream and downstream of said buffer and for generating conditional stuffing control codes (C0, C1) in accordance with the difference between the phase difference signals and a predetermined reference phase difference (D);

stuffing control means for determining the potential length of the stuffing control field if varied in accordance with the conditional control codes (C0, C1) and, if the potential



length stuffing control field is outside minimum and maximum lengths, generating unconditional stuffing control codes (F0, F1) such that the length of the stuffing field is not outside said minimum and maximum lengths; and

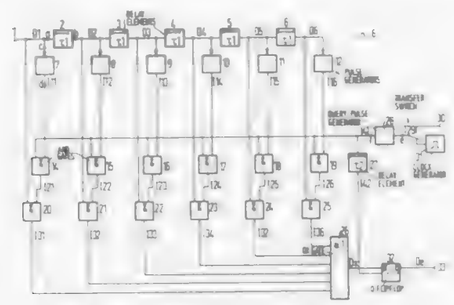
stuffing means for adding or subtracting stuffing bits in said stuffing field in accordance with said unconditional stuffing control codes (F0, F1) in order to compensate for differences in frequencies between said local and extracted clock signals (CLK2, CLK1).

5,146,478

METHOD AND APPARATUS FOR RECEIVING A BINARY DIGITAL SIGNAL

Alexander Dragotin, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 500,914
Claims priority, application Fed. Rep. of Germany, May 29, 1989, 3917426
Int. Cl.[5] H04L *7/02*
U.S. Cl. 375—119 **19 Claims**



1. A method for receiving a binary digital signal which may have phase shifts, using a clock whose frequency is identical to or plesiochronic with the bit rate of the digital signal and whose phase difference compared to the digital signal is arbitrary, comprising the steps of:

generating query pulses from the edges of the clock, the query pulses having a duration which is short in comparison to the clock period and longer than the setting and holding time of a D flip-flop plus the time interval of the pulse distortion duration of the digital signal during implementation of the method;

generating n−1 delayed digital signals on the basis of a delay wherein n>3 with approximately identical first delay times given an overall delay of at least one clock period and less than two clock periods;

generating delayed pulses from the leading and trailing edges of all the delayed digital signals such that at least one of the delayed pulses appears during the full duration of a query pulse and the delayed pulses being short in comparison to the clock period and longer than said first delay time;

first ANDing the query pulses separately with each simultaneously-appearing delayed pulse;

secondly, ANDing the results of the first ANDing the individual delayed digital signals to connect through the digital signals;

ORing the through-connected digital signals;

delaying the query pulses an optimal second delay time; and

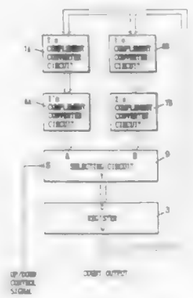
sampling the results of the ORing step with the delayed query pulses such that the sampling occurs approximately one-fourth of a clock period following an effective edge of the signal resulting from the ORing step.

5,146,479

UP/DOWN COUNTER FOR COUNTING BINARY DATA STORED IN FLIP FLOPS

Keisuke Okada, and Masatoshi Kimura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1991, Ser. No. 709,580
Claims priority, application Japan, Jun. 5, 1990, 2-148128; May 30, 1991, 3-127425
Int. Cl.[5] H03K *23/66*
U.S. Cl. 377—41 **25 Claims**



1. A binary counter for up-counting and down-counting binary data, comprises:

memory means for storing binary data to be counted;

up-count means for up-counting said binary data stored in said memory means by converting the same into a complement on two after converting the same to a complement on one;

down-count means for down-counting said binary data stored in said memory means by converting the same into a complement on one after converting the same to a complement on two; and

control means for selectively activating said up-count means in an up-count mode and activating said down-count means in a down-count mode; wherein

said data stored in said memory means is rewritten, depending on a count result of said up-count means or said down-count means activated by said control means.

5,146,480

SAMPLING AN ANALOG SIGNAL VOLTAGE USING FILL AND SPILL INPUT IN CHARGE TRANSFER DEVICE

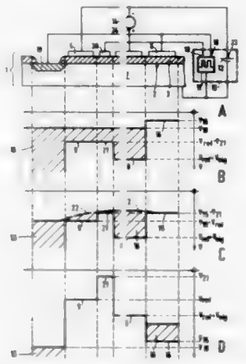
Laksmi N. Sankaranarayanan, and Anton H. Rensink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1991, Ser. No. 688,015

Claims priority, application United Kingdom, May 23, 1990, 9011507

Int. Cl.[5] G11C *19/28*; H01L *29/78*

U.S. Cl. 377—60 6 Claims



1. Apparatus for sampling an analogue signal voltage to provide charge packets representative of successive samples, said apparatus comprising: a semiconductor substrate of a given conductivity type and adjacent a surface of which a charge carrier source region of opposite conductivity type is provided and a channel region for transporting charge carriers from said source region is defined, said channel region having the given or the opposite conductivity type and having a plurality of gate electrodes insulatingly overlaying it for controlling the charge carrier transport, said electrodes including a first gate electrode for forming a metering potential well within said channel region, a second gate electrode for forming a first potential barrier within said channel region between said metering potential well and said source region, and a third gate electrode for controlling the transfer of charge packets from said metering potential well towards an output, an input for said analogue signal voltage, coupled to said first gate electrode, and a control signal generator coupled to said source region and to said first, second and third gate electrodes for applying a bias voltage in conjunction with said analogue signal voltage to said first gate electrode so as to create said metering potential well, for applying a bias voltage to said second gate electrode so as to create said first potential barrier, and for applying clock signals having substantially the same phase to both said source region and said third gate electrode to control the potentials of the source region and the third gate electrode between (a) values at which said metering potential well will be filled over said first potential barrier with charge carriers from said soruce region to a level determined by the potential of said source region and said third gate electrode will create a second potential barrier acting to prevent said charge carriers from leaving said metering potential well, and (b) values at which said first potential barrier will act to prevent charge carriers entering the metering potential well from said source region and said third gate electrode will no longer create a potential barrier acting to prevent charge carriers from leaving said metering potential well, characterized in that said plurality of gate electrodes includes a fourth gate electrode for forming a third potential barrier within said channel region between said metering potential well and said first potential barrier, and in that said control signal generator is coupled to said fourth gate electrode for applying a clock signal thereto substantially in antiphase to the clock signals applied to the source region and the third gate electrode to control the potential of said fourth gate electrode between a first value at which the third potential barrier is at least as low as said first potential barrier and a second value at which the third potential barrier is higher than said first potential barrier.

5,146,481

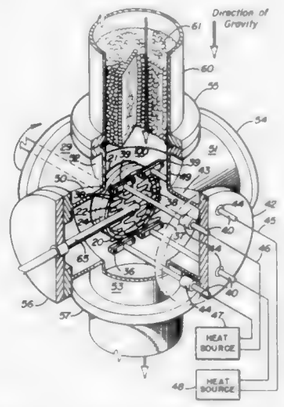
DIAMOND MEMBRANES FOR X-RAY LITHOGRAPHY

Diwakar Garg, 2815 Whitemarsh Pl.; Vyril A. Monk, P.O. Box 496, 6563 Mountain Rd., both of Macungie, Pa. 18062, and Carl F. Mueller, 1221 Tatamy Rd., Easton, Pa. 18042

Filed Jun. 25, 1991, Ser. No. 720,605

Int. Cl.[5] G21K *5/00*; B01J *3/06*

U.S. Cl. 378—35 31 Claims



9. A method for producing a substantially compressive stress free, pin-holes and defects free, continuous polycrystalline diamond X-ray membrane comprising:

preparing the surface of a supporting substrate comprising a material selected from the group consisting of silicon, polysilicon, silicon carbide, silicon nitride, silicon oxynitride, boron carbide, boron nitride, alumina, titanium carbide, titanium nitride, tungsten, molybdenum, tantalum and mixtures thereof by treating said substrate surface with a slurry of diamond particles and a volatile solvent placed in an ultrasonic bath for a predetermined period of time;

placing said substrate into a hot filament chemical vapor deposition reactor chamber;

pre-heating said substrate by electrically charging the precarburized filament network of said reactor to a temperature in the range of about 400° C. to 650° C. in the presence of an inert gas;

maintaining said pre-heating temperature for a predetermined period of time;

heating said substrate to a temperature in the range of approximately 650° C.–700° C. in the presence of a gaseous mixture of flowing hydrogen and carbon compounds;

chemically vapor depositing a substantially optically and X-ray transparent, adherent and coherent polycrystalline diamond membrane having a substantially uniform thickness onto said substrate;

cooling said substrate by extinguishing said deposition process and passing an inert gas over said substrate until the temperature of said substrate has reached substantially room temperature during said cooldown step;

removing said substrate coated with a substantially compressive stress free polycrystalline diamond X-ray membrane from said reactor;

applying an etch resistant mask to the back surface of the said substrate to define one or more openings;

etching said back surface of said substrate by preferential chemical etchant; and

recovering said compressive stress free, pin-holes and defects free, continuous polycrystalline diamond membrane supported by a substrate frame.

5,146,482

MULTISPECTRAL VARIABLE MAGNIFICATION GLANCING INCIDENCE X-RAY TELESCOPE

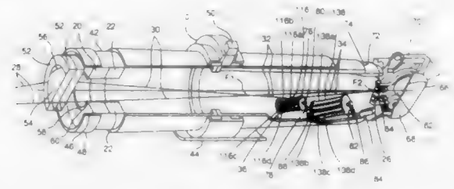
Richard B. Hoover, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 765,979, Aug. 15, 1989, Pat. No. 4,941,163. This application Jun. 28, 1990, Ser. No. 545,008

The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.

Int. Cl.[5] G21K *7/00*

U.S. Cl. 378—43 16 Claims



1. A variable magnification x-ray telescope for high-resolution imaging of wavelengths in an x-ray and extreme ultraviolet radiation band comprising: a telescope housing, a primary optical system having a glancing incidence primary mirror carried at a receiving end of said telescope housing for reflecting a beam of incident radiation, said primary optical system having an optical axis and a primary focus lying on said axis disposed within said housing, a plurality of rotatable cylindrical mirror carriers disposed one behind the other within said housing behind said primary focus, a plurality of mirrors each having a respective surface corresponding to a segment of a surface of revolution mounted on each of said carriers and positioned at an inclination to said optical axis, each of said mirrors having a layered synthetic microstructure coating on the respective concave surface to enhance the reflectivity of a desired wavelength in said band, the coatings on the mirrors of a first carrier differing from each other and the coatings on the mirrors of at least a second carrier differing from each other, each of said mirrors having a first focus coincident with the primary focus and a second focus off of said optical axis, an x-ray detector disposed at the second focus of each of said mirrors, means for selectively rotating said carriers to select a mirror thereon for receiving said incident radiation beam, and selection means for selectively moving at least the first carrier into and out of a disposition for receiving reflected radiation from said primary system to permit said radiation to strike a selected mirror on said second carrier when said first carrier is moved out of said disposition to form an image upon the detector at the second focus of said selected mirror, and to permit said radiation to strike a selected mirror on said first carrier when said first carrier is in said disposition to form a higher magnification, smaller field of view image upon the detector at the second focus of the selected mirror on said first carrier.

5,146,483

ROTARY ANODE X-RAY TUBE

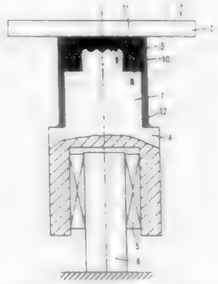
Rolf Behling, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 18, 1991, Ser. No. 717,303

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1990, 4019614

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—127 19 Claims



18. A rotary anode X-ray tube comprising:

a rotary anode stem tube exhibiting different temperatures;

a bearing; and

means for securing the stem tube to the bearing;

said means for securing including means for thermally conducting heat from said stem tube to said bearing, said means for thermally conducting heat having a heat resistance that changes in value in accordance with the temperature of said stem tube.

5,146,484

SHEET-FILM CASSETTE

Alfred Trumpp, Stuttgart, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

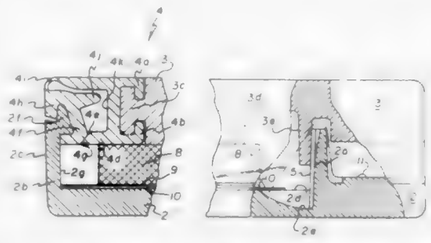
PCT No. PCT/EP89/01009, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO90/02356, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 28, 1989, Ser. No. 646,599

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 38293137

Int. Cl.[5] G03B *42/04*

U.S. Cl. 378—188 8 Claims



1. Sheet-film cassette (**1**) comprising a lower cassette portion (**2**) serving to position the sheet film (**10**), an upper cassette portion (**3**) forming the cassette lid and including sheet-film pressure means (**8**), a narrow side wall (**2***b*) connected to said lower portion (**2**), said upper cassette portion (**3**) being held to said side wall (**2***b*), and thereby to said lower cassette portion (**2**), by a hinge (**4**), said hinge (**4**) extending in a direction parallel to said side wall (**2***b*) and having a surface aligned with the outer surface (**2***c*) of said side wall (**2***b*), one part of the hinge being connected to the side wall, a second part of the hinge

being connected to the upper cassette portion, the cassette (1) also having a closing device (7) which is arranged on the side of the cassette opposite to said hinge (4), the hinge (4) further comprising a first projection (4*f*), which extends from the part of the hinge (4) connected to the side wall (2*b*) in a direction parallel with the hinge (4) and projects into the interior of the cassette, a second projection (4*d*) which extends from the part of the hinge (4) connected to the upper cassette portion (3) in a direction parallel with the first projection (4*f*) and projects into the interior of the cassette, characterized in that when the cassette is closed the second projection (4*d*) engages the first projection (4*f*) from below, whereby the projections (4*d*, 4*f*) support each other.

5,146,485

X-RAY EXAMINATION APPARATUS

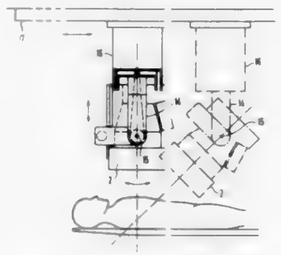
Gerd Schweichler, Dormitz, and Michael Meyer, Roettenbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

Filed Jan. 17, 1992, Ser. No. 821,824

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1991, 4102894

Int. Cl.[5] H05G 1/02

U.S. Cl. 378—197 **2 Claims**



1. An x-ray apparatus comprising:

an x-ray radiator and an X-ray image intensifier disposed to receive x-rays from said x-ray radiator, said x-ray radiator and said x-ray image intensifier being adjustable components,

a circular arc section suspending one of said adjustable components, said circular arc section being telescopically adjustable in length and defining an imaginary surface;

rigidly mounted rails, extending perpendicularly to said surface, to which said circular arc section is mounted for adjustment along said rails; and

a holder for said component suspended from said circular arc section, said holder being moveable with said component around the circular arc of said circular arc section, said holder being mounted to said circular arc section so as to be movable along a longitudinal axis of said holder and holding said component so that said component is pivotable around a transverse axis of said holder.

5,146,486

CELLULAR NETWORK DATA TRANSMISSION SYSTEM

Mayer M. Lebowitz, 5515 Northaven Rd., Dallas, Tex. 75229

Filed Aug. 31, 1989, Ser. No. 401,651

Int. Cl.[5] H04B 1/04 *11/04*

U.S. Cl. 379—40 **30 Claims**

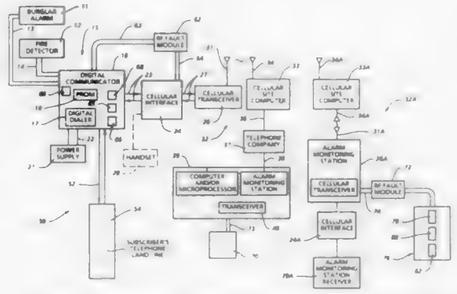
1. A system for transmitting data between a subscriber site and at least one monitoring station, comprising:

sensor circuitry for generating data responsive to an event at the subscriber site;

first transmission circuitry responsive to said sensor circuitry operable to transmit the data from the subscriber site using a cellular telecommunication network and including a cellular transceiver that transmits to and receives from said cellular telecommunications network radio frequency signals, a digital communicator connected to said sensor circuitry for receiving data therefrom, and a cellular interface connected to said digital communicator;

second transmission circuitry directly connected to said digital communicator and being operable to transmit the data from the subscriber site using a landline telecommunications network;

fault detect circuitry including a first lead line connected to said digital communicator and a sensor lead line connected to said cellular interface for continuously monitoring the operability of the system and the integrity of said cellular telecommunication network, said fault detect



circuitry including circuitry operable to detect a loss of a radio frequency data link transmitted by said cellular telecommunications network and to generate a lost radio frequency link signal responsive to a loss of the radio frequency link;

circuitry coupled to said fault detect circuitry for receiving said lost radio frequency link signal and transmitting data to the monitoring station using said landline based telecommunication network responsive to said lost radio frequency link signal received from said fault detect circuitry indicating a lack of integrity in said cellular telecommunication network.

5,146,487

METHOD FOR CREATING AND COMPOSING AUDIO TEXT MESSAGE

Barry Bergsman, Los Angeles, and Curtis Pearlman, Woodland Hills, both of Calif., assignors to Intertel Entertainment, Inc., Los Angeles, Calif.

Filed Jun. 26, 1990, Ser. No. 544,390

Int. Cl.[5] H04M 1/64

U.S. Cl. 379—67 **4 Claims**

1. A method for determining a name of a person who is to receive an audio text message which is to be subsequently delivered utilizing a touch tone telephone system comprising the steps of:

a) prompting a caller to press four touch tone keys wherein said four keys correspond to the first four letters of said person's name;

b) generating a number representing the four keys pressed by the caller;

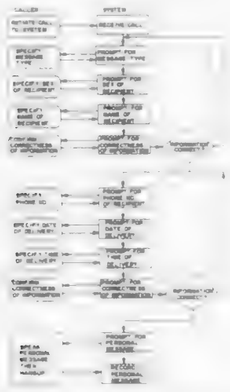
c) using said number to access a list containing a prerecorded voice for each of at least one name which corresponds to said number;

d) prompting the caller to press a key after the desired name is pronounced during the next step

e) playing said prerecorded voice to the caller beginning with the first name in said list until the caller has pressed a key or all names in the list have been played;

f) generating and storing a second number representing the

name which immediately preceded the caller's key press responsive to the prompt of step d), or , if there was no



key press, a second number representing the fact that no key was pressed responsive to the prompt of step d).

5,146,488

MULTI-MEDIA RESPONSE CONTROL SYSTEM

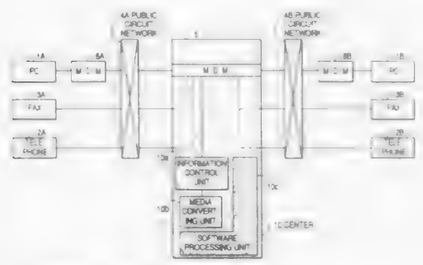
Akihiro Okada, Zama; Tooru Kino, Kunitachi, and Katsumi Tanaka, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 14, 1990, Ser. No. 465,266

Claims priority, application Japan, Jun. 14, 1988, 63-144650; Feb. 26, 1989, 1-044128

Int. Cl.[5] H04M 3/50, 7/00, 11/00

U.S. Cl. 379—88 **6 Claims**



1. A response control system comprising:

first storing means for obtaining encoded first sound piece data, for attaching a first descriptor to respective encoded first sound piece data which represent units of a sentence part and for storing the first descriptor and corresponding encoded first sound piece data,

second storing means for obtaining encoded second sound piece data, for attaching a second descriptor to respective encoded second sound piece data which represent units of a sentence part and for storing the second descriptor and corresponding encoded second sound piece data,

third storing means for using the first and second descriptors stored in said first and second storing means to produce a plurality of sentence structures constituting a sentence and for storing the sentence structures, and

control means for receiving a voice output request signal including designation data, for reading a sentence structure from said third storing means in accordance with said voice output request signal, for selecting among the first sound piece data and the second sound piece data based on the designation data to form voice data and for outputting a voice response signal indicative of the voice data.

5,146,489

DEDICATED LINE ELIMINATOR FOR FACSIMILE/TELEPHONE SYSTEMS

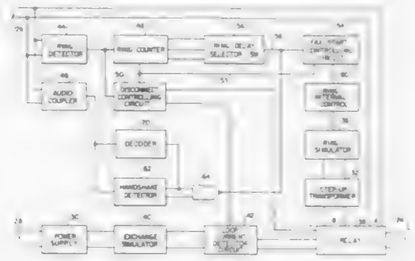
Marius Telibasa, Woodside, N.Y., assignor to IT Systems Corporation, Yonkers, N.Y.

Continuation of Ser. No. 482,200, Feb. 20, 1990, abandoned.

This application Jun. 19, 1991, Ser. No. 717,680

Int. Cl.[5] H04M 11/00

U.S. Cl. 379—100 **3 Claims**



1. An electronic device for controlling the operation of a facsimile machine and a telephone which are both connected to a single telephone line, the device being located between the facsimile machine and the telephone line such than an incoming call, either a fax call or a voice call, will activate both the electronic device and the telephone, said electronic device comprising:

means for detecting said incoming call;

means for disconnecting said facsimile machine from said telephone line for a predetermined period of time in response to said detection means detecting said incoming call without affecting the connection of said telephone to said telephone line, thereby preventing said facsimile machine from automatically answering said incoming call and allowing a person to answer said incoming call with said telephone;

means for determining whether the incoming call, once answered, is fax call, intended for said facsimile machine;

means for activating said disconnected facsimile machine by generating imitation "ring" signals which simulate an incoming call so that said facsimile machine answers said imitation "ring" signals, said activating means being responsive to said determining means determining said incoming call is a fax call;

means for detecting when said facsimile machine answers said imitation "ring" signals; and

means for connecting said facsimile machine back with said telephone line so that said fax call is received by said facsimile machine.

5,146,490

PASSIVE TELEPHONE LINE MONITORING SYSTEM

Alfred J. Beckman, Plano, Tex., assignor to Primo Microphones, Inc., McKinney, Tex.

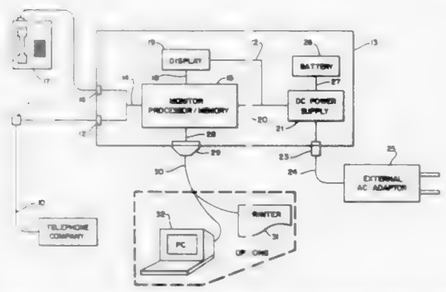
Filed May 31, 1991, Ser. No. 708,310

Int. Cl.[5] H04M 15/04, 15/08, 15/10, 15/38

U.S. Cl. 379—113 **15 Claims**

1. A telephone line activity, both incoming and outgoing calls, passive monitoring system comprising: microcomputer means; read only memory (ROM) means mounted with said microcomputer means circuit connected for control by an on-board program contained in said ROM; random access memory (RAM) means in said system; circuit means interconnecting said RAM means and said microcomputer means; said on-board program carrying ROM having the capacity to work

with at least 16K bytes of said random access memory (RAM) divided into at least 16 byte caches allowing for up to at least 500 phone call registers depending upon utilization of available space; phone line to microcomputer signal input means; display means; clock means; keyboard entry means; and said clock means including a clock source feeding said display means; wherein said phone line to microcomputer signal input means includes, on/off hook detecting means; ring detect means, and answer detect means; and circuit means interconnecting said on/off hook detecting means, said ring detect means, and answer detect means and said microcomputer means; said phone line to microcomputer signal input means also includes,



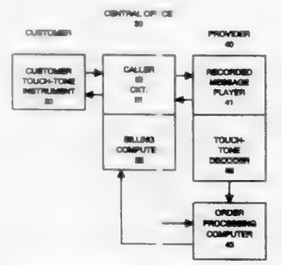
a dual tone multi-frequency (DTMF) circuit that decodes dual tones from said phone line to generate binary equivalent numbers as data to said microcomputer and that is an interrupting signal source to said microcomputer circuit means; said circuit means includes an address/data buss system, and a read/write interrupt drive interconnect line, both connected to said on/off hook detecting means, said ring detect means, said answer detect means, and said DTMF circuit; said phone line to microcomputer signal input means also includes, a call number decoder (CND) call ID circuit; and connection of said CND call ID circuit to said address/data buss system, and to said read/write interrupt drive interconnect line.

5,146,491

TELEPHONE BILLING METHOD

David Silver, Newtonville, and Stanley Kugell, Newton Center, both of Mass., assignors to Pilgrim Telephone, Inc., Newtonville, Mass.

Filed Aug. 8, 1991, Ser. No. 742,135
Int. Cl.[5] H04M *15/12*
U.S. Cl. 379—114 **18 Claims**



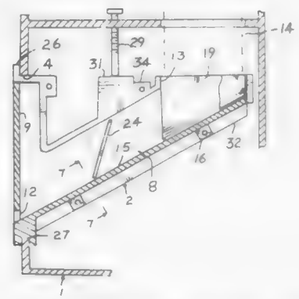
1. A method of telephone billing comprising the steps of:
a. providing a toll-free number or local number to a customer to access a provider in a toll-free call or local call from an originating customer telephone number;
b. receiving the originating customer telephone number in response to the toll-free call
c. converting the toll-free call to a billable call during or after the toll-free call; and
d. billing the billable call to the originating customer telephone number.

5,146,492

ANTI-EXPLOSIVE RETURN COIN DISCHARGE UNIT FOR THE CABINET OF A COIN OPERABLE TELEPHONE

Steve Stone, 220-58 75th Ave., and Steve Fama, 75-12 Springfield Blvd., both of Bayside, N.Y. 11364

Filed Jul. 18, 1991, Ser. No. 732,160
Int. Cl.[5] H04M *17/00*
U.S. Cl. 379—145 **8 Claims**



1. A return coin discharge unit comprising a housing having a coin entry opening in a top rear area thereof and a horizontal coin exit slot beneath a front wall thereof, a flat surfaced ramp in the housing having a high rear end spaced below the entry opening and a low forward end extending through the slot, and a trough of U-form seated on the high rear end of the ramp having a curved inner bottom surface below the entry opening, the entry opening being adapted to have a coin dropped through it onto the curved surface of the trough, the trough being adapted to cause the coin as it moves over its curved surface to obtain a horizontal position, and the ramp being adapted to allow the coin to slide down its surface from the trough and exit through the slot; wherein the housing has a pair of laterally spaced side walls between which the ramp extends, the entry opening is adapted to have a multiple number of coins dropped in succession through it onto the curved surface of the trough for movement down the ramp, and a flap gate is pivoted at its upper sides between the side walls and is inclined forwardly with a bottom end thereof resting upon the ramp, the gate being adapted to allow sliding of one coin at a time beyond it to the slot.

5,146,493

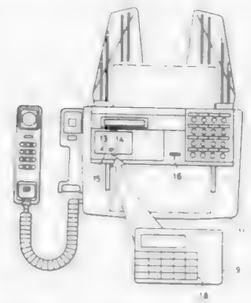
COMMUNICATION SYSTEM

Masao Kiguchi, Yokohama, and Yuji Kurosawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 537,817
Claims priority, application Japan, Jul. 6, 1989, 1-175074; Oct. 5, 1989, 1-261875; Nov. 17, 1989, 1-297376
Int. Cl.[5] H04M *1/27*
U.S. Cl. 379—357 **36 Claims**

1. A communication system comprising a card-like device and a data receiving apparatus for receiving data from said card-like device,
said data receiving apparatus comprising:
communication means for communicating via a line on the basis of data received from said card-like device;
obtaining means for obtaining electric power from the line;
a first internal power supply for generating electric power independently of the electric power from the line; and
first supply means for supplying said card-like device with

electric power from a selected one of said obtaining means and said first internal power supply, and
said card-like device comprising:
transmission means for transmitting data to said data receiving apparatus without using a conductor;



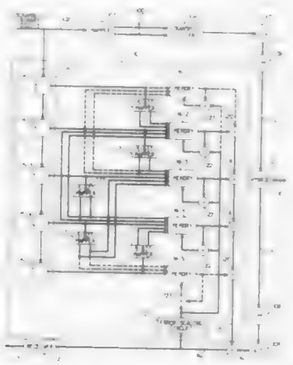
a second internal power supply for generating electric power independently of the electric power from said first supply means; and
second supply means for supplying said transmission means with electric power from a selected one of said first supply means and said second internal power supply.

5,146,494

OVERLAPPING LOOK-UP-AND-ADD ECHO CANCELLER REQUIRING A SMALLER MEMORY SIZE

Dale D. Harman, Freehold, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1989, Ser. No. 386,753
Int. Cl.[5] H04M *3/23*
U.S. Cl. 379—411 **11 Claims**



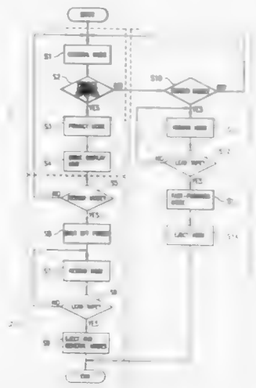
1. An echo canceller for use in a transceiver which transmits and receives data symbols, each of said data symbols being representative of a plurality of bits, said echo canceller comprising
a plurality of memories for storing appropriate echo cancellation values;
means for addressing each of said memories with the plurality of bits representative of a different associated data symbol in a sequence of transmitted data symbols and less than all of the bits representative of at least one of the data symbols adjacent to said associated data symbol in said sequence and for reading said echo cancellation values in response to the memories being addressed; and
means for combining all of said echo cancellation values read out of said memories.

5,146,495

CIRCUIT AND METHOD FOR MAINTAINING SECURITY OF VIDEO TAPE USING PRIVACY NUMBER

Young T. Son, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 18, 1991, Ser. No. 776,436
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—5 **13 Claims**



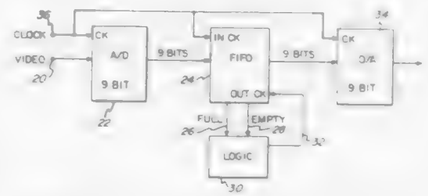
1. A circuit for maintaining security of a video tape using a privacy number, comprising:
sensing means for sensing lead tape portions of the video tape and for producing a sensed lead signal upon sensing the lead tape portions;
a microcomputer for producing a desired control signal in response to the sensed lead signal from said sensing means;
means for applying the privacy number to said microcomputer, said microcomputer producing a switching signal when the privacy number is applied;
control means connected to said microcomputer for controlling the operation of said sensing means in response to the switching signal received from said microcomputer; and
a deck connected to said microcomputer for being driven in accordance with the desired control signal produced by said microcomputer.

5,146,496

METHOD AND APPARATUS FOR ENHANCING THE SECURITY OF A SCRAMBLED TELEVISION SIGNAL

Richard Westerfer, Blue Bell; Clyde Robbins, Maple Glen, both of Pa., and Anthony M. Radice, Riverside, N.J., assignors to General Instrument Corporation, Hatboro, Pa.

Filed Jun. 13, 1991, Ser. No. 714,673
Int. Cl.[5] H04N *7/16*
U.S. Cl. 380—15 **20 Claims**



8. Apparatus for enhancing the scrambling security of a

television signal that is scrambled by the suppression of synchronization information, comprising:

means for providing a scrambled television signal containing successive lines of video information;

first means coupled to said providing means for adding a time increment to at least one line of said scrambled television signal to achieve a cumulative delay corresponding at least to the width of a color burst component of the television signal, said time increment having a duration calculated to maintain a fixed phase relationship between successive color burst components in active video lines of said television signal; and

second means coupled to said providing means for deleting a time increment from at least one other line of said television signal to reduce said delay while maintaining said fixed phase relationship;

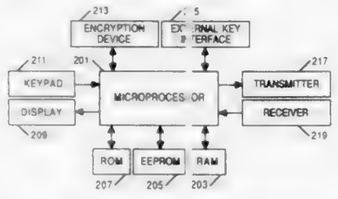
wherein said color burst component is caused to drift over time without corrupting the color content of said television signal, while rending it unacceptable for use as a timing reference.

5,146,497

GROUP REKEY IN A COMMUNICATION SYSTEM

Michael W. Bright, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1991, Ser. No. 662,581
Int. Cl.[5] H04L *9/08*
U.S. Cl. 380—21 **14 Claims**



8. A communication system with key distribution between a key management controller and at least two communication units in a communication system, comprising:

means for sending a rekeying message to the at least two communication units;

means for requesting an acknowledgment, delayed beyond a first chance to acknowledge, from each of the at least two communication units at receipt of said rekeying message; and

means for resending said rekeying message to at least one of the at least two communication units when said delayed acknowledgment is not received from said at least one of the at least two communication units.

5,146,498

REMOTE KEY MANIPULATIONS FOR OVER-THE-AIR RE-KEYING

Jeffrey D. Smith, Lauderhill, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

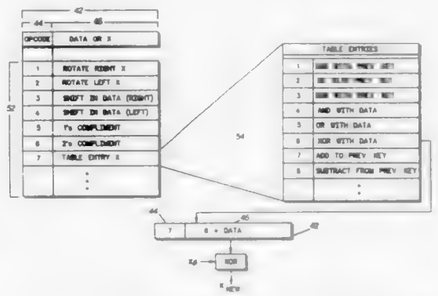
Filed Jan. 10, 1991, Ser. No. 639,476
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—21 **20 Claims**

1. A method for remotely changing an original voice encryption key in a secure radio, comprising:

storing said original voice encryption key in said secure radio;

transmitting by a central controller to said secure radio a digital word representing only a selective operation selectable from a plurality of different key operations to be performed on said original voice encryption key alone without changing an encryption polynomial; and

performing only said operation on said original voice encryption key alone in said secure radio to generate a current voice encryption key alone in response to said digital word.

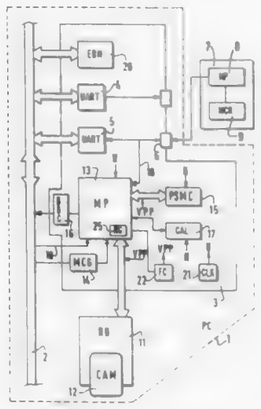


5,146,499

DATA PROCESSING SYSTEM COMPRISING AUTHENTIFICATION MEANS VIZ A VIZ A SMART CARD, AN ELECTRONIC CIRCUIT FOR USE IN SUCH SYSTEM, AND A PROCEDURE FOR IMPLEMENTING SUCH AUTHENTIFICATION

Bernard Geffrotin, Meudon, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1990, Ser. No. 604,711
Claims priority, application France, Oct. 27, 1989, 89 14144
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 **15 Claims**



1. A data processing system comprising

a) microprocessor means (MP) interfaced to an internal smart card reader (RD) and to a security microcircuit (PSMC);

b) a main bus (2);

c) further data processing means connnected via said main bus to said microprocessor means, for cooperatively under control of a random number (RN) and a reversible algorithm (ALG) from said system authentifying a smart card (CAM) presented to said reader, by means of a first key (SK21) generated from first identity quantities (NI, NOP) from said card and an associated second key (SK21') generated from a second identity quantity (NI') from the security microcircuit, an authentification represented by correspondence among said first and second keys resulting in a correspondence signal;

d) a start-up detection circuit (MCD) for detecting an initiation of said authentifying and thereupon generating a first control signal to said microprocessor means;

e) a main bus blocking circuit (BBC) fed by said microprocessor means and further connected to said bus for under control of said first control signal generating a bus-unblocking signal of predetermined duration; and

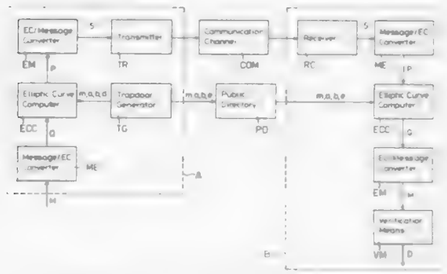
f) wherein absence of said correspondence signal before end of said duration drives said blocking circuit to generating and maintaining a continuous bus blocking signal.

5,146,500

PUBLIC KEY CRYPTOGRAPHIC SYSTEM USING ELLIPTIC CURVES OVER RINGS

Ueli Maurer, Weiherhofgasse, Switzerland, assignor to Omnisec A.G., Switzerland

Filed Mar. 22, 1991, Ser. No. 673,716
Claims priority, application European Pat. Off., Mar. 14, 1991, 91103933
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—30 **54 Claims**



1. Cryptographic system comprised of at least one encryption station, at least one decryption station and a trapdoor generator, said trapdoor generator comprising

means for selecting a multiplicity r of distinct prime numbers pi wherein i is an integer satisfying the conditions $1 \leqq i \leqq r$;

means for generating a modulus m that is a product of said prime numbers pi;

means for selecting a pair of integers (a,b) satisfying the conditions $0 \leqq a < m$ and $0 \leqq b < m$;

means for computing, for each prime number pi, a number N(pi) of distinct pairs of integers (x,y) satisfying the conditions $0 \leqq x < pi$ and $0 \leqq y < pi$ and further satisfying the condition

$$y^2 \equiv x^3 + a \cdot x + b \pmod{pi}$$

and for computing from said numbers N(pi) a sum value N(pi)+1 representative of an order of such an elliptic curve which is defined as the set of said pairs of integers (x,y);

means for computing a least common multiple μ of said sum values N(pi)+1;

means for selecting a public multiplier e which is relatively prime to μ;

means for computing a secret multiplier d according to an equation

$$d \equiv 1/e \pmod{\mu};$$

and

transfer means for transferring data comprising at least said modulus m, pair of integers (a,b) and public multiplier e to a corresponding storage means provided in the cryptographic system for locally storing said data therein,

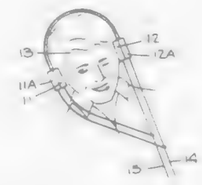
whereby the cryptographic system is provided with a trapdoor one-way function for a transformation whose trapdoor is the secret multiplier d.

5,146,501

ALTITUDE-SENSITIVE PORTABLE STEREO SOUND SET FOR DANCERS

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Mar. 11, 1991, Ser. No. 667,179
Int. Cl.[5] H04R *1/10*; H03G *9/00, 3/00*
U.S. Cl. 381—25 **6 Claims**



1. A portable stereo system for a dancer comprising:

(a) a portable stereo sound set adapted to be worn by a dancer, said set including left and right binaural audio signal amplifying channels, each having an adjustable amplitude control stage;

(b) left and right electrically operated earphones mounted on the head of the dancer and connected by an electrical line to the outputs of the corresponding channels of the set whereby dance music conveyed as audio signals through the channels and applied to the earphones is heard in stereo by the dancer at a base volume level determined by the setting of said amplitude-control stage; and

(c) left and right attitude-sensitive electrical devices attached to the corresponding earphones mounted on the head of the dancer and so connected to the corresponding channels of the set as to cause deviations from the base level of volume heard in the earphones to an extent that depends on the orientation of the head, whereby the volume of sound heard by the dancer is coordinated with his head movement.

5,146,502

SPEECH PATTERN CORRECTION DEVICE FOR DEAF AND VOICE-IMPAIRED

Stephen A. Davis, Coral Springs, Fla., assignor to Davis, Van Nortwick & Company, Gainesville, Fla.

Filed Feb. 26, 1990, Ser. No. 484,877
Int. Cl.[5] C10L *8/04*
U.S. Cl. 381—43 **19 Claims**

1. An apparatus, comprising:

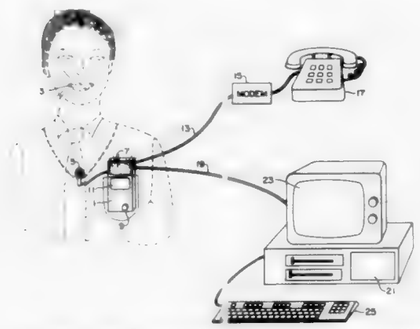
a microphone used to receive unintelligible voice utterances from a deaf or voice-impaired person;

a voice-word-profile containing representations of said voice unintelligible utterances and corresponding correct speech patterns;

a sound recognition routine to match said unintelligible voice utterances to said correct speech patterns; and

a speaker to output said correct speech patterns matched by said sound recognition routine,

so that said apparatus corrects unintelligible speech patterns enabling a deaf or voice-impaired person to communicate



in correct speech patterns by uttering otherwise unrecognizable speech pattern.

5,146,503

SPEECH RECOGNITION

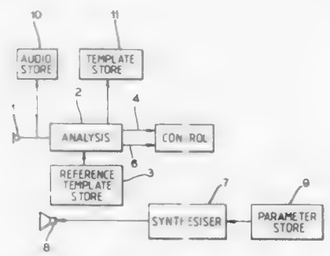
Ian R. Cameron, Ipswich, and Paul C. Millar, Felixstowe, both of England, assignors to British Telecommunications public limited company, London, England

Filed Aug. 24, 1988, Ser. No. 235,416

Claims priority, application United Kingdom, Aug. 28, 1987, 8720392; Feb. 23, 1988, 8804201

Int. Cl.[5] G10L *5/06*

U.S. Cl. 381—43 **11 Claims**



1. A method of constructing templates for use in speech recognition, the method comprising the steps of:

analysing speech signals from a plurality of users to construct at least one template for each word input by each user, and

constructing from said templates a set of representative templates for each of said words,

wherein during said constructing step each user inputs all the words of a given list of words in a "forced" mode, and then inputs at least some of the words of the list in a "free" mode by answering a series of questions.

5,146,504

SPEECH SELECTIVE AUTOMATIC GAIN CONTROL

Danny T. Pinckley, Arlington, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 7, 1990, Ser. No. 623,481

Int. Cl.[5] G10L *3/02*

U.S. Cl. 381—46 **18 Claims**

1. A communication device including an automatic gain control circuit comprising:

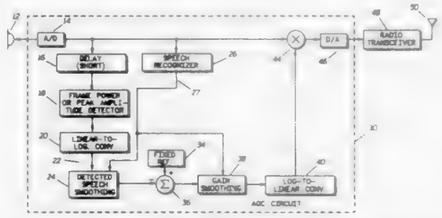
an analog-to-digital converter, coupled to a source of analog audio signals, for producing a digital input signal representing the analog audio signal;

first delay means, coupled to the analog-to-digital converter for delaying the digital input signal provided by the analog-to-digital converter;

power detector means, coupled to the first delay means, for detecting the power level of the digital input signal, and for producing a linear power signal representing the power level of the digital signal;

a linear-to-logarithmic converter, coupled to the power detector means, for converting the linear power signal into a logarithmic power signal;

speech smoothing means, coupled to the linear-to-logarithmic converter, for smoothing the logarithmic power signal to provide a smoothed logarithmic power signal;



a first summer for substracting the smoothed logarithmic power signal from a reference signal to provide a logarithmic error signal representing a logarithmic gain signal;

gain smoothing means, coupled to the summer, for smoothing the logarithmic gain signal to provide a smoothed logarithmic gain signal;

a logarithmic-to-linear converter, coupled to the gain smoothing means, for converting the smoothed logarithmic gain signal to a smoothed linear gain signal;

a multiplier for multiplying the smoothed linear gain signal with the digital input signal to provide an amplified digital input signal; and

a speech recognizer, coupled to the analog-to-digital converter, for determining whether the digital input signal represents recognizable speech, and for enabling the detected speech smoothing means and the gain smoothing means, when speech is detected in the input signal.

5,146,505

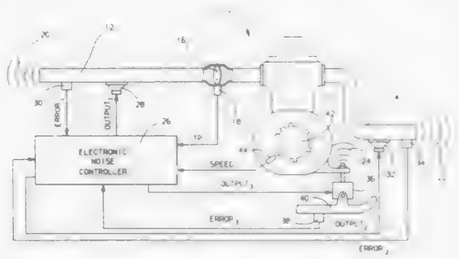
METHOD FOR ACTIVELY ATTENUATING ENGINE GENERATED NOISE

Donald P. Pfaff, Mount Clemens; Nick S. Kapsokavathis, Rochester, and Natalie A. Parks, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1990, Ser. No. 594,495

Int. Cl.[5] G10K *11/16*

U.S. Cl. 381—71 **3 Claims**



1. For an internal combustion engine having an operating cycle characterized by the generation of engine noise containing harmonic components, the frequencies of which are related to engine rotational speed, a method for selectively attenuating the amplitude of multiple harmonic noise components in engine noise, the steps of the method comprising:

deriving an indication of the angular rotation of the engine in the operating cycle;

generating a signal representative of selected multiple harmonic noise components from a predetermined schedule of values as a function of the derived indication of the angular rotation of the engine in the operating cycle, with the value sin the schedule determined by summing separate sinusoidal terms, with each sinusoidal term corresponding to one of the selected multiple harmonic component and having an argument related to an integer multiple of the angular rotation of the engine in the operating cycle; and

attenuating noise generated by the engine in accordance with the signal generated to represent the selected multiple harmonic noise components.

5,146,506

ISOLATOR CIRCUIT FOR AN AUDIO SYSTEM

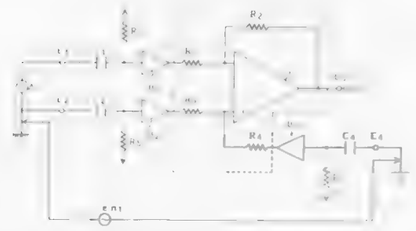
Yoshio Sasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,697

Claims priority, application Japan, Oct. 25, 1990, 2-287989

Int. Cl.[5] H04R *3/00;* **H03G** *5/00;* **H03H** *7/00;* **H04B** *15/00*

U.S. Cl. 381—94 **1 Claim**



1. An isolator circuit for an audio system having an operational amplifier provided between a signal source and an output to an audio system amplifier, the operational amplifier having an inverting input and a noninverting input, comprising:

a first capacitor and a first resistor connected in series between the signal source and one of the inputs of the operational amplifier;

a first buffer amplifier provided between the first capacitor and the first resistor;

a second capacitor and a second resistor connected in series between a ground and the other input of the operational amplifier;

a second buffer amplifier provided between the second capacitor and the second resistor;

a third capacitor and a third resistor connected in series between ground and the noninverting input of the operational amplifier; and

a third buffer amplifier provided between the third capacitor and the third resistor.

5,146,507

AUDIO REPRODUCTION CHARACTERISTICS CONTROL DEVICE

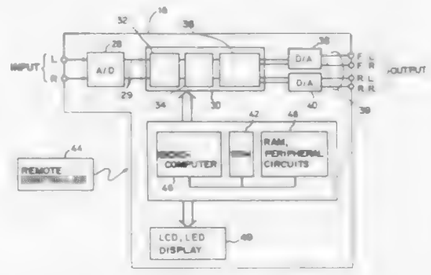
Yuji Satoh; Hiromi Sotome; Yoshiki Fukazawa, and Kiyoto Kuroiwa, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 21, 1990, Ser. No. 482,826

Claims priority, application Japan, Feb. 23, 1989, 1-21214[U]; Feb. 23, 1989, 1-21215[U]

Int. Cl.[5] H03G *5/00, 3/00*

U.S. Cl. 381—103 **10 Claims**



1. An audio reproduction characteristics control device comprising:

frequency response characteristic correction parameter memory means for prestoring frequency response characteristic correction parameters for correcting a frequency response characteristic of a given reproduction environment to a standard frequency response characteristic or other predetermined frequency response characteristic;

reflected sound characteristic parameter memory means for prestoring reflected sound characteristic parameters for a plurality of sound fields to be reproduced;

reproduction characteristics control means for imparting a predetermined frequency response characteristic and a predetermined reflected sound characteristic to an input source signal;

reproduction environment designation means for designating an environment in which a sound is reproduced;

reproduced sound field designation means for designating a sound field to be reproduced;

parameter selection means for selecting a frequency response characteristic correction parameter from said frequency response characteristic correction parameter memory means in accordance with either or both of the reproduction environment designated by said reproduction environment designation means and with the designated sound field to be reproduced, and also for selecting a reflected sound characteristic parameter from said reflected sound characteristic parameter memory means in accordance with the sound field to be reproduced designated by said reproduced sound field designation means thereby to supply the selected parameters to said reproduction characteristics control means.

5,146,508

OMINDIRECTIONAL MODULAR SIREN

Joseph F. Bader, Crete, Ill., and Earl W. Gosswiller, Pompano Beach, Fla., assignors to Federal Signal Corporation, Oak Brook, Ill.

Filed Sep. 7, 1990, Ser. No. 579,307

Int. Cl.[5] H04R *25/00;* **H05K** *5/00*

U.S. Cl. 381—156 **15 Claims**

1. An omnidirectional siren, comprising:

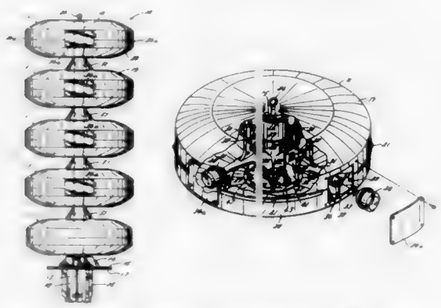
a support column;

a plurality of hollow modules supported in spaced-apart, vertical alignment on the support column, each module

having apertures in both its top and bottom surfaces through which the support column extends;

each but one of the modules being active due to enclosure of a plurality of sound wave producing transducers, the transducers being mounted peripherally within the active modules so as to be accessible through access slots in the peripheral surfaces of the modules, wherein one of the apertures in each of the active modules is larger in diameter than the support column extending therethrough, thereby providing an annular port for emission of sound waves form the module; and

means in each active module for guiding sound waves from the enclosed plurality of transducers to the annular sound wave emission port, the means including:



(a) a manifold having a longitudinal passage through which the support column extends and a plurality of waveguides through which sound waves travel, wherein each waveguide includes a separate input port for receiving sound waves from a transducer and the plurality of waveguides terminate adjacent to one another and form an annular output port which cooperates with the annular sound wave emission port of the module; and

(b) a plurality of waveguide horns which couple the plurality of transducers to the input ports of the manifold waveguides.

5,146,509

METHOD OF INSPECTING DEFECTS IN CIRCUIT PATTERN AND SYSTEM FOR CARRYING OUT THE METHOD

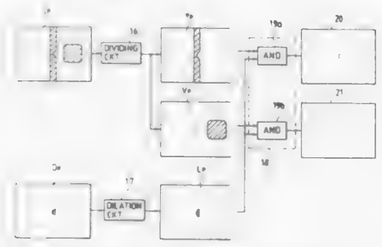
Yasuhiko Hara, Machida; Mitsuyoshi Koizumi, and Shigeki Kitamura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Video Engineering, Inc., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 575,380

Claims priority, application Japan, Aug. 30, 1989, 1-221450

Int. Cl.[5] G06K *9/03*

U.S. Cl. 382—8 **21 Claims**



1. A method of inspecting a defect in a circuit pattern comprising the steps of:

imaging, two-dimensionally, a circuit pattern to be inspected by imaging means while the imaging means relatively scans an image of the circuit pattern so as to sequentially produce an inspection image signal representing said circuit pattern;

generating sequentially and synchronized with said scanning, a reference image signal corresponding to said inspection image signal;

detecting a candidate defect image signal and a defect designation point signal of said candidate defect obtained as by comparing said inspection image signal with said reference image signal generated sequentially;

delaying by a delay means said inspection image signal, said reference image signal and said candidate defect image signal such that said signals are transmitted at a rate asynchronous with said imaging;

storing into a local image memory,

i) a local inspection image signal, including said candidate defect, extracted from said delayed inspection image signal,

ii) a local reference image signal, corresponding to said local inspection image signal, extracted from said delayed reference image signal and,

iii) a local candidate defect image signal extracted from said delayed candidate defect image signal,

said storing occurring in accordance with respective writing addresses generated by said defect designation point signal;

checking whether said candidate defect exists on a line circuit pattern of said circuit pattern or an areal circuit pattern of said circuit pattern by using at least two of, i) said local inspection image signal, ii) said local reference image signal and iii) said local candidate defect image signal, said signals being selectively read out of said local image memory in accordance with respective addresses generated by said defect designation point signal;

extracting at least one of a pinhole defect, an intrusion defect and an extrusion defect for said line circuit pattern by examining whether said candidate defect exists on said line circuit pattern by processing a first partial image signal corresponding to a portion of said line circuit pattern, set within a first window including said local inspection image signal, said local candidate defect image signal or said local reference image signal;

detecting whether each of said pinhole defect, said intrusion defect and said extrusion defect detected on said line circuit pattern is a defect harmful to electrical conductivity of said line circuit pattern by comparing each of said pinhole defect, said intrusion defect and said extrusion defect with each of first standard references;

extracting at least one of said pinhole defect, said intrusion defect and said extrusion defect for said areal circuit pattern by examining whether said candidate defect exists on said areal circuit pattern, by processing a second partial image signal corresponding to a portion of said areal circuit pattern, set within a second window including said local inspection image signal, said local candidate defect image signal or said local reference image signal; and

detecting whether each of said pinhole defect, intrusion defect and extrusion defect detected on said areal circuit pattern is a defect harmful to electrical conductivity of said areal circuit pattern by comparing each of said pinhole defect, said intrusion defect and said extrusion defect with each of second standard references being different from each of said first standard references.

5,146,510

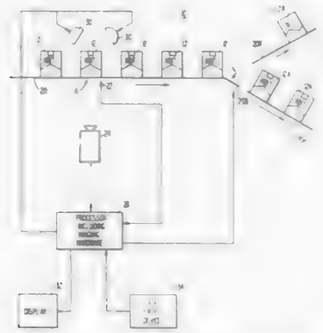
METHODS AND APPARATUS FOR OPTICALLY DETERMINING THE ACCEPTABILITY OF PRODUCTS

Kenneth A. Cox; Henry M. Dante, and Robert J. Maher, all of Midlothian, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 308,739, Feb. 9, 1989, Pat. No. 5,046,111. This application Feb. 27, 1991, Ser. No. 661,809

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—8 **44 Claims**



1. The method of determining the acceptability of the appearance of each of a plurality of objects comprising the steps of:

forming an image of each of a first subplurality of said objects;

combining the images of said first subplurality to produce an initial discriminant function;

forming an image of each of a second subplurality of said objects;

using said initial discriminant function to process each of the images of said second subplurality in order to produce a processed value for each of said images from said second subplurality which is indicative of how similar said image from said second subplurality is to said initial discriminant function;

selecting first processed value thresholds between which a first majority of said processed values fall;

selecting second processed value thresholds between which a second majority of said processes values fall, said second majority being larger than said first majority;

forming an image of each of a third subplurality of said objects;

using selected images of said third subplurality to progressively refine said discriminant function by (1) using said discriminant function to process each successive image from said third subplurality in order to produce a processed value for said image from said third subplurality, (2) determining whether said processed value is substantially between said second value thresholds, and (a) if not, discarding said image from said third subplurality and skipping step (3) below, or (b) if so, determining whether said processed value is substantially between first processed value thresholds, and (i) if so, continuing with step (3) below, or (ii) if not, discarding said image from said third subplurality and skipping step (3) below unless said image from said third subplurality appears acceptable, and (3) modifying said discriminant function in accordance with said image from said third subplurality;

forming an image of each of a fourth subplurality of said objects; and

using the refined discriminant function to determine whether or not each of the images of said fourth subplurality has an acceptable appearance.

5,146,511

IMAGE PROCESSING METHOD AND APPARATUS THEREFOR

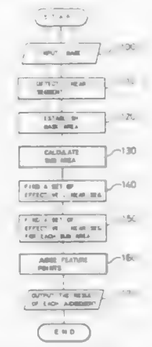
Akihiko Shirasaki, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Apr. 30, 1991, Ser. No. 693,504

Claims priority, application Japan, May 9, 1990, 2-119066

Int. Cl.[5] G06K *9/46*

U.S. Cl. 382—19 **16 Claims**



1. An image processing apparatus for finding and classifying feature points existing in a linework image, said feature points being points having a plurality of branches and end points of said linework image, comprising:

(a) linear segment detecting means for detecting linear segments representing core parts of said linework image by thinning processing, to thereby producing vector data representing said linear segments;

(b) mask area establishment means for establishing mask areas for respective end points of said linear segments identified by said vector data;

(c) sum area production means for producing a sum area of said mask areas overlapping with each other;

(d) set finding means for, with respect to each of said sum areas, finding a set of effective linear segments which have only one end point within each of said sum areas; and

(e) feature point classifying means for classifying said feature points in each of said sum areas according to the number of elements of said set.

5,146,512

METHOD AND APPARATUS FOR UTILIZING MULTIPLE DATA FIELDS FOR CHARACTER RECOGNITION

William E. Weideman, Arlington, Tex., and Carl G. O'Connor, Arlington, Va., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Feb. 14, 1991, Ser. No. 655,085

Int. Cl.[5] G06K *9/62*

U.S. Cl. 382—30 **8 Claims**

1. A system for recognizing numerical characters of a numerical field of numerical characters which appears in both numerical characters and words on a document comprising:

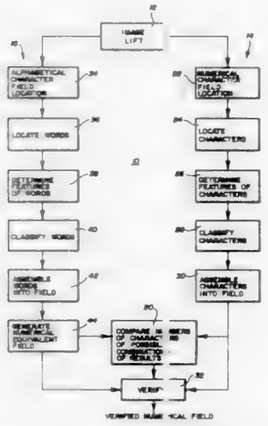
image capture means for capturing the image of the document;

first recognition means connected to said image capture means for recognizing each of the numerical characters of the numerical field and for generating a first set of recognition signals representing each of the numerical characters and including:

means for storing feature sets representative of known numerical characters to form a reference data set;

means for storing an image containing a plurality of unknown numerical characters;

means for scanning said image containing said plurality of unknown numerical characters;
means for segmenting said plurality of unknown numerical characters contained in said image;
means for forming feature sets representative of each of said segmented unknown numerical characters; and
means for comparing said reference data set with said feature sets of each of said segmented unknown numerical characters;



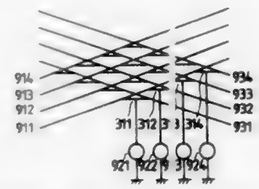
second recognition means connected to said image capture means for recognizing the words representing the numerical characters and for generating a second set of recognition signals; and
means connected to said first and second recognition means for comparing said first and second sets of recognition signals to determine if each of said recognition signals of said first set of recognition signals is correct.

5,146,513

SEMICONDUCTOR OPTICAL DEVICE AND ARRAY OF THE SAME

Hiroaki Inoue, Saitama; Kazuhisa Uomi, Hachioji, and Koji Ishida, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 464,192 Jan. 12, 1990, Pat. No. 5,044,745. This application Apr. 1[illegible], 1991, Ser. No. 684,378
Claims priority, application Japan, Jan. 30, 1989, 1-17604
Int. Cl.[5] G02B *6/02*
U.S. Cl. 385—13 **16 Claims**



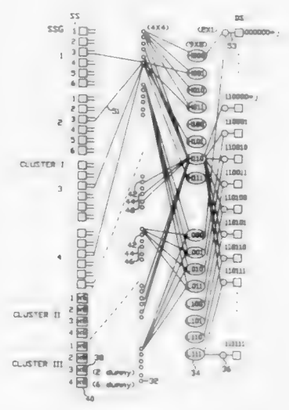
1. A semiconductor optical device array including means for changing a propagation direction of light waves comprising:
a plurality of input waveguides for receiving input light waves and a plurality of output waveguides for providing output light waves;
a plurality of switching function portions respectively disposed at intersections of said input and output waveguides; and a plurality of light wave amplifying means provided in said switching function portions to compensate for losses in the switching function portions so that said output waves have substantially the same amplitude or a greater amplitude than said input light wave, respectively.

5,146,514

EFFICIENT SINGLE-HOP DIRECTIONAL MULTICHANNEL SYSTEM

Yitzhak Birk, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1991, Ser. No. 769,988
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—24 **32 Claims**



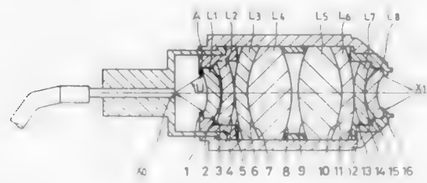
1. A shared directional multichannel system for scheduled uniform traffic of up to k concurrent transmissions from m source stations to n destination stations, each said destination station including one receiver input, each said source station including p transmitter outputs and all said source stations being partitioned into at least one source station group such that no more than one said source station group contains less than k source stations, wherein k, m, n and p are positive nonzero integers and $m \geq k = (\lceil \log_p n \rceil$ choose $(p-1))$, the system comprising:
a first stage including at least (p*k) first directional couplers, each said first directional coupler having $\lceil n/p \rceil$ outputs and no more $\lceil m/k \rceil$ inputs, all said inputs of each said first directional coupler being connected to transmitter outputs from a respective source station group;
a second stage including n second directional couplers, each said second directional coupler having at least k inputs and one output, said output being connected to a destination station receiver input; and
interconnection means for coupling said first stage to said second stage by connecting said first directional coupler outputs to said second directional coupler inputs in a manner such that the l^{th} transmitter output of the i^{th} source station within each said source station group is connected to the receiver input of the j^{th} destination station, where the modulo p sum of the digits of (j modulo p) in positions corresponding to unit digit positions in (i radix 2) is equal to $(l-1)$.

5,146,515

STRUCTURE OF LENS COMBINATION FOR OPTICAL FIBER FINE DISPLACEMENT DETECTING SYSTEM

Zu-Wen Chao, and Jinn T. Wu, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Nov. 8, 1990, Ser. No. 610,682
Int. Cl.[5] G02B *6/32*
U.S. Cl. 385—35 **6 Claims**



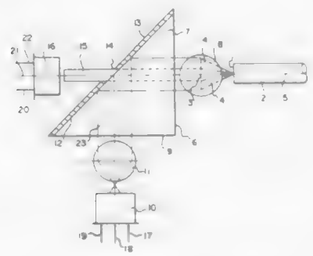
1. An apparatus for use with an optical fiber fine displacement detecting system having a detecting head, the apparatus comprising:
focusing means, disposed a first predetermined distance from the detecting head, for first focusing light rays emitting from the detecting head to form a real image of the detecting head at a second predetermined distance from the detecting head, the real image being formed to enable the detecting head to be positioned at a third distance from an object being examined by the optical fiber fine displacement detecting system, and for second focusing a portion of the light rays which are reflected by the object positioned at the third predetermined distance from the detecting head onto the detecting head; and
housing means, adaptable to be attached to the detecting head, for positioning the focusing means at the first predetermined distance away from the detecting head.

5,146,516

OPTOELECTRICAL SENDING AND RECEIVING APPARATUS

Thomas Blümke, Bohrenbach, and Jürgen Röckle, Krichheim, both of Fed. Rep. of Germany, assignors to Richard Hirschmann GmbH & Co., Fed. Rep. of Germany

Filed Jul. 30, 1990, Ser. No. 559,969
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3925128
Int. Cl.[5] G02B *6/34*
U.S. Cl. 385—36 **35 Claims**



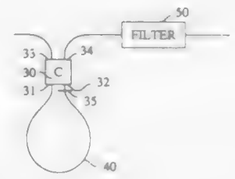
20. A beam wave guide optoelectrical sender/receiver apparatus comprising:
an optical prism exhibiting a reflecting surface arranged on a hypotenuse of said prism, said reflecting surface defining a non-reflecting aperture;
an optoelectrical receiver aligned with said non-reflecting aperture;
an optoelectric sender facing said reflecting surface;
wherein said prism, said sender and said receiver are configured and positioned so that a first beam path is established from an optical port through said prism and said aperture to said optoelectric receiver and a second beam path is established by said reflecting surface from said optoelectric sender through said prism to said optical port.

5,146,517

LOW DISTORTION ALL-OPTICAL THRESHOLD DEVICE

Hercules Avramopoulos, Red Bank, N.J.; Paul M. William French, Essex, England; M. Christina Gabriel, Middletown, and Norman A. Whitaker, Jr., Atlantic Highlands, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 5, 1991, Ser. No. 726,057
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—39 **25 Claims**



1. An optical digital noise reducer comprising:
an arrangement having a first pair of ports and a second pair of ports, where an input signal applied to one port of said first pair develops an output signal at both ports of said second pair, which arrangement is unbalanced in that an input signal applied to a port of a first pair develops output signals at the ports of said second pair that are not of equal magnitude;
a non-linear optical signal path connected between one port of said second pair of ports and the other port of said second pair of ports for communicating signals between said one port and said other port of said second pair of ports, to form thereby a transmission path between the ports of said first pair of ports that possesses a sigmoid transfer function which has a first saturation region at low input signal levels, followed by a nearly linear region at intermediate input signal levels, and still followed by a second saturation region at higher input signal levels, where a saturation region is a region where the ratio of changes in output signal over corresponding changes in input signal is substantially smaller than the ratio of changes in output signal over corresponding changes in input signal in the nearly linear region, and
means for applying two-level input signals where, in the absence of noise, one level of said input signal is at said first region and the other level of said input signal is at said second region.

5,146,518

OPTICAL DIRECTIONAL COUPLER DEVICE AND A METHOD OF DRIVING SAME

Hon-Ming Mak, and Hisaharu Yanagawa, both of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1991, Ser. No. 674,567
Claims priority, application Japan, Mar. 30, 1990, 2-83337; Nov. 19, 1990, 2-313057
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—41 **6 Claims**

1. A directional coupler type optical functional device having first and second optical waveguides in which pn junction structures are formed by laminating semiconductor material,

and a coupling portion in which said two optical waveguides are evanescent-coupled to each other and arranged in parallel, comprising:

voltage application electrodes formed on an upstream side portion of said first optical waveguide and a downstream side portion of said second optical waveguide in said coupling portion;

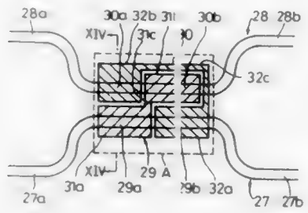
said voltage application electrodes being electrically connected to each other;

current injection electrodes formed on a downstream side portion of said first optical waveguide and an upstream side portion of said second optical waveguide in said coupling portion; and

said current injection electrodes being electrically connected to each other and electrically isolated from said voltage application electrodes.

3. A method for driving a directional coupler type optical functional device having first and second optical waveguides in which pn junction structures are formed by laminating semiconductor material, and a coupling portion in which said optical waveguides are evanescent-coupled to each other and arranged in parallel, wherein:

voltage application electrodes are formed on an upstream side portion of said first optical waveguide and a downstream side portion of said second optical waveguide in said coupling portion;



said voltage application electrodes being electrically connected to each other;

current injection electrodes are formed on a downstream side portion of said first optical waveguide and an upstream side portion of said second optical waveguide in said coupling portion; and

said current injection electrodes being electrically connected to each other and electrically isolated from said voltage application electrodes;

the method comprising:

causing incident light including TE mode light and TM mode light to enter one of said first and second optical waveguides;

injecting current of a predetermined value into said optical waveguides via said current injection electrodes to establish a cross state between said optical waveguides in said coupling portion; and

applying a present voltage to said voltage application electrodes while maintaining said cross state so as to establish a through state only for the TE mode light between said optical waveguides in said coupling portion, thereby splitting the incident light into the TE mode light and the TM mode light.

5,146,519

ROTARY VARIABLE OPTICAL TAP

William J. Miller, Corning, and Alan J. Morrow, Elmira, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,828
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—43 6 Claims

4. A rotary variable optical tap comprising:

at least two waveguides each comprising a core of a predetermined refractive index and a cladding surrounding said core and having a lower refractive index than said core;

an overcladding, having a lower refractive index than said cladding, surrounding said waveguides;

said waveguides being tapered toward a narrowed region such that their core separation is reduced;

means for maintaining said waveguides in a bent state within the narrowed region; and

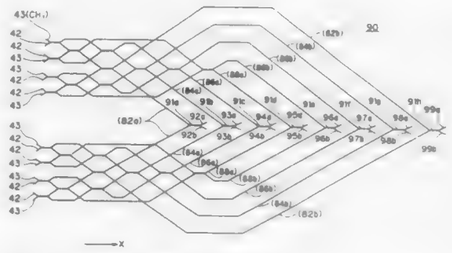
means for rotating said overcladding in said bent state to vary the degree of light coupling between said waveguides.

5,146,520

OPTICAL COUPLER AND METHOD OF PRODUCING THE SAME

Hayato Yuuki, Suzuka, and Takeharu Ito, Yokkaichi, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Jan. 16, 1991, Ser. No. 642,266
Claims priority, application Japan, Jan. 26, 1990, 2-17554; May 21, 1990, 2-131962; May 28, 1990, 2-137964; Aug. 6, 1990, 2-208345
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—45 15 Claims



15. An optical coupler, comprising:

a first and a second optical coupler each of which has 2^n ($n \geq 1$) input fiber branches and 2^n output fiber branches, said input fiber branches serving as an input port, said output fiber branches serving as an output port; and

a plurality of bonding portions at which two cores of said all plastic fibers are bonded with each other,

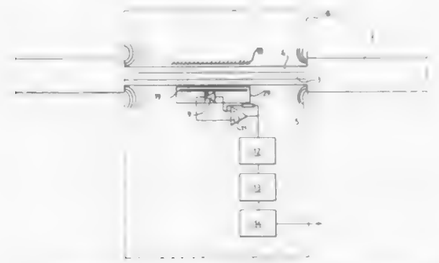
wherein said output fiber branches of said first optical coupler are fused to said output fiber branches of said second optical coupler along opposing sides thereof with a one-to-one correspondence by applying ultrasonic vibration to said bonding portions in a direction perpendicular to a direction of elongation of said fibers, whereby said bonding portions are formed.

5,146,521

OPTICAL FIBRE COMMUNICATION NETWORK

Arthur H. Hartog, Southampton, England, assignor to York Limited, United Kingdom

Filed Jun. 10, 1991, Ser. No. 713,122
Claims priority, application United Kingdom, Jun. 18, 1990, 9013578
Int. Cl.[5] G02B 6/26; H04J 1/00; H01J 5/16
U.S. Cl. 385—48 10 Claims



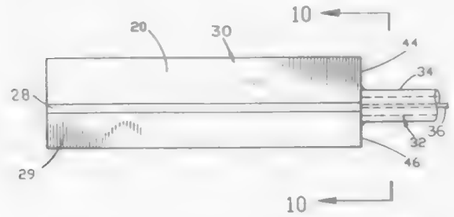
1. An optical fibre communication network comprising one optical source connected to one end of an optical fibre, and several optical receivers for detecting light scattered to the side of the optical fibre, the network being characterised by the fact that each optical receiver is sufficiently sensitive to require for reliable communication only light lost by the fundamental scattering of the optical fibre during normal propagation of the light originating in said optical source whilst travelling in the vicinity of the optical receiver whereby the network is free of means inducing excess loss in the optical fibre for the purpose of enabling the optical receivers to detect the light scattered to the side of the optical fibre.

5,146,522

METHODS FOR RUGGED ATTACHMENT OF FIBERS TO INTEGRATED OPTICS CHIPS AND PRODUCT THEREOF

George A. Pavlath, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Continuation of Ser. No. 579,302, Sep. 7, 1990, abandoned, which is a division of Ser. No. 310,336, Feb. 13, 1989, Pat. No. 4,976,506. This application Jun. 18, 1991, Ser. No. 719,085
Int. Cl.[5] G02B 6/30
U.S. Cl. 385—49 45 Claims



1. A method for attachment of a jacketed optical fiber to an integrated optics chip comprising:

(a) attaching a first surface of a first plate to a first surface of a substrate of said chip having a light conduit thereon ending at an end face thereof so that an end face of said first plate extends substantially to said end face of said chip, said chip having a thickness less than the diameter of said jacketed fiber;

(b) attaching a first surface of a second plate to a second surface of said chip, an end face of said second plate extending substantially to said end face of said chip;

(c) positioning an end face of said jacketed fiber adjacent to said end face of said chip so that said fiber can properly transmit light to and receive light from said conduit; and

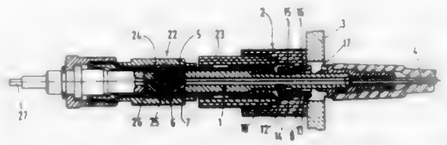
(d) attaching the jacket of said jacketed optical fiber at said end face of said fiber to said end faces of said first and second plates at a plurality of locations.

5,146,523

ALVEOLAR CONNECTOR COMPRISING AT LEAST ONE CONNECTION DEVICE FOR FIBER OPTICS

Gérard Maillot, Neuilly Plaisance, France, assignor to Radiall, Rosny-Sous-Bois, France

Filed Sep. 27, 1991, Ser. No. 767,275
Claims priority, application France, Sep. 28, 1990, 90 12012
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—60 9 Claims



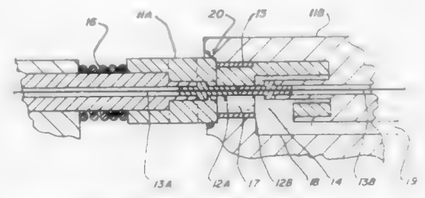
1. Alveolar connector, comprising a male connector element and a female connector element, having parts provided with aligned sockets suitable for receiving at least one connection device for fiber optics formed of a male contact and a female contact working together, each of which can be engaged in a socket of one of the connector elements, with one of the said contacts being installed fixed in its socket, while the other can move axially in its socket, between a disconnection position and a connection position of the connection device for fiber optics, characterized by the fact that it comprises a ring (8; 8', 8''; 8''') surrounding the said movable contact (1), installed and immobilized axially in the socket, the said movable contact and the said ring comprising conical and/or cylindrical contact areas on their opposite surfaces, arranged and disposed in such a manner than in the said disconnection position, and preferably also during a part of the course of displacement of the movable contact during the course of the connection and disconnection phases, at least one contact area (12, 13; 32, 34; 32) of the said ring essentially rests against a contact area (16, 17; 33, 35; 33) of the movable optic contact, and that in the said connection position, the said contact areas of the said ring and the said movable contact are separated from each other.

5,146,524

FIBRE OPTIC CONNECTOR

Arne Berg, Vipev. 10, N-7082 Kattem, Norway

Filed Aug. 26, 1991, Ser. No. 749,711
Claims priority, application Norway, Mar. 3, 1989, 890905; PCT Int'l Appl., Jan. 16, 1990, PCT/NO90/00012
Int. Cl.[5] G02B 6/38
U.S. Cl. 385—75 7 Claims



1. A fibre optic connecting device comprising two cooperating connector parts, each having a protective housing (1*a*, 1*b*, 11*a*, 11*b*) and at least one ferrule (2*a*, 2*b*, 12*a*, 12*b*) for a corre-

sponding end of an optical fibre (3*a*, 3*b*, 13*a*, 13*b*), where a centring unit (5, 15) serves to guide the ferrules to make accurate connections, and where each part of the connector is filled by a filling agent (4, 14) to protect vital, sensitive components, characterized by the filling agent (4, 14) consisting of a material that is insoluble in water, and is a greasy or visco-elastic substance capable of withstanding shear forces when the connector is disconnected giving it a stable, free surface towards the surroundings, and that during connection or disconnection the relative movements of the parts of the connector (1*a*, 1*b*, 11*a*, 11*b*) and/or components (2*a*, 2*b*, 12*a*, 12*b*) in said parts are arranged so as to cause a pumping action that during connection presses some of said agent (4, 14) away from the area around the fibre ends inwards in one or both parts of the connector, and during disconnection draws the agent that has been pressed away, back towards the area around the fibre ends, so as to provide the required protection while being in a disconnected state.

5,146,525

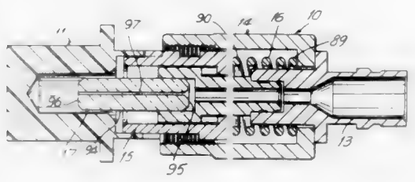
FIBER OPTIC PLUG CONNECTOR HAVING OPTICAL CENTER ADJUSTMENT MEANS

Peter P. Tabone, Kings Park, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 3, 1991, Ser. No. 754,071

Int. Cl.[5] G02B 6/36

U.S. Cl. 385—78 2 Claims



1. A fiber optic plug connector having means for rotationally adjusting a terminated optical fiber about its own axis with respect to the axis of the connector, said connector comprising: a front body element, a rear body element attached to said front body element in coaxial relation, a threaded coupling nut surrounding and engaging said interconnected front and rear body elements, and providing means for securing said plug connector to an adapter; said front body element having at least one rearwardly extending projection; said rear body element having means for engaging a fiber optic cable; said front body element having a bore and a fiber supporting ferrule engaged within said bore; a key body surrounding said front body element and having a plurality of slots selectively engaging said rearwardly extending projections on said front body element; resilient means interconnecting said key body and said coupling nut serving to maintain engagement of said projections within said slots; said key body having a forwardly-extending key for engaging said adapter in predetermined relative rotational position; and an adjusting tool selectively engaging said key body to move said key body axially against said resilient means and rotate the same to selectively permit engagement of said slots with said rearwardly-extending projections; whereby when said plug connector is engaged within said adapter, the rotational position of said ferrule is established relative to the ferrule of a mating plug connector.

5,146,526

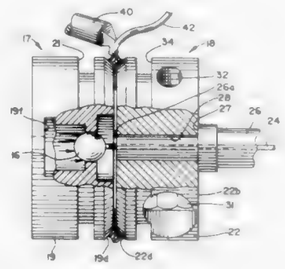
LASER PIGTAIL ASSEMBLY AND METHOD

Kevin L. Sweeney, Naperville, and Michael R. Keur, Des Plaines, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 12, 1991, Ser. No. 685,222

Int. Cl.[5] G02B 6/36

U.S. Cl. 385—90 21 Claims



1. Apparatus, comprising:

a. a first metal member carrying a diode pumped solid-state laser and an optical focusing element for said laser, having a generally flat end through which laser light is emitted from said focusing element, having a side wall adjacent to said flat end, and having a peripheral edge which is located between said side wall and said flat end;

b. a second metal member which is spaced apart from said first metal member, which has mating end which carries an optical fiber pigtail having a receiving end which is aligned to receive said laser light from said focusing element, which has a side wall adjacent to said mating end, and which has a peripheral edge which is located between said side wall and said mating end, said receiving end of said optical fiber pigtail and said optical focusing element defining a gap; and

c. solder joining means, substantially carried by said peripheral edge of said first member and said peripheral edge of said second member, for joining together said first metal member and said second metal member.

5,146,527

OPTICAL FIBRE SPLICE

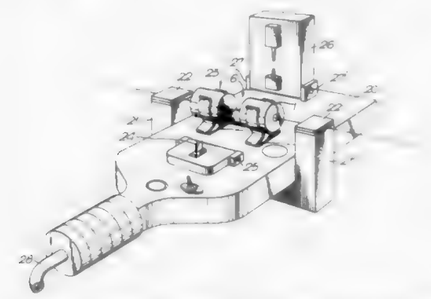
Stephen R. Mallinson, Ipswich, England, assignor to British Telecommunications public limited company, London, England

Filed Sep. 1, 1989, Ser. No. 401,406

Claims priority, application United Kingdom, Sep. 1, 1988, 8820662

Int. Cl.[5] G02B 6/38

U.S. Cl. 385—98 22 Claims



7. Fusion splicing apparatus for forming low loss splices between single mode fibre ends, said apparatus comprising:

a one-piece ferrule having a central bore therethrough, said ferrule including an aperture in a ferrule wall which communicates with said bore;

said bore being sized to allow said fibre ends to be aligned one with the other when inserted into opposite ends of the bore; and

a fuser for applying thermal energy to the fibre ends via said aperture for fusing the fibre ends together therewithin and leaving the ferrule disposed about the fused fibre to form a permanent protective sheath.

5,146,528

CABLE FOR CONDUCTING SIMULTANEOUSLY ELECTRICITY AND LIGHT

Günter Gleim, and Siegfried Quandt, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

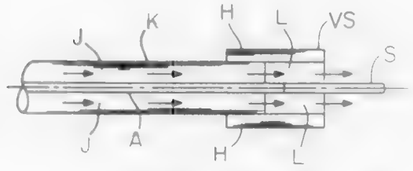
PCT No. PCT/EP88/01143, § 371 Date Jun. 18, 1990, § 102(e) Date Jun. 18, 1990, PCT Pub. No. WO89/05988, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 12, 1988, Ser. No. 499,258

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744125

Int. Cl.[5] G02B 6/44

U.S. Cl. 385—101 8 Claims



1. A cable for conducting simultaneously electricity and light, comprising: at least one electrically conducting core; and at least one layer of insulation surrounding said core; said layer of insulation being comprised of optically conductive material for conducting light therethrough, so that electrical signals can be conducted through said core simultaneously with light signals through said insulation layer; a connector secured to at least one end of said cable and resting against said optically conductive insulation layer for producing an optical coupling; said connector having a portion resting against said insulation layer, said portion being transparent and comprised of optically conductive material or producing an optical transmission channel; said insulation layer being a cylindrically-shaped glass filament having an inside surface, said core being fused to said inside surface; said insulation layer comprising at least two sub-layers; at least one optically insulating intermediate layer between said two sub-layers, said sub-layers being optically conductive.

5,146,529

METHOD OF FORMING AN OPTICAL FIBER UNIT

Akihiko Mizutani, Yokohama, Japan, assignor to Sumitomo Electronic Industries Ltd., Osaka, Japan

Continuation of Ser. No. 543,540, Jun. 26, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 740,660

Claims priority, application Japan, Jun. 26, 1989, 1-163341; Apr. 27, 1990, 2-114255

Int. Cl.[5] G02B 6/44

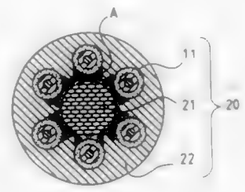
U.S. Cl. 385—103 5 Claims

1. A method of forming an optical fiber unit, said method comprising the steps of:

mixing an optimized concentration of pigments into a resin covering layer for a coated optical fiber, the concentration of pigments mixed into said resin covering layer being in a range of from 0.01 to 1.40 by weight,;

applying said resin covering layer to a plurality of coated optical fibers, each of said plurality of coated optical fibers being colored differently by the resin covering layer;

arranging said plurality of coated optical fibers around an inner tensile member;



applying an ultraviolet curable resin about the arrangement of the plurality of coated optical fibers and said tensile member; and

passing ultraviolet light through said plurality of coated optical fibers and thus curing said ultraviolet curable resin by irradiating it with said ultraviolet light.

5,146,530

Patent Not Issued For This Number

5,146,531

ULTRAVIOLET RADIATION-CURABLE COATINGS FOR OPTICAL FIBERS AND OPTICAL FIBERS COATED THEREWITH

Paul J. Shustack, West Chester, Ohio, assignor to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 350,239, May 11, 1989, abandoned. This application Aug. 8, 1991, Ser. No. 742,531
Int. Cl.[5] G02B *6/16*
U.S. Cl. 385—128 **86 Claims**

30. A coated optical fiber comprising an optical fiber, a primary coating layer and a secondary coating layer,

wherein said primary coating layer comprises

(A) from about 20 percent to about 80 percent by weight, based upon total weight of (A), (B), (C), (D) and (E), of an acrylated urethane oligomer which is the reaction product of (i) a hydrocarbon polyol, the hydrocarbon portion of which is from about 600 to 4,000 molecular weight; (ii) an aliphatic polyisocyanate; and (iii) an endcapping monomer selected from the group consisting of hydroxyalkylacrylate and hydroxyalkylmethacrylate;

(B) from about 5 percent to about 50 percent by weight, of an alkyl acrylate or methacrylate monomer having between 6 and 18 carbon atoms in the alkyl moiety;

(C) from about 5 percent to about 60 percent by weight of a monomer or oligomer having (1) an aromatic moiety, (2) a moiety containing available acrylic or methacrylic unsaturation, and (3) a hydrocarbon moiety, which monomer or oligomer is capable of increasing the refractive index of the composition relative to that of a composition containing only (A), (B), (D) and (E);

(D) from about 0.1 percent to about 3.0 percent by weight of an organofunctional silane adhesion promoter; and

(E) from about 1.0 percent to about 10 percent by weight of a photoinitiator,

wherein all of the stated percentages are percentages by weight based on total weight of (A), (B), (C), (D) and (E), and said secondary coating layer comprises

(I) from about 20 percent to about 80 percent by weight of an aliphatic urethane acrylate oligomer based on a polyester;

(II) from about 20 percent to about 60 percent by weight of an acrylated or methacrylated compound selected from the group consisting of isobornyl acrylate; isobornyl methacrylate; C_6 to C_{16} saturated hydrocarbon diol diacrylates; C_6 to C_{16} saturated hydrocarbon diol dimethacrylates; and mixtures thereof; and

(III) from about 1 percent to about 10 percent by weight of a photoinitiator,

wherein all of the above percentages for said secondary coating are percentages by weight based on the total weight of (I), (II), and (III).

5,146,532

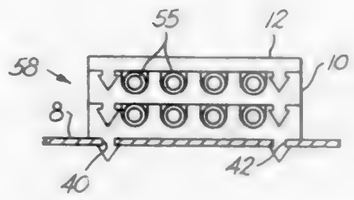
OPTICAL FIBER RETENTION DEVICE

Ronald L. Hodge, Lawrenceville, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Nov. 20, 1990, Ser. No. 616,277
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—136 **15 Claims**

1. An optical fiber retention device for positively locating, retaining, and strain-relieving optical fiber strands, said retention device comprising:

a base member integrally formed of a resilient material and including a substantially strip-shaped support section



having one or more generally U-shaped support channels;

a cover member integrally formed of a resilient material and having a substantially strip-shaped covering section; and

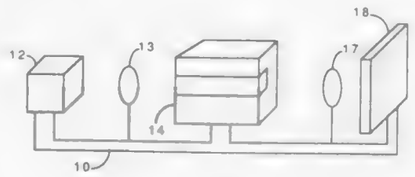
means for resiliently locking said cover member to said base member such that the optical fiber strands are positively located by said channels, and retained and strain-relieved by said cover member, wherein said means for resiliently locking said cover member to said base member are integrally formed in at least one of said cover member and said base member.

5,146,533

ION EXCHANGED CRYSTALLINE WAVEGUIDES AND PROCESSES FOR THEIR PREPARATION

John D. Bierlein; August Ferretti, both of Wilmington, and Mark G. Roelofs, Hockessin, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1991, Ser. No. 738,775
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—141 **16 Claims**



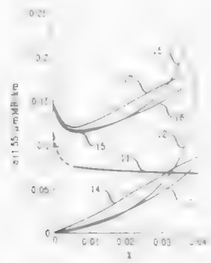
1. An optical waveguide comprising: a $K_{1-x}Rb_xTiOMO_4$ single crystal substrate, wherein x is from 0 to 1 and M is P or As, having at least one optically smooth surface wherein sufficient K^+, Rb^+ or both K^+ and Rb^+ have been replaced by (i) ions selected from the group consisting of H^+ and NH_4^+ and, optionally, (ii) ions selected from the group consisting of Rb^{30}, Cs^+, Tl^+, Ba^{+2}, Sr^{+2}, Ca^{+2} and Pb^{+2}, to change the surface index of refraction at least about 0.00025 with respect to the index of refraction of the single crystal substrate.

5,146,534

SiO_2-BASED ALKALI-DOPED OPTICAL FIBER

Malcolm E. Lines, Millington, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 12, 1991, Ser. No. 790,836
Int. Cl.[5] G02B *6/16*
U.S. Cl. 385—142 **8 Claims**



1. A silica-based fiber that is a single mode fiber at a predetermined operating wavelength, the fiber comprising a core and a cladding contactingly surrounding the core, the core comprising at least 0.8 mole fraction SiO_2, CHARACTERIZED IN THAT

a) the core further comprises x mole fraction M_2O, where M is selected from the group consisting of Na, K, Rb and combinations thereof, and $0 < x \lesssim 0.07$; and

b) associated with the core is an intrinsic loss at the operating wavelength that is lower than the intrinsic loss associated with the core of an otherwise identical comparison fiber whose core is essentially M-free.

5,146,535

LIGHT-TRANSMITTING FIBER

Hisao Anzai, Otake; Isao Sasaki, Saeki; Kozi Nishida, Toyama; Hideaki Makino, Otake; Masami Ohtani, Kuga, and Katsuhiko Shimada, Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Division of Ser. No. 398,976, Aug. 28, 1989, Pat. No. 5,023,302. This application Apr. 15, 1991, Ser. No. 685,208
Claims priority, application Japan, Aug. 30, 1988, 63-215774
Int. Cl.[5] G02B *6/16*
U.S. Cl. 385—143 **7 Claims**

1. A light-transmitting fiber comprising a polymer as a core component and a polymer having a refractive index smaller than that of the core component as a sheath component, wherein the core component is a methacrylimide group-containing polymer prepared by a process comprising polymerizing methacrylic acid, a methacrylic acid ester, or a monomer mixture predominantly comprised of methacrylic acid or an ester thereof in the absence of a chain transfer agent and then reaction the thus-prepared polymer with a compound represented by the following general formula:

$$R—NH_2$$

wherein R stands for H, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 7 to 11 carbon atoms or an aryl group having 6 to 10 carbon atoms,

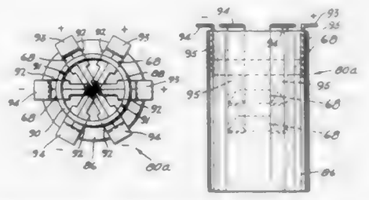
in the presence of a mixed solvent comprising methanol and a solvent having a solubility parameter δ of 8.5 to 13.9 $(cal/cm^3)^{\frac{1}{2}}$.

5,146,536

HIGH TEMPERATURE ELECTRIC AIR HEATER WITH TRANVERSELY MOUNTED PTC RESISTORS

Brooke N. Westover, 1044 Fleming Dr., Pensacola, Fla. 32514

Continuation-in-part of Ser. No. 268,188, Nov. 7, 1988, Pat. No. 5,004,893. This application Mar. 1, 1991, Ser. No. 662,955
Int. Cl.[5] H05B *3/10, 3/78*
U.S. Cl. 392—488 **12 Claims**



1. A high-speed high temperature electrical heater construction, comprising in combination:

a) means constituting an elongate multi-piece hollow pipe having spaced-apart inlet and outlet openings and having a longitudinal axis, the pieces of said pipe extending axially, said hollow pipe having an unobstructed bore defining an elongate air-tunnel,

b) a plurality of elongate PTC resistance members mounted in the air-tunnel of the pipe in axially spaced-apart relation and extending transversely thereof, said PTC resistance members each having intermediate ignitor portions extending diametrically across the unobstructed bore of the hollow pipe and having opposite integral electrical terminal end portions extending through the walls of said pipe, said end portions being adapted for connection to an electrical supply,

c) each of said PTC resistance members being disposed between said inlet and said outlet openings of the pipe,

d) the pieces of said hollow pipe comprising two sleeve-like mutually electrically insulated current supply conductors for said PTC resistance members, said conductors having sets of openings which are axially displaced from each other and which receive said opposite end portions of the PTC resistance members, and

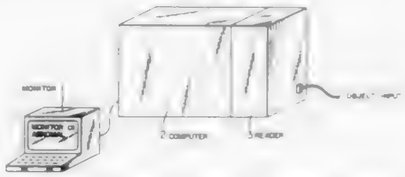
e) means for electrically connecting said opposite end portions of the PTC members to said sleeve-like conductors respectively to be energized thereby.

5,146,537

METHOD FOR JUDGING WHETHER CONDITIONS ARE SATISFIED BY USING A NETWORK HAVING A PLURALITY OF NODES REPRESENTING THE CONDITIONS

Shunichi Tano, Machida; Motohisa Funabashi, Sagamihara; Shoichi Masui, Kawasaki, and Seiji Sakaguchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 883,959, Jul. 10, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 368,958
Claims priority, application Japan, Jul. 12, 1985, 60-152204
Int. Cl.[5] G06F *7/06*
U.S. Cl. 395—1 **8 Claims**



1. In a system in which a plurality of complex conditions for

object data of a plurality of objects each including a data name and at least a pair of an attribute name and attribute data are judged whether said object data satisfy said complex conditions with an aid of a network of a structure having nodes representing respective conditions for said object data, said nodes including an intra node representing an intra condition for an intra comparison between a constant and a data value of a given one of said objects and an inter node representing an inter condition for an inter comparison between data of different ones of said objects, said judging being sequentially performed in a top-down manner, starting from a top point of said network according to a method, performed by a computer, comprising steps of:

converting each of a plurality of conditional clauses of statements describing said conditions for said object data into a plurality of independent subnetworks by using virtual nodes which link conditional clauses related to one another for allowing relevant conditions of said conditions to be handled independent of one another, said virtual nodes storing objects satisfying conditions and objects not satisfying a condition at said inter node;

integrating said subnetworks into a network of said structure; and

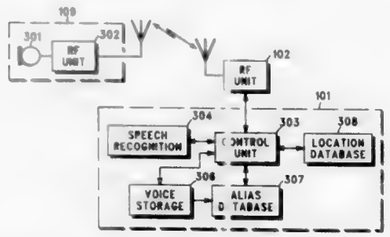
making a judgment to determine whether or not said conditions are satisfied by using said stored objects at said virtual nodes in conformity with an integrated network.

5,146,538

COMMUNICATION SYSTEM AND METHOD WITH VOICE STEERING

Arun Sobti, Wheaton, and Richard A. Comroe, Dundee, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1989, Ser. No. 402,017
Int. Cl.[5] G10L *7/08*; H04M *1/64*
U.S. Cl. 395—2 **14 Claims**



1. A method of facilitate a dispatch communication between a first communication unit and a second communication unit, comprising the steps of:

A) receiving a verbal communication intended for reception by the second communication unit that includes verbal identifying information related to the second communication unit;

B) subsequent to receiving the verbal communication; automatically processing at least part of the verbal communication to allow recognition of the verbal identifying information;

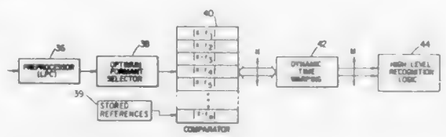
C) automatically providing at least part of the verbal communication to the second communication unit.

5,146,539

METHOD FOR UTILIZING FORMANT FREQUENCIES IN SPEECH RECOGNITION

George R. Doddington, Richardson, Tex.; Yeunung Chen, Chelmsford, Mass., and R. Gary Leonard, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 676,687, Nov. 30, 1984, abandoned.
This application Nov. 8, 1988, Ser. No. 270,427
Int. Cl.[5] G10L *9/02*
U.S. Cl. 395—2 **7 Claims**



1. A method for recognizing speech signals organized into a sequence of frames, said method comprising:

storing a plurality of reference frames of formant frequencies representative of linguistic units providing a vocabulary of words;

generating a plurality of format frequency candidates for each frame of the speech signals desired to be recognized;

creating a plurality of all possible subsets of optimum formant frequencies for each frame based upon the plurality of formant frequency candidates generated for the respective frame, wherein each subset comprises some but not all of the formant frequency candidates generated for that frame;

comparing each subset of the plurality of all possible subsets of optimum formant frequencies for each frame of the speech signals to be recognized with each of the plurality of reference frames of formant frequencies;

selecting one subset from said plurality of all possible subsets of optimum formant frequencies for each frame from said formant frequency candidates which best matches the stored formant frequencies of a corresponding reference frame of formant frequencies in accordance with predetermined criteria; and

recognizing said speech signals in response to the selected one subset of optimum formant frequencies for respective frames.

5,146,540

PROCESSOR ALLOCATION METHOD AND APPARATUS FOR MULTIPROCESSOR EXECUTION OF A CONSTRAINT SATISFACTION SEARCH

Kadathur S. Natarajan, Millwood, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 484,034, Feb. 22, 1990. This application Dec. 30, 1991, Ser. No. 815,634
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—11 **9 Claims**

7. In a multiprocessor data processing system including a plurality of discrete data processing units, a method of solving an instance of a constraint-satisfaction problem with a backtrack search tree, comprising the steps of:

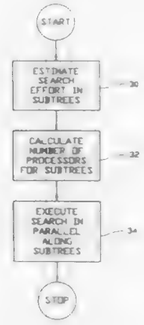
estimating with a control data processor an amount of backtrack search effort required for different subtrees of a backtrack search tree;

allocating with the control data processor one or more of the discrete data processing units to each of the different subtrees of the backtrack search tree, a number of discrete data processing units allocated to each subtree being selected as a function of the estimated amount of backtrack search effort so as to minimize a variance in backtrack search processing time along the different subtrees; and

executing the backtrack search in a parallel manner with the allocated processing units along the different subtrees of the backtrack search tree; wherein the step of allocating includes the steps of:

partitioning the backtrack search tree into N(<M) subspaces, denoted as $T_1, T_2, \ldots T_N$, wherein M is a total number of processing units available for conducting the backtrack search and wherein an estimated size of the subspaces is expressed as Size(T_1), Size(T_2), . . . , Size(T_N), respectively; and

assigning the M processing units to the subspaces in proportion to an estimated amount of effort involved in performing the backtrack search of the subspaces.

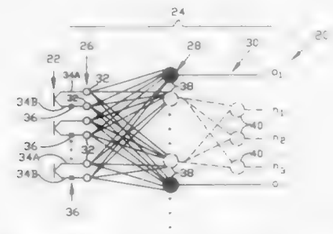


5,146,541

SIGNAL PHASE PATTERN SENSITIVE NEURAL NETWORK SYSTEM AND METHOD

Steven L. Speidel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1989, Ser. No. 368,504
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—21 **10 Claims**



5. A signal phase sensitive neural network system, comprising:

(a) a plurality of means for sensing a signal emanating from an environment of interest;

(b) a first layer means composed of a plurality of processing elements connected to said plurality of sensing means for receiving inputs representative of said sensed signal; and

(c) a second layer means composed of a plurality of processing and learning elements, each of said processing elements of said first layer means being connected to all of said processing and learning elements of said second layer means for fanning out said inputs to all of the processing and learning elements, each of said processing and learning elements being capable of selecting out and learning different segments of the signal in accordance with a predetermined competitive learning rule that partitions the signal into said different segments, said competitive learning rule being a modified Kohonen competitive learning rule in accordance with the expression:

$$W_i^{new} = W_i^{old} + \alpha(x_{ik} - c_{ik}) \quad d_{ik}$$

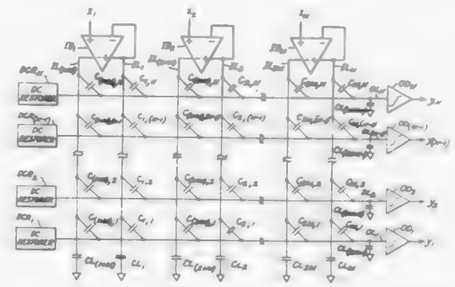
where W_i is the weight plane, expressed as a bi-vector, of the ith PE of layer 2, α is the learning rate, $d_{ik} = x_k \cdot W_i$ the bar denotes normalization, c_{ik} is the projection of x_k onto W_i, normalized to unit length, and the symbol denotes the wedge product.

5,146,542

NEURAL NET USING CAPACITIVE STRUCTURES CONNECTING OUTPUT LINES AND DIFFERENTIALLY DRIVEN INPUT LINE PAIRS

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,839
Int. Cl.[5] G06G *7/12, 7/184*; G06J *1/00*
U.S. Cl. 395—24 **57 Claims**



1. A processor for providing a response to a plurality of input signal voltages, said processor comprising:

an output line on which a weighted summation of said input signal voltages appears;

an amplifier having an input port to which said output line connects and having an output port at which said response is provided;

a plurality, 2M in number, of input lines respectively identified by consecutive ordinal numbers first through $2M^{th}$, M being a positive integer;

a plurality, 2M in number, of capacitive elements, each exhibiting a respective capacitance including at least a respective stray capacitance component, each said capacitive element connecting a respective one of said input lines to said output line, and being identified by the same ordinal number as the input line it connects to said output line;

means for referring said output line to a reference voltage during dc-restoration periods interspersed among times of normal operation;

means for applying voltages associated with zero-valued first through M^{th} input signal voltages to said first through M^{th} input lines during said dc-restoration periods;

means for applying voltages associated with zero-valued first through M^{th} input signal voltages to said $(M+1)^{th}$ through $2M^{th}$ input lines during said dc-restoration periods; and

means for applying M input signal voltages in balanced form each to a respective pair of said input lines, identified by ordinal numbers M apart, so that said input lines in each respective pair simultaneously differ from the respective voltages applied to them during said dc-restoration periods by voltages of the same amplitude and opposite polarity; the difference in the capacitances of the capacitive elements connecting to said output line from said pair of input lines determining the weighting of the input signal

applied in balanced form on that said pair of input lines, as appears in said weighted summation of input signals.

5,146,533

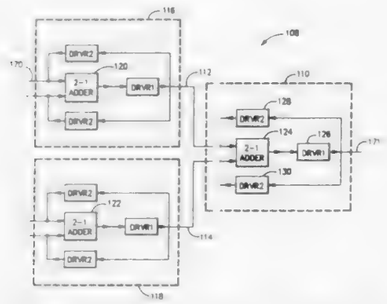
SCALABLE NEURAL ARRAY PROCESSOR

Stamatis Vassiliadis, Vestal, and Gerald G. Pechanek, Endwell, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 526,866, May 22, 1990, Pat. No. 5,065,339. This application Aug. 5, 1991, Ser. No. 740,355

Int. Cl.[5] G06F 15/18

U.S. Cl. 395—27 **1 Claim**



1. A scalable neural array processor comprising a plurality of neurons, each neuron including an input function element, an activity function element, and a device functioning as a communicating adder, including:

state means for defining a compute state and a communications state;

selection means for selecting said compute state or said communications state;

in said compute state said neuron has means responsive to said compute state for operating said input function element and said activity function element to generate a neuron value;

said device functioning as a communicating adder is placed in a compute mode and is responsive to said state means in said compute state; and

in said communication state a neuron has means responsive to said communications state for operating said device functional as a communicating adder for communicating said neuron value to said input function element.

5,146,544

PRINTER CONTROL DEVICE

David R. Altham, 98 Norroy Road, Putney, London, United Kingdom SW15 1PG, and Andrew P. Prince, 10 Shepherd's Bush Place, London, United Kingdom W12 8LX

PCT No. PCT/GB89/00468, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO89/11132, PCT Pub. Date Nov. 16, 1989

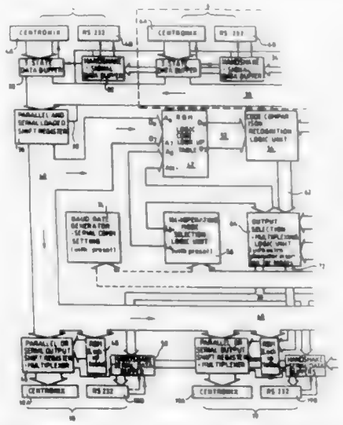
PCT Filed May 3, 1989 Ser. No. 603,683

Claims priority, application United Kingdom, May 3, 1988, 10387

Int. Cl.[5] G06K 15/00

U.S. Cl. 395—115 **22 Claims**

1. A dedicated printer control device (2) comprising at least one input port (2, 4, 6, 8, 10) for receiving text data, a first output port (18) for connection to a printer on which the text data is to be printed, means (24, 60) for designating characters as control codes identifying the beginning and end respectively of a part of the data, which part is to be separately printed, means (42, 54, 80) for recognising the or each control code in the input text data, user operable selection means (64, 80) for selectively directing the identified part of the text data to a second or third printer output port (19, 44) for the said separate printing, and means (66, 64, 80) for modifying the format of the said part of the text data applied to the second or third output port (19, 44), whereby the device (2) is operable automatically to feed all of the text data to be printed, including the said part,



to the first output port for a first printing operation, and the said part to the second or third output ports for a separate, second printing operation.

5,146,545

MEMORY DEVICE FOR A PAGE PRINTER

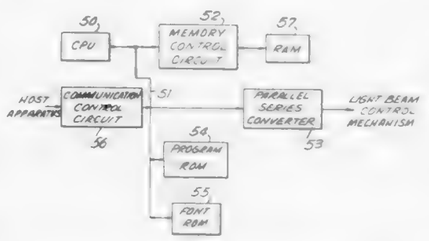
Michio Maruyama, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,931

Claims priority, application Japan, Oct. 17, 1988, 63-260899

Int. Cl.[5] G06K 15/00

U.S. Cl. 395—115 **5 Claims**



1. A memory device utilized with a page printer for storing print data comprising a CPU for processing the print data and producing address data, a left side mask width, right side mask width, a zero shift quantity and a plurality of transfer bytes, font memory means directly coupled to said CPU for storing character pattern data, a one port random access memory for storing an image data and having at least a first memory region and an other memory region therein, and accessing means for receiving said address data, transfer bytes, left mask width, right mask width and zero shift quantity and masking the image data to be written into the first region of said one port random access memory in response thereto.

5,146,546

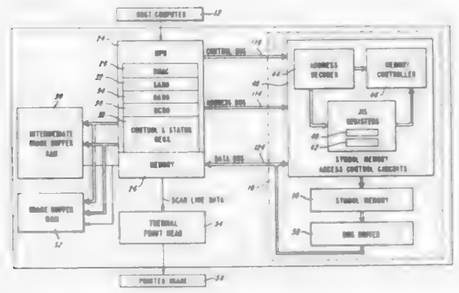
PRINTER WITH HARDWARE SYMBOL DATA ACCESSING SCHEME

Lance D. Neuhard, New Carlisle, and John S. Cetnar, Brookville, both of Ohio, assignors to Monarch Marking Systems, Inc., Miamaisburg, Ohio

Filed Apr. 29, 1991, Ser. No. 692,548

Int. Cl.[5] G06K 15/00

U.S. Cl. 395—115 **27 Claims**



1. A printer for use with a symbol selection device, said printer printing symbols including selected symbols from a standardized set, each symbol in said set having associated coded information identifying said symbol within said set, said coded information being provided by said symbol selection device to select a symbol to be printed, said printer comprising:

means for storing coded information identifying a selected symbol to be printed;

symbol memory means for storing pixel data defining each symbol in said standardized set, each symbol having associated addresses for accessing the pixel data defining the symbol in said symbol memory means, said addresses including a starting address for said symbol;

reconfiguration circuitry for reconfiguring said coded information into said starting address for said selected symbol to be printed;

means for incrementing from said starting address to sequentially generate said addresses subsequent to said starting address for accessing the pixel data for said selected symbol from said symbol memory means;

image buffer means for storing pixel data for a plurality of selected symbols to be printed;

data accessing means for controlling the reading of pixel data from said symbol memory to said image buffer; and

print head means for printing an image of said selected symbols defined by pixel data stored in said image buffer.

5,146,547

PRINTER BUFFER AND RASTERIZATION ARRANGEMENT

James L. Beck, Versailles; James R. Booth, Nicholasville; Carl P. Cole; Lynn M. Oliver, both of Lexington; Warren J. Spina, and Stephen R. Troyer, both of Lexington, all of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Continuation of Ser. No. 399,632, Aug. 28, 1989, abandoned. This application Nov. 7, 1991, Ser. No. 790,101

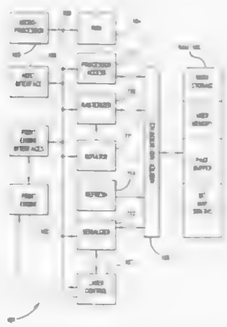
Int. Cl.[5] G06K 15/00

U.S. Cl. 395—116 **6 Claims**

1. A printer comprising:

means for receiving data for an entire page to be printed, the received data being in an order other than that in which the data is to be printed;

means for storing the received data for the page to be printed without indexing in packets of data, the data within each packet being in printing order but the packets themselves not being stored in printing order, a plurality of the packets of data containing unrasterized data; and



means for printing the received data for the page to be printed in printing order by retrieving data from the packets of data, rasterizing unrasterized data, to assemble the data into printing order.

5,146,548

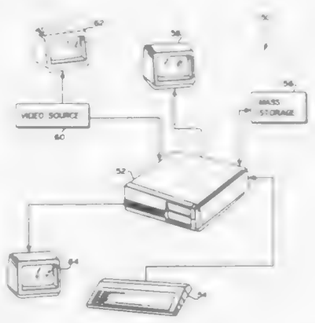
METHOD AND APPARATUS FOR OPTIMIZING AND STORING CONTONE IMAGES FOR SUBSEQUENT HALF-TONING AND MERGING WITH TEXT

Leendert M. Bijnagte, Minneapolis, Minn., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 211,054, Jun. 24, 1988, abandoned. This application Aug. 15, 1990, Ser. No. 569,388

Int. Cl.[5] G06F 3/12, 15/68; H04N 1/387

U.S. Cl. 395—117 **28 Claims**



12. A system for printing text and images comprising:

means for providing an image;

means for providing text corresponding to said image;

means for converting said image to a digital graphic, including:

means for electronically defining a crop area corresponding to an area of said image,

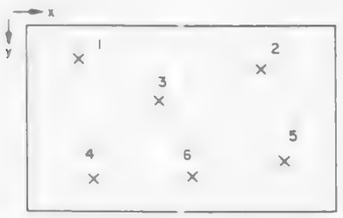
means for converting the portion of said image within said crop area to digital signals representing the density distribution of said image portion, and

means for statistically analyzing said digital signals and shifting the density distribution represented by said digital signals in response to said statistical analysis, said shifting means including means for optimizing said shifted density distribution for a particular half-tone printing process;

storing means coupled to said analyzing means for storing said shifted density digital signals in an image database and

for subsequently retrieving said stored digital signals from said image database;
means connected to said storing means for electronically merging said text with said digital graphic represented by said retrieved shifted density digital signals; and
means connected to said merging means for printing said merged text and graphic using said particular half-tone printing process.

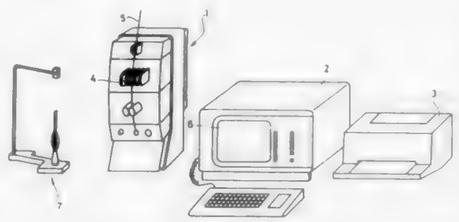
5,146,549
METHOD AND APPARATUS FOR IDENTIFYING A PAIR OF GROUPS IN AN IMAGE HAVING A MINIMUM SEPARATION DISTANCE
Ryohei Kumagai, Tokyo, Japan, assignor to Ezel, Inc., Tokyo, Japan
Continuation of Ser. No. 331,36 , Mar. 31, 1989, abandoned. This application Jun. 4, 1991, Ser. No. 711,493
Claims priority, application Japan, Apr. 11, 1988, 63-88483
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—138 **15 Claims**



1. A method for transforming an original image into a modified image comprising steps of:
generating a first representation of the original image in a frame memory;
generating a second representation of the image in a frame memory, said second representation including indices stored in frame memory locations corresponding to coordinates of centroids of groups in the original image;
generating a table of x- and y-coordinates of centroids of groups in the image, said table organized in order of centroid coordinates;
excluding particular pairs of groups from further processing based on relative locations of coordinates of group centroids in the table;
measuring distances between centroids of non-excluded pairs of groups; and
generating a representation of the original image indicating which pair of groups in the image have the minimum measured distance between centroids.

5,146,550
PROCESS FOR DISPLAYING MEASURING RESULTS IN GRAPHIC FORM IN TEST APPARATUS FOR TESTING TEXTILE GOODS AND APPARATUS FOR CARRYING OUT THE PROCESS
Richard Furter, Zug, and Benno Christen, Winterthur, both of Switzerland, assignors to Zellweger Uster Ltd., Switzerland
Continuation of Ser. No. 52,410, May 21, 1987, abandoned. This application Jul. 17, 1991, Ser. No. 731,266
Claims priority, application Switzerland, May 21, 1986, 02043/86
Int. Cl.[5] G06F *15/46*
U.S. Cl. 395—140 **24 Claims**

13. A test apparatus for testing a roving, yarn or sliver and providing a presentation of information indicating a quality of the tested material, comprising
a sensing head and means for successively running a plurality of samples of the roving, yarn or sliver lengthwise past said sensing head, said sensing head being operative to produce signals indicating values along the length of said samples;
means for analyzing variations caused in said sensing head signals when each of said samples of roving, yarn or sliver moves lengthwise past said sensing head to produce for each individual sample a set of analytical quantities of the same type which is plottable as a graph representative of that individual sample;



memory means for storing said sets of analytical quantities; and
means for presenting in the form of a collective chart, a graph for each of said sets of analytical quantities of the same type, with said graphs being shifted vertically and horizontally relative to one another.

5,146,551
SYSTEM FOR GENERATING A CIRCULAR OR ELLIPTIC ARC ON A DIGITAL DISPLAY
Atsushi Miyazawa, Kawasaki, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 18, 1986, Ser. No. 853,572
Claims priority, application Japan, Apr. 26, 1985, 60-89088
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—142 **20 Claims**

1. A computerized method for automatically generating a desired circular arc on a raster scan digital display having a plurality of pels, each of the pels being designated by two-dimensional coordinates, said method comprising the steps of:
obtaining input information identifying 1) the outline of a figure to be painted on said display comprising said desired arc, 2) the pel positions of the points of intersection between said outline and the display scan lines, and 3) the pairing of said pel positions, said input information including input data representing the two-dimensional coordinates (x_c, y_c) of the center and representing the radius r of said desired arc on said display;
generating digitized image data in the form of a group of two-dimensional coordinates (x_k, y_k), where k=0, 1, 2, etc., said group of coordinates representing a series of pels for defining a digitized imaginary arc corresponding to said desired arc, having said radius r and the center positioned on two-dimensional initial coordinates (0,0), in accordance with the following recurrence formulae,

$$y_{k+1}=y_k+1$$

$$x_{k+1}=x_k-y_{k+1}/x_k$$

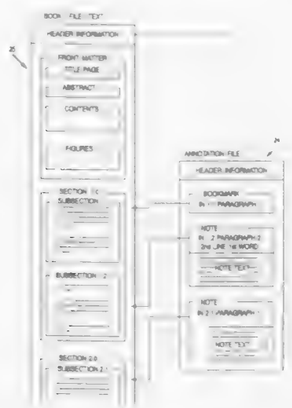
for counterclockwise generation and

$$y_{k+1}=y_k-1$$

$$x_{k+1}=x_k+y_{k+1}/x_k$$

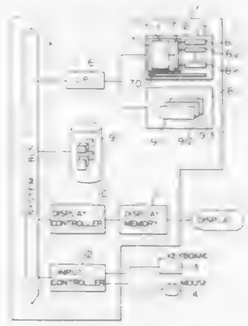
for clockwise generation, where $x_k \neq 0$;
transforming said generated image data by respectively displacing each of said group of coordinates (x_k, y_k) to other coordinates determined by a vector distance between said initial coordinates (0,0) and said input data coordinates (x_c, y_c); and
generating a circular arc on said raster scan digital display by selecting the appropriate pels using the coordinates of said transformed image data whereby said desired arc is generated on said display.

5,146,552
METHOD FOR ASSOCIATING ANNOTATION WITH ELECTRONICALLY PUBLISHED MATERIAL
Elie Cassoria, Croton-on-Hudson, N.Y.; Jacqueline P. de Vries, Mahwah, N.J.; Michael E. Moran, Spring Valley, N.Y.; James J. Slater, Boulder, Colo., and Jay Unger, Mohegan Lake, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 28, 1990, Ser. No. 486,461
Int. Cl.[5] G06F *15/00*
U.S. Cl. 395—145 **29 Claims**



1. A method for creating an annotation associated with a designated portion of an on-line book, comprising the steps:
storing a formatted text stream representing an on-line book in a first memory partition;
storing coordinates of the locations of a plurality of portions of said formatted text stream;
said coordinates of portion locations within said text stream being based upon a hierarchical organization of said portions within said formatted text stream, characterized by at least a first and a second hierarchical variable, said first hierarchical variable identifying a number of headings at a first hierarchical level from a beginning point of said formatted text stream to a particular portion and said second hierarchical variable indicating a number of subsidiary headings from a point designated by said first hierarchical variable to said particular portion;
displaying a designated portion of said formatted text stream;
entering an annotation and storing it in a second memory partition, associated with coordinates for said designated portion of said formatted text stream;
selectively accessing said designated portion of said formatted text stream and identifying said coordinates thereof, and in response thereto selectively accessing said annotation and displaying it proximate to a display location for said designated portion of said formatted text stream.

5,146,553
DOCUMENT EDITING APPARATUS WHICH ACTIVATES APPLICATION PROGRAMS IN RESPONSE TO DOCUMENT DATA INPUT
Yasuhiro Noguchi, Hitachi; Kazuo Takei, Ibaraki; Yukio Funyu, Kitaibaraki; Yosuke Mori, Tokyo, and Isao Yasuda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 15, 1989, Ser. No. 310,650
Claims priority, application Japan, Feb. 19, 1988, 63-35284
Int. Cl.[5] G06F *15/62, 15/40*
U.S. Cl. 395—146 **12 Claims**



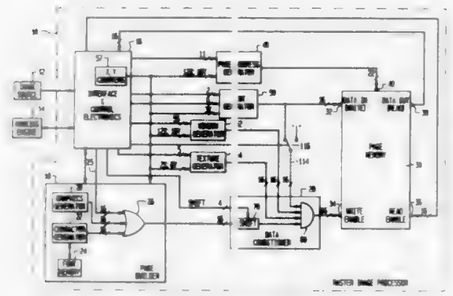
1. A document editing apparatus, comprising:
input means for inputting data, including characters, for a document being edited;
display means for displaying the document being edited;
document file means for storing documents to be edited;
a main memory for storing application programs and a document editing program for performing document inputting, document display and document storage; and
means for executing said document editing program, in response to predetermined data input by said input means at a defined region of the document being edited, by activating an application program corresponding to said inputted predetermined data so that said application program adds a descriptive element, including at least one of characters, graphics and image data stored in said document file means to the document being edited, so that the document is subjected to editing through said document editing program.

5,146,554
PAGE MEMORY CONTROL IN A RASTER IMAGE PROCESSOR EMPLOYED FOR DIGITAL HALFTONING
David J. Statt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 29, 1989, Ser. No. 414,501
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—150 **13 Claims**

1. A raster image processor for processing a continuous tone digital image having pixels with x,y addresses and image tone values representing continuous density levels to produce a halftoned digital image having pixels, comprising:
a. a page memory for storing a binary bit pattern representing the halftoned digital image, the page memory having an x,y address input, a data input, and a write enable input;
b. tint generator means connected to the data input of the page memory and containing a plurality of halftone dot patterns representing a plurality of the density levels, responsive to the tone value to select one of the halftone dot patterns for producing an output word corresponding to a dot within a halftone dot pattern, and applying the output word to the data input of the page memory;
c. character generator means connected to the write enable input of the page memory, responsive to a text character

selected for generating a tint bit mask character having an n×n bit pattern of "1's" at a location in the character corresponding to the x page address and "0's" elsewhere, and for applying the mask character to the write enable input of the page memory;

d. control means, connected to the page memory, the tint generator means and the character generator means, for



receiving the continuous tone digital image, and for each pixel of the continuous tone digital image,

1) sending the x,y address of the pixel to the page memory and selecting the output pixel position,

2) sending the image tone value to the tint generator means and selecting the halftoning dot pattern, and

3) sending the character selected to the character generator and selecting the character.

5,146,555

HIGH SPEED PAGE TURNING CONTROL SYSTEM AND METHOD WITH DISPLAY WINDOW COMPRESSION

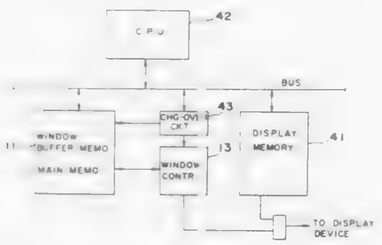
Toshimi Kiyohara, Nara, Japan assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1988, Ser. No. 221,350

Claims priority, application Japan, Jul. 22, 1987, 62-184059

Int. Cl.[5] G06F *3/14, 15/62;* **G09G** *5/14*

U.S. Cl. 395—157 **6 Claims**



1. A high speed page turning control system which comprises:

a window buffer memory for storing image information such as sentences, drawings, tables, etc. to be displayed on a display device;

display priority order setting means for setting priority order of display, between a rectangular region for a turning page and that for a stationary page on said display device;

turning amount calculation means for successively calculating the size of the rectangular region of the turning page to be displayed on said display device;

thinning-out amount calculating means for successively calculating the thinning-out amount of the image information for the turning page according to the size of the rectangular region as calculated by said turning amount calculating means; and

a controller for directly displaying the images for the turning page and stationary page on the display device successively, by controlling reading position of the image information for the turning page and that for the stationary page stored in said window buffer memory, according to the display priority order set by said display priority order setting means, the size of the rectangular region for the turning page as calculated by said turning amount calculating means, and the thinning-out amount for the turning page image information as calculated by said thinning-out amount calculating means.

5,146,556

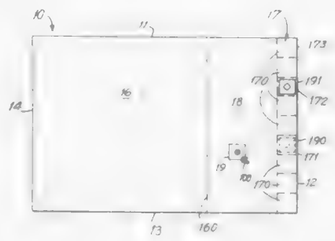
SYSTEM AND METHOD FOR MANAGING GRAPHIC IMAGES

Jean-Marie Hullot, Palo Alto; Steven P. Jobs, Woodside, and Christopher M. Franklin, Saratoga, all of Calif., assignors to NeXT Computer, Inc., Redwood City, Calif.

Continuation of Ser. No. 256,764, Oct. 11, 1988, abandoned. This application Feb. 27, 1991, Ser. No. 660,905

Int. Cl.[5] G06F *15/40*

U.S. Cl. 395—159 **54 Claims**



1. In a computer system having a visual display on which graphic images are capable of being moved and released within boundaries of said display, a graphic image display control system comprising:

means for moving said graphic images within at least a portion of said display within said boundaries;

means for providing a parking region for said graphic images within said boundaries of said display;

means for providing a retention field, distinct from said parking region, within said portion of said display within said boundaries; and

means for automatically transferring one of said graphic images into said parking region when said one of said graphic images is released in said retention field.

5,146,557

USER INTERFACE FOR A GOLF GREEN AND A GOLF PUTT MODELLING SYSTEM

Boris Yamrom, Schenectady, and William E. Lorensen, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

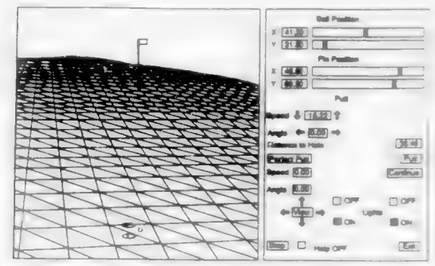
Filed Jul. 27, 1990, Ser. No. 559,879

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—161 **18 Claims**

1. A user interface for facilitating interaction between a system user simulating a natural player and a golf green/golf putt modeling system, said interface comprising a screen for display of a simulated golf green and a window display representing a control panel, said green including a display of a golf ball, a putter head and a cup, pointing means for positioning a virtual camera for viewing the green from different points on the green to present a display of the green from the point of viewing, said control panel including means for performing interactions between the putter head and a golf ball in response to control selections by the system user, including a plurality of

control elements responsive to said control selections by the system user to effect said interaction, said control elements including a first x and y coordinate slider for selecting and changing the position of the golf ball on the green, a second x



and y coordinate slider for selecting and changing the position of the cup on the green and means for placing the virtual camera in a position simulating a position of a natural player so that the ball and the cup are maintained in the field of view whenever a selected position of the ball or cup is changed.

5,146,558

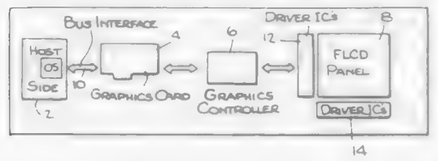
DATA PROCESSING SYSTEM AND APPARATUS

Hiroshi Inoue, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 468,605

Int. Cl.[5] G06K *15/00*

U.S. Cl. 395—166 **2 Claims**



1. A data processing apparatus for processing plural tasks concurrently and asynchronously and for outputting data from each of the plural tasks, said data processing apparatus comprising:

an input means for inputting data;

memory means for storing data output from each of the plural tasks and data input via said input means;

display means, comprising a display memory means for storing data transferred by said memory means, wherein said display means displays data stored in said display memory means; and

control means for monitoring the data transferred to said display means from said memory means and for controlling, in accordance with the monitoring, transferring of data output by the plural tasks and of data input via said input means to said display memory means,

wherein said control means obtains starting and ending addresses of the data stored in said display memory means,

wherein said control means determines if data has been input via said input means,

wherein, when the starting address is equal to the ending address and said control means determines that data has been input via said input means, the data input via said input means is transferred to said memory means prior to storage in said memory means of any other data processed by the plural tasks but not yet stored in said memory means, and

wherein, when the starting address is not equal to the ending address, and said control means determines data has been input via said input means, (1) said control means monitors the starting address and the ending address until the starting address equals the ending address, (2) and the data input via said input means is stored in said memory means prior to storage in said second memory means of any other data processed by any of the plural tasks but not yet stored in said memory means.

5,146,559

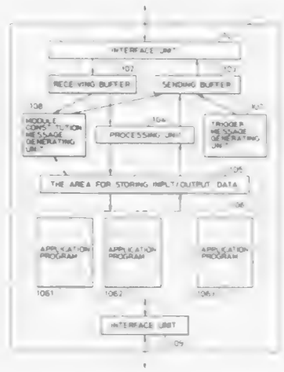
SYSTEM FOR RECOGNIZING PROGRAM CONSTITUTION WITHIN A DISTRIBUTED PROCESSING SYSTEM BY COLLECTING CONSTITUTION MESSAGES GENERATED BY DIFFERENT PROCESSORS

Masayuki Orimo, Kawasaki; Kinji Mori, Yokohama; Yasuo Suzuki, Ebina; Katsumi Kawano, Fuchuu; Minoru Koizumi, Yokohama; Kozo Nakai, Katsuta, and Hirokazu Kasahima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1987, Ser. No. 101,961

Int. Cl.[5] G06F *15/80*

U.S. Cl. 395—200 **10 Claims**



4. A distributed processing system comprising:

a common transmission line; and

a plurality of processors connected to said common transmission line wherein each processor has stored therein in a particular sequence a plurality of executable programs, said each processor comprises means for generating a program constitution message for identifying said sequence of executable programs stored in said each processor, said program constitution message including information related to at least a processor which is enabled to execute each of said executable programs, input data, indicating at least a program, being inputted to each of said plurality of executable programs and output data, indicating at least a program, being outputted from each of said plurality of executable programs, and means for sending said program constitution message, generated by said generating means, onto said common transmission line;

wherein at least one processor includes means for gathering said program constitution message sent from at least another processor through said common transmission line so as to recognize a program constitution in said system by the use of the gathered program constitution message;

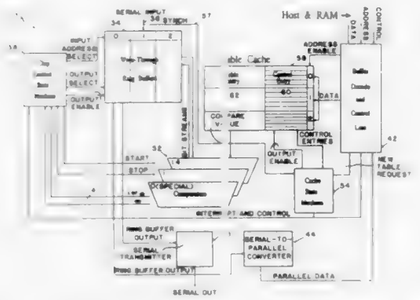
wherein said means for generating a program constitution message generates said program constitution message when a program constitution in said each processor has changed.

5,146,550

APPARATUS FOR PROCESSING BIT STREAMS

Marshall R. Goldberg, Mason, N.H., and Mitchell N. Rosich, Acton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 200,698, May 31, 1989, abandoned.
This application Mar. 15, 1991, Ser. No. 671,176
Int. Cl.[5] G06F *7/38*
U.S. Cl. 395—200 42 Claims



1. Apparatus for processing a stream of bits that have plural possible states and are received over an input line comprising

a hardware comparator that compares first predetermined bits of said stream at predetermined positions in a group of bits in said stream, said predetermined bits being fewer in number than all bits in said group,

comparison input means to provide a table of comparison values to said hardware comparator for comparison with said predetermined bits of said stream,

said comparison input means being programmable to provide one of a plurality of different tables stored therein in response to a table select control signal

an index generator that receives a comparison output from said comparator and generates an index based on the states of said predetermined bits indicated by said comparison output, and

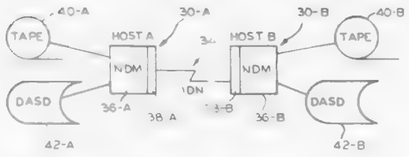
a processor for accessing said index and processing said group of said bits in said stream of bits in at least one of a plurality of different ways based on said index.

5,146,561

COMMUNICATION NETWORK DATA MANAGER SYSTEM

Paul J. Carey, Arlington Heights; Thomas R. Imburgia, Naperville; John L. Edgar, Buffalo Grove; Denis C. McHugh, Palatine; Lan P. Tam, Chicago; Douglas Chieng, Schaumburg, and Mark Williamson, Warrenville, all of Ill., assignors to Sears Communications Network, Inc., Arlington Heights, Ill.

Filed Jun. 2, 1988, Ser. No. 203,874
Int. Cl.[5] G06F *15/16, 15/40, 13/00*
U.S. Cl. 395—200 19 Claims
MICROFICHE APPENDIX INCLUDED
(121 Microfiche 6818 Pages)



1. In a communication network data system including a plurality of central processing unit (CPU) systems, each said CPU system including means for generating processing commands executable on any one of said CPU systems and including means for selecting one of said CPU systems for executing a generated processing command, and command processing means responsive thereto for implementing said commands, and a data communication network interconnecting each of said CPU systems, a command management system associated with each of said CPU command processing means comprising:

means operatively associated with said command generating means for receiving commands therefrom;

means for determining a CPU system for which each said command is selected to be implemented by; and

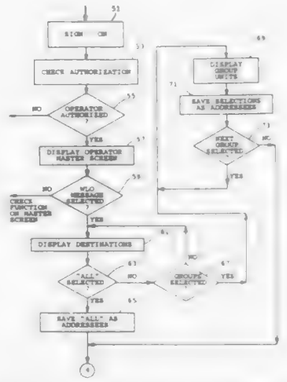
means operatively associated with said determining means for transmitting each said command to said CPU system's command processing means, or alternatively, to another of said CPU system's command processing means, according to the selected CPU system which is to implement the command as determined by said determining means.

5,146,562

PATIENT CARE COMMUNICATION SYSTEM

Robert W. Kukla, Irving, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 771,320, Aug. 30, 1985, Pat. No. 5,101,476.
This application Sep. 23, 1991, Ser. No. 764,003
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—200 15 Claims



1. A process for selectively and electronically composing and displaying for transmission messages at a communication station in a communications system which includes a plurality of display terminals connected to a central computer, said communication station being one of said display terminals and displaying screens containing reference data items stored in said central computer, the process comprising the steps of:

displaying the reference data items in a screen on said communication station for selection by an operator;

saving the reference data items selected by the operator in a temporary storage;

composing a message made up of operator-selected items; and

displaying the composed message for review and correction prior to transmission to another communications station in the communication system,

displaying a second screen containing a list of possible addresses to whom the message may be sent for selection by the operator; and

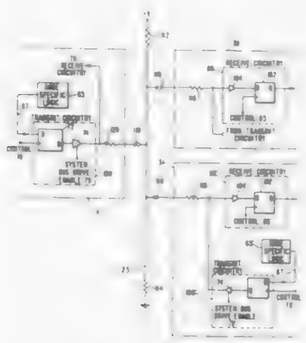
saving in said temporary storage the addresses selected by the operator from said second screen, said composed message also including the addresses selected from said second screen.

5,146,563

NODE WITH COUPLING RESISTOR FOR LIMITING CURRENT FLOW THROUGH DRIVER DURING OVERLAP CONDITION

Darrel D. Donaldson, Lancaster, and Richard B. Gillett, Jr., Westford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 44,485, May 1, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 327,425
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—250 20 Claims



1. A node capable of connection to a bus wherein the bus interconnects a plurality of nodes and more than one node is capable of driving the bus simultaneously to transfer data, and wherein the bus has a current source for supplying, together with such nodes, current for the transfer of data such that during such transfer of data the state of the bus transitions between one predetermined voltage level and another predetermined voltage level, the node comprising:

a driver designed to supply current to the bus in parallel with the current source of the bus for the transfer of data; and

linear resistive means, having a predetermined resistance value, for coupling said driver to the bus and, during occasions when the node is driving the bus to one predetermined voltage level simultaneously with at least another of the plurality of nodes driving the bus to another predetermined voltage level, for limiting the current flowing through said driver and avoiding damage to said driver.

5,146,564

INTERFACE BETWEEN A SYSTEM CONTROL UNIT AND A SERVICE PROCESSING UNIT OF A DIGITAL COMPUTER

Michael B. Evans, Marlboro; Rueysen Lin, Lexington; Brian F. Rost, Northboro, and R. Stephen Polzin, Holden, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 3, 1989, Ser. No. 306,325
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—250 5 Claims

1. A method for transferring data between a first unit and a second unit of a computer system, comprising the steps of:

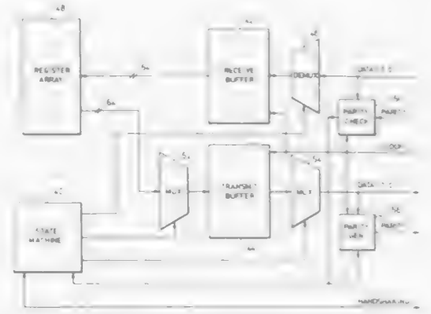
a) asserting a request signal from the first unit to the second unit when the first unit has data to send;

b) asserting a grant signal from the second unit to the first unit in response to receiving said request signal if said second unit has a buffer able to receive data from the first unit; and

c) in response to receipt of said grant signal by said first unit, transferring said data from the first unit to the buffer of the second unit in a plurality of following operating cycles of said computer system; and

transferring data from said second unit to said first unit by the steps of:

d) asserting a buffer full signal from the first unit to the second unit if a buffer in the first unit is not able to receive data;



e) asserting a transmit signal from the second unit to the first unit if said buffer full signal is not received by the second unit;

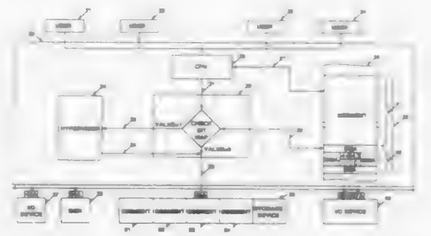
f) and transferring data from the second unit to said buffer of the first unit in a plurality of following operating cycles of said computer system after receipt of said transmit signal by said first unit.

5,146,565

I/O CONTROL SYSTEM HAVING A PLURALITY OF ACCESS ENABLING BITS FOR CONTROLLING ACCESS TO SELECTIVE PORTS OF AN I/O DEVICE

Greg J. Blanck, Santa Clara, and Rakesh K. Agarwal, Palo Alto, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 469,755, Jan. 3, 1990, abandoned, which is a continuation of Ser. No. 886,918, Jul. 18, 1986, abandoned. This application Jun. 19, 1991, Ser. No. 722,395
Int. Cl.[5] G06F *13/20, 13/00*
U.S. Cl. 395—275 19 Claims



10. A digital computer apparatus for selectively controlling direct access to an input/output (I/O) device comprising:

a central processing unit (CPU) for performing a plurality of substantially simultaneous tasks;

a plurality of I/O ports coupled to said CPU for accessing I/O devices;

means for accessing a plurality of I/O access enabling bits stored in a first memory coupled to said CPU, said plurality of I/O access enabling bits being associated with said plurality of I/O ports, wherein for each task, a corresponding I/O access enabling bit is assigned for each I/O port and in which a value of said corresponding I/O access enabling bit determines accessibility of its associated I/O port by that task, said plurality of I/O access

enabling bits being stored in a variable length storage location;

means for accessing a set of modifying instructions stored in a second memory coupled to said CPU;

means for selecting a plurality of said I/O access enabling bits for each task, said plurality of I/O access enabling bits selected by said means for selecting corresponding to I/O ports of said I/O device, said means for selecting being coupled to said CPU and to said first memory;

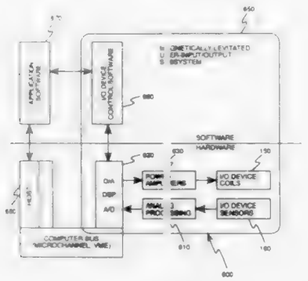
control means for permitting a given task to directly access said I/O device when said corresponding plurality of I/O access enabling bits selected by said means for selecting are of a first value and providing an instruction from said set of modifying instructions to virtualize access to said I/O device when said plurality of I/O access enabling bits selected by said means for selecting are of a second value, said control means being coupled to said CPU, said means for accessing said first memory and said means for accessing said second memory being coupled to said control means.

5,146,566

INPUT/OUTPUT SYSTEM FOR COMPUTER USER INTERFACE USING MAGNETIC LEVITATION

Ralph L. Hollis, Jr., Yorktown Heights, N.Y., and Septimiu E. Salcudean, Vancouver, Canada, assignors to IBM Corporation, Armonk, N.Y.

Filed May 29, 1991, Ser. No. 707,549
Int. Cl.[5] G06F *3/033*
U.S. Cl. 395—275 10 Claims



1. A programmable computer user input/output (I/O) system, comprising:

a multiple degree-of-freedom magnetic levitation (maglev) device having a matched electrodynamically levitated flotor and stator combination and an electrodynamic forcer means for receiving coil currents for applying controlled magnetic forces mutual to the flotor and stator and sensing means for measuring the relative position and orientation of the flotor and stator;

a maglev I/O device control software module for measuring the relative movement of the flotor-stator combination of the maglev device and for controlling the coil currents provided to the electrodynamic forcer means;

at least one active device model module, comprising a software representation of a mechanical I/O device, for controlling said maglev I/O device control software module to generate signals which emulate the mechanical I/O device represented by said active device model;

an application software module containing code instructions representing predetermined information relevant to that application and understandable to the user of said application software; and

an application binding software module interposed and operatively coupled between said maglev I/O device control software module and said application software module for controlling at least one of

a) said application software module as a function of said measured relative movement of the flotor-stator combination, and

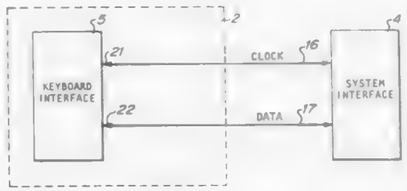
b) said maglev I/O device control software module as a function of said predetermined application software information.

5,146,567

KEYBOARD INTERFACE

Kent Kao, Taipei, Taiwan, assignor to Acer Incorporated, Taiwan

Filed Aug. 22, 1989, Ser. No. 397,000
Int. Cl.[5] G06F *15/02, 3/02, 11/28*
U.S. Cl. 395—325 15 Claims



1. A keyboard interface apparatus for communication with a system interface, comprising:

a keyboard interface having a first input/output port for sending and receiving data and clock signals, and a second input/output port for sending and receiving data signals;

a clock line connecting the first input/output port to the system interface; and

a data line connecting the second input/output port to the system interface;

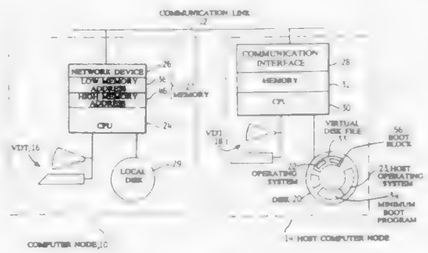
wherein the keyboard interface senses the clock line through the first input/output port and the data line through the second input/output port for detecting status signals from the system interface, and for controlling transmission and reception of data from the system interface through the data line and the second input/output port.

5,146,568

REMOTE BOOTSTRAPPING A NODE OVER COMMUNICATION LINK BY INITIALLY REQUESTING REMOTE STORAGE ACCESS PROGRAM WHICH EMULATES LOCAL DISK TO LOAD OTHER PROGRAMS

James E. Flaherty, Hudson, and Alan Abrahams, Framingham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 6, 1988, Ser. No. 240,955
Int. Cl.[5] G06F *13/14, 15/16*
U.S. Cl. 395—325 4 Claims



1. A method of downline loading an executable bootstrapping image from a host computer over a communications link to a node, said node having an interface through which it communicates over said communications link, comprising the steps of

initiating execution by said node of a node initialization program,

after said initiation, requesting a remote storage access program by sending one of a small set of specialty messages over said communications link, and retrieving by said node said remote storage access program from the host over the communications link,

execution of said retrieved remote storage access program to link said remote storage access program to a local storage interrupt service routine,

in response to a local storage interrupt service request, execution by said node of said linked remote storage access program to emulate a local physical disk, send a message over said communications link to establish a communication session, said communication session permitting a protocol that is more complex than permitted by said set of specialty messages over said communications link, and initiate retrieval of an executable bootstrapping image over the communications link from a file on the host, by using the emulated local physical disk after the establishing of said communication session, and

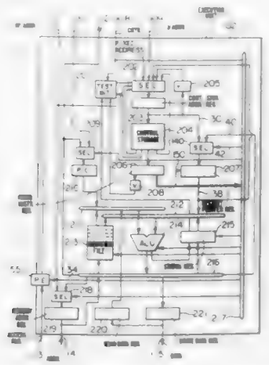
execution by said node of said retrieved executable bootstrapping image.

5,146,569

SYSTEM FOR STORING RESTART ADDRESS OF MICROPROGRAM, DETERMINING THE VALIDITY, AND USING VALID RESTART ADDRESS TO RESUME EXECUTION UPON REMOVAL OF SUSPENSION

Shinichiro Yamaguchi; Hidekazu Matsumoto, both of Hitachi; Tadaaki Bandoh, Ibaraki; Hirokazu Hirayama, Hitachi; Morioka Takayuki, Hitachi; Soichi Takaya, Hitachi; Yukio Kawamoto, Hitachi; Jushi Ide, Mito, and Yoshihiro Miyazaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 111,618, Oct. 23, 1987, Pat. No. 5,003,458. This application Mar. 25, 1991, Ser. No. 674,398
Claims priority, application Japan, Oct. 24, 1986, 61-251760; Feb. 4, 1987, 62-22347
Int. Cl.[5] G06F *9/26*
U.S. Cl. 395—375 9 Claims



1. A microprogram controlled data processing apparatus of the type that restarts execution of an instruction, after suspension of instruction execution of said instruction, in accordance with a microprogram, said data processing apparatus comprising:

first storage means for storing a restart address designated by said microprogram;

second storage means for storing information indicating whether said restart address is stored in said first storage means;

judgement means, coupled to said second storage means, for checking a content of said second storage means and indicating whether said content of said second storage means indicates that said restart address is stored in said first storage means;

means, responsive to an indication by said judgment means that said content of said second storage means indicates that said restart address is stored in said first storage means, for saving a content of said first storage means in a main memory in accordance with a saving microprocessor when an instruction execution suspension occurs; and

means, responsive to completion of a removal process which removes a cause of said instruction execution suspension, for restoring said restart address obtained from said main memory;

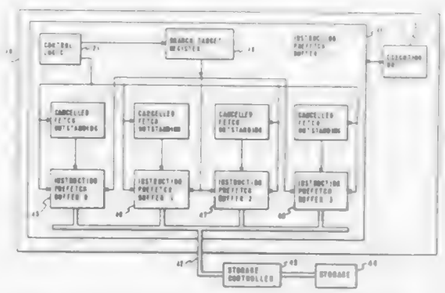
wherein execution of said instruction restarts from said restored restart address.

5,146,570

SYSTEM EXECUTING BRANCH-WITH-EXECUTE INSTRUCTION RESULTING IN NEXT SUCCESSIVE INSTRUCTION BEING EXECUTE WHILE SPECIFIED TARGET INSTRUCTION IS PREFETCHED FOR FOLLOWING EXECUTION

Phillip D. Hester, Austin, and William M. Johnson, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 180,872, Apr. 13, 1988, abandoned, which is a division of Ser. No. 666,790, Oct. 31, 1984, Pat. No. 4,775,927. This application Jul. 3, 1990, Ser. No. 547,423
Int. Cl.[5] G06F *12/02*
U.S. Cl. 395—375 10 Claims



1. In a processing system including a processor and a storage from which said processor prefetches instructions, a method for executing a plurality of instructions in said processor having at last one branch-with-execute instruction, said method comprising:

executing said branch-with-execute instruction resulting in a next successive instruction, a subject instruction, being next executed while a target instruction specified by the branch-with-execute instruction is being prefetched from the storage for execution after the execution of the subject instruction;

storing the subject instruction in an instruction buffer; and

determining an available location in the instruction buffer for holding the target instruction prior to execution of the target instruction and,

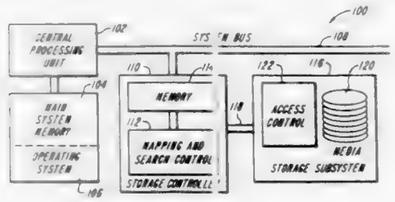
clearing all other locations in said instruction buffer which are not storing the subject instruction.

5,146,571

REMAPPING DEFECTS IN A STORAGE SYSTEM THROUGH THE USE OF A TREE STRUCTURE

Donald G. Logan, Blackstone, Mass., assignor to EMC Corporation, Hopkington, Mass.

Continuation of Ser. No. 173,982, Mar. 28, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 488,454
Int. Cl.[5] G06F *11/22*
U.S. Cl. 395—400 20 Claims



1. Apparatus for transforming ogical addresses produced by a device requesting access to sto age media in a disk subsystem into defect free physical addres es corresponding to specific locations on said media so as to create the appearance to said requesting device that said medi. includes a large, continuous, defect-free address space compr sing:

means for generating a defec list comprising addresses of defective sectors in said sto age media of said disk subsystem;

means for restructuring said li t to produce a list comprising defect free logical addresses employed as decisional criteria and to produce an offse list containing a plurality of predetermined offset values

means for ordering said list of defect free logical addresses and said offset list into an array having a predetermined organizational structure wherein said array may be traversed in a preselected manner within a predetermined maximum number of traver es;

said organizational structure comprising a memory table including a plurality of elements corresponding to elements of a tree structure, said tree structure having a plurality of upper levels and a lower level;

means for storing values from said list of defect free logical addresses in selected elemen s in said memory table corresponding to elements of said upper tree levels;

means for storing said predetermined offset values from said offset list in selected elemen s in said memory table corresponding to elements of said lower tree level;

means for traversing selected element in said table corresponding to elements of said upper level tree levels for each logical address produced by said requesting device to arrive at an element in the lower tree level of said table containing a predetermined offset value associated with the respective logical addres s; and

means for adding said predetermined offset value to the respective logical address to produce a defect free physical address corresponding to a sector on said media for access.

5,146,572

MULTIPLE DATA FORMAT INTERFACE

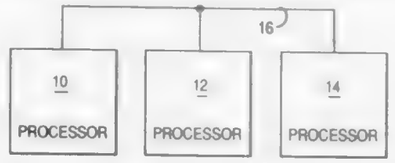
Roger N. Bailey, and Robert L. Mansfield, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 273,286, Nov. 17, 1980. This application Oct. 4, 1988, Ser. No. 593,606
Int. Cl.[5] G06F *12/00;13/00;3/00;* G11C *8/00*
U.S. Cl. 395—425 10 Claims

1. An apparatus for interfacing with a parallel data bus transferring information in multiple formats, said apparatus comprising:

(a) first means connected to receive control information from said parallel bus specifying one of a plurality of formats, for computing addresses for each data received according to either a first format having a first data word on a first data bus portion of said data bus or a second format having the first data word on a second data bus portion of said data bus:

wherein first means computes said address according to the first format when the transfer includes a single data word;



said first means computes said address according to the second format when the transfer includes a plurality of data words; and

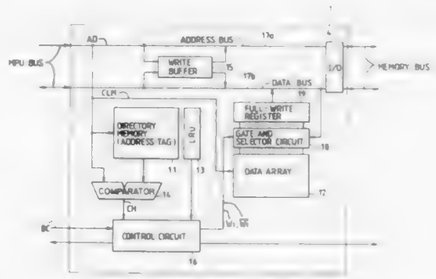
(b) second means, connected to said bus and said first means for storing data from said first data bus portion or said second data bus portion of said data bus according to the computed address and detection of the first format or the second format.

5,146,573

SINGLE CHIP CACHE WITH PARTIAL-WRITE CIRCUIT FOR TRANSFERRING A PRESELECTED PORTION OF DATA BETWEEN MEMORY AND BUFFER REGISTER

Katsuyuki Sato, Akishima; Tadahiko Nishimukai, Sagamihara; Kunio Uchiyama; Hirokazu Aoki, both of Hachioji; Susumu Hatano, Musashino; Kanji Oishi, Koganei; Hiroshi Fukuta, Kodaira; Takashi Kikuchi, Akishima, and Yasuhiko Saigou, Fuchuu, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Oct. 25, 1989, Ser. No. 426,781
Claims priority, application Japan, Nov. 1, 1988, 63-277624; Dec. 26, 1988, 63-330040
Int. Cl.[5] G06F *13/14, 12/02*
U.S. Cl. 395—425 8 Claims



1. The buffer storage device according to claim 1, wherein a single semiconductor chip cache buffer storage device comprising:

directory memory means for storing an address tag, said directory memory means being integrally formed on a common substrate;

data memory means for storing first data which corresponds to said address tag stored in said directory memory means, said data memory means being integrally formed on said common substrate;

buffer register means for holding second data, said buffer register means being integrally formed on said common substrate; and

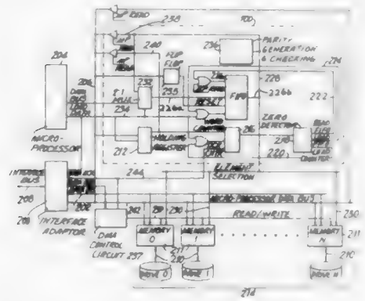
selector means, electrically connected between said data memory means and said buffer register means and integrally formed on said common substrate, for selectively transferring a part of said first data from said data memory means to said buffer register means, said selector means comprises a comprising data replacement means for replacing a preselected portion of the first data from said data memory means with replacement data for transfer to said buffer register means.

5,146,574

METHOD AND CIRCUIT FOR PROGRAMMABLE SELECTING A VARIABLE SEQUENCE OF ELEMENT USING WRITE-BACK

Kumar Gajjar, San Jose, and Anh Nguyen, Sunnyvale, both of Calif., assignors to SF2 Corporation, Sunnyvale, Calif.

Filed Jun. 27, 1989, Ser. No. 372,278
Int. Cl.[5] G06F *3/06, 13/12*
U.S. Cl. 395—425 18 Claims



1. In a system including a plurality of elements each selectable to perform a task, a programmable circuit for selecting a variable sequence of elements from the plurality of elements to perform a series of tasks, the circuit comprising:

(*a*) sequence storage means for storing a sequence of element identifiers, the sequence storage means having an input terminal through which element identifiers are loaded into the sequence storage means to be stored, an output terminal through which element identifiers stored in the sequence storage means are accessed, and input and output terminal control circuitry responsive respectively to input and output terminal control signals for controlling the input and output terminals;

(*b*) processor means, coupled by bus and signal logic means to the input terminal and to the input terminal control circuitry of the sequence storage means to program the sequence storage means by loading a sequence of element identifiers in the sequence storage means, each of the element identifiers in the loaded sequence of element identifiers having a value;

(*c*) access means, including bus and signal logic means coupled to the processor means, and to the output terminal and the output terminal control circuitry of the sequence storage means, for providing an output terminal control signal to the output terminal control circuitry to access an element identifier stored in the sequence storage means responsive to a read signal;

(*d*) write-back means, including bus and signal logic means coupled to the input and output terminals of the sequence storage means, and to the input and output terminal control circuitry of the sequence storage means, for reloading an accessed element identifier from the output terminal of the sequence storage means into the input terminal of the sequence storage means responsive to a load signal;

(*e*) element selection means, including signal lines coupled to the output terminal of the sequence storage means and to the plurality of elements, for selecting at least one element from the plurality of elements identified by a value of an element identifier accessed from the sequence storage means; and

(*f*) read and load signal providing means, coupled by signal lines to the access means and the write-back means, for providing read and load signals respectively to the accessing means and the write-back means when a task is completed by a selected element,

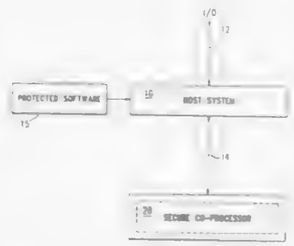
whereby upon completion of each of a series of tasks an accessed element identifier is automatically reloaded into the sequence storage means, thus providing automatic programming of the sequence storage means, and an element identifier is automatically accessed from the sequence storage means to select one or more elements from the plurality of elements to perform a successive task in the series, until the series of tasks is completed.

5,146,575

IMPLEMENTING PRIVILEGE ON MICROPROCESSOR SYSTEMS FOR USE IN SOFTWARE ASSET PROTECTION

Thomas J. Nolan, Jr., Mahopac, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 5, 1986, Ser. No. 927,286
Int. Cl.[5] G06F *12/14*
U.S. Cl. 395—425 22 Claims



1. A logically secure processor with an I/O terminal for input or output operations with security for protected data stored in said processor comprising:

application processor means for executing software in accordance with a first set of operations,

supervisor processor means coupled to and controlling said application processor means,

a system bus coupled to both said supervisor and application processor means and to said I/O terminal,

a secure read only memory device also coupled to said system bus and controlled by said supervisor processor means, said secure read only memory device having contents defining a second set of operations, unique from said first set for execution by said application processor means only when said secure read only memory device is enabled by said supervisor processor means,

a secure read/write memory device coupled to said system bus, said secure read/write memory device including means enabling response of said source read/write memory device to signals on said system bus only on enablement by said supervisor processor means,

whereby said application processor means, responsive to external commands via said system bus, is prohibited from performing operations requiring access to said secure read only memory device absent enablement of said secure read only memory device by said supervisor processor means.

5,146,576

MANAGING HIGH SPEED SLOW ACCESS CHANNEL TO SLOW SPEED CYCLIC SYSTEM DATA TRANSFER

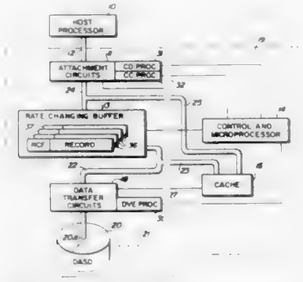
Brent C. Beardsley; Michael T. Benhase, and Susan K. Candelaria, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 575,748
Int. Cl.[5] G06F *13/00, 13/12*
U.S. Cl. 395—425 13 Claims

7. In apparatus for a peripheral data processing system, including, in combination:

a peripheral data processing device having a plurality of addressable data storage areas, each of said addressable data storage areas for storing one or more data records;

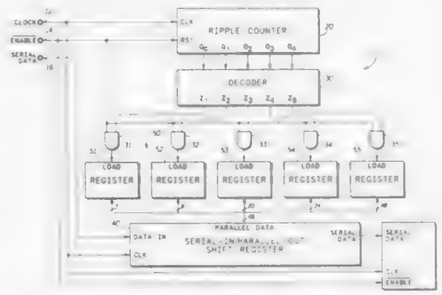
a cache connected to the peripheral data processing device;
a data buffer connected to the cache and to the peripheral data processing device;
attachment means connected to the cache and to the data buffer;
control means connected to the cache, data buffer, attachment means and to the peripheral data processing device;
data transfer means for transferring data records between the attachment means, the cache and the peripheral data processing device, including accessing a predetermined one of said addressable data storage areas as a current track being scanned, an index or a break point in said current track being scanned
first means in the control means for monitoring the data record transfer and the operation of the device for detecting either said index or break point of said current track being scanned for indicating; when the operation of the device has reached said predetermined reference state;



second means for monitoring the cache and the peripheral data processing device for detecting that a complete copy of data stored in the current area of the device is stored in the cache; and
said first means having third means responsive to said first means detecting that the operation of the peripheral data processing device has reached said predetermined reference state and to said second means detecting that a complete copy of data records stored in the current area is stored in the cache to indicate a gocache condition, fourth means connected to the third means for responding to the gocache indicating condition to stop further operations of the device irrespective of whether or not the data record transfer has been completed; said fourth means further responding to said gocache indicated condition for initiating operation of the cache with the host processor for transferring said data records between the cache and the host processor.

5,146,577
SERIAL DATA CIRCUIT WITH RANDOMLY-ACCESSED REGISTERS OF DIFFERENT BIT LENGTH
David C. Babin, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 10, 1989, Ser. No. 335,391
Int. Cl.[5] G06F *12/04*; **G11C** *19/28, 7/00*
U.S. Cl. 395—425 **6 Claims**

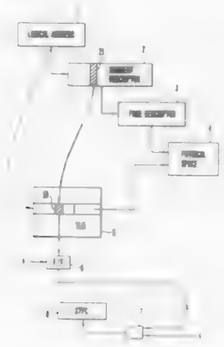
5. A method for receiving serial data for storage in a storage means and loading the data from the storage means into a predetermined one of several registers, comprising the steps of:
receiving and counting a plurality of clock pulses during a time period when a control signal is in a first predetermined state;
generating a binary signal corresponding to a counted number of clock pulses; and
converting the binary signal to a plurality of load select signals equal in number to the number of registers, each of said load select signals for selectively allowing a predetermined one of the several registers to receive data in parallel from the storage means when the control signal is in a second predetermined state.



5,146,578
METHOD OF VARYING THE AMOUNT OF DATA PREFETCHED TO A CACHE MEMORY IN DEPENDENCE ON THE HISTORY OF DATA REQUESTS
Saied Zangenehpour, Stevensville, Mich., assignor to Zenith Data Systems Corporation, Buffalo Grove, Ill.
Continuation of Ser. No. 345,915, May 1, 1989, abandoned. This application Apr. 12, 1991, Ser. No. 685,157
Int. Cl.[5] G06F *12/02*
U.S. Cl. 395—425 **14 Claims**

1. A method of prefetching data for a cache memory from a mass-storage device in response to a fetch request generated by a requesting circuit, comprising the steps of:
checking whether a previous fetch and a current fetch request are for data with sequential addresses, and prefetching data with sequential addresses beyond the current fetch request if the previous fetch and the current fetch request are for data with sequential addresses; and
keeping track of the number of successive fetches with sequential addresses, and progressively increasing the amount of said data with sequential addresses prefetched as the number of successive fetches with sequential addresses progressively increases.

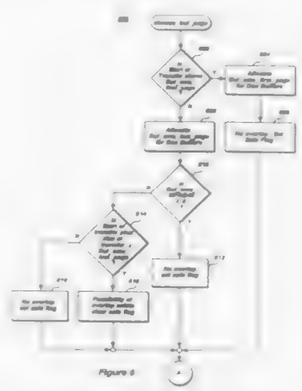
5,146,579
DATA PROCESSING APPARATUS
Hirotaka Nakano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 340,490, Apr. 19, 1989, abandoned. This application Feb. 21, 1992, Ser. No. 837,602
Claims priority, application Japan, Apr. 25, 1988, 63-100249
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—425 **1 Claim**



1. A data processing apparatus that executes machine instructions, comprising:
segment and page descriptors as a control structure for realizing a logical address;
a step counter for counting the number of machine instructions executed;
count control information contained in one of said segment and page descriptors;
count control means for causing said step counter to be incremented or decremented each time said machine instruction is executed when said count control information designates counting of said step counter and for preventing said step counter from counting even during execution of machine instructions when said count control information designates topping of said counter.

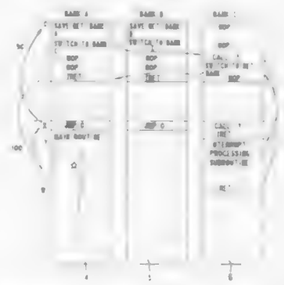
5,146,580
METHOD AND SYSTEM FOR USING EXPANDED MEMORY FOR OPERATING SYSTEM BUFFERS AND APPLICATION BUFFERS
Harish K. Naidu, Redmond; Thomas E. Lennon; Mike R. Williamson, both of Seattle, all of Wash., and Sunil Pai, New Delhi, India, assignors to Microsoft Corporation, Remond, Wash.
Filed Oct. 25, 1989, Ser. No. 427,343
Int. Cl.[5] G06F *9/26, 12/02, 12/06, 12/08*
U.S. Cl. 395—425 **5 Claims**

1. A computer implemented method of transferring data between a user buffer and system buffer in a computer system having a plurality of user buffers and system buffers, the computer system having expanded memory comprising logical pages and conventional memory comprising physical pages, the computer system having an address space, the conventional memory being within the address space of the computer system, the user buffers and system buffers being stored in expanded memory, the method comprising the steps of:
(a) allocating a page frame in conventional memory for mapping of logical pages into the address space;
(b) logically dividing the page frame into at least three pages, including a highest page and a lowest page;
(c) mapping user buffers into the page frame;
(d) for each page in the mapped user buffers, determining whether any of the pages need to have data transferred between a target system buffer;
(e) if a transfer is needed with a determined page that is not the highest page of the page frame, mapping the target system buffer into the highest page of the page frame, transferring data between the determined page nd the mapped target system buffer, and re-mapping the user buffer that was previously in the highest page back into the highest page of the page frame upon completion of the transfer; and



(f) if a transfer is needed with a determined page that is the highest page of the page frame, mapping the target system buffer into the lowest page of the page frame, transferring data between the determined page and the mapped target system buffer, and re-mapping the user buffer that was previously in the lowest page back into the lowest page of the page frame upon completion of the transfer.

5,146,581
SUBPROGRAM EXECUTING DATA PROCESSING SYSTEM HAVING BANK SWITCHING CONTROL STORING IN THE SAME ADDRESS AREA IN EACH OF MEMORY BANKS
Yutaka Kaneko, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Feb. 22, 1989, Ser. No. 313,677
Claims priority, application Japan, Feb. 24, 1988, 63-41535; Feb. 24, 1988, 63-41536; May 19, 1988, 63-122313; May 26, 1988, 63-129052
Int. Cl.[5] G06F *12/00, 13/10*
U.S. Cl. 395—425 **17 Claims**



1. An apparatus for executing a subprogram in a data processing system having a plurality of memory banks (4, 5, 6) and having facility of expanding storage capacity of the system by switching said memory banks, said subprogram comprising either one of a subroutine and an interrupt handling routine, wherein

each of said plurality of memory banks comprises a first memory area (**100**) for storing a predetermined processing program, said predetermined processing program differing in each said plurality of memory banks, and at least one (**6**) of said plurality of memory banks stores said subprogram in said first memory area,

the memory banks (**4, 5**) excluding at least one memory bank for storing said subprogram comprises a second memory area (**90**) for storing a first control program for selecting a memory bank for storing said subprogram when said subprogram must be executed during the execution of a processing program in the first memory area and a second control program for returning to the processing program requiring said subprogram after the execution of said subprogram is completed,

the memory bank (**6**) for storing said subprogram to be executed comprises a third memory area (**90**) for storing a third control program for calling said subprograms to be executed and a fourth control program for selecting a memory bank for storing said processing program requiring said subprogram to be executed after the execution of said subprogram to be executed is completed, and

said second memory area and said third memory area are respectively provided in memory areas to which same addresses are assigned in said plurality of memory banks.

5,146,582

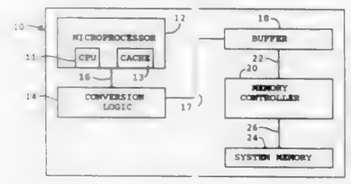
DATA PROCESSING SYSTEM WITH MEANS TO CONVERT BURST OPERATIONS INTO MEMORY PIPELINED OPERATIONS

Ralph M. Begun, Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 19, 1989, Ser. No. 368,449

Int. Cl.[5] **G06F** *13/00*

U.S. Cl. 395—500 **3 Claims**



1. In a data processing system having a system memory comprising a multiplicity of addressable memory locations for storing a multiplicity of data items, bus means including a data path connected to said system memory for transferring data into and out of said system memory, and a memory controller connected to said bus means and being operative in response to receiving a first series of pipelined system addresses on successive bus cycles to convert each system address into a corresponding memory address and transmit each such memory address to said system memory for reading a series of data items from said system memory and placing such data items on said data path on successive bus cycles whereby the first data items in said series is placed on said data path at a time after the time when the first one of said first series of system addresses is received by said memory controller and whereby said system addresses of data items subsequent to said first data items are received by said memory controller concurrently with reading of preceding data items so as to provide pipelining of addresses with data, said memory controller being further operative to generate a plurality of NACACHE control signals for requesting pipeline addressing by said first series of system addresses and of BURSTRDY control signals indicating when data items have been placed on said data path, the combination comprising:

a processor operable in a burst mode of operation to read said series of data items from said system memory, said processor lacking means to receive and act in response to said NACACHE signals, said processor being connected to said bus means and operative to generate during each burst operation and transmit on said bus means a plurality of burst mode signals comprising

a single control signal (ADS) for initiating said burst mode,

a plurality of control signals defining a burst request and including a BLAST signal for controlling termination of said burst mode,

and a second series of system addresses identifying data items to be read, said addresses in said second series being in a predetermined order that differs during successive burst modes by being sequential addresses and non-sequential addresses;

said processor being further operative to receive said BURSTRDTY signals and strobe data items from said data path into said processor in response to said BURSTRDY signals;

and converter logic means connected to said bus means and being operative to convert said burst mode signals from said processor into pipelined signals for operating said memory controller, said logic means comprising

first means operative in response to said ADS signals and only to the first one of said second series of system addresses from said processor to generate said first series of system addresses that are transmitted to said memory controller with each subsequent system address in said first series being generated and transmitted before corresponding addresses in said second series are generated and transmitted by said processor, said first means being further operative to generate a series of MISS1 signals signifying availability to said memory controller of said second series of system addresses.

5,146,583

LOGIC DESIGN SYSTEM FOR CREATING CIRCUIT CONFIGURATION BY GENERATING PARSE TREE FROM HARDWARE DESCRIPTION LANGUAGE AND OPTIMIZING TEXT LEVEL REDUNDANCY THEREOF

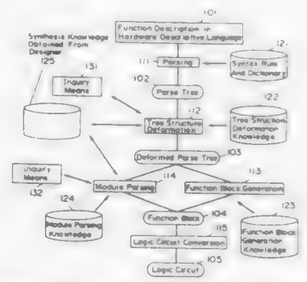
Masahiko Matsunaka, Osaka; Tamotsu Nishiyama, Hirakata, and Masahiko Ueda, Kashiwara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 249,554, Sep. 26, 1988, abandoned. This application Jul. 24, 1991, Ser. No. 734,113

Claims priority, application Japan, Sep. 25, 1987, 62-241289; Mar. 15, 1988, 63-61081

Int. Cl.[5] **G06F** *15/20*

U.S. Cl. 395—500 **7 Claims**



1. A computer processing method for translating a function description of a circuit, said computer processing method comprising:

a parsing step for parsing, using a computer system, the function description of the circuit in hardware description language to generating a parse tree;

a tree structure deforming step for deforming, using the computer system, a structure of the parse tree generated during said parsing step and for optimizing a text level redundancy in said parse tree; and a function block generation processing step for translating, using the computer system, the thus deformed parse tree into a circuit configuration made up of function blocks, thereby translating the function description of the circuit into connection information among function blocks as a hardware image.

5,146,584

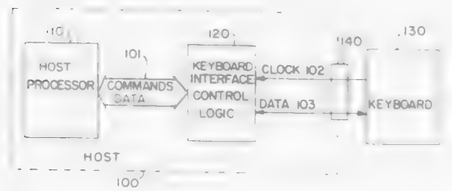
KEYBOARD INTERFACE SYSTEM ALLOWING A SYNCHRONOUS KEYBOARD TO COMMUNICATE WITH A HOST PROCESSOR ASYNCHRONOUSLY BY MANIPULATING THE KEYBOARD CLOCK'S STATE

Mark E. Christensen, Holden, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Feb. 27, 1989, Ser. No. 316,357

Int. Cl.[5] **G06F** *3/023*

U.S. Cl. 395—550 **6 Claims**



1. In a computer system having a synchronous keyboard, the keyboard having clock signal generation means; a host processor; and interface means connected between the keyboard and the host processor, the interface means having means for receiving serial data from the keyboard, means for providing serial data to the keyboard, means for receiving parallel data from the host processor, means for providing parallel data to the host processor, means connected to the serial data receiving means and the parallel date providing means for converting serial data from the keyboard to parallel form and means connected to the parallel data receiving means and the serial data providing means for converting parallel data from the host processor to serial form, a method for handling data transmissions from said keyboard comprising the steps of

a) generating a keyboard clock signal,

b) providing the keyboard clock signal to the interface means,

c) clocking a scan code from said keyboard into said interface means in synchronization with said keyboard clock signal,

d) when the entire scan code has been received by the interface means, inhibiting the keyboard clock signal,

e) transmitting the received scan code in parallel from the interface means to the host processor,

f) interpreting the received scan code to determine if a transmission from the host processor back to the keyboard in response to the scan code is required,

g) if a transmission from the host processor back to the keyboard is not required, releasing the keyboard clock signal, and

h) if a transmission from the host processor back to the keyboard is required, performing the transmission from the host processor back to the keyboard.

5,146,585

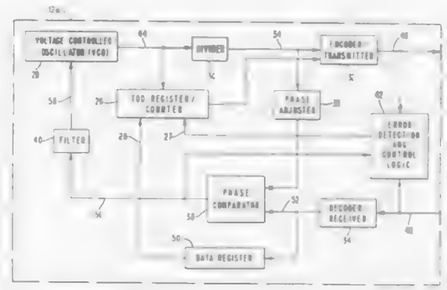
SYNCHRONIZED FAULT TOLERANT CLOCKS FOR MULTIPROCESSOR SYSTEMS

Thomas B. Smith, III, Wilton, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 519,301, May 8, 1990, abandoned, which is a continuation of Ser. No. 262,416, Oct. 25, 1988, abandoned. This application Nov. 5, 1990, Ser. No. 610,336

Int. Cl.[5] **G06F** *1/12, 1/04, 11/00*

U.S. Cl. 395—550 **21 Claims**



1. A fault-tolerant synchronization system for TOD clocks in a multiprocessor complex comprising:

at least a pair of time of day (TOD) clock sources, each of said clock sources including;

means for generating an internal clock signal having a nominal frequency,

TOD register/counter means for holding a data value and being responsive to said internal clock signal for incrementing the data value held thereby at a rate determined by said internal clock signal and including frequency divider means responsive to the internal clock signal for providing a periodic reference signal having a selected period, wherein the data value held by said register/counter represents a TOD clock value,

means coupled to said register/counter means for transmitting said reference signal to the other of said TOD clock sources,

means for receiving said reference signal from said other of said clock sources, and

means, responsive to said received reference signal for synchronization said clock source to the other of said clock sources, to within a predetermined skew, wherein the period of said reference signal is selected to be greater than said predetermined skew.

5,146,586

ARRANGEMENT FOR STORING AN EXECUTION HISTORY IN AN INFORMATION PROCESSING UNIT

Hirotaka Nakano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,379

Claims priority, application Japan, Feb. 17, 1989, 1-36370

Int. Cl.[5] **G06F** *11/00*

U.S. Cl. 395—575 **8 Claims**

1. An arrangement for storing an execution history in an information processing unit, comprising:

control storage means for storing at least one microprogram consisting of a plurality of microinstructions;

microinstruction storage means for temporarily storing a microinstruction read out of said control storage means;

pointer storage means for storing a pointer value;

history data storage means for storing a state of a predetermined group of logical signals at a storage location in said history data storage means designated by said pointer value;

mask-start-address storage means and mask-end-address storage means for storing a mask start address and mask end address, respectively;

mask indication means for selectively indicating one of first and second states; and

history storage control means for performing, if said mask indication means indicates said first state, a first process of storing the result of addition of said pointer value and one

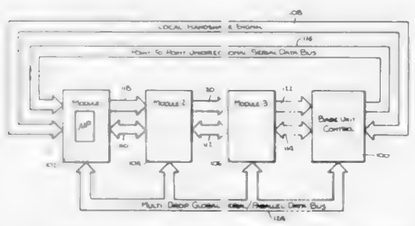
into said pointer storage means and, when said result of addition has surpassed an end address of said history data storage means, storing a head address of said history data storage means into said pointer storage means, but if said mask indication means indicates said second state, a second process of updating said pointer value so as to prevent accessing of the addresses ranging from said mask start address in said mask-start-address storage means to said mask end address in said mask-end-address storage means.

5,146,587

SYSTEM WITH SIMULTANEOUS STORAGE OF MULTILINGUAL ERROR MESSAGES IN PLURAL LOOP CONNECTED PROCESSORS FOR TRANSMISSION AUTOMATIC TRANSLATION AND MESSAGE DISPLAY

Robert Francisco, New Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,060
Int. Cl.[5] G06F *11/32*
U.S. Cl. 395—575 **16 Claims**



1. In material processing system comprising a plurality of material processing stations, a base material processing station, and means directing material to be processed serially through said plurality of stations in a given order to said base station;

the improvement wherein each of said plurality of stations and said base station comprises a separate data and control processor, and further comprising a communication loop interconnecting the processors of said plurality of stations in said given order to the processor of said base station and interconnecting said processor of said base station to the processor of the first of said plurality of stations;

said base station including a display, each of said processors comprising means for generating a first status message and means for passing said first status message and a second status message received from a preceding one of said processors to a next succeeding station; the processor of said base station comprising means for displaying said status messages received thereby on said display;

each of said status messages existing simultaneously in each of said processors in a plurality of memory locations in different spoken languages, each of said memory locations occupying a different quantity of memory;

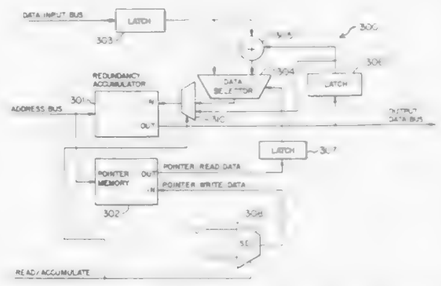
said material processing system further comprising means for establishing a pointer for locating as a base one of said languages; means for inputting a control signal for selecting one of said languages; and means responsive to said control signal for moving said pointer to select said one language; said status messages thereafter displayed in each instance in said one language.

5,146,588

REDUNDANCY ACCUMULATOR FOR DISK DRIVE ARRAY MEMORY

Michael R. Crater, Arvada, and David P. Haldeman, Broomfield, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 26, 1990, Ser. No. 617,574
Int. Cl.[5] G06F *11/08*
U.S. Cl. 395—575 **16 Claims**



1. Apparatus, having an input and an output, for producing a set of redundancy data in response to a predetermined number of data records, in a stream of data records from a processor, received at said input, comprising:

redundancy accumulator memory means, having address, input and output leads and a plurality of memory locations therein, for storing data;

redundancy operator means, connected to said output leads of said redundancy accumulator memory means, for calculating a redundancy product using both an addressed data element of a data record presently extant on said apparatus input and a redundancy product calculated from said predetermined number of data records and previously stored in said redundancy accumulator memory means at a memory location determined by a selected address applied to said address leads of said redundancy accumulator memory means;

means, connected to and interconnecting said redundancy generator means and said redundancy accumulator memory means, for writing said calculated redundancy product in said redundancy accumulator memory means at said addressed memory location;

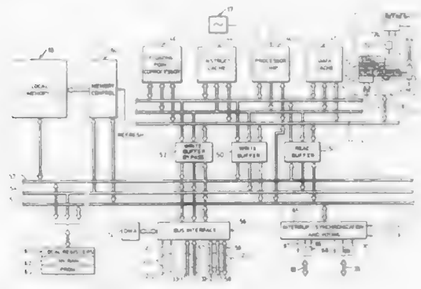
means for identifying whether data representative of said redundancy product is stored in each memory location in said redundancy accumulator memory means.

5,146,589

REFRESH CONTROL FOR DYNAMIC MEMORY IN MULTIPLE PROCESSOR SYSTEM

Charles E. Peet, Jr.; John D. Allison; Kenneth C. Debacker, all of Austin,, Tex., and Robert W. Horst, Champaign, Ill., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 282,540, Dec. 9, 1988, abandoned. This application Dec. 17, 1990, Ser. No. 629,698
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—575 **13 Claims**



1. A computer system, comprising:

a) a plurality of CPUs each executing the same instruction stream, each CPU having a clock to define machine cycles, the CPUs being clocked independently of one another by said clocks, said machine cycles providing execution cycles when instructions of said instruction stream execute or providing stall cycles when an instructions of said instruction stream do not execute;

b) each of the CPUs having a first counter to count execution cycles but not stall cycles, and having a second counter to count stall cycles;

c) each of said CPUs having a local memory requiring periodic refresh;

d) each of said CPUs having a separate refresh control responsive to a given count in said first counter of the CPU to initiate a refresh of said local memory of the CPU, and responsive to said second counter to perform a number of cycles of refresh of said local memory depending upon a selected count of the second counter, said refresh of said local memory occurring at the execution of an instruction in said instruction steam in all of said CPUs.

5,146,590

METHOD FOR SORTING USING APPROXIMATE KEY DISTRIBUTION IN A DISTRIBUTED SYSTEM

Raymond A. Lorie, and Honesty C. Young, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 297,169, Jan. 13, 1989, abandoned. This application Feb. 5, 1992, Ser. No. 830,796
Int. Cl.[5] G06F *7/06, 7/08, 7/14, 7/36*
U.S. Cl. 395—600 **22 Claims**

9. In a digital computer, programmable for executing a series of steps, a method executable on the digital computer for sorting data in a distributed data processing system having at least two processors, storage means attached to each processor for storing data, means in each processor for sorting data in response to key values included in the data, communications means for communicating between each of the processors, and regulator means for requesting sorting of the processors' data, the method comprising the steps of:

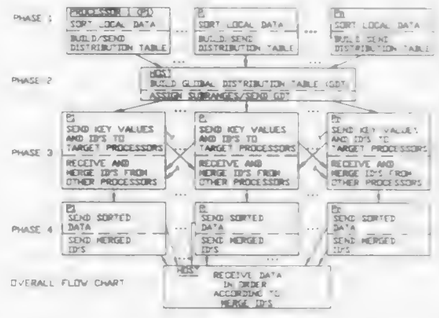
(a) communicating a sort request from the requestor means to the processors;

(b) for each processor, sorting data stored in the processor's storage means into local sorted files, and determining a distribution of key values of that data;

(c) producing a global key value distribution from key value distributions determined for the processors, the global key value distribution including a range of key values, the range of key values being divided into at least two subranges;

(d) assigning each subrange of key values to target ones of the processor;

(e) for each processor, communicating that processor's key values to their respective assigned target processors, together with means for identifying the sending processor;



(f) for each target processor, merging the key values received from the processors to produce a sorted subrange of the range of key values, such that data taken from the processors' local sorted files in the order specified by the representations of the sorted subrange are in sorted order;

(g) for each target processor, communicating at least a representation of the sorted subrange of the requestor; and

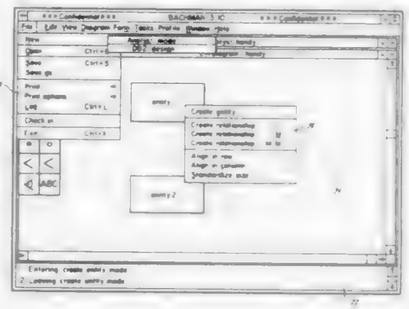
(h) processing by the requestor records received from the processors local sorted files in the order specified by the representations of the sorted subrange of key values.

5,146,591

DYNAMIC INFORMATION MANAGEMENT SYSTEM UTILIZING ENTITY-RELATIONSHIP INFORMATION MODEL IN WHICH THE ATTRIBUTE IS INDEPENDENT OF AN ENTITY

Charles W. Bachman, Lexington; John J. Cimral, Framingham, both of Mass.; Christopher P. Gane, New York, N.Y.; David A. Krieger, Cambridge, Mass.; John T. Micco, Waltham, Mass., and Igor Abramovich, Medford, Mass., assignors to Bachman Information Systems, Inc., Burlington, Mass.

Filed Apr. 27, 1990, Ser. No. 516,822
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—600 **89 Claims**



1. A computer system for establishing a dynamic model of information systems of organizations comprising:

A. at least one information modeler subsystem (IMS) including Information Model (IM) means for creating, analyzing

and modifying an entity-relationship information model (information model), said information model having IM design data representative of elements including at least one from the group consisting of attribute, entity method, attribute method, partnership set, and partnership set method, said attribute being independent of an entity;

B. at least one process modeler subsystem (PMS) including Information Flow Model (IFM) means for creating, analyzing, and modifying a process model said process model having IFM design data representative of elements including at least one from the group consisting of processes, information stores, information flows, messages, view, process local stores, sources, and destinations, said IFM design data relating to at least one of said elements of said IM design data;

C. modeler linking subsystem (MLS) coupled to said IMS and said PMS, said MLS including means for dynamically correlating said IMS and said PMS, whereby a change to any of said IM design data affects a corresponding IM-IFM change in said IFM design data, and whereby a change to any of said IFM design data affects a corresponding IFM-IM change in said IM design data; and

D. operator means coupled to said IMS and said PMS for applying external signals to said IMS and said PMS, said signals being effective to evoke a creating, analyzing, or modifying response from at least one of said IM means and said IFM means.

5,146,592

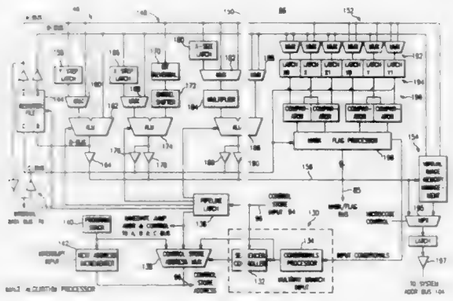
HIGH SPEED IMAGE PROCESSING COMPUTER WITH OVERLAPPING WINDOWS-DIV

David M. Pfeiffer, Plano; David T. Stoner, McKinney; John P. Norsworthy, Carrollton; Dwight D. Dipert, Richardson; Jay A. Thompson; James A. Fontain, both of Plano, and Michael K. Corry, Dallas, all of Tex., assignors to Visual Information Technologies, Inc., Plano, Tex.

Division of Ser. No. 97,664, Sep. 4, 1987, Pat. No. 4,985,848. This application Jan. 24, 1989, Ser. No. 301,371

Int. Cl.[5] G06F *15/20*

U.S. Cl. 395—157 **13 Claims**



1. An image processing system comprising:

a memory for storing image data, said memory having a number of storage locations greater than needed for displaying an image on a monitor;

a memory address generation circuit for generating addresses for accessing said memory;

a window defining circuit for defining a window are in said memory corresponding to a viewable area of said monitor;

circuitry for simultaneously writing plural pixels to said memory;

a window clipping circuitry for monitoring the addresses generated by said address generator circuit and operable to determine whether any one of said plural pixels are located outside said window and masking circuitry for writing selected bits of desired pixels into said memory without overwriting non-selected bits.

5,146,593

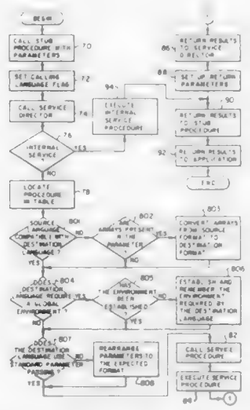
PROCEDURE CALL INTERFACE

Richard T. Brandle, Marietta; Don L. Goodliffe, Dunwoody; Donald E. Keith, Peachtree City; Randy A. Robinette; Robert C. Sizemore, both of Acworth; Garry J. Smithwick, Alpharetta, and Anthony J. Zappavigna, Marietta, all of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1989, Ser. No. 320,086

Int. Cl.[5] G06F *12/04*

U.S. Cl. 395—700 **10 Claims**



1. A digital computer system for processing procedure calls from an application program written in a first programming language to any selected one of a plurality of procedures, at least a first of which procedures is written in a second programming language, wherein the first programming language utilizes a first calling convention and the second programming language utilizes a second calling convention, the digital computer system comprising:

a data structure defining a map for converting between an expression of parameters in conformance with the first calling convention and an expression of parameters in conformance with the second calling convention;

means for generating a procedure call in the application program, the procedure call having an expression of parameters and an identification of the second programming language; and

means responsive to the procedure call for accessing the data structure, for converting the expression of parameters from the procedure call into a reexpression of the parameters in conformance with the second calling convention and for generating a procedure call including the reexpression of the parameters to the selected procedure written in the second programming language.

5,146,594

METHOD OF PRODUCING OBJECT PROGRAM BASED ON INTERPROCEDURAL DATAFLOW ANALYSIS OF A SOURCE PROGRAM

Takayoshi Iitsuka, Koganei, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,479

Claims priority, application Japan, Nov. 6, 1987, 62-279214

Int. Cl.[5] G06F *9/45*

U.S. Cl. 395—700 **3 Claims**

1. A method of generating an object program from a source program which includes a plurality of procedures, at least one procedure of the procedures including at least one loop containing a procedure call for calling another procedure within the source program as a called procedure, and the object program being for executing the loop in parallel for different iterations of the loop, the method comprising the steps executed by a computer, the steps including:

detecting one or plural regions of a first kind, one or plural regions of a second kind and one or plural regions of a third kind, for each of iterations of the loop with respect to each of one or more arrays each appearing in a statement of the loop except the procedure call or each appearing as an actual argument in the procedure call, each of the one or plural regions of the first kind and each of the one or plural regions of the second kind for said each appearing array for said each iteration of the loop being regions respectively defined and used on one or more program execution paths executable for said each iteration which includes one or plural program execution paths in the called procedure executable for said each iteration, and each of the one or plural regions of the third kind for the each appearing array for the each iteration being a region within the one or plural regions of the second kind which is used on one of the program execution paths for said each iteration without being defined on said one program execution path before being used;

wherein said detecting step includes the step of detecting the regions of the first to third kinds for said each iteration for one of the one or more appearing arrays which appears as an actual argument in the procedure call, by regarding definition and use of a dummy argument associated with the actual argument within the called procedure, as definition and use of the one appearing array respectively;

determining whether or not each of the one or more appearing arrays satisfies a first or second condition, the first condition being that any one of the one or plural regions of the first kind for the each appearing array for any iteration of the loop does not intersect with any one of the one or plural regions of the second kind for said each appearing array for any iteration of the loop, and the second condition being that nay one of the one or plural regions of the first kind for the appearing array for any iteration of the loop does not intersect with any of the one or plural regions of the third kind for said each appearing array for another iteration of the loop following an iteration of the loop for which one of the one or plural regions of the first kind has been detected;

replacing, when any of the one or more appearing arrays is one of an array of a first kind which satisfies the first condition and an array group of a second kind which does not satisfy the first condition but satisfies the second condition, each of the one or more arrays which is an array of the second kind by a new array having more dimensions than the each replaced array by one added dimension, a subscript of the new array for the added dimension being a loop control variable of the loop; and,

compiling the source program after replacing the replaced each of the one or more arrays into an object program including codes for executing the loop in parallel.

5,146,595

GROUPING DEVICE FOR FORMING INPUT SIGNALS INTO GROUPS

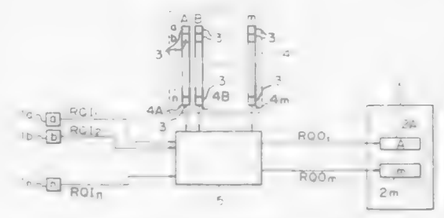
Hiroyuki Fujiyama, Hino; Kouichi Kuroiwa, Yokohama; Shinji Nishikawa; Hidetoshi Shimura, both of Kawasaki, and Shinji Oyamada, Yokohama, all of Japan, assignors to Fujitsu Limited and Fujitsu Microcomputer System Limited, Kawasaki, Japan

Filed Nov. 7, 1988, Ser. No. 267,862

Claims priority, application Japan, Nov. 11, 1987, 62-285125

Int. Cl.[5] G06F *13/14*

U.S. Cl. 395—725 **12 Claims**



1. A grouping device for forming n input signals into m groups, wherein both n and m are greater than zero, comprising:

a register table having m registers corresponding to m groups, each register including an n-bits data storing portion, each bit of said data storing portion corresponding to one of said n input signals, wherein when data is stored in said data storing portion each bit of said data stored in said data storing portion designates an assignment of one of said n-input signals to one of said m groups;

a grouping means receiving said n input signals and grouping signals output from each of said registers in said register table, each of said grouping signals indicating whether said data designating an assignment is presently stored in said data storing portion of the register, wherein said grouping means comprises m converter circuits, each of said converter circuits receiving said n input signals and n grouping signals output from one of said m registers, said grouping means selecting one group from said m groups for each input signal and grouping said each input signal into said selected group depending on which of said m-registers data corresponding to said each input signal is stored in.

5,146,596

MULTIPROCESSOR MULTIFUNCTION ARBITRATION SYSTEM WITH TWO LEVELS OF BUS ACCESS INCLUDING PRIORITY AND NORMAL REQUESTS

Bruce E. Whittaker, Mission Viejo; Saul Barajas, Capistrano Beach, and Leland E. Watson, Mission Viejo, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jan. 29, 1990, Ser. No. 471,904

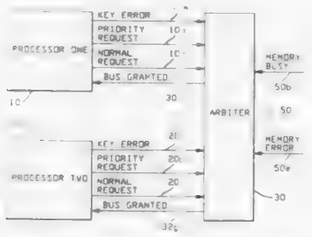
Int. Cl.[5] G06F *13/14*

U.S. Cl. 395—725 **3 Claims**

1. A system for providing bus access arbitration and control for a least two processors sharing a common bus comprising:

(a) a first processor means having bus access request lines and error notification lines connected to an arbiter logic means and including: (a1) connection means to a shared system bus;

(b) a second processor means having bus access request lines and error notification lines connected to said arbiter logic means and including: (b1) connection means to said shared sytem bus;
(c) shared system bus means for enabling connection of said processor means to system resource means;
(d) said arbiter logic means for enabling access of said first or second processor means to said shared system bus means according to protocol implemented in a single programmable logic array unit, said protocol for setting two levels of bus access mechanisms wherein each first and each second level of bus access, functions, during moments of contention, to grant access to that processor which was least recently granted bus access, thus preventing



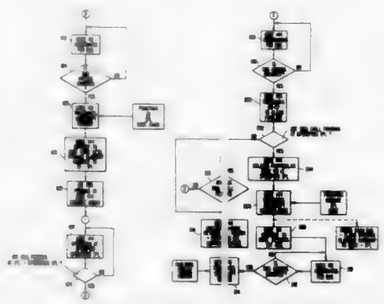
monopoliztion of access by any one processor; said bus access mechanism including:
(d1) first logic means to evaluate both said first level of normal bus-access requests and said second level or priority bus-access requests from said first and second processor means so as to grant bus access to that particular processor sending a priority bus-access request by generating a bus granted signal to the priority requesting processor means;
(d2) second logic means for detecting an error signal from a system resource means and locking out, from bus access, the processor means which was not involved in the error cycle until the original accessing processor means has corrected the error.

5,146,59[illegible]

APPARATUS AND METHOD FOR SERVICING INTERRUPTS UTILIZING A PENDED BUS

Douglas D. Williams, Pepperell, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 45,046, May 1, 1987, abandoned. This application Nov. 19, 1991 Ser. No. 798,853
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—725 **35 Claims**



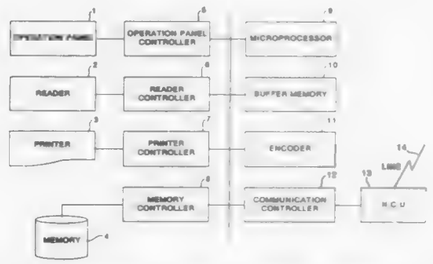
1. A method for performing an interrupt function on a pended bus for transferring messages between an interrupting node and an interrupt servicing node, the method comprising the following steps executed by a data processing system including the pended bus, the interrupting node, and the interrupt servicing node:
providing to the bus from the interrupting node an interrupt request message including ID data for identifying the interrupting node and priority level data for specifying a priority level of the interrupt request message;
monitoring interrupt request messages on the bus at the interrupt servicing node to detect the interrupt request message including ID data identifying the interrupting node and priority level data specifying the priority level of the interrupt request message;
providing to the bus from the interrupt servicing node, in response to the detection of the interrupt request message including ID data identifying the interrupting node and priority level data specifying the priority level of the interrupt request message, an interrupt acknowledge message including destination data specifying the interrupting node priority level data specifying the priority level of the interrupt request message at times when the interrupt servicing node is ready to service the interrupt request message at the specified priority level;
monitoring interrupt acknowledge messages on the bus at the interrupting node to detect the interrupt acknowledge message including destination data specifying the interrupting node and priority level data specifying the priority level of the interrupt request message; and
providing to the bus from the interrupting node, in response to the detection of the interrupt acknowledge message including destination data specifying the interrupting node and priority level data specifying the priority level of the interrupt request message, an interrupt vector message.

5,146,598

COMMUNICATION TERMINAL APPARATUS HAVING AN INTERRUPT/RESTART FUNCTION WITH TIME MEASURING CONTROL FOR INTERRUPTION AND DISABLING FEATURE

Katsuhito Takezawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,512
Claims priority, application Japan, Dec. 27, 1988, 63-327659
Int. Cl.[5] G06F *13/38*
U.S. Cl. 395—725 **8 Claims**



1. A communication terminal apparatus connected to an integrated services digital network (ISDN) having an interrupt/restart function, comprising:
communication means for performing data communication with a communication apparatus on another end of a line via the ISDN;
time measuring means for measuring a time period during which said communication means is initially interrupted to communicate with the communicate apparatus on the other end;
communication termination means for terminating the communication of said communication means with the communication apparatus on the other end when the time

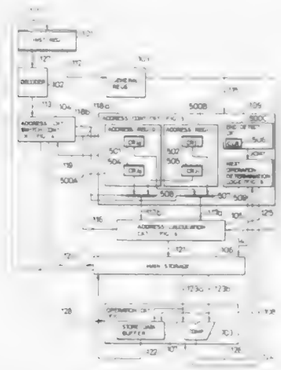
period measured by said time measuring means reaches a predetermined value;
interrupt command detection means for detecting a subsequent communication interrupt command from the ISDN while the communication between said communication means and the communication apparatus on the other end is interrupted; and
control means for controlling said time measuring means to stop its time measuring operation in order to disable said communication termination means when said interrupt command detection means detects a subsequent communication interrupt command from the ISDN.

5,146,599

SYSTEM FOR FETCHING A PLURALITY VECTOR-DATA GROUPS USING A PLURALITY OF ADDRESSING DEVICE

Keiji Kojima, Kodaira, and Shunichi Torii, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 106,502, Oct. 9, 1987, abandoned. This application Mar. 7, 1990, Ser. No. 489,884
Claims priority, application Japan, Oct. 9, 1986, 61-239006
Int. Cl.[5] G06F *15/347*
U.S. Cl. 395—800 **13 Claims**



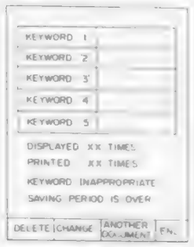
1. A data processor, comprising:
a memory for storing a group of data elements to be processed, said group of data elements being divided into a plurality of partial groups of data elements;
a plurality of address means connected to said memory, wherein each address means sequentially designates data elements belonging to plural ones of the partial groups according to a predetermined order of said partial groups and according to a predetermined order of data elements within each partial group, and wherein said plurality of partial groups are preassigned to said plurality of address means in such a manner that a partial group preassigned to an address means differs from a partial group preassigned to another address means;
control means connected to said plurality of address means for sequentially selecting different ones of said plurality of address means according to a predetermined order, wherein said sequential selection is repeatedly performed and for fetching from said memory a data element designated by a selected address means;
wherein said control means includes means for responding to said fetched data element and for determining whether a data element to be designated next by said selected address means is a succeeding data element belonging to the same partial group as the fetched data element belongs to or is another data element other than the succeeding data element, and for causing said selected address means to designate next, one of said succeeding data element and said other data element other than said succeeding data element in response to a result of said determining operation; and
said control means executing sequential election of another address means so that another data element designated thereby is fetched from said memory in parallel with said determining operation.

5,146,600

DOCUMENT IMAGE FILING SYSTEM FOR FURNISHING ADDITIONAL MANAGERIAL INFORMATION FOR MANAGEMENT OF DOCUMENTS FILED IN THE SYSTEM

Masamichi Sugiura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 1, 1989, Ser. No. 345,794
Claims priority, application Japan, Apr. 30, 1988, 63-108783; Apr. 30, 1988, 63-108784; Apr. 30, 1988, 63-108785
Int. Cl.[5] G06F *7/00*
U.S. Cl. 395—800 **16 Claims**



1. In an image filing system for reading an image on a document, for preserving data relating to an image read from the document and for reading out preserved data for use thereafter, a method of managing documents filed in the system, comprising the steps of
a) reading an image on a document, generating image data representative of an image read from the document, and storing the image data in first memory means,
b) storing in second memory means control data associated with said image data,
c) generating additional managerial information regarding the image data to be stored in said first memory means,
d) inspecting the additional managerial information to determine if the additional managerial information is appropriate,
e) when the additional managerial information inspected is determined to be inappropriate, generating a message indicating that the additional managerial information inspected is determined to be inappropriate, said message being to prompt an operator of the system to enter any instruction responsive to the message, and
f) executing a procedure responsive to said instruction, in which
the step of generating additional managerial information comprises
c-1) counting a number of times which the document has been searched for,
c-2) counting a number of time which the document has been used for printing purposes, and
c-3) generating data relating to the number of times which the document has been searched for and the number of times which the document has been used for printing purposes as said additional managerial information, and in which
the step of inspecting the additional managerial information to determine if the additional managerial information is appropriate comprises
d-1) determining whether or not the number of times which said document has been searched for and the

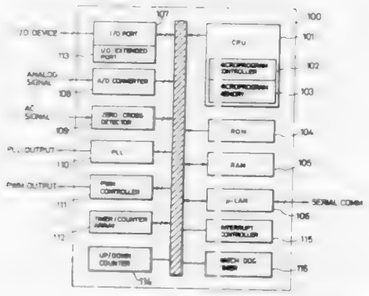
number of times which said document has been used for printing purposes satisfy a predetermined relationship therebetween, the predetermined relationship being predetermined to be probative of said additional managerial information being inappropriate.

5,146,601

PULSE WIDTH MODULATION INPUT/OUTPUT CONTROLLER FOR IMAGE PROCESSING APPARATUS

Masao Hosaka, Sagamihara; Kazutoshi Shimada, Kawasaki, and Tsuneki Inuzuka, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 60,074, Jun. 9, 1987, abandoned. This application May 11, 1990, Ser. No. 522,081
Claims priority, application Japan, Jun. 13, 1986, 61-136229
Int. Cl.[5] G06F 9/00
U.S. Cl. 395—800 15 Claims



1. A controller for an image apparatus comprising at least one electrical load, said controller comprising:

memory means for storing plural parameters, the parameters including a first parameter for a period and a second parameter for a duty factor;

generating means for repeatedly generating a pulse control signal for controlling the load in accordance with the parameters, said generating means comprising means for determining a period of the pulse control signal in accordance with the first parameter, and means for determining a duty factor of the pulse control signal in accordance with the second parameter; and

reading and setting means for reading the parameters from said memory means and setting the parameters into said generating means,

wherein said generating means repeatedly generates the pulse control signal having a predetermined pulse width corresponding to the second parameter at a period corresponding to the first parameter

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5,146,602

METHOD OF INCREASING THE ACCURACY OF AN ANALOG NEURAL NETWORK AND THE LIKE

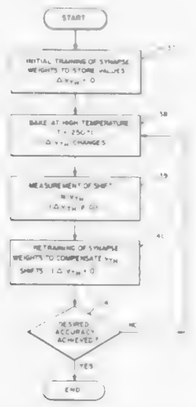
Mark A. Holler, Palo Alto, and Simon M. Tam, Redwood City, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 26, 1990, Ser. No. 634,033
Int. Cl.[5] G06C 7/00
U.S. Cl. 395—23 11 Claims

1. In a neural network having a plurality of programmable synapses for computing a sum-of-products between an input vector and a stored weight vector, a method of increasing the accuracy of said neural network comprising the steps of:

(a) initially training said neural network by programming said synapses with a certain weight vector;

(b) baking said neural network to effectuate a change in said certain weight vector; and



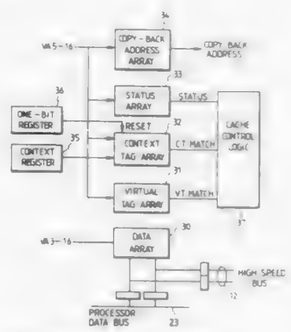
(c) retraining said neural network to compensate for said change resulting from said baking step.

5,146,603

COPY-BACK CACHE SYSTEM HAVING A PLURALITY OF CONTEXT TAGS AND SETTING ALL THE CONTEXT TAGS TO A PREDETERMINED VALUE FOR FLUSHING OPERATION THEREOF

Adrian R. Frost, Camberley, and Karl M. Henson, Windsor, both of Great Britain, assignors to International Computers Limited, London, England

Filed May 16, 1989, Ser. No. 352,393
Claims priority, application United Kingdom, Jun. 14, 1988, 8814077
Int. Cl.[5] G06F 12/08, 13/00, 12/12
U.S. Cl. 395—425 5 Claims



1. A data processing system comprising:

(a) a main memory

(b) a cache, having a plurality of locations, each location having a context tag, and a status indicator,

(c) data processing means for executing a plurality of processes, and for allocating one of a predetermined set of values excluding a predetermined reserved value to each of the processes as a context number for that process,

(d) context means coupled to said data processing means for storing a current context number equal to the context number of the process currently being executed by the data processing means,

(e) loading means coupled to the main memory, the cache, and the context means for loading a data item from the main memory into a location of the cache, overwriting any data item already in that location, and setting the context tag of that location equal to the current context number,

(f) setting means coupled to the cache for setting the status indicator of a location in the cache to indicate when a data item held in that location has been modified,

(g) copyback means coupled to the main memory and the cache for copying back modified data items from the cache to the main memory when they are about to be overwritten in the cache, and

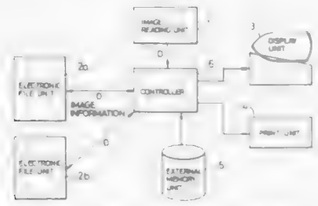
(h) flushing means couple to the cache and the data processing means and operative when all of said predetermined set of values have been allocated, for setting all the context tags in the cache to said predetermined reserved value.

5,146,604

INFORMATION FILING APPARATUS THAT STORES AND ERASES INFORMATION BASED ON FREQUENCY OF ITS USE

Yasufumi Takada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 55,515, May 29, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 655,186
Claims priority, application Japan, Jun. 6, 1986, 61-131436
Int. Cl.[5] G06F 12/00, 13/00
U.S. Cl. 395—425 31 Claims



1. An information filing apparatus comprising:

a plurality of memory mediums, comprising at least a first and a second memory medium;

information input means for inputting information to be stored into at least one of said plurality of memory mediums;

first filing means for storing the input information input by said information input means into said first memory medium and for reading out information stored in said first memory medium;

second filing means for copying a part of the information stored in said first memory medium to said second memory medium and reading out information stored in said second memory medium, wherein said second filing means comprises erasing means for erasing information stored in said second memory medium;

retrieving information input means for inputting retrieval information for retrieval of a desired information stored in said first and second memory mediums;

storage means for storing a retrieval history of the information retrieved; and

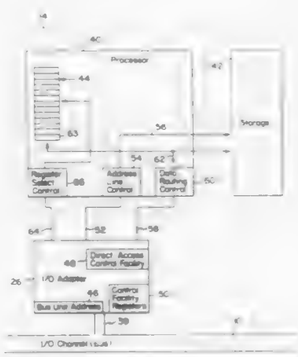
control means (1) for retrieving information from said first and second memory mediums on the basis of the retrieval information input by said retrieving information input means, wherein said control means determines which one of said first and second memory mediums the information to be retrieved has been stored into, and retrieves the information from said first or said second memory medium on the basis of such determination so that information is retrieved from said second memory medium when the information is stored in at least said second memory medium, and (2) for determining which information in said first memory medium is to be copied to said second memory medium in accordance with the retrieval history and initiating the copying of the determined information, wherein said control means determines which information is to be copied, in accordance with the retrieval history of the information which has been frequently used, and (3) for determining information to be erased in said second memory medium and initiating the erasing of the determined information, wherein said control means determines which information is to be erased, in accordance with the retrieval history of the information which has been infrequently used.

5,146,605

DIRECT CONTROL FACILITY FOR MULTIPROCESSOR NETWORK

Bruce L. Beukema, Hayfield; David W. Marquart, and Ronald D. Morse, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 119,758, Nov. 12, 1987, abandoned. This application Jan. 23, 1991, Ser. No. 644,799
Int. Cl.[5] G06F 9/00
U.S. Cl. 395—575 25 Claims



1. A control facility in a processor for providing control of the processor, said processor being coupled to a bus and having means for receiving and executing data processing commands from said bus, said control facility comprising:

means coupled to the bus for monitoring communications on the bus intended for the processor, wherein the bus communications comprise data, data processing commands from other processors attached to the bus, and control panel commands;

identifying means coupled to the monitoring means for identifying the control panel commands;

intercepting means responsive to the identifying means for intercepting communications consisting of control panel commands intended for the processor;

control panel command execution means for executing the commands identified by the identifying means; and

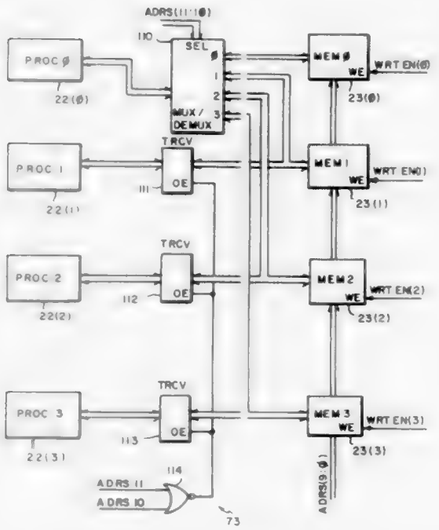
register selection means coupled to the command execution means and the processor for reading and writing registers in the processor as directed by the control panel commands to control the processor directly through the bus

5,146,605

SYSTEMS FOR INTERCONNECTING AND CONFIGURING PLURALITY OF MEMORY ELEMENTS BY CONTROL OF MODE SIGNALS

Robert S. Grondalski, Maynard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 909,013, Sep. 18, 1986, Pat. No. 4,985,832. This application Mar. 21, 1990, Ser. No. 496,886
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—800 17 Claims



1. An array processing system comprising:

A. a plurality of processing element means for processing data in response to instructions;

B. a plurality of memory means, corresponding to the number of processing element means, each said memory means for storing data in a plurality of storage locations each identified with a different one of said processing element means, said storage locations addressable by each said processor element means defining the address space for that processor element means; and

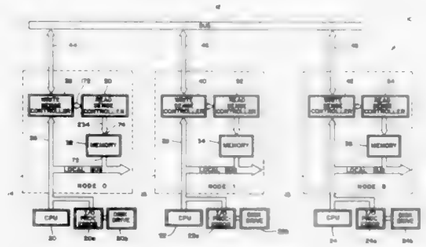
C. memory interconnection means connected to all of said processing element means and all of said memory means responsive to address signals defining an address and a mode signal having one of a plurality of conditions for coupling data between said memory means and said processing element means, said memory interconnection means being responsive to a first condition of said mode signal selected from said plurality of conditions for coupling data between each of said processing element means and its identified memory means, and responsive to a second condition of said mode signal selected from said plurality of conditions for coupling data between selected ones of said processing element means and memory means identified with others of said processing element means such that the address space for said selected ones of said processing element means is expanded to include the address space of said other processing element means.

5,146,607

METHOD AND APPARATUS FOR SHARING INFORMATION BETWEEN A PLURALITY OF PROCESSING UNITS

Paardeep K. Sood, Plantation; Roger A. Smith, Sunrise; Timothy J. Heeter, Ft. Lauderdale; Adriano Roganti, Margate, and John D. Acton, Ft. Lauderdale, all of Fla., assignors to Encore Computer Corporation, Marlborough, Mass.

Continuation of Ser. No. 403,779, Sep. 8, 1989, abandoned, which is a continuation of Ser. No. 880,222, Jun. 30, 1986, abandoned. This application Sep. 9, 1991, Ser. No. 758,726
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—800 7 Claims



1. A data processing system, comprising:

a data bus; and

a plurality of nodes connected to the data bus, at least one of said plurality of nodes comprises:

processor means for generating a data signal, an address signal and a memory write signal;

a dual port memory unit having a first storage area for storing data local to a respective node and a second storage area for storing data shared between the plurality of nodes;

a local bus connecting the processor means to a first port of the memory unit; and

write sensing means connected to the data bus and also to the processing unit through the local bus, said write sensing means comprising:

first comparator means for comparing address signals sensed from the local bus with a first predetermined value;

second comparator means for comparing the address signals sensed from the local bus with a second predetermined value;

first latch means for holding the data signals, address signals and write signals;

first offset logic means for normalizing the address signal in response to the address signal being released from the first latch means;

first request FIFO means for receiving data signals, and write signals from the first latch means, in response to receipt of a signal by the first latch means indicating that the address signal is of a value larger the first predetermined value, of a value smaller than the second predetermined value, and address signals from the first offset logic means;

transmitter means for transmitting the sensed data signals, normalized address signals and memory write signals in order of receipt by the first request FIFO means;

third comparator means for comparing address signals sensed from the data bus with a third predetermined value;

fourth comparator means for comparing the address signals sensed from the data bus with a fourth predetermined value; and

second offset logic means for offsetting the address signal to its original value upon a determination that the address signal is of a value larger than the third predetermined value and of a value smaller than the fourth predetermined value;

the at least one of the processing nodes further comprising read sensing means connected between the write sensing means and a second port of the memory, unit, said read sensing means comprising:

correction logic means for generating corrected signals for data sensed from the data bus by the write sensing means;

second request FIFO means for receiving data signals, address signals and write sense signals from the write sense logic; and

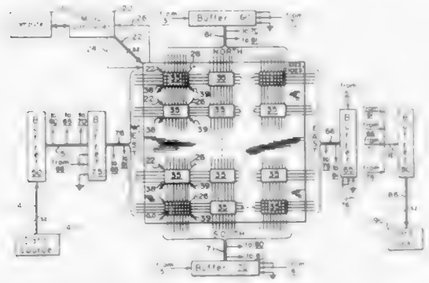
combining means for combining the correction signals with the data signals producing a corrected data signal to be delivered to the shared storage area of the memory unit.

5,146,608

PARALLEL PROCESSOR ARRAY SYSTEM CONTROLLED IN RESPONSE TO COMPOSITION STATUS SIGNAL

W. Daniel Hillis, 111 Ivy St., Brookline, Mass. 02146

Division of Ser. No. 184,739, Jun. 27, 1988, Pat. No. 5,008,815, which is a continuation of Ser. No. 499,474, May 31, 1983, Pat. No. 4,814,973. This application Oct. 23, 1990, Ser. No. 602,441
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—800 28 Claims



1. A parallel computer system comprising:

A. a communications network including a plurality of communications nodes interconnected by a plurality of communications links, said communications nodes receiving messages and transferring them over said communications links to others of said communications nodes in accordance with address information in said messages;

B. a processor array comprising a plurality of processing elements, each processing element being connected to a communications node, each processing element being responsive to commands to, in a plurality of successive processing cycles, selectively process data and generate messages including address information for transfer to the communications node connected thereto to thereby initiate transfer of the messages over said communications network, each processing element further generating processing status information having selected conditions each indicating the occurrence of a selected processing condition in said processing element;

C. a control processor for generating commands for transmission to said processing elements in parallel to control operations by said processing elements, said control processor operating in response to the condition of composite processing status information to facilitate selection of commands to be transmitted to the processing elements during the successive processing cycles; and

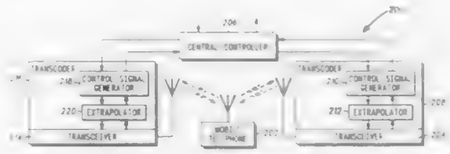
D. a command and status information distribution network connected to said control processor and said processing elements for coupling commands generated by said control processor to said processing elements in parallel to control processing by said processing elements in parallel, and for receiving processing status information from said processing elements in parallel and generating in response composite processing status information for transfer to said control processor, the composite processing status information generated during a processing cycle having a condition that reflects the condition of the processing status information concurrently generated by all of said processing elements.

5,146,609

CELLULAR RADIO SYSTEM HAVING REDUCED HANDOVER DISRUPTION AND METHOD FOR USE IN SUCH A SYSTEM

Daniel R. Tayloe, Arlington Heights, and Michael D. Kotzin, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1990, Ser. No. 486,049
Int. Cl.[5] H04Q *7/00;* H04B *1/00*
U.S. Cl. 455—33.2 20 Claims



15. A method of handover from a first channel in a first cell to a second channel in a second cell in a cellular radio communication system covering a plurality of cells and having a plurality of base station radios each serving a respective cell, a population of user radios which may communicate on radio channels with the plurality of base station radios in the plurality of cells, and a central controller linked to the plurality of base station radio transceivers for communicating messages between the central controller and the population of user radios, the method comprising the steps of:

generating a fill-in message extrapolated from the message of the one of the user radios on the first channel and communicating the fill-in message when the one of the user radios ceases communicating on the first channel in the first cell;

validating when the one of the user radios begins communicating on the second channel in the second cell; and terminating the fill-in message when the one of the user radios begins communicating on the second channel, in the second cell, thereby reducing handover disruption.

5,146,610

DISCONTINUOUS TRANSMISSION MUTING/UNMUTING SYSTEM WITH LINK CONTINUITY

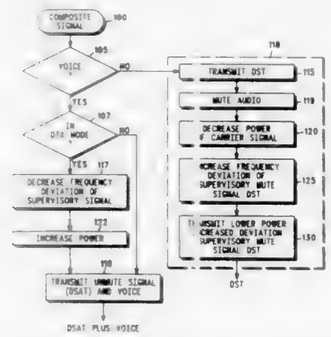
Theodore F. Longshore, Hoffman Estates, Ill.; William H. Balacky, Hammond, Ind.; William P. DeClerk, Palatine, Ill.; James C. Baker, Hanover Park, Ill.; Paul S. Everline, Schaumburg, Ill., and Christopher G. Rittler, Elmhurst, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 29, 1989, Ser. No. 442,956
Int. Cl.[5] H04Q *7/00, 9/02;* H04B *1/10*
U.S. Cl. 455—35.1 20 Claims

1. A method for facilitating communication link continuity, comprising the steps of:

(a) decreasing power of a carrier signal modulated by a modulating signal; and

(b) increasing the frequency deviation of the modulating signal to a point not to exceed a predetermined bandwidth



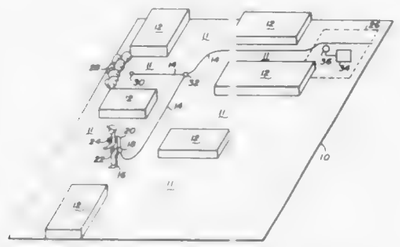
such that the signal to noise ratio of the modulated carrier signal is maintained at a predetermined threshold.

5,146,61

MINE COMMUNICATION CABLE AND METHOD FOR USE

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Filed Nov. 17, 1987, Ser. No. 121,524
Int. Cl.[5] H04B *13/02*
U.S. Cl. 455—40 **32 Claims**



25. A mine communication system comprising:

a portable lightweight rope that can be carried into a mine by a single human being miner and extended along a mine passageway, and comprising a plurality of flexible, noninsulated tin plated copper wires extending continuously over the length of the rope and interwoven with a plurality of strands of a flexible, strong, lightweight synthetic material;

at least one insulated stainless steel wire extending continuously over the length of the rope;

a first transceiver inductively coupled to the lightweight rope at a first location by a first magnetic dipole antenna; and

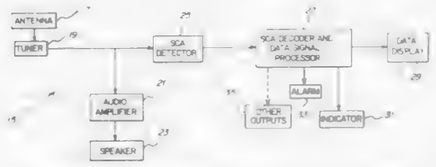
a second transceiver inductively coupled to the lightweight rope at a second location by a second magnetic dipole antenna, whereby a radio communication pathway is established between the first and second transceivers over the lightweight rope.

5,146,612

TECHNIQUE FOR USING A SUBCARRIER FREQUENCY OF A RADIO STATION TO TRANSMIT, RECEIVE AND DISPLAY A MESSAGE TOGETHER WITH AUDIO REPRODUCTION OF THE RADIO PROGRAM

Jon P. Grosjean, Box 110, Pulpit Rock Rd., S. Woodstock, Conn. 06267; Stuart E. Ross, 22 Capitola Rd., Danbury, Conn. 06811, and Daniel J. Semple, 4615 Northwood Rd., Glen Arbor, Mich. 49636

Continuation of Ser. No. 339,313, Apr. 17, 1989, abandoned. This application May 3, 1991, Ser. No. 697,728
Int. Cl.[5] H04B *7/00*
U.S. Cl. 455—45 **3 Claims**



1. Apparatus for transmitting and receiving a radio frequency signal, comprising:

radio program input means for providing a program signal on a main carrier frequency;

information signal generating means for providing an information signal normally continuously transmitted on a subcarrier frequency of the main carrier frequency, except for given time intervals;

data generating means for providing a data signal to be transmitted on said subcarrier frequency and including first means for determining said given time intervals when the information signal is not transmitted on said subcarrier frequency, and means for transmitting said data signal over said subcarrier frequency during said given time intervals;

transmitting means for normally combining the program signal and the information signal into a first composite signal, and for combining the program signal and the data signal only during at least a portion of the given time intervals to form a second composite signal;

receiver means for receiving the first and second radiated composite signals and separating them into a program signal component, a first subcarrier frequency component, and a second subcarrier frequency component;

second means for determining said given time intervals when the information signal is not present on the subcarrier frequency component;

speaker means for audibly reproducing the program signal component and the first subcarrier frequency component;

means for inhibiting said speaker means during at least a portion of the given time intervals; and

display means for displaying a message corresponding to the data signal in the second subcarrier frequency component simultaneously with the audible reproduction of the program signal component.

5,146,613

LOW POWER UHF DATA TRANSCEIVER

Fred J. Anderson, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Nov. 16, 1990, Ser. No. 614,488
Int. Cl.[5] H04B *1/44*
U.S. Cl. 455—78 **11 Claims**

9. A low power data transceiver comprising;

an antenna,

a transmission buffer,

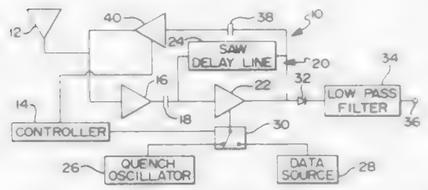
an RF amplifier

an RF oscillator having an input and an output and a feedback circuit containing a surface acoustic wave device coupling the input and the output to cause RF oscillations,

means for coupling the oscillator output to the transmission buffer to produce a signal for transmission,

switch means connected to the transmission buffer for coupling transmit signals to the antenna during transmission mode,

means effective during receiving mode for switching the



oscillator between an oscillating and an non-oscillating condition,

means for coupling the RF amplifier to the oscillator input to modulate the oscillator, and

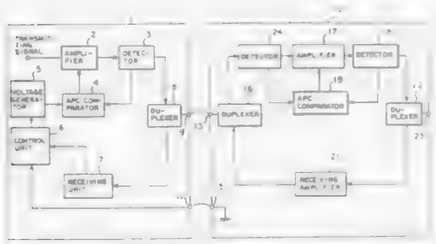
a low pass filter means coupled to said output of said oscillator for detecting oscillation modulation caused by input signals.

5,146,614

RADIO TRANSCEIVER APPARATUS WITH BOOSTER

Kenichi Furuno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,156
Claims priority, application Japan, Apr. 10, 1989, 1-88104
Int. Cl.[5] H04B *1/38, 1/04*
U.S. Cl. 455—89 **22 Claims**



17. A booster apparatus comprising:

a signal terminal for receiving a transmitting signal which is to be amplified and for outputting a received signal which is received from an external transmission source;

an amplifier connected to receive said transmitting signal from said signal terminal and which amplifies said transmitting signal supplied from said signal terminal;

an input power detecting means which detects the signal level of said transmitting signal which is inputted to said amplifier;

a transmitting power detecting means which detects the signal level of the output signal of said amplifier;

a transmitting level setting means which receives a first detected signal output by said input power detecting means and a second detected signal output by said transmitting power detecting means, and causes the signal level of the output signal of said amplifier to set the gain of said amplifier such that said signal level of said second detected signal is maintained in a fixed relation with said first detected signal; and

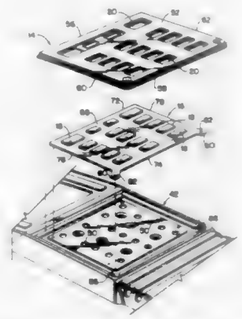
means for outputting the output signal of said amplifier to an antenna connecting terminal for the booster apparatus and supplying a received signal input to said antenna connecting terminal for the booster apparatus to said signal terminal.

5,146,615

INTERCHANGEABLE CONTROL PANELS AND KEYPADS FOR RADIO TRANSCEIVERS AND RELATED PROCESS

Roy F. Hodsdon, and Douglas M. Dickson, both of Lynchburg, Va., assignors to Ericsson GE Mobile Communications Holding Inc., Lynchburg, Va.

Filed Aug. 7, 1989, Ser. No. 390,254
Int. Cl.[5] H04B *1/38*
U.S. Cl. 455—90 **4 Claims**



1. A method of configuring an other wise standardized radio transceiver unit to one of a plurality of specific model designations, each with a different capability, the transceiver unit including a housing, the housing having a front cover for receiving a keypad formed with a plurality of keys and a control panel formed with apertures corresponding in number and arrangement to said keys, and a circuit board within said housing, said circuit board including a maximum number of switches arrayed thereon, said maximum number corresponding to one model designation of highest capability, said switches which are individually and directly accessible by individual ones of said keys, the method comprising the steps of:

a) providing a plurality of flexible keypads having varying numbers to keys equal to or less than said maximum number of switches, the keys of each keypad located and arranged to access respective ones of said switches;

b) providing a plurality of control panels, each having a plurality of apertures, wherein each keypad has an associated control panel with apertures arranged to receive the keys of a respective keypad; and

c) selecting a keypad and associated control panel which permits access to a predetermined number of said switches, so that said standardized transceiver unit can be configured to said one model designation of highest capability or other model designations of lesser capability without altering said circuit board.

5,146,616

ULTRA WIDEBAND RADAR TRANSMITTER EMPLOYING SYNTHESIZED SHORT PULSES

Raymond Tang, Fullerton, and James G. Small, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

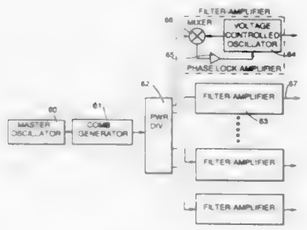
Filed Jun. 27, 1991, Ser. No. 722,621
Int. Cl.[5] H04B *7/00;* **G01S** *7/282*
U.S. Cl. 455—103 **5 Claims**

1. A phase coherent transmitter chain comprising;

a master oscillator;

a harmonic generator coupled to said master oscillator for

developing an output signal containing all of the spectral components of a predetermined pulse train;
a power divider coupled to said harmonic generator for distributing said output signal;
a plurality of final filter amplifiers coupled to said power divider that are responsive to said output signal developed by said harmonic generator, each of said plurality of final filter amplifiers adapted to amplify one spectral component of said predetermined pulse train, each of said plurality of final filter amplifiers comprising a voltage controlled oscillator, a phase lock amplifier and a mixer connected as a phase-locked VCO circuit;
a plurality of duplexers each individually coupled to the output of a different one of said plurality of final filter amplifiers; and
a broadband multiplexing feed coupled to said plurality of duplexers and having an aperture.

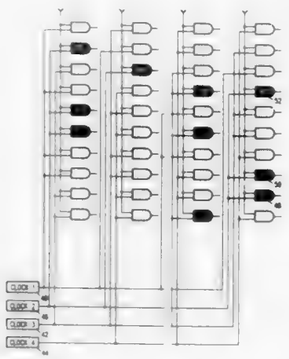


5,146,617

HARMONIC NOISE MINIMIZATION IN A RADIO RECEIVER BY SELECTIVELY OPTIMIZING IC'S WHICH PRODUCE HARMONICS IN THE RADIO'S FREQUENCY RANGE

Russell R. Moen, Jr., Tigard, Oreg., assignor to Seiko Corp., Japan and Seiko Epson Corp., Japan

Filed Oct. 15, 1990, Ser. No. 597,834
Int. Cl.[5] H03K 6/04; H04B 1/10
U.S. Cl. 455—310 4 Claims



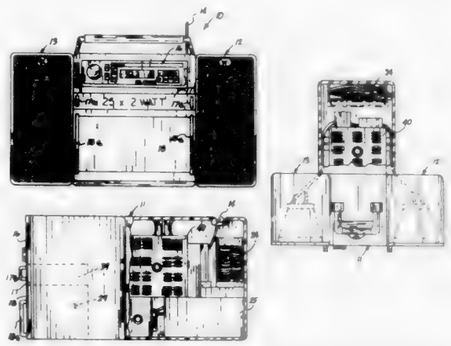
3. A digital electronic circuit as part of a radio/pager receiver, electronic signals at certain interfering frequencies interfering with the operation of said radio/pager receiver, said digital electronic circuit having harmonic noise minimization circuitry comprising:
a plurality of clock mechanisms in a digital circuit, at least one of said clock mechanisms operating at a frequency which generates harmonic signals which normally interfere with the operation of the radio receiver,
a power supply which supplies a known voltage to said electronic circuit,
an array of digital electronic devices coupled to said plurality of clock mechanisms, said array having devices of a first design and devices of a second design, said devices of said first design being standard devices, said devices of said second design being driven by said at least one clock mechanism which operates at an interfering frequency, said devices of said second design being modified to operate at a voltage and current less than said known voltage and current.

5,146,618

AUTOMOTIVE RADIO SUPPORT AND CONVERSION APPARATUS

Jeffrey W. Wenner, 108 Pixie Moss Trail, Medford, N.J. 08055

Filed May 24, 1990, Ser. No. 527,853
Int. Cl.[5] H04B 1/08
U.S. Cl. 455—345 1 Claim



1. An automotive radio support and conversion apparatus comprising, in combination,
a housing, the housing including a forward wall, a top wall, a rear wall, a right side wall, and a left side wall, the right side wall including a right speaker selectively securable thereto, and the left side wall including a left speaker selectively securable thereto, and
an audio unit securable within said housing, and
power means within said housing for directing selectively direct current or alternating current to said audio means, and
a battery pack mounted through a rear wall of said housing, and
an alternating current electrical cord mounted through the wall of said housing adjacent the battery pack, and
a storage unit mounted within said housing underlying the audio unit, and
wherein the top wall of the housing includes a telescoping antenna pivotally mounted thereto, and a semi-cylindrical recess mounted to the top wall of the housing for receiving the antenna in a nested configuration therewithin, and
wherein the storage unit includes a panel removably mounted thereto, and
wherein the panel includes a first and second "U" shaped handle fixedly mounted to a forward surface of the panel to permit selective removal of the panel relative to the housing, and
including a compartment directed rearwardly of the panel underlying the audio unit, the compartment including a series of vertical partition walls mounted within the compartment, and
the partition panels define a plurality of "T" shaped cavities, the "T" shaped cavities vertically aligned within the compartment to selectively receive a cassette member or a compact disk member within each "T" shaped cavity, and
the housing is formed of a polymeric fluid impermeable material, and
the right speaker and the left speaker include a respective right speaker wire and left speaker wire directed from each respective right and left speakers to the housing, and the housing including a right spool and a left spool to selectively accommodate the respective right and left speaker wire thereabout for storage, and
each right and left spool is fixedly and orthogonally mounted to the rear wall of the housing, and
each right and left speaker includes a speaker wire cavity formed through the rear wall of each speaker, the speaker wire cavity of each speaker including a plurality of speaker wire connectors to permit selective association of each speaker, with alternative audio speaker outputs from an associated amplifier.

5,146,619

EAR-SUPPORTED RADIO

Nancy Brown, #3 Solitude Way, Wilmington, Del. 19808

Filed Jul. 25, 1990, Ser. No. 557,022
Int. Cl.[5] H04B 1/08
U.S. Cl. 455—351 11 Claims

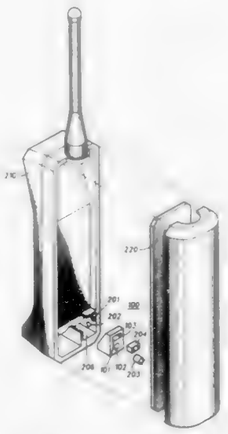
11. An ear radio to be supported by the ears of a user, said radio comprising:
(a) a first component comprising a first casement having inner and outer surfaces and designed in size and configuration to fit over a first ear of said user, radio circuitry means for receiving radio signals and converting said radio signals to sound mounted within said first casement, radio function controls mounted on said exterior surface of said first casement, radio speaker means operatively connected to said radio circuitry means and mounted on said inner surface of said first casement and designed to extend within the ear canal of said first ear and first retaining means for retaining said first component at said first ear, said first retaining means being configured to conform to the juncture between said first ear and the head of the user;
(b) a second component comprising a second casement having inner and outer surfaces and designed in size and configuration to fit over a second ear of said user, power supply means mounted within said second casement, radio speaker means mounted on said inner surface of said second casement and designed to extend within the ear canal of said second ear, and second retaining means for retaining said second component at said second ear, said second retaining means being configured to conform to the juncture between said second ear and the head of the user;
(c) circuitry for electrically connecting said power supply means and said speaker means in said second component with said radio circuitry means in said first component; and
wherein said first and second retaining means includes flexible wire like-element having a first loop-like portion with one end secured to the inner surface of said casement and a second portion integral with said loop-like portion and configured to snugly fit into said junction between the ears and the head.

5,146,620

ONE-PIECE, LIGHT CONDUCTING GASKET

Todd G. Swikle, Chicago, and Carl V. Novak, Pell Lake, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1990, Ser. No. 545,012
Int. Cl.[5] H04B 1/08
U.S. Cl. 455—351 5 Claims



1. A one-piece, light-conducting, gasketing apparatus for a device having internal connecting means and lighting means, the internal connecting means having the ability to couple to external connecting means through a first opening in the device, the lighting means emitting light through a second opening in the device, the apparatus comprising:
a translucent material having a resilient property to seal the first and second openings;
a first receptacle in the material, having at least five sides, for receiving the internal connecting means, the first receptacle having a hole through a first side of the at least five sides and extending through the apparatus; and
a second receptacle in the material for receiving the lighting means

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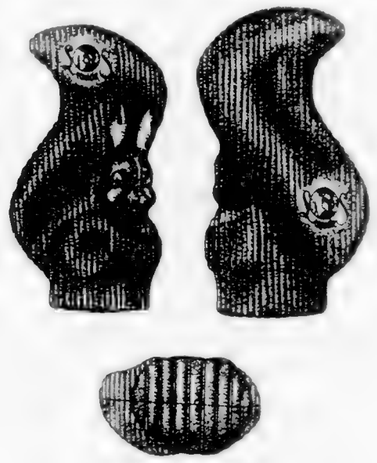
DESIGN PATENTS

GRANTED September 8, 1992

ERRATA

For CLASS	See PATENT NO.
D06-333 ...	 329,248

329,114
CHOCOLATE CANDY
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,266
Claims priority, application Hague, Oct. 3, 1989, DM/014749
Term of patent 14 years
U.S. Cl. D1—107



329,115
CHOCOLATE CANDY
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,267
Claims priority, application Hague, Oct. 3, 1989, DM/014.749
Term of patent 14 years
U.S. Cl. D1—107

329,116
CHOCOLATE CANDY
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,273
Claims priority, application Hague, Oct. 3, 1989, DM/014.749
Term of patent 14 years
U.S. Cl. D1—107

329,117
CHOCOLATE CANDY
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,274
Claims priority, application Hague, Oct. 3, 1989, DM/014.749
Term of patent 14 years
U.S. Cl. D1—107

329,118
CHOCOLATE CANDY IN THE SHAPE OF A BISHOP
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,270
Claims priority, application Hague, Oct. 3, 1989, DM/014.749
Term of patent 14 years
U.S. Cl. D1—108

329,119
CHOCOLATE CANDY
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,271
Claims priority, application Hague, Oct. 3, 1989, DM/014749
Term of patent 14 years
U.S. Cl. D1—108

329,120
PRALINE OR SIMILAR ARTICLE
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,421
Claims priority, application Netherlands, Oct. 3, 1989, DM/014.749
Term of patent 14 years
U.S. Cl. D1—127

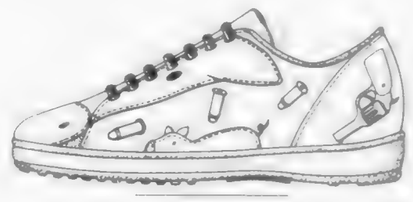
329,121
PRALINE OR SIMILAR ARTICLE
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,422
Claims priority, application Hague, Oct. 3, 1989, DM/014749
Term of patent 14 years
U.S. Cl. D1—127

329,122
PRALINE OR SIMILAR ARTICLE
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,432
Claims priority, application Hague, Oct. 3, 1989, DM/014749
Term of patent 14 years
U.S. Cl. D1—127

329,123
PRALINE OR SIMILAR ARTICLE
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,433
Claims priority, application Hague, Oct. 3, 1989, DM/014749
Term of patent 14 years
U.S. Cl. D1—127

329,124
SHOE
Mike Soo, No. 403, Chung Shan Rd., Jen Teh Hsiang, Tainan Hsien, Taiwan
Filed Feb. 14, 1991, Ser. No. 655,095
Term of patent 14 years
U.S. Cl. D2—275

329,125
TENNIS SHOE
Pauline Hatfield, 67 47 16th Pl. North, Apt. 534, St. Petersburg, Fla. 33710
Continuation-in-part of Ser. No. 191,109, May 5, 1988, abandoned. This application Jan. 29, 1991, Ser. No. 648,444
Term of patent 14 years
U.S. Cl. D2—279

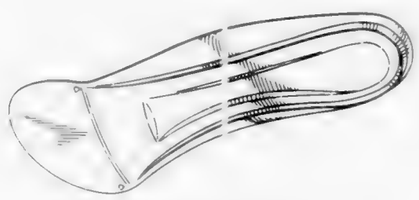


329,126
ELEMENT OF UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 6, 1990, Ser. No. 505,526
Term of patent 14 years
U.S. Cl. D2—314

329,127
SHOE UPPER
David Preskar, N. Quincy; Wayne Russell, Cohasset, and Paul D. Brown, Hingham, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Nov. 22, 1991, Ser. No. 795,901
Term of patent 14 years
U.S. Cl. D2—314

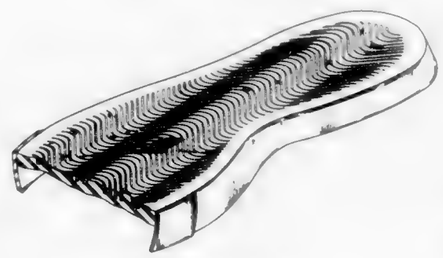
329,128
SHOE UPPER
Bruce E. Rogers, Portland, and Michael A. Aveni, Lake Oswego, both of Oreg., assignors to Nike, Inc. & Nike International, Ltd., Beaverton, Oreg.
Filed Jul. 3, 1991, Ser. No. 725,249
Term of patent 14 years
U.S. Cl. D2—314

329,129
ORTHOTIC SHOE INSERT
Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratory, Inc., Blaine, Wash.
Filed Feb. 16, 1990, Ser. No. 481,126
Term of patent 14 years
U.S. Cl. D2—318

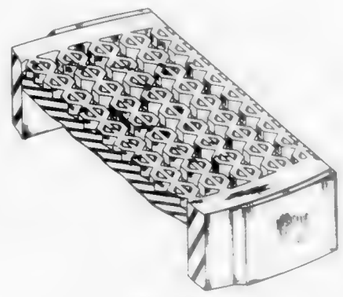


329,130
SHOE SOLE
Mike Y. S. Yoon, Sam Ho Garden, Apartment 2-1106, Pusan, Rep. of Korea
Filed Oct. 19, 1989, Ser. No. 423,116
Claims priority, application Rep. of Korea, Apr. 19, 1989, 5017
Term of patent 14 years
U.S. Cl. D2—320

329,131
SHOE SOLE WITH WAVY TREAD
Leif J. Ostberg, Wayne, N.J., assignor to Leif J. Ostberg, Inc., Wayne, N.J.
Filed Feb. 21, 1991, Ser. No. 658,577
Term of patent 14 years
U.S. Cl. D2—320



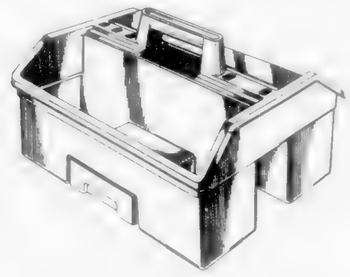
329,132
SHOE SOLE WITH DEEP HEXAGON TREAD
Leif J. Ostberg, Wayne, N.J., assignor to Leif J. Ostberg, Inc., Wayne, N.J.
Filed Feb. 21, 1991, Ser. No. 658,580
Term of patent 14 years
U.S. Cl. D2—320



329,133
LIGHTED WALKING CANE
Henry H. Ragatz, 2469 E. "F" St., Moscow, Id. 83843
Filed Dec. 20, 1990, Ser. No. 630,947
Term of patent 14 years
U.S. Cl. D3—7

329,134
ATTACHE CASE
Mitsushige Tokuda; Jiro Mokko, and Hiroshi Kinoshita, all of Tokyo, Japan, assignors to Sky Aluminium Co., Ltd., Tokyo, Japan
Filed Jul. 6, 1990, Ser. No. 549,500
Claims priority, application Japan, Aug. 1, 1988, 63-30798
Term of patent 14 years
U.S. Cl. D3—76

329,135
TOOL CADDY
Donald Embree, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 23, 1988, Ser. No. 197,814
Term of patent 14 years
U.S. Cl. D3—30.1



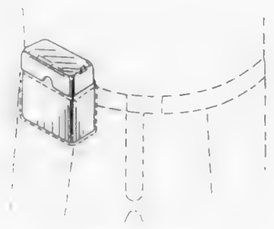
329,136
CONDOM HOLDING KEYCHAIN
Marion A. Sanchez, 1324 Jacqueline Pl., San Lorenzo, Calif. 94580
Filed Mar. 15, 1988, Ser. No. 168,365
Term of patent 14 years
U.S. Cl. D3—62

329,137
COMBINATION KEY HOLDER AND FLOSS DISPENSER
James P. Hinson, 1626 Fountainview Rd., Houston, Tex. 77057
Filed Mar. 29, 1990, Ser. No. 500,856
Term of patent 14 years
U.S. Cl. D3—62

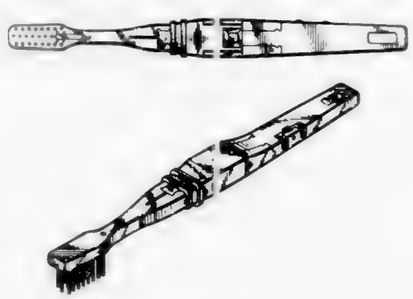
329,138
SUITCASE
Dick M. Hsieh, No. 18, Lane 777, Chung Shan Rd., Kuei Jen Hsiang, Tainan Hsien, Taiwan
Filed Dec. 20, 1990, Ser. No. 631,035
Term of patent 14 years
U.S. Cl. D3—76

329,139
PULLMAN SUITCASE
Terry Oltrogge, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Dec. 21, 1989, Ser. No. 454,870
Term of patent 14 years
U.S. Cl. D3—77

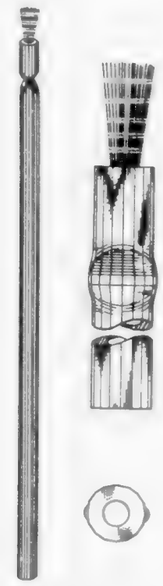
329,140
CARRYING CASE FOR SHOTGUN SHELLS
Mark W. Maricle, P.O. Box 323, Jamestown, Colo. 80455
Filed May 9, 1990, Ser. No. 521,168
Term of patent 14 years
U.S. Cl. D3—104



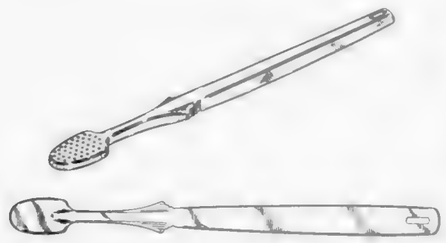
329,141
ELECTRONIC TOOTHBRUSH
Hiroshi Hukuba, No. 914-1, Nazukari, Nagareyama, Chiba, Japan
Filed Jul. 16, 1990, Ser. No. 553,005
Claims priority, application Japan, Jan. 18, 1990, 2-997
Term of patent 14 years
U.S. Cl. D4—101



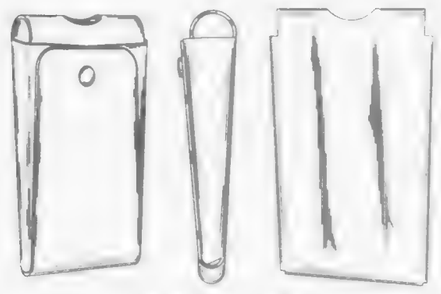
329,142
DENTAL BRUSH HANDLE
John J. Discko, Jr., Hamden, and William B. Dragan, Easton, both of Conn., assignors to Centrix, Inc., Milford, Conn.
Filed Mar. 5, 1990, Ser. No. 487,824
Term of patent 14 years
U.S. Cl. D4—104



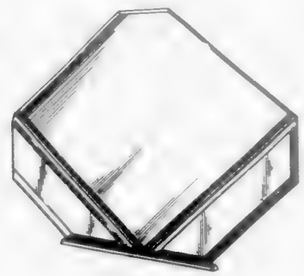
329,143
TOOTHBRUSH HEAD AND HANDLE UNIT
Anthony Booth, Chester; Anthony Piano, Sparta; Byron Woodrum, Flemington; Michael J. Allsop, West Windsor, all of N.J.; Robert L. Berger, New Hope, Pa., and Richard M. Hyman, Sr., Iowa City, Iowa, assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 24, 1990, Ser. No. 514,498
Term of patent 14 years
U.S. Cl. D4—104



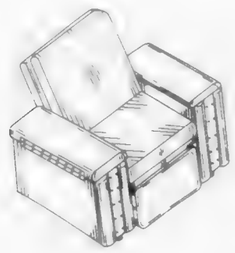
329,144
PROTECTIVE COVER FOR A PAINTBRUSH
Devin E. Kurtz, 4201 Kingsbury Dr., Fort Collins, Colo. 80525
Filed Jan. 11, 1990, Ser. No. 463,665
Term of patent 14 years
U.S. Cl. D4—199



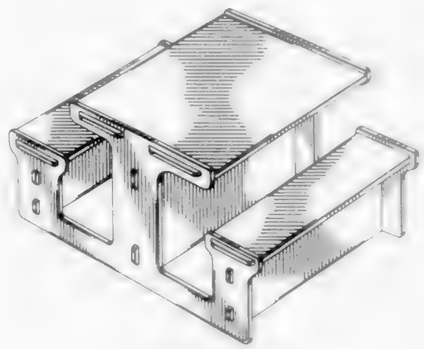
329,145
MIRROR
Jericho P. Pauer, Onalaska, and Darrin M. Swagel, Arcadia, both of Wis., assignors to Ashley Furniture Industries, Inc., Arcadia, Wis.
Filed Jun. 4, 1990, Ser. No. 532,984
Term of patent 14 years
U.S. Cl. D6—300



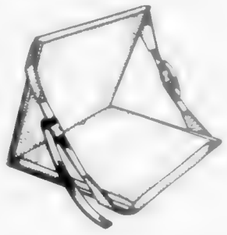
329,146
COMBINED CHAIR AND STORAGE UNIT
Kathleen Neal, 1004 W. Lusher Ave., Elkhart, Ind. 46517
Filed Jul. 14, 1989, Ser. No. 379,905
Term of patent 14 years
U.S. Cl. D6—336



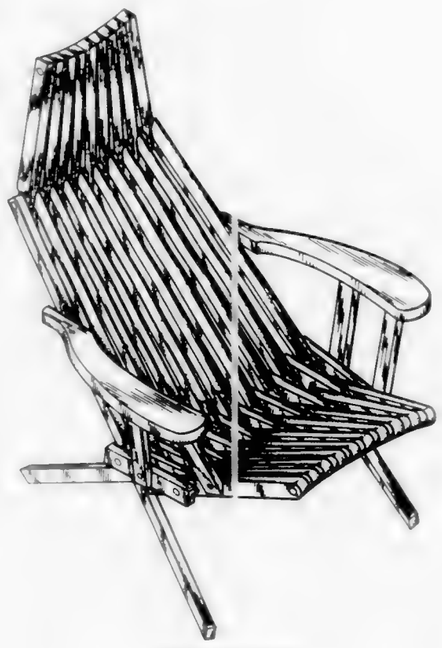
329,147
COMBINED TABLE AND BENCH UNIT
Paul J. Gandy, Tucson, Ariz., assignor to Marana Unique Products Inc., Marana, Ariz.
Filed May 8, 1989, Ser. No. 349,333
Term of patent 14 years
U.S. Cl. D6—337



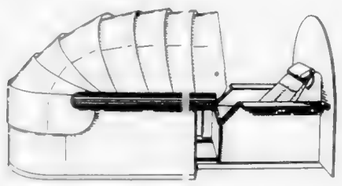
329,148
COLLAPSIBLE SEAT
Phillip Hwang, and Lisa Hwang, both of Taipei, Taiwan, assignors to Goodway Corporation, Taipei, Taiwan
Filed Sep. 13, 1989, Ser. No. 406,745
Term of patent 14 years
U.S. Cl. D6—368



329,149
LOUNGE CHAIR
Kathryn E. Swope, 1693 Newmans-Cardington Rd., E., Waldo, Ohio 43356
Filed Jun. 14, 1991, Ser. No. 716,380
Term of patent 14 years
U.S. Cl. D6—370

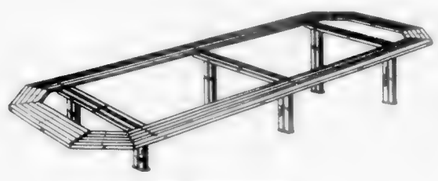


329,150
COMPUTER WORK STATION
Douglas Ball, 178 Senneville Road, Senneville, Que., H9X 3L2, Canada
Filed Aug. 2, 1990, Ser. No. 561,660
Term of patent 14 years
U.S. Cl. D6—397

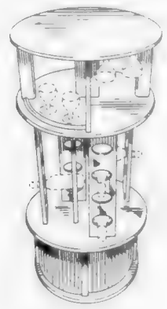


329,151
PORTABLE STORAGE UNIT
Jeffrey A. Baer, Rockford, Ill., assignor to Smith Investment Company, Belvidere, Ill.
Filed Nov. 13, 1989, Ser. No. 434,127
Term of patent 14 years
U.S. Cl. D6—433

329,152
DISPLAY STAND FOR A VEHICLE
Lars A. Mattsson, Malmö , Sweden, assignor to Media Display AB, Malmo, Sweden
Filed Feb. 22, 1989, Ser. No. 314,208
Claims priority, application Sweden, Aug. 22, 1988, 88 1881
Term of patent 14 years
U.S. Cl. D6—462



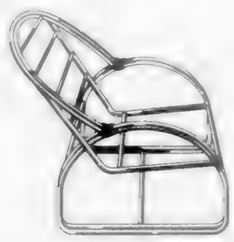
329,153
BEVERAGE CAROUSEL
Kevin Kijanka, 9 Tomlinson Ave., and Richard Kijanka, 11 Fox Rd., both of Plainville, Conn. 06062
Filed Feb. 12, 1990, Ser. No. 478,785
Term of patent 14 years
U.S. Cl. D6—467



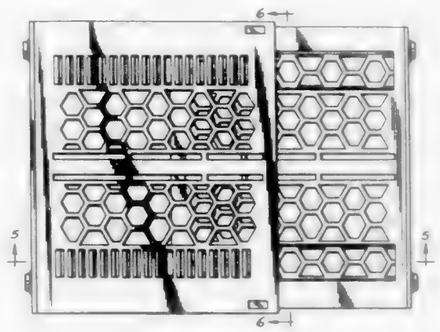
329,154
FILE FOR RECYCLABLE PAPER MATERIALS
Rebecca L. Waterston, Golden Valley, Minn., assignor to Liberth Diversified Industries, New Hope, Minn.
Filed Apr. 11, 1990, Ser. No. 507,728
Term of patent 14 years
U.S. Cl. D6—476

329,155
SHELVING UNIT
Paul Schremmer, Hunters Hill, Australia, assignor to John Lysaght (Australia) Ltd., Sydney, Australia
Filed May 30, 1990, Ser. No. 530,250
Claims priority, application Australia, Feb. 23, 1990, 553/90
Term of patent 14 years
U.S. Cl. D6—479

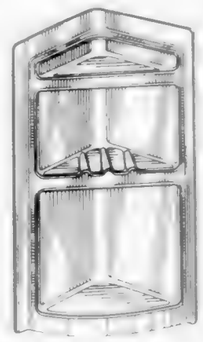
329,156
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company, Inc., Birmingham, Ala.
Filed Sep. 25, 1990, Ser. No. 588,306
Term of patent 14 years
U.S. Cl. D6—500



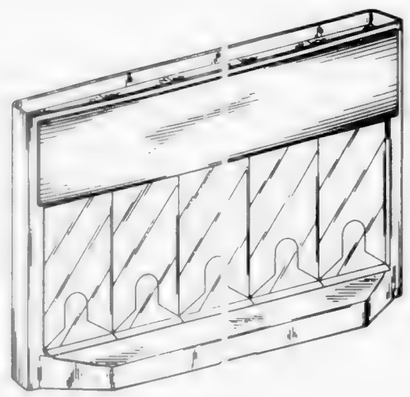
329,157
ADJUSTABLE SHELF FOR USE IN A LOCKER
Donald G. Santucci, 1154 Avenue Le Provence, Naperville, Ill. 60540
Filed Jun. 2, 1989, Ser. No. 360,727
Term of patent 14 years
U.S. Cl. D6—511



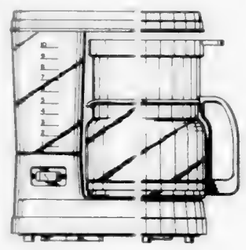
329,158
BATHROOM CORNER SHELF UNIT
Gino Tuzi, 5 Oldham Crescent, Brampton, Ontario, L6Z 1W2, Canada
Filed Oct. 24, 1989, Ser. No. 426,360
Claims priority, application Canada, Sep. 29, 1989, 20-09-89-2
Term of patent 14 years
U.S. Cl. D6—562



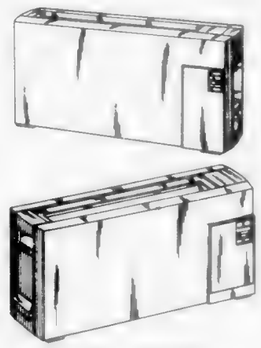
329,159
FIVE COLUMN COUNTER DISPLAY
Dennis L. Oldorf, 8178 Round Hills Cir., Las Vegas, Nev. 89113
Filed Feb. 15, 1990, Ser. No. 481,465
The portion of the term of this patent subsequent to Jul. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—515



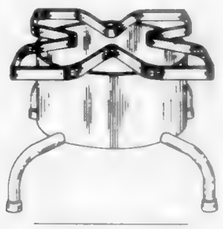
329,160
COFFEE MAKER
Lung W. Choi, Kowloon, Hong Kong, assignor to Goodway Electrical Company Limited, Kowloon, Hong Kong
Filed Oct. 24, 1989, Ser. No. 425,717
Claims priority, application United Kingdom, May 4, 1989, 1059211
Term of patent 14 years
U.S. Cl. D7—309



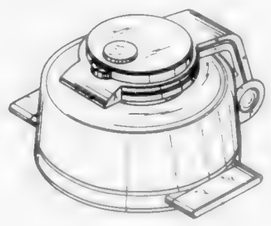
329,161
TOASTER
Roger Eisenberg, Marly, France, assignor to SEB, Selongey, France
Filed Jul. 12, 1990, Ser. No. 551,478
Claims priority, application France, Jan. 12, 1990, 900210
Term of patent 14 years
U.S. Cl. D7—330



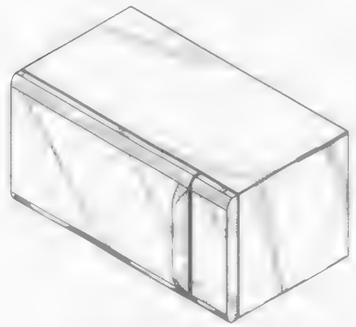
329,162
PORTABLE COOKER
William A. Dutro, 12043 N. 2000 East, Cove, Utah 84320, and Ty Meason, 137 W. 500 South, Logan, Utah 84321
Filed Dec. 24, 1990, Ser. No. 632,509
Term of patent 14 years
U.S. Cl. D7—332

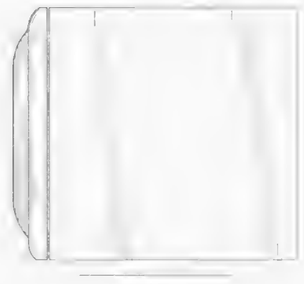


329,163
CONVECTION OVEN
Kwei T. Chang, No. 14, Lane 54, Luong Chuan St., Panchiao, Taipei Hsien, Taiwan
Filed Apr. 27, 1989, Ser. No. 344,157
Term of patent 14 years
U.S. Cl. D7—348

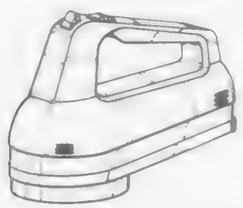


329,164
MICROWAVE OVEN
Robin Edman, Dublin, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jun. 17, 1991, Ser. No. 716,618
Term of patent 14 years
U.S. Cl. D7—351

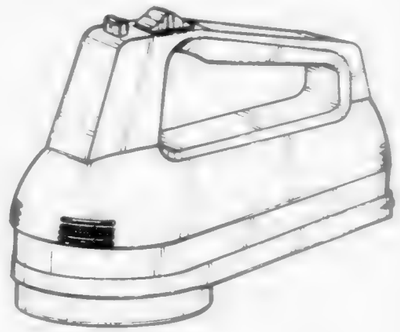




329,165
HOUSING FOR A HAND-HELD MIXER
Lawrence A. Doggett, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 12, 1989, Ser. No. 449,610
The portion of the term of this patent subsequent to Sep. 8, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—376

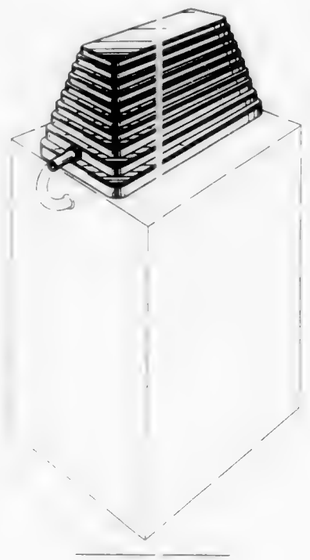


329,166
HOUSING FOR A HAND-HELD MIXER
Lawrence A. Doggett, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 12, 1989, Ser. No. 449,733
The portion of the term of this patent subsequent to Sep. 8, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—376

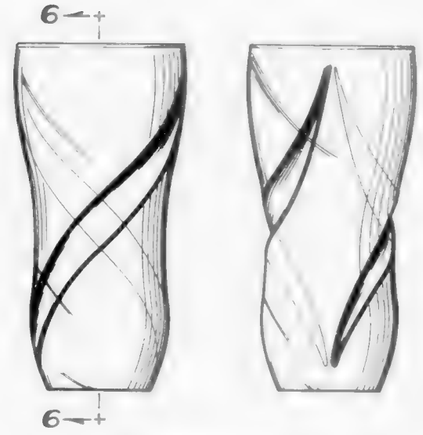


329,167
COLLAPSIBLE WATER COOLER CONTAINER
Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35631
Filed Oct. 9, 1990, Ser. No. 594,196
Term of patent 14 years
U.S. Cl. D7—397

329,168
COLLAPSIBLE WATER COOLER CONTAINER
Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35631
Filed Oct. 9, 1990, Ser. No. 594,197
Term of patent 14 years
U.S. Cl. D7—397

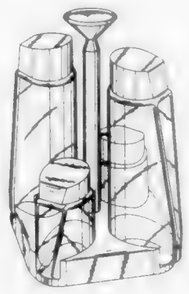


329,170
DRINKING GLASS
William E. Hoffer, Yardley, Pa., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Aug. 15, 1989, Ser. No. 394,789
Term of patent 14 years
U.S. Cl. D7—509

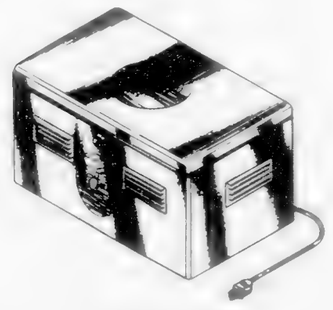


329, 69
COLLAPSIBLE WATER COOLER CONTAINER
Edward S. Robbins, III, 459 North Ct., Florence, Ala. 35631
Filed Oct. 9, 1990, Ser. No. 594,199
Term of patent 14 years
U.S. Cl. D7—397

329,171
COMBINED CRUETS AND STAND THEREFOR
Furio Minuti, Macerata, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jan. 29, 1990, Ser. No. 471,805
Claims priority, application Italy, Aug. 23, 1989, 21622/89[U]
Term of patent 14 years
U.S. Cl. D7—592

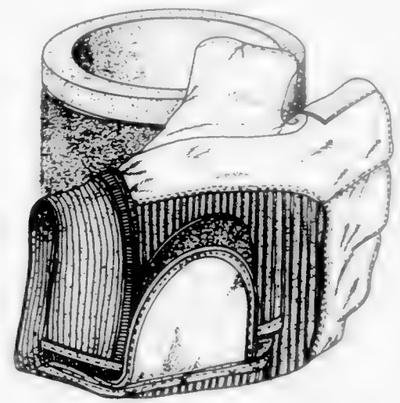


329,172
COOLER
James Greene, Jr., 3129 Roosevelt Blvd., Kenner, La. 70065
Filed Jun. 14, 1990, Ser. No. 537,753
Term of patent 14 years
U.S. Cl. D7—605

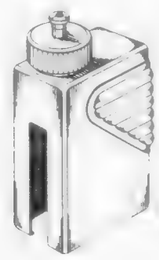


329,173
EGG DIPPING TOOL
Gerald D. Thill, Eden Prairie, Minn., assignor to Spearhead Industries, Inc., Eden Prairie, Minn.
Filed Dec. 10, 1990, Ser. No. 629,344
Term of patent 14 years
U.S. Cl. D7—611

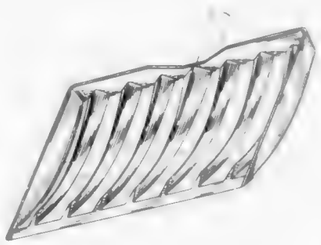
329,175
BEVERAGE HOLDER
W. Spence Harber, 1309 Cumberland Ct., Smyrna, Ga. 30080
Filed Oct. 19, 1990, Ser. No. 600,232
Term of patent 14 years
U.S. Cl. D7—620



329,174
HOLDER FOR A BEVERAGE CARTON
Keith D. Patterson, Providence, R.I., assignor to Little Kids, Inc., Providence, R.I.
Filed Jun. 4, 1990, Ser. No. 532,733
Term of patent 14 years
U.S. Cl. D7—619



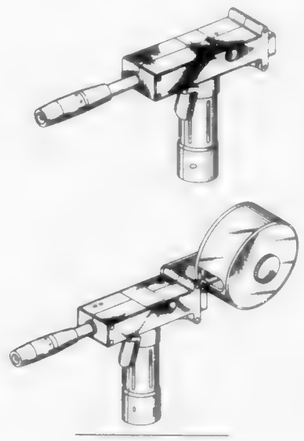
329,176
SNOW SHOVEL BLADE
Ian F. Norton, Toronto; Micheal Dolson, Brockville, and Colin Overy, North Augusta, all of Canada, assignors to True Temper Hardware Company, Miamisburg, Ohio
Filed Aug. 10, 1990, Ser. No. 566,030
Term of patent 14 years
U.S. Cl. D8—10



329,177
LAWN RAKE
Brenda Nace, Hilltop Apartments #04, Edwardsville, and David Moyer, 362 E. Main St., Nanticoke, both of Pa. 18704
Filed Jun. 21, 1990, Ser. No. 541,358
Term of patent 14 years
U.S. Cl. D8—13

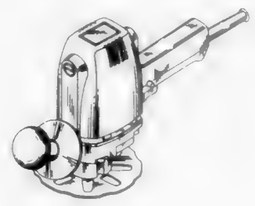
329,178
WING NUT WRENCH
John Ackerman, 17006 W. 250th St., Belle Plaine, Minn. 56011
Division of Ser. No. 766,586, Sep. 27, 1991. This application Nov. 12, 1991, Ser. No. 790,697
Term of patent 14 years
U.S. Cl. D8—21

329,179
WELDING GUN
Milo M. Kensrue, 49-320 Sunrose La., Palm Desert, Calif. 92260
Filed Feb. 20, 1990, Ser. No. 482,360
Term of patent 14 years
U.S. Cl. D8—30

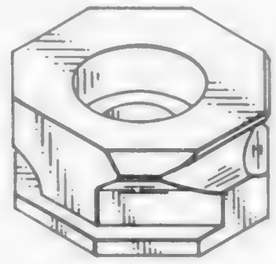


329,180
PLIERS
William A. Warheit, 121 Iroquois Dr., Butler, Pa. 16001
Filed Jan. 30, 1990, Ser. No. 472,490
Term of patent 14 years
U.S. Cl. D8—52

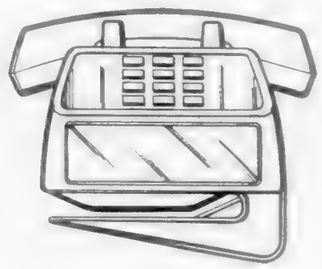
329,181
PORTABLE ELECTRIC CHAMFERING MACHINE
Tomoki Noda, and Kenji Fukuda, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Jul. 3, 1990, Ser. No. 547,158
Claims priority, application Japan, Jan. 25, 1990, 2-1699
Term of patent 14 years
U.S. Cl. D8—67



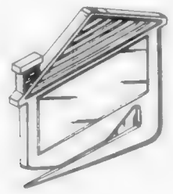
329,182
GRIPPING PAD FOR A JIG BORING DEVICE
Brian Challis, #9 Northride Way, Sandy, Utah 84092
Filed Feb. 16, 1990, Ser. No. 481,610
Term of patent 14 years
U.S. Cl. D8—71



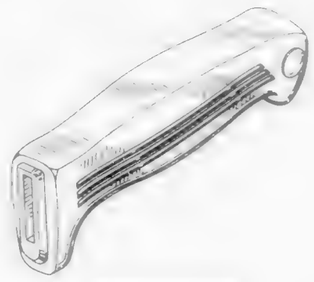
329,183
ENVELOPE OPENER
David P. Lage, and Albert P. Carney, both of St. Louis County, Mo., assignors to Quick Point, Inc., Fenton, Mo.
Filed Nov. 15, 1990, Ser. No. 615,001
Term of patent 14 years
U.S. Cl. D8—102



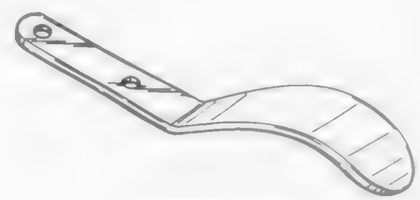
329,184
ENVELOPE OPENER
David P. Lage, and Albert P. Carney, both of St. Louis County, Mo., assignors to Quick Point, Inc., Fenton, Mo.
Filed Jun. 7, 1990, Ser. No. 534,843
Term of patent 14 years
U.S. Cl. D8—103



329,185
HANDLE FOR A KNIFE
Katsumi Hasegawa, Seki, Japan, assignor to Kai R&D Center Co., Ltd., Seki, Japan
Filed Aug. 17, 1990, Ser. No. 569,155
Term of patent 14 years
U.S. Cl. D8—107

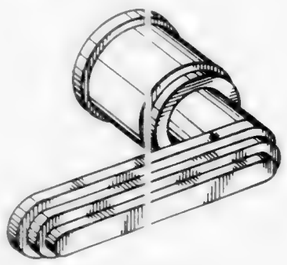


329,186
LIFTING HANDLE FOR A TOILET SEAT
Larry J. Sorensen, 1171 S. Hwy. 49, San Andreas, Calif. 95249
Filed Apr. 5, 1990, Ser. No. 505,113
Term of patent 14 years
U.S. Cl. D8—307

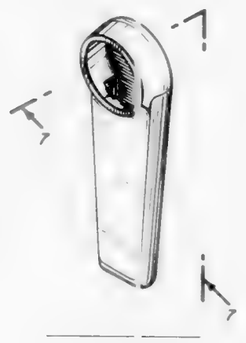


329,187
LIFTING HANDLE FOR A TOILET SEAT
Larry J. Sorensen, 1171 S. Hwy. 49, San Andreas, Calif. 95249
Filed May 9, 1990, Ser. No. 521,471
Term of patent 14 years
U.S. Cl. D8—307

329,188
HANDLE
Stanley M. Paul, Greenwich, Conn., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed May 18, 1990 Ser. No. 526,315
Term of patent 14 years
U.S. Cl. D8—308

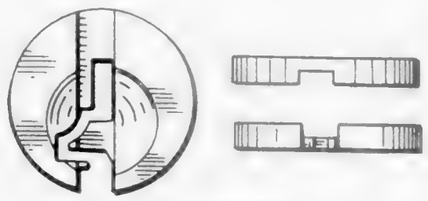


329,189
DOOR HANDLE COVER
Kevin W. Beck, 183 Sheppard Rd., Santa Paula, Calif. 93060
Filed Feb. 27, 1990, Ser. No. 485,740
Term of patent 14 years
U.S. Cl. D8—322

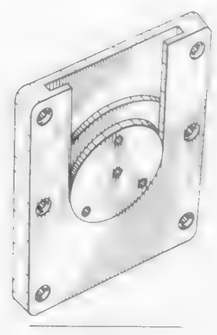


329,190
DAMPER STAY FOR FURNITURE DOORS
Kazuo Kotsuka, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan
Filed Aug. 30, 1989, Ser. No. 400,559
Claims priority, application Japan, Mar. 6, 1989, 1-8095
Term of patent 14 years
U.S. Cl. D8—330

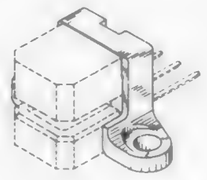
329,191
FRONT FACE OF A KEYPLUG
Walter E. Best; Timothy R. Bjornson, both of Indianapolis; James W. Borgmann, Carmel, and Gary R. Jacobs, Indianapolis, all of Ind., assignors to Best Lock Corporation, Indianapolis, Ind.
Filed Mar. 29, 1991, Ser. No. 678,621
The portion of the term of this patent subsequent to Jul. 7, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—343



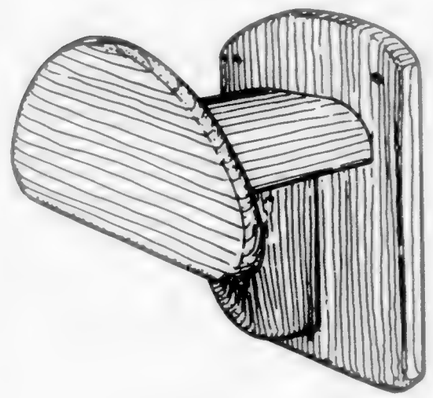
329,192
ARTICLE MOUNTING SUPPORT UNIT
Andrija Susac, 53 Manbari Crescent, Wanneroo, Western Australia, Australia 6065
Filed Mar. 19, 1991, Ser. No. 672,586
Term of patent 14 years
U.S. Cl. D8—349



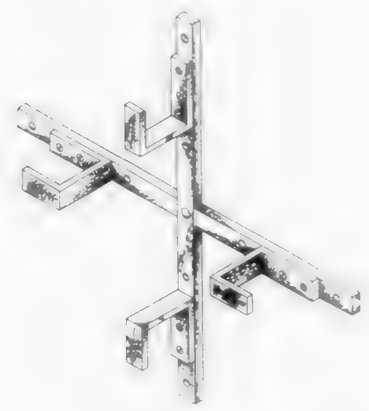
329,193
OPTICAL ENCODER BRACKET
Chris K. Togami, and Richard Ruh, both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 30, 1989, Ser. No. 374,393
Term of patent 14 years
U.S. Cl. D8—354



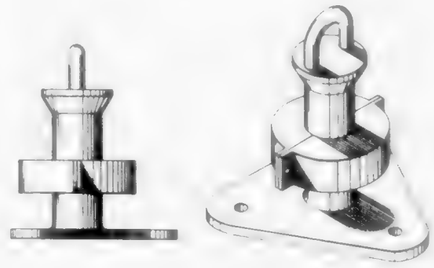
329,194
HOSE CADDY
Edward A. Gillooly, 24723 Upper Trail, Carmel, Calif. 93923
Filed Apr. 24, 1990, Ser. No. 514,496
Term of patent 14 years
U.S. Cl. D8—356



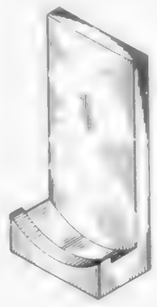
329,195
HOSE HOLDING DEVICE
Kenneth Yanish, Box 356A Leberty St., Old Bridge, N.J. 08857
Filed May 23, 1990, Ser. No. 527,247
Term of patent 14 years
U.S. Cl. D8—356



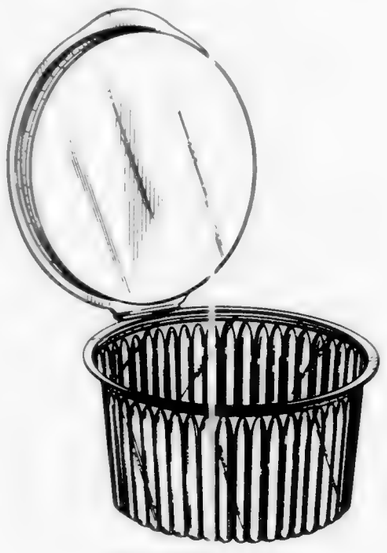
329,196
ROOF ANCHOR FOR AN EXISTING ROOF
Michael A. Schor, St. Catherines, Canada, assignor to Niagara Roof Anchors Inc., Canada
Filed Jul. 9, 1991, Ser. No. 727,162
Claims priority, application Canada, Mar. 18, 1991, 18039116
Term of patent 14 years
U.S. Cl. D8—373



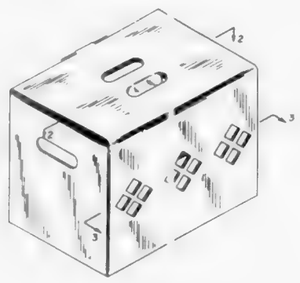
329,197
PLATE HOLDER
Lilburn E. Tibbs, 2213 Corrientes St., Bakersfield, Calif. 93306
Filed Aug. 27, 1990, Ser. No. 572,806
Term of patent 14 years
U.S. Cl. D8—380



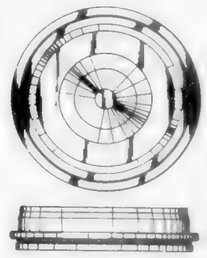
329,198
CONTAINER WITH HINGED LID
Cal Krupa, Plymouth, Minn., assignor to Ultra Pac, Inc., Rogers, Minn.
Filed Jul. 27, 1990, Ser. No. 558,848
Term of patent 14 years
U.S. Cl. D9—423



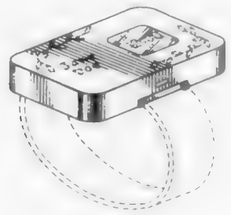
329,199
HAND CARRY BOX
Thomas I. Corso, Pittsburgh, Pa. assignor to Corso Brothers, Inc., Pittsburgh, Pa.
Filed Apr. 17, 1989, Ser. No. 338,653
Term of patent 14 years
U.S. Cl. D9—432



329,200
CLOSURE FOR A CONTAINER
Malcolm G. Collins, Wantage, Great Britain, assignor to CBM Foodcan PLC, Worcester, Great Britain
Filed Dec. 6, 1990, Ser. No. 623,245
Claims priority, application United Kingdom, Jun. 7, 1990, 2007398
Term of patent 14 years
U.S. Cl. D9—454



329,201
COMBINED WATCH AND KEY CASE
Esther L. Barat, 27527 Orsini Ave., Canyon Country, Calif. 91351
Filed May 29, 1990, Ser. No. 529,267
Term of patent 14 years
U.S. Cl. D10—31



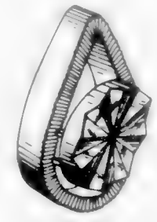
329,202
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Division of Ser. No. 509,138, Apr. 16, 1990, Pat. No. Des.321,838, which is a division of Ser. No. 351,553, May 15, 1989, Pat. No. Des. 311,149, which is a division of Ser. No. 904,301, Sep. 5, 1986, Pat. No. Des. 302,399. This application Oct. 11, 1991, Ser. No. 775,051
Claims priority, application World Int. Prop. O., Mar. 25, 1986, DM/006 689
Term of patent 14 years
U.S. Cl. D10—126

329,203
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Division of Ser. No. 509,138, Apr. 6, 1990, Pat. No. Des. 321,838, which is a division of Ser. No. 351,553, May 15, 1989, Pat. No. Des. 311,149, which is a division of Ser. No. 904,301, Sep. 5, 1986, Pat. No. Des. 302,399. This application Oct. 15, 1991, Ser. No. 776,475
Claims priority, application World Int. Prop. O., Mar. 25, 1986, DM/006689
Term of patent 14 years
U.S. Cl. D10—126

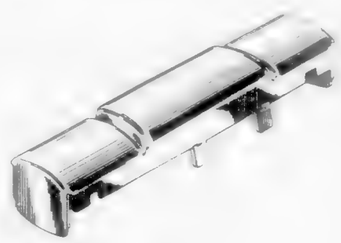
329,204
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Division of Ser. No. 509,078, Apr. 6, 1990, Pat. No. Des. 321,837, which is a division of Ser. No. 361,106, Jun. 5, 1989, Pat. No. Des. 311,150, which is a division of Ser. No. 876,339, Jun. 19, 1986, Pat. No. Des. 302,53. This application Oct. 15, 1991, Ser. No. 776,476
Claims priority, application World Int. Prop. O., Dec. 20, 1985, DM/006257
Term of patent 14 years
U.S. Cl. D10—126

329,205
JEWELRY CHAIN
David Rozenwasser, Savion, Israel, assignor to David Rozenvasser Ltd., Petah Tikva, Israel
Filed Jul. 3, 1990, Ser. No. 547,905
Claims priority, application Israel, Jan. 4, 1990, 15949
Term of patent 14 years
U.S. Cl. D11—17

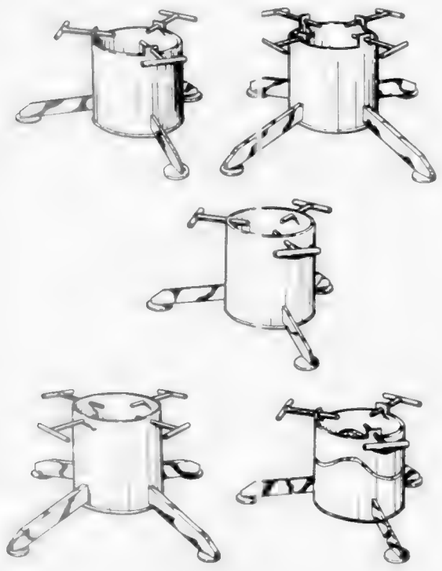
329,206
JEWELRY LINK
Meang Chia, and Cheo Chia, both c/o Chain & Charm Manufacturers, 412 W. 6th St., Suite #1104, Los Angeles, Calif. 90014
Filed Dec. 8, 1989, Ser. No. 447,699
The portion of the term of this patent subsequent to May 28, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—93



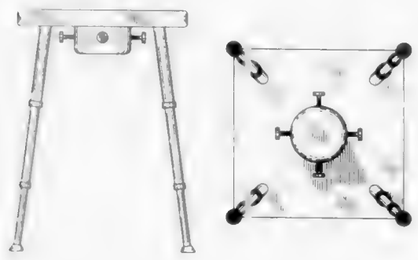
329,207
TOP SHELL FOR EXPANSION BRACELET LINK
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc., Providence, R.I.
Filed Apr. 23, 1990, Ser. No. 513,177
Term of patent 14 years
U.S. Cl. D11—93



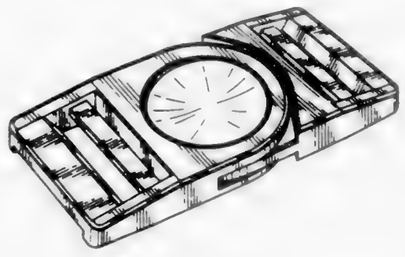
329,208
TREE STAND
Floyd I. Bowling, Rte. One, and Floyd S. Bowling, Jr., Spruce Ridge Dr., both of Bear Lake, Mich. 49614
Filed Oct. 9, 1990, Ser. No. 594,649
Term of patent 14 years
U.S. Cl. D11—130.1



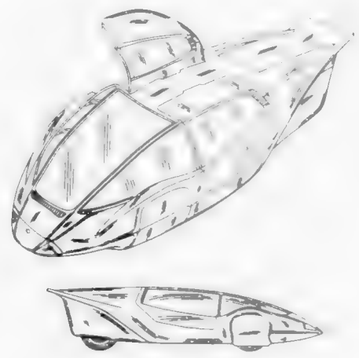
329,209
COMBINED CHRISTMAS TREE STAND AND TABLE
Robert A. De Carlo, 102 Cardinal Ct., Williamsburg, Va. 23185
Filed Oct. 18, 1990, Ser. No. 601,176
Term of patent 14 years
U.S. Cl. D11—130.1



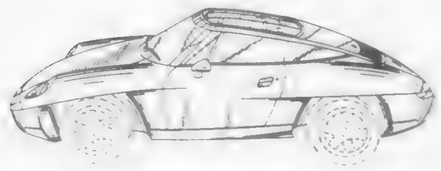
329,210
BELT BUCKLE
Wolfgang Cullmann, Langenzenn, Fed. Rep. of Germany, assignor to Cullmann Handelsgesellschaft, Langenzenn, Fed. Rep. of Germany
Filed Mar. 6, 1990, Ser. No. 489,595
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, M8906561.1
Term of patent 14 years
U.S. Cl. D11—216



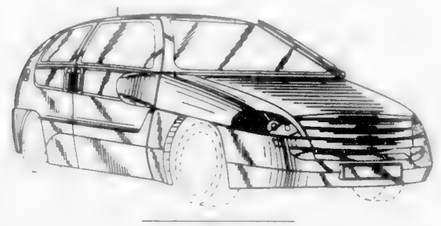
329,211
THREE WHEELED AUTOMOBILE
Douglas J. Malewicki, 14962 Merced Circle, Irvine, Calif. 92714
Filed Jun. 12, 1990, Ser. No. 537,100
Term of patent 14 years
U.S. Cl. D12—85



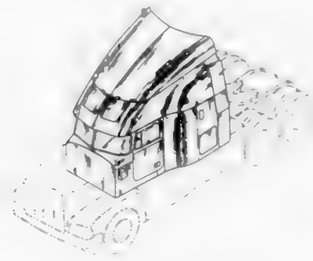
329,212
SPORTS CAR BODY
Stephen Murkett, Gerlingen, and Harm Lagaay, Marbach, both of Fed. Rep. of Germany, assignors to Porsch AG, Fed. Rep. of Germany
Filed Mar. 2, 1990, Ser. No. 487,800
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, M8906219.1
Term of patent 14 years
U.S. Cl. D12—91



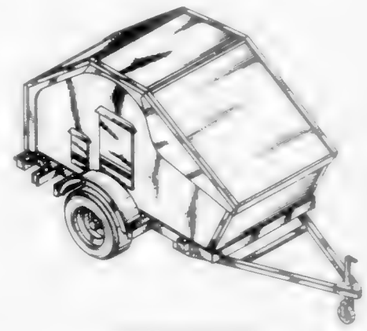
329,213
MOTOR VEHICLE BODY
Bruno Sacco; Harald Leschke, both of Sindelfingen, and Stephen Ferrada, Unterreichenbach, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed May 22, 1990, Ser. No. 526,625
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1989, M8908427.6
Term of patent 14 years
U.S. Cl. D12—91



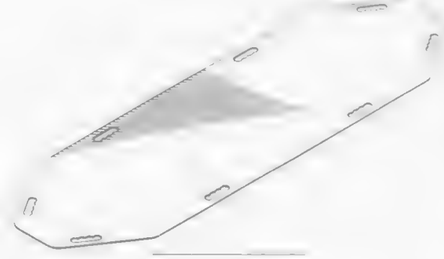
329,214
TRUCK CAB
Huston Marlow, Orinda; John C. Lindsley, Felton, and Alan Havassy, Oakland, all of Calif., assignors to PACCAR Inc., Bellevue, Wash.
Filed Oct. 29, 1990, Ser. No. 604,598
Term of patent 14 years
U.S. Cl. D12—96



329,215
CAMPING TRAILER
Paul H. Alexander, and William E. Huffman, both of 11550 Noguera Ave., Ventura, Calif. 93001
Filed Oct. 26, 1990, Ser. No. 605,188
Term of patent 14 years
U.S. Cl. D12—102



329,216
PATIENT MOVER OR BACKBOARD
Robert A. Beeley, and Brenda K. Oswalt, both of Tomball, Tex., assignors to Dixie U.S.A., Inc., Houston, Tex.
Filed Nov. 5, 1990, Ser. No. 609,667
Term of patent 14 years
U.S. Cl. D12—128

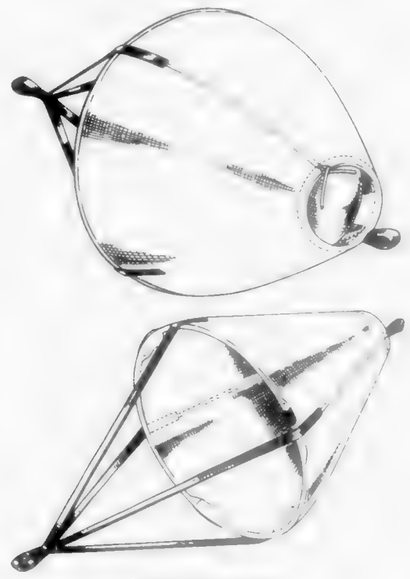


329,217
AUTOMOBILE TIRE
Shigeki Ota, Osaka, and Kiyoshi Ochiai, Hyogo, both of Japan, assignors to Sumitomo Rubber Industries Ltd., Kobe, Japan
Filed Jun. 13, 1990, Ser. No. 537,760
Claims priority, application Japan, Dec. 14, 1989, 1-45803
Term of patent 14 years
U.S. Cl. D12—146

329,218
AUTOMOBILE TIRE
Akihiro Ohtsu, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Jun. 13, 1990, Ser. No. 537,748
Claims priority, application Japan Dec. 14, 1989, 1-45802
Term of patent 14 years
U.S. Cl. D12—147

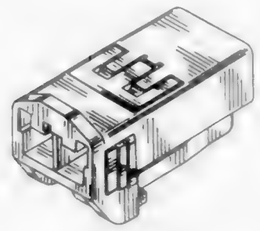
329,219
OUTSIDE INSPECTION MIRROR FOR ATTACHMENT TO THE TOP OF AN INDUSTRIAL VEHICLE CAB
Bruno Ropolo, San Paolo Solbrito, Italy, assignor to IVECO FIAT S.p.A., Turin, Italy
Filed Jun. 22, 1989, Ser. No. 369,923
Claims priority, application Italy, Dec. 23, 1988, 53625/88[U]
Term of patent 14 years
U.S. Cl. D12—187

329,220
DRIFT ANCHOR
Gregory L. Pauley, and Claud C. Kelso, both of Pierre, S. Dak., assignors to Quick Change Systems, Pierre, S. Dak.
Filed Apr. 16, 1990, Ser. No. 509,427
Term of patent 14 years
U.S. Cl. D12—215



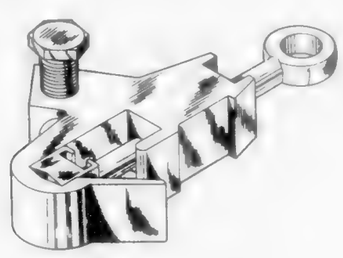
329,221
COMBINED RECHARGER AND SIGNAL INTERFACE BOX FOR USE WITH A SELECTIVE CALL ENCODER AND TRANSMITTER, OR SIMILAR ARTICLE
Bee Lay Khoo, Johor, Malaysia, assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 13, 1990, Ser. No. 508,398
Term of patent 14 years
U.S. Cl. D13—107

329,222
ELECTRICAL CONNECTOR HOUSING
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Yoshitsugu Sawada, and Yukio Ohta, both of Shizuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Aug. 17, 1989, Ser. No. 394,849
Claims priority, application Japan, Feb. 23, 1989, 1-6441
Term of patent 14 years
U.S. Cl. D13—133

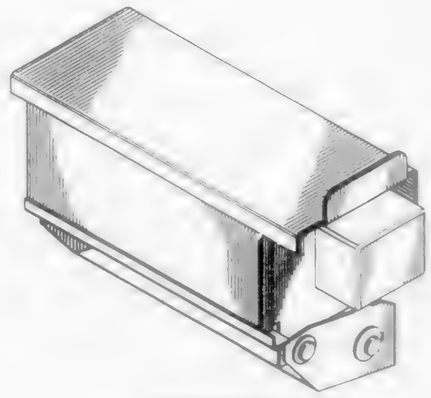


329,223
ELECTRICAL PLUG FOR AUDIO EQUIPMENT
Noel Lee, South San Francisco, Calif., assignor to Monster Cable, South San Francisco, Calif.
Filed Apr. 19, 1990, Ser. No. 511,002
Term of patent 14 years
U.S. Cl. D13—133

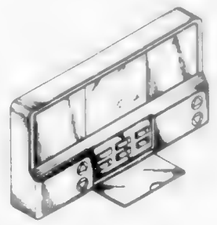
329,224
HOT LINE CABLE CONNECTOR
Gunter E. Dinkel, Cincinnati, Ohio, assignor to Connector Manufacturing Company, Hamilton, Ohio
Filed Nov. 30, 1990, Ser. No. 620,595
Term of patent 14 years
U.S. Cl. D13—149



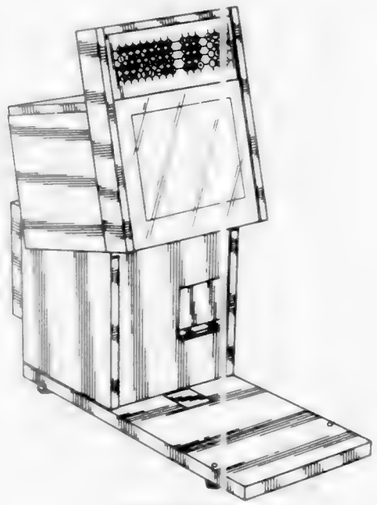
329,225
REPLACEABLE FUSER UNIT FOR A SPATIAL LIGHT MODULATING PRINTER
William E. Nelson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 21, 1989, Ser. No. 454,567
Term of patent 14 years
U.S. Cl. D13—161



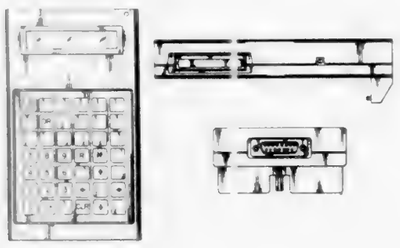
329,226
REMOTE CONTROL FOR COMBINED CEILING FAN AND LIGHT FIXTURE
Richard M. Holbrook, Redondo Beach, Calif., assignor to Casablanca Acquisition Corp.
Filed Apr. 27, 1990, Ser. No. 515,271
Term of patent 14 years
U.S. Cl. D13—162



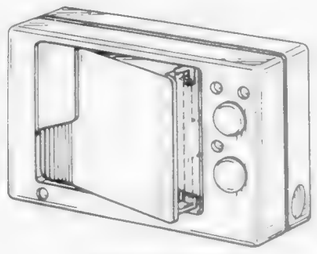
329,227
COMBINED COMPUTER AND SCALE FOR PREPARING MIXTURES OF PAINTS, COLORS AND LACQUERS
Egon Kurth, Neu-Isenburg, and Wolfgang Eyssen, Rödermark, both of Fed. Rep. of Germany, assignors to Connex Datensysteme und Beratungsgesellschaft mbH, Griesheim, Fed. Rep. of Germany
Filed Apr. 2, 1990, Ser. No. 503,160
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1989, M8907169.7[U]
Term of patent 14 years
U.S. Cl. D14—100



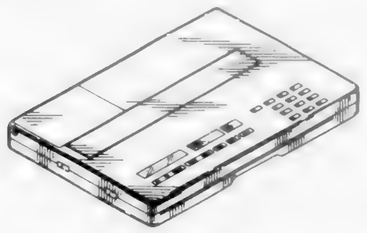
329,228
HANDHELD PROGRAMMER FOR USE WITH COMPUTER PERIPHERALS
Sherman G. Thomas, Earlysville, Va., assignor to GE Fanuc Automation North America, Inc., Charlottesville, Va.
Filed Jan. 11, 1991, Ser. No. 639,997
Term of patent 14 years
U.S. Cl. D14—100



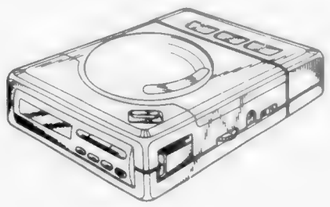
329,229
DATA STORAGE UNIT
Siegfried Koch, Villingen-Schwenningen, and Otto Becker, Trossingen, both of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
Filed Mar. 9, 1990, Ser. No. 490,965
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1989, 8906459[U]
Term of patent 14 years
U.S. Cl. D14—109



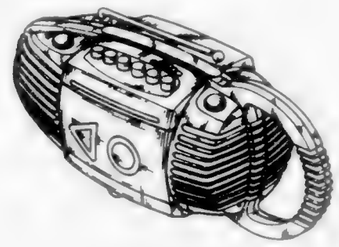
329,230
FACSIMILE TRANSMITTER
Takuro Masuda, Yokohama, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Sep. 13, 1990, Ser. No. 581,657
Claims priority, application Japan, Jun. 8, 1990, 2-19097
Term of patent 14 years
U.S. Cl. D14—118



329,231
COMPACT DISK PLAYER
Ha Y. Lee, Koyang, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 25, 1990, Ser. No. 543,184
Claims priority, application Rep. of Korea, Dec. 29, 1989, 17854/1988[U]
Term of patent 14 years
U.S. Cl. D14—156



329,232
CASSETTE TAPE RECORDER
Sun Il Yu, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 27, 1990, Ser. No. 544,369
Claims priority, application Rep. of Korea, Dec. 30, 1989, 18080[U]
Term of patent 14 years
U.S. Cl. D14—165

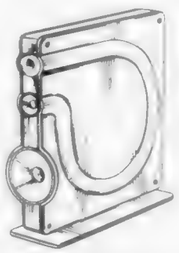


329,233
SPEAKER
Hidehiko Miura, Chiba, Japan, assignor to Yamaha Corporation, Japan
Filed Aug. 28, 1990, Ser. No. 574,221
Claims priority, application Japan, Feb. 28, 1990, 2-6494
Term of patent 14 years
U.S. Cl. D14—204

329,234
SPEAKER
Ewald Winkelbauer, Ludwigsburg, Fed. Rep. of Germany, assignor to Yamaha Corporation, Japan
Filed Aug. 28, 1990, Ser. No. 574,222
Claims priority, application Japan, Feb. 28, 1990, 2-6486
Term of patent 14 years
U.S. Cl. D14—204

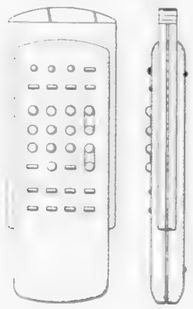
329,235
SPEAKER
Alejandro Sarmiento, Buenos Aires, Argentina, assignor to Yamaha Corporation, Japan
Filed Aug. 28, 1990, Ser. No. 574,224
Claims priority, application Japan, Aug. 28, 1990, 2-6485
Term of patent 14 years
U.S. Cl. D14—215

329,236
SPEAKER
Shosuke Ko, Oosaka, Japan, assignor to Yamaha Corporation, Japan
Filed Aug. 28, 1990, Ser. No. 574,225
Claims priority, application Japan, Feb. 28, 1990, 2-6482
Term of patent 14 years
U.S. Cl. D14—215

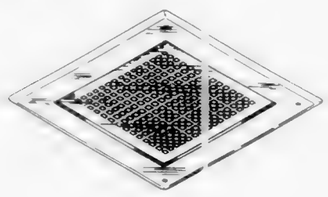


329,237
SPEAKER
Takeshi Ishikawa, Tokyo, Japan, assignor to Yamaha Corporation, Japan
Filed Aug. 28, 1990, Ser. No. 574,223
Claims priority, application Japan, Feb. 28, 1990, 2-6483
Term of patent 14 years
U.S. Cl. D14—216

329,238
UNIVERSAL REMOTE CONTROLLER
Joseph A. Grasso, San Jose, Calif.; Donald T. Metzger, Bedford, Tex., and Daniel Klitsner, San Francisco, Calif., assignors to Tandy Corporation, Fort Worth, Tex.
Filed Dec. 21, 1990, Ser. No. 631,546
Term of patent 14 years
U.S. Cl. D14—218

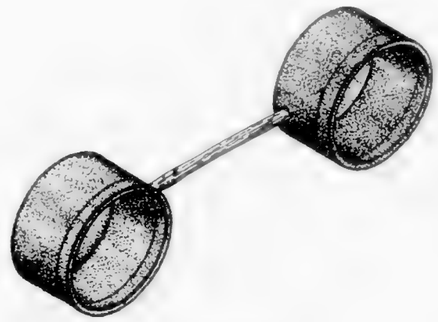


329,239
RECESSED SPEAKER GRILL
Richard Hahn, Richmond Heights, Mo., assignor to PRS, Inc., St. Louis, Mo.
Filed Jun. 26, 1989, Ser. No. 374,221
Term of patent 14 years
U.S. Cl. D14—219

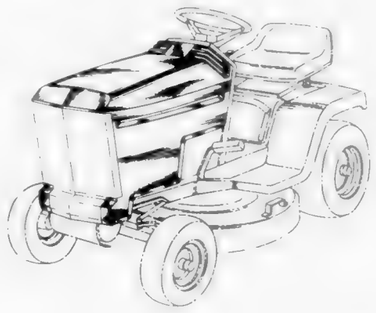


329,240
COMMUNICATIONS ANTENNA
Gershon N. Cooper, Encino, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.
Filed Jun. 11, 1990, Ser. No. 535,858
Term of patent 14 years
U.S. Cl. D14—230

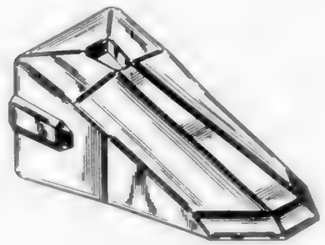
329,241
PORTABLE COVER FOR TELEPHONE MOUTHPIECE AND EARPIECE
Jeffrey S. Carlson, 26800 Sand Canyon Rd., Canyon Country, Calif. 91351
Filed Feb. 10, 1992, Ser. No. 832,500
Term of patent 14 years
U.S. Cl. D14—250



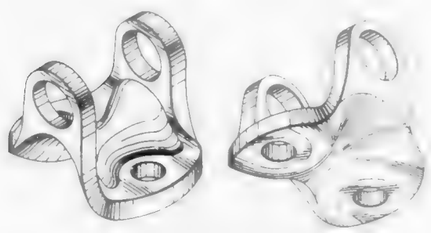
329,242
TRACTOR HOOD
David R. Holm, Oconomowoc; David A. Westimayer, Horicon, both of Wis.; William E. Crookes, Waldwick, N.J., and Daniel R. Nickles, Monroe, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Jul. 24, 1990, Ser. No. 558,557
Term of patent 14 years
U.S. Cl. D15—17



329,243
EXCAVATOR TOOTH
Howard W. Robinson, Grapevine, Tex., assignor to G. H. Hensley Industries, Inc., Dallas, Tex.
Filed Mar. 20, 1990, Ser. No. 496,340
The portion of the term of this patent subsequent to Aug. 4, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—29

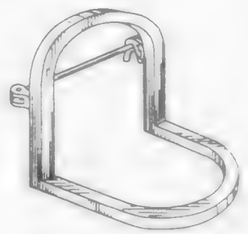


329,244
YOKE FOR UNIVERSAL JOINT
Shigeru Saito; Atsushi Narue, and Tomoyuki Maruyama, all of Kosai, Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan
Filed Oct. 25, 1985, Ser. No. 791,606
Claims priority, application Japan, Jun. 21, 1985, 60-26135
Term of patent 14 years
U.S. Cl. D15—148

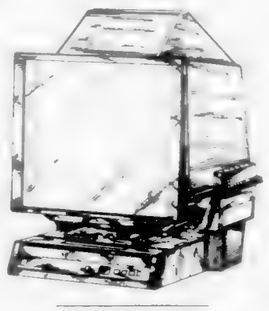


329,245
SAFETY SPECTACLES
René Duvert, Paris, France, assignor to Sofraf, Paris, France
Filed Dec. 19, 1990, Ser. No. 629,976
Claims priority, application France, Jan. 5, 1990, 900080
Term of patent 14 years
U.S. Cl. D16—102

329,246
EYE GLASS HOLDER
Irene Eppenauer, 2502 SW. Loop 410, San Antonio, Tex. 78227
Filed Jan. 16, 1991, Ser. No. 643,655
Term of patent 14 years
U.S. Cl. D16—129

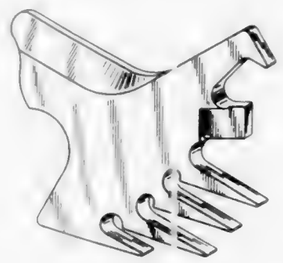


329,247
COMBINED MICROFILM VIEWER AND PRINTER
James H. Westoby; Todd A. Kahle, both of Hartland; Robert E. Gunst, Neosho, and James E. Grace, Cedarburg, all of Wis., assignors to Infographix, Inc., Sussex, Wis.
Filed Apr. 6, 1990, Ser. No. 507,064
Term of patent 14 years
U.S. Cl. D16—223

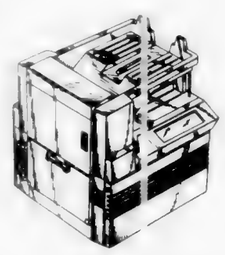


329,248
BODY WARMING BAG FOR A CHILD'S SEAT
Giselle B. Brown, 8601 S. 35th Terrace, Ft. Smith, Ark. 72906
Filed Mar. 1, 1989, Ser. No. 317,806
Term of patent 14 years
U.S. Cl. D6—333

329,249
GUITAR BODY
Joel M. Harriott, P.O. Box 542, Minneapolis, Minn. 55458
Continuation-in-part of Ser. No. 19,993, Feb. 27, 1987. This application Nov. 28, 1989 Ser. No. 442,176
The portion of the term of this patent subsequent to Aug. 25, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D17—20

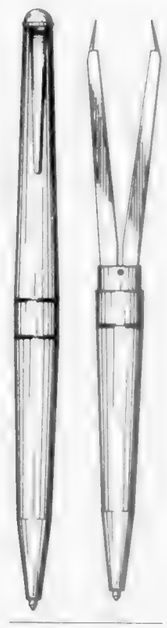


329,250
PRINTER FOR COMPUTER
Nobuki Matsumoto, Miura, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 6, 1988, Ser. No. 280,731
Claims priority, application Japan, Jun. 6, 1988, 63-22319
Term of patent 14 years
U.S. Cl. D18—55



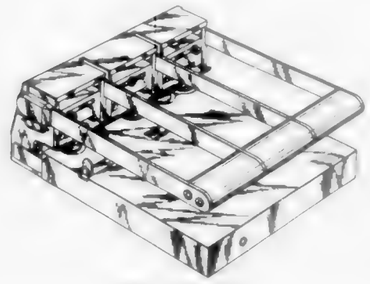
329,251
STAND FOR PRINTERS AND FACSIMILE MACHINES
Charles L. Olswold, Muscatine, and Lavern L. Weinschenk, Jr., Davenport, both of Iowa, assignors to Ring King Visibles, Inc., Muscatine, Iowa
Filed Mar. 12, 1991, Ser. No. 669,206
Term of patent 14 years
U.S. Cl. D18—59

329,252
COMBINED PEN AND CALIPER
Robert A. Mackin, 3220 Idlewood, Flagstaff, Ariz. 86004
Filed Sep. 28, 1990, Ser. No. 590,066
Term of patent 14 years
U.S. Cl. D19—36



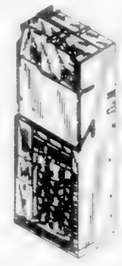
329,253
CORRECTION PEN
Shungo Sekiguchi, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 19, 1990, Ser. No. 467,765
Claims priority, application Japan, Jul. 26, 1989, 1-27544
Term of patent 14 years
U.S. Cl. D19—43

329,254
PUNCH
Chuzo Mori, Funabashi, Japan, assignor to Carl Jimuki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 20, 1990, Ser. No. 541,244
Term of patent 14 years
U.S. Cl. D19—72

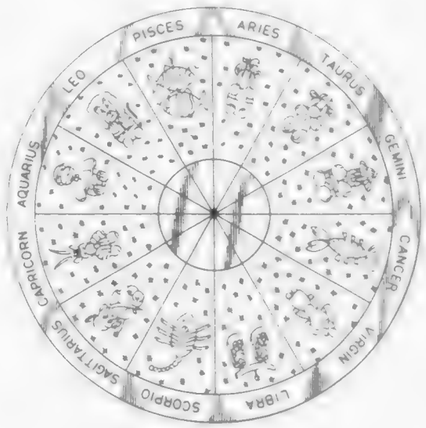


329,255
PAPERWEIGHT
Charlie Tu, Taipei, Taiwan, assignor to Chuang Tao Corporation, Taipei, Taiwan
Filed Jan. 30, 1991, Ser. No. 649,876
Term of patent 14 years
U.S. Cl. D19—96

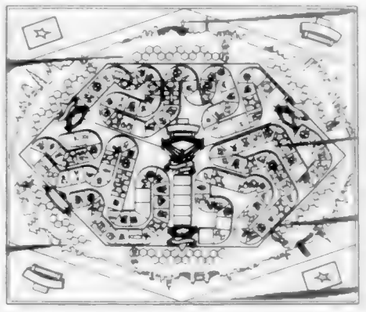
329,256
COIN CHANGER FOR AN AUTOMATIC VENDING MACHINE
Kenji Nakajima, Gose, and Kenji Nishiumi, Sakado, both of Japan, assignors to Kabushiki Kaisha Nippon Conlux, Japan
Filed May 7, 1990, Ser. No. 519,545
Claims priority, application Japan, Nov. 7, 1989, 1-040588
Term of patent 14 years
U.S. Cl. D20—9



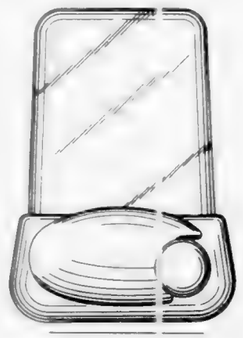
329,257
ZODIAC FIGURINE DISPLAY BOARD
Renee Deloose, Waasmunster, Belgium, assignor to C.V. Kwartstechniek, Temse, Belgium
Filed Aug. 1, 1990, Ser. No. 561,516
Claims priority, application Int'l Pat. Institute, Feb. 1, 1990, DM/015776
Term of patent 14 years
U.S. Cl. D20—29



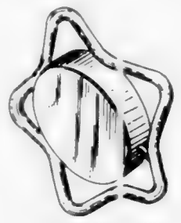
329,258
GAME BOARD
Nicholas Missailidis, 3 Redfern Close, Thomastown, Victoria, Australia 3074
Filed Apr. 24, 1990, Ser. No. 514,497
Claims priority, application Australia, Dec. 4, 1989, 3979/89
Term of patent 14 years
U.S. Cl. D21—31



329,259
HOUSING FOR WATER GAME
Chieko Nakazawa, and Michiaki Tomimatsu, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Feb. 11, 1991, Ser. No. 653,127
Claims priority, application Japan, Aug. 13, 1990, 2-27477
Term of patent 14 years
U.S. Cl. D21—59

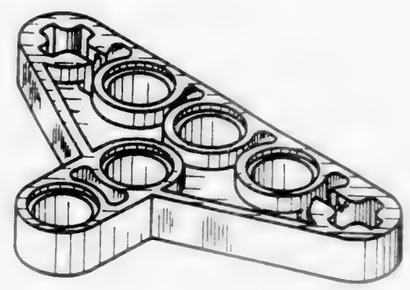


329,260
TOY RATTLE
Michael Williams, New York, N.Y., assignor to Gruner & Jahr Printing & Publishing Co., New York, N.Y.
Filed Feb. 19, 1991, Ser. No. 657,553
The portion of the term of this patent subsequent to Dec. 23, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—65



329,261
BALLOON SUPPORT AND SEALING DEVICE
Jules Pollack, Pebble Beach, Calif., assignor to Creative Balloons Manufacturing, Inc., Pebble Beach, Calif.
Filed Oct. 9, 1990, Ser. No. 595,378
Term of patent 14 years
U.S. Cl. D21—84

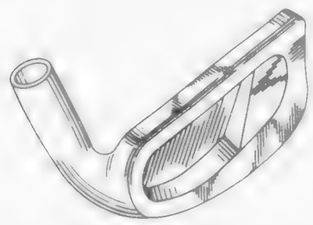
329,262
TOY CONSTRUCTION ELEMENT
Jan Hatting, Vejle, and Olav Kristgaard, Egtved, both of Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,924
Term of patent 14 years
U.S. Cl. D21—108



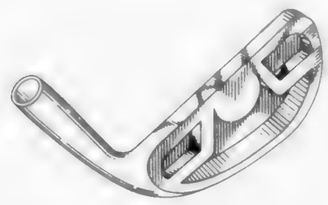
329,263
SIMULATIVE TOY FLASHLIGHT
Benjamin J. Cimock, Altamonte Springs, Fla., assignor to I & K Trading Company, Vienna, Va.
Continuation-in-part of Ser. No. 231,415, Aug. 12, 1988, abandoned. This application May 11, 1990, Ser. No. 522,355
Term of patent 14 years
U.S. Cl. D21—109

329,264
MOTOR DRIVEN TOY INSECT
Yasuta Satoh, Nagareyama, and Mikitoshi Amano, Matsudo, both of Japan, assignors to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 16, 1990, Ser. No. 494,522
Claims priority, application Japan, Sep. 22, 1989, 1-34768
Term of patent 14 years
U.S. Cl. D21—185

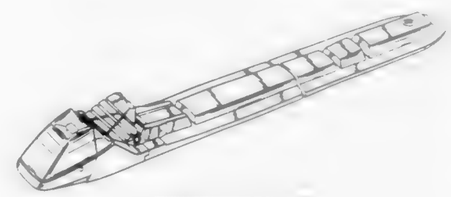
329,265
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Nov. 8, 1989, Ser. No. 433,173
The portion of the term of this patent subsequent to Jun. 30, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—220



329,266
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Mar. 8, 1990, Ser. No. 490,261
Term of patent 14 years
U.S. Cl. D21—220

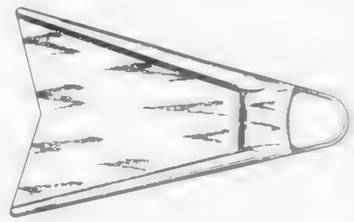


329,267
SKI BINDING
Paul Arnulf, Alby sur Cheran, France, assignor to Salomon S.A., Chavanod, France
Filed May 23, 1990, Ser. No. 527,260
Claims priority, application Int'l Pat. Institute, Dec. 4, 1989, DM/015248
Term of patent 14 years
U.S. Cl. D21—230



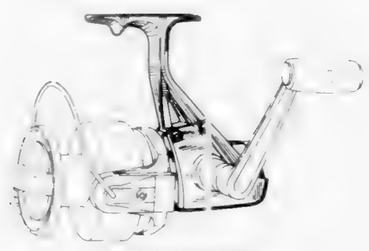
329,268
GOLF SWING PRACTICE DEVICE
David V. Perry, Manteca, Calif., assignor to David Perry, Manteca, Calif.
Filed Apr. 2, 1990, Ser. No. 502,762
Term of patent 14 years
U.S. Cl. D21—234

329,269
SWIM FIN
Robert F. Szabad, Jr., Carlsbad, Calif., and Jon A. Glydon, West Barnstaple, Mass., assignors to Packaging Industries Group, Inc., Hyannis, Mass.
Filed Jan. 31, 1991, Ser. No. 648,370
Term of patent 14 years
U.S. Cl. D21—239



329,270
GROUND RODENT CONTROLLER
Jan Der-Jinn, 12F-3, No. 163 Nanking E. Rd., Sec. 5, Taipei, Taiwan
Filed Oct. 30, 1990, Ser. No. 605,468
Term of patent 14 years
U.S. Cl. D22—120

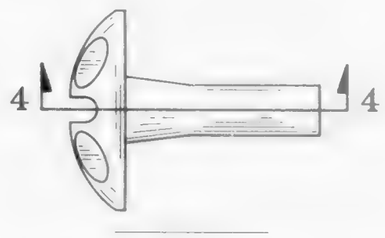
329,271
FISHING REEL BODY
Akihisa Shiozaki, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 31, 1990, Ser. No. 473,191
Claims priority, application Japan, Aug. 1, 1989, 1-28380
Term of patent 14 years
U.S. Cl. D22—141



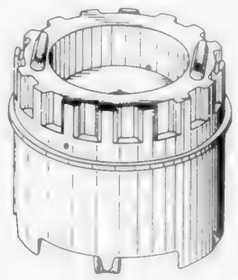
329,272
REEL SEAT FOR FISHING ROD
Shinya Takizawa, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Feb. 9, 1990, Ser. No. 477,667
Claims priority, application Japan, Aug. 11, 1989, 1-29751
Term of patent 14 years
U.S. Cl. D22—142

329,273
REEL SEAT FOR FISHING ROD
Mitsuyoshi Oyama, and Shinya Takizawa, both of Musashino, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 10, 1991, Ser. No. 639,534
Claims priority, application Japan, Jul. 23, 1990, 2-24739; Jul. 23, 1990, 2-24740
Term of patent 14 years
U.S. Cl. D22—142

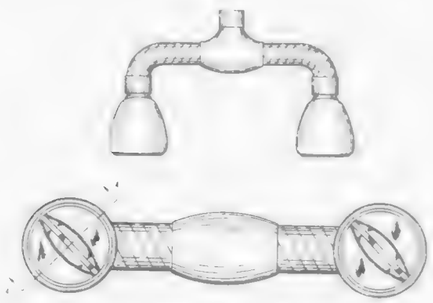
329,274
BASE FOR A FISHING POLE HOLDER OR THE LIKE
Hannah C. Wilson, 7453 E. 3rd, Tulsa, Okla. 74112
Filed Jan. 16, 1990, Ser. No. 465,020
Term of patent 14 years
U.S. Cl. D22—147



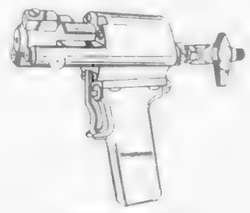
329,275
TANK FOR TRANSPORTING HAZARDOUS LIQUIDS
Kenneth M. McKenzie, and Wayne R. Anderson, both of Winnipeg, Canada, assignors to Bonar Inc., Burlington, Canada
Filed Oct. 3, 1990, Ser. No. 592,064
Term of patent 14 years
U.S. Cl. D23—202



329,276
DUAL SHOWER HEAD UNIT
Robert Blake, 295 Cozine Ave., Brooklyn, N.Y. 11207
Filed Jun. 1, 1988, Ser. No. 200,781
Term of patent 14 years
U.S. Cl. D23—213

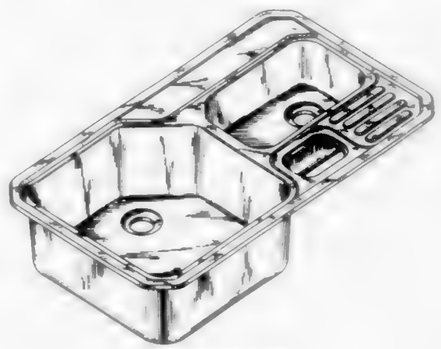


329,277
URETHANE FOAM GUN
David G. Keske, 1510 Page Ind. Blvd., St. Louis, Mo. 63132; Donald L. Kahmke, and Donald R. Kahmke, both of 12940 Bellefontaine, St. Louis, Mo. 63138
Filed Dec. 14, 1989, Ser. No. 450,728
Term of patent 14 years
U.S. Cl. D23—226



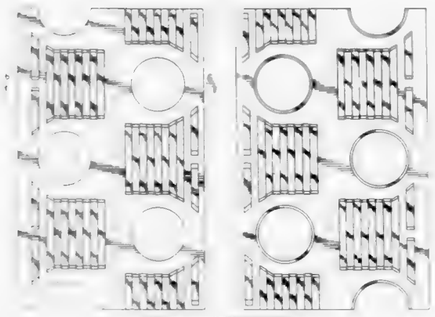
329,278
INFANT'S BATHING SUPPORT
Allen I. Gallup, 218 W. 2nd Ave., Corsicana, Tex. 75110
Filed Oct. 1, 1990, Ser. No. 591,014
Term of patent 14 years
U.S. Cl. D23—278

329,279
SINK
Walter Blanc, Oberderdingen-Grossvillars, and Uwe Johannböke, Eppingen-Mühlbach, both of Fed. Rep. of Germany, assignors to Blanco GmbH & Co. KG, Obererdingen, Fed. Rep. of Germany
Filed Jul. 2, 1990, Ser. No. 546,941
Term of patent 14 years
U.S. Cl. D23—287



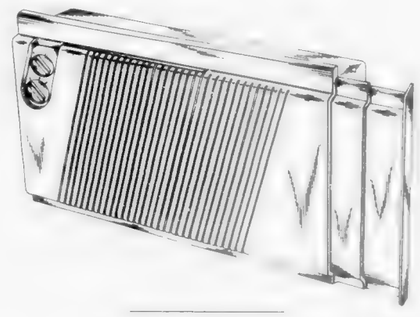
329,280
PORTABLE BACKSPLASH
Joseph D. Draucek, Sr., 2415 Grant Rd., Palm Bay, Fla. 32905, assignor to Joseph D. Draucek, Sr., Palm Bay, Fla.
Filed Oct. 26, 1989, Ser. No. 428,338
Term of patent 14 years
U.S. Cl. D23—308

329,281
FIN FOR USE IN A FIN AND TUBE HEAT EXCHANGER IN AN AIR CONDITIONER
Takayuki Yoshida; Tomohumi Tezuka, both of Shizuoka, and Masao Huzii, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 23, 1989, Ser. No. 313,810
Claims priority, application Japan, Oct. 27, 1988, 63-42291
Term of patent 14 years
U.S. Cl. D23—323

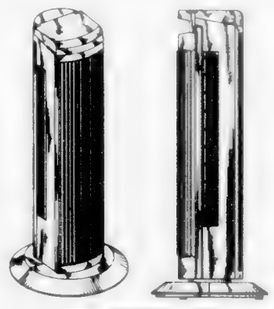


329,282
AIR FRESHENER FOR A FAN
Chalcey L. Petersimes, Sr., 402 Risha Ave. Box 342, Anna, Ohio 45302, and George E. Pash, 109 E. Walnut St., Botkins, Ohio 45306
Filed Apr. 15, 1991, Ser. No. 685,488
Term of patent 14 years
U.S. Cl. D23—366

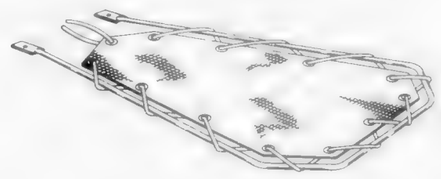
329,283
WINDOW FAN OR THE LIKE
Joseph C. Maiellano, Jr., Chelmsford, Mass., and Walter B. Herbst, Evanston, Ill., assignors to Raytheon Company, Lexington, Mass.
Filed Aug. 20, 1991, Ser. No. 748,165
Term of patent 14 years
U.S. Cl. D23—370



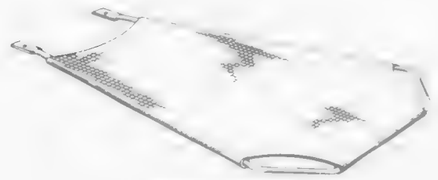
329,284
PORTABLE ELECTRIC FAN
Noel T. Patton, Hong Kong, Hong Kong, assignor to Patton Electric Company, Inc., New Haven, Conn.
Filed Apr. 15, 1991, Ser. No. 685,287
Term of patent 14 years
U.S. Cl. D23—378



329,285
CEILING FAN BLADE
William N. Taylor, III, P.O. Box 810121, Dallas, Tex. 75381-0121
Continuation-in-part of Ser. No. 490,950, Mar. 9, 1990. This application May 21, 1991, Ser. No. 703,355
The portion of the term of this patent subsequent to Sep. 8, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—413



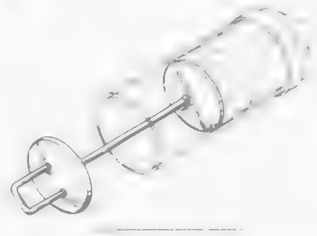
329,286
CEILING FAN BLADE
William N. Taylor, III, P.O. Box 810121, Dallas, Tex. 75381-0121
Continuation-in-part of Ser. No. 490,950, Mar. 9, 1990. This application May 21, 1991, Ser. No. 703,356
The portion of the term of this patent subsequent to Sep. 8, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—413



329,287
TONGUE DEPRESSOR OR THE LIKE
Richard G. Ziese, H.C. 72, P.O. Box 774, Cookson, Okla. 74427
Filed Feb. 26, 1990, Ser. No. 484,637
Term of patent 14 years
U.S. Cl. D24—136

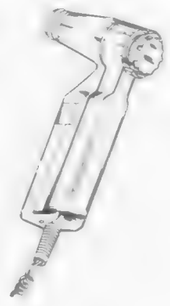
329,288
CABINET FOR AN OXYGEN CONCENTRATOR
Gregory R. Miller, Chesterfield; Steven G. Clark, St. Paul, and James S. Veesaert, Chesterfield, all of Mo., assignors to Puritan-Bennett Corporation, Lenexa, Kans.
Continuation-in-part of Ser. No. 437,493, Nov. 15, 1989, abandoned. This application Jan. 2, 1990, Ser. No. 469,365
Term of patent 14 years
U.S. Cl. D24—164

329,289
PLUNGER FOR A DISPOSABLE BAG TYPE NURSING BOTTLE
David T. Bernstein, P.O. Box 723784, Atlanta, Ga. 30339, and Claude Chapuis, 1089 Oakland Trace, Atlanta, Ga. 30319
Filed Aug. 23, 1990, Ser. No. 571,438
Term of patent 14 years
U.S. Cl. D24—193

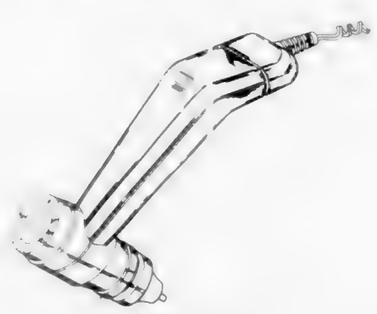


329,290
MASSAGER
Francois Geneve; Luc Heiligenstein, and Stephen Melamed, all of Chicago, Ill., assignors to Associated Mills, Inc., Chicago, Ill.
Filed Mar. 30, 1990, Ser. No. 503,178
Term of patent 14 years
U.S. Cl. D24—211

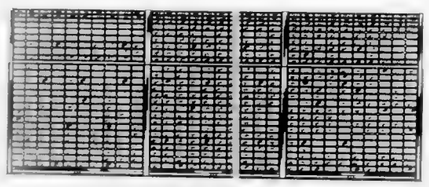
329,291
HAND-HELD MASSAGER
Howard Wollman, North Hollywood, Calif., assignor to HWE, Inc., North Hollywood, Calif.
Filed Jun. 4, 1990, Ser. No. 532,988
Term of patent 14 years
U.S. Cl. D24—214



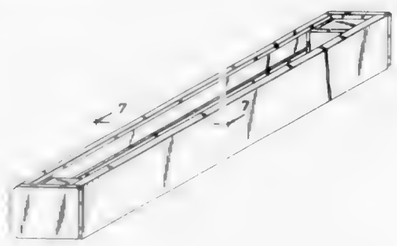
329,292
HAND-HELD MASSAGER
Howard Wollman, North Hollywood, Calif., assignor to HWE, Inc., North Hollywood, Calif.
Filed Jun. 4, 1990, Ser. No. 532,991
Term of patent 14 years
U.S. Cl. D24—214



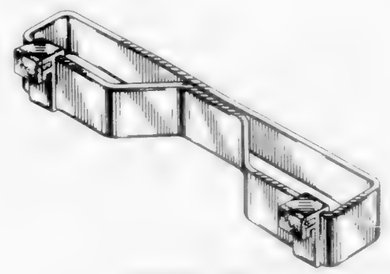
329,293
BUS STOP MARQUEE
Francisco J. Landaluce-Echevarria, Caserio Olondo-B° Matieno, 48220 Abadiano, Spain
Filed Mar. 13, 1989, Ser. No. 322,706
Term of patent 14 years
U.S. Cl. D25—18



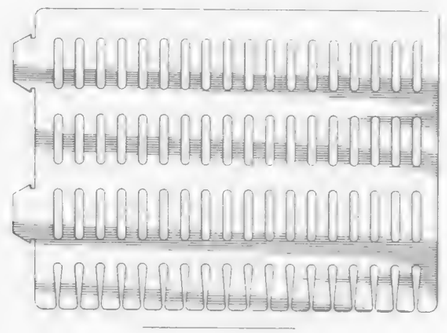
329,294
BEVELED HEADRAIL
John M. DuBeau, Warwick; Anthony Torti, Cranston, and Paul E. Comeau, Warwick, all of R.I., assignors to Kenney Manufacturing Company, Warwick, R.I.
Filed Aug. 2, 1989, Ser. No. 389,119
Term of patent 14 years
U.S. Cl. D25—49



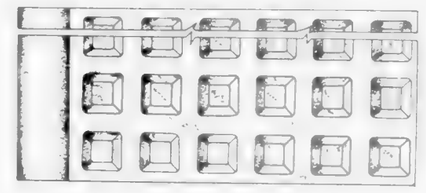
329,295
BRACE FOR LADDERS
Alex Homery, 346 Evansdale Rd., Lake Mary, Fla. 32746
Filed Oct. 21, 1991, Ser. No. 779,613
Term of patent 14 years
U.S. Cl. D25—68



329,296
GUARD FOR PROTECTING THE BASES OF TREE TRUNKS FROM TRIMMING DEVICES
Leonard N. Albrecht, Irvine, Calif., assignor to Deep Root Corporation, Westminster, Calif.
Filed Apr. 17, 1990, Ser. No. 510,272
Term of patent 14 years
U.S. Cl. D25—156



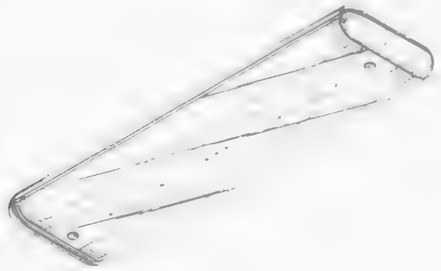
329,297
FOUNDATION DRAIN
Richard D. Smith, 7 Southmoor, St. Louis, Mo. 63105
Filed Jan. 29, 1990, Ser. No. 471,721
Term of patent 14 years
U.S. Cl. D25—138



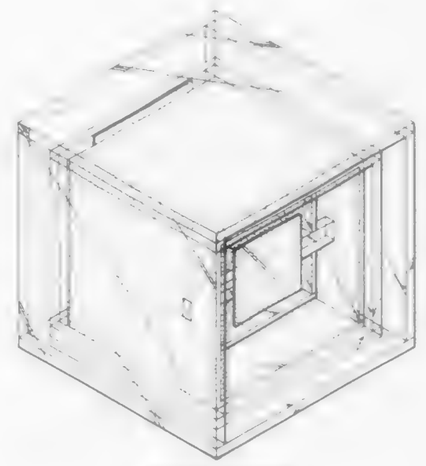
329,298
ADJUSTABLE LAMP
Huo T. Huang, No. 5, Nung 14, Lane 33, Chang-tai Str., San-Hsia, Taipei, Taiwan
Filed Feb. 13, 1991, Ser. No. 656,258
Term of patent 14 years
U.S. Cl. D26—62

329,299
RECESSED INDIRECT WALL WASH FLUORESCENT LIGHTING FIXTURE
John M. Cole, Jr., Hingham, Mass., assignor to Litecontrol Corporation, Hanson, Mass.
Filed Oct. 31, 1990, Ser. No. 606,342
Term of patent 14 years
U.S. Cl. D26—74

329,300
FLUORESCENT WALL LIGHT
Apex Hong, No. 9, Kung 4 Rd., Lin Kou Industrial Park, Taipei Hsien, Taiwan
Filed Jan. 3, 1991, Ser. No. 636,986
Term of patent 14 years
U.S. Cl. D26—78



329,301
ILLUMINATED SCULPTURE
Miranda Leonard, Church Court Condominiums, 492 Beacon St., Boston, Mass. 02115
Filed Jun. 4, 1990, Ser. No. 533,040
Term of patent 14 years
U.S. Cl. D26—104

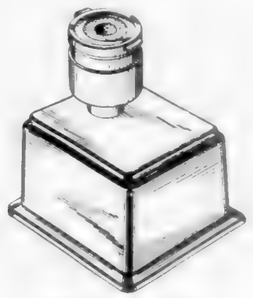


329,302
LIGHTER
Sin-Hwa Huang, c/o Hung Hsing Pateat Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan
Filed Jan. 14, 1991, Ser. No. 641,081
Term of patent 14 years
U.S. Cl. D27—148

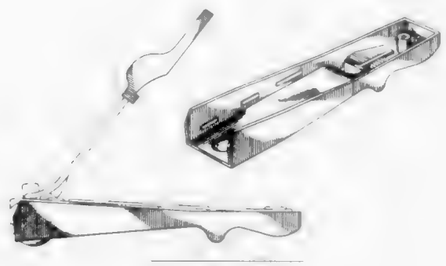
329,303
PERMING ROD
Hiromi Asakura, 2-7-39, Matsushima-cho, Takamatsu-shi, Kagawa, Japan
Division of Ser. No. 512,076, Apr. 12, 1990, abandoned, which is a continuation of Ser. No. 263,240, Oct. 27, 1988, abandoned.
This application Feb. 14, 1991, Ser. No. 654,675
Term of patent 14 years
U.S. Cl. D28—37

329,304
STAND FOR HANDHELD CURLING IRON OR SIMILAR ARTICLE
Charles S. Tipp, 6427 Quarry La., Dublin, Ohio 43017
Filed Mar. 27, 1990, Ser. No. 499,672
Term of patent 14 years
U.S. Cl. D28—38

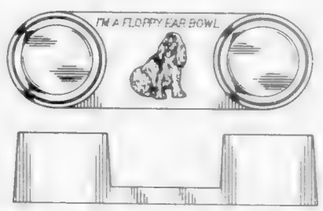
329,305
FINGERNAIL POLISH REMOVER
Calvert Billings, 23221 Peralta, Suite H, Laguna Hills, Calif. 92653
Filed Jun. 1, 1990, Ser. No. 531,542
Term of patent 14 years
U.S. Cl. D28—56



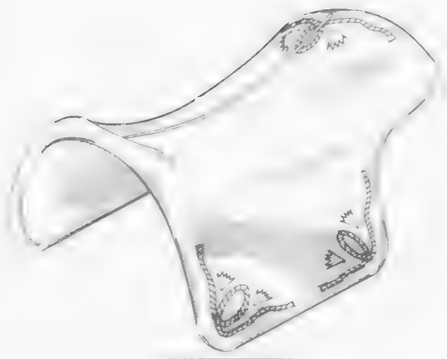
329,306
COMBINED THUMB AND FINGER GRIP FOR NAIL CLIPPERS
Eric Rommerdale, Brandon, Miss., assignor to The W. E. Bassett Company, Shelton, Conn.
Filed Aug. 25, 1989, Ser. No. 399,089
Term of patent 14 years
U.S. Cl. D28—62



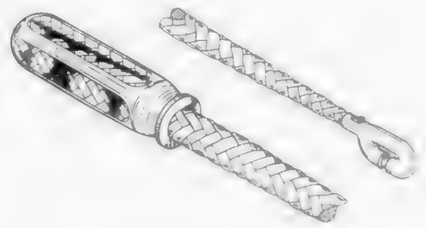
329,307
FEEDER FOR DOGS
Noraine Lamela, 5980 Piney Ct., Lakeworth, Fla. 33463, and Anna Lamela, 4391 Rende La., Lake Worth, Fla. 33461
Filed Apr. 4, 1991, Ser. No. 680,265
Term of patent 14 years
U.S. Cl. D30—131



329,308
GEL FILLED SADDLE PAD
Kerry Millikin, 205 N. Wawaset Rd., West Chester, Pa. 19382
Filed Aug. 14, 1990, Ser. No. 567,347
Term of patent 14 years
U.S. Cl. D30—134

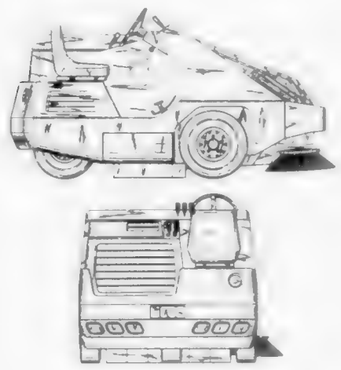


329,309
WHIPLEASH
Cheryl Washington, 1239 W. Greenleaf, #2 South, Chicago, Ill. 60626
Filed Jul. 12, 1990, Ser. No. 551,723
Term of patent 14 years
U.S. Cl. D30—153



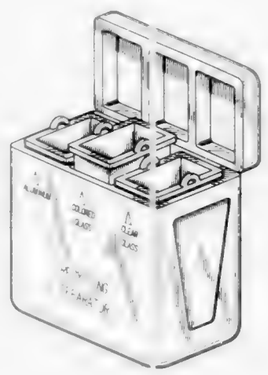
329,310
TUG TOY FOR DOGS
Anthony O'Rourke, Malibu, Calif., assignor to Booda Products, Inc., Gardena, Calif.
Filed Feb. 14, 1991, Ser. No. 655,902
Term of patent 14 years
U.S. Cl. D30—160

329,311
SWEEPER VEHICLE
Christopher M. Knowlton, Pinehurst, and Robert J. O'Hara, Southern Pines, both of N.C., assignors to AAR Corporation, Elk Grove Village, Ill.
Filed Dec. 28, 1989, Ser. No. 458,527
Term of patent 14 years
U.S. Cl. D32—16



329,312
COMBINED PAN AND DIAPER PAIL AND COVER THEREFOR
Lena Ross, #55, 6001 Promontory Rd., Sardis, British Columbia, Canada V2R 1B1
Filed Oct. 4, 1991, Ser. No. 771,248
Term of patent 14 years
U.S. Cl. D32—37

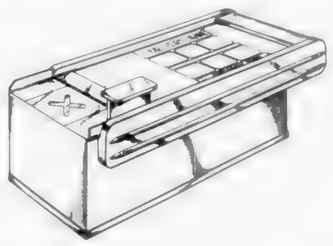
329,313
MULTI-COMPARTMENT WASTE RECEPTACLE FOR RECYCLING
Patrick Ward, and Judith G. Ward, both of 2 Catalina Dr., Bricktown, N.J. 08723
Filed Jul. 17, 1989, Ser. No. 380,257
Term of patent 14 years
U.S. Cl. D34—7



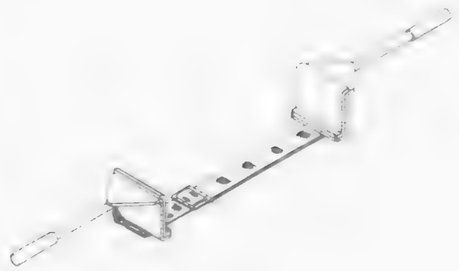
329,314
COUPON HOLDER FOR A SHOPPING CART
Paul A. Lawrence, 40800 SE. Coalman Rd., Sandy, Oreg. 97055
Filed Sep. 11, 1990, Ser. No. 580,617
Term of patent 14 years
U.S. Cl. D34—27

329,315
EXTENSION CHUTE
William L. Loefke; Ronald E. Christenson, both of Kasson, and Garwin B. McNeilus, Dodge Center, all of Minn., assignors to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.
Filed Jan. 26, 1990, Ser. No. 471,132
Term of patent 14 years
U.S. Cl. D34—28

329,316
CONVEYER BELT FOR A CHECKOUT COUNTER
Greg Adams, 9538 Bakers Bridge Rd., Douglasville, Ga. 30134
Filed Sep. 26, 1990, Ser. No. 588,422
Term of patent 14 years
U.S. Cl. D34—29



329,317
CARRYING HANDLE FOR CASKETS AND THE LIKE
DeWitt T. Bell, Jr., 6529 Pinewood Dr., Pinson, Ala. 35126
Filed May 29, 1990, Ser. No. 529,265
Term of patent 14 years
U.S. Cl. D99—8



329,318
CURRENCY DISCRIMINATING MACHINE
Koji Yukimoto; Hiroshi Hayashi, both of Sakado, and Yukio Ito, Niiza, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Japan
Filed Jul. 22, 1988, Ser. No. 223,178
Claims priority, application Japan, Feb. 3, 1988, 63-3760
The portion of the term of this patent subsequent to May 21, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D99—28

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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1992

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Zeitvogel, Christine H.; Adamczyk, Maciej B.; Betebenner, David A.; and Vaughan, Kenward S., 5,145,791, Cl. 436-546.000

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Abe, Hiroyuki, to Ricoh Company, Ltd.; and Ricoh Research Institute of General Electronics Co., Ltd. Image detecting unit having emitting means and light receiving means and method for arranging the light emitting means and the light receiving means. 5,146,082, Cl 250-227.200.

Abe, Kouji: *See—*
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Abe, Takefumi: *See—*
Koyama, Takeshi; and Abe, Takefumi, 5,146,025, Cl. 585-412.000.

Abelen, Thomas; Berges, Hans-Peter; Boley, Gustav; and Kaiser, Winfried, to Leybold AG. Low-noise vacuum pump. 5,145,335, Cl 417-410.000.

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Abraham, William E.: *See—*
Stoddart, John S.; and Abraham, William E., 5,145,429, Cl. 441-4.000

Abrahams, Alan; and Flaherty, James E., to Digital Equipment Corporation. Remote bootstrapping a node over communication link by initially requesting remote storage access program which emulates local disk to load other programs. 5,146,568, Cl. 395-325.000.

Abramovich, Igor: *See—*
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Abramovici, Rudolf, to Benchmark Structural Ceramics Corporation. Combustion-synthesis process for making friction materials. 5,145,619, Cl. 264-60.000

Abril, Obsidiana: *See—*
Cox, Daniel E.; Abril, Obsidiana; Bauminger, Sara; Neri, Bruce P.; and Shinefeld, Lisa, 5,145,784, Cl. 436-526.000.

Acer Incorporated: *See—*
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Ackerman, Dennis F.; Bender, David R.; Chu, Salina S.; Deibert, George R.; Hallock, Gary G.; Lackey, David E.; Sheldon, Robert G.; and Stranko, Thomas A., to International Business Machines. Logic simulation using a hardware accelerator together with an automated error event isolation and trace facility. 5,146,460, Cl. 371-23.000

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Rees, James D.; and Acquaviva, Thomas, 5,146,286, Cl. 355-309.000.

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Uenishi, Nobuaki; Nagayoshi, Mitsugu; Miyanaga, Hirofumi; Sato, Tomoaki; Sakiyama, Katsunori; Ueda, Yasuhiro; and Adachi, Hideyuki, 5,144,848, Cl. 73-866.500.

Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, to Matsushita Electric Industrial Co., Ltd. Time code recording or reproducing apparatus and time code converter. 5,146,448, Cl. 369-83.000

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Adams, Jerry L.; Bender, Paul E.; Gleason, John G.; Hanna, Nabil; Newton, John F., Jr.; Perchonock, Carl D.; and Razgaitis, Kazys, to SmithKline Beecham Corp. Pyrrolo [1,2-A] imidazole and imidazo [1,2-A] pyridine derivatives and their use as 5-lipoxygenase pathway inhibitors. 5,145,858, Cl. 514-318.000.

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Paserin, Vladimiri; Babjak, Juraj; Ettel, Victor A.; and Adams, Richard S., 5,145,716, Cl. 427-55.000.

Adan, Alberto; and Horita, Masayoshi, to Sharp Kabushiki Kaisha. Method for manufacturing a semiconductor apparatus. 5,145,796, Cl. 437-40.000

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Marrison, William C.; and Rogers, Russell L., 5,145,213, Cl 285-2.000

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Belanger, Thomas D., Jr., 5,145,400, Cl. 439-376.000.

Agarwal, Rakesh K.: *See—*
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Allard, Pierre-Yves, to Dowell Schlumberger Incorporated. Packing for piston and valve machine. 5,145,140, Cl. 417-568.000.
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Hirschberg, Eugene H.; and Huff, George A., Jr., 5,145,826, Cl. 502-262.000
Sweeney, Kevin L.; and Keur, Michael R., 5,146,526, Cl. 385-90.000.
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Brownlie, Alan W.; Derr, John W.; Keener, Scott A.; Robertson, James W.; and Shay, Francis J., 5,145,388, Cl. 439-142.000.
Manabe, Sakae, 5,145,398, Cl. 439-341.000
Minnis, Alan J., 5,145,356, Cl. 439-352.000.
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Volz, Keith L., 5,145,381, Cl. 439-62.000.
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Bassett, David R.; and Amstutz, Gary A., 5,145,763, Cl. 430-169.000.
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Kosmala, Alexandre; Malone, David; and Masak, Peter, 5,146,433, Cl. 367-83.000
Anagnostopoulos, Constantine N.: *See*—
Bell, Cynthia S.; Anagnostopoulos, Constantine N.; Williams, Paul M.; Gaboury, Michael J.; and Koudelka, James R., 5,146,258, Cl. 354-432.000.
Analog Devices, Inc.: *See*—
Bowers, Derek F.; and Henry, Peter S., 5,146,181, Cl. 330-268.000
Anaquest, Inc.: *See*—
Lin, Bor-Sheng; Spencer, H. Kenneth; and Scheblein, Joseph W., 5,145,967, Cl. 546-208.000
Ancona, Giuseppe; Benelli, Giancarlo; De Michele, Gennaro; Ligasacchi, Sergio; Mascalzi, Gianni; Scavizzi, Giancarlo; Trebbi, Giuliano; and Zennaro, Aldo, to Ente Nazionale Per l'Energia Elettrica; and Ansaldo Componenti s.r.l. Burner for thermic generators. 5,145,359, Cl. 431-184.000
Anderson, Charles B.; and Kenrick, Charles R., to Builder's Pride, Inc. Universal dryer duct and vent. 5,145,217, Cl. 285-179.000
Anderson, Fred J., to Delco Electronics Corporation. Low power UHF data transceiver. 5,146,613, Cl. 455-78.000
Anderson, Gary V.: *See*—
Paviescak, Jim J.; and Anderson, Gary V., 5,145,030, Cl. 182-113.000.
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Ancona, Giuseppe; Benelli, Giancarlo; De Michele, Gennaro; Ligasacchi, Sergio; Mascalzi, Gianni; Scavizzi, Giancarlo; Trebbi, Giuliano; and Zennaro, Aldo, 5,145,359, Cl. 431-184.000
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Anthony Welded Products, Inc.: *See*—
Salvucci, Frank S., 5,145,311, Cl. 414-592.000
Anton, Douglas R.; and Druliner, Joe D., to Du Pont de Nemours, E. I., and Company. Cyanocarbon compounds as lubricants in refrigeration compositions. 5,145,594, Cl. 252-68.000
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APA Optics, Inc.: *See*—
Khan, Muhammad A.; VanHove, James M.; and Olson, Donald T., 5,146,465, Cl. 372-45.000
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Arakawa Kagaku Kogyo Kabushiki Kaisha: *See*—
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Araki, Toshimitsu; Kawamata, Fumihiko; Miyagawa, Hitoshi; Yoshida, Masahito; and Masuda, Naotaka, to Ishikawajima-Harima Heavy Industries Co., Ltd.; and Tokyo Electric Power Co., Inc., The. Water disaster prevention water curtain forming apparatus. 5,145,280, Cl. 405-62.000
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Aralis, James M.: *See*—
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Archer, Thomas J.: *See*—
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Arco Chemical Technology, L.P.: *See*—
Morales, Edrick; Gaffney, Anne M.; and Sofranko, John A., 5,146,034, Cl. 585-654.000
Ardaud, Pierre; and Mignani, Gerard, to Rhone-Poulenc Chimie. Boron/nitrogen/silicon preceramic polymers and boron nitride ceramic materials produced therefrom. 5,145,917, Cl. 525-474.000
Aristech Chemical Corporation: *See*—
Salek, Jeffrey S.; Pugach, Joseph; Elias, Carole L., and Cullo, Leonard A., 5,146,012, Cl. 568-881.000
Armah, Ben: *See*—
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Arnold, David: *See*—
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Arnold, Wendell R.; Coghlan, Michael J.; Jourdan, Glen P.; Krumkalns, Eriks V.; and Suhr, Robert G., to DowElanco. Quinoline and cinnoline fungicides. 5,145,843, Cl. 514-63.000.
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Arthropharm PTY. Limited: *See*—
Cullis-Hill, David; and Ghosh, Peter, 5,145,841, Cl. 514-54.000
Arthur, Rodney I., to Rope & Marine Supplies Pty. Ltd. Battery lift handle. 5,144,719, Cl. 16-114.00R.
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Asaba, Eiki; and Tanabe, Yoshihito, to Fanuc, Ltd. Rotary code disk mounting structure for an optical encoder with an adhesive substance filling the circular recess of the spindle for adherence to said disk. 5,146,084, Cl. 250-231.140
Asahi Glass Company Ltd.: *See*—
Saito, Joichi; Kozawa, Sigeyuki; Kunii, Nobuaki; Yamamoto, Hirotsugu; and Takeyasu, Hiromitsu, 5,145,883, Cl. 521-172.000
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
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Asaka, Tatsuya: *See*—
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Asakawa, Kazushige; Fukushima, Minoru; and Fujikura, Mitsuo, to Molex Incorporated. Electrical connector and terminal therefor. 5,145,384, Cl. 439-78.000
Asakuno, Hiroyoshi: *See*—
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Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai Kenji, 5,145,892, Cl. 524-34.000
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Asano, Mitsuyasu: *See*—
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Asano, Toshihisa; Tanaka, Yoshiaki; Fukutomi, Masao; and Maeda, Hiroshi, to National Research Institute for Metals. Method for manufacturing oxide high-temperature superconductor. 5,145,829, Cl. 505-1.000
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Ashida, Yasuko: *See*—
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Ashland Oil, Inc.: *See*—
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Assistance Publique: *See*—
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Aswal, Bacchan S.; Chander, Ramesh; Chatterji, Sunil K.; Dhawan, Bhola N.; Dwivedi, Yogesh; Garg, Narendra K.; Jain, Poonam; Kapoor, Narinder K.; Kulshreshtha, Dinesh K.; Mehrotra, Bishan N.; Patnaik, Gyanendra K.; Rastogi, Ravi; Sarin, Jagat P. S.; Saxena, Krishna C.; Sharma, Shekhar C.; Sharma, Shri K.; Shukla, Binduja; and Visen, Pradeep K. S., to Council of Scientific & Industrial Research. Process for the preparation and composition of a fraction containing picroside I and kutkoside. 5,145,955, Cl. 536-124.000

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Arroyo, Candido J.; Bogdan, Stanley R.; and Hancock, David S., 5,146,046, Cl. 174-23.00R
Avramopoulos, Hercules; William French, Paul M.; Gabriel, M. Christina; and Whitaker, Norman A., Jr., 5,146,517, Cl. 385-39.000
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Eng, Wing K.; and Slack, William F., 5,146,396, Cl. 363-16.000
Goke, Louis R.; and Grimes, Gary J., 5,146,455, Cl. 370-68.000
Green, Donald R., Jr., 5,146,175, Cl. 330-54.000
Harman, Dale D., 5,146,494, Cl. 379-411.000.
Licht, Steven J., 5,146,361, Cl. 359-280.000
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Lisco, Richard J., 5,146,079, Cl. 250-214.0AG
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Bohon, William M., 5,145,332, Cl. 417-390.000
Cornette, Holley M., 5,145,004, Cl. 166-278.000
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Auhorn, Werner; Linhart, Friedrich; Lorencak, Primoz; Kroener, Michael; Sendhoff, Norbert; Denzinger, Walter; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Production of paper, board and cardboard. 5,145,559, Cl. 162-168.200.

Auman, Brian C., to Du Pont de Nemours, E. I., and Company. Polymers modified by ketonic and ether-ketonic compounds. 5,145,899, Cl. 524-357.000

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Aumueller, Alexander; and Trauth, Hubert, to BASF Aktiengesellschaft. Cyclic amides. 5,145,966, Cl. 546-193.000

Austin, Jared A., Miller, Joseph H.; and Hyslop, Robert F., to Fiberweb North America, Inc. Wiping fabric and method of manufacture. 5,144,729, Cl. 28-105.000.

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Kirschner, Craig A., 5,145,132, Cl. 248-59.000

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Avery, Ragnar R., to Dow Corning Corporation. Shipping package combination. 5,144,897, Cl. 108-55.300.

Avis, Graham M.: *See*—
Critchlow, David N.; Yehushua, Moshe; Avis, Graham M.; Heimbigner, Wade L.; and Johnson, Charle J., 5,146,473, Cl. 375-8.000

Avon Industrial Polymers Limited: *See*—
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Avramopoulos, Hercules; William French, Paul M.; Gabriel, M. Christina; and Whitaker, Norman A., Jr., to AT&T Bell Laboratories. Low distortion all-optical threshold device, 5,146,517, Cl. 385-39.000

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Ayers, Jack D., to United States of America, Navy. Method of making composite field-emitting arrays. 5,145,435, Cl. 445-24.000

Ayter, Sevig: *See*—
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Azuma, Hiroshi: *See*—
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Babuder, Gerald A., to Cajon Company. Tube coupling with gasket retainer. 5,145,219, Cl. 285-330.000

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Bachman, Charles W.; Cimral, John J.; Gane, Christopher P.; Krieger, David A.; Micco, John T.; and Abramovich, Igor, 5,146,591, Cl. 395-600.000

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Baggiolini, Enrico G., deceased; Hennessy, Bernard M.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 5,145,846 Cl. 514-167.000

Baggiolini, Enrico G., deceased (by Baggiolini, Barbara J., executrix); Hennessy, Bernard M., Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Vitamin D3 analogs. 5,145,846, Cl. 514-167.000.

Baheri, Hamid, to Wangtek. Adjustable magnetic head mounting system. 5,146,377, Cl. 360-109.000

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Baiel, James J.: *See*—
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Bailey, Joseph S.; and Cox, Nelson A., to United States of America, Agriculture. Preenriched broth medium for the simultaneous sampling of foods for salmonella and listeria. 5,145,786, Cl. 435-252.400

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Bailey, Roger N.; and Mansfield, Robert L., to International Business Machines Corporation. Multiple data format interface. 5,146,572, Cl. 395-425.000

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Balke, Roy L.; and Jack, Joseph E., to General Electric Company. Method of establishing a leakage current path for a commutator. 5,144,739, Cl. 29-597.000.

Ball Corporation: *See*—
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Ballance, David S.; Camilletti, Robert C.; and Gentle, Theresa E., to Dow Corning Corporation. Process for coating a substrate with silica. 5,145,723, Cl. 427-397.700.

Ban, Masaaki: *See*—
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Banaska, John G., to Keithley Instruments, Inc. High voltage solid-state switch with current limit. 5,146,100, Cl. 250-551.000.

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Bander, Neil H.: *See*—
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Banfield, Robert R.: *See*—
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Bang, Gary M.: *See*—
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Bank, Harvey L.: *See*—
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Barito, Thomas R.; and Fraser, Howard H., Jr., to Carrier Corporation. Magnetically actuated seal for scroll compressor. 5,145,345, Cl. 418-55.400

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Bohac, Frank J., Jr.: *See*—
Lippmann, Raymond; Nelson, James E.; Schnars, Michael J.; Chintyan, James R.; Aralis, James M.; and Bohac, Frank J., Jr., 5,146,154, Cl. 323-367.000

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Bohon, William M., to Atlantic Richfield Company. Well pumping. 5,145,332, Cl. 417-390.000.

Boiron, Guy F. V.; and Kretz, Laurent, to Societe Alsacienne d'Aluminium. System for closure and subsequent opening of sterilizable containers. 5,145,737, Cl. 428-334.000.

Bol, Igor I., to Xerox Corporation. Method of manufacturing a planar microelectronic device. 5,145,438, Cl. 445-49.000

Boland, Bernard W.: *See*—
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Boley, Gustav: *See*—
Abelen, Thomas; Berges, Hans-Peter; Boley, Gustav; and Kaiser, Winfried, 5,145,335, Cl. 417-410.000

Bolinger, Judd A. Adjustable spectacle leg apparatus. 5,146,245, Cl. 351-118.000

Bonsu, Alex K.: *See*—
Westerberg, J. Lennart; Bonsu, Alex K.; and Perrett, Fred J., 5,145,556, Cl. 162-29.000

Booher, Loodie M., to Reynolds Metals Company. Reversed can end ejection system. 5,145,050, Cl. 198-395.000

Booke, Michael A.; Kallmeyer, Michael H. W.; Rizk, Nabil A.; and Yau, You-Wen, to International Business Machines Corporation High accuracy, high flexibility energy beam machining system. 5,145,551, Cl. 156-626.000

Booth, James R.: *See*—
Beck, James L.; Booth, James R.; Cole, Carl P.; Oliver, Lynn M.; Spina, Warren J.; and Troyer, Stephen R., 5,146,547, Cl 395-116.000

Bopp, Richard C.; and Roberts, Daniel L., to General Electric Co. Polyphenylene oxide-recycled polystyrene composition and method 5,145,877, Cl. 521-40.000

Borcherdt, D. Thomas. Mortarless retaining wall. 5,145,288, Cl 405-284.900.

Borden, Inc.: *See*—
Gerber, Arthur H., 5,145,913, Cl. 525-506.000
Shustack, Paul J., 5,146,531, Cl. 385-128.000
Taylor, John G.; and Gerber, Arthur H., 5,145,887, Cl. 523-145.000

Boris, Joseph F., Sr.: *See*—
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Boris, Sherri M.; and Boris, Joseph F., Sr. Inflatable lifesize toy structure with interlocking elements. 5,145,440, Cl. 446-106.000

Boucheron: *See*—
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Boucheron, Thierry; Christian, Blanchard, and Lauraire, Michel, to Telemecanique. Current limiting switch device. 5,146,055, Cl. 200-144.00R

Bowen, David C.; and Leonard, Russell J., to Molex Incorporated Male electrical contact and connector embodying same. 5,145,383, Cl. 439-78.000

Bowers, Derek F.; and Henry, Peter S., to Analog Devices, Inc. BiCMOS output stage with improved output voltage signal. 5,146,181, Cl. 330-268.000

Bowling, Kinred: *See*—
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Bowser, David; and Warden, Gerald D., to Bell & Howell Phillipsburg Co. Sheet feeder. 5,145,161, Cl. 271-12.000

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Boykin, Michael A., to Boykin, Michael A.; and Boykin, Dorothy M. Retractile speargun line. 5,145,740, Cl. 428-371.000.

Boyle, Colin S., to Otis Engineering Corporation. Running and pulling tool. 5,145,228, Cl. 294-86.250

Boyle, William J., Jr.: *See*—
Tang, Reginald Ting-Hong; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundanbhai, 5,145,945, Cl. 528-370.000

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Bradley, Donald A., to Wiltron Company. Full reversing millimeter test set. 5,146,171, Cl. 324-639.000

Brams, Peter, to Krauss-Maffei Aktiengesellschaft. Apparatus for the plastifying of thermoplastic synthetic resins. 5,145,694, Cl. 425-174.80R

Brand, Siegbert: *See*—
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Brandani, Paolo, to Savio S.p.A. Control device and method for electromagnetic needle selection in circular knitting machine. 5,144,818, Cl. 66-219.000

Brandle, Richard T.; Goodliffe, Don L.; Keith, Donald E.; Robinette, Randy A.; Sizemore, Robert C.; Smithwick, Garry J.; and Zappavigna, Anthony J., to International Business Machines Corporation. Procedure call interface. 5,146,593, Cl. 395-700.000

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Breed, Michael S. Golf putting training device. 5,145,179, Cl 273-189.00R

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Bridgestone Corporation: *See—*
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Brient, James A.; and Strunk, Marvin H., Jr., to Merichem Company. Pyrolysis of naturally occurring cresylic acid mixtures. 5,146,010, Cl. 568-761.000

Bright, Michael W., to Motorola, Inc. Group rekey in a communication system. 5,146,497, Cl. 380-21.000

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Brinkerhoff, Susan M.: *See—*
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Brinkhoff, Michael: *See—*
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British Petroleum Company p.l.c., The *See—*
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Broer, Dirk J.: *See—*
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Brokman, Avner: *See—*
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Bromley, Daniel. Sound focusing device 5,146,434, Cl. 367-140.000

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Brooks, Peter E.; Reidenbach, John R. and Troutman, Mark E., to International Business Machines Corporation. Method and apparatus for bearing to comb attachment. 5,146,450, Cl. 369-244.000.

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Brooks, William M., to PYR Systems, Inc. Optical communications system and method for transmitting information through a single optical waveguide. 5,146,358, Cl. 359-181.000.

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Brown, Ernest D. Vapor treatment facilities for petroleum storage tank cleaning. 5,144,807, Cl. 62-20.000

Brown, Gene W.; and Biere, David A., to Baldwin Filters, Inc. Self-venting drain valve. 5,144,978, Cl. 137-588.000

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Brown, Nancy. Ear-supported radio. 5,146,619, Cl. 455-351.000

Brown, Robert G.; Faygenblat, Edward; Quasney, Robert S.; Cardno, Charles M.; and Siegel, William J., to Pace Incorporated. Tweezer handpiece for installation and removal of electronic components with respect to a substrate and tips and tools for use therewith. 5,145,101, Cl. 228-51.000

Brown, Ronald E.; and Lee, Fu-Ming, to Phillips Petroleum Company. Extractive distillation of mixtures containing aromatic and olefinic hydrocarbons. 5,145,562, Cl. 203-51.00

Brown, Rork S. Pressure measuring device responsible to a magnetic flux field. 5,146,165, Cl. 324-260.000

Brownlie, Alan W.; Derr, John W.; Keener, Scott A.; Robertson, James W.; and Shay, Francis J., to AMP Incorporated. Enclosure for cross-connect terminal block. 5,145,388, Cl. 439-142.000

Bruckner, Attila A., to Ansorg Lichttechnik Gesellschaft Mit Beschrankter Haftung. Variable-position recessed light fixture. 5,145,249, Cl. 362-365.000

Brumwell, Dennis: *See—*
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Brun, Claude: *See—*
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Brun, Jean-Paul; Sarradin, Jean-Louis; and Dol, Christian, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Bill publishing apparatus. 5,146,066, Cl. 235-380.000.

Brunel, Christian; and Thioulouse, Pascal. Electroluminescent display with memory effect and half-tones. 5,146,213, Cl. 340-781.000.

Brunskill, Michael R.; and McKelvey, Wilfred G., to Allied-Signal Inc. Fluid conditioning system and apparatus. 5,145,124, Cl. 244-118.500

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Budnik, Richard A.; Blevins, Charles H., II; Murphy, Gerald J.; Grabowski, Wojciech; and Cobb, Raymond L., to Union Carbide Chemicals & Plastics Technology Corporation. Surfactants for manufacture of urethane foams. 5,145,879, Cl. 521-112.000.

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Buehler, Wolfhardt; Poisel, Hans; and Trommer, Gert, to Messerschmitt-Boelkow-Blohm GmbH. Method for self-correction of a fiber gyroscope with a 3×3-coupler. 5,146,292, Cl. 356-350.000.

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Cajigas, Stanley, to MPY Foods, Inc. Instant yogurt composition and process. 5,145,698, Cl. 426-43.000.

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Cartier, George E.; Piretti, Carl P.; and Simon, Robert H. M., to Monsanto Company. Bilayer glazing panel. 5,145,744, Cl. 428-423.700.
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Tanis, Dale R., 5,145,461, Cl. 460-67.000.
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Fox, Richard S.; and Case, Frederick J., 5,146,277, Cl. 355-245.000.
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Caserta, Joseph N.; Mims, William D.; and Crenshaw, David A., to ITT Corporation. Gated voltage apparatus for high light resolution and bright source protection of image intensifier tube. 5,146,077, Cl. 250-213.0VT.
Cassady, William E. Method of surface hardening titanium and other metals. 5,145,530, Cl. 148-565.000.
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Cassorla, Elie; de Vries, Jacqueline P.; Moran, Michael E.; Slater, James J.; and Unger, Jay, to International Business Machines Corporation. Method for associating annotation with electronically published material. 5,146,552, Cl. 395-145.000.
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Caston, Jackie L.; and Simoneaux, Tracy L. Golf score card support bracket. 5,145,140, Cl. 248-447.200.
Castonguay, Roger N.; and Arnold, David, to General Electric Company. Molded case circuit breaker with linear responsive unit. 5,146,195, Cl. 335-35.000.
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Chang, Robert C., to Aluminum Company of America. Method of indentifying and quantifying oxides on rolled metal strip. 5,146,311, Cl. 358-100.000.
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Chou, Luc L.; and Cheng, Jonathan C., to DAY Sheng-Tong. Fully automatic collapsible umbrella. 5,144,969, Cl. 135-22.000.
Chow, Jessie. Control device for ratchet wrenches. 5,144,869, Cl. 81-63.000.
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Christopherson, Ernest W. Biomass pellet-burning orchard heaters. 5,144,939, Cl. 126-25.00R.
Chronister, Clyde H. Internal tank valve with valve lock. 5,145,151, Cl. 251-144.000.
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Fisher, Marvin D.: *See—*
Altenhof, Jr. James N.; Crookston, Ronald W.; Bratkowski, Walter V.; Barkell, James W., Jr.; and Fisher, Marvin D., 5,146,194, Cl. 335-16.000.

Fitness Master, Inc.: *See—*
Friedebach, Adolph H., 5,145,481, Cl. 482-70.000.

Fittery, Larry R.: *See—*
Foster, James P.; Mullen, C. Thomas; Rambacher, Bruce A.; Rhoads, Herman P.; Fittery, Larry R.; and Schiavone, Michael C., Jr., 5,145,306, Cl. 414-417.000.

Fitzner, Klaus, to Heinrich Nickel GmbH. Double floor for removing air from rooms. 5,144,781, Cl. 52-303.000

Fitzwater, Garland J. Front end loader-mounted ditch hoe attachment 5,144,761, Cl. 37-117.500

Fladung, Manfred, to Manfred Fladung GmbH. Cable winding device. 5,145,040, Cl. 191-12.20R.

Flaherty, James E.: *See—*
Abrahams, Alan; and Flaherty, James E., 5,146,568, Cl. 395-325.000.

Flamm, Peter M., to Deutsche ITT Industries GmbH. Apparatus and method for reducing line flicker in a television picture. 5,146,329, Cl. 358-166.000

Fleischmann, Jonathan D., to Case Western Reserve University. Methods of treating interstitial cystitis and urethral syndrome. 5,145,859, Cl. 514-356.000

Flem, Per E., to Performance Plastics. Double flange pop-in bearing. 5,145,265, Cl. 384-296.000

Flora, Laurence P.: *See—*
Peterson, LuVerne R.; and Flora, Laurence P., 5,146,424, Cl. 364-786.000

Flores, Gerhard; Reisser, Helmut; and Lex, Konrad, to Kadia-Diamant Maschinen-und Werkzeugfabrik O. Kopp GmbH & Co. Honing or grinding tool and measuring device for measuring wear. 5,144,773, Cl. 51-165.740.

Floroski, James M.; and Bartley, Eileen A., to United Technologies Corporation. Diffusion bonding process. 5,145,105, Cl. 228-194.000.

Flow International Corporation: *See—*
Hashish, Mohamed A.; Olsen, John H.; Zarin, Katherine J.; and Erichsen, Glenn A., 5,144,766, Cl. 51-439.000

Flueckiger, Rudolph H., to National Carbide Outlet, Inc. Milling cutter capable of using indexable inserts of various shapes. 5,145,294, Cl. 407-42.000

Flux, Peter J.; and Martyn, Gerald H., to Westland Helicopters Limited. Helicopter rotors with elastomeric bearings. 5,145,321, Cl. 416-244.00R.

FMC Corporation: *See—*
Kamienski, Conrad W.; and Dover, B. Troy, 5,145,600, Cl. 252-182.300

FMG Timberjack AB: *See—*
Hult, Bror, 5,144,748, Cl. 30-276.000

Foa, Marco: *See—*
Gardano, Andrea; Coassolo, Alfredo; Casagrande, Francesco; Foa, Marco; and Chapoy, Larry L., 5,146,008, Cl. 568-743.000.

Fock, Jurgen: *See—*
Esselborn, Eberhard; Fock, Jurgen; and Lammering, Helmut, 5,145,914, Cl. 525-329.500.

Focke & Co.: *See—*
Focke, Heinz; and Buse, Henry, 5,144,789, Cl. 53-381.200

Focke, Heinz; and Buse, Henry, to Focke & Co. Process and apparatus for transporting stacks of blanks for producing (cigarette) packs. 5,144,789, Cl. 53-381.200

Foerg, Franz: *See—*
Klueppel, Hans-Juergen; and Foerg, Franz, 5,145,665, Cl 424-50.000

Foley, John A., Jr.: *See—*
Smith, Steven I.; and Foley, John A., Jr., 5,145,695, Cl. 426-2.000

Foley, Paul; and Buckpesch, Rainer, to Hoechst Aktiengesellschaft Ceramic composition of matter and its use. 5,145,540, Cl. 156-89.000.

Fontaine, James A.: *See—*
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 5,146,592, Cl. 395-157.000

Forbus, Ellen S.: *See—*
Willis, Mitchell J.; Young, Raymond H.; Forbus, Ellen S.; and Donaldson, Larry W., 5,145,814, Cl. 501-146.000

Ford Motor Company: *See—*
Hellebuyck, Charles G.; and Khalid, Syed M., 5,146,057, Cl 200-313.000
Logothetis, Eleftherios M.; and Soltis, Richard E., 5,145,566, Cl 204-153.180
Oyafuso, Harry H., 5,144,738, Cl. 29-596.000

Forestier, Serge; Lang, Gerard; and Richard, Herve, to L'Oreal. Cosmetic use of dibenzoylmethane diorganopolysiloxanes and novel cosmetic compositions containing such compounds for the protection of skin and hair. 5,145,662, Cl. 424-45.000

Forschungszentrum Julich GmbH: *See—*
Lemke, Heiko; Goddenhenrich, Thomas, Bochem, Hans-Peter; and Hartmann, Uwe, 5,145,564, Cl. 204-129.550.

Fortmann, Norbert: *See—*
Muller, Rudolf; Muller, Peter; and Fortmann, Norbert, 5,144,883, Cl. 92-137.000

Fortney, Donald Z.; and Durham, Donald R., to W. R. Grace & Co.-Conn. Compositions containing protease produced by vibrio and method of use in debridement and wound healing. 5,145,681, Cl. 424-94.630.

Fortsch, Friedrich, to Steelcase Strafor (S.A.). Device for receiving, guiding, protecting, and concealing the electric power leads in a piece of furniture supporting electric and electronic appliances. 5,144,896, Cl. 108-50.000

Foseid, Peter T.: *See—*
Puccinelli, Joseph S.; Foseid, Peter T.; and Karlsen, Stig, 5,145,032, Cl. 182-142.000

Foster, James P.; Mullen, C. Thomas; Rambacher, Bruce A.; Rhoads, Herman P.; Fittery, Larry R.; and Schiavone, Michael C., Jr., to Hershey Corp. Method and apparatus for handling confections 5,145,306, Cl. 414-417.000

Foster, Joseph W.: *See—*
Sloan, Joseph W.; Snyder, Harry P.; Foster, Joseph W.; Day, Mark C.; Berg, Timothy G.; Jarreau, Michael; Miller, Mark P.; and Bush, A. Michael, 5,146,067, Cl. 235-381.000

Foster, Raymond K. Container for liquid bearing material. 5,145,309, Cl. 414-525.100.

Foster Wheeler Energy Limited: *See—*
Stoddart, John S.; and Abraham, William E., 5,145,429, Cl 441-4.000

Fowler, Hubert H., Jr.: *See—*
Chambers, Douglas R.; Fowler, Hubert H., Jr.; Fujiura, Yoji; and Masuda, Fusayoshi, 5,145,906, Cl. 524-732.000

Fox, Nathaniel S.; and Lawton, Evert C. Discontinuous structural reinforcing elements and method of reinforcing and improving soils and other construction materials. 5,145,285, Cl. 405-258.000

Fox, Richard S.; and Case, Frederick J., to Eastman Kodak Company Dual-flow ribbon blender having interstream mixing member 5,146,277, Cl. 355-245.000

Foxconn International, Inc.: *See—*
Tan, Haw-Chan; Yu, Nobbert; Lin, Yuan-Chieh; and Chen, Vincent, 5,145,412, Cl. 439-620.000

Frachet, Bruno; and David, Michel Y., to Assistance Publique. Transcutaneous connection device. 5,144,952, Cl. 128-642.000

France, Robert W. Target holder. 5,145,133, Cl. 248-168.000

Francisco, Robert, to Pitney Bowes Inc. System with simultaneous storage of multilingual error messages in plural loop connected processors for transmission automatic translation and message display. 5,146,587, Cl. 395-575.000

Francombe, Maurice H.: *See—*
Lampe, Donald R.; Sinharoy, Samar; Wu, Shu Y.; Buhay, Harry, Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S. Visvanathan, 5,146,299, Cl 357-23.500

Frank, James C., to General Motors Corporation. Anti-rattle feature for solenoid. 5,146,196, Cl. 335-271.000

Franke, Raymond C., to Union Switch & Signal Inc. Master-Satellite railway track circuit. 5,145,131, Cl. 246-122.00R

Franklin, Christopher M.: *See—*
Hullot, Jean-Marie; Jobs, Steven P.; and Franklin, Christopher M., 5,146,556, Cl. 395-159.000

Franklin, James: *See—*
Dogimont, Charles; Franklin, James; Janssens, Francine, and Schoebrechts, Jean-Paul, 5,146,013, Cl. 570-101.000

Franz, Laimbock. Two-stroke cycle reciprocating internal combustion engine for spark ignition and crankcase scavenging. 5,144,919, Cl 123-65.00W.

Fraser, Howard H., Jr.: *See—*
Barito, Thomas R.; and Fraser, Howard H., Jr., 5,145,345, Cl 418-55.400

Fraser, Stuart: *See—*
Reay, Derek W.; Fraser, Stuart; and Heddle, Richard G., 5,145,612, Cl. 261-79.200

Fraunhofer Gesellschaft zur Forderung der Angewandten for Schung E. V.: *See—*
Hartrumpf, Matthias, 5,146,290, Cl. 356-152.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Grisar, Roland; and Riedel, Wolfgang, 5,146,294, Cl. 356-435.000.

Frederick, Clay B.; and Udinsky, John R., to Rohm and Haas Company. Method for reducing the carboxylester content of an emulsion polymer. 5,145,890, Cl. 524-21.000.

Freeman, Richard R., to Concentric Pumps Limited. Gerotor pump with blind-end groove on each lobe of the annulus. 5,145,347, Cl 418-77.000

Freidhoff, Carl B.: *See—*
Lampe, Donald R.; Sinharoy, Samir; Wu, Shu Y.; Buhay, Harry; Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S. Visvanathan, 5,146,299, Cl 357-23.500

Freitag, Dieter: *See—*
Eckel, Thomas; Freitag, Dieter; Westeppe, Uwe; and Wittmann, Dieter, 5,145,911, Cl. 525-67.000.
Hess, Bernhard; Freitag, Dieter; and Idel, Karsten-Josef, 5,145,920, Cl. 525-528.000.

Frenzel, Jochen; Weber, Josef; and Gutowski, Horst, deceased (by Gutowski, Lieselohe, legal representative), to Linde Aktiengesellschaft. Process for the liquefaction of gases. 5,144,806, Cl. 62-9.000.

Frese, Stefan, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Helical UHF transmitting and/or receiving antenna. 5,146,235, Cl. 343-895.000.

Freudenberg-NOK: *See—*
Boardman, Thomas A., 5,145,190, Cl. 277-166.000.

Friedebach, Adolph H., to Fitness Master, Inc. Ski exercise machine 5,145,481, Cl. 482-70.000.

Friedrich Boysen GmbH & Co. KG: *See—*
Dummel, Karl-Heinz, 5,146,052, Cl. 181-240.000

Fromion, Andre: *See—*
Vilas Boas, Jean-Claude; and Fromion, Andre, 5,145,069, Cl. 206-497.000

Fromm, Paul M.; Kromm, Alvin D., Jr., and Levy, Jeffrey B., to Xerox Corporation. Oil handling around a metering roll. 5,145,525, Cl. 118-260.000

Frosig, Peter A.; and Lucyszyn, Roman, to Eastman Kodak Company. Close-up attachment for single-use camera. 5,146,256, Cl. 354-295.000

Frost, Adrian R.; and Henson, Karl M., to International Computers Limited. Copy-back cache system having a plurality of context tags and setting all the context tags to a predetermined value for flushing operation thereof. 5,146,603, Cl. 395-425.000.

Fruhling, Gerhard, to U. S. Philips Corporation. Power supply device with unbalance monitoring circuit. 5,146,397, Cl. 363-74.000

Fry, Rupert J., to Molex Incorporated. Female electrical terminal with improved contact force. 5,145,422, Cl. 439-856.000.

Frye, Ricky J., to MIM Industries, Inc. Method and apparatus for attaching binding to extensible material. 5,145,158, Cl. 270-45.000.

Fuchigami, Tokuhiko; Konishi, Masaya; Yasura, Sadahiro; and Yamada, Yasuhiro, to Victor Company of Japan, Ltd. Method of coding an audio signal by using coding unit and an adaptive orthogonal transformation. 5,146,222, Cl. 341 76.000.

Fuel Systems Textron Inc.: *See—*
Koblish, Theodore R.; and Bell, Leonard D., 5,144,804, Cl 60-740.000

Fuels Management Inc.: *See—*
Dunlop, Donald D., 5,145,489, Cl. 44-626.000.

Fuji Electric Corporation, Ltd.: *See—*
Hirota, Takato; Kogawa, Kuniyuki; and Ohtake, Shigeaki, 5,145,057, Cl. 200-243.000.

Fuji Photo Film Co., Ltd.: *See—*
Ichikawa, Yasunori; Ohnishi, Hiroshi; Urabe, Shigeharu; Kojima, Akira; and Katoh, Akira, 5,145,768, Cl. 430-569.000
Kato, Mikihiko; Endo, Yasushi; Kawamata, Toshio; and Nishikawa, Yasuo, 5,145,738, Cl. 42[illegible]336.000.
Minato, Shinichiro; Uesugi, Akio; and Kakei, Tsutomu, 5,145,102, Cl. 228-125.000
Mizutani, Shigemitsu; Seto, Yoshihiro; Tanaka, Hiroshi; and Nishiyama, Yoshihiro, 5,145,065, Cl. 206-389.000.
Morita, Naoyuki, 5,145,170, Cl. 271 276.000.
Nakai, Norihiro; and Mochizuki, Tatsuya, 5,146,255, Cl 354-288.000
Okamura, Hisashi; and Katoh, Kazunobu, 5,145,765, Cl 430-264.000
Orimoto, Masaaki; and Harase, Toshikatsu, 5,146,069, Cl 235-475.000

Fuji Xerox Corporation, Ltd.: *See—*
Yamasaki, Toru; Ikegami, Hiroaki; Ueki, Noriaki; Hibi, Yoshiharu; and Terada, Yoshihiro, 5,146,328 Cl. 358-164.000.

Fujibayashi, Kentaro: *See—*
Kawamura, Hideaki; Fujibayashi, Kentaro; and Hidaka, Yosata, 5,146,410, Cl. 364-474.310

Fujii, Hiroshi; and Yamashita, Keitaro, to Sony Corporation. Reel lock mechanism for tape cassette. 5,146,380, Cl. 360-132.000

Fujii, Kazuyoshi: *See—*
Yamamoto, Shinji; Tanaka, Hidetho; and Fujii, Kazuyoshi, 5,145,916, Cl. 525-421.000

Fujii, Keiko, administrator: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, administrator; Takada, Kaoruko, administrator; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,145,865, Cl. 514-424.000.

Fujii, Kensaku; Ohga, Juro; and Masuda, Hiroyuki, to Fujitsu Limited. Adaptive digital filter including low-pass filter. 5,146,470, Cl 375-103.000.

Fujii, Mikihito: *See—*
Tanaka, Toshimitsu; Yamagata, Naoyuki; Hitomi, Mitsuo; Hattori, Toshihiko; Marubara, Masashi; and Fujii, Mikihito, 5,144,918, Cl 123-52.00M.

Fujii, Setsuro, deceased (by Fujii, Keiko, administrator); by Fujii, Shinichiro, administrator; by Takada, Kaoruko, administrator; Kawamura, Hiroyuki; and Watanabe, Shinichi, to Otsuka Pharmaceutical Company, Limited. Phenylcarboxylic acid derivatives having hetero ring. 5,145,865, Cl. 514-424.000.

Fujii, Shinichiro, administrator: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, administrator; Takada, Kaoruko, administrator; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,145,865, Cl. 514-424.000

Fujii, Tsuguo; Yamamoto, Katsumasa; and Uda, Junji, to Toyo Boseki Kabushiki Kaisha. Process for preparing polyarylene sulfide with alkali metal salt of phenolic aromatic carboxylic acid. 5,145,946, Cl 528-388.000.

Fujii, Yoshiharu, to Sharp Kabushiki Kaisha. Image processing device for determining and printing a maximum number of image frames in desired size and layout. 5,146,343, Cl. 358-296.000.

Fujikawa, Yasuo: *See—*
Hirai, Masazumi; Takebayashi, Katsuhiro; Yamaguchi, Ryuji; and Fujikawa, Yasuo, 5,144,998, Cl. 164-71.100.

Fujiki, Michiya: *See—*
Fujiura, Kazuo; Ohishi, Yasutake; Fujiki, Michiya; Kanamori, Terutoshi; and Takahashi, Shiro, 5,145,508, Cl. 65-3.120.

Fujikura, Mitsuo: *See—*
Asakawa, Kazushige; Fukushima, Minoru; and Fujikura, Mitsuo, 5,145,384, Cl. 439-78.000.

Fujimoto, Tetsuo: *See—*
Yuasa, Kimihiro; Fujimoto, Tetsuo; and Hashimoto, Kenji, 5,145,546, Cl. 156-324.000

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takasugi, Hisashi; Nishino, Shigetaka; and Tanaka, Akito, 5,145,860, Cl. 514-365.000.

Fujita, Norihisa; Nagasawa, Hiroaki; and Sahara, Shinsuke, to Tsubakimoto Chain Co. Fastening a wheel or wheel-like body to a shaft. 5,145,277, Cl. 403-374.000.

Fujita, Shinji: *See—*
Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, 5,145,312, Cl. 414-719.000.

Fujitsu Limited: *See—*
Fujii, Kensaku; Ohga, Juro; and Masuda, Hiroyuki, 5,146,470, Cl. 375-103.000.
Fujiyama, Hiroyuki; Kuroiwa, Kouichi; Nishikawa, Shinji; Shimura, Hidetoshi; and Oyamada, Shinji, 5,146,595, Cl 395-725.000.
Hasegawa, Makoto, 5,146,326, Cl. 358-135.000.
Kase, Masataka; Kimura, Nami; and Kikuchi, Yoshio, 5,145,794, Cl 437-24.000.
Okada, Akihiro; Kino, Tooru; and Tanaka, Katsumi, 5,146,488, Cl 379-88.000.
Okada, Masaki, 5,146,113, Cl. 307-303.100.
Shima, Toshinori, 5,146,049, Cl. 178-18.000.
Suwada, Makoto; Inoue, Shuichi; and Usui, Yuzo, 5,146,188, Cl. 331-111.000.

Fujitsu Microcomputer System Limited: *See—*
Fujiyama, Hiroyuki; Kuroiwa, Kouichi; Nishikawa, Shinji; Shimura, Hidetoshi; and Oyamada, Shinji, 5,146,595, Cl 395-725.000.

Fujitsu VLSI Limited: *See—*
Okada, Masaki, 5,146,113, Cl. 307-303.100

Fujiura, Kazuo; Ohishi, Yasutake; Fujiki, Michiya; Kanamori, Terutoshi; and Takahashi, Shiro, to Nippon Telegraph and Telephone Corporation. Method of making fluoride glass using barium β-diketones. 5,145,508, Cl. 65-3.120.

Fujiura, Yoji: *See—*
Chambers, Douglas R.; Fowler, Hubert H., Jr.; Fujiura, Yoji; and Masuda, Fusayoshi, 5,145,906, Cl. 524-732.000.

Fujiwara, Hideki; Kaga, Chizuru; and Kano, Isao, to Jujo Paper Co., Ltd. Method for measuring gloss profile. 5,146,097, Cl. 250-372.000.

Fujiyama, Hiroyuki; Kuroiwa, Kouichi; Nishikawa, Shinji; Shimura, Hidetoshi; and Oyamada, Shinji, to Fujitsu Limited; and Fujitsu Microcomputer System Limited. Grouping device for forming input signals into groups. 5,146,595, Cl. 395-725.000.

Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; Sato, Chikara; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Video signal processing device for image editing using memory. 5,146,334, Cl. 358-183.000.

Fukazawa, Yoshiki: *See—*
Satoh, Yuji; Sotome, Hiromi; Fukazawa, Yoshiki; and Kuroiwa, Kiyoto, 5,146,507, Cl. 381-103.000.

Fukuchi, Masakazu: *See—*
Matsuo, Shunji; Morita, Sizuo; Haneda, Satoshi; Fukuchi, Masakazu; and Shoji, Hisashi, 5,146,270, Cl. 355-200.000.

Fukuda, Hideo: *See—*
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000

Fukuda, Hiroshi: *See—*
Miyahara, Shinjirou; Matsumoto, Ikuo; Tabata, Kenji; and Fukuda, Hiroshi, 5,145,648, Cl. 422-124.000.

Fukuda, Katsunori: *See—*
Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, 5,145,312, Cl. 414-719.000

Fukuda, Masayo: *See—*
Kimura, Masahiro; Matsuo, Kenji; Tsuchiya, Ikuo; and Fukuda, Masayo, 5,146,120, Cl. 307-570.000.

Fukuda, Yasuaki: *See—*
Iizuka, Takashi; Fukuda, Yasuaki; Hayashida, Masami; and Niibe, Masahito, 5,145,649, Cl. 422-129.000.

Fukui, Kazuyuki: *See—*
Hattori, Yoshihiro; Fukui, Kazuyuki; and Hada, Yoshinobu, 5,146,274, Cl. 355-208.000.

Fukumoto, Katsumi: *See—*
Eby, Michael D.; Fukumoto, Katsumi; Griffus, Michael J.; and Pham, Giao N., 5,146,431, Cl. 365-238.500.

Fukunaga, Takao; Nakajima, Hisao; Kobayashi, Kenzo; Kono, Masanao; Irie, Hisao; and Inoue, Ryo, to Furukawa Electric Co., Ltd., The; and Harima Chemicals, Inc. Solder precipitating composition. 5,145,532, Cl. 148-23.000.

Fukushima, Minoru: *See—*
Asakawa, Kazushige; Fukushima, Minoru; and Fujikura, Mitsuo, 5,145,384, Cl. 439-78.000

Fukuta, Hiroshi: *See—*
Sato, Katsuyuki; Nishimukai, Tadahiko; Uchiyama, Kunio; Aoki, Hirokazu; Hatano, Susumu; Oishi, Kanji; Fukuta, Hiroshi; Kikuchi, Takashi; and Saigou, Yasuhiko, 5,146,573, Cl. 395-425.000.

Fukutomi, Masao: *See—*
Asano, Toshihisa; Tanaka, Yoshiaki; Fukutomi, Masao; and Maeda, Hiroshi, 5,145,829, Cl. 505-1.000

Fuldner, Friedrich: *See—*
Gleim, Gunter; Fuldner, Friedrich; and Rekla, Bernd, 5,146,444, Cl. 369-44.410.

Fuller Company: *See—*
Paul, Kermit D.; Bartholomew, Leslie C.; Szazdi, John S., Jr.; and Labelle, Gerald J., 5,145,253, Cl. 366-101.000.

Fulton Thermatec Corporation: *See—*
Palm, R. Bramley, Jr., 5,145,354, Cl. 431-1.000

Funabashi, Motohisa: *See—*
Tano, Shunichi; Funabashi, Motohisa; Masui, Shoichi; and Sakaguchi, Seiji, 5,145,537, Cl. 395-1.000.

Funahashi, Yoshiki; and Hibi, Masayuki, to Tokai Rubber Industries, Ltd. Method of manufacturing fluid-filled elastic mount having fluid injection hole for filling pressure-receiving and equilibrium chambers. 5,145,155, Cl. 267-140.120.

Funahashi, Yoshiki: *See—*
Muramatsu, Atsushi; and Funahashi, Yoshiki, 5,145,156, Cl 267-140.140

Funaki, Keisuke; and Yamasaki, Komei, to Idemitsu Kosan Co., Ltd. Method of storing food or plant materials by wrapping with a stretched syndiotactic polystyrene film. 5,145,950, Cl. 528-481.000

Funatsu, Masayuki: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000

Funayama, Osamu: *See—*
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio; Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000

Funk, Helmut, to Eastman Kodak Company. Device for limiting rotary movement. 5,144,858, Cl. 74-526.000

Funyu, Yukio: *See—*
Noguchi, Yasuhiro; Takei, Kazuo; Funyu, Yukio; Mori, Yosuke; and Yasuda, Isao, 5,146,553, Cl. 395-146.000

Furter, Richard; and Christen, Benno, to Zellweger Uster Ltd. Process for displaying measuring results in graphic form in test apparatus for testing textile goods and apparatus for carrying out the process. 5,146,550, Cl. 395-140.000

Furtmayer, Kurt, to Zach, Johann. Pressure or force measuring device. 5,144,847, Cl. 73-862.625.

Furuhashi, Kenshi; Sugiyama, Yoshinobu; and Taguchi, Hitoshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Rotation transmitting mechanism for steering wheel. 5,144,860, Cl. 74-552.000.

Furukawa Electric Co., Ltd., The: *See—*
Fukunaga, Takao; Nakajima, Hisao; Kobayashi, Kenzo; Kono, Masanao; Irie, Hisao; and Inoue, Ryo, 5,145,532, Cl 148-23.000
Mak, Hon-Ming; and Yanagawa, Hisaharu, 5,146,518, Cl 385-41.000
Okoshi, Takanori; and Yamashita, Shinji, 5,146,359, Cl 359-189.000

Furuno, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Radio transceiver apparatus with booster. 5,146,614, Cl. 455-89.000

Furutsu, Etsuro, to Canon Kabushiki Kaisha. Vibration wave driven motor. 5,146,143, Cl. 318-116.000

G. D. Searle & Co.: *See—*
Mueller, Richard A.; and Partis, Richard A., 5,145,992, Cl 562-431.000

G & H Technology, Inc.: *See—*
Hager, Jeffrey J., 5,145,394, Cl. 439-321.000

G.P.B. Beghelli S.R.L.: *See—*
Beghelli, Gian P., 5,146,209, Cl. 340-693.000

Gaboury, Michael J.: *See—*
Bell, Cynthia S.; Anagnostopoulos, Constantine N.; Williams, Paul M.; Gaboury, Michael J.; and Koudelka, James R., 5,146,258, Cl. 354-432.000

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Avramopoulos, Hercules; William French, Paul M.; Gabriel, M. Christina; and Whitaker, Norman A., Jr., 5,146,517, Cl 385-39.000

Gaffney, Anne M., to Atlantic Richfield Co.; and Phillips Petroleum Co. Methane conversion process. 5,146,027, Cl. 585-500.000.

Gaffney, Anne M.: *See—*
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Gaidis, James M.; Wiercinski, Robert A.; and Ehrlich, Susan G., to W.R. Grace & Co. -Conn. Waterproofing system for water-penetrable construction surfaces. 5,145,748, Cl. 428-489.000

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Spehlmann, Benjamin C.; Gray, Gail L.; Vail, Lawrence D.; and Gajda, Gregory J., 5,146,035, Cl. 585-667.000.

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Gale, Andrew L.: *See—*
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Gallay S.A.: *See—*
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Gallop, Paul M.: *See—*
Aizenman, Elias; Rosenberg, Paul A.; and Gallop, Paul M., 5,145,862, Cl. 514-398.000

Gallup, Darrell L.; Featherstone, John L.; Reverente, Jessie P.; Messer, Philip H.; and Doty, Allen W., to Union Oil Company of California. Treatment of brine. 5,145,515, Cl. 75-712.000

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Gamoh, Yoshikazu: *See—*
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Ganci, James B., to Ciba-Geigy Corporation. Surface modified pigment compositions. 5,145,524, Cl. 106-493.000

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Pasini, Alessandro; Zunino, Franco; Tofanetti, Odoardo; Gandolfi, Carmelo A.; Tognella, Sergio; and Spinelli, Silvano, 5,145,848, Cl. 514-185.000

Gane, Christopher P.: *See—*
Bachman, Charles W.; Cimral, John J.; Gane, Christopher P.; Krieger, David A.; Micco, John T.; and Abramovich, Igor, 5,146,591, Cl. 395-600.000

Gane, David H.: *See—*
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Gansen, Peter: *See—*
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Garber Company, The: *See—*
Meyers, George L., 5,145,091, Cl. 221-45.000

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Gariepy, Bruno; and Dube, Ghyslain, to Alcan International Limited Treating aluminium with chlorine. 5,145,514, Cl. 75-681.000

Garnier, Mile D.: *See—*
Berion, Roland; Garnier, Mile D.; and Menard, Claude, 5,145,627, Cl. 264-113.000

Garrett, Jimmy R. Rotary cutter knife. 5,144,874, Cl. 83-332.000

Garrido, Alphonso; Sanchez, Antonio; Sandoval, Jose M.; and Sevilleja, Jose, to Otis Elevator Company. Elevator disc brake. 5,145,035, Cl. 187-20.000

Gates, John. Method of playing a word forming game. 5,145,183, Cl. 273-240.000

Gathman, Richard W.; and Breed, Jeffrey M. Symmetrical dice with card indicia. 5,145,175, Cl. 273-146.000

Gatti, Armand, to Contemporary Medical Equipment Corp. Folding wheelchair with rigid seat. 5,145,194, Cl. 280-304.100

Gaudette, Marvin, to Eaton Corporation. Thermistor calibration. 5,144,814, Cl. 62-225.000

Gaudin, Jeffrey. Purge valve assembly. 5,144,974, Cl. 137-204.000

Gayout, Patrick: *See*—
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Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Leong, Koon-Wah; and Kumar, Anand, 5,145,787, Cl. 436-79.000.

Gebauer, Gerhard: *See*—
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Gebhard, David F., to Grumman Aerospace Corporation. Unmanned boom/canard propeller w/stol aircraft. 5,145,129, Cl. 244-12.500

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Gec-Ferranti Defence Systems Limited: *See*—
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Geffrotin, Bernard, to U.S. Philips Corporation. Data processing system comprising authentification means viz a viz a smart card, an electronic circuit for use in such system, and a procedure for implementing such authentification. 5,146,499, Cl. 380-23.000

Gehrig, Hans-Jorg: *See*—
Burer, Franz; Gehrig, Hans-Jorg; Kaufmann, Josef; Maurer, Heinz; and Muller, Hanspeter, 5,144,917, Cl. 139-450.000

Geiger, Rudi: *See*—
Gockelmann, Karl; and Geiger, Rudi, 5,144,886, Cl. 99-297.000.

General DataComm, Inc.: *See*—
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General Electric Company: *See*—
Balke, Roy L.; and Jack, Joseph H., 5,144,739, Cl. 29-597.000
Bopp, Richard C.; and Roberts, Daniel L., 5,145,877, Cl. 521-40.000.
Castonguay, Roger N.; and Arnold, David, 5,146,195, Cl. 335-35.000
Cipullo, Michael J., 5,146,007, Cl. 568-727.000
Engeler, William E., 5,146,542, Cl. 395-24.000
Hui, Marvin M., 5,145,639, Cl. 37-283.000
Katz, Allen; and Moochalla, Shabbir S., 5,146,177, Cl. 330-149.000.
Kim, Bang M.; and Woodmansee, Donald E., 5,145,615, Cl. 264-25.000
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Nye, Susan A., 5,145,939, Cl. 528-196.000
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Pope, Adam N., 5,145,189, Cl. 273-3.000
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Whipple, Walter, III, 5,144,840, Cl. 73-660.000
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General Motors Corporation: *See*—
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Pfaff, Donald P.; Kapsokavathis, Nick S.; and Parks, Natalie A., 5,146,505, Cl. 381-71.000.
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Ballance, David S.; Camilletti, Robert C.; and Gentle, Theresa E., 5,145,723, Cl. 427-397.700

Genzel, Charles C. J.; and Genzel, Linda. Swimming pool cover with multiple air compartments. 5,144,704, Cl. 4-499.000

Genzel, Linda: *See*—
Genzel, Charles C. J.; and Genzel, Linda, 5,144,704, Cl. 4-499.000.

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George, Gregory B.: *See*—
Graybill, John K.; and George, Gregory B., 5,146,014, Cl. 570-131.000

Georgia Tech Research Corporation: *See*—
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Taylor, John G.; and Gerber, Arthur H., 5,145,887, Cl. 523-145.000

Gerdes, William H.: *See*—
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GH Hensley Industries, Inc.: *See*—
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Ghaem, Sanjar; Lauro, George L.; and Barnea, Michael, to Motorola, Inc. Electronic direction finder. 5,146,231, Cl. 342-419.000.

Ghazarossian, Vartan: *See*—
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Giannakopoulos, Cidell M. Disposable kitty litter box. 5,144,914, Cl. 119-168.000.

Giberson, Melbourne F.; and Lindgren, Richard P. Rotating shaft mounted actuating mechanism. 5,144,862, Cl. 74-573.00R

Gibler, Martin J.: *See*—
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Giblin, Edward J., to Lever Brothers Company, Division of Conopco, Inc. Carton with integral closure. 5,145,111, Cl. 229-219.000.

Gieling, Thomas G.; Behoteguy, David; and Dillon, Ralph. Portable structure. 5,144,780, Cl. 52-298.000.

Gill, Gerald L., Jr., to Westech Systems, Inc. Cleaning brush for semiconductor wafer. 5,144,711, Cl. 15-97.100.

Gillberg-LaForce, Gunilla E.; and Pruksarnukul, Josefina L., to Hoechst Celanese Corp. Side chain polymers as ultraviolet protecting agents. 5,145,928, Cl. 526-313.000.

Gillett, Richard B., Jr.: *See*—
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Girault, Pablo; and Grijalva, Nicolas. Method and apparatus for lifting gas streams to a great elevation in the atmosphere. 5,145,458, Cl. 454-189.000

Giudici, Marino, to Fiat Auto S.p.A. Device for adjusting the position of a vehicle gear-shift lever. 5,144,853, Cl. 74-473.00R.

Glacier Metal Company Limited, The: *See*—
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Glatt, Terrence L.: *See*—
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Gleason, John G.: *See*—
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Gleim, Gunter; Fuldner, Friedrich; and Rekla, Bernd, to Deutsche Thomson-Brandt GmbH. Servo control loop. 5,146,444, Cl. 369-44.410

Gleim, Gunter; and Quandt, Siegfried, to Deutsche Thomson-Brandt GmbH. Cable for conducting simultaneously electricity and light. 5,146,528, Cl. 385-101.000

Glockner, Hermann: *See*—
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Glowacki, Pierre A., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviations S.N.E.M.C.A. Axial flow turbomachine rotor. 5,145,319, Cl. 416-193.00A

Glycomed Incorporated: *See*—
Lam, Lun H.; and Tyrrell, David, 5,145,956, Cl. 536-124.000

Glynn, William, to Sinco Incorporated. Portable handrail counterweight system. 5,145,153, Cl. 256-59.000

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Gockelmann, Karl; and Geiger, Rudi, to WMF Wurttembergische Metallwarenfabrik Aktiengesellschaft. Coffee machine. 5,144,886, Cl. 99-297.000

Godden, Walter R.: *See*—
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Goes, Wilfried; and Gebauer, Gerhard, to J. Wagner GmbH. Diaphragm pump. 5,145,331, Cl. 417-383.000.

Goke, Louis R.; and Grimes, Gary J., to AT&T Bell Laboratories. Wide range mixed rate TDM bus using a multiple of time slot interchange circuit switches. 5,146,455, Cl. 370-68.000

Gold Medal Products Co.: *See*—
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Gold Star Co., Ltd.: *See*—
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Goldberg, Marshall R.; and Rosich, Mitchell N., to Digital Equipment Corporation. Apparatus for processing bit streams. 5,146,560, Cl. 395-200.000

Goldenberg, Jill F.: *See*—
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Goldfarb, Adolph E. Multiple choice verbal sound toy. 5,145,447, Cl. 446-408.000.

Golding, Peter: *See*—
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Goldstar Co., Ltd.: *See*—
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Goldstein, David; and Hoover, Scott M., to United States of America, Navy. Method of bonding metal carbides in non-magnetic alloy matrix. 5,145,506, Cl. 75-240.000

Goldstein, Jonathan; Korall, Menachem; and Brokman, Avner, to Luz Electric Fuel Israel Limited. Electrodes for metal/air batteries and bipolar metal/air batteries incorporating the same. 5,145,752, Cl. 429-27.000.

Goldstein, Ralph S.: *See*—
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Golebiewski, Julie A.: *See*—
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Golonka, Kenneth A., Sr.: *See*—
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Gong, Ke-Cheng; Ou, Yang-Meng; and Yeh, Gregory S. Non asbestos ion-polyer composite friction materials. 5,145,888, Cl. 523-156.000

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Goodman, Howard M.; and Donn, Gunter, to General Hospital Corporation, The. Plant cells resistant to herbicidal glutamine synthetase inhibitors. 5,145,777, Cl. 435-172.300.

Goodman, Howard M.: *See*—
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Gora, Tetsuo: *See*—
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Gorza, Roberto, to Nordica S.p.A. Safety fastening, particularly for skis. 5,145,203, Cl. 280-632.000

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Gosswiller, Earl W.: *See*—
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Gotomyo, Yasuo, to Mazda Motor Corporation. Roof structure of an automotive vehicle. 5,145,231, Cl. 296-220.000

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Gowen, Richard T. Efficiency of laying pipe. 5,145,283, Cl. 405-157.000.

Graber Industries, Inc.: *See*—
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Grabowski, Wojciech: *See*—
Budnik, Richard A.; Blevins, Charles H., II; Murphy, Gerald J.; Grabowski, Wojciech; and Cobb, Raymond L., 5,145,879, Cl. 521-112.000

Grabs, Manfred, to Robert Bosch GmbH. System for controlling an operating parameter of an internal combustion engine of a vehicle. 5,144,915, Cl. 123-683.000

Graco Inc.: *See*—
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Graco Metal Products, Inc.: *See*—
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Graham, George W.: *See*—
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Graham, Kenneth. Plumbing drainage system. 5,144,699, Cl. 4-256.100

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Grass Valley Group, Inc., The: *See*—
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Gravino, Marc C., to Trilby, Ltd. Capless closure for a fuel tank filler pipe. 5,145,081, Cl. 220-86.200

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Graybill, John K.; and George, Gregory B., to Air Products and Chemicals, Inc. Perfluoroethyldimethyl cyclohexane. 5,146,014, Cl. 570-131.000.

Green, Donald R., Jr., to AT&T Bell Laboratories. Combining technique for a multistage, parallel amplifier. 5,146,175, Cl. 330-54.000

Green, J. Kenneth; Watson, Eugene L.; and Whalen, Paul S., to Safety Assurance Corporation. Safety valve for compressed gas cylinders. 5,144,973, Cl. 137-71.000

Green, James A., II, to Union Oil Company of California. Sulfuric acid/polyamide compositions. 5,145,521, Cl. 106-161.000.

Green, Peter, to Waste Hoists Limited. Collection vehicle, apparatus for use in the vehicle and method of collecting material. 5,145,305, Cl. 414-406.000

Greenidge, St. Clair W.: *See*—
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Grenlulnd, Wesley E., to Weyerhaeuser Company. Method and apparatus for monitoring and controlling the velocity of a jet along the slice opening of a papermaking machine. 5,145,560, Cl. 162-198.000

Grieben, Albrecht: *See*—
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Griffus, Michael J.: *See*—
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Grijalva, Nicolas: *See*—
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Grimes, Gary J.: *See*—
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Grimm, Duane H.; and Jones, Teddy L., to Sundstrand Corp. Jam tolerant linear actuator. 5,144,851, Cl. 74-424.80B

Grisar, Roland; and Riedel, Wolfgang, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Process and device for measuring isotope ratios. 5,146,294, Cl. 356-435.000

Grisoni, Bernard F. R.; and Pocknell, David, to Dow Corning France S.A. Organosiloxane gel-forming compositions and use thereof. 5,145,933, Cl. 528-15.000

Grohe, Klaus: *See*—
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Grondalski, Robert S., to Digital Equipment Corporation. Systems for interconnecting and configuring plurality of memory elements by control of mode signals. 5,146,606, Cl. 395-800.000

Gros, Gerard: *See*—
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Grosjean, Jon P.; Ross, Stuart E.; and Semple, Daniel J. Technique for using a subcarrier frequency of a radio station to transmit, receive and display a message together with audio reproduction of the radio program. 5,146,612, Cl. 455-45.000

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Grosse-Bauer, Elizabeth: *See*—
Matteazzi, Paolo; Le Caer, Gerard, and Grosse-Bauer, Elizabeth, 5,145,513, Cl. 75-255.000

Grossman, Stanley J. Composite, prestressed structural member and method of forming same. 5,144,710, Cl. 14-73.000

Grotepass, Johann; Hamraths, Konrad; Hauck, Albert; Keller, Karl; and Muller, Hubert, to SMS Schloemann-Siemag Aktiengesellschaft. Combined light-section mill and wire mill. 5,144,828, Cl. 72-235.000

Groth, Clarence R.: *See*—
Valentine, Michael D.; Scholl, Stephen R.; and Groth, Clarence R., 5,146,226, Cl. 342-20.000

Grubbs, Gary D., to Thomson Consumer Electronics, Inc. Using a first IF of 43.5 MHZ or less in an FM radio in a television tuner. 5,146,337, Cl. 358-191.100

Gruber, Heinz, to Go-Anker GmbH. Stator for eccentric spiral pump. 5,145,342, Cl. 418-48.000

Grumman Aerospace Corporation: *See*—
Gebhard, David F., 5,145,129, Cl. 244-12.500
Guerci, Joseph R.; Schutz, Robert W.; and Hulsmann, John D., 5,146,229, Cl. 342-204.000

Grupp, Larry A.; Perlanski, Edward; and Stewart, Robert B., to Alcoholism and Drug Addiction Research Foundation. Reduction of

voluntary alcohol consumption by treatment with angiotensin converting enzyme inhibitors. 5,145,864, Cl. 514-423.000

Grushkin, Bernard, to Xerox Corporation. Processes for the preparation of toners. 5,145,762, Cl. 430-137.000.

Grussing, David R.: *See—*
Hermanson, Harry; Hultz, Robert C.; and Grussing, David R., 5,145,617, Cl. 264-37.000

GTE Products Corporation: *See—*
Alwine, K. Troy, 5,145,391, Cl. 4[illegible]9-188.000
Lagushenko, Radomir, 5,146,135, Cl. 313-619.000
Piejak, Robert B.; Godyak, Valery A.; and Alexandrovich, Benjamin M., 5,146,140, Cl. 315-248.000.
Schneider, John L.; and Walker, Timothy R., 5,146,199, Cl. 337-380.000
Spencer, James R.; and Mullendore, James A., 5,145,512, Cl. 75-248.000

Gualtierotti, Gianfranco; and Stelle, Alessandro M. D., to Cassina S.p.A. Reversibly deformable frame with upper members flexible in any direction and a lower horizontally deformable band for the backs of chairs and the like. 5,145,234, Cl. 297-460.000.

Gucyski, Jeff. Switching power apparatus having high factor and comprising pair of converter for obtaining fixed or variable output voltage. 5,146,399, Cl. 363-89.000.

Guerci, Joseph R.; Schutz, Robert W.; and Hulsmann, John D., to Grumman Aerospace Corporation. Constrained optimum matched illumination-reception radar. 5,146,29[illegible], Cl. 342-204.000

Guerng, Paul; Gayout, Patrick; and Vizet, Philippe, to Saint-Gobain Vitrage International. Process and device for measuring the optical quality of a glazing. 5,146,282, Cl. 36-239.000.

Guetron, Robert: *See—*
Meline, Francois; and Guetron, Robert, 5,145,459, Cl. 454-190.000

Guillemont, Jerome: *See—*
Chabardes, Pierre; Duhamel, Lucette; Duhamel, Pierre; Guillemont, Jerome; and Poirier, Jean-Marie, 5,145,972, Cl. 549-221.000

Gullick Dobson Limited: *See—*
Smart, Brian G. D., 5,145,235, Cl. 299-1.900

Gundlach, Larry C.: *See—*
Anderson, James E.; Skaar, Gary F.; Bernthal, Paul H.; and Gundlach, Larry C., 5,145,453, Cl. 452-142.000.

Gunter, Matthias: *See—*
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Gunzi, Thutomu: *See—*
Kirikami, Seiichi; Satoh, Tomo; Saito, Isao; Gunzi, Thutomu; and Iizuka, Nobuyuki, 5,144,794, Cl. 60-39.750.

Gurak, Nur R.; and Hamard, Jacques M., to Exxon Chemical Patents Inc. Desulfurization of light olefins. 5,146,042, Cl. 585-867.000

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Lampe, Donald R.; Sinharoy, Samar; Wu, Shu Y.; Buhay, Harry; Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S Visvanathan, 5,146,299, Cl. 357-23.500

Guskov, Valery: *See—*
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Gutknecht, Daniel A., to Allied-Signal Inc. Turbocharger bearing retention and lubrication system. 5,145,334, Cl. 417-407.000

Gutowski, Horst, deceased: *See—*
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Gutowski, Lieselohe, legal representative: *See—*
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Guy, James O.: *See—*
Strozeski, Bernard B.; Steinsiek, Roger R.; and Guy, James O., 5,146,050, Cl. 181-102.000

Gyenes, Russell E.; and Kleinert, Raymond J., III, to Motorola, Inc. Safe battery cell interconnects. 5,14[illegible],150, Cl. 320-17.000

Gyulai, Peter: *See—*
Dziabo, Anthony J.; Wong, Michelle P.; and Gyulai, Peter, 5,145,643, Cl. 422-28.000

H. Krantz GmbH & Co.: *See—*
Obermueller, Herbert, 5,145,362, Cl. 432-72.000

Ha, Bao V., to Liquid Air Engineering Corporation. Cryogenic air separation process and apparatus. 5,144,808, Cl. 62-24.000

Haag, Robert A., Jr.: *See—*
Means, Jeffrey; Haag, Robert A., Jr.; and Steffy, Richard D., 5,146,043, Cl. 86-24.000

Haarmann & Reimer: *See—*
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Habibi, Hamid R.: *See—*
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Hada, Yoshinobu: *See—*
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Haga, Shuji; and Tanuma, Masatomo, to Iwata Air Compressor Manufacturing Co. Ltd. Scroll-type fluid machinery with offset passage to the exhaust port. 5,145,344, Cl. 418-55.200.

Hagemann, Hans-Jurgen E.: *See—*
Bachmann, Peter K.; Hagemann, Hans-Jurgen E.; Warnier, Jacques P. M.; and Wilson, Howard J. C., 5,145,509, Cl. 65-3.120.

Hagenbuch, Ernst, to Bandfabrik Breitenbach AG. Method for manufacturing a semifinished material for forming a blossom-type decoration. 5,144,728, Cl. 28-147.000

Hager, Jeffrey J., to G & H Technology, Inc. Anti-rotation assembly for interconnect devices. 5,145,394, Cl. 439-321.000

Hagi, Takashi; Misawa, Kouichi; Saito, Shuji; Sakamoto, Yuji; Kadota, Noriaki; Toda, Yoshiro; and Yamazaki, Nagataka, to Taiyo Kagaku Co., Ltd. Method for preparation of plasma powder and product thereof. 5,145,706, Cl. 426-647.000

Hagino, Sadaaki: *See—*
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Hagiuda, Nobuyoshi: *See—*
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Hagiwara, Makoto, to Viscodrive Japan Kabushiki Kaisha. Power delivering apparatus. 5,145,470, Cl. 475-230.000.

Hahn, Amand J.: *See—*
Bansal, Ravinder M.; and Hahn, Amand J., 5,146,401, Cl. 364-138.000.

Hahn, Klaus; and Dietrich, Matthias. Drying of finely divided, expandable styrene polymers. 5,145,878, Cl. 521-60.000.

Hajaligol, Mohammad R.: *See—*
Counts, Mary E.; Hajaligol, Mohammad R.; Morgan, Constance H.; Smith, Ulysses; Sprinkel, Francis M.; and Utsch, Francis V., 5,144,962, Cl. 131-194.000

Haldeman, David P.: *See—*
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Haldor Topsoe A/S: *See—*
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Hale Fire Pump Company: *See—*
Eberhardt, H. Alfred, 5,145,014, Cl. 169-14.000.

Hale, John M.; and Weber, Eugen, to Orbisphere Laboratories Neuchatel SA. Method and apparatus for monitoring gas concentrations. 5,144,831, Cl. 73-19.050.

Hall, Judy L.: *See—*
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Hallewell, Robert A.; Edman, Jeffrey C.; Rutter, William J.; and Goodman, Howard M., to University of California, The Regents of the. DNA expression vector suitable for direct expression of a foreign gene. 5,145,782, Cl. 435-320.100.

Halliburton Logging Services, Inc.: *See—*
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Hallman, Edward H., to General DataComm, Inc. Method for imbedding information in modem handshake procedure and modems incorporating the same. 5,146,472, Cl. 375-8.000.

Hallock, Gary G.: *See—*
Ackerman, Dennis F.; Bender, David R.; Chu, Salina S.; Deibert, George R.; Hallock, Gary G.; Lackey, David E.; Sheldon, Robert G.; and Stranko, Thomas A., 5,146,460, Cl. 371-23.000

Halpin, John M.; and Quam, David J., to Van Waters and Rogers, Inc. Solutions for cleaning plastic and metallic surfaces. 5,145,523, Cl. 106-287.240

Hamada, Hiroki; Honda, Shoji; Shono, Masayuki; and Yamaguchi, Takao, to Sanyo Electric Co., Ltd. Semiconductor laser device. 5,146,466, Cl. 372-45.000

Hamada, Toshihiko; Ihara, Keizo; and Iijima, Masato, to Teac Corporation. System including a digital audio tape recorder or equivalent device for recording non-audio signals. 5,146,371, Cl. 360-32.000

Hamamoto, Takeshi; Kobayashi, Toshifumi; Yamagata, Tadato; and Mihara, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device having improved stacked capacitor and manufacturing method therefor. 5,146,300, Cl. 357-23.600.

Hamard, Jacques M.: *See—*
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Hamilton-Greenough, George: *See—*
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Hamma, Kentaro: *See—*
Kobori, Yasunori; Hamma, Kentaro; and Mochimaru, Yoshiaki, 5,146,323, Cl. 358-76.000

Hammer Metals Company, Inc.: *See—*
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Hammett, Robert B. Free-piston engine. 5,144,917, Cl. 123-46.0SC.

Hammett, Roy; and Hammett, Shirley A. Animal feeding device. 5,144,912, Cl. 119-61.000

Hammett, Shirley A.: *See—*
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Hamraths, Konrad: *See—*
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Han, Sihui. Human-powered boat propelling equipments. 5,145,424, Cl. 440-13.000.

Han, Sihui. Spring saddle cycle. 5,145,477, Cl. 482-57.000.

Hanari, Jun: *See—*
Higuchi, Yoshinori; and Hanari, Jun, 5,146,102, Cl. 250-556.000.

Hanatani, Naoyoshi: *See—*
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Hancock, Charles O.: *See—*
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Hancock, David S.: *See—*
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Haneda, Satoshi: *See—*
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Hangey, Dale A.; Harris, Paul W.; Cole, Charles J.; and Corcoran, Daniel J., Jr., to Allied-Signal Inc. Methods and compositions to enhance stain resistance of carpet fibers using sulfonated aromatic condensates. 5,145,487, Cl. 8-557.000

Hanna, Nabil: *See—*
Adams, Jerry L.; Bender, Paul E.; Gleason, John G.; Hanna, Nabil; Newton, John F., Jr.; Perchonock, Carl D.; and Razgaitis, Kazys, 5,145,858, Cl. 514-318.000.

Hannemann, Klaus, to Ciba-Geigy Corporation. Process for dyeing wool with reactive dyes. 5,145,486, Cl. 8-543.000.

Hannibal, Wilhelm: *See—*
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Hannon, Charles; and Vallender, Leonard J. Pilfer-proof bottle cap. 5,145,078, Cl. 215-252.000.

Hansel, Gail W.; and Fausett, Phillip D. Disposable toothbrush. 5,144,712, Cl. 15-167.100.

Hansen, Guenter: *See—*
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Hansen, Jutta: *See—*
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Hanson, Edward. Method of protecting vehicle finishes. 5,144,736, Cl. 29-403.100.

Hanssens, Alain; and Morin, Michel, to Commissariat A L'Energie Atomique. Pulsed column with basket lining. 5,145,577, Cl. 210-189.000

Hara, Kenji; and Wada, Yoshio, to Kabushiki Kaisha Toshiba. Video signal delay circuit having self adjusting gain. 5,146,332, Cl. 358-172.000

Hara, Masaki: *See—*
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Hara, Yasuhiko; Koizumi, Mitsuyoshi; and Kitamura, Shigeki, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Method of inspecting defects in circuit pattern and system for carrying out the method. 5,146,509, Cl. 382-8.000

Harada, Kazuo: *See—*
Yajima, Shoji; and Harada, Kazuo, 5,144,867, Cl. 76-112.000

Haraga, Hisato; Inatomi, Yasutoshi; Obata, Takashi; Hashida, Mituaki; Uchiyama, Koichi; and Moriyama, Kenji, to Toto Ltd. Blow-off nozzle structure capable of automatically varying the blow-off volume of water. 5,144,702, Cl. 4-541.600

Harandi, Mohsen N., to Mobil Oil Corporation. Integrated process for converting methanol to gasoline and distillates. 5,146,032, Cl. 585-640.000

Harase, Toshikatsu: *See—*
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Harbour, Richard: *See—*
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Hanma Chemicals, Inc.: *See—*
Fukunaga, Takao; Nakajima, Hisao, Kobayashi, Kenzo; Kono, Masanao; Irie, Hisao; and Inoue, Ryo, 5,145,532, Cl. 148-23.000

Harless, Ronald L.; Buehl, Robert T.; and Musgrave, Steven R. Air brake safety and anti-theft valve assembly. 5,145,240, Cl. 303-89.000.

Harley, David N., to Titus Tool Company Limited. Screws. 5,145,302, Cl. 411-404.000

Harman, Dale D., to AT&T Bell Laboratories. Overlapping look-up-and-add echo canceller requiring a smaller memory size. 5,146,494, Cl. 379-411.000.

Harmon, J. P.: *See—*
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Harper, Fred J., to Du Pont de Nemours, E. I., and Company. Method of making double-sided magneto-optical disks having reduced birefringence. 5,146,438, Cl. 369-13.000

Harris, Paul W.: *See—*
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Harrison, Brian H.: *See—*
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Harrison, Serge. Shrouded propeller system for a sailboat. 5,145,428, Cl. 440-89.000

Harshavardhan, Kolagani S.; Sampere, Samuel M.; Sands, Timothy D.; and Venkatesan, Thirumalai, to Bell Communications Research, Inc. Superconducting film on a flexible two-layer zirconia substrate. 5,145,832, Cl. 505-1.000

Hartmann, Heinrich: *See—*
Auhorn, Werner; Linhart, Friedrich; Lorencak, Primoz; Kroener, Michael; Sendhoff, Norbert; Denzinger, Walter; and Hartmann, Heinrich, 5,145,559, Cl. 162-168.200

Hartmann, Uwe: *See—*
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Hartog, Arthur H., to York Limited. Optical fibre communication network. 5,146,521, Cl. 385-48.000

Hartrumpf, Matthias, to Fraunhofer Gesellschaft zur Forderung der Angewandten for Schung E. V. Process and apparatus for determining the position of an object. 5,146,290, Cl. 356-152.000

Hartung, Erwin: *See—*
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Haruhiko Murakami: *See—*
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Haruyama, Satoshi: *See—*
Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, 5,145,691, Cl. 425-110.000

Harwath, Frank L., to Suntec Industries Incorporated. Fuel supply unit for an oil burner. 5,145,328, Cl. 417-299.000

Hasegawa, Makoto, to Fujitsu Limited. Coded picture information decoding apparatus having means for improving picture distortion. 5,146,326, Cl. 358-135.000

Hashida, Mituaki: *See—*
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Hashimoto, Hisayoshi: *See—*
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Hashimoto, Kimio; Ikoma, Katsuyuki; and Tsushima, Koji, to Matsushita Electric Industrial Co., Ltd. Tiltable-turntable for display monitor. 5,145,134, Cl. 248-183.000

Hashimoto, Seiji: *See—*
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Hashish, Mohamed A.; Olsen, John H.; Zarin, Katherine J.; and Erichsen, Glenn A., to Flow International Corporation. Liquid abrasive cutting jet cartridge and method. 5,144,766, Cl. 51-439.000

Hatanaka, Masataka: *See—*
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Hatano, Kazuyoshi: *See—*
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Hatta, Shinichiro: *See—*
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Hattori, Toshihiko: *See—*
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Hattori, Yoshihiro; Fukui, Kazuyuki; and Hada, Yoshinobu, to Minolta Camera Co., Ltd. Toner density measurement apparatus having output characteristics variable with humidity. 5,146,274, Cl. 355-208.000

Hauck, Albert: *See—*
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Hauenstein, Dale E.; and Vincent, Harold L., to Dow Corning Corporation. Method for preparing oximosilane-functional vinylic copolymers. 5,145,912, Cl. 525-326.500

Hautala, Jouko, to Oy Tampella AB. Method for screening and treating pulp. 5,145,072, Cl. 209-273.000

Haven, Willem S.: *See—*
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Havens, Stephen J.: *See—*
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Hergenrother, Paul M.; and Havens, Stephen J., 5,145,942, Cl. 528-353.000

Hawkins, George W., III, to W. R. Grace & Co.-Conn. Blow molding a container having three handles. 5,145,633, Cl. 264-531.000

Hayakawa, Hiroshi: *See—*
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Hayashi, Masao, to Hayashi, Masao; and Nisshin Flour Milling Co., Ltd., a part interest. Eye drop formulation useful for treating lesions of corneal epithelium. 5,145,680, Cl. 424-427.000

Hayashi, Seizo: *See—*
Mori, Hiroshi; Hayashi, Seizo; Hayakawa, Hiroshi; and Mitani, Tomomi, 5,144,714, Cl. 15-319.000.
Hayashi, Shigenori: *See—*
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Hayashi, Shunichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Shape memory polyurethane elastomer molded article. 5,145,935, Cl. 528-65.000.
Hayashi, Takamasa; Mori, Goro; Aoki, Shigeyuki; Yamamoto, Masahiro; Takahashi, Masaru; Senma, Toshitaka; Miyajima, Masami; and Isobe, Takundo, to Ricoh Company, Ltd. Image forming apparatus with plural dot densities. 5,146,24[illegible]. Cl. 346-108.000.
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Heacox, Albert E.: *See—*
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Head, Robert W.; and Aldridge, James S., to Avon Industrial Polymers Limited. Grips for handles. 5,145,171, Cl. 273-67.00R.
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Health Research, Inc.: *See—*
Dougherty, Thomas J.; Potter, William R.; and Weishaupt, Kenneth R., 5,145,863, Cl. 514-410.000.
Hearn, Anthony R.; and Commander, Robert D., to International Business Machines Corporation. Voice coil actuator with resiliently mounted shorted turn. 5,146,122, Cl. 310-13.000.
Heberle, Klaus, to Deutsche ITT Industries GmbH. Wireless remote control system for a television receiver. 5,146,210, Cl. 340-709.000.
Hecker, Eric: *See—*
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Heddle, Richard G.: *See—*
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Schulz, Reinhard; Neukirchen, Axel; and Obermeier, Josef, 5,145,237, Cl. 299-94.000.
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Gardano, Andrea; Coassolo, Alfredo; Casagrande, Francesco; Foa, Marco; and Chapoy, Larry L., 5,146,008, Cl. 568-743.000.
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Hirata, Takaaki, to Optical Measurement Technology Development Co., Ltd. Method of fabricating a semiconductor optical device. 5,145,792, Cl. 437-129.000.
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Sato, Kensaku; Miyahira, Hitoshi; and Iwasawa, Tadayasu, 5,145,409, Cl. 439-585.000.
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Hiyama, Isao; Niwase, Yoshio; Nagano, Yousuke; Nakano, Shigeharu; and Shikamori, Tamotu, 5,144,819, Cl. 68-12.040.
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Kirikami, Seiichi; Satoh, Tomo; Sato, Isao; Gunzi, Thutomu, and Iizuka, Nobuyuki, 5,144,794, Cl. 60-39.750.
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Watanabe, Syuji; Sagawa, Kouiti; Sasai, Gorou; and Sakurai, Hidetoshi, 5,144,716, Cl. 15-323.000.
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Hoagland, Larry D.; and Brockman, Stephen J., to Ideatech, Inc. Air bag device for vehicles. 5,145,208, Cl. 280-734.000

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Hodge, Ronald L., to Scientific-Atlanta, Inc. Optical fiber retention device. 5,146,532, Cl. 385-136.000

Hodsdon, Roy F.; and Dickson, Douglas M., to Ericsson GE Mobile Communications Holding Inc. Interchangeable control panels and keypads for radio transceivers and related process. 5,146,615, Cl. 455-90.000

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Ellory, John C.; Englert, Heinrich C.; Lang, Hans-Jochen; Mania, Dieter; and Merkel, Wulf, 5,145,167, Cl. 514-445.000
Foley, Paul; and Buckpesch, Rainer, 5,145,540, Cl. 156-89.000
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Dougherty, Edward F.; and Paul James L., 5,145,989, Cl. 560-205.000
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Dunn, Robert W.; and Corbett, Roy, 5,145,866, Cl. 514-425.000.
Kosley, Raymond W., Jr.; and Spahl, Bettina, 5,145,855, Cl. 514-269.000
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Kardorff, Uwe; Neubauer, Hans-Jergen; Leyendecker, Joachim; Kuenast, Christoph; Hofmeister, Peter; Krieg, Wolfgang; and Buerstinghaus, Rainer, 5,145,873, Cl. 514-624.000.

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Holcomb, Bruce D.; and Lantz, Franklin D., to Homaco, Inc. Patch panel. 5,145,380, Cl. 439-49.000

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Holmgren, Bertil, to M W Trading APS. Anti-theft device for spectacle frames. 5,144,820, Cl. 70-57.100

Holoptics International, Inc.: *See*—
Marks, Mortimer, 5,146,246, Cl. 351-7.000

Holscher, Ebo J.: *See*—
Dijkshoorn, Jacobus; and Holscher, Ebo J., 5,145,699, Cl. 426-94.000.

Holster, Jesse L.; Estes, Roy D.; Castle, Jack; and Parys, Paul G., to Exxon Production Research Company. Kerf-cutting apparatus for increased drilling rates. 5,145,017, Cl. 175-333.000.

Holtsch Metallwarenherstellung: *See*—
Holtsch, Peter, 5,145,139, Cl. 248-313.000.

Holtsch, Peter, to Holtsch Metallwarenherstellung. Holding device for containers with tissues and the like. 5,145,139, Cl. 248-313.000.

Holzer, Raymond F.: *See*—
Calloway, Jack D.; Holzer, Raymond F.; Matheny, Stephen E.; and Orwig, Gary W., 5,146,404, Cl. 364-401.000.

Homaco, Inc.: *See*—
Holcomb, Bruce D.; and Lantz, Franklin D., 5,145,380, Cl. 439-49.000

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Horimura, Hiroyuki, 5,145,503, Cl. 75-228.000.
Miyashita, Yukio; Mifune, Hiroshi; Matsubara, Atsushi; and Noguchi, Kunio, 5,144,931, Cl. 123-682.000.
Miyashita, Yukio; Mifune, Hiroshi; and Matsubara, Atsushi, 5,144,932, Cl. 123-695.000.
Miyashita, Yukio; Mifune, Hiroshi; and Matsubara, Atsushi, 5,144,934, Cl. 123-682.000
Tsuboi, Kiyoshi, 5,144,838, Cl. 73-579.000.
Tsurumi, Yashuyuki; and Isomura, Mamoru, 5,145,023, Cl. 180-68.100.

Honda, Haruo: *See*—
Itoh, Syunji; Seki, Takahide; and Honda, Haruo, 5,146,387, Cl. 361-115.000

Honda, Shoji: *See*—
Hamada, Hiroki; Honda, Shoji; Shono, Masayuki; and Yamaguchi, Takao, 5,146,466, Cl. 372-45.000

Honeywell Inc.: *See*—
Bansal, Ravinder M.; and Hahn, Amand J., 5,146,401, Cl. 364-138.000
Yue, Jerry; and Liu, Michael S. T., 5,146,304, Cl. 357-34.000.

Hong, Chang W.: *See*—
Kim, Jihn K.; and Hong, Chang W., 5,146,335, Cl. 358-183.000.

Honjo, Shigeru: *See*—
Sasaki, Katsuro; Moriwaki, Nobuyuki; Honjo, Shigeru; and Nakamura, Hideaki, 5,146,427, Cl. 365-189.050.

Honkomp, Glenn A.; McNay, Thomas O.; Burrows, Larry G.; and Heimbrock, H. Howard, to Emerson Electric Co. Terminal block assembly for hermetic terminal structure. 5,145,417, Cl. 439-685.000.

Hooper, Jefferson E.; and Irvine, John E., to Materials International, Inc. Plastic panel erosion barrier. 5,145,287, Cl. 405-242.000.

Hoover, Linn C., to Eastman Kodak Company. Fusing station having release-oil level detector. 5,146,271, Cl. 355-206.000.

Hoover, Richard B., to United States of America, National Aeronautics and Space Administration. Multispectral variable magnification glancing incidence x-ray telescope. 5,146,482, Cl. 378-43.000.

Hoover, Scott M.: *See*—
Goldstein, David; and Hoover, Scott M., 5,145,506, Cl. 75-240.000

Hopp, Rudolf: *See*—
Emberger, Roland; Gunter, Matthias; Hopp, Rudolf; Kopsel, Manfred; Kuhn, Walter; and Werkhoff, Peter, 5,145,703, Cl. 426-535.000

Hoppmann Corporation: *See*—
Hoppmann, Kurt H., 5,145,051, Cl. 198-396.000.

Hoppmann, Kurt H., to Hoppmann Corporation. Disc for centrifugal feeder. 5,145,051, Cl. 198-396.000

Hopson, Purnell, Jr.: *See*—
Zuckerwar, Allan J.; Cuomo, Frank W.; Robbins, William E.; and Hopson, Purnell, Jr., 5,146,083, Cl. 250-227.210.

Hori, Kazumasa: *See*—
Masui, Tsutomu; Hori, Kazumasa; and Ueno, Akio, 5,146,164, Cl. 324-233.000

Hori, Kazuto: *See*—
Tone, Eiichi; Ohata, Yosuke; and Hori, Kazuto, 5,146,275, Cl. 355-244.000.

Horikawa, Osamu; and Ikeshima, Koichi, to NGK Insulators, Inc. Method of producing a honeycomb structural body having at least one step protruded from or recessed in at least one portion of an outer circumferential surface thereof. 5,145,539, Cl. 156-89.000.

Horikoshi, Kouki: *See*—
Bellamy, Robert W.; and Horikoshi, Kouki, 5,145,778, Cl. 435-232.000.

Horimura, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Process product, and powder for producing high strength structural member. 5,145,503, Cl. 75-228.000

Horita, Masayoshi: *See*—
Adan, Alberto; and Horita, Masayoshi, 5,145,796, Cl. 437-40.000

Horrobin, David F.; and Lieb, Julian, to Efamol Limited. Topical pharmaceutical compositions. 5,145,686, Cl. 424-677.000

Horst, Robert W.: *See*—
Peet, Charles E., Jr.; Allison, John D., Debacker, Kenneth C.; and Horst, Robert W., 5,146,589, Cl. 395-575.000.

Hosaka, Masao; Shimada, Kazutoshi; and Inuzuka, Tsuneki, to Canon Kabushiki Kaisha. Pulse width modulation input/output controller for image processing apparatus. 5,146,601, Cl. 395-800.000.

Hosaka, Yukio: *See*—
Satake, Toshihiko; and Hosaka, Yukio, 5,145,117, Cl. 241-8.000.

Hoshino, Kunio: *See*—
Okamoto, Hiroyuki; Hoshino, Kunio; Umemura, Masakazu; and Kitahara, Sayoko, 5,145,413, Cl. 439-620.000.

Hosotani, Shiro: *See*—
Ito, Masao; and Hosotani, Shiro, 5,146,112, Cl. 307-303.000.

Hosoya, Yasuhiko; and Iwata, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Knock suppression apparatus and method for a multi-cylinder internal combusiton engine. 5,144,929, Cl. 123-425.000

Hospal Industrie: *See*—
Angleraud, Rene; and Brun, Claude, 5,145,583, Cl. 210-646.000.

Hotta, Takaomi: *See*—
Sugie, Tosio; Yamada, Yoji; Kobori, Seiji; Hotta, Takaomi; and Serizawa, Yasuhiro, 5,144,731, Cl. 28-117.000

Hougen, Everett D. Apparatus and method for cutting holes. 5,145,296 Cl. 408-1.00R

Houtteman, Bernard; and Mussen, Michel, to Siemens Aktiengesellschaft. Connector for solderless attachment to a printed circuit board 5,145,408, Cl. 439-581.000

Hovis, Keith W., to Phillips Petroleum Company. Transfer of catalyst 5,146,036, Cl. 585-723.000.

Hovstadius, Gunnar, to ITT Flygt AB. Mixer device. 5,145,254, Cl. 366-286.000

Howard Florey Institute of Experimental Physiology and Medicine: *See*—
Hudson, Peter J.; Shine, John; Niall, Hugh D.; and Tregear, Geoffrey W., 5,145,962, Cl. 530-324.000.

Howard, James P. Clear bed gooseneck trailer hitch. 5,145,199, Cl. 280-495.000

HR Textron Inc.: *See*—
Hutchins, Curtis J., 5,146,126, Cl. 310-156.000

Hradisky, John L.: *See*—
Craft, Charles W., Jr.; and Hradisky, John L., 5,145,082, Cl. 220-755.000.

Hruschka, Anton: *See*—
Peter, Walter; Hruschka, Anton; and Hoglinger, Oskar, 5,145,557, Cl. 162-40.000

Hsieh, You-Zung; Chen, Fu-Tai A.; Sternberg, James C.; Klein, Gerald; and Liu, Cheng-Ming, to Beckman Instruments, Inc. Capillary zone electrophoretic analysis of isoenzymes. 5,145,567, Cl. 204-180.100.

Hsue, James S.: *See*—
Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Hsue, James S., 5,146,306, Cl. 357-41.000.

Hsun, Yan J. Constructional kit. 5,145,441, Cl. 446-126.000

Hu, Mae W. L.: *See*—
Tarnowski, Thomas L.; Hu, Mae W. L.; Laney, Maureen; Pease, John S.; and Ghazarossian, Vartan, 5,145,774, Cl. 435-7.250.

Huang, Hua-Feng: *See*—
Herfindahl, Dean R.; Huang, Hua-Feng; Lewis, Richard W.; and Wallace, Walter A., 5,146,058, Cl. 219-10.55A.

Hubbell Incorporated: *See*—
Misencik, John J., 5,146,385, Cl. 361-56.000.

Huber, Robert A.: *See*—
Clark, William F.; Huber, Robert A.; Evans, Michael A.; Waldman, Jaime I.; and Healey, Thomas C., 5,145,066, Cl. 206-409.000

Hubsch, Walter; Angerbauer, Rolf; Fey, Peter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Gunter, to Bayer Aktiengesellschaft. Substituted pyrido (2,3-d) pyrimidines as intermediates. 5,145,959, Cl. 544-279.000

Hubsch, Walter: *See*—
Fey, Peter; Angerbauer, Rolf; Hubsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter, and Schmidt, Delf, 5,145,857, Cl. 514-318.000

Hudson, Peter J.; Shine, John; Niall, Hugh D.; and Tregear, Geoffrey W., to Howard Florey Institute of Experimental Physiology and Medicine. Human pro relaxin polypeptides. 5,145,962, Cl. 530-324.000

Hudson Products Corporation: *See*—
Kluppel, George E., 5,145,000, Cl. 165-113.000.

Huebler, James E.; Arnold, John M.; and Saha, Narayan C., to Institute of Gas Technology. Electrode for an electric discharge machining apparatus. 5,146,061, Cl. 219-69.150.

Huels Aktiengesellschaft: *See*—
Wildt, Thomas; Nierlich, Franz; Droste, Wilhelm; Neumeister, Joachim; and Scholz, Bernhard, 5,146,039, Cl. 585-820.000

Huff, George A., Jr.: *See*—
Hirschberg, Eugene H.; and Huff, George A., Jr., 5,145,826, Cl. 502-262.000

Huff, Robert O.; Jordan, Paul T.; and Owens, Valerie, to Jacobs Chuck Technology Corporation. Impact tool chuck. 5,145,194, Cl. 279-62.000

Hughes Aircraft Company: *See*—
Brodie, Eugene L.; and Jameson, Chris A., 5,144,811, Cl. 62-176.600
Kaspaul, Alfred F., 5,145,722, Cl. 427-388.100.
Kimura, Hiroshi; and Pastor, Ricardo C., 5,146,468, Cl. 372-59.000.
Larson, Lawrence E., 5,146,117, Cl. 307-465.000
Lippmann, Raymond; Nelson, James E.; Schnars, Michael J.; Chintyan, James R.; Aralis, James M.; and Bohac, Frank J., Jr., 5,146,154, Cl. 323-367.000
Tang, Raymond; and Small, James G., 5,146,616, Cl. 455-103.000.
Turner, Raymond L.; Mays, Randall L.; and Montgomery, Billy L., 5,145,531, Cl. 148-23.000

Hughes Company, Inc.: *See*—
Mietzel, Dennis O., 5,144,887, Cl. 99-636.000.

Hui, Marvin M., to General Electric Company. Dual-phase reactor plant with partitioned isolation condenser. 5,145,639, Cl. 376-283.000

Hules, Joseph C., to ITT Corporation. Electromagnetic beam system with switchable active transmit/receive modules. 5,146,230, Cl. 342-374.000

Hulett, Jeffrey M.; Murff, James D.; and Raines, Richard D., to Exxon Production Research Company. Method for increasing the end-bearing capacity of open-ended piles. 5,145,284, Cl. 405-232.000

Hullett, John L.: *See*—
Cantoni, Antonio; Budrikis, Zigmantas L.; Newman, Robert M.; and Hullett, John L., 5,146,477, Cl. 375-112.000.

Hullot, Jean-Marie; Jobs, Steven P.; and Franklin, Christopher M., to NeXT Computer, Inc. System and method for managing graphic images. 5,146,556, Cl. 395-159.000.

Hulsmann, John D.: *See*—
Guerci, Joseph R.; Schutz, Robert W.; and Hulsmann, John D., 5,146,229, Cl. 342-204.000

Hult, Bror, to FMG Timberjack AB. Cleaning device. 5,144,748, Cl. 30-276.000

Hultgren, Kent G.: *See*—
North, William E.; Hultgren, Kent G.; Dishman, Christopher D.; and Van Heusden, Gary S., 5,145,315, Cl. 415-115.000

Hultz, Robert C.: *See*—
Hermanson, Harry; Hultz, Robert C.; and Grussing, David R., 5,145,617, Cl. 264-37.000

Hummer, Frederick B.: *See*—
Herzog, David K.; Haven, Willem S.; Hummer, Frederick B.; and Razzacki, Syed T., 5,144,854, Cl. 74-476.000.

Humphrey Engineering, Inc.: *See*—
Humphrey, John M., 5,145,200, Cl. 280-605.000

Humphrey, John M., to Humphrey Engineering, Inc. Universal integral ski control system. 5,145,200, Cl. 280-605.000

Humphries, Robert H.: *See*—
Schlanger, Raphael; and Humphries, Robert H., 5,145,138, Cl. 248-311.200

Hunt, Mitchell. Adjustable meter setter. 5,145,214, Cl. 285-30.000

Hunter, Mark A. Clipboard. 5,145,141, Cl. 248-452.000

Hupe, Jurgen; and Iwan, Herbert, to Blasberg Oberflachentechnik GmbH. Process for manufacturing through-hole contacting plated printed circuit. 5,145,572, Cl. 205-219.000

Husain, Altaf: *See*—
Bundens, Robert G.; Keville, Kathleen M.; Huss, Albin, Jr.; Chu, Cynthia T-W; and Husain, Altaf, 5,146,029, Cl. 585-533.000

Husky Injection Molding Systems Ltd.: *See*—
Schad, Robert D., 5,145,630, Cl. 264-328.800

Husler, Rinaldo: *See*—
Berner, Godwin; Meier, Kurt; Dietliker, Kurt; and Husler, Rinaldo, 5,145,885, Cl. 522-39.000

Huss, Albin, Jr.: *See*—
Bundens, Robert G.; Keville, Kathleen M.; Huss, Albin, Jr.; Chu, Cynthia T-W; and Husain, Altaf, 5,146,029, Cl. 585-533.000

Hutchins, Curtis J., to HR Textron Inc. Adjustable rotor assembly 5,146,126, Cl. 310-156.000.

Hutchins, Richard D.; Sandiford, Burton B.; and Dovan, Hoai T., to Union Oil Company of California. Method for selectively reducing subterranean water permeability. 5,145,012, Cl. 166-292.000

Hutchinson, Michael D.: *See*—
Clarke, David J.; and Hutchinson, Michael D., 5,146,157, Cl. 324-142.000.

Hutchison, Wayne R.: *See*—
Sebben, Daniel A.; Hutchison, Wayne R.; and Patterson, Jon M., 5,145,019, Cl. 180-62.000

Huth, Gerald C., to Xsirius Photonics, Inc. Devices for detecting and/or imaging single photoelectron. 5,146,296, Cl. 357-19.000.

Huttlin, Herbert. Fluidized bed apparatus for making and/or processing pourable material. 5,145,650, Cl. 422-143.000

Hyakutake, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Variable gain amplifier. 5,146,180, Cl. 330-254.000

Hydrolux S.a.r.l.: *See*—
Schwelm, Hans, 5,144,983, Cl. 137-625.640

Hyslop, Robert F.: *See*—
Austin, Jared A.; Miller, Joseph H.; and Hyslop, Robert F., 5,144,729, Cl. 28-105.000

Hyster Company: *See*—
Miles, Kevin L., 5,145,034, Cl. 187-1.00R

Hyundai Electronics Ind., Co., Ltd.: *See*—
Choi, Heung M., 5,145,137, Cl. 248-288.500

Ibrahim, Nader; and Sodano, Jeanette L., to Beecham Inc. Compositions. 5,145,667, Cl. 424-52.000

Ichihashi, Toshihiro, to Advantest Corporation. High-frequency multipin connector. 5,145,387, Cl. 439-108.000

Ichikawa, Yasunori; Ohnishi, Hiroshi; Urabe, Shigeharu; Kojima, Akira; and Katoh, Akira, to Fuji Photo Film Co., Ltd. Process of forming silver halide grains. 5,145,768, Cl. 430-569.000

Ichiryu, Ken: *See*—
Tamura, Morio; Sato, Fujio; Hashimoto, Hisayoshi; Ichiryu, Ken; Hatano, Kazuyoshi; Tanaka, Kiyoshi; and Tobita, Nobuyuki, 5,144,843, Cl. 73-727.000

Ichiyama, Masaaki: *See*—
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio; Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000.

Ichiyanagi, Takashi: *See*—
Watanabe, Keigo; Naka, Hiroyuki; and Ichiyanagi, Takashi, 5,145,528, Cl. 118-411.000

ICI India Limited: *See*—
Mandal, Arun K.; Mahajan, Satish W.; and Jawalkar, Damodar G., 5,145,994, Cl. 562-478.000

ICT Integrated Circuit Testing Gesellschaft fur Halbleiterpruftechnik mbH: *See*—
Rosien, Jurgen, 5,146,089, Cl. 250-307.000.
Ide, Jushi: *See*—
Yamaguchi, Shinichiro; Matsumoto, Hidekazu; Bandoh, Tadaaki; Hirayama, Hirokazu; Morioka Takayuki; Takaya, Soichi; Kawamoto, Yukio; Ide, Jushi; and Miyazaki, Yoshihiro, 5,146,569, Cl. 395-375.000.
Ideal-Standard GmbH: *See*—
Monch, Heinrich, 5,145,114, Cl. 239/126.000.
Ideatech, Inc.: *See*—
Hoagland, Larry D.; and Brockman, Stephen J., 5,145,208, Cl. 280-734.000
Idel, Karsten-Josef: *See*—
Hess, Bernhard; Freitag, Dieter; and Idel, Karsten-Josef, 5,145,920, Cl. 525-528.000
Idemitsu Kosan Co., Ltd.: *See*—
Funaki, Keisuke; and Yamasaki, Konrei, 5,145,950, Cl. 528-481.000
Yuasa, Kimihiro; Fujimoto, Tetsuo; and Hashimoto, Kenji, 5,145,546, Cl. 156-324.000.
Ihara, Keizo: *See*—
Hamada, Toshihiko; Ihara, Keizo; and Iijima, Masato, 5,146,371, Cl. 360-32.000
Ihara, Kiyohiko; and Yamaguchi, Fumihiko, to Daikin Industries Ltd. Chlorotrifluoroethylene/perfluoro(alkyl vinyl ether) copolymer. 5,145,925. Cl. 526-247.000
Iida, Kazumasa: *See*—
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,144,916, Cl. 123-41.120.
Iijima, Masato: *See*—
Hamada, Toshihiko; Ihara, Keizo; and Iijima, Masato, 5,146,371, Cl. 360-32.000
Iio, Itsushi, to Sumitomo Heavy Industries, Ltd. Rolling mill stand 5,144,827, Cl. 72-224.000.
Iio, Takayuki; and Tanigaki, Ryuhei, to Mitsubishi Jukogyo Kabushiki Kaisha. Scroll type fluid machinery having a tilt regulating member 5,145,346, Cl. 418-55.500.
Iitsuka, Takayoshi, to Hitachi, Ltd. Method of producing object program based on interprocedural dataflow analysis of a source program. 5,146,594, Cl. 395-700.000.
Iizuka, Nobuyuki: *See*—
Kirikami, Seiichi; Satoh, Tomo; Sato, Isao; Gunzi, Thutomu; and Iizuka, Nobuyuki, 5,144,794, Cl. 60-39.750
Iizuka, Takashi; Fukuda, Yasuaki; Hayashida, Masami; and Niibe, Masahito, to Canon Kabushiki Kaisha. Apparatus for cleaning an optical element for use with a radiation beam. 5,145,649, Cl 422-129.000
Ikai, Takashi: *See*—
Watanabe, Junichi; Kondo, Yasuo; Hatanaka, Masataka; Ikai, Takashi; Suzuki, Koichi; Nawamaki Tsutomu; and Watanabe, Shigeomi, 5,145,502, Cl. 71-90.000
Ikeda, Atsushi: *See*—
Nakagawa, Hiroshi; Ikeda, Atsushi; Sakai, Itsuo; and Tani, Nobuyuki, 5,145,522, Cl. 106-287. 70.
Ikeda, Hiroshi; Kishine, Nobuyuki; Oyani, Tsuyoshi; and Niinomi, Mashahiko, to KAO Corporation. Magnetic disk jacket. 5,146,381, Cl. 366-133.000
Ikegami, Hiroaki: *See*—
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Ikegami, Yuichi: *See*—
Yoshizawa, Tetsuo; Miyazaki, Toyotaide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000
Ikeshima, Koichi: *See*—
Horikawa, Osamu; and Ikeshima, Koichi, 5,145,539, Cl. 156-89.000
Ikeuchi, Masayuki: *See*—
Murata, Shigemi; and Ikeuchi, Masayuki, 5,144,936, Cl 123-655.000
Ikoma, Katsuyuki: *See*—
Hashimoto, Kimio; Ikoma, Katsuyuki; and Tsushima, Koji, 5,145,134, Cl. 248-183.000
Illinois Tool Work Inc.: *See*—
Etters, Harry N., 5,146,054, Cl. 200/85.00A
IMA-NORTE Maschinenfabriken Klessmann GmbH & Co.: *See*—
Riesmeier, Wilhelm, 5,144,737, Cl. 29-564.700
Imaeda, Hirofumi: *See*—
Kobayashi, Noboru; and Imaeda, Hirofumi, 5,145,426, Cl. 440-38.000
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Dye-receiving sheets for dye transfer type thermal printing 5,145,827, Cl. 503-227.000
Imai, Akihiro: *See*—
Taguchi, Nobuyoshi; Imai, Akihiro; Matsuda, Hiromu; Kawakami, Tetsuji; and Yubakami, Keiichi, 5,146,237, Cl. 346-1.100.
Imai, Kiyoshi: *See*—
Ishizu, Atsushi; Sokawa, Kenta; and Imai, Kiyoshi, 5,146,317, Cl 358-31.000
Imai, Masao: *See*—
Suzuki, Toshiyuki; Sasagawa, Katsuyoshi; Imai, Masao; and Kanemura, Yoshinobu, 5,145,927 Cl. 526-301.000
Imanaga, Eisuke; and Maeda, Hirokazu to Metarex Research Institute Corp. Tape cassette. 5,146,376, Cl. 360-94.000
Imanaka, Koichi; and Sato, Fumihiko, to Omron Tateisi Electronic Co. Semiconductor light emitting device having a superlattice buffer layer. 5,146,295, Cl. 357-4.000.
Imazu, Katsuhiro: *See*—
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Imbery, Leo R., Jr., to Seaquist Closures. Positive orientation system for a threaded closure and container. 5,145,080, Cl. 215-331.000
Imburgia, Thomas R.: *See*—
Carey, Paul J.; Imburgia, Thomas R.; Edgar, John L.; McHugh, Denis C.; Tam, Lan P.; Chieng, Douglas; and Williamson, Mark, 5,146,561, Cl. 395-200.000
Imokawa, Genji: *See*—
Yamada, Shinji; Kawamata, Akira; Imokawa, Genji; Masuda, Shinichi; Yamaguchi, Masakazu; Ninaka, Koichi; and Joukura, Hiroko, 5,146,002, Cl. 568-337.000.
Imperial Chemical Industries PLC: *See*—
Anthony, Vivienne M.; Clough, John M.; DeFraine, Paul; Godfrey, Christopher R. A.; Wiggins, Thomas E.; and Tapolczay, David J., 5,145,954, Cl. 534-852.000.
Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, 5,145,856, Cl. 514-274.000.
Duncan, Helen, 5,145,903, Cl. 524-437.000
Imperial, Renzo. Automatic timing governor between crankshaft and camshafts, operating by means of actuators on the shaft connecting chain. 5,144,920, Cl. 123-90.150.
Inaba, Kazuo: *See*—
Nishijima, Kazuyoshi; Inaba, Kazuo; and Sugiyama, Tomokazu, 5,144,861, Cl. 74-552.000
Inagaki, Mitsuo: *See*—
Kojima, Akikazu; Miyoshi, Shinji; and Inagaki, Mitsuo, 5,144,798, Cl. 60-303.000
Inaguchi, Takashi: *See*—
Nagao, Masashi; Yoshimura, Hideto; and Inaguchi, Takashi, 5,144,805, Cl. 62-6.000.
Nagao, Masashi; Yoshimura, Hideto; and Inaguchi, Takashi, 5,144,810, Cl. 62-471.000.
Inatomi, Yasutoshi: *See*—
Haraga, Hisato; Inatomi, Yasutoshi; Obata, Takashi; Hashida, Mituaki; Uchiyama, Koichi; and Moriyama, Kenji, 5,144,702, Cl. 4-541.600.
Incas Holding S.p.A.: *See*—
Cavallini, Alberto, 5,145,268, Cl. 400-196.100
Inco Limited: *See*—
Paserin, Vladimiri; Babjak, Juraj; Ettel, Victor A.; and Adams, Richard S., 5,145,716, Cl. 427-55.000
Industrial Technology Research Institute: *See*—
Chao, Zu-Wen; and Wu, Jinn T., 5,146,515, Cl. 385-35.000.
Industrias Gaser, S.L.: *See*—
Riubrugent, Narcis G., 5,145,690, Cl. 425-89.000.
Innovationsgesellschaft fur fortgeschrittene Produktion-ssysteme in der Fahrzeugindustrie MbH: *See*—
Mathiak, Friedrich; Krawietz, Arnold; Nowack, Horste; and Trautmann, Karl-Heinz, 5,144,844, Cl. 73-79.400
Inokuti, Yukio, to Kawasaki Steel Corporation. Low iron loss grain oriented silicon steel sheets and method of producing the same. 5,146,063, Cl. 219-121.350.
Inomet, Inc.: *See*—
Knudson, Mark B., 5,146,091, Cl. 250-341.000
Inoue, Akira: *See*—
Ishii, Tooru; Mitsui, Kiichiro; Sano, Kunio; and Inoue, Akira, 5,145,587, Cl. 210-759.000
Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, 5,145,657, Cl. 423-219.000
Inoue, Hiroaki; Uomi, Kazuhisa; and Ishida, Koji, to Hitachi, Ltd. Semiconductor optical device and array of the same. 5,146,513, Cl. 385-13.000
Inoue, Hiroshi, to Canon Kabushiki Kaisha. Data processing system and apparatus. 5,146,558, Cl. 395-166.000.
Inoue, Kouji: *See*—
Torimaru, Yasuo; and Inoue, Kouji, 5,146,430, Cl. 365-222.000.
Inoue, Masayoshi: *See*—
Kawamata, Taisuke; Maruyama, Toshio; Irie, Hidetaka; Inoue, Masayoshi; Nishio, Shinji; and Murayama, Koichi, 5,144,772, Cl. 51-105.0SP
Inoue, Ryo: *See*—
Fukunaga, Takao; Nakajima, Hisao; Kobayashi, Kenzo; Kono, Masanao; Irie, Hisao; and Inoue, Ryo, 5,145,532, Cl. 148-23.000.
Inoue, Shinichi: *See*—
Makino, Kenji; Matuda, Tohoru; Inoue, Shinichi; Itoh, Fujihiro; and Kusano, Yutaka, 5,146,378, Cl. 360-121.000
Inoue, Shuichi: *See*—
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Institute of Gas Technology: *See*—
Huebler, James E.; Arnold, John M.; and Saha, Narayan C., 5,146,061, Cl. 219-69.150.
Integrated System Assemblies Corporation: *See*—
Eichelberger, Charles W., 5,144,747, Cl. 29-839.000.
Intel Corporation: *See*—
Blanck, Greg J.; and Agarwal, Rakesh K., 5,146,565, Cl. 395-275.000
Holler, Mark A.; and Tam, Simon M., 5,146,602, Cl. 395-23.000

Interflo Medical, Inc.: *See*—
McKown, Russel; Yelderman, Mark; and Quinn, Michael, 5,146,414, Cl. 364-510.000.
International Business Machines: *See*—
Ackerman, Dennis F.; Bender, David R.; Chu, Salina S.; Deibert, George R.; Hallock, Gary G.; Lackey, David E.; Sheldon, Robert G.; and Stranko, Thomas A., 5,146,460, Cl. 371-23.000
International Business Machines Corporation: *See*—
Albrechta, Stanley M.; Clementi, Robert J.; and Kindl, Thomas E., 5,145,553, Cl. 156-640.000
Amer, Nabil M.; and Meyer, Gerhard, 5,144,833, Cl. 73-105.000
Apap, Joseph A.; Brown, Mark A.; Emerick, Alan J.; Miller, Thomas L.; Murray, James R.; and Sissenstein, David W., Jr., 5,145,104, Cl. 228-179.000
Bailey, Roger N.; and Mansfield, Robert L., 5,146,572, Cl. 395-425.000
Beardsley, Brent C.; Benhase, Michael T.; and Candelaria, Susan K., 5,146,576, Cl. 395-425.000
Begun, Ralph M., 5,146,582, Cl. 395-500.000
Beukema, Bruce L.; Marquart, David W.; and Morse, Ronald D., 5,146,605, Cl. 395-575.000
Birk, Yitzhak, 5,146,514, Cl. 385-24.000.
Booke, Michael A.; Kallmeyer, Michael H. W.; Rizk, Nabil A.; and Yau, You-Wen, 5,145,551, Cl. 156-626.000
Brandle, Richard T.; Goodliffe, Don L.; Keith, Donald E.; Robinette, Randy A.; Sizemore, Robert C.; Smithwick, Garry J.; and Zappavigna, Anthony J., 5,146,593, Cl. 395-700.000.
Brooks, Peter E.; Reidenbach, John R.; and Troutman, Mark E., 5,146,450, Cl. 369-244.000
Cassorla, Elie; de Vries, Jacqueline P.; Moran, Michael E.; Slater, James J.; and Unger, Jay, 5,146,552, Cl. 395-145.000
Chen, Chengjun J., 5,145,547, Cl. 156-345.000
Ciraula, Michael K.; Durham, Christopher M.; and Jallice, Derwin L., 5,146,111, Cl. 307-296.300.
Faber, Brenda G.; and Jansen, Louis A., 5,146,411, Cl. 364-480.000
Hearn, Anthony R.; and Commander, Robert D., 5,146,122, Cl 310-13.000
Hester, Phillip D.; and Johnson, William M., 5,146,570, Cl 395-375.000
Hollis, Ralph L., Jr.; and Salcudean, Septimiu E., 5,146,566, Cl. 395-275.000
Jensen, Karen, 5,146,406, Cl. 364-419.000
Kukla, Robert W., 5,146,562, Cl. 395-200.000
Lorie, Raymond A.; and Young, Honesty C., 5,146,590, Cl. 395-600.000
Maass, Klaus K.; and Shen, David T., 5,146,422, Cl. 364-768.000
Miyazawa, Atsushi, 5,146,551, Cl. 395-142.000.
Natarajan, Kadathur S., 5,146,540, Cl. 395-11.000
Nguyen, Hoang K.; and Draina, Joseph M., 5,145,493, Cl. 55-17.000
Nolan, Thomas J., Jr., 5,146,575, Cl. 395-425.000
Smith, Thomas B., III, 5,146,585, Cl. 395-550.000
Vassiliadis, Stamatis; and Pechanek, Gerald G., 5,146,420, Cl. 364-757.000
Vassiliadis, Stamatis; and Pechanek, Gerald G. 5,146,543, Cl. 395-27.000
International Computers Limited: *See*—
Frost, Adrian R.; and Henson, Karl M., 5,146,603, Cl. 395-425.000
International Mobile Machines Corporation: *See*—
Critchlow, David N.; Yehushua, Moshe; Avis, Graham M., Heimbigner, Wade L.; and Johnson, Karle J., 5,146,473, Cl. 375-8.000
International Paper Company: *See*—
Silver, Virginia K.; and Gordon, Robert L., 5,145,107, Cl. 229-1.50B
Westerberg, J. Lennart; Bonsu, Alex K.; and Perrett, Fred J., 5,145,556, Cl. 162-29.000.
International Sales & Engineering, Inc.: *See*—
Stewart, Todd B.; and Yurgaites, Daniel G., 5,145,191, Cl. 277-212.0FB
Intertel Entertainment, Inc.: *See*—
Bergsman, Barry; and Pearlman, Curtis, 5,146,487, Cl. 379-67.000
Inuishi, Masahide: *See*—
Watabe, Kiyoto; Mitsui, Katsuyoshi; and Inuishi, Masahide, 5,146,291, Cl. 357-23.400.
Inukai, Hiroshi: *See*—
Kubo, Motonobu; Inukai, Hiroshi; and Kitahara, Takahiro, 5,145,761, Cl. 430-108.000
Inuzuka, Tsuneki: *See*—
Hosaka, Masao; Shimada, Kazutoshi; and Inuzuka, Tsuneki, 5,146,601, Cl. 395-800.000
Invacare Corporation: *See*—
Quintile, Mark J.; and Curran, Neal J., 5,145,020, Cl. 180-65.100.
Inventures Niagara Inc.: *See*—
LaFontaine, Roy A., 5,145,226, Cl. 294-27.100
Ionics, Incorporated: *See*—
MacDonald, Russell J.; Hodgdon, Russell B.; and Alexander, Samuel S., 5,145,618, Cl. 264-46.300
Iowa State University Research Foundation, Inc.: *See*—
Pometto, Anthony L., III; and Lee, Byungtae, 5,145,779, Cl. 435-262.000.
Irani, Geoffrey B.; Constantikes, Kim T.; and Shiflett, Gary D., to Johns Hopkins University, The. Coherent correlation addition for increasing match information in scene matching navigation systems. 5,146,228, Cl. 342-64.000.
Irie, Hidetaka. *See*—
Kawamata, Taisuke; Maruyama, Toshio; Irie, Hidetaka; Inoue, Masayoshi; Nishio, Shinji; and Murayama, Koichi, 5,144,772, Cl 51-105.0SP
Irie, Hisao: *See*—
Fukunaga, Takao; Nakajima, Hisao; Kobayashi, Kenzo; Kono, Masanao; Irie, Hisao; and Inoue, Ryo, 5,145,532, Cl. 148-23.000.
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, to Mitsubishi Jukogyo Kabushiki Kaisha. Solid electrolyte fuel cell. 5,145,753, Cl 429-32.000
Irvine, John E.: *See*—
Hooper, Jefferson E.; and Irvine, John E., 5,145,287, Cl 405-242.000
Iscar Ltd.: *See*—
Satran, Amir, 5,145,295, Cl. 407-113.000
Ishida, Kazunari: *See*—
Kondo, Toshio; Ogawa, Toshio; Ishida, Kazunari; and Ueyama Akihiro, 5,146,192, Cl. 333-164.000
Ishida, Koji: *See*—
Inoue, Hiroaki; Uomi, Kazuhisa; and Ishida, Koji, 5,146,513, Cl. 385-13.000
Ishida, Masayuki: *See*—
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Ishida, Takehisa: *See*—
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Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, 5,146,370, Cl. 360-32.000
Ishigaki, Tsuneo: *See*—
Komuro, Hiroshi; and Ishigaki, Tsuneo, 5,145,152, Cl. 251-331.000
Ishiguro, Yoichi: *See*—
Kyoto, Michihisa; Ishiguro, Yoichi; Urano, Akira; and Kakuzen, Hideo, 5,145,507, Cl. 65-2.000
Ishii, Kazuya; Aoyama, Motoo; Ishii, Yoshihiko; Uchikawa, Sadao; Takeda, Renzo; and Yokomizo, Osamu, to Hitachi, Ltd. Fuel assembly and nuclear reactor. 5,145,635, Cl. 376-173.000
Ishii, Masaaki: *See*—
Takatsuna, Kazutoshi; Ishii, Masaaki; Ogawa, Hideaki; Shinohara, Akihito; Shiozawa, Kouji; Okumura, Yoshiharu; and Ishikawa Masako, 5,145,979, Cl. 556-440.000
Ishii, Shizuo; and Yokoyama, Masao, to Konica Corporation. Camera with electronic flash unit. 5,146,251, Cl. 354-145.100.
Ishii, Takuya; and Macoka, Tatsuo, to Matsushita Electric Industrial Co., Ltd. Fly back converter switching power supply device 5,146,394, Cl. 363-16.000
Ishii, Tooru; Mitsui, Kiichiro; Sano, Kunio; and Inoue, Akira, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for treatment of waste water. 5,145,587, Cl. 210-759.000
Ishii, Yoshihiko: *See*—
Ishii, Kazuya; Aoyama, Motoo; Ishii, Yoshihiko; Uchikawa, Sadao; Takeda, Renzo; and Yokomizo, Osamu, 5,145,635, Cl 376-173.000
Ishikawa, Masako: *See*—
Takatsuna, Kazutoshi; Ishii, Masaaki; Ogawa, Hideaki; Shinohara, Akihito; Shiozawa, Kouji; Okumura, Yoshiharu; and Ishikawa Masako, 5,145,979, Cl. 556-440.000
Ishikawa, Masayuki; Azuma, Hiroshi; Ito, Shigeru; and Yamaguchi, Tomohiro, to Hitachi Chemical Co., Ltd. Method for treating urinary obstruction. 5,145,851, Cl. 514-252.000
Ishikawa, Toshio; Iwaasa, Shuzuo; Utsumi, Tomoaki; and Endo, Fumihiro, to Hitachi, Ltd. Method and apparatus for locating an abnormality in a gas-insulated electric device. 5,146,170, Cl 324-536.000
Ishikawa, Yuji, to Canon Kabushiki Kaisha. Data conversion method and apparatus for converting undefined length data to fixed length data. 5,146,220, Cl. 341-67.000
Ishikawajima-Harima Heavy Industries Co., Ltd.: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Miyagawa, Hitoshi; Yoshida, Masahito; and Masuda, Naotaka, 5,145,280, Cl 405-62.000
Ishimaru, Teruta: *See*—
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Ishiyama, Tamio: *See*—
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio, Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000
Ishizu, Atsushi; Sokawa, Kenta; and Imai, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Signal separating apparatus. 5,146,317, Cl 358-31.000
Ishizuka, Koh; and Nishimura, Tetsuharu, to Canon Kabushiki Kaisha Encoder with high resolving power and accuracy. 5,146,085, Cl 250-231.160.
Ishizuka, Makoto; and Wakasugi, Takashi, to Kureha Chemical Industry Co., Ltd. Process for producing hydrazone derivatives. 5,145,988 Cl. 560-159.000
Ishizuka, Mitsuru; and Yamaguchi, Noriyuki, to Mitsubishi Denki Kabushiki Kaisha. Motion adaptive luminance signal and color signal separating filter. 5,146,318, Cl. 358-31.000

Isis Inc.: *See—*
Stark, Iain E., 5,146,094, Cl. 250-363.80

Isobe, Takundo: *See—*
Hayashi, Takamasa; Mori, Goro; Araki, Shigeyuki; Yamamoto, Masahiro; Takahashi, Masaru; Sonma, Toshitaka; Miyajima, Masami; and Isobe, Takundo, 5,146,240, Cl. 346-108.000.

Isoda, Takeshi: *See—*
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio; Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000

Isoguchi, Seiichi; Tsuchida, Masaaki; Ota, Yoshitaka; and Tamura, Tomoaki, to Konica Corporation. Still video camera with a playback function and sound recording feature. 5,146,353, Cl. 358-909.000

Isomura, Mamoru: *See—*
Tsurumi, Yashuyuki; and Isomura, Mamoru, 5,145,023, Cl. 180-68.100

Isomura, Manabu: *See—*
Sakai, Hiroaki; and Isomura, Manabu, 5,145,620, Cl. 264-65.000

ISP Investments Inc.: *See—*
Kwak, Yoon T.; Kopolow, Stephen L.; Helioff, Michael W.; and Tazi, Mohammed, 5,145,669, Cl. 55-313.000

Istvan nee Katona, Terezia: *See—*
Timar, Tibor; Eszenyi, Tibor; Sebok, Peter; Galamb, Vilmos; Fazekas nee Kozak, Julia; Istvan nee Katona, Terezia; Kovach nee Lakatos, Eva; and Nagy nee Csaki, Erika, 5,145,985, Cl. 548-525.000

Isuzu Glass Co., Ltd.: *See—*
Tarumi, Takashi; and Einishi, Toshihiko, 5,145,805, Cl. 501-78.000.

Isuzu Motors Limited: *See—*
Kuwahara, Tohru, 5,145,038, Cl. 188-158.000
Tsuchiya, Yoshinobu; Shirata, Akihiro; and Moroboshi, Hiroyoshi, 5,146,095, Cl. 290-38.00R

IT Systems Corporation: *See—*
Tehbasa, Marius, 5,146,489, Cl. 379-100.000

Itaba, Yasushi; Yoshifuji, Yutaka; Kondo, Takayoshi; Saitoh, Keichiro; Yoshino, Tadao; Izawa, Minoru; and Sakamoto, Ichiro, to Toa Nenryo Kogyo Kabushiki Kaisha. Oriented polyethylene film. 5,145,728, Cl. 428-213.000

Ito, Akira: *See—*
Seike, Shoji; Watanabe, Keiichiro; and Ito, Akira, 5,145,011, Cl. 165-9.000

Ito, Koichi; Asano, Hideo; and Higashihara, Akihito, to Nippondenso Co., Ltd. Automotive air-conditioner. 5,145,456, Cl. 454-75.000.

Ito, Masao; and Hosotani, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit with analogue signal processing circuit and digital signal processing circuit formed on single semiconductor substrate. 5,146,112, Cl. 307-30.000

Ito, Seiichi: *See—*
Nishino, Seigou; Kawai, Masato; Ohno, Kiyoshi; Ito, Seiichi; and Itoh, Nobuyoshi, 5,144,945, Cl. 123-205.120.

Ito, Shigeru: *See—*
Ishikawa, Masayuki; Azuma, Hiroshi; Ito, Shigeru; and Yamaguchi, Tomohiro, 5,145,851, Cl. 514-252.000.

Ito, Takashi; Iwasaki, Osamu; Ohuchi, Akimicu; Otomo, Koichiro; and Saito, Yoshiaki, to Kanebo Limited; and Mitsui Mining Company, Limited. Woven fabric high-purity alumina continuous filament, high-purity alumina filament for production thereof, and processes for production of woven fabric and continuous filament. 5,145,734, Cl. 428-229.000

Ito, Takeharu: *See—*
Yuuki, Hayato; and Ito, Takeharu, 5,146,520, Cl. 385-45.000

Itoh, Fujihiro: *See—*
Makino, Kenji; Matuda, Tohoru; Inoue, Shinichi; Itoh, Fujihiro; and Kusano, Yutaka, 5,146,378, Cl. 360-121.000

Itoh, Hiro: *See—*
Kishi, Minoru; Kaneko, Yukihiro; and Itoh, Hiro, 5,145,736, Cl. 428-332.000

Itoh, Nobuyoshi: *See—*
Nishino, Seigou; Kawai, Masato; Ohno, Kiyoshi; Ito, Seiichi; and Itoh, Nobuyoshi, 5,144,945, Cl. 123-205.120.

Itoh, Syunji; Seki, Takahide; and Honda, Haruo, to Hitachi, Ltd. Interrupter having grounded interrupter container within a grounded cover. 5,146,387, Cl. 361-115.000

Itoh, Takashi: *See—*
Okubo, Yasuhiro; and Itoh, Takashi, 5,145,589, Cl. 210-795.000

ITT Corporation: *See—*
Caserta, Joseph N.; Mims, William D.; and Crenshaw, David A., 5,146,077, Cl. 250-213.0VT
Hules, Joseph C., 5,146,230, Cl. 342-374.000
Okubo, Isao, 5,145,389, Cl. 439-159.000

ITT Flygt AB: *See—*
Hovstadius, Gunnar, 5,145,254, Cl. 366-286.000

Ivey, Glen E.: *See—*
Whiting, Douglas L.; George, Glen A.; and Ivey, Glen E., 5,146,221, Cl. 341-67.000

Iwaasa, Shuzuo: *See—*
Ishikawa, Toshio; Iwaasa, Shuzuo; Utsumi, Tomoaki; and Endo, Fumihiro, 5,146,170, Cl. 324-536.000

Iwai, Kenji: *See—*
Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai, Kenji, 5,145,891, Cl. 524-34.000.
Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai, Kenji, 5,145,892, Cl. 524-34.000

Iwan, Herbert: *See—*
Hupe, Jurgen; and Iwan, Herbert, 5,145,572, Cl. 205-219.000

Iwanami, Teruo: *See—*
Takida, Hiroshi; and Iwanami, Teruo, 5,145,909, Cl. 525-57.000

Iwasaki, Osamu: *See—*
Ito, Takashi; Iwasaki, Osamu; Ohuchi, Akimicu; Otomo, Koichiro; and Saito, Yoshiaki, 5,145,734, Cl. 428-229.000

Iwasawa, Tadayasu: *See—*
Sato, Kensaku; Miyahira, Hitoshi; and Iwasawa, Tadayasu, 5,145,409, Cl. 439-585.000.

Iwase, Munehiko; and Takeya, Noriyoshi, to Pioneer Electronic Corporation. Servo apparatus for optical disk player having both open loop coarse gain control and closed loop fine gain control. 5,146,443, Cl. 369-44.290.

Iwata Air Compressor Manufacturing Co. Ltd.: *See—*
Haga, Shuji; and Tanuma, Masatomo, 5,145,344, Cl. 418-55.200

Iwata, Tetsuya; and Sakurai, Yutaka, to Alps Electric Co., Ltd. Thin film magnetic head. 5,146,379, Cl. 360-126.000

Iwata, Toshio: *See—*
Hosoya, Yasuhiko; and Iwata, Toshio, 5,144,929, Cl. 123-425.000.

Iwatsu Electric Co., Ltd.: *See—*
Tsuboi, Kiyoshi, 5,144,838, Cl. 73-579.000

Izawa, Minoru: *See—*
Itaba, Yasushi; Yoshifuji, Yutaka; Kondo, Takayoshi; Saitoh, Keichiro; Yoshino, Tadao; Izawa, Minoru; and Sakamoto, Ichiro, 5,145,728, Cl. 428-213.000.

J. Wagner GmbH: *See—*
Goes, Wilfried; and Gebauer, Gerhard, 5,145,331, Cl. 417-383.000.

Jachmann, Emil F.; and Sweet, Alan F., to Pitney Bowes Inc. Records management system having dictation/transcription capability. 5,146,439, Cl. 369-25.000.

Jack, Joseph E.: *See—*
Balke, Roy L.; and Jack, Joseph E., 5,144,739, Cl. 29-597.000.

Jackson, Andrew; Wu, Margaret M.; Chu, Alice S.; and Pelrine, Bruce P., to Mobil Oil Corporation. VI enhancing compositions and Newtonian lube blends. 5,146,021, Cl. 585-10.000.

Jackson, Arthur C.; and Chandler, Raymond P., to Steel Parts Corporation. Vibration damper. 5,145,143, Cl. 248-635.000.

Jackson, Michael: *See—*
Danielsson, K. Ove; Falk, Bo G. S.; and Jackson, Michael, 5,145,010, Cl. 162-26.000.

Jacob, Friedrich, to Agfa-Gevaert Aktiengesellschaft. Apparatus and method for the reproduction of a colored master. 5,146,265, Cl. 355-32.000

Jacobs Chuck Technology Corporation: *See—*
Huff, Robert O.; Jordan, Paul T.; and Owens, Valerie, 5,145,194, Cl. 279-62.000

Jacobson, Michael; and Clark, Kirtland P., to Ciba-Geigy Corporation Heteroatom containing perfluoroalkyl terminated neopentyl mercapto-alcohols and compositions therefrom. 5,145,996, Cl. 564-98.000

Jae-Il Engineering Company: *See—*
Park, Sung-Taek, 5,145,059, Cl. 200-527.000

Jaerger, Marc; and Lhoest, Willy, to Gallay S.A.; and Lhoest Vereeken Concepts Sprl. Installation for the transfer between receptacles of products that flow under the effect of gravity. 5,144,992, Cl. 141-346.000

Jain, Poonam: *See—*
Aswal, Bacchan S.; Chander, Ramesh; Chatterji, Sunil K.; Dhawan, Bhola N.; Dwivedi, Yogesh; Garg, Narendra K.; Jain, Poonam; Kapoor, Narinder K.; Kulshreshtha, Dinesh K.; Mehrotra, Bishan N.; Patnaik, Gyanendra K.; Rastogi, Ravi; Sarin, Jagat P. S.; Saxena, Krishna C.; Sharma, Shekhar C.; Sharma, Shri K.; Shukla, Binduja; and Visen, Pradeep K. S., 5,145,955, Cl. 536-124.000.

Jakobsen, Palle; and Drejer, Jorgen, to Novo Nordisk A/S. Aryloxyphenylpropylamines their preparation and use. 5,145,870, Cl. 514-524.000

Jallice, Derwin L.: *See—*
Ciraula, Michael K.; Durham, Christopher M.; and Jallice, Derwin L., 5,146,111, Cl. 307-296.300

Jamco Corporation: *See—*
Motoki, Shigeru, 5,146,065, Cl. 219-386.000
Umeda, Katsuhiko, 5,145,128, Cl. 244-118.500.

James River Graphics Limited: *See—*
Matthew, Michael K., 5,145,749, Cl. 428-511.000

Jameson, Chris A.: *See—*
Brodie, Eugene L.; and Jameson, Chris A., 5,144,811, Cl. 62-176.600

Jan, Shwu-Meei; and Chen, Hsien-Pao. Automobile steering lock. 5,144,822, Cl. 70-209.000

Janhunen, Timo. Rack for instruments. 5,145,366, Cl. 433-77.000

Jankevics, Andris: *See—*
Wirth, Allan; and Jankevics, Andris, 5,146,073, Cl. 250-201.900

Jansen, Louis A.: *See—*
Faber, Brenda G.; and Jansen, Louis A., 5,146,411, Cl. 364-480.000

Janssen, Mechilium J. G.: *See—*
Verduijn, Johannes P.; Janssen, Mechilium J. G.; De Gruijter, Cornelis B.; Koetsier, Wicher T.; and Van Oorschot, Cornelis W. M., 5,146,040, Cl. 585-825.000

Janssens, Francine: *See—*
Dogimont, Charles; Franklin, James; Janssens, Francine; and Schoebrechts, Jean-Paul, 5,146,013, Cl. 570-101.000

Japan Crown Cork Co., Ltd.: *See—*
Murayama, Kashiwa; Tatsuta, Masakazu; Shibata, Yoshiharu; and Yajima, Hideki, 5,145,084, Cl. 220-260.000.

Japan Electronic Control Systems Co., Ltd.: *See—*
Nakaniwa, Shinpei, 5,144,933, Cl. 123-675.000.

Japan Felt Industrial Company Limited: *See—*
Kyutoku, Hirofumi; Yamamoto, Kouichi; and Otani, Yoshihisa, 5,145,732, Cl. 428-36.100.

Japan Steel Works, Ltd., The: *See—*
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Nielsen, Kai H.; and Jensen, Frands E., 5,145,363, Cl. 432-180.000.

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Jobs, Steven P.: *See—*
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Johnson, Karle J.: *See—*
Critchlow, David N.; Yehushua, Moshe; Avis, Graham M.; Heimbigner, Wade L.; and Johnson, Karle J., 5,146,473, Cl. 375-8.000.

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Johnson, Robert B.: *See—*
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Johnson, William M.: *See—*
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Jonas, Robert R.; and Rubscha, Robert F., to Xerox Corporation. Counter-clockwise single sheet rotator. 5,145,168, Cl. 271-234.000.

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Jones, Thad M. Method and means for sensing a change in capacitance by a computer. 5,146,412, Cl. 364-482.000

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Kadokura, Susumu, to Canon Kabushiki Kaisha. Electro-deposition coated member. 5,145,733, Cl. 428-55 .000

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Kadowaki, Tomoko; and Murakami, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 5,146,467, Cl. 372-46.000

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Kagosaki, Hiroshi; and Komatsubara, Shoji, to Dainippon Screen Mfg. Co., Ltd. Method of controlling exposure of process camera. 5,146,268, Cl. 355-70.000

Kahl, Judith A. Article of clothing. 5,144,696, Cl. 2-207.000

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Kalinowski, Robert E.; Liles, Donald T.; and Shephard, Nick E., to Dow Corning Corporation. Precure silicone emulsion. 5,145,907, Cl. 524-789.000

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Kameswaran, Venkataraman; and Kuhn, David G., to American Cyanamid Company. Process for the manufacture of insecticidal, nematicidal and acaricidal 2-aryl-3-substituted-5-(trifluoromethyl)pyrrole compounds from N-(substituted benzyl)-2,2,2-trifluoro-acetimidoyl chloride compounds. 5,145,986, Cl. 548-531.000.

Kameyama, Isao: *See*—
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Kamienski, Conrad W.; and Dover, Eric Troy, to FMC Corporation. Low viscosity hydrocarbon solution of dialkylmagnesium compounds. 5,145,600, Cl. 252-182.300

Kamikawai, Ryotaro; and Masaki, Akira, to Hitachi, Ltd. Switching circuit and its signal transmission method. 5,146,119, Cl. 307-476.000

Kamiyama, Hideyuki; Sasaki, Masahiro; and Oki, Youji, to Stanley Electric Company, Ltd. Engine speed measuring device with plural counters for averaging angular velocity. 5,146,162, Cl. 324-166.000.

Kan, Shoichi, to Canon Kabushiki Kaisha. Sheet feeding apparatus. 5,145,164, Cl. 271-170.000

Kanai, Hiroyuki, to Kao Corporation. Magnetic recording medium comprising magnetic particles and binder and a dioxolane ester lubricant. 5,145,751, Cl. 428-694.000

Kanaishi, Yasuhiro: *See*—
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Kanamori, Terutoshi: *See*—
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Kaneko, Yukihiro: *See*—
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Kaneko, Yutaka, to Sanyo Electric Co., Ltd. Subprogram executing data processing system having bank switching control storing in the same address area in each of memory banks. 5,146,581, Cl. 395-425.000

Kanemura, Yoshinobu: *See*—
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Kaneyama, Yoshinobu, to Kabushiki Kaisha Toshiba. Store-and-forward switching system. 5,146,348, Cl. 358-407.000.

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Kang, Sin W., to Samsung Electronics Co., Ltd. Compact disk player with two stacked, rotary, rotationally offset carrying plates for plural disks. 5,146,451, Cl. 369-270.000.

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Kano, Isao: *See*—
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Kanzaki, Toshihide: *See*—
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Kao, Kent, to Acer Incorporated. Keyboard interface. 5,146,567, Cl. 395-325.000.

Kapoor, Narinder K.: *See*—
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Kappele, William D., to Hewlett-Packard Company. Specific dye set for thermal ink-jet printing. 5,145,519, Cl. 106-22.000.

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Kardorff, Uwe; Neubauer, Hans-Juergen; Leyendecker, Joachim; Kuenast, Christoph; Hofmeister, Peter; Krieg, Wolfgang; and Buerstinghaus, Rainer, to BASF Aktiengesellschaft. Specifically substituted cyclopropanecarboxamides and their use for controlling pests. 5,145,873, Cl. 514-624.000.

Karg, Rudolph; and Kirschbaum, Robert. Process for manufacturing a hose clad with ultra-high molecular weight polyethylene. 5,145,628, Cl. 264-248.000

Karlsen, Stig: *See*—
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Kasahima, Hirokazu: *See*—
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Kasbo, Loyd G.: *See*—
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Kasboske, George C. Vehicle lamp with universal mounting capability. 5,146,392, Cl. 362-61.000

Kase, Masataka; Kimura, Nami; and Kikuchi, Yoshio, to Fujitsu Limited. Formation of shallow junction by implantation of dopant into partially crystalline disordered region. 5,145,794, Cl. 437-24.000.

Kashihara, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Vehicular steering condition detecting apparatus. 5,146,202, Cl. 340-438.000.

Kashiwagi, Kazuo, to Canon Kabushiki Kaisha. Information retrieval apparatus. 5,146,247, Cl. 353-26.00A

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Kataoka, Hiroyuki, to Canon Kabushiki Kaisha. Camera provided with image-shake preventing function. 5,146,263, Cl. 354-430.000

Katayama, Kazuyori: *See*—
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Kater, John; and Pelikan, Glenn, to SpaceLabs, Inc. Contamination-free method and apparatus for measuring body fluid chemical parameters. 5,145,565, Cl. 204-153.100.

Kato Hatsujo Kaisha, Ltd.: *See*—
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Kato, Heizaburo, to Sankyo Manufacturing Company, Ltd. Roll feed device. 5,145,169, Cl. 271-272.000.

Kato, Hiroaki, to Zexel Corporation. Fuel injection pump of distribution type. 5,144,926, Cl. 123-380.000.

Kato, Mikihiko; Endo, Yasushi; Kawamata, Toshio; and Nishikawa, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,145,738, Cl. 428-336.000

Kato, Shigeru: *See*—
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Kato, Takeyuki; Yoneda, Yasunobu; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. Metallized ceramic structure comprising aluminum nitride and tungsten layers. 5,146,313, Cl. 357-74.000

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Katoh, Junichi: *See*—
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Katoh, Kazunobu: *See*—
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Katoh, Shoiti: *See*—
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Katz, Allen; and Moochalla, Shabbir S., to General Electric Co. Balanced reflective nonlinear processor using FETs. 5,146,177, Cl. 330-149.000.

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Kaul, Karlheinz, to Siemens Aktiengesellschaft. Apparatus having a mechanism for the acceptance of an electrical conductor. 5,145,390, Cl. 439-164.000

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Kawa, Rolf: *See*—
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Kawamoto, Susumu: *See*—
Shioya, Yoshiaki; Shimamoto, Toshiro; Kawamoto, Susumu; and Arai, Izumi, 5,144,800, Cl. 60-323.000

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Yamaguchi, Shinichiro; Matsumoto, Hidekazu; Bandoh, Tadaaki; Hirayama, Hirokazu; Morioka Takayuki; Takaya, Soichi; Kawamoto, Yukio; Ide, Jushi; and Miyazaki, Yoshihiro 5,146,569, Cl. 395-375.000.

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Kawano, Katsumi: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasahima, Hirokazu 5,146,559, Cl. 395-200.000

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Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, 5,145,312, Cl. 414-719.000.

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Inokuti, Yukio, 5,146,063, Cl. 219-121.350.

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Brandle, Richard T.; Goodliffe, Don L.; Keith, Donald E.; Robinette, Randy A.; Sizemore, Robert C.; Smithwick, Garry J.; and Zappavigna, Anthony J., 5,146,593, Cl. 395-700.000

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Banaska, John G., 5,146,100, Cl. 250-551.000

Keller, Karl: *See*—
Grotepass, Johann; Hamraths, Konrad; Hauck, Albert; Keller Karl; and Muller, Hubert, 5,144,828, Cl. 72-235.000

Keller, Paul D.: *See*—
McGraw, Thomas C.; Van Ryne, Randall E.; Soler, Jose J.; and Keller, Paul D., 5,145,167, Cl. 271-186.000

Kellner, Carl S., Rao, V. N. Mallikarjuna; and Weigert, Frank J., to Du Pont de Nemours, E. I., and Company. Hydrogenolysis/dehydrohalogenation process. 5,146,018, Cl. 570-156.000

Kelly, Eudell L., to Cummins Engine Company, Inc. Two-part piston assembly device. 5,144,884, Cl. 92-186.000.

Kemp, Richard R., to F. L. Aerospace Corp. Self-locking bipin lamp holder. 5,145,392, Cl. 439-232.000

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Blanchet-Fincher, Graciela B.; Chang, Catherine T.; and Kempf, Richard J., 5,145,760, Cl. 430-73.000

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Matsuda, Atsuko; and Kenpo, Tsutomu, 5,145,745, Cl. 428-425.900

Kenrick, Charles R.: *See*—
Anderson, Charles B.; and Kenrick, Charles R., 5,145,217, Cl. 285-179.000

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Scanderbeg, Dino; Wilkerson, William D.; Kenyon, Richard L.; and Nolan, Michael E., 5,144,801, Cl. 60-475.000

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Sweeney, Kevin L.; and Keur Michael R., 5,146,526, Cl. 385-90.000

Keville, Kathleen M.: *See—*
Bundens, Robert G.; Keville, Kathleen M.; Huss, Albin, Jr.; Chu, Cynthia T-W; and Husain, Altaf 5,146,029, Cl. 585-533.000.

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Hellebuyck, Charles G.; and Khalid, Syed M., 5,146,057, Cl 200-313.000

Khan, Muhammad A.; VanHove, James M., and Olson, Donald T., to APA Optics, Inc. Aluminum gallium nitride laser. 5,146,465, Cl. 372-45.000

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Blasdell, Donald W., Jr.; and Wetzel, Raymond H., 5,145,029, Cl 182-63.000

Kido, Tomoyuki, to Daihatsu Motor Co., Ltd. System and method for pivotally controlling vehicle rear wheels. 5,145,022, Cl. 180-79.100

Kidokoro, Toru: *See—*
Yoshioka, Mamoru; Sugiyama, Toshihisa; and Kidokoro, Toru, 5,144,803, Cl. 60-612.000

Kiener, Heinz: *See—*
Benktander, Sven; Kiener, Heinz; and Kober, Jurgen, 5,145,379, Cl 439-34.000

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Kikuchi, Noboru: *See—*
Nakamura, Tohru; Aikoh, Hideki, Shinoda, Masayuki; and Kikuchi, Noboru, 5,146,445, Cl. 369-44.410.

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Sato, Katsuyuki; Nishimukai, Tadahiko; Uchiyama, Kunio; Aoki, Hirokazu; Hatano, Susumu; Oishi, Kanji; Fukuta, Hiroshi; Kikuchi, Takashi; and Saigou, Yasuhiko, 5,146,573, Cl. 395-425.000

Kikuchi, Yoshio: *See—*
Kase, Masataka; Kimura, Nami; and Kikuchi, Yoshio, 5,145,794, Cl 437-24.000

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Kim, In O.; Song, Choong E.; and Lee, Jae K., to Korea Institute of Science and Technology. Process for preparing D-2-(6-methoxy-2-naphthyl)-propionic acid and intermediate thereof. 5,145,993, Cl. 562-466.000

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Kimball, Christopher V.; and Ayter, Sevig, to Schlumberger Technology Corporation. Method for making cement impedance measurements with characterized transducer 5,146,432, Cl. 367-13.000

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Cartwright, William F.; DiGrigoli Carmen P.; and Kasbo, Loyd G., 5,144,967, Cl. 131-365.000
Potts, David C.; Young, George A Everhart, Dennis S.; MacDonald, J. Gavin; and Nohr, Ronald S., 5,145,727, Cl. 428-198.000

Kimura, Hiroshi; and Pastor, Ricardo C., to Hughes Aircraft Company. Gas doping of solids by crystal growth. 5,146,468, Cl. 372-59.000

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Saito, Shun; Kimura, Kazumi; and Utsunomiya, Akira, 5,145,510, Cl. 65-18.100

Kimura, Masahiro; Matsuo, Kenji; Tsuchiya, Ikuo; and Fukuda, Masayo, to Kabushiki Kaisha Toshiba. Low-noise output buffer circuit 5,146,120, Cl. 307-570.000

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Okada, Keisuke; and Kimura, Masatoshi, 5,146,479, Cl. 377-41.000.

Kimura, Nami: *See—*
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Kindl, Thomas E.: *See—*
Albrechta, Stanley M.; Clementi, Robert J.; and Kindl, Thomas E., 5,145,553, Cl. 156-640.000

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Colvin, Richard O., 5,144,937, Cl. 124-44.500.

King, Dannie H.: *See—*
Kirk, Leone E., III; King, Dannie H.; Clemons, Richard H.; Lehrman, Sandra N.; and Barry, David W., 5,145,840, Cl. 514-49.000.

Kingham, David R.; and Waugh, Alan R., to VG Instruments Group Limited. Method and apparatus for surface analysis. 5,146,088, Cl. 250-288.000

Kino, Tooru: *See—*
Okada, Akihiro; Kino, Tooru; and Tanaka, Katsumi, 5,146,488, Cl. 379-88.000

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Uematsu, Kazuma; Kinoshita, Shigehiro; and Tsuji, Kazuo, 5,144,951, Cl. 128-633.000.

Kinugasa, Tomohumi: *See—*
Komurasaki, Satosi; Katoh, Shoiti; and Kinugasa, Tomohumi, 5,144,837, Cl. 73-517.00R.

Kinuhata, Satoru; and Yamada, Seiki, to Sumitomo Rubber Industries, Ltd. Tire grooving apparatus and method. 5,144,996, Cl. 157-13.000.

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Yajima, Shoji; and Harada, Kazuo, 5,144,867, Cl. 76-112.000.

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Kirk, Leone E., III; King, Dannie H.; Clemons, Richard H.; Lehrman, Sandra N.; and Barry, David W., to Burroughs Wellcome Co. Treatment of idiopathic thrombocytopaenic purpura. 5,145,840, Cl 514-49.000.

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Karg, Rudolph; and Kirschbaum, Robert, 5,145,628, Cl. 264-248.000

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Kiser, Timothy J., to VLSI Technology, Inc. Integrated circuit test system. 5,146,161, Cl. 324-158.00R.

Kishi, Minoru; Kaneko, Yukihiro; and Itoh, Hiro, to Lion Corporation. Cellulose-derived sponge and process for manufacturing same. 5,145,736, Cl. 428-332.000

Kishine, Nobuyuki: *See—*
Ikeda, Hiroshi; Kishine, Nobuyuki; Otani, Tsuyoshi; and Ninomi, Mashahiko, 5,146,381, Cl. 366-133.000

Kishore, Ganesh M.; and Shah, Dilip M., to Monsanto Company. Glyphosate-tolerant 5-endolpyruvyl-3-phosphoshikimate synthase 5,145,783, Cl. 435-320.100.

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Kitazawa, Makio; Akahane, Masuo; Nakano, Yasushi; Tsubaki, Atsushi; Sato, Kazuaki; Ban, Masaaki; and Kobayashi, Michihiro, 5,145,869, Cl. 514-510.000

Kissel, Charles L., to Union Oil Company of California. Sol/gels containing nonionic surfactants and preparation methods. 5,145,602, Cl. 252-309.000

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Kisu, Hiroki, to Canon Kabushiki Kaisha. Image forming apparatus having charging means. 5,146,281, Cl. 355-219.000.

Kitagawa, Katsuhiko; and Yamada, Miki, to Central Glass Company, Limited. Pallet for holding glass plates in standing posture. 5,145,073, Cl. 211-41.000

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Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000

Kitahara, Sayoko: *See—*
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Kitahara, Takahiro: *See—*
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Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Pallet changer 5,145,048, Cl. 198-346.100.

Kitamura, Kozo: *See—*
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Kitamura, Koichiro, 5,145,048, Cl. 198-346.100

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Hara, Yasuhiko; Koizumi, Mitsuyoshi; and Kitamura, Shigeki, 5,146,509, Cl. 382-8.000

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Omure, Yukio; Kitano, Keisuke; and Hanatani, Naoyoshi, 5,145,606, Cl. 252-350.000.

Kitayoshi, Hitoshi, to Advantest Corporation. AC signal generating apparatus for voltage and current standard. 5,146,224, Cl. 341-147.000

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Morikawa, Kiyoshi; Kurokawa, Atsushi; Onishi, Sei; Kajihara, Kiyohito; Takemasa, Kaoru; and Kitazawa, Osamu, 5,145,039, Cl. 188-298.000.

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Klam, Ruediger: *See—*
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Klauber, Robert D.; and Vigmostad, Erik B., to SensorTech, L.P. Minimal structure magnetostrictive stress and torque sensor. 5,144,846, Cl. 73-862.336

Klein, Gerald: *See—*
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Kleinert, Raymond J., III: *See—*
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Kloosterboer, Johan G.: *See—*
Eguchi, Shuji; Kloosterboer, Johan G.; and Broer, Dirk J., 5,145,579, Cl. 210-198.200

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Weger, Kenneth F., Jr., 5,145,087, Cl. 220-334.000.

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Becker, Erich; and Riedlinger, Heinz, 5,145,336, Cl. 417-413.000

Knifton, John F., to Texaco Chemical Company. Method of separating isobutylene from a C-4 hydrocarbon fraction using montmorillonite catalysts. 5,146,041, Cl. 585-864.000.

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Sanderson, John R.; Knifton, John F.; and Marquis, Edward T., 5,146,030, Cl. 585-533.000

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Apperson, Jerry R.; Knodle, Daniel W.; Labuda, Lawrence L.; Russell, James T.; and Bang, Gary M., 5,146,092, Cl. 250-343.000.

Knogo Corporation: *See—*
Zhou, Peter Y.; and Solaski, Thomas P., 5,146,204, Cl. 340-551.000

Knoll, Rudolf, to Siemens Aktiengesellschaft. Attachment unit for attaching and connecting electrical lines. 5,145,406, Cl. 439-532.000

Knoll, Thomas, to Adobe Systems Incorporated. Method for displaying and printing multitone images derived from grayscale images 5,146,346, Cl. 358-298.000.

Knox, Benjamin H.: *See—*
Hendrix, John P., Jr.; Knox, Benjamin H.; London, Joe F., Jr.; and Noe, James B., 5,145,623, Cl. 264-103.000.

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Kobayashi, Kazuo; and Yamamoto, Yokichi, to Dow Corning Toray Silicone Company. Method for neutralizing acids in organopolysiloxanes. 5,145,934, Cl. 528-23.000

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Shimada, Takafumi; Ogasawara, Hiroaki; Mori, Hidetaro; Omoto, Setsuo; Kobayashi, Kazuto; and Yamazaki, Takao, 5,145,255, Cl 366-329.000

Kobayashi, Kenzo: *See—*
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Kobayashi, Kinzo; and Gamoh, Yoshikazu, to Tokico Ltd. Disk brake 5,145,037, Cl. 188-73.100.

Kobayashi, Michihiro: *See—*
Kitazawa, Makio; Akahane, Masuo; Nakano, Yasushi; Tsubaki, Atsushi; Sato, Kazuaki; Ban, Masaaki; and Kobayashi, Michihiro, 5,145,869, Cl. 514-510.000

Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for purification of gas. 5,145,657, Cl. 423-219.000

Kobayashi, Noboru; and Imaeda, Hirofumi, to Yamaha Hatsudoki Kabushiki Kaisha. Multi jet propelled watercraft. 5,145,426, Cl 440-38.000

Kobayashi, Takeo; Nishida, Takao; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronically controlled camera including automatic shutter speed changing apparatus. 5,146,259, Cl. 354-456.000

Kobayashi, Tomomi: *See—*
Kobayashi, Akira; Imazu, Katsuhiro; Aizawa, Masanori; and Kobayashi, Tomomi, 5,144,824, Cl. 72-46.000.

Kobayashi, Toshifumi: *See—*
Hamamoto, Takeshi; Kobayashi, Toshifumi; Yamagata, Tadato and Mihara, Masaaki, 5,146,300, Cl. 357-23.600

Kober, Jurgen: *See—*
Benktander, Sven; Kiener, Heinz; and Kober, Jurgen, 5,145,379, Cl 439-34.000

Koblish, Theodore R.; and Bell, Leonard D., to Fuel Systems Textron Inc. Small airblast fuel nozzle with high efficiency inner air swirler 5,144,804, Cl. 60-740.000

Kobori, Seiji: *See—*
Sugie, Tosio; Yamada, Yoji; Kobori, Seiji; Hotta, Takaomi, and Serizawa, Yasuhiro, 5,144,731, Cl. 28-117.000

Kobori, Yasunori; Hamma, Kentaro; and Mochimaru, Yoshiaki, to Hitachi, Ltd; and Hitchi Video Engineering Incorporated. Signal processing circuit including a white balance adjusting circuit in a color video printer apparatus. 5,146,323, Cl. 358-76.000

Koch, Juergen; Schuermann, Gregor; and Heinz, Gerhard. Stabilized polyaryl ether ketone molding compositions containing a phosphorus compound. 5,145,894, Cl. 524-129.000

Koda, Nobuji; Kanaishi, Yasuhiro; and Samizo, Yokichi, to Yajima Kogyo, Inc. Feeding device for a welding bolt. 5,146,062, Cl 219-93.000

Kodama, Shinichi: *See—*
Ookubo, Mitsumasa; Yaji, Tsuyoshi; Toizumi, Yasushi; Sasaki, Toyoji; Kato, Shigeru; Miyasaka, Tetsuo; Odanaka, Yasushi; Yamashaki, Masafumi; and Kodama, Shinichi, 5,146,071, Cl. 250-201.200.

Koepsen, Bo: *See—*
Andersson, Peter; Koepsen, Bo; Berglin, Jonas; and Vock, Josef, 5,144,948, Cl. 128-419.0PG.

Koetsier, Wicher T.: *See—*
Verduijn, Johannes P.; Janssen, Mechilium J. G.; De Gruijter, Cornelis B.; Koetsier, Wicher T.; and Van Oorschot, Cornelis W. M., 5,146,040, Cl. 585-825.000

Kogawa, Kuniyuki: *See—*
Hirota, Takato; Kogawa, Kuniyuki; and Ohtake, Shigeaki, 5,145,057, Cl. 200-243.000

Kohiki, Shigemi; Enokihara, Akira; Higashino, Hidetaka; Hatta, Shinichiro; Setsune, Kentaro; Wasa, Kiyotaka; Kamada, Takeshi; and Hayashi, Shigenori, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing thin film oxide superconductors and superconductor devices by X-ray irradiation. 5,145,830, Cl 505-1.000

Kohler, Burkhard; and Reinking, Klaus, to Bayer Aktuengesellschaft Blends of modified polyarylene sulfides and polycarbonates 5,145,895, Cl. 524-160.000

Kohshi, Ichiro: *See—*
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio; Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000

Koiwa, Mitsuru: *See—*
Taruya, Masaaki; and Koiwa, Mitsuru, 5,144,935, Cl. 123-633.000

Koizumi, Kazuo, to Ork Corporation. Quenching and deodorizing compositions. 5,145,673, Cl. 424-76.100

Koizumi, Minoru: *See—*
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasahima, Hirokazu, 5,146,559, Cl. 395-200.000

Koizumi, Mitsuyoshi: *See—*
Hara, Yasuhiko; Koizumi, Mitsuyoshi; and Kitamura, Shigeki, 5,146,509, Cl. 382-8.000

Kojima, Akikazu; Miyoshi, Shinji; and Inagaki, Mitsuo, to Nippon Soken, Inc. Regenerative particulate trap system for emission control 5,144,798, Cl. 60-303.000

Kojima, Akira: *See—*
Ichikawa, Yasunori; Ohnishi, Hiroshi; Urabe, Shigeharu; Kojima Akira; and Katoh, Akira, 5,145,768, Cl. 430-569.000

Kojima, Keiji; and Torii, Shunichi, to Hitachi, Ltd. System for fetching a plurality vector-data groups using a plurality of addressing device. 5,146,599, Cl. 395-800.000

Kojima, Takeshi; and Nakajima, Taketoshi, to Haruhiko Murakami Method of coating an article with a polytetrafluoroethylene coating material. 5,145,721, Cl. 427-379.000

Kokosing Construction Company Inc.: *See—*
Wise, Eugene E., 5,145,290, Cl. 405-179.000.

Kokubo, Tadashi; Yamamuro, Takao; and Yoshihara, Satoshi, to Kyoto University. Bioactive cement. 5,145,520, Cl. 106-35.000

Komai, Hiromichi: *See*—
Hirata, Tositaka; Ameyama, Minoru; Komai, Hiromichi; Naruse, Osamu; Matsumoto, Syuzo; and Nakano, Tomoaki, 5,146,236, Cl. 346-1.100.

Komaniecki, James M.: *See*—
Tupek, Garry F.; Manser, John W.; and Komaniecki, James M., 5,144,892, Cl. 101-363.000.

Komatsubara, Shoji: *See*—
Kagosaki, Hiroshi; and Komatsubara, Shoji, 5,146,268, Cl 355-70.000

Komurasaki, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus with a knock sensor for an internal combustion engine. 5,144,928, Cl. 123-425.000

Komurasaki, Satosi; Katoh, Shoiti; and Kinugasa, Tomohumi, to Mitsubishi Denki K.K. Acceleration detector. 5,144,837, Cl. 73-517.00R.

Komuro, Hiroshi; and Ishigaki, Tsuneo, to SMC Corporation. High-vacuum valves. 5,145,152, Cl. 251-331.000.

Kondo, Hiroshi: *See*—
Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000.

Kondo, Kazuo: *See*—
Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Device for conveying printed circuit board. 5,145,055, Cl. 198-803.900.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Soldering apparatus. 5,145,100, Cl. 228-42.000.

Kondo, Takayoshi: *See*—
Itaba, Yasushi; Yoshifuji, Yutaka; Kondo, Takayoshi; Saitoh, Keichiro; Yoshino, Tadao; Izawa, Tsunoru; and Sakamoto, Ichiro, 5,145,728, Cl. 428-213.000

Kondo, Toshio; Ogawa, Toshio; Ishida, Kazunari; and Ueyama, Akihiro, to Hitachi Medical Corporation. Delay circuit of ultrasonic diagnostic apparatus using delay line comprising variable capacitance diode and inductor. 5,146,192, Cl. 333-164.000.

Kondo, Yasuo: *See*—
Watanabe, Junichi; Kondo, Yasuo; Watanaka, Masataka; Ikai, Takashi; Suzuki, Koichi; Nawama, Tsutomu; and Watanabe, Shigeomi, 5,145,502, Cl. 71-90.000.

Kong, Hakchul, to Southwest Research Institute. Fuel ignition system for compression ignition engines. 5,144,922, Cl. 123-145.00A

Konica Corporation: *See*—
Ishii, Shizuo; and Yokoyama, Masao, 5,146,251, Cl. 354-145.100
Isoguchi, Seiichi; Tsuchida, Masaaki; Ohta, Yoshitaka; and Tamura, Tomoaki, 5,146,353, Cl. 358-909.000
Matsuda, Atsuko; and Kenpo, Tsutomu, 5,145,745, Cl. 428-425.900.
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Konishi, Masaya: *See*—
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Kono, Masanao: *See*—
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Konrad, Eugen: *See*—
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Kopolow, Stephen L.: *See*—
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Kopsel, Manfred: *See*—
Emberger, Roland; Gunter, Matthias; Hopp, Rudolf; Kopsel, Manfred; Kuhn, Walter; and Werkhoff, Peter, 5,145,703, Cl 426-535.000

Korall, Menachem: *See*—
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Korea Institute of Science and Technology: *See*—
Kim, In O.; Song, Choong E.; and Lee, Jae K., 5,145,993, Cl 562-466.000

Korhonen, Osmo, to Valmet-Ahlstrom Inc. Actuator of modular construction for rolls of a machine calender. 5,144,890, Cl. 100-163.00A

Korn, Thomas, to United Technologies Corporation. Floating voltage reference having dual output voltage. 5,146,151, Cl. 323-267.000

Kornrumpf, William P.; Marcinkiewicz, Walter M.; Davern, William E.; Zieger, Herbert C.; and Miles, Jonathan R., to General Electric Company. Compact, thermally efficient focal plane array and testing and repair thereof. 5,146,303, Cl. 357-30.000

Kortenbach Verwaltungs-und Beteiligungsgesellschaft mbH & Co.: *See*—
Seidel, Joachim; and Stiller, Klaus 5,144,970, Cl. 135-22.000

Kortenbach Verwaltungs-und Beteiligungsgesellschaft MBH & Co.: *See*—
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Kosley, Raymond W., Jr.; and Spahr, Bettina, to Hoechst Roussel Pharmaceuticals, Inc. 6- and 7-deoxyforskolin and derivatives thereof. 5,145,855, Cl. 514-269.000

Kosmala, Alexandre; Malone, David; and Masak, Peter, to Anadrill, Inc. Mud pump noise cancellation system and method. 5,146,433, Cl 367-83.000

Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijai, Detlef, to Man Roland Druckmaschinen AG. Method of producing a printing image carrier. 5,145,758, Cl. 430-49.000

Kotikovsky, Alexander P., to TRW Vehicle Safety Systems Inc. Seat belt retractor with vehicle sensitive locking mechanism. 5,145,123, Cl. 242-107.40A

Kotzin, Michael D.: *See*—
Tayloe, Daniel R.; and Kotzin, Michael D., 5,146,609, Cl. 455-33.200

Koudelka, James R.: *See*—
Bell, Cynthia S.; Anagnostopoulos, Constantine N.; Williams, Paul M.; Gaboury, Michael J.; and Koudelka, James R., 5,146,258, Cl. 354-432.000

Koura, Soushichi, to Ohi Seisakusho Co., Ltd. Automatic door operating system. 5,144,769, Cl. 49-360.000.

Kovach nee Lakatos, Eva: *See*—
Timar, Tibor; Eszenyi, Tibor; Sebok, Peter; Galamb, Vilmos; Fazekas nee Kozak, Julia; Istvan nee Katona, Terezia; Kovach nee Lakatos, Eva; and Nagy nee Csaki, Erika, 5,145,985, Cl. 548-525.000.

Kowaleski, Ruth M.: *See*—
Buffum, John E.; Kowaleski, Ruth M.; and Gerdes, William H., 5,145,824, Cl. 502-216.000.

Kowdley, Balasubramanian S.: *See*—
Richardson, David L.; Berg, David C.; Kowdley, Balasubramanian S.; Matsumoto, Jack T.; Smith, Thurman D.; and Clark, Jack P., 5,145,637, Cl. 376-249.000

Koyama, Takeshi; and Abe, Takefumi, to Mitsubishi Gas Chemical Company, Inc. Naphthalene compounds. 5,146,025, Cl. 585-412.000.

Koyo Seiko Co., Ltd.: *See*—
Nakamura, Yasuhiro; and Chikamori, Akira, 5,145,021, Cl. 180-79.100.
Narumiya, Hisayoshi, 5,145,261, Cl. 384-45.000.

Kozachevskiy, Gennadiy: *See*—
Bartelt, Dietrich; Guskov, Valery; Kozachevskiy, Gennadiy; Rak, Janusz; and Schneck, Walter, 5,145,188, Cl. 474-153.000.

Kozawa, Sigeyuki: *See*—
Saito, Joichi; Kozawa, Sigeyuki; Kunii, Nobuaki; Yamamoto, Hirotsugu; and Takeyasu, Hiromitsu, 5,145,883, Cl. 521-172.000.

Kozono, Seiji: *See*—
Maejima, Toshiro; Sakurai, Kazuaki; Kozono, Seiji; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,145,410, Cl. 439-587.000.

Kraatz, Udo: *See*—
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Kraemer, Daniel, to Piepenbrock Pyrotechnik GmbH. Sea marker. 5,144,906, Cl. 116-209.000.

Kraft General Foods, Inc.: *See*—
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Kraftanlagen Aktiengesellschaft: *See*—
Veser, Kurt; and Muller-Odenwald, Hermann-Eugen, 5,145,652, Cl. 422-171.000

Kramer, Jochen; and Dohse, Hans-Peter, to Andreas Stihl. Two-handle arrangement for a handheld portable tool. 5,145,044, Cl. 192-131.00R.

Kramer, Wolfgang: *See*—
Himmler, Thomas; Kraatz, Udo; Kramer, Wolfgang; and Stroech, Klaus, 5,146,001, Cl. 568-323.000

Krass, Jennifer M. Teaching aid for foreign language. 5,145,376, Cl. 434-157.000

Kraus, Kenneth; and Page, Edward J. Window operator. 5,144,770, Cl. 49-360.000

Krause, Arthur A. Captive tear tab with protective means for container opening. 5,145,086, Cl. 220-270.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Brams, Peter, 5,145,694, Cl. 425-174.80R.

Krauss, Mark J., to American Cord & Webbing, Inc. Side-release buckle with accidental release guard. 5,144,725, Cl. 24-625.000.

Krauss, Werner: *See*—
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Krawietz, Arnold: *See*—
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Kretschmer, Karl-Heinz: *See*—
Gesche, Roland; and Kretschmer, Karl-Heinz, 5,146,137, Cl. 315-111.210

Kretz, Laurent. *See*—
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Krieg, Wolfgang: *See*—
Kardorff, Uwe; Neubauer, Hans-Juergen; Leyendecker, Joachim; Kuenast, Christoph; Hofmeister, Peter; Krieg, Wolfgang; and Buerstinghaus, Rainer, 5,145,873, Cl. 514-624.000.

Krieger, David A.: *See*—
Bachman, Charles W.; Cimral, John J.; Gane, Christopher P.; Krieger, David A.; Micco, John T.; and Abramovich, Igor, 5,146,591, Cl. 395-600.000

Krieger, Eberhard; Dietrich, Walter; and Weber, Siegfried. Conveyor apparatus in packaging machines. 5,145,053, Cl. 198-626.500.

Krishnaswamy, S. Visvanathan: *See*—
Lampe, Donald R.; Sinharoy, Samar; Wu, Shu Y.; Buhay, Harry; Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S. Visvanathan, 5,146,299, Cl. 357-23.500.

Kroener, Michael: *See*—
Auhorn, Werner; Linhart, Friedrich; Lorencak, Primoz; Kroener, Michael; Sendhoff, Norbert; Denzinger, Walter; and Hartmann, Heinrich, 5,145,559, Cl. 162-168.200

Krofta, Milos, to Lenox Institute for Research, Inc. Method for stabilizing sludge. 5,145,582, Cl. 210-609.000.

Kroll, Arthur S.; DeCecca, Michael L.; and Dunn, Arthur E., to Eastman Kodak Company. Apparatus for applying toner to an electrostatic image. 5,146,278, Cl. 355-253.000.

Kromm, Alvin D., Jr.: *See*—
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Krueger, Andrew J.; and Yang, Joseph J., to Mobil Oil Corporation Apparatus for conducting mammalian dermatological studies 5,144,958, Cl. 128-743.000

Krumenacker, Rudolf: *See*—
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Krumkalns, Eriks V.: *See*—
Arnold, Wendell R.; Coghlan, Michael J.; Jourdan, Glen P.; Krumkalns, Eriks V.; and Suhr, Robert G., 5,145,843, Cl. 514-63.000.

Kuang-Shiung, Fan. PE/PP bag weaving machine without a power lubrication and cooling system. 5,144,732, Cl. 28-182.000.

Kub, George F., Jr.: *See*—
Moore, Dean T.; Kub, George F., Jr.; and Golonka, Kenneth A., Sr., 5,145,106, Cl. 228-241.000.

Kubo, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Maximum-likelihood sequence estimation apparatus. 5,146,475, Cl. 375-94.000

Kubo, Motonobu; Inukai, Hiroshi; and Kitahara, Takahiro, to Daikin Industries, Ltd. Carriers for developing electrostatic images 5,145,761, Cl. 430-108.000

Kuczynski, Robert A. Snap-in bracket for circuit breaker. 5,146,056, Cl 200-296.000

Kudo, Toshiharu: *See*—
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Kuehnle, Hans-Frieder: *See*—
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Kuei Lai, Lee C. Electrical connector embedded with plastic latches 5,145,395, Cl. 439-326.000

Kuekenhoehner, Thomas: *See*—
Wenderoth, Bernd; Sauter, Hubert; Wingert, Horst; Hepp, Michael; Brand, Siegbert; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,145,980, Cl 560-35.000

Kuenast, Christoph: *See*—
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Kugell, Stanley: *See*—
Silver, David; and Kugell, Stanley, 5,146,491, Cl. 379-114.000

Kuhn, David G.: *See*—
Kameswaran, Venkataraman; and Kuhn, David G., 5,145,986, Cl 548-531.000

Kuhn, Walter: *See*—
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Kukla, Robert W., to International Business Machines Corporation Patient care communication system. 5,146,562, Cl. 395-200.000.

Kulshreshtha, Dinesh K.: *See*—
Aswal, Bacchan S.; Chander, Ramesh; Chatterji, Sunil K.; Dhawan, Bhola N.; Dwivedi, Yogesh; Garg, Narendra K.; Jain, Poonam; Kapoor, Narinder K.; Kulshreshtha, Dinesh K.; Mehrotra, Bishan N.; Patnaik, Gyanendra K.; Rastogi, Ravi; Sarin, Jagat P. S.; Saxena, Krishna C.; Sharma, Shekhar C.; Sharma, Shri K.; Shukla, Binduja; and Visen, Pradeep K. S., 5,145,955, Cl 536-124.000

Kumada, Norimasa, to Mitsubishi Denki Kabushiki Kaisha. Charge skimming solid-state imaging device including sampling circuits. 5,146,302, Cl. 357-24.000.

Kumagai, Ryohei, to Ezel, Inc. Method and apparatus for identifying a pair of groups in an image having a minimum separation distance. 5,146,549, Cl. 395-138.000

Kumamoto, Toshio: *See*—
Kimura, Masatoshi; and Kumamoto, Toshio, 5,146,201, Cl. 338-32.00H.

Kumar, Anand: *See*—
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Kunii, Nobuaki: *See*—
Saito, Joichi; Kozawa, Sigeyuki; Kunii, Nobuaki; Yamamoto, Hirotsugu; and Takeyasu, Hiromitsu, 5,145,883, Cl. 521-172.000.

Kunzer, Hermann: *See*—
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Kuo, Di-Son: *See*—
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Kuo, J. F. Hydraulic clutch. 5,145,043, Cl. 192-61.000

Kuo, Shun-Meen, to Motorola, Inc. Method and apparatus for accurately measuring thickness of a semiconductor die bond material. 5,146,416, Cl. 364-563.000.

Kuo, Yi-Yu. Retractable toy sword with video and sound effect 5,145,446, Cl. 446-405.000

Kureha Chemical Industry Co., Ltd.: *See*—
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Kurematsu, Katsumi: *See*—
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Kuroda, Masaaki, to Canon Kabushiki Kaisha. Process for preparing magnet made of resin. 5,145,614, Cl. 264-24.000

Kuroiwa, Kiyoto: *See*—
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Kuroiwa, Kouichi: *See*—
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Kurokawa, Atsushi: *See*—
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Kurokawa, Koichi; and Hashimoto, Kenji, to Nippon Oil and Fats Co Ltd. Wireless detonator. 5,146,044, Cl. 102-202.500

Kurosawa, Yuji: *See*—
Kiguchi, Masao; and Kurosawa, Yuji, 5,146,493, Cl. 379-357.000

Kurtze, Wolf-Rudiger: *See*—
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Kurzinski, Edward F., to Combustion Research, Inc. Burner and method for metallurgical heating and melting. 5,145,361, Cl 432-19.000

Kusano, Yutaka: *See*—
Makino, Kenji; Matuda, Tohoru; Inoue, Shinichi; Itoh, Fujihiro and Kusano, Yutaka, 5,146,378, Cl. 360-121.000

Kusyk, Richard G.: *See*—
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Kuwahara, Tohru, to Isuzu Motors Limited. Eddy current type retarder. 5,145,038, Cl. 188-158.000

Kwak, Yoon T.; Kopolow, Stephen L.; Helioff, Michael W.; and Tazi, Mohammed, to ISP Investments Inc. Sunscreen composition 5,145,669, Cl. 525-313.000

Kwon, Young I.: *See*—
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Kyoto, Michihisa; Ishiguro, Yoichi; Urano, Akira; and Kakuzen, Hideo, to Sumitomo Electric Industries, Ltd. Method for producing glass preform for optical fiber. 5,145,507, Cl. 65-2.000

Kyoto University: *See*—
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Kyutoku, Hirofumi; Yamamoto, Kouichi; and Otani, Yoshihisa, to Osaka Gas Company Limited; and Japan Felt Industrial Company Limited. High bulk density carbon fiber felt and thermal insulator 5,145,732, Cl. 428-36.100

La Barre, Paul: *See*—
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Labelle, Gerald J.: *See*—
Paul, Kermit D.; Bartholomew, Leslie C.; Szazdi, John S., Jr.; and Labelle, Gerald J., 5,145,253, Cl. 366-101.000

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Apperson, Jerry R.; Knodle, Daniel W.; Labuda, Lawrence L.; Russell, James T.; and Bang, Gary M., 5,146,092, Cl. 250-343.000

Lacas, Francois: *See*—
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Ackerman, Dennis F.; Bender, David R.; Chu, Salina S.; Deibert, George R.; Hallock, Gary G.; Lackey, David E.; Sheldon, Robert G.; and Stranko, Thomas A., 5,146,460, Cl. 371-23.000

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LaFontaine, Roy A., to Inventures Niagara Inc. Paint can holder securable against accidental detachment. 5,145,226, Cl. 294-27.100

Lagushenko, Radomir, to GTE Products Corporation. Glow discharge lamp having anode probes. 5,146,135, Cl. 313-619.000

Lai, Hoi K.; and Davis, Robert A., to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical Ltd./Ltee. Fungicidal oxathin azoles 5,145,982, Cl. 548-266.200

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Chevalier, Gilbert; Muller, Christiane; Rousseau, Frederic; Savinel, Laurent; and Thonnelier, Jean-Yves, 5,144,809, Cl. 62-36.000

Lake, Robin B., to Standard Oil Company, The. System to mitigate the effect of an environmental release of a contaminant gas. 5,145,651, Cl 422-168.000

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Lampe, Donald R., Sinharoy, Samar; Wu, Shu Y.; Buhay, Harry; Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S. Visvanathan, to Westinghouse Electric Corp. Ferroelectric thin film material, method of deposition, and devices using same. 5,146,299, Cl. 357-23.500

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Lane, Richard H.; and Ebel, Timothy M., to Bipolar Integrated Technology, Inc. Gold interconnect with sidewall-spacers. 5,145,571, Cl 205-123.000

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Ellory, John C.; Englert, Heinrich C.; Lang, Hans-Jochen; Mania, Dieter; and Merkel, Wulf, 5,145,467, Cl. 514-445.000.

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Helcomb, Bruce D.; and Lantz, Franklin D., 5,145,380, Cl. 439-49.000

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Larson, Kent R., to Dow Corning Corporation. Bonding polysulphide sealant to silicone. 5,145,918, Cl. 525-474.000

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Newman, John W., 5,146,289, Cl. 356-35.500

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Laswell, William L.: *See*—
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Lau, Jack; Akar, Armagan A.; and Lau, Hung-Wah A., 5,146,159, Cl. 324-158.00R

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Laurent, Ray V., to Siemens Automotive L.P. Solenoid valve operating mechanism comprising a pin having a plastic sleeve molded onto a metal core. 5,145,148, Cl. 251-129.140

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Fox, Nathaniel S.; and Lawton, Evert C., 5,145,285, Cl 405-258.000

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Tessier, Alain; Champagne, Jean P.; Milot, Maurice; Belanger, Albert; and Tardif, Yves, 5,146,36, Cl. 358-183.000

Learned, Edward B., to Potter & Brumfield, Inc. Electronic monitoring and redundant control circuit for a power switch. 5,146,386, Cl 361-91.000

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Pometto, Anthony L., III; and Lee, Byungtae, 5,145,779, Cl. 435-262.000.

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Baron, Kenneth S.; Brinkerhoff, Susan M.; Lee, Frank W.; and McKinney, Stella M., 5,145,541, Cl. 156-98.000.

Lee, Fu-Ming: *See*—
Brown, Ronald E.; and Lee, Fu-Ming, 5,145,562, Cl. 203-51.000.

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Kim, In O.; Song, Choong E.; and Lee, Jae K., 5,145,993, Cl. 562-466.000.

Lee, James K., to Eastman Kodak Company. Electric motor. 5,146,144, Cl. 318-138.000

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Li, Hsueh M.; and Lee, John Y., 5,145,943, Cl. 528-353.000

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Dickerson, Stephen L.; and Lee, Kok-Meng, 5,146,340, Cl 358-213.270.

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Kim, Tae-Jin; and Lee, Kyu-Chan, 5,146,110, Cl. 307-296.200.

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Boeke, Gregg M.; and Lee, Mark, 5,144,752, Cl. 33-247.000.

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Larcheron, Gerard; and Legendre, Yves, 5,145,279, Cl. 405-50.000

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Seeburger, Helmut; Lehfeld, Peter; and Kurtze, Wolf-Rudiger, 5,144,938, Cl. 125-11.120.

Lehmann, William L.; and Wignot, Leroy S., to Thomson Consumer Electronics, Inc. Fixed RF AGC of a television tuner for FM reception in a television receiver. 5,146,338, Cl. 358-191.100

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Kirk, Leone E., III; King, Dannie H.; Clemons, Richard H.; Lehrman, Sandra N.; and Barry, David W., 5,145,840, Cl. 514-49.000

Leites, Jose M. M.; Mendes, Jose A. C.; and Banfield, Robert R., to Metal Leve S/A Industria E Comercio. Method for the manufacture of a two piece piston and piston. 5,144,923, Cl. 123-193.600.

Lemasters, John J.; and Thurman, Ronald G., to University of North Carolina at Chapel Hill, The. Rinse solution for organs and tissues. 5,145,771, Cl. 435-1.000.

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Peter, Walter; Hruschka, Anton; and Hoglinger, Oskar, 5,145,557, Cl. 162-40.000.

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Holmes, Thomas F.; and Leonard, Karen M., 5,146,217, Cl 340-825.440.

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Lesins, Viesturs, to Occidental Chemical Corporation. Process for the preparation of oxydiphthalic acid and purified oxydiphthalic anhydride from crude oxydiphthalic anhydride. 5,145,971, Cl. 549-250.000

Lever Brothers Company: *See*—
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Giblin, Edward J., 5,145,111, Cl. 229-219.000.

Levif, Gabriel; and Coupe, Frederic, to Atochem. Rubbery composition and polynorbornene-based thermoplastic elastomer with improved heat stability. 5,145,897, Cl. 524-296.000.

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Mika, Anton L.; and Levin, Robert F., 5,144,989, Cl. 140-93.200

Levy, Jeffrey B.: *See*—
Fromm, Paul M.; Kromm, Alvin D., Jr.; and Levy, Jeffrey B., 5,145,525, Cl. 118-260.000.

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Cowan, Kevin P.; Lewandowski, Stanley R.; Reilly, David M.; and Uber, Arthur E., III, 5,145,163, Cl. 271-161.000

Lewis, Lindon L., to Ball Corporation. Compact optically pumped resonance system and apparatus. 5,146,185, Cl. 331-3.000.

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Jaerger, Marc; and Lhoest, Willy, 5,144,992, Cl. 141-346.000

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Nair, Madhavan G.; and Li, Shu W., 5,145,854, Cl. 514-259.000

Li, Simon M., to Shell Oil Company. Process for preparing tetraphenoic compounds. 5,146,006, Cl. 568-720.000.

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Marcel, Etter, 5,146,156, Cl. 324-127.000

Liang, Septimus H.; Harrison, Brian H.; and Pagotto, Jack G., to Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government. Reduced pressure sublimation of amine compounds on activated carbons. 5,145,820, Cl. 502-401.000

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Licht, Steven J., to AT&T Bell Laboratories. Apparatus comprising a magneto-optic isolator utilizing a garnet layer. 5,146,361, Cl. 359-280.000

Lieb, Julian: *See*—
Horrobin, David F.; and Lieb, Julian, 5,145,686, Cl. 424-677.000

Ligasacchi, Sergio: *See*—
Ancona, Giuseppe; Benelli, Giancarlo; De Michele, Gennaro; Ligasacchi, Sergio; Mascalzi, Gianni; Scavizzi, Giancarlo; Trebbi, Giuliano; and Zennaro, Aldo, 5,145,359, Cl. 431-184.000

Liles, Donald T.: *See*—
Kalinowski, Robert E.; Liles, Donald T.; and Shephard, Nick E., 5,145,907, Cl. 524-789.000

Lim, Thiam B. Insulated lead frame for semiconductor packaged devices. 5,146,312, Cl. 357-70.000

Limpert, Johnathan Dean: *See*—
Wood, Gary J., 5,144,823, Cl. 72-31.000

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Lin, John W-P.: *See*—
Winnik, Francoise M.; Davidson, Anthony R.; Lin, John W-P.; and Croucher, Melvin D., 5,145,518, Cl. 106-21.000

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Evans, Michael B.; Lin, Rueysen; Rost, Brian F.; and Polzin, R Stephen, 5,146,564, Cl. 395-250.000

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Frenzel, Jochen; Weber, Josef; and Gutowski, Horst, deceased 5,144,806, Cl. 62-9.000
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Giberson, Melbourne F.; and Lindgren, Richard P., 5,144,862, Cl 74-573.00R.

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Vaisnys, Gintaras A.; Black, Philip C.; Piels, Barry Y.; and McDarren, Robert S., 5,145,443, Cl. 446-242.000

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Kishi, Minoru; Kaneko, Yukihiro; and Itoh, Hiro, 5,145,736, Cl 428-332.000

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Spinner, Charles R.; Chen, Fusen E.; and Liou, Fu-Tai, 5,146,309, Cl. 357-59.000

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Lipson, Earl. Pneumatically operated golf ball tee. 5,145,176, Cl 273-201.000

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Ha, Bao V., 5,144,808, Cl. 62-24.000

Lisauskas, Richard J.: *See*—
Ty, Henry; Lisauskas, Richard J.; Behler, Matthew L.; and Zaveri, Narendra R., 5,144,815, Cl. 62-196.100

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Little, Charles D., to Ellicott Machine Corporation. Spud assembly for dredges. 5,145,425, Cl. 440-36.000

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Littleton, Teresa: *See*—
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Liu, Michael S. T.: *See*—
Yue, Jerry; and Liu, Michael S. T., 5,146,304, Cl. 357-34.000

Liu, Morgan C., to Enlight Corporation. Upstanding mother board structure for a personal computer. 5,145,243, Cl. 312-265.100

Liversidge, Gary G.; Cundy, Kenneth C.; Bishop, John F.; and Czekai, David A., to Sterling Drug Inc. Surface modified drug nanoparticles 5,145,684, Cl. 424-489.000

Lobach, Ernst: *See*—
Tabarelli, Werner; and Lobach, Ernst, 5,146,284, Cl. 356-345.000

Lochner, Peter, to Fabriques de Tabac Reunies, S.A. Method of checking the presence of a pipeline connection between two end points 5,144,839, Cl. 73-609.000.

Logan, Donald G., to EMC Corporation. Remapping defects in a storage system through the use of a tree structure. 5,146,571, Cl 395-400.000

Logan, James R.: to Westinghouse Electric Corp. Modular superconducting magnetic energy storage inductor. 5,146,383, Cl. 361-19.000

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Forestier, Serge; Lang, Gerard; and Richard, Herve, 5,145,662, Cl. 424-45.000
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Auhorn, Werner; Linhart, Friedrich; Lorencak, Primoz; Kroener, Michael; Sendhoff, Norbert; Denzinger, Walter; and Hartmann, Heinrich, 5,145,559, Cl. 162-161.200

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Lorie, Raymond A.; and Young, Honesty C., to International Business Machines Corporation. Method for sorting using approximate key distribution in a distributed system. 5,146,590, Cl. 395-600.000

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Lowe, Irving J., to University of Pittsburgh. Self-shielding homogeneous spherical gradient coils. 5,146,177, Cl. 335-299.000

Lowe, John P. Salt shaker device with a resilient cover retaining device. 5,145,097, Cl. 222-543.000

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Goldstein, Jonathan; Korall, Menachem; and Brokman, Avner, 5,145,752, Cl. 429-27.000

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Hellon, Keith; and Nickerson, Gerald D., 5,145,273, Cl. 403-24.000

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Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijai, Detlef, 5,145,758, Cl. 430-49.000

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Spoeler, Johannes-Gerhard; and Grapentin, Manfred, 5,144,990, Cl. 104-130.000

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Mar, Andrew: *See—*
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Marasco, Angelo M.; Shepherd, Dorothy C.; and Johnson, Daniel C., to Graber Industries, Inc. Drapery fixture. 5,144,997, Cl. 160-349.200

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Tang, Reginald Ting-Hong; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundanbbai, 5,145,945, Cl. 528-370.000

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Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., to Texaco Chemical Company. Removal of water and methanol from propylene oxide by extractive distillation. 5,145,561, Cl. 203-51.000.

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Martin, Joseph C.: *See—*
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Martin Marietta Energy Systems, Inc.: *See—*
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Maruyama, Michio, to Seiko Epson Corporation. Memory device for a page printer. 5,146,545, Cl. 395-115.000

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Masak, Peter: *See—*
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Mascotte, Lawrence L. Shoe-covering members. 5,144,759, Cl. 36-71.00R.

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Masuda, Fusayoshi: *See—*
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Masuda, Hiroyuki: *See—*
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Masuda, Naotaka: *See—*
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Materials International, Inc.: *See—*
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Matheny, Stephen E.: *See—*
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Mathiak, Friedrich; Krawietz, Arnold; Nowack, Horste; and Trautmann, Karl-Heinz, to Innovationsgesellschaft fur fortgeschrittene Produktion-ssysteme in der Fahrzeugindustrie MbH. Cruciform planar specimen for biaxial materials testing. 5,144,844, Cl. 73-79.400

Mati, Nicholas P.: *See—*
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Matsuda, Atsuko; and Kenpo, Tsutomu, to Konica Corporation. Magnetic recording medium comprising plural magnetic layers wherein each layer has specified loss-modulus properties. 5,145,745, Cl 428-425.900

Matsuda, Hiromu: *See—*
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Matsumoto, Akio: *See—*
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Matsumoto, Ikuo: *See—*
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Matsumoto, Jack T.: *See—*
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Matsuo, Kenji: *See—*
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Mays, Randall L.: *See—*
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McClung, James A.: *See—*
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McGalliard, Russell L.: *See—*
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McGill, George P.: *See—*
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McGrath, Patrick J., Jr., to Northrop Corporation. System and method for particulate matter removal. 5,145,297, Cl. 409-132.000.

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McGraw, Thomas C.; Van Ryne, Randall E.; Soler, Jose J.; and Keller, Paul D., to Xerox Corporation. Disk stacker including trail edge transport belt for stacking short and long sheets. 5,145,167, Cl. 271-186.000.

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McKenna, Thomas G., to Monarch Marking Systems, Inc. Web handling method and apparatus. 5,144,891, Cl. 101-227.000.

McKenzie, Clancy D. Toilet seat cover including handling mitts. 5,144,698, Cl. 4-245.500.

McKie, Richard L. Power supply including two tank circuits. 5,146,395, Cl. 363-13.000.

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McKinney, Stella M.: *See—*
Baron, Kenneth S.; Brinkerhoff, Susan M.; Lee, Frank W.; and McKinney, Stella M., 5,145,541, Cl. 156-98.000

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McMillen, Richard E.: *See—*
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MCNC: *See—*
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Medtronic, Inc.: *See—*
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Olson, Walter H., 5,144,949, Cl. 128-419.0PG.

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Meier, Kurt: *See—*
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Metzger, Romain. Bowling ball holder. 5,145,229, Cl. 294-158.000

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Meyer, Lester E. Device for locking tractor trailer and sea-rail container doors. 5,145,222, Cl. 292-258.000

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Microsource, Inc.: *See—*
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Toyoda, Nobuhiko; Mishina, Yoshihiko; Murata, Ryuji; Uozu, Yoshihiro; Oda, Masaaki; and Ishimaru, Teruta, 5,146,530, Cl. 385-124.000.
Mita Industrial Co., Ltd.: *See—*
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000
Tone, Eiichi; Ohata, Yosuke; and Hori, Kazuto, 5,146,275, Cl. 355-244.000.
Mitani, Tomomi: *See—*
Mori, Hiroshi; Hayashi, Seizo; Hayakawa, Hiroshi; and Mitani, Tomomi, 5,144,714, Cl. 15-319.000.
Mitsubishi Denki K.K.: *See—*
Komurasaki, Satosi; Katoh, Shoiti; and Kinugasa, Tomohumi, 5,144,837, Cl. 73-517.00R.
Niwa, Tomomitsu, 5,144,871, Cl. 82-1.110.

Tanabe, Tsuneo, 5,144,930, Cl. 123-478.000
Mitsubishi Denki Kabushiki Kaisha: *See—*
Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, 5,146,370, Cl. 360-32.000
Furuno, Kenichi, 5,146,614, Cl. 455-89.000
Hamamoto, Takeshi; Kobayashi, Toshifumi; Yamagata, Tadato; and Mihara, Masaaki, 5,146,300, Cl. 357-23.600.
Hosoya, Yasuhiko; and Iwata, Toshio, 5,144,929, Cl. 123-425.000.
Hyakutake, Junichi, 5,146,180, Cl. 330-254.000
Ishizuka, Mitsuru; and Yamaguchi, Noriyuki, 5,146,318, Cl. 358-31.000
Ito, Masao; and Hosotani, Shiro, 5,146,112, Cl. 307-303.000
Kadowaki, Tomoko; and Murakami, Takashi, 5,146,467, Cl 372-46.000
Kashihara, Masanobu, 5,146,202, Cl. 340-438.000.
Kawai, Shinji; Mori, Shigeru; and Kikuda, Shigeru, 5,146,429, Cl 365-200.000
Kimura, Masatoshi; and Kumamoto, Toshio, 5,146,201, Cl. 338-32.00H
Komurasaki, Satoshi, 5,144,928, Cl. 123-425.000
Kubo, Hiroshi, 5,146,475, Cl. 375-94.000.
Kumada, Norimasa, 5,146,302, Cl. 357-24.000.
Miyoshi, Atsuko; and Miwa, Hiroshi, 5,146,099, Cl. 250-548.000
Murata, Shigemi; and Ikeuchi, Masayuki, 5,144,936, Cl 123-655.000
Nagao, Masashi; Yoshimura, Hideto; and Inaguchi, Takashi, 5,144,805, Cl. 62-6.000.
Nagao, Masashi; Yoshimura, Hideto; and Inaguchi, Takashi, 5,144,810, Cl. 62-471.000.
Okada, Keisuke; and Kimura, Masatoshi, 5,146,479, Cl. 377-41.000
Ono, Akihiko, 5,146,458, Cl. 371-21.200
Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, 5,145,793, Cl. 437-5.000.
Ootera, Hiroki; and Tsuda, Mutsumi, 5,146,138, Cl. 315-111.210.
Taruya, Masaaki; and Koiwa, Mitsuru, 5,144,935, Cl. 123-633.000.
Tetsuda, Hiroshi, 5,146,322, Cl. 358-60.000
Uemura, Masaru, 5,146,464, Cl. 372-38.000
Utsumi, Yoshiyuki; and Katayama, Kazuyori, 5,146,103, Cl. 307-10.100
Watabe, Kiyoto; Mitsui, Katsuyoshi; and Inuishi, Masahide, 5,146,291, Cl. 357-23.400.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Koyama, Takeshi; and Abe, Takefumi, 5,146,025, Cl. 585-412.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Shioya, Yoshiaki; Shimamoto, Toshiro; Kawamoto, Susumu; and Arai, Izumi, 5,144,800, Cl. 60-323.000.
Mitsubishi Jidosho Kogyo Kabushiki Kaisha: *See—*
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,144,916, Cl. 123-41.120.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Shimada, Takafumi; Ogasawara, Hiroaki; Mori, Hidetaro; Omoto, Setsuo; Kobayashi, Kazuto; and Yamazaki, Takao, 5,145,255, Cl. 366-329.000
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hayashi, Shunichi, 5,145,935, Cl. 528-65.000.
Iio, Takayuki; and Tanigaki, Ryuhei, 5,145,346, Cl. 418-55.500.
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000
Mitsubishi Kasei Corporation: *See—*
Saito, Shun; Kimura, Kazumi; and Utsunomiya, Akira, 5,145,510, Cl. 65-18.100.
Shimoyama, Kenji; and Gotoh, Hideki, 5,145,807, Cl. 437-129.000.
Mitsubishi Materials Corporation: *See—*
Masui, Tsutomu; Hori, Kazumasa; and Ueno, Akio, 5,146,164, Cl. 324-233.000
Tekeshita, Takuo; Hagino, Sadaaki; Ajima, Tatsuro; and Suzuki, Motokazu, 5,145,835, Cl. 505-1.000.
Mitsubishi Rayon Company Ltd.: *See—*
Anzai, Hisao; Sasaki, Isao; Nishida, Kozi; Makino, Hideaki; Ohtani, Masami; and Shimada, Katsuhiko, 5,146,535, Cl. 385-143.000
Toyoda, Nobuhiko; Mishina, Yoshihiko; Murata, Ryuji; Uozu, Yoshihiro; Oda, Masaaki; and Ishimaru, Teruta, 5,146,530, Cl. 385-124.000
Mitsui, Katsuyoshi: *See—*
Watabe, Kiyoto; Mitsui, Katsuyoshi; and Inuishi, Masahide, 5,146,291, Cl. 357-23.400.
Mitsui, Kiichiro: *See—*
Ishii, Tooru; Mitsui, Kiichiro; Sano, Kunio; and Inoue, Akira, 5,145,587, Cl. 210-759.000
Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, 5,145,657, Cl. 423-219.000
Mitsui, Kotaro: *See—*
Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, 5,145,793, Cl. 437-5.000
Mitsui Mining Company, Limited: *See—*
Ito, Takashi; Iwasaki, Osamu; Ohuchi, Akimicu; Otomo, Koichiro; and Saito, Yoshiaki, 5,145,734, Cl. 428-229.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Tsutsui, Toshiyuki; Sugimura, Kenji; and Ueda, Takashi, 5,145,818, Cl. 502-113.000
Mitsui Toatsu Chemicals, Inc.: *See—*
Suzuki, Toshiyuki; Sasagawa, Katsuyoshi; Imai, Masao; and Kanemura, Yoshinobu, 5,145,927, Cl. 526-301.000
Yamaguchi, Keizaburo; Tanabe, Yoshimitsu; Urakami, Tatsuhiro; Yamaguchi, Akihiro; Yamaya, Norimasa; and Ohta, Masahiro, 5,145,949, Cl. 528-422.000
Mitsutake, Hideaki: *See—*
Minoura, Nobuo; Yanagi, Haruyuki; Mitsutake, Hideaki; and Kurematsu, Katsumi, 5,146,365, Cl. 359-619.000
Miwa, Hiroshi: *See—*
Miyoshi, Atsuko; and Miwa, Hiroshi, 5,146,099, Cl. 250-548.000
Miwa, Yuji, to Brother Kogyo Kabushiki Kaisha. Liquid supply system of an ultrasonic machine. 5,144,771, Cl. 51-59.0SS.
Miyagawa, Hitoshi: *See—*
Araki, Toshimitsu; Kawamata, Fumihiko; Miyagawa, Hitoshi; Yoshida, Masahito; and Masuda, Naotaka, 5,145,280, Cl 405-62.000
Miyahara, Shinjirou; Matsumoto, Ikuo; Tabata, Kenji; and Fukuda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Exhaust smoke purifier apparatus. 5,145,648, Cl. 422-124.000.
Miyahira, Hitoshi: *See—*
Sato, Kensaku; Miyahira, Hitoshi; and Iwasawa, Tadayasu 5,145,409, Cl. 439-585.000
Miyajima, Masami: *See—*
Hayashi, Takamasa; Mori, Goro; Araki, Shigeyuki; Yamamoto, Masahiro; Takahashi, Masaru; Senma, Toshitaka; Miyajima, Masami; and Isobe, Takundo, 5,146,240, Cl. 346-108.000
Miyake, Akio; and Ashida, Yasuko, to Takeda Chemical Industries, Ltd. Imidazopyridazines, their production and use. 5,145,850, Cl 514-248.000
Miyake, Toshio: *See—*
Suzuki, Yukio; Suzuki, Kei; Yoneyama, Masaru; Hijiya, Hiromi and Miyake, Toshio, 5,145,781, Cl. 435-99.000
Miyamoto, Hitoshi: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000
Miyamoto, Katsuhiko: *See—*
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Miyamoto, Satoru: *See—*
Shirai, Shoji; Miyamoto, Satoru; Noguchi, Kazunari; and Miyazaki Masahiro, 5,146,133, Cl. 313-414.000
Miyanaga, Hirofumi: *See—*
Uenishi, Nobuaki; Nagayoshi, Mitsugu; Miyanaga, Hirofumi; Sato, Tomoaki; Sakiyama, Katsunori; Ueda, Yasuhiro; and Adachi, Hideyuki, 5,144,848, Cl. 73-866.500.
Miyasaka, Tetsuo: *See—*
Ookubo, Mitsumasa; Yaji, Tsuyoshi; Tozumi, Yasushi; Sasaki, Toyoji; Kato, Shigeru; Miyasaka, Tetsuo; Odanaka, Yasushi; Yamashaki, Masafumi; and Kodama, Shinichi, 5,146,071, Cl 250-201.200.
Miyashita, Yukio; Mifune, Hiroshi; Matsubara, Atsushi; and Noguchi, Kunio, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control method for internal combustion engines. 5,144,931, Cl 123-682.000
Miyashita, Yukio; Mifune, Hiroshi; and Matsubara, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control method for internal combustion engines. 5,144,932, Cl. 123-695.000
Miyashita, Yukio; Mifune, Hiroshi; and Matsubara, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control method for internal combustion engines. 5,144,934, Cl. 123-682.000
Miyazaki, Masahiro: *See—*
Shirai, Shoji; Miyamoto, Satoru; Noguchi, Kazunari; and Miyazaki, Masahiro, 5,146,133, Cl. 313-414.000
Miyazaki, Toyohide: *See—*
Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000
Miyazaki, Yoshihiro: *See—*
Yamaguchi, Shinichiro; Matsumoto, Hidekazu; Bandoh, Tadaaki; Hirayama, Hirokazu; Morioka Takayuki; Takaya, Soichi; Kawamoto, Yukio; Ide, Jushi; and Miyazaki, Yoshihiro, 5,146,569, Cl. 395-375.000
Miyazawa, Atsushi, to International Business Machines Corporation. System for generating a circular or elliptic arc on a digital display 5,146,551, Cl. 395-142.000
Miyoshi, Akira; and Taniguchi, Takashi, to Matsushita Electric Industrial Co., Ltd. Floating point addition-subtraction apparatus 5,146,419, Cl. 364-748.000
Miyoshi, Atsuko; and Miwa, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for measuring amount of positional deviation of a recording sheet. 5,146,099, Cl. 250-548.000
Miyoshi, Shinji: *See—*
Kojima, Akikazu; Miyoshi, Shinji; and Inagaki, Mitsuo, 5,144,798, Cl. 60-303.000
Mizuguchi, Hideki: *See—*
Shirato, Toru; Mizuguchi, Hideki; and Yoshida, Minoru, 5,145,251, Cl. 366-80.000

Mizuguchi, Shinichi: *See—*
Asano, Takahiro; and Mizuguchi, Shinichi, 5,145,715, Cl. 427-54.100.

Mizushina, Fumio: *See—*
Sano, Kaoru; Mizushina, Fumio; Goto, Takashi; Maruki, Toshimitsu; and Naganuma, Yukio, 5,144,834, Cl. 73-118.100

Mizutani, Akihiko, to Sumitomo Electric Industries Ltd. Method of forming an optical fiber unit. 5,146,52[illegible] Cl. 385-103.000.

Mizutani, Shigemitsu; Seto, Yoshihiro; Tanaka, Hiroshi; and Nishiyama, Yoshihiro, to Fuji Photo Film Co., Ltd. Package for photographic film cartridge. 5,145,065, Cl. 206-389.000.

Moagon AG: *See—*
Ruth, Ragnar, 5,145,246, Cl. 362-31[illegible]00

Mobil Oil Corporation: *See—*
Beck, Jeffrey S.; Calabro, David C.; McCullen, Sharon B.; Pelrine, Bruce P.; Schmitt, Kirk D.; and Vartuli, James C., 5,145,816, Cl. 502-60.000.
Buchanan, J. Scott; and Wu, Margaret M., 5,146,022, Cl. 585-12.000
Bundens, Robert G.; Keville, Kathleen M.; Huss, Albin, Jr.; Chu, Cynthia T-W; and Husain, Altaf, 5,146,029, Cl. 585-533.000.
Harandi, Mohsen N., 5,146,032, Cl. 585-640.000.
Jackson, Andrew; Wu, Margaret M.; Chu, Alice S.; and Pelrine, Bruce P., 5,146,021, Cl. 585-10.000.
Krueger, Andrew J.; and Yang, Joseph J., 5,144,958, Cl. 128-743.000
McWilliams, John P., 5,145,659, Cl. 423-328.000.
Owen, Hartley; and Schipper, Paul H., 5,145,654, Cl. 422-190.000.

Mochimaru, Yoshiaki: *See—*
Kobori, Yasunori; Hamma, Kentaro; and Mochimaru, Yoshiaki, 5,146,323, Cl. 358-76.000.

Mochizuki, Tatsuya: *See—*
Nakai, Norihiro; and Mochizuki, Tatsuya, 5,146,255, Cl. 354-288.000

Moehle, Martin, to Robert Bosch GmbH. Form-fitting connection of a magnet valve to a housing block. 5,14[illegible]5,149, Cl. 251-129.150

Moen, Russell R., Jr., to Seiko Corp.; and Seiko Epson Corp. Harmonic noise minimization in a radio receiver by selectively optimizing ic's which produce harmonics in the radio's frequency range. 5,146,617, Cl. 455-310.000

Mohr, Juergen: *See—*
Oppenlaender, Knut; Schwen, Roland; Baur, Richard; Gousetis, Charalampos; Mohr, Juergen; and Mach, Helmut, 5,145,948, Cl. 528-409.000

Molex Incorporated: *See—*
Asakawa, Kazushige; Fukushima, Minoru; and Fujikura, Mitsuo, 5,145,384, Cl. 439-78.000.
Berg, B. Alan; and Kachlic, Jerry D., 5,145,386, Cl. 439-83.000.
Bowen, David C.; and Leonard, Russell J., 5,145,383, Cl. 439-78.000
Fry, Rupert J., 5,145,422, Cl. 439-86.000.
Yamada, Tomoo; Yamamoto, Yoshihisa; and Yagi, Masanori, 5,145,397, Cl. 439-328.000.

Molins PLC: *See—*
Pyke, John A., 5,144,845, Cl. 73-82[illegible]000.

Molyneux, Sydney, to Danby of North America, Inc. Method of renovating and/or protecting sewers or pipes. 5,145,281, Cl. 405-154.000.

Molzahn, David C., to Dow Chemical Company, The. Process for the preparation of cis-1,2-trans-4-cyclohexane tricarboxylic acid and esters. 5,145,987, Cl. 560-114.000.

Momiyama, Fujio; Ohmori, Kenichi; Oka, Shinichi; and Katoh, Junichi, to Hino Jidosha Kogyo Kabushiki Kaisha. Limited slip differential and power device. 5,145,466, Cl. 475-86.000.

Monarch Marking Systems, Inc.: *See—*
McKenna, Thomas G., 5,144,891, Cl. 101-227.000.
Neuhard, Lance D.; and Cetnar, John S., 5,146,546, Cl. 395-115.000.

Monbaliu, Marcel J.: *See—*
Terrell, David R.; De Meutter, Stefaan K.; and Monbaliu, Marcel J., 5,145,759, Cl. 430-58.000.

Monch, Heinrich, to Ideal-Standard GmbH. Spray head for a sink faucet or the like. 5,145,114, Cl. 239-[illegible]26.000.

Monford, Leo G., Jr., to United States of America, National Aeronautics and Space Administration. Electromagnetic attachment mechanism. 5,145,227, Cl. 294-65.500.

Mongoin, Jacques: *See—*
Ravet, Georges; Mongoin, Jacques; and Suau, Jean-Marc, 5,145,902, Cl. 524-425.000

Monk, Vyril A.: *See—*
Garg, Diwakar; Monk, Vyril A.; and Mueller, Carl F., 5,146,481, Cl. 378-35.000.

Monnier, John R.; and Muehlbauer, Peter J., to Eastman Kodak Company. Selective monoepoxidation of styrene, styrene analogs, and styrene derivatives to the corresponding oxide with molecular oxygen. 5,145,968, Cl. 546-268.000.

Mono Pumps Limited: *See—*
Belcher, Ian R., 5,145,343, Cl. 418-48.000.
Drane, John, 5,145,341, Cl. 418-48[illegible]00.

Monsanto Company: *See—*
Cartier, George E.; Piretti, Carl F.; and Simon, Robert H. M., 5,145,744, Cl. 428-423.700.
Kishore, Ganesh M.; and Shah, Dilip M., 5,145,783, Cl. 435-320.100.

Montedison S.p.A.: *See—*
Bastioli, Catia; and Del Tredici, Gianfranco, 5,145,626, Cl. 264-112.000

Montgomery, Billy L.: *See—*
Turner, Raymond L.; Mays, Randall L.; and Montgomery, Billy L., 5,145,531, Cl. 148-23.000.

Moochalla, Shabbir S.: *See—*
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Moody, Richard A.: *See—*
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Moore Business Forms, Inc.: *See—*
Bijnagte, Leendert M., 5,146,548, Cl. 395-117.000.

Moore, Cheri L.; and Hall, Judy L. Component bed system for a pet. 5,144,911, Cl. 119-28.500.

Moore, Dean T.; Kub, George F., Jr.; and Golonka, Kenneth A., Sr., to Erico International Corporation. Welding apparatus and method. 5,145,106, Cl. 228-241.000.

Moore, Joseph L. Children's apparatus for recreation and for learning world geography. 5,145,474, Cl. 482-51.000

Morales, Edrick; Gaffney, Anne M.; and Sofranko, John A., to Arco Chemical Technology, L.P. Conversion of paraffins to olefins. 5,146,034, Cl. 585-654.000.

Moran, Michael E.: *See—*
Cassorla, Elie; de Vries, Jacqueline P.; Moran, Michael E.; Slater, James J.; and Unger, Jay, 5,146,552, Cl. 395-145.000.

Moranski, Jeffrey A.; Malecki, Ronald J.; Davidsz, Mark E.; and Felber, Arthur J., to Allen-Bradley Company, Inc. Terminal block segment with feet for mounting on tracks of two different widths. 5,145,418, Cl. 439-716.000.

Moreno Danvila, Alfonso: *See—*
Berna Tejero, Jose L.; and Moreno Danvila, Alfonso, 5,146,026, Cl. 585-467.000.

Morgan, Constance H.: *See—*
Counts, Mary E.; Hajaligol, Mohammad R.; Morgan, Constance H.; Smith, Ulysses; Sprinkel, Francis M.; and Utsch, Francis V., 5,144,962, Cl. 131-194.000.

Morgese, Nicola: *See—*
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Mori, Goro: *See—*
Hayashi, Takamasa; Mori, Goro; Araki, Shigeyuki; Yamamoto, Masahiro; Takahashi, Masaru; Senma, Toshitaka; Miyajima, Masami; and Isobe, Takundo, 5,146,240, Cl. 346-108.000

Mori, Hidetaro: *See—*
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Mori, Hiroshi; Hayashi, Seizo; Hayakawa, Hiroshi; and Mitani, Tomomi, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 5,144,714, Cl. 15-319.000.

Mori, Kinji: *See—*
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasahima, Hirokazu, 5,146,559, Cl. 395-200.000.

Mori, Kinya: *See—*
Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai, Kenji, 5,145,891, Cl. 524-34.000.
Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai, Kenji, 5,145,892, Cl. 524-34.000

Mori, Masanori, to Aisin Seiki Kabushiki Kaisha. Centrifugal cvt oil pressure control device. 5,145,464, Cl. 474-16.000.

Mori, Shigeru: *See—*
Kawai, Shinji; Mori, Shigeru; and Kikuda, Shigeru, 5,146,429, Cl. 365-200.000.

Mori, Yosuke: *See—*
Noguchi, Yasuhiro; Takei, Kazuo; Funyu, Yukio; Mori, Yosuke; and Yasuda, Isao, 5,146,553, Cl. 395-146.000.

Mori, Yukikazu, to Ricoh Company, Ltd. Facsimile apparatus which can coordinate communication with more than one external apparatus. 5,146,349, Cl. 358-407.000.

Moribe, Akira: *See—*
Yamamoto, Yasuyoshi; Kaga, Yuzo; Yoshikawa, Toshiharu; and Moribe, Akira, 5,145,884, Cl. 522-14.000

Morikawa, Kiyoshi; Kurokawa, Atsushi; Onishi, Sei; Kajihara, Kiyohito; Takemasa, Kaoru; and Kitazawa, Osamu, to Pioneer Electronic Corporation. Damper filled with oil. 5,145,039, Cl. 188-298.000.

Morimoto, Shinichi, to Shimano Industrial Co., Ltd. Fishing reel with one-way mechanism. 5,145,125, Cl. 242-268.000

Morin, Michel: *See—*
Hanssens, Alain; and Morin, Michel, 5,145,577, Cl. 210-189.000.

Morioka Takayuki: *See—*
Yamaguchi, Shinichiro; Matsumoto, Hidekazu; Bandoh, Tadaaki; Hirayama, Hirokazu; Morioka Takayuki; Takaya, Soichi; Kawamoto, Yukio; Ide, Jushi; and Miyazaki, Yoshihiro, 5,146,569, Cl. 395-375.000

Morishige, Chitoshi: *See—*
Sawasaki, Tomoo; and Morishige, Chitoshi, 5,144,864, Cl. 74-866.000.

Morishita, Shinya; Suzuki, Kenichi; Oohori, Masae; and Nakada, Masahiko, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kabushiki Kaisha. Reference electrode and a pair of electrodes for detecting the acidity or basicity of oil. 5,146,169, Cl. 324-438.000.

Morita Iron Works Co., Ltd.: *See—*
Morita, Motoo, 5,144,826, Cl. 72-140.000

Morita, Kunihiko, to Nippon Thompson Co., Ltd. Compact ball spline bearing assembly. 5,145,262, Cl. 384-49.000.

Morita, Motoo, to Morita Iron Works Co., Ltd. Forming device to be practiced in coil spring forming machine and method of replacing said device. 5,144,826, Cl. 72-140.000.

Morita, Naoyuki, to Fuji Photo Film Co., Ltd. Drum for image recording apparatus having a guide member with a sheet retaining member 5,145,170, Cl. 271-276.000.

Morita, Sizuo: *See—*
Matsuo, Shunji; Morita, Sizuo; Haneda, Satoshi; Fukuchi, Masakazu; and Shoji, Hisashi, 5,146,270, Cl. 355-200.000.

Morita, Toshiki: *See—*
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Moriwaki, Nobuyuki. *See—*
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Moriya, Mitsuro: *See—*
Yamaguchi, Hiroyuki; Moriya, Mitsuro; and Yamada, Shin-ich, 5,146,440, Cl. 369-32.000

Moriyama, Kenji: *See—*
Haraga, Hisato; Inatomi, Yasutoshi; Obata, Takashi; Hashida, Mituaki; Uchiyama, Koichi; and Moriyama, Kenji, 5,144,702, Cl. 4-541.600.

Moro, Masaru: *See—*
Matsuyo, Tadashi; Kimura, Masahiro; Okubo, Hideo; Yamaguchi, Seiji; Kawakami, Hiroshi; and Moro, Masaru, 5,144,715, Cl. 15-319.000.

Moroboshi, Hiroyoshi: *See—*
Tsuchiya, Yoshinobu; Shirata, Akihiro; and Moroboshi, Hiroyoshi, 5,146,095, Cl. 290-38.00R.

Morris, Don L.; Beavers, William A.; and Choate, William E., to Eastman Kodak Company. Continuous process for the preparation of 2-ethyl-2-(hydroxymethyl) hexanal and 2-butyl-2-theyl-1,3-propanediol. 5,146,004, Cl. 568-463.000.

Morris, Patricia A.; Wharry, Donald L.; and Roheim, John R., to Vista Chemical Company. Anti-static fabric softening article for use in an automatic clothes dryer. 5,145,595, Cl. 252-91.000

Morrow, Alan J.: *See—*
Miller, William J.; and Morrow, Alan J., 5,146,519, Cl. 385-43.000.

Morse, Ronald D.: *See—*
Beukema, Bruce L.; Marquart, David W.; and Morse, Ronald D., 5,146,605, Cl. 395-575.000

Morton, Douglas R.: *See—*
Johnson, Roy A.; Bundy, Gordon L.; Youngdale, Gilbert A.; Morton, Douglas R.; Wallach, Donald P., deceased; and Wallach, Vera M., legal representative, 5,145,874, Cl. 514-650.000.

Mosburger, Hans, to BHS-Bayerische Berg-, Hutten-und Salzwerke AG. Apparatus for producing one-sided corrugated paperboard 5,145,549, Cl. 156-382.000.

Motohashi, Minoru, to Pioneer Electronic Corporation. Apparatus responsive to a vehicle's parking brake switch to enable operation of other apparatus. 5,146,407, Cl. 364-424.050.

Motoki, Shigeru, to Jamco Corporation. Cart. 5,146,065, Cl. 219-386.000

Motorola, Inc.: *See—*
Babin, David C., 5,146,577, Cl. 395-425.000
Bright, Michael W., 5,146,497, Cl. 380-21.000.
DeLuca, Michael J.; and DeLuca, Joan S., 5,146,216, Cl. 340-825.520.
Dickirson, David M., 5,145,382, Cl. 439-63.000
Ghaem, Sanjar; Lauro, George L.; and Barnea, Michael, 5,146,231, Cl. 342-419.000
Gyenes, Russell E.; and Kleinert, Raymond J., III, 5,146,150, Cl. 320-17.000
Holmes, Thomas F.; and Leonard, Karen M., 5,146,217, Cl. 340-825.440
Kuo, Shun-Meen, 5,146,416, Cl. 364-563.000.
Longshore, Theodore F.; Balacky, William H.; DeClerk, William P.; Baker, James C.; Everline, Paul S.; and Rittler, Christopher G., 5,146,610, Cl. 455-35.100
Nguyen, Hoang K.; and Draina, Joseph M., 5,145,493, Cl. 55-17.000
Pinckley, Danny T., 5,146,504, Cl. 381-46.000.
Ristic, Ljubisa; and Dunn, William C., 5,146,389, Cl. 361-283.000
Sanders, Paul W.; and Boland, Bernard W., 5,145,795, Cl. 437-33.000
Smith, Jeffrey D., 5,146,498, Cl. 380-21.000.
Sobti, Arun; and Comroe, Richard A., 5,146,538, Cl. 395-2.000
Sokola, Raymond L., 5,146,193, Cl. 333-206.000.
Swikle, Todd G.; and Novak, Carl V., 5,146,620, Cl. 455-351.000
Tayloe, Daniel R.; and Kotzin, Michael D., 5,146,609, Cl. 455-33.200

Motouji, Satoshi: *See—*
Matsuoka, Yasushi; Matsumoto, Akio; Kanda, Yoshimi; Endo, Hirofumi; Ajioka, Tsutomu; and Motouji, Satoshi, 5,146,107, Cl. 307-253.000

MPY Foods, Inc.: *See—*
Cajigas, Stanley, 5,145,697, Cl. 426-43.000.
Cajigas, Stanley, 5,145,698, Cl. 426-43.000.

Muccini, Edward J.: *See—*
Yearick, David J.; Walsh, Timothy W.; and Muccini, Edward J., 5,145,184, Cl. 273-248.000.

Muehlbach, Klaus; Steiert, Peter; and Benker, Klaus, to BASF Aktiengesellschaft. Reinforced colored thermoplastic molding materials based on polyphenylene ethers and polyamides. 5,145,904, Cl. 524-494.000

Muehlbauer, Peter J.: *See—*
Monnier, John R.; and Muehlbauer, Peter J., 5,145,968, Cl 546-268.000

Muehlberger, Rupert: *See—*
Stadler, Karl; Stark, Roland; Klam, Ruediger; Muehlberger, Rupert; and Brinkhoff, Michael, 5,146,134, Cl. 313-579.000

Muelas-Medrano, Santiago: *See—*
Vidal, Henri; and Muelas-Medrano, Santiago, 5,144,779, Cl 52-295.000

Mueller, Carl F.: *See—*
Garg, Diwakar; Monk, Vyril A.; and Mueller, Carl F., 5,146,481 Cl. 378-35.000

Mueller, Eugene M.: *See—*
Ernesti, Robert M.; and Mueller, Eugene M., 5,144,821, Cl 70-159.000

Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Process and preparation of α-alkoxy acetic acids and their salts 5,145,992, Cl. 562-431.000.

Muir, Gregory A.: *See—*
Henry, Daniel L.; Muir, Gregory A.; and Desimone, Joseph P., 5,146,207, Cl. 340-573.000

Mukainakano, Hiroshi: *See—*
Kawahara, Yukito; Machida, Satoshi; Mukainakano, Hiroshi; and Yokomichi, Masahiro, 5,146,074, Cl. 250-208.100.

Mukainishi, Munetaka: *See—*
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000

Mukaiya, Hitoshi, to Canon Kabushiki Kaisha. Four-group zoom lens 5,146,366, Cl. 359-683.000

Mukherjee, Satyendranath; Tsou, Len-Yuan; and Kuo, Di-Son, to North American Philips Corp. Electrically erasable and programmable read only memory with trench structure. 5,146,426, Cl 365-149.000

Mullen, C. Thomas: *See—*
Foster, James P.; Mullen, C. Thomas; Rambacher, Bruce A.; Rhoads, Herman P.; Fittery, Larry R.; and Schiavone, Michael C., Jr., 5,145,306, Cl. 414-417.000

Mullendore, James A.: *See—*
Spencer, James R.; and Mullendore, James A., 5,145,512, Cl 75-248.000

Muller, Christiane: *See—*
Chevalier, Gilbert; Muller, Christiane; Rousseau, Frederic; Savinel, Laurent; and Thonnelier, Jean-Yves, 5,144,809, Cl. 62-36.000

Muller, Dietmar: *See—*
Schutze, Detlef-Ingo; and Muller, Dietmar, 5,145,964, Cl 546-37.000

Muller, George M.; and Stuart, Gordon H. Carpet stretcher. 5,145,225 Cl. 294-8.600

Muller, Gerhard: *See—*
Staudenrausch, Georg; and Muller, Gerhard, 5,145,450, Cl 452-47.000

Muller, Hanspeter: *See—*
Burer, Franz; Gehrig, Hans-Jorg; Kaufmann, Josef; Maurer, Heinz and Muller, Hanspeter, 5,144,987, Cl. 139-450.000

Muller, Hubert: *See—*
Grotepass, Johann; Hamraths, Konrad; Hauck, Albert; Keller Karl; and Muller, Hubert, 5,144,828, Cl. 72-235.000

Muller, Klaus-Dieter, to BTS Broadcast Television Systems GmbH. Method and apparatus for automatically setting parameters in the derivation of a mixer keying signal from video signals. 5,146,315, Cl 358-22.000

Muller-Odenwald, Hermann-Eugen: *See—*
Veser, Kurt; and Muller-Odenwald, Hermann-Eugen, 5,145,652 Cl. 422-171.000

Muller, Peter: *See—*
Muller, Rudolf; Muller, Peter; and Fortmann, Norbert, 5,144,883, Cl. 92-137.000

Muller, Rudolf; Muller, Peter; and Fortmann, Norbert, to Mannesmann Aktiengesellschaft. Cylinder without a piston rod. 5,144,883, Cl 92-137.000

Muller, Thomas: *See—*
Preisegger, Ewald; Scholten, Wolfgang; and Muller, Thomas, 5,146,016, Cl. 570-134.000

Mullikin, Jeffrey A.: *See—*
Sandberg, Kenneth F.; and Mullikin, Jeffrey A., 5,145,454, Cl 452-174.000

Mumford, Ronald W. J., deceased: *See—*
Lees, Roger T.; Godden, Walter R.; Mumford, Ronald W. J., deceased; and Millward, John D., 5,146,321, Cl. 358-54.000

Mumford, Shaiagh Mary, personal representative: *See—*
Lees, Roger T.; Godden, Walter R.; Mumford, Ronald W. J., deceased; and Millward, John D., 5,146,321, Cl. 358-54.000

Munday, Jerry T.; and Meiss, Theodore D., to Hoechst Celanese Corporation. Flame resistant, low pilling polyester fiber. 5,145,941, Cl 528-287.000

Murakami, Takashi: *See—*
Kadowaki, Tomoko; and Murakami, Takashi, 5,146,467, Cl 372-46.000

Muramatsu, Atsushi; and Funahashi, Yoshiki, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having two differently tuned orifices selectively utilized for damping or isolating vibrations in different frequency ranges. 5,145,156, Cl. 267-140.140

Murano, Kanji; Sekiya, Tetsuo; Ohashi, Akihiko; and Ishida, Takehisa, to Sony Corporation. Bearing system. 5,145,259, Cl. 384-1.000

Murase, Satoru: *See*—
Yamada, Yutaka; and Murase, Satoru, 5,145,831, Cl. 505-1.000.

Murata Manufacturing Co., Ltd.: *See*—
Kato, Takeyuki; Yoneda, Yasunobu; and Sakabe, Yukio, 5,146,313, Cl. 357-74.000.
Mandai, Harufumi; Chigodo, Yoshikazu; and Tojo, Atsushi, 5,146,191, Cl. 333-161.000

Murata, Ryuji: *See*—
Toyoda, Nobuhiko; Mishina, Yoshihiko; Murata, Ryuji; Uozu, Yoshihiro; Oda, Masaaki; and Isumaru, Teruta, 5,146,530, Cl. 385-124.000

Murata, Shigemi; and Ikeuchi, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus for internal combustion engine 5,144,936, Cl. 123-655.000

Murayama, Kashiwa; Tatsuta, Masakazu; Shibata, Yoshiharu; and Yajima, Hideki, to Japan Crown Cork Co., Ltd. Container closure having metallic body and plastic grip piece. 5,145,084, Cl. 220-260.000

Murayama, Koichi: *See*—
Kawamata, Taisuke; Maruyama, Toshio; Irie, Hidetaka; Inoue, Masayoshi; Nishio, Shinji; and Murayama, Koichi, 5,144,772, Cl. 51-105.0SP

Murchison, Craig B.: *See*—
Khazai, Bijan; Vrieland, G. Edwin; Murchison, Craig B.; Dixit, Ravi S.; and Wehl, Edwin D., 5,146,031, Cl. 585-624.000

Murff, James D.: *See*—
Hulett, Jeffrey M.; Murff, James D.; and Raines, Richard D., 5,145,284, Cl. 405-232.000

Murphy, Gerald J.: *See*—
Budnik, Richard A.; Blevins, Charles H., II; Murphy, Gerald J.; Grabowski, Wojciech; and Cobb, Raymond L., 5,145,879, Cl. 521-112.000

Murphy, Gordon J. Probe instrument. ,144,753, Cl. 33-514.000

Murphy, Richard F.; and Burke, Michael K., to Zeftek, Inc. Plastic knuckle pin with annular relief grooves for preventing pin failure due to fatigue. 5,145,076, Cl. 213-155.000

Murray, James R.: *See*—
Apap, Joseph A.; Brown, Mark A.; Emerick, Alan J.; Miller, Thomas L.; Murray, James R.; and Sissenstein, David W., Jr., 5,145,104, Cl. 228-179.000

Murray, John R., to Differential Steel Car Company. Hopper door apparatus for a railway car. 5,144,895, Cl. 105-286.000

Murray, Robert H. Low pressure fluid pump. 5,145,338, Cl. 417-480.000

Murray-Shelley, Richard, to Smiths Industries Public Limited Co. Autoclaves. 5,145,647, Cl. 422-116.000

Musgrave, Steven R.: *See*—
Harless, Ronald L.; Buchl, Robert T.; and Musgrave, Steven R., 5,145,240, Cl. 303-89.000

Mussen, Michel: *See*—
Houtteman, Bernard; and Mussen, Michel, 5,145,408, Cl. 439-581.000

Muto, Hiroyasu, to NEC Corporation. Analog-to-digital converter circuit. 5,146,223, Cl. 341-118.000

Myhre, Douglas C.; O'Brien, Richard; Pui, David Y. H.; and Tsai, Chuen-Jinn, to Rosemount Inc. Window purging system for a combustion instrument. 5,146,244, Cl. 359-509.000

Nagabhusan, Prabhakar, to Compudrive Corporation. Adjustable cycloidal speed reducer. 5,145,468, Cl. 475-170.000

Nagai, Katsutoshi: *See*—
Kobayashi, Takeo; Nishida, Takao; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,146,259, Cl. 354-456.000

Nagai, Kazukiyo, to Ricoh Company, Ltd. Optical information recording medium and nickel dithiolate complex compounds employed in the same. 5,145,963, Cl. 546-6.000

Nagai, Kiyotaka: *See*—
Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,146,448, Cl. 369-83.000

Nagano, Chikara, to Olympus Optical Co., Inc. Microscope optical system. 5,146,363, Cl. 359-363.000

Nagano, Yousuke: *See*—
Hiyama, Isao; Niwase, Yoshio; Nagano, Yousuke; Nakano, Shigeharu; and Shikamori, Tamotu, 5,144,819, Cl. 68-12.040

Naganuma, Yukio: *See*—
Sano, Kaoru; Mizushina, Fumio; Goto, Takashi; Maruki, Toshimitsu; and Naganuma, Yukio, 5,144,834, Cl. 73-118.100.

Nagao, Masashi; Yoshimura, Hideto; and Inaguchi, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Multi-stage cold accumulation type refrigerator and cooling device including the same. 5,144,805, Cl. 62-6.000

Nagao, Masashi; Yoshimura, Hideto; and Inaguchi, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Multi-stage cold accumulation type refrigerator and cooling device including the same. 5,144,810, Cl. 62-471.000

Nagaoka, Shinji; Sato, Koji; and Kawai, Michio, to Seikosha Co. Ltd. Auto focus camera. 5,146,262, Cl. 354-403.000

Nagasato, Makoto; and Yana, Masasumi, to Kabushiki Kaisha Toshiba. Optical/optomagnetic disk apparatus. 5,146,447, Cl. 369-77.200.

Nagasawa, Hiroaki: *See*—
Fujita, Norihisa; Nagasawa, Hiroaki; and Sahara, Shinsuke, 5,145,277, Cl. 403-374.000

Nagasawa, Kenichi: *See*—
Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; Sato, Chikara; and Nagasawa, Kenichi, 5,146,334, Cl. 358-183.000

Wakui, Tetsuya; Takayama, Nobutoshi; Yoshimura, Katsuji; and Nagasawa, Kenichi, 5,146,373, Cl. 360-77.010.

Nagashima, Hideo, to Tachi S Co., Ltd. Arrangement of headrest in seat. 5,145,233, Cl. 297-408.000.

Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, to Mita Industrial Co., Ltd. Sheet sending apparatus. 5,145,160, Cl. 271-9.000.

Nagashima, Takashi: *See*—
Yokoo, Toru; and Nagashima, Takashi, 5,146,342, Cl. 358-231.000.

Nagata, Kouji; Sugita, Minoru; Kida, Keisuke; Watanabe, Toru; and Matsushita, Ken'yo, to Shimizu Construction Co., Ltd.; and Nippon Light Metal Company, Ltd. Electric-wave absorbing material for construction. 5,146,047, Cl. 174-35.0MS.

Nagayoshi, Mitsugu: *See*—
Uenishi, Nobuaki; Nagayoshi, Mitsugu; Miyanaga, Hirofumi; Sato, Tomoaki; Sakiyama, Katsunori; Ueda, Yasuhiro; and Adachi, Hideyuki, 5,144,848, Cl. 73-866.500.

Nagler, Werner; Hlawa, Fritz; and Schmidt, Lothar, to Siemens Aktiengesellschaft. Circuit configuration for clock-controlled time division multiplex telecommunications switching installations. 5,146,453, Cl. 370-16.000.

Nagler, Werner; and Krumenacker, Rudolf, to Siemens Aktiengesellschaft. Circuit arrangement for the routine testing of an interface between line terminator groups and the switching matrix network of a PCM telecommunication switching system. 5,146,474, Cl. 375-10.000

Nagy nee Csaki, Erika: *See*—
Timar, Tibor; Eszenyi, Tibor; Sebok, Peter; Galamb, Vilmos; Fazekas nee Kozak, Julia; Istvan nee Katona, Terezia; Kovach nee Lakatos, Eva; and Nagy nee Csaki, Erika, 5,145,985, Cl. 548-525.000.

Naidu, Harish K.; Lennon, Thomas E.; Williamson, Mike R.; and Pai, Sunil, to Microsoft Corporation. Method and system for using expanded memory for operating system buffers and application buffers. 5,146,580, Cl. 395-425.000

Nair, Madhavan G.; and Li, Shu W. 1-formyl-5,8,10-trideazafolates. 5,145,854, Cl. 514-259.000

Naka, Hiroyuki: *See*—
Watanabe, Keigo; Naka, Hiroyuki; and Ichiyanagi, Takashi, 5,145,528, Cl. 118-411.000.

Nakabu, Shigeo: *See*—
Yamamura, Keiji; Nukii, Takashi; and Nakabu, Shigeo, 5,146,301, Cl. 357-23.700

Nakada, Akira, to Yamaha Corporation. Music sheet. 5,144,875, Cl. 84-611.000

Nakada, Masahiko: *See*—
Morishita, Shinya; Suzuki, Kenichi; Oohori, Masae; and Nakada, Masahiko, 5,146,169, Cl. 324-438.000

Nakagawa, Hiroshi; Ikeda, Atsushi; Sakai, Itsuo; and Tani, Nobuyuki, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Ketene dimer sizing agent for paper making. 5,145,522, Cl. 106-287.170

Nakai, Kozo: *See*—
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi, Koizumi, Minoru; Nakai, Kozo; and Kasahima, Hirokazu, 5,146,559, Cl. 395-200.000

Nakai, Norihiro; and Mochizuki, Tatsuya, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package and method of film reloading therefor. 5,146,255, Cl. 354-288.000.

Nakajima, Hisao: *See*—
Fukunaga, Takao; Nakajima, Hisao; Kobayashi, Kenzo; Kono, Masanao; Irie, Hisao; and Inoue, Ryo, 5,145,532, Cl. 148-23.000.

Nakajima, Nobuyuki; and Nakaya, Tatsuo, to Zexel Corporation. Variable capacity vane compressor having an improved bearing for a capacity control element. 5,145,327, Cl. 417-295.000

Nakajima, Taketoshi: *See*—
Kojima, Takeshi; and Nakajima, Taketoshi, 5,145,721, Cl. 427-379.000

Nakajima, Yasushi: *See*—
Adachi, Tatsuya; Nagai, Kiyotaka; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,146,448, Cl. 369-83.000

Nakamura, Hideaki: *See*—
Sasaki, Katsuro; Moriwaki, Nobuyuki; Honjo, Shigeru; and Nakamura, Hideaki, 5,146,427, Cl. 365-189.050.

Nakamura, Hisanori: *See*—
Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, 5,145,312, Cl. 414-719.000.

Nakamura, Katsufumi: *See*—
Carley, L. Richard; and Nakamura, Katsufumi, 5,146,179, Cl. 330-253.000

Nakamura, Kiyoshi: *See*—
Tokubo, Kazo; Yamaguchi, Michihiro; Ohtsu, Yutaka; Nakamura, Kiyoshi; Matsumoto, Satoshi; and Yamagishi, Akihiko, 5,145,578, Cl. 210-198.200.

Nakamura, Michinori; and Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Bi-CMOS logic gate circuits for low-voltage semiconductor integrated circuits. 5,146,118, Cl. 307-475.000.

Nakamura, Tohru; Aikoh, Hideki; Shinoda, Masayuki; and Kikuchi, Noboru, to Matsushita Electric Industrial Co., Ltd. Optical head with tracking error detecting system. 5,146,445, Cl. 369-44.410

Nakamura, Toshiyuki: *See*—
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000.

Nakamura, Tsutomu: *See*—
Sadanobu, Jiro; Ohba, Akihiro; and Nakamura, Tsutomu, 5,145,616, Cl. 264-29.200.

Nakamura, Yasuhiro; and Chikamori, Akira, to Koyo Seiko Co., Ltd. Power steering apparatus. 5,145,021, Cl. 180-79.100.

Nakanishi, Shoji, to Seiko Instruments, Inc. Method of making semiconductor devices having an implant damage protection film on the gate electrode sidewalls. 5,145,797, Cl. 437-43.000.

Nakanishi, Youichi: *See*—
Matsuda, Shinji; Sugimura, Kenji; and Nakanishi, Youichi, 5,145,269, Cl. 400-216.200

Nakaniwa, Shinpei, to Japan Electronic Control Systems Co., Ltd. Wall flow learning method and device for fuel supply control system of internal combustion engine. 5,144,933, Cl. 123-675.000.

Nakano, Hirotaka, to NEC Corporation. Data processing apparatus. 5,146,579, Cl. 395-425.000

Nakano, Hirotaka, to NEC Corporation. Arrangement for storing an execution history in an information processing unit. 5,146,586, Cl. 395-575.000.

Nakano, Shigeharu: *See*—
Hiyama, Isao; Niwase, Yoshio; Nagano, Yousuke; Nakano, Shigeharu; and Shikamori, Tamotu, 5,144,819, Cl. 68-12.040

Nakano, Tomoaki: *See*—
Hirata, Tositaka; Ameyama, Minoru; Komai, Hiromichi; Naruse, Osamu; Matsumoto, Syuzo; and Nakano, Tomoaki, 5,146,236, Cl. 346-1.100.

Nakano, Yasushi: *See*—
Kitazawa, Makio; Akahane, Masuo; Nakano, Yasushi; Tsubaki, Atsushi; Sato, Kazuaki; Ban, Masaaki; and Kobayashi, Michihiro, 5,145,869, Cl. 514-510.000

Nakashima, Naoki: *See*—
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000.

Nakatani, Yoshihiro: *See*—
Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; Sato, Chikara; and Nagasawa, Kenichi, 5,146,334, Cl. 358-183.000

Nakatsuka, Yasuo: *See*—
Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi, Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000.

Nakaya, Tatsuo: *See*—
Nakajima, Nobuyuki; and Nakaya, Tatsuo, 5,145,327, Cl. 417-295.000

Nakayama, Tadashi: *See*—
Yoshitomi, Yasunari; Suga, Yozo; Takahashi, Nobuyuki; Ushigami, Yoshiyuki; and Nakayama, Tadashi, 5,145,533, Cl. 148-111.000.

Nakayama, Tadayoshi: *See*—
Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; Sato, Chikara; and Nagasawa, Kenichi, 5,146,334, Cl. 358-183.000

Nakayama, Takeshi: *See*—
Yamashita, Atsushi; and Nakayama, Takeshi, 5,146,345, Cl. 358-297.000.

Nakayoshi, Kazumi; and Mine, Katsutoshi, to Dow Corning Toray Silicone Company, Ltd. Semiconductor pellet adhesive and article made therewith. 5,145,931, Cl. 528-15.000

Nakazato, Shinichi: *See*—
Satoh, Koichi; and Nakazato, Shinichi, 5,146,375, Cl. 360-92.000.

Nakazawa, Akira; and Ohsasa, Hiroshi, to Stec Inc. Normally closed-type fluid control valve. 5,145,147, Cl. 251-129.060.

Nanba, Muneyoshi: *See*—
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,144,916, Cl. 123-41.120.

Nanba, Yoku: *See*—
Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, 5,145,657, Cl. 423-219.000

Nannichi, Toshihiko, to Kabushiki Kaisha Toshiba. Reader/recorder in a facsimile machine. 5,146,352, Cl. 358-451.000

Nannini, Richard J.: *See*—
Vaughn, E. Lanny; and Nannini, Richard J., 5,145,308, Cl. 414-462.000

Nanus, David M.: *See*—
Albino, Anthony P.; Nanus, David M.; Bander, Neil H.; and Pfeffer, Lawrence M., 5,145,773, Cl. 435-7.230.

Narula, Dipak; Glover, Shedric O.; and Tselepis, Arthur J., to Dow Corning Corporation. Aqueous siliocone-organic hybrids. 5,145,898, Cl. 524-310.000

Narumiya, Hisayoshi, to Koyo Seiko Co., Ltd. Linear guide device. 5,145,261, Cl. 384-45.000.

Naruse, Osamu: *See*—
Hirata, Tositaka; Ameyama, Minoru; Komai, Hiromichi; Naruse, Osamu, Matsumoto, Syuzo; and Nakano, Tomoaki, 5,146,236, Cl. 346-1.100.

Nasu, Nobuo, to Kabushiki Kaisha Kawakami Seisakusho. Method and apparatus for cutting patterned sheets. 5,144,873, Cl. 83-19.000.

Natarajan, Kadathur S., to International Business Machines Corp. Processor allocation method and apparatus for multiprocessor execution of a constraint satisfaction search. 5,146,540, Cl. 395-11.000.

NATEC Incorporated: *See*—
Yamamoto, Ryoichi, 5,145,548, Cl. 156-350.000

National Carbide Outlet, Inc.: *See*—
Flueckiger, Rudolph H., 5,145,294, Cl. 407-42.000.

National Research Institute for Metals: *See*—
Asano, Toshihisa; Tanaka, Yoshiaki; Fukutomi, Masao; and Maeda, Hiroshi, 5,145,829, Cl. 505-1.000.

National Semiconductor Corp.: *See*—
Bayan, Jaime A.; Demmin, Jeffrey C.; DiOrio, Mark L.; and Kwon Young I., 5,146,310, Cl. 357-70.000

Nave, Jean-Francois: *See*—
Ducep, Jean B.; and Nave, Jean-Francois, 5,145,861, Cl. 514-381.000

Nawa, Michio, to Kabushiki Kaisha Meidensha. Method and apparatus having transversely offset eddy current sensors for detecting defect in elongated metal strip joined by way of welding. 5,146,163, Cl. 324-232.000.

Nawamaki, Tsutomu: *See*—
Watanabe, Junichi; Kondo, Yasuo; Hatanaka, Masataka; Ikai, Takashi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe Shigeomi, 5,145,502, Cl. 71-90.000

Naylor, Carter G.: *See*—
Culbreth, William K., III; Pottratz, David G.; Su, Wei-Yang; Sheu, Yu-Hwa E.; and Naylor, Carter G., 5,145,563, Cl. 203-64.000

NCR Corporation: *See*—
Adams, John M.; Herbert, Brian K.; Johnson, Stephen M.; and Robbins, Jamey L., 5,146,211, Cl. 340-709.000

NEC Corporation: *See*—
Muto, Hiroyasu, 5,146,223, Cl. 341-118.000
Nakano, Hirotaka, 5,146,579, Cl. 395-425.000
Nakano, Hirotaka, 5,146,586, Cl. 395-575.000.
Satoh, Koichi; and Nakazato, Shinichi, 5,146,375, Cl. 360-92.000

Nelson, James E.: *See*—
Lippmann, Raymond; Nelson, James E.; Schnars, Michael J.; Chintyan, James R.; Aralis, James M.; and Bohac, Frank J., Jr 5,146,154, Cl. 323-367.000

Nelson, Michael A.: *See*—
De, Bibhas R.; Nelson, Michael A.; and Pande, Kiran K., 5,146,086 Cl. 250-253.000

Nelson, Steven D., to Rodix, Inc. Vibratory feeder voltage control 5,145,054, Cl. 198-751.000.

NeoRx Corporation: *See*—
Vanderhevden, Jean-Luc E.; Su, Fu-Min; and Ehrhardt, Gary J., 5,145,636, Cl. 376-189.000

Neri, Bruce P.: *See*—
Cox, Daniel E.; Abril, Obsidiana; Bauminger, Sara; Neri, Bruce P and Shinefeld, Lisa, 5,145,784, Cl. 436-526.000

Neubauer, Hans-Juergen: *See*—
Kardorff, Uwe; Neubauer, Hans-Juergen; Leyendecker, Joachim; Kuenast, Christoph; Hofmeister, Peter; Krieg, Wolfgang; and Buerstinghaus, Rainer, 5,145,873, Cl. 514-624.000

Neudecker, Karl; Reuter, Hans-Joachim; Schmidt, Manfred; and Zanner, Johann, to Agfa-Gevaert Aktiengesellschaft. Supply magazine for X-ray sheet film stack in light-tight envelope. 5,145,166, Cl. 271-164.000.

Neuhard, Lance D.; and Cetnar, John S., to Monarch Marking Systems, Inc. Printer with hardware symbol data accessing scheme. 5,146,546 Cl. 395-115.000

Neukirchen, Axel: *See*—
Schulz, Reinhard; Neukirchen, Axel; and Obermeier, Josef, 5,145,237, Cl. 299-94.000

Neumeister, Joachim: *See*—
Wildt, Thomas; Nierlich, Franz; Droste, Wilhelm; Neumeister, Joachim; and Scholz, Bernhard, 5,146,039, Cl. 585-820.000

Neumiller, Phillip J., to S. C. Johnson & Son, Inc. Aqueous emulsion and aerosol delivery system using same. 5,145,604, Cl. 252-312.000

Newman, John W., to Laser Technology, Inc. Nondestructive testing using air-coupled acoustic excitation. 5,146,289, Cl. 356-35.500.

Newman, Peter A., to Eastman Kodak Company. Arrangements for, method of, and lenses configured to provide thermal compensation in lens element mounts. 5,146,367, Cl. 359-820.000.

Newman, Robert M.: *See*—
Cantoni, Antonio; Budrikis, Zigmantas L.; Newman, Robert M and Hullett, John L., 5,146,477, Cl. 375-112.000

Newman, Ronald S.; and Greenidge, St. Clair W., to Union Carbide Chemicals & Plastics Technology Corporation. Oxa-Bicyclic polyfunctional compounds and preparation thereof. 5,145,973, Cl 549-397.000

Newton, John F., Jr.: *See*—
Adams, Jerry L.; Bender, Paul E.; Gleason, John G.; Hanna, Nabil, Newton, John F., Jr.; Perchonock, Carl D.; and Razgaitis Kazys, 5,145,858, Cl. 514-318.000

NeXT Computer, Inc.: *See*—
Hullot, Jean-Marie; Jobs, Steven P.; and Franklin, Christopher M., 5,146,556, Cl. 395-159.000

Ng, Sheau-Bao, to RCA Thomson Licensing Corporation. Video signal decompression apparatus for independently compressed even and odd field data. 5,146,325, Cl. 358-135.000

NGK Adrec Co., Ltd.: *See*—
Shirakawa, Hiroshi; and Yamakawa, Osamu, 5,145,806, Cl 501-80.000

NGK Insulations, Ltd.: *See*—
Seike, Shoji; Watanabe, Keiichiro; and Ito, Akira, 5,145,011, Cl 165-9.000

NGK Insulators, Inc.: *See*—
Horikawa, Osamu; and Ikeshima, Koichi, 5,145,539, Cl. 156-89.000

NGK Insulators, Ltd.: *See—*
Misawa, Hidenobu; and Yamada, Hirotake, 5,145,754, Cl. 429-32.000
Sakai, Hiroaki; and Isomura, Manabu, 5,145,620, Cl. 264-65.000
Shirakawa, Hiroshi; and Yamakawa, Osamu, 5,145,806, Cl. 501-80.000
Suzuki, Tomio; and Ohi, Hiroyuki 5,144,885, Cl. 92-222.000
Nguyen, Anh: *See—*
Gajjar, Kumar; and Nguyen, Anh, 5,146,574, Cl. 395-425.000
Nguyen, Hieu V.: *See—*
Cronch, Robert; Hertz, Mark D.; and Nguyen, Hieu V., 5,146,372, Cl. 360-51.000
Nguyen, Hoang K.; and Draina, Joseph M., to International Business Machines Corporation; and Motorola Inc. Molecular restricter. 5,145,493, Cl. 55-17.000
Niall, Hugh D.: *See—*
Hudson, Peter J.; Shine, John; Niall, Hugh D.; and Tregear, Geoffrey W., 5,145,962, Cl. 530-324.000.
Nichols, James D.; and Dickenson, John B., to Air Products and Chemicals, Inc. Polymeric diorganotin catalysts for use in polyurethane systems. 5,145,976, Cl. 556-88.000.
Nick, Edward V. Apparatus for selectively installing fasteners. 5,144,870, Cl. 81-434.000.
Nickerson, Gerald D.: *See—*
Hellon, Keith; and Nickerson, Gerald D., 5,145,273, Cl. 403-24.000
Nielsen, Kai H.; and Jensen, Frands E., to Haldor Topsoe A/S. Method and an apparatus for continuously purifying an oxygen-containing gas for combustible contaminants. 5,145,463, Cl. 432-180.000.
Niemitz, Matthias: *See—*
Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijai, Detlef, 5,145,758, Cl. 430-49.000
Nierhaus, Wolfgang: *See—*
Weber, Jurgen; Lappe, Peter; De Win, Werner; and Nierhaus, Wolfgang, 5,145,488, Cl. 44-363.000.
Nierlich, Franz: *See—*
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Nihon Den-Netsu Keiki Co., Ltd.: *See—*
Kondo, Kenshi, 5,145,055, Cl. 198-803.900.
Kondo, Kenshi, 5,145,100, Cl. 228-42.000.
Nihon Plast Co., Ltd.: *See—*
Nishijima, Kazuyoshi; Inaba, Kazuo; and Sugiyama, Tomokazu, 5,144,861, Cl. 74-552.000
Niibe, Masahito: *See—*
Iizuka, Takashi; Fukuda, Yasuaki; Hayashida, Masami; and Niibe, Masahito, 5,145,649, Cl. 422-129.000.
Niinaka, Koichi: *See—*
Yamada, Shinji; Kawamata, Akira; Imokawa, Genji; Masuda, Shinichi; Yamaguchi, Masakazu Niinaka, Koichi; and Joukura, Hiroko, 5,146,002, Cl. 568-337.00.
Niinomi, Mashahiko: *See—*
Ikeda, Hiroshi; Kishine, Nobuyuki Otani, Tsuyoshi; and Niinomi, Mashahiko, 5,146,381, Cl. 366-1.3.000.
Nikaido, Masataka: *See—*
Adachi, Tatsuya; Nagai, Kiyota a; Nakajima, Yasushi; Ueno, Takafumi; Ejima, Naoki; and Nikaido, Masataka, 5,146,448, Cl. 369-83.000
Nikon Corporation: *See—*
Sakamoto, Hiroshi; and Hagiuda, Nobuyoshi, 5,146,250, Cl 354-145.100.
Nilssen, Ole K. Controllable gas discharge lighting system. 5,146,139, Cl. 315-205.000
Nilssen, Ole K. Automotive-type storage battery with built-in charger. 5,146,149, Cl. 320-2.000
Nilsson, Robert T.: *See—*
Pyzik, Aleksander J.; and Nilsson, Robert T., 5,145,504, Cl 75-230.000
Nilsson, Torsten, to PLM AB. Process and apparatus for temperature conditioning a thermoplastic blank ,145,629, Cl. 264-292.000
Nippon Air Brake Co., Ltd.: *See—*
Tamamori, Hideo, 5,144,985, Cl. 1 7-627.500
Nippon CMK Corp.: *See—*
Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, 5,145,691, Cl. 425-110.000.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Takida, Hiroshi, and Iwanami, Teruo, 5,145,909, Cl. 525-57.000
Nippon Light Metal Company, Ltd.: *See—*
Nagata, Kouji; Sugita, Minoru; Kida, Keisuke; Watanabe, Toru; and Matsushita, Ken'yo, 5,146,07 7, Cl. 174-35.0MS.
Nippon Mining Co., Ltd.: *See—*
Tanaka, Kazuhiko, 5,146,003, Cl. 568-350.000.
Nippon Oil Co., Ltd.: *See—*
Kinoshita, Hirotugu; Sekiya, Makoto; and Mishima, Masaru, 5,145,591, Cl. 252-51.50R.
Takashima, Hiroyuki, 5,145,593, Cl. 252-56.00S
Nippon Oil and Fats Co., Ltd.: *See—*
Kurokawa, Koichi; and Hashimoto, Kenji, 5,146,044, Cl. 102-202.500
Nippon Sanso Kabushiki Kaisha: *See—*
Nishino, Seigou; Kawai, Masato; Ohno, Kiyoshi; Ito, Seiichi; and Itoh, Nobuyoshi, 5,144,945, Cl 28-205.120
Nippon Seiko Kabushiki Kaisha: *See—*
Takata, Hirotoshi; and Suzuki, Susumu, 5,145,267, Cl. 384-558.000
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Ishii, Tooru; Mitsui, Kiichiro; Sano, Kunio; and Inoue, Akira, 5,145,587, Cl. 210-759.000
Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, 5,145,657, Cl. 423-219.000.
Nippon Soken, Inc.: *See—*
Kojima, Akikazu; Miyoshi, Shinji; and Inagaki, Mitsuo, 5,144,798, Cl. 60-303.000.
Nippon Steel Corporation: *See—*
Yoshitomi, Yasunari; Suga, Yozo; Takahashi, Nobuyuki; Ushigami, Yoshiyuki; and Nakayama, Tadashi, 5,145,533, Cl. 148-111.000.
Nippon Telegraph and Telephone Company: *See—*
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Nippon Telegraph and Telephone Corporation: *See—*
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Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, 5,145,793, Cl. 437-5.000
Yamada, Tomoyuki; and Onoe, Seizo, 5,146,214, Cl. 340-825.030.
Nippon Television Network Corporation: *See—*
Sugimori, Yoshio; Kimata, Yoshihide; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,146,327, Cl. 358-141.000.
Nippon Thompson Co., Ltd.: *See—*
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Nippondenso Co., Ltd.: *See—*
Ito, Koichi; Asano, Hideo; and Higashihara, Akihito, 5,145,456, Cl. 454-75.000
Nishida, Kozi: *See—*
Anzai, Hisao; Sasaki, Isao; Nishida, Kozi; Makino, Hideaki; Ohtani, Masami; and Shimada, Katsuhiko, 5,146,535, Cl. 385-143.000
Nishida, Takao: *See—*
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Nishihara Environmental Sanitation Research Corporation Limited: *See—*
Okubo, Yasuhiro; and Itoh, Takashi, 5,145,589, Cl. 210-795.000.
Nishii, Hayato: *See—*
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio; Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000
Nishijima, Kazuyoshi; Inaba, Kazuo; and Sugiyama, Tomokazu, to Nihon Plast Co., Ltd. Steering wheel construction. 5,144,861, Cl 74-552.000
Nishikawa, Kunitoshi; and Sato, Kazuo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Low profile antenna for land mobile communications. 5,146,232, Cl. 343-713.000.
Nishikawa, Shinji: *See—*
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Nishikawa, Yasuo: *See—*
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Nishiki, Sadayuki: *See—*
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Nishimukai, Tadahiko: *See—*
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Nishimura, Takashi: *See—*
Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, 5,145,793, Cl. 437-5.000.
Nishimura, Tetsuharu: *See—*
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Nishino, Seigou; Kawai, Masato; Ohno, Kiyoshi; Ito, Seiichi; and Itoh, Nobuyoshi, to Nippon Sanso Kabushiki Kaisha. Portable oxygen-enriching air inhaler. 5,144,945, Cl. 128-205.120
Nishino, Shigetaka: *See—*
Takasugi, Hisashi; Nishino, Shigetaka; and Tanaka, Akito, 5,145,860, Cl. 514-365.000.
Nishino, Yukishige: *See—*
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Nishio, Shinji: *See—*
Kawamata, Taisuke; Maruyama, Toshio; Irie, Hidetaka; Inoue, Masayoshi; Nishio, Shinji; and Murayama, Koichi, 5,144,772, Cl. 51-105.0SP
Nishiura, Masanori: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000.
Nishiyama, Tamotsu: *See—*
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Nishiyama, Yoshihiro: *See—*
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Nissan Chemical Industries Ltd.: *See—*
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Nissan Motor Co., Ltd.: *See—*
Doi, Kazuhiro, 5,145,024, Cl. 180-312.000.
Hibi, Toshifumi, 5,144,850, Cl. 74-200.000.
Sugano, Kazuhiko, 5,144,866, Cl. 74-867.000
Tanigaito, Yasushi; and Maeda, Ryoji, 5,145,457, Cl. 454-147.000
Wakahara, Tatsuo, 5,145,045, Cl. 192-3.290.
Nisshin Flour Milling Co., Ltd.: *See—*
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Nisshinbo Industries, Inc.: *See—*
Sugie, Tosio; Yamada, Yoji; Kobori, Seiji; Hotta, Takaomi; and Serizawa, Yasuhiro, 5,144,731, Cl. 28-117.000.
Nitto Denko Corporation: *See—*
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Sakuramoto, Takafumi; Tominaga, Takashi; Takenoshita, Itsuroh; and Ashida, Megumi, 5,145,726, Cl. 428-195.000.
Nitto Kohki Co., Ltd.: *See—*
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Niwa, Tomomitsu, to Mitsubishi Denki K.K. Numerically controlled screw cutting method for fine screw surface finishing. 5,144,871, Cl. 82-1.110.
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Noakes, John E.: *See—*
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Jorneus, Lars, 5,145,371, Cl. 433-173.000.
Nobuo, Yamazaki: *See—*
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Noe, James B.: *See—*
Hendrix, John P., Jr.; Knox, Benjamin H.; London, Joe F., Jr.; and Noe, James B., 5,145,623, Cl. 264-103.000
Noguchi, Kazunari: *See—*
Shirai, Shoji; Miyamoto, Satoru; Noguchi, Kazunari; and Miyazaki, Masahiro, 5,146,133, Cl. 313-414.000
Noguchi, Kunio: *See—*
Miyashita, Yukio; Mifune, Hiroshi, Matsubara, Atsushi; and Noguchi, Kunio, 5,144,931, Cl. 123-682.000.
Noguchi, Yasuhiro; Takei, Kazuo; Funyu, Yukio; Mori, Yosuke; and Yasuda, Isao, to Hitachi, Ltd. Document editing apparatus which activates application programs in response to document data input. 5,146,553, Cl. 395-146.000.
Nohr, Ronald S.: *See—*
Potts, David C.; Young, George A.; Everhart, Dennis S.; MacDonald, J. Gavin; and Nohr, Ronald S., 5,145,727, Cl. 428-198.000
Nojima, Toshio; and Nishiki, Sadayuki, to Nippon Telegraph and Telephone Company. Impedance-matched, class F high-frequency amplifier. 5,146,178, Cl. 330-251.000
Nolan, Michael E.: *See—*
Scanderbeg, Dino; Wilkerson, William D.; Kenyon, Richard L.; and Nolan, Michael E., 5,144,801, Cl. 60-475.000
Nolan, Thomas J., Jr., to International Business Machines Corp. Implementing privilege on microprocessor systems for use in software asset protection. 5,146,575, Cl. 395-425.000.
Nolen, Edward F., Jr., to Air Kontrol, Inc. Trimmable range hood filter. 5,145,500, Cl. 55-501.000
Noma, Hiroyuki; and Saitou, Saneto, to Sumitomo Rubber Industries, Ltd. Radial tire which runs safe after a loss of tire pressure. 5,145,536, Cl. 152-209.0WT.
Nonogaki, Masaru: *See—*
Okada, Takashi; Ogawa, Masumi; Asano, Mitsuyasu; and Nonogaki, Masaru, 5,146,330, Cl. 358-167.000.
Nordica S.p.A.: *See—*
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Norenberg, Marye S.: *See—*
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Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 5,146,592, Cl. 395-157.000
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Carlson, Allan I., 5,146,356, Cl. 359-59.000
Duwaer, Arne L.; and Goldenberg, Jill F., 5,146,248, Cl. 353-122.000
Mukherjee, Satyendranath; Tsou, Len-Yuan; and Kuo, Di-Son, 5,146,426, Cl. 365-149.000.
Van Tol, Willem C., 5,146,142, Cl. 315-382.000.
North, William E.; Hultgren, Kent G.; Dishman, Christopher D.; and Van Heusden, Gary S., to Westinghouse Electric Corp. Gas turbine vane cooling air insert. 5,145,315, Cl. 415-115.000.
Northern Telecom Limited: *See—*
Markovic, Milan; and Shtulman, Alexander, 5,146,384, Cl. 361-55.000.
Reisman, Arnold; Temple, Dorota; and Turlik, Iwona, 5,145,714, Cl. 427-53.100
Searles, Shawn; and Kusyk, Richard G., 5,146,121, Cl. 307-603.000
Northey, William. Head and jaw actuation device. 5,145,445, Cl. 446-329.000
Northrop Corporation: *See—*
Carder, Bruce M., 5,146,287, Cl. 356-5.000.
McGrath, Patrick J., Jr., 5,145,297, Cl. 409-132.000
Notetry Limited: *See—*
Dyson, James, 5,145,499, Cl. 55-337.000
Novak, Carl V.: *See—*
Swikle, Todd G.; and Novak, Carl V., 5,146,620, Cl. 455-351.000
Novo Nordisk A/S: *See—*
Jakobsen, Palle; and Drejer, Jorgen, 5,145,870, Cl. 514-524.000
Novy, Vladimir A.; and Caballero, Ross C., to County Sanitation Districts of Los Angeles County. Composting system utilizing air recirculation. 5,145,581, Cl. 210-609.000
Nowack, Horste: *See—*
Mathiak, Friedrich; Krawietz, Arnold; Nowack, Horste; and Trautmann, Karl-Heinz, 5,144,844, Cl. 73-79.400
NSK Ltd.: *See—*
Yamaguchi, Mikio; and Matsumoto, Sakae, 5,144,855, Cl 74-493.000
NTC Technology, Inc.: *See—*
Apperson, Jerry R.; Knodle, Daniel W.; Labuda, Lawrence L.; Russell, James T.; and Bang, Gary M., 5,146,092, Cl. 250-343.000
Nukii, Takashi: *See—*
Yamamura, Keiji; Nukii, Takashi; and Nakabu, Shigeo, 5,146,301, Cl. 357-23.700
Numabe, Hideo; and Oshino, Genji, to Tohoku Ricoh Co., Ltd.; and Nitto Denko Corporation. Line-type thermal printing apparatus for printing on a sheet having different thicknesses. 5,146,238, Cl. 346-76.0PH.
Numako, Norio: *See—*
Kobayashi, Takeo; Nishida, Takao; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,146,259, Cl. 354-456.000
Nutec Manufacturing, Inc.: *See—*
Sandberg, Kenneth F.; and Mullikin, Jeffrey A., 5,145,454, Cl. 452-174.000
N.V. Bekaert S.A.: *See—*
Weedaeghe, Jozef; and Corteville, Marcel, 5,145,534, Cl 148-596.000
Nye, Susan A., to General Electric Company. Dihydroxy-meta-terphenyl polycarbonate. 5,145,939, Cl. 528-196.000
O-Motus, Inc.: *See—*
Luttrell, Tammy C.; and Crepeau, Eugene G., 5,144,943, Cl. 128-25.00B.
Obata, Hiroyuki; and Manabe, Sakae, to AMP Incorporated. Mounting device for components. 5,145,407, Cl. 439-567.000.
Obata, Mitsuyoshi; and Takagi, Noboru, to Kabushiki Kaisha Kobe Seiko Sho. Internal pressure explosion-proof system. 5,146,105, Cl 307-118.000
Obata, Takashi: *See—*
Haraga, Hisato; Inatomi, Yasutoshi; Obata, Takashi; Hashida, Mituaki; Uchiyama, Koichi; and Moriyama, Kenji, 5,144,702, Cl. 4-541.600
Obermeier, Josef: *See—*
Schulz, Reinhard; Neukirchen, Axel; and Obermeier, Josef, 5,145,237, Cl. 299-94.000
Obermueller, Herbert, to H. Krantz GmbH & Co. Apparatus for burning pollutants contained in a carrier flow. 5,145,362, Cl. 432-72.000
Obert, Hans-Joachim: *See—*
von Eichborn, Johann-Friedrich; Obert, Hans-Joachim; and Brzoska, Josef, 5,145,677, Cl. 424-85.500
O'Brien, James J.: *See—*
Shero, Eric J.; O'Brien, James J.; and Priddy, Duane B., 5,145,924 Cl. 526-225.000
O'Brien, Richard J.: *See—*
Myhre, Douglas C.; O'Brien, Richard J.; Pui, David Y. H.; and Tsai, Chuen-Jinn, 5,146,244, Cl. 359-509.000
Occidental Chemical Corporation: *See—*
Lesins, Viesturs, 5,145,971, Cl. 549-250.000
Ocean Torque Patent Pty. Ltd.: *See—*
Weldon, Jeffrey W., 5,144,904, Cl. 114-311.000
OCG Microelectronic Materials, Inc.: *See—*
Bassett, David R.; and Amstutz, Gary A., 5,145,763, Cl. 430-169.000
OCLC Online Computer Library Center, Incorporated: *See—*
Riley, Michael H., 5,146,267, Cl. 355-68.000.
O'Coin, James R.: *See—*
Burwell, Donald E.; Yanosy, James L.; Coates, Glen R.; and O'Coin, James R., 5,145,113, Cl. 239-102.200.
O'Connor, Carl G.: *See—*
Weideman, William E.; and O'Connor, Carl G., 5,146,512, Cl 382-30.000
Oda, Masaaki: *See—*
Toyoda, Nobuhiko; Mishina, Yoshihiko; Murata, Ryuji; Uozu, Yoshihiro; Oda, Masaaki; and Ishimaru, Teruta, 5,146,530, Cl 385-124.000
Odanaka, Yasushi: *See—*
Ookubo, Mitsumasa; Yaji, Tsuyoshi; Toizumi, Yasushi; Sasaki, Toyoji; Kato, Shigeru; Miyasaka, Tetsuo; Odanaka, Yasushi; Yamashaki, Masafumi; and Kodama, Shinichi, 5,146,071, Cl 250-201.200
Odessey, Richard: *See—*
Tubo, Ross A.; Schaeffer, Susan F.; Schermer, Alexander; and Odessey, Richard, 5,145,770, Cl. 435-1.000
Ogasawara, Hiroaki: *See—*
Shimada, Takafumi; Ogasawara, Hiroaki; Mori, Hidetaro; Omoto, Setsuo; Kobayashi, Kazuto; and Yamazaki, Takao, 5,145,255, Cl 366-329.000
Ogasawara, Nobuyoshi: *See—*
Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, 5,145,793, Cl. 437-5.000

Ogawa, Hideaki: *See—*
Takatsuna, Kazutoshi; Ishii, Masaaki; Ogawa, Hideaki; Shinohara, Akihito; Shiozawa, Kouji; Okumura, Yoshiharu; and Ishikawa, Masako, 5,145,979, Cl. 556-440.000.

Ogawa, Masumi: *See—*
Okada, Takashi; Ogawa, Masumi; Asano, Mitsuyasu; and Nonogaki, Masaru, 5,146,330, Cl. 358-167.000.

Ogawa, Toshio: *See—*
Kondo, Toshio; Ogawa, Toshio; Ishida, Kazunari; and Ueyama, Akihiro, 5,146,192, Cl. 333-164.000.

Ogawa, Yoshihiko: *See—*
Sugimori, Yoshio; Kimata, Yoshinide; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,146,327, Cl. 358-141.000.

Ogura, Kazumi: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi, Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000.

Ogura, Toshio; and Kuga, Masumi, to Hitachi, Ltd.; and Hitachi Nishin Electronics Co., Ltd. Magnetron having identically shaped strap rings separated by a gap and connecting alternate anode vane groups. 5,146,136, Cl. 315-39.690.

Oh, Keun-Yeong, to Samsung Electronics Co., Ltd. Kneading wing sensing apparatus of microwave oven for baking a bread. 5,145,252, Cl. 366-98.000.

O'Hara, Michael L., to Cordis Corporation. Doppler velocity measuring medical unit. 5,144,955, Cl. 128-6[illegible]2.060.

Ohashi, Akihiko: *See—*
Murano, Kanji; Sekiya, Tetsuo; Ohashi, Akihiko; and Ishida, Takehisa, 5,145,259, Cl. 384-1.00.

Ohata, Yosuke: *See—*
Tone, Eiichi; Ohata, Yosuke; and Hori, Kazuto, 5,146,275, Cl. 355-244.000.

Ohba, Akihiro: *See—*
Sadanobu, Jiro; Ohba, Akihiro and Nakamura, Tsutomu, 5,145,616, Cl. 264-29.200.

Ohga, Juro: *See—*
Fujii, Kensaku; Ohga, Juro; and Matsuda, Hiroyuki, 5,146,470, Cl. 375-103.000.

Ohi, Hiroyuki: *See—*
Suzuki, Tomio; and Ohi, Hiroyuki, 5,144,885, Cl. 92-222.000.

Ohi Seisakusho Co., Ltd.: *See—*
Aihara, Tsutomu; and Takeda, Akinuro, 5,144,849, Cl. 74-89.140.
Koura, Soushichi, 5,144,769, Cl. 49-360.000.

Ohishi, Yasutake: *See—*
Fujiura, Kazuo; Ohishi, Yasutake; Fujiki, Michiya; Kanamori, Terutoshi; and Takahashi, Shiro, 5,145,508, Cl. 65-3.120.

Ohmachi, Yoshiro: *See—*
Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, 5,145,793, Cl. 437-5.000.

Ohmori, Kenichi: *See—*
Momiyama, Fujio; Ohmori, Kenichi; Oku, Shinichi; and Katoh, Junichi, 5,145,466, Cl. 475-86.000.

Ohnishi, Hiroshi: *See—*
Ichikawa, Yasunori; Ohnishi, Hiroshi; Urabe, Shigeharu; Kojima, Akira; and Katoh, Akira, 5,145,738, Cl. 430-569.000.

Ohno, Kiyoshi: *See—*
Nishino, Seigou; Kawai, Masato; Ohno, Kiyoshi; Ito, Seiichi; and Itoh, Nobuyoshi, 5,144,945, Cl. 128-205.120.

Ohsasa, Hiroshi: *See—*
Nakazawa, Akira; and Ohsasa, Hiroshi, 5,145,147, Cl. 251-129.060.

Ohta, Hiroyuki, to Pioneer Electronic Corporation. Method of manufacturing a magnetic head with two canted gaps. 5,144,741, Cl. 29-603.000.

Ohta, Masahiro: *See—*
Yamaguchi, Keizaburo; Tanabe, Yoshimitsu; Urakami, Tatsuhiro; Yamaguchi, Akihiro; Yamaya, Norimasa; and Ohta, Masahiro, 5,145,949, Cl. 528-422.000.

Ohta, Yoshitaka: *See—*
Isoguchi, Seiichi; Tsuchida, Masaaki; Ohta, Yoshitaka; and Tamura, Tomoaki, 5,146,353, Cl. 358-909.000.

Ohtake, Shigeaki: *See—*
Hirota, Takato; Kogawa, Kuniyuki; and Ohtake, Shigeaki, 5,145,057, Cl. 200-243.000.

Ohtake, Yasuhide, to Toyo Tire & Rubber Co., Ltd. Apparatus for vulcanizing pneumatic tires. 5,145,68[illegible], Cl. 425-28.100.

Ohtani, Masami: *See—*
Anzai, Hisao; Sasaki, Isao; Nishida, Kozi; Makino, Hideaki; Ohtani, Masami; and Shimada, Katsuhiko, 5,146,535, Cl. 385-143.000.

Ohtsu, Shigenobu: *See—*
Yutori, Toshiaki; and Ohtsu, Shigenobu, 5,146,048, Cl. 174-36.000.

Ohtsu, Yutaka: *See—*
Tokubo, Kazo; Yamaguchi, Michihiro; Ohtsu, Yutaka; Nakamura, Kiyoshi; Matsumoto, Satoshi and Yamagishi, Akihiko, 5,145,578, Cl. 210-198.200.

Ohuchi, Akimicu: *See—*
Ito, Takashi; Iwasaki, Osamu; Ohuchi, Akimicu; Otomo, Koichiro; and Saito, Yoshiaki, 5,145,734, Cl. 428-229.000.

Oikawa, Ryuetsu, to Yazaki Corporation. Fuse holder construction. 5,145,414, Cl. 439-621.000.

Oishi, Kanji: *See—*
Sato, Katsuyuki; Nishimukai, Tadahiko; Uchiyama, Kunio; Aoki, Hirokazu; Hatano, Susumu; Oishi, Kanji; Fukuta, Hiroshi; Kikuchi, Takashi; and Saigou, Yasuhito, 5,146,573, Cl. 395-425.000.

Oishi, Kunio; and Aoi, Shuichi, to Kabushikikaisha Kibun & Kabushikikaisha Kibun Fudokemifa. Method of decomposing nucleic acids with a heat stable nuclease from *Trichoderma* or *Fusarium*. 5,145,780, Cl. 435-262.000.

Oka, Kengo, to Sumitomo Rubber Industries, Ltd. Golf ball. 5,145,180, Cl. 273-232.000.

Okabayashi, Takahiro: *See—*
Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000.

Okabe, Toshihiro: *See—*
Arai, Kiyokazu; Kawashima, Masatoshi; Yamagiwa, Akira; and Okabe, Toshihiro, 5,145,800, Cl. 437-51.000.

Okada, Akihiro; Kino, Tooru; and Tanaka, Katsumi, to Fujitsu Limited Multi-media response control system. 5,146,488, Cl. 379-88.000.

Okada, Keisuke; and Kimura, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Up/down counter for counting binary data stored in flip flops. 5,146,479, Cl. 377-41.000.

Okada, Masaki, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor integrated circuit having an oriented resistance pattern 5,146,113, Cl. 307-303.100.

Okada, Masayoshi: *See—*
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000.

Okada, Takashi; Ogawa, Masumi; Asano, Mitsuyasu; and Nonogaki, Masaru, to Sony Corporation. Apparatus and method for reducing noise in a video signal. 5,146,330, Cl. 358-167.000.

Okamoto, Hiroyuki; Hoshino, Kunio; Umemura, Masakazu; and Kitahara, Sayoko, to Yazaki Corporation. Noise suppressing connector. 5,145,413, Cl. 439-620.000.

Okamura, Hisashi; and Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,145,765, Cl. 430-264.000.

Oki Electric Industry Co., Ltd.: *See—*
Matsumi, Koji, 5,145,810, Cl. 437-228.000.
Ugawa, Akira; and Takizawa, Toshio, 5,146,068, Cl. 235-441.000.

Oki, Youji: *See—*
Kamiyama, Hideyuki; Sasaki, Masahiro; and Oki, Youji, 5,146,162, Cl. 324-166.000.

Okonogi, Hirotaka: *See—*
Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, 5,145,691, Cl. 425-110.000.

Okoshi, Takanori; and Yamashita, Shinji, to Furukawa Electric Co., Ltd., The; Okoshi, Takanori; and Yamashita, Shinji. Double-stage phase-diversity receiver. 5,146,359, Cl. 359-189.000.

Oku, Kimio. Optical instrument for producing artificial rainbows. 5,146,364, Cl. 359-615.000.

Oku, Shinichi: *See—*
Momiyama, Fujio; Ohmori, Kenichi; Oku, Shinichi; and Katoh, Junichi, 5,145,466, Cl. 475-86.000.

Okubo, Hideo: *See—*
Matsuyo, Tadashi; Kimura, Masahiro; Okubo, Hideo; Yamaguchi, Seiji; Kawakami, Hiroshi; and Moro, Masaru, 5,144,715, Cl. 15-319.000.

Okubo, Isao, to ITT Corporation. Card connector with ejector 5,145,389, Cl. 439-159.000.

Okubo, Yasuhiro; and Itoh, Takashi, to Nishihara Environmental Sanitation Research Corporation Limited. Solid-liquid separator and process for washing the same. 5,145,589, Cl. 210-795.000.

Okumura, Ichiro: *See—*
Tamura, Masahisa; and Okumura, Ichiro, 5,146,129, Cl. 310-323.000.

Okumura, Yoshiharu: *See—*
Takatsuna, Kazutoshi; Ishii, Masaaki; Ogawa, Hideaki; Shinohara, Akihito; Shiozawa, Kouji; Okumura, Yoshiharu; and Ishikawa, Masako, 5,145,979, Cl. 556-440.000.

Oldham, Terry L., to Hammer Metals Company, Inc. Apparatus for facilitating the spraying of articles. 5,145,526, Cl. 118-319.000.

Olin Corporation: *See—*
Rooney, James F., 5,144,709, Cl. 7-335.000.
Shen, Ming; and Wojtowicz, John A., 5,146,011, Cl. 568-844.000.

Oliver, Lynn M.: *See—*
Beck, James L.; Booth, James R.; Cole, Carl P.; Oliver, Lynn M.; Spina, Warren J.; and Troyer, Stephen R., 5,146,547, Cl. 395-116.000.

Olschansky, Brad; Lee, Raymond H., Jr.; and Olschansky, Scott. Total body exercising apparatus. 5,145,479, Cl. 482-62.000.

Olschansky, Scott: *See—*
Olschansky, Brad; Lee, Raymond H., Jr.; and Olschansky, Scott, 5,145,479, Cl. 482-62.000.

Olsen, John H.: *See—*
Hashish, Mohamed A.; Olsen, John H.; Zarin, Katherine J.; and Erichsen, Glenn A., 5,144,766, Cl. 51-439.000.

Olson, Donald T.: *See—*
Khan, Muhammad A.; VanHove, James M.; and Olson, Donald T., 5,146,465, Cl. 372-45.000.

Olson, Stephen C., to Bird-Johnson Company. Flange-mounted controllable pitch marine propeller. 5,145,318, Cl. 416-167.000.

Olson, Walter H., to Medtronic, Inc. Dual chamber rate responsive pacemaker with automatic mode switching. 5,144,949, Cl. 128-419.0PG.

Olympus Optical Co., Inc.: *See—*
Nagano, Chikara, 5,146,363, Cl. 359-363.000.

Olympus Optical Co., Ltd.: *See—*
Ookubo, Mitsumasa; Yaji, Tsuyoshi; Toizumi, Yasushi; Sasaki, Toyoji; Kato, Shigeru; Miyasaka, Tetsuo; Odanaka, Yasushi, Yamashaki, Masafumi; and Kodama, Shinichi, 5,146,071, Cl. 250-201.200.
Toma, Tomohide, 5,146,070, Cl. 235-475.000.
Uenishi, Nobuaki; Nagayoshi, Mitsugu; Miyanaga, Hirofumi; Sato, Tomoaki; Sakiyama, Katsunori; Ueda, Yasuhiro; and Adachi, Hideyuki, 5,144,848, Cl. 73-866.500.

Omalia, Michael. Self controlled safety descent retarder. 5,145,036, Cl. 188-65.500.

Omelete, Ogbemi O.: *See—*
Jenny, Mark A.; and Omelete, Ogbemi O., 5,145,908, Cl. 524-827.000.

Omnisec A.G.: *See—*
Maurer, Ueli, 5,146,500, Cl. 380-30.000.

Omoto, Setsuo: *See—*
Shimada, Takafumi; Ogasawara, Hiroaki; Mori, Hidetaro; Omoto, Setsuo; Kobayashi, Kazuto; and Yamazaki, Takao, 5,145,255, Cl. 366-329.000.

Omron Corporation: *See—*
Matsuoka, Yasushi; Matsumoto, Akio; Kanda, Yoshimi; Endo, Hirofumi; Ajioka, Tsutomu; and Motouji, Satoshi, 5,146,107, Cl. 307-253.000.

Omron Tateisi Electronic Co.: *See—*
Imanaka, Koichi; and Sato, Fumihiko, 5,146,295, Cl. 357-4.000.

Omure, Yukio; Kitano, Keisuke; and Hanatani, Naoyoshi, to Daikin Industries, Ltd. Blowing compositions. 5,145,606, Cl. 252-350.000.

Ondra, Jay D.; and Riopel, Paul R., to Zenith Electronics Corporation. Faceplate stress-relief in tension mask color cathode ray tube manufacture. 5,145,437, Cl. 445-45.000.

1-2-3 Training Systems, Ltd.: *See—*
Tarvin, Diana J.; and Goerne, Ronald E., 5,145,377, Cl. 434-219.000.

O'Neil, Walter K.: *See—*
Zumbusch, Steven J.; and O'Neil, Walter K., 5,145,329, Cl. 417-356.000.

Onishi, Sei: *See—*
Morikawa, Kiyoshi; Kurokawa, Atsushi; Onishi, Sei; Kajihara, Kiyohito; Takemasa, Kaoru; and Kitazawa, Osamu, 5,145,039, Cl. 188-298.000.

Ono, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Data transfer checking system. 5,146,458, Cl. 371-21.200.

Ono, Yoshiaki, to Tokyo Electric Co., Ltd. Tag printer. 5,146,239, Cl. 346-76.0PH.

Onoe, Seizo: *See—*
Yamada, Tomoyuki; and Onoe, Seizo, 5,146,214, Cl. 340-825.030.

Oohara, Takahiko; Ohmachi, Yoshiro; Kadota, Yoshiaki; Mitsui, Kotaro; Ogasawara, Nobuyoshi; and Nishimura, Takashi, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Telegraph and Telephone Corporation. Manufacturing a gallium arsenide solar cell on a silicon substrate. 5,145,793, Cl. 437-5.000.

Oohori, Masae: *See—*
Morishita, Shinya; Suzuki, Kenichi; Oohori, Masae; and Nakada, Masahiko, 5,146,169, Cl. 324-438.000.

Ooijman, Jan: *See—*
Van Keulen, Eduard; and Ooijman, Jan, 5,146,189, Cl. 331-158.000.

Ookie, Yukio, to Yazaki Corporation. Externally adjustable stopper plate in a cross-coil type meter. 5,146,158, Cl. 324-146.000.

Ookubo, Mitsumasa; Yaji, Tsuyoshi; Toizumi, Yasushi; Sasaki, Toyoji; Kato, Shigeru; Miyasaka, Tetsuo; Odanaka, Yasushi; Yamashaki, Masafumi; and Kodama, Shinichi, to Olympus Optical Co., Ltd. Optical lens system-driving control apparatus for microscopically driving a plurality of lens groups. 5,146,071, Cl. 250-201.200.

Oosterkamp, Willem J., to General Electric Company. RPV housed ATWS poison tank. 5,145,638, Cl. 376-282.000.

Ootera, Hiroki; and Tsuda, Mutsumi, to Mitsubishi Denki Kabushiki Kaisha. Plasma processor. 5,146,138, Cl. 315-111.210.

Ootsuka, Shigeru: *See—*
Saneshige, Ryoji; and Ootsuka, Shigeru, 5,145,266, Cl. 384-322.000.

Opheij, Willem G., to U.S. Philips Corporation. Planar optical scanning head with concentric diffraction gratings. 5,146,080, Cl. 250-216.000.

Oppenlaender, Knut; Schwen, Roland; Baur, Richard; Gousetis, Charalampos; Mohr, Juergen; and Mach, Helmut. Preparation of highly viscous adducts of butylene oxide with alcohols. 5,145,948, Cl. 528-409.000.

Opta Food Ingredients, Inc.: *See—*
Stark, Leonard E.; and Gross, Akiva T., 5,145,702, Cl. 426-531.000.

Optical Measurement Technology Development Co., Ltd.: *See—*
Hirata, Takaaki, 5,145,792, Cl. 437-129.000.

Optima Industries, Inc.: *See—*
Marantette, William F., 5,145,298, Cl. 409-135.000.

Orbisphere Laboratories Neuchatel SA: *See—*
Hale, John M.; and Weber, Eugen, 5,144,831, Cl. 73-19.050.

Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasahima, Hirokazu, to Hitachi, Ltd. System for recognizing program constitution within a distributed processing system by collecting constitution messages generated by different processors. 5,146,559, Cl. 395-200.000.

Orimoto, Masaaki; and Harase, Toshikatsu, to Fuji Photo Film Co., Ltd. Device for loading and unloading a memory cartridge using a sliding member. 5,146,069, Cl. 235-475.000.

Ork Corporation: *See—*
Koizumi, Kazuo, 5,145,673, Cl. 424-76.100.

Ormco Corporation: *See—*
Farrokh, Farzin-Nia; and Pettigrew, Richard W., 5,145,365, Cl. 433-8.000.

Orner, Robert E.; Cassarino, Aurelio V.; and Sepso, Roger P., to Robertshaw Controls Company. Control device having a shape memory wire, refrigerator system utilizing the control device and methods of making the same. 5,144,813, Cl. 62-187.000.

Orwig, Gary W.: *See—*
Calloway, Jack D.; Holzer, Raymond F., Matheny, Stephen E.; and Orwig, Gary W., 5,146,404, Cl. 364-401.000.

Oryx Energy Company: *See—*
Dees, John M.; Begnaud, William J.; and Sahr, Nancy L., 5,145,013, Cl. 166-295.000.

Osaka Gas Company Limited: *See—*
Kyutoku, Hirofumi; Yamamoto, Kouichi; and Otani, Yoshihisa, 5,145,732, Cl. 428-36.100.

Oscar Mayer Foods Crporation: *See—*
Anderson, James E.; Skaar, Gary R.; Bernthal, Paul H.; and Gundlach, Larry C., 5,145,453, Cl. 452-142.000.

Oshino, Genji: *See—*
Numabe, Hideo; and Oshino, Genji, 5,146,238, Cl. 346-76.0PH.

Oskar Dilo Maschinenfabrik KG: *See—*
Dilo, Johann P., 5,144,730, Cl. 28-109.000.

Ota, Miho; and Masaki, Naoki, to Pioneer Electronic Corporation. Disc player having automatic disc ejection, and method of providing same 5,146,446, Cl. 369-77.200.

Otani, Tsuyoshi: *See—*
Ikeda, Hiroshi; Kishine, Nobuyuki; Otani, Tsuyoshi; and Ninomi, Mashahiko, 5,146,381, Cl. 366-133.000.

Otani, Yoshihisa: *See—*
Kyutoku, Hirofumi; Yamamoto, Kouichi; and Otani, Yoshihisa, 5,145,732, Cl. 428-36.100.

Otis Elevator Company: *See—*
Garrido, Alphonso; Sanchez, Antonio; Sandoval, Jose M.; and Sevilleja, Jose, 5,145,035, Cl. 187-20.000.
Powell, Bruce A.; and Williams, John N., 5,146,053, Cl. 187-127.000.

Otis Engineering Corporation: *See—*
Boyle, Colin S., 5,145,228, Cl. 294-86.250.
Dollison, William W., 5,145,005, Cl. 166-334.000.

Otomo, Koichiro: *See—*
Ito, Takashi; Iwasaki, Osamu; Ohuchi, Akimicu; Otomo, Koichiro, and Saito, Yoshiaki, 5,145,734, Cl. 428-229.000.

Otsuka Pharmaceutical Company, Limited: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, administrator; Takada, Kaoruko, administrator; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,145,865, Cl. 514-424.000.

Otterholm, Bengt; and Walba, David M., to University of Colorado Foundation Inc., The. Ferroelectric liquid crystals with nicotinic acid cores. 5,145,601, Cl. 252-299.610.

Ou-Yang, David T., to Minnesota Mining and Manufacturing Company. Pressure-activated adhesives. 5,145,929, Cl. 526-338.000.

Ou, Yang-Meng: *See—*
Gong, Ke-Cheng; Ou, Yang-Meng; and Yeh, Gregory S., 5,145,888, Cl. 523-156.000.

Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation Apparatus for multi-stage regeneration of catalyst in a bubbling bed catalyst regenerator and side mounted fast fluidized bed regenerator 5,145,654, Cl. 422-190.000.

Owens-Corning Fiberglas Corporation: *See—*
Clifford, Graham F.; Turner, James K.; and Spurrier, Mack W., 5,145,527, Cl. 118-411.000.

Owens, Valerie: *See—*
Huff, Robert O.; Jordan, Paul T.; and Owens, Valerie, 5,145,194, Cl. 279-62.000.

Oxman, Joel D.; and Boardman, Larry D., to Minnesota Mining and Manufacturing Company. Radiation activated hydrosilation reaction. 5,145,886, Cl. 522-66.000.

Oy Tampella AB: *See—*
Hautala, Jouko, 5,145,072, Cl. 209-273.000.

Oy Wartsila Diesel International Ltd.: *See—*
Paro, Daniel, 5,144,924, Cl. 123-275.000.

Oyafuso, Harry H., to Ford Motor Company. Automatic retention adjustment of motor armature assembly. 5,144,738, Cl. 29-596.000.

Oyamada, Shinji: *See—*
Fujiyama, Hiroyuki; Kuroiwa, Kouichi; Nishikawa, Shinji; Shimura, Hidetoshi; and Oyamada, Shinji, 5,146,595, Cl. 395-725.000.

Ozaki, Yoshikazu: *See—*
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Fischer, Melchior; and Lang, Helmut, 5,145,653, Cl. 422-186.180.

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Cares, Paul, 5,145,475, Cl. 482-52.000.

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Pace Incorporated: *See—*
Brown, Robert G.; Faygenblat, Edward; Quasney, Robert S.; Cardno, Charles M.; and Siegel, William J., 5,145,101, Cl. 228-51.000.

Pacione, Joseph R., to Tac-Fast Systems SA. Anchor board system. 5,144,786, Cl. 52-747.000

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Valenta, Robert J.; and Noakes, John E., 5,146,093, Cl. 250-362.000

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Voges, Klaus-Peter; Habich, Dieter; Hansen, Jutta; and Paessens, Arnold, 5,145,951, Cl. 530-330.000.

Page, Edward J.: *See—*
Kraus, Kenneth; and Page, Edward J., 5,144,770, Cl. 49-360.000.

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Liang, Septimus H.; Harrison, Brian H.; and Pagotto, Jack G., 5,145,820, Cl. 502-401.000.

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Naidu, Harish K.; Lennon, Thomas E.; Williamson, Mike R.; and Pai, Sunil, 5,146,580, Cl. 395-425.000.

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De, Bibhas R.; Nelson, Michael A.; and Pande, Kiran K., 5,146,086, Cl. 250-253.000.

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Mika, Anton L.; and Levin, Robert F., 5,144,989, Cl. 140-93.200

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Rosen, Arnold M., 5,145,304, Cl. 4 4-228.000.

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Worley, Joe C.; Parker, Dale K.; Campo, Manuel; and Camden, Jerry W., 5,145,218, Cl. 285-243.000

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Scanderbeg, Dino; Wilkerson, William D.; Kenyon, Richard L.; and Nolan, Michael E., 5,144,80 Cl. 60-475.000.

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Parra, Jorge M. Method and apparatus for detecting intrusion into a body of water. 5,146,208, Cl. 340-573.000.

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Lampe, Donald R.; Sinharoy, Samir; Wu, Shu Y.; Buhay, Harry; Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S. Visvanathan, 5,146,299, Cl. 357-23.500

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Daimer, Johann; and Paschke, Hartmut, 5,145,803, Cl. 501-15.000

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Kimura, Hiroshi; and Pastor, Ricardo C., 5,146,468, Cl. 372-59.000.

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Patilla, Richard G., to Rolls-Royce plc. Engine nacelle. 5,145,126, Cl. 244-53.00B.

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Hetzel, Joseph R.; and Virgins, Kenneth L., 5,144,776, Cl. 52-92.000.

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Aswal, Bacchan S.; Chander, Ramesh; Chatterji, Sunil K.; Dhawan, Bhola N.; Dwivedi, Yogesh; Garg, Narendra K.; Jain, Poonam; Kapoor, Narinder K.; Kulshreshtha, Dinesh K.; Mehrotra, Bishan N.; Patnaik, Gyanendra K.; Rastogi, Ravi; Sarin, Jagat P. S.; Saxena, Krishna C.; Sharma, Shekhar C.; Sharma, Shri K.; Shukla, Binduja; and Visen, Pradeep K. S., 5,145,955, Cl. 536-124.000.

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Pelrine, Bruce P.: *See—*
Beck, Jeffrey S.; Calabro, David C.; McCullen, Sharon B.; Pelrine, Bruce P.; Schmitt, Kirk D.; and Vartuli, James C., 5,145,816, Cl. 502-60.000
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Pendar Industries: *See—*
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Pennebaker, Ashley; Picht, Duane R.; and Purkapile, Emerson, to Chicago Electrical Tool Company, Inc. Sliding latch lock. 5,145,221, Cl. 292-175.000.

Pent Corporation, The: *See—*
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Perchonock, Carl D.: *See—*
Adams, Jerry L.; Bender, Paul E.; Gleason, John G.; Hanna, Nabil; Newton, John F., Jr.; Perchonock, Carl D.; and Razgaitis, Kazys, 5,145,858, Cl. 514-318.000.

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Savino, James J.; Rotolico, Anthony J.; Spaulding, Mark F.; and Goering, Richard A., 5,145,293, Cl. 406-193.000.

Perkins, David J., to Chrysler Corporation. Stamped wheel support bracket for vehicle suspension. 5,145,204, Cl. 280-668.000.

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Perlmutter, Thom M., to Bennett, Edward M. Dispensing closure for squeeze bottle. 5,145,094, Cl. 222-153.000.

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Persson, Anders, to ABB Flakt AB. Method for controlling the supply and the discharge of hot air to and from, respectively, a blowing tunnel. 5,144,754, Cl. 34-29.000

Peter, Walter; Hruschka, Anton; and Hoglinger, Oskar, to Lenzing Aktiengesellschaft. Chlorine-free bleaching method for dissolving-grade pulps using an OP-Z-P sequence. 5,145,557, Cl. 162-40.000.

Peterson, LuVerne R.; and Flora, Laurence P., to Unisys Corporation. Digital adder having a high-speed low-capacitance carry bypass signal. 5,146,424, Cl. 364-786.000.

Peterson, Timothy D. Decoy with wind-actuated wings. 5,144,764, Cl. 43-3.000

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Petroff, Lenin J.; Romenesko, David J.; and Bahr, Bradley C., to Dow Corning Corporation. Postemergent herbicide compositions containing acetoxy-terminated silicone glycol and dispersant. 5,145,977, Cl. 556-437.000

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Hubsch, Walter; Angerbauer, Rolf; Fey, Peter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Gunter, 5,145,959, Cl. 544-279.000

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Pfaff, Donald P.; Kapsokavathis, Nick S.; and Parks, Natalie A., to General Motors Corporation. Method for actively attenuating engine generated noise. 5,146,505, Cl. 381-71.000

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Counts, Mary E.; Hajaligol, Mohammad R.; Morgan, Constance H.; Smith, Ulysses; Sprinkel, Francis M.; and Utsch, Francis V., 5,144,962, Cl. 131-194.000
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Demain, Barbu A., 5,144,964, Cl. 131-275.000
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Pick, James; Cooper, Robert; and Donner, Richard, to Eaton Corporation. Pilot operated electrically actuated value assembly. 5,145,145, Cl. 251-30.030.

Pickart, Loren R., to ProCyte Corporation. Methods and compositions for healing ulcers. 5,145,838, Cl. 514-18.000.

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Martignoni, Fabrizio; Diazzi, Claudio; Pidutti, Albino; and Vio, Fabio, 5,146,109, Cl. 307-270.000

Piejak, Robert B.; Godyak, Valery A.; and Alexandrovich, Benjamin M., to GTE Products Corporation. Method and apparatus to reduce Hg loss in rf capacitively coupled gas discharges. 5,146,140, Cl. 315-248.000

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Piepenbrock Pyrotechnik GmbH: *See—*
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Pierce, Kerry M.: *See—*
Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Hsue, James S., 5,146,306, Cl. 357-41.000

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Pierret, Peter G.: *See—*
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Pinckney, Keith T.; Seabold, Thomas W.; and Faust, Michael C., to Minnesota Mining and Manufacturing Company. Tape handle for carrying boxes. 5,145,108, Cl. 229-117.260.

Pinkston, Rodney G. Auxiliary power unit test kit. 5,146,160, Cl. 324-158.00R.

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Piretti, Carl P.: *See—*
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Jachmann, Emil F.; and Sweet, Alan F., 5,146,439, Cl. 369-25.000.

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Plastiques RG: *See—*
Goujon, Daniel, 5,145,088, Cl. 220-355.000.

Plesinger, Boris, to Compaq Computer Corporation. LCD system with a backlight having a light source at a light pipe's edge and with the LCD enframed. 5,146,354, Cl. 359-48.000.

Pless, Janos: *See—*
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Plies, Erich, to Siemens Aktiengesellschaft. Particle beam apparatus having an immersion lens arranged in an intermediate image of the beam. 5,146,090, Cl. 250-310.000.

PLM AB: *See—*
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Plyler, Robert G.; and Senk, Joseph M., to General Motors Corporation. Electrical connector. 5,145,402, Cl. 439-459.000.

Pocknell, David: *See—*
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Poirier, Jean-Marie: *See—*
Chabardes, Pierre; Duhamel, Lucette; Duhamel, Pierre; Guillemont, Jerome; and Poirier, Jean-Marie, 5,145,972, Cl. 549-221.000.

Poirier, Norbert, to Serimer, Societe a Responsabilite Limitee. Mechanical system for automatically guiding one or more electrodes in an arc-welding unit. 5,146,064, Cl. 219-124.340.

Poisel, Hans: *See—*
Buehler, Wolfhardt; Poisel, Hans; and Trommer, Gert, 5,146,292, Cl. 356-350.000.

Poister, Clarence E. Flexible strand or hose caddy. 5,145,122, Cl. 242-85.100.

Polis, Morris. Automatic antifreeze back-up valve for sewer. 5,144,975, Cl. 137-392.000.

Polk, James D. Adjustable workpiece holding system. 5,145,157, Cl. 269-266.000.

Pollard, David D.; and Bailey, Mark W., to Westinghouse Electric Corp. Segmented core inductor. 5,146,198, Cl. 336-178.000.

Polysar Rubber Corporation: *See—*
Drope, David L., 5,144,832, Cl. 73-54.150.

Polzin, R. Stephen: *See—*
Evans, Michael B.; Lin, Rueysen; Rost, Brian F.; and Polzin, R. Stephen, 5,146,564, Cl. 395-250.000.

Pometto, Anthony L., III; and Lee, Byungtae, to Iowa State University Research Foundation, Inc. Process of biodegradation of high molecular weight polyethylene by aerobic lignolytic microorganisms. 5,145,779, Cl. 435-262.000.

Pope, Adam N., to General Electric Company. Hydro-lift dynamic circumferential seal. 5,145,189, Cl. 277-3.000.

Porta Systems Corp.: *See—*
Tabone, Peter P., 5,146,525, Cl. 385-78.000.

Posly, Louis M. Adjustable table. 5,144,898, Cl. 108-148.000.

Postal Buddy Corporation: *See—*
Goodman, Sidney R., 5,146,403, Cl. 364-401.000.

Potter & Brumfield, Inc.: *See—*
Learned, Edward B., 5,146,386, Cl. 361-91.000.

Potter, William R.: *See—*
Dougherty, Thomas J.; Potter, William R.; and Weishaupt, Kenneth R., 5,145,863, Cl. 514-4[illegible]0.000.

Pottratz, David G.: *See—*
Culbreth, William K., III; Pottratz, David G.; Su, Wei-Yang; Sheu, Yu-Hwa E.; and Naylor, Carter J., 5,145,563, Cl. 203-64.000.
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,145,561, Cl. 203-51.000.

Potts, David C.; Young, George A.; Everhart, Dennis S.; MacDonald, J. Gavin; and Nohr, Ronald S., to Kimberly-Clark Corporation. Multilayer nonwoven composite structure. 5,145,727, Cl. 428-198.000.

Pourtau, Jean-Jacques; and Pourtau, Thierry, to Societe Anonyme. Profiled strip adapted to be used when laying tilings or other surface coverings. 5,144,778, Cl. 52-254.000.

Pourtau, Thierry: *See—*
Pourtau, Jean-Jacques; and Pourtau, Thierry, 5,144,778, Cl. 52-254.000.

Powell, Bruce A.; and Williams, John N., to Otis Elevator Company. Elevator dispatching based on remaining response time. 5,146,053, Cl. 187-127.000.

Pratt, Richard D., to General Electric Company. Crossover mold tool for consolidating composite material. 5,145,621, Cl. 264-102.000.

Preisegger, Ewald; Scholten, Wolfgang; and Muller, Thomas, to Hoechst Aktiengesellschaft. Filler for sensor systems of temperature-sensitive displacement pickups. 5,146,016, Cl. 570-134.000.

Preiss, Holger: *See—*
Lund, Klaus; and Preiss, Holger, 5,145,731, Cl. 482-35.400.

Premark FEG Corporation: *See—*
Whitby, Michael A.; Ratermann, Philip A.; and Bowling, Kinred, 5,144,787, Cl. 53-66.000.

President & Fellows of Harvard College: *See—*
Tabor, Stanley; and Richardson, Charles C., 5,145,776, Cl. 435-91.000.

Preuss, Klaus-Peter: *See—*
Hinzpeter, Jurgen; Schmidt, Ingo; Behrmann, Heinrich; Reitberger, Jorg; and Preuss, Klaus-Peter, 5,145,693, Cl. 425-149.000.

Priddy, Duane B.: *See—*
Shero, Eric J.; O'Brien, James J.; and Priddy, Duane B., 5,145,924, Cl. 526-225.000.

Prieto, Nelson E.: *See—*
Rodriguez, Manual S.; and Prieto, Nelson E., 5,145,597, Cl. 252-135.000.

Primo Microphones, Inc.: *See—*
Beckman, Alfred J., 5,146,490, Cl. 379-113.000.

Prince, Andrew P.: *See—*
Altham, David R.; and Prince, Andrew P., 5,146,544, Cl. 395-115.000.

Prince Corporation: *See—*
Park, Sung-Taek, 5,145,059, Cl. 200-527.000.

Prince, John C.; and Farrell, James F., to Litton Systems Canada Limited. Transflective mode liquid crystal display with phosphor illumination. 5,146,355, Cl. 359-50.000.

Proctor & Gamble Co., The: *See—*
Lukacovic, Michael F.; and Majeti, Satyanarayana, 5,145,666, Cl. 424-52.000.

ProCyte Corporation: *See—*
Pickart, Loren R., 5,145,838, Cl. 514-18.000.

Progesan SRL: *See—*
Rossi, Guido, 5,145,351, Cl. 425-80.100.

Protex International Corp.: *See—*
Keifer, Terry A.; and Yeager, Larry R., 5,146,205, Cl. 340-568.000.

Protoned B.V.: *See—*
Heine, Klaus A.; and Fischer, Uwe, 5,144,888, Cl. 108-64.000.

Pruksarnukul, Josefina L.: *See—*
Gillberg-LaForce, Gunilla E.; and Pruksarnukul, Josefina L., 5,145,928, Cl. 526-313.000.

Prunier, Arthur R., Jr.; Spangenberg, Stanley F.; and Wijeyesekera, Sunil, to Dow Chemical Company, The. Method for producing ceramic bodies. 5,145,833, Cl. 505-1.000.

Puccinelli, Joseph S.; Foseid, Peter T.; and Karlsen, Stig, to Figgie International, Inc. Mason's scaffold. 5,145,032, Cl. 182-142.000.

Pugach, Joseph: *See—*
Salek, Jeffrey S.; Pugach, Joseph; Elias, Carole L.; and Cullo, Leonard A., 5,146,012, Cl. 568-881.000.

Pui, David Y. H.: *See—*
Myhre, Douglas C.; O'Brien, Richard J.; Pui, David Y. H.; and Tsai, Chuen-Jinn, 5,146,244, Cl. 359-509.000.

Pujol Y Tarrago, S.A.: *See—*
Roca, Agustin, 5,144,856, Cl. 74-501.50R.

Purkapile, Emerson: *See—*
Pennebaker, Ashley; Picht, Duane R.; and Purkapile, Emerson, 5,145,221, Cl. 292-175.000.

Purolator Products Company: *See—*
Padden, James B., 5,145,729, Cl. 428-220.000.

Purves, Lloyd R., to United States of America, National Aeronautics & Space Administration. Robot serviced space facility. 5,145,130, Cl. 244-159.000.

Pyke, John A., to Molins PLC. Adhesive testing device. 5,144,845, Cl. 73-827.000.

PYR Systems, Inc.: *See—*
Brooks, William M., 5,146,358, Cl. 359-181.000.

Pyzik, Aleksander J.; and Nilsson, Robert T., to Dow Chemical Company, The. Boron carbide-copper cermets and method for making same. 5,145,504, Cl. 75-230.000.

Quadflieg, Erich; and Heestermans, Martinus C. J., to Mannesmann Aktiengesellschaft Wavin B.V. Method and apparatus for applying a metallic coating to threaded end sections of plastic pipes and resulting pipe. 5,145,710, Cl. 427-34.000.

Quam, David J.: *See—*
Halpin, John M.; and Quam, David J., 5,145,523, Cl. 106-287.240.

Quandt, Siegfried: *See—*
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Quantum Chemical Corporation: *See—*
Buehler, Charles K.; and Masino, Albert P., 5,145,821, Cl. 502-119.000.

Quasney, Robert S.: *See—*
Brown, Robert G.; Faygenblat, Edward; Quasney, Robert S.; Cardno, Charles M.; and Siegel, William J., 5,145,101, Cl. 228-51.000.

Quick, James: *See—*
Driedger, Paul E.; and Quick, James, 5,145,842, Cl. 514-63.000.

Quick, Nathaniel R. Converting ceramic materials to electrical conductors and semiconductors. 5,145,741, Cl. 428-402.000.

Quinn, Michael: *See—*
McKown, Russel; Yelderman, Mark; and Quinn, Michael, 5,146,414, Cl. 364-510.000.

Quintile, Mark J.; and Curran, Neal J., to Invacare Corporation. Suspension for seat of powered wheel chair. 5,145,020, Cl. 180-65.100.

Rabii, Khosro M.: *See—*
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Radford, Kenneth C.: *See—*
Lampe, Donald R.; Sinharoy, Samar; Wu, Shu Y.; Buhay, Harry; Gurkovich, Stephen R.; Partlow, Deborah P.; Radford, Kenneth C.; Freidhoff, Carl B.; Charles, Robert G.; Francombe, Maurice H.; and Krishnaswamy, S. Visvanathan, 5,146,299, Cl. 357-23.500.

Radiall *See—*
Maillot, Gerard, 5,146,523, Cl. 385-60.000.

Radice, Anthony M.: *See—*
Westerfer, Richard; Robbins, Clyde; and Radice, Anthony M., 5,146,496, Cl. 380-15.000.

Raines, Richard D.: *See—*
Hulett, Jeffrey M.; Murff, James D.; and Raines, Richard D., 5,145,284, Cl. 405-232.000.

Rajewski, Robert K. Detonation arrestor. 5,145,360, Cl. 431-346.000.

Rak, Janusz: *See—*
Bartelt, Dietrich; Guskov, Valery; Kozachevskiy, Gennadiy; Rak, Janusz; and Schneck, Walter, 5,145,188, Cl. 474-153.000.

Raman, L. Venkata: *See—*
Gambale, Richard A.; Crittenden, James F.; and Raman, L. Venkata, 5,144,959, Cl. 128-772.000.

Rambacher, Bruce A.: *See—*
Foster, James P.; Mullen, C. Thomas; Rambacher, Bruce A.; Rhoads, Herman P.; Fittery, Larry R.; and Schiavone, Michael C., Jr., 5,145,306, Cl. 414-417.000.

Rando, Joseph F., to Spectra-Physics Scanning Systems, Inc. Pointer beam for hand-held laser scanner. 5,146,463, Cl. 372-24.000.

Rao, V. N. Mallikarjuna: *See—*
Kellner, Carl S.; Rao, V. N. Mallikarjuna; and Weigert, Frank J., 5,146,018, Cl. 570-156.000.

Rastogi, Ravi: *See—*
Aswal, Bacchan S.; Chander, Ramesh; Chatterji, Sunil K.; Dhawan, Bhola N.; Dwivedi, Yogesh; Garg, Narendra K.; Jain, Poonam; Kapoor, Narinder K.; Kulshreshtha, Dinesh K.; Mehrotra, Bishan N.; Patnaik, Gyanendra K.; Rastogi, Ravi; Sarin, Jagat P. S.; Saxena, Krishna C.; Sharma, Shekhar C.; Sharma, Shri K.; Shukla, Binduja; and Visen, Pradeep K. S., 5,145,955, Cl. 536-124.000.

Ratermann, Philip A.: *See—*
Whitby, Michael A.; Ratermann, Philip A.; and Bowling, Kinred, 5,144,787, Cl. 53-66.000.

Raven, Claudia: *See—*
Bennett, Elizabeth A.; Raven, Claudia; and Rourke, John L., 5,146,344, Cl. 358-296.000.

Raverdy, Yvan; Chareyre, Francois; and De Grott, Paul, to Thomson Tubes Electroniques. Input screen for radiological image intensifier tube utilizing an anti-reflecting layer. 5,146,076, Cl. 250-213.0VT.

Ravet, Georges; Mongoin, Jacques; and Suau, Jean-Marc, to Coatex S.A. Application to aqueous calcium carbonate pigment suspensions of a polycarboxylic agent with phosphoric or phosphonic groups which inhibit the shock effect caused by the introduction of an electrolyte at high concentration. 5,145,902, Cl. 524-425.000.

Ravichandran, Ramanathan: *See—*
Galbo, James P.; Ravichandran, Ramanathan; Schirmann, Peter J.; and Mar, Andrew, 5,145,893, Cl. 524-99.000.

Raychem Corporation: *See—*
Mercer, Frank, 5,145,936, Cl. 528-86.000.

Raychem Limited: *See—*
Towle, Ian D. H., 5,145,938, Cl. 528-125.000.

Raytheon Company: *See—*
Collins, Steven R.; and Johnson, Robert B., 5,146,297, Cl. 357-13.000.

Razgaitis, Kazys: *See—*
Adams, Jerry L.; Bender, Paul E.; Gleason, John G.; Hanna, Nabil; Newton, John F., Jr.; Perchonock, Carl D.; and Razgaitis, Kazys, 5,145,858, Cl. 514-318.000.

Razzacki, Syed T.: *See—*
Herzog, David K.; Haven, Willem S.; Hummer, Frederick B.; and Razzacki, Syed T., 5,144,854, Cl. 74-476.000.

RCA Thomson Licensing Corporation: *See—*
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Reay, Derek W.; Fraser, Stuart; and Heddle, Richard G., to British Petroleum Company p.l.c., The. Apparatus for mixing vapor in a countercurrent column. 5,145,612, Cl. 261-79.200.

Recognition Equipment Incorporated: *See—*
Weideman, William E.; and O'Connor, Carl G., 5,146,512, Cl. 382-30.000.

Redd, Bryan; Enders, Mark L.; Young, Michael H.; and Dolling, William T., to Thiokol Corporation. Combination filament winding and tape laying apparatus and method for making and using the same. 5,145,543, Cl. 156-171.000.

Redicon Corporation: *See—*
Bulso, Joseph D., Jr.; McClung, James A.; and Dottavio, Alexander P., 5,145,292, Cl. 406-88.000.

Reed, Larry E., to Phillips Petroleum Company. Hydroalkylation of aromatic hydrocarbons. 5,146,024, Cl. 585-270.000.

Rees, James D.; and Acquaviva, Thomas, to Xerox Corporation. Compact copy sheet input/output apparatus for an electrophotographic printing machine. 5,146,286, Cl. 355-309.000.

Reichelt, Helmut: *See—*
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hansen, Guenter; Reichelt, Helmut; and Schefczik, Ernst, 5,145,952, Cl. 534-753.000.

Reidenbach, John R.: *See—*
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Reilly, David M.: *See—*
Cowan, Kevin P.; Lewandowski, Stanley R.; Reilly, David M.; and Uber, Arthur E., III, 5,145,163, Cl. 271-161.000.

Reimann, Werner: *See—*
Hobes, John V.; Payer, Wolfgang; and Reimann, Werner, 5,145,923, Cl. 526-193.000.

Reinking, Klaus: *See—*
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Reisman, Arnold; Temple, Dorota; and Turlik, Iwona, to MCNC; and Northern Telecom Limited. Metal-organic chemical vapor deposition for repairing broken lines in microelectronic packages. 5,145,714, Cl. 427-53.100.

Reisser, Helmut: *See—*
Flores, Gerhard; Reisser, Helmut, and Lex, Konrad, 5,144,773, Cl. 51-165.740.

Reitberger, Jorg: *See—*
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Rekla, Bernd: *See—*
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Reliance Comm/Tec Corporation: *See—*
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Rensink, Anton H.: *See—*
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Rentsch, Stefan F.: *See—*
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Reseaarch Development Corporation of Japan: *See—*
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Research Association for Biotechnology of Agricultural Chemicals: *See—*
Yamada, Nobutoshi; Matsuo, Norifusa; and Araki, Takaaki, 5,145,775, Cl. 435-69.100.

Resta, Mario: *See—*
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Resta, Roberto: *See—*
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RESTA S.r.l.: *See—*
Resta, Rodolfo; Resta, Mario; and Resta, Roberto, 5,145,144, Cl. 248-637.000.

Reuter, Hans-Joachim: *See—*
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Gallup, Darrell L.; Doty, Allen W.; Wong, Morton M.; Wong, Charles F.; Featherstone, John L.; Reverente, Jessie P.; and Messer, Philip H., 5,145,656, Cl. 423-42.000.

Revlon, Inc.: *See—*
Castrogiovanni, Anthony; Sandewicz, Robert W.; and Amato, Steven W., 5,145,670, Cl. 424-61.000.
Castrogiovanni, Anthony; Sandewicz, Robert W.; and Amato, Steven W., 5,145,671, Cl. 424-61.000.

Reynolds Metals Company: *See—*
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Rheem Australia Limited: *See—*
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Rheo-Technology Ltd.: *See—*
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Rhoads, Herman P.: *See—*
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Rhodes, Alan, to Ethical Pharmaceuticals, Ltd. Nifedipine-containing pharmaceutical compositions and process for the preparation thereof 5,145,683, Cl. 424-451.000.

Rhone-Poulenc Chimie: *See—*
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Rhone-Poulenc Nutrition Animale: *See—*
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Rhone-Poulenc Specialties Chimiques: *See—*
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Ribbon Textiles, Inc.: *See—*
Johnson, R. Thurman; and Johnson, Hal G., 5,145,725, Cl. 428-102.000.
Rice, Charles D., to University of Arkansas. Skin closure dressing for eyelids. 5,144,944, Cl. 602-74.000.
Rich, Arthur G., to Takasago International Corporation (U.S.A.). Optically clear conditioning shampoo comprising anionic and cationic surfactants. 5,145,607, Cl. 252-547.000.
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Forestier, Serge; Lang, Gerard; and Richard, Herve, 5,145,662, Cl. 424-45.000
Richard Hirschmann GmbH & Co.: *See—*
Blumke, Thomas; and Rockle, Jurgen, 5,146,516, Cl. 385-36.000.
Richard Wolf GmbH: *See—*
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Richardson, Charles C.: *See—*
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Richardson, David L.; Berg, David C.; Howdley, Balasubramanian S.; Matsumoto, Jack T.; Smith, Thurman D.; and Clark, Jack P., to General Electric Company. Incore housing examination system 5,145,637, Cl. 376-249.000.
Ricoh Company, Ltd.: *See—*
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Hayashi, Takamasa; Mori, Goro; Araki, Shigeyuki; Yamamoto, Masahiro; Takahashi, Masaru; Senma, Toshitaka; Miyajima, Masami; and Isobe, Takundo, 5,14 ,240, Cl. 346-108.000.
Hirata, Tositaka; Ameyama, Minoru; Komai, Hiromichi; Naruse, Osamu; Matsumoto, Syuzo; and Nakano, Tomoaki, 5,146,236, Cl. 346-1.100.
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Nagai, Kazukiyo, 5,145,963, Cl. 546- .000.
Tsurukawa, Ikuya; and Yamaguchi, Kunihisa, 5,146,254, Cl 354-195.120
Ricoh Research Institute of General Electronics Co., Ltd.: *See—*
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Riedel, Guenther; and Vamvakaris, Christos, to BASF Aktiengesellschaft. Marked mineral oils and method of marking mineral oils with basic dyes. 5,145,573, Cl. 208-14.000
Riedel, Wolfgang: *See—*
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Riesmeier, Wilhelm, to IMA-NORTE Maschinenfabriken Klessmann GmbH & Co. Apparatus for applying and contouring edge strips for plates. 5,144,737, Cl. 29-564.700
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Scheuer, Paul, 5,144,894, Cl. 104-127.000
Riley, Michael H., to OCLC Online Computer Library Center, Incorporated. Reflectance based microfilming process. 5,146,267, Cl. 355-68.000
Riopel, Paul R.: *See—*
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Ristic, Ljubisa; and Dunn, William C., to Motorola, Inc. Differential capacitor structure and method. 5,146, 89, Cl. 361-283.000.
Rittler, Christopher G.: *See—*
Longshore, Theodore F.; Balacky, William H.; DeClerk, William P.; Baker, James C.; Everline, Paul S.; and Rittler, Christopher G., 5,146,610, Cl. 455-35.100
Riubrugent, Narcis G., to Industrias Gaser, S.L. Hamburger making machine. 5,145,690, Cl. 425-89.000.
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Rizk, Nabil A.: *See—*
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Roadmaster Corporation: *See—*
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Roane, James B. Endodontic post. 5,145, 73, Cl. 433-221.000.
Robbins, Clyde: *See—*
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Robbins, Jamey L.: *See—*
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Robbins, William E.: *See—*
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Roberts, Gerald E.: *See—*
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Roberts Systems, Inc.: *See—*
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Robertshaw Controls Company: *See—*
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Orner, Robert E.; Cassarino, Aurelio V.; and Sepso, Roger P., 5,144,813, Cl. 62-187.000.
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Robida, James E.; and Strickland, Kenneth W., to Emhart Inc. Cylindrical lock assembly. 5,145,223, Cl. 292-347.000.
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Robinson, Howard W., to GH Hensley Industries, Inc. Wear indicating and tooth stabilizing systems for excavating tooth and adapter assemblies. 5,144,762, Cl. 37-141.00T.
Roca, Agustin, to Pujol Y Tarrago, S.A. Adjustable cable sheath terminal. 5,144,856, Cl. 74-501.50R.
Rock Bit International, Inc.: *See—*
Estes, Roy D., 5,145,016, Cl. 175-331.000.
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Fahey, Thomas J., III; Sherry, Barbara A.; and Cerami, Anthony, 5,145,676, Cl. 424-85.100.
Henderson, Graeme B.; Ulrich, Peter C.; and Cerami, Anthony, 5,145,975, Cl. 552-299.000.
Rockle, Jurgen: *See—*
Blumke, Thomas; and Rockle, Jurgen, 5,146,516, Cl. 385-36.000.
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Tupek, Garry F.; Manser, John W.; and Komaniecki, James M., 5,144,892, Cl. 101-363.000
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Nelson, Steven D., 5,145,054, Cl. 198-751.000.
Rodriguez, Manual S.; and Prieto, Nelson E., to Shell Oil Company. Cleaning composition and method of use. 5,145,597, Cl. 252-135.000
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Wenderoth, Bernd; Sauter, Hubert; Wingert, Horst; Hepp, Michael; Brand, Siegbert; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,145,980. Cl 560-35.000.
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Sood, Paardeep K.; Smith, Roger A.; Heeter, Timothy J.; Roganti, Adriano; and Acton, John D., 5,146,607, Cl. 395-800.000.
Roger Bullivant of Texas, Inc.: *See—*
Bullivant, Roger A., 5,145,291, Cl. 405-230.000.
Rogers, John E. Seat cushions including a plurality of individual support cells. 5,144,705, Cl. 5-453.000.
Rogers, Nancy K.: *See—*
Fishel, Duane D.; and Rogers, Nancy K., 5,144,777, Cl. 52-144.000
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Rohde, Klaus-Dieter, to Siemens Aktiengesellschaft. Hollow-electrode switch. 5,146,141, Cl. 315-326.000.
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Morris, Patricia A.; Wharry, Donald L.; and Roheim, John R. 5,145,595, Cl. 252-91.000.
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Frederick, Clay B.; and Udinsky, John R., 5,145,890, Cl. 524-21.000
Lashen, Edward S.; and Petigara, Ramesh B., 5,145,501, Cl. 71-67.000
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Winter, Andreas; Antberg, Martin; Spaleck, Walter; Rohrmann, Jurgen; and Dolle, Volker, 5,145,819, Cl. 502-117.000.
Rohsaint, Wolfgang: *See—*
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ROJ Electrotex S.p.A.: *See—*
Del Favero, Angelo, 5,144,988, Cl. 139-452.000.
Rolls-Royce plc: *See—*
Birch, Kenneth W., 5,145,316, Cl. 415-173.100
Patilla, Richard G., 5,145,126, Cl. 244-53.00B

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Petroff, Lenin J.; Romenesko, David J.; and Bahr, Bradley C., 5,145,977, Cl. 556-437.000
Petroff, Lenin J.; Romenesko, David J.; and Ekeland, Robert A., 5,145,978, Cl. 556-437.000
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Adiletta, Matthew J.; and Root, Stephen C., 5,146,421, Cl. 364-758.000
Ropars, William J. Golf game apparatus. 5,145,178, Cl. 273-184.00A.
Rope & Marine Supplies Pty. Ltd.: *See—*
Arthur, Rodney I., 5,144,719, Cl. 16-114.00R.
Rosemount Inc.: *See—*
Myhre, Douglas C.; O'Brien, Richard J.; Pui, David Y. H.; and Tsai, Chuen-Jinn, 5,146,244, Cl. 359-509.000
Rosen, Arnold M., to Park Plus Corporation. Height adjustable vehicle parking apparatus. 5,145,304, Cl. 414-228.000.
Rosenberg, Paul A.: *See—*
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Rosenberg, Peretz. Fluid flow control apparatus. 5,144,980, Cl. 137-624.140.
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Mastenbroek, Barend; Petrus, Leonardus; and Rosenbrand, Gerrit G., 5,145,947, Cl. 528-392.000.
Rosich, Mitchell N.: *See—*
Goldberg, Marshall R.; and Rosich, Mitchell N., 5,146,560, Cl. 395-200.000.
Rosien, Jurgen, to ICT Integrated Circuit Testing Gesellschaft fur Halbleiterpruftechnik mbH. Ion beam device and method for carrying out potential measurements by means of an ion beam. 5,146,089, Cl. 250-309.000.
Ross, Hugh M.: *See—*
Bryden, Donald J. S.; Work, Peter T.; Mair, Hugh; McCulloch, Roy K.; and Ross, Hugh M., 5,145,264, Cl. 384-275.000.
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Rourke, John L.: *See—*
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Rubio, Rafael R. Moving message learning system and method. 5,145,375, Cl. 434-157.000
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Rudershausen, Charles G., to Du Pont de Nemours, E. I., and Company. Disproportionation of selected chlorofluoromethanes. 5,146,020, Cl. 570-163.000
Ruis, Jean-Michel: *See—*
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Rummer, Jurgen. System for coating strips of backing. 5,145,529, Cl. 118-413.000
Rurali, Carlo: *See—*
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Russell, Kenneth M. Pearl loupe. 5,146,288, Cl. 356-30.000.
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Chien, Yie W.; and Chien, Te-Yen, 5,145,682, Cl. 424-448.000.
Ruth, Ragnar, to Moagon AG. Arrangement for collecting and emitting light via defined surface areas. 5,145,246, Cl. 362-31.000.
Rutter, William J.: *See—*
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Ruzic, Ivan. Rotary fluid apparatus having pairs of connected vanes 5,144,802, Cl. 60-484.000
S. C. Johnson & Son, Inc.: *See—*
Neumiller, Phillip J., 5,145,604, Cl. 252-312.000
Sadanobu, Jiro; Ohba, Akihiro; and Nakamura, Tsutomu, to Teijin Limited. Process for the preparation of pitch-based carbon fiber. 5,145,616, Cl. 264-29.200.
Sadowski, Richard S., to CRS Sirrine Engineers, Inc. Process for fixed bed coal gasification. 5,145,490, Cl. 48-197.00R.
Safety Assurance Corporation: *See—*
Green, J. Kenneth; Watson, Eugene L.; and Whalen, Paul S., 5,144,973, Cl. 137-71.000
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Saito, Joichi; Kozawa, Sigeyuki; Kunii, Nobuaki; Yamamoto, Hirotsugu; and Takeyasu, Hiromitsu, to Asahi Glass Company Ltd. Methods for producing polyether ester polyols and polyurethanes 5,145,883, Cl. 521-172.000
Saito, Kazuo: *See—*
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Saito, Shuji: *See—*
Hagi, Takashi; Misawa, Kouichi; Saito, Shuji; Sakamoto, Yuji, Kadota, Noriaki; Toda, Yoshiro; and Yamazaki, Nagataka, 5,145,706, Cl. 426-647.000.
Saito, Shun; Kimura, Kazumi; and Utsunomiya, Akira, to Mitsubishi Kasei Corporation. Silica glass powder and a method for its production and a silica glass body product made thereof. 5,145,510, Cl. 65-18.100
Saito, Takeshi; Kitamura, Kozo; and Ueki, Mitsuo, to Toshiba Tungaloy Co., Ltd. High toughness cermet and process for preparing the same. 5,145,505, Cl. 75-238.000
Saito, Toshihiko; and Saito, Kazuo, to Kabushiki Kaisha Toshiba Combustion system for suppressing emission of gases believed to cause green-house-effect. 5,144,941, Cl. 126-507.000
Saito, Yoshiaki: *See—*
Ito, Takashi; Iwasaki, Osamu; Ohuchi, Akimicu; Otomo, Koichiro, and Saito, Yoshiaki, 5,145,734, Cl. 428-229.000
Saitoh, Keichiro: *See—*
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Sakai, Hiroaki; and Isomura, Manabu, to NGK Insulators, Ltd. Method of producing a silicon nitride sintered body. 5,145,620, Cl. 264-65.000
Sakai, Itsuo: *See—*
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Sakaki, Takashi: *See—*
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Sakamoto, Hiroshi; and Hagiuda, Nobuyoshi, to Nikon Corporation. External power source for electronic flash. 5,146,250, Cl 354-145.100.
Sakamoto, Ichiro: *See—*
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Sakito, Yoji; Suzukamo, Gohfu; and Yoneyoshi, Yukio, to Sumitomo Chemical Company, Limited. Method for producing optically active amines. 5,145,998, Cl. 564-321.000

Sakiyama, Katsunori: *See—*
Uenishi, Nobuaki; Nagayoshi, Mitsugu; Miyanaga, Hirofumi; Sato, Tomoaki; Sakiyama, Katsunori; Ueda, Yasuhiro; and Adachi, Hideyuki, 5,144,848, Cl. 73-866.500.

Sakurai, Hidetoshi: *See—*
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Sakurai, Kazuaki: *See—*
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Sakurai, Tetsuji, to Kabushiki Kaisha Toshiba. Method and apparatus for determining track position of a head on a recording medium. 5,146,374, Cl. 360-78.140

Sakurai, Yutaka: *See—*
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Sakuramoto, Takafumi; Tominaga, Takashi; Takenoshita, Itsuroh; and Ashida, Megumi, to Nitto Denko Corporation. Sheet for formation of burned pattern and burning label. 5,145,726, Cl. 428-195.000

Salcudean, Septimiu E.: *See—*
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Salek, Jeffrey S.; Pugach, Joseph; Elias, Carole L.; and Cullo, Leonard A., to Aristech Chemical Corporation. Manufacture of neopentyl glycol (III). 5,146,012, Cl. 568-881.000

Salice, Luciano, to Arturo Salice S.p.A. Furniture hinge. 5,144,722, Cl. 16-240.000

Salvucci, Frank S., to Anthony Welded Products, Inc. Cylindrical tank lift with four wheels for mobility and stability. 5,145,311, Cl. 414-592.000

Samann, Rudolf, to BSG-Schalttechnik GmbH & Co. KG. Method and device for operating electric drives. 5,146,146, Cl. 318-768.000.

Samaritter, Reinhard; Gansen, Peter; and Seel, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of low-density flexible polyurethane foams. 5,145,882, Cl. 521-155.000.

Samarov, Victor M.: *See—*
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Sameshima, Toshiyuki; Hara, Masaki; Sano, Naoki; and Usui, Setsuo, to Sony Corporation. Method of crystallizing a semiconductor thin film 5,145,808, Cl. 437-173.000.

Samizo, Yokichi: *See—*
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Sampere, Samuel M.: *See—*
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SamSung Electronics Co., Ltd.: *See—*
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Kang, Sin W., 5,146,451, Cl. 369-70.000
Kang, Youngtae; and Kang, Laek, 5,146,425, Cl. 365-149.000
Kim, Jihn K.; and Hong, Chang W., 5,146,335, Cl. 358-183.000
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Sandbeck, Rick L. Bi-waisted trousers. 5,144,697, Cl. 2-236.000

Sandberg, Kenneth F.; and Mullikin, Jeffrey A., to Nutec Manufacturing, Inc. Patty machine. 5,145,454, Cl. 452-174.000

Sanden Corporation: *See—*
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Uchiyama, Yuji, 5,145,330, Cl. 417-363.000

Sanders, Paul W.; and Boland, Bernard W., to Motorola, Inc. Semiconductor device and method therefore. 5,145,795, Cl. 437-33.000.

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Sanderson, John R.; Knifton, John F. and Marquis, Edward T., to Texaco Chemical Company. Process for oligomerizing olefins using halogen-free titanium salts or halogen-free zirconium salts on clays. 5,146,030, Cl. 585-533.000

Sandewicz, Robert W.: *See—*
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Castrogiovanni, Anthony; Sandewicz, Robert W.; and Amato, Steven W., 5,145,671, Cl. 424-61.000

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Saneshige, Ryoji; and Ootsuka, Shigeru, to Matsushita Electric Industrial Co., Ltd. Bearing apparatus. 5,145,266, Cl. 384-322.000.

Sankaranarayanan, Laksmi N.; and Rensink, Anton H., to U.S. Philips Corporation. Sampling an analog signal voltage using fill and spill input in charge transfer device. 5,146,480, Cl. 377-60.000.

Sankyo Manufacturing Company, Ltd.: *See—*
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Sano, Kaoru; Mizushina, Fumio; Goto, Takashi; Maruki, Toshimitsu, and Naganuma, Yukio, to Kabushiki Kaisha Meidensha. System for simulating power plant of automotive vehicle utilizing electrically powered high inertia power plant. 5,144,834, Cl. 73-118.100

Sano, Kunio: *See—*
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Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, 5,145,657, Cl. 423-219.000.

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Santandrea, Luciano; and Lombardi, Massimo, to Axis USA, Inc. Apparatus for substantially simultaneously processing multiple electric motor parts. 5,145,052, Cl. 198-468.200

Sanyo Electric Co., Ltd.: *See—*
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Sarin, Vinod K. Abrasion resistant coated articles. 5,145,739, Cl. 428-336.000.

Sarinopoulos, George A.; and Eaton, Charles K., to BancTec, Inc. Device for sequentially stacking documents in a paper document pocket. 5,145,165, Cl. 271-177.000.

Sarradin, Jean-Louis: *See—*
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Sasagawa, Katsuyoshi: *See—*
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Sasaki, Isao: *See—*
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Sasaki, Katsuro; Moriwaki, Nobuyuki; Honjo, Shigeru; and Nakamura, Hideaki, to Hitachi Ltd.; and Hitachi VISI Engineering Corp. High speed semiconductor memory having a direct-bypass signal path 5,146,427, Cl. 365-189.050

Sasaki, Masahiro: *See—*
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Sasaki, Shosaku; and Masaoka, Hiroshi, to Toray Silicone Company, Ltd. Organopolysiloxane composition for the formation of a release film. 5,145,932, Cl. 528-15.000

Sasaki, Toyoji: *See—*
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Sasaki, Yoshio, to Pioneer Electronic Corporation. Isolator circuit for an audio system. 5,146,506, Cl. 381-94.000.

Sasso, Pasquale, to Elite S.r.l. Hair dryer with spiral blower. 5,144,757, Cl. 34-97.000

Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko; and Hosaka, Yukio, 5,145,117, Cl. 241-8.000.

Satake, Nozomi, to Kabushiki Kaisha Toshiba. Ultrasonic diagnosing apparatus. 5,144,954, Cl. 128-661.090.

Satake, Tokuji: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000.

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Fukatsu, Tsutomu; Nakayama, Tadayoshi; Nakatani, Yoshihiro; Hirose, Hisataka; Sato, Chikara; and Nagasawa, Kenichi, 5,146,334, Cl. 358-183.000

Sato, Fujio: *See—*
Tamura, Morio; Sato, Fujio; Hashimoto, Hisayoshi; Ichiryu, Ken; Hatano, Kazuyoshi; Tanaka, Kiyoshi, and Tobita, Nobuyuki, 5,144,843, Cl. 73-727.000.

Sato, Fumihiko: *See—*
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Sato, Isao: *See—*
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Sato, Kazuaki: *See—*
Kitazawa, Makio; Akahane, Masuo; Nakano, Yasushi; Tsubaki, Atsushi; Sato, Kazuaki; Ban, Masaaki; and Kobayashi, Michihiro, 5,145,869, Cl. 514-510.000.

Sato, Kazuo: *See—*
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Sato, Kensaku; Miyahira, Hitoshi; and Iwasawa, Tadayasu, to Hirose Electric Co., Ltd. Miniature electrical connector. 5,145,409, Cl. 439-585.000

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Nagaoka, Shinji; Sato, Koji; and Kawai, Michio, 5,146,262, Cl. 354-403.000

Sato, Tomoaki: *See—*
Uenishi, Nobuaki; Nagayoshi, Mitsugu; Miyanaga, Hirofumi; Sato, Tomoaki; Sakiyama, Katsunori; Ueda, Yasuhiro; and Adachi, Hideyuki, 5,144,848, Cl. 73-866.500.

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Satoh, Naoto, to Sanden Corporation. Coin handling mechanism for vending machine. 5,145,046, Cl. 194-203.000.

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Yoshimura, Kazuo; Shimozono, Shigeru; and Satoh, Ryo, 5,144,745, Cl. 29-602.100.

Satoh, Tomo: *See—*
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Satoh, Yuji; Sotome, Hiromi; Fukazawa, Yoshiki; and Kuroiwa, Kiyoto, to Yamaha Corporation. Audio reproduction characteristics control device. 5,146,507, Cl. 381-103.000

Satran, Amir, to Iscar Ltd. Milling cutting insert. 5,145,295, Cl. 407-113.000

Sattelmeyer, Richard, to Hoechst AG. Vulcanizates comprised of different diene rubber components, and novolak. 5,145,905, Cl. 524-511.000

Sauter, Hubert: *See—*
Wenderoth, Bernd; Sauter, Hubert; Wingert, Horst; Hepp, Michael; Brand, Siegbert; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,145,980, Cl. 560-35.000

Savinel, Laurent: *See—*
Chevalier, Gilbert; Muller, Christiane; Rousseau, Frederic; Savinel, Laurent; and Thonnelier, Jean-Yves, 5,144,809, Cl. 62-36.000

Savino, James J.; Rotolico, Anthony J.; Spaulding, Mark F.; and Goering, Richard A., to Perkin-Elmer Corporation, The. Powder pickup device with extended life. 5,145,293, Cl. 406-193.000

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Savolainen, Juha: *See—*
Heikkinen, Kari; and Savolainen, Juha, 5,146,081, Cl. 250-221.000

Sawasaki, Tomoo; and Morishige, Chitoshi, to Mazda Motor Corporation. Hydraulic control apparatus for hydraulic transmission 5,144,864, Cl. 74-866.000

Saxena, Krishna C.: *See—*
Aswal, Bacchan S.; Chander, Ramesh; Chatterji, Sunil K.; Dhawan, Bhola N.; Dwivedi, Yogesh; Garg, Narendra K.; Jain, Poonam; Kapoor, Narinder K.; Kulshreshtha, Dinesh K.; Mehrotra, Bishan N.; Patnaik, Gyanendra K.; Rastogi, Ravi; Sarin, Jagat P. S.; Saxena, Krishna C.; Sharma, Shekhar C.; Sharma, Shri K.; Shukla, Binduja; and Visen, Pradeep K. S., 5,145,955, Cl. 536-124.000

Scallan, David J.: *See—*
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Scanderbeg, Dino; Wilkerson, William D.; Kenyon, Richard L.; and Nolan, Michael E., to Parker Hannifin Corporation. Electro-hydraulic actuator system. 5,144,801, Cl. 60-475.000.

Scavizzi, Giancarlo: *See—*
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Schad, Robert D. to Husky Injection Molding Systems Ltd. Direct gating into the lip of thin walled container. 5,145,630, Cl. 264-328.800

Schade, Daniel J. Adjustable hinge assembly. 5,144,721, Cl. 16-237.000.

Schaeffer, Susan F.: *See—*
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Schafer, Fred: *See—*
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Schaffert, Gary C.; Archer, Thomas J.; Chilton, Timothy M.; and Shincovich, John T., to Meter Devices Company, Inc. Safety cover for meter socket. 5,145,403, Cl. 439-508.000

Scheblein, Joseph W.: *See—*
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Scheer, Martin: *See—*
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Schefczik, Ernst: *See—*
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Scherer, Kirby V.: *See—*
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Schering Aktiengesellschaft: *See—*
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Scheys, Guy F. J.: *See—*
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Schiavone, Michael C., Jr.: *See—*
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Schimke, Thomas O.; and McCord, Wilfred M., Jr., to Vermont American Corporation. Drill bit for drilling along an arcuate path 5,145,018, Cl. 175-385.000

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Schirmann, Peter J.: *See—*
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Schirmer, Patrick J.: *See—*
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Schittenhelm, Hans-Joachim; and Joseph, Werner, to Bayer Aktiengesellschaft. Enamel powder for electrostatic application. 5,145,804, Cl. 501-21.000

Schlaikjer, Carl R.; and Jones, Melinda D., to United States of America, Navy. Method of making tetrachloroaluminate + sulfur dioxide electrolytes in which hydrolysis products are removed. 5,145,755, Cl. 429-196.000

Schlanger, Raphael; and Humphries, Robert H., to Cannondale Corporation. Water bottle cage for bicycles. 5,145,138, Cl. 248-311.200

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Schlumberger Technologies, Inc.: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmidt, Delf: *See—*
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Schmidt, Ingo: *See—*
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Schmidt, Lothar: *See—*
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Schmidt, Manfred: *See—*
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Schneck, Gene D.; and Wagner, John W., to Bemis Company Inc. Hinged handle for multiple ply bag. 5,145,258, Cl. 383-14.000

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Schneider, John L.; and Walker, Timothy R., to GTE Products Corporation. Circuit breaker having crimped metal cover. 5,146,199, Cl. 337-380.000

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Bohlmann, Rolf; Kunzer, Hermann; Wiechert, Rudolf; Henderson, David; Schneider, Martin; and Nishino, Yukishige, 5,145,847, Cl. 514-182.000

Schneider, Michael; and Miess, Georg E., to Hoechst Aktiengesellschaft. Process for desalting solvent-containing electrolyte solutions by electrodialysis. 5,145,569, Cl. 204-182.400

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Schoebrechts, Jean-Paul: *See—*
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Scholz, Bernhard: *See—*
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Schoon, Leslie R. Electrical plug device. 5,145,393, Cl. 439-269.000

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Schott Glaswerke: *See—*
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Schrock, Alan K.: *See—*
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Schuermann, Gregor: *See—*
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Schult, Manfred: *See—*
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Schulz, Reinhard; Neukirchen, Axel; and Obermeier, Josef, to Hilti Aktiengesellschaft. Cutter bit with optimized shank. 5,145,237, Cl. 299-94.000

Schumacher, Hartmut; Crispin, Norbert; and Mattes, Bernhard, to Robert Bosch GmbH. Electronic device for triggering a safety device. 5,146,104, Cl. 307-10.100

Schutz, Robert W.: *See—*
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Schwartz, Russell J.; Zwirgzdas, Anthony C.; and Chamberlain, Terence R., to Sun Chemical Corporation. Poly (alkylene oxide) substituted acetoacetanilides. 5,145,997, Cl. 564-158.000.

Schweichler, Gerd; and Meyer, Michael, to Siemens Aktiengesellschaft. X-ray examination apparatus. 5,146,485, Cl. 378-197.000

Schweizer, George W. Baseball cap retention device. 5,144,695, Cl. 2-189.000

Schwelm, Hans, to Hydrolux S.a.r.l. Position-controlled proportional directional valve. 5,144,983, Cl. 137-625.640

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Seagate Technology, Inc.: *See—*
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Seeburger, Helmut; Lehfeld, Peter; and Kurtze, Wolf-Rudiger, to Elektronik-Grundstoffe mbH. Method and device for resharpening saws especially used for making semiconductor wafers. 5,144,938, Cl. 125-11.120.

Seeds, W. R., to Country Flavor. Fried flavor roux base. 5,145,705, Cl. 426-589.000.

Seegers, Gunter: *See—*
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Seel, Klaus: *See—*
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Seidel, Joachim; and Stiller, Klaus, to Kortenbach Verwaltungs-und Beteiligungsgesellschaft mbH & Co. Self opening umbrella. 5,144,970, Cl. 135-22.000.

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Seigenji, Kiyoshi: *See—*
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Seike, Shoji; Watanabe, Keiichiro; and Ito, Akira, to NGK Insulations, Ltd. Sealing members for use in gas preheater. 5,145,011, Cl. 165-9.000.

Seiko Corp.: *See—*
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Sekiya, Makoto: *See—*
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Sekiya, Tetsuo: *See—*
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Semal, Pierre N. W.: *See—*
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Semiconductor Energy Laboratory Co., Ltd.: *See—*
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Semple, Daniel J.: *See—*
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Sen, Subhayu: *See—*
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Senior Engineering Investments, B.V.: *See—*
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Senior, Roy F., Jr.; and Lyon, Charles T., to Senior, Roy F., Jr. Pump bearing overheating detection device and method. 5,145,322, Cl. 417-32.000.

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Seog Tae, Kim, to Goldstar Co., Ltd. Microwave leakage shielding device for a microwave oven door. 5,146,059, Cl. 219-10.55D.

Sepso, Roger P.: *See—*
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Serimer, Societe a Responsabilite Limitee: *See—*
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Serizawa, Yasuhiro: *See—*
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Seto, Yoshihiro: *See—*
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SGN-SocieteGeneral Pour les Techniques Nouvelles: *See—*
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SGS-Thomsan Microelectronics S.r.l.: *See—*
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Li, Simon M., 5,146,006, Cl. 568-720.000.
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Shirata, Akihiro: *See—*
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Heilmann, Joachim; and Zoedl, Heinrich, 5,146,200, Cl. 338-21.000.
Hermann, Dietmar, 5,146,051, Cl. 181-130.000.
Houtteman, Bernard; and Mussen, Michel, 5,145,408, Cl 439-581.000.
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Nagler, Werner; Hlawa, Fritz; and Schmidt, Lothar, 5,146,453, Cl 370-16.000.
Nagler, Werner; and Krumenacker, Rudolf, 5,146,474, Cl 375-10.000.
Plies, Erich, 5,146,090, Cl. 250-310.000.
Rohde, Klaus-Dieter, 5,146,141, Cl. 315-326.000.
Schweichler, Gerd; and Meyer, Michael, 5,146,485, Cl 378-197.000.
Westerberg, Hans; and Thorsen, Bill, 5,144,984, Cl. 137-625.180.

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Silver, Virginia K.; and Gordon, Robert L., to International Paper Company. Insulated paper cup. 5,145,107, Cl. 229-1.50B.

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Simmons Company: *See—*
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Simon, Robert H. M.: *See—*
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Sinclair, Paul L.: *See—*
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Edelmann, Ludwig; Glockner, Hermann; Laszlofalvi, Zoltan; Mayer, Uwe; and Walter, Lothar, 5,145,260, Cl. 384-43.000.

Slack, William F.: *See—*
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Smith, James D.: *See—*
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Smith, Larry L. Windingless rotor, field excited, variable reluctance, synchronous-type machines. 5,146,127, Cl. 310-166.000.

Smith, Robert Gene: *See—*
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Smith, Roger A.: *See—*
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Boiron, Guy F. V.; and Kretz, Laurent, 5,145,737, Cl. 428-334.000

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Pourtau, Jean-Jacques; and Pourtau, Thierry, 5,144,778, Cl. 52-254.000

Societe Civile des Brevets de Henri Vidal: *See—*
Vidal, Henri; and Muelas-Medrano, Santiago, 5,144,779, Cl. 52-295.000

Societe d'Applications Generales d'Electricite et de Mecanique Sagem: *See—*
Brun, Jean-Paul; Sarradin, Jean-Louis; and Dol, Christian, 5,146,066, Cl. 235-380.000

Societe Nationale d'Etude et de Construction de Moteurs d'Aviations S.N.E.M.C.A.: *See—*
Glowacki, Pierre A., 5,145,319, Cl. 416-193.00A.

Societe Nationale Industrielle et Aerospatiale: *See—*
Demange, Claude, 5,145,276, Cl. 403-349.000

Sodano, Jeanette L.: *See—*
Ibrahim, Nader; and Sodano, Jeanette L., 5,145,667, Cl 424-52.000

Sodo, James P.: *See—*
Mills, Eugene L., Jr., Sodo, James P.; Palmer, John M., and Pierret, Peter G., 5,144,812, Cl. 62-186.000

Sofranko, John A.: *See—*
Morales, Edrick; Gaffney, Anne M.; and Sofranko, John A., 5,146,034, Cl. 585-654.000

Sokawa, Kenta: *See—*
Ishizu, Atsushi; Sokawa, Kenta, and Imai, Kiyoshi, 5,146,317, Cl 358-31.000

Sokola, Raymond L., to Motorola, Inc. Monolithic ceramic filter or duplexer having surface mount corrections and transmission zeroes. 5,146,193, Cl. 333-206.000

Solaski, Thomas P.: *See—*
Zhou, Peter Y.; and Solaski, Thomas P., 5,146,204, Cl. 340-551.000

Solbourne Computer, Inc.: *See—*
Duschatko, Douglas E.; Mati, Nicholas P.; and Herrington, Richard A., 5,146,461, Cl. 371-40.100

Soler, Jose J.: *See—*
McGraw, Thomas C.; Van Ryne, Randall E.; Soler, Jose J.; and Keller, Paul D., 5,145,167, Cl 271-186.000

Soltis, Richard E.: *See—*
Logothetis, Eleftherios M.; and Soltis, Richard E., 5,145,566, Cl. 204-153.180.

Solvay Catalysts GmbH: *See—*
Falke, Holger; and Strauss, Guenther, 5,145,822, Cl. 502-150.000

Solvay & Cie (Societe Anonyme): *See—*
Dogimont, Charles; Franklin, James; Janssens, Francine, and Schoebrechts, Jean-Paul, 5,146,013, Cl. 570-101.000
Lasson, Pierre, 5,145,921, Cl. 526-74.000

Son, Young T., to Gold Star Co., Ltd. Circuit and method for maintaining security of video tape using privacy number. 5,146,495, Cl 380-5.000

Song, Choong E.: *See—*
Kim, In O.; Song, Choong E.; and Lee, Jae K., 5,145,993, Cl 562-466.000.

Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, to Kawasaki Jukogyo Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Industrial robot 5,145,312, Cl. 414-719.000

Sony Corporation: *See—*
Fujii, Hiroshi; and Yamashita, Keitaro, 5,146,380, Cl. 360-132.000
Murano, Kanji; Sekiya, Tetsuo; Ohashi, Akihiko; and Ishida, Takehisa, 5,145,259, Cl. 384-1.000
Okada, Takashi; Ogawa, Masumi; Asano, Mitsuyasu; and Nonogaki, Masaru, 5,146,330, Cl. 358-167.000
Sameshima, Toshiyuki; Hara, Masaki; Sano, Naoki; and Usui, Setsuo, 5,145,808, Cl. 437-173.000
Tamura, Takahiko; and Ueshima, Jun, 5,146,108, Cl. 307-261.000
Tsuchida, Susumu, 5,146,331, Cl. 359-169.000

Sood, Paardeep K.; Smith, Roger A.; Heeter, Timothy J.; Roganti, Adriano; and Acton, John D., to Encore Computer Corporation Method and apparatus for sharing information between a plurality of processing units. 5,146,607, Cl. 395-800.000

Soshi, Isao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing camera. 5,146,261, Cl. 354-402.000

Sotome, Hiromi: *See—*
Satoh, Yuji; Sotome, Hiromi; Fukazawa, Yoshiki; and Kuroiwa, Kiyoto, 5,146,507, Cl. 381-103.000.

Souma, Takahiro, to Terumo Kabushiki Kaisha. Electronic sphygmomanometer. 5,144,956, Cl. 128-682.000

Southwest Research Institute: *See—*
Kong, Hakchul, 5,144,922, Cl. 123-145.00A.

Southwick, Everett W., to Philip Morris Incorporated; and Philip Morris Products Inc. Smoking compositions containing a vanillin-release additive. 5,144,965, Cl. 131-276.000

Southwick, Jeffrey G., to Shell Oil Company. Process for the reduction of diene polymer hot melt adhesive color. 5,145,896, Cl. 524-180.000

Sowinski, Richard F. Method and means for filtering polychlorinated biphenyls from a gas stream. 5,145,434, Cl. 55-74.000

SpaceLabs, Inc.: *See—*
Kater, John; and Pelikan, Glenn. 5,145,565, Cl. 204-153.100.

Spahl, Bettina: *See—*
Kosley, Raymond W., Jr.; and Spahl, Bettina, 5,145,855, Cl. 514-269.000.

Spaleck, Walter: *See—*
Winter, Andreas; Antberg, Martin; Spaleck, Walter; Rohrmann, Jurgen; and Dolle, Volker, 5,145,819, Cl. 502-117.000.

Spangenberg, Stanley F.: *See—*
Prunier, Arthur R., Jr.; Spangenberg, Stanley F.; and Wijeyesekera, Sunil, 5,145,833, Cl. 505-1.000.

Spaulding, Mark F.: *See—*
Savino, James J.; Rotolico, Anthony J.; Spaulding, Mark F.; and Goering, Richard A., 5,145,293, Cl. 406-193.000.

Specialised Conductives Pty. Ltd.: *See—*
MacFarlane, Douglas R.; Philpott, Arthur K.; and Tetaz, John R., 5,146,391, Cl. 361-525.000.

Spector, Donald. Altitude-sensitive portable stereo sound set for dancers. 5,146,501, Cl. 381-25.000

Spectra-Physics Scanning Systems, Inc.: *See—*
Rando, Joseph F., 5,146,463, Cl. 372-24.000

Spectral Sciences, Inc.: *See—*
Zakin, Mitchell R.; Bernstein, Lawrence S.; and Moody, Richard A., 5,145,645, Cl. 422-98.000.

Spectrum Sciences B.V.: *See—*
Landa, Benzion, 5,146,276, Cl. 355-243.000.

Speese, Scott: *See—*
Pallett, William L.; Speese, Scott; and Dixon, Lloyd R., 5,145,070, Cl. 206-521.000.

Spehlmann, Benjamin C.; Gray, Gail L. Vail, Lawrence D.; and Gajda, Gregory J., to UOP. Butene isomerization process. 5,146,035, Cl. 585-667.000.

Speidel, Steven L., to United States of America, Navy. Signal phase pattern sensitive neural network system and method. 5,146,541, Cl. 395-21.000.

Spencer, H. Kenneth: *See—*
Lin, Bor-Sheng; Spencer, H. Kenneth; and Scheblein, Joseph W., 5,145,967, Cl. 546-208.000

Spencer, James R.; and Mullendore, James A., to GTE Products Corporation. Tungsten nickel iron alloys. 5,145,512, Cl. 75-248.000.

Spengler, Ralph: *See—*
Chen, Chao; and Spengler, Ralph, 5,144,961, Cl. 128-898.000

Speranza, George P.: *See—*
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,145,561, Cl. 203-51.000

Speronello, Barry K.: *See—*
Deeba, Michel; Chen, James M.; Lu, Yiu K.; and Speronello, Barry K., 5,145,825, Cl. 502-242.000

Spina, Warren J.: *See—*
Beck, James L.; Booth, James R.; Cole, Carl P.; Oliver, Lynn M.; Spina, Warren J.; and Troyer, Stephen R., 5,146,547, Cl. 395-116.000

Spinelli, Silvano: *See—*
Pasini, Alessandro; Zunino, Franco; Tofanetti, Odoardo; Gandolfi, Carmelo A.; Tognella, Sergio; and Spinelli, Silvano, 5,145,848, Cl. 514-185.000

Spinner, Charles R.; Chen, Fusen E.; and Liou, Fu-Tai, to SGS-Thomson Microelectronics, Inc. Method for forming polycrystalline silicon contacts. 5,146,309, Cl. 357-59.000

Spira, Joel S.: *See—*
Luchaco, David G.; Yuhasz, Stephen J.; Buehler, David; Tang, Raphael K. T.; and Spira, Joel S. 5,146,153, Cl. 323-324.000

Spoeler, Johannes-Gerhard; and Grapentin, Manfred, to Mannesmann A.G. Switch in overhung rail system. 5,144,990, Cl. 104-130.000.

Sprinkel, Francis M.: *See—*
Counts, Mary E.; Hajaligol, Mohammad R.; Morgan, Constance H.; Smith, Ulysses; Sprinkel, Francis M.; and Utsch, Francis V., 5,144,962, Cl. 131-194.000

Sprunger, Powell L. Electric ladder. 5,145,031, Cl. 182-141.000

Spurrier, Mack W.: *See—*
Clifford, Graham F.; Turner, James K.; and Spurrier, Mack W., 5,145,527, Cl. 118-411.000.

Stac, Inc.: *See—*
Whiting, Douglas L.; George, Glen A.; and Ivey, Glen E., 5,146,221, Cl. 341-67.000

Stack, Andrew P., to VLSI Technology, Inc. Ion beam contamination sensor. 5,146,098, Cl. 250-492.200

Stadler, Karl; Stark, Roland; Klam, Roediger; Muehlberger, Rupert; and Brinkhoff, Michael, to Patent Treuhand Gesellschaft fur Elektrische Gluhlampen m.b.H. Halogen incandescent lamp, particularly for operation from power networks, and method of its manufacture. 5,146,134, Cl. 313-579.000

Standard Oil Company, The: *See—*
Lake, Robin B., 5,145,651, Cl. 422-68.000

Stanley Electric Company, Ltd.: *See—*
Kamiyama, Hideyuki; Sasaki, Masahiro; and Oki, Youji, 5,146,162, Cl. 324-166.000

Stanley Works, The: *See—*
Parker, Edward I.; Piucci, Vincent A., Jr.; and Weiss, Harold, 5,146,388, Cl. 361-153.000.

Stansbury, Jeffrey W., to United States of America, Commerce. Synthetic dental compositions formed from cyclopolymerizable bis-acrylate and multi-functional oligomer and bonding method. 5,145,374, Cl. 433-228.100

Stark, Iain E., to Isis Inc. Medical diagnostic nuclear camera system 5,146,094, Cl. 250-363.080.

Stark, Leonard E.; and Gross, Akiva T., to Opta Food Ingredients, Inc. Hydrophobic protein microparticles and preparation thereof 5,145,702, Cl. 426-531.000.

Stark, Roland: *See—*
Stadler, Karl; Stark, Roland; Klam, Ruediger; Muehlberger, Rupert; and Brinkhoff, Michael, 5,146,134, Cl. 313-579.000.

Stark, William H., to General Electric Company. Apparatus for assembling a permanent magnet rotor. 5,144,735, Cl. 29-732.000.

Starowski, Robert M.: *See—*
Burg, Bruce M.; Gane, David H.; and Starowski, Robert M., 5,144,825, Cl. 72-60.000.

Statt, David J., to Eastman Kodak Company. Page memory control in a raster image processor employed for digital halftoning. 5,146,554, Cl. 395-150.000.

Staudenrausch, Georg; and Muller, Gerhard, to Albert Handtmann Maschinenfabrik GmbH & Co. KG. Method and apparatus for separating a continuous string of sausage meat into individual sausages 5,145,450, Cl. 452-47.000.

Staudenrausch, Georg, to Albert Handtmann Maschinenfabrik GmbH & Co., KG. Apparatus for separating a continuous sausage skein coming from a stuffing machine into individual sausages. 5,145,451, Cl. 452-48.000.

Stec Inc.: *See—*
Nakazawa, Akira; and Ohsasa, Hiroshi, 5,145,147, Cl. 251-129.060.

Stecker, David W., Sr. Portable universal saw table. 5,144,994, Cl 144-286.00A.

Steed, Charles E.: *See—*
Callaway, Milton A.; and Steed, Charles E., 5,144,707, Cl 5-451.000.

Steel Parts Corporation: *See—*
Jackson, Arthur C.; and Chandler, Raymond P., 5,145,143, Cl 248-635.000.

Steelcase Strafor (S.A.): *See—*
Fortsch, Friedrich, 5,144,896, Cl. 108-50.000.

Steele, Dennis L.: *See—*
Cavitt, Michael B.; Steele, Dennis L.; and Duncan, David J 5,145,919, Cl. 525-481.000.

Stefanescu, Doru M.: *See—*
Chen, In-Gann; Stefanescu, Doru M.; Sen, Subhayu; and Betts, Joel, 5,145,836, Cl. 505-1.000.

Steffy, Richard D.: *See—*
Means, Jeffrey; Haag, Robert A., Jr.; and Steffy, Richard D. 5,146,043, Cl. 86-24.000

Steiert, Peter: *See—*
Muehlbach, Klaus; Steiert, Peter; and Benker, Klaus, 5,145,904, Cl 524-494.000

Steinberg, David H.: *See—*
Leppard, David G.; Steinberg, David H.; and Dubas, Henri, 5,145,766, Cl. 430-372.000.

Steinmann, Bettina, to Ciba-Geigy Corporation. Polyether-polyester block copolymers and their use as dispersants. 5,145,944, Cl. 528-366.000.

Steinsiek, Roger R.: *See—*
Strozeski, Bernard B.; Steinsiek, Roger R.; and Guy, James O., 5,146,050, Cl. 181-102.000.

Stelle, Alessandro M. D.: *See—*
Gualtierotti, Gianfranco; and Stelle, Alessandro M. D., 5,145,234, Cl. 297-460.000.

Stenger, Tracy K., to Johnson Enterprises, Inc. Slide-on tap for a beverage container. 5,145,096, Cl. 222-400.800.

Stenzel, Wolfgang; and Armah, Ben, to Beiersdorf Aktiengesellschaft Indolylpropanols and preparations containing the compounds 5,145,849, Cl. 514-210.000

Stephenson, Everett H., Jr., to Union Camp Corporation. Remote release device for load binders. 5,145,299, Cl. 410-100.000.

Sterling Drug Inc.: *See—*
Liversidge, Gary G.; Cundy, Kenneth C.; Bishop, John F.; and Czekai, David A., 5,145,684, Cl. 424-489.000.

Sternberg, James C.: *See—*
Hsieh, You-Zung; Chen, Fu-Tai A.; Sternberg, James C.; Klein, Gerald; and Liu, Cheng-Ming, 5,145,567, Cl. 204-180.100

Sterzel, Hans-Josef; Ter Maat, Johan H. H.; Ebenhoech, Johan; and Meyer, Marion, to BASF Aktiengesellschaft. Thermoplastic materials for the production of ceramic moldings. 5,145,900, Cl. 524-404.000.

Stewart, Robert B.: *See—*
Grupp, Larry A.; Perlanski, Edward; and Stewart, Robert B., 5,145,864, Cl. 514-423.000

Stewart, Todd B.; and Yurgaites, Daniel G., to International Sales & Engineering, Inc. Heat-resistant protective cover for a drive axle joint seal. 5,145,191, Cl. 277-212.0FB.

Stille, Larry: *See—*
Braun, Keith; Stille, Larry; and Brumwell, Dennis, 5,144,755, Cl 34-52.000

Stiller, Klaus: *See—*
Seidel, Joachim; and Stiller, Klaus, 5,144,970, Cl. 135-22.000.
Seidel, Joachim; and Stiller, Klaus, 5,144,971, Cl. 135-22.000.

Stoddart, John S.; and Abraham, William E., to Foster Wheeler Energy Limited. Fluid and material transfer at sea. 5,145,429, Cl. 441-4.000

Stolar, Inc.: *See—*
Stolarczyk, Larry G., 5,146,611, Cl. 455-40.000.

Stolarczyk, Larry G., to Stolar, Inc. Mine communication cable and method for use. 5,146,611, Cl. 455-40.000.

Stolberger Maschinenfabrik GmbH & Co. KG: *See—*
Lange, Rudiger; and Classen, Helmut, 5,144,792, Cl. 57-59.000

Stone, Steve; and Fama, Steve. Anti-explosive return coin discharge unit for the cabinet of a coin operable telephone. 5,146,492, Cl 379-145.000.

Stoner, David T.: *See—*
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 5,146,592, Cl. 395-157.000.

Stoop, G. A. P.; and Begemann, Malcolm J. S., to Vitatron Medical B.V. Rate controlled pacemaker system using AR interval for rate control. 5,144,950, Cl. 128-419.0PG.

Storage Technology Corporation: *See—*
Crater, Michael R.; and Haldeman, David P., 5,146,588, Cl. 395-575.000.

Strahm, Ulrich: *See—*
Lacroix, Roger; and Strahm, Ulrich, 5,145,484, Cl. 8-524.000.

Stranko, Thomas A.: *See—*
Ackerman, Dennis F.; Bender, David R.; Chu, Salina S.; Deibert, George R.; Hallock, Gary G.; Lackey, David E.; Sheldon, Robert G.; and Stranko, Thomas A., 5,146,460, Cl. 371-23.000

Strauss, Guenther: *See—*
Falke, Holger; and Strauss, Guenther, 5,145,822, Cl. 502-150.000.

Streeting, Ian T.: *See—*
Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, 5,145,856, Cl. 514-274.000.

Strenzke, Hilmar; and Hartung, Erwin, to Linde Aktiengesellschaft. Method of braking a vehicle. 5,145,238, Cl. 303-10.000.

Strickland, Kenneth W.: *See—*
Robida, James E.; and Strickland, Kenneth W., 5,145,223, Cl. 292-347.000

Strickland, Robert W.; and Sinclair, Paul L., to Halliburton Logging Services, Inc. Method and apparatus for determining the conductivity of subsurface earth formations by filtering and summing in-phase and quadrature conductivity signals with correction values. 5,146,167, Cl. 324-339.000.

Stroech, Klaus: *See—*
Himmler, Thomas; Kraatz, Udo; Kramer, Wolfgang; and Stroech, Klaus, 5,146,001, Cl. 568-323.000

Strozeski, Bernard B.; Steinsiek, Roger R.; and Guy, James O., to Western Atlas International, Inc. Method and apparatus for acoustic formation dip logging. 5,146,050, Cl. 181-102.000.

Strunk, Marvin H., Jr.: *See—*
Brient, James A.; and Strunk, Marvin H., Jr., 5,146,010, Cl. 568-761.000

Stuart, Gordon H.: *See—*
Muller, George M.; and Stuart, Gordon H., 5,145,225, Cl. 294-8.600

Su, Fu-Min: *See—*
Vanderhevden, Jean-Luc E.; Su, Fu-Min; and Ehrhardt, Gary J., 5,145,636, Cl. 376-189.000.

Su, Wei-Yang: *See—*
Culbreth, William K., III; Pottratz, David G.; Su, Wei-Yang; Sheu, Yu-Hwa E.; and Naylor, Carter G., 5,145,563, Cl. 203-64.000.

Suau, Jean-Marc: *See—*
Ravet, Georges; Mongoin, Jacques; and Suau, Jean-Marc, 5,145,902, Cl. 524-425.000

Sudhaus, Norbert: *See—*
Clos, Richard; Hannibal, Wilhelm; Schafer, Fred; and Sudhaus, Norbert, 5,144,921, Cl. 123-90.170.

Suga, Yozo: *See—*
Yoshitomi, Yasunari; Suga, Yozo; Takahashi, Nobuyuki; Ushigami, Yoshiyuki; and Nakayama, Tadashi, 5,145,533, Cl. 148-111.000.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Shift control system for automatic transmission. 5,144,866, Cl. 74-867.000.

Sugie, Tosio; Yamada, Yoji; Kobori, Seiji; Hotta, Takaomi; and Serizawa, Yasuhiro, to Kabushikikaisha Hara Shokki Seisakusho; and Nisshinbo Industries, Inc. Automatic lap piecing method and an apparatus for carrying out the same. 5,144,731, Cl. 28-117.000.

Sugimori, Yoshio; Kimata, Yoshihide; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, to Kabushiki Kaisha Toshiba; and Nippon Television Network Corporation. Addition signal multiplexing apparatus for a television system. 5,146,327, Cl. 358-141.000

Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshida. ECL circuit with a reduced power active pulldown. 5,146,116, Cl. 307-455.000.

Sugimoto, Yasuhiro: *See—*
Nakamura, Michinori; and Sugimoto, Yasuhiro, 5,146,118, Cl. 307-475.000

Sugimura, Kenji: *See—*
Matsuda, Shinji; Sugimura, Kenji; and Nakanishi, Youichi, 5,145,269, Cl. 400-216.200.
Tsutsui, Toshiyuki; Sugimura, Kenji; and Ueda, Takashi, 5,145,818, Cl. 502-113.000.

Sugino, Koichi, to Seikosha Co., Ltd. Serial printer. 5,145,271, Cl 400-711.000

Sugino, Yoshito, to Sugiyo Co., Ltd. Method of producing a fish meat paste product simulating crab leg meat. 5,145,701, Cl. 426-249.000

Sugita, Minoru: *See—*
Nagata, Kouji; Sugita, Minoru; Kida, Keisuke; Watanabe, Toru; and Matsushita, Ken'yo, 5,146,047, Cl. 174-35.0MS.

Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. Document image filing system for furnishing additional managerial information for management of documents filed in the system. 5,146,600, Cl 395-800.000

Sugiyama, Tomokazu: *See—*
Nishijima, Kazuyoshi; Inaba, Kazuo; and Sugiyama, Tomokazu, 5,144,861, Cl. 74-552.000

Sugiyama, Toshihisa: *See—*
Yoshioka, Mamoru; Sugiyama, Toshihisa; and Kidokoro, Toru, 5,144,803, Cl. 60-612.000

Sugiyama, Yoshinobu: *See—*
Furuhashi, Kenshi; Sugiyama, Yoshinobu; and Taguchi, Hitoshi, 5,144,860, Cl. 74-552.000

Sugiyo Co., Ltd.: *See—*
Sugino, Yoshito, 5,145,701, Cl. 426-249.000.

Suhr, Robert G.: *See—*
Arnold, Wendell R.; Coghlan, Michael J.; Jourdan, Glen P.; Krumkalns, Eriks V.; and Suhr, Robert G., 5,145,843, Cl. 514-63.000

Sulzer Brothers Limited: *See—*
Burer, Franz; Gehrig, Hans-Jorg; Kaufmann, Josef; Maurer, Heinz, and Muller, Hanspeter, 5,144,987, Cl. 139-450.000

Sumi, Masao: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi, Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000.

Sumitomo Chemical Company, Limited: *See—*
Sakito, Yoji; Suzukamo, Gohfu; and Yoneyoshi, Yukio, 5,145,998, Cl. 564-321.000

Sumitomo Electric Industries, Ltd.: *See—*
Kyoto, Michihisa; Ishiguro, Yoichi; Urano, Akira; and Kakuzen, Hideo, 5,145,507, Cl. 65-2.000.
Shiga, Nobuo, 5,146,182, Cl. 330-307.000.
Tada, Koji; and Tatsumi, Masami, 5,145,550, Cl. 156-605.000

Sumitomo Electronic Industries Ltd.: *See—*
Mizutani, Akihiko, 5,146,529, Cl. 385-103.000

Sumitomo Heavy Industries, Ltd: *See—*
Iio, Itsushi, 5,144,827, Cl. 72-224.000.

Sumitomo Metal Mining Co., Ltd.: *See—*
Hirai, Toshio; and Yamane, Hisanori, 5,145,720, Cl. 427-255.300

Sumitomo Rubber Industries, Ltd.: *See—*
Kinuhata, Satoru; and Yamada, Seiki, 5,144,996, Cl. 157-13.000
Noma, Hiroyuki; and Saitou, Saneto, 5,145,536, Cl. 152-209.0WT.
Oka, Kengo, 5,145,180, Cl. 273-232.000.
Tanaka, Yukihisa; Tsukamoto, Kouji; and Shinoda, Katsuaki, 5,145,542, Cl. 156-159.000.

Sumitomo Wiring Systems, Ltd.: *See—*
Yuuki, Hayato; and Ito, Takeharu, 5,146,520, Cl. 385-45.000

Summers, Eugene R. Earth anchor driving and removing apparatus and method therefore. 5,145,286, Cl. 405-258.000

Sun Chemical Corporation: *See—*
Schwartz, Russell J.; Zwirgzdas, Anthony C.; and Chamberlain, Terence R., 5,145,997, Cl. 564-158.000

Sun, Han-Ching. Modular bamboo rake. 5,144,791, Cl. 56-400.040.

Sunds Defibrator Industries Aktiebolag: *See—*
Danielsson, K. Ove; Falk, Bo G. S.; and Jackson, Michael, 5,145,010, Cl. 162-26.000

Sundstrand Corporation: *See—*
Dickes, Gary E.; Brekhus, Roger D.; and Seidel, William E., 5,145,324, Cl. 417-222.100
Grimm, Duane H.; and Jones, Teddy L., 5,144,851, Cl. 74-424.80B
Mehr-Ayin, Kourosh; Conn, William; Rivera, Luis M.; Gale, Andrew L.; and Marsh, Phillip A., 5,146,172, Cl. 324-691.000
Westhoff, Paul E., Jr.; and Weber, Kent, 5,145,314, Cl. 415-1.000

Suntec Industries Incorporated: *See—*
Harwath, Frank L., 5,145,328, Cl. 417-299.000

Superior Modular Products, Inc.: *See—*
Archer, Lee A., 5,145,401, Cl. 439-395.000

Suran, Michael J.: *See—*
Bederka, John M.; Suran, Michael J.; and El-Bohy, Ahmed, 5,145,207, Cl. 280-732.000

Surface Technology, Inc.: *See—*
Feldstein, Nathan; and Lindsay, Deborah J., 5,145,517, Cl 106-1.050

Suwada, Makoto; Inoue, Shuichi; and Usui, Yuzo, to Fujitsu Limited. Constant current circuit and an oscillating circuit controlled by the same. 5,146,188, Cl. 331-111.000.

Suzukamo, Gohfu: *See—*
Sakito, Yoji; Suzukamo, Gohfu; and Yoneyoshi, Yukio, 5,145,998, Cl. 564-321.000

Suzuki, Hajime, to Brother Kogyo Kabushiki Kaisha. Needle thread holding device for holding leading end portion of the needle thread in sewing machine having thread cutting mechanism. 5,144,901, Cl. 112-253.000

Suzuki, Hiroyuki: *See—*
Aihara, Masahiro; and Suzuki, Hiroyuki, 5,144,720, Cl. 16-232.000

Suzuki, Kei: *See—*
Suzuki, Yukio; Suzuki, Kei; Yoneyama, Masaru; Hijiya, Hiromi, and Miyake, Toshio, 5,145,781, Cl. 435-99.000.

Suzuki, Kenichi: *See—*
Morishita, Shinya; Suzuki, Kenichi; Oohori, Masae; and Nakada, Masahiko, 5,146,169, Cl. 324-438.000

Suzuki, Koichi: *See—*
Watanabe, Junichi; Kondo, Yasuo; Hatanaka, Masataka; Ikai, Takashi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,145,502, Cl. 71-90.000.

Suzuki, Masao, to Canon Kabushiki Kaisha. White balance adjusting device. 5,146,316, Cl. 358-29.000

Suzuki, Motokazu: *See—*
Tekeshita, Takuo; Hagino, Sadaaki; Ajima, Tatsuro; and Suzuki, Motokazu, 5,145,835, Cl. 505-1.000

Suzuki, Susumu: *See—*
Takata, Hirotoshi; and Suzuki, Susumu, 5,145,267, Cl. 384-558.000

Suzuki, Tadashi: *See—*
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio; Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000.

Suzuki, Takehiko: *See—*
Kobayashi, Motonobu; Mitsui, Kiichiro; Nanba, Yoku; Kanzaki, Toshihide; Sano, Kunio; Suzuki, Takehiko; and Inoue, Akira, 5,145,657, Cl. 423-219.000.

Suzuki, Tomio; and Ohi, Hiroyuki, to NGK Insulators, Ltd. Ceramic-metal friction welding member and ceramic cast-in bonded piston made thereof. 5,144,885, Cl. 92-2.2.000.

Suzuki, Toshiyuki; Sasagawa, Katsuyoshi; Imai, Masao; and Kanemura, Yoshinobu, to Mitsui Toatsu Chemicals, Inc. High surface hardness transparent resin prepared from a compound having terminal isopropenyl phenyl groups. 5,145,927, Cl. 526-301.000.

Suzuki, Yasuo: *See—*
Orimo, Masayuki; Mori, Kinji; Suzuki, Yasuo; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasahima, Hirokazu, 5,146,559, Cl. 395-200.000

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Svana, Erik, to Elkem Technology a/s. Method and means for continuous production of carbon bodies. 5,146,469, Cl. 373-89.000.

Swamikannu, A. Xavier, to Allied-Signal Inc. Processes for using a thin film composite ultrafiltration membrane. 5,145,584, Cl. 210-650.000.

Swan, Ellen L.; and Basu, Rajat S., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, dichlorotrifluorethane, nitromethane and methanol or ethanol. 5,145,598, Cl. 252-171.000.

Swars, Helmut, to Emitec Gesellschaft fur Emissionstechnologie mbH Bypassable catalytic converter, in particular starting catalytic converter that can be circumvented. 5,144,796, Cl. 60-288.000

Swars, Helmut, to Emitec Gesellschaft Fuer Emissionstechnologie mbH. Exhaust gas pipe with catalyst carrier body exposed to a helical flow. 5,144,797, Cl. 60-299.000.

Swayze, Samuel F., to Eastman Kodak Company. Photographic camera with collapsible optical devices. 5,146,253, Cl. 354-187.000.

Sweeney, Kevin L.; and Keur, Michael R., to Amoco Corporation. Laser pigtail assembly and method. 5,146,526, Cl. 385-90.000.

Sweet, Alan F.: *See—*
Jachmann, Emil F.; and Sweet, Alan F., 5,146,439, Cl. 369-25.000.

Swift, Eric: *See—*
Swift, Philip; Swift, Eric; and Glatt, Terrence L., 5,145,182, Cl. 273-238.000

Swift, Philip; Swift, Eric; and Glatt, Terrence L., to Entercon Technologies, Inc. Board game with laser beam paths. 5,145,182, Cl. 273-238.000

Swikle, Todd G.; and Novak, Carl V., to Motorola, Inc. One-piece, light conducting gasket. 5,146,620 Cl. 455-351.000

Sykes, Philip K.: *See—*
Schmitz, Stephen R.; Sykes, Philip K.; and Johnson, Breck J., 5,145,068, Cl. 206-472.000

Symoniak, Martin F.: *See—*
Zarchy, Andrew S.; and Symoniak, Martin F., 5,146,037, Cl. 585-738.000

Synaptics, Incorporated: *See—*
Anderson, Janeen D. W.; Mead, Carver A.; Allen, Timothy P.; and Wall, Michael F., 5,146,106, Cl. 307-246.000

Syntex (U.S.A.) Inc.: *See—*
Tarnowski, Thomas L.; Hu, Mae W. L.; Laney, Maureen; Pease, John S.; and Ghazarossian, Vartan, 5,145,774, Cl. 435-7.250

Szazdi, John S., Jr.: *See—*
Paul, Kermit D.; Bartholomew, Leslie C.; Szazdi, John S., Jr.; and Labelle, Gerald J., 5,145,253, Cl. 366-101.000

Szoke, Bela B. Reader's board. 5,145,142, Cl. 248-455.000.

T. A. Tecnologie Alimentari srl: *See—*
Alessi, Marion, 5,144,879, Cl. 99-327.000

Tabarelli, Werner; and Lobach, Ernst, to Tabarelli, Werner. Interferometer gas flow system. 5,146,284 Cl. 356-345.000.

Tabata, Kenji: *See—*
Miyahara, Shinjirou; Matsumoto, Ikuo; Tabata, Kenji; and Fukuda, Hiroshi, 5,145,648, Cl. 422-124.000

Tabata, Yasushi: *See—*
Kobayashi, Takeo; Nishida, Takao; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,146,259, Cl. 354-456.000.

Tabone, Peter P., to Porta Systems Corp. Fiber optic plug connector having optical center adjustment means. 5,146,525, Cl. 385-78.000

Tabor, Stanley; and Richardson, Charles C., to President & Fellows of Harvard College. Method of using T7 DNA polymerase to mutagenize and fill-in DNA. 5,145,776, Cl. 435-91.000.

Tac-Fast Systems SA: *See—*
Pacione, Joseph R., 5,144,786, Cl. 52-747.000

Tachi S Co., Ltd.: *See—*
Nagashima, Hideo, 5,145,233, Cl. 297-408.000

Tada, Koji; and Tatsumi, Masami, to Sumitomo Electric Industries, Ltd. Process and apparatus for growing single crystals of III-V compound semiconductor. 5,145,550, Cl. 156-605.000.

Taggart, Davis L.; McGalliard, Russell L.; Eguren, Ralph R.; and Hild, David G., to Amoco Corporation. Method of oil/water separation utilizing coalescing bodies. 5,145,586, Cl. 210-708.000

Taguchi, Hitoshi: *See—*
Furuhashi, Kenshi; Sugiyama, Yoshinobu; and Taguchi, Hitoshi, 5,144,860, Cl. 74-552.000.

Taguchi, Nobuyoshi; Imai, Akihiro; Matsuda, Hiromu; Kawakami, Tetsuji; and Yubakami, Keiichi, to Matushita Electric Industrial Co., Ltd. Resistive sheet transfer printing and electrode head. 5,146,237, Cl. 346-1.100.

Taguchi, Nobuyoshi: *See—*
Imai, Akihiro; Kawakami, Tetsuji; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 5,145,827, Cl. 503-227.000

Taiyo Kagaku Co., Ltd.: *See—*
Hagi, Takashi; Misawa, Kouichi; Saito, Shuji; Sakamoto, Yuji, Kadota, Noriaki; Toda, Yoshiro; and Yamazaki, Nagataka, 5,145,706, Cl. 426-647.000.

Takada, Kaoruko, administrator: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, administrator; Takada, Kaoruko, administrator; Kawamura, Hiroyuki; and Watanabe, Shinichi, 5,145,865, Cl. 514-424.000

Takada, Yasufumi, to Canon Kabushiki Kaisha. Information filing apparatus that stores and erases information based on frequency of its use. 5,146,604, Cl. 395-425.000.

Takagi, Noboru: *See—*
Obata, Mitsuyoshi; and Takagi, Noboru, 5,146,105, Cl. 307-118.000

Takagi, Shozo: *See—*
Chow, Laurence C.; and Takagi, Shozo, 5,145,668, Cl. 424-52.000

Takahashi, Ichiro: *See—*
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo, Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000.

Takahashi, Masaru: *See—*
Hayashi, Takamasa; Mori, Goro; Araki, Shigeyuki; Yamamoto, Masahiro; Takahashi, Masaru; Senma, Toshitaka; Miyajima, Masami; and Isobe, Takundo, 5,146,240, Cl. 346-108.000

Takahashi, Nobuyuki: *See—*
Yoshitomi, Yasunari; Suga, Yozo; Takahashi, Nobuyuki; Ushigami, Yoshiyuki; and Nakayama, Tadashi, 5,145,533, Cl. 148-111.000.

Takahashi, Shiro: *See—*
Fujiura, Kazuo; Ohishi, Yasutake; Fujiki, Michiya; Kanamori, Terutoshi; and Takahashi, Shiro, 5,145,508, Cl. 65-3.120.

Takahashi, Yoshimi, to Juki Corporation. Control device for sewing machine. 5,144,900, Cl. 112-121.110.

Takahashi, Yutaka, to Kirin Beer Kabushiki Kaisha. Cap device for mouthpiece of container and methods of sealing mouthpiece portion of container and opening the same. 5,145,083, Cl. 220-206.000

Takamizawa, Minoru: *See—*
Takeda, Yoshifumi; Takamizawa, Minoru; Takeno, Tsutomu; and Hayashida, Akira, 5,145,813, Cl. 501-97.000.

Takamura, Takashi: *See—*
Seki, Tetsuya; Asaka, Tatsuya; and Takamura, Takashi, 5,145,554, Cl. 156-643.000

Takano, Tsunesuke, to Kabushiki Kaisha TAN T. Electrical connector device. 5,145,385, Cl. 439-79.000.

Takasago International Corporation (U.S.A.): *See—*
Rich, Arthur G., 5,145,607, Cl. 252-547.000.

Takase, Tomio: *See—*
Makino, Akihiro; and Takase, Tomio, 5,144,999, Cl. 164-423.000.

Takashima, Hiroyuki, to Nippon Oil Co., Ltd. Lubricating oil compositions containing a glyceride from a saturated fatty acid and a fatty acid. 5,145,593, Cl. 252-56.00S.

Takashima, Yutaka, to Gosen Co., Ltd. String for racket. 5,145,172, Cl. 273-73.00R

Takasugi, Hisashi; Nishino, Shigetaka; and Tanaka, Akito, to Fujisawa Pharmaceutical Co., Ltd. Thiazole compounds and pharmaceutical composition comprising the same. 5,145,860, Cl. 514-365.000

Takata Corporation: *See—*
Yoshimura, Kazuo; Shimozono, Shigeru; and Satoh, Ryo, 5,144,745, Cl. 29-602.100.

Takata, Hirotoshi; and Suzuki, Susumu, to Nippon Seiko Kabushiki Kaisha. Automatic center adjusting roller bearing. 5,145,267, Cl. 384-558.000

Takatsuna, Kazutoshi; Ishii, Masaaki; Ogawa, Hideaki; Shinohara, Akihito; Shiozawa, Kouji; Okumura, Yoshiharu; and Ishikawa, Masako, to Tonen Corporation. Processes for the preparation of γ-methacryloxypropylsilane compounds. 5,145,979, Cl. 556-440.000

Takaya, Soichi: *See—*
Yamaguchi, Shinichiro; Matsumoto, Hidekazu; Bandoh, Tadaaki; Hirayama, Hirokazu; Morioka Takayuki; Takaya, Soichi; Kawamoto, Yukio; Ide, Jushi; and Miyazaki, Yoshihiro, 5,146,569, Cl. 395-375.000.

Takayama, Nobutoshi: *See—*
Wakui, Tetsuya; Takayama, Nobutoshi; Yoshimura, Katsuji; and Nagasawa, Kenichi, 5,146,373, Cl. 360-77.010.

Takazawa, Atsuro: *See—*
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio, Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000

Takebayashi, Katsuhiro: *See—*
Hirai, Masazumi; Takebayashi, Katsuhiro; Yamaguchi, Ryuji; and Fujikawa, Yasuo, 5,144,998, Cl. 164-71.100

Takeda, Akihiro: *See—*
Aihara, Tsutomu; and Takeda, Akihiro, 5,144,849, Cl. 74-89.140.

Takeda Chemical Industries, Ltd.: *See—*
Miyake, Akio; and Ashida, Yasuko, 5,145,850, Cl. 514-248.000

Takeda, Renzo: *See—*
Ishii, Kazuya; Aoyama, Motoo; Ishii, Yoshihiko; Uchikawa, Sadao, Takeda, Renzo; and Yokomizo, Osamu, 5,145,635, Cl. 376-173.000

Takeda, Yoshifumi; Takamizawa, Minoru; Takeno, Tsutomu; and Hayashida, Akira, to Shin-Etsu Chemical Co., Ltd. Process for manufacturing organic silazane polymers and ceramics therefrom. 5,145,813, Cl. 501-97.000

Takegahara, Takashi: *See—*
Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,146,402, Cl. 364-191.000

Takehara, Shin; and Morita, Toshiki, to Mazda Motor Corporation Vehicle suspension system. 5,145,205, Cl. 280-707.000.

Takei, Kazuo: *See—*
Noguchi, Yasuhiro; Takei, Kazuo; Funyu, Yukio; Mori, Yosuke; and Yasuda, Isao, 5,146,553, Cl. 395-146.000

Takemasa, Kaoru: *See—*
Morikawa, Kiyoshi; Kurokawa, Atsushi; Onishi, Sei; Kajihara, Kiyohito; Takemasa, Kaoru; and Kitazawa, Osamu, 5,145,039, Cl. 188-298.000

Takenaka, Kenji: *See—*
Izumura, Kazuya; and Takenaka, Kenji, 5,145,326, Cl. 417-222.200.

Takeno, Tsutomu: *See—*
Takeda, Yoshifumi; Takamizawa, Minoru; Takeno, Tsutomu; and Hayashida, Akira, 5,145,813, Cl. 501-97.000

Takenobu, Koichi: *See—*
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000

Takenoshita, Itsuroh: *See—*
Sakuramoto, Takafumi; Tominaga, Takashi; Takenoshita, Itsuroh; and Ashida, Megumi, 5,145,726, Cl. 428-195.000

Takeya, Noriyoshi: *See—*
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Takeyasu, Hiromitsu: *See—*
Saito, Joichi; Kozawa, Sigeyuki; Kunii, Nobuaki; Yamamoto, Hirotsugu; and Takeyasu, Hiromitsu, 5,145,883, Cl. 521-172.000.

Takezawa, Katsuhito, to Canon Kabushiki Kaisha. Communication terminal apparatus having an interrupt/restart function with time measuring control for interruption and disabling feature. 5,146,598, Cl. 395-725.000

Takida, Hiroshi; and Iwanami, Teruo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Halogen-containing thermoplastic resin composition. 5,145,909, Cl. 525-57.000.

Takigawa, Masahiro: *See—*
Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, 5,145,312, Cl. 414-719.000

Takizawa, Toshio: *See—*
Ugawa, Akira; and Takizawa, Toshio, 5,146,068, Cl. 235-441.000

Tam, Lan P.: *See—*
Carey, Paul J.; Imburgia, Thomas R.; Edgar, John L.; McHugh, Denis C.; Tam, Lan P.; Chieng, Douglas; and Williamson, Mark, 5,146,561, Cl. 395-200.000

Tam, Simon M.: *See—*
Holler, Mark A.; and Tam, Simon M., 5,146,602, Cl. 395-23.000

Tamamori, Hideo, to Nippon Air Brake Co., Ltd. Variable load valve for railway vehicles. 5,144,985, Cl. 137-627.500

Tamura, Masahisa; and Okumura, Ichiro, to Canon Kabushiki Kaisha. Vibration wave motor. 5,146,129, Cl. 310-323.000

Tamura, Morio; Sato, Fujio; Hashimoto, Hisayoshi; Ichiryu, Ken; Hatano, Kazuyoshi; Tanaka, Kiyoshi; and Tobita, Nobuyuki, to Hitachi Construction Machinery Co., Ltd. Pressure sensor. 5,144,843, Cl. 73-727.000

Tamura, Takahiko; and Ueshima, Jun, to Sony Corporation. Parabolic wave generator. 5,146,108, Cl. 307-261.000.

Tamura, Tomoaki: *See—*
Isoguchi, Seiichi; Tsuchida, Masaaki; Ohta, Yoshitaka; and Tamura, Tomoaki, 5,146,353, Cl. 358-909.000

Tamura, Yoichi: *See—*
Yoshizawa, Tetsuo; Miyazaki, Toyohide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000

Tan, Haw-Chan; Yu, Nobbert; Lin, Yuan-Chieh; and Chen, Vincent, to Foxconn International, Inc. Filter connector. 5,145,412, Cl. 439-620.000

Tanabe, Tsuneo, to Mitsubishi Denki K.K. Electronic control type fuel injection device. 5,144,930, Cl. 123-478.000

Tanabe, Yoshihito: *See—*
Asaba, Eiki; and Tanabe, Yoshihito, 5,146,084, Cl. 250-231.140

Tanabe, Yoshimitsu: *See—*
Yamaguchi, Keizaburo; Tanabe, Yoshimitsu; Urakami, Tatsuhiro; Yamaguchi, Akihiro; Yamaya, Norimasa; and Ohta, Masahiro, 5,145,949, Cl. 528-422.000

Tanaka, Akio. Diving boat. 5,144,905, Cl. 114-333.000

Tanaka, Akito: *See—*
Takasugi, Hisashi; Nishino, Shigetaka; and Tanaka, Akito, 5,145,860, Cl. 514-365.000

Tanaka, Hideho: *See—*
Yamamoto, Shinji; Tanaka, Hideho; and Fujii, Kazuyoshi, 5,145,916, Cl. 525-421.000

Tanaka, Hiroshi: *See—*
Mizutani, Shigemitsu; Seto, Yoshihiro; Tanaka, Hiroshi; and Nishiyama, Yoshihiro, 5,145,065, Cl. 206-389.000

Tanaka, Katsumi: *See—*
Okada, Akihiro; Kino, Tooru; and Tanaka, Katsumi, 5,146,488, Cl. 379-88.000

Tanaka, Kazuhiko, to Nippon Mining Co., Ltd. 3-amino-2-hydroxybornane derivatives, asymmetric Michael reaction using the same, and process for preparing optically active muscone utilizing Michael reaction. 5,146,003, Cl. 568-350.000.

Tanaka, Kiyoshi: *See—*
Tamura, Morio; Sato, Fujio; Hashimoto, Hisayoshi, Ichiryu, Ken; Hatano, Kazuyoshi; Tanaka, Kiyoshi; and Tobita, Nobuyuki, 5,144,843, Cl. 73-727.000

Tanaka, Toshimitsu; Yamagata, Naoyuki; Hitomi, Mitsuo; Hattori, Toshihiko; Marubara, Masashi; and Fujii, Mikihito, to Mazda Motor Corporation. Intake system for engine. 5,144,918, Cl. 123-52.00M

Tanaka, Yoshiaki: *See—*
Asano, Toshihisa; Tanaka, Yoshiaki; Fukutomi, Masao; and Maeda, Hiroshi, 5,145,829, Cl. 505-1.000

Tanaka, Yukihisa; Tsukamoto, Kouji; and Shinoda, Katsuaki, to Sumitomo Rubber Industries, Ltd. Method and apparatus for producing a biased belt sheet. 5,145,542, Cl. 156-159.000.

Tandem Computers Incorporated: *See—*
Peet, Charles E., Jr.; Allison, John D.; Debacker, Kenneth C.; and Horst, Robert W., 5,146,589, Cl. 395-575.000

Tang, Raphael K. T.: *See—*
Luchaco, David G.; Yuhasz, Stephen J.; Buehler, David, Tang, Raphael K. T.; and Spira, Joel S., 5,146,153, Cl. 323-324.000

Tang, Raymond; and Small, James G., to Hughes Aircraft Company Ultra wideband radar transmitter employing synthesized short pulses. 5,146,616, Cl. 455-103.000

Tang, Reginald Ting-Hong, Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundanbhai, to Allied-Signal Inc. Homopolymers and copolymers having recurring carbonate units. 5,145,945, Cl. 528-370.000

Tani, Nobuyuki: *See—*
Nakagawa, Hiroshi; Ikeda, Atsushi, Sakai, Itsuo; and Tani, Nobuyuki, 5,145,522, Cl. 106-287.170.

Tanigaito, Yasushi; and Maeda, Ryoji, to Nissan Motor Co., Ltd. Ventilation air intake structure of motor vehicle. 5,145,457, Cl. 454-147.000.

Tanigaki, Ryuhei: *See—*
Iio, Takayuki; and Tanigaki, Ryuhei, 5,145,346, Cl. 418-55.500

Taniguchi, Nobuyuki: *See—*
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Taniguchi, Takashi: *See—*
Miyoshi, Akira; and Taniguchi, Takashi, 5,146,419, Cl. 364-748.000

Tanimura, Nobuyoshi, to Hitachi, Ltd. Single chip gate array. 5,146,428, Cl. 365-189.080.

Tanis, Dale R., to Case Corporation. Door assembly for an axial-flow combine. 5,145,461, Cl. 460-67.000

Tanis, Dale R.; Matousek, Robert A.; and McMillen, Richard E., to Case Corporation. Infeed assembly for an axial-flow combine. 5,145,462, Cl. 460-68.000

Tano, Shunichi; Funabashi, Motohisa; Masui, Shoichi; and Sakaguchi, Seiji, to Hitachi, Ltd. Method for judging whether conditions are satisfied by using a network having a plurality of nodes representing the conditions. 5,146,537, Cl. 395-1.000

Tanuma, Masatomo: *See—*
Haga, Shuji; and Tanuma, Masatomo, 5,145,344, Cl. 418-55.200

Tapolczay, David J.: *See—*
Anthony, Vivienne M.; Clough, John M., DeFraine, Paul; Godfrey, Christopher R. A.; Wiggins, Thomas E.; and Tapolczay, David J., 5,145,954, Cl. 534-852.000

Tardif, Yves: *See—*
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Tarnowski, Thomas L.; Hu, Mae W. L.; Laney, Maureen, Pease, John S.; and Ghazarossian, Vartan, to Syntex (U.S.A.) Inc. Fluorescent dyes. 5,145,774, Cl. 435-7.250.

Tarumi, Takashi; and Eimishi, Toshihiko, to Isuzu Glass Co., Ltd. Glass compositions. 5,145,805, Cl. 501-78.000

Taruya, Masaaki; and Koiwa, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha. Ignition coil unit for an internal combustion engine 5,144,935, Cl. 123-633.000

Tarvin, Diana J.; and Goerne, Ronald E., to 1-2-3 Training Systems, Ltd. Color-coded training method. 5,145,377, Cl. 434-219.000

Tatsumi, Masami: *See—*
Tada, Koji; and Tatsumi, Masami, 5,145,550, Cl. 156-605.000

Tatsuta, Masakazu: *See—*
Murayama, Kashiwa; Tatsuta, Masakazu; Shibata, Yoshiharu, and Yajima, Hideki, 5,145,084, Cl. 220-260.000

Tayloe, Daniel R.; and Kotzin, Michael D., to Motorola, Inc. Cellular radio system having reduced handover disruption and method for use in such a system. 5,146,609, Cl. 455-33.200

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Tazi, Mohammed: *See—*
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Teac Corporation: *See—*
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Teco-Systems Oy: *See*—
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Tecumseh Products Company: *See*—
Farr, James B., 5,145,323, Cl. 417-36.000.
Tegeler, John J.; and Shoger, Kirk D., to Hoechst-Roussel Pharmaceuticals Incorporated. Methods of using hydroxy-, alkoxy- and benzyloxy-substituted phospholipids to treat phospholipase A_2-mediated conditions and to alleviate pain. 5,145,844, Cl. 514-77.000
Tegtmeyer, Dietrich: *See*—
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Tekeshita, Takuo; Hagino, Sadaaki; Ajima, Tatsuro; and Suzuki, Motokazu, to Mitsubishi Materials Corporation. Process for fabricating superconducting ceramic materials by HIP treatment. 5,145,835, Cl. 505-1.000.
Telectronics Pacing Systems, Inc.: *See*—
Wilson, Stephen G., 5,144,947, Cl. 128-419.0PG
Telemecanique: *See*—
Boucheron, Thierry; Christian, Blanchard; and Lauraire, Michel, 5,146,055, Cl. 200-144.00R
Telettra-Telefonia Elettronica. *See*—
Cucchi, Silvio, 5,146,462, Cl. 371-7.100.
Telibasa, Marius, to IT Systems Corporation. Dedicated line eliminator for facsimile/telephone systems. 5,146,489, Cl. 379-100.000.
Temple, Dorota: *See*—
Reisman, Arnold; Temple, Dorota; and Turlik, Iwona, 5,145,714, Cl. 427-53.100.
Tepe, Thomas W.: *See*—
Midland, Richard W.; Rozansky, Boris; and Tepe, Thomas W., 5,145,432, Cl. 445-3.000
Terada, Yoshihiro: *See*—
Yamasaki, Toru; Ikegami, Hiroaki; Seki, Noriaki; Hibi, Yoshiharu, and Terada, Yoshihiro, 5,146,32[illegible], Cl. 358-164.000.
Terauchi, Kiyoshi, to Sanden Corporation. Slant plate type compressor with variable displacement mechanism. 5,145,325, Cl. 417-222.200.
Terayama, Yoshimi: *See*—
Yoshizawa, Tetsuo; Miyazaki, Tomohide; Kondo, Hiroshi; Sakaki, Takashi; Terayama, Yoshimi; Tamura, Yoichi; Okabayashi, Takahiro; Kondo, Kazuo; Nakatsuka, Yasuo; and Ikegami, Yuichi, 5,145,552, Cl. 156-638.000
Ter Maat, Johan H. H.: *See*—
Sterzel, Hans-Josef; Ter Maat, Johan H. H.; Ebenhoech, Johan; and Meyer, Marion, 5,145,900, Cl. 544-404.000
Terni Acciai Speciali S.p.A.: *See*—
Ferrotti, Giannio; and Fabbri, Ferruccio, 5,144,830, Cl. 72-356.000
Terpstra, Nicholas. Box construction with interlocking tab fastening means. 5,145,110, Cl. 229-155.000.
Terracol, Claude; Boch, Kazimir; and Gros, Gerard, to Merlin Gerin. Flexible production system comprising individually motorized mechanical modules whose operation is selected and synchronized by electronic means. 5,145,047, Cl. 198-41.000
Terrell, David R.; De Meutter, Stefaan K.; and Monbaliu, Marcel J., to AGFA-Gevaert, N.V. Electrophotographic recording material. 5,145,759, Cl. 430-58.000
Terry, Peter R.: *See*—
Deller, Paul N.; and Terry, Peter R., 5,145,735, Cl. 428-246.000
Terumo Kabushiki Kaisha: *See*—
Souma, Takahiro, 5,144,956, Cl. 128-682.000
Tesmann, Holger: *See*—
Paasch, Stefan; Tesmann, Holger; and Kawa, Rolf, 5,145,603, Cl. 252-311.000
Tessier, Alain; Champagne, Jean P.; Milot, Maurice; Belanger, Albert; and Tardif, Yves, to Le Groupe Videotron LTEE. Sync control for video overlay. 5,146,336, Cl. 358-183.000
Tetaz, John R.: *See*—
MacFarlane, Douglas R.; Philpott, Arthur K.; and Tetaz, John R., 5,146,391, Cl. 361-525.000
Tetsuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Projection television apparatus for reducing re-emphasized peripheral screen portions. 5,146,322, Cl. 358-60.000
Texaco Chemical Company: *See*—
Culbreth, William K., III; Pottratz, David G.; Su, Wei-Yang; Sheu, Yu-Hwa E.; and Naylor, Carter G., 5,145,563, Cl. 203-64.000
Knifton, John F., 5,146,041, Cl. 585-864.000
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,145,561, Cl. 203-51.000
Sanderson, John R.; and Marquis, Edward T., 5,146,023, Cl. 585-255.000
Sanderson, John R.; Knifton, John F.; and Marquis, Edward T., 5,146,030, Cl. 585-533.000
Texaco Inc.: *See*—
Pasternak, Mordechai, 5,146,038, Cl. 585-818.000
Texas Instruments Incorporated: *See*—
Brouwers, Arnoldus M.; Amin, Ahmed H.; and Padovani, Francois A., 5,144,841, Cl. 73-706.000
Doddington, George R.; Chen, Yenung; and Leonard, R. Gary, 5,146,539, Cl. 395-2.000
Kaya, Cetin, 5,146,307, Cl. 357-51.000
McDavid, James M., 5,144,746, Cl. 29-830.000
Rodder, Mark S., 5,145,799, Cl. 437-47.000.
Smayling, Michael C.; and Duane, Michael P., 5,145,798, Cl. 437-44.000
Ty, Henry; Lisauskas, Richard J.; Behler, Matthew L.; and Zaveri, Narendra R., 5,144,815, Cl. 62-196.100.
TH. Goldschmidt AG: *See*—
Esselborn, Eberhard; Fock, Jurgen; and Lammering, Helmut, 5,145,914, Cl. 525-329.500
Weitemeyer, Christian; and Dohler, Hardi, 5,145,915, Cl. 525-403.000
Weitemeyer, Christian; and Dohler, Hardi, 5,146,005, Cl. 568-616.000.
Thakur, Bhabesh K.: *See*—
Feathers, Charles H., III; Thakur, Bhabesh K.; and Hancock, Charles O., 5,145,642, Cl. 422-26.000.
Theus, Ulrich, to Deutsche ITT Industries GmbH. CMOS circuit for averaging digital-to-analog converters. 5,146,225, Cl. 341-152.000.
Thiokol Corporation: *See*—
Redd, Bryan; Enders, Mark L.; Young, Michael H.; and Dolling, William T., 5,145,543, Cl. 156-171.000.
Thioulouse, Pascal: *See*—
Brunel, Christian; and Thioulouse, Pascal, 5,146,213, Cl. 340-781.000.
Thomas, Gunter: *See*—
Hubsch, Walter; Angerbauer, Rolf; Fey, Peter; Philipps, Thomas Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Gunter, 5,145,959, Cl. 544-279.000.
Thomas, William J.: *See*—
Woodrow, James R.; and Thomas, William J., 5,145,079, Cl. 215-232.000
Thompson, Alex, to Thompson, Russel L. Object support rack 5,145,135, Cl. 248-201.000.
Thompson, George A. Well point. 5,145,015, Cl. 175-21.000.
Thompson, Jay A.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry Michael K., 5,146,592, Cl. 395-157.000
Thompson McKay Pharmaceuticals, Ltd.: *See*—
Thompson, William J., 5,145,664, Cl. 424-49.000
Thompson, Russel L.: *See*—
Thompson, Alex, 5,145,135, Cl. 248-201.000.
Thompson, William J., to Thompson McKay Pharmaceuticals, Ltd Mouthwash. 5,145,664, Cl. 424-49.000.
Thomson Consumer Electronics, Inc: *See*—
Grubbs, Gary D., 5,146,337, Cl. 358-191.100.
Thomson Consumer Electronics, Inc.: *See*—
Lehmann, William L.; and Wignot, Leroy S., 5,146,338, Cl. 358-191.100.
Thomson-CSF: *See*—
Ursenbach, Francois, 5,146,233, Cl. 343-815.000.
Thomson Tubes Electroniques: *See*—
Firmain, Gerard, 5,146,190, Cl. 333-117.000.
Raverdy, Yvan; Chareyre, Francois; and De Grott, Paul, 5,146,076, Cl. 250-213.0VT.
Thonnelier, Jean-Yves: *See*—
Chevalier, Gilbert; Muller, Christiane; Rousseau, Frederic; Savinel, Laurent; and Thonnelier, Jean-Yves, 5,144,809, Cl. 62-36.000
Thorsen, Bill: *See*—
Westerberg, Hans; and Thorsen, Bill, 5,144,984, Cl. 137-625.180
Thurman, Ronald G.: *See*—
Lemasters, John J.; and Thurman, Ronald G., 5,145,771, Cl. 435-1.000
Tibbals, E. C., Jr., to Draper Corporation. Yarn feed assembly 5,144,817, Cl. 66-140.00R
Timar, Tibor; Eszenyi, Tibor; Sebok, Peter; Galamb, Vilmos; Fazekas nee Kozak, Julia; Istvan nee Katona, Terezia; Kovach nee Lakatos, Eva; and Nagy nee Csaki, Erika, to Alkaloida Vegyeszeti Gyar. Process for the preparation of anti-hypertensive benzopyran derivative. 5,145,985, Cl. 548-525.000
Tino, Joseph A.: *See*—
Zahler, Robert; and Tino, Joseph A., 5,145,960, Cl. 544-310.000.
Tisma Machinery Corporation: *See*—
Tisma, Stevan, 5,144,790, Cl. 53-251.000.
Tisma, Stevan, to Tisma Machinery Corporation. High speed automatic packaging machine with anti-centrifugal force transport means 5,144,790, Cl. 53-251.000.
Titus, Paul E., to Shell Oil Company. Reduced J-tube riser pull force 5,145,289, Cl. 405-169.000.
Titus Tool Company Limited: *See*—
Harley, David N., 5,145,302, Cl. 411-404.000.
Tjoe, Sioe-Heng A.: *See*—
Chung, Ding Y.; Debroy, Tapan K.; and Tjoe, Sioe-Heng A., 5,145,568, Cl. 204-181.700
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Arai, Mikiro; Funayama, Osamu; Nishii, Hayato; Ishiyama, Tamio, Kaya, Hiroshi; Isoda, Takeshi; Yasuda, Kouichi; Takazawa, Atsuro; Suzuki, Tadashi; Kohshi, Ichiro; Ichiyama, Masaaki; and Kato, Tomohiro, 5,145,812, Cl. 501-97.000.
Itaba, Yasushi; Yoshifuji, Yutaka; Kondo, Takayoshi; Saitoh, Keichiro; Yoshino, Tadao; Izawa, Minoru; and Sakamoto, Ichiro, 5,145,728, Cl. 428-213.000.
Tobita, Nobuyuki: *See*—
Tamura, Morio; Sato, Fujio; Hashimoto, Hisayoshi; Ichiryu, Ken, Hatano, Kazuyoshi; Tanaka, Kiyoshi; and Tobita, Nobuyuki, 5,144,843, Cl. 73-727.000.

Toda, Yoshiro: *See*—
Hagi, Takashi; Misawa, Kouichi; Saito, Shuji; Sakamoto, Yuji; Kadota, Noriaki; Toda, Yoshiro; and Yamazaki, Nagataka, 5,145,706, Cl. 426-647.000.
Todd, William M., to Cummins-Allison Corp. Wave-type coin sorter. 5,145,455, Cl. 453-6.000.
Tofanetti, Odoardo: *See*—
Pasini, Alessandro; Zunino, Franco; Tofanetti, Odoardo; Gandolfi, Carmelo A.; Tognella, Sergio; and Spinelli, Silvano, 5,145,848, Cl. 514-185.000
Togashi, Sumio, to Bridgestone Corporation. Elastic endless crawler. 5,145,242, Cl. 305-35.0EB.
Tognella, Sergio: *See*—
Corti, Angelo; Piro, Paola; Carta, Emanuela; Rovelli, Cesare; Bassi, Rosangela; Lamponi, Sandro; Morgese, Nicola; Rurali, Carlo; and Tognella, Sergio, 5,145,789, Cl. 436-530.000.
Pasini, Alessandro; Zunino, Franco; Tofanetti, Odoardo; Gandolfi, Carmelo A.; Tognella, Sergio; and Spinelli, Silvano, 5,145,848, Cl. 514-185.000
Tohoku Ricoh Co., Ltd.: *See*—
Numabe, Hideo; and Oshino, Genji, 5,146,238, Cl. 346-76.0PH.
Toizumi, Yasushi: *See*—
Ookubo, Mitsumasa; Yaji, Tsuyoshi; Toizumi, Yasushi; Sasaki, Toyoji; Kato, Shigeru; Miyasaka, Tetsuo; Odanaka, Yasushi; Yamashaki, Masafumi; and Kodama, Shinichi, 5,146,071, Cl. 250-201.200.
Tojo, Atsushi: *See*—
Mandai, Harufumi; Chigodo, Yoshikazu; and Tojo, Atsushi, 5,146,191, Cl. 333-161.000
Tokai Corporation: *See*—
Shike, Tsutomu; Eguchi, Toshihiko; and Nobuo, Yamazaki, 5,145,358, Cl. 431-153.000
Tokai Rubber Industries, Ltd.: *See*—
Funahashi, Yoshiki; and Hibi, Masayuki, 5,145,155, Cl. 267-140.120
Muramatsu, Atsushi; and Funahashi, Yoshiki, 5,145,156, Cl. 267-140.140.
Tokico Ltd.: *See*—
Kobayashi, Kinzo; and Gamoh, Yoshikazu, 5,145,037, Cl. 188-73.100.
Tokubo, Kazo; Yamaguchi, Michihiro; Ohtsu, Yutaka; Nakamura, Kiyoshi; Matsumoto, Satoshi; and Yamagishi, Akihiko, to Shiseido Company Ltd. Packing material for liquid chromatography. 5,145,578, Cl. 210-198.200.
Tokyo Electric Co., Ltd.: *See*—
Ono, Yoshiaki, 5,146,239, Cl. 346-76.0PH.
Tokyo Electric Power Co., Inc., The: *See*—
Araki, Toshimitsu; Kawamata, Fumihiko; Miyagawa, Hitoshi; Yoshida, Masahito; and Masuda, Naotaka, 5,145,280, Cl. 405-62.000.
Toliver, Samuel; Roberts, Gerald E.; and Turner, Myron A., Jr., to Ericsson GE Mobile Communications Inc. Switching arrangement method and apparatus for making parameter measurement and adjustment of coupled dual resonator crystals using both resonator ports 5,146,174, Cl. 324-727.000
Toma, Tomohide, to Olympus Optical Co., Ltd. Drive device for use with the information recording/reproducing apparatus. 5,146,070, Cl. 235-475.000
Tomic, Dobrivoje. Suction root elevator and suction dental curette. 5,145,368, Cl. 433-91.000.
Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kogyosho. Cell-forming assembly for a household aquarium. 5,144,908, Cl. 119-5.000.
Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kogyosho. Cell-forming assembly for a household aquarium. 5,144,909, Cl. 119-5.000
Tominaga, Takashi: *See*—
Sakuramoto, Takafumi; Tominaga, Takashi; Takenoshita, Itsuroh; and Ashida, Megumi, 5,145,726, Cl. 428-195.000
Tomita, Nobuyoshi: *See*—
Irino, Mitsuhiro; Gora, Tetsuo; Minami, Masaharu; Miyamoto, Hitoshi; Sumi, Masao; Tomita, Nobuyoshi; Watanabe, Kiyoshi; Ogura, Kazumi; Nishiura, Masanori; Funatsu, Masayuki; Yoshimoto, Kazuhiro; Takenobu, Koichi; and Satake, Tokuji, 5,145,753, Cl. 429-32.000
Tomoyuki, Kotani, to Diafoil Company, Ltd. Laminating material for safety glass. 5,145,746, Cl. 428-458.000.
Tone, Eiichi; Ohata, Yosuke; and Hori, Kazuto, to Mita Industrial Co., Ltd. Composite image forming apparatus. 5,146,275, Cl. 355-244.000.
Tonen Corporation: *See*—
Takatsuna, Kazutoshi; Ishii, Masaaki; Ogawa, Hideaki; Shinohara, Akihito; Shiozawa, Kouji; Okumura, Yoshiharu; and Ishikawa, Masako, 5,145,979, Cl. 556-440.000
Toray Silicone Company, Ltd.: *See*—
Sasaki, Shosaku; and Masaoka, Hiroshi, 5,145,932, Cl. 528-15.000.
Toreki, Robert: *See*—
Schrock, Richard R.; and Toreki, Robert, 5,146,033, Cl. 585-647.000
Torii, Shunichi: *See*—
Kojima, Keiji; and Torii, Shunichi, 5,146,599, Cl. 395-800.000.
Torimaru, Yasuo; and Inoue, Kouji, to Sharp Kabushiki Kaisha. Self-refresh system for use in a field memory device. 5,146,430, Cl. 365-222.000
Toshiba Lighting & Technology Corporation: *See*—
Kawakatsu, Akira, 5,146,130, Cl. 313-112.000
Toshiba Tungaloy Co., Ltd.: *See*—
Saito, Takeshi; Kitamura, Kozo; and Ueki, Mitsuo, 5,145,505, Cl. 75-238.000
Total Raffinage Distribution S.A.: *See*—
Durneu, Marc, 5,145,580, Cl. 210-321.610
Toto Ltd.: *See*—
Haraga, Hisato; Inatomi, Yasutoshi; Obata, Takashi; Hashida, Mituaki; Uchiyama, Koichi; and Moriyama, Kenji, 5,144,702, Cl. 4-541.600
Totsuka, Mitsuhiko: *See*—
Maejima, Toshiro; Sakurai, Kazuaki; Kozono, Seiji; Totsuka, Mitsuhiko; and Kudo, Toshiharu, 5,145,410, Cl. 439-587.000.
Towata, Atsuya; and Sando, Mutsuo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for coating surface of fine particles with a layer of fine metal oxide powder. 5,145,719, Cl. 427-215.000
Towle, Ian D. H., to Raychem Limited. Preparation of poly(arylene ether ketones). 5,145,938, Cl. 528-125.000
Toyo Boseki Kabushiki Kaisha: *See*—
Fujii, Tsuguo; Yamamoto, Katsumasa; and Uda, Junji, 5,145,946, Cl. 528-388.000
Toyo Seikan Kaisha, Ltd.: *See*—
Kobayashi, Akira; Imazu, Katsuhiro; Aizawa, Masanori; and Kobayashi, Tomomi, 5,144,824, Cl. 72-46.000
Toyo Tire & Rubber Co., Ltd.: *See*—
Ohtake, Yasuhide, 5,145,688, Cl. 425-28.100.
Toyoda Koki Kabushiki Kaisha: *See*—
Kawamata, Taisuke; Maruyama, Toshio; Irie, Hidetaka; Inoue, Masayoshi; Nishio, Shinji; and Murayama, Koichi, 5,144,772, Cl. 51-105.0SP.
Toyoda, Masanori: *See*—
Nagashima, Takashi; Nakamura, Toshiyuki; Fukuda, Hideo; Toyoda, Masanori; Nakashima, Naoki; Takahashi, Ichiro; Mukainishi, Munetaka; Kitagawa, Shouichi; and Okada, Masayoshi, 5,145,160, Cl. 271-9.000
Toyoda, Nobuhiko; Mishina, Yoshihiko; Murata, Ryuji; Uozu, Yoshihiro; Oda, Masaaki; and Ishimaru, Teruta, to Mitsubishi Rayon Company Ltd. Distributed graded index type optical transmission plastic article and method of manufacturing same. 5,146,530, Cl. 385-124.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Morishita, Shinya; Suzuki, Kenichi; Oohori, Masae; and Nakada, Masahiko, 5,146,169, Cl. 324-438.000
Sonoda, Akikazu; Fujita, Shinji; Takigawa, Masahiro; Fukuda, Katsunori; and Nakamura, Hisanori, 5,145,312, Cl. 414-719.000
Yoshioka, Mamoru; Sugiyama, Toshihisa; and Kidokoro, Toru, 5,144,803, Cl. 60-612.000
Trauth, Hubert: *See*—
Aumueller, Alexander; and Trauth, Hubert, 5,145,966, Cl. 546-193.000
Trautmann, Karl-Heinz: *See*—
Mathiak, Friedrich; Krawietz, Arnold; Nowack, Horste; and Trautmann, Karl-Heinz, 5,144,844, Cl. 73-79.400
Trebbi, Giuliano: *See*—
Ancona, Giuseppe; Benelli, Giancarlo; De Michele, Gennaro, Ligasacchi, Sergio; Mascalzi, Gianni; Scavizzi, Giancarlo; Trebbi, Giuliano; and Zennaro, Aldo, 5,145,359, Cl. 431-184.000
Tregear, Geoffrey W.: *See*—
Hudson, Peter J.; Shine, John; Niall, Hugh D.; and Tregear, Geoffrey W., 5,145,962, Cl. 530-324.000
Tremonis Gesellschaft Mit Beschrankter Haftung Brauerei-Nebenerzeugnisse: *See*—
Weiergraber, Peter, 5,145,492, Cl. 55-17.000
Trilby, Ltd.: *See*—
Gravino, Marc C., 5,145,081, Cl. 220-86.200
Trinh Van, Christian; and Desperben, Lydie, to Alcatel N.V. Digital measuring circuit for measuring an electrical signal. 5,146,155, Cl. 324-99.00D
Trommer, Gert: *See*—
Buehler, Wolfhardt; Poisel, Hans; and Trommer, Gert, 5,146,292, Cl. 356-350.000
Tropix, Inc.: *See*—
Voyta, John C.; Edwards, Brooks; Bronstein, Irena Y.; and McGrath, Patricia, 5,145,772, Cl. 435-4.000
Troutman, Mark E.: *See*—
Brooks, Peter E.; Reidenbach, John R.; and Troutman, Mark E., 5,146,450, Cl. 369-244.000
Trouve, Arnaud-Christophe: *See*—
Poinsot, Thierry; Lacas, Francois; Chambon, Jean; Veynante, Denis; and Trouve, Arnaud-Christophe, 5,145,355, Cl. 431-1.000
Troyer, Stephen R.: *See*—
Beck, James L.; Booth, James R.; Cole, Carl P.; Oliver, Lynn M., Spina, Warren J.; and Troyer, Stephen R., 5,146,547, Cl. 395-116.000
Trudeau, Luc: *See*—
Paquette, Jean-Paul; and Trudeau, Luc, 5,144,782, Cl. 52-408.000
True Temper Hardware Company: *See*—
Shaver, Paul V., 5,145,116, Cl. 239-665.000
Truitt, Gary A.: *See*—
Baggiolini, Enrico G., deceased; Hennessy, Bernard M.; Shiuey, Shian-Jan; Truitt, Gary A.; and Uskokovic, Milan R., 5,145,846, Cl. 514-167.000
Trumpp, Alfred, to Eastman Kodak Company. Sheet-film cassette. 5,146,484, Cl. 378-188.000
TRW Inc.: *See*—
Williams, Daniel E., 5,145,206, Cl. 280-707.000

TRW Vehicle Safety Systems Inc.: *See*—
Kotikovsky, Alexander P., 5,145,123, Cl. 242-107.40A.
Lenzen, Reiner, 5,145,209, Cl. 280-806.000.
Tsai, Chuen-Jinn: *See*—
Myhre, Douglas C.; O'Brien, Richard J.; Pui, David Y. H.; and Tsai, Chuen-Jinn, 5,146,244, Cl. 359-509.000
Tschaen, David M.; Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, to Merck & Co., Inc. Stereoselective synthesis of a chiral cis 3-beta hydrogen (3R) 4-aroyloxy azetidinone 5,145,957, Cl. 540-200.000
Tselepis, Arthur J.: *See*—
Narula, Dipak; Glover, Shedrick O.; and Tselepis, Arthur J., 5,145,898, Cl. 524-310.000
Tsou, Len-Yuan: *See*—
Mukherjee, Satyendranath; Tsou, Len-Yuan; and Kuo, Di-Son, 5,146,426, Cl. 365-149.000.
Tsubaki, Atsushi: *See*—
Kitazawa, Makio; Akahane, Mazuo; Nakano, Yasushi; Tsubaki, Atsushi; Sato, Kazuaki; Ban, Masaaki; and Kobayashi, Michihiro, 5,145,869, Cl. 514-510.000.
Tsubakimoto Chain Co.: *See*—
Fujita, Norihisa; Nagasawa, Hiroaki; and Sahara, Shinsuke, 5,145,277, Cl. 403-374.000
Tsuboi, Kiyoshi, to Iwatsu Electric Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Defect detecting method and apparatus. 5,144,838, Cl. 73-579.000
Tsuchida, Masaaki: *See*—
Isoguchi, Seiichi; Tsuchida, Masaaki; Ohta, Yoshitaka; and Tamura, Tomoaki, 5,146,353, Cl. 358-909.000.
Tsuchida, Susumu, to Sony Corporation. Apparatus for adjusting picture quality of high definition television signals of either standard or wide aspect ratios displayed on a wide aspect ratio display. 5,146,331, Cl. 359-169.000.
Tsuchiya, Ikuo: *See*—
Kimura, Masahiro; Matsuo, Kenji; Tsuchiya, Ikuo; and Fukuda, Masayo, 5,146,120, Cl. 307-570.00
Tsuchiya, Michiyo: *See*—
Arano, Noriyuki; and Tsuchiya, Michiyo, 5,145,613, Cl. 264-8.000
Tsuchiya, Yoshinobu; Shirata, Akihiro; and Moroboshi, Hiroyoshi, to Isuzu Motors Limited. Low discharge capacitor motor starter system. 5,146,095, Cl. 290-38.00R.
Tsuda, Mutsumi: *See*—
Ootera, Hiroki; and Tsuda, Mutsumi, 5,146,138, Cl. 315-111.210.
Tsuji, Kazuo: *See*—
Uematsu, Kazuma; Kinoshita, Shigehiro; and Tsuji, Kazuo, 5,144,951, Cl. 128-633.000.
Tsukamoto, Kouji: *See*—
Tanaka, Yukihisa; Tsukamoto, Kouji; and Shinoda, Katsuaki, 5,145,542, Cl. 156-159.000.
Tsurukawa, Ikuya; and Yamaguchi, Kunihisa, to Ricoh Company, Ltd. Apparatus for driving varifocal lens. 5,146,254, Cl. 354-195.120
Tsurumi, Yashuyuki; and Isomura, Mamoru, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle fuel tank providing multiple enhancements. 5,145,023, Cl. 180-68.100
Tsushima, Koji: *See*—
Hashimoto, Kimio; Ikoma, Katsuyuki; and Tsushima, Koji, 5,145,134, Cl. 248-183.000.
Tsutsui, Toshiyuki; Sugimura, Kenji; and Ueda, Takashi, to Mitsui Petrochemical Industries, Ltd. Olefin polymerization catalyst and process for the polymerization of olefins. 5,145,818, Cl. 502-113.000.
Tubo, Ross A.; Schaeffer, Susan F.; Schermer, Alexander; and Odessey, Richard, to BioSurface Technology, Inc. Cryopreservation of cultured epithelial sheets. 5,145,770, Cl. 435-1.000.
Tung, Chen-Jen. Foldable and telescopic garment hanger. 5,145,098, Cl. 223-94.000
Tupek, Garry F.; Manser, John W.; and Komaniecki, James M., to Rockwell International Corporation. Printing fluid circulator for use in a printing press. 5,144,892, Cl. 101-363.000
Turlik, Iwona: *See*—
Reisman, Arnold; Temple, Dorota; and Turlik, Iwona, 5,145,714, Cl. 427-53.100.
Turner, James K.: *See*—
Clifford, Graham F.; Turner, James K.; and Spurrier, Mack W., 5,145,527, Cl. 118-411.000.
Turner, Myron A., Jr.: *See*—
Toliver, Samuel; Roberts, Gerald E.; and Turner, Myron A., Jr., 5,146,174, Cl. 324-727.000
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Yamashita, Atsushi; and Nakayama, Takeshi, to Matsushita Electric Industrial Co., Ltd. Foldable electronic print board with centrally located printer for stability. 5,146,345, Cl. 358-297.000.

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Yamazaki, Shunpei; and Hayashi, Shigenori, to Semiconductor Energy Laboratory Co., Ltd. Cyclotron resonance chemical vapor deposition method of forming a halogen-containing diamond on a substrate. 5,145,711, Cl. 427-38.000.

Yamazaki, Takao: *See—*
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Yanai, Noriyuki; and Watabe, Masahiro, to Canon Kabushiki Kaisha. Method of making a cleaning blade coated with graphite fluoride. 5,145,724, Cl. 427-430.100.

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Yao-Ko, Chen. Floppy disk cleaning machine. 5,146,382, Cl. 360-137.000.

Yarr, George A. Linear reciprocating alternator. 5,146,123, Cl. 310-15.000.

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Yasuda, Shoki, to Brother Kogyo Kabushiki Kaisha. Numerically controlled machine tool with automatic tool exchange device and indexing device. 5,144,740, Cl. 483-4.000.

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Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai, Kenji, to Chisso Corporation. Polypropylene resin composition. 5,145,891, Cl. 524-34.000.

Yasukawa, Yoshiaki; Asakuno, Hiroyoshi; Mori, Kinya; and Iwai, Kenji, to Chisso Corporation. Polypropylene resin composition. 5,145,892, Cl. 524-34.000.

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Yoshioka, Mamoru; Sugiyama, Toshihisa; and Kidokoro, Toru, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with a dual turbocharger system. 5,144,803, Cl. 60-612.000.

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Yuasa, Kimihiro; Fujimoto, Tetsuo; and Hashimoto, Kenji, to Idemitsu Kosan Co., Ltd. Method of producing a substrate coated with a film of liquid crystal material and method of producing a liquid crystal optical device. 5,145,546, Cl. 156-324.000.

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Zan, Ja D. Multi-purpose solar energy operated toy vehicle. 5,145,442, Cl. 446-163.000

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Zeller, Henry O. Toothpaste dispenser. 5,145,093, Cl. 222-103.000.

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Zhou, Peter Y.; and Solaski, Thomas P., to Knogo Corporation. Theft detection apparatus and flattened wire target and method of making same. 5,146,204, Cl. 340-551.000.

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Zumbusch, Steven J.; and O'Neil, Walter K., to Eaton Corporation. Homoplanar brushless electric gerotor. 5,145,329, Cl. 417-356.000

Zumbusch, Steven J., to Eaton Corporation. Gerotor pump having an improved drive mechanism. 5,145,348, Cl. 418-171.000.

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Zycon Corporation: *See—*
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Zouston, Clarence H. Smoke stack exhaust system. 5,145,498, Cl. 55-222.000

Zimura, Kazuya; and Takenaka, Kenji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable capacity wobble plate type compressor with capacity regulating valve. 5,145,326, Cl. 417-222.200

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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1992

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Akima, Toshio: *See*—
Kawai, Hiromasa; Morinaga, Takashi; Miyajima, Hiromu; Akima, Toshio; Kato, Mitsuharu; and Hosoi, Yutaka, Re. 34,061, Cl. 526-282.000.

Akitake, Hiroshi, to Olympus Optical Company, Ltd. Zooming mechanism for zoom lens. Re. 34,059, Cl. 359-700.000.

Arthur, Samuel D., to Du Pont de Nemours, E. I., and Company. Multilayer reverse osmosis membrane of polyamide-urea. Re. 34,058, Cl. 210-500.370.

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Electric Power Research Institute, Inc.: *See*—
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Hitachi Chemical Co., Ltd.: *See*—
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Hitachi, Ltd.: *See*—
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Hitachi Microcomputer Engineering Ltd.: *See*—
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Hosoi, Yutaka: *See*—
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Kawai, Hiromasa; Morinaga, Takashi; Miyajima, Hiromu; Akima, Toshio; Kato, Mitsuharu; and Hosoi, Yutaka, to Hitachi Chemical Co., Ltd. Polymers of tricyclo[5.2.1.$0^{2,6}$]deca-8-yl (meth)acrylate. Re. 34,061, Cl. 526-282.000.

Lindgren, Per G., to C.R. Bard, Inc. Tissue sampling device. Re. 34,056, Cl. 128-754.000.

Middlesworth, Tommy A., to Simplicity Manufacturing, Inc. Steering mechanism for a zero turning radius vehicle. Re. 34,057, Cl. 180-6.200.

Millington, Douglas; and Yewman, Peter W. W., to Cogsdill Tool Products, Inc. Reamer with angled blade and full length clamp and method of assembly. Re. 34,054, Cl. 29-525.100.

Miyajima, Hiromu: *See*—
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Holm, David R.; Westimayer, David A.; Crookes, William E.; and Nickles, Daniel R., 329,242, Cl. D15-17.000.
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Whirlpool Corporation: *See*—
Doggett, Lawrence A., 329,165, Cl. D7-376.000.
Doggett, Lawrence A., 329,166, Cl. D7-376.000.
White Consolidated Industries, Inc.: *See*—
Edman, Robin, 329,164, Cl. D7-351.000
Williams, Michael, to Gruner & Jahr Printing & Publishing Co. Toy rattle. 329,260, 9-8-92, Cl. D21-65.000.
Wilson, Hannah C. Base for a fishing pole holder or the like. 329,274, 9-8-92, Cl. D22-147.000.
Winkelbauer, Ewald, to Yamaha Corporation. Speaker. 329,234, 9-8-92, Cl. D14-204.000
Winston Furniture Company, Inc.: *See*—
Hess, Stephen C., 329,156, Cl. D6-500.000.
Wollman, Howard, to HWE, Inc. Hand-held massager. 329,291, 9-8-92, Cl. D24-214.000.
Wollman, Howard, to HWE, Inc. Hand-held massager. 329,292, 9-8-92, Cl. D24-214.000.
Woodrum, Byron: *See*—
Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., 329,143, Cl. D4-104.000
Yamaha Corporation: *See*—
Ishikawa, Takeshi, 329,237, Cl. D14-216.000
Ko, Shosuke, 329,236, Cl. D14-215.000.
Miura, Hidehiko, 329,233, Cl. D14-204.000
Sarmiento, Alejandro, 329,235, Cl. D14-215.000
Winkelbauer, Ewald, 329,234, Cl. D14-204.000.
Yanish, Kenneth. Hose holding device. 329,195, 9-8-92, Cl. D8-356.000
Yazaki Corporation: *See*—
Nagasaka, Yasuhiro; Hirayama, Yasuo; Sawada, Yoshitsugu; and Ohta, Yukio, 329,222, Cl. D13-133.000
Yoon, Mike Y. S. Shoe sole. 329,130, 9-8-92, Cl. D2-320.000.
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Yu, Sun Il, to Goldstar Co., Ltd. Cassette tape recorder. 329,232, 9-8-92, Cl. D14-165.000
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Bennett, Cecilia L. D., deceased: *See*—
O'Brien, Susan M.; and Bennett, Cecilia L. D., deceased, 7,962, Cl. 8.200

Goldsmith Seeds, Inc.: *See*—
Hanes, Mitchell, 7,969, Cl. 87.120

Hanes, Mitchell, to Goldsmith Seeds, Inc. Geranium named Eclipse Salmon Orange. 7,969, 9-8-92, Cl. 87.120.

Hokeutsu Nohji Co., Ltd.: *See*—
Katsuo, Kiyoshi, 7,968, Cl. 67.300

Hokuetsu Nohji Co., Ltd.: *See*—
Katsuo, Kiyoshi, 7,964, Cl. 67.300
Katsuo, Kiyoshi, 7,965, Cl. 67.300
Katsuo, Kiyoshi, 7,966, Cl. 67.300
Katsuo, Kiyoshi, 7,967, Cl. 67.300

Katsuo, Kiyoshi, to Hokuetsu Nohji Co., Ltd. Crape-myrtle named Summer Dream. 7,964, 9-8-92, Cl. 67.300.

Katsuo, Kiyoshi, to Hokuetsu Nohji Co., Ltd. Crape-myrtle named Summer Flash. 7,965, 9-8-92, Cl. 67.300.

Katsuo, Kiyoshi, to Hokuetsu Nohji Co., Ltd. Crape-myrtle named Summer Venus. 7,966, 9-8-92, Cl. 67.300.

Katsuo, Kiyoshi, to Hokuetsu Nohji Co., Ltd. Crape-myrtle named Summer Fantasy. 7,967, 9-8-92, Cl. 67.300.

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O'Brien, Susan M.; and Bennett, Cecilia L. D., deceased (by O'Brien, Susan Mae, Administrator). Miniature rose plant named 'Yantai'. 7,962, 9-8-92, Cl. 8.200.

O'Brien, Susan Mae, Administrator: *See*—
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 8, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
69 5,144,694
189 5,144,695
207 5,144,696
236 5,144,697

CLASS 4
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515 5,144,701
541.6 5,144,702
580 5,144,703

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400 5,144,706
451 5,144,707
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446 5,144,744
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564.7 5,144,737
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602.1 5,144,745
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830 5,144,742
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625.5 5,144,982
625.64 5,144,983
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189 R 5,145,179
201 5,145,176
232 5,145,180
237 5,145,181
238 5,145,182
240 5,145,183
248 5,145,184
287 5,145,185
422 5,145,186
5,145,187

CLASS 277

3 5,145,189
166 5,145,190
212 FB 5,145,191

CLASS 279

62 5,145,192
5,145,193
5,145,194

CLASS 280

28 5,145,195
278 5,145,196
281.1 5,145,210
304.1 5,145,197
426 5,145,198
495 5,145,199
605 5,145,200
609 5,145,201
613 5,145,202
632 5,145,203
668 5,145,204
707 5,145,205
5,145,206
732 5,145,207
734 5,145,208
806 5,145,209

CLASS 283

80 5,145,211
86 5,145,212

CLASS 285

2 5,145,213
30 5,145,214
49 5,145,215
162 5,145,216
179 5,145,217
243 5,145,218
330 5,145,219
374 5,145,220

CLASS 290

38 R 5,146,095
44 5,146,096

CLASS 292

175 5,145,221
258 5,145,222
347 5,145,223

CLASS 294

2 5,145,224
8.6 5,145,225
27.1 5,145,226
65.5 5,145,227
86.25 5,145,228
158 5,145,229

CLASS 296

100 5,145,230
220 5,145,231

CLASS 297

329 5,145,232
408 5,145,233
460 5,145,234

CLASS 299

1.9 5,145,235
12 5,145,236
94 5,145,237

CLASS 303

10 5,145,238
14 5,145,239
89 5,145,240

CLASS 305

31 5,145,241
35 EB 5,145,242

CLASS 307

10.1 5,146,103
5,146,104
118 5,146,106
246 5,146,105
253 5,146,107
261 5,146,108
270 5,146,109
296.2 5,146,110
296.3 5,146,111
303 5,146,112
303.1 5,146,113
355 5,146,114
452 5,146,115
455 5,146,116
465 5,146,117
475 5,146,118
476 5,146,119
570 5,146,120
603 5,146,121

CLASS 310

13 5,146,122
15 5,146,123
17 5,146,124
68 R 5,146,125
156 5,146,126
166 5,146,127
323 5,146,129

CLASS 312

259 5,145,244
265.1 5,145,243
321.5 5,145,245

CLASS 313

112 5,146,130
346 R 5,146,131
407 5,146,132
414 5,146,133
579 5,146,134
619 5,146,135

CLASS 315

39.69 5,146,136
111.21 5,146,137
5,146,138
205 5,146,139
248 5,146,140
326 5,146,141
382 5,146,142

CLASS 318

116 5,146,143
138 5,146,144
254 5,146,145
768 5,146,146
797 5,146,147
803 5,146,148

CLASS 320

2 5,146,149
17 5,146,150

CLASS 323

267 5,146,151
280 5,146,152
324 5,146,153
367 5,146,154

CLASS 324

99 D 5,146,155
127 5,146,156
142 5,146,157
146 5,146,158
158 R 5,146,159
5,146,160
166 5,146,161
232 5,146,162
233 5,146,163
260 5,146,164
321 5,146,165
339 5,146,166
392 5,146,167
438 5,146,168
536 5,146,169
639 5,146,170
691 5,146,171
714 5,146,172
727 5,146,173
5,146,174

CLASS 330

54 5,146,175
69 5,146,176
149 5,146,177
251 5,146,178
253 5,146,179
254 5,146,180
268 5,146,181
307 5,146,182

CLASS 331

1 A 5,146,183
3 5,146,184
5,146,185
16 5,146,186
17 5,146,187
111 5,146,188
158 5,146,189

CLASS 333

117 5,146,190
161 5,146,191
164 5,146,192
206 5,146,193

CLASS 335

16 5,146,194
35 5,146,195
271 5,146,196
299 5,146,197

CLASS 336

178 5,146,198

CLASS 337

380 5,146,199

CLASS 338

21 5,146,200
32 H 5,146,201

CLASS 340

438 5,146,202
443 5,146,203
551 5,146,204
568 5,146,205
573 5,146,206
5,146,207
5,146,208
693 5,146,209
709 5,146,210
5,146,211
5,146,212
781 5,146,213
825 03 5,146,214
825.32 5,146,215
825 44 5,146,217

825.52 5,146,216
995 5,146,219

CLASS 341

67 5,146,220
5,146,221
76 5,146,222
118 5,146,223
147 5,146,224
152 5,146,225

CLASS 342

20 5,146,226
5,146,227
64 5,146,228
204 5,146,229
374 5,146,230
419 5,146,231

CLASS 343

713 5,146,232
815 5,146,233
895 5,146,234
5,146,235

CLASS 346

1.1 5,146,236
5,146,237
76 PH 5,146,238
5,146,239
108 5,146,240
5,146,241
5,146,242
140 R 5,146,243

CLASS 351

118 5,146,245

CLASS 353

7 5,146,246
26 A 5,146,247
122 5,146,248

CLASS 354

21 5,146,249
145.1 5,146,250
5,146,251
149.11 5,146,252
187 5,146,253
195.12 5,146,254
288 5,146,255
295 5,146,256
298 5,146,257
400 5,146,260
402 5,146,261
403 5,146,262
430 5,146,263
432 5,146,258
456 5,146,259

CLASS 355

27 5,146,264
32 5,146,265
50 5,146,266
68 5,146,267
70 5,146,268
200 5,146,269
5,146,270
206 5,146,271
208 5,146,272
5,146,273
5,146,274
215 5,146,279
219 5,146,280
5,146,281
243 5,146,276
244 5,146,275
245 5,146,277
253 5,146,278
270 5,146,285
309 5,146,286

CLASS 356

5 5,146,287
30 5,146,288
35.5 5,146,289
152 5,146,290
239 5,146,282
246 5,146,283
345 5,146,284
350 5,146,292
356 5,146,293
435 5,146,294

CLASS 357

4 5,146,295
13 5,146,297
19 5,146,296
22 5,146,298
23.4 5,146,291
23.5 5,146,299
23.6 5,146,300
23.7 5,146,301
24 5,146,302
30 5,146,303
34 5,146,304
38 5,146,305
41 5,146,306
51 5,146,307
55 5,146,308
59 5,146,309
70 5,146,310
5,146,312
74 5,146,313
82 5,146,314

CLASS 358

22 5,146,315
29 5,146,316
31 5,146,317
5,146,318
39 5,146,319
44 5,146,320
54 5,146,321
60 5,146,322
76 5,146,323
100 5,146,311
133 5,146,324
135 5,146,325
5,146,326
141 5,146,327
164 5,146,328
166 5,146,329
167 5,146,330
172 5,146,332
182 5,146,333
183 5,146,334
5,146,335
191 1 5,146,336
5,146,337
5,146,338
212 5,146,339
213 27 5,146,340
214 5,146,341
231 5,146,342
296 5,146,343
5,146,344
297 5,146,345
298 5,146,346
342 5,146,347
407 5,146,348
5,146,349
441 5,146,350
448 5,146,351
451 5,146,352
909 5,146,353

CLASS 359

49 5,146,354
50 5,146,355
59 5,146,356
152 5,146,357
169 5,146,331
181 5,146,358
189 5,146,359
216 5,146,360
280 5,146,361
353 5,146,362
363 5,146,363
509 5,146,244
615 5,146,364
619 5,146,365
683 5,146,366
700 Re 34,059
820 5,146,367
861 5,146,368

CLASS 360

15 5,146,369
32 5,146,370
5,146,371
51 5,146,372
77.01 5,146,373
78 14 5,146,374
92 5,146,375
94 5,146,376
109 5,146,377
121 5,146,378
126 5,146,379
132 5,146,380
137 5,146,382

CLASS 361

19 5,146,383
55 5,146,384
56 5,146,385
91 5,146,386
115 5,146,387
153 5,146,388
283 5,146,389
427 5,146,390
525 5,146,391

CLASS 362

31 5,145,246
61 5,146,392
148 5,145,247
217 5,145,248
260 5,146,393
365 5,145,249

CLASS 363

13 5,146,395
16 5,146,394
5,146,396
74 5,146,397
89 5,146,398
5,146,399
98 5,146,400

CLASS 364

138 5,146,401
191 5,146,402
401 5,146,403
5,146,404
419 5,146,405
5,146,406
424.05 5,146,407
426.02 5,146,408
472 5,146,409
474.31 5,146,410
480 5,146,411
482 5,146,412
497 5,146,413
510 5,146,414
563 5,146,416
571.01 5,146,417
729 5,146,418
748 5,146,419
757 5,146,420
758 5,146,421
768 5,146,422
771 5,146,423
786 5,146,424

CLASS 365

149 5,146,425
5,146,426
189.05 5,146,427
189.08 5,146,428
200 5,146,429
208 Re 34,060
222 5,146,430
238.5 5,146,431

CLASS 366

8 5,145,250
80 5,145,251
98 5,145,252
101 5,145,253
133 5,146,381
286 5,145,254
329 5,145,255
336 5,145,256

CLASS 367

13 5,146,432
83 5,146,433
140 5,146,434
181 5,146,435

CLASS 368

21 5,146,436
282 5,146,437

CLASS 369

13 5,146,438
25 5,146,439
32 5,146,440
44 15 5,146,441
44.29 5,146,442
5,146,443
44.41 5,146,444
5,146,445
77.2 5,146,446
5,146,447
83 5,146,448
106 5,146,449
244 5,146,450
270 5,146,451

CLASS 370

16 5,146,452
5,146,453
60 5,146,454
68 5,146,455
110.4 5,146,456
111 5,146,457

CLASS 371

21.2 5,146,458
21.5 5,146,459
23 5,146,460
40.1 5,146,461
47.1 5,146,462

CLASS 372

24 5,146,463
38 5,146,464
45 5,146,465
5,146,466
46 5,146,467
59 5,146,468

CLASS 373

89 5,146,469

CLASS 374

131 5,145,257

CLASS 375

1 5,146,471
8 5,146,472
5,146,473
10 5,146,474
94 5,146,475
98 5,146,476
103 5,146,470
112 5,146,477
119 5,146,478

CLASS 376

173 5,145,635
189 5,145,636
249 5,145,637
282 5,145,638
283 5,145,639

CLASS 377

41 5,146,479
60 5,146,480

CLASS 378

35 5,146,481
43 5,146,482
127 5,146,483
188 5,146,484
197 5,146,485

CLASS 379

40 5,146,486
67 5,146,487
88 5,146,488
100 5,146,489
113 5,146,490
114 5,146,491
145 5,146,492
357 5,146,493
411 5,146,494

CLASS 380

5 5,146,495
15 5,146,496
21 5,146,497
5,146,498
23 5,146,499
30 5,146,500

CLASS 381

25 5,146,501
43 5,146,502
5,146,503
46 5,146,504
71 5,146,505
94 5,146,506
103 5,146,507
156 5,146,508

CLASS 382

8 5,146,509
5,146,510
19 5,146,511
30 5,146,512

CLASS 383

14 5,145,258

CLASS 384

1 5,145,259
43 5,145,260
45 5,145,261
49 5,145,262
219 5,145,263
275 5,145,264
296 5,145,265
322 5,145,266
558 5,145,267

CLASS 385

13 5,146,513
24 5,146,514
35 5,146,515
36 5,146,516
39 5,146,517
41 5,146,518
43 5,146,519
45 5,146,520
48 5,146,521
49 5,146,522
60 5,146,523
75 5,146,524
78 5,146,525
90 5,146,526
98 5,146,527
101 5,146,528
103 5,146,529
124 5,146,530
128 5,146,531
136 5,146,532
141 5,146,533
142 5,146,534
143 5,146,535

CLASS 392

488 5,146,536

CLASS 395

1 5,146,537
2 5,146,538
5,146,539
11 5,146,540
21 5,146,541
23 5,146,602
24 5,146,542
27 5,146,543
101 5,146,415
115 5,146,544
5,146,545
5,146,546
116 5,146,547
117 5,146,548
138 5,146,549
140 5,146,550
142 5,146,551
145 5,146,552
146 5,146,553
150 5,146,554
157 5,146,555
5,146,592
159 5,146,556
161 5,146,557
166 5,146,558
200 5,146,559
5,146,560
5,146,561
5,146,562
250 5,146,563
5,146,564
275 5,146,565
5,146,566
325 5,146,567
5,146,568
375 5,146,569
5,146,570
400 5,146,571
425 5,146,572
5,146,573
5,146,574
5,146,575
5,146,576
5,146,577
5,146,578
5,146,579
5,146,580
5,146,581
5,146,603
5,146,604
500 5,146,582
5,146,583
550 5,146,584
5,146,585
5,146,586
575 5,146,587
5,146,588
5,146,589
5,146,605
600 5,146,590
5,146,591
700 5,146,593
5,146,594
725 5,146,595
5,146,596
5,146,597
800 5,146,598
5,146,599
5,146,600
5,146,601
5,146,606
5,146,607
5,146,608

CLASS 400

196 1 5,145,268
216.2 5,145,269
488 5,145,270
711 5,145,271

CLASS 401

112 5,145,272

CLASS 403

24 5,145,273
79 5,145,274
171 5,145,275
349 5,145,276
374 5,145,277

CLASS 404

6 5,145,278

CLASS 405

50 5,145,279
62 5,145,280
154 5,145,281
155 5,145,282
157 5,145,283
169 5,145,289
179 5,145,290
230 5,145,291
232 5,145,284
242 5,145,287
258 5,145,285
5,145,286
284 5,145,288

CLASS 406

88 5,145,292
193 5,145,293

CLASS 407

42 5,145,294
113 5,145,295

CLASS 408

1 R 5,145,296

CLASS 409

132 5,145,297
135 5,145,298

CLASS 410

100 5,145,299

CLASS 411

1 5,145,300
82 5,145,301
404 5,145,302

CLASS 414

217 5,145,303
228 5,145,304
406 5,145,305
417 5,145,306
458 5,145,307
462 5,145,308
525.1 5,145,309
537 5,145,310
592 5,145,311
719 5,145,312
723 5,145,313

CLASS 415

1 5,145,314
115 5,145,315
173.1 5,145,316
224.5 5,145,317

CLASS 416

167 5,145,318
193 A 5,145,319
230 5,145,320
244 R 5,145,321

CLASS 417

32 5,145,322
36 5,145,323
222.1 5,145,324
222.2 5,145,325
5,145,326
295 5,145,327
299 5,145,328
356 5,145,329
363 5,145,330
383 5,145,331
390 5,145,332
405 5,145,333
407 5,145,334
410 5,145,335
413 5,145,336
423.3 5,145,337
480 5,145,338
521 5,145,339
568 5,145,340

CLASS 418

48 5,145,341
5,145,342
5,145,343
55.2 5,145,344
55.4 5,145,345
55.5 5,145,346
77 5,145,347
171 5,145,348
206 5,145,349

CLASS 422

22 5,145,640
26 5,145,641
5,145,642
28 5,145,643
5,145,644
98 5,145,645
102 5,145,646
116 5,145,647
124 5,145,648
129 5,145,649
143 5,145,650
168 5,145,651
171 5,145,652
186 15 5,145,350
186 18 5,145,653
190 5,145,654
300 5,145,655

CLASS 423

42 5,145,656
219 5,145,657
232 5,145,658
328 5,145,659
480 5,145,660

CLASS 424

9 5,145,661
45 5,145,662
47 5,145,663

CLASSIFICATION OF PATENTS

49	5,145,664
50	5,145,665
52	5,145,666
	5,145,667
	5,145,668
61	5,145,670
	5,145,671
76.1	5,145,673
78.08	5,145,674
78.31	5,145,675
85.1	5,145,676
85.5	5,145,677
94.63	5,145,681
195.1	5,145,678
401	5,145,679
427	5,145,680
448	5,145,682
451	5,145,683
489	5,145,684
501	5,145,685
677	5,145,686

CLASS 425

9	5,145,687
28.1	5,145,688
72.2	5,145,689
80.1	5,145,351
89	5,145,690
110	5,145,691
139	5,145,692
149	5,145,693
174.8 R	5,145,694
205	5,145,352
588	5,145,353

CLASS 426

2	5,145,695
5	5,145,696
43	5,145,697
	5,145,698
94	5,145,699
240	5,145,700
249	5,145,701
531	5,145,702
535	5,145,703
576	5,145,704
589	5,145,705
647	5,145,706
649	5,145,707
662	5,145,708

CLASS 427

8	5,145,709
34	5,145,710
38	5,145,711
	5,145,712
53.1	5,145,713
	5,145,714
54.1	5,145,715
55	5,145,716
96	5,145,717
171	5,145,718
215	5,145,719
255.3	5,145,720
379	5,145,721
388.1	5,145,722
397.7	5,145,723
430.1	5,145,724

CLASS 428

24	5,145,730
36.1	5,145,732
102	5,145,725
195	5,145,726
198	5,145,727
213	5,145,728
220	5,145,729
229	5,145,734
246	5,145,735
332	5,145,736
334	5,145,737
336	5,145,738
	5,145,739
371	5,145,740
402	5,145,741
	5,145,742
403	5,145,743
423.7	5,145,744
425.9	5,145,745
458	5,145,746
484	5,145,747
489	5,145,748
511	5,145,749
551	5,145,733
690	5,145,750
694	5,145,751

CLASS 429

27	5,145,752
32	5,145,753
	5,145,754
196	5,145,755

CLASS 430

1	5,145,756
5	5,145,757
49	5,145,758
58	5,145,759
73	5,145,760
108	5,145,761
137	5,145,762
169	5,145,763
260	5,145,764
264	5,145,765
338	5,145,767
372	5,145,766
569	5,145,768

CLASS 31

1	5,145,354
	5,145,355
143	5,145,357
153	5,145,358
184	5,145,359
346	5,145,360

CLASS 32

19	5,145,361
72	5,145,362
180	5,145,363

CLASS 33

6	5,145,364
8	5,145,365
77	5,145,366
84	5,145,367
91	5,145,368
118	5,145,369
126	5,145,370
173	5,145,371
	5,145,372
221	5,145,373
228.1	5,145,374

CLASS 414

157	5,145,375
	5,145,376
219	5,145,377
302	5,145,378

CLASS 415

1	5,145,769
	5,145,770
	5,145,771
4	5,145,772
7.23	5,145,773
7.25	5,145,774
69.1	5,145,775
91	5,145,776
99	5,145,781
172.3	5,145,777
232	5,145,778
252.4	5,145,786
262	5,145,779
	5,145,780
320.1	5,145,782
	5,145,783

CLASS 416

8	5,145,785
79	5,145,787
106	5,145,788
526	5,145,784
530	5,145,789
536	5,145,790
546	5,145,791

CLASS 417

5	5,145,793
24	5,145,794
33	5,145,795
40	5,145,796
43	5,145,797
44	5,145,798
47	5,145,799
51	5,145,800
52	5,145,801
63	5,145,802
129	5,145,792
	5,145,807
173	5,145,808
203	5,145,809
228	5,145,810

CLASS 431

34	5,145,379
49	5,145,380
62	5,145,381
63	5,145,382
78	5,145,383
	5,145,384
79	5,145,385
83	5,145,386
108	5,145,387
142	5,145,388
159	5,145,389
164	5,145,390
188	5,145,391
232	5,145,392
269	5,145,393
321	5,145,394
326	5,145,395
	5,145,396
328	5,145,397
341	5,145,398
352	5,145,356
371	5,145,399
376	5,145,400
395	5,145,401
459	5,145,402
508	5,145,403
521	5,145,404
525	5,145,405
532	5,145,406
567	5,145,407
581	5,145,408
585	5,145,409
587	5,145,410
598	5,145,411
620	5,145,412
	5,145,413
621	5,145,414
	5,145,415
668	5,145,416
685	5,145,417
716	5,145,418
752	5,145,419
783	5,145,420
801	5,145,421
856	5,145,422

CLASS 440

13	5,145,424
36	5,145,425
38	5,145,426
52	5,145,427
63	5,145,423
89	5,145,428

CLASS 441

4	5,145,429
74	5,145,430
135	5,145,431

CLASS 445

3	5,145,432
7	5,145,433
23	5,145,434
24	5,145,435
45	5,145,437
49	5,145,438

CLASS 446

34	5,145,439
106	5,145,440
126	5,145,441
163	5,145,442
242	5,145,443
	5,145,444
329	5,145,445
405	5,145,446
408	5,145,447

CLASS 449

43	5,145,436

CLASS 452

18	5,145,448
29	5,145,449
47	5,145,450
48	5,145,451
118	5,145,452
142	5,145,453
174	5,145,454

CLASS 453

6	5,145,455

CLASS 454

75	5,145,456
147	5,145,457
189	5,145,458
190	5,145,459
253	5,145,460

CLASS 455

33.2	5,146,609
35.1	5,146,610
40	5,146,611
45	5,146,612
78	5,146,613
89	5,146,614
90	5,146,615
103	5,146,616
310	5,146,617
345	5,146,618
351	5,146,619
	5,146,620

CLASS 460

67	5,145,461
68	5,145,462

CLASS 464

63	5,145,463

CLASS 474

16	5,145,464
101	5,145,465
153	5,145,188

CLASS 475

86	5,145,466
162	5,145,467
170	5,145,468
209	5,145,469
230	5,145,470
331	5,145,471

CLASS 482

35.4	5,145,731
37	5,145,472
49	5,145,473
51	5,145,474
52	5,145,475
53	5,145,476
57	5,145,477
61	5,145,478
62	5,145,479
63	5,145,480
70	5,145,481

CLASS 483

4	5,144,740

CLASS 501

15	5,145,803
21	5,145,804
78	5,145,805
80	5,145,806
95	5,145,811
97	5,145,812
	5,145,813
146	5,145,814

CLASS 502

52	5,145,815
60	5,145,816
65	5,145,817
113	5,145,818
117	5,145,819
119	5,145,821
150	5,145,822
155	5,145,823
216	5,145,824
242	5,145,825
262	5,145,826
401	5,145,820

CLASS 503

227	5,145,827
	5,145,828

CLASS 505

1	5,145,829
	5,145,830
	5,145,831
	5,145,832
	5,145,833
	5,145,834
	5,145,835
	5,145,836

CLASS 514

16	5,145,837
18	5,145,838
27	5,145,839
49	5,145,840
54	5,145,841
63	5,145,842
	5,145,843
77	5,145,844
80	5,145,845
167	5,145,846
182	5,145,847
185	5,145,848
210	5,145,849
248	5,145,850
252	5,145,851
253	5,145,852
254	5,145,853
259	5,145,854
269	5,145,855
274	5,145,856
318	5,145,857
	5,145,858
356	5,145,859
365	5,145,860
381	5,145,861
398	5,145,862
410	5,145,863
423	5,145,864
424	5,145,865
425	5,145,866
445	5,145,867
456	5,145,868
510	5,145,869
524	5,145,870
532	5,145,611
546	5,145,871
620	5,145,872
624	5,145,873
650	5,145,874
772	5,145,875

CLASS 518

715	5,145,876

CLASS 521

40	5,145,877
60	5,145,878
112	5,145,879
115	5,145,880
129	5,145,881
155	5,145,882
172	5,145,883

CLASS 522

14	5,145,884
39	5,145,885
66	5,145,886

CLASS 523

145	5,145,887
156	5,145,888
451	5,145,889

CLASS 524

21	5,145,890
34	5,145,891
	5,145,892
99	5,145,893
129	5,145,894
160	5,145,895
180	5,145,896
296	5,145,897
310	5,145,898
357	5,145,899
404	5,145,900
424	5,145,901
425	5,145,902
437	5,145,903
494	5,145,904
511	5,145,905
732	5,145,906
789	5,145,907
827	5,145,908

CLASS 525

57	5,145,909
61	5,145,910
67	5,145,911
313	5,145,669
326.5	5,145,912
329.5	5,145,914
403	5,145,915
421	5,145,916
474	5,145,917
	5,145,918
481	5,145,919
506	5,145,913
528	5,145,920

CLASS 526

74	5,145,921
124	5,145,922
193	5,145,923
225	5,145,924
247	5,145,925
282	Re.34,061
284	5,145,926
301	5,145,927
313	5,145,928
338	5,145,929

CLASS 528

4	5,145,930
15	5,145,931
	5,145,932
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23	5,145,934
65	5,145,935
86	5,145,936
125	5,145,937
	5,145,938
196	5,145,939
226	5,145,940
287	5,145,941
353	5,145,942
	5,145,943
366	5,145,944
370	5,145,945
388	5,145,946
392	5,145,947
409	5,145,948
422	5,145,949
481	5,145,950

CLASS 530

324	5,145,962
330	5,145,951

CLASS 534

753	5,145,952
851	5,145,953
852	5,145,954

CLASS 536

124	5,145,955
	5,145,956

CLASS 540

200	5,145,957

CLASS 544

106	5,145,958
279	5,145,959
310	5,145,960
334	5,145,961

CLASS 546

6	5,145,963
37	5,145,964
63	5,145,965
193	5,145,966
208	5,145,967
268	5,145,968

CLASS 548

213	5,145,981
266.2	5,145,982
341	5,145,983
522	5,145,984
525	5,145,985
531	5,145,986
546	5,145,970

CLASS 549

221	5,145,972
250	5,145,971
397	5,145,973
510	5,145,974

CLASS 552

299	5,145,975

CLASS 556

88	5,145,976
437	5,145,977
	5,145,978
440	5,145,979

CLASS 560

35	5,145,980
114	5,145,987
159	5,145,988
205	5,145,989

CLASS 562

16	5,145,990
87	5,145,991
431	5,145,992
466	5,145,993
478	5,145,994
522	5,145,995

CLASS 564

98	5,145,996
158	5,145,997
321	5,145,998
442	5,145,999

CLASS 568

26	5,146,000
323	5,146,001
337	5,146,002
350	5,146,003
463	5,146,004
616	5,146,005
720	5,146,006
727	5,146,007
743	5,146,008
761	5,146,010
844	5,146,011
881	5,146,012
889	5,146,009

CLASS 570

101	5,146,013
131	5,146,014
134	5,146,015
	5,146,016
143	5,146,017
156	5,146,018
160	5,146,019
163	5,146,020

CLASS 585

10	5,146,021
12	5,146,022
255	5,146,023
270	5,146,024
412	5,146,025
467	5,146,026
500	5,146,027
512	5,146,028
533	5,146,029
	5,146,030
624	5,146,031
640	5,146,032
647	5,146,033
654	5,146,034
667	5,146,035
723	5,146,036
738	5,146,037
818	5,146,038
820	5,146,039
825	5,146,040
864	5,146,041
867	5,146,042

CLASS 602

74	5,144,944

CLASSIFICATION OF DESIGNS

D1—	107	329,114		368	329,148		71	329,182		128	329,216		59	329,251		413	329,285
		329,115		370	329,149		102	329,183		146	329,217	D19—	36	329,252			329,286
		329,116		397	329,150		103	329,184		147	329,218		43	329,253	D24—	136	329,287
		329,117		433	329,151		107	329,185		187	329,219		72	329,254		164	329,288
	108	329,118		462	329,152		307	329,186		215	329,220		96	329,255		193	329,289
		329,119		467	329,153			329,187	D13—	107	329,221	D20—	9	329,256		211	329,290
	127	329,120		476	329,154		308	329,188		133	329,222		29	329,257		214	329,291
		329,121		479	329,155		322	329,189			329,223	D21—	31	329,258			329,292
		329,122		500	329,156		330	329,190		149	329,224		59	329,259	D25—	18	329,293
		329,123		511	329,157		343	329,191		161	329,225		65	329,260		49	329,294
D2—	275	329,124		515	329,159		349	329,192		162	329,226		84	329,261		68	329,295
	279	329,125		562	329,158		354	329,193	D14—	100	329,227		108	329,262		138	329,297
	314	329,126	D7—	309	329,160		356	329,194			329,228		109	329,263		156	329,296
		329,127		330	329,161			329,195		109	329,229		185	329,264	D26—	62	329,298
		329,128		332	329,162		373	329,196		118	329,230		220	329,265		74	329,299
	318	329,129		348	329,163		380	329,197		156	329,231			329,266		78	329,300
	320	329,130		351	329,164	D9—	423	329,198		165	329,232		230	329,267		164	329,301
		329,131		376	329,165		432	329,199		204	329,233		234	329,268	D27—	148	329,302
		329,132			329,166		454	329,200			329,234		239	329,269	D28—	37	329,303
D3—	7	329,133		397	329,167	D10—	31	329,201		215	329,235	D22—	120	329,270		38	329,304
	30.1	329,135			329,168		126	329,202			329,236		141	329,271		56	329,305
	62	329,136			329,169			329,203		216	329,237		142	329,272		62	329,306
		329,137		509	329,170			329,204		218	329,238			329,273	D30—	131	329,307
	76	329,134		592	329,171	D11—	17	329,205		219	329,239		147	329,274		134	329,308
		329,138		605	329,172		93	329,206		230	329,240	D23—	202	329,275		153	329,309
	77	329,139		611	329,173			329,207		250	329,241		213	329,276		160	329,310
	104	329,140		619	329,174		130.1	329,208	D15—	17	329,242		226	329,277	D32—	16	329,311
D4—	101	329,141		620	329,175			329,209		29	329,243		278	329,278		37	329,312
	104	329,142	D8—	10	329,176		216	329,210		148	329,244		287	329,279	D34—	7	329,313
		329,143		13	329,177	D12—	85	329,211	D16—	102	329,245		308	329,280		27	329,314
	199	329,144		21	329,178		91	329,212		129	329,246		323	329,281		28	329,315
D6—	300	329,145		30	329,179			329,213		223	329,247		366	329,282		29	329,316
	333	329,248		52	329,180		96	329,214	D17—	20	329,249		370	329,283	D99—	8	329,317
	336	329,146		67	329,181		102	329,215	D18—	55	329,250		378	329,284		28	329,318
	337	329,147															

CLASSIFICATION OF PLANTS

P	8.2	7,962		67.3	7,964										
	9	7,963			7,965			7,966			7,967			7,968	
													87.12	7,969	

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September 15, 1992

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
September 15, 1992 Volume 1142 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 12, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,864,653 through 4,866,788
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 10, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,539,713 through 4,541,124
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 12,1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,458,363	06/389,946	7/10/84
4,458,364	06/396,619	7/10/84
4,458,369	06/443,509	7/10/84
4,458,376	06/414,781	7/10/84
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4,458,569	06/239,490	7/10/84
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4,756,509	07/021,[illegible]71	7/12/88
4,756,511	07/042,[illegible]71	7/12/88
4,756,516	06/840,[illegible]17	7/12/88
4,756,517	06/772,[illegible]12	7/12/88
4,756,519	06/924,[illegible]38	7/12/88
4,756,523	06/882,[illegible]79	7/12/88
4,756,524	07/073,[illegible]06	7/12/88
4,756,528	06/889,[illegible]44	7/12/88
4,756,530	07/070,[illegible]77	7/12/88
4,756,533	06/946,[illegible]73	7/12/88
4,756,538	06/843,[illegible]06	7/12/88
4,756,542	07/043,[illegible]03	7/12/88
4,756,543	07/011,[illegible]84	7/12/88
4,756,551	07/004,[illegible]92	7/12/88
4,756,554	06/845,[illegible]70	7/12/88
4,756,556	07/031,[illegible]74	7/12/88
4,756,560	06/920,[illegible]56	7/12/88
4,756,578	07/037,[illegible]53	7/12/88
4,756,579	06/942,[illegible]68	7/12/88
4,756,580	06/935,[illegible]06	7/12/88
4,756,586	06/849,[illegible]21	7/12/88
4,756,597	06/922,[illegible]00	7/12/88
4,756,614	07/038,[illegible]06	7/12/88
4,756,615	06/927,[illegible]19	7/12/88
4,756,616	07/082,[illegible]47	7/12/88
4,756,618	07/07[illegible],614	7/12/88
4,756,623	06/93[illegible],453	7/12/88
4,756,624	07/06[illegible],203	7/12/88
4,756,635	07/02[illegible],081	7/12/88
4,756,642	07/02[illegible],899	7/12/88
4,756,657	06/84[illegible],408	7/12/88
4,756,658	07/03[illegible],754	7/12/88
4,756,659	07/00[illegible],856	7/12/88
4,756,660	07/03[illegible],217	7/12/88
4,756,663	06/22[illegible],357	7/12/88
4,756,666	06/63[illegible],321	7/12/88
4,756,670	06/92[illegible],530	7/12/88
4,756,678	06/919,989	7/12/88
4,756,686	07/003,729	7/12/88
4,756,690	06/938,458	7/12/88
4,756,699	06/874,562	7/12/88
4,756,703	06/926,857	7/12/88
4,756,705	06/939,422	7/12/88
4,756,711	06/945,670	7/12/88
4,756,713	06/917,976	7/12/88
4,756,724	06/937,313	7/12/88
4,756,725	06/900,680	7/12/88
4,756,739	06/944,547	7/12/88
4,756,742	06/757,739	7/12/88
4,756,748	07/033,367	7/12/88
4,756,754	07/022,895	7/12/88
4,756,755	07/052,078	7/12/88
4,756,760	06/907,544	7/12/88
4,756,764	07/019,289	7/12/88
4,756,766	07/046,762	7/12/88
4,756,772	06/664,237	7/12/88
4,756,777	07/046,474	7/12/88
4,756,779	07/098,569	7/12/88
4,756,783	06/930,782	7/12/88
4,756,787	07/118,484	7/12/88
4,756,800	06/903,174	7/12/88
4,756,806	07/064,997	7/12/88
4,756,807	07/109,836	7/12/88
4,756,818	07/018,200	7/12/88
4,756,824	06/876,088	7/12/88
4,756,827	07/016,775	7/12/88
4,756,829	07/035,014	7/12/88
4,756,831	06/869,101	7/12/88
4,756,835	06/901,827	7/12/88
4,756,837	07/036,504	7/12/88
4,756,840	07/092,756	7/12/88
4,756,853	06/736,622	7/12/88
4,756,858	07/011,880	7/12/88
4,756,861	06/948,097	7/12/88
4,756,869	06/840,426	7/12/88
4,756,870	06/880,897	7/12/88
4,756,871	06/679,461	7/12/88
4,756,877	06/795,305	7/12/88
4,756,879	06/613,882	7/12/88
4,756,889	07/041,598	7/12/88
4,756,897	06/877,418	7/12/88
4,756,904	06/871,044	7/12/88
4,756,913	07/043,453	7/12/88
4,756,929	06/681,686	7/12/88
4,756,936	07/045,313	7/12/88
4,756,938	06/906,917	7/12/88
4,756,949	06/676,090	7/12/88
4,756,971	06/907,687	7/12/88
4,756,973	06/882,303	7/12/88
4,756,974	06/928,558	7/12/88
4,756,978	06/932,264	7/12/88
4,756,979	06/875,593	7/12/88
4,756,996	06/926,192	7/12/88
4,757,002	06/814,558	7/12/88
4,757,011	06/537,560	7/12/88
4,757,018	06/700,199	7/12/88
4,757,019	06/845,479	7/12/88
4,757,021	06/795,144	7/12/88
4,757,030	06/935,111	7/12/88
4,757,049	06/921,885	7/12/88
4,757,058	06/891,003	7/12/88
4,757,079	06/877,738	7/12/88
4,757,084	06/776,191	7/12/88
4,757,085	07/037,918	7/12/88
4,757,086	06/762,980	7/12/88
4,757,101	07/020,928	7/12/88
4,757,114	06/799,520	7/12/88
4,757,115	06/931,496	7/12/88
4,757,122	06/896,622	7/12/88
4,757,125	07/070,990	7/12/88
4,757,163	06/934,901	7/12/88
4,757,164	07/042,521	7/12/88
4,757,171	07/068,243	7/12/88
4,757,182	07/058,342	7/12/88
4,757,183	06/865,257	7/12/88
4,757,188	06/804,340	7/12/88

Patent Number	Serial Number	Issue Date
4,757,204	06/823,261	7/12/88
4,757,209	06/769,588	7/12/88
4,757,212	06/929,478	7/12/88
4,757,221	07/026,123	7/12/88
4,757,239	06/789,107	7/12/88
4,757,243	06/862,229	7/12/88
4,757,249	07/061,618	7/12/88
4,757,250	07/016,869	7/12/88
4,757,254	07/054,937	7/12/88
4,757,259	06/927,089	7/12/88
4,757,270	06/921,217	7/12/88
4,757,278	07/116,810	7/12/88
4,757,284	06/848,711	7/12/88
4,757,291	07/018,420	7/12/88
4,757,293	07/055,448	7/12/88
4,757,294	07/079,556	7/12/88
4,757,295	07/097,047	7/12/88
4,757,305	07/000,739	7/12/88
4,757,308	06/791,169	7/12/88
4,757,317	06/827,588	7/12/88
4,757,318	06/924,781	7/12/88
4,757,320	06/807,669	7/12/88
4,757,324	07/041,394	7/12/88
4,757,330	07/019,036	7/12/88
4,757,333	07/096,771	7/12/88
4,757,334	06/940,242	7/12/88
4,757,341	07/011,727	7/12/88
4,757,358	06/752,216	7/12/88
4,757,360	06/511,250	7/12/88
4,757,367	06/797,965	7/12/88
4,757,405	06/885,350	7/12/88
4,757,407	07/034,692	7/12/88
4,757,408	06/866,150	7/12/88
4,757,415	07/026,244	7/12/88
4,757,419	07/040,832	7/12/88
4,757,422	06/906,907	7/12/88
4,757,427	06/921,711	7/12/88
4,757,452	06/859,117	7/12/88
4,757,453	06/843,589	7/12/88
4,757,464	06/874,494	7/12/88
4,757,485	07/024,539	7/12/88
4,757,486	07/048,141	7/12/88
4,757,498	06/836,032	7/12/88
4,757,514	06/765,229	7/12/88
4,757,524	06/841,398	7/12/88
4,757,527	06/772,571	7/12/88
4,757,544	06/941,763	7/12/88
4,757,548	06/803,146	7/12/88

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,438,032, Re. S.N. 07/917,539, Filed July 21, 1992, Cl. 530, UNIQUE T-LYMPHOCYTE LINE AND PRODUCTS DERIVED THEREFROM, David W. Golde, Owner of Record: *The Regents of the University of California, Berkeley, Calif.*, Attorney or Agent: Bertram I. Rowland, Ph.D., Ex. Gp.: 1814

4,517,236, Re. S.N. 07/902,498, Filed June 23, 1992, Cl. 200/16, ELECTRIC CONTACT SWITCHING DEVICE, Kozo Maenishi, et. al., Owner of Record: *Omron Tateisi Electronics, Kyoto, Japan*, Attorney or Agent: Barry E. Bretschneider, Ex. Gp.: 2104

4,809,070, Re. S.N. 07/920,062, Filed July 27, 1992, Cl. 358/166, METHOD AND APPARATUS FOR ADDING TEXTURING HIGHLIGHTS TO A VIDEO SIGNAL, David E. Lake, Jr., Owner of Record: *Grass Valley Group, Inc., Grass Valley, Calif.*, Attorney or Agent: Francis I. Gray, Ex. Gp.: 2602

4,839,754. Re. S.N. 07/920,143, Filed July 24, 1992, Cl. 360/73.1, WINCHESTER DISK DRIVE MOTOR CIRCUITRY, Bipin V. Gami, et. al., Owner of Record: *Micropolis Corp., Chatsworth, Calif.*, Attorney or Agent: Alan C. Rose, Ex. Gp.: 2513

4,916,389, Re. S.N. 07/875,088, Filed Apr. 28, 1992, Cl. 324/158, SEMICONDUCTOR INTEGRATED CIRCUIT WITH VOLTAGE LIMITER HAVING DIFFERENT OUTPUT RANGES FROM NORMAL OPERATION AND PERFORMING OF AGING TEST, Ryoichi Hori, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Carl I. Brundidge, Ex. Gp.: 2607

4,928,688, Re. S.N. 07/890,280, Filed May 29, 1992, Cl. 128/419.0PG, METHOD AND APPARATUS FOR TREATING HEMODYNAMIC DISFUNCTION, Morton M. Mower, Owner of Record: *Mirowski Mieczyslaw, Owings Mills, Md.*, Attorney or Agent: Ronald D. Cohn, Ex. Gp.: 3305

4,937,134, Re. S.N. 07/919,511, Filed June 24, 1992, Cl. 428/213, ELASTOMERIC OPTICAL INTERFERENCE FILMS, Walter J. Schrenk, et. al., Owner of Record: *The Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Lloyd E. Hessenaur, Jr., Ex. Gp.: 1513

4,943,464, Re. S.N. 07/919,047, Filed July 23, 1992, Cl. 428/76, ELECTRONIC COMPONENT SUPPORT FOR MEMORY CARD AND PRODUCT OBTAINED THEREBY, Jean-Pierre Gloton, et. al., Owner of Record: *SGS Thomson Microelectronics, S.A., Gentilly, France*, Attorney or Agent: Lisa K. Jorgenson. Ex. Gp.: 1508

4,945,504, Re. S.N. 07/919,838, Filed July 27, 1992, Cl. 364/709.11, INSTRUCTION INPUT SYSTEM FOR ELECTRONIC PROCESSOR, Masato Nakama, et. al., Owner of Record: *Casio Computer Co., Ltd., Tokyo, Japan*, Attorney or Agent: Thomas Langer, Ex. Gp.: 2306

4,945,571, Re. S.N. 07/924,337, Filed July 31, 1992, Cl. 2/2, LIQUID-CUSHIONED OUTERWEAR, Nathaniel Calvert, Owner of Record: *In Motion, Inc., Minneapolis, Minn.*, Attorney or Agent: Nickolas E. Western, Ex. Gp.: 2407

4,945,923, Re. S.N. 07/916,520, Filed July 17, 1992, Cl. 128/842, CONTRACEPTIVE AND PROPHYLACTIC DEVICE, Mark I. Evans, et. al., Owner of Record: *Inventors*, Attorney or Agent: William T. Rifkin, Ex. Gp.: 3301

4,946,436, Re. S.N. 07/925,726, Filed Aug. 4, 1992, Cl. 604/8, PRESSURE-RELIEVING DEVICE AND PROCESS FOR IMPLANTING, Stewart G. Smith, Owner of Record: *Inventor*, Attorney or Agent: David A. Warmbold, Ex. Gp.: 3308

4,947,689, Re. S.N. 07/922,046, Filed July 29, 1992, Cl. 73/304, CAPACTIVE LIQUID SENSOR, Peter A. Hochstein, Owner of Record: *Inventor*, Attorney or Agent: Laurie A. Ebling, Ex. Gp.: 2406

4,972,457, Re. S.N. 07/831,671, Filed Feb. 5, 1992, Cl. 379/59, PORTABLE HYBRID COMMUNICATIONS SYSTEM AND METHODS, Harry Michael O'Sullivan, Owner of Record: *Spectrum Information Technologies, Inc., Dallas, Tex.*, Attorney or Agent: Evan R. Smith, Ex. Gp.: 2601

4,978,771, Re. S.N. 07/922,011, Filed July 29, 1992, Cl. 558/459, PROCESS FOR THE SELECTIVE HYDROGENATION OF UNSATURATED COMPOUNDS, Paul Fiedler, et. al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany*, Attorney or Agent: Robert G. McMorrow, Jr., Ex. Gp.: 1201

4,982,398, Re. S.N. 07/926,511, Filed Aug. 3, 1992, Cl. 369/119, AN OPTICAL RECORDING APPARATUS FOR FORMING GROOVES AND PITS IN AN OPTICALLY RECORDABLE DISC, Masanobu Yamaoto, et. al., Owner of Record: *Sony Corp., Tokyo, Japan*, Attorney or Agent: Lewis T. Steadmen, Ex. Gp.: 2506

4,998,277, Re. S.N. 07/921,564, Filed July 29, 1992, Cl. 379/454, TELEPHONE HANGER FOR HOSPITAL BED, Robert A.

Rioux, Jr., Owner of Record: *Inventor*, Attorney or Agent: Thomas J. Wall, Ex. Gp.: 2601

5,043,233, Re. S.N. 07/921,39[illegible]. Filed July 29, 1992, Cl. 429/59, HYDROGEN-ABSORBING ALLOY-ELECTRODE FOR USE IN AN ALKALINE STORAGE CELL AND ITS MANUFACTURING METHOD, Seiji Kameoka, et. al., Owner of Record: *Sanyo Electric Co., Ltd., Osaka, Japan*, Attorney or Agent: Mary E. Gormley, Ex. Gp.: 1104

5,056,029, Re. S.N. 07/922,46[illegible], Filed July 30, 1992, Cl. 364/468, METHOD AND APPARATUS FOR MANUFACTURING AND VENDING SOCIAL EXPRESSION CARDS, Thomas G. Cannon, Owner of Record: *Inventor*, Attorney or Agent: Charles L. Gholz, Ex. Gp.: 2306

5,094,518, Re. S.N. 07/921,32[illegible], Filed July 29, 1992, Cl. 385/35, OPTICAL COMPONENTS, Robert W. Musk, Owner of Record: *B T & D Technologies, Ltd., Suffolk, England*, Attorney or Agent: Paul J. Henon, Ex. Gp.: 3501

5,110,375, Re. S.N. 07/921,31[illegible], Filed July 28, 1992, Cl. 148/534, METHOD OF HEAT TREATING EXPANDABLE BATON, Kevin L. Parsons, Owner of Record: *Inventor*, Attorney or Agent: Robert C. Curfiss, Ex. Gp.: 1101

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,872,647, Reexam. No. 90/002,697, Requested Apr. 10, 1992, Cl. 256/001, DECORATIVE ATTACHMENT FOR A CHAIN LINK FENCE, Francis M. Paradise, et. al., Owner of Record: *American Permahedge, Inc., Ronkonkoma, N.Y.*, Attorney or Agent: Rosenman & Colin, New York, N.Y., Ex. Gp.: 3501, Requester: Francis M. Paradise, James R. Paradise, Jamaica, N.Y.

4,968,993, Reexam. No. 90/002,792, Requested July 22, 1992, Cl. 346/160, PRINTING PRESS, Larry Wolfberg, et. al., Owner of Record: *L & C Family Partnership, Honolulu, Hi.*, Attorney or Agent: Thomas H. Jackson, Banner, Birch, McKie & Beckett, Washington, D.C., Ex. Gp.: 2108, Requester: Owner

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Errata

In the "Trademark Registrations Issued" section of the *Trademark Official Gazette* the following registration numbers were erroneously listed in the *Trademark Official Gazette*:

TM 285, TMI 34	1,681,702	Apr. 7, 1992
TM 400, TMI 13	1,685,618	May 5, 1992
TM 394, TMI 15	1,685,361	May 5, 1992
TMI 14	1,687,127	May 12, 1992
TM 488, TMI 5	1,694,553	Jun. 16, 1992
TM 382, 384, 387, TMI 26	1,699,331	July 7, 1992
TM 368, 373, TMI 18	1,698,710	July 7, 1992
TM 470, TMI 8	1,700,230	July 14, 1992
TM 297, TMI 37	1,682,247	Apr. 7, 1992

Consequently, the certificate of registrations bearing the above-identified registration numbers were not issued on the date indicated, and the registration number has been vacated.

Aug. 7, 1992

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration numbers were erroneously listed as cancelled in the "Trademark Registration Cancelled, Section 8" and "Index of Registrants" sections of the *Official Gazette*:

TM 681, TMI 20	906,766	Jun. 9, 1992
TM 338, TMI 14	1,351,577	Apr. 21, 1992
TM 472, TMI 20	1,361,712	May 26, 1992
TM 395, TMI 2	1,376,424	Apr. 28, 1992
TM 461, TMI -	1,365,446	May 12, 1992
TM 185, TMI 5	1,344,905	Feb. 4, 1992
TM 222, TMI 18	1,366,827	Dec. 24, 1991
TM 222, TMI 11	1,367,446	Dec. 24, 1991
TM 259, TMI 14	1,357,399	Dec. 10, 1991

Consequently, the above-identified registrations are still active.

Aug. 7, 1992

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration numbers were erroneously listed as cancelled in the "Trademark Registration Cancelled, Section 8" and "Index of Registrants" sections of the *Official Gazette* of July 18, 1989:

TM 171 & TMI 7	1,515,758
TM 171 & TMI 22	1,520,139
TM 171 & TMI 8	1,520,302
TM 171 & TMI 19	1,521,327
TM 171 & TMI 26	1,521,996
TM 171 & TMI 15	1,522,102

Conseuqently, the above-identified registrations are still active.

Aug. 7, 1992

DAVID E. BUCHER
Director of Trademark Examining Groups

Mailing of Maintenance Fee Statements and Related Notices

On June 23, 1992, the Office published a notice at 1139 OG 123 requesting comments from maintenance fee customers regarding the impact of planned changes in procedures that would enable the Patent Maintenance Division to reach the goal of returning statements within 30 days of initial receipt and mailing all other maintenance fee related notices within 2 weeks. The introduction of automated mailing equipment is a key initiative which would allow the Division to promptly and efficiently process the more than 200,000 mailings this fiscal year.

Continuing to use today's manual mailing procedures will result in a 60 day turnaround time for customers to receive their statements unless an additional 3 staff members are hired at an annual cost of $60,000. An automatic mailing system can be purchased at a onetime cost of $15,000 allowing the Office to return statements in 30 calendar days without hiring additional staff.

Three specific changes to current practices are required to ensure that the Office can take full advantage of automated mailing technology to improve the overall level of services to the greatest number of customers.

First, the correspondence submitted to the Office at the time the maintenance fee is paid will no longer be returned with the payment statement. Only the payment statement itself will be returned. Should any questions arise regarding payment, proof of payment could continue to be verified through presentation of the statement, a cancelled check, or by reference to the Patent and Trademark Office deposit account statement. The Office's automated maintenance fee records and financial systems would continue to record and document all maintenance fee payments.

Second, the mailing of maintenance fee reminder notices will be streamlined by eliminating the "Part B" copy. Less than 2% of the patent owners who submit payment after receipt of the reminder notices return the "Part B" copy. Eliminating the mailing of this copy will increase the number of statements which can be mailed daily and eliminate the need to design and purchase specially notched paper for proper collation with the new equipment.

Third, the mailing of patent expiration notices would be streamlined by eliminating the "Part B" copy. Less than 0.5% of these "Part B" copies are returned by owners who wish to communicate with the Office after the receipt of the notice. Eliminating the mailing of this copy will also increase the number of notices which can be mailed daily and eliminate the need for notched paper.

Informal discussions with a cross-section of patent maintenance fee customers confirm that the impact of the three changes would be minimal, especially if the alternative were long delays in receiving statements and/or additional costs to the Office. No negative comments were received in response to the June 23, 1992, notice in the *Official Gazette*.

The above three changes will take effect with the installation of mailing equipment on Sept. 21, 1992.

In addition to the above changes, the Patent Maintenance Division is now accepting maintenance fee payments, when charged to a deposit account, via facsimile. Other services in regards to patent maintenance fee related documents are also available via facsimile. The Patent Maintenance Division fax number is (703) 308-7110.

If you have any question or concerns regarding the changes to patent maintenance processing or facsimile services, please contact:

Teresa Knight, Program Analyst
Patent Maintenance Division
North Tower, 10B10
U.S. Patent & Trademark Office
Washington, D.C. 20231
Telephone: (703) 308-9750
FAX No.: (703) 308-7110

Aug. 19, 1992

THERESA A BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT NOTICES

Certificates of Correction For Week of September 15, 1992

D. 314,854	4,957,379	4,992,545	5,006,137	5,019,397	5,021,913	5,041,174	5,121,471
D. 316,576	4,957,974	4,992,686	5,006,394	5,021,508	5,022,332	5,047,016	
D. 316,775	4,960,669	4,992,783	5,006,620	5,021,634	5,022,443	5,053,233	
D. 316,842	4,961,622	4,992,819	5,006,693	5,021,755	5,024,867	5,070,882	
D. 316,909	4,963,005	4,992,863	5,006,770				
4,408,582	4,964,201	4,992,937	5,006,793				
4,608,688	4,964,350	4,993,012	5,006,824				
4,687,929	4,965,619	4,993,220	5,007,330				
4,694,328	4,966,629	4,993,394	5,007,498				
4,697,157	4,968,339	4,993,613	5,007,500				
4,755,162	4,968,452	4,994,155	5,007,693				
4,767,675	4,969,321	4,994,612	5,007,738				
4,790,850	4,969,925	4,994,707	5,007,759				
4,794,354	4,970,388	4,994,715	5,008,007				
4,823,528	4,970,532	4,994,835	5,008,025				
4,837,772	4,970,641	4,994,896	5,008,046				
4,849,841	4,971,727	4,994,902	5,008,123				
4,851,309	4,972,534	4,994,957	5,008,315				
4,851,746	4,972,719	4,995,179	5,008,916				
4,853,212	4,972,987	4,995,181	5,008,922				
4,854,832	4,973,752	4,995,466	5,008,990				
4,863,759	4,974,013	4,995,708	5,009,196				
4,865,961	4,974,072	4,995,785	5,009,633				
4,868,419	4,974,545	4,996,182	5,009,657				
4,870,589	4,975,280	4,996,241	5,009,722				
4,870,610	4,975,364	4,996,320	5,009,793				
4,875,871	4,975,470	4,996,329	5,010,144				
4,877,494	4,975,787	4,996,604	5,010,207				
4,877,597	4,975,954	4,996,952	5,010,240				
4,880,060	4,976,212	4,997,010	5,010,492				
4,891,526	4,976,506	4,997,317	5,010,496				
4,895,105	4,976,899	4,997,390	5,010,553				
4,898,289	4,977,041	4,997,498	5,010,708				
4,898,544	4,977,155	4,997,573	5,010,776				
4,899,205	4,977,231	4,997,614	5,011,397				
4,899,227	4,977,470	4,997,624	5,011,549				
4,899,755	4,977,957	4,997,988	5,011,677				
4,899,917	4,978,845	4,998,219	5,011,716				
4,899,946	4,979,074	4,998,325	5,011,728				
4,901,084	4,979,101	4,998,336	5,011,909				
4,902,246	4,979,949	4,998,887	5,011,945				
4,903,060	4,980,463	4,999,205	5,012,093				
4,907,909	4,982,428	4,999,353	5,012,468				
4,910,040	4,982,934	4,999,598	5,012,633				
4,910,559	4,982,973	5,000,388	5,012,689				
4,913,439	4,983,019	5,000,715	5,012,806				
4,916,179	4,983,346	5,000,799	5,013,116				
4,916,546	4,983,863	5,000,889	5,013,542				
4,916,604	4,984,006	5,000,897	5,013,886				
4,917,174	4,984,993	5,000,977	5,014,221				
4,920,753	4,985,239	5,001,117	5,014,233				
4,922,015	4,985,950	5,001,446	5,014,302				
4,922,501	4,986,018	5,001,447	5,014,784				
4,924,462	4,986,589	5,001,565	5,014,829				
4,924,639	4,986,670	5,001,589	5,014,994				
4,926,251	4,986,850	5,001,777	5,015,101				
4,926,458	4,987,645	5,002,404	5,014,700				
4,928,331	4,987,756	5,004,424	5,016,218				
4,929,662	4,987,763	5,002,431	5,016,392				
4,931,886	4,988,155	5,002,522	5,016,701				
4,932,464	4,988,241	5,002,550	5,016,758				
4,940,012	4,988,246	5,002,594	5,016,787				
4,942,123	4,988,992	5,003,080	5,017,006				
4,942,956	4,989,084	5,003,185	5,017,090				
4,943,206	4,989,949	5,004,006	5,017,132				
4,943,392	4,990,228	5,004,275	5,017,865				
4,944,231	4,990,273	5,004,368	5,017,931				
4,944,814	4,990,306	5,004,713	5,018,059				
4,946,724	4,990,326	5,004,840	5,018,118				
4,948,690	4,990,329	5,005,029	5,018,132				
4,949,119	4,990,534	5,005,156	5,018,513				
4,950,766	4,990,543	5,005,415	5,018,770				
4,955,352	4,990,658	5,005,439	5,018,821				
4,956,729	4,990,813	5,005,709	5,019,062				

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PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
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GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	5/16/91
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	11/27/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	7/08/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/02/91
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ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY Director	308-0962	12/27/90
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	9/13/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-0651	7/02/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during August 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,897,596 to 3,902,195 inclusive
Plant Patents ..... 3,755 to 3,775

REEXAMINATIONS

SEPTEMBER 15, 1992

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 33,128 (1784th)

PAPERBOARD CONTAINER FOR LIQUIDS INCLUDING MEANS TO PREVENT FITMENT ROTATION

Duane M. Nordstrom, Kelso, Wash.

Reexamination Request No. 90/002,502, Nov. 7, 1991.

Reexamination Certificate for Reissue Patent Re. 33,128, issued Dec. 12, 1989, Ser. No. 182,716, Apr. 18, 1988.

Int. Cl.[5] **B65D** *90/04*

U.S. Cl. 220—465

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

New claims **7** and **8** are added and determined to be patentable.

7. The container of claim 1 wherein the one of said peripheral flaps containing a fitment opening and every other flap spaced therefrom are larger than the intermediate ones of said flaps.

8. The container of claim 6 wherein the one of said peripheral flaps containing a fitment opening and every other flap spaced therefrom are larger than the intermediate ones of said flaps.

B1 4,600,919 (1785th)

THREE DIMENSIONAL ANIMATION

Garland Stern, Brookville, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Reexamination Request No. 90/002,379, Jun. 26, 1991.

Reexamination Certificate for Patent No. 4,600,919, issued Jul. 15, 1986, Ser. No. 404,965, Aug. 3, 1982.

Int. Cl.[5] **G09G** *1/16*

U.S. Cl. 340—725

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–22** are cancelled.

New claims **23–36** are added and determined to be patentable.

23. The method as defined by claim 1, wherein said sets of vectors define three-dimensional limbs, and further comprising the steps of applying said sets of vectors defining said limbs to the joints of said generated in-between frames, and displaying the generated in-between frames as a continuous video sequence to view the motion of the three-dimensional limbs.

B1 4,619,494 (1786th)

SHIELDED ELECTRICAL CONNECTOR

Peter Noorily, Bridgewater, and Joseph P. Slachetka, Ringoes, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Reexamination Request No. 90/002,369, Jun. 17, 1991.

Reexamination Certificate for Patent No. 4,619,494, issued Oct. 28, 1986, Ser. No. 785,313, Oct. 7, 1985.

Int. Cl.[5] **H01R** *13/20, 13/58*

U.S. Cl. 439—449

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2, 4–6, 8, 9** and **12** are cancelled.

Claims **3, 7, 10** and **13** are determined to be patentable as amended.

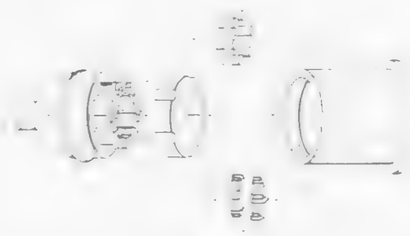
Claims **11, 14** and **15**, dependent on an amended claim, are determined to be patentable.

New claims **16–33** are added and determined to be patentable.

10. A shielded electrical connector for electrical attachment to a shielded electrical cable of the type including a plurality of electrical conductors, a shielding member and an outer insulative jacket, comprising:

a housing defining a mating end for electrical connection to an electrical component and a cable receiving end for receipt of said electrical cable, said housing defining first and second communicating compartments, said first compartment being disposed adjacent said connector mating end and supporting a plurality of electrical contacts therein, an electrical shield at least in said first compartment and including a conductive wall between said first and second compartments, said wall [including] *having an opening therethrough of predetermined size for passage of a portion of said cable and said cable shielding member into said first compartment and into said shield, and conductive* means *disposed within said shield* for providing electrical engagement with said cable shielding member and for providing cooperative strain relief thereto, *said conductive means comprising an apertured element having an inner aperture and a peripheral extent greater than said predetermined size of said wall opening, the apertured element adapted to receive a portion of said cable through said aperture and said cable shielding member on said peripheral extent and to press said shielding member against an interior surface of said wall along an axial direction of said cable,* said second compartment having walls defining at least one accessible port for exiting of said cable, said at least one accessible port being spaced from said shield wall a sufficient spacing to accommodate bending of said cable in said second compartment.

B1 4,660,698 (1787th)
ONE WAY CLUTCH
Osamu Miura, Shiraoka, Japan, assignor to Tok Bearing Company Ltd., Japan
Reexamination Request No. 90/002,000, Apr. 13, 1990.
Reexamination Certificate for Patent No. 4,660,698, issued Apr. 28, 1987, Ser. No. 727,123, Apr. 25, 1985.
Int. Cl.[5] **F16D** *41/06*
U.S. Cl. 192—45

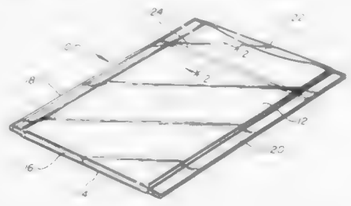


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–20** are cancelled.

[**1**. A one way clutch comprising an outer member integrally formed of a polymeric resin composition rotatable about a longitudinal axis and having formed therein a longitudinal cavity open at an end thereof a sleeve of a relatively hard material located in said cavity and interlocked and rotatable with said outer member and having on its inside peripheral face a plurality of circumferentially spaced similarly directed circumferentially radially inclined wedge surfaces, an integrally formed cage member projecting into said cavity and including an outer base section and a plurality of circumferentially spaced inwardly directed longitudinal columns delineating retainer spaces registering with respective wedge surfaces, said cage and outer members having integrally formed therewith radially relatively resiliently separable complementary fastening means interlocking said members in assembled condition against relative longitudinal movement, a roller element disposed and circumferentially movable in each of said retainer spaces and a shaft coaxially registering with said cage member, the opposite faces of said roller elements confronting the surface of said shaft and respective sleeve wedge surfaces.]

B1 4,756,414 (1788th)
ANTISTATIC SHEET MATERIAL AND PACKAGE
Charles L. Mott, Midland, Mich., assignor to Minnesota Mining and Manufacturing Comp.
Reexamination Request No. 90/002,544, Dec. 13, 1991.
Reexamination Certificate for Patent No. 4,756,414, issued Jul. 12, 1988, Ser. No. 785,808, Oct. 9, 1985.
Int. Cl.[5] **B65D** *73/02, 81/00*
U.S. Cl. 206—328



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 8–14** and **23–25** are cancelled.

Claims **2, 4–7, 15, 16, 18, 19, 21, 22** and **26** are determined to be patentable as amended.

Claims **3, 17** and **20** dependent on an amended claim, are determined to be patentable.

New claims **27–37** are added and determined to be patentable.

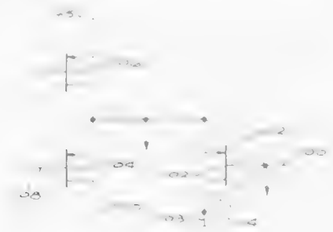
27. A flexible sheet material adaptable for forming a package, bag, pouch, or the like for containing electrostatically sensitive components comprising:

(a) a first layer of a flexible heat sealable plastic material having primary and secondary major surfaces with antistatic properties on at least said secondary major surface thereof;

(b) a second layer a flexible plastic material having primary and secondary major surfaces with an electrically conductive material on said primary major surface and with antistatic properties on at least said secondary major surface; and

(c) a thermosetting adhesive bonding said first and second layers of material together along said primary major surfaces, respectively, of said first and second layers, said thermosetting adhesive containing an antistatic material.

B1 4,831,282 (1789th)
CMOS INPUT CIRCUIT
Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation
Reexamination Request No. 90/002,243, Jan. 4, 1991.
Reexamination Certificate for Patent No. 4,831,282, issued May 16, 1989, Ser. No. 104,690, Oct. 5, 1987.
Int. Cl.[5] **H03K** *17/16, 19/017, 17/687*
U.S. Cl. 307—443



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2, 6–9, 11–14, 16, 18** and **19** are determined to be patentable as amended.

Claims **3–5, 10, 15** and **17** dependent on an amended claim, are determined to be patentable.

New claims **20–30** are added and determined to be patentable.

1. In combination for providing an output current having characteristics indicating a binary *input* voltage having first characteristics representing a binary "1" and second characteristics representing a binary "0",

a first MOS transistor,

means for introducing a substantially constant reference voltage to the first transistor,

means for introducing the binary input voltage to the first MOS transistor to obtain a conductivity of the first MOS transistor for a particular one of the first and second characteristics and to obtain a non-conductivity of the first MOS transistor for the other one of the first and second characteristics,

means including a second MOS transistor connected to the first *MOS* transistor and constructed to become non-conductive upon a state of conductivity in the first MOS transistor,

means for introducing a substantially constant bias voltage to the second MOS transistor,

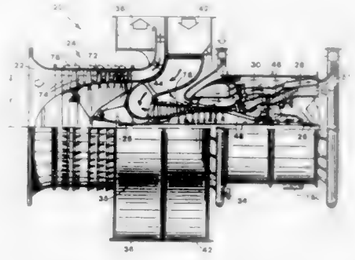
means operatively coupled to the first and second MOS transistors and responsive to the substantially constant bias *voltage* introduced to the second *MOS* transistor for providing for a substantially constant flow of current through the second MOS transistor, second MOS transistor, and no flow of current through the first *MOS* transistor, during the state of conductivity in the second *MOS* transistor and for providing for the flow of the substantially constant current through the first MOS transistor and no flow of current through the second [transistors] *transistor*, during the state of conductivity in the first MOS transistor to obtain the output current from the second *MOS* transistor in representation of the binary input signal,

there being distributed capacitances in the first MOS transistor, the distributed capacitances being charged during the state of non-conductivity in the first *MOS* transistor, the first and second *MOS* transistors being connected to provide for the control in the operation of the second *MOS* transistor in accordance with the state of operation in the first *MOS* transistor and the charge in the distributed capacitances, and

the transition from the state of non-conductivity to the state of conductivity in the second MOS transistor being expedited by the charging of the distributed capacitances when the first *MOS* transistor becomes non-conductive, and

means connected to the second *MOS* transistor to provide the output current through the second *MOS* transistor.

B1 4,896,499 (1790th)
COMPRESSION INTERCOOLED GAS TURBINE COMBINED CYCLE
Ivan G. Rice, P.O. Box 233, Spring, Tex. 77383
Reexamination Request No. 90/002,663, Mar. 9, 1992.
Reexamination Certificate for Patent No. 4,896,499, issued Jan. 30, 1990, Ser. No. 251,076, Sep. 28, 1988.
Continuation of Ser. No. 818,472, Jan. 13, 1986, abandoned, which is a division of Ser. No. 572,548, Jan. 20, 1984, Pat. No. 4,592,204, which is a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, Ser. No. 416,171, Sep. 9, 1982, abandoned, Ser. No. 416,172, Sep. 9, 1982, abandoned, Ser. No. 416,173, Sep. 9, 1982, Pat. No. 4,550,562, Ser. No. 416,275, Sep. 9, 1982, Pat. No. 4,507,914, Ser. No. 486,334, Apr. 19, 1983, Pat. No. 4,545,197, Ser. No. 486,336, Apr. 19, 1983, Pat. No. 4,565,490, and Ser. No. 486,495, Apr. 19, 1983, Pat. No. 4,543,781, said Ser. No. 224,496, is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953, said Ser. No. 274,660, is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, said Ser. No. 416,171, and Ser. No. 416,172, and Ser. No. 416,173, and Ser. No. 416,275, and Ser. No. 486,334, and Ser. No. 486,336, and Ser. No. 486,495, is a continuation-in-part of Ser. No. 47,571, Ser. No. 224,496, Ser. No. 954,832, and Ser. No. 274,660, said Ser. No. 486,334, Ser. No. 486,336, and Ser. No. 486,495, is a continuation-in-part of Ser. No. 416,171, Ser. No. 416,172, Ser. No. 416,173,
Int. Cl.[5] **F02C** *3/10, 7/143*
U.S. Cl. 60—39.161



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7** and **8** is confirmed.

Claims **1** and **3** are determined to be patentable as amended.

Claims **2** and **4–6**, dependent on an amended claim, are determined to be patentable.

New claims **9–16** are added and determined to be patentable.

1. In a power producing system comprising a twin spool gas generator and a power turbine, said gas generator having a low pressure compressor driven by a low pressure turbine, a high pressure compressor driven by a high pressure turbine, a combustor positioned between said high pressure compressor and said high pressure turbine, said power turbine positioned

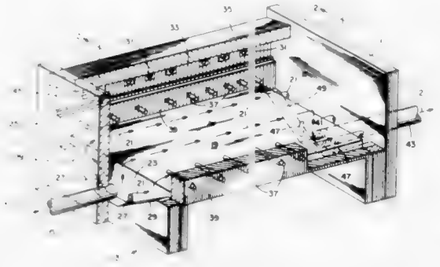
downstream from said low pressure turbine, the improvement being characterized in that: said high and low pressure turbines being axially positioned and independently rotatable for driving said high and low pressure compressors, respectively, by means of concentric coaxial outer and inner shafting, respectively, said gas generator including at least one externally mounted intercooler positioned between said low pressure compressor and said high pressure compressor, at least one compressoroutlet duct from said low pressure compressor communicating with said intercooler, and at least one return high pressure compressor, wherein said compressor outlet and return ducts and connections between said compressors and said intercooler are provided between said axially positioned low and high pressure compressors for air flow to and from said intercooler in counterflow with coolant, said outlet duct being configured to radially expand said air flow to a low velocity and said return duct being configured for low radial flow return velocity to said high pressure compressor, *the high pressure compressor having an inlet flow area directly proportional to the outlet flow area of the low pressure compressor, and inversely proportional to the absolute temperature ratio between the high temperature air flow discharged from the low pressurecompressor compared to the low temperature air flow from the intercooler passing to the inlet area of the high pressure compressor.*

B1 4,906,272 (1791st)

FURNACE FOR FINING MOLTEN GLASS

George B. Boettner, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Reexamination Request No. 90/002,500, Nov. 4, 1991.
Reexamination Certificate for Patent No. 4,906,272, issued Mar. 6, 1990, Ser. No. 339,605 Apr. 17, 1989.
Int. Cl.[5] C03B *5/225*
U.S. Cl. 65—346



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

9. Apparatus for processing molten glass comprising:
(a) an elongated chamber having first and second ends, first and second side walls which define the width of the chamber, and a bottom surface for supporting molten glass, said bottom surface being at a first level in the region of the second end;
(b) means for heating at least a portion of the chamber;
(c) means for introducing molten glass into the chamber, said means being located in the region of the first end of the chamber;
(d) means for cooling molten glass, said means:
(i) being located in the region of the second end of the chamber,
(ii) causing molten glass to flow downward from the first level to a second level, and
(iii) including a portion at the first level which extends across essentially the full width of the chamber; and
(e) means for removing molten glass from the chamber once said glass has reached the second level.

B1 4,917,196 (1792nd)

EXCAVATING TOOTH FOR AN EARTH AUGER

Stephen P. Stiffler, New Enterprise; Wayne H. Beach, Roaring Spring; Don C. Rowlett, Bedford, and Steven D. Shirk, Altoona, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Reexamination Request No. 90/002,430, Aug. 30, 1991.
Reexamination Certificate for Patent No. 4,917,196, issued Apr. 17, 1990, Ser. No. 394,045, Aug. 15, 1989.
Int. Cl.[5] E21B *10/44, 10/58, 10/62*
U.S. Cl. 175—385

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **11** and **15** is confirmed.

Claims **6** and **10** are cancelled.

Claims **1**, **4**, **7**, **9** and **14** are determined to be patentable as amended.

Claims **2**, **3**, **5**, **8**, **12** and **13**, dependent on an amended claim, are determined to be patentable.

7. [The digging tooth according to claim 6 wherein] *An excavating tooth for an earth auger comprising:*
(a) a main body portion having a forward face, a back face, a gauge side and a working end;
(b) a shank extending upwardly from the main body portion and receivable in a support block of an auger; and
(c) a plurality of digging inserts made of a hard, wear resistant material embedded in the working end of the main body section and projecting outwardly therefrom to engage the medium being worked, each of the inserts including a generally cylindrical proximal end and a distal end having forward and rearward inclined faces converging to form a transverse cutting edge, and wherein the axis of each of the inserts inclines forwardly with respect to the plane of the shank and the angle between the plane of the shank and the axis of the inserts is between approximately 20 degrees and 70 degrees.

9. [The excavating tooth according to claim 6 wherein] *An excavating tooth for an earth auger comprising:*

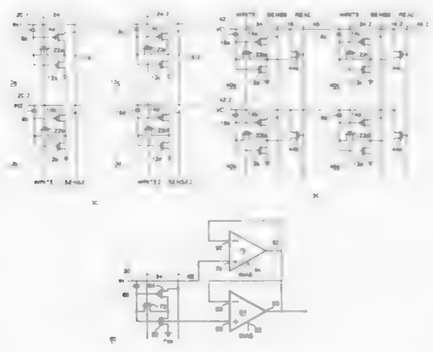
(a) a main body portion having a forward face, a back face, a gauge side and a working end;
(b) a shank extending upwardly from the main body portion and receivable in a support block of an auger; and
(c) a plurality of digging inserts made of a hard, wear resistant material embedded in the working end of the main body section and projecting outwardly therefrom to engage the medium being worked, each of the inserts including a generally cylindrical proximal end and a distal end having forward and rearward inclined faces converging to form a transverse cutting edge, and wherein the axis of each of the inserts inclines forwardly with respect to the plane of the shank and the forward inclined face of the inserts are disposed in a plane parallel to the plane of the shank.

B1 4,962,342 (1793rd)

DYNAMIC SYNASE FOR NEURAL NETWORK

Carver A. Mead, Pasadena; Timothy P. Allen, Palo Alto, and Federico Faggin, Los Altos Hills, all of Calif., assignors to Synaptics Inc., San Jose, Calif.

Reexamination Request No. 90/002,584, Feb. 11, 1992.
Reexamination Certificate for Patent No. 4,962,342, issued Oct. 9, 1990, Ser. No. 347,837, May 4, 1989.
Int. Cl.[5] G11C *27/02, 7/00;* **H03K** *19/094, 19/177*
U.S. Cl. 307—201



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

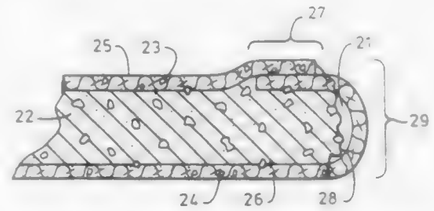
1. An adaptive amplifier, including:
an input node,
an inverter including a P-channel MOS inverter transistor and an N-channel MOS inverter transistor, said P-channel MOS inverter transistor having its source connected to an output current sense node, its drain connected to the drain of said N-channel MOS inverter transistor, and a gate connected to the gate of said N-channel MOS inverter transistor, the source of said N-channel MOS inverter transistor connected to a source of negative voltage,
a capacitor connected between said input node and the gates of said P-channel and N-channel MOS inverter transistors, and
an MOS adapt transistor, having its drain connected to the gates of said P-channel and N-channel inverter transistors, its source connected to the drains of said P-channel and N-channel inverter transistors, and its gate connected to an adapt node.

B1 5,030,502 (1794th)

CEMENTITIOUS CONSTRUCTION PANEL

John W. Teare, 26 Hollytree Ct., Hamilton, Ohio 45011

Reexamination Request No. 90/002,492, Oct. 21, 1991.
Reexamination Certificate for Patent No. 5,030,502, issued Jul. 9, 1991, Ser. No. 573,544, Aug. 27, 1990.
Continuation-in-part of Ser. No. 473,895, Feb. 2, 1990, abandoned
Int. Cl.[5] B32B *1/04, 23/02*
U.S. Cl. 428—193



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

Claims **8–10** are cancelled.

1. A fabric reinforced cementitious construction panel comprising a cementitious core layer and a layer of pervious reinforcing fabric covering each of the two faces of said core layer, said fabric also wrapping at least one of the two longitudinal edges of said panel, said fabric being bonded to each of said two core faces and being unbonded along said wrapped longitudinal edge of said panel.

B1 5,040,436 (1795th)

METHOD AND APPARATUS FOR TIPPING SAW BLADES

James R. Pfaltzgraff, Beaverton, Oreg., assignor to Armstrong Manufacturing Company, Portland, Oreg.

Reexamination Request No. 90/002,647, Feb. 14, 1992.
Reexamination Certificate for Patent No. 5,040,436, issued Aug. 20, 1991, Ser. No. 651,107, Feb. 4, 1991.
Continuation of Ser. No. 579,172, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 484,432, Feb. 16, 1990, abandoned, which is a continuation of Ser. No. 360,389, Jun. 2, 1989, abandoned, which is a continuation of Ser. No. 67,645, Jun. 26, 1987, Pat. No. 4,864,896
Int. Cl.[5] B23D *1/12*
U.S. Cl. 76—112

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–18** is confirmed.

1. A method for tipping a saw blade comprising the steps:

providing a saw blade;
providing a plurality of loose tip pellets;
automatically conveying said loose pellets to a tip positioning station;
positioning one of said loose pellets adjacent a tooth of the saw blade;
passing an electrical current between the pellet and the tooth adjacent thereto to:
heat the adjoining portions of the pellet and the blade to a temperature at which said portions can fuse together; and
heating other portions of the pellet and the blade to a plastic deformation temperature; and
forging the pellet at least partially into the blade under the influence of a force.

B1 5,051,621 (1796th)

AREA-EFFICIENT LOW-POWER BIPOLAR CURRENT-MODE LOGIC

Michael E. Wright, Berkeley, Calif., assignor to National Semiconductor Corporation

Reexamination Request No. 90/002,599, Feb. 11, 1992.
Reexamination Certificate for Patent No. 5,051,621, issued Sep. 24, 1991, Ser. No. 519,385, May 4, 1990.
Int. Cl.[5] **H03K** *19/086, 19/082, 19/013, 19/003*
U.S. Cl. 307—455

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

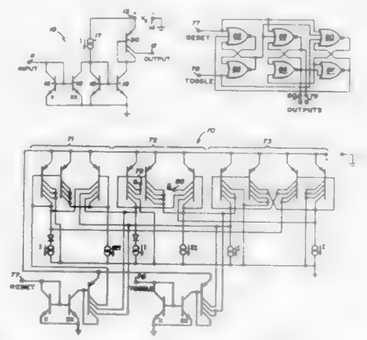
Claims **1**,8 and **9** are determined to be patentable as amended.

Claims 2–7, dependent on an amended claim, are determined to be patentable.

1. A current mode logic circuit, *in which input current is manipulated to produce an output logic current,* for use in conjunction with linear integrated circuits which employ silicon epitaxial monolithic PN junction isolated construction, operable from first and second power supply terminals, said circuit comprising:

lateral PNP transistor means, *constructed to operate at the supply voltage levels employed in said linear integrated circuits, and* connected to said first power supply terminal, to act as current source means that will provide said circuit output [means] *logic;*

vertical NPN transistor means, *constructed to operate at the*



supply voltage levels employed in said linear integrated circuits, and connected, into current mirror configurations, to said second power supply terminal to act as current sink means that will [provide] *respond to* said circuit input [means] *current;*

means for coupling said PNP and said NPN transistor means together to perform a desired logic function; and

means for applying controlled currents to said circuit to [determine the] *represent said* current logic [state levels].

REISSUES

SEPTEMBER 15, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,062

FABRIC SOFTENING COMPOSITION CONTAINS WATER-INSOLUBLE SURFACTANT AND ALIPHATIC MONO-CARBOXYLIC ACID

Martin A. Wells, Higher Bebington, England, assignor to Lever Brothers Company, New York, N.Y.

Original No. 4,308,024, dated Dec. 29, 1981, Ser. No. 89,809, Oct. 31, 1979. Application for reissue Oct. 3, 1984, Ser. No. 657,441
Claims priority, application United Kingdom, Nov. 3, 1978, 43158/78
Int. Cl.[5] **C11D** *9/30;* **D06L** *1/12;* **D06M** *13/46, 15/18*
U.S. Cl. 8—137 **36 Claims**

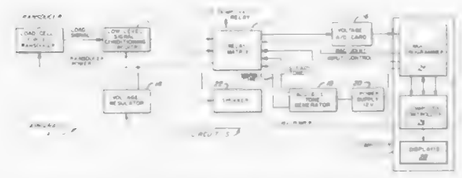
1. A fabric softening composition consisting essentially of an aqueous liquid containing from 20–95 mole % of a relatively water-insoluble cationic detergent surfactant having two C_{12}–C_{22} alkyl-or alkenyl groups, and from 5–80 mole % of a free C_8–C_{24} alkyl-or alkenylmonocarboxylic acid, the total amount of cationic detergent surfactant plus alkyl- or alkenyl-monocarboxylic acid being from 2–20% by weight of the aqueous liquid, the composition having a pH of 5 or less.

Re. 34,063

MONITORING TORQUE IN TUBULAR GOODS

Darrell L. Vincent, 7950 Locke La., #10, Houston, Tex. 77063; Larry W. Vincent, 965 Lakeview Dr., Montgomery, Tex. 77353, and John E. Shaunfield, 1101 Rainbow, Richardson, Tex. 75081

Original No. 4,738,145, dated Apr. 19, 1988, Ser. No. 383,516, Jun. 1, 1982. Application for reissue Apr. 17, 1990, Ser. No. 510,539
Int. Cl.[5] **G01L** *5/24;* **B25B** *23/14*
U.S. Cl. 73—862.23 **63 Claims**



30. A method of monitoring torque conditions during the make-up of a threaded tubular connection, wherein shoulder contact is formed in the threaded connection, comprising the steps of:

(a) sensing the torque imposed on the connection during makeup;

(b) monitoring the torque conditions during said step of sensing the torque to detect if a satisfactory threaded connection is obtained;

(c) establishing a supplemental torque level for an acceptable minimum torque differential imposed after shoulder contact; and

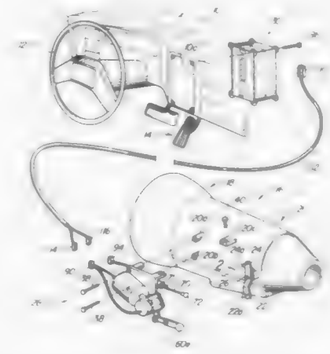
(d) displaying the torque sensed during make-up.

Re. 34,064

ELECTRIC SHIFT APPARATUS

Edward L. Tury, Brighton; David F. Salzmann, South Lyon; Keith V. Leigh-Monstevens, Rochester Hills; John G. Vander Poorte, St. Clair Shores, and David C. Peterson, Walled Lake, all of Mich., assignors to Automotive Products (USA) Inc., Auburn Hills, Mich.

Original No. 4,790,204, dated Dec. 13, 1988, Ser. No. 62,775, Jun. 16, 1987. Application for reissue Dec. 13, 1990, Ser. No. 626,988
Int. Cl.[5] **F16H** *59/02;* **G05G** *11/00*
U.S. Cl. 74—335 **26 Claims**



1. An electric shift apparatus for use with a motor vehicle having an automatic transmission of the type including a mode select lever and a kick-down lever positioned outside of the transmission housing and mounted for pivotal movement at one end thereof about a common axis, said apparatus comprising:

(A) a bracket adapted to be secured to said transmission housing proximate said levers;

(B) first motor means mounted on said bracket and adapted to be drivingly connected to the free end of the mode select lever; and

(C) second motor means mounted on said bracket and adapted to be drivingly connected to the free end of the kick-down lever.

18. An electric shift apparatus for use with a motor vehicle having an automatic transmission of the type including a mode select [lever] *element* to selectively shift the transmission between a plurality of shift positions, said apparatus comprising:

(A) a power module adapted to be mounted on the housing of the transmission proximate the mode select [lever] *element* and including an electric motor assembly adapted to be drivingly connected to the mode select [lever] *element* and encoder means operative to sense the shift position of the transmission and generate an encoder signal representative of the sensed shift position;

(B) a control module adapted to be mounted in the passenger compartment of the vehicle and including a plurality of mode select members accessible to the vehicle operator and corresponding respectively to the transmission shift positions, and generator means operative in response to operator actuation of each mode select member to generate an operator signal representative of the selected shift position; and

(C) comparator means receiving said encoder signal and said

operator signals, operative in response to receipt of an operator signal differing from the received encoder signal to energize said motor assembly in a sense to move the mode select [lever] *element* to a position corresponding to the operator signal, and operative in response to arrival of the mode select [lever] *element* in the selected position to de-energize and brake said motor assembly.

Re. 34,067

HYPOCHLORITE: TERTIARY ALCOHOL DISINFECTANTS WITH REDUCED OFFENSIVE ODOR

Mark A. Wainberg, Montreal, and Chiu-Ming Wong, Winnipeg, both of Canada, assignors to Kan Scientific Inc., Winnipeg, Canada

Original No. 4,839,079, dated Jun. 13, 1989, Ser. No. 112,205, Oct. 22, 1987. Application for reissue Jul. 3, 1990, Ser. No. 547,772

Claims priority, application Canada, Oct. 24, 1986, 521327

Int. Cl.[5] **A61L** *2/18, 9/01;* **C11D** *7/26, 7/54*

U.S. Cl. 252—104 **2 Claims**

1. A stabilized disinfectant composition, comprising, in aqueous solution:

0.5% w/w of hypochlorite selected from the group consisting of sodium hypochlorite, lithium hypochlorite, potassium hypochlorite and calcium hypochlorite;

5.0% w/w of t-butanol;

0.01% w/w sodium dodecyl sulphate; and

0.01% w/w lemon fragrance.

Re. 34,068

PRIMER COMPOSITIONS

Shosaku Yamamoto, and Kazuo Kaminuma, both of Yokohama, Japan, assignors to Nippon Oil & Fats Co., Ltd., Japan

Original No. 48,307,789, dated May 16, 1989, Ser. No. 3,238, Jan. 14, 1987. Application for reissue May 2, 1990, Ser. No. 518,101

Claims priority, application Japan, Jan. 23, 1986, 61-11152

Int. Cl.[5] **C08K** *3/04;* **H01B** *1/06*

U.S. Cl. 252—511 **6 Claims**

1. A primer composition consisting essentially of (A) at least one resin having a glass transition temperature of not higher than −20° C. and an enlogation at break of not less than 400% at 20° C. and (B) at least one crosslinking resin, the weight ratio as solid resin content of component (A) to component (B) being 70–99:30–1, said component (A) comprising polyurethane resin or a linear high molecular weight elastomer of a modified resin thereof, and said component (B) comprising polyisocyanate resin or a [linear high molecular weight elastomer of a] modified resin thereof said composition further containing a pigment at a ratio of pigment to components (A) and (B) of not more than 2.

Re. 34,068

RACQUETBALL RACQUET WITH INCREASED HITTING AREA IMPROVED RACQUETBALL RACQUET CONSTRUCTION

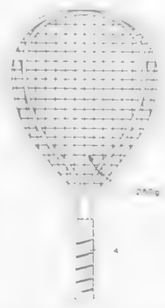
Raymond L. Mortvedt, Santee, and Steven M. Thompson, San Diego, both of Calif., assignors to Ektelon, San Diego, Calif.

Original No. 4,531,738, dated Jul. 30, 1985, Ser. No. 560,538, Dec. 12, 1983. Continuation of Ser. No. 291,434, Dec. 28, 1988, abandoned. Application for reissue Jul. 6, 1990, Ser. No. 549,638

Int. Cl.[5] **A63B** *49/12*

U.S. Cl. 273—73 C **17 Claims**

1. A racquetball racquet comprising a frame having a head connected to a handle grip so as to have an overall length of 19 to 22½ inches and a weight of 220 grams to 270 grams, said head having a strung surface of 75 to 100 square inches, the length of said strung surface in a direction along the longitudinal axis of the racquet being between 12 and 14¾ inches and between 53 and 68 percent of the length of the racquet, said *frame and said* strung surface having a maximum width between 9½ and 11½ inches in a direction generally perpendicular to said longitudinal axis, the center of gravity of the racquet being at a location within a range of ¾ inch toward the handle grip and ½ inch toward the head as measured from the longitudinal center



point of the racquet, and the center of percussion [average] is spaced from the center of gravity toward the head a distance substantially greater than 3.6 inches.

Re. 34,068

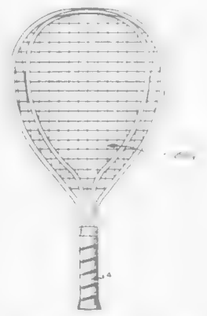
RACQUETBALL RAQUET WITH INCREASED HITTING AREA

Raymond L. Mortvedt, Santee, and Steven M. Thompson, San Diego, both of Calif., assignors to Ektelon, San Diego, Calif.

Original No. 4,618,148, dated Oct. 21, 1986, Ser. No. 760,337, Jul. 29, 1985. Continuation of Ser. No. 291,248, Dec. 28, 1988, abandoned, which is a continuation of Ser. No. 560,538, Dec. 12, 1983, Pat. No. 4,531,738. Application for reissue Jul. 9, 1990, Ser. No. 550,220

Int. Cl.[5] **A63B** *49/12*

U.S. Cl. 273—73 C **5 Claims**



1. A racquetball racquet comprising a frame having a head connected to a handle grip so as to have an overall length of 19 to 22½ inches and a weight of 220 grams to 270 grams, said head having a strung surface of 75 to 100 square inches, the length of said strung surface in a direction along the longitudinal axis of the racquet being between 12 and 14¾ inches and between 53 and 68 percent of the length of the racquet, the sum total of the length of said frame plus the width of said strung surface being substantially greater than 27 inches, the center of gravity of the racquet being at a location within a range of ¾ inch toward the handle grip and ½ inch toward the head as measured from the longitudinal center point of the racquet, and the center of percussion [average] is spaced from the center of gravity toward the head a distance substantially greater than 3.6 inches.

Re. 34,069

PROCESS FOR THE PREPARATION OF OLIGONUCLEOTIDES

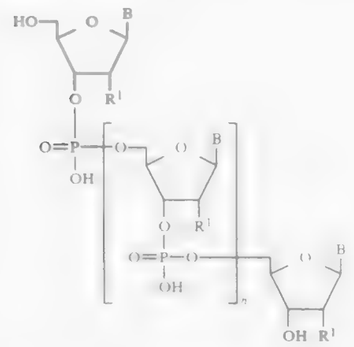
Hubert Köster, Concord, Mass., and Nanda D. Sinha, San Rafael, Calif., assignors to Biosyntech GmbH, Hamburg, Fed. Rep. of Germany

Original No. 4,725,677, dated Feb. 16, 1988, Ser. No. 752,178, Aug. 10, 1984. Application for reissue Feb. 16, 1990, Ser. No. 481,572

Int. Cl.[5] **C07H** *15/12, 17/00*

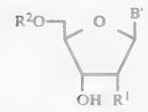
U.S. Cl. 536—27 **19 Claims**

1. A process for the preparation of oligonucleotides of the [general] formula I



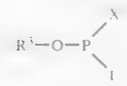
in which B denotes a nucleoside base, R^1 denotes hydrogen, hydroxyl or hydroxyl which is protected by , *where appropriate,* a removable protective group and n denotes an integer from 1 to 200, comprising the steps of

(a) reacting a nucleoside of the [general] formula II



(II)

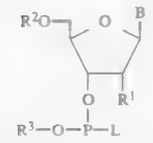
in which R^1 as defined as above, and R^2 denotes a removable protective group and B′ denotes the nucleotide base B protected by the protective groups which can be eliminated, with a phosphine derivative of the [general] formula III



(III)

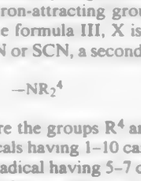
in which R^3 is a protective group which can be eliminated, and X and L are groups which react with hydroxyl groups in the sugar moieties of the nucleotides or nucleosides, in the presence of a base to thereby form a nucleotide phosphite

(b) reacting the nucleotide phosphite obtained in step (a) and represented by the formula IV:



(IV)

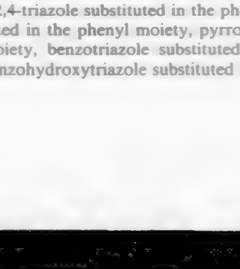
in which B′, R^1, R^2, R^3 and L are as defined above, with a nucleoside, of the [general] formula V, bound to a polymeric carrier



(V)

in which B′ and R^1 are as defined above and C denotes the polymeric carrier;

(c) oxidizing the carrier-bound nucleoside-nucleotides obtained in step (b) and represented by the formula:



(VI)

in which B′, R^1, R^2, R^3 and C are as defined above, with formation of phosphotriester groups,

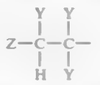
(d) blocking free primary 5′—OH groups, which have not been reacted in the reaction according to step (b), with permanent protective groups;

(e) eliminating the protective group R^2;

(f) optionally repeating steps (a) to (e) to introduce further nucleoside phosphate or oligonucleoside phosphate units; and

(g) cleaving the nucleoside carrier bond and optionally eliminating the protective groups present in the oligonucleoside phosphates,

which process comprises using in step (a) as the phosphine derivative of the [general] formula III a compound in which R^3 denotes a group of the formula VII



(VII)

in which the groups Y, which can be identical or different, represent hydrogen, methyl, and/or ethyl and Z represents an electron-attracting group, where, in the phosphine derivative of the formula III, X is chlorine, bromine, CN or SCN and L is CN or SCN, a secondary amino radical of the formula (VIII)

$$-NR_2^4 \qquad (VIII)$$

where the groups R^4 are primary, secondary, or tertiary alkyl radicals having 1–10 carbon atoms, or together form a cycloalkyl radical having 5–7 carbon atoms, which can contain one or two nitrogen, oxygen, or sulfur atoms as hereoatoms, or are imidazole, triazole, tetrazole, 3-nitro-1,2,4-triazole, thiazole, pyrrole, benzotriazole, benzohydroxytriazole, imidazole substituted in the phenyl moiety, triazole substituted in the phenyl moiety, tetrazole substituted in the phenyl moiety, 3-nitro-1,2,4-triazole substituted in the phenyl moiety, thiazole substituted in the phenyl moiety, pyrrole substituted in the phenyl moiety, benzotriazole substituted in the phenyl moiety, or benzohydroxytriazole substituted in the phenyl moiety.

PLANT PATENTS

GRANTED SEPTEMBER 15, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,970

MINIATURE ROSE PLANT NAMED 'LITTLE CAROL'

Cecilia L. D. Bennett, late of Chula Vista by Susan O'Brien administrator , and Susan M. O'Brien, deceased, 489 Minot Ave., Chula Vista, Calif. 91910 by Susan M. O'Brien administrator

Filed Dec. 31, 1990, Ser. No. 636,392
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant, named 'Little Carol', of hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea form blooms ranging from near Magenta to near Rose Bengal with flowers usually borne one to a stem but occasionally in sprays of 3 to b 5 or more.

7,971

MINIATURE ROSE PLANT NAMED IRRESISTIBLE

Cecelia L. D. Bennett, deceased, 489 Minot Ave., late of Chula Vista by Susan Mae O'Brien, Special Administrator , and Susan M. O'Brien, 489 Minot Ave., Chula Vista, both of Calif. 91910

Filed Dec. 31, 1990, Ser. No. 636,394
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant, named 'Irresistible', or hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described, characterized by its hybrid tea form blooms of white with inner petals ranging from pale Azalea Pink to pale Shell Pink which open white, with flowers usually borne one to a stem but occasionally in sprays of 3 to 5 or more.

7,972

ROSE PLANT — MARIBELL VARIETY

Jean Gressard, St Remy de Provence, France, assignor to Georges Delbard Société Civile Agricole, Malicorne, France

Filed Sep. 7, 1990, Ser. No. 578,573
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of hybrid tea rose plant characterized by the following combination of characteristics:

(a) from a physical point of view forms bronze green mature wood, assumes an upright growth habit, and forms attractive double flowers having consistent petals which are primarily deep on the inside and white with red shadings which intensify uniformly towards the margins of the petals on the outside, and
(b) from the biological point of view forms semivigorous vegetation, produces flowers in abundance, exhibits the ability readily to be forced, is not particularly susceptible to diseases, and forms long lasting flowers comprising petals which detach cleanly;

substantially as herein shown and described.

7,973

HYBRID TEA ROSE PLANT NAMED TWOADMIRE

Jerry Twomey, Leucadia, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Dec. 13, 1990, Ser. No. 627,037
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

7,974

HIGHBUSH BLUEBERRY—MARIMBA CULTIVAR

Paul M. Lyrene, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Jan. 10, 1991, Ser. No. 639,469
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—33.1 **1 Claim**

1. A new and distinct variety of highbush blueberry, substantially as illustrated and described, characterized by its low chilling requirement, disease-resistant bush, early ripening fruit, firm berry, small dry fruit scar, and easy detachment from the plant.

7,975

PLUM TREE (RED NOBLE)

Lowell G. Bradford, 12439 E. Savana Rd., and Norman G. Bradford, 11875 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Apr. 15, 1991, Ser. No. 684,855
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38.1 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, which most nearly resembles Red Beaut (U.S. Plant Pat. No. 2,539) by being self-sterile and by producing fruit that is early in maturing and medium in size, but is distinguished therefrom and an improvement thereon by producing fruit that is darker purplish red in color, that is clingstone rather than freestone in type, that is firmer in texture, and that is substantially better in flavor.

7,976

NECTARINE TREE "MAY KIST"

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95351

Filed Apr. 22, 1991, Ser. No. 688,677
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41.1 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as illustrated and described, characterized by large size, vigorous upright growth; it is a productive and regular bearer of medium size, firm, clingstone fruit with good eating, storage and shipping qualities: the early maturing fruit is further characterized in comparison to the May Grand Nectarine (U.S. Plant Pat. No. 2,794) and the Ruby Gold Nectarine (U.S. Plant Pat. No. 3,101) by its maturing approximately 3 weeks earlier.

7,977

CORN PLANT NAMED TRIPSACORN

Mary W. Eubanks, 4110 Hulon Dr., Durham, N.C. 27705

Filed Nov. 13, 1990, Ser. No. 613,269
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—100 **1 Claim**

1. A new and distinct variety of corn plant, substantially as herein shown and described, characterized by its profuse production of fruit, multiple types of inflorescence, bifurcated style, perennial habit, drought tolerance and pest resistance.

PATENTS

GRANTED September 15, 1992

ERRATA

5-093	5,146,631
5-100	5,146,632
5-421	5,146,633
5-486	5,146,634
5-620	5,146,635
374-175	5,146,780
72-206	5,146,781
409-199	5,147,163
475-226	5,147,252
292-246	5,147,331
292-284	5,147,351
420-556	5,147,471
428-189	5,147,685
437-031	5,147,775
524-152	5,147,935
526-332	5,147,963
527-400	5,147,964
346-140	5,148,203
346-153	5,148,204
369-059	5,148,335
395-800	5,148,389
364-574	5,148,402
382-066	5,148,477
380-046	5,148,485

PATENTS

GRANTED SEPTEMBER 15, 1992

GENERAL AND MECHANICAL

5,146,621

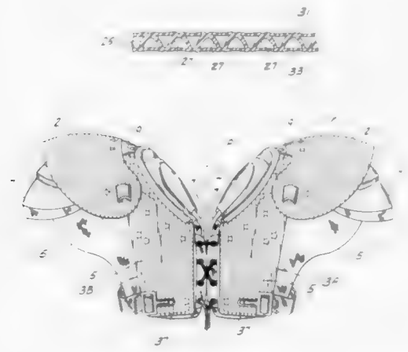
SHOULDER PAD

Joseph C. Hadar, Ellisville, and James R. Conley, Chesterfield, both of Mo., assignors to Figgie International Inc., Willoughby, Ohio

Filed Apr. 1, 1991, Ser. No. 678,594

Int. Cl.[5] A41D *13/00*

U.S. Cl. 2—2 **7 Claims**



1. A shoulder pad comprising a left-hand member adapted to fit over the left shoulder of a wearer and a right-hand member adapted to fit over the right shoulder of a wearer, each of said members being of generally inverted U-shaped as viewed from the side and having a chestplate portion, a backplate portion and an arch connecting the plate portions, said arches being laterally spaced to provide an opening for the neck of the wearer, said members combining to form a shoulder pad shell, each of said members having padding secured to an inside surface thereof for protecting the wearer, said members of the shell being fabricated from lightweight synthetic resin sheet material, said sheet material having a corrugated central layer formed with parallel corrugations, and a pair of generally parallel outer layers forming opposite exterior surfaces of the sheet material, said corrugations being resiliently deformable upon application of an impact load to said sheet material to attenuate the shock of said impact load on the wearer.

5,146,622

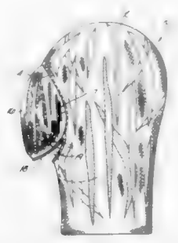
HUNTING HOOD WITH NYLON NET FACE COVER

Morton Blutstein, Milwaukee, Wis., assignor to Reliable Knitting Works, Milwaukee, Wis.

Filed Jun. 20, 1991, Ser. No. 718,545

Int. Cl.[5] A42B *3/00*

U.S. Cl. 2—4 **12 Claims**



1. A head covering comprising a hat including a face opening, said hat being constructed and arranged to cover the entire head of a wearer except for the wearer's face which is substantially exposed by said face opening, and a face covering extending across said face opening, said face covering including an edge attached to said hat, said edge including a lower edge portion disconnected from said hat to provide a gap therebetween, and said face covering being formed of a mesh-like material which permits the wearer visibility and said face covering being constructed and arranged to be positioned in spaced relation from the wearer's face.

5,146,623

SAFETY SPECTACLES AGAINST LASER RADIATION

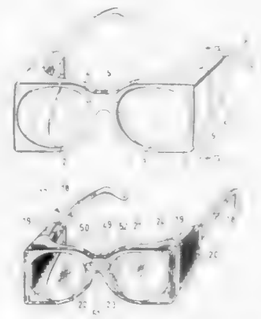
Heinz-Wilhelm Paysan, Aalen-Waldhausen; Wolfgang Grimm, Heidenheim; Hermann Schurle, Aalen; Hans Gaiser, Reutlingen, and Heinz Gutbrod, Leonberg, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 573,632

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 8910235[U]

Int. Cl.[5] A61F *9/00*

U.S. Cl. 2—12 **15 Claims**



1. Safety spectacles to use in an area with laser radiation, the spectacles comprising

protective filters for protecting the eyes against laser radiation,

a spectacle frame serving to accommodate said protective filters and moveable side arms,

wherein said frame is of integral construction and has in one cross section the form of a dish that is open towards a spectacle wearer's face,

said frame has an inner, a front, a top and a bottom surface,

said protective filters are inserted in said front surface of said frame,

said top and said bottom surfaces substantially cover the entire area as far as the spectacle wearer's face,

said frame has sides that extend temporally into the spectacle wearer's temple area,

said sides form a temple plate in each case,

said temple plate has an inside and a first hinge part attached on said inside for pivotable attachment of one of said side arms,

each of said side arms has a side arm plate,

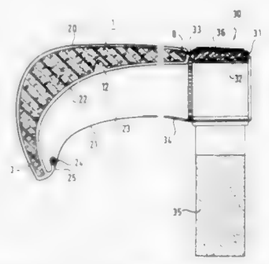
said side arm plate has an inside and forms a continuation of said temple plate when said side arm is at least partly open,

said temple plate and said side arm extend to the spectacle wearer's face,

each of said side arms has an end portion facing said temple plate, and

a second hinge part, pivotable with said first hinge part, is integrated in said inside of said end portion of said side arm plate.

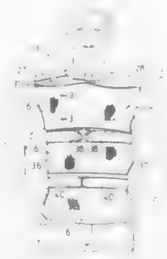
5,146,624
HAND PROTECTOR FOR PUGILISTIC SPORTS
George F. Brückner, Hohenzollerndamm 177, D-1000 Berlin 31, Fed. Rep. of Germany
PCT No. PCT/DE87/00238, § 371 Date Sep. 29, 1989, § 102(e) Date Sep. 29, 1989, PCT Pub. No. WO88/07395, PCT Pub. Date Oct. 6, 1988
PCT Filed May 25, 1987, Ser. No. 423,420
Claims priority, application Fed Rep. of Germany, Apr. 1, 1987, 3710832
Int. Cl.[5] A41I *13/10*
U.S. Cl. 2—18 14 Claims



1. A hand protector for pugilistic sports, comprising a flexible cover of a material selected from the group consisting of leather and imitation leather, and an elastic padding of foam material inserted in said flexible cover, said padding being made from a one-piece shaped body of highly cushioning, open pore polyurethane foam material, and having a main section including a wrist section for covering the wrist, a hand section for covering the back of the hand and a finger section for covering the fingers, said main section being prearched crosswise, corresponding to the natural arch of the hand, and defining a downward arch in the longitudinal direction at an angle of substantially 90° in the vicinity of the rear knuckles and forming a bulge in the region of the downward arch, said elastic padding defining an outer surface with an outer radius of curvature and an inner surface with an inner radius of curvature, said outer radius of curvature in the vicinity of said bulge being at most equal to said inner radius of curvature, and said outer surface and said inner surface approaching each other substantially asymptotically towards a region for the fingertips on the one end and towards the wrist at the other end.

5,146,625
COOLING VEST
Sandra L. Steele, Kingston, and Harry W. Nettleton, Hansville, both of Wash., assignors to Steele And Associates, Inc., Kingston, Wash.
Filed Mar. 27, 1991, Ser. No. 676,092
Int. Cl.[5] A41D *1/04*
U.S. Cl. 2—102 15 Claims

1. A cooling vest comprising:
(a) opposed front and back panels to substantially cover the front and back of a user's torso, said panels being non-integral along a first side of the vest and non-integral on a first shoulder;
(b) first shoulder connector means adjacent the first shoulder allowing the front and back panels to releasably connect to one another adjacent the first shoulder, said first shoulder connector means comprising overlapping segments of the front and back panels, and a hook and loop releasable connector disposed between the overlapping segments; and
(c) a plurality of elongated pockets on at least one of the panels, each of said pockets having an opening such that



respective elongated cooling packs can be received therein.

5,146,626
INTERCHANGEABLE DECORATIVE FRONT PIECE FOR A GARMENT
Zonguie Rosado, 21 Victor Braegger, Villa Caparra, Guaynabo, P.R. 00657
Filed Feb. 21, 1991, Ser. No. 658,524
Int. Cl.[5] A41B *1/22*
U.S. Cl. 2—105 8 Claims

1. For use with a garment having a front part which, in use, extends between the neck and waist of a wearer and is normally exposed to view, said garment including a neck encircling neckline the front part of which is cut to a predetermined shape, an interchangeable decorative front piece for said garment comprising a decorative front flap of a size to cover a substantial portion of the exposed front part only of said garment and a doubled over rear flap located behind said front flap, said flaps having free outer edges and inner edges cut to conform substantially to the same shape as said front part of said neckline of said garment and being joined together by a line of connection, said flaps extending from said line of connection in overlapping substantially parallel relationship, said rear flap being constructed and arranged to be tucked behind said front part of said neckline of a garment with said line of connection in engagement with said front part of the neckline of said garment and said front flap covering a substantial portion of the normally exposed front part of said garment, said line of connection with said front part of said neckline providing substantially the sole support of said decorative front piece on said garment.

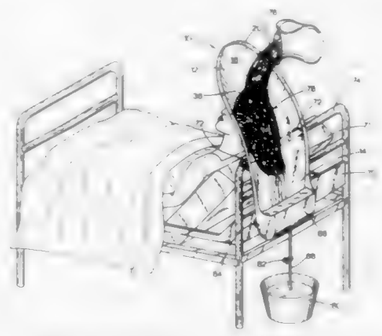
5,146,627
GOLF GLOVE WITH REDUCED PALMAR AREA AND METHOD OF MAKING
Charles W. Weiser, 1310 Providence Rd., NE., Massillon, Ohio 44646
Filed Jul. 2, 1991, Ser. No. 724,711
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 A 3 Claims

3. The method of improving an athletic glove to enhance feel and gripping power of a wearer's hand on a handle of an athletic device comprising the steps of severing an area of a palmar facing surface of said glove in a curvilinear pattern substantially parallel to a wearer's palmar fold lines, overlapping the said severed area of said palmar facing surface of said glove in a long flat oval-shaped configuration, and forming a seam with an adjacent portion of said palmar facing surface to reduce the palmar facing surface area adjacent the said palmar fold lines so that on closing flexure of the wearer's hand a taut non-wrinkling fit is obtained.

5,146,628
SLIP-RESISTANT PROTECTIVE GLOVE AND METHOD FOR MANUFACTURING SLIP-RESISTANT GLOVE
Raymond J. Herrmann, Westlake, and Keith A. Furgalus, Rocky River, both of Ohio, assignors to Bettcher Industries, Inc., Birmingham, Ohio
Filed Oct. 26, 1990, Ser. No. 604,589
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 R 26 Claims

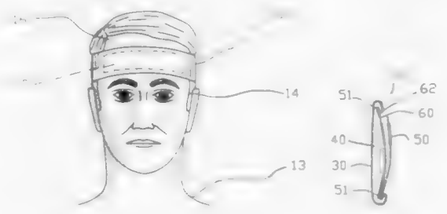
19. A cut-resistant glove having a patterned slip-resistant polyurethane coating adhered to the outer surface of the glove comprising:
a cut-resistant yarn, the yarn comprising a core of two strands of a wire and a strand of high strength synthetic fiber; and a wrapping, the wrapping comprising a first wrapping strand of a high strength synthetic fiber wrapped about the core in a first direction and a second wrapping strand of a high strength synthetic fiber wrapped about the first wrapping strand in an opposite direction from the first wrapping strand and a third wrapping strand of a synthetic fiber wrapped about the second wrapping strand; and the coating is in the form of non-intersecting strips, the strips being about 1/32 inch high and about 1/16 inch wide to give the glove slip-resistance and grip properties, the coating comprising a cured polyurethane composition formed from (a) a pre-mixed thixotropic component, a non-thixotropic component, and an accelerator, and (b) a cross-linking agent, the coating in part permeating the glove surface for adhesion while essentially retaining dimensional stability.

5,146,629
RINSE SHIELD
Monica L. Barnes, 108 N.W. St. Helens Pl., Bend, Oreg. 97701
Filed Aug. 7, 1991, Ser. No. 741,316
Int. Cl.[5] A45D *44/00*
U.S. Cl. 2—174 18 Claims



1. A rinse shield wearable by a person while the person's hair is being shampooed, rinsed, and the like, the rinse shield comprising:
a sheetlike taut portion having an upper major surface, a lower major surface, and a front margin, the taut portion defining an opening therethrough adapted to sealingly fit on a person's head at about a hairline level with the front margin oriented forwardly and the upper major surface oriented upwardly relative to the person's head with the person's hair placed above the hairline level so as to form the taut portion into a brim around the person's head while preventing liquid applied to the person's hair from passing from the upper major surface to the lower major surface, the brim adapted to inhibit propagation of drips and splashes from above the brim to below the brim;
a flexible sheetlike tail portion contiguous with the taut portion opposite the front margin, the tail portion adapted to drape relative to the taut portion rearwardly relative to the person's head and conduct liquid from the upper major surface of the taut portion to a receptacle for capturing the liquid drained by the tail portion; and
attachment means fastened to the tail portion, said attachment means adapted for coupling the tail portion to the receptacle.

5,146,630
SWEATBAND
Raymond J. Richard, Bradenton, Fla., assignor to Ray-Ed Products, Sarasota, Fla.
Filed Apr. 3, 1991, Ser. No. 680,093
Int. Cl.[5] A42C *5/02*; A42B *1/24*
U.S. Cl. 2—181 8 Claims



6. A sweatband comprising:
a liquid impermeable first fabric having an elongated rectan-

gular shape configured to fit about the head of a wearer and having a periphery;

a liquid permeable second fabric having an elongated rectangular shape configured to fit about the head of the wearer with said second fabric attached to said periphery of the first fabric;

a liquid permeable third fabric having an elongated rectangular shape configured to extend along the forehead of a wearer and having a periphery partially secured to said second fabric thereby forming a pocket having an opening to permit access into said pocket;

securing means for securing in use said fabrics to the head of the wearer such that one of said first and said third fabric is pressed against the forehead of the wearer by tension generated by said securing means;

a removable package for holding hydrophilic polymeric granules for absorbing moisture and having an elongated rectangular shape configured to fit within said pocket such that upon saturation of said granular polymeric material with absorbed moisture, said package may be removed from said pocket by way of said opening to enable said granular polymeric material to be dried and to permit replacement of said removable package with a removable package having dry granular polymeric material; and

said removable package further includes hanging means for suspending said package in order to allow said granular material to air-dry.

5,146,631

CONVERTIBLE CRIB, TODDLER AND TWIN BED

Harry Deal, Newark, Del., assignor to Simplicity Inc., Wyncote, Pa.

Filed Sep. 4, 1991, Ser. No. 754,569
Int. Cl.[5] A47D *7/00*
U.S. Cl. 5—93.2 **27 Claims**

1. A convertible bed arrangement comprising:

a pair of end assemblies respectively serving as headboard and footboard assemblies;

each of said assemblies comprising an upper and a lower section releasably joined to one another by suitable fastening means for forming a crib arrangement;

each of said headboard and footboard assemblies being provided with first and second coupling means for respectively coupling a fixed crib side rail and a drop side crib side rail thereto to form a crib arrangement;

first and second pairs of twin bed conversion pieces adapted to be arranged along opposite lateral sides of each of said headboard and footboard assemblies to laterally extend a width of said headboard and footboard;

said headboard and footboard assemblies each being provided with pre-drilled openings for receiving fastening means for coupling the twin bed conversion pieces to the sides of said headboard and footboard assemblies;

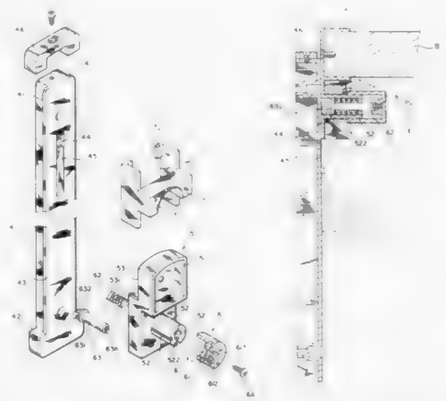
said headboard and footboard assembly lower sections being removable for converting to either a toddler bed or twin bed arrangement.

5,146,632

LIFTING GATE CONTROL DEVICE FOR A BABY'S CRIB

Hsing Li, No. 17, Yung Hsing Street, Taichung, Taiwan

Filed Dec. 10, 1991, Ser. No. 804,411
Int. Cl.[5] A47D *7/02*
U.S. Cl. 5—100 **1 Claim**



1. A lifting gate controlling device for securing the front face of a baby's crib permitting it to be fixed in position or moved down, the improvement comprising:

a mounting bar fastened in a corner post on a baby's crib, said mounting bar comprising sliding surface, a slot on said sliding surface at an upper location, an elongated, sloping track longitudinally extending downwards from said slot, and a unitary stop block at the bottom;

a slide movably mounted on said sliding surface of said mounting bar, said slide comprising a fastening hole for holding the top rail of said baby's crib, and a a circular rod at right angle below said fastening hole, said circular rod having a through-hole through the central axis thereof;

a lock bolt fastened in said through-hole on said circular rod by a movable socket to secure said slide to said mounting bar, said lock bolt having a bolt hole at one end inserted into said through-hole and secured to said movable socket by a screw and a hooked portion at an opposite end engaged into said slot on said mounting bar;

a compression spring mounted on said lock bolt and squeezed between the front end of said circular rod and the hooked portion of said lock bolt;

a retaining block mounted on said slide and retained between said fastening hole and said circular rod, said retaining block having a front projection and a sloping edge on said front projecting at the bottom; and

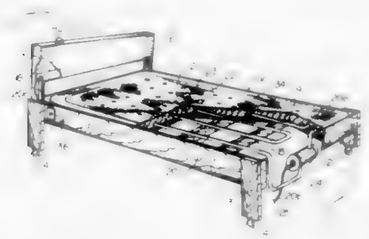
wherein moving said top rail upwards causes said lock bolt to be pulled into said through-hole on said circular rod by said movable socket and disengaged from said slot on said mounting bar so that the front gate of said baby's crib can be moved from an upper limit position to a lower limit position; moving the front gate of said baby's crib from said lower limit position upwards causes said lock bolt to be moved along said sloping track and engaged into said slot on said mounting bar to lock the front gate of said baby's crib in an upper limit position.

5,146,633

THERAPEUTIC, PORTABLE BED PROVIDED WITH A WATER HEATING SYSTEM

Yong Hak Kim, and Soon Ja Kim, both of 330 S. Parrish St., Baltimore, Md. 21223

Filed Nov. 4, 1991, Ser. No. 787,229
Int. Cl.[5] A47C *21/04*
U.S. Cl. 5—421 **5 Claims**



1. A therapeutic, portable bed provided with a water heating system, comprising:

a base member having a bottom support member, an insulating plate disposed on said bottom support member, a concrete plate and a laminated paper cover disposed in sequence on said insulated plate, a pair of longitudinal frames, and a plurality of transverse frames, said longitudinal frames and said transverse frames defining a bed support for said insulating plate, concrete plate, and laminated cover,

a serpentine configured water tube extending through said concrete plate of the base member,

a hollow headboard which functions as a water tank, said hollow headboard communicating with said serpentine configured water tube,

an electric water heater attached to and disposed within said base member, said electric water heater communicating with said serpentine configured water tube, said electric water heater being provided with a cylindrical heater body adapted to contain water and for slidably receiving the electric water heater therewithin and a water heater cover defining a pair of semi-body covers and a pair of caps for covering the cylindrical heater body therewithin, and

a cotton pad member containing mugwort herb, *Artemisian vulgaris*, and disposed on said laminated paper cover, whereby the bed having a water heater system can be easily moved and a vapor from the cotton pad can warm and treat the human body lying on the water heating bed.

5,146,634

THREE ZONE BED COVER WITH AN INFLATABLE HUMAN FORM

Lewis Hunt, P.O. Box 111, 6 E. Lynn St., New Lisbon, Ind. 47366

Filed Sep. 11, 1991, Ser. No. 757,639
Int. Cl.[5] A47G *9/00*
U.S. Cl. 5—486 **4 Claims**

1. A new and improved heat insulative covering for use as a comforter, blanket or sleeping bag, said heat insulative covering comprising:

a first length portion formed from a light insulative material, said first length portion being formed at a first end of said covering;

a second length portion formed from a medium insulative material, said second length portion being formed at an intermediate portion of said covering;

a third length portion formed from a heavy insulative material, said third length portion being formed at a remaining free end of said covering; and

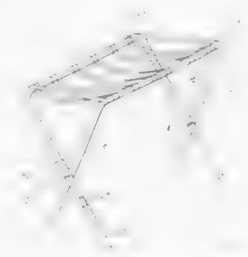
an inflatable human form which is formed in a side of said covering.

5,146,635

VETERINARY SURGERY TABLE

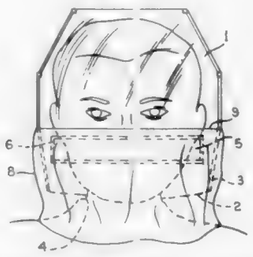
Thomas H. Gastle, Lakefield, Canada K0L 2H0 , and James E. Gastle, P.O. Box 430, Lakefield, Ontario, Canada K0L 2H0

Filed May 11, 1990, Ser. No. 521,996
Claims priority, application Canada, Jun. 1, 1989, 601523
Int. Cl.[5] A61G *13/00*
U.S. Cl. 5—620 **3 Claims**



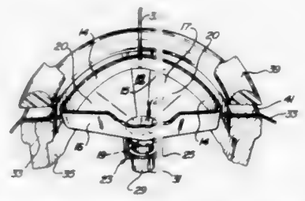
1. A veterinary surgery table comprising a pair of frame portions having a distance therebetween, said frame portions including a pair of inverted U-shaped members, each having a beam and a pair of legs depending from each end thereof, said members being pivotally mounted to one another by a pivot means extending through said legs at a point spaced from said beams, flexible support means extending between said frame portions to support an animal of a given width thereon and thereby forming an animal support bed, said support means having a length and a number of segments along said length, said bed having a width and a depth, a plurality of first adjustment means located at successiuve locations along said frame to vary the length of an individual segment of said support means between said frame portions; second adjustment means for adjusting the distance between said frame portions, said first and second adjustment means together constituting means to configure said animal support bed by adjusting said width and depth according to the type of surgery to be undertaken on said animal; said frame portions being movable from a relatively low position to receive said animal to a relatively high position for surgery on said animal wherein a veterinarian can operate in comfort.

5,146,636
HEAT AND SMOKE PROTECTIVE HOOD
John M. D. De La Pena, Old Farm House Hanwell, Nr. Banbury, Oxon OX17 1HN, Great Britain
PCT No. PCT/GB90/01534, § 371 Date Aug. 2, 1991, § 102(e) Date Aug. 2, 1991, PCT Pub. No. WO91/04765, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 5, 1990, Ser. No. 687,922
Claims priority, application United Kingdom, Oct. 5, 1989, 8922427
Int. Cl.[5] A62B 3/00
U.S. Cl. 2—202 4 Claims



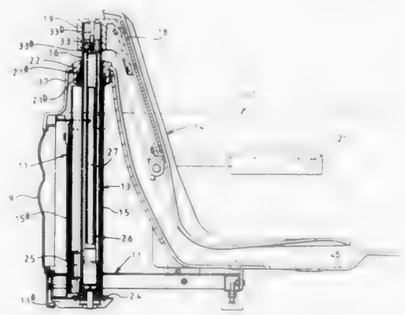
1. A heat and smoke protective hood comprising a bag-like head covering of a heat-resistant substantially gas-impermeable sheet material adapted to fit loosely over the head of the wearer; filter means provided in an aperture of the hood covering to filter harmful ingredients from air inhaled by the wearer through said aperture and a neck portion of stretchable material attached to the open end of the head covering and having a hole through which the head of the wearer may be inserted by stretching the neck portion, said stretchable material being such as to revert to a less stretched condition in which it embraces the neck of the wearer; and an annular skirt of a flexible, heat-resistant material attached to the head covering around its circumference so as to hang down over the outside of the neck portion and the filter means to protect the neck portion, the filter means and the neck of the wearer from heat and flames.

5,146,637
FEMALE URINE COLLECTION APPARATUS
Mark Bressler, 3566 Liberty La., Marietta, Ga. 30062, and Stephen Blank, 5290 Woodridge Forest Trail, Atlanta, Ga. 30327
Filed Jan. 24, 1991 Ser. No. 645,209
Int. Cl.[5] A47K 11/00
U.S. Cl. 4—445 5 Claims



1. A female urine collection apparatus comprising an open top body having connected side, front, rear and bottom walls; the side and front walls being connected and inclined downwardly and inwardly towards said bottom wall:
portions of said bottom wall being inclined downwardly and rearwardly from said front wall toward said rear wall;
opposed portion of said bottom wall being inclined downwardly and inwardly from said side walls;
said bottom wall portions terminating in a funnel-shaped drain spaced from said rear wall and having a depending outlet;
an adapter depending from and connected to said bottom wall underlying said outlet;
a semicircular mount flange on said adapter and spaced from said drain;
a cup having a top flange slidably and removably positioned upon said mount flange in registry with said outlet for collecting liquids; and
a plurality of right angularly related mount strips at their one ends connected to said body and extending radially outward thereof adapted for supportive positioning over a toilet bowl.

5,146,638
BATH
Derek J. Richards, Longhope, England, assignor to Arjo Mecanaids Limited, Gloucester, England
Filed Mar. 1, 1991, Ser. No. 663,325
Claims priority, application United Kingdom, Mar. 23, 1990, 9006507
Int. Cl.[5] A47K 3/12
U.S. Cl. 4—562.1 9 Claims

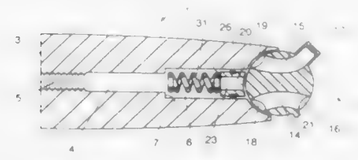


1. A bath comprising a bath tub having an upper rim and apparatus for assisting persons into and out of the bath tub, the apparatus comprising a lifting column having a first actuator movably mounted therewith, a seat supported by the first actuator, said first actuator being operable for raising and lowering the seat relative to the bath tub, and a second actuator connected to the lifting column for angularly displacing the lifting column, thereby causing the seat to swivel when the first actuator is in an elevated position, said lifting column extending through a hole in the bath tub rim at one end of the bath tub, said bath tub including at least one panel extending downwardly from the rim and said second actuator being disposed below the bath tub rim and behind the panel so as to be concealed from view

5,146,639
COMBINATION BATH, SHOWER AND BIDET SPOUT
Wilbur Krause, 9910-B N.E. 190th St., Bothell, Wash. 98011
Continuation-in-part of Ser. No. 580,318, Sep. 10, 1990. This application Oct. 31, 1990, Ser. No. 606,151
Int. Cl.[5] A47K 3/20, 3/00
U.S. Cl. 4—567 6 Claims

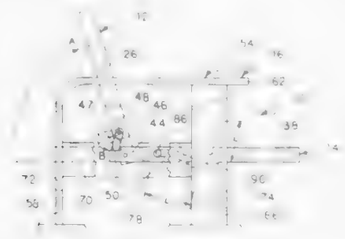
1. A bath tub spout comprising:
an inlet channel, said inlet channel capable of being connected to a bath tub fill pipe;
a plurality of outlet channels within said spout;
a rotatable body for selectively directing water to one of said plurality of outlet channels within said spout, said body having a substantially cylindrical construction and is rotatable upon a central axis extending through said cylindrical body;

one of said plurality of outlet channels comprises an upwardly directed spout, said upwardly directed spout rigidly attached to said rotatable body;



wherein, said body may be rotated to a plurality of predetermined positions defining a plurality of paths for the flow of water through said plurality of outlet channels.

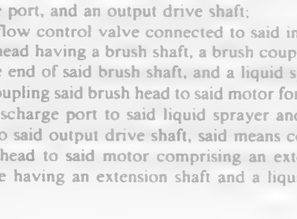
5,146,640
LATCHING ASSEMBLY FOR A CONVERTIBLE SOFA BED
Mark S. Barton, Black River Falls; Kurt J. Bandach, Stanley, and Mark E. Schlichter, Beloit, all of Wis., assignors to August Lotz Co., Inc., Boyd, Wis.
Filed Oct. 29, 1991, Ser. No. 783,682
Int. Cl.[5] A47C 17/17, 17/16
U.S. Cl. 5—47 6 Claims



1. A convertible sofa comprising:
a seat,
a back,
a frame which supports said seat and said back, said frame providing means to slidably attach said seat and said back to said frame,
means to join said seat and said back, said means to join providing a movable joint between said seat and said back,
a readily releasable latch assembly including a pivotal pawl having a tapered edge, said pawl being pivotally connected to said seat, said tapered edge being engagable and disengagable with a step located on said back to form an alternative sofa and bed, whereby
when said convertible sofa is in a bed position, said seat is lifted to engage said pivotal pawl with said step and thereafter lowering said seat raises the back to thereby form a sofa and when said convertible sofa is in a sofa position the seat is thereafter slightly lifted to disengage said readily releasable latch with substantially no resistance, whereby said seat and back may be lowered to form said bed.

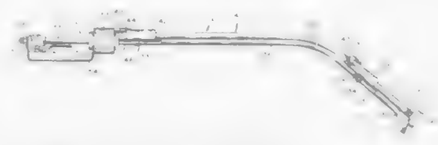
5,146,641
TRAUMA VICTIM HEAD IMMOBILIZATION DEVICE AND METHOD
Wayne C. Zwickey, 209 12th Ave. NE., Minneapolis, Minn. 55413
Filed Feb. 15, 1991, Ser. No. 656,405
Int. Cl.[5] A47C 70/02; A61G 13/00
U.S. Cl. 5—628 10 Claims

1. Apparatus for immobilizing the head of a trauma victim positioned on a stretcher board, comprising:
(a) a first sheet of flexible material;
(b) a second sheet of flexible material having a first face for engaging the stretcher board and a second, opposite face for mounting said first sheet of flexible material when said second sheet of flexible materials is stretched into a planar configuration;
(c) means for mounting said first sheet of flexible material to the second sheet of flexible material such that a pair of normally flaccid, open-sided loops with open sides are defined in said first sheet of flexible material, wherein said pair of open-sided loops straddle an intended location of the trauma victim's head;



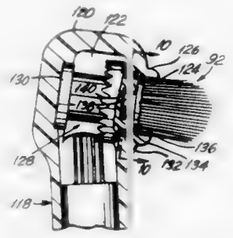
(d) a pair of compressible blocks, each receivable within one of said loops through one of said open sides thereof to be constrained by its respective loop in a manner wherein one of said blocks, in combination with the other of said blocks, defines a seat in which the head of the trauma victim can be received; and
(f) means for attaching an assembly of said first sheet of flexible material, said second sheet of flexible material, and said compressible blocks to the stretcher board.

5,146,642
POWERED SCRUB BRUSH
James F. Mank, Dublin; Michael D. Milosh, and Timothy J. Carpenter, both of Columbus, all of Ohio, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 28, 1991, Ser. No. 706,487
Int. Cl.[5] A46B 13/04
U.S. Cl. 15—24 6 Claims



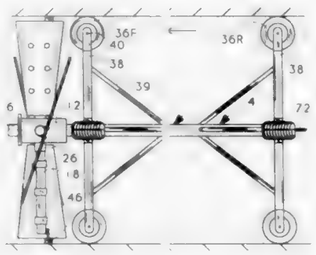
1. A powered scrub brush comprising:
a hydraulic motor having a liquid inlet port, a liquid discharge port, and an output drive shaft;
a liquid flow control valve connected to said inlet port;
a brush head having a brush shaft, a brush coupler mounted on one end of said brush shaft, and a liquid sprayer; and
means coupling said brush head to said motor for connecting said discharge port to said liquid sprayer and said brush shaft to said output drive shaft, said means coupling said brush head to said motor comprising an extension shaft module having an extension shaft and a liquid extension tube

5,146,643
END BRUSH WITH MALE PROJECTION
James A. Bojar, Wauwatosa, and Richard J. Shaw, Hartland, both of Wis., assignors to Professional Dental Technologies Corporation, Batesville, Ark.
Division of Ser. No. 402,341, Aug. 31, 1989, Pat. No. 5,072,482.
This application Aug. 27, 1991, Ser. No. 750,470
Int. Cl.[5] A61C 17/36; A46B 13/02
U.S. Cl. 15—28 12 Claims



1. A brush assembly comprising:
a plurality of generally parallel fibers bundled to form a brush having first and second ends; a base formed at said first bundle end by solidifying said fibers, said fibers extending away from said base and terminating in said second end, the base having a first portion disposed in a plane substantially perpendicular to the fibers and a projecting portion extending from said first portion in a direction opposite to said fibers, said projecting portion being of smaller diameter than said first portion, and having means for connecting the base to a drive means for rotating the brush, the projecting portion having a protrusion extending perpendicular to the projecting portion, for connecting the base to a drive means for rotating the brush, the protrusion spaced away from and substantially parallel to the first portion of the base
drive means for imparting rotation to said brush; and
mounting means associated with said drive means for securing said brush thereto, said mounting means including a recess adapted to receive the projecting portion and means for securing the projecting portion within said recess.

5,146,644
PIPELINE CLEANING DEVICE
Domenic C. Crocco, 1656 40th Ave., Vero Beach, Fla. 32960
Filed Jul. 10, 1991, Ser. No. 727,864
Int. Cl.[5] B08B 9/02
U.S. Cl. 15—104.12 6 Claims

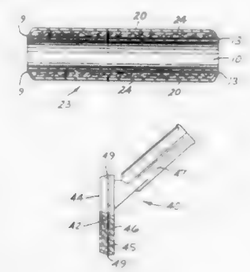


1. A device for periodic cleaning from the inside wall of large diameter, cylindrical pipelines marine growths or other deposits that impede liquid flow through said pipelines, said device comprising:
an elongated central shaft having a longitudinal axis and defined by a shaft front end portion, a shaft rear end portion and a shaft central portion integrally joining said shaft front end portion to said shaft rear end portion,
a cylindrical member carried on said shaft front end portion in fixed longitudinal position relative to said shaft, but free to rotate about said shaft front end portion concentric with said longitudinal axis,
at least two elongated standards that extend laterally from said cylindrical member normal to said longitudinal axis, each standard being defined by a standard outer end portion, a standard inner end portion and a standard central portion integrally joining said standard outer end portion to said standard inner end portion, said standards being fixed by their said inner end portions to said cylindrical member,
a plurality of substantially planar rotor blades equal in number to the number of said standards, each defined by a short inner end, a long arcuate outer end, and a pair of substantially equal length sides that each form an obtuse angle with said inner end, each said blade being fixed to one of said standards by fastener means so its said inner end juxtaposes said inner end portion of the respective standard and holds said blade at an acute angle relative to said longitudinal axis,
at least three rotatable, forward wheels fixed by strut means to said central shaft so all their axes of rotation are substantially an equal radial distance from said central shaft in a plane that is normal to said longitudinal axis and their plane of rotation passes through said longitudinal axis, said forward wheels being also fixed at substantially equal circumferential distances apart from each other,
a plurality of rotatable, rearward wheels that are equal in number to and mimic said forward wheels in radial and circumferential distances relative to each other and to said central shaft, said forward and rearward wheels extending outwardly from said central shaft to contact the inside wall of a pipeline, and
a plurality of cleaner tools equal in number to the number of said standards, each pivotally carried upon one of said outer end portions of a respective standard by holder means that allows its associated said cleaner tool to rotate outward from said longitudinal axis.

5,146,645
TOOTHBRUSH EMPLOYING RESILIENTLY BUCKLING ARCH TO INDICATE EXCESSIVE BRUSHING PRESSURE
Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 1, 1991, Ser. No. 663,214
Int. Cl.[5] A46B 5/02, 9/04
U.S. Cl. 15—167.1 15 Claims

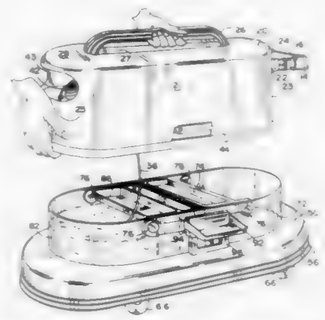
1. A toothbrush comprising a handle having a face side and a back side opposite said face side and a brush head having a face side which carries a cleansing medium for cleaning the user's teeth and gums and a back side opposite said face side, said toothbrush further including a force indicator which simultaneously visually and tactually signals the user when a predetermined brushing force is exceeded, said force indicator comprising a resilient twin beam structure having a first end connected to said brush handle and a second end connected to said brush head, said resilient twin beam structure comprising a face side beam extending between said face side of said handle and said face side of said brush head and a back side beam extending between and substantially rigidly connected to said back side of said handle and said back side of said brush head, said back side beam exhibiting an arched at rest configuration including a point of formed weakness intermediate said first end and said second end of said resilient twin beam structure which will permit said back side beam to behave as an upwardly convex arch when said back side beam is initially subjected to compressive stress and said face side beam is initially subjected to tensile stress resulting from the user gripping said handle and bringing the cleansing medium on said brush head in contact with their teeth and gums, the predetermined force which may be exerted on the user's teeth and gums being limited by the maximum compressive force which said back side beam can resist before it ceases to function as an upwardly convex arch and undergoes temporary and resilient buckling and deformation sufficient to cause it to invert to a downwardly convex configuration, thereby providing a simultaneous visual and tactile signal to the brush user that a predetermined brushing force has been exceeded.

5,146,646
PAINT APPLICATOR
Nathanial P. Langford, and Daniel H. Bishop, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 20, 1990, Ser. No. 482,258
Int. Cl.[5] B05C 1/06
U.S. Cl. 15—210.1 16 Claims



1. A paint applicator comprising:
a paint-impervious backing,
a resilient reticulated reservoir formed of reticulations for receiving and holding paint to be applied by said paint applicator, said reservoir having a rear surface carried by the backing, an opposite front surface, and edge surfaces between said front and rear surfaces, said reservoir being of substantially uniform thickness between said front and rear surfaces,
a flexible exterior reticulated metering layer formed of reticulations and extending over the front surface of the reservoir, which metering layer is not bonded to the reservoir except at crossing points of the reticulations in the reservoir and metering layer, which metering layer has at least twice as many openings linearly measured in any direction along the metering layer as does the reservoir measured in any direction along the reservoir and has a substantially uniform thickness less than one-half that of the reservoir to allow paint to flow into the reservoir through the metering layer and to restrict the flow of paint from the reservoir through the metering layer onto a surface to which the paint is being applied, and
means overlaying the edge surfaces of the reservoir between the front surface of the reservoir and the backing for restricting the flow of paint within the reservoir through the edge surfaces of the reservoir.

5,146,647
CARPET EXTRACTOR WITH BUCKET CADDY
Michael R. Blase, Grand Rapids; Giovanni Pino, Kentwood; Kenneth E. Gibbs, Wyoming, and Douglas C. Finn, Grand Rapids, all of Mich., assignors to Bissell Inc., Grand Rapids, Mich.
Filed May 4, 1990, Ser. No. 519,004
Int. Cl.[5] A47L 5/36
U.S. Cl. 15—321 30 Claims



1. A liquid extraction surface cleaning apparatus comprising:
a floor-supported carriage for removably receiving and supporting two buckets;
two buckets removably located in said carriage independently of each other;
said carriage having a well in which said buckets are removably received;
said well including perimeter well wall portions which project upwardly a substantial portion of the height of said buckets and in close proximity to said buckets, to generally closely surround and embrace said buckets when they are seated in said well to prevent said buckets from tipping when said carriage is moved;
cleaning solution delivery means in fluid communication with one of said two buckets for drawing solution therefrom and conveying it to a dispensing tool;
a housing removably positioned upon said buckets and having a vacuum hose connection means in fluid communication with an opening in the bottom of said housing, said opening being positioned over the other of said two buckets such that liquid and solid debris drawn in through said vacuum hose connection means will be deposited into said other bucket; and
suction means in said housing in fluid communication with said other bucket for drawing liquid and solid debris through said vacuum hose connection means and into said other bucket.

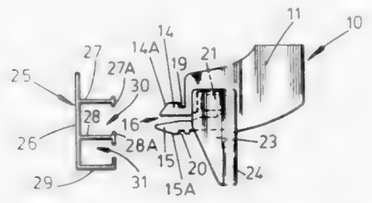
5,146,648
MOUNTING BRACKET
Peter W. Hudson, Woldingham, United Kingdom, assignor to Hallis Hudson Group Limited, Preston, United Kingdom
Filed Sep. 14, 1990, Ser. No. 582,752
Claims priority, application United Kingdom, Sep. 15, 1989, 89 20965
Int. Cl.[5] A47H 1/04
U.S. Cl. 16—94 R 7 Claims

1. A curtain rail assembly comprising:
(A) (i) a curtain rail constituted by a facia strip having a back surface;
(ii) three parallel and vertically-spaced flanges extending along the facia strip from, and at right angles to, the back surface to define, when the curtain is in a horizontal in-use position two parallel, vertically-shaped tracks, namely an upper mounting track and a lower track for receiving

curtain-supporting sliders; the upper and middle flanges being of T-cross-section with the crossbar of each T vertical and the lower flange being of L-cross-section; and

(B) a plurality of brackets for mounting the curtain rail in horizontal disposition on a wall, each bracket including:

a body adapted to be secured to the wall;



a pair of parallel and vertically-spaced mounting fingers extending from the body and engaged in the upper track of the curtain rail;

a rotatable cam supported within the space in the body between the mounting fingers; and

means connected with the cam for rotating the came to urge the mounting fingers apart into locking engagement with the crossbars of the T-section upper and middle flanges.

5,146,649

RESILIENT HINGE DEVICE FOR SPECTACLES

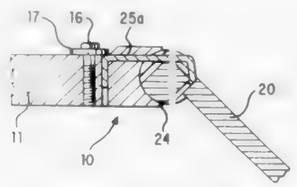
Bortolo Da Pra', Cornuda, Italy, assignor to NEOFORM S.n.c. di Bortolo Da Pra' & C., Cornuda, Italy

Filed May 3, 1991, Ser. No. 695,225

Claims priority, application Italy, May 10, 1990, 84951 A/90

Int. Cl.[5] G02C 5/22, 5/14

U.S. Cl. 16—228 **6 Claims**



1. Resilient or flexible hinge device (**10**) for spectacles, comprising a first element (**11**) provided with a rotation axis for a second element (**20**) rotatable about said axis, and means (**25**) for joining said first (**11**) and second (**20**) elements, characterised in that said first element (**11**) is constituted by a synthetic or metallic elongated element which is provided, at one end thereof, with a notch (**12**) having a section shaped as a circular sector defining a rotation surface in that said second element (**20**) is constituted by synthetic or metallic elongated element which is provided, at one end thereof, with a pair of extensions (**18, 19**) having a section substantially shaped as a circular sector and forming a rotatable body which is movable on said rotation surface about the rotation axis defined by said notch (**12**), in that said second element (**20**) further comprises, in correspondence of said end, a groove (**21**) parallel to the longitudinal axis of said second element (**20**) and two other grooves (**22, 23**) perpendicular to said longitudinal axis, and in that said first element (**11**) and said respective grooves (**21, 22, 23**) are suitable for housing, in operation said joining means (**25**).

5,146,650

MOLDED LATCHABLE HINGE

James W. Robertson, Oberlin, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1991, Ser. No. 708,401

Int. Cl.[5] E05D 7/10

U.S. Cl. 16—259 **4 Claims**

1. A clip comprising a body section, a hook section extending outwardly from a first end of said body section and defining a slot and having a first selected transverse dimension, and a latch arm extending from a second end of said body section toward said hook section to a free end proximate said slot and having a second selected transverse dimension less than said first selected transverse dimension, said latch arm being deflectable toward said body section; and said slot having an arcuate inner surface extending about a circle angularly at least about 160° whereby an angular opening extends about the remaining portion of said circle, and said latch arm defining a surface substantially filling said angular opening,

said hook section having two portions spaced from each other a distance greater than said second transverse dimension and extending from said body section at opposed sides thereof to a common free end section extending transversely between said spaced hook portions, together defining an enclosed opening opposed from said latch arm free end

whereby said latch arm is deflectable toward said body section during insertion of a transversely disposed cylindrical article into said slot through said opening and upon complete insertion said cylindrical article is held within said slot by said latch arm free end upon resiling of said latch arm, and whereby a relief region between said latch arm and said body section is easily moldable by providing access for a mold core pin extending thereinto from a direction opposite said opening and enabling said body section, said hook portions and said latch arm to be easily molded in an integral article.

5,146,651

PROCESS AND APPARATUS FOR TOW CROSS-SECTION MEASUREMENT AND CONTROL

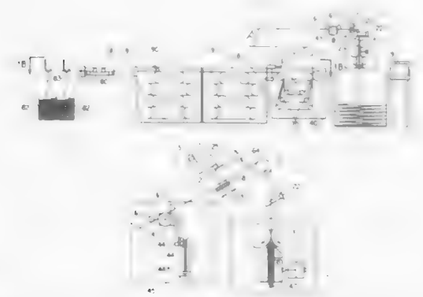
Joseph J. Duffy, Newark; Jerry F. Potter, Seaford; Elwood A. Roth, Seaford; Kalika R. Samant, Seaford; Richard E. Thek, Seaford, all of Del., and Maurice C. Todd, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1990, Ser. No. 631,432

Int. Cl.[5] D01G 23/06

U.S. Cl. 19—65 T **2 Claims**

1. A method for controlling a mass distribution profile of a tow band width of a moving tow band at a predetermined value, said method comprising: sensing the mass distribution profile of the tow band across the width of the moving tow band; comparing the sensed mass distribution profile to a predetermined value of the mass distribution profile and determining the difference between the sensed and predetermined mass



distribution profile; generating a signal proportional to said difference; and moving at least one positioning device in accordance to said signal to adjust a position of the tow band and thereby adjust said mass distribution profile toward the predetermined mass distribution profile.

5,146,652

APPARATUS FOR OPENING AND CLEANING FIBER MATERIAL

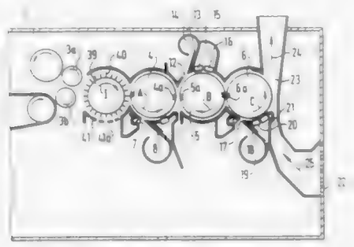
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Möchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 23, 1991, Ser. No. 644,538

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1990, 4001816

Int. Cl.[5] D01B 3/00

U.S. Cl. 19—204 **10 Claims**



1. In an apparatus for opening and cleaning fiber material, including consecutively arranged first, second and third clothed rolls each having a clothing thereon; said second clothed roll cooperating with said first clothed roll as a doffer and opening roll and said third clothed roll cooperating with said second clothed roll as a doffer and opening roll; further wherein centrifugal forces generated at peripheries of said clothed rolls increase from roll to roll from the first clothed roll; fiber feeding means for advancing the fiber material towards said first clothed roll; and covers each closely surrounding the respective said first, second and third clothed rolls; the improvement wherein said first, second and third clothed rolls have at least approximately identical diameters; the improvement further comprising a waste discharge opening provided in the cover of each clothed roll; a mote knife bounding each waste discharge opening; and an additional clothed roll situated between said fiber feeding means and said first clothed roll; said additional clothed roll having a clothing formed of pins or needles; said additional clothed roll being arranged for receiving the fiber material from said fiber feeding means and for transferring the fiber material to said first clothed roll.

5,146,653

SUCTION CHAMBER

Hubert Hergeth, Koenigsmuehlenweg 11, 5100 Aachem, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 505,706, Apr. 5, 1990, abandoned. This application May 9, 1991, Ser. No. 697,696

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912529

Int. Cl.[5] D01B 3/00

U.S. Cl. 19—205 **6 Claims**

1. A suction chamber for removing fibers from an opening roller of textile fiber opening and cleaning machines, said suction chamber comprising wall means defining a suction space; an air screen superimposable over the opening roller, said wall means including a stationary wall having an outlet for connection to a suction source, and a wall portion pivotable relative to said stationary wall, said wall portion having a limiting face and being connected to said air screen for joint pivotal movement therewith; and pivot means for pivoting said wall portion together with said air screen.

5,146,654

STRETCHED CABLE TIE

Jack E. Caveney, Hinsdale; James A. Brownlee, Park Forest, and Jeffery S. Kuzmuk, Tinley Park, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed May 3, 1991, Ser. No. 695,153

Int. Cl.[5] B65D 63/00

U.S. Cl. 24—16 PB **23 Claims**

1. A stretched cable tie comprising a head and a strap having a plurality of teeth on both sides of said strap;

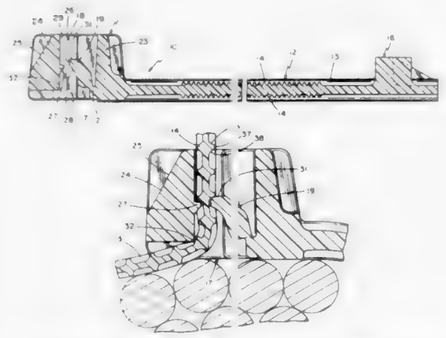
said strap having been stretched from its as-molded condition to lengthen both said strap and the as-molded spacing between said teeth;

said head having an abutment wall connected to a pair of spaced side walls having an entry face and an exit face with a strap receiving aperture extending therebetween;

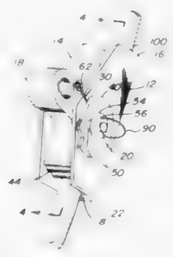
said abutment wall having a fixed tooth extending into said strap receiving aperture intermediate the entry and exit faces, said fixed tooth having a locking surface facing toward said exit face; and

a pawl mounted for movement in said head having a single pawl tooth extending into said strap receiving aperture,

said tooth being adapted to engage one of said teeth when said strap is positioned through said strap receiving aperture and a force is applied in a direction toward said strap entry face to a portion of said strap within said head.

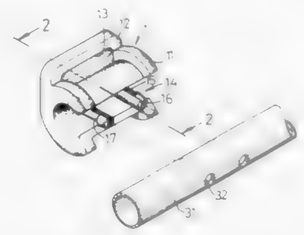


5,146,655
SAFETY CLAMP APPLIANCE
Peter E. Gibbs, 2608 E. 3830 South, Salt Lake City, Utah 84109
Filed Oct. 29, 1991 Ser. No. 783,914
Int. Cl.[5] A44B *21/00*; F16G *11/00*
U.S. Cl. 24—134 R 9 Claims



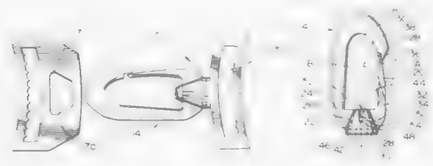
1. A safety clamp appliance, comprising:
a housing having parallel first and second side walls and a U-shaped rear wall, said housing being longitudinally slidable on a safety rope;
said U-shaped rear wall having a hinged means to pivot said first side wall to open said housing to remove a safety rope from said housing;
said first side wall having a rope slide means perpendicular to said first side wall to guide a safety rope through said housing where said rope slide means is in said housing and above said hinge means of said U-shaped rear wall when said side walls are parallel
a brake lever means having a brake means end and a handle end with a pivot point intermediate said ends, an actuating spring connected at one end to said handle end and connected at the other end to said housing, where said brake lever means being pivoted by said actuating spring into constant engagement with the safety rope pressing the safety rope against the guide means;
a disconnect means for disconnecting said actuating spring thereby changing said safety clamp appliance from being spring loaded to being non-spring loaded.

5,146,656
DEVICE FOR ATTACHING A SEAT TO A STROLLER
Ming-Tai Huang, 4 Fl., No. 302, Pai Ling Wu Rd., Taipei, Taiwan
Filed Jul. 2, 1991, Ser. No. 724,831
Int. Cl.[5] A44B *17/00*; A47C *7/00*
U.S. Cl. 24—265 C 3 Claims



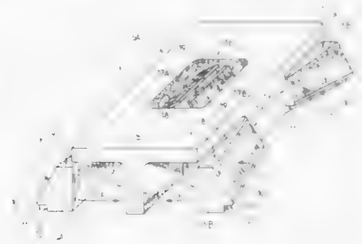
1. A device for attaching a seat to a stroller, said device being made of flexible material and comprising:
a buckle for grasping an external portion of a tubular structural member of the stroller;
hook means being fixed to said buckle and insertable through the tubular structural member of the stroller for releasably locking said buckle to the stroller; and
a lug means being integral with said buckle and t which a strip of the seat is secured.

5,146,657
SWIVEL SNAP HOOK CONNECTOR ASSEMBLY HAVING INCREASED HOLDING POWER WHEN UNDER LOAD
Francis G. Frano, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Mar. 25, 1992, Ser. No. 857,190
Int. Cl.[5] A44B *11/00*, *13/00*
U.S. Cl. 24—265 H 16 Claims



1. A snap hook and complementary buckle member device having a connector assembly for connecting the snap hook to the buckle member and having increased holding power when under a load comprising:
a buckle member having a male connector member formed therewith to be attached to the snap hook, said male connector member having an elongate stem with first and second opposite ends and a shoulder formed on said first end of said stem, said shoulder having a predetermined shape and exterior dimensions;
a snap hook member including a female receptor member formed therewith for receiving said male connector member therein, said female receptor member having a tapered channel extending therethrough, said channel having a first tapered end, a second opposite flared end and a side wall interconnecting said first and second ends and forming said tapered channel, the interior dimensions of said first tapered end being smaller, and the interior dimensions of said second flared end being larger, than said exterior dimensions of said shoulder of said stem; and
at least one slot formed through a portion of said side wall of said channel, a first end of said slot being open to said first tapered end of said channel, said slot extending along said side wall a predetermined distance toward said second flared end of said channel and terminating in a second closed end of said slot, said slot enabling outward resilient expansion of said first tapered end of said channel for insertion of said shoulder therethrough from the inside of said female receptor member, said first tapered end resiliently closing about said stem behind said shoulder after insertion and, upon placing a tensile load between said male connector member and said female receptor member, said first tapered end further collapses against and provides increased holding of said stem behind said shoulder.

5,146,658
TRIM FASTENER
Didier Devismes, Levallois Perret, France, assignor to Itw De France, Beauchamp, France
Filed Jul. 16, 1990, Ser. No. 552,672
Claims priority, application France, Jul. 17, 1989, 89 09591
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—292 12 Claims



1. A fastener for securing an object to an underlying support, comprising:
a fastener body having a longitudinal axis, a predetermined lateral extent defined by means of a pair of laterally spaced sidewalls, and means for securing said fastener to an underlying support; and
two pairs of spring tabs mounted upon said pair of laterally spaced fastener body sidewalls with one pair of said spring tabs mounted within each one of said pair of laterally spaced fastener body sidewalls wherein each one of said spring tabs is pivotably mounted in a cantilevered manner about a hinge portion defined within a respective one of said fastener body sidewalls and disposed within a plane which is transverse to said longitudinal axis of said fastener body such that said tabs of each one of said pairs of spring tabs mounted within each one of said fastener body sidewalls move, in opposite directions with respect to each other and with respect to said longitudinal axis of said fastener body, between a first laterally outward position with respect to said respective one of said fastener body sidewalls at which each one of said spring tabs engages said object to be secured upon said underlying support, and a second laterally inward position with respect to said respective one of said fastener body sidewalls at which each one of said spring tabs is lockingly engaged with said object such that said object is fixedly secured upon said underlying support through means of said fastener; through means of said fastener;
said fastener body further comprising a surface portion which is separated from said underlying support, so as to define a space therebetween, and extending laterally outwardly with respect to said longitudinal axis of said fastener body such that when said spring tabs are moved from said first laterally outward position to said second laterally inward position, said spring tabs will be disposed within said space and beneath said surface portion of said fastener body such that said surface portion of said fastener body overlies said spring tabs when said spring tabs are disposed at said second laterally inward position.

5,146,659
TRIANGULAR WEAVING FRAME
Carl R. Spriggs, II, 227 Columbia Regency, Columbia, Mo. 65201, and Carol L. Brack-Kaiser, 7001 Hillcreek Rd., Columbia, Mo. 65203
Filed Nov. 30, 1990, Ser. No. 620,134
Int. Cl.[5] D03D *29/00*
U.S. Cl. 28—152 8 Claims

5. An adjustable triangular weaving frame for weaving woven pieces of various sizes comprising sections formed by three rails connected to form a plane triangle, each rail having first and second adjoining rails and upper and lower surfaces, inner and outer side edges and end edges and each rail having a row of generally vertical pins rising from the upper surface of the rail for winding string or yarn thereon in the formation of woven piece, said vertical pins set at regular intervals along each rail with the spacing regulated by the law of triangles such that there is an equal number of pins on each of the rails when the rails are assembled into plane triangles of the same shape but different size, and means for connecting the rails together in a selected position to form one of a plurality of plane triangles of the same shape but different size, said means for connecting the rails together comprising first and second joints, said first joint formed by one end of each rail partially lapping the inner side of the first adjoining rail at a selected one of a plurality of positions along said first adjoining rails's inner side and said second joint formed by each rail partially lapping an end of the second adjoining rail at a selected one of a plurality of positions along each rails's inner side, said row of vertical pins on the rail extending the length of the rail at the first joint and intersecting the row of vertical pins on the first adjoining rail at a vertical pin on the first adjoining rail forming a vertex pin which is equally spaced with the other pins in the row of vertical pins on the rail and said row of vertical pins on the second adjoining rail extending the length of the rail at the second joint and intersecting the row of vertical pins on said rail forming a vertex pin which is equally spaced with the other pins in the row of vertical pins on the second adjoining rail so that there are no unequal gaps between the vertical pins in the intersecting rows at the joints.

5,146,660
DEVICE FOR AIR-INTERMINGLING MULTIFILAMENT YARNS
Helmut Ritter, Wattwil, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland
Filed Jun. 20, 1991, Ser. No. 719,114
Claims priority, application Switzerland, Jul. 2, 1990, 2197/90
Int. Cl.[5] D02G *1/16*
U.S. Cl. 28—274 6 Claims

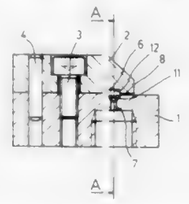
1. A device for intermingling multifilament yarns, comprising: a body (1, 2) composed of two sections secured to one another, namely a nozzle unit section (1) and an impingement unit section (2),
said nozzle unit section (1) being formed with a first continu-

ous linear groove defined by a first hollow wall surface (**11**), and with at least one blast nozzle (**7**) having an orifice in said first hollow wall surface (**11**),

said impingement unit section (**2**) being formed with a second continuous linear groove defined by a second hollow wall surface (**12**) which lies in opposition to said orifice,

said first and second hollow wall surfaces (**11**, **12**) together defining a continuous yarn channel (**6**) having a longitudinal axis (A), and said hollow wall surfaces (**11**, **12**) each being symmetrical with respect to a plane of symmetry (E) containing said longitudinal axis (A),

a continuous threading slot (**9**) communicating with said yarn channel provided between said nozzle unit section



(**1**) and said impingement unit section (**2**) and extending to a rim of said first hollow wall surface (**11**) and to a rim of said second hollow wall surface (**12**),

said rim of said first hollow wall surface (**11**) having a greater spacing from said plane of symmetry (E) than said rim of said second hollow wall surface (**12**),

said first and second hollow wall surfaces (**11**, **12**) defining said yarn channel (**6**) together being composed of at least four component surfaces of which at least two are planar,

and thread guide members (**13**, **14**) fixed directly in said nozzle unit section (**1**) at both ends of said yarn channel (**6**) for keeping any multifilament yarn, which is tensioned over said thread guide members (**13**, **14**), at a distance h from said first hollow wall surface (**11**).

5,146,661

PACKAGED DEVICE HANDLING METHOD AND APPARATUS

Jonathan D. Knepper, Salisbury Township, Lehigh County; Gerald J. Masavage, Macungie, and Phillip A. Solomon, Fleetwood, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 7, 1990, Ser. No. 610,369
Int. Cl.[5] H01L *21/58*
U.S. Cl. 29—25.01 **4 Claims**

1. Apparatus for combining integrated-circuit device packages with carriers, comprising:

support means for packages, carriers, and package-carrier combinations, said support means being capable of tilting from the horizontal,

pick-and-place means on said support means, and

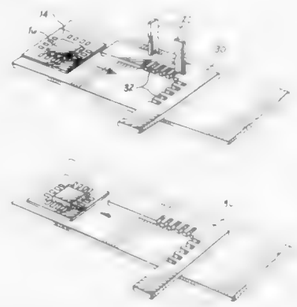
means for releasing packages and carriers whereby said packages and carriers move due to the influence of gravity to said pick-and-place means; and means for conveying package-carrier combinations away from said pick-and-place means.

5,146,662

LEAD FRAME CUTTING APPARATUS FOR VARIOUS SIZED INTEGRATED CIRCUIT PACKAGES AND METHOD THEREFOR

Richard H. J. Fierkens, Keurbeck 15, 6914 AE Herwen, Netherlands

Filed Dec. 30, 1991, Ser. No. 814,504
Int. Cl.[5] H01L *21/60*
U.S. Cl. 29—25.03 **11 Claims**



1. A lead frame cutting apparatus for integrated circuit packages comprising, in combination:

an integrated circuit package comprising, in combination:

a lead frame comprising a base portion having metal leads that extend from said base portion, and having dam bar metal interconnections located adjacent to said base portion between said metal leads of said lead frame, and having an outer metal frame interconnecting all of said metal leads, said dam bar interconnections and said outer metal frame comprising portions to be removed from said lead frame;

a semiconductor chip fixedly attached to said base portion of said lead frame and having bonding wires connecting portions of said semiconductor chip to said metal leads of said lead frame; and

means for protecting and surrounding said semiconductor chip and said base portion of said lead frame such that said metal leads of said lead frame extend to the exterior of said semiconductor chip;

a thin L-shaped cutting plate upon which said integrated circuit package is placed having recesses that correspond to half of said portions to be removed from said lead; and

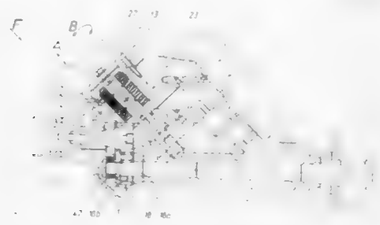
punching tool means having removable punch means aligned with said recesses in said thin L-shaped cutting plate for exerting a downward force on half of said dam bar interconnection for pressing said dam bar interconnections of said lead frame into said recesses of said cutting plate with a shearing action thereby removing said dam bar interconnections from said lead frame.

5,146,663

REVOLVING HEAD FOR MACHINE-TOOL

Pierre Buessinger, Colmar, France, assignor to Somex Mulhouse S.A., France

PCT No. PCT/FR89/00247, § 371 Date Nov. 21, 1990, § 102(e) Date Nov. 21, 1990, PCT Pub. No. WO89/11376, PCT Pub. Date Nov. 30, 1989
PCT Filed May 24, 1989, Ser. No. 613,623
Claims priority, application France, May 25, 1988, 88 07142
Int. Cl.[5] B23B *39/20*
U.S. Cl. 29—40 **10 Claims**



1. A revolving head for machine tools comprising a fixed frame, a spindle-bearer turret rotatable relative to said frame, at least two tool-supporting spindles attached to said turret, drive means for rotating a desired one of said spindles comprising a drive shaft (**15**), wherein a first element is fixed to said frame and said turret comprises a second element which is axially and rotatably movable with respect to said first element and which is indexed with respect to said first element by means of protruding portions carried by one of said first and second elements engaging with complementary recesses carried by the other of said first and second elements, automatic control means comprising an axial piston (**25**) which displaces said second element (**22**) axially with respect to the said first element (**21**), a rotary piston (**36**) which rotates said second element (**22**) relative to said first element (**21**), and the axis of said drive shaft (**15**) forms a 45° angle with an axis of said turret (**12**),

characterized in that said axial piston comprises a rod (**24**) rotatably mounted to said first element (**21**) and to the fixed frame (**11**), and a cap (**26**) secured to said second element (**22**) and axially and rotatably movable with respect to said rod, and compression spring means (**28**) attached between a base of said axial piston (**25**) and said second element (**22**) for biasing said second element (**22**) into contact with the said first element (**21**) after relative axial displacement of said first and second elements.

5,146,664

CONTROLLED DEFLECTION ROLL

Mario Biondetti, Venice, Italy, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Mar. 15, 1991, Ser. No. 669,961
Claims priority, application Switzerland, Mar. 20, 1990, 915/90
Int. Cl.[5] B21B *13/02*
U.S. Cl. 29—116.2 **15 Claims**

1. A controlled deflection roll comprising:

a stationary support having a lengthwise axis;

a roll shell rotatable about said stationary support and having oppositely situated ends;

at least one support device exerting a pressing force in a pressing plane in a predetermined pressing direction;

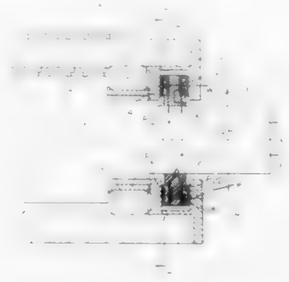
said at least one support device supporting said roll shell at the stationary support;

said roll shell being movable throughout the entire length thereof in the direction of application of the pressing force in the predetermined pressing direction;

means provided at the region of each ends of the roll shell for exerting a rotational moment;

said rotational moment exerting means defining an axis which extends substantially perpendicular to the pressing plane;

said rotational moment exerting means comprising at least one pair of force-exerting elements; and



said at least one pair of force-exerting elements, being effective in opposite directions with respect to one another approximately in the axial direction of the stationary support at a predetermined distance from the lengthwise axis of the stationary support

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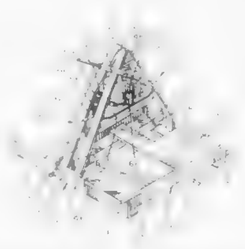
5,146,665

BELT SPLICING APPARATUS

Royce Wheatcroft, Box 968, Dighton, Kans. 67839

Continuation-in-part of Ser. No. 415,865, Oct. 2, 1989, Pat. No. 5,018,262. This application May 22, 1991, Ser. No. 704,062
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—243.51 **10 Claims**



1. An apparatus for lacing ends of a belt and the like comprising:

(a) a base means for supporting the apparatus for lacing in an upright position;

(b) a pair of shoulders secured to said base means in an opposed relationship, each of said shoulders having a structure defining an arcuate recess;

(c) a base support member connected to said pair of shoulders below said arcuate recess of each shoulder;

(d) a pair of guide members connected to said pair of shoulders in a generally parallel spaced relationship;

(e) a generally A-frame member secured to the pair of shoulders and extending upwardly therefrom;

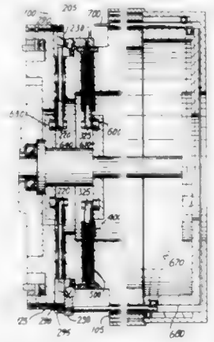
(f) a lever means slidably disposed between said pair of guide members for moving up and down therebetween;

(g) at least one spring means coupled to the A-frame member and to the lever means for biasing the lever means upwardly;

(h) a means for driving the lever mean downwardly towards the base support member to contact and close a clipper vise lacer means containing a plurality of clipper hooks

such that the clipper hooks are driven and embedded into an end of a belt that has been previously disposed in the clipper vise lacer means.

5,146,666
METHOD AND APPARATUS FOR CUTTING, FORMING, AND INSERTING CUPS INTO TUBES
Terry Babbitt; Michael S. Braunstein; Andrew J. Gillespie, all of Richmond; Donald H. Jones; Billy J. Keen, Jr., both of Chesterfield; Robert H. Raynor; Renzer R. Ritt, both of Richmond, and Robert E. Talley, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Nov. 19, 1991, Ser. No. 794,528
Int. Cl.[5] B23P *17/00*; B23Q *7/02*
U.S. Cl. 29—429 18 Claims



18. A method for forming cups from a strip of material and inserting the cups into the ends of tubes, comprising the steps of:

providing a strip of material;

providing a first member having a periphery;

providing a plurality of workstations positioned around the periphery of the first member for forming the cups and inserting the cups into the tubes, each workstation comprising means for cutting a disk of material from the strip of material, means for forming the disk into a cup, means for locating the cup adjacent a tube, and means for inserting the cup into the tube;

providing a plurality of stationary cams for controlling the means for cutting a disk of material from the strip of material, the means for forming the disk into a cup, the means for locating the cup adjacent a tube, and the means for inserting the cup into the tube;

providing a second member having a periphery;

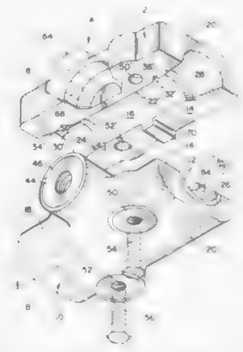
providing a plurality of receptacles for containing a tube, the plurality of receptacles being spaced around the periphery of the second member;

advancing the first and second members so that each receptacle holds a tube adjacent each workstation in a first region;

advancing the strip of material around a portion of the periphery of the first member in synchronism with the advance of the first member so that the strip of material comes into relative stationary contact with each workstation in a second region; and

imparting controlling motion to each of the plurality of workstations by the advance of the workstation on the first member relative to the stationary cams whereby each workstation performs the steps of cutting a disk of material from the strip of material, forming the cut disk into a cup, positioning the formed cup adjacent a tube, and inserting the formed cup into the adjacent tube.

5,146,667
CABLE SUPPORT ASSEMBLY AND METHOD OF STRINGING THE SAME
Thomas E. Sherman, Chagrin Falls, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio
Continuation of Ser. No. 552,257, Jul. 12, 1990, abandoned, which is a division of Ser. No. 167,039, Mar. 11, 1988, Pat. No. 5,014,941. This application Dec. 11, 1991, Ser. No. 807,785
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—433 5 Claims



1. A method of stringing an overhead cable form poles or support structures by using a cable support assembly for both stringing and supporting the suspended cable, the cable support assembly including first and second mating body members each having a smooth faced recess with tapered portions that increase in diameter as the recess extends toward an end, a cushion member, means for mounting the cable support assembly to the support structure, and means for securing the body members together, the method comprising the sequential steps of:

mounting one of the first and second body members with the mounting means to the associated support structure;

securing the other of the first and second body members to said one body member with the securing means, said securing means maintaining the body members in close proximity to one another, yet allowing the cable to be adjusted relative thereto;

feeding the cable between said first and second body members;

adjusting the sag of the cable form one support structure to another support structure while the cable is contained between said body members; and

tightening together said first and second body members in mating relation to clampingly engage and support the cable.

5,146,668
METHOD FOR MANUFACTURING PART FOR FLOATING NUT ASSEMBLY
Bulent Gulistan, 20568 Pinnacle Way, Malibu, Calif. 90265
Filed Jun. 18, 1991, Ser. No. 717,327
Int. Cl.[5] B23P *17/00*; B21J *5/12*; F16B *37/04*
U.S. Cl. 29—525 4 Claims

1. A method for forming and securing an attaching sleeve for a floating nut assembly comprising the steps of:

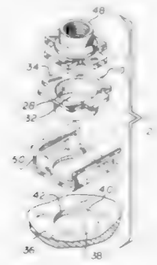
cutting off a longitudinal segment from an input bar or wire stock made of steel, said longitudinal segment having a first portion located toward a front end of said segment, and a second portion located toward a rear end of said segment;

forming a first flange on said front end of said longitudinal segment;

forming a first centrally disposed hole in said front end of said longitudinal segment, said hole extending rearward from said flange toward the second portion of said segment;

forming a predetermined number of longitudinally extending knurls projecting outwardly around the periphery of said first portion adjacent said flange;

forming a second centrally disposed hole in said rear end of said longitudinal segment, said second hole extending forward from said rear end toward the first portion, said hole communicating with said first hole to form a substantially uniform diameter opening through said segment;



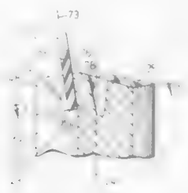
all of said forming steps being achieved by cold heading or cold deforming operations;

trimming said flange to form outwardly extending tabs;

preparing a hole for receiving said sleeve having recesses around the inner wall of said hole, the number of said recesses being equal to said predetermined number of cold headed or deformed knurls; and

subsequent to preparing said hole, securing said cold headed or deformed sleeve into said hole by embedding or pressing said sleeve into said hole with each knurl fitting into a corresponding recess in the wall of said hole.

5,146,669
METHOD OF MANUFACTURING AN INSERT DRILL
Joseph F. Fabiano, 4776 Huxley Dr., Rockford, Ill. 61101
Filed Jul. 31, 1991, Ser. No. 738,671
Int. Cl.[5] B21K *5/02*
U.S. Cl. 29—557 14 Claims



1. A method of manufacturing an insert drill comprising the steps of:

providing an elongate insert drill shank having a drill axis, a drill portion extending from a cutting end of the drill shank, a chip channel in the drill portion extending along the drill shank from the cutting end, and defined by a boundary of a generally flat insert face approximating a plane that is generally parallel to the drill axis and forms the chip channel adjacent to the cutting end that moves in a direction following the chip channel as the drill shank is rotated about the drill axis in a drill rotation direction;

providing a pocket cutting tool for rotation about a tool axis that is sized to allow the pocket cutting tool to extend into the chip channel from the cutting end when the tool axis is oriented generally along the drill axis and constructed to cut along a cylindrical cutting surface extending from a tool cutting end defined by rotation of the tool about the tool axis and extending from a tool cutting end;

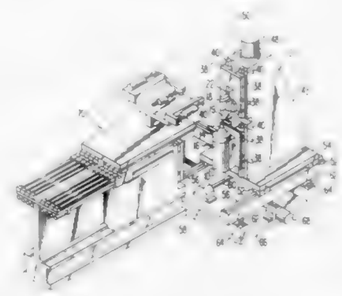
positioning the pocket cutting tool so that the tool axis extends in a direction approximately along the axis of the drill shank and the pocket cutting tool is spaced apart from the insert face adjacent to a location on the insert face at which an insert pocket for receiving a cutting tool insert is to be formed and the tool cutting end is at a location not farther from the cutting end than an axial pocket length of the insert pocket and the cylindrical cutting surface extends beyond the cutting end;

cutting the insert pocket into the insert drill shank by translating the pocket cutting tool into the insert face along a direction approximately perpendicular to the tool axis to a machined depth and translating the pocket cutting tool in a plane generally parallel to the insert face to radially inner and outer extents of the insert pocket and in a direction generally along the drill axis to the pocket length; and

removing the pocket cutting tool by translating the cutting tool in a direction away from the insert pocket

whereby an insert pocket may be machined at the cutting end of an insert drill by a cutting tool extending generally along the axis of the drill into the chip channel from the cutting end of the drill.

5,146,670
PROFILING AND DEBURRING OF WORKPIECES
Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 226,552, Jul. 29, 1988, Pat. No. 4,998,206, which is a continuation-in-part of Ser. No. 107,477, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 942,261, Dec. 16, 1986, Pat. No. 4,700,308, which is a continuation of Ser. No. 726,701, Apr. 24, 1985, abandoned. This application Jun. 26, 1990, Ser. No. 543,406
Int. Cl.[5] B23Q *39/02*; B23C *3/12*
U.S. Cl. 29—561 16 Claims



1. A device for profiling and deburring a workpiece, the device comprising:

profiling means including a cutting edge for profiling a workpiece;

deburring means including a cutting edge for deburring profiled edges of a workpiece;

yoke means for supporting said profiling means and said deburring means in opposed relation on opposite sides of a planar work position, said yoke means being movable along a z-axis perpendicular to said work position to alternately move the cutting edges of said profiling means and said deburring means toward and away from a workpiece in said work position;

means for selectively moving the cutting edges of said profiling means and said deburring means in the plane of said work position; and

means for controlling the movement of said yoke means and said moving means to profile and deburr a workpiece in

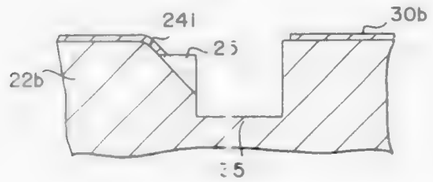
said work position in accordance with a predetermined pattern.

5,146,671

METHOD OF MANUFACTURING FLOATING TYPE MAGNETIC HEAD

Takahiro Ogawa, Sennan; Atsushi Inoue, Yao; Kazuhiko Koga; Kiyotaka Ito, both of Daito, and Yutaka Ueta, Yao, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 30, 1991, Ser. No. 753,157
Claims priority, application Japan, Aug. 31, 1990, 2-231676
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 11 Claims



1. A method of manufacturing a floating type magnetic head having a magnetic gap (g) between a pair of magnetic core halves mutually abutted with nonmagnetic material interposed therebetween and including a head core fixed to a slider formed of nonmagnetic material comprising steps of:

preparing first and second magnetic core half members including ferromagnetic oxide and respectively having first and second gap forming surfaces to be abutted against each other to defined said magnetic gap (g);

forming a first groove on said second gap forming surface;

forming a glass layer inside said first groove by the steps of (1) filling glass inside an apex groove, and (2) forming difference in level (l) between the surface of the glass layer and said second gap forming surface inside said apex groove by partially removing said filled glass;

selectively forming a first thin film including a ferromagnetic metal thin film on said first gap forming surface;

selectively forming a second thin film including a ferromagnetic metal thin film on said second gap forming surface so that a portion except a surface of said glass layer in said second gap forming surface is at least exposed;

forming a second groove on said exposed said second gap forming surface adjacent said first groove; and

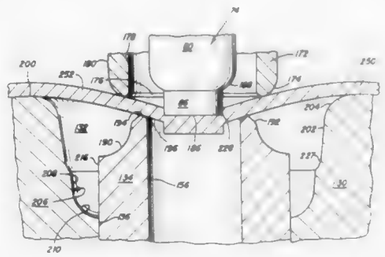
abutting and bonding with glass said first and second magnetic core half members so that said first and second gap forming surfaces face each other to define said magnetic gap by bonding said first and second thin films with nonmagnetic material interposed therebetween.

5,146,672

DIE ASSEMBLY FOR ATTACHING A FEMALE ELEMENT

Rudolf R. M. Muller, Frankfurt am Main, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 457,060, Dec. 26, 1989, Pat. No. 5,072,518, which is a division of Ser. No. 271,123, Nov. 14, 1988, Pat. No. 4,893,394, which is a division of Ser. No. 111,966, Oct. 21, 1987, Pat. No. 4,831,698, which is a continuation-in-part of Ser. No. 69,804, Aug. 17, 1987, Pat. No. 4,810,143, which is a division of Ser. No. 869,507, Jun. 2, 1986, Pat. No. 4,700,470, which is a division of Ser. No. 657,570, Oct. 4, 1984, Pat. No. 4,610,072, which is a continuation-in-part of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, and a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, which is a division of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Dec. 12, 1991, Ser. No. 806,172
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003908
Int. Cl.[5] B21D *39/00*
U.S. Cl. 29—798 6 Claims



1. A die assembly for attaching a female element to a plastically deformable panel, said female element including a body portion having a bore therethrough and an integral annular barrel portion generally concentric with said body portion bore having internal and external surfaces and an open free end, said die assembly including a die member having a concave bowl-shaped die cavity, a panel supporting surface on at least opposed sides of said die cavity and a bore through the center of said die cavity, a die post telescopically extending through said die member bore projecting into said die cavity having a free end and an axial bore extending through said free end, said die post having a radially outwardly extending concave arcuate die surface spaced from said free end and said die cavity having a generally concave mating surface, biasing means resiliently biasing said die post into said die cavity to extend said die post free end to adjacent the plane of said die member panel supporting surface to receive a slug pierced from said panel in said die post bore, and stop means limiting movement of said die post into said die cavity against the force of said biasing means substantially aligning said die post radial arcuate die surface and said mating die cavity surface, said die post free end telescopically receivable in said barrel portion internal surface at said free end and said die post radial die surface and said mating die member surface cooperating to radially outwardly deform said barrel portion free end into locking engagement with a panel formed in said die cavity.

5,146,673

MULTIPLE BLADE SET STRIP PROCESS FOR CABLE AND WIRE

Jack L. Hoffa, Brea, Calif., assignor to Eubanks Engineering Company, Monrovia, Calif.

Filed Nov. 9, 1990, Ser. No. 611,057
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—828 28 Claims

1. In the method of processing wire to cut the wire into

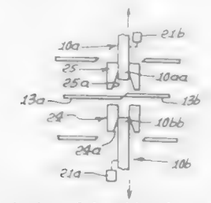
sections and to strip sheathing from the wire to expose wire ends at opposite ends of the sections, and by operation of wire feed means and cutter means, the steps that include operating the feed means and cutter means to:

a) displace the wire endwise along an axis to a first position,

b) sever the wire thereby to form wire forward and rearward sections, the forward section having a rearward end portion, and the rearward section having a forward end portion, and

c) strip sheathing from the forward section rearward portion and from the rearward section forward portion thereby to expose wire ends at said portions,

d) said cutter means including three blade pairs, each pair including two blades located at opposite sides of said axis, both blades of one pair being displaced toward the wire to sever the wire, and including the step of displacing both blades of the remaining two pairs toward the wire sections



to facilitate stripping of sheathing from said rearward and forward portions during controlled endwise displacement of said sections,

e) said displacing of the blades of the remaining two blade pairs toward the wire sections being carried out to control penetration of the blades into the sheathing to selected depth,

f) displacing at least one of said sections relatively endwise along an axis extending in the direction of said wire, and guiding said endwise displacement of said one section at a location between two of said pairs of blades,

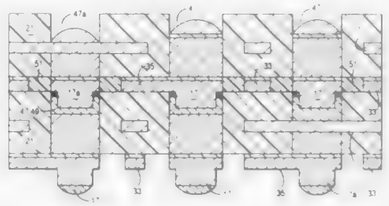
g) said guiding carried out by providing guide means at said location, and including the step of moving one part of said guide means away from said axis, as well as relatively about said axis while moving away from the side of the wire, and also relative to said two pairs of blades, to allow removal of a severed length of said sheathing.

5,146,674

MANUFACTURING PROCESS OF A HIGH DENSITY SUBSTRATE DESIGN

Richard F. Frankeny; Karl Hermann, both of Austin; Ronald L. Imken, Round Rock, and Joseph LaTorre, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 1, 1991, Ser. No. 724,245
Int. Cl.[5] H05K *3/36*
U.S. Cl. 29—830 17 Claims



1. A method of producing a high density one signal layer, one reference plane substrate for use in an electronic component, said method comprising the steps of:

coating a first side of an etched metal foil layer with a first dielectric layer and forming a plurality of via holes in said metal foil layer;

placing electrically conductive material within said via holes to form a plurality of studs;

placing a signal layer on a surface of said first dielectric layer opposite said metal foil;

forming projections by extending said studs outwardly past said signal layer in a direction away from said foil layer; and

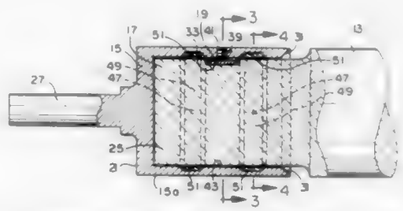
applying a second dielectric layer to a side of said foil opposite said first dielectric layer, and forming a plurality of cavities therein aligned with said studs.

5,146,675

CYLINDRICAL ROLLER FOR A GLASS TEMPERING OVEN HAVING IMPROVED ENDS CAPS

George Ford, Fort Washington; Richard G. Ford, Ambler, and Thomas J. Ford, Oreland, all of Pa., assignors to George Ford & Sons, Inc., Philadelphia, Pa.

Filed Jun. 7, 1991, Ser. No. 711,808
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—123 7 Claims



5. A cylindrical roller apparatus for a glass tempering oven comprising

a ceramic roller having a first end portion and a second end portion,

a flat formed on the first end portion of the roller,

an end cap having a cylindrical wall mounted on the first end portion of the roller, and

securing and aligning means for securing the end cap on the first end portion of the roller and for aligning the end cap properly on the roller,

said securing and aligning means including

a metal retaining plate positioned on the flat, and

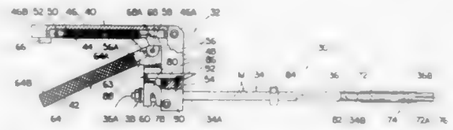
a screw threaded through the end cap wall that screws into contact with the retaining plate for securing the end cap to the roller and for pushing the roller flush against the inner surface of the end cap wall.

5,146,676

HAND-ACTUATED SPRING CLIP INSERTION TOOL

Gary W. Cuba, Hopkins, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1991, Ser. No. 785,593
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—229 17 Claims



1. A hand-actuated insertion tool, comprising:

(a) a handle assembly including a first handle member, a second handle member pivotally mounted to the first handle member for movement between unactuated and

actuated positions and biasing means mounted between said first and second handle members for biasing said second handle member toward said unactuated position relative to said first handle member;

(b) means for releasably locking said second handle member in a fixed relation to said first handle member when said second handle member is disposed at said unactuated position relative to said first handle member;

(c) means attached in a fixed relation to said first handle member and extending therefrom for defining a linear guide channel;

(d) means extending along said linear guide channel for positioning an object adjacent to an end of said linear guide channel, said positioning means being slidably movable relative to said linear guide channel between home and retracted positions; and

(e) means for movably coupling said positioning means to said second handle member such that said positioning means will undergo sliding movement from the home position to the retracted position as said second handle member is moved from the unactuated position to the actuated position relative to said first handle member;

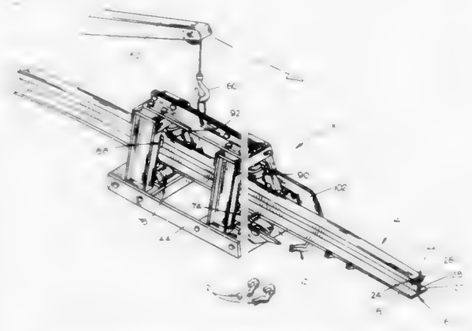
(f) said guide channel defining means being disposed relative to said positioning means for causing release of the object from said positioning means adjacent to said end of said linear guide channel upon movement of said positioning means from said home position to said retracted position.

5,146,677

RAIL ANCHOR REMOVER

Curtis W. Holman, 21426 Shamrock La., and Bobby A. Moser, 1419 S. 217th St., both of Elkhorn, Nebr. 68022

Filed Mar. 6, 1991, Ser. No. 665,267
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—243.5 16 Claims



1. A rail anchor remover for removing rail anchors mounted on a rail, the rail including a base and a head, the anchors being mounted on the base of the rail comprising,

a substantially horizontally disposed lower frame having a forward end, a rearward end, and opposite sides,

at least one rail supporting roller means rotatably mounted, about a horizontal axis, on said lower frame adjacent the forward end thereof,

at least one rail supporting roller means rotatably mounted, about a horizontal axis, on said lower frame adjacent the rearward end thereof,

a first side frame mounted at one side of said lower frame and extending upwardly therefrom, said first side frame having rearward and forward ends,

at least one rail engaging roller means rotatably mounted on said first side frame for engaging one side of the rail,

a second side frame mounted at the other side of said lower frame and extending upwardly therefrom, said second side frame having rearward and forward ends,

means operatively connecting the upper ends of said side frames,

at least one rail engaging roller means rotatably mounted on said second side frame for engaging the other side of the rail,

and a rail anchor engaging means mounted on said lower frame adjacent the forward end thereof for engaging one end of the rail anchor and to exert downward force thereon to release the rail anchor from the rail as the rail anchor remover is moved longitudinally with respect to the rail.

5,146,678

PROCESS FOR ELECTRICALLY CONNECTING AN END OF A POWER CABLE TO A CABLE SPLICE

Wayne W. Lien, Waukesha, Wis., assignor to Cooper Power Systems, Inc., Houston, Tex.

Division of Ser. No. 383,934, Jul. 21, 1989, Pat. No. 5,041,027. This application Jul. 1, 1991, Ser. No. 723,844
Int. Cl.[5] H02G *15/08;* B23P *19/04*
U.S. Cl. 29—857 4 Claims

1. A process for electrically connecting an end of a power cable to the female contact assembly of a cable splice, said process comprising the steps of:

electrically connecting a probe to the end of the power cable; and

inserting said probe into the female contact assembly of the cable splice, said step of inserting said probe into the female contact assembly of the cable splice comprising providing a mechanism for pulling said probe toward the splice, attaching said mechanism to the cable end and to the cable splice with said probe in position for engagement with the female contact assembly, and causing said mechanism to pull said probe towards the splice so that said probe is inserted into the female contact assembly.

5,146,679

METHOD OF CONVERTING GROUPED BLADING TO EQUIVALENT INTEGRAL COVERED BLADED

Ralph J. Ortolano, 3776 Coolheights Dr., Rancho Palos Verdes, Calif. 90274

Filed Jan. 16, 1991, Ser. No. 642,014
Int. Cl.[5] B21K *3/04;* B23P *15/04, 19/04*
U.S. Cl. 29—889.7 15 Claims

1. A method of constructing equivalent integral covered blading for a turbine having multiple blades supported by a rotor comprising:

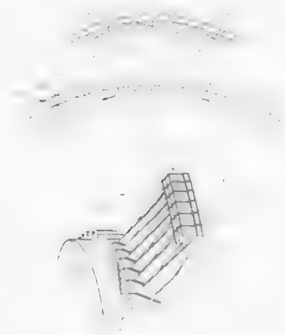
(a) cutting an arc cover spanning tips of multiple adjacent blades while supported by the rotor, the cut being between tip locations of said adjacent blades to form cover portions for each of said adjacent blade, thereby forming a space between the cover portions associated with respective adjacent blades, and thereby forming facing sides for adjacent cover portions of said adjacent blades;

(b) removing separately each of said blades together with the cover portion associated with each of said blades from the rotor;

(c) positioning said blades adjacent to each other and applying a material buildup on at least one facing side of the cover portions of said adjacent blades;

(d) machining the material buildup thereby developing de-

velop an interface between adjacent cover portions for each of said adjacent blade; and



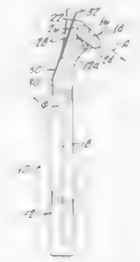
(e) replacing the blades in the rotor thereby forming equivalent integral covered blading.

5,146,680

SHAVING APPARATUS AND METHOD

Youssef G. Bakhos, 9171 Aubrey Cir., Villa Park, Calif. 92667

Continuation-in-part of Ser. No. 07/236,375, Mar. 21, 1989, abandoned. This application Jul. 25, 1990, Ser. No. 561,231
Int. Cl.[5] B26B *21/40*
U.S. Cl. 30—90 8 Claims



1. Shaving apparatus for shaving hair from human skin and for alerting the user to the continued presence of significant hair stubble on the skin comprising, in combination:

(a) a safety razor having a structural frame including a razor head and an elongate handle extending therefrom;

(b) means mounted on said structural frame for scraping hair stubble on human skin and receiving induced vibrations therefrom as the razor head is passed along the skin; and,

(c) means responsive to said induced vibrations in the scraping means, for audibly amplifying said vibrations to alert the user to the continued presence of hair stubble.

5,146,681

ELONGATE VEGETABLE SKIN CLEANER APPARATUS

Cyrus Haghkar, 610 Middleton Pl., Norristown, Pa. 19403

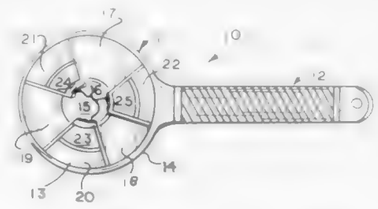
Filed Apr. 16, 1990, Ser. No. 510,194
Int. Cl.[5] A23N *7/00;* A47J *17/00*
U.S. Cl. 30—123.5 7 Claims

1. An elongate vegetable skin cleaner apparatus comprising, on combination,

a cleaning head, the cleaning head including a longitudinally aligned cylindrical body, the cylindrical body including an annular entrance opening, and

cutting means mounted within the cylindrical body coaxially aligned therewith for receiving elongate vegetables therethrough, and

the cutting means includes a first, second, and third conical resilient web segment, each first, second, and third conical resilient web segment includes an annular upper end spaced above and fixedly mounted interiorly of the cylindrical body and fixedly secured to the annular entrance opening, and each first, second, and third conical resilient web segment includes an annular lower end, wherein each annular lower end of each of the first, second, and third



resilient web segment defines a conical segment, wherein each conical segment is annularly displaced relative to one another to define an exit opening, and a fourth, fifth, and sixth conical resilient web segment each including an upper annular end mounted to the annular entrance opening, wherein the fourth, fifth, and sixth conical resilient web segments are spaced apart relative to one another sixty degrees of arc, and wherein the first, second, and third conical resilient web segments are spaced apart by sixty degrees of an arc

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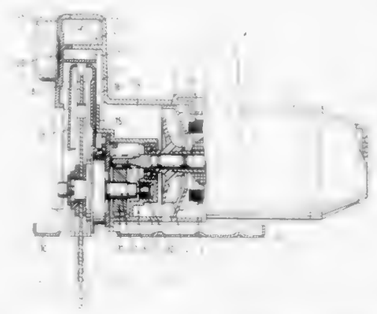
5,146,682

HAND-HELD CIRCULAR SAW

Hans Blöchle; Rainer Schilling, both of Stuttgart; Martin Kummer, Filderstadt; Eduard Gansel, Dettenhausen; Heribert Schramm, Stuttgart; Helmut Eblen, Stuttgart, and Joachim Müller, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00742, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO90/06832, PCT Pub. Date Jun. 28, 1990
PCT Filed Nov. 29, 1989, Ser. No. 687,920
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843236
Int. Cl.[5] B23D *47/00*
U.S. Cl. 30—124 15 Claims



1. A hand-held circular saw, comprising a housing; a saw blade; a motor arranged to drive said saw blade; a fan wheel driven by said motor; a protective housing having a gearing housing portion, said protective housing having an inlet and an outlet opening for removal of the sawdust, and also a third

opening for supplying fan air produced by said fan wheel; and means forming a duct which is connected with said opening for supplying the fan air, said duct extending in said gearing housing portion and being connected with an exhaust side of said fan wheel

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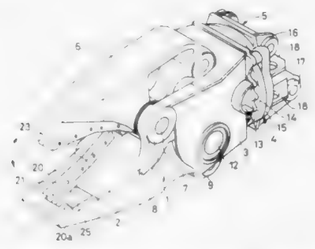
5,146,683

REINFORCEMENT CUTTER

Sumio Morikawa, Sakai, and Nobuyuki Zakoji, Toyonaka, both of Japan, assignors to Oyodokomatsu Company, Limited, Osaka, Japan

Filed Aug. 27, 1991, Ser. No. 750,682
Claims priority, application Japan, May 20, 1991, 3-45672[U]
Int. Cl.[5] B23P *19/00*; E02F *3/28*
U.S. Cl. 30—134 **2 Claims**



1. A scissor-action reinforcement cutter comprising;
a lower jaw having a cutting section with an opposed inner lateral surface and a supporting section with a pivot disposed therebetween;
a supporting bracket disposed proximate said supporting end of said lower jaw and means disposed between said lower jaw and said supporting bracket for allowing said lower jaw to rotate relative to said supporting bracket;
an upper jaw having a cutting section with an opposed inner lateral surface and an operating section, said upper jaw being mounted intermediate said cutting and operating sections on said pivot of said lower jaw;
a hydraulic cylinder having a first end pivoted on said lower jaw and a second end mounted to said operating end of said upper jaw; and
first and second shearing cutter means dismountably secured to each of said opposed inner lateral surfaces on said cutting sections of said upper and lower jaws in a bent formation in the longitudinal direction of the jaw, said lower jaw being provided with a through-opening in a forward part of said cutting section to accept a forward end portion of said cutting section of said upper jaw in such a manner that said first shearing cutter means of said upper and lower jaws intersects each other to grip a workpiece to be cut, said lower jaw being provided at said cutting section with a land series configured generally in the shape of the capital letter L around said through-opening, said shearing cutter means being disposed along a long lateral side of said land series, clearance being provided between a short side of said land series which is opposite to the side of the lower jaw on which the corresponding shearing cutter means is disposed and the side of said upper jaw which is opposite to the side on which the corresponding shearing cutter means is disposed

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5,146,684

MOLDED KNIFE SHEATH

James E. Hagler, La Mesa, Calif., assignor to Buck Knives, Inc., El Cajon, Calif.

Filed Jul. 29, 1991, Ser. No. 737,188
Int. Cl.[5] B26B *29/02*
U.S. Cl. 30—162 **15 Claims**

1. A one piece molded sheath for a fixed blade knife having a blade and a handle extending from the blade and including a forefinger groove separated from the blade by a handle ridge, said molded sheath comprising:
a sheath body defining a blade-contoured sheath pocket having an open upper end for receiving the blade and the handle ridge of said fixed blade knife, said sheath body having an elongated back wall, a shorter front wall, and a pair of side walls interconnecting said front wall to said back wall;
slots in an upper end portion of the side walls of said sheath

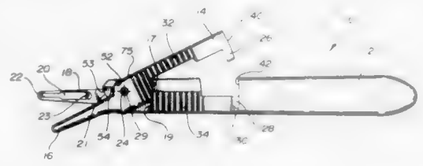
body, said slots permitting forward and rearward flexing of an upper portion of said front wall with respect to said back wall by the handle ridge of said knife during insertion of the blade and handle ridge thereof into said pocket and withdrawal thereof from said pocket; and
an opening in the upper portion of the front wall of said sheath body for receiving the handle ridge of said knife upon insertion of said knife blade into said pocket and for maintaining said knife within said sheath against accidental dislodgement.

5,146,685

MULTI-DIMENSIONAL SURGICAL BLADE HOLDER AND BLADE COMBINATION

Thomas H. Doucette, West Milford, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 612,356, Nov. 13, 1990, Pat. No. 5,060,387. This application Jan. 24, 1991, Ser. No. 645,387
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.
Int. Cl.[5] B26B *1/00*
U.S. Cl. 30—330 **12 Claims**



1. A blade holder, comprising
(a) an elongated flat fixed body portion;
(b) a blade receiving area at a first end of said elongated fixed body portion for receiving the tang of a blade;
(c) said blade receiving area being an elongated integral boss;

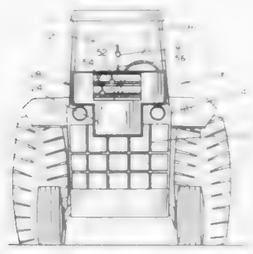
(d) said elongated integral boss having a cleat positioned proximal the said first end of said fixed body portion and an abutment positioned distal the said first end of said fixed body portion;
(e) a handle gripping area at a second end of said fixed body portion opposite said blade receiving area;
(f) a pivot pin on said flat fixed body portion intermediate said fist and second ends and adjacent said blade receiving area;
(g) the axis of said pivot pin being perpendicular to said flat fixed body portion;
(h) an elongated flat rotatable body portion;
(e) said rotatable body portion rotatable around said pivot pin from an open position for receiving a blade in said blade receiving area to a closed position wherein the cooperating opposed surfaces of said fixed body portion and said rotatable body portion lock a blade tang in said blade receiving area; and
(j) cooperating locking means on said flat fixed body portion and said rotatable body portion for locking the tang of a blade in aid blade receiving area.

5,146,686

VARIABLE CENTERLINE SIGHT

Sam J. Brown, R.R. 3, Box 38, Cozad, Nebr. 69130

Filed Sep. 26, 1991, Ser. No. 766,014
Int. Cl.[5] G01C *5/02*
U.S. Cl. 33—264 **4 Claims**



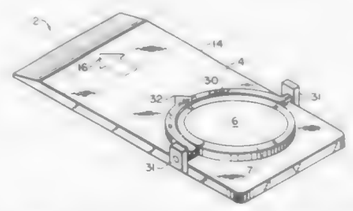
1. In combination:
a tractor having forward and rearward ends, an operator's seat, a longitudinal axis, and a first reference sight mounted forwardly of the operator's seat to sight along a furrow;
an apparatus for centering said tractor along a predetermined course, comprising:
a housing mounted on the forward end of said tractor;
a second reference sight mounted on said housing for reference alignment with respect to the first reference sight;
a sight arm operably mounted to said housing for transverse movement with respect to the longitudinal axis of the tractor;
motor means in said housing operably connected to said sight arm for selectively moving said sight arm in one transverse direction or the other;
means for sensing lateral cant of said tractor with respect to its longitudinal axis, operably connected to said motor means to operate the motor upon sensing a lateral cant in a first direction and to reverse the motor upon sensing a lateral cant in the opposite direction;
said sensing means operably connected to said motor means to move said sight arm a distance proportional to the amount of lateral cant sensed.

5,146,687

COMPASS

Bjorn Kjellstrom, Honey Hollow Rd., R.R. 2 Box 209, Pound Ridge, N.Y. 10576

Filed Feb. 25, 1991, Ser. No. 660,374
Int. Cl.[5] G01C *17/04*
U.S. Cl. 33—355 R **20 Claims**



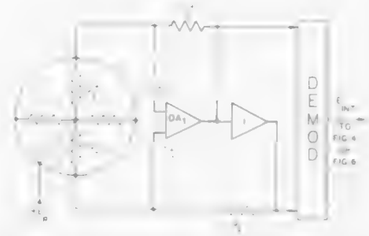
1. A compass of the type including a compass housing, a freely movable magnetic needle pointing to magnetic North enclosed within said compass housing, said compass housing having direction orienting indicia thereon, said improvement comprising:
directional indicating means pivotably mounted relative to said compass housing and movable between a first position in which said means is oriented to indicated a forward direction of travel selectively established by said direction orienting indicia on said housing and a second position in which said means is oriented to indicate a reverse direction of travel selectively established by said direction orienting indicia on said housing.

5,146,688

LOW POWER TILTMETER ELECTRONICS WITH COMPENSATION FOR BUBBLE LEVEL FLUID TEMPERATURE

Paul H. Ito, Los Angeles, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

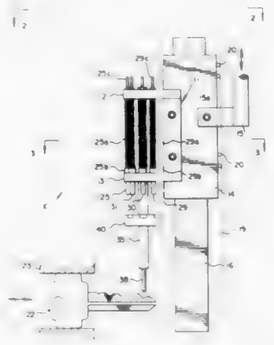
Filed Jan. 28, 1991, Ser. No. 646,310
Int. Cl.[5] G01C *9/20*
U.S. Cl. 33—366 **8 Claims**



1. In a bubble level based tiltmeter comprising a first tilt conductance which produces a first current and a second tilt conductance which produces a second current, a method for at least partially compensating for bubble level fluid temperature, the method comprising:
(a) inputting the first current to a first terminal of a difference amplifier and inputting the second current to a second terminal of the difference amplifier, the difference amplifier producing a conductivity compensated voltage;
(b) feeding back the conductivity compensated voltage through a first feedback conductance to the first terminal of the difference amplifier;
(c) inverting the conductivity compensated voltage to produce an inverted voltage; and
(d) feeding back the inverted voltage through a second feedback conductance, substantially equal in magnitude to

the first feedback conductance, to the second terminal of the difference amplifier.

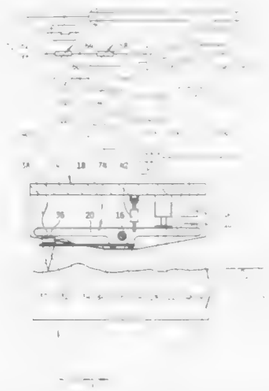
5,146,689
KEY READING METHOD AND APPARATUS
Max G. Roland, San Clemente, Calif., assignor to Maromatic Company, Inc., Mountain View, Calif.
Filed Jan. 29, 1992, Ser. No. 827,766
Int. Cl.[5] G01B *11/24*; G01D *5/32*
U.S. Cl. 33—539 19 Claims



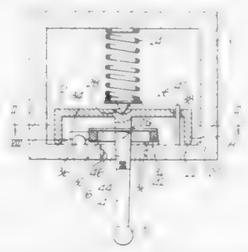
1. An apparatus for reading the depth of notches on a key, comprising:
a reading pin mounted on a frame for movement along a path towards and away from a notch of a key, the depth of which is to be read,
a plurality of contact pins mounted on the frame substantially parallel to the reading pin for movement parallel to said path, with and relative to the reading pin after the reading pin has reached a reference position relative to the notch being read, there being a separate contact pin for each different depth which is capable of being sensed at that notch, and
a reader body fixed to the reading pin for movement therewith, said reader body having sensing means which cooperates with the contact pins for determining the depth of the notch being read as a function of the movement of the contact pins relative to the reading pin.

5,146,690
SCANNING HEAD
Ulrich O. Breitmeier, Ettlingen, Fed. Rep. of Germany, assignor to Focus Messtechnik GmbH & Co KG, Ettlingen, Fed. Rep. of Germany
Filed Apr. 19, 1991, Ser. No. 687,571
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1990, 4013742
Int. Cl.[5] G01B *7/28*
U.S. Cl. 33—551 12 Claims

1. A scanning head for a machine for measuring the microsurface contouor of work-piece which includes a housing (14), a rigid probe tip support (18) mounted (16) to move on the housing (14) and which supports a fine probe tip (30) means (42 to 46) for the resilient biasing of the probe tip (30) against the work-piece surface (10) and a position indicator (50) cooperating with the probe tip support 18), characterized in that a force sensor (34; 50, 86, 88) is provided which measures the force acting on the probe tip (30) and included in the biasing means is a controllable servo motor (44, 46) acting on the probe tip support (18), the output force of which is adjusted (56 to 60) to a constant output signal of the force sensor (34; 50, 86, 88), the probe tip (30) on the probe tip support (18) being shiftable perpendicularly to the reference surface (82) and being supported by way of the force sensor (34) on the probe tip support (18).



5,146,691
TOUCH PROBE
David R. McMurtry, Gloucestershire, United Kingdom, assignor to Renishaw plc, Gloucestershire, England
Filed Feb. 25, 1991, Ser. No. 660,048
Claims priority, application United Kingdom, Feb. 23, 1990, 9004117
Int. Cl.[5] G01B *5/20*
U.S. Cl. 33—559 13 Claims



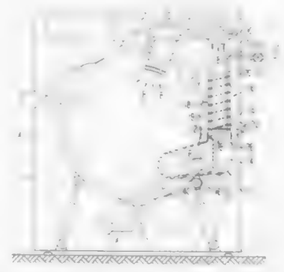
1. A touch probe for position determining apparatus, said touch probe having an axis and comprising:
a fixed member;
a first movable member for carrying a workpiece-contacting stylus;
first support means comprising at least one pair of first mutually engageable elements; and second support means, independent from the first support means and comprising at least one pair of second mutually engageable elements; the two support means co-operating with each other when all said elements are engaged to hold the first movable member in an axially and laterally constrained rest position relative to the fixed member, the first elements providing axial constraint but substantially no lateral constraint, the second support means providing at least lateral constraint;
first and second bias means for biasing all said elements into engagement; both said pairs of elements being disengageable against the action of the bias means to permit displacement, in the same direction, of the first movable member relative to the fixed member out of said rest position when said stylus contacts a workpiece;
said pair of first elements being biased into engagement with a lower force than said pair of second elements, whereby upon displacement of the first movable member said pair of first elements disengages, against said lower bias force, and then subsequently said pair of second elements disengages; and
means for providing a signal when said stylus contacts a workpiece.

5,146,692
ON-LINE MOISTURE CONTROL METHOD FOR POWDERED OR GRANULAR MATERIALS AND A SYSTEM FOR PERFORMING THE METHOD
Hiroshi Ogiri, Kanagawa; Kazue Murata, Nara, and Sadaaki Tanaka, Osaka, all of Japan, assignors to Kabushiki Kaisha Matsui Seisakusho, Osaka, Japan
Filed Jul. 26, 1990, Ser. No. 557,865
Claims priority, application Japan, Aug. 1, 1989, 1-201049
Int. Cl.[5] F26B *7/00*
U.S. Cl. 34—12 6 Claims

1. An on-line moisture control method for powdered materials, comprising the steps of:
sampling a fixed amount of powdered materials by material sampling means;
transporting said materials from said material sampling means to a heat treatment chamber via a transport pipe;
heating said sampled materials in said heat treatment chamber having an airtight heating means;
titrating and analyzing moisture evaporated from said heated materials in a moisture measuring unit led from the upper part of said heat treatment chamber via a branch pipe;
discharging said heated materials from said heat treatment chamber into a weight measuring unit;
weighing said fed materials in said weight measuring unit; and
calculating the moisture content of the sampled fixed amount of materials in an operation unit which receives a measured weight value of the materials from said weight measuring unit and a titrated and analyzed value from said moisture measuring unit.

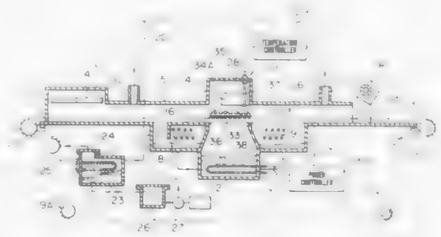
5,146,693
STEAM CONDENSATION DEVICE IN A DRYER OR COMBINATION WASHER/DRYER
Giambattista Dottor, and Silvano Cimetta, both of Treviso, Italy, assignors to Industrie Zanussi S.p.A., Pordenone, Italy
Filed Nov. 26, 1990, Ser. No. 617,888
Claims priority, application Italy, Dec. 1, 1989, 34090 B/89
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—77 15 Claims

5. Condenser structure for use in an appliance in which a drying operation is carried out, said structure comprising:
a tubular casing;
a least one condenser conduit extending and supported within said casing so that an annular space is defined between internal and external surfaces of said casing and said at least one condenser conduit, respectively; and
a spiral wall disposed between the respective internal and external surfaces of said at least one condenser conduit



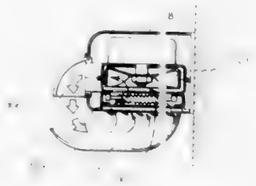
and said casing so as to define a spiral conveying path alongside the external surface of said at least one conduit, and a spiral wall having a bottom portion extending in a loop around said at least one condenser conduit, and defining a plurality of openings through said bottom portion.

5,146,694
VAPOR REFLOW TYPE SOLDERING APPARATUS
Haruo Mishina, Ushiku, and Shinya Yamama, Abiko, both of Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan
Filed Oct. 2, 1990, Ser. No. 591,884
Claims priority, application Japan, Oct. 3, 1989, 1-257036
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—78 4 Claims



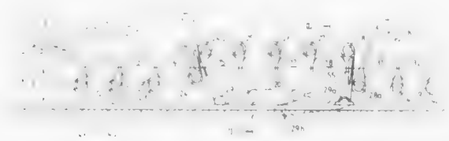
1. A vapor reflow type soldering apparatus comprising:
a vapor generating tank means for heating a thermal medium to generate a vapor thereof;
a conveyor means for delivering an article to be processed while passing through said vapor generating tank means;
a lower vapor supply hole means for introducing the thermal medium vapor generated in said vapor generating tank means to a lower surface of the article; and
an upper vapor supply hole means for introducing the thermal medium vapor to an upper surface of the article
at a position displaced in a direction of delivery of said conveyor means with respect to said lower vapor supply hole means for raising a temperature of the upper surface of the article more moderately than a temperature of a lower surface of the article.

5,146,695
HAND OR HAIR DRYER
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan
Filed Nov. 21, 1990, Ser. No. 616,434
Int. Cl.[5] F26B *9/00*
U.S. Cl. 34—90 4 Claims



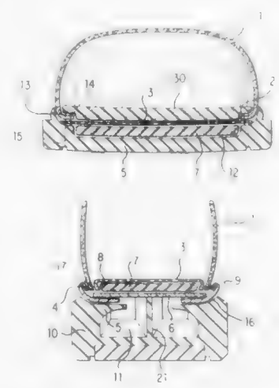
1. A hand or hair dryer having an air inlet, an air outlet, means for drawing air in through the air inlet and expelling said air from the air outlet and means for heating the air that is drawn in through the air inlet, the device comprising the air inlet including a cowl, the cowl having a mouth being located in the path of the air expelled from the air outlet, such that at least a portion of the hot air expelled from the air outlet is received in the mouth of the cowl, the cowl further formed so that hot air received in the mouth of the cowl is directed to the air inlet, whereby in use, at least some of the hot air expelled from the air outlet is subsequently drawn in through the air inlet, the mouth of the cowl being substantially larger than the air outlet, such that a substantial portion of the hot air expelled from the air outlet is received in the mouth of the cowl, further comprising a cabinet having the air outlet mounted on the exterior of one wall portion and having at least one inlet aperture formed in an adjacent wall portion of the cabinet, the dryer further comprising said air inlet includes the cowl being mounted on the exterior of said adjacent wall portion, so as to cover said at least one inlet aperture the cowl having an external opening which faces the mouth of the air outlet, wherein the wall portions are transverse to each other and the mouth of the cowl extends beyond the common boundary region of said wall portions.

5,146,696
DRYING CYLINDER AXIS ARRANGEMENT FOR DRYING SECTION
Wolfgang Mayer, and Hans-Jurgen Wulz, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany
Filed Mar. 4, 1991, Ser. No. 664,545
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1990, 4037423
Int. Cl.[5] F26B *3/24*
U.S. Cl. 34—117 27 Claims



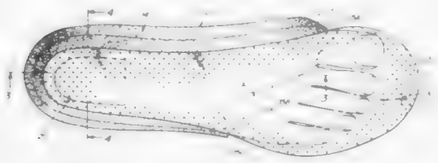
24. A drying section for a machine for fabricating a fiber web, the drying section comprising:
a first plurality of heatable drying cylinders arranged in a first row and forming a first drying group; the first drying cylinders having respective first cylinder axes of rotation; the first cylinders having top sides;
a second plurality of heatable drying cylinders arranged in a second row and forming a second drying group which is adjacent the first drying group; the second drying cylinders having respective second cylinder axes of rotation; the second drying cylinders having bottom sides;
a first upper endless web support belt, means for guiding the first belt over the top sides of each of the first drying cylinders for holding the web between the first belt and the top sides of the first drying cylinders;
a second lower endless web support belt, means for guiding the second belt under the bottom sides of each of the second drying cylinders for holding the web between the second belt and the bottom sides of the second drying cylinders;
means for transmitting the web from the respective web support belt at the end of the drying group that is preceding along the path of web travel to the respective web support belt at the start of the next drying group that follows along the path of web travel;
longitudinal beam means extending in the lengthwise direction of the machine past the first and second drying groups, the drying cylinders being supported on the beam means;
the second drying cylinder axes being at least at the same height above the longitudinal beams as the first drying cylinder axes.

5,146,697
FLEXIBLE SHOE
Howard K. Weiss, 630 First Ave., New York, N.Y. 10016
Filed Jan. 14, 1991, Ser. No. 640,958
Int. Cl.[5] A43B *13/28, 3/14, 13/18, 9/02*
U.S. Cl. 36—12 25 Claims



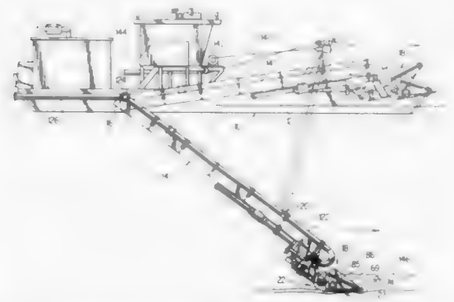
1. A slip-lasted flexible shoe comprising:
a. a sock horizontally extended along the length of the shoe;
b. an upper with a last allowance in the forepart of the shoe;
c. a sole extending the length of the shoe and having a foam filled cavity in the forepart, said sole being stitched in the forepart to said upper at the position of said last allowance with said sock interposed and held by said stitching between said upper and said sole;
d. a shank design in the bottom of said sole, extending from the metatarsal region to a mid-portion of the heel for providing support without torsional rigidity;
e. an insole board substantially covering the heel area of said sole and further having a forward part which tapers in width, becoming narrower as the taper proceeds away from the width of said heel section, said insole board allowing for flexibility in the forepart of the shoe; and
f. a wrap in the heel portion of the shoe which is fastened to said sock, said upper, and said insole board with said upper and insole board interposed between said wrap and said sock, said wrap having a lasting allowance affixed to said heel portion of said sole.

5,146,698
SHOE INSOLE PROFORM II
Harvey G. Tilles, P.O. Box 5466, 614 N. Hamilton, High Point, Guilford, N.C. 27262, and Michel Marc, 48 Ridge Hilll Farm Rd., Wellesley, Mass. 02181
Continuation of Ser. No. 348,896, May 8, 1989, abandoned. This application Nov. 8, 1991, Ser. No. 789,614
Int. Cl.[5] A43B *13/40, 13/38*
U.S. Cl. 36—44 31 Claims



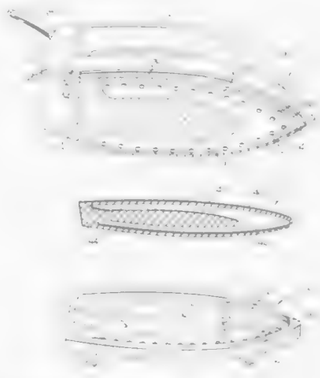
1. A shoe insole comprising:
a resilient base piece adapted to conform to the foot and having a base surface, a top surface and a cupped periphery for accommodating the heel and extending to the arch area,
a heel piece disposed in a cut out opening in the base piece under the heel for absorption of shock,
and a top cushioning layer having a portion thereof affixed to and overlying the resilient base piece and heel piece and having a top surface adapted to receive the foot,
said top cushioning layer extending over the base piece from the heel area thereof and forwardly beyond a front edge of the base piece to underlie the toe area,
said resilient base piece front edge including at least first and second segments thereof;
said first segment extending along the large toe joint from the inside of the foot to the foot ball area;
said second segment contiguous from said first segment and extending rearwardly from the foot ball area such that the large toe joint is substantially the only toe joint along which the resilient base piece front edge extends.

5,146,699
AUGER DREDGE SPECIALLY ADAPTED TO REMOVAL OF TOXIC SEDIMENT
Keith W. Lipford, Pasadena, Md., assignor to Ellicott Machine Corporation, Baltimore, Md.
Filed Dec. 5, 1991, Ser. No. 802,548
Int. Cl.[5] E02F *3/92*
U.S. Cl. 37—57 13 Claims



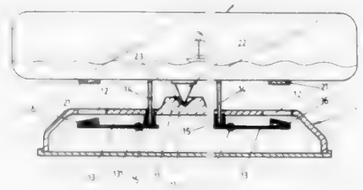
1. In dredging apparatus of the type including auger means rotatably enclosed in a shroud having transversely spaced end walls, a substantially closed rear wall, and an open front face, said auger means being constructed and arranged to deliver dredged material to a central region of said shroud, and transfer means communicating with said central region to convey material delivered thereto by said auger means to a location remote from said apparatus, in combination therewith a wedge shaped digger frame having laterally spaced side walls, an open rear face of substantially the same size as the open front face of said shroud, and upper and lower forwardly converging faces terminating at their forward ends in a laterally extending cutting edge, at least the upper face of said frame being open, a screen over said open face constructed to permit dredged particles to enter said frame, vibration damping means connecting said frame to said shroud with their respective open faces in substantial registry, and means carried by said frame for vibrating it during use relative to said shroud.

5,146,700
STEAM IRON WITH BONDED CERAMIC AND ALUMINUM COMPONENTS
Albert C. Prosser, Norman, Okla., assignor to Coors Technical Ceramics Company, Norman, Okla.
Filed Oct. 31, 1991, Ser. No. 786,081
Int. Cl.[5] D06F *75/20, 75/38*
U.S. Cl. 38—77.9 24 Claims



1. An electrical steam iron having:
a housing means for housing components of the iron including an electrical heating element, a steam generating chamber, temperature controls, a handle, and comprising
a connecting shoe portion made of aluminum material mounted on the bottom of said housing means and having a plurality of upper steam transfer passages extending therethrough;
a sole plate member made of ceramic material mounted on the bottom of said connecting shoe portion and having a lowermost flat ceramic ironing surface and a plurality of lower steam outlet passages aligned and in fluid communication with said upper steam transfer passages for applying steam to an article being ironed; and
resilient sealing and connecting means mounted between said connecting shoe portion and said sole plate member and being bonded to and between aluminum surface portions of said connecting shoe portion and ceramic surface portions of said sole plate member and being located in spaced surrounding sealing relationship to said steam passages for permanently fixedly connecting said sole plate member to said connecting shoe portion in heat transfer relationship therewith and providing a peripheral seal between said connecting shoe portion and said sole plate member preventing lateral outward passage of steam therebetween while permitting downward passage of steam from the upper steam passages in said shoe portion to the lower steam passages in said sole plate member and downwardly through said lowermost flat ceramic ironing surface.

5,146,701
LIQUID SWING DECORATION
Vincent K. W. Lee, No. 44, Lane 454, Sheh Chung Street, Taipei, Taiwan, Taiwan
Filed Dec. 29, 1989, Ser. No. 458,943
Int. Cl.[5] H01F *1/00*
U.S. Cl. 40—406 4 Claims

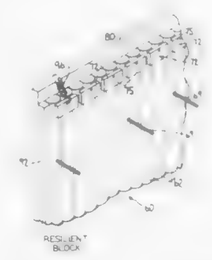


1. A liquid swing decoration comprising:
a partially liquid filled transparent bar;
a base stand;
pivot means positioned between said bar and said base stand and located centrally of said bar;
first and second magnets located on said bar and positioned on opposite sides of said pivot means; and
first and second magnets located in said base stand and positioned on opposite sides of said pivot means and in vertical alignment with said magnets on said bar, wherein each magnet on said bar is oriented to exhibit the same polarity as the corresponding facing magnet on said base;
whereby as said bar swings in relation to said base, opposed magnetic action tends to return said bar to a horizontal position.

5,146,702
DISPLAY HAVING AN ELECTRIC MOTOR FOR SIMULATING A FLYING OBJECT
Paul Belokin, Jr., Denton, Tex., assignor to Martin Paul, Inc., Denton, Tex.
Filed Jan. 3, 1992, Ser. No. 816,731
Int. Cl.[5] G09F *19/00*
U.S. Cl. 40—430 5 Claims

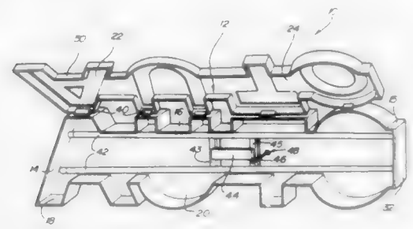
1. A display unit simulating a flying object such as a bat, butterfly or the like, and comprising:
a support structure;
an electric motor mounted on said structure and having a rotatably driven shaft extending therefrom;
a rotatably driven member having a central, generally vertically disposed hole for being drivingly engaged on said driven shaft;
said driven member having a second hole therethrough and located adjacent the periphery of said driven member;
a thin, tempered wire of a small diameter attached and located adjacent the periphery of said driven member;
a thin, tempered wire of a small diameter attached at one end of said driven member, said flying object being attached to the other end of said wire, said one end of said wire bent to form a generally C-shaped open crank portion, said wire attached to said driven member by having said open crank portion inserted loosely in said second hole and rotatably freely in respect to said driven member and independent thereof, whereby when said driven member is rotated said wire is not bodily rotated in its entirety around said member with each rotation of the latter but is more slowly swung around, and said object assumes a flying fluttering motion due to the vibrations through said wire from said motor, and is drivingly rotated in a swinging and erratic motion around said unit but at much slower rate of rotation than said motor shaft and member.

5,146,703
LENTICULAR SIGNS WITH DISCRETE LENS ELEMENTS
Edward Boden, 218 Erica St., Philadelphia, Pa. 19116
Filed Feb. 1, 1991, Ser. No. 648,911
Int. Cl.[5] G03B *25/02*
U.S. Cl. 40—454 14 Claims



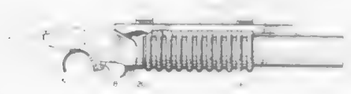
1. A sign for selective display of multiple image fields, comprising:
an image panel having at least two image fields, sub-divided into image segments, grouped said image segments from each of said at least two image fields being spaced to define an image pitch spacing extending across at least one of a length and width of the display;
a lens panel having lenses defining a lens pitch spacing, the lens pitch spacing corresponding substantially to said image pitch spacing, the lens panel comprising a plurality of discrete and relatively movable lens elements, each said lens element having at least one said lens, the lens elements being dimensioned to abut one another to position the lenses at said lens pitch spacing, the lenses and the image segments being defined by elongated strips, the lenses being fixed relative to the image panel and at least some of the lenses being movable relative to one another along abutments parallel to a line of elongation of the lenses;
means for mounting the lens elements adjacent one another over the grouped image segments of the image panel, so as to allow relative motion between abutted ones of the lens elements in at least one direction; and,
a transparent facer panel defining first opposite edges in the direction of elongation, the lens elements being mounted to the facer panel at least at one of the opposite edges.

5,146,704
ILLUMINATED SIGN
Billy G. Dugan, 5855 Brookwood Rd., Indianapolis, Ind. 46226
Filed Apr. 1, 1991, Ser. No. 678,758
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—552 9 Claims



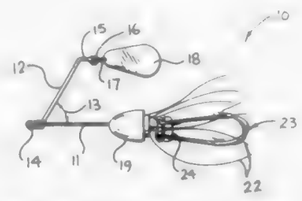
1. A sign comprising:
a sign back panel cut out into a predetermined shape and formed of a single piece, said sign back panel being opaque;
a sign front panel cut out into substantially the same shape as the back panel, said sign front panel formed of a single piece and including at least two separate characters of a word or phrase embossed on said front panel, the embossed characters defining outer perimeter contours, wherein the cut out shape of the front panel and the back panel substantially follow the contours of the at least two characters except for a middle portion wherein each contoured character cut out of the front panel has an uppermost edge, and wherein the embossed characters are translucent and the middle portion of the front panel is opaque;
a sign side panel connected to and separating the sign back panel and the sign front panel such that the combination of the sign side panel, sign back panel and sign front panel form a single sign enclosure, wherein the sign side panel includes an uppermost edge for each character corresponding to the uppermost edges of the front panel; and
closure means comprising a hinge connected between substantially each corresponding uppermost edge whereby access is provided to said enclosure.

5,146,705
TRIGGER AND SAFETY
Ronald J. Martin, Miami, Fla., assignor to R/M Equipment, Inc., Miami, Fla.
Filed Feb. 8, 1991, Ser. No. 654,211
Int. Cl.[5] F41A *17/46*
U.S. Cl. 42—70.06 12 Claims



1. In a main weapon equipped with an auxiliary weapon mounted thereon, wherein the main weapon is fired by a first trigger member and safety combination for the auxiliary weapon which comprises:
(a) a safety mechanism on the auxiliary weapon for preventing the second trigger member from rotating; and
(b) a lock member on the second trigger member which may be selectively placed in abutting engagement with the safety mechanism for preventing the safety mechanism from being accidentally released

5,146,706
WEEDLESS FISHING LURE APPARATUS
Vernon D. Hilliard, 637 Delaware Ave., Burlington, N.C. 27215
Filed Oct. 3, 1991, Ser. No. 770,439
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.13 3 Claims

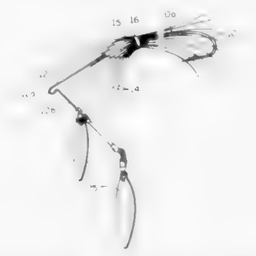


1. A weedless fishing lure apparatus, comprising.
a first rigid support rod, the first rigid support rod secured to a second rigid support rod at an eye loop junction defining an eye loop, wherein a predetermined acute angle is defined between the first rigid support rod and the second rigid support rod, and
the second rigid support rod including a second rod extension leg oriented parallel to the first rigid support rod terminating in a second rod eye, and
a spinner plate including a spinner plate forward distal end pivotally mounted to the second rod eye, and
the first rigid support rod including a support head mounted at a support head forward distal end spaced from the eye loop junction, including a support head base, and
a mounting loop fixedly secured to the support head base including a support leg, wherein the support leg is arranged orthogonally relative to the first rigid support rod, and
a hook assembly mounted to the support leg, and
a matrix of strands pivotally secured to the support head base extending in surrounding relationship to the hook assembly to effect camouflage of the hook assembly, and
the hook assembly includes a first hook member and a second hook member, the first hook member including a first shank, and the second hook member including a second shank, and the first shank including a first loop and the second shank including a second loop, the first loop and the second loop pivotally mounted to the support leg, and a flexible shape retentent polymeric hub arranged to completely encase the first loop, the second loop, and the support leg to maintain the first shank and the second shank in a first position

5,146,707
FISHING LURE AND METHOD OF MANUFACTURE
David Nichols, 8415 Lavenham, San Antonio, Tex. 78250
Filed Jun. 20, 1991, Ser. No. 718,251
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.53 8 Claims

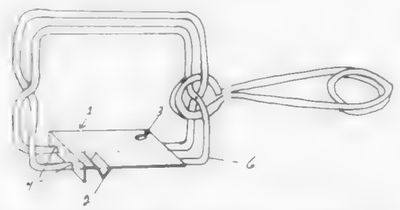
1. A light dispersing and reflecting fishing lure comprising a body securable to a fishing line;
said body having a solid, light dispersing, transparent resin coating over the entire outer surface of said body;
said transparent resin coating containing a large plurality of pieces of brightly colored, light reflecting glitter particles of a size not exceeding 0.01 mms in any direction; and

said glitter particles being substantially uniformly dispersed throughout said coating, whereby substantially all light



incident on said body is reflected and dispersed in all directions from said transparent resin coating.

5,146,708
ANIMAL TRAP TRIGGER
Emmanuel Boucher, 1 Rang 4 St Eugene, Lislet, Quebec, Canada G0R 1X0
Filed Apr. 14, 1989, Ser. No. 338,608
Int. Cl.[5] A01M *23/28*
U.S. Cl. 43—94 3 Claims



1. An animal trap trigger comprising a top plate, an edge plate and a tab means, wherein the tab means and the edge plate are spaced apart and extend from the top plate in a substantially perpendicular fashion, the edge plate further comprising two receptacles to receive the jaws of a trap, the tab being positioned so as to function as a fulcrum to disengage the receptacles from their associated jaw when the top plate is tilted

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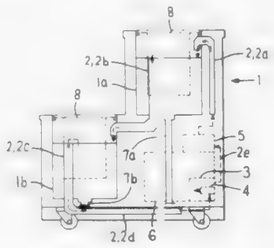
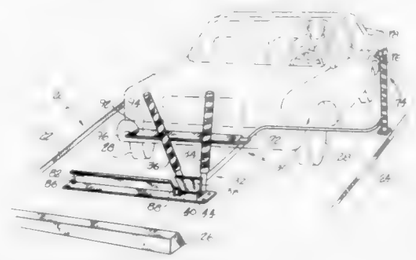
5,146,709
CUT FLOWERS DISPLAY WATER TANK
Tosiyuki Iseki, Hiroshima, Japan, assignor to Nihon Heating Service Co., Ltd., Sakai, Japan
Filed Oct. 30, 1990, Ser. No. 605,961
Claims priority, application Japan, Nov. 8, 1989, 1-291906
Int. Cl.[5] A01G *5/00*
U.S. Cl. 47—41.01 2 Claims



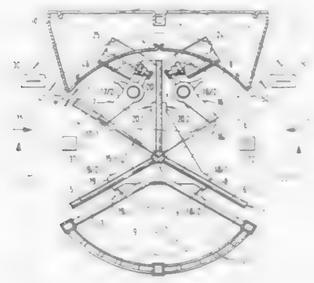
1. A cut flowers display water tank comprising:
an upper water tank and a lower water tank
a pipe system for connecting the upper water tank and the lower water tank for circulating water in both the upper and the lower tanks;
a circulating pump connected to the pipe system;
a filter connected to the circulating pump for filtering water;
a cooler having a coolant therein for cooling water supplied from the lower water tank and contained therein and supplying the cooled water to the upper water tank;
a freezer connected to the cooler for cooling the coolant in the cooler;
the filter, the cooler and the freezer being disposed under the upper water tank;
pots having a plurality of slits defined around the circumferential surface thereof through which the cut flowers are inserted into the upper and the lower water tanks, the pots removably attached to both the upper and the lower water tanks.

5,146,710
PARKING SPACE CONTROL
Wesley A. Caldwell, 17493 McGregor Blvd., Ft. Myers, Fla. 33908
Filed Feb. 20, 1991, Ser. No. 658,782
Int. Cl.[5] E05B *65/00*
U.S. Cl. 49—35 20 Claims



1. Apparatus for reserving a parking space for use by authorized users, comprising:
(a) movably mounted barrier means adapted for movement between access blocking and entry permitting positions for restricting use of a parking space by wheeled vehicles,
(b) control means, operably by an authorized user from a vehicle trying to enter said space, for actuating movement of said barrier means from access blocking position to entry permitting position, and
(c) means for automatically resetting said barrier means back to an access blocking position including first and second spaced movable members disposed for successive selective contact with at least one vehicle wheel following a path defined by entry and exit of a vehicle, means for connecting said spaced members whereby each member is moved from an inactive to an active position for future contact with and movement by wheel contact in response to wheel contact moving the other member from an active to an inactive position, and means operable by movement of one of said members in response to wheel contact with a member as a vehicle leaves said space for moving said barrier means back into access blocking position.

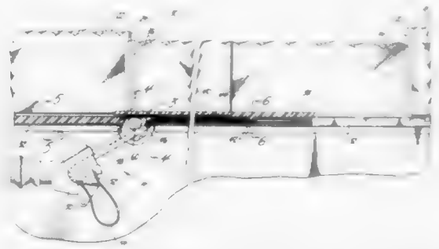
5,146,711
SECURITY REVOLVING DOOR
Thomas Gallenschütz, Bühl/Baden; Hermann Vogel, Bühlertal, and Erwin Hochstuhl, Bühl, all of Fed. Rep. of Germany, assignors to Gallenschütz Metallbau GmbH, Bühl/Baden, Fed. Rep. of Germany
Filed Mar. 8, 1991, Ser. No. 666,238
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1990, 4007303
Int. Cl.[5] E06B *11/08*
U.S. Cl. 49—46 7 Claims



1. A security revolving door arrangement, comprising:
a turnstile including at least two cross wings;
passage sector means surrounding and defining a passage sector on one side of the turnstile, said passage sector means including a stationary housing part which extends over a central angle which is approximately equal to or smaller than an angular distance between two successive cross wings;
blocking sector means surrounding and defining a blocking sector at a side of said turnstile opposite to said passage sector;
a blocking device including a blocking member connected non-rotatably to said turnstile, said blocking member including blocking cams with a first side stop face and a second side stop face, the number of cams corresponding to the number of cross wings of the turnstile;
two electromagnetically controlled blocking arms, said blocking arms being moveable into and out of engagement with the first and second stop faces, one blocking arm engaging the first stop face of a blocking cam for blocking counterclockwise rotation and the other blocking arm engaging with the second stop face of a blocking cam for blocking clockwise rotation, each of said blocking arms is designed as a catch having two coupling fingers offset by substantially 90° relative to a bearing access, one of said coupling fingers being optionally coupled with an armature of an electromagnet of said electromagnetic drive means, whereby the coupling of one or another of said coupling fingers changes the orientation of the associated blocking arm; and
electronic control means including peripheral monitor devices for controlling the blocking arms for releasing or blocking the rotation of the turnstile.

5,146,712
POWER SLIDING WINDOW FOR TRUCK CAB
David G. Hlavaty, Allen Park, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 8, 1991, Ser. No. 666,286
Int. Cl.[5] E05F *17/00*
U.S. Cl. 49—118 1 Claim

1. A power window assembly for a rear window opening of a truck cab, the rear window opening having an inboard channel and an outboard channel, the power window assembly comprising:
a pair of stationary window panes spaced apart and securely mounted in the outboard channel of the rear window opening and defining therebetween a center window opening;
a raceway formed along the rear window opening inboard of the inboard channel;
first and second movable window panes slidably located in the inboard channel of the rear window opening and adapted for sliding movement toward each other to a closed position where the panes abut each other closing the center window opening and away from each other to an opened position overlying at least a portion of the stationary window panes thereby opening the center window opening;
a reversible electric motor having a single drive means connected to a primary drive gear for generating rotary motion of the primary drive gear;
a tape having a plurality of slots engaging and driven by the primary drive gear so that the tape moves in a translational push-pull movement upon rotation of the primary drive gear by the motor;



a track extending between the primary drive gear and the first movable window pane for guiding the tape;
an arm of the first movable window pane projecting downward and inboard into the raceway and the arm having a plurality of teeth depending into the track and engaging the slots in the tape for driving the first movable window pane so that the translational push-pull movement of the tape moves the first movable window pane between the closed position and the opened position;
an arm of the second movable window pane projecting downward and inboard into the raceway and the arm having a rack received in the raceway; and
a secondary drive gear rotatably mounted and engaging the tape and the rack of the second movable window pane so that the tape drives the secondary drive gear and the secondary drive gear drives the second movable window pane whereby the movable window panes move simultaneously toward each other to the closed position and away from each other to the opened position.

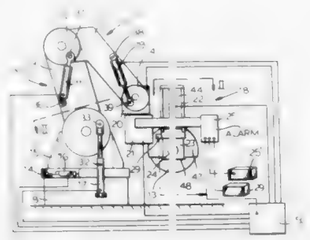
5,146,713
HYDRAULIC DOOR OPERATING SYSTEM FOR AUTOCLAVES AND STERILIZERS
Gerald R. Grafius, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.
Filed May 2, 1991, Ser. No. 695,051
Int. Cl.[5] E05F *7/02*
U.S. Cl. 49—255 23 Claims

1. Apparatus for opening, closing, and sealing a door of a chamber, said apparatus comprising:
a) means for moving said door between an open and a closed position; and
b) hydraulically activated means for clamping said door to said chamber, said clamping means providing clamping force such that an effective seal is provided between said door and said chamber, said clamping means comprising a

plurality of extendable pins, said pins exerting variable clamping force when extended, said clamping force being

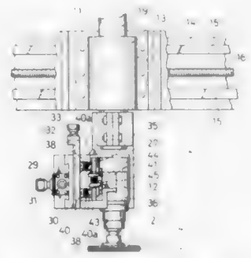
proportional to hydraulic pressure supplied to said clamping means.

5,146,714
PROCESS AND ARRANGEMENT FOR REMOVING EXCESS MATERIAL FROM CASTINGS
Werner Lüber, Bahnhofstr. 23/32, CH-9602 Bazenheid, Switzerland
PCT No. PCT/CH89/00040, § 371 Date Oct. 25, 1989, § 102(e) Date Oct. 25, 1989, PCT Pub. No. WO89/08523, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 8, 1989, Ser. No. 434,677
Claims priority, application Switzerland, Mar. 9, 1988, 880/88
Int. Cl.[5] B24B *9/00, 51/00*
U.S. Cl. 51—165.71 6 Claims



1. An apparatus for removing excess material from a casting, comprising:
a rotating abrasive cut-off disk,
a tool holder carrying said abrasive cut-off disk and provided with means enabling linear advance of said cut-off disk relative to said casting on said tool holder to remove excess material from said casting;
a multiple-arm industrial orbit carrying said tool holder at a free end of said multiple-arm industrial robot, said multiple-arm industrial robot having a multiplicity of mutually displaceable angularly adjustable parts enabling positioning of said tool holder at a predetermined location adjacent said casting; and
centrally control and lockable hydraulic actuators between said parts whereby all of said mutually displaceable angularly adjustable parts can be rigidly locked relative to one another under central control upon positioning of said tool holder at said predetermined location for subsequent linear displacement of said cut-of disk relative to si casting on said tool holder to remove said excess material, said multiple-arm industrial robot having a stand pivotable about a vertical axis relative to a stationary support and forming one pair of said mutually displaceable angularly adjustable parts, an articulated leer supported on said stand and pivotable about a horizontal axis and forming with said stand at least one other pair of said mutually displaceable angularly adjustable parts, said tool holder forming with said leer another pair of said mutually displaceable angularly adjustable parts.

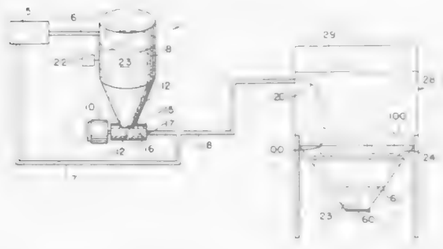
5,146,715
APPARATUS FOR GRINDING A PERIPHERAL EDGE OF A GLASS SHEET
Shigeru Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima, Japan
Filed Nov. 30, 1990, Ser. No. 620,070
Claims priority, application Japan, Nov. 30, 1989, 1-312620
Int. Cl.[5] B24B *9/10*
U.S. Cl. 51—165.77 4 Claims



1. An apparatus for working a glass member, which comprises:
a working tool for working the glass member,
positioning means for relatively moving the tool and the glass member in a first direction and a second direction perpendicular to the first direction to position a working portion of the working tool at a portion of the glass member to be worked,
orbiting means connected to the tool for orbiting the tool around an axis perpendicular to a plane defined by the first and second direction, said axis extending through a working point where the working portion of the working tool contacts with the portion of the glass member to be worked,
supporting means connected to the tool for elastically supporting the tool so that the tool is elastically movable in a third direction normal to a profile of the glass member at the working point,
inhibiting means for inhibiting an elastically supporting action of the supporting means to rigidly support the tool in said third direction when a working operation is in a predetermined state.

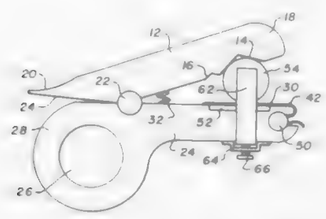
5,146,716
PLIANT MEDIA BLASTING METHOD
William R. Lynn, Dover, N.H., assignor to Sponge-Jet, Inc., Dover, N.H.
Continuation of Ser. No. 376,764, Jul. 7, 1989, abandoned. This application Nov. 15, 1991, Ser. No. 794,600
Int. Cl.[5] B24C *11/00*
U.S. Cl. 51—320 14 Claims

1. A method of treating a contaminated surface with a plurality of discrete, individual particles of a pliant particulate blasting media capable of absorbing a contaminant from said surface comprising a dry light resilient absorbent cellular material pretreated with a dry powder to increase the density and abrasiveness of said media, said method comprising the steps of
a) positively conveying said pliant blasting media comprising a dry light resilient absorbent cellular material pretreated with a dry powder to increase the density and abrasiveness of said media from a storage container into a discharge conduit;
b) supplying an air flow under pressure to said discharge conduit;



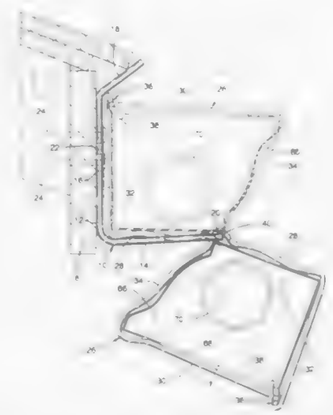
c) mixing said air flow and said pliant blasting media together to form a pressurized mixture thereof in said discharge conduit; and
d) discharging said pressurized mixture against the contaminated surface and absorbing contaminant from said surface with said absorbent cellular material.

5,146,717
ROTATING TOOL
Josef Shemesh, 8560 Caversham Court, Vancouver, B.C., Canada V6P 6R8, and William Z. Gelbart, 2284 Allison Drive, Vancouver, B.C., Canada V6T 1T8
Filed Dec. 3, 1991, Ser. No. 801,864
Int. Cl.[5] B24D *15/04*
U.S. Cl. 51—392 6 Claims



1. A hand tool for finishing exterior peripheries of cylindrical components of variable diameters comprising:
a lower body having a pivot means adjacent one end and an abrasive strip located on a planar flexible backing member adjacent the other end, the lower body having a ring integral therewith adjacent the one end, the ring having an aperture for finger insertion, adapted to rotate the hand tool about the cylindrical component;
a top body having spring means joining to the lower body, adapted to pivot at the pivot means, and having guide means to guide the cylindrical component in contact with the abrasive strip on the planar flexible backing member, the spring means adapted to apply force between the cylindrical component and the abrasive strip on the planar flexible backing member as the hand tool is rotated.

5,146,718
HINGED SUPPORT ASSEMBLY FOR DUMPING-TYPE RAIN GUTTERS
Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash. 98441
Filed Jul. 15, 1991, Ser. No. 729,981
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—11 15 Claims

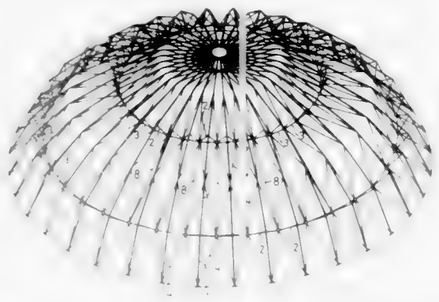


1. A hinged support assembly for mounting a swinging, dumping-type rain gutter beneath the eaves on fascia boards or other structural members, the support comprising a bracket component and a wraparound hanger component,
a) the bracket component comprising,
1) a vertical segment adapted for positioning against the fascia board.
2) a horizontal segment adapted to underlie the gutter.
3) securing means for securing the vertical segment to the fascia board, and
4) a hinge eye in the horizontal segment.
b) the hanger component comprising:
1) an elongated flexible support member dimensioned for reception in the eye of the bracket component in hinge-forming relation thereto, the hanger component terminating at each end with a meeting end, and to wraparound the gutter with meeting ends, and
2) latch means releasably interengaging the meeting ends of the flexible support member.

5,146,719
SPACE TENSION CHORD ARCH DOME REINFORCED WITH TENSION MEMBERS AND METHOD FOR BUILDING SAME
Masao Saito, 4-11-13 Harayma, Urawa-shi Saitama; Shigeru Ban, Tokyo; Yoshio Takita, Tokyo; Yoshiki Mihara, Tokyo, and Shinichi Takahashi, Tokyo, all of Japan, assignors to Masao Saito, Saitama and Kajima Corporation, Tokyo, both of, Japan
Filed Feb. 12, 1991, Ser. No. 654,201
Claims priority, application Japan, Feb. 16, 1990, 2-35696
Int. Cl.[5] E04B *1/18*
U.S. Cl. 52—80 8 Claims

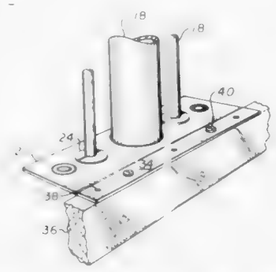
1. A tension chord reinforced arched dome comprising: a first sub-arch member having upper and lower ends; a first pair of spreader means having near and remote ends, said near ends being secured to the midpoint of said first sub-arch member; said first pair of spreader means extending normally downwardly and diverging laterally away from said sub-arch member in equal and opposite directions; and first cable means connecting said first spreader means remote ends to said first sub-arch member upper and lower ends; a second sub-arch member having upper and lower ends; a second pair of

spreader means having near and remote ends, said near ends being secured to the midpoint of said second sub-arch member, said second pair of spreader means extending normally downwardly and diverging laterally away from said sub-arch means



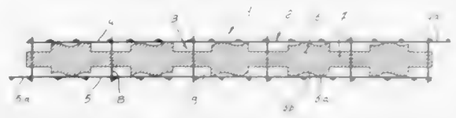
in equal and opposite directions; second cable means connecting said second spreader means remote ends to said second sub-arch member upper and lower ends, and means to hingedly secure said first sub-arch member to said second sub-arch member.

5,146,720
PIPE STABILIZER
Richard F. Turner, 310 Fox St., Ojai, Calif. 93023
Filed Jun. 19, 1991, Ser. No. 717,694
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—98 13 Claims



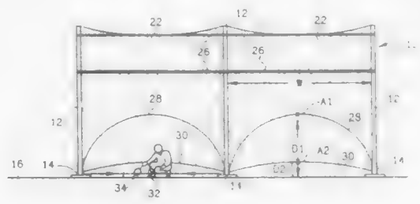
1. A building system for stabilizing pipes, tubes or the like, comprising:
a rigid preformed stabilizer plate having at least one removable pop-out impression which, when removed, defines an opening for the pipe, tube or the like;
a supporting extension along one side of the plate;
means for attaching the extension to the stabilizer plate along the one side thereof, wherein the attaching means provides a strong yet brittle connection between the extension and the plate such that the plate is broken away from the extension when forceably bent at the attaching means; and
means for securing said extension to a selected ceiling, floor, or wall structure to support the plate in a cantilevered configuration relative to the selected ceiling, floor or wall structure.

5,146,721
WALL PANEL WITH THERMOACOUSTIC INSULATION CHARACTERISTICS
Angelo Candiracci, Fano, Italy, assignor to Monolite S.r.l., Fano, Italy
Filed Jul. 1, 1991, Ser. No. 723,888
Int. Cl.[5] E04B *1/74, 2/02;* E04C *1/40*
U.S. Cl. 52—144 7 Claims



1. A wall panel with thermoacoustic insulation characteristics comprising;
a pair of metallic nets made of wires;
an insulating layer made of foamed plastic material and being interposed between said metallic nets;
opposite faces defined by said insulating layer;
elements perforating said insulating layer and being connected to each of said pair of said metallic nets,
reduced thickness portions defined by said insulating layer;
corrugated portions defined by said insulating layer and being interconnected by reduced thickness portions, and;
an alternate succession of troughs and crests defined by said corrugated portions at said opposite faces of said insulating layer;
wherein said wires of said pair of metallic nets include wires arranged parallel to and overlying said troughs, said troughs being arranged in a median position with respect to said wires arranged parallel to and overlying said troughs.

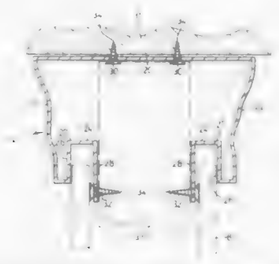
5,146,722
FABRIC STRUCTURE WITH DOUBLE TENSIONING CABLES
Robert M. Stafford, 3017 Clay, Newport Beach, Calif. 92663
Filed Jul. 31, 1990, Ser. No. 561,017
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—222 7 Claims



1. A building structure, comprising:
a plurality of arches each having a pair of lower ends;
base means for holding the lower ends of the arches to position them in longitudinally spaced, transversely extending, vertical positions;
a plurality of panels of a flexible web material each having a pair of opposite side edges, a width corresponding to a longitudinal distance between adjacent ones of the arches and a length corresponding to a transverse distance spanned by the arches;
each panel having a first pair of lines connected to a first end portion of the panel and a second pair of lines connected to an opposite second end portion of the panel, the lines having terminal segments and extending generally arcuately between the side edges of the panel and being spaced a predetermined distance apart in the transverse direction;

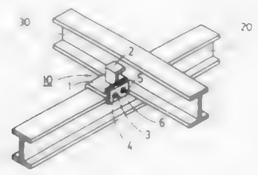
means for connecting the side edges of each of the panels to corresponding ones of the arches; and
the base means each including means for guiding the corresponding terminal segment of each line so that the terminal segments of the same line can be pulled together to thereby transversely tension the panels.

5,146,723
DRYWALL CONSTRUCTION
Frank D. Greenwood, 400 Keewatin Avenue, Toronto, Ontario, Canada M4P 2A5 , and Kazimir Kobielski, 24 Dustan Crescent, Toronto, Ontario, Canada M4J 4G5
Continuation of Ser. No. 396,971, Aug. 22, 1989, abandoned.
This application Feb. 27, 1991, Ser. No. 660,985
Int. Cl.[5] E04B *2/00*
U.S. Cl. 52—287 5 Claims



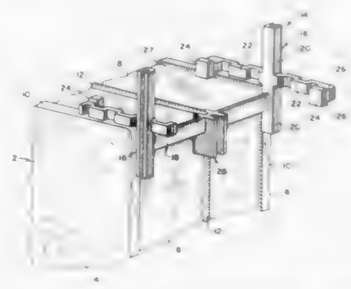
1. A wall mounting device comprising a single continuous elongated floor element having a base plate for attachment to a floor and having opposing terminating ends forming an open trough, said element having at least one side flange upstanding from the base plate to form a baseboard and terminating in an upwardly opening channel, said device further comprising a single continuous elongated ceiling element having a base plate for attachment to a ceiling and having opposing terminating ends forming an open trough, said ceiling element having at least one side flange downwardly projecting from the base plate to form a cornice and terminating in a downwardly opening channel, the inside walls of the channels each lying in a plane normal to its associated base plate, the floor and ceiling elements being juxtaposable whereby a plurality of vertical wall studs are securable laterally to the outer faces of the inside walls of the channels to bear downwardly on the base plate of the floor element, whereby a planar sheet is receivable in the channels and securable against the studs to form a permanent wall.

5,146,724
TWO-PART CLAMP FOR CONNECTING INTERSECTING I-BEAMS
Arthur Angelo, Poway, Calif., assignor to Intertrack Management, Inc., San Diego, Calif.
Filed Apr. 3, 1991, Ser. No. 680,133
Int. Cl.[5] E02D *27/42*
U.S. Cl. 52—299 6 Claims



1. A clamping assembly for a mobile dwelling auxiliary support system, adapted to become fully actuated during seismic disturbances, in uniting two structural and angularly intersecting I-beams that are horizontally adjacent to one another at the bottom flange of said upper I-beam to the upper flange of said lower I-beam, said assembly comprising:
a rigid rectangular two-part connector defined by:
a first part consisting of a flat plate member having a contiguous L-shaped lip that extends first vertically upward while terminating horizontally away from said plate surface, and situated at one end of said plate, while clockwise to said lip and at a right-planar angle thereto a second integrally and downwardly curved lip arrangement, and at a counter-clockwise right-planar angle to said L-shaped lip is further disposed a vertically upturned end of said plate wherein two apertures are intermediately situated;
a second part consisting of a L-shaped bracket having a horizontally flat surface while contiguously depending from said surface member is an upturned ridge containing two intermediately disposed apertures mattingly commensurate to cooperate with said plate apertures; and
a pair of bolts, washers, and nuts suitable to tightly fasten said plate to said bracket through their common apertures.

5,146,725
SPACER MEMBER FOR CONSTRUCTION ELEMENTS
Mary L. Bruce, Murrysville; Larell Harris, Pittsburgh, and Robert M. McMarlin, Murrysville, all of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.
Filed May 29, 1991, Ser. No. 706,884
Int. Cl.[5] E04C *1/42*
U.S. Cl. 52—308 28 Claims



1. A spacer member for use in spacing adjacent construction elements from one another during construction of a structure comprising a plurality of said construction elements, said construction elements each including oppositely directed face surfaces defining parallel planes and a plurality of side walls having engageable formation structure provided thereon, said formation structure including both a raised seam extending substantially continuously along the periphery of said side walls in a plane located substantially centrally of said parallel planes defined by said oppositely directed face surfaces and first and second raised side edges of said side walls, said first and second raised side edges including interior shoulder regions, said spacer member comprising:
first and second spacing elements lying in spaced apart parallel planes, said spacing elements including means positionable upon at least one of said first and second raised side edges for defining joint spacing between said adjacent construction elements;
means for connecting said first and second spacing elements; and
means carried by said spacer member between said spaced apart parallel planes of said first and second spacing elements for engaging said formation structure in order to inhibit displacement of said spacer member and said construction elements during placement of said construction elements, said means for engaging said formation structure including first means for receiving a portion of said raised

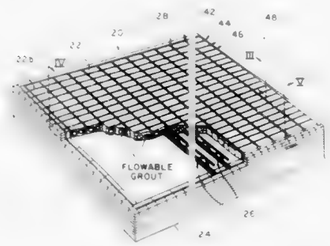
seam and second means carried by said joint spacing defining means for receiving said interior shoulder regions of said first and second raised side edges.

5,146,726

COMPOSITE BUILDING SYSTEM AND METHOD OF MANUFACTURING SAME AND COMPONENTS THEREFOR

Russell P. Ellison, Jr., 109 Ralston Rd., Richmond, Va. 23229

Filed Oct. 26, 1990, Ser. No. 603,515
Int. Cl.[5] E04B 5/10
U.S. Cl. 52—320 18 Claims



1. A composite building system comprising:

a metal open web joist having a lower chord with a lower flange, an upper chord with openings therein which is narrower than said lower chord and a web member narrower than said upper chord connected to and undulating between said lower and upper chords;

at least two columns of a plurality of masonry blocks taller than said joist with each column having at least some straight vertical sides and bottom edges with said bottom edges supported by and in contact with said flange of said joist so that one of said columns is on one side of said joist abutting and in contact with said upper chord and the other of said columns is on the opposite side of said joist abutting and in contact with said upper chord so as to define a longitudinal trough in which said joist is disposed to receive flowable grout poured through said openings in said upper chord to flow around said web member, the blocks having mutually co-planar upper surfaces and at least one stepped upper edge, the stepped upper edges of the plurality of blocks running substantially transverse the trough in a grid-like pattern and

a cured flowable grout filling the stepped edges and the trough and binding the joist and the plurality of blocks to form an integral structure having a substantially planar upper surface.

5,146,727

CLADDING PANEL

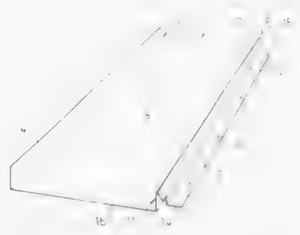
Sören Hansson, Kalix, Sweden, assignor to NPF Nordisk Platformning AB, Alvsbyn, Sweden

This application Sep. 6, 1991, Ser. No. 758,458

Continuation of Ser. No. 476,471, filed as PCT/SE88/00663, Dec. 5, 1988, abandoned.

Claims priority, application Sweden, Dec. 7, 1987, 8704873
Int. Cl.[5] E04D 1/00
U.S. Cl. 52—531 13 Claims

1. A sheet metal cladding panel for outer walls and roofs comprising: a middle portion, an upwardly folded flange extending along a first side of said middle portion, and an upwardly folded edge side extending along an oppositely positioned second side of said middle portion, at least said upwardly folded edge side having a downwardly folded half seam extending therefrom for joining juxtaposed panels to one another, said half seam being folded downwardly to define an acute angle with respect to said edge side, said edge side and said half seam being formed with double walls along at least a portion of their longitudinal extent to define inner and outer walls of said edge side and inner and outer walls of said half seam, the combination of said edge side and said half seam defining a cross-sectional shape that is substantially constant along substantially the entire longitudinal extent of the edge side and the half seam, the inner wall of the edge side having an attachment flange connected thereto and extending outwardly therefrom for fastening the panel to a substructure, said attachment flange, said middle portion, said edge side and said half seam having respective oppositely positioned end edges located at corresponding ends thereof, at least one of the end edges of the attachment flange being positioned inwardly of



the corresponding end edge of the middle portion so that a portion of the longitudinal extent of the middle portion is absent on outwardly extending attachment flange, a portion of said edge side and a portion of said half seam being single walled, said single walled portion of said half seam and said edge side corresponding in longitudinal extent to the portion which is absent the attachment flange, said single walled portion of the half seam terminating at a free edge, the cross-sectional shape defined by the combination of the single walled portion of the edge side and the single walled portion of the entire half seam being substantially the same as the cross-sectional shape defined by the combination of the double walled portion of the edge side and the double walled portion of the half seam.

5,146,728

APPARATUS FOR THE PACKAGING OF CIGARETTES

Siegfried Knecht, Gevelsberg, and Jürgen Sakowski, Ennepetal, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Dec. 7, 1990, Ser. No. 623,608

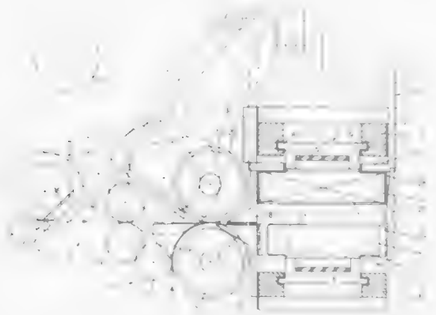
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 3940789
Int. Cl.[5] B65B 11/38, 61/20, 19/02
U.S. Cl. 53—136.1 18 Claims

1. In apparatus for the packaging of cigarettes, the apparatus incorporating an irregularly shaped collar defining member into each package during the fabrication thereof with said member being of a smaller width then the circumference of a package, the improvement comprising:

first conveyor means, said first conveyor means including a plurality of spacially separated cells, said cells each being sized and shaped to receive and transport a cigarette block wrapped with inner paper, said cells of said first conveyor means having a bottom wall and a pair of longitudinal side walls and being open on the side thereof which is opposite to the bottom wall;

second conveyor means, said second conveyor means including a plurality of spacially separated cells, said cells of said second conveyor means each being sized and shaped to receive and transport a cigarette block, the cells of second conveyor means having a bottom wall and a pair of longitudinal side walls and being open on the side thereof which is opposite to the bottom wall, said second conveyor means being positioned relative to said first conveyor means so as to cause cells of said first and second conveyor means to be brought into an aligned confronting relationship whereby an individual wrapped cigarette block may be transferred from a cell of said first conveyor means to a cell of second conveyor means, said transfer occurring at a transfer station, cells of said first and second conveyor means being spacially displaced at said transfer station;

means for feeding collar defining members into the space between aligned cells of said first and second conveyor means at the transfer station, said feeding means positioning and subsequently supporting a collar defining member above the position to be occupied by the open side of a cell on side second conveyor means means for pushing the contents of a cell of said first conveyor means into an aligned cell of said second conveyor means for pressing the collar defining member into the receiving cell of said second conveyor means by the contents of an aligned cell of said first conveyor means, to fold the collar defining member about only three sides of a wrapped cigarette



block during the pushing of the contents of the cell of said first conveyor means into the cell of said second conveyor means said feeding means including:

lever means for advancing the collar defining members into the transfer station, said lever means having arm means which engage a trailing edge of a collar defining member; and

guide means for defining the path of motion of the collar defining members while such members are engaged by said arm means;

said feeding means further comprises:

cooperating conveying rollers arranged upstream in the direction of collar defining member movement from said guide means; and

drive means for causing said arm means to move in a forward direction through the region of said rollers and said guide means to thereby push an engaged collar defining member into the transfer station, said drive means causing a retraction of said arm means after delivery of a collar defining member into the transfer station.

5,146,729

CASSETTE ACCOMMODATING METHOD AND INDEX CARD FOR CASSETTE CASE

Makoto Sato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

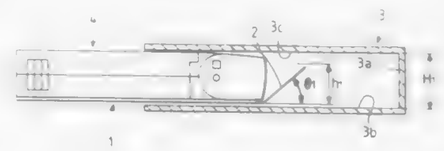
Division of Ser. No. 652,727, Feb. 8, 1991. This application Nov. 4, 1991, Ser. No. 787,612

Claims priority, application Japan, Feb. 13, 1990, 2-29700
Int. Cl.[5] B65B 61/20, 35/30
U.S. Cl. 53—445 7 Claims

1. A method for accommodating a magnetic tape cassette and an index card in a book-case type cassette storage case into which said magnetic tape cassette is inserted while being moved in one direction so as to be accommodated therein, comprising the steps of:

providing an index card made of a rectangular sheet material;

bending a portion of said index card so that said portion is brought into planar contact with an inner surface of a rear wall of said cassette storage case when said index card is inserted in said storage case, said bending being performed along a bending line in one end portion of said index card in such a manner that, in a direction of thickness of said cassette storage case, the height (h_1) of said bent portion is smaller than the height (H_1) of an internal space in said



cassette storage case when said index card is inserted into said cassette storage case, and said bent portion including a wide portion defined by a distance (w_1) between said bending line and the outer edge of said bent portion, which distance is larger than said height (H_1) of said internal space in said cassette storage case; and

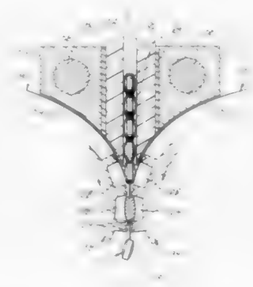
inserting said index card into said case by pushing said index card with said magnetic tape cassette in such a manner that said wide portion of said index card is pushed against said inner surface of said rear wall of said cassette storage case by a front end of said magnetic tape cassette so as to be held bent between the inner walls of the top and bottom walls of said cassette storage case.

5,146,730

FILM-ENROBED UNITARY-CORE MEDICAMENT AND THE LIKE

Hani Sadek, Calabasas, and Gregory L. Dietel, Moorpark, both of Calif., assignors to Banner Gelatin Products Corp., Chatsworth, Calif.

Filed Sep. 20, 1989, Ser. No. 410,134
Int. Cl.[5] B65B 47/00
U.S. Cl. 53—454 54 Claims



1. A method of film enrobing article preforms such as medicine tablets comprising the steps of

(A) providing a pair of films of selected thickness and composition each defined to be elastic, plastic and self-adhering to the other film, the films each having obverse and reverse surfaces,

(B) moving the films along selected paths including through a place of coaction of a pair of coacting dies where the

film obverse surfaces contac each other, the dies having cooperating working surfac es contoured for formation between them upon coactio n of the dies of at least one cavity sized and shaped fo loosely receiving therein a single article preform,

(C) substantially at the place of die coaction individually dispensing for each cavity formed between the dies an article preform into contact with the obverse surface of at least one of the films at eac location on the at least one film which corresponds to the location of a cavity for movement of the dispensed preforms through the place of die coaction,

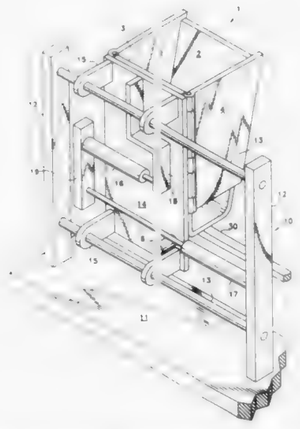
(D) at the place of die coaction, stretching the films into contact with each other peripherally around the preforms to cause each preform to be enrobed by and between the films, and sealing the films to each other at lines peripherally around and contiguous to each preform, and

(E) separating the enrobed preforms from the films essentially at said peripheral lines to provide the articles of manufacture each of which comprises a single preform sealed between applied layers of the film material.

5,146,731
BAGGER RECEIVER BOX

Dale E. Marshall, Haslett; Galen K. Brown, Okemos, and Richard J. Wolthuis, Haslett, all of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 540,982, Jun. 20, 1990, Pat. No. 5,095,686. This application Dec. 2, 1991, Ser. No. 801,157
Int. Cl.[5] B65B *7/02, 43/42*
U.S. Cl. 53—469 **16 Claims**



1. A bagger receiver box and transfer apparatus for receiving a bag filled with articles and transferring and discharging said bag comprising:

a. an enclosure having a closed bottom, opposed upwardly extending front and rear walls, opposed first and second openable and closable side walls extending between said front and rear walls, and an open top, said enclosure being tiltable about a horizontal axis through a plane including said rear wall;

b. means for independently opening and closing said first and second side walls;

c. means for mounting and moving said enclosure in an approximately horizontal direction perpendicular to said first and second side walls and said horizontal axis; and

d. means for tilting said enclosure about said horizontal axis to an extent that a bag filled with articles and within said enclosure may be discharged by gravity through one of said side walls;

said apparatus being operable to receive a bag filled with articles at a bag filling station, transfer said filled bag to a bag closing station, and then discharging the closed bag.

5,146,732
RECYCLE SHIPPING ASSEMBLY

Michael J. Grey, Richboro, Pa.; Wayne Williams, Boxford, and William H. Shaw, Manchester, both of Mass., assignors to ReSource America, Inc., Southampton, Pa.

Continuation of Ser. No. 690,082, Apr. 23, 1991, which is a continuation-in-part of Ser. No. 427,812, Oct. 26, 1989, abandoned. This application Oct. 10, 1991, Ser. No. 774,596
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Int. Cl.[5] B65B *61/22*
U.S. Cl. 53—472 **22 Claims**

1. A process for recycling or reprocessing a cushioned shipping container, comprising the steps of:

a. providing the container of reusable, reprocessable or replaceable elements, selected from the group consisting of (i) an external portion comprising wood fiber based products or plastic materials; and (ii) an internal portion comprising resilient cushioning inserts;

b. shipping the container to a customer with a provider's product cushioned therein and with directions for returning the container to a designated fabricator or a third party after receipt by the customer of the provider's product;

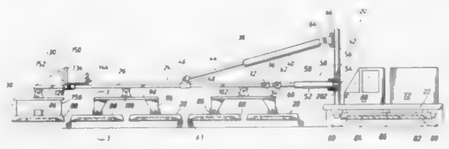
c. at the fabricator or said third party, inspecting and refurbishing or replacing the external or internal elements to make the container like new, and reprocessing the elements replaced; and

d. repeating steps (b) and (c) during a useful lifetime of the container.

5,146,733
WIDE SWATH MOWER AND METHOD OF MOWING

Joseph H. Klaeger, P.O. Drawer 445, Hondo, Tex. 78861

Filed Mar. 5, 1991, Ser. No. 664,834
Int. Cl.[5] A01D *75/18, 75/30*
U.S. Cl. 56—6 **18 Claims**



12. A method of mowing a wide swath comprising:

pivoting a wing mounted to a chassis at the proximal end thereof and having a prime mover mounted thereto from a first, folded position to a second, open position for mowing operations;

powering forward movement of the chassis with the prime mover to commence mowing operations;

supporting a first portion of the weight of the wing during mowing operations with a wheel mounted on the wing;

supporting a second portion of the weight of the wing from the chassis;

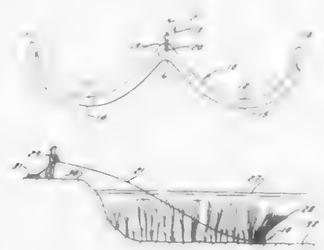
maintaining the second portion of the weight of the wing supported from the chassis at a selected weight by pivoting the wing vertically in response to changes in the first portion of the weight of the wing caused by changes in the contour of the swath being mowed to maintain a plurality of mowers mounted on the wing distal to the chassis at a desired height during mowing operations; and

stopping forward movement of the chassis when one of the mowers encounters an obstacle, causing the wing to pivot horizontally from the second position in a direction away from the first position.

5,146,734
UNDERWATER VEGETATION CUTTER

Paul, J. Smyczek, 9937 W. Edgerton Ave., Hales Corners, Wis. 53130

Filed Mar. 18, 1991, Ser. No. 670,570
Int. Cl.[5] A01D *1/06*
U.S. Cl. 56—8 **5 Claims**



3. A weed cutter comprising two flat curved blade sections having corresponding concave edges and corresponding generally concentric convex edges, respectively, said suction having correspond ends integrally joined in end-to-end fashion such that said cutter consist of a single piece of metal having both concave edges presented in the same direction to serve as cutting edges and both convex edges presented in the opposite direction, said sections being arranges symmetrically to where said ends are joined.

5,146,735
LAWN MOWER DRIVE AND CONTROL SYSTEMS

Orville R. McDonner, Conyers, Ga., assignor to Fuqua Industries, Inc., McDonough, Ga.

Filed Jun. 29, 1990, Ser. No. 545,563
Int. Cl.[5] A01D *69/08, 69/10*
U.S. Cl. 56—11.3 **36 Claims**

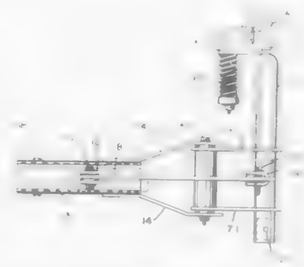
1. In a power driven walk-behind lawn mower having a pair of drivable wheels, two drives for establishing drive to said wheels respectively and two brakes for braking said wheels respectively, and a handlebar extending generally transversely of the mower for operating the mower; the improvement comprising a control system for operating the drives and brakes comprising in combination, two individual hand levers laterally spaced from each other and extending generally parallel to the handlebar, said hand levers being pivotable towards and away from said handlebar for controlling the drives and brakes of the wheels respectively and an individual park brake

lever located between said hand levers for simultaneously applying the brakes to both of said wheels.

5,146,736
REVERSIBLE ATTACHMENT FOR THREE POINT HITCH RAKES TO TRACTOR

Carletto Tonutti, Tricesmio, Italy, assignor to Tonutti S.p.A., Italy

Filed Jun. 18, 1991, Ser. No. 717,270
Claims priority, application Italy, Jun. 21, 1990, 60381/90[U]
Int. Cl.[5] A01D *67/00*
U.S. Cl. 56—14.9 **7 Claims**



1. An attachment for interposition between a tractor and an implement adapted to be towed by the tractor, comprising:

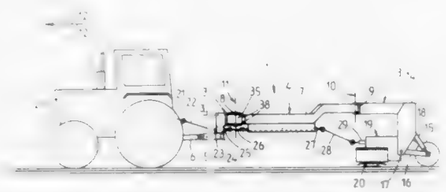
a frame mountable to the rear of the tractor;

a hinge assembly connected to the frame and defining a substantially vertical hinge axis;

an implement mounting assembly for receiving a connecting portion of the implement, the implement mounting assembly being connectable to the hinge assembly so as to be pivotable about the hinge axis; and

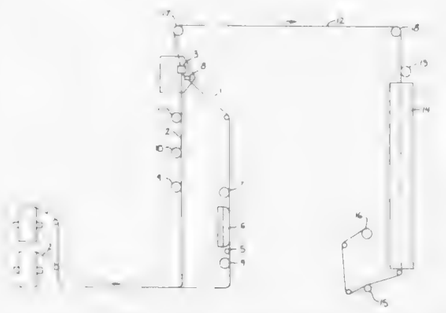
a positioning assembly disposed between the implement mounting assembly and the frame for establishing the position of the implement mounting assembly relative to the frame by selectively preventing pivoting movement of the implement mounting assembly about the hinge axis.

5,146,737
FARM MACHINE HAVING A PROTECTED JOINT PERMITTING ROTATION BETWEEN TWO ELEMENTS
Jean-Paul Gantzer, Lutzelbourg, France, assignor to Kuhn, S.A., Saverne Cedex, France
Filed Jun. 5, 1991, Ser. No. 710,771
Claims priority, application France, Jun. 6, 1990, 90 07208
Int. Cl.[5] A01D *34/00*
U.S. Cl. 56—14.9 14 Claims



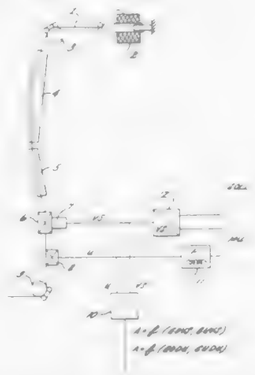
1. A farm machine comprising:
first and second elements connected to each other through a joint, said joint permitting a rotation between said first and second elements;
stop means intended to come into contact with one of said first and second elements in order to limit the rotation between said first and second elements in at least one direction; and
a protective device for isolating said stop means, said protective device not being deformed during the rotation between said first and second elements.

5,146,738
THREAD HAVING LOOPED EFFECT YARN INTERMINGLED WITH MULTI-FILAMENT CORE YARN
Karl Greifeneder, Heilbronn, and Kurt Truckenmuller, Flein, both of Fed. Rep. of Germany, assignors to Amann und Sohne GmbH & Co., Fed. Rep. of Germany
Division of Ser. No. 453,067, Dec. 11, 1989, Pat. No. 5,083,419, and a continuation of Ser. No. 206,528, Jun. 14, 1988, abandoned. This application Jul. 19, 1991, Ser. No. 732,814
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3720237
Int. Cl.[5] D02G *3/34, 3/36*
U.S. Cl. 57—207 17 Claims



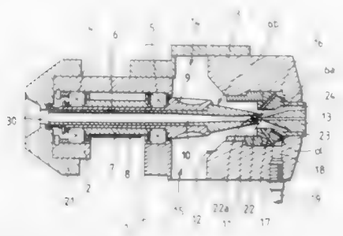
1. A thread, suitable for use as a sewing thread and having increased tenacity and reduced thermal shrinkage properties, said thread comprising:
at least one synthetic, oriented, multifilament core yarn formed from a pre-oriented yarn having a titer of between about 100 dtex and about 1000 dtex which has been turned around an unheated pin of less than 10 mm diameter, heated to a temperature of between 100° C. and 250° C. for from 0.01 to 10 seconds and drawn with a drawing ratio equal to or greater than a normal drawing ratio specified for the material of the yarn; and
at least one effect yarn intermingled with said core yarn to form a core-jacket thread having loops, not more than 15% of said loops being drawn tight in a knot-like manner.

5,146,739
YARN FALSE TWIST TEXTURING PROCESS AND APPARATUS
Hellmut Lorenz, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany
Filed Jan. 24, 1991, Ser. No. 645,464
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1990, 4002211; Feb. 17, 1990, 4005074
Int. Cl.[5] D01H *7/92;* D02G *1/06*
U.S. Cl. 57—264 10 Claims



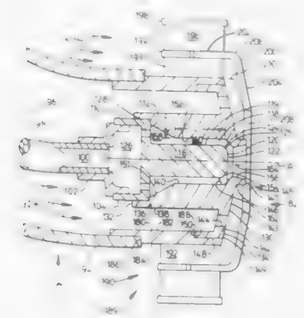
1. A yarn false twist texturing process having provision for controlling the twist imparted to an advancing yarn, and comprising the steps of
feeding the advancing yarn through a false twist unit which acts to impart a frictional force to the yarn which has a twisting component ad a tension imparting component,
monitoring the tension of the advancing yarn and generating a signal (U) representative of the monitored tension,
processing the generated tension signal (U) through a time filter to produce a time averaged signal (MU),
comparing the time averaged signal (MU) with a set point signal (Soll) and producing an adjusting signal (VS) representing the difference therebetween,
comparing the adjusting signal (VS) with the tension signal (U) and producing a differential signal (DU) representing the difference therebetween,
generating an alarm signal whenever at least one of the following conditions is present: (1) the adjusting signal (VS) leaves a predetermined range, and (2) the differential signal (DU) leaves a second predetermined range, and
controlling the operation of the false twist unit so that the frictional force imparted to the yarn varies as a function of the value of the adjusting signal (VS).

5,146,740
SPINNING APPARATUS
Shigeki Mori, Ohtsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Feb. 19, 1991, Ser. No. 657,488
Claims priority, application Japan, Feb. 20, 1990, 2-39129; Feb. 20, 1990, 2-39130; Feb. 20, 1990, 2-39131; Feb. 20, 1990, 2-39132
Int. Cl.[5] D01H *5/28, 1/115*
U.S. Cl. 57—328 6 Claims



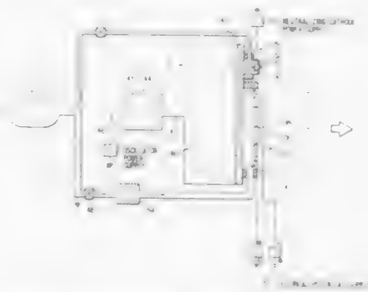
1. A spinning apparatus for spinning a fiber bundle provided by a draft device, comprising:
a nozzle block for imparting a turning air stream to the fiber bundle, the air stream having a speed,
a guide member supporting body securing within the nozzle block, the guide member supporting body having a conically shaped end portion, wherein a gap for passage of the fiber bundle is formed between a side portion of the guide member supporting body and the nozzle block,
a rotatable spindle defining an axis and an inlet, and
a guide member defining an axis, the guide member projecting from the conically shaped end portion of the guide member supporting body and including an end portion,
wherein the rotatable spindle and the guide member are arranged substantially coaxially.

5,146,741
GASEOUS FUEL INJECTOR
Virendra M. Sood, Encinitas, Calif., assignor to Solar Turbines Incorporated, San Diego, Calif.
Filed Sep. 14, 1990, Ser. No. 582,739
Int. Cl.[5] F02C *7/22;* F02G *1/00*
U.S. Cl. 60—39.55 27 Claims



1. A gas turbine engine including a gaseous fuel injector comprising:
a turbine section having a gas producing section;
a combustor section being positioned in working relationship to the turbine section and having an inlet end and an outlet end, said conbustor section further having an outlet flow exiting the outlet end for driving the turbine section;
a compressor section being driven by the gas producing section of the turbine section and having an air flow therefrom, a portion of said air flow being in fluid communication with the inlet end of the combustor section;
a device for causing a flow of fuel during operation of the gas turbine engine;
said gaseous fuel injector including an outlet end having an exit surface thereon, a water injection passage being substantially centered at the outlet end and having an axis A, a plurality of gaseous fuel passages surrounding the water injection passage at the outlet end and existing beyond the exit surface and having the flow of fuel exiting therethrough during operation of the gas turbine engine;
means for directing and swirling a portion of the air flow into contact with the flow of fuel exiting the exit surface prior to entering the combustor section;
means for causing the swirling of the gaseous fuel and the combustion air flow prior to entering the combustor section;
means for causing the swirling of water at the outlet end, said means for causing the swirling of the water at the outlet end being positioned din the water injection passage; and
each of said directing and swirling means inputing an angular momentum which is aerodynamically verctorially additive.

5,146,742
ION THRUSTER FOR INTERPLANETARY SPACE MISSION
Hiroshi Iida; Kyoichi Kuriki, and Hitoshi Kuninaka, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 606,984
Claims priority, application Japan, Oct. 31, 1989, 1-285815; Oct. 31, 1989, 1-285816
Int. Cl.[5] F03H *1/00*
U.S. Cl. 60—202 4 Claims



1. An ion thruster which is operable for interplanetary space travel and comprises:
a vessel defining first, second, and third hollow spaces and a window between said first hollow space and said second and said third hollow spaces, said second hollow space having an opening open to a surrounding space;
microwave generating means for generating microwaves in said first hollow space, said first hollow space being operable as a cavity resonator for said microwaves so that a standing wave is produced in said first hollow space to penetrate into said second and said third hollow spaces through said window and to induce electric field power in said second and said third hollow spaces;
propellant supplying means for supplying a propellant to said second and said third spaces, said propellant serving as a main and a neutralizing propellant in said second and said third hollow spaces, respectively, said main propellant absorbing said electric field power to produce main plasma ions and main plasma electrons in said second hollow space; and

accelerating means adjacent to said opening for accelerating only said main plasma ions to form an ion beam and to inject said ion beam to said surrounding space through said opening;

said third space serving as neutralizing means for neutralizing said vessel by using the electric field power induced in said third hollow space and said neutralizing propellant.

5,146,743

PROCESS FOR ACCELERATING THE RESPONSE OF AN EXHAUST GAS CATALYST, AND APPARATUS AND ELECTRICALLY HEATABLE CARRIER BODIES FOR PERFORMING THE METHOD

Wolfgang Maus; Helmut Swars, both of Bergisch Gladbach; Hans-Jürgen Breuer, Overath, and Theodor Cyron, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

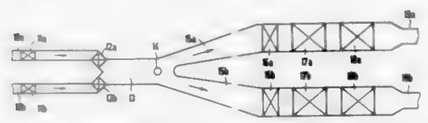
Continuation of PCT/EP89/00129, Feb. 18, 1989

This application Oct. 25, 1990, Ser. No. 604,060

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 3813928

Int. Cl.[5] F01N *3/20*

U.S. Cl. 60—274 34 Claims



1. A method of accelerating the response of an exhaust gas catalyst system downstream of an internal combustion engine, the exhaust gas catalyst system including a main catalytic converter and at least one precatalyst with a catalyst carrier body formed of sheet metal layers coated with ceramic and catalytically active material and defining a multiplicity of channels through which a fluid can flow, the catalytically active material having a given response temperature, the method which comprises:

supplying an electric current of at least 300 amperes to the metal catalyst carrier body for direct heating of the at least one precatalyst,

switching on the current for a given period of time at least as early as immediately after the onset of engine operation for raising the temperature of the at least one precatalyst to above the given response temperature.

5,146,744

ELECTRICALLY HEATABLE CATALYTIC CONVERTER INSERT

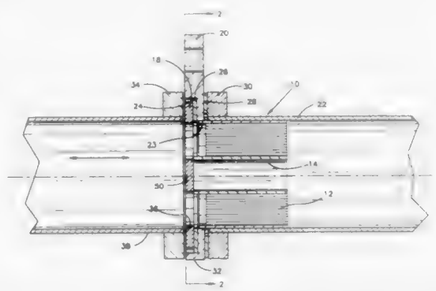
William A. Whittenberger, Garrettsville, Ohio, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 13, 1991, Ser. No. 669,110

Int. Cl.[5] F01N *3/28*

U.S. Cl. 60—300 12 Claims

1. An electrically heatable catalytic converter insert for insertion in an exhaust line from an internal combustion engine comprising a catalyst bearing corrugated thin metal polycellular honeycomb monolith dimensioned and having a circular configuration for placement within an exhaust line, said insert having a metallic central core; (b) at least one corrugated thin metal strip wrapped about said central core and having one end thereof in electrical contact therewith; (c) a peripheral metal housing in electrical contact with the other end of said at least one corrugated thin metal strip; (d) a first metallic terminal member attached to said central core and having an annular configuration, and having lug means projecting from the outer periphery for connecting to one pole of a voltage source; (e) a second metallic terminal member having a central opening and having lug means projecting from the outer periphery thereof for connecting to the other pole of the voltage source; said members (d) and (e) being electrically isolated from each



other, and at least one of said members (d) and (e) being electrically isolated from said peripheral housing.

5,146,745

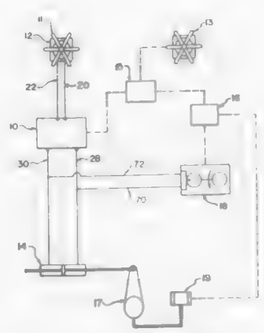
STEERING SIGNAL CONVERSION MANIFOLD

Peter Doetsch, North Vancouver, Canada, assignor to Jastram Engineering, Ltd., N. Vancouver, Canada

Filed Sep. 17, 1990, Ser. No. 583,483

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—403 20 Claims



1. A conversion manifold connectable between a hydraulic fluid supply and a hydraulic cylinder comprising:

(a) at least one inlet port for receiving hydraulic fluid from said hydraulic fluid supply;

(b) at least one outlet port for enabling delivery of hydraulic fluid from said manifold to said cylinder;

(c) a first conduit connecting said inlet port and said outlet port;

(d) an internal chamber within said manifold in communication with said first conduit;

(e) diverter means for selectively diverting hydraulic fluid from said first conduit into said internal chamber;

(f) an actuator mounted within said internal chamber responsive to variation in the flow of fluid into said internal chamber; and

(g) signal generating means cooperating with said actuator for generating an electrical signal proportional to the change in position of said actuator.

5,146,746

LOADING/UNLOADING CONTROL APPARATUS FOR INDUSTRIAL VEHICLES

Katsumi Nagai, and Teruyuki Nishimyou, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 612,193, Nov. 13, 1990, abandoned.

This application Dec. 6, 1991, Ser. No. 807,765

Claims priority, application Japan, Nov. 20, 1989, 1-299679

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—445 9 Claims

1. A loading/unloading control apparatus for an industrial vehicle comprising a variable displacement type hydraulic pump for supplying hydraulic fluid to a hydraulic actuator, said hydraulic pump having a displacement varying mechanism for regulating the discharge capacity of said pump; means for detecting the amount of load of said hydraulic actuator; means for setting the working speed of said hydraulic actuator; a selector switch connected between said load detecting means and said speed setting means for selectively outputting a signal from either said load detecting means or said speed setting means; and a controller for outputting a control signal to said displacement varying mechanism in response to a signal from said selector switch, wherein said controller, when receiving a signal from said load detecting means, outputs a control signal so as to decrease the discharge capacity of said hydraulic pump as the amount of load increases, and when receiving a signal from said speed setting means, outputs a control signal so as to obtain the discharge capacity of said hydraulic pump corresponding to the speed set by said speed setting means.

5,146,747

VALVE APPARATUS AND HYDRAULIC CIRCUIT SYSTEM

Genroku Sugiyama, Ibaraki, and Toichi Hirata, Ushiku, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01045, § 371 Date Dec. 18, 1990, § 102(e) Date Dec. 18, 1990, PCT Pub. No. WO91/02902, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 16, 1990, Ser. No. 623,644

Claims priority, application Japan, Aug. 16, 1989, 1-210043

Int. Cl.[5] F16D *31/02*; F15B *11/08*

U.S. Cl. 60—452 5 Claims

1. A valve apparatus comprising at least one directional control valve having a supply passage communicating with a hydraulic fluid supply source, a pair of load passages communicating with an actuator, a pair of variable restricting sections disposed between said supply passage and said pair of load passages and formed in an axially movable valve spool in such a manner as to continuously vary opening areas from a closed state dependent on an amount of movement of said valve spool, and a first passage located between said pair of variable restricting sections and said pair of load passages; pressure regulating means for holding a differential pressure across said variable restricting sections at a predetermined value; a detection line branched from said first passage for receiving a load pressure produced upon operation of said actuator; and a control line for introducing the load pressure led through said detection line, as a control pressure, to said pressure regulating means, said valve apparatus further comprising:

first flow control means disposed downstream of a point where said detection line is branched from said first passage, for allowing a flow of hydraulic fluid proceeding from said first passage toward the load passage corresponding to one of said variable restricting sections, but blocking off a flow of the hydraulic fluid in a reverse direction when said one variable restricting section is opened; and said pressure regulating means being a pressure compensating valve disposed between said supply passage and said pair of variable restricting sections so that an outlet pressure of said one variable restricting section and a supply pressure from said hydraulic fluid supply source are applied in a valve-opening direction, while an input pressure of said one variable restricting section and said control pressure are applied in a valve-closing direction, and said first flow control means communicating an outlet side of said one variable restricting section with said corresponding load passage directly.

5,146,748

AXLE DRIVING APPARATUS

Hideaki Okada, Takarazuka, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Continuation of Ser. No. 304,644, Feb. 1, 1989, Pat. No. 4,986,073. This application Aug. 16, 1990, Ser. No. 568,061

Claims priority, application Japan, Feb. 3, 1988, 62-24193; Mar. 9, 1988, 63-55828; Apr. 18, 1988, 63-51707

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] F16D *31/02*; B60K *17/00*

U.S. Cl. 60—454 4 Claims

1. An axle driving apparatus comprising:

a transmission casing including an upper casing and a lower casing joined together to form an enclosed transmission;

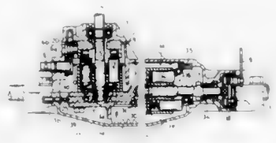
an axle disposed within said transmission casing;

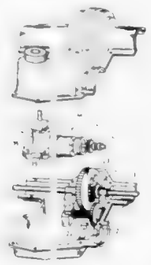
a center section enclosed within said transmission casing, said center section supporting a hydraulic pump and a hydraulic motor, wherein said hydraulic pump includes a pump shaft, and said hydraulic motor includes a motor shaft;

a closed fluid path for transfer of fluid between said hydraulic pump and said hydraulic motor provided within said center section, said closed fluid path being subjected to fluid pressure from said hydraulic pump to rotate said hydraulic motor;

a suction port provided along an exterior surface of said center section for providing fluid from within said transmission casing to said hydraulic pump, said fluid being provided through said suction port when fluid pressure within said closed fluid path is decreased due to fluid leaking from said closed fluid path into said transmission casing;

a check valve disposed at an opening of said suction port; and





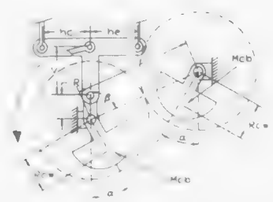
means for filtering fluid disposed within said transmission casing at another opening of said suction port, said filter means being fitted between said center section and said lower casing.

5,146,749

BALANCING TECHNIQUE FOR ROSS-TYPE STIRLING AND OTHER MACHINES

James G. Wood, 3996 Marion Johnson Rd., Albany, Ohio 45710, and Melvin A. Ross, 3169 Lake Bluff Ct., Columbus, Ohio 43235

Filed Apr. 15, 1991, Ser. No. 684,863
Int. Cl.[5] F02G *1/053*
U.S. Cl. 60—517 5 Claims



1. An apparatus for balancing inertia forces and rocking couples resulting from the approximately parallel reciprocation of a pair of unequal piston masses linked to a crankshaft and reciprocating out of phase, the apparatus comprising:

(a) a first counter balance weight mounted to the crankshaft eccentrically of the crankshaft axis of rotation and at an angle which leads the crank throw by a lead angle of more than 180°;

(b) a balance shaft mounted for rotation about an axis parallel to the crankshaft axis and drivingly coupled to the crankshaft for rotation in a direction opposite to the crankshaft rotation and at the same angular velocity, the balance shaft axis being offset and spaced from a plane extending through the crankshaft axis and oriented substantially parallel to the axes of reciprocation of the piston masses, said balance shaft being positioned on a radial of the crankshaft axis on the same side of the plane as the greater piston mass; and

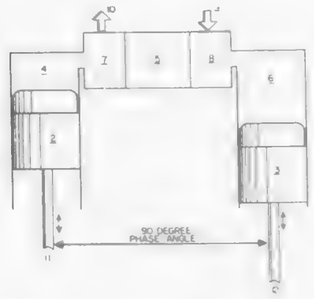
(c) a second counter balance weight mounted eccentrically to the balance shaft and having the product of its mass multiplied by the radial, eccentric offset of its center of mass equal to the product of the first counterbalance weight multiplied by the radial eccentric offset of its center of mass and positioned to lead the crank throw by said lead angle of the first counterbalance mass.

5,146,750

MAGNETOELECTRIC RESONANCE ENGINE

William M. Moscrip, Arlington County, Va., assignor to Gordon W. Wilkins, Warsaw, Va.

PCT No. PCT/US90/04744, § 371 Date Jun. 18, 1991, § 102(e) Date Jun. 18, 1991
PCT Filed Aug. 21, 1990, Ser. No. 691,003
Int. Cl.[5] F02G *1/045*
U.S. Cl. 60—517 4 Claims



1. A magnetoelectric resonance thermal machine comprising: (1) a reciprocating, multiple-piston, Alpha-type Stirling-cycle mechanical assembly having at least one pair of opposed pistons in a hermetically sealed cylinder, each piston being a mechanical oscillator having a given natural frequency of mechanical resonance harmonic with respect to the nominal electrical operating frequency of the machine and incorporating reversible electric motor/generator means operatively connected to an electrical oscillator having the same natural frequency as the mechanical oscillator; (2) an electronic quadrature phase-lock circuit incorporating a two-phase power oscillator operating in conjunction with each pair of pistons permitting their motion closely to approximate that of a classic two-degree-of-freedom spring-mass system undergoing forced damped vibration and imposing a prescribed phase angle upon both the mechanical oscillators and the electrical oscillators of the machine; (3) an ancillary external energy and mass transfer subsystem; and (4) a master microcomputer control system whereby said ancillary external energy and mass transfer subsystem is controlled to achieve automatic operation of the machine within the performance specifications of a given field of its application.

5,146,751

DUAL MASTER CYLINDER WITH COMPENSATION

Henri Savidan, Luzarches, France, assignor to General Motors France, Gennevilliers, France

Filed Aug. 24, 1990, Ser. No. 693,180
Claims priority, application United Kingdom, Sep. 14, 1989, 8920873
Int. Cl.[5] B60T *11/20*
U.S. Cl. 60—562 10 Claims

1. A dual master cylinder for the braking system of a motor vehicle comprising a bore having an open end and a closed end;

a primary portion including a primary piston slidable in the bore, a low pressure chamber within the bore and defined by the shape of the primary piston, and a compensation port opening into the low pressure chamber and connectable with a primary fluid reservoir;

and a secondary portion including a secondary piston slidable in the bore, a low pressure chamber within the bore and defined by the shape of the secondary piston, and a compensation port opening into the low pressure chamber and connectable with a secondary fluid reservoir;

a primary spring between the primary and secondary pistons;

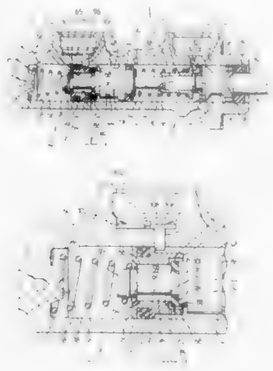
the primary portion including a high pressure chamber within the bore between the primary piston and the secondary piston, and the secondary portion including a high pressure chamber within the bore between the secondary piston and the closed end of the bore;

a seal being mounted on the primary piston between the low and high pressure chambers of the primary portion;

a seal being mounted on the secondary piston between the low and high pressure chambers of the secondary piston;

the high pressure chamber of the primary portion being fluidly connectable with the primary fluid reservoir by dilation means;

the secondary piston comprising an outer piston slidable in the bore and having the secondary piston seal mounted thereon, and a central piston, the central piston including a main body slidable in the bore and a secondary body slidable in a piston bore in the outer piston, the piston bore having a shoulder engageable with a first abutment face on the central piston during the actuation of the master



cylinder to define a check valve, the piston bore providing a fluid passage between the high pressure chamber and the low pressure chamber of the secondary portion, the check valve allowing hydraulic fluid to flow through the fluid passage during a rest mode or a release mode of the dual master cylinder, but preventing such flow during an apply mode, wherein the piston bore comprises a small diameter portion which opens into the high pressure chamber of the secondary portion and a large diameter portion, the shoulder being positioned between the large diameter portion and the small diameter portion;

wherein the large diameter portion opens into the low pressure chamber of the secondary piston;

wherein the central piston comprises an intermediate body between the main body and the secondary body and positioned within the large diameter portion of the piston bore;

and wherein the secondary body is sildably positioned in the small diameter portion of the piston bore, the first abutment face being positioned between the intermediate body and the secondary body, the secondary body having a channel in its surface;

the fluid passage being defined by the channel, and the large diameter portion; and a secondary spring in the high pressure chamber of the secondary portion contacting the closed end of the bore and the secondary body of the central piston to bias the first abutment face away from the shoulder of the bore of the central piston and wherein the axial length of the secondary body is greater than the axial length of the small diameter portion of the piston bore by a predetermined amount to define the maximum separation of the first abutment face and shoulder and wherein an abutment means projects into the low pressure chamber of the secondary portion which is engageable by shoulder means on the outer piston to ensure opening of the fluid passage in the rest mode and wherein the secondary spring has a larger diameter than the outer piston bore small diameter portion and the end of the secondary spring contacting the secondary body of the central piston is prevented from moving excessively in a return direction by the outer piston upon failure of the primary spring.

5,146,752

EXHAUST GAS TURBOCHARGER ON AN INTERNAL-COMBUSTION ENGINE

Claus Bruestle, Heimsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Dec. 6, 1990, Ser. No. 623,674
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1989, 3941715
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—602 20 Claims

1. An exhaust gas turbocharger on an internal-combustion engine, comprising a turbine for driving a compressor, adjustable guide blades adjustably arranged with respect to the turbine, an adjusting mechanism operatively arranged in a first lateral casing wall of the turbocharger for adjusting the adjustable guide blades to influence the flow conditions in the turbine, a blow-off device arranged in a second lateral casing wall of the turbocharger to guide a portion of the exhaust gases past the turbine, and a single common actuator for actuating both the adjusting mechanism and the blow-off device, wherein the adjusting mechanism includes an adjusting ring rotatable about an axis of rotation of a turbine wheel and a driving device for adjusting the guide blades.

5,146,753

TURBOCHARGED INTERNAL COMBUSTION ENGINE HAVING REDUCED HIGH SPEED EMISSIONS

Michael A. Potter, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1990, Ser. No. 553,018
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—602 1 Claim

1. An exhaust driven supercharger assembly comprising a turbine portion, having a housing with an inlet, an outlet, and an impeller rotatably supported therein, a compressor portion, having a housing with an inlet, an outlet, and an impeller rotatably supported therein, a rotor shaft extending between, and interconnecting said turbine and compressor impellers,

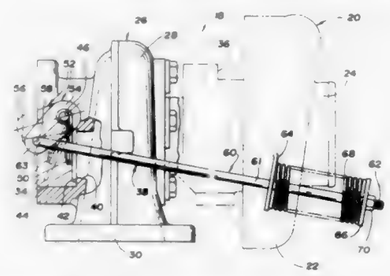
and a turbine inlet pressure deper dent wastegate apparatus for bypassing exhaust gas entering th : turbine around the impeller to limit turbine speed and comp essor output, said wastegate apparatus further comprising:

a turbine bypass, extending fr om said turbine inlet to said turbine outlet;

a valve member, disposed wit in the turbine outlet to close said bypass;

a valve shaft having a first end connected to said valve member and a second end extending through an opening in said turbine housing; and

valve biasing means comprisi g a crank member having a first end fixed to said valve haft, a second end extending radially outwardly therefro n to define a lever arm between said valve shaft and said second end of said crank



member, and a strut mech nism having a compression spring positioned between a first retaining plate fixed relative to said turbocharge assembly and a second movable retainer plate, a rod h aving a first end fixed to said movable retainer plate, and second end extending axially through said spring and an opening in said fixed retaining plate and coupled to said sec ond end of said crank member for exerting a predetermine d closing force on said valve member;

wherein turbine inlet pressure acts to open said valve member upon overcoming said predetermined closing force, thereby rotating said crank member and moving said rod axially to compress said spring; and

wherein said lever arm decrea es as said valve opens thereby reducing the closing force e xerted thereon by said biasing means.

5,146 754

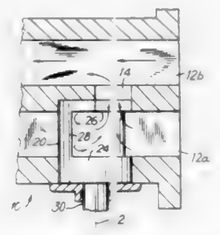
EXHAUST GAS DIVERTER FOR DIVIDED VOLUTE TURBOCHARGER OF IN TERNAL COMBUSTION ENG NE

Adish Jain, Avon; Zdenek S. Me trick, Bloomfield, and Vincent J. Pitzi, South Windsor, all of Conn., assignors to Jacobs Brake Technology Corp., Wil mington, Del.

Filed Feb. 8, 1991, Ser. No. 652,652

Int. Cl.[5] F02B *37/00*

U.S. Cl. 60—602 **5 Claims**



1. A divided volute turbocha ger diverter disposed between the exhaust manifold of an internal combustion engine and the turbine of the turbocharger comprising:

first and second volute passageways;

an interconnection passageway interconnecting said first and second volute passageways; and

a diverter member disposed in only said first of said first and second volute passageways, said diverter member being rotatable about an axis between (1) a first position in which said diverter member leaves said first volute passageway substantially unobstructed and substantially closes said interconnection passageway, thereby allowing exhaust gas to flow from said exhaust manifold to said turbine via both of said first and second volute passageways, and (2) a second position in which said diverter member blocks said first volute passageway downstream from said interconnection passageway and opens said interconnection passageway so that gas from said exhaust manifold in said first volute passageway is diverted from said first volute passageway through said interconnection passageway into said second volute passageway and is thereby added to the gas flowing from said exhaust manifold to said turbine via said second volute passageway.

5,146,755

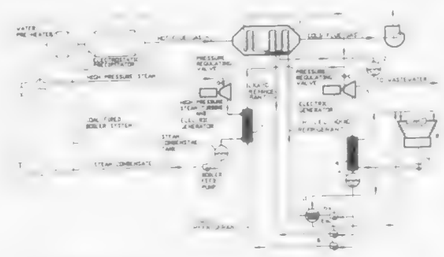
METHOD FOR REDUCING FLUE GAS ACID VAPOR EMISSIONS AND ENERGY RECOVERY

Fawzy T. Abdelmalek, 12807 Willowyck Dr., St. Louis, Mo. 63146

Filed Jan. 25, 1991, Ser. No. 645,804

Int. Cl.[5] F01K *23/04*

U.S. Cl. 60—655 **2 Claims**



1. In combination,

an electric power plant having a continuous emission of boiler flue gases;

a conduit for conducting the flue gas emissions;

a heat exchange system for absorbing heat from the flue gas to allow for flue gas condensation and collection, and for supplying that absorbed heat to a flow of liquid refrigerant to vaporize and superheat the refrigerant;

an expander through which the superheated refrigerant gas expands at lower pressure and lower saturation temperature, and drives an impeller for the generation of power;

a condenser for further cooling and condensing the saturated refrigerant gas at constant pressure;

a refrigerant pump for pressurizing and recycling the refrigerant back through the heat exchange system from the condenser;

a second refrigerant pump through which flows a portion of the refrigerant condensate under pressure from the condenser;

a steam condenser through which flows that portion of the refrigerant condensate from said second refrigerant pump to the expander; and

a steam turbine which sends high pressure steam exhaust to the steam condenser;

wherein heat from the steam exhaust is exchanged at the steam condenser, vaporizing that portion of the refrigerant condensate flowing therethrough and allowing said refrigerant to be recycled to the expander in gaseous form under pressure from said second refrigerant pump

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5,146,756

AIR SEPARATION

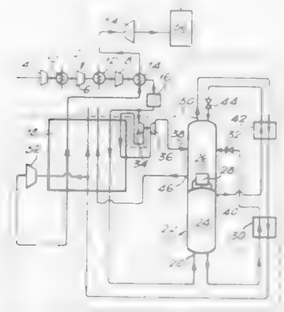
John T. Lavin, Guildford, England, assignor to The BOC Group plc, Surrey, England

Filed Jul. 11, 1991, Ser. No. 728,435

Claims priority, application United Kingdom, Jul. 12, 1990, 9015377

Int. Cl.[5] F25J *3/02*

U.S. Cl. 62—24 **8 Claims**



1. A method of separating air, comprising: reducing the temperature of the compressed air stream by heat exchange in at least one main heat exchanger to a temperature suitable for its separation by rectification; rectifying the air in a double rectification column; withdrawing an oxygen stream and a nitrogen stream from the lower pressure column of the double rectification column, and passing the oxygen and nitrogen streams through the main heat exchanger in countercurrent heat exchange relationship with the air stream; wherein the lower pressure rectification column is operated at a pressure of at least 2 bar and at least part of the nitrogen stream is expanded in a turbine and passed through the main heat exchanger countercurrently to the air stream so as to create refrigeration and maintain a mean temperature difference of at least 10K between the expanded nitrogen and the air stream being cooled in the main heat exchanger.

5,146,757

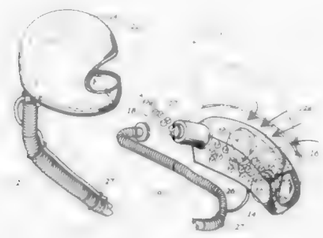
HELMET COOLING SYSTEM

David Dearing, 4945 Dana Dr., Kennesaw, Ga. 30144

Filed Jun. 18, 1991, Ser. No. 717,280

Int. Cl.[5] A42B *3/02;* **B32B** *3/00*

U.S. Cl. 62—61 **16 Claims**



1. An air cooled helmet system for use by the rider of a vehicle comprising:

a helmet;

a receptacle having an air inlet means and an air outlet means and a lower portion, said receptacle being adapted to contain an air cooling medium;

air transmission means for conveying air from said air outlet means to the helmet; and

flexible conduit means having first and second ends with said first end being connected to said lower portion of said receptacle and being connected adjacent its second end to said helmet.

5,146,758

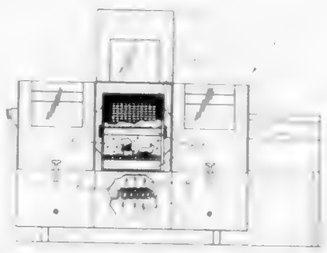
PROCESS OF PRODUCING SOFT ELASTIC GELATIN CAPSULES

Norman L. Herman, 6905 Hwy. 81, N., Piedmont, S.C. 29673

Filed Mar. 4, 1991, Ser. No. 663,567

Int. Cl.[5] F25D *25/00*

U.S. Cl. 62—62 **32 Claims**



1. A process for treating newly formed soft elastic gelatin capsules to avoid their sticking to one another and to remove matter in the form of oils, pastes, and solid particles from exterior surfaces of said capsules, comprising the steps of:

cooling said capsules to aid in preventing capsule deformation and to aid in removing aqueous moisture from exterior surfaces of said capsules; and

contacting said capsules with an absorbent material to remove said oils, pastes, and solid particles from said exterior surfaces of said capsules.

5,146,759

METHOD FOR RAPID DIRECT COOLING OF A HOT-ROLLED WIRE ROD

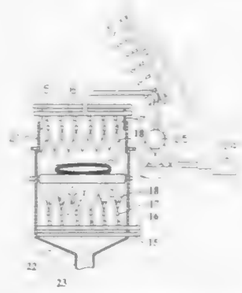
Toyoaki Eguchi; Noriyoshi Ohwada; Yutaka Sagae, and Katsumi Ito, all of Tokyo, Japan, assignors to Toa Steel Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,874

Claims priority, application Japan, Sep. 16, 1988, 63-229864; Mar. 1, 1989, 1-046625

Int. Cl.[5] C21D *1/62;* **F25D** *17/02*

U.S. Cl. 62—64 **33 Claims**



1. A method for the rapid, direct cooling of a hot-rolled wire rod, comprising the steps of:

transporting a hot-rolled and coiled wire rod on a conveyer

said wire rod being in a form of continuous series of loops; and

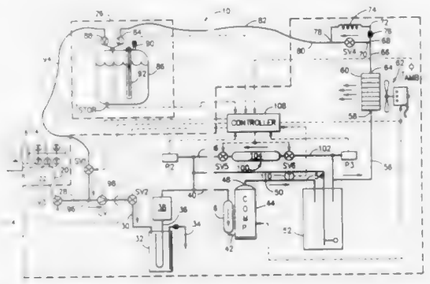
blasting an air-water mist to said wire rod and simultaneously blasting air to the back side of said wire rod from below to cool said wire rod at a cooling rate of 10° to 100° C./sec. while transporting said wire rod on said conveyer, said air-water mist providing 0.5 to 10 m^3/minute water and having an air to water ratio of 200 Nm^3/m^3 or less.

5,146,760

METHOD AND APPARATUS FOR COMPRESSOR PROTECTION IN A REFRIGERANT RECOVERY SYSTEM

Lowell E. Paige, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 17, 1991, Ser. No. 716,183
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—149 5 Claims



1. Apparatus for recovering compressible refrigerant from a refrigeration system of the type including:

compressor means for compressing gaseous refrigerant delivered thereto, said compressor means having a suction port and a discharge port

first conduit means for connecting the refrigeration system to said suction port of said compressor means;

condenser means for passing refrigerant therethrough, said condenser means having an inlet and an outlet;

second conduit means for connecting said discharge port of said compressor means with said inlet of said condenser means;

means for storing refrigerant;

third conduit means for connecting said outlet of said condenser means with said means for storing refrigerant;

fourth conduit means for connecting said means for storing refrigerant with said first conduit means;

first valve means operable between open and shut conditions, and, disposed in said first conduit means upstream from the connection of said fourth conduit means with said first conduit means;

second valve means operable between an open condition and a refrigerant expanding condition and disposed in said third conduit means;

third valve means operable between open and shut conditions and disposed in said fourth conduit means;

control means for operating the system in a refrigerant recovery mode of operation wherein, said first valve means is open, said second valve means is open, and, said third valve means is closed; and

for operating the system in a refrigerant cooling mode of operation wherein said first valve means is closed, said second valve means is in the refrigerant expanding condition, and, said third valve means is open, the improvement comprising;

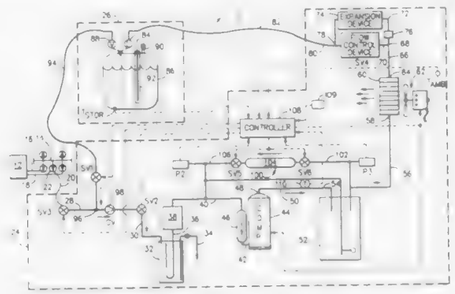
said control means further including means for operating the system in a pre-refrigerant cooling mode of operation, following a refrigerant recovery mode and before a refrigerant cooling mode, wherein, said first valve means is operated to a closed condition, said second valve means is operated to an open condition, and said third valve means is operated to an open condition.

5,146,761

METHOD AND APPARATUS FOR RECOVERING REFRIGERANT

Wayne B. Cavanaugh, Kirkville, and Lowell E. Paige, Pennellville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 17, 1991, Ser. No. 716,184
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—149 8 Claims



1. Apparatus for recovering compressible refrigerant from a refrigeration system comprising;

compressor means for compressing gaseous refrigerant delivered thereto, said compressor means having a suction port and a discharge port;

first conduit means for connecting the refrigeration system to said suction port of said compressor means;

condenser means for passing refrigerant therethrough, said condenser means having an inlet and an outlet;

second conduit means for connecting said discharge port of said compressor means with said inlet of said condenser means;

means for storing refrigerant;

third conduit means for connecting said outlet of said condenser means with said means for storing refrigerant;

fourth conduit means for connecting said means for storing refrigerant with said first conduit means;

first valve means operable between open and shut conditions and disposed in said first conduit means upstream from the connection of said fourth conduit means with said first conduit means;

second valve means operable between open and shut conditions and disposed in said fourth conduit means;

refrigerant flow control means disposed in said third conduit means said flow control means comprising;

a refrigerant expansion device having a predetermined effective refrigerant metering capability which is to small to effectively meter higher pressure refrigerants at ambient temperatures above a predetermined value; and

a flow control valve operable between an open and a. closed condition, said flow control valve having a flow passage therethrough, said flow passage being of a size that will serve as an expansion device for higher pressure refrigerants at ambient temperatures above said predetermined value, said flow passage size also being such that it will allow substantially unrestricted flow of refrigerant therethrough at ambient temperatures less than said predetermined value;

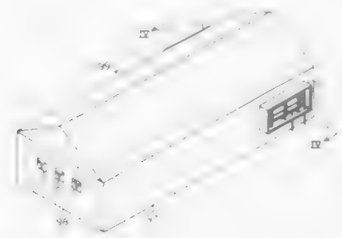
said expansion device and said flow control valve being disposed in parallel fluid flow relationship in said third conduit.

5,146,762

EVAPORATIVE COOLING SYSTEM FOR BUILDINGS

Robert C. Atkins, 3555 Agricultural Center Dr., St. Augustine, Fla. 32092

Filed Nov. 21, 1991, Ser. No. 795,496
Int. Cl.[5] B01D *47/16*
U.S. Cl. 62—171 10 Claims



1. An apparatus for cooling buildings by the evaporative cooling process, comprising:

(A) means to draw air out of a building;

(B) air ingress means to allow exterior air to be drawn into said building comprising an opening in a wall of said building and a plurality of air permeable pads positioned vertically within said opening, said pads each having an exterior face, and air ingress means positioned at substantially maximum distance from said means to draw air out of the building;

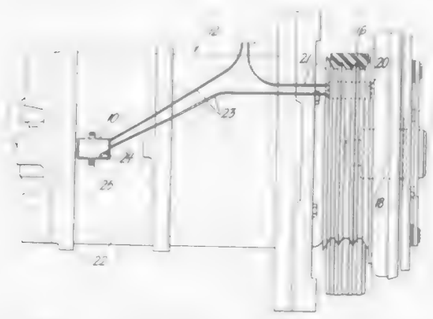
(C) an evaporative cooling assembly comprising at least one water conduit, a plurality of fogger nozzles connected to said water conduit and directed at said exterior faces of said pads, where said water conduit supplies water to said fogger nozzles, and a water and air impermeable screen extending from said wall of said building and surrounding said air ingress means, said water conduit and said fogger nozzles.

5,146,763

AIR CONDITIONING COMPRESSOR PROTECTION DEVICE

Larry D. Cummings, Clarence, and Peter S. Eros, Williamsville, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 670,624, Mar. 18, 1991. This application Dec. 12, 1991, Ser. No. 806,957
Int. Cl.[5] F25B *1/00*
U.S. Cl. 62—228.1 1 Claim



1. A refrigerant vapor compressor assembly for an automobile air conditioning system for enabling and inhibiting compressor operation, said assembly comprising:

compressor means having a housing containing a pumping mechanism for compressing refrigerant vapor,

limit means connected to said housing at a position of most significant temperature differential as determined by thermography of said housing as said mechanism approaches a failure mode from overheating so as to provide for sensing the temperature of said compressor means and for disabling said compressor means when said temperature is greater than a cut-out temperature below an abnormal operating temperature of the compressor assembly and enabling said compressor means when said temperature is less than a cut-in temperature wherein said cut-in temperature is less than said cut-out temperature representing normal operation.

5,146,764

SYSTEM AND METHOD FOR CONTROLLING A VARIABLE GEOMETRY DIFFUSER TO MINIMIZE NOISE

Bruce K. Bauman, Glen Rock, and Charles F. Boal, Greensburg, both of Pa., assignors to York International Corporation, York, Pa.

Filed Jul. 25, 1990, Ser. No. 557,009
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—228.5 22 Claims

9. A control system for a chiller system including a centrifugal compressor capable of operating at different capacities having variable pre-rotation vanes and a variable width diffuser; an evaporator heat exchanger for producing chilled water; a condenser heat exchanger; and an expansion device; the system comprising:

first means for sensing a water temperature of the chilled water produced by the evaporator heat exchanger and developing an error signal representative of a difference between the sensed water temperature and a preselected desired water temperature;

second means for sensing at least one additional operational parameter of the chiller system, the at least one additional operational parameter being indicative of the level of noise generation in the compressor;

third means for varying a position for the pre-rotation vanes;

fourth means for varying the width of the variable width diffuser;

and control means, interconnected with said first, second, third and fourth means, for periodically varying the position of the pre-rotation vanes to minimize the error signal and for periodically varying the width of the variable width diffuser to achieve acceptable noise generation and performance, according to a predetermined relationship between the additional operational parameter and the width of the variable width diffuser.

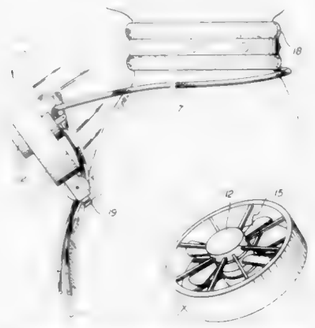
21. A method of controlling a chiller system including an evaporator heat exchanger for producing chilled water and a centrifugal compressor having a variable width diffuser section and a variable capacity, the method comprising:

selecting a desired temperature of the chilled water;

periodically sensing the temperature of the chilled water;

periodically comparing the sensed temperature with the desired temperature to obtain an error signal;
periodically varying the capacity of the compressor to minimize the error signal;
periodically sensing one or more parameters representative of the capacity of the compressor; and
periodically varying the width of the diffuser section, based upon the sensed parameter and a defined relationship between the sensed parameter and noise level, to control noise generation at an acceptable level.

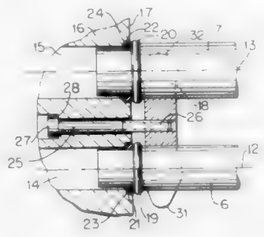
5,146,765
DEVICE FOR EVAPORATIE COOLING OF THE NECK
William A. Waters, 3648 E. 49th St., Tulsa, Okla. 74135-3102
Continuation-in-part of Ser. No. 594,164, Oct. 9, 1990, abandoned. This application Oct. 3, 1991, Ser. No. 770,484
Int. Cl.[5] F25I *23/12*
U.S. Cl. 62—259.3 24 Claims



1. An air conditioning unit for use in the cooling of persons comprising:
a fan means for blowing air in a direction including a) a frame, b) an electric motor mounted on said frame, c) a fan blade operably connected with said motor and rotatable thereby for moving air, d) a power source operably connected with said motor for actuation thereof, and e) a switch means operably connected between said power source and said motor for controlling the actuation of said motor;
a flexible element attached to said fan means and adapted to be worn around a back of a user's neck so as to suspend said frame in a position whereby the direction of the air moved by said fan means is against the neck area; and
a foam pad positioned in front of the user's neck which is moistened to cooperate with said moving air to provide evaporatively cooled air blown by said fan means to the user's neck and head, said foam pad including a mounting means for adjustably mounting said foam pad to said flexible element between said fan means and the user's neck.

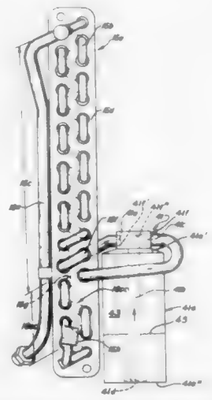
5,146,766
ANCHOR PLATE FOR FASTENING INLET AND OUTLET BRANCHES OF AN EVAPORATOR
Carlos Martins, 9, rue Dampierre 78720 Senlisse, France
Filed Oct. 15, 1991, Ser. No. 777,666
Claims priority, application France, Oct. 17, 1990, 90 12834
Int. Cl.[5] F16L *39/00*
U.S. Cl. 62—298 6 Claims

1. An anchor plate for simultaneously fastening an inlet branch and an outlet branch of an evaporator of an air conditioning installation to an expansion chamber of the same installation, where the two said branches are substantially horizontal and arranged one above the other, with each said branch having a bead for engagement by the anchor plate thereon in order to compress a sealing element between the bead and a receiving surface of the expansion chamber, the anchor plate comprising an elongated plate having means for engaging gripping means adapted to secure the anchor plate to the expansion chamber whereby to cause the former to be urged towards the expansion chamber, the said plate having two slots extending through its thickness and being open at respective opposite ends of the plate, with each said slot being configured



so as to receive a respective one of the said branches, wherein each said slot has a semi-circular base portion adapted to the circumference of the corresponding said branch, with at least a first said slot defining an aperture extending between the corresponding end of the plate and the semi-circular base portion of the same slot, the said aperture having parallel edges which are substantially tangential to the base portion, with the said edges being inclined with respect to a plane containing the geometrical centre of the two semi-circular base portions.

5,146,767
CONDENSER WITH DEHYDRATOR SUBCOOLER
Prasad S. Kadle, Getzville; Barry J. Frombgen, Lockport, and John P. Telesz, Williamsville, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed May 13, 1991, Ser. No. 699,033
Int. Cl.[5] F25B *43/00*
U.S. Cl. 62—474 3 Claims

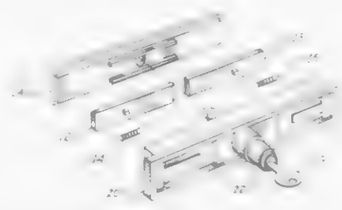


1. In a motor vehicle air conditioning system having a low pressure refrigerant vapor side including an evaporator for cooling air flow from a blower and a compressor for compressing low pressure refrigerant vapor from the evaporator and for discharging the refrigerant vapor under pressure into a condenser in a high pressure refrigerant side of the system for condensing the high pressure refrigerant vapor into high pressure liquid refrigerant for expansion across an expansion device connected to the inlet of the evaporator:
said condenser including a series of parallel tubes with return bends joined in a serpentine pattern having two inlets and two outlets; said serpentine pattern forming a plurality of refrigerant passes including a condensing section with an inlet defined by one of said two inlets of said serpentine pattern and with an outlet at one of said two outlets and a refrigerant subcooling section with an inlet defined by the other of said two inlets of said serpentine pattern and with an outlet at the other of said two outlets; and
liquid refrigerant separator means connected between said refrigerant passes for backfilling said refrigerant subcooling section with liquid refrigerant;
said liquid refrigerant separator means including a container with opposite ends; an adapter fitting on one of said opposite ends including an adapter inlet and an adapter outlet; said adapter inlet connected to said one of said two outlets; a standpipe located interiorly of said container having opposite open ends thereof; one of said open ends fluidly connected to the other of said two inlets by said adapter outlet and the other of said open ends located in close spaced relationship to the other of said opposite ends; said adapter inlet directing combined liquid and vapor refrigerant into said container and said liquid refrigerant collecting on said other of said opposite ends;
said other of said open ends being located vertically below said other of said two inlets for providing backfilling of said subcooling passes with a lesser reserve charge of refrigerant.

5,146,768
BENDABLE EARRING AND METHOD OF MAKING SAME
Connie Dichtel, 22316 Strathern St., Canoga Park, Calif. 91304
Filed Nov. 22, 1991, Ser. No. 796,560
Int. Cl.[5] A44C *7/00*
U.S. Cl. 63—14.8 2 Claims

1. An improved method of making an earring, said method comprising:
a) providing a bendable vertical straight pin having an expanded head at the upper end thereof and an opposite lower end with an integral shaft therebetween;
b) sliding a curved bead with a central passageway therethrough up over said lower pin end to a point above said lower end of said pin, said passageway being of larger diameter than said shaft and lower pin end but smaller diameter than said head;
c) coating said pin shaft just below said head with liquid settable bonding material;
d) pushing said pin down through a horizontal pad until said bead is against said head;
e) holding said bead by said pad against said head until said bonding material sets to bond said bead against said head;
f) removing said pin from said pad;
g) securing a second bead on said pin; and,
h) bending said pin into a generally U-shape with the curved surfaces of said beads opposing each other for releasably gripping an earlobe.

5,146,769
LOCKING DEVICE FOR A VIDEO GAME ELECTRONIC APPARATUS AND METHOD THEREFOR
Martin C. Smith, 18624 N. 15th Pl., Phoenix, Ariz. 85024
Continuation-in-part of Ser. No. 562,264, Aug. 3, 1990, Pat. No. 5,124,871, and a continuation-in-part of Ser. No. 716,829, Jun. 17, 1991. This application Dec. 30, 1991, Ser. No. 814,619
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—14 3 Claims



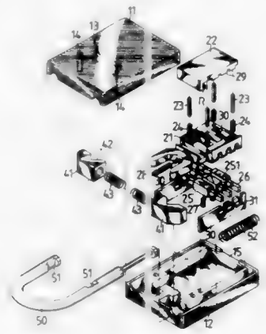
1. A combined video game electronic apparatus and locking device therefor comprising, in combination:
a video game electronic apparatus having an empty game cartridge region;
an openings located in said apparatus with an associated video game cartridge tray means for receiving a video game cartridge, said opening having side faces with recesses when said video game cartridge tray means is depressed in a lower position; and
locking device means for insertion within said opening for preventing entry of a video game cartridge in said opening comprising, in combination:
a front plate having a key mechanism with associated key slot, and having a front cavity area;
key means for placing in said key slot, which key means causes movement of said key mechanism in an unlocked position;
an actuator coupled to said key mechanism, said actuator being cylindrical in shape with a portion on an end thereof of reduced diameter;
a back plate fixedly coupled to said front plate, having hole means for allowing said actuator to pass through said back plate, and having a rear cavity area that matches up with said front cavity area in said front plate, thereby defining first and second internal cavities of said locking device means; and
first and second cams movably located respectively within said first and second internal cavities of said locking device means, having first and second spring means to provide a force which biases said first and second cams in an inward or retracted position, actuator being a separate element unattached to said first and second cams, said first and second cams positioned against said reduced diameter portion of said actuator, which causes said first and second cams to be fully retracted within said first and second internal cavities of said locking device means, said locking device means thereby being in said unlocked position, with said first and second cams positioned against said actuator such that extension of said actuator pushes said first and second cams in an outward direction, overcoming the biasing force of said first and second spring means, thereby extending said first and second cams outside said first and second internal cavities of said locking device means, thereby engaging said recesses is said side faces of said opening, said locking device means thereby being in a locked position.

5,146,770

CARD-OPERATED LOCK

Chung Yun-Sheng, No. 5, Chung Chyau 2 Street, Dah Lii Country, Taichung Hsien, Taiwan

Filed Sep. 27, 1991, Ser. No. 766,512
Int. Cl.[5] E05B *67/22, 35/04*
U.S. Cl. 70—38 C 3 Claims



1. A card-operated lock comprising:

a lock body having upper and lower housing members, a slot for inserting a card therebetween and a releasable shackle; said housing members enclosing a sliding block and a sliding plate mounted thereover, said block having three bottom blocks therein, and a front fork mounted thereon;

three letter profiles formed on the upper surface of said three bottom blocks each having an embossed or engraved letter thereon and a side lever mounted at each lateral side of each bottom block;

two retaining plates mounted on either side of said sliding block each having three chambers receiving said side levers of said bottom blocks;

shackle retaining means including two sliding pieces each having a notch with V shaped slant surfaces and a compression spring mounted within the lock body registering in on the front fork for releasably holding said shackle; and

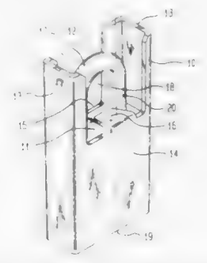
a card in the form of a rectangular strip having three embossed or hollow letters corresponding to the letters on the letter profiles whereby insertion of the card will match the letters thereon in the profiles so that the block may be moved forward whereby the front fork engages the slant surfaces to release the shackle by urging said sliding pieces together.

5,146,771

SECURITY SHIELD FOR PADLOCKS

Robert W. Loughlin, P.O. Box 29, Stanton, N.J. 08885

Filed Jun. 3, 1991, Ser. No. 709,491
Int. Cl.[5] E05B *67/38*
U.S. Cl. 70—56 1 Claim



1. A protective shield for a shackle padlock having a lock body of a predetermined configuration and a U-shaped shackle member having a leg swingably carried by said lock body, said shackle member being movable longitudinally relative to said lock body between a closed, locked position and an open, unlocked position, and said shackle member being freely swingable about said leg when said shackle member is in said open, unlocked position, said protective shield comprising:

a hollow substantially tubular member, having four walls and open at both ends, adapted to receive said shackle padlock within the interior thereof, said hollow tubular member having a hollow interior of the same cross-sectional configuration as said predetermined configuration of said lock body, and the longitudinal dimension of said tubular member being greater than the longitudinal length of said shackle member when said shackle member is in said closed position:

said tubular member having a wall with at least one clearance opening therein which extends from one end of said tubular member toward the other end of said tubular member, said clearance opening being sized and arranged in said wall so that said shackle member may freely swing through said clearance opening when said shackle member is in said open, unlocked position: and

a tab projecting from a first wall portion of said tubular member into said interior of said tubular member toward a second opposite wall portion of said tubular member for limiting longitudinal movement of said shackle padlock relative to said tubular member, said tab being dimensioned and arranged so as to be disposed in interfering relationship between said lock body and said shackle member when said shackle member is in said closed, locked position, and yet spaced from said second wall portion a sufficient distance to permit passage of said shackle member between said second wall portion and said tab when said shackle member is in said open, unlocked position and swung toward said second wall portion to thereby permit assembly and disassembly of said shackle padlock in said protective shield.

5,146,772

VEHICLE DOOR LOCK DEVICE

Yoshikazu Hamada, and Yozo Ogino, both of Utsunomiya, Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,599
Claims priority, application Japan, Feb. 22, 1990, 2-41638
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] E05B *65/36*
U.S. Cl. 70—264 4 Claims

1. A vehicle door lock device comprising a synthetic resin body having a front side and a rear side and being provided with a latch rotatably engaged with a striker at the vehicle body ad a ratchet preventing said latch from reverse-rotating,

a back plate attached to the rear side of the synthetic resin body,

a lock lever installed between said back plate and the synthetic resin body so as to change-over the lock device between its locked condition and unlocked condition,

an actuator box of synthetic resin having a front side and a rear side, installed below the synthetic resin body for containing a power source for changing-over the lock lever,

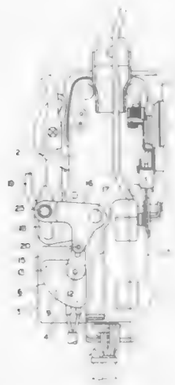
a switch box adjacent the rear side of the actuator box, and a switch body in said switch box,

a rotation shaft protruding rearward from said switch body through said switch box,

a switch are mixed on the protruded portion of the rotation shaft, and

a connecting lever having an end connected to the switch arm and another connected to a key cylinder of the door or the lock lever,

wherein said switch body is electrically connected to lock devices of other doors so as to function cooperatively with motions of the key cylinder or the lock lever and output control signal for changing-over the lock devices of the other doors between a locked condition and an unlocked condition.



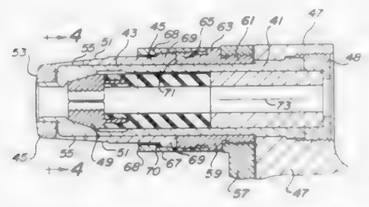
lock devices of other doors so as to function co-operatively with motions of the key cylinder or the lock lever and output control signal for changing-over the lock devices of the other doors between a locked condition and an unlocked condition.

5,146,773

TAPERED ROTATABLE OFFSET NOSE ASSEMBLY

Hendrik E. Rosier, Kingston, N.Y., assignor to Huck Manufacturing Co., Irvine, Calif.

Filed Jul. 19, 1991, Ser. No. 732,864
Int. Cl.[5] B21J *15/30*
U.S. Cl. 72—391.4 6 Claims



1. An offset nose assembly for use with a fastener installation tool powered by a piston movable within a cylinder along an actuator axis, said assembly comprising:

anvil means having a tapered end portion which includes a pair of substantially flat opposed side surfaces which extend along and define a reduced material section diverging forwardly along said end portion of said anvil means each of said side surfaces having a hole formed therein;

collet means slidable within said anvil means and having a portion exposed by each said hole;

jaw means carried by said collect means and movable along an axis radially spaced from said actuator axis; and

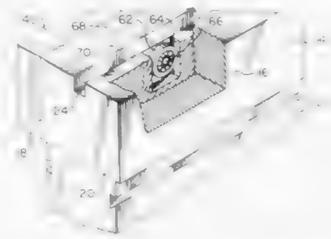
mounting means for rotatably mounting said anvil means on said nose assembly for selective orientation of said end portion around said offset axis.

5,146,774

LIFT MECHANISM FOR INSTALLATION AND REMOVAL OF PRESS BRAKE DIES

Dana C. Smith, Benton, Kans., assignor to Uniflo Conveyor, Inc., Wichita, Kans.

Filed Feb. 27, 1991, Ser. No. 661,883
Int. Cl.[5] B21J *13/00*
U.S. Cl. 72—446 22 Claims



1. A mechanism for disengaging and installing a press brake die having a lower tang on the lower surface of a press brake, the mechanism comprising:

press brake die tang receiving and holding means in the form of a groove having a lower longitudinal surface;

a plurality of spaced apart openings defined along the length of said lower longitudinal surface of said groove of said press brake die receiving and holding means, each said opening terminating at said lower surface of said groove of said press brake die receiving and holding means, said termination of each said opening being substantially adjacent to any press brake die tang which may be received and held by said groove of said press brake die receiving and holding means;

a plurality of means for engaging the bottom of a tang of a press brake die, each said press brake die tang bottom engaging means being located within one said opening, each said press brake die tang bottom engaging means normally being within its said opening below said lower surface of said groove of said press brake die receiving and holding means, but capable of movement out of its opening and above said lower surface of said groove of said press brake die receiving and holding means to thereby engage the bottom of any press brake die tang which is received and held by said press brake die receiving and holding means, whereby any such die will be moved away from and out of contact with said groove of said press brake die receiving and holding means; and

means for moving said plurality of press brake die bottom engaging means above said lower surface of said groove of said press brake die receiving and holding means to thereby engage the bottom of any press brake die tang which is held by said groove of said press brake die receiving and holding means, and move any such die tang away from and out of contact with said lower surface of said groove of said press brake die receiving and holding means.

5,146,775

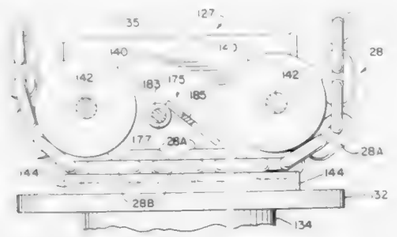
CHAIN LINER

James G. Ballard, Waukesha, and Craig A. Wisner, Wauwatosa, both of Wis., assignors to Hein-Werner Corporation, Waukesha, Wis.

Division of Ser. No. 619,257, Nov. 28, 1990. This application Dec. 12, 1991, Ser. No. 806,722
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—447 5 Claims

1. A chain liner assembly for maintaining the relation of the links of a chain, said assembly comprising a base plate, a pair of brackets mounted in a parallel spaced relation on said base plate, a chain sprocket mounted at each end of said brackets,

and a pair of blocks mounted on said base plate beneath each of said sprockets in a spaced relation to said sprockets for defining



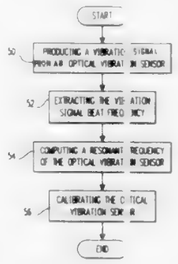
a channel for each vertical link in the chain and a horizontal plane for supporting each horizontal link.

5,146,776

METHOD FOR CONTINUOUSLY CALIBRATING AN OPTICAL VIBRATION SENSOR

Michael Twerdochlib, Oviedo, and Richard B. Chianese, Altamonte Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 26, 1990, Ser. No. 618,135
Int. Cl.[5] G01D *18/00;* **G01N** *29/22, 29/12*
U.S. Cl. 73—1 DV **15 Claims**



1. A method for calibrating a vibration sensor attached to equipment, comprising the steps of

(a) obtaining a vibration signal, corresponding to vibration of the equipment, from the vibration sensor;

(b) extracting a beat frequency vibration signal having a beat frequency from the vibration signal obtained in step (a);

(c) computing a resonant frequency of the vibration sensor in dependence upon the beat frequency extracted in step (b); and

(d) calibrating the vibration sensor in dependence upon the resonant frequency computed in step (c).

5,146,777

DEVICE FOR DETECTING PINKING, CYLINDER BY CYLINDER, IN A MULTI-CYLINDER OTTO ENGINE

Gino Polito, Voghera; Franco Malberti, Torre D'Isola, and Franco Salerno, Alpignano, all of Italy, assignors to Marelli Autronica SpA, Milan, Italy

Filed Oct. 3, 1990, Ser. No. 592,401
Claims priority, application Italy, Oct. 3, 1989, 67846 A/89
Int. Cl.[5] G01L *23/22*
U.S. Cl. 73—35 **6 Claims**

1. A device for detecting pinking in a multi-cylinder Otto engine, comprising:

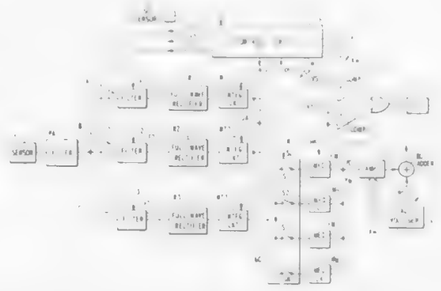
a sensor which is intended to be associated with the engine for generating a signal with a noise component and a useful signal component whose spectrum has peaks indicative of pinking in a plurality of frequency ranges;

at least first and second signal processing channels connected to the sensor, for each combustion phase of the engine, to supply respective first and second detection signals representative of the useful signal component in first and second frequency ranges respectively;

a third signal-processing channel also connected to the sensor, in each combustion phase of the engine, to supply a third detection signal representative of the noise component in a frequency band different from the aforesaid frequency ranges;

comparison and processing means arranged to generate a signal indicative of pinking on the basis of comparisons carried out on data derived from the first, second and third detection signals;

multiplexer means having an input connected to the output of the third channel and a plurality of outputs, each of which is associated with a corresponding cylinder of the engine, the multiplexer means, in each combustion phase, providing a sample of the third detection signal at its output associated with the cylinder which is in the combustion phase;



a respective filter and memory device being connected to each output of the multiplexer means for supplying to the comparison and processing means an averaged signal indicative of a weighted average of at least those samples of the third detection signal received lastly and penultimately, the comparison and processing means being arranged, in each combustion phase, to generate the signal indicative of pinking on the basis of comparisons carried out on the first and second detection signals and the averaged signals supplied by the filter and memory devices;

wherein each of the signal-processing channels includes respective input band-pass filter and a rectifier connected in cascade, and each of the channels downstream of the respective rectifier includes a respective integrator, the output of the integrator of the third channel being connected to the input of the multiplexer means, and

wherein comparison and processing means are arranged to output a signal indicative of pinking during a combustion phase of a cylinder, when the signal provided by the integrator of either the first or second channel exceeds a reference signal which depends on the averaged signal corresponding to that cylinder.

5,146,778

OIL AND/OR WATER DETECTION APPARATUS

Charles J. Hsu, Box 460 Grand Central Station, New York, N.Y. 10017

Filed Dec. 26, 1990, Ser. No. 634,024
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—61.41 **14 Claims**

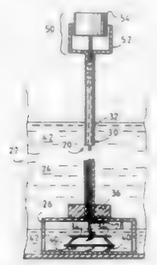
1. Apparatus for detecting the pesence of oil or water on a surface, under a surface or at the bottom of a liquid-containing tank, comprising:

an expandable absorbent material;

a housing having an upper and a lower surface and a plurality of openings, including an opening in said upper surface, said housing containing said expandable absorbent material therein;

a hollow rod extending from said opening in said upper surface of said housing;

a wire running through said hollow rod with a first end of said wire extending into said housing and said wire having a second end;



a weighted member affixed to said first end of said wire within said housing; and,

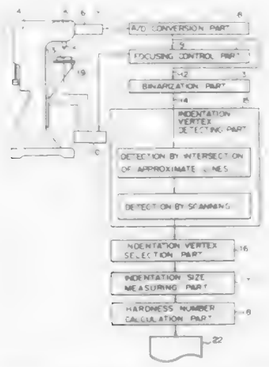
means for signalling the presence of oil or water, said signalling means being activated by a pressure on said wire, said pressure being exerted by an expansion force, against said weighted member, created by said expandable absorbent material when having expanded upon the absorption of the liquid substance sought to be detected.

5,146,779

INDENTATION HARDNESS TESTER

Takao Sugimoto, Sagamihara; Takehiro Nishimura, Muroran; Yohichi Fujikake, and Akiomi Yamaguchi, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 576,968, Sep. 4, 1990, abandoned. This application Dec. 16, 1991, Ser. No. 807,734
Claims priority, application Japan, Sep. 5, 1989, 1-230053
Int. Cl.[5] G01N *3/48*
U.S. Cl. 73—81 **10 Claims**



1. An indentation hardness tester for determining the hardness number of a testing piece even when the indentation formed in the testing piece is incorrectly aligned and/or shaped, said indentation hardness tester comprising:

a testing machine for forming an indentation on a testing piece by indenting a surface of the testing piece with a pyramid shape indenter under a predetermined indenting load;

a camera attached to a microscope for picking up a two-dimensional image of said indentation;

conversion means for converting the two-dimensional image into a binary image of said indentation;

an indentation vertex determining means for determining two-dimensional positions of vertices and a center of said indentation regardless of alignment and shape of the indentation formed in the testing piece based on said binary image;

an indentation size measuring means for measuring diagonal lengths of said indentation based on said determined two-dimensional positions of the vertices of said indentation; and

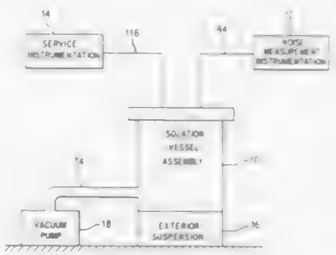
a hardness number calculation means for calculating a hardness number base don the diagonal lengths and said predetermined indenting load.

5,146,780

VACUUM-ISOLATION VESSEL AND METHOD FOR MEASUREMENT OF THERMAL NOISE IN MICROPHONES

Allan J. Zuckerwar, and Kim Chi T. Ngo, both of Newport News, Va., assignors to The Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 7, 1991, Ser. No. 773,376
Int. Cl.[5] G01K *7/30*
U.S. Cl. 374—175 **28 Claims**



17. A vibration and acoustic isolation vessel, comprising:

an outer vessel;

an inner vessel suspended within said outer vessel and being vacuum sealed, said inner vessel adapted to support a test microphone for use in recording thermal noise data in the inner vessel; and

a vacuum system coupled to said outer vessel for creating a vacuum between said outer vessel and said inner vessel.

5,146,781

TREATMENT OF METAL SLABS

Geoffrey Wilson, and Timothy J. Bradshaw, both of Sheffield, England, assignors to Davy McKee (Sheffield) Limited, Sheffield, England

PCT No. PCT/GB89/00987, § 371 Date Feb. 19, 1991, § 102(e) Date Feb. 19, 1991, PCT Pub. No. WO90/02004, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 24, 1989, Ser. No. 659,350
Claims priority, application United Kingdom, Aug. 26, 1988, 8820296
Int. Cl.[5] B21B *15/00, 39/24;* **B21D** *31/06*
U.S. Cl. 72—206 **9 Claims**

1. Apparatus for reducing the width of a hot metal slab (6) comprising:

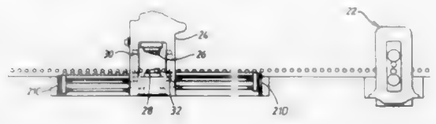
means for presenting the slab (6) to a pressing machine (24) for applying forces to the edges of the slab (6) and adapted to incrementally displace the slab (6) forward after each application of the forces to reduce the width along its whole length,

a rolling mill (22), and means for presenting the slab (6) to

the rolling mill (22) subsequent to the width reduction, in which

the pressing machine (24) has vertically acting platens at least one of which is vertically movable whereby, when the slab (6) is presented to the pressing machine (24) with its width dimension vertical, the forces are applied to the top and bottom edges of the slab (6);

the means for presenting the slab (6) to the pressing machine (24) includes a press roller table (21),



the means for presenting the slab (6) to the rolling mill (22) comprises a mill roller table (20) and

the press roller table (21) and the mill roller table (20) are arranged in parallel and a turning means is adapted to move the slab (6) from the press roller table (21) and deposit the slab (6) on the mill roller table (20) in a condition with its width dimension horizontal.

5,146,782

FLOWMETER

Torben B. Rasmussen, Thorsgade 68, 3. th., DK-2200 Copenhagen N, Denmark

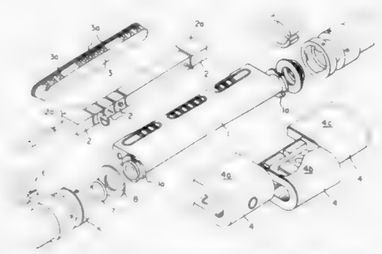
PCT No. PCT/DK88/00176, § 371 Date Jun. 13, 1990, § 102(e) Date Jun. 13, 1990, PCT Pub. No. WO89/04464, PCT Pub. Date May 18, 1989

PCT Filed Nov. 1, 1988 Ser. No. 488,057

Claims priority, application Denmark, Nov. 13, 1987, 5965/87

Int. Cl.[5] G01F *15/18*

U.S. Cl. 73—273 8 Claims



1. A gas-flow meter which is disposed between adjacent sections of a straight portion of a gas piping having a piping longitudinal axis comprising:

a central elongate housing which is connected between the adjacent sections of the piping and which is symmetrically located about a plane including the longitudinal axis of the piping, said elongate housing including therein

a central gas passage about the longitudinal axis,

a plurality of sensor modules arranged in a row adjacent said central passage which are adapted to measure characteristics of a gas flowing in the gas piping including flow and to generate measuring signals indicative of the measured characteristics, and

a distribution strip which is arranged along said plurality of sensor modules in electrical contact therewith upon engagement with said sensor modules such that said distribution strip serves to conduct the measuring signals of said sensor modules; and

a plurality of electronic processing units mounted about said elongate housing and in electrical contact with said distribution strip whereby the measuring signals conducted from said sensor modules are processed and processed signals from said units are thus produced, said units being shell shaped with an open longitudinal side so as to fit onto and about a corresponding portion of said elongate housing and make electrical contact with said distributor strip upon being fit onto said housing.

5,146,783

LIQUID CONTAINER HYDROSTATIC LEVEL GAUGE

Walter Jansche, Durmersheim; Erich Zabler, Stutensee, and Anton Dukart, Maximiliansau, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

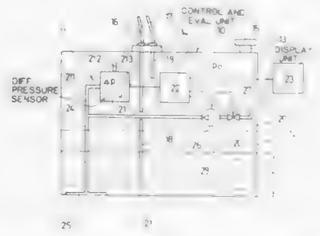
PCT No. PCT/DE90/00265, § 371 Date Jan. 2, 1991, § 102(e) Date Jan. 2, 1991, PCT Pub. No. WO90/13796, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 5, 1991, Ser. No. 634,226

Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914637

Int. Cl.[5] G01F *23/18*

U.S. Cl. 73—301 16 Claims



1. A liquid container hydrostatic liquid level gauge, in particular a fuel tank liquid level indicator, which has a differential pressure sensor and a control and evaluation unit that determines an instantaneous liquid level in said liquid container from electrical output signals of the differential pressure sensor and a display unit outside of said liquid container for displaying the instantaneous liquid level, said liquid level indicator is disposed in an interior of said container and includes a meter tube (24) of small diameter, open at a face end juxtaposed a bottom of said liquid container and extending from an upper end disposed above a maximum liquid level (20') in said liquid container to juxtapose the container bottom (121) and at an onset of measurement is filled with liquid up to the liquid level of the container (20), said differential pressure sensor (21) is provided with a first meter input connection (211) to which said upper end of the meter tube (24) is connected and a second meter input connection (212) which is open to an air pressure (p_0) which air pressure also acts upon the surface of the liquid; a zero point displacement output signal (U_0) is stored in memory in the control and evaluation unit (22) when the meter tube (24) is filled with liquid up to the instantaneous liquid level, then an air pump (26) is connected to an upper end portion of the meter tube (24) at a position above the maximum liquid level, said air pump pumps air into said meter tube (24) above the instantaneous liquid level which for liquid level measurement forces out the liquid about said face end to evacuate the meter tube (24), and that a liquid level determination in the control and evaluation unit (22) is effected from a difference between an output signal (u(t)) of the differential pressure sensor (21) with the meter tube (24) evacuated and said stored zero point displacement output signal.

5,146,784

SENSOR FOR MEASURING LIQUID-LEVEL CHANGES IN STORAGE TANKS

Joseph W. Maresca, Jr., Sunnyvale, Calif.; James W. Starr, Bound Brook, and Richard F. Wise, Manville, both of N.J., assignors to Vista Research, Inc., Mountain View, Calif.

Filed Mar. 4, 1991, Ser. No. 664,320

Int. Cl.[5] G01F *23/60*; H01F *21/06*

U.S. Cl. 73—313 7 Claims

1. A device for measuring level changes in a storage tank containing a liquid product, comprising:

(a) float means to track vertical displacement of the surface of said liquid product;

(b) linear variable differential transducer sensor means including a linear variable differential transducer coil assembly and a linear variable differential transducer core;

(c) adjustable vertical mounting means for positioning said linear variable differential coil assembly at any vertical distance below the surface of said liquid product in said storage tank; and

(d) connection means for rigidly connecting said float means to said linear variable differential transducer core, said core positioned below the surface of said liquid product and the combined center of gravity of said float, said connection means, and said core lying below the combined center of buoyancy of said float, said connection means, and said core, thereby permitting said core to move in relation to said coil assembly with changes in the height of said float means on the liquid product surface.

5,146,785

FLUID LEVEL SENSOR WITH STAIR STEP OUTPUT

Richard E. Riley, Riverside, Calif., assignor to Spectrol Electronics Corp., Ontario, Calif.

Filed Jan. 30, 1991, Ser. No. 647,751

Int. Cl.[5] G01F *23/70*

U.S. Cl. 73—313 24 Claims

1. A liquid level sensor for providing a variable resistance corresponding to fluid level in a container, said sensor comprising:

a conductive strip having a first and a second surface;

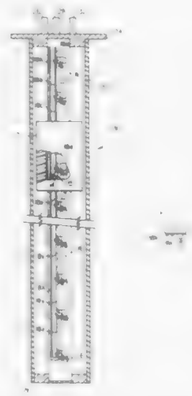
an insulator attached to and substantially covering said first surface of said strip;

first, second, and third conductive segments mounted end to end on said insulator in non-touching substantially linear arrangement;

a first resistive device attached to said insulator and electrically connected between said first conductive segment and said second conductive segment;

a second resistive device attached to said insulator and electrically connected between said second conductive segment and said third conductive segment;

a float including a hole therethough for receiving said strip, said float disposed about said strip and movable in response to the fluid level in the container;



electrical contact means attached to said float for electrically connecting said second surface of said strip and one of said first, second, or third conductive segments when said float is positioned about said strip

wherein said first and second resistive devices are discrete resistors connected in series.

5,146,786

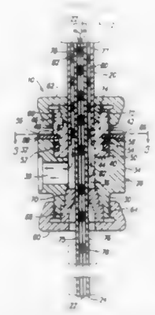
ROTARY UNION FOR USE WITH ULTRASONIC THICKNESS MEASURING PROBE

Henry D. Nachbar, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 7, 1991, Ser. No. 660,183

Int. Cl.[5] G01N *29/26*

U.S. Cl. 73—623 14 Claims



1. A rotary union for use with an ultrasonic probe which utilizes electricity and water for operation supplied by an electrical cable within a water supply tube in defining an annular arrangement positioned within a connector element connected to said ultrasonic probe and adapted to be extended from within said union, said rotary union comprising:

(a) a stationary body having a lower end portion, an opposite upper end portion, a bore extending through said body from said lower to said upper end portions and an outlet drain extending between said bore and an outer side wall

of said body for draining water utilized by said ultrasonic probe;

(b) a rotatable fitting rotatably mounted within the upper end portion of said body and having a bore extending therethrough and aligned with said bore of said body to thereby permit said annular arrangement and said connector element to pass through said body and said fitting bore;

(c) lower sealing means for sealing said annular arrangement to said lower end portion of said body; and

(d) upper sealing means for sealing said connector element to said fitting and permitting said connector element and said ultrasonic probe connected thereto to rotate with said fitting relative to said body;

said lower and upper sealing means permitting water to be introduced through said annular arrangement for operation of said ultrasonic probe and thereafter discharged between said annular arrangement and said connector element to said outlet drain.

5,146,78

PRESSURE MICROSENSOR

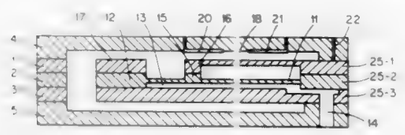
Isabelle Thomas, and Pierre O. Lefort, both of Valence, France, assignors to Sextant Avionique, Meudon-la-Foret, France

Filed Jul. 19, 1991, Ser. No. 732,193

Claims priority, application France, Jul. 20, 1990, 90 09468

Int. Cl.[5] G01L *11/00*

U.S. Cl. 73—704 **6 Claims**



1. A pressure microsensor comprising between two plates of insulating material:

a bottom silicon plate (**3**) forming a base,

a middle silicon plate (**2**) constituting a diaphragm (**11**) surrounded by a frame (**12**), a first part (**15**) of a stud being formed at a decentred location of the diaphragm,

a top silicon plate (**1**) comprising a frame (**17**) corresponding to that of the middle plate, a second part (**16**) of said stud and a silicon blade (**18**) constituting a resonator connecting the top of the stud to a high area of the frame, a measuring interval (**13**) being provided between the diaphragm and the bottom plate, this interval comprising an access (**14, 28**), and the two insulating plates (**4, 5**) cooperating with the border of the three assembled silicon plates to form a closed cavity.

5,146,78

APPARATUS AND METHOD FOR A TEMPERATURE COMPENSATION OF A CATHETER TIP PRESSURE TRANSDUCER

John W. Raynes, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 25, 1990, Ser. No. 602,571

Int. Cl.[5] G01L *9/06, 19/04*

U.S. Cl. 73—708 **7 Claims**

1. A compensation circuit for a resistance bridge with a pair of arms, wherein each arm includes a pair of resistors, one of which increases with strain, and another of which decreases with strain comprising:

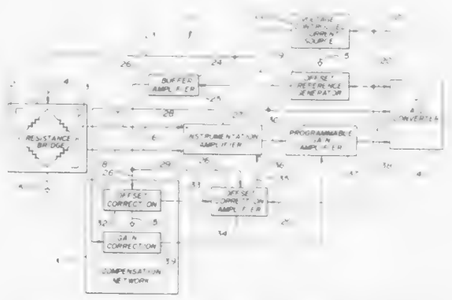
a) a power input, a ground reference, a positive signal output and a negative signal output of the resistance bridge providing a response across the signal outputs as a function of pressure applied to the resistance bridge and an electrical signal applied to the power input;

b) an offset reference generator to receive a fixed circuit reference voltage for generating a reference offset voltage;

c) a voltage controlled current source connected across the power input and the ground reference, the voltage controlled current source having a bridge excitation output current directly proportional to the fixed circuit reference voltage;

d) a buffer amplifier having a buffer input connected to the power input, the buffer amplifier configured as a voltage follower generating a buffer output voltage proportional to the power input voltage;

e) an instrumentation amplifier with a positive terminal and a negative terminal connected to the positive signal output and negative signal output respectively to generate an initial output proportional to the response of the signal outputs;



f) a compensation network having an offset correction part to receive the buffer output voltage and the ground reference, for generating an initial offset current wherein the buffer output voltage varies proportionately to temperature change of the resistance bridge providing a temperature dependent part of the initial offset current;

g) an offset correction amplifier for receiving the initial offset current, the buffered output voltage, and the fixed circuit reference voltage, for generating a correction signal to counteract an offset error in the response of the signal outputs wherein the buffer output voltage and the initial offset current both vary proportionately to temperature change in the resistance bridge and thereby provide a temperature dependent part of the correction signal; and

h) a reference input of the instrumentation amplifier connected for receiving the correction signal to modify the initial output in response to the correction signal.

5,146,789

TURBINE FLOWMETER

Takashi Kato, Kawasaki; Yutaka Morita, Takarazuka; Takeshi Yamaguchi, Kyoto; Kazuo Tsuge, Yokohama; Kyoji Imamura, Tokyo; Yoshio Kawai, Yokohama; Hiroaki Hasegawa, Yokohama, and Hiroyuki Amemori, Kawasaki, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 469,277, Jan. 24, 1990, abandoned, which is a division of Ser. No. 310,748, Feb. 14, 1989, Pat. No. 4,903,533, which is a continuation-in-part of Ser. No. 106,175, Sep. 30, 1987, Pat. No. 4,918,996. This application Dec. 3, 1990, Ser. No. 621,584

Claims priority, application Japan, Sep. 30, 1986, 61-150145[U]; Sep. 30, 1986, 61-231527

Int. Cl.[5] G01F *1/10*

U.S. Cl. 73—861.91 **9 Claims**

1. A turbine flowmeter comprising:

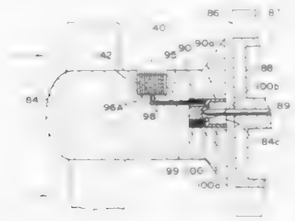
an impeller rotatably provided within a flow passage through which a fluid to be measured flows, said impeller comprising a rotary shaft which rotates together with said impeller;

a pair of bearing means having bearing surfaces for axially supporting said rotary shaft;

a holding means for holding said bearing means and provided on the flow passage;

an oil accumulating space defined by an end portion of said rotary shaft and bearing surfaces facing respective sides of the end portion;

an oil accumulating means provided on said holding means and filled with the lubricating oil to be supplied to said oil accumulating space; and



an oil supplying means for supplying oil to said oil accumulating space which means comprises a capillary means connected on one end direct to said oil accumulating means and communicated on the other end to said space, wherein the lubricating oil is supplied to said space via said oil supplying means from oil accumulating means by capillarity introduced in said oil accumulating means and said space by the action of said capillary means, and wherein the surface tension of the lubricating oil in said space is equal to or larger than the surface tension of the lubricating oil in said oil accumulating means.

5,146,790

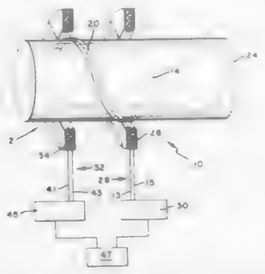
TORQUE SENSOR

Gordon E. Fish, Verona, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 4, 1990, Ser. No. 532,484

Int. Cl.[5] G01L *3/02*

U.S. Cl. 73—862.336 **2 Claims**



2. A method for measurement of torque in a shaft comprising:

(a) attaching a first magnetic strain gage and a second magnetic strain gage to said shaft, said first and second magnetic strain gages comprising respectively, first and second sense coils and first and second magnetostrictive, soft ferromagnetic elements and being operative to sense a change in the coercive field of said ferromagnetic elements, said first magnetic strain gage being operative to measure strain along a first helical direction of said shaft and said second magnetic strain gage being operative to measure strain along a second helical direction of said shaft having chirality opposite to that of said first helical direction; and

(b) measuring the strains indicated by said first and said second magnetic strain gages by subjecting each of said first and second ferromagnetic elements to cyclic alternating magnetic fields having substantially equal magnitudes at each of said first and second ferromagnetic elements and sensing the difference in phase of the voltage peaks induced in said first and second sense coils.

5,146,791

APPARATUS AND METHOD FOR MEASURING A SPINDLE FORCE

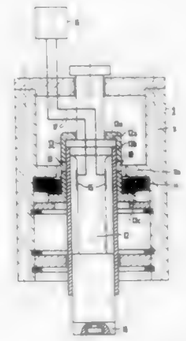
Martin Peter, and Markus Reismann, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1990, Ser. No. 622,940

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1990, 9006338[U]

Int. Cl.[5] G01L *5/12*

U.S. Cl. 73—862.49 **11 Claims**



1. Measuring apparatus for determining a force exerted by a spindle associated with a spindle housing, comprising a measuring apparatus housing to be firmly connected to the spindle housing, a plunger being disposed in said measuring apparatus housing for being acted upon by a force exerted by the spindle, a mechanical spring braced against said measuring apparatus housing and operatively connected to said plunger, and a strain gauge disposed on said plunger.

5,146,792

SAMPLING DEVICE WITH A VALE UNIT AND A RECEIVING UNIT

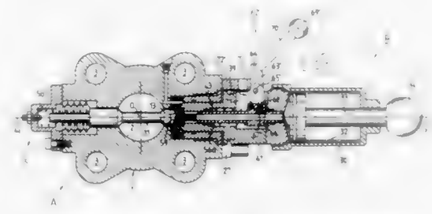
René Iff, Lostorf, Switzerland, assignor to Neotech AG, Hombrechtikon, Switzerland

Filed Jan. 7, 1991, Ser. No. 638,608

Claims priority, application Switzerland, Jan. 30, 1990, 285/90

Int. Cl.[5] G01N *1/00*

U.S. Cl. 73—863.86 **12 Claims**



1. A sampling device having a valve unit arranged at a

conduit and a receiving unit arranged in a removable manner at said valve unit for receiving a sample of a fluid flowing in said conduit and in a bore hole of said valve unit, said valve unit having a valve head that is spring biased in a closing direction of said valve unit, said receiving unit having a closure head that is spring-biased in a closing direction of said receiving unit, said valve unit being constructed to be opened by actuation of said valve head is a direction which is opposed to the closing direction and directed towards said bore hole of said valve unit, and said receiving unit being constructed to be opened by actuation of said closure head in a direction which is opposed to the closing direction of said receiving unit and directed towards the bore hole of said valve unit when the receiving unit is arranged at said valve unit, and the receiving unit when arranged at the valve unit being effectively connected therewith in a sealing manner, said sampling device comprising a single actuating device for the simultaneous actuation of said valve unit and said receiving unit, said actuating device being effectively connected with said closure head of said receiving unit for opening said receiving unit and having a locking device effectively connected with said valve unit and said receiving unit and adopted to allow an opening of said closure head of said receiving unit only if said receiving unit is arranged at said valve unit in a predetermined actuating position.

5,146,794

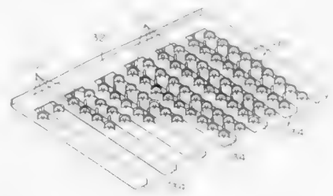
FILTER PUNCH AND FILTER COLLECTION SYSTEM

Donald B. Rising, Stowe; Kenneth G. Desilets, Westford, and Thomas Zermani, Concord, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 583,428, Oct. 15, 1990, Pat. No. 5,062,308, which is a division of Ser. No. 169,523, Mar. 17, 1988, Pat. No. 4,974,462. This application Jul. 17, 1991, Ser. No. 731,574

Int. Cl.[5] **G01N** *1/04*

U.S. Cl. 73—864.41 **11 Claims**



1. A filter punch which comprises a punch section having a thickness and two opposing surfaces,

a filter piercing member secured to and extending from a central portion of one of said opposing surfaces, said one of said opposing surfaces having a plurality of peripheral piercing points extending substantially in the same direction as said filter piercing member, said filter piercing member having a sharp point and having a side area and a vertical axis, said side area and said vertical axis forming a small angle such that a filter pierced by said piercing member is secured to said piercing member and

a punch guide formed on the second of said opposing surfaces, said punch section, piercing member and punch guide having a size and shape to permit said filter punch to pass through a filter having substantially the same size and shape of said one of said opposing surfaces.

5,146,795

HOT KILN ALIGNMENT SYSTEM

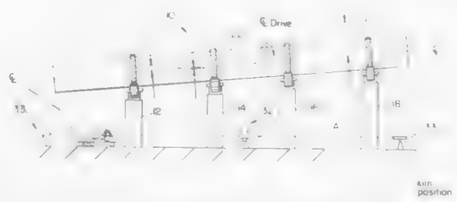
Walter M. Gebhart, 72 Tapscott Rd., Unit 2, Scarborough, Ontario, Canada M1B 3G7

Filed Apr. 25, 1990, Ser. No. 514,483

Claims priority, application Canada, Sep. 29, 1989, 614456

Int. Cl.[5] **G01B** *11/14*

U.S. Cl. 73—865.9 **15 Claims**



1. In a method of determining the condition of alignment location of a long, flexible substantially cylindrical body subject to dynamic distortion during centerless rotation thereof upon support rollers about a normal central polar axis thereof, the steps comprising:

a) determining a plurality of at least three axial locations widely spaced along the length of said body, intermediate the ends thereof and adjacent selected ones of said bearings to establish a measuring station adjacent the body at each location;

b) establishing a first baseline datum generally substantially parallel with the body, extending for at least a portion of the length of the body;

5,146,796

PROBE FOR TAKING GAS SAMPLES AND HEAT MEASUREMENTS ABOVE THE CHARGING SURFACE OF A SHAFT FURNACE

Pierre Mailliet, Howald; Emile Lonardi, Bascharage, and Georges Wies, Dudelange, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Mar. 1, 1991, Ser. No. 663,143

Claims priority, application Luxembourg, Mar. 7, 1990, 87694

Int. Cl.[5] **G01N** *1/22*

U.S. Cl. 73—866.5 **12 Claims**

1. A probe for taking gas samples and heat measurements above the charging surface of a shaft furnace, said shaft furnace having a furnace wall, comprising:

a probe arm for inserting into the furnace through an opening in the furnace wall, said probe arm extending longitudinally from a first end, said first end to be disposed outside the furnace and including a circular sliding surface, to a tip, said tip to be disposed with said furnace, said arm defining a plurality of orifices for simultaneously taking gas samples and measuring heat at different locations above the charging surface;

support hoop means surrounding said opening for pivotably and rotatably mounting said probe arm, said support means including:

a pair of diametrically opposed articulated arms pivotably mounted on said probe arm,

a pair of diametrically opposed outer journals for pivotably supporting said pair of articulated arms, and

an inner surface for sealingly contacting the circular sliding surface of the probe arm; and

actuator means mounted between the hoop means and the probe arm for moving said probe arm about the center of the support hoop means.

5,146,797

SUPPORT HOUSING FOR AN ELECTRIC STARTER MOTOR FOR AN INTERNAL COMBUSTION ENGINE

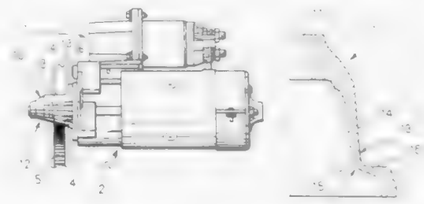
Lorella Annovazzi, Segrate, and Fabio Arpino, Milan, both of Italy, assignors to Industrie Magneti Marelli SpA, Milan, Italy

Filed Jun. 20, 1991, Ser. No. 718,472

Claims priority, application Italy, Jun. 20, 1990, 53093/90[U]

Int. Cl.[5] **F02N** *15/06*

U.S. Cl. 74—6 **2 Claims**



1. A support housing for an electric starter motor unit (1) for an internal combustion engine, particularly for motor vehicles including a substantially bell-shaped end body (10) with a central axial hole (11) in which a shaft for carrying an output pinion (4) of a starter motor unit (1) is supported for rotation in use, and a side aperture (12) through which the pinion (4) can mate with a rotary member (5) of the internal combustion engine, wherein the side wall of the bell-shaped body (10) opposite the side aperture (12) has a recess (13) with a flat wall portion (14) extending in a plane substantially parallel to the axis of the body (10).

5,146,798

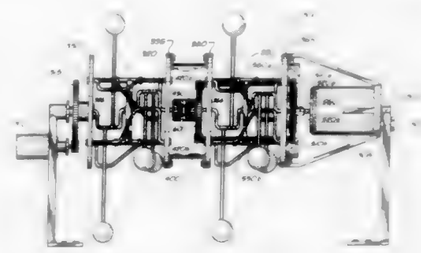
WEDGE-HINGE TRANSMISSION APPARATUS AND METHOD

Clifton G. Anderson, 11502 Fruitwood Dr., Houston, Tex. 77089

Filed May 30, 1990, Ser. No. 508,831

Int. Cl.[5] **F16H** *31/10*

U.S. Cl. 74—87 **3 Claims**



1. A transmission apparatus comprising:

a first substantially circular plate;

a second substantially circular plate parallel to and spaced apart from said first plate, and fixedly attached thereto;

a crankshaft disposed transversely of said first and second plates and passing axially therethrough, and supported by a crossbrace member disposed transversely thereof, and fixedly attached at each end to a support brace member disposed parallel of said longitudinal axis of said crankshaft and fixedly attached to said first and second plates;

said crankshaft comprising a first crank portion and a second crank portion interconnected by a contiguous central boss portion, with said second crank portion

c) locating a distance measuring, radiant beam instrument successively at each said measuring station and obtaining readings of the distance from the instrument to the surface of the body aligned normal to the instrument;

d) simultaneously determining the distance from said first datum to said measuring instrument at each station;

e) taking a plurality of said distance readings at predetermined intervals, during rotation of the periphery of the body past said instrument, for each station;

f) obtaining a mean value of said readings for each station to establish the mean distance from said instrument to said body surface, and

g) adjusting said mean value to include the value of step d) above, to establish the mean distance between said first datum and said body surface.

5,146,794

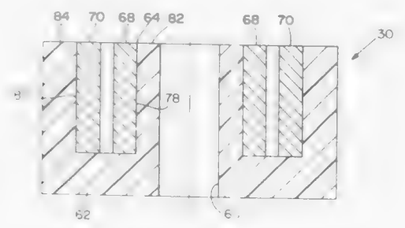
FLUID SEAL

George E. Sgourakes, Millis, and Stanislaw Koziol, Wrentham, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Oct. 6, 1989, Ser. No. 418,103

Int. Cl.[5] **B01L** *3/02*

U.S. Cl. 73—864.21 **2 Claims**



1. A fluid seal construction adapted to seal against liquid flow in an axial direction between a cylindrical surface of an outer member and the cylindrical surface of an inner member needle, said construction comprising a jacket having a central bore and a first slot having a U-shaped cross section positioned around said bore, said first slot having an inner axial surface and an outer axial surface, a first spring comprising a hollow first cylinder having a second slot extending through the thickness of said first cylinder and through the entire axial length of said first cylinder, said first spring being positioned within said U-shaped cross section to fit and provide a pressure against said inner axial surface, a second spring spaced apart from said first spring, said second spring comprising a hollow second cylinder having a third slot extending through the thickness of said second cylinder and through the entire axial length of said second cylinder, said second spring being positioned within said U-shaped cross section, coaxial with said first spring to fit and provide a pressure against said outer axial surface

disposed oppositely of said first crank portion, with respect to said longitudinal axis of said crankshaft;

each said crankshaft first and second crank portion comprising, successively, an edge boss member, a first transversal member, a crank member, and a second transversal member;

a plurality of wedge hinge assemblies with each said wedge hinge assembly comprising an arm having a weight at its remote end, and adapted to be pivotally attached with said crankshaft at the other end and further adapted to be pivotally attached to a wedge hinge between said ends thereof, for rotating said crankshaft in response to functionally related rotation of said first and second plates; and

said crank member of each said first and second crank portion of said crankshaft adapted to pivotally receive two said remote ends of said arm of each two of said wedge hinge assemblies, and receiving two said remote ends of said arms of said each of two said wedge hinge assemblies.

5,146,709

ACTUATOR IN POWER ANTENNA DEVICE

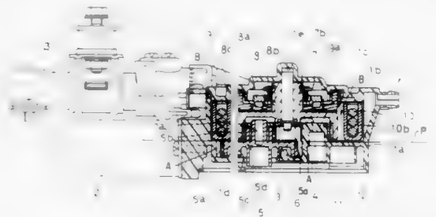
Masaei Sato, Nitta, and Yukiteru Hosoya, Sawa, both of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Jul. 9, 1991, Ser. No. 727,468

Claims priority, application Japan, Jul. 9, 1990, 2-072872[U]; Jul. 9, 1990, 2-072873[U]

Int. Cl.[5] F16H *19/02, 1/16;* **H01Q** *1/10*

U.S. Cl. 74—89.14 **4 Claims**



1. An actuator in a power antenna device for extension and retraction of an antenna rod by a drive motor comprising:

a worm on an axle of the drive motor;

a first gear unit integrally including a worm wheel and an intermediate, the worm wheel engaging the worm gear;

a second gear unit integrally including an internal gear and a torque input portion, the internal gear engaging the intermediate gear;

a drive gear driven by the torque input portion of the second gear unit;

clutch means located between the torque input portion of the second gear unit and the drive gear for disconnecting transmission of torque from the drive motor to the drive gear when the drive gear is overloaded;

a cord case for housing a drive cord for extension and retraction of the antenna rod, the drive gear engaging the drive cord;

speed reducer means for reducing rotational speed of the axle of the drive motor, including first reduction gears in which torque is transmitted from the worm to the worm wheel and second reduction gears in which torque is transmitted from the intermediate gear to the internal gear; and

a rigid support board for rotatably supporting the first and second gear units on a side of the support board on which the intermediate gear and the internal gear engage.

5,146,800

TRAFFIC CONTROL BARRIER

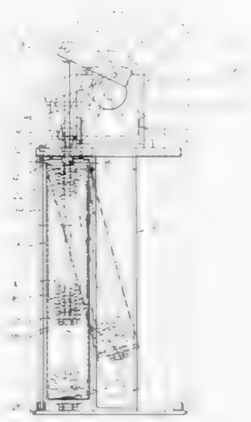
Peter J. Farrell, Middlesex, England, assignor to APT Controls Limited, Harrow, England

Filed Mar. 15, 1991, Ser. No. 670,074

Claims priority, application United Kingdom, Mar. 16, 1990, 9005921

Int. Cl.[5] F16H *21/44;* **E01F** *13/00*

U.S. Cl. 74—100.1 **9 Claims**



1. An operating mechanism for raising and lowering a traffic barrier arm, said mechanism comprising:

a drive shaft, said drive shaft for connecting in use to a traffic barrier arm;

a crank arm, said crank arm being mounted on said drive shaft;

a draw rod, said draw rod having first and second ends and being connected to said crank arm at said first end;

a bearing, said draw rod passing through and being slidably pivoted in said bearing;

a spring guide mounted at said bearing, said draw rod extending into said spring guide;

a spring compression element, said spring compression element being carried on said second end of said draw rod; and,

at least one spring contained within said spring guide, said spring compression element being arranged to compress said at least one spring on rotation of said drive shaft in a first direction which, in use, causes said barrier arm to be lowered.

5,146,801

GEAR APPARATUS

Atsuhi Oda, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan

Filed Mar. 27, 1991, Ser. No. 676,241

Claims priority, application Japan, Mar. 28, 1990, 2-77044

Int. Cl.[5] F16H *1/14*

U.S. Cl. 74—417 **6 Claims**

1. A gear apparatus, comprising:

(a) a gear housing;

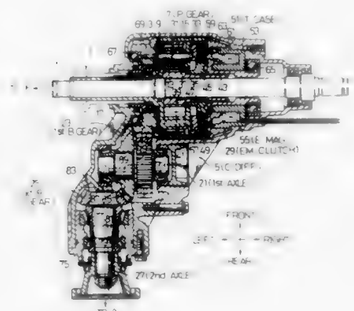
(b) a first axle rotatably supported by first and second bearings within said gear housing;

(c) a first bevel gear fixed to said first axle near the first bearings;

(d) a spur gear fixed to said first axle between said first bevel gear and the second bearing;

(e) a second axle rotatably supported by third and fourth bearings within said gear housing and disposed perpendicular to said first axle,

(f) a second bevel gear fixed to said second axle near the third bearing in mesh with said first bevel gear; and



(g) the first bearing for supporting said first axle being located on two extension lines of an axis of said second rotary axle and a gearing contact line between said first and second bevel gears.

5,146,802

DRIVE SYSTEM

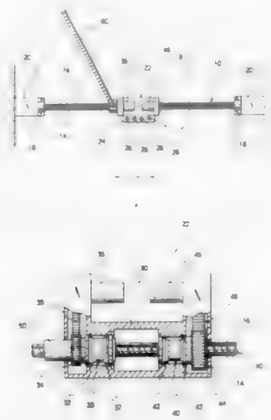
Ken Yanagisawa, c/o Kabushiki Kaisha Mechanic Sekkei Jimusho, 5175-1, Ooaza Toyoshina, Toyoshina-machi, Minamiazumi-gun, Nagano-ken, Japan

Filed Jan. 9, 1991, Ser. No. 639,072

Claims priority, application Japan, Apr. 14, 1990, 2-99044

Int. Cl.[5] F16H *25/20, 29/20*

U.S. Cl. 74—424.8 R **19 Claims**



1. A drive system comprising:

a main shaft having a spiral screw groove formed on an outer circumferential face thereof and a linear spline groove formed thereon in an axial direction to cross the screw groove, both ends of the main shaft are fixed to be nonrotatable;

a rotatable moving body having a rotatable screw-rotor covering the main shaft and screwing the screw groove thereon and a rotatable spline-rotor covering the main shaft and engaging with the spline groove thereon; and

driving means for selectively rotating the screw-rotor and the spline-rotor, the driving means being mounted on the rotatable moving body.

5,146,803

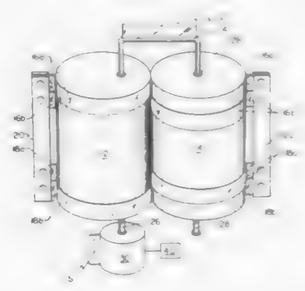
NONCIRCULAR ROLLING JOINTS FOR VIBRATIONAL REDUCTION IN SLEWING MANEUVERS

Meng-Sang Chew, Virginia Beach; Jer-Nan Juang, Poquoson, both of Va., and Li-Farn Yang, Boulder, Colo., assignors to Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 28, 1991, Ser. No. 678,551

Int. Cl.[5] F16H *49/00, 21/16*

U.S. Cl. 74—437 **13 Claims**



1. A rolling joint comprising:

a noncircular, nonelliptical drive cylinder having a drive axle passing through a rotational point of said drive cylinder;

a noncircular, nonelliptical driven cylinder having a spindle axle passing through a rotational point of said driven cylinder;

a stationarily fixed arm connected end to end between the drive axle and the spindle axle to maintain a constant distance between the respective rotational points of the drive and driven cylinders, the drive axle and spindle axle rotatably journalled to said arm; and

means for maintaining contact between the circumferential peripheries of said drive and driven cylinders to permit said driven cylinder to be rolled relative to said drive cylinder,

wherein said drive cylinder is profiled such that its pitch radius r_1 is substantially defined as:

$$r_1 = \frac{CN_g(\theta_2)}{[1 + N_g(\theta_2)]}$$

where C is the distance between the respective rotational points of said drive cylinder and said driven cylinder, and $N_g(\theta_2)$ is the varying gear ratio between said drive cylinder and said driven cylinder defined as a function of the output angle of rotation θ_2 of said drive cylinder, and

wherein said driven cylinder is profiled such that its pitch radius r_2 is substantially defined as

$$r_2 = \frac{C}{[1 + N_g(\theta_2)]}$$

5,146,804

MECHANISM INCORPORATING A VIBRATION DAMPER, IN PARTICULAR FOR AN AUTOMATIVE VEHICLE

Roger F. Carmillet, Franklin, Mich., assignor to Valeo, Paris, France

Filed Nov. 28, 1990, Ser. No. 618,991

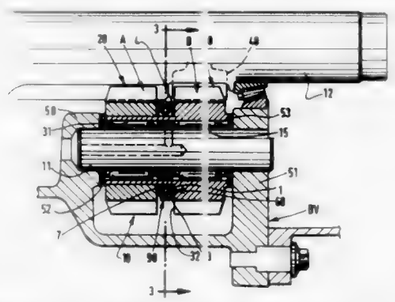
Claims priority, application France, Nov. 30, 1989, 89 15779

Int. Cl.[5] F16H *55/18*

U.S. Cl. 74—440 **8 Claims**

1. A transmission mechanism for an automotive vehicle

comprising a vibration damper and a fluid lubricated gearbox including a gearbox shaft, a gearbox pinion, and an axle, the vibration damper comprising a double inverter pinion and means mounting the double inverter pinion rotatably on said axle, the double inverter pinion being divided into two separate pinions, namely a first pinion and a second pinion, one of said first and second pinions mounting the other coaxially thereon for relative rotational movement of one of said pinions with respect to the other, said first pinion fixedly carrying a first group of fins and the second pinion fixedly carrying a second group of fins, said fins extending generally in radial planes with any one fin of a group being interposed circumferentially between two fins of the other group to define limits of predetermined angular displacement between said first and second pinions, the vibration damper further including resilient means operatively interposed between said groups of fins to resist said angular movement, said vibration damper being defined within the double inverter pinion in the gearbox, with one of said first and second pinions being arranged to be coupled in rotation with said gearbox shaft and the other being arranged to mesh with said gearbox pinion, wherein said resilient means comprise a plurality of resilient members, each interposed circumferentially between a fin of one said group and a fin of the other said group, there being fewer of said resilient members than of the fins in total, whereby between two consecutive fins of one group, there is at least one chamber from which said resilient members are absent.



5,146,805

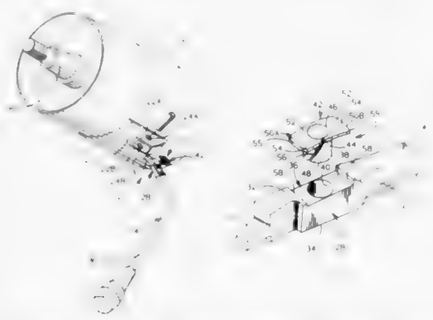
BUSHING ASSEMBLY FOR A PIVOT CONNECTION

Ronald L. Harkrader, Clio, and Thomas C. Zebehazy, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1991, Ser. No. 758,024

Int. Cl.[5] B60K *20/00*; F16C *11/04*; F16D *1/08*; G05G *9/00*

U.S. Cl. 74—473 SW 3 Claims



1. A pivot mount for a vehicular shift lever which precludes the play in said shift lever, said mount comprising: a shift bowl rotatably mounted on a steering column; a clevis extending radially outwardly from said shift bowl, said clevis having laterally spaced connecting plates; a bore penetrating each said connecting plate; said bores through said connecting plates being registered; a shift lever; said shift lever having a mounting block; said mounting block having laterally spaced, substantially parallel first and second faces disposed between said connecting plates; an aperture penetrating said mounting block and opening through said first and second faces to register with the bores through said connecting plates; a bushing assembly having an annular body portion with longitudinally spaced first and second rim edges; said body portion received within said aperture penetrating said mounting block; a pivot pin extending through said bores in said connecting plates and the aperture through said mounting block; a pair of longitudinally resilient arms extending transversely outwardly from said first rim edge; a slot extending between said first and second rim edges; said slot opening through said first rim edge between said resilient arms; a recess in said first face extending radially outwardly from said aperture through said mounting block and receiving said resilient arms.

5,146,806

SHIFTING ARRANGEMENT FOR A GEAR WHEEL CHANGE BOX OF A MOTOR VEHICLE

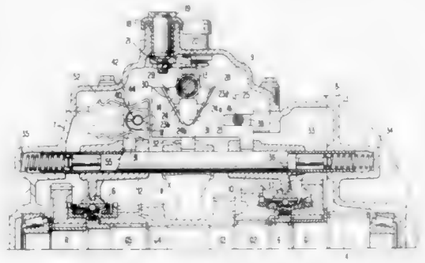
Klaus Doster, Frickenhausen, and Hubert Mueller, Tiefenbronn, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Sep. 7, 1990, Ser. No. 578,786

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1989, 3929678

Int. Cl.[5] G05G *9/12*

U.S. Cl. 74—477 16 Claims



2. The shifting arrangment according to claim 1, wherein the spring, as viewed in a transverse direction of the shift rials, has a U-shaped center section in which the shift rails are arranged.

5,146,807

BELL CRANK ACTUATED SPINDLE ADJUSTMENT MECHANISM

Barry D. Wixey, Pittsburgh; Kenneth Kapton, Verona; Raymond L. Wilson, and Charles J. Baird, both of Pittsburgh, all of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Division of Ser. No. 595,891, Oct. 16, 1990. This application Jul. 22, 1991, Ser. No. 733,834

Int. Cl.[5] G05G *11/00, 5/06*; F16H *29/20*

U.S. Cl. 74—479 7 Claims

1. A spindle adjustment mechanism, comprising:

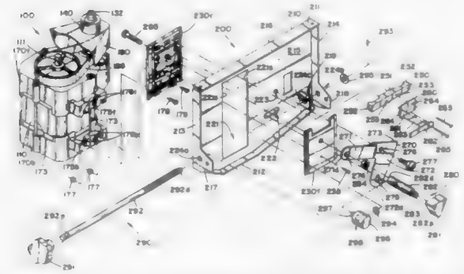
(a) a bell crank having a vertex from which first and second extremities extend and which is pivotable about the vertex,

(b) a spindle in communication with the first extremity of the bell crank whereby linear movement of the spindle may be effected by pivoting of the bell crank about the vertex thereof,

(c) a positioning knob including:

(i) a longitudinally elongated shaft having first and second longitudinal ends and defining a longitudinal axis, and

(ii) a handle coupled to the first longitudinal end of the shaft for facilitating rotation of the shaft about the longitudinal axis thereof, and,



(d) a means, in communication with the positioning knob and the second extremity of the bell crank, for translating rotation of the positioning knob about the longitudinal axis thereof into pivotal motion of the bell crank about the vertex thereof.

5,146,808

ANGLE ADJUSTING MECHANISM FOR AN ARTICLE SUPPORT

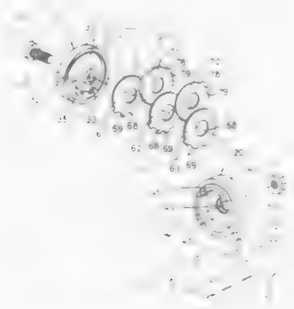
Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Oct. 12, 1990, Ser. No. 596,485

Claims priority, application Japan, Jun. 28, 1990, 2-171136

Int. Cl.[5] G05G *5/06*

U.S. Cl. 74—531 18 Claims



1. A rotation angle adjusting mechanism for adjusting the relative rotative position of a rotary member with respect to a fixed position holding member, the rotation angle adjusting mechanism comprising:

the holding member including first rotative orientation fixing means; at least one fixed side friction plate, including second rotative orientation fixing means thereon which are in engagement with the first rotative orientation fixing means such that the relative rotative orientations of the fixed plate and the holding member are fixedly established;

the rotary member including third rotative orientation fixing means; at least one rotary side friction plate, including fourth rotative orientation fixing means thereon which are in engagement with the third rotative orientation fixing means such that the relative rotative orientations of the rotary plate and the rotary member are fixedly established;

the fixed plate and the rotary plate having respective sides next to one another, the fixed and rotary plates being relatively rotatable with respect to each other permitting relative rotation of the rotary member with respect to the holding member;

means for selectively compressing the sides of the rotary holding plate and the fixed holding plate into friction engagement sufficient to prevent relative rotation of the rotatable plate and the fixed plate with respect to each other for fixing the orientation of the rotary member and the holding member with respect to each other at a selected rotative orientation;

the holding member having a first periphery and the first rotative orientation fixing means is disposed at the periphery of the holding member;

the rotary member having a third periphery and the third rotative orientation fixing means is disposed at the third periphery of the rotary member;

the fixed plate having a second periphery and the second rotative orientation fixing means is at the second periphery of the fixed plate;

the rotary plate having a fourth periphery and the fourth rotative orientation fixing means is located at the fourth periphery of the rotary plate;

the first, second, third and fourth rotative orientation fixing means comprising respective first, second, third and fourth claw parts placed and shaped such that the first and second claw parts of the first and second rotative orientation fixing means engage and the third and fourth claw parts of the third and fourth rotative orientation fixing means engage.

5,146,809

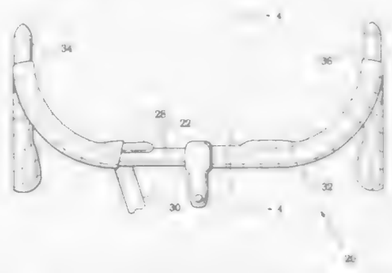
METHOD OF SHAPING A BICYCLE HANDLEBAR AND APPARATUS THEREFORE

Bruce M. Ruana, 1905 N. Olive St., Santa Ana, Calif. 92706

Filed Aug. 26, 1991, Ser. No. 749,556

Int. Cl.[5] B62K *21/26*

U.S. Cl. 74—551.9 9 Claims



1. Apparatus for customized shaping of a bicycle handlebar, comprising:

a form configured with a first surface conforming with the outer surface of a bicycle handlebar and with a second surface conforming with at least a portion of the human hand; and

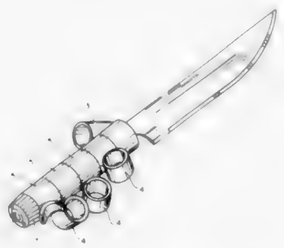
tape for securing said form to said handlebar with said first surface abutting said handlebar at a location thereon in accordance with a bicycle rider's preference.

5,146,810

GRIP SYSTEM FOR HAND TOOLS AND INSTRUMENTS

Lawrence P. Mueller, 3700 Ithaca, Merced, Calif. 95348

Division of Ser. No. 367,234, Jun. 16, 1989, Pat. No. 5,046,381.
This application Aug. 5, 1991, Ser. No. 740,334
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] G05G *1/04*
U.S. Cl. 74—558 15 Claims



1. Grip system for single hand grip instruments, comprising
a receiving stem functioning as a handle and having a free end and an attached end,
a thumb piece having a concave inner surface to accommodate the convexity of at least a portion of the thumb of a holding hand, secured to said attached end of said handle of said receiving stem,
a plurality of finger pieces, each having a concave inner surface to accommodate the convexity of finger pads of holding hand,
a plurality of finger piece mounting means, each having a cavity, an outer wall and ends at least one of which is interdigitated with the adjacent end of another finger piece mounting means, means for mounting said finger pieces on said handle of said receiving stem so that said receiving stem is telescopically received in said cavities of said finger piece mounting means, each of said finger pieces being connected to the outer wall of a separate finger piece mounting means

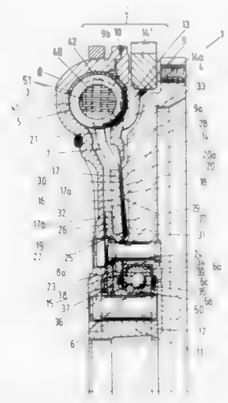
5,146,811

VIBRATION DAMPING APPARATUS

Johann Jäckel, Baden-Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Nov. 19, 1991, Ser. No. 794,872
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1990, 4041747
Int. Cl.[5] F16I *15/10*
U.S. Cl. 74—574 25 Claims

1. Apparatus for damping vibrations in a power train between an engine and a transmission in a vehicle, comprising at least two components which are rotatable relative to each other about on axis and include a first component connectable with the engine and a second component connectable with the transmission; and means for transmitting torque between said components, including at least one torsionally elastic damper and a slip clutch in series with said at least one damper, said slip clutch comprising a diaphragm spring device for transmission of torque between said damper and said slip clutch, means for stressing said device in the axial direction of said components including two radially offset abutments flanking said device and rotatable with one of said components, the other of said components having an annular chamber which is at least partially filled with a viscous fluid and includes a sealed radially outermost portion and a radially inner portion, said device having a radially outer portion and said torque transmitting means further comprising a diaphragm seal for the radially inner portion of said chamber and a torque transmitting disc,



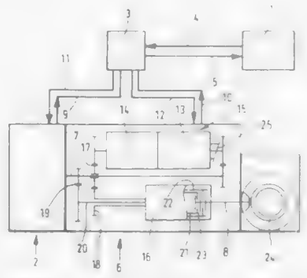
said disc and said seal being interposed between said one component and the radially outer portion of said device.

5,146,812

ARRANGEMENT AND METHOD FOR OPERATING A CONTINUOUSLY VARIABLE DRIVE UNIT IN A MOTOR VEHICLE

Heinrich Nikolaus, Hamburg, and Robert Paton, Passau, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP89/00957, § 371 Date Feb. 13, 1991, § 102(e) Date Feb. 13, 1991, PCT Pub. No. WO90/02059, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 12, 1989, Ser. No. 656,044
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827861
Int. Cl.[5] F16H *47/04*
U.S. Cl. 74—858 8 Claims



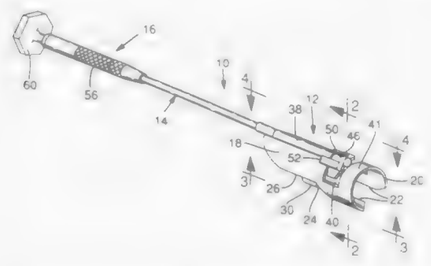
1. An arrangement for operating a continuously variable drive unit of a motor vehicle comprising:
a controllable internal combustion engine operated predominantly with a constant rotational speed over an entire speed range of the motor vehicle;
a hydrostatic-mechanical power split transmission with a continuously variable transmission ratio, the transmission including:
a mechanical branch;
a hydrostatic branch formed with:
a primary unit having a swash plate; and
a secondary unit with variable rotational speeds with respect to the continuously variable transmission ratio between gear-shift points of the mechanical branch; and
an output shaft connected to the transmission; and
a control device functioning in a manner that comprises:
reducing a speed (n_1) of the internal combustion engine to a lower value before a transmission ratio of the power split transmission is reached at which the secondary unit presents its maximal rotational speed, thereby changing a signal for controlling the swash plate so that at a decreasing speed of the internal combustion engine an almost constant rotational speed is maintained at the output shaft;
after reaching a shift point the control device modifies the control signal for the swash plate by a value calculated from a difference between a highest control signal (I_{actual}) and a preselected control signal (I_{target}) and a ratio of transmission in the mechanical branch at a shift point;
after conclusion of a shifting operation the control device further lowers the speed of the internal combustion engine and changes the swash plate control signal so that rotational speed of the output shaft is kept almost constant;
subsequently changing the rotational speed of the output shaft at a constant transmission ratio by increasing the speed of the internal combustion engine until the speed (n_1) is again reached;
further changing the rotational speed of the output shaft at a constant speed (n_1) of the internal combustion engine by modifying the gear ratio of the transmission.

5,146,813

INSTALLATION AND REMOVAL TOOL FOR FIBER OPTIC CONNECTORS

Willis H. Stanfill, Jr., 4414 NE. Irving, Portland, Oreg. 97213

Filed Aug. 15, 1991, Ser. No. 746,354
Int. Cl.[5] B25B *13/04, 13/00, 13/28, 13/48*
U.S. Cl. 81—120 9 Claims



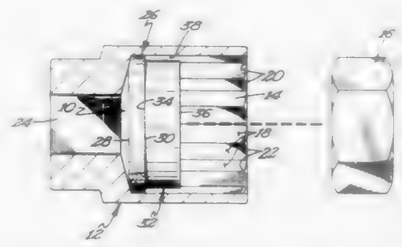
1. A manipulator device for manipulating a connector from a remote position comprising:
a socket portion adapted to be fitted about the connector having a hollow interior and an open end for receiving the connector,
an elongate handle mounted on said socket portion and extending axially of said socket portion in a direction away from said open end,
stop means mounted on the socket portion limiting the extent of movement in a direction extending axially of the socket portion of a connector into the socket portion,
an elongate slot extending in an axial direction along a side of the socket portion inwardly from said open end, said slot means comprises a stop shoulder disposed, in a direction extending axially of the socket portion, intermediate the ends of the slot, and
a movable grab element disposed adjacent one side of the hollow interior of the socket portion and circumfrentially spaced from the slot and toward said open end from said stop means and actuatable to move against and to grab a connector residing within said socket portion.

5,146,814

MAGNETIC KEEPER ACCESSORY FOR WRENCH SOCKETS

Richard A. Vasichek, HCR 2, Box 30, Brocket, N. Dak. 58321

Filed Jun. 3, 1991, Ser. No. 709,588
Int. Cl.[5] B25B *13/02*
U.S. Cl. 81—125 14 Claims



8. Tool for a fastener comprising, in combination: a wrench socket including a well having an inner periphery formed by multiple sides intersecting at outer corners and including a handle mounting end, with the well slideably receiving the fastener; and an accessory for preventing the fastener from sliding from the well to hold the fastener captive in the well while the socket is being moved to the fastening location, with the accessory comprising, in combination: a nonmagnetic, compressible disk having planar, parallel, opposed, first and second faces and a periphery having at least portions of a size greater than the inner periphery of the well; a generally cylindrical magnet having planar, parallel, opposed, first and second faces and a periphery smaller than the inner periphery of the well, with the magnet being secured to the disk with the second face of the magnet spaced from the second face of the disk, with the disk being deformable under force to pass into and snuggly fit within the inner periphery of the well with the magnet positioned on the opposite side of the disk than the handle mounting end of the socket with the disk magnetically insulating the magnet from the socket and with the magnet positioned generally concentrically within the inner periphery of the well creating an air space between the inner periphery of the well and the periphery of the magnet for magnetically insulating the magnet from the socket and without need to modify the wrench socket.

5,146,815

FOLDING TOOL FOR BICYCLES

George W. Scott, III, Riverside, Conn., assignor to Cannondale Corporation, Georgetown, Conn.

Filed Mar. 12, 1991, Ser. No. 668,079
Int. Cl.[5] B25F *1/00*
U.S. Cl. 81—437 9 Claims

1. A folding tool comprising a chassis in the form of a generally U-shaped metal band having a base portion at one end and a pair of elongated substantially parallel spaced-apart leg portions extending from the base portion and having free ends remote from the base portions, an axle joined to the leg portions adjacent their free ends and transversely spanning the space between them, a multiplicity of different elongated tools pivotally received on the axle and individually pivotable selectively about the axle between a storage position in which they are received between the leg portions of the chassis and a deployed position in which they extend away from the chassis, and a handle having a top wall, a pair of side walls and one end wall receiving the chassis and joined to it, the chassis being received in the handle with the leg portions engaging the side walls and the base portion engaging the end wall, and the handle having a bottom opening between the leg portions of the chassis and an end opening between the free ends of the leg

portions through which the tools are movable between their storage and deployed positions, the external surfaces of the top

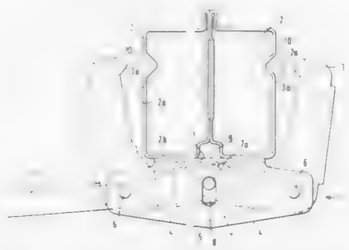
and side walls of the handle being contoured to facilitate gripping.

5,146,816

CONNECTING FORMWORK PANELS

Johann Badstieber, Rutesheim, Fed. Rep. of Germany, assignor to Josef Maier, Steinach, Fed. Rep. of Germany

PCT No. PCT/DE89/00658, § 371 Date May 13, 1991, § 102(e) Date May 13, 1991, PCT Pub. No. WO90/05225, PCT Pub. Date May 17, 1990
PCT Filed Oct. 18, 1989, Ser. No. 679,039
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 8814208
Int. Cl.[5] B25H *3/00*
U.S. Cl. 81—487 22 Claims



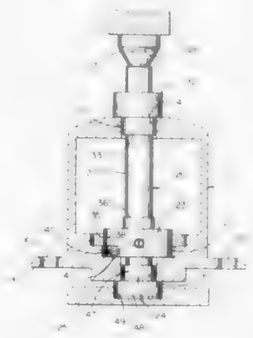
1. A clamp for connecting formwork panels, particularly formwork panels which are to be disposed side-by-side in a common plane and have profiles extending peripherally thereof, comprising a pair of clamping members each of which includes a clamping arm for urging one formwork panel towards another and an adjusting arm which is noncollinear with the respective clamping arm, said adjusting arms having overlapping end portions; means mounting said clamping members for pivotal movement between a rest position and an operative position in which said clamping arms can urge respective formwork panels towards each other, said mounting means comprising a hollow support and pivot pins connecting said clamping members to said support; and means for pivoting said clamping members between said positions, said pivoting means including an eccentric cam which engages both of said end portions, and said cam comprising a pivot which is movable transverse to said adjusting arms, said adjusting arms and said cam being received in said support.

5,146,817

BORING BAR FOR A LIMITED SLIP DIFFERENTIAL

Delton C. Bickle, 1427 Barham Ave., Janesville, Wis. 53547

Filed Dec. 21, 1990, Ser. No. 631,461
Int. Cl.[5] B23B *1/00, 5/00*
U.S. Cl. 82—1.11 5 Claims



1. A method for refinishing a bearing seat of a limited slip differential, the differential having a case formed with upper and lower bores and with a side opening, the method comprising:

a) inserting a boring head having a cutter and a central bore into the case through the side opening;

b) concentrically aligning the boring head and the bearing seat; and

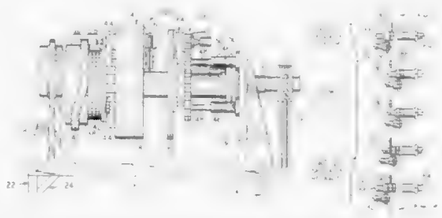
c) rotating the boring head to cause the cutter to refinish the bearing seat.

5,146,818

CAN TRIMMING APPARATUS

Siegfried Hellweg, Mount Prospect, Ill., assignor to H. L. Fisher Mfg. Co., Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 181,209, Apr. 13, 1988, Pat. No. 4,914,990. This application Apr. 9, 1990, Ser. No. 506,855
Int. Cl.[5] B23B *5/14*
U.S. Cl. 82—58 44 Claims



1. An apparatus for trimming cans comprising:

a headstock assembly supported by shaft means for rotation about an axis including at least one trimmer unit rotatably associated with the headstock assembly along an axis radially disposed from the axis of the shaft means, the trimmer unit comprising first spindle means including a first rotatable cutting element and second spindle means including a second rotatable cutting element;

a tailstock assembly supported by the shaft means for coaxial rotation with the headstock assembly including at least one can supporting means rotatably associated with the tailstock assembly;

means for axially jointly moving the first and second spindle means relative to the tailstock assembly to position a can between the can supporting means and the first and second rotatable cutting elements with the can remaining supported by the can supporting means; and

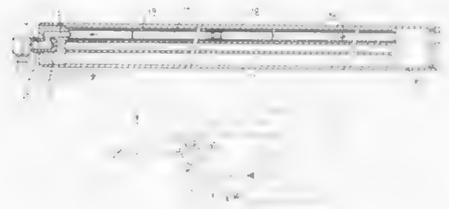
means for rotating the first and second spindle means while the headstock and the tailstock assemblies are rotated about the shaft means whereby the first and second rotatable cutting elements cooperate to trim the cans to a uniform length.

5,146,819

GUIDE-BAR DEVICE FOR AUTOMATIC LATHE AND METHOD OF FABRICATION THEREOF

Markus Geiser, Péry, and Claude Vandevoir, La Neuveville, both of Switzerland, assignors to Sameca SA, Lamboing, Switzerland

Continuation of Ser. No. 210,029, Jun. 22, 1988, Pat. No. 5,048,383. This application Jul. 9, 1991, Ser. No. 727,584
Claims priority, application European Pat. Off., Jun. 24, 1987, 87810361.3
Int. Cl.[5] B23B *13/08*
U.S. Cl. 82—127 10 Claims



2. Guide-bar device for receiving and guiding bar stocks of different diameters and/or profiles to be machined in an automatic lathe, comprising:

a cylindrical body having a length at least equal to the length of the bars to be machined with a longitudinal axis running the length thereof;

a plurality of tubular members forming tubular cavities of different diameters for receiving and guiding the bars to be machined, said tubular cavities being arranged in said cylindrical body parallel to the longitudinal axis of said cylindrical body, and said tubular cavities being capable of comprising on their whole length oil distribution channels for dipping said bars to be machined;

said cylindrical body including a peripheral ring connected by reinforcing ribs to each of said tubular members, each of said tubular members being further connected by reinforcing ribs to adjacent tubular members, said reinforcing ribs enhancing the moment of inertia and hence the rigidity and the stability of said cylindrical body; and

said cylindrical body also including a plurality of cavities of substantially triangular shape formed by said peripheral ring and each pair of adjacent tubular members connected by said reinforcing ribs, and said plurality of cavities being capable of comprising on their whole length oil return channels.

5,146,820

PAPER CUTTING APPARATUS AND METHOD

Peter Nemeth; Tibor Dancs, both of Aurora; Robert L. Simmons, Lafayette, and Istvan Kalman, Westminster, all of Colo., assignors to Machine Design Service, Inc., Denver, Colo.

Filed May 10, 1991, Ser. No. 697,980
Int. Cl.[5] B26D *1/62*
U.S. Cl. 83—37 27 Claims

21. A method primarily intended for cutting a substantially planar sheet of flexible material such as paper into segments, said method including the steps of:

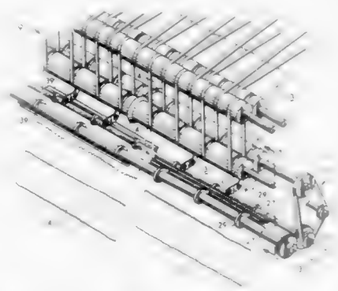
(a) providing a first blade member with a sawtoothed, cutting portion having a plurality of pointed teeth,

(b) providing a second blade member with a sawtoothed, cutting portion having a plurality of pointed teeth,

(c) feeding said sheet of paper substantially vertically downwardly substantially along a planar path,

(d) moving the cutting portion of said first blade member downwardly about a first axis along an arcuate path substantially passing through said planar sheet feeding path to contact and deflect a first path of said sheet away from said planar sheet feeding path in a first direction substantially away from said first axis,

(e) moving the cutting portion of said second blade member downwardly about a second axis along an arcuate path overlapping the arcuate path of the cutting portion of said first blade member to contact and deflect a second part of said sheet in a direction substantially opposite to said first



direction and substantially away from said second axis, said first and second parts of said sheet being attached to and vertically adjacent one another,

(f) puncturing said respective first and second sheet parts with the respective, pointed teeth of the cutting portions of the first and second blade members, said cutting portions being moved downwardly faster than said downwardly fed sheet wherein said cutting portions accelerate said sheet as said respective pointed teeth of said cutting portions puncture said respective first and second sheet parts, and

(g) continuing to move said cutting portions of said first and second blade members among the respective arcuate paths about the respective first and second axes to a substantially overlapping position substantially between said first and second axes to cut said sheet into segments substantially between said first and second sheet parts.

5,146,821

METHOD OF CUTTING BLANKS FROM WEBS OF MATERIAL

Wolfgang Bruder, Bielefeld; Klaus Biervert, Spenge, and Jürgen Meybrink, Gutersloh, all of Fed. Rep. of Germany, assignors to Dürkopp Adler AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 274,460, Nov. 21, 1988, Pat. No. 4,972,745. This application Nov. 27, 1990, Ser. No. 618,661
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739201
Int. Cl.[5] B26D *3/00*
U.S. Cl. 83—40 21 Claims

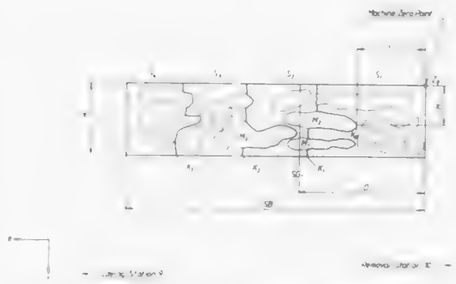
1. A method for cutting blanks from a web of material, comprising the steps of:

a) defining a cutting pattern which includes a plurality of contours along which the web will be cut in order to cut out said blanks;

b) defining a first segment of said cutting pattern, said first segment being defined so that at least a first one of said blanks extends from the first segment into an adjacent second segment;

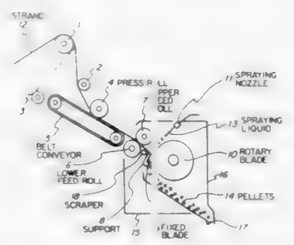
c) supporting said first segment on a first pallet; and locating

said first pallet so as to plac : said first segment in a cutting area;
d) in a first cutting step, usi g a cutting device associated with the cutting area to cu the contours that are within the first segment, including the partial contour of said first blank which is within said first segment;
e) defining a second segment of said cutting pattern, which includes an uncut partial contour of said first blank;
f) moving a second pallet so that it supports both said second segment and said cut partial contour of said first blank within said first segment;



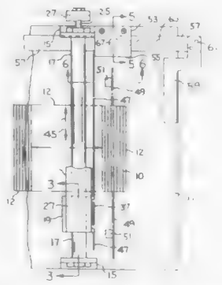
g) moving said first pallet in a downstream direction so as to permit said cut partial contour of said first blank to be transferred to said second pallet, and so as to carry any completely cut blanks of said first segment away from said first blank;
h) moving said second pallet nto said cutting area; and
i) in a second cutting step, cutting out the uncut portion of the contour of said first blank which is within said second segment.

5,146,822
PROCESS FOR PRODUCING PELLETS
Shuhei Noda, Akashi, and Kiyoji Hashimoto, Okayama, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Continuation of Ser. No. 557,599 Jul. 25, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 758,534
Claims priority, application Japan, Jul. 31, 1989, 1-199606
Int. Cl.[5] B26D *1/56;* **B29C** *47/88*
U.S. Cl. 83—22 **4 Claims**



1. A process for producing pellets comprising the steps of:
A. aligning strands to be cut into pellets parallel to each other on a conveyor by the steps of:
1. passing the strands along a conveyor slanted downwardly in a direction of an advancement of the conveyor, wherein the strands are flexible resin strands that will, when laid on a table such that their ends when pulled to extend over an edge of said table by 10 cm, will, upon release, hand down by their weight at 20° C. to a length measured from the end of said strands to a horizontal plane of said table of from 3 to 9 cm., and
2. passing the strands between a press roll mounted on the conveyor and the conveyor surface; then
B. introducing the thus aligned advancing strands between upper and lower feed rolls,
C. causing the strands to come in contact with a support having a fixed blade on a head thereof, wherein a tangential plane at the contact point of the upper and lower feed rolls crosses an upper surface of the support having the fixed blade of the head thereof; and
D. cutting the strands with a rotary blade while simultaneously spraying a liquid onto the strands from above the support so that said liquid impinges upon the strands in a region between the feed rolls and the fixed and rotary blades.

5,146,823
METHOD AND APPARATUS FOR PRECISION CUTTING OF CORRUGATED PAPERBOARD SPECIMENS
William C. Holmes, South Harpswell, Me., assignor to Emerson Apparatus Co., Inc., Portland, Me.
Filed Nov. 4, 1991, Ser. No. 787,555
Int. Cl.[5] B26D *1/04, 7/01*
U.S. Cl. 83—56 **14 Claims**

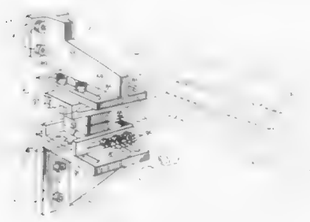


1. A method for precision cutting of corrugated paperboard panel specimens into rectangular shapes of predetermined size, wherein said corrugated specimens have parallel internal flutes extending across the entire specimen face area: said method comprising the steps of extending a linear reference rod through a flute of said specimen so that opposite ends thereof project beyond said specimen's end edges; anchoring the opposite ends of said reference rod at specific points on a table surface, with said specimen lying flat on said surface; moving a cutter means linearly across said table surface, along a predetermined pathline related to the direction taken by said reference rod, whereby said cutter means forms a first straight edge on said specimen; positioning said specimen on said table surface, with said first edge engaged against a linear abutment extending normal to said cutter means pathline; and moving said cutter means a second time to form a second straight edge oriented at a right angle to said first straight edge.

5,146,824
AUXILIARY PUNCHING DEVICE FOR PUNCHING MACHINE
J.-André Lajoie, 730 Côté, St. Charles de Drummond, Canada J2C 4Z7
Filed Jan. 29, 1992, Ser. No. 827,602
Int. Cl.[5] B26D *1/09*
U.S. Cl. 83—90 **9 Claims**

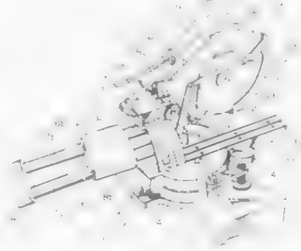
1. An auxiliary punching device attachable to a machine for punching holes at one given location into a stack of sheets of given size,
said auxiliary device being useful for simultaneously punching other holes at another given location into the same stack,

said machine to which said auxiliary device is attachable being of the type comprising:
(a) a frame having a longitudinal axis;
(b) a main punching assembly transversally mounted onto said frame, said main punching assembly comprising:
a main die rigidly mounted onto the frame;
a main punching tool including a ram supporting a set of punches facing the main die, said ram being reciprocable in a direction perpendicular to said longitudinal axis between a fed position where the punches extend away from the main die and define therewith a gap, and a punching position where the punches engage said main die; and
a ram actuator for reciprocating said ram between said feed and punching positions;
(c) a feed carriage for longitudinally feeding said stack to be punched into said gap when the ram is in the feed position;
(d) retractable stopping means for stopping the stack in a preselected longitudinal position with respect to the main die when said stack is fed into the gap;
(e) at least one actuable back guide adjustable according to the size of the sheets, for pressing the stack against the stopping means after said stack has been fed, and thus ensuring that said stack is longitudinally well positioned relative to said main die;
(f) side guides located on both sides of the feed carriage for transversely positioning said stack with respect to said main die, at least one of said side guides being adjustable so as to fit the size of the sheets;



(g) a delivery conveyor for removing the punched stack from the gap after the ram has been reciprocated and is back in the feed position before feeding a new stack to be punched; and
(h) control means for sequentially operating said feed carriage, stopping means, at least one back guide, ram actuator and delivery conveyor;
wherein said auxiliary device comprises:
(i) a first arm rigidly connecting a first mounting plate to a first supporting plate;
(j) means for rigidly attaching the first mounting plate to said frame so that the first supporting plate extends toward the stack fed to the main punching assembly;
(k) an auxiliary die carrier slidably mounted on said first supporting plate, said auxiliary die carrier being slidable in one given direction with respect to said first supporting plate and lockable in one selected position along said one direction;
(l) an auxiliary die slidably mounted onto said auxiliary die carrier, said auxiliary die being slidable in another given direction perpendicular to the one direction with respect to said auxiliary die carrier and lockable in another selected position along said other direction, said auxiliary die extending substantially in the same plane as said main die;
(m) a second arm rigidly connecting a second mounting plate to a second supporting plate, said second mounting and supporting plates being perpendicular to each other;
(n) means for rigidly attaching the second mounting plate to the ram so that the second supporting plate faces the first supporting plate;
(o) an auxiliary punching tool carrier slidably mounted onto said second supporting plate, said auxiliary punching tool carrier being slidable in said one given direction with respect to said second supporting plate and lockable in said one selected position along said one direction; and
(p) an auxiliary punching tool slidably mounted onto said auxiliary punching tool carrier, said auxiliary punching tool including another set of punches and being slidable in said other direction perpendicular to the one direction and lockable in said other selected position along said other direction so as to face and operatively cooperate with said auxiliary die, said auxiliary punching tool extending substantially in the same plane as said main punching tool;
whereby, in use, said auxiliary punching tool is reciprocated in unison with said main punching tool and punches said other holes at said other location into the stack at the very same time as said holes are punched at the on location by said main punching tool.

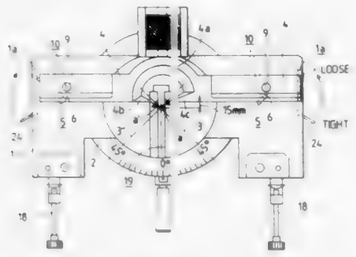
5,146,825
MOTOR-DRIVEN CHOP SAW HAVING IMPROVED LOWER BLADE GUARD ARRANGEMENT
Tomoshige Dehari, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan
Filed Jul. 17, 1991, Ser. No. 731,600
Claims priority, application Japan, Jul. 31, 1990, 2-81943[U]
Int. Cl.[5] B23D *45/14*
U.S. Cl. 83—397 **8 Claims**



1. A chop saw comprising:
a saw table;
a main chopping mechanism positioned on said saw table and comprising a drive motor, a circular saw blade drivingly connected to said drive motor and rotatable about a center axis, and an upper safety guard for covering a generally upper half portion of said circular saw blade;
a pivot member positioned so as to pivotally move said main chopping mechanism between an upper rest position and a lower chopping position;
a lower blade guard pivotally movable about said center axis; and
a lower blade guard pivoting mechanism comprising a replaceable swingable arm having a first end detachably and pivotally supported to the pivot member and, the swingable arm being provided with a cam surface;
a link member having one end detachably and pivotally connected to a second end of said swingable arm and another end pivotally connected to said lower blade guard; and
a collar member fixed to said main chopping mechanism in and slidable contact with said cam surface, said collar member being movable in accordance with the pivotal movement of said main chopping portion, so as to angularly move said swingable arm by virtue of contact with

said cam portion, to thereby angularly move said lower blade guard.

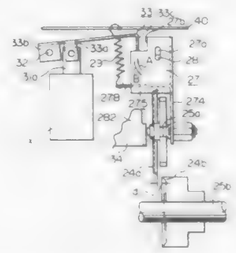
5,146,826
CIRCULAR SAW DEVICE HAVING VARIABLE CUT-OFF ANGLE
Takeshi Shiotani, and Kouichi Miyamoto, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 13, 1990, Ser. No. 627,096
Claims priority, application Japan, Jan. 13, 1990, 2-2007[U]
Int. Cl.[5] B26D 1/16
U.S. Cl. 83—468.2 31 Claims



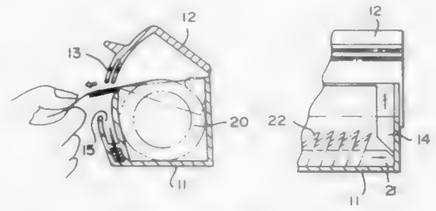
24. A circular saw device having a variable cut-off angle, comprising:
a base having first holes and second holes therein;
a rotary table provided on said base;
a rotatable circular saw provided on said table to be movable upwardly and downwardly;
a locator provided on said base so that said locator does not interfere with said saw when said saw moves downwardly, said locator being securable in a first and second position;
fitted members provided in a bottom of said locator and being securely and slidably fitted in said first holes of said base so that said fitted members are slidable in said first holes to move said locator from said first position to said second position;
bolts having threaded portions and being provided in said locator; and
pins being coupled to bottoms of said bolts, wherein said locator is secured in one of said first and second positions by said threaded portions of said bolts being engaged in said second holes of said base and said pins being removably fitted in small holes provided at bottoms of said second holes.

5,146,827
SLITTER MOVING MECHANISM
Fumito Komatsu, and Hiroyasu Shimokawa, both of Ina, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Sep. 25, 1991, Ser. No. 765,424
Claims priority, application Japan, Sep. 27, 1990, 2-257983
Int. Cl.[5] B26D 1/24, 5/06
U.S. Cl. 83—482 2 Claims

1. A slitter moving mechanism including an upper blade unit having an upper blade and a lower blade unit having a lower blade, the upper blade being movable between a slitting position to slit a web and a retracted position wherein the web can pass through between the upper and lower blades without being slit, the upper blade in cooperation with the lower blade being adaptable to slit the web at the slitting position in a feed direction of the web, said slitter moving mechanism further comprising:
a supporting member for rotatably supporting the upper blade, the supporting member being vertically and laterally movable within predetermined ranges;
a biasing member for upwardly biasing the supporting member and generating a coupling force for laterally moving said upper blade in a separating direction to separate said upper blade from the lower blade; and
guide means for restraining lateral movement of the upper blade in the separating direction beyond a predetermined distance from the lower blade and for guiding the vertical movement of the supporting member between said slitting and retracted position;
the upper blade unit including lowering means for lowering the supporting member and for generating another coupling force to swing the upper blade in a contact direction and to bring the upper blade into contact with the lower blade, said lowering means including a vertical slot in said supporting member and a stationary pin for guiding vertical movement of said supporting member to a lower-most position in which said pin contacts an upper edge of said slot and where-upon said supporting member is swingable about said pin for allowing said lateral movement of the upper blade into contact with the lower blade.



5,146,828
WRAP FILM CUTTER
Hong-Yuan Huang, and Kuo-Feng Huang, both of No. 148, Jeng Yih North Road, San Chung City, Taipei Hsien, Taiwan
Filed Mar. 29, 1991, Ser. No. 677,562
Int. Cl.[5] B26D 1/02; B65H 35/06
U.S. Cl. 83—570 8 Claims



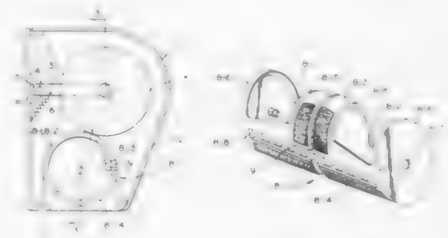
1. A wrap film cutter comprising:
an elongated housing having front and rear edges;
a trough located along the front edge of said housing;
an elongated lid having a front and a rear edge, the rear edge of said lid being pivotally secured to said housing;
biasing means interconnecting said housing and said lid, said biasing means tending to force said lid into an open position;
a double tiered protrusion extending from the front edge of said elongated lid toward said housing;
a shaft having a first end attached to said lid and a second end extending toward said trough, said second end of said shaft having a declined plane;
cutting means including an elongated base having first and second ends and an elongated cutting edge projecting toward said protrusion, said cutting means being slidably mounted within said trough, the first end of said base having a declined plane; and
a spring positioned between said housing and the second end of said base, said wrap film cutter being adapted to receive a roll of wrapping film within said housing such that when a portion of such film is positioned between the front edges of said housing and said lid and said lid is closed, said double tiered protrusion presses the film portion into said trough to cause said cutting edge to pierce the film and said second end of said shaft engages said first end of said base to cause said cutting means to slide within said trough against the biasing force of said spring to thereby cut the film.

5,146,829
STRAIGHT CUT COATER UNWIND KNIFE
Michael J. Wadzinski, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.
Filed Feb. 22, 1991, Ser. No. 658,819
Int. Cl.[5] B26D 1/09
U.S. Cl. 83—620 12 Claims

6. A web severing device for a moving web, comprising:
a support member positioned substantially orthogonal to a longitudinal direction of and facing said web, a centerline of said support member corresponding to a longitudinal center line of said moving web;
a first plurality of blade sections individually mounted at a predetermined acute angle to said support member;
a second plurality of blade sections individually mounted at a predetermined acute angle to said support member and opposite an orientation of said first plurality of blade sections; and
means for simultaneously engaging said first and second plurality of blade sections with the moving web free of an anvil or backing on an opposing face of the moving web from said support member, said means for engaging enabling said first and second plurality of blade sections to cut said moving web, thereby providing a smooth severed web edge which extends in a straight line from one longitudinal edge of the web to the other longitudinal edge of the web.

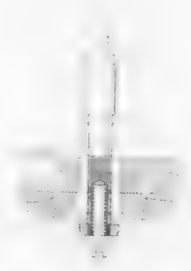
5,146,830
UNIT TO SIMULTANEOUSLY DISPENSE AND CUT STRIPS OF ROLLED UP MATERIALS
Maurice Granger, 17 Ruse Marcel Pagnol 42270, Saint Priest En Jarez, France
Filed Dec. 6, 1990, Ser. No. 623,216
Claims priority, application France, Dec. 28, 1989, 8917570
Int. Cl.[5] A47K 10/36; B26D 1/58
U.S. Cl. 83—649 12 Claims

1. A material dispenser for dispensing predetermined lengths of a material from a roll of material comprising:
support means for supporting said roll of material; and
an axially supported generally cylindrical rotatable drum disposed radially adjacent to said roll of material wherein said drum comprises:
a) cutting means for cutting said material including a transverse slot and a cutting blade which protrudes therethrough;
b) a gripping surface which cooperates with material from said roll of material thereby preventing slippage of said material on said gripping surface;
c) means for receiving a portion of said material therein thereby enabling proper disposal of predetermined lengths of material upon pulling an end of said roll of material



substantially independent of a pulling angle defined by the angle between the pulling direction and a central axis of said drum, said means comprising at least two peripheral recesses disposed on said drum; and
d) a continuous central strip located between and defined by said two recesses.

5,146,831
QUICK RELEASE CUTTING HUB ASSEMBLY
Richard H. Fetter, Jr., County of Bay; Jerry L. Austin, County of Saginaw, and Robert A. Hewitt, County of Bay, all of Mich., assignors to The Conair Group, Inc., Pittsburgh, Pa.
Filed Sep. 30, 1991, Ser. No. 768,825
Int. Cl.[5] B26D 7/26; B29B 9/06
U.S. Cl. 83—698 9 Claims



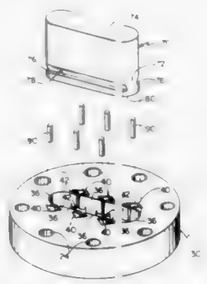
1. A quick release cutting hub assembly for a pelletizer with a cutting plane formed between a cutter and a die plate comprising:
a. a pelletizer shaft having two ends and a bore at one end;
b. a cutter assembly supporting the cutter; and
c. a support means mounted on the end of the pelletizer shaft having the bore and partially extending into the bore and partially extending outside of the bore and supporting the cutter assembly and having a spring means completely within the bore in compression urging the cutter assembly toward the cutting plane and having a quick release means pivotally mounted within the support means for supporting the cutter assembly in a first position and releasing the cutter assembly from the shaft in a second position.

5,146,832

CONNECTOR FOR RIGIDLY CONNECTING PUNCH TIP TO PUNCH PAD

Kenneth J. Wilson, and John Morehead, both of White Bear Lake, assignors to Wilson Tool International, Inc., White Bear Lake, Minn.

Filed May 24, 1991, Ser. No. 705,189
Int. Cl.[5] B21D 7/26
U.S. Cl. 83—698 8 Claims



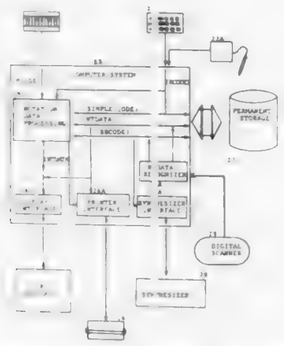
1. A punch comprising a punch tip having an elongated shank, a punch pad having an orifice sized to closely receive the shank and including a hole positioned closely adjacent to the orifice to define a thin wall between the hole and the orifice, the thin wall including a slot extending through its thickness to provide a pair of deformable tabs, and an insert receivable in the hole for deforming the tabs into supportive, retaining contact with the shank when the shank is received within the orifice.

5,146,833

COMPUTERIZED MUSIC DATA SYSTEM AND INPUT/OUT DEVICES USING RELATED RHYTHM CODING

Philip Y. F. Lui, 55 W. 16th St., New York, N.Y. 10011

Continuation-in-part of Ser. No. 332,412, Mar. 30, 1989, Pat. No. 4,958,551, which is a continuation of Ser. No. 44,839, Apr. 30, 1987, abandoned. This application Sep. 24, 1990, Ser. No. 587,215
The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.
Int. Cl.[5] G09B 15/04; G10G 3/04; G10H 7/00
U.S. Cl. 84—462 20 Claims



1. A computerized music data system comprising:

(a) first input means for receiving pitch codes representing respective pitches which are to be designated as occurring in a series of basic music intervals of a music piece;

(b) second input means for receiving relative rhythm codes for designating respective types of rhythm elements, including said pitches, as occurring in the basic music intervals of the music piece, wherein said relative rhythm codes include at least a series of main division codes, each of which represents a respective main division rhythm element designated as occurring in a basic music interval, and interposed demarcation codes each of which delimits a respective one of the basic music intervals of the music piece, wherein the relative rhythm codes for each basic music interval includes one or more main division codes and a demarcation code delimiting each said basic music interval;

(c) third input means for selecting a desired interval duration value to be assigned to each of the basic music intervals corresponding to a selected time signature for the music piece;

(d) computer means receiving the inputs of said first, second, and third input means and including: (1) programmed counting means for counting the number of main division codes designating respective rhythm elements occurring in each basic music interval, as delimited by a respective demarcation code, from said relative rhythm codes received through said second input means; and (2) programmed duration assigning means for assigning a fixed duration value to each of the main division rhythm elements in each respective basic music interval, said fixed duration value assigned to each main division rhythm element occurring in any given basic music interval being computed based upon said selected interval duration value assigned to the basic music intervals divided by the number of main division codes counted by said programmed counting means as occurring in said given basic music interval; and

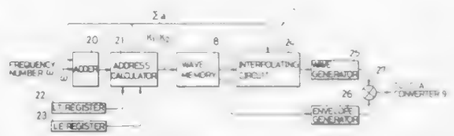
(e) relative rhythm data storage means operative in conjunction with said computer means for storing relative rhythm coded data based upon said pitch codes representing pitches for the respective rhythm elements, and said relative rhythm codes designating the rhythm elements including pitches occurring in the basic music intervals of the music piece, so that the corresponding fixed duration values can be assigned to the respective rhythm elements by said computer means.

5,146,834

INTERPOLATING TONE WAVE GENERATOR HAVING TRUNCATED DATA

Gen Izumisawa, and Yutaka Washiyama, both of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jun. 10, 1991, Ser. No. 712,861
Claims priority, application Japan, Jul. 31, 1990, 2-201355
Int. Cl.[5] G10H 7/12
U.S. Cl. 84—607 12 Claims



1. A tone generating apparatus, comprising:

a wave memory having tone wave data of a single period to be repeatedly read out, said wave memory being stored only at a loop top address, a loop end address, an address preceding by "1" said loop end address, and at plural integer addresses between said loop top address and said address preceding by "1" said loop end address, and wherein the same tone wave data that is stored at said loop top address is also stored at said loop end address;

address generating means for generating a read address including a fraction portion, which sequentially increases from said loop top address toward said loop end address at an interval corresponding to a pitch, and which returns to said loop top address when said loop end address is exceeded;

interpolating means for, when said read address includes a significant fraction portion, preparing tone wave data acquired by proportional distribution of two pieces of tone wave data, said first piece being read out from said wave memory with an integer portion of said read address used as an address, and said second piece of tone wave data being read out from said wave memory having a value acquired by adding "1" to said integer portion of said read address used as an address, using said fraction portion;

said interpolating means performing interpolation using tone wave data stored at integer addresses preceding and following a read address, and when a read address lies between said loop end address and said address preceding by "1" said loop end address, interpolation is performed using tone wave data stored at said loop end address and said address preceding by "1" said loop end address, said interpolation therefore using the same tone wave data stored at said loop top address and said address preceding by "1" said loop end address because the tone wave data stored at the loop end address is equal to the tone wave data stored at said loop top address; and

tone generating means for generating a musical tone based on said tone wave data prepared by said interpolating means;

whereby said tone generating apparatus employs a conventional interpolation circuit; and

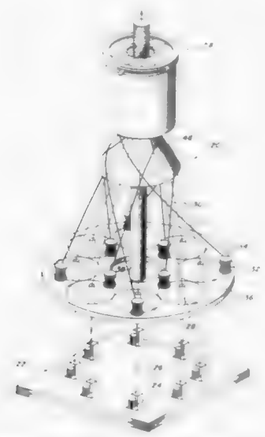
whereby wave data is calculated by means of said conventional interpolation circuit at a real number read address including a fraction portion, without enlarging the size of said conventional interpolation circuit.

5,146,835

IN-LINE CONSOLIDATION OF BRAIDED STRUCTURES

Ronald F. McConnell, West Chester, Pa., and Peter Popper, Wilmington, Del., assignors to E. I. duPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 151,582, Feb. 2, 1988, abandoned. This application Mar. 8, 1989, Ser. No. 320,553
Int. Cl.[5] D04C 1/00
U.S. Cl. 87—1 4 Claims



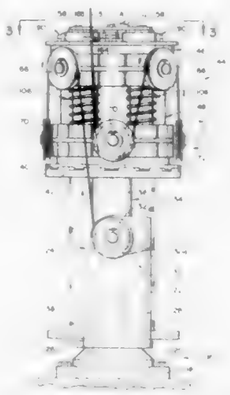
1. An elongated circular braided composite structure from a plurality of fiber reinforced thermoplastic resin strands which interlace each other and pass through the structure in a helical path, the strands passing through the structure having a local crimp of less than 3 percent.

5,146,836

STRAND CARRIER FOR A BRAIDING MACHINE

Simon A. DeYoung, 5132 Mayview Rd., Lyndhurst, Ohio 44124

Filed Aug. 6, 1990, Ser. No. 563,538
Int. Cl.[5] D04C 3/18
U.S. Cl. 87—22 27 Claims



1. A tension head for controlling the tension on a strand withdrawn from a strand carrier in a braiding machine, said tension head having an axis and comprising first and second head member means coaxial with said axis, means supporting said first and second member means in a first axially spaced apart position and for axial displacement of said second member means toward said first member means, and spring means biasing said first and second member means toward said first position, said spring means including spring cartridge means between said first and second member means, said spring cartridge means including compression spring means having an axis and an uncompressed length and spring supporting means coaxial with said spring axis and forming with said compression spring means the said spring cartridge means as a self-contained unitary assembly, said spring support means holding said compression spring means of said spring cartridge means in a compressed condition for displacement from a first compressed length shorter than said uncompressed length to a second compressed length shorter than said first compressed length, and said spring cartridge means being insertable and removable as a unit from between said first and second member means with said compression spring means held in said compressed condition by said spring support means.

5,146,837

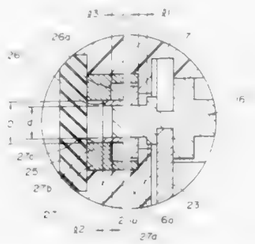
REACTION TRANSMITTING MECHANISM OF BRAKE BOOSTER

Yoshimichi Inoue, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1991, Ser. No. 788,045
Claims priority, application Japan, Nov. 22, 1990, 2-12257[U]
Int. Cl.[5] F15B 9/10
U.S. Cl. 91—369.2 5 Claims

1. A reaction transmitting mechanism for brake booster which comprises a valve mechanism responsive to a back-and-forth movement of a valve plunger mechanically coupled to an input shaft to exercise a controlling action upon opening or closing a flow path of a pressure fluid, an output shaft having its one end slidably fitted in a valve body in which the valve mechanism is received, a reaction disc interposed between the

said one end of the output shaft and the valve plunger, and an annular reaction transmitting member reciprocably mounted on the valve body and interposed between the reaction disc and the valve plunger, the annular reaction transmitting member being arranged such that upon actuating a brake, the inner periphery of the reaction transmitting member engages the valve plunger to transmit a reaction from the reaction disc to the valve plunger while upon releasing the brake, the outer periphery of the reaction transmitting member engages the valve body to transmit a reaction from the reaction disc to the valve body;



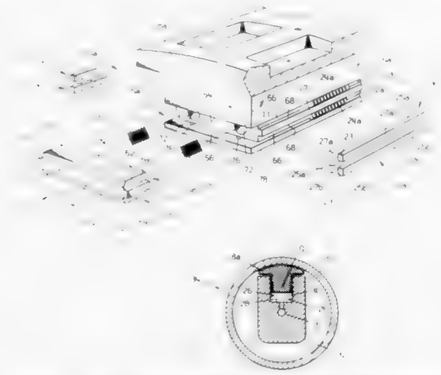
the reaction transmitting mechanism being characterized in that the reaction transmitting member includes a tubular portion engageable with the valve plunger, and a flange-like portion extending radially outward from the end of the tubular portion opposite from the reaction disc and engageable with the valve body, an annular member being disposed over the valve body and including a covering which is interposed between the reaction disc and the flange-like portion of the reaction transmitting member so as to cover the flange-like portion, and a through-opening in which the tubular portion of the reaction transmitting member is slidably fitted.

5,146,838

PISTON APPARATUS FOR USE IN WEB PRESSING COMPONENTS IN PAPERMAKING MACHINERY

Keith R. Olson, Beloit, Wis., and Charles C. Moschel, Stephens City, Va., assignors to Beloit Corporation, Beloit, Wis.

Filed Jan. 9, 1992 Ser. No. 818,577
Int. Cl.[5] F16J *1/00*
U.S. Cl. 92—177 9 Claims



1. Piston sealing apparatus for use in a controlled deflection roll or an extended nip press apparatus, said apparatus including a support shaft with a channel having a pair of spaced, longitudinally extending side walls, the apparatus comprising:

a piston having upper and lower surfaces, a pair of spaced, longitudinally extending side walls, and a pair of spaced end walls extending transversely between the side walls;

side slot means extending longitudinally in each of the side walls;

end slot means extending across each of the end walls and having an interior wall intersecting with the side slot means longitudinally inwardly of the piston end walls where the end walls and side walls intersect;

end dams mounted to the support shaft at either end of the channel, each end dam including a non-movable seal surface facing the channel;

side seal means having at least two surfaces and disposed within the side slot means and extending longitudinally to a point at least near the intersection of the piston side and end walls, and extending outwardly of the side slot means for engagement with the channel side walls;

end seal means slidably disposed within the end slot means at either end of the piston and including at least one notch surface at either end thereof cooperating with at least one surface of the side seal means to sealingly engage the side seal means and to provide, with the side seal means and end dam seal surfaces, a continuous seal extending peripherally about the piston;

biasing means operatively associated with the end seal means at either end of the piston for urging the end seal means outwardly relative to the piston and against the non-movable end dam seal surface;

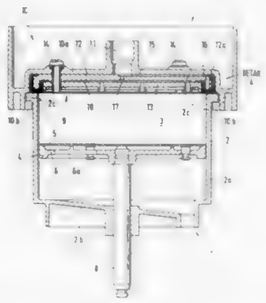
hydraulic means for establishing fluid communication between the end seal means and a source of pressurized hydraulic fluid whereby the end seal means at either end of the piston can be biased outwardly from the piston and against the non-movable end dam seal surfaces.

5,146,839

BREWING MEANS FOR A COFFEE MACHINE

Karl Göckelmann, Gerstetten, and Rudi Geiger, Weissenstein, both of Fed. Rep. of Germany, assignors to WMF Württembergische Metallwarenfabrik AG, Geislingen/Steige, Fed. Rep. of Germany

Filed Feb. 4, 1991, Ser. No. 650,556
Claims priority, application European Pat. Off., Feb. 8, 1990, 90102520
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—287 8 Claims



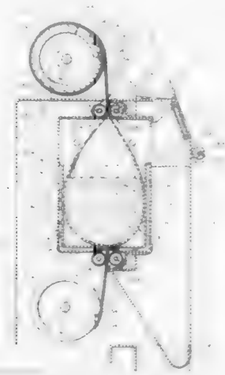
1. Brewing apparatus for a coffee making machine, comprising a housing defining a brewing chamber, the brewing chamber housing having an opening at an upper end thereof; a closing element adapted to close said opening; a hot water conduit being fluidly connected by a flow path to said brewing chamber for supplying pressurized hot water to said brewing chamber for brewing ground coffee disposable in said brewing chamber; seal means being disposed between said closing element and said housing, said seal means extending around said opening of said brewing chamber housing for sealing said brewing chamber, said seal means including a seal member disposed on one of said closing element and said housing, and a sealing seat attached to the other of said closing element and said housing, said seal member including a flexible membrane defining with said one of said closing element and said housing, a sealing chamber, at least a wall portion of said sealing chamber facing toward said sealing seat being formed by said flexible membrane; and a channel connecting said sealing chamber to said supply conduit for subjecting said sealing chamber and said flexible membrane to said pressure of said hot water, said flexible membrane being elastically deformable towards and pressed against said sealing seat by said hot water pressure.

5,146,840

AUTOMATIC BAKING APPARATUS AND MIXBAG THEREFORE

Rolf P. Hedenberg, Maspalomas City, Spain, assignor to Heden-Team AG, Triesenberg, Liechtenstein

Division of Ser. No. 440,195, Nov. 22, 1989, abandoned. This application Aug. 23, 1991, Ser. No. 751,672
Int. Cl.[5] A47J *37/01*
U.S. Cl. 99—328 15 Claims



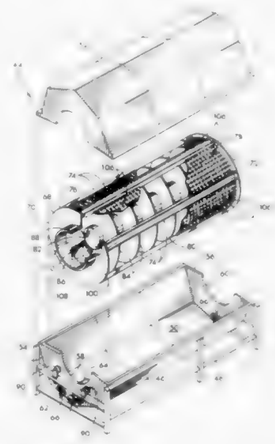
11. Baking apparatus for making a food product in piece form from dough-like substances, comprising a housing containing holding means affixed to a top and bottom portion of a flexible sealable mixbag having two faces each having inner and outer surfaces and containing dry ingredients and water for the dough-like substance, kneading means for mechanically working the ingredients in the mixbag and including moving means for creating relative movement between the mixbag and the kneading means so that the ingredients are kneaded into a dough-like substance, and heat treatment means for baking the kneaded dough-like substance, the improvement comprising said moving means being in the form of drums having a longitudinal length located above and below said mixbag; said holding means being at least one female groove in the outer peripheries of said drums running the longitudinal length thereof and engaging with at least one male protrusion of commensurate shape, the male protrusion projecting from said face outer surface on at least the top portion of said mixbag to detachably engage with the female groove so as to hold said mixbag to said drum during the kneading operation.

5,146,841

OPEN-THROAT BLANCHER

David R. Zittel, 155 Oak Grove Dr., Columbus, Wis. 53925

Filed Mar. 12, 1992, Ser. No. 850,042
Int. Cl.[5] A23L *3/00;* A23N *12/00;* A47J *37/12*
U.S. Cl. 99—348 9 Claims



1. A blancher comprising:

a) a tank having an inlet end and a discharge end;

b) an inlet end plate positioned within the tank adjacent the inlet end, the inlet end plate having portions defining an inlet opening;

c) a discharge end plate positioned within the tank adjacent the tank discharge end, the discharge end plate having portions defining a discharge opening;

d) a plurality of linear support members extending between and connecting the inlet end plate and discharge end plate, wherein the end plates and support members define a drum rotatably mounted within the tank;

e) an auger having a plurality of helical continuous flights, the flights having outer peripheral edges which are connected to the support members;

f) a perforated cylinder enclosing the auger and extending from the inlet end plate to the discharge end plate;

g) a central cylindrical core tube mounted coaxially within the cylinder and connected to the auger, the core and auger terminating at a position spaced axially from the inlet opening, such that an unobstructed infeed path is defined between the central core tube, the auger and the inlet opening, to facilitate unhindered entry of food product into the drum.

5,146,842

ROTISSERIE

Philip J. Romano, Dallas, Tex., assignor to Brinker International, Inc., Dallas, Tex.

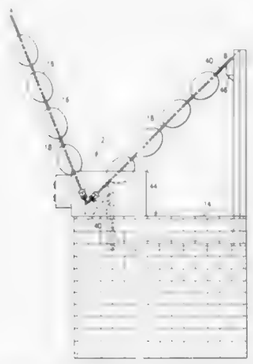
Filed Jan. 27, 1992, Ser. No. 825,964
Int. Cl.[5] A23C *3/00;* A47J *37/04*
U.S. Cl. 99—421 V 14 Claims

1. A rotisserie for imparting axial rotation to a spit having a first end and a second end comprising:

a central post having a first end and a second end, said central post being constructed for pivotal movement about a first axis between a first position and a second position;

a spit retainer rotatably mounted on said central post at said second end of said central post, said spit retainer being

constructed releasably to retain said first end of said spit; and



a drive mechanism mounted on said spit retainer, said drive mechanism being constructed to impart rotational motion to said spit retainer relative to said central post.

5,146,843

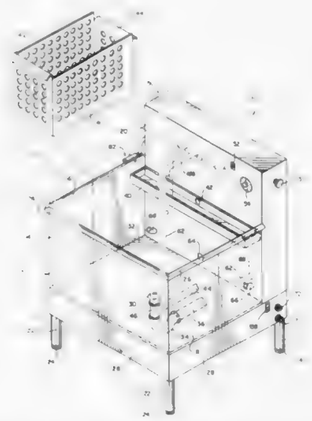
APPARATUS FOR THAWING FROZEN FOOD

Robert Fuller, 1211 Evergreen Ave., South, Clearwater, Fla. 33516, and David Pasek, 3338 Hunt Club Dr., Clearwater, Fla. 33519

Continuation of Ser. No. 193,194, May 9, 1988, abandoned, which is a continuation of Ser. No. 771,727, Sep. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,087, Aug. 31, 1984, abandoned, and a continuation-in-part of Ser. No. 669,791, Nov. 9, 1984, abandoned. This application Jul. 15, 1991, Ser. No. 730,579

Int. Cl.[5] A23L *3/00*; A23B *7/00*

U.S. Cl. 99—483 12 Claims



1. Apparatus for thawing frozen foods, comprising:

a container having a top and a bottom;

a drain disposed adjacent to the top of said container;

first means for filling said container with fresh water to a predetermined level;

second means, operative upon filling said container to said predetermined level, for supplying a flow of fresh water into said container at a predetermined first flow rate such that water in said container rises above said predetermined level and enters into said drain, whereby water is removed from said apparatus; and

third means, operative concurrently with the second means, for removing water from said container and recirculating it back into the container at a predetermined second flow rate which is higher than said first flow rate, such that circulation of water in said container is sufficient (i) to maintain a substantially even water temperature throughout said container and (ii) to dislodge food particles from frozen foods immersed in said container.

5,146,844

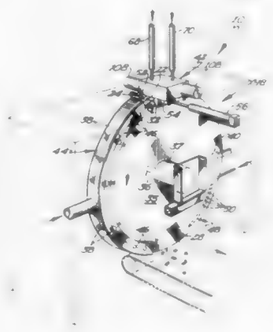
DUAL TEXTURED FOOD PIECE FABRICATION APPARATUS

John M. Dubowik, Buzzards Bay; Karl T. Ulrich, Belmont, and Michael A. Nemirow, Lancaster, all of Mass., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 10, 1990, Ser. No. 624,945

Int. Cl.[5] A23P *1/00*

U.S. Cl. 99—450.6 22 Claims



1. An apparatus for fabricating a shaped food piece comprising, in combination: a first plate having an inner surface; a second plate having an inner surface; means for moving the first and second plates along a circuitous path with the circuitous path having a first portion with the inner surfaces of the first and second plates abutting and a second portion with the inner surfaces of the first and second plates being spaced from each other; at least a first cavity formed in and defined by the first and second plates; and means located in the first portion of the circuitous path for filling the cavity with at least a first food material when the inner surfaces of the first and second plates area butting to harden in the cavity while the first and second plates are in the first portion of the circuitous path, with the hardened food piece being removable from the cavity when the first and second plates are in the second portion of the circuitous path.

5,146,845

CONTINUOUS CHEESE FORMER FOR BULK CHEESE

Allen J. Pittelko, Oakfield, Wis., assignor to Damrow Company, Inc., Fond du Lac, Wis.

Filed Aug. 7, 1991, Ser. No. 741,319

Int. Cl.[5] A01J *11/06, 25/00, 25/11*

U.S. Cl. 99—454 49 Claims

1. A cheese forming apparatus for continuously making bulk cheese from a source of a mixture containing curds and whey, comprising:

a. a tower having a closed top and an open bottom, a substantially cylindrical side wall and a central axis;

b. discharge means for selectively opening and closing the bottom of the tower;

c. transfer means for introducing the mixture into the tower at its closed top;

d. first separator means substantially concentric with and adjacent the inner periphery of the tower side wall and adapted for separating whey from the mixture and collecting the separated whey at the periphery of the tower;

e. second separator means substantially coaxial with the

central axis of the tower and adapted for separating whey from the mixture and collecting the separated whey at the center of the tower; and

f. means for simultaneously drawing a vacuum on said first separator means and said second separator means when said tower bottom is closed, for placing the tower and transfer means under negative pressure, whereby mixture is drawn into the tower.

5,146,846

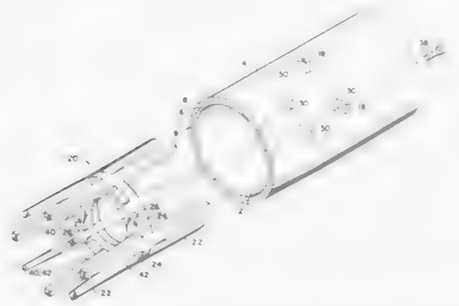
ROLLER ASSEMBLY FOR GRAIN SHELLERS

Stanley M. Lee, Tomball; Jimmy C. Terry, Spring, and John A. Mrosko, Katy, all of Tex., assignors to F. H. Maloney Company, Houston, Tex.

Continuation-in-part of Ser. No. 517,578, May 1, 1990. This application Apr. 18, 1991, Ser. No. 685,921

Int. Cl.[5] B02B *3/00, 3/04*

U.S. Cl. 99—620 13 Claims



1. A roller sleeve assembly for grain shellers, said assembly comprising a round tubular rigid first sleeve, said first sleeve having locking lugs fixed to said first sleeve by screws, and a second sleeve of flexible material bonded to an exterior surface of said first sleeve, with heads of said screws disposed in recesses in an exterior surface of said first sleeve, an interior surface of said roller assembly second sleeve closing an end of each of said recesses, thereby covering each of said screw heads, said locking lugs extending radially inwardly of said first sleeve and being adapted for connection to a mounting means.

5,146,847

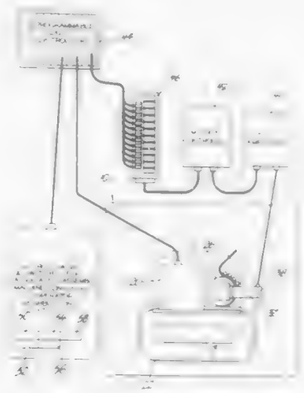
VARIABLE SPEED FEED CONTROL AND TENSIONING OF A BANDER

Peter A. Lyon, and Warren L. Gawve, both of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1991, Ser. No. 678,095

Int. Cl.[5] B65B *13/22*

U.S. Cl. 100—2 6 Claims



4. A method of wrapping a flexible strap around an item utilizing a drive wheel connected to a reversible variable speed drive motor for feeding and reversing the strap to wrap the strap around the item and to tension the strap once it is wrapped around the item, the method including the steps of:

continuously sensing and producing a length signal indicative of the length of strap fed by the drive wheel;

controlling the drive motor at a first forward predetermined speed,

comparing the length of the length signal to a first predetermined length of strap,

decreasing the speed of the drive motor to a second forward predetermined speed upon sensing of the first predetermined length of strap,

comparing the length of the length signal to a second predetermined length of strap, and

stopping and reversing the drive motor upon detection of the second predetermined length of strap.

5,146,848

APPARATUS FOR RECOVERING LIQUID FROM LIQUID-FILLED CONTAINERS

Henri Dufour, 1251 Grande Caroline, Rougemont, Quebec, Canada G0L 1M0

Filed Jan. 30, 1991, Ser. No. 648,122

Int. Cl.[5] B30B *15/16, 9/06*

U.S. Cl. 100—53 30 Claims

1. An apparatus for recovering liquid from refuse liquid-filled containers, comprising:

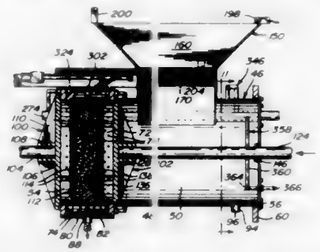
an elongated compression chamber having an open end and including an inlet opening for admitting said refuse containers thereinto, said chamber being formed by a cylindrical wall having a perforated cylindrical wall portion provided with a plurality of liquid collection orifices;

an annular liquid collection chamber surrounding said perforated wall portion for collecting liquid expelled through said liquid collection orifices;

a first plunger movable relative to said open end;

a second plunger axially movable in said compression chamber, said first and second plungers having respective first and second heads with respective first and second perforated plates mounted thereon, each head having a lead surface and the respective heads and perforated plates of said first and second plungers being arranged at one extremity of each said plunger, each plate being provided with a plurality of liquid discharge orifices and being mounted on a respective head in spaced-apart relation to define a gap between each plate and substantially the whole lead surface of each head, said gap permitting liquid flow communication between said liquid discharge orifices and said liquid collection orifices;

a first plunger actuating means coupled to said first plunger for moving said first head to close said open end and position said first perforated plate inside said compression



chamber in working relation to the perforated wall portion thereof; and

a second plunger actuating means coupled to said second plunger for moving said second head with said second perforated plate in a direction toward said first head to compress said refuse containers between said first and second perforated plates and thereby cause said containers to burst and expel liquid, said liquid being expessed through said liquid discharge orifices and said liquid collection orifices as said plungers move closer to one another;

whereby during compression of said containers, said first and second perforated plates together with said perforated wall portion define a strainer completely enclosing said containers such that said liquid passes freely through said liquid discharge orifices and said liquid collection orifices, and directly into said liquid collection chamber.

5,146,849

PRINT HEAD, MOUNTING THEREFOR AND METHOD OF MOUNTING

Leon C. Jobenning, II, Lexington, Va., assignor to Genicom Corporation, Waynesboro, Va.

Continuation-in-part of Ser. No. 241,310, Sep. 7, 1988. This application Sep. 17, 1990, Ser. No. 583,247

Int. Cl.[5] B41J *2/245*

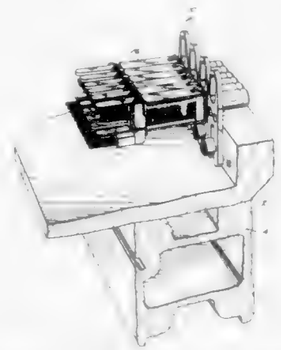
U.S. Cl. 101—93.05 **23 Claims**

1. In a line matrix printer having a horizontal print line, a method of assembling first and second print heads on a support frame having a pair of elongated angularly related support surfaces, each print head having a print head support with a linear surface, an actuator carried by each said print head support and having an actuator wire and a wire guide support for said actuator wire mounted on said print head support and projecting therefrom to form a predetermined angle with the linear surface of the print head support, comprising the steps of:

mounting said first and second print heads on the support frame by engaging each wire guide support on one of said angularly related surfaces and aligning the axes of the actuator wires horizontally with the horizontal print line of the line matrix printer,

engaging the linear surfaces of said first and second print head supports against the other of said angularly related surfaces of the support frame;

engaging at least one of said print head support and aid wire guide support of said first print head with a corresponding



one of said print head support and wire guide support of said second print head; and

thereafter securing each print head support to the support frame.

5,146,850

METHOD FOR CONTROLLING IMPRESSION-ON OPERATIONS FOR AN INTAGLIO PRINTING PRESS AND A DEVICE THEREOF

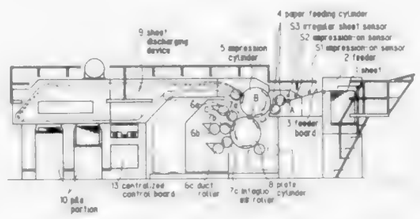
Hitoshi Funada, Chiba, and Hiromitsu Numauchi, Toride, both of Japan, assignors to Komori Corporation, Tokyo, Japan

Filed May 14, 1991, Ser. No. 699,900

Claims priority, application Japan, Jun. 1, 1990, 2-141589

Int. Cl.[5] B41F *9/06, 13/24*

U.S. Cl. 101—153 **2 Claims**



2. A device for controlling impression-on and impression-off operations of an intaglio printing press comprising an intaglio printing press having a plate cylinder, an impression cylinder mounted for movement for impression on said plate cylinder, ink rollers mounted for movement for impression on said plate cylinder for transferring ink to said plate cylinder, a feeder board, a sheet feeder mechanism for sequentially feeding sheets to be printed between said impression cylinder and said plate cylinder, said sheets being sequentially fed to said impression and plate cylinders from said feeder board to a position downstream of said feeder board, a control for said sheet feeder, impression-on and impression-off control means for said ink rolls and said impression cylinder,

a first sensor located at said upstream position on said feeder board for detecting the presence on said feeder board of a said sheet;

a second sensor located at a downstream position on said feeder board and for detecting the presence on said board of a fed sheet;

a third sensor positioned downstream of said second sensor and for detecting the presence of a defective sheet exiting said board; and

a control circuit operatively connected to said first, second and third sensors and operatively connected to said control for said sheet feeder and to said impression-on and impression-off control means for said ink rolls and said impression cylinder, said control circuit being operative to operate said control means for said ink rolls to an impression-on condition in the presence of a said sheet sensed by said first sensor;

said control circuit being operative to operate said control means for said impression cylinder to an impression-on condition in the presence of a said sheet sensed by said second sensor;

said control circuit being operative to operate said sheet feeder to an off-condition, and to operate said control means for said ink rolls and said impression cylinder to an impression-off condition in the presence of a defective sheet sensed by said third sensor.

5,146,851

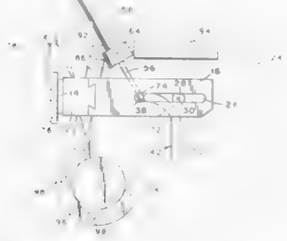
PRINT HEAD ASSEMBLY WITH A STATIONARY HEATER

Patrick H. Anderson, 14 Nortoft Rd., Chalfont St. Peter, Bucks SL9 OLD, and Barry Kossick, 33 High Street, Winslow, Bucks, both of England

Continuation of Ser. No. 594,667, Oct. 9, 1990, abandoned, which is a continuation of Ser. No. 254,101, Oct. 6, 1988, abandoned. This application Jul. 19, 1991, Ser. No. 733,007

Int. Cl.[5] B41F *17/00;* **B41K** *1/40*

U.S. Cl. 101—305 **26 Claims**



1. A print head assembly comprising:

a type holder for carrying type;

means for moving the type holder between a rest position and a printing position where the type is pressed into direct engagement with an article to be printed, said type lying in a first plane in said rest position and in a second plane in said printing position, said first and second planes being substantially perpendicular to each other;

ink supply means adapted to supply the type with a heat-softenable ink when said type holder is between said rest and printing positions, and wherein the ink supply means is arranged to engage the type during movement of the type holder from the rest position to the printing position, but to not engage the type upon return movement of the type holder to the rest position; and stationary means for heating the type, said stationary heating means lying substantially in said first plane such that said type engages said stationary heating means when said type holder is in the rest position.

5,146,852

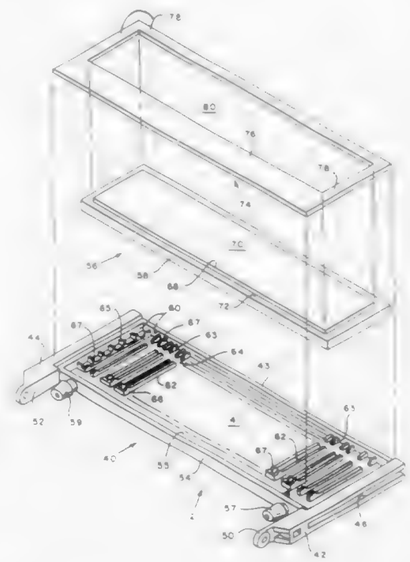
INKING DEVICE FOR POSTAGE METERS

Jerome E. Jackson, Newtown, and Charles F. Murphy, III, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 16, 1991, Ser. No. 777,052

Int. Cl.[5] B41F *31/24*

U.S. Cl. 101—335 **5 Claims**



1. An inking device for continuously applying ink to the printing die of a postage meter during continuous operation of the postage meter, said inking device comprising:

A. a generally rectangular tray having a flat bottom wall and upstanding peripheral front, rear and side walls,

B. a plurality of spaced apart, parallel, elongate, upstanding ribs extending along a major portion of the lateral dimension of said tray and extending upwardly from said bottom wall and forming channels therebetween for the flow of ink, said ribs being of a uniform height with respect to said bottom wall over a major portion of their length, but having relatively short end portions which are inclined upwardly toward the ends of said ribs,

C. an ink pad formed of a relatively flexible, porous absorbent material adapted to hold ink, said ink pad having a raised central portion covering a major portion of the area of said ink pad thereby defining a peripheral flange portion, said ink pad being dimensioned longitudinally to overlie all of said ribs, with said peripheral flange portion of said ink pad lying over said upwardly slanted end portions of said ribs,

D. a generally rectangular cover member adapted to overlie said peripheral flange portion of said ink pad for securing said ink pad in said tray, said cover member having an aperture therein through which said raised portion of said ink pad extends, and

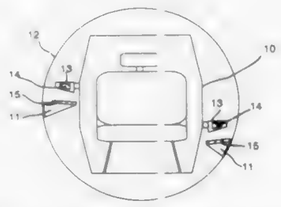
E. a raised protrusion disposed on said upwardly inclined end portions of said ribs for pressing into said peripheral flange portion of said ink pad to prevent said peripheral flange portion from creeping down said upwardly slanted portions of said ribs, thereby maintaining the integrity of the seal between the upper surface of said flange portion of said ink pad and the underside of said cover member.

5,146,853

COMPACT MAGNETIC LEVITATION TRANSPORTATION SYSTEM

Galen J. Suppes, 4327 Morris Ct. Pearland, Tex. 77584

Continuation-in-part of Ser. No. 376,437, Jul. 7, 1989, abandoned. This application Nov 20, 1990, Ser. No. 616,237
Int. Cl.[5] E01B *25/00*
U.S. Cl. 104—138.2 24 Claims



1. A magnetic levitation transportation system comprising;
a plurality of vehicle loading and unloading stations,
at least one primary pair of laterally spaced rails comprised of magnetically interactive material extending between said vehicle loading and unloading stations,
a vehicle of a size such that its periphery is spaced inwardly from said primary rails and its interior is of a size to accommodate a person in a sitting position,
a magnetic levitation means extending laterally along opposite sides of said vehicle and positioned such that one magnetic levitation means is above the longitudinal axis of said vehicle and the opposed magnetic levitation means is below the longitudinal axis of said vehicle and said magnetic levitation means positioned relative to said rails to exert a controlled vehicle force therebetween to levitate said vehicle,
said magnetic levitation means being energized to exert a controlled vertical force on said primary rails to magnetically levitate said vehicle on said rails such that negligible torque is imparted to said vehicle and lateral motion of said vehicle is stabilized under normal operating conditions,
energy conversion means for energizing said magnetic levitation means on said vehicle and for maintaining the speed and acceleration of said vehicle during travel,
braking control means for creating a net braking force on said vehicle in a braking condition, and
speed control means on said vehicle for accelerating and decelerating said vehicle.

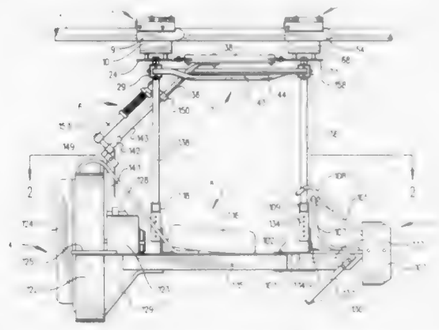
5,146,854

SUSPENDED PERSONNEL CARRIER WITH ARTICULATED FRONT AND REAR PORTIONS STEERABLE INDEPENDENTLY OF TRACK CURVATURE AND TELESCOPIC SHOCK ABSORBING STRUT FOR TRANSFERRING DRIVE FORCE

Philip Poulos, 3319 Candlewood Dr., Hampton, Va. 23666

Filed May 13, 1991, Ser. No. 699,141
Int. Cl.[5] B61B *3/02*
U.S. Cl. 105—150 20 Claims

5. A personnel carrier, comprising:
an elevated track;
a carrier suspended beneath said track;
a bearing assembly supporting said carrier for movement along said track;
a fan drive on said carrier for propelling said carrier along said track, said fan drive including a propeller driven by a motor;
means mounting said motor for limited reciprocal movement on said carrier; and
means connecting said motor to said bearing assembly, such that thrust force exerted on said motor by said propeller is



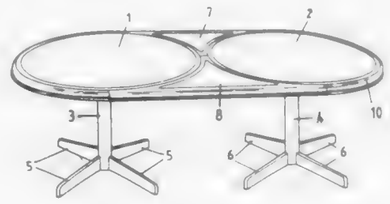
transmitted to said bearing assembly, whereby said carrier is pulled along said track by said bearing assembly.

5,146,855

ARRANGEMENT FOR THE COMPLEMENTARY INTERCONNECTION OF ROUND TABLE TOPS

Brian J. Morgan, 20 Cichon Road, Bridgewater, Australia

PCT No. PCT/AU89/00274, § 371 Date Dec. 31, 1990, § 102(e) Date Dec. 31, 1990, PCT Pub. No. WO90/00022, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 27, 1989, Ser. No. 646,752
Claims priority, application Australia, Jul. 1, 1988, PI9083
Int. Cl.[5] A47B *57/00*
U.S. Cl. 108—64 10 Claims



1. A round top table arrangement comprising at least two round top tables in adjacent relationship and at least two in-fill pieces, each of the said in-fill pieces extending between respective adjacent edges of the adjacent tables and having an approximately triangular shape, the sides of the triangular shape having a concave shape aligning to match with that of the appropriate edge of the round top of the respective table.

5,146,856

POWER PLAN WITH A SCREW CONVEYOR ASH COOLER

Bengt-Göran George, Enköping, Sweden, assignor to ABB Stal Ab, Finspong, Sweden

Filed Mar. 21, 1991, Ser. No. 634,134
Claims priority, application Sweden, Jul. 6, 1988, 8802526-7
Int. Cl.[5] F23J *1/02*
U.S. Cl. 110—171 10 Claims

1. In a power plant, preferably of PFBC type, with a cooler for ashes originating in a bed, said cooler comprising an elongated, substantially horizontal cylinder or tray with a screw having a water-cooled shaft which transports the ashes through the cylinder and cools the ashes the lower part of the

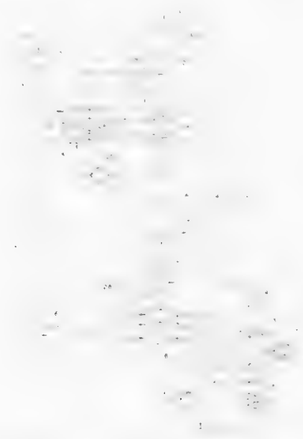
cylinder or tray of the cooler being provided with a fluidization device which includes a gas-permeable bottom and devices for supplying this bottom with a gas fluidization of ashes present in the cylinder.

5,146,857

PROCESS FOR THE PRODUCTION OF ELECTRICAL ENERGY AND/OR HEATING AND PROCESS HEAT

Heinz Spliethoff, Friedrichsthal, Fed. Rep. of Germany; Burkhard Möller, Dresden, and Bodo Wolf, Freital, both of German Democratic Rep., assignors to Saarberg-Interplan Gesellschaft Für Rohstoff-, Energie- und Ingenieurtechnik mbH, Saarbrucken, Fed. Rep. of Germany

PCT No. PCT/DE89/00650, § 371 Date Mar. 6, 1991, § 102(e) Date Mar. 6, 1991, PCT Pub. No. WO90/04702, PCT Pub. Date May 3, 1990
PCT Filed Oct. 12, 1989, Ser. No. 536,660
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835427; Oct. 18, 1988, 3835428
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—234 16 Claims



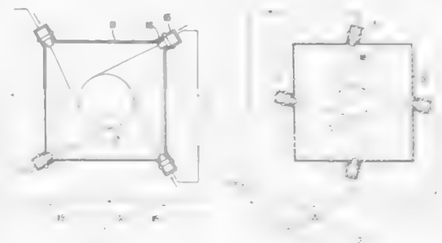
1. A process for the production of electrical energy and/or heating and operational heat by utilization of the combustion heat from fossil fuels, especially lignite comprising drying the fossil fuels prior to the combustion in an indirectly heated fluidized bed dryer, cooling the flue gases derived from combustion in a heat exchange with combustion air to an intermediate temperature level, freeing the flue gases from dust and other damaging substances, and discharging into the atmosphere, wherein a partial flue gas stream, already rendered dust free, is used as a support medium for the fluidized bed dryer, and a mixture of flue gas and steam developed during the drying process, after an intermediate treatment, is discharged together with the main flue gas stream.

5,146,858

BOILER FURNACE COMBUSTION SYSTEM

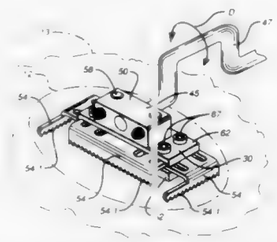
Kimishiro Tokuda; Masaharu Oguri, both of Nagasaki, and Shuzo Naito, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 593,021
Claims priority, application Japan, Oct. 3, 1989, 1-115882[U]
Int. Cl.[5] F23K *5/00*; F23D *1/00*
U.S. Cl. 110—261 4 Claims



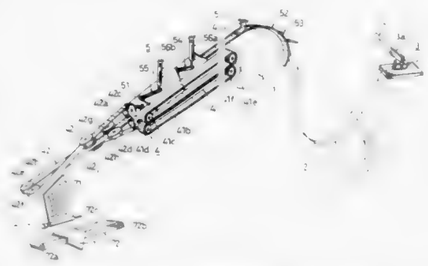
1. In a boiler having a vertically extending square barrel-shaped furnace formed by side walls intersecting at corner portions and defining a longitudinal axis centrally thereof, a combustion system comprising:
a plurality of main burners disposed nearly horizontally on the side walls or at the corner portions of the furnace, said main burners defining axes along which fuel is injected into a main fuel combustion region of the furnace by the main burners, said axes of the main burners extending tangentially to an imaginary cylinder coaxial with the furnace;
fuel supply means and air supply means for supplying fuel to said main burners and introducing air into the main fuel combustion region in amounts sufficient to produce a reducing atmosphere or an atmosphere of a low oxygen concentration of 1% or less in the main fuel combustion region;
at least one group of air nozzles located at a lower level above the main fuel combustion region for injecting additional air into the furnace above the main combustion region, and air supply means for blowing air through said air nozzles disposed at the lower level,
the air nozzles at said lower level being disposed at said corner portions of the furnace and defining axes, respectively, along which additional air is injected into the furnace,
the axes of said air nozzles at said lower level extending tangentially to a second imaginary cylinder coaxial with the furnace and having a diameter larger than that of said first imaginary cylinder; and
at least one group of air nozzles located at an upper level above said lower level for also injecting additional air into the furnace, and air supply means for blowing air through said air nozzles at the upper level,
the air nozzles at said upper level being disposed at portions of the side walls of the furnace located centrally of the corner portions, respectively, and defining respective axes along which additional air is also injected into the furnace,
the axes of said air nozzles at said upper level extending tangentially to a third imaginary cylinder coaxial with the furnace and having a diameter smaller than that of said second imaginary cylinder.

5,146,859
ADJUSTABLE CLAMP FOR USE IN A SEWING MACHINE
Ralph F. Conley, Jr., Miamisburg, and Clint E. Gehres, Moraine, both of Ohio, assignors to MIM Industries, Inc., Miamisburg, Ohio
Filed Jun. 20, 1991, Ser. No. 718,012
Int. Cl.[5] D05B 3/20
U.S. Cl. 112—114 22 Claims



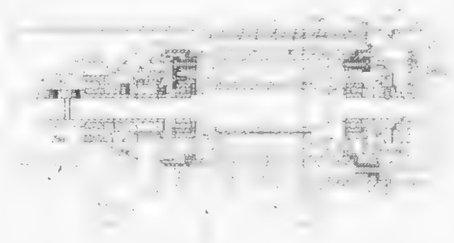
1. An adjustable clamp for securing a workpiece having a predetermined shape against a clamping surface at a sewing station in a sewing machine, said adjustable clamp comprising:
a support;
a plurality of clamp members
adjusting means for adjustably securing said at least one of said plurality of clamp members to said support; and
means for permitting the sewing machine to sew around the support and said plurality of clamp members, said means comprising a connector coupled to said support for detachably mounting said support to said sewing machine;
said at least one of said plurality of clamp members being adjustably secured to said support so that said plurality of clamp members will define a predetermined clamp size which generally corresponds to the predetermined shape, thereby permitting the adjustable clamp to clamp workpieces of different shapes against the clamping surface when the support is mounted to the sewing machine.

5,146,860
SEWING AND STACKING APPARATUS
Katsuhiro Niwa, Hyogo; Tsugutiro Shimoyama, Miyazu; Katsumi Tabushi, Miyazu, and Toshio Anazawa, Miyazu, all of Japan, assignors to Gunze Limited, Kyoto, Japan
Filed Apr. 19, 1991 Ser. No. 687,505
Claims priority, application Japan, Oct. 19, 1990, 2-109982[U]
Int. Cl.[5] D05B 33/00, 27/00, 37/04
U.S. Cl. 112—121.27 10 Claims



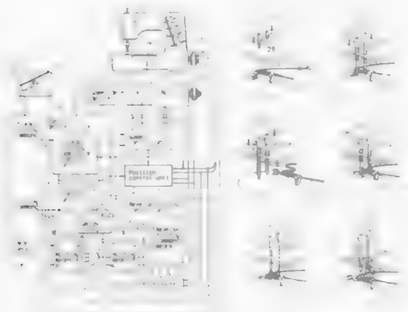
1. A sewing and stacking apparatus comprising:
sewing means for stitching a folded tape on a series of sewing mediums of a substantially identical shape and size arranged spaced apart;
transporting means for transporting the sewing mediums having the folded tape stitched thereon;
detecting means for detecting that one of the sewing mediums reaches a specified position;
cutting means for cutting the folded tape at a specified point when said detecting means detects that one of the sewing mediums reaches the specified position, the specified point being between said one of the sewing mediums and another sewing medium adjacent thereto;
a guiding plate provided below said cutting means, wherein said cutting means comprises a first pair of lower and upper blades, a second pair of lower and upper blades, and a driving member for closing each pair of the blades, the first and the second pairs of blades being respectively disposed at an upstream position and a downstream position, wherein the upstream position is further from the downstream position than a length of each sewing medium in a transporting direction thereof, the lower blades of the first and the second pairs being disposed on slits of the guiding plate;
stacking means for stacking the sewing mediums separated from each other by said cutting means;
wherein said detecting means comprises first and second photosensors provided on a transporting path of the sewing mediums in the vicinity of the first and the second pairs of lower and upper blades, respectively; and
wherein the first photosensor is connected to a detecting circuit for detecting a leading end of each sewing medium, and drives the first pair of blades in accordance with the detection result of the detecting circuit, and the second photosensor is connected to a detecting circuit for detecting a rear end of each sewing medium, and drives the second pair of blades.

5,146,861
SEWING MACHINE WITH A BUILT-IN DRIVING MOTOR
Katsuhiko Sato, Nagoya; Yasuo Sakakibara, Hekinan, and Kohtaro Miyazaki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 5, 1991, Ser. No. 665,411
Claims priority, application Japan, Apr. 26, 1990, 2-111127; May 18, 1990, 2-129693
Int. Cl.[5] D05B 75/00
U.S. Cl. 112—259 13 Claims



1. A sewing machine comprising:
a bed;
a pedestal supported by said bed with a left side wall and a right side wall and having an internal hollow between said left and right side walls;
an arm having one end supported by said pedestal and having an opposite end extending in a horizontal direction;
a motor for driving said sewing machine;
a bottom shaft rotatably provided in said bed;
transmitting means provided near to said left side wall in said internal hollow for transmitting the driving force of said motor to said bottom shaft; and
an accommodating means provided in said one end of said arm for accommodating said motor on the right side of said transmitting means, said accommodating means defining an accommodating space across an extension line of said right wall, said motor being mounted detachably from the accommodating space in said horizontal direction.

5,146,862
SEWING MACHINE-DRIVING APPARATUS
Tadashi Sato, Hirakata; Masaharu Imanishi, Sanda, and Katsuhiko Iwai, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Yamato Mishin Seizo Kabushiki Kaisha, Toyonaka, both of, Japan
Filed Jul. 9, 1991, Ser. No. 727,849
Claims priority, application Japan, Jul. 16, 1990, 2-189123
Int. Cl.[5] D05B 69/18, 69/22
U.S. Cl. 112—275 6 Claims



1. A sewing machine-driving apparatus for driving a sewing machine having needles, a thread cutter means, a position detecting device for detecting a needle position, and a motor for driving the sewing machine, said sewing machine-driving apparatus comprising:
a speed control unit for controlling a rotating direction and rotating speed of said motor in response to one of a driving command from an operator and a reverse driving command,
a position control unit for controlling a position of said needles of said sewing machine in response to a signal from said position detecting device issued at a first predetermined needles position to stop said needles at a constant height,
a thread cutting operation control unit for actuating said thread cutter means of said sewing machine in response to a thread cutting command,
a stitch start control unit for controlling the driving direction of said motor and having a reverse driving control unit, said reverse driving control unit issuing, in response to a driving command after the actuation of said thread cutter means, a reverse driving command to said speed control unit for driving said motor to drive said sewing machine in a direction reverse to that of a usual stitching operation until said position detecting device detects a second predetermined needles position.

5,146,863
AIR CUSHION DISPLACEMENT HULL WATER VEHICLE
Allen G. Ford, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 21, 1991, Ser. No. 779,795
Int. Cl.[5] B63B 1/34
U.S. Cl. 114—67 A 5 Claims

1. An air cushion displacement hull water vehicle, comprising:
a hull having a forward bow portion, an opposing aft end portion, a pair of sidewalls spaced from each other and extending between said forward bow portion and said aft end portion and a bottom wall extending between said forward bow portion and said aft end portion and between said sidewalls and having a recessed portion formed therein which extends into an interior portion of said hull to define an air cushion region; said bow portion being a sharp bow which divides approaching water to the right and left and
air supply means positioned within said interior portion of said hull and operatively connected with said air cushion region for supplying pressurized air to said hull and water passing under said hull as said hull is propelled through said water,
said air cushion region has a forward end portion and a rearward end portion said region extending from near the bow to near the stern of the vehicle; and
said air supply means includes a source of air at elevated pressure and a common header for passing pressurized air from the source of air, said common header including a check valve therein to prevent water from entering the source of air through the common header;

a first air supply line,
a second air supply line,
said first air supply line having a first end and a second end and being connected at a first end with the said common header, said second end being located in the said rearward end portion of said air cushion region said first air line passes air from said air source to said rearward end portion of said air cushion region;
said second air supply line having a first end an a second end, and being connected at the first end with the said common header, said second end being located in the said forward end portion of said air cushion region, said second air supply line passes air from said air source to said forward end portion of said air cushion region;
said forward end portion of said air cushion region includes a component shaped in the form of a cusp having a sharp face at the lowest point on the vehicle said face being pointed in the aft direction to cause smooth separation of the water passing thereunder as said hull is propelled through the water.

5,146,864
VARIABLE LENGTH BATTEN
Ross Harrington, Victoria, Canada, assignor to Venturi Designs Ltd., Victoria, Canada
Filed Apr. 16, 1991, Ser. No. 686,105
Int. Cl.[5] B63H 9/04
U.S. Cl. 114—103 36 Claims

1. A telescopic, flexible sail batten for a mast supported sail comprising:
a) first and second batten elements, each of said elements having first and second ends, said second end of said first element and said first end of said second element being

nested for telescopic, free-sliding relative movement between extended and retracted positions, said second end of said second element comprising a surface for transferring force to said sail; and,

b) biasing means acting on said first and second elements to bias said elements toward an extended position.

5,146,865

WATER-JET PROPULSION SYSTEM FOR SHIPS WHICH ARE INTENDED TO BE USED IN SHALLOW WATERS

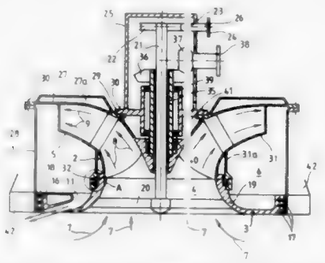
Siegfried Lais, Spay, and Gerd Krautkramer, Remagen, both of Fed. Rep. of Germany, assignors to Schottel-Werft Joseph Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany

Filed Jun. 28, 1991, Ser. No. 724,972

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1990, 4021340

Int. Cl.[5] B63H *11/113*

U.S. Cl. 114—151 **15 Claims**



1. A water-jet propulsion system for ships which are intended to be used in shallow waters, comprising:

a cylindrical pressure housing adapted to be fixed with respect to the ship with which it is used,

a bottom plate having a central inlet opening through which water can flow into the pressure housing, the bottom plate being rotatable with respect to the pressure housing and having at least one water outlet nozzle,

a cover plate secured to the pressure housing,

the pressure housing, bottom plate, and cover plate defining between them an annular pressure chamber,

a turbine wheel rotatable with respect to the pressure housing for drawing water upwardly through the opening in the bottom plate,

guide means for directing water pumped by the turbine wheel into the pressure chamber,

the pressure chamber being so sized with respect to the guide means that the flow energy of the water flowing from the turbine wheel through the guide means is converted to pressure energy in the pressure chamber, the water leaving the pressure chamber through the outlet nozzle in the bottom plate to propel the ship, and

means for rotating the bottom plate so as to change the orientation of the outlet nozzle with respect to the ship and thereby guide the direction of the ship.

5,146,867

PASSIVE RODENT CONTROL SYSTEM

S. A. Goldschmidt, 3525 Eel Rock Rd., Myers Flat, Calif. 95554

Filed Oct. 16, 1991, Ser. No. 777,038

Int. Cl.[5] A01N *29/00*

U.S. Cl. 116—22 A **3 Claims**

1. A passive rodent control system for imparting air induced vibrations into the soil; wherein, the system comprises

a plurality of elongated ground penetrating metal stakes having a top and bottom, and disposed at a selected distance from one another; wherein, the bottom of the metal stakes penetrate the ground to a selected depth; and,

at least one generally thin, flat elongated flexible ribbon having its opposite ends secured proximate to the tops of said plurality of stakes, such that the flat intermediate portion of said at least one elongated ribbon is disposed in a vertical orientation and placed into a selected degree of

tension between said stakes, such that when non-parallel wind forces encounter the flat intermediate portions of said at lest one flexible ribbon, wind generated vibrations are imparted to the bottoms of said metal stakes.

5,146,868

SELF CONTAINED RECIRCULATING POWDERING A VACUUMING ASSEMBLY

Cecil K. Kirk, 6605 21st St. East, Sarasota, Fla. 34243

Filed Oct. 23, 1990, Ser. No. 601,994

Int. Cl.[5] B05B *7/14*

U.S. Cl. 118—713 **7 Claims**

1. A self contained recirculating powdering and vacuuming assembly of a thermographic relief printing system comprising:

a blower operably connected within a housing creating a low pressure region and a high pressure region within said housing;

a powder tray beneath a first outlet of said low pressure region, said powder tray structured to hold a quantity of powder and to controllably deposit powder onto a paper stock therebelow having a wet ink coating on preselected areas of the paper stock;

a vacuum passage extending between an inlet of said low pressure region and an elongated powder pick-up slot just above and transverse to a conveyor for transforming the paper stock;

a pressurized airflow manifold extending between an outlet of said high pressure region and a first elongated air discharge nozzle on each upstream side and downstream side of, and generally coextensive with, said powder pick-up slot;

each said first discharge nozzle positioned immediately above and in very close proximity to the conveyor and directed toward said powder pick-up slot;

a lower margin of each said first discharge nozzle structured to sealably act with the paper stock to confine substantially all pressurized air exiting from said first discharge nozzle therebetween to loosen unadhered powder from atop the paper stock for suction transfer into said vacuum passage;

said lower pressure region structured to continuously separate air and powder drawn into said low pressure region through said low pressure region inlet, to deposit the powder at said low pressure region first outlet, return the air into a second outlet of said low pressure region into said high pressure region, then into said pressurized airflow manifold;

a sealed means connected beneath said low pressure region first outlet for transferring powder accumulated at said low pressure region first outlet into said powder tray.

5,146,869

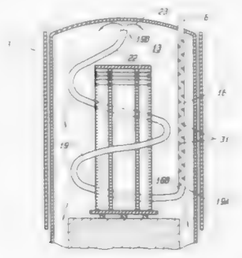
TUBE AND INJECTOR FOR PREHEATING GASES IN A CHEMICAL VAPOR DEPOSITION REACTOR

Kenneth W. Bohannon; Kuppuswamy Srikrishna, both of Puyallup; Anthony F. Sholing, Spanaway, and Steven E. Reder, Puyallup, all of Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 11, 1990, Ser. No. 535,811

Int. Cl.[5] C23C *16/00*

U.S. Cl. 118—724 **11 Claims**



1. An apparatus allowing preheating of reactant gases in a vertical CVD reactor, the reactor having a heated chamber, said apparatus comprising an injector tube for preheating said reactant gases to substantially near the reactor temperature, wherein said injector tube has its distal end disposed near the top of said chamber and has a length within said chamber substantially greater than the length of the longest dimension of said chamber plus the horizontal distance from a sidewall of said chamber to said distal end.

5,146,870

LIQUID NUTRIENT DISPENSERS FOR AQUARIUM BIOLOGICAL FILTER MEDIA

Andres V. Eyas, Carol Stream, Ill., assignor to International Seaboard Corp., Chicago, Ill.

Filed Jan. 29, 1990, Ser. No. 471,929

Int. Cl.[5] A01K *63/04*

U.S. Cl. 119—5 **10 Claims**

1. A filter for an aquarium, which filter comprises at least one biological fitler media and a dispenser for liquid nutrients used to sustain the metabolism of said biological filter media, wherein said dispenser comprises:

(a) a rigid container having an opening therein adapted to permit the introduction of liquid nutrients into said container;

(b) means for preventing the flow out of said container through said opening of liquid nutrient introduced therein; and

(c) means for allowing the permeation to the exterior of said container of liquid nutrient introduced therein.

5,146,871

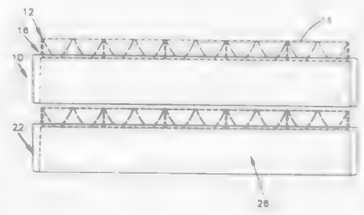
INCUBATOR AND HATCHER TRAY

Thomas P. Havran, Seville, Ohio, assignor to Chick Master Incubator Company, Medina, Ohio

Filed Sep. 24, 1991, Ser. No. 764,838

Int. Cl.[5] A01K *43/00, 41/06*

U.S. Cl. 119—43 **13 Claims**



1. An improved nestable setter/hatcher egg tray comprising:

a. a base portion;

b. an upper egg support portion secured to the base portion and defining a plurality of egg receptacles, said receptacles each having egg support means to support an egg in a substantially vertical position within said receptacles;

c. a hatch portion secured to said base portion opposite said upper egg support portion and having a hatch section defined by apertured sidewalls, said sidewalls substantially enclosing the upper egg support portion of another like tray when placed in nesting relationship with such other tray;

d. the distance between such base portion of said other tray and a top surface of said upper egg support portion is less than the length of an egg of the type the tray is intended to support when two of such trays are in nested relationship whereby the eggs are supported in a substantially vertical orientation when the eggs are supported on the hatch portion after invertion and prior to unnesting of the trays; and

e. said hatch section providing unobstructed rolling movement of said eggs within said hatch section when a stack of nested trays are inverted and unnested.

5,146,872

ANIMAL-ACTUATED FEED-DISPENSING APPARATUS

Larry L. Waldner, Raymond, S. Dak., assignor to Clark Hutterian Brethren, Inc., Raymond, S. Dak.

Filed Jul. 5, 1991, Ser. No. 726,330

Int. Cl.[5] A01K *1/10*

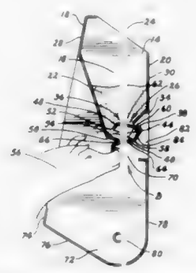
U.S. Cl. 119—54 **10 Claims**

1. An animal actuated, feed dispensing apparatus comprising:

a feed storage bin having a bottom opening for dispensing feed from said bin;

gate means swingable between closed and open positions and mounted on said bin to permit opening and closing of said bottom opening, said gate means normally disposed in said closed position;

a feed charge chamber for receiving a predetermined charge of feed from said bin through said opening when said gate means is swung to said open position and for discharging said feed into an animal feeding area when said gate means is swung to said closed position, said feed charge chamber



being carried on said gate means for movement therewith; and

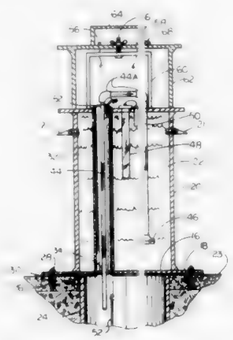
means engagable by an animal for swinging said gate means between said closed and open positions, whereby an animal can engage said means for swinging so said gate means swing from said closed to said open position so that said feed charge chamber can receive a charge of feed from said bin and whereby the animal can dispense said charge of feed by disengaging from said means for swinging so said gate means swings to said closed position and said feed is discharged from said feed charge chamber.

5,146,873

FREEZELESS ANIMAL WATERER

Donald E. Gray, R.R. 4, Box 313A, West Burlington, Iowa 52655

Filed Jun. 27, 1991, Ser. No. 722,508
Int. Cl.[5] A01K *7/06*
U.S. Cl. 119—73 7 Claims



1. A livestock waterer, comprising, a vertical container having a top, bottom, sidewalls and an interior compartment,

a vertical tube in said compartment extending upwardly from said bottom, said tube having an open bottom adapted to communicate with a water riser tube,

a pressurized water supply pipe in said vertical tube and having a cross sectional area less than that of said vertical tube, said pipe having an outlet opening in said compartment,

a heating element in said compartment to warm water therein,

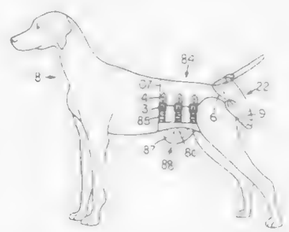
and at least one animal operable watering valve in said container to permit animals to selectively withdraw water from said compartment.

5,146,874

DEVICE WITH POUCHES FOR RECEIVING ANIMAL WASTE

Stella M. Vidal, 21 E. 22nd St., #6H, New York, N.Y. 10010

Continuation-in-part of Ser. No. 216,941, Jul. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 944,344, Dec. 18, 1986, Pat. No. 4,779,573, which is a continuation-in-part of Ser. No. 755,263, Jul. 15, 1985, abandoned, which is a continuation of Ser. No. 623,222, Jun. 21, 1984, Pat. No. 4,537,153, which is a continuation of Ser. No. 337,712, Jan. 7, 1982, abandoned. This application May 19, 1989, Ser. No. 354,220
Int. Cl.[5] A01K *23/00*
U.S. Cl. 119—95 11 Claims



1. A device to be worn on the body by an animal such as a dog, cat or the like, for receiving and retaining the discharge of body waste, said animal being a wearer of the device, and having a top line, a rear, an anal region at the rear, a tail with a root at the rear above the anal region, a genital region, a neck, a chest, a belly, hind legs, and forelegs, said root having a top and said tail projecting rearwardly from said root, said device comprising: a wearer-contacting garment having an upper portion which extends over the top line of the wearer, a back portion which extends over the rear of the wearer, said back portion having an opening for register with the root of the tail and the anal region of the wearer and supporting first container means connected to said opening for receiving solid body waste discharged therethrough, a lower portion which extends over the genital region of the wearer, said lower portion having an opening for register with the genital region of the wearer, and supporting second container means connected to said opening for receiving fluid body waste discharged therethrough and having a closed bottom and one entrance opening to receive the discharge of fluid body waste, said one entrance opening for register with the genital region of the wearer, said second container means being connected to said lower portion along the periphery of said opening of said lower portion and said second container means being a pouch and having an absorbent pad connected to and lining the inside of said pouch to retain fluid waste, and means connected to said wearer-contacting garment at selected regions to fasten the garment tightly yet comfortably and securely around the body of the wearer.

5,146,875

MEDICATED THERAPY APPARATUS FOR PETS

Paul D. Bolt, 2918 Albee St., Eureka, Calif. 95501

Filed Oct. 7, 1991, Ser. No. 772,319
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—96 7 Claims

1. A medicated therapy apparatus for applying medicant

over a large surface area on a dog; wherein, the apparatus comprises

a harness unit comprising a plurality of strap member including: a pair of front strap member having front, intermediate and rear portion; wherein, the intermediate portions of said front strap members are operatively connected together by a first gusset element; a pair of rear strap mem-

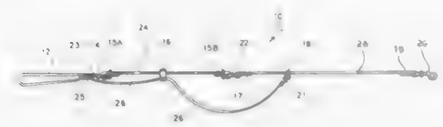
bers operatively connected to said front strap members, wherein the rear strap members have front, intermediate, and rear portions; wherein, the rear portions of the said rear strap members are connected together by a second gusset element; and, wherein each of said strap members are fabricated from an outer layer, an inner apertured layer and a medicated insert disposed between said outer and inner layers.

5,146,876

SHOCK ABSORBER LEASH

Gregory E. McPhail, HC01 Box 610, Ilwaco, Wash. 98624

Filed Nov. 29, 1991, Ser. No. 800,129
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—109 5 Claims



5. An extensible pet leash comprising;

a first elongated strap having a first end and a second end, a handle being provided at said first end, a first means for guiding being provided at said second end, and an intermediate means for guiding being provided between said first and second ends;

a second elongated strap having a first end and a second end, a first means for connecting mounted on said first end of said second elongated strap, and a clip mounted on said second end of said second elongated strap;

said handle including a second means for connecting; and

an elastic cord connected between said first means for connecting and said second means for connecting; whereby

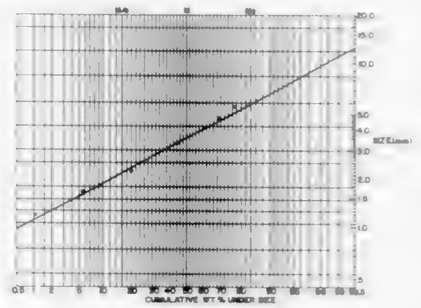
when a pet, connected to said leash, pulls on said leash, said elastic cord will stretch and said extensible leash will expand until said first means for connecting on said first end of said second elongated strap engages said first means for guiding on said second end of said first elongated strap, thereby absorbing forces placed on said extensible pet leash by a tethered pet.

5,146,877

PARTICULATE ABSORBENT MATERIAL HAVING CONTROLLED BULK DENSITY

Richard M. Jaffee, Lincolnwood; William F. Moll, Crystal Lake, and G. Robert Goss, Quincy, all of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Filed Apr. 17, 1991, Ser. No. 686,702
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—172 12 Claims



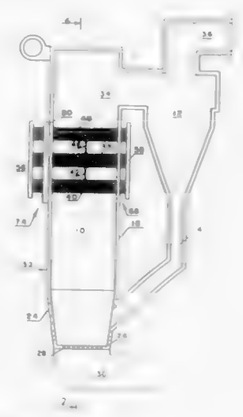
1. A particulate absorbent material constituted by a blend of discrete clay granules and discrete paper granules; the weight ratio of paper granules-to-clay granules being in the range of about 0.09 to about 9.

5,146,878

BOILER AND A SUPPORTED HEAT TRANSFER BANK

Tuomo Hulkkonen, Varkaus, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Dec. 3, 1991, Ser. No. 800,518
Claims priority, application Finland, Dec. 21, 1990, 906348
Int. Cl.[5] F22B *37/24*
U.S. Cl. 122—510 20 Claims



1. A boiler comprising:

a plurality of walls defining a reaction chamber;

a first heat transfer panel comprising a plurality of elongated first, heat transfer tubes vertically stacked, one atop the other, and extending in a first horizontal dimension;

a second heat transfer panel comprising at least one, second,

heat transfer tube extending in a second horizontal dimension, essentially perpendicular to said first horizontal dimension;

means for operatively attaching said first elongated heat transfer tubes to two of said reaction chamber walls to support said first elongated tubes extending in said first dimension;

means for operatively attaching said at least one second heat transfer tubes to two of said reaction chamber walls to support said second tubes extending in said second dimension; and

means for connecting said at least one second heat transfer tube to said first heat transfer panel so as to stiffen said first heat transfer panel against sideways movement.

5,146,879

VARIABLE COMPRESSION RATIO APPARATUS FOR INTERNAL COMBUSTION ENGINE

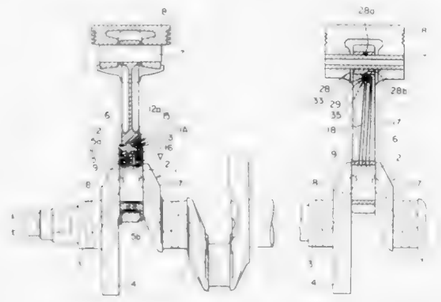
Tateo Kume; Kazuhiro Shiraishi, both of Kameoka; Masahiko Matsuda, Kyoto, and Toru Okada, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1991, Ser. No. 642,335

Claims priority, application Japan Jan. 17, 1990, 2-7527; Jan. 17, 1990, 2-7528; May 15, 1990, 2-125166

Int. Cl.[5] F02B *75/02*

U.S. Cl. 123—48 B **22 Claims**



1. A variable compression ratio apparatus for an internal combustion engine having at least one cylinder, a piston reciprocally disposed within the cylinder and a connecting rod pivotally connected at one end thereof to the piston and at the other end thereof to a crankshaft, comprising:

an eccentric sleeve rotatably arranged in one of pivot portions at opposite ends of the connecting rod so as to make a bearing hole of the connecting rod and a pin, which extends through the bearing hole, eccentric relative to each other; and

an eccentric sleeve lock means capable of fixing rotation of the eccentric sleeve at a desired position, said eccentric sleeve lock means comprising

a pin member engageable with one of engagement portions formed in the eccentric sleeve, and

a piston-type fluid pressure drive system having a means for producing a pressure difference between fluid pressure chambers formed at opposite sides of a piston portion, which is connected to the pin member, in a state that the fluid pressure chambers are simultaneously applied with a prescribed fluid pressure, whereby the piston portion is moved to drive the pin member.

5,146,880

RADIAL CYLINDER MACHINE

Alfred R. Mayne, Surfers Paradise, Australia, assignor to Split-Cycle Technology Limited, Newcastle, Australia

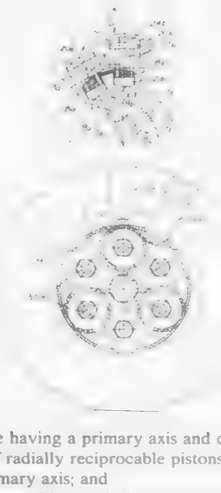
PCT No. PCT/AU89/00275, § 371 Date Feb. 20, 1991, § 102(e) Date Feb. 20, 1991, PCT Pub. No. WO90/00218, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 27, 1989, Ser. No. 654,631

Claims priority, application Australia, Jun. 26, 1988, PI9023; Dec. 16, 1988, PJ2001

Int. Cl.[5] F02B *75/22*

U.S. Cl. 123—55 A **22 Claims**



1. A machine having a primary axis and comprising:

a plurality of radially reciprocable pistons disposed radially of said primary axis; and

a circular array of lobed shafts constrained for orbital motion about said primary axis, each shaft being rotatable about a respective secondary axis parallel to the primary axis, the shafts being rotatably driven by drive means at a rate being a predetermined proportion of their orbital rate, and the planes of the lobes lying approximately in the radial plane of the pistons, and wherein during the rotation and orbit of the shafts and reciprocation of the pistons each piston is connected with at least one lobe for rotation and orbit of the shaft in unison with reciprocation of that piston.

5,146,881

METHOD OF OPERATING I.C. ENGINES AND APPARATUS THEREOF

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

PCT No. PCT/US90/00860, § 371 Date Jul. 19, 1991, § 102(e) Date Jul. 19, 1991

Continuation-in-part of Ser. No. 311,848, Feb. 17, 1989, Pat. No. 4,896,636. This PCT application Feb. 15, 1990, Ser. No. 730,959

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

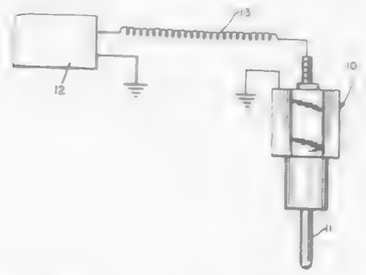
Int. Cl.[5] F02P *19/00, 23/02*

U.S. Cl. 123—145 A **2 Claims**

1. A method for more rapid starting of an unthrottled internal combustion engine, which method comprises:

(a) electrically heating an ignition catalyst comprising at least an effective portion of the ignition surface of a glow plug to a temperature effective for vaporization and ignition said temperature being at least about 75 degrees Kelvin below that value required for ignition with a non-catalytic glow plug of the same size and configuration as said catalytic plug; and

(b) igniting gas phase combustion of an admixture of fuel and air by contact of said admixture with said heated catalyst,



said combustion resulting in a combustion wave in the immediate vicinity of top dead center.

5,146,882

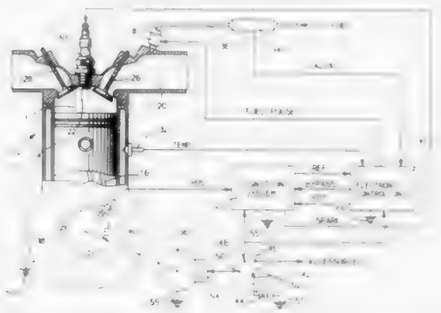
METHOD AND APPARATUS FOR COLD STARTING A SPARK IGNITED INTERNAL COMBUSTION ENGINE FUELED WITH AN ALCOHOL-BASED FUEL MIXTURE

Norman D. Brinkman, Troy; Cameron J. Dasch, Bloomfield Hills, both of Mich.; Lynn A. Rockwell, Anderson, and Daniel H. Hopper, Peru, both of Ind., assignors to General Motors Corporation, Detroit, Mich. and Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 27, 1991, Ser. No. 750,357

Int. Cl.[5] F02D *43/00, 41/06*

U.S. Cl. 123—179.5 **21 Claims**



1. A method for enhancing the cold-starting capability of an internal combustion engine operating on an alcohol-based fuel mixture, the engine including a cranking means for rotating the engine during starting, a means for delivering the fuel mixture to each engine cylinder, and a spark plug with an arc gap positioned in each engine cylinder for igniting the delivered fuel mixture, the steps of the method comprising:

regulating the quantity of alcohol-based fuel delivered to the engine during cranking to establish a combustible fuel vapor-air mixture in each engine cylinder, while restricting the accumulation of unvaporized fuel in each engine cylinder so as not to exceed a predetermined amount; and

providing to each cylinder spark plug an ignition current having a peak magnitude sufficient to effectuate voltage break down across each spark plug arc gap, when each arc gap is resistively loaded due to wetting in accordance with the predetermined amount of accumulated unvaporized fuel.

5,146,883

PISTON AND CONNECTING ROD ASSEMBLY

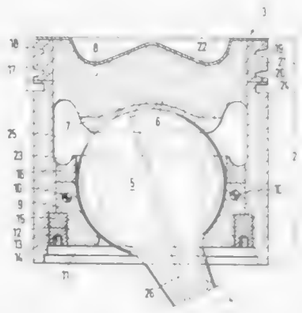
Peter Reipert, Stuttgart; Arno Kolb, Offenau; Siegfried Mielke; Tjark Coners, both of Neckarsulm, all of Fed. Rep. of Germany, and Dean Reichenbach, Kolumbus, Ind., assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed May 21, 1991, Ser. No. 703,563

Claims priority, application Fed. Rep. of Germany, May 24, 1990, 4016723

Int. Cl.[5] F02F *3/00*

U.S. Cl. 123—193.6 **15 Claims**



1. In a piston and connecting rod assembly for an internal combustion engine, comprising an aluminum alloy cast piston which includes top and bottom parts and a spherical small end portion formed on the upper end of the connecting rod a spherical segment-shaped recess formed in the bottom surface of the piston head and surrounding the spherical end portion of the connecting which is movably mounted in a hingelike retaining ring detachably connected to the skirt of the piston, the improvement wherein the piston (3) is made by squeeze casting and the whole piston is reinforced by fibers except that the top part is free of fibers in a layer (7) which adjoins the spherical segment-shaped recess (6) in the bottom surface of the piston head (8), the assembly including a ring carrier (21) which has open pores completly filled with the aluminum alloy of the piston, the ring carrier being embedded in the ring-carrying portion (17) and joined thereto by a metallic bond, and a collar (16) serving as an abutment for the retaining ring (9) is integrally cast with the bottom part on the inside of the bottom part.

5,146,884

ENGINE WITH AN OFFSET CRANKSHAFT

Ronald F. Merkel, 2010 Yorktown Ct. S., League City, Tex. 77573

Filed Nov. 26, 1990, Ser. No. 617,671

Int. Cl.[5] F02B *75/04, 75/32*

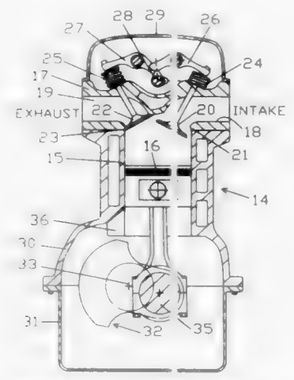
U.S. Cl. 123—197.4 **11 Claims**

1. An internal combustion engine having a cylinder, a single piston positioned for reciprocal movement in each said cylinder, fixed length connecting rod, and fixed crankshaft with crank arms in which

said crankshaft is in a fixed position offset by about the length of the crank arm with respect to the vertical center line of said piston and cylinder whereby the downstroke of said piston rotates said crankshaft through more than 180° of rotation,

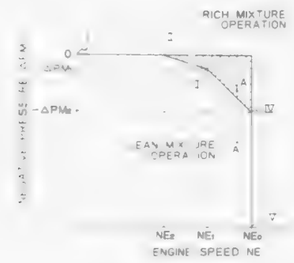
said cylinder has a relieved section in the lower portion

thereof allowing excess sidewise movement of said connecting rod, and



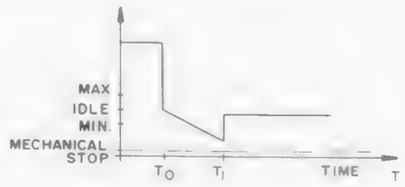
the offset position of the crankshaft produces a lower maximum torque on the crankshaft.

5,146,885
AIR-FUEL RATIO CONTROL DEVICE FOR AN ENGINE
Takao Fukuma; Keisuke Tsukamoto; Toshio Takaoka, and Hirofumi Yamasaki, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Continuation of Ser. No. 647,497, Jan. 29, 1991, abandoned. This application Oct. 31, 1991 Ser. No. 785,166
Claims priority, application Japan, Jan. 31, 1990, 2-18977
Int. Cl.[5] F02D *41/04, 41/10*
U.S. Cl. 123—308 19 Claims



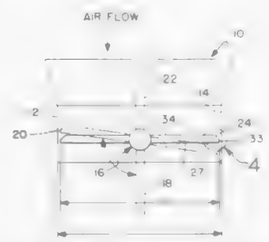
1. An air-fuel ratio control device for an engine comprising:
means for detecting a load of the engine;
means for detecting a speed of the engine;
operation mode selecting means for selecting operation modes of said engine, said operation mode selecting means selecting a rich mixture operation mode in which said engine is operated on a rich air-fuel mixture having an air-fuel ratio lower than or equal to a stoichiometric ratio when the load of the engine is higher than a set load value, and said operation mode selecting means selecting a lean mixture operation mode in which said engine is operated on a lean air-fuel mixture having an air-fuel ratio higher than the stoichiometric ratio when said engine load is lower than or equal to said set load value;
air-fuel ratio setting means for adjusting the air-fuel ratio in accordance with said operation mode selected by said operation mode selecting means;
load value setting means for setting said set load value, said load value setting means setting said set load value in accordance with the engine speed so that said set load value is reduced as the engine speed is increased.

5,146,886
SYSTEM FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE
Erik Männle, Oberkirch; Bernd Lieberoth-Leden, Leonberg, and Wolfgang Maisch, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE90/00445, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO91/00957, PCT Pub. Date Jan. 24, 1991
PCT Filed Jun. 13, 1990, Ser. No. 646,770
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922419
Int. Cl.[5] F02D *11/10*
U.S. Cl. 123—325 26 Claims



1. A system for controlling an internal combustion engine of a motor vehicle, the engine having at least one electronically controllable adjusting component such as for influencing the power of the engine, the system comprising:
a measuring unit fixedly connected to said adjusting component for detecting the position of said adjusting component;
control means for fixing the position of said adjusting component with a pregiven normal operating range in dependence upon measured variables of a least one of the engine and motor vehicle; and,
actuating means for moving said adjusting component out of said operating range for a short time duration in at least one operating mode of the engine wherein an acceleration of the vehicle does not take place as a consequence of fuel metered to the engine.

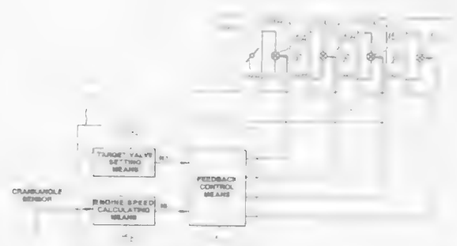
5,146,887
VALVE ASSEMBLY
Paul L. Gluchowski, Rochester; Karl J. Haltiner, Jr., Fairport; David G. Savini, Penfield; Roger M. Brisbane, Spencerport, and Daniel F. Smith, Conesus, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 743,946, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 550,313, Jul. 12, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 827,559
Int. Cl.[5] F02D *9/08*
U.S. Cl. 123—337 7 Claims



1. A valve assembly for regulating air flow to an internal combustion engine, said valve assembly comprising:
a valve body having a valve bore forming an induction passage for air flow to the engine;

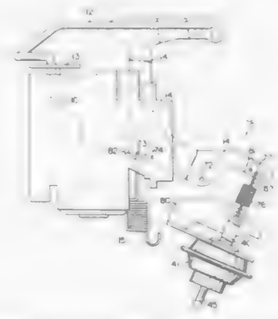
a shaft having opposite ends which are journalled for rotation in said valve body, said shaft extending across said valve bore;
a flat butterfly valve member having a periphery enclosing an area which is smaller than the cross sectional area of said valve bore, said valve member being secured to said shaft rotation between a nonactuating position and a maximum actuating position to vary the flow area around said valve member, the flow area being maximum when said valve member is in said maximum actuating position, said valve member being rotated in excess of 90 degrees between said maximum actuating and nonactuating positions, said valve member passing through a zero degree position when rotated from said maximum actuating position to said nonactuating position, said zero degree position being defined by said valve member being perpendicular to the axis of said valve bore, the flow area around said valve member when in said zero degree position being less than the flow area around said valve member when in said nonactuating position; and
a return means being adapted to urge said valve member toward said nonactuating position when said valve member is rotated away from said nonactuating position.

5,146,888
IDLE ENGINE SPEED CONTROL APPARATUS
Kunifumi Sawamoto, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed Jun. 21, 1991, Ser. No. 718,672
Claims priority, application Japan, Jun. 29, 1990, 2-172128
Int. Cl.[5] F02D *41/16*
U.S. Cl. 123—339 7 Claims



1. An idle engine speed control apparatus for a multiple cylinder engine, comprising:
a throttle valve disposed in each intake manihold branch upstream of each cylinder of the engine;
means defining an air passage connected with each intake manifold branch downstream of said throttle valve;
an idle control valve disposed in each air passage, an opening state of said control valve being changeable to control an amount of air flowing in said air passage;
means setting a target value of an idle engine speed;
means for detecting a crankangle of the engine;
means for calculating an engine speed in a combustion stroke of each cylinder of the engine in accordance with said detected crankangle; and
means for feedback-controlling the opening state of said idle control valve so that the calculated engine speed is brought into agreement with said target value.

5,146,889
GOVERNOR ASSIST MECHANISM
Steven M. Swanson, Minneapolis; John C. Fanner, Coon Rapids, and Nick V. Halstead, Oak Grove, both of Minn., assignors to Onan Corporation, Minneapolis, Minn.
Division of Ser. No. 341,644, Apr. 21, 1989, Pat. No. 5,003,949.
This application Sep. 18, 1990, Ser. No. 584,265
Int. Cl.[5] F02D *31/00;* F02M *39/00*
U.S. Cl. 123—376 11 Claims

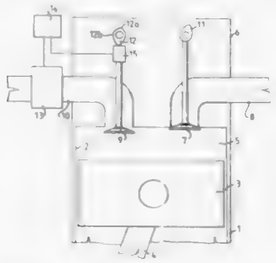


1. An apparatus for affecting the speed of an engine having an intake manifold, comprising:
(a) a primary governor device having a control arm and a primary governor arm, said control arm having two ends, a first end interconnected to a throttle device and a second end which is directly connected to said primary governor arm at one of several attachment points, said primary governor arm including a pivot point and including a primary governor spring which is attached to said primary governor arm at one of several attachment points;
(b) an assist spring having a first end directly interconnected to the primary governor arm at one of several attachment points, said assist spring having an opposite second end, wherein movement of said assist spring adjusts the position of said primary governor arm and said control arm;
(c) vacuum actuating means operatively interconnected to said second end of said assist spring, including:
(i) a vacuum capsule having a first and second chamber, said first chamber being at atmospheric pressure and said second chamber being in fluid communication with the intake manifold via a conduit so as to have the same pressure as the intake manifold, said first and second chambers being divided by a movable diaphragm; and
(ii) a diaphragm plunger interconnected to said diaphragm, one end of said diaphragm plunger being directly interconnected to said assist spring so as to control movement thereof, said assist spring being external to said vacuum capsule,
wherein said diaphragm moves automatically in response to the pressure in the intake manifold.

5,146,890
METHOD AND A DEVICE FOR ENGINE BRAKING A FOUR STROKE INTERNAL COMBUSTION ENGINE
Ulrich Gobert, Hisings-Kärra, and Ola Danielsson, Västra Frölunda, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden
PCT No. PCT/SE90/00102, § 371 Date Sep. 13, 1991, § 102(e) Date Sep. 13, 1991, PCT Pub. No. WO90/09514, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 15, 1990, Ser. No. 752,461
Claims priority, application Sweden, Feb. 15, 1989, 8900517
Int. Cl.[5] F01L *13/06;* F02D *13/04*
U.S. Cl. 123—321 8 Claims

1. A method for engine braking with a four-stroke internal combustion engine, said engine having for each cylinder (2) at

least one inlet valve (7) and at least one exhaust valve (9) for controlling communication between a combustion chamber (5) in the cylinder (2) and an inlet system (8) and an exhaust system (10) respectively, characterized by opening a communication between the combustion chamber (5) and the exhaust system (10) when the piston (3) is located in the proximity of its bottom-dead-centre position subsequent to the inlet stroke, by closing said communication when the piston (3) has performed less than half the compression stroke and holding the communication closed during part of the compression stroke, by opening said communication when the piston (3) has performed more that half the compression stroke, and by holding said communication open during the remaining part of the compression stroke and during at least a part of the expansion stroke, said communication of the combustion chamber (5) with the exhaust system (10) being effected upstream of a throttling device (13) mounted in the exhaust system and for engine braking being actuated to throttle at least a part of the flow through the exhaust system (10) and therewith cause an increase in pressure upstream of said throttling device (13).



5,146,891

SYSTEM AND METHOD FOR CONTROLLING FUEL SUPPLY TO INTERNAL COMBUSTION ENGINE ACCORDING TO OPERATION OF AUTOMATIC TRANSMISION APPLICABLE TO AUTOMOTIVE VEHICLE

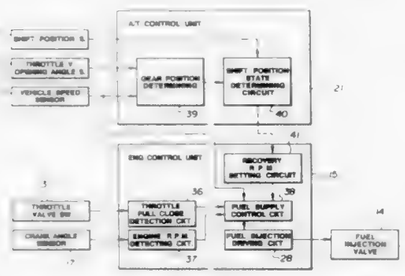
Shinsuke Nakazawa, Kanagawa; Yuji Kato, Tokyo; Tatsuo Wakahara, Kanagawa; Shigeki Shimanaka, Kanagawa; Hiroshi Asano, Kanagawa; Hiroshi Sasaki, Kanagawa; Hiroshi Yamaguchi, Kanagawa; Kazuhiro Ishigami, Kanagawa, and Shinich Takenouchi, Kanagawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 12, 1990, Ser. No. 625,998

Claims priority, application Japan, Dec. 13, 1989, 1-321321; Dec. 18, 1989, 1-326072

Int. Cl.[5] F02D 41/12

U.S. Cl. 123—325 11 Claims



1. A system for controlling an operation of an internal combustion engine of a vehicle having an automatic transmission, comprising:

a) first means for detecting a dynamic operating characteristic of the engine;

b) second means for detecting whether a first factor inherent to a characteristic of the automatic transmission which influences fuel consumption of the engine occurs, said second means including a first sensor for detecting whether an overrun clutch installed in the automatic transmission and used for controlling engine braking is turned on;

c) third means for detecting whether an idle switch associated with the engine has been turned on; and

d) fourth means for varying and setting a second factor inherent to the dynamic operating characteristic of the engine for determining a fuel consumption of the engine with respect to the dynamic operating characteristic of the engine according to a state of the first factor when the first means detects that the idle switch has been turned on, said fourth means varying and setting at least one of a fuel supply recovery engine revolutional speed at which the fuel supply cut-off is released and a fuel supply cut-off engine revolutional speed at which the fuel supply cut-off is executed to higher values when an overrun clutch solenoid is turned off, and setting both the fuel recovery and the fuel supply cut-off engine revolutional speeds to lower values when the overrun clutch solenoid is turned on.

5,146,892

METHOD AND ARRANGEMENT FOR THE OPEN-LOOP AND/OR CLOSED-LOOP CONTROL OF THE ENGINE POWER OF AN INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

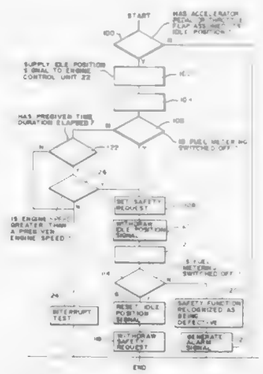
Wolfgang Krampe, Seoul, Rep. of Korea, and Bernd Lieberoth-Leden, Leonberg, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 4, 1991, Ser. No. 671,858

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1989, 3925881

Int. Cl.[5] F02D 11/10, 41/22

U.S. Cl. 123—399 14 Claims



1. A method for control of the engine power of an internal combustion engine of a motor vehicle wherein said control is at least one of open-loop control and closed-loop control, with the driver's desire being electronically transmitted to an engine power actuating element and with a safety function becoming effective when there is an operating condition critical to safety in the area of said control which intervenes on the metering of fuel in the sense of reducing engine speed, the method comprising the steps of:

checking the safety function by triggering the safety function during a pregiven operational phase of the engine independently of an operating condition critical to safety; and,

checking the correct performance of the safety function.

5,146,893

APPARATUS FOR AND A METHOD OF DETECTING COMBUSTION IN AN INTERNAL COMBUSTION ENGINE

Toshio Ohsawa, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Division of Ser. No. 684,076, Apr. 12, 1991. This application Jan. 29, 1992, Ser. No. 827,935

Claims priority, application Japan, May 18, 1990, 2-126985; Jun. 14, 1990, 2-153992

Int. Cl.[5] F02P 5/14

U.S. Cl. 123—425 1 Claim

1. A method of detecting combustion in an internal combustion engine having a plurality of cylinders wherein an ignition control is performed being synchronized with a revolution number of the internal combustion engine, an ionic current detector installed at a plug of at least one cylinder of the plurality of cylinders, and an ECU which determines a combustion state of the cylinder based on an ionic current detect value from the ionic current detector, which comprises steps of:

calculating an ionic current detect time during between the detection of an edge of an ignition signal of the cylinder and an edge of a next ignition signal of the cylinder by the ECU; and

determining the combustion state of the cylinder by comparing the ionic current detect time with a predetermined value by the ECU.

5,146,894

RESERVOIR-TYPE FUEL INJECTION SYSTEM

Helmut Rembold, Stuttgart, and Ernst Linder, Muehlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00108, § 371 Date Sep. 6, 1991, § 102(e) Date Sep. 6, 1991, PCT Pub. No. WO90/10789, PCT Pub. Date Sep. 20, 1990

PCT Filed Feb. 17, 1990, Ser. No. 752,534

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907766

Int. Cl.[5] F02M 45/02

U.S. Cl. 123—447 20 Claims

1. A reservoir-type fuel injection system having a high-pressure pump, which can be made to communicate with a first reservoir (6) and a second reservoir (7), each reservoir is provided with a wall (8, 9; 22, 23) that is movable relative to a restoring force (10, 11; 24) in each said reservoir, wherein the first reservoir (6) can be decoupled from the high-pressure pump (1) by a first one-way check valve (3) and the second reservoir (7) can be decoupled from this said high-pressure pump by a second one-way check valve (4), and wherein the first reservoir and the second reservoir can be made to communicate with a common injection nozzle via a first line (14) and a first, controlled valve (16) that communicates directly with said first reservoir and a second line (15) and a controlled valve (17) that communicates with said second reservoir, said second reservoir (7; 21, 23) is also connected to an outlet side of the first reservoir (6; 21, 22) via the second check valve (4); and the first reservoir (6; 21, 22) has a stroke limiting stop (12; 25) for said movable wall (8; 22) therein and said second reservoir (7; 21, 23) has an overflow opening (13; 26) controlled by said movable wall (9; 23) therein.

5,146,895

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Wolfgang Fehlmann, Stuttgart; Helmut Laufer, Gerlingen, and Ewald Eblen, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

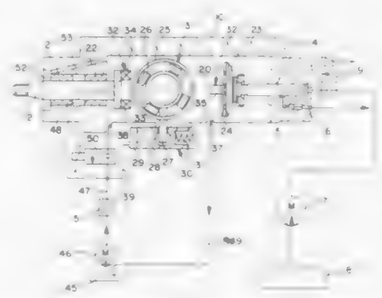
PCT No. PCT/DE90/00904, § 371 Date Jun. 28, 1991, § 102(e) Date Jun. 28, 1991, PCT Pub. No. WO91/10063, PCT Pub. Date Jul. 11, 1991

PCT Filed Nov. 24, 1990, Ser. No. 691,022

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1989, 3943299

Int. Cl.[5] F01M 39/00

U.S. Cl. 123—449 20 Claims



1. A fuel injection pump for internal combustion engines, having a pump housing; a distributor piston guided rotatably and axially displaceably in the pump housing; a rotating drive shaft supported in the pump housing for at least the distributor piston; a transmission, which couples the drive shaft to the distributor piston and is disposed in a transmission chamber and which includes a claw clutch having torque transmitting faces to generate a rotational motion of the distributor piston, a roller race with rollers and an eccentric disk connected to the distributor piston to generate an axial displacement motion of the distributor piston, said disk is supported by its face end which carry cams on the rollers of the roller race by spring force; a lubricating oil circulation loop, which has a lubricating oil feed line, which discharges into a lubricating oil groove surrounding the drive shaft, and a lubricating oil return line leading away from the partly lubricating-oil-filled transmission chamber, a flow of lubricating oil exists through the drive shaft (12) from the lubricating oil groove (48) to the claw clutch (32), which flow emerges into the transmission chamber (20) via lubricating oil openings (64, 65, 68, 69) in at least those

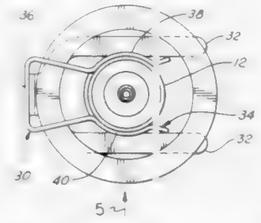
faces (33*a*, 34*a*, 41*a*, 43*a*) of the claw clutch (32) that transmit a torque.

5,146,806

MOUNTING FUEL INJECTION SYSTEM COMPONENTS ON A FUEL RAIL

William J. Imoehl, and Michael J. Hornby, both of Williamsburg, Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Jul. 25, 1991, Ser. No. 735,554
Int. Cl.[5] F02M *55/02*
U.S. Cl. 123—470 **1 Claim**



1. An internal combustion engine fuel rail assembly comprising a fuel rail having a socket in which is received a particular device selected from the group of devices consisting of fuel injectors and pressure regulators, such devices having cylindrically shaped bodies that are circumferentially bounded by flange means extending around and radially outwardly of said bodies and that cooperatively define with said socket an ensealed zone that contains liquid fuel passing through the fuel rail, and a one-piece metal clip having generally uniform thickness that separably mounts on said fuel rail and that when mounted on the fuel rail with said particular device received in said socket serves to prevent said particular device from being removed from said socket characterized in that said fuel rail comprises thin elongate slots on opposite sides of said socket that are exterior to said ensealed zone, and said clip comprises a thin forked blade portion that is received in said slots by insertion along a particular direction radial to said socket and particular device and that laterally spans said socket between said slots in overlying relation to said flange means, said clip further comprises a body-clasping portion that is spaced from said forked blade portion in the direction axially of said socket and particular device and joins with said forked blade portion externally of said socket by means of a joining portion that is disposed, as viewed axially of said socket and particular device, at an end of said clip that is toward one end of said particular direction, said body-clasping portion comprising resilient spring fingers cantilevered on said joining portion and engaging opposite sides of said body exterior to said ensealed zone, and in said fingers said generally uniform thickness is disposed at ninety degrees to said generally uniform thickness in said forked blade portion.

5,146,897

INTAKE MANIFOLD OF INTAKE SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

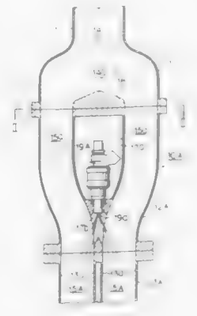
Toshihiko Hattori; Mitsuo Hitomi, both of Hiroshima; Toshimitsu Tanaka, Otaki, and Noboyuki Yamagata, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 13, 1991, Ser. No. 759,433
Claims priority, application Japan, Sep. 20, 1990, 2-248622
Int. Cl.[5] F02M *55/00, 31/00;* **F02B** *3/00*
U.S. Cl. 123—470 **12 Claims**

1. An intake manifold of an intake system for supplying a fuel mixture into a multi cylinder internal combustion engine comprising:

upstream intake passage means for forming a common upstream passage portion of said intake manifold common to all cylinders of said multi cylinder internal combustion engine;

downstream intake passage means, connected between a downstream end of said upstream intake passage means and said cylinders, for forming individual downstream passage portions of said intake manifold leading individually to the cylinders, upstream end portions of said individual downstream passage portions being symmetrically joined together with respect to a centerline of said common upstream passage portion, centerlines of said individual downstream passage portions being arranged at substantially equal spacings from each other;



fuel injection means for introducing fuel into said intake system disposed at a center of said symmetrically joined upstream end portions of the individual downstream passage portions, said upstream end portions of said individual downstream passage portions being symmetrically arranged with respect to said fuel injection means; and

fuel passage means, opening into an upstream end portion of each individual downstream passage portion, for introducing fuel from said fuel injection means into said individual downstream passage portions.

5,146,898

FUEL INJECTION CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Tomiya Itakura, and Hiroshi Kamifuji, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

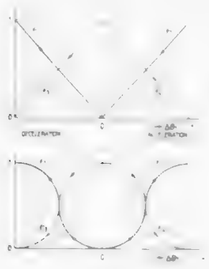
Continuation of Ser. No. 416,408, Oct. 3, 1989, Pat. No. 4,966,118. This application Oct. 23, 1990, Ser. No. 601,433
Claims priority, application Japan, Oct. 14, 1988, 63-257157
The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.
Int. Cl.[5] F02D *41/10, 41/12*
U.S. Cl. 123—492 **7 Claims**

1. A control apparatus for an internal combustion engine, comprising:

a control device for controlling a control operation of the internal combustion engine in response to a control signal applied thereto;

sensing means for detecting operational conditions relating to at least one fundamental parameter of internal combustion engine operation controlled by said control operation in response to a command from an operator and for producing sensor signals indicative of detected operational conditions; and

a controller for executing a predetermined processing using said sensor signals to produce said control signal for control of said control device, including a microprocessor producing a basic signal to control said control operation and correcting said basic signal using a correction coefficient in accordance with the degree of control of said fundamental parameter commanded by the operator to produce said control signal supplied to said control device, said microprocessor being provided with membership functions varying linearly with respect to said fundamental parameter, which membership functions are used by said microprocessor only to determine said correction coefficient for correcting said basic signal on the basis of the degree of control of said fundamental parameter commanded by the operator in accordance with fuzzy reasoning.

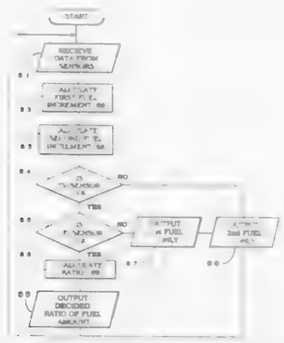


5,146,899

FUEL CONTROL SYSTEM FOR INJECTED ENGINE

Takeshi Tanaka, and Kunio Kajiwara, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 25, 1991, Ser. No. 765,134
Claims priority, application Japan, Sep. 25, 1990, 2-256452
Int. Cl.[5] F02D *41/04;* **F02M** *33/04*
U.S. Cl. 123—494 **59 Claims**



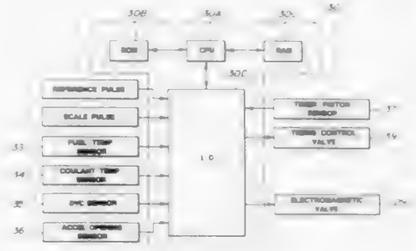
1. A fuel control system for an internal combustion engine operating over a range of speed and load conditions, a first sensor for sensing a certain engine condition, a second sensor for sensing a certain engine condition, said first sensor being more accurate in certain portions of the engine range than said second sensor is in that range portion, and control means for receiving input signals from said first and said second sensors for controlling the amount of fuel delivered to said engine, said control means being more responsive to the input signal from said first sensor when operating in the certain range portion.

5,146,900

APPARATUS FOR TREATING EXHAUST PARTICULATES RESULTING FROM COMBUSTION IN DIESEL ENGINE

Yoshiki Sekiya, Yokohama City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Jun. 11, 1990, Ser. No. 536,105
Claims priority, application Japan, Jun. 12, 1989, 1-146579
Int. Cl.[5] F01N *3/02;* **F02M** *37/04*
U.S. Cl. 123—501 **9 Claims**



1. In a diesel engine:

a pump arranged to carry out a fuel injection to the engine;

an exhaust passage connected to the engine;

a honeycomb catalytic converter installed within said exhaust passage, said honeycomb catalytic converter including a plurality of passages which an exhaust gas passes through;

means for detecting an engine operating condition and generating an engine operating condition indicative signal indicative of said engine operating condition detected;

means for setting a fuel injection amount based on said engine operating condition indicative signal;

means for determining a basal fuel injection timing based on said engine operating condition indicative signal and generating a basal fuel injection timing indicative signal indicative of said basal fuel injection timing determined;

means for determining whether said engine operating condition falls in a predetermined operating range based on said engine operating condition indicative signal, said predetermined operating range defined such that

1) an engine speed is between a first predetermined low engine speed and a second predetermined low engine speed and

2) an engine load is less than a predetermined low engine load;

means for correcting said basal fuel injection timing when said engine operating condition falls in said predetermined operating range and generating a fuel injection timing correcting signal indicative of said fuel injection timing corrected; and

means for modifying operation of said pump based on said fuel injection timing correcting signal.

5,146,901

VAPOR SUPPRESSING FUEL HANDLING SYSTEM

Grady D. Jones, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1992, Ser. No. 829,192
Int. Cl.[5] F02M *33/02, 37/04*
U.S. Cl. 123—516 **2 Claims**

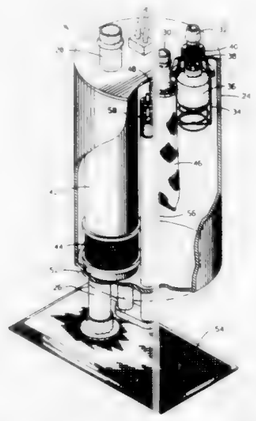
1. In a vehicle having a main fuel tank and an engine that creates a back flow of return fuel to said main tank that is elevated in temperature and therefore prone to increased vaporization, a fuel handling system, comprising,

a fuel canister separate from said main fuel tank and completely enclosed but for a make up fuel inlet from said main fuel tank, a fuel outlet to said engine, a return fuel inlet from said engine that receives said return fuel, and a

fuel vapor outlet through the top of said canister having a predetermined size,

a second stage pump adapted to pump fuel from said fuel canister and through said fuel outlet to said engine as needed and then back to said canister through said return fuel inlet,

a fuel level controlled blocking valve adapted to close said fuel vapor outlet when the fuel level within said canister is at or above a normal level below the top of said canister, so that vapor from said return fuel will rise and collect in a vapor space located between the level of fuel in said canister and the top of said canister, and to open when enough vapor has collected in said vapor space to lower the level of fuel within said canister below said normal level.



a first stage pump having sufficient capacity to continually pump fuel from said main fuel tank through said make up fuel inlet and into said canister to compensate for the fuel pumped out by said second stage pump, thereby pressurizing said vapor space and creating an elevated canister internal pressure when said blocking valve is closed while expelling vapor through said vapor outlet when said blocking valve is open, said predetermined vapor outlet size being small enough, relative to said first stage pump capacity, to substantially maintain said canister internal pressure as said vapor is being expelled,

whereby a constant supply of fuel to said second stage pump is actively maintained while fuel vapor formation within said canister is continually suppressed by the maintenance of said elevated canister internal pressure.

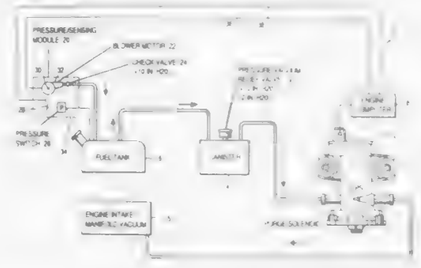
5,146,902

POSITIVE PRESSURE CANISTER PURGE SYSTEM INTEGRITY CONFIRMATION

John E. Cook, and Murray F. Busato, both of Chatham, Canada, assignors to Siemens Automotive Limited, Chatham, Canada

Filed Dec. 2, 1991, Ser. No. 801,322
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—518 **20 Claims**

1. A canister purge system comprising a collection canister for collecting volatile fuel vapors from a fuel tank, and means for selectively purging collected fuel vapors from said, canister to an internal combustion engine's intake manifold for entrainment with a combustible mixture that passes from the manifold into combustion chamber space of the engine for combustion therein, said means including a purge flow path between said canister and intake manifold, characterized by an associated diagnostic system that detects unacceptable leakage from a portion of the canister purge system, which portion includes said canister and tank, and that comprises means for positively pressurizing said portion to a predetermined positive pressure, detecting means for detecting a certain decrease in the positive pressure, in said portion from said predetermined positive



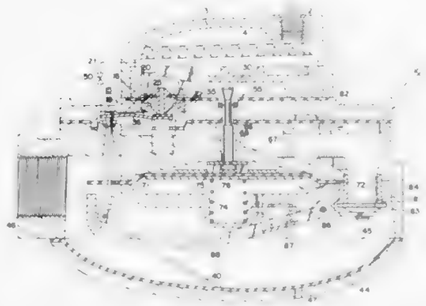
pressure indicative of unacceptable leakage from said portion, and signaling means for giving a signal indicative of such decrease.

5,146,903

LOW HEIGHT LIQUID FUEL LOCK AND CONVERTER TO THE GASEOUS PHASE

Richard Baverstock, Long Beach, Calif., assignor to OHG, Inc., Santa Fe Springs, Calif.

Filed Oct. 25, 1991, Ser. No. 781,311
Int. Cl.[5] F02M *21/06*
U.S. Cl. 123—527 **5 Claims**



1. A fuel lock/converter for providing a gaseous fuel in response to an engine demand, converting said fuel from the liquid phase, and providing a lock against fuel flow or leakage when no engine demand exists, said fuel lock/converter comprising:

an integrated housing having a liquid fuel inlet port and a gaseous fuel outlet port, said inlet port being adapted for connection to a supply of liquid fuel, said outlet port being adapted for connection to an engine, and thereby to a demand for gaseous fuel;

a pilot chamber in said housing, a flexible lock diaphragm dividing said pilot chamber into a first region and a second region, a lock seat in said first region so disposed and arranged as to be closed by said lock diaphragm in one position of said lock diaphragm, and opened in another position of said lock diaphragm;

a first branch of said inlet port opening into said first region;

a second branch of said inlet port opening into said second region;

a first orifice in said lock diaphragm aligned with said lock seat, and a second orifice through said second branch, the flow cross-section of the first orifice being larger than the flow cross-section of the second orifice;

a pilot valve plate pivotally mounted adjacent to the lock diaphragm, a lock valve seal on said pilot valve plate adapted to close said first orifice in one position thereof, and to be moved away to open it, said valve plate being mounted to a lever, said lever being pivotally mounted to said housing by a flexible O-ring which permits rocking movement of said valve plate and lever;

an actuator responsive to engine demand linked to said lever to move said valve seal away from said first orifice when an engine demand exists;

a regulator chamber in said housing downstream from said lock seat;

a vaporizer chamber downstream from said regulator chamber, and means for heating said vaporizer chamber;

a primary regulator valve interconnecting said regulator chamber and vaporizer chambers, said primary regulator valve being responsive to engine demand to provide a sufficient supply of liquid fuel to said vaporizer chamber at a reduced and regulated pressure;

a secondary regulator valve downstream from, and receiving gaseous fuel from said vaporizer chamber, said secondary regulator valve having a valve seat and an actuator, a valve seal on said actuator adapted to bear against and close said valve seat when no engine demand exists, and to move away from said seat when sufficient demand exists,

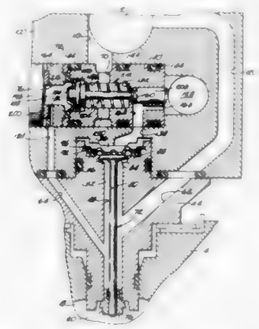
whereby when no engine demand exists, both the lock valve and the secondary regulator valve are closed to flow, and both are open when sufficient demand exists.

5,146,904

INTERNAL COMBUSTION ENGINE FUEL SUPPLY SYSTEM

Jeffrey A. Olson, Vernon Hills, and Donald Custer, Jr., Grayslake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 20, 1991, Ser. No. 718,008
Int. Cl.[5] F02M *67/12*
U.S. Cl. 123—533 **24 Claims**



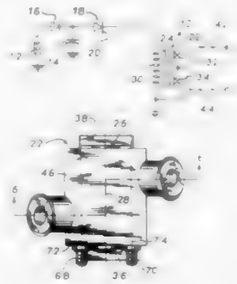
1. An internal combustion engine comprising means defining a combustion chamber, means defining a fuel/air chamber adapted to communicate with a source of air under pressure, means including a moveable wall defining a fuel chamber, selectively operable means for supplying fuel to said fuel chamber at a pressure sufficient to move said wall in the direction increasing the volume of said fuel chamber, means defining a fuel orifice which is spaced from said wall and which communicates between said fuel chamber and said fuel/air chamber, and means for opening said fuel/air chamber to said combustion chamber in response to movement of said wall in the direction increasing the volume of said fuel chamber.

5,146,905

CAPACITOR DISCHARGE IGNITION SYSTEM WITH DOUBLE OUTPUT COIL

James A. Davis, Ripon, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 1, 1991, Ser. No. 723,851
Int. Cl.[5] F02P *3/06*
U.S. Cl. 123—599 **6 Claims**



1. A capacitor discharge ignition system for an internal combustion engine, comprising:

a stator coil energized by rotation of said engine to develop voltage;

a capacitor charged by voltage from said stator coil;

a semiconductor switch for discharging said capacitor;

an ignition coil comprising a magnetically permeable core having an axially extending core bar, a primary winding wound around said core bar and energized by discharge of said capacitor through said semiconductor switch, and a pair of secondary windings energized by said primary winding;

a pair of spark plugs each energized by a respective one of said secondary windings, the output voltage rise time of each of said secondary windings being fast enough and of sufficient magnitude to cause the respective spark plug to ignite a combustible mixture in said engine,

wherein said core bar, said primary winding, and said secondary windings are coaxial and embedded in an electrically insulating housing extending axially and having a pair of end walls at opposite axial ends of said housing and having a circumferential sidewall extending axially between said end walls, said secondary windings are axially spaced from each other along the axis of said core bar, a first terminal in said sidewall and radially aligned with one of said secondary windings, a second terminal in said sidewall and radially aligned with the other of said secondary windings.

5,146,906

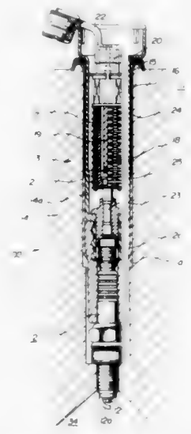
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Eiji Agatsuma, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1991, Ser. No. 770,916
Claims priority, application Japan, Oct. 5, 1990, 2-268122
Int. Cl.[5] F02P *3/02, 13/00;* **H01T** *13/04;* **H01R** *13/625*
U.S. Cl. 123—634 **8 Claims**

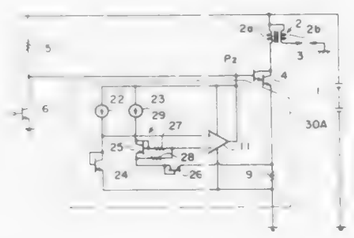
1. An ignition system of an internal combustion engine including a cylinder head having a plug insertion hole, a combustion chamber, an ignition plug inserted in the plug insertion hole and having electrodes exposed in the combustion chamber, the ignition plug having an input terminal, a plug cap covering the input terminal of the ignition plug, and an ignition coil assembly having a primary coil, a secondary coil, and a core extending through the primary and secondary coils, the ignition coil assembly being disposed in the plug cap, wherein the improvement comprises:

magnets mounted on respective ends of the core, said magnets being oriented so as to produce magnetic fluxes in a



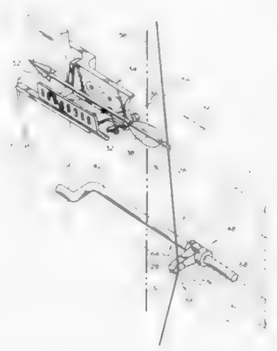
direction opposite to magnetic fluxes generated by the primary coil.

5,146,907
IGNITION APPARATUS HAVING A CURRENT LIMITING FUNCTION FOR AN INTERNAL COMBUSTION ENGINE
Nobuyuki Sawazaki; Masaaki Taruya, and Mitsuru Koiwa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1991, Ser. No. 774,234
Claims priority, application Japan, Oct. 12, 1990, 2-272105
Int. Cl.[5] F02P 9/00
U.S. Cl. 123—644 **7 Claims**



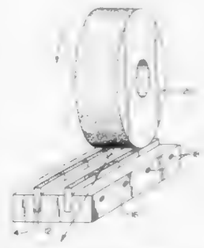
1. An ignition apparatus having a current limiting function for an internal combustion engine comprising:
an ignition coil connected to a power source and having a primary winding and a secondary winding connected to a spark plug;
a power transistor connected to the primary winding of said ignition coil for controlling the power supply from said power source to said ignition coil, said power transistor having a base connected to said power source through a switch;
a current sensing resistor having a first end connected to said power transistor and a second end connected to ground for sensing the magnitude of a primary winding current flowing through the primary winding of said ignition coil;
a first constant current supply having one end thereof connected to said power source and the other end thereof connected to the first end of said current sensing resistor through a first transistor;
a second constant current supply having one end thereof connected to said power source and the other end thereof connected to the second end of said current sensing resistor through a second transistor;
a differential amplifier having a first input terminal connected to a junction between said first constant current supply and said first transistor, a second input terminal connected to a junction between said second constant current supply and said second transistor, and an output terminal connected to the base of said power transistor, said differential amplifier being operable to absorb a part of current supplied from said power source to the base of said power transistor in accordance with a difference between a reference voltage applied to the first input terminal of said differential amplifier and a voltage across said current sensing resistor as applied to the second input terminal of said differential amplifier to thereby limit the primary winding current to a predetermined value; and
a temperature coefficient compensator connected to one of the first and second input terminals of said differential amplifier for compensating for a change in the resistance of said current sensing resistor due to a variation in temperature thereof so that a temperature dependent change in the reference voltage at the first input terminal of said differential amplifier matches a temperature dependent change in the voltage at the second input terminal of said differential amplifier.

5,146,908
HOLD-BACK SYSTEM FOR BOWSTRING
Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah
Filed Mar. 21, 1990, Ser. No. 496,858
Int. Cl.[5] F41B 5/00
U.S. Cl. 124—88 **24 Claims**



1. A bowstring hold-back apparatus for an archery bow with an overdraw structure and a bowstring having an at-rest position, comprising:
a support shaft mounted on said bow and extending rearward past said at-rest position of said bowstring;
arm means mounted on said support shaft rearward of the at-rest position of said bowstring, and movable between a position for retaining a partially drawn tensed said bowstring and a retracted position free of said bowstring; and
biasing means for providing force to motivate said arm means from said bowstring retaining position to said retracted position outside the plane of movement of said bowstring.

5,146,909
STATIONARY FINE POINT DIAMOND TRUEING AND DRESSING BLOCK AND METHOD OF USE
William W. Ruark, Westerville, and Robert L. Henry, Hilliard, both of Ohio, assignors to The General Electric Company, Columbus, Ohio
Filed Dec. 28, 1990, Ser. No. 635,034
Int. Cl.[5] B24B 1/00
U.S. Cl. 125—11.01 **7 Claims**

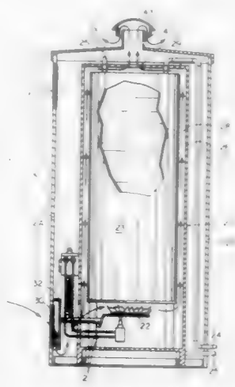


1. A method for trueing and dressing a grinding wheel having a a peripheral surface and a rotational axis comprising:
providing a stationary trueing and dressing tool with at least one polygonal block having an upper surface, sides and a vertically-disposed thin, generally planar layer of diamond particles having an exposed edge on said upper surface of said block;
rotating said grinding wheel about said rotational axis;
engaging said peripheral surface of the rotating grinding wheel with said exposed edge of the diamond layer; and
traversing said grinding wheel along a linear path forming an oblique angle with said exposed edge of the diamond layer effective to dress and true said wheel across said peripheral surface.

5,146,910
NOX REDUCING DEVICE FOR FUEL-FIRED HEATING APPLIANCES
Keith M. Grahl, and Larry R. Mullens, both of Fort Smith, Ark., assignors to Rheem Manufacturing Company, New York, N.Y.
Filed Jul. 18, 1991, Ser. No. 732,502
Int. Cl.[5] F24H 3/02
U.S. Cl. 126—110 R **9 Claims**

1. For use in a fuel-fired heating appliance, heat exchange apparatus comprising:
a generally tubular combustor member having a first longitudinal portion adapted to internally receive a flame through an outer end thereof, said first longitudinal portion circumscribing an axis and having an essentially constant interior diameter along its length, and a second longitudinal portion adapted to discharge combustion gases, generated by the received flame, through an outer end thereof; and
NOx reducing means, disposed within and extending axially along said first longitudinal combustor member portion, for reducing the NOx level of the discharged combustion gases by dispersing and thermally quenching the received flame, said NOx reducing means being operative along its axial length to divide the interior of said first longitudinal combustor member portion, along generally planar boundary surfaces extending radially outwardly from said axis, into a plurality of circumferential segments, said NOx reducing means having a relatively thin leading edge portion configured and position to initially intercept the received flame with minimal disruption thereof,
said NOx reducing means having generally plate-like portions which radially outwardly extend from said axis and define said boundary surfaces, each of said generally plate-like portions having upstream and downstream end portions which press-fittingly engage the interior surface of said first longitudinal combustor member portion, said generally plate-like portions having leading edges which combinatively defines said leading edge portion of said NOx reducing means,
said generally plate-like portions further having radially outer side edge notches formed therein and extending from their upstream end portions to their downstream end portions, each of said radially outer side edge notches defining a passage through which a pair of said circumferential segments communicate, said radially outer side edge notches functioning to diminish noise created by said NOx reducing means during operative combustion product flow through said combustor member.

5,146,911
EXTERIOR ENCLOSURE FOR GAS-FIRED WATER HEATER
John W. Adams, 934 Mallard Creek Church Rd. W., Charlotte, N.C. 28262
Filed Nov. 25, 1991, Ser. No. 797,702
Int. Cl.[5] F24H 1/00
U.S. Cl. 126—350 R **7 Claims**



1. An exterior gas-fired storage tank-type water heater enclosure, comprising:
(a) a base;
(b) sidewalls mounted on said base and defining an interior space for receiving a gas-fired water heater including a heated water storage tank;
(c) a top positioned on the top of the sidewalls;
(d) a flue positioned in said top and communicating with the interior of the enclosure for discharging heated combustion air from the enclosure;
(e) vent means positioned adjacent the bottom of the sidewalls for permitting air flow into the enclosure from a

point closely proximate a gas burner positioned in the bottom of the water heater; and

(f) baffle means positioned over the vent means adjacent the bottom of the side walls, said baffle means comprising a cover having a back, a top, and opposed sides attached to the sidewalls of the enclosure surrounding the vent means and defining a baffle chamber, said baffle chamber having a downwardly directed opening for directing an air flow through the vent downwardly to a position below and sufficiently close to the gas burner of the water heater to be drawn into a combustion zone surrounding the gas burner for mixture with gas introduced into the combustion zone by the gas burner.

5,146,91

VARIABLE ENERGY SHOCK WAVE PRODUCTION

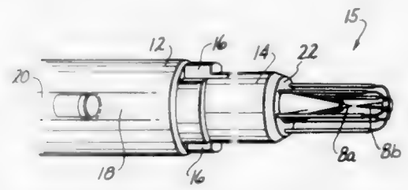
Harald Eizenhoefer, Johannesberg, Fed. Rep. of Germany, assignor to Dornier Medizin Technik, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 311,461, Feb. 16, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 598,225

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3804993

Int. Cl.[5] **A61B** *17/22*

U.S. Cl. 128—24 EL **4 Claims**



1. A kit adapted to be used in an arrangement for the comminution of concrements of various kinds in the body of a living being, the arrangement including a underwater arc gap established by an electrode assembly and an electrical energizing circuit adapted for connection to that electrode assembly, comprising:

a plurality of electrode assemblies from which one is selected for connection to the electrical energizing circuit, to serve as said electrode assembly when so connected to the energizing circuit, said electrode assemblies being basically similarly configured and each having an ohmic resistor connected directly in series with one electrode, of the electrode assembly when connected to the energizing circuit;

the respective resistance values for the resistors in the electrode assemblies being different so that different amounts of energy will be dissipated in the gap between the electrodes resulting in different shockwave intensities on discharge in the respective gap for different ones from said plurality of assemblies as selected from the kit and when connected to the energizing circuit.

5,146,913

HOLDER AND LOCK FOR ORO-INTUBATION

Asphendiar Khorsandian, 337 N. Clyde Morris Blvd., Daytona Beach, Fla. 32114, and Jenabe E. Caldwell, 18 Domicilio Ave., Ormand Beach, Fla. 32174

Filed Mar. 4, 1991, Ser. No. 663,608

Int. Cl.[5] **A61M** *16/00, 5/01, 5/178;* **A62B** *9/06*

U.S. Cl. 128—200.26 **9 Claims**

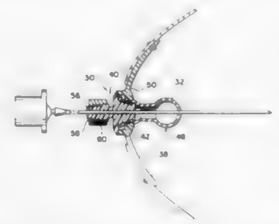
1. A device for oral intubation, comprising

a face plate having a thickened central portion with a central aperture therethrough and a large peripheral flange to prevent the device from being swallowed, said flange being shaped to contact a patient's face beneath the nose,

a hollow, resilient bite protector having an open proximal end inserted in said aperture, and a distal end having a through hole,

a lock member comprising a core having a plug protruding into the end of the bite protector, the plug extending through the central face plate aperture, and into the distal end of the bite protector, for locking both the bite protector and the lock member to the face plate,

said lock member further having a peripheral flange abutting a front surface of the face plate, and an externally tapered



and threaded collet portion split by longitudinal cuts into plural segments, each capable of limited movement in a radial direction, and an internally tapered and threaded nut engaged with the threads on the collet portion, and

an orotracheal tube extending entirely through said lock member, said face plate, and said bite protector throughhole, whereby the tube is prevented from contacting the upper palates and said tube can be secured without damage in the lock member by tightening said nut, thus forcing the collet segments inward against the tube.

5,146,914

REUSABLE, VALVED, TRANSPARENT, POCKET RESUSCITATION MASK

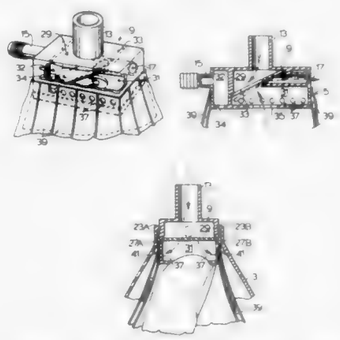
Sheldon Sturrock, 56 Lanstaff Road West, Richmond Hill, Ontario, Canada L4C 6N2

Filed May 2, 1991, Ser. No. 694,823

Claims priority, application Canada, Mar. 3, 1990, 2016005

Int. Cl.[5] **A61M** *16/00;* **A62B** *18/02, 18/08*

U.S. Cl. 128—203.11 **2 Claims**



1. A resuscitation mask comprising a reusable shell having an aperture disposed centrally thereof and a disposable liner forming a generally conical space adapted to surround the mouth and nose of a patient while isolating the patient from said shell, said liner being provided with a one-way valve detachably connected to said aperture for passing air from a resuscitator into the lungs of said patient and passing exhaust air from said patient into the atmosphere, whereby said shell may be repeatedly reused as a result of being isolated from the patient, wherein said valve further comprises upper and lower chambers separated by a pivoting flapper, an inlet port connected to said upper chamber, an opening from said lower chamber into said generally conical space, and an exhaust port connected to said lower chamber, said flapper being adapted to pivot from a first position for blocking said exhaust port and allowing the passage of air from said upper to said lower chamber and therefrom through said opening into said conical space, and a second position for preventing air passage from said lower to said upper chamber and allowing the passage of exhaust air from said conical space through said opening and into the atmosphere via said exhaust port, further comprising a plurality of small apertures in said valve between said lower chamber and a corresponding plurality of air passages within said liner, said air passages extending from said apertures to said cushion for inflating said cushion.

5,146,915

ANESTHETIC VAPORIZERS

Fredrick J. Montgomery, Bradford, England, assignor to The BOC Group plc., Windlesham, England

Filed Jan. 8, 1991, Ser. No. 638,861

Claims priority, application United Kingdom, Jan. 9, 1990, 9000421

Int. Cl.[5] **A61M** *11/00*

U.S. Cl. 128—203.14 **10 Claims**

1. An anaesthetic vaporizer comprising: an inlet for carrier gas; an outlet for carrier gas and gaseous anaesthetic agent for delivery to a patient; a first passage extending between the inlet and the outlet for flow of carrier gas, and a flow restrictor contained in the first passage; a first regulator; a second passage extending between the first passage at a location upstream of the flow restrictor and the first regulator; a vaporizing chamber containing anaesthetic agent; a third passage extending form said vaporizing chamber to the first passage at a location downstream of said flow restrictor; and a flow control valve contained in the third passage and wherein; the first regulator further including means for controlling the pressure of gaseous anaesthetic agent when flowing through the third passage dependent on the pressure of carrier gas in the first passage upstream of the flow restrictor.

5,146,916

ENDOTRACHEAL TUBE INCORPORATING A DRUG-IRRIGATION DEVICE

Angelo S. Catalani, Via dei Colli 7, 00198 Roma, Italy

Filed Jan. 3, 1991, Ser. No. 637,078

Claims priority, application Italy, Jan. 5, 1990, 47503 A/90; Jan. 25, 1990, 47566 A/90; Feb. 5, 1990, 47601 A/90; Feb. 14, 1990, 47628 A/90; Dec. 12, 1990, 48560 A/90

Int. Cl.[5] **A61M** *16/04, 25/10*

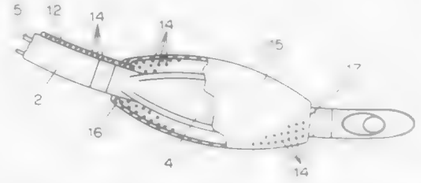
U.S. Cl. 128—207.14 **2 Claims**

1. An endotracheal tube with provision for delivering a drug externally of the tube, comprising:

an endotracheal tube body having proximal and distal ends and a balloon portion at said distal end;

at least one flexible irrigation cannula extending along said endotracheal tube body to said distal end divided in its proximal portion into two branch cannulas;

an irrigation diffuser means comprising a pair of chambers respectively circumscribed by a pair of cuffs located proximally and distally with respect to said balloon portion, respectively, said cuffs each comprising a double wall, and outer wall of each cuff having a plurality of small holes for emitting a drug; and



a pair of grooves opening outwardly of said tube body for respectively containing said pair of cuffs without substantial protrusion of said cuffs beyond a main outer surface of said body.

5,146,917

FIBRE-OPTIC APPARATUS FOR THE PHOTODYNAMIC TREATMENT OF TUMORS

Georges Wagnières, Lutry; Hubert van den Bergh, Goumoens-la-Ville, and Philippe Monnier, Lausanne, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 4, 1991, Ser. No. 638,248

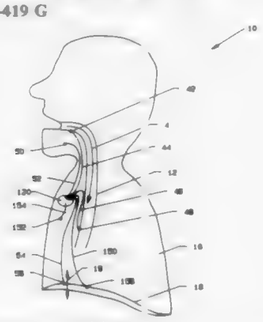
Claims priority, application Switzerland, Jan. 9, 1990, 59/907

Int. Cl.[5] **A61N** *5/06*

U.S. Cl. 128—397 **6 Claims**

1. A fibre-optic apparatus for the photodynamic treatment of tumours in a patient, which apparatus has an optical fibre connected to a laser for conveying light to a site of the tumour in a patient, wherein first and second lenses comprising a pair of lenses (**14**, **15**) which are similar plano-convex microlenses (**14**, **15**), each microlens having a planar side and a convex side; a focal length which locates a focal point relative to the lens; a central ray axis; and a diameter the focal length of which is smaller than the diameter thereof, said microlenses being arranged such that the convex sides (**19**, **20**) thereof are facing each other and which are at a distance from one another that is smaller than the focal length of the microlenses (**14**, **15**), and including means for locating said microlenses coaxially with respect to a light (**13**)-emitting end face (**9**) of the fibre (**8**) and are so adjusted and have a spherical aberration such that edge rays (**23**) having an angle of divergence (β) of a divergent pencil of light rays (**23**) emerging from the end face (**9**) of the fibre (**8**) are so greatly refracted by the first lens (**14**) of the lens pair, owing to the spherical aberration of said first lens (**14**), that, after traversing radially the central ray axis of the pair of lenses (**14**, **15**) before the focal point (**24'**), said edge rays enter the convex side (**20**) of the second lens (**15**) of the lens pair (**14**, **15**) at a site (**25**) lying diametrically opposite a site of emergence (**26**) from the convex side (**19**) of the first lens (**14**), as a result of which the angle of divergence (β) of the edge rays (**23**) is reduced.

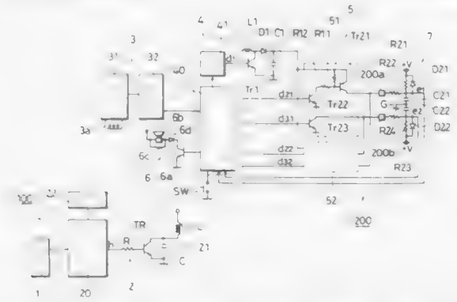
5,146,918
DEMAND APNEA CONTROL OF CENTRAL AND OBSTRUCTIVE SLEEP APNEA
Michael J. Kallok, New Brighton, and H. Toby Markowitz, Roseville, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Mar. 19, 1991, Ser. No. 671,513
Int. Cl.[5] A61N 1/00
U.S. Cl. 128—419 G 12 Claims



1. An apparatus comprising:
a. first means for sensing a central apnea event;
b. first means responsibly coupled to said first sensing means for providing stimulation to a diaphragm of a patient in response to sensing of said central apnea event;
c. second means coupled to said first sensing means for sensing an obstructive apnea event; and,
d. second means coupled to said second sensing means for generating electrical stimulation of muscles of said patient in response to sensing by said second sensing means of said obstructive apnea event.

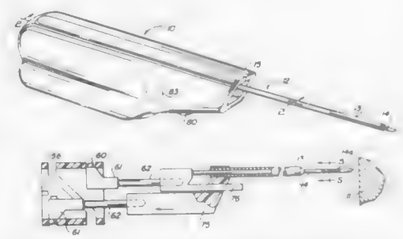
5,146,919
Patent Not Issued For This Number

5,146,920
WIRELESS LOW-FREQUENCY MEDICAL TREATMENT DEVICE WITH PULSE INTERRUPTION BASED UPON ELECTRODE CONTACT WITH THE BODY
Takahiro Yuuchi; Yasuyuki Tsuchida, both of Hyogo, and Masakatsu Fujiwara, Kasai, all of Japan, assignors to Sanyo Electric Co., Ltd, Osaka, Japan
Filed Nov. 15, 1990, Ser. No. 614,172
Claims priority, application Japan, Nov. 20, 1989, 1-302944
Int. Cl.[5] A61N 1/36, 1/08
U.S. Cl. 128—423 R 26 Claims



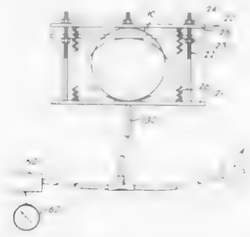
1. A wireless low-frequency medical treatment device having a sending section for sending various data for low-frequency medical treatment and a pulse applying section for receiving the above data, for generating a low-frequency pulse corresponding to the data and for applying the pulse on a living body, the device being characterized in that the pulse applying section comprises:
a plurality of pulse applying bodies to be pasted on the living body;
low-frequency pulse generating means for generating a low-frequency pulse to be supplied to the pulse applying bodies in accordance with data sent from the sending section;
detecting means for detecting if at least one of the pulse applying bodies comes off from the living body;
pulse stopping means for stopping generation of the low-frequency pulse when the detecting means detects that at least one of the pulse applying bodies comes off from the living body;
timer means for measuring a past time after the detecting means detects at least one of the pulse applying bodies having come off from the living body;
pulse recovery means for increasing a potential of the low-frequency pulse gradually from a low level to a predetermined high level when the pulse applying body once having come off from the living body is pasted again on the living body before a preset time of said timer means has passed;
state transition controlling means for transiting to a state to stop generation of the pulse after the preset time of said timer means has passed and to refuse the data sent from the sending section.

5,146,921
BIOPSY INSTRUMENT STYLET AND CANNULA ASSEMBLY
Richard A. Terwilliger, Alamo; John D. Hebert, San Francisco, and Jack Hall, Portola Valley, all of Calif., assignors to Vance Products Inc., Spencer, Ind.
Continuation-in-part of Ser. No. 521,259, May 9, 1990, Pat. No. 5,048,538, which is a continuation of Ser. No. 441,776, Nov. 27, 1987, Pat. No. 4,940,061. This application Sep. 17, 1990, Ser. No. 583,597
Int. Cl.[5] A61B 10/00
U.S. Cl. 128—754 20 Claims



1. A biopsy stylet and cannula assembly suitable for use with a biopsy instrument having a first drive rod and a second drive rod, comprising:
a cannula mount having a tubular cannula secured thereto and projecting forwardly therefrom, wherein said cannula mount has first recess means in a back side of said cannula mount receiving a first drive rod of the biopsy instrument therein; and
a stylet mount having a stylet secured thereto and projecting forwardly within said tubular cannula and slidable with respect to said cannula, wherein said stylet mount has second recess means in a back side of said stylet mount for receiving a second drive rod of the biopsy instrument therein, wherein said first recess means has first locking means for securing to the first drive rod to resist forward removal of said cannula mount from the first drive rod.

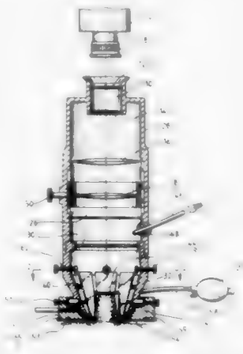
5,146,922
VOLUMETRIC MEASUREMENT OF A BODY CAVITY OF A PATIENT
Ian G. Williamson, Southampton, and David H. Kerridge, Wiltshire, both of England, assignors to National Research Development Corporation, London, England
PCT No. PCT/GB90/01604, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO91/05510, PCT Pub. Date May 2, 1991
PCT Filed Oct. 17, 1990, Ser. No. 678,943
Claims priority, application United Kingdom, Oct. 17, 1989, 8923343
Int. Cl.[5] A61B 5/103
U.S. Cl. 128—774 16 Claims



1. A method of volumetic measurement of a first closed space of unknown volume, said method comprising the steps of:
communicating said first closed space with a second closed space of known volume;
changing said known volume of said second closed space by a predetermined amount;
obtaining representations of pressures in said closed spaces respectively with said second closed space at its original known volume and its changed volume; and
determining a measure of said unknown volume of said first closed space from said known volume of said second closed space, the volume change of said second closed space and said pressure representations, said first closed space being a body cavity of a patient, said predetermined amount of known volume change being small relative to the sum of the original known and unknown volumes, said known volume change and related pressure measurement being made within a short period of time.

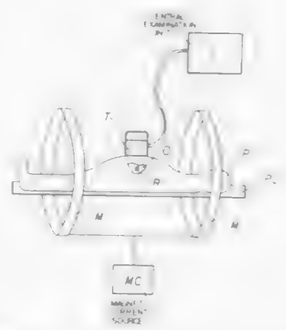
5,146,923
APPARATUS AND METHOD FOR SKIN LESION EXAMINATION
Atam P. Dhawan, 8085 Pine Terrace Dr., Cincinnati, Ohio 45255
Continuation-in-part of Ser. No. 943,089, Dec. 18, 1986, abandoned. This application Oct. 24, 1989, Ser. No. 426,111
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—633 33 Claims

1. An apparatus for observing nevi, lesions, or other abnormalities in the skin, said apparatus comprising:
(a) means for receiving a specimen of skin containing said abnormality of interest;
(b) means for transilluminating the specimen of skin, said means for transilluminating includes means for uniformly directing light into the skin surrounding said abnormality in the shape of a converging ring of light having a focal point in the skin of the patient below said abnormality;
(c) vacuum means coupled to said specimen receiving means for creating a vacuum contact between said transillumination means and skin surrounding said abnormality to facilitate the coupling of said ring of light into the skin of the patient;
(d) means for recording multiple mirror images of the transilluminated abnormality; and



(e) means for generating a three-dimensional reconstruction of said abnormality from said multiple mirror images.

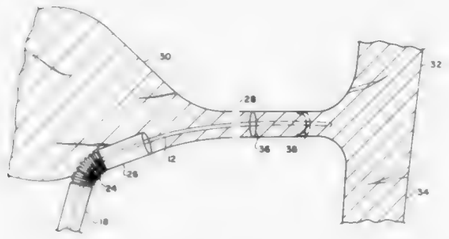
5,146,924
ARRANGEMENT FOR EXAMINATION OF A MATERIAL
Raimo E. Sepponen, Helsinki, Finland, assignor to Instrumentarium Corp., Finland
Filed Aug. 29, 1989, Ser. No. 400,461
Claims priority, application Finland, Sep. 12, 1988, 884174
Int. Cl.[5] A61B 5/055
U.S. Cl. 128—653.2 4 Claims



1. An apparatus for enabling an operator to carry out an examination of a target area within an object subjected to a polarizing magnetic field produced by a magnetic field generating means external of the object, said apparatus comprising:
means for transmitting ultrasonic energy to the target area and for receiving reflected ultrasonic energy therefrom for obtaining ultrasonic data from the target area;
NMR means including means for applying rf pulse signals to the target area, means for applying a magnetic field gradient to the target area, and means for receiving NMR signals from the target area;
means for supplying electron spin resonance energy to the target area for amplifying, by dynamic nuclear polarization, the NMR signals received from the target area; and
said apparatus including a common unit freely movable by the operator to a desired position with respect to the target area, said common unit containing at least a portion of said ultrasonic energy transmitting and receiving means, at least a portion of said NMR means, and at least a portion of said means for supplying electron spin resonance energy; said common unit including sensor means

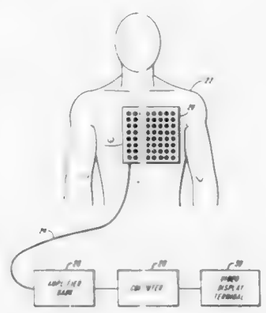
for sensing the direction of the polarizing magnetic field to which the object is subjected.

5,146,925
CHOLANGIOCATHETER AND DELIVERY SYSTEM
Lamar Snow, 125 Louiselle St., Mobile, Ala. 36607
Filed Nov. 21, 1990, Ser. No. 616,941
Int. Cl.[5] A61M *25/00*
U.S. Cl. 128—658 26 Claims



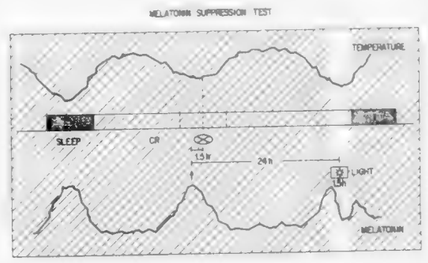
1. A self anchoring catheter comprising:
a tubular main body portion having a proximal end, a distal end, and a longitudinal axis and
an anchoring hub portion defined on an exterior surface of said tubular main body portion adjacent said distal end, said anchoring hub portion being formed from a resiliently compressible material having a non-smooth exterior surface, said anchoring hub portion being formed from one of a foam rubber material and a cellular plastic material.

5,146,926
METHOD AND APPARATUS FOR IMAGING ELECTRICAL ACTIVITY IN A BIOLOGICAL SYSTEM
Richard J. Cohen, Waban, Mass., assignor to Massachusetts Institute of Technology, Mass
Filed Oct. 26, 1990, Ser. No. 604,142
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—710 67 Claims



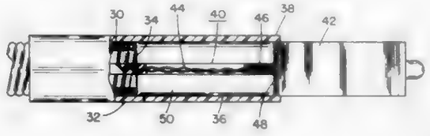
1. Method for imaging electrical activity in a biological system comprising:
applying an array of electrodes to a surface of the biological system to generate signals;
processing the signals from the electrodes to compute a surface differential of the surface potential at a multiplicity of spatial locations within a given time epoch;
repeating the processing for multiple sequential time epochs;
constructing a two-dimensional projection image of the electrical activity from the surface differential of the surface potential for sequential time epochs; and
displaying sequential images corresponding to sequential time epochs.

5,146,927
TEST FOR EVALUATION OF VISUAL FUNCTIONING IN VISUALLY IMPAIRED SUBJECTS
Charles A. Czeisler, Cambridge; Heinz Martens, Jamacia Plain, both of Mass., and Theresa L. Shanahan, Madison, Wis., assignors to Brigham and Women's Hospital, Boston, Mass.
Filed Jun. 14, 1991, Ser. No. 714,154
Int. Cl.[5] A61B *13/00*
U.S. Cl. 128—745 20 Claims



1. A method of determining the functional integrity of the visual system mediating photic input from the retina to the hypothalamus of a visually impaired human subject by measuring the melatonin secretion of said subject, comprising the steps of:
collecting a first blood sample from said visually impaired human subject;
thereafter exposing said subject to a bright light stimulus;
collecting a second blood sample from said subject during said exposure to said stimulus;
measuring the melatonin content in said first and second collected samples; and
comparing the measured melatonin content in said first and second collected samples to determine whether said melatonin content in said second collected sample is less than the melatonin content in said first collected sample to thereby evaluate the functional integrity of the visual system of said subject.

5,146,928
SAMPLING DEVICE FOR COLLECTING MICROBIOLOGICAL BIOPSY SPECIMEN
Theodor Esser, 21 William Penn Dr., Stony Brook, N.Y. 11790
Filed Jan. 30, 1992, Ser. No. 828,370
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—756 13 Claims

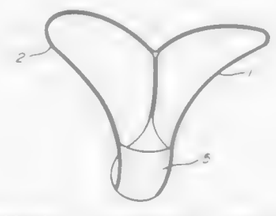


1. A specimen sampling device for collecting microbiological specimen from a body cavity, said device comprising
(a) an elongate flexible tubular member having proximal and distal ends;
(b) an outer sleeve encompassing said tubular member, said outer sleeve being fixedly connected with said tubular member, a portion of said outer sleeve extending axially beyond the distal end of said flexible tubular member so as to form a cylindrical section having an internal diameter commensurate with the external diameter of said tubular member; and
(c) flexible wire means extending longitudinally through said tubular member and having sample collecting means fastened thereto proximate the distal end of said tubular member; and manipulating means at the opposite end of said flexible wire means cooperating with means on the outer sleeve at the proximate end of said flexible tubular member to enable imparting a predetermined longitudinal movement to said wire means whereby in one direction of movement of said wire means said sample collecting means is fully retracted into the cylindrical section formed by space of said extended outer sleeve portion and in an opposite direction of movement of said wire means is at least partially extended from the cylindrical section of said outer sleeve so as to be exposed to enable the brushing and collecting thereof of microbiological biopsy specimen from said body cavity.

5,146,929
LUMBAR SPINE MOTION SENSOR
James A. Sawhill, P.O. Box 115, Lyndon Center, Vt. 05850
Filed Oct. 11, 1991, Ser. No. 776,061
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—781 7 Claims

1. An apparatus for measuring angular rotations of the lumbar spine of a subject about three axes, comprising:
an articulating enclosure including first and second housings;
first pivot means joining the first and second housings for relative motion about a first axis;
first plate means operably mounted to the first housing;
the first plate means being adapted to be secured against the back of a subject at the base of the lumbar spine with the first housing vertically aligned under the second housing and with the first axis located transversely across a sacral interspace;
second plate means operably mounted to the second housing;
the second plate means being adapted to be secured to the subject adjacent tot eh tope of the lumbar spine, whereby flexion/extension of the lumbar spine will result in relative pivotal movement being imparted between the first and second housings about the first axis;
second pivot means operably mounting the first plate means to the first housing about at second axis that is perpendicular to the first axis, whereby lateral bending of the lumbar spine will result in relative pivotal motion being imparted between the first plate means and the first housing about the second axis;
third pivot means operably connecting the second plate means and second housing about a third axis perpendicular to the first and second axes, whereby axial rotation of the lumbar spine will result in relative pivotal motion being imparted between the second plate means and the second housing about the third axis; and
a plurality of sensing means within the enclosure for separately measuring relative pivotal motion between the first and second housings about the first axis, between the first plate means the first housing about the second axis, and between the second plate means and the second housing about the third axis.

5,146,930
CONTRACEPTIVE AND ANTI-INFECTIVE BARRIER DEVICE
Margaret P. Richardson, and Philip Richardson, both of The Bungalow, Pibwrlwyd Lane, Carmarthen, United Kingdom
Continuation of Ser. No. 569,514, Aug. 20, 1990, abandoned, which is a continuation of Ser. No. 391,583, Jul. 18, 1989, abandoned. This application Nov. 8, 1991, Ser. No. 794,803
Claims priority, application United Kingdom, Feb. 11, 1987, 8703157; PCT Int'l Appl., Feb. 22, 1987, PCT/GB88/00042; United Kingdom, Feb. 22, 1987, 8701385
Int. Cl.[5] A61F *6/06, 6/04*
U.S. Cl. 128—830 28 Claims

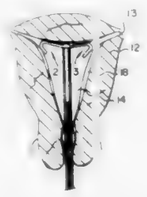


1. In combination, a contraceptive, anti-infective barrier device for use by a female user, and an applicator member therefor, in which the barrier device comprises: (a) a continuous, liquid impermeable flexible pouch having an open end and a closed end such that the pouch can be introduced into a user's vagina and subsequently receive a penis; (b) a continuous, liquid-impermeable peripheral flange integral with the open end of said pouch, the flange being shaped and dimensioned such that when said pouch has been introduced into the vagina, the flange covers the periphery of the vaginal entrance and said flange and said pouch together form a barrier to liquid passing between the penis and the vagina; (c) a peripheral rim surrounding said flange said rim and said flange not forming part of a garment to pass around the legs of the user; and (d) projecting formations provided on set pouch proximate said flange portion for engaging the internal walls of the vagina such that said flange is retained in the position in which it covers the periphery of the vaginal entrance and in which the applicator comprises an elongate body which is arranged to introduce said pouch into said vagina and be withdrawn therefrom leaving said pouch in place.

5,146,931
DEVICE TO BE PLACED IN THE UTERUS
Karl-Heinz Kurz, Kaiser Wilhelm Ring 22, 4000 Düsseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 240,121, Aug. 15, 1988, abandoned.
This application Jun. 8, 1990, Ser. No. 535,006
Int. Cl.[5] A61F *6/14*
U.S. Cl. 128—833 11 Claims

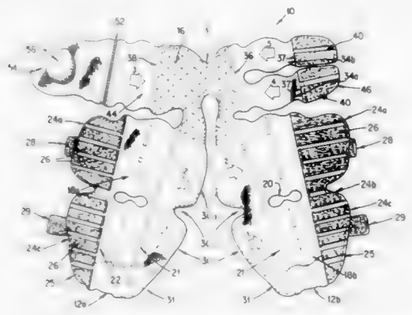
1. Device which is to be placed in the uterus and to which certain substances particularly metals, metal ions, hormones and therapeutic substances which are to be effective in the uterus for a certain time, can be attached, and comprising a stem having two resilient arms projecting on opposed sides of

the stem at one extremity thereof, the extremity of each of the two arms is bent through an angle greater than 90° so that the extremities point towards the stem and the arms are thus built up of three parts, comprising a first part attached to the stem and a second extension part having a free end and a bent piece having an inner radius of curvature between them, the three



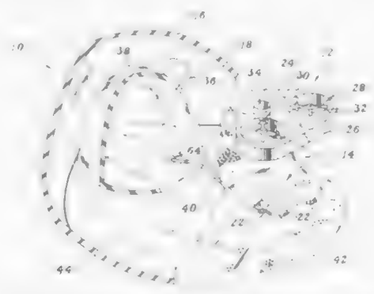
parts of each arm together define an arrow comprising the first part and the second part of a said arm, the parts of a said arm being compliantly connected to each other by the bent piece, and the first part of each said arm being straight and projecting between either a horizontal position or slightly obliquely upward position.

5,146,932
ELASTIC COUNTERPRESSURE GARMENT
Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901
Filed Nov. 1, 1990, Ser. No. 609,170
Int. Cl.[5] A61F *5/37, 5/00*
U.S. Cl. 128—873 **6 Claims**



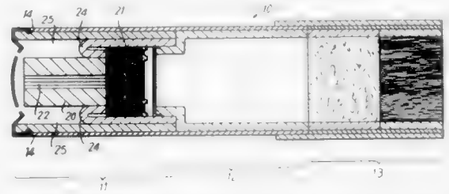
1. In a counterpressure garment for medical use by application to a patient, said garment having a pair of leg sections adapted to enclose the legs of a patient and a lower torso section adapted to enclose the lower torso and abdomen of a patient, the improvement comprising:
elastic material means in said leg and lower torso sections for providing when stretched, counterpressure to the circulatory system of said patient
fastening means engaging the leg sections and lower torso sections for securing each section around a portion of the patient with the elastic material stretched; and each of said leg sections further comprising individual flap subsections that can be fasten together individually to provide a counterpressure to selected areas of the leg.

5,146,933
IMPLANTABLE PROSTHETIC DEVICE AND TETHERED INFLATION VALVE FOR VOLUME
Lawrence M. Boyd, Memphis, Tenn., assignor to Dow Corning Wright Corporation, Arlington, Tenn.
Filed Sep. 20, 1991, Ser. No. 764,560
Int. Cl.[5] A61B *19/00*
U.S. Cl. 128—899 **2 Claims**



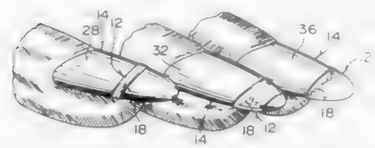
1. An implantable prosthetic device inflatable by a self-contained resealable valve comprising:
a outer flexible elastomeric envelope;
an inner elastomeric envelope spaced inwardly from the outer envelope, respectively defining an outer closed lumen and an inner closed lumen nested within the outer lumen;
a resealable injection valve attached to a selected area of the outer envelope, the inner envelope being tethered to the valve and spaced inwardly from the selected area by a fill-tube for directly inflating the inner lumen.

5,146,934
COMPOSITE HEAT SOURCE COMPRISING METAL CARBIDE, METAL NITRIDE AND METAL
Seetharama C. Deevi; Sarojini Deevi, both of Midlothian; Mohammad R. Hajaligol, Richmond, and Kenneth S. Houghton, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed May 13, 1991, Ser. No. 699,490
Int. Cl.[5] A24B *15/16;* **C10L** *5/40, 11/00*
U.S. Cl. 131—359 **32 Claims**



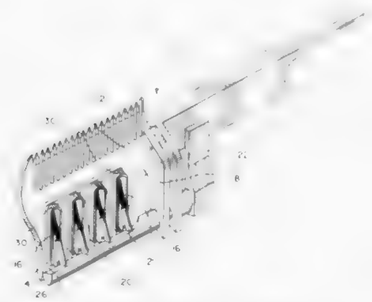
1. A heat source comprising a first component with an ignition temperature in the range of between about 150° C. and about 380° C. and a combustion temperature in the range of between about 350° C. and about 650° C.; a second component with an ignition temperature in the range of between about 340° C. and about 600° C. and a combustion temperature in the range of about 500° C. and about 800° C.; and a third component with an ignition temperature in the range of between about 500° C. and about 900° C. and a combustion temperature in the range of between about 700° C. and about 1500° C.

5,146,935
FINGERNAIL REPAIR METHOD
Lynn Rumore, 73 Cromer Rd., Elmont, N.Y. 11003, and Dolores Sapienza, Franklin Square, N.Y., assignors to Lynn Rumore, Lake Ronkonkoma, N.Y.
Filed Mar. 7, 1991, Ser. No. 666,201
Int. Cl.[5] A45D *29/00*
U.S. Cl. 132—73 **1 Claim**



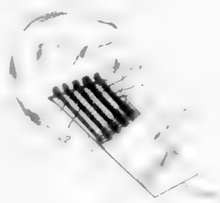
1. A method for repairing a damaged natural fingernail, comprising the steps of:
a) inspecting the natural fingernail to determine the type and extent of the damage;
b) selecting an appropriately sized and molded nail patch from a group of fingernail repair patches, said selected nail patch being of a size to cover only the damaged portion of the fingernail;
c) removing the appropriate nail patch from the group of fingernail repair patches;
d) applying only one layer of glue directly to the damaged portion of the fingernail;
e) applying the selected nail patch to the damaged portion of the fingernail;
f) filing the nail patch into the material of the natural fingernail; and
g) applying a wrap over the nail patch so that the nail patch will enhance the strength of the wrap.

5,146,936
HAIR COLORING APPARATUS AND METHOD
Hilbert H. M. Ng, Chicago, Ill., assignor to Charlene Products, Inc., Bolingbrook, Ill.
Filed Jul. 26, 1990, Ser. No. 558,652
Int. Cl.[5] A61K *7/13*
U.S. Cl. 132—208 **20 Claims**



1. A hair strand color apparatus, comprising:
a row of teeth members;
at least one applicator member to hold and apply coloring ingredient to strands of hair which are contacted by the applicator member; and
means for mounting the row of teeth members and at least one applicator member for relative movement therebetween
an application position in which at least one applicator member resides entirely between and is spaced at a distance away from a pair of adjacent teeth members for application of liquid ingredient to hair passing only between said pair of teeth; and
an ingredient load position in which the at least one applicator member is spaced from between the pair of adjacent teeth sufficiently to enable its immersion into liquid ingredient without immersing the row of teeth members.

5,146,937
METHOD OF HAIR HIGHLIGHTING USING POLYSTYRENE SHEET
Stéphane Lefebvre, 3556, Clark Street, Montréal, Québec, Canada H2X 2R8
Filed Sep. 23, 1991, Ser. No. 764,209
Int. Cl.[5] A61K *7/13*
U.S. Cl. 132—208 **2 Claims**



1. A method for highlighting hair with a quadrangular, planar sheet of expanded polystyrene material, comprising the steps of:
(a) laying a few locks of a person's hair onto a first half portion of said sheet;
(b) applying a dye fluid to said locks of hair;
(c) folding a second half portion of said polystyrene sheet over said sheet first portion, to take in sandwich therebetween said locks of hair;
(d) applying planar pressure evenly over said sheet folded half portions, to bring said sheet first and second half portions flatly against each other in an operative hair highlighting condition, and to accordingly spread said dye fluid within a generally open pocket defined between the two said sheet half portions;
(e) releasing said planar pressure in such a way as to allow the locks of hair to adhere to both sheet half portions in a releasable but firm fashion, so as to glue said sheet half portions to one another in their said folded operative condition;
(f) allowing the assembly of folded polystyrene sheet and glued locks of hair to hang freely from that person's scalp for a controlled dye development period of approximately ten to sixty minutes;
(g) releasing said sheet second half portion from said sheet first half portion, at the end of said dye development period; and
(h) releasing said sheet first portion from said locks of hair;
wherein said expanded polystyrene sheet has a thickness ranging between 115 and 250 microns, and defines on its wall a plurality of micro-cavities at least a number of which become filled by said dye.

5,146,938

CLEANING OF MILL GEARS

Stuart B. Lutener, 7557-10th Ave., P.O. Box 3029, Fort Saskatchewan, Alberta, Canada T8L 2T8, and David W. Burns, 1802-32 Avenue, Vernon, B.C., Canada V1T 2J4

Continuation of Ser. No. 558,472, Jul. 27, 1990, Pat. No. 5,031,648, which is a continuation-in-part of Ser. No. 352,316, May 16, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 726,834

The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.

Int. Cl.[5] B08B 3/04; C23G 5/024

U.S. Cl. 134—32 16 Claims

1. A method of cleaning mill gears and large diameter industrial drive gears soiled with gear lubes, greases and hardened residues which are difficult to remove, said method comprising applying a cleaning solution which does not include methylene-chloride, said cleaning solution being capable of dissolving or softening hardened lubricating residues on said gears during operation of the gears, said cleaning solution comprising a hydrocarbon solvent, an extreme pressure lubricant, surfactants and a thickener to increase the viscosity of said cleaning solution and thereby ensure effective coating of said gears to provide the required lubrication to said gears, continuing to contact the gears with the cleaning solution for sufficient time for the solution to loosen and/or remove surface residues from the gears, and thereafter slowing the rate of rotation of the gears to a slow non-operating speed not requiring effective lubrication of said gears, and thereafter rinsing the surfaces of the gears with a water based liquid to remove the loosened surface residues and the cleaning solution applied to the gears and including substituting, when a higher performance rate of the cleaning solution is required, a terpene for a portion of the amount of solvent

5,146,939

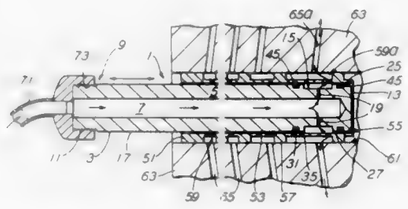
VALVE BUSHING CLEANING DEVICE AND METHOD OF CLEANING VALVE BUSHINGS

Alvin J. Matthews, Pittsburgh; Thomas M. Hartzell, Wilmerding; Ronald M. Markos, McKeesport, and Richard H. Gumbert, North Huntington, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 12, 1990, Ser. No. 626,303

Int. Cl.[5] B08B 3/02

U.S. Cl. 134—167 R 14 Claims



10. In a valve device which includes a valve bushing having apertures in a wall thereof and disposed in a valve bore of a valve body, said valve body having fluid passages that communicates with an interior chamber of said valve bushing, the improvement comprising a means engageable in said valve bushing for cleaning said valve bushing while it is disposed in said valve bore of said valve body, said means for cleaning said valve bushing including:

a hollow cylindrical conduit having a wall;

a first open end on said conduit adapted to be connected to a source of fluid pressure;

means engageable with a second end of said conduit for closing said second end of said conduit;

a recessed portion formed in an outer surface of said wall bordered by an end section of said wall adjacent said second end of said cylindrical conduit and a shoulder between said outer surface of said cylindrical conduit and said recessed portion;

a plurality of fluid passageways through said recessed portion of said wall of said conduit;

first means for securing a first sealing member on said outer surface of said wall of said conduit spaced from and on one side of said plurality of fluid passageways comprising said end section and a first spaced outwardly extending flange, with a first gap therebetween for seating of said first sealing member; and

second means for securing a second sealing member on said outer surface of said wall of said conduit spaced from and on an other side of said plurality of fluid passageways comprising said shoulder and a second spaced outwardly extending flange, with a second gap therebetween for seating of said second sealing member.

5,146,940

UMBRELLA COVER COMPRISING EXTENSIBLE CYLINDRICAL ROLL

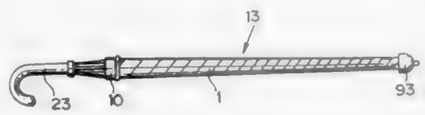
Fumio Hamada, 25-12, Tama-ku, Ikuta 6-chome, Kawasaki-shi, Kanagawa 214, Japan

Filed May 29, 1991, Ser. No. 707,338

Claims priority, application Japan, May 31, 1990, 2-142690

Int. Cl.[5] A45B 15/00

U.S. Cl. 135—34.2 6 Claims



1. An umbrella cover for covering an umbrella having a ferrule comprising

an extensible cylindrical roll of a spirally wound strip which may be pulled out along the axis of the cylindrical roll; wherein

said spirally wound strip has an inner end portion, an outer end portion, and opposite longitudinal edges extending in the longitudinal direction of the strip;

said strip has a plurality of parallel slits formed at predetermined intervals, said slit extending at a predetermined tilt angle in relation to the longitudinal direction of the strip;

said strip has and a plurality of lips formed in the vicinity of one longitudinal edge of the strip at predetermined intervals, said lip having a configuration capable of engaging with said slit; and

said strip is wound such that said lip in one turn of the spirally wound strip is slidably engaged with the slit in the adjacent turn of the wound strip so that the lip can slide along the slit in its longitudinal direction upon elongation of the cylindrical roll.

5,146,941

HIGH TURNDOWN MASS FLOW CONTROL SYSTEM FOR REGULATING GAS FLOW TO A VARIABLE PRESSURE SYSTEM

William O. Statler, Scotia, N.Y., assignor to Unitech Development Corp., Schenectady, N.Y.

Filed Sep. 12, 1991, Ser. No. 758,672

Int. Cl.[5] G05D 7/06

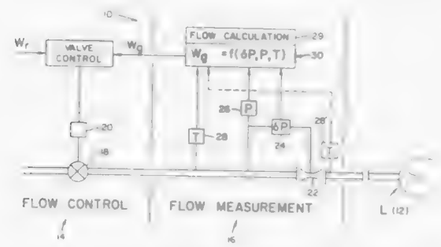
U.S. Cl. 137—8 8 Claims

1. A method for controlling the flow within a conduit of a gas fluid stream into a load system by using a fixed restriction device with conventional instrumentation and where gas pressure at an inlet of the system is strong function of mass flow of the gas, the method comprising:

establishing control over gas flow in the conduit means by use of a single valve responsive to control signals derived from a functional calculation on data collected on stream flow measurement wherein said data are taken proximate a gas flow restricting means;

placing a fixed flow gas restricting element downstream of the single valve and upstream of the load system;

determining, in said gas fluid stream, a temperature and inlet pressure at a first point in the stream, a pressure differential between said first point, taken immediately before and



upstream of said restricting element and a second point located within the restricting element; whereby upon said determining of temperature, pressure and pressure differential,

calculating a true gas mass flow rate, W_g, correlating W_g with a desired reference gas mass flow, W_r; and thereafter physically actuating the single valve to nullify the difference between W_r and W_g by altering the stream passing through said single valve.

5,146,942

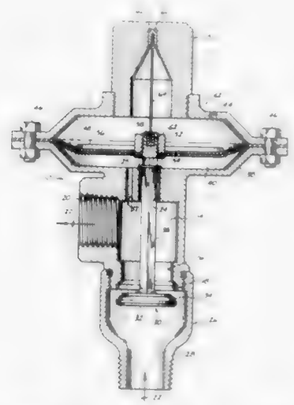
LOW PRESSURE FLUID EMERGENCY SHUTDOWN VALVE

Julian S. Taylor, 8300 SW. 8th, Oklahoma City, Okla. 73128

Continuation-in-part of Ser. No. 695,830, May 6, 1991, Pat. No. 5,067,511. This application Oct. 21, 1991, Ser. No. 780,180

Int. Cl.[5] F16K 17/00

U.S. Cl. 137—67 4 Claims



1. A low pressure fluid conduit emergency shutdown valve comprising: a valve body having an inlet port and an outlet port forming a

fluid passageway interposed in a conduit; a valve seat in the inlet port; normally open valve means supported by said body for movement

toward said valve seat and closing the fluid passageway; and, axially collapsible pin means for normally

biasing said valve means toward a fluid passageway open position and diaphragm means for biasing said valve means toward said valve seat in response to a predetermined value of fluid pressure in the fluid passageway.

5,146,943

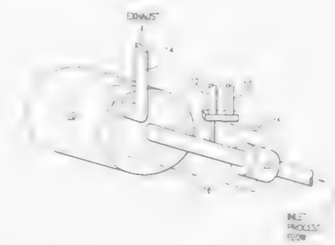
APPARATUS FOR CONTROLLING THE FLOW OF A PROCESS FLUID INTO A PROCESS VESSEL

David R. Bert, Bakersfield, Calif., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 27, 1992, Ser. No. 826,497

Int. Cl.[5] F16K 17/40

U.S. Cl. 137—87 12 Claims



1. Apparatus for controlling the flow of a process fluid into a process vessel, comprising:

a) a process vessel having an inlet for receiving a process fluid and an outlet for exhausting process fluid into the atmosphere should the pressure within said process vessel exceed a preset limit,

b) a pneumatic safety device positioned within said inlet for shutting down the flow of process fluid into said process vessel when actuated pneumatically,

c) a pressure-relieving device positioned within said outlet for exhausting process fluid from said process vessel into the atmosphere when the pressure within said process vessel exceeds said preset limit as established by a burst pressure level of said pressure-relieving device, and

d) a pneumatic control link connecting said pressure-relieving device to said pneumatic safety device, said pneumatic control link actuating said pneumatic safety device to shut-down the flow of process fluid into said process vessel in response to the exhausting of said process fluid through said outlet into the atmosphere.

5,146,944

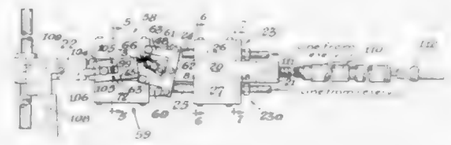
DUAL PUMP METERING DILUTION APPARATUS

John E. Waldrum, Ambler, Pa., assignor to DowElanco, Indianapolis, Ind.

Filed Oct. 3, 1991, Ser. No. 770,512

Int. Cl.[5] F04D 25/16

U.S. Cl. 137—99 18 Claims



1. A dual pump metering dilution apparatus comprising:

a longitudinal conduit with a sidewall, a rear end, and a forward discharge end, the conduit having an inlet at about the rear end for liquid for dilution:

dual piston displacement pumps mounted one on either side of the conduit, each pump having an inlet for liquid to be diluted and a discharge port leading to an inlet through the sidewall of the conduit: and

respective hydraulic piston means adapted to utilize liquid

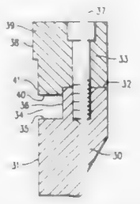
for dilution flowing through the conduit from about the rear end thereof for continuously alternatingly and mutually exclusively powering the respective pistons of the displacement pumps at a rate directly proportional to the rate of flow of the diluting liquid traversing the longitudinal conduit.

5,146,945

SEAL RING RETAINER AND GUIDE RING FOR VALVE PLUG

Joachim A. La Rosa, Winter Springs, Fla.; Joseph W. Ross, Huntsville, Ala., and Frank J. Heymann, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 6, 1989, Ser. No. 446,957
Int. Cl.[5] F16J 9/26; F16K 41/00, 43/00
U.S. Cl. 137—315 17 Claims



8. In a control valve having a substantially hollow cylindrical bonnet provided with an inner circumferential surface, the improvement comprising:

a valve plug disposable within the bonnet and having an outer circumferential surface arranged to face the inner circumferential surface of the bonnet when disposed within the bonnet, the outer circumferential surface of the valve plug having a stepped indentation extending about the periphery of the valve plug;

a retaining ring securable to the valve plug, the retaining ring having a first surface which extends adjacent the stepped indentation of the valve plug when the retaining ring is secured with the valve plug, the retaining ring having an outer circumferential surface which faces the inner circumferential surface of the bonnet when the retaining ring is secured with the valve plug and the valve plug is disposed within the bonnet, the outer circumferential surface of the retaining ring having a stepped indentation extending about the periphery of the retaining ring; and

a guide ring securable to the retaining ring, the guide ring having a second surface which faces the inner circumferential surface of the bonnet when the guide ring is secured with the retaining ring which is secured with the valve plug and the valve plug is disposed within the bonnet, the guide ring having a third surface which extends adjacent the stepped indentation of the retaining ring when the guide ring is secured with the retaining ring, the guide ring being formed to have at least one fluid flow passage extending across the entirety of said first surface of said guide ring for equalizing the pressure across said guide ring and thereby reducing the occurrence of vibration of said valve plug and guide ring;

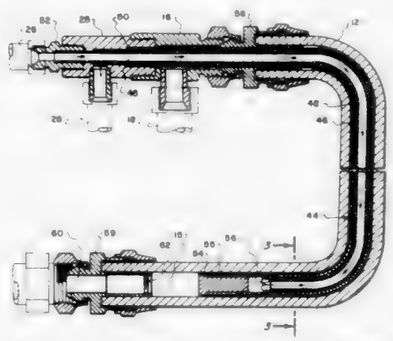
wherein the stepped indentation of the valve plug and the first surface of the retaining ring form a first three-sided annular groove and the stepped indentation of the retaining ring and the third surface of the guide ring form a second three-sided annular groove when the guide ring, retaining ring and valve plug are secured with each other.

5,146,946

APPARATUS FOR IMPROVING THE VISCOSITY OF COATING MATERIALS

James R. Maugans, San Francisco, Calif., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed May 31, 1991, Ser. No. 708,940
Int. Cl.[5] F16K 49/00
U.S. Cl. 137—340 14 Claims



1. A system for controlling the viscosity of a coating material delivered to a spray gun comprising;

a reservoir for storing a coating material;

a supply hose for supplying said coating material to a spray gun;

connecting means connecting said supply hose to said reservoir at one end and to said spray gun at the other;

heating means for heating said coating means throughout its flow through said supply hose, said heating means comprising;

a low friction fluid;

heating means for heating said low friction fluid;

coaxial hose means constructed to be inserted inside said supply hose for circulating said heated low friction fluid, said coaxial hose means having a length that extends approximately to the end of said supply hose connected to said spray gun; approximately equal to the length of said supply hose;

pump means for continually circulating said low friction heating fluid through said heating means and said coaxial hose;

distribution means connecting said coaxial hose to said pump means, said heating means and to the supply end of said supply hose;

whereby said heating means maintains the delivered temperature of said coating material at said spray gun at a predetermined level.

5,146,947

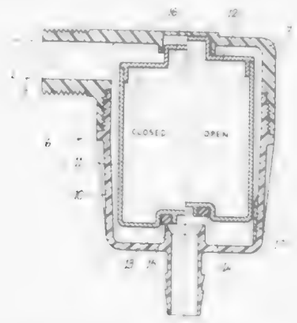
CONDENSATE DRAINAGE FOR GASEOUS FUEL FIRED CONDENSATION BOILERS

Gianni Vetrini, Teramo, Italy, assignor to AFA-TEC S.r.l., Notaresco, Italy

Filed Jul. 9, 1991, Ser. No. 727,044
Claims priority, application Italy, Jul. 30, 1990, 35940 [U]
Int. Cl.[5] F16K 131/18
U.S. Cl. 137—433 3 Claims

1. A condensate drainage device for gaseous fuel fired condensation boilers, comprising an outer body consisting of a cover portion and of a bottom portion, said cover portion having a first member for connection with an inlet conduit for condensate and burnt gases, said bottom portion having a second portion for connection with a condensate drainage conduit, and a float which is provided in its bottom portion with an annular housing for a tight seal gasket, a gap for passage of condensate being provided between said float and said

outer body, said gasket housed within said annular housing engaging with a mouth of said second connection portion, thereby preventing condensate and/or gas from being drained,



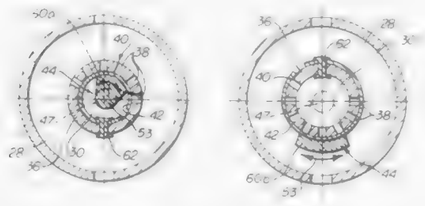
and said float comprising a top portion provided with a projecting part engaging with a corresponding cavity provided in an inner part of said cover portion of said outer body.

5,146,948

DAMPING VALVE WITH IMPROVED DAMPING ADJUSTMENT

Walter Runkel, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Aug. 1, 1990, Ser. No. 560,611
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925520
Int. Cl.[5] F16K 15/14, 17/18
U.S. Cl. 137—493.8 8 Claims



1. Damping valve for hydraulic media in damping systems, such as shock and vibration damping systems and the like, comprising:

plural throttling channels equipped with a valve element for damping adjustment, each throttling channel having an aperture;

said valve element comprising a leaf-spring element (42) which is secured at one end in such a way that the leaf-spring element covers the apertures (40) of the throttling channels (38) for the medium while the damping adjustment is accomplished by varying the length of the free end of the leaf-spring element;

said several throttling channels (38) extend through a partition (36) separating a first valve chamber (28) from a second valve chamber (30);

a pressure element (44) for varying the length (1) of the free end of the leaf spring element (42) affixed at one end to the partition (36);

said pressure element (44) is movably guided over said leaf-spring element, while the leaf-spring element (42) is clamped between the pressure element (44) and the partition (36);

said partition (36) being of planar design and the throttling channels (38) being arranged axially parallel to each other and spaced in an arc;

the leaf-spring element (42) is a planar, radially slotted, annular plate covering the throttling channels (38); and

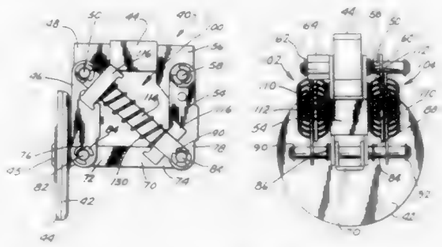
the pressure element (44) is a radial pressure piece (48) affixed to a rotatably mounted shaft (47) perpendicular to the partition (36) and by means of said shaft (47), pivotable over the annular leaf-spring element (42), so as to vary the length of the free end.

5,146,949

CHECK VALVE WITH SPRING LOADED CLAPPER ASSEMBLY

James G. Retzloff, Lansing, and Perin E. Truax, Caledonia, both of Mich., assignors to The Viking Corporation, Hastings, Mich.

Filed Jan. 4, 1991, Ser. No. 653,883
Int. Cl.[5] F16K 15/03
U.S. Cl. 137—527 24 Claims



1. A check valve assembly comprising:

a housing defining an inlet, an outlet, a seat and a chamber;

a clapper; and

clapper mounting means within said chamber for movably mounting said clapper and resiliently biasing said clapper towards a closed position against said seat, said clapper mounting means including:

linkage means between said housing and said clapper for supporting said clapper for movement towards and away from said seat, said linkage means including a first arm and a second arm;

a compression spring; and

draw bar means connected to said linkage means, extending between said first and second arms and engaging said compression spring for compressing said spring as said clapper moves from the closed position to an open position away from said valve seat.

5,146,950

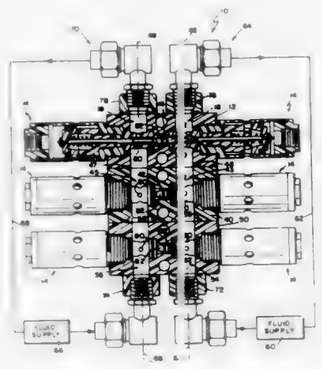
MODULAR PLASTIC COLOR CHANGER

Michael C. Rodgers; D. William Medlock, and Matthew D. Byam, all of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 551,195, Jul. 11, 1990, abandoned. This application Aug. 21, 1991, Ser. No. 750,748
Int. Cl.[5] B05B 9/06
U.S. Cl. 137—563 8 Claims

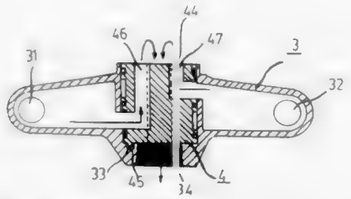
1. A fluid type changer for supplying at least two devices with fluid from a single fluid supply line, the changer comprising a manifold assembly including first and second fluid outlet passages for supplying fluid to first and second devices, respectively, a fluid circulation line extending through the manifold assembly, valve means for selectively coupling the fluid circulation line to the fluid outlet passages for separately controlling flow of fluid from the circulation line to the first and second outlet passages, and means for coupling the valve means to the manifold assembly, the valve means being arranged in pairs, one valve means of each pair disposed across a respective fluid

outlet passage directly opposite the other valve means of its respective pair, the manifold assembly comprising a plurality of segments which are joined together to form the manifold assembly, at least a portion of each fluid circulation line being



provided by a respective segment and the valve means being removably attached to the segments to permit removal and replacement of a valve means without disconnection of a respective fluid circulation line.

5,146,951
WATER FAUCET
M. J. Chuang, Chang-Chin N Road, Taipei, Taiwan 111
Filed Sep. 24, 1991, Ser. No. 765,021
Int. Cl.[5] F16K *27/00*
U.S. Cl. 137—594 **5 Claims**



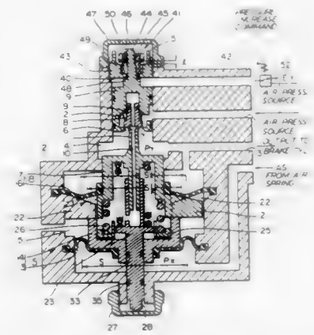
1. A water faucet comprising

an integral, die cast main component including a hollow main body portion, a cold water supply inlet and a hot water supply inlet, said hollow main body portion having a cold water inlet port aligned with said cold water supply inlet and a hot water inlet port aligned with said hot water supply inlet formed therein; said hollow main body portion including a bottom side having a threaded opening formed therein and a locating hole offset from said opening;

an integral, die cast internal component adapted to be sealably mounted within said hollow main body portion with a locating pin carried by said internal component being seated in said locating hole said internal component having an upper surface portion and a lower surface portion, a cold water inlet chamber located between said upper and lower surface portions which is in fluid communication with said cold water inlet port and terminates in a cold water inlet opening formed in said upper surface, a hot water inlet chamber located between said upper and lower surface portions which is in fluid communication with said hot water inlet port and terminates in a hot water inlet opening formed in said upper surface, and an outlet passage extending from said upper surface in fluid communication with said hot and cold inlet openings to said lower surface in fluid communication with said threaded opening; and

a hollow, die-cast water outlet component threadably secured in said threaded opening of said main component such that said water outlet component is in fluid communication with said outlet passage for the flow of water therethrough.

5,146,952
FLUID PRESSURE CONTROL VALVE DEVICE FOR A RAILWAY CAR
Hideo Tamamori, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan
Filed Sep. 24, 1991, Ser. No. 764,699
Claims priority, application Japan, Sep. 26, 1990, 2-101250[U]
Int. Cl.[5] F16K *31/126*
U.S. Cl. 137—627.5 **11 Claims**



1. A fluid pressure control valve device comprising:

(a) a supply passage to which a source of fluid under pressure is connected;

(b) an output passage to which a fluid pressure operating cylinder is connected;

(c) an exhaust passage connected to atmosphere;

(d) a valve member;

(e) a supply valve seat between said supply passage and said output passage with which said valve member coacts to control the supply of fluid under pressure to said operating cylinder;

(f) means for urging said valve member toward engagement with said supply valve seat;

(g) an exhaust valve seat between said output passage and said exhaust passage with which said valve member coacts to control the exhaust of fluid under pressure from said operating cylinder;

(h) a balancing chamber to which said output passage is connected;

(i) a first piston member in said balancing chamber having said exhaust valve seat, said first piston member being displaced in a first axial direction to effect disengagement of said exhaust valve seat from said valve member in response to fluid pressure effective in said balancing chamber acting on one side of said first piston member;

(j) means acting on said first piston member on the side thereof opposite said one side for urging axial movement of said first piston member in a second axial direction to effect engagement of said exhaust valve seat with said valve member and to effect disengagement of said valve member from said supply valve seat;

(k) said first piston member having a lap position in which said valve member is engaged with said supply valve seat and said exhaust valve seat, said first piston member further comprising:

(i) a piston body;

(ii) an annular diaphragm member having an inner periphery fixed to said piston body and an outer periphery fixed to the body of said control valve device; and

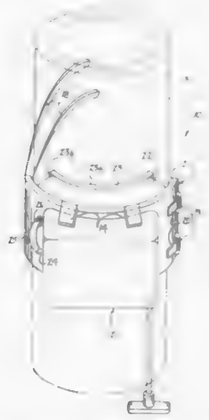
(iii) a first plurality of fins projecting radially from said piston body and having a first support surface with which said diaphragm member is removably engaged;

(l) a second plurality of fins projecting radially from the body of said control valve device into the spaces between said second fins and having a second support surface with which said diaphragm member is removably engaged, said first and second support surfaces being tapered in opposite directions such that the effective pressure area of said first piston member subject to the fluid pressure effective in said balancing chamber varies as the axial position of said first piston member changes;

(m) a second piston member having first and second axially spaced stops and further including said supply valve seat, said second piston member being axially movable from a first position to a second position; and

(n) a positioning member connected to the body of said control valve device and interposed between said first and second stops for engagement therewith to limit said axial movement of said second piston member in said first and second axial directions to establish said first and second positions thereof and accordingly vary the effective pressure area of said first piston member in said lap position thereof.

5,146,953
PIPE SEALING APPARATUS
David C. Bell, P.O. Box 3142, Deer Park, Md. 21550
Filed Jul. 1, 1991, Ser. No. 723,774
Int. Cl.[5] F16L *55/16*
U.S. Cl. 138—99 **3 Claims**



1. A pipe sealing apparatus for securement to an exterior surface of an associated fluid directing pipe, the apparatus comprising,

a rigid arcuate mounting plate, the mounting plate including a concave plate interior surface spaced from a concave plate exterior surface, and

a first edge spaced from a second edge, the first edge including at least one flexible securement strap for securement about the pipe, and

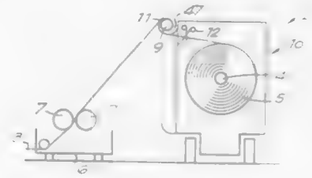
the second edge including at least one support loop, the at least one support loop includes a "D" shaped ring to receive the flexible securement strap therethrough for securement about the pipe, and

the concave interior surface including an inflation bladder fixedly mounted to the interior surface, and

the convex exterior surface including an inflation housing means for effecting selective inflation of the bladder, the bladder including a flexible sealing plate, the flexible sealing plate mounted to the bladder in spaced relationship relative to the concave plate interior surface for contiguous communication with the pipe, and

the inflation housing means includes a housing rear wall and a housing forward wall, the inflation housing means further including a top wall, the inflation housing means including a canister cavity, the canister cavity slidably receiving a pressurized gas canister therewithin, the canister cavity including a neck receiving bore, and the gas canister including a gas canister neck slidably received within the neck receiving bore, and the canister cavity directed through the housing means rear wall, and the housing means forward wall including a puncture needle directed therethrough in coaxially aligned communication with the neck receiving bore adjacent the gas canister neck, and an outlet pipe directed through the inflation housing means exteriorly thereof in pneumatic communication with the neck receiving bore, and a rotary valve in pneumatic communication between the outlet pipe and the neck receiving bore, with the rotary valve including a rotary valve bore means for selective stoppage of pneumatic gas from the neck receiving bore to the outlet pipe, and an auxiliary inflation tube in pneumatic communication through the inflation housing means and the outlet pipe, with the auxiliary inflation tube including a needle valve directed therewithin for receiving pressurized gas through the needle valve into the auxiliary inflation tube and the outlet pipe, and the outlet pipe in pneumatic communication with the directional conduit, the directional conduit directed through a mounting plate aperture directed through the mounting plate.

5,146,954
LOOM CLOTH BEAM REPLACEMENT IN WEAVING MACHINES
Geert Ostyn, Moorslede, and Kristof Roelstraete, Zwevegem, both of Belgium, assignors to Picanol N.V., Naamloze vennootschap, Belgium
Filed Jun. 13, 1991, Ser. No. 714,843
Claims priority, application Belgium, Jun. 19, 1990, 09000623
Int. Cl.[5] D03D *49/00*
U.S. Cl. 139—1 R **14 Claims**



1. A method of replacing a cloth beam in a weaving machine, comprising the steps of: removing a cloth beam from a cloth winding device; pressing an empty cloth beam against a fabric extending from the removed cloth beam, and against a guide piece fixed to a frame and extending along a width of the fabric, to thereby cause the fabric to turn over the guide piece and extend substantially around the circumference of the empty cloth beam and to extend from the empty cloth beam towards the winding device, a portion of the fabric which extends towards the winding device enveloping a portion of the fabric which is turned over the guide piece and which lies between the guide piece and the portion of the fabric which extends towards the winding device; releasing a part of the fabric that is situated, with respect to a moving direction of the fabric, beyond the empty cloth beam; driving the empty cloth beam such that the part of the fabric that is situated beyond the empty cloth beam is wound between the guide piece and the portion of the fabric which extends towards the winding de-

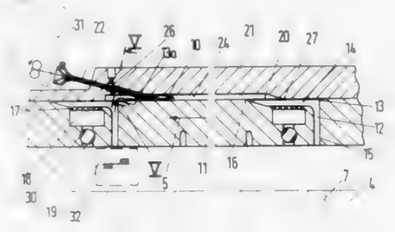
vice; and mounting the empty cloth beam in the winding device.

5,146,955

FILLING THREAD DISTRIBUTOR MECHANISM FOR A SERIES-SHED WEAVING MACHINE

Alois Steiner, Rieden; Theodor Wiest, and Marcel Christe, both of Ruti, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 6, 1990, Ser. No. 609,892
Claims priority, application Switzerland, Nov. 16, 1989, 4130/89
Int. Cl.[5] D03D *47/30*
U.S. Cl. 139—450 23 Claims



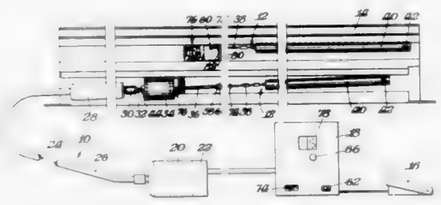
1. A filling thread distributor mechanism comprising:
a stationary annular part having at least one channel in an end face thereof;
at least one feeder nozzle positioned in said stationary part for continuously blowing a filling thread into said channel; and
a rotatable annular part coaxial of said stationary part for rotation with a weaving rotor of series-shed weaving machine, said rotatable part having a plurality of circumferentially spaced picking tubes for selective communication with said channel of said stationary part, each of said tubes being sequentially aligned with said channel of said stationary part for receiving a filling thread therefrom for passage to a picking channel on the weaving rotor, wherein said channel of said stationary part extends along a segment of circular arc and faces said rotatable part.

5,146,956

PROGRAMMABLE CONTROLLED WINDER

Iris Burgos, Wilmington, Del.; Leroy Dunn, Coatesville, Pa., and Altan Husni, Middletown, Del., assignors to Slocomb Industries, Inc., Wilmington, Del.

Filed Aug. 9, 1990, Ser. No. 564,592
Int. Cl.[5] B21F *9/00*
U.S. Cl. 140—89 22 Claims



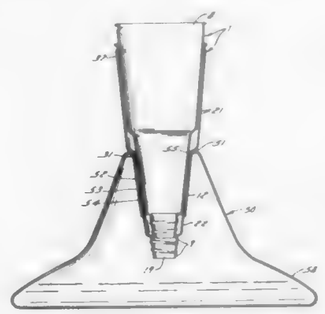
1. A winder for creating tension in a single element by rotating the single element a preselected number of times comprising a hand piece, a tool bit operatively connected to said hand piece, motor means operatively connected to said hand piece for rotating said tool bit, single element attaching means on said tool bit for detachable attachment to the single element for rotating the element, control means operatively connected to said motor means for preselecting the number of rotations of said tool bit and automatically halting the rotation when the preselected number has been reached, in combination therewith, a spiral balance in an extruded tilt window, said spiral balance being said single element, said attaching means being detachably attached to said spiral balance, said extruded tilt window having a hollow frame, and said spiral balance being in a portion of said frame.

5,146,957

NESTABLE CONTAINER AND METHOD FOR DISPENSING AND DRAINING LIQUID THEREFROM

Paul Belokin, Jr., and Martin P. Belokin, both of 7801 1-35N & Milam Rd., Denton, Tex. 76201

Division of Ser. No. 7,680,320, Apr. 4, 1991, Pat. No. 5,123,461.
This application Jan. 4, 1992, Ser. No. 830,686
Int. Cl.[5] B65B *17/50*; B67C *9/00*; B67D *21/02*; B67B *7/24*
U.S. Cl. 141—1 7 Claims



1. The combination of a container for liquid which is nestable with at least one other like container when said one other like container is empty after the liquid therein has been emptied and a residual liquid collector means for successively receiving a plurality of said empty containers in a nested relationship to permit residual liquid to drain therefrom and to consolidate a plurality of said empty containers for recycling comprising:
the container having a body including a longitudinal axis, a side wall means, a large bottom end having a cross-sectional area, a small top dispensing end that is smaller than said large bottom end and inner and outer side wall surfaces, said side wall means tapering from said large bottom end to said small top end to define a tapered liquid confining space having large bottom and small top openings at said bottom and top ends;
a bottom closure means for sealing said large bottom opening and which is removable when dispensing said liquid to open said cross-sectional area of said bottom end; and
a top closure means for sealing said small top opening which is removable to permit liquid to be emptied from said container;
said collector means including an upper portion having a tapered socket presenting an inverted open apex for receiving therein said tapered outer shide wall surface of an inverted empty container body with said top and bottom closure means removed to permit residual liquid to drain therefrom;
said tapered socket being dimensioned so that in use it will hold said container securely to permit successive containers to be axially aligned and inserted into said bottom end when said bottom closure means is removed of a preceding container to nest therein for consolidation and draining of residual liquid from a plurality of such containers; and
a receptacle means for receiving and holding said drained residual liquid.

5,146,958

METHOD AND APPARATUS FOR PASTING A POROUS PLATE

Bernard Bugnet, Saint-Genis-Pouilly; Denis Doniat, Le Perreux, and Robert Rouget, Paris, all of France, assignors to Sorapec S.A., Fontenay-sous-Bois, France

Filed Nov. 15, 1990, Ser. No. 613,131
Claims priority, application France, Nov. 16, 1989, 89 15291
Int. Cl.[5] H01M *4/20*
U.S. Cl. 141—1.1 21 Claims

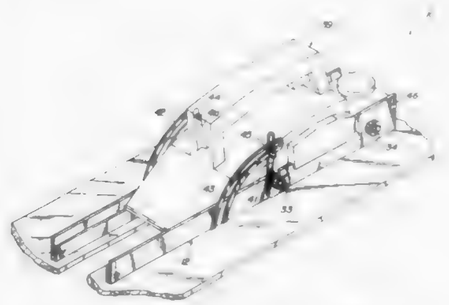
1. A method of pasting a porous structure, comprising:
inserting pasty material continuously and evenly as a sandwich filling between two primary conveyer strips driven at substantially the same speed to deliver a first pasty material with a predefined thickness and with a flat translational motion onto a substantially horizontal platen, said two primary conveyer strips including a first primary conveyer strip upon which the pasty material is transported on the platen, and a second primary conveyer strip which is removable to expose one surface of the first pasty material;
removing the secondary primary conveyer strip to uncover one surface of the first pasty material;
bringing the porous structure substantially level with the platen, and positioning the porous structure onto said one surface of the first pasty material;
pressing said first pasty material into the porous structure to form a pasted porous structure; and
removing the pasted porous structure from the first primary conveyer strip.

5,146,959

POWER PLANE SUPPORT APPARATUS

Noel E. Terrell, 1713 McArthur, Colorado Springs, Colo. 80909

Filed Nov. 12, 1991, Ser. No. 790,820
Int. Cl.[5] B27C *9/02*, *5/10*
U.S. Cl. 144—1 F 3 Claims



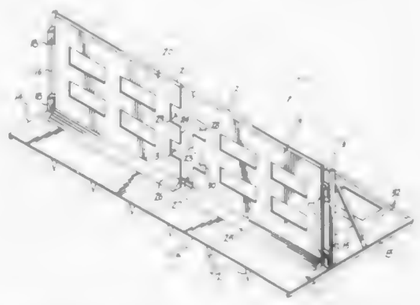
1. A power plane support apparatus, comprising,
a side plate mounted parallel to, coextensive with and in a spaced relationship to a second side plate, the first side plate including a first side plate bottom surface, the second side plate including a second side plate bottom surface, wherein the first bottom surface is coplanar with the second bottom surface, and
the first side plate including a first forward top edge, the second side plate including a second forward top edge, and
the first plate including a first top edge recess defined by a floor positioned below the first forward top edge, and
the second side plate including a second top edge recess positioned rearwardly of the second forward top edge and including a second top edge recess floor coplanar with the first top edge recess floor and below the second forward top edge, and
the first side plate further including a first rear top edge spaced above the first top edge recess floor and the second side plate including a second rear top edge spaced above the second top edge recess floor, and
the first side plate including a first plate first bore spaced from a first plate second bore, the second side plate including a second plate first bore spaced from a second plate second bore, and
the first plate first bore and the second plate first bore are coaxially aligned, and the first plate second bore and the second plate second bore are coaxially aligned, and
a first rod directed through the first plate first bore and the second plate first bore, with a second rod directed through the second plate second bore and the first plate second bore, the first rod arranged parallel to the second rod, and
including a power plane clampingly mounted between the first side plate and the second side plate, and
a first support plate mounted to an interior surface of the first side plate, and a second support plate mounted to an interior surface of the second side plate, wherein the first support plate and the second support plate are in confronting relationship relative to one another, wherein the first support plate includes a first support plate top edge and the second support plate includes a second support plate top edge, wherein the first support plate top edge and the second support plate top edge are coplanar and positioned below the first top edge recess floor and the second top edge recess floor, wherein the first support plate top edge and the second support plate top edge mount the power plate thereon.

5,146,960

DELIMBING APPARATUS

Leslie J. Blakely, 1720 Thistlewaite Dr., Mobile, Ala. 36618

Filed Jan. 13, 1992, Ser. No. 819,968
Int. Cl.[5] B27G *1/00*
U.S. Cl. 144—2 Z 8 Claims



1. A delimbing apparatus, comprising,
a platform base, the platform base including a base bottom surface and a base top surface, and
a base front edge spaced from a base rear edge, and
a first side edge spaced from a second side edge, and

a first gate post mounted fixed y and orthogonally adjacent the first side edge between the front edge and the rear edge, and

a second gate post mounted adjacent the second side edge between the front edge and the rear edge, wherein the first gate post and the second gate post are spaced from the front edge a predetermined distance, and

the first gate post including at least one gate hinge, and the second gate post including at least one second gate hinge, and

a first gate mounted to the first gate hinge, and a second gate mounted to the second gate hinge, and the first gate and the second gate are in a coplanar relationship in a first position orthogonally oriented relative to the first side edge and the second side edge, and wherein the first gate and the second gate are displaced to define a generally acute included angle therebetween when the first gate and the second gate are displaced forwardly relative to the first gate post and the second gate post.

5,146,961

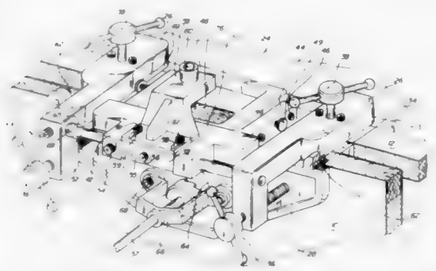
APPARATUS FOR HINGING A DOOR TO A DOOR JAMB

Siegmund Schoeller, 6161 Buxton, West Bloomfield, Mich. 48322

Continuation-in-part of Ser. No. 264,837, Oct. 31, 1988, abandoned. This application Nov. 15, 1990, Ser. No. 614,232

Int. Cl.[5] **B27C** *1/04, 3/02*

U.S. Cl. 144—3 R **27 Claims**



1. A tool set for preliminarily fitting a door to a door jamb prior to fitting the door and door jamb assembly into a doorway and for drilling holes in a door for a doorlock set, said door and said door jamb assembly having a first end and a second end, said tool set comprising:

a portable main work unit for selectively releasably locking said door to said door jamb, said work unit including a hinge cutting template pivotably attached to said work unit, at least one doorlatch drill guide pivotably attached to said work unit and at least one doorlock drill guide fixedly attached to said work unit;

said work unit having means for releasably and selectively interlocking said door and said door jamb; and

a pair of portable end clamps removably attachable to said first end and said second end of said door and door jamb assembly for aligning said door with said door jamb.

5,146,962

WOODWORKING MACHINE

Edward Drees, 11011 Ayres Ave., Los Angeles, Calif. 90723

Filed Aug. 27, 1991, Ser. No. 750,829

Int. Cl.[5] **B27C** *5/00*; **B27M** *3/00*

U.S. Cl. 144—137 **17 Claims**

8. An apparatus for cutting a curved surface on a workpiece, comprising.

a. a support frame including a first pair of spaced-apart guide rods;

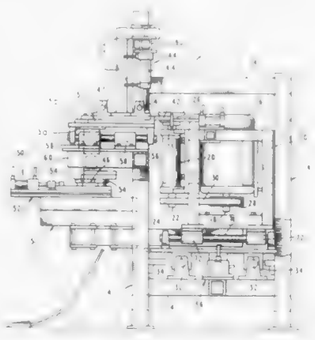
b. cutter means for cutting the workpiece said cutter means comprising:

(i) first guide rod engagement means for engagement with said first pair of guide rods for movement of said cutter means between first and second positions;

(ii) a motor having a shaft; and

(iii) a cutter head removably connected to said shaft;

c. support means for supporting the workpiece, said support means being mounted on said frame for movement toward and away from said cutter means; said support means comprising:



(i) a supporting table;

(ii) locating means for locating the work piece on said supporting table; and

(iii) a template having a curved surface corresponding to the curved surface to be cut on the workpiece;

d. follower means connected to said cutter means for following said template to control the movement of said supporting table toward and away from said cutter means.

5,146,963

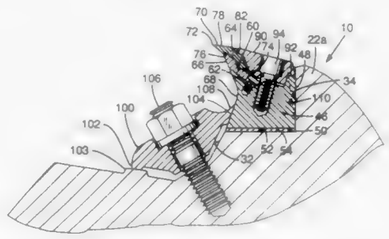
CHIPPING DEVICE

Charles T. Carpenter, and Robert M. Bayly, both of Lake Oswego, Oreg., assignors to Commercial Knife, Inc., Wilsonville, Oreg.

Filed Nov. 4, 1991, Ser. No. 787,253

Int. Cl.[5] **B26D** *1/12*; **B27G** *13/00*

U.S. Cl. 144—231 **8 Claims**



1. In a chipping cutter head that includes a shaft, spindle segments mounted on and spaced axially on the shaft, and multiple knife elements mounted on the spindle segments and rotatable in circular paths about the axis of said shaft with rotation of the cutter head, a first knife element on one spindle segment producing an approximately cylindrical cut with rotation of the cutter head and a second knife element on another spindle segment producing an approximately cylindrical cut with rotation of the cutter head, the cylindrical cut of the second element being an approximate continuation in an axial direction of the cylindrical cut produced by the first element,

each knife element having a pair of cutting edges forming opposite edge extremities of the knife element and opposed sides bounding the knife element between the cutting edges of the element, a mounting for each knife element on its respective spindle segment comprising a pocket in the spindle segment and the pocket having a floor, a knife holder received in the pocket, the knife holder having an established desired position supported by the floor of the pocket, the knife element being supported on the knife holder,

releasable holder-securing means securing the knife holder to the spindle segment and releasable knife-securing means securing the knife element to the knife holder, the knife-securing means comprising an adjustable clamp clamping against a side of the knife element and the clamp being releasable to enable removal of the knife element.

5,146,964

APPARATUS AND METHOD FOR CUTTING OR SLOTTING RIGID MATERIAL, IN PARTICULAR WOOD

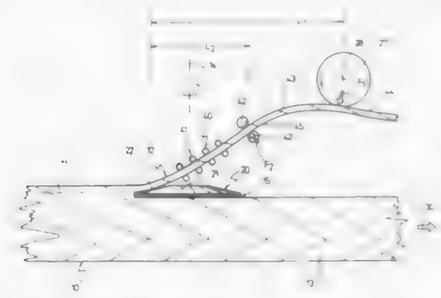
Hans Dietz, Ammerbuch, Fed. Rep. of Germany, assignor to Wurster u. Dietz GmbH u. Co., Tubingen-Derendingen, Fed. Rep. of Germany

Filed Nov. 4, 1991, Ser. No. 787,224

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1990, 4035048

Int. Cl.[5] **B27G** *19/08*; **B26D** *7/08*; **B27B** *1/00, 5/28*

U.S. Cl. 144—363 **5 Claims**



1. An apparatus for cutting elongate pieces of wood, said pieces of wood having a modulus of elasticity between 50,000 and 400,000 kg/cm^2, comprising:

a circular saw blade having a plurality of spaced peripheral teeth;

drive means for rotating said saw blade about an axis at a cutting speed of said teeth exceeding 40 m/s;

feeding means for displacing said pieces of wood relative to said saw blade along a feeding direction extending perpendicularly to said axis;

stationary bending means arranged on a broad side of said circular saw blade adjoining said cutting teeth, said stationary bending means having a radially profiled surface with a thickness increasing towards said axis and decreasing towards said cutting teeth, whereby said saw blade can be used to cut a slot into said pieces of wood along said feeding direction thus generating a first and a second section of said pieces of wood, and whereby said first section is lifted from said saw blade immediately after the formation of said slot;

deflection means arranged at a first distance (L_1) from said stationary bending means downstream along said feeding direction, said deflection means exerting a first force (F_1) on a first surface of said first section facing away from said stationary bending means; and

supporting means arranged at a second distance (L_2) from said stationary bending means downstream along said feeding direction with said second distance (L_2) being smaller than said first distance (L_1), said supporting means exerting a second force (F_2) on a second surface of said first section facing said stationary bending means.

5,146,965

ROUTER ATTACHMENT

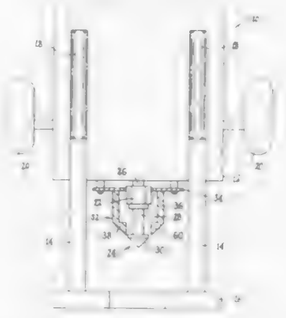
Nigel Gibson, 10 Nichols St., Kings Meadow, Tasmania 7249, Australia

Filed Oct. 29, 1991, Ser. No. 784,530

Claims priority, application Australia, Oct. 29, 1990, PK3070

Int. Cl.[5] **B27M** *1/00, 3/00*; **B27C** *5/02*

U.S. Cl. 144—372 **14 Claims**



1. A router attachment comprising:

a body member, having a mounting end, adapted to be mounted to a router;

and a work end having an inclined guide surface capable of engaging a variable width slot in a template;

said body member having a centrally located bore adapted to encircle a shaft of a cutter member of a router.

6. A variable depth router comprising;

a cutter member including a cutter tip and a shaft;

a router attachment according to claim 1 or 2;

said cutter member being located within said bore, the shaft being releasibly secured to a collet located near the mounting end of the body member, and the cutter tip protruding externally of the work end.

13. A method of producing a routered article comprising the steps of:

providing a variable depth router according to claim 6;

affixing a template with at least one variable width slot to a surface to be routered;

urging the variable depth router toward the template to engage the inclined guide surface with the slot, applying relative lateral movement between the router attachment and template, varying the relative height of the cutter blade, dependent upon the width of the slot, and the cutter blade contacting the surface to be routered at least at one point.

5,146,966

HOOP-SHAPED HANDBAG

Michael Romano, Wakefield, Mass., assignor to MPJ Manufacturing Company, Inc., Marlboro, Mass.

Filed Jan. 17, 1992, Ser. No. 822,355

Int. Cl.[5] **A45C** *3/00*

U.S. Cl. 150—110 **4 Claims**

1. A hoop shaped handbag comprising:

a tubular member joined at both ends to form a continuous circular hoop;

a pouch surrounding a portion of a periphery of the circular

hoop having an opening that extends across the hoop, wherein the surrounded portion of the hoop forms a frame

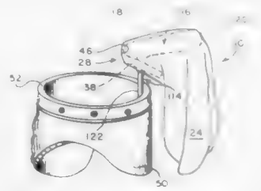
for the pouch and the remaining portion of the hoop forms a handbag.

5,146,967
GOLF BAG RAIN COVER
James W. Chapman, 4645 Savage Hills Dr., Macon, Ga. 31210
Filed Dec. 23, 1991, Ser. No. 812,030
Int. Cl.[5] A63B 55/00, 57/00
U.S. Cl. 150—159 20 Claims

1. A golf bag rain cover constructed of flexible material as an envelope which is sized and shaped to receive at least one golf bag in standing condition with golf clubs positioned therein,
an open bottom of the envelope through which at least one golf bag is insertable,
a roof edge opposite the open bottom of the envelope,
at least one access orifice positioned a select distance down from the roof edge on an access surface of the envelope and proximate ends of the golf clubs positioned in the golf bag,
an access flap having a surface larger than an open area of the access orifice and attached to the access surface at a position above the at-least-one access orifice and swivelable flexibly between an access-orifice-covered position and an access-orifice-uncovered position, and
a means for attachment of the envelope to a golf car.

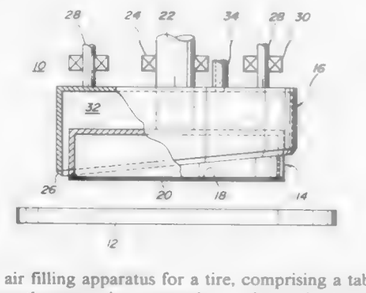
5,146,968
COMBINED WIPER AND CLUB HEAD COVER
William Meek, 1728 Old Ranch Rd., Los Angeles, Calif. 90049
Filed Jan. 17, 1991, Ser. No. 642,389
Int. Cl.[5] A63B 57/00
U.S. Cl. 150—160 18 Claims

6. A combined wiper and head cover for a golf club having a head attached to a shaft, comprising:
a panel of pliant material having an end-engaging portion for engaging a first end of the club head, said panel including two edges joined to one another at said end-engaging portion; and
fastening means at said edges in the vicinity of said end-engaging portion for releasably securing said panel to the



club shaft with said end-engaging portion engaging the head's first end and with said panel covering the club head and draping over a second end of the head when the club is vertically positioned with the head above the shaft.

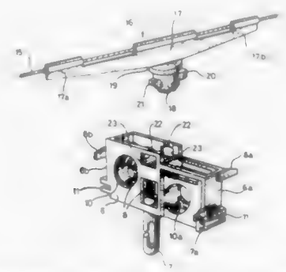
5,146,969
AIR FILLING APPARATUS FOR TIRE
Hiroshi Kawabe, and Toshiyuki Watanabe, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 7, 1991, Ser. No. 788,948
Claims priority, application Japan, Nov. 7, 1990, 2-299978
Int. Cl.[5] B60C 25/06
U.S. Cl. 157—1.1 2 Claims



1. An air filling apparatus for a tire, comprising a table for supporting thereon a tire mounted on a rim, an inner cylinder member having an end face lying in a plane parallel to said table and air-tightly engageable with a flange of the rim, an outer cylinder member slidably supported by said inner cylinder member and air-tightly engageable with a side rubber of the tire means for filling pressurized air into the tire, and means for moving the outer cylinder member relative to the inner cylinder member in an axial direction perpendicular to said table, wherein an end face of the outer cylinder member air-tightly engageable with the side rubber of the tire is inclined relative to said axial direction.

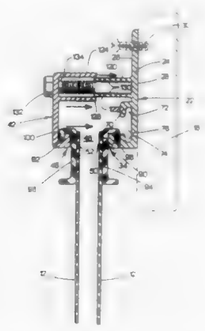
5,146,970
SUPPORT FOR CURTAINS, PARTICULARLY CURTAINS OF THE ADJUSTABLE SUN-LOUVER TYPE
Remo Danieli, Padua, Italy, assignor to Solar Systems SpA, Italy
Filed Mar. 14, 1991, Ser. No. 669,692
Claims priority, application Italy, Mar. 14, 1990, 41560 A/90
Int. Cl.[5] E06B 9/30
U.S. Cl. 160—173 11 Claims

1. A support for curtains, particularly curtains of the adjustable sun-louver type, comprising a plurality of carts fitting slidably in a slideway and being interconnected by a string for sequentially towing them along said slideway from a gathered position, where said carts are packed together, to a spread position where said carts are set at pitch distances from one another along said slideway, said string being attached to each cart by a corresponding anchor member effective to bias said string to huddle into side-by-side bights above said carts when the latter are packed in said gathered position, each anchor



member comprising at least one support arm connected to said string and jutting out from a corresponding cart above said cart for holding said string some distance above the corresponding cart both in the gathered position and spread position of the carts.

5,146,971
STRIP DOOR SUSPENSION SYSTEM
Lon H. McCarty, Estacada, Oreg., assignor to Econo Max Manufacturing, Gresham, Oreg.
Filed Mar. 9, 1990, Ser. No. 491,354
Int. Cl.[5] E05D 15/00
U.S. Cl. 160—184 22 Claims

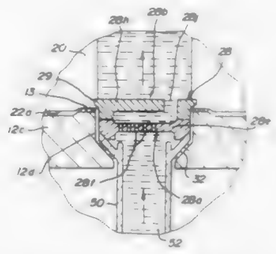


1. A strip door suspension system for suspending plural strips forming a strip door in a door frame, the system comprising:
an elongated frame mounting element having a base for mounting to an upper section of a door frame and a first elongated clamping element projecting outwardly from the base and away from the door frame and terminating in a first flange which defines a first clamping surface; and
a cover element having an elongated body and a second elongated clamping element projecting outwardly from the body and terminating in a second clamping surface, the cover element being coupled to the door frame with the second clamping element extending toward the first clamping element with the first and second clamping surfaces being oriented in a face-to-face relationship when the frame mounting element and the cover element are drawn together, with the first and second clamping elements being separated by a gap between the first and second clamping surfaces and such that the first and second clamping elements are movable toward one another to close the gap to thereby clamp strips forming the strip door between the clamping elements.

5,146,972
METHOD FOR DRAPING CURTAINS
William L. Tacchella, Sturgis, Mich., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Jan. 24, 1992, Ser. No. 825,217
Int. Cl.[5] A47H 1/00
U.S. Cl. 160—330 17 Claims

1. A method for draping curtains comprising the steps of
attaching a curtain fabric attachment means to the rear of a curtain rod,
attaching a curtain fabric attachment means to the front, upper edge of a curtain,
securing said curtain rod in a substantially horizontal position in spaced relationship to a vertical wall with at least two brackets,
securing said curtain to said rear of said curtain rod utilizing said curtain fabric attachment means, and
installing a pair of rings over the end portion of said curtain fabric and onto said curtain rod so that said curtain rod extends through said rings to form a draping arc between the end portions of said curtain rod.

5,146,973
COUNTERGRAVITY CASTING METHOD AND APPARATUS
George D. Chandley, Amherst, N.H., assignor to Hitchiner Manufacturing Co., Inc., Milford, N.H.
Continuation-in-part of Ser. No. 303,813, Jan. 27, 1989, Pat. No. 4,982,777. This application Dec. 17, 1990, Ser. No. 628,479
Int. Cl.[5] B22D 18/06
U.S. Cl. 164—63 13 Claims



1. In a method for the countergravity casting of a melt, comprising the steps of:
a) forming a mold having a mold cavity, a lower mold portion adapted for engaging an underlying source of melt and having a fill passage, and inlet passage-forming means disposed between the mold cavity and the lower mold portion, said inlet passage-forming means including a perforated portion defining at least one melt inlet passage for communicating the fill passage and the mold cavity and an adjacent melt impermeable portion extending laterally inwardly from a periphery of said inlet passage-form-

ing means partially across said fill passage toward said perforated portion to form a dam when the mold is tilted after filling with said melt, said inlet passage-forming means further including a fluid impermeable portion spaced above said perforated portion when the lower mold portion and the source are engaged,

b) relatively moving the mold and the source of the melt to engage the lower mold portion and the source,

c) applying a differential pressure between the mold cavity and the source to urge the melt upwardly through the inlet passage into the mold cavity to fill the mold cavity with the melt,

d) relatively moving the mold and the source to disengage the lower mold portion and the source after the mold cavity is filled with the melt, and

e) tilting the disengaged mold in a direction to raise the perforated portion above the melt impermeable portion such that said melt impermeable portion acts as a dam extending partially across said fill passage to reduce run-out of the melt from the mold as the mold is tilted and such that said fluid impermeable portion entraps any gas that may enter the mold through said perforated portion so as to prevent the gas from entering the mold cavity.

5. In a method for the countergravity casting of a melt, comprising the steps of:

a) forming a mold having a mold cavity, an upstanding fill passage on a bottom side thereof adapted for engaging an underlying source of melt and inlet passage-forming means disposed between the mold cavity and the fill passage, said inlet passage-forming means including a perforated portion defining at least one melt inlet passage for communicating the fill passage and the mold cavity and an adjacent melt impermeable portion extending laterally inwardly from a periphery of said inlet passage-forming means partially across said fill passage toward said perforated portion to form a dam when the mold is tilted after filling with said melt, said inlet passage-forming means further including a fluid impermeable portion spaced above said perforated portion when the fill passage and the source are engaged,

b) relatively moving the mold and the source of the melt to engage the lower mold portion and the source,

c) applying a differential pressure between the mold cavity and the source to urge the melt upwardly through the fill passage and the inlet passage into the mold cavity to fill the mold cavity with the melt,

d) relatively moving the mold and the source to disengage the fill passage and the source after the mold cavity is filled with the melt, including draining the melt from the fill passage, and then

e) tilting the disengaged mold in a direction to raise the perforated portion above the melt impermeable portion such that said melt impermeable portion acts as a dam extending partially across the fill passage to reduce run-out of the melt from the mold during tilting of the mold and such that said fluid impermeable portion entraps any gas that may enter the mold through said perforated portion so as to prevent the gas from entering the mold cavity.

5,146,974

LEAD POURING SYSTEM

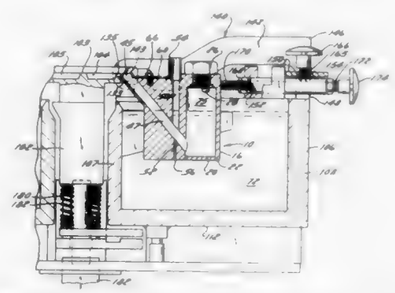
Robert W. Mayer, Milwaukee; James B. Nowakowski, Brookfield; Bruce A. Pusey, Milwaukee, and Kashyap H. Shah, Menomonee Falls, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Oct. 2, 1990, Ser. No. 591,611

Int. Cl.[5] B22D *17/06, 17/30*

U.S. Cl. 164—309 22 Claims

1. A system for pouring a liquid into a receptacle comprising a receptacle, a bath of the liquid a low pressure air source, a pump housing having a chamber for containing the liquid, the housing being at least partially immersed in the bath and having a refilling hole communicating with the bath, a discharge passageway communicating with the chamber and terminating in a pouring spout, a conduit for coupling the air source to the chamber, valve and timer means for admitting a predetermined amount of said low pressure air from the source through the conduit and into the chamber force a predetermined quantity of the liquid through the passageway and out of the spout, said



receptacle being adjacent to but spaced apart form the spout, the system further comprising spacer means on the housing for maintaining a predetermined spacing between the spout and the receptacle and means for urging the spacer means on the pump housing against the receptacle so that the spacing therebetween is maintained at the predetermined spacing.

5,146,975

WIDTH-VARIABLE MOLD DEVICE

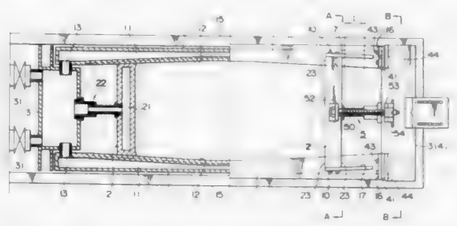
Yoshio Negishi, Fukui, Japan, assignor to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,968

Claims priority, application Japan, May 30, 1990, 2-140978

Int. Cl.[5] B22D *11/04*

U.S. Cl. 164—436 8 Claims



1. In a mold device formed in an approximately rectangular shape by both two mutually opposed major side members having slightly curved opposed surfaces so that their opposed intervals may become maximum at their center portion and become minimum at both ends and two opposed minor side members bringing their both side ends into contact with the opposed surfaces of said major side members and placing between said major side members, wherein said major side members and said minor side members are equipped with their water cooled jackets at their outside, said major side members are suspended and supported by support tables at both sides so as to move each of said major side members toward the direction where their opposed interval varies, and at the same time, said minor side members are suspended and supported to upper portions of said major side members so as to move each of said minor side members toward the direction where their opposed interval varies, a width-variable mold device, comprising:

a feed device for moving each of said minor side members toward the direction where their mutually opposed interval varies; and

support plates having their slots along the longitudinal direction and installed to the upper portions of said major side members under the condition that the respective slots oppose mutually along the longitudinal direction of the opposed surfaces of said major side members;

said minor side members and said support plates being fixed by means of bolts passed through said slots.

5,146,976

ELECTRO-SLAG CASTING APPARATUS AND METHOD

John D. Bramblett, Dapto, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

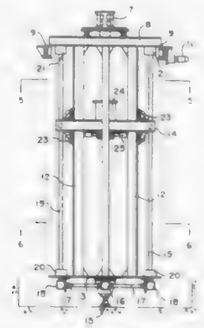
PCT No. PCT/AU89/00136, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO89/09291, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 30, 1989, Ser. No. 585,097

Claims priority, application Australia, Mar. 31, 1988, PI7569

Int. Cl.[5] B22D *23/10, 27/02*

U.S. Cl. 164—470 13 Claims



1. An electro-slag continuous casting apparatus comprising an electro-slag mould comprising a bath adapted to hold a pool of molten flux and an underlying pool of refined liquid metal, and an exit passage extending downwardly from the mould, electrode carrier means adapted to feed a consumable electrode of raw metal into said bath, power supply means to pass a heating current from the electrode through the pool of molten flux to melt the electrode, product transporter means to draw a cast product downwardly from the mould, and drive means for effecting concerted rotary oscillation of the mould, transporter means and product about the axis of the product.

9. A method of making a cast product comprising the steps of charging an electro-slag mould with molten flux, continuously feeding a consumable electrode of raw metal into the flux, passing an electric current from the electrode through the flux to maintain it molten and progressively melt off the electrode to form a pool of molten metal, and while rotationally oscillating the mould and product in unison about the axis of the product, withdrawing a solidified product through the bottom of the mould.

5,146,977

ENVIRONMENTAL CONTROL IN A CONFINED WORKPLACE

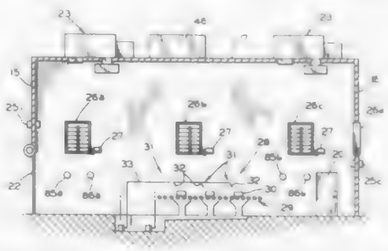
Thomas E. Kiser, Fremont, Ohio, assignor to Professional Supply, Inc., Fremont, Ohio

Continuation-in-part of Ser. No. 665,352, Mar. 6, 1991. This application Jul. 19, 1991, Ser. No. 732,592

Int. Cl.[5] B64D *13/04*

U.S. Cl. 165—15 32 Claims

1. A method of minimizing dispersal of liquid material utilized within a workplace into the atmosphere of the workplace wherein a supply of the liquid is maintained and liquid is withdrawn from the supply and utilized in a process whereby it is exposed to the atmosphere, comprising observing the temperature of the liquid in said supply of liquid and the dry bulb and the wet bulb temperature of the atmosphere in said workplace, comparing said liquid temperature, said dry bulb temperature and said wet bulb temperatures to corresponding predetermined temperatures which define a relationship between said liquid and said atmosphere whereby said atmosphere is not receptive to said liquid in vaporized form, generating signals



indicative of deviations of the observed temperatures from the predetermined temperatures, and adjusting at least one of the liquid temperature, the dry bulb temperature and the wet bulb temperature in response to said signals to establish said relationship between said liquid and said atmosphere.

5,146,978

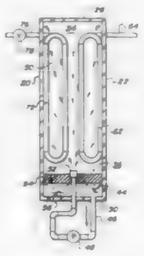
METHOD AND APPARATUS FOR MONOCHANNEL SIMULTANEOUS HEAT AND MASS TRANSFER

Walter F. Albers, 2626 E. Arizona Biltmore Cir., #23, Phoenix, Ariz. 85016, and James R. Beckman, Tempe, Ariz., assignors to Walter F. Albers, Phoenix, Ariz.

Filed Oct. 30, 1990, Ser. No. 605,911

Int. Cl.[5] F28D *3/02;* **B01F** *3/04*

U.S. Cl. 165—111 5 Claims



1. Apparatus for changing the temperature and composition of a wetting desiccant, said apparatus comprising:

a chamber containing a plurality of sectors;

a wetting means for segmentedly wetting a plurality of said sectors with said wetting desiccant;

migration means coupled to said wetting means for providing a migratory movement for said wetting desiccant between adjacent sectors;

a heat sink within said chamber, said heat sink having a liquid flowing therethrough;

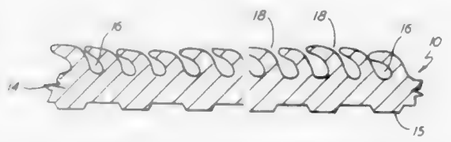
a heat transferring barrier thermally connecting said chamber and said heat sink;

a fluid flow means controlling a wetting desiccant flow through said heat sink;

a gas flow means controlling a flow of a gas through said chamber wherein a temperature of said gas and a temperature of said liquid result in transfer of heat between said chamber and said heat sink through said heat transferring barrier, wherein temperatures of said wetting desiccant are below a boiling temperature for said wetting desiccant during wetting, wherein interaction in said sectors between said wetting desiccant and said gas causes a change in the temperature and composition of said wetting desic-

cant, said gas approaching a vapor-liquid equilibrium with said wetting desiccant for each of said wetted sectors, wherein interaction by said wetting desiccant and said migratory movement causes said temperature and composition of said wetting desiccant in an adjacent sector and a temperature of said liquid to change while passing through said chamber.

5,146,979
ENHANCED HEAT TRANSFER SURFACE AND APPARATUS AND METHOD OF MANUFACTURE
Steven R. Zohler, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Division of Ser. No. 82,017, Aug. 5, 1987, Pat. No. 4,765,058.
This application May 10, 1988, Ser. No. 192,094
Int. Cl.[5] F28F *1/42*
U.S. Cl. 165—133 **1 Claim**

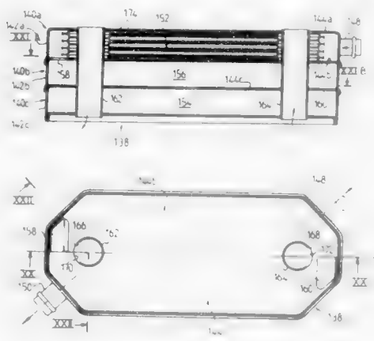


1. A heat exchanger tube for use in transferring heat between a boiling fluid in contact with the exterior surface of the tube and a fluid flowing through the interior of the tube comprising:
at least one radially extending helical fin convolution formed on the exterior surface along the longitudinal axis of the tube having a distal single tip portion and a proximate root portion, the radial height of all of said radially extending helical fin convolutions along the longitudinal axis are generally the same,
said single tip portion inclined toward the next adjacent convolution of said radially extending helical fin convolution which is inclined in the same direction as said single tip portion, said inclined single tip portion defining a subsurface channel between adjacent convolutions of helical fins, said subsurface channel having alternating closed portions where said inclined single tip portion contacts an adjacent helical fin convolution and open pores where said inclined tip portion is spaced from an adjacent helical fin convolution, and the boiling fluid in contact with the exterior surface of the tube communicates with said subsurface channels, and a worked interior surface of the tube wherein said worked interior surface has between thirty-six and forty-eight ribs about the interior circumference of the tube.

5,146,980
PLATE TYPE HEAT ECHANGER, IN PARTICULAR FOR THE COOLING OF LUBRICATING OIL IN AN AUTOMOTIVE VEHICLE
Philippe Le Gauyer, Paris, France assignor to Valeo Thermique Moteur, Le Mesnil-Saint-Denis France
Filed Dec. 19, 1990, Ser. No. 630,254
Claims priority, application France, Dec. 21, 1989, 89 17002
Int. Cl.[5] F28F *3/00*
U.S. Cl. 165—167 **12 Claims**

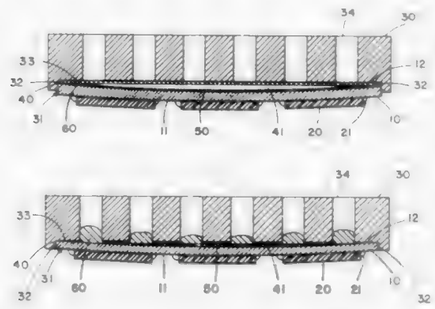
1. A plate type heat exchanger for effecting heat transfer between a first fluid and a second fluid, comprising a casing having top and bottom covers and at least one planar side wall, an inlet means for the second fluid carried by the casing, an outlet means for the second fluid carried by the casing, at least one of said second fluid inlet and outlet means connected to said at least one planar side wall, and a stack of half-plates mounted within the casing and defining a direction of stacking, the half-plates being arranged in pairs of opposed half-plates so that each said pair defines within it a flow passage for the first fluid, with the pairs of half-plates defining at their peripheries, and within the casing, flow passages for the second fluid in communication with each other, the half-plates further having communicating means for flow of the first fluid through said communicating means between successive pairs of half-plates, and the heat exchanger further comprising an inlet for the first fluid and an outlet for the first fluid, said first fluid inlet and outlet being in communication with said flow passages for the first fluid so that said circulation of the latter is from the first fluid inlet to the first fluid outlet, the heat exchanger further including at least one cross wall arranged within the casing parallel to the half-plates so as to define within the casing at least two chambers, there being a plurality of said half-plate pairs in each said chamber, each of said inlet and outlet means for the second fluid being open into a respective one of said two chambers, and each cross wall defining a flow opening of a selected configuration for ensuring the circulation of the second fluid from one chamber to the other by setting up forced circulation.

11. A plate type heat exchanger for effecting heat transfer between a first fluid and a second fluid, comprising a casing, an inlet for the second fluid carried by the casing, an outlet for the second fluid carried by the casing, and a stack of half-plates mounted within the casing and defining a direction of stacking, the half-plates being arranged in pairs of opposed half-plates so that each said pair defines within it a flow passage for the first fluid, with the pairs of half-plates defining at their peripheries, and within the casing, flow passages for the second fluid in



communication with each other, the half-plates further having communicating means for flow of the first fluid through said communicating means between successive pairs of half-plates, and the heat exchanger further comprising an inlet for the first fluid and an outlet for the first fluid, said first fluid inlet and outlet being in communication with said flow passages for the first fluid so that said circulation of the latter is from the first fluid inlet to the first fluid outlet, the heat exchanger further including at least one cross wall arranged within the casing parallel to the half-plates so as to define within the casing at least two chambers, there being a plurality of said half-plates in each said chamber, each of said inlet and outlet means for the second fluid being open into a respective one of said two chambers, and the or each cross wall defining a flow opening of a selected configuration for ensuring the circulation of the second fluid from one chamber to the other by setting up forced circulation, and wherein the or each cross wall is a flat plate disposed between two pairs of adjacent half-plates, the or each cross wall defining flow means for enabling the first fluid to pass between said adjacent pairs of half-plates and defining said flow passage for the second fluid, said cross wall occupying substantially the whole of the remainder of the transverse cross section of the casing wherein the casing comprises a plurality of casing members, at least one of which comprises an envelope wall and a base portion joined to the envelope wall and defining a cross wall.

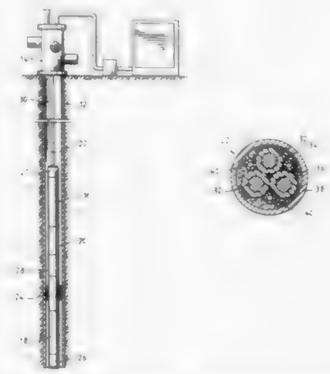
5,146,981
SUBSTRATE TO HEATSINK INTERFACE APPARATUS AND METHOD
Victor M. Samarov, Carlisle, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Nov. 14, 1991, Ser. No. 792,128
Int. Cl.[5] F28F *7/00*
U.S. Cl. 165—185 **16 Claims**



1. An apparatus for cooling a heat generating device mounted on a substrate comprising:
a substrate having a first and second surface, the heat generating device being solder-mounted on said first surface via solder connections;
a first layer of material formed of a releasing agent provided on said second surface of said substrate;
a second layer of thermally conductive material provided on said first layer, said second layer substantially conforming to said first layer and having a melting point lower than the melting point of said solder connections;
a heatsink provided on said second layer with said second layer substantially conforming with a surface of said heatsink to further dissipate heat transmitted from said heat generating device through said substrate, said first layer, and said second layer; and
means for clamping said substrate, said first layer, said second layer, and said heatsink together after said second layer is heated to its melting point, compressed between said substrate and said heatsink for providing a conformal interface between said substrate and said heatsink, and then cooled below its melting point.

12. A method for making a cooling apparatus for a heat generating device mounted on a first surface of a substrate via solder connections comprising the steps of:
spraying a first layer of material formed of a releasing agent on a second surface of said substrate;
placing a second layer of thermally conductive material on said first layer;
heating said second layer to a temperature above its melting point but below the melting point of said solder connections;
compressing said second layer between said substrate and a heatsink while restricting its lateral flow and permitting said second layer to substantially conform to the second surface of said substrate and a surface of said heatsink;
cooling said second layer to a temperature below its melting point; and
clamping said substrate, said first layer, said second layer, and said heatsink to one and another.

5,146,982
COIL TUBING ELECTRICAL CABLE FOR WELL PUMPING SYSTEM
Walter R. Dinkins, Lawrence, Kans., assignor to Camco International Inc., Houston, Tex.
Filed Mar. 28, 1991, Ser. No. 676,994
The portion of the term of this patent subsequent to Sep. 8, 2009, has been disclaimed.
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—65.1 **6 Claims**

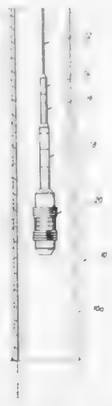


1. An electrical motor operated well pumping system for use in a well comprising,
an electrical cable adapted to be connected to the motor, said cable having a plurality of insulated electrical conductors having a diameter and which are twisted to have a lay length and which are enclosed in a low tensile strength corrosion-resistant metal tubing, and
said lay length of the conductors is approximately eight to fourteen times the diameter of the insulated conductors.

5,146,983
HYDROSTATIC SETTING TOOL INCLUDING A SELECTIVELY OPERABLE APPARATUS INITIALLY BLOCKING AN ORIFICE DISPOSED BETWEEN TWO CHAMBERS AND OPENING IN RESPONSE TO A SIGNAL
Joe C. Hromas, Sugar Land; A. Glen Edwards, Hockley, and Klaus B. Huber, Sugar Land, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed Mar. 15, 1991, Ser. No. 670,554
Int. Cl.[5] E21B *23/04*
U.S. Cl. 166—65.1 **17 Claims**

1. A setting tool adapted to be disposed in a wellbore, an annulus being defined by said setting tool and said wellbore, annulus fluid at hydrostatic pressure being disposed in said annulus, comprising:
a housing;
first means disposed diametrically across said housing for defining a first chamber at least partially filled with fluid on one side of said first means and a second chamber on the other side of said first means, said first means including intercommunication means for intercommunicating said first chamber with said second chamber, said intercommunication means including an orifice disposed longitudinally through said first means;
selectively operable means initially disposed in a closed condition and blocking said orifice for selectively changing from said closed condition to an open condition thereby removing the block of said orifice and opening communication between said first chamber and said second chamber, said orifice including a bore, said bore including a smaller part and a larger part, said selectively

operable means being disposed within said bore and including a piston having a first part and a second part, said first part being initially disposed in said smaller part of said bore, said second part being initially disposed in said larger part of said bore, a ring disposed around and in firm contact with at least a portion of said second part of said piston, heating means disposed around said ring and responsive to a signal for heating said ring, said ring releasing said piston when said heating means heats said ring, said first part of said piston moving from said smaller part to said larger part of said bore in response to the pressure



exerted on said fluid in said first chamber when said ring releases said piston thereby changing said selectively operable means to said open condition and opening said communication between said first chamber and said second chamber; and

pressure exerting means responsive to the hydrostatic pressure of said annulus fluid for exerting pressure on said fluid in said first chamber,

the fluid transferring from said first chamber to said second chamber when said selectively operable means changes to said open condition.

5,146,984

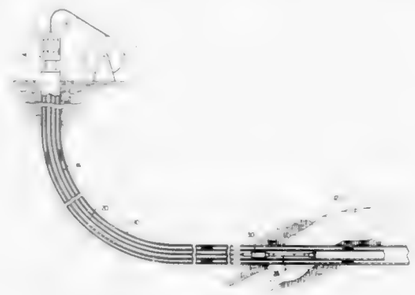
EMERGENCY RELEASE DEVICE FOR CONNECTING BETWEEN TUBULAR MEMBERS IN OIL AND GAS WELLS

Charles W. Pleasants, Carrollton, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Apr. 9, 1991, Ser. No. 682,811

Int. Cl.[5] E21B *43/00*

U.S. Cl. 166—238 **18 Claims**



1. A device for connecting a first tubular member to a second tubular member for operating in an earth well, said device comprising a first tubular body member having a longitudinal bore extending therethrough, means for connecting said first body member to one of said tubular members, a second tubular body member having a longitudinal bore extending therethrough, means for connecting said second body member to the other tubular member, means for connecting said second body member to said first body member while preventing relative rotational movement therebetween, and means for releasing said second body member from said first body member in said well.

5,146,985

HYDROPHILIC POLYMER GEL WATER SEALING PROCESS

Bernard Alquié, Pau; Norbert Kohler, Villennes-Sur-Seine, and Marcel Wild, Vernouillet, all of France, assignors to Societte Nationale Elf Aquitaine, France

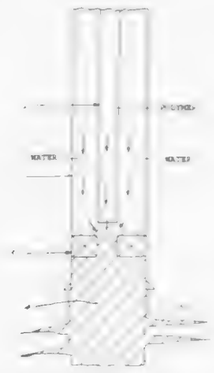
PCT No. PCT/FR89/00274, § 371 Date Jan. 16, 1991, § 102(e) Date Jan. 16, 1991, PCT Pub. No. WO89/12157, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 2, 1989, Ser. No. 635,560

Claims priority, application France, Jun. 3, 1988, 88 07396

Int. Cl.[5] E21B *43/22*

U.S. Cl. 166—270 **12 Claims**



1. A process for placing a sealing gel in a well drilled in the ground, which includes the use of a suspension or solution of a hydrophilic gel-forming polymer in an organic liquid at least partially miscible with water comprising the steps of selecting a bridging agent containing a borate of an alkali metal or a zirconium salt and introducing the suspension or solution into the well in such a way that it only comes into contact with water in the location where the gel is required for sealing purposes.

5,146,986

METHODS OF REDUCING THE WATER PERMEABILITY OF WATER AND OIL PRODUCING SUBTERRANEAN FORMATIONS

E. Dwyann Dalrymple, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 669,830, Mar. 15, 1991, abandoned. This application Dec. 11, 1991, Ser. No. 805,129

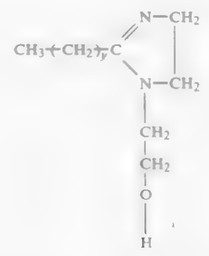
Int. Cl.[5] E21B *33/138, 43/22, 43/32*

U.S. Cl. 166—294 **19 Claims**

7. A method of reducing the water produced from a subterranean formation penetrated by a wellbore without appreciably reducing the oil produced therefrom comprising the steps of:

pumping a hydrocarbon solution of a hydrocarbon carrier liquid and a treating agent into said formation by way of said wellbore, said treating agent being comprised of a surface active agent consisting of compounds selected from the group consisting of imidazoline compounds amides and mixtures thereof;

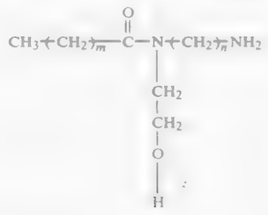
and then discontinuing said pumping and returning said formation to production, wherein said imidazoline compounds are defined by the general formula (1)



and mixtures thereof

wherein X is a number in the range of from about 1 to about 5 and Y is a number in the range of from about 2 to about 17 and

wherein said amides are defined by the general formula (2)



and mixtures thereof

wherein Z is a number in the range of from about 1 to about 5, m is a number in the range of from about 2 to about 17 and n is a number in the range of 1 to 3.

5,146,987

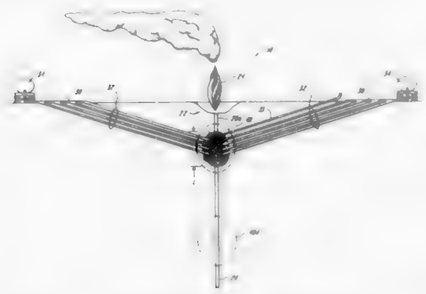
METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF CRUDE OIL FROM THE EARTH

Ronald K. Krieg, Blaine, Wash., assignor to RKK, Ltd., Bellevue, Wash.

Filed Apr. 9, 1991, Ser. No. 682,644

Int. Cl.[5] E21B *35/00, 36/00, 43/12*

U.S. Cl. 166—302 **5 Claims**



1. Method for substantially stopping the flow of crude oil from a location along a pipe extending from an underground crude oil deposit, comprising the steps of:

A. identifying the location of one or more underground segments of said pipe between said deposit and said location along said pipe,

B. establishing a fluid flow path from at least two points on the surface of the earth displaced from said location along said pipe to an underground region adjacent to at least one of said one or more underground segments, and

C. establishing flow of a coolant in said fluid flow path and controlling said flow whereby sufficient heat is extracted from said one underground segment so that the flow rate of crude oil flowing through said one segment is reduced substantially to zero,

wherein said flow path establishing step includes the substeps of:

i. slant drilling boreholes from at least two of said points to said underground region, and

ii. placing an elongated hollow tube within each of said boreholes, whereby said flow path is defined at least in part by the inner walls of said tubes,

wherein said slant drilling step includes the step of establishing boreholes from at least two points radially dispersed by 180 degrees about the axis of said pipe.

5,146,988

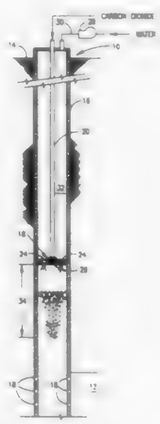
METHOD FOR SCALE REMOVAL IN A WELLBORE

James M. Paul, Dallas, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 16, 1991, Ser. No. 745,780

Int. Cl.[5] E21B *37/00*

U.S. Cl. 166—312 **11 Claims**



1. A method of dissolving a calcium sulfate wellbore scale which comprises contacting the scale in the wellbore with a solution consisting essentially of carbon dioxide dissolved in water.

5,146,989

APPARATUS FOR RECOVERING A WELLHEAD

Geoffrey O. Rouse, Aberdeen, Scotland, assignor to Homco International Inc., Pearland, Tex.

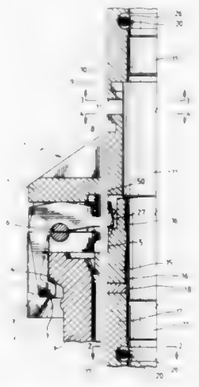
PCT No. PCT/GB89/01203, § 371 Date Apr. 2, 1991, § 102(e) Date Apr. 2, 1991, PCT Pub. No. WO91/02138, PCT Pub. Date Feb. 21, 1991

PCT Filed Aug. 2, 1989, Ser. No. 671,812

Claims priority, application United Kingdom, Aug. 3, 1989, 8917818; Aug. 9, 1989, 8918198

Int. Cl.[5] E21B 33/02

U.S. Cl. 166—339 9 Claims



1. An apparatus for recovering a wellhead, comprising:

a housing;

a latch device mounted on the housing for movement between engaged and disengaged positions relative to said wellhead; and

a latch device actuator movably coupled to the housing to actuate said latch device and to move said latch device between said engaged and disengaged positions, the apparatus configured that when a force is applied to said apparatus to separate said apparatus from the wellhead, said latch device actuator moves to actuate said latch device to engage an external profile of the wellhead so that said apparatus remains in engagement with the wellhead.

5,146,990

ANCHORING STRUCTURE FOR MARINE RISER ASSEMBLY

Paul B. Ritter, Jr., Slidell, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed Apr. 30, 1991, Ser. No. 693,870

Int. Cl.[5] E21B 43/013

U.S. Cl. 166—340 6 Claims

1. An anchor system for anchoring the lower end of a marine riser, lower marine riser package (LMRP) assembly and drill string to the ocean floor, comprising:

an anchor assembly secured to the ocean floor, said assembly including a tubular member extending into the ocean bottom;

a guide means, said guide means being positioned at the top of the tubular member to guide a member lowered from the surface of the ocean into said tubular member;

an elongated weight means disposed in said tubular member, said weight means being flexible and having sufficient length to extend above the top of the tubular member; and

a connecting means, said connecting means being coupled to one end of the elongated weight means and adapted to be coupled to an elongated member that extends through said

LMRP assembly and riser and can be secured to said connecting means.

5,146,991

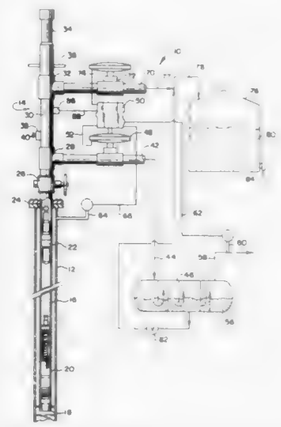
METHOD FOR WELL PRODUCTION

Jack R. Rogers, Jr., Tyler, Tex., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Apr. 11, 1991, Ser. No. 684,162

Int. Cl.[5] E21B 34/16, 43/12

U.S. Cl. 166—369 22 Claims



1. The method for operating a well installation having a control valve regulating the flow of fluid hydrocarbon from a well tubing string to a sales line which is selectively actuated between an on-state and an off-state, and wherein a plunger is located within the said tubing string of said well for movement between a lower region and a wellhead sensing position, comprising the steps of:

assigning first values corresponding with the rate of movement of said plunger from said lower region to said wellhead which represent normal plunger performance;

assigning second values less than said first values corresponding with the rate of movement of said plunger from said lower region to said wellhead which represent slow plunger performance;

assigning a predetermined value for the time interval of said on-state;

assigning a predetermined value for time interval of said off-state;

actuating said control valve to transition from an off-state to an on-state;

then detecting the arrival of said plunger at said wellhead prior to expiration of said predetermined value for the time interval of said on-state, and determining the time elapsed from said actuation;

determining the presence of any coincidence of said time elapsed from said actuation of said control valve with said assigned second values;

then increasing said predetermined value for the time interval of said off-state by a predetermined first time increment when a said coincidence with said assigned second value is present; and

terminating the said on-state in response to said plunger detection, and actuating said control valve to transition from said on-state to the next off-state in response to said termination of said on-state.

5,146,992

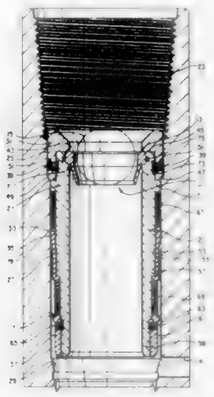
PUMP-THROUGH PRESSURE SEAT FOR USE IN A WELLBORE

John L. Baugh, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Aug. 8, 1991, Ser. No. 742,399

Int. Cl.[5] E21B 43/00, 23/00

U.S. Cl. 166—383 36 Claims



1. A valve seat, adapted for receiving a valve plug having a plugging dimension, for use in a fluid conduit having an inner wall disposed about a central longitudinal axis, said inner wall defining a central bore for passage of fluid from an upstream location to a downstream location, comprising:

an anchor section axially aligned with said central longitudinal axis of said fluid conduit defining a first clearance within said central bore greater than said plugging dimension of said valve plug to allow passage of said valve plug through said central bore of said fluid conduit past said anchor section;

a sealing lip coupled to said anchor section in a first position relative to said anchor section and defining a second clearance within said fluid conduit which is smaller than said plugging dimension, said sealing lip including a seating surface which at least in-part defines said second clearance, for sealingly engaging said valve plug and substantially occluding passage of said fluid from said upstream location to said downstream location;

wherein a pressure differential is developed across said valve seat when said valve plug sealingly engages said seating surface, applying force to said sealing lip;

said sealing lip being formed of a yieldable material which deforms to expand said second clearance to said plugging dimension to allow passage to said valve plug downstream within said fluid conduit when a predetermined amount of force is applied thereto through said valve plug;

wherein after passage of said valve plug, said seating surface of said seating lip is disposed in a second position relative to said anchor section defining a third clearance intermediate said first and second clearances.

5,146,993

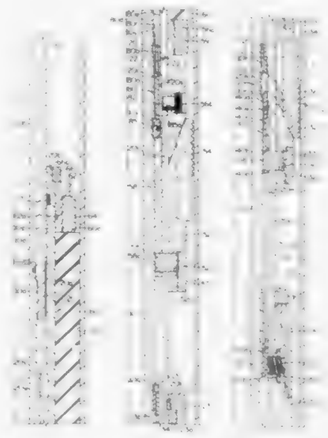
PACKING MECHANISM FOR SUBTERRANEAN WELLS

Louis M. Gambertoglio, 195 S. Deerfoot Cir., The Woodlands, Tex. 77380

Filed Jul. 6, 1990, Ser. No. 549,218

Int. Cl.[5] E21B 33/129

U.S. Cl. 166—387 19 Claims



1. A packing tool for a subterranean well conduit comprising:

a mandrel insertable in the well conduit:

means on the top end of said mandrel for connection to a string extending to the well surface;

a tubular body assemblage surrounding said mandrel;

control dog and slot means connecting said tubular body assemblage to said mandrel for run-in, relocation and removal purposes;

a collet having a ring portion surrounding a medial portion of said mandrel, a plurality of peripherally spaced axially extending arms, and enlarged latching heads on each of said arms, each said latching head having external ratchet threads formed thereon;

thread means on the bore surface of said tubular body assemblage for effecting an elongated ratcheting engagement with said latching heads;

drag block means on said tubular body assemblage engagable with the conduit bore for resisting rotational movement of said tubular body assemblage;

said control dog and slot means being operable by rotational movement of said mandrel in one direction plus tension to move said mandrel upwardly relative to said tubular body assemblage;

lower slip means on said tubular body assemblage settable by upward movement of said collet ring portion;

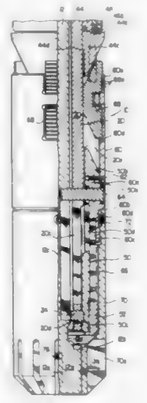
said mandrel having an annular recess receiving said latching collet heads during run-in, relocation or removal;

said annular recess having an inclined upwardly facing bottom end surface, the initial upward movement of said mandrel engaging said inclined upwardly facing end surface with said collet latching heads to move said collet

upwardly with said mandrel to set said lower slip means in engagement with the conduit bore wall;
further upward movement of said mandrel after setting said lower slip means moving said annular recess past said latching heads, thereby securing said collet heads in locked engagement with said tubular body assemblage and securing said lower slip means in setting relationship to the conduit bore wall;
a tubular packing element surrounding the upper portion of said tubular body assemblage;
upper anchor means secured to said upper end of said tubular body assemblage against relative upward movement and abutting the upper end of said packing element;
a tubular upper cone axially slidably mounted on said tubular body assemblage below said packing element;
the upper end of said tubular upper cone being abuttable with the lower end of said packing element;
the lower end of said tubular upper cone defining conical ramps for slips;
a tubular upper slip holder axially slidably mounted on said tubular body assemblage below said upper cone;
a plurality of upper slips mounted on said upper slip holder in peripherally spaced relation, said slips being radially outwardly shiftable relative to said slip holder by upward movement of said slip holder relative to said conical ramps;
said tubular body assemblage defining a first axially extending slot underlying said upper slip holder;
at least one pin radially traversing said first slot and having its outer end engagable with said upper cone holder and its inner end disposed adjacent said mandrel; and
abutment means on said mandrel operatively engagable with said pin by said further upward movement of said mandrel after said setting of said lower slips and locking of said collet heads, whereby said further upward movement of said mandrel moves said upper slips and said packing element into engagement with the bore wall of the well conduit.

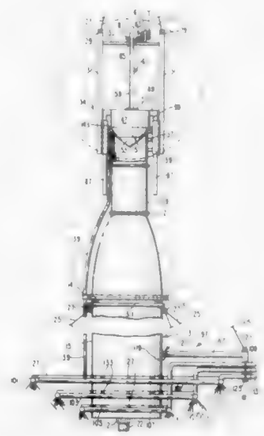
5,146,994
PACKING ASSEMBLY FOR USE WITH REELED TUBING AND METHOD OF OPERATING AND REMOVING SAME
Charles W. Pleasants; Pat M. White, both of Carrollton, Tex.; Ronald J. Fischer, Bakersfield, Calif.; Robert D. Harrison, Jr., Houston, and John R. Setterberg, Jr., Dallas, both of Tex., assignors to Otis Engineering Corporation, Carrollton and Shell Western E&P, Inc., Houston, both of, Tex.
Continuation of Ser. No. 468,599, Jan. 23, 1990, Pat. No. 5,000,265. This application Dec. 27, 1990, Ser. No. 635,900
Int. Cl.[5] F21B *23/02*
U.S. Cl. 166—387 24 Claims

1. Apparatus for operating in a tube in a well containing fluid, said apparatus comprising:
two members adapted for relative movement; means responsive to said relative movement for engaging said tube;
hydraulically operated actuator means for receiving pressurized fluid and causing said relative movement in response to a predetermined pressure of said fluid for actuating said engaging means;
means for locking said engaging means in said tube-engaging position;
means for permitting flow of said well fluid through said apparatus before said actuating and for preventing said flow after said locking; and



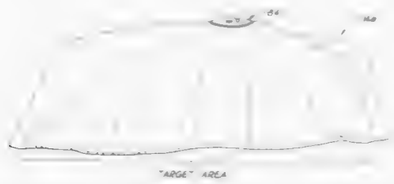
means for equalizing the pressure of said well fluid across said members.

5,146,995
OIL WELL FIRE EXTINGUISHER HAVING UPPER AND LOWER EXTERNAL FLAME RETARDANT-DISPERSING RINGS
Hilton S. Kim, Los Angeles, Calif., assignor to Hilton & Chris Enterprises, Los Angeles, Calif.
Filed May 6, 1991, Ser. No. 696,234
Int. Cl.[5] A62C *3/06, 2/04*
U.S. Cl. 169—48 22 Claims



1. An extinguisher system for extinguishing flames from combustible fluid exiting from a pipe, the system comprising:
an elongated tubular extinguisher body disposable over the combustible fluid emitting pipe, said extinguisher body having a lower inlet end and an upper outlet end and adapted to accommodate an entire flow of the combustible fluid exiting from the pipe through said extinguisher body;
valve means mounted in said extinguisher body adjacent said upper outlet end for eliminating the flow of the combustible fluid exiting from the pipe through said extinguisher body; and
flame inhibiting means including circular nozzle structures disposed adjacent said lower inlet end and adjacent said valve means externally of said extinguisher body for preventing combustion of the combustible fluid adjacent said extinguisher body's lower inlet end and adjacent said valve means.

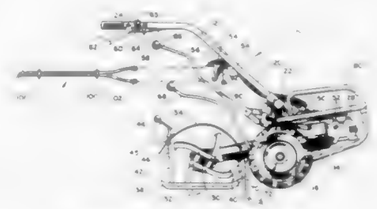
5,146,996
APPARATUS AND METHOD FOR THRUSTING A COVER OVER A TARGET AREA
William C. Gainer, Jr., P.O. Box 452, Luther, Okla. 73054
Filed Jan. 16, 1991, Ser. No. 641,849
Int. Cl.[5] A62C *2/06, 2/08, 3/00*
U.S. Cl. 169—49 34 Claims

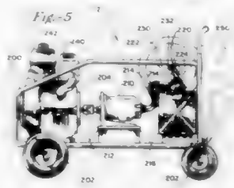


1. An apparatus for thrusting a cover over a target area, the apparatus comprising:
a housing having an opening forming a cavity within the housing;
a cover disposed within the cavity and sized to envelop the target area, the cover comprising a support surface substantially in the middle of the cover; and
thrusting means for propelling the cover from the cavity onto the target area, the thrusting means comprising means for providing sufficient pressure to the support surface within the housing sufficient to expel the support surface and the cover from the housing cavity and onto the target area;
wherein the cavity and the opening are sized to receive and expel the cover from the housing.

5,146,997
LAKE WEED REMOVING APPARATUS
Mark R. Korin, 866 - 124th La. NE., Blaine, Minn. 55434
Filed Dec. 16, 1991, Ser. No. 808,109
Int. Cl.[5] A01B *33/16;* A01D *44/00*
U.S. Cl. 172—42 16 Claims

1. An apparatus for removing weeds from a lake bottom comprising, in combination:
(a) a land-based unit, comprising:
(i) a first housing;
(ii) a power means attached to said first housing for providing mechanical power;
(iii) a hydraulic pump drivingly coupled to said power means; and
(iv) an elongated hose coupled to said hydraulic pump and having a pair of passageways each containing a substantially non-compressible fluid; and
(b) a submersible unit, comprising:
(i) a second housing;
(ii) a hydraulic motor connected to said hose and driven by said fluid in said hose when said fluid is pumped by said hydraulic pump;
(iii) a drum rotatably attached to said second housing and drivingly coupled to said hydraulic motor, said drum including a plurality of tines extending radially outward for grubbing the weeds when said drum is rotated;
(iv) wheel means rotatably attached to said second housing for supporting said second housing on said lake bottom;
(v) steering means connected to said second housing for steering said submersible unit independent of said land-based unit about the lake bottom; and





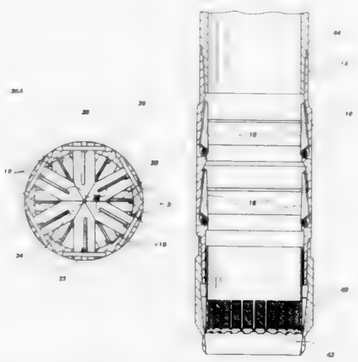
(vi) urging means for urging said drum downward in response to said submersible unit being propelled.

5,146,998
APPARATUS AND METHOD FOR UNDERGROUND SAMPLING
Kent E. Cordry, Clayton, Calif.; K. Lynne Niehaus, Manchester, and David Mioduszewski, Ann Arbor, both of Mich., assignors to QED Environmental Systems, Inc., Ann Arbor, Mich.
Filed May 11, 1990, Ser. No. 522,153
Int. Cl.[5] E21B *7/26*
U.S. Cl. 175—21 8 Claims

1. A system for sampling underground fluids said system comprising:
a drive cone adapted to penetrate the ground;
a hollow body forming a cavity for receiving underground fluids, said hollow body removably attached to said drive cone; said body removable from said cone during a first range of upward motion of said body, wherein said cone is frictionally restrained by said ground;
a tubular screen within said hollow body for filtering said underground fluids entering said cavity;
said screen also being fixedly attached to said drive cone

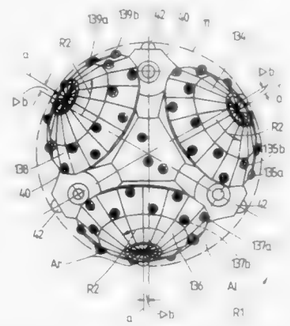
wherein said screen can slide partially out of said cavity, during said first range of upward motion of said body; and said screen being removable from said body during a second range of upward motion of said body, greater than said first range, wherein said cone remains frictionally restrained by said ground, whereby said cone and screen remain in the ground when said body is removed from said ground.

5,14 ,999
SHOE ASSEMBLY WITH CATCHER FOR CORING
Helma S. Wiser, Bountiful, and Steven R. Radford, South Jordan, both of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.
Filed Apr. 4, 1991 Ser. No. 680,304
Int. Cl.[5] E21B *25/14*
U.S. Cl. 175—254 **14 Claims**



1. In a coring apparatus of the kind having a coring barrel and a coring bit for removing a core of a rock formation, a core retaining device comprising:
a tube section having first and second ends and an inner surface defining a cylindrical passageway for receiving a core, said tube section adapted to fit removably within a core barrel with said first end proximal to a coring bit;
a plurality of first finger members each having hinge means at one end for attachment to aid inner surface, said first finger members being attached at first attachment points lying on a first inner circumference of said tube section with the respective hinge ends of each said first finger member being circumferentially displaced at substantially equal angular intervals from adjacent said first finger members; and
a plurality of second finger members each having hinge means at one end for attachment to aid inner surface, said second finger members being attached by said hinge means at second attachment points lying on a second inner circumference of said tube section with each said second finger member being circumferentially displaced at substantially equal angular intervals from adjacent said second finger members; wherein
each of said first and second finger members is movable at said hinge means between an open position wherein said finger members do not occlude said passageway and a closed position wherein said finger members partially occlude said passageway; and
said first attachment points of said first finger members are circumferentially displaced from said second attachment points of said second finger members to provide that in said closed position, said first finger members occlude a substantially different portion of the cross-sectional area of said tube opening than said second finger members.

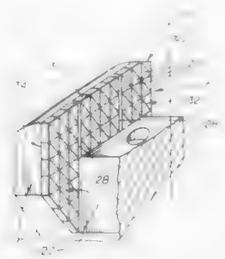
5,147,000
DISC DRILL BIT
Oscar Kaalstad, Winter Springs, Fla., assignor to Norvic S.A., Fribourg, Switzerland
Continuation-in-part of Ser. No. 540,161, Jun. 19, 1990, Pat. No. 5,064,007. This application Sep. 27, 1991, Ser. No. 767,225
Int. Cl.[5] E21B *10/12*
U.S. Cl. 175—334 **28 Claims**



1. A drill bit for use in drilling a well bore, comprising
a main drill body designed to rotate about a substantially vertically disposed axis of rotation and incorporating at least one longitudinal duct for either supplying a drill fluid or air under pressure to the well bore or removing a drill fluid or air combined with debris and excavated rock from the well bore and intended to be assembled to a drill rod,
at least one generally circular, rotatable cutting disc mounted on lower portion outside of the said main drill body, causing the said drill bit to form a well bore having a substantially cylindrical wall portion and a generally concave portion, the said cutting disc having cutting elements disposed in generally ring-shaped formations, with its axis of rotation disposed at an acute angle to the axis of rotation of the main body, the lowest cutting point of the said disc being radially remote in relation to the axis of rotation of the drill body,
the axis of rotation of the cutting disc being slightly offset laterally in a rearward direction from the centerline of the said main drill body in relation to the direction of rotation of the main drill body, while leaving all angles between the axes unchanged, causing the entire bit to be placed in a nonequilibrium position, the rotation of the said main body enabling the disc to seek equilibrium by the cutting elements penetrating the well wall and shearing the rocks as the combined downward forces exceed the opposing forces (making the drill bit self-loading), the downward force being essentially concentrated around the lowest cutting element causing a destabilization of the well wall making easier the cutting action of the bit.

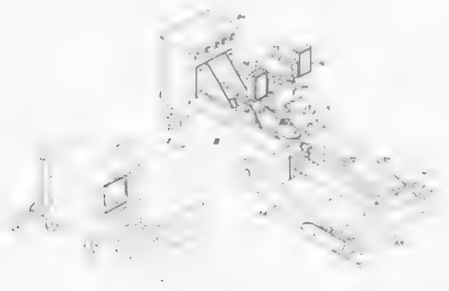
5,147,001
DRILL BIT CUTTING ARRAY HAVING DISCONTINUITIES THEREIN
Jacob Chow, Salt Lake City; Ralph M. Horton, Murray, and Mark L. Jones, Midvale, all of Utah, assignors to Norton Company, Worcester, Mass.
Continuation of Ser. No. 490,041, Mar. 6, 1990, abandoned. This application May 28, 1991, Ser. No. 707,411
Int. Cl.[5] E21B *10/56*
U.S. Cl. 175—428 **15 Claims**

1. A drill bit for drilling a subterranean formation, including at least one substantially planar cutting face disposed at an acute angle to the longitudinal axis of said drill bit, facing generally in the direction of the bit rotation and comprised of a plurality of discrete cutting elements, said substantially planar cutting face incorporating at least one discontinuity therein substantially dividing said substantially planar cutting face into



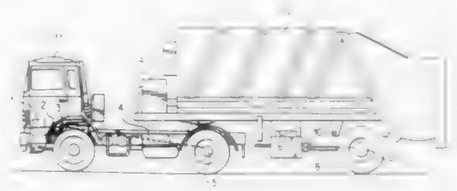
a plurality of laterally adjacent segments, each of said laterally adjacent segments including a plurality of said discrete cutting elements in substantially contiguous mutual lateral proximity.

5,147,002
ROBOTIC DECONTAMINATION APPARATUS
Joel J. Hughes, Wilmington, N.C., assignor to Container Products Corporation, Wilmington, N.C.
Filed Dec. 24, 1990, Ser. No. 633,280
Int. Cl.[5] A47L *9/00;* **B62D** *51/04;* **G08B** *5/36*
U.S. Cl. 180—6.5 **13 Claims**



1. A self-propelled robotic decontaminating apparatus adapted to be coupled to a source of pressurized heated cleaning fluids and a filtered vacuum recovery system comprising:
a) a self-propelled vehicle,
b) means for propelling and steering said vehicle over a surface to be treated,
c) a surface treating element carried by and movable with said vehicle,
d) a pair of removable arms mounted on said vehicle for attaching said element thereto,
e) a rotatable shaft mounted on said vehicle removably connected to each of said arms so as to mount said arms onto said vehicle,
f) a pair of pivot links fixedly mounted on said shaft,
g) means carried by said vehicle and connected to said links so as to pivot said links and rotate said shaft about a fixed horizontal axis so as to provide limited vertical movement of said arms relative to said surface to be cleaned,
h) means providing a limited floating connection between said arms and surface treating element,
i) means for removably connecting said surface treating element to said means providing a limited floating connection, and
j) a remote control for said means for propelling and steering said vehicle and said surface treating element over the surface to be treated.

5,147,003
COMPOSITE ROAD VEHICLE WITH ELECTRIC AND THERMAL PROPULSION MEANS
Bruno De Monclin, Paris, France, assignor to Societe Dite Sita, Paris, France
Continuation of Ser. No. 530,796, May 30, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 790,781
Claims priority, application France, Oct. 26, 1989, 89 14030
Int. Cl.[5] B62D *59/04*
U.S. Cl. 180—14.2 **11 Claims**

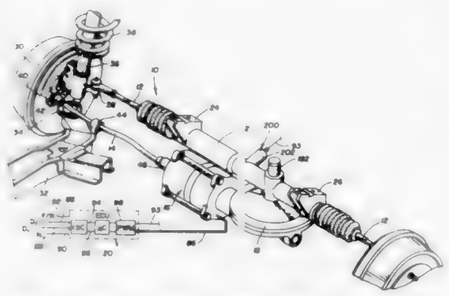


1. A composite road vehicle comprising:
a tractor provided with first driving wheels and thermal driving means for providing power to the first driving wheels for propelling the composite road vehicle at a first traveling speed; and
a collection and distribution trailer or semitrailer removably connected to said tractor, the trailer or semitrailer comprising a support structure; second driving wheels attached to said support structure; an electric power source of the battery type; electric driving means controlled from the cabin of the tractor for providing sufficient power to the second driving wheels for propelling the composite road vehicle, with the trailer or semitrailer connected to the tractor, at a second traveling speed lower than said first traveling speed; a transmission coupling said electric driving means to said second driving wheels; and a hauling compartment, attached to said support structure, with substantial available space over and above that occupied by the electric power source, electric driving means and transmission for collection and distribution of materials;
whereby, when the thermal driving means is disengaged and the electric driving means is engaged, the trailer or semitrailer propels the composite road vehicle at the second traveling speed for collection and distribution of materials, whereas when the electric driving means is disengaged and the thermal driving means is engaged, the tractor propels the composite road vehicle at the first traveling speed.

5,147,004
POWERTRAIN-DRIVEN ELECTROMAGNETIC REAR STEERING SYSTEM
Thomas W. Weisgerber; Jeffery A. Zuraski; James W. Babineau, and Brian P. McDonald, all of Saginaw, Mich., assignors to General Motors Corp., Detroit, Mich.
Filed Jan. 7, 1991, Ser. No. 638,242
Int. Cl.[5] B60K *25/08*
U.S. Cl. 180—53.6 **7 Claims**

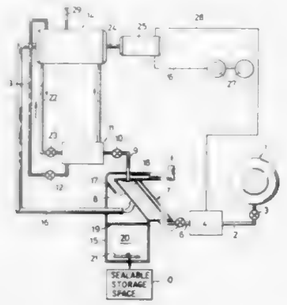
1. Apparatus for steering a rear wheel of a motor vehicle, comprising:
rack and pinion steering means including a rack connected to said rear wheel for steering said rear wheel when axially displaced by rotation of a pinion gear;
means for developing a rotary steering input utilizing said rear wheel as a rotary drive source;

torque transmitting means for selectively applying said rotary steering input to the pinion gear of said rack and



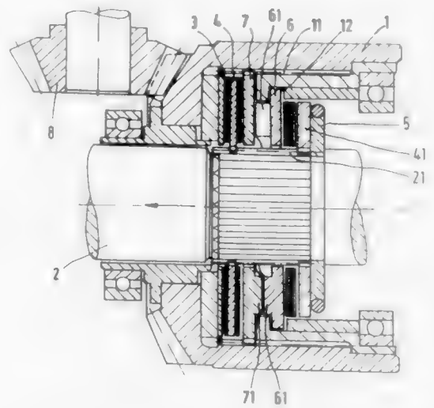
pinion steering means to effect selective displacement of said rack for steering said rear wheel.

5,147,005
DRIVE FOR MOTOR VEHICLES
Gunnar O. Haeggström, 1, Körundvägen, 148 00 Ösmo, Sweden
Filed Apr. 11, 1990, Ser. No. 507,504
Int. Cl.[5] B60K *15/10*
U.S. Cl. 180—69.5 4 Claims



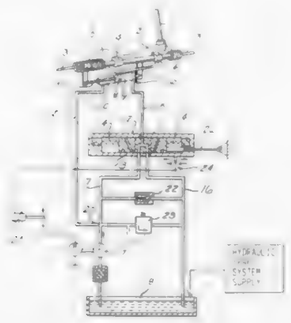
1. A drive for large motor vehicles having at least one drive wheel, said drive comprising in combination:
a gas motor (14) adapted to be fueled by natural gas;
at least one electric motor (27) for driving the vehicle drive wheel;
a generator (25) driven by said gas motor to supply electrical energy to said electric motor
at least one container carried by the vehicle for containing natural gas in a liquid state as LNG;
means for transferring said LNG from said container to said gas motor and including a block (7) having a separation surface (8) and means for passing exhaust gases from said gas motor into heat exchange relation with said separation surface to convert carbon dioxide in the exhaust gases to a solid state and to convert said LNG in said block at least partially to a gaseous state; and
means for transferring solid carbon dioxide from said separation surface to a sealable storage space on the vehicle;
said gas motor including a cooling medium for transferring heat from said motor,
said means for transferring said LNG including a further evaporation unit located downstream from said block and means for passing said cooling medium in heat exchange relation to partially gasified LNG passing from said block, thereby to bring said LNG into a completely gaseous state for transfer to said gas motor

5,147,006
FRICTION CLUTCH
Alfons Weissbrich, Gauting; Horst Nikl, and Nikolaus Wahnschaffe, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagen AG, Fed. Rep. of Germany
PCT No. PCT/EP89/00781, § 371 Date Jan. 29, 1991, § 102(e) Date Jan. 29, 1991, PCT Pub. No. WO90/01640, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 7, 1989, Ser. No. 640,361
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827349
Int. Cl.[5] F16D *43/02*
U.S. Cl. 180—79.4 3 Claims



1. A friction coupling actuated by axial force comprising a clutch drive member rotatable about an axis, a clutch output member coaxial with the clutch drive member, a plurality of axially displaceable friction members having facing engageable friction surfaces and alternately connected in angularly fixed relation to the clutch drive member and the clutch output member, axially displaceable pressure plate means for applying an axial force to produce frictional coupling engagement of the adjacent surfaces of the friction members, and two pressure-generating members operationally interposed between the pressure plate means and the friction members, the pressure-generating members having on one side adjacent facing surfaces with cooperating axially inclined surface portions disposed coaxially about the axis of rotation of the clutch so that the pressure-generating members when in contact with each other are urged axially apart upon relative rotation, exerting an axial force on the friction members, and having friction surfaces on the opposite sides thereof, the pressure-generating member located farther from the pressure plate means being axially displaceable but angularly fixed with respect to the clutch drive member and the pressure-generating member located closer to the pressure plate means being mounted for rotation with respect to the clutch drive member and having an outer periphery received in an axially captive relation to the clutch drive member, and a clutch plate disposed between the pressure plate means and the adjacent pressure-generating member and retained in angularly fixed relation to the clutch output member.

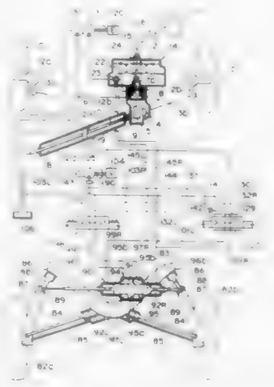
5,147,007
HYDRAULICALLY ASSISTED STEERING SYSTEM FOR AUTOMOTIVE VEHICLES
Manfred Kahrs, Wiesbaden; Lothar Kunze, Hofheim-Langehain; Joachim Baier, Hanau; Gerhard Kunz, Linden; Bernhard Moeller, Frankfurt am Main; Wilhelm Beer, Ruesselsheim; Hans-G. Krines, Usingen, and Gerhardt Schudt, Hanau, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany
PCT No. PCT/EP89/01069, § 371 Date Jun. 1, 1990, § 102(e) Date Jun. 1, 1990, PCT Pub. No. WO90/03908, PCT Pub. Date Apr. 19, 1990
PCT Filed Sep. 14, 1989, Ser. No. 499,383
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833637; Dec. 24, 1988, 3843893; Aug. 28, 1989, 3928376
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—132 28 Claims



1. A hydraulically assisted steering system for an automotive vehicle having a pair of steering members comprising: a mechanical steering gear coupled to said steering members, elastic mounting means allowing shifting of at least a portion of said steering gear by a steering force reaction created by a predetermined steering force applied to said steering members by said steering gear;
a source of pressurized hydraulic fluid;
hydraulic actuator means for controllably applying a steering assist force to at least one of said steering members in either direction to assist steering by said steering gear;
control valve means responsive to shifting of at least a portion of said steering gear in either direction caused by said steering reaction force to pressurize said hyraulic actuator means to exert said steering assist force in a respective direction.

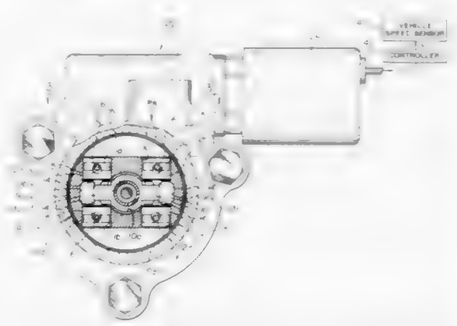
5,147,008
FOUR-WHEEL VEHICLE STEERING APPARATUS
Masayoshi Nishimore, Okazaki; Hiroshi Yoshida, Toyokawa; Masanori Tani, Okazaki; Tadao Tanaka, Okazaki; Hiroshi Fujii, Okazaki, and Hiroyuki Masuda, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Jidosha Engineering Kabushiki Kaisha, both of Tokyo, Japan
Filed Oct. 23, 1989, Ser. No. 425,598
Claims priority, application Japan, Oct. 31, 1988, 63-275648; Oct. 31, 1988, 63-275649; Oct. 31, 1988, 63-275650; Oct. 31, 1988, 63-275652
Int. Cl.[5] B62D *5/06, 5/087, 7/14*
U.S. Cl. 180—140 24 Claims

1. A four-wheel steering apparatus for a vehicle having steerable front and rear wheels, comprising:
in-phase steering control means for generating hydraulic output for steering the rear wheels in the same direction as that of the front wheels in accordance with a steering state of the front wheels;
antiphase steering control means, arranged in parallel to said in-phase steering control means, for generating hydraulic output for steering the rear wheels in a direction opposite to a direction in which the steering state of the front wheels changes, in accordance with a rate of change in the steering state of the front wheels; and
a hydraulic actuator receiving the hydraulic output from the in-phase steering control means to generate a steering



force for steering the rear wheels in the same direction as that of the front wheels, receiving the hydraulic output from the antiphase steering control means to generate a steering force for steering the rear wheels in a direction opposite to a direction in which the steering state of the front wheels changes, and steering the rear wheels in accordance with a composite force of the steering forces.

5,147,009
STEERING FORCE CONTROL APPARATUS OF POWER STEERING SYSTEM
Isamu Chikuma, and Hiroshi Eda, both of Maebashi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 26, 1991, Ser. No. 692,305
Claims priority, application Japan, Apr. 27, 1990, 2-44553[U]; Apr. 27, 1990, 2-110503
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—143 4 Claims



1. In a power steering system having an output shaft connected to a steering mechanism, an input shaft connected to the output shaft so as to be relatively displaceable in accordance with a steering torque applied to the output shaft, a steering assisting force generating mechanism for generating a steering assisting force in accordance with a relative displacement between the input shaft and the output shaft, a steering reaction force generating mechanism formed between the input shaft

and the output shaft, and a control apparatus for controlling the steering assisting force generating mechanism and the steering reaction force generating mechanism, the improvement comprising:

the steering reaction force generating mechanism including:

a pair of reaction force chambers formed in a confronting surface of one of the input shaft and the output shaft;

an accommodating section formed between the reaction force chambers for oscillatably accommodating a control arm which is protrudingly formed on the other of the input shaft and the output shaft;

through bores respectively formed between one of the reaction force chambers and the accommodating section, and between the other of the reaction force chambers and the accommodating section;

plungers respectively disposed in the through bores so as to be slidable in an axial direction; and

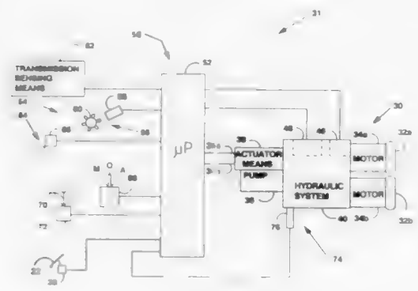
a movement restricting mechanism including further through bores formed respectively in the plungers penetrating in a direction orthogonal to the axial direction of the plungers, and movement restricting pins respectively inserted into the further through bores to restrict movement of the plungers in the axial direction.

5,147,010

METHOD AND APPARATUS FOR CONTROLLING A SUPPLEMENTAL VEHICLE DRIVE IN RESPONSE TO SLIP IN A MAIN VEHICLE DRIVE

Stephen R. Olson, and William J. Tate, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 6, 1990 Ser. No. 623,630
Int. Cl.[5] B60K *28/16, 17/356*
U.S. Cl. 180—197 **19 Claims**



1. An electronic control for a vehicle having an engine, a main drive driven by said engine, a fluid pump driven by said engine for providing pressurized fluid, and a supplemental drive driven by said pressurized fluid, comprising:

main drive sensor means for sensing the speed of the main drive and responsively producing a main drive speed signal;

vehicle speed sensor means for sensing the speed of said vehicle relative to the ground irrespective of wheelslip and responsively producing a vehicle ground speed signal; and

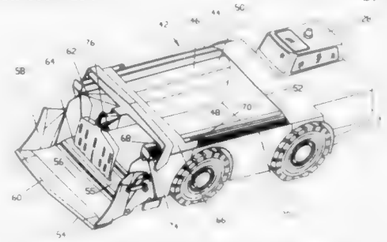
processor means for receiving said main drive speed signal and vehicle ground speed signal, producing an error signal in response to the received signals and controlling the pressure in said supplemental drive in response to said error signal.

5,147,011

MULTI-PURPOSE UNI-BODY DIGGING SERVICE VEHICLE

Dusan J. Hvolka, Salt Lake City, Utah, assignor to DJH Engineering Center, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 568,767, Aug. 17, 1990, Pat. No. 082,082, which is a continuation-in-part of Ser. No. 359,277, May 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 140,671, Jan. 4, 1988, abandoned.
This application Jul. 8, 1991, Ser. No. 726,776
Int. Cl.[5] B60K *17/358*
U.S. Cl. 180—234 **17 Claims**



1. A U-shaped multi-purpose uni-body digging service vehicle comprising:

I. at least one multi-purpose vehicle having:

a. a uni-body U-shaped frame supporting and defining the shape of the vehicle, with opposing sides and rear ends connected by a back piece, and front ends defining an open interior space in communication with an open front end of sufficient size to accommodate respective rear ends of a corresponding U-shaped multi-purpose service vehicle's uni-body U-shaped frame when inserted within an interior space of a corresponding multi-purpose vehicle, said U-shaped frame further including frame structure to secure to the frame within the interior space a plurality of loads,

b. an open top earthmover carrying module structured to fit within and mounted within the interior of the opening of the U-shaped frame to carry loads,

c. wheel mounts capable of pivoting attached to the opposing sides,

d. a plurality of wheels independently suspended and rotatably attached to the wheel mounts,

e. pivot means associated with the wheel mounts to pivot and turn each wheel in a desired direction,

f. independent drive means associated with each wheel to rotate said wheels forward and backward,

g. a power source to operate the pivot means and independent drive means, and

h. control means mounted to the frame and associated with the drive means, and pivot means to selectively activate the drive means and pivot means to align and drive each wheel at the desired speed and direction; and

II. a uni-body U-shaped digging system component mounted within the opening of the frame having:

a. an open top bucket load chamber tiltably mounted to the frame, having opposing sides attached to a bed, with rear side ends connected by a back piece, and front ends defining an opening leading into an interior load carrying space of the chamber,

b. a bucket loader having a bottom and sides defining an open top scoop with open ends, the forward open end of the bottom sharpened to dig and scoop earth, ore, and the like into said bucket loader,

c. transfer means to transfer the contents of the bucket loader into the bucket load chamber,

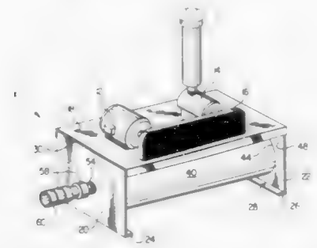
d. dumping means operably associated with the frame and bucket load chamber to selectively lift and tilt the bottom of the bucket load chamber to unload the contents of said chamber through the open end of the bucket loader in one mode, and to lower and ready the bucket load chamber for receipt of materials in the other mode

5,147,012

DISCHARGE SILENCING APPARATUS

David R. Hays, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 21, 1990, Ser. No. 570,580
Int. Cl.[5] F01N *5/00, 5/02*
U.S. Cl. 181—211 **6 Claims**



1. A blower and blower motor mounting base and housing for a blower discharge silencing apparatus comprising:

a. first and second vertical end support plates in substantially parallel spaced apart relation, each of said support plates having a bottom edge flange extending the full length of each plate defining a mounting foot on each support plate bottom edge for mounting said apparatus on a supporting surface;

b. a bedplate secured along opposite ends to top edges of said first and second end support plates, said bedplate including integral downwardly turned opposite side edge flanges secured at opposite ends to upper side edge portions of said end support plates, said bedplate providing a supporting surface for a blower and a blower drive motor, said bedplate having an opening therein for a discharge conduit from a blower positioned near a first end of said bedplate and a first of said end support plates;

c. a housing for blower discharge silencing apparatus mounted between said end support plates extending between inside faces of said end support plates and spaced below said bedplate;

d. a blower discharge conduit connected at a lower end into a top portion of said housing for said blower discharge apparatus and extending upwardly therefrom through said opening in said bedplate for connection with a discharge from a blower mounted on said bedplate; and

e. a housing discharge conduit connected with the outside face of said second of said end support plates opening through said support plate into said housing.

5,147.013

CONFINED SPACE ENTRY APPARATUS

Wayne L. Olson, Central Point, Oreg., and Gary E. Choate, Lakewood, Colo., assignors to Rose Manufacturing Company, Englewood, Colo.

Filed Oct. 29, 1990, Ser. No. 605,565
Int. Cl.[5] A62B *1/08;* **B66D** *5/02*
U.S. Cl. 182—231 **19 Claims**

1. Apparatus for moving a load, such as personnel or materials, through an opening in a sidewall of a vessel and lowering or raising of the load inside of the vessel comprising:

a vessel having a sidewall for defining the inside and outside of said vessel and having an opening in said sidewall;

a lower support mounted on the lower portion of the sidewall defining said opening;

an upper support mounted on an upper portion of said sidewall defining said opening;

load supporting means mounted on said lower and upper supports and located within said vessel for supporting said load;

at least one hoist mounted on said upper support;

line means attached at a first end to said hoist for being wound into or unwound out of said hoist;

a pulley mounted on said load supporting means and located within said vessel;

a load supporting device; and

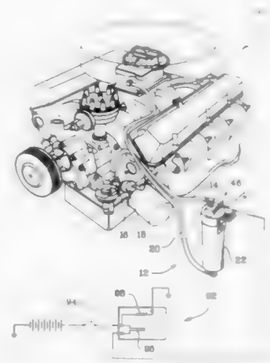
said line means passing over said pulley and having a second end connected to said load supporting device for lowering or raising said load within said vessel.

5,147,014

LUBRICATING SYSTEM FOR AN ENGINE PRIOR TO START-UP

Walter H. Pederson, 4600 64th St. S.E., St. Cloud, Minn. 56304

Filed Jul. 9, 1991, Ser. No. 727,841
Int. Cl.[5] F01M *9/00*
U.S. Cl. 184—6.3 **3 Claims**



1. A pre-start lubricating system for reducing wear in a diesel, gasoline or other internal combustion engine by delivering lubricating oil into the engine's oiling system immediately before the engine is cranked at a pressure greater than the engine's normal operating oil pressure, thereby preventing excessive wear due to dry friction at start-up and extending the useful life of the engine, said pre-start lubricating system to be used in connection with the engine vacuum system, the engine electrical system and the engine oiling system associated with, or incorporated into, the internal combustion engine, said pre-start lubrication system comprising:

(a) a pressure vessel of desired volume having a vacuum

communication means, as further defined, and an oil communication means, as further defined;

(b) a piston, biased by a spring means as further defined, disposed within said pressure vessel between said oil communication means and said vacuum communication means defining

(1) an oil storage reservoir between said oil communication means and said piston and

(2) a vacuum reservoir between said vacuum communication means and said piston;

(c) a vacuum communication means for connecting said vacuum reservoir with the engine vacuum system;

(d) an oil communication means for connecting said oil storage reservoir with the engine oiling system, said oil communication means having a first aperture opening;

(e) a valve means disposed adjacent to said first aperture for controlling flow of oil to and from said oil storage reservoir and the engine oiling system, further comprising;

(1) a moveable core;

(2) a biasing spring which acts to force said moveable core toward said first aperture

(3) said moveable core is moved away from said first aperture when pressure in the engine oiling system exceeds reservoir pressure by an amount sufficient to overcome the force exerted on said moveable core by said biasing spring, and

(4) said moveable core is seated against said first aperture by said biasing spring when reservoir pressure is at least equal to engine oiling system pressure;

(f) a piston spring means operatively connected to said piston

(1) for biasing said piston by providing a force on said piston acting in opposition to the combination of the forces of said piston created by the action of oil pressure in said oil reservoir and vacuum in said vacuum reservoir, and

(2) further, for raising the oil pressure in said oil storage reservoir after the engine has been shut down and the vacuum in the vacuum reservoir has dissipated;

(g) actuator means for operating said valve means thereby releasing oil held under pressure in said oil storage reservoir, further comprising;

(1) an electrical solenoid, adapted for connection to the engine electrical system, operatively connected to said moveable core so as to urge said moveable core away from said first aperture when said solenoid is energized, thereby releasing oil stored in said oil storage reservoir;

(2) a switch means, disposed at a location convenient to the person operating the engine, for energizing said solenoid;

(3) a timer means electrically disposed between said switch means and said solenoid for controlling said solenoid in such a manner that

(A) said solenoid is energized and thereby holds said moveable core away from said first aperture for a predetermined amount of time

(1) which is longer than the amount of time required for complete evacuation of said oil storage reservoir, and

(2) for a time sufficient to permit a substantially complete recharge of said oil storage reservoir after engine start-up, and

(B) said solenoid is then de-energized permitting oil pressure in said oil storage reservoir and the bias induced by said biasing spring to urge said moveable core against, and thereby close, said first aperture; and

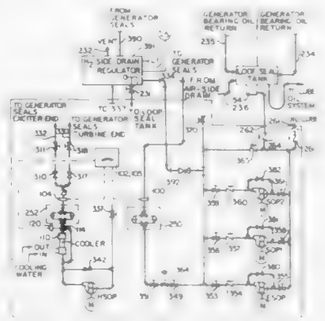
(h) thermal pressure relief means disposed in said valve means for relieving excess pressure created by thermal expansion of oil in said oil storage reservoir.

5,147,015

SEAL OIL TEMPERATURE CONTROL METHOD AND APPARATUS

Owen R. Snuttjer, Oviedo, and Michael J. Rasinski, Winter Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1991, Ser. No. 646,925
Int. Cl.[5] F01M 5/00
U.S. Cl. 184—6.22 20 Claims



1. A system for supplying seal oils to a gland seal wherein said gland seal receives at least two sources of oil and directs the oils toward and along a shaft to form a seal, the system comprising:

first oil feeding means for providing a first supply of oil to a gland seal;

second oil feeding means for providing a second supply of oil to said gland seal;

reference temperature means for providing a reference temperature signal indicative of the temperature of the second supply of oil fed to said gland seal; and

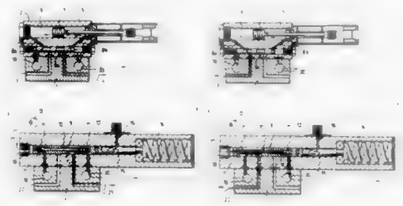
temperature control means for controlling the temperature of said first supply of oil fed to said gland seal in response to said reference temperature signal.

5,147,016

LUBRICATING GREASE DOSER ARRANGEMENT WITH IMPROVED FLOW CONTROL, FOR PREVENTING LUBRICANT OIL-HARDENER SEPARATION

Kari Antila, Korpilahti, Finland, assignor to Safematic OY, Muurame, Finland

Filed Aug. 7, 1991, Ser. No. 741,659
Claims priority, application Finland, Jun. 10, 1991, 912786
Int. Cl.[5] F16N 27/00
U.S. Cl. 184—7.4 6 Claims



1. A lubricating grease doser arrangement with improved flow control for preventing lubricant oil-hardener separation, for supplying charges of grease from a single control-pressurized supply thereto, alternately to each of two lubricant outlet lines connected therewith;

said doser arrangement comprising:

a body means having means defining an axially elongated cylinder therein;

a valve stem axially slidingly received in said cylinder;

spring means engaged between said body means and said valve stem for resiliently tending to force said valve stem towards one end of said cylinder;

means defining an inlet port through said body means to said one end of said cylinder, for connection with a single control-pressurized supply of lubricating grease for application to said valve stem in a sense to force said valve stem to slide in said cylinder towards said spring means, thereby resiliently compressing said spring means;

means defining two outlet ports from said cylinder through said body means, for connection with respective device-lubricating lines;

a system of channels within and upon said valve stem for alternately communicating said one end of said cylinder with each of said outlet ports;

cooperating cam groove and cam-follower pin means provided on said valve stem and said body for causing said valve stem, for each time said valve stem is returned by recovery of said spring towards said one end of said cylinder after pressurized supply of lubricating grease to said inlet port is terminated, to rotate around the longitudinal axis of the valve stem, by a predetermined angular increment, such as to effectively place the valve stem alternately in two different conditions while the valve stem is at rest following termination of pressurized supply of grease to said inlet port, and while said valve stem is moving towards said spring means due to pressure being applied to said valve stem by pressurized supply of lubricating grease to said inlet port, said two different conditions being:

one in which said one end of said cylinder is communicated with one of said outlet ports but cut off from the other of said outlet ports; and

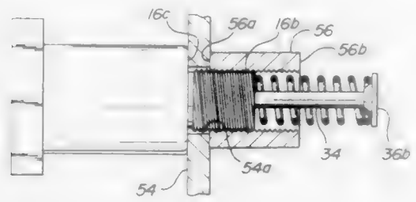
another in which said one end of said cylinder is communicated with said other of said outlet ports but cut off from said one of said outlet ports.

5,147,017

SHOCK ABSORBER

Robert J. Heideman, Westland, and Richard T. Mitera, Canton, both of Mich., assignors to Enertrols, Inc., Westland, Mich.

Filed May 8, 1989, Ser. No. 350,340
Int. Cl.[5] F16F 9/44
U.S. Cl. 188—287 4 Claims



1. A shock absorber comprising:

an internal subassembly including a piston, a piston rod, and a pad on the free end of said piston rod presenting an impact surface;

a housing defining a bore for receipt of said internal subassembly and including a central main body portion, a reduced diameter threaded forward portion forming an annular forward shoulder with said main body portion and providing front mounting means for said shock absorber, and a rear flange portion rigidly and immovably secured to the rear end of said main body portion and extending radially outwardly from said main body portion to provide rear mounting means for said shock absorber, said internal subassembly being installed in said bore with said piston rod extending out of the forward end of said housing; and

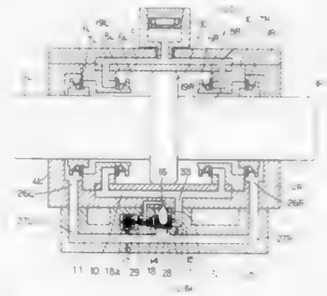
an internally threaded stop collar adapted to be screwed onto said reduced diameter threaded forward portion of said housing and presenting a stop surface spaced axially outwardly from the forward end of said reduced diameter threaded forward portion and spaced axially inwardly from said impact surface on said pad with the shock absorber in its extended rest position by a distance corresponding generally to the stroke of the shock absorber less the desired clearance at the bottomed position of the shock absorber.

5,147,018

CYLINDER LOCK DEVICE FOR USE IN STRUCTURE

Takuji Kobori; Koji Ishii; Motoichi Takahashi; Junichi Hirai; Yoshinori Adachi; Naoki Niwa; Shigeru Ariki, all of Tokyo; Toshiaki Kamei, and Takeharu Shizume, both of Kangawa, all of Japan, assignors to Kajima Corporation and Kayaba Kogyo Kabushikikaisha, both of Tokyo, Japan

Continuation of Ser. No. 487,403, Mar. 2, 1990, abandoned. This application Feb. 27, 1992, Ser. No. 845,497
Claims priority, application Japan, Mar. 2, 1989, 1-24243[U]; Mar. 3, 1989, 1-51574; Feb. 19, 1990, 2-37992
Int. Cl.[5] F16F 9/32
U.S. Cl. 88—300 16 Claims



1. A cylinder lock device for use in a structure, in which an oil pressure chamber is provided on opposite sides of a piston of a double-rod type in a cylinder body, and the flow of pressurized oil in each oil pressure chamber is controlled by a valve adapted to hold the piston stationary or to render the piston movable, comprising:

an outflow blocking check valve adapted for blocking the outflow of pressurized oil from each oil pressure chamber;

an inflow blocking check valve adapted for blocking the inflow of pressurized oil into said each oil pressure chamber;

an inflow passage provided in and concentric with the said cylinder body and connecting the outflow blocking check valves of both oil pressure chambers to each other;

an outflow passage provided exterior of the cylinder body and connecting the inflow blocking check valves of both oil pressure chambers to each other; and

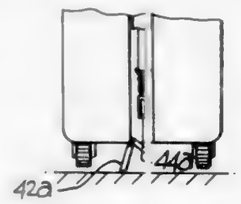
a changeover valve capable of connecting and disconnecting said inflow and outflow passages to and from each other;

said inflow passage and said outflow passage being connected to each other through said changeover valve, wherein said changeover valve has a valve body provided at one end with an inlet port and an outlet port, and at the other end with a back pressure port, said inlet port and said back pressure port being connected to each other, and said changeover valve being provided at the back pressure port side with a shut-off valve capable of blocking the outflow of pressurized oil.

5,147,0 9
BRAKE SYSTEM FOR LUGGAGE CASE

Godwin Van Hooreweder, Brug e, Belgium; Georg A. W. Bartsch, Iserlohn, Fed. Rep. of ermany; Klaus-Dieter Hesse, Sundern-Amecke, Fed. Rep. o Germany, and Ulf Rasch, Iserlohn, Fed. Rep. of Germany assignors to Samsonite Corporation, Denver, Colo.

Filed Oct. 25, 1990, er. No. 603,591
Claims priority, application Fra ce, Oct. 27, 1989, 89 14168
Int. Cl.[5] A45C *5/14 13/22, 13/28*
U.S. Cl. 190—18 A 9 Claims



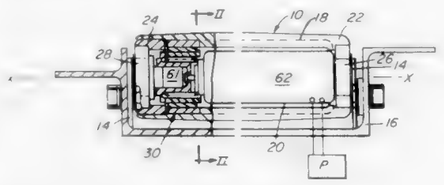
1. In a luggage case and the l ce having wheels or casters mounted to constantly protrude elow the case for enabling rolling movement along a horizo tal or inclined surface, said case includes means for towing the case on the wheels or casters, the improvement compri ing

means for selectively disabling at least some of said wheels or casters when unintended rolling movement is to be hindered, and means for operatively connecting said means for towing to said me ns for selectively disabling, whereby said means for sele tively disabling said wheels or casters is operated by sai means for towing.

5,147,0 0
CONVEYOR ROI LER BRAKE

Dale Scherman; Jim Brown, and Gary Carpenter, all of Jamestown, N. Dak., assignors to Lucas Western Inc., Jamestown, N. Dak.

Filed Jun. 17, 1991, er. No. 716,276
Int. Cl.[5] B65G *13/075*
U.S. Cl. 193—35 A 10 Claims



1. A braking apparatus for s lectively braking the axial rotation of a conveyor roller com prising:

a friction means coaxially and nonrotatably disposed with respect to such a conveyor oller and having a generally cylindrical friction surface n eans disposed coaxially with respect to such a roller;

brake shoe means disposed for coaxial rotation with respect to such a conveyor roller r dially adjacent said friction surface means;

said brake shoe means includin g a generally cylindrical shoe surface portion which is mai tained in continuously biased frictional engagement with s id friction surface means and a first hub means disposed coaxially with respect to said shoe surface portion;

second hub means carried coa ially with respect to such a roller;

means nonrotatably constraining said second hub means with respect to such a roller;

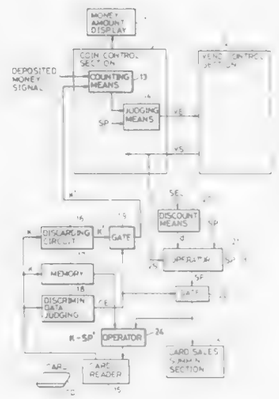
said first and second hub means including mutually cooperable interlocking means which are selectively interengageable to nonrotatably constrain said first and second hub means with respect to each other; and

selectively operable actuator means cooperably associated with one of said first and second hub means to move said one of said first and second hub means with respect to the other of said first and second hub means to move said interlocking means selectively into and out of interengagement for selectively constraining and releasing said first hub means for rotation with respect to said second hub means.

5,147,021
VENDING MACHINE

Yoshinori Maruyama, Kawagoe, and Takeshi Ishida, Sakado, both of Japan, assignors to Nippon Conlux Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 249,886, Sep. 29, 1988, abandoned. This application Dec. 5, 1990, Ser. No. 622,377
Claims priority, application Japan, Sep. 29, 1987, 62-147558[U]
Int. Cl.[5] G07F *7/08*
U.S. Cl. 194—217 2 Claims



1. A vending machine including judging means for judging whether vending is possible or not on the basis of comparison of an amount of deposited money with a vend price, and being adapted for processing money amount data using a minimum money amount digit of a minimum denomination coin or bill handleable by the machine, said vending machine comprising:

card reading and writing means for receiving a card on which money amount data including data of a money amount less than the minimum money amount digit and necessary discrimination data are recorded and reading the data from the card and writing money amount data on the card;

memory means for storing said money amount data including data of a money amount less than the minimum money amount digit that has been read by said card reading and writing means;

discarding means for discarding a money amount less than the minimim money amount digit from said money amount data read by said card reading and writing means;

means for adding money amount data left after discarding by said discarding means to the amount of deposited money and for applying the result of the addition as total deposited amount to said judging means;

discount means for effecting a predetermined discount from a predetermined vend price of a vended article for a discount amount or at a discount rate that can be set for said money amount less than the minimum money amount digit; and

control means for substracting a vend price after said discount from the money amount data that has been read from the card by said card reading and writing means and stored in said memory means, and for causing the balance to be written in the card by said card reading and writing means.

5,147,022
APPARATUS FOR MERGING MASS FLOWS OF ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

Wolfgang Raschka, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed May 6, 1991, Ser. No. 695,977
Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014713
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—347.2 15 Claims

1. Apparatus for merging first and second mass flows of parallel rod-shaped articles of the tobacco processing industry which are transported sideways, comprising a first article supplying conveyor defining an elongated first path and having means for advancing the first mass flow in a first direction; a second article supplying conveyor defining an elongated second path which extends at an acute angle to and merges into said first path at a junction zone, and second conveyor having means for advancing the second mass flow in a second direction toward and into said junction zone; an article removing conveyor having means for transporting the merged mass flows away from said junction zone; and means for regulating the advancement of articles at said junction zone, comprising a gate disposed at said junction zone and including a first section and at least one second section, said gate being movable between a first position in which said first section prevents entry of one of said first and second mass flows into said junction zone and said at least one second section guides the other of said first and second mass flows at said junction zone, and a second position in which the one mass flow is free to enter said junction zone, the path for said one mass flow being a substantially horizontal path and the path for said other mass flow merging into said substantially horizontal path from below.

5,147,023
METHOD AND APPARATUS FOR CONVERTING A MULTI-ROW CONTAINER INTO, A SINGLE ROW STREAM

Theodor Meindl, Geiselhöring, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Continuation of Ser. No. 571,133, Aug. 22, 1990, abandoned.
This application Jan. 21, 1992, Ser. No. 824,727
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3928017
Int. Cl.[5] B65G *47/12*
U.S. Cl. 198—454 14 Claims

1. A method of rearranging containers which are advancing abreast of each other in successive rows into a series of containers advancing in single file formation comprising the steps of:

feeding said rows of containers successively onto an infeed conveyor having a predetermined width and is slanted at an angle relative to a horizontal plane transversely to the longitudinal direction in which said infeed conveyor is moving,

having following successive rows of containers push leading rows of containers onto and off of a planar surface which is slanted at an angle corresponding to the angle of the infeed conveyor with the containers substantially maintaining their track positions abreast of each other as they pass over said planar surface,

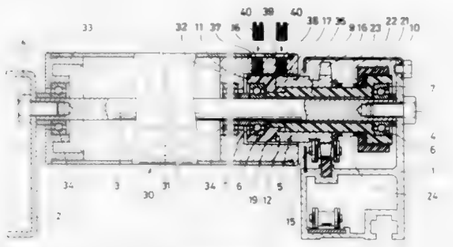
receiving said rows of containers as they are pushed off the slanted planar surface with their track positions maintained on an intermediate conveyor having a width corresponding to said width of the infeed conveyor and is comprised of longitudinally running adjacent belts which are slanted in succession transversely to the direction in which the belts run at an angle in respect to the horizontal plane corresponding to the slant of said infeed conveyor and said planar surface,

having the highest belt among the slanted belts of the intermediate conveyor run at a predetermined longitudinal speed and having the slanted succession of adjacent belts run at increasing speeds progressing away from said highest belt to the lowest belt,

arranging a container discharge conveyor closely adjacent and parallel to the lowest belt in the intermediate conveyor and lower than any container in the lowest track position in the row of containers being pushed off the slanted planar surface such that any container coming off the slanted planar surface must travel onto at least one belt of the intermediate conveyor to undergo a downward component of force imparted by the slant of the intermediate conveyor before the container arrives on the discharge conveyor, and

providing for at least some of said containers which are in track positions aligned with the lowermost belt of the intermediate and infeed conveyors to begin moving onto said discharge conveyor immediately after said containers are pushed off the planer surface and temporarily conveyed by the lowermost belt of the intermediate conveyors.

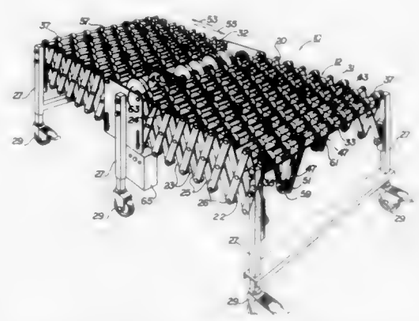
5,147,024
ROLLER CONVEYOR
Ryuzo Yamada, 3-36, Saiwai-cho, Tajimi (507), Japan
Filed Dec. 24, 1991, Ser. No. 813,946
Claims priority, application Japan, Jun. 3, 1991, 3-159776
Int. Cl.[5] B65G *13/07*
U.S. Cl. 198—781 1 Claim



1. A roller conveyor comprising:
a plurality of center shafts connected between a pair of frames extending in parallel to each other;
a friction tube mounted at least on one end of each said center shaft in rotatable but axially unmovable manner, said friction tube being formed around one end thereof adjacent said one end of said center shaft with a male thread and on the other end with a diameter-enlarged block of which the end surface facing said one end of said center shaft defines a friction surface;
a sprocket rotatably mounted on said friction tube, including a cylindrical portion provided in alignment with and in contiguity to said diameter-enlarged block of said friction tube, and said cylindrical portion having an end surface defining a friction surface adapted to be in contact with the first-mentioned friction surface;
a nut to be engageably put on said male thread of said friction tube;
a compression coil spring mounted on said friction tube between said nut and said sprocket;
a hollow roller rotatably mounted around said center shaft and loosely surrounding at an end said diameter-englarged block of said friction tube and said cylindrical portion of said sprocket;
a pair of through-holes radially extending through said end of said hollow roller to the outer peripheral surface of said diameter-enlarged block forming a part of said friction tube and the outer peripheral surface of said cylindrical portion forming a part of said sprocket, respectively;
fastening members detachably inserted into said respective through-holes so as to be engaged with said diameter-enlarged block and said cylindrical portion, respectively, so that said hollow roller may be rotated integrally with said friction tube or said sprocket; and
a chain adapted to be engaged with said sprocket and thereby to rotate said sprocket.

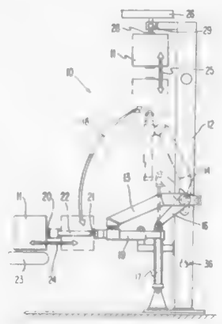
5,147,025
EXPANDABLE POWERED ROLLER CONVEYOR
Bobby K. Flippo, Jonesboro, Ark. assignor to Northstar Industries, Inc., Jonesboro, Ark.
Filed Jan. 16, 1991, Ser. No. 642,012
Int. Cl.[5] B65G *13/02*
U.S. Cl. 198—782 25 Claims

1. A conveyor structure comprising:
(a) a frame comprising:
(1) a plurality of lazy tong structures, each comprising a plurality of bars connected to each other;
(2) a plurality of axles connected to the lazy tong structures;
(b) at least one roller connected to each axle;
(c) a plurality of drive sheaves, each supported by an axle and each containing a groove conforming substantially to the surface dimensions of a drive belt that is used to power the conveyor structure;
(d) at least one guide roller rotatably mounted on at least one of the axles adjacent to the drive sheaves;
(e) at least two followers connected to the conveyor structure and corresponding to a drive sheave and a guide roller;



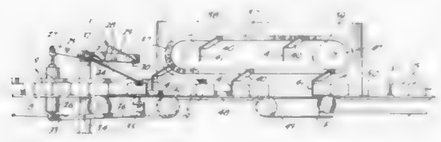
(f) at least one drive belt extending over the drive sheaves and guide rollers and under the followers, in a continuous loop; and
(g) a drive means connected to the belt to pull the belt over the drive sheaves and guide rollers and transport articles over the rollers on the conveyor structure.

5,147,026
DEVICE TO TRANSFER ROVING PACKAGES WITH THE ROVING PRE-POSITIONED
Enzo Scaglia, Milan, Italy, assignor to Scaglia SpA, Brembilla, Italy
Filed Jun. 19, 1990, Ser. No. 540,277
Claims priority, application Italy, Jun. 30, 1989, 83447 A/89
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—409 20 Claims



1. Device to transfer packages of roving with the roving pre-positioned, the packages being taken from discharge means belonging to or, in any event, connected to machines that prepare the roving for spinning, the packages thereafter having to be positioned on conveyor means which are advantageously automatic, to feed creels of spinning machines, the device being characterized in that is comprises the following assemblies working in functional sequence:
a self-aligning assembly which cooperates with the discharge means and is suitable to position in a desired and pre-determined manner the packages arriving at the end of the discharge means,
an arm to engage and transfer the packages which is suitable to cooperate with the self-aligning assembly in engaging the packages and transferring them onto support means connected to the conveyor means, and
an assembly to clamp the support means temporarily in a desired position so as to enable the packages to be transferred onto the support means by the arm.

5,147,027
ARTICLE GROUP-SEGREGATING APPARATUS AND METHOD
Michael Cruver, Port Townsend, Wash., assignor to Formost Packaging Machines, Inc., Woodinville, Wash.
Continuation of Ser. No. 661,742, Feb. 27, 1991, abandoned, which is a division of Ser. No. 256,899, Oct. 13, 1988, Pat. No. 5,012,916. This application Jan. 31, 1992, Ser. No. 830,536
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—419.3 2 Claims

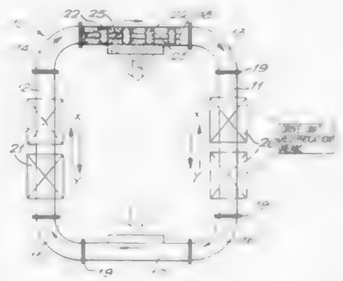


1. Apparatus for segregating groups of articles from a line of such articles comprising segregating mechanism including an orbiting group-forming member movable along a substantially horizontal path for controlling movement of a group of articles behind it and drive means for driving said group-forming member continuously in its orbit, an infeed conveyor for moving the line of articles toward said segregating mechanism and crowding a plurality of articles against the back side of said group-forming member to form a group, clamp means engageable with the article on said infeed conveyor next behind the group to be segregated by said segregating mechanism for arresting movement of such article and further removable thereafter for releasing such article, a swingable arm supporting said clamp means for movement toward and away from such article, and means for effecting swinging of said arm to move said clamp means toward such article including fluid pressure jack means and yielding resilient pressure means for clamping such article resiliently by said clamp means.

5,147,028
DEVICE TO RECOVER THE PAINT FROM BELT CONVEYORS IN SPRAY PAINTING PLANTS
Gianni Raggi, Imola, Italy, assignor to Cefla-Soc. Coop. A R.L., Imola, Italy
Filed Oct. 22, 1990, Ser. No. 600,822
Claims priority, application Italy, Oct. 24, 1989, 21988/89[U]
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—495 5 Claims

1. Device to recover paint from belt conveyors passing about drums in spray painting plants, comprising a cylinder parallel to the drums of the belt conveyor, driven to rotate in the same direction as said drums and contacting an outer surface of said belt so that the adjacent surfaces of the cylinder and of the belt move opposite to each other, the cylinder having a smooth and hard surface and being positioned close to the lower surface of the downstream drum of said conveyor, means extending full width of the cylinder to scrape off the paint on said surface of the cylinder, and wetting means contacting said cylinder downstream of said means to scrape off the paint, in order to deposit a film of solvent on said surface of said cylinder.

5,147,029
ELECTROMAGNETICALLY DRIVER CONVEYOR APPARATUS
Lars G. A. Wadell, Aengelholm, Sweden, assignor to Nestec S.A., Vevey, Switzerland
Filed Oct. 5, 1990, Ser. No. 593,864
Claims priority, application European Pat. Off., Oct. 9, 1989, 89118745.2
Int. Cl.[5] B65G *35/00*
U.S. Cl. 198—619 7 Claims

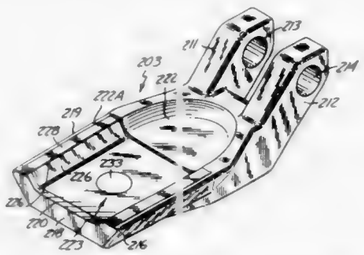


1. A conveyor apparatus comprising:
an endless enclosure having an interior surface defining a channel and being made of a non-magnetic material;
infeed means associated with the enclosure for introducing products into the channel for being conveyed through the channel;
outfeed means associated with the enclosure for removing conveyed products from the channel;
a plurality of channel partitioning elements having edges which are slidably fitted against the interior surface of the enclosure and having a magnetic core;
a prolongation positioned between each partitioning element for spacing apart each successive partitioning element of the plurality of partitioning elements;
at least two electromagnetic drive units positioned adjacent an outside surface of the enclosure; and
moving means for movably reciprocating each electromagnetic drive unit.

5,147,030
IMPELLER ASSEMBLY
Floyd E. Buschbom, Long Lake, Minn., assignor to Van Dale, Inc., Long Lake, Minn.
Continuation-in-part of Ser. No. 542,538, Jun. 25, 1990, Pat. No. 5,035,317, which is a division of Ser. No. 388,140, Aug. 1, 1989, Pat. No. 4,964,502. This application Jul. 25, 1991, Ser. No. 735,634
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] B65G *31/04*
U.S. Cl. 198—642 17 Claims

1. A paddle assembly for an impeller of a material handling machine comprising: a body having a leading side, arm means connected to the body adapted to be attached to a movable member, said body having an outer end opposite the arm means and a recess on the leading side of the body, a transverse lip at the outer end of the leading side thereof, said lip having a transverse cutting edge and a transverse wall inwardly of the

cutting edge, liner means of low friction and abrasive resistant plastic located in said recess, and means connecting the liner



means to said body thereby holding the liner means in said recess

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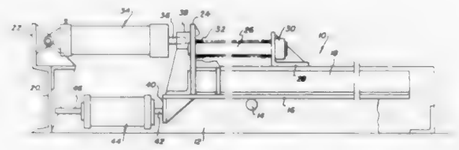
5,14 ,031

FLAT STROK CONVEYOR

James H. Carpenter, Hagerstown, Md., assignor to Pangborn Corporation, Hagerstown, Md.

Filed Apr. 10, 199 , Ser. No. 683,249
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—750 9 Claims



1. A spring actuated flat str ke drive for an oscillating conveyor, said drive comprising a head member for supporting at least one end of a conveyor, a fluid cylinder coupled to said head member and forming fee l means for periodically axially advancing said head member, a spring unit opposing aid head member and forming resilient eturn means for rapidly returning said head member after each axially advance, and fluid flow control means for said fluid cylinder, said fluid flow control means comprising a ource of fluid under pressure coupled to said fluid cylinder hrough a flow control valve to progressively advance said head member, an axially fixed support member, means mou ting said support member for rotary movement, about an ax al axis and cooperating mounting means on said head mem ber and said support member mounting said head member both for rotary movement with said support member about sa d axial axis and for axial movement relative to said support member.

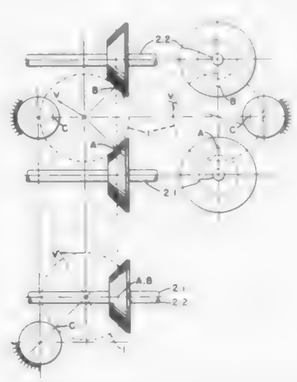
5,14 ,032

CONVEYOR SYSTEM WITH DRIVEN BALLS, PROTECTABLE AGA INST OVERLOADING

Nico Rombouts, Hoofddorp, Netherlands, assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 295,24 , Jan. 11, 1989, abandoned. This application Jan. 11, 991, Ser. No. 640,513
Claims priority, application European Pat. Off., Jan. 15, 1988, 88200063.1
Int. Cl.[5] B65G *13/06*
U.S. Cl. 198—789 2 Claims

1. A conveyor system with driven balls, in which each driven ball is supported by at least one driving roller, said driving roller having an axis which is located in a substantially horizontal plane through the center of the driven ball, and the driven ball is supported by a freely rotating element with the



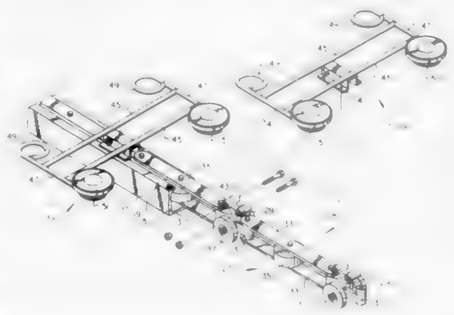
driven ball resting between the driving roller and the freely rotating element.

5,147,033

CONTINUOUS PROOFING AND BAKING APPARATUS HAVING MAGNETIC CONVEYOR SYSTEM

John P. Kasik, Dallas, Tex., assignor to Stewart Systems, Inc., Plano, Tex.

Continuation of Ser. No. 578,539, Sep. 7, 1990, Pat. No. 5,056,654, which is a continuation of Ser. No. 320,492, Mar. 8, 1989, Pat. No. 4,972,941, which is a continuation of Ser. No. 59,600, Jun. 8, 1987, Pat. No. 4,836,360. This application Aug. 2, 1991, Ser. No. 729,389
Int. Cl.[5] B65G *15/46*
U.S. Cl. 198—803.6 18 Claims



1. Apparatus for transporting products with grids carried by a conveyor chain along a track including at least one curve comprising:

at least one product pan,

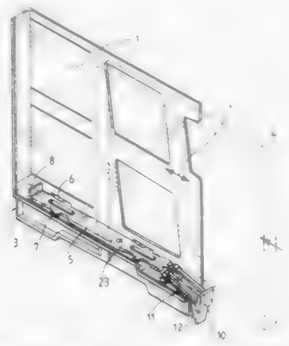
magnets mounted for limited movement relative to the grids for connecting said product pan to adjacent grids.

5,147,034

SLIDING RAIL LATCH MECHANISM

Robert M. Broadhead, Hall Farm Cottage, Chattisham, Ipswich, IP8 3PX, England, and David F. Whitehead, Romford, England, assignors to Robert M. Broadhead, Ipswich

Filed Aug. 21, 1991, Ser. No. 747,998
Claims priority, application United Kingdom, Apr. 22, 1991, 9108603
Int. Cl.[5] B65D *85/30;* A45S *13/18*
U.S. Cl. 206—1.5 10 Claims



1. A container adapted to contain at least one article, which container has access means whereby the article can be inserted into or removed from the container, the container being provided with a detent mechanism adapted to retain the article within the container, which detent mechanism comprises:

a. a sole plate member located adjacent the interior face of one wall of the container and adapted to move axially substantially parallel to the plane of that wall and to bear against a face of the article which is to be inserted into or removed from the container through said access means;

b. a biassed member adapted to move between an operative position towards which the member is biassed by a biassing means, at which the member engages the sole plate member so as to retain it against axial movement, and an inoperative position, at which the biassed member permits axial movement of the sole plate member; and

c. a stop member adapted to engage said article and to retain said article within the container when said biassed member engages the sole plate member in its operative position.

5,147,035

INTERLOCKING DIMPLE-HINGED DOOR BLISTER PACKAGE

Eric E. Hartman, Ridgefield, Conn., assignor to Chesebrough-Pond's USA Co., Greenwich, Conn.

Filed Apr. 17, 1991, Ser. No. 686,903
Int. Cl.[5] B65D *5/52*
U.S. Cl. 206—45.23 8 Claims

1. A thermoformed blister of flexible plastic material for a reclosable blister card display package to contain cotton swab sticks having a predetermined length comprising:

(a) a bubble body comprising

(i) an article compartment for holding a plurality of cotton swab sticks;

(ii) top, left, right and bottom peripheral flanges for sealing to a backing card to close the article compartment;

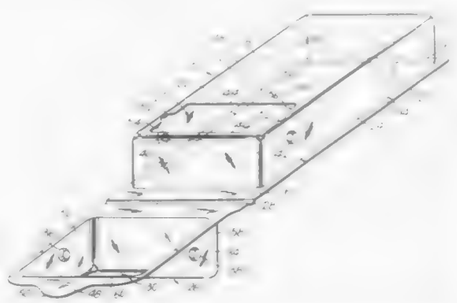
(iii) a body front face including a portion defining an egress opening in the body front face, said egress opening being slightly smaller than the predetermined length to enable said cotton swab sticks to pass therethrough, a pair of opening extension apertures being cut outward along opposite borders of said egress opening, said apertures being of a spaced apart dimension greater than the predetermined length to permit individual extraction of said cotton swab sticks from said compartment;

(iv) left and right body side walls each having a respective outer surface and perpendicularly flanking the body front face;

(v) means on each of the left and right body side walls for forming a seal; and

(b) a cover independent of the body and connected to a flange of the body by an integral hinge, the cover comprising

(i) a cover front face;



(ii) a means on the cover front face for sealing that face to the body front face;

(iii) a left and right cover side wall each having an inner surface, said respective inner surface being engageable and contacting a respective one of said outer surfaces of said left and right body side walls;

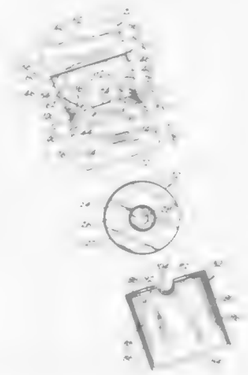
(iv) means on each of the left and right cover side walls for forming a seal, the sealing means of respective left and right cover and body side walls cooperating with one another, and said sealing means being a projecting button engaging a matchingly contoured depression.

5,147,036

COMPACT DISC PACKAGING SYSTEM

Raphael G. Jacobs, 130 Dean St., Harrington Park, N.J. 07640

Filed May 3, 1991, Ser. No. 695,574
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—232 15 Claims



1. A protective envelope for use in a packaging system for the transportation and storage of a compact disc having a

central aperture and a predetermined diameter, the protective envelope comprising:

a back sheet having a bottom edge, a top edge, a length extending longitudinally between the bottom edge and the top edge, opposite side edges and a width extending laterally between the opposite side edges, the length and width each corresponding essentially to the predetermined diameter of the compact disc;

an intermediate sheet having a bottom edge and being integral with the back sheet along the respective bottome dges of the back sheet and the intermediate sheet, the intermediate sheet extending laterally across the back sheet from adjacent one of the opposite side edges to adjacent the other of the opposite side edges to establish a pocket between the back sheet and the intermediate sheet, the intermediate sheet including a top edge and a length extending longitudinally between the top edge and the bottom edge of the intermediate sheet, the length of the intermediate sheet, all along the width fo the intermediate sheet, being less than one-half the predetermined diameter of the compact disc such that the pocket includes an opening at the top edge of the intermediate sheet and a longitudinal depth between the bottom edge of the intermediate sheet and the opening less than one-half the predetermined diameter of the compact disc so as to maintain at least a major portion of the compact disc and at least a major portion of the central aperture of the compact disc outside the pocket and thereby exposed for grasping when the compact disc is seated in the pocket; and

a front sheet having a top edge and being integral with the back sheet along the respective top edges of the front sheet and the back sheet, the front sheet having opposite side edges and a width extending laterally between the opposite side edges such that upon folding the front sheet into juxtaposition with the back sheet, the respective opposite side edges of the front sheet and of the back sheet will be juxtaposed, the front sheet further having a length extending longitudinally from the top edge a distance greater than one-half the diameter of the compact disc so as to overlap the opening of the pocket and enclose the compact disc, when seated in the pocket, between the front sheet and the back sheet;

including a protective jacket within whcih the protective envelope is inserted when the compact disc is placed in the protective envelope; and

the top edge of the back sheet and the top edge of the front sheet each have a lateral extent less than the predetermined diameter of the compact disc; and

the front sheet and the back sheet each include at least one side edge portion extending in a direction laterally inwardly from the width adjacent the opneing of the pocket, corresponding to the predetermined diameter of the compact disc, toward the respective top edges so as to establish an envelope portion tapered from a larger width adjacent the opneing of the pocket, toward a smaller width at the top edges for facilitating insertion of the envelope portion and the protective envelope into the protective jacket.

8. A packaging system for the transportation and storage of a compact disc having a central aperture and a predetermined diameter, the packaging system comprising:

a protective envelope for receiving the compact disc;

a protective jacket for receiving the protective envelope with the compact disc placed within the envelope;

the protective envelope including

a back sheet having a bottom edge, a top edge, a length extending longitudinally between the bottom edge and the top edge, opposite side edges and a width extending laterally between the opposite side edges, the length and width each corresponding essentially to the predetermined diameter of the compact disc;

an intermediate sheet having a bottom edge and being integral with the back sheet along the respective bottom edges of the back sheet and the intermediate sheet, the intermediate sheet extending laterally across the back sheet from adjacent one of the opposite side edges to adjacent the other of the opposite side edges to establish a pocket between the back sheet and the intermediate sheet, the intermediate sheet including a top edge and a length extending longitudinally between the top edge and the bottom edge of the intermediate. sheet, the length of the intermediate sheet, all along the width of the intermediate sheet, being less than one-half the predetermined diameter of the compact disc such that the pocket includes an opening at the top edge of the intermediate sheet and a longitudinal depth between the bottom edge of the intermediate sheet and the opening less than one-half the predetermined diameter of the compact disc so as to maintain at least a major portion of the compact disc and at least a major portion of the central aperture of the compact disc outside the pocket and thereby exposed for grasping when the compact disc is seated in the pocket; and

a front sheet having a top edge and being integral with the back sheet along the respective top edges of the front sheet and the back sheet, the front sheet having opposite side edges and a width extending laterally between the opposite side edges such that upon folding the front sheet into juxtaposition with the back sheet, the respective opposite side edges of the front sheet and of the back sheet will be juxtaposed, the front sheet further having a length extending longitudinally from the top edge a distance greater than one-half the diameter of the compact disc so as to overlap the opening of the pocket and enclose the compact disc, when seated in the pocket, between the front sheet and the back sheet;

the protective jacket including

a first panel having a top edge, a bottom edge, a length extending longitudinally between the top edge and the bottom edge, opposite side edges and a width extending laterally between the opposite side edges;

a second panel having opposite side edges and a width extending laterally between the opposite side edges, the second panel being integral with the first panel along corresponding respective side edges of the first and second panels;

a first fold line along said corresponding respective side edges for enabling folding of the first panel into juxtaposition with the second panel, the relative dimensions of the first and second panels being such that upon such juxtaposition of the first and second panels, the corresponding respective opposite side edges of the first and second panels are brought into close proximity with one another;

a third panel having opposite side edges and a width extending laterally between the opposite side edges, the third panel being integral with the second panel along corresponding respective side edges of the second and third panels, opposite the corresponding side edges along which the first and second panels are joined; and

a second fold line along said corresponding respective side edges where the third panel is integral with the second panel for enabling folding of the third panel into juxtaposition with the first and second panels, with the first panel interposed between the second and third panels;

the first panel including a pouch having an opening along the side edge of the first panel opposite the first fold line, the relative dimensions of the pouch and the protective envelope being such that the protective envelope may be inserted selectively into the pouch;

whereby upon insertion of the compact disc into the protective envelope and insertion of the protective envelope into the pouch, and subsequently folding the first and third panels into said juxtaposition with the second panel, the opening of the pouch will be secured between the second and third panels, adjacent the second fold line, to close the opening of the pouch and secure the protective envelope, and the compact disc therein, within the protective jacket.

5,147,037

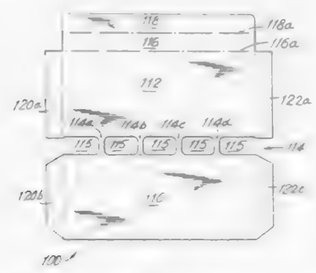
CARTON PROVIDING EASY ACCESS TO PACKAGED GOODS CONTAINED THEREIN

Donald H. Evers, Richmond; William C. Harris, Jr., Midlothian, and Robert E. Talley, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 774,529, Oct. 8, 1991. This application Jan. 28, 1992, Ser. No. 827,113

Int. Cl.[5] **B65D** *85/10, 25/00*

U.S. Cl. 206—256 **68 Claims**



1. A cigarette carton for packaging cigarette packs, said carton comprising:

a front wall having a top edge, a bottom edge, and two side edges;

a rear wall, spaced from said front wall, and having a top edge, a bottom edge, and two side edges;

first and second side walls connecting juxtaposed side edges of said front wall and said rear wall;

a first extension panel formed along said top edge of said rear wall for folding across the top of said carton to form a top wall, wherein said first extension panel has a free edge which lies adjacent said top edge of said front wall when said first extension panel is folded over the top of said carton;

a bottom wall extending from said bottom edge of said front wall to said bottom edge of said rear wall;

a second extension panel formed along said free edge of said first extension panel for securing to said front wall to close said carton;

at least one line of weakness substantially perpendicular to said free edge of said first extension panel and extending across the height of said second extension panel to define a portion of said second extension panel to be detached from said front wall when said carton is sealed, to access a portion of said cigarette packs contained within said carton; and

access means provided along said first extension panel and cooperating with said at least one line of weakness such that a portion of said first extension panel may be lifted when said portion of said second extension panel is detached to access said cigarette packs.

5,147,038

MULTIPLE VARIABLE TOOL HOLDER WITH INCLINING BORES

Albert M. Pergeau, 394 W. Meyers, Hazel Park, Mich. 48030

Filed Jul. 29, 1991, Ser. No. 737,357

Int. Cl.[5] **B65D** *85/20, 6/04;* **A47F** *7/00*

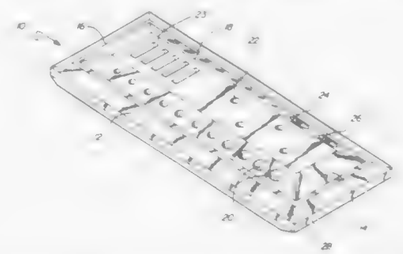
U.S. Cl. 206—373 **15 Claims**

1. A tool holder comprising:

a housing having opposed first and second sides that incline inwardly from a lower edge to an upper edge, and a planar, horizontally disposed top;

a first plurality of bores formed in said sides at spaced intervals thereon, each of such bores begin configured to receive a portion of one of tool therein such that said tool inclines outwardly with respect to said top; and

a second plurality of bores formed in said top at spaced intervals thereon and each configured to receive a portion of another tool therein, said second plurality of bores defining a first set alternating with a second set, the axes of



said first set of bores inclining outwardly toward said first side and the axes of said second set inclining outwardly toward said second side.

5,147,039

CONTAINMENT TRAY

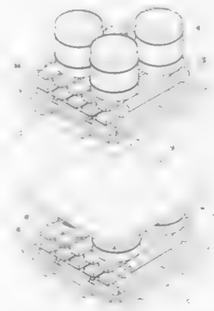
Lee G. Sechler, Westminster; Robert L. Eckert, and Don C. Aktins, both of Los Alamitos, all of Calif., assignors to Containment Corporation, Los Alamitos, Calif.

Continuation of Ser. No. 477,482, Feb. 9, 1990, Pat. No. 5,036,976, which is a continuation of Ser. No. 279,876, Dec. 5, 1988, Pat. No. 4,830,632. This application May 28, 1991, Ser. No. 706,293

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] **B65D** *85/62*

U.S. Cl. 206—386 **18 Claims**



1. A device for containing leakage of liquid from containers of hazardous liquid, said device comprising:

(a) a containment tray having a floor and a plurality of vertical side walls surrounding said floor and extending upwardly therefrom;

(b) a pair of parallel fork receiving channels sized and configured to receive the forks of a forklift beneath the floor of said containment tray;

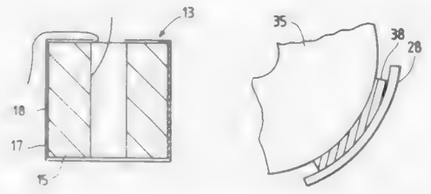
(c) a removeable support structure insertable into said containment tray so as to rest on the floor thereof said support structure comprising:

(i) a plurality of generally upright support members restable on the floor of said tray and extending upwardly therefrom; and,

(ii) a plurality of members positioned on said support members to form, in combination with said support members, a generally horizontal pallet support platform upon which a palletized load of containers may be positioned;

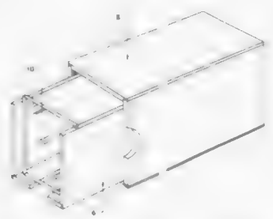
(d) said support structure being constructed and configured to permit liquid to drain into said containment tray; and,
(e) said pallet support platform being located at sufficient height relative to the side walls of the tray to permit a conventional forklift to, without interference from the side walls of the tray,
(i) deposit a palletized load of containers onto said platform; and,
(ii) remove said palletized load of container from said platform.

5,147,040
ROVING PACKAGE WRAPPER
Ryouzou Koike, and Mituhiro Hashimoto, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan
Filed Oct. 4, 1990, Ser. No. 592,919
Claims priority, application Japan, Oct. 6, 1989, 1-261484
Int. Cl.[5] B65H *85/67*
U.S. Cl. 206—410 13 Claims



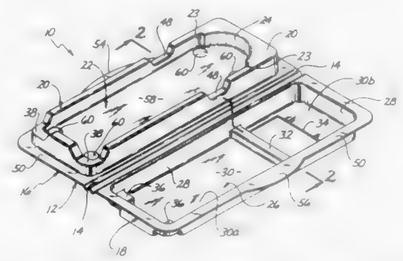
1. A roving package and wrapper comprising:
a roving package including roving wound into a substantially cylindrical configuration with an outer circumferential surface;
a heat-shrinking film wrapped about said outer circumferential surface of said roving package; and
a heat-bondable resin sheet interposed between said heat-shrinking film and the outer circumferential surface of said roving package to bond said sheet and said heat-shrinking film to said outer circumferential surface, said heat-bondable resin sheet having adhesive properties which are realized at temperatures associated with heat-shrinking of the heat-shrinking film such that the heat-shrinking film and the sheet are bonded to the roving package outer circumferential surface as the heat-shrinking film is heat-shrunk onto the roving package.

5,147,041
STORAGE CONTAINER FOR SPORTS CARDS
Richard Lemieux, 4022, 918-16th Ave., N.W., Calgary, AB, Canada T2M 0K3 , and Terrence Neufeld, 1088, Marcombe Drive N.E., Calgary, AB, Canada T2A 4J8
Filed Apr. 29, 1991, Ser. No. 692,989
Int. Cl.[5] B65D *25/54, 85/48*
U.S. Cl. 206—449 7 Claims



1. A container for the storage of multiple sports cards whereby said cards are maintained in pristine condition, comprising:
(a) an external enclosure having a plurality of walls each of said walls being fixed in relationship to the other and forming a generally rectangular shaped container open at one end; and
(b) an internal enclosure having a transparent front wall for viewing the cards, a rear wall, two side walls and two bottom walls with said walls cooperating to form a generally rectangular shaped container open at the top with a longitudinal aperture at the bottom comprising a random access means to facilitate the retrieval of any given card and said internal enclosure constructed to be separable from said external enclosure and slidably insertable and removable in said external enclosure.

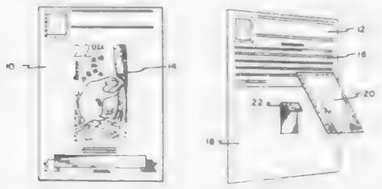
5,147,042
HOLDER FOR MEDICAL SPECIMEN SLIDE
Abner Levy, 325 N. Oakhurst Dr., P4, Beverly Hills, Calif. 90210
Filed Mar. 8, 1991, Ser. No. 666,891
Int. Cl.[5] B65D *85/48*
U.S. Cl. 206—456 8 Claims



1. A unitary holder for a medical specimen slide formed from a single originally planar thin sheet of moldable material into a three dimensional structure wherein said sheet retains a substantially uniform thickness throughout said holder, said sheet divided along a hinge line into a tray portion and a cover portion and having a peripheral flange defining a base plane in an open condition of said holder:
a male ridge structure rising above said plane on said tray portion, said ridge structure defining a tray recess including a tray bottom dimensioned to receive the specimen slide;
a concave shell formed below said plane in said cover portion, said shell defining a cavity including a cover top and a side wall adapted to mate onto said ridge structure in a folded condition of said holder for covering said slide; and
spacer means integral with said sheet for supporting said slide in spaced relationship away from contact with said tray bottom and said cover top.

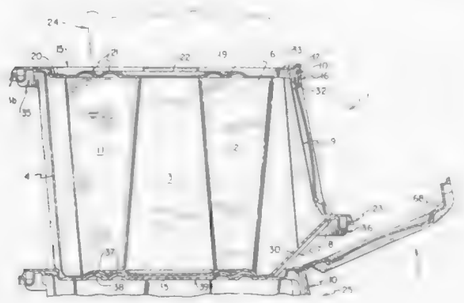
5,147,043
COLLECTOR CARD DEVICE FOR STAMP COLLECTORS
John C. Gould, 12 Mine Hill Rd., West Reading, Conn. 06896
Filed Jun. 10, 1991, Ser. No. 712,704
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—457 2 Claims

1. A collector card device for stamp collectors comprising:
a postage stamp issued by an appropriate organization and having a gummed rear surface;
a thin flat durable collector card having opposite front and rear surfaces, the front surface carrying a reproduction of the front surface of said stamp, the rear surface of the card carrying explanatory data applicable to said reproduction and also having a region spaced from the data; and



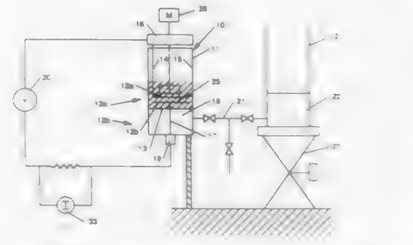
a stamp hinge for detachably securing the rear surface of the stamp to the region on the rear surface of the card.

5,147,044
STACKABLE STORAGE CONTAINER
Frank J. DiSesa, Jr., Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Continuation of Ser. No. 480,239, Feb. 15, 1990, Pat. No. 5,038,937. This application May 14, 1991, Ser. No. 699,739
Int. Cl.[5] B65D *21/02*
U.S. Cl. 206—501 8 Claims



1. A stackable container comprising:
a molded plastic container body having bottom, back and side walls joined to form an open top and an open front, each of said sidewalls having a front section with exposed front edges sloping downwardly from the top thereof to define a downwardly sloping front opening, an extension piece angled upwardly from the front end of the bottom wall intersecting the downwardly sloping side wall front sections front edges, the top edge of the extension piece defining the bottom edge of the downwardly sloping front opening, a continuous flange forming a border abound the edges of the back and side walls forming the open top and bottom wall of the upwardly angled extension piece forming the open front,
a removable lid, sized to cover the open top and having a mating flange defining its periphery, the lid mating flange having a recess sized to accept the back and side wall continuous flange,
a front cover hingedly attached at one end to the lid, the front cover sized to cover the body front opening and having a mating flange sized to accept the side wall front and bottom wall extension piece of the container body flange therein.

5,147,045
PARTICULATE SEPARATIONS BY ELECTROSTATIC COALESCENCE
Sheng-Ming B. Chi, Pittsburgh, and Robin R. Oder, Export, both of Pa., assignors to Exportech Company, Inc., New Kensington, Pa.
Filed Nov. 28, 1988, Ser. No. 277,018
Int. Cl.[5] B03B *1/04;* B03C *5/00;* C10G *33/04*
U.S. Cl. 209—9

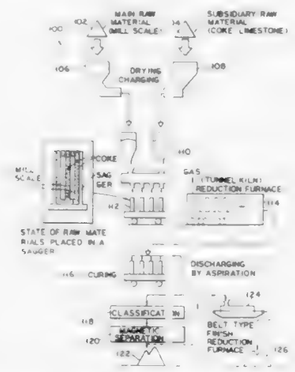


1. A method for separating hydrophilic particulates from hydrophobic particulates, said method including the steps of:
a. mixing said hydrophilic and hydrophobic particulates in an emulsion of water and an organic liquid, said emulsion including an emulsifier;
b. placing the emulsion in an electrostatic separator adjacent a layer of a primarily water phase so as to create a water-/emulsion interface, at least a portion of said emulsion being located between an upper and lower electrode, said upper and lower electrodes being spaced apart and being substantially parallel to one another, said interface lying below and in close proximity to said lower electrode;
c. coalescing at least a portion of said water in said emulsion by passing an electric field between said electrodes, said coalesced water forming substantially tubular sections extending substantially vertically between the electrodes, with at least a portion of said hydrophilic particulates being encased in said tubular sections, said hydrophobic particulates remaining substantially uniformly distributed and suspended in said organic liquid;
d. removing said hydrophilic particulates from said coalesced water through settling, whereby said hydrophilic particulates pass through said tubular sections and cross said water/emulsion interface and settle in agglomerates in said primarily water phase.

5,147,046
GRAVITY SEPARATION METHOD USING IRON POWDER
Masamichi Hata, and Manabu Futamata, both of Kitakyushu, Japan, assignors to Kyusyumetal Industry Co., Ltd., Kitakyushu, Japan
Continuation-in-part of Ser. No. 492,207, Mar. 12, 1990, abandoned, which is a continuation of Ser. No. 255,654, Oct. 7, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 559,307
Claims priority, application Japan, Apr. 15, 1988, 63-92844
Int. Cl.[5] B03B *5/30*
U.S. Cl. 209—172.5 1 Claim

1. A gravity separation method using an iron composition powder comprising mixing and suspending said iron composition powder composed of fine particles having a size of 40 microns or less in water to form a liquid suspension having specific gravity within the range of 2.6 to 3.5, and pouring non ferrous metals or ores into said specific gravity liquid suspen-

sion so as to subject said nonferrous metals or ores to sink-float separation wherein said powder used for said specific gravity



liquid has surfaces with oxide films composed of Fe_3O_4 and insides composed of carbon steel

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5,147,047

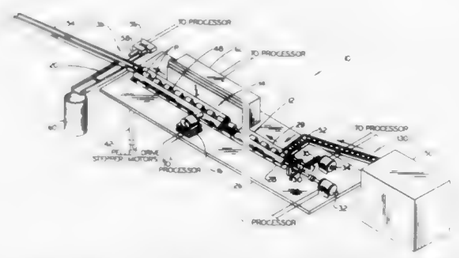
PELLET INSPECTION SYSTEM

Hassan J. Ahmed, Irmo, S.C.; John M. Beatty, Murrysville, and Ralph W. Kugler, Mt. Lebanon Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 14, 1991, Ser. No. 640,770

Int. Cl.[5] B07C *5/02*

U.S. Cl. 209—538 **26 Claims**



1. A method of inspecting cylindrically configured pellets for surface defects comprising the steps of

optically sensing the entire peripheral surface of a pellet as a series of sets of discrete digital values representative of different axially extending linear portions of the peripheral surface of a pellet,

generating a set of discrete digital values representative of the optically sensed portions of the pellet surface,

forming an image of the entire peripheral surface of the pellet from said series of sets of discrete digital values,

identifying the digital values corresponding to the edges of the pellet,

calculating the area circumscribed by the edges of the pellet and rejecting the pellet is the calculated value is greater than a predetermined amount.

5,147,048

SORTING LINE FOR PROCESSING ENVELOPES, PARTICULARLY FOR PHOTOGRAPHIC LABORATORIES

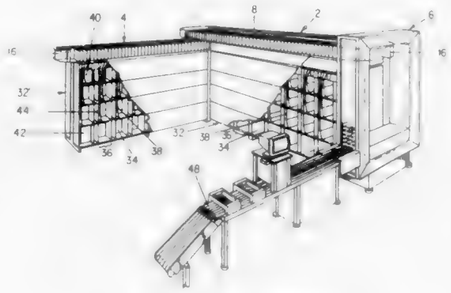
Roberto Signoretto, Olmo di Martellago, Italy, assignor to Systel International S.p.A., Milan, Italy

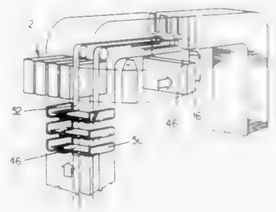
Filed Oct. 17, 1990, Ser. No. 599,012

Claims priority, application Italy, Oct. 24, 1989, 84158 A/89

Int. Cl.[5] B07C *5/342;* **B65G** *47/46*

U.S. Cl. 209—698 **8 Claims**





1. A sorting line for processing envelopes for photographic laboratories, comprising:

a feeder unit of the processing envelopes to be sorted;

a main leg for supporting and guiding a first endless conveyor for a plurality of boxes provided with a base which opens under a command correlated with the position of the boxes along their path, said boxes being individually fed by said feeder unit;

at least one branch leg for supporting and guiding a second endless conveyor for a plurality of boxes substantially similar to the boxes of the main leg, said branch leg being located at a lower level than the main let, the arrangement of each branch leg with respect to the main leg being such that there exists at least one position in which a box of the first conveyor is exactly above a box of the second conveyor wherein the feeder unit comprises a tray elevator which receives individual envelopes from a feed line and after raising them to a height exceeding the upper edge of said boxes inserts them, when in a predetermined position, into an underlying box ready to receive them, and wherein said tray elevator extends vertically through at least one section to raise the horizontally arranged processing envelopes to a height exceeding the upper edge of said boxes, and then extending horizontally through a further section to convey the now vertically arranged processing envelopes to the region for their insertion into the underlying boxes, and said feeder further comprises a belt conveyor extending within said tray elevator to prevent movement of the processing envelopes relative to the trays, the horizontal portion of said belt conveyor extending as far as the region in which the envelopes are inserted into the boxes.

5,147,049

SKI HOLDER

Horst Schwendemann, and Friedwald Joos, both of Geislingen, Fed. Rep. of Germany, assignors to E. Raff Maschinenbau GmbH, Fed. Rep. of Germany

Filed Jul. 10, 1991, Ser. No. 727,905

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1990, 9010649[U]

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—70.5 **4 Claims**

1. A ski holder for the temporary, theft-proof storage of skis with a support structure, to which a lockable ski-holding device is attached, characterized in that

(a) said support structure comprises at least one guide tube (1) extending vertically;

(b) said ski-holding device (10) being attached to said guide tube (1) so that it is infinitely adjustable;

(c) said ski-holding device (10) comprising a coin-operated locking device (4) that includes a key (15) which actuates a bolt that prevents the removal of the skis in storage and allows removal of the key (15) solely after the insertion of a coin, and

(d) said ski-holding device (10) also including a guide bracket (3) engaging around said guide tube (1), which bracket tilts with respect to the guide tube (1) under the weight of the ski-holding device (10) and is secured axially thereby.

5,147,050

CUSTOM HANGING RACK WITH INTERCHANGEABLE SUPPORT HOOKS AND METHOD THEREFOR

Lawrence E. Cullen, Chicago, Ill., assignor to Surface Sciences, Inc., Chicago, Ill.

Filed Jun. 27, 1991, Ser. No. 722,133

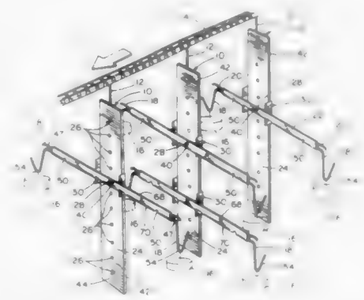
Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—118 **17 Claims**

1. A support rack for supporting workpieces during transport through a finishing station, comprising:

a support frame including a crossbar having an elongated, substantially enclosed hollow interior with a pair of ends, one of which is a hollow open end and a detent extending into said hollow interior spaced inwardly from said hollow open end; and

a support hook having a workpiece engaging portion and a resiliently deformed crossbar engaging portion which releasably engages with the crossbar and the detent upon



insertion of the support hook into said open end of the crossbar.

5,147,051

HOISTING DEVICE FOR INDIVIDUALS

Gunnar Liljedahl, Alvik 7555, S951 50 Lulea, Sweden

Filed Jun. 5, 1991, Ser. No. 710,806

Claims priority, application European Pat. Off., Jun. 6, 1990, 90850229

Int. Cl.[5] A61G *7/14;* **B66C** *17/00*

U.S. Cl. 212—214 **2 Claims**

1. A hoisting device, preferably for hoisting individuals, whereby the hoisting device is mounted on an higher level than that at which the individual is situated, comprising:

a bracket having a first end and a second end which can be mounted on a wall, a ceiling or a stand; a driving means mounted on the bracket at the first end of the bracket;

a piston mounted within the bracket, attached to the driving means whereby the driving means can displace the piston longitudinally within the bracket;

a slide mounted within the bracket which is free to slide longitudinally within the bracket; and wherein the slide is fixed to an end of the piston which is not attached to the driving means; and whereby the slide is moved by the piston as the piston is moved by the driving means;

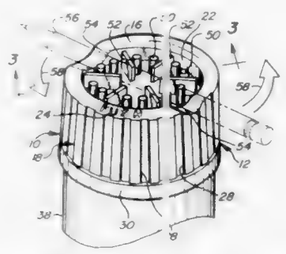
at least one guide roller mounted on the slide;

at least one pulley wheel mounted on the second end of the bracket;

a trolley mounted on guide rails which guide rails are

mounted on the bottom of the bracket such that the trolley can slide along the length of the bracket;
a pair of guide pulleys mounted on the trolley;
a band which is attached at one end near the top of the second end of the bracket by a first attachment means and is attached to the bracket near the first end by a second attachment means;
the band runs from the first attachment means, over and around the guide roller, then runs over and around the pulley wheel, then runs over and around the first guide pulley, down into a loop, up over the second guide pulley, and to the second attachment means; and
the loop is extended and retracted by moving the slide toward and away from the guide roller whereby less or more band length is required to reach from the guide roller to the pulley wheel.

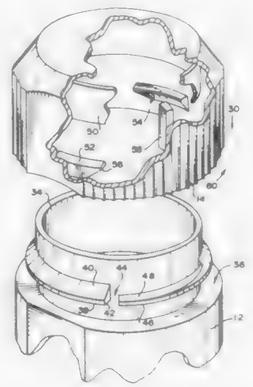
5,147,052
CHILD RESISTANT CLOSURE
Jeffrey C. Minette, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.
Filed Sep. 30, 1991, Ser. No. 769,928
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—215 **13 Claims**



1. A two-piece child restraint closure for a container having a threaded neck comprising, in combination:
an inner cap having a top and a skirt depending from the periphery of said top with internal threads for engaging the threaded container neck;
an outer driver cap having an open center top and a skirt depending from the outer periphery of said top within which said inner cap is retained;
drive means on said inner and outer cap allowing the closure to be threaded onto the container neck by rotation of the outer cap but allowing the outer cap to rotate freely in an unthreading direction until the outer cap is manipulated to drivingly engage the inner cap; and
engagement means including diametrically opposed projections on the top of the inner cap accessible through the open center of the outer cap which projections can be engaged to permit unthreading rotation of the inner cap relative to said container whether or not said drive means is engaged.

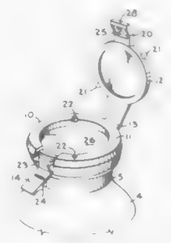
5,147,053
CONTAINER WITH CHILD PROOF CLOSURE
Reginald Friedenthal, Johannesburg, South Africa, assignor to Daredi Products Close Corporation, Johannesburg, South Africa
Filed Sep. 30, 1991, Ser. No. 767,660
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—216 **11 Claims**

1. A container which includes a body, a neck on the body, a peripheral formation on the neck, the peripheral formation including a deformable portion, and a closure which is engageable with the neck, the closure including retaining means which engages with the peripheral formation thereby to restrain the closure from being drawn off the neck, the closure being axially movable to a limited extent towards the body and including a member which thereby deflects the deformable



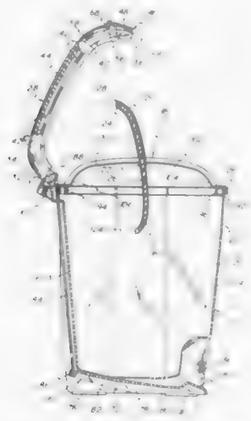
portion to form a pathway along which the retaining means can be moved to permit disengagement of the closure from the neck.

5,147,054
TAMPER-PROOF CONTAINER
Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207
Filed May 20, 1991, Ser. No. 702,897
Int. Cl.[5] B65D *41/00*
U.S. Cl. 215—253 **15 Claims**



1. A tamper evident container for over-the-counter drugs or the like, the container comprising:
(a) a contents holding portion terminating in a mouth;
(b) a two part closure including a cap ring and a cap, said cap ring including securing means to substantially non-removably secure said cap ring about said mouth;
(c) a tamper tab projection formed to a first of said cap and said ring by a frangible tear region prior to initial opening of said closure; said tamper tab projection mating with a tamper tab receiving region on a second of said cap and said ring when said cap is closed and prior to the initial opening of said closure; and
(d) said tamper tab projection being connected to said receiving region by welding means such that said tamper tab projection is fixedly secured to said tamper tab receiving region such that said frangible tear region must be ruptured to open said container.

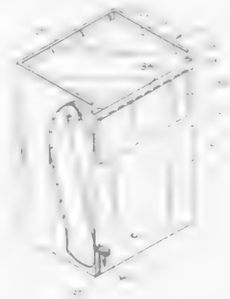
5,147,055
DIAPER CONTAINER
Jeffery T. Samson; Roy E. Knoedler, both of Boulder, and Patrick M. Bertsch, Littleton, all of Colo., assignors to Gerry Baby Products Company, Denver, Colo.
Filed Sep. 4, 1991, Ser. No. 755,013
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—254 **20 Claims**



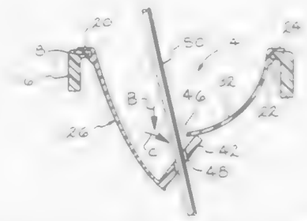
1. A container for storing diapers comprising:
a container body portion forming a receptacle for receiving diapers, said body portion having an upper edge, a lower edge and front and rear sides,
an outer lid forming a closure over said body portion and having an exterior and an interior surface and a front and a rear edge,
a pivot mounting for supporting said rear edge for pivotal movement such that said front edge may be lifted away from said body portion to an open position,
first odor absorbing means attached to said interior surface of said outer lid,
an interior flap located adjacent to said upper edge and forming an odor barrier between said body portion and said lid, said flap including a front portion and a rear portion,
pivot means for mounting said flap for pivotal movement intermediate said front and rear portions,
a bag retaining ring extending around the periphery of said upper edge such that a bag may be held in position within said body portion by said retaining ring, and
a cover member removably positioned over said retaining ring, said pivot means including surfaces formed on said cover member for engaging cooperating surfaces on said flap.

5,147,056
FOOT ACTUATED OPENER FOR TRASH BIN
Mark Ma, 1415 Martens Dr., Hammond, La. 70401
Filed Jan. 16, 1990, Ser. No. 466,000
Int. Cl.[5] B65O *43/26*
U.S. Cl. 220—263 **7 Claims**

1. An apparatus for opening a door of a container, without the use of one's hands, the apparatus comprising:
a) a four wall container, with at least one wall having a hinged door along its upper portion, normally in a closed position forming a portion of the wall;
b) a foot pedal, positioned substantially along the lower portion of the wall, the foot pedal protruding outward from a slot in the front wall of the four wall structure, and movable between a first up position to a second down position when a person's foot forces the foot pedal to the down position;
c) a line extending between the foot pedal and the hinged door, so that upon downward movement of the foot pedal, the line would pull the hinged door from the closed position, to a position so that the door allows access into the container while the foot pedal is in the down position; and means intermediate the foot pedal and the door for allowing upward swinging of the door when the foot pedal is moved downward.



5,147,057
INVERTED CLOSURES FOR BEVERAGE CONTAINERS
Dennis L. Marshall, Wauwatosa; Bora Tekkanat, Milwaukee, and Bryan L. McKinney, Mequon, all of Wis., assignors to Hoover Universal, Inc., Plymouth, Mich.
Filed Oct. 18, 1990, Ser. No. 599,501
Int. Cl.[5] B65D *41/32*
U.S. Cl. 220—268 **4 Claims**



1. A single service container adapted to be filled with a beverage that is to be consumed through a straw inserted into the container, said container comprising:
a hollow body having upright side walls defining a cavity and having an annular mouth formed at an upper end thereof;
a closure cap in sealing engagement with said mouth, said closure cap including a recessed portion being generally interiorly recessed toward said cavity, said recessed portion being positioned substantially concentrically with respect to said mouth and having a recessed center section and an outer edge section being located radially outwardly from said center section, a score line formed in said recessed portion and defining a tab having a free end and a fixed end, actuator means extending upwardly from said tab and being integrally formed therewith, said actuator means being manually operable to effect substantial separation of said tab from said recessed portion along said score line and said free end thereby defining and forming a container opening in said center section of said recessed portion of said closure cap, said fixed end of said tab being fixedly connected to said recessed portion in said outer

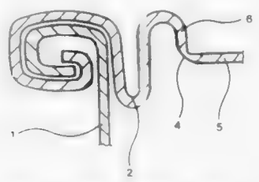
edge section of said recessed portion and said free end extending into said center section, said tab being flexible through said container opening toward said cavity during substantial separation from said recessed portion, said actuator means being engagable with said recessed portion adjacent said score line so as to maintain said tab in a stable position depressed into said container cavity at a position below said container opening after substantial separation of said tab from said recessed portion, said actuator means having a straw opening formed therein, said straw opening in connection with said tab being fixedly connected at said outer edge section of said recessed portion enabling unobstructed access by straw through said container opening and said straw opening into said cavity.

5,147,058

EASILY OPENED METAL LID FOR A CONTAINER

Jean-Francois Secondé, Metz, and Gerard Heurteboust, Roussy-le-Village, both of France, assignors to Sollac (Societe Anonyme), Paris, France

Filed Oct. 26, 1990, Ser. No. 604,974
Claims priority, application France, Oct. 27, 1989, 89 14383
Int. Cl.[5] B65D *17/40*
U.S. Cl. 220—276 5 Claims



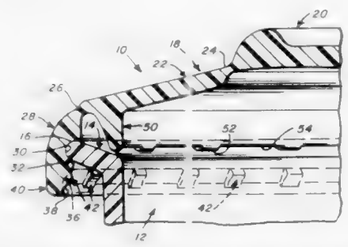
1. Lid for a sealed container openable along a line of reduced strength by merely exerting a pull thereon, said lid comprising a sheet of steel having at thickness of not more than 0.16 mm, a horizontal wall having a first thickness, a vertical wall having the first thickness and, a substantially right-angled fold therebetween, said fold constituting said line of reduced strengh and having a curved inner wall and a curved outer wall, said fold having a second, lesser, thickness than said first thickness and being a result of a drawing operation on the sheet of steel.

5,147,159

SEAL WITH AUTOMATIC RELEASE

Eskil H. Olsen; Stig Lillelund, both of Gentofte, Denmark, and Robert H. C. M. Daenen, Erembodegen, Belgium, assignors to Dart Industries Inc., Deerfield Ill.

Filed Sep. 4, 1991, Ser. No. 754,863
Int. Cl.[5] B65D *43/04*
U.S. Cl. 220—281 19 Claims



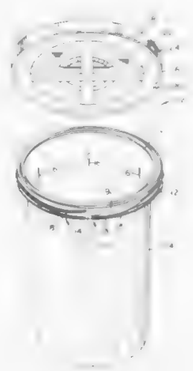
1. A seal adapted to mount to an outwardly directed rim portion of a container, the rim portion having a peripheral lip; said seal comprising a top panel including a central section, a lever section peripherally about and extending outwardly from said central section thereabout and terminating in an outer edge portion, and hinge means integrally joining said lever section to said central section for pivotal movement of said lever section relative to said central section, an imperforate side wall integral with and depending from said outer edge portion of said lever section, fulcrum means integral with and depending from said lever section in spaced relation between said hinge means and said side wall and relatively closer to said side wall, said fulcrum means being selectively engageable with the container rim portion for fulcrum movement of said lever section and an upward and outward movement of said side wall upon a depression of said top panel adjacent said hinge means, said side wall having an inner surface, a concavity defined in said inner surface continuously along said side wall and downwardly spaced from said lever section for a hermetic sealed positioning of the rim lip therein upon downward movement of said seal on the container rim portion, said concavity being defined in part by a convexity on said inner surface coextensive with said concavity and immediately therebelow, first vent means for maintaining an air flow communication transversely across said fulcrum means when said fulcrum means is selectively engaged with the container rim portion for fulcrum movement of said lever section, and second vent means through said convexity for maintaining air flow a said seal is moved to position the container rim lip into said concavity.

5,147,060

SAFETY CONTAINER

William Lima, Monmouth Beach; Earl V. Lind, Brick; Philip D. Bartlett, Holmdel, all of N.J., and Michael R. McGrath, Colton, Calif., assignors to Russell-Stanley Corporation, Red Bank, N.J.

Filed Nov. 1, 1991, Ser. No. 786,394
Int. Cl.[5] B65D *41/04*
U.S. Cl. 220—288 4 Claims



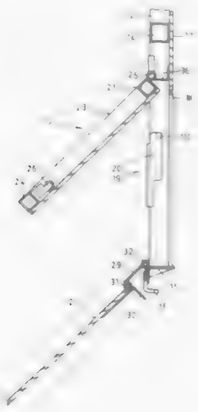
1. A safety closure assembly comprising;
a) a bucket having a circular opening;
b) a pitched thread on the exterior of the circular opening on the bucket;
c) a cover having a depending rim sized to fit the bucket opening;
d) a pitched thread on the interior of the depending rim of the cover;
e) ratchet teeth on the outer periphery of the bucket opening;
f) means on the cover for cooperating with the ratchet teeth to enable uninhibited securement of the cover to the bucket and to prevent removal of the cover without the constant application of force on said means comprising;
i) a ratchet pawl stop having a leading edge that extends beyond the interior surfaces of the cover into engagement with the ratchet teeth on the periphery of the bucket opening when the cover is secured to the bucket; and
ii) a means for removing the leading edge of the ratchet pawl stop from engagement with the ratchet teeth comprising a hinge at the end of the ratchet pawl stop opposite the leading edge of the ratchet pawl stop; a post located at an intermediate position between the hinge and the leading edge of the ratchet pawl stop; whereby the inner surface of the ratchet pawl stop bears against said post and force applied to the exterior surface of the stop between said hinge and said post rotates with the leading edge of the ratchet pawl stop out of engagement with the ratchet teeth; and
g) a depending rim on the exterior of the bucket opening on which said thread and ratchet teeth are mounted.

5,147,061

CONTAINER DISCHARGE SIDE DOOR

Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah, New South Wales 2229, Australia

PCT No. PCT/AU90/00557, § 371 Date Jul. 22, 1991, § 102(e) Date Jul. 22, 1991, PCT Pub. No. WO91/08149, PCT Pub. Date Jun. 13, 1991
PCT Filed Nov. 19, 1990, Ser. No. 730,852
Claims priority, application Australia, Nov. 29, 1989, PJ7611
Int. Cl.[5] B65D *88/00*
U.S. Cl. 220—334 9 Claims



1. A discharge side for a container to permit the gravity discharge of flowable non-liquid material from a plastic bag housed in the container where the container is comprised of a multi-sided circumscribing wall means and a base, said discharge side comprises a rectangular frame with a top rail, a bottom rail and two uprights which join the respective ends of the said rails and a covering for said frame comprised of an upper covering sheet mounted on said frame and terminating with a bottom edge spaced from the bottom rail and a lower covering sheet which extends between the bottom edge of the upper covering sheet and the bottom rail of said frame, hinge means connects the lower covering sheet to the frame so the lower covering sheet is outwardly downwardly movable between said uprights and relative to said frame, an upwardly outwardly opening gate is hingedly connected to said frame and locking means is provided to releasably lock said gate closed in overlying relationship with the lower covering sheet thereby to retain said lower covering sheet in an operative position as a substantially coplanar extension of said upper covering sheet.

5,147,062

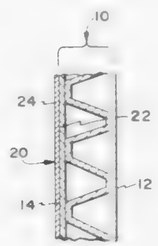
PAPER PACK CONTAINER WITH INTERNAL BAG FOR RECEIVING FLUIDS

Erich Heuberger, Taxisstrasse 22, D-7925 Trugenhofen, and Karl-Josef Ehrhart, Ludwig-Richter-Strasse 40, D-7920 Heidenheim, both of Fed. Rep. of Germany

PCT No. PCT/EP90/00779, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990, PCT Pub. No. WO90/14292, PCT Pub. Date Nov. 29, 1990
PCT Filed May 14, 1990, Ser. No. 634,149
Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915899
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—410 13 Claims

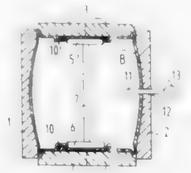
1. A pack container having an outer shell formed from an elongated carton blank and an inside bag for receiving fluids, said outer shell having two large elongate main panels parallel to each other, defined by longitudinal and transverse edges, respectively, two side surface areas extending vertically from said main panels between same, a bottom panel and a head panel, the two latter each extending between the main panels as well as between the side surface areas, said shell being pre-glued at a flap provided at a transverse edge common to said bottom panel and one of said main panels and interconnecting said bottom panel and said main panel to form a pre-glued, folded carton which is uprighted from a collapsed condition into a tubular body having a rectangular cross-section, at least one of the longitudinal edges of each main panel having an upper portion to roughly half of the amount of its length running slanted so as to provide the shell with a trapezoidal profile in an upper portion thereof, with the lower portions of said longitudinal edges running parallely to each other, wherein at each one of said lower portions of said longitudinal edges a lower side flap is provided, folded vertically from said main panel, so that the lower side flap provided at one of said main panels covers the lower side flap provided at the other of said main panels and glued thereto, and at each one of said slanted portions of said longitudinal edges an upper side flap is provided, folded vertically from said main panel, so that each upper side flap of one main panel is opposite to a respective upper side flap of the other main panel, so as to form a pair of opposite upper side flaps, and wherein each pair of opposite upper side flaps is covered by a common cover flap extending from an upper end of the outer one of the corresponding lower side flaps and is glued onto said upper side flaps, said cover flaps being in turn partially covered by flaps extending from the head panel and glued onto said cover flaps, and wherein said bag is formed from a liquid-tight tube of a plastic film arranged in said shell and having a weld running parallely to the transverse edges of said main panels, said tube having ends being closed off by welds running parallely to the longitudinal edges of said main panels.

5,147,063
TITANIUM ALUMINIDE STRUCTURE
John K. Pulley, Huntington Beach, and George W. Stacher, Westminster, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Feb. 4, 1991, Ser. No. 650,159
Int. Cl.[5] B65D *25/14*; F17C *1/00*; B32B *15/00*
U.S. Cl. 220—454 19 Claims



9. A storage container for hydrogen fuel materials, comprising an outer wall of titanium aluminide material fashioned into a predetermined hydrogen fuel containing shape, and an inner wall of titanium aluminide material covering said outer wall and being exposed to the hydrogen fuel materials within said container, said inner wall being formed of a gamma-phase titanium aluminide material.

5,147,064
METHOD AND DEVICE FOR MANUFACTURING A PLASTIC CONTAINER WITH REINFORCED END WALLS
Godefridus H. J. Jonkers, Helmond, and Cornelis J. Jansen, Rijen, both of Netherlands, assignors to Wiva Verpakkingen B.V., Netherlands
Filed Jul. 8, 1991, Ser. No. 726,805
Claims priority, application Netherlands, Jul. 10, 1990, 9001573
Int. Cl.[5] B65D *1/24*
U.S. Cl. 220—651 5 Claims

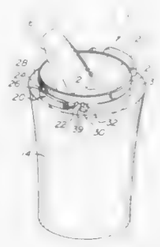


1. A blow-moulded container which includes two opposite end walls and a side wall extending between said opposite end walls, said end walls and said side wall defining an interior chamber within said container, each of said end walls including a ridge which extends into said interior chamber and a plate element, one of said two plate elements including support means for supporting construction elements which extend within said interior chamber.

5,147,065
DISPOSABLE CUP LID HAVING A TEAR-RESISTANT STRAW SLOT
Jonathan E. Rush, Phillipsburg, N.J., and Robert J. Linnander, Nazareth, Pa., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Nov. 4, 1991, Ser. No. 787,639
Int. Cl.[5] B65D *51/00*
U.S. Cl. 220—709 18 Claims

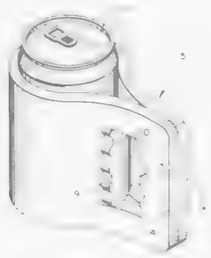
1. A straw-insertable lid for a drinking cup comprising;
a flexible disk-like body having a top surface;
a plurality of intersecting lines of weakness each extending between two ends, said lines of weakness located on the body and adapted to permit the insertion of a drinking straw through said top surface and thus into the drinking cup;
wherein the body is further provided with tear-stopping lines of weakness transverse to said intersecting lines of weakness, and spaced from the ends thereof.

5,147,066
CHILD'S OR INFANT'S DRINKING CUP ASSEMBLY WITH DUAL LOCKING MECHANISMS
Donna Snider, 3381 W. Newark, Lapeer, Mich. 48446
Filed Aug. 19, 1991, Ser. No. 746,897
Int. Cl.[5] A47G *19/22*
U.S. Cl. 220—717 9 Claims



9. A baby's or child's drinking cup assembly for containing and dispensing fluids comprising:
a cup portion having a fluid holding cavity and an upwardly facing annular top surface;
said annular to surface of said cup portion having at least two stops;
a lid portion having a spout and a spout chamber;
said spout having at least one access hole;
means for engaging said lid portion to said cup portion;
said spout chamber of said lid portion providing a passage between said at least one access hole and said fluid holding cavity; and
means for locking said lid portion to said cup portion, said means for locking comprising at least two locking mechanisms on said lid portion;
one of said at least two locking mechanisms on said lid portion lockingly engaging one of said at least two stops on said annular top surface of said cup portion;
another of said at least two locking mechanisms on said lid portion lockingly engaging another of said at least two stops on said annular top surface of said cup portion.

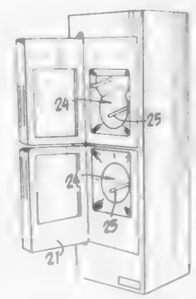
5,147,067
INSULATED JACKET FOR BEVERAGE CONTAINER
Charles E. Effertz, Wayzata, Minn., assignor to EBI, Victoria, Minn.
Filed Dec. 2, 1991, Ser. No. 801,382
Int. Cl.[5] B32B *3/26*
U.S. Cl. 220—739 5 Claims



1. A handled open-ended, single layer, elastic thermal insulator for a cylindrical beverage container comprising:
(a) a flat generally rectangularly-shaped strip of flexible, elastic, expanded thermal insulating material having opposite terminal portions;
(b) each of said terminal portions having a free-swinging tab section disposed inwardly of outer ends of said terminal portions and being swingable inwardly of a remainder of said terminal portions into over-lapping relation to each other;
(c) cooperative engagement means carried by each of said free-swinging tab sections in position to cooperatively inter-engage each other when said strip is placed in encircling relation to the container and said tab sections are so over-lapped to thereby secure said strip in close-enclosing relation to the container; and
(d) the remainder of said terminal portions extending radially outwardly relative to said tab sections in the form of closed loops when said strip encircles the cylindrical container and said cooperative engagement means of said tab sections are so interengaged to thereby constitute handles for said strip to support the strip and the container so secured therewithin.

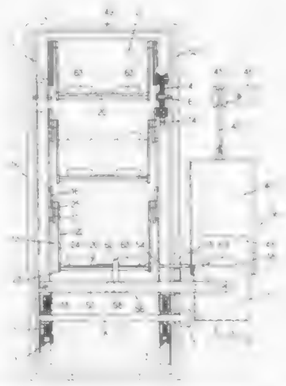
5,147,068
AUTOMATED FOOD VENDING SYSTEM
Christopher B. Wright, San Francisco, Calif., assignor to Wright Food Systems, Inc., San Francisco, Calif.
Filed Jan. 16, 1991, Ser. No. 641,885
Int. Cl.[5] G07F *11/00*
U.S. Cl. 221—9 14 Claims

1. An automated food vending system comprising:
holding means including a plurality of stacks for holding respective stacks of food package units having a predetermined standardized shape;
a dispenser mechanism for dispensing a food package unit from any selected one of the holding stacks to a dispenser outlet;
a microwave oven having a code reader located in a predetermined position in an interior cavity of the oven, said microwave oven having a door at a front portion thereof which is openable to allow insertion of a food package unit into the interior cavity of the oven, and interior walls defining the interior cavity in a predetermined shape for receiving the predetermined standardized shape of the food package units such that the shaped interior cavity functions to constrain insertion of a standardized-shape food package unit therein to substantially one degree of freedom of insertion movement, and said code reader being located in the predetermined position in the interior



cavity so as positioned for reading a predetermined portion of the food package unit when it is inserted in the interior cavity constrained to the one degree of freedom of insertion movement; and
the food package units having a code for controlling the microwave oven printed thereon in a predetermined position which is readable automatically by the code reader when the selected package unit is taken from the dispenser outlet and inserted in the oven cavity.

5,147,069
APPARATUS FOR THE AUTOMATIC DISPENSING OF PRODUCTS, ESPECIALLY OF FOOD PRODUCTS, IF NECESSARY REHEATED
André S. Dubik, 44 Avenue La Bruyère, F-38100 Grenoble, France
Filed Oct. 10, 1989, Ser. No. 417,968
Claims priority, application France, Oct. 10, 1988, 88 13827
Int. Cl.[5] G07F *11/00*
U.S. Cl. 221—79 46 Claims



1. Apparatus for automatically dispensing packaged food products, comprising, gear members with parallel horizontal axes, at least one continuous chain engaged with said gear members, product-supporting trays suspended from said chain, said trays having transverse ends, means for moving said trays

and products thereon in closed circuit paths which include a discharging station, and an extracting device provided with a pusher for extracting products from the trays, means for moving said pusher parallel to the axes of the gear members and against a product to be extracted on the tray at the discharging station to push and slide the product in a direction parallel to said axes and to extract the product at a transverse end of the tray, and tray guide means for maintaining said trays at a horizontal orientation at all times during their movement in their closed circuit path,

suspending means for connecting the trays to the chain, said suspending means being spaced from the pusher so as not to interference with movement of the pusher when it extracts products from a tray at the discharging station, said suspending means including inverted L-shaped arms which are perpendicular to said axes of the gear members; each of said arms having a vertical branch which a lower end which is fixed to a tray and a horizontal branch connected to the chain.

5,147,070
POURING PLUG FOR A CONTAINER HAVING A TUBULAR BLADE

Hidechika Iwamoto, Tokyo, Japan, assignor to Yamato Kakozai Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 671,924
Claims priority, application Japan, Mar. 23, 1990, 2-30450[U]
Int. Cl.[5] B65D *5/06*
U.S. Cl. 222—83 **2 Claims**

1. A pouring spout for a container, comprising:

a tubular body to be mounted on a container wall, the inner surface of said tubular body having a guiding recess therein extending parallel to the axis of said tubular body, said recess having a greater width at the portion thereof toward one end of said tubular body and a shoulder at an end corresponding to another end of said tubular body;

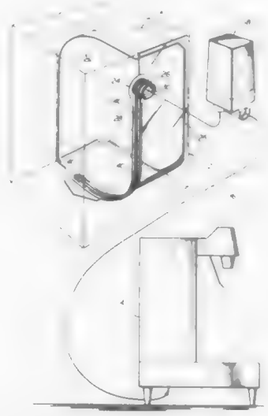
a tubular blade movably mounted within said tubular body and having a longitudinal projection on the outer surface thereof and an outward projection at the end of said longitudinal projection corresponding to said one end of said tubular body, the longitudinal projection being slidably engaged in said recess for guiding movement of said tubular blade into said tubular body in a direction from said one end toward said other end, said shoulder having a notch portion in an inner peripheral edge having a cross-sectional shape different from the cross-sectional shape of said longitudinal projection for blocking movement of said tubular blade in said direction at a set position within said tubular body by engagement of said longitudinal projection with said shoulder at the position of said notch portion, and said shoulder being deformable for permitting said longitudinal projection to fit into said notch and permit movement of said tubular blade in said direction past said set position until said outward projection engages said shoulder; and

a cap mounted over said tubular body.

5,147,071
COLLAPSIBLE BAG WITH EVACUATION PASSAGEWAY AND METHOD FOR MAKING THE SAME

Christopher C. Rutter, Oakland, and James H. Rebholz, San Ramon, both of Calif., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Apr. 9, 1991, Ser. No. 682,817
Int. Cl.[5] B65D *35/00*
U.S. Cl. 222—92 **26 Claims**



1. A collapsible bag for use in containing and dispensing a liquid comprising:

(a) a liquid tight bag having a flexible bag wall having a discharge opening therethrough and enclosing a liquid chamber;

(b) a one-piece spout and elongated evacuation strip unit sealed to an outside surface of said bag wall;

(c) said spout and strip unit including a spout overlying said discharge opening and having an axial spout opening extending axially therethrough in liquid communication with said chamber through said discharge opening and said spout having a sidewall opening into said axial spout opening, and said strip unit having a proximal end thereof in contact with said spout and extending to a distal end remote from said spout, said strip unit including an elongated liquid channel, said proximal end of said strip unit contacting said spout adjacent said sidewall opening and said channel being in liquid communication with said spout opening through said sidewall opening, said spout and strip unit including a flat peripheral sealing flange sealed to said outside surface of said bag; and

(d) said bag wall having at least one opening therethrough underlying said channel providing liquid communication between said liquid chamber and said channel, said channel and said at least one opening providing a liquid passageway from inside of said bag to said spout opening, said channel and said opening having dimensions such that as said bag wall collapses during dispensing of liquid from the bag, the bag wall cannot collapse into and block said passageway, such that said passageway remains open to achieve substantially complete withdrawal of liquid from said bag as said bag collapses.

5,147,072
TOGGLE CLOSURE WHICH PERMITS UNINTERRUPTED GLUG-FREE POURING FROM A RESILIENTLY DEFORMABLE CONTAINER

Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 24, 1991, Ser. No. 719,455
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—212 **17 Claims**

1. A toggle closure for securement in sealed relation to the discharge orifice of a resiliently deformable container of liquid product, said toggle closure having a closed position for preventing the loss of said liquid product and an open position for substantially continuous, uninterrupted, glug-free dispensing of said liquid product from said resiliently deformable container, said toggle closure comprising in combination;

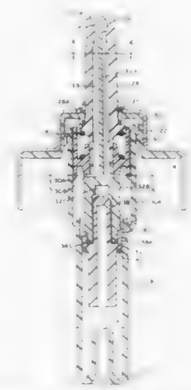
(a) a cap member comprising means to sealingly engage and secure said toggle closure to said resiliently deformable container, said cap member including a base sealing plate including a liquid discharge tube extending upwardly and outwardly from the outermost surface of said base sealing plate and a smaller vent tube extending inwardly from the innermost surface of said base sealing plate and upwardly and outwardly from the outermost surface of said base sealing plate, said cap member further including pivotal bearing means secured on the outermost surface of said base sealing plate, and

(b) a toggle member having an outlet port and comprising pivoting means releasably engageable with said pivotal bearing means on said cap member, said toggle member including a liquid discharge channel in fluid communication with said outlet port and having means for sealingly engaging the uppermost end of said liquid discharge tube in said cap member in both the open and the closed condition of said toggle closure, said toggle member further including a vent channel in fluid communication with said outlet port and having means for sealingly engaging the uppermost end of said vent tube in said cap member in both the open and the closed condition of said toggle closure, said liquid discharge tube and said liquid discharge channel together forming a liquid discharge conduit and said vent tube and said vent channel together forming a vent conduit, each of said conduits placing the interior of said container in fluid communication with the surrounding atmosphere through the outlet port of the toggle member when said toggle member is in it its open condition, whereby inverting said container will cause said liquid in said resiliently deformable container to be simultaneously dispensed in a substantially continuous, uninterrupted, glug-free manner through said liquid discharge conduit and said vent conduit, if said container undergoes resilient deformation tending toward collapse as said liquid is being discharged, but discharge of said liquid through said vent conduit will cease and air will enter said container through said vent conduit while liquid continues to be dispensed in a substantially continuous, uninterrupted, glug-free manner through said liquid discharge conduit in the event said container does not undergo resilient deformation tending toward collapse as said liquid is being discharged.

5,147,073
FLUID PUMP DISPENSER FOR PHARMACEUTICAL USE

Miro S. Cater, Newtown, Conn., assignor to Spruhventile GmbH, Fed. Rep. of Germany

Filed Feb. 11, 1991, Ser. No. 653,048
Int. Cl.[5] B65D *88/54*
U.S. Cl. 222—321 **8 Claims**



1. A finger actuated pump dispenser mounted on a fluid containing vessel and comprising:

a vertical hollow elongated body having an upper section defining a first hollow vertical cylinder with a first diameter and open upper end and an integral lower section defining a second hollow vertical cylinder with a second and smaller diameter and a closed lower end with a central opening, the lower end of the first cylinder being joined to an open upper end of the second cylinder, the body having a vertical bore extending through both cylinders;

collar means having a central opening aligned with the bore and enclosing the upper end of the first cylinder;

a first outer hollow stem open at upper and lower ends and having a first outwardly extending enlargement intermediate these ends, the first stem having a vertical bore aligned with the body bore, the portion of the first stem intermediate the upper end and the first enlargement extending upwardly through the collar means opening with the first enlargement being disposed below the collar, the first enlargement and the remaining portion of the first stem being disposed within the first cylinder;

a hollow vertical main piston having a upper open end and a lower closed end having a central opening which is aligned with the body bore, the main piston being disposed and vertically slidable along the outside of the first stem within the first cylinder;

a second inner stem having an upper vertical section with relatively small cross sectional area which extends upwardly through the main piston and through the vertical bore, the upper section being spaced inwardly from the inner surface of the first stem, thus defining a vertical fluid discharge path, the second stem having an integral lower vertical section with a cross sectional area which is larger than that of the uppersection and smaller than that of the second cylinder, the upper end of the lower section engaging the lower end of the main piston in such manner that at least one horizontal channel is formed and disposed

between the upper end of the lower section and the lower end of the main piston and connects the region between the inner wall of the first cylinder and the lower section with the fluid discharge path;

the upper ends of the first stem and the upper section of the second stem being engagable with and disengable from each other and cooperating together to define a fluid discharge port which has an open position when these ends are disengaged for allowing fluid discharge therethrough and a closed position when these ends are engaged for blocking fluid discharge therethrough;

a vertical inner piston vertically slidable in the second cylinder with an upper end adjacent and engagable with the lower end of the lower section, the inner piston having a second outer enlargement intermediate its ends which engages the inner wall of the second cylinder;

first spring means disposed within the first cylinder between the lower end of the main piston and the first enlargement, the first spring means causing the discharge port to be closed except during a downstroke movement of the pistons and stems, the port being opened a selected point during said downstroke movement;

a second spring disposed within the second cylinder between the lower end of the second cylinder and the second enlargement; and

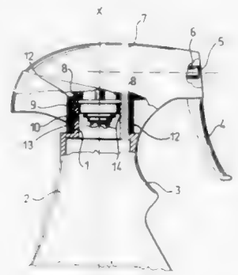
means associated with the inner piston and the second cylinder which when actuated during an upstroke movement of the pistons and stems following the downstroke movement establishes a fluid transfer path between the fluid in the container and a pump chamber formed by the space subtended by the inner wall of the first cylinder, the second stem and the two pistons when the inner piston attains a selected position with respect to the second cylinder.

5,147,074

DEVICE FOR RELEASABLY CONNECTING A SPRAYER HAVING A PUMP OPERATED THROUGH A TRIGGER-TYPE LEVER TO THE NECK PORTION OF A HAND-HELD CONTAINER

Piero Battegazzore, Alessandria, Italy, assignor to Guala S.p.A., Alessandria, Italy

Filed Mar. 15, 1991, Ser. No. 669,901
Claims priority, application Italy, Mar. 27, 1990, 19827 A/90
Int. Cl.[5] B67D *5/40*
U.S. Cl. 222—383 7 Claims



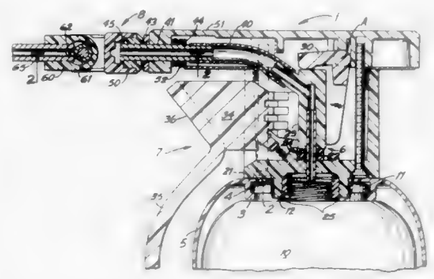
1. A device for releasably connecting a sprayer operated through a trigger-lever, to a neck portion of a hand-held container, the neck portion having an orifice, the device comprising: a base body carrying the sprayer; a tubular element formed with an inside threadway on an inner surface, and open at an end adjacent to the container neck portion for connection to a sleeve, said tubular element being attached rigidly to the base body; and the sleeve located inside said tubular element, an outer surface of said sleeve being threadably and releasably engaged with said inside threadway of the tubular element, said sleeve having an inner surface provided with a snap-action engagement means engaging with a counter-means provided on the container neck portion forming an unreleasable axial coupling.

5,147,075

ACTUATING MECHANISM FOR PRESSURIZED FLUID CONTAINERS AND NOZZLE ASSEMBLY

Richard B. Regan, New York, N.Y., assignor to Falcon Safety Products Incorporated, Somerville, N.J.

Continuation of Ser. No. 252,750, Oct. 3, 1988, abandoned. This application May 8, 1991, Ser. No. 700,113
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—402.15 14 Claims



1. A nozzle assembly for emitting fluid therethrough from a self-contained pressurized container comprising:

a first barrel having one end in fluid communication with a first joint means;

said first joint means being rotatable about the axis of said first barrel;

a second joint means in fluid communication with said first joint means;

said second joint means being rotatable about an axis perpendicular to the axis of rotation of said first joint means; and

a second barrel in fluid communication with said second joint means,

wherein the path of travel provided for said fluid within the nozzle assembly prior to entry of said fluid into said second barrel includes travel around at least a portion of said second joint means.

5,147,076

DEVICE FOR CLOSING CONTAINERS AND POURING LIQUIDS FROM THEM

Giovanni F. Zanotelli, Milan, Italy, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Mar. 12, 1991, Ser. No. 668,000
Claims priority, application Italy, Mar. 13, 1990, 67170 A/90
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—484 5 Claims

1. A closure device for containers containing liquids comprising:

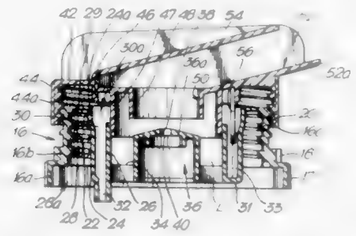
connecting means for mounting said closure device on a mouthpiece of a container, said connecting means having a central valve seat defining an annular orifice for the outflow of liquid from the container;

a vent membrane that is permeable to air but impermeable to liquids fitted centrally on the central valve seat;

said connecting means having a circular outer wall provided with internal and external screw threads, the internal screw threads cooperating with threads on the mouthpiece;

a cap unit screwed to the connecting means, the cap unit having threads cooperating with the external screw threads of the circular outer wall of the connecting means and having a pouring spout and an annular shutter collar which are rotatably mounted on the connecting means so that the cap unit can be rotated to a closed position with the annular shutter collar in contact with the central valve seat or to a pouring position with the annular shutter collar separated from the central valve seat;

said connecting means having a first annular inside wall forming a tightening chamber with said outer wall;



said connecting means having a second inside annular wall placed radially internal to said tightening chamber forming an auxiliary annular chamber with said first annular inside wall, the auxiliary annular chamber being open in the direction of the cap unit, and

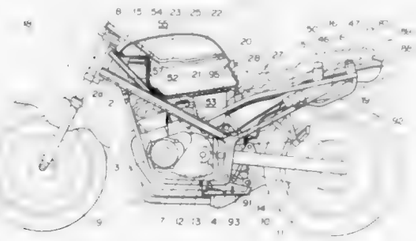
said auxiliary annular chamber having a vent means in the lowest part of its base for equalization of pressure inside the container when liquid is being poured out of the container and through the closure device.

5,147,077

STORAGE BOX COMPARTMENT MEANS FOR A MOTORCYCLE

Shinji Nakajima, and Toshimasa Miyabe, both of Shizuoka, Japan, assignors to Suzuki Kabushiki Kaisha, Japan

Filed Jan. 14, 1991, Ser. No. 640,726
Claims priority, application Japan, Jan. 25, 1990, 2-15724; Jan. 25, 1990, 2-15727; Jan. 30, 1990, 2-17946; Feb. 5, 1990, 2-24344
Int. Cl.[5] B62J *7/00*; B60R *7/00*
U.S. Cl. 224—32 R 20 Claims



1. A storage box container, for a motorcycle having an engine unit disposed at a substantially central portion of a motorcycle body and below a main tube extending rearwardly from a head pipe, and additionally including a seat detachably mounted upon a seat rail extending rearwardly from a rear end of said main tube, said storage box container being disposed at a substantially upper central portion of said body frame of said motorcycle and comprising:

a storage box body having an opening defined within an upper surface portion thereof, a rear portion thereof supported upon said seat rail by means of a first hinge means such that said storage box body is pivotably movable between a first lowered position and a second raised position, and a front portion thereof adapted to be secured to said main tube when said storage box body is disposed at said first lowered position;

a lid member mounted upon said storage box body by means of a second hinge means such that said lid member is pivotably movable between a first lowered position for closing said opening of said storage box body and a second raised position for uncovering said opening of said storage box body so as to permit an article to be inserted into or removed from said storage box body;

a first lock means mounted upon said storage box body for locking said lid member at said first lowered position;

a second lock means for securing said seat upon said seat rail; and

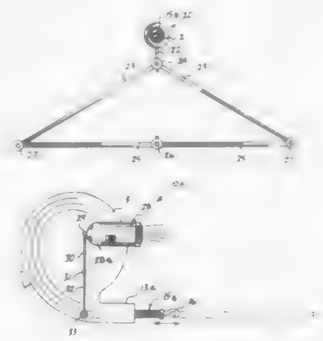
said rear portion of said storage box body being overlapped by means of a front end portion of said seat when said seat is secured to said seat rail by said second lock means such that said storage box body is prevented from being pivotably moved from said first lowered position to said second raised position when said seat is secured to said seat rail by said second lock means.

5,147,078

RETRACTABLE AUTOMOTIVE CLOTHESLINE

Joseph M. Flieder, 18426 Prairie Ave., Torrance, Calif. 90504

Filed Nov. 20, 1989, Ser. No. 439,153
Int. Cl.[5] B60R *7/10*
U.S. Cl. 224—42.46 A 4 Claims



1. A retractable automotive clothesline apparatus for suspension between spaced hook members mounted on opposed sides of an automotive interior, the apparatus comprising,

a housing including an outlet conduit defined by a predetermined diameter, wherein the conduit is in communication with an interior cavity of the housing, and

an elongate flexible line wound within the housing, and

a retraction means within said cavity of said housing for normally biasing the line interiorly of the housing, and

a line hook mounted to a free end of the line for securement to one of said hook members, and

a housing hook pivotally mounted to the housing for securement to a remaining hook member, and

wherein the housing is defined by a cylindrical configuration and the outlet conduit is tangentially arranged relative to the cylindrical housing, and

wherein the flexible line includes a main flexible body member, and further includes spaced encircling grooves formed at predetermined intervals along the main body member, and the encircling grooves are defined by a groove diameter less than that defined by a main body diameter of the main body member, and

further including a plurality of hanger members captured and securable onto the flexible line, and the hanger members each are defined by an articulated framework, the articulated framework including a plurality of arm members, each arm member of a predetermined width equal to

or less than a groove width defined by each encircling groove, and

wherein each hanger member includes a cylindrical head member mounted about the flexible line about one of the plurality of encircling grooves, and a support rod integrally formed to the cylindrical head member, and a first pivot mounted to a further end of the support rod remote from the cylindrical head member, and a plurality of top frame arms mounted to the first pivot, and remote ends of the top frame arms remote from the first pivot mounted and integrally secured to a third pivot, each third pivot further including a base arm member mounted thereto, and each base arm member secured together by a second pivot, the second pivot underlying the first pivot.

5,147,079

CARRIER DEVICE FOR CONTAINERS

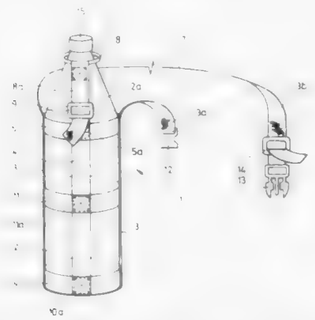
Campbell S. N. Heather, Zum Talblick 19, 6246 Glashütten 1, Fed. Rep. of Germany

Filed Dec. 4, 1990 Ser. No. 622,255

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1990, 4030770

Int. Cl.[5] A45F *5/00*

U.S. Cl. 224—148 14 Claims



1. A carrier device adapted for substantially vertically receiving a cylindrical drinking bottle having a top end and a bottom end, the carrier device comprising a strap assembly composed of longitudinal and transverse straps made of a flexible material, said carrier device comprising:

a first longitudinal strap adapted to extend around the drinking bottle from the top end to the bottom end thereof, across said bottom end and extending back to the top end thereof;

a second longitudinal strap adapted to extend around the drinking bottle from the top end to the bottom end thereof, across said bottom end and extending back to the top end thereof, said second longitudinal strap being approximately 90° circumferentially offset from said first longitudinal strap and having a free end;

said first and second longitudinal straps intersecting one another at right angles to form a bottom support portion and being fixed to one another at the intersection by sewing;

a first, upper circumferential strap adapted to receive a portion of the cylindrical drinking bottle proximate said top end thereof and interconnecting said first and second longitudinal straps, said first and second longitudinal straps each being fixed to said upper circumferential strap at two diametrically opposite positions;

a second, lower circumferential strap adapted to receive a portion of the drinking bottle proximate said bottom end thereof and adjacent to the bottom support portion and interconnecting said first and second longitudinal straps, said first and second longitudinal straps each being fixed to said lower circumferential strap at two diametrically opposite positions;

a third, immediate circumferential strap adapted to receive a portion of the drinking bottle substantially equidistant from the top end and the bottom end thereof and interconnecting said first and second longitudinal straps, said first and second longitudinal straps each being fixed at said intermediate circumferential strap at two diametrically opposite positions;

a shoulder carrying strap integrally formed from a first end of the first longitudinal strap;

an upper bottle closing means which closes said drinking bottle and comprises a support ring adapted to surround a mouth opening of the drinking bottle, said support ring being connected to a securing strap portion having a free end; and

a fastening buckle which is disposed at the free end of the second longitudinal strap for attaching together the free end of said second longitudinal strap to the free end of said securing strap portion in a longitudinally adjustable manner.

5,147,080

STAPLE FORMING AND STAPLING MACHINE

Kenneth Assink, and Mitchell J. Weener, both of Holland, Mich., assignors to J. R. Automation Technologies, Inc., Holland, Mich.

Filed Oct. 8, 1991, Ser. No. 773,130

Int. Cl.[5] B27F *7/21*

U.S. Cl. 227—82 19 Claims

1. A staple forming and driving apparatus comprising:

a anvil block including:

an anvil member upon which a staple can be formed;

a spring biased stripper member for removing a formed staple from said anvil member;

a guide member having a channel therein for receiving and supporting a staple removed from said anvil member by said stripper member; and

a forming block movable toward and away from said anvil block, said forming block including:

at least one projecting stripper cam for moving said stripper member away from said anvil member as said forming block approaches said anvil block;

a pressure foot for holding a length of wire on said anvil member; and

a forming blade on each side of said pressure foot for cutting said wire and for shaping said cut wire into a staple on said anvil member; and

a driving block movable toward and away from said forming block, said driving block including:

a driving blade for driving staples from said guide member into a workpiece; and

a containment cover for said driving blade.

5,147,081

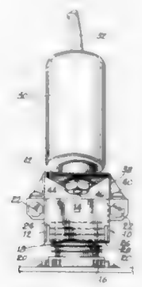
FLAT PACK DESOLDERING TOOL

Henry Kim, 12665 Salmon River Rd., San Diego, Calif. 92129

Continuation-in-part of Ser. No. 557,451, Jul. 25, 1990, Pat. No. 5,054,681. This application Sep. 9, 1991, Ser. No. 757,020

Int. Cl.[5] B23K *3/03*

U.S. Cl. 228—51 6 Claims



1. A desoldering tool for simultaneously desoldering the four rows of contacts from the four sides of a quad flat pack IC comprising:

(a) an enclosure having four substantially contiguous walls;

(b) the lower edges of said four walls being spaced, oriented and dimensioned to simultaneously rest against the four rows of contacts of a quad IC when said enclosure is placed over same;

(c) heating means for heating said walls;

(d) said enclosure being substantially completely open at the top; and,

(e) a handle mounted to said enclosure.

5,147,082

TOOL CONFIGURATION FOR ULTRASONIC WELDING

Ralf D. Krause, Nürnberg, and Helmut Moll, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

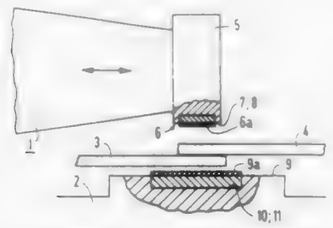
PCT No. PCT/EP88/00686, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO89/01384, PCT Pub. Date Feb. 23, 1989

PCT Filed Jul. 28, 1988, Ser. No. 460,909

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727406

Int. Cl.[5] B23K *1/06*

U.S. Cl. 228—1.1 12 Claims



1. In a tool configuration for ultrasonic welding comprising a sonotrode as an active tool and an anvil as a work fixture for workpieces wherein at least the sonotrode is provided with a wear-reducing layer on its working surface through which the ultrasound is injected into the workpieces to be welded together, the improvement comprising the wear-reducing layer is polycrystalline diamond.

5,147,083

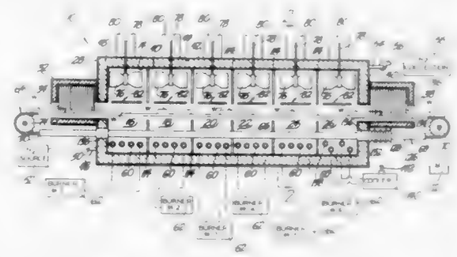
METHOD AND APPARATUS FOR CONVECTION BRAZING OF ALUMINUM HEAT EXCHANGERS

Gary A. Halstead, Lockport; Michael J. Irish, Tonawanda, and Brian L. Barten, Lockport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1991, Ser. No. 765,334

Int. Cl.[5] B23K *1/00;* F27D *7/04, 9/00, 15/02*

U.S. Cl. 228—42 1 Claim



1. A convection braze furnace assembly for brazing aluminum heat exchanger workparts, said assembly comprising:

a housing having a plurality of successive interior heating zones generally isolated from one another and preceding a terminal cooling zone;

conveyor means for sequentially conveying workparts to each of said heating zones and said cooling zone;

an impeller for establishing an atmospheric convection current in each of said heating zones and said cooling zone;

a burner type disposed in each of said heating zones and said cooling zone for elevating the atmospheric temperature of the respective said convection current;

and a cooling tube disposed in said convection current of said cooling zone and spaced from the respective said burner tube for improving regulation of braze solidification within said cooling zone;

said cooling tube and said respective burner tube in said cooling zone being mutually supported on said housing by a unitary support plate removably secured to said housing.

5,147,084

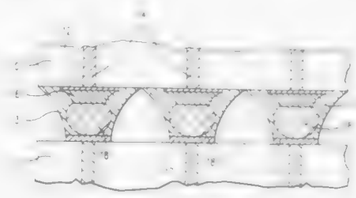
INTERCONNECTION STRUCTURE AND TEST METHOD

John R. Behun; Anson J. Call, both of Poughkeepsie; Francis F. Cappo; Marie S. Cole, both of Wappingers Falls, all of N.Y.; Karl G. Hoebener, Georgetown, Tex.; Bruno T. Klingel, Hopewell Junction, and John C. Milliken, Patterson, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Division of Ser. No. 555,120, Jul. 18, 1990, Pat. No. 5,060,844. This application Aug. 9, 1991, Ser. No. 743,048

Int. Cl.[5] B23K *101/40;* H05K *3/34;* H01L *21/60*

U.S. Cl. 228—56.3 14 Claims



1. A connector structure on a substrate comprising:

at least one first solder portion on the surface of said substrate:

at least one second solder portion connected to each of said at least one first solder portions; and

an epoxy layer disposed about said at least one first and second solder portions in such a manner as to cover said first solder portion and contact, but not cover, said second solder portion.

5,147,085

COLD PRESSURE WELDING METHOD AND MACHINE

Daniel J. Hawkes; Leslie J. Webb, both of Ashford, and Douglas E. Anderson, Canterbury, all of England, assignors to BWE Limited, Ashford, England

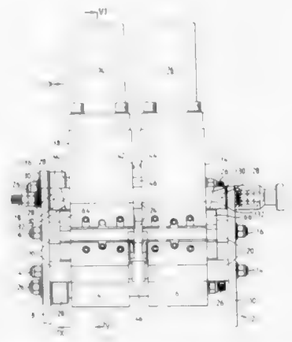
PCT No. PCT/GB90/00323, § 371 Date Oct. 5, 1990, § 102(e) Date Oct. 5, 1990, PCT Pub. No. WO90/09862, PCT Pub. Date Sep. 7, 1990

PCT Filed Mar. 2, 1990, Ser. No. 576,527

Claims priority, application United Kingdom, Mar. 3, 1989, 8904859

Int. Cl.[5] B23K *20/12*

U.S. Cl. 228—115 14 Claims



5. A cold pressure welding machine characterized in that the machine includes a main frame (2) having a pair of side plates (8, 10) rigidly mounted on a base frame (12) and braced apart by a plurality of guide rods (14, 16, 18), a pair of clamp bodies (4, 6) reciprocably mounted on the guide rods (14, 16, 18) and each carrying a hydraulically actuable piston and cylinder assembly (74, 76) connected to effect reciprocal movement in a direction perpendicular to the guide rods (14, 16, 18) of one of a pair of die halves (60, 62) positioned in the associated clamp body (4, 6) into and out of engagement with the other one (62) of the pair of die halves secured to the associated clamp body (4, 6) a plurality of tie rods (26) extending through bores in the clamp bodies (4, 6) in a direction parallel to the guide rods (14, 16, 18) and each connected to a piston and cylinder assembly (28) hydraulically actuatable to move the clamp bodies (4, 6) the one toward the other and means (52, 54) effective to urge the clamp bodies apart.

5,147,086

PREPARATION OF CAPSULE FOR USE IN ISOSTATIC PRESSING TREATMENT

Takao Fujikawa, Kobe; Yasuo Manabe, Osaka, and Kazuhiko Nakajima, Kabe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 11, 1991, Ser. No. 683,732

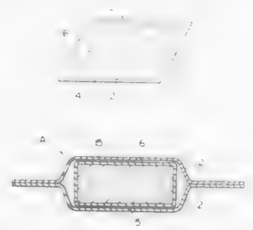
Claims priority, application Japan, Aug. 8, 1990, 2-210635

Int. Cl.[5] B2K *35/24*

U.S. Cl. 228—243 6 Claims

1. A process for preparation of capsule for use in isostatic pressing treatment which comprises:

a first step of enclosing a material to be treated with metallic foil having a thickness of from 30 to 300 μm, said material to be treated being covered with a ceramic or metal layer which prevents adhesion between the material to be treated and the metallic foil; and



a second step of welding the metallic foil so as to seal the material to be treated in the metallic foil thus welded, thereby preparing a capsule, the welding being carried out by means of TIG welding.

5,147,087

HAND-OPERATED APPLICATOR FOR MEDIA

Karl-Heinz Fuchs, Radolfzell, Fed. Rep. of Germany, assignor to Ing. Erich Pfeiffer Gmbh & Co. KG, Fed. Rep. of Germany

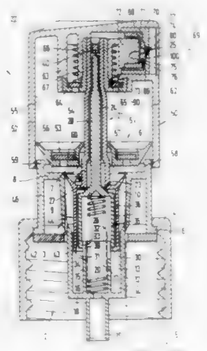
PCT No. PCT/EP88/00598, § 371 Date Jan. 5, 1990, § 102(e) Date Jan. 5, 1990, PCT Pub. No. WO89/00086, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 5, 1988, Ser. No. 455,362

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722470

Int. Cl.[5] B05B *9/043*

U.S. Cl. 239—333 39 Claims



1. A manually operable discharging apparatus for discharging media to an environment outside of said apparatus, comprising:

a medium pump to be operated with a handle;

a medium outlet channel leading to a discharge nozzle, said discharge nozzle having at least one nozzle opening leading to the environment;

an at least two-stage atomizer for the additional atomization of a pre-atomized media flow by a nozzle air flow in the vicinity of the discharge nozzle; and

a control means for the delayed opening of at least one of flow paths defined by said medium outlet channel and a compressed air channel, wherein a control member exposed to an air pressure is provided for operating at least one movable valve body.

5,147,088

MISSILE TRACKING SYSTEMS

James M. Smith, and Peter W. Busby, both of Stevenage, United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Apr. 16, 1987, Ser. No. 41,124

Claims priority, application United Kingdom, Apr. 29, 1986, 8610507

Int. Cl.[5] F41G *7/00*

U.S. Cl. 244—3.11 11 Claims

1. A tracking system including target image sensor means for imaging the viewed scene for a predetermined controllable first series of exposure periods at predetermined intervals, and for outputting data to enable the location of a target within the viewed scene to be determined, missile image sensor means for repetitively imaging the viewed scene for a predetermined controllable second series of exposure periods interspersed with said first series of exposure periods and for outputting data to enable the location of a missile within the viewed scene to be determined, and means for enhancing the image of the missile or a part thereof only during at least part of each exposure period of said second series of exposure periods.

5,147,089

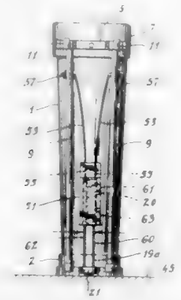
GOLF BAG STAND

Victor R. Anderson, Trumbull, Conn., assignor to Loctec Corporation, Monroe, Conn.

Continuation-in-part of Ser. No. 727,869, Jul. 10, 1991. This application Jan. 13, 1992, Ser. No. 819,956

Int. Cl.[5] A63B *55/00*

U.S. Cl. 248—96 15 Claims



1. A collapsible supporting stand for a golf bag, said stand having collapsed and erect positions and having actuating and disabling states, said stand including

a collar securable to said bag proximate to the top thereof, a pair of legs pivotally secured to said collar side by side, a base bracket securable to the base of said bag,

a control block between said legs,

a pair of spring arms having their lower ends fixedly secured to said control block, and their upper ends pivotally secured one to each said leg,

a projector vertically slidingly engaging said control block and extending below said control block, said projector sliding within said base bracket, and

means for positively securing said projector in at least one position relative to said control block with said projector extending beyond said bracket when said stand is in its collapsed condition,

whereby upward force on said projector, when said stand is in its actuating state, will erect said stand, and said stand can be made actuable or can be disabled.

5,147,090

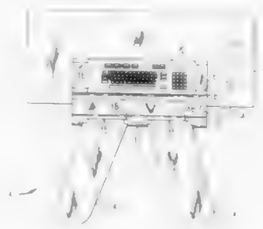
WRIST AND FOREARM SUPPORT AND REST APPARATUS FOR USE WITH KEYBOARDS AND THE LIKE

Sandra Mandell, 35 Gabriel Dr., Montville, N.J. 07045, and Madge W. Weiss, 556 Eagle Rock Ave., Roseland, N.J. 07068

Filed Nov. 4, 1991, Ser. No. 787,517

Int. Cl.[5] B43L *15/00*

U.S. Cl. 248—118.1 11 Claims



1. Wrist and forearm support and rest apparatus for use with keyboards and the like, comprising:

a base having its front disposed near the front edge of a work surface;

a keyboard disposed on top of the base;

said base terminating at its front in an integral slightly raised, generally elongated wrist support;

a correspondingly elongated integral wrist rest appended to the wrist support and slanting slightly downwardly and outwardly therefrom;

said wrist rest terminating in a correspondingly elongated integral bracket;

a pair of forearm rests, each of which is removably and adjustably mounted to the bracket, said forearm rests extending outwardly from the bracket in angular spaced relation to each other corresponding to the angular spaced relation of the forearms of an operator when using the keyboard, and overhanging the front edge of the work surface;

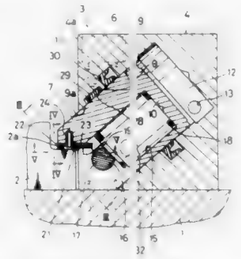
the bracket being a substantially tubular-like member having at least three slots at each end thereof and disposed in corresponding spaced relation around the front circumference of the bracket;

each of the forearm rests having a mounting end, said mounting ends having tabs;

the tabs at the mounting ends of each of the forearm rests being inserted in corresponding slots at each of the ends of the bracket, whereby the forearm rests are mounted to the bracket in a selected position; and

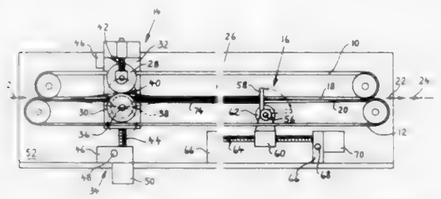
the fit relationship between the tabs and the slots is such that the tabs are retained in the slots until pulled away therefrom for removal of the forearm rests from the bracket so that the tabs can be inserted in other corresponding slots in the bracket for mounting the rests thereto in an other selected position.

5,147,091
CLAMPING APPARATUS
Keitaro Yonezawa, and Tsutomu Shirakawa, both of Kobe, Japan, assignors to Kabushiki Kaisha Kosmek, Hyogo, Japan
Filed Nov. 27, 1991, Ser. No. 798,908
Claims priority, application Japan, Nov. 29, 1990, 2-334507
Int. Cl.[5] B23Q 3/08
U.S. Cl. 269—137 3 Claims



1. A clamping apparatus comprising:
a housing (4, 54) having a front surface (4a, 54a);
a clamping-member (7, 36, 43, 46, 67, 57) adapted to be linearly actuated from slantly above relative to a clamped surface (2a, 52a) of a clamped object (2, 52) placed in front of said front surface (4a, 54a) and provided with a clamping end surface (22, 47, 62, 72) substantially in parallel to said clamped surface (2a, 52a);
a shuttle member (21, 35, 41, 48, 61, 71) for sliding interposed between said clamped surface (2a, 52a) and said clamping end surface (22, 47, 62, 72) and so supported by said clamping end surface as to be slidingly movable within a certain extent in front and rear directions; and
resilient means (23, 45, 63) for resiliently urging said shuttle member (21, 35, 41, 48, 61, 71) forwardly relative to said clamping-member (7, 36, 43, 46, 67, 57).

5,147,092
ROLLER-ACCUMULATOR FOR SHEETS
James N. Driscoll, Perkasie, and Thomas E. Bieber, Coplay, both of Pa., assignors to Bell & Howell Phillipsburg Company, Skokie, Ill.
Filed Aug. 19, 1991, Ser. No. 746,622
Int. Cl.[5] B65H 29/00
U.S. Cl. 271—184 21 Claims



1. A roller-accumulator for the seriatim feeding and accumulation of sheets into stacks and for further transportation of accumulated stacks, the roller-accumulator comprising:
upper and lower endless belt means, said upper belt means having lower reaches, said lower belt means having upper reaches, said upper and lower reaches being driven in a common direction and being disposed substantially in and thereby defining a common plane, said upper and lower reaches being disposed along a stacking region substantially in said common plane;
driven roller means for feeding therethrough sheets in seriatim delivered thereto by said upper and lower belt means, said driven roller means including upper and lower roller means having a nip therebetween, said nip being disposed along said upper and lower reaches upstream from said stacking region and having an offset in relation to said common plane; and,
stop gate means for selectively stopping and releasing sheets from said stacking region, said stop gate means being disposed along said upper and lower reaches downstream from said driven roller means;
whereby sheets are fed in seriatim by and between said upper and lower reaches into and through said nip to said stacking region wherein the sheets are selectively stopped by said gate means and stacked into stacks that are subsequently selectively released by said stop gate means for further transport by said upper and lower endless belt means, said driven roller means being operative in offsetting a sheet in the direction of said offset so that the sheet is fed to said stacking region.

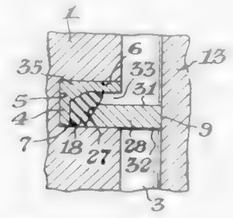
5,147,093
PUZZLE BOLT
Roger B. Tisdale, R.R. 5, Box 215, Fayetteville, Ark. 72701
Filed Sep. 25, 1991, Ser. No. 765,324
Int. Cl.[5] A63F 9/08; F16B 23/00
U.S. Cl. 273—156 2 Claims

1. An improved puzzle, comprising:
a) an elongated left-hand threaded bolt having a first end and second end;
b) a first nut fixedly mounted on said first end;
c) a second left-hand threaded nut having a left-hand threaded passageway therethrough, said passageway having a first region and a second region;
d) said first region being filled with a short left-hand threaded rod fixedly mounted therein and extending slightly outwardly from said first region whereby left-hand threaded side walls thereof are visible;
e) said second region being threaded over said second end of said bolt with said second end tightened against said short rod;
f) a split ring captured between said first nut and said second left-hand threaded nut, said split ring having a split defined by two opposed faces which are misaligned with respect to one another; and
g) said first nut and said second left-hand threaded nut each having outer peripheral surfaces with grooves therein to give a mistaken impression that said split ring may be removed from said bolt by allowing at least one of said faces of said split ring to enter one of said grooves.

5,147,094
SUBSTANTIALLY ZERO LEAKAGE PATH SEALING ASSEMBLY WITH INSULATING MEMBER
Frederick L. J. Rehfeld, Saginaw, Mich., assignor to Leber Corporation, Midland, Mich.
Division of Ser. No. 331,303, Mar. 31, 1989. This application Jun. 18, 1990, Ser. No. 539,224
Int. Cl.[5] F16J 15/46
U.S. Cl. 277—144 2 Claims

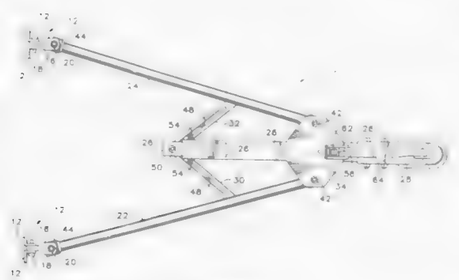
1. A sealing assembly for internal combustion engines and other high speed reciprocating devices such as compressors, fluid motors, fluid pumps, and other devices which require

sealing which comprises: an assembly of members to be sealed, one member axially centered over another member with a clearance passage between the assembled members, capable of allowing the assembly of members to move in relation to one and the other; said clearance passage being capable of transmitting a fluid under pressure; one of the members having one or more grooved openings to the clearance passage between the assembly of members, said groove openings having side walls and a bottom and having positioned thereon an insulating member; positioned within (and the bottom of) said groove



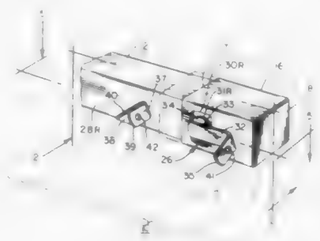
openings and contacting said insulating member is a continuous, resilient, elastomeric, expander seal; positioned within said groove openings and biased to said expander seal is a gapped sealing band having a circumference of greater than 360 degrees; the one gapped sealing band having a circumference of greater than 360 degrees has an inclined surface that engages the expander seal and said incline surface is in the direction of a fluid source under pressure; a means for actuating the fluid under pressure whereby the fluid under pressure engages the grooved member and against the wall of said groove opening thereby causing a seal.

5,147,095
VEHICLE TOW BAR
Lee H. Duncan, 88806 Greenhill Rd., Eugene, Oreg. 97402
Filed Feb. 1, 1991, Ser. No. 698,742
Int. Cl.[5] B60D 13/00
U.S. Cl. 280—491.4 7 Claims



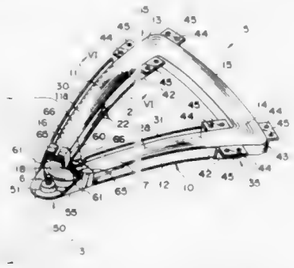
1. A vehicle tow bar, comprising:
a) a base member having a central longitudinal opening therethrough,
b) an elongated reach member extending slidably through the longitudinal opening in the base member and having forward and rearward ends,
c) a hitch component on the forward end of the reach member configured for releasable coupling to a complimentary hitch component on a towing vehicle,
d) a pair of elongated arm members secured pivotally at one end to the base member on opposite lateral sides of the reach member for lateral pivotal movement toward and away from said reach member,
e) connector means on the ends of the arm members opposite the base member configured for releasable pivotal attachment to laterally spaced positions on one end of a vehicle to be towed,
f) lock means releasably interengaging the base member and reach member for securing said members together when the reach member is moved to its rearwardmost position relative to the base member and for disengaging said members for slidably moving said reach member forwardly of said rearwardmost position, and
g) link means interconnecting the reach member adjacent the rearward end thereof and each of the arm members intermediate the ends of said arm members, the link means being configured to allow the arm members to pivot on the base member toward and away from the reach member independently of each other and to limit the lateral spacing between the connector means on the arm members to a predetermined maximum.

5,147,096
EASY LATCH AND UNLATCH CAM ACTION TRAILER HITCH
Gerald H. Rogers, Rte. 1, Box 1336, Athens, Tex. 75751
Filed Oct. 25, 1991, Ser. No. 782,618
Int. Cl.[5] B60D 1/28
U.S. Cl. 280—507 11 Claims



1. An easy latch and unlatch vehicle trailer hitch comprising: a trailer hitch tongue rectangular in transverse section having a lead end, opposite side walls and a top wall; a trailer hitch ball socket member mounted in place within said lead end of the trailer hitch tongue and having a socket opening therein facing downwardly, sized and shaped to receive a spherical section surfaced trailer hitch ball; a rectangular cap member slidably mounted on and generally enclosing the lead end of said trailer hitch tongue with said cap member including a top, opposite sides and a bottom side; opening means in said bottom side having a large opening portion and a narrow opening extension extended forwardly from said large opening portion; said cap slidable to a forward position with said large opening portion in alignment with said socket opening permitting passage of a trailer hitch ball through said large opening portion into and removal from said socket opening; and with the narrow opening extension being so dimensioned that when said cap member is slid back from said forward position while large enough to accomodate the shank of the trailer hitch ball it is narrow enough to capture the trailer hitch ball locking it in place in said ball socket opening; wherein positioning drive means is provided for positioning said rectangular cap member back and forth on said trailer hitch tongue between said forward position and a rearward position; said rectangular cap member has a forward end wall with an inside surface in close adjacency with the forward end of said trailer hitch tongue when said rectangular cap member is in its rearward position on said trailer hitch tongue; and wherein said positioning drive means is a cam drive rotatably mounted in side wall means of said trailer hitch tongue.

5,147,097
SUSPENSION SYSTEM FOR A VEHICLE
Shuji Hiromoto; Roh Kitamura; Fumitaka Yoshino; Takeshi Kamisaku, and Toshihiro Takeuchana, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan
Filed Apr. 5, 1991, Ser. No. 681,092
Int. Cl.[5] B60G *3/28*
U.S. Cl. 280—691 11 Claims



1. A suspension system for a vehicle, which connects a vehicle body and axle means for supporting wheels, comprising:
- a front cantilever spring arm including a matrix resin and fibers embedded in the resin, said first spring arm having a first end portion supported on the vehicle body, a second end portion extending toward the axle means, and a longitudinal intermediate portion situated between the two end portions, and being capable of vertical deflection;
- a rear cantilever spring arm including a matrix resin and fibers embedded in the resin, said rear spring arm having a first end portion supported on the vehicle body, a second end portion extending toward the axle means, and a longitudinal intermediate portion situated between the two end portions, and being captured of vertical deflection;
- supporting means for supporting the respective first end portions of the spring arms on the vehicle body;
- connecting means for connecting the respective second end portions of the spring arms to each other; and
- a joint assembly, having a metallic base plate, fixed to the respective second end portions of the spring arms, said axle means being attached to the joint assembly.

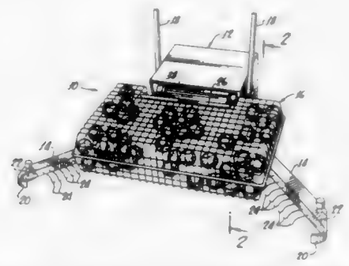
5,147,098
SKI BOOT SCRAPER
David J. McCrink, 17 Margaretta Rd., Boonton, N.J. 07005
Filed Nov. 29, 199 , Ser. No. 800,022
Int. Cl.[5] A63C *11/18*
U.S. Cl. 280—813 1 Claim

1. A ski boot scraping device for removing ice and snow from the bottom surface of a ski boot, wherein the improvement comprises:
- (a) a base having a top surface, a bottom surface, and four sides, the bottom surface of the base being adapted to be mounted on the top surface of a ski; and
- (b) four identically shaped segments extending upwardly from the top surface of said base and arranged symmetrically with respect to said four sides, each of said segments having a first vertical wall extending parallel to and along a respective one of said sides, said first vertical wall having a first vertical edge adjacent the center of said side and a second vertical edge adjacent an end of said side, a second vertical wall extending inwardly at a perpendicular angle from the first vertical edge of said first vertical wall, a third vertical wall extending inwardly at an acute angle from the second vertical edge of said first vertical wall, and a fourth vertical wall extending parallel to said first vertical wall and interconnecting innermost edges of said second and third vertical walls, said first vertical wall having a vertical recess extending therein, each of said segments having a top surface which slopes downwardly from said first vertical wall to said fourth vertical wall and being formed with a plurality of saw tooth ridges, wherein said base and said four segments are molded from an elastomeric material having sufficient elasticity to permit compression and rotation of said segments upon downward pressure thereon by the bottom of the ski boot.

5,147,099
DRAWER OR CABINET LATCH
Thomas McLinden, Woodbury, Conn., and Ralph M. Nowak, Marblehead, Mass., assignors to Kidie Products, Inc., Avon, Mass.
Filed Sep. 30, 1991, Ser. No. 768,824
Int. Cl.[5] E05C *1/10*
U.S. Cl. 292—175 12 Claims

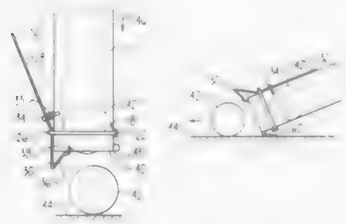
1. A drawer or cabinet door latch comprising:
- a support member having a base, adapted for mounting on the inside surface of an openable drawer or cabinet door, and having a latch support;
- a latch member slidably mounted to said latch support for reciprocal movement in a plane normal to said base between extended and retracted positions relative to said latch support, said latch member comprising a latch surface on the side of said latch member facing said extended position, said latch surface spaced from and facing toward said base, and a cam surface extending from said latch surface away from said base and sloping from said latch surface in the direction of said retracted position;
- a biasing member connected between said support member and said latch member normally biasing said latch member toward said extended position; and
- a separate actuator member slidably mounted to said latch support for selectively moving said latch member from said extended position to its retracted position, said actuator extending over and normally engaging said latch member on a portion thereof facing said extended position, said latch member separate from and moveable between said extended and retracted positions independently of said actuator; and mutually engageable locking surfaces on said actuator and said support member extending transversely of said plane and normally engaged, said locking surfaces selectively disengageable by movement of said actuator transversely of said plane for movement of said latch member to said retracted position by movement of said actuator in said plane.

5,147,100
DEVICE FOR RETRIEVING AND SECURELY STORING BALLS
Edward B. Frankel, 434 S. Euclid St., Anaheim, Calif. 92802-1247
Filed Aug. 1, 1991, Ser. No. 738,926
Int. Cl.[5] B60P *3/00*
U.S. Cl. 294—19.2 9 Claims



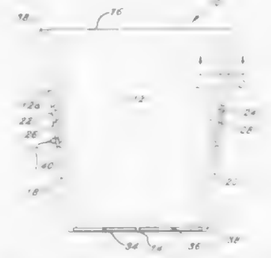
4. A ball retrieval device for collecting balls from an underlying surface, comprising:
- a main body;
- a collection basket for storing retrieved balls;
- a pair of arms, each of which is attached to the main body and which, in an opened position, are substantially parallel to the underlying surface and define between them a capture area; and
- retaining means attached to the arms for holding balls within the capture area when they come within a predetermined capture distance of the arms; said retaining means comprising a channel means for forming a channel at least as wide as the diameter of the balls, and for restraining balls to move relative to the arms toward the main body when the ball retrieval device is moved substantially forward of is turned.

5,147,101
GOLF BALL DISPENSING AND RETRIEVING SYSTEM
Ralph Tiller, 1534 Old Creek Ct., Cardiff, Calif. 92007
Filed Sep. 6, 1991, Ser. No. 756,174
Int. Cl.[5] A63B *47/02*
U.S. Cl. 294—19.2 2 Claims



1. An apparatus for dispensing and retrieving golf balls, comprising:
- a hollow tube having a bottom end formed to allow passage of golf balls therethrough;
- stop means removably attachable to said tube, said stop means being movable between a closed position wherein golf balls are prevented from passing out of said end of said tube, and an open position wherein golf balls are permitted to pass through said end of said tube, wherein said stop means comprises a pivotal lever having a detent for obstructing said end, bias means associated with said lever for biasing said detent to said closed position, said lever having a trigger which can be pressed to move said detent to said open position to allow a golf ball to be released from said end of said tube, wherein said detent includes a slanted front surface engageable with a golf ball positioned partially within said end of said tube for urging said detent to said open position to allow the golf ball to enter said tube through said end, said detent moving to said normally closed position; and
- means for inclining said tube for allowing a golf ball to roll out from said end of said tube when said detent is urged by said trigger to said open position, wherein said stop means is removably attached to said tube by means of a strap connected around the outer circumference of said tube adjacent said end, wherein said tube includes a space-adjacent said bottom end,
- wherein said inclining means is removably attached to said tube by a U-shaped wire stand connected through holes in a top end of said tube.

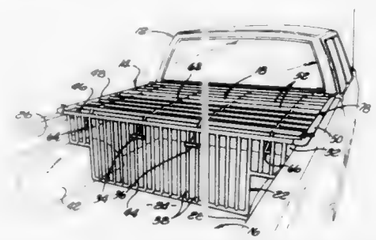
5,147,102
REFUSE CARRIER
Richard H. Dyer, Jr., Black Rock Farm, Black Rock Rd., Watertown, Conn. 06795
Filed Feb. 11, 1991, Ser. No. 653,306
Int. Cl.[5] B65D *75/00*; B65F *1/12*
U.S. Cl. 294—152 4 Claims



1. In a flexible carrier for embracing and transporting a shapeable load of refuse or the like comprising:
- a) a trapezoidal sheet of fabric defined by a shorter front edge, a longer back edge parallel to the front edge, and connecting side edges; and
- b) a pair of rigid elongated support elements coextensive with the side edges respectively and secured along the side edges;

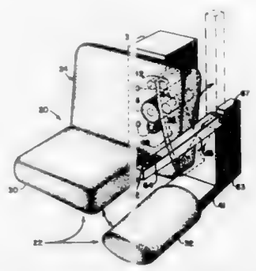
wherein the fabric has a smooth and slippery surface, the fabric having notches formed therein in the middle of the side edges, the side edges being double-back and the fabric secured against itself to form elongated tunnels, and the elongate support elements are rotatable members freely disposed in and along the tunnels, the tunnels being ample in width so that when the carrier is full of refuse the members are readily rotated about their longitudinal axes in the slippery tunnels respectively as they are drawn together through notches to provide a means to support the load suspended below the members during transport.

5,147,103
UTILITY CAGE FOR A PICKUP TRUCK
Wayne E. Ducote, Rte. 1, Box 413-2, Cottonport, La. 71327
Filed Aug. 26, 1991, Ser. No. 749,959
Int. Cl.[5] B60R 5/04
U.S. Cl. 296—37.6 4 Claims



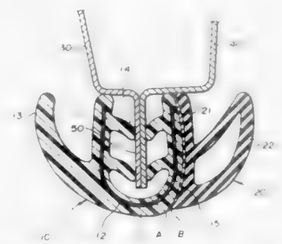
1. A utility cage for a pickup truck having a truck cab, a back wall of said truck cab being adjacent a truck bed of said pickup truck, said truck bed containing side panels and a floor, said utility cage comprising:
a fixed top wall mounted on the side panels of said pickup truck and extending rearwardly from the back wall of said cab; and
a rear wall pivotally secured at the upper edge thereof to the rear edge of said top wall and forming an enclosed cage defined by the top wall, the rear wall, the truck bed side panels, the back wall of said truck cab and said truck floor bed.

5,147,104
AUTOMOTIVE VEHICLE SEAT FOR DISABLED PERSONS
Wojciech Zalewski, Belmont, Mass., assignor to Enhancements Unlimited, Inc., Newton, Mass.
Continuation-in-part of Ser. No. 490,086, Mar. 7, 1990, Pat. No. 5,040,832. This application Aug. 16, 1991, Ser. No. 745,944
Int. Cl.[5] B60N 1/10
U.S. Cl. 296—65.1 15 Claims



1. A seat only for a single driver or single passenger at the door of an automotive vehicle, said door moving between closed and open positions at a doorway through which said seat is accessible, said seat comprising:
(a) back cushion means presenting a geometrical contour only for said single driver or single passenger;
(b) seat cushion means presenting a geometrical contour only for said single driver or single passenger;
(c) electromechanical means and
(d) operational means;
(e) said seat cushion means including stationary cushion means remote from the doorway and transport cushion means adjacent to the doorway, said stationary cushion means providing the major portion of said geometrical contour of said seat cushion means;
(f) said transport cushion means being constrained for movement in a path between a retracted position and an extended position;
(g) said transport cushion means, when in retracted position, presenting, together with said stationary cushion means, a substantially geometrically continuous upper surface having a trough along its front edges;
(h) said transport cushion means, when moving into extended position, traversing a path from its retracted position;
(i) said operational means including manual actuating means for maintaining movement between said retracted position and said extended position when under constant manual control;
(j) said actuating means being accessible to said constant manual control in close proximity to the doorway of said automotive vehicle;
(k) said path extending downwardly and outwardly from the innermost location of said transport cushion.

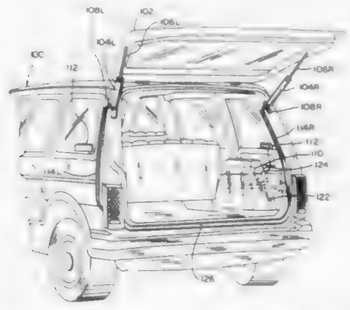
5,147,105
WELT SYSTEM FOR AUTOMOTIVE VEHICLE
Tomohisa Ono; Hitoshi Takahashi, and Toshiaki Yamaguchi, all of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan
Filed Aug. 28, 1991, Ser. No. 751,154
Claims priority, application Japan, Aug. 31, 1990, 2-231209
Int. Cl.[5] B60J 5/04
U.S. Cl. 296—146 F 11 Claims



1. A weatherstrip system disposed on a body flange of a vehicle for providing a seal between the door flange and a door system of the vehicle when the door system is closed, comprising:
a first member extending in a lengthwise direction along the body flange so as to clamp the flange in said first member;
a second member fixed to a surface of the first member at a location which is exposed to ambient environment, the second member being laid in a lengthwise direction on the first member; and
a third member joined to the surface of said second member for contact in the door system for establishing the seal between the body flange and the door system, so that an edge line of the third member is established on the second member, wherein the second member is colored with the color of the third member to enhance the outer appearance thereof.

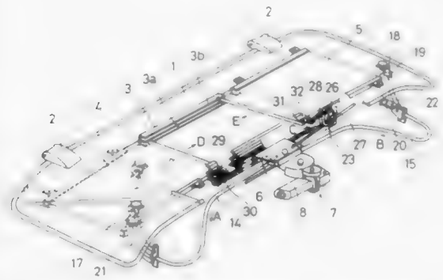
5,147,106
REINFORCED VEHICLE REAR GATE WITH OPTIONAL HYDRAULIC OPERATION
Robert D. Bartelt, Merton; William W. Belson, III, Nashota; Michael R. Bruno, 3950 Southwood Dr., Oconomowoc, and Robert M. Boyd, Watertown, all of Wis., assignors to Michael Roman Bruno, Oconomowoc, Wis.
Continuation of Ser. No. 437,792, Nov. 16, 1989, abandoned.
This application Apr. 15, 1991, Ser. No. 686,863
Int. Cl.[5] B60J 5/10
U.S. Cl. 296—202 19 Claims

19. In a vehicle having a frame and a vertically openable access door, the opening and closing of said door being assisted by at least one cylinder having a rod slidable therein, including first means for pivotably mounting said cylinder to said vehicle frame and second means for pivotably mounting said rod to said door, the improvement comprising:
means mounted to the exterior of said frame for reinforcing



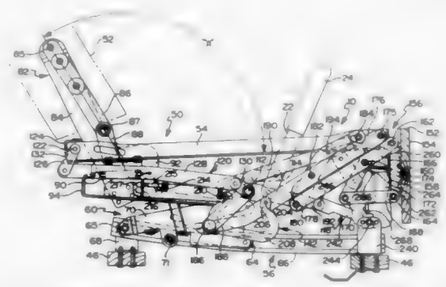
said first mounting means, said reinforcing means including a generally planar member engaging said first mounting means and covering the point at which force is applied to said vehicle frame and further wherein a portion of said member is bent to increase the ability of said member to absorb forces applied to said vehicle frame and said member.

5,147,107
SUN ROOF DEVICE
Nobuhiro Yamauchi, Kariya, and Kazuhisa Nagata, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Jul. 9, 1991, Ser. No. 725,816
Claims priority, application Japan, Jul. 10, 1990, 2-73707
Int. Cl.[5] B60J 7/00
U.S. Cl. 296—214 3 Claims



1. A sunroof assembly for an opening in a vehicle roof, said assembly comprising:
an exterior transparent panel pivotable about a lateral vehicle axis for movement between open and closed positions;
a pair of interior sunshade panels located under said exterior transparent panel and movable in directions parallel to said axis between a light shading position, in which said sunshade panels are spaced from each other, and a retracted position in which said sunshade panels are substantially superposed;
means for driving said exterior transparent panel between said open and closed positions; and
linkage means for moving said interior sunshade panels from said light shading position to said retracted position upon operation of said driving means to move said exterior transparent panel to said open position.

5,147,108
RECLINING SOFA
Larry P. LaPointe, Temperance, Mich., assignor to La-Z-Boy Chair Company, Monroe, Mich.
Filed Oct. 18, 1990, Ser. No. 600,181
Int. Cl.[5] A47C 1/02
U.S. Cl. 297—85 27 Claims

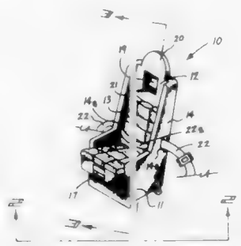


1. A seating unit for use in an article of furniture of the type having a stationary frame section within which said seating unit is secured for longitudinal and angular movement therein, said seating unit comprising:
track means secured to a base within said frame section;
a seat assembly having a seat member, a seat back, and swing link means for pivotally interconnecting said seat back and seat member to permit reclining movement of said seat assembly between a non-reclined first position and a reclined second position in response to pressure applied by a seat occupant to said seat back;
carriage means supporting said seat assembly for translational and tilting movement on said track means between a rear-upright position and a forward-tilted position;
a leg rest assembly supported for movement with said carriage means between a retracted position when said carriage means is in said rear-upright position and an extended operative position when said carriage means is in said forward-tilted position;
drive means for operatively connecting said carriage means and said leg rest assembly, said drive means being movable between a locked position wherein said carriage means is releasably retained in said rear-upright position and a released position for permitting said carriage means to move to said forward-tilted position;
first over-center linkage means for selectively moving said drive means between said locked and released positions, said first over-center linkage means being movable between a first position for releasably locking said drive means in said locked position and a second position for moving said drive means to said released position;
tilt linkage means operatively coupling said carriage means to said drive means for causing tilting movement of said seat assembly toward said forward-tilted position when said drive means is in said released position, said tilt linkage means being operable for assisting said first over-center linkage means in releasably locking said carriage means in said rear-upright position when said drive means is in said locked position;
second over-center linkage means operatively coupling said leg rest assembly to said drive means for biasingly retaining said leg rest assembly in said retracted position when said drive means is in said locked position and for biasingly driving said leg rest assembly toward said extended operative position when said drive means is in said released position;
locking means operably interconnecting said seat assembly to said drive means for inhibiting reclining movement of said seat assembly from said non-reclined first position toward said reclined second position when said drive

means is in said locked position, said locking means being operable to permit reclining movement of said seat assembly when said drive means is in said released position whereby said seat back is substantially confined within said frame section during tilting and reclining movement of said seat assembly; and

manually operated actuation means for moving said first over-center linkage means from said first position to said second position.

5,147,109
CAR SEAT APPARATUS
Jack L. Jolly, Rte. 1 Box 800, Esparto, Calif. 95627
Filed Oct. 7, 1991, Ser. No. 772,104
Int. Cl.[5] A47D *1/10*
U.S. Cl. 297—217 **3 Claims**



1. A car seat apparatus, comprising,

a base portion fixedly mounted to a back portion, wherein the base portion and back portion each include respective right and left side walls defining a seat cavity, the seat cavity receiving an L-shaped cushion therewithin, and

the side walls including aligned side wall slots for receiving a vehicular seat belt therethrough, and

the base portion including a base cavity, the base cavity including a sound reproducing mechanism contained therewithin, and

the sound reproducing mechanism including an actuator pull cord directed through the base portion for selective actuation of the sound reproducing mechanism, and

a sound directing conduit is directed coextensively from the base portion through the back portion, and the sound reproducing mechanism is mounted fixedly adjacent the sound directing conduit, and a matrix of apertures communicating between the sound reproducing mechanism and the sound directing conduit to direct audible signals into the sound directing conduit, and

the sound directing conduit directed through the back portion terminates in a sound chamber cavity formed within the back portion adjacent an upper terminal end of the back portion, and a back portion projecting plate coextensive with the back portion extending above the chamber cavity, and a flexible animal representation member mounted to coextensively overlie the base portion and the back portion positioned forwardly of the sound chamber cavity, and

the animal representation member includes a head portion, the head portion mounted to a body member, the body member including a plurality of arm members and a plurality of leg members, the arm members positioned along the side walls, and the leg members extending forwardly along the base portion, and

the head portion includes a pocket mounted to the rear surface of the head portion the pocket including a pocket entrance formed at a lower terminal end of the pocket, and the back portion projecting plate complementarily received within the pocket mounting the animal representation member to the back portion, and

the head portion includes a head portion sound directing conduit directed from the forward surface of the head portion extending through the rear surface of the head portion at an intersection of the head portion with the pocket entrance, and the pocket entrance positioned adjacent the sound chamber cavity to direct an audible signal from the sound chamber cavity through the head portion sound directing conduit.

5,147,110
REMOVABLE HEADREST ASSEMBLY FOR MOTOR VEHICLE SEATS
Charles S. Syers, 325 Ascot Rd., Hillsborough, Calif. 94010
Filed Nov. 26, 1990, Ser. No. 617,832
Int. Cl.[5] A61G *15/00*
U.S. Cl. 297—397 **12 Claims**

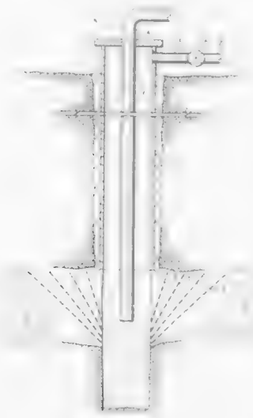
1. A removable headrest assembly for installation on a vehicle seat having a seatback and a bottom seat, the seatback having a forward side, a rearward side, an upper surface and a lower surface, the removable headrest assembly comprising:

a cushioned headrest, the cushioned headrest having a resilient energy-absorbing pad arranged in a flexible housing, the housing including means for removably affixing the housing to the upper surface of the seatback, the affixing means including a first portion secured to the housing and a second portion secured to the upper surface of the seatback, the first portion and the second portion configured to removably mate together to securely connect the cushioned headrest to the upper surface of the seatback and restrict movement in all directions;

a sheet portion having a first end, a second end, a front side and a back side, said first end attached to said cushioned headrest and said second end having a width and including a securing means, the securing means including a first part which removably mates with a corresponding second part, the first part being disposed on said front side of the sheet portion and the second part being disposed on the back side of the sheet portion to thereby allow the second end of the sheet portion to be rolled upon itself in either direction adjustably between a first position and a second position and secure the front side to the back side by mating the first part and second part together; and

an anchoring means for anchoring the second end of said sheet portion adjacent said seatback and said bottom seat, the anchoring means including a tubular member configured to lie adjacent the second end of the sheet portion, whereby when the second end is inserted between the lower surface of the seatback and the bottom seat, the front side and the back side of the sheet portion can be rolled around the tubular member and mated together between the first position and the second position to thereby adjustably tension the sheet and restrict movement of the second end of the sheet portion.

5,147,111
CAVITY INDUCED STIMULATION METHOD OF COAL DEGASIFICATION WELLS
Carl T. Montgomery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Aug. 2, 1991, Ser. No. 739,939
Int. Cl.[5] E21B *43/26;* **E21C** *37/14*
U.S. Cl. 299—16 **7 Claims**



1. A cavity induced stimulation method for improving the production of fluids from a subterranean coal seam, said method comprising:

drilling a wellbore to a point substantially at the top of the coal seam;

casing said wellbore;

drilling below the cased wellbore to extend the wellbore into said coal seam;

lowering a tubing into the wellbore to a point adjacent the wellbore; said tubing forming an annulus with the wall of the wellbore;

flowing liquid CO_2 down said tubing while maintaining a backpressure on said annulus at about the critical temperature of liquid CO_2 until the tubing has been cooled by the liquid CO_2 to the critical temperature of liquid CO_2 and is then increased to from about 1500 psia to 2000 psia;

displacing said liquid CO_2 into said coal seam;

shutting in the wellbore and allowing the pressure to build on the coal seam; and

releasing said pressure quickly to thereby cause at least a portion of the coal seam to fail and fragment into coal particles in said wellbore.

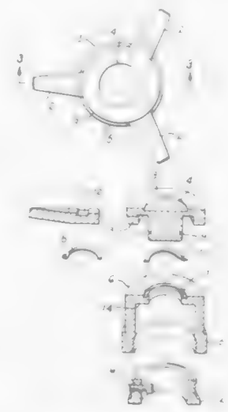
5,147,112
VEHICLE WHEEL KNOCKOFF
Brett R. Forrester, P.O. Box 2616, Costa Mesa, Calif. 92628
Filed Jul. 29, 1991, Ser. No. 736,794
Int. Cl.[5] B60B *7/04*
U.S. Cl. 301—37 SC **2 Claims**

1. An improved decorative wheel attachment for the wheel of a vehicle where the wheel has an axial opening, the attachment mounting at the opening of the wheel, the outside of the mounted attachment and of the wheel being the side facing away from the body of the vehicle, the inside of the mounted attachment and of the wheel being the side facing toward the body of the vehicle, the improvement comprising:

a hollow cylindrical base, the base sized to mount at the axial opening of the wheel, the base having two ends, one end, the inside end, being threaded internally, the other end, the outside end, being partially closed,

a flanged, threaded ring with threads sized to match those of the base, the flange holding the base to the outside of the wheel when the flange is threaded onto the base through the wheel opening from the inside of the wheel,

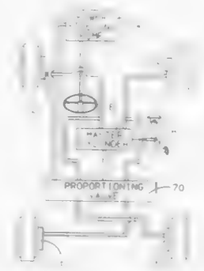
a cap having an extended cylindrical portion, the cylindrical portion inserted within the hollowed-out, non-threaded



end of the base, the cap acting as a retainer for decorative shapes, the shapes being retained on the outside end of the cap,

means arranged inside the base, accessible from the inside of the wheel, for attaching the cap to the base.

5,147,113
PROPORTIONING BRAKE PRESSURE VALVE RESPONSIVE TO STEERING SYSTEM HYDRAULIC PRESSURE
Robert L. Nisonger, Milford, and Richard W. Topping, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 19, 1991, Ser. No. 718,327
Int. Cl.[5] B60T *8/26, 8/24*
U.S. Cl. 303—9.73 **3 Claims**



1. A braking system for an automotive vehicle comprising:

a first fluidly activated brake; a second fluidly activated brake;

master cylinder means for supplying pressurized fluid to the first and second brakes;

a powered hydraulic steering system responsive to a vehicle operator command for steering the vehicle;

means for proportioning the pressurized fluid delivered by the master cylinder to the first and second brakes at a first given ration up to a first predetermined pressure and thereafter at a second given ration above the first predetermined pressure;

and means for sensing a hydraulic pressure within the steering system and providing a signal corresponding thereto; and

means responsive to the steering system hydraulic pressure for operational association with the proportioning means to modify the predetermined pressure of the proportioning means.

5,147,114

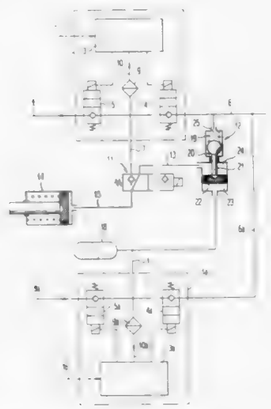
ELECTRICALLY CONTROLLABLE PRESSURE MEDIUM BRAKE FOR VEHICLES

Winfried Hommen; Georg Stäudle, both of Munich; Thomas Störzinger, Stamberg; Tiberius Wieser, and Thomas Wissler, both of Munich, all of Fed. Rep. of Germany, assignors to Knorr-Bremse AG, Fed. Rep. of Germany

Filed Jan. 28, 1991, Ser. No. 646,274

Int. Cl.[5] B60T *8/18*

U.S. Cl. 303—15 **9 Claims**



1. Electrically controllable pressure medium brake for vehicles having wheels, with a control system that can be controlled with an electrical brake request signal to generate a brake pressure for a brake cylinder during normal operation corresponding to the brake request signal, wherein the control system comprises an emergency braking device effective in emergencies to generate an emergency brake pressure that corresponds to a maximum braking force possible without locking said wheels, and that is defined by an electric vehicle load signal as a function of vehicle load, and with an emergency brake valve (**11**), which feeds the brake pressure to a brake cylinder (**14**) during normal operation and feeds an emergency brake pressure to said brake cylinder in an emergency by blocking the brake pressure, said pressure medium brake comprising

(a) a first electric pressure means, EP, converter (**1***a*; **1**) which is closed in a current less state and which converts the electrical vehicle load signal into a vehicle load-dependent pressure medium pressure; and

(b) a pressure medium-based limiting valve (**12**; **12'**) downstream of said first EP converter and comprising a piston (**22**) pressurized by the vehicle load-dependent pressure medium pressure against the emergency brake pressure to be fed to the emergency brake valve (**11**) in order to switch a shutoff valve (**20**), which is arranged in a connection between a pressure medium source line (**6**), under a pressure that is at least sufficient to achieve maximum braking, and a chamber (line **13**) under the emergency brake pressure.

5,147,115

ADAPTIVE RELEASE APPLY ALGORITHM

Kevin G. Leppek, Troy, and Martin A. Hogan, Farmington Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 509,700, Apr. 16, 1990, abandoned. This application Jul. 22, 1991, Ser. No. 734,079

Int. Cl.[5] B60T *8/00*

U.S. Cl. 303—105 **8 Claims**

1. A method of limiting the brake pressure applied to the brake of a vehicle wheel traveling over a road surface, the method comprising the steps of:

cyclically (A) detecting a brake pressure release condition when a condition of the wheel exceeds a release condition threshold indicating an incipient wheel lockup condition, (B) releasing brake pressure to allow wheel recovery when a brake pressure release condition is detected, and (C) reapplying brake pressure following wheel recovery until a brake pressure release condition is again detected;

detecting a predetermined rapid cycling condition of the cyclic detection, releasing and reapplying; and

progressively increasing the release condition threshold while the rapid cycling condition is detected.

5,147,116

INTEGRAL ABS AND TRACTION CONTROL HAVING AN ELECTRIC MODULATOR

Donald L. Parker, Middletown, Ohio; Jerry L. Newton, Richmond, Ind.; David F. Reuter, Beavercreek, Ohio, and Fred W. Huntzicker, Ann Arbor, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1991, Ser. No. 723,127

Int. Cl.[5] B60T *8/42*

U.S. Cl. 303—115 EC **3 Claims**

1. An integrated anti-lock braking/traction control braking system for a vehicle having a fluid actuated wheel brake comprising:

a system controller cognizant of a rotational condition of a wheel for signalling the system to an anti-lock braking or traction control mode;

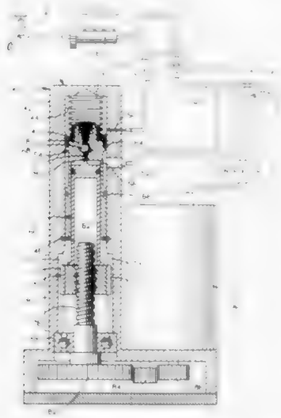
master cylinder means for fluidly delivering pressurized fluid to the wheel brake;

an actuator frame with a longitudinal bore, the bore having a first fluid connection with the master cylinder and spaced therefrom a second fluid connection with the wheel brake;

a first normally open solenoid valve for isolating the master cylinder from the wheel brake when the controller places the system in an anti-lock braking or traction control mode;

a hollow primary piston slidably mounted within the longitudinal bore along first, second and third spaced sealed peripheries having a first port connecting the interior of the primary piston with its exterior between the first and second sealed peripheries and communicating with the second fluid connection of the bore, and the primary piston having a second port fluidly connecting an end of the primary piston most adjacent to the bore first fluid connection with the interior of the primary piston and the primary piston having a check valve mounted within the second port and the primary piston having the third sealed periphery generally adjacent the bore first fluid connection;

a secondary piston slidably sealably mounted within the primary piston movable in a direction towards the bore first fluid connection to pressurize said wheel brake and movable in an opposite direction to release the pressure within the wheel brake, the secondary piston having an



extreme position with respect to the primary piston wherein the secondary piston opens the check valve within the second port of the primary piston and further movement of the secondary piston with respect to the primary piston causes the pistons to move in unison pressurizing the wheel brake;

a nut operatively associated with the secondary piston;

means to prevent the nut from rotating;

a drive screw threadably engaged and projecting through the unit;

a gear train connected with the drive screw; and

a reversible motor connected with the gear train for moving the secondary piston in response to signals given by the controller.

5,147,117

INTEGRATED ANTI-LOCK BRAKING AND TRACTION CONTROL SYSTEM

James F. Quinn, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1991, Ser. No. 671,570

Int. Cl.[5] B60T *8/58*

U.S. Cl. 303—115 EC **4 Claims**

1. A braking system for a vehicle having anti-lock braking capabilities and traction control braking capabilities for a vehicle having a fluid actuated brake for a wheel comprising:

a system controller aware of the rotational condition of the wheel for signaling the system to an anti-lock braking mode and to a traction control mode from a normal mode of operation and from another mode of operation differing from the signaled mode of operation;

master cylinder means for delivering pressurized fluid to the wheel brake;

an actuator frame with a bore having two ends, the bore being fluidly connected with the master cylinder means and the wheel brake generally along the first end;

a first fluid network fluidly connecting the master cylinder means with the wheel brake;

a reservoir fluidly connected with the bore and the brake for selective receipt of fluid from the bore;

a second fluid network fluidly connecting the reservoir and the two ends of the bore with one another and fluidly connecting the reservoir with the wheel brake;

check valve means having a first position preventing flow from the master cylinder to the brake via the first fluid network and the check valve means having a second position allowing flow from the master cylinder to the brake via the first fluid network;

means responsive to the controller for isolating the reservoir from the second fluid network when the braking system is in the normal mode of operation and when the braking system integration is in traction control mode of operation;

means responsive to the controller for preventing fluid communication through the second fluid network between the two ends of the bore when the integration is in an anti-lock braking mode;

means responsive to the controller for preventing fluid communication between the master cylinder in the bore when the integration is in a traction control mode;

a piston slidably mounted in the bore with a head sealably separating the first and second ends of the bore, the piston having a connected rod sealed with respect to the bore;

mechanical means for retaining the check valve means to an open position when the piston head is adjacent to the first end of the bore during normal operation;

and means to reversibly move the piston in response to the controller causing the piston to open the check valve in normal operation.

5,147,118

PRESSURE ACTUATOR FOR A FLUID ACTUATED BRAKING SYSTEM

David F. Reuter, Beavercreek; Thomas C. Downs, Tipp City, and Alisa A. Greywitt, Centerville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1991, Ser. No. 736,302

Int. Cl.[5] B60T *8/42*

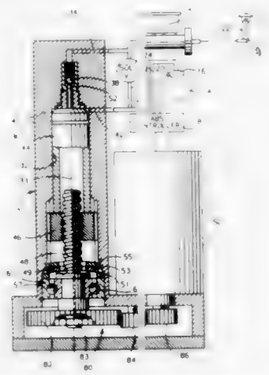
U.S. Cl. 303—115 EC **4 Claims**

1. A vehicle wheel braking system pressure actuator for modulating a fluid pressure within a vehicle wheel brake, the actuator comprising:

an actuator frame having a bore with means of fluid communication with the wheel brake;

a piston slidably sealably mounted in the bore for providing

a variable control volume in communication with the wheel brake and thereby modulating the pressure therein;
a nut operatively associated with the piston and slidably mounted within the bore in a non-rotative fashion;
a power screw projecting into the nut and threadably engaged therein, the power screw having a fixed rotational axis with respect to the actuator frame and a thrust flange generally adjacent an end of the power screw;



support means locationally generally fixed with respect to the actuator frame;
at least one bevel washer, supported on the support means encircling the power screw and arching toward the nut wherein movement of the nut towards the thrust flange causes the nut to flatten the washer and further movement of the nut causes the washer to contact and provide braking friction to the flange.

5,147,119
SOCK STORAGE AND DISPENSING APPARATUS
Jonathan L. Harris, 24 Leonard Ave., Leonardo, N.J. 07737
Filed Jun. 28, 1990, Ser. No. 544,963
Int. Cl.[5] A47F *1/08*
U.S. Cl. 312—49 **3 Claims**

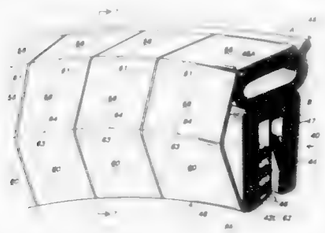
1. An integral plastic sock storage and organizing apparatus wherein rolled socks are stored and accessed comprising:
an elongated tubular member having an upper portion and a lower portion including an axial slot extending therealong for viewing the stored socks, said slot flairing outwardly for a substantial distance and downwardly at the lower portion to form a sock dispensing opening,
a base attached across an end of the tubular member to make the apparatus self-standing, and,
a lip having ends, the lip mounted on the base and extending solely across the opening and having the lower portion of the tubular member joined to the ends of the lip, to provide additional stiffness to the tubular member and to prevent the socks from spilling out from said tubular member.

5,147,120
STACKABLE BUREAU AND RACK FURNITURE
Frank J. Ray, 5340 Prospect St., Cocoa, Fla. 32926
Filed Aug. 20, 1990, Ser. No. 569,608
Int. Cl.[5] A47B *47/02*
U.S. Cl. 312—111 **32 Claims**

1. A stackable bureau having:
two side walls, a rear wall and a front wall with top and bottom edges;
a drawer orifice in the front wall for a stackable drawer bureau;
a drawer slidable in and out of the bureau through the drawer orifice in the front wall;
a stack-positioning leg positioned at the front-corner juncture of the bottom edge of the inside surface of the front wall and each side wall as front legs and positioned at a rear-corner juncture of the bottom edge of the inside surface of the rear wall and each side wall as back legs; and
a portion of each leg extendable from below the bottom edge of each wall at each corner to a position selectively above each bottom edge and below the top edge of each wall at each corner as corner braces in rigid contact with an inside wall at each corner, such that the legs are bureau-bottom legs and also bureau-positioning legs positionable within the top corners of a bottom bureau so formed from the bottom corners of a top bureau so formed.

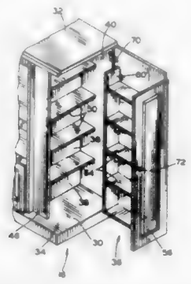
5,147,121
GASKET FOR PROVIDING EMI/RFI SHIELDING
George McIlwraith, Stone Mountain, Ga., assignor to Gichner Systems Group, Inc., Dallastown, Pa.
Continuation-in-part of Ser. No. 434,323, Nov. 13, 1989, Pat. No. 5,020,806, which is a continuation-in-part of Ser. No. 612,586, Nov. 9, 1990, abandoned. This application Feb. 28, 1991, Ser. No. 662,296
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—296 **25 Claims**

1. A sealing device, comprising:
an elongate compressible, resilient head;
a pair of legs extending downwardly from said head; and
a conductor disposed between said legs and extending upwardly adjacent the outer surface of one of said legs and a portion of said head, said conductor comprising:



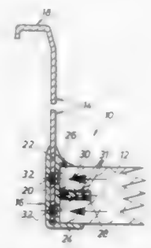
a plurality of individually movable fingers each extending from between said legs to the outer surface of said head; and
means for interconnecting said fingers.

5,147,122
TAPE STORAGE RACK
Michael K. Short, Archbold, Ohio, assignor to Sauder Woodworking Co., Archbold, Ohio
Filed Apr. 15, 1991, Ser. No. 685,509
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—321.5 **20 Claims**



1. An article of furniture comprising a stationary back wall, first and second upright side walls extending outwardly from said back wall in spaced relationship, a plurality of stationary shelves of predetermined depth extending between said side walls and outwardly from said back walls, a movable back wall, third and fourth upright side walls extending outwardly from said movable back wall in spaced relationship, a plurality of movable shelves of predetermined depth extending between said third and fourth side walls and outwardly from said movable back wall, hinge means connecting said movable back wall and said first side wall, said fourth upright side wall having a width at least equal to the depth of both said stationary shelves and said movable shelves, said fourth upright side wall completely overlapping said second side wall when said back walls are in parallel relationship, with the article in a closed condition.

5,147,123
METAL PANEL FOR DRAWER WALLS
Horst Berger, Bielefeld, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany
Filed Apr. 12, 1991, Ser. No. 685,899
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011815
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—348.1 **10 Claims**

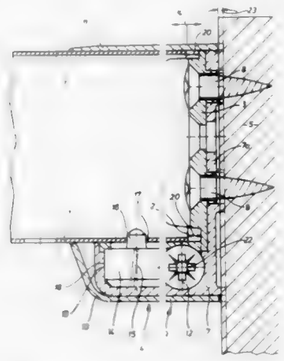


1. A metal panel for drawer walls, comprising a wall plate (**14**) having a single-thickness and stamped and shaped from sheet metal and a separately made drawer-bottom holding shaped structure (**16**; **16'**) formed of metal, said wall plate having a lower marginal area which said drawer bottom holding shaped structure is fastened to and which extends substantially over an entire length of this bottom margin, said wall plate having a longitudinal slot and the drawer-bottom holding shaped structure (**16**) is a section of metal, which has coupling portion (**20**) comprising a longitudinal slot (**22**) into which is fitted the bottom margin of the wall place (**14**), a strip-like bottom holding flange (**24**) projecting at right angles from the coupling portion (**20**), and a transition flange (**26**) projecting at a distance above the bottom-holding flange forming a cove of concavely rounded cross section in an area of transition from an inside surface of the wall plate (**14**) to a top side of the corresponding drawer bottom (**12**), wherein the bottom-holding flange (**24**) and the transition flange (**26**) are spaced apart a distance approximately equal to a thickness of a drawer bottom (**12**) which is to be mounted between these flanges; and wherein about centrally between the bottom-holding flange (**34**) and the transition flange (**26**) a strip-like anchoring flange (**28**) projects at right angles from the coupling portion (**20**), adapted to be hammered into a slot-shaped groove (**30**) made in an edge surface of the drawer bottom (**12**) to be accommodated between the flanges (**24**, **26**).

5,147,124
FALSE FRONT WITH ADJUSTMENT DEVICE
Alfred Grass, Hochst/Vlbg., and Ingo Gasser, Höchst, both of Austria, assignors to Grass AG, Hochst/Vlbg., Austria
Filed Sep. 10, 1990, Ser. No. 580,266
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930662
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—348.4 **5 Claims**

1. A device for adjusting the incline of a false front of a drawer of the type having a drawer back and respective side frame rails connected to the drawer back, comprising:
a gear housing attachable to the false front;
a worm rotatably supported in said gear housing;
a pinion meshing with said worm and having portions defining an eccentric bolt;
the respective side frame rails each having a forward end including portions defining a receiving slot, and said eccentric bolt slidably engaging said receiving slot of a respective side frame rail and, upon rotation of said worm

and thus said pinion and eccentric bolt, displacing said gear housing and thus said false front in directions toward



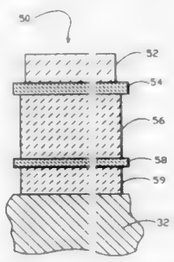
and away from said forward end of said respective side frame rail.

5,147,125

MULTILAYER ANTI-REFLECTION COATING USING ZINC OXIDE TO PROVIDE ULTRAVIOLET BLOCKING

R. Russel Austin, Novato, Calif., assignor to Viratec Thin Films, Inc., Faribault, Minn.

Filed Aug. 24, 1989 Ser. No. 398,136
Int. Cl.[5] G02B 5/28
U.S. Cl. 359—359 15 Claims



1. An anti-reflection coating formed on a surface of a substrate, comprising:

five layers, numbered consecutively beginning with the layer furthest from said substrate, wherein at least the third layer is zinc oxide having an optical thickness at a wavelength of about 520 nanometers of at least about six-tenths of a wavelength, and the four other layers each have an optical thickness at a wavelength of about 520 nanometers less than about one-third of a wavelength;

the first layer having an index of refraction less than that of said substrate;

the second and fourth layers having a refractive index greater than zinc oxide; and

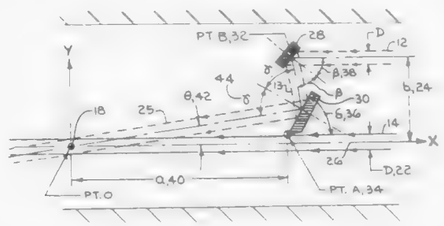
the fifth layer having a refractive index less than the fourth layer but greater than that of said substrate.

5,147,126

DUAL LASER BEAM ANGULAR SEPARATION CONTROL APPARATUS

Wilfred H. Bachle, Orange, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 8, 1987, Ser. No. 93,467
Int. Cl.[5] G02B 27/14, 26/08, 26/10
U.S. Cl. 359—862 1 Claim



1. A dual laser beam angular separation control apparatus, said dual laser beam separation control apparatus connected between a dual laser beam source and a beam scanning apparatus, said dual laser beam angular separation control apparatus comprising:

a housing, said housing having a longitudinal cavity therethrough;

said dual laser beam source outputting a pair of substantially parallel laser beams, one beam being a central beam and the other beam being the outer beam, said beams being input into said longitudinal cavity of said housing;

a first mirrored flat, said first mirrored flat being rotatably mounted within said housing;

a second mirrored flat, said second mirrored flat being rotatably mounted within said housing;

means for selectively rotating said mirrors

said outer beam entering said housing and reflecting off said first mirrored flat to form a first reflected beam, said first reflected beam reflecting off said second mirrored flat to form a second reflected beam, said second reflected beam converging with said central beam at an angle θ and said second reflected beam and said central beam crossing at an aperture point;

said first and said second mirrored flat, said central beam and said outer beam, and said aperture point being positionally connected by the equation:

$$\frac{\tan\theta - \tan(\pi + \theta - 2\gamma)}{\tan(\pi/2 + \theta - \gamma) - \tan\theta} - \frac{b - (a + D/2)\tan(\pi + \theta - 2\gamma)}{a\tan(\pi/2 + \theta - \gamma) - D/2}$$

wherein:

θ is the angle between the central beam and the second reflected beam at the aperture point;

γ is one half the angle between the first reflected beam and the second reflected beam at said second mirrored flat;

b is the distance between an outer beam axis and a central beam axis;

D is the diameter of said outer and said central beam;

a is the distance from the aperture point to the pivot of said second mirrored flat: whereby

said first mirrored flat is oriented at an angle β from a horizontal line being the same as the outer beam axis, β equals γminus $\theta/2$;

said second mirrored flat is oriented at an angle δ from a horizontal line being the same as the central beam axis, δ equals $\pi/2$ plus θ minus γ;

said δ and β being determined by a θ minimum having a, b, and D as parameters:

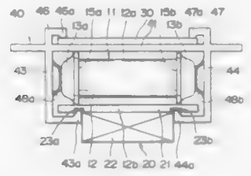
said variables and parameters being selected to minimize θ and minimize an aperture at said aperture point where said beams cross.

5,147,127

LIQUID CRYSTAL DISPLAY APPARATUS

Hisashi Honda, Yokohama, and Yoji Yuge, Chigasaki, both of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Jan. 24, 1991, Ser. No. 645,259
Claims priority, application Japan, Jan. 25, 1990, 2-15730
Int. Cl.[5] F21V 9/16
U.S. Cl. 362—23 5 Claims



1. A liquid crystal display apparatus, which comprises:

a liquid crystal display panel;

a fluorescent lamp for illuminating said liquid crystal display panel, said fluorescent lamp being provided with a glass bulb in which at least a pair of electrodes are disposed and filled with mercury and gas, said glass bulb having an inner surface on which a fluorescent material is applied and said fluorescent lamp being further provided with a pair of receiving terminals;

a lighting unit for lighting said fluorescent lamp, said lighting unit being electrically connected to a pair of supply terminals; and

a holding unit for holding said liquid crystal display panel, detachably holding said fluorescent lamp and holding said lighting unit in an assembled state in which said paired receiving terminals are supported by said paired supply terminals;

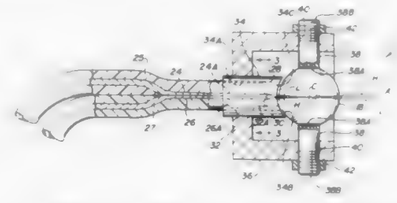
wherein said lighting unit comprises a substrate of thin rectangular plate-like structure, a lighting circuit element is mounted on one surface of said substrate and a pair of recesses are formed on bilateral edge portions of one surface of the substrate and wherein said holding unit comprises a holding plate of a rectangular plate-like structure having a window disposed at substantially a central portion thereof and a bilateral pair of pawl members which engage with said recesses when said lighting unit is assembled with said holding unit, said pawl members being disposed on one surface of said holding plate at bilateral edge portions of the window, each of said engaging pawl members having an L-shaped structure having a vertical portion projecting from the one surface of the holding plate and a horizontal portion inwardly horizontally extending from a front end of the vertical portion, and said horizontal portion having a front end projecting inwardly towards said window.

5,147,128

FIBEROPTIC MULTI-BEAM ROADWAY ILLUMINATION DEVICE

Gene R. Windross, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1991, Ser. No. 811,253
Int. Cl.[5] F21V 7/04
U.S. Cl. 362—32 14 Claims



1. A fiberoptic multi-beam roadway illumination device. comprising:

a single optical lens having a center and a longitudinal axis extending through said center;

means for defining separate beam light paths comprising:

a pair of fiberoptic conductors disposed in parallel with one above the other to define a low and high beam for inputting low and high beam light into said lens respectively above and below said longitudinal axis of said lens and outputting the low and high beam light from said lens respectively below and above said longitudinal axis of said lens to thereby project respective low and high beams of light, and

a ferrule inserted over end portions of said fiberoptic conductors and defining apertures in side-by-side relationship with the others of said apertures, each of said apertures for receiving light emitted from a corresponding one of said fiberoptic conductors and passing light to said lens at separate locations relative to said longitudinal axis and to thereby project respective separate multiple beams of light, and

a hollow cylindrical coupling member inserted over said ferrule and engaged with said lens, said coupling member disposing said apertures in said ferrule in spaced relation from said lens, and

means for adjusting the alignment of said lens.

5,147,129

AUTONOMOUS VISUAL-ATTRACTION ENHANCEMENT UTILIZING EDGE-ILLUMINATED PANEL

Ming-ho Ku, Kowloon, Hong Kong, assignor to Tradebest International Corporation, Hong Kong

Continuation of Ser. No. 403,692, Sep. 6, 1989, abandoned, which is a division of Ser. No. 239,621, Sep. 1, 1988, Pat. No. 4,975,809, which is a continuation of Ser. No. 864,188, May 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 773,184, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 594,209, Mar. 28, 1984, Pat. No. 4,559,583. This application Aug. 22, 1991, Ser. No. 748,655
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] F21L 15/14
U.S. Cl. 362—106 4 Claims

1. An illuminable hat comprising:

a hat body having a display surface;

an aperture formed in the display surface;

an edge-illuminable, essentially solid, internally light transmissive panel having an illuminable projection surface;

said panel positioned within the hat body and fixed behind the display surface;

said projection surface observable within the aperture upon illumination of the panel; and

a means for edge illumination of the panel, said edge-illumination means being disposed within said body, wherein

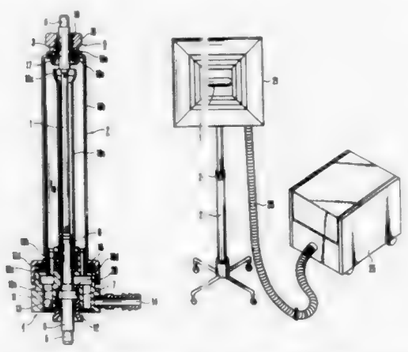
the panel contains an illuminable pattern observable within the aperture upon illumination of the panel.

5,147,130

COOLING LIQUID RECIRCULATION SYSTEM FOR LIGHT SOURCE UNIT

Minoru Watanuki, Tokyo, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1989 Ser. No. 430,264
Claims priority, application Japan, Jun. 21, 1989, 1-159045
Int. Cl.[5] F21V *29/00*
U.S. Cl. 362—218 **7 Claims**



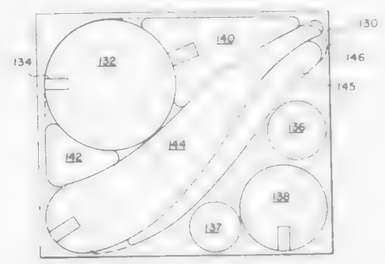
1. A movable cooling liquid recirculation system for a light source unit, said system comprising:
- cooling means disposed to surround the light source unit for removing heat generated by the light source unit;
- cooling liquid supply means for circulating a cooling liquid in said system, said cooling liquid supply means including:
  - (a) a storage tank for storing the cooling liquid;
  - (b) cleaning means for cleaning the cooling liquid; and
  - (c) bubble separation means for removing entrained air from the cooling liquid
- pump means for recirculating the cooling liquid in said system; and
- connecting means for flexibly connecting said pump means, said cooling means and said cooling liquid supply means so that the cooling liquid can be recirculated between said cooling means and said cooling liquid supply means via said pump means.

5,147,131

SHADOW PANEL ASSEMBLY

Ross Lowel, Katonah, and Apiruk Pronputhsri, Long Island City, both of N.Y., assignors to Lowel-Light Manufacturing, Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 537,411, Jun. 16, 1990, Pat. No. 5,072,350. This application Mar. 4, 1991, Ser. No. 664,374
Int. Cl.[5] F21V *11/00*
U.S. Cl. 362—351 **18 Claims**



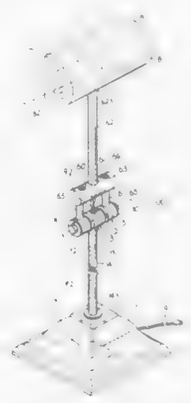
1. A shade panel assembly for use in forming at least one shade leaf to be used for support in front a light to cast a shadow, the assembly comprising:
- an opaque flexible metallic sheet having opposite surfaces; and
- markings on one of said surfaces which delineate a plurality of shapes each defining the shape of a separate shade leaf, the markings being useable for guiding the cutting of said panel into at least one opaque shade leaf, said markings being non-glare, low reflection markings, said panel having a dark color contrasting with said markings;
- whereby when a predetermined shape is cut from the panel and supported in front of a light, the resulting element functions as a shade leaf.

5,147,132

SWIVEL MEANS FOR LIGHTING FIXTURE

Chia-Yu Lee, Taipei, Taiwan, assignor to Sangara Industrial Co., Ltd., Taipei, Taiwan

Filed Apr. 2, 1992, Ser. No. 863,697
Int. Cl.[5] F21S *3/02*
U.S. Cl. 362—426 **8 Claims**



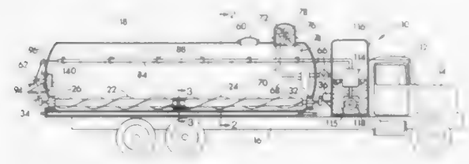
1. A swivel means for lighting fixture comprising:
- a swivel base secured on a supporting base of a lighting fixture of an electric lamp;
- an upper bracket secured with a lampshade having an illuminator electrically connected to a power source and held in said lampshade, and rotatably mounted on said swivel base;
- at least a packing sleeve packed between said swivel base and said upper bracket for frictionally holding and positioning said upper bracket secured with said lampshade when optionally rotating said upper bracket about said swivel base; and
- at least a tensioning spring retained in between said swivel base and said upper bracket for resiliently holding said upper bracket and said lampshade on said swivel base after angularly rotating said upper bracket about said swivel base.

5,147,133

TANK TRUCK WITH AGITATOR FOR FLUID PRODUCTS

Justin T. White, P.O. Box 392, Velva, N. Dak. 58790

Filed Feb. 15, 1991, Ser. No. 656,204
Int. Cl.[5] B01F *7/08, 15/00, 15/06*
U.S. Cl. 366—138 **11 Claims**



1. A tank truck comprising,
- a fluid storage tank,
- an agitator mounted within the tank,
- said agitator including a shaft means having first and second end journaled for support on an axis of rotation in first and second bearings means, respectively, at spaced locations on the tank,
- the first of said bearing means including a pivotable member adapted to allow the second end of the agitator mounted in the second bearing to be raised or lowered with respect to the second bearing,
- said second bearing is a removable bearing supporting the second end of the agitator,
- a drive means connected to the agitator for rotating the agitator, and
- a releasable connection between the first end of the agitator and the drive means whereby the agitator can be released from the second bearing and withdrawn while the second end thereof is lifted away from the second bearing.

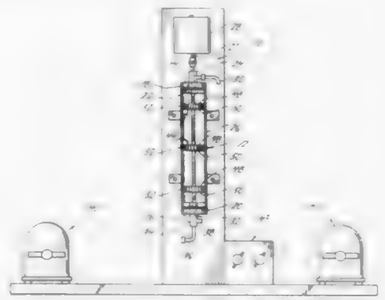
5,147,134

PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGH-INTERNAL-PHASE-RATIO EMULSIONS

Guy M. Bradley, Chesterfield, and Todd D. Stone, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 334,643, Apr. 6, 1989, which is a continuation-in-part of Ser. No. 898,663, Aug. 21, 1986, abandoned. This application Jul. 2, 1991, Ser. No. 724,699
Int. Cl.[5] B01F *15/02*
U.S. Cl. 366—150 **7 Claims**

1. A process for the production of a stable highly viscous high-internal-phase-ratio emulsion (HIPRE) of at least 75% by volume internal phase comprising the steps of:
- (a) moving a first liquid having a viscosity substantially lower than the viscosity of the resulting HIPRE product at a first volume flow rate;
- (b) moving a second liquid having a viscosity substantially lower than the viscosity of the resulting HIPRE product at a second volume flow rate of at least three times that of the volume flow rate of the first liquid, said first liquid and said second liquid being substantially immiscible with each other with at least one of said liquids containing an emulsifying agent;
- (c) simultaneously and continuously metering the first liquid and the second liquid into a confined emulsion forming zone to form a confluent stream of said liquids;
- (d) moving the resulting confluent stream undirectionally through the emulsion forming zone;



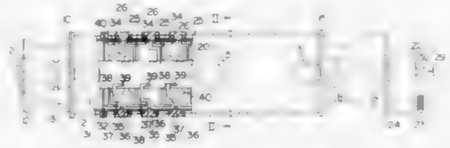
- (e) establishing and maintaining within the confined emulsion forming zone a plurality of low shear mixing stages such that the confluent streams being mixed flows substantially unobstructed between the said mixing stages; and
- (f) removing the resulting HIPRE product from the confined emulsion zone.

5,147,135

CONTINUOUSLY OPERATING MIXING KNEADER

Jorg List, Pratteln; Walther Schwenk, Kaiseraugust; Winfried Dotsch, Pratteln, and Pierre Liechti, Muttenz, all of Switzerland, assignors to List AG, Switzerland

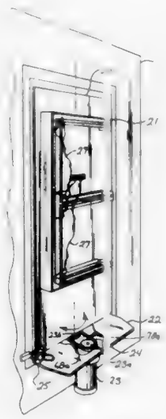
Filed Apr. 10, 1991, Ser. No. 683,328
Claims priority, application Switzerland, Apr. 11, 1990, 01-244/90
Int. Cl.[5] B01F *7/00*
U.S. Cl. 366—303 **12 Claims**



1. A continuously operating mixing kneader for the thermal or chemical treatment of products in liquid, pasty or pulverulent state or combinations thereof, which comprises: a housing; a kneader shaft arranged in the housing, running axially and concentrically therein; disk elements and kneading bars on said shaft; wherein, said shaft rotates about an axis of rotation (2) and effects the transportation of product in the housing in a direction of transport (x); counter-elements provided between the disk elements fixed to the housing; said disk elements being arranged in planes perpendicular to the kneader shaft, forming free sectors between disk elements defining kneading chambers; wherein the kneading bars are arranged on a line offset with respect to the kneading chambers selected from the group consisting of a positive offset line and a negative offset line, wherein in the case of a positive offset line each kneading bar assigned to two disk elements is followed against the direction of rotation (2) by a kneading bar assigned to the next two disk elements of the kneading chamber following in the direction of transport (x), whereas in the case of a negative offset line each kneading bar assigned to two disk elements is followed in the direction of rotation (2) by a kneading bar assigned to the next

two disk elements of the kneading chamber following in the direction of transport (x).

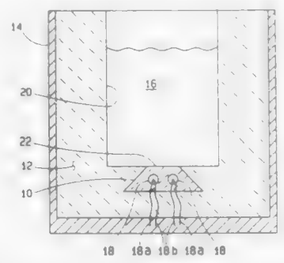
5,147,136
TEMPERATURE CYCLING TEST CHAMBERS
Jeffrey W. Hartley, Lancaster, and Burch E. Zenler, Pataskala, both of Ohio, assignors to Cran Plastics Company, Columbus, Ohio
Filed May 20, 1991, Ser. No. 702,869
Int. Cl.[5] G01M *19/00*; G01N *25/72*
U.S. Cl. 374—57 10 Claims



1. A temperature cycling test device for exposing materials to repeated thermal cycles comprising:
a first zone maintained at a selected temperature,
a second zone maintained at a different selected temperature from the temperature selected in said first zone,
said first and second zones being adjacent each other and separated from each other by an insulated wall,
said first and second zones also being insulated from the ambient air environment,
said insulated wall having a rotatable portion therein,
means for rotating said rotatable portion of said insulated wall on an axis substantially in the plane of said wall so as to alternately expose one side of said rotatable portion of said wall to said first zone and then to expose said one side of said rotatable portion of said wall to said second zone, and
means for securing a test specimen of a material to said one side of said rotatable portion of said wall.

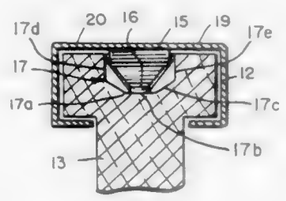
5,147,137
REFRACTORY THERMOWELL FOR CONTINUOUS HIGH TEMPERATURE MEASUREMENT OF MOLTEN METAL
Todd J. Thiesen, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 22, 1991, Ser. No. 643,320
Int. Cl.[5] G01K *1/12*
U.S. Cl. 374—139 8 Claims

1. In a vessel for handling molten metal having an interior refractory lining, apparatus for continuous high temperature measurement of the molten metal comprising:
a) a thermowell constituting an element of the interior lining, being constructed from the same refractory material as that of the interior lining, the thermowell further having a front face and a rear face, the front face lying adjacent to the lining of the vessel but not projecting into the vessel, and the rear face being backed by the refractory lining;
b) the thermowell containing a multiplicity of thermocouples, the thermocouples having leads which exit through



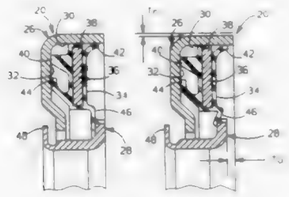
apertures in the rear face of the thermowell and through small penetrations in the refractory lining,
c) the leads being coupled to a means for continuously indicating the temperature of the molten metal in the vessel.

5,147,138
DRAWER SLIDE AND GUIDE ASSEMBLY
Kenneth H. Gutner, 4505 Lindenwood La., Northbrook (Cook), Ill. 60062
Filed Apr. 29, 1991, Ser. No. 692,701
Int. Cl.[5] F16C *29/02*
U.S. Cl. 384—21 3 Claims



1. A sliding assembly for the drawer of a furniture piece comprising a relatively elongated steel slide adapted to be mounted on a drawer and having a generally C-shaped cross section and a relatively elongated guide adapted to be mounted on a furniture piece having a generally T-shaped cross section on which said slide is slidingly mounted, a longitudinally extending slot in the top of said wood guide, a detent on said metal slide projecting into said slot, and a spring clip in said slot of the wood guide for resilient engagement with said detent, said detent being adjacent one end of said slide and said spring clip being adjacent the other end of said guide whereby said detent and spring clip serve to restrict withdrawal of a drawer from a furniture piece, said spring clip including an elongated generally flat resilient unitary element secured at one end to said guide, said spring clip having a longitudinally arched portion intermediate the ends thereof and an integral foot portion adjacent the other end, said foot portion being substantially narrower than the portion of said element adjacent said one end, said slot having a generally U-shaped bottom in cross section to provide a substantially flat bearing area for said foot portion.

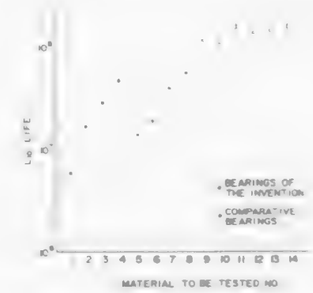
5,147,139
MULTIPLE LIP SEAL ASSEMBLY WITH IMPROVED ACCURACY
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 22, 1992, Ser. No. 824,128
Int. Cl.[5] F16C *33/78*, *33/76*
U.S. Cl. 384—486 3 Claims



1. An improved bearing seal assembly for use between a first bearing race that has a sealing surface spaced from a second bearing race, comprising,
a seal casing adapted to be installed to said second race within a tolerance beyond a nominal position relative to said sealing surface,
a substantially rigid seal body oriented generally coaxial to said sealing surface, said seal body having a generally cylindrical, substantially rigid register extending therefrom and abuttable with said sealing surface when said seal casing is at said nominal position,
said seal body further having a flexible seal lip adjacent to and extending beyond said register, so that, when said register is abutted with said sealing surface, said seal lip is assured of being deflected against said sealing surface, and,
a flexible seal hinge joining said seal body to said seal casing and having a rigidity greater than said seal lip but less than said register and having a degree of flexibility at least equal to said predetermined tolerance,
whereby, when said seal casing is located beyond said nominal position and within said tolerance, said hinge is flexed by said register, thereby allowing said seal lip to remain deflected substantially the same relative to said sealing surface.

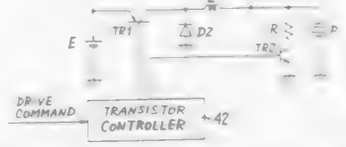
5,147,140
BALL-AND-ROLLER BEARING
Yasuo Murakami, Yamato; Shinichi Shirota, Ebina, and Shigeru Okita, Yokohama, all of Japan, assignors to NSK Ltd., Tokyo, Japan
Filed Nov. 26, 1991, Ser. No. 799,437
Claims priority, application Japan, Nov. 30, 1990, 2-334146
Int. Cl.[5] F16C *33/62*
U.S. Cl. 384—492 4 Claims

1. A ball-and-roller bearing provided with a bearing ring and rolling element, having:
the surface hardness of at least one of said bearing ring and rolling element of Hv 900 or more; and
the minimal compression residual stress of 100 kgf/mm^2 or more in the depth from the surface of the bearing ring



and/or rolling element to the depth up to substantially 2% of the mean diameter of the rolling element.

5,147,141
DRIVER CIRCUIT FOR PIEZOELECTRIC ACTUATOR, AND DOT-MATRIX HEAD AND PRINTER USING PIEZOELECTRIC OR OTHER ACTUATOR HAVING DISCHARGE CONTROL MEANS
Atsuo Sakaida, Gifu; Yoshiyuki Ikezaki, Nagoya; Akira Iriguchi, Nagoya; Takeshi Niikawa, Nagoya, and Masashi Suzuki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Oct. 26, 1989, Ser. No. 426,773
Claims priority, application Japan, Oct. 28, 1988, 63-273921; Nov. 12, 1988, 63-286210; May 16, 1989, 1-121841
Int. Cl.[5] B41J *2/95*
U.S. Cl. 400—124 20 Claims



1. A driver circuit for driving a piezoelectric element, including a charging circuit having a DC power source and a coil which are connected in series to the piezoelectric element for charging the piezoelectric element, and a discharging circuit for allowing said piezoelectric element to be discharged, said driver circuit comprising:
first conditioning means provided in said charging circuit, and having an original state for inhibiting said piezoelectric element from being charged, and a charging state for allowing said piezoelectric element to be charged, said first conditioning means being normally placed in said original state, and brought into said charging state upon generation of a drive command to activate said piezoelectric element, said first conditioning means being returned to said original state at a first point of time a predetermined time after a voltage of said piezoelectric element has reached a predetermined level not higher than a line voltage of said power source;
second conditioning means provided in said discharging circuit, and having an original state for inhibiting said piezoelectric element from being discharged, and a discharging state for allowing said piezoelectric element to be discharged, said second conditioning means being normally placed in said original state thereof, and brought into said discharging state thereof at one of said first point

of time and a second point of time a predetermined time after said first point, said second conditioning means being returned to said original state thereof by the time when said first conditioning means is placed in said charging state thereof for a next activation of said piezoelectric element; and

voltage limiting means for providing a flow of an electric current in a direction from said coil toward said power source only after said voltage of the piezoelectric element has reached said predetermined level, thereby preventing said piezoelectric element from receiving an excessive electric energy that causes said voltage of the piezoelectric element to exceed said predetermined level, and thereby limiting said voltage of the piezoelectric element to said predetermined level,

said voltage limiting means further providing a flow of the electric current in a direction from said coil toward said piezoelectric element, to thereby permit an energy stored in said coil to be supplied to said piezoelectric element when said voltage of said element falls below said predetermined level while said first conditioning means is placed in said original state.

5,147,142

IMPACT TYPE RECORDING APPARTUS HAVING REDUCED IMPACT SOUND DURING RETURN OF THE HAMMER

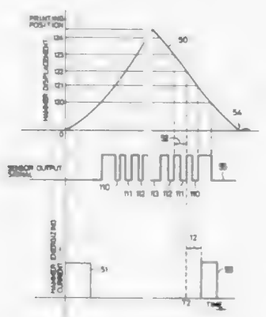
Nobuo Shibazaki, Tokyo, and Tetsuya Saito, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 418,823, Oct. 4, 1989, abandoned, which is a continuation of Ser. No. 94,894, Sep. 10, 1987, abandoned. This application Sep. 25, 1990, Ser. No. 588,481

Claims priority, application Japan, Sep. 16, 1986, 61-216051; Sep. 25, 1986, 61-224906

Int. Cl.[5] **B41J** *9/42*

U.S. Cl. 400—167 **43 Claims**



1. An impact type recording apparatus

platen means for supporting a recording medium;

a character wheel having characters;

hammer means guided reciprocatingly between an impacting position for impacting said platen means through a character of said character wheel and a retracted position spaced apart from said platen means;

energizing means producing a force for biasing said hammer means from said retracted position toward said impacting position;

means for detecting a return speed at which said hammer means returns along a return path to said retracted position from said impacting position; and

drive control means for applying a braking force of only one pulse to said hammer means at a point along the return path when said hammer means is moved from said impacting position to said retracted position,

said drive control means having means for adjusting the timing for initiating an operation of said drive control means in response to a result of the detection by said detecting means, wherein operation of said drive control means is initiated at said point along the return path as determined as a function of the detected return speed.

5,147,143

PRINTER CARRIAGE HOMING MECHANISM

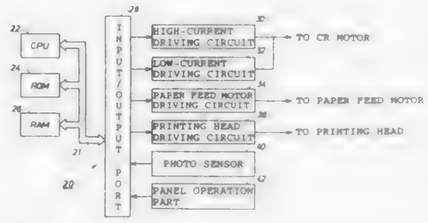
Toshiki Morita, Toyoake; Takeshi Niikawa, Nagoya; Kiroyuki Kato, Nagoya, and Masashi Suzuki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 12, 1990, Ser. No. 536,787

Claims priority, application Japan, Jun. 12, 1989, 1-149082

Int. Cl.[5] **B41J** *19/30*

U.S. Cl. 400—279 **18 Claims**



1. A printer comprising:

a print head;

a stepping motor for reciprocating the print head in a predetermined direction in relation to a print medium;

a print-head control means for driving the stepping motor to move the print head within a range of reciprocation of the print head by selectively supplying either of a first driving current or a second driving current to the stepping motor, where the first driving current is greater than the second driving current; and

a detecting means for detecting an ongoing initial positioning operation for the print head, the second driving current being supplied during the initial positioning operation.

5,147,144

HOLLOW SHAFT

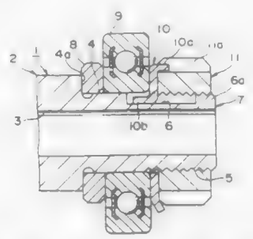
Makoto Kasai, Maebashi, Japan, assignor to Mitsuba Electric Manufacturing Co. Ltd., Gunma, Japan

Filed Jun. 19, 1991, Ser. No. 718,339

Claims priority, application Japan, Jun. 20, 1990, 2-65389[U]

Int. Cl.[5] **F16B** *3/04;* **F16C** *3/02*

U.S. Cl. 403—259 **5 Claims**



1. A hollow shaft wherein an externally threaded portion is formed on an outer periphery of an opening portion at an end of a main body thereof, and an engageable groove engageable with a tongue piece of a washer for a bearing is recessedly provided in an axial direction in said externally threaded portion,

characterized in that said engageable groove is recessedly provided with a remaining wall portion formed at an outer end portion thereof in the axial direction, whereby a reinforcing ring portion is integrally formed at an end portion of said externally threaded portion in the axial direction, the width of said remaining wall portion in the axial direction being set at a dimension with which said washer for a bearing can be coupled onto said externally threaded portion.

5,147,145

CONNECTOR FOR WIRES

Hugh D. Facey, Sheffield, and Brian E. Shawcross, Cheadle Hulme, both of England, assignors to Gripple Limited, Sheffield, England

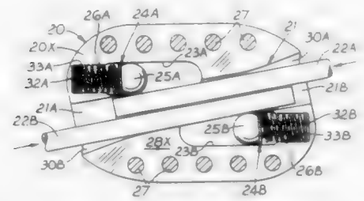
PCT No. PCT/GB88/00762, § 371 Date Mar. 23, 1990, § 102(e) Date Mar. 23, 1990, PCT Pub. No. WO89/02994, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 21, 1988, Ser. No. 469,553

Claims priority, application United Kingdom, Sep. 26, 1987, 8722683; Feb. 3, 1988, 88022345

Int. Cl.[5] **F16G** *11/00*

U.S. Cl. 403—314 **15 Claims**



1. A connector for wires comprising a body having through passage means adapted to receive a pair of oppositely directed wire end portions, channels within the body disposed one to each side of the through passage means and acutely inclined to and, at their inner ends, breaking into the through passage means, and wedge means within the channels adapted upon attempted withdrawal of either of the wire end portions from the through passage means to urge the wires therebetween forcibly towards each other and thus secure the wires firmly in the connector, characterized in that the through passage means consists of twin bores in close lengthwise relationship with each other, and adapted to receive the pair of oppositely directed wire end portions, one in each bore, whereby the wedge means within the channels are adapted upon attempted withdrawal of either of the wire end portions from the respective bore to urge said wire into frictional engagement with said bore.

5,147,146

VARIABLE PITCH POWER TROWEL

Edward M. Harding, Jr., Middletown, Md., assignor to Equipment Development Company, Inc., Frederick, Md.

Filed Mar. 22, 1991, Ser. No. 673,720

Int. Cl.[5] **E01C** *19/22*

U.S. Cl. 404—97 **3 Claims**

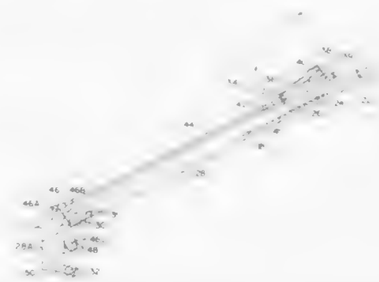
1. A surface finishing apparatus comprising:

a rotatable trowel blade assembly having a plurality of trowel blades disposed in a circumferentially-spaced arrangement, each of the trowel blades being mounted for rotation on radial axes substantially parallel to the surface to be finished, said trowel blades being adapted to rest on the surface to be finished and rotate across the surface;

first adjustment means for selectively pivoting the trowel blades about the respective radial axes thereof to selectively adjust the pitch of the blades in controlled increments throughout an adjustment range with respect to said surface and maintain the pitch so selected within the adjustment range; and

second adjustment means coupled to said first adjustment means for overriding said first adjustment means and rapidly pivoting the trowel blades about the respective radial axes to position the trowel blades from the selected pitch to another selected pitch within the adjustment range in response to manual movement of the second adjustment means by an operator from a rest position and for rapidly returning the blades to the selected pitch set by the first adjustment means when returned by the operator to the rest position;

whereby high or low spots of the surface to be finished can be rapidly removed or filled, respectively, by movement of the second adjustment means.



5,147,147

METHOD FOR THE REMOVAL OF AQUEOUS LIQUIDS FROM THE SUMP OF AN UNDERGROUND CAVITY

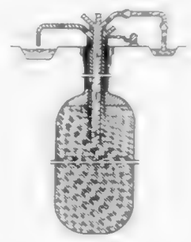
Harald Peterson; Jurgen Martens; Werner Harms, and Uwe Kramer, all of Oldenburg, Fed. Rep. of Germany, assignors to Energieversorgung Weser-Ems AG, Oldenburg, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 571,755

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927906

Int. Cl.[5] **B65G** *5/00*

U.S. Cl. 405—59 **6 Claims**



1. A method for the removal of water or an aqueous liquid from a sump for use to store a gas in an underground cavity comprising:

adding a water-miscible organic liquid to the sump to form a mixture in the cavity while avoiding the formation of liquid layers;

extracting said mixture from the cavity, by removing the mixture upwardly only;

continuing the adding of the water-miscible organic liquid, and extraction of the resulting mixture, which occur at the same time, until the sump consists essentially of said organic liquid;

selecting said water-miscible organic liquid from the group consisting of a monohydroxy alcohol, a mixture of mono-

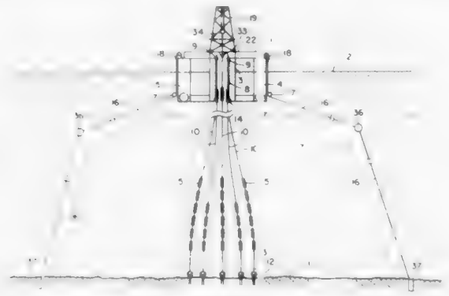
hydroxy alcohols, a polyhydroxy alcohol, a mixture of polyhydroxy alcohols, and a mixture of monohydroxy and polyhydroxy alcohols.

5,147,148

HEAVE-RESTRAINED PLATFORM AND DRILLING SYSTEM

Charles N. White, and Riley G. Goldsmith, both of Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed May 2, 1991, Ser. No. 695,484
Int. Cl.[5] E02D *5/52, 5/34*
U.S. Cl. 405—199 **21 Claims**



1. A heave-restrained platform comprising:
(a) a floating structure having a central buoyancy means and at least three outrigger columns connected in substantially rigid relationship to one another, the central buoyancy means having supports for upper terminations of a plurality of production risers,
(b) means for imparting sole vertical tension comprising a plurality of production risers connected to hydrocarbon wells on the floor of a body of water upon which the floating structure floats within a horizontal locus on the floor of the body of water generally beneath the floating structure and being connected to the floating structure under sufficient tension so as to function as sole vertical tendons to substantially completely restrain heave of the floating structure in addition to functioning as conduits for hydrocarbon production,
(c) each riser being comprised of plural concentric tubular structural and pressure containment elements connecting a hydrocarbon well on the floor of the body of water with a pressure containment means located on the floating structure, and
(d) at least three lateral anchor lines attached to the floating structure and to the floor of the body of water at loci lateral of the horizontal locus on the floor of the body of water of attachment of the risers and under sufficient tension and in an array so as to maintain the floating structure substantially on horizontal location.

5,147,149

TENSION LEG DEWATERING APPARATUS AND METHOD

Steven M. Craig, Terryville, Conn.; Douglas H. Warren, West Springfield, Mass.; Lee M. Sandoval, East Granby; Robert R. Masecar, Meriden, both of Conn.; Norman W. Hein, Katy, and Andrew F. Hunter, Houston, both of Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed May 16, 1991, Ser. No. 701,498
Int. Cl.[5] E02B *17/02*
U.S. Cl. 405—223.1 **27 Claims**

1. A method for dewatering an interior of a hollow tension leg connecting a tension leg platform to a floor of a body of water comprising:
(a) lowering an elongated pump and storage tank assembly into said interior of said hollow tension leg;
(b) pumping water from said interior into said storage tank with said pump; and

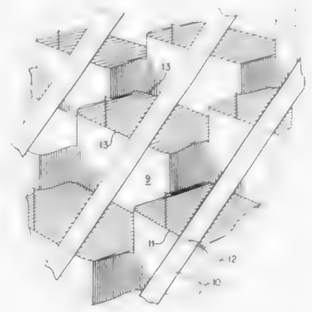
(c) retrieving said pump and storage tank assembly from said hollow tension leg thereby removing water from said interior of said hollow tension leg.

5,147,150

CELL STRUCTURE FOR GROUND CONSOLIDATION

Hendrik C. Berkhout, Arnhem, and Paul A. Villerius, Delft, both of Netherlands, assignors to Akzo N.V., Netherlands

Filed Jun. 19, 1990, Ser. No. 540,481
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919902
Int. Cl.[5] E02D *17/20*
U.S. Cl. 405—258 **11 Claims**



1. A foldable cell-structure comprising;
a sheet material provided with off-set, mutually, at least approximately parallel incisions of finite length to form strips; and
at least two stabilizing bands arranged substantially straight and parallel to one another and attached to longitudinal edges of the incisions such that the strips of the sheet material form cells whose height is the width of the strips and the stabilizing bands stabilized the cells.

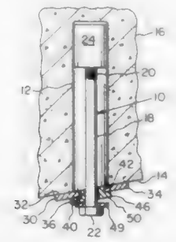
5,147,151

WASHER INSERT FOR BEARING PLATE

Edward C. Hipkins, Jr., 49 Escalon Dr., Coraopolis, Pa. 15108

Filed Aug. 23, 1991, Ser. No. 748,971
Int. Cl.[5] E21D *20/02*
U.S. Cl. 405—259.1 **13 Claims**

1. A washer insert for use with a bearing plate and a mine roof bolt, the bearing plate having an upper surface, a lower surface and a hole passing therethrough, and the roof bolt having a shaft with a head attached to the shaft, the outer diameter of the head being greater than the outer diameter of the shaft, said washer insert comprising:
a hollow first section having a first end and an inner diameter equal to or greater than the outer diameter of said roof bolt shaft and less than the outer diameter of the bolt head; and
a flange made of plastic material attached to said first end of



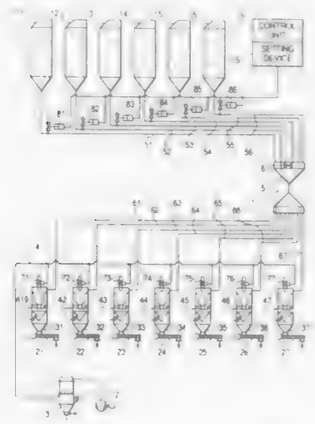
said first section extending outwardly from said first section and coaxial with said first section, said flange having an upper surface whereby said first section is adapted to be received within the bearing plate hole so that the upper surface of said flange abuts against the lower surface of the bearing plate, the bolt shaft passes through the hollow portion of said first section and said flange is sandwiched between the bolt head and the bearing plate, said flange bearing capable of being deformed during installation of the mine roof bolt.

5,147,152

PNEUMATIC SUCTION CONVEYOR MEANS FOR THE GRAVIMETRIC DOSING OF BULK MATERIAL COMPONENTS

Otmar Link, Buchen-Götzingen, Fed. Rep. of Germany, assignor to AZO GmbH & Co., Osterburken, Fed. Rep. of Germany

Filed Oct. 17, 1990, Ser. No. 599,021
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934910
Int. Cl.[5] B65G *53/24*
U.S. Cl. 406—1 **13 Claims**



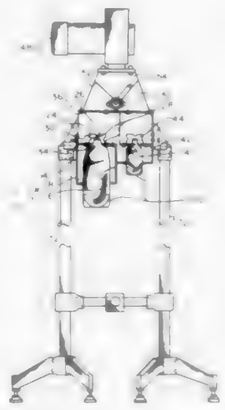
1. Pneumatic suction conveyor means for a gravimetric dosing of different pourable materials to a plurality of demand stations, the pneumatic suction conveyor means comprising: a plurality of storage containers respectively accommodating one of said materials;
a plurality of first delivery lines respectively connecting the plurality of storage containers to a distributor;
a separator provided at each demand station for separating the respective material supplied thereto from the respective storage containers, each of said separators including an upper chamber and a lower chamber;
a closable discharge opening provided in the lower chamber of each of said separators;
a plurality of further delivery lines for respectively connecting the distributor to the upper chamber of the respective separators;
a suction line connected to a suction fan and to the upper chamber of each of said separators;
stop valve means provided at each separator for controlling communication between the suction line and the respective separators;
a weighing container disposed between the upper chamber and the lower chamber of the respective separators for receiving the material separated by the respective separators;
a transducer means for supporting said weighing container in the respective separators;
a bottom-side material outlet provided in the respective weighing containers for discharging the material separated by the respective separators into the lower chamber of the respective separators; and
a closure means provided at the bottom-side material outlet of each weighing container, said closure means being responsive to a material demand indicator provided at the associated demand station so as to be brought into a closed position and being adapted to be brought into an open position when a setting device is activated by the transducer means with a set time delay.

5,147,153

DUAL LANE AIR TRANSPORT ASSEMBLY

Stephen H. Aidlin, 1521 Eastbrook Dr., Sarasota, Fla. 34231; Larry Kincaid, 2635 Hyde Park St., Sarasota, Fla. 33579, and Salvatore A. Uccello, 6527 Waterford Cir., Sarasota, Fla. 34238

Filed Jan. 25, 1991, Ser. No. 645,730
Int. Cl.[5] B65G *51/02, 51/03*
U.S. Cl. 406—86 **6 Claims**



6. A pneumatic conveyor for articles, each article having an intermediate enlargement and an upper portion thereabove and a lower portion therebeneath, the conveyor comprising:
two pairs of laterally spaced tracks, each pair defining an

elongated slot therebetween for slidably supporting an article by its enlargement;

two inverted, U-shaped, interior channel members, each extending upwardly from one of the pairs of tracks spanning the slot and having a cross sectional area sufficient to receive the upper portions of the articles, each interior channel member having a top wall and side walls with air directing louvers formed therein to provide a driving force for the article;

an inverted, U-shaped, exterior channel member extending upwardly from the tracks enclosing the interior channel members to define spaces between the interior channel members and the exterior channel member and extending longitudinally substantially the length of the slots, and

pneumatic means to introduce air under pressure to the spaces between and adjacent the exterior channel member and the interior channel members;

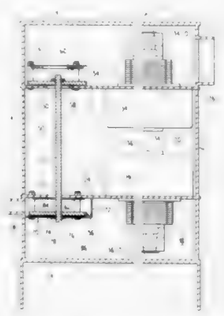
a transition module between the exterior channel member and the pneumatic means with a butterfly plate positionable between two positions whereby a space of said spaces adjacent to each interior channel member constitutes a plenum chamber and directs a flow of air into one interior channel member in a direction dictated by the position of the butterfly plate and the angle of the louvers for conveying an article supported by its enlargement on the tracks in the direction of the air flow.

5,147,154

PRESSURE REGULATION APPARATUS INCLUDING COOPERATING VALVE MEMBER AND AIR DAM MEANS

Lowell Scott, Burlington, Ky., assignor to Hamilton Air Products, Fairfield, Ohio

Filed Apr. 8, 1991, Ser. No. 681,923
Int. Cl.[5] B65G *51/00*
U.S. Cl. 406—112 20 Claims



1. A pressure regulation apparatus comprising:

means defining a first flow chamber having a port, a second flow chamber, and a third flow chamber having a port;

pump means for selectively pumping air from said second chamber to said first chamber or from said second chamber to said third chamber;

air dam means disposed in said third flow chamber; and

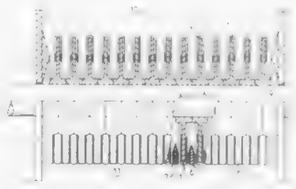
valve means which, when in a first position, cooperates with said air dam means by isolating a sub-chamber of said third chamber from said third chamber port to provide a flow path from said third flow chamber port through said valve means and said pump means to said first flow chamber and said port thereof, and which, when in a second position, opens communication between said sub-chamber and said third chamber port to provide a second flow path from said port of said first flow chamber through said valve means and said pump means to said third flow chamber and said third flow chamber port.

5,147,155

DEVICE FOR ACHIEVING UNIFORM DISTRIBUTION OF AIRBORNE FIBRES, E.G. CELLULOSE-FIBRES

Kjell Hansen, Jersoy, Norway, assignor to Molnlycke AB, Gothenburg, Sweden

PCT No. PCT/SE89/00658, § 371 Date May 2, 1991, § 102(e) Date May 2, 1991, PCT Pub. No. WO90/05689, PCT Pub. Date May 31, 1990
PCT Filed Nov. 14, 1989, Ser. No. 679,001
Claims priority, application Sweden, Nov. 15, 1988, 8804118
Int. Cl.[5] B65G *51/18;* B02C *7/02*
U.S. Cl. 406—191 7 Claims



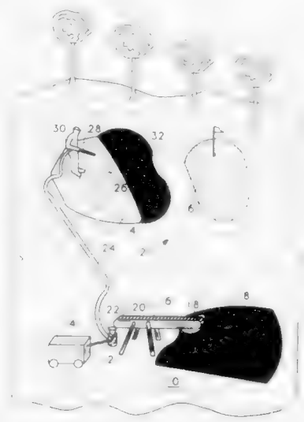
1. A device for achieving uniform distribution of airborne fibres, for instance cellulose-fibres, in the outlet of an air-transport fibre conduit, said device being placed in said outlet (10) and having an outlet side and an inlet side, characterized in that the device includes a plurality of mutually similar and concentrically arranged circular rotors (1), and a plurality of semi-circular stators (6) which are disposed between the rotors on the outlet side of the device.

5,147,156

GOLF COURSE CONSTRUCTION AND MAINTENANCE METHODS

Phillip G. Guettler, and Robert G. Ritten, both of Ft. Pierce, Fla., assignors to Sandscape Inc., Ft. Pierce, Fla.

Filed Jul. 29, 1991, Ser. No. 737,312
Int. Cl.[5] B65G *53/04, 53/06*
U.S. Cl. 406—197 3 Claims



1. In a method for the removal of sand from a sand trap of a golf course in an operation for refurbishment of said trap, the improvement which comprises:

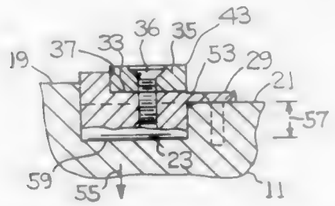
pneumatically transporting said sand as a suspension in an air stream passing through a flexible conduit from said trap to a site remote from said sand trap and discharging said sand from said conduit at said remote site.

5,147,157

ADJUSTABLE LEAF SPRING CARTRIDGE FOR FACE MILLS

James A. Pawlik, Sterling Heights, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Aug. 7, 1991, Ser. No. 741,386
Int. Cl.[5] B26D *1/12*
U.S. Cl. 407—36 1 Claim



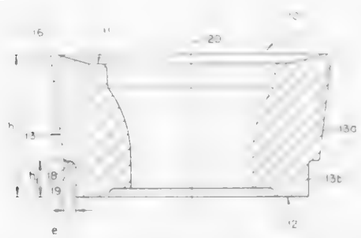
1. A face mill comprising a milling tool body having a rotational axis and an end face extending generally transverse to the rotational axis; a concave arcuate segmental seat in said end face remote from said rotational axis; said seat having an arcuate seat surface centered on a second axis; a cutter insert support cartridge slideably and rockably positioned in said segmental seat for arcuate adjustment around said second axis; torsional spring leaf means integral with said cartridge for biasing said cartridge in a first arcuate direction; and a manual adjustment means for biasing said cartridge in a second arcuate direction; said spring leaf means comprising an anchoring tab element positioned on the tool body alongside the cartridge and a neck structure extending between the cartridge and tab element; said tab element and neck structure being integral with the cartridge; whereby operation of said manual adjustment means causes a torsion force to be exerted on the neck structure; said end face further equipped with two clamp screws extending through said tab element into the tool body, whereby the neck structure forms a torsional connection between the tool body and the cartridge; said neck structure has a flat rectangular cross section in which one cross sectional dimension is several times the other cross sectional dimension.

5,147,158

CUTTING INSERT

Bertrand Rivière, Bourges, France, assignor to Seco Tools AB, Fagersta, Sweden

Filed May 15, 1991, Ser. No. 700,448
Claims priority, application European Pat. Off., May 22, 1990, 90850203.2
Int. Cl.[5] B26D *1/00*
U.S. Cl. 407—113 8 Claims



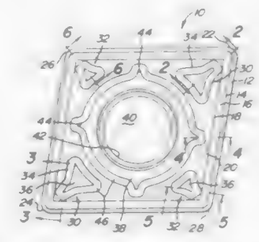
1. A cutting insert for controlling undesired insert breakage during chip forming machining, comprising upper and lower faces spaced apart along a longitudinal center axis of said insert, an edge face interconnecting said upper and lower faces, and at least one cutting edge formed by a transition between said upper face and said face, said upper face defining a rake face, and said edge face defining a clearance face, said edge face provided with a step situated intermediate said upper and lower faces and arranged such that a distance from said center axis to said edge face in a direction perpendicular to said center axis is shorter below the step than above the step, and a distance from said lower face to said step in a direction parallel to said center axis is 15–40 percent of a distance from said lower face to said cutting edge in said direction parallel to said center axis, wherein a depth of said step measured perpendicular to said center axis is about 0.2–2.5 mm, wherein a fracture initiated at the cutting edge will progress toward the intersection of said step and said edge face limiting said fracture to an area of the insert above said step.

5,147,159

CHIP CONTROL INSERT

Tony M. Lowe, Royal Oak, and Yefim Val, Troy, both of Mich., assignors to GTE Valenite Corporation, Troy, Mich.

Filed Dec. 24, 1990, Ser. No. 633,725
Int. Cl.[5] B26D *1/00*
U.S. Cl. 407—114 7 Claims



1. A diamond shaped polygonal chip control insert comprising side cutting edge periphery, inclined entry surface descending from said periphery to a bottom surface, annular planar seating surface projecting from said bottom surface above said periphery, discrete polygon chip breaking islands with radially outwardly pointed top surfaces in the plane of said seating surface, each of said top surfaces having flanking concave ramp walls ascending from said bottom surface to said top surface, said islands at the obtuse corners being smaller than the islands at the acute corners of the diamond shaped insert, and said annular seating surface having radially outwardly pointed extensions intermediate each polygon side.

5,147,160

THIN PANEL DRILLING METHOD AND APPARATUS

Herbert M. Reed, Duncansville; Scott J. Sager, Altoona; Alexander Grebenyuk, Hollidaysburg, and Stephen F. Torchia, Seward, all of Pa., assignors to Micromation Systems, Inc., Altoona, Pa.

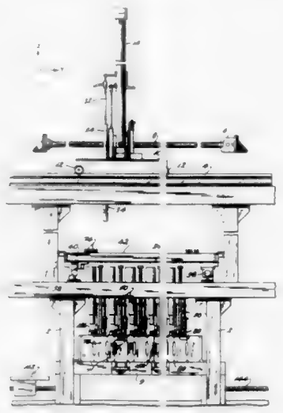
Continuation of Ser. No. 484,905, Feb. 26, 1990, which is a division of Ser. No. 164,840, Mar. 7, 1988, Pat. No. 4,932,117.
This application Nov. 2, 1990, Ser. No. 608,466
Int. Cl.[5] B23B *39/18;* B23Q *3/157*
U.S. Cl. 408—3 3 Claims

1. An apparatus for drilling holes in thin panel material, said panel material being situated in an X-Y plane of an X-Y-Z cartesian positioning system, said apparatus comprising:

at least one X axis row of multiple drills and means for moving each of said drills simultaneously and independently of each other in either direction in X of said cartesian coordinate system and relative to said thin panel material for positioning of each of said drills at an assigned hole location of said thin panel material in said one X axis;

said multiple drills being immovable in Y of said cartesian coordinate system;

means for selectively moving said panel material in Y of said cartesian coordinate system relative to individual ones of said drills in order to accomplish said Y axis positioning,



said means for moving said panel material being immovable in both X and Z of said cartesian coordinate system; and

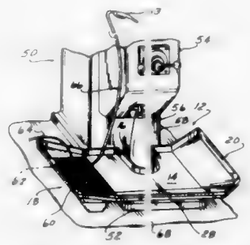
means for selectively moving each of said drills independently in Z relative to said X-Y plane in order to accomplish said hole drilling at programmed X-Y locations.

5,147,161

RETROFIT COOLANT SUPPLY SYSTEM FOR A MACHINE TOOL

Robert L. Whiting, 14440 Boucher, Linden, Mich. 48451

Filed Oct. 28, 1991, Ser. No. 784,165
Int. Cl.[5] B23B *47/00*
U.S. Cl. 408—61 3 Claims



1. A retrofit coolant circulation system for a machine tool of the type having a forwardly projecting base portion resting on a supporting surface and a vertical post projecting up from said base portion, said system comprising:

a drip tray having a generally planar main section resting on said base portion, with a slot cutout extending in from a rear side of said main section accommodating said post therein;

said drip tray further including a first and second upwardly angled side collector sections located on one side of said main section, and a forwardly flared forward collector section extending across said first and second side collector sections and said main section;

an upturned border extending about the perimeter of said drip tray confining coolant therein;

a sump cavity formed in one of said side collector sections extending downwardly to said supporting surface;

a pump disposed in said cavity;

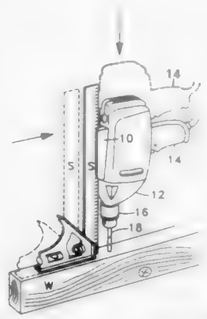
an outlet hose and nozzle connected to said pump for receiving a jet flow of coolant recirculated from said sump cavity.

5,147,162

SELF-GUIDABLE DRILL HOUSING

Rosario Capotosto, and Michael Capotosto, both of 9 Griggs Dr., Greenlawn, N.Y. 11740

Filed Feb. 20, 1992, Ser. No. 837,885
Int. Cl.[5] B23B *45/14*
U.S. Cl. 408—110 1 Claim



1. A self-guidable motor housing component for a portable electric drill, having a built-in capability to facilitate alignment of the rotational axis of the drill perpendicular to a work surface, comprising an integral appendage on each section of a typical longitudinally bi-sectioned drill motor housing, each said appendage located along the rims of said motor housing sections in the area opposite the handle and extending longitudinally, each face of said appendages chamfered in diametrically opposed directions from a baseline extending lengthwise on an axis parallel to the rotational axis of said drill, said baseline stands slightly above the adjacent surface of said motor housing, said faces of diametrically opposed chamfers forming a longitudinal V-grooved channel having said baseline at the interface of said appendages of joined sections of said drill motor housing, said V-grooved channel extends on an axis parallel to the said rotational axis of said drill, said V-grooved channel may be butted firmly against the leading edge of a perpendicularly standing blade of a try or combination square held on the work surface allowing said drill to slidably move downward on an axis perpendicular to said work surface whereby a drill bit chucked in said drill will enter said work surface perpendicularly and accordingly bore a hole perpendicular to said work surface.

5,147,163

AUTOMATIC TREAD REMOVAL APPARATUS

Price S. Booker, 239 Dallas Rd. 851, Selma, Ala. 36701, and Carl N. Donaldson, 9801 1st Ave., East, Aurora, Colo. 80010

Filed Aug. 16, 1989, Ser. No. 394,730
Int. Cl.[5] B02C *19/12*
U.S. Cl. 409—199 22 Claims

1. An automatic apparatus for removing tread from beads of various sized tires, comprising:

a tire centering means for vertically orienting the tire such that the radial center axis of the tire is positioned along a horizontal reference axis, said tire centering means including

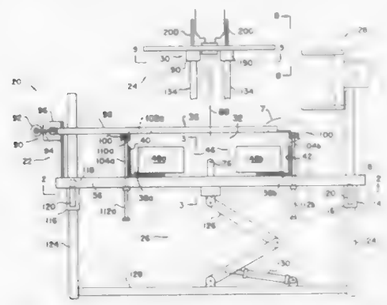
(a) a catch box having an open top through which an upright tire is admitted into said catch box, a back wall, a front wall, a left side wall, a right side wall, and an open bottom in which a bottom support means is located for centering the tire between said two side walls,

(b) a side moving means for moving said side walls inwardly toward the tire centered on said bottom support means,

(c) a bottom moving means for moving said bottom support means upwardly at the same time and at the same rate at which said side walls are moved toward each other by said side moving means,

(d) a stop means for stopping the movement of said side moving means and said bottom moving means when both said side walls are immediately adjacent the tire,

(e) an erector means for holding the tire flat against said back wall after said side walls have stopped moving



such that the radial center axis of the tire is positioned along the horizontal reference axis, and

(f) a front moving means for moving said front wall from in front of the tire;

a tire gripping means for gripping the rim of the tire;

a tire moving means for moving one of said catch box and said tire gripping means relative to one another along the horizontal reference axis whereby said tire gripping means engages the tire in said catch box and subsequently the tire and said tire gripping means are separated from said catch box;

a tire cutting means for cutting the tread from the bead of the tire; and

a tire ejecting means for ejecting the remaining bead of the tire from said tire gripping means.

5,147,164

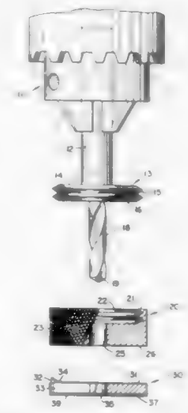
DRILL BIT DEPTH MINDER

Paul C. Fraver, 725 Edison Rd., Dauphin, Pa. 17018

Filed Oct. 3, 1991, Ser. No. 770,448
Int. Cl.[5] B23B *49/00, 51/02*
U.S. Cl. 408—202 13 Claims

5. A depth minder comprising a drill bit having a shank and an integrally attached flange which has:

A. male threads on the outer circumference thereof; and



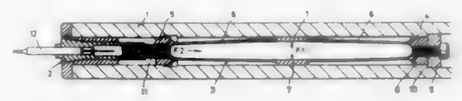
B. a larger diameter than said shank so that the lower face of said flange prevents drilling to a deeper depth than the length of said drill bit beyond said flange.

5,147,165

CENTRIFUGAL SPINDLE

Michael C. Tempest, Poole, United Kingdom, assignor to Federal Mogul Westwind Air Bearings Ltd., United Kingdom

PCT No. PCT/GB91/00302, § 371 Date Oct. 18, 1991, § 102(e) Date Oct. 18, 1991, PCT Pub. No. WO91/13716, PCT Pub. Date Sep. 19, 1991
PCT Filed Feb. 27, 1991, Ser. No. 768,230
Claims priority, application United Kingdom, Mar. 7, 1990, 9005113
Int. Cl.[5] B23B *31/14*
U.S. Cl. 409—232 7 Claims



1. A centrifugal spindle comprising a hollow shaft having a collet at one end for gripping a tool shank, characterised by a centrifugal loading means housed within the hollow shaft (1) wherein the loading means comprises two coaxial pistons (4, 5) spaced from each other and linked by flexible connecting members (6), one piston (4) being secured axially to the hollow shaft while the other piston (5) is secured to the collet (2) so that rotation of the shaft causes the flexible connecting members to move radially outwards under centrifugal force to draw the piston and collet into the hollow shaft gripping the tool shank (12).

5,147,166

WALL ANCHOR

Brian G. Harker, Granger, Ind., assignor to JTB, Inc., South Bend, Ind.

Filed Oct. 22, 1990, Ser. No. 601,308
Int. Cl.[5] F16B *13/04, 21/00, 25/00*
U.S. Cl. 411—29 19 Claims

18. A wall anchor for retaining an article to a structural member, said structural member having an exterior surface, an

interior surface, and a rearward cavity adjacent said interior surface, said wall anchor comprising:

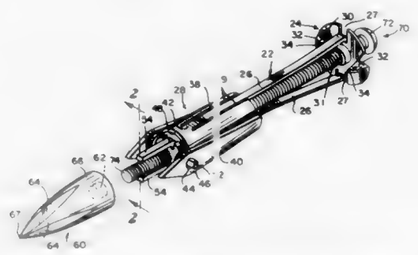
an actuating element having a portion which extends through said structural member into said rearward cavity;

an expandable retention element having a first end and a second end;

said first end of said expandable retention element being connected to said actuating element;

said second end of said expandable retention element being unconnected to said actuating element;

said actuating element having a first means for drawing said



expandable retention element towards said interior surface of said structural member in response to rotation of actuating element after insertion of said expandable retention element into said rearward cavity;

a second means attached to said expandable retention element for precluding rotation of said expandable retention element upon rotation of said actuating element; and

wherein said second end of said expandable retention element transitions from a first position substantially adjacent said actuating element to a second position a radial distance further away from said actuating element in response to said rotation of said actuating element.

5,147,167

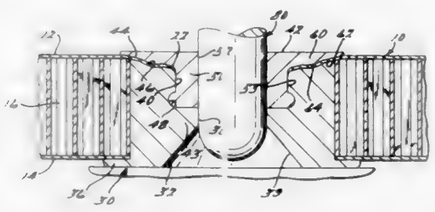
TWO PART GROMMET FOR SOFT PANELS

Imre Berecz, Rancho Santa Margarita, and Derek Elmes, Chino Hills, both of Calif., assignors to Microdot Inc., Chicago, Ill.

Filed Jul. 15, 1991 Ser. No. 731,114

Int. Cl.[5] F16B *13/06, 21/00*

U.S. Cl. 411—44 **3 Claims**



1. A grommet for a panel having a core with a skin on an exterior surface thereof, the core of said panel having a first hole therethrough, and the skin of said panel having a second hole relatively smaller than said first hole and coaxially aligned therewith, said grommet comprising

a female element having a cylindrical outer surface acceptable in the hole in the core of said panel and a central bore, said female element having a counterbore of relatively larger diameter than said central bore and a conical end face extending between the cylindrical outer surface and counterbore thereof, said female element having an annular radially outwardly extending groove at the end of the counterbore therein, and

a male element having a cylindrical portion with an outer diameter complementary to the counterbore in said female element and to the second hole in the skin of said panel, the cylindrical portion of said male element having a central bore of a diameter equal to the central bore in said female element, said male element having an annular flange extending radially outwardly from the cylindrical portion thereof with a conical axially inner face complementary to the conical end face on said female element so as to pinch the skin of said panel therebetween when said male and female elements are assembled, said male element having an annular protrusion extending radially inwardly from the central bore thereof in radial alignment with the annular groove in said female element so as to be deformable radially outwardly thereinto to lock said male and female elements to one another and to the skin of said panel.

5,147,168

LOADING AND UNLOADING AIRLOCK APPARATUS FOR A VACUUM TREATMENT CHAMBER

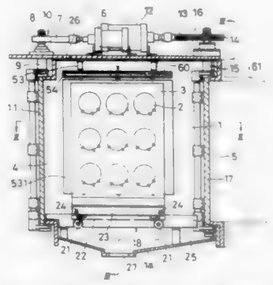
Hidenori Suwa, Zushi; Shinichi Ono, Chigasaki; Hiroyuki Hirano, Hiratsuka, and Humio Naruse, Yokohama, all of Japan, assignors to Nihon Shinku Gujutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Dec. 14, 1989, Ser. No. 450,481

Claims priority, application Japan, Dec. 18, 1988, 63-318939

Int. Cl.[5] C23C *13/08*

U.S. Cl. 414—217 **4 Claims**



1. A loading and unloading airlock apparatus for a vacuum treatment comprising:

an airlock chamber;

a transport means inside the airlock chamber for transporting into and out of said airlock chamber a substrate holder means for detachably mounting substrates thereon;

an exhaust port means for exhausting the airlock chamber to a vacuum;

a gas inlet port means for introducing a gas into said airlock chamber to bring the airlock chamber, which has been exhausted, back to atmospheric pressure;

at least one rectifying plate means located inside said airlock chamber adjacent to and at a predetermined distance away from the substrate holder means, said rectifying plate means provided on a side of said substrate holder means upon which the substrates are detachably mounted; and

a gas introduction pipe means, having a gas ejection outlet in said airlock chamber, for introducing additional gas in a space defined by said predetermined distance to flow along surfaces of said substrates and said substrate holder means.

5,147,169

AUTOMATED ENVELOPE HANDLING SYSTEM

Lester Miller, Danbury, and Szee M. Yao, Norwalk, both of Conn., assignors to Agissar Corporation, Stratford, Conn.

Continuation of Ser. No. 458,772, Dec. 29, 1989, Pat. No. 5,052,875. This application May 30, 1991, Ser. No. 707,622

Int. Cl.[5] B65B *43/30*

U.S. Cl. 414—403 **18 Claims**

1. An envelope handling system for receiving pre-slit content-bearing envelopes, separately displaying each of the envelope sidewalls and the contents of the envelope in independent planes, thereby enabling the efficient removal of the contents from the envelope, while also assuring that all of the contents has been removed prior to discarding the envelope, the system comprising:

A. envelope transfer means for automatically advancing the envelope through the system;

B. an envelope and contents processing zone comprising channel-defining means forming three independent, substantially parallel, longitudinally extending transfer planes for separately and simultaneously accommodating one of the following in one of said planes

a. the contents of the envelope,

b. a first sidewall of the envelope, and

c. a second sidewall of the envelope;

C. a first detector

a. mounted in association with the transfer plane of the first sidewall of the envelope, and

b. comprising a first pair of sensor means mounted in juxtaposed, spaced, cooperating relationship on opposed sides of the first envelope sidewall transfer plane for independently sensing the first envelope sidewall to determine the presence of material in addition to the first sidewall; and

D. a second detector

a. mounted in association with the transfer plane of the second sidewall of the envelope, and

b. comprising a second pair of sensor means mounted in juxtaposed, spaced cooperating relationship on opposed sides of the transfer plane of the second envelope sidewall for independently sensing the second envelope sidewall to determine the presence of material in addition to the second sidewall

whereby a highly effective and efficient envelope separation system is attained which virtually eliminates mishandling of the contents by automatically sensing the presence of any material in addition to the sidewall prior to discarding the envelope.

5,147,170

POWER-DRIVEN ADJUSTABLE EQUIPMENT RACK CARRIER

John E. Detrick, Vero Beach, Fla., assignor to Hi-Tech Handler Corp., Melbourne, Fla.

Continuation-in-part of Ser. No. 227,667, Aug. 2, 1988, Pat. No. 4,963,070. This application Oct. 15, 1990, Ser. No. 597,078

Int. Cl.[5] B60P *1/16*

U.S. Cl. 414—492 **7 Claims**

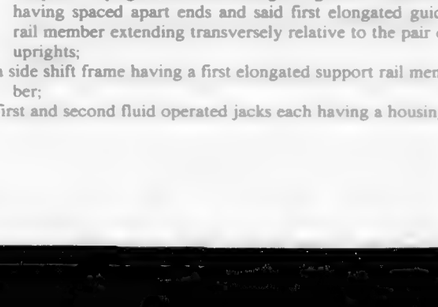
1. A power-driven, floor-rollable, electronic equipment rack transport apparatus comprising:

a first, generally horizontally extending, support frame, sized to accommodate an electronic equipment rack and supported for rolling and steered movement on a surface by way of a steered wheel and plurality of casters attached thereto;

a second support frame pivotally attached to said first end of said first support frame, so as to be rotatable between a first, horizontal position, at rest on said first support frame, and a second, vertical position adjacent to said first end of said first support frame;

a translatable subframe, having a footmember at one end thereof, supported by said second support frame, so as to be translatable along said second support frame in the direction in which said second support frame is oriented with respect to said first support frame;

a first electrically-powered piston unit, pivotally attached to said first and second support frames, for controllably rotating said second support frame about its pivotal attachment to said first support frame;



a second electrically-powered piston unit attached to said translatable subframe and said second support frame for translatably adjusting the position of said subframe along said second support frame;

an electrical power supply support bracket, mounted to a second end of said first support frame, for supporting an electrical power supply unit for operating said first and second electrically-powered piston units;

means coupled to said second end of said first support frame for providing motive power for rolling along the surface and for providing a balancing, stabilizing force at the second end of the said first support frame opposite to the first end thereof at which an electronic equipment rack is engaged by said translatable subframe supported on said second support frame; and

a control handle coupled to the motive power means for controlling the operation of said motive power means.

5,147,171

SIDE SHIFT CARRIAGE FOR A LIFT MAST

Kenneth R. Murray, Chardon, and William T. Yarris, Twinsburg, both of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Jul. 25, 1991, Ser. No. 735,736

Int. Cl.[5] B66F *9/14*

U.S. Cl. 414—671 **17 Claims**

1. A side shiftable carriage assembly for a lift mast having a pair of spaced elevationally oriented uprights, comprising:

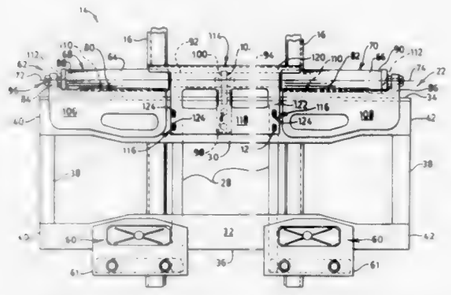
a carriage frame having a first elongated guide rail member and being connectable to and elevationally movable along the pair of uprights, said first elongated guide rail member having spaced apart ends and said first elongated guide rail member extending transversely relative to the pair of uprights;

a side shift frame having a first elongated support rail member;

first and second fluid operated jacks each having a housing,

a rod slidably disposed in each of the housings, and a longitudinal axis;

bracket means for slidably connecting the side shift frame to the carriage frame and for releasably connecting the housings of the first and second jacks to the side shift frame at spaced apart locations along the first elongated support rail member, said bracket means maintaining the first elongated guide rail member substantially parallel to the first elongated support rail member and the longitudinal axis of the first and second jacks substantially in axial alignment with each other and substantially parallel to the first elongate guide rail member; and



force reaction means connected to and extending from the carriage frame at a location between the spaced apart ends of said first elongated guide rail member, said force reaction means extending in a direction transverse relative to a direction of orientation of the first elongated guide rail member, said force reaction means having opposite sides and said rod of the first jack being engaged with one of the sides and the rod of the second jack being engaged with the other of the sides, said side shift frame being moveable along the carriage frame in response to a force being applied by one of the rods of the first and second jacks to the force reaction means.

5,147,172

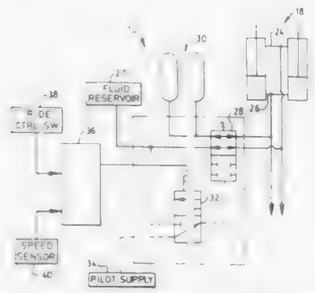
AUTOMATIC RIDE CONTROL

Javad Hosseini, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 3, 1991, Ser. No. 753,552

Int. Cl.[5] E02F *3/04*

U.S. Cl. 414—719 **8 Claims**



1. A ride control for a vehicle having an implement and a hydraulic lift cylinder for moving the implement to and between a plurality of positions, comprising:

means for sensing a velocity of the vehicle and responsively producing a velocity signal;

a hydraulic accumulator;

a control valve connected to and between said hydraulic accumulator and the lift cylinder, said control valve having an open state in which hydraulic fluid passes between the lift cylinder and said hydraulic accumulator and a closed state in which hydraulic fluid is prevented from passing between the lift cylinder and said hydraulic accumulator; and

means for opening said control valve in response to said velocity signal being greater than a first predetermined magnitude and closing said control valve in response to said velocity signal being less than a second predetermined magnitude.

5,147,173

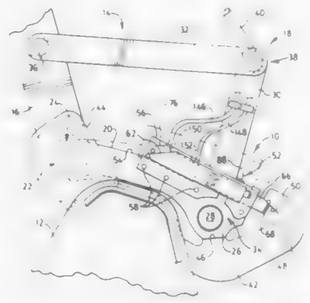
COUPLING DEVICE

Raymond L. Fauber; Richard A. Fauber, both of Bartonville, and Ronald E. Fauber, East Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 3, 1991, Ser. No. 709,452

Int. Cl.[5] E02F *3/96*

U.S. Cl. 414—723 **20 Claims**



1. A coupling device for securing a linkage arrangement having a pair of connecting links to a work implement having a pair of mounting plates, with the connecting links positioned in linear alignment with respect to the mounting plates, comprising:

means for locking the respective connecting links to the mounting plates, said locking means being secured to each of the respective connecting links in a manner to position it in linear alignment with the respective connecting links and the mounting plates; a pair of fluid actuators, each actuator mounted on a respective connecting link in overlying, linear alignment with respect thereto and being connected to the locking means to selectively move the locking means between a first position wherein the locking means is disengaged from the mounting plates and a second position wherein the locking means is engaged with the mounting plates; and

means for biasing the locking means toward its second position, said biasing means being attached to the respective locking means associated with each connecting link in such a manner that the biasing means is located substantially on the same lateral plane as the locking means and slightly offset from the respective actuator and from alignment with the respective connecting link and mounting plate.

5,147,174

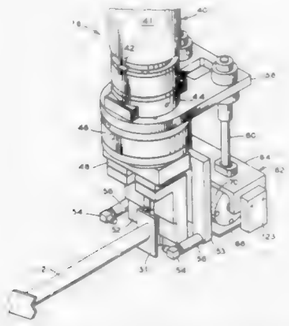
ROBOTIC TOOL END ASSEMBLY

E. Thomas Gossler, and Michael A. Paul, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 16, 1991, Ser. No. 746,376

Int. Cl.[5] B25J *15/02*

U.S. Cl. 414—730 **14 Claims**



1. A robotic tool end assembly for transporting a blade to and from a workstation comprising:

a) gripping means for selectively engaging one end region of the blade to be transported;

b) presence sensor means for detecting the presence of the blade between said gripping means so that said gripping means can be activated to engage the blade;

c) coupling means for coupling the robotic tool end assembly with the workstation, said coupling means comprising operating means for engaging gripping members on the workstation so that the blade may be transferred between said gripping means of the robotic tool end assembly and said gripping members of the workstation; and,

d) control means for controlling the operation of said gripping means and said operating means.

5,147,175

WAFER TRANSFER DEVICE FOR A SEMICONDUCTOR DEVICE FABRICATING SYSTEM

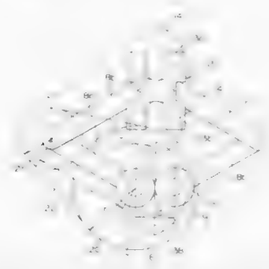
Keishi Tada, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Dec. 27, 1991, Ser. No. 813,665

Claims priority, application Japan, Jan. 10, 1991, 2-13771

Int. Cl.[5] B25J *18/00*

U.S. Cl. 414—749 **2 Claims**



1. A wafer transfer device for a semiconductor device fabricating system, comprising: a rotary member; a driving member disposed for rotation coaxially with the rotary member; a driven member engaging the driving member so as to be driven by the driving member; a frog leg linkage comprising a first link having one end fixed to the driving member, a second link having one end fixed to the driven member, a third link having one end pivotally joined to the other end of the first link, and a fourth link having one end pivotally joined to the other end of the second link; engaging gear means positioned between the other ends of said third and fourth links for providing co-operative movement between said third and fourth links; and a wafer support plate supported on the other ends of the third and fourth links;

the improvement comprising an auxiliary escape mechanism for moving the frog leg linkage out of its dead point, the dead point being the position wherein the links lie along the same horizontal line, comprising a first pulley fixed to the rotary member coaxially with the driving member, a second pulley supported for rotation on a pivot shaft pivotally joining the first link and the third link and having a diameter smaller than that of the first pulley, and a belt wound around the first and second pulleys;

characterized in that the radius of the first pulley is greater than the center distance between the driving member and the driven member.

5,147,176

METHOD OF HANDLING GOODS, AND MORE PARTICULARLY ROD, RAIL OR PLATE GOODS IN BOX PALLETS, AND GOODS HANDLING SYSTEM

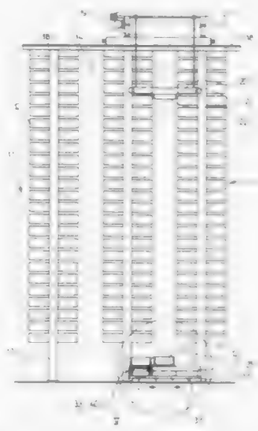
Armin Stolzer, Renchen, and Rudolf Blust, Sasbact-Obersasbach, both of Fed. Rep. of Germany, assignors to KEURO Maschinebau GmbH & Co. KG, Achern-Gamshurst, Fed. Rep. of Germany

Filed Jun. 25, 1990, Ser. No. 542,911

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922964

Int. Cl.[5] B65G *1/04*

U.S. Cl. 414—786 **8 Claims**



1. A handling method for handling goods in a system for handling the goods,

wherein said goods are retained in a plurality of storage means (**12**), each defining a longitudinal side;

wherein said system includes

a plurality of storage racks (**13**), each storage rack having support means (**15**) for said storage means (**12**) positioned transversely to the longitudinal sides of the storage means, and wherein the storage racks, each, are spaced from each other and define, transversely to the longitudinal sides on the storage racks, rack passageways between adjacent racks; and

a transport wagon (**25**, **25'**) for moving the storage means between said storage locations on said racks and a remote utilization station (**40**, **54**), said remote utilization station

transferring said good into and out of said storage means (12),

said transport wagon being movable on a support means transversely with respect to said passageways and passing at least in part beneath a lowest one of said support means (15) of the racks (12),

said transport wagon having

at least two adjacent locations (1, 2, 3) thereon for at least one (A) of said storage means (12), and

conveyor means (30) operatively engageable with at least one of the storage means (12) on said transport wagon and having a conveying direction for moving said one of said storage means in a direction parallel to the longitudinal side to define, on said wagon, a removal location; and

load transferring means (19, 23) movable in said passageways and transversely of said longitudinal side for transferring said storage means (12) between the storage locations of said storage racks, and said wagon,

said method comprising the steps of

identifying a selected storage location on a selected one of said storage racks, at which selected storage location a specific one of said storage means, among said plurality of storage means (12), is located, wherein

said specific storage means defines an exchange storage means (C), and

said at least one storage means on said transport wagon defines a prior storage means (A);

operating said load transferring means (19, 23) to remove the exchange storage means (C) from said identified selected storage location and to place said exchange means (C) on said transport wagon (25, 25') at a location adjacent said prior storage means (A); and

placing said prior storage means (A) at said selected identified storage location on said selected one of said storage racks which had become empty upon removal of the exchange storage means (C) from said identified selected location.

5,147,177
PACKAGE PALLETIZING SYSTEM

Shuichi Kikuchi, Shiga, and Takenori Yanai, Inuyama, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 490,140, Mar. 7, 1990, abandoned. This application Nov. 5, 1991, Ser. No. 790,010

Claims priority, application Japan, Mar. 10, 1989, 1-27408[U]; Mar. 10, 1989, 1-59068

Int. Cl.[5] B60P *1/36*; B65B *25/14*

U.S. Cl. 414—788.3 6 Claims

1. A package palletizing system comprising:

a winding station having a winder for producing cone packages;

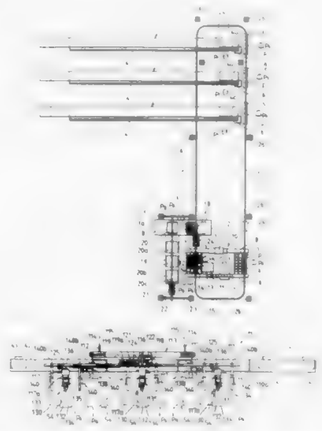
an inspection station for inspecting cone packages produced by said winder;

a palletizing station having means for storing and delivering pallets;

a closed loop rail extending through said winding station, said inspection station, and said palletizing station;

orienting means provided adjacent said closed loop rail and between said palletizing station and said inspection station for selectively orienting each cone package in either one of two respectively opposite postures; and

a self-travelling truck for receiving cone packages from said orienting means, for transporting said cone packages to said palletizing station, and for transferring said cone packages onto said pallets to form at least one layer of said cone packages thereon, said truck being supported by said rail and having a first chuck member and a second chuck member for respectively retaining each cone package



being transported by said truck in a respective one of the two postures.

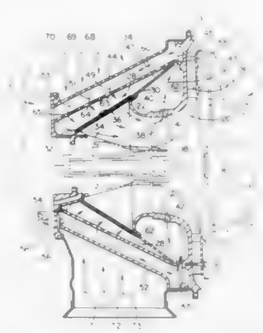
5,147,178
COMPRESSOR SHROUD AIR BLEED ARRANGEMENT

William D. Treece, La Mesa, Calif., assignor to Sundstrand Corp., Rockford, Ill.

Filed Aug. 9, 1991, Ser. No. 744,120

Int. Cl.[5] F01D *1/12*

U.S. Cl. 415—58.4 5 Claims



1. In a compressor a method of ensuring a mating relationship between a compressor shroud and a mating compressor rotor blade arrangement where said compressor shroud and an associated compressor housing are structurally supported by elongated members that span a compressor inlet region, said elongated support members being cooled by low temperature inlet ambient air passing thereover such that said elongated support members contract and pull said shroud away from said mating compressor rotor blade arrangement thereby increasing compressor rotor blade clearance between said rotor and said shroud causing a performance drop in said compressor, said method including the steps of:

(a) bleeding air through passages in said shroud, said bled air being warmed by compression of said inlet air by action of said compressor blade arrangement on said low temperature inlet air; and

(b) delivering said bled warmed compressed inlet air through said elongated support members to thereby overcome said cooling of said members by said low temperature inlet ambient air and decrease clearance between said mating compressor rotor blade and said compressor shroud, thereby restoring compressor performance.

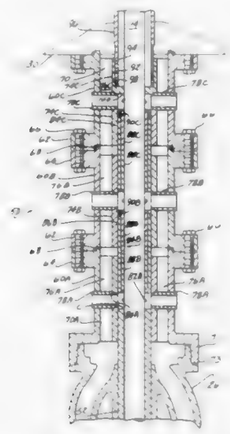
5,147,179
TURBINE PUMP WITH MULTISTAGE VENTING OF LUBRICATING FLUID FLOW

Edward J. Bransch, 1760 Old Plank Rd., Milford, Mich. 48042

Filed Dec. 8, 1989, Ser. No. 447,681

Int. Cl.[5] F01D *25/32*

U.S. Cl. 415—168.2 6 Claims



1. A vertical turbine pump having a pumping section including an impeller casing containing one or more impellers, a central drive shaft affixed to said one or more impellers, at least one bearing guiding said drive shaft in said impeller casing, motor drive means for rotating said drive shaft and one or more impellers to cause pumping of fluid upward in said impeller casing, a discharge casing including a horizontally turned fitting receiving the flow of fluid pumped up in said impeller casing and directing said flow to a system, said drive shaft extending up and through a wall of said discharge casing to said drive motor located above said discharge casing, a stationary enclosing sleeve located surrounding said drive shaft and passing through said discharge casing, said enclosing sleeve sealed against the entrance of pumped fluid, the improvement comprising:

a vertical series of venting housing sections surrounding said drive shaft and located above said pumping section, each of said venting housing sections including an outer wall and an inner center bearing tube connected together with a space therebetween, said space receiving said flow of pumped fluid, a bearing within said center bearing tube receiving said drive shaft, with a clearance space therebetween, said clearance space receiving lubricating flow through said at least one bearing in said pumping section, at least one venting pipe mounted in each venting housing section extending through said outer wall and said center bearing tube of each venting housing sections to receive said lubricating flow and direct said flow out of said casing to be vented, whereby a successive cascading of venting flow at each housing sections is enabled.

5,147,180
OPTIMIZED BLADE ROOT PROFILE FOR STEAM TURBINE BLADES

Mike C. Johnson, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1991, Ser. No. 672,971

Int. Cl.[5] F01D *5/30*

U.S. Cl. 416—219 R 13 Claims

1. A turbine blade comprising:

an airfoil portion;

a platform portion from which the airfoil portion extends upwardly; and

a root portion extending downwardly from the platform portion; the root portion including in descending order an upper-most neck, an intermediate neck, and a lower-most neck, an upper-most lug being formed beneath the upper-most neck, an intermediate lug being formed beneath the intermediate neck, and a lower-most lug being formed beneath the lower-most neck, and

wherein each of the necks and lugs has a curved surface defined by two vertically staggered pivot centers, a first radial portion pivoting on an upper pivot center and a second radial portion pivoting on a lower pivot center, each of the upper-most neck and the lower-most lug having a compound radius wherein the radius of the first radial portion and the radius of the second radial portion are of different lengths, the radius of the first radial portion of the upper-most neck being 30% longer than the radius of the second radial portion of the upper-most neck, each of the uppermost lug, the intermediate neck, the intermediate lug, and the lower-most neck having a single radius length wherein the radius of the first radial portion and the radius of the second radial portion are of the same length, the single radius of the intermediate neck being larger than the single radius of the lower-most neck.

5,147,181
HYDRODYNAMIC RETARDER

Donald Klemen, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

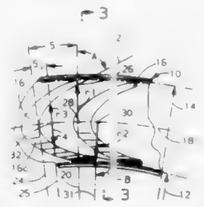
Filed May 22, 1991, Ser. No. 704,236

Int. Cl.[5] B63H *1/26*

U.S. Cl. 416—223 R 6 Claims

1. A hydrodynamic retarder comprising a pair of facing substantially semi-toroidal bodies, each of the bodies having an inner radius and an outer radius defining the limits of the toroid and a mean radius, one of the bodies being mounted for rotation and the other being stationary; a plurality of blade elements disposed on each of said bodies with each blade element having an entrance angle substantially adjacent one of the inner and outer radii, an exit angle substantially adjacent the

other of the radii, and a fluid flow profile surface means connecting the entrance and exit angle defined by a plurality of radial dimensions measured from the mean radius for providing a constant acceleration fluid flow path defined by a relationship comprised of a distance (S) along a circumference of the toroid being equal to a constant (K) multiplied by the

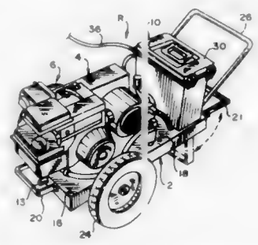


square of the radial dimension (R) of the toroid between the inner and outer radii measured from the mean radius, wherein the constant (K) is determined by evaluation of the first derivative of the relationship $S=KR^2$ a tangent of one of the entrance angle and exit angle and a value equal to twice the radius at the one angle such that $K=(\text{Tan}(\theta)/2R$.

5,147,182
INTEGRATED VACUUM PRESSURE SYSTEM FOR A BLADDER PUMP

Robert D. Timmons, S 9061, Meadowdale Rd., Prairie Du Sac, Wis. 53578

Filed Oct. 17, 1990, Ser. No. 599,011
Int. Cl.[5] F04B *1/00, 43/10*
U.S. Cl. 417—234 20 Claims



1. An apparatus for driving a sampling pump disposed in a monitoring well, said apparatus comprising:

a) a structural support member including a container for pressurized gas, said support member having a first and second tubular portions, said second tubular portion extending away from said first tubular portion;

b) a platform supported by said structural member, said platform having length, width and a top surface, said platform being disposed on top of said structural support member and secured thereto, said structural support member first and second tubular portions spanning the length and width of said platform, respectively, thereby to provide support thereto;

c) means for generating pressurized gas secured on said top surface and operably connected to said container;

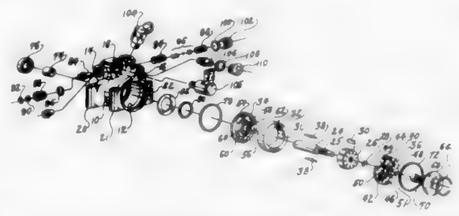
d) means for generating a vacuum from the pressurized gas in said container; and

e) a controller carried by said platform and operably connected to said container and said vacuum generating means and a sampling pump for alternatively directing compressed gas and vacuum to the pump to thereby operate the pump.

5,147,183
ROTARY VANE PUMP HAVING ENHANCED COLD START PRIMING

Roger W. Gettel, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 11, 1991, Ser. No. 667,114
Int. Cl.[5] F04B *49/02*
U.S. Cl. 417—300 4 Claims



1. A system for priming a rotary, sliding vane, hydraulic pump comprising:

a rotor having radially directed vane slots spaced angularly about the axis of the rotor;

a first pressure plate located at a first axial side of the rotor, having an inlet port and an outlet port spaced mutually around the rotor axis;

a second pressure plate located at a second axial side of the rotor, having inlet and outlet ports spaced mutually around the rotor axis and aligned with corresponding ports of the first pressure plate;

a cam surrounding the rotor, having a first arcuate surface aligned with the inlet ports and a second arcuate surface aligned with the outlet ports,

first passage means formed in the first pressure plate and extending angularly from the outlet port to the inlet port, for communicating with the vane slots;

second passage means formed in the second pressure plate, aligned with the vane slots and the first passage means, having a first blind passage extending angularly along at least a portion of the outlet port of the second pressure plate and a second passage extending angularly along at least a portion of the inlet port of the second pressure plate; and

third passage means formed in the second pressure plate, aligned with the vane slots and the first passage means, extending angularly along at least a portion of the outlet port of the second pressure plate and a second passage extending angularly along at least a portion of the inlet port of the second pressure plate.

5,147,184
FLOATING LAYER RECOVERY APPARATUS

Kevin L. Newcomer, Monroe, and Steve Richter, Ann Arbor, both of Mich., assignors to QED Environmental Systems, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 436,546, Nov. 14, 1989, Pat. No. 4,998,585. This application May 14, 1990, Ser. No. 522,629
Int. Cl.[5] F04B *43/10*
U.S. Cl. 417—394 6 Claims

1. A top inlet apparatus disposed at the top of a gas displacement pump, said pump having a bladder and an air chamber surrounding said bladder, said apparatus comprising:

air inlet means for permitting compressed gas to pass through said apparatus to enter said air chamber;

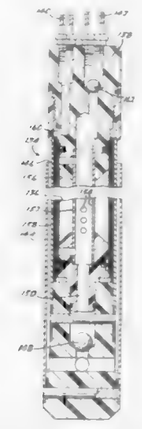
liquid inlet conduit disposed within said apparatus for permitting liquid to enter said apparatus, said liquid inlet conduit having a u-shaped chamber for reversing the direction of liquid flow from a downward to an upward direction;

central chamber coupled to said u-shaped conduit;

first check valve means for permitting said liquid to flow upward into said central chamber but preventing flow of said liquid downward from said central chamber back to said u-shaped conduit;

secondary conduit coupled to said central chamber for permitting liquid to flow out of said central chamber and into said bladder;

fluid discharge conduit for permitting liquid to flow out of said apparatus; and



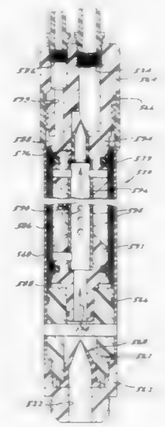
second check valve means coupled to said central chamber located opposite to said first check valve means for permitting liquid to flow out of said bladder through said central chamber and into said fluid discharge conduit, but said second check valve preventing fluid from flowing from said liquid discharge conduit back into to said central chamber.

5,147,185
PUMP APPARATUS FOR FLUID SAMPLING AND COLLECTION, AND THE LIKE

K. Lynn Niehaus, Manchester; Kevin L. Newcomer, Monroe, and Steven C. Richter, Ann Arbor, all of Mich., assignors to QED Environmental Systems, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 522,629, May 14, 1990. This application Feb. 22, 1991, Ser. No. 660,333
Int. Cl.[5] F04B *47/08*
U.S. Cl. 417—394 2 Claims

1. A gas-actuated liquid pump adapted to be at least partially submerged within a liquid to be pumped, said liquid pump comprising: a pump body, a liquid inlet, a liquid outlet, a gas chamber in said pump body for receiving a gas therein, a liquid chamber in said pump body in fluid communication with said liquid to be pumped longitudinally through said inlet, a flexible bladder isolating said gas chamber form said liquid chamber, said flexible bladder being selectively deformable in response to changes in the pressure of said gas in order to cause said liquid to flow through said liquid chamber from said inlet to said outlet, inlet check valve means between said inlet and said liquid chamber for allowing one-way flow of said liquid therethrough from said inlet to said liquid camber and for substantially preventing back-flow of said liquid therethrough from said liquid chamber to said inlet regardless of the vertical, horizontal, non-vertical, or inverted orientation of said pump, outlet check valve means between said outlet and said liquid chamber for allowing one-way flow of said liquid therethrough from said liquid chamber to said outlet and for substantially preventing back-flow of said liquid therethrough from said outlet to said liquid chamber regardless of the vertical, horizontal, non-vertical, or inverted orientation of said pump, and anti-chafe means generally surrounding said flexible bladder and disposed between said flexible bladder and the interior of said pump body for substantially preventing contact of said flexible bladder with said pump body, each of said inlet and outlet check valve means including a reed-type check valve member having a body portion having an internal flow opening extending therethrough, a flange portion at one end of said body portion surrounding said internal flow opening in sealing engagement with said pump adjacent said inlet, and a lip portion at the opposite end of said body portion resiliently deflectable between an open position in communication with said internal flow opening for allowing said one-way flow therethrough and a closed position blocking off said internal flow opening for substantially preventing said back-flow therethrough, said lip portion being resiliently biased toward said closed position, said lip portion being resiliently deflectable to



said open position in response to a predetermined liquid pressure within said internal flow opening, said lip portion being further biased toward said closed position by a back-pressure exerted thereon from within said liquid camber, said reed-type check valve member including a generally frusto-conical tapered portion converging toward said opposite end of said body portion and defining said lip portion at said opposite end, said anti-chafe means including an anti-chafe sleeve disposed between said flexible bladder and the interior of said pump body in a laterally generally-surrounding relationship with sad flexible bladder, said anti-chafe sleeve having at least one open unsecured end portion thereon providing fluid communication between the interior of said anti-chafe sleeve and said gas chamber.

5,147,186
BLOOD PUMP DRIVE SYSTEM

Dwight A. Buckholtz, Eden Prairie, Minn., assignor to Bio Medicus, Inc., Minneapolis, Minn.

Division of Ser. No. 389,634, Aug. 4, 1989, Pat. No. 5,021,048. This application Jan. 4, 1991, Ser. No. 638,366
Int. Cl.[5] F16C *1/02;* A61M *1/10*
U.S. Cl. 417—420 1 Claim

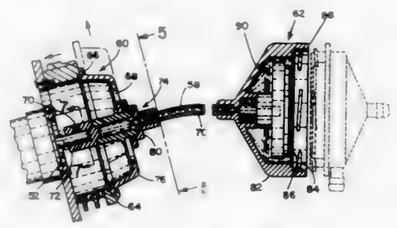
1. Apparatus for pumping blood, comprising:

a pump controller console having a motor and having a pump receiver; said pump receiver including detent means for securing flanges and an annular recess for retaining flanges;

kinetic pump means for imparting kinetic energy to said blood; said pump means including rotator means for increasing the angular velocity of said blood; drive magnet means embedded in said rotator means adapted for coupling energy to said rotator;

coupler means for interconnecting said kinetic pump to said

console; said coupler means including a pump receptacle and a console adapter, the console adapter comprising an annular housing **76** having, a peripheral flange **64** to mate with said annular recess on said console pump receiver **14**



and having a recessed slot **66** to engage said detent on said console pump receiver; power transfer means having a bushing **74** for coupling to a flexible shaft **58** located in said annular housing **76** and having coupling means **72** for connection to said motor.

5,147,187

BLOOD PUMP AND EXTRACORPOREAL BLOOD CIRCULATING APPARATUS

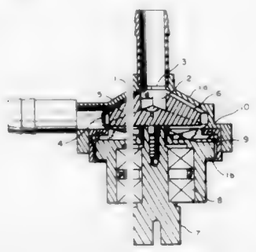
Kazuyuki Ito; Takeshi Aizawa and Makoto Tsuneda, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1991, Ser. No. 685,268

Claims priority, application Japan, Apr. 16, 1990, 2-99653; Apr. 23, 1990, 2-106807; Dec. 28, 1990, 2-406111

Int. Cl.[5] F04B *17/00;* **B63H** *7/02;* **F03B** *13/00*

U.S. Cl. 417—423.1 **5 Claims**



1. An extracorporeal blood pump which comprises:

a pump housing having a pump chamber defined therein and also having blood inflow and outflow ports defined therein in communication with the pump chamber;

a rotary vane assembly rotatably accommodated within the pump chamber and including a substantially conical rotary pedestal having a base surface and a conical surface opposite to the base surface, a plurality of generally elongated plate-like vanes each having radially inner and outer ends opposite to each other, and a driven shaft connected at one end with the base surface of the rotary pedestal;

said plate-like vanes being mounted on the conical surface of the rotary pedestal so as to extend radially outwardly from an axis of rotation of the rotary pedestal with said radially inner ends of said respective vanes being spaced a predetermined equal distance from an apex of the shape of the conical surface of the rotary pedestal while substantially depicting a circle coaxial with the axis of rotation of the rotary pedestal, each neighboring members of said plate-like vanes being equally spaced from each other in a direction circumferential y of the rotary pedestal;

said base surface of said rotary pedestal being of a circular shape of a diameter within the range of 30 to 55 mm enough to substantially cover a surface area of a bottom wall surface which partly defines the pump chamber and confronts said base surface of said rotary pedestal;

each of said plate-like vanes being in the form of a straight plate of generally rectangular shape and mounted on the conical surface of the rotary pedestal so as to incline at an angle within the range of 20 to 50 degrees relative to an imaginary line tangential to the circle delimited by the radially inner ends of the respective plate-like vanes; and

each of said plate-like vanes being so sized that the ratio L/H of the minimum height H in elevation of the radially outer end of each plate-like vane as measured in a direction parallel to the axis of rotation of the rotary pedestal relative to the length L of one of opposite side edges of such plate-like vane which is held in contact with the conical surface of the rotary pedestal is chosen to be within the range of 2.5 to 6.

5,147,188

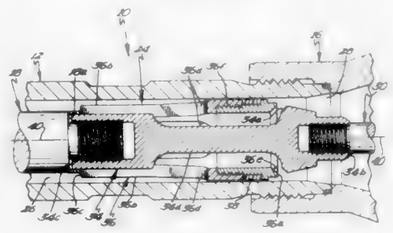
PRIMING PISTON PUMP PISTON CHECK VALVE

Thomas J. Shaefer, Buffalo, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Apr. 11, 1990, Ser. No. 507,629

Int. Cl.[5] F04B *7/02*

U.S. Cl. 417—511 **5 Claims**



1. In a reciprocating piston displacement pump having a displacment rod in a cylinder having upper and lower chambers and valve means for controlling the flow between said chambers, said valve means comprising:

a valve seat attached to said rod, said valve seat comprising:

seating area first and second ends, each of said valve seat seating area first and second ends having diameters; and

a center section having a reduced diameter relative to said valve seat seating area first and second ends, said valve seat center section being smooth and free of grooves;

an annular piston having a circumference and first and second piston ends and being slidably mounted coaxially about said seat, said piston having a conical seating area on said piston first end and a plurality of spaced guides extending toward said piston second end, said piston being slidably located in said cylinder; and

seal means mounted between said piston and said cylinder wherein said seat is attached to the lower end of said displacement rod, the length of said piston being less than the distance between said first valve seat seating area and said displacement rod and said seat has a tapered first end and smooth contours over the remainder of said seat to allow fluid to flow from said lower chamber between said seat seating area and said piston seating area when said piston in contacting said displacement rod and thence between the center section of said seat and the interior of said piston first end and thence between said guides into said upper chamber, said seal means extending over only a relatively small fraction of said piston length.

5,147,189

PRESSURE PUMP WITH SEALING SLEEVE BETWEEN HEAD AND CHAMBER

Ulrich Barnowski, Oelde, Fed. Rep. of Germany, assignor to Paul Hammelmann Maschinenfabrik GmbH, Oelde, Fed. Rep. of Germany

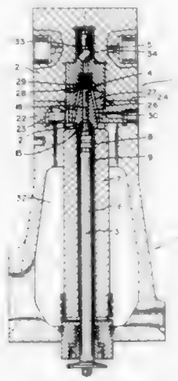
PCT No. PCT/DE91/00020, § 371 Date Oct. 31, 1991, § 102(e) Date Oct. 31, 1991, PCT Pub. No. WO91/10830, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 11, 1991, Ser. No. 743,286

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1990, 4001335

Int. Cl.[5] F04B *21/06*

U.S. Cl. 417—567 **8 Claims**



1. Maximum-pressure plunger pump with, coaxial with its longitudinal axis, a compression valve and a suction valve, with a sleeve that floats on a plunger and rests on the end facing the head of the pump on an inset provided with a seat area for the body of the suction valve and with suction channels, whereby the sleeve has a sliding bushing and the suction valve is in the form of a disk with a spring-loaded annular body that rests on the valve-seat area that the suction channels open out of in the insert in the pump head, characterized in that the plunger's sliding bushing (**9**) extends to the end of the sleeve (**7**) that faces the head (**2**) of the pump with its face against the insert (**12**) and in that a sealing sleeve (**15**) that overlaps the area or seam of impact between the insert and the sleeve is accommodated in the flow channel demarcated by the bushing and the insert.

5,147,190

INCREASED EFFICIENCY VALVE SYSTEM FOR A FLUID PUMPING ASSEMBLY

Len A. Hovarter, Eaton Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1991, Ser. No. 717,571

Int. Cl.[5] F04B *21/02*

U.S. Cl. 417—571 **4 Claims**

1. A valve system for a fluid pumping assembly, said system comprising;

a valve plate including at least one intake port extending therethrough and at least one discharge port extending therethrough;

a suction reed valve disposed adjacent said valve plate and having a valve member overlaying said intake port and moveable between an open position for allowing fluid flow through said intake port and a closed position for preventing fluid flow through said intake port;

said valve member including a discharge aperture disposed adjacent said discharge port of said valve plate and allowing continuous fluid flow to said discharge port;

said valve member defined at its distal edge by an arcuate slot in said suction reed valve, said slot being disposed arcuately and radially spaced from said discharge aperture and terminating at either end in inwardly extending lobe

portions which define a neck portion in said valve member extending between said lobe portions and having an axis about which said valve member substantially moves between said open and closed positions.

5,147,191

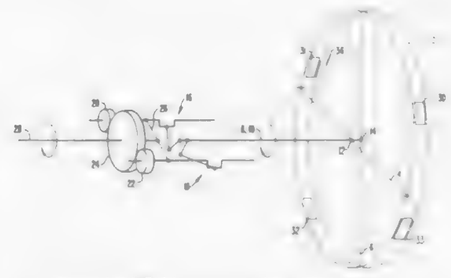
PRESSURIZED VAPOR DRIVEN ROTARY ENGINE

Mathew A. Schadeck, 783 Fairfax Dr., Salinas, Calif. 93901

Filed Feb. 8, 1991, Ser. No. 652,802

Int. Cl.[5] F01C *1/077*

U.S. Cl. 418—36 **7 Claims**



1. A pressurized fluid rotary engine comprising:

a piston housing;

first and second hubs, each hub being rotatably supported in said piston housing about a common axis;

piston heads extending radially outwardly from said hubs for travel in a circular path about said axis, each piston head having a pair of working surfaces, each working surface facing the piston head adjacent thereto;

a transmission housing coupled to said piston housing;

an output shaft extending from said transmission housing;

a pair of crank levers each coupled to one of said hubs and rotatably mounted about said axis;

a pair of connecting rods each having first and second portions, each first end portion being pivotally coupled to noe of said crank levers;

a sun gear secured to said transmission housing;

a pair of planet gears coupled to said sun gear;

a pair of crank journals;

a pair of crankshafts each having a first portion pivotally coupled through one of said crank journals to said second end portion of one of said connecting rods and a second portion coupled to one of said planet gears and said output shaft for rotating said plate gears and said output shaft; and

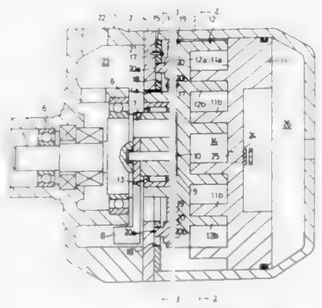
the moment arm between said axis and each connecting rod, the moment arm between each crank journal and the crank lever coupled thereto through a respective connecting rod and the moment arm between each piston head and said axis being essentially equal in length.

5,147,192

SCROLL-TYPE FLUID COMPRESSOR WITH ROTATION PREVENTING COUPLING MEMBERS

Shinichi Suzuki; Takashi Ban; Yuji Izumi; Tetsuo Yoshida, and Tetsuhiko Fukanuma, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed May 23, 1990, Ser. No. 528,042
Claims priority, application Japan, May 24, 1989, 1-131183
Int. Cl.[5] F04C *18/04, 29/02;* F16D *3/04, 3/16*
U.S. Cl. 418—55.3 14 Claims



1. A volumetric fluid compressor comprising:
a fixed scroll having a fixed base portion and a fixed spiral portion protruding from said fixed base portion;
a movable scroll including a movable base portion having first and second surfaces and a movable spiral portion protruding from the first surface of said movable base portion, the movable spiral portion being interleaved with the fixed spiral portion to define at least one compression chamber therebetween, the second surface of said movable base portion having a plurality of equal diameter first recesses disposed in a circular pattern;
a support plate positioned adjacent the second surface of said movable base portion, the support plate having a plurality of equal diameter second recesses provided in a circular pattern so as to face said first recesses, wherein the diameters of the first recesses are different than the diameters of the second recesses; and
a plurality of coupling members, each coupling member being held between a facing pair of said first and second recesses, the coupling member having a small diameter portion that engages a side wall of the smaller recess in said facing recess pair and a large diameter portion that engages a side wall of the larger recess in said facing recess pair, the small and large diameter portions of the coupling member each having a diameter that is less than the diameter of their associated recess by an amount equal to the orbital radius of the movable scroll.

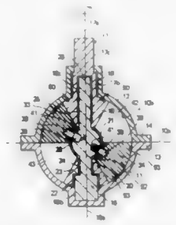
5,147,193

POWER CONVERSION MACHINE WITH PISTONS ROTATING IN PAIRS RELATIVE TO EACH OTHER IN A SPHERICAL HOUSING

Thor Larsen, Fyllingsdalen, Norway, assignor to 3D International A/S, Bergen, Norway

PCT No. PCT/NO90/00003, § 371 Date Jul. 3, 1991, § 102(e) Date Jul. 3, 1991, PCT Pub. No. WO90/07632, PCT Pub. Date Jul. 12, 1990
PCT Filed Jan. 4, 1990, Ser. No. 721,474
Claims priority, application Norway, Jan. 9, 1989, 890081; Dec. 22, 1989, 895204
Int. Cl.[5] F01C *3/06;* F02B *53/00*
U.S. Cl. 418—68 16 Claims

1. A power conversion machine comprising
a housing defining a spherical cavity;
a stator secured in said housing on a first axis disposed radially of said cavity, said stator having an annular groove disposed in a plane at an inclined angle to said axis;
an annular guide manner slidably mounted in said groove for rotation about a second axis at an inclined angle to said first axis;
a shaft rotatably mounted on said stator and extending from said cavity;
a first rotor part secured to said shaft for rotation therewith, said rotor part having a first pair of pistons defining ball shaped segments within said cavity of said housing for rotation about said first axis;



a second rotor part having a second pair of pistons defining a pair of ball shaped segments within said cavity of said housing, said second rotor part being disposed on a second axis perpendicular to said first axis with each piston thereof disposed on an opposite side of said first rotor part to define a chamber therebetween; and
pin means securing said second rotor part to said annular guide member for rocking of said second rotor part about said second axis during rotation of said first rotor part about said first axis.

5,147,194

ROTARY PISTON MACHINE WITH A PROTUBERANCE IN THE CYLINDER WALL

Peter Kuhn, Weinheim, Fed. Rep. of Germany, and Frank Obrist, Dornbirn, Austria, assignors to TES Wankel Technische Forschungs-und Entwicklungsstelle Lindau GmbH, Lindau, Fed. Rep. of Germany

Filed Nov. 20, 1991, Ser. No. 796,050
Claims priority, application Switzerland, Dec. 28, 1990, 04139/90
Int. Cl.[5] F04C *2/24*
U.S. Cl. 418—125 9 Claims

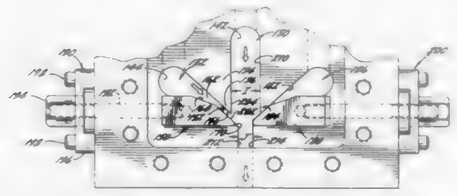
1. A rotary piston machine with rotors (**1, 2**) enclosed in a common casing (**3**) and rotatable about fixed shafts (**4, 5**), surfaces (**8–10**) of the outer circumference of at least one of the rotors (**1, 2**) performing their rotary movement around one of the shafts (**4, 5**) with a sealing gap-forming spacing along the inner surfaces (**14**) of the casing (**3**), wherein on the inner surface (**14**) of the casing (**3**) is provided at least one rib-like protuberance (**11, 16, 19**) shaped out of the casing material, so that between the said protuberance (**11, 16, 19**) and the circumference (**8–10**) of the rotor (**1, 2**) a sealing gap is formed and that prior to the first putting into operation of the machine said sealing gap is made narrower than would be possible for the contact-free operation in the entire speed and temperature range.

5,147,195

EXTRUSION APPARATUS WITH ADJUSTABLE FLOW-RESTRICTING MEMBER

Peter F. Cloeren, Orange, Tex., assignor to The Cloeren Company, Orange, Tex.

Filed Jun. 13, 1991, Ser. No. 714,794
Int. Cl.[5] B29C *47/16, 47/92*
U.S. Cl. 425—133.500 16 Claims



7. An extrusion apparatus comprising a first flow channel and a second flow channel which are separated by a divider member and which converge, said first flow channel having a main flow direction; a flow-restricting member having a first stream-contacting face, a portion of which in a first position together with an opposing wall of said divider member defines an output gap of said second flow channel, and in a second position contacts said opposing wall and a second stream-contacting face of said flow-restricting member in said second position, forms a linear continuation of a downstream wall of said first flow channel, said first stream-contacting face having a stream-contacting portion which projects inward of a boundary of said first flow channel as defined by an upstream wall of said first flow channel and means in operative communication with said flow-restricting member, for moving said flow-restricting member between said first position and said second position to adjust said gap.

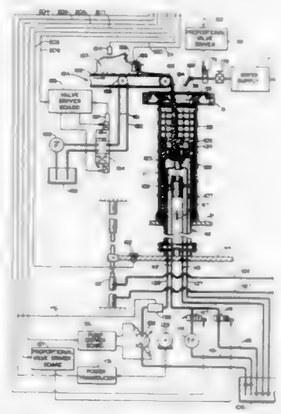
5,147,196

MACHINE FOR MAKING CONCRETE PIPES

Tarek A. Adly, Nashua, Iowa, assignor to International Pipe Machinery Corporation, Sioux City, Iowa

Filed Nov. 13, 1989, Ser. No. 435,192
Int. Cl.[5] B28B *21/28*
U.S. Cl. 425—145 31 Claims

22. A machine for concurrently making a plurality of concrete pipes with use of vertically oriented mold means having side walls surrounding mold chambers, comprising: a support for holding the mold means in vertically oriented positions, a plurality of packerhead and core assemblies located below said support in vertical alignment with the mold chambers of the mold means, table means supporting the plurality of packerhead and core assemblies for concurrent movement into the mold chambers to form a plurality of concrete pipes, each packerhead and core assembly having a core with a side wall and a top wall secured to the side wall, means for vibrating said core, a packerhead located above the top wall, means rotatably mounting the packerhead on the top wall for rotation about the upright axis of the core, drive means for rotating said packerhead, a plurality of separate means for supplying concrete to the mold chambers above the packerheads located therein, separate drive means for each means for supplying concrete to the mold chambers, lift means connected to the table means to selectively move the plurality of packerhead and core assemblies concurrently into and out of the mold chambers to concurrently form a plurality of concrete pipes when concrete is supplied to the mold chambers by the plurality of separate means, means for sensing the power used by the drive means for rotating each packerhead and providing signals representative of the sensed power, control means responsive to said signals separately for regulating the operation of each drive means to independently operate the plurality of separate means for supplying concrete into the mold chambers and the lift



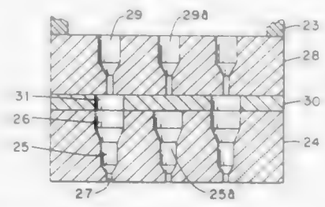
speed of the lift means to maintain selected amounts of concrete above each packerhead whereby the packerheads have substantially constant and independent packing forces during the forming of the plurality of concrete pipes in said mold means, sensor means for monitoring moisture content of concrete supplied to the mold chambers above the packerheads, said sensor means providing a signal representative of the moisture content of the concrete, means for directing water into the mold chambers, and control means responsive to the signal for regulating the means for directing water into the mold chambers whereby the moisture content of the concrete in the mold chambers is maintained within selected limits.

5,147,197

SEALING PLATE FOR A SPINNERETTE ASSEMBLY

John A. Hodan, Arden; Robert N. Armstrong, Ashville, and Robert E. First, Candler, all of N.C., assignors to BASF Corporation, Parsippany, N.J.

Filed Dec. 26, 1990, Ser. No. 633,810
Int. Cl.[5] B29C *47/12*
U.S. Cl. 425—192 S 1 Claim



1. A spinnerette assembly comprising:
a spinnerette plate with an upstream side and having a number of bores, each bore with one or more tapered sections; and a sealing plate adjacent to the upstream side of said

spinnerette plate and forming an interface therewith, said sealing plate having cylindrical flow channels formed therein, said flow channels having a diameter corresponding to the diameter of said bores at the interface and being fewer in number than the number of bores in said spinnerette plate, each of said flow channels corresponding in position to a bore in said spinnerette plate; and

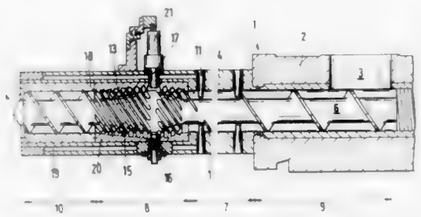
a metering plate adjacent to the upstream side of said sealing plate, said metering plate having a number of metering apertures corresponding in number and location to the bores in said spinnerette plate.

5,147,198

HIGH PERFORMANCE EXTRUDER WITH A CONSTANT NUMBER OF THREADS IN THE INLET AND OUTLET REGIONS OF A TRANSFER SHEARING SECTION

Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 29, 1991 Ser. No. 693,237
Claims priority, application Japan, Dec. 14, 1990, 2-4039942
Int. Cl.[5] B01F *7/00*; B29C *47/00*
U.S. Cl. 425—205 10 Claims



1. An extruder for processing thermoplastic material, comprising:

an elongated extruder housing defining a feed section in which a feed inlet is provided for feeding material to the extruder, and an outlet section having a material outlet opening for discharging molten material under pressure from the extruder,

an extruder screw having a screw core and a helical flight, said screw being mounted for rotation in said housing about the longitudinal axis of said screw, said housing and said screw core defining therebetween a processing chamber, and means for driving said screw,

said housing further defining a pin-barrel section in which at least one row of pins extends radially inwardly toward the housing through the processing chamber toward the core of said screw, said helical flight of said screw being interrupted in the regions of said pins so as to accommodate rotation of said screw in such region,

a transfer mix section defined by said housing longitudinally adjacent to said pin-barrel section, the helical flight of said screw in said transfer mix section being constructed so that thread depth of the areas between adjacent flight sections first decreases toward zero and then increases from a feed side of the transfer mix section to an outlet side to a maximum value, and wherein said housing in said transfer mix section is also formed with a helical flight generally aligned with the helical flight of said screw, said helical flight of said housing defining between adjacent flight sections thereof grooves which vary in depth and which are radially aligned with the areas between adjacent flight sections of said screw, the depth of said grooves between adjacent flight sections of said housing first increasing to a maximum thread volume and then decreasing from the feed side of the transfer mix section to the outlet side, and being generally inversely proportional to the thread depth between radially adjacent flight sections of said screw,

a plurality of radially adjustable throttle pins protrudable into the housing and into the housing threads and processing chamber, and means for radially adjusting the depth of protrusion of said throttle pins, and

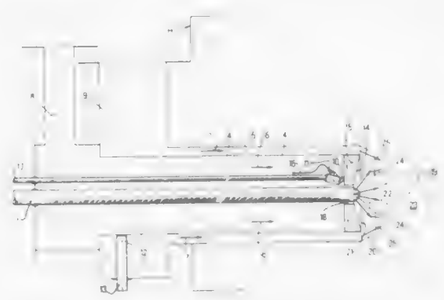
wherein said transfer mix section is formed with inlet and outlet regions to either side of said region of maximum thread volume, the number of threads, and consequently the number of screw flights, in said inlet and outlet regions of said transfer mix sections being constant independently of the cross-sectional area of said housing threads and screw threads.

5,147,199

DOUBLE FUEL JET BURNER AND METHOD FOR ITS IMPLEMENTATION

Edmond Perthuis, 31 Avenue Robert-Hardouin, F-78220 Viroflay, and Francois Audibert, 6, Avenue du Prieure, F-79130 Ecully, both of France

Continuation of Ser. No. 249,572, Sep. 22, 1988, abandoned. This application Nov. 8, 1990, Ser. No. 610,562
Claims priority, application France, Dec. 12, 1986, 86 17538; Dec. 11, 1987, PCT/FR87/00498
Int. Cl.[5] F23D *14/24*
U.S. Cl. 431—10 18 Claims



1. Process for burning fuel gas with comburant gas, the process comprising the steps of introducing the comburant gas into a hearth in at least one substantially central comburant gas stream and at least one additional comburant gas stream convergent toward the at least substantially central comburant gas stream, producing at least two jets of fuel gas, from a single fuel introduction means, supplying one of said at least two jets of fuel gas to the substantially central comburant gas stream, and supplying the other of said at least two jets of fuel gas to the at least one additional comburant gas stream.

5,147,200

METHOD OF OPERATING A FIRING INSTALLATION

Hans-Peter Knöpfel, Besenbüren; Claude Pelet, Windisch, and Hans Peter, Urdorf, all of Switzerland, assignors to Asea Brown Boveri, Ltd., Baden, Switzerland

Filed Nov. 29, 1990, Ser. No. 619,439
Claims priority, application Switzerland, Dec. 1, 1989, 4278/89
Int. Cl.[5] F23C *9/00*
U.S. Cl. 431—11 9 Claims

1. A method of operating a firing installation with a premixing burner, comprising the steps of:

introducing fresh air and recirculated flue gas into an inlet of a fan means of a first stage of a multi-stage mixing and preheating system of said firing installation;

mixing said fresh air with said recirculated flue gases with said fan means in said first stage of said system to form an initial combustion air mixture;

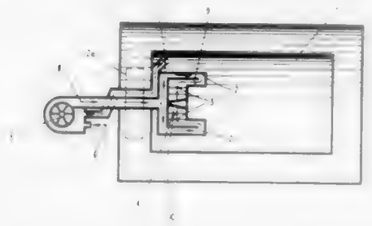
heating said fresh air and said recirculated flue gases during said mixing in said first stage of said system;

supplying said initial combustion air mixture to at least one heat exchanger of a second stage of said system;

heating said initial combustion air mixture in said second stage of said system, said at least one heat exchanger disposed downstream of said fan;

supplying said initial combustion air mixture to a jet injector apparatus of a third stage of said system;

mixing said initial combustion air mixture with additional flue gas in said third stage of said system to form a final



combustion air mixture, said jet injector apparatus disposed downstream of said at least one heat exchanger;

heating said final combustion air mixture in said jet injector apparatus, said jet injector apparatus being disposed upstream of combustion air inlet slots of said premixing burner;

supplying said final combustion air mixture to said premixing burner;

supplying fuel to said premixing burner for combustion in said final combustion air mixture.

5,147,201

ULTRA-LOW POLLUTANT EMISSIONS RADIANT GAS BURNER WITH STABILIZED POROUS-PHASE COMBUSTION

Tian-Yu Xiong, Darien, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 19, 1990, Ser. No. 615,583
Int. Cl.[5] F23D *3/40*
U.S. Cl. 431—326 11 Claims

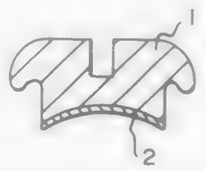
1. A radiant gas burner comprising: a fuel/air mixture inlet, a flow distributor positioned near an inlet downstream end of said fuel/air mixture inlet, a porous matrix bed comprising one of a plurality of discrete particles and a plurality of fibers, said porous matrix bed having an upstream matrix end, a downstream matrix end and a cross-sectional area, said upstream matrix end positioned downstream from said flow distributor, and flame stabilization means for stabilizing a combustion flame within said porous matrix bed, and a radiant surface layer adjacent and downstream from said downstream matrix end, said radiant surface layer comprising a rigid porous plate.

5,147,202

BRACKET FOR ORTHODONTICS

Eiichi Masuhara, Tokyo; Shigeo Komiya, Urawa, and Kiyomi Sanbonmatsu, Yomo, all of Japan, assignors to Japan Institute of Advanced Dentistry, Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 260,639
Claims priority, application Japan, Oct. 22, 1987, 62-265434; Jul. 6, 1988, 63-166775; Jul. 6, 1988, 63-166776
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—8 3 Claims



1. A bracket for orthodontics comprising:

a bracket body made of a composite resin material; and

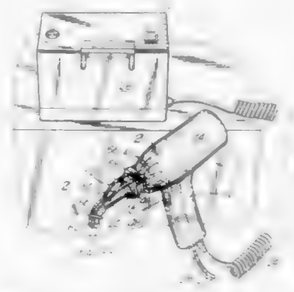
a thin layer of a synthetic resin material which consists essentially of a polymethyl methacrylate having an average molecular weight of 100,000 or less or a polymethyl methacrylate copolymer, the synthetic resin thin layer being laminated on the base surface of said bracket body in such a manner that the composite resin material constituting the bracket body and the synthetic resin material constituting said thin layer are mingled with each other at the boundary therebetween.

5,147,203

AIR/WATER DELIVERY SYSTEM FOR USE WITH DENTAL ILLUMINATION DEVICES

Jack W. Seidenberg, 936 Madison St., Woodmere, N.Y. 11598

Filed Jul. 30, 1991, Ser. No. 737,774
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—29 3 Claims



1. An apparatus for the provision of air and water to the tip of a dental illuminator having a neck terminating at an illumination tip extending from a handpiece, said handpiece further comprising a hand-grip portion, said dental illuminator being operatively connected to an illumination power supply independent of a dental pedestal and without a water or air supply, said apparatus comprising a pair of supply lines having first and second ends, said first ends adapted to connect to air and water supplies on a dental pedestal; a first clamp adapted to be mounted to the neck of said illuminator proximate the handpiece; a pair of connector tubes each having a first end adapted to connect with a second end of one of said supply tubes and a second end adapted to be mounted on and supported by said first clamp, the terminating portions of said supply tubes proximate said second ends projecting through said clamp towards

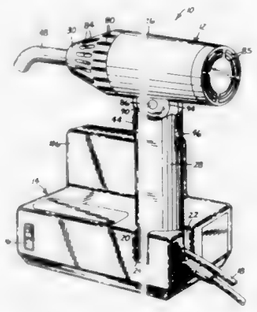
the tip of said illuminator; a second clamp adapted to be mounted to the dental illuminator neck proximate the illumination tip; and a pair of nozzle tubes each having a first end adapted to dispense the supplied material and positioned proximate the tip of the illuminator and being held in position with respect thereto by said second clamp, said second ends of said nozzle tubes being removably connected to said second ends of said connector tubes.

5,147,204

DENTAL MATERIAL CURING APPARATUS

Richard L. Patten, Minneapolis, and Ronald A. Carlson, St. Croix Beach, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Aug. 8, 1991, Ser. No. 742,404
Int. Cl.[5] A61C *1/00, 1/00*; G02B *6/14*
U.S. Cl. 433—229 **14 Claims**



1. Light emitting apparatus for curing photocurable dental material comprising:

a housing;

a handle for grasping by a user's hand, said handle depending from said housing and having a longitudinal axis;

a head connected to said housing and movable in a rotational direction relative to said housing about a reference axis that is generally transverse to said longitudinal axis of said handle;

a source of light coupled to said housing; and

a light guide detachably connected to said head for communication with said source of light and movable in a rotational direction about said reference axis with said head as said head is moved in a rotational direction relative to said housing,

said head including means engageable with a finger of the user's hand for single-handedly moving said head and thereby said light guide in a rotational direction relative to said housing from one operating position to another as the user's same hand grasps said handle.

5,147,205

TACHISTOSCOPE AND METHOD OF USE THEREOF FOR TEACHING, PARTICULARLY OF READING AND SPELLING

Theodore D. Gross, 2372 Bahia Dr., La Jolla, Calif. 92037, and Keith Rayner, University of Massachusetts, Amherst, Mass. 01003

Continuation-in-part of Ser. No. 150,387, Jan. 29, 1988, abandoned. This application Feb. 2, 1990, Ser. No. 475,298
Int. Cl.[5] G09B *5/00*
U.S. Cl. 434—169 **37 Claims**

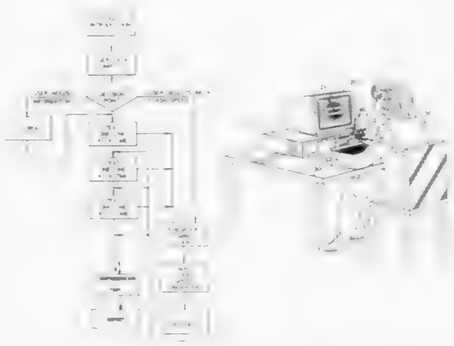
1. A tachistoscope comprising

means for successively presenting visual stimuli (i) at a base presentation rate between successive presentations, and (ii) at a base presentation latency time duration during which each visual stimuli is viewable; and

means for automatically intermittently varying the presentation rate of the successively presenting means during the course of its successive presentations of the visual stimuli so as to deviate from the base presentation rate.

8. A tachistoscopic presentation method comprising:

successively preventing a tachistoscopic visual stimuli by a successively presenting means (i) at a base presentation



rate between successive presentations, and (ii) at a base presentation latency time duration during which each visual stimuli is viewable; and

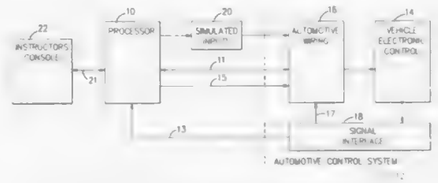
first automatically intermittently varying the presentation rate of the successively presenting means during the course of its successive presentations of the visual stimuli so as to deviate from the base presentation rate.

5,147,206

COMPUTERIZED SYSTEM FOR TRAINING ENGINE MAINTENANCE PERSONNEL

Stephen S. Golenski, R.R. 2, Box 11B, New Milford, Pa. 18834

Filed Dec. 31, 1990, Ser. No. 636,654
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—219 **14 Claims**



1. An automobile engine operating simulation system for training maintenance and service personnel to diagnose and repair engines, said engine operating simulation system having an electronic control unit for providing operation signals normally obtained in actual engine operation for the control of fuel delivery, emissions and diagnostics of a running engine, the automobile engine operating simulation system comprising:

a) an automobile engine electronic control unit;

b) processing means for performing a simulation of an automobile engine operating parameters, said processing means interfacing with said automobile engine electronic control unit for providing operating signals of an actual engine; and

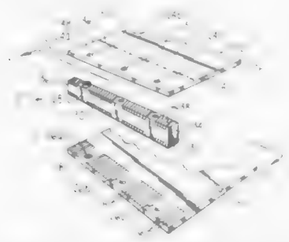
c) input means for generating input signals, said input means being operatively connected to said processing means and to said automobile engine electronic control unit providing engine parameters representative of engine operating characteristics to said automobile engine electronic control unit.

5,147,207

BALANCED PRESSURE CONNECTOR

Thomas E. Mowry, Cardiff, Calif., assignor to Teledyne Kinetics, San Diego, Calif.

Continuation of Ser. No. 605,491, Oct. 30, 1990, abandoned. This application Jul. 30, 1991, Ser. No. 740,856
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—66 **12 Claims**



1. A connector for electrically engaging a contact beam with an electronic substrate which comprises:

a support body for holding a plurality of said contact beams in juxtaposed alignment said support body having a first end and a second end;

a plurality of mounting points formed on said support body for mounting said support body on said substrate, said mounting points being positioned on said support body to divide said support body into segments, each said segment holding a plurality of said contact beams and each said segment having either a first length or a second length with one said mounting point being distanced said first length from said first end and another said mounting point being distanced said first length from said second end to cantilever said first end and said second end of said support body, said first length being more than approximately one third said second length; and

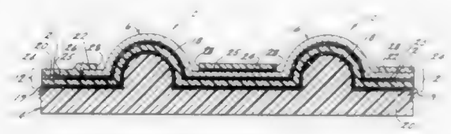
means for fastening said support body to said substrate at said mounting points, said fastening means thereby applying concentrated loads to said substrate at said mounting points.

5,147,208

FLEXIBLE PRINTED CIRCUIT WITH RAISED CONTACTS

Gary A. Bachler, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jun. 28, 1991, Ser. No. 722,957
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—67 **22 Claims**



1. A raised contact pad, comprising:

an electrically non-conductive generally planar rigid substrate having a non-deformable raised portion extending therefrom; and

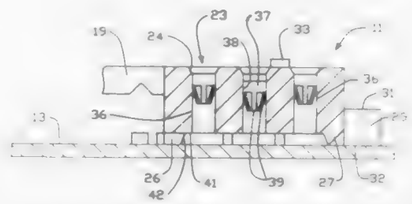
flexible circuit means having a contact pad, said flexible circuit means being disposed on said substrate with said contact pad being disposed over said non-deformable raised portion thereby defining a raised contact pad supported by said substrate.

5,147,209

INTERMEDIARY ADAPTER-CONNECTOR

Stanley M. Litwin, San Jose; Jeffrey L. Davis, San Carlos, and Michael S. Scott, San Jose, all of Calif., assignors to McKenzie Socket Technology, Inc., Fremont, Calif.

Continuation of Ser. No. 511,439, Apr. 16, 1990, abandoned. This application Nov. 20, 1991, Ser. No. 798,032
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—70 **21 Claims**



1. An adapter for electrically connecting pins of an electrical circuit device with a surface mount printed circuit board, comprising a dielectric body defining a bottom surface to be adjacent said printed circuit board when said adapter is connected with the same, which body is formed with a pattern of holes opening at said bottom surface adapted to mate with a corresponding pattern of pins of a device with at least some of said holes terminating at said bottom surface at a location remote from an edge of said surface,

first means in each of said holes to form an electrical connection with a corresponding one of said pins,

a plurality of second means on said bottom surface of said body remote from said holes adapted to form an electrical connection with contacts of a PCB, and

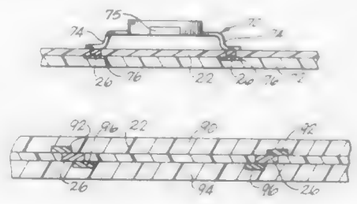
third means having a lead on said bottom surface electrically connecting each of said first means with a corresponding one of said second means.

5,147,210

POLYMER FILM INTERCONNECT

Timothy P. Patterson, Costa Mesa, and Carl E. Hoge, Encinitas, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation of Ser. No. 568,543, Aug. 15, 1990, abandoned, which is a continuation of Ser. No. 425,492, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 163,793, Mar. 3, 1988, abandoned. This application Oct. 1, 1991, Ser. No. 769,475
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—91 **14 Claims**



1. A polymer film interconnect for forming an electrical interconnect between a first pattern of electrical conductors on a first electrical component and a second pattern of electrical conductors on a second electrical component, the polymer film interconnect comprising:

a thin, flexible, self-supporting dielectric polymeric carrier film provided as a free film and having a substantially planar first surface and an opposing substantially planar second surface, the carrier film having a preset pattern of

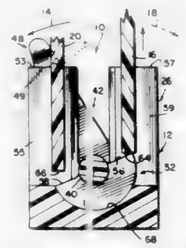
mutually spaced apart plugs of an electrically conductive bonding material extending entirely through the carrier film from the first surface to the second surface thereof, the plugs of bonding material being arranged on the carrier film in a pattern corresponding to the patterns of electrical conductors on the electrical components; wherein the plugs of conductive bonding material are supported in their preset pattern by the film, are electrically isolated from each other by the film, and substantially fill respective holes in the film so that opposite end surfaces of the plugs are directly exposed to and are substantially in the plane of the first and second surfaces of the film, and wherein the carrier film and the plugs are each made of a heat-activated polymeric adhesive bonding material so that the plugs are capable of adhesion by thermally bonding to the first pattern of electrical conductors adjacent the first surface of the film and to the second pattern of electrical conductors adjacent the second surface of the film and so that at least one of the surfaces of the carrier film is capable of adhesion by thermally bonding to an adjacent nonconductive surface of one of said electrical components under externally applied heat, the polymeric adhesive bonding material contained in the conductive plugs and in the carrier film being heat activatable so the opposite end surfaces of the plugs and said one surface of the carrier film are heat bonded directly to the conductors and to the nonconductive surface of the component, respectively, the heat-activated resinous characteristics of the polymeric adhesive bonding material itself causing softening of the material, under externally applied heat at temperatures below about 200° C. and thereby substantially below the heat tolerance limits of the electrical components, and wherein contact between the respective electrical conductors, said nonconductive surface and the softened bonding material, followed by hardening of the material under a temperature reduction, rigidly bonds the electrical conductors to the respective plugs and rigidly bonds said one surface of the carrier film to said nonconductive surface for use in interconnecting the first electrical conductors to corresponding second electrical conductors associated with respective plugs of conductive material, to thereby provide a plurality of discrete electrically isolated conductive paths from the first pattern of electrical conductors through the carrier film to the second pattern of electrical conductors on the opposite side of the film, while the carrier film remains in place bonded between the first and second electrical components.

5,147,211

ELECTRICAL INTERCONNECT DEVICE WITH MODULE EJECTION MEANS

Robert J. Tondreault, Louisville, Ky.; Robert W. Rollings, Georgetown, and James F. DePriest, New Albany, both of Ind., assignors to Robinson Nugent, Inc., New Albany, Ind.

Filed Jul. 3, 1991 Ser. No. 725,581
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—160 **47 Claims**



1. An electrical interconnect device comprising

an elongated socket including means for releasably holding first and second modules in engaged positions,

means for ejecting at least a portion of the first and second modules from the holding means, and

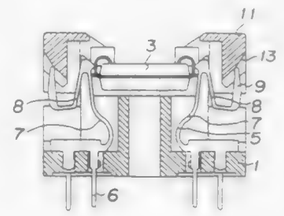
means for rotating the ejecting means about an axis extending in the direction of elongation of the socket to move the ejecting means relative to the socket against a selected module held in the socket so that at least a portion of the selected module is disengaged from the socket to enable a user to extract the selected module from the socket, said ejecting means including a cam member and pivot means mounted on the socket for supporting the cam member for rotation on the socket about said axis, the rotating means including a lever arm coupled to the pivot means, the lever arm being pivotable about the pivot means in a clockwise direction between an inactive position and a first module-ejecting position to eject the first module from the holding means and in a counterclockwise direction between the inactive position and a second module-ejecting position to eject the second module from the holding means.

5,147,212

SOCKET FOR ELECTRIC PART

Kazumi Uratsuji, Tokyo, and Noriyuki Matsuoka, Yokohama, both of Japan, assignors to Yamaichi Electric Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1991, Ser. No. 715,485
Claims priority, application Japan, Jun. 15, 1990, 2-157119
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—266 **9 Claims**



1. A socket for an electric component having a plurality of terminals, said socket comprising:

a socket body having a plurality of elastic contacts adapted to contact the terminals of the electric component;

a movable contact shutter member disposed on an upper part of said socket body for upward and downward movement relative to said socket body for backward displacement of said contacts against the elasticity thereof upon downward movement and forward displacement of said contacts due to the elasticity thereof upon upward movement of said movable contact shutter member;

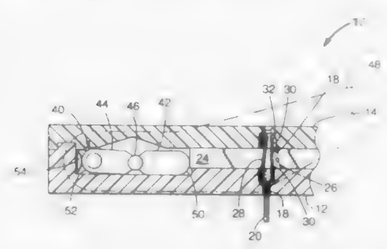
means for causing a sliding movement between said plurality of contacts and the terminals of the electric component when the electric component is mounted in said socket body, said means comprising said movable contact shutter member having an electric component supporting portion which is one piece therewith and movable upward and downward together with said movable contact shutter member for supporting the electric component and a spring means arranged on said socket body for upwardly biasing said movable contact shutter member, wherein when said movable contact shutter member is lowered and said contacts move backward for the mounting of the electric component, said spring means subsequently moves said movable contact shutter member upward, causing said electric component supporting portion to move the electric component upward, the terminals thereof sliding against said contacts.

5,147,213

ZERO INSERTION PRESSURE TEST SOCKET FOR PIN GRID ARRAY ELECTRONIC PACKAGES

Ruben A. Funk, and Richard D. Twigg, both of Columbia, Mo., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 24, 1991, Ser. No. 784,476
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—266 **11 Claims**



1. A zero insertion pressure test socket comprising a movable plate and a cover plate atop said movable plate, said movable plate and said cover plate having aligned, vertical holes therein into which are inserted contacts having two connected arms forming a U-shape and aligned in the direction of movement of said movable plate and a toggle mechanism for producing movement of said movable plate relative to said cover plate, said toggle mechanism including a first link, a second link, a hinge pin connecting the first and the second links and a handle attached to one of the first or second links so that rotation of said handle to a position wherein the ends of said first and said second links most distant from said hinge pin and said hinge pin are aligned results in maximum separation of said link ends and rotation of said handle away from said position of maximum separation of said link ends results in movement of said link ends toward each other, and wherein said toggle mechanism is captured between said cover plate and said movable plate so that movement of said link ends away from each other causes movement of said movable plate relative to said cover plate and movement of one of said contact arms toward the other contact arm and movement of said link ends toward each other permits movement of said movable plate in a direction allowing separation of said contact arms.

5,147,214

ELECTRICAL TERMINAL WHICH HAS OVERSTRESS PROTECTION

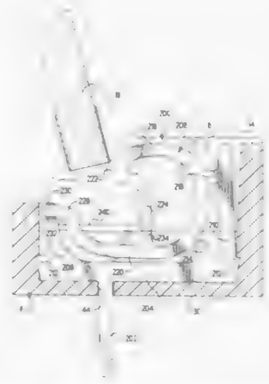
Iosif Korsunsky, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 27, 1991, Ser. No. 766,876
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—326 **11 Claims**

1. An electrical connector for connecting a first printed circuit board to a second printed circuit board, the second printed circuit board being rotatable relative to the first printed circuit board between a first and a second position, the electrical connector having a housing with a recess provided therein, the recess extends from proximate a first end of the housing to proximate a second end of the housing, and is dimensioned to receive the second printed circuit board therein, contact terminals are positioned adjacent to the recess, and are configured to make an electrical connection with the second printed circuit board when the second printed circuit board is in the second position in the recess, the electrical connector comprising:

the contact terminals have base portions for securing the contact terminals in the housing, post portions for making electrical connection with the first printed circuit board, and resilient contact portions for making electrical connection with the second printed circuit board, the resilient contact portions have overstress projections integral therewith, the longitudinal axis of each overstress projection is offset from the longitudinal axis of the respective resilient contact portion from which it extends;

shoulders provided in contact receiving cavities of the housing, the shoulders are provided proximate the overstress projections of the resilient contact portions;



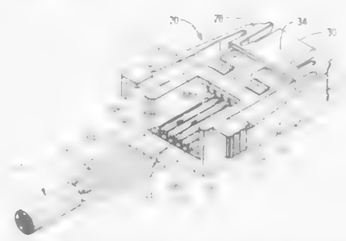
whereby as the second printed circuit board is moved relative to the contact terminals, the overstress projections engage respective shoulders of the housing to prevent the resilient contact portions from being deformed.

5,147,215

CONNECTOR WITH INTEGRAL WIRE MANAGEMENT SYSTEM

James Pritulsky, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 490,178, Mar. 8, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 739,781
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—344 **2 Claims**



1. A dielectric housing for an electrical connector having a plurality of insulation displacement contacts for interconnecting with conductors of a multiple conductor cable, said housing comprising:

a mating end adapted to mate with a complementary connector;

a rearward end opposite the mating end, said rearward end having a transverse external rear surface;

a cable receiving cavity for receiving the cable, said cavity being adapted to receive the conductors, said cable receiving cavity opening through the transverse rear surface and extending from the transverse rear surface to contact receiving passages, said cavity defining a rear opening at the transverse rear surface, and end wall opposite the transverse rear surface, a first side wall, a second side wall opposite the first side wall, a bottom surface between said

first and second side walls, and a top wall opposite the bottom wall; and

a series of contact receiving passages at the mating end corresponding to respective contacts, the passages being adapted to receive respective contacts, the passages extending through the top wall and intersecting with the cable receiving cavity;

said housing being characterized by:

rib means on the bottom wall of the cable receiving cavity, said rib means defining grooves therebetween and extending from substantially the contact receiving passages to substantially the transverse rear surface, said grooves being adapted to align the conductors for interconnection with the respective contacts

ity and means holding and positioning respective leads of the electrical component in terminal cavities at opposite longitudinal ends of the component cavity inserted into downwardly opening insulation displacement slots of terminals that are subsequently assembled into the respective terminal cavities, and

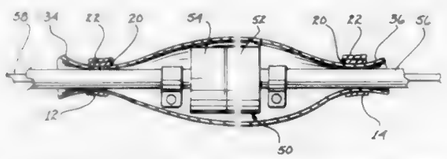
the terminals having upwardly opening insulation displacement slots for receiving electric cables after the terminals are assembled into the respective terminal cavities.

5,147,216

SHROUD FOR IN-LINE ELECTRICAL PLUG

Michael J. Shotey, 7733 E. Cypress, Scottsdale, Ariz. 85257

Filed Oct. 12, 1990, Ser. No. 596,781
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—367 **7 Claims**



1. Apparatus for protecting a in-line electrical connector, said apparatus comprising in combination:

a) a sheath of flexible water resistant material having a longitudinal axis and a lateral axis for encircling the in-line electrical connector and for accommodating protrusions of electrical conductors extending from the in-line connector, said sheath including opposed first and second longitudinal edges permanently attached to one another to form a closed longitudinal wall of uniform water resistance and defining said sheath;

b) first means for closing one end of said sheath; and

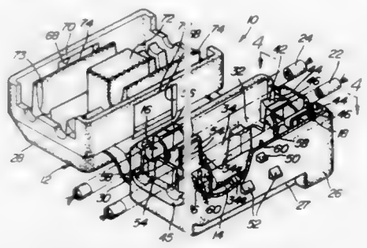
c) second means for closing the other end of said sheath to enclose the in-line connector within said sheath.

5,147,217

ELECTRICAL COMPONENT PACKAGE

Frank T. Neale, III, Niles; Detlev H. Von Schwerdtner, Hudson, and John A. Yurtin, Southington, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 18, 1991, Ser. No. 716,736
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—403 **20 Claims**



1. An electrical component package comprising:

an electrical component having leads,

an insulator housing of thermoplastic material having a hollow base and a cover,

the hollow base having means supporting and locating the electrical component longitudinally in a component cav-

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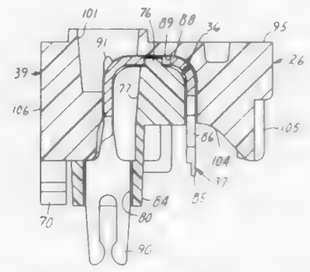
5,147,218

PLUGGABLE MODULAR SPLICING CONNECTOR AND BRIDGING ADAPTER

Gary B. Matthews, Austin, and Jerome A. Pratt, Leander, both of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 12, 1991, Ser. No. 684,323
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—404 **11 Claims**



1. A multiple wire-splice module comprising

an elongate base formed of an insulating polymeric material having opposite longitudinal sides and opposite surfaces, with slotted openings extending through said base between said surfaces along one side and wire retaining members positioned along one surface adjacent the opposite side forming channels for receiving the wires,

an elongate body of insulative material having opposite surface, said body comprising

an elongate insert having a ridge extending the length of said insert, and a plurality of openings positioned along the length of the insert and extending therethrough,

a plurality of conductive contacts, said contacts being supported on said ridge of said insert, each said contact having a bifurcated wire receiving end portion positioned along a side of said ridge with the slot between the legs thereof extending transversely to said ridge, a second connecting member at the other end of each contact being positioned on the other side of said ridge and extending through a said openings in said insert and beyond the side of the insert opposite the ridge, and a third connection portion intermediate the ends of the contact, and

a cap positioned over said insert, said cap having side walls and a top wall, the inner surface of the top wall forming means to capture the contacts between the cap and said insert,

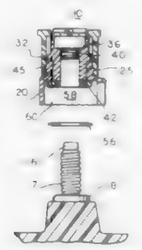
said bifurcated wire receiving end portion being adapted to connect to a said wire in a channel of said base and said second connecting member and said third connection portion being accessible at opposite surfaces of the base and body, when said base and body are assembled with a wire junction being formed therebetween.

5,147,219

REUSABLE TERMINAL LOCKING CAP

Alexander G. Gilberts, Barrington Hills; Richard Kaczmarek, Chicago; Edward S. Paluch, Elmwood Park, and Thomas G. Volk, Grayslake, all of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.

Continuation of Ser. No. 524,772, May 16, 1990. This application May 17, 1991, Ser. No. 704,708
Int. Cl.[5] H01R *4/22*
U.S. Cl. 439—521 **7 Claims**



1. A cap for encapsulating a terminal having an extended threaded terminal stud, said cap comprising:

a) a nonconductive housing having a first end; a second end having an aperture, and an aperture open to said first end, said aperture of said first end configured and oriented for allowing said cap to encapsulate said terminal independent of any of one or more wires which pass through said aperture of said first end and are connected to said threaded terminal stud, said housing being sized to cover said terminal;

b) threaded engagement means for engaging said threaded terminal stud, said engagement means being captively rotatably seated in said aperture of said housing second end so as to be rotatable without causing rotation of said housing; and

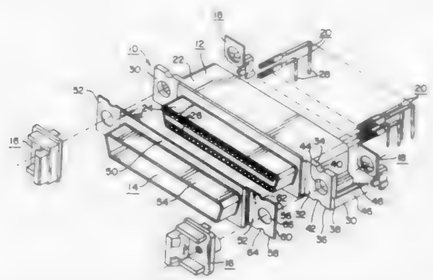
c) a nonconductive disengageable cover for said engagement means engageable with said housing for completely enclosing and covering said engagement means; said engagement means being rotatable without causing rotation of said cover; said cover being permanently tethered to said housing.

5,147,220

BOARD MOUNTED SHIELDED ELECTRICAL CONNECTOR

Brent B. Lybrand, 216 Seven Oaks La., Spartanburg, S.C. 29301

Filed May 30, 1991, Ser. No. 707,725
Int. Cl.[5] H01R *13/73, 13/648*
U.S. Cl. 439—567 **19 Claims**



1. A shielded electrical connector for mounting on a printed circuit board and for attachment to a complementary electrical connector, comprising:

an insulator of insulative material including a body and two spaced ear portions, each ear portion projecting outwardly from said body and comprising a mounting wall having an opening therethrough and a base, said body having a plurality of apertures therein supporting a respective plurality of electrical contacts;

a conductive shell supported on said insulator body and comprising two spaced flanges, each flange having a surface disposed adjacent a respective said insulator mounting wall and having an opening therethrough in substantial registry with a respective said opening in said insulator mounting wall;

two one-piece, metal latching blocks separate from said conductive shell for attachment to a complementary electrical connector, each block being disposed against a respective said flange of said shell, each block comprising a generally flat plate having opposed surfaces, a latching member projecting outwardly from one of said surfaces and in a direction away from said shell flange, and a bushing projecting from said opposite plate surface, said bushing extending through said opening in said shell flange and through said opening in said ear portion mounting wall, said bushing having an internally threaded aperture opening through said surfaces of said flat plate, each said block including a keying element projecting toward a respective said ear portion mounting wall and being in engagement therewith said keying element aligning each block relative to said shell flange and providing anti-rotation resistance, said keying element being spaced from said bushing and lying within the periphery of said mounting wall; and

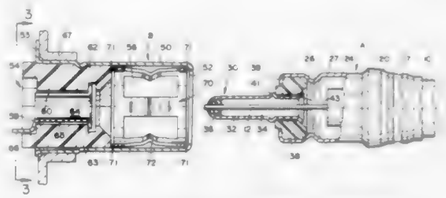
two conductive locking clips supported by said insulator bases, each clip having a securement portion secured to a respective bushing and a resilient latching portion projecting outwardly from said base for resilient mounting to an electrical circuit on a printed circuit board.

5,147,221

COMBINATION SOCKET AND WINGLESS CABLE-END RADIO PIN CONNECTOR

Robert R. Cull, Brecksville, and Walter Cizek, Brooklyn, both of Ohio, assignors to The Starling Manufacturing Company, Cleveland, Ohio

Continuation of Ser. No. 393,941, Aug. 13, 1989, abandoned. This application Apr. 23, 1991, Ser. No. 689,672
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—585 **9 Claims**



1. A detachable coaxial cable connector comprising:

a plug pin assembly comprising,

a coaxial cable with inner and outer electrical conductive material separated by dielectric insulating material,

a cable sleeve having an extension with an annular groove, said cable sleeve maintaining a secure electrical interface with said outer electrical conductive material,

a pin with a section for receiving the inner conductive material of said coaxial cable, the inner electrical conductive material being maintained in a secured electrical interface with respect to said pin, and

insulation support means for insulating against electrical signals passing between said cable sleeve and said pin and for securing said pin to said pin plug assembly; and,

a socket assembly for receiving said plug pin assembly, said socket assembly and said plug pin assembly, when assem-

bled, forming a plurality of mechanical and electrical connections between said plug pin assembly and said socket assembly, said socket assembly comprising,

a metal sleeve extending substantially the length of said socket assembly, said metal sleeve having a reduced opening,

a generally cylindrical split ring contact sleeve having axially extending circumferentially spaced portions which are radially resilient and which are interconnected to first and second axially spaced end sections, the first and second end sections having substantially the same diameter, in a relaxed state which is larger than the diameter of said reduced opening and a diameter in a compressed state which is less than the diameter of said reduced opening thereby facilitating the insertion and removal of said contact sleeve from said metal sleeve, said circumferentially spaced portions and said first and second axially spaced end sections being defined by a single layer, of electrically conductive material, and a plurality of detents carried by said axially extending circumferentially spaced portions between the first and second end sections and spaced around its circumference, said contact sleeve confined in and impinging upon the interior of said metal sleeve in electrical contact therewith, said plurality of detents engaged with said annular groove forming an electrical and mechanical joint with said plug pin assembly, and,

an insulated contact for contacting said pin at one location and for contacting a device at another location.

5,147,222

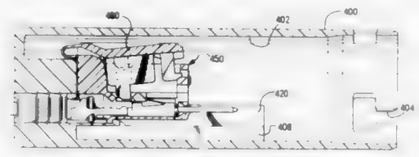
SEALED ELECTRICAL CONNECTOR

Gheorghe Hotea, Griesheim, and Jurgen Hass, Erzhausen, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 602,432, Oct. 23, 1990, abandoned. This application Jan. 3, 1992, Ser. No. 816,794

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—589 **4 Claims**



1. A sealed electrical connector comprising:

an insulating outer housing having at least one terminal receiving opening therethrough, the opening comprising an enlarged bore section which extends inwardly from an outer rear wall, the bore extending forwardly toward a mating end of the shell, the bore extending forwardly and spiring at an end face, the housing having an alignment member extending forwardly from the end face and having a surface which is axially coincident with the inner surface of the bore, the alignment member having at an inner end thereof a rearwardly facing latching surface;

a terminal receiving inner housing profiled for receipt with the outer shell, the housing having a rear face which abuts with the end face of the outer shell, the inner housing having at least one terminal receiving passageway which, when in place in the outer housing, is aligned with the opening in the outer housing, the passageway extending from a rear face of the inner housing to a font mating face of the inner housing, the passageway having a terminal latching surface therein, the portion of the passageway which is adjacent of the rear face of the inner housing including an open axial slot which is profiled to receive the alignment member of the outer shell therein, the slot having at an inner end thereof a lip which overlaps the rearwardly facing latch surface to fixedly latch the inner housing to the outer housing;

an electrical terminal positioned in said terminal receiving passageway and in position against said terminal latching surface; and

a sealing grommet positioned in said enlarged bore, said grommet having an aperture therethrough, whereby said sealing grommet can be slidable received over the wire, and the sire and an electrical terminal can be positioned in said inner housing, while said grommet is positioned in said enlarged bore to seal the terminal receiving passageway.

5,147,223

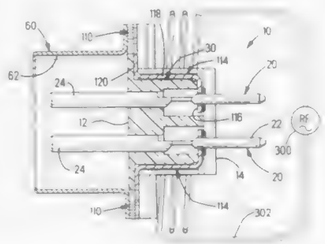
ELECTRICAL CONNECTOR CONTAINING COMPONENTS AND METHOD OF MAKING SAME

Teresa K. Black, Etters; James M. English, Harrisburg; Homer E. Henschen, Carlisle, and Joseph M. Pawlikowski, Lancaster, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 673,623, Mar. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 586,362, Sep. 21, 1990, Pat. No. 5,018,989. This application Apr. 3, 1992, Ser. No. 863,523

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—620 **7 Claims**



1. An electrical connector of the type for transmitting signals and having a dielectric housing means, a plurality of contacts secured in passageways thereof and extending from a mounting face to a mating face of the connector, and further having a conductive shell secured to the housing, said connector further comprising:

said dielectric housing means having a body extending between said mounting face and said mating face and having side surfaces;

said conductive shell mountable to and about at least a portion of said housing means;

a conductive means at least electrically connected to said conductive shell;

said plurality of electrical contacts secured in said housing means and including first sections extending from said mounting face for being connected to corresponding contact means of a corresponding first electrical article, and further including second sections at least exposed along said mating face for electrical connection with mating contacts of a corresponding second electrical article;

a like plurality of small electrical components initially attached to only said conductive means each at a location associated with a respective one of said electrical contacts and having first electrodes electrically connected to said conductive means for grounding, each component having a second electrode separate from said first electrode; and

a like plurality of discrete straps extending from first strap sections each adjacent a respective said contact first section along said mounting face, each said strap including an intermediate strap section extending to a second strap section adjacent a said second electrode of an associated said component to be electrically connected thereto, each said strap to define a circuit from a said contact to an associated said component with said conductive means and said conductive shell defining a ground means of said component;

each said strap comprising a first metal having low magnetic permeability and low electrical resistance, and at least a portion thereof including a layer of a second metal having high magnetic permeability and high electrical resistance, to define a self-regulating temperature heater to generate thermal energy for melting solder when subjected to constant amplitude high frequency alternating current,

whereby after being secured to said housing, each said strap is adapted to provide thermal energy for soldering at least said second strap section to a respective said second electrode of said component when subjected to said constant amplitude high frequency alternating current, thereafter completing said circuit from a said contact to an associated said component with said conductive means and said conductive shell, thereby facilitating fabrication of a circuit-protected connector.

5,147,224

ELECTRICAL CONNECTOR WITH CONDUCTIVE MEMBER ELECTRICALLY COUPLING CONTACTS AND FILTER COMPONENTS

Haw-Chan Tan, Diamond Bar; Nobbert Yu, Culver City, and Yuan-Chieh Lin, Fountain Valley, all of Calif., assignors to Foxconn International, Inc., Sunnydale, Calif.

Filed May 29, 1991, Ser. No. 707,058

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—620 **16 Claims**

1. A programmable electrical connector assembly comprising:

a plurality of individual conductive members, each conductive member including an elongated pin output portion formed at one end, an input receiving portion formed at an opposing end thereof and an intermediate contact region disposed between the pin output portion and said input receiving portion;

a first insulative housing defining a plurality of individual first passages each extending therethrough and each dimensioned to axially accept an individual input receiving portion of an individual conductive member;

a second insulative housing secured to said first housing and defining a plurality of second passages each extending therethrough and each aligned with a corresponding one of the first passages and each dimensioned to axially receive only an individual elongated pin output portion of an individual conductive member;

a plurality of electrical filtering components; and

a plurality of individual conductive bridge members electrically coupled to provide electrical communication between individual of said electrical filtering components and individual intermediate contact regions of corresponding conductive members;

wherein each conductive bridge member includes a first segment and an opposed second;

wherein said first housing defines a plurality of individual first grooves dimensioned to receive first segments of individual conductive bridge members; and

wherein said second housing defines a plurality of individual second grooves dimensioned to receive second segments of individual conductive bridge members.

5,147,225

SHROUD-TO-BOARD POLARIZATION AND KEYING SYSTEM

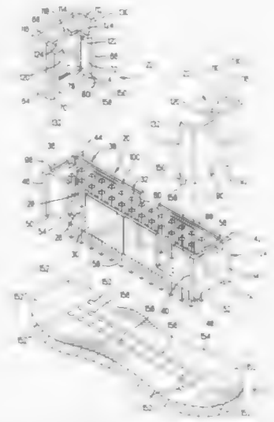
Richard A. Kile, Hummelstown; Ronald P. Locati, Harrisburg; Joseph R. Smee, Oberlin-Steelton, and Charles T. Wood, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 25, 1991, Ser. No. 645,864

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] H01R *13/64*

U.S. Cl. 439—680 **12 Claims**



1. A polarization shroud securable to a connector housing, the housing having a plurality of contacts secured therein, the polarization shroud comprising:

a body section having means cooperable with the connector housing for securing said shroud to the connector housing and an extension section adapted to extend beyond the connector housing when the shroud is secured thereto, the extension section having guide means adapted to taper inwardly toward the connector housing for guiding a complementary connector into the connector housing; and

a protrusion extending from the body section, said protrusion adapted to extend beyond a bottom surface of the connector housing when said shroud is secured thereto to be received in an aperture in a circuit board on which the shroud is mounted whereby the protrusion provides a polarization function when the polarization shroud is secured to the connector housing and the connector housing is mounted on the board.

5,147,226

CONNECTOR ASSEMBLY AND KEYED ALIGNMENT ASSIST SHROUD THEREFOR

Richard A. Kile, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 25, 1991, Ser. No. 645,863

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] H01R *13/64*

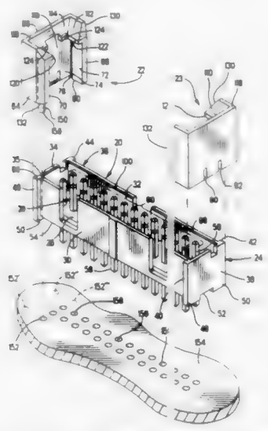
U.S. Cl. 439—680 **16 Claims**

1. A shroud securable to a connector housing mountable on a circuit board and matable with a complementary connector,

the housing having keying structure and a plurality of contacts secured therein, the shroud comprising:

a body section having means cooperable with the connector housing for securing the shroud to the connector housing, said body section having keying means complementary to the keying structure on the connector for cooperating with the keying structure to permit the shroud to be secured to the housing in the presence of keying structure and to prevent the shroud from being secured to the housing in the absence of keying structure, whereby the key structure and the keying means provide a keying system to key the shroud to a connector housing, and

an extension section, said extension section adapted to extend beyond the connector housing when the shroud is secured thereto, the extension section having guide means adapted to taper inwardly toward the connector housing for guiding a complementary connector into the connector housing.

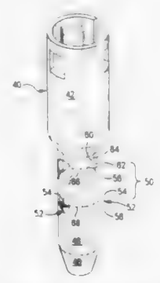


5,147,227

TERMINAL RETENTION DEVICE

Garold M. Yurko, Greensboro, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 17, 1991, Ser. No. 777,962
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—733 2 Claims



1. A terminal retention device for retaining a terminal in a hole in a plastic housing, said device comprising two sets of outwardly projecting nibs with each set spaced apart and spaced around a cylindrical section of a terminal,

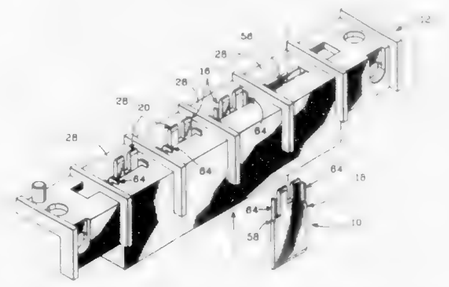
said nibs having a flat edge surface axially normal to said terminal and each set of said nibs being oriented so that said flat surfaces of one set face said flat surfaces of said other set of nibs, said flat surfaces on at least one set of nibs adapted to dig into said plastic housing to prevent axial movement of said terminal.

5,147,228

TERMINAL HAVING POSITIVE RETENTION FEATURE AND METHOD OF USING SAME

Mitchell E. Miller, Clemmons, and Victor E. Slack, Lewisville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 698,516, May 10, 1991, abandoned.
This application Mar. 26, 1992, Ser. No. 859,277
Int. Cl.[5] H01R *13/415*
U.S. Cl. 439—741 12 Claims



1. An electrical terminal received in and secured to an electrical connector comprising:

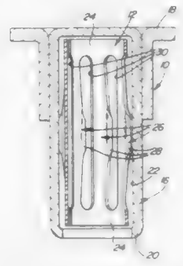
an insulative header defining a mounting face, a mating portion of the terminal facing toward an open mating face of the header, a terminating portion of the terminal, tines laterally spaced from the terminating portion, the terminating portion being bent to overlie the mounting face of the header, and the tines remaining unbent for aligning the terminal in the header.

5,147,229

HIGH CURRENT ELECTRICAL CONNECTOR

Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1989, Ser. No. 448,387
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—843 8 Claims



1. A high current electrical connector having a resilient metal contact strip which provides a circumferential array of mechanically connected contacts for transmitting large amounts of current from one cylindrical contact surface to another comprising:

a connector member having a cylindrical contact surface which supports the resilient metal contact strip for engagement by a cylindrical contact surface of a mating connector member,

the resilient metal contact strip having end bands and a plurality of vanes which are attached to the end bands at their respective ends and which are shaped to resiliently support and retain the contact strip on the cylindrical contact surface of the connector member while providing low pressure, large contact areas for engaging the cylindrical contact surface of the mating connector member,

the plurality of vanes having small central tabs on one edge which are bent at an angle with respect to straight portions of the respective vanes which extend between the end bands, the central tabs supporting the resilient metal contact strip at high pressure, small contact areas of engagement so that there is little, if any relative movement between the tabs and the cylindrical contact surface of the connector member during engagement and disengagement of the mating connector member, and

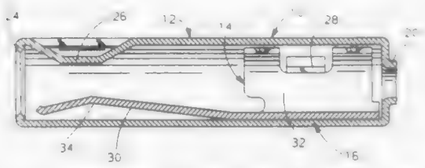
the straight portions of the vanes providing the low pressure, large contact areas for engaging the cylindrical contact surface of the mating connector member.

5,147,230

TWO PIECE ELECTRICAL FEMALE TERMINAL

Robert G. Plyler, Vienna; Bruce J. Serbin, Canfield, and Bruce N. Sech, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1991, Ser. No. 810,057
Int. Cl.[5] H01R *13/187*
U.S. Cl. 439—843 3 Claims



3. An electrical female terminal (**10**) of two piece construction comprising a base terminal (**12**) and a spring member (**14**);

the base terminal (**12**) being stamped and formed from a blank strip of relatively soft and formable electrically conductive metal and including a round, protrusion-free contact end in the form of a rolled socket (**16**) that is attached to crimp wings (**18**) by an intermediate cylindrical neck (**20**) of a rolled cylindrical form;

the rolled socket (**16**) having an annular lip (**24**) at its front end defining an entrance for plugging a terminal pin into the socket (**16**) and at least a pair of contacts (**26**) near the front end that are formed from the material of the socket (**16**) and depressed inwardly to provide contact portions that lie radially inwardly of the annular lip (**24**);

the spring member (**14**) being stamped and bent from a sheet of spring metal and having a spring finger (**30**) that is attached to a support (**32**) at one end,

the spring finger (**30**) being bent in the longitudinal direction to form a raised portion located across from the depressed contacts (**26**); and

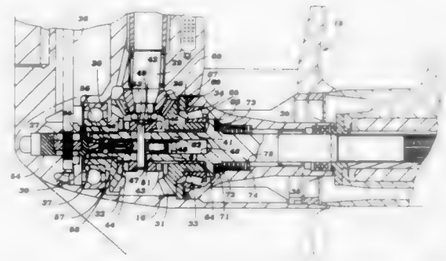
the spring member (**14**) being located inside the rolled socket (**16**) by portions (**28**) of the rolled socket (**16**) engaging the support (**32**).

5,147,231

PROPELLER DRIVING SYSTEM FOR MARINE PROPULSION UNIT

Takaji Kawai, and Kenichi Handa, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 462,793, Jan. 10, 1990, Pat. No. 5,000,708.
This application Jan. 2, 1991, Ser. No. 636,875
Claims priority, application Japan, Jan. 11, 1989, 1-4048
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—75 4 Claims



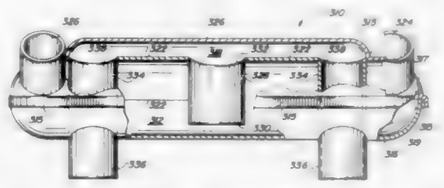
1. A forward reverse drive for a marine propulsion lower unit comprising a propulsion shaft journaled for rotation about an axis, a pair of spaced apart beveled gears each directly journalled on said propulsion shaft for free rotation, a driving beveled gear interposed between and driving said pair of driven beveled gears for rotation in opposite directions, dog clutching means carried by said propulsion shaft between said driven beveled gears for drivably coupling either of said driven beveled gears for rotation with said propulsion shaft for driving said propulsion shaft in selected forward and reverse directions, forward and reverse thrust taking shoulders formed integrally on said propulsion shaft and operatively associated with thrust bearings for transferring forward and reverse thrust from said propulsion shaft to said lower unit, said forward and reverse thrust shoulders of said propulsion shaft being spaced axially thereon from said pair of driven beveled gears.

5,147,232

MARINE ENGINE EXHAUST SYSTEM AND METHOD

Charles C. Miles, Jr.; Charles C. Miles, III, both of Longwood; Emery S. Sims, III, Orlando; David T. Parks, Clermont, and Lee R. Witte, Altamonte Springs, all of Fla., assignors to Marine Muffler Corporation, Apopka, Fla.

Continuation-in-part of Ser. No. 507,124, Apr. 4, 1990, Pat. No. 5,045,005, which is a division of Ser. No. 322,408, Mar. 13, 1989, Pat. No. 4,917,640. This application Aug. 30, 1991, Ser. No. 751,930
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] B63H *21/10*
U.S. Cl. 440—89 26 Claims



1. An exhaust muffler for marine engines, comprising:

a first enclosed chamber defined by an upper wall portion and a bottom wall portion;

inlet means extending into the first chamber for passing

exhaust gases from a marine engine into the first chamber and so that cooling liquids entrained with the exhaust gases collect in the bottom portion of the first chamber;

an oblong second enclosed chamber having an outer second chamber wall which is integrally formed with the upper portion of the first chamber;

an internal plate member for laterally separating the first and second chambers;

at least one intermediate exhaust passageway extending from near the bottom portion of said first chamber, through the plate member and into said second chamber; and

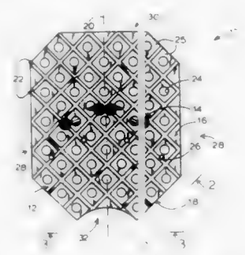
at least one outlet exhaust passageway spaced from the one intermediate exhaust passageway along the lengthwise dimension of said second chamber and extending from said second chamber through the plate member and through the first chamber for venting of the muffler exhaust gases.

5,147,233

SWIMMER TRAINING PADDLE

Richard L. Hannula, Tacoma, Wash., assignor to Han's Paddles, Inc., Tacoma, Wis.

Filed Aug. 5, 1991, Ser. No. 740,292
Int. Cl.[5] A63B *31/00*
U.S. Cl. 441—56 **8 Claims**



1. An aquatic device for use by a swimmer in a body of water, comprising:

a rigid generally planar member having lateral, distal and proximal edges, said member having formed therein plural apertures arrayed across said member to provide a desired flow of water through said member:

said member including water-channeling means formed in a leading surface thereof for controlling a volume of water in frictional engagement with said surface, thereby to increase traction between said member and such body of water when said member is thrust therethrough, the water-channeling means including a plurality of interconnected recesses interposing said apertures; and

means for securing said member to a swimmer's hand

5,147,234

HEEL-BINDING DEVICE

Byron L. Brug, 337 Honono St., Honolulu, Hi. 96825, assignor to Byron Lance Brug and Dennis Brian Kirk, both of Pearl City, Hi.

Filed Feb. 8, 1991, Ser. No. 653,013
Int. Cl.[5] B63B *35/85*
U.S. Cl. 441—70 **56 Claims**

1. A heel binding device for binding a user's heel to a board having a top side, comprising:

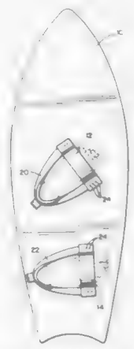
an elastic member having a board end and a member end;

first member fastening means for fastening said member end of said first anchor to said first end of said elastic member;

a second anchor having a board end and a member end; and

second member fastening means for fastening said member end of said second anchor to said second end of said elastic member;

first board attachment means for attaching said board end of said first anchor to said top side of said board;



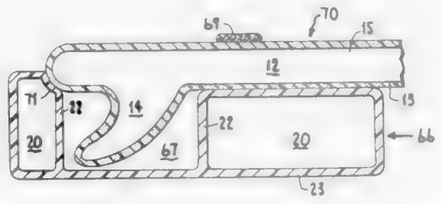
wherein said first board attachment means comprises a plurality of grommets inserted into said first anchor.

5,147,235

PROTECTIVE COVER FOR SURFBOARD

Robert Bamburak, Ortley Beach, N.J., and Robert Degnan, 224 24th Ave., South Seaside Park, N.J. 08752, assignors to Robert Degnan, South Seaside Park, N.J.

Continuation-in-part of Ser. No. 281,812, Dec. 8, 1988, abandoned. This application Jul. 6, 1990, Ser. No. 549,109
Int. Cl.[5] B63B *35/85*
U.S. Cl. 441—79 **5 Claims**



1. A fin protecting cover for a surfboard having at least one fin protruding therefrom, the cover comprising:

a shock absorbing cushion means forming a cushioning block sized to fit against the surfboard at the protruding fin, the cushioning block defining a resilient body with a pocket spaced inwardly from sides of the block for receiving the protruding fin, the cushioning block occupying a space around the fin for protecting the fin; and,

means for attaching said cushion means to the surfboard so as to retain the cushioning block over the fin.

5,147,236

WHIRLIGIG WITH ARTICULATED FRAME

Richard B. Hartman, 7516 201st SE, Issaquah, Wash. 98027

Filed Jul. 8, 1991, Ser. No. 726,986
Int. Cl.[5] A63H *1/32*
U.S. Cl. 446—253 **6 Claims**

1. A spinning toy comprising:

(a) a string torsion device comprising a spinning member and a plurality of intertwistable strands, said spinning member being mounted on said plurality of intertwistable strands providing rotating means for rotating said spinning member at a high velocity in alternating directions when said intertwistable strands are alternately tensed and relaxed;

(b) an enclosed articulated frame comprising a plurality of rigid struts, each one of said rigid struts being pivotally joined at each end there of to another one of said rigid struts to form said enclosed articulated frame, said enclosed articulated frame providing attaching means for engaging ends of said string torsion device, whereby said

string torsion device spans said enclosed articulated frame;

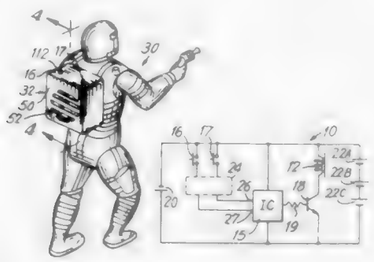
(c) said enclosed articulated frame providing means for employing contracting force of said string torsion device to distort said enclosed articulated frame.

5,147,237

TOY AUDIO DEVICE

David C. K. Kwan; Ma H. Wai, both of Tsuen Wan, Hong Kong; Steven Lebensfeld, Woodsburgh, N.Y., and Harvey Goldberg, Thornhill, Canada, assignors to Toymax Inc., Cedarhurst, N.Y.

Continuation of Ser. No. 613,613, Nov. 15, 1990, Pat. No. 5,092,810, which is a continuation-in-part of Ser. No. 602,150, Oct. 22, 1990, Pat. No. 5,073,140. This application Dec. 11, 1991, Ser. No. 805,536
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] A63H *3/28*
U.S. Cl. 446—297 **25 Claims**



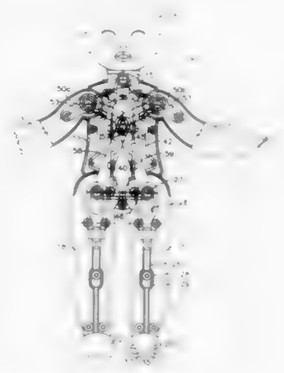
1. A toy audio device configured as an accessory for a toy action figure attachable to, attached to or forming part of the toy action figure, said accessory having a configuration and visual appearance which are coordinated with the configuration and visual appearance of the toy action figure, said device comprising an audio generating system including circuitry comprising an integrated circuit, a switch coupled to said circuitry, at least one battery coupled at least to said circuitry and a speaker coupled to said circuitry, said integrated circuit including read only memory storing signals representing at least one speech phrase and at least one sound effect, said circuitry in response to a single actuation of said switch causing said memory to provide signals representing both said speech phrase and said sound effect, and said circuitry to provide audio signals to said speaker representing said speech phrase and said sound effect.

5,147,238

TAP DANCE DOLL

William J. Kelley, Torrance, and Howard R. Stern, Redondo Beach, both of Calif., assignors to Mattel, Inc., El Segundo, Calif.

Filed Nov. 9, 1990, Ser. No. 611,998
Int. Cl.[5] A63H *3/20, 3/28*
U.S. Cl. 446—330 **3 Claims**



1. A movable figure toy comprising:

a torso;

a pair of arms;

means rotatably joining said arms to said torso;

a pair of hollow legs;

means rotatably joining said legs to said torso;

a pair of feet;

means rotatably joining said feet to the distal ends of said legs;

each of said legs further including drive links slidably mounted within said legs, one end of said drive links being pivotally mounted to said feet and the opposite end of said drive links including elongated slots for pivotable mounting to a pivot means positioned such that said drive links move through a center of rotation established by said means rotatably joining said legs to said torso; each said arms including extension portions extending into said torso and; connecting links connecting each said extension portions to said drive links in the legs so that when said arms are rotated, said connecting links actuate said drive links, causing said feet to simultaneously pivot.

5,147,239

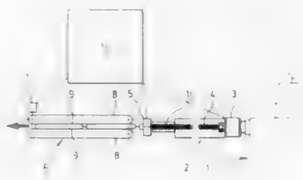
METHOD AND APPARATUS FOR MAKING SAUSAGES

Georg Staudenrausch, Biberach an der Riss, Fed. Rep. of Germany, assignor to Albert Handtmann Maschinenfabrik GmbH & Co. KG, Biberach/Riss, Fed. Rep. of Germany

Filed Jul. 1, 1991, Ser. No. 723,953
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1990, 4028343
Int. Cl.[5] A22C *11/10*
U.S. Cl. 452—47 **3 Claims**

1. In method for making sausages, in which sausage meat is expelled from a filling machine and filled into sausage skin

being pulled off a skin caterpillar to form a sausage rope and the rope is then divided into individual sausages by twisting it between every two adjacent sausage portions, the improvement comprising pulling forwards a leading sausage portion



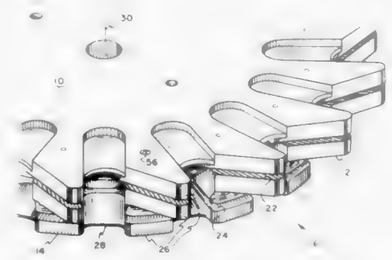
together with the sausage skin downstream of the twisting step at a speed greater than the speed of expulsion of the sausage meat from the filling machine during the twisting step to increase the spacing in the skin between each two adjacent sausage portions.

5,147,241

MULTIPIECE POULTRY WING RECEIVING WHEEL AND METHOD

Kenneth A. Rudin, Canton, Ga., assignor to Meyn USA, Inc., Gainesville, Ga.

Filed Apr. 26, 1991, Ser. No. 692,377
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—169 **39 Claims**



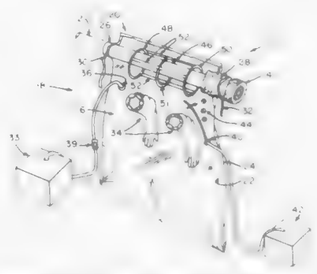
1. A wheel assembly for use with a poultry wing cutting machine in processing wings on a given respective side of such poultry, comprising plural generally planar elements including respective planar elements each with a toothed periphery and respective planar elements each with an annular periphery, and reversible securement means for removably securing said planar elements collectively in predetermined alignment about a common rotatable axis, such that said respective planar elements each with an annular periphery respectively form cutting blade receiving annular slots in said wheel assembly generally perpendicular to said common rotatable axis, and such that said respective planar elements each with a toothed periphery collectively form a plurality of circumferentially spaced poultry wing receiving troughs generally parallel to said common rotatable axis, so that respective of said planar elements may be replaced through operation of said securement means as damage or wear occurs to such elements.

5,147,242

NEGATIVE AIR BAG

Robert E. Lowe, Jr., Box 84, Custer, Mont. 59024

Filed Nov. 2, 1990, Ser. No. 608,388
Int. Cl.[5] F24F *7/00*
U.S. Cl. 454—63 **5 Claims**



1. An apparatus for subatmospheric removal of a contaminant such as an asbestos coating from the surface of tubular conduits and the like, said apparatus comprising:

a flexible bag having a generally rectangular configuration and including,

a generally rectangular front panel having an upper portion operable to be positioned above the conduit and a lower portion operable to be positioned below the conduit,

a generally rectangular back panel having a lower portion joined to said lower portion of said front panel to form a collection chamber and an upper portion operable to be joined to said upper portion of said front panel,

means for securing said upper portion of said front panel to said upper portion of said back panel above the conduit to form an upper section of said flexible bag which operably extends above the conduit and a lower section of said flexible bag which operably extends below the conduit such that the conduit extends laterally through said flexible bag,

means for securing a first lateral edge of said flexible bag about the peripheral surface of the conduit extending through said flexible bag,

means for securing a second lateral edge of said flexible bag about the peripheral surface of the conduit extending through said flexible bag,

said means for securing said upper portion of said front panel to said upper portion of said back panel, said means for securing said first lateral edge of said flexible bag about the conduit, and said means for securing said second lateral edge of said flexible bag about the conduit being operable to enclose a segment of the conduit to form an enclosure being essentially impermeable to dust and particulate matter;

at least one glove sleeve fashioned through said front panel and said flexible bag to permit an operator to remove asbestos from a segment of the conduit enclosed within said flexible bag;

means fashioned through at least one of said front panel and said back panel of said flexible bag for permitting an asbestos removing tool to be inserted into said bag;

means fashioned through at least one of said front panel and said back panel of said flexible bag for operably maintaining subatmospheric air pressure within said flexible bag;

at least one replacement air inlet valve positioned on at least one of said front panel and said back panel to permit the ingress of ambient air into said bag while concomitantly preventing egress of air or particulate contents of said bag out of said bag, said at least one replacement air inlet valve comprising;

a ring member;

a hub;

radiating spokes extending between said hub and said ring member; and

a flexible diaphragm connected to said hub and extending to the perimeter of said ring member; and

a cage member operable to be disposed around the conduit and within said flexible bag, said cage member having,

a first end ring,

a second opposing end ring, and

at least three connecting straps extending longitudinally between said first end ring and said second end ring; and

said means for securing said first lateral edge and said means for securing said second lateral edge of said flexible bag to the conduit are releasable to operably permit lateral translation of said flexible bag along the conduit as asbestos is removed from the conduit.

5,147,243

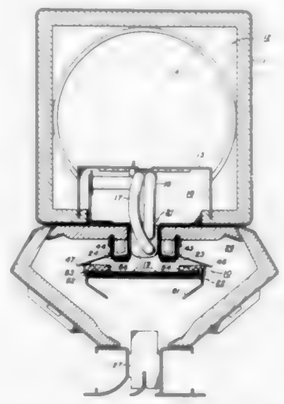
AIR TERMINAL APPARATUS

Stephen C. Inglis, Kirkville, N.Y., and Carl C. Herb, Savannah, Ga., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 10, 1991, Ser. No. 698,205
Int. Cl.[5] F24F *13/10*
U.S. Cl. 454—323 **9 Claims**

1. An improved air terminal of a type having an elongate slot at least partially defined by a pair of spaced cut-off plates, a plenum fluidly connected to the slot for supplying a flow of air thereto, and an inflatable bellows located adjacent the cut-off plates so as to be selectively expandable toward the plates to thereby impede the discharge flow of air from the slot, wherein the improvement comprises:

a seal element disposed between the bellows and the cut-off plates and secured at a central portion thereof to a central portion of the bellows, with said transversely extending ends of said seal element not being attached to said bellows but extending to a transverse extent so as to overlap the cut-off plates, said seal element being composed of a closed cell material which is moved by the expanding bellows toward the cut-off plates to reduce the flow of air therefrom; and



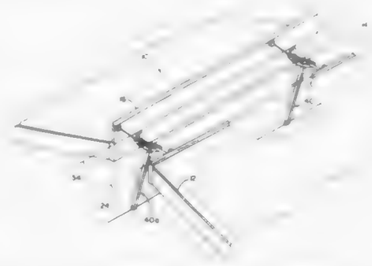
a pad attached to each of the respective cut-off plates, between the respective cut-off plates and said seal element, so as to be engageable of said bellows to thereby enhance the sealing relationship between said seal element and said cut-off plates, said pads being composed of a closed cell material.

5,147,244

VENTILATION SYSTEM INCLUDING VENT CONTROLLER APPARATUS

Rodney L. Spilde, 6300 W. Richmond Rd., Aberdeen, S. Dak. 57401

Filed Aug. 30, 1991, Ser. No. 755,506
Int. Cl.[5] F24F *7/02*
U.S. Cl. 454—364 **12 Claims**



10. A vent controller apparatus for opening and closing a door of a building, the door rotatable about an axis parallel to a major surface of the door, the controller apparatus comprising:

a bracket member pivotally attachable to the building for rotation about a first axis transverse to the axis of rotation of the door;

a link rod including an elongate portion extending between first and second ends, the first and second ends each including a ball portion;

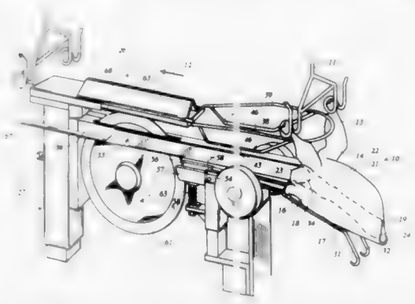
a first socket portion attachable to the door, the first socket

5,147,240

THIGH JOINT SEPARATOR AND CARCASS HALVING APPARATUS

Jacobus E. Hazenbroek, and Bastiaan Verrijp, both of Burg de Zeeuwstraat 52, Numansdorp, Netherlands

Filed Jan. 23, 1992, Ser. No. 824,345
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—165 **21 Claims**



1. A method of opening and dislocating the thigh joints of previously eviscerated poultry carcasses comprising the steps of:

moving poultry carcasses with an overhead conveyor system along a processing path suspended by their legs in an inverted attitude and as each poultry carcass moves along the processing path,

orienting the vertebrae of the carcass approximately parallel to the processing path,

supporting the vertebrae of each poultry carcass adjacent the thigh joints of the poultry carcass, and

urging the knuckles of the thigh bones out of mating engagement with the backbones of each poultry carcass.

portion receiving the ball portion of the first end of the link rod to form a first ball and socket joint; and

a second socket portion attached to the bracket, the second socket portion receiving the ball portion of the second end of the link rod to form a second ball and socket joint.

5,147,245

HYDRAULIC TORQUE IMPULSE GENERATOR

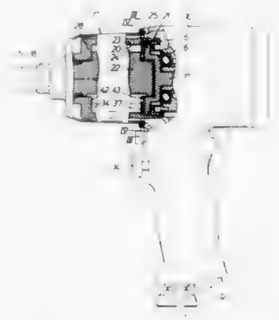
Knut C. Schoeps, Tyresö, Sweden, assignor to Atlas Copco Tools AB, Stockholm, Sweden

Filed Jun. 28, 1991, Ser. No. 722,693

Claims priority, application Sweden, Jul. 3, 1990, 9002328

Int. Cl.[5] B25B *21/02*; **B25D** *15/00*

U.S. Cl. 464—25 **5 Claims**



1. Hydraulic torque impulse generator, comprising a drive member (**21**) connected to a rotation motor (**16**) and including a cylindrical fluid chamber (**24**) defined by a circumferential wall (**20**) and two end walls (**25**, **28**), an output spindle (**18**) rotatably supported in a coaxial relationship with said drive member (**21**) and having a rear portion (**22**) extending into said fluid chamber (**24**), said rear spindle portion (**22**) having at least one radial slot (**31**, **32**) each supporting a radially movable seal element (**33**, **34**) for sealing cooperation with seal lands (**35**, **36**) on the circumferential fluid chamber wall (**20**), and first seal ridges (**38**, **39**) on said rear spindle portion (**22**) for sealing cooperation with second seal ridges (**40**, **41**) on said circumferential fluid chamber wall (**20**), thereby dividing said fluid chamber (**24**) into at least one high pressure compartment (H.P.) and at least one low pressure compartment (L.P.) during short intervals of the relative rotation between said drive member (**21**) and said output spindle (**18**), wherein an annular, non-resilient contact element (**37**) is associated with one of said fluid chamber end walls (**25**), said contact element (**37**) is freely axially displaceable between a rest position and an active position in which it cooperates sealingly with said seal elements (**33**, **34**) and said rear spindle portion (**22**) for sealing off said at least one high pressure compartment (H.P.) from said at least one low pressure compartment (L.P.), a pressure chamber (**44**) formed between said contact element (**37**) and the respective end wall, and a passage means (**45**, **46**) connecting said pressure chamber (**44**) with said at least one high pressure compartment (H.P.) during said short rotation intervals to thereby impart a bias pressure on said contact element (**37**) toward said active position.

5,147,246

DEVICE WITH TORSION DAMPING BY RESILIENT PLATES, ESPECIALLY FOR AN AUTOMOTIVE VEHICLE

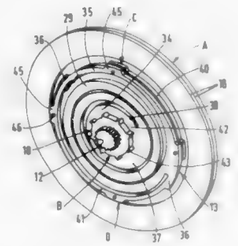
Hervé Focqueur, Franconville; Bernard Jumel, Pierrefitte; Jacques Paquin, Villeneuve La Garenne, and Jacky Naudin, Ermont, all of France, assignors to Valeo, Paris, France

Continuation of Ser. No. 347,211, May 4, 1989, abandoned. This application Jun. 18, 1991, Ser. No. 715,719

Claims priority, application France, May 6, 1988, 88 06102; Mar. 17, 1989, 89 03545

Int. Cl.[5] F16D *3/12, 3/52*

U.S. Cl. 464—59 **8 Claims**



1. A device with torsional damping of the kind comprising at least two coaxial parts, the device comprising a support member and a hub forming part of a first of said coaxial parts and of a second of said coaxial parts respectively, mounting means mounting the support member and said hub for relative rotation of one with respect to the other and a plurality of resilient means for resiliently opposing the relative rotation of the hub and the support member, second mounting means mounting said resilient means in parallel with each other whereby said resilient means couple the support member and the hub together, each of said resilient means being formed as a resilient plate which comprises at least one resiliently deformable arm together with inner and outer carrier rings, said arm extending between said carrier rings and being connected integrally with at least said outer carrier ring through a junction or base zone, the device further comprising first coupling means coupling said outer carrier ring with said support member of said first coaxial part of the device for rotation therewith, said resilient plates being arranged in two pairs, a first of said pairs lies axially between the resilient plates of a second of said pairs, the plates of each pair being offset circumferentially by 180 degrees with respect to those of the other pair, the resilient arms of the plates constituting each said pair being aligned with each other, said first coupling means coupling said outer carrier ring to said support member comprises at least one radially outwardly projecting element for attachment of the outer carrier ring with said support member for rotation therewith, each said radially outwardly projecting element having at least one through hole, the device further including a plurality of fastener members extending through said holes and axially joining the pairs of resilient plates together, said junction zone joining the resilient arm to the outer carrier ring also comprises a radially outwardly extending projection element which is larger than each said radially outwardly projecting element.

5,147,247

SWING THROW-OVER BARRIER

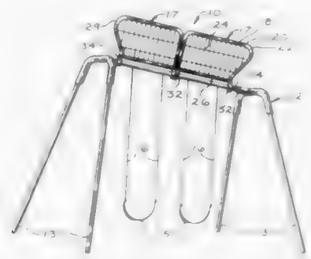
Keith A. Addleman, Hillsdale, Mich., assignor to Quality Industries, Inc., Hillsdale, Mich.

Filed Mar. 11, 1991, Ser. No. 667,536

Int. Cl.[5] A63G *9/02*

U.S. Cl. 472—118 **7 Claims**

1. A barrier for use in conjunction with a playground swing set having a substantially horizontal top crossbeam having ends and including a swing suspended on flexible strands from the crossbeam for preventing the swing from being thrown over the crossbeam comprising, in combination, a frame having a generally planar configuration, swing barrier means mounted on said frame, and fastening means substantially



vertically mounting said frame upon the swing set adjacent and above the crossbeam whereby said frame plane is substantially vertically oriented above the crossbeam, said frame having a vertical height sufficient to render the throwing of a swing thereover difficult.

5,147,248

POWER TRANSMISSION SHEAVE AND METHOD OF MANUFACTURING THE SAME

Michael L. Lewis; Paul G. Kurre; George B. Day, all of Mason; Daniel G Fannin, Lewis, and Roland C. Thomas, Mason, all of Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 26, 1991, Ser. No. 749,673

Int. Cl.[5] F16H *55/49*

U.S. Cl. 474—166 **15 Claims**

1. An improved sheave having at least one groove adaptable to any one of a plurality of commercially available sheave grooves and to any one of select, specific V-belts, each associated with at least one of said commercially known grooved sheaves, including the grooved sheaves commonly used and commercially designated as types "A", "B", "5V", "4L" AND "5L" with each of said commercially available grooved sheaves having differing angles of groove wall slope, differing groove top and differing groove bottom widths and differing groove depths measured normally between top and bottom groove widths comprising; a sheave having at least one groove having critical dimensions including a side wall angle of slope range from the top of the groove wall of the sheave to the bottom of the groove wall of the sheave in a range of 34° to 42°, a top groove width measuring in a range of 0.619 to 0.656 inches, a bottom groove width measuring in a range of 0.139 to 0.231 inches and a minimum groove depth measuring substantially normally from top to bottom groove widths in an amount of 0.645 inches.

5,147,249

POWER TRANSMISSION MULTI-GROOVE SHEAVE AND METHOD OF MANUFACTURING THE SAME

Michael L. Lewis; Paul G. Kurre; George B. Day, all of Mason County; Daniel G. Fannin, Lewis County, and Roland C. Thomas, Mason County, all of Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 26, 1991, Ser. No. 749,675

Int. Cl.[5] F16H *55/49*

U.S. Cl. 474—168 **15 Claims**

1. An improved multi-groove sheave assembly having at least two side-by-side sheave grooves with centers of groove bottom widths spaced apart a preselected distance, said multi-groove sheave being adaptable to any one of a plurality of commercially available preselected multi-groove sheaves with a like number of grooves and to any one of select, specific V-belt sets, each belt set being specifically associated with at least one of said commercially available preselected multi-groove sheaves including the multi-groove sheaves commonly used and commercially available multi-groove sheaves designated as types "A", "B", "5V", "A/B Combination" and "SPB" with each of said commercially available and designated multi-groove sheaves having a set of similar grooves with the grooves of the sets having differing angles of groove wall slope, differing groove top and differing groove bottom widths and differing groove depths measure normally between top and bottom groove widths comprising: a multi-groove sheave having a set of at least two side-by-side adjacent grooves, each of said side-by-side adjacent grooves of said set having dimensions including a side wall angle of slope range from the top of said groove wall to the bottom of said groove wall of 34° to 42°, a top groove width range measuring from 0.619 inches to 0.656 inches, a bottom groove width range of 0.139 to 0.231 inches with centers of adjoining groove bottom widths being spaced apart from 0.600 to 0.755 inches and a minimum groove depth measured normally from top to bottom groove widths from 0.645 inches.

5,147,250

CHAIN DESIGN

Philip J. Mott, Dryden, N.Y., assignor to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Filed Jun. 13, 1991, Ser. No. 714,645

Int. Cl.[5] F16G *13/04*

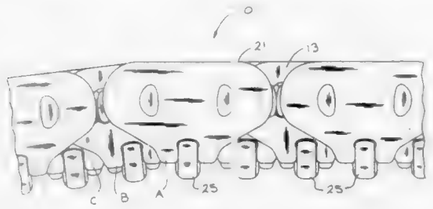
U.S. Cl. 474—206 **12 Claims**

1. A chain (**10**) comprising:

a plurality of links (**13**) positioned in substantially parallel relationship with respect to each other, said links (**13**) having an aperture (**15**) located at each end of said links (**13**), an end region (**14**) of said links (**13**) extending from said end of said aperture (**15**) to said end of said link (**13**); and,

a plurality of connecting elements (**19**) connecting together adjacent links (**13**), said links being interconnected in a three-link arrangement in which similarly located end regions (**14**) of said links (**13**) are offset and said pattern repeats every three links, said connecting elements (**19**) passing through said aperture (**15**) on one end of one of

said links (13) and said aperture (15) on the opposite end of said adjacent links (13), said end region (14) of said links (13) extending substantially to said adjacent connecting



element (19) whereby said end region (14) of said links (13) is increased in size and substantially increases the strength of said chain (10).

5,147,251

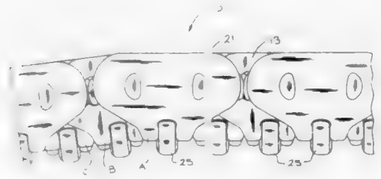
CHAIN DESIGN

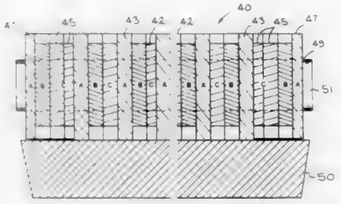
Edward H. Cole, Jr., Ithaca, N.Y., assignor to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Filed Jun. 13, 1991, Ser. No. 714,644

Int. Cl.[5] F16G *13/00*

U.S. Cl. 474—206 19 Claims





1. A three-way laced chain (41) having a plurality of links (42, 43, 45) arranged in rows (A, B, C) extending across the width of said chain (40) in which similarly located end regions of said links (42, 43, 45) are offset and said links (42, 43, 45) being arranged in columns (53) extending along the direction of travel for said chain (40) comprising:

a plurality of first (43), second (42) and third (45) links positioned in substantially parallel relationship with respect to each other, said second links (42) having a thickness less than said first links (43) and said third links (45) having a thickness greater than said first links (43);

an aperture (49) located at each end of said first (43), second (42) and third (45) links;

a plurality of connecting elements (51) extending through said apertures (49) and connecting together adjacent first (43), second (42) and third (45) links, said second links (42) and said third links (45) are positioned in said chain (40) to vary the spacings between adjacent links (42, 43, 45) and to vary the distribution of loads on said links (42, 43, 45) whereby said loads on said links (42, 43, 45) are substantially balanced across the width of said chain (40) and bending of said connecting elements (51) is substantially reduced.

5,147,252

DIFFERENTIAL UNIT

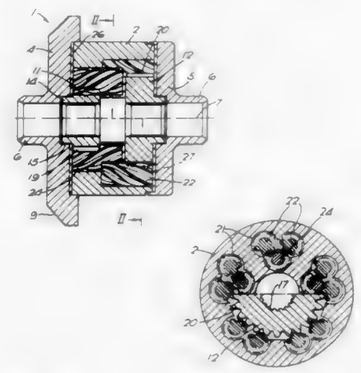
Graham H. Mace, Basildon, and Andrew C. Thompson, Attleborough, both of United Kingdom, assignors to Group Lotus P/C, Norfolk, United Kingdom

Continuation-in-part of Ser. No. 365,401, Jun. 13, 1989, abandoned. This application Jan. 22, 1991, Ser. No. 644,147

Claims priority, application United Kingdom, Jun. 15, 1988, 8814226; Jul. 14, 1988, 8816712

Int. Cl.[5] F16H *1/38*

U.S. Cl. 475—226 19 Claims



1. A differential unit comprising:

a gear carrier designed for rotation about a first axis;

means on said carrier whereby said carrier can be rotated about said first axis;

first and second toothed output gears of different diameters, each gear being mounted in the carrier for rotation about the first axis;

a first plurality of intermediate gears, each journalled in a pocket in the carrier to rotate with respect to the carrier about a first plurality of intermediate gear axes spaced from and parallel to the first axis, said first plurality of axes being equally spaced from the first axis at a first radial distance therefrom, and each of the first plurality of intermediate gears in driving engagement with the first output gear,

a second plurality of intermediate gears each journalled in a pocket in the carrier to rotate with respect to the carrier about a second plurality of intermediate gear axes spaced from and parallel to the first axes, said second plurality of axes being equally spaced from the first axis at a second radial distance therefrom, each of the second plurality of intermediate gears in driving engagement with the second output gear;

wherein at least one of the first plurality of intermediate gears meshes with at least one of the second plurality of intermediate gears and the said second radial distance between the second plurality of intermediate gear axes and the first axis is larger than the first radial distance between the first plurality of intermediate gear axes and the first axis.

5,147,253

VARIABLE SPEED TRANSMISSION DEVICE

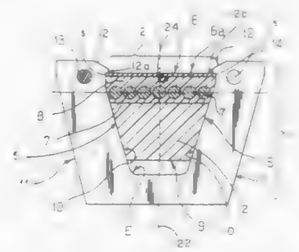
Louis Douhairet, Saint-Leger-Des-Vignes; Daniel Play, Saint-Genis-Les-Ollieres, and Roger Trinquard, Saint-Leger-Des-Vignes, all of France, assignors to Caoutchouc Manufacture et Plastiques, Versailles, France

Filed Apr. 1, 1991, Ser. No. 678,827

Claims priority, application France, Apr. 2, 1990, 90 04163; Apr. 2, 1990, 90 04162

Int. Cl.[5] F16G *5/16*

U.S. Cl. 474—242 20 Claims



1. A continuously variable speed transmission comprising:

a drive pulley;

a driven pulley;

each of said drive pulley and said driven pulley having conical surfaces to provide variable diameters thereof;

a transmission mechanism extending around each of said drive pulley and said driven pulley; said transmission mechanism comprising:

at least one endless flexible connecting element, said at least one endless flexible connecting element having an endless dimension;

said endless flexible connecting element defining a generally trapezoidal cross section generally perpendicular to the endless dimension, said cross-section having a first, oblique, side portion, a second, oblique, side portion spaced apart from and oblique to said first, oblique, side portion, a third side portion connecting said first, oblique, side portion to said second, oblique, side portion, and a fourth side portion parallel to said third side portion, said third side portion and said fourth side portion each having a width, said width of said fourth side portion being greater than said width of said third side portion;

a plurality of links mounted on said endless flexible connecting element;

each link of said plurality of links comprising a first oblique side part and a second oblique side part, said second oblique side part being oblique to and spaced apart from said first oblique side part to form groove means therebetween for receipt of said endless flexible connecting element therein, said first oblique side part having a first oblique inner surface disposed toward said groove and said second oblique side part having a second oblique inner surface disposed toward said groove, said first and said second oblique inner surfaces contacting said first and said second, oblique, side portions of said endless flexible connecting element, said groove having a base extending from said first oblique inner surface to said second oblique inner surface, said third side portion of said endless flexible connecting element being disposed towards said base;

said first, oblique, side portion and said second, oblique, side portion of said endless flexible connecting element substantially comprising the sole portions of said endless flexible connecting element for transmitting and receiving mechanical power; and

said endless flexible connecting element being configured for transmitting and receiving substantially all mechanical power through said first and said second, oblique, side portions to and from said first and said second oblique inner surfaces of said links.

5,147,254

TORQUE TRANSMISSION UNIT FOR THE DRIVE CONNECTION OF A SECONDARY UNIT WITH AN INTERNAL COMBUSTION ENGINE

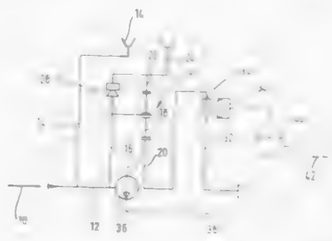
Wolfgang Baier, Gochsheim, and Walter Kurz, Durach, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 526,297

Claims priority, application Fed. Rep. of Germany, May 24, 1989, 3916979

Int. Cl.[5] F16H *47/00, 37/00;* B60K *7/00;* F16D *23/00*

U.S. Cl. 475—121 6 Claims



6. Torque transmission unit for the drive connection of at least one secondary unit with an internal combustion engine, comprising an input member (12) for connection with an output shaft (10) of the internal combustion engine, an output member (24) for connection with the secondary unit, a planetary gear wheel unit (P), a free-wheel (28) and a clutch device (30) for connecting a wheel (20) of the planetary gear wheel unit (P) with one of a stationary support part (32) and a further wheel of the planetary gear wheel unit (P), said clutch device (30) being actuatable by the output pressure of a hydraulic pump (36), which is integrated into the torque transmission unit, said hydraulic pump (36) drawing from a tank (44) which is integrated into the torque transmission unit, said tank (44) being made in the form of a replaceable cartridge which permits replacement of the tank at least with a part of the filling of a hydraulic circuit of the hydraulic pump (36).

5,147,255

SPUR GEAR TRANSMISSION, IN PARTICULAR FOR A DRIVE UNIT OF AN INDUSTRIAL TRUCK

Richard Strehler, Chieming, and Max Bartl, Munich, both of Fed. Rep. of Germany, assignors to Hurth Getriebe und Zahnraeder G.m.b.H., Munich, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,773

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1990, 4010742; Apr. 7, 1990, 4011304

Int. Cl.[5] F16H *3/44*

U.S. Cl. 475—311 5 Claims

1. A spur gear transmission for a drive unit of an industrial truck, comprising:

a transmission housing;

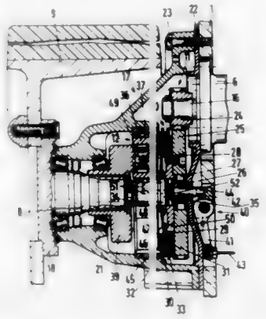
at least two spur gears supported in the transmission housing and meshingly engaged with one another;

a first disk carrier arranged on one of the two spur gears, on which carrier at least one first braking disk is mounted fixed against relative rotation, however, is axially movable;

a second disk carrier fastened in the transmission housing, on which carrier at least one second braking disk is mounted fixed against relative rotation, however, is axially movable, which second braking disk cooperates with the at least one first braking disk such that in an arrangement of several first braking disks and just as many second braking

disks, these are arranged alternately in a conventional manner; and

the one spur gear having the first disk carrier thereon being axially movable against the force of a spring by a pressure



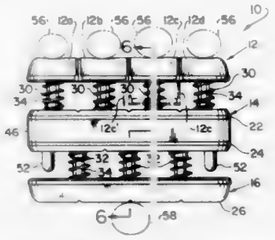
pin extending through the transmission housing and operable from outside such that the braking disks are pressed against one another between the one spur gear and a bearing surface in the transmission housing.

5,147,256

COMBINATION INDIVIDUAL FINGER AND ENTIRE HAND EXERCISER

Howard Silagy, 265 Post Ave., Westbury, N.Y. 11590

Filed Nov. 12, 1991, Ser. No. 789,945
Int. Cl.[5] A63B *21/16, 21/05*
U.S. Cl. 482—47 3 Claims



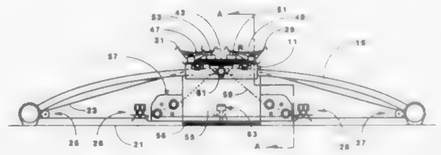
1. A combination individual finger and entire hand exerciser comprising in an operative arrangement of three cooperating body members a first body member having a centrally disposed position in said arrangement, said centrally disposed first body member having a set of four and a set of three adjacently spaced apart exercising springs operatively mounted to extend in opposite directions therefrom, said second body of said arrangement for promoting individual finger-exercising use consisting of cooperating four adjacent independently slidable finger grips each mounted on a cooperating one of said set of four exercising springs so that incident to individual finger exercising a selected finger grip is depressed for urging same from an initial clearance position through closing movement against said first body member while an adjacent non-depressed finger grip remaining in its clearance position contributes to the tracking of said moving finger grip during said closing movement, and said third body member of said arrangement for prompting entire hand-exercising use mounted on said set of three exercising springs so that incident to entire hand exercising both said second and third body members are simultaneously closed from opposite directions against said centrally located first body member against the resistance of cooperating individual exercise springs and entire hand exercising against the resistance of all exercise springs is available.

5,147,257

SKI EXERCISING APPARATUS

R. Joel Loane, 535 Placitas Ave., Atherton, Calif. 94025

Division of Ser. No. 178,354, Jul. 30, 1987, Pat. No. 4,743,014.
This application Sep. 4, 1990, Ser. No. 577,101
Int. Cl.[5] A63B *69/18*
U.S. Cl. 482—71 9 Claims



1. A device for exercising comprising:

at least two rails positioned in a spaced apart parallel relationship;

brace means for holding said rails in said spaced apart relationship;

carriage means for providing a stable riding area for riding along said rails;

resilient means for providing a restoring force on said carriage means toward the middle of said rails;

first platform means for one of a user's feet, said first platform means having a pivotal attachment to said carriage means such that said first platform means may rotate in either direction from the horizontal about an axis that is orthogonal to said rails;

second platform means adjacent said first platform means for the other of the user's feet, said second platform means having a pivotal attachment to said carriage means such that said second platform means may rotate in either direction from the horizontal about an axis that is orthogonal to said rails;

said pivotal attachment of said first platform means positioned offset from the center of said first platform means in the direction away from said second platform means such that a user's weight applied to said first platform means will rotate said first platform means toward said second platform means; and

said pivotal attachment of said second platform means positioned offset from the center of said second platform means such that a user's weight applied to said second platform means will rotate said second platform means toward said first platform means;

bumper means, located between said first platform means and said carriage means and between said second platform means and said carriage means toward the middle of said carriage means relative to said pivotal attachment of said first platform means and relative to said pivotal attachment of said second platform means, for providing a resilient stop to rotational motion of said first platform means about its pivotal attachment and for providing a resilient stop to rotational motion of said second platform means about its pivotal attachment.

5,147,258

PUNCHING BAG CONSTRUCTION AND SUSPENSION

Patrick T. Donohue, 1822 NE. 143rd, Portland, Oreg. 97230

Filed Dec. 14, 1990, Ser. No. 627,633
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] A63B *64/00*
U.S. Cl. 482—87 20 Claims

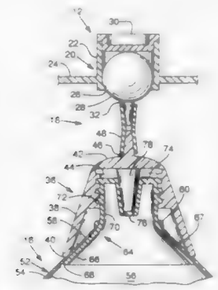
1. A resilient bag for recreational use comprising:

a first elastic envelope having a wall and an inflation orifice in the wall and inflatable to define an enclosed chamber;

an inflation collar having a body with a through passage and a flange generally concentric with and extending outwards from the body, said flange having an outer surface and an outer rim; and

valve means carried by the collar and associated with the through passage for controlling inflation of the envelope,

wherein, in assembly, the inflation orifice of the envelope is stretched over the flange of the inflation collar and grips



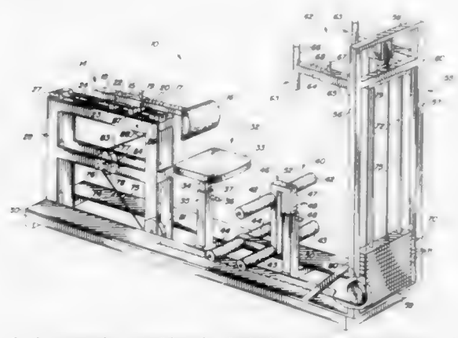
the collar with an airtight grip and the passage communicates with the chamber so that the bag may be inflated through the valve means and inflation maintained through the action of the airtight grip and the valve means and so that the wall of the envelope overlays the outer surface and bears on at least the rim of the flange and the collar is substantially integrated with the wall of the envelope.

5,147,259

ABDOMINAL MUSCLE EXERCISE MACHINE

Kenneth M. Hutchins, 350 Hidden Pines Cir., Casselberry, Fla. 32707

Filed Oct. 16, 1990, Ser. No. 598,131
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—101 18 Claims



1. An exercise machine for isolating and strengthening abdominal muscles of a user, said machine comprising:

a base having a front and a rear;

a seat mounted on said base intermediate said front and rear;

means mounted on said base, ahead of said seat, for restraining leg movement of the user seated on said seat;

an elongated plunger having a free end dimensioned configured and adapted for contacting the seated user;

means mounting said plunger on said base behind said seat, for horizontal movement of said plunger relative to said base rearwardly away from said seat in response to skeletal movement of the seated user applied to said free end;

a weight; and

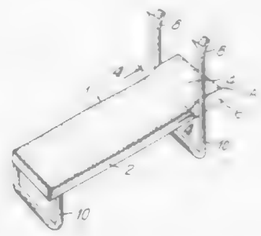
means mounted on said base connecting said weight to said plunger for causing said weight to move vertically in response to said horizontal movement rearwardly away from said seat, so that said weight applies a force directed forwardly toward said seat on said plunger during said plunger horizontal movement, to resist said skeletal movement by the user.

5,147,260

THORACIC WEIGHTLIFTING BENCH

Andrew Roosevelt, 414 E. 73 St., Apt. 5RW, New York, N.Y. 10021

Continuation-in-part of Ser. No. 572,436, Aug. 27, 1990, Pat. No. 5,039,090. This application Aug. 16, 1991, Ser. No. 745,735
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] A63B *21/028*
U.S. Cl. 482—104 12 Claims



1. A weightlifting bench for performing a bench press exercise by a user comprising:

an elongated bench means for supporting the user's body having a first body support section for supporting the lower thoracic region of the user, a second body support section having a substantially longitudinally arcuate portion extending from said first body support section and about the middle thoracic region of the user to the cervical region of the user, said arcuate portion comprising a continuously upwardly curved support surface which conforms to the upper thoracic curvature of the user, and which supports and elevates the shoulder area of the user above the user's middle and lower thoracic regions, and a third body support section attached to said arcuate portion for supporting the user's head in an elevated position proximate an end of said bench means;

a weight support means attached to said elongated bench means for supporting a barbell; and

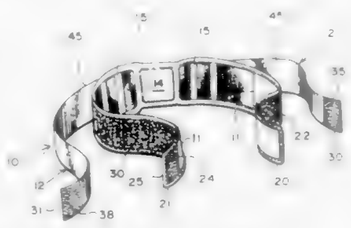
a weight support means for supporting said weight support means and said elongated bench means.

5,147,261

LIFTING BELT

Neil Smith, and Gerson M. Greenbarg, both of Boca Raton, Fla., assignors to Florida Orthopedics, Inc., Opa Locka, Fla.

Filed Mar. 6, 1991, Ser. No. 666,267
Int. Cl.[5] A63B *21/072*
U.S. Cl. 482—106 1 Claim



1. A lifting belt comprising, in combination,

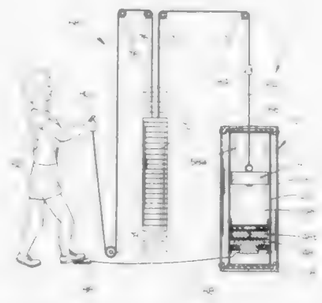
a lumbar belt portion

a compression pad at a mid-portion in the rear of the lumbar belt,
said lumbar belt having two ends, each of which has releasable securable material thereon for securing the lumbar belt around the waist of a lifter with the lumbar compression pad overlying the back of the user,
an abdominal belt having two portions,
each of the portions of the abdominal belt being anchored adjacent the lumbar compression pad of the lumbar belt,
each of said abdominal belt portions having an expandable type material,
each of said abdominal belt portions having releasable secured end members,
said abdominal belt having overlapping releasable securable members at its end on both side thereof,
said abdominal belt having a first end member engageable to the releasable securing material on the outer portion of the second lumbar belt member and means on its opposite side portion of the end to engage a further releasable securable member on the lower belt member,
and an inner releasable securable member on the outer end of the abdominal belts for overlapping securement to its underlying and mating releasable lumbar belt portion, whereby the lumbar belt provides the inner support to the back and the abdomen, and the adjustable outer abdominal belt may be worn loosely and thereafter secured in position to augment the support function of the combination of belts.

5,147,262
ISOKINETIC OSCILLATING EXERCISE APPARATUS
Bruce Hymanson, P.O. Box 5100, Playa del Rey, Calif. 900256
Continuation of Ser. No. 546,542, Jun. 29, 1990, abandoned, which is a continuation of Ser. No. 263,820, Oct. 28, 1988, Pat. No. 4,964,633. This application Mar. 2, 1992, Ser. No. 845,745
Int. Cl.[5] A63B 21/002
U.S. Cl. 482—110 3 Claims

1. A method of exercising using an oscillating exercise apparatus comprising the steps of:
providing a flexible elongated member of sufficient flexibility and length to oscillate a a predetermined oscillating range,
grasping said flexible elongated member near a middle portion thereof; and
moving said flexible elongated member back and forth to cause opposite ends of said flexible elongated member to oscillate at from about three to about seven cycles per seconds resulting in oscillating movement so that said back and forth movement and said oscillating movement are coplanar.

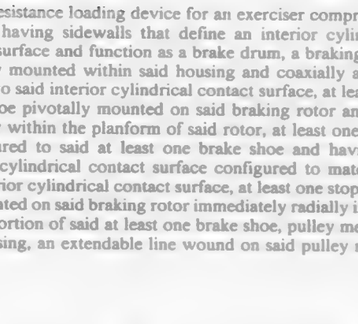
5,147,263
PNEUMATIC WEIGHT LIFT ASSIST APPARATUS
King L. Mueller, 143 Hillcrest Dr., North Platte, Nebr. 69101
Continuation-in-part of Ser. No. 560,543, Jul. 30, 1990, abandoned. This application Nov. 21, 1991, Ser. No. 795,498
Int. Cl.[5] A63B 21/008
U.S. Cl. 482—112 4 Claims



1. A weight lifting assist apparatus, for use with a weight machine of the type having a cable operably extending through a series of pulleys to a handle, comprising:
a hollow upright cylinder having upper and lower ends;
a piston operably mounted within said cylinder for reciprocal vertical movement;
said piston having an outer diameter smaller than the inner diameter of the cylinder, to form an annular space therebetween which permits leakage of fluid past the piston;
the upper end of said cylinder having an opening formed therein through which said weight machine cable will extend for connection to said piston, said opening permitting the entrance of fluid into said cylinder above said piston;
means connected to said cylinder for selectively producing vacuum pressure in said cylinder below said piston, to place a downward force on said piston and apply a force to said cable;
means connected to said vacuum pressure producing means for selectively varying the vacuum pressure in the cylinder, and thereby vary the force applied to the cable; and
said vacuum pressure producing means including a port in said cylinder below said piston for the passage of fluid out of the cylinder.

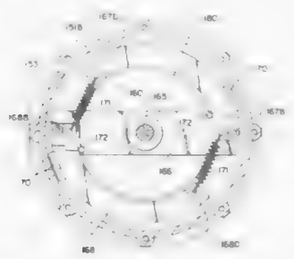
5,147,264
RESISTANCE REEL FOR AN EXERCISER
Thor F. Braathen, N-3358 N., Eggedal, Norway
PCT No. PCT/NO89/00066, § 371 Date Dec. 6, 1990, § 102(e) Date Dec. 6, 1990, PCT Pub. No. WO90/00077, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 27, 1989, Ser. No. 613,910
Claims priority, application Norway, Jun. 30, 1988, 882927
Int. Cl.[5] A63B 21/015
U.S. Cl. 482—118 10 Claims

1. A resistance reel for an exerciser, said reel comprising:
a central pin having a supporting first end including means for attaching said central pin to a stationary position for support of said reel, and said central pin having a free second end;
an extraction section mounted on said central pin and supporting an extraction band to be unwindable therefrom and a return spring for rewinding said extractive band;
a resistance section mounted on said central pin for imparting an adjustable resistance force to unwinding of said extractive band;
said extraction section and said resistance section having respective components that are rotatable relative to said central pin;
clutch means connecting said components to prevent relative rotation therebetween during rotation thereof in an extraction direction of said extractive band and allowing relative rotation therebetween during rewinding of said extractive band;



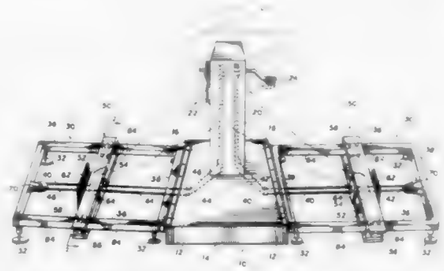
whereby during use of said reel, pulling of said extractive band from aid extraction section generates pulling forces that are transferred to said central pin via said extraction section and said resistance section; and
a cover substantially enclosing said reel and including two separate portions that individually are mounted on and supported solely by said central pin at respective locations and by respective means substantially preventing said cover portions from being loaded by said pulling forces.

5,147,265
ROTATION-ACTIVATED RESISTANCE DEVICE
Edward A. Pauls, Excelsior; Timothy S. Engel, Bloomington; Michael E. Heutmaker, Long Lake; Robert A. Iverson, Eden Prairie, and Jeffrey E. Sandahl, Burnsville, all of Minn., assignors to NordicTrack, Inc., Minn.
Continuation of Ser. No. 500,517, Mar. 28, 1990, Pat. No. 5,090,694. This application Dec. 13, 1991, Ser. No. 808,675
Int. Cl.[5] A63B 21/015
U.S. Cl. 482—119 7 Claims



1. A resistance loading device for an exerciser comprising a housing having sidewalls that define an interior cylindrical contact surface and function as a brake drum, a braking rotor rotatably mounted within said housing and coaxially aligned relative to said interior cylindrical contact surface, at least one brake shoe pivotally mounted on said braking rotor and substantially within the planform of said rotor, at least one brake pad secured to said at least one brake shoe and having an exterior cylindrical contact surface configured to mate with said interior cylindrical contact surface, at least one stop member mounted on said braking rotor immediately radially inward from a portion of said at least one brake shoe, pulley means in said housing, an extendable line wound on said pulley means, which line is manually extendable for rotating said pulley means for exercising, and one way drive means operable between said pulley means and said braking rotor to drive said braking rotor in a first direction to cause a braking load when said line is extended while exercising to rotate said pulley means, wherein upon extension of said line, said at least one brake shoe has an inertia to provide radially outward force, and said exterior cylindrical contact surface of said at least one brake pad engages said interior cylindrical contact surface of said housing sidewalls to provide said braking load, and greater speed of rotation increases frictional resistance force between said contact surfaces and thus, increases said braking load.

5,147,266
LEG STRETCHING MACHINE
Roger W. Ricard, 1401 Bell Trace Rd., Antioch, Tenn. 37013
Filed Mar. 11, 1991, Ser. No. 667,770
Int. Cl.[5] A63B 23/04
U.S. Cl. 482—131 14 Claims



1. A stretching machine for performing splits comprising:
a base, for resting on a floor, including an end, a right side, and a left side, a right hinge mounted upon the right side, a left hinge mounted upon the left side, the right hinge having an axis parallel to the axis of the left hinge and to the floor when the base is resting upon the floor, the axis of the right hinge and the axis of the left hinge equidistant from the floor;
a straight right track attached to the right hinge, whereby the right track may rotate from the resting position on the floor to an elevated storage position;
a straight left track attached to the left hinge, whereby the left track may rotate from the resting position on the floor to the elevated storage position;
a right foot platform slidingly engaging the right track for linear motion perpendicular to the right hinge axis;
a left foot platform slidingly engaging the left track for linear motion perpendicular to the left hinge axis;
an upright column fixed to the base adjacent the end of the base;
at least one handle attached to the column for grasping by a user while the user is standing upon the platforms, straddling the base, and stretching; and
displacement means, mounted upon the column for convenient control by a hand of the user, for moving the platforms along the tracks in either direction simultaneously to maintain equal separations of the right platform from the right side and the left platform from the left side, said displacement means further comprising drum means rotatably mounted on said column, said handle being operatively connected thereto for rotation thereof, and cable means wound about said drum means and connected to said platforms, for moving said platforms together when said drum means are rotated in a first direction by said handle, and for pulling said platforms apart when said drum means are rotated in a second direction, oppositely of said first direction, by said handle;

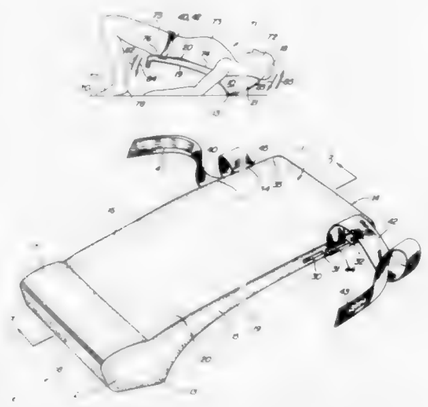
whereby a user may employ the displacement means to controllably move into and out of a split while standing upon the platforms and straddling the base.

5,147,26[illegible]

EXERCISE AID

Anthony P. Kunewalder, 2700 N. Cahuenga, #4319, Los Angeles, Calif. 90068

Filed Oct. 11, 1990, Ser. No. 595,551
Int. Cl.[5] A63B *26/00*
U.S. Cl. 482—142 8 Claims



1. For use in the exercise and strengthening of the buttocks muscles by a human user, an exercise aid comprising:

a tilting device defining a generally rectangular planar member defining a pair of generally straight side edges each defining a plurality of slots therein having an upper surface, a generally concave undersurface, a head end, a bottom end and a downwardly extending pivot, said pivot being closer to said head end and said concave undersurface extending from said pivot to said bottom end and defining a downwardly extending stop member; and

fastening means secured to said planar member for securing a portion of the human user to said upper surface including a pair of flexible straps each having a fixed end selectively coupled to a selected one of said slots to position said belts and securing means at the other end,

said upper surface of said exercise aid defining a generally convex back supporting surface and a headrest at said head end for receiving and supporting a human resting face up upon said upper surface with head on one side of said pivot and hips on the other side and with said fastening means securing a portion of the lower torso of the user to the upper surface

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5,147,268

FOLDING BOX GLUING MACHINE FOR PACKAGE PRODUCTION PROVIDED WITH SAFETY AND NOISE PROTECTION WALLS

César C. Cermeno, Chavannes, Switzerland, assignor to Bobst SA, Switzerland

Filed Apr. 11, 1991, Ser. No. 683,883
Claims priority, application Switzerland, Apr. 12, 1990, 01275/90
Int. Cl.[5] B31B *5/26, 5/62;* F16P *3/08*
U.S. Cl. 493—38 6 Claims

1. A folding box gluing machine for production of a box from a sheetlike blank in response to a machine control, comprising:

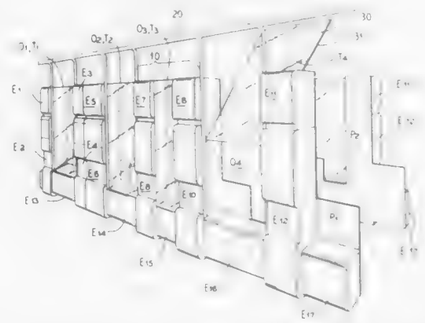
at least a feeding, a gluing, a folding and a delivery section for transforming said blank into a box,

two lateral walls, one situated on an operator's side and one on an opposite side from an operator, wherein said operator's wall has a first part extending throughout a whole length of said machine, thus forming a frame for said machine,

said first part being provided with several apertures defined by upper, lower and lateral edges for access to and survey of an inner machine area,

said first part, with the exception of said apertures, being covered on an outer side by a second part comprising hollow panels at least some of said hollow panels receiving various control and drive devices of the machine,

said lower edge of said apertures being situated with regard to a floor, at an adequate height ensuring appropriate accessibility to said inner machine area,



said apertures being closed by transparent panels pivotally movable between a first complete closing position of said apertures and a second position in which said panels allow an access to said inner machine area,

at least some of said transparent panels are pivotable about a horizontal axle, said horizontal axle being situated at a lower end of said panel and guiding means being provided at an upper end of said panel engageable with guiding means on said wall to ensure a guiding of an upper end of said panel as said upper end is moved upwardly and inwardly,

detection means for said panels which, acting jointly with said machine control, prevent the operation of said machine when said panels are not situated in said closing position, and

said hollow panels, as well as said transparent panels, having a height sufficient to allow said lateral wall to act as a noise protection screen.

5,147,269

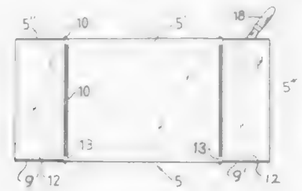
METHOD FOR MANUFACTURING CARTONS AND BLANKS THEREFOR AND APPARATUS FOR CARRYING OUT THE METHOD

Björn Jondelius, Upplandsgatan 84, S-113 44 Stockholm, Sweden

Filed Aug. 24, 1990, Ser. No. 572,225
Int. Cl.[5] B31B *3/14, 3/22, 3/28*
U.S. Cl. 493—57 19 Claims

1. A method for manufacturing a sheet blank, adapted to be folded to a carton, from a sheet of carton material, said carton comprising a substantially tubular carton part which, in cross-section, has at least three sides and which is constructed from a sheet blank with a continuous row of sequential adjacent carton portions which will form side parts of the carton, which sheet blank further includes flap parts located at least at one of the two ends of the tubular carton part at least at some of the side parts, the flap parts being adapted to close the tubular

carton part, said method comprising making a sheet blank (1') of requisite configuration with the aid of a fixture (5) having a longitudinal extended shape, which corresponds to the longitudinal extended shape of the desired tubular carton part (2), and a cross-sectional outer profile which corresponds to the cross-sectional outer profile of the desired tubular carton part (2); by the steps of obtaining and mounting a sheet of carton material, of requisite size sufficient to make at least a sheet blank, on the fixture (5); the step of locating an edge part (8) of said sheet of



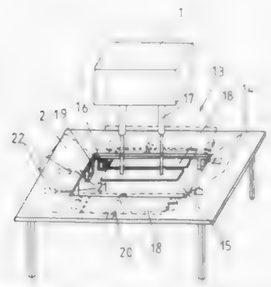
carton material contiguous with a longitudinally extending corner part (9) of the fixture, said corner part (9) forming a demarcation line between two mutually adjacent side parts (4); the step of folding and wrapping the sheet of carton material around the fixture to form said desired tubular carton part and the contiguous flap parts (3), which form a continuation of said tubular carton part; and the steps of slitting and removing excessive parts of the sheet of carton material, while wrapped on the fixture, as necessary to make the final shaped sheet blank, while using the fixture as a template.

5,147,270

EQUIPMENT FOR FOLDING AND JOINING BOXES MADE FROM FLAT OR BASICALLY FLAT MATERIALS

Oddbjørn Grønnevik, Nesbru, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed Jan. 7, 1991, Ser. No. 638,434
Claims priority, application Norway, Jan. 5, 1990, 900059
Int. Cl.[5] B31B *1/46*
U.S. Cl. 493—141 12 Claims



1. An apparatus for folding and joining portions of a flat or substantially flat box material and thereby forming a box, said apparatus comprising:

a folding device including a table-like member having therein a rectangular opening and thereby defining a die;

advancing means for forwarding a flat box material from stock or storage to a position on said table-like member and above said opening;

whereby the box material may be folded by being caused to pass into said opening, thereby forming folded corners;

pretreatment means for subjecting the box material, prior to folding thereof, to a treatment to enable folded portions whereof to be joined;

first, upper retractable stoppers positionable beneath said opening to prevent the box material, during said treatment thereof by said pretreatment means, from being bent downwardly into said opening;

second, lower retractable stoppers positionable beneath said opening to be abutted by the folded box material and thereby to support and prevent temporarily the folding box material from falling through said opening;

pressurizable cushions positioned directly under corners of said opening to apply a uniform force distribution to the folded portions of the box material when the folded box material is supported by said second stoppers, thereby enabling the folded portions of the box material to be joined, thus forming a completed box; and

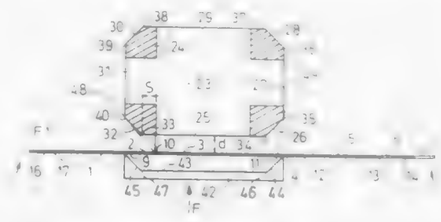
conveyor means positioned to receive and discharge the completed box.

5,147,271

MACHINE FOR PRODUCING POLYGONAL CASES

Jean-Yves Bacques, Paris, and Guy Coalier, Noce, both of France, assignors to Otor, Paris, France

Filed Jul. 9, 1991, Ser. No. 727,117
Claims priority, application France, Jul. 24, 1990, 90 09457
Int. Cl.[5] B31B *3/28, 3/02*
U.S. Cl. 493—176 2 Claims



1. A machine for forming a carton with a polygonal section having at least five faces from a blank having at least five side wall panel elements (1 to 8) delineated by first bending lines (9 to 14) parallel to each other including two end side wall panel elements (1 and 8) and at least three intermediate side wall panel elements (2 to 7), and side flaps (18.1 to 18.7) intended to form the bottom of said carton and respectively connected to said side wall panel elements by second bending lines (20.1 to 20.7) perpendicular to said first bending lines, the free edge of at least one of said end side wall panel elements (1) of said blank having a tongue (16) connected to said one end side wall panel elements by a third bending line (17) parallel to said first bending lines, comprising: a mandrel (23) having an external section corresponding to the inner section of said carton and at least five lateral faces (25 to 32) respectively corresponding to said end and intermediate side wall panel elements (1 to 8);

means for placing one (3) of said intermediate side wall panel elements approximately opposite the corresponding lateral face (25) of said mandrel (23), but at some distance from said corresponding face (25);

means for folding said side wall panel elements respectively adjacent to said one intermediate side wall panel element (3) around the respective first bending lines joining the respective said adjacent sidewall panel elements to said one intermediate sidewall panel element, in such a way that said adjacent side wall panel elements or other side wall elements connected to said adjacent side wall panel elements bear against said mandrel;

a pushing plate (42) having two faces (43 and 44), connected rigidly together, the first (43) of said faces corresponding to said one intermediate side wall panel (3) and the second (44) to a first side wall panel (4) adjacent said one intermediate panel (3), said first and second faces of the pushing plate defining a first dihedral such that, when said first face (43) is applied against said corresponding face (25) of the mandrel, said second face (44) which is applied against the face (26) of said mandrel corresponds to said first

adjacent side wall panel (**4**), the edge (**46**) of said first dihedral then being in coincidence with the edge (**34**) of said mandrel defined by said corresponding faces of said mandrel;

means for pushing said intermediate side wall panel element (**3**) toward said corresponding face (**25**) of said mandrel by means of said pushing plate (**42**) and means for maintaining said adjacent side wall panel elements or said other side wall panel elements in contact against said mandrel and making free said intermediate side wall panel element (**3**) to shift in a direction parallel to said face of said mandrel and perpendicular to said first bending lines, so that said adjacent of other side wall panel elements assist in aligning said intermediate side wall panel element with sad corresponding face of said mandrel, said means for pushing also being for pressing said intermediate side wall panel element (**3**) against said corresponding lateral face (**25**) by means of said pushing plate (**42**);

means for winding said blank around said mandrel so that each of the side wall panel elements is applied against the corresponding face of said mandrel and so that said first bending lines bear against an edge of said mandrel;

means for fixing said tongue to said other end side wall panel element (**5**);

means for folding said side flaps and for fixing them together for forming the bottom of said carton; and

means for ejecting said carton from said mandrel.

5,147,272

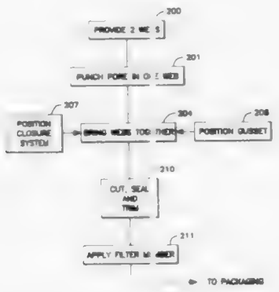
METHOD OF MAKING A VENTED POUCH

Cecil Richison, Hudson, Wis., and Gary M. Bell, Crystal, Minn., assignors to Kapak Corporation, St. Louis Park, Minn.

Division of Ser. No. 516,111, Apr. 27, 1990, Pat. No. 5,059,036. This application Aug. 8, 1991, Ser. No. 742,401

Int. Cl.[5] **B31B** *37/18, 37/84*

U.S. Cl. 493—195 **4 Claims**



1. A method of preparing pouch arrangements having: first and second opposed panel sections, a bottom edge; a base gusset member; a rib and trough closure arrangement; and, a gas filter oriented in one of the panel sections; said method including the steps of:

(a) providing a continuous full web of panel section material;

(b) splitting the full web into first and second continuous half webs of panel section material;

(c) forming a continuous feed of pouch blank by:

(i) directing the first and second continuous half webs into juxtaposed orientation with one another to form the continuous feed of pouch blank with: front and back faces; and, first and second, opposite, longitudinal side edges;

(ii) orienting a first continuous base gusset between the first and second half webs along the first longitudinal side edge;

(iii) orienting a second continuous base gusset between the first and second half webs along the second longitudinal side edge;

(iv) orienting first and second continuous strips of rib and trough closure arrangement;

(A) aligned substantially parallel to one anther and substantially parallel to the first and second longitudinal side edges; and

(B) positioned between the first and second half webs and also between the first and second continuous base gussets;

(d) dealing the continuous feed of pouch blank to form a plurality of sections therein comprising pouch arrangements joined to one another with:

(i) a top end of each pouch arrangement joined to a top end of another pouch arrangement along a center line of the continuous feed, the center line being oriented between and substantially parallel to the first and second rib and through closure arrangements;

(ii) a side edge of each pouch arrangement joined to a side edge of a next pouch arrangement; and

(e) cutting the pouch blank into individual ones of the pouch arrangements;

(f) said method being further characterized by steps of:

(i) punching a plurality of pores in the first continuous half web such that pouch arrangements therefrom will each have a pore positioned a first distance from the rib and trough closure arrangement therein and toward the bottom edge thereof; said first distance being about 2% to about 30% of a distance between the rib and trough closure arrangement and the bottom end edge of the pouch arrangement; and

(ii) orienting a gas filter arrangement over the pore in each pouch arrangement.

5,147,273

METHOD AND APPARATUS FOR PRODUCING STACKS OF INTERLEAVED MATERIAL SHEETS

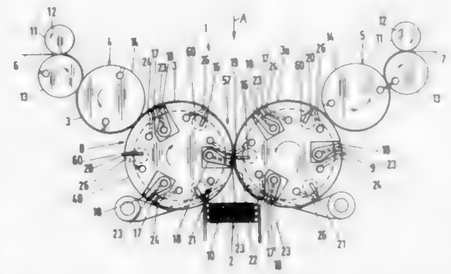
Engelbert Rottmann, Andernach; Gilbert Hauschild, Neuwied, and Christian Riedel, Dormagen, all of Fed. Rep. of Germany, assignors to Winkler & Duennebier Maschinenfabrik KG, und Eisengiesserer KG Sohler, Fed. Rep. of Germany

Filed Jul. 10, 1990, Ser. No. 551,439

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923436

Int. Cl.[5] **B31F** *1/00;* **B65H** *45/00*

U.S. Cl. 493—349 **10 Claims**



1. An apparatus for producing a stack of interleaved material sheets meshing with one another, comprising a stacking station, two co-operating stacking roller means (**8, 9**) arranged to form a stack of sheets (**3**; **3***a*) at said stacking station, roller means (**11, 13, 14**) for transporting and guiding material webs (**3, 3***a*) to said stacking roller means (**8, 9**), said roller means comprising web cutting means (**12**) for cutting said material webs into individual sheets, each of said stacking roller means comprising crimping-and folding-edge means (**16, 20, 21**) for creasing and folding each individual sheet (**3, 3***a*), sheet gripper means (**18**) mounted on each of said stacking roller means (**8, 9**) for rotation with said stacking roller means, said sheet gripper means holding a sheet temporarily, each sheet gripper means (**18**) comprising a journal pin (**35**) and a suction gripper flap (**18**) tiltably mounted with said journal pin (**35**) for journalling said suction gripper flap (**18**) in addition to rotation with said stacking roller means, and suction means (**23, 24, 26**) arranged at a circumference of each stacking roller means (**8, 9**), said suction means cooperating with said crimping- and folding-edge means (**16, 20, 21**) and with said gripper means (**18**) for a firm and positive handling of each sheet (**3, 3***a*) to form said stack in which the sheets are interleaved in a U- or zig-zag-configuration, said suction means comprising at least one suction element (**23**) in each suction gripper flap of said sheet gripper means (**18**), whereby said first suction element (**23**) tilts back and forth with its suction gripper flap, at least one second suction element (**24**) in said stacking roller means (**8, 9**) behind the respective suction gripper flap of said gripper means for cooperation with said suction gripper flap (**18**), at least one third suction element (**26**) arranged on said stacking roller means (**8, 9**) for cooperation with its respective crimping- and folding-edge means, and means (**37, 38, 39**) for controlling a tilting movement of said suction gripper flap (**18**) between a sheet gripping position and a release position.

5,147,274

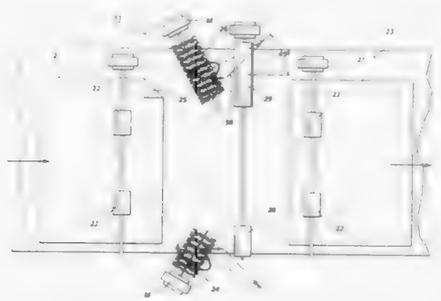
DOCUMENT FEEDING DOG-EAR STRAIGHTENING SYSTEM

Barry P. Mandel, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 20, 1991, Ser. No. 702,863

Int. Cl.[5] **B65H** *47/00, 5/30*

U.S. Cl. 493—409 **18 Claims**



11. A method of automatically unfolding folded over corners of a sheet, comprising the steps of:

normally moving said sheet in a sheet feeding direction through a sheet feeding path at a normal sheet movement speed,

engaging lead edge area corners of said sheets which are folded back relative to said sheet feeding direction with rotating brush bristles extending into said sheet feeding path while said sheet continues to move at said normal sheet movement speed,

rotating said rotating brush bristles engaging said lead edge area corners of said sheets at a peripheral speed having a forward vector velocity component in said sheet feeding direction which is substantially higher than said normal sheet movement speed,

and acquiring, lifting, and unfolding said folded back sheet corners forwardly, in said sheet feeding direction, with said rotating brush bristles while said sheet continues to move in said sheet feeding direction.

5,147,275

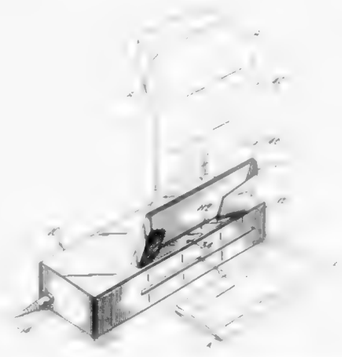
AUTOMATIC PAPER FOLDER

Tadeusz Staniszewski, Budd Lake, N.J., assignor to Hunt Holdings, Inc., Wilmington, Del.

Filed Jan. 6, 1992, Ser. No. 817,078

Int. Cl.[5] **B65H** *45/04*

U.S. Cl. 493—416 **7 Claims**



1. Folder apparatus for folding a paper-like sheet, comprising:

(a) means for advancing the sheet into said folder apparatus;

(b) guide means for guiding the leading edge of said advancing sheet in a path turning back upon itself in a loop, so that said leading edge of said sheet impinges a transverse line in a trailing portion of said sheet;

(c) roller means forming a folding nip extending along and adjacent to said line;

(d) wherein said advancing means continually advances said leading edge against said line in said trailing portion of said sheet, to force into said folding nip both said leading edge of said sheet and said transverse line in said sheet, and to form a first creased fold in said sheet extending along said transverse line and containing said sheet leading edge;

(e) whereby, upon further operation, said leading edge of said sheet remains within and travels with said fold as it passes through said folding nip, and the portion of said sheet extending in a loop between said fold line and said sheet leading edge thereafter passes through said folding nip to form a second creased fold, thereby folding said sheet into said three sections.

5,147,276

LONGITUDINAL FOLDING DEVICE

Rudolf Stäb, Frankenthal, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Wurzburg, Fed. Rep. of Germany

Filed Jun. 21, 1991, Ser. No. 719,007

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1990, 4020937

Int. Cl.[5] **B65H** *45/18, 45/22*

U.S. Cl. 493—444 **7 Claims**

1. A longitudinal folding device usable to longitudinally fold sections of paper webs, said longitudinal folding device comprising:

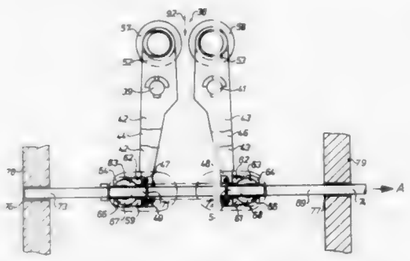
a vertically reciprocable folding blade engageable with the sections of paper webs;

a first driven folding roller and a second driven folding roller, said first and second driven folding rollers forming a pair of spaced driven folding rollers cooperable with said folding blade and receiving the sections of paper webs from said folding blades;

a first pair of spaced double arm levers having first and second ends and being pivotable about a first fixed pivot axis intermediate said first and second ends, and a second pair of spaced double arm levers having first and second

ends and being pivotable about a second fixed pivot axis intermediate said first and second ends;

means for rotatably supporting said first folding roller between said first ends of said first pair of spaced double arm levers and means for rotatably supporting said second folding roller between said first ends of said second pair of opposed double arm levers; and



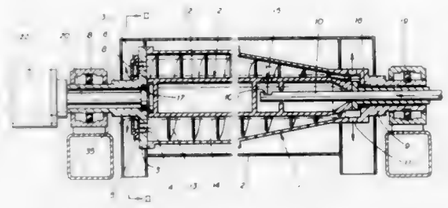
means for selectively laterally shifting said pair of spaced driven rollers with respect to said folding blade and for varying a spacing distance between said first driven folding roller and said second driven folding roller in said pair of spaced driven folding rollers.

5,147,277

POWER-EFFICIENT LIQUID-SOLID SEPARATING CENTRIFUGE

Ascher H. Shapiro, Jamaica Plain, Mass., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Mar. 19, 1991, Ser. No. 671,579
Int. Cl.[5] B04B *1/20*
U.S. Cl. 494—53 **10 Claims**



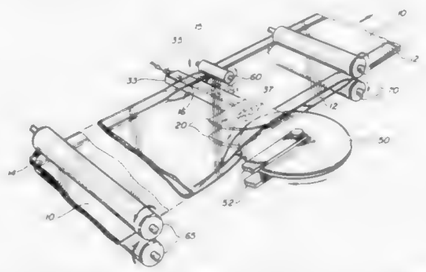
1. A liquid-solid separating centrifuge comprising a rotary bowl of generally cylindrical configuration having a frusto-conical end extension at one end thereof and a bowl-head closing the other end thereof to define an interior space; said bowl-head defining an outer surface relative to said interior space; a rotary conveyor mounted co-axially in the bowl along a common axis; means for rotating said bowl and conveyor about their common axis in the same direction but at different speeds of rotation; means for feeding a solids-liquid slurry into said bowl; a solids discharge port in the frusto-conical end extension for flow of solids separated from the slurry away from the interior space; at least one liquid transfer port in and extending through the bowl-head for flow of liquid separated from the slurry away from the interior space; the cylindrical inner surface of the bowl between said ports defining an annular surface for holding a pool of slurry for separation upon rotation of the bowl, a weir fixedly attached on and rotatable with the bowl-head defining a plurality of liquid flow passageways and an outlet, said liquid flow passageway being in flow communication with the liquid transfer port and extending to said outlet for defining the height of the pool level, said outlet being positioned radially inwardly of the liquid transfer port relative to said common axis; said passageway being configured and arranged to direct the liquid exiting the bowl via the transfer port to discharge from the outlet at a radially inwardly position relative to the liquid transfer port and to flow with a reduced velocity component in the direction of the rotation of the bowl, thereby recovering power previously expended to accelerate slurry fed to the bowl; wherein said weir means comprises a ring-shaped weir member on the outer surface of the bowl-head having means defining a plurality of said liquid flow passageways therein, said means defining a plurality of said liquid flow passageways being fixedly attached to and rotatable with said ring shaped weir member.

5,147,278

AIR SEPARATION METHOD AND APPARATUS FOR PLEATING A PLASTIC FILM WEB

Michael Demura, Sterling; James LaCombe; Roger A. Novak, both of Bay City, and Raymond D. Barta, Midland, all of Mich., assignors to DowBrands L.P., Indianapolis, Ind.

Filed Sep. 29, 1989, Ser. No. 414,844
Int. Cl.[5] B65H *45/08*
U.S. Cl. 493—439 **12 Claims**



1. Apparatus for introducing a pleat into an advancing, substantially continuous, folded-over web of plastic film comprising:

a pair of substantially aligned and spaced-apart receiving plates positioned inside said film web over which opposing faces of said film web pass;

means positioned between said receiving plates and extending into the space therebetween for forming a pleat in said folded-over film;

means positioned between said receiving plates for directing a flow of air between said opposing faces of said web prior to passing over said receiving plates; and

means for supporting said receiving plates in a spaced apart position;

in which said support means comprises a support bar; and

in which said support bar includes an orifice therethrough for supplying air to the area between said receiving plates.

5,147,279

DEVICE DESTINED TO AUTOMATICALLY DISPENSE WIPING MATERIALS OF A CONCERTINA FORM CONSISTING OF ROLLED UP STRIPS

Maurice Granger, 17 rue Marcel Pagnol, 42270 Saint Priest En Jarez, France

Division of Ser. No. 224,408, Jul. 26, 1988, Pat. No. 5,013,291.
This application Jan. 15, 1991, Ser. No. 641,723
Claims priority, application France, Apr. 26, 1988, 88 05939; Jun. 6, 1988, 88 07823
Int. Cl.[5] B31F *1/00*
U.S. Cl. 493—448 **5 Claims**

1. A device for manually dispensing and cutting discrete longitudinally corrugated web materials from an elongated web comprising:

support means,

wall means dependingly hinged from said support means,

the support means and the wall means together define a housing,

elongated web support means disposed on one side of said wall means,

a plurality of elongated spaced first projections defining a fan configuration affixed to the other side of said wall means,

a plurality of elongated spaced second projections defining a fan configuration affixed to said support means,

said first projections and said second projections positioned whereby the said projections interleave in spaced relationship when said dependingly hinged wall means is arcuately moved into operative confronting relationship with said support means,

guide roll means positioned transverse with respect to said first and second projections when said depending hinged wall means is in confronting relationship with said support means adapted and constructed to guide said elongated web from said support means to between the spaces of said projections, and to longitudinally corrugated said elongated web,

a pair of cooperatively journalled intermeshing cogwheels positioned transverse to said first and second projections on the side opposite to said guide rolls adapted and constructed to receive therebetween said corrugated elongated web as it is payed from said elongated web support means,

each of said cogwheels having cooperatively disposed radial recesses and being oppositely rotated when said elongated web passes therebetween,

each of said cogwheels having a cooperatively disposed recess,

each of said recesses having jaw means adapted and constructed to pinch therebetween said corrugated elongated web when said jaws are in confrontation and said corrugated elongated web is therebetween,

severing means associated with said jaw means adapted and constructed to at least partially sever the corrugated elongated web to thereby define discrete portions of elongated longitudinally corrugated web,

each cogwheel is keyed to separated parallelly disposed axles, including

gears mounted on each of said axles displaced from each of said cogwheels, and in intermeshing relationship, and

kinetic energy storage means loaded when said elongated longitudinally corrugated web is manually pulled from between said cogwheels and unloaded when said discrete portion of elongated longitudinally corrugated web is severed,

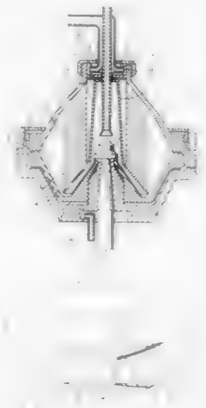
each end of said axles being journalled in a removable cartridge, said housing having internal catch means for holding said removable cartridge, said removable cartridge having cooperating retention means to releasably engage said catch means, said housing having an opening at an end portion opposite to said projections dimensioned whereby said removable cartridge may be selecetively passed into and out of said housing into either retaining engagement or out of retaining engagement in said housing as desired.

5,147,280

ENERGY TRANSFORMATION DEVICE

Claes-Göran Carlsson, Tumba; Claes Inge, Saltsjö-Duvnäs; Peter Franzén, Tullinge; Torgny Lagerstedt, Stockholm; Leonard Borgström, Bandhagen; Hans Moberg, Stockholm, and Olle NÅbo, Tullinge, all of Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

PCT No. PCT/SE90/00208, § 371 Date Nov. 8, 1990, § 102(e) Date Nov. 8, 1990, PCT Pub. No. WO90/11835, PCT Pub. Date Oct. 18, 1990
PCT Filed Mar. 30, 1990, Ser. No. 602,247
Claims priority, application Sweden, Apr. 7, 1989, 8901254
Int. Cl.[5] B04B *7/00, 11/00*
U.S. Cl. 494—56 **18 Claims**



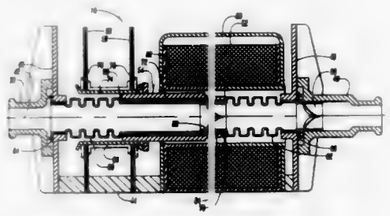
1. A discharge element for use in a centrifugal separator having a device for the transformation of kinetic energy of a liquid rotating in a chamber around a rotational axis to pressure energy, comprising: means defining a surface surrounding the rotational axis of the separator whereby the liquid in the chamber flows in a predetermined direction along and in contact with the surface; an outlet tube, the outlet tube being disposed at the center of the discharge element; outlet channel means for communicating between the surface means and the outlet tube, the outlet channel means including an inlet opening extending in the surface means substantially in the flow direction of the liquid flow, the inlet opening in the downstream direction of the liquid flow delimited by a cross edge extending perpendicular to the flow direction, the outlet channel extending for a distance in the downstream direction of the liquid flow from the cross edge; and two passages, each extending from one end of the cross edge, connecting a part of the outlet channel to the chamber and arranged so that liquid entering the outlet channel through the inlet opening is partially conducted to the chamber through the passages.

5,147,281

BIOLOGICAL FLUID PUMPING MEANS AND METHOD

Kenneth O. Thornton, Polk City and Steven J. Phillips, Des Moines, both of Iowa, assignors to Advanced Medical Systems, Inc., Polk City, Iowa

Filed Apr. 23, 1990, Ser. No. 512,944
Int. Cl.[5] A61M *1/10*
U.S. Cl. 600—16 26 Claims



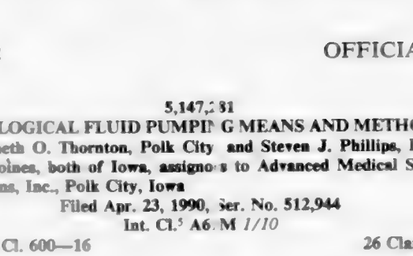
1. A biological fluid pumping means comprising:
a bio-compatible tubular fluid conduit having a longitudinal axis, an inlet end, and an outlet end;
a bio-compatible flow restriction means having an inlet side and an outlet side secured in the conduit, the flow restriction means resisting fluid flow from the outlet side to the inlet side;
the conduit including a rigid tubular middle portion and expandable and contractible portions an opposite sides of the middle portion so that the middle portion can reciprocate a distance between the expandable and contractible portions;
means immediately adjacent to the conduit for reciprocating the middle portion of the conduit generally along the longitudinal axis to produce flow of biological fluid through the conduit; and
connecting means for putting a biological fluid into fluid communication with the inlet and outlet ends of the conduit.

5,147,282

IRRADIATION LOADING APPARATUS

William Kan, 2000 Baker Trace, Dothan, Ala. 36303

Continuation-in-part of Ser. No. 347,020, May 4, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,708
Int. Cl.[5] A61N *5/00*
U.S. Cl. 600—1 13 Claims



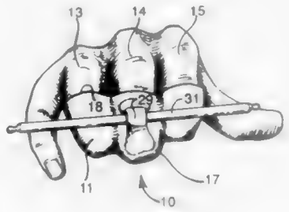
1. An irradiation loading apparatus, comprising:
a main shielding body, said body having a housing, a first housing end plate and a second housing stop end plate on either end of said housing, and a cylindrical central passageway extending between said first and second housing end plates wherein said second housing stop end plate includes a passage extending therethrough, an outer portion of said second housing end plate passage having a diameter smaller than a diameter of the cylindrical central passageway and an inner portion having the diameter equal to the diameter of the cylindrical central passageway, and said first housing end plate includes a passage extending therethrough, an outer portion of said first housing end plate passage having a diameter larger than the diameter of the cylindrical central passageway and having threads to accept a lock ring screw coupling structure, and an inner portion having a diameter equal to the diameter of the cylindrical central passageway;
an interchangeable cartridge removably placed within the cylindrical central passageway between the two housing nd plates of the main shielding body comprising:
first and second cartridge end plates, an outer portion of said first cartridge end plate having a tapered patient catheter-receiving first passage therethrough, and an inner portion of said first cartridge end plate having a continuous first passage with a diameter equal to the smaller end of the tapered portion therethrough, and said second cartridge end plate having a second passage with a diameter equal to the smaller end of the tapered first passage of the first cartridge end plate throughout,
an outer cylindrical cartridge wall extending between the first and second cartridge end plates, and
a third passage formed by tubing extending between the first and second cartridge end plates, linking the first and second passages;
a cartridge lock-ring having threads for engaging the interchangeable cartridge securely in the passage between the first and second housing end plates of the main shielding body; and
means for carrying a radiation source being slidably and removably received in said third receiving passage such that a first portion of the carrying means having the radiation source thereon can be advanced from a storage position in the third receiving passage through the inner portion of the first receiving passage of the first cartridge end plate and into a patient catheter received in the outer portion of the first receiving passage of the first cartridge end plate, and wherein said first portion of said carrying means having said radiation source thereon is located in the third receiving passage when said irradiation loading apparatus is in a storage position, wherein a portion of the carrying means extends out of said second receiving passage beyond said second cartridge end plate.

5,147,283

CUSTOM FINGER ATTACHMENT

John W. Johnson, Andrews AFB, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 5, 1989, Ser. No. 376,052
Int. Cl.[5] A61F *5/04*
U.S. Cl. 602—7 4 Claims



1. A method for making a finger attachment structure for connection to a passive motion machine or the like in the rehabiliatation and therapy of the hand and fingers, comprising the steps of:
(a) providing a sheet of low temperature formable plastic of preselected size sufficient to enclose a selected plurality of fingers of a hand;
(b) heating said sheet to soften said formable plastic;
(c) placing said selected plurality of fingers on said sheet;

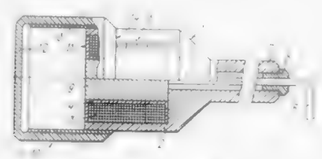
(d) folding an edge of said sheet over said fingers to enclose said plurality of fingers to preselected extent;
(e) forming said sheet around individual said fingers to produce a body member defining a plurality of spaced cavities for receiving said plurality of fingers and individually enclosing and separating the ends of said plurality of fingers to said preselected extent;
(f) cooling said body member to harden said plastic in the shape of said body member; and
(g) attaching a loop member to the outer surface of said body member atop a location correspondinq to the top of at least one of said plurality of fingers for receiving a bar member for connection to a machine for providing passive motion to said plurality of fingers.

5,147,284

DEVICE AND METHOD FOR RESTORATION OF VISUAL FUNCTIONS

Svyatoslav N. Fedorov, pereu lok Dostoevskogo, 1/21, kv. 32; Leonid F. Linnik, Degunimskaya ulitsa, 17, kv.36; Gennady M. Antropov, ulitsa Bolshaya Akademicheskaya, 24-a, kv.117; Nina A. Shigina, ulitsa Leskova, 30, kv.5; Vladimir I. Nikitenko, Novocherkassky bulvar, 26, kv.109; Leonid N. Arnautov, ulitsa Kharkovskaya, 11, korpus 2, kv.318; Alexandr P. Stromakov, ulitsa Matveevskaya, 1, kv.49; Irina A. Boldysheva, Abramtsevskaya ulitsa, 9, korpus 1, kv.54, all of Moscow; Valery P. Oreshkin, ulitsa 60 let VLKSM, 7, kv.98, Voronezh, and Lev A. Chernyakov, ulitsa Klimashkina, 12, kv. 209, Moscow, all of U.S.S.R.

Filed Aug. 9, 1990, Ser. No. 565,449
Claims priority, application U.S.S.R., Aug. 17, 1989, 4729978
Int. Cl.[5] A61N *2/00*
U.S. Cl. 600—9 12 Claims



1. A device for restoration of visual functions affecting the optic nerve and retina, which comprises:
an electromagnetic field radiator emitting said field into the region of the eyeball, said radiator including a source of a pulsed magnetic field provided with an electromagnet and a distance adjuster; and
an electromagnetic field receiver, including an inductor; said receiver adapted to interact with said source of a pulsed magnetic field and producing an electrostimulation effect on the optic nerve and the retina; said inductor comprising a winding, lead wires and electrodes, said electrodes being connected to said lead wires and having an active surface area in excess of 10 mm^2;
said distance adjuster setting a distance between said electromagnet and said receiver.

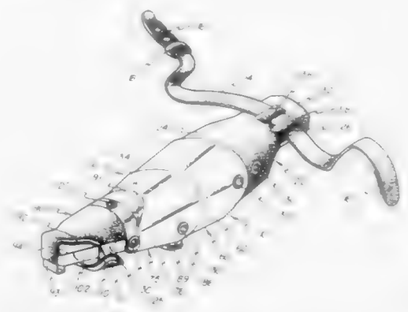
5,147,285

MOVABLE THUMB BRACE

Aldene H. Buxton, c/o 416 Fourth St., Warsaw, Ohio 43844-0416

Filed Aug. 1, 1991, Ser. No. 738,899
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—22 15 Claims

1. A movable thumb brace comprising
first and second hinged components, said first component being a tip component comprising a relatively rigid casing having an upper surface portion and a tip portion, said first component also having a thumb surface portion, said second component being adjacent said first component and comprising a relatively rigid casing for placement adjacent the upper surface of a thumb, said relatively rigid casing having an upper surface portion and side wall portions,



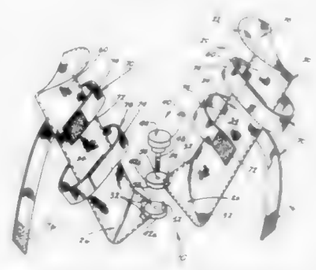
a support brace secured to said tip component upper surface portion and to said second component side walls,
a thumb guard hingedly secured by one hinge to both said first and second components, and to said support brace, and
a wrist strap.

5,147,286

HIP ABDUCTION DEVICE

Roy A. Meals, Los Angeles, Calif., assignor to Bissell Healthcare Corporation, Grand Rapids, Mich.

Filed Aug. 27, 1990, Ser. No. 573,679
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—24 16 Claims



1. A collapsible hip abductor device comprising, in combination:
first and second support arms adapted to support and index the lower limb position of a patient to properly position the patient's hips and inhibit improper positioning, said first and second support arms being substantially similar in configuration, and each being formed of a peripheral frame work comprising a single continuous length of wire;
said peripheral wire frame work defining (1) a mid portion having two opposing side edges, a proximal end and a distal end, (2) a generally triangularly-shaped proximal end flange portion extending from said proximal end of said mid portion to an apex at an angle to said mid portion of approximately 115°; and
a generally semi-circular shaped distal end flange portion projecting from said distal end of said mid portion, said proximal and distal end flange portions projecting to the same side of said mid portion;

a flexible material suspended within at least across said mid portion of said frame work, said flexible material providing a seat for the thigh region of each lower limb of the patient, said proximal and distal ends of said mid portion being open between said opposing side edges whereby a portion of a user's thigh can be between said opposing side edges, causing said flexible material to contour to the shape of the user's thigh;

attachment means for securing said first and second arms together, comprising a first one of said support arms including a first cooperating attachment member secured to said apex of said proximal end flange of said first support arm;

the second of said support arms including a second cooperating attachment member secured to said apex of said proximal end flange of said second support arm, and said first and second cooperating members being adapted to releasably and directly interconnect for positioning said first and second support arms in a predetermined orientation defining an included angle between said first and second arms of approximately 50°; and

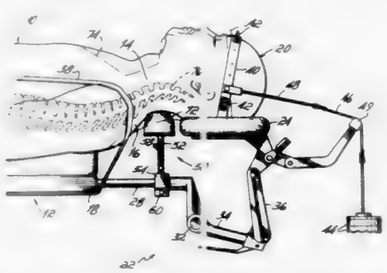
said support arms further including releasable fastening means for attaching each support arm to the respective legs of the patient.

5,147,287

NECK SUPPORT MEANS FOR CERVICAL SURGERY

Brian Jewell, Batavia, Ohio, and Stephen M. Papadopoulos, Ann Arbor, Mich., assignors to Ohio Medical Instrument Company, Cincinnati, Ohio

Filed Mar. 18, 1991 Ser. No. 671,012
Int. Cl.[5] A61F 5/01; A61G 13/00
U.S. Cl. 602—32 **12 Claims**



1. In combination, a surgical operating table having a head support for supporting a patient's head beyond an end of the table, said head support having two arms mounting it to an end of the table, and a neck support for supporting the neck of a patient for cervical surgery while the head is supported on said head support,

said neck support being mountable to said head support between said end of said table and said head support and comprising,

two uprights mountable to the respective arms of said head support,

a base mounted transversely to said upright,

each said upright being laterally movable relative to said base, whereby said base can accommodate different spacings between said uprights, and

a cushion mounted to said base, said cushion shaped to engage the back of a patient's neck and lift the neck upwardly from the position the neck would occupy without the neck support, such lifting thereby relatively increasing the anterior spacing between the vertebrae of the patient's cervical spine,

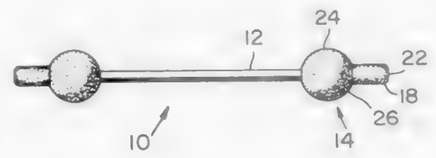
said base having slots transverse to said arms and being adjustably connected to said uprights by fastening means which extend through said slots.

5,147,288

COTTON SWAB WITH DEPTH PREVENTION MECHANISM

Pietro Schiavo, Chiuppano, Italy, assignor to Ivalda S.P.A., Chiuppano, Italy

Continuation of Ser. No. 185,961, Apr. 25, 1988. This application Jun. 3, 1991, Ser. No. 709,160
Int. Cl.[5] A61M 35/00
U.S. Cl. 604—1 **4 Claims**



1. A cotton swab, comprising: an ear canal engaging portion of a small enough diameter to fit within and clean the inside surface of an ear canal and having a substantially uniform diameter over its length with a substantially flat terminal end, an adjacently located ear cavity engaging portion of greater diameter than said ear canal within which said cotton swab is intended to be used, and a stick securely holding said ear canal and ear cavity engaging portions, said stick having a longitudinal axis, said ear cavity engaging portion having a gradual sloping interface surface which is non-perpendicular to said axis of said stick and providing a smooth contour directly connected to said ear canal engaging portion, said ear cavity engaging portion comprising a first section incrementally increasing in dimension from said interface surface to a maximum diameter and a second section incrementally decreasing in dimension from said maximum diameter and located distally from said ear canal engaging portion to provide and axial length of said ear canal engaging portion which is no greater than said maximum diameter, said first and second section being substantially symmetrical to one another about an axis perpendicular to said longitudinal axis of said stick, said ear cavity engaging portion serving to prevent depth penetration of said ear canal engaging portion beyond a predetermined length and at the same time providing a surface for cleaning that portion of an ear cavity adjacent to the ear canal and other portions of said ear cavity as said cotton swab is moved within said ear canal, said second section of said ear cavity engaging portion also providing a surface for cleaning those portions of the ear cavity which can not be reached by said first section due to the interference of said ear canal engaging portion extending therefrom.

5,147,289

NON-SPECIFIC IMMUNE SYSTEM ENHANCEMENT

Richard L. Edelson, Westport, Conn., assignor to Therakos, Inc, West Chester, Pa.

Filed Mar. 29, 1990, Ser. No. 502,083
Int. Cl.[5] A61M 37/00
U.S. Cl. 604—4 **19 Claims**

1. A method for non-specifically enhancing the immune system response of a mammal to an antigen which comprises the steps of:

(A) enhancing the immune system response by:

(a) withdrawing leukocyte containing material from the mammal,

(b) treating the withdrawn leukocytes in a manner to alter the cells,

(c) returning the treated leukocytes to the mammal, and

(B) artificially contacting the mammal's immune system with the antigen for a suitable period of time to stimulate the immune system.

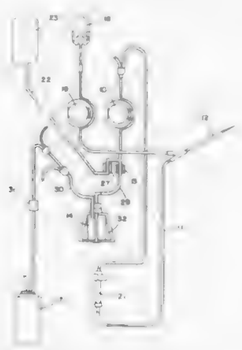
5,147,290

METHOD AND MACHINE BASED ON THE PRINCIPLE OF CENTRIFUGATION FOR CYTAPHERESIS SUCH AS PLATELET APHERESIS, AND FOR PLASMA EXCHANGE TREATMENT

Svante U. R. Jonsson, Glumslöv, Sweden, assignor to Stafilum AB, Uppsala, Sweden

Continuation of Ser. No. 265,138, filed as PCT/SE87/00213, Apr. 24, 1987, abandoned.

This application Dec. 21, 1990, Ser. No. 633,082
Claims priority, application Sweden, Apr. 24, 1986, 8601891
Int. Cl.[5] A61M 37/00
U.S. Cl. 604—5 **16 Claims**



1. Machine for platelet apheresis comprising:

(-) a tubing operable for connection to a donor/patient for the drawing of blood therefrom and subsequent return of platelet depleted blood thereto;

(-) a centrifugal separating means for separation of blood into various components including at least a cell enriched fraction, a platelet enriched fraction, and a plasma fraction;

(-) a reservoir for the cell enriched fraction which forms an integral portion of the centrifugal separating means;

(-) a first pump capable of operating in two opposite directions;

(-) a first connection between said first pump and said tubing;

(-) a second connection between said first pump and said separating means;

(-) a first container for said plasma fraction;

(-) a third connection from said first container to said separating means;

(-) a second container for said platelet enriched fraction;

(-) a fourth connection from said second container to said separating means;

(-) a fifth connection from said first container to said second connection whereby a junction of said fifth connection and said second connection is formed; and

(-) control means operable during return of platelet depleted blood to the donor/patient for admixture of said plasma fraction from said first container through said fifth connection to flow of said cell enriched fraction from said reservoir passing through said second connection.

5,147,291

SOUND TRANSMISSION APPARATUS FOR UNIFORMLY ADMINISTERING CHEMICAL COMPOSITION THROUGH THE SKIN

A. David Cukier, 2604 S. Bala Dr., Tempe, Ariz. 85282

Filed Jun. 11, 1990, Ser. No. 535,510
Int. Cl.[5] A61N 1/30
U.S. Cl. 604—20 **2 Claims**

1. A method of uniformly introducing an anti-inflammatory drug at selected points in an area of intact skin, said method including the steps of

(a) applying a layer of an aqueous high molecular weight semi-solid sound transmission gel to a selected area of intact skin, said gel

(i) including a water soluble anti-inflammatory chemical compound in a concentration in the range of 0.1% to 1.0% by weight,

(ii) transmitting sound waves at a speed in the range of 1,200 to 1,700 meters per second,

(iii) having a density in the range of 1.01 to 1.5 grams per cubic centimeter,

(iv) having a viscosity in the range of 120,000 to 200,000 centipoise at an ambient temperature of 76° F., said viscosity of said gel decreasing when said gel is warmed by the skin of an individual, and

(v) having a pH in the range of 6.0 to 7.3;

(b) placing a sound transmitting head over said selected area of skin, said head including a smooth face contacting said gel intermediate said sound transmitting head and a portion of said selected area of skin;

(c) continuously moving for a period of time greater than four minutes said sound transmitting head over said points in said selected area of skin to knead said skin while maintaining contact between said face and said gel; and,

(d) directing sound waves from said head through said gel into said skin while said transmitting head is continuously moved over said selected area of skin, said sound waves having a frequency greater than 0.5 megahertz and driving

said chemical compound into said skin; completely off of and moving back over each of said points a generally equivalent number of times to insure that a substantially uniform amount of chemical compound enters the skin at each of said points,

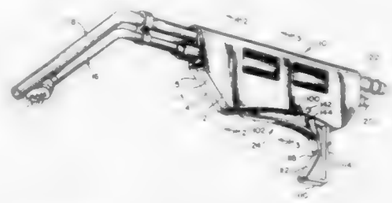
the introduction of said anti-inflammatory chemical compound into the skin with said sound transmitting head causing the warming of said skin to reduce the viscosity of said gel.

5,147,292

CONTROL HANDLE WITH LOCKING MEANS FOR SURGICAL IRRIGATION

Karen E. Kullas, Taunton, and Bruce E. Newcomb, Berkley, both of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 5, 1991, Ser. No. 650,688
Int. Cl.[5] A61M 1/00
U.S. Cl. 604—34 **6 Claims**



1. A handpiece for a surgical irrigator comprising:

a handle body;

a flexible fluid conduit extending through the body for connection at one end to a source of irrigation fluid and at the other end of a fluid outlet;

a closure member engageable with a portion of the flexible conduit and being movable with respect tot he conduit to variably constrict the flow passage through the conduit, thereby to variably control or shut off flow through the conduit;

a trigger movably mounted to the handle body and connected to the flow control member for controlling the extent to which the passage through the flexible conduit is constricted;

means biasing the trigger toward a position in which the

flexible conduit is fully closed whereby the trigger may be squeezed to variably open the flexible conduit;
the trigger including a relatively rigid portion and a relatively flexible portion, the flexible portion defining a trigger extension that projects substantially out of the housing, the trigger extension including a latch element selectively engageable with a portion of the housing to latch the trigger in an open position

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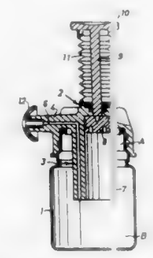
5,147,293
APPARATUS FOR LIQUID FLUSHING OF BODY CAVITIES AND/OR SUPPLYING ACTIVE SUBSTANCE TO SUCH CAVITIES
Lars Lejdeborn, Västergöksvägen 10, Vällingby, Sweden S-162 24, and Olle Berg, Elfviksvägen 66, Lidingö, Sweden
PCT No. PCT/SE89/00146, § 371 Date Nov. 5, 1990, § 102(e) Date Nov. 5, 1990, PCT Pub. No. WO89/08470, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 17, 1989, Ser. No. 573,169
Claims priority, application Sweden, Mar. 18, 1988, 8801003
Int. Cl.[5] A61M 1/00, 5/315
U.S. Cl. 604—38 20 Claims

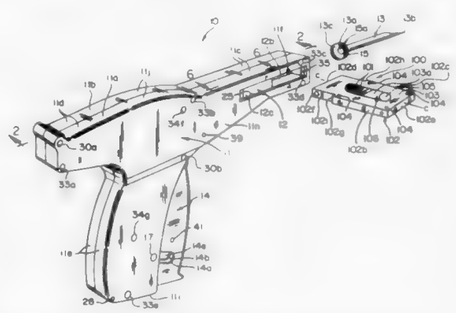


1. In an apparatus for liquid flushing of body cavities and/or supplying an active substance to such cavities, for example, medicines, including a piston/cylinder-device, means for manual activation of the piston, and an insertion tube projecting from the piston/cylinder-device having a free end adapted for insertion into the body cavity and having two separated channels each terminating at one outer end in said free end of the insertion tube of the piston, the insertion of the insertion tube into the body cavity producing a closed flush system for reciprocating flow of liquid upon reciprocating movement of the piston between end positions thereof in the cylinder, the improvement comprising:
a closed receptacle connected to said piston/cylinder device for containing said liquid, on a side of the piston facing said receptacle;
an open end on said cylinder on said side of said piston facing said receptacle and immersed in said liquid in said receptacle;
an inner end on one of said channels immersed in said liquid in said receptacle;
a space in said receptacle above the level of said liquid therein; and
an inner end on the other of said channels communicating with said space, so that air in said channels and at least an essential part of the air in the body cavity is driven into said space through said other of said channels by reciprocation of said piston in said cylinder.

5,147,294
THERAPEUTIC METHOD FOR REDUCING CHRONIC PAIN IN A LIVING SUBJECT
Ivor S. Smith, Brookline, and Timothy J. Stafford, Boston, both of Mass., assignors to Trustees of Boston University, Boston, Mass.
Filed Oct. 1, 1990, Ser. No. 590,904
Int. Cl.[5] A61M 31/00
U.S. Cl. 604—49 11 Claims

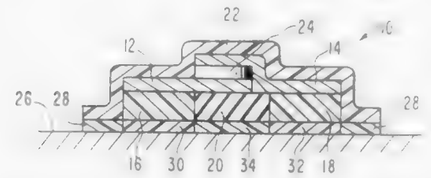
1. A therapeutic method for alleviating sympathetically mediated chronic pain in a living subject, said therapeutic method comprising the steps of:
identifying the anatomical area of the living subject from which the chronic pain originates as being mediated by the sympathetic nervous system;
initiating at least one sympathetic nerve block to the living subject such that the part of the sympathetic nervous system innervating said chronically painful anatomical area becomes blocked and unable to conduct a nerve impulse for a predeterminable time; and
administering an effective amount of at least one antagonist of nerve growth factor to said chronically painful anatomical area of the living subject whereby said administered antagonist nullifies the neuron stimulation effect of such nerve growth factor as is present at said chronically painful anatomical area.

5,147,295
RETRACTABLE IMPLANTER
R. Glen Stewart, Lake Villa, Ill., assignor to Ideal Instruments, Inc., Chicago, Ill.
Filed Jan. 23, 1991, Ser. No. 644,531
Int. Cl.[5] A61M 31/00
U.S. Cl. 604—61 25 Claims



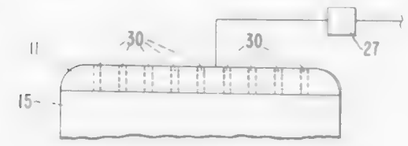
1. A hand held gun apparatus for implanting a pellet into an animal which comprises:
(a) a hollow needle having a barrel for implanting the pellet into the animal along a longitudinal axis of the needle;
(b) a head means linearly moveable in the gun apparatus along the axis, the head means supporting the needle with an opening through the head means and into the barrel of the needle;
(c) a carrier for a pellet mounted at the opening in the head means for holding the pellet in the opening so that the pellet can pass through the barrel of the needle;
(d) a pistol grip means supporting the head means;
(e) a drive rod linearly moveable through the opening in the head means and into the barrel of the needle along the axis from the pistol grip means;
(f) a first, elongate linkage means mounted on the pistol grip means and extending between the drive rod and the trigger means and pivoting on the pistol grip means for moving the drive rod;
(g) a second, elongate linkage means mounted on the pistol grip means and extending between the head means and the trigger means and pivoting on the pistol grip means for moving the head means; and
(h) a trigger means mounted on the pistol grip means and actuatable by the fingers of an operator for moving the first linkage means and the second linkage means, wherein the first linkage means moves the drive rod through the opening in the head means and into the barrel of the needle and wherein the second linkage means moves the needle and head means into the pistol grip means after the drive rod has moved into the barrel of the needle.

5,147,296
MEMBRANE FOR ELECTROTRANSPORT TRANSDERMAL DRUG DELIVERY
Felix Theeuwes; J. Richard Gyory, both of Los Altos, and Ronald P. Haak, Cupertino, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Division of Ser. No. 252,402, Oct. 3, 1988, Pat. No. 5,080,646.
This application Aug. 28, 1991, Ser. No. 751,276
The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.
Int. Cl.[5] A61N 1/30
U.S. Cl. 604—20 24 Claims



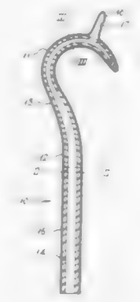
1. A membrane for controlling agent delivery from an electrotransport delivery system, the membrane permitting electrically-assisted flux (J_{EK}) of the agent therethrough and impeding passive flux (Jp) of said agent therethrough, the membrane exhibiting a ratio of J_{EK}:J_P of at least about 2.5.

5,147,297
IONTOPHORETIC DELIVERY DEVICE
Robert M. Myers, Stanford, and Mark G. Stahl, Sunnyvale, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Filed May 7, 1990, Ser. No. 521,761
Int. Cl.[5] A61N 1/30
U.S. Cl. 604—20 46 Claims



1. An electrically powered iontophoretic delivery device including a donor electrode assembly, a counter electrode assembly and a source of electrical power adapted to be electrically connected to the donor electrode assembly and the counter electrode assembly, at least one of the electrode assemblies including an agent reservoir containing an agent, the agent reservoir adapted to be placed in agent transmitting relation with a body surface, and an electrode adapted to be electrically connected to the source of electrical power and to the agent reservoir, wherein the electrode comprises:
a polymeric matrix;
about 5 to 40% of a conductive filler forming a conductive network through the matrix; and
about 5 to 40 vol% of a chemical species able to undergo oxidation or reduction during operation of the device, the matrix having a plurality of fluid flow pathways therethrough.

5,147,298
FEEDING APPARATUS
John J. Turner; Mary J. A. Turner, both of Liverpool, and Peter Watt, Wirral, all of England, assignors to National Research Development Corporation, London, England
Filed Apr. 3, 1991, Ser. No. 680,170
Claims priority, application United Kingdom, Apr. 6, 1990, 9007890
Int. Cl.[5] A61J 9/00
U.S. Cl. 604—79 14 Claims



1. An apparatus for use in administering ingestible oral fluid to a patient, comprising:
an elongate tubular member shaped over one end portion as a hook, said one end portion being closed at its free end; and
a projection connected with said one end portion partway therealong to extend generally radially outwardly from said hook shape, said projection having an area facing in the same direction as a longitudinal direction of said free end, said projection being hollowed to communicate with an interior of said tubular member, being resilient over at least said area, and said projection has an orifice in said area;
said hook shape serving for disposition of said one end portion to pass over the lower lip and gum, teeth or denture of the patient to locate and facilitate retention of said projection in the patient's mouth, while the remaining other end portion of said member depends from the mouth across the patient's jaw.

5,147,299
DEVICE TO FACILITATE ARTIFICIAL INSEMINATION OF BOVINES AND SIMILAR ANIMALS
Marco A. H. Mendoza, Rebsamen 573, Col. Narvarte, 03020, and Malcolm Niven, Montes Urales 625, Lomas de Chapultepec, 11000, both of Mexico
Filed Jan. 29, 1990, Ser. No. 471,213
Claims priority, application Mexico, Jan. 31, 1989, 14076
Int. Cl.[5] A61M 29/00
U.S. Cl. 604—96 7 Claims

1. Apparatus to facilitate the artificial insemination of bovines and similar species, comprising:
a conventional semen injecting insemination pipette for bovines through which semen will be introduced with a syringe;
a rigid tube having a diameter greater than the diameter of the pipette fitted over and attached to the distal end of the pipette;
seal forming means attached to the rigid tube;
an insemination tip formed at the distal end of the rigid tube and having a diameter less than the diameter of the pipette

so that the distal end of the pipette extending into the tube abuts the tip, the insemination tip having an open ejection port at its end;

at least one lateral ejection port formed on a lateral side of the insemination tip;

wherein the rigid tube is about 4 cm long and about 5 mm in diameter.

5,147,300

BALLOON CATHETER INFLATION DEVICE

David B. Robinson, Chanhassen; Daniel O. Adams, Blaine; William H. Penny, St. Anthony, and Gerald G. Voegele, St. Bonifacius, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Division of Ser. No. 165,600, Mar. 8, 1988, Pat. No. 5,019,041.
This application Feb. 21, 1990, Ser. No. 482,828
The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.
Int. Cl.[5] A61M 79/00
U.S. Cl. 604—97 41 Claims

1. A pressure controller for use with a balloon-type angioplasty catheter, the pressure controller comprising:

a housing;

syringe body mounted in the housing, with the syringe body having an open proximal end and a distal end in fluid communication with an angioplasty catheter;

a syringe plunger having a distal portion longitudinally and sealably received within the open proximal end of the syringe body and a proximal end extending out of the housing, with the plunger being movable longitudinally relative to the syringe body for pressurizing the syringe body and angioplasty catheter connected thereto;

a pressure measurement gauge in fluid communication with the syringe body; and

a plunger lock assembly mounted in the housing for selectively liming longitudinal movement of the syringe plunger, the lock assembly including:

a latch movable laterally between a first position engaged with the plunger and a second position spaced from the plunger;

a longitudinally movable control button on the housing for moving the latch between the first position and the second position; and

a linkage assembly connecting the control button to the latch for coupled movement therebetween.

5,147,301

FEMALE INCONTINENT DEVICE

Francesco Ruvio, 1922 E. 28th St., Brooklyn, N.Y. 11229

Filed Dec. 11, 1991, Ser. No. 805,039
Int. Cl.[5] A61F 5/44
U.S. Cl. 604—98 10 Claims

1. A female incontinent device which comprises:

a) a cylindrical stem insertable into a vaginal canal of a patient;

b) means for retaining said stem within the vaginal canal of the patient in a stationary position;

c) means rigidly connected to said stem for draining urine from the urethral meatus of the patient;

d) wherein said stem has a closed end, an open end and a plurality of small orifices located near the closed end thereof;

e) and wherein said retaining means includes:

a balloon anchor placed over the closed end and the orifices of said stem;

a retainer for securing a mouth of said balloon anchor to said stem;

a cap to fit onto said balloon anchor for holding said stem and said balloon anchor stationary at the closed end of said stem; and

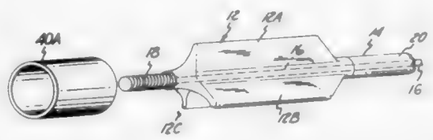
means at the open end of said stem for controlling the flow of fluid/air into said stem for inflating said balloon anchor, so as to retain said stem within the vaginal canal and for deflating said balloon anchor, so that said stem can be removed from the vaginal canal when needed.

5,147,302

METHOD OF SHAPING A BALLOON OF A BALLOON CATHETER

Charles L. Euteneuer, St. Michael, and Peter T. Keith, Edina, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Apr. 21, 1989, Ser. No. 341,430
Int. Cl.[5] A61M 29/02
U.S. Cl. 604—103 34 Claims



1. A method of shaping a balloon of a balloon catheter when the balloon is in a deflated state and includes a member extending longitudinally through the balloon, the method comprising:

inflating at least a portion of the balloon;

applying external pressure to the balloon in a generally radially inward direction;

deflating the balloon to form at least three folded wings;

applying a cover over the balloon which causes the wings to wrap around the member, the cover including a plurality of tubes, each having a length which is less than a length of the balloon; and

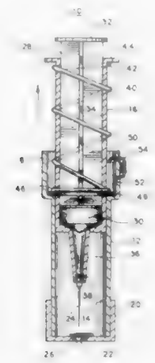
subjecting the balloon to a heat treatment at an elevated temperature with the tubes of the cover in place.

5,147,303

DISPOSABLE SAFETY SYRINGE

Bret C. Martin, 2001 Range Ave. No. 62, Santa Rosa, Calif. 95401

Filed May 23, 1991, Ser. No. 704,395
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 5 Claims



1. A disposable safety syringe comprising:

a sheath means having an opening for slidably receiving a syringe means therein;

a syringe means slidably received in said sheath means;

needle means extending from said syringe means;

latch mean holding said syringe means in operative position within said sheath means;

means for sealing said needle means within said sheath means after said latch means is released prior to disposal of said safety syringe; whereby handlers of said safety syringe are protected from accidental pricks by said needle means subsequent to use thereof;

said sheath means comprising a central elongated cylinder means having a longitudinal opening therethrough, an upper cup means having a base means integral with said central elongated cylinder means and having a longitudinal opening therein communicating with and having a larger diameter than the longitudinal opening of said central elongated cylinder means, and a lower cap means having a small diameter opening therein for said needle means;

said syringe means comprising an elongated cylinder means slidable in the longitudinal opening of said central elongated cylinder means of said sheath means at one end and a depressor plate means at the other end, said plunger means insertable in said elongated cylinder means of said syringe means, and a needle mount means at the base of said elongated cylinder means of said syringe means, said needle means being mounted in said needle mount means; and

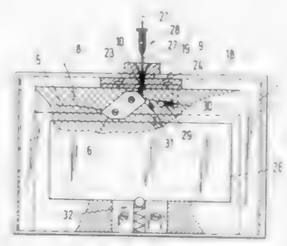
said sealing means comprising a compression spring means surrounding said elongated cylinder means of said syringe means, one end of said compression spring means being attached to an upper flange means of said elongated cylinder means of said syringe means, a lower end of said compression spring means being attached to a gasket means surrounding said elongated cylinder means of said syringe means, said gasket means also being attached to said base means of said upper cup means of said sheath means, said latch means to engage and retain said compression spring means in a compressed state and thereby retaining said syringe means within said sheath means in an operational mode, said cap means having a spring biased pivoted disc means effective to cover and seal said small diameter opening therein when said needle means is withdrawn into said sheath means; whereby when it is desired to dispose of said safety syringe a user depresses said depressor plate and said syringe means in said sheath means to an extent sufficient to release said latch means, thereby enabling said compression spring means to expand sufficiently to raise said syringe means in said sheath means and to withdraw said needle means into said sheath means, enabling said disc means to seal said small diameter opening, while said gasket means provides a seal above said needle means by cooperating with said elongated cylinder means of said syringe means, said user being protected against accidental needle pricks during disposal of said safety syringe.

5,147,304

DEVICE SUITABLE FOR RENDERING HARMLESS THE CANNULA OF SYRINGES

Ruediger Fladung, Duderstadt, Fed. Rep. of Germany, assignor to Duderstaedter Dental-Labor GmbH, Duderstadt, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 690,776
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 9004788[U]
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 15 Claims



1. An apparatus for rendering harmless the cannulae of disposable syringes, each of said cannulae having a head and a metal tube extending longitudinally from said cannula, said apparatus comprising:

(A) a casing having a first circular insertion opening formed therein which is capable of receiving the metal tube of a cannula only in the longitudinal direction of said metal tube, said casing also having a stop formed thereon which abuts the head of said cannula to limit insertion of said metal tube into said casing; and

(B) an electrode arrangement which forms a closed electrical circuit when said metal tube is inserted into said first insertion opening, said electrode arrangement comprising

(i) a first electrode which is located directly beneath said first insertion opening and into which is formed a second insertion opening which is capable of receiving said metal tube after said metal tube is inserted through said first insertion opening,

(ii) a second electrode formed by a stationary, rigid metal block which has a substantially linear side face sloping to one side, said side face of said metal block being

located directly beneath said first electrode and being capable of contacting a tip of said metal tube after said metal tube is inserted through said second insertion opening; and

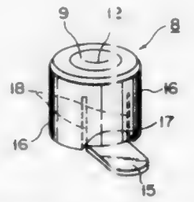
(C) a drawer which is located in said casing vertically beneath said first and second electrodes and which receives melted cannula pieces from said side face of said metal block.

5,147,305

MEDICAL INSTRUMENT AND VALVE TO BE MOUNTED ON A MOUNT PIECE OF THAT INSTRUMENT

Ichiro Nakamura, Kokubunji, and Hideki Tujiya, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 500,764, Mar. 28, 1990, Pat. No. 5,104,379.
This application Oct. 3, 1991, Ser. No. 770,649
Claims priority, application Japan, Apr. 3, 1989, 1-84447; Aug. 14, 1989, 1-207849; Sep. 5, 1989, 1-230133; Feb. 2, 1990, 2-8946[U]
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 13 Claims



1. A medical instrument which is insertable into a body cavity of a subject and which is used in cooperation with a treating unit, comprising:

an insertion section including a distal end which is insertable into the body cavity of a subject and having a first opening, a proximal base end located outside the body of the subject, and a channel extending from the proximal base end toward the first opening;

an operation section connected to the proximal base end and having a second opening leading to the channel;

a mount piece provided around the second opening; and

a valve for closing the second opening said valve including:

a body having first means adapted to be opened when the treating unit is inserted into the channel through the second opening and to be closed when the treating unit is withdrawn from the channel and second means detachably mounted on the mount piece; and

third means for destroying the body when the body is removed from the mount piece.

5,147,306

DEVICE FOR PUCKERING THE FLESH TO FACILITATE INJECTIONS

Stephen J. Gubich, 3042 Middletown Rd., Bethlehem, Pa. 18017

Filed Jul. 1, 1991, Ser. No. 723,606
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—115 11 Claims

1. A flesh puckering device for self-administration of injections of medicinal fluids comprising:

(a) a pair of elongated lever arm means effectively pivoted to each other between the ends,

(b) a pair of laterally extended opposed jaw means mounted upon one end of each of the pair of elongated lever arm means, said jaws having opposed faces,

(c) handle means attached to a portion of said elongated lever arm means removed from the jaw means,

(d) resilient means arranged and constructed to bias the elongated lever arm means to move the jaw means along with their opposed faces toward each other,

(e) each jaw means having a sharply tapered elongated contour extending outwardly from the face of said jaw means in the direction of the other jaw means and directly opposed to the sharply tapered elongated contour of the

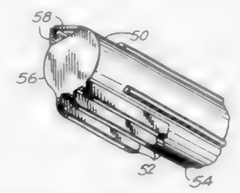
other jaw means providing a narrow laterally extended intersecting pair of sharply tapered lips for applying to the surface of a living human body and being biased toward each other by the resilient means for gathering a portion of flesh between them and retaining it in position for insertion of a hollow needle thereinto.

5,147,307

ANATOMICAL MARKER DEVICE AND METHOD

Seymour M. Gluck, 1204 Beach 9th St., Far Rockaway, N.Y. 11691

Filed Jun. 17, 1991, Ser. No. 716,823
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—116 20 Claims



1. An independently hand-held device for marking the surface of the skin to identify a selected area for a diagnostic or therapeutic procedure, which comprises

(a) a supporting body;

(b) one or more firm patterning elements extending in relief from the supporting body for impressing directional and/or positioning markings on the skin through brief compressive contact; and

(c) a marking element extending in relief from the supporting body for impressing a positioning marking on the skin for identifying a target site for a medical or surgical instrument.

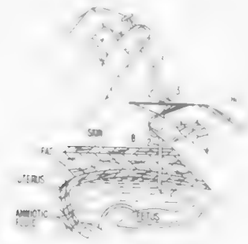
5,147,308

SURGICAL NEEDLE AND STYLET WITH A GUARD

Andrew Singer, 33 Pond Ave. Apt. 421, Brookline, Mass. 02146

Filed Jan. 4, 1990, Ser. No. 461,024
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—117 2 Claims

1. Surgical needle probing and aspiration having, in combination, an outer hollow needle provided with a bore extending from a proximal hub end to a distal insertion end, an inner removable stylet extending coaxially along the bore from the hub end to the insertion end of the needle, and shielding guard means intermediately apertured to receive the needle-stylet and provided with means for positioning the same at a predetermined position along the needle below the said proximal hub end of the needle, the guard means extending laterally of the external circumferential surface of the needle and around the needle sufficiently to protect the fingers of one hand holding the needle between the guard means and the said distal intertion end of the needle from contact with the stylet during its re-insertion by the other hand, following removal, into the



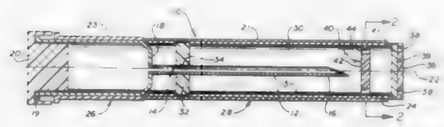
said hub end of the needle, and in which means is provided for varying the said position of the guard means along the needle to control or limit the depth of penetration of the needle into the body and in which said guard means comprises means converging toward the needle and there-provided with sleeve means slidable along the needle for adjusting the position of the guard means therealong, and in which said guard means is conical.

5,147,309

APPARATUS FOR PRIMING A HYPODERMIC NEEDLE WITH HAZARDOUS FLUID

Karl J. Hemmerich, Del Mar, and Henry D. Kraus, Valley Center, both of Calif., assignors to Biosafety Systems, Inc., San Diego, Calif.

Filed Oct. 22, 1991, Ser. No. 780,925
Int. Cl.[5] A61M 1/00
U.S. Cl. 604—122 7 Claims



1. An apparatus for purging air from a hypodermic needle and priming the needle with hazardous fluid, and for retaining said hazardous fluid expelled from said needle, comprising:

a) a hypodermic needle having proximal and distal ends and a tubular connector on said proximal end of said needle adapted to be connected to a source of said hazardous fluid for communication of air and said hazardous fluid from said source to be expelled through said distal ends of said needle;

b) a tubular sheath member having a longitudinal axis, proximal and distal ends, a proximal base portion and a distal fluid containment portion, said tubular connector being removably disposed in said proximal base portion, and said needle being disposed coaxially within said containment portion;

c) means disposed within said containment portion for preventing escape of said hazardous fluid from said proximal end of said tubular sheath member;

d) means disposed in said containment portion for venting air expelled from said needle from said containment portion and for preventing escape of said hazardous fluid from said containment portion through said distal end of said tubular sheath member; and

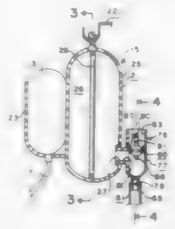
e) a planar deflector member within said containment portion between said distal end of said hypodermic needle and said means for venting for deflecting said fluid expelled from said distal end of said needle away from said means for venting, said planar deflector member extending transversely within said containment portion, having a shield portion adjacent to said needle end for deflecting hazardous fluid expelled from said needle away from said means for venting, and having at least one fluid flow passage for communicating air from said needle through said means for venting.

5,147,310

PRESSURE INFUSION SYSTEM

Peter T. Giannini, 1891 River Valley Dr., Germantown, Tenn. 38138, and Dennis H. Currie, 2982 Mt. Terrace, Memphis, Tenn. 38127

Continuation-in-part of Ser. No. 612,602, Nov. 13, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 753,920
Int. Cl.[5] A61M 5/14
U.S. Cl. 604—141 24 Claims



1. Valve means for a pressure infusion system of the type including a flexible bag for containing a quantity of liquid for being infused into a patient, a source of pressurized fluid, and pressure means for being coupled to said bag and to said source of pressurized fluid and for selectively applying pressure to said bag to force said liquid from said bag, said pressure means including a pressure infusion cuff for holding said bag, said pressure means including an inflatable bladder for movement between a deflated position in which said bag can be easily removed from or inserted into said pressure infusion cuff and an inflated position in which pressure is applied to said bag to force liquid from said bag, said bladder having a hollow interior and having a port for allowing fluid to pass into and out of said interior of said bladder; said valve means comprising:

a) body means having first port means for being coupled to said source of pressurized fluid, second port means for being coupled to said bladder in communication with said port of said bladder, third port means for being vented to the atmosphere, and an open interior for connecting said first, second and third port means to one another and for allowing pressurized fluid to pass therebetween; each of said second and third port means having a cross sectional area greater than the cross sectional area of said first port means to allow pressurized fluid to quickly escape from said interior of said bladder through said second and third port means; and

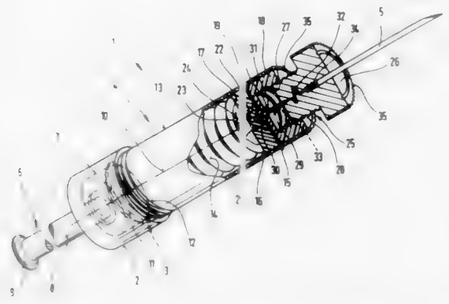
b) plug means positioned within said open interior of said body means for movement between an inflate position and a deflate position; said first and second port means being open and said third port means being blocked when said plug means is in said inflate position for allowing inflation of said bladder of said pressure infusion cuff; said first port means being blocked and said second and third port means being opened when said plug means is in said deflate position for allowing rapid deflation of said bladder of said pressure infusion cuff.

5,147,311

INJECTION DEVICE FOR USE WITH A DEFORMABLE AMPOULE

Ewald Pickhard, Redtenbachergasse 15, A-1160 Vienna, Austria

PCT No. PCT/AT88/00068, § 371 Date May 3, 1980, § 102(e) Date May 3, 1980, PCT Pub. No. WO89/02286, PCT Pub. Date Mar. 23, 1989
PCT Filed Aug. 29, 1988, Ser. No. 477,831
Claims priority, application Austria, Sep. 9, 1987, 2289/87
Int. Cl.[5] A61M 5/24, 5/315
U.S. Cl. 604—153 29 Claims



1. An injection device for selectively dispensing a small, controlled amount of a medicament into a body of a patient, comprising

(a) a deformable bag-shaped ampoule having a closed end and an opposite open dispensing end, the ampoule having a longitudinal axis and defining an interior chamber containing the medicament,

(b) a coaxial support receiving the ampoule between the ends thereof,

(c) a housing providing an abutment for the ampoule support,

(d) a hypodermic needle,

(e) a device for sealing the open ampoule end and for holding the hypodermic needle, the device comprising

(1) a holding element fixedly held in the support,

(1) a carrier for the hypodermic needle, the carrier being mounted on the holding element for axial adjustment relative thereto, and

(2) a piercing device penetrating through the holding element into the interior ampoule chamber upon axial adjustment of the hypodermic needle carrier, the piercing device having an axial bore receiving medicament from the interior ampoule chamber upon penetration thereof by the piercing device,

(f) an actuating mechanism for compressing the deformable ampoule and extending into the housing, the actuating mechanism comprising

(1) a piston slidable in an axial direction towards the sealing and holding device, the piston acting upon the closed ampoule end for compressing the deformable ampoule,

(2) the support having a guide track extending between the ampoule ends and being arranged for guiding the slidable piston, and

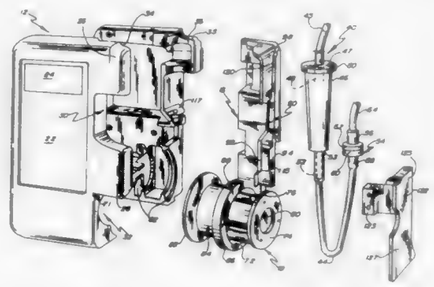
(g) a constricted, pressure-regulating channel extending through the hypodermic needle carrier, the channel connecting the interior ampoule chamber to the hypodermic needle through the bore of the piercing device.

5,147,312

PERISTALTIC INFUSION DEVICE DRIP CHAMBER YOKE

Clarence L. Walker, Webster Groves; Richard A. Sunderland, Creve Coeur, and Mark A. Davis, O'Fallon, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Division of Ser. No. 538,791, Jun. 15, 1990, Pat. No. 5,057,081.
This application Jun. 25, 1991, Ser. No. 720,331
Int. Cl.[5] A61M 1/00
U.S. Cl. 604—153 19 Claims



1. A drip chamber yoke assembly for retaining drip chamber assembly of a fluid delivery set in proper alignment with the drop sensing elements of a peristaltic pump, the drip chamber yoke assembly comprising:

a body member having top and bottom and side surfaces and a downwardly extending drip chamber receiving first recess therein;

a shoulder area operatively associated with said body member wherein said shoulder area is sized to receive an annular rim located near the top of a drip chamber assembly therein; and

a mounting member including a second recess therein, said second recess including a shoulder surface thereon and wherein said mounting member is spaced a predetermined distance below said body member such that when the length of the drip chamber assembly exceeds said predetermined distance, the bottom of the drip chamber assembly rests on said mounting member and when the length of the drip chamber assembly is less than said predetermined distance, the annular rim of the drip chamber assembly rests adjacent said shoulder area of said body member and the bottom of the drip chamber assembly is spaced apart from said shoulder surface of said second recess.

5,147,313

MEDICAL FLUID DELIVERY SYSTEM WITH UNIQUELY CONFIGURED PUMP UNIT AND FLUID DELIVERY SET

Cary Dikeman, Leawood, Kans., assignor to Entracare Corporation, St. Louis, Mo.

Filed Oct. 22, 1990, Ser. No. 601,191
Int. Cl.[5] A61M 1/00
U.S. Cl. 604—153 22 Claims

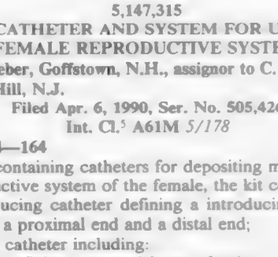
1. A medical fluid delivery system comprising:

a peristaltic pump unit, and

a fluid delivery set adapted to be operatively mounted on the pump unit, said fluid delivery set comprising a drip container having a longitudinal axis for holding fluid to be pumped by the pump unit, and a formation on the drip container having an external contour of unique configuration, said external contour being non-circular in a plane generally transverse to said longitudinal axis of the drip container,

said pump unit comprising holding means having a socket for receiving and holding said drip container in an operative position on the pump unit,

said socket having a uniquely configured non-circular internal contour adapted to mate with the uniquely configured



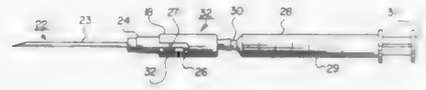
external contour of said formation on the drip container when the drip container is received in the socket whereby a fluid delivery set without said uniquely configured formation cannot be mounted in said operative position on the pump unit.

5,147,314

APPARATUS FOR INTRODUCING AT LEAST ONE OF A CATHETER AND A GUIDE WIRE INTO A BODY CAVITY

Vincent L. Vaillancourt, 14 Bunyan Dr., Livingston, N.J. 07039

Filed Nov. 18, 1991, Ser. No. 793,861
Int. Cl.[5] A61M 5/178
U.S. Cl. 604—158 8 Claims



1. An apparatus for introducing at least one of a catheter and a guide wire into a body cavity, said apparatus comprising

an introducer having a tubular portion for introduction into a body cavity, a hub at a proximal end of said tubular portion and a first membrane disposed at a proximal end of said hub in sealed relation;

a syringe having a barrel, a hollow tip extending from said barrel and a plunger slidably mounted in said barrel; and

a connector having a tubular housing mounted on and extending from said tip of said syringe for slidably receiving said hub of said introducer therein, a collapsible tube disposed about said tip and a second membrane disposed across said tube in sealed relation and in spaced relation to said tip to abut said first membrane in seal-tight relation.

5,147,315

ACCESS CATHETER AND SYSTEM FOR USE IN THE FEMALE REPRODUCTIVE SYSTEM

Mark V. Weber, Goffstown, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Apr. 6, 1990, Ser. No. 505,426
Int. Cl.[5] A61M 5/178
U.S. Cl. 604—164 15 Claims

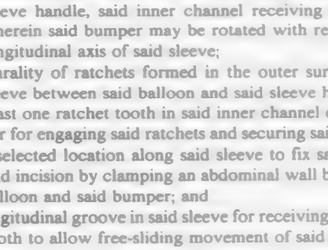
1. A kit containing catheters for depositing material within the reproductive system of the female, the kit comprising:

an introducing catheter defining a introducing lumen and having a proximal end and a distal end;

an access catheter including:

a shaft defining a second lumen, having a proximal end and a distal end, and having an outer diameter smaller than the diameter of said introducing lumen;

a nonexpansible segment having a proximal end and a distal end, said proximal end connected at a junction to said distal end of said shaft, said segment defining a passage communicating with said lumen at said junction and communicating with a distal opening at said distal end of said segment, and said segment being formed of at least first and second layers of material and having an outer diameter smaller than that of said shaft; and



reinforcing material disposed between said first and second layers of said segment to resist constriction of said passage; and

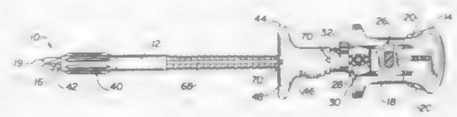
a transfer catheter having a length at least as long as that of said access catheter and having a diameter smaller than that of said second lumen of said access catheter.

5,147,316

LAPAROSCOPIC TROCAR WITH SELF-LOCKING PORT SLEEVE

Thomas A. Castillenti, P.O. Box 8728, Warren, Ohio 44484

Filed Nov. 19, 1990, Ser. No. 615,394
Int. Cl.[5] A61B 17/34
U.S. Cl. 604—164 4 Claims



1. In a surgical trocar for making and inserting into an abdominal incision, said trocar having a trocar handle which carries a shaft and a blade and having a sleeve carried on a sleeve handle, said sleeve and sleeve handle having concentric bores for receiving said shaft and blade, the improvement comprising:

a balloon at an end of said sleeve opposite said sleeve handle, said balloon inflatable to form an enlarged annular region around said end of said sleeve;

a self-locking bumper having an inner channel slideably mounted on said sleeve between said balloon and said sleeve handle, said inner channel receiving said sleeve, wherein said bumper may be rotated with respect to the longitudinal axis of said sleeve;

a plurality of ratchets formed in the outer surface of said sleeve between said balloon and said sleeve handle;

at least one ratchet tooth in said inner channel of said bumper for engaging said ratchets and securing said bumper at a selected location along said sleeve to fix said sleeve in said incision by clamping an abdominal wall between said balloon and said bumper; and

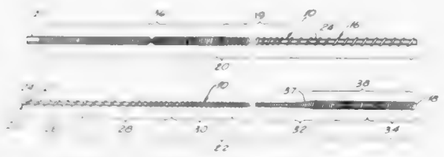
a longitudinal groove in said sleeve for receiving said ratchet tooth to allow free-sliding movement of said bumper.

5,147,317

LOW FRICTION VARIED RADIOPACITY GUIDEWIRE

Peter J. Shank, Burlington, and Kenneth W. Horton, Westford, both of Mass., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Filed Jun. 4, 1990, Ser. No. 532,381
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 31 Claims



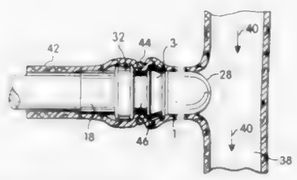
1. A guidewire for use with a catheter comprising:
an elongate flexible core wire;
a helical coil formed from a wire having a predetermined diameter, the helical coil being wrapped about the core wire and extending along the length of the core wire, at least a major portion of the length of the helical coil having adjacent turns spaced from each other by an amount at least equal to the diameter of the wire from which the helical coil is formed.

5,147,318

VALVED ARTERIAL CATHETER

David C. Hohn, Houston, assignor to Board of Regents, The University of Texas System, Houston, Tex.

Filed Mar. 4, 1991, Ser. No. 664,362
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—174 14 Claims



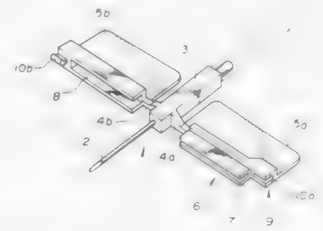
1. An arterial valved catheter for arterial delivery of medication comprising:
an elongate flexible tubular shaft having a lumen extending therethrough;
a tip mounted on and closing off the distal end of the shaft, the tip having a self-sealing slit formed at its distal end and in communication with the lumen; and
a pair of annular retention ridges formed on the exterior of the tip in close proximity to each other and in proximity to the distal end of the tip, the ridges being defined by radially extending circumferential flanges on opposite sides of and defining a groove therebetween whereby the device may be secured in position in an artery by securing a constricting member about the artery in the region of the groove to constrict the artery tightly about the catheter tip in the region of the groove

5,147,319

WINGED NEEDLE

Toichi Ishikawa, and Hiroyuki Asano, both of Yokohama, Japan, assignors to Kato Hatsujo Kaisha, Ltd., Kanagawa, Japan

Filed Jun. 13, 1991, Ser. No. 714,956
Claims priority, application Japan, Jan. 17, 1991, 3-016977
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—174 5 Claims



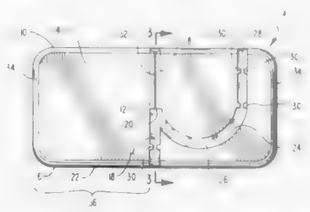
1. A winged needle comprising:
a needle;
a base into which the needle is rooted;
a pair of flat wings which flank both sides of said base, for providing flat surfaces with which said winged needle can be fastened to an arm of a patient;
hinge means which allow said pair of wings to fold toward said needle;
sheath-portions respectively integrated with said pair of flat wings which surround said needle on all sides when said pair of flat wings are folded toward said needle; and
coupling means for coupling said pair of flat wings together with said sheath-portions when said pair of wings are folded to maintain said needle surrounded by said sheath portions.

5,147,320

CATHETER AFFIXING AND ANCHORING PAD AND METHOD OF USE

Valdon G. Reynolds, Bountiful, and John A. Davison, Sandy, both of Utah, assignors to Sorex Medical, Inc., Salt Lake City, Utah

Filed May 3, 1991, Ser. No. 695,258
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—174 19 Claims



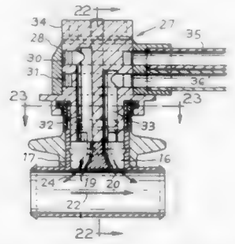
1. An apparatus for affixing and anchoring a catheter to the body of a patient, the apparatus comprising:
a pad having a first surface, a second surface and a peripheral edge;
a passageway extending from said peripheral edge of the pad, through a portion of the pad between said first and second surfaces and terminating in an opening located within the pad and away from the peripheral edge thereof, the size and configuration of the passageway being such that the passageway can snugly receive a portion of said catheter therein;
an open channel formed in the first surface of the pad and communicating with the passageway through said opening, said open channel extending from said opening to the peripheral edge of the pad, the size and configuration of the channel being such that the channel can receive therein a portion of the catheter extending from the opening formed by the passageway; and
wherein the passageway and the open channel are configured and positioned so as to permit substantially unrestricted fluid flow through said catheter when portions of said catheter are received therein.

5,147,321

ROTATIONALLY OPERATED DEVICE FOR ATRAUMATIC ACCESS TO THE BLOOD CIRCUIT

Jean-Pierre Slonina, deceased, late of Le Vesinet by Marie-Noëlle Slonina, Caroline Slonina, Frederic A. Slonina, Aurélie M. Slonina, legal representatives, and Sylvie Hamann, Levallois, both of France, assignors to Biomasys, France

PCT No. PCT/FR87/00191, § 371 Date Jan. 19, 1989, § 102(e) Date Jan. 19, 1989, PCT Pub. No. WO87/07509, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 2, 1987, Ser. No. 301,756
Claims priority, application France, Jun. 3, 1986, 86 07984
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—175 13 Claims



1. A device for atraumatic access to a blood circuit of a patient comprising:
a tubular conduit insertable into a blood vessel;
a tubular central segment mounted on and extending from said tubular conduit, said tubular central segment having a bottom wall provided with at least one opening for providing communication between said tubular central segment and said tubular conduit;
rotatable valve means disposed within said central segment, said rotatable valve means having spaced apart passageways and being rotatable within the central segment between a non-operating position for which the spaced apart passageways are not aligned with the opening and an operative position for which the spaced apart passageways are aligned with the opening, thereby providing selective communication between said tubular conduit communicating with the blood vessel and said central segment; and
a removable head rotatably disposed within said central segment for selectively rotating said rotatable valve means, said removable head comprising a main body portion having an inlet passageway and an outlet passageway for selective communication with the spaced apart passageways of the valve means.

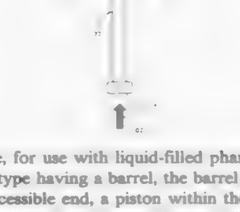
5,147,322

MEDICAL APPLIANCE SECURING DEVICE

Michael L. Bowen, Arlington, and Roger A. Liebelt, Mansfield, both of Tex., assignors to Highpoint Medical Corporation, Arlington, Tex.

Filed Nov. 26, 1991, Ser. No. 799,122
Int. Cl.[5] A61M *25/02*
U.S. Cl. 604—180 7 Claims

1. A holder for securing a generally tubular member of a medical device to a support surface comprising:
an anchoring patch having a top surface and a bottom surface, said bottom surface coated with an adhesive for attaching said anchoring patch to the support surface;
a retaining tab having a first portion and a second portion, said first portion connected to said anchoring patch and having an aperture therein, said second portion having a width less than the width of said first portion and dimensioned to allow said second portion to be inserted through said aperture, said retaining tab being of sufficient length to wrap around the circumference of the generally tubular member, extend through said aperture and contact said top surface of said anchoring patch; and



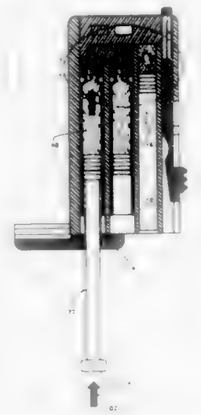
first fastening means secured to said top surface of said anchoring patch and complementary second fastening means secured to said second portion of said retaining tab such that when said retaining tab is wrapped around the circumference of the generally tubular member and said second portion of said retaining tab is inserted through said aperture, said first fastening means may be firmly and removably secured to said complementary fastening means.

5,147,323

MULTIPLE CARTRIDGE SYRINGE

Terry M. Haber, Lake Forest; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

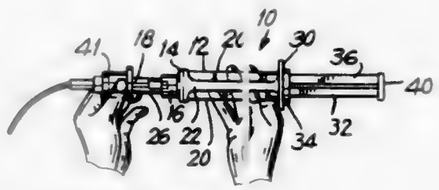
Filed Mar. 8, 1991, Ser. No. 667,319
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—191 16 Claims



1. A syringe, for use with liquid-filled pharmaceutical cartridges of the type having a barrel, the barrel having an open end and an accessible end, a piston within the interior of the barrel and a liquid within the barrel between the piston and the accessible end, comprising:

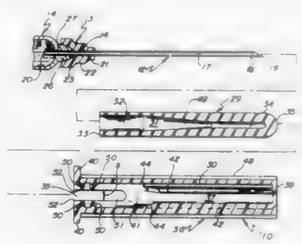
a body configured to house first and second of the cartridges therein;
an elongate accumulator chamber;
a movable accumulator piston housed within the accumulator chamber;
first means, engageable with the accessible ends of the first and second cartridges, for fluidly coupling the interiors of the barrels of the first and second cartridges to the accumulator chamber;
means for preventing fluid flow into the interiors of the barrels of the first and second cartridges;
a hollow needle;
means for selectively fluidly coupling the hollow needle with the accumulator chamber; and
a stem engageable with the cartridge pistons and the accumulator piston by which selected amounts of liquid from the first and second cartridges are forcible by the stem into the accumulator chamber to mix within the accumulator chamber, the mixed liquid in the accumulator chamber being forcible by the stem through the selectively fluidly coupling means and through the hollow needle.

5,147,324
PREFILLED SYRINGE DELIVERY SYSTEM
James G. Skakoon, Melrose; Steven E. Kern, Somerville, and William V. Lombardi, Northboro, all of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J. and Astra Pharmaceutical Products Inc., Westboro, Mass.
Division of Ser. No. 280,368, Dec. 6, 1988, abandoned. This application Apr. 27, 1990 Ser. No. 515,860
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—192 **7 Claims**



1. An apparatus comprising:
a syringe having a barrel and a piston disposed therein;
a syringe holder engaging said syringe with the syringe being disposed within and embraced by the holder;
interconnecting surface means between the syringe and syringe holder for permitting the syringe and holder to be relatively rotatable while preventing any longitudinal disassociation of the syringe relative to the holder;
a needle with a tip extending from said syringe and including a passage for flow of liquid from said syringe through said needle in response to pushing said plunger longitudinally through said syringe; and
a needle guard substantially permanently attached to and formed integrally with said syringe holder and extending beyond the tip of said needle, said needle guard being formed integrally with said syringe holder, the needle guard being a hollow cylindrical shape with said needle extending along a portion of a longitudinal axis of said needle guard, said syringe being prefilled, a tubing set with a puncture port means of a diameter equal to an interior diameter of said needle guard whereby when said puncture port means is inserted into said needle guard a liquid-proof connection is formed between said puncture port means and said needle, said tubing set including anti-siphoning means leading from said puncture port means, said puncture portion means being removable from said anti-siphoning means in order to expose a female lock connector.

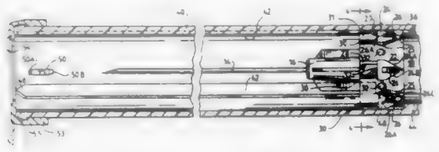
5,147,325
RIGID NEEDLE SHIELD
Jay F. Mitchell, Deland; Roger L. Crouse, Ormond Beach, and Herbert W. Lesher, Lake Helen, all of Fla., assignors to Sherwood Medical Company, St. Louis, Mo.
Filed May 3, 1991, Ser. No. 695,365
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **45 Claims**



1. A shield for a hypodermic syringe assembly which includes a sheath/needle sub-assembly having a resilient sheath covering a distal portion of a needle cannula, said shield comprising:
a relatively rigid housing forming an elongate chamber therein said chamber forming an open proximal end, and said chamber and said open proximal end having cross-sectional areas sized to allow the sheath/needle sub-assembly to be inserted through said open proximal end and into said chamber, said relatively rigid housing further forming a pair of slots extending longitudinally along said shield from said open proximal end thereof, said slots extending through said housing into said chamber, and said slots being located at opposite positions in said chamber; and
retention means formed as a part of said housing for holding the sheath in said chamber and for preventing separation of the sheath from said shield when the needle cannula is removed from the sheath;
whereby said shield is easily positionable over the sheath/-handle sub-assembly, and the sheath, when engaged within said shield, is easy removed from the needle cannula by exerting a gripping force on said housing near said open proximal end thereof to resiliently deform said housing to form an effective cross-sectional area of said chamber which is less than the cross-sectional area of the sheath, and withdrawing said shield from the needle cannula.

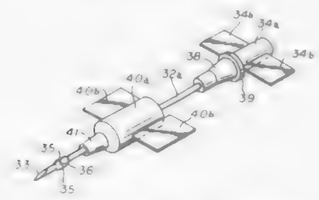
5,147,326
COMBINED SYRINGE AND NEEDLE SHIELD AND METHOD OF MANUFACTURE
Daniel A. Talonn, University City, and Alan B. Ranford, St. Louis, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 212,524, Jun. 28, 1988, Pat. No. 5,053,018. This application Mar. 1, 1991, Ser. No. 627,062
The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 **25 Claims**

1. A needle shielding device for use with a barrel, wherein a needle is attached to the forward end of the barrel, the improvement comprising:
a separate shield retaining means mounted on said barrel and including at least one locking slot on its outer surface,
an elongated needle shield having distal and proximal ends wherein said shield is movable over said barrel and retaining means between a retracted position in which the needle is exposed and an extended position in which said shield protects said needle, said shield including at least one elongated key on its interior surface, said key adapted to slide in a path outside said locking slot and being rotatable into said locking slot when said shield is in its extended position; and



an elongate needle protecting needle sheath having an open proximal end and a closed distal end wherein said need sheath is removably mounted on said distal end of said shield and said shield is movable between said retracted and extended positions with said needle sheath mounted thereon.

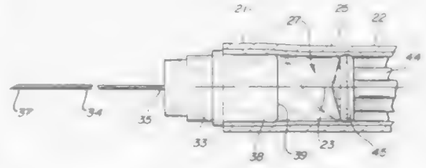
5,147,327
HYPODERMIC NEEDLE WITH PROTECTIVE SHEATH
Gerald W. Johnson, 17115 Red Oak, #211, Houston, Tex. 77090
Division of Ser. No. 462,788, Jan. 10, 1990, Pat. No. 5,049,136. This application Aug. 1, 1991, Ser. No. 739,325
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 **14 Claims**



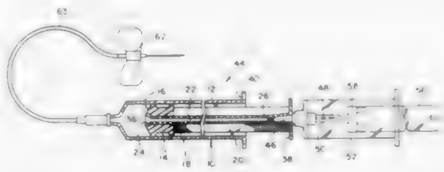
1. A sheathed hypodermic needle comprising
a tubular fluid handling needle having a front end adapted for hypodermic penetration and a rear end adapted for connection to fluid ejection or withdrawal means,
protrusions on the exterior forward portion of said needle formed by flattening a portion of said needle near its front end to cause a portion of the needle exterior diameter to protrude outward sufficient to frictionally engage the interior of said sheath while allowing unobstructed fluid flow through the needle interior,
a retractable sheath slidably mounted on said needle and movable relative thereto between a rearward retracted position exposing the front end of said needle and a forward protective position enclosing the front end of said needle to prevent inadvertent injury by contact with said needle and to facilitate disposal of said needle,
the interior of said sheath adapted to frictionally engage said protrusions in said forward protective position and cover the front end of said needle.

5,147,328
SYRINGE ASSEMBLY
Thomas J. Dragositz, Valley Cottage; Lennox Watts, Bronx, both of N.Y., and Steven Doumanis, Lincoln Park, N.J., assignors to Becton, Dickerson and Company, Franklin Lakes, N.J.
Continuation of Ser. No. 360,968, Jun. 2, 1989, abandoned. This application Mar. 21, 1991, Ser. No. 673,854
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—218 **22 Claims**

1. An operable syringe assembly comprising:
a barrel including a cylindrical coextruded body portion having a longitudinal axis, said body portion forming a side wall spaced from said axis defining a chamber for retaining fluid, said body portion including an open proximal end and a distal end portion having a passageway therethrough in fluid communication with said chamber, said body portion having an inner portion of plastic material and a rigid portion of plastic material surrounding said inner portion wherein said inner portion and said rigid portion form an irremovably connected extrudate, said rigid portion having a higher hardness than said inner portion; and
a plunger including an elongate shaft portion having a proximal end, a distal end and a rigid piston portion at said distal end having an outside diameter greater than the inside diameter of said inner portion, said piston having a higher hardness than said inner portion, said piston portion slidably positioned in fluid-tight engagement inside said barrel, said fluid-tight engagement being caused by said piston compressing said inner portion, said piston portion capable of moving fluid from said chamber through said passageway upon its movement toward said distal end, said piston portion capable of facilitating the drawing of fluid into said chamber through said passageway upon its movement away from said distal end, said proximal end of said plunger extending outwardly from said proximal end of said barrel to facilitate moving said piston portion with respect to said barrel.



5,147,329
INTRAVENOUS ACCESS DEVICES
James K. Brannon, 5729 Canterbury Dr., Culver City, Calif. [illegible]
Continuation of Ser. No. 270,400, Nov. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 13,417, Feb. 11, 1987, abandoned. This application Jul. 5, 1991, Ser. No. 727,372
Int. Cl.[5] A61M *5/315;* **A61B** *5/00*
U.S. Cl. 604—231 **18 Claims**



1. A syringe for extraction of a fluid into at least one fluid container or for delivery of an injectable fluid comprising:
(a) a cylindrical body having a distal end and an open proximal end, said distal end including an opening and a portion of a size and shape adapted for mounting a cannula thereon, said distal end being open to the flow of fluids into and out of said cylindrical body through said opening at all times when said syringe is in use;
(b) a piston sealably engaging, and slidable along the interior wall of said cylindrical body, said piston including a piston face extending transversely across said interior wall and

defining a fluid chamber between said piston face and said distal end of said cylindrical body;

(c) plunger means for moving said piston proximally or distally within said cylindrical body, said plunger means being attached at one end to said piston, said plunger means having another end extending beyond said open proximal end of said cylindrical body, said plunger means having a size and shape that minimizes substantial lateral motion in said cylindrical body;

(d) conduit means extending distally through said piston and proximally through said plunger means, said conduit means having a sufficiently narrow, uniform internal diameter to induce the passage of a fluid into said fluid chamber and through said piston and said plunger means; and

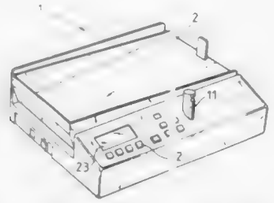
(e) detachably engaging the proximal end of said conduit means, means for sealing said proximal end of said conduit means to the inflow and outflow of air to said conduit means, said sealing means comprising a fluid collection receptacle sealably engaging said open proximal end of said conduit means, said fluid collection receptacle including a passage that communicates with the interior of said conduit means.

5,147,330

BLOOD CRADLE

Arne Kögel, Sollentuna, Sweden, assignor to Ljungberg & Kögel, Sollentuna, Sweden

Filed Oct. 16, 1990, Ser. No. 598,073
Claims priority, application Sweden, Oct. 18, 1989, 8903440
Int. Cl.[5] A61M *5/05*
U.S. Cl. 604—245 3 Claims



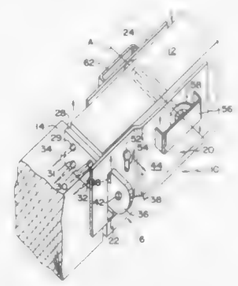
1. A blood-collecting bag cradle comprising a bag carrier, with a support surface, adapted to support a blood-collecting bag, means including an axle connected to and extending under and essentially parallel with said surface, and a crank offset from and parallel with said axle and engaging said carrier for reciprocatingly rocking said carrier on said axle, said cradle also being provided with a weight measuring device connected to said carrier to measure the quantity of blood that has flowed into the bag, said cradle also being provided with a clamping device adapted to receive a part of a hose connected to the blood-collecting bag and operable to clamp and unclamp the hose to respectively prevent and permit flow of blood therethrough and electromagnetic power means to operate said clamping device, and said cradle including a control circuit means connected to said power means to control at least the clamping device, said control circuit means being so constructed and connected to said clamping device so that, upon receipt of a first signal from an operator, the control circuit means will operate the power means for said clamping device to clamp the hose, and, in response to a second, start, signal from an operator, will operate the power means for said clamping device to unclamp said hose; and wherein said control circuit means includes first control means responsive to said weight measuring device to operate the clamping device to alternately positively clamp the hose and to unclamp said hose, by operating said electromagnetic power means, so as to permit passage of a small quantity of blood at a time through said hose when a given amount of blood remains to be taken from the donor; and wherein the control circuit means has additional means also responsive to said weight measuring device to operate said power means to cause the clamping device to clamp the hose when a predetermined total amount of blood has flowed into the blood-collecting bag.

5,147,331

RELEASABLE LOCKING APPARATUS

Fred Rust, 2404 Cedar Point Dr., Janesville, Wis. 53546

Filed Sep. 13, 1991, Ser. No. 759,394
Int. Cl.[5] E05C *19/08*
U.S. Cl. 292—246 11 Claims



1. A releasable locking apparatus for securing a closure member to a frame, said apparatus comprising:

a catch plate rigidly secured to the frame, said plate defining a catch;

a locking means pivotally secured to the closure, said locking means defining an aperture which co-operates with said catch, the arrangement being such that in use of said apparatus, said locking means moves from a first pivotal disposition in which said catch and said aperture are spaced relative to each other to permit movement of the closure member relative to the frame to a second pivotal disposition in which said catch and said aperture co-operate together so that said locking means rides upon said catch, said locking means moving to a third pivotal disposition in which said catch is latchingly disposed within said aperture for securing the closure member to the frame;

biasing means bearing against the closure member for biasing said locking means from said second pivotal disposition to said third pivotal dispositon for securing the closure member to the frame;

a backing plate rigidly secured to said locking means for pivotal movement therewith, such that the closure member is disposed between said backing plate and said locking means;

said locking apparatus further including:

a base plate having a first and a second portion and a transitional portion disposed between said first and second portions, said first portion defining said aperture;

said second portion being spaced relative to the closure member; and

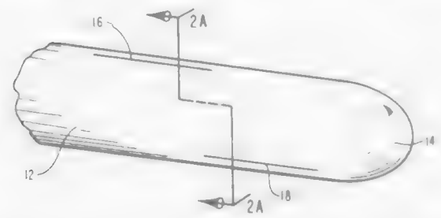
said transitional portion being angled relative to said first and said second portions such that said second portion is disposed spaced and parallel relative to said closure member.

5,147,332

MULTI-VALVE CATHETER FOR IMPROVED RELIABILITY

H. Robert Moorehead, Salt Lake City, Utah, assignor to C.R. Bard, Inc., Murrah Hill, N.J.

Filed May 17, 1991, Ser. No. 702,032
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—247 95 Claims



1. A catheter for use in aspirating or infusing fluids to a patient, the catheter comprising:

a cannula having an outer-wall made of a biocompatible material, the cannula having a distal end and a proximal end and at least one internal lumen for transmitting liquids, the at least one internal lumen providing for two-way fluid flow between the proximal end and the distal end of the cannula such that the fluid flow is initiated by the application of a pressure differential to the fluid;

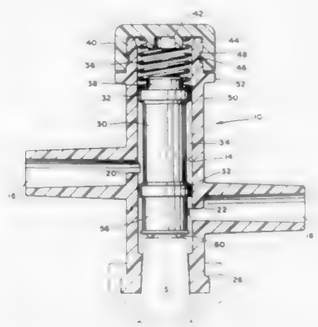
means for selectively communicating between the at least one lumen of the cannula and the exterior of the cannula, said means for selectively communicating comprising a plurality of valves, the plurality of valves being comprised of a primary valve and a secondary valve, the primary valve being constructed to operate at a lower threshold pressure differential than the secondary valve so as to be preferably operable relative to the secondary valve during aspiration or infusion, the secondary valve acting as a surrogate to the primary valve should the primary valve fail to operate.

5,147,333

NEEDLELESS INJECTION PORT WITH AUTOMATIC BACKCHECK VALVE

Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed May 13, 1991, Ser. No. 698,987
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—249 4 Claims



1. A needleless injection port and automatic backcheck valve comprising

a generally tubular body having a bore extending along a first axis,

a pair of ports extending laterally from said body, each port being in communication with said bore, and said ports being offset along said axis,

a spool inserted within said bore, said spool having a pair of rims defining an annular space therebetween,

means for biasing said spool toward one end of said bore,

said spool being axially movable between a first position in which said ports are in fluid communication with one another via said annular space, and a second position in which one of said rims blocks such communication,

one end of the body having an opening into which a syringe tip can be inserted to move said spool from said first position to said second position, whereupon the syringe is in fluid communication with only one of said ports,

wherein said body has a luer fitting at one end for receiving a syringe, the fitting including a luer taper of lesser diameter than said bore, thus defining a circumferential ledge at one end of the bore which provides a stop for the spool, and

the spool has a cylindrical extension at one end, said extension fitting closely within said luer taper, and having a bead at its distal end which bears against the luer taper, forming a seal therewith.

5,147,334

CATHETER FOR CHOLANGIOGRAPHY

James P. Moss, 4001 Kresge Way, Louisville, Ky. 40207-4604

Filed Jan. 2, 1991, Ser. No. 636,739
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—264 3 Claims

1. A cholangiographic catheter comprising: an elongated tube having proximal and distal end portions, a curved section on the distal end portion and said curved section having a tapered tip at the distal end of said curved section; a first and second plurality of holes disposed radially on said curved section for discharging a fluid in a directional flow for reaching the proximal of intrahepatic bile ducts as well as the duodenum, said second plurality of holes being smaller than said first plurality of holes; a soft and blunt distal end on said tapered tip; and a detachable coupling attached to the proximal end of said elongated tube.

5,147,335

TRANSURETHROVESICAL BIOPSY, AMNIOCENTESIS AND BIOLOGICAL SAMPLING GUIDE

Jeffrey Wright, San Antonio, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Aug. 24, 1989, Ser. No. 398,848
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—280 10 Claims

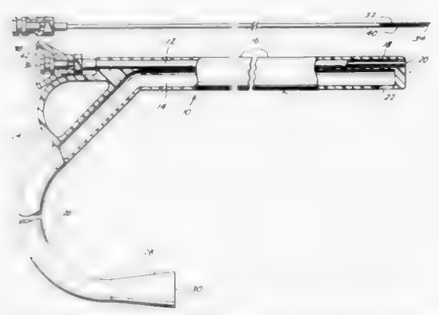
1. A multi-lumen catheter comprising:

an amniocentesis needle;

a first rigid lumen having a first end and a second end, said first end having a first orifice for receiving said needle and said second end having a second orifice opposite said first orifice to enable said needle to exit the second end of said first lumen; and

a second lumen having a fluid inlet and a fluid outlet;

said first lumen being attached to said second lumen in parallel relationship, said first end being in proximal relation to



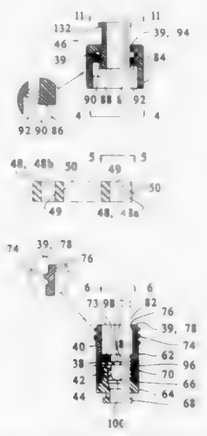
said fluid inlet, and said second end being in proximal relation to said fluid outlet.

5,147,336

ADAPTER KIT FOR A CATHETER INTRODUCER

Amy M. Wendell, Franklin, and James P. Cianci, Walpole, both of Mass., assignors to The Kendall Company, Mansfield, Mass.

Filed Jun. 5, 1990, Ser. No. 533,185
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—283 11 Claims



1. An adapter kit for a catheter introducer for a catheter, comprising:

a body member having a cavity,

an elastomeric means in said cavity;

a compression member aligned with said cavity, said compression member having a tubular plunger aligned with said cavity;

said body member having a mouth in said cavity for receiving said tubular plunger, said mouth having a bore lip having an internal dimension less than the internal dimensions of said cavity;

said elastomeric means being two silicone elastomeric glands with approximately a 40 Shore A (durometer hardness), each of different length, having approximately the same outside dimension for fitting interchangeably in said cavity, so that the glands can be used interchangeably, each with a different outside dimensioned catheter gripped by the compression of a different length gland;

said elastomeric glands each being cut in a different length from the same extrusion and having a bore of approximately the same cross sectional dimensions, said elastomeric gland being telescoped over the catheter;

said elastomeric glands having outside diameters greater than the internal dimension of said bore lip and fitting into the internal dimension of said cavity, so that said glands can be telescoped through said mouth into said cavity and detachably held in said cavity by said bore lip; and

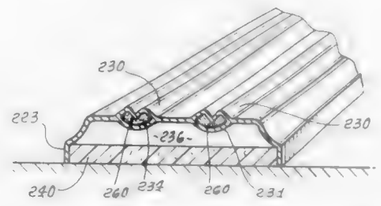
a coupling means responsive to bringing together and connecting said members for compressing said elastomeric means against the catheter by said compression member in a controlled manner in a catheter gripping position, said gripping position being the same in use with either elastomeric gland so that the catheter is not adversely crushed.

5,147,337

MEDICAMENT DISPENSER

Clifford Plone, 1619 W. Coventry Pl., Palmdale, Calif. 93551

Continuation-in-part of Ser. No. 520,276, May 7, 1990, Pat. No. 5,035,320, and a continuation-in-part of Ser. No. 628,147, Dec. 12, 1990, Pat. No. 5,076,425, which is a division of Ser. No. 520,276, May 7, 1990, Pat. No. 5,035,320. This application Jul. 22, 1991, Ser. No. 734,173
Int. Cl.[5] A61F *13/00*
U.S. Cl. 604—306 8 Claims



1. In a medicament dispenser, to dispense medicament onto a user's surface, the combination comprising

a) carrier means having a dome portion,

b) elongated pusher means on the carrier means,

c) elongated receptacle means beneath the pusher means and on the carrier means, there being an elongated zone between the pusher means and receptacle means to receive dispensable medicament substance or substances,

d) the pusher means being selectively manually deflectable toward the receptacle means, at selected locations along pusher means length,

e) the receptacle means having selected lengthwise locations corresponding to said selected pusher means locations that are rendered porous in response to deflection of the pusher means toward the receptacle means and including said medicament substance or substances in said zone,

f) whereby dispensing of dispensable medicament substance or substances occurs at locations on said receptacle means corresponding to said selected deflected locations of the pusher means toward the receptacle means,

g) the pusher means and receptacle means being on said dome portion of the carrier, said zone adapted to receive and confine the medicament substance, and wherein there is a medicament-containing sponge between the receptacle means and the pusher means, the sponge being elongated,

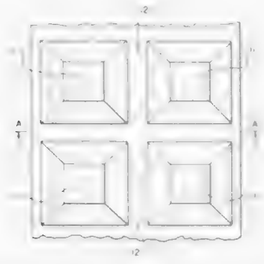
h) there being a space in the carrier at a side of the receptacle means, wherein an applicator sponge is positioned in said space to receive medicament substance via the porous receptacle when the pusher means is pushed toward the receptacle means.

5,147,338

MEDICATED, LOW ADHERENCY WOUND DRESSINGS

Stephen M. Lang, Wicken Bonhunt Nr. Saffron Walden, and David F. Webster, Bishop's Stortford, both of United Kingdom, assignors to Smith and Nephew Associated Companies Limited, United Kingdom

Continuation of Ser. No. 554,334, Jul. 17, 1990, abandoned, which is a continuation of Ser. No. 423,807, Oct. 18, 1989, abandoned, which is a continuation of Ser. No. 5,254, Jan. 20, 1987, abandoned, which is a continuation of Ser. No. 814,560, Dec. 30, 1985, abandoned, which is a continuation of Ser. No. 396,732, Jul. 9, 1982, abandoned, which is a continuation of Ser. No. 345,488, Feb. 3, 1982, abandoned. This application Jun. 17, 1991, Ser. No. 717,167
Claims priority, application United Kingdom, Feb. 13, 1981, 8104568; May 22, 1981, 8115742
Int. Cl.[5] A61F *13/00, 13/02*
U.S. Cl. 604—304 13 Claims



1. A conformable, low adherency wound dressing which comprises:

(a) A low adherency wound facing layer 0.05–2.5 mm thick which is a conformable elastomeric apertured net;

(b) An absorbent layer comprising a conformable hydrophilic foam 0.5–20 mm thick;

(c) A therapeutically effective amount of a medicament suitable for a topical application to humans located in the hydrophilic foam layer; and

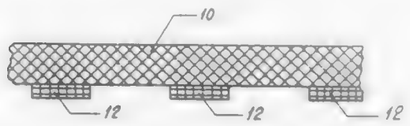
(d) A continuous conformable moisture vapor permeable outer film layer which acts as a bacterial barrier and has a moisture vapor transmission rate of from 300–5,000 grams/sq. meter/24 hours at 37° C. at 100%–10% relative humidity difference, said wound facing layer and said outer layer being laminated to opposing faces of said absorbent layer over the operative area of the dressing.

5,147,339

DRESSING MATERIAL FOR THE TREATMENT OF WOUNDS, AND CORPUSCLES FOR USE IN THE PRODUCTION THEREOF

Staffan Sundström, Helsingborg, Sweden, assignor to Coloplast A/S, Denmark

PCT No. PCT/DK88/00153, § 371 Date May 31, 1989, § 102(e) Date May 31, 1989, PCT Pub. No. WO89/02754, PCT Pub. Date Apr. 6, 1989
PCT Filed Sep. 19, 1998, Ser. No. 375,019
Claims priority, application Denmark, Sep. 22, 1987, 4962/87
Int. Cl.[5] A61F *13/02*
U.S. Cl. 604—307 12 Claims



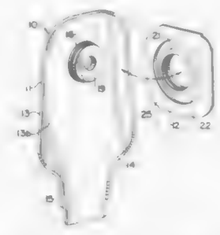
1. A corpuscle for treating wounds in the skin and mucous membranes of the human body, comprising a solid, hydrophobic, water-insoluble, biologically inert, continuous matrix, the matrix being stable at temperatures below about 50° C., the matrix containing at least one hydrophilic discontinuous phase including a biologically active wound care substance, the biologically active substance being dissolved or dispersed in the hydrophilic discontinuous phase or present as a coating thereon.

5,147,340

TWO-PIECE OSTOMY APPLIANCE

Michael R. Lavender, Round Lake Beach, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Apr. 18, 1991, Ser. No. 686,397
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—344 5 Claims



1. An ostomy appliance comprising a collection pouch having a side wall with an opening therein; a flexible plastic first coupling ring secured to said side wall about said opening; a faceplate having a second coupling ring of flexible plastic adapted to latch with said first coupling ring; said forceplate including annular adhesive attachment means defining an opening and extending radially outwardly from said second coupling ring for adhesively engaging a wearer's skin; wherein the improvement comprises a pouch barrier ring of soft, compressible, sealant material secured to said first coupling ring; said pouch barrier ring having an outside diameter smaller than said opening of said adhesive attachment means and extending radially inwardly from said first coupling ring for sealing contact with surfaces of a wearer's skin within the area circumscribed by both of said coupling rings when said appliance is worn.

5,147,341

SELF CONTAINED URINARY CATHETER ASSEMBLY

Richard N. Starke, 1718 Arrowhead Trail NE, Atlanta, Ga. 30345, and Raymond G. Bigler, 1771 Wesley Way, Conyers, Ga. 30207

Filed Mar. 5, 1991, Ser. No. 664,873
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—349 14 Claims

1. A self contained urinary catheter assembly for use in draining the bladder through the urethra comprising:

a) a flexible receptacle defining a closed chamber therein;

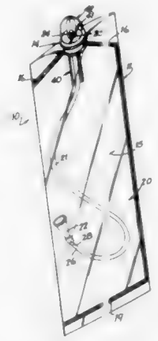
b) a catheter carried in said closed chamber in said flexible receptacle and including:

b1) an elongate catheter tube defining a projecting end and a drainage end at opposite ends thereof and defining a drainage passage extending from said projecting end to said drainage end so that fluids in the bladder can drain therethrough when said projecting end of said catheter tube is inserted into the bladder through the urethra,

b2) arresting means at said drainage end of said catheter tube and

b3) release means for selectively releasing said arresting means from said catheter tube; and,

c) mounting means mounted on said flexible receptacle and defining a catheter opening therethrough into said closed chamber through which said projecting end of said catheter tube can extend for insertion into the bladder through



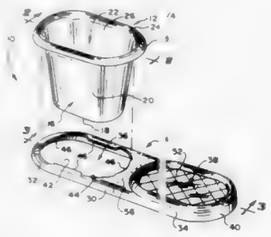
the urethra, said catheter opening configurated so as to prevent said drainage end of said catheter tube from passing therethrough until said release means releases said arresting means from said catheter tube.

5,147,342

SYSTEMS FOR COLLECTING URINE AND OTHER BODY FLUIDS

Patricia B. Kane, 4529 Hitching Post Trail, Rockford, Ill. 61101, and June G. Halvorson 4068 Caraway Ct., Loves Park, Ill. 61111

Filed Nov. 21, 1990, Ser. No. 616,428
Int. Cl.[5] A61F *19/00*
U.S. Cl. 604—356 34 Claims



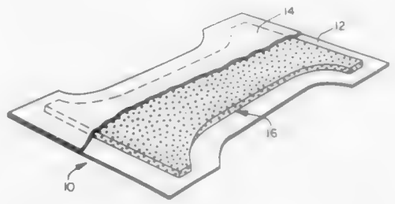
1. A system for collecting body fluids comprising:
a first unitary component part comprising a container having a chamber with an opening for receiving fluid, and
a second unitary component part comprising a handling assembly for the container comprising
holder means for removably receiving the container and supporting the container in an upright position to receive fluid through the opening, and
handle means extending from the holder means and forming a generally rigid structure for the user to support the container, when it is removably received by the holder means, in an outwardly extended position away from the user's hand, the handle means including cover means of substantially the same size as said chamber opening and being operative, when the container is removed from the holder means for movement into engagement with the opening of the container.

5,147,343

ABSORBENT PRODUCTS CONTAINING HYDROGELS WITH ABILITY TO SWELL AGAINST PRESSURE

Stanley R. Kellenberger, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 184,302, Apr. 21, 1988, abandoned. This application Apr. 10, 1989, Ser. No. 334,260
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—368 40 Claims



1. An absorbent composite comprising a porous fiber matrix and an amount of superabsorbent material present in said porous fiber matrix, wherein said superabsorbent material can absorb at least 27 milliliters of an aqueous solution of sodium chloride containing 0.9 weight percent, sodium chloride, per gram of superabsorbent material while under a restraining pressure of at least 21,000 dynes per square centimeter, provided that, when said superabsorbent material is in the form of discrete particles, at least about 50%, by weight, of said superabsorbent material has a size greater than the median pore size of said porous fiber matrix when wet.

5,147,344

HYDROGEL FOAMS, AND A PROCESS FOR THEIR PREPARATION

Günther Sachau, Quickborn; Katrin Borgschulte, and Hanns Pietsch, both of Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1991, Ser. No. 664,904
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1990, 4007668
Int. Cl.[5] A61F *13/15;* B01J *13/00;* A61K *9/66*
U.S. Cl. 604—368 10 Claims

1. A hydrogel foam comprising by weight
0.01%–20.0% of at least one crosslinking agent selected from the group consisting of
i) a compound of an at least trivalent metal or semimetal and
ii) an organic or inorganic acid or salt thereof,
0.01%–30.0% of gelatin,
30.0%–0.0% of polyvinyl alcohol,
0.0%–50.0% of an organic plasticizer,
50.0%–90.0% of water and
0 to about 20% of at least one auxiliary agent or additive.

5,147,345

HIGH EFFICIENCY ABSORBENT ARTICLES FOR INCONTINENCE MANAGEMENT

Gerald A. Young, Cincinnati; Gary D. LaVon, Harrison, and Gregory W. Taylor, Springdale, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 12, 1991, Ser. No. 743,950
Int. Cl.[5] B32B *27/00, 3/26;* A61F *13/15, 13/20*
U.S. Cl. 604—378 21 Claims

1. An absorbent article useful for absorbing aqueous body fluids discharged by an incontinent individual, said absorbent article comprising
A) a relatively liquid-impervious backing sheet;
B) a relatively liquid-pervious topsheet; and

C) an absorbent core positioned between said backing sheet and said topsheet, said absorbent core comprising
i) a fluid acquisition/distribution component positioned to receive discharged body fluids passing through the article topsheet, said fluid acquisition/distribution component comprising a porous hydrophilic structure which exhibits an initial Fluid Acquisition Rate of at least about 2 mL of synthetic urine per second; and
ii) a fluid storage/redistribution component maintained in

fluid communication with said fluid acquisition/distribution component, said storage/redistribution component comprising a polymeric foam material in the form of a hydrophilic, flexible, open-celled structure which has a free absorbent capacity at 37° C. of at at least about 12 mL of synthetic urine per gram of dry foam material and which also has an absorbent capacity for said synthetic urine under a confining pressure of 5.1 kPa maintained for 15 minutes at 37° C. which is at least about 5% of its free absorbent capacity.

5,147,346

COEXTRUDED MULTI-LAYER THERMOPLASTIC SHEET MATERIAL HAVING ONE LAYER WITH HIGH MODULUS FOR REPOSITIONING TAPE-TAB FASTENERS THEREON, ABSORBANT ARTICLES AND METHODS

Leopoldo V. Cancio; James R. Snyder, and Pai-Chuan Wu, all of Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Filed Aug. 14, 1989, Ser. No. 393,646
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—389 17 Claims

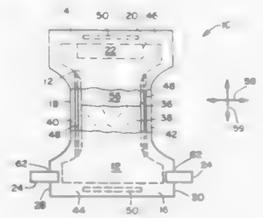
1. A coextruded thermoplastic sheet material having an outer layer especially adapted for positioning and repositioning adhesive tape-tab fasteners thereon, said sheet material having an overall thickness of from between about 0.5 mils to about 2.0 mils and an overall stiffness of from between about 20,000 psi to about 80,000 psi as measured by secant modulus at about 1% elongation and comprising at least two coextruded layers, a first layer being said outer tape-tab fastener securing layer formed with a first thermoplastic polymer having an effective modulus for resisting tear when detaching the adhesive tape-tab fasteners therefrom and an effective bonding affinity for maintaining between said outer layer and the adhesive tape-tab fasteners, and a second layer being an inner layer formed with a second thermoplastic polymer for imparting softness and effective impact strength to said sheet material, said outer layer forming a landing zone for positioning and repositioning tape-tab fasteners thereon, so that when the tape-tab fasteners are initially positioned on said outer layer and intentionally detached therefrom for repositioning thereon, said sheet material neither tears nor loses substantial adhesion therebetween.

5,147,347

DISPOSABLE GARMENT HAVING A REFASTENABLE ADHESIVE TAPING SYSTEM

Yung-Hsiang Huang, Appleton; Dave A. Soerens, Neenah; Ruth A. Lachapell, Menasha, and Paul M. Linker, III, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 17, 1991, Ser. No. 642,612
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—390 70 Claims



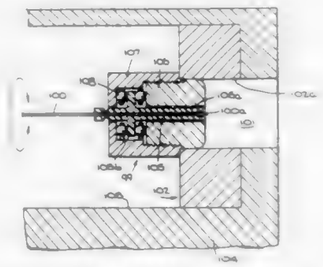
1. An article, comprising:
an outer cover having waistband sections positioned at opposite ends thereof and having an intermediate section which interconnects said waistband sections, said outer cover including a securing zone which is located at a first of said waistband sections and which provides a landing surface appointed for receiving adhesion of one or more adhesive tabs thereon, said securing zone having a peak strength of not more than about 2500 gm per inch of width and a selected rigidity value; and
an adhesive tab located at least one lateral side edge of a second of said waistband sections for securing said waistband sections around a wearer, said tab including a backing layer and an adhesive layer, said tab having, when adhered to said landing surface, a 180 degree peel adhesion value which is not more than 600 gm per inch of width as measured at a peel speed of 300 mm/sec, said backing layer having a rigidity value selected to provide a rigidity ratio of not more than about 10:1, said rigidity ratio determined by dividing said backing layer rigidity value by said securing zone rigidity value, said securing zone and adhesive tab thereby providing a refastenable taping system.

5,147,348

OPTICAL FIBER ROTATIONAL CONNECTOR

Michael E. Leckrone; Jonathan Kagan; Darryl A. Knight, and Larry A. Gunseor, all of Indianapolis, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 169,937, Mar. 18, 1990, Pat. No. 5,026,367. This application Aug. 20, 1990, Ser. No. 569,516
Int. Cl.[5] G02B *6/26*
U.S. Cl. 606—16 1 Claim



1. A rotary connecting device for rotatably connecting

device for rotatably connecting a source of laser energy disposed in a housing to an optical fiber comprising:

a positioner adapted to be mounted on the housing, the positioner having a receptacle therein adapted to be adjustably aligned with the source of laser energy.

a cylindrical carrier having an end portion thereof adapted to be mounted in the receptacle, the carrier having a cylindrical bore extending therethrough,

a ferrule having an elongated shaft portion and a disc portion, said shaft portion adapted to fit rotatably within the bore of the carrier, the ferrule having a passage extending along the central axis of its shaft portion for receiving and supporting an optical fiber therein,

a socket having a first cylindrical receptacle at one end portion thereof adapted to engage the cylindrical carrier, and another cylindrical receptacle at the other end thereof for receiving the disc portion of said ferrule, and

thrust bearing means mounted within said another cylindrical receptacle in engagement with the disc portion of the ferrule for limiting movement of the ferrule in the direction of the axis of its passage

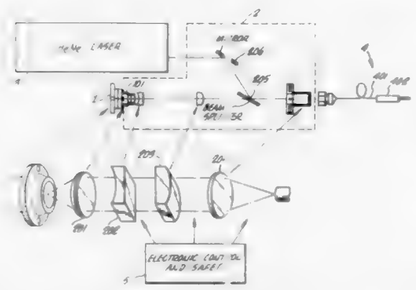
whereby an optical fiber can be supported by the ferrule in alignment with the source of laser energy for rotation with respect to the positioner without axial movement with respect thereto.

5,147,349

DIODE LASER DEVICE FOR PHOTOCOAGULATION OF THE RETINA

Robert W. Johnson, Los Altos; Ralph B. Bettman, Mountain View; Acle V. Hicks, Cupertino, and Michael Yessik, San Francisco, all of Calif., assignors to Spectra-Physics, Inc., Wilmington, Del.

Filed Oct. 7, 1988, Ser. No. 254,994
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—4 26 Claims



1. In a device for achieving photocoagulation of the retina upon delivery of a laser beam to the retina,

a diode laser for producing a diode laser beam from a diode within the diode laser, the beam diverging along an optical path extending from the diode into a beam having an approximately elliptical shape in cross-section; and

an optical system configured to substantially collimate the beam, and including at least one lens matched to said beam and configured to shape the beam so that it is approximately circular in cross-section.

5,147,350

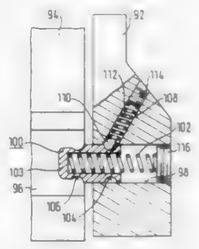
Patent Not Issued For This Number

5,147,351

SAFETY SEAL FOR STERILIZABLE CONTAINERS

Peter Wagner, Starnberg-Söcking, Fed. Rep. of Germany, assignor to Wagner GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1991, Ser. No. 743,138
Claims priority, application European Pat. Off., Aug. 10, 1990, 90115428.6
Int. Cl.[5] E05C *1/02*
U.S. Cl. 292—284 3 Claims



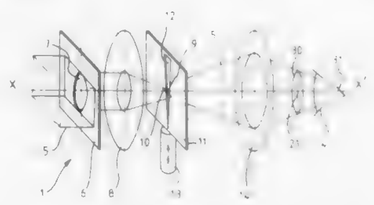
1. Safety seal for sterilizable containers, with a definite closure state that ensures that the container has remained closed subsequent to sterilization and with an open state that indicates that it has been opened subsequent to sterilization, characterized in that the seal has a locking mechanism (**100**) that automatically mechanically locks the container closed subject to the heat of sterilization, a bracket (**94**) for maintaining said container closed, the locking mechanism including a pushbutton (**100**) that inheres in both a locking and an unlocking position (**104 & 106**) relative to bracket (**94**) and that can be manually shifted into the unlocking position at will, said pushbutton (**100**) when in said locking position blocking operation of said bracket (**94**) and thereby prevent opening of said container, said pushbutton (**100**) requiring application of direct manual force for operation to said unlocking position clear of said bracket (**94**) whereby the latter may be operated to permit opening of said container.

5,147,352

OPTICAL SYSTEM FOR USE IN A SURGICAL APPARATUS

Alain Azema, 28, avenue des Arénes; Jean Botineau, 5, avenue Chateaubriand, and Gérard Moulin, 167, avenue Maréchal Lyautey, all of Nice, France, assignors to Alain Azema; Jacques Arneodo, both of Nice; Jean Botineau, Valbonne; Philippe Crozafon, Nice and Gérard Moulin, Valbonne, all of, France

Filed Jun. 29, 1988, Ser. No. 214,046
Claims priority, application France, Jul. 8, 1987, 87 09703
Int. Cl.[5] A61N *5/06*
U.S. Cl. 606—5 8 Claims



1. An optical system to be disposed between a source capable of emitting a divergent beam of light and a target, said optical system including first optics for focusing said beam of light, wherein at the upstream focal point of said first optics, said beam produces an image which is at least substantially circular in section, but wherein due to the divergent nature of the beam of light, produces an image at the downstream focal point of said first focusing optics which has a section of oblong shape, wherein said optical system successively comprises, in the direction of propagation of said beam, downstream of said first optics, first shaping means disposed near the focal point of said first focusing optics, said first shaping means obscuring a variable part of said beam, and second focusing optics, with the result that, for any relative displacement of the target and said optical system wherein said target is within about one focal length of said second focusing optics, the area of said beam removed by said first shaping means is adjustable so as to obtain, at the level of the target, a section of beam which remains at least substantially circular,

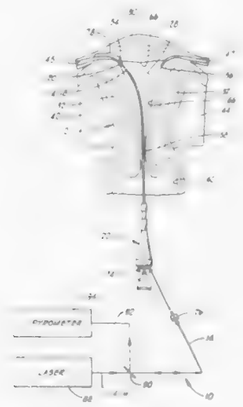
wherein said first shaping means are constituted by a diaphragm disposed transversely to the direction of propagation of the beam, said diaphragm including a slot, the width of said slot uninterruptingly varying between zero and the largest dimension of the oblong section of the beam at the location of said first shaping means, and said optical system further comprises means for displacing said diaphragm relative to the rest of said system transverse to the direction of propagation of the beam.

5,147,353

MEDICAL METHOD FOR APPLYING HIGH ENERGY LIGHT AND HEAT FOR GYNECOLOGICAL STERILIZATION PROCEDURES

Royice B. Everett, Edmond, Okla., assignor to MyriadLase, Inc., Forest Hill, Tex.

Filed Mar. 23, 1990, Ser. No. 498,349
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—15 15 Claims



1. A method of sterilizing a female patient, comprising:

(a) inserting into the patient's uterus an elongated light transmitting conduit having a heat generating device on a distal end thereof, said heat generating device having a light transmitting aperture extending through a forward portion thereof;

(b) maintaining the heat generating device in fixed contact with an inner wall of the patient's uterus adjacent one of the patient's tubal ostia while transmitting light energy to the heat generating device to coagulate a substantial part of the interstitial portion of the patient's fallopian tube associated with said one of the patient's tubal ostia so that the fallopian tube is closed, wherein a portion of the light energy transmitted through said conduit passes out through said aperture and through said tubal ostia into said fallopian tube to aid in coagulating said interstitial portion of said fallopian tube; and

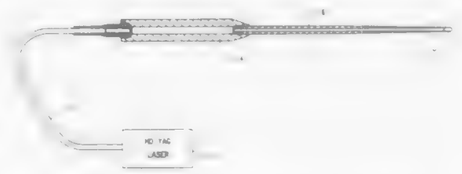
(c) repeating step (b) for the other of the patient's fallopian tubes, so that both fallopian tubes are closed.

5,147,354

MID-INFRARED LASER ENDOSCOPE

Theodore A. Boutacoff, Los Altos; David M. Buzawa, San Jose, and Thomas S. Nelsen, Stanford, all of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Continuation of Ser. No. 626,388, Dec. 12, 1990, Pat. No. 5,037,421, which is a continuation of Ser. No. 418,942, Oct. 6, 1989, abandoned, which is a continuation of Ser. No. 234,307, Aug. 19, 1988, abandoned. This application Jul. 25, 1991, Ser. No. 735,819
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—15 9 Claims



1. A method of performing an endoscopic procedure comprising the steps of:

generating a laser beam having a wavelength of between 1.8 and 2.2 microns;

directing the beam into one end of a fiber optic cable, with the other end of the fiber optic cable defining the delivery end thereof;

positioning the delivery end of the fiber optic cable adjacent the tissue to be ablated by the laser beam; and

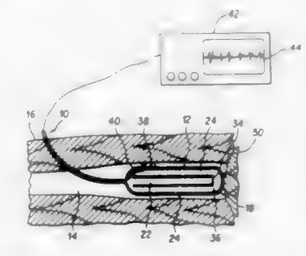
irrigating the tissue with a liquid medium as it is being ablated by the laser beam.

5,147,355

CRYOABLATION CATHETER AND METHOD OF PERFORMING CRYOABLATION

Peter L. Friedman, Rowley; Paul Wang, Brookline, and Ernest G. Cravalho, Wellesley Hills, all of Mass., assignors to Brigham and Womens Hospital, Boston, Mass.

Filed Sep. 23, 1988, Ser. No. 249,343
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—23 6 Claims



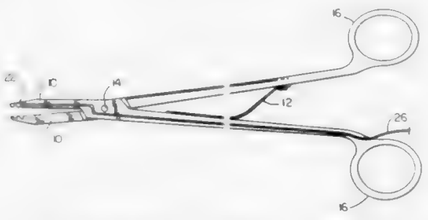
1. A method of cryogenically ablating a predetermined portion of tissue within a blood vessel of a patient, comprising the steps of:

inserting a catheter having a tip portion into the lumen of the blood vessel;

guiding said catheter to a predetermined portion of the patient's body and positioning said tip portion adjacent tissue within the lumen of the blood vessel to be ablated;

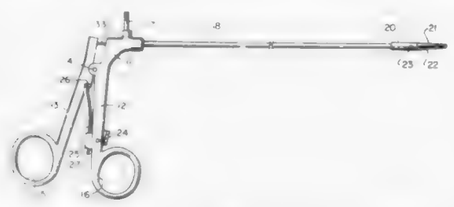
directing a flow of cryogenic fluid to said tip portion;
effecting a cooling of said cryogenic fluid adjacent said tip portion; and
removing said fluid from said tip portion.

5,147,356
SURGICAL INSTRUMENT
Nayantara Bhatta, Brookline, Mass., assignor to Microsurge, Inc., Needham, Mass.
Filed Apr. 16, 1991, Ser. No. 686,248
Int. Cl.[5] A6 B *17/36*
U.S. Cl. 606—37 8 Claims



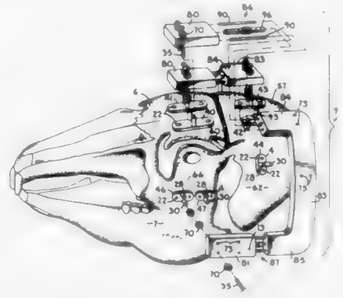
1. A surgical instrument comprising a pair of opposed jaw members, at least one of which jaw member is moveable with respect to the other jaw member, and including a heat source operatively disposed on or adjacent at least one of said jaw members for cutting and/or cauterizing during the performance of surgery, wherein said jaw members are dimensioned to receive and hold ligating clips, and wherein said jaw members are moveable between a clip applying open position, and a clip closing position.

5,147,357
MEDICAL INSTRUMENT
Anthony T. Rose, and Theresa M. Rose, both of 741 Lakefield Rd., Suite G, Westlake, Calif. 91361
Filed Mar. 18, 1991, Ser. No. 670,955
Int. Cl.[5] A6 B *17/39*
U.S. Cl. 606—49 7 Claims



1. A medical instrument of the forcep type comprising the combination of:
an instrument body having a downwardly extendig handle portion;
a handle lever pivotally carried on said instrument body;
an elongated tube having one end secured to said instrument body outwardly projecting normal to said handle portion to terminate in a free end;
a jaw arrangement operably to open and close in response to movement of said handle lever;
a gear arrangement movably carried on said tube and coupled to asid jaw arrangement; and
an actuation rod movable within said tube having one end secured to said gear arrangement and its other end pivotally secured to said handle lever.

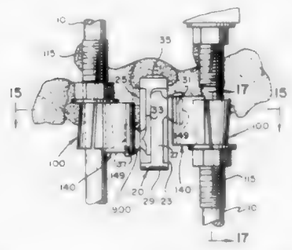
5,147,358
CRANIAL FIXATION-DISTRACTION AND POSITIONING APPARATUS AND METHOD
Daniel J. Remmler, 2330 S. 17th St. #2, Lincoln, Nebr. 68502
Filed Oct. 23, 1990, Ser. No. 602,947
Int. Cl.[5] A61F *5/00*
U.S. Cl. 606—57 15 Claims



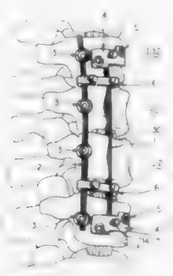
10. An apparatus for distracting an anterior portion of an animal skull and facial skeleton portion forwardly from a posterior and a temporal portion of the skull and depositing new bone at a cranial suture therebetween and for holding the skull at a precise position relative to monitoring equipment; said apparatus comprising:
(a) a first fixation plate assembly adapted to be attached to the anterior portion of a skull;
(b) a second fixation plate assembly adapted to be attached to the facial skeleton;
(c) a third fixation plate assembly adapted to be attached to the posterior portion of the skull;
(d) a fourth fixation plate assembly adapted to be attached to the temporal portion of the skull;
(e) a U-shaped distraction bar assembly fixedly attached to said first, second, third and fourth fixation plate assemblies; said distraction bar assembly having:
(1) a first generally horizontally oriented anterior leg;
(2) a second generally horizontally oriented anterior leg having an aperture; and
(3) a generally vertically oriented posterior end member;
(f) a first jackscrew assembly fixedly attached to said first leg and said posterior end member and located between said first fixation plate and said third fixation plate;
(g) a second jackscrew assembly fixedly attached to said second leg and said posterior end member and located between said second fixation plate and said fourth fixation plate;
(h) a base;
(i) a radiograph holder fixedly attached to said base;
(j) a telescoping lower support slidingly attached to said base and selectively spaced from said radiograph holder; and
(k) a skull holding and positioning assembly connected to and adjustably spaced from said radiograph holder and adapted for being inserted into said aperture.

5,147,359
SPINAL HOOK BODY
Trent E. Cozad, Fort Wayne; Antony J. Lozier, Warsaw; Jerry L. Lower, Bourbon, all of Ind., and Allan F. Tencer, Seattle, Wash., assignors to Zimmer, Inc., Warsaw, Ind.
Division of Ser. No. 287,245, Dec. 21, 1988, Pat. No. 5,074,864.
This application May 14, 1991, Ser. No. 700,221
Int. Cl.[5] A61F *5/00*
U.S. Cl. 606—61 3 Claims

1. A spinal hook body assembly including a structure having a stud extending outwardly therefrom, an elongated rod, and a hook body for interconnecting the structure and the rod, the hook body comprising:
(a) a recess in said body with an opening at one side thereof for receiving said stud therein through said opening; and
(b) an open-backed tapered bore in said body connected with said recess and adapted to receive said rod therethrough, and wherein said hook body assembly further includes a locking means for locking said hook body to said stud and rod, and wherein said locking means comprises a locking sleeve means interposable between said rod and bore and including a surface adapted to lock said stud in said recess.



5,147,360
OSTEOSYNTHESIS DEVICE FOR THE CORRECTION OF SPINAL CURVATURES
Jean Dubousset, Clamart, France, assignor to Societe de Fabrication de Materiel Orthopedique, Paris, France
Filed Feb. 19, 1991, Ser. No. 656,822
Claims priority, application France, Feb. 19, 1990, 9001970
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—61 18 Claims

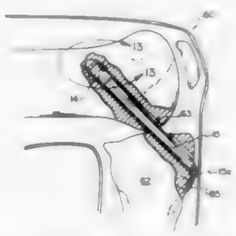


7. An osteosynthesis device for the correction of spinal curvatures, comprising:
a first rod to be fixed on the anterior part of the vertebral bodies and a second rod to be fixed on the lateral or posterior part of the vertebral bodies;
means for fixing said second rod to the lateral or posterior part of the vertebral bodies;
a plurality of plates, each said plate having shape of an inward curve with an arched convex outer surface, said arched convex outer surface corresponding to the anterolatral anatomy of the vertebral bodies, and an inner surface opposite said arched convex outer surface having a boss protruding from said inner surface in a median area of said plate in a direction away from said arched convex outer surface, said boss having an opening extending therethrough for receiving said first rod;
means for locking said first rod in said plates; and
means for anchoring said plates in the vertebral bodies.

5,147,361
VERTEBRAL CONNECTING PLATE
Satoshi Ojima, and Hiromi Matsuzaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 29, 1990, Ser. No. 619,492
Claims priority, application Japan, Nov. 29, 1989, 1-138193[U]
Int. Cl.[5] A61B *17/56, 17/58*
U.S. Cl. 606—61 22 Claims

18. A vertebral connecting plate comprising vertebra connecting portions adapted to be connected to associated vertebra members, and an intermediate connecting portion connecting said vertebra connecting portions, said vertebra connecting portions having threaded holes in which associated set screws are adapted to be screwed, said threaded holes in each of said vertebra connecting portions being aligned along a line that intersects the longitudinal axis of said vertebral connecting plate at an oblique angle.

5,147,362
ENDOSTEAL LIGAMENT FIXATION DEVICE
E. Marlowe Goble, 850 E. 1200 North, Logan, Utah 84321
Filed Apr. 8, 1991, Ser. No. 681,974
Int. Cl.[5] A61F *2/08*
U.S. Cl. 606—72 15 Claims



1. An endosteal fixation device comprising, a mounting means including a plurality of pin means to extend outwardly from around a graft; said plurality of pin means are spaced equidistantly and extend radially outwardly and rearwardly from said mounting means, each at an angle less than sixty (60) degrees of from said graft surface, said pin means each formed to flex toward said graft surface when compressed during travel within a bone tunnel or hole and will spring outwardly to their original altitude when that compression is released so as to lock into the bone endosteum wherein said bone tunnel or hole is formed.

5,147,353
SCREW FOR USE IN OSTEOSYNTHESIS
Anton Härle, Drechslerweg 40, D-4400 Münster, Fed. Rep. of Germany
Filed Dec. 19, 1990, Ser. No. 629,996
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942326
Int. Cl.[5] A61B *17/53*
U.S. Cl. 606—73 11 Claims

1. An osteosynthetic screw for setting bones or bone fragments, comprising an osteological thread zone, an extension for coupling the screw to an osteosynthetic accessory, and a threadless handle between said zone and said extension, said zone including a divergent reinforcing portion which is adjacent said handle and has a diameter which increases toward said handle, said portion of said zone extending radially outwardly beyond said handle

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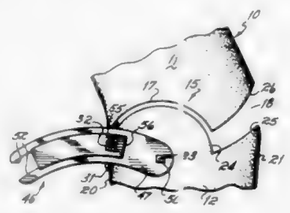
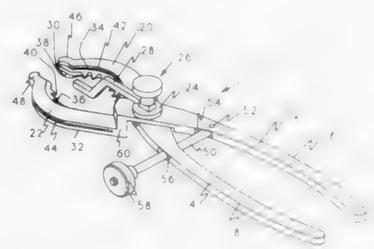
5,147,364
OSTEOTOMY SAW/FILE, CUTTING GUIDE AND METHOD
John E. Comparetto, Cincinnati, Ohio, assignor to Ohio Medical Instrument Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 304,257, Feb. 8, 1989, Pat. No. 4,952,214, which is a continuation-in-part of Ser. No. 841,948, Mar. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,475, Jun. 27, 1985, Pat. No. 4,664,102, and Ser. No. 721,640, Apr. 10, 1985, Pat. No. 4,708,133, and Ser. No. 667,424, Nov. 1, 1984, Pat. No. 4,632,102, which is a division of Ser. No. 294,653, Aug. 20, 1981, Pat. No. 4,501,268. This application Mar. 1, 1990, Ser. No. 486,815
Int. Cl.[5] A61B *5/04*
U.S. Cl. 606—85 31 Claims



1. An osteotomy saw/file comprising:
a semicircularly curved blade of uniform thickness having first and second faces on opposite sides thereof and first and second longitudinal edges between said faces,
at least one of said faces comprising a file having teeth for filing a kerf in a bone in a direction transverse to said face, said first edge having teeth formed thereon for cutting edgewise through a bone to make an arcuate cut having a curvature corresponding to that of said blade, and
a shank for engagement by a drive motor to apply reciprocating motion to said blade,
the described configuration of said blade thereby enabling an arcuate osteotomy including both a correction cut and an arcuate cut to be performed without removing the blade from a bone, the blade filing a correction cut as a kerf when the blade is advanced in a bone in a direction transverse to said one face and sawing an arcuate cut when advanced circumferentially in a bone along the circumference of said blade.

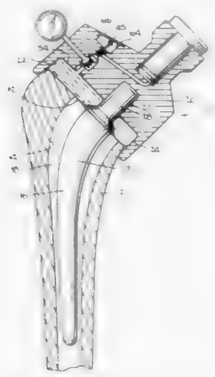
5,147,365
PATELLAR OSTEOTOMY GUIDE
Steven I. Whitlock, Austin, and Steven G. Brown, Pflugerville, both of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.
Filed Aug. 19, 1991, Ser. No. 746,964
Int. Cl.[5] A61B *17/14*
U.S. Cl. 606—88 16 Claims



1. An apparatus for guiding a sagittal saw during resection of a bone comprising
means for gripping the bone;
slot means integral with said gripping means for receiving a blade of the sagittal saw and defining a plane of resection for said sagittal saw; and
means setting a depth of resection to be made in the bone by the sagittal saw, said depth setting means comprising
a stylus for contacting an exposed surface of said bone;
means for displacing said stylus in a linear direction substantially perpendicular to said plane of resection;
means for locking said stylus at a selected linear displacement; and
means for rotating said stylus about an axis parallel to said linear direction, said rotating means being operable independently of said displacing means and said locking means.

5,147,366
PRESSURIZATION OF BONE CEMENT SURROUNDING AN ENDOPROSTHESIS
Nestor A. Arroyo, East Windsor; Casper F. Stark, Pompton Lakes, and Raymond W. Augustin, Kendall Park, all of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.
Filed Mar. 1, 1990, Ser. No. 487,342
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—94 4 Claims

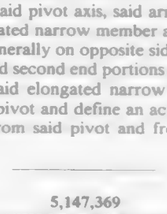
1. An apparatus for use in applying a predetermined pressure to an exposed surface of a curable bone cement in an area surrounding an exposed end of a prosthesis, during the curing of the cement to achieve fixation of the prosthesis, the apparatus comprising:
a generally annular inflatable resiliently expandable fluid-containing sealing member having a deformable bottom surface having an opening therein for fitting over the exposed end of the prosthesis, said sealing member having an outer diameter extending beyond the exposed surface of the bone cement, said sealing member having a deformable surface disposed in a substantially co-planar relationship with the exposed surface of the bone cement and extending beyond the edges of a bone defining the cavity to seal the bone cavity upon the deformation of said deformable surface;
a rigid body having a downwardly open recess formed in a bottom surface thereof for receiving said resiliently expandable fluid-containing sealing member with said deformable surface disposed adjacent to the downward opening of said open recess;
a fluid reservoir formed within said rigid body;
a piston operatively mounted within said fluid reservoir and moveable from a first position within said fluid reservoir to a second position, such that fluid is expelled from the fluid reservoir as said movement progresses;



a passageway formed within said rigid body for connecting said fluid reservoir to said resiliently expandable sealing member;
means mounted in said passageway for permitting fluid expelled from said reservoir to flow through said passageway from said reservoir to said resiliently expandable fluid-filled sealing member, but preventing fluid from flowing through said passageway from said resiliently expandable fluid-filled sealing member to said reservoir;
means for inflating said sealing member and causing said deformable surface to apply pressure to said exposed surface of said cement;
means for controlling the pressure applied to the exposed surface of the bone cement by said sealing member to within a predetermined range; and
means for deflating said fluid-filled sealing member by relieving the pressure therein.

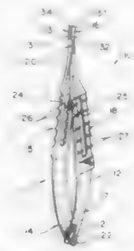
5,147,367
DRILL PIN GUIDE AND METHOD FOR ORTHOPEDIC SURGERY
Alfred B. Ellis, 5263 Santa Elena, El Paso, Tex. 79932
Filed Feb. 22, 1991, Ser. No. 660,719
Int. Cl.[5] A61B *17/56, 17/58*
U.S. Cl. 606—96 17 Claims

1. An orthopedic device for setting a bond fragment relative to an adjacent bone mass, said device comprising:
a body;
a barrel located on and rotatable relative to said body;
a first channel through said barrel for accepting a first elongated orthopedic fastening device installed in said bone fragment and for aligning said barrel along said first elongated orthopedic fastening device; and
a second channel for laterally spacing a second elongated fastening device from said first elongated orthopedic fastening device and for aligning said second elongated



orthopedic fastening device parallel to said first elongated orthopedic fastening device.

5,147,368
NUCLEUS SPLITTER
Alan W. Brown, 4 Hartley Cir., Apt. 824, Owings Mills, Md. 21117
Filed Apr. 5, 1991, Ser. No. 680,888
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—107 9 Claims

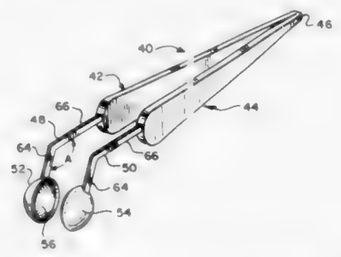


3. A nucleus splitter sized and configured to crack a hard nucleus of an eye after the latter has been sculpted by a pair of crossing grooves to form quadrants comprising a pair of arms, said arms each having opposite first and second end portions and a medial portion therebetwen, said arms being united at a pivot located between the first portions and the medial portions, said pivot having a pivot axis, said first end portions each being a relatively elongated narrow member, said elongated narrow members including opposing adjacent face surfaces and nonopposing lateral edge surfaces, each lateral edge surface ending in a nucleus splitting tip having a lateral axis of projection generally parallel to the pivot axis, said second end portions being generally resilient and normally urging said narrow members and tips into peripherally coincident overlapped side-by-side abutment with each other along a plane generally through said pivot axis, said arms first end portions including the elongated narrow member and tips thereof each lying at all times generally on opposite sides of said plane, and forces applied to said second end portions and directed toward each other cause said elongated narrow members to spread apart through said pivot and define an acute angle opening in a direction away from said pivot and from said second end portions.

5,147,369
FORCEPS AND METHOD FOR NUCLEAR FRAGMENT REMOVAL
Michael A. Wagner, 5127 Vista Hermosa, Long Beach, Calif. 90815
Filed Jul. 1, 1991, Ser. No. 723,797
Int. Cl.[5] A61F *9/00*
U.S. Cl. 606—107 15 Claims

1. Forceps for use in ophthalmic surgery comprising a pair of elongated arms both having mutually attached ends joined

together at a single common fulcrum connection and opposite free ends movable in rotation relative to each other, and concave cup-shaped implements located at the extreme tips of said free ends of said arms in mutually facing relationship, wherein said cup-shaped implements have recessed central regions and



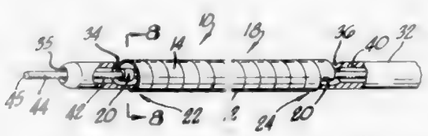
surrounding cutting edges that extend completely around said central regions and which are movable into mutual contact throughout their entire perimeters, whereupon said implements define an isolated, completely enclosed cavity therebetween.

5,147,370

NITINOL STENT FOR HOLLOW BODY CONDUITS

Thomas O. McNamara, 919 Levering #505, Los Angeles, Calif. 90024, and Gregory Mednik, 1530 N. Pointettia Place #221, Los Angeles, Calif. 90046

Filed Jun. 12, 1991, Ser. No. 713,770
Int. Cl.[5] A61M *5/00*; A61B *17/00*
U.S. Cl. 606—108 10 Claims



9. A method of placing an internal support into a hollow structure utilizing a tubular placement device, the tubular placement device having a central lumen extending along its length comprising:

forming a fixed length wire of a shape memory alloy into a first shape sized to fit within and support the hollow structure, said wire having first and second retention means on the ends thereof,

cooling the wire to a temperature below the transition temperature range of the shape memory alloy,

placing the first retention means through a first opening in the wall of the tubular placement device,

securing the first retention means within the lumen of the tubular placement device by advancing an end of a mandril along a portion of the length of the lumen and through the first retention means,

wrapping the wire around the outer surface of the tubular placement device and placing the second retention means through a second opening in the wall of the tubular placement device into the lumen,

securing the second retention means in the lumen by advancing the end of the mandril further along the length of the tubular placement device through the second retention means and past the second opening,

advancing the tubular placement device with the wire wound on its outer surface into the hollow structure until the first retention means is at a desired location in the hollow structure,

releasing the second retention means by withdrawing the end of the mandril to a point between the first and second opening in the wall,

allowing the wire to at least partially reform to its first shape an amount sufficient to retain the wire within the hollow structure, said reformation being caused by exposing the wire to a temperature greater than the transition temperature range of the alloy,

releasing the first retention means by withdrawing the end of the mandril past the first opening, and

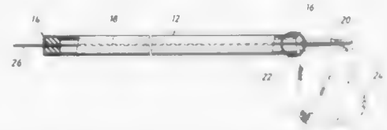
withdrawing the tubular placement device and mandril from the hollow structure.

5,147,371

APPARATUS FOR REMOVING GALLSTONES AND TISSUE DURING SURGERY

Charles N. Washington, deceased, late of Lake Charles, and by Virginia Y. Washington, executrix, 980 Terry La., Lake Charles, both of La. 70605

Filed Jun. 28, 1991, Ser. No. 723,057
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—127 2 Claims



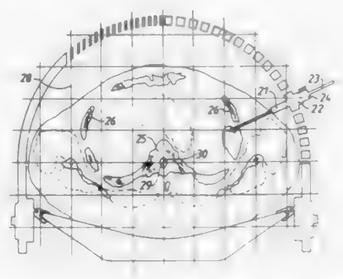
2. An apparatus for the in situ collection of surgically excised material comprising: an elongated tube having a first end and a second end; a wire entering said tube at said first end, traversing the length of said tube, exiting said tube at said second end, forming a loop at said second end which includes at least a full circle of said wire, reentering the tube at said second end and again traversing the length of the tube to exit at the site of entry; and a collection pouch having an openable mouth and means at said openable mouth for encircling said loop, wherein said loop acts as a drawstring for said pouch and the size of said loop generally defines the opening size of said openable mouth of said pouch.

5,147,372

BIOPSY ARC MEANS AND THE USE OF THE SAME

Bernt Nymark, S-931 45, and Gunnar Näsström, S-931 51, both of Skellefteå, Sweden

PCT No. PCT/SE89/00411, § 371 Date Jan. 11, 1991, § 102(e) Date Jan. 11, 1991, PCT Pub. No. WO90/00372, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 13, 1989, Ser. No. 634,884
Claims priority, application Sweden, Jul. 13, 1988, 8802620
Int. Cl.[5] A61B *19/00*
U.S. Cl. 606—130 22 Claims



11. A frame for use in computed tomography, comprising: an arc comprising a material having a radiation attenuation

coefficient which is less than a radiation attenuation coefficient of some organic tissue that is to be examined;

a plurality of apertures arranged in the arc having axes directed towards an area under the arc; and

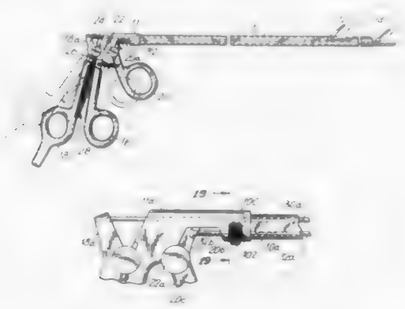
means for angularly adjusting the arc so that at least some of said aperture axes coincide with a section plane of a tomographic image in order to form a part of said tomographic image.

5,147,373

LAPAROSCOPIC INSTRUMENT

George S. Ferzli, 48 Merrick Ave., Staten Island, N.Y. 10301

Continuation-in-part of Ser. No. 703,529, May 21, 1991, which is a continuation-in-part of Ser. No. 692,422, Apr. 29, 1991. This application Nov. 1, 1991, Ser. No. 786,482
Int. Cl.[5] A61B *17/04*
U.S. Cl. 606—144 15 Claims



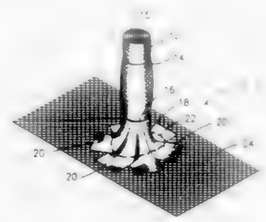
1. A laparoscopic instrument for use in laparoscopic surgery comprising an elongated member, said elongated member having a proximal end and a distal end, first jaw means comprising two relatively movable jaw elements disposed at said distal end, second jaw means comprising two relatively movable jaw members disposed intermediate said proximal and distal ends, said first and second jaw means being movable between open and closed positions, finger grip means on said proximal end of said elongated member, said finger grip means being operably connected to said first and second jaw means for actuating said first and second jaw means between said open and closed positions, and rotating means on said elongated member for rotating one of said jaw means relative to the other jaw means.

5,147,374

PROSTHETIC MESH PATCH FOR HERNIA REPAIR

Alfredo Fernandez, 16145 Carden Dr., Odessa, Fla. 33556

Filed Dec. 5, 1991, Ser. No. 802,504
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—151 12 Claims



1. A surgical flared patch for use in laparoscopic hernia repair comprising

a rolled up sheet of a surgical plastic mesh maintained in a rolled up form by at least two bands and multiple longitudinal cuts in a first end of the rolled up mesh to form multiple flared out flaps,

a planer sheet of a surgical plastic mesh permanently attached to the flaps in a flared out position, the flaps and planer sheet being capable of compressing together as a longitudinal extension of the rolled up sheet of surgical plastic mesh and inserted into a cylindrical plastic delivery tube.

5,147,375

SAFETY FINGER PRICK INSTRUMENT

Ann Sullivan, 5605 N. Winthrop Ave., Indianapolis, Ind. 46220; Lara Dein, 8120 Rucker Rd., Indianapolis, Ind. 46220, and Scott T. Engelking, 7256 Jessman Rd.E. Dr. #H, Indianapolis, Ind. 46256

Filed May 31, 1991, Ser. No. 708,759
Int. Cl.[5] A61B *17/34*
U.S. Cl. 606—182 4 Claims

1. A skin pricker device kit comprising, in combination:

a hollow tubular shell;

a control shaft;

support means supporting the control shaft within the shell but permitting it to move axially of the shell;

the shell having a skin-pricking end, and the shell extending from the skin-pricking end providing a handle by which the person administering the skin-pricking procedure may carry the shell and administer the skin-pricking procedure;

first spring means carried by the shell, and biasing the control shaft toward the skin-pricking end of the shell;

a needle having a sharp end for pricking the skin of the person whose skin is to be pricked and an opposite end for receiving support for the needle;

a support base which supportively carries the needle;

the control shaft having at its skin-pricking end a receiver of the needle's support base;

the receiver and the support base being formed to provide them to be non-rotatable with respect to one another;

there being second spring means biasing the control shaft opposite from the bias imposed by the first spring means, and the second spring means being operable, after the first spring means has caused the control shaft to move to force the needle the axial distance needed for the skin-pricking procedure, to cause the control shaft to move the needle oppositely to its skin-pricking movement;

and manually operable control means for controlling whether the first spring means is in a stressed or unstressed condition;

in a combination in which the needle support base and the needle are connected by a needle stem, and in which there is provided a hollow carrier sleeve closed at one end but

open at its other end, the said other end having female screw threads, and the sleeve's open end having a recess in which the needle and the needle's stem are receivable;
the needle's support base having male screw threads which are screw-threadedly engageable with the female screw threads of the carrier sleeve;
and in which there is provided a cap body having an opening, the opening accommodating the reception therethrough of the carrier sleeve;
the cap body and the shell, at the skin-pricking end of the shell, having cooperative retention means by which the cap body provides an abutment blocking the needle assembly from moving outwardly of the shell except as the carrier sleeve pulls the needle's support base by force transmitted through the said threaded engagement of the threads of the sleeve and support base, which can occur only if the needle and needle stem are received in the carrier sleeve.

5,147,375

TROCAR NEEDLE LAPAROSCOPY WITH A THREADED TRUNCATED CONE BIT

Francesco Pianetti, Via Turati, 22, 20013 Magenta (Prov. of Milan), Italy

Filed May 2, 1991, Ser. No. 695,000
Claims priority, application Italy, May 4, 1990, 20218 A/90
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—170 **5 Claims**

1. Trocar needle for laparoscopy with a threaded truncated cone bit (1) characterized in that it has at the truncated cone end a flat cutting blade (2) with rounded edge and arranged obliquely to the needle axis and the plane perpendicular to the needle axis and which continues with a cutting thread (3) developing in a single turn around the truncated cone bit and designed to penetrate the abdominal wall by a single rotation without pressure.

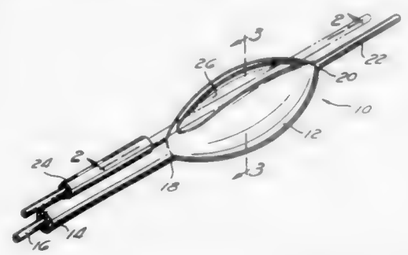
5,147,377

BALLOON CATHETERS

Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740

Continuation of Ser. No. 276,375, Nov. 23, 1988, Pat. No. 4,983,167. This application Jul. 12, 1990, Ser. No. 551,466
The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.
Int. Cl.[5] A61M *26/00*
U.S. Cl. 606—194 **10 Claims**

1. A catheter for seducing body lumens having a stenotic region, comprising:
an axially elongate catheter shaft, constructed and arranged for insertion into a distal body lumen, said catheter shaft having an inflation conduit extending axially therethrough;
a dilatation balloon secured to said catheter shaft so that no portion of said catheter shaft extends beyond the distal end of said ballon, said dilatation balloon being in fluid communication with said inflation conduit and outwardly radially expandable to a preselected configuration in response to inflation thereof;
a first guide wire extending through said catheter shaft and attached to said dilatation balloon, said catheter having



only a small advance wire segment extending beyond the distal end of said balloon; and
a second guide wire disposed adjacent said catheter shaft and movably secured thereto, said second guide wire adapted to remain behind said dilatation balloon during the initial insertion thereof across said stenotic region and adapted for advancement across said stenotic region within said body lumen, after said lumen has been dilated by said dilatation balloon, so as to provide distal access to the body lumen in the event of occlusion thereof.

5,147,378

GRASPING FORCEPS

Harold Markham, 508 N. Rexford Dr., Beverly Hills, Calif. 90210

Filed Mar. 5, 1991, Ser. No. 664,778
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—206 **3 Claims**

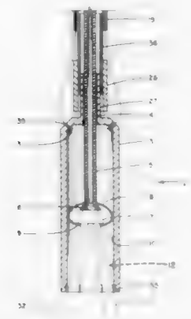
1. Apparatus for grasping human tissue or the like comprising:
a flexible handle having a first portion spaced from a second portion and an elongated hollow cannula having one end fixed to said second portion and extending through said first portion and the other end opening externally of and remote from said handle;
an elongated stylet telescopingly and slidably mounted within said cannula having one end fixed to said handle and the other end terminating adjacent the open end of said cannula;
a pair of integrally connected resilient spaced gripping members coupled to the distal end of said stylet, each of said gripping members extending away from the distal end of said stylet and outwardly therefrom each other, said open end of said cannula being adapted to abut against said gripping members when said handle is squeezed, whereby said cannula moves linearly with respect to said handled while said stylet remains stationary and the open end of said cannula moves over said gripping members forcing them together to grasp human tissue therebetween; and
a cover disposed on top of said first and second portions, said stylet being connected to said cover.

5,147,379

INSERTION INSTRUMENT FOR VENA CAVA FILTER

Mehdy Sabbaghian, Baton Rouge, La.; Tony Barfield, Beaumont, Tex.; Patrick Schiele, Schenectady, N.Y.; David W. Newton, Baton Rouge, La.; Gregory J. Lormand, Baton Rouge, La., and Glen J. Schwartzberg, Baton Rouge, La., assignors to Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed Nov. 26, 1990, Ser. No. 617,672
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—206 **2 Claims**



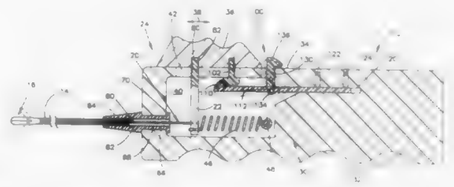
1. In an insertion instrument for positioning a filter in a blood vessel, including a carrier for carrying said filter to an implantation site in said blood vessel, an ejector actuating means and plunger means operatively connected to said carrier for ejecting the filter from said carrier, an elongated flexible tube connected at one end to said carrier for advancing said carrier to the intended filter placement location, and a plunger housing secured to said flexible tubing at an end opposite said carrier to provide a guide for said ejector actuating means and a rigid structure for securing other associated component parts, the improvement of which comprises means operatively connected to said plunger means within said carrier for retaining and retracting said filter prior to release of said filter into the blood vessel, wherein said means for retaining and retracting comprises:
(i) a plunger tip at the end of said plunger means for making contact with said filter and ejecting said filter from said carrier;
(ii) a resilient clamping means secured to said plunger means compressed while within said carrier for retaining said filter prior to complete ejection, resiliently expanding upon exiting said carrier and thereby releasing said filter into said blood vessel; and
(iii) a plurality of filter leg alignment slots formed into the inner surface of said carrier for maintaining equal spacing between said filter legs and guiding said filter legs as said filter is ejected into said blood vessel.

5,147,380

BIOPSY FORCEPS DEVICE HAVING IMPROVED LOCKING MEANS

Ernesto Hernandez, Miami, and James A. Rigsby, North Miami Beach, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Filed Oct. 3, 1991, Ser. No. 770,606
Int. Cl.[5] A61B *10/00*
U.S. Cl. 606—207 **8 Claims**



1. A biopsy forceps device comprising:
a handle;
an elongated flexible hollow body portion having a lumen extending therethrough and having a proximal end and a distal end;
a forceps assembly coupled to the distal end of said body portion, and including a pair of forceps;
control wire means having proximal and distal ends and extending through the lumen in said body portion and coupled at its said proximal end to said handle and at its said distal end to said forceps assembly;
trigger means connected to the proximal end of said control wire means, said trigger means being slidably mounted to said handle for slidable movement relative thereto between a rear position and a forward position for respectively causing said forceps to be in a closed condition and in an open condition;
releasable forceps locking means for normally blocking forward slidable movement of said trigger means when said trigger means is in its said rear position thereby preventing said forceps from being actuated to said open condition; and
release means for releasing said locking means from blocking forward movement of said trigger means to thereby permit the forward movement of said trigger means to cause said forceps to be actuated to said open condition.

5,147,381

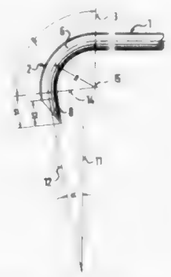
SURGICAL CLIP

Albert Heimerl, and Holger Kartheus, both of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf AG, Hamburg, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,365
Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014653
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—219 **9 Claims**

1. A surgical clip having an axis of symmetry and comprising a bridge and two legs extending therefrom, one on each side of said axis of symmetry, each leg having a part extending over an arc of a circle and being connected to, and projecting from, the

bridge, from which arcuate part extends a straight free ended section having a cutting edge, wherein each straight section is



set at an angle which lies in the range of 2.5° to 10° with respect to said axis of symmetry.

5,147,382

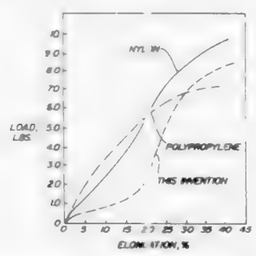
ELASTOMERIC SURGICAL SUTURES COMPRISING SEGMENTED COPOLYETHER/ESTERS

Arthur A. Gertzman, Bridgewater, and Mark T. Gaterud, Annandale, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

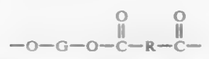
Division of Ser. No. 77,055, Sep. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 967,656, Dec. 8, 1978, abandoned. This application Oct. 16, 1981, Ser. No. 311,829

Int. Cl.[5] A61L *17/00*

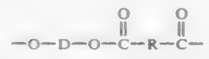
U.S. Cl. 606—228 **5 Claims**



1. A non-absorbable monofilament sterile surgical suture having an attached needle comprising a segmented copolyether/ester of long chain ether/ester units of the general formula:



wherein G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly (C_{2-10} alkylene oxide) glycol having a number average molecular weight within the range of about 350 to about 6000 and R is a divalent radical remaining after the removal of carboxyl groups from an aromatic dicarboxylic acid having a molecular weight of less than about 300 or is cyclohexylene; and short chain ester units of the formula:



wherein D is a divalent radical remaining after removal of hydroxyl groups from an alkyl diol having a molecular weight of less than 250 and R is as defined above; said short chain ester units comprising from 50 to 90 percent by weight of said segmented copolyether/ester, and said segmented copolyether/ester having a number average molecular weight of from about 15,000 to 40,000, such that said suture or ligature has good flexibility and high tensile strength.

5,147,383

SUTURE COATED WITH A POLYVINYL ESTER

Rao S. Bezwada, Whitehouse Station, and Alastair W. Hunter, Bridgewater, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 473,505, Feb. 1, 1990, Pat. No. 5,089,013. This application Nov. 12, 1991, Ser. No. 792,321

Int. Cl.[5] A61L *17/00*

U.S. Cl. 606—231 **11 Claims**

1. A suture wherein the outer surface thereof is coated with at least one homopolymer of a vinyl ester monomer in an amount between about 0.3 to about 20 percent of the weight of the coated suture.

5,147,384

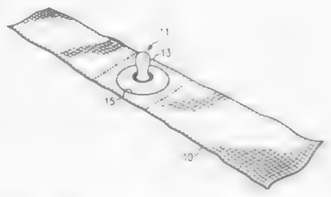
PACIFIER TETHER FOR USE IN ENHANCING AN INFANT'S DEVELOPMENTAL REFLEXES

Mechelle La Rocca, 6109 Preston Creek Dr., Dallas, Tex. 75240

Filed Jun. 20, 1991, Ser. No. 718,204

Int. Cl.[5] A61J *17/00*

U.S. Cl. 606—234 **8 Claims**



8. A pacifier tether for use in conjunction with a pacifier to enhance developmental reflexes in an infant, the pacifier having a base and a nipple, comprising:

a generally elongate body having a central portion and at least one extension extending therefrom adapted to be grasped and retained by the infant;

a reinforcing disk attached to the central portion of the elongate body;

an aperture extending through the reinforcing disk and the central portion sized and configured to receive the nipple, the reinforcing disk adapted to retain the nipple in an upright midline position; and

a pocket attached to the central portion and underlying the aperture sized and configured to retain the pacifier base in the tether.

5,147,385

STENT AND CATHETER FOR THE INTRODUCTION OF THE STENT

Andreas Beck, Hornberg, and Norbert A. Nanko, Freiburg, both of Fed. Rep. of Germany, assignors to Schneider (Europe) A.G., Zurich, Switzerland

Filed Oct. 25, 1990, Ser. No. 603,576

Claims priority, application Switzerland, Nov. 1, 1989, 03946/89

Int. Cl.[5] A61F *2/06, 7/12*

U.S. Cl. 623—1 **5 Claims**

1. A method of treating a stenosed section of a blood vessel; said method comprising:

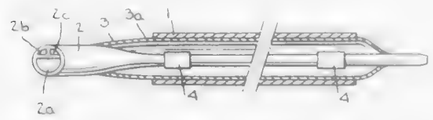
a) providing an intravascular stent having a hollow cylindrical structure and constructed of a material which has a melting point or a softening range between about 45° and 75° Celsius;

b) providing a balloon catheter having means whereby the balloon thereof is heatable when disposed intravascularly;

c) mounting the stent on said balloon by slightly inflating the balloon;

d) employing the balloon catheter to deliver the mounted stent to the stenosed section;

e) heating the balloon to a temperature sufficient to soften



the stent mounted thereon, and subsequently inflating the balloon to thereby radially expand the stent until it resides against the inner wall of the vessel with slight pressure;

f) discontinuing the heating of the balloon to thereby allow the stent to harden in its radially expanded configuration; and

g) deflating the balloon and withdrawing the balloon catheter.

5,147,386

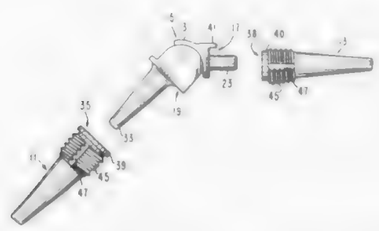
SECURABLE PISTONING FINGER PROSTHESIS

Roger G. Carignan, Thousand Oaks, and Gregory C. Rose, Ventura, both of Calif., assignors to Techmedica, Inc., Camarillo, Calif.

Continuation-in-part of Ser. No. 234,538, Aug. 22, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 483,590

Int. Cl.[5] A61F *2/42*

U.S. Cl. 623—21 **23 Claims**



1. A prosthesis device for phalangeal joint replacement between a proximal phalangeal or metacarpal bone and a distal phalangeal bone comprising:

(a) an independent metacarpal body having a first end adapted for operative securement to human bone and a second end defining an axially oriented receiving chamber;

(b) an independent phalangeal body having a first end adapted for operative securement to human bone and a second end defining an axially oriented receiving chamber;

(c) a hinge means joining said independent phalangeal body to said metacarpal body for twisting, flexing, pistoning, distracting, and laterally rotating said phalangeal body relative to said metacarpal body;

wherein said first ends of said independent metacarpal and phalangeal bodies include a self-tapping threaded portion with a plurality of spaced interrupting channels; and

wherein said second ends of said independent metacarpal and phalangeal bodies are conical in shape with smooth exterior surfaces.

5,147,387

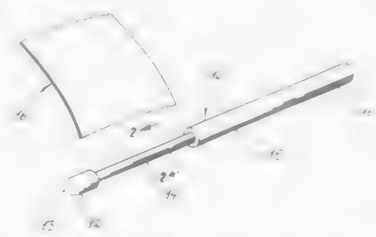
PROCESS OF IMPLANTING A PROSTHETIC SHEET REPAIR MATERIAL

David W. Jansen, and Thomas M. O'Hara, both of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 598,465, Oct. 10, 1990, abandoned. This application Oct. 11, 1991, Ser. No. 803,651

Int. Cl.[5] A61F *2/06*

U.S. Cl. 623—1 **8 Claims**



1. A process of implanting a prosthetic sheet repair material comprising:

a) making a surgical incision in a body;

b) inserting a hollow sleeve into the body through incision;

c) providing a surgical laparoscopy instrument comprising a rod having a length, an outside diameter and first and second ends, further having a portion of said length adjacent to the first end wherein said length portion has the reduced outside diameter in comparison to the rod outside diameter;

d) rolling a substantially flat sheet of prosthetic sheet repair material around the reduced diameter portion of the surgical laparoscopy instrument;

e) inserting said laparoscopy instrument and prosthetic sheet repair material into the incision through the hollow sleeve;

f) unrolling the sheet of prosthetic repair material from the surgical laparoscopy instrument;

g) fastening the sheet of prosthetic repair material within the body by means for surgical fastening;

h) removing the laparoscopy instrument and the hollow sleeve from the body; and

i) closing the incision.

5,147,388

AUXILIARY ARTIFICIAL HEART OF THE EMBEDDED-IN-BODY TYPE

Kenji Yamazaki, 2-477-RC1-201, Uwano, Nagano-shi, Nagano-ken, Japan, assignor to Kenji Yamazaki and Misuzu Industries Corporation, Nagano, Japan

Filed Mar. 5, 1991, Ser. No. 664,744

Claims priority, application Japan, Mar. 8, 1990, 2-54910; Jun. 24, 1990, 2-164819

Int. Cl.[5] A61M *1/12*

U.S. Cl. 623—2 **6 Claims**

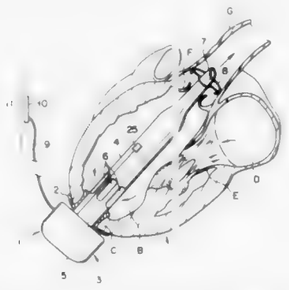
1. An auxiliary artificial heart of the embedded-in-body type structured to be embedded in one of the ventricles of the heart of a human body comprising:

a) an apex cordis area ring structured to be fixedly embedded in a cutout portion of the apex cordis area of the human heart;

b) an artificial heart body including a pump section, a drive section for driving the pump section, and a nozzle;

said pump section including a cylindrical pump of the axial-flow type having a base portion and a front end, driven by the drive section to suck blood through the base portion of the pump section and discharge it through the front end thereof, and said pump section being structured to be

inserted into one of the ventricles, passing through the apex cordis area ring;
said drive section being structured to be arranged outside the human heart;
said nozzle being provided at the front end of the pump section and structured to be inserted through the aortic valve of the human heart and into the aorta, whereby the



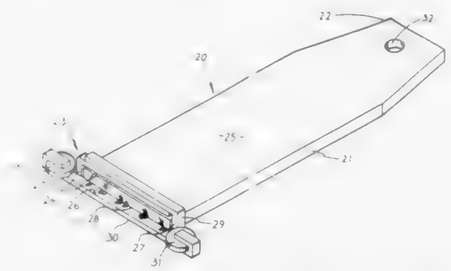
blood in the ventricle is fed into the aorta through the nozzle at the front end of the pump by means of the pump section; and
c) a positioning ring structured to be fitted into the aorta, said front end being fitted into the positioning ring whereby said ring serves to position the nozzle at a predetermined position with respect to the aortic valve.

5,147,389

CORRECTION OF INCOMPETENT VENOUS VALVES

Rodney J. Lane, Cremorne, Australia, assignor to Vaso Products Australia Pty Limited, Sydney, Australia

Division of Ser. No. 446,180, Dec. 5, 1989, abandoned, which is a continuation of Ser. No. 191,168, filed as PCT/AU87/00215, Jul. 13, 1987, Pat. No. 4,904,254. This application Nov. 8, 1991, Ser. No. 793,236
Claims priority, application Australia, Jul. 17, 1986, PH6992; Feb. 10, 1987, PH0270; Mar. 24, 1987, PH1053
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **14 Claims**



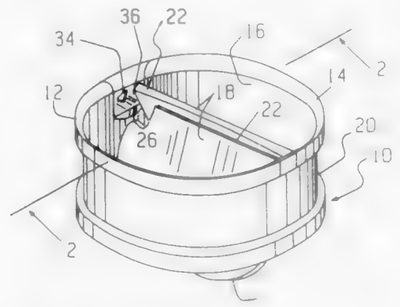
1. A venous valve competence-restoring cuff, said cuff comprising an elongated band, having one end and opposite overlapping end portions, of biocompatible implantable material, said material having an elasticity such that it is not stretchable at blood flow pressures, the band having a length to encompass the vein at the site of the venous valve, with said end portions of the band overlapping, the end portions being joinable together to form a cuff of desired circumference small enough to restore competence yet not too tight to decrease blood flow, and further including loop means adjacent said end portion of the band to which said overlapping end portion of the band is joined.

5,147,390

HEART VALVE PROSTHESIS WITH IMPROVED BI-LEAFLET PIVOT DESIGN

Louis A. Campbell, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Filed Oct. 25, 1989, Ser. No. 427,246
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **29 Claims**



1. A heart valve prosthesis comprising:
a generally annular valve body configured around an axis and having an inner surface defining a central passageway through which blood flows;
a pair of leaflet occluders proportioned to be pivotally received within said valve body and to move between an open position permitting blood to flow in a downstream direction and a closed position blocking the reverse flow of blood in an upstream direction, said leaflet occluders each having
a diametral edge;
a generally arcuate edge opposite the diametral edge; and
a pair of opposed outwardly protruding mounting ears on the generally arcuate edge adjacent the diametral edge for pivotally mounting the leaflet occluder to the valve body, the mounting ears having a proximal end adjacent the diametral edge; and a distal end spaced away from the diametral edge;
said valve body defining, for each leaflet occluder, a pair of recesses, each recess comprising a generally triangular-shaped opening in the valve body inner surface, each said recess further comprising
a first arcuate end portion adjacent an upstream side of said annular valve body and configured to periodically receive the proximal end of the respective mounting ear in generally rolling contact and
second and third arcuate end portions downstream from said first arcuate end portion with a first sidewall extending between said first end portion and said second end portion and a second side wall extending between said first end portion and said third end portion, said second arcuate end portion being adjacent to a center line lying parallel to the axis of the valve body and between the two occluders and said third arcuate end portion being spaced away from said center line, the second end portion being downstream from the third end portion, and said first side wall being angled away from the center line from the first arcuate end portion to the second arcuate end portion; and
a third side wall extending between said second end portion and said third end portion and configured to periodically receive the distal end of the respective mounting ear in generally sliding contact.

5,147,391

BIOPROSTHETIC HEART VALVE WITH SEMI-PERMEABLE COMMISSURE POSTS AND DEFORMABLE LEAFLETS

Ernest Lane, Huntington Beach, Calif., assignor to Carbomedics, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 508,275, Apr. 11, 1990, Pat. No. 5,037,434. This application May 6, 1991, Ser. No. 695,851
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **11 Claims**

1. A prosthetic heart valve comprising
a generally annular frame having a plurality of commissures joined thereto and extending generally axially therefrom and each commissure terminating at a distal end, each commissure being covered with a semipermeable membrane, said membrane becoming substantially impermeable upon immersion in body fluids; and
valve leaflets attached to said frame and connecting adjacent commissures, said valve leaflets further comprising a free edge connecting two adjacent commissures, said free edge being convex with respect to a line connecting a junction between said free edge and one of said adjacent commissures and a junction between said free edge and the other of said adjacent commissures, and said free edge being adjacent said line so that, when the leaflets are closed and before being subjected to pressure, substantially all of each free edge is spaced away from the free edge of the adjacent leaflet, said leaflets being capable of stretching in response to pressure loads and hydration, whereby the free edges become mating.

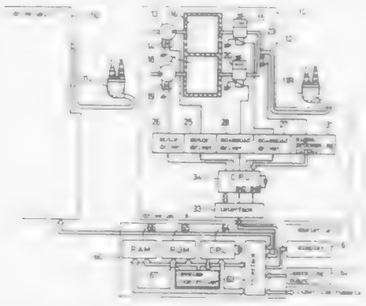
5,147,392

PUMPING DRIVE UNIT

Yoshitaka Inagaki, Nagoyashi; Akira Suzuki, Nishio, and Sadahiko Mushika, Ichinomiya, all of Japan, assignors to Aisin Seiki K.K., Aichi, Japan

Continuation of Ser. No. 176,129, Mar. 31, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,571
Claims priority, application Japan, Mar. 31, 1987, 62-78391; Apr. 7, 1987, 62-85084
Int. Cl.[5] A61M *1/10*; A61N *1/362*
U.S. Cl. 623—3 **2 Claims**

1. A pumping drive unit for driving a pumping unit, the pumping unit having a drive chamber, said pumping drive unit comprising:
a source of positive pressure;
a source of negative pressure;
a single positive pressure open/close valve unit interposed between the drive chamber of the pumping unit and the source of positive pressure;
a single negative pressure open/close valve unit interposed between the drive chamber of the pumping unit and the source of negative pressure;
fluid connecting means interconnecting the positive and negative open/close valve units with the drive chamber of the pumping unit;
pressure detecting means for detecting a fluid pressure in said fluid connecting means which extends from the positive and the negative pressure open/close valve units to the drive chamber of the pumping unit; and
drive pressure control means operative during a preset systole of the pumping unit to close the negative pressure open/close valve unit and to close or open the positive pressure open/close valve unit responsive to the fluid pressure in said fluid connecting means as detected by the pressure detecting means relative to a first predetermined pressure value to maintain the positive pressure supplied to the pumping unit at said first predetermined pressure value and said drive pressure control means oiperative during a preset diastole of the pumping unit to close said positive pressure open/close valve unit and to close or open the negative pressure open/close valve unit responsive to the fluid pressure in said fluid connecting means as detected by the pressure detecting means relative to a second predetermined pressure value to maintain the



negative pressure supplied to the pumping unit at said second predetermined pressure value; wherein the drive pressure control means is operative during a preset systole of the pumping unit to close the positive pressure open/close valve unit when the fluid pressure detected by the pressure detecting means is equal to or greater than a first predetermined pressure value and to open the positive pressure open/close valve unit when the fluid pressure detected by the pressure detecting means is less than the first predetermined pressure value and operative during a preset diastole of the pumping unit to close the negative pressure open/close valve unit when the fluid pressure detected by the pressure detecting means is equal to or less than a second predetermined pressure value and to open the negative pressure open/close valve unit when the fluid pressure detected by the pressure detecting means exceeds the second predetermined pressure value.

5,147,393

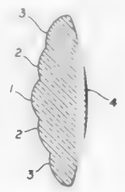
BIFOCAL INTRAOCULAR LENS WITH CORRECTION FOR SPHERICAL ABBERATION

Stephen J. Van Noy, Fort Worth; Anilbhai S. Patel, Arlington, both of Tex., and Thomas Carncross, Kirkland, Wash., assignors to Alcon Surgical, Inc., Fort Worth, Tex.

Filed Apr. 5, 1991, Ser. No. 681,814
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **14 Claims**

1. A bifocal intraocular lens made of PMMA, having an optic portion comprising a central zone with a radius of curva-

ture of about 28.54 mm, a second zone surrounding said central zone having a radius of curvature of about 15.70 mm–19.63



mm, and a third zone surrounding said second zone having a radius of curvature of about 30.2 mm.

5,147,394

HIGH REFRACTIVE INDEX POLYMERIC COMPOSITIONS SUITABLE FOR USE AS EXPANSILE HYDROGEL INTRAOCULAR LENSES

Steven B. Siepser, 866 Downgintown Pike, West Chester, Pa. 19380; B. David Halpern, R.D. #4 1057 Kingsley Rd., Jenkintown, Pa. 19046, and Wolf Kaps, 328 Rockledge Ave., Huntingdon Valley, Pa. 19006

Continuation of Ser. No. 455,087, Dec. 22, 1989, abandoned, which is a continuation of Ser. No. 107,281, Oct. 9, 1987, abandoned. This application Nov. 16, 1990, Ser. No. 615,440

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 5 Claims

2. An expansile, polymeric, optically clear hydrogel having a dehydrated state, wherein said hydrogel is capable of being formed in the dehydrated state into an intraocular lens and having

(a) an equilibrium water content of at least 40 per cent by weight of the gel,

(b) a refractive index measured from air with respect to the lens material of at least 1.53 in the dehydrated state and at least 1.40 in a swollen state, and

(c) a swell factor in aqueous humor which renders the intraocular lens particularly suitable for small incision cataract surgery.

5,147,395

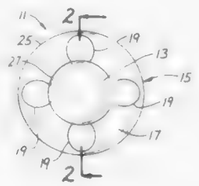
SMALL INCISION ENDOCAPSULATOR IOL

Timothy R. Willis, Lake Forest, Calif., assignor to Allergan Inc., Irvine, Calif.

Filed Jul. 16, 1991, Ser. No. 730,683

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 14 Claims



1. An intraocular lens comprising:

a deformable optic which can be deformed for insertion through an incision into the eye;

at least one fixation member for use in fixing the optic in the eye;

said at least one fixation member including a deformable element joined to the optic and a resilient stiffening element;

said stiffening element being an elongated strand and having opposite end portions received in circumferentially spaced regions of the optic;

said stiffening element forming a portion of a loop which opens toward the optic;

a major region of the stiffening element being received within the deformable element; and

the stiffening element stiffening the deformable element.

5,147,396

INTRAOCULAR LENS

Mayumi Kageyama, Akishima; Takeyuki Sawamoto, Tokyo; Niro Tarumi, Akishima, and Hiroshi Sakai, Kodaira, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,701

Claims priority, application Japan, Mar. 28, 1988, 63-73559

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 14 Claims

1. An intraocular lens whose optic or optic and haptic are composed of a substantially soft polymer obtained by curing a composition comprising:

(a) a dimethylsiloxane-phenylsiloxane copolymer having a vinyl group at each of the two terminals of the molecular chain,

(b) a diorganopolysiloxane having at least three hydrosilyl groups in the molecule, and

(c) an U.V. absorber.

5,147,397

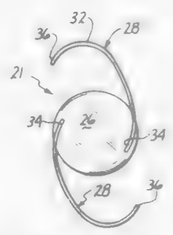
INTRAOCULAR LENS AND METHOD FOR MAKING SAME

F. Richard Christ, Laguna Beach; David A. Fencil, Goleta, and Patricia M. Knight, Laguna Niguel, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Jul. 3, 1990, Ser. No. 547,859

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 17 Claims



1. An intraocular lens comprising:

an optic; and

at least one haptic including a lens bonding region bonded to said optic, wherein said lens bonding region is exposed to plasma prior to being bonded to said optic, and the bond strength between said haptic and said optic is increased as a result of said exposure relative to a substantially identical intraocular lens including a haptic the lens bonding region of which is not subjected to said exposure.

5,147,398

MULTIPLE COMPARTMENT BREAST PROSTHESIS

Lawrence A. Lynn, 1275 Olentangy River Rd., Suite 202, Columbus, Ohio 43212, and Mark Foglietti, 3755 Orange Pl., Cleveland, Ohio 44122

Division of Ser. No. 518,709, May 4, 1990, Pat. No. 5,092,882. This application Jun. 26, 1991, Ser. No. 721,262

Int. Cl.[5] A61F *2/12*

U.S. Cl. 623—8 4 Claims

1. A breast prosthesis for insertion under subcutaneous tissue of a chest wall, the prosthesis comprising:

an apical compartment having a relatively low surface area to volume ratio and adapted to be positioned relatively distally;

a basilar compartment having a relatively high surface area to volume ratio and adapted to be positioned relatively proximally;

said apical compartment and said basilar compartment are each filled with a single permanently deformable material

and said apical and basilar compartments are mutually exclusive to one another; and

outer housing means for positionally fixing said apical and basilar compartments with respect to one another and adapted to envelope said apical and basilar compartments, wherein the volume of said outer housing means is substantially equal to the combined volumes of said apical and said basilar compartments.

5,147,399

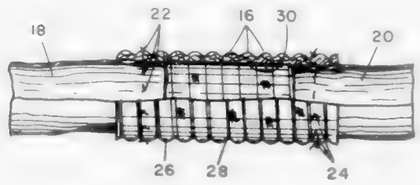
METHOD OF TREATING NERVE DEFECTS THROUGH USE OF A BIOABSORBABLE SURGICAL DEVICE

Arnold L. Dellon, 3901 Greenspring Ave., Suite 104, Baltimore, Md. 21211, and Susan E. Mackinnon, 293 Forest Hill Rd., Toronto, Canada M5P 2N7

Continuation of Ser. No. 150,593, Feb. 1, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 664,448

Int. Cl.[5] A61F *2/04*

U.S. Cl. 623—12 15 Claims



1. A method of promoting regrowth of a severed nerve across an extended nerve gap in excess of one centimeter, comprising the steps of:

(a) providing a flexible and porous tube device manufactured from synthetic bioabsorbable polymer fibers;

(b) inserting a proximal end of the severed nerve in a first end of the tube device;

(c) inserting a distal end of the severed nerve in a second end of the tube device;

(d) affixing the nerve ends within the tube device such that the proximal and distal ends of the severed nerve form a free space in excess of one centimeter depending on the length of missing nerve tissue; and

(e) allowing new nerve tissue to grow across to free space.

5,147,400

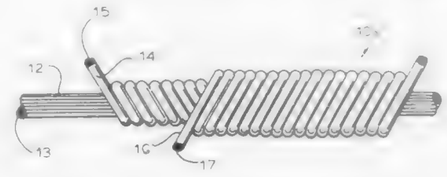
CONNECTIVE TISSUE PROSTHESIS

Donald S. Kaplan, Weston; John Kennedy, Stratford, and Ross R. Muth, Brookfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 349,648, May 10, 1989, Pat. No. 4,990,158. This application Sep. 12, 1990, Ser. No. 581,462

Int. Cl.[5] A61F *2/08*

U.S. Cl. 623—13 58 Claims



1. A connective tissue prosthesis comprising:

a) a core made up of a first biocompatible composite yarn extending in a lengthwise direction; and

b) a sheath surrounding the core, said sheath being fabricated from a second biocompatible yarn;

the first composite yarn in said core (a) comprising a non-bioabsorbable core yarn component surrounded by an at least semi-bioabsorbable sheath yarn component.

5,147,401

ARTIFICIAL SKIN

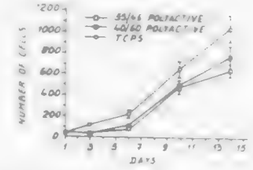
Dirkjan Bakker, Alphen Aan Den Rijn, and Maria Ponec-Waelsch, Leiderdorp, both of Netherlands, assignors to H.C. Implants B.V., Leiden, Netherlands

Filed Aug. 29, 1990, Ser. No. 574,659

Claims priority, application Netherlands, Sep. 6, 1989, 8902237

Int. Cl.[5] A61F *2/10, 13/00, 15/00;* B32B *3/26*

U.S. Cl. 623—15 12 Claims



1. Artificial skin, made up of

(1) a water vapour-permeable, non-porous top layer having a thickness of 5–200 um and made of a segmented thermoplastic copolyester, consisting essentially of a multiplicity of recurring long-chain-ester-units and short-chain-ester-units, the long-chain-ester-units making up 30–70% by weight of the copolyester and being represented by the formula

—OLO—CO—R—CO—

and the short-chain-ester-units being represented by the formula

—OEO—CO—R—CO—

wherein

L in the long-chain-unit represents a divalent group which remains after removal of the terminal hydroxyl groups from a poly(oxyethylene) glycol with an average molecular weight of 500–3000;

R is a divalent group which remains after removing the

carboxyl groups from a dicar oxylic acid with a molecular weight of at most 300; a nd

E in the above mentioned sho t-chain-unit represents an alkylene group having 2–6 c rbon atoms, and

(2) a macroporous lower layer of a degradable, biocompatible (co)polymer material select d from the group consisting of polymers and copolym rs having a thickness of 30–300 um, the diameter of the nacropores having a value of 30–300 microns and the mac roporosity being 30–80%.

5,147,402

IMPLANT FOR INGROWTH OF OSSEOUS TISSUE

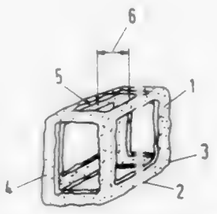
Nikolaus Bohler, Linz, Austria, and Rudolf Koch, Berlingen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 30, 1991, Se . No. 784,896

Claims priority, application Switzerland, Dec. 5, 1990, 3845/90

Int. Cl.[5] A61F *2/28;* A61B *17/56, 17/58*

U.S. Cl. 623—16 1 Claim



1. An implant for ingrowth of c sseous tissue comprising a hollow skeletal three-dimensional c ubic shaped support member having a plurality of interconne cted beams defining at least one opening in each wall of said member for an ingrowth of osseous tissue into an interior cavity, each said beam having a roughened surface and each said opening having a diameter greater than 3 millimeters, and wh rein said support member is made of titanium.

5,147,403

PROSTHESIS IMPLANTATION METHOD

Steven Gitelis, Oakbrook, Ill., assig or to United States Gypsum Company, Chicago, Ill.

Filed Mar. 15, 1989, S r. No. 324,208

Int. Cl.[5] A61 *2/28*

U.S. Cl. 623—16 9 Claims

1. A method of implanting a pr sthesis in a host bone comprising the steps of:

preparing the surface of the hos bone to receive the respective engaging surface of the prosthesis, thereby defining mating surfaces;

mixing a material consisting e sentially of calcium sulfate hemihydrate with water to pr duce a free-flowing suspension;

applying the calcium sulfate sus ension in free-flowing form to the receiving surface of th host bone; and

seating the prosthesis in the hos t bone such that the mating surfaces of the prosthesis and the host bone engage, whereby one or more cavit es which result between the mating surfaces of the prosth sis and a host bone are filled with the calcium sulfate.

5,147,404

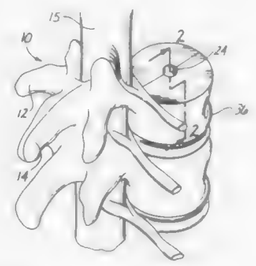
VERTEBRA PROSTHESIS

Ernest L. Downey, 10559 S. Avenue G, Chicago, Ill. 60617

Continuation-in-part of Ser. No. 522,076, May 10, 1990, Pat. No. 5,035,716, which is a continuation of Ser. No. 361,363, Jun. 5, 1989, abandoned, which is a division of Ser. No. 129,302, Dec. 7, 1987, Pat. No. 4,874,389. This application Oct. 24, 1990, Ser. No. 607,367

Int. Cl.[5] A61F *2/44*

U.S. Cl. 623—17 19 Claims



1. An apparatus useful to replace at least a portion of a vertebra in a spinal column associated with a spinal cord which comprises:

a vertebra body including a plurality of elements sized and adapted to be fitted together in a position to substantially surround the spinal cord, said vertebra body having the same shape as a naturally occurring vertebra having pedicles, laminae and processes which is located in said position and acting as at least a portion of a naturally occurring vertebra located in said position; and

a securement assembly located in conjunction with said vertebra body and adapted to secure said vertebra body in place in the spinal column.

5,147,405

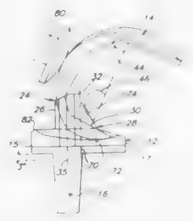
KNEE PROSTHESIS

Richard Van Zile; Donald McNulty, and James Caywood, all of Warsaw, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Continuation of Ser. No. 477,037, Feb. 7, 1990, abandoned. This application Jul. 8, 1991, Ser. No. 728,016

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 20 Claims



1. A knee joint prosthesis comprising:

a femoral component including first and second spaced apart, convexly curved condyle bearing surfaces and a cam surface extending between the first and second bearing surfaces; and

a tibial component, the femoral component being articulatable with the tibial component between an extended position and a flexed position, the tibial component including first and second bearing surfaces for engaging the first and second bearing surfaces of the femoral component, respectively, and means for engaging the cam surface of the femoral component to control the position of the femoral component relative to the tibial component only upon flexion of the femoral and tibial components between about 25 degrees and the flexed position, the cam surface being spaced apart from the engaging means upon flexion of the femoral and tibial components between the extended position and about 25 degrees, and wherein the control provides for a point of contact between the femoral and tibial components to move in a posterior direction from about 25 degrees through 45 degrees and to remain substantially unchanged from about 45 degrees to the flexed position.

5,147,406

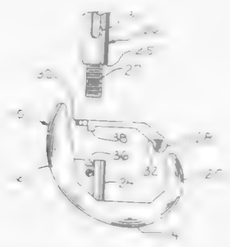
FEMORAL COMPONENT FOR A KNEE JOINT PROSTHESIS HAVING A MODULAR CAM AND STEM

Michelle L. Houston, Winona Lake, and Kevin M. Greig, Leesburg, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Apr. 22, 1991, Ser. No. 690,191

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 9 Claims



1. An implantable femoral component for a prosthetic knee joint, said femoral component including a pair of spaced condyle members interconnected at one end by a bridge member, said spaced condyle members and said bridge member defining an articular surface and an opposite femoral bone contact surface, a stem base means extending upwardly from said femoral contact surface adjacent said bridge member, a stem base extender means having connecting means for connecting said stem base means thereto, locking means for locking said stem extender means to said stem base means, and a separate cam member having a body portion configured to be positioned between said stem base means and stem extender means for clamping engagement therebetween, said cam member further including a bar portion extending from said body portion toward said spaced condyle members of said femoral component, said bar portion of said cam member configured to contact a cooperating articulate surface to thereby limit movement of said femoral component relative to said articulate surface.

5,147,407

PROSTHETIC CUP MEMBER

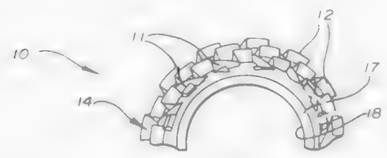
Karl H. Täger, Fichtenstrasse 1, D-8035 Gauting, Fed. Rep. of Germany

Filed Oct. 15, 1991, Ser. No. 776,122

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1990, 9014542

Int. Cl.[5] A61F *2/34*

U.S. Cl. 623—22 13 Claims



1. A prosthetic cup member comprising:

a hollow outer shell having an outer surface adapted to be affixed to the bone;

an inner shell located within said outer shell and forming a recess for accommodating a bearing insert element, said inner shell and said outer shell being spaced radially from on another to define an intermediate space therebetween;

the outer surface of said outer shell having coaxial than portions along an axial length thereof interrupted by grooves formed in the outer shell and bending transversely to said thread, said threads being self-tapping to permit said outer shell to be screwed into said bone, said grooves in said outer shell being in the form of elongated openings in said outer shell opening to said intermediate space to permit material to be introduced into and held within said intermediate space during surgical emplacement to the cup member so as to enhance the growth of new bone tissue into said intermediate space, said grooves formed by said elongated openings extending over the majority of the axial length of said outer shell.

5,147,408

PROSTHETIC DEVICE AND METHOD OF IMPLANTATION

Philip C. Noble, Houston, Tex., and Mary Beth Padgett, Parsippany, N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Division of Ser. No. 557,272, Jul. 24, 1990, Pat. No. 5,062,854, which is a division of Ser. No. 255,206, Oct. 7, 1988, Pat. No. 5,002,580. This application Jun. 19, 1991, Ser. No. 717,559

Int. Cl.[5] A61F *2/32;* A61B *5/04*

U.S. Cl. 623—23 16 Claims

1. A bone implant kit comprising a broach and an implantable body member, said broach having a proximal portion configured and dimensioned so as to prepare a bone cavity with a proximal region having a portion of the side walls consisting of cancellous bone and a portion of the side walls consisting of cortical bone; said body member comprising a neck and a stem; said stem having a proximal portion with predetermined dimensions relative to the proximal portion of said broach so as to provide a nonuniform interference press-fit with said prepared bone cavity upon insertion: said nonuniform interference press-fit comprising an interference press-fit with those portions of the side wall consisting of cancellous bone and a line-to-line fit with those portions of the side wall consisting of cortical bone, wherein the proximal portion of said stem has an anterior side, a posterior side, a medial side and a lateral side, an anterior-lateral corner, an anterior-medial corner, a posterior-lateral corner and a posterior-medial corner; said proximal portion of said stem having at least one groove on each of the anterior-lateral, anterior-medial, posterior-lateral and posterior-medial corners; and each said groove terminating adjacent each said corner.

5,147,409

AGENT AND METHOD FOR TREATING WOOL FIBERS WHEREIN THE AGENT IS TRIS(HYDROXYPROPYL)PHOSPHINE AND/OR ALKYLENE OXIDE ADDITION PRODUCTS THEREOF

Seiji Shimura; Masashi Sugiya; Yoshifusa Hara, all of Tokyo; Kunio Kako, Yokohama, and Akira Saito, Tokyo, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd.; Koizumi Chemical Co., Ltd. and Chiyoda Shoji Co., Ltd., all of Tokyo, Japan

PCT No. PCT/JP88/00924, § 371 Date May 4, 1989, § 102(e) Date May 4, 1989, PCT Pub. No. WO89/02497, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 13, 1988, Ser. No. 360,939

Claims priority, application Japan, Sep. 14, 1987, 62-228378; Jan. 14, 1988, 63-4679; Jan. 14, 1988, 63-4680

Int. Cl.[5] D06M *11/68*

U.S. Cl. 8—128.1 12 Claims

1. A method for treating wool fibers which comprises adding wool fibers to an aqueous bath solution at pH 2 to 7 which consists essentially of an aqueous solution of one or more water soluble organic phosphine compounds selected from the group consisting of tris(hydroxypropyl)phosphine and alkylene oxide addition products thereof, in an amount of 0.005 to 3.0% o.w.m. as P; and acidified with weak acid to pH 2 to 7 so that no phosphonium addition product is produced, at a temperature from room temperature to 100° C., at a ratio of 1:1 to 100:1.

5,147,410

PROCESS FOR THE END-TO-END DYEING OF CELLULOSIC FIBRES: DESALTED DIRECT DYE AND MIGRATION INHIBITOR

Anette Heindl, Inzlingen, Fed. Rep. of Germany; Rudolf Schaulin, Riehen, Switzerland, and Thomas Stockhorst, Bocholt, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 14, 1991, Ser. No. 700,001

Claims priority, application Switzerland, May 18, 1990, 1699/90

Int. Cl.[5] C09B *67/00;* D06P *1/52, 3/62*

U.S. Cl. 8—555 11 Claims

1. A process for the end-to-end dyeing of cellulosic fibres or cellulosic fibre blends with direct dyes by the pad dyeing process, which comprises padding said fibre materials with an aqueous liquor containing one or more deionised direct dyes having a salt content of 2.5% or less by weight of the dye and a migration inhibitor, then expressing the padded goods and subsequently fixing the dye thereon, said migration inhibitor selected from the group consisting of alginates, polyacrylates, copolymers derived from acrylic acid or acrylamide with other comonomers, alkyl sulfates, ethylene oxide adducts, polyglycol ethers, oxypropylation products, cellulose or starch ethers, locust bean gum ethers, carboxymethyl celluloses, modified polysaccharides, polyvinyl alcohols and other polyelectrolytes.

5,147,411

PROCESS FOR IMPROVING THE YIELD AND THE WET FASTNESS PROPERTIES OF DYEINGS OR PRINTS PRODUCED WITH ANIONIC DYES ON CELLULOSE FIBRE MATERIAL USING ALKYL DI-ALLYL OR HALO-HYDROXYPROPYL AMMONIUM SALTS

Rosemarie Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

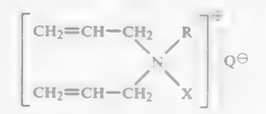
Filed Mar. 11, 1991, Ser. No. 667,720

Claims priority, application Switzerland, Mar. 15, 1990, 848/90

Int. Cl.[5] D06P *1/66, 3/62;* C09B *67/00;* C07C *213/00*

U.S. Cl. 8—606 10 Claims

1. A process for improving the colour yield and the wet fastness properties of dyeings or prints produced with anionic dyes on cellulose fibre material, which process comprises treating the fibre material before dyeing or during dyeing with a quaternary ammonium salt of the formula



(1)

in which

R is C_1-C_3alkyl,

X is the group

Hal is a halogen atom and $Q^{\ominus}$ is the anion of an aromatic sulfonic acid or a C_1-C_3alkylsulfate ion.

5,147,412

PRODUCTION OF DISPERSIONS OF SPHERICAL PARTICLES BY CRYSTALLIZATION OF EMULSIONS

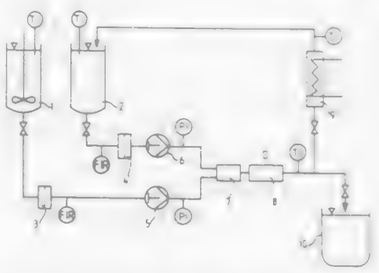
Bernd Klinksiek, Bergisch-Gladbach; Dietmar Kalz, Neunkirchen-Seelscheid; Carsten Gerdes; Ferdinand Kümmeler, both of Leverkusen; Gunter Heinrich, Leverkusen; Karl Reizlein, Cologne, and Manfred Zimmermann, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 525,414, May 18, 1990, abandoned. This application Dec. 2, 1991, Ser. No. 800,700

Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916465

Int. Cl.[5] D01H *5/18*

U.S. Cl. 23—293 R 6 Claims



1. A process for the production of a finely dispersed crystal suspension of an organic compound comprising the steps of

a) spraying a melt of the organic compound into an aqueous phase having a temperature below the crystallization point of the molten organic compound, in such a manner that the mixing ratio of melt to aqueous phase results in a mixture, the temperature of the mixture being lower than the solidification or crystallization temperature of the melt to form a preliminary emulsion, and

b) feeding the preliminary emulsion within a residence time of 0.005 s to 0.15 s through a homogenizing nozzle to form a finely dispersed emulsion, thereby solidifying the finely dispersed emulsion to form a final crystal suspension.

5,147,413

METHANOL FUEL CONTAINING FLAME LUMINOSITY AGENT

Thomas E. Kiovsky, Solon, and Wendy L. Clark, Hudson, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 20, 1989, Ser. No. 382,902
Int. Cl.[5] C10L 1/22
U.S. Cl. 44—328 22 Claims

1. A methanol fuel composition which comprises methanol and a flame luminosity enhancing amount of at least one azo dye flame luminosity enhancing agent, the flame luminosity of the fuel composition during burning being appreciably enhanced relative to the flame luminosity of the same burning fuel composition but to which no flame luminosity enhancing agent has been added.

12. A method for enhancing the flame luminosity of a methanol fuel which comprises adding to the methanol fuel a flame luminosity enhancing amount of at least one azo dye flame luminosity enhancing agent, the flame luminosity of the methanol fuel during burning being appreciably enhanced relative to the flame luminosity of the same burning methanol fuel but to which no flame luminosity enhancing agent has been added.

5,147,414

PROCESS FOR PRODUCING ORI CONTROL ADDITIVES

William J. Powers, III; Leonard A. Matthews; Marian F. Leong, all of Port Arthur, and Robert W. Erickson, Jr., Nederland, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 3, 1989, Ser. No. 389,436
Int. Cl.[5] C10L 1/22
U.S. Cl. 44—347 3 Claims

1. A method of producing an ORI control additive which is the reaction product of a polybutenyl succinic anhydride having a molecular weight of 500–10,000 and a polyoxyalkylene diamine, wherein the improvement comprises reacting solvent free said anhydride and diamine at a temperature ranging from about 325° C., measuring the relative absorbancy of the reaction product at 1705cm^{-1} and the reaction for about 5.0 to about 12.0 hours and monitoring the absorbancies so that when they are equivalent in two successive time periods, the reaction is stopped/completed and the reaction product withdrawn.

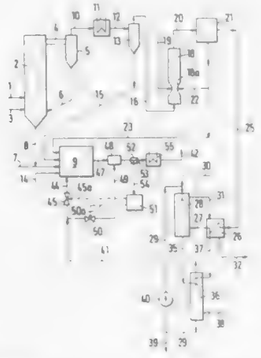
5,147,415

PROCESS OF TREATING THE GASES PRODUCED BY THE GASIFICATION OF SOLID FINE-GRAINED FUELS

Peter Herbert, Frankfurt am Main; Horst Mielke, Neu-Isenburg, and Gerhard Schmitt, Schmitten, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 29, 1990, Ser. No. 574,983
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929926
Int. Cl.[5] C10J 3/46; C10K 1/04, 10/06, 1/10
U.S. Cl. 48—197 R 5 Claims

1. A process for reducing the amount of NH_3 in a product gas produced by gasifying fine grained solid fuels in a fluidized state in a gasification zone, feeding an oxygen-containing gas and at least one gasifying agent selected from the group consisting of water vapor and carbon dioxide into said gasification zone, withdrawing said product gas containing carbon oxides, hydrogen, methane and NH_3 from said gasification zone, which comprises cooling said product gas and removing NH_3 from the cooled product gas, dividing the removed NH_3 into a first and a second portion, feeding said first portion into a combustion zone and together with an additional fuel combusting the NH_3 in said combustion zone, withdrawing from said combustion zone a first exhaust gas containing NO_x, feeding said first exhaust gas to a mixing zone and introducing said second portion into said mixing zone for reaction of NO_x with



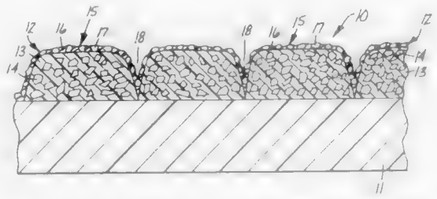
NH_3, and withdrawing a second exhaust gas with reduced NO_x content from said mixing zone.

5,147,416

SURFACE FINISHING TAPE AND METHOD OF MAKING THE SAME

Michihiro Ohishi, Sagamihara, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1990, Ser. No. 624,569
Int. Cl.[5] B24D 3/00
U.S. Cl. 51—293 2 Claims



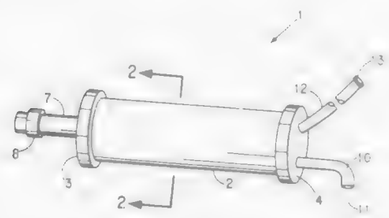
1. A method of making a surface finishing tape comprising the steps of:
(a) preparing a solution of a curable resin and volatile solvent;
(b) coating said solution of (a) onto a sheet-like backing;
(c) evaporating the volatile solvent from said solution to form a residual layer of curable resin having convection or Benard cells on said sheet-like backing;
(d) curing said residual layer of curable resin to form closely spaced protuberances separated by narrow openings on said sheet-like backing;
(e) coating said protuberances with a dispersion of curable binder resin and abrasive material so as to produce an abrasive layer which on curing said curable binder forms an abrasive layer over said protuberances without filling said narrow spaces; and
(f) curing said curable binder resin.

5,147,417

AIR-INTAKE SYSTEM FOR MOBILE ENGINES

Stuart M. Nemser, Wilmington, Del., assignor to Du Pont Canada Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 538,058, Jun. 13, 1990, Pat. No. 5,051,113. This application Jul. 2, 1991, Ser. No. 724,700
The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.
Int. Cl.[5] B01D 53/22, 71/32
U.S. Cl. 55—16 29 Claims



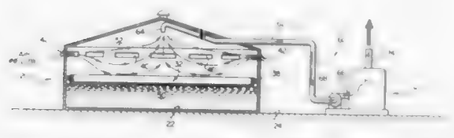
1. A process for the operation of a mobile combustion engine having a combustion zone an air intake system for the combustion zone comprising feeding air to a feed side of an oxygen enrichment membrane in the air intake system in a manner that causes an oxygen enriched portion of the air to permeate the membrane to a permeate side of the membrane, and then feeding air from one of the permeate side and the feed side to the combustion zone of the mobile combustion engine, for oxygen enrichment membrane comprising a film or coating of an amorphous polymer of perfluoro-2-2- dimethyl-1,3--dioxole on a porous support, said membrane exhibiting an oxygen/nitrogen selectivity of at least 1.4:1.

5,147,418

VOLATILE LIQUID STORAGE SYSTEM

Royce J. Laverman, South Holland; Philip J. Winters, Lockport, and Jeffrey K. Rinehart, Naperville, all of Ill., assignors to Chicago Bridge & Iron Technical Services Company, Oak Brook, Ill.

Filed Dec. 19, 1991, Ser. No. 810,294
Int. Cl.[5] B01D 53/04, 50/00
U.S. Cl. 55—18 23 Claims



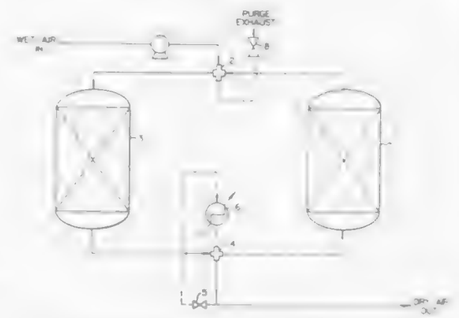
1. A method of collecting and abating emissions from a volatile liquid in an above.ground storage tank;
the liquid storage tank having a bottom, a vertical cylindrical circular wall having a lower edge portion joined to the bottom, and an external fixed roof, the tank having an internal floating roof floating on a volatile liquid stored in the tank, and air vent means in the tank in communication with a vapor space in the tank constituting at least the space above the floating roof when the floating roof floats on a predetermined maximum volume of volatile liquid in the tank;
permitting ambient air to flow inwardly through the air vent means into the tank vapor space at an air flow rate under specified ambient wind speed conditions and tank operating conditions;
pumping emissions laden air from the tank vapor space above the floating roof by a conduit having an inlet end communicating with the tank vapor space, an outlet end communicating with the inlet end of an emissions abatement apparatus, and a pump means in the conduit for effecting said pumping and thereby delivering the emissions laden air to the emissions abatement apparatus; while simultaneously having air flow inwardly through the air vent means into the tank vapor space; and
by means of the emissions abatement apparatus eliminating most of the emissions from the emissions laden air with formation of a gaseous effluent and then discharging the resulting gaseous effluent to the atmosphere.

5,147,419

APPARATUS AND METHOD FOR AIR DRYING WITH REDUCED OXYGEN ENRICHMENT

Gregory R. Schoofs, 560 Riverside Dr., Apt. 10H, New York, N.Y. 10027, and Richard J. Schoofs, 125 Tharp Dr., Moraga, Calif. 94556

Filed Jul. 19, 1990, Ser. No. 555,957
Int. Cl.[5] B01D 53/04
U.S. Cl. 55—33 11 Claims



1. A method of air drying comprising:
(a) adsorbing water vapor from an air stream by contacting such air stream with an adsorbent composition comprising one or more molecular sieve zeolites capable of adsorbing water vapor from air, wherein such composition is substantially free of molecular sieve zeolites capable of substantially selectively adsorbing nitrogen in preference to oxygen, and isolating such adsorbent composition from such air stream,
(b) reducing the pressure of the air in contact with such adsorbent composition,
(c) heating such adsorbent composition to desorb water, and
(d) increasing the pressure of air in contact with such adsorbent composition.

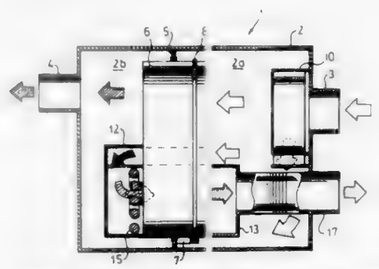
6. An apparatus for drying air comprising:
(a) at least one adsorbent chamber containing an adsorbent composition comprising one or more molecular sieve zeolites capable of adsorbing water vapor from air, wherein such composition is substantially free of molecular sieve zeolites capable of substantially selectively adsorbing nitrogen in preference to oxygen,
(b) means for providing an air stream and connecting such air stream to such chamber to adsorb water,
(c) means for isolating such chamber from such air stream, and
(d) means for reducing the air pressure in such isolated chamber, heating such adsorbent composition to substantially desorb water from such adsorbent composition, and increasing the air pressure in such isolated chamber.

5,147,420

METHOD AND APPARATUS FOR DRYING AIR

Knut Claesson, Stocksund, Sweden, assignor to Corroventa AB, Sweden

PCT No. PCT/SE89/00667, § 371 Date Apr. 26, 1991, § 102(e) Date Apr. 26, 1991, PCT Pub. No. WO90/06165, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 17, 1989, Ser. No. 678,347
Claims priority, application Sweden, Nov. 25, 1988, 8804281
Int. Cl.[5] B01D *53/08*
U.S. Cl. 55—34 12 Claims



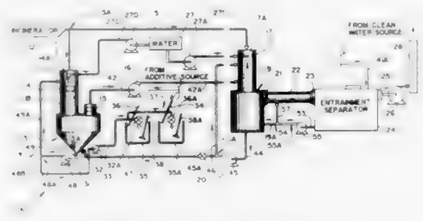
1. A method of drying air with a rotating rotor mounted in a housing provided with an inlet and first and second outlets, wherein air entering via said inlet is pressurized by a fan and passed through a first part of the rotor and moisture present in the air is taken-up by moisture-sorbent means disposed in said rotor, and wherein a first portion of said air exits said housing through said first outlet and a second portion of said air is heated and passed through a second part of the rotor for regenerating said rotor part while taking-up moisture, and is discharged from the housing through said second outlet, said method comprising the step of causing the regeneration air to flow in heat transfer relationship with heat-emitting devices which are mounted adjacent the rotor on a low-pressure side thereof and which are operative to direct radiant heat axially onto the moisture-absorbent means located in the interior of the rotor, wherein the regeneration air is heated to a temperature, which together with the radiant heat emitted, will bring the rotor material adjacent said casing to a temperature above 200° C.

5,147,421

WET SCRUBBER PARTICLE DISCHARGE SYSTEM AND METHOD OF USING THE SAME

Shui-Chow Yung, Encinitas, Calif., assignor to Calvert Environmental, Inc., San Diego, Calif.

Filed Jul. 12, 1991, Ser. No. 728,973
Int. Cl.[5] B01D *47/06*
U.S. Cl. 55—85 19 Claims



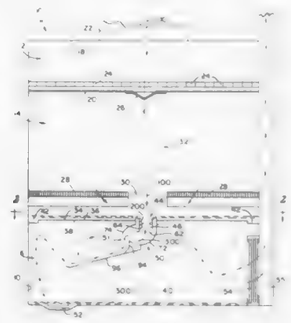
17. A method of concentrating sludge from a wet scrubber comprising:
diverting a part of an airstream having unwanted constituents into a treatment chamber;
providing means within said chamber for evaporating at least a portion of said airstream to product a sludge;
supplying hot waste gas to mix with the sludge to evaporate liquid therefrom;
collecting the sludge;
removing the sludge from said chamber;
conveying the sludge to a collector;
collecting the sludge in a collector;
adding a solidfying agent to the collected sludge; and
removing the sludge from the collector.

5,147,422

PAINT SPRAY BOOTH

Thomas S. Neeley; Kenneth N. Kraft, and James H. Muehlbauer, all of Evansville, Ind., assignors to George Koch Sons, Inc., Evansville, Ind.

Filed Aug. 5, 1991, Ser. No. 740,314
Int. Cl.[5] B01D *47/10*
U.S. Cl. 55—90 28 Claims



1. A method for removing paint overspray from a paint spray booth, the paint spray booth comprising a floor covered with flowing liquid, said floor comprising means for defining an elongated passageway therein having an upper entrance opening and a lower exit opening and including a pair of laterally spaced apart, longitudinally and downwardly extending passageway walls, the paint spray booth further comprising a first longitudinally extending concave plate and a second longitudinally extending concave plate and spaced apart from the first concave plate with concave faces of the two plates facing each other where the first faces upwardly and the second faces downwardly to define a longitudinally extending flow chamber and longitudinally extending discharge opening therebetween, the method comprising the steps of:
forcing a stream of paint-laden air downwardly through the entrance opening into the passageway,
flowing a stream of scrubbing liquid into the passageway to mix with the stream of paint-laden air to form a mixed stream,
flowing the mixed stream downwardly against the concave face of the first concave plate to deflect the mixed stream upwardly to flow against
the opposed concave face of the second concave plate to deflect the mixed stream downwardly to be atomized
at the discharge opening to scrub paint particles from the air stream.

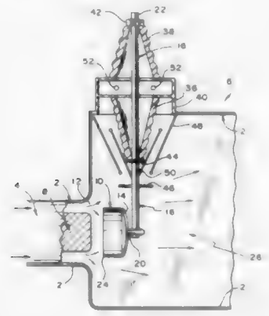
5,147,423

CORONA ELECTRODE FOR ELECTRICALLY CHARGING AEROSOL PARTICLES

Clyde N. Richards, P.O. Box 216, Peralta, N. Mex. 87042

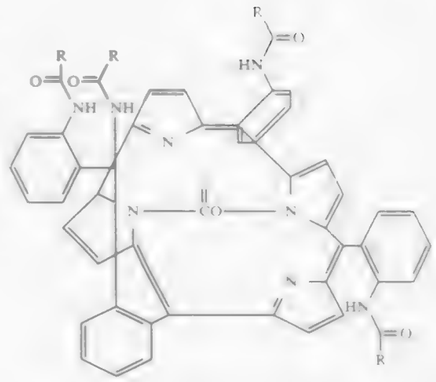
Filed Mar. 1, 1991, Ser. No. 663,320
Int. Cl.[5] B03C *3/36*
U.S. Cl. 55—129 15 Claims

13. Electrode support apparatus, for supporting an electrode within a chamber having a wall and containing a gas containing aerosol particulates, comprising:
(a) A rod of conductive material, essentially perpendicular to said wall of said chamber;
(b) Two high voltage insulators surrounding said rod in a snug fit engagement, an exterior insulator located outside of said chamber and an interior insulator located inside of said chamber;
(c) Passage flange means, in said wall of said chamber, for allowing passage of said rod through said wall;
(d) Compression clamping means, connected to said rod, to said insulators, and to said passage flange means, for compression clamping said insulators firmly against said passage flange means, and for thereby holding said rod securely attached to said passage flange means;



(e) Heating means, in thermal contact with said insulators, for heating said insulators to a temperature above the dew points of any gases to which said insulators are exposed;
(f) Ionization means connected to said rod within said chamber near said interior insulator, for ionizing aerosol particulates moving toward said interior insulator; and
(g) Electrostatic precipitation means, connected to said rod between said ionization means and said interior insulator, for electrostatically sweeping up and removing charged aerosol particulates from said gas before said aerosol particulates reach the surface of said interior insulator said electrostatic precipitation means comprising a first electrically conductive insulator shield and a second electrically conductive insulator shield within said first shield and both said first and second shields surrounding said rod.

(I)



in which r's are a substituent each, being acetyl, acryl, methacryl, or pival, and (c) an aromatic amine polymer.

5,147,424

OXYGEN-PERMEABLE POLYMERIC MEMBRANES

Eishun Tsuchida; Hiroyuki Nishide, both of Tokyo, and Hiroyoshi Kawakami, Hachioji, all of Japan, assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Jun. 28, 1991, Ser. No. 722,831
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—158 8 Claims

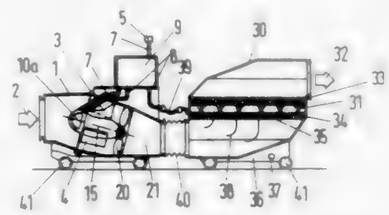
1. An oxygen-permeable polymeric membrane characterized by a complex comprising (a) a transition metal (II) ion, (b) a ligand comprising a meso-tris(α,α,α-o-substituted-amidophenyl)-mono-(β-o-substituted amidophenyl)porphyrinato, said metal ion and porphyrin being of the formula (I)

5,147,425

DRIVING AND SUPPLY UNIT FOR A COOLER

Joseph Hueber, Gruningen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 21, 1991, Ser. No. 673,275
Claims priority, application Switzerland, Apr. 4, 1990, 01134/90
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—230 13 Claims



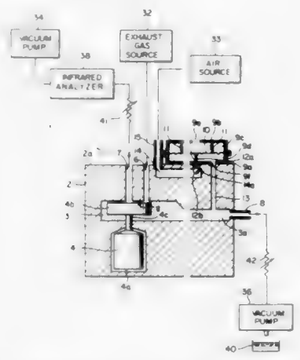
1. A driving and supply unit for a cooler comprising:
an air channel;
a fan disposed in said air channel for driving a flow of air through said channel;
an impulse turbine having a rotatable wheel, said impulse turbine being an axial turbine, and a gear transmission connected between said wheel and said fan for driving said fan in response to rotation of said wheel;
a cooling water supply means having a high pressure nozzle for directing a pressurized flow of water onto said wheel for rotating said wheel;
a collector for collecting water downstream of said wheel;
a delivery pipe extending from said collector for conveying the collected water; and
a cooling water main connected to said delivery pipe for delivering the water to a cooler in said air channel, wherein said collector includes a collector nozzle for receiving a jet of water and a diffuser connected to and between said collector nozzle and said delivery pipe to throttle the velocity of the received jet of water for feeding to said water main under pressure.

5,147,42[illegible]

CENTRIFUGAL SEPARATOR FOR PREPARING AUTOMOTIVE EXHAUST GAS FOR POLLUTION TESTING WITH PRESSURE COMPENSATION

Hideki Koike, and Junji Aoki, both of Miyanshigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 4, 1991, Ser. No. 656,418
Claims priority, application Japan, Feb. 7, 1990, 2-27884
Int. Cl.[5] G01N *1/22*
U.S. Cl. 55—270 5 Claims



1. A centrifugal separator system for treating exhaust gases comprising:

a housing having a separating chamber therein;

means for centrifugally introducing an exhaust gas into the introduced chamber;

means for separating the exhaust gas into gases and a fluid stream containing particulates of liquids and/or solids;

means for removing a predetermined portion of the separated gases substantially free of particulates;

means for removing the fluid stream from the housing by passing it into and through a discharge passageway, and means for providing a constant pressure, lower than pressure levels of the exhaust gas introduced into the chamber, in the discharge passageway, and

means for regulating the pressure of the fluid stream in the discharge passageway at a relatively constant level despite any fluctuation in pressure levels of the exhaust gas introduced into the chamber including a pressure regulator assembly for compensating for any pressure fluctuation in the discharge passageway, the pressure regulator assembly including a valve connected to a source of gas at a pressure level higher than the provided constant pressure to the discharge passageway, the valve being responsive to any fluctuation in pressure levels in the fluid stream passing into the discharge passageway to control introducing of gas the amount from the gas source through the valve, whereby a constant effluence of separated liquids and/or solids is accomplished from the separator.

5,147,42[illegible]

AIR FILTRATION SYSTEM

Kenneth E. Abbot, and Patrick J. Lyons, both of Tucson, Ariz., assignors to Stripping Technologies Inc., Tucson, Ariz.

Filed Jul. 15, 1991, Ser. No. 731,755
Int. Cl.[5] B01D *41/00*
U.S. Cl. 55—302 22 Claims

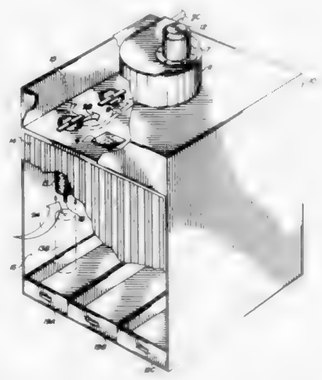
1. An air filtration system for cleaning air within a room comprising:

a) a housing, one side of said housing forming a common wall with said room, said housing having a lower first section and an upper second section;

b) baffles disposed between the first section of said housing and said room, said baffles substantially covering said common wall;

c) a chamber formed in the second section having at least three air filtration cartridges extending into said first section;

d) blower means attached to an exterior portion of said housing, said blower means communicating with said second section for drawing air from said second section and exhausting the air exterior to said housing;



e) a motor located external to said housing for driving said blower means; and,

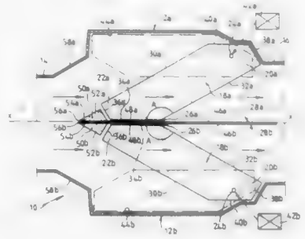
f) at least two drawers located substantially at the bottom of said housing, said drawers being operable from an exterior position to said housing, said drawers being positioned to receive falling debris from said baffles and from said first section of said housing.

5,147,428

APPARATUS FOR FILTERING AN AIR STREAM, IN PARTICULAR FOR A MOTOR VEHICLE

Gilles Elliot, Courcouronnes, France, assignor to Valeo Thermique Habitacle, Saint Denis, France

Filed Jul. 18, 1991, Ser. No. 732,175
Claims priority, application France, Jul. 19, 1990, 90 09245
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—309 10 Claims



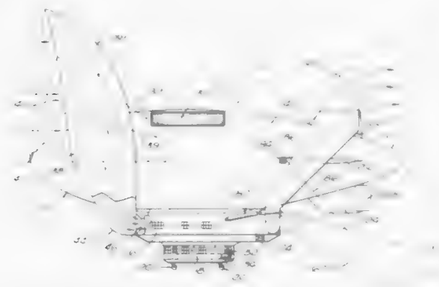
1. Apparatus for filtering an air stream, comprising a housing defining a direction of flow for a said air stream to pass through the housing, at least one filter member within the housing, first pivot means defining a first pivot axis extending at right angles to the said direction of flow, the first pivot means mounting each filter member for pivoting movement within the housing between a working position and a retracted position, each filter member having a first end and a second end, with the said first end being mounted on the said first pivot means, the apparatus further comprising at least one flap type valve member, second pivot means defining a second pivot axis parallel to the first pivot axis and mounting each said valve member for free pivoting movement, whereby in the working position each filter member extends in a direction which is inclined with respect to the said direction of air flow, with each flap valve extending in a direction which is substantially parallel to the said flow direction, and in the retracted position, each filter member and valve member extends in a direction substantially parallel to the said flow direction.

5,147,429

MOBILE AIRBORNE AIR CLEANING STATION

James Bartholomew, 23000 Avenue San Luis #4, Woodland Hills, Calif. 91364, and Dino M. Gentile, 21218 Lemarsh, Chatsworth, Calif. 91311

Filed Apr. 9, 1990, Ser. No. 506,197
Int. Cl.[5] B01D *50/00, 53/00;* B64B *1/00, 1/36*
U.S. Cl. 55—356 7 Claims



1. A mobile airborne pollution removal system comprising.

air cleaning means for removing pollutants from ambient air, thereby producing purified air;

dirigible means for airborne transportation of said air cleaning means while said air cleaning means effects pollution removal from the ambient air;

support means for enabling said dirigible means to transport said air cleaning means;

air intake means for directing ambient air to said air cleaning means;

air exhaust means for directing a purified air flow from said air cleaning means to the atmosphere; and

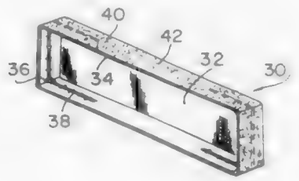
means for utilizing said purified air flow as a propulsion source for said dirigible means.

5,147,430

AIR SCOOP SCREEN

Steven A. Kidd, 8403 Alameda Ct., Alexandria, Va. 22309

Division of Ser. No. 103,216, Oct. 1, 1987, abandoned. This application Mar. 6, 1991, Ser. No. 665,486
Int. Cl.[5] B01D *39/08*
U.S. Cl. 55—385.3 4 Claims



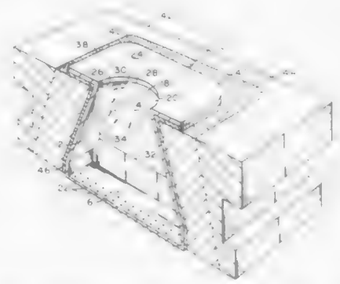
1. An automotive air scoop screen for a high performance racing automobile comprising a soft, flexible rectangular fiberglass fabric screen folded outward along its periphery to form soft upper and lower and first and second opposite side soft, flexible flange-like fabric screen edge portions, the flange-like edge portions forming rectangular intersections between the upper flange-like edge portion and the two side edge portions, and between the lower flange-like edge portion and the two side flange-like edge portions, and a first soft, flexible microloop-type fastener strip fixed on outward-facing surfaces of the flange-like edge portions and a complementary soft microhook-type fastener strip with first and second surfaces and with microhook-type fastener elements on the first surface thereof, and securing means on the second surface for joining the second surface of the microhook-type fastener strip with peripheral upper, lower and opposite side portions surrounding an intake opening of an automotive air intake on a high speed racing automobile, wherein the first fastener strip extends entirely around the flange-like edge portions of the screen, and wherein the first strip has an inside surface which lies against an outside surface of the flange-like edge portions and is joined thereto by textile fabric stitches extending through the first strip, the flange-like edge portions and a soft, flexible grosgrain ribbon reinforcement tape positioned around and against an inside surface of the flange-like edge portions.

5,147,431

BUSHING ASSEMBLY FOR MAKING GLASS FIBERS

Dean J. Gaertner, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 11, 1991, Ser. No. 713,477
Int. Cl.[5] C03B *37/09*
U.S. Cl. 65—1 15 Claims



1. A metal bushing for supplying molten vitreous material in the form of exudations to be attenuated into filaments, said bushing having side, end and bottom walls defining an open, elongated interior chamber for said molten vitreous material, said bottom wall having a plurality of filament orifices, a continuous flange portion extending outwardly from said side and said end walls at an opening of said chamber, the improvement comprising said end walls of said bushing being contoured to thereby uniformly distribute the operating stresses occurring in the area of the junction of said flange with said side walls and end walls when said bushing is heated.

5,147,432

METHODS OF AND APPARATUS FOR COATING OPTICAL FIBERS

Don R. Edmonston, Atlanta, Ga., and Richard G. Huff, Basking Ridge, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 424,774, Oct. 19, 1989, abandoned. This application Jul. 10, 1991, Ser. No. 729,785
Int. Cl.[5] C03C *25/02;* C03B *37/027, 37/025*
U.S. Cl. 65—3.11 7 Claims

1. A method of providing a coated optical fiber, said method including the steps of:

providing an optical fiber preform to be drawn;

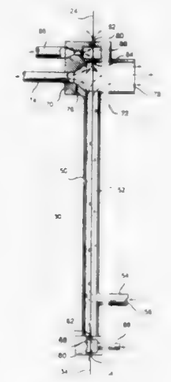
heating the preform in a furnace and drawing an optical fiber therefrom;

coating the drawn optical fiber the step of coating the fiber comprising the sub-steps of:

(a) moving the drawn optical fiber from the furnace into and through an entry plenum, through a cross-flow manifold which is disposed adjacent to a fiber entry end of an elongated coating deposition chamber having a longitudinal axis and then through the deposition chamber while the drawn optical fiber is within a predetermined temperature range above ambient and then out of the deposition chamber through an exit plenum positioned at the end of the deposition chamber opposite its entry end, the entry and exit plenums each having optical fiber entry and exit orifices through which the optical fiber is moved into and out of each plenum, the entry and exit plenums, cross-flow manifold and coating deposition chamber being connected together such that the fiber will not be subjected to external air;

(b) causing a reactive gas, which when subjected to said predetermined temperature range reacts to provide a reaction product, to be moved into the deposition chamber;

(c) causing the reactive gas to engage the drawn optical fiber within the coating deposition chamber while the drawn optical fiber is within the predetermined temperature range whereupon the reactive gas reacts upon



contacting the drawn optical fiber to thereby provide a reaction product that coats the fiber and a suspended soot;

(d) purging the entry and the exit plenums of the coating deposition chamber each with a purge gas (1) to prevent external air from entering the entry orifice of the entry plenum and the exit orifice of the exit plenum and further (2) to prevent the movement of reactive gas from the coating deposition chamber into the entry plenum through the fiber exit orifice of the entry plenum and into the exit plenum through the fiber entry orifice of the exit plenum; and

(e) causing a cross-flow gas to be flowed into, through and out of said cross-flow manifold, the flow of the cross-flow gas being perpendicular to said longitudinal axis of the coating deposition chamber, and directly in between the fiber exit orifice of the entry plenum and the fiber entry end of the elongated coating deposition chamber, wherein the cross-flow gas prevents an accumulation of the soot comprising reaction products of the reactive gas at the fiber exit orifice of the entry plenum adjacent to the entrance of the coating deposition chamber and wherein the reactive gas and suspended soot are exhausted with the cross-flow gas perpendicularly to said longitudinal axis of the coating deposition chamber; and

taking-up the coated optical fiber.

5,147,433

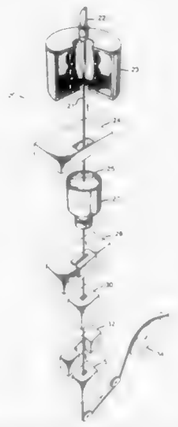
METHODS OF MAKING COATED OPTICAL FIBER

James R. Petisce, Norcross, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 659,985, Feb. 22, 1991, abandoned, which is a division of Ser. No. 480,414, Feb. 15, 1990, Pat. No. 5,015,068. This application Oct. 22, 1991, Ser. No. 780,451

Int. Cl.[5] **C03C** *25/02; C03B 37/025*

U.S. Cl. 65—3.11 **4 Claims**



1. A method of coating optical fiber, said method comprising the steps of:

drawing optical fiber from a preform;

applying inner and outer layers of coating materials to the drawn fiber, the coating materials being such that the photoactive region of one is different from the photoactive region of the other;

curing the coating material of the inner layer by first exposing the drawn coated fiber to a curing lamp which is characterized by an emission spectrum exclusively in one light region; and

subsequently curing the coating material of the outer layer by exposing the drawn optical fiber to a curing lamp characterized by an emission spectrum exclusively in another light region; and

taking up the drawn coated fiber.

5,147,434

APPARATUS FOR FUSION-SPLICING A PAIR OF POLARIZATION MAINTAINING OPTICAL FIBERS

Kenichiro Itoh; Takeshi Yamada; Tsutomu Onodera, all of Sakura; Mikio Yoshinuma, Yachiyo, and Yasuyuki Kato, Mito, all of Japan, assignors to Fujikura Ltd. and Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Division of Ser. No. 633,764, Dec. 26, 1990, which is a continuation of Ser. No. 379,690, Jul. 11, 1989, Pat. No. 4,986,843, which is a continuation of Ser. No. 51,741, May 18, 1987, abandoned. This application Apr. 16, 1991, Ser. No. 686,750

Claims priority, application Japan, May 20, 1986, 61-115901; May 20, 1986, 61-115902; May 20, 1986, 61-115903; May 20, 1986, 61-115904

Int. Cl.[5] **C03B** *23/20*

U.S. Cl. 65—12 **2 Claims**

1. An apparatus for fusion-splicing a pair of polarization maintaining optical fibers, comprising:

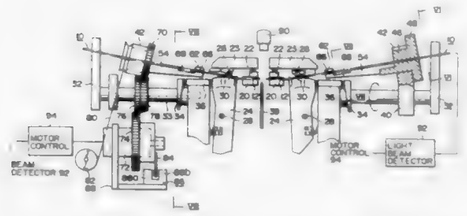
a body;

a pair of supporting members provided on said body, the supporting members being arranged in a line and having means for supporting a pair of polarization maintaining optical fibers in a line;

a pair of rotatable clamp means provided on said body for clamping said pair of optical fibers, the rotatable clamp means being rotated, while clamping said pair of optical fibers, so that said pair of optical fibers are rotated to align with each other in a circumferential direction;

means for fusion-splicing said pair of aligned optical fibers by an arc discharge; and

twist preventing means removably coupled to said body with an arm member, said twist preventing means comprising a pair of clamps, the pair of clamps being provided



on the arm member and having a predetermined distance therebetween, the pair of clamps having means for clamping said pair of optical fibers when the twist preventing means is coupled with said body and after said pair of optical fibers are fusion-spliced, so that, even when said rotatable clamp means release the clamping of said pair of optical fibers, twisting of said pair of optical fibers which is caused, at portions of said pair of optical fibers which are not between said rotatable clamp means, by the rotation of said rotatable clamp means is not transmitted to the fusion-spliced portion of said pair of optical fibers.

5,147,435

METHOD FOR SUPPRESSING CRYSTALLIZATION OF FLUORIDE GLASS ARTICLES BY TREATMENT WITH INORGANIC FLUORIDE

Yoshinori Kubota; Akira Sakanoue, and Yasushi Kita, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 13, 1991, Ser. No. 698,896

Claims priority, application Japan, May 23, 1990, 2-133643

Int. Cl.[5] **C03C** *17/22*

U.S. Cl. 65—30.1 **11 Claims**

1. A method for suppressing crystallization of an article made of a glass consisting of metal fluorides, the method comprising the step of treating at least one surface of the glass article with a solution of an inorganic fluorine compound, which is selected from the group consisting of alkali metal compounds containing fluorine and ammonium compounds containing fluorine, in an organic solvent having no water by immersing the glass article in said solution for at least about 3 hr.

5,147,436

METHOD FOR FORMING FLAT GLASS-CERAMIC ARTICLES

William W. Blakeslee, deceased, late of Corning by Carol A. Blakeslee, executrix ; Ronald A. Davidson, Horseheads; Edwin Q. Giles, Beaver Dams; Robert M. Menihan, Corning; David L. Naylor, Horseheads; Richard B. Pitbladdo, Corning; Martin J. Schad, Corning; Kevin B. Sterner, Corning; Jackson P. Trentelman, Painted Post, and Jason S. Watts, Horseheads, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Apr. 9, 1991, Ser. No. 682,657

Int. Cl.[5] **C03B** *11/00*

U.S. Cl. 65—33 **4 Claims**

1. A method for press molding a thin, substantially flat glass-ceramic article possessing a substantially uniform thickness comprising the steps of:

(a) preheating a receiving molding surface and an opposing molding surface of a mold to predetermined different temperatures;

(b) then delivering to said receiving molding surface a glass charge;

(c) aligning and maintaining said receiving and molding surfaces such that they are in a substantially parallel relationship;

(d) bringing said receiving and opposing molding surfaces of said mold into close proximity to press mold said delivered charge of molten glass into a press molded glass article of substantially uniform thickness for a period of time sufficient to symmetrically remove enough heat from the press molded glass article to result in said receiving and opposing molding surfaces and the press molded glass article surfaces reaching nearly equal temperatures in nearly the same amount of time;

(e) removing said press molded glass article from said mold;

(f) placing said press molded glass article between, and into contact with, opposing layers of a refractory insulating setter material;

(g) heat treating said glass article placed between the layers of setter material at a temperature and for a time sufficient to cause said glass article to thereby form a glass-ceramic article; and

(h) cooling said glass-ceramic article to room temperature and removing the glass-ceramic article from the layers of setter material.

5,147,437

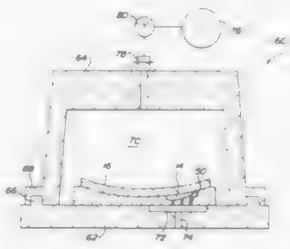
INVISIBLE FLAT-TOP MOLD BLANK AND METHOD FOR MANUFACTURING SAME

Alexander C. Bristol, 14317 SW. 142 Ave., Miami, Fla. 33186

Division of Ser. No. 223,645, Jul. 25, 1988, Pat. No. 4,883,524. This application Aug. 28, 1989, Ser. No. 399,251

Int. Cl.[5] **C03B** *23/00*

U.S. Cl. 65—102 **8 Claims**



7. An invisible flat top mold blank, comprising:

a mold blank having a concave surface and a convex surface;

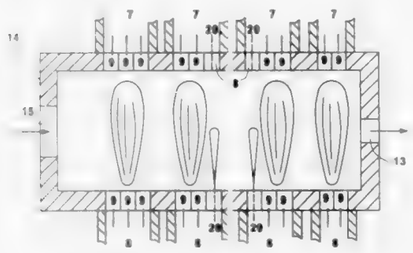
a platform having a concave surface, said concave surface receiving said convex surface of said mold blank, said concave platform surface further having a recess defined therein;

a housing having a lower housing part and an upper housing part, said housing encapsulating said mold blank and said platform to form a housing chamber;

means for heating said mold blank to a preselected temperature; and

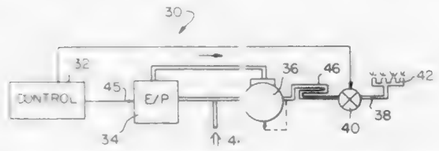
means for deforming a portion of said mold blank against said platform recess so as to form a flat top bifocal segment, said deforming means comprising an air pressure source connected to said housing chamber, said air pressure source causing said mold blank to deform against said platform recess so as to form a flat top bifocal segment.

5,147,438
AUXILIARY OXYGEN BURNERS TECHNIQUE IN GLASS MELTING CROSS-FIRED REGENERATIVE FURNACES
Robert J. Castelain, Godarville, and Luc Wouters, Schilde, both of Belgium, assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.
Filed Sep. 18, 1991, Ser. No. 761,448
Int. Cl.[5] C03B 5/04
U.S. Cl. 65—135 9 Claims



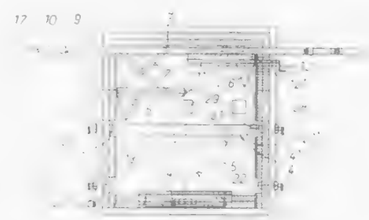
1. A process for melting raw glass forming ingredients in a cross-fired regenerative furnace having at least two regenerators which communicate with a melting chamber through a plurality of ports along the lateral sides of the melting chamber having a bottom, a roof, side-walls, raw ingredients inlet means and melt outlet means, comprising heating the raw glass forming ingredients and the resulting melt in the melting chamber by using burners placed under or adjacent to some or all of said plurality of ports, said burners comprising air-fuel burners and at least one oxygen-fuel auxiliary burner which is operated to heat a specific area in the melting chamber without substantially disrupting the flame momentum of the air-fuel burners, wherein said at least one oxygen-fuel auxiliary burner is bent, angled or inclined to direct its flame toward the batchline or in the vicinity of said batchline.

5,147,439
VARIABLE PRESSURE GAS JET SYSTEM FOR LIFTING AND FORMING GLASS SHEETS
Gregory Ritz, Sylvania, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio
Filed May 1, 1990, Ser. No. 517,166
Int. Cl.[5] C03B 23/035
U.S. Cl. 65—158 2 Claims



1. In a glass sheet press bending system including a furnace having a heating chamber for heating glass sheets, a conveyor for conveying the glass sheets in a generally horizontally extending orientation, and an upper forming mold located above the conveyor and having a downwardly facing curved surface, a variable pressure gas jet system for lifting the glass sheet upwardly by the impingement of gas flow from the conveyor to the upper forming mold, the system comprising:
control means including at least one output for providing electrical signals corresponding to preselected pressures; and
a plurality of arrays, each of said arrays including,
a converter including a first input connected to the output of the control means for receiving the electrical signal from the control means, a second input connected to means for supplying pressurized gas and an output for providing pressurized gas at a pressure which varies as a function of the value of the electrical signal received in the first input,
a gas flow regulator including a first input connected to the converter for receiving the pressurized gas transmitted from the converter output, a second input connected to means for supplying pressurized gas, and a first output for providing pressurized gas at a pressure which varies as a function of the value of the pressurized gas received at the first input, and
gas jet means connected to the gas flow regulator for directing the pressurized gas from the output of the gas flow regulator to the lower surface of the glass sheet.

5,147,440
APPARATUS FOR BENDING A GLASS SHEET SUPPORTED ON A RING MOULD
Mauri E. Leponen; Erkki Yli-Vakkuri, and Kalevi Lind, all of Tampere, Finland, assignors to Tamglass Oy, Tampere, Finland
Filed Jun. 11, 1991, Ser. No. 713,073
Claims priority, application Finland, Apr. 26, 1991, 912022
Int. Cl.[5] C03B 23/03
U.S. Cl. 65—287 10 Claims

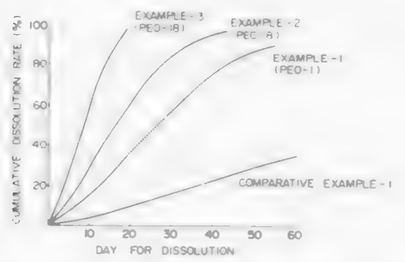


1. An apparatus for bending a glass sheet supported on a ring mould, said apparatus comprising:
a press-bending station provided with a plurality of thermally insulated walls;
a press-bending tool assembly arranged above the glass sheet supported on a ring mould in the press-bending station;
a claw crane mounted in said station for raising and lowering said press-bending tool assembly;
said claw crane including first and second articulated arms connected to each other along a common axis of rotation;
said first articulated arm having one end fixed to a ceiling in said press-bending station and an opposite end movable along said press-bending tool assembly;
said second articulated arm having one end fixed to said press-bending tool assembly and an opposite end movable in a horizontal plane along said ceiling of said press-bending station;
a power unit which is located outside the station; and
a driving rod connected to said movable end of said second articulated arm and being driven by said power unit through one of said walls such that said press bending tool assembly is raised and lowered according to horizontal movement of said movable end of said second articulated arm.

5,147,441
BIOLOGICAL PRODUCT FOR SOIL IMPROVEMENT AND METHOD OF APPLICATION TO SOIL
Mohamed E. A. Megeed, Montana State Univ., Plant Path Dept., Bozeman, Mont. 59717
Filed May 31, 1991, Ser. No. 708,383
Int. Cl.[5] C05G 3/08
U.S. Cl. 71—7 6 Claims

1. An improved biological product for actively producing nitrogen and phosphate enrichment of soil comprising a nitrogen fixing effective amount of Azospirillum sp. M32, an amount of *Bacillus polymixa* M7 sufficient to produce polymyxin, which is an anti-microbial peptide active against Gram negative bacteria which converts phosphorus compounds in the soil to which it is applied to a phosphate in plant-available forms, and a nutrient for said bacteria utilizing a cellulosic material containing cellulose as an integral component selected from the group consisting of straw, xylan, hemicellulose and lignin.

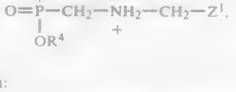
5,147,442
COATED GRANULAR FERTILIZER
Nobumasa Kosuge; Toshio Fujita, both of Kitakyushushi; Yoshisato Yamashita, Minamatashi; Shigemitsu Yoshida, Minamatashi; Katsutoshi Yamahira, Minamatashi, and Sayoko Miyoshi, Kitayushushi, all of Japan, assignors to Chisso Corporation, Osaka, Japan
Filed Feb. 7, 1989, Ser. No. 306,897
Int. Cl.[5] C05G 3/10, 5/00
U.S. Cl. 71—64.07 13 Claims



1. Granules of fertilizer coated with a resin film consisting essentially of
(a) an olefin polymer, and
(b) 0.1 to 10% by weight based on the resin of a polyether polyol selected from the group consisting of
(1) an ethylene oxide polymer,
(2) a propylene oxide polymer,
(3) an ethylene oxide-propylene oxide copolymer, and
(4) ether products between (1), (2) or (3) and a polyhydric alcohol.

5,147,443
MICROBICIDAL AGENTS
Hans-Joachim Diehr, Wuppertal; Karl-Heinz Kuck, Langenfeld; Wilfried Paulus, Krefeld, and Hans-Georg Schmitt, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 581,441, Sep. 11, 1990, abandoned, which is a continuation of Ser. No. 210,898, Jun. 24, 1988, abandoned. This application Sep. 26, 1991, Ser. No. 767,528
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722320
Int. Cl.[5] A01N 43/82
U.S. Cl. 71—67 4 Claims

1. A method for protecting industrial materials from attach by algae which method comprises contacting the industrial material with an effective amount of a 2,5-substituted 1,3,4-thiadiazole of the formula


(I)

in which
R^1 is a straight-chain or branched halogenalkyl,
R^2 is a straight-chain or branched alkyl and
n is 1 or 2.

5,147,444
HERBICIDAL COMPOSITIONS BASED ON A GLYPHOSATE HERBICIDE AND ACIFLUORFEN
Jean-Pierre Decor, Thurins, and Guy Borrod, Lyons, both of France, assignors to Rhone Poulenc Agrochimie, Lyons, France
Continuation of Ser. No. 326,909, Mar. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 927,070, Nov. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 879,685, Jun. 27, 1986, abandoned. This application May 14, 1991, Ser. No. 701,630
Int. Cl.[5] A01N 57/12, 37/10
U.S. Cl. 71—86 21 Claims

1. A herbicidal composition, comprising
(a) a glyphosate herbicide of formula I or Ia:

(I)

wherein:
Z is a cyano group or COOR;
R is a hydrogen atom; lower alkyl; lower alkenyl; lower alkoxyalkyl; aryl having 6 to 10 carbon atoms, wherein the aryl is unsubstituted or substituted by 1 to 3 substituents chosen independently from among lower alkyl, lower alkoxy, halogen, trifluoromethyl, nitro and cyano; or a compatible cation capable of forming a salt; and
R^1 and R^2, which may be identical or different, are a hydrogen atom; lower alkyl; aryl having 6 to 10 carbon atoms, wherein the aryl is unsubstituted or substituted by 1 to 3 substituents chosen independently from lower alkyl, lower alkoxy, halogen, trifluoromethyl, nitro and cyano; biphenyl; or an herbicidally-acceptable cation capable of forming a salt;

(Ia)

wherein:
Z^2 is a herbicidally acceptable anion capable of forming a salt;
R^3 and R^4, which may be identical or different, are a hydrogen atom; lower alkyl; aryl having 6 to 10 carbon atoms, wherein the aryl is unsubstituted or substituted by 1 to 3 substituents chosen independently from lower alkyl, lower alkoxy, halogen, trifluoromethyl, nitro and cyano; or biphenyl;
Z^1 is cyano or $COOR^5$; and
R^5 is a hydrogen atom; lower alkyl; lower alkenyl; lower alkoxyalkyl; or aryl having 6 to 10 carbon atoms, wherein the aryl is unsubstituted or substituted by 1 to 3 substituents chosen independently from among lower alkyl, lower alkoxy, halogen, trifluoromethyl, nitro and cyano; and
(b) acifluorfen or salt thereof; wherein the weight ratio of

acifluorfen or salt thereof to the glyphosate herbicide is between about 1:12 and about 1:80.

5,147,445

HERBICIDAL TRIAZOLE COMPOUNDS AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME

Masaki Takeuchi, Saitama; Mitsuhiro Yasuda, Tokyo, and Mitsuru Kanzaki, Shizuoka, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

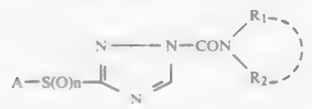
Continuation of Ser. No. 319,242, Jun. 6, 1989, abandoned. This application Jan. 25, 1991, Ser. No. 646,481

Claims priority, application Japan, Mar. 7, 1988, 63-53153; Jul. 5, 1988, 63-16712; Aug. 31, 1988, 63-217722

Int. Cl.[5] A01N *43/653*; C07D *249/12*

U.S. Cl. 71—92 10 Claims

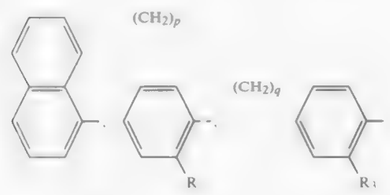
1. A triazole compound of the formula:

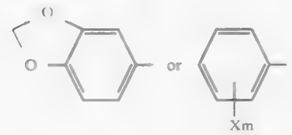


where

R_1 and R_2 which may be the same or different each represents ethyl or n-propyl;

A represents a group represented by one of the following formulas:





(where X is a hydrogen atom or an optionally hydroxyl substituted lower alkyl, cycloalkyl, alkoxy, alkoxycarbonyl, alkylcarbonyl, phenoxy, benzyl or α-hydroxybenzyl group, a halogen, a nitro group, an amino group or a trifluoromethyl group; R_3 is a hydrogen atom or lower alkoxy; m is 0, 1, 2, 3 or 4; n is 0 or 2; and p and q are each 2, 3, 4 or 5).

5,147,446

METHOD FOR FABRICATION OF DENSE COMPACTS FROM NANO-SIZED PARTICLES USING HIGH PRESSURES AND CRYOGENIC TEMPERATURES

Alexander Pechenik, Rockville, Md., and Gasper J. Piermarini, McLean, Va., assignors to The United States of America as represented by the Secretary of the Commerce, Washington, D.C.

Filed Aug. 6, 1991, Ser. No. 740,889

Int. Cl.[5] C22C *29/00*

U.S. Cl. 75—230 19 Claims

1. A method of producing a compact of ultra-fine powder, comprising:

pre-compacting or agglomerating a starting powder having a particle size of from 1.0 to 50 nm into particles of 50–100 μm in size and a density of from 20 to 40% of true density;

placing said pre-compacted powder into a pressure cell;

lowering the temperature of said cell below room temperature (20° C.); and

applying pressure of from 0.1 to 5 GPa to said cell while maintaining the cell at said lowered temperature, thereby forming said compact.

5,147,447

SINTERED RARE EARTH METAL-BORON-IRON ALLOY MAGNETS AND A METHOD FOR THEIR PRODUCTION

Takuo Takeshita, Kawagoe, and Muneaki Watanabe, Urawa, both of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

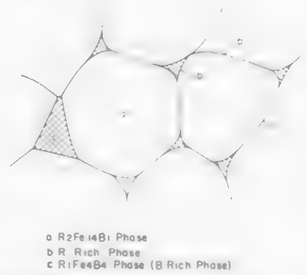
PCT No. PCT/JP89/00491, § 371 Date Feb. 2, 1990, § 102(e) Date Feb. 2, 1990, PCT Pub. No. WO89/12113, PCT Pub. Date Dec. 14, 1989

PCT Filed May 15, 1989, Ser. No. 460,079

Claims priority, application Japan, Jun. 3, 1988, 63-136732; Jul. 15, 1988, 63-176786

Int. Cl.[5] G22F *9/00*

U.S. Cl. 75—246 25 Claims



a $R_2Fe_{14}B_1$ Phase
b R Rich Phase
c $R_1Fe_4B_4$ Phase (B Rich Phase)

1. A manufacturing method for sintered rare earth metal-B-Fe alloy magnets comprising the steps of

a) preparing a powder obtained by adding at least one additive agent of an oxide powder of Al, Ga, Ni, Co, Mn, Cr, Ti, V, Nb, Y, Ho, Er, Tm, Lu, Zr or Eu, or a hydride powder of Zr, Ta, Ti, Nb, V, Hf, or Y, to R-B-Fe alloy powder wherein R is a rare earth element or Y, the amount of said additive agent totaling from 0.0005 to 3.0 weight %,

b) molding the alloy powder and additive agent; and,

c) sintering the molded alloy powder and additive agent.

5,147,448

TECHNIQUES FOR PRODUCING FINE METAL POWDER

Peter R. Roberts, Groton, and James E. Blout, Concord, both of Mass., assignors to Nuclear Metals, Inc., Concord, Mass.

Filed Oct. 1, 1990, Ser. No. 591,284

Int. Cl.[5] B22F *9/00*

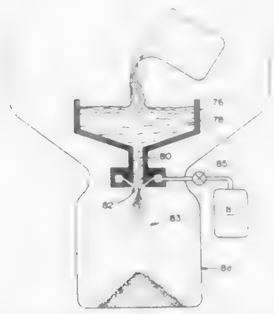
U.S. Cl. 75—331 23 Claims

1. A method of producing fine metal powder particles, comprising:

producing droplets of molten metal to be formed into a powder;

providing an environment including a substance specifically introduced for combining with said droplets; and

submitting said droplets to said environment for combining said introduced substance with the droplet metal to form



at least a partial coating including at least part of said introduced substance on said powder particles.

5,147,449

PROCESS FOR PRODUCTION OF METAL-METALMETALLOID POWDERS WITH THEIR ARTICLES HAVING ULTRAMICROCRYSTALLINE TO NANOCRYSTALLINE STRUCTURE

Hans Grewe, Grefrath-Vinkrath, and Wolfgang Schlump, Essen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit Beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,664

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813224

Int. Cl.[5] C22C *1/10*

U.S. Cl. 75—354 7 Claims

1. A process for producing a metal-metalmetalloid powder comprising a metal matrix and a metalmetalloid component including particles having an ultramicrocrystalline to nanocrystalline structure both in the metal matrix and in the metal-metalloid component, said process comprising the steps of:

mixing a metal powder consisting essentially of the intended matrix metal with a second metal powder to form a first powder mixture,

adding at least one metalloid selected from the group consisting of C, N, O, H, B, Si in a highly reactive solid or gaseous form, to said first powder mixture to form a second powder mixture consisting of said metalloid, said matrix metal powder, and said second metal powder, and

milling said second powder mixture with high energy in a mill, so as to react said second metal powder with said metalloid to produce a third powder mixture including a metalmetalloid component and said matrix metal, said third powder mixture comprising particles having an ultramicrocrystalline to nanocrystalline structure both in the matrix metal and in the metalmetalloid component.

5,147,450

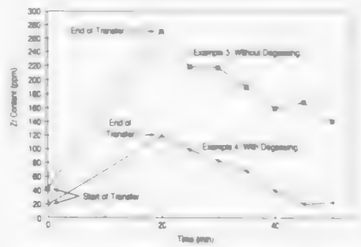
PROCESS FOR PURIFYING MAGNESIUM

Barry A. Mikucki, Lake Jackson, and James E. Hillis, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 26, 1991, Ser. No. 736,195

Int. Cl.[5] C22B *26/22*

U.S. Cl. 75—601 26 Claims



1. A process for producing high purity magnesium low in iron contamination, said process essentially comprising:

(a) degassing molten Mg which contains iron, while under a protective flux or protective atmosphere, to purge out at least an appreciable amount of hydrogen present in the Mg,

(b) introducing Zr and Si material to the molten Mg in amounts and ratios sufficient to form

(i) a ternary intermetallic of Fe, Zr and Si with the iron in the Mg, and

(ii) a binary intermetallic of Si and Zr, both the ternary and binary intermetallic compounds precipitating as rapidly-settling precipitates, and

(c) separating the precipitates from the magnesium melt to recover magnesium which is of high purity and low iron content, the recovered magnesium being essentially free of suspended ZrH_2 by way of having been degassed to remove at least an appreciable amount of the hydrogen from the Mg.

5,147,451

METHOD FOR REFINING REACTIVE AND REFRACTORY METALS

John D. Leland, Corvallis, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed May 14, 1991, Ser. No. 699,606

Int. Cl.[5] C12C *16/00*

U.S. Cl. 75—620 6 Claims

1. A process for the recovery of high purity refractory product metal from the regulus of an unleached or undistilled reduction reaction mixture, said mixture comprising a by-product metal halide, excess reducing metal and product metal, which process comprises:

(1) feeding crushed regulus material into a cold mold induction furnace crucible or a plasma melting furnace;

(2) heating the regulus material at temperatures sufficient to first melt, and removing by vaporization the byproduct metal halide and the excess reducing metal, then melting the product metal.

(3) recovering the product metal from the furnace pool.

5,147,452

METHOD OF AGGLOMERATING MINERAL ORE CONCENTRATE

Dale J. Anderson, Tinley Park, Ill., and David C. Cloutier, Dyer, Ind., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 24, 1991, Ser. No. 690,434

Int. Cl.[5] C22B *1/16*

U.S. Cl. 75—767 5 Claims

1. A method of agglomerating a particulate material prior to

sintering comprising comingling said particulate with a binding amount of a treatment solution consisting essentially of oil and from a trace up to about 0.0[illegible] weight percent, based upon the weight of said oil, of a water insoluble elastomeric polymer in an aqueous spray to form an agglomerate and thereafter heating said agglomerate to a sintering temperature.

5,147,453

PAINT COMPOSITIONS CONTAINING SILVER METAL FLAKE PIGMENT

Sol Panush, Farmington Hills, and James M. Gelmini, Warren, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 244,611, Apr. 9, 1988, abandoned, which is a continuation of Ser. No. 116,422, Nov. 3, 1987, abandoned. This application Dec. 20, 1991, Ser. No. 811,902

Int. Cl.[5] C09D *5/00*; C08K *3/08*; B05D *7/16*; B32B *27/20*

U.S. Cl. 106—1.19 12 Claims

1. A film-forming coating composition comprising

a thermosetting acrylic resin wherein the acrylic resin has minimal hydroxyl functionality, said coating composition having less than 8.0 wt. % hydroxyl functionality; and

silver metal flake,

the coating composition, when cured to a hard film, exhibiting no discoloration due to the presence of the silver flake.

5,147,454

ELECTROLESSLY SOLDER PLATING COMPOSITION

Yukio Nishihara, Hirakata, and Akemi Oharada, Moriguchi, both of Japan, assignors to Okuno Chemical Industries Co., Ltd., Osaka, Japan

Filed Jan. 17, 1990, Ser. No. 466,528

Claims priority, application Japan, Jan. 24, 1989, 1-15822

Int. Cl.[5] B22F *7/00*; C09D *5/00*

U.S. Cl. 106—1.22 19 Claims

1. A bath composition for electroless solder plating comprising:

(A) about 5 to about 120 g/l of at least one compound selected from the group consisting of alkanesulfonic acids represented by formula (1) and alkanolsulfonic acids represented by formula (2),

$$RSO_3H \qquad \text{formula (1)}$$

wherein R is an alkyl group of 1 to 12 carbon atoms

$$C_nH_{2n+1}-CH(OH)-(CH_2)_m-SO_3-H \qquad \text{formula (2)}$$

wherein m is an integer of 1 to 11, and n is an integer of 0 to 10, provided that $m+n \leqq 12$

(B) about 10 to about 100 g/l of at least one compound selected from the group consisting of tin salts of said alkanesulfonic acids and tin salts of said alkanolsulfonic acids,

(C) about 10 to about 100 g/l of at least one compound selected from the group consisting of lead salts of said alkanesulfonic acids and lead salts of said alkanolsulfonic acids,

(D) about 10 to about 200 g/l of at least one compound selected from the group consisting of thiourea, dimethylthiourea, trimethylthiourea, allylthiourea, acetylthiourea and ethylthiourea, and

(E) about 1 to about 250 g/l of at least one compound selected from the group consisting of C_2–C_{18} monocarboxylic acids, C_2–C_6 dicarboxylic acids, C_6–C_8 tricarboxylic acids and sodium, potassium and ammonium salts thereof.

5,147,455

METHOD OF PREVENTING POLYMER SCALE DEPOSITION AND POLYMER SCALE PREVENTIVE LIQUID USED THEREIN

Mikio Watanabe; Masahiro Usuki, both of Kamisu, and Susumu Ueno, Hazaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 24, 1991, Ser. No. 705,644

Claims priority, application Japan, May 25, 1990, 2-135679

Int. Cl.[5] C08F *2/44*; C09K *3/00*

U.S. Cl. 106—2 7 Claims

1. A polymer scale preventive liquid for use in polymerization of a monomer having a ethylenic double bond, consisting of:

(A) an organic compound containing at least one group selected from the group consisting of a sulfonic group and a carboxy group which each may form a salt, said organic compound having a molecular weight of 1,000 or less, said organic compound being selected from the group consisting of terephthalic acid, 1,12-dodecanedicarboxylic acid, 1-dodecanedisulfonic acid, benzoic acid, lauric acid, sulfanilic acid, p-styrenesulfonic acid, propionic acid, salicylic acid, glycine hydrochloride, urocanic acid, L-ascorbic acid, D-isoascorbic acid, chlorogenic acid, caffeinic acid, p-toluene sulfonic acid, sorbic acid, β-naphthoquinone-4-sulfonic acid, sodium salts thereof, potassium salts thereof, ammonium salts thereof, and mixtures thereof; and

(B) a compound which is insoluble in water and has a absorption band in a visible light range of 540 to 750 nm, the compounds (A) and (B) having been dissolved or dispersed in

(C) an organic solvent containing 30% or more of an organic acid ester; and

having a pH of 3 or less.

5,147,456

POLYGLYCIDOL SULFATED SURFACTANTS HAVING ANTIMICROBIAL ACTIVITY

Michael Scardera, Hamden, and Frank R. Grosser, Bethany, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 590,998, Oct. 1, 1990, abandoned. This application Oct. 18, 1991, Ser. No. 778,548

Int. Cl.[5] C11D *1/18*; C07C *309/69*

U.S. Cl. 106—18.33 7 Claims

1. An antimicrobial composition for use in controlling bacteria and fungi in an aqueous medium comprising a compound represented by the formula:

$$R-N(R^1)-(CH_2-CH(OH)-CH_2-O)_n-SO_3^-M^+$$

wherein R is an alkyl group having from about 8 to about 18 carbon atoms, and mixtures thereof, n has a value from 1 to 6, R^1 is selected from the group consisting of an alkyl group having from 1 to about 12 carbon atoms and H, and M is NH_4, Na, or K.

5,147,457

CORRECTION STICK

Heijiro Hino, and Shigeo Asada, both of Osaka, Japan, assignors to Fuekinori Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 12, 1990, Ser. No. 597,302

Claims priority, application Japan, Oct. 12, 1989, 1-265492

Int. Cl.[5] C09D *13/00*, *10/00*

U.S. Cl. 106—19 10 Claims

1. Correction sticks comprising 2–20 wt % of a gelatinizer, 30–70 wt % of white pigments, 0.02–5 wt % of a dispersant and 0.2–15 wt % of a water-soluble or dispersible film-forming resin and 0.1–10 wt % of a gelation modifier, said gelatinizer being alkali metal salts or ammonium salts of aliphatic carboxylic acids having 8 to 36 carbon atoms and said gelation modifier being organic or inorganic salts which form univalent metallic positive ions in an aqueous solution.

5,147,458

STRUCTURED PIGMENT FROM HIGH TiO_2/Fe_2O_3 KAOLINITE REJECT MATERIAL

Bobby R. Skipper, Cochran; Robert E. Hardy, and Albert C. Kunkle, both of Macon, all of Ga., assignors to J. M. Huber Corporation, Rumson, N.J.

Filed Jan. 18, 1991, Ser. No. 643,884

Int. Cl.[5] C04B *33/14*

U.S. Cl. 106—416 6 Claims

1. A reduced brightness alkali metal alumino-silicate pigment comprising:

A core of kaolin clay platelets which have been altered at their edges by a SAMS reaction so as to be integral with the essentially amorphous alkali metal silicate-base kaolin clay reaction product, the platelets of kaolin clay having a TiO_2 content substantially between 5–12% by weight dry clay, and an Fe_2O_3 content substantially between 0.5–2.5% by weight dry clay.

5,147,459

CEMENTITIOUS PRODUCTS

Michael E. Lynn, Tonbridge, and Christine A. Durey, Bexley, both of England, assignors to Marley Tile AG, Zurich, Switzerland

PCT No. PCT/GB89/00229, § 371 Date Sep. 5, 1990, § 102(e) Date Sep. 5, 1990, PCT Pub. No. WO89/08627, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 7, 1989, Ser. No. 571,626

Claims priority, application United Kingdom, Mar. 8, 1988, [redacted]

Int. Cl.[5] C04B *12/04*

U.S. Cl. 106—601 18 Claims

1. A cementitious product comprising the reaction product of 1%–30% by weight of water; 30%–90% by weight of reactive filler; and 1%–30% by weight of water soluble alkali metal silicate; said reactive filler being a siliceous or aluminosiliceous material capable of reacting with said alkali metal silicate to form a cementitious composition; wherein the total volume of the product comprises not more than 4% of pores having a maximum dimension exceeding 100 microns; the product having a MOR value of at least 15 MPa.

5,147,460

INTERNAL COATING MATERIALS FOR A CATHODE RAY TUBE

Shiro Otaki, Tokyo, Japan, assignor to Acheson Industries, Inc., Port Huron, Mich.

Filed May 20, 1991, Ser. No. 702,749

Claims priority, application Japan, May 21, 1990, 2-130549

Int. Cl.[5] C04B *28/20*, *14/04*; C09C *1/02*

U.S. Cl. 106—626 9 Claims

1. A coating composition for a cathode ray tube, comprising:

zeolite powder, having an average particle size of about 0.5 to about 20 microns,

electrically conductive graphite powder, with the pigment ratio of zeolite to graphite being within the range of about 0.1 to 15,

an organic thickening agent,

water glass,

and the balance water,

said coating composition having a viscosity within the range of about 150 to about 700 cps.

5,147,461

MOLECULAR BEAM EPITAXIAL GROWTH DEVICE AND MOLECULAR BEAM CONTROL METHOD THEREIN FOR EXACTLY CONTROLLING THICKNESS AND COMPOSITION OF EPITAXIAL FILM

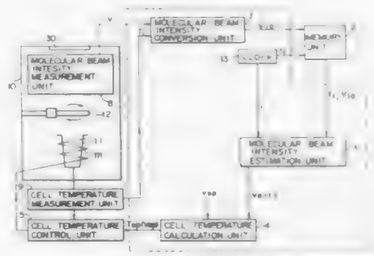
Takeshi Igarashi, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 672,558, Mar. 20, 1991, Pat. No. 5,096,533. This application Dec. 4, 1991, Ser. No. 802,306

Claims priority, application Japan, Mar. 20, 1990, 2-70894

Int. Cl.[5] C23C *14/22*

U.S. Cl. 118—666 6 Claims



1. A molecular beam epitaxial growth device comprising:

a vacuum chamber;

at least one molecular beam source cell having a heating means, provided in said vacuum chamber, for heating and evaporating molecular beam source material in each of said molecular beam source cells;

a shutter, provided in said vacuum chamber for each of said molecular beam source cells, for controlling the quantity of the molecular beam evaporated from said molecular beam source cell;

a cell temperature measurement means, for measuring a temperature T_i of each of said molecular beam source cells;

a cell temperature control means, connected to said heating means of each of said molecular beam source cells, for controlling the temperature of each molecular beam source cell;

a molecular beam intensity measurement means, for measuring an intensity V_i of a molecular beam evaporated from each of said molecular beam source cells;

a molecular beam intensity conversion means, receiving the molecular beam intensity V_i measured by said molecular beam intensity measurement means and the cell temperature T_i measured by said cell temperature measurement means, for converting the measured molecular beam intensity V_i into a value V_{io} at a reference temperature T_0 by calculating the following equatio, using the measured molecular beam intensity V_i and the measured cell temperature T_i;

$$V_{i0} = V_i \cdot \exp\left(A\left(\frac{1}{T_0} - \frac{1}{T_i}\right)\right)$$

a memory means, receiving the converted molecular beam intensity V_{io} and a corresponding time t_i of each converted molecular beam intensity V_{io}, for successively storing the converted molecular beam intensity V_{io} and the corresponding time t_i thereof;

a molecular beam intensity estimation means, for successively reading out the estimated molecular beam intensity V_{io} and the corresponding time t_i thereof, and for estimating a molecular beam intensity $V_0(t)$ and a time (t) after the last converted and stored time based on the reference temperature T_0 in accordance with the converted molecu-

lar beam intensity V_{io} and the corresponding time t_i thereof; and

a cell temperature calculation means, for calculating a cell temperature $T_{SP}(V_{SP})$, to realize a predetermined molecular beam intensity V_{SP}, given by successively inputting the estimated molecular beam intensity $V_O(t)$ and a predetermined molecular beam intensity V_{SP} into the following equation, and for successively inputting the calculated cell temperature $T_{SP}(V_{SP})$ as an objective temperature into said cell temperature control means;

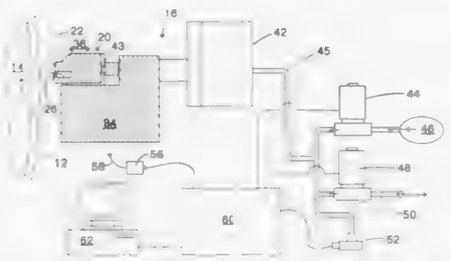
$$T_{SP}(V_{SP}) = \frac{1}{\frac{1}{T_0} + \frac{1}{A}\log\frac{V_{SP}}{V_O(t)}}$$

5,147,462

APPARATUS FOR AUTOMATIC FILM THICKNESS CONTROL

Carl A. Wollam, Cortland, Ohio, assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Feb. 16, 1990, Ser. No. 481,603
Int. Cl.[5] B05C 5/02
U.S. Cl. 118—679 10 Claims



1. An apparatus for coating a major surface of a continuously longitudinally advancing elongated strip article with a uniform predetermined thickness of a liquid coating material comprising:

(a) means for continuously longitudinally advancing the strip article over a support for the strip article;

(b) means for positioning an extended surface a predetermined distance away from the major surface of the strip article opposite the strip support, which major surface extends in the direction of advancement of the strip article and traverses a path defined by the advancing article, while said means for positioning permits translational movement of the extended surface perpendicular to the strip article major surface, forming a distance gap having a height between the major surface and the extended surface, which gap height varies in response to the translational movement;

(c) means for supplying liquid coating material to the gap sufficient to fill the gap substantially as the strip article advances past the extended surface;

(d) means for continuously urging the extended surface toward the major surface by exerting on the extended surface a load having a variable magnitude;

(e) means mounted behind and adjacent to extended surface, for repetitively sensing the gap distance between the extended surface and the adjacent article major surface and for generating a sensor signal; and

(f) means for controlling the urging means to vary the load magnitude on the extended surface in response to the sensor signal, so as to reduce difference between the gap height and a predetermined height, thus producing a layer of liquid coating material of a predetermined film thickness on the longitudinally advancing strip article.

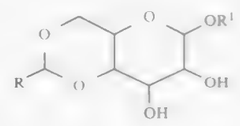
5,147,463

CYCLIC ACETALS

Robert G. Eilerman, Merrick, N.Y.; Philip A. Christenson, Midland Park, N.J.; John M. Yurecko, Jr., Dayton, N.J.; Frank Mild, Westwood, N.J., and Peter E. Kucharski, Yardley, Pa., assignors to BASF K&F Corporation, Whippany, N.J.

Filed Aug. 18, 1989, Ser. No. 395,628
Int. Cl.[5] A24B 3/12; C07D 31/02
U.S. Cl. 131—277 32 Claims

1. A compound represented by the formula:

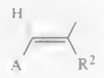


where R^1 is H or C_1 to C_6 alkyl;

R is Ar or Ar^1,

with Ar equal to 3-ethoxy-4-hydroxyphenyl or 5-methylthiophen-2-yl, and

Ar^1 is



with A representing phenyl, 4-methoxyphenyl or 3-methoxy-4-hydroxyphenyl,

such that when A is phenyl, R^2 is C_1 to C_6 alkyl;

when A is 4-methoxyphenyl, R^2 is H or C_1 to C_6 alkyl; and

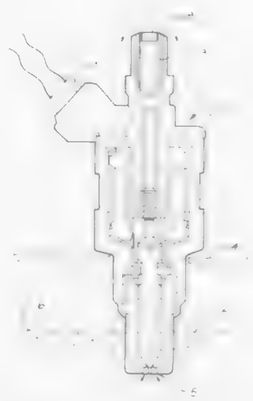
when A is 3-methoxy-4-hydroxyphenyl, R^2 is H.

5,147,464

ELECTRIC FUEL INJECTION CLEANER APPARATUS AND METHOD

Alan Skovron, Sydney, Australia, assignor to High Tech Auto Tools Pty. Ltd., Sydney, Australia

Filed Feb. 14, 1990, Ser. No. 479,449
Claims priority, application Australia, Feb. 14, 1989, PJ2727
Int. Cl.[5] B08B 9/00
U.S. Cl. 134—1 12 Claims



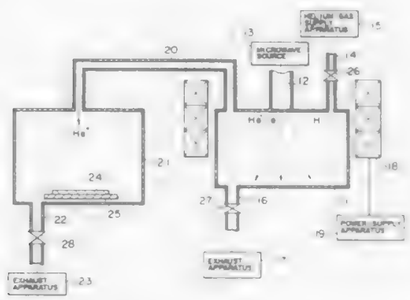
1. A method of cleaning an electronic fuel injector having an inlet and an outlet, comprising the steps of supporting an electronic fuel injector in an ultrasonic bath of cleaning fluid such that at least the outlet tip is immersed in the fluid, resonating said bath with ultrasonic energy, and pulsing said injector at a rate which causes the cleaning fluid to flow in a reverse direction from the bath, into the injector outlet, through said injector, and out of the injector inlet, as a result of the interaction of the ultrasonic resonance and said pulsing action of said injector.

5,147,465

METHOD OF CLEANING A SURFACE

Takahiro Maruyama; Toshiaki Ogawa; Hiroshi Morita; Tomoaki Ishida, and Kenji Kawai, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 30, 1990, Ser. No. 605,427
Claims priority, application Japan, Dec. 13, 1989, 1-321471
Int. Cl.[5] H01L 21/00
U.S. Cl. 134—1 2 Claims



1. A method of cleaning a surface of s substrate comprising:

producing a magnetic field in a first chamber;

introducing helium into the first chamber;

exciting the helium in the first chamber to produce helium ions, electrons, and metastable helium;

separating the helium ions and the electrons from the metastable helium in the first chamber by deflecting the helium ions and the electrons with the magnetic field; and

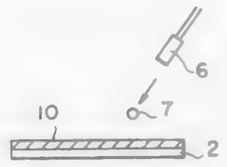
conducting the metastable helium from the first chamber to a second chamber and to a surface of a substrate on which contaminants are present in the second chamber to interact with and remove the contaminants without etching of the surface of the substrate.

5,147,466

METHOD OF CLEANING A SURFACE BY BLASTING THE FINE FROZEN PARTICLES AGAINST THE SURFACE

Toshiaki Ohmori; Itaru Kanno, and Takaaki Fukumoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 27, 1990, Ser. No. 588,806
Claims priority, application Japan, Sep. 29, 1989, 1-252076
Int. Cl.[5] B08B 7/00
U.S. Cl. 134—7 4 Claims



1. A method of cleaning a surface comprising:

selecting a temperature between −20° C. and −100° C. for freezing water to produce fine frozen particles having a hardness no harder than the hardness of a surface to be cleaned by blasting the fine frozen particles against the surface;

freezing the liquid at the selected temperature to produce fine frozen particles; and

blasting the fine frozen particles against the surface with a carrier gas at a gauge pressure in a range from 1 to 10 Kg/cm^2, thereby cleaning the surface.

5,147,467

METHOD FOR CLEANING A TEXTILE FLOOR COVERING

Cheryl Virtue, 3598 Kings Way, #36, Sacramento, Calif. 95821

Filed Apr. 19, 1991, Ser. No. 687,961
Int. Cl.[5] B08B 1/00, 3/02, 5/04, 7/04
U.S. Cl. 134—18 7 Claims

1. A method of cleaning a textile floor covering having surface fibers and an underlying and supporting backing material, comprising the steps of:

a) finely misting said fibers of said textile floor covering with an atomized liquid cleaning compound whereby said cleaning compound wets said surface fibers only and not substantially said backing material;

b) agitating said wetted fibers to further emulsify said cleaning compound and to aid in cleaning said fibers; and

c) drying said agitated and wetted fibers before said cleaning compound significantly wets said backing material

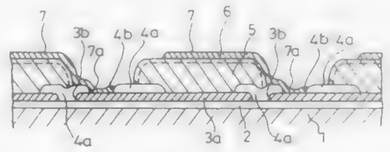
d) raking said fibers after said drying step.

5,147,468

PHOTOVOLTAIC SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Mikio Deguchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1991, Ser. No. 714,934
Claims priority, application Japan, Oct. 17, 1990, 2-281060
Int. Cl.[5] H01L 31/05, 31/18
U.S. Cl. 136—244 12 Claims



1. A photovoltaic semiconductor device including:

a high temperature resistant, electrically insulating substrate;

a plurality of unit photovoltaic elements disposed on said

substrate and connected to each other in series, said photovoltaic elements comprising:

a plurality of first semiconductor layers, each having a relatively low resistivity, disposed on said substrate spaced apart at a predetermined interval;

a plurality of second semiconductor layers selectively disposed on respective first semiconductor layers so that part of the respective first semiconductor layer is not covered by the corresponding second semiconductor layer and each respective second semiconductor layer only contacts the respective first semiconductor layer, each second semiconductor layer including a photovoltaic junction; and

electrodes disposed on respective second semiconductor layers, each electrode contacting a first semiconductor layer adjacent the first semiconductor layer corresponding to the second semiconductor layer on which the respective electrode is disposed.

5,147,469

PROCESS FOR PRODUCING COPPER-BASED ALLOYS HAVING HIGH STRENGTH AND HIGH ELECTRIC CONDUCTIVITY

Toshihiro Kanzaki, Akikawa; Akira Sugawara, Hachioji; Isamu Amatsu, Akikawa, and Kouichi Hatakeyama, Hachioji, all of Japan, assignors to Dowa Mining Co. Ltd., Tokyo, Japan

Filed Nov. 14, 1991 Ser. No. 792,248

Claims priority, application Japan, Nov. 15, 1990, 2-309032

Int. Cl.[5] C22C *9.00*; C22F *1/08*

U.S. Cl. 148—684 **8 Claims**

1. A process for producing a copper-based alloy having high strength and high electric conductivity, which comprises the steps of preparing a copper-base alloy consisting essentially of 0.01–3.0 wt % Co and 0.01–0.5 wt % P with the balance being Cu and incidental impurities, quenching said alloy from a temperature not lower than 750° C. down to 450° C. and below at a cooling rate of at least 1° C./sec, heat treating the quenched alloy at a temperature of 480°–600° C. for 30–600 minutes, cold working said alloy for a working ratio of 20–80%, further heat treating the alloy at a temperature of 440°–470° C. for 30–600 minutes, and subsequently performing cold working for a working ratio of at least 50% and heat treatment at 380° C. and below

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5,147,470

HIGH STRENGTH LEAD FRAME MATERIAL AND METHOD OF PRODUCING THE SAME

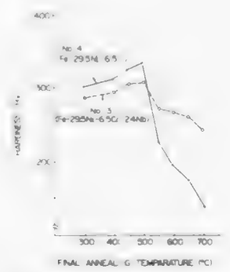
Shuichi Nakamura, Yasugi; Hakaru Sasaki, Matsue, and Rikizo Watanabe, Mooka, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 7, 1991 Ser. No. 671,379

Claims priority, application Japan, Dec. 25, 1990, 2-413670

Int. Cl.[5] C 2C *38/08*

U.S. Cl. 148—677 **15 Claims**



1. A high strength lead frame material consisting essentially, by weight, of 0.5 to 22% Co, 22 to 32.5% Ni, not more than 1.0% Mn and not more than 0.5% Si and the balance Fe and incidental impurities, the contents of Ni and Co being selected so that the Ni content is 27 to 32.5% when the Co content is less than 12%, and so that, when the Co content is not less than 12%, the Ni content and the Co content meet the condition of $66\% \leqq 2Ni + Co \leqq 74\%$, said material also having structure comprising inverse-transformation austenitic phase, residual austenitic phase, and at least one phase selected from the group consisting of martensitic phase and ferritic phase, both of the austenitic phases occupying together not less than 50% of said structure.

5,147,471

SOLDER FOR OXIDE LAYER-BUILDING METALS AND ALLOYS

James W. Kronberg, 108 Independent Blvd., Aiken, S.C. 29801

Filed Apr. 8, 1991, Ser. No. 681,290

Int. Cl.[5] C22C *28/00*

U.S. Cl. 420—556 **10 Claims**

1. A solder for use on a metal surface, said solder comprising tin, zinc, and germanium, said germanium comprising between 0.10 and 10% of said solder by weight.

5,147,472

METHOD FOR SEALING CONVERSION COATED METAL COMPONENTS

David W. Reichgott, Richboro, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Jan. 29, 1991, Ser. No. 647,324

Int. Cl.[5] C23C *22/82*

U.S. Cl. 148—255 **10 Claims**

6. A method of sealing a conversion coated metal component which comprises contacting a conversion coated metal component with a chromium free aqueous bath consisting essentially of a tetrahydro-2- furanmethanol and phosphoric acid.

5,147,473

PERMANENT MAGNET ALLOY HAVING IMPROVED RESISTANCE TO OXIDATION AND PROCESS FOR PRODUCTION THEREOF

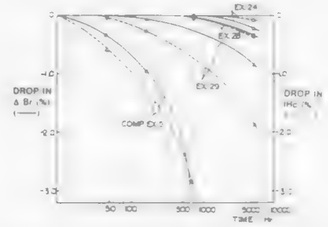
Toshio Ueda; Yuichi Sato; Masayasu Senda; Seiji Isoyama, and Seiichi Hisano, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 565,452

Claims priority, application Japan, Aug. 25, 1989, 1-217500; Aug. 25, 1989, 1-217501; Nov. 22, 1989, 1-301907; Nov. 22, 1989, 1-301908

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—302 **32 Claims**



30. In an improved permanent magnet made of a R-Fe-Co-B-C system alloy, R being at least one of the rare-earth elements including Y, the improvement comprising said alloy comprising individual magnetic crystal grains having a particle size of 0.3–150 μm and which are covered with an oxidation-resistant protective film, with 0.05–16 wt % of said protective film comprising C, and up to 30 wt %, not inclusive of zero wt %, of said protective film comprising Co, and the composition of said magnet alloy as the sum of the magnetic crystal grains and the oxidation-resistant protective film comprising 10–30% R, less than 2%, not inclusive of zero percent, of B, 0.1–20% C, up to 40%, not inclusive of zero percent, of Co, all percentages being on an atomic basis, with the balance being Fe and incidental impurities.

5,147,474

BUILDING CONSTRUCTION STEEL HAVING EXCELLENT FIRE RESISTANCE AND LOW YIELD RATIO

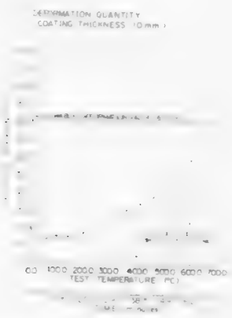
Hiroshi Tamehiro; Rikio Chiziiwa, both of Kimitsu; Yoshifumi Sakumoto, Tokyo; Kazuo Funato; Yuzuru Yoshida, both of Kimitsu, and Koichiro Keira, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 364,608, Jun. 9, 1989, Pat. No. 4,990,196. This application Nov. 13, 1990, Ser. No. 614,076

Claims priority, application Japan, Jun. 13, 1988, 63-143740; Aug. 5, 1988, 63-195600; Jun. 2, 1989, 1-139328; Jun. 2, 1989, 1-139329

Int. Cl.[5] C22C *38/12*

U.S. Cl. 148—320 **4 Claims**



1. A construction steel material having an excellent fire resistance and low yield ratio comprising a steel substrate composed of predominantly large size ferrite grains and a highly heat resistant paint coating layer disposed on a heat receiving surface of said steel substrate, the steel of said steel substrate being produced by a process which comprises: heating a slab, billet or bloom consisting of 0.04 to 0.15% by weight of C, up to 0.6% by weight of Si, 0.5 to 1.6% by weight of Mn, 0.005 to 0.04% by weight of Nb, 0.4 to 0.7% by weight of Mo, up to 0.1% by weight of Al and 0.001 to 0.006% by weight of N, with the balance being Fe and unavoidable impurities, at a temperature in the range of from 1100° to 1300° C. and finishing hot rolling at a temperature of from 800° to 1000° C., and naturally cooling to room temperature.

5,147,475

HIGH STRENGTH STAINLESS STEEL

Hakan Hölmberg, Gävle, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Feb. 26, 1991, Ser. No. 661,000

Claims priority, application Sweden, Feb. 26, 1990, 9000675

Int. Cl.[5] C22C *38/18, 38/34, 38/40*

U.S. Cl. 148—327 **8 Claims**

1. Non-magnetic, stainless steel alloy having high strength, consisting essentially of, in percent by weight:

C: 0.04–0.25%
Si: 2.0–5.0%
Mn: 3.5–7.5%
Cr: 16–21%
Ni: 8–11%
N: 0.10–0.45%

the remainder being iron and normal impurities, the contents of said elements being balanced so that the austenite phase remains stable against deformation into martensite during cold working.

5,147,476

DELAY COMPOSITION AND DEVICE

Michael W. Beck, Edenvale, South Africa, and John Flanagan, Ayrshire, Scotland, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 12, 1991, Ser. No. 669,062

Claims priority, application United Kingdom, Mar. 12, 1990, 9005473

Int. Cl.[5] C06B *5/00, 33/00*

U.S. Cl. 149—37 **13 Claims**

1. A delay composition comprising a consolidated, particulate mixture of silicon and a suitable: oxidant, and a minor effective proportion of dispersed metal compound intimately incorporated therewith to serve as a reaction facilitating flux.

5,147,477

PNEUMATIC TIRE HAVING FOAMED TREAD RUBBER

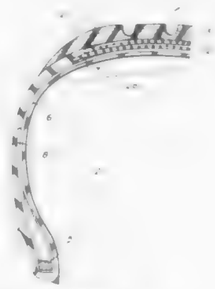
Hiroshi Mouri; Yasuyoshi Kawaguchi; Michio Ishii; Seiichiro Iwafune, and Toshiro Iwata, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 307,219, Feb. 6, 1989, abandoned, which is a continuation of Ser. No. 9,367, Jan. 30, 1987, abandoned. This application May 24, 1990, Ser. No. 527,706

Claims priority, application Japan, Feb. 5, 1986, 61-24634; Apr. 2, 1986, 61-77081; Oct. 2, 1986, 61-235921; Oct. 2, 1986, 61-235923

Int. Cl.[5] B60C *11/00*

U.S. Cl. 152—209 R **17 Claims**



1. A pneumatic tire comprising:

a case having a crown portion; and

a tread covering said crown portion of the case, said tread including as an outer surface portion a foamed rubber which has a volume not less than approximately 10% and not more than approximately 70% of that of the entire of said tread, said foamed rubber being formed of a rubber composition which contains rubber components each having a glass transition point not higher than −60° C., and which additionally contains process oil,

wherein said foamed rubber has an expansion ratio ranging from approximately 5% to approximately 50%, has closed cells the mean diameter of which ranges from approximately 5 μm to approximately 150 μm, and has not less than 20 closed cells of diameters from approximately 30 μm to approximately 200 μm per 1 mm^2.

5,147,478

TIRE TREAD PATTERN HAVING TRANSVERSE GROOVES WITH INTERLOCKING NOISE BAFFLES

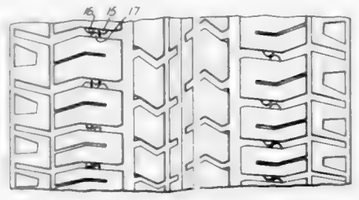
Nigel G. Nock, Birmingham; David H. Clarke, Walsall, and John Martin, Coldfield, all of Great Britain, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Mar. 28, 1990, Ser. No. 500,121

Claims priority, application United Kingdom, Apr. 1, 1989, 8907406

Int. Cl.[5] B60C 11/11

U.S. Cl. 152—209 R 4 Claims



1. A tire having a tread pattern comprising a central zone and two edge zones, said edge zones being subdivided circumferentially of the tire by a series of transverse grooves each having an axially outer end open to the tread edge, a plurality of noise baffles extending into each of said transverse grooves from opposite sidewalls thereof to interlock such that there is no straight path therethrough, said noise baffles extending from the base of the groove to a height of 25% to 75% of the groove depth and positioned at a distance of 2 to 25% of the tread width from the edge of the tread.

5,147,479

ANTI-SKID DEVICE FOR USE ON PNEUMATIC TIRES FOR AUTOMOTIVE VEHICLES

Masaki Koshi, 4-40-1-601, Yoyogi, Shibuya-ku, Tokyo; Shouji Yamada, Shizuoka; Akihiko Watanabe, Shizuoka, and Kouji Nemoto, Shizuoka, all of Japan, assignors to Sumitomo Wiring System, Ltd., Mie and Masaki Koshi, Tokyo, both of, Japan

Filed Dec. 27, 1990, Ser. No. 634,734

Claims priority, application Japan, Dec. 27, 1989, 1-336343; Dec. 27, 1989, 1-336344

Int. Cl.[5] B60C 17/20, 27/04

U.S. Cl. 152—216 4 Claims

1. An anti-skid device for use on pneumatic tires of an automotive vehicle, comprising:

a mounting plate which is detachably mountable to a wheel of an automotive vehicle;

a supporting ring rotatably provided on the outer circumferential periphery of said mounting plate;

a plurality of ribs of a material having elasticity and toughness, said ribs being provided on said supporting ring in a radial fashion and bent so as to extend in a configuration conforming to that portion of a pneumatic tire extending from the outer side of the pneumatic tire to a tread thereof;

first and second endless bands provided on the leading-end portion of each of said ribs (41) in such a manner as to be locatable within the width of the tread of a pneumatic tire, rivets secured at portions where said first and second bands intersect said ribs, and prevention means provided on either of said first and second bands for preventing an imbalance in the degree of stretch between said first and second bands.

5,147,480

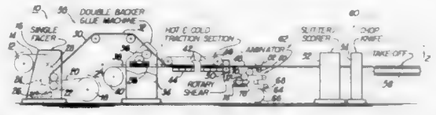
METHOD OF APPLYING A FINISHING LAYER IN A CORRUGATOR LINE

Robert A. Lang, Atlanta, Ga., assignor to Lin Pac, Inc., Atlanta, Ga.

Filed May 16, 1990, Ser. No. 524,352

Int. Cl.[5] B32B 31/08, 31/18

U.S. Cl. 156—64 18 Claims



1. A process for producing corrugated product on a corrugator line for an inventory of outstanding jobs, each job having board grade, blank width, blank length, finish layer and number of containers ordered requirements, and the corrugator line having a wet end and a dry end, comprising the steps of:

(a) reviewing the inventory of outstanding jobs, selecting jobs which require common board grade and selecting a width of board with which to produce the selected jobs;

(b) scheduling for production the selection jobs which require common board grade and board width, according to blank width, in order to maximize efficient use of the width of the corrugator line;

(c) in conjunction with the previous step, scheduling the jobs according to blank length and number of containers required in order to maximize efficiencies associated with long production runs;

(d) producing corrugated paperboard on the corrugator line according to the schedule of selected jobs, the corrugated paperboard comprising single face liner, medium and double face liner;

(e) laminating onto the corrugated paperboard, in coordination with the scheduled production of the corrugated paperboard and at the dry end of the corrugator line, at least one finish layer of predetermined width and length at at least one desired location across as the width and along the length of the corrugator line as the portion of the corrugated paper board which corresponds to the job requiring the finish layer passes such locations; and

(f) cutting the corrugated paperboard, in synchronization with the scheduled production of the corrugated paperboard, and in registration with the finish layer in width and length, to desired length and width requirements in order to simultaneously form at least two sets of blanks, at least one set of which blanks bears a finish layer.

5,147,481

INSECT RESISTANT FOAM BODY USEFUL IN FARM BUILDINGS

Jean-Philippe Deblander, Mundolsheim, France, assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 19, 1991, Ser. No. 746,849

Claims priority, application United Kingdom, Aug. 24, 1990, 9018471

Int. Cl.[5] E04B 2/00; C08J 9/00

U.S. Cl. 156—71 7 Claims

1. A method of insulating a building useful for housing farm animals which comprises affixing to the interior walls, the interior ceiling or both a plastic foam body comprising a foamed plastic polymer having a plurality of closed non-interconnecting cells, a minimum cross-sectional dimension of at least about 30 mm, and a water vapor permeability not greater than about 1.8 perm inches as measured by ASTM Method C-355-64, Procedures for Desiccant Method, said foam body being without discontinuities and substantial variation in average cell size when cell size is measured by averaging cell diameter across the minimum cross-sectional dimension of the body by D-2842-69, wherein the foam body has a density d, of about 38 kg/m^3 or greater, and average cell dimensions V, E, and H in three mutually perpendicular directions of at least about 1.0 mm, at least about 1.0 mm, and at least about 0.9 mm respectively, and a resistance factor, R, of about 500 or greater, as calculated by Formula 1

$$R = \frac{V \times E \times H}{(V \times E) + (V \times H) + (E \times H)} \cdot d^2. \qquad \text{FORMULA 1}$$

5,147,482

METHOD OF FORMING A THROUGHHOLE IN A SHEET TYPE STORAGE BATTERY

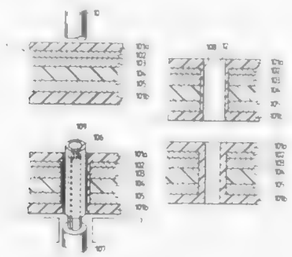
Takeshi Miyabayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 625,102, Dec. 10, 1990, Pat. No. 5,073,684, which is a division of Ser. No. 425,952, Oct. 24, 1989, Pat. No. 5,019,468. This application Oct. 3, 1991, Ser. No. 770,357

Claims priority, application Japan, Oct. 27, 1988, 63-271792; Oct. 28, 1988, 63-274251; Oct. 31, 1988, 63-274776; Oct. 31, 1988, 63-274778

Int. Cl.[5] B32B 31/16

U.S. Cl. 156—73.1 2 Claims



1. A method for forming a throughhole in a sheet type storage battery comprising a negative electrode layer, a solid electrolyte layer, a positive electrode layer and a thermoplastic resin film laminated on at least one of the surfaces of the positive and negative electrode layers, comprising the steps of:

forming a throughhole in the sheet-type storage battery by drilling or punching;

coating the inner wall of a throughhole with a thin layer of the thermoplastic resin film, the thin layer produced by extension of the laminated thermoplastic resin film during the forming of the throughhole;

inserting a cylindrical hollow thermoplastic resin into the throughhole; and

inserting an ultrasonic horn of an ultrasonic welder into the cylindrical hollow thermoplastic resin and welding the thermoplastic resin film coating the inner wall of the throughhole and the cylindrical hollow thermoplastic resin by a welding operation of the ultrasonic welder.

5,147,483

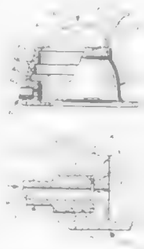
IMPLANTABLE INFUSION DEVICE AND METHOD OF MANUFACTURE THEREOF

Gerald S. Melsky, Lexington, and Frank R. Proal, Duxbury, both of Mass., assignors to Therex Corporation, Walpole, Mass.

Division of Ser. No. 343,914, Apr. 26, 1989. This application Apr. 13, 1990, Ser. No. 509,564

Int. Cl.[5] B23K 11/02; B29C 61/02

U.S. Cl. 156—86 6 Claims



1. A method of manufacturing an implantable infusion apparatus having:

(a) housing means for forming an infusate chamber, said housing means including:

(i) a generally tubular wall section disposed about said chamber, said wall section including an interior surface,

(ii) a base closing said wall section proximate a bottom end thereof,

(iii) an entry port into said chamber at a top end of said housing means, and

(iv) a ledge disposed intermediate said entry port and chamber,

(B) means for closing said entry port including a self-sealing, penetrable septum of resilient material disposable on said ledge,

(C) means defining a fluid outlet passage from said chamber for selectively delivering infusate therefrom, said passage defining means including a hollow exterior stem having a stem end and connected to said housing means,

said method comprising the steps of:

forming a socket in said wall section,

providing said stem end with a circular ridge of reduced cross-section,

seating said stem end in said socket;

generating sufficient heat by resistance welding so as to melt said ridge and flow the melted material about said stem end thereby creating a secure butt weld with said wall section,

after said joining step, disposing said septum on said ledge to close said entry port, including installing said septum from said top end of said housing, and

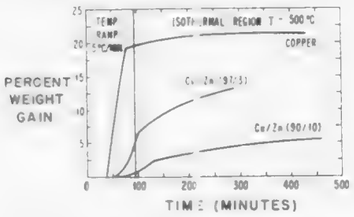
retaining said septum at least partially within said entry port.

5,147,4 4

METHOD FOR PRODUCING MULTI-LAYER CERAMIC SUBSTRATES WITH OXI DATION RESISTANT METALIZ TION

Dudley A. Chance, Newton, Conn.; Gareth G. Hougham, Ossining, and David B. Goland, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 296,290, Jan. 10, 1989, abandoned, which is a continuation of Ser. No. 110,246, Oct. 19, 1987, abandoned.
This application Apr. 10, 1991, Ser. No. 683,397
Int. Cl.[5] C04B 37/00
U.S. Cl. 156—89 18 Claims



1. A method for forming a ceramic composite structure with copper based conductors comprising:

forming at least two green sheets comprised of a thermoplastic organic binder having dispersed therein particles selected from the group consisting of particles of a crystallizable glass and an admixture of glass particles and crystalline particles, said green sheet having a sintering temperature below the melting point of said copper based conductors;

forming on a surface of one of said at least two green sheets a pattern of a copper based conductors forming composition wherein the predominant component of said composition is copper based particles containing an additive within said copper based particles and wherein said composition is resistant to oxidation during the subsequent burn out of said thermoplastic organic binder;

superimposing the other of said at least two green sheets on said surface of said one of said at least two green sheets to sandwich said pattern therebetween;

laminating said superimposed sheets together;

heating said laminate in an oxidizing ambient to a burn-out temperature and maintaining said laminate thereat for sufficient time to decompose and eliminate said binder without substantial oxidation of said index forming composition; and

sintering said laminate in a reducing or inert atmosphere to form a ceramic structure having said copper bead conductors extending within the interior thereof.

5,147,485

LAMINATION OF SEMI-RIGID MATERIAL BETWEEN GLASS

Kenneth J. Gajewski, Woodhaven, and John H. Meyer, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1990, Ser. No. 604,689
Int. Cl.[5] B32B 31/20; C03C 27/12
U.S. Cl. 156—104 16 Claims

1. A method for producing a safety laminate, comprising the steps of:

first, reducing the equilibrium temperature of the laminate elements from ambient temperature, said laminate elements including:

(a) a first rigid transparent layer;

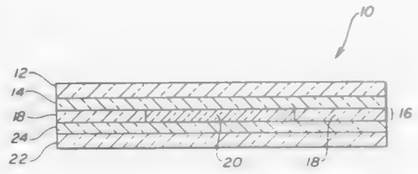
(b) a first layer of thermoplastic laminating material;

(c) an interlayer, comprising a semi-rigid material said semi-rigid material capable of bending and flexing, and tending to crease and fold thereby;

(d) a second layer of said thermoplastic laminating material;

(e) a second rigid transparent layer; and

then, assembling said laminate elements into a laminate assembly at said reduced equilibrium temperature, with said interlayer positioned between said first and second layers of said thermoplastic laminating material;



enclosing at least the edges of said laminate assembly in a sealed space;

degassing said laminate assembly by reducing the pressure of said sealed space by means of evacuating air therefrom;

maintaining the reduced pressure of said sealed space for a period of time;

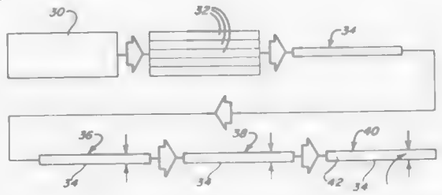
heating said laminate assembly and applying pressure thereto, to bond said laminate elements.

5,147,486

BUILDING PLYWOOD PRODUCT AND METHOD

Harry O. Hoffman, 4411 YakataDoro Dr., Youngstown, Ohio 44511, assignor to Harry O. Hoffman and Kathleen A. Hoffman, Youngstown, Ohio

Division of Ser. No. 324,611, Mar. 17, 1989, Pat. No. 5,071,688.
This application Nov. 30, 1990, Ser. No. 620,143
Int. Cl.[5] B27D 1/04
U.S. Cl. 156—154 11 Claims



1. A method of manufacturing an exterior plywood building trim product comprising the steps of:

forming a base plywood board of an odd number of plies between 7 to 13 inclusive, said board having a ratio of 7 plies per five-eights inch of total board thickness and an approximately equal ratio for increased thicknesses of boards, by:

arranging each ply so that its grain is positioned perpendicularly to an adjacent ply to form alternately arranged plies having alternating degrees of edge coarseness,

forming the board to have appearance and construction side plies and interior plies,

providing said interior plies so that each ply thereof has substantially the same uniform thickness,

adhering adjacent said plies together,

forming the board to have a length substantially greater than its width, and to have two exposed ply edges opposite each other extending the length of the board, wherein said ply edges will have edge openings and edge core gaps;

sanding said appearance side ply to reduce show-through imperfections;

covering said appearance side ply with a fiber overlay;

filling said edge openings and edge core gaps with a filler compound to fill at least the outside portions of said openings and gaps and to cover the entire surfaces of said ply edges to an extent sufficient only to create substantially uniformly covered edges;

sanding said covered edges so that the sanded edges have a predetermined degree of overall coarseness created by said sanding, wherein the coarse sanding and said different degrees of edge coarseness of said alternately arranged plies form a strong bond between said ply edges and a covering of paint or stain; and

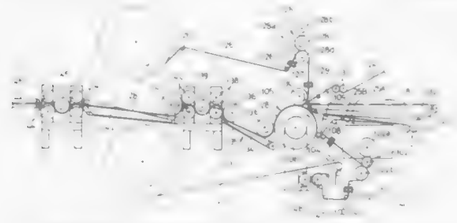
covering said sanded edges and said covered appearance side ply with paint or stain, wherein said appearance side ply and said ply edges are substantially resistant to conditions affecting appearance and longevity and have the appearance as to said covered edges and appearance side ply of a solid integral wood product.

5,147,487

METHOD OF MANUFACTURING DISPOSABLE UNDERPANTS BY APPLYING ANNULAR ADHESIVE ZONES TO THE BACKSHEET AND TOP SHEET FOR RETAINING ELASTIC FOR LEG HOLES

Hironori Nomura, Iyomishima; Taiji Shimakawa; Yoshinori Matsura, both of Kanonji; Hiroki Yamamoto, Kawanoe, and Hirofumi Ohnishi, Iyomishima, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 545,621, Jun. 29, 1990, abandoned.
This application Aug. 16, 1991, Ser. No. 745,708
Claims priority, application Japan, Jun. 29, 1989, 1-167224
Int. Cl.[5] B32B 31/10; A61F 13/15
U.S. Cl. 156—164 19 Claims



1. A method for disposable underpants comprising steps of:

a) providing adhesive zones centrally on one side of a first continuous web intermittently along the length thereof;

b) introducing first and second continuous elastic members having a width narrower than that of a strip of adhesive defining said annular adhesive zones toward the central area on said one side, of said first continuous web so that said first continuous elastic member is laid to bond substantially along a half of said annular adhesive zone while said second continuous elastic member is laid to bond substantially along the remainder half of said annular adhesive zone;

c) providing adhesive zones extending along lateral edges on one side of at least one of said first continuous web and a second continuous web;

d) introducing third group of continuous elastic members between the mutually opposed sides of said first continuous web and said second continuous web along the respective lateral edges so as to be bonded between these webs along said adhesive zones;

e) bonding said first and second continuous webs together along said respective one sides to form a continuous combined web;

f) folding said continuous combined web into two along a longitudinally central line;

g) cutting off portions of said continuous combined web encircled within the respective annular zones each comprising said annular adhesive zone, said first and second elastic members bonded to the web along said annular adhesive zones, after forming or folding double said combined web to form cutouts for leg-holes;

h) providing linear seal zones extending transversely of said folded continuous combined web centrally through said respective cutouts for the leg-holes to one lateral edge of said combined web corresponding to a waist line so as to form continuous series of underpants; and

i) cutting said continuous series of underpants along each of said linear seal zones transversely of said continuous series of underpants so that each of said linear seal zones is divided in two longitudinally of said continuous combined web and thereby obtaining individual underpants.

5,147,488

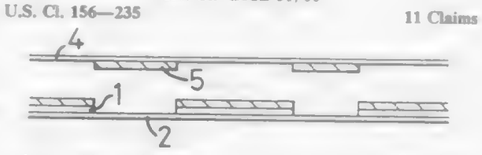
Patent Not Issued For This Number

5,147,489

COLOURED IMAGES

Simon L. Scrutton, Iden, and John V. Shepherd, Wye, both of England, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Oct. 25, 1989, Ser. No. 427,177
Claims priority, application United Kingdom, Nov. 2, 1988, [illegible]
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—235 11 Claims



1. A method of building-up a multi-colored image, which method comprises:

(1) preparing a colored, non-thermoplastic positive image on a carrier, by applying a carrier bearing a colored, transferable non-thermoplastic layer over a thermoplastic negative image, subjecting the carrier and image assembly to non-imagewise heat and pressure, and peeling apart the assembly, whereby the colored non-thermoplastic layer material adheres to the thermoplastic negative image to leave a colored non-thermoplastic positive image on the carrier;

(2) applying said carrier bearing the colored, non-thermoplastic positive image over a receptor having a thermoplastic surface, the image being in contact with the thermoplastic surface;

(3) subjecting the carrier and receptor assembly to non-imagewise heat and pressure and removing the carrier to leave the colored positive image adhered to the thermoplastic surface of the receptor; and

(4) repeating step (1) using at least a second color and positive image, applying the second colored non-thermoplastic positive image on the carrier so obtained to the thermoplastic surface of the receptor obtained in step (3), and subjecting the assembly of the second carrier and the receptor to non-imagewise heat and pressure and removing the carrier to leave the second colored positive image adhered to the thermoplastic surface of the receptor.

5,147,490

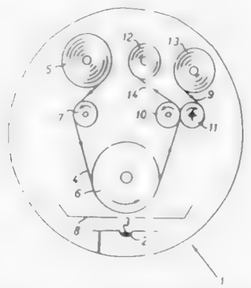
PROCESS FOR THE PRODUCTION OF A HEAT-MODE RECORDING MATERIAL

Luc H. Leenders, Herentals; Lucian F. Voet, St. Katelijne-Waver, and Dirk M. D'hont, Mortsel, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Feb. 15, 1990, Ser. No. 480,603
Claims priority, application European Pat. Off., Feb. 24, 1989, 89200466
Int. Cl.[5] B44C 1/00; C23C 14/00
U.S. Cl. 156—238 15 Claims

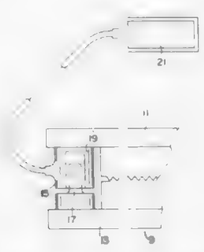
1. In a process for the production of a heat-mode recording

material having "direct read after write" (DRAW) capabilities wherein a web support is coated within a sealed zone maintained under vacuum conditions with a heat-mode recording layer, the improvement of laminating a protective organic



resin layer in web form onto said supported recording layer by means of an adhesive layer while said supported recording layer remains within said sealed zone and while maintaining said vacuum conditions.

5,147,491
FORM, FILL AND SEAL PROCESS AND DEVICE
John T. Thomas, Clover, and Claude E. Monsees, Fort Mill, both of S.C., assignors to Roberts Systems, Inc., Charlotte, N.C.
Continuation of Ser. No. 140,963, Jan. 4, 1988, abandoned, which is a continuation of Ser. No. 825,054, Jan. 31, 1986, abandoned. This application Jul. 11, 1989, Ser. No. 378,461
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—251 5 Claims

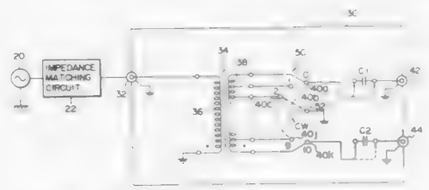


1. In a process of producing a form, fill and seal package wherein a thermoplastic packaging material is formed into a tube filled with product and sealed to complete the package, the improvement comprising:
detecting distance between said sealing jaws having said tube therebetween during the sealing thereof; and
activating an alarm if said distance between said sealing jaws is not in conformity with a predetermined distance.

5,147,492
METHOD OF BONDING COPPER AND RESIN
Chung J. Chen, Taipei, Taiwan, assignor to Compeq Manufacturing Co., Ltd., Tao Yuan Hsien, Taiwan
Filed Feb. 20, 1991, Ser. No. 658,783
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—281 19 Claims

1. A method of bonding copper and resin comprising the steps of:
a) forming a layer of copper oxide on a surface of copper by oxidation of copper;
b) reducing said layer of copper oxide thus formed to metallic copper with a reducing solution of a controlled concentration at a controlled temperature under a well-circulated condition within a controlled period of reaction time to modify the morphology thereof;
c) forming a layer of copper oxide on the surface of said metallic copper by baking; and
d) bonding the surface of said copper oxide formed by baking and a resin together by heat-pressing, whereby a copper board is formed.

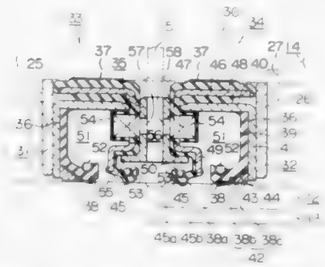
5,147,493
PLASMA GENERATING APPARATUS
Eiichi Nishimura; Akihito Toda, both of Yamanashi; Kazuhiko Sugiyama, Hachioji, and Yukio Naitou, Kofu, all of Japan, assignors to Tokyo Electron Limited, Tokyo and Tokyo Electron Yamanashi Limited, Nirasaki, both of, Japan
Filed Jun. 12, 1991, Ser. No. 714,231
Claims priority, application Japan, Jun. 15, 1990, 2-15676
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—345 9 Claims



1. A plasma apparatus comprising:
a transformer including a primary winding connected to a high frequency power source and a secondary winding electrically insulated from said primary winding and having two end terminals and a plurality of tap terminals connected between the end terminals, and intermediate tap means connected to a reference potential point, said transformer being adapted to deliver high frequency electric powers with a phase difference of 180° from the end terminals;
a sealed chamber;
first electrode means disposed in said sealed chamber and having a plurality of fine pores through which reaction gas is fed into said sealed chamber;
second electrode means disposed in said sealed chamber and opposed to said first electrode means at a predetermined distance therefrom, a to-be-processed object being put on said second electrode means;
gas pipe means provided penetrating said second electrode means for introducing a gas medium for facilitating heat transfer between said second electrode means and said to-be-processed object;
means for connecting said first and second electrode means to said end terminals of said secondary winding, respectively;
power splitter means for adjusting the intermediate tap means of the secondary winding to supply to said second electrode means the high frequency power having a power level lower than that supplied to said first electrode means.

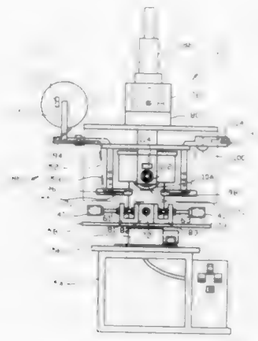
5,147,494
SEAL DEVICE FOR TIRE PRESSURE-ADJUSTING DEVICE
Shuji Torii; Hiromichi Nozaki, both of Yokohama; Kazuyuki Aoshima, Fujisawa, and Norimasa Matsui, Kawasaki, all of Japan, assignors to Keeper Co., Ltd., Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan
Filed Jul. 27, 1990, Ser. No. 558,444
Claims priority, application Japan, Jul. 28, 1989, 1-88025[U]
Int. Cl.[5] B60C *23/00*; F16K *41/08*
U.S. Cl. 156—417 8 Claims

1. In a central tire inflation system, a rotary seal device, said seal device comprising a pair of first and second seal rings which are disposed in opposed relation to each other and having an air passage therebetween, each of said first and second seal rings comprising:
(a) a main seal of an annular shape having a radially inwardly-directed lip formed on an inner periphery of said main seal, said lip having at its distal end a lip sliding surface having a gently-inclined portion and an abruptly-inclined portion extending continuously from said gently-inclined portion axially outwardly, said main seal having a self-



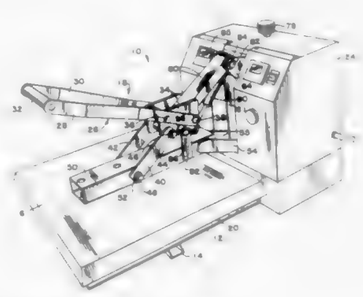
lubricating thin plate which is secured to said lip sliding surface and is adapted for sliding contact;
(b) an auxiliary seal of an annular shape having a radially inwardly-directed lip which is formed on an inner periphery of said auxiliary seal and is adapted for sliding contact, said auxiliary seal being connected to said main seal to form therebetween a closed space for holding grease; and
(c) valve means mounted on said auxiliary seal for effecting the intake and exhaust of air relative to said closed space such as to push grease towards said sliding surface with air from said central tire inflation system.

5,147,495
THERMAL TRANSFER DEVICE
James M. Douglas, 2112 Lagoon Dr., Dunedin, Fla. 34698
Filed Dec. 3, 1990, Ser. No. 620,907
Int. Cl.[5] B65C *3/12*
U.S. Cl. 156—540 22 Claims



1. An apparatus for thermally transferring an image from a thin flexible backing containing the image onto an outer cylindrical surface of a cylindrical closed cell resilient material, the closed cell material having an inner cylindrical surface, comprising:
a rotatable cylindrical mount for supporting the inner cylindrical surface to hold the cylindrical closed cell resilient material and for allowing the cylindrical closed cell resilient material to rotate about an axis of said rotatable mount;
a roller assembly comprising a plurality of rotatable rollers for holding the thin flexible backing and for allowing the thin flexible backing to move linearly in accordance with the rotation of said plurality of rotatable rollers;
positioning means for moving one of the thin flexible backing and the cylindrical closed cell resilient material for positioning the thin flexible backing and the cylindrical closed cell resilient material in contact;
said positioning means locating the thin flexible backing against the cylindrical closed cell resilient material and for compressing the cylindrical closed cell resilient material against said cylindrical rotatable cylindrical mount;
heating means for applying heat to the thin flexible backing; and
motive means for linearly moving the thin flexible backing on said roller assembly and for rotating the cylindrical closed cell resilient material about said axis of said rotatable mount for transferring the image from the thin flexible backing to the outer cylindrical surface of the compressed cylindrical closed cell resilient material and for permanently affixing the image to the cylindrical closed cell resilient material.

5,147,496
LINKAGE FOR HEAT TRANSFER MACHINE
Clifford A. Hix, Pittsburg, Kans., assignor to Hix Corporation, Pittsburg, Kans.
Filed Mar. 6, 1991, Ser. No. 665,381
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—583.8 5 Claims



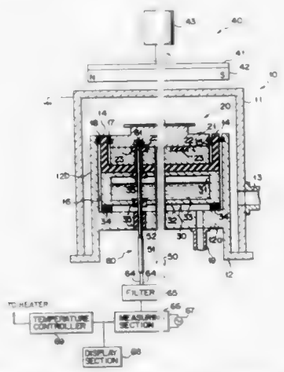
1. A platen-type press comprising:
first and second platens; and
a linkage coupled with one of said platens, said linkage including a lever arm and primary and secondary pivot axes, said linkage further including a stop for moving the linkage between a primary linkage configuration pivoting about said primary pivot axis and a secondary linkage configuration pivoting about said secondary pivot axis in response to movement of the lever arm, said secondary linkage configuration providing greater amplification of a force applied to the lever arm than the amplification provided by the primary linkage configuration when the force is applied to the lever arm.

5,147,497

PLASMA APPARATUS, AND METHOD AND SYSTEM FOR EXTRACTING ELECTRICAL SIGNAL OF MEMBER TO WHICH HIGH-FREQUENCY WAVE IS APPLIED

Toshihisa Nozawa; Osamu Kamikunda; Yukimasa Yoshida, all of Yokohama, and Haruo Okano, Tokyo, all of Japan, assignors to Tokyo Electron Limited, Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Jul. 17, 1991, Ser. No. 731,261
Claims priority, application Japan, Jul. 20, 1990, 2-192469
Int. Cl.[5] B44C *1/22*
U.S. Cl. 156—626 **14 Claims**



3. A method of extracting an electrical signal which is sent from a member applied with a high-frequency wave and which has a lower frequency than the high-frequency power, comprising the steps of:

arranging a transmitting medium of an electrical signal to be extracted, inside a metal container to be insulated therefrom;

arranging said metal container to be insulated from the member to which the high frequency power is applied;

keeping said metal container in a DC floating state; and

causing filter means to remove a high-frequency component of the electrical signal sent from said transmitting medium.

5,147,498

APPARATUS FOR CONTROLLING TEMPERATURE IN THE PROCESSING OF A SUBSTRATE

Kiyoshi Nashimoto, Fuchu, Japan, assignor to ANELVA Corporation, Tokyo, Japan

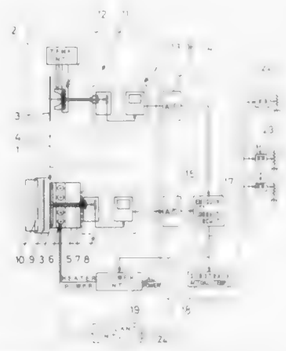
Filed Apr. 5, 1991, Ser. No. 680,938
Claims priority, application Japan, Apr. 9, 1990, 2-37891[U]
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—627 **10 Claims**

7. In the processing of a front surface of a substrate, a method for regulating the temperature of the substrate, said method comprising:

prior to the processign of the front surface of the substrate, measuring the emissivity of the substrate by using a sensor, that is disposed out of contact with the substrate and faces a back surface thereof opposite said front surface, to sense the temperature of heat emitted from the back surface of the substrate through a space that is free of obstacles;

during the processing of the front surface of the substrate, measuring the emissivity of the substrate of using a sensor, that is disposed out of contact with the substrate and faces the back surface thereof, to sense the temperature of heat emitted from said back surface through a space that is free of obstacles; and

processing the measurement of emissivity to obtain the actual temperature of the substrate during processing; and based on the determined actual temperature of the substrate, effecting a heating or cooling of the substrate to maintain



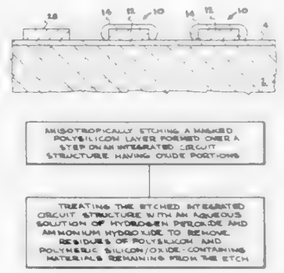
the temperature of the substrate within a predetermined range.

5,147,499

PROCESS FOR REMOVAL OF RESIDUES REMAINING AFTER ETCHING POLYSILICON LAYER IN FORMATION OF INTEGRATED CIRCUIT STRUCTURE

Chester Szwejkowski, Palisades, N.Y.; Ian S. Latchford, Cupertino, Calif.; Isamu Namose, Nagano, and Kazumi Tsuchida, Narita, both of Japan, assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 24, 1991, Ser. No. 735,127
Int. Cl.[5] H01L *21/306*; **B44C** *1/22*; **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **19 Claims**



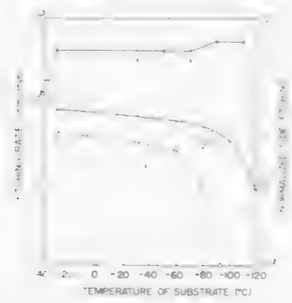
1. In a process wherein a polysilicon layer, which is formed over a step on an integrated circuit structure and masked with a photoresist, is anisotropically etched to remove the exposed portions of the polysilicon layer leaving residues of a polymerized silicon/oxide-containing material adjacent the sidewalls of the masked portions of polysilicon, the improvement comprising: treating the integrated circuit substrate with an aqueous hydroxide/peroxide solution to remove said residues of polymerized silicon/oxide-containing material with minimum damage to exposed oxide portions on the structure.

5,147,500

DRY ETCHING METHOD

Shinichi Tachi, Sayama; Kazunori Tsujimoto, Higashiyamato; Sadayuki Okudaira, Ome, and Kiichiro Mukai, Hachioji, all of Japan, assignors to Hitachi, Ltd., Chiyoda, Japan

Continuation of Ser. No. 225,813, Jul. 29, 1988, abandoned. This application Oct. 10, 1990, Ser. No. 598,808
Claims priority, application Japan, Jul. 31, 1987, 62-190036
Int. Cl.[5] C23F *1/02*
U.S. Cl. 156—643 **16 Claims**



1. A dry etching method comprising the steps of:

disposing an article to be etched in the reaction chamber of an etching apparatus, a mask made of a photoresist film having a predetermined pattern being formed on a surface of the article to be etched, wherein said surface of said article to be etched is made of a material selected from the group consisting of Si, Al, W, SiO_2, Si_3N_4 and a silicide; and

putting the article to be etched in contact with the plasma of an etching gas while controlling the pressure of said etching gas, applying a bias voltage in a range from −10 to −100 V and controlling the temperature of the article to be etched at lower than 0° C. so as to etch the surface of the article to be etched in a condition that the gas pressure in the reaction chamber, the bias voltage applied to the article to be etched and the temperature of the article to be etched are set as to make it possible to make the etching rate for the article to be etched higher than 0.5 μm/min, to make a ratio of the etching rate for the article to be etched to the etching rate for the mask greater than ten, and to make a ratio of the length of side etching in the article to be etched to the depth of etching in the article to be etched less than 1/100.

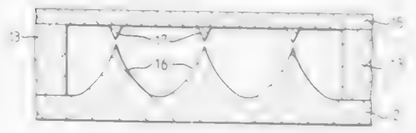
5,147,501

ELECTRONIC DEVICES

Neil A. Cade, Rickmansworth; Rosemary A. Lee, Northwood; Chandrakant Patel, Edgware, and Helen A. Williams, High Wycombe, all of United Kingdom, assignors to The General Electric Company, p.l.c., England

Filed Jan. 12, 1990, Ser. No. 464,431
Claims priority, application United Kingdom, Jan. 18, 1989, 8901083
The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.
Int. Cl.[5] H01J *1/30*
U.S. Cl. 156—656 **10 Claims**

1. A method of forming an electron emission device, the method comprising the steps of: providing a first layer of electrically-conductive material; forming from said first layer a column-like structure having a first end integral with said first layer and a second end, said structure having a first portion tapering from said first end towards an intermediate region of the structure and a second portion tapering from said second end towards said intermediate region; said second end of said structure being attached to a second electrically-conductive layer spaced from said first layer; and removing part of the structure at said intermediate region to separate said first and



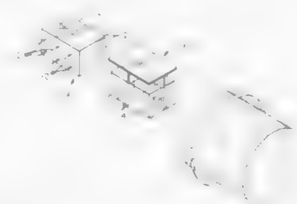
second portions from each other, whereby two tapered bodies are provided with their sharp ends substantially aligned and closely spaced, to form respective electrodes of the device.

5,147,502

METHOD FOR CONDITIONING BALED WASTEPAPER IN RECYCLING OPERATIONS

Willard E. Carlson, Hilton Head Island, S.C., and Ivar H. Stockel, Naples, Fla., assignors to Recycle Processes Inc., Naples, Fla.

Filed May 10, 1990, Ser. No. 521,361
Int. Cl.[5] D21B *1/32*
U.S. Cl. 162—4 **17 Claims**



1. In a method of recycling wastepaper contained in waste material packaged as a bound bale by subjecting the waste material to defibration pulping and sorting operations for recovering cellulosic fibers of the wastepaper, the improvement comprising the steps of:

bringing a jet producing orifice of nozzle means and an exterior surface of said bound bale of waste material into intimate association,

discharging a jet of cellulosic fiber softening and swelling-inducing liquid from said nozzle means orifice at a sufficiently high velocity and flow as establishes penetration of said liquid jet a substantial distance into the interior of said bound bale,

following said jet penetration continuing to discharge said liquid from said nozzle means orifice into said bale at a velocity and flow for a time period as results in waste material within the interior of said bale becoming wetted with said liquid,

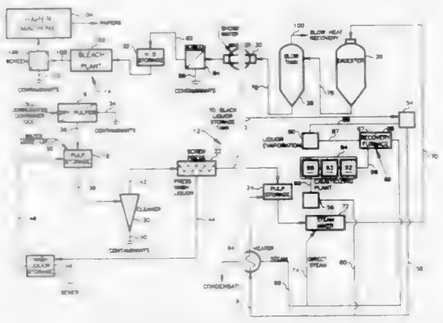
and subsequent to said time period maintaining said bale of wetted waste material in a quiescent state for the time required for said liquid wetted waste material of said bale to sorb sufficient wetting liquid as results in the wastepaper cellulosic fibers of said bale softening and swelling prior to subjecting the waste material of said blade to defibration pulping of the cellulosic fiber recovery operation.

5,147,503

RECYCLING WASTE CELLULOSIC MATERIAL WITH SODIUM SULPHIDE DIGESTION

Xuan T. Nguyen, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Mar. 1, 1991, Ser. No. 663,397
Int. Cl.[5] D21C 5/02
U.S. Cl. 162—7 13 Claims



1. A process for recycling waste cellulosic paper product to produce a cellulosic fiber pulp comprising:

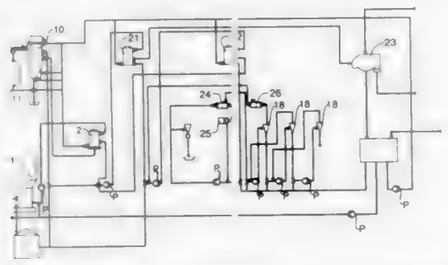
digesting a waste manufactured paper product having a kappa number of at least 80 in an aqueous alkaline cooking liquor containing at least sodium sulphide at a temperature of 160° C. to 180° C. to effect a delignification of cellulosic fibers in said waste product and produce a brownstock of a cellulosic fiber pulp and spent liquor, said cellulosic fiber pulp having a kappa number up to 40, a viscosity of at least 11 cps, and comprising fibres of a quality such that the pulp can be employed as the sole pulp in paper product manufacture.

5,147,504

APPARATUS FOR TREATING PULP IN A PRESSURIZED STATE

Kaj Henricson, Kotka, and Olavi Pikka, Karhula, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 500,475, Mar. 28, 1990. This application Aug. 24, 1990, Ser. No. 573,388
Claims priority, application Finland, Mar. 29, 1989, 891484
Int. Cl.[5] D21C 9/00
U.S. Cl. 162—55 4 Claims



1. A screening plant for treating pulp in a pulp mill, having means for pumping, treating and thickening, said screening plant comprising:

(a) a pump, receiving pulp and exhausting the pulp at an increased pressure;

(b) a treatment apparatus consisting of at least one of a cleaner and a screen, receiving pulp pressurized by said pump; and

(c) a first thickener, receiving pulp pressurized by said pump and increasing a solids content of a portion thereof,

wherein said pump, said treatment apparatus and said thickener are interconnected in closed hydraulic communication and structured so that no air enters into the pulp.

5,147,505

MULTILAYER PAPER AND METHOD FOR THE MANUFACTURING THEREOF

Thomas E. Altman, Yardley, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed May 24, 1991, Ser. No. 705,219
Int. Cl.[5] D21H 27/38
U.S. Cl. 162—129 17 Claims

1. The multilayer paper sheet made from chemical pulps, said sheet comprising a first layer comprised o a first fibers and a second layer immediately adjacent thereto comprised of a second fibers;

said first fibers having average coarseness at least 5 mg/100 m greater than the average coarseness of said second fibers;

said immediately adjacent second layer being more compressible than said first layer; and

the surface smoothness of said multilayer sheet being predominantly characterized by the surface smoothness properties of said second layer.

5,147,506

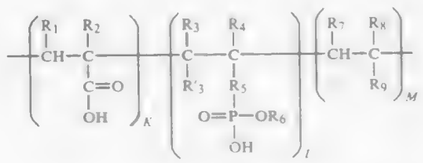
COMPATIBILITY AGENT FOR AQUEOUS POLYPIGMENTARY SUSPENSIONS CONTAINING HYDRATED CALCIUM SULFATE

Jacques Mongoin, Champagne Au Mont D'Or; Georges Ravet, Saint Genis Les Ollieres, and Jean-Marc Suau, Lyon, all of France, assignors to Coatex S.A., Caluire, France

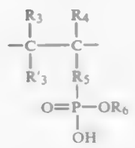
Division of Ser. No. 418,869, Oct. 10, 1989, Pat. No. 5,109,090. This application Aug. 15, 1991, Ser. No. 745,402
Claims priority, application France, Oct. 10, 1988, 88 13511
Int. Cl.[5] D21H 19/56
U.S. Cl. 162—135 2 Claims

1. A process for making paper, comprising the step:

(i) coating a paper support with a suspension comprising hydrated calcium sulfate and a water-soluble copolymer having the formula (I):



wherein L is a value such that the amount of the comonomer of the formula



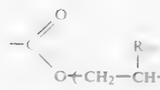
is between 5 and 95 parts by weight, based on the total weight of said copolymer, and one of K and M may be 0 and the sum of K, L, and M equals 100 parts by weight; wherein R_1 is one member selected from the group consisting of hydrogen and a carboxylic acid group which may be esterified with a C_1 to C_{12} alkyl group;

R_2 is one member selected from the group consisting of hydrogen and C_1–C_{12} alkyl;

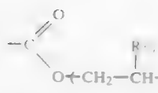
R_3 and R'_3 are each, independently, one member selected from the group consisting of hydrogen, a carboxylic acid group, halogen, C_1–C_{12} alkyl, and substituted or unsubstituted aryl;

R_4 is one member selected from the group consisting of hydrogen, C_1–C_{12} alkyl, substituted or unsubstituted aryl, and a carboxylic acid group which may be esterified with a C_114 C_{12} alkyl group;

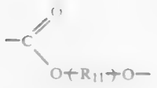
R_5 is one member selected from the group consisting of an ester group, a substituted amide, oxygen, C_1–C_{12} alkylene, substituted or unsubstituted arylene, substituted or unsubstituted cycloalkylene, substituted or unsubstituted cycloalkenylene and substituted or unsubstituted aralkylene, an ethylene or propylene oxide carboxylic ester of the formula:



in which R_{10} is hydrogen or methyl and n has a value of between 1 and 50, an alkyl, aryl, or aralkyl carboxylic ester of the formula:



wherein R_{11} contains 1 to 12 carbon atoms, and a substituted amide of the formula:



wherein R_{12} is hydrogen, C_{1-C12} alkyl, substituted or unsubstituted aryl, or aralkyl, and R_{13} is C_1–C_{12} alkylene substituted or unsubstituted arylene, substituted or unsubstituted cycloalkylene, substituted or unsubstituted cycloalkenylene, or substituted or unsubstituted aralkylene;

R_6 is one member selected from the group consisting of hydrogen, a cation, an amine, C_1–C_3 alkyl, substituted or unsubstituted aryl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted aralkyl, a C_1–C_{12} ester, and a substituted amide;

R_7 is one member selected from the group consisting of hydrogen, a carboxylic acid group, a C_1–C_{12} ester, C_1–C_{12} alkyl, aryl, cycloalkyl, cycloalkenyl, and aralkyl;

R_8 is one member selected from the group consisting of hydrogen, a carboxylic acid group, C_1–C_3 alkyl, and halogen; and

R_9 is one member selected form the group consisting of a C_1–C_{12} ester, substituted or unsubstituted amide, C_1–C_{12} alkyl, cycloalkyl, cycloalkenyl, aryl, aralkyl, halogen, —CO_2H, and a sulfonated or sulfated alkyl or aryl group.

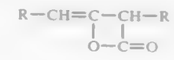
5,147,507

CATIONIC POLYMER-MODIFIED FILLER MATERIAL, PROCESS FOR ITS PREPARTION AND METHOD OF ITS USE IN PAPERMAKING

Robert A. Gill, Bethlehem, Pa., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 490,909, Mar. 8, 1990. This application Dec. 17, 1990, Ser. No. 628,318
Int. Cl.[5] D21H 17/69
U.S. Cl. 162—158 2 Claims

1. A method for improving papermaking by accomplishing at least one of the results of reducing the amount of sizing required; maintaining the sizing content over time; improving the handling properties of a formed paper web, including water release; improving the physical properties of the resulting paper, including filler retention, filler distribution, tensile strength, and surface coefficient of friction; and improving the optical properties of the resulting paper, including brightness, opacity, and pigment scattering coefficient, the method comprising adding to a papermaking furnish from about 5 to about 50 weight percent of a filler material which has been surface-treated with from about 0.1 to about 10.0 weight percent, based on the dry weight of filler material, of a cationic polymer, which is a dimer of the general formula



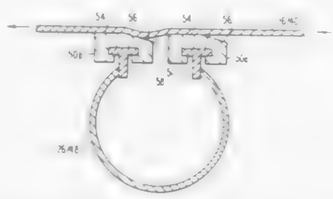
where R is a hydrocarbon group selected from the group consisting of alkyl with at least 8 carbon atoms, cycloalkyl with at least 6 carbon atoms, aryl, aralkyl and alkaryl, which has been made cationic by treatment with at least one of a polyamino-amide and a polyamine polymer, both of which have been reacted with an epoxidized halohydrin compound, to form tertiary and quaternary amine groups on the dimer surface.

5,147,508

SUCTION BOX COVERS FOR CLEANING PAPERMAKING MACHINE FELTS

Douglas F. Sweet, Birmingham, Ala., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Oct. 11, 1991, Ser. No. 775,004
Int. Cl.[5] D21F 1/32, 1/52
U.S. Cl. 162—279 19 Claims



1. In a papermaking machine having a forming section for forming and partly drying a paper web, and a separate press section to which the formed and partly dried paper web is transferred for further drying, press section apparatus comprising:

a moving felt web for receiving the paper web from the forming section; and

a suction box for applying suction to said moving felt web, said felt web being substantially planar adjacent to said suction box and moving relative to said suction box from a location upstream from said suction box to a location downstream from said suction box, said suction box including:

a longitudinal chamber extending longitudinally substan-

tially parallel to the plane of said felt web and transverse to the direction of motion of said felt web, said chamber having an open side adjacent said felt web for communicating reduced pressure in said chamber to said felt web, said open side having substantially parallel first and second edges which are respectively upstream and downstream of said open side in relation to the direction of motion of said felt web;

a first wear strip mounted on said first edge; and

a second wear strip mounted on said second edge, said first and second wear strips being spaced from one another parallel to the direction of motion of said felt web, each of said wear strips having a surface which includes a substantially planar portion substantially parallel to the plane of said felt web, said planar portions of said first and second wear strips being in contact with respective first and second portions of a surface of said felt web, and said surface of at least one of said wear strips including a feathered portion which is upstream from the remainder of said surface in relation to the direction of motion of said felt web, said feathered portion being inclined away from the plane of said felt web in the direction opposite the direction of motion of said felt web so that said felt web comes into contact with said surface of said at least one of said wear strips more gradually than it would in the absence of said feathered portion, said feathered portion being substantially planar and at least about 25% of the dimension of said surface of said at least one of said wear strips parallel to the direction of motion of said felt web, and wherein said paper web is in contact only with a third portion of a surface of said felt web, said third portion being upstream from said first portion in relation to the direction of motion of said felt web.

5,147,509

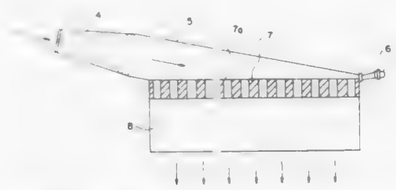
HEADBOX FOR A PAPERMAKING MACHINE WITH DISTRIBUTION TUBES

Mutsuo Kuragasaki; Yasuhiro Suzuoka, both of Nagasaki; Akira Equchi, and Tetsuo Makino, both of Hiroshima, all of Japan, assignors to Beloit Corporation, Beloit, Wis.

Filed Jun. 25, 1990, Ser. No. 543,881

Int. Cl.[5] D21F *1/02*

U.S. Cl. 162—343 **1 Claim**



1. A headbox apparatus for ejecting stock onto a forming wire of a papermaking machine said apparatus comprising:

a header for the flow therethrough of the stock, said header defining an inlet and an outlet, said outlet having an upstream and a downstream end, said header being tapered in a cross-machine direction from said upstream end towards said downstream end such that said flow of stock through said outlet remains substantially constant from said upstream to said downstream end;

a distributor disposed immediately downstream relative to said outlet and in fluid communication therewith, said distributor including:

a plurality of distributor tubes, each tube of said plurality of tubes being disposed parallel relative to each other, each of said tubes having an upstream extremity such that the stock flows from said outlet through each of said upstream extremities, each of said extremities defining an upstream edge and a downstream edge, the arrangement being such that for each tube, said upstream edge is disposed nearer than said downstream edge to said upstream end of said outlet; and

said upstream edges only of said tubes being rounded such that the generation of eddies within said tubes is inhibited.

5,147,510

FLAT MULTICORE WIRE AND METHOD OF FORMING THE SAME WIRE

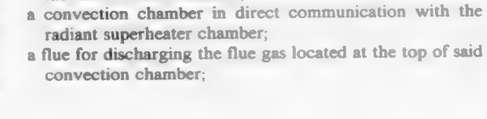
Kazuo Iura, Kameyama; Yoshiaki Yamano, Suzuka, and Kazuhito Saka, Mie, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Feb. 8, 1991, Ser. No. 653,069

Claims priority, application Japan, Feb. 9, 1990, 2-31166

Int. Cl.[5] H01B *7/08*

U.S. Cl. 174—117 F **9 Claims**



1. A flat multicore cable characterized by an end structure in which a plurality of round wires is disposed in a planar configuration parallel to each other and spaced apart at predetermined intervals, insulating coatings on said wires, said coatings uniformly peeled off end portions of said wires to form a group of exposed conductors which act as contact portions, a connecting tape of some length applied to a top surface of said coatings along proximal portions of said contact portions, and a securing tape on an underside of said exposed conductors whereby said securing tape extends over a part of said coatings of said round wires.

9. A method of forming a flat multicore cable comprising disposing a plurality of round wires in a planar configuration parallel to each other and spaced apart at predetermined intervals, said wires having a coating thereon, said method comprising

applying a connecting tape over a top surface of said plurality of said round wires leaving end portions of said plurality uncovered,

removing said coating from at least part of said end portions projecting from said connecting tape to form a group of exposed conductors, and

applying a securing tape on an underside of said group of exposed conductors whereby said securing tape extends over a part of said coating.

5,147,511

APPARATUS FOR PYROLYSIS OF HYDROCARBONS

Herman N. Woebcke, Barnstable, Mass., assignor to Stone & Webster Engineering Corp., Boston, Mass.

Filed Nov. 29, 1990, Ser. No. 619,740

Int. Cl.[5] C10G *9/20*

U.S. Cl. 196—110 **12 Claims**

1. A furnace for cracking hydrocarbon feed to produce olefins comprising:

an unfired radiant superheater chamber;

a fired radiant chamber;

radiant burners in the fired radiant chamber;

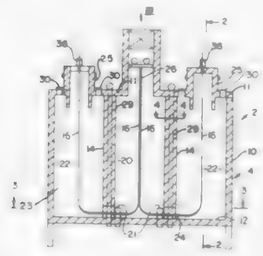
means for passing the flue gases from the radiant burners from the radiant chamber to the superheater chamber;

at least one process coil having an inlet in the superheater zone and extending continuously to an outlet located in the fired radiant chamber;

a convection chamber in direct communication with the radiant superheater chamber;

a flue for discharging the flue gas located at the top of said convection chamber;

convection tubes in the convection chamber upstream of and in direct communication with the inlet of the process coil; and



an adiabatic reactor located directly on top of said fired radiant chamber and having an inlet in direct communication with the process outlet in the fired radiant chamber.

5,147,512

SEPARATION OF KETONE ISOMERS BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and Thomas A. Edison, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Jun. 28, 1991, Ser. No. 723,043

Int. Cl.[5] B01D *3/40;* **C07C** *45/83*

U.S. Cl. 203—51 **4 Claims**

1. A method for recovering 3-pentanone from a mixture of 3-pentanone and 2-pentanone in the presence of about one part of an extractive agent per part of 3-pentanone-2-pentanone mixture, recovering 3-pentanone as overhead product and obtaining the 2-pentanone and the extractive agent from the stillpot, wherein said extractive agent comprises at least one material selected from the group consisting of ethylene glycol, propylene glycol, 1,3-butanediol, 1,2-butanediol, triethylene glycol, tetraethylene glycol, dipropylene glycol, hexylene glycol, 1,4-butanediol, polyethylene glycol, 2-methyl-1,3-propanediol and propoxypropanol.

5,147,513

PROCESS FOR THE PRODUCTION OF A SURFACE STRUCTURE ON PRINTING MECHANISM CYLINDERS FOR OFFSET PRINTING PRESSES

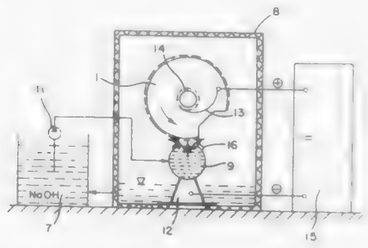
Werner Sondergeld, and Gerhard Hackelberger, both of Offenbach am Main, Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Oct. 8, 1991, Ser. No. 772,921

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1990, 4031860

Int. Cl.[5] C25F *3/14*

U.S. Cl. 204—129.65 **16 Claims**



1. A process for the production of a surface structure on a printing cylinder for offset printing presses, wherein said cylinder includes a galvanically coated hard chrome surface comprising:

applying a thin layer of alkali-resistant negative-resist material to said hard chrome surface;

contacting said alkali-resistant negative-resist material layer with a positive raster film;

irradiating said cylinder by with radiation having a wavelength sufficient to harden at least a portion of the surface of said alkali-resistant negative-resist material layer;

removing the unirradiated portion of said alkali-resistant negative-resist layer to expose said hard chrome surface;

and etching said hard chrome surface, said etching comprising

forming a circuit with said printing cylinder as the anode and cathode means capable of passing a solution therethrough;

contacting said hard chrome surface with a solution of from about 10 to about 20 percent by weight sodium hydroxide, said solution being passed through said cathode means; and

removing said hardened partial surfaces of said alkali-resistant negative-resist layer from said printing cylinder.

5,147,514

PROCESS FOR CROSS-LINKING COLLAGENOUS MATERIAL AND RESULTING PRODUCT

Gerald L. Mechanic, Chapel Hill, N.C., assignor to University of North Carolina, Chapel Hill, N.C.

Continuation-in-part of Ser. No. 388,003, Aug. 2, 1987, abandoned. This application Jul. 30, 1990, Ser. No. 557,639

Int. Cl.[5] C08K *5/00*

U.S. Cl. 204—157.68 **19 Claims**

1. A process for cross-linking collagen fibrils comprising the steps of:

soaking a sample of collagen fibrils to be cross-linked in an aqueous media solution of a photooxidative catalyst buffered to a pH of from about 6.8 to about 8.6 for a period of time sufficient to allow equilibration of the concentrations of media solution, collagen fibrils, and catalyst and

irradiating the equilibrated collagen fibrils with light in the presence of oxygen for a period of time sufficient to cross-link the collagen fibrils by transfer of electrons from catalyst to collagen fibrils while maintaining the temperature of the media solution at between about −2 and about 40° C.

5,147,515

METHOD FOR FORMING CERAMIC FILMS BY ANODE-SPARK DISCHARGE

Haruo Hanagata, Ebina; Tsukasa Suzuki; Kazuo Yanagida, both of Kasukabe, and Hidesato Igarashi, Tokyo, all of Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,703

Claims priority, application Japan, Sep. 4, 1989, 1-228639; Mar. 6, 1990, 2-54827

Int. Cl.[5] H05F *3/04*

U.S. Cl. 204—164 **13 Claims**

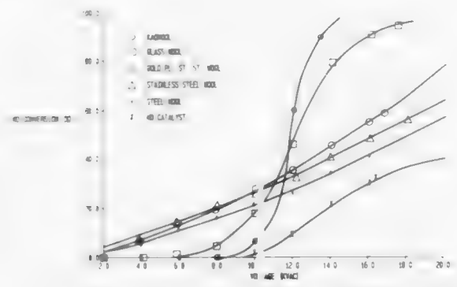
1. A method for forming a ceramic film on the surface of a substrate by spark discharge performed in an electrolytic bath, said electrolytic bath consisting essentially of an aqueous solution of an oxyacid salt selected from the group consisting of tungstates, stannates, molybdates, borates, aluminates and phosphates in which fine ceramic particles having particle sizes ranging from 0.03 to 100 μm and selected from the group consisting of Al_2O_3, $Al(OH)_3$, SiO_2, $3Al_2O_3.2SiO_2$, TiO_2, ZrO_2, Cr_2O_3, SiC, TiC, TiN, TiB, ZrB, BN, WC, WSi_2, and $MoSi_2$ are dispersed and the spark discharge being conducted in the electrolytic bath at a bath temperature ranging from 5° of 90° C. and a current density ranging from 0.2 to 20 A/dm^2 for not less than 5 minutes while ensuring the suspended state of the ceramic particles in the electrolytic bath.

5,147,516

NOX REDUCTION BY SULFUR TOLERANT CORONAL-CATALYTIC APPARATUS AND METHOD

Virendra K. Mathur, Durham; Ronald W. Breault, Kingston; Christopher R. McLarnon, Exeter, all of N.H., and Frank G. Medros, Waltham, Mass., assignors to Tecogen, Inc., Waltham, Mass.

Filed Jul. 19, 1990, Ser. No. 555,561
Int. Cl.[5] C01B 21/00, 21/30
U.S. Cl. 204—177 11 Claims



1. A method of environment effective reducing of NO_x emission comprising the step of reactively exposing NO_x to a sulfur tolerant coronal-catalyst said catalyst in a filamentous form and said exposing occurring at an electric power density of at least about 75 watts/meter^3.

5,147,517

METHOD OF CAPILLARY ELECTROPHORESIS

Koichi Yamagata, Osaka, and Yoshinari Shirasaki, Otsu, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 28, 1991, Ser. No. 676,301
Int. Cl.[5] B01D 57/02, 61/42; C25B 1/00
U.S. Cl. 204—180.1 7 Claims

1. A method of capillary electrophoresis which comprises subjecting a sample mixture of substances to be separated to capillary electrophoresis, wherein the electrophoretic buffer contains an ungelled agarose polymer, whereby the substances in the sample are separated from each other.

5,147,518

PROCESS FOR ADHERING METAL TO POLYIMIDE FILM

Steven C. Freilich, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1991, Ser. No. 666,156
Int. Cl.[5] C23C 14/34, 16/00; B05D 3/04
U.S. Cl. 204—192.14 27 Claims

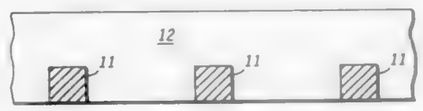
1. A process for the treatment of at least one surface of a polyimide substrate to improve the adhesion of metal deposited thereon in the absence of an adhesive comprising contacting the polyimide surface with a solution of an organic amino thiol, in a solvent, then applying a metal to the coated surface.

5,147,519

METHOD OF MANUFACTURING ELASTOMERS CONTAINING FINE LINE CONDUCTORS

Ronald Legge, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 27, 1990, Ser. No. 559,250
Int. Cl.[5] C23C 14/00
U.S. Cl. 204—192.29 14 Claims



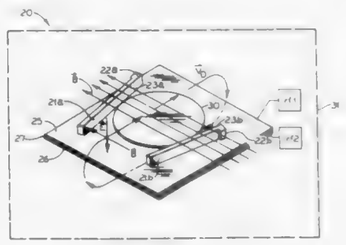
1. A method for forming conductor patterns in flexible elastomeric materials which comprises:
providing a sacrificial substrate that is substantially planar;
forming conductor patterns having geometries of less than 50 microns on the substrate by a means that includes evaporating and sputtering;
coating the conductor pattern and the substrate with a flexible elastomeric material; and
removing the substrate by a destructive means which includes dissolving and melting, and leaving the patterned conductors in the flexible elastomeric coating.

5,147,520

APPARATUS AND METHOD FOR CONTROLLING PROCESSING UNIFORMITY IN A MAGNETRON

Stephen M. Bobbio, Wake Forest, N.C., assignor to MCNC, Research Triangle Park, N.C.

Filed Feb. 15, 1991, Ser. No. 656,790
Int. Cl.[5] B01J 19/12; H05H 1/46; C23F 4/04
U.S. Cl. 204—192.33 39 Claims



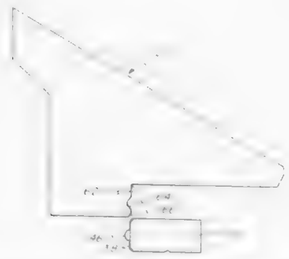
32. A method for raising a relative processing rate for a portion of a substrate surface in a magnetron plasma processing apparatus, the magnetron having a magnetic field parallel to the substrate surface, said method comprising the steps of:
generating a plasma adjacent the substrate surface, the magnetic field confining the plasma adjacent the substrate surface; and
more narrowly electrostatically confining the plasma, in a lateral direction transverse to the magnetic field, adjacent a predetermined portion of the substrate surface so as to electrostatically confine the plasma and thereby raise the relative plasma processing rate for the predetermined portion of the substrate surface independent of the magnetic field.

5,147,521

QUICK CHANGE SPUTTER TARGET ASSEMBLY

Robert L. Belli, Columbus; Martin L. Blazic, Bexley; Rick O. Eller, Orient; Kenneth B. Fielder, Circleville, and Conrad E. Fuchs, Grove City, all of Ohio, assignors to Tosoh SMD, Inc., Grove City, Ohio

Filed May 20, 1991, Ser. No. 702,885
Int. Cl.[5] C23C 14/34
U.S. Cl. 204—298.12 5 Claims



1. A sputtering source having a quick change target from which material is sputtered, comprising:
a sputtering gun having inner and outer annular walls, where said inner wall has locking means extending radially outwardly therefrom;
an annular mounting ring adapted for slidable receipt over said inner annular wall, said annular mounting ring having a plurality of spring loaded ball plungers disposed in a radial array around said ring, said annular mounting ring having an outer peripheral surface and an inner peripheral surface, said outer peripheral surface spaced from said outer annular wall, thereby forming an annular gap; and
a removable annular shaped target from which material can be sputtered, said target having an inner rim having an inwardly facing groove, said spring loaded ball plungers being retractable into said mounting ring to receive said inner rim, and expandable into said inwardly facing groove for retaining said target to said sputtering gun,
said annular mounting ring including a plurality of threaded bores, each threaded bore extending radially from said inner peripheral surface to said outer peripheral surface of said annular mounting ring, each of said spring loaded ball plungers housed within a threaded insert member threadably received in a corresponding threaded bore, whereby a radial disposition of each said threaded insert can be varied within its corresponding mating threaded bore.

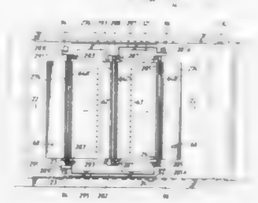
5,147,522

AUTOMATIC ELECTROPHORESIS APPARATUS AND METHOD

Robert J. Sarrine, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Continuation-in-part of Ser. No. 263,627, Oct. 27, 1988, which is a continuation-in-part of Ser. No. 26,465, Mar. 16, 1987, Pat. No. 4,810,348. This application Jan. 16, 1991, Ser. No. 642,199
Int. Cl.[5] G01N 27/26; R01D 57/02
U.S. Cl. 204—299 R 1 Claim

1. Electrophoresis apparatus comprising
a base,
an application plate longitudinally disposed on said base,
an electrophoresis support medium removably disposed on said application plate having longitudinal and lateral dimensions with raised first, second and third lateral reservoir strips of electrically conductive material disposed respectively at one longitudinal end, at the other longitudinal end, and at an intermediate position,
a cathode electrode pair having first two electrodes disposed on opposite lateral sides of said support medium at a first longitudinal end of said application plate, each of said first two electrodes adapted for connection to a negative terminal of a source of d.c. electricity,
an anode electrode pair having second two electrodes disposed on opposite lateral sides of said support medium at a second longitudinal end of said application plate, each of said anode electrodes adapted for connection to a positive terminal of a source of d.c. electricity,
a first conductive electrode bar laterally disposed across said support medium in electrical contact with said first lateral reservoir strip,
a second conductive electrode bar laterally disposed across said support medium in electrical contact with said second lateral reservoir strip,
a third conductive electrode bar laterally disposed across said support medium in electrical contact with said third lateral reservoir strip, and
cathode connecting means for electrically connecting said cathode electrode pair to said first and second conductive electrode bars, and
anode connecting means for electrically connecting said anode electrode pair to said third electrode bar, and wherein
said first electrodes include magnetic posts which extend upwardly from said application plate,
said second electrodes include magnetic posts which extend upwardly from said application plate,



said cathode connecting means includes a cathode longitudinal member adapted for placement between one of said first two magnetic posts and one of said second two magnetic posts,
said cathode longitudinal member including a cathode ferrous material strip and an anode ferrous material strip disposed at opposite longitudinal ends, which when placed next to magnetic posts, are secured thereto by magnetic attraction of the magnetic posts and ferrous material and establishes electrical contact between posts and strips,
said cathode longitudinal member including first, second and third magnets, each one arranged to maintain the physical position and establish electrical contact between such magnets and an end of a corresponding one of said first, second and third conductive electrode bars, and
a conductive lead placed between said cathode ferrous material strip and said first and second magnets, whereby an electrical path is created between said cathode electrode pair and said first and second conductive electrode bars, and wherein
said anode connecting means includes an anode longitudinal member adapted for placement between the other of said first two magnetic posts and the other of said second two magnetic posts,

said anode longitudinal member including a cathode ferrous material strip and an anode ferrous material strip disposed at opposite longitudinal ends thereof, which when placed next to magnetic posts, are secured thereto by magnetic attraction of the magnetic posts and ferrous material and establishes electrical contact between posts and strips,

said anode longitudinal member including fourth, fifth and sixth magnets, each one arranged to maintain the physical position and establish electrical contact between such magnets and an opposite end of a corresponding one of said first, second, and third conductive electrode bars, and

a conductive lead placed between said anode ferrous material strip and said sixth magnet, whereby an electrical path is created between said anode pair and said third conductive electrode bar.

5,147,523

THIN FILM GAS SENSOR

Shinji Yagawara, and Wasaburo Ohta, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 10, 1991, Ser. No. 712,410

Claims priority, application Japan, Jun. 11, 1990, 2-152140; Aug. 30, 1990, 2-228851; Sep. 10, 1990, 2-239694; Jan. 30, 1991, 3-29578

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—424 25 Claims

1. A gas sensor which senses gas using a metal oxide semiconductor whose resistance changes depending on gas adhesion on a surface of the metal oxide semiconductor, said gas sensor comprising:

a base structure; and

a gas sensitive layer formed on said base structure and made of a metal oxide semiconductor,

said gas sensitive layer having a multi-layer structure which includes at least two layer portions having mutually different grain structures.

5,147,524

PH SENSOR

Scott T. Broadley, Mission Viejo, Calif., assignor to Broadley-James Corporation, Santa Ana, Calif.

Filed Jul. 25, 1991, Ser. No. 735,993

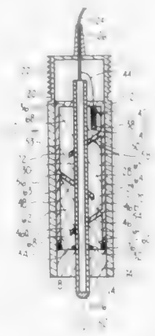
Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—433 19 Claims

1. A device for use in connection with measuring pH in a specimen fluid, which comprises:

a salt bridge comprising an electrolyte-impregnated unitary semi-permeable plug having a first end adapted to contact the specimen liquid, a second end opposite the first end, a longitudinal axis extending between the first end and the second end, and an outer surface radially outward of the longitudinal axis, wherein said plug has at least a first notch and a second notch formed therein extending part way across the plug, said notches being axially spaced from each other, said first notch extending radially inwardly from a first side of said surface of said plug, said second notch extending radially inwardly from a second side of said surface of said plug; and

an impermeable material deposited in each said notch to substantially fill said notch, such that a portion of said



material in said first notch radially overlaps a portion of said material in said second notch.

5,147,525

SYNTHESIS OF CRYSTALLINE METALLOALUMINOPHOSPHATE COMPOSITION

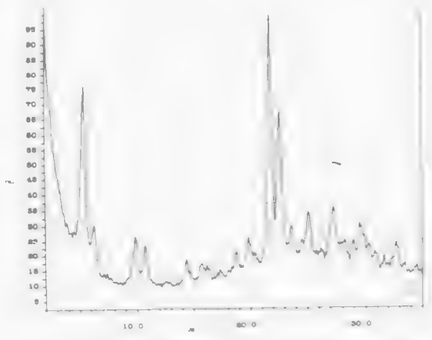
Clarence D. Chang, Princeton, and John D. Lutner, Hamilton Square, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 136,083, Dec. 21, 1987, Pat. No. 4,880,611, which is a continuation of Ser. No. 117,858, Nov. 6, 1987, abandoned, which is a continuation of Ser. No. 878,754, Jun. 26, 1986, Pat. No. 4,891,197, which is a continuation-in-part of Ser. No. 642,925, Aug. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 562,673, Dec. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 685,171, Dec. 21, 1984, Pat. No. 4,673,559, said Ser. No. 642,925, is a continuation-in-part of Ser. No. 615,391, May 30, 1984, abandoned, said Ser. No. 878,754, is a continuation-in-part of Ser. No. 685,186, Dec. 21, 1984, Pat. No. 4,623,527, which is a continuation-in-part of Ser. No. 562,909, Dec. 19, 1983, abandoned. This application Apr. 8, 1988, Ser. No. 179,341

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[5] C10G *11/00*

U.S. Cl. 208—46 18 Claims



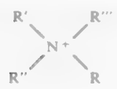
1. A method for synthesizing a metalloaluminophosphate composition comprising crystals having a framework topology after heating at 110° C. or higher giving an X-ray diffraction pattern with lines shown in Table 1A of the specification, which comprises (i) preparing a mixture capable of forming

said composition, said mixture comprising sources of aluminum, phosphorus, one or more elements (M) other than aluminum or phosphorus, water and a directing agent (DA), and having a composition, in terms of mole ratios, within the following ranges:

M/Al_2O_3	0.01 to 0.5
P_2O_5/Al_2O_3	0.5 to 1.25
H_2O/Al_2O_3	10 to 100
DA/Al_2O_3	0.5 to 1.5

wherein DA is a compound of the formula:

wherein R, R′, R″ and R‴ are the same or different and are selected from the group consisting of $—CH_2X$ and $—CH_2CH_2X$, X is hydroxide or halide, and M is one or more elements characterized by an oxidation number of from +2 to +6 and a Radius Ratio of from 0.15 to 0.73, and a combination thereof with Si^{+4} where less than about 50% of the atoms of M are Si^{+4}, (ii) maintaining said mixture under sufficient conditions including a temperature of from about 100° C. to less than about 147° C. for a period of time of less than about 80 hours and (iii) recovering said metalloaluminophosphate composition from step (ii) containing the cation



5,147,526

DISTILLATE HYDROGENATION

Simon G. Kukes, Naperville; Frederick T. Clark, Wheaton, and P. Donald Hopkins, St. Charles, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 1, 1991, Ser. No. 769,533

Int. Cl.[5] C10G *47/18*

U.S. Cl. 208—111 25 Claims

1. A process for hydrogenation of a hydrocarbon feedstock consisting essentially of material boiling between about 150° F. and about 700° F. which comprises reacting said feedstock with hydrogen at hydrogenation conditions in the presence of a catalyst comprising hydrogenation metals and a support comprising zeolite Y, said hydrogenation metals comprising from about 0.1 percent to about 2.0 percent by weight each of palladium and platinum and measured as a percentage of said catalyst, and said zeolite Y comprising sodium in an amount ranging from about 1.5 percent to about 8.0 percent by weight of said zeolite Y.

5,147,527

MAGNETIC SEPARATION OF HIGH METALS CONTAINING CATALYSTS INTO LOW, INTERMEDIATE AND HIGH METALS AND ACTIVITY CATALYST

William P. Hettinger, Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 3, 1989, Ser. No. 332,079

Int. Cl.[5] C10G *11/05*

U.S. Cl. 208—120 35 Claims

1. In a process for economically converting carbometallic oils to lighter products in a system comprising a progressive-flow reactor and a particulate regenerator comprising:

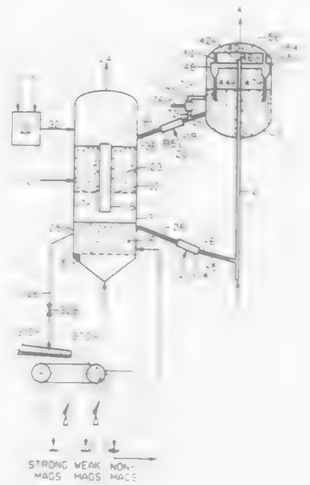
a. providing a converter feed containing metal(s);

b. bringing said converter feed together with inorganic particulate matter to form a stream comprising a suspension of said particulates in said feed and causing the resultant stream to flow through a progressive flow reactor having an elongated reaction chamber;

c. separating spent, coke-laden particulates from the stream of hydrocarbons formed by vaporized feed and resultant cracking products;

d. maintaining, in one or more regeneration zones, one or more fluidized particulate regeneration beds comprising spent particulates undergoing regeneration by combustion of the coke with oxygen on the spent particulate and supplying additional spent particulates to one or more of such fluidized regeneration bed or beds;

e. retaining said particles in said regeneration zone or zones in contact with a flow of said combustion—supporting gas under conditions of temperature, atmosphere and average total residence time in said zone or zones sufficient for combustion of the coke on the particulates and for reducing the level of carbon on the particulates while forming gaseous combustion product gases comprising CO and/or CO_2;



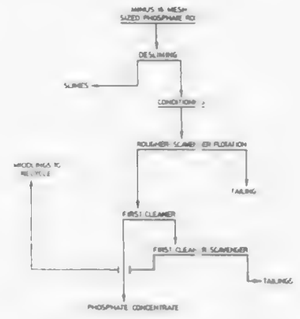
f. recycling the regenerated particulates to the reactor for contact with fresh feed;

The improvement comprising:

g. withdrawing a portion of the particulates from the cycle, said portion including particulates of relatively high activity and low metals and particulates of relatively low activity and high metals;

h. spreading withdrawn particulates over a conducting moving belt which eliminates electrostatic charge and which passes over a rotating roll containing a high intensity magnet so arranged in spacing and orientation so as to create high magnetic field gradients, having sufficient magnetic strength and belt speed so as to discharge, a first portion of low magnetic propertied particulates in one container, and a second retained higher magnetic propertied portion of particulates into a second container, whereby the first portion of particulates is higher in activity and lower in metals content then the second portion of particulates.

5,147,528
PHOSPHATE BENEFICIATION PROCESS
Srdjan Bulatovic, Peterborough, Canada, assignor to Falconbridge Limited, Toronto, Canada
Continuation-in-part of Ser. No. 508,385, Apr. 12, 1990, abandoned. This application Apr. 8, 1991, Ser. No. 681,817
Int. Cl.[5] B03D *1/006, 1/08, 1/01, 1/02*
U.S. Cl. 209—166 7 Claims

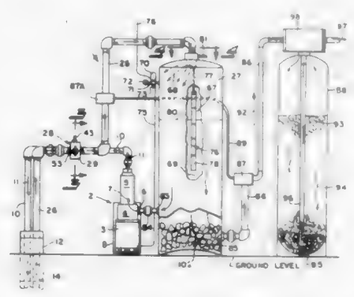


1. A process for the froth flotation separation of phosphate minerals contained in a phosphorus-containing ore, comprising the steps of:
a) preparing a phosphate mineral collector agent by mixing ingredients initially comprising:
i) 20–60% by weight of a fatty acid containing 12–36 carbon atoms in its hydrocarbon chain,
ii) 5–25% by weight of a tall oil pitch,
iii) 2.5–15% by weight of an amine derived from a plant,
iv) 0–15% by weight of sarcosine; and
oxidizing said mixture by means of a method selected from the group consisting of: sparging with an oxygen-containing gas, adding a liquid oxidizing agent and adding a solid oxidizing agent; and thereafter adding to the oxidized mixture, as the balance, 20–72.5% by weight of one member of the group consisting of fuel oil and furnace oil;
b) grinding a phosphate mineral-bearing ore, and thereafter slurrying said ground core in water;
c) conditioning the ore slurry by adding thereto conditioning agents and the phosphate mineral collector agent resulting in step a) followed by agitation
d) subjecting the ore slurry so conditioned to froth flotation separation, and thereafter separating a phosphate mineral concentrate-bearing froth and treating said phosphate mineral concentrate for phosphate recovery.

5,147,529
METHOD FOR AUTOMATICALLY PROCESSING MAGNETIC SOLID PHASE REAGENTS
Ching-Cherng Lee, Newark, and James E. Davis, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 10, 1988, Ser. No. 230,449
Int. Cl.[5] G01N *5/04*
U.S. Cl. 210—695 9 Claims

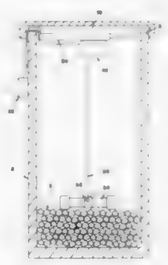
1. An automatic method for separating particles from liquid dispersions of such particles disposed in a plurality of reaction vessels, the particles being responsive to a magnetic field comprising the steps of:
transporting the vessels to a plurality of processing positions, and
subjecting each of the vessels at at least two consecutive processing positions, to a magnetic field for a dwell time at each position less than that required to effect a complete separation of the particles from the dispersion.

5,147,530
WELL WATER REMOVAL AND TREATMENT SYSTEM
James W. Chandler; William D. Chandler, Jr., and William J. Conery, all of Ashland, Ohio, assignors to Water Soft Inc., Ashland, Ohio
Filed Nov. 10, 1988, Ser. No. 271,349
Int. Cl.[5] C02F *1/52*
U.S. Cl. 210—90 59 Claims



1. A well water removal and treatment system comprising tank means having a water column and a pressurized air head and further having an inlet and outlet for water passing therethrough, above ground pump means having a water intake and pressurized water outlet to pump the water in the system, a water inlet line from said tank means outlet to the water intake of the pump means, a pressurized water drive line leading from the pump outlet to a well water ejector, a water return line leading from the well water ejector to the tank means inlet to spray the system water and the water withdrawn from the well through the tank means inlet into the air head of the tank means, a mixing manifold means fluidically connected between the water drive line and the water return line to entrain air into the water in the system during pump operation and means selectively to deliver the water from the system to service.

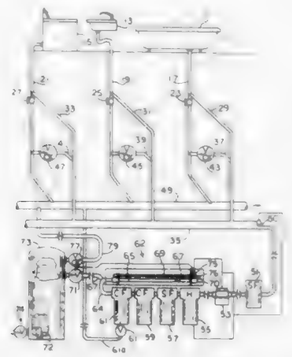
5,147,531
SALT LEVEL MONITORING DEVICE FOR WATER SOFTENERS
Stephen W. Dougal, 8250 Ustick Road, Boise, Id. 83704
Filed Jun. 17, 1991, Ser. No. 716,205
Int. Cl.[5] C02F *1/42*
U.S. Cl. 210—91 6 Claims



1. A device for monitoring solid salt level within a water softener, comprising:
a drop line;
a weight connected to the lower end of said drop line, said weight having a mass density less than the mass density of solid salt but greater than the mass density of salt brine for sinking through salt brine and resting upon the top surface of the salt being monitored;
a sensor connected to the opposing top end of said drop line,

said sensor actuated by tension placed upon said drop line by said weight when said salt level drops below a selected level; and
sensor support means mounted on said water softener.

5,147,532
DOMESTIC GREY WATER PURIFIER USING DIVERTER AND UV FILTER TREATER WITH PREHEATER
Kenneth F. Leek, Jr., 1973 Cordilleros, Redwood City, Calif. 94062
Filed Feb. 21, 1991, Ser. No. 659,607
Int. Cl.[5] B01D *36/00*
U.S. Cl. 210—97 19 Claims



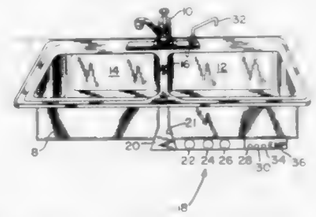
1. A water purification system adapted for use in a home or other facility which contains at least one application which discharges grey water into a sewer system, comprising:
means for diverting said at least one grey water discharged from said appliance,
a grey water purifier for receiving the grey water diverted from said at least one appliance, said purifier comprising:
at least one filter for filtering said water,
means for heating said water, and
ultraviolet water sterilizer means for receiving said grey water and sterilizing said grey water to provide purified grey water,
said means for heating said water being arranged to heat said water after it is discharged from said at least one appliance and before it is supplied to said sterilizer means so as to supply heated water to said sterilizer means, and
means for discharging said purified grey water for non-potable uses.

9. The system of claim 1, said grey water purifier further including pump means for pumping said at least one grey water through said filter and said sterilizer means.

10. The system of claim 9, further including a holding tank for storing said grey water before it it sent to said grey water purifier, and said grey water purifier further including a level switch for actuating said pump if the level of grey water in said holding tank reaches a predetermined level.

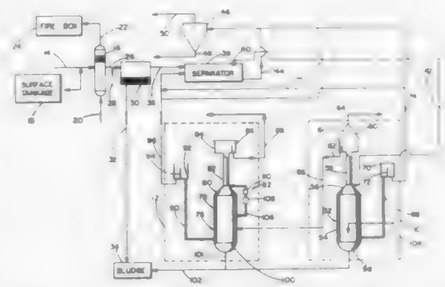
5,147,533
SINK WITH WATER PURIFICATION SYSTEM THEREUNDER
Alfred J. Lipshultz, 4090 Lake Dr., Coconut Creek, Fla. 33066, and Mitchell Lipshultz, Ft. Lauderdale, Fla., assignors to Alfred J. Lipshultz, Coconut Ck, Fla.
Filed Nov. 1, 1991, Ser. No. 786,596
Int. Cl.[5] B01D *61/08*
U.S. Cl. 210—98 1 Claim

1. A combination comprising a water purification system and a kitchen sink having a right well and a left well symmetrically disposed on opposite sides of a central ridge providing a gap therebeneath on the underside of said sink, said water purification system comprising a plastic air/water storage tank molded in place in said gap on the underside of said sink, wherein said water purification system further comprises a prefilter, a reverse osmosis element, a deionization module, a



feedwater connection, a brine discharge line and an electronic memory panel, all of which are incorporated within the underside of said sink, and wherein said water purification system further comprises a long reach faucet and a product water connection that connects said tank to said long reach faucet from which purified water is discharged from said tank.

5,147,534
WASTE WATER TREATMENT SYSTEM
Theodore R. Rymal, Jr., 7400 Jones Rd., Apt. 269, Galveston, Tex. 77551
Filed Jul. 31, 1990, Ser. No. 560,436
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—104 20 Claims



14. Apparatus for separating the mixture of first and second materials having different densities, the density of the first material being greater than the density of the second material, the apparatus comprising:
a separation tank including a first material storage chamber and a separation chamber spaced above the first material storage chamber, the separation chamber having a horizontal cross-sectional area which continually decreases with increased spacing from the first material storage chamber for housing a first material/second material interface;
a fluid inlet to the separation tank for continually inputting the mixture of first and second materials into the separation tank;
a second material leg flow line spaced above the separation chamber, the second material leg flow line having a second material inlet adjoining the separation chamber and a second material outlet above the second material inlet;
a second material overflow weir means adjacent the second material outlet;
a first material leg flow line spaced in parallel with the separation tank, the first material leg flow line having a first material inlet in fluid communication with the first

material storage chamber and a first material outlet spaced vertically between the first material storage chamber and the second material outlet;

a first material overflow weir means adjacent the first material outlet;

the first material overflow weir means and the second material overflow weir means creating a head pressure in the first material leg flow line relative to the head pressure in the second material leg flow line to maintain the first material/second material interface within the separation chamber; and

at least one of the first material overflow weir and the second material overflow weir being adjustable for selectively varying the elevation of the respective outlet with respect to the separation tank and thereby the head pressure of the material within the respective flow line.

5,147,535

ARRANGEMENT FOR DRIVING OUT OF VOLATILE IMPURITIES FROM GROUND WATER USING VIBRATIONS

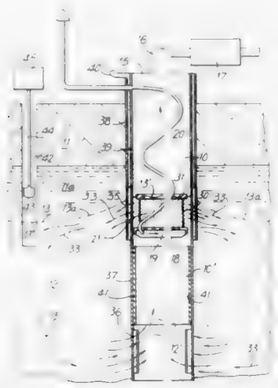
Bruno Bernhardt, Reutlingen, Fed. Rep. of Germany, assignor to IEG Industrie-Engineering GmbH, Reutlingen, Fed. Rep. of Germany

Filed Dec. 5, 1990, Ser. No. 624,324

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940433

Int. Cl.[5] B01D *17/12*

U.S. Cl. 210—138 **6 Claims**



1. An arrangement for driving out of volatile impurities from ground water and ground region through which the ground water flows, comprising a well shaft arranged to extend from a ground surface to a ground region which contains contaminated ground water, said well shaft having at least partially water-permeable shaft walls; means for supplying fresh air into said well shaft; means comprising at least one vibration generator generating mechanical vibrations in ground layers adjacent to the ground water with a limited energy such that the vibrations cause molecular liquid movements in capillaries in the ground layers adjacent to the ground water and do not destroy the capillaries; and at least one opening extending near said well shaft through the ground layers adjacent to the ground water, said at least one vibration generator being respectfully arranged in said at least one opening.

6. An arrangement as defined in claim 1, wherein said vibration generator is adapted to generate vibrations during an adjustable operation time.

5,147,536

ANION EXCHANGER WITH A LIGAND COMPRISING TWO QUATERNARY AMINO GROUPS AT A DISTANCE OF TWO ATOMS

Björn Engström, Sundsvall, Sweden, assignor to Pharmacia LKB Biotechnology AB, Uppsala, Sweden

Filed Feb. 26, 1991, Ser. No. 651,405

Claims priority, application Sweden, Jun. 27, 1989, 8902315-4

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **8 Claims**

1. An ion exchanger for chromatographic separation, having the structure

P—S—A

where

P is an insoluble support,

S is a spacer, and

A is a functional ligand that comprises two quaternary amino groups at a distance of two atoms from each other.

5,147,537

CARRIER FOR AFFINITY CHROMATOGRAPHY IMMOBILIZED WITH ANTIBODIES

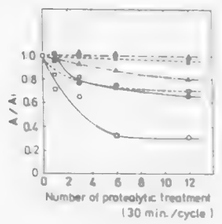
Eizo Sada; Shigeo Katoh, both of Kyoto; Akihiko Kondo, Kohshoku, and Masaaki Kishimura, Kishiwada, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 317,561, Mar. 1, 1989, abandoned. This application Jan. 31, 1992, Ser. No. 827,917

Claims priority, application Japan, Mar. 10, 1988, 63-57299

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **6 Claims**



1. A carrier for affinity chromatography comprising an insoluble carrier and antibodies immobilized on the insoluble carrier, said antibodies modified by activated polyethylene glycol at a location other than at an immobilizing site.

5,147,538

FIELD-PORTABLE APPARATUS AND METHOD FOR ANALYTICAL SUPERCRITICAL FLUID EXTRACTION OF SORBENT MATERIALS

Bob W. Wright, and Jonathan S. Fruchter, both of Richland, Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 510,987, Apr. 19, 1990, Pat. No. 5,087,360. This application Nov. 8, 1991, Ser. No. 790,190

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **1 Claim**

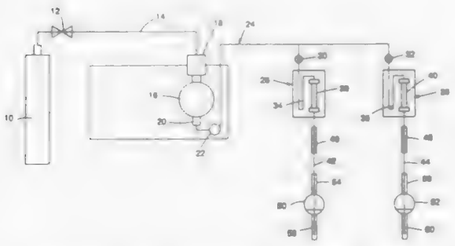
1. A combination for use in portable supercritical fluid extraction of analytes of semivolatile and higher molecular weight materials from a solid absorbent matrix comprising:

a) reciprocating high pressure liquid chromatography pump having a pumphead having pumphead cooling means;

b) pumphead cooling means comprising a copper plate mounted on said pumphead, said copper plate attached to a thermoelectric cooler assembly;

c) including a wafer-shaped, single stage thermoelectric cooler, a liquid cooled copper heat exchanger, and a convective cooled heat sink a heated extraction effluent restriction tube; and,

d) a collection flask assembly which is designed to sealingly receive said extraction effluent restriction tube, said collection flask assembly having a collection tube for holding



collection solvent, and having a collection solvent condenser provided at the top of the collection flask assembly to condense collection solvent vapors entrained by escaping Supercritical Fluid Extraction solvent and wherein said combination is sized and dimensioned for field use.

5,147,539

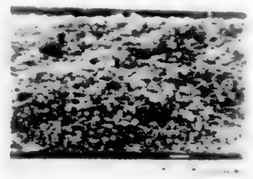
CONTROLLED PORE COMPOSITE POLYTETRAFLUOROETHYLENE ARTICLE

Donald F. Hagen, Woodbury; Craig G. Markell, White Bear Township, Ramsey County; William V. Balsimo, Afton, and Louis A. Errede, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 639,515, Jan. 10, 1991, Pat. No. 5,071,610, which is a continuation-in-part of Ser. No. 484,184, Feb. 23, 1990, abandoned. This application May 28, 1991, Ser. No. 706,420

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.3 **20 Claims**



1. A separation composite article having controlled void volume and mean pore size comprising: polytetrafluoroethylene (PTFE) fibril matrix, and insoluble, non-swellable sorptive particles enmeshed in said matrix, the ratio of non-swellable sorptive particles to PTFE is in the range of 40:1 to 1:4 by weight, the composite article having a porosity in the range of 30 to 80 percent void volume and a mean pore size in the range of 0.3 to 5.0 micrometers, said article being provided by a method comprising the steps of:

admixing lubricant with a blend comprising insoluble, non-swellable, sorptive particles and polytetrafluoroethylene to form a soft dough-like mass, the lubricant being present in an amount to exceed the sorptive capacity of the particles by at least 3 weight percent, said mass having a cohesive consistency, and the ratio of insoluble particles to PTFE being in the range of 40:1 to 1:4;

b) intensively mixing said mass at a temperature and for a time sufficient to cause initial fibrillation of said PTFE particles;

c) biaxially calendering said mass between gaps in calendering rolls maintained at a temperature and for a time, while closing the gap between the calendering rolls with each successive calendering operation, to cause additional fibrillation of said PTFE particles to form a self-supporting tear-resistant sheet having a void volume in the range of 30 to 80 percent and a mean pore size in the range of 0.3 to 5.0 micrometers, wherein said void volume and mean pore size vary directly with and are controlled by the amount of lubricant present during processing and wherein said article has reproducible porosity and mean pore size.

5,147,540

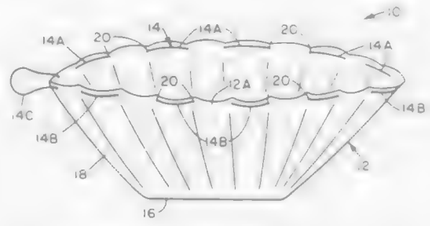
DISPOSABLE COFFEEMAKER FILTER WITH DRAWSTRING

John V. Hagan, 7755 S. Sheridan Ct., Littleton, Colo. 80123

Filed Sep. 24, 1991, Ser. No. 764,457

Int. Cl.[5] B01D *29/085*

U.S. Cl. 210—232 **6 Claims**



1. A coffeemaker filter, comprising:

(a) a flexible porous filter bag for use in brewing coffee; and

(b) a drawstring threaded about and slidable relative to a top perimeter edge portion of the bag and capable of being pulled from an undrawn state to a drawn state to draw the filter bag from an expanded open condition to a collapsed closed condition for thereby enabling lifting of the collapsed filter bag and removal and disposal thereof from a basket of a coffeemaker without spilling moist coffee grounds from said filter bag;

(c) said top perimeter edge portion of said filter bag being folded back and attached to itself so as to leave a passageway about an open top of said filter bag through which said drawstring is threaded.

5,147,541

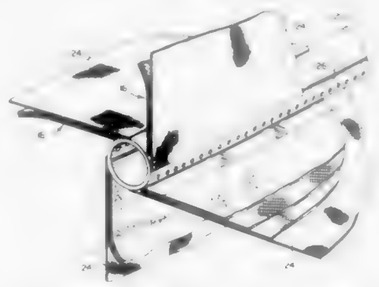
SPIRAL FILTRATION MODULE WITH STRENGTHENED MEMBRANE LEAVES AND METHOD OF CONSTRUCTING SAME

Thomas C. McDermott, Jr., Lynn, and Daniel F. Skelton, Billerica, both of Mass., assignors to Koch Membrane Systems, Inc., Wilmington, Mass.

Continuation-in-part of Ser. No. 612,802, Nov. 14, 1990, abandoned. This application Apr. 29, 1991, Ser. No. 692,689

Int. Cl.[5] B01D *63/00*

U.S. Cl. 210—321.74 **19 Claims**



8. A spiral filtration module for separating a fluid into a

filtrate portion and a permeate portion, said module comprising:

a permeate carrier tube having a plurality of openings in the tube wall for receiving said permeate portion;

at least one leaf packet spirally wound around said tube,

said packet comprising a membrane sheet including a membrane material and a backing material and presenting first and second sheet sections each having at least one end in planar alignment with an end of the other section,

said membrane material having a surface integrally joined to a facing surface of the backing material,

both said membrane material and said backing material being characterized by undergoing physical change as the glass transition temperature of said materials is approached,

said membrane material being characterized by a densified surface opposite said surface joined to the backing material in the area of said aligned ends,

said sections being further densified throughout their cross section in said area and fused in the area of the membrane/backing interface; and

permeate carrier means spirally wound around said tube between each of said leaf packets and joined to each adjacent ultrafiltration sheet along the sides and across the width of the carrier means.

5,147,54.

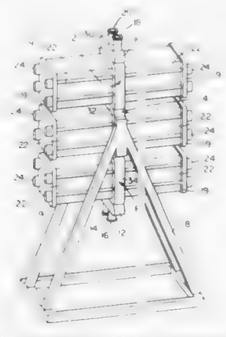
MANIFOLD AND MANIFOLD SEGMENT FOR TANGENTIAL FLOW FILTRATION APPARATUS

Andrew Proulx, Westford, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Feb. 4, 1991, Ser. No. 650,251

Int. Cl.[5] B01D *63/00*

U.S. Cl. 210—321.75 **11 Claims**



1. A manifold apparatus which comprises a plurality of manifold segments adapted to be connected to each other,

each of said manifold segments having a first surface, a second surface, a third surface and a fourth surface,

said first surface having a fluid feed inlet and a first filtrate outlet,

said second surface having a retentate outlet and a second filtrate outlet,

said third and fourth surfaces spaced apart from each other and positioned between said first surface and said second surface and having fluid feed inlet means in fluid communication with (a) said fluid feed inlet and (b) a filtration module, a retentate outlet means in fluid communication with (a) said retentate outlet and (b) a filtration module and a filtrate outlet means in fluid communication with (a) a filtration module, (b) said first filtrate outlet and (c) said second filtrate outlet,

a plurality of said filtration modules adapted to separate a feed fluid into a retentate fluid and a filtrate fluid each secured to said third and fourth surfaces of each of said manifolds segments,

said manifold segments being connected at a first surface of a first manifold segment to a second surface of an adjacent second manifold segment to effect fluid communication of retentate channels, filtrate channels and feed channels in connected manifold segments.

5,147,543

ROTATING ELEMENT FOR A SCREENING APPARATUS WITH A CONTOUR SURFACE PRODUCED BY A PLURALITY OF PROTRUSIONS IN THE DIRECTION OF THE AXIAL LENGTH OF THE CYLINDRICAL ROTOR

Frey Frejborg, Glens Falls, N.Y., assignor to A. Ahlstrom Corporation, Noormarkuu, Finland

Continuation-in-part of Ser. No. 252,810, Oct. 3, 1988, Pat. No. 4,950,402, which is a continuation-in-part of Ser. No. 41,241, Apr. 22, 1987, Pat. No. 4,776,957, and Ser. No. 61,594, Jun. 11, 1987, Pat. No. 4,880,540, said Ser. No. 41,241, and Ser. No. 61,594, each is a continuation-in-part of Ser. No. 738,743, May 29, 1985, Pat. No. 4,676,903, which is a continuation-in-part of Ser. No. 472,742, Mar. 7, 1983, Pat. No. 4,529,520. This application Aug. 15, 1990, Ser. No. 567,925

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.[5] B01D *29/62*; B07B *1/20*

U.S. Cl. 210—413 **23 Claims**

1. In an apparatus for screening pulp which comprises a vessel, a screen cylinder having an envelope surface and a contour surface within the vessel, a rotor moving in the vicinity of the screen cylinder at a predetermined speed on an axis of rotation, said rotor having an axial length, an inlet for the unscreened pulp, a first outlet for the accept screened pulp in said vessel and a second outlet for the reject, said first and second outlets being in operative communication with said screen cylinder, said rotor having a cylindrical shape and having a contoured surface consisting of a plurality of spaced protrusions disposed about the periphery of the rotor, each of said protrusions being shorter than the axial length of said rotor, each protrusion having a side plane essentially perpendicular to the rotor surface which is the leading surface, two edge surfaces, an upper plane parallel to the rotor surface and an inclined plane, said inclined plane forming an angle between 5°–60° with said rotor surface whereby high frequency high intensity positive pulses are generated with additional high intensity axial shears with improved screening at a pulp concentration up to 6%.

5,147,544

BLOOD FILTER IN MEDICAL DEVICES

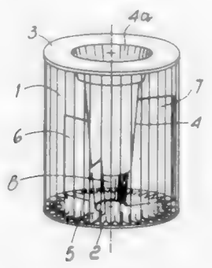
Pietro Vescovini, Medolla, Italy, assignor to Dideco S.r.l., Italy

Filed Apr. 26, 1991, Ser. No. 691,938

Claims priority, application Italy, May 2, 1990, 20181 A/90

Int. Cl.[5] B01D *35/00*

U.S. Cl. 210—438 **5 Claims**



1. A blood filter comprising:

a generally cylindrically shaped container having a top, a bottom, and an inlet;

a filter medium positioned within said container between the top and bottom thereof;

a plurality of partitions, each extending upwardly from the bottom of said container toward the top thereof, providing a plurality of adjacent lower sections to include an inlet section within said container,

wherein the inlet section has an inlet port on one side of said filter medium interconnecting said inlet section with said inlet, and each of the sections has an outlet port on the other side of the said filter medium;

whereby when blood is introduced into said filter, the blood flows initially and at low flow rates only through the inlet section, the inlet section opening into one lower section so the other sections are fed only by spilling over the top of one or more partitions with blood flow at sufficiently higher flow rates the blood level exceeds the height of one or more partitions of the inlet section and further flows successively thereover and through the adjacent sections.

5,147,545

MATED DISK FILTER HOUSING

Peter J. Despard, Hamlin; Donald M. Forster, Penfield, and Gregory P. Guyette, Macedon, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1990, Ser. No. 510,354

Int. Cl.[5] B01D *29/05*

U.S. Cl. 210—445 **20 Claims**

1. A housing for a disk of filter material, said housing including:

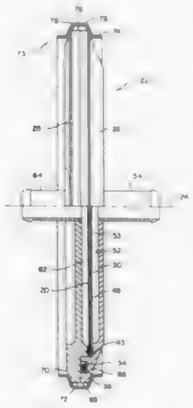
a first disk shaped housing part having an axis and a cylindrical surface facing radially inwardly toward said axis;

a second disk shaped housing part;

said radially inwardly facing cylindrical surface serving to locate the periphery of a disk of filter material radially inwardly of said cylindrical surface when said housing parts are in the disassembled condition and a filter disk is being installed;

first annular resilient sealing means disposed radially inwardly of said cylindrical surface and adapted to seat on one of said housing parts and to be compressed between the periphery of the filter disk and the other of said housing parts, thereby minimizing leakage past the filter disk;

second annular resilient sealing means disposed radially outwardly of said cylindrical surface and adapted to be compressed and create a seal between said housing parts, thereby preventing leakage between the interior and the exterior of the housing; and



means for securing said first and second housing parts in assembled condition.

5,147,546

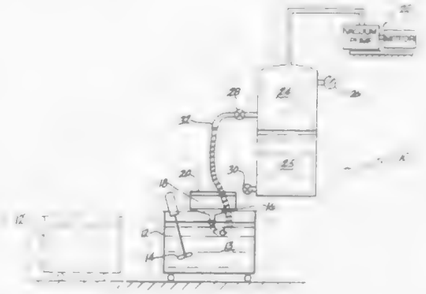
CERAMIC FOAM FILTER BODY HAVING A GASKET CHEMICALLY AND MECHANICALLY BONDED THERETO

Fereshteh Tadayon, Hendersonville, N.C., assignor to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Division of Ser. No. 356,076, May 24, 1989, Pat. No. 5,030,482. This application May 31, 1991, Ser. No. 708,904

Int. Cl.[5] B01D *29/05*

U.S. Cl. 210—506 **10 Claims**



1. A filter suitable for use in the filtration of molten metal, said filter comprising:

a filter body formed by a porous ceramic foam filter material;

a gasket about peripheral edges of said filter material;

said gasket being bonded both chemically and mechanically to said filter material and being characterized by the presence of a binder and by ceramic fibers at least partially penetrating into said porous ceramic foam filter material; and

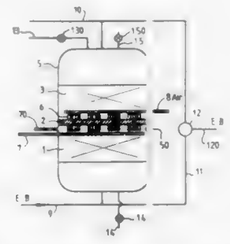
said partially penetrating ceramic fibers providing improved adhesion between the gasket and the ceramic foam filter material.

5,147,54[illegible]

OXIDATION AND BIOLOGICAL REDUCTION REACTOR, BIOFILTRATION METHOD AND WASHING METHODS USED IN THIS REACTOR

Vincent Savall, Velizy Villacoublay, and Jean-Louis Vital, Boulogne, both of France, assignors to Degremont S.A., France

Filed Dec. 2, 1991, Ser. No. 800,353
Claims priority, application France, Dec. 3, 1990, 90 15088
Int. Cl.[5] C02F *3/06*
U.S. Cl. 210—605 14 Claims



1. An oxidation and biological reduction reaction for liquid treatment by upward circulation and recirculation, comprising a longitudinal vertical enclosure having a liquid inlet means connected to a source of liquid for treatment and an outlet means for the treated liquid, respectively located at the lower and upper ends of the enclosure, a lower bed supporting fixed biomass made of material whose density is lower than that of the liquid, and upper bed supporting fixed biomass made of material whose density is higher than that of the liquid, wherein the lower layer is separated from the upper layer by a transverse wall means for preventing the passage of the filtration materials between a lower and an upper zone as defined in the enclosure with means for allowing passage of water, wherein the lower layer is located under the wall, and the upper layer above the wall, a gas inlet means connected to a source of oxidation gas is positioned under the upper layer and above the wall, and further comprising pump means for recycling treated liquid from the outlet to the liquid inlet.

5,147,548

COLOSTRUM FILTERED STERILE

Henry Hies, Rodermark; Wolfgang Moller, Oberursel; Herbert Dichtelmuller, Sulzbach, and Wolfgang Stephan, Dreieich, all of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Dreieich, Fed. Rep. of Germany

Filed Aug. 14, 1991, Ser. No. 745,036
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1990, 4026365
Int. Cl.[5] B01E *6/16*
U.S. Cl. 210—639 16 Claims

8. A method of obtaining a sterile-filtered colostrum that contains casein, comprising:
a) acidifying a colostrum solution until the casein precipitates and then returns to solution and
b) sterile filtering the resulting solution.

5,147,54[illegible]

MEMBRANE SEPARATION PROCESS

Kechia J. Chou, Wappingers Falls, and Kathleen M. Hellmuth, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,519
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 5 Claims

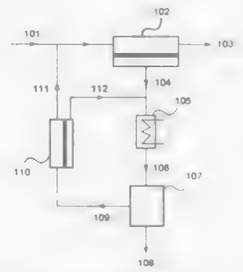
1. A membrane support layer, characterized by its high degree of bonding ability to a membrane separating layer, comprising a carbon-carbon backbone polymer containing —CN groups and a surface thereof which has been treated with oxygen-plasma sufficient to enable at least a portion of the surface to be oxidized to —COOH groups.

5,147,550

MEMBRANE PROCESS AND APPARATUS FOR REMOVING A COMPONENT FROM A FLUID STREAM

Johannes G. Wijmans, Menlo Park; Jürgen Kaschemekat, and Richard W. Baker, both of Palo Alto, all of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 635,919, Dec. 28, 1990, Pat. No. 5,071,451. This application Dec. 5, 1991, Ser. No. 803,109
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 48 Claims



1. A method for increasing efficiency in a pervaporation system for removing a component from a liquid stream, said system including in series a pervaporation unit, a driving means for transmembrane permeation and a recovery unit, comprising:
(a) connecting a permselective membrane to said system in such a way that a driving force for transmembrane permeation is provided by said driving means;
(b) passing a stream from said recovery unit across said permselective membrane, thereby producing a depleted stream depleted in said component compared with said stream and an enriched stream enriched in said component compared with said stream; and
(c) passing said enriched stream to an inlet side of said driving means.

30. Apparatus for separating a component from a liquid stream, comprising:
(a) a pervaporation unit;
(b) a driving means for transmembrane permeation connected to an outlet from said pervaporation unit;
(c) a recovery unit connected downstream of said driving means;
(d) a permselective membrane connected to said recovery unit and said driving means, in such a way that a driving force for transmembrane permeation is provided by said driving means.

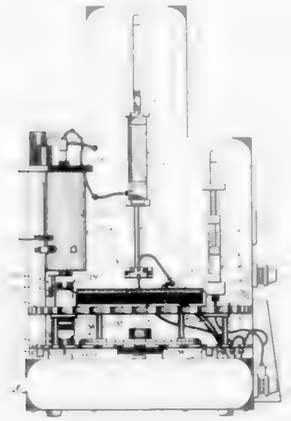
5,147,551

SOLIDS AND SEMI-SOLIDS SAMPLING APPARATUS, METHOD, AND FLUID INJECTION APPARATUS

Julius P. Averette, Baker, La., assignor to Dynatech Precision Sampling Corporation, Baton Rouge, La.

Filed Apr. 20, 1990, Ser. No. 512,194
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—640 22 Claims

22. In a process for the liquid extraction and separation for analysis of a non-solids component, or components, from a solid or semi-solids material by crushing and grinding said solid or semi-solids material, contacting said particulate solid or semi-solids material with a liquid to extract said non-solids component, or components, and then further contacting said liquid-dispersed solids mixture with a gas for the pick up and removal of said non-solids component, therefrom for analysis, the improvement comprising conducting said solids grinding, liquid contacting and extraction steps in a first zone separated from a second zone by a member selectively permeable to the flow of gas therethrough but impermeable to the flow of liquid therethrough, and subsequently passing the gas from the second zone through said selectively permeable member to pick up and remove for analysis the non-solids component, or components, from the liquid-dispersed solids mixture.

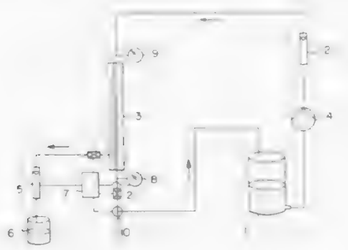


5,147,552

METHOD OF AND APPARATUS FOR CLEANING FILTERS IN TANGENTIAL MICROFILTRATION

Marc Hlavacek, Coogee South, Australia; John Dodds, Nancy, and Jean-Michel Bauer, Pagny sur Moselle, both of France, assignors to Le Carbone Lorraine, Courbevoie, France

Filed Jul. 25, 1991, Ser. No. 735,894
Claims priority, application France, Jul. 30, 1990, 90 09927
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—650 13 Claims



1. A method for tangential filtration of solids from a liquid with filter cleaning, comprising the steps of:
a) circulating a liquid to be filtered in a liquid loop from a liquid source, tangentially across one surface of a membrane serving as a filter in a filtration module, and through a regulable filtration valve located in said loop downstream of said membrane, said circulating taking place via a pump located in said loop upstream of said membrane, and creating a hydrodynamic pressure Ph at said one surface of said membrane;
b) setting said hydrodynamic pressure to a predetermined value by adjustment of said filtration valve;
c) filtering said liquid by passing a portion of said liquid through said membrane to form a filtrate, and passing said filtrate through a conduit including a regulable filtrate valve to a receptacle at substantially atmospheric pressure Pa, said filtering taking place via a positive transmembranal pressure;
d) cleaning said membrane by:
1) closing said filtrate valve to stop flow of liquid through said membrane and simultaneously opening said filtration valve an amount sufficient to maintain said hydrodynamic pressure at said predetermined value; and
2) suddenly opening said filtration valve an amount sufficient to cause an abrupt drop in said hydrodynamic pressure, thereby dislodging solids from said membrane into said loop; and
e) restoring filtering by opening said filtrate valve and closing said filtration valve progressively, in order to create desired hydrodynamic and transmembranal pressure.

5,147,553

SELECTIVELY PERMEABLE BARRIERS

Warren A. Waite, Burlington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation-in-part of Ser. No. 366,714, Jun. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 278,524, Dec. 1, 1988, Pat. No. 4,913,816, which is a continuation-in-part of Ser. No. 190,204, May 4, 1988, Pat. No. 4,802,984. This application Mar. 29, 1991, Ser. No. 677,201
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—654 16 Claims

13. A process for separating a fluid mixture into less permeable and more permeable fractions comprising contacting said fluid mixture with one surface of a selectively permeable barrier prepared by contacting a microporous membrane with a first liquid comprising a suspension or emulsion which suspension or emulsion comprises as the disperse phase particles of one or more compounds which are solids at room temperature and substantially insoluble in said first liquid, said first liquid also comprising one or more moieties selected from the group consisting of polyethylenimines; reaction products of ethylene diamine, piperazine, methyl piperazine, and/or dimethyl piperazines with a polyepihalohydrin;
phenylene diamines;
xylylene diamines;
chlorophenylene diamines;
benzene triamines;
bis(aminobenzyl) aniline;
tetraaminobenzenes;
piperazine;
methyl piperazine;
dimethyl piperazines;
homopiperazine;
N,N'-diphenylethylene diamine;
aminobenzamides;
aminobenzhydrazides; and
bis(alkylamino)phenylene diamines
and subsequently contacting said microporous membrane with a second liquid comprising one or more moieties seiected from the group consisting of
phthaloyl halides;
benzene tricarboxylic acid halides;
cyclohexane tricarboxylic acid halides;
pyridine dicarboxylic acid halides;
trimellitic anhydride acid halides;
sebacic acid halides;
azelaic acid halides;
adipic acid halides;
dodecanedioic acid halides;
toluene diisocyanate;
methylene bis(phenylisocyanates);
polymethylene bis(phenylisocyanates);
naphthalene diisocyanates;
bitolyene diisocyanates;
hexamethylene diisocyanate; and
phenylene diisocyanates,

creating a pressure difference through said selectively permeable barrier in a direction to urge said more permeable fraction from said one surface of said selectively permeable barrier through said selectively permeable barrier and recovering separately said less permeable and more permeable fractions.

5,147,55-

PROCESS FOR TREATING WASTES FROM THE MACHINING OF FERROMAGNETIC MATERIALS

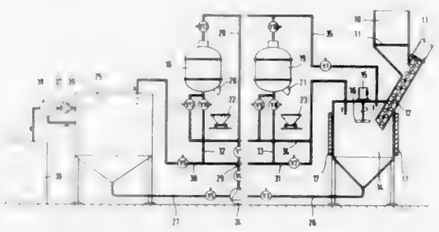
Alfred Heck, Eupen, Belgium, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 25, 1991, Ser. No. 720,379

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1990, 4020229

Int. Cl.[5] B01D *35/06*

U.S. Cl. 210—695 **13 Claims**



1. A process for treating wastes from machining of ferromagnetic materials comprising:

feeding said wastes to a separating tank having at least one vertical wall, filled with a wash solution, and mixing said wastes with said wash solution;

producing a magnetic field on said at least one vertical tank wall, and accumulating ferromagnetic components on said at least one wall;

thereafter, filtering out non-ferromagnetic solids from said wash solution;

removing said magnetic field and releasing ferromagnetic components from said at least one wall into said wash solution from which non-ferromagnetic solids have been filtered; and

then filtering out released ferromagnetic components from said wash solution.

5,147,55-

METHODS OF CONTROLLING SCALE FORMATION IN AQUEOUS SYSTEMS

J. Michael Brown, The Woodlands; John F. McDowell, Willis, both of Tex., and Kin-Tai Chang, Columbus, Ga., assignors to Betz Laboratories, Inc., Trevose, Pa.

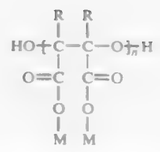
Continuation-in-part of Ser. No. 518,045, May 4, 1990, Pat. No. 5,062,962. This application Jul. 30, 1991, Ser. No. 738,080

The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.[5] C02F *5/10*

U.S. Cl. 210—698 **21 Claims**

1. A method of controlling the formation and deposition of scale forming salts including $CaCO_3$ in an aqueous system comprising introducing into said aqueous system a substoichiometric amount sufficient for the purpose of a treatment comprising a polyepoxysuccinic acid of the general formula



wherein n ranges from about 2 to about 50, M is hydrogen or a water soluble cation and R is hydrogen, C_{1-4} alkyl or C_{1-4} substituted alkyl.

5,147,556

THICKENER

David Taylor, New South Wales, Australia, assignor to Supaflo Pty. Limited, Australia

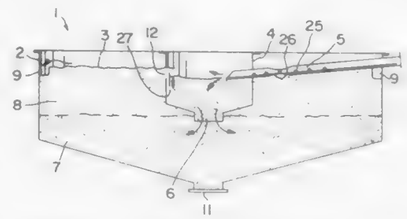
Continuation-in-part of Ser. No. 436,720, Nov. 15, 1989, Pat. No. 5,015,392. This application Dec. 19, 1990, Ser. No. 629,339

Claims priority, application Australia, Nov. 17, 1988, PJ1518; Apr. 24, 1989, PJ3869

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] B01D *21/24*

U.S. Cl. 210—712 **20 Claims**



1. A thickener for liquids or pulps comprising:

a tank in which flocculation takes place whereby precipitate of higher relative density tends to settle towards the bottom of the tank and dilute liquid of lower relative density is thereby displaced toward the top of the tank;

a feedwell for feed liquid disposed generally within the tank and having a restricted bottom opening in fluid communication with the tank, the bottom opening having an effective cross-sectional area substantially less than the mean cross-sectional area of the feedwell to restrict the flow of liquid between the tank and the feedwell through the bottom opening and thereby promote homogeneous mixing of the feed liquid within the feedwell;

a conduit for supplying the feed liquid to the feedwell; and

an aperture formed in the feedwell or the conduit above the bottom opening and below the upper marginal edge of the feedwell, the aperture and the bottom opening being sized and arranged to create a difference in height between the surface level of the surrounding dilute liquid in the tank and a more dense feed liquid contained within the feedwell, the aperture being positioned to permit the recirculation of dilute liquid directly from the tank through the aperture and into the feed liquid when the surface level of the tank is higher than the surface level in the feedwell to provide for autogenous dilution of the feed liquid.

5,147,557

PAINT SPRAY BOOTH TREATMENT PROGRAM FOR WATER BASE AND WATER BASE AND WATER BASE BLENDED WITH OIL BASE PAINTS

Deborah L. Purnell, Philadelphia, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 590,910, Oct. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 388,435, Aug. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 327,846, Mar. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 161,866, Feb. 29, 1988, Pat. No. 4,853,132. This application Sep. 4, 1991, Ser. No. 754,783

The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—712 **3 Claims**

1. In a paint spray booth containing water for collection of oversprayed water-borne or mixed water-borne and oil base paint, a process for detackifying and coagulating the oversprayed water-borne or mixed water-borne and oil base paint consisting essentially of adding to the water from 0.01 to 90%, based on paint, of a unitary blend comprising at least one cationic polymer selected from the group consisting of polydiallyl dimethyl ammonium chloride, a condensation product of dimethylamine plus epichlorohydrin plus ethylene diamine and a condensation product of dimethylamine plus epichlorohydrin, an inorganic anion selected from the group consisting of metasilicate, orthosilicate, disilicate, mixed silicate, metalluminate, aluminosilicate, molybdate, phosphomolybdate and phosphate or the sodium, potassium or ammonium salts thereof wherein the weight ratio of inorganic anion to cationic polymer is between 0.25 to 10 and 10 to 1, and from about 50% to 60%, by weight, of water.

5,147,558

ONE DRUM ACTIVATOR CATALYZED PAINT DETACKIFICATION PROGRAM

Deborah L. Purnell, Philadelphia, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 590,910, Oct. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 388,435, Aug. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 327,846, Mar. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 161,866, Feb. 29, 1988, Pat. No. 4,853,132. This application Aug. 29, 1991, Ser. No. 751,945

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—712 **4 Claims**

1. In a paint spray booth containing water for collection of oversprayed paint, a process for detackifying and coagulating the oversprayed paint consisting essentially of adding to the water from 0.1 to 60%, based on paint, of a unitary blend comprising at least one cationic polymer selected from the group consisting of polydiallyl dimethyl ammonium chloride, a condensation product of dimethylamine plus epichlorohydrin plus ethylene diamine and a condensation product of dimethylamine plus epichlorohydrin, an inorganic anion selected from the group consisting of metasilicate, orthosilicate, disilicate, mixed silicate, metaaluminate, aluminosilicate, molybdate, phosphomolybdate and phosphate or the sodium, potassium or ammonium salts thereof wherein the weight ratio of inorganic anion to cationic polymer is between 0.25 to 10 and 10 to 1, and from about 20% to 60%, by weight, of water.

5,147,559

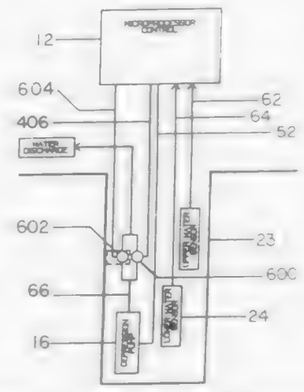
CONTROLLING CONE OF DEPRESSION IN A WELL BY MICROPROCESSOR CONTROL OF MODULATING VALVE

Robert W. Brophey, 1134 Upton Ave. North, and Robert J. Kadwell, 1111 Sheridan Ave. North, both of Minneapolis, Minn. 55411

Division of Ser. No. 412,939, Sep. 26, 1989, Pat. No. 5,028,212. This application May 1, 1991, Ser. No. 694,411

Int. Cl.[5] E21B *34/06, 43/12;* **B01D** *17/12*

U.S. Cl. 210—744 **9 Claims**



1. A method for removing floating and substantially immiscible liquid from a well containing both said floating immiscible liquids and water, wherein said floating immiscible liquid and water meet at a water interface, by controlling a cone of depression having an apex within the well using a removal system for removing said floating immiscible liquids, the removal system including a mircoprocessor, a discharge water line and an upper sensor, at least a portion of the discharge water line being located within the well, the upper sensor being located within the well at a sensor location, and wherein the upper sensor supplies signals to the microprocessor indicating the presence of the water interface, the method comprising the steps of:

a. inserting a modulating control valve into the discharge water line, the modulating control valve being connected to be controlled by the microprocessor;

b. adapting the microprocessor in response to the signal from the upper sensor, to control opening of the modulating control valve when the water interface rises up to the sensor location;

c. adapting the microprocessor in response to the signal from the upper sensor to control closing of the modulating control valve when the water interface falls below the sensor location; and

d. adapting the microprocessor, in response to the signal from the upper sensor to control the opening and closing of the modulating control valve at optimal speeds which keeps the apex of the cone of depression at a substantially static level.

5,147,560

METHOD FOR MONITORING TURBIDITY OF WASTE LIQUID IN BACKWASHING FILTER BEDS

William R. Nichols, Richmond, Va., assignor to Infilco Degremont Inc., Richmond, Va.

Division of Ser. No. 561,335, Aug. 1, 1990, Pat. No. 5,089,117. This application Sep. 16, 1991, Ser. No. 760,583

Int. Cl.[5] B01D *24/46*

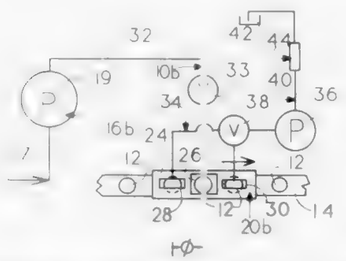
U.S. Cl. 210—745 **4 Claims**

1. In a method of cleansing a plurality of seriate filter beds in

an automatic backwash filter system by subjecting said filter beds seriatim to a backwashing step, wherein during said backwashing step backwash liquid is withdrawn from an effluent channel common to seriate effluent ports of said filter beds and pumped through a first port which is the effluent port of a first filter bed of said plurality of filter beds to flow upwardly through said first filter bed, repeating said backwashing step on a second filter bed through a second port which is the effluent port of said second bed and further repeating said backwashing step on third and further beds through their respective effluent ports, the improvement which comprises:

simultaneous with said backwashing step of said second bed applying a purging step to said first filter bed by pumping waste liquid downwardly through said first bed and out said first port,

monitoring said waste liquid from said first bed for turbidity,



continuing said waste liquid pumping from said first bed until the turbidity thereof reaches a predetermined low level,

discontinuing said backwashing step on said second bed only after said turbidity of said waste liquid from said first bed reaches said predetermined low level,

after discontinuing said backwashing step on said second bed applying said backwashing step to a third filter bed and simultaneously applying said purging step with said monitoring to said second filter bed,

discontinuing said backwashing step on said third bed and applying said purging step with monitoring thereto only after said turbidity of said waste liquid from said second bed reaches said predetermined low level, and

repeating in like manner said backwashing step and said purging step with monitoring to further filter beds in said automatic backwash filter system.

5,147,563

DEVICE FOR SAMPLING AND STRIPPING VOLATILE CHEMICALS WITHIN WELLS

Scott R. Burge, 8869 S. Myrtle, Tempe, Ariz. 85331, and Russell Burge, 21140 Covina Hills Rd., Covina, Calif. 91724

Continuation-in-part of Ser. No. 383,340, Jul. 24, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 612,613

Int. Cl.[5] B02D *19/00* **E21B** *49/08*

U.S. Cl. 210—747 **27 Claims**

12. A method of sampling a selected medium containing volatile compounds, said method comprising the steps of:

a) placing a sampling device into the casing of a well containing said selected medium, said sampling device including:

i) a housing,

ii) a sealed chamber within said housing, and

iii) inlet means communicating with said sealed chamber for allowing said selected medium into said chamber;

b) providing a seal between said housing and said well casing to prevent volatile compounds from escaping from the well to the atmosphere;

c) drawing said medium through said inlet means into said sealed chamber;

d) volatizing and releasing said volatile compounds from said medium while said medium is in said chamber including the step of injecting an inert gas into said sealed chamber; and

e) analyzing said volatile compounds.

5,147,562

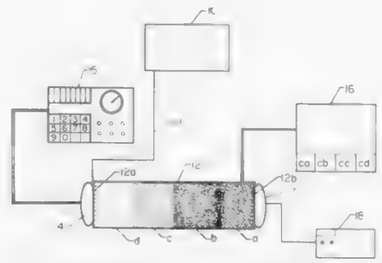
ACOUSTOPHORESIS METHOD AND APPARATUS

Joseph S. Heyman, Williamsburg, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 17, 1990, Ser. No. 628,062

Int. Cl.[5] B01D *35/06, 17/06, 15/08*

U.S. Cl. 210—748 **14 Claims**



11. A method for separation of a medium comprising at least two species, the method comprising the steps of:

filling a sample container with the medium to be separated;

applying a first acoustic wave at one end of the sample container to the medium in said sample container, wherein the acoustic wave has a frequency tuned to the point of resonance of a specific species to be separated; and

removing the specific species from an end of said sample container opposite from the one end of the sample container where the acoustic wave is applied.

5,147,563

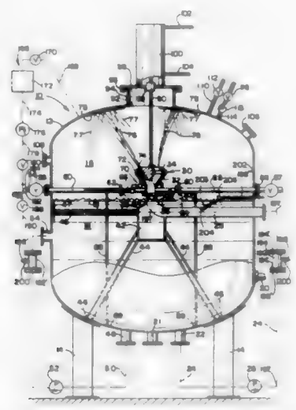
SEWAGE SLUDGE TREATMENT WITH GAS INJECTION

Charles A. Long, Jr., Birmingham, Ala.; Robert D. Blythe, Bethesda, Md.; William A. Cobb, and Philip M. Grover, both of Birmingham, Ala., assignors to Long Enterprises, Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 402,276, Sep. 1, 1989, Pat. No. 4,936,983. This application Jun. 15, 1990, Ser. No. 539,112

Int. Cl.[5] C02F *11/06*

U.S. Cl. 210—758 **9 Claims**



1. A process for treating sewage sludge comprising

(a) mascerating the raw sludge obtained from a sewage treatment facility,

(b) adjusting the pH of the mascerated sludge to a pH of about 2.5 to about 3,

(c) adjusting the solids content of the sludge to about 2.5% to about 4% by weight,

(d) adjusting the temperature of the sludge to about 20° C. to about 40° C.,

(e) mixing an oxygen-rich gas selected from the group consisting of oxygen, ozone and mixtures thereof with the sludge as the sludge is mixed or recirculated through a hyperbaric vessel having an upper portion wherein the pressure of the oxygen-rich gas is maintained at a pressure of about 45 psig to about 60 psig,

(f) simultaneously injecting the oxygen-rich gas into a combination gas and sludge mixing and dispersing means by which the oxygen-rich gas is mixed with the sludge and the combination of the gas and sludge is dispersed throughout the upper portion of the hyperbaric vessel in a plurality of streams in a manner to atomize and oxygenate the sludge,

(g) continuing steps (e) and (f) for a time sufficient to produce a treated sludge having an amount of bacteria not greater than minimum governmental standards, and

(h) adding sodium nitrite to the treated sludge in an amount effective to reduce viruses in the sludge to a level not greater than minimum governmental standards.

5,147,564

METHOD FOR RECOVERING ENERGY FROM A WET OXIDATION PRODUCTS STREAM FLOW USING ROTATIONAL ENERGY

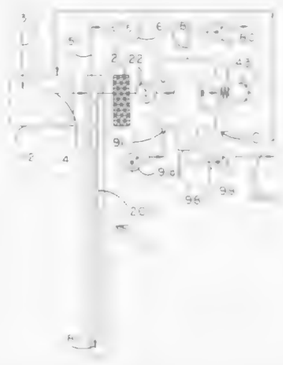
James A. Titmas, Kent, Ohio, assignor to Titmas and Associates Incorporated, Hudson, Ohio

Filed Aug. 22, 1991, Ser. No. 748,513

Int. Cl.[5] F01D *15/12, 37/00;* **F04B** *37/10*

U.S. Cl. 210—767 **9 Claims**

1. A method of recovering energy from a wet oxidation products stream flow comprising the steps of directing the stream flow to an energy recovery assembly which includes a reaction barrel affixed to and rotatable with an axle and having at least one race, each race being provided with a plurality of evenly spaced rocket nozzles; channeling portions of the stream flow to each rocket nozzle in order to cause the reaction barrel to rotate; and imparting rotational energy from the



reaction barrel to a generator such that rotation of the reaction barrel causes the generator to generate electricity.

4. A method as in claim 1, further comprising the initial step of filtering the stream flow without separation of gases or liquids by passing the stream flow through a suitable filter prior to the step of directing.

5,147,565

FOAMED WELL CEMENTING COMPOSITIONS AND METHODS

Daniel L. Bour, and Jerry D. Childs, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 626,360, Dec. 12, 1990. This application Aug. 7, 1991, Ser. No. 742,673

Int. Cl.[5] E21B *33/13*

U.S. Cl. 252—8.551 **7 Claims**

1. A foamed cement composition for cementing a well penetrating a salt containing subterranean formation:

said cement composition consists essentially of Portland cement, sufficient water to form a pumpable slurry, sodium chloride present in said water in an amount in the range of from about 18% by weight of water to saturation, sufficient gas dispersed in said slurry to produce a foam, a foaming agent present in said composition in an amount in the range of from about 0.25% to about 6.0% foaming agent by weight of water in said composition and a foam stabilizer present in said composition in an amount in the range of rom about 0.25% to about 3.0% stabilizer by weight of water;

said foaming agent is selected from compounds having the general formulae

$$H(CH_2)_f(OC_2H_4)_3OSO_3^-Na^+$$

and

$$H(CH_2)_f(OC_2H_4)_3OSO_3^-(CH_3)_2CHNH_3^+$$

wherein f is an integer in the range of form 6 to 10, and said foam stabilizer is selected from compounds having the general formulae

$$CH_3O(CH_2CR_1HO)_nR_2$$

and

-continued

$$R{-}CONHCH_2CH_2CH_2N^+(CH_3)_2CH_2CO_2^-$$

wherein R_1 and R_2 are independently hydrogen or a methyl radical, n is an integer from 20 to 200 and R is a radical selected from decyl, cetyl, oleyl, lauryl and coco.

5,147,568

HIGH SPEED SILENT CRACKING AGENT OF THE LIQUID-SOAKED TYPE AND THE PROCESS FOR MAKING SAME

Shichao Chen; Tianyin Liu, and Hezhang Lai, all of Xunchang, China, assignors to Furong Mineral Bureau, Xunchang, China

Filed Oct. 17, 1990, Ser. No. 599,204

Claims priority, application China, Mar. 27, 1990, 90105791.6

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—8.551 **18 Claims**

1. A high speed silent cracking agent of the liquid-soaked type comprising a cartridge of solid cracking agent and a solution of liquid inhibitor catalyst, wherein said cartridge of solid cracking agent contains about 50 to about 90 percent by weight of quicklime, about 1 to about 4 percent by weight of borax, about 8 to about 30 percent by weight of vermiculite 0 to about 2 percent by weight of aluminum powder and 0 to about 14 percent by weight of sulphur of the total weight of the mixture in the cartridge; said solution of liquid inhibitor catalyst contains about 0.05 to about 1.040 percent by weight of caustic soda, about 0.10 to about 0.50 percent by weight of quartz, about 0.04 to about 0.30 percent by weight of ammoniation agent, and about 99.8 to about 98.0 percent by weight of water of the total weight of said solution.

5,147,567

SYNTHETIC LUBRICATING OIL GREASES CONTAINING METAL CHELATES OF SCHIFF BASES

Vinod S. Agarwala, Warminster; Alfeo A. Conte, Jr., Warrington, both of Pa.; Krishnaswami S. Rajan, Elmhurst, and Prabir K. Sen, Skokie, both of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1971, Ser. No. 700,373

Int. Cl.[5] C10M *105/80*

U.S. Cl. 252—42.7 **8 Claims**

1. A synthetic lubricating oil grease having improved corrosion-resistance and anti-wear properties comprising a major amount of a synthetic lubricating oil grease and about 0.01 to 5.0 percent by weight of said grease of a zinc or copper chelate of a Schiff base derived from the condensation of approximately stoichiometic amounts of at least one aromatic aldehyde and a polyamine.

5,147,568

SUBSTITUTED 2,3-DIHYDROPERIMIDINE STABILIZERS

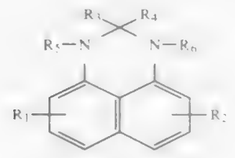
John J. Luzzi, Carmel, and David I. Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 696,693, May 7, 1991, abandoned. This application Oct. 28, 1991, Ser. No. 783,946

Int. Cl.[5] C10M *105/72*; **C07D** *239/00*

U.S. Cl. 252—47 **17 Claims**

1. An N-substituted 2,3-dihydroperimidine of formula I



(I)

wherein

R_1 and R_2 are independently hydrogen, alkyl of 1 to 12 carbon atoms, alkenyl of 3 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms or aryl of 6 to 10 carbon atoms,

R_3 is hydrogen or alkyl of 1 to 12 carbon atoms,

R_4 is hydrogen, alkyl of 1 to 17 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by phenyl, alkenyl of 2 to 17 carbon atoms, alkenyl of 2 to 4 carbon atoms substituted by phenyl or aryl of 6 to 10 carbon atoms, or

R_3 and R_4 together are straight or branched alkylene of 4 to 11 carbon atoms, and

R_5 and R_6 are independently hydrogen, alkenyl of 3 to 18 carbon atoms, $—CH_2—S—E_1$, $—CH_2—S—C_nH_{2n}—S—E_1$ or $—CH_2—S—T—COOE_2$, where n is 2 to 6, E_1 is alkyl of 1 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aryl of 6 to 10 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, or said aryl or said phenylalkyl substituted on the aryl or phenyl moiety by one or two alkyl of 1 to 8 carbon atoms or by hydroxyl and by one or two alkyl of 1 to 8 carbon atoms, E_2 is alkyl of 1 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or phenylalkyl of 7 to 9 carbon atoms, and T is methylene, ethylene or ethylidene,

with the proviso that R_5 and R_6 are not both hydrogen at the same time.

5,147,569

LUBRICANT ADDITIVE TO ENHANCE ANTI-WEAR, ANTI-OXIDANCY, AND DISPERSANCY THEREOF

Thomas F. DeRosa, Passaic, N.J.; Benjamin J. Kaufman, Hopewell Junction, and Rosemary J. Jennejahn, Nelsonville, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 4, 1990, Ser. No. 576,807

Int. Cl.[5] C10M *151/00*; **C08F** *228/06*

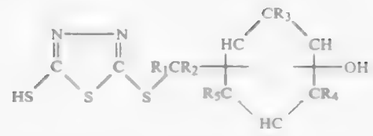
U.S. Cl. 252—47.5 **11 Claims**

1. An antiwear, antioxidancy dispersant, lubricant additive composition prepared by the steps comprising:

(a) reacting a polymer prepared from ethylene and at least one (C_3–C_{10}) alpha-monoolefin and, optionally, a polyene selected from non-conjugated dienes and trienes comprising from about 15 to 80 mole percent of ethylene, from about 20 to 85 mole percent of said (C_3–C_{10}) alpha-monoolefin and from about 0 to 15 mole percent of said polyene, said polymer having a number average molecular weight ranging from about 5,000 to about 500,000, said polymer being reacted with at least one olefinic epoxide acylating agent at a mole ratio of polymer to olefinic expoxide of about 10.5:1 at a temperature of about 160° C. for about 1.75 to 2.0 hours to form a reaction intermediate having an epoxide function within its structure; and

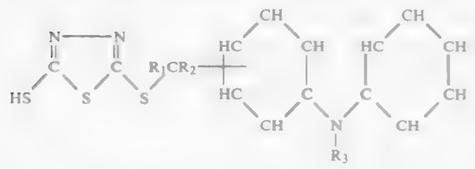
(b) reacting said reaction intermediate with each of the following substituted thiadiazoles at a mole rati of 20:0.15 at a temperature of about 155° C. for about 2.0 hours;

(i) a modified 1,3,4-thiadiazole containing a substituted phenol represented by the formula:



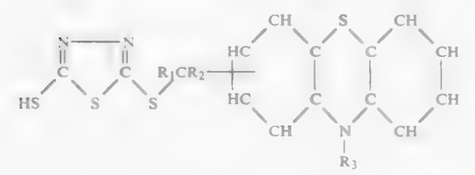
wherein R_1, R_2 and R_3 are each hydrogen or a (C_1–C_{10}) alkyl radical; and R_4 and R_5 are each a (C_1–C_{10}) alkyl radical;

(ii) a modified 1,3,4-thiadiazole containing a substituted diaryl amine represented by the formula:



wherein R_1, R_2, and R_3 are each hydrogen or a (C_1–C_{10}) alkyl radical; and

(iii) Reacting said reaction intermediate in (A) with modified 1,3,4-thiadiazole containing substituted phenothiazole represented by the formula:



wherein R_1, R_2, and R_3 are each H_2 or a (C_1–C_{10}) alkyl group, to form said lubricant additive; and

(d) isolating and recovering the product lubricant additive composition.

5,147,570

PROCESS FOR PREPARING A DISPERSANT/VI IMPROVER AND PRODUCT PREPARED THEREFROM

Arie Van Zon, and Gerarda J. Klaver, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1991, Ser. No. 672,995

Claims priority, application United Kingdom, Mar. 30, 1990, 9007267

Int. Cl.[5] C10M *149/00*

U.S. Cl. 252—51.5 A **14 Claims**

1. A process for preparing a dispersant/VI improver which comprises

1) reacting an alpha-beta unsaturated carboxylic acid or active derivative thereof with a selectively hydrogenated star-shaped polymer comprising a polyvinylaromatic nucleus having at least 4 polymeric arms linked to said nucleus, wherein said polymeric arms are selected from the group consisting of:

(i) hydrogenated homopolymers and hydrogenated copolymers of conjugated dienes;

(ii) hydrogenated copolymers of conjugated dienes and monoalkenyl arenes; and

(iii) mixtures thereof; and wherein at least 80% of the aliphatic unsaturation of the star-shaped polymer has been reduced by hydrogenation while less than 20% of the aromatic unsaturation has been reduced; and

2) reacting the activated star polymer thus formed with:

(a) at least one compound of general formula

$$RO(AO)_nH \qquad (I)$$

wherein R is a C_{4-20} alkyl group, A is an independent moiety of either ethylene or propylene, and n is an integer from 2 to 10 followed by reaction with

(b) a long chain alkane-substituted carboxylic acid or active derivative thereof, and/or (c) a C_1 to C_8 amine containing 1 to 8 nitrogen atoms and/or an alkane polyol having at least two hydroxy groups; or with (d) the pre-formed product of reactants (b) and (c).

5,147,571

DISPERSANT, VI IMPROVER, ADDITIVE AND LUBRICATING OIL COMPOSITION CONTAINING SAME

Thomas F. DeRosa, Passaic, N.J.; Benjamin J. Kaufman, Hopewell Junction, and Rosemary J. Jennejahn, Nelsonville, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 440,639, Nov. 24, 1989, abandoned. This application Jan. 16, 1991, Ser. No. 642,259

Int. Cl.[5] C10M *149/06*, *149/10*

U.S. Cl. 252—51.5 R **19 Claims**

1. A method of preparing a lubricant additive comprising:

(a) mixing a polymer consisting of a polymerized ethylene and at least one (C_3–C_{10}) alpha-monolefin, with methyl acrylamidoglycolate methyl ether at a temperature of about 100°–250° C. under a blanket of N_2 to from poly [(ethylene-co-alpha-mono-olefin-graft-(methylacrylamide-glycolate methyl ether];

(b) reacting said poly-(methyl acrylamidoglycolate methyl ether) with an amino aromatic compound to form the corresponding poly [(ethylene-co-alpha-monolefin)-graft-(methyl acryl amidoglycolate)] aromatic amide; and

(c) recovering said aromatic amide lubricant additive product.

5,147,572

FLOTATION COMPOSITION USING A MIXTURE OF COLLECTORS

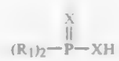
James H. Bush, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 539,104, Jun. 15, 1990, Pat. No. 5,094,746. This application Oct. 11, 1991, Ser. No. 775,335

Int. Cl.[5] B03D *1/012*, *1/014*

U.S. Cl. 252—61 **10 Claims**

1. A composition, comprising: an ore flotation collector which is a mixture of (A) at least one metal salt of a phosphorus acid represented by the Formula:



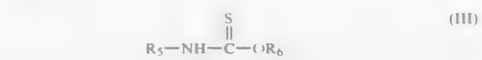
(I)

wherein each R_1 is independently a hydrocarbyl, hydrocarbyloxy or hydrocarbylthio group having from 1 to about 18 carbon atoms, each X is independently oxygen or sulfur, and the lowest oxidation state of the metal is plus two, and (B) (i) at least one dithiocarbamate represented by the formula:

(II)

wherein each R_2 is independently hydrogen, a hydrocarbyl group having from 1 to about 18 carbon atoms, or R_2 taken together with R_3 and the nitrogen atom form a five, six or seven member heterocyclic group; each R_3 is independently a hydrocarbyl group having from 1 to about 18 carbon atoms, or R_3 taken together with R_2 and the nitrogen atom form a five, six or seven member heterocyclic group; and R_4 is a hydrocar-

bylene group having from 1 to about 10 carbon atoms, and optionally at least one thionocarbamate represented by the Formula



(III)

wherein R_5 and R_6 are each independently hydrocarbyl groups having from 1 to about 18 carbon atoms.

5,147,573

SUPERPARAMAGNETIC LIQUID COLLOIDS

Mark S. Chagnon, Lowell, Mass., assignor to Omni Quest Corporation, Lawrence, Mass.

Filed Nov. 26, 1990, Ser. No. 617,956
Int. Cl.[5] H01F 1/28, 1/20
U.S. Cl. 252—62.52 28 Claims

1. A colloidal dispersion of electrically conductive magnetic particles consisting essentially of

a. superparamagnetic magnetic particles;

b. an electrically conductive organometallic compound having a conductivity of less than 1×10^{-10} ohms/cm^2 absorbed as a conductive shell around the magnetic particle;

c. a dispersing agent comprising a nonionic, anionic or cationic surfactant; and

d. a carrier fluid selected from the groups consisting of: hydrocarbon solvents having from about 4 to 40 carbon atoms, fluoroethers, and ester or diester oils.

5,147,574

STABLE LIQUID SOAP PERSONAL CLEANSER

Neil A. MacGilp; Kathleen G. Bauer; Richard M. Girardot, and Efrain Torres, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 5, 1991, Ser. No. 665,620
Int. Cl.[5] C11D 9/02, 9/04, 17/08
U.S. Cl. 252—108 12 Claims

1. A dispersoidal liquid soap personal cleansing composition comprising:

A. from about 5% to about 20% by weight of potassium fatty acid soap;

B. from about 2.5% to about 18% C_8–C_{22} free fatty acid; wherein said fatty acid has an Iodine Value of from zero to about 15; and a titer of from about 44° to about 70° C.;

C. from about 55% to about 90% water; and

wherein said soap and said free fatty acid have a weight ratio of about 1:0.5 to about 1:1; and wherein said product has a viscosity of from about 4,000 cps to about 100,000 cps; and wherein said composition contains no more than 10% synthetic surfactant by weight of said composition.

5,147,575

COMPOSITION AND METHOD FOR CLEANING AND LUBRICATING HAIR SHEARS

Ronald S. Hampton, Sr., 7095 Winkfield Pl., College Park, Ga. 30349

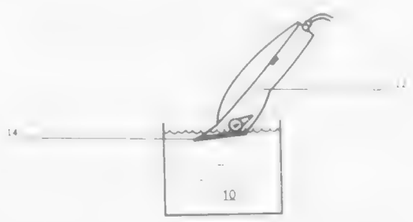
Continuation-in-part of Ser. No. 402,628, Sep. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 181,054, Apr. 13, 1988, abandoned. This application Aug. 14, 1991, Ser. No. 745,001
Int. Cl.[5] C11D 7/50, 7/48; C11G 5/032
U.S. Cl. 252—171 6 Claims

1. A hard surface cleaning solution comprising by volume:

about 85 to 95 percent of a nonchlorinated aliphatic hydrocarbon

having a boiling range of from about 350 degrees to about 550 degrees F., a natural flash point greater than or equal to 140 degrees F., and a kauributanol value of less than or equal to 30;

about 4 to 12 percent of dimethylpolysiloxane having a viscosity in the range of about 100 cs. to 1,000 cs. measured at a temperature of 77 degrees F.;



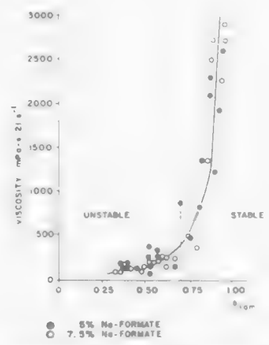
about 1 to 20 percent of mineral oil; and about 0.1 to 5.0 percent of an anti-microbial agent.

5,147,576

LIQUID DETERGENT COMPOSITION IN THE FORM OF LAMELLAR DROPLETS CONTAINING A DEFLOCCULATING POLYMER

Peter G. Montague, Dunchurch, Great Britain, and Johannes C. Van de Pas, Vlaardingen, Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 365,080, Jun. 12, 1989, abandoned.
This application Apr. 22, 1991, Ser. No. 689,124
Claims priority, application United Kingdom, Jun. 13, 1988, 8813978
Int. Cl.[5] C11D 3/37, 10/02, 17/00
U.S. Cl. 252—174 15 Claims



1. A liquid detergent composition comprising from 25% to 60% by weight of non-soap detergent active material and 1 to 60% by weight of electrolytes to form a dispersion of lamellar droplets in an aqueous continuous phase, the composition having a pH of less than 12.5 and yielding no more than 2% by volume phase separation when stored at 25° C. for 21 days from the time of preparation and further comprising from about 0.01 to about 5% by weight of a deflocculating polymer having a weight average molecular weight of from 500 to 500,000, wherein said deflocculating polymer comprises a combination of a hydrophillic backbone comprising monomer units selected from:

a) one or more ethylenically unsaturated hydrophillic monomers selected from the group consisting of unsaturated C_{1-6} acids, ethers, alcohols, aldehydes, ketones or esters; and/or

b) one or more polymerizable hydrophillic cyclic monomer units; and/or

c) one or more non-ethylenically unsaturated polymerizable hydrophillic monomers selected from the group consisting of glycerol and other polyhydric alcohols;

wherein said polymer is optionally substituted with one or more amino, amine, amide, sulphonate, sulphate, phosphonate, hydroxy, carboxyl or oxide groups;

and at least one hydrophobic side chain comprising monomers selected from siloxanes, saturated or unsaturated alkyl and hydrophobic alkoxygroups, aryl and aryl-alkyl groups, and mixtures thereof;

with the proviso that said deflocculating polymer may not include partially esterified copolymers of maleic anhydride or substituted maleic anhydride.

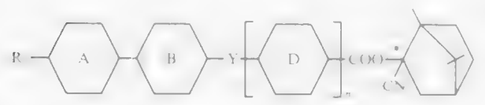
5,147,577

CYANO-ALICYCLIC ESTERS IN LIQUID CRYSTAL COMPOSITIONS

George W. Gray; Kenneth J. Toyne; David Lacey, all of North Humberside; David Holmes, Durham, and Richard M. Scroston, North Humberside, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of PCT/GB87/00888, Dec. 8, 1987.
This application Jun. 1, 1989, Ser. No. 359,790
Claims priority, application United Kingdom, Dec. 8, 1986, 8629322
Int. Cl.[5] C09K 19/30, 19/32; C07C 255/00
U.S. Cl. 252—299.62 9 Claims

1. A compound suitable for use as a constituent of a ferroelectric smectic liquid crystal composition, being an ester of the formula:



in which * is an asymmetrically substituted carbon atom; R_1 represents C_1 to C_{12} alkyl or alkoxy; rings A, B and D each independently represent phenyl, chloro- or fluoro- substituted phenyl, or cyclohexyl; n is 0 or 1; Y may be a single bond or CH_2CH_2 if n is 0, or Y may be a single bond, CH_2CH_2COO or COO if n is 1.

5,147,578

AMINO/POLYOXYALKYLENATED POLYDIORGANOSILOXANES

James R. Kirk, Ecosse, United Kingdom, assignor to Rhone-Poulenc Chimie, Courbevoie, France

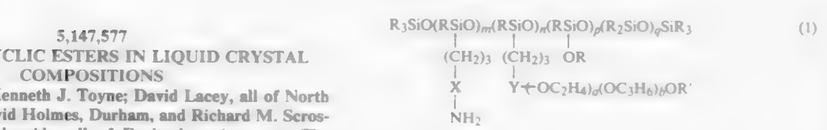
Division of Ser. No. 542,120, Jun. 22, 1990, Pat. No. 5,075,403.
This application Oct. 2, 1991, Ser. No. 769,789
Claims priority, application France, Jun. 22, 1989, 89 08581
Int. Cl.[5] C01K 3/00; B01D 19/04
U.S. Cl. 252—358 1 Claim

1. A solid antifoam adapted for use in a washing powder comprising:

(i) 100 parts by weight of a polyethylene glycol, a polyoxyethylene/polyoxypropylene copolymer, a solid surfactant, a solid wax, or admixture thereof;

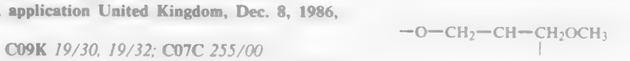
(ii) 10 to 80 parts by weight of a dispersion of pyrogenic or precipitated silica in a silicone oil; and

(iii) 10 to 20 parts by weight of a polydiorganosiloxane comprising amino and polyoxyalkylene groups and having the average formula (1):



(1)

in which the radicals R are C_1–C_4 alkyl, phenyl or 3,3,3-trifluoropropyl radicals wherein at least 80% of the number of the radicals R being methyl radicals; X is a single covalent bond; Y is a divalent radical of the formula (3):



(3)

m is a number ranging from 1 to 25; n is a number ranging from 1 to 25; p is a number ranging from 0 to 15; q is a number ranging from 5 to 500; a is a number ranging from 0 to 150; b is a number ranging from 0 to 150; a+b ranges from 5 to 200; R' is a hydrogen atom, and C_1–C_6 alkyl radical, a C_1–C_6 acyl radical or a phenyl radical; and R'' is a linear or branched C_1–C_6 alkyl radical.

5,147,579

MOISTURE RESISTANT SODIUM TITANATE AND POTASSIUM TITANATE

Terence C. Dean, Youngstown, N.Y., assignor to Tam Ceramics, Inc., Niagara Falls, N.Y.

Filed Jul. 17, 1989, Ser. No. 380,926
Int. Cl.[5] C09K 3/00
U.S. Cl. 252—385 19 Claims

1. A method for rendering granular hygroscopic materials moisture resistant and free flowing comprising:

mixing a hygroscopic material with a sealing material, said sealing material having a melting point lower than said hygroscopic material and said sealing material having a particle size fine enough to enter surface fissures on said hygroscopic material;

heat treating said mixture for a time and at a temperature sufficient to form a glassy moisture barrier between the hygroscopic material and the atmosphere;

screening and drying the heat treated material.

5,147,500

SELF TEMPERATURE LIMITING ELECTRICAL-CONDUCTING COMPOSITE

Robert G. Hill, Inch Abbey House Inch Abbey Road, Downpatrick, Co. Down, Northern Ireland

Filed Aug. 31, 1990, Ser. No. 575,606
Claims priority, application United Kingdom, Sep. 7, 1989, 8920283
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—506 12 Claims

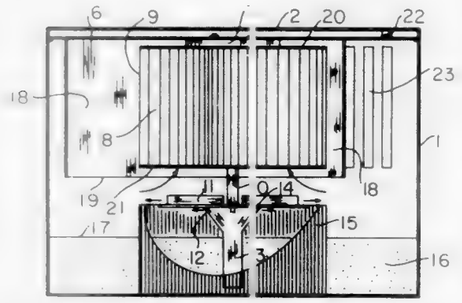
1. A self temperature limiting electrical conducting composite comprising a dispersion of an electrical conducting aggregate having a particle size in the range of from 50 to 75 microns and an electrical insulating aggregate having a particle size in the range of from 0.03 mm to 2.5 mm in a polymer matrix of an ester of methacrylic acid.

5,147,501

NEW EVAPORATIVE AIR COOLER

Qiu-Jiang Lu, 740 E. 300 S. #101 Salt Lake City, Utah 84102

Filed Feb. 4, 1991, Ser. No. 650,209
Int. Cl.[5] B01D *47/00*
U.S. Cl. 261—24 8 Claims



1. In an evaporative air cooler comprising a housing having rear inlets, front outlets, a cover and a motor-supporting plate, an electric motor being mounted to said plate with its shaft being directed downward, a rotary fan with its blades being vertically oriented and retained by an upper ring and a lower ring, said fan having a hub connected to said lower ring by spokes, said fan being connected to said motor shaft through said hub, an impeller having blades, a fluid-sucking tube, fluid outlets, and a hub, said impeller being situated below said rotary fan and being mounted to said motor shaft through said impeller hub, an air flow guiding wall partially surrounding said rotary fan with its upper edge being connected to said motor-supporting plate, a cylindrical screen surrounding said impeller and being mounted on the bottom of said housing, and a fluid fill pipe being directed downward from said cover and going through said motor-supporting plate.

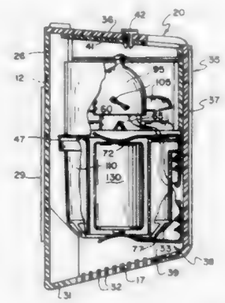
5,147,512

TURBO AIR FRESHENER

Charles R. Holzner, Sr., Chicago, and Allen J. Voth, Oak Park, both of Ill., assignors to Steiner Company, Inc., Chicago, Ill.

Continuation of Ser. No. 445,273, Dec. 4, 1989, abandoned. This application Jun. 13, 1991, Ser. No. 715,023
Int. Cl.[5] A61L *9/12*; B01F *3/04*
U.S. Cl. 261—30 16 Claims

2. A self-contained air freshener or deodorizing apparatus comprising an enclosure vertically disposed in use having positioned there within a battery-powered air movement generating means including a fan having a hub with an odd number of blades mounted to said hub, each of said fan blades having a base angularly disposed to the vertical mounted to said hub and a free end angularly rotated with respect to said blade base, a motor nested at least partially within said hub and connected thereto for rotating said fan hub generating a path of air flow through said enclosure, means positioned below said motor for accelerating air in the path of air, said accelerating means includes a cylindrical shroud having at least one vertically extending chute in the inner surface thereof surrounding



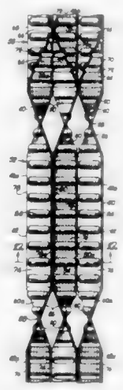
said fan having a plurality of radially extending struts positioned in use below said fan, each of said struts having a surface facing said fan which accelerates air passing across said strut surface, and air freshening or deodorizing means for supplying a source of vaporizable material to said path of air flow.

5,147,583

NON-CLOGGING FILM FILL ASSEMBLY FOR COUNTERFLOW WATER COOLING TOWER

Thomas W. Bugler, III, Prairie Village, and Ohler L. Kinney, Jr., Leawood, both of Kans., assignors to The Marley Cooling Tower Company, Mission, Kans.

Continuation-in-part of Ser. No. 631,378, Dec. 20, 1990, abandoned. This application Nov. 1, 1991, Ser. No. 786,376
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—112.2 22 Claims



1. In a counterflow water cooling tower having hot water distribution means and structure for causing cooling air to flow in countercurrent relationship to hot water gravitating downwardly from the distribution means, a fill pack assembly comprising:

a series of generally parallel film fill sheet sections in side-by-side relationship,

said pack being adapted to be located in vertically disposition for receipt of hot water at the top thereof from the hot water distribution means and to receive upflowing cooling air at the lower part thereof,

each of said fill sheet sections having at least two separate wall regions with one being above the other, each of the regions of said sheet sections being generally horizontally aligned with a corresponding wall region of the next adjacent fill sheet section,

each of said wall regions having portions which define a horizontally extending undulating pattern with successive portions extending toward and away from an adjacent fill sheet section, said portions of each wall region cooperating with the portions of an adjacent fill sheet to define a series of elongated, side-by-side vertical passage segments for receipt of hot water which flows downwardly therethrough in essentially film form over the surface of each such passage segment and for receipt of cooling air which flows upwardly through a corresponding passage segment in generally countercurrent heat exchange relationship with hot water,

each of the passages defined by portions of adjacent, horizontally aligned regions of the fill sheets presenting an open area extending from the top of the passage to the lower extremity of the same, said passages being of transverse dimensions throughout the length thereof to impede clogging of the passages by extraneous objects in the water or microorganism growths on the wall regions defining such passages,

the portions of the wall structures being configured such that the passage segments defined by the wall regions of adjacent pairs of fill sheets are horizontally offset from the passage segments defined by the next vertically adjacent regions of the same pair of fill sheets so that each passage is non-linear along its length with the cross-sectional area thereof being sufficiently open along the length thereof to maintain the essentially anti-clogging characteristics thereof,

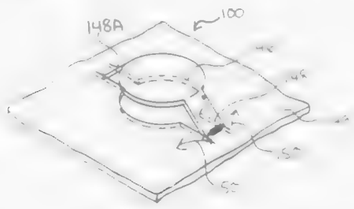
the passage segments defined by the wall structures of adjacent sheet sections being offset horizontally from the passage segments defined by sheet sections on opposite sides of each adjacent pair of sheet sections, said wall structure of each fill sheet being provided with transition zones between adjacent regions which are configured to interconnect the horizontally offset passage segments of adjacent wall regions, each of said transition zones including a wall sector which merges smoothly from the lower end of one passage segment into the entrance end of an adjacent horizontally offset passage segment therebelow.

5,147,584

CONTACT TRAY ASSEMBLY AND METHOD

Michael J. Binkley, Glenn Heights; John T. Thorngren, Dallas; Richard P. Lewis, Farmers Branch, all of Tex., and Walter W. Grigson, Baton Rouge, La., assignors to Glitsch, Inc., Dallas, Tex.

Division of Ser. No. 577,360, Sep. 4, 1990, which is a continuation-in-part of Ser. No. 320,420, Mar. 8, 1989, Pat. No. 4,956,127. This application Jan. 31, 1992, Ser. No. 829,988
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—114.3 3 Claims



1. An improved method of assembling a contact structure in a process column of the type wherein liquid flows downwardly through a first downcomer and is discharged along a notional plane onto a first tray and across the active area thereof through which vapor flows upwardly for interaction and mass transfer with the liquid before passing therefrom by a second downcomer, said improvement comprising the steps of constructing apertures in said tray active area with a generally circular shape on the order of one inch in diameter and disposing a circular disc of substantially the same size thereabove, mounting said circular disc upon said aperture with first and second legs disposed on opposite sides thereof, providing said first leg of said disc with a wider surface than said second leg, disposing said first leg in said aperture to intercept the flow of liquid across said tray from said downcomer for discharging a directional thrust of vapor through said aperture outwardly into the liquid in a directional manner facilitating the flow of liquid around said aperture wherein said step of forming said contact structure includes punching said structure within said tray surface area in a permanently disposed configuration upstanding therefrom and adapted for the discharge of vapor therethrough in a directional thrust configuration facilitating the flow of liquid therearound.

5,147,585

METHOD FOR FORMING PLASTIC OPTICAL QUALITY SPECTACLE LENSES

Ronald D. Blum, 5320 Silver Fox Rd., Roanoke, Va. 24014

Continuation-in-part of Ser. No. 594,136, Oct. 10, 1990, which is a continuation-in-part of Ser. No. 446,151, Dec. 5, 1989, which is a continuation-in-part of Ser. No. 422,399, Oct. 12, 1989, abandoned, and a continuation-in-part of Ser. No. 339,217, Apr. 17, 1989, Pat. No. 5,028,358, and a continuation-in-part of Ser. No. 190,856, May 6, 1988, Pat. No. 4,919,850, and a continuation-in-part of Ser. No. 114,962, Oct. 30, 1987, Pat. No. 4,873,029. This application Aug. 6, 1991, Ser. No. 740,946
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—1.4 9 Claims

1. A method for making a finished lens having a multifocal or progressive region, said method comprising:

providing a mold having a molding surface;

providing an optical quality resin composition containing an ultraviolet light initiator;

providing a preformed plastic lens of optical quality having a predetermined lens correction at its optical center, said lens having a bonding surface;

said mold having a first complementary surface of a curvature substantially the same as that of the bonding surface on the preformed plastic lens and a second surface corresponding to a multifocal region of a lens, said multifocal region constituting a minor portion of the mold;

placing said resin composition of a material of a different composition than said lens on said mold;

arranging said preformed lens with said mold such that the bonding surface of said preformed lens and said mold form a cavity enclosing said resin composition, said cavity having a first portion cooperating with said mold to form a relatively thin space therebetween of substantially constant thickness and a second portion cooperating with said mold to form said multifocal region;

curing the outer surface of said resin with UV light having a first wavelength and subsequently curing resin beneath said surface with UV light having a second wavelength; and

maintaining pressure on said resin composition during said curing step;

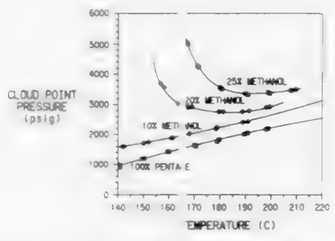
wherein the lens correction of said resulting lens is substantially the same as said predetermined lens correction of said preformed lens and the only substantial change in power being substantially in the vicinity of said multifocal region.

5,147,586

FLASH-SPINNING POLYMERIC PLEXIFILAMENTS

Hyunkook Shin, Wilmington, and Sam L. Samuels, Claymont, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 22, 1991, Ser. No. 660,768
Int. Cl.[5] D01D *5/11*
U.S. Cl. 264—13 19 Claims



1. An improved process for flash-spinning plexifilamentary film-fibril strands wherein polyethylene is dissolved in a hydrocarbon/co-solvent spin liquid to form a spin mixture containing 8 to 35 percent of polyethylene by weight of the spin mixture at a temperature in the range of 130° to 300° C. and a mixing pressure that is greater than 1500 psig, which spin mixture is flash-spun at a spin pressure greater than 1500 psig into a region of substantially lower temperature and pressure, the improvement comprising the hydrocarbor/co-solvent spin liquid consisting essentially of a hydrocarbon spin liquid containing from 4 to 5 carbon atoms and having an atmospheric boiling point less than 45° C. and a co-solvent spin liquid having an atmospheric boiling point less than 100° C. and capable of raising the cloud-point pressure of the resulting spin mixture by at least 200 psig at the polyethylene concentration and the spin temperature used for flash spinning, the co-solvent spin liquid being present in an amount greater than 10 percent by weight of the total hydrocarbon co-solvent spin liquid present.

5,147,587

METHOD OF PRODUCING PARTS AND MOLDS USING COMPOSITE CERAMIC POWDERS

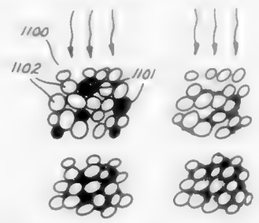
Harris L. Marcus, and Udaykumar Lakshminarayan, both of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 559,338, Jul. 30, 1990, Pat. No. 5,076,869, which is a continuation of Ser. No. 402,694, Sep. 5, 1989, Pat. No. 4,944,817, which is a continuation-in-part of Ser. No. 920,580, Oct. 17, 1986, Pat. No. 4,863,538. This application Feb. 19, 1991, Ser. No. 657,151
Int. Cl.[5] B29C *35/02*; B44H *1/16*; B32B *31/00*
U.S. Cl. 264—22 28 Claims

1. A method of producing a part, comprising:

depositing a powder onto a target surface, said powder comprising first and second materials;

heating a selected portion of said powder above the melting point of said first material so that said first material binds said second material in said selected portion to define a cross-sectional region of the part; and



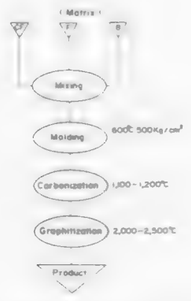
reacting the first and second materials in said cross-sectional region of the part to form a chemical compound of said first and second materials.

5,147,588

METHOD OF MAKING CARBON/CARBON COMPOSITE

Akimitsu Okura, Tokyo; Toushoku Chou, Chiba, and Nobuo Kamioka, Kasukabe, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Hanyu, both of, Japan

Filed Jun. 12, 1990, Ser. No. 536,471
Claims priority, application Japan, Jun. 16, 1989, 1-153667
Int. Cl.[5] C01B *31/04*
U.S. Cl. 264—29.7 5 Claims



1. A method of manufacturing hybrid carbon/carbon composite, wherein a raw material containing carbon fibers with two or more different lengths within the range of 3 mm/6 mm to 3 mm/20 mm, and meso-phase carbon as a binder is kneaded in the presence of adhesives, dried and defibrated, then molded under heat and pressure by hot press, and thereafter subjected to heat treatment.

5,147,589

METHOD OF MAKING A SHOE SOLE OF THERMOPLASTIC MATERIALS

Shui P. Chang, and Rong I. Chang, both of No. 13-5, Shenlin Rd., Shenkang Hsiang, Taichung Hsien, Taiwan

Continuation-in-part of Ser. No. 551,234 Jul. 11, 1990, and a continuation of Ser. No. 384,927, Aug. 1, 1989, abandoned.
This application Jul. 2, 1991, Ser. No. 724,635
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—45.1 3 Claims

1. A method of making a shoe sole product comprising:

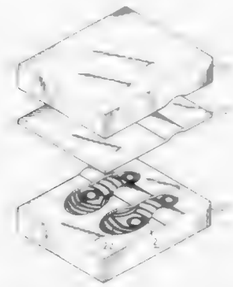
preparing an upper mold and a lower mold which have a first mold cavity and a second mold cavity formed therein respectively, said first mold cavity and said second mold cavity being smaller than said shoe sole product and having a shape in proportion to said shoe sole product, a first pattern being carved in a lower surface of said second mold cavity, and a second pattern being carved in an inner peripheral surface of said first mold cavity;

inserting a first material in said first mold cavity of said upper mold, and inserting a second material in said second mold cavity of said lower mold, said first material comprising a synthetic rubber, a vulcanizing agent and a foaming agent, said second material comprising a vulcanizing agent and a polymer blend which includes synthetic rubber and plastic, said first material being foamable, said first material and said second material being capable of being fused together under heat;

preparing a plate between said upper mold and said lower mold;

hot-pressing said first material and said second material in said first mold cavity and said second mold cavity respectively with said plate disposed therebetween;

removing said plate;



hot-pressing said first material and said second material to fuse said first material and said second material together so as to form a united body, said first pattern being transferred to a lower surface of said united body, and said second pattern being transferred to an upper peripheral surface of said united body;

removing said united body from said upper mold and said lower mold, said first material foaming by heat, said united body being distorted due to foaming of said first material, said second material not foaming; and

heating said united body, said first material being expanded by heat, said second material which is stretchable being softened by heat and being stretched by said first material when said first material expands, said second material being straightened when cooled, so that said shoe sole product is directly formed without any cutting process and so that said first pattern and said second pattern are directly formed on said shoe sole product.

5,147,590

METHOD OF MAKING THE ELECTRODE

Walter Preidel, and Herbert Grossmann, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 691,840
Claims priority, application Fed. Rep. of Germany, May 2, 1990, 4014110
Int. Cl.[5] B29C *41/02*; C23C *16/00*
U.S. Cl. 264—81 4 Claims

1. A method of manufacturing an electrode for medical applications comprising the steps of:

a) annealing a shaped body of glassy carbon at temperatures of up to approximately 2500° C.;

b) depositing pyrographite on the shaped body of glassy carbon by means of a pyrolysis of a hydrocarbon at temperatures ranging approximately from 1800° to 2100° C. to form a pyrographite coating;

c) cooling the shaped body and the pyrographite coating;

d) removing the pyrographite coating from the shaped body; and

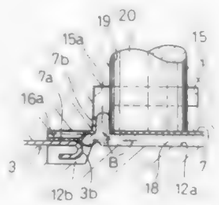
e) producing the electrode from the pyrographite coating.

5,147,591

METHOD OF PRODUCING A LID DEVICE FOR WIDE-MOUTHED CONTAINER

Yoshiaki Yoshida, Nara, Japan, assignor to Tenryu Chemical Industry Co., Ltd., Nara, Japan

Division of Ser. No. 426,012, Oct. 24, 1989, Pat. No. 5,054,642.
This application Apr. 18, 1991, Ser. No. 687,002
Claims priority, application Japan, Mar. 15, 1989, 1-30204[U]; May 18, 1989, 1-125657
Int. Cl.[5] B29C *45/03, 45/14*
U.S. Cl. 264—163 6 Claims



1. A method of producing a lid device for a wide-mouthed container, said lid device comprising a lid body fittable to an open mouth of the container, said lid body having an inner margin defining an opening of a predetermined shape, and a closure member made of a soft synthetic resin for closing said opening of said lid body, said closure member having an openable portion integrally formed with a pull tab which is used for opening said openable portion, said method comprising the steps of:

placing said lid body and a vapor impervious film between a first mold body and a second mold body, said first mold body having a closure forming cavity on an inner side of said lid body, said second mold body having a tab forming cavity on an outer side of said lid body, said film being located on said outer side of said lid body in facing relation to said opening of said lid body, and

injecting a fluid synthetic resin under pressure from the side of said first mold body until said fluid resin fills said closure forming cavity and said tab forming cavity, said fluid resin breaking through said film when filling said tab forming cavity, wherein said film is broken through only by said fluid resin.

5,147,592

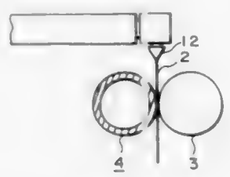
PROCESS OF AND APPARATUS FOR PREPARING OPTICAL RECORDING MEDIUM SUBSTRATES

Tetsuya Sato; Osamu Kanome, both of Kawasaki; Hitoshi Yoshino, Tokyo; Hirofumi Kamitakahara, Yokohama; Hisanori Hayashi, Kawasaki, and Tsuyoshi Santoh, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 580,218
Claims priority, application Japan, Sep. 12, 1989, 1-234747
Int. Cl.[5] B29C *47/00, 47/88*
U.S. Cl. 264—167 7 Claims

1. A process for preparing a substrate sheet for optical recording mediums, comprising the steps of extruding a molten resin from a T-die to form a resin sheet and pressing said resin sheet in a substantially molten state between a preformat roll and a roll disposed opposingly to said preformat roll to transfer a preformat pattern to a surface of the resin sheet such that said resin sheet is brought into direct contact with the circumferential surface of said roll disposed opposingly to said preformat roll while said resin sheet is maintained at a temperature higher than a surface temperature of said roll disposed opposingly to the preformat roll, wherein

said roll disposed opposingly to the preformat roll comprises a metal roll a surface of which is covered with an elasto-



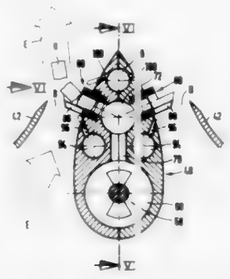
meric resin having a thickness ranging from 0.1 mm to 5 mm.

5,147,583

METHOD TO PREPARE EXTRUDED PARTICLES BY BREAKING WITH AN AIR STREAM

Herbert Huttllin, Daimlerstrasse 7, 7853 Steinen, Fed. Rep. of Germany

Filed Nov. 8, 1990, Ser. No. 611,971
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1990, 4000571
Int. Cl.[5] B29C 9/02
U.S. Cl. 264—500 6 Claims



1. A method of preparing extruded particles to avoid agglomeration with other extruded particles upon dropping comprising the steps of:

extruding a doughy mass in the form of a strand transversely into a first gas stream which is upwardly directed wherein said first gas stream upwardly directs said extruded particles to produce a fluidized bed of said particles; and

drying and breaking said strand into particles using said first gas stream and a second gas stream which is upwardly directed and sharply focussed onto the surface of said strand.

5,147,584

EXTRUDING VINYLIDENE CHLORIDE COPOLYMER FLEXIBLE PACKAGING FILM

Ronald D. Moffitt, Duncan, S.C. assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 364,664, Jun 9, 1989, Pat. No. 5,030,511. This application Mar. 25, 991, Ser. No. 674,843
Int. Cl.[5] B29C 47/06
U.S. Cl. 264—514 3 Claims

1. A method of improving the heat stability of vinylidene chloride copolymer during tubular extrusion with a hot blown bubble, said method comprising extruding a film with a layer of vinylidene chloride copolyme blend comprising:

(a) about 0.01% to 6% by weight of processing aid wherein the processing aid possesses an epoxy functionality, and

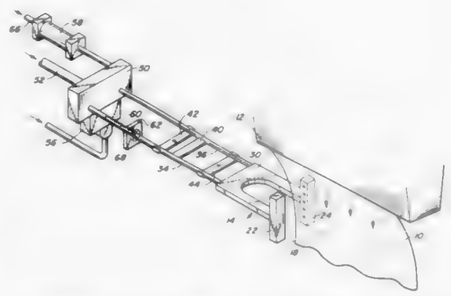
(b) low weight-average molecular weight vinylidene chloride copolymer wherein the major portion of the copolymer is vinylidene chloride.

5,147,595

APPARATUS AND METHOD FOR REDUCING PLASTIC FILM NECK-IN

Bruce Sanderford, Dublin, Calif., assignor to James River II, Inc., Oakland, Calif.

Filed Jul. 23, 1991, Ser. No. 734,555
Int. Cl.[5] B29C 41/52
U.S. Cl. 264—555 11 Claims



1. Apparatus for stabilizing and reducing neck-in and edge thickness of a hot plastic web having opposed, unsupported planar sides and first and second edges, said web moving in a predetermined direction of movement, said apparatus comprising:

a first nozzle assembly including a pair of first nozzle elements, said first nozzle elements being located adjacent to said first edge inwardly of said first edge with said first nozzle elements in opposition to each other and positioned on opposite sides of said web adjacent said opposed, unsupported planar sides, said first nozzle assembly for directing a first pair of gaseous flows along opposed first portions of said unsupported web planar sides adjacent to said first edge transverse to the direction of movement of said web and toward said first edge, said first pair of gaseous flows extending along a substantial, predetermined length of said opposed first portions and each of said first pair of gaseous flows including a primary gaseous flow component exiting from said first nozzle assembly and a secondary gaseous flow component comprised of ambient air entrained by the primary gaseous flow component exiting from said first nozzle assembly, each of said first nozzle elements defining at least one aperture for directing said primary gaseous flow component toward a first web portion along said substantial predetermined length thereof and at an acute angle thereto, and each of said first nozzle elements defining a restricted fluid flow path with said web whereby the Venturi effect is generated with respect to at least said secondary gaseous flow components; and

a second nozzle assembly spaced from said first nozzle assembly including a pair of second nozzle elements, said second nozzle elements being located adjacent to said second edge inwardly of said second edge with said second nozzle elements in opposition to each other and positioned on opposite sides of said web adjacent said opposed, unsupported planar sides, said second nozzle assembly for directing a second pair of gaseous flows along opposed second portions of said unsupported web planar sides adjacent to said second edge transverse to the direction of movement of said web and toward said second edge, said second pair of gaseous flows extending along a substantial, predetermined length of said opposed second portions and each of said second pair of gaseous flows including a primary gaseous flow component exiting from said second nozzle assembly and a secondary gaseous flow component comprised of ambient air entrained by the primary gaseous component exiting from said second nozzle assembly, each of said second nozzle elements defining at least one aperture for directing said primary gaseous flow component toward a second web portion along said substantial predetermined length thereof and at an acute angle thereto, and each of said second nozzle elements defining a restricted fluid flow path with said web whereby the Venturi effect is generated with respect to at least said secondary gaseous flow components.

9. A method of stabilizing and reducing neck-in and edge thickness of a hot plastic web having opposed planar sides and first and second edges, said method comprising the steps of:

moving said web in a predetermined direction of movement with the opposed planar sides thereof unsupported;

during said web movement, directing a first pair of gaseous flows along opposed first portions of said unsupported web planar sides adjacent to said first edge transverse to the direction of movement of said web and toward said first edge, said first pair of gaseous flows extending along a substantial, predetermined length of said opposed first portions;

simultaneously with said step of directing said first pair of gaseous flows, directing a second pair of gaseous flows along opposed second portions of said unsupported web planar sides adjacent to said second edge transverse to the direction of movement of said web and toward said second edge, said second pair of gaseous flows extending along a substantial, predetermined length of said opposed second portions;

forming each of said gaseous flows by forcing air through at least one restricted opening to create a primary gaseous component and entraining ambient air therewith after passage through said at least one restricted opening to provide a secondary gaseous component;

passing at least the secondary gaseous flow component through a restricted fluid flow path to generate the Venturi effect with respect thereto; and

exerting opposed tensional forces on said web by said first and second pair of gaseous flows to stabilize and hold said web and reduce web neck-in by directing the primary flow components of each pair of gaseous flows along converging flow paths and intercepting the primary flow component by said web at diametric locations on the opposed, unsupported planar sides of the web closely adjacent to said edges.

5,147,596

TOPOLOGICALLY CONSTRAINED RELAXATION METHOD AND APPARATUS FOR PRODUCING REVERSED-FIELD PINCH WITH INNER DIVERTOR IN PLASMA CONFINEMENT

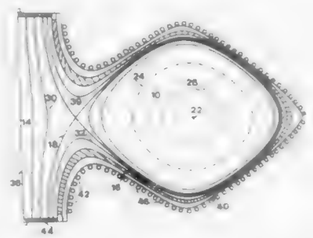
Daniel Weil, Jerusalem, Israel, assignor to Laboratory of Ionised Gases The Hebrew University of Jerusalem, Jerusalem, Israel

Filed Mar. 7, 1990, Ser. No. 489,074
Claims priority, application Israel, Mar. 7, 1989, 89519
Int. Cl.[5] G21B 1/00
U.S. Cl. 376—134 24 Claims

1. A method for generating and confining plasma by plasma relaxation comprising:

generating plasma;

generating and maintaining within the plasma a magnetic field configuration having a non-zero homotopic invariant, comprising at least one region of nested toroidal magnetic surfaces defining a magnetic elliptic axis, a region of open field-lines extending along the major axis of symmetry of said at least one region of toroidal magnetic surfaces, and an open-ended divertor separatrix surface comprising a poloidal null, with toroidal magnetic orientation at said poloidal null reversed with respect to orientation of said elliptic axis of said at least one toroidal region, by passing current through the plasma in a plurality of toroidal and straight channels producing at least one toroidal reversed-field-pinch-like region and a straight z-pinch-like region along the major toroidal axis of said at least one toroidal region, producing said open-ended separatrix surface with said poloidal null, part of said separatrix



surface enclosing said at least one toroidal channel, said open-ended separatrix surface being surrounded by an additional set of nested, open field-lines, cylindrical magnetic surfaces within the plasma; and

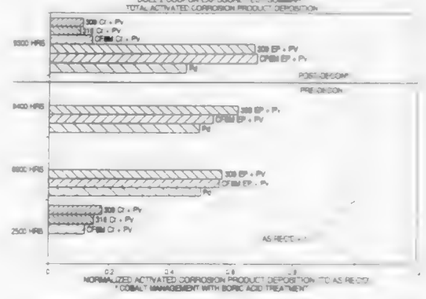
forming within said plasma at least one region of nested toroidal surfaces wherein the safety factor q changes sign and attains for both signs absolute values different from zero but substantially in all said region less than 1.

5,147,597

PRESTABILIZED CHROMIUM PROTECTIVE FILM TO REDUCE RADIATION BUILDUP

Roger L. A. Roofthooft, Linkebeek, Belgium, and Roger H. Asay, Santa Clara, Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Apr. 9, 1991, Ser. No. 682,613
Int. Cl.[5] G21C 19/00
U.S. Cl. 376—305 3 Claims



1. A method for retarding buildup of radioactive materials on a water exposed steel surface of a pipe which forms a part of a water system of a light water nuclear reactor, comprising the steps of:

preparing said water exposed steel surface to obtain a clean base metal starting surface;

depositing a chromium film at least five hundred Angstroms thick on said pipe surface from a solution of chromic acid and sulfuric acid under controlled electrochemical deposition conditions;

exposing said deposited chromium film and said underlying base metal to a gaseous oxygen source at temperatures between 150° C. and 450° C. to obtain a thin stabilized chromium-rich oxide film on the exposed surface of said deposited chromium film; and,

using said chromium-coated pipe with an oxide film as a

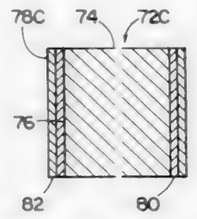
portion of the water system of the light water nuclear reactor.

5,147,598

NUCLEAR REACTOR CORE HAVING NUCLEAR FUEL AND COMPOSITE BURNABLE ABSORBER ARRANGED FOR POWER PEAKING AND MODERATOR TEMPERATURE COEFFICIENT CONTROL

Sushil K. Kapil, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 465,286, Jan. 16, 1990, Pat. No. 5,075,075.
This application May 2, 1991, Ser. No. 644,659
Int. Cl.[5] G21C 3/00
U.S. Cl. 376—419 10 Claims



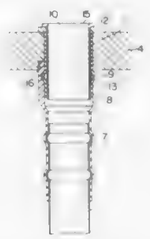
1. A burnable absorber coated nuclear fuel, comprising:
(a) a nuclear fuel substrate containing a fissionable material; and
(b) an outer burnable absorber coating applied on an outer surface of said substrate, said outer absorber coating being composed of an inner layer of a boron-bearing material except for erbium boride and an outer layer of an erbium material.

5,147,599

FUEL ASSEMBLY OF A NUCLEAR REACTOR

Ragnar Månsson, Västerås, Sweden, assignor to ABB Atom AB, Västerås, Sweden

Filed Mar. 6, 1991, Ser. No. 665,317
Claims priority, application Sweden, Mar. 9, 1990, 9000849
Int. Cl.[5] G21C 3/32
U.S. Cl. 376—446 7 Claims



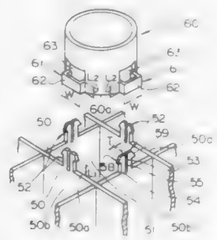
1. A fuel assembly for a nuclear reactor which comprises a top tie plate which has a top surface, a bottom surface and a hole which extends therethrough from said top surface to said bottom surface, a bottom tie plate, a plurality of parallel fuel rods which extend between said top tie plate and said bottom tie plate, a plurality of spacer lattices positioned along said fuel rods, a plurality of guide tubes located between said fuel rods, said guide tubes being fixed to said spacer lattices, a seat in said top tie plate around said hole, a top sleeve which defines a lower end to which an upper end of a guide tube can be joined and an upper end which abuts said seat, a first locking means inside said top sleeve, a guide sleeve which is positionable through said hole in said top tie plate and into said top sleeve, and a second locking means on the outside of said guide sleeve which is cooperable with said first locking means to connect said guide sleeve and said top sleeve together.

5,147,600

GRID FOR NUCLEAR FUEL ASSEMBLY

Hiroaki Kadono; Akio Oriuchi, and Koichi Tominaga, all of Ibaraki, Japan, assignors to Mitsubishi Nuclear Fuel Co., Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 619,971
Claims priority, application Japan, Dec. 6, 1989, 1-316932
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] G21C 3/34
U.S. Cl. 376—462 15 Claims



1. A grid in a nuclear fuel assembly for supporting fuel rods and thimbles, comprising:
a plurality of elongated straps intersecting perpendicularly with each other to define a plurality of first grid cells for supporting the fuel rods and a plurality of second grid cells for supporting the thimbles, each of said grid cells having a prescribed intervening distance defined between the opposed straps, those portions of said straps defining a respective one of said grid cells having opposite ends defining opposite opening ends of said respective grid cell;
a plurality of cylindrical sleeves each arranged on at least one of said opposite ends of said strap portions defining said respective second grid cell and having an inner diameter generally identical to said intervening distance; and
engaging means for securing each of said sleeves to said strap portions defining said second grid cell, said engaging means including at least one first engaging portion provided on said strap portions defining said second grid cell adjacent one of said opposite ends and at least one second engaging portion provided on said sleeve adjacent an axial bottom thereof, said first and second engaging portions being formed such that said first and second engaging portions are held in resilient engagement with each other when said axial bottom is held in abutment with said one of said opposite ends, wherein said second engaging portions do not extend to the other of said opposite ends when said axial bottom is held in abutment with said one of said opposite ends.

5,147,601

PROCESS FOR MANUFACTURING A SOFT MAGNETIC BODY OF AN IRON-NICKEL ALLOY

Akihito Ohtsuka, Sakura, and Yoshio Kijima, Tokyo, both of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1992, Ser. No. 860,183
Claims priority, application Japan, Apr. 30, 1991, 126646
Int. Cl.[5] G22F 1/00
U.S. Cl. 419—25 6 Claims

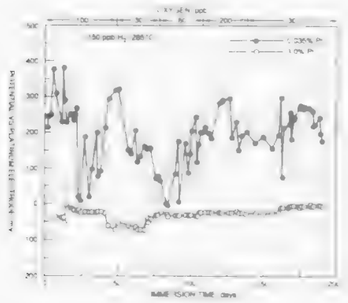
1. A process for manufacturing a soft magnetic body of an iron-nickel alloy which comprises:
injection molding a composition comprising a powder containing 0.5 to 10% by weight of nickel and having an average particle diameter of at most 45 microns, and a binder, the balance of said powder being substantially iron;
removing said binder from the molded product of said composition;
sintering said product; and
cooling said sintered product at a rate of 2° C. to 50° C. per minute.

5,147,602

CORROSION RESISTANT HIGH CHROMIUM STAINLESS STEEL ALLOY

Peter L. Andresen, and Leonard W. Niedrach, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 20, 1991, Ser. No. 703,325
Int. Cl.[5] C22C 38/40, 30/00
U.S. Cl. 420—35 2 Claims



1. A corrosion resistant stainless steel alloy comprised of, in weight percent, about 24 to 32 percent chromium, about 20 to 40 percent nickel, up to about 10 percent manganese, up to about 0.06 percent carbon, a platinum group metal in an effective amount to reduce the corrosion potential of the alloy in high-temperature water provided with hydrogen, about 2 to 9 percent of at least one of the metals titanium, niobium, or tantalum, and the balance substantially iron.

5,147,603

RAPIDLY SOLIDIFIED AND WORKED HIGH STRENGTH MAGNESIUM ALLOY CONTAINING STRONTIUM

Gilles Nussbaum, Passy; Damien Deweirder, Saint Leu La Forêt, both of France, and Haavard T. Gjestland, Porsgrunn, Norway, assignors to Pechiney Electrometallurgie, Courbevoie, France and Norsk Hydro A.S., Oslo, Norway

Filed May 23, 1991, Ser. No. 704,620
Claims priority, application France, Jun. 1, 1990, 9007299
Int. Cl.[5] C22C 1/00
U.S. Cl. 420—409 17 Claims

1. An alloy based on Mg, with a load at rupture of at least 290 MPa and an elongation at rupture of at least 5%, comprising, by weight, the elements:
Aluminium 2–11%;
Manganese 0–1%;
Strontium 0.1–6%;
with the following content of the main impurities:
Silicon <0.6%
copper <0.2%
iron <0.1%
nickel <0.01%
the remainder being magnesium,
said alloy having a structure including a matrix of fine grains of magnesium of a mean size below 3 μm reinforced by intermetallic compounds dispersed homogeneously at the grain boundaries and having a size less than 1 μm, said structure remaining unchanged if kept for more than 24 hours at a temperature up to 300° C.

5,147,604

DIOXO-AROMATIC COMPOUNDS AS OXYGEN SCAVENGERS

Stanley J. Ciuba, Burnsville, Minn., and John A. Muccitelli, Feasterville, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 454,931, Jan. 3, 1983, abandoned, which is a continuation of Ser. No. 144,723, Apr. 28, 1980, abandoned. This application Sep. 6, 1988, Ser. No. 241,801
Int. Cl.[5] C23F 11/06
U.S. Cl. 422—13 15 Claims

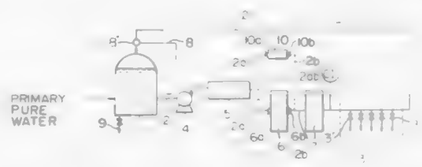
1. A method for reducing the amount of oxygen in an oxygen containing aqueous medium contained in a condensate system of a boiler system through the use of an oxygen scavenger which comprises adding to said aqueous medium an effective amount for the purpose of an oxygen scavenger comprising a hydrazine-free solution, said solution comprising a member selected from the group consisting of:
benzoquinone, and
napthoquinone.

5,147,605

METHOD FOR THE STERILIZATION OF ULTRAPURE WATER LINE

Toshio Tatsuno; Mitsuo Miyamoto, both of Osaka; Yoshiharu Ohta, and Koichi Sawada, both of Tokyo, all of Japan, assignors to Morita Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 5, 1990, Ser. No. 487,937
Claims priority, application Japan, Mar. 6, 1989, 1-52153
Int. Cl.[5] A01N 59/10
U.S. Cl. 422—37 5 Claims



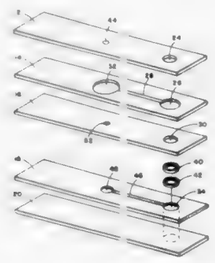
2. A method for the sterilization of an ultrapure water line provided in an ultrapure water-producing system, said ultrapure water line comprising an ion exchange resin unit as well as an inlet-side conduit section and an outlet-side conduit section as connected to an inlet and an outlet of the ion exchange resin unit, which method comprises:
(a) disconnecting from the ion exchange resin unit and connecting the inlet-side conduit section and the outlet-side conduit section directly to each other to form a bypass circuit and to permit bypassed feeding of water through said bypass circuit without passing the water through the ion exchange resin unit provided in the ultrapure water line;
(b) passing an aqueous solution containing hydrofluoric acid at a concentration of 1–100 ppm, through the ultrapure water line which has been rearranged by the direct connection of the inlet-side conduit section to the outlet-side conduit section to form the bypass circuit and permit the bypassed feeding of said solution without passing said solution through the ion exchange resin unit, whereby the sterilization is effected in the so rearranged ultrapure water line; and
(c) allowing the aqueous solution of hydrofluoric acid to remain within the ultrapure water line having been so rearranged to have the bypass circuit, until the sterilization has been completed in said ultrapure water line.

5,147,606

SELF-METERING FLUID ANALYSIS DEVICE

Steven C. Charlton, Osceola; Michailo V. Rebec, Bristol, and Catherine Ruetten, Granger, all of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Aug. 6, 1990, Ser. No. 563,044
Int. Cl.[5] G01N *21/03*
U.S. Cl. 422—56 18 Claims



1. A diagnostic device for testing fluid, comprising:
a housing for containing fluid;
a sample application port defined in the housing for introducing a sample of fluid into the housing;
a metering chamber means positioned in the housing and constructed so as to receive the fluid sample via the sample application port;
a fluid capillary positioned in the housing comprising a first end and a second end wherein the first end is coupled to the metering chamber means for carrying fluid therefrom toward the second end; and
a reaction compartment means positioned in the housing and including:
a first chamber means containing a reagent, and
a second chamber means, disposed between the metering chamber means and the first chamber means, containing a filter therein, said filter positioned in flow communication with said metering chamber means;
wherein the filter is positioned and arranged to allow fluid entering the reaction compartment means from the metering chamber means to be filtered and the reagent react with the filtered fluid.

5,147,607

REACTION VESSEL WITH A ROCKING BASE

Ei Mochida, Tokyo, Japan, assignor to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,523
Claims priority, application Japan, Nov. 30, 1989, 1-312122
Int. Cl.[5] G01N *1/00, 31/22*
U.S. Cl. 422—57 22 Claims

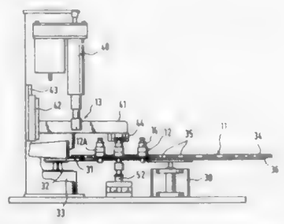
1. A fluid circuit reaction vessel for detecting a target substance contained in a minute amount in a fluid sample, wherein said vessel comprises:
(A) a body structure, said body structure comprising an upstream portion on one side of a center of gravity of the body structure and a downstream portion on the other side of the center of gravity of the body structure;
(B) a fluid circuit defined in said body structure, said fluid circuit comprising,
(a) at least one fluid inlet for introducing at least one fluid including the fluid sample containing the target substance, said fluid inlet being provided in the upstream portion of the body structure,
(b) at least one fluid sump provided in the downstream portion of the body structure,
(c) at least one fluid channel connecting said fluid inlet and said fluid sump,
(d) at least one reagent-immobilized area provided in said fluid channel, said reagent-immobilized area having a reagent fixedly immobilized thereto, said reagent being able to specifically react with said target substance contained in the sample,
(e) at least one reagent-attached area provided in said fluid channel between said fluid inlet and said reagent immobilized area, said reagent-attached area having a reagent reversibly attached thereto, and
(f) a vent mechanism comprising at least one ventilatory outlet provided in said fluid circuit for venting said fluid circuit; and
(g) a rocking means for allowing said body structure to become inclined with said downstream portion of the body structure including said fluid sump moving downward to indicate substantial completion of the detection, said inclination being induced by the movement of the fluid into said fluid sump.

5,147,608

APPARATUS AND PROCESS FOR PERFORMING REPETITIVE CHEMICAL PROCESSING

Derek Hudson, San Anselmo; Jordan Honig, San Francisco; Ronald M. Cook, Ross, and Douglas J. Ng, El Cerrito, all of Calif., assignors to Millipore Corporation, Bedford, Mass.

Filed Apr. 29, 1988, Ser. No. 188,453
Int. Cl.[5] G01N *33/68*
U.S. Cl. 422—63 13 Claims



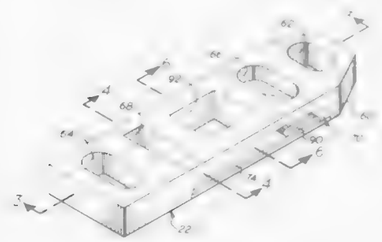
1. A system for automated chemical processing, comprising:
a plurality of chemical storage cartridges, at least one cartridge for storing a first chemical;
means for choosing between any one of said cartridges and holding said chosen cartridge and positioning said cartridge at a fixed location within said system;
a reservoir spaced from said location for containing a second chemical to be reacted with said first chemical in said chosen cartridge to produce a third chemical;
means at said location for fluid coupling to said chosen cartridge to establish fluid communication with the contents thereof;
a fluid conduit connected to said fluid coupling means and said reservoir to dissolve and conduct said first chemical from said chosen cartridge to said reservoir to react with said second chemical;
valve means operably connected with said fluid conduit for controlling flow through said conduit;
said cartridges including pump means operable when said chosen cartridge is positioned at said location for changing the internal volume thereof so as to cause bi-directional flow of said first chemical through said fluid coupling means, alternatively into and out of said reservoir and said chosen cartridge to promote mixing and reacting with said second chemical in said reservoir to complete the formation of said third chemical, said pump means comprises a plunger slidably sealed in said cartridges and a reciprocating arm connected with said plunger to reciprocate said plunger when said chosen cartridge is at said location to alternately draw material into said chosen cartridge and then expel the material from said chosen cartridge; and
automatically operated control means connected with said pump means and said valve means to obtain a predetermined sequence of operation of said pump means and said valve means for controlling the dispensing of said first and second chemicals and the further processing of said third chemical.

5,147,609

ASSAY ELEMENT

Gerd Grenner, Lincoln, Mass., assignor to PB Diagnostic Systems, Inc., Westwood, Mass.

Filed May 19, 1989, Ser. No. 354,026
Int. Cl.[5] G01N *31/22, 33/53, 21/77*
U.S. Cl. 422—58 20 Claims



1. An assay element comprising a housing including a porous member arranged between top and bottom guide surfaces,
a chamber for dispensing fluid to an end portion of said porous member and a chamber for receiving fluid which leaves said porous member, said fluid dispensing chamber and said fluid receiving chamber being disposed contiguous opposed ends of said porous member,
wherein said fluid dispensing chamber includes a well having a port in the bottom thereof contiguous said porous member and opening to said porous member for conducting fluid from said well to said porous member; and
a ridge encircling the perimeter of said port and protruding into and compressing said porous member for entraining fluid from said fluid dispensing chamber to propagate into and within said porous member.

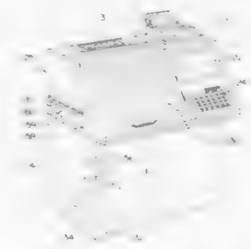
5,147,610

AUTOMATIC ANALYZING APPARATUS

Miyoko Watanabe, and Hiroshi Mitsumaki, both of Mito, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1991, Ser. No. 709,881
Claims priority, application Japan, Jun. 15, 1990, 2-157263
Int. Cl.[5] G01N *33/00;* B08B *3/00*
U.S. Cl. 422—64 10 Claims

1. An automatic analyzing apparatus for analyzing samples including egesta from organisms and tissues thereof, including:
a housing;
analysis means disposed within said housing, including at least one reaction vessel and a reaction vessel supporting means for supporting said at least one reaction vessel for accommodating a sample and a reagent, and measurement means for measuring the result of the reaction between the sample and the reagent in the reaction vessel;
a waste liquid reservoir detachably disposed within said housing;
cleaning means disposed within said housing for cleaning with cleaning water a reaction vessel which has been used for an analysis;
liquid conveying means disposed within said housing and in fluid communication with said waste liquid reservoir for conveying reaction liquid formed of the sample and the reagent as well as the water used for cleaning the reaction vessel to said waste liquid reservoir; and
sterilizing liquid supply means disposed within said housing



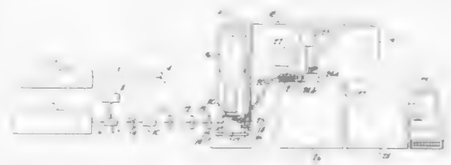
and in fluid communication with said waste liquid reservoir for supplying a sterilizer or disinfection into said waste liquid reservoir,
wherein said liquid conveying means includes at least one suction nozzle movable into and out of the reaction vessel, a drainage line extending from said nozzle to said waste liquid reservoir, gas-liquid separation means provided in said drainage line, a vacuum pump for sucking the gas separated from the liquid within said gas-liquid separation means and containing suspended particles, and a filter for filtering the gas discharged from said vacuum pump and containing an infectious aerosol.

5,147,611

OPTICAL AND PYROLYZATE ANALYZER APPARATUS

Scott A. Stout, Fullerton; Rui Lin, Corona; Gunnar W. Recht, La Habra, all of Calif.; Joseph T. Senftle, Plano, Tex., and Stephen R. Larter, Venice, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 24, 1989, Ser. No. 384,805
Int. Cl.[5] G01N *25/02, 33/24*
U.S. Cl. 422—78 63 Claims



1. An apparatus for analyzing a particle within a sample, said apparatus comprising:
a sensor capable of detecting emitted radiation from said particle within a detection zone, said sensor detecting emitted radiation centered around an axis and said zone located substantially around a portion of said axis wherein detection sensitivity of said sensor is substantially at a maximum sensitivity from within said zone;
a chamber attached to said sensor wherein at least a portion of said chamber extends along said axis towards said particle, said chamber having a first chamber aperture located substantially around said axis;
a contact surface for setting said particle, at least a portion of said contact surface spaced apart from said particle, said

contact surface shaped and dimensioned to contact a portion of said chamber located near said first aperture when said particle is within said zone, wherein said contact surface and the set particle can be spaced apart from said chamber;

means for changing the relative spacing between said set particle and said chamber, so that when said contact surface is substantially contacting said chamber, a partial boundary is formed around said particle by said chamber and said contact surface;

means for transmitting said emitted radiation from the partially bounded particle to said sensor;

a source of energy capable of heating said particle until a fluid emanates from a portion of the partially bounded particle;

means for transferring energy from said energy source to a portion of the partially bounded particle;

means for collecting said fluid from said chamber.

5,147,612

APPARATUS FOR PREPARATION OF STANDARD GAS MIXTURES

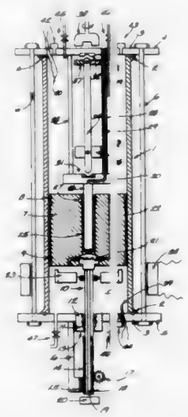
Johan D. Raal, 12 St Georges Dr., Westville, Natal, South Africa

Filed Oct. 9, 1990, Ser. No. 594,550

Claims priority, application South Africa, Oct. 9, 1989, 89/7655

Int. Cl.[5] **B01L** *3/00, 1'/00;* **G05D** *11/00*

U.S. Cl. 422—99 **8 Claims**



1. An apparatus for use to prepare gas mixtures of accurately known composition which comprises a cylinder having a first end wall at one end and a second end wall at the other end, a piston movable in the cylinder and sealing with the cylinder walls, said piston and cylinder defining a first chamber on a first side of the piston and a second chamber on a second side of the piston, means defining a hole in the first side of said piston, a first piston rod fixed to the first end wall and slidable into said hole in the first side of the piston and sealing with the hole defining means, means defining a hole in the second end wall, a second piston rod connected to the second side of the piston and exiting from the second chamber through the hole in the second end wall and sealing with the hole defining means therein, a device for causing linear movement and for measuring that movement, said device being couple to and acting on the second piston rod outside the cylinder, the first and second piston rods having the same diameter, a valved passage penetrating the piston from the first side to the second side, stirring means mounted on the piston rod located in at least one of the chambers, valve means for admission of gas to each chamber and valve means for extracting gas from each chamber.

5,147,613

APPARATUS FOR STERILIZING A MEDICAL UNIT

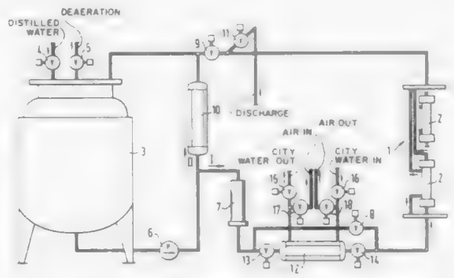
Klaus Heilmann, St. Wendel; Bernd Mathieu, Spiesen-Elversberg; Michael Rink, St. Ingbert-Hassel, and Wolfram Weber, Spiesen-Elversberg, all of Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Nov. 2, 1990, Ser. No. 608,560

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1989, 3936785

Int. Cl.[5] **A61L** *2/00;* **B01D** *63/00;* **C02F** *1/44;* **G05B** *17/11*

U.S. Cl. 422—116 **14 Claims**



1. An apparatus for sterilizing a medical unit comprising at least two connections for a fluid flow pathway where a sterilizing medium flows through said unit comprising:

(a) means for generating and/or providing a sterilizing medium in said apparatus;

(b) at least one fastening means which is subjected to a pressure and holds a medical unit in place, is used for the temporary pressure-tight coupling of at least two medical unit connections, and comprises an inlet and an outlet;

(c) at least one conduit from said sterilizing medium generating and/or providing means connected to the inlet of said at least one fastening means;

(d) at least one conduit connected to the outlet of said at least one fastening means;

(e) a closing member in each of said conduits; and

(f) at least one means for the germproof closing of said at least two medical unit connections in the temporary pressure-tight coupled state.

5,147,614

SELF-CONTAINED TUBULAR CORONA CELL FOR GENERATING OZONE

Richard H. Conrad, 950 Idylberry Rd., San Rafael, Calif. 94903

Filed Apr. 27, 1990, Ser. No. 515,440

Int. Cl.[5] **B01J** *19/08, 19/12*

U.S. Cl. 422—186.18 **12 Claims**

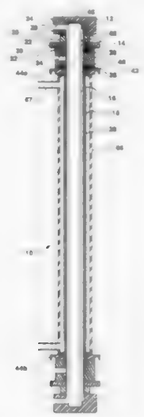
1. A self-contained tubular corona cell for generating ozone, said tubular corona cell comprising:

an inner tube member comprising a conductive electrode having an inside surface, an outside surface, a pair of ends, a longitudinal length, and a generally uniform outside diameter;

an outer tube member comprising a dielectric electrode having an inside surface an outside surface, and bearing a conductive layer over at least a portion of said outside surface, said outer tube member further having a pair of ends, a longitudinal length less than said inner tube member longitudinal length, an inside diameter greater than said inner tube member outside diameter, and an outside diameter;

a pair of support cylinders conditioned to position said outer tube member in concentric arrangement with said inner

tube member, one support cylinder carried proximate each end of said inner tube member, each of said support cylinders having a distal surface, a medial surface, and an inside bore; said inside bore including a first section having a diameter generally equal to said inner tube member outside diameter, said inside bore first section positioned proximate said support cylinder distal surface and including sealing means for sealing capture of said inner tube member outside surface; a second section having a diameter generally greater than said inner tube member outside diameter, said inside bore second section positioned between said support cylinder distal surface and said medial surface, said second section including port means for passage of a gas; and a third section having a diameter slightly greater than said outer tube member outside diameter, said inside bore third section positioned proximate said support cylinder medial surface and including sealing



means for sealing capture of said outer tube member outside surface, so that said first, second, and third sections of said inside bore support said outer tube member inside surface in alignment with said inner tube member outside surface to define an annular gap, said annular gap being in fluid communication with said support cylinder inside bore second section; and

clamping means for removably securing said support cylinders proximate said inner tube member ends, said clamping means comprising a clamping assembly mounted at said inner tube member ends adjacent said support cylinder distal surfaces, said clamping assembly comprising a collar member transversely clamped to said inner tube member, with said support cylinder inside bore first section sealing means comprising a seal member positioned adjacent said collar member, wherein said collar member is isolated from fluid communication with said annular gap and said support cylinder inside bore second section.

5,147,615

METHOD OF DISPENSING AND DISPENSER THEREFOR

K. J. H. Bird, Beeston; G. W. Crossdale, Swanwick, both of England, and J. W. Livingston, Santa Cruz, Calif., assignors to Diversey Corporation, Mississauga, Canada

Filed Jul. 20, 1988, Ser. No. 221,890

Claims priority, application United Kingdom, Jul. 23, 1987, 8717407

Int. Cl.[5] **B01F** *3/08*

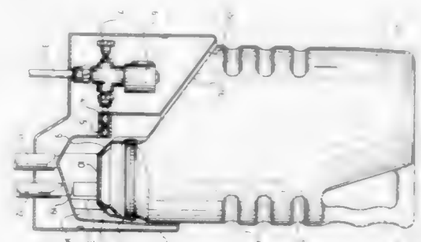
U.S. Cl. 422—261 **2 Claims**

1. A dispenser for receiving an dispensing granular detergent from a container, comprising:

(a) a support for supportably receiving an inverted container of granular detergent;

(b) a container for holding and dispensing granular detergent, having a head portion which is lowermost of said container as inverted and positioned in and extending vertically in said support, said head portion having an aperture formed therein which opens laterally of said head portion and extends transversely of said vertically extending container;

(c) means for injecting and directing a horizontal stream of water into said container to dissolve granular detergent in said head portion, said water injecting means extending through a portion of said support adjacent and spaced



apart from said container head portion aperture, whereby said water injecting means directs a horizontal stream of water into said aperture; and

(d) said container head portion having a bottom in which an outlet is provided, said outlet comprising a plurality of louvres traversing said outlet to define a mesh which substantially retains granular detergent in said container and which permits dissolved granular detergent to pass through said outlet;

wherein the support further comprises an overflow which is dimensioned such that the vertical distance between the water surface in the overflow and the water injection point is always at least 40 mm.

5,147,616

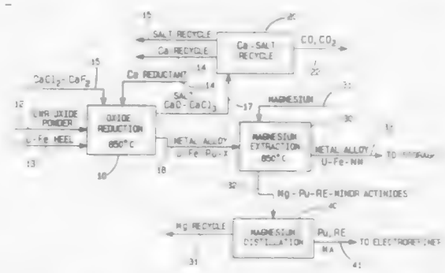
MAGNESIUM TRANSPORT EXTRACTION OF TRANSURANIUM ELEMENTS FROM LWR FUEL

John P. Ackerman, Downers Grove; James E. Battles, Oak Forest; Terry R. Johnson, Wheaton; William E. Miller, and R. Dean Pierce, both of Naperville, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 3, 1991, Ser. No. 770,387

Int. Cl.[5] **C22B** *60/02*

U.S. Cl. 423—5 **20 Claims**



16. A process of separating transuranium actinide values from uranium values present in spent nuclear oxide fuels containing rare earth and noble metal fission products as well as

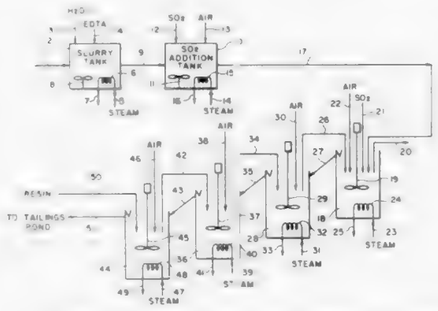
fission products of alkali metals alkaline earth metals and iodine, comprising reducing the oxide fuel with Ca metal in the presence of Ca halide containing predominantly $CaCl_2$ and a U-Fe alloy having not less than about 84% by weight uranium which is liquid at about 800° C. to dissolve uranium values and the noble metal fission products and transuranium actinide values and rare earth fission products leaving Ca halide having CaO and fission products of alkali metals and the alkaline earth metals and iodine dissolved therein, separating the Ca halide with the CaO and the fission products contained therein from the U-Fe alloy and the metal values dissolved therein and electrolytically contacting the calcium salts with a carbon electrode to reduce the CaO to Ca metal while converting the carbon electrode to CO and CO2 and thereafter recycling the Ca metal and Ca halide salt to reduce successive batches of spent nuclear oxide fuel, contacting the liquid U-Fe alloy having dissolved therein reduced metals from the spent nuclear fuel with liquid Mg metal to transfer transuranium actinide values and rare earth metals to the liquid Mg metal leaving the uranium and noble metal fission products in the U-Fe alloy, thereafter separating the liquid Mg and the metals dissolved therein from the U-Fe alloy and the metals dissolved therein, distilling the Mg from the transuranium actinide and rare earth metals, recontacting the U-Fe alloy with liquid Mg metal a sufficient number of times until not less than about 99% by weight of the transuranium actinide values have been removed from the U-Fe alloy, and thereafter contacting a portion of the U-Fe alloy with another batch of spent nuclear oxide fuel in the presence of Ca metal and Ca halide salt at a temperature not less than about 800° C.

5,147,617

PROCESS FOR RECOVERY OF GOLD FROM GOLD ORES USING A COMPLEXING PRETREATMENT AND SULFUROUS ACID LEACHING

Freddie J. Touro, and Tadeusz K. Wiewiorowski, both of New Orleans, La., assignors to Freeport-McMoRan Inc., New Orleans, La.

Filed May 21, 1991, Ser. No. 703,853
Int. Cl.[5] C01G *7/00;* **C22B** *3/06, 11/06*
U.S. Cl. 423—27 **52 Claims**



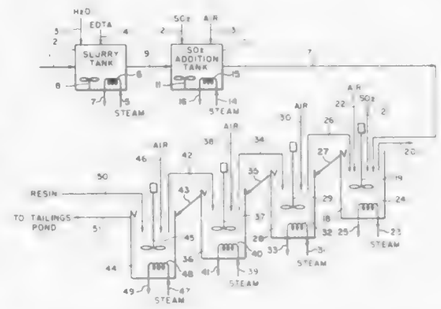
1. A process for leaching gold values from gold-containing ores comprising treating the ore with a gold oxidizing and complexing agent to form a gold complex and leaching said ore with sulfurous acid leaching agent to form a gold sulfite complex.

5,147,618

PROCESS FOR RECOVERY OF GOLD FROM REFRACTORY GOLD ORES USING SULFUROUS ACID AS THE LEACHING AGENT

Freddie J. Touro, and Tadeusz K. Wiewiorowski, both of New Orleans, La., assignors to Freeport-McMoRan Inc., New Orleans, La.

Filed May 21, 1991, Ser. No. 703,843
Int. Cl.[5] C01G *7/00;* **C22B** *3/06, 11/06*
U.S. Cl. 423—27 **52 Claims**



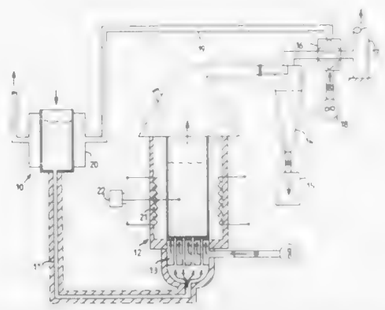
1. A method of leaching gold from gold-containing ore comprising leaching said ore with a sulfurous acid leaching agent to form a gold-sulfite complex.

5,147,619

NICKEL RECOVERY USING A FLUIDIZED BED PROCESS

Christopher J. Cutchey, Jutbury, and Trevor J. Keirle, Walsall, both of United Kingdom, assignors to Camlaw Limited, Tamworth, United Kingdom

Continuation of Ser. No. 138,456, Dec. 18, 1987, abandoned. This application Apr. 18, 1990, Ser. No. 512,540
Claims priority, application United Kingdom, Feb. 19, 1986, 86004080; PCT Int'l Appl., Feb. 19, 1987, PCT/GB87/00122
Int. Cl.[5] C22B *23/00;* **B01J** *38/30*
U.S. Cl. 423—148 **12 Claims**



11. A process for the recovery of nickel catalyst metal in the form of nickel oxide from a top portion of a fluidized bed, the process consisting essentially of the steps of:
providing a sludge material including spent catalyst comprising recoverable catalyst metal in the form of nickel particles which are finely divided, and organic material consisting essentially of fat, the organic material being combustible or otherwise degradable under conditions attainable by fluidized bed techniques;
feeding the sludge material into a base portion of a fluidized bed comprising a bed of inert carrier material;

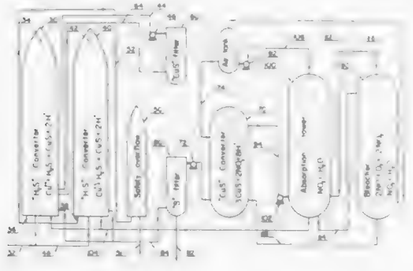
converting the organic material to waste gases in the fluidized bed;
oxidizing the particles of recoverable catalyst metal to particles of a recoverable metal oxide;
maintaining the fluidized bed under conditions which cause the particles of recoverable metal oxide to rise to a top portion of the fluidized bed, the recoverable metal oxide comprising particles having an average particle size of less than 50 microns;
removing the particles of recoverable metal oxide and the waste gases from the top portion of the fluidized bed; and
separating the particles of recoverable metal oxide from the waste gases.

5,147,620

PROCESS FOR THE PURIFICATION OF GASEOUS STREAMS

Istvan K. Rozsa, Mt. Clemens, Mich., assignor to Linko Enterprises, Inc., Mt. Clemens, Mich.

Filed Jun. 8, 1989, Ser. No. 363,631
Int. Cl.[5] C01B *17/16, 31/20, 17/02*
U.S. Cl. 423—224 **1 Claim**



1. A continuous process for removing hydrogen sulfide from a stream of sour natural gas, said method comprising:
forming an aqueous solution of Cu^{++} ions by combining solid copper with a nitric acid solution, said aqueous solution containing from about 10 to about 20 percent by weight Cu^{++} ions and said nitric acid solution having a nitric acid concentration of from about 45 to 65 percent by weight;
placing said Cu^{++} ion solution in a substantially gas-tight vessel having an outlet at its bottom and having a chamber adapted to receive a liquid and natural gas, said Cu^{++} ion solution partially filling said chamber and defining a gas space in said chamber, and said vessel being operated at a temperature of from about −10° to about 60° C., said chamber having a volume of about 400 to 1000 gallons;
said chamber having a circulation tube positioned therein for increasing mass transfer between said sour natural gas and said Cu^{++} ion solution and for preventing copper sulfide from clogging said bottom outlet, said circulation tube having a bore therethrough vertically disposed in said chamber and being spaced from the inner wall of said fist vessel such that an annulus is defined between said circulation tube and said inner wall of said first vessel, and wherein said aqueous solution of Cu^{++} ions in said chamber fills said bore and said annulus such that said circulation tube is completely immersed in said aqueous solution;
flowing from a wellhead as a pressurized gas stream of about 15 to about 3000 psia a sour natural gas feedstock stream containing hydrogen sulfide into at least one pipe having a first end disposed in said chamber inside the bore of said circulation tube, said first end having a diffuser attached thereto and spaced from the bottom end of said circulation tube, said diffuser being immersed in said Cu^{++} ion solution;
forming bubbles of said sour natural gas feedstock stream by flowing said sour natural gas stream into said Cu^{++} ion solution in said bore of said circulation tube such that hydrogen sulfide in said gas bubbles is contacted by said Cu^{++} ions forming a copper sulfide precipitate in said Cu^{++} solution and removing hydrogen sulfide from said sour natural gas stream, wherein the pressure within said vessel is maintained at between about 15 to about 400 psia; and
said gas bubbles moving upwardly through said bore of said circulation tube and then, while remaining in said Cu^{++} ion solution, at least some of said gas bubbles moving downwardly into said annulus and then again upwardly into said gas space in said first vessel;
collecting from said gas space said natural gas stream from which hydrogen sulfide has been removed, wherein the hydrogen sulfide content of said collected natural gas stream is less than about 1 ppm;
removing said copper sulfide from said Cu^{++} ion solution;
regenerating said Cu^{++} ion solution by treating said copper sulfide with a nitric acid solution containing approximately 45 to 65 percent by weight nitric acid in a second vessel into which an oxygen-containing gas is added, wherein said treatment liberates nitrogen dioxide and nitrogen oxide and forms elemental sulfur;
producing nitric acid by flowing said nitrogen dioxide through water and returning said nitric acid so produced to said second vessel; and
isolating said elemental sulfur.

5,147,621

METHOD FOR STABILIZING PHOSPHORUS TRICHLORIDE

Rudolf Schumann, Raguhn, Fed. Rep. of Germany, assignor to Chemie AG Bitterfeld-Wolfen, Bitterfeld, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,512
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—265 **20 Claims**

1. A method for stabilizing phosphorus trichloride, comprising adding to a composition consisting essentially of phosphorus trichloride a stabilizing agent selected from the group consisting of amines having at least two hydrocarbons linked to one nitrogen atom, salts of said amines, reaction products of said amines with phosphorus halides, and mixtures thereof.

5,147,622

METHOD FOR STABILIZING PHOSPHORUS TRICHLORIDE

Rudolf Schumann, Raguhn, Fed. Rep. of Germany, assignor to Chemie AG Bitterfeld-Wolfen, Bitterfeld, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,511
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—265 **14 Claims**

1. A method of stabilizing phosphorus trichloride, comprising adding at least one derivative of dithiocarbamic acids to a composition consisting essentially of phosphorus trichloride.

5,147,623

FABRICATION METHOD OF CUBIC BORON NITRIDE

Kwang Y. Eun, Seoul; Jong K. Park, Kyungki-Do, and Seung T. Park, Seoul, all of Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Mar. 28, 1991, Ser. No. 676,344
Claims priority, application Rep. of Korea, Sep. 13, 1990, 14472/1990
Int. Cl.[5] C01B *21/064*
U.S. Cl. 423—290 **3 Claims**

1. A process for preparing large granules of cubic boron nitride greater than 100 μm in diameter, which comprises providing hexagonal boron nitride in the presence of a binary

alloy of Al-Mg as a catalyst, at a temperature of about 1,450° C. to 1,650° C. and under a pressure of about 50Kbar to 60Kbar.

5,147,624

PRODUCTION PROCESS OF CHLORINE

Tadamitsu Kiyoura, Kawasaki; Masanobu Ajioka, Omuta; Naoshi Fujimoto, Omuta; Toshihide Suzuki, Omuta; Yasuo Kogure, Yokosuka; Tokio Nagayama, Yokohama, and Kazuo Kanaya, Kamakura, all of Japan assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 565,200 Aug. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 235,481, Aug. 24, 1988, abandoned, which is a division of Ser. No. 132,665, Dec. 10, 1987, Pat. No. 4,828,815, which is a continuation of Ser. No. 804,149, Dec. 3, 1985, abandoned. This application Sep. 16, 1991, Ser. No. 759,630

Claims priority, application Japan, Dec. 3, 1984, 59-254234; May 28, 1985, 60-113238; Nov. 14 1985, 60-253646

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[5] C01B *7/04*

U.S. Cl. 423—502 6 Claims

1. A process for producing chlorine by the oxidation of hydrogen chloride with an oxygen-containing gas, the process comprising:

(i) containing reactants consisting of hydrogen chloride and the oxygen-containing gas with a catalyst;

wherein a molar ration of oxygen of hydrogen chloride in the range of 0.2 to 1 is used;

wherein the hydrogen chloride and the oxygen-containing gas are contacted with the catalyst at an hourly space velocity of hydrogen chloride in the range of from 200 to 1,800 Nl/hr.KgCat and at a temperature of from 330° C. to 390° C. and at a pressure of from atmospheric pressure to 10 kg/cm^2 G;

wherein said catalyst is prepared from a chromium compound obtained by reaction of chromium chloride with ammonia in combination with a silicon compound, using Cr_2O_3/SiO_2 in weight ratio of from 30/70 to 95/5, and then calcination at a temperature of from 500° C. to 800° C.; and

(ii) obtaining chlorine in an amount of at least equivalent to 90% of equilibrium conversion, with an operating lifetime of 200 hours or more.

5,147,625

PROCESS FOR THE PREPARATION OF PHOSPHOROUS ACID

Alexander Tapper, Mönchengladbach; Horst Buhl, and Josef Holz, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

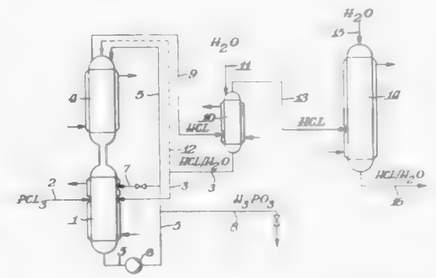
Filed Aug. 2, 1991, Ser. No. 739,873

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025937

Int. Cl.[5] C01B *25/16, 7/01*

U.S. Cl. 423—316 7 Claims

1. A continuous process for the preparation of a 60 to 110% by weight phosphorous acid, calculated as H_3PO_3 equivalent, with simultaneous production of a pure, 20.2 to 42% by weight hydrochloric acid, which comprises hydrolyzing phosphorus trichloride with aqueous hydrochloric acid in a reaction zone charged with the reaction products, which reaction zone is in open communication with a first scrubbing zone arranged on top of it, a portion of the reaction product being recycled from the bottom of the reaction zone into the top of the scrubbing zone, while phosphorus acid is removed from recirculation; bringing the hydrogen chloride gas escaping from the top of the first scrubbing zone into contact, in a cooled, second scrubbing zone, with an over-stoichiometric amount of water, calculated relative to the amount of phosphorus trichloride fed into the reaction zone, and, depending on the extent of external cooling of the second scrubbing zone to an internal temperature of 80 to 110° C., obtaining a 32 to 20.2% by weight hydrochloric acid, which is passed as starting material into the reaction zone or into the top of the first scrubbing zone, the temperature in the reaction zone being kept constant at a desired value from 90° to 130° C., without introducing any external cooling or heating energy, by controlling the external cooling of the



second scrubbing zone; and obtaining a pure, 20.2 to 42% by weight hydrochloric acid in an absorption zone with the addition of water from the excess hydrogen chloride gas newly formed in each reaction and escaping in undissolved form at the top of the second scrubbing zone together with excess water vapor.

5,147,626

SYNTHESIS OF CRYSTALLINE ALUMINOPHOSPHATE COMPOSITION

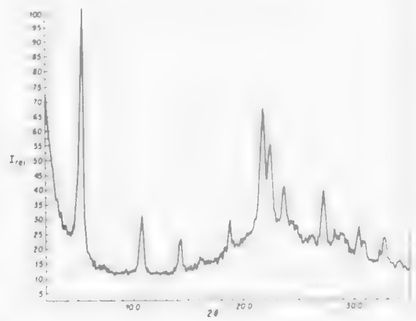
Clarence D. Chang, Princeton, and John D. Lutner, Hamilton Square, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 8, 1988, Ser. No. 179,173

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—328 17 Claims



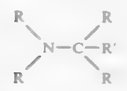
1. A method for synthesizing an aluminophosphate composition comprising crystals having a framework topology after heating at 110° C. or higher giving an X-ray diffraction pattern with lines shown in Table 1A of the specification, which comprises (i) preparing a mixture capable of forming said composition, said mixture comprising sources of an oxide of aluminum, an oxide of phosphorus, water and a directing agent (DA), and having a composition, in terms of mole ratios, within the following ranges:

P_2O_5/Al_2O_3	0.5 to 1.25
H_2O/Al_2O_3	10 to 100

-continued

DA/Al_2O_3	0.5 to 1.5

wherein DA is a compound of the formula:



wherein R is selected from the group consisting of —H, —CH_2X, —CH_2CH_2X and combinations thereof, R′ is selected from the group consisting —CH_2X, —CH_2CH_2X and combination thereof, and X is hydroxide, halide, amino or a combination thereof, (ii) maintaining said mixture under sufficient conditions including a temperature of from about 100° C. to less than about 150° C. until crystals of said composition are formed and (iii) recovering said crystalline aluminophosphate composition from step (ii) having the formula in terms of mole ratios $mDA:Al_2O_3:xP_2O_5:nH_2O$, wherein m is a number from about 0.5 to about 1.5, x is a number from about 0.5 to about 1.5, and n is a number from 0 to about 100.

5,147,627

SYNTHESIS OF CRYSTALLINE SILICOALUMINOPHOSPHATE COMPOSITION

Clarence D. Chang, Princeton, and John D. Lutner, Hamilton Square, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 8, 1988, Ser. No. 179,338

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

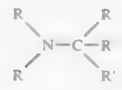
Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—328 20 Claims

1. A method for synthesizing a silicoaluminophosphate composition comprising crystals having a framework topology after heating at 110° C. or higher giving an X-ray diffraction pattern with lines shown in Table 1A of the specification, which comprises (i) preparing a mixture capable of forming said composition, said mixture comprising sources of an oxide of silicon, an oxide of aluminum, an oxide of phosphorus, water and a directing agent (DA), and having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3	0.01 to 0.5
P_2O_5/Al_2O_3	0.5 to 1.25
H_2O/Al_2O_3	10 to 100
DA/Al_2O_3	0.5 to 1.5

wherein DA is a compound of the formula:



wherein R is selected from the group consisting of —H, —$CH_2X[—CH_3X]$, —CH_2CH_2X and combinations thereof, R′ is selected from the group consisting —$CH_2X[—CH_3X]$, —CH_2CH_2X and combinations thereof, and X is hydroxide, halide, amino or a combination thereof, (ii) maintaining said mixture under sufficient conditions including a temperature of from about 100° C. to less than about 160° C. for a period of time of less than about 80 hours and (iii) recovering said silicoaluminophosphate composition from step (ii) having the formula in terms of mole ratios $mDA:Al_2O_3:xP_2O_5:ySiO_2:nH_2O$, wherein m is a number from about 0.5 to about 1.5, x is a number from about 0.5 to about 1.5, y is a number from 0.01 to about 0.5, and n is a number from 0 to about 100.

5,147,628

PROCESS FOR PRODUCING ALKYLTETRAHYDROANTHRAHYDROQUINONES AND WORKING SOLUTIONS CONTAINING THEM FOR PRODUCING HYDROGEN PEROXIDE BY THE ANTHRAQUINONE PROCESS

Dietolf Simon, and Otmar Woost, both of Bad Hoenningen, Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Apr. 24, 1991, Ser. No. 690,615

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1990, 4013090

Int. Cl.[5] C01B *15/023*

U.S. Cl. 423—588 14 Claims

1. A process for producing an alkyltetrahydroanthrahydroquinone product solution by heterogeneously catalyzed pressure hydrogenation of an alkylanthraquinone starting solution in a loop-type hydrogenation reactor equipped with an injector mixing nozzle, comprising hydrogenating a solution of alkylanthraquinone in a solvent system suitable for the production of hydrogen peroxide by the anthraquinone process in the presence of a suspension catalyst or a carrier suspension catalyst selected from the group consisting of nickel, platinum and rhodium at a temperature in the range from 50° to 75° C. and a pressure in the range from 800 to 1500 kPa, by continuously pumping the anthraquinone solution through the reactor loop while hydrogen gas is homogeneously introduced into the solution with intensive mixing through the injector mixing nozzle.

5,147,629

PROCESS FOR PRODUCTION OF NUCLEI FOR USE IN TITANIUM DIOXIDE MANUFACTURE

John Robb, Stockton on Tees, and Ian G. Dobson, Northallerton, both of England, assignors to Tioxide Group Services Limited, United Kingdom

Filed Aug. 12, 1991, Ser. No. 743,685

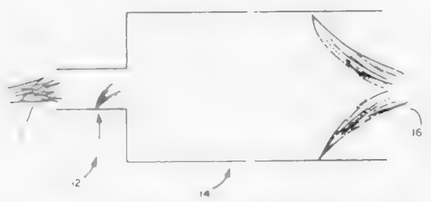
Claims priority, application United Kingdom, Aug. 16, 1990, 9018034

Int. Cl.[5] C01G *23/04*

U.S. Cl. 423—612 15 Claims

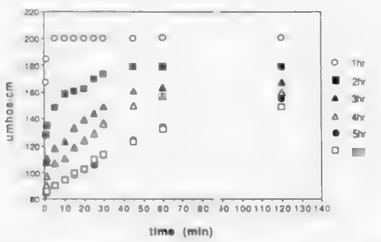
1. A process for the production of a nuclei suspension comprising forming an aqueous mixture of titanium tetrachloride, aluminium ions and hydroxyl ions, curing the mixture at a temperature in the range 50° C. to the boiling point of the mixture, cooling the mixture and, when the mixture has a pH value outside the range 6.5 to 10.5, adjusting the pH value to be within said range.

5,147,630
METHOD OF PRODUCING ALUMINA FOAMS
Steven R. Reznek, 20 Garden Rd., Wellesley, Mass. 02181, and Bruce E. MacKay, 1 Summer St., Framingham, Mass. 01701
Filed Jun. 5, 1989, Ser. No. 361,549
Int. Cl.[5] C01F *7/04*
U.S. Cl. 423—625 10 Claims



1. A method for producing alumina foam particles comprising:
a) atomizing a solution of aluminum sulfate to form droplets thereof;
b) heating the droplets of aluminum sulfate until the droplets of aluminum sulfate convert to foamed aluminum sulfate particles; and
c) heating the foamed aluminum sulfate particles until the foamed aluminum sulfate particles convert to foamed alumina particles.

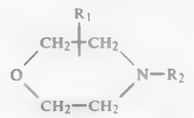
5,147,631
POROUS INORGANIC ULTRASOUND CONTRAST AGENTS
Joseph L. Glajch, Nashua, N.H.; Gary L. Loomis, Drexel Hill, Pa., and Walter Mahler, Wilmington, Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.
Filed Apr. 30, 1991, Ser. No. 693,476
Int. Cl.[5] A61K *49/00*; A61B *8/00*
U.S. Cl. 424—9 60 Claims



1. An ultrasound contrast agent comprising a pharmaceutically acceptable carrier and porous particles of an inorganic material containing an entrapped gas and having an average particle diameter of 0.01 to 500 microns, said inorganic material being selected from one or more of the group consisting of: monomeric or polymeric borates; monomeric or polymeric aluminas; monomeric or polymeric carbonates and bicarbonates; monomeric or polymeric silicas and silicates; monomeric or polymeric aluminosilicates; and monomeric or polymeric phosphates; and pharmaceutically acceptable organic or inorganic cationic salts thereof.

5,147,632
ANTI-PLAQUE COMPOSITIONS COMPRISING A COMBINATION OF MORPHOLINOAMINO ALCOHOL AND CHELATING AGENT
Pauline H. Pan, Morris Plains, and Linda D. Sturdivant, East Orange, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Oct. 31, 1990, Ser. No. 606,218
Int. Cl.[5] A61K *7/22, 9/68*
U.S. Cl. 424—54 12 Claims

1. A composition having synergistic anti-plaque or anti-gingivitis activity comprising in combination a synergistic pharmaceutically effective amount of a) a morpholinoamino alcohol or pharmaceutically - acceptable salt thereof, wherein said morpholinoamino alcohol has the chemical formula



wherein R_1 is a straight or branched alkyl group containing 8 to 16 carbon atoms at the 2- or 3-position of the morpholino ring, and R_2 is a straight or branched alkyl group containing 2 to 10 carbon atoms terminating with a hydroxy group and (b) a chelating agent, wherein the amount of said morpholinoamino alcohol or salt thereof ranges from about 0.005% to about 5% by weight, and the amount of said chelating agent ranges from about 0.03% to about 0.5% by weight based on total weight of said composition.

5,147,633
ALKYL SULPHATE SALTS
Hubert-Pierre-Eugene Ramakers, Angleur, Belgium, assignor to ICI Renory SA/NV, Seraing, Belgium
Filed Dec. 3, 1990, Ser. No. 620,940
Claims priority, application United Kingdom, Dec. 1, 1989, 8927213
Int. Cl.[5] A61K *7/16*
U.S. Cl. 424—56 11 Claims

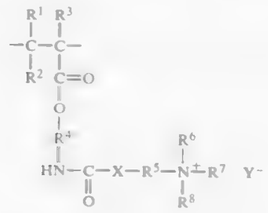
1. A free flowing particulate composition suitable for use as a toothpaste additive which comprises at least 85% by weight of an alkyl sulphate salt of which the alkyl group has 10 to 20 carbon atoms of which at least 15% of the alkyl groups are branched and which has a tendency to stickiness, and 1 to 10% by weight of a polyalkylene glycol which is solid at 20° C. and which functions to avoid the stickiness of said salt.

5,147,634
HEAT GENERATING PERMANENT WAVING COMPOSITION
Vikas M. Deshpande, Ringwood, N.J., and John M. Walts, Shohola, Pa., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 7, 1991, Ser. No. 651,869
Int. Cl.[5] A61K *7/07, 7/09*
U.S. Cl. 424—70 10 Claims

1. A heat generating hair permanent composition having a pH of about 6.8 to 10, contains no residual hydrogen peroxide and is the reaction product of a mixture of (a) about 6 to 10 parts of an aqueous hair reducing composition containing from 5 to 20 weight percent of a reducing agent selected from the group consisting of sulfites, bisulfites or a mixture of both and (b) with about 0.5 to 3 parts of an aqueous oxidizing solution which contains 1 to 6 weight percent hydrogen peroxide.

5,147,635
CONDITIONERS BASED ON CATIONIC POLYMERS
Janusz Jachowicz, Bethel, Conn., and Chittamura Ramireddy, Austin, Tex., assignors to Clairol Incorporated, New York, N.Y.
Division of Ser. No. 481,417, Feb. 16, 1990. This application Oct. 2, 1991, Ser. No. 770,195
Int. Cl.[5] A61K *7/075, 7/08*
U.S. Cl. 424—72 6 Claims

1. A composition for treating keratinaceous substrates which contains a cationic polymer comprising units of formula I:



(I)

wherein:
(a) R^1, R^2 and R^3 are each independently selected from the group consisting of H, halogen, alkyl, C_{1-6} alkoxy, C_{1-6} aminoalkyl, C_{1-6} haloalkyl, phenyl, C_{1-6} alkylphenyl, C_{1-6} alkoxyphenyl, halophenyl containing 1 to 5 halogen atoms, and aminophenyl containing 1 to 5 amino groups;
(b) R^4 and R^5 are each independently C_{1-20} alkylene linkages bearing from 0 to 10 halogen or C_{1-6} alkoxy substituents;
(c) Y is a halide ion or C_{1-6} alkyl sulfate ion;
in the presence of a non-polymeric surfactant selected from the group consisting of amphoteric surfactants, anionic surfactants and mixtures thereof.

5,147,636
MODULATION OF ANIMAL CELLULAR RESPONSES WITH COMPOSITIONS CONTAINING 8-SUBSTITUTED GUANINE DERIVATIVES AND INTERFERONS
Michael G. Goodman, Carlsbad, and William O. Weigle, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.
Division of Ser. No. 361,974, Jun. 6, 1989, Pat. No. 4,948,730, which is a division of Ser. No. 14,618, Feb. 13, 1987, Pat. No. 4,849,411, which is a continuation of Ser. No. 546,679, Nov. 1, 1983, Pat. No. 4,643,992, which is a continuation-in-part of Ser. No. 439,846, Nov. 9, 1982, Pat. No. 4,539,205. This application Aug. 2, 1990, Ser. No. 562,101
Int. Cl.[5] A61K *37/66*
U.S. Cl. 424—85.4 9 Claims

1. A method of inducing increased differentiative activity in B lymphocytes comprising contacting said B lymphocytes with a composition including as active ingredients (a) an effective amount of 8-substituted guanine derivative bonded 9-1' to an aldose having 5 or 6 carbon atoms in the aldose chain, said guanine derivative being free of electrically charged functionality, and said 8-substituent having an electron withdrawing effect greater than that of hydrogen and containing fewer than about 15 atoms, and (b) a second effective amount of interferon, said active ingredients being together in said composition with a diluent amount of a physiologically tolerable carrier.

5,147,637
METHOD OF INHIBITING THE INFLUX OF LEUKOCYTES INTO ORGANS DURING SEPSIS OR OTHER TRAUMA
Samuel D. Wright, and Elaine Tuomanen, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.
Continuation-in-part of Ser. No. 204,037, Jun. 7, 1988, abandoned. This application Mar. 31, 1989, Ser. No. 331,450
Int. Cl.[5] A61K *39/00, 35/14*; C12N *5/00*
U.S. Cl. 424—85.8 6 Claims

1. A method substantially reducing inflammation associated with the disease state of meningitis or encephalitis in a patient in need of such therapy wherein the patient is being administered an anti-infective agent which comprises the administering of a therapeutic amount of an anti-CD18 monoclonal antibody or active fragments thereof, in a pharmaceutically acceptable carrier, prior to, concurrent with, or after, the administration of the anti-infective agent, to said patient.

5,147,638
INHIBITION OF TUMOR GROWTH BY BLOCKADE OF THE PROTEIN C SYSTEM
Charles T. Esmon, and Philip C. Comp, both of Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.
Continuation-in-part of Ser. No. 292,447, Dec. 30, 1988, abandoned. This application Aug. 4, 1989, Ser. No. 389,617
Int. Cl.[5] A61K *37/00, 37/66, 39/00*
U.S. Cl. 424—85.8 29 Claims

12. A method for inhibition of tumor growth in a patient comprising: administering to a patient having a tumor a compound specifically blocking protein C, wherein the compound is not a cytokine, in a dosage blocking the Protein C anticoagulation system and facilitating hemorrhagic necrosis of microvasculated solid tumors.

5,147,639
TYPE-C ROTAVIRUS CULTURES AND USES THEREFOR
Mark W. Welter, Ubandale; David M. Chambers, and C. Joseph Welter, both of Des Moines, all of Iowa, assignors to Ambico, Inc., Dallas Center, Iowa
Filed Jun. 19, 1990, Ser. No. 540,672
Int. Cl.[5] A61K *39/12*
U.S. Cl. 424—89 19 Claims

1. A method for propagating a Group C rotavirus in cell culture which comprises passaging a Group C rotavirus in swine testicular cells capable of supporting the growth of the virus for at least five passages, said cells being provided with a medium which supports the growth of the cells and is further characterized as having a non-cytopathic amount of proteolytic enzymes which can exert a cytopathic effect on said rotavirus.

5,147,640
STRAINS OF *BACILLUS THURINGIENSIS* INSECTICIDAL COMPOSITIONS CONTAINING THE SAME
Ivan E. Gard, Jr., Holland, Pa.; Jose M. Gonzalez, Jr., West Trenton, N.J., and Dennis R. Ciarlante, Newtown, Pa., assignors to Ecogen Inc., Langhorne, Pa.
Filed Nov. 7, 1988, Ser. No. 268,307
Int. Cl.[5] A01N *63/00*; C12N *1/20*
U.S. Cl. 424—93 A 5 Claims

1. A biologically pure culture of *Bacillus thuringiensis* var. aizawai bacterium selected from strains HD-122A deposited with NRRL and assigned accession No. B-18406; HD-122B deposited with NRRL and assigned accession No. B-18407 and HD-122C deposited with NRRL and assigned accession No. B-18408.

5,147,641

MICROCAPSULE FOR THE REMOVAL OF SPECIFIC AMINO ACIDS THROUGH THE ENTERO-PORTAL RECIRCULATION

Thomas M. S. Chang, St-Lambert; Louis Bourget, Pierrefonds, and Colin Lister, Brossard, all of Canada, assignors to The Royal Institution for the Advancement of Learning (McGill University), Quebec, Canada

Continuation of Ser. No. 327,745, Mar. 23, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 719,110

Int. Cl.[5] A61K *3/48, 9/50*

U.S. Cl. 424—94.5 12 Claims

1. A method for decreasing the reabsorption of at least one undesirable endogenous amino acid selected from only the amino acids secreted directly into the intestinal tract from the enteroportal recirculation system of the human body, which comprises orally administering microcapsules consisting of an outer-layer membrane which is acid resistant and retains its structure in an alkaline environment, said membrane encapsulating at least one enzyme capable of degrading said undesirable amino acid present in the intestinal tract or derived from a protein or peptide secreted into the intestinal tract wherein said undesirable amino acid in the intestinal tract will diffuse into said microcapsules where said amino acid is subjected to a partial or complete degradation by the encapsulated enzyme and the degradation products are then secreted from said microcapsules into the intestinal tract and said microcapsules are naturally excreted from the intestinal tract.

5,147,642

USE OF BACTERIOLYTIC ENZYME PRODUCT AND PROTEASE AS ADDITIVE FOR IMPROVING FEED CONVERSION IN LIVESTOCK PRODUCTION

Andreas Lotz, Frankfurt am Main; Hans-Dieter Pries, Eching; Gerhard Wöhner, Wunstorf, and Stefan E. Scheuermann, Hünstetten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 5, 1989, Ser. No. 446,541

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841152

Int. Cl.[5] A61K *37/54*

U.S. Cl. 424—94.61 9 Claims

1. A method of improving feed conversion in livestock using the bacteriolytic enzyme product from Streptomyces ceolicolor DSM 3030 characterized as having a temperature optimum of 50° to 60° C. and the ability to lyse bacteria at a pH of 3.0 to 9.0, as well as mutants and variants thereof, comprising adding an effective amount of said product to animal feed.

5,147,643

DNA SEQUENCES ENCODING HUMAN T-PA SUBSTITUTED AT POSITION 275 OR AT POSITIONS 275 AND 277 AND PHARMACEUTICAL COMPOSITIONS

Herbert L. Heyneker, Hillsborough, and Gordon A. Vehar, San Carlos, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 522,480, May 11, 1990, Pat. No. 5,073,494, which is a continuation of Ser. No. 186,494, Apr. 26, 1988, abandoned, which is a continuation of Ser. No. 71,506, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 846,697, Apr. 1, 1986, abandoned, which is a continuation of Ser. No. 725,468, Apr. 22, 1985, abandoned. This application Aug. 5, 1991, Ser. No. 741,120

Int. Cl.[5] A61K *32/547;* C12P *21/02;* C12N *15/58, 9/48*

U.S. Cl. 424—94.64 16 Claims

1. An isolated DNA sequence encoding a human tissue plasminogen activator (t-PA) in which position 275 is substituted by an amino acid other than arginine.

3. A DNA sequence according to claim 1 wherein position 277 is substituted by an amino acid other than lysine.

13. A composition comprising a therapeutically effective amount of a human tissue plasminogen activator in which position 275 is substituted by an amino acid other than arginine in admixture with a pharmaceutically acceptable carrier.

16. A method of treating thrombotic conditions in a subject comprising administering to said subject the composition of claim 13.

5,147,644

USE OF MIXTURES OF POLYGLYCEROL FATTY ESTERS AS EMULSIFIERS IN COSMETIC AND PHARMACEUTICAL FORMULATIONS

Knut Oppenlaender, Ludwigshafen; Brigette Wegner, Speyer; Karl Stork, Carlsberg; Franz Frosch, Duerkheim, and Hans-Ulrich Wekel, Ellerstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 22, 1991, Ser. No. 659,254

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005819; Jul. 25, 1990, 4023593

Int. Cl.[5] A61K *7/48*

U.S. Cl. 424—401 8 Claims

1. A process for emulsifying immiscible phases in cosmetic and pharmaceutical formulations, wherein a mixture of polyglycerol fatty esters is used for this purpose, said mixture being obtainable by partial esterification of a polyglycerol mixture consisting of

from 0 to 5% by weight of monoglycerol,
from 15 to 40% by weight of diglycerol,
from 30 to 55% by weight of triglycerol,
from 10 to 25% by weight of tetraglycerol,
from 0 to 15% by weight of pentaglycerol,
from 0 to 10% by weight of hexaglycerol and
from 0 to 5% by weight of higher polyglycerols

with one or more saturated fatty acids of 12 to 22 carbon atoms or one or more unsaturated fatty acids of 16 to 22 carbon atoms, where the unsaturated fatty acid or fatty acid mixture used may furthermore contain up to 10% by weight of saturated fatty acids of 16 to 22 carbon atoms and the degree of esterification of the saturated or unsaturated fatty acids in the mixture is from 20 to 70%, as an emulsifier in cosmetic and pharmaceutical formulations.

5,147,645

PYRETHROIDS AND THEIR USE FOR CONTROLLING PESTS

Bernd Wolf, Mutterstadt; Hans Theobald, Limburgerhof; Winfried Zombik, Ilvesheim; Norbert Goetz, Worms; Jochen Wild, Deidesheim; Albrecht Harreus, Ludwigshafen; Peter Hofmeister, Neustadt; Christoph Kuenast, Ottenstadt, and Jacobus J. DeKramer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

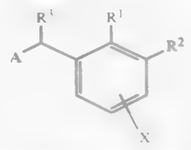
Continuation of Ser. No. 367,738, Jun. 19, 1989, abandoned. This application Oct. 1, 1990, Ser. No. 590,690

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820895

Int. Cl.[5] A01N *25/00*

U.S. Cl. 424—405 8 Claims

1. A benzyl ester of the formula



(I)

wherein R^1 is methyl, ethyl, halogen, methoxy or ethoxy; R^2 is straight-chain or branched C_1–C_{20}-alkyl, straight-chain or branched C_2–C_{20}-alkenyl, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkenyl, C_5–C_{12}-bicycloalkyl, C_5–C_{12}-bicycloalkenyl, C_1–C_5-alkyl-substituted C_3–C_8-cycloalkyl, C_1–C_5-alkyl-substituted C_3–C_8-cycloalkenyl, C_1–C_5-alkyl-substituted C_5–C_{12}-bicycloalkyl, or C_1–C_5-alkyl-substituted C_5–C_{12}-bicycloalkenyl; R^3 is hydrogen; A is the carboxylate radical of an acid selected from the group consisting of 3-(2', 2'-dimethylvinyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2', 2'-dichlorovinyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2'-chloro-3',3',3'-trifluoroprop-1'-enyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2',2'-dibromovinyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2',2'-difluorovinyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2'-fluoro-3',3',3'-trifluoroprop-1'-enyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2',2'-bistrifluoromethylvinyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 2-(4'-chlorophenyl)-3-methylbutyric acid, 2-(4'-fluorophenyl)-3-methylbutyric acid, 2-(4'-difluoromethoxyphenyl)-3-methylbutyric acid, 3-(4'-tert-butylphenyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 2,2,3,3-tertramethylcyclopropane-1-carboxylic acid, 1-(4'-chlorophenyl)-cyclopropane-1-carboxylic acid, 1-(4'-ethoxyphenyl)-2,2-dichlorocyclopropane-1-carboxylic acid, 3-[2'-(4''-chlorophenyl)-2'-chlorovinyl]-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(1',3-butadienyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(2'-methyl-2'-methoxycarbonylvinyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 2-(2'-chloro-4'-trifluoromethylphenylamino)-3-methylbutyric acid, 2-(2'-fluoro-4'-trifluoromethylphenylamino)-3-methylbutyric acid, 3-methyl-2-(4'-trifluoromethylphenylamino)butyric acid, 3-methyl-2-(pyrrol-1'-yl)-butyric acid, 3-methyl-2-(3'-methylpyrrol-1-yl)-butyric acid, 2-(3',4'-dimethylpyrrol-1'-yl)-3-methylbutyric acid, 2-(2'-5'-dimethylpyrrol-1'-yl)-3-methylbutyric acid, 2-(isoindolin-2-yl)-3-methylbutyric acid, 1,1-dimethyl-2,2[H]indenespirocyclopropane-3-carboxylic acid, 3-cyclopentylidenemethyl-2,2-dimethylcyclopropane-1-carboxylic acid, 3-(1',2'-dibromo-2',2'-dichloroethyl)-2,2-dimethylcyclopropane-1-carboxylic acid, 3methyl-2-(pyrazol-1'-yl)-butyric acid, and 3-methyl-2-(imidazol-1-yl)-butyric acid; and X is hydrogen or halogen; with the proviso that R^2 is not CH_2—CH=CH—B when B is hydrogen, alkyl or alkenyl and at the same time R^1 is methyl or halogen, and furthermore with the proviso that R^2 is not methyl when R^1 is methyl.

5,147,646

HYDROGEL CONTAINING ENVELOPES

Neil B. Graham, Glasgow, United Kingdom, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 229,725, Aug. 5, 1988, abandoned, which is a continuation of Ser. No. 818,076, Jan. 13, 1986, abandoned, which is a continuation of Ser. No. 585,541, Mar. 2, 1984, abandoned. This application Sep. 16, 1991, Ser. No. 759,623

Claims priority, application United Kingdom, Mar. 2, 1983, 8305797

Int. Cl.[5] A01J *21/00, 25/00;* A21C *3/00, 11/00*

U.S. Cl. 424—424 14 Claims

1. A method of treating animals which method comprises administering to the animal an envelope having flexible water-permeable or porous walls and a given maximum non-stretched internal volume and containing a quantity of particulate water-insoluble hydrogel and a veterinarily active ingredient in sustained release form in the closed envelope wherein the volume of the quantity of hydrogel when fully swollen at 20° C. amounts to at least 66% of the given maximum non-stretched internal volume but is insufficient when fully swollen at 20° C. to rupture the envelope.

5,147,647

OCULAR INSERT FOR THE FORNIX

Sohrab Darougar, 2 Digby Place, Croydon CR0 5QR, England

Continuation-in-part of Ser. No. 500,093, Mar. 21, 1990, which is a continuation of Ser. No. 330,959, Mar. 29, 1989, abandoned, which is a continuation of Ser. No. 104,045, Oct. 1, 1987, abandoned. This application Dec. 12, 1990, Ser. No. 626,001

Int. Cl.[5] A61F *9/00*

U.S. Cl. 424—427 9 Claims

1. A method for the controlled sustained release of an ophthalmic drug into the eye over a period of time which comprises:

(a) inserting an elongated cylindrical shaped device of a polymeric material in the form of a rod or tube containing an ophthalmic drug into the upper or lower fornix so as to anchor said device into position therein, wherein the length of the device is at least 8 mm and the diameter does not exceed 1.9 mm, wherein said device is sufficiently flexible to allow it to bend along the curvature of the eye within the upper or lower fornix upon being positioned so that the longitudinal axis of said device is generally parallel to the transverse diameter of the eyeball, said device being of a size and configuration such that, upon insertion into the upper or lower fornix, the device does not extend onto any visible portion of the eyeball, said device being independent of movement of the eye and remaining out of the field of vision so as to be well retained in place and imperceptible by a patient over a prolonged period of use; and

(b) allowing said device to remain in the upper or lower fornix for drug release during said period of time, whereby the device when inserted into the upper or lower fornix can be retained therein for more than seven days.

5,147,648

METHOD OF IMPROVING THE ADHESIVENESS OF GELS TO MUCOSAE

Christian Bannert, Miltenbergstrasse 17, D-8900 Augsburg, Fed. Rep. of Germany

Continuation of Ser. No. 272,801, filed as PCT/EP86/00750, Dec. 15, 1986. This application Sep. 17, 1990, Ser. No. 584–373

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1986, 3601132

Int. Cl.[5] A61K *9/12, 33/00*

U.S. Cl. 424—435 4 Claims

1. The method of treating xerostomia with a gel having an improved adhesiveness to the oral mucosa of a human patient, which comprises first applying to the oral mucosa of said patient an aqueous solution of a calcium salt which is capable of forming a gel with a polysaccharide, where the calcium salt solution has a concentration of 0.01 to 50 mMols of calcium per 100 ml, and subsequently applying to the thus treated oral mucosa of said patient an aqueous solution of a polysaccharide selected from the group consisting of sodium alginate and pectin, where said polysaccharide solution contains 0.01 to 12.5% by weight of polysaccharide.

5,147,649

Patent Not Issued For This Number

5,147,650

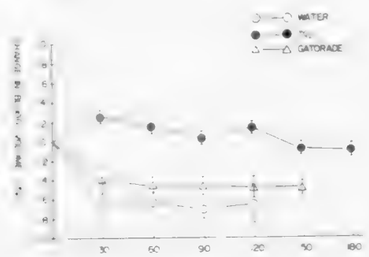
COMPOSITIONS AND METHODS FOR ACHIEVING IMPROVED PHYSIOLOGICAL RESPONSE TO EXERCISE

Melvin J. Fregly; R. Malcolm Private, and Robert Cade, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 378,582, Jul. 17, 1989, Pat. No. 4,981,687, which is a continuation-in-part of Ser. No. 226,027, Jul. 29, 1988, abandoned. This application Dec. 31, 1990, Ser. No. 636,329

Int. Cl.[5] A61K *47/00, 33/14, 31/70, 31/52*

U.S. Cl. 424—439 5 Claims



1. A fluid composition comprising:
(a) water;
(b) electrolytes;
(c) at least one sugar compound selected from the group consisting of glucose, fructose and sucrose;
(d) glycerol in a concentration of from about 0.5% to about 5.0%; and
(e) lactate.

5,147,65

HOOF PACK OF POLYOLEFIN FIBER AND PINE TAR

Don R. Hobson, R.D. No. 2, Box 6[illegible], Dunkirk, Ind. 47336, and Edwin L. Kinney, 1321 Windemere La., Tustin, Calif. 92680

Filed Apr. 23, 1990, Ser. No. 512,460

Int. Cl.[5] A61K *9/70, 33/18, 47/32;* A61L *15/42*

U.S. Cl. 424—443 20 Claims

1. A composition for treatment of hooves of horses which comprises:
a. a filler comprising fibers of a polyolefin selected from the group consisting of polypropylene and polyethylene having lengths from about 0.1 to about 2 inches in an amount from 5 to about 25 weight percent of the composition;
b. a carrier in an amount sufficient to enhance the penetration properties of the composition and from 55 to about 80 weight percent of the composition and comprising a mixture of from 65 to 80 weight percent of a hoof penetrant selected from the group consisting of pine tars and pitches and from 20 to 35 weight percent of an additive selected from the group consisting of vegetable oils and wax;
c. an oil-in-water emulsifier in an amount from 2 to about 10 weight percent of the composition; and
d. from 2 to about 10 weight percent starch.

5,147,65[illegible]

AUTOBIOTICS AND THEIR USE IN ELIMINATING NONSELF CELLS IN VIVO

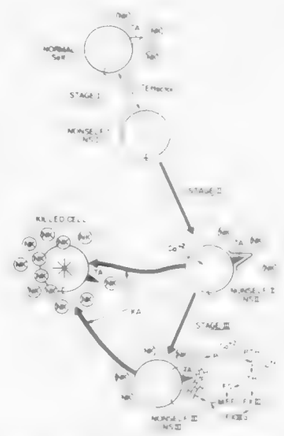
Laszlo G. Egyud, Woods Hole, Mass., assignor to Cell Research Corporation, Newton, Mass.

Filed Jul. 3, 1990, Ser. No. 547,983

Int. Cl.[5] A61K *37/22*

U.S. Cl. 424—450 5 Claims

1. A composition comprising an alpha-ketoaldehyde incapsulated in the lipid phase of a liposome, whereby its CO—CHO group extends outward from the exterior surface of the liposome, and a therapeutic compound encapsulated in the aqueous phase of the liposome.



5,147,653

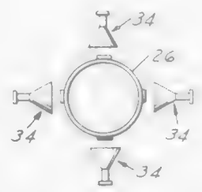
DIRECTED FIBER PREFORMING

Gullmar V. Nelson, Durham, N.H., assignor to Dadison Textron Inc., Dover, N.H.

Filed Nov. 15, 1991, Ser. No. 792,658

Int. Cl.[5] B28B *13/00*

U.S. Cl. 425—470 7 Claims



1. For use with a chopper/blower assembly and moving means therefor, a fiber placement control apparatus comprising a rigid fiber delivery tube communicating from the chopper/blower assembly to deliver a stream of fibers therethrough, a first set of circumferentially equally spaced nozzles positioned adjacent the exit end of the delivery tube for directing a binder into the stream of fibers, a preform screen, and a second set of circumferentially equally spaced nozzles positioned downstream of said first set of nozzles adapted to being selectively operated to direct air onto the stream of fibers to variably control the distribution pattern of the fibers onto the stationary preform screen.

5,147,654

ORAL OSMOTIC DEVICE FOR DELIVERING NICOTINE

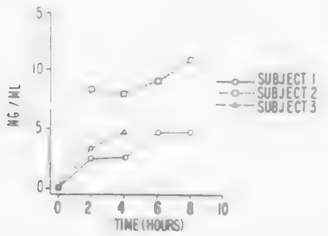
Virgil A. Place, Kawaihe, Hi.; Patrick S. L. Wong, Palo Alto, Calif.; Brian L. Barclay, and Jerry D. Childers, both of Sunnyvale, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 557,434, Jul. 23, 1990, abandoned. This application Nov. 15, 1991, Ser. No. 793,058

Int. Cl.[5] A61K *9/24*

U.S. Cl. 424—473 74 Claims

1. An osmotic device for the controlled systemic delivery of nicotine base through an oral mucosal membrane in an oral cavity over an extended delivery period, including: a semipermeable wall surrounding and forming a compartment containing a nicotine salt which is capable of reacting with an aqueous fluid to form nicotine base, the wall being formed of a material which is permeable to the passage of an aqueous fluid present in the oral cavity, and a passageway through the semipermeable wall for delivering the nicotine base formed in the compartment to the oral mucosal membrane, wherein the device when in operation in the oral cavity imbibes the aqueous fluid through the wall into the compartment, thereby initiating a chemical reaction between the nicotine salt and the aqueous fluid to produce nicotine base which is delivered from the compartment through the passageway and into the oral cavity over time.



5,147,655

ORAL COMPOSITION CONTAINING PARTICLES COMPRISING AN ACTIVE SUBSTANCE

Lars S. Ibsen, Frederiksberg, Denmark, assignor to A/S Alfred Benzon, Copenhagen, Denmark

Continuation of Ser. No. 166,638, Mar. 11, 1988, abandoned. This application May 21, 1990, Ser. No. 526,671

Claims priority, application Denmark, Mar. 13, 1987, 1302/87

Int. Cl.[5] A61K *9/14, 9/50*

U.S. Cl. 424—489 23 Claims

1. An oral composition in dry form adapted to be reconstituted in an aqueous carrier, the composition comprising a multiplicity of solid particles which have sizes and shapes such that they normally feel gritty and which remain solid after reconstitution with the aqueous carrier, the particles
a) containing at least one active substance selected from the group consisting of drugs, vitamins and nutrients; and
b) comprising a first viscosity-increasing agent which, upon reconstitution with the aqueous carrier, provides the surfaces of the particles with an aqueous masking surface layer of higher viscosity than the viscosity prevailing in the aqueous medium resulting from reconstitution with the aqueous carrier, the masking surface layer being in intimate contact with the surfaces of the solid particles and thereby reducing the grittiness of said particles and/or contributing to masking any unpleasant taste of the active substance, and said first viscosity-increasing agent being selected from the group consisting of:
i) at least one gelling or swelling agent,
ii) a substance having a redox potential such that, in the aqueous medium resulting from reconstitution with the aqueous carrier, it is oxidized or reduced,
iii) a substance which forms a salt or chelate with a gelling or swelling agent dispersed in said aqueous medium, and
iv) a surfactant which reduces the surface tension of the water in said aqueous medium;
the particles being admixed with at least one second viscosity-increasing agent which is different from the first viscosity-increasing agent and which, upon reconstitution with the aqueous carrier, imparts to the aqueous medium resulting from the reconstitution with the aqueous carrier a viscosity which is higher than the viscosity of the aqueous carrier for reducing the tendency of the particles to settle, to adhere to a container from which the reconstituted composition is administered, or to adhere to the oral mucosa.

5,147,656

APPARATUS FOR VULCANIZING ELASTOMER PRODUCT

Akinori Kubota, Kobe; Masaaki Ijiri, Aichi, and Michihito Kobayashi, Toyota, all of Japan, assignors to Sumitomo Rubber Industries Limited, Kobe, Japan

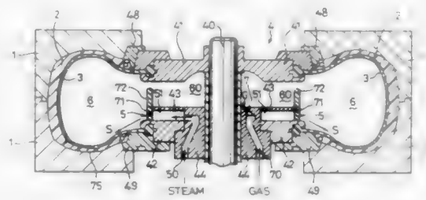
Continuation-in-part of Ser. No. 287,413, Dec. 20, 1988, Pat. No. 5,020,982, and a continuation-in-part of Ser. No. 614,429, Nov. 15, 1990. This application Mar. 6, 1991, Ser. No. 665,510

Claims priority, application Japan, Dec. 29, 1987, 62-334256; Jul. 19, 1988, 63-180798

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] B29C *35/04;* B29D *30/00*

U.S. Cl. 425—42 12 Claims



1. An apparatus for vulcanizing an elastomeric product comprising mold means in which said elastomeric product to be vulcanized is disposed, said product having a central axis which is vertically disposed such that upper and lower interior portions of said product overlie one another, a piston gland means having first supply passage means for supplying a heating medium, junction chamber means defining an annular junction chamber, said first supply passage means communicating with the interior of said junction chamber, said junction chamber means having an outer wall which separates said junction chamber from the interior of said product, first nozzle means in said outer wall directing heating medium from said junction chamber into the interior of said product in a downward direction toward said lower portion of said product, enclosure means defining an enclosure overlying said junction chamber, said piston gland means having a second supply passage means for supplying a pressurizing medium, said second supply passage means having second nozzle means disposed to discharge said pressurizing medium radially outwardly and axially upwardly at an acute angle relative to said central axis such that said pressure medium passes into said enclosure means, said enclosure means having a top wall and a bottom wall, said bottom wall having an outer peripheral end spaced from said top wall to thereby define a passage between said outer peripheral end and said top wall of said enclosure means such that pressurizing medium passes from said enclosure to the interior of said product through said passage.

5,147,657

RETRACTABLE PIN FOR AN INJECTION MOLD

John Giza, 10 Morningside Ave., Acushnet, Mass. 02743

Continuation of Ser. No. 584,292, Sep. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 429,522, Oct. 31, 1989, Pat. No. 4,959,000. This application Apr. 22, 1991, Ser. No. 689,118

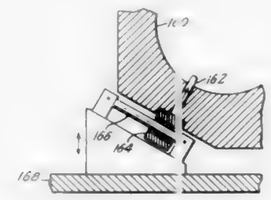
Int. Cl.[5] B29C *45/36, 41/34*

U.S. Cl. 425—117 14 Claims

1. A retractable pin for an injection mold comprising:
(a) a retractable pin having one end positioned inside a mold cavity and retractable from inside said mold cavity and

another end outside said mold cavity, said pin being oriented in a non-vertical plane;

(b) a frictionless bushing means affixed to the other end of said retractable pin and slidable along a shaft, said shaft



being perpendicular to the retractable pin and said shaft and said bushing means being coaxial; and

(c) means for moving said shaft so as to move the retractable pin.

5,147,658

APPARATUS FOR CONTINUOUS MANUFACTURING OF INJECTION MOLDED ARTICLES

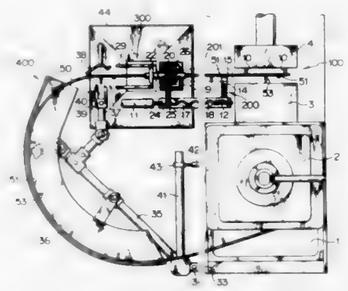
Yasuhiro Furukawa, and Kihei Takahashi, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 510,855, Apr. 18, 1990, abandoned. This application May 1, 1991, Ser. No. 694,071

Claims priority, application Japan, Apr. 20, 1989, 1-101394

Int. Cl.[5] B29C *45/40*

U.S. Cl. 425—127 6 Claims



1. An apparatus of continuous manufacturing of injection molded articles, said apparatus having an injection molding unit which is provided with a storage for molten material and which carries out injection molding of a piece containing a continuous runner-strip to be molded in a runner and a number of said articles attached to said runner-strip, a separating unit which separates said molded piece into said runner-strip and said articles automatically and collecting units which are placed separately, said apparatus comprising:

(a) a stationary mold and a movable mold forming said injection molding unit, said molds forming a pattern for molding a pulled-out and engaged portion of said runner-strip at a certain part of said runner, said injection molding unit having an opening formed by at least one side face of at least one of said stationary mold and said movable mold, wherein said stationary mold is provided with a pin which is urged resiliently toward said opening;

(b) a pulling-out unit for said molded piece which has an engaging means for engaging with said pulled-out and engaged portion of said runner-strip only in one direction and which has a reciprocating member moving backward and forward with a predetermined stroke in extending direction of said runner-strip while a backward end of said runner-strip is left in said opening so that said piece is molded to a proceeding piece and a following piece;

(c) said separating unit for said runner-strip and said articles having a shock means for giving a shock to said articles attached to said runner-strip by an operation interlocked with operation of said engaging means; and

(d) said collecting units connected to said separating unit having collecting means so as to sort and collect said articles and said runner-strip respectively.

5,147,659

NOZZLE TOUCH APPARATUS IN AN INJECTION MOLDING MACHINE

Kikuo Watanabe, Oshino; Masaki Muranaka, Shibuya, and Masayuki Iwatsuki, Kofu, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

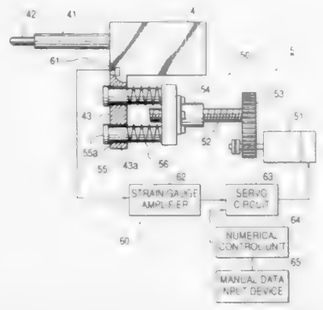
PCT No. PCT/JP89/00771, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO90/01404, PCT Pub. Date Feb. 22, 1990

PCT Filed Jul. 27, 1989, Ser. No. 465,270

Claims priority, application Japan, Aug. 5, 1988, 63-194585

Int. Cl.[5] B29C *45/80*

U.S. Cl. 425—145 13 Claims



1. A nozzle touch apparatus for use in an injection molding machine, the injection molding machine having a mold clamping unit and an injection unit arranged to be movable toward and away from the mold clamping unit, the nozzle touch apparatus comprising:

a transfer section having a servomotor serving as a driving source, and means for generating a nozzle touch force and for moving the injection unit toward and away from the mold clamping unit;

means for detecting an actual nozzle touch force;

means for variably setting a predetermined nozzle touch force; and

control means coupled to the detection means and the setting means for controlling drive of the servomotor in accordance with a deviation between the actual nozzle touch force and the predetermined nozzle touch force.

5,147,660

DEVICE FOR FILLING MOLDS WITH A CASTING RESIN AND THE LIKE

Hans-Joachim Steindorf, Sinn, Fed. Rep. of Germany, assignor to Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG, Ehringshausen-Katzenfurt, Fed. Rep. of Germany

Filed Apr. 22, 1991, Ser. No. 689,344

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1990, 9013922[U]; Oct. 13, 1990, 9014257[U]

Int. Cl.[5] B29C *31/04, 45/18*

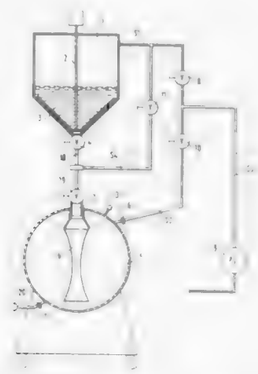
U.S. Cl. 425—148 9 Claims

1. A device for filling molds with a casting resin, comprising:

a hollow and closed pressure box having connection means on an exterior thereof for selectively pressurizing an interior thereof with positive and negative pressures;

a tubular casting container having an elastically expandable and contractible wall oriented in said interior of said pressure box, said casting container having means defining a fill and discharge opening thereon for facilitating a filling and emptying of said casting container and rendering said fill and discharge opening accessible at the exterior of said pressure box while simultaneously maintaining the closed and pressurizable characteristic of said pressure box;

emptying means for selectively connecting said fill and discharge opening on said casting container to an inlet to the mold;



fill means for selectively connecting said fill and discharge opening on said casting container to a storage container for the casting resin; and

a vacuum source and connection means for selectively connecting said vacuum source to (1) an interior of said storage container for degassing the casting resin and (2) said interior of said pressure box when said fill and discharge opening is connected to said fill means so that as the casting resin enters said casting container, the wall thereof will expand, a releasing of the vacuum in said interior of said pressure box being required in order to facilitate an emptying of said casting container when said casting container is connected to said emptying means.

5,147,661

MOLD ALIGNING DEVICE FOR A COMPRESSION MOLDING MACHINE

Masanobu Kurumaji; Naoki Takeuchi, both of Kobe; Tutomu Sano, Toyonaka; Kazuyuki Kajiyama, Akashi; Hiroaki Kondo, and Etujiro Imanishi, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 409,298, Sep. 19, 1989, abandoned, which is a continuation of Ser. No. 289,037, Dec. 23, 1988, abandoned. This application Jan. 29, 1991, Ser. No. 648,316

Claims priority, application Japan, Dec. 26, 1987, 62-198653[U]; Apr. 7, 1988, 63-86791

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] B30B *15/02, 15/16*

U.S. Cl. 425—150 8 Claims

1. A compression molding machine comprising:

(a) a bed;

(b) a plurality of uprights projecting upwardly from said bed;

(c) a crown block mounted on said plurality of uprights;

(d) a slide block guided for vertical sliding movement on said plurality of uprights;

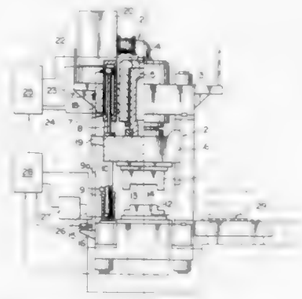
(e) a main cylinder actuator mounted on said crown block and having a piston rod joined to said slide block;

(f) an upper mold detachably attached to the lower surface of said slide block;

(g) a lower mold detachably attached to the upper surface of said bed;

(h) a plurality of mold position adjusting cylinder actuators, each one of said plurality of mold position adjusting cylinder actuators comprising a cylinder and a piston rod projecting vertically from said cylinder;

(i) a plurality of jacks means mounted to one of said bed and said slide block, each one of said plurality of jacks comprising a rod member operatively connected to an associated one of said plurality of mold position adjusting cylinder actuators such that said jacks and mold position adjusting cylinder actuators are operative to provide mold position adjustment;



(j) actuating means for actuating said plurality of jacks means, said actuating means comprising a driving motor having an output shaft;

(k) a detector for detecting a stroke or position of said rod member;

(l) a central processing unit operatively connected to said detector and to said actuating means; and

(m) a terminal for controlling said central processing unit.

5,147,662

TWISTED WIRE MANUFACTURING APPARATUS AND CONCENTRIC TWISTED WIRE MANUFACTURING MACHINE

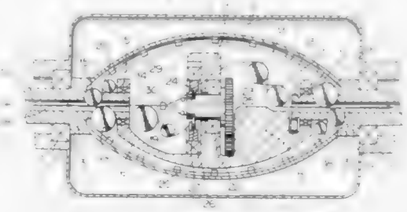
Tamotsu Nishijima, and Toshihiro Fujino, both of Numazu, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 519,517, May 4, 1990. This application Jul. 8, 1991, Ser. No. 727,809

Claims priority, application Japan, May 8, 1989, 1-113687; Aug. 1, 1989, 1-198014

Int. Cl.[5] B29C *53/14*

U.S. Cl. 425—500 1 Claim



1. A twisted wire manufacturing apparatus in which a cradle is supported by bearings on a pair of axially aligned rotating shafts and a main body of a wire twisting machine is mounted on said cradle, an improvement in which a raw material guide and a twisted wire guide are suspended with respect to said

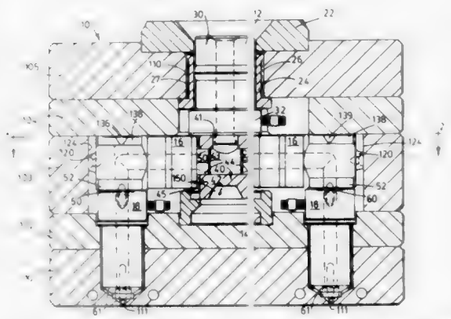
pair of rotating shafts, said shafts each having an axial insertion hole therein, a capstan and a twisted wire take-up machine mounted on said cradle, means for directing raw wire inserted into one of said rotating shafts is guided from said raw material guide to said main body of said wire twisting machine through said capstan, and means for directing twisted wire from said twisted wire guide inserted into the other of said rotating shafts through said twisted wire take-up machine and fed out of said apparatus.

5,147,663

MODULAR MANIFOLD ASSEMBLY

Panos Trakas, 1820 Amelia La., Addison, Ill. 60101

Filed Oct. 9, 1990, Ser. No. 595,180
Int. Cl.[5] B29C *45/22*
U.S. Cl. 425—549 40 Claims



1. An injection molding manifold assembly for heating and conveying liquid melt injected from an injection molding machine into one or more mold cavity gates wherein the manifold assembly provides a heated pathway between the injection molding machine and the one or more cavity gates, the manifold assembly comprising:

a primary heated member, one or more secondary heated members corresponding in number to said one or more mold cavity gates, the primary heated member having a body with a heated internal melt passageway disposed between an inlet end and an outlet end of the body, the inlet end being adapted to engage the injection molding machine and the outlet end engaging means for distributing the injected melt to a plurality of manifold components, each individual manifold component of the plurality of manifold components having an elongated body with a heated internal melt passageway disposed between an inlet end and an outlet end of each said manifold component, each said manifold component inlet end being adapted to engage the melt distribution means and each said manifold outlet end being adapted to engage a respective secondary heated member, each respective secondary heated member having a body extending between an inlet end and an outlet end of said body, the secondary heated member inlet end being adapted to engage said outlet end of a manifold component and the secondary heated member outlet end being adapted to engage a gate of a mold cavity, the elongated body of each said manifold component of said plurality of manifold components having an internal melt passageway generally centrally disposed therein, each manifold component internal melt passageway being adapted to receive pressurized melt at said inlet end thereof and being adapted to discharge said pressurized melt at said outlet end thereof, elongated internal heating means disposed in an elongated annular compartment of each of said manifold components and disposed proximate to said manifold component internal melt passageway, the internal heating means extending substantially along the length of said internal melt passageway and substantially surrounding said internal melt passageway, each of said manifold components having an inner core wall which defines each manifold component internal melt passageway and a manifold component outer wall which defines the outer surface of said manifold component body member, said manifold component inner core and said manifold outer wall defining said annular compartment therebetween, each of said component inner core walls and outer walls being integrally joined together at a manifold component endwall.

5,147,664

PROCESS FOR PREPARING AN AQUEOUS SOLUTION OF AN ALKALI METAL SALT OF METHIONINE

Claude Gillonnier, Neris-les-Bains, and René Moisson, Montlucon, both of France, assignors to A.E.C. Societe de Chimie Organique et Biologique, France

Continuation of Ser. No. 545,757, Jun. 29, 1990, abandoned, which is a continuation of Ser. No. 251,846, Oct. 3, 1988, abandoned, which is a division of Ser. No. 936,393, Dec. 1, 1986, abandoned. This application Dec. 16, 1991, Ser. No. 807,664
Claims priority, application France, Dec. 3, 1985, 85 17847
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—2 1 Claim

1. Method of supplying livestock with their dietary requirements of methionine which consists essentially of feeding to said livestock an amount effective to provide said dietary requirements of a stable solution of sodium methioninate free from inorganic salts and having a methionine content of 30 to 60% obtained by hydrolysing 4-methylmercapto-2-aminobutyramide with sodium hydroxide and removing the ammonia formed to produce a solution of sodium methioninate useful as such for directly feeding livestock.

5,147,665

PROCESS FOR IMPROVING THE SHELF LIFE OF BAKED GOODS

Susan Furcsik, Lake Station, Ind., assignor to American Maize-Products Company, Stamford, Conn.

Filed Mar. 28, 1991, Ser. No. 676,870
Int. Cl.[5] A21D *8/02, 13/06;* A23L *1/0522*
U.S. Cl. 426—19 19 Claims

1. In a baked good prepared from a batter comprising base flour component, water and a leavening agent, the improvement comprising adding an effective amount of a duwx starch, the amount being effective to improve the shelf life and resilience of the baked good.

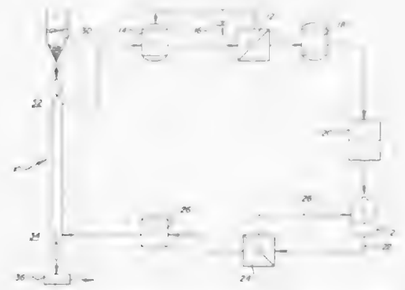
5,147,666

REMOVAL OF MALIC ACID FROM COFFEE BY FERMENTATION

Barbara B. Doonan, Mt. Vernon; Geoffrey H. Bertkau; Dennis F. Hayes, both of Brewster; Frank Sabella, Brooklyn, all of N.Y., and Ronald H. Skiff, Whippany, N.J., assignors to Kraft General Foods, Inc., Northfield, Ill.

Continuation-in-part of Ser. No. 625,514, Dec. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 348,627, May 8, 1989, Pat. No. 4,976,983. This application Mar. 6, 1991, Ser. No. 665,124
The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.
Int. Cl.[5] A23F *5/00;* A23L *1/36*
U.S. Cl. 426—45 22 Claims

1. A process for removing malic acid from a coffee product comprising subjecting a malic acid-containing aqueous coffee extract to malolactic fermentation, and recovering a malic acid-lean aqueous coffee extract having a reduced malic acid content.



5,147,667

BEEF FLAVOR

Steven S. Kwon, New Milford, Conn.; Michael A. Marsico, Bronxville, N.Y., and Dharam V. Vadehra, New Milford, Conn., assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 26, 1991, Ser. No. 675,435
Int. Cl.[5] A23L *1/231*
U.S. Cl. 426—56 12 Claims

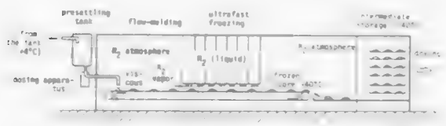
1. A process for enhancing the flavor of a beef juice comprising adding a protease and a culture of lactobacilli to a concentrated beef juice and heating the concentrate containing the protease and lactobacilli culture at a temperature of from 50° C. to 60° C. for obtaining a hydrolysed flavor enhanced concentrate.

5,147,668

PROCESS OF PRODUCING A RECONSTITUTABLE SOLID LACTIC ACID DRIED PRODUCT

Werner G. Munk, Bergstr. 12,, D-7981 Vogt/Ravensburg, Fed. Rep. of Germany

Continuation of Ser. No. 234,256, Aug. 19, 1988, abandoned. This application Sep. 5, 1990, Ser. No. 577,793
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727946
Int. Cl.[5] A23C *9/12;* A23B *7/024*
U.S. Cl. 426—61 8 Claims



1. A process for the production of a solid, dried product for direct consumption which is reconstitutable by saliva and storable at room temperature, consisting essentially of milk or a milk product, carbohydrates, lactic acid bacteria in an amount of at least about 10^8/g of the dried product and lactulose in an amount below about 0.5% by weight based upon the weight of the dried product, said product containing an outer portion comprising a fine-pore structure for protecting the lactic acid bacteria contained within the product such that lactic acid bacteria within the product remains viable for a prolonged period of storage, comprising the steps of:

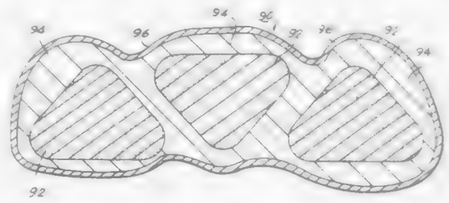
(a) preparing an aqueous basic mixture of milk or milk product and carbohydrates,
(b) homogenizing the mixture,
(c) heating the mixture,
(d) cooling the mixture,
(e) inoculating the mixture with lactic acid bacteria,
(f) incubating the mixture in the presence of an inert gas atmosphere,
(g) flow-molding the mixture to produce a flow-molded product,
(h) ultrafast freezing the flow-molded product in the presence of an inert gas atmosphere,
(i) collecting the frozen product in the presence of an inert gas atmosphere,
(j) freeze-drying the frozen product in the presence of an inert gas atmosphere, and
(k) packing the dried product in a gas and aroma tight packaging in the presence of an inert gas atmosphere.

5,147,669

EDIBLE COOKIE BITS PRODUCTS

William G. Crothers, Princeton, N.J., assignor to Deer Park Baking Company, Hammonton, N.J.

Continuation of Ser. No. 356,643, May 22, 1989, abandoned, which is a continuation of Ser. No. 74,318, Jul. 10, 1987, abandoned, which is a continuation of Ser. No. 464,595, Feb. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 228,292, Jan. 26, 1981, Pat. No. 4,381,697, which is a continuation-in-part of Ser. No. 240,895, Mar. 5, 1981, Pat. No. 4,397,881, which is a continuation-in-part of Ser. No. 31,402, Apr. 19, 1979, Pat. No. 4,397,880. This application Apr. 24, 1991, Ser. No. 691,171
The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.
Int. Cl.[5] A21D *13/08;* A23G *9/02*
U.S. Cl. 426—94 16 Claims

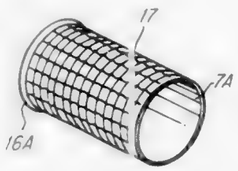


1. An edible article of manufacture for ingestion, said edible article comprising an edible cookie bit defined by a mixture of flour, sugar and shortening an baked into a predetermined size and into a predetermined shape, said edible cookie, after baking, having a predetermined structural characteristic, said predetermined size defined by the number of individual edible cookie bits in a pound of said edible cookie bits, said predetermined size in the range of 500 edible cookie bits per pound to about 3000 edible cookie bits per pound, said edible cookie bit having a surface defining said predetermined shape, said surface having a characteristic for absorbing an edible foodstuff into at least a portion of said surface while retaining said predetermined shape, said predetermined structural characteristic defined by the ability of said edible cookie bit for absorbing the foodstuff and retaining the structural integrity of said edible cookie bit, said edible foodstuff for coating said surface without compromising said predetermined shape but covering said edible cookie bit so that said surface is not visible in the finished edible article of manufacture.

5,147,670
EDIBLE FAT-BASED FILMS
Deryck J. Cebula, Eaton Sogon, and John P. Pierce, Rushden Northants, both of Great Britain, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Jul. 25, 1990, Ser. No. 557,345
Claims priority, application European Pat. Off., Jul. 25, 1989, 89201945.6; Jun. 21, 1990, 90201644.4
Int. Cl.[5] A23D 9/00; A23P 1/08
U.S. Cl. 426—98 8 Claims

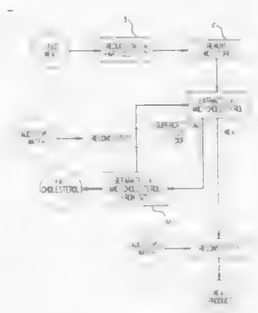
1. A composite food product comprising two or more fat based components physically separated by an edible fat diffusion-retarding film based on fat which comprises 50 to 100% by weight of a blend of one or more polyol fatty acid polyesters.

5,147,671
COLLAGEN WRAPTED MEAT PRODUCTS
Bruno Winkler, Weinheim-Oberflockenbach, Fed. Rep. of Germany, assignor to Naturin-Werk Becker & Co., Weinheim/-Bergstrasse, Fed. Rep. of Germany
Division of Ser. No. 428,360, Oct. 27, 1989, Pat. No. 4,958,477, which is a division of Ser. No. 63,715, Jun. 15, 1987, Pat. No. 4,910,034, which is a continuation of Ser. No. 770,412, Aug. 28, 1985, abandoned. This application Aug. 17, 1990, Ser. No. 568,823
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431521
Int. Cl.[5] A22C 1/31
U.S. Cl. 426—140 1 Claim



1. A meat product including at least one individual chunk of meat heat treated in a compact form in an inner collagen form and an outer mesh netting; said product being prepared by a process comprising the steps of:
simultaneously wrapping and covering said meat with both a thin and fragile edible inner collagen film having a thickness in a range of from 8 μm to 40 μm and a width in a range of 12 cm to 65 cm and an outer netting such that said edible inner collagen film is in surface contact with the meat product as a casing and as a separating medium to hinder adhesion of the outer netting to said meat product, and said netting completely encloses both said meat product and said inner collagen film;
said outer netting having a mesh width in the range of from 5 mm to 15 mm with elastic fibers aligned in a lateral direction and non-elastic fibers aligned in an axial direction, said outer netting primarily having an object of holding together the meat product;
thereupon heat treating said meat as well as the edible inner collagen film and outer netting collectively to avoid any problem of sticking of the netting to the meat and preclude damage to said edible inner collagen film, said edible collagen film being insoluble in water so that said heat treating makes it possible to provide a compact, ready-to-eat meat product with flawless, intact outer surfacing; and
finally removing the outer netting to obtain a visually pleasing meat product absent any damage thereto and to preclude any appearance of unappetizing meat portions.

5,147,672
REMOVAL OF LIPID COMPONENTS FROM FOODSTUFFS
Corran N. S. McLachlan, Auckland, New Zealand; Owen J. Catchpole, Birmingham, England, and Ross S. Nicol, Victoria, Australia, assignors to Corran Norman Stuart McLachlan, Auckland, New Zealand
Continuation-in-part of Ser. No. 434,818, Nov. 13, 1989, Pat. No. 5,026,565, which is a continuation-in-part of Ser. No. 314,216, Feb. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 269,760, Nov. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 144,384, Jan. 26, 1988, abandoned. This application Mar. 14, 1991, Ser. No. 669,264
Claims priority, application New Zealand, Aug. 19, 1987, 221503
Int. Cl.[5] A23L 1/31, 1/325; C11B 3/00
U.S. Cl. 426—241 13 Claims

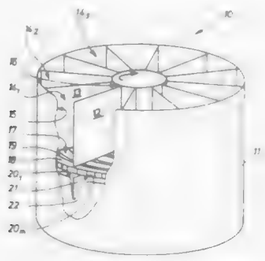


1. A method of removing sterols and/or lipids from proteinaceous foods comprising the steps of:
(a) drying a proteinaceous food of the group consisting of meat, poultry and fish to remove all or substantially all of the "free water" and optionally some but not all of the "bound water" therefrom to produce an intermediate moisture containing proteinaceous food product containing not less than about 25 percent of water by weight of such proteinaceous food product;
(b) removing some of the sterols and/or lipids from such intermediate moisture containing proteinaceous food product using a sub or supercritical physiologically acceptable gas; and
(c) adding a solution comprising water to the intermediate moisture containing proteinaceous food product to form a low cholesterol reconstituted proteinaceous food product.

5,147,673
COLORANT BASED ON CARMINIC ACID, METHOD OF PREPARATION, AND METHOD OF COLORING A FOODSTUFF
Jose Schul, Miraflores Av. Pardo 257 N' 1601, Lima, Peru
Filed Aug. 16, 1989, Ser. No. 394,572
Int. Cl.[5] A23L 1/27
U.S. Cl. 426—250 25 Claims

1. A red colorant composition comprising the reaction product of carminic acid, an organic acid and a nitrogenous base, reacted to produce a colorant which is substantially stable against color changes when exposed to acidic media having a pH of about 1.74 or higher, said colorant having absorption wavelength peaks at about 567 and 538 nanometers when placed in a solution at a pH of about 9.5 and having absorption wavelength peaks at about 562, 560 and 529 nanometers when placed in a solution at a pH of about 1.74.

5,147,674
METHOD FOR CONTINUOUSLY DECAFFEINATING RAW COFFEE
Hermann Schweinfurth, Bremen, Fed. Rep. of Germany, assignor to Jacobs Suchard AG, Fed. Rep. of Germany
Continuation of Ser. No. 260,077, Oct. 20, 1988, Pat. No. 4,922,812. This application Apr. 3, 1990, Ser. No. 503,686
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735636
Int. Cl.[5] A23F 5/16
U.S. Cl. 426—427 15 Claims



13. A method of using a device for decaffeinating raw coffee, said device including a rotary extractor having at least one extractor cell positioned above a plurality of adjacently arranged extractor receiving chambers, said at least one extractor cell having a bottom, an outer wall and two side walls that converge towards one another at an angle of at least 20° to thereby define a wedge-shaped cell, the method comprising the steps of:
feeding raw coffee into the at least one wedge-shaped extractor cell when the at least one extractor cell is positioned in alignment with a first extractor receiving chamber;
preswelling the raw coffee in the at least one wedge-shaped extractor cell for a predetermined period of time by spraying the raw coffee with a fluid for preswelling; and
extracting caffeine from the coffee that has been preswollen by successively moving the at least one wedge-shaped extractor cell into alignment with adjacently positioned individual extractor receiving chambers and wetting the coffee in the at least one wedge-shaped extractor cell that has been preswollen with a fluid for extracting caffeine.

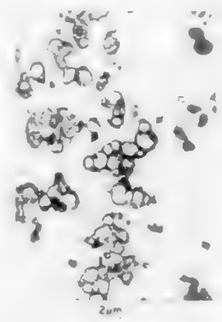
5,147,675
PROCESS FOR MAKING EXTRUSION COOKED SNACK CHIPS
Dennis R. Gage, Cincinnati; Richard W. Lodge, Mt. Healthy; Stephen R. Cammarn, Cincinnati, and Vincent Y. Wong, Westchester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 356,818, May 24, 1989, which is a division of Ser. No. 38,400, Apr. 15, 1987, abandoned. This application Sep. 18, 1991, Ser. No. 762,042
Int. Cl.[5] A23L 1/10
U.S. Cl. 426—549 12 Claims

1. A process for producing an extrusion-cooked snack chip comprising:
a) comminuting a cereal material which has not been steeped or pre-cooked prior to comminution;
b) adding the comminuted particles of said cereal material, having only its natural moisture content to a cooking extruder;
c) extrusion-cooking said cereal material in said cooking extruder at an exit pressure of from about 500 to about 1400 pounds per square inch with added water into a plasticized mass which is a dough comprising from about 70% to about 85% by weight cereal material and from about 15% to about 30% by weight water, said plasticized mass dough having a degree of starch gelatinization of at least about 60%;
d) forming said plasticized mass dough into a sheet;
e) cutting said sheet into individual pieces; and
f) frying said individual pieces into the final snack chip.

5,147,676
BLENDS OF NON-LAURIC COATING FATS AND LIQUID, TRANS-HARDENED HIGH STABILITY OILS WITH HIGH RANCIMAT INDUCTION PERIOD VALUES AND COATINGS AND FOOD PRODUCTS OBTAINED THEREFROM
Geoffrey Talbot, Kempston, Great Britain, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands
Filed Jun. 14, 1991, Ser. No. 714,897
Claims priority, application European Pat. Off., Jun. 14, 1990, 90306472.3
Int. Cl.[5] A23D 9/02
U.S. Cl. 426—601 15 Claims

1. A blend of
(I) non-lauric coating fats comprising a mid-fraction of the wet fractionation of fat mixtures containing hardened soybean oil and
(II) liquid, trans-hardened high-stability oils comprising the olein-fraction of the wet fractionation of mixtures containing soybean oil, wherein the weight ratio of I:II ranges from 90:10 to 70:30 and wherein the Rancimat Induction Period value of the blend is more than calculated from the Rancimat Induction Period values of the individual components of the blend.

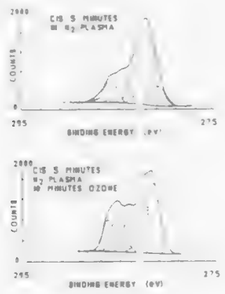
5,147,677
PROCESS FOR PRODUCING MICROPARTICULATED PROTEIN AND THE PRODUCT THEREOF
Gregory R. Ziegler, State College, Pa., assignor to The Pennsylvania Research Corporation, University Park, Pa.
Filed Aug. 21, 1990, Ser. No. 570,582
Int. Cl.[5] A23L 1/32, 1/307
U.S. Cl. 426—614 12 Claims



1. A microparticle which comprises egg white proteins;
the microparticle having a particle size of from about 0.5 to 3.0 μm; the microparticle having a dense outer coat consisting essentially of the egg white proteins; the microparticle having an interior region therein which is less dense than the outer coat of the microparticle; and the interior

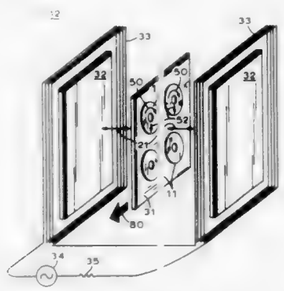
region of the microparticle containing therein a volume which is devoid of the egg white proteins.

5,147,671
MODIFICATION OF POLYMER SURFACES BY TWO-STEP REACTIONS
Renate Foerch; Duncan H. Hunter; N. Stewart McIntyre, all of London, and Rana N. S. Sodhi, Toronto, all of Canada, assignors to The University of Western Ontario, London, Canada
Filed Dec. 22, 1989, Ser. No. 456,119
Claims priority, application Canada, Dec. 22, 1988, 586755
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—40 14 Claims



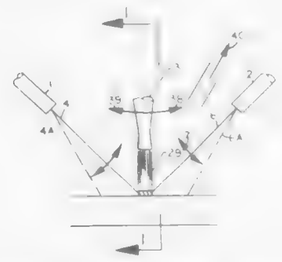
1. A method of modifying the surface characteristics of a polymer, comprising the steps of:
exposing said polymer to a plasma in a low pressure stream of nitrogen atoms in a primary reaction chamber;
transferring said polymer from said primary reaction chamber to a secondary reaction site; and
exposing said polymer to a secondary treatment at said secondary reaction site, wherein said secondary treatment is selected from the group consisting of remote plasma treatment, corona discharge treatment or ozone treatment.

5,147,679
METHOD FOR PROVIDING UNIAXIAL ANISOTROPY IN MAGNETIC RECORDING DISKS
Michael L. Mallary, Berlin, Mass.; Kazuo Ishibashi, Matsudo, and Hiroshi Sato, Yokohama, both of Japan, assignors to Digital Equipment Corp., Maynard, Mass.
Filed Dec. 26, 1990, Ser. No. 629,191
Claims priority, application Japan, Dec. 27, 1989, 1-339705
Int. Cl.[5] B05D 3/14
U.S. Cl. 427—48 20 Claims



1. A method for manufacturing a magnetic recording disk, comprising:
forming on a conductive substrate a coating of a soft magnetic material, and
during said forming of said coating, exposing said conductive substrate to an alternating magnetic field, said alternating magnetic field being oriented in a direction perpendicular to the surface of said substrate.

5,147,680
LASER ASSISTED MASKING PROCESS
Paul Slysh, P.O. Box 711401, San Diego, Calif. 92171
Filed Nov. 13, 1990, Ser. No. 612,870
Int. Cl.[5] B05D 3/06, 5/00, 1/02; B23K 26/00
U.S. Cl. 427—53.1 16 Claims

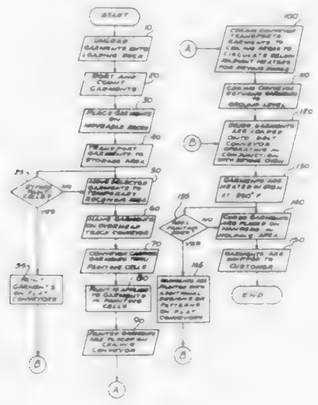


11. The method of applying maskant to selected areas of a workpiece which comprises the steps of:
directing a stream of material capable of forming a maskant coating on a workpiece surface toward said surface in a selected linear pattern; and
simultaneously scanning laser beams along both edges of said selected linear pattern adjacent to said maskant stream to disintegrate maskant material extending beyond said edge of said selected pattern; and
directing a flow of inert gas past said surface during maskant material deposition to remove disintegration products;
whereby maskant material deposited on said workpiece surface beyond said edge and airborne maskant material drifting beyond said edge is disintegrated and precise maskant edges result.

5,147,681
METHOD OF PAINTING AND PRINTING GARMENTS AND FABRIC
Dennis J. Maroney, Studio City, Calif., assignor to L.A. Air Line, Inc., Vernon, Calif.
Filed Apr. 13, 1990, Ser. No. 509,164
Int. Cl.[5] B05D 3/02, 3/06, 5/00
U.S. Cl. 427—56.1 5 Claims

1. In an enclosed structure, a method for applying paints and pigments to the surface of garment fabric and curing and drying the paints and pigments thereon, which comprises:
(a) Loading garments on a means to transport said garments to a first storage area;
(b) Sorting and counting said garments;
(c) Transporting said garments to said first storage area;
(d) Transporting said garments from said first storage area to a first painting area containing a first conveyer from which said garments are individually hanged and secured;
(e) Applying paints or pigments to said garments as they move within the first painting area along the first conveyer using one or more applicator means so that the paints or pigments initially lay on the surface of the garment fabric;
(f) Transferring said garments from the first conveyor to a second conveyor which transports said garments to the ceiling area of said enclosed structure to permit said garments to circulate through the heated air beneath a series of radiant tube-type heaters to enable the paint or pigments thereon to be slowly absorbed into the fabric and have sufficient time to dry;

(g) Placing said garment on a belt conveyer to subject the applied paints or pigments thereon to intense heat inside a dryer to enable the paints or pigments to cure; and,



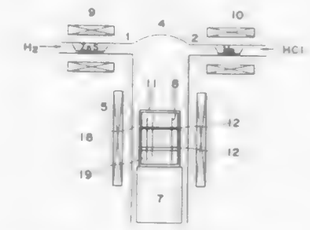
(h) Transporting the dried garments from the belt conveyer to a second storage area for eventual shipment.

5,147,682
METHOD FOR ORIENTING A LIQUID CRYSTAL POLYMER
Yasuyuki Takiguchi; Shigeki Iida, both of Kawasaki, and Takehiro Toyooka, Yokohama, all of Japan, assignors to Ricoh Company, Ltd. and Nippon Oil Company, Limited, both of Tokyo, Japan
Filed Jun. 4, 1990, Ser. No. 532,682
Claims priority, application Japan, Jun. 6, 1989, 1-143595
Int. Cl.[5] B05D 5/12
U.S. Cl. 427—58 13 Claims

1. A method of orienting a liquid crystal polymer, which comprises:
a) rubbing a plastic substrate in one direction by directly using a rubbing member,
b) coating and drying a solution of a polymeric compound having a thermotropic liquid crystal property on the surface of the plastic substrate, and
c) a subjecting the coated plastic substrate to a heat-treatment at a temperature whereby the liquid crystal polymer exhibits a liquid crystal phase.

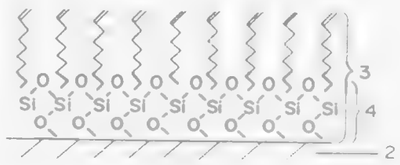
5,147,683
PROCESS FOR PREPARING A THIN FILM ELECTROLUMINESCENT DEVICE
Koichi Tanaka, Nara; Akiyoshi Mikami, Yamatotakada; Kouji Taniguchi, Nara; Katsushi Okibayashi, Sakurai; Kousuke Terada; Takuo Yamashita, both of Tenri; Takashi Ogura, Nara; Hiroaki Nakaya, Tenri; Masaru Yoshida, and Shigeo Nakajima, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jan. 8, 1991, Ser. No. 638,841
Claims priority, application Japan, Jan. 9, 1990, 2-3190
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—69 6 Claims

1. A process for preparing a thin film electroluminescent device comprising forming a luminescent layer on a substrate by a reduced-pressure chemical vapor deposition method wherein a source material gas is introduced into a reaction chamber, and wherein
said reaction chamber includes a screening means which screens said source material gas flow in said chamber to form a first area in which said gas is flowing and a second area in which said gas substantially does not flow,
said screening means has apertures for connecting said first area and second area, and



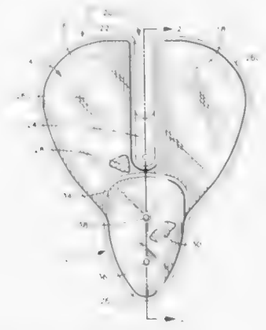
said substrate is placed in said second area, to which the source material is supplied by means of gas diffusion.

5,147,684
FORMING METHOD OF MAGNETIC RECORDING MEDIUM PROTECTIVE FILM
Hideharu Tamura, Katano, and Kazufumi Ogawa, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 574,378, Aug. 28, 1990, abandoned, which is a continuation of Ser. No. 303,657, Jan. 30, 1989, abandoned. This application Sep. 30, 1991, Ser. No. 768,468
Claims priority, application Japan, Jan. 29, 1988, 63-20491
Int. Cl.[5] B05D 5/12
U.S. Cl. 427—131 2 Claims



1. A method of forming a protective film on a magnetic recording medium, consisting essentially of the steps of:
preliminary forming a metal oxide film on a surface of a magnetic recording layer formed on a magnetic disc substrate, said metal oxide film comprised of a member selected from the group consisting of molybdenum oxide, titanium oxide, and tungsten oxide, and
forming a chemically adsorbed monomolecular film on said metal oxide film by immersing said magnetic disc substrate in a nonaqueous solvent solution containing a silane surface-active agent having a chloro-silyl group and a hydrocarbon chain, wherein the film is composed of the silane surface-active agents and wherein all of the silane surface-active agents composing the film are bonded covalently to the metal oxide film in an aligned monomolecular layer.

5,147,685
PADDING DEVICE
Chris A. Hanson, Boulder, Colo., assignor to Alden Laboratories, Inc., Boulder, Colo.
Division of Ser. No. 573,365, Aug. 27, 1990, Pat. No. 5,058,291, which is a division of Ser. No. 257,955, Oct. 14, 1988, Pat. No. 4,952,439. This application Feb. 19, 1991, Ser. No. 657,489
Int. Cl.[5] B32B *3/18*; B62J *1/20, 1/26*
U.S. Cl. 428—189 2 Claims

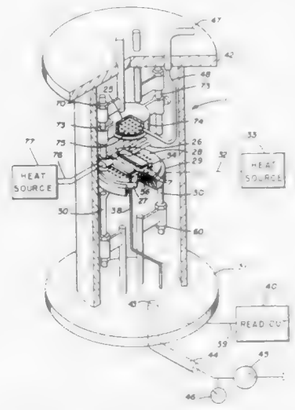


1. A padding device comprising:
(1) a bicycle seat cover;
(2) a low compression set foam located within said cover and having an ASTM constant deflection compression set for a 50% deflection, of greater than 10%, expressed as a percentage of original thickness, and
(3) flowable material located at selected positions within said cover and overlapping at least portions of said low compression set foam, wherein said flowable material is resistant to flow in response to instantaneously applied pressure and flows in response to continuously applied pressure, said flowable material being further characterized in that it is capable of deforming into an irregular shape in response to said continuously applied pressure and is capable of substantially retaining said irregular shape after all applied pressure is removed.

5,147,686
METHOD OF MAKING TITANIUM OXIDE POWDER HAVING ANTIMICROBIAL METAL SUPPORTED THEREON
Kenichi Ichimura, Moriyama; Hajime Murakami; Nobutoshi Yamada, Otsu, and Sadanori Mizukoshi, Moriyama, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan
Division of Ser. No. 323,874, Mar. 15, 1989, abandoned. This application Jan. 9, 1991, Ser. No. 639,183
Claims priority, application Japan, Mar. 17, 1988, 63-64392; Mar. 17, 1988, 63-64393
Int. Cl.[5] B05D *7/24*
U.S. Cl. 427—217 1 Claim

1. A method for producing antimicrobial powders, which comprises compression mixing at least one antimicrobial metal selected from the group consisting of copper, zinc and alloys thereof with hydrous titanium oxide or titanium oxide particles to support the antimicrobial metal on the surface of the particles.

5,147,687
HOT FILAMENT CVD OF THICK, ADHERENT AND COHERENT POLYCRYSTALLINE DIAMOND FILMS
Diwakar Garg; Sui-Yuan Lynn, both of Macungie; Robert L. Iampietro, Emmaus; Ernest L. Wrecsics, Bethlehem, and Paul N. Dyer, Allentown, all of Pa., assignors to Diamonex, Inc., Allentown, Pa.
Division of Ser. No. 582,517, Sep. 13, 1990, abandoned. This application May 22, 1991, Ser. No. 707,984
Int. Cl.[5] C23C *16/26*
U.S. Cl. 427—249 28 Claims



1. A chemical vapor deposition method for fabricating a coated substrate product comprising:
placing a parent substrate comprising a material selected from the group consisting of a single crystal, polycrystalline materials, metal, metal alloy, mixture of metals, ceramic materials and mixtures thereof into a hot filament chemical vapor deposition reactor;
chemical vapor depositing at least four separate polycrystalline diamond layers onto said parent substrate in the presence of a hot filament during at least two sets of two cycles in which at least 25° C. deposition temperature difference exists between each of the cycles, with the length of time of each cycle being at least three hours; and
recovering a substrate coated with a thickness of said polycrystalline diamond layers of at least 12 μm and exhibiting uniform microstructure and a high electrical resistivity.

5,147,688
MOCVD OF INDIUM OXIDE AND INDIUM/TIN OXIDE FILMS ON SUBSTRATES
Andreas A. Melas, Burlington, Mass., assignor to CVD, Inc., Woburn, Mass.
Division of Ser. No. 514,055, Apr. 24, 1990, abandoned. This application Jan. 11, 1991, Ser. No. 639,374
Int. Cl.[5] C23C *16/18, 16/40*
U.S. Cl. 427—255.3 14 Claims

1. The process of depositing an oxide coating containing indium on a substrate comprising:
(A) transporting, in an inert carrier gas, vapors of an indium alkyl etherate having a melting point of less than 100 degrees Celsius and a vapor pressure of at least 1 torr at a temperature in the range of from minus 20 degrees to 100 degrees Celsius and which is a liquid at room temperature and ambient atmospheric pressure;
(B) heating said substrate to a temperature of from about 200 to 800 degrees Celsius; and
(C) contacting said heated substrate in an oxidizing atmosphere with vapors from said indium alkyl etherate to form said oxide coating containing indium on said substrate.

5,147,689
METHOD FOR FORMING A COATING FILM WITH A RELIEF PATTERN
Hiroshi Igarashi, Nishinomiya; Osamu Terao, Taishibashi; Nobuhide Tsutsumi, and Yukio Yamamoto, both of Neyagawa, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka and Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, both of, Japan
Filed Feb. 22, 1991, Ser. No. 658,865
Claims priority, application Japan, Feb. 22, 1990, 2-41553
Int. Cl.[5] B05D *3/02, 5/00*
U.S. Cl. 427—264 10 Claims

1. A method for forming a coating film with a relief pattern, which comprises coating an undercoating material on a substrate surface to form a cured undercoating film, coating an intermediate coating material partly on the undercoating film in a desired pattern, drying it to such an extent that the amount of the solvent in the formed intermediate coating film is within a range of from 1 to 50% by weight, then overcoating a top coating material comprising, as binders, a polyester resin and an aminoplast resin cross-linking agent having a surface tension of at least 40 dyn/cm over the entire surface, followed by baking and curing to form a top coating film with said relief pattern.

5,147,690
PROCESS AND APPARATUS FOR DRYING A LIQUID FILM APPLIED TO A MOVING SUBSTRATE
Horst Faust; Guenter Hultzsch, both of Wiesbaden, and Reinhard Nies, Hamburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Aug. 22, 1990, Ser. No. 570,848
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927627
Int. Cl.[5] B05D *3/02*; F26B *13/00*
U.S. Cl. 427—372.2 21 Claims

18. A process for drying, by means of a heated drying gas, a liquid film which is applied to a moving substrate and includes vaporizable solvent components and solid components, comprising the steps of
(a) suspending the moving substrate on a carrying cushion of the heated drying gas which flows against the underside of the moving substrate,
(b) vaporizing a substantial portion of the solvent components via the contact between the heated drying gas and the underside of the moving substrate and
(c) removing the vaporized solvent components from the upper side of the liquid film by passing a supply gas through an upper gas system comprising a first porous plate, flowing the supply gas along the upper side of the liquid film at a differential speed between the moving substrate and the supply gas of less than about 0.25 m/s, such that the supply gas becomes enriched with the vaporized solvent components, and exhausting the solvent-enriched gas via a second porous plate.

5,147,691
METHOD OF PRODUCING COVER-PACKING ASSEMBLY FOR HARD DISK DEVICE
Noboru Shimamoto; Tooru Takamura, and Ryuichi Handa, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jul. 2, 1990, Ser. No. 546,764
Claims priority, application Japan, Jul. 3, 1989, 1-171510
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—387 8 Claims

1. A method of producing a cover-packing assembly for a hard disk device which comprises applying a liquid self-adhesive silicone rubber material to a predetermined position of a cover member for the hard disk device, curing the liquid self-adhesive silicone rubber material to form a cured silicone rubber material, and subsequently mating the cured silicone rubber material and the cover member to a base, wherein said cover-packing assembly consists of said cover member and a packing adhered to said cover member wherein said packing is made of said cured silicone rubber material.

5,147,692
ELECTROLESS PLATING OF NICKEL ONTO SURFACES SUCH AS COPPER OR FUSED TUNGSTON
Jon E. Bengston, Newington, Conn., assignor to MacDermid, Incorporated, Waterbury, Conn.
Continuation of Ser. No. 520,635, May 8, 1990, abandoned. This application Apr. 23, 1991, Ser. No. 689,666
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—438 18 Claims

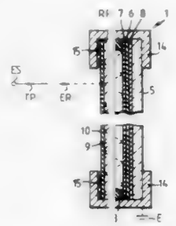
1. A process for selectively providing an electroless plating comprised of nickel over a conductive surface area of a substrate containing both a conductive surface area and a non-conductive surface area, said process consisting essentially of:
(a) providing a substrate containing both a conductive surface area and non-conductive surface area;
(b) non-selectively contacting said conductive surface area and said non-conductive surface area of said substrate with a composition comprising particulate zinc metal suspended in a carrier liquid, whereby said particulate zinc metal is thereby caused to be present on said conductive surface area and said non-conductive surface area of said substrate; and
(c) non-selectively contacting said conductive surface area and said non-conductive surface area of said substrate, having said particulate zinc metal thereon, with an electroless nickel plating bath, whereby electroless deposition of a plating comprised of nickel selectively occurs over said conductive surface area of said substrate and not over said non-conductive area of said substrate.

5,147,693
BIOLOGICALLY STABLE, UNTANNED WET ANIMAL HIDES
Jean-Pierre Communal, La Varenne Saint Hilaire, and Gerard Gavend, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Jul. 30, 1990, Ser. No. 559,337
Claims priority, application France, Jul. 28, 1989, 89 10193
Int. Cl.[5] B37B *3/00*
U.S. Cl. 428—22 3 Claims

1. A biologically stable, fungistatic and bacteriostatic, untanned wet animal hide, having a shrinkage temperature of about 64° to 68° C., and intrinsically insensitive to mildews, said wet animal hide being devoid of coloration and chromium values and comprising from 50% to 70% by weight of water, from 50% to 30% by weight of total inorganic matter relative to the dry and degreased leather, from 0.5 to 1.5% by weight of Al_2O_3 relative to the dry and degreased leather, and from

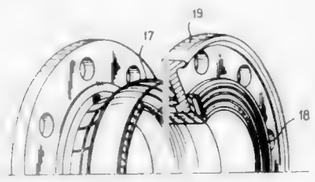
85% to 90% by weight of derma material relative to the dry and degreased leather.

5,147,6 4
ELECTROMAGNETIC S HIELDING PANEL
Leslie T. Clarke, Wirral, United I ingdom, assignor to Pilkington PLC, St. Helens, England
Filed Aug. 6, 1990, S er. No. 563,183
Claims priority, application Un ted Kingdom, Aug. 18, 1989, 8918859
Int. Cl.[5] E06B *3/24*; H05K *9/00*
U.S. Cl. 428—34 29 Claims



1. An electromagnetic shieldin g panel comprising in combination;
first and second panes, each in ependent, of glass or plastics said first and second panes ach having major inner and outer surfaces thereof, and eing positioned in opposed spaced parallel relationship;
and, first and second electroc nductive coatings, said first electroconductive coating eing located on the major outer surface of the first pa e of glass or plastics and the second electroconductive c ating being located between the first and second panes of glass or plastics, wherein the second electroconductive c ating is electrically coupled to the first electroconductiv coating so that, in use of the shielding panel, direct elec rical connection to the first electroconductive coating t enable said first electroconductive coating to be conne ted to earth also provides for the connection of the secon electroconductive coating to earth to provide effective a tenuation of electromagnetic radiation in the path of the shielding panel while providing good optical qualities.

5,147, 95
FLEXIBLE EXPANSION COM PENSATION SLEEVE FOR CONNECTING SEC TIONS OF PIPE
Robert Colley; Fabrice Lecoutur er, both of Decize, and Christian Ledevehat, Clermont-Ferr nd, all of France, assignors to Caoutchouc Manufacture Et P lastiques, Versailles, France
Division of Ser. No. 461,362, Jan 5, 1990, which is a division of Ser. No. 276,264, Nov. 25, 19 8, Pat. No. 4,936,814. This application Dec. 30, 19 1, Ser. No. 815,947
Claims priority, application Fr nce, Nov. 24, 1987, 87 16235
Int. Cl.[5] B 2B *1/08*
U.S. Cl. 428—34.1 20 Claims

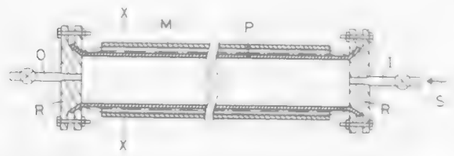


1. A flexible expansion comp nsation sleeve for connecting sections of pipe, said flexible expansion compensation sleeve comprising:
a sleeve portion having at least one end;
at least one counterflange encircling said sleeve portion, said at least one counterflange being configured for connection to a pipe;
said at least one end of said sleeve portion comprising at least one integrated flange, said at least one integrated flange being configured to be connected to said at least one counterflange;
said at least one integrated flange comprising at least one bead;
said at least one bead comprising a composite material;
said composite material comprising:
an elastomer matrix forming the basic component of said material;
said elastomer matrix including a cross-linking system;
at least one fiber reinforcement means comprising discontinuous fibers;
said fibers being disposed throughout said elastomer matrix and being generally oriented to extend in a first direction of reinforcement of said fibers;
at least one thermosetting resin, in said elastomer matrix, to promote reinforcement of said elastomer matrix;
said elastomer matrix which includes said cross-linking system, said fiber reinforcement means and said thermosetting resin having a first elastic modulus for a strain substantially less than 100% in said first direction of reinforcement of said fibers and a second elastic modulus in a second direction which is perpendicular to said first direction of reinforcement of said fibers;
said thermosetting resin being in a proportion to said fiber reinforcement means and said elastomer matrix, so that said second elastic modulus is at least 6 MPa; and
said fiber reinforcement means being in a proportion to said thermosetting resin and said elastomer matrix, so that an anisotropy ratio of said first elastic modulus to said second elastic modulus is at least 6.

5,147,696
MULTIPLE-LAYER POLYOLEFIN FILMS
Robert C. Lansbury, and Douglas L. Mitchell, both of Hertfordshire, England, assignors to Imperial Chemical Industries PLC, London, England
Filed Nov. 30, 1990, Ser. No. 620,473
Claims priority, application United Kingdom, Nov. 30, 1989, 8927050; Feb. 21, 1990, 9003902
Int. Cl.[5] B65D *65/40*; B29D *22/00*; B32B *27/08*
U.S. Cl. 428—36.4 10 Claims

1. A multiple-layer film comprising a substrate layer of a polyolefin and, on at least one surface thereof, a polymeric heat-sealable layer wherein
a) the substrate comprises a layer of an oriented propylene polymer, and
b) the heat-sealable layer comprises an ethylene polymer
i) of density not exceeding 0.95 $g.cm^{-3}$ at 23° C., and containing
ii) an effective amount of a substantially spherical, non-agglomerating, particulate additive having an average particle size not exceeding 5.0 μm.

5,147,697
POLYVINYL CHLORIDE PIPE FOR THE INNER LINING OF EXISTING PIPES
Makoto Ijyuin, Osakashi; Akihiko Tsuda, Neyagawashi, and Shinichi Nawata, Kitakatsuragigun, all of Japan, assignors to Tsutsunaka Plastic Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Mar. 18, 1991, Ser. No. 670,689
Claims priority, application Japan, Mar. 26, 1990, 2-77476; Mar. 26, 1990, 2-77477
Int. Cl.[5] F16L *55/162*
U.S. Cl. 428—36.6 6 Claims



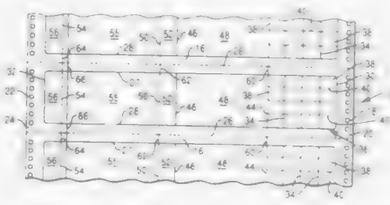
1. In combination, an installed pipe and a polyvinyl chloride resin pipe as an inner lining therefor wherein the resin pipe is heated without mechanical deformation to soften the same, inserted into the installed pipe, further heated and inflated therein to closely engage with the inner surface of the installed pipe, said polyvinyl chloride resin pipe being formed of a resin composition which consists essentially of polyvinyl chloride as a main component and a modifying agent blended therewith, the polyvinyl chloride having an average degree of polymerization $\overline{DP}$ included in a range of 600 to 1,050, and 3 to 25 parts by weight of said modifying agent being blended with 100 parts by weight of said main component, said modifying agent being a member, selected from the class consisting of MMA- and MBS-modifiers which are a polymer of methyl methacrylate and a copolymer of butadiene-styrene-methyl methacrylate, respectively.

5,147,698
PRESSURE SENSITIVE ADHESIVE FILM ARTICLE HAVING HIGH MOISTURE VAPOR TRANSMISSION RATE
Susan M. Cole, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 561,247, Jul. 30, 1990, Pat. No. 5,009,224, which is a continuation of Ser. No. 266,201, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 913,688, Sep. 30, 1986, abandoned. This application Jan. 22, 1991, Ser. No. 643,781
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—40 19 Claims

1. A pressure sensitive adhesive article comprising a continuous, liquid impermeable film of pressure sensitive adhesive, derived from the polymerization of a hydrophilic premix comprising at least one ethylenically unsaturated monomer, said film having dispersed therein a discontinuous gaseous phase constituting at least 10 percent of the volume of said film, and said film having a moisture vapor transmission rate from about 600 to about 2400 g/m^2 per 24 hours at 40° C. and an 80% humidity differential.

5,147,699
DISTRIBUTION LABEL
Jovona C. Browning, Miamisburg, Ohio, and Vernon B. Harvey, Florence, S.C., assignors to NCR Corporation, Dayton, Ohio
Filed Jan. 7, 1991, Ser. No. 637,844
Int. Cl.[5] A61F *13/02*
U.S. Cl. 428—40 18 Claims

1. A distribution label comprising:
facestock material having adhesive on the back side thereof, and
liner material underlying the entire surface of and adhered by means of said adhesive to the back side of the facestock material, said facestock material including a first line of perforations therein and spaced from one edge of the facestock material and forming a first label portion, a slit in said facestock material and spaced from said first line of perforations and forming a second label portion, a second line of perforations in the facestock material and spaced from said first line of perforations, a third line of perforations in said facestock material and spaced from said second line of perforations and forming a third label portion, the slit and the second line of perforations in said feedstock material being adjacent and spaced from each other and the slit and the second line of perforations being arranged for providing release of a portion of the facestock material from the liner material and forming a first edge portion of the facestock material for adhering to a package, said first edge portion being formed upon folding

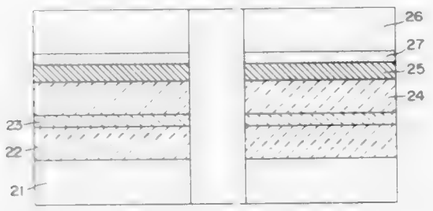


said first label portion along said first line of perforations under said second label portion and upon folding said second label portion along a line aligned with said second line of perforations under said third label portion, and a slit in the liner material adjacent the third line of perforations in the facestock material permitting removal of a portion of the liner material from the facestock material and forming a second edge portion of the facestock material for adhering to the package, the first, second and third label portions of the distribution label being adhered to the package by means of the first edge portion and by means of the second edge portion, the removal of said third label portion along said second and said third lines of perforations in said facestock material exposing said first label portion and said second label portion for retrieval thereof and leaving the first edge portion and the second edge portion adhered to the package.

5,147,700
MOLDING COMPOSITIONS OF LOW DOUBLE REFRACTION
Horst Brüggemann, Cologne; Dieter Freitag, Krefeld; Lothar Meier, Sprockhoevel; Christian Lindner, and Hans-Eberhard Braese, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany
Division of Ser. No. 512,558, Apr. 23, 1990, which is a continuation of Ser. No. 436,114, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 205,734, Jun. 13, 1988, abandoned. This application May 17, 1990, Ser. No. 510,111
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721054; Mar. 23, 1988, 3809779
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 3 Claims

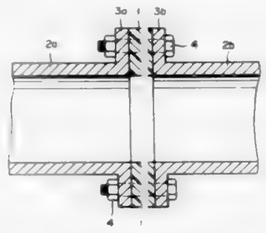
1. Optical discs of extremely low double refraction and a transmittance from 85.7% to 89.2% at 550 nm comprising mixtures of
A. PVC
B. a (ter)polymer of vinyl monomers produced by the polymerization of a mixture of monomers comprising styrene, α-methyl styrene, acrylonitrile and methyl methacrylate which
C. is grafted on to a rubber phase comprising diene rubbers.

5,147,701
INFORMATION RECORDING MEDIUM
Shigeaki Furukawa, Shiki; Takeo Ohta, Nara; Tetsuya Akiyama, Moriguchi, and Hidemi Isomura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 28, 1989, Ser. No. 458,376
Claims priority, application Japan, Dec. 28, 1988, 63-334420; Jan. 23, 1989, 1-13812
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 11 Claims



1. An information recording medium comprising an active layer for absorbing light to write and erase information, and a protective layer formed at least on one surface to the active layer and mainly composed of a metal chalcogenide and a material which does not react with the active layer, said material comprising at least one oxide selected from the group consisting of SiO_2, Ta_2O_5, TiO_2, Al_2O_3, MgO, WO_3 and SnO_2 or at least one nitride selected from the group consisting of AlN, Si_3N_4TiN and ZrN or at least one carbide selected from the group consisting of SiC, TiC, WC and ZrC, and wherein said material is present at 90% or more in an area near the border contacting the active layer and is present at at least 20% in the other areas.

5,147,702
SEAL
Juuro Aoyagi, 9-11, 3-chome, Hamadayama, Suginami-ku, Tokyo, Japan
Continuation of Ser. No. 427,193, Oct. 26, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 772,632
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—65 3 Claims

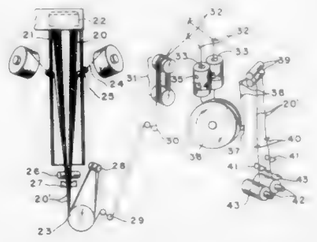


1. An annular seal comprising a co-polymer cross-linked by ionizing radiation and free of chemical cross-linking agents, said copolymer being obtained from
(i) 60 to 98 mol % of an unsubstituted Á-olefin of 2 to 5 carbon atoms and
(ii) 2 to 40 mol % of a carboxylic acid ester containing vinyl unsaturation in either the acid or the alcohol portion of said ester.

5,147,703
GOLF TOWEL SET
Jack Provost, P.O. Box 1063, and Kenneth Martin, 25 Hickory Rd., Apt. B2,, both of Chatham, N.J. 07928
Filed Apr. 22, 1991, Ser. No. 688,867
Int. Cl.[5] A47K *10/02, 10/12*
U.S. Cl. 428—82 18 Claims

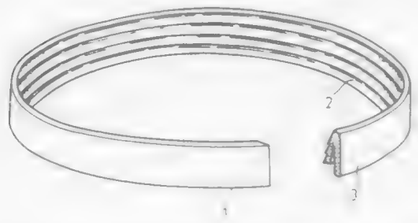
1. A golf towel adapted for attachment to a golf bag or other article, comprising:
a main towel;
a fastening means for attaching said main towel to said golf bar or other article; and
an accessory towel releasably attached to said main towel.

5,147,704
CARPETS MADE WITH ANTI-STATIC YARNS CONTAINING POLYSTYRENE
Perry H. Lin, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 566,972, Aug. 13, 1990, Pat. No. 5,116,681, which is a division of Ser. No. 406,575, Oct. 5, 1989, Pat. No. 4,997,712, which is a division of Ser. No. 179,015, Apr. 8, 1988, Pat. No. 4,900,495. This application Feb. 6, 1992, Ser. No. 831,888
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—97 2 Claims



1. Carpets having a level of static protection less than 2.0 kilovolts and which are tufted from multi-filament yarns where one or more of the multi-filament yarns comprise at least one spin-oriented, conductive filament having a nonconductive polymeric component coextensive with a component of electrically conductive carbon dispersed in a polymeric matrix wherein the nonconductive polymeric component of the spin-oriented, conductive filaments is a melt-blend containing a major amount of a nonconductive, fiber-forming polymeric material and a minor amount of a polystyrene.

5,147,705
ELASTIC BAND
Lin Ta-Shun, and Chen Kuan-Yu, both of Room 602, No. 49, Sec. 3, Chung-Shan N. Road, Taipei, Taiwan
Filed Dec. 4, 1990, Ser. No. 621,831
Int. Cl.[5] B32B *3/28*
U.S. Cl. 428—167 5 Claims

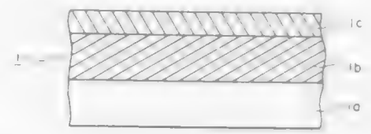


1. An elastic band for releasable securement to an object comprising:
a first member extending in a longitudinal direction having opposing first and second continuous surfaces, said first surface being substantially planar in contour and said second surface having a plurality of projections protruding therefrom for contiguous interface with said object; and,
a second member extending in a longitudinal direction having first and second continuous surfaces, said second member having a longitudinal edge angularly affixed to a longitudinal edge of said first member.

5,147,706
WATER BASED INK ON FOIL AND/OR SYNTHETIC ORGANIC POLYMER
Kevin P. Kingman, 605 Zschokke, Highland, Ill. 62249
Filed Dec. 31, 1990, Ser. No. 636,048
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 18 Claims

1. An article of manufacture, comprising:
a substrate comprising foil, synthetic organic polymer or combinations thereof; and
a water-based ink composition affixed to at least a portion of the substrate, the ink composition being water-resistant upon curing, the ink composition in an uncured condition comprising:
about 5% to 99% by weight of composition of a water resistance agent comprising an acrylic polymer emulsion;
about 1% to about 85% by weight of composition of a blocking agent having a glass transition point of about 30° C. to about 100° C.;
an effective amount of a coloring agent capable of providing color to the composition the coloring agent being present in the composition from about 0.1% to about 14% by weight of the composition;
means for maintaining a basic pH in the composition; and
an effective amount of an aqueous solution to control the viscosity of the composition, with the proviso that the composition substantially does not contain a hydrocarbon solvent.

5,147,707
THERMAL TRANSFER MATERIAL
Tetsuo Hasegawa, Tokyo; Takayuki Suzuki, Kawasaki; Naoki Kushida, Yokohama, and Yoshihisa Takizawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1990, Ser. No. 472,792
Claims priority, application Japan, Feb. 2, 1989, 1-025278; Jul. 31, 1989, 1-198251; Jul. 31, 1989, 1-198253; Jul. 31, 1989, 1-198254; Jul. 31, 1989, 1-198256; Jul. 31, 1989, 1-198273
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—212 15 Claims



1. A thermal transfer material comprising a support and an ink layer disposed thereon comprising a binder and a colorant, wherein the binder comprises 40–80 wt. % of an ethylene-vinyl acetate copolymer and 20–60 wt. % of a wax based on the total weight of the binder, and the ink layer has a breakdown strength of 30–80 kg/cm^2 at 25° C.

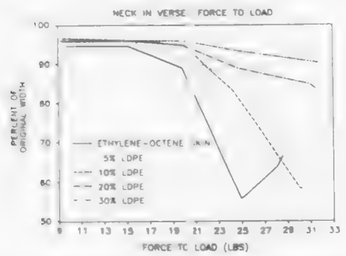
5,147,708
THERMOPLASTIC FILMS FOR USE IN STRETCH/CLING APPLICATIONS
Patrick Brant, Seabrook, and Paul M. German, Friendswood, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.
Continuation-in-part of Ser. No. 123,002, Nov. 19, 1987, abandoned. This application Dec. 20, 1990, Ser. No. 631,860
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—213 13 Claims

1. A thermoplastic stretch cling film, comprising:
a cling layer, essentially free of tackifying additive, comprising a polymer of two or more monomers, wherein a first monomer comprises ethylene and a second monomer comprises an acrylate said acrylate being present at from about 2 to about 40 weight percent based upon the weight of said polymer; and
a slip layer comprising polyethylene or polypropylene

5,147,709
STRETCH FILM WITH REDUCED NOISE AND NECK
Gregory L. Dohrer, Broken Arrow; Michael D. Holler, Collinsville, and Dwyane B. Nichols, Tulsa, all of Okla., assignors to Paragon Films Incorporated, Broken Arrow, Okla.
Filed Jun. 28, 1991, Ser. No. 722,839
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—213 20 Claims

1. A stretch wrap thermoplastic multi-layer film comprising:
as a first layer linear low density polyethylene and a minor amount of non-linear low density polyethylene, and;
as a second layer an ethylene polymer selected from the group comprising ultra low density polyethylenes having a melt flow ratio of between about 0.1 and about 30 and a density of between about 0.900 and about 0.912 g. cm^{-3}

and linear low density polyethylenes having a melt flow ratio of between about 0.1 and about 30 and a density of



between about 0.912 and about 0.935 g. cm^{-3}, and blends thereof.

5,147,710

FLAME RETARDANT LOW DENSITY FOAM ARTICLES

Richard C. Bopp, West Coxsackie, N.Y., and Richard D. Lassor, Danville, Calif., assignors to General Electric Company, Selkirk, N.Y.

Filed Oct. 27, 1989, Ser. No. 427,754
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—213 18 Claims

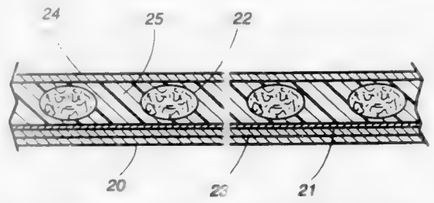
1. A low density, fire-resistant, structural composite comprised of:
(a) a foam substrate comprised of thermoplastic resin; and
(b) a flame-resistance-conferring material adhered to the substrate, wherein the foam substrate is comprised of a polyphenylene ether resin and the flame-resistance-conferring material is comprised of aluminum foil and is present on the substrate surface in a thickness of about 0.1 to about 5 mils.

5,147,711

VACUUM BARRIER FOR EXCIMER LASERS

Roger P. Shurter, Jemez Springs, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 10, 1990, Ser. No. 596,154
Int. Cl.[5] B32B *27/06, 15/08;* H01S *3/22*
U.S. Cl. 428—216 7 Claims



1. A vacuum barrier for separating a region of vacuum from a pressurized gaseous region in an excimer laser, said barrier comprising:
a first thin layer of metal having a thickness in the range of 2000–4000 Angstroms;
a first thin layer of polyimide having a thickness of approximately 1 mil overlying said first thin layer of metal;
a second thin layer of metal having a thickness in the range of 2000–4000 Angstroms overlying said first thin layer of polyimide;
carbon fibers formed into a plurality of graphite fiber yarns, said graphite fiber yarns comprising 500–2000 carbon fibers and being formed into a matrix overlying said second thin layer of metal; and
a second thin layer of polyimide having a thickness of approximately 1 mil overlying said carbon fiber tapes;
wherein said first thin layer of metal is adjacent to said pressurized gaseous region, and said second thin layer of polyimide is adjacent to said region of vacuum.

5,147,712

NON-WOVEN FABRIC

Yoshiki Miyahara, Uji; Satoshi Kasetani, Nara; Shigetaka Nishimura, Uji, Japan; Kunihiro Hirsoe, Kawasaki; Takashi Inoue, Yokosuka, and Takashi Nogi, Kyoto, all of Japan, assignors to Nippon Unicar Company Limited, Danbury, Conn.

Filed Aug. 27, 1991, Ser. No. 750,303
Int. Cl.[5] D04H *1/04;* B32B *5/22;* C08L *67/07*
U.S. Cl. 428—224 19 Claims

1. A non-woven fabric, the fibers of which are comprised of a blend:
(i) polyethylene;
(ii) polycaprolactone; and,
(iii) a copolymer of ethylene and carbon monoxide and, optionally, one or more ethylenically unsaturated monomeric organic compounds having 3 or more carbon atoms wherein ethylene is present in major proportion, by weight, and carbon monoxide is present in an amount of about 1.5 to about 7 percent by weight, all based on the weight of the copolymer.

5,147,713

CONVERTIBLE FABRIC

Charles E. Dalbec, Spartanburg, and Marshall S. Hobson, Anderson, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 11, 1991, Ser. No. 667,012
Int. Cl.[5] B32B *27/02, 27/08, 27/20*
U.S. Cl. 428—229 4 Claims

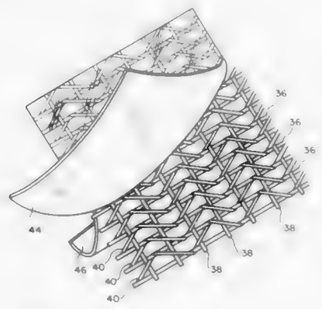
1. A single ply convertible top fabric comprising: a woven substrate fabric and a vinyl coating on said woven fabric, said woven fabric having a blend of solution dyed polyester yarn and cotton in both the warp and weft.

5,147,714

ANTISTATIC REINFORCED FABRIC CONSTRUCTION

James R. Ellison, Leesburg, and Robert W. Hoy, Warsaw, both of Ind., assignors to ABC Industries, Inc., Warsaw, Ind.

Filed Nov. 9, 1990, Ser. No. 612,003
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—254 22 Claims



9. An antistatic knitted fabric, comprising:
a plurality of substantially nonconductive warp yarns;
a plurality of substantially nonconductive weft yarns; and
conductive tie yarn interconnecting said substantially nonconductive warp and weft yarns.

5,147,715

CLOTHES DRYER AUGMENTATION DEVICE

Robert B. Thurman, 1565 Highway 81 East No. 166, New Braunfels, Tex. 78130

Filed Dec. 4, 1990, Ser. No. 623,222
Int. Cl.[5] B44D *1/46*
U.S. Cl. 428—286 8 Claims

1. A device for acceleration of the drying process in a clothes dryer without connection to or incorporation of means for independently generating heat comprising:
a water repellent fabric member; and
a plurality of heat retentive members (**14**) encapsulated within said fabric member, said heat retentive members comprising a semi-rigid plastic material, said fabric member and heat retentive members being constructed of materials which are more heat retentive than fabric items dried in the clothes dryer.

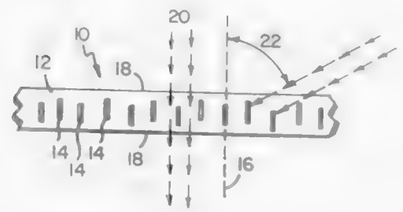
5. A method for accelerating the drying of damp fabric items in a clothes dryer comprising the steps of:
selecting a device for acceleration of the drying process in a clothes dryer comprising:
a water repellent fabric member; and
a plurality of heat retentive members (**14**) encapsulated within said fabric member, said heat retentive members comprising a semi-rigid plastic material, said fabric member and heat retentive members being constructed of materials which are more heat retentive than fabric items dried in the clothes dryer.

5,147,716

MULTI-DIRECTIONAL LIGHT CONTROL FILM

Peter A. Bellus, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 16, 1989, Ser. No. 367,489
Int. Cl.[5] B32B *5/08;* G05D *25/00*
U.S. Cl. 428—323 12 Claims



1. A light control film having a sharp cutoff angle comprising a plurality of magnetically alignable aciculae having aspect ratios in the range of 2,500 to 100,000:1 fixedly disposed within a solidified resin matrix, said resin matrix being light transmissive material and thermoplastic or thermoset, said aciculae having their major axes generally aligned in parallel within said matrix.

5,147,717

TRANSPARENT IMAGE-RECORDING ELEMENTS

William A. Light, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1991, Ser. No. 752,755
Int. Cl.[5] B41M *5/00*
U.S. Cl. 428—327 17 Claims

1. A transparent image-recording element comprising a support and an ink-receptive layer in which the element is adapted for use in a printing process where liquid ink dots are applied to the ink-receptive layer wherein the ink-receptive layer is capable of controlling ink dot size to produce ink-filled image areas on the ink-receptive layer having an enhanced optical density, said ink-receptive layer comprising:
(i) a vinyl pyrrolidone;
(ii) particles of a polyester which is a poly(cyclohexylenedimethylene-co-xylylene terephthalate-co-malonate-co-sodioiminobis(sulfonylbenzoate));
(iii) a homopolymer or a copolymer of an alkylene oxide containing from 2 to 6 carbon atoms;
(iv) a polyvinyl alcohol;
(v) a compound or mixture of compounds having the general formula:

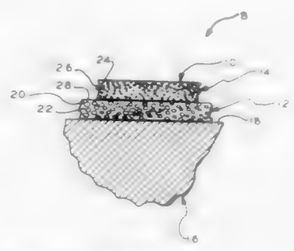
wherein R_1 represents a hydrogen atom or a methyl group, R_2 and R_3 each represent a hydrogen atom, an alkyl group having a carbon number of 1 to 4 or a phenyl group, and n is an integer of 1 to 10, and
(vi) inert particles.

5,147,718

RADAR ABSORBER

Sotiri A. Papoulias, Madison, and Henry Seiwatz, Wayne, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Apr. 24, 1990, Ser. No. 513,693
Int. Cl.[5] B32B *5/30*
U.S. Cl. 428—328 8 Claims



1. A radar absorber comprising:
an inner layer having a coating material containing a carbonyl iron powder with a selected uniform grade size particle disposed therein; and
an outer layer having a coating material containing a carbonyl iron powder with a selected uniform grade size of a finer size particle than that in the inner layer disposed therein, wherein the iron carbonyl particle of the inner layer has a grade size of about 4 to about 5 microns; and the finer size iron carbonyl particle of the outer layer has a grade size of about 0.5 to about 1.5 microns.

5,147,715

PRODUCTION OF PHENYLENE SULFIDE-ARYLENE SULFIDE/SULFONE BLOCK COPOLYMERS

Melvin D. Herd, Idaho Falls, Id., and Lyle R. Kallenbach, Bartlesville, Oreg., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 588,399, Sep. 25, 1990, abandoned, which is a continuation of Ser. No. 356,956, May 24, 1989, abandoned. This application Jun. 19, 1991, Ser. No. 718,493
Int. Cl.[5] B32B *17/06, 15/08*
U.S. Cl. 428—332 5 Claims

1. A coated substrate wherein said substrate is selected from the group consisting of metals, glasses and ceramics and having a cured coating thereon of about 1 to about 25 mils thickness wherein said coating comprises a block copolymer composed of at least one poly(phenylene sulfide) segment and at least one poly(arylene sulfide/sulfone) segment.

5,147,721

MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC LAYER AND A BACKCOAT LAYER

Akira Kawakami, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 580,214
Claims priority, application Japan, Sep. 14, 1989, 1-239175
Int. Cl.[5] G11B *5/00*
U.S. Cl. 428—336 18 Claims

1. A magnetic recording medium comprising a support, and provided thereon, a magnetic layer containing a binder and a magnetic powder, and a back coat layer containing a carbon black on the side opposite to the magnetic layer, wherein said magnetic layer contains a copolymer comprising a unit derived from a vinyl monomer having a sulfonic acid salt group and having a unit derived from a vinyl carboxylic acid ester having a hydroxyl group, said back coat layer having an average surface roughness Ra of from 0.000 to 0.035 μm, and not less than 70% by weight of the carbon black has an average particle diameter of from 10 to 30 mμ

5,147,721

CERAMIC REINFORCED GLASS MATRIX

Kenneth S. Baron, San Ramon; Milton F. Custer, Byron, and Andreas G. Hegedus, San Francisco, all of Calif., assignors to Hexcel Corporation, Dublin, Calif.

Filed Jul. 7, 1989, Ser. No. 377,165
Int. Cl.[5] B29B *11/16*
U.S. Cl. 428—365 13 Claims

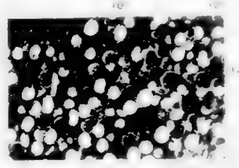
1. A yarn which may be incorporated in a fabric or filament wound, comprising commingled staple length strands of glass matrix precursor fiber and ceramic reinforcement fiber, said yarn being prepared by twisting a mixture of said fibers together in a ratio of 1:1-5:1, glass matrix precursor to ceramic reinforcement, to provide a yarn wherein the two components are present in said ratio.

5,147,722

PROCESS FOR THE PRODUCTION OF MATERIALS AND MATERIALS PRODUCED BY THE PROCESS

Evan E. Koslow, Westport, Conn., assignor to Koslow Technologies Corporation, Bridgeport, Conn.

Division of Ser. No. 455,997, Dec. 22, 1989, Pat. No. 5,019,311, which is a continuation-in-part of Ser. No. 314,651, Feb. 23, 1989, abandoned. This application Jan. 25, 1990, Ser. No. 571,075
Int. Cl.[5] B32B *15/02, 17/04, 19/02*
U.S. Cl. 428—402 87 Claims



1. A porous composite article comprising:
a plurality of primary particles having relatively high softening temperatures, said particles having a diameter between about 0.1 and about 3000 micrometers; and
a matrix of from 3 to 30% by weight of a substantially continuous thermoplastic binder phase supporting and emeshing said primary particles, said continuous binder phase being formed from binder particles having a diameter of between about 0.1 to about 150 micrometers, said binder particles being substantially incapable of fibrillation under normal conditions into micro fibers of less than 10 micrometers diameter at room temperature and having a softening temperature substantially below the softening temperature of the primary particles,
and where such primary particles are consolidated into a uniform matrix with the continuous binder material present as a dilute material within the pores between the primary particles, the remainder of the pore volume comprising a continuous volume of voids and said binder material being forced into macropores and exterior voids of individual primary particles having such macropores and exterior voids.

5,147,723

PAUCILAMELLAR LIPID VESICLES

Donald F. H. Wallach, Brookline, Mass., assignor to Micro-Pak, Inc., Wilmington, Del.

Continuation of Ser. No. 157,571, Mar. 3, 1988, Pat. No. 4,911,928, which is a continuation-in-part of Ser. No. 25,525, Mar. 13, 1987, abandoned, and a continuation-in-part of Ser. No. 78,658, Jul. 28, 1987, Pat. No. 4,855,090, and a continuation-in-part of Ser. No. 124,824, Nov. 25, 1987, Pat. No. 4,917,951. This application Nov. 29, 1989, Ser. No. 443,516
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] A61K *9/127*; B01J *13/02*
U.S. Cl. 428—402.2 25 Claims

1. A method of making paucilamellar lipid vesicles having 2 to 8 exterior lipid bilayers surrounding a large, amorphous, substantially aqueous filled center comprising the steps of:
A. forming a lipophilic phase of a surfactant and any lipid soluble materials to be incorporated into said lipid vesicles, said surfactant being selected from a group consisting of
polyoxyethylene fatty esters having the formula

$$R_1—COO(C_2H_4O)_nH$$

where R_1 is a radical of lauric, myristic, cetyl, stearic, or oleic acid and n=2-10;
polyoxyethylene fatty acid ethers, having the formula

$$R_2—CO(C_2H_4O)_mH$$

where R_2 is a radical of lauric, myristic, or cetyl acids, single or double unsaturated octadecyl acids, or double unsaturated eicodienoic acids and m ranges from 2-4;
polyoxyethylene (20) sorbitan mono- or trioleate; and
polyoxyethylene glyceryl monostearate with 1-10 polyoxyethylene groups;
B. forming an aqueous phase of an aqueous solution and any aqueous soluble material to be incorporated into said lipid vesicles; and
C. blending said lipophilic phase and said aqueous phase in a single step under shear mixing conditions.
21. Paucilamellar lipid vesicles consisting of 2 to 8 lipid bilayers in the form of substantially spherical shells separated by aqueous layers surrounding a large, amorphous, substantially aqueous filled central cavity, said lipid bilayers comprising
a surfactant selected from a group consisting of diethanolamides having the formula

$$(HOCH_2—CH_2)_2NCO—R_3$$

where R_3 is a radical of caprylic, lauric, myristic or linoleic acids;
long chain acyl hexosamides having the formula

$$R_4—NHCO—(CH_2)_b—CH_3$$

where b ranges from 10-18 and R_4 is a radical of a sugar molecule selected from a group consisting of glucosamine, galactosamine, and N-methylglucamine;
long chain acyl amino acid amides having the formula

$$R_5—CH(COOH)—NHCO—(CH_2)_c—CH_3$$

where c ranges from 10-18 and R_5 is an amino acid side chain; and
long chain acyl amides having the formula

$$HOOC—(CH_2)_d—N(CH_3)—(CH_2)_3—NHCO—R_6$$

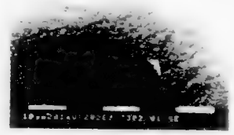
where R_6 is an acyl chain having 12-20 carbons and not more than two unsaturations, and d ranges from 1-3.

5,147,724

METHOD FOR PRODUCING SMOOTH SURFACES ON PLASTICS

ManfredNeumann Eschwey, Düsseldorf; Rolf van Bonn, Duisburg, and Horst Neumann, Kelkheim, all of Fed. Rep. of Germany, assignors to MG Industries, Valley Forge, Pa.

Continuation of Ser. No. 578,394, Sep. 7, 1990, Pat. No. 5,073,231. This application Oct. 8, 1991, Ser. No. 772,786
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—409 6 Claims



1. A plastic object having a smooth surface the object is made of a polymer selected from the group consisting of ethylene, propylene, butadiene polystyrene and hydrocarbon compounds the object being produced by a process of selecting the object and exposing the object to a gas mixture containing fluorine and a gaseous oxidizing agent.

5,147,725

METHOD FOR BONDING SILICONE RUBBER AND POLYURETHANE MATERIALS AND ARTICLES MANUFACTURED THEREBY

Leonard Pinchuk, Miami, Fla., assignor to Corvita Corporation, Miami, Fla.

Filed Jul. 3, 1990, Ser. No. 548,285
Int. Cl.[5] B32B *27/00, 27/40*
U.S. Cl. 428—425.5 19 Claims

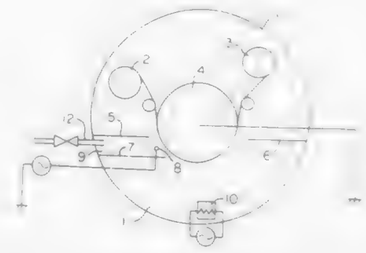
1. A method for applying a silicone rubber material, comprising:
supplying a base material having an exposed surface which includes a polyurethane;
applying an uncured silicone rubber material to said exposed polyurethane surface of the base material, said silicone rubber material being an acetoxy-terminated siloxane, a halogenterminated siloxane or a combination thereof said acetoxy and halogen moieties being bonded directly to silicon in said rubber material;
heating said base material at a temperature above about 70° C. to condition said polyurethane surface for bonding said silicone rubber material to said polyurethane; and
curing said silicone rubber material;
whereby said heating of said base material provides a bond between said silicone rubber material and said polyurethane which is stronger than a bond which occurs between said polyurethane and said silicone rubber material in the absence of said heating step.

5,147,726

ALUMINUM DEPOSITED FILM AND PROCESS FOR PRODUCING IT

Motoyuki Suzuki, Kyoto, and Yukichi Deguchi, Otsu, both of Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP89/00985, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO90/03266, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 28, 1989, Ser. No. 476,481
Claims priority, application Japan, Sep. 29, 1988, 63-245258; Apr. 18, 1989, 1-98367; Sep. 28, 1989, 63-243433
Int. Cl.[5] B32B *15/08*
U.S. Cl. 428—458 11 Claims



3. An aluminum deposited film wherein an aluminum thin layer is formed on at least one surface of a plastic base film by vacuum deposition characterized in that the surface area coefficient C of the surface of said deposited layer determined by equation (I) is not greater than 1.00×10^{-4}, and said aluminum thin layer contains aluminum crystals the planes of which are oriented in parallel with the surface of said base film, wherein

$$C=(Lb-La)/La \quad (I)$$

wherein:
a. La and Lb are determined from a roughness curve determined by a two beam type scanning electron microscope;
b. La and Lb represent the projected length of said roughness curve on a base line and the length of said roughness curve, respectively; and

c. La and Lb are determined by equations (II) and (III) respectively where equations (II) and (III) are defined as

$$La = n \cdot \Delta x \quad \text{(II)}$$

$$Lb = \sum_{i=1}^{n} [(\Delta x^2 + (y_i - y_{i-1})^2)] \quad \text{(III)}$$

wherein "x" and "y" represent the coordinates on the axis in the direction of the scanning for measuring the roughness curve by the two beam type scanning electron microscope and on the axis in the height direction of the curve perpendicular to the scanning direction axis, respectively.

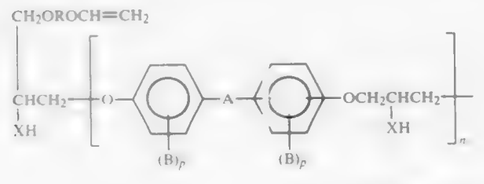
5,147,727

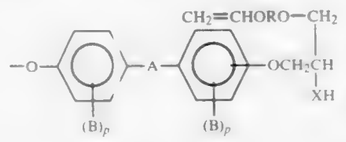
ARYLOXY POLYVINYL ETHERS

Kou-Chang Liu, Wayne; Fulvio J. Vara, Chester, and James A. Dougherty, Pequannock, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Division of Ser. No. 475,535, Feb. 6, 1990, Pat. No. 5,082,874.
This application Oct. 7, 1991, Ser. No. 772,408
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—500 13 Claims

1. A substrate having a cured surface coating of an effective protective amount of the cured product of a composition containing between about 0 and about 80 wt. % of a monomer or oligomer selected from the group of an epoxide, an acrylate or methacrylate, an olefin and an aliphatic vinyl ether and between about 20 and about 100 wt. % of an aryloxy polyvinyl ethers having the formula





wherein R is a radical having from 2 to 20 carbon atoms and is selected from the group of alkylene, alkyleneoxy alkylene, polyalkyleneoxy alkylene, arylene, alkarylene, aslkarylalkylene and aralkylene; X is oxygen or sulfur; A is branched or linear alkylene having from 1 to 20 carbon atoms; V is halo or lower alkyl; n has a value of from 1 to 6 and p has a value of from 0 to 4, said composition containing up to about 5 wt. % of a cationic photoinitiator.

5,147,728

AG-SnO_2 ELECTRICAL CONTACT MATERIALS

Seiichi Tanaka, 13/7, Kitasenzoku 2-chome, Ohta-ku, Tokyo; Teruo Hirata, 19/53, Wakamatsu-cho 2-chome, Toshima-ku, Tokyo, and Masaharu Yida, Suite 6-602, No. 9, Nakameguro 2-chome, Meguro-ku, Tokyo, all of Japan

Division of Ser. No. 477,347, Feb. 8, 1990, Pat. No. 5,078,810.
This application Jul. 5, 1991, Ser. No. 726,314
Claims priority, application Japan, Jan. 26, 1990, 2-17514
Int. Cl.[5] C22C *5/00*
U.S. Cl. 148—431 1 Claim

1. Ag-SnO_2 electrical contact materials made of Ag alloys consisting of more than 5 weight % and up to 20 weight % of Sn, 0.001 to 1 weight % of one or more elements selected from the iron family elements of Fe, Co, and Ni, and the balance of Ag, said alloys having been internal-oxidized in an oxygen atmosphere of more than 10 atm. and up to 200 atm. and at a temperature of 500° C. to 750° C. where the alloys were kept at a solid phase not involving any liquid phase.

5,147,729

STEEL PLATE WITH ORGANIC COATING HAVING IMPROVED CORROSION RESISTANCE IN AS-WORKED STATE

Hideo Ogishi; Kenji Takao; Shigeru Umino, and Koji Yamato, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Continuation of Ser. No. 502,066, Mar. 29, 1990, abandoned.
This application Oct. 29, 1991, Ser. No. 784,130
Claims priority, application Japan, Mar. 31, 1989, 1-80759
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—623 4 Claims

1. A steel plate with an organic coating having improved corrosion resistance in its as-worked state, comprising:
a steel substrate;
a zinc or zinc alloy-plated layer on the steel substrate;
a chromate film deposited on the zinc or zinc alloy-plated layer to a coating weight of 5 to 500 mg/m^2 in terms of metallic chromium; and
a solid organic film deposited on the chromate film to a coating weight of 0.3 to 4.0 g/m^2 by applying an organic coating composition on the chromate film;
said organic coating composition having been prepared by
mixing 100 parts by weight of epichlorohydrin-bisphenol A epoxy resin and 10 to 100 parts by weight of an isocyanate compound to produce a urethanated epoxy resin having an epoxy equivalent of 1,000 to 5,000,
adding 0.5 to 1.0 mole of a dialkanolamine per equivalent of the epoxy group of the urethanated epoxy resin to produce a dialkanolamine-modified urethanated epoxy resin, and
mixing 100 parts by weight of the dialkanolamine-modified urethanated epoxy resin with 10 to 150 parts by weight of silica on a solid basis to produce the organic coating composition.

5,147,730

STEEL PLATE WITH ORGANIC COATING HAVING IMPROVED CORROSION RESISTANCE

Hideo Ogishi; Shigeru Umino; Kenji Takao; Hajime Kimura, and Koji Yamato, all of Chiba, Japan, assignors to Kawasaki Steel Corp. and Dai Nippon Toryo Co., Ltd., Japan

Continuation of Ser. No. 485,455, Feb. 27, 1990, abandoned.
This application Nov. 7, 1991, Ser. No. 790,142
Claims priority, application Japan, Feb. 27, 1989, 1-45976; Feb. 27, 1989, 1-45977; Jun. 21, 1989, 1-159324; Jul. 26, 1989, 1-193753
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—623 17 Claims

10. A steel plate with an organic coating having improved corrosion resistance comprising a steel plate at least one side of which is plated with zinc or a zinc alloy and thereafter coated with a chromate solution that is adhered in an amount of 5–500 mg/m^2 in terms of metallic chromium, has a molar ratio of trivalent chromium to total chromuium (Cr^{3+}/T-Cr) in the range of 0.05–0.7 and contains zinc oxide in such an amount that the molar ratio of total chromium to zinc oxide (T-Cr/ZnO) is in the range of 4–25, and contains a silica sol in an amount of 50–300% of total chromium, the applied chromate solution having a baked solid film overlay present in an amount of 0.1–4.0 g/m^2 and comprising a paint composition consisting of 100 parts by weight of a modified epoxy resin having 0.8–1.0 mole of a dialkanolamine per equivalent of epoxy groups in an epichlorohydrin-bisphenol A epoxy resin having 500–5,000 epoxy equivalents, 0.5–10 parts by weight of a silane coupling agent, 5–70 parts by weight of an amino resin, and 10–150 parts by weight on a solids basis of silica.

5,147,731

STABILIZED ZIRCONIA/COCRALY HIGH TEMPERATURE COATING

Charles M. Gilmore, Great Falls, Va.; Earl F. Skelton, Washington, D.C.; Louis F. Aprigliano, Riva, Md., and Syed B. Qadri, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 574,855, Aug. 30, 1990, abandoned.
This application Sep. 11, 1991, Ser. No. 759,149
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—633 6 Claims

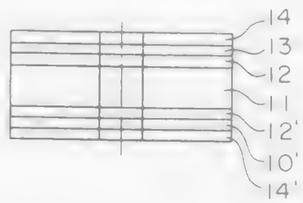
1. A corrosion resistant structure comprising an outer ceramic layer resistant to oxidation at high temperatures over a base alloy selected from the group consisting of CoCrAlY and NiCrAlY, said outer ceramic layer being comprised of alumina stabilized zirconia, wherein said alumina stabilized zirconia consists of from about 40 to about 50 weight percent zirconium, from about 32 to about 36 weight percent oxygen and from about 18 to about 24 weight percent aluminum, and wherein said outer ceramic layer has been applied to said base alloy by physical vapor deposition, and further wherein said outer ceramic layer has a thickness of from about 0.5 μm to about 200 μm.

5,147,732

LONGITUDINAL MAGNETIC RECORDING MEDIA AND MAGNETIC MEMORY UNITS

Yoshihiro Shiroishi, Hachioji; Takeo Yamashita, Tachikawa; Sadao Hishiyama, Sayama; Noriyuki Kumasaka, Ome; Yoshibumi Matsuda, Kokubunji; Hiroyuki Suzuki, Kawasaki; Kazumasa Takagi, Nishitama; Norikazu Tsumita, Kanagawa; Masaki Ohura, Odawara, and Tomoyuki Ohno, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,988
Claims priority, application Japan, Sep. 28, 1988, 63-241102
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—668 34 Claims



1. A longitudinal magnetic recording medium comprising a composite magnetic film formed on a nonmagnetic substrate directly or through a nonmagnetic underlayer, in which all of the magnetic thin metal films constituting the composite magnetic film are magnetically coupled so as to have a single in-plane coercivity, and the in-plane coercivity is greater than the in-plane coercivity of a longitudinal magnetically anisotropic magnetic thin film constituting a magnetic thin metal film nearest to an information recording side among the magnetic thin metal films constituting the composite film.

5,147,733

METHOD OF ROLLING METAL IN A FOUR-HIGH OR SIX-HIGH ROLL STAND IN A HOT CONTINUOUS ROLLING MILL TRAIN WITH A COMPOSITE BIMETALLIC SUPPORT ROLL

Jean-Claude Werquin, Ronchin, and Jacques Bocquet, Maubeuge, both of France, assignors to Chavanne-Ketin Institut de Recherches de la Siderugie Francaise, Puteaux, France

Division of Ser. No. 415,302, filed as PCT/FR88/00624, Dec. 19, 1988, abandoned. This application May 28, 1991, Ser. No. 706,418
Claims priority, application France, Dec. 23, 1987, 87 18069
Int. Cl.[5] B32B *15/00*
U.S. Cl. 428—683 5 Claims

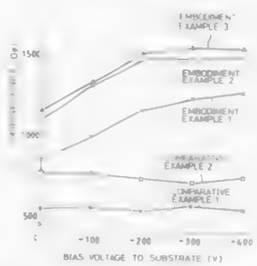
1. A method of rolling metal in a four-high or six-high roll stand in a hot continuous rolling mill train with a composite bimetallic support roll, wherein the support roll comprises an envelope metal of steel with a chromium content of between 13 and 17% by weight, and a carbon content of between 0.5 and 0.8% by weight, the chromium/carbon ratio being between 20 and 25.

5,147,734

MAGNETIC RECORDING MEDIA MANUFACTURED BY A PROCESS IN WHICH A NEGATIVE BIAS VOLTAGE IS APPLIED TO THE SUBSTRATE DURING SPUTTERING

Kyuzo Nakamura; Yoshifumi Ota; Michio Ishikawa; Noriaki Tani, and Masanori Hashimoto, all of Yachimata, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Mar. 14, 1989, Ser. No. 323,452
Claims priority, application Japan, Mar. 15, 1988, 63-59537
Int. Cl.[5] G11B *5/00*; C23C *14/00*
U.S. Cl. 428—694 10 Claims



7. A magnetic recording member manufactured by a process which comprises the steps of:
(a) forming by sputtering a Cr film on a non-magnetic substrate;
(b) forming by sputtering an epitaxially grown film of a Co alloy containing at least Cr as an additional metal directly on the Cr film formed in the step (a);
wherein a negative bias voltage is applied to the substrate during the entire duration of step (b), and a negative bias voltage is optionally applied to the substrate during the entire duration of step (a).

5,147,735

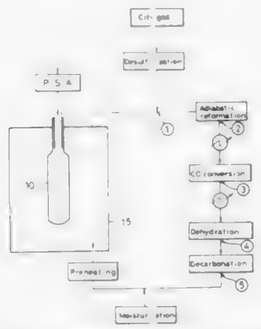
METHOD OF OPERATING A SOLID ELECTROLYTE FUEL CELL

Masamichi Ippommatsu; Akira Hirano, both of Hyogo, and Hirokazu Sasaki, Osaka, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Jun. 4, 1990, Ser. No. 533,268
Claims priority, application Japan, Jun. 9, 1989, 1-147973
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—17 1 Claim

1. A method of operating a solid electrolyte fuel cell including a plurality of cells each comprising either a porous support

adapted to provide a cell with structural integrity and serially superimposed thereon an air electrode, an electrolyte and a fuel electrode in the order mentioned or a porous air electrode which doubles as a support and serially superimposed thereon an electrolyte and a fuel electrode in the order mentioned, comprising supplying oxygen-enriched air to said air electrode,



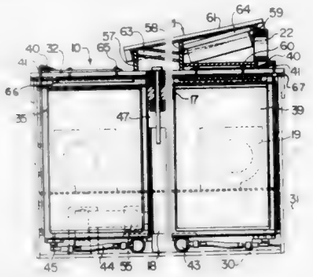
preparing a fuel by steam reformation of a hydrocarbon followed by subjecting the reformed hydrocarbon to CO conversion, dehydration and decarbonation in the order mentioned, then supplying said fuel to said fuel electrode, recycling said fuel, and mixing the recycled fuel with the hydrocarbon prior to the steam reformation.

5,147,736

METAL/AIR FUEL CELL WITH ELECTROLYTE FLOW EQUALIZATION MANIFOLD

Steven P. Lapp, Sydenham, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Oct. 9, 1991, Ser. No. 773,510
Int. Cl.[5] H01M *8/04, 4/00*
U.S. Cl. 429—27 **6 Claims**



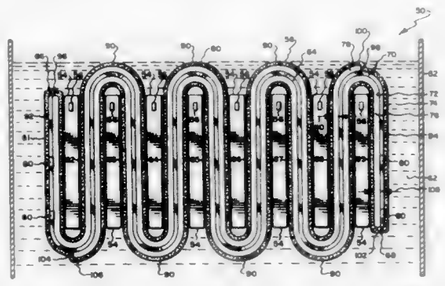
1. A fuel cell assembly comprising:
(a) a housing,
(b) a plurality of metal/air cells disposed vertically in the housing,
(c) air injection means for flowing oxidized air between the metal/air cells,
(d) an electrolyte storage tank,
(e) a recirculation loop for continuously recirculating electrolyte from the storage tank through the metal/air cells,
(f) an electrolyte inlet manifold forming part of said recirculation loop, said manifold comprising a large manifold tube extending horizontally beneath a plurality of said metal/air cells and a plurality of small feeder tubes extending horizontally, laterally from said large tube, each small feeder tube extending across beneath a single metal/air cell and flow connecting to the bottom of the cell, said large tube having a diameter sufficiently greater than the diameter of the small feeder tubes such that the total combined flow of all of the small feeder tubes does not cause a significant pressure drop in the large manifold tube.

5,147,737

ELECTROCHEMICAL CELL WITH IMPROVED EFFICIENCY SERPENTINE ELECTRODE

Clifford J. Post, East Amherst, and Esther S. Takeuchi, Williamsville, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed May 7, 1991, Ser. No. 696,711
Int. Cl.[5] H01M *4/00, 6/10*
U.S. Cl. 429—94 **15 Claims**



1. A cell for providing an electric current comprising a casing, a first electrode means in said casing, a second electrode means in said casing, an electrolyte in said casing and in contact with said first and second electrode means, means for providing electrical connection to said first electrode means, means for providing electrical connection to said second electrode means, and means for separating said first and second electrode means, said first electrode means comprising a plurality of plates in spaced apart relation, and said second electrode means comprising an elongate sheet of electrically conductive material having a pair of sides, a pair of longitudinal edges, and a pair of end edges and which is folded at spaced intervals along the length thereof to form a serpentine-like structure having a plurality of spaced sections, said plates disposed between said sections respectively in an alternating relationship, said second electrode means further comprising at least one layer of electrode active material on each of said sides, said plurality of spaced sections including a pair of end sections each having a side which is a portion of one of said sheet sides and which faces outwardly of said serpentine-like structure whereby said end section side does not face any of said plates, said at least one layer of electrode active material on said one sheet side extends along the length of said sheet to and terminates at the fold defining said end section side whereby said end section side is substantially free of electrode active material.

5,147,738

NONAQUEOUS ELECTROLYTE SECONDARY BATTERY

Yoshinori Toyoguchi, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

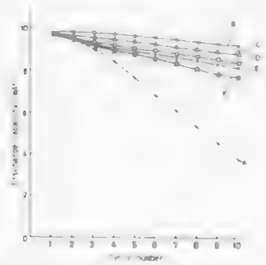
Filed Oct. 4, 1990, Ser. No. 592,488
Claims priority, application Japan, Oct. 6, 1989, 1-262430
Int. Cl.[5] H01M *4/52*
U.S. Cl. 429—194 **9 Claims**

1. A nonaqueous electrolyte secondary battery comprising:
an anode containing lithium or lithium compound,
a nonaqueous electrolyte containing lithium compound, and,
a cathode having a cathode active material represented by expression:

$$Li_xCo_{(1-y)}M_yO_2$$

wherein X and Y are defined as follows:

$0.85 \leqq X \leqq 1.3$,



$0.05 \leqq Y \leqq 0.35$,

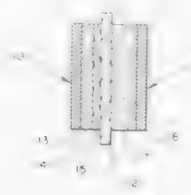
wherein M is a metal of at least one member selected from the group consisting of W, Ta, Ti and Nb.

5,147,739

HIGH ENERGY ELECTROCHEMICAL CELL HAVING COMPOSITE SOLID-STATE ANODE

Kirby W. Beard, Perkasie, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 1, 1990, Ser. No. 561,134
Int. Cl.[5] H01M *6/14, 4/58*
U.S. Cl. 429—194 **27 Claims**



1. An improved composite anode for high rate non-aqueous electrochemical cells including both primary and secondary cells comprising:
(a) a reversible lithium intercalation material selected from transition metal chalcogenides having a metastable phase when contacted with lithium and the ability to reversibly transport lithium ions and having the general formula:

$$Li_xM_aX_b$$

where
M is selected from transition metals having a reversible lithium insertion ability and a relatively low potential vs. lithium,
X is selected from O, S, and Se,
x, a and b are numbers representing relative combining rations where

$0 < x < 9$

$0.5 \leqq a \leqq 6$ and

$1.0 \leqq b \leqq 9$

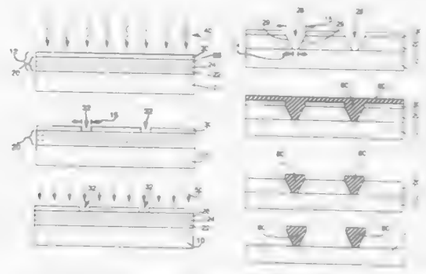
(b) an amount of material selected from lithium or a lithium alloy or combinations thereof;
(c) wherein the node intercalation material is disposed to function as an intermediary ion transport medium between the lithium or lithium alloy and an electrolyte.

5,147,740

STRUCTURE AND PROCESS FOR FABRICATING CONDUCTIVE PATTERNS HAVING SUB-HALF MICRON DIMENSIONS

Gerald D. Robinson, Westlake Village, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Aug. 9, 1990, Ser. No. 564,996
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 **7 Claims**



1. A method of masking a semiconductor substrate comprising:
selecting a semiconductor substrate;
depositing a first portion over said semiconductor substrate, said first portion being formed by depositing a plurality of successive layers over one another with each of said layers having a successively increasing concentration of the deposited material;
depositing a second portion over said first portion;
exposing said second portion to radiation to define a pattern in said second portion;
developing said second portion to define openings through said second portion corrresponding to said pattern;
exposing said first portion to radiation through said openings to define a tapered pattern of exposure of sub-half-micron dimensions adjacent said substrate; and
developing said first portion to form openings tapering from the dimensions of the openings in said second portion to sub-half-micron openings at the interface between said first portion and said substrate in a pattern corresponding to the openings in said second portion.

5,147,741

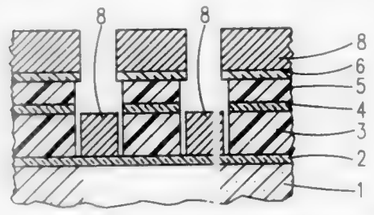
PHENYL-ENDCAPPED DEPOLYMERIZABLE POLYMER

Constance J. Araps, Wappingers Falls; Jon A. Casey, Poughkeepsie, both of N.Y.; Renuka S. Divakaruni, Ridgefield, Conn.; Steven M. Kandetzke, Poughkeepsie, and Catherine A. Lotsko, Beacon, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 423,505, Oct. 13, 1989, Pat. No. 4,987,211, which is a continuation of Ser. No. 28,822, Mar. 20, 1987, abandoned. This application Oct. 23, 1990, Ser. No. 602,013
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 **10 Claims**

1. A method for forming a conductive pattern on a substrate which comprises the steps of:
depositing over said substrate a blanket layer of a depolymerizable polymer selected from the group consisting of phenyl-endcapped poly (methyl methacrylate) and phenyl-endcapped poly (alpha-methyl styrene);
patterning said depolymerizable polymer to form a mask complementary to the desired metal pattern; coating a blanket layer of a conductive material over said mask;

thermally depolymerizing said mask to cause said blanket layer of conductive material to spontaneously delaminate



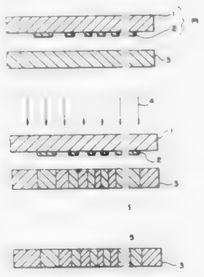
and roll up; and removing said depolymerized mask and the conductive material thereon.

5,147,742

PHOTOMASK AND FABRICATION OF THE SAME

Yasutaka Ban, Yokohama, and Kazuo Tokitomo, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 450,955 Dec. 15, 1989, abandoned. This application May 24, 1991, Ser. No. 707,220
Claims priority, application Japan, Dec. 20, 1988, 63-325077
Int. Cl.[5] G03F *1/00*
U.S. Cl. 430—5 **11 Claims**



3. A method for fabricating a photomask to be used for photolithography, said method comprising the steps of:

arranging an original photomask opposed to a substrate of a single layer of material, said substrate transmitting light ranging from ultraviolet light to deep ultraviolet light, said original photomask having an original pattern provided on an original substrate, said original substrate transmits light ranging from ultraviolet light to deep-ultraviolet light, said original pattern absorbing light ranging from visible light to deep-ultraviolet light; and

forming a pattern including a color center corresponding to said original pattern on said substrate by irradiating said substrate with light, having a wavelength shorter than that of ultraviolet light, through said original photomask.

5,147,743

PROCESS FOR THE PREPARATION OF OPTICAL COLOR FILTERS

Mario Grossa, Dreieich, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 28, 1990, Ser. No. 545,045
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—7 **14 Claims**

1. A process for the preparation of a monochromatic or polychromatic color filter by

(a) applying a negative-working, light-sensitive, tonable layer onto a transparent support,

(b) imagewise exposing in a pattern corresponding to a spatial configuration of a filter element color,

(c) toning the layer with colored toner present as a coalescible powder,

(d) subjecting the toned layer to a heat treatment wherein said heat treatment consists essentially of heating at a temperature below 240° C. and wherein said heating coalesces the colored toner powder.

5,147,744

MICR PROCESSES WITH COLORED ENCAPSULATED COMPOSITIONS

Guerino G. Sacripante, Cambridge; Richard P. N. Veregin; Beng S. Ong, both of Mississauga, and Padam K. Angra, Brampton, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1991, Ser. No. 665,550
Int. Cl.[5] G03G *19/00, 9/083*
U.S. Cl. 430—39 **27 Claims**

1. A colored magnetic encapsulated toner composition consisting essentially of a core comprised of a polymer binder, magnetic metal particles, whitener, color pigment, dye or mixtures thereof, and which core is encapsulated in a polymeric shell, and wherein the toner surface comprises conductive metal oxide, or metal oxides and an optional release additive, or additives; and wherein the magnetic metal particles exhibit a magnetic saturation moment of from about 85 to about 400 emu per gram, a remanence of from about 25 to about 300 Gauss, a coercivity of from about 70 to about 1,600 Oersteds, and where the ratio of the magnetic saturation moment in emu per gram to the coercivity in Oersteds is from about 2 to 1 to about 1 to 5, and wherein the average particle diameter of the toner is from about 0.5 to about 6 microns.

17. A magnetic image character recognition process which comprises developing the images or characters formed in a magnetic image character recognition process with the encapsulated toner composition of claim 1.

5,147,745

APPARATUS FOR PRODUCING RAISED MULTIPLE COLOR IMAGES

Matthew J. Russel, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1990, Ser. No. 604,272
Int. Cl.[5] G03G *13/26*
U.S. Cl. 430—49 **4 Claims**

1. A method for producing a raised multiple color image on a substrate, the method comprising the steps of:

(a) forming a first latent image electrostatically on an image-bearing member;

(b) forming a second latent image electrostatically on an image-bearing member;

(c) toning said first and second latent images with toner particles of a first color and of a second color, respectively;

(d) forming a third latent image electrostatically on an image-bearing member, such that said third latent image is a combination of said first and second latent images;

(e) toning said third latent image with colorless toner particles; and

(f) transferring said first, second, and third toner particle toned images, in registration, onto the substrate such that said third image is directly on top of said first and second images.

5,147,746

POWDERED DEVELOPER MATERIAL HAVING SPECIFIC PARTICLE DIAMETER DISTRIBUTION

Mitsura Ohta, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 23, 1990, Ser. No. 601,400
Claims priority, application Japan, Oct. 23, 1989, 1-275399; Oct. 26, 1989, 1-279227
Int. Cl.[5] G03G *9/09*
U.S. Cl. 430—106 **17 Claims**

1. Developer toner comprising: developer material particles color-reactable with dye or dye precursor to form a color image, the developer material particles having a particle-diameter distribution, a maximum particle-diameter of said particle-diameter distribution being not greater than the second power of an average particle diameter on volume-basis of said particle-diameter distribution.

5,147,747

LOW FUSING TEMPERATURE TONE POWDER OF CROSSLINKED CRYSTALLINE AND AMORPHOUS POLYESTERS

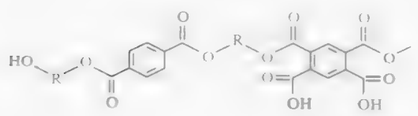
John C. Wilson, and Lawrence P. DeMejo, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,010
Int. Cl.[5] G03G *9/00*
U.S. Cl. 430—109 **8 Claims**

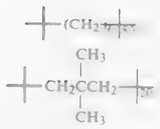
1. A process for preparing a polymer for a low fusing temperature toner powder comprising the steps of:

(a) admixing;

(1) about 25 to about 75 weight percent of a low molecular weight, crystalline polyester that has been esterified with pyromellitic dianhydride and has the formula:

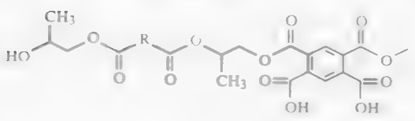


Where R =



and has a glass transition temperature in the range of about −20° to about 60° C., a melting temperature in the range of about 60° to about 120° C., a number average molecular weight in the range of about 1,500 to about 5,000 and a weight average molecular weight in the range of about 3,000 to about 10,000, and containing about 2 carboxyl groups per molecule;

(2) about 25 to about 75 weight percent of a low molecular weight, amorphous polyester that has been esterified with pyromellitic dianhydride and has the formula:



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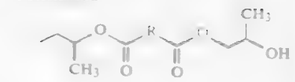
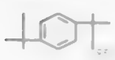
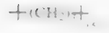


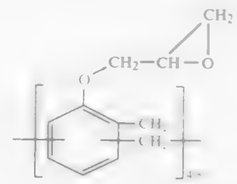
Where R =





and has a glass transition temperature in the range of about 50° to about 90° C., a number average molecular weight in the range of about 1,500 to about 5,000 and a weight average molecular weight in the range of about 3,000 to about 10,000, and containing about 2 carboxyl groups per molecule;

(3) about 2 to about 10 weight percent of a low molecular weight epoxy novolac resin that has the formula:



and has an epoxy functionality of about 4.8; and

(4) about 0.5 to about 4 weight percent of a crosslinking catalyst; and

(b) melt blending said mixture at a temperature in the range of about 90° to about 180° C.

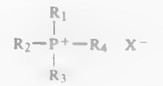
5,147,748

USE OF COLORLESS HIGHLY FLUORINE-SUBSTITUTED PHOSPHONIUM COMPOUNDS AS CHARGE CONTROL AGENTS FOR ELECTROPHOTOGRAPHIC RECORDING PROCESSES

Jörg Gitzel, Hattersheim am Main; Hans-Tobias Macholdt, Darmstadt, and Wolfgang Knaup, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 12, 1990, Ser. No. 508,852
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1989, 3912396
Int. Cl.[5] G03G *9/097*
U.S. Cl. 430—110 **8 Claims**

1. A method for effecting in toners and developers a positive or negative charge control effect (for electrophotogrpahic recording processes) comprising the step of incorporating the compounds of the formula (I)



(I)

in which R_1 to R_4 are hydrogen atoms or organic radicals, at least one of the radicals R_1 to R_4 being a straight-chain or branched, fluorine-substituted, unsaturated and/or saturated alkyl radical having 1 to 30 carbon atoms and 3 to 50 fluorine atoms, which can contain further halogen atoms, hydroxyl and/or chloromethyl and/or carboxamide and/or sulfonamide and/or urethane and/or keto and/or amino and/or R_5-O-R_6

and/or R_7-C(O)-O-R_8 groups in which R_5, R_6, R_7 and R_8 are alkyl (C_1–C_{30}) radicals, or a fluorine-substituted aryl radical, or an aralkyl radical fluorine-substituted on the aromatic ring, it being possible for the aryl or aralkyl radical to be additionally substituted on the aromatic ring by saturated or unsaturated, straight-chain or branched alkyl(C_1–C_{30}), alkoxy(C_1–C_{30}), halogenalkyl, halogenoalkoxy-(C_1–C_{30}), or hydroxyl groups or further halogen atoms, and in the case of an aralkyl radical the alkyl bridge between the phosphorus atom and the aromatic ring contains 1 to 30 carbon atoms, and no more than three of the radicals R_1 to R_4, independently of one another, are hydrogen atoms, straight-chain or branched, unsaturated or saturated, substituted or unsubstituted alkyl radicals having 1 to 30 carbon atoms, aryl radicals or aralkyl radicals, it being possible for the aryl or aralkyl radicals to be substituted on the aromatic ring by alkyl(C_1–C_{30}), alkoxy(C_1–C_{30}), halogenalkyl(C_1–C_{30}), halogenoalkoxy(C_1–C_{30}) or hydroxyl groups or halogen atoms, and X is an organic or inorganic anion, it being possible for the radicals R_1 to R_4 to contain a COO or SO_3 group as substitutent and X in this case becoming superfluous, including the step of providing said compounds as colorless charge control agents having a positive or negative control effect in toners and developers for electrophotographic recording processes.

5,147,749

TONERS AND DEVELOPERS CONTAINING N-SUBSTITUTED QUINOLINIUM SALTS AS CHARGE CONTROL AGENTS

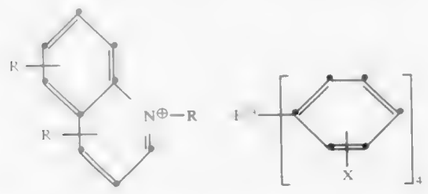
Peter S. Alexandrovich, and John C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1990, Ser. No. 560,695

Int. Cl.[5] G03G *9/00*

U.S. Cl. 430—110 **11 Claims**

1. A dry, particulate, electrostatographic toner composition comprising a polymeric binder and a charge control agent comprising an N-substituted quinolinium salt having the structure



wherein R is a straight or branched chain alkyl group having from 1 to 5 carbon atoms, aralkyl in which the alkyl group has 1 to 20 carbon atoms and the aryl group has from 6 to 14 carbon atoms, R′ and R″, which are the same or different, represent hydrogen or a straight or branched chain alkyl or alkoxy group having from 1 to 24 carbon atoms, aralkyl or alkaryl in which the alkyl group has 1 to 20 carbon atoms and the aryl group has from 6 to 14 carbon atoms, unsubstituted aryl having from 6 to 14 carbon atoms or aryl having from 6 to 14 carbon atoms substituted with one or more nitro, alkoxy or halo groups and X is hydrogen, chlorine, bromine, fluorine or iodine.

5,147,750

ELECTROPHOTOGRAPHIC TONER AND CHARGE CONTROLLER THEREFOR

Hideo Nakanishi, Ohtsu, Japan, assignor to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Jun. 13, 1990, Ser. No. 538,094

Claims priority, application Japan, Jun. 13, 1989, 1-151361

Int. Cl.[5] G03G *9/087*

U.S. Cl. 430—110 **21 Claims**

1. An electrophotographic toner, which comprises a toner binder and a charge controlling polymer, said polymer comprising moiety of (A) a polymer having amino group-containing monomer units and moiety of (B) at least one polymer selected from the group consisting of styrenic polymers, olefinic polymers, polyesters, epoxy resins and polyurethanes; the moiety of (A) and the moiety of (B) being linked block-wise or graft-wise, or in combination; wherein the amino group is selected from the group consisting of primary, secondary and tertiary amino groups, salts thereof and quaternary ammonium salts; wherein the weight ratio of the toner binder to said polymer is 99:1–50:50.

5,147,751

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR AND ELECTROPHOTOGRAPHIC COPYING PROCESS AND APPARATUS USING THE PHOTOCONDUCTOR

Narihito Kojima; Hiroshi Nagame, both of Numazu; Mitsuru Seto, Kanagawa; Takashi Rokutanzono, and Shinji Nousho, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 459,348, Dec. 29, 1989, abandoned.

This application Oct. 22, 1991, Ser. No. 780,454

Claims priority, application Japan, Jan. 13, 1989, 1-4745; Oct. 12, 1989, 1-263815

Int. Cl.[5] G03G *13/22*

U.S. Cl. 430—125 **9 Claims**

1. An electrophotographic copying process comprising the steps of:

charging uniformly an electrophotographic photoconductor to a predetermined polarity in the dark, which comprises (a) an electroconductive support, (b) a photoconductive layer formed thereon comprising a selenium alloy, and (c) a protective layer, formed on said photoconductive layer, consisting essentially of a binder resin component and an anti-oxidizing agent;

exposing the uniformly charged electrophotographic photoconductor to a light image to form a latent image thereon corresponding to said light image;

developing said latent electrostatic image with a toner to a visible toner image;

transferring said visible toner image to a transfer sheet;

cleaning the surface of said electrophotographic photoconductor to eliminate residual toner from the surface thereof; and

abrading the surface of said protective layer with a predetermined rate so as to expose said anti-oxidizing agent contained in said protective layer.

5,147,752

PROCESS FOR PRODUCING ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 30, 1990, Ser. No. 607,328

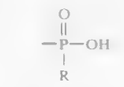
Claims priority, application Japan, Oct. 31, 1989, 1-282029; Jan. 25, 1990, 2-13739

Int. Cl.[5] G03G *5/05*

U.S. Cl. 430—134 **13 Claims**

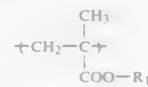
1. A process for producing an electrophotographic light-sensitive material comprising a support having provided thereon a photoconductive layer containing an inorganic photoconductive substance and a binder resin, which comprises mixing the inorganic photoconductive substance and the binder resin to prepare a dispersion for forming the photoconductive layer, and coating the dispersion on the support, wherein said binder resin contains at least one resin (A) which has a weight average molecular weight of from 1×10^3 to 1×10^4 contains a repeating unit represented by the formula (I) shown below as a polymer component, has a crosslinked structure prior to the preparation of the dispersion for forming the photoconductive layer, and

has at least one acidic group selected from a $—PO_3H_2$ group, a $—SO_3H$ group, a —COOH group, a



group

(wherein R represents a hydrocarbon group or a —OR′ group (wherein R′ represents a hydrocarbon group)) and a cyclic acid anhydride-containing group bonded at only one terminal of at least one polymer main chain:



(I)

wherein R_1 represents a hydrocarbon group.

5,147,753

PROCESS FOR PRODUCING TONER FOR DEVELOPING ELECTROSTATIC IMAGE

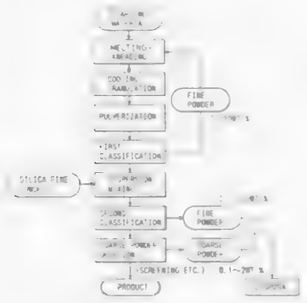
Norio Hikake, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,652

Claims priority, application Japan, Sep. 19, 1989, 1-240836

Int. Cl.[5] G03G *9/08*

U.S. Cl. 430—137 **16 Claims**



1. A process for producing a toner for developing an electrostatic image, comprising:

a first classification step for classifying a colored resin powder containing at least a resin and a coloring agent to remove a first fine powder to provide a classified powder having a given particle size, wherein the fine powder removed in the first classification step is recycled as a material for the colored resin powder;

a mixing step for mixing the classified powder thus obtained and a fine silica powder to provide a mixed powder; and

a second classification step for removing a second fine powder from said mixed powder.

5,147,754

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okamura; Hisashi Okada; Morio Yagihara, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 511,165, Apr. 19, 1990, abandoned.

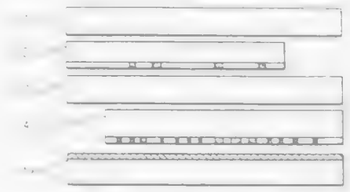
This application Aug. 7, 1991, Ser. No. 742,070

Claims priority, application Japan, Apr. 21, 1989, 1-102394

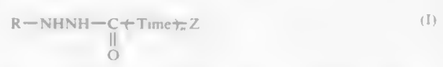
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] G03C *1/06*

U.S. Cl. 430—264 **14 Claims**



1. A silver halide photographic material containing a compound represented by the formula (I):



(I)

wherein R represents an aliphatic group, an aromatic group, or a heterocyclic group, which may be substituted by a group which accelerates adsorption onto silver halide or by a ballast group; Z represents a development inhibitor group containing an anionic functional group which is a member selected from the group consisting of a carboxyl group, a sulfo group, a sulfamoyl group, or a salt thereof as a partial structure; "Time" represents a divalent group which contains a hetero atom and which connects to the carbonyl group through the hetero atom; and n is 0 or 1.

5,147,755

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kazunobu Katoh, and Hisashi Okada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

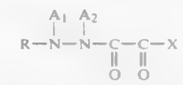
Continuation of Ser. No. 658,431, Feb. 20, 1991, abandoned, which is a continuation of Ser. No. 417,536, Oct. 5, 1989, abandoned. This application Aug. 9, 1991, Ser. No. 745,956

Claims priority, application Japan, Oct. 5, 1988, 63-251213

Int. Cl.[5] G03C *1/06*

U.S. Cl. 430—264 **17 Claims**

1. An ultra-high contrast negative type silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer and containing in said emulsion layer or another hydrophilic colloid layer formed on said support (i) at least one hydrazine derivative represented by formula (I)



(I)

wherein A_1 and A_2 both represent hydrogen atoms, or one represents a hydrogen atom and the other represents a sulfinic acid residual group or an acyl group, R represents an aliphatic group, an aromatic group or a heterocyclic group, and X represents a group as indicated by formulae (II) and (III).

(II)

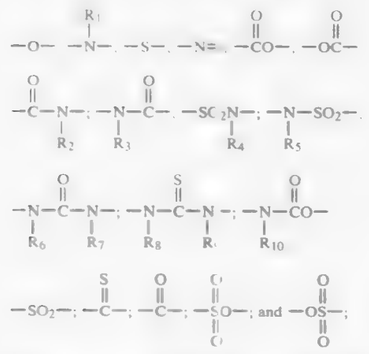
wherein X_1 and X_2 each represent a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, and X_1 and X_2 may be joined together to form a ring,

(III)

wherein X_3 represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group or a heterocyclic group; and (ii) at least one compound represented by formula (IV)

(IV)

wherein Y_0 represents a group which promotes adsorption on silver halide which is selected from the group consisting of a nitrogen-containing heterocyclic group, a group with a thioamide linkage, a mercapto group and a group with disulfide linkage, A_0 represents a divalent linking group comprising an atom or a group of atoms selected from carbon atoms, nitrogen atoms, oxygen atoms and sulfur atoms, a straight chain or branched alkylene group, a straight chain or branched alkenylene group, a straight chain or branched aralkylene group, a straight chain or branched alkynylene group, an arylene group,



and groups that can be formed using any combination of these groups wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10} each represent a hydrogen atom, or substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, or a substituted or unsubstituted aralkyl group, B represents an amino group, an ammonium group or a nitrogen-containing heterocyclic group, m represents 1, 2 or 3, and n represents 0 or 1.

5,147,756

STABILIZED, AQUEOUS HYDRAZIDE SOLUTIONS FOR PHOTOGRAPHIC ELEMENTS

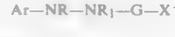
Ludovic Fodor, Jamesburg, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 11, 1991, Ser. No. 684,132

Int. Cl.[5] **G03C** *1/34*

U.S. Cl. 430—264 **7 Claims**

1. A process for the stabilization of an aqueous solution of an aryl hydrazide of the general formula:



wherein:

Ar is a substituted phenyl group or another substituted or unsubstituted aryl group;

G is CO, SO, SO_2, PO_2, PO_3, and $C{=}NR_2$;

X^+ is a radical containing a cationic group;

R, R_1, R_2, which can be the same or different, are hydrogen, alkyl of 1–6 carbon atoms, and alkyl sulfinyl of 1–6 carbon atoms; and

A^- is an anion,

the improvement comprising adding to said aqueous solution a stabilizing amount of a stabilizer/antioxidant selected from the group consisting of ascorbic acid, an ascorbic acid isomer, tartaric acid, citric acid, glucose, α-cyclodextrin, β-cyclodextrin and gamma-cyclodextrin, and mixtures thereof.

5,147,757

OPTICALLY TRANSPARENT POLYMER ALLOY AND ITS USE IN MOLDING MATERIALS, MOLDINGS, FILMS, COATINGS, ADHESIVES AND PHOTOSENSITIVE RECORDING ELEMENTS

Karl-Rudolf Kurtz, Heidelberg; Horst Koch, Gruenstadt, and Thomas Telser, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 476,938, Feb. 8, 1990, abandoned. This application Sep. 17, 1991, Ser. No. 759,979

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905947

Int. Cl.[5] **G03C** *1/74;* **C08L** *23/26;* **B32B** *27/28*

U.S. Cl. 430—270 **8 Claims**

1. A photosensitive recording element for the production of relief printing plates, containing a dimensionally stable substrate and a photopolymerizable relief-forming recording layer consisting essentially of

(i) at least one optically transparent polymer alloy comprising

A) at least one elastomer which contains ethylene and propylene as a copolymerized units and

B) at least one elastomer which contains ethylene and (meth)acrylic acid as copolymerized units, as a polymeric binder and

(ii) at least one photopolymerizable olefinically unsaturated monomer and

(iii) at least one photopolymerization initiator.

5,147,758

RED SENSITIVE PHOTOPOLYMERIZABLE COMPOSITIONS

William K. Smothers, Hockessin, Del.; Gregory C. Weed, Towanda, Pa.; Evan D. Laganis, Wilmington, Del., and George Lalka, Lindenwold, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1991, Ser. No. 657,736

Int. Cl.[5] **G03F** *7/032, 7/031, 7/029*

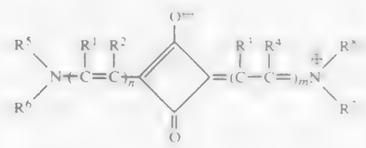
U.S. Cl. 430—281 **42 Claims**

1. A photopolymerizable composition comprising:

(A) an ethylenically unsaturated monomer; and

(B) an initiator system, said initiator system comprising:

(1) a squarylium compound selected from the group consisting of:



(a)

wherein:

R^1, R^2, R^3, and R^4 are each independently hydrogen, hydroxyl, halogen, alkyl of one to six carbon atoms,

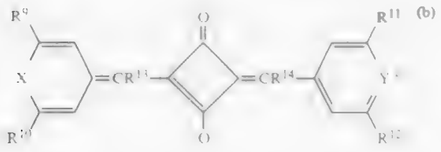
or substituted or unsubstituted aryl or heteroaryl group having from 5 to 10 atoms;

R^5, R^7, and R^8 are each independently hydrogen, a substituted or unsubstituted alkyl or cycloalkyl group having from 1 to 6 carbon atoms or a substituted or unsubstituted aryl or heteroaryl group having from 5 to 10 atoms;

or any of R^1, R^2, R^3, and R^4 groups are combined with any of R^5, R^6, R^7, and R^8 and/or with each other to a form a 5- to 7-membered substituted or unsubstituted carbocyclic or heterocyclic ring;

or any of R^5, R^6, R^7, and R^8 are joined together to form a 5- to 7-membered substituted or unsubstituted nitrogen-containing heterocyclic ring; and

n and m are each independently 1 to 3; and



(b)

wherein

X and Y are each independently oxygen or sulfur and R^9, R^{10}, R^{11}, R^{12}, R^{13}, and R^{14} are each independently alkyl groups from one to eight carbon atoms; and

(2) a borate salt containing (a) an alkali metal cation or a quarternary ammonium cation and (b) a borate anion container represented by the formula:

$(BZ^1Z^2Z^3Z^4)^-$

wherein

Z^1, Z^2, Z^3, and Z^4, the same or different, are selected from the group consisting of alkyl, aryl, aralkyl, alkenyl, alkynyl, alicyclic, heterocyclic, and allyl groups, with the proviso that at least one of Z^1, Z^2, Z^3, and Z^4 is not aryl.

21. The composition of claim 1 additionally comprising an s-triazine comprising at least one halogenated methyl group.

5,147,759

PHOTOPOLYMERIZABLE COMPOSITIONS

Shigeru Ohtawa, Yamato; Junichi Onodera, Samukawa, and Kouji Harada, Yamato, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 332,917, Apr. 4, 1989, abandoned. This application Dec. 6, 1990, Ser. No. 622,320

Claims priority, application Japan, Apr. 15, 1988, 63-91262

Int. Cl.[5] **G03F** *7/033*

U.S. Cl. 430—285 **5 Claims**

1. A composition for forming a dry film resist, comprising a photopolymerizable composition dispersed or dissolved in an organic solvent, said photopolymerizable composition consisting essentially of

(a) a linear acrylic compolymer having a weight average molecular weight of 30,000 to 200,000 and a glass transition point of 20°–80° C.;

(b) an ethylenically-unsaturated component; and

(c) a photoinitiator the weight ratio of the ethylenically unsaturated component to the acrylic copolymer being 0.1:1 to 1:1 and the ethylenically-unsaturated component (b) comprising 10–50 wt. %, based on the total amount of component (b), of an acrylic ester of the formula $CH_2{=}C(X)\text{-}COO\text{-}Y\text{-}OCO\text{-}Z\text{-}COOH$, wherein X is selected from the group consisting of hydrogen and methyl, Y is (C_1–C_3) alkylene, and Z is selected from the group consisting of a single bond, (C_1–C_8) alkylene, phenylene and cyclohexylene.

5,147,760

METHOD OF EXPOSING PRINTED WIRING BOARDS HAVING THROUGH HOLES

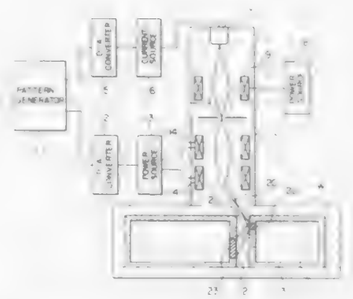
Susumu Hoshinoughi; Akio Yoshida, and Akinobu Kawazu, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,646

Claims priority, application Japan, Jul. 21, 1989, 1-189769; Jul. 21, 1989, 1-189770

Int. Cl.[5] **G03F** *7/20*

U.S. Cl. 430—296 **3 Claims**



1. A method of exposing a resist formed on a substrate having at least one cylindrical through hole, wherein said resist covers a wall surface of the cylindrical through hole as well as a planar surface of the substrate, said method comprising the steps of:

irradiating an opening area of the through hole and the planar surface of the substrate with an exposure energy beam according to a predetermined pattern;

controlling an amount of exposure per unit area over the opening area of the cylindrical through hole to not less than 2h/r times an amount of exposure per unit area over the planar surface of the substrate, wherein h is the depth of the cylindrical through hole and r is the radius of the cylindrical through hole; and

positioning the exposure energy beam so that the beam is incident on the opening area of the through hole at an irradiation inclination angle with respect to a normal to the opening area of the through hole, such that a first portion of the wall-surface of the through hole is irradiated by an incident beam and a second portion of the wall surface of the through hole is irradiated by a beam reflected from the first portion, whereby the first and second wall portion are irradiated simultaneously.

5,147,761

METHOD FOR PREPARING RELIEF IMAGE PRINTING PLATES

Forrest A. Wessells, Deltona, Fla.; Edward T. Murphy, Douglasville, and Steven A. Tamburnini, Atlanta, both of Ga., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 11, 1990, Ser. No. 535,819

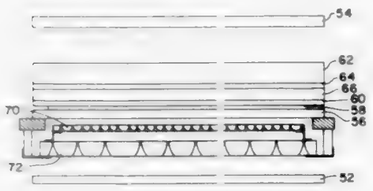
Int. Cl.[5] **G03F** *7/00*

U.S. Cl. 430—306 **12 Claims**

1. A method for producing a high resolution latent relief image comprising the steps of:

positioning an image bearing negative transparency closely adjacent and substantially parallel to a layer of a photocurable material; positioning on the side of the negative transparency opposite said layer of photocurable material and substantially parallel thereto at least two louvers in series, each of said louvers having a plurality of open cells, each cell extending through the louver along an axis perpendicular to said negative transparency and having reflective cell walls contoured to reflect and redirect rays of radiant

energy incident thereon to a direction more normal to the negative transparency surface, each of said louvers having different cell outlet areas; and



passing radiant energy which is capable of curing said photocurable material through each of said louvers and said negative transparency and onto said layer of photocurable material for a time sufficient to form a latent relief image in said layer of photocurable material.

5,147,762

PROCESS FOR PREPARING A ROTARY SILK-SCREEN PRINTING STENCIL FOR PRINTING

Wilhelmus J. F. Verheesen, Zwartven, and Arnoldus T. Steenkamer, Oostrum, both of Netherlands, assignors to Stork X-Cel B.V., Netherlands

Filed Apr. 3, 1989, Ser. No. 332,750
Claims priority, application Netherlands, Apr. 16, 1988, 8800991; May 9, 1988, 8801218
Int. Cl.[5] G03F *7/12*
U.S. Cl. 430—308 6 Claims

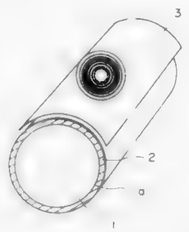
1. Process for preparing a cylindrical rotary silk-screen printing stencil for printing comprising the steps of:
first affixing an end ring to the inside of each end of an uncoated cylindrical stencil;
forming a patterned sealing coating on said uncoated stencil comprising the steps of:
coating said uncoated stencil with a layer of photographic lacquer;
drying said layer;
exposing said layer to light in a pattern;
developing said exposed layer and
hardening said developed layer.

5,147,763

PROCESS FOR PRODUCING MOLDING STAMPER FOR DATA RECORDING MEDIUM SUBSTRATE

Hirofumi Kamitakahara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 422,639, Oct. 17, 1989. This application Jan. 7, 1992, Ser. No. 815,610
Claims priority, application Japan, Oct. 19, 1988, 63-264691
Int. Cl.[5] G03C *5/00*, G11B *3/72*
U.S. Cl. 430—320 13 Claims



1. A process for producing a stamper in the form of a roller to be used for forming a predetermined pattern on a data recording medium substrate, said process comprising the steps of:
forming a layer of a photoresist on a stamper substrate in the form of a roller;
winding a flexible exposure mask, which includes a predetermined pattern, by affixing, to the roller stamper substrate having the photoresist layer thereon, and exposing the roller stamper substrate through the exposure mask to band-like exposure light, while moving the roller stamper substrate and the exposure mask relative to the band-like exposure light;
subjecting the photoresist layer to development thereby to form on the stamper substrate a pattern of the photoresist corresponding to the pattern of the exposure mask; and
forming on the stamper substrate an unevenness pattern corresponding to the pattern of the photoresist.

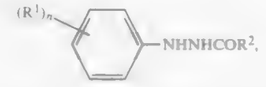
5,147,764

PHOTOGRAPHIC ELEMENT WITH 2-EQUIVALENT 5-PYRAZOLONE AND COMPETITOR FOR OXIDIZED DEVELOPING AGENT

Arlyce T. Bowne, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 545,172, Jun. 28, 1990, abandoned. This application Apr. 30, 1991, Ser. No. 696,313
Int. Cl.[5] G03C *7/38, 5/50*
U.S. Cl. 430—372 22 Claims

12. A color reversal processing method comprising the steps of developing an imagewise exposed photographic element with a non-chromogenic developer, then uniformly fogging the element, and then developing with a chromogenic developer, wherein said element comprises a support having thereon
a silver halide emulsion layer
a 2-equivalent 5-pyrazolone coupler in reactive association with said silver halide emulsion layer, and
a competitor for oxidized developer in reactive association with said coupler having the formula:



R^1 represents an electron donating group,
R^2 represents hydrogen, alkyl, alkoxy, aryl, aryloxy, aralkyl or amino of the formula —NHR^3, where R^3 is phenyl or benzyl, with the proviso that at least one of the substituents R^1 and R^2 (a) represents (1) a ballast group of sufficient size as to render the hydrazide compound non-diffusible in the photographic element prior to development in alkaline processing solution and (b) comprises a polar group, and
n is 0, 1, or 2.

5,147,765

PROCESS COMPRISING BLEACHING, BLEACH-FIX AND FIXING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masatoshi Goto; Yoshihiro Fujita, and Shigeru Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 31, 1990, Ser. No. 607,325
Claims priority, application Japan, Nov. 7, 1989, 1-289332; Dec. 29, 1989, 1-342986; Aug. 16, 1990, 2-216389
Int. Cl.[5] G03C *7/40, 7/42, 5/38*
U.S. Cl. 430—376 21 Claims

1. A method for processing silver halide color photographic materials comprising:
(1) color-developing an imagewise exposed silver halide color photographic material containing a color coupler with a primary aromatic amine-based color developing agent, and then
(2) desilvering said photographic material by a process comprising the following steps conducted in sequence:
(a) treating in a bleaching bath,
(b) treating in a bleach-fixing bath, and
(c) treating in a fixing bath,
wherein said bleaching bath is a bath of a bleaching solution having a pH of not more than 5.0 which contains an aminopolycarboxylic acid ferric complex salt having a redox potential of at least 150 mV, said fixing bath is a bath of a fixing solution having a pH of at least 6.5 which contains an aminopolycarboxylic acid whose corresponding ferric complex salt has a redox potential of less than 150 mV, or a salt of said acid, and said bleach-fixing bath comprises at least a bleaching solution which has been introduced from said bleaching bath and a fixing solution which has been introduced from said fixing bath.

5,147,766

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takatoshi Ishikawa; Kazuaki Yoshida, and Hiroshi Fujimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 6, 1990, Ser. No. 578,370
Claims priority, application Japan, Sep. 7, 1989, 1-232481; Sep. 7, 1989, 1-232483
Int. Cl.[5] G03C *5/35*
U.S. Cl. 430—399 12 Claims

1. A method for continuously processing an imagewise exposed silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer containing 95 mol % or more of silver chloride, comprising (a) developing the silver halide color photographic material in a developing tank containing a color developer, (b) supplying a replenisher to the color developer to result in an overflow of used color developer from the developing tank, (c) collecting the overflow liquid in a stock tank, (d) adding a regenerant to the stocked overflow liquid to obtain a color developer replenisher, and (e) replenishing the color developer of step (b) with said replenisher from step (d), wherein components accumulated in the color developer during the continuous processing are not removed from the replenisher, the replenishment rate to the color developer is in the range of 1.2 to 20 times the amount of color developer carried over with the developed photographic material to a succeeding bath, and the regenerating rate defined as the amount of overflow used for regeneration divided by the total amount of overflow multiplied by 100% is at least 80%.

5,147,767

GLUCONIC ACID-BASED DEVELOPER COMPOSITION

Audenried W. Knapp, 225 Larch Rd., Frankfort, Ill. 60423

Filed Apr. 10, 1991, Ser. No. 683,248
Int. Cl.[5] G03C *5/30*
U.S. Cl. 430—435 31 Claims

1. A method of effecting development of an image-wise exposed photographic material comprising effecting development of said material while in contact with an aqueous, alkaline photographic developer composition comprising a developer selected from the group consisting of 2-keto gluconic acid and derivatives thereof.

5,147,768

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING MAGNETIC RECORDING ELEMENT

Yoshio Sakakibara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1991, Ser. No. 727,163
Claims priority, application Japan, Jul. 10, 1990, 2-181799
Int. Cl.[5] G03C *3/C2;* G11B *5/633*
U.S. Cl. 430—501 11 Claims

1. A silver halide color photographic material comprising a transparent support having provided on the frontside thereof at least one hydrophilic colloid layer at least one layer of which is a photosensitive silver halide emulsion layer, said photographic material further comprising a transparent magnetic recording layer provided on the backside of the transparent support, said magnetic layer containing a ferromagnetic fine powder containing Fe^{2+} in a proportion of 5–50 wt % to Fe^{3+} dispersed in a binder at a coverage of from 10^{-2} to 1.8 g/m^2 based on the weight of the ferromagnetic fine powder and having a gray degree of transmission density of 70% or more and an average transmission density of 0.5 or less in the visible region.

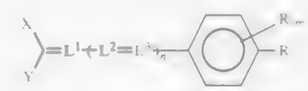
5,147,769

X-RAY PHOTOGRAPHIC MATERIAL

Ichizo Toya, and Yoshihiro Jimbo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 5, 1990, Ser. No. 533,542
Claims priority, application Japan, Jun. 5, 1989, 1-142688; Oct. 23, 1989, 1-275551
Int. Cl.[5] G03C *1/46*
U.S. Cl. 430—496 5 Claims

1. An X-ray photographic material having:
(1) at least one sensitive silver halide photographic emulsion layer provided on both sides of a support; and
(2) at least one dye-fixing layer provided on at least one side of the support for fixing a dye which can be decolorized during development and which absorbs light in the sensitive region of the photographic material and wherein:
(3) the dye is incorporated in the dye-fixing layer and contributes to the reduction of cross-over to less than 10%; and
(4) the dye is a compound selected from the group consisting of compounds represented by the following general formula (I) and is dissolved in an oil which is a solvent substantially insoluble in water and having a boiling point of not lower than 160° C. and which is dispersed as oil droplets or is loaded and dispersed in a polymer latex:



wherein X and Y each represents a substituent group, or X and Y may be combined together to form a heterocyclic group; L^1, L^2 and L^3 each represents a methine group; R and R' each represents a hydrogen atom or a substituent group; m represents an integer of from 1 to 4; and n represents 0 or 1.

5,147,771

ENTITLED SILVER HALII E PHOTOGRAPHIC MATERI/ LS

Kokichi Waki, and Shigeru Ohno both of Kanagawa, Japan, assignors to Fuji Photo Film Co Ltd., Kanagawa, Japan

Continuation of Ser. No. 385,962 Jul. 28, 1989, abandoned, which is a continuation of Ser. No. 79,073, Jul. 29, 1987, abandoned. This application Dec. 30, 1991, Ser. No. 814,858
Claims priority, application Japan, Jul. 29, 1986, 61-178444
Int. Cl.[5] G03C *1/06, 7/26*
U.S. Cl. 430—522 8 Claims

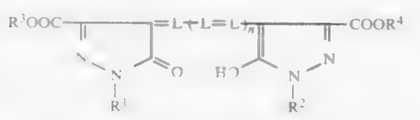
1. A silver halide color photographic material which comprises a support having provided thereon at least one spectrally sensitized silver halide emulsion layer wherein silver halide grains comprise monodisperse silver chlorobromide containing at least 2 mol % of silver chloride and having an area ratio of crystal face of a Mirror indeces (100) satisfying the relationship:

$$\frac{K}{K+1} \geq 0.5$$

wherein K represents the ratio of the intensity of diffracted rays attributable to (200) face to that of diffracted rays attributable to (222) face determined by X-ray diffraction analytical method, represented by:

$$K = \frac{\text{Intensity of diffracted rays attributable to 200 face)}}{\text{Intensity of diffracted rays attributable to (222) face)}}$$

and wherein said silver halide color photographic material contains at least one dye represented by the formula (II)



wherein n represents 0, 1 or 2, R^1 and R^2 each represents an aryl group selected from the group consisting of a 4-(3-sulfopropylcarbamoyl)phenyl group, a 2,4-disulfophenyl group, a 3,5-dicarboxylphenyl group, and a 3-(3-sulfopropylamino)-phenyl group, a 3,5-dicarboxylphenyl group, and a 3-carboxy-5-sulfophenyl group; R^3 and R^4 each represents a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group when n represents 0 or 1, or a hydrogen atom, a substituted alkyl group containing at least one sulfonic acid group or carboxylic acid group or a substituted aryl group containing at least one sulfonic acid group or carboxylic acid group when n represents 2; and L represents a substituted or unsubstituted methine group, and any two or more of the substituents on L may be linked together to form a ring.

5,147,772

PROCESS OF PREPARING A REDUCED DISPERSITY TABULAR GRAIN EMULSION

Allen K. Tsaur, and Mamie Kam-Ng, both of Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 14, 1991, Ser. No. 700,020
Int. Cl.[5] G03C *1/015*
U.S. Cl. 430—569 20 Claims

1. A process of preparing a photographic emulsion containing tabular silver halide grains exhibiting a reduced degree of total grain dispersity comprising

forming in the presence of a dispersing medium a population of silver halide grain nuclei containing parallel twin planes,

ripening out a portion of the silver halide grain nuclei, and

growing the silver halide grain nuclei containing parallel twin planes remaining to form tabular silver halide grains,

characterized in that

(a) prior to forming the silver halide grain nuclei halide ion consisting essentially of bromide ion is present in the dispersing medium and,

(b) at the time parallel twin planes formed in the silver halide grain nuclei, a grain dispersity reducing concentration of a polyalkylene oxide block copolymer surfactant is present comprised of at least three terminal lipophilic alkylene oxide block units each linked through a hydrophilic alkylene oxide block linking unit accounting for from 4 to 96 percent of the molecular weight of the copolymer.

5,147,77

PROCESS OF PREPARING A REDUCED DISPERSITY TABULAR GRAIN EMULSION

Allen K. Tsaur, and Mamie Kam-Ng, both of Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 14, 1991, Ser. No. 700,220
Int. Cl.[5] G03C *1/015*
U.S. Cl. 430—569 16 Claims

1. A process of preparing a photographic emulsion containing tabular silver halide grains exhibiting a reduced degree of total grain dispersity comprising

forming in the presence of a dispersing medium a population of silver halide grain nuclei containing parallel twin planes,

ripening out a portion of the silver halide grain nuclei, and

growing the silver halide grain nuclei containing parallel twin planes remaining to form tabular silver halide grains,

CHARACTERIZED IN THAT

prior to forming the silver halide grain nuclei halide ion consisting essentially of bromide ion is present in the dispersing medium and,

at the time parallel twin planes are formed in the silver halide grain nuclei, a grain dispersity reducing concentration of a

polyalkylene oxide block copolymer surfactant is present comprised of only two terminal lipophilic alkylene oxide block units linked by a hydrophilic alkylene oxide block unit accounting for from 4 to 96 percent of the molecular weight of the copolymer.

5,147,773

PROCESS OF PREPARING A REDUCED DISPERSITY TABULAR GRAIN EMULSION

Allen K. Tsaur, and Mamie Kam-Ng, both of Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 14, 1991, Ser. No. 699,851
Int. Cl.[5] G03C *1/015*
U.S. Cl. 430—569 21 Claims

1. A process of preparing a photographic emulsion containing tabular silver halide grains exhibiting a reduced degree of total grain dispersity comprising

forming in the presence of a dispersing medium a population of silver halide grain nuclei containing parallel twin planes,

ripening out a portion of the silver halide grain nuclei, and

growing the silver halide grain nuclei containing parallel twin planes remaining to form tabular silver halide grains,

characterized in that

(a) prior to forming the silver halide grain nuclei halide ion consisting essentially of bromide ion is present in the dispersing medium and,

(b) at the time parallel twin planes formed in the silver halide grain nuclei, a grain dispersity reducing concentration of a polyalkylene oxide block copolymer surfactant is present comprised of at least three terminal hydrophilic alkylene oxide block units each linked through a lipophilic alkylene oxide block linking unit accounting for from 4 to 96 percent of the molecular weight of the copolymer.

5,147,774

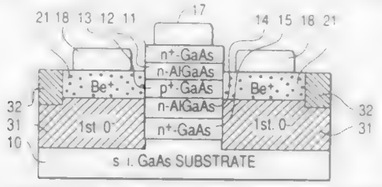
Patent Not Issued For This Number

5,147,775

METHOD OF FABRICATING A HIGH-FREQUENCY BIPOLAR TRANSISTOR

Yorito Ota, Kobe; Masanori Inada, Nara, and Manabu Yanagihara, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 424,009, Jul. 25, 1988, abandoned. This application Aug. 21, 1990, Ser. No. 570,958
Claims priority, application Japan, Jul. 24, 1987, 62-186176; Jul. 24, 1987, 62-186181
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 6 Claims



1. A method of fabricating a bipolar transistor comprising the steps of:

1) forming a multilayer structure by sequentially stacking on a semi-insulating substrate, a collector contact layer, a collector layer, a base layer, and an emitter layer in this order;

2) forming a first mask on a part of the multilayer structure;

3) changing the collector contact layer and the collector layer to be a first semi-insulative region by a deep ion-implantation at portions except for portions below the first mask so that the portions of the collector contact layer and the collector layer below the first mask become a collector contact region and a collector region, respectively;

4) forming a second mask on a part of the multilayer structure to partly overlap a part of the first mask;

5) removing the first mask except for the part overlapped with the second mask;

6) changing the base layer to be second semi-insulative region by a shallow ion-implantation at a portion except for a portion below the second mask so that the portion of the base layer below the second mask becomes a base region having an extrinsic base region formed on the first semi-insulative region;

7) removing the second mask so that the part of the first mask which was overlapped with the second mask remains as a third mask;

8) etching off the emitter layer at a portion except for a portion below the third mask so that the portion of the emitter layer below the third mask remains as an emitter region; and

9) removing the third mask.

5,147,776

USE OF 2,5-ANHYDROMANNITOL FOR CONTROL OF PH DURING BLOOD STORAGE

Theodore A. W. Koerner, Jr., Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Feb. 26, 1990, Ser. No. 484,792
Int. Cl.[5] A01N *1/02*
U.S. Cl. 435—2 9 Claims

1. A method of controlling pH during storage of blood platelets in gas permeable blood storage bags which allow excessive CO_2 diffusion causing an increase in alkalinity, said method comprising: placing blood platelets and a small but pH stabilizing amount

of 2,5 anhydromannitol in a sealable gas permeable storage bag; and sealing said bag.

5,147,777

BIOLOGICALLY ACTIVE REAGENTS PREPARED FROM CARBOXY-CONTAINING POLYMER, ANALYTICAL ELEMENT AND METHODS OF USE

Richard C. Sutton; Susan J. Danielson; John B. Findlay; Fred T. Oakes; Marsha D. B. Oenick, all of Rochester; Ignazio S. Ponticello, Pittsford, and Harold C. Warren, III, Rush, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

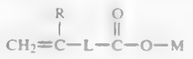
Filed Jun. 18, 1990, Ser. No. 539,774
Int. Cl.[5] G01N *33/545, 33/546*
U.S. Cl. 435—5 21 Claims

1. A biologically active reagent comprising:

(I) a water-insoluble particle composed of a copolymer having recurring units derived from:

(a) from about 60 to about 99.8 mole percent of one or more ethylenically unsaturated polymerizable oleophilic monomers which provide hydrophobicity to said copolymer,

(b) from about 0.2 to about 40 mole percent of one or more ethylenically unsaturated polymerizable monomers having a reactive carboxy group, or salt thereof, and represented by the structure:



wherein R is hydrogen, halo or alkyl of 1 to 3 carbon atoms, M is hydrogen, an alkali metal ion or an ammonium ion and L is an organic linking group having from 8 to 50 atoms selected from the group consisting of carbon, nitrogen, oxygen and sulfur atoms in the linking chain,

said organic linking group further defined as having two or more divalent groups selected from the group consisting of alkylene, arylene, alkylenearylene and arylenealkylene which are connected to each other or terminated with an oxy, thio, imino, carbonyloxy, carbonylimino, ureylene or sulfonylimino group and

(c) from 0 to about 15 mole percent of one or more additional ethylenically unsaturated polymerizable monomers other than those identified in categories (a) and (b) above, and

(II) a biologically active substance covalently attached to said particle through said reactive carboxy group or salt thereof.

5,147,778

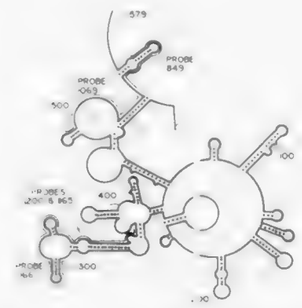
PROBES AND METHODS FOR THE DETECTION OF SALMONELLA

Raymond M. Nietupski, Millbury; Stephen G. Wilson, Southbridge, both of Mass.; Jyotsna Shah, Nashua, N.H.; Samuel W. Chan, Newton, Mass.; Donald N. Halbert, and David J. Lane, both of Milford, Mass., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 127,484, Dec. 1, 1987, abandoned. This application Nov. 20, 1988, Ser. No. 277,579

Int. Cl.[5] **C12Q** *1/68, 1/02;* **C07H** *15/12;* **G01N** *33/48*

U.S. Cl. 435—6 **8 Claims**



1. A nucleic acid probe consisting essentially of a sequence of nucleotides of any one of probes **849**, **1069**, **1166**, or **1200**, or nucleotide sequences complementary thereto, which nucleic acid probe preferentially hybridizes to rRNA or rDNA of Salmonella over rRNA or rDNA of non-Salmonella bacteria.

5,147,779

METHOD FOR EVALUATING IMMUNOGENICITY

Pamela C. Esmon, Richmond, and Michael A. Fournel, Castro Valley, both of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed Jun. 1, 1988, Ser. No. 202,177

Int. Cl.[5] **C12Q** *1/68;* **G01N** *33/543*

U.S. Cl. 435—6 **8 Claims**

1. A method of evaluating the immunogenicity of a first product (PX) that is a recombinant product in comparison to a reference produce (PR) which is the naturally-occurring equivalent of the first product, comprising:

(a) administering PX to an animal to produce antibodies to PX;

(b) contacting said antibodies with PR to remove antibody to PR from said antibodies, thereby producing a depleted antibody preparation; and

(c) reacting said depleted antibody preparations with PX, whereby the detection of the presence of antibodies capable of recognizing PX is indicative of a potential immunogenic reaction in humans.

5,147,780

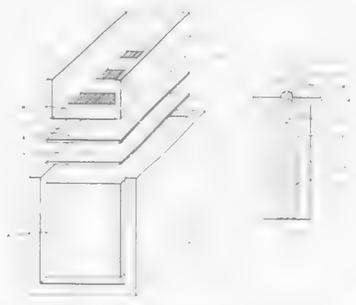
MULTIWELL STAT TEST

Philippe Pouletty, Redwood City; Beth Atwood, San Bruno, and David Rommler, Woodside, all of Calif., assignors to Sangstat Medical Corporation, Menlo Park, Calif.

Division of Ser. No. 444,814, Dec. 1, 1989. This application Jan. 23, 1991, Ser. No. 644,941

Int. Cl.[5] **G01N** *33/536*

U.S. Cl. 435—7.1 **4 Claims**



2. A method for detecting the presence of an analyte in a sample, said method employing a reagent system which produces a visual signal for detecting the formation of specific binding pair member complexes, and a collector-dilutor-dispenser device useful for processing a sample for a diagnostic assay and measuring a sample volume, said device comprising:

a compressible tube closed at one end;

a cover mounted over the open end of said tube and comprising at least one aperture;

a liquid medium for use in said diagnostic assay is said tube as the assay medium;

a least one frangible barrier separating said medium from said aperture; and

at least one absorbent nib in said tube above said barrier and extending through said aperture, said nib comprising means for preventing said nib to pass through said aperture, wherein said nib is supported by said frangible barrier and becomes at least partially immersed in said medium upon breaking of said frangible barrier, said nib being capable of absorbing a predetermined liquid volume and substantially quantitatively releasing said sample into said liquid medium; said method comprising:

contacting said sample with said nib, wherein said nib absorbs said sample in a predetermined volume;

breaking said frangible barrier, whereby said nib is combined with said liquid medium and said sample is dispensed into said liquid medium, wherein said liquid medium optionally includes at least one reagent of said reagent system;

transferring said liquid medium through said aperture in the absence of said nib to the reservoir of a diagnostic device for measuring an analyte which is a member of a specific binding pair, said device comprising:

a housing comprising an upper reservoir portion and a lower casing portion for holding at least one layer;

in said casing in the direction of flow:

a porous reactive filter as the floor of said reservoir component comprising a measurement circle of a member of a specific binding pair immobilized to said filter and defining a concentration gradient comprising an inner circle at an elevated concentration and an outer contiguous circle at a substantially lower concentration; and

fluid receiving means for receiving fluid from said porous reactive filter;

allowing said liquid medium to pass through said porous reactive filter into said fluid receiving means;

adding any additional reagents of said reagent system to said porous reactive filter; and

detecting the presence of said visual signal in relation to a visual signal obtained with a sample having a known amount of analyte.

5,147,781

ENZYME ELECTRODE AND ASSAY FOR DETERMINING LDH5

Judith Rishpon, Meonot Wolfson B, Weizmann Institute, Rehovot; Ilana Rosen, 74 Krinitzi Street, Ramat Gan, both of Israel, and Zeev Hollander, 954 Celia Dr., Palo Alto, Calif. 94303

Filed Mar. 2, 1987, Ser. No. 20,946

Claims priority, application Israel, Mar. 4, 1986, 78034

Int. Cl.[5] **G01N** *33/573, 33/577*

U.S. Cl. 435—7.4 **9 Claims**

7. As assay for the quantitative determination of LDH5, which comprises inserting a biosensor comprising a glassy carbon electrode having anti-LDH5 directly bound thereto, said bound anti-LDH5 being capable of binding LDH5 in such a manner that LDH5 bound to said anti-LDH5 remains capable thereafter of specifically binding to lactic acid and NAD, into a solution containing the LDH5 which is the antigen to be determined, incubating said biosensor in said solution, removing and rinsing the biosensor, inserting same into a solution of NAD, connecting with an amperometric system, adding lactic acid and measuring the current change.

5,147,782

PROCESS FOR THE ISOLATION OF BASEMENT MEMBRANE PROTEINS FROM HUMAN AND ANIMAL TISSUES

Dietrich Brocks, Wiesbaden; Rupert Timpl, Gauting, and Mats Paulsson, Martinsried, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,177

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708198

Int. Cl.[5] **G01N** *33/567;* **C12N** *9/99*

U.S. Cl. 435—7.21 **7 Claims**

6. A method for the immunological determination of basement membrane proteins in a sample of body fluid or tissue extract comprising the steps of extracting basement membrane proteins from tissue in the presence of a protease inhibitor in a physiological buffer which preserves the natural conformation of the basement membrane proteins and which contains a chelating agent, preparing a highly specific antisera or antibodies to the isolated basement membrane proteins and thereafter incubating the sample with the antisera or antibodies and detecting specific binding of the antisera or the antibodies to immunologically determine the concentration of basement membrane proteins in the sample.

5,147,783

METHODS TO SCREEN FOR OVARIAN CANCER AND MYOCARDIAL INFARCTION

Taizo Uda; Yukikatsu Itoh; Tetsuo Kawaguchi; Emi Hifumi, all of Ube; Naoyuki Taniguchi, Toyonaka; Keiichiro Suzuki, Takatsuki; Mutsuo Ishikawa, Asahikawa, and Shirou Noji, Tokyo, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed May 15, 1989, Ser. No. 352,109

Claims priority, application Japan, May 27, 1988, 63-128165; Jul. 15, 1988, 63-175129; Mar. 3, 1989, 1-50005; Mar. 7, 1989, 1-52780

Int. Cl.[5] **G01N** *33/543, 33/574, 33/573, 33/577*

U.S. Cl. 435—7.23 **4 Claims**

1. A method of screening for human epithelial ovarian cancer, which comprises (a) assaying for a concentration of human Mn-SOD in a body fluid by contacting the bodily fluid with a monoclonal antibody having a high specificity against human Mn-SOD, said monoclonal antibody not being reactive with any human albumin, human globulin, Cu and Zn-SOD, said monoclonal antibody being immobilized on a carrier, and (b) determining whether a concentration of 130 ng/ml or more of human Mn-SOD in a bodily fluid is present as an indication of the presence of epithelial ovarian cancer.

5,147,784

T-LYMPHOCYTE PROGENITOR CELL ASSAY

Bruno Peault, Menlo Park, Calif., assignor to SyStemix, Inc., Palo Alto, Calif.

Filed Apr. 12, 1990, Ser. No. 508,225

Int. Cl.[5] **C12Q** *1/04, 1/24;* **C12N** *5/06;* **G01N** *33/569*

U.S. Cl. 435—7.24 **11 Claims**

1. A method for determining the presence in a cellular composition of human progenitor cells to T lymphocytes, said method comprising:

depleting human thymus tissue of lymphoid cells;

repopulating said thymus tissue with said cellular composition, wherein said cells of said cellular composition are HLA mismatched with said thymus tissue;

implanting said repopulated thymus tissue in an immunocompromised non-human mammalian host at a site where said tissue is vascularized, when said thymus tissue has not been previously transplanted; and

after a predetermined time period, assaying for the presence of T lymphocytes having the HLA of said cellular composition.

5,147,785

METHOD AND APPARATUS FOR MEASURING THE DEGREE OF REACTION BETWEEN A FOREIGN ENTITY AND WHITE BLOOD CELLS

Mark J. Pasula, Miami, Fla., assignor to Amtl Corporation, Hollywood, Fla.

Continuation of Ser. No. 902,313, Aug. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 547,767, Nov. 1, 1983, Pat. No. 4,614,722. This application Jun. 9, 1989, Ser. No. 363,854

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[5] **G01N** *33/53*

U.S. Cl. 435—7.24 **19 Claims**

1. A method for diagnosing the presence or absence of a malady affecting the immune system in a subject, said method comprising the steps of:

counting a number of leukocytes in a first blood sample drawn from said subject;

mixing a substance having a predetermined relationship with said malady with a second blood sample drawn from said subject to form a mixture, and thereby allow leukocytes of said second blood sample to react with said substance;

counting a number of unreacted and reacted leukocytes in said mixture; and

comparing said number of said leukocytes counted in said first blood sample with said number of unreacted and reacted leukocytes counted in said mixture, to determine if said leukocytes in said second blood sample reacted with said substance, thereby diagnosing the presence or absence of said malady in said subject.

5,147,786

IMMUNOASSAY FOR THE DETECTION OF α-HALOACETAMIDES

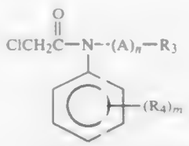
Paul Feng, Babler; Stephen J. Wratten, Maryland Heights; Peggy A. Winzenburger, High Ridge; Cindy J. Gross, St. Louis, and Dennis K. Flaherty Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 184,884, Apr. 22, 1988, abandoned. This application Nov. 29, 1990, Ser. No. 619,560

Int. Cl.[5] G01N *33/552;* **C07K** *17/14*

U.S. Cl. 435—7.94 **20 Claims**

1. Antibodies against haptens conjugated to a protein carrier through the halogen site of the acetyl group of said hapten wherein said haptens are α-chloroacetanilides having the formula



wherein A is a C_{1-4} straight or branched-chain alkylenyl radical and n is zero or 1;

R_3 is hydrogen, C_{1-5} alkyl or halo-alkyl; C_{1-6} acyl or acylamido; a heterocycl o heterocyclyl-methyl radical having up to 10 ring atoms of which 1-3 may be nitrogen, oxygen and/or sulfur, optionally substituted with C_{1-5} alkyl or alkoxy radicals; or an —OR_5 radical where R_5 is a C_{1-6} alkyl, haloalkyl or a koxyalkyl radical, and

R_4 is a R_5 radical, CF_3, NO_2 or an alkoxy radical having up to 5 carbon atoms and m is 0–5.

5,147,787

RECOVERY OF IMAGEABLE POLYACETYLENES FROM BINDER CONTAINING AQUEOUS DISPERSIONS

David F. Lewis, Monroe, Conn., and Robert D. Schenfele, Caldwell, N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Aug. 5, 1988, Ser. No. 228,426

Int. Cl.[5] C12P *1/00;* **C07K** *3/12;* **C12N** *9/48, 9/78*

U.S. Cl. 435—41 **15 Claims**

1. The process which comprises contacting an aqueous dispersion of a substantially water insoluble, radiation imageable, crystalline polyacetylene in a binder containing an amido linkage with an effective hydrolyzing amount of an amido hydrolyzing enzyme; hydrolyzing said amido group of said binder in said dispersion at a temperature of between about 20° and about 70° C. and at a pH of from about 3 to about 9 to form an aqueous phase and a solids phase and to solubilize said binder decomposition product in the aqueous phase and separating said polyacetylene solids from said aqueous phase.

5,147,788

BACULOVIRUS VECTORS AND METHODS OF USE

Martin J. Page, and Brian C. Rodgers, both of Beckenham, United Kingdom, assignors to Burroughs Wellcome Co., Research Triangle, N.C.

Continuation of Ser. No. 256,496, Oct. 12, 1988, abandoned. This application Dec. 3, 1990, Ser. No. 622,177

Claims priority, application United Kingdom, May 6, 1988, 8810808

Int. Cl.[5] C12N *15/86, 15/00;* **C12P** *21/02*

U.S. Cl. 435—69.1 **22 Claims**

1. A baculovirus transfer vector comprising the following elements operably linked 5' to 3':

(A) a first flanking sequence composed of baculovirus DNA;

(B) a polyhedrin promoter;

(C) in place of the natural ATG translation start codon for the polyhedrin coding sequence, another triplet of nucleotides;

(D) the next 21 to 47 bases of the N-terminal region of the polyhedrin coding sequence, which are thereby retained but not capable of being translated;

(E) immediately thereafter, a restriction site into which a foreign gene may be cloned; and

(F) a second flanking sequence composed of baculovirus DNA.

5,147,789

STABILIZED EPRESSION VECTORS CONTAINING LAMBDA PL PROMOTER AND THE GENE FOR THE CI434 REPRESSOR, PLASMIDS CONTAINING THE VECTORS, HOSTS CONTAINING THE PLASMIDS AND RELATED METHODS

Amos B. Oppenheim, and Hilla Locker-Giladi, both of Jerusalem, Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 317,629, Mar. 1, 1989, Pat. No. 5,059,529, which is a continuation of Ser. No. 644,551, Aug. 27, 1984, abandoned. This application Oct. 22, 1991, Ser. No. 780,353

Int. Cl.[5] C12P *21/02;* **C12N** *15/70, 15/73, 1/21*

U.S. Cl. 435—69.4 **14 Claims**

12. A method for producing a polypeptide analog of an animal growth hormone which comprises growing

a suitable *Escherichia coli* host cell comprising a plasmid for the production of a polypeptide analog of an animal growth hormone having substantially the same amino acid sequence as, and the biological activity of, the corresponding naturally-occurring animal growth hormone which upon introduction into a suitable *Escherichia coli* host cell containing the thermolabile repressor cI renders the host cell capable, upon increasing the temperature of the *Escherichia coli* host cell to a temperature at which the cI repressor is inactivated, of effecting expression of DNA encoding the polypeptide analog of the animal growth hormone consisting essentially of:

a double-stranded DNA molecule which comprises in 5' to 3' order the following:

a DNA sequence which includes the promoter and operator P_LO_L from lambda bacteriophage;

an N utilization site selected from the group consisting of Nut_L and Nut_R for binding antiterminator N protein produced by the host cell;

a DNA sequence which contains a mutant cII ribosomal binding site from lambda bacteriophage having the sequence:

TAAGGAAGTACTTACAT
ATTCCTTCATGAATGTA

for rendering the mRNA transcript of the DNA encoding the polypeptide analog of the animal growth hormone capable of binding to ribosomes within the *Escherichia coli* host cell;

an ATG initiation codon;

DNA encoding the polypeptide analog of the animal growth hormone in phase with the ATG initiation codon;

a DNA sequence which contains a T_1T_2 rRNA termination sequence located less than about 100 base pairs from the 3' end of the DNA encoding the polypeptide analog of animal growth hormone;

and which additionally includes a DNA sequence which contains the origin of replication from the bacterial plasmid pBR322 which is capable of autonomous replication in the *Escherichia coli* host cell and a DNA sequence which contains the fragment designated cI^{434}, such fragment including the gene for the cI^{434} repressor protein and its associated promoter and operator and the distance between the 3' end of the P_LO_L promoter and operator sequence from lambda bacteriophage and the 5' end of the N utilization site being less than about 80 base pairs and the distance between the 3' end of the N utilization site and the 5' end of the ribosomal binding site being less than about 300 base pairs under suitable conditions permitting production of the polypeptide analog of the animal growth hormone and recovering the resulting polypeptide analog of the animal growth hormone.

5,147,790

SERUM-INDEPENDENT HUMAN CELL LINES, PROCESS FOR PRODUCING SAME, AND PROCESSES FOR PRODUCING PROTEINS THEREFROM

Elaine L. Wilson, Newlands, South Africa, assignor to t-PA Technology Trust

Continuation of Ser. No. 854,729, Apr. 17, 1986, which is a continuation of Ser. No. 754,798, Jul. 12, 1985, abandoned, which is a continuation of Ser. No. 566,467, Dec. 28, 1983, abandoned. This application Oct. 4, 1988, Ser. No. 253,190

Claims priority, application South Africa, Dec. 30, 1982, 82/9576; Jun. 22, 1983, 83/4576

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] C12P *21/00;* **C12N** *5/06*

U.S. Cl. 435—70.3 **8 Claims**

3. A process for the production of a human melanoma cell line capable of reproducibly and indefinitely propagating in culture in the absence of serum and in the absence of exogenous macromolecular growth factors, comprising the steps of:

(a) establishing a culture of a serum-dependent human melanoma cell line in a culture medium containing serum;

(b) removing the culture medium containing serum from said culture and replacing it with a culture medium deprived of serum and deprived of exogenous macromolecular growth factors;

(c) feeding the adherent and any non-adherent cells with culture medium deprived of serum and deprived of exogenous macromolecular growth factors; and

(d) culturing the cells until they propagate reproducibly and indefinitely in culture medium deprived of serum and deprived of exogenous macromolecular growth factors, thereby establishing a human melanoma cell line which is capable of reproducibly and indefinitely propagating in medium deprived of serum and deprived of exogenous macromolecular growth factors.

5,147,791

ENZYME CATALYZED SYNTHESIS OF POLYESTERS

Cary J. Morrow, and Joe S. Wallace, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Continuation of Ser. No. 333,675, Apr. 6, 1989, abandoned. This application Sep. 17, 1991, Ser. No. 759,971

Int. Cl.[5] C12P *17/02, 7/62*

U.S. Cl. 435—123 **19 Claims**

1. A method for synthesizing a polyester, comprising reacting a diester and a dialcohol at approximately ambient temperature in the presence of a hydrolase enzyme catalyst, said diester and said dialcohol being reacted in a molar ratio of about 2:1 when said diester is of racemic character and in equimolar amounts when said diester is of nonracemic character, and said polyester exhibiting a weight average molecular weight, Mw, as measured by gel permeation chromatography, of at least about 3000.

5,147,792

METHOD OF SHIFTING THE FATTY ACID DISTRIBUTION IN PLASTIDS TOWARDS SHORTER-CHAINED SPECIES BY USING THIOESTERASE II AND ACYL CARRIER PROTEIN

John T. Perchorowicz, Tucson, Ariz.; Andree L. Genez, Tuscon, and Vic C. Knauf, both of Davis, Calif., assignors to Calgene, Inc., Davis, Calif.

Continuation-in-part of Ser. No. 916,885, Oct. 9, 1986, abandoned. This application Nov. 29, 1988, Ser. No. 279,047

Int. Cl.[5] C12P *7/64*

U.S. Cl. 435—134 **9 Claims**

1. A method for changing the fatty acid composition produced by fatty acid synthesizing plastids from a composition having a given proportion of longer chain fatty acids to a composition having a lower proportion of longer chain fatty acids, comprising:

combining the fatty-acid-producing components from isolated broken plastids with a fatty-acid-composition-modifying amount of thioesterase II in the presence of metabolites in the fatty acid pathway, said metabolites being malonyl-CoA and either acetyl-CoA or a metabolite subsequent in the metabolic pathway to malonyl-CoA.

5,147,793

BIOCATALYTIC OXIDATION USING SOYBEAN PEROXIDASES

Mark A. Johnson, Chillicothe; Alexander R. Pokora, Pickerington, and William L. Cyrus, Jr., Ray, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 18, 1990, Ser. No. 599,584

Int. Cl.[5] C12P *7/22;* **C12N** *9/04, 9/08*

U.S. Cl. 435—156 **7 Claims**

1. A method for biocatalytic oxidation of an oxidizable substrate which comprises preparing a solution of said oxidizable substrate and contacting said solution with soybean hulls in the presence of a peroxide.

5,147,794

TYPE II RESTRICTION ENDONUCLEASE OBTAINABLE FROM *KLUYVERA ASCORBATA* AND A PROCESS FOR PRODUCING THE SAME

Carol Polisson, Reading, and Janet M. Barsomian, Georgetown, both of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Jul. 23, 1990, Ser. No. 557,394

Int. Cl.[5] C12N *9/22, 15/00*

U.S. Cl. 435—199 **5 Claims**

1. A substantially pure Type II restriction endonuclease obtainable from *Kluyvera ascorbata* ATCC No. 55054 recognizing the following base sequence in double-stranded deoxyribonucleic acid molecules:

5'-GGCGCC-3'

3'-CCGCGG-5'

and having a cleavage position defined by the arrows.

5,147,795

ALKALINE PULLULANASE FROM BACILLUS SP. FERM P-10887

Katsutoshi Ara, Oyama; Kazuaki Igarashi, Ichikai; Katsuhisa Saeki, Kawachi, and Susumu Ito, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 575,434

Claims priority, application Japan, Aug. 31, 1989, 1-226210; Aug. 31, 1989, 1-226211

Int. Cl.[5] C12N *9/44, 1/00*

U.S. Cl. 435—210 **2 Claims**

1. A substantially purified alkaline pullulanase derived from

Bacillus sp. B2C FERM P-1088 ' possessing the following enzymological characteristics:

(a) Action
Hydrolyzes α-1,6-linkage of pull ılan to produce maltotriose, and hydrolyzes α-1,6 glycos ıic bond of starch, amylopectin, glycogen, or their part al decomposition products;

(b) Working pH and optimum pH range
Has an active pH range of 4–12 with an optimum pH range being 9.5–11;

(c) pH stability
Is stable in a pH range of 7–10 when treated at 45° C. for 10 minutes, and retains relative activity of 50% or more in a pH range of 6–11.5 when treated at 45° C. for 10 minutes;

(d) Working temperature and optimum temperature
Is active at a wide temperature range of from 10° to 60° C. with an optimum temperature being around 55° C.;

(e) Thermal stability
Is very stable up to 45° C., when treated in 10 mM glycine-NaCl—NaOH buffer (pH 9.5 for 30 minutes;

(f) Molecular weight
About 110,000±10,000, when measured by means of a gel filtration method using Bio-gel A 0.5 m.

5,147,795

ALKALINE PULLULANASE Y HAVING α-AMYLASE ACTIVITY

Katsutoshi Ara, Oyama; Katsuhisa Saeki, Kawachi; Kazuaki Igarashi, Ichikai, and Susumu Ito, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 583,849, Jul. 13, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 825,314
Claims priority, application Japan, Sep. 19, 1989, 1-242605
Int. Cl.[5] C12N 9/44, 1/00
U.S. Cl. 435—210 1 Claim

1. An alkaline pullulanase Y having α-amylase activity which has an optimum pH range of 8.5–10 against pullulan and an optimum pH range of 7–9.5 against soluble starch, which possesses the following enzymological characteristics:

(1) action
acts on pullulan and soluble starch to produce mainly maltotriose from pullulan and mainly maltotetraose and maltopentaose from soluble starch, and acts also on glycogen to produce maltotetraose and maltopentaose;

(2) substrate Specificity
acts on pullulan, soluble starch, and glycogen;

(3) working pH and Optimum pH Range
has an active pH range on pullulan of 5–12 with an optimum pH range being 8.5–10, and has an active pH range on soluble starch of 4–12 with an optimum range being 7–9.5;

(4) pH Stability
is stable in a pH range of 6–11.5 against pullulan and in a pH range of 4–12 against soluble starch (treating condition: 45° C., 10 minutes);

(5) Working Temperature and Optimum Temperature
acts on pullulan and soluble starch at wide temperatures ranging from 10° to 65° C. with an optimum temperature being around 50° C.;

(6) thermal Stability
Is stable up to 45° C. when treated in a 10 mM glycine-NaCl-NaOH buffer (pH 9.5) for 30 minutes;

(7) molecular Weight
about 200,000±5,000, when measured by menas of electrophoresis using sodium dodecyl sulfate (SDS);

(8) effects of Metal Ions
pullulanase activity is adversely affected by Hg^{2+}, Mn^{2+}, and Pb^{2+} ions and α-amylase activity is adversely affected by Hg^{2+}, Mn^{2+}, Pb^{2+}, and Zn^{2+} and Cd^{2+} ions,

said alkaline pullulanase Y being produced by a process comprising: culturing a microorganism producing an alkaline pullulanase having α amylase activity, which is named as Bacillus sp, KSM AP1378 and deposited as FERM P-10886 with Fermentation Research Institute, Agency of Industrial Science and Technology; and isolating the alkaline pullulanase Y having α-amylase activity from the cultured medium.

5,147,797

POLYPEPTIDES WITH FIBRONECTIN ACITIVITY

James B. McCarthy, and Leo T. Furcht, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 326,279, Mar. 21, 1989, which is a division of Ser. No. 89,073, Aug. 25, 1987, Pat. No. 4,839,464. This application Aug. 8, 1991, Ser. No. 741,954
Int. Cl.[5] C12N 5/00; C07K 7/08
U.S. Cl. 435—240.1 5 Claims

1. A cell culture substrate having a surface coated with a composition consisting essentially of a polypeptide of the formula:

tyr-glu-lys-pro-gly-ser-pro-pro-arg-glu-val-val-pro-arg-pro-arg-pro-gly-val,

lys-asn-asn-gln-lys-ser-glu-pro-leu-ileu-gly-arg-lys-lys-thr-asp-glu-leu, or mixtures thereof.

5,147,798

MONOPHENOTYPIC XENOGRAFT OF MEGAKARYOCYTIC LINEAGE AND ORIGIN

Beatrice C. Lampkin; David P. Witte; Richard E. Harris, and Michael A. Liebermann, all of Cincinnati, Ohio, assignors to Children's Hospital Medical Center, Cincinnati, Ohio

Continuation of Ser. No. 565,190, Aug. 8, 1990, abandoned, which is a continuation of Ser. No. 884,714, Jul. 11, 1986, abandoned. This application Jul. 5, 1991, Ser. No. 727,373
Int. Cl.[5] C12N 5/00, 5/08; C12P 21/02; C07K 15/06
U.S. Cl. 435—240.1 1 Claim

1. A xenograft deposited with the American Type Culture Collection under accession number ATCC CRL 9139.

5,147,799

REPOPULATION OF MACROPHAGES AND GRANULOCYTES USING TRANSFORMING GROWTH FACTOR-BETA

Isia Bursuker, 29 Currier Way, Cheshire, Conn. 06410; Joseph A. Carlino, 445 Hugo St. #5, San Francisco, Calif. 94122; Kim Neddermann, 183 Crestwood Dr., Naugatuck, Conn. 96770; Bernice Schacter, 748 Durham Rd., Madison, Conn. 06443; Larry Ellingsworth, 3566 Woodley Dr., San Jose, Calif. 95148, and George Spitalny, 6 Brookfield Ct., Cheshire, Conn. 06410

Filed Apr. 25, 1990, Ser. No. 513,999
Int. Cl.[5] C12N 5/00; C07K 13/00; A61K 37/02
U.S. Cl. 435—240.1 5 Claims

1. A method of inducing the proliferation and differentiation of mammalian granulocytes or monocyte/macrophages, comprising the steps of:

administering to a mammal having hematopoietic stem cells, an effective amount of TGF-β selected from the group consisting of TGF-β1 and TGF-β2, the TGF-β being administered such that a sufficient amount contacts the hematopoietic stem cells to affect hematopoietic stem cell growth or differentiation;

removing the hematopoietic stem cells affected by the TGF-β from the mammal; and

contacting the removed cells with an effective amount of a CSF selected from the group consisting of M-CSF, G-CSF and GM-CSF, the removed cells being contacted with a sufficient amount of CSF to stimulate the formation of granulocytes and/or monocyte/macrophages.

5,147,800

HOST EXPRESSING NGOAIII RESTRICTION ENDONUCLEASE AND MODIFICATION METHYLASE FROM NEISSERIA

Alan W. Hammond, and Deb K. Chatterjee, both of Gaithersburg, Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Filed Jun. 8, 1990, Ser. No. 535,021
Int. Cl.[5] C12N 1/21, 15/74
U.S. Cl. 435—252.3 10 Claims

1. A recombinant host expressing a gene encoding for a restriction endonuclease, said restriction endonuclease recognizing the palindromic sequence:

5' CCGC ↓ GG 3'

3'GG ↑ CGCC 5'

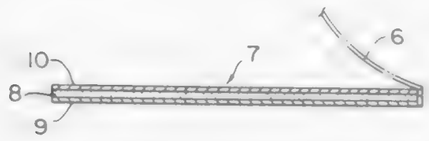
and cleaving said sequence between the second C and G residues form the 5' end, producing a two-base 3' extension, wherein said gene is obtainable from the recombinant host on deposit with the Patent Culture Collection, Northern Regional Research Center, USDA, under deposit no. NRRL B-18657

5,147,801

CULTURE MEDIUM DEVICE FOR BACTERIA

Akira Suzuki; Yuji Sakamoto, and Yuko Masuda, all of Tokyo, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1989, Ser. No. 452,767
Claims priority, application Japan, Dec. 21, 1988, 63-322432
Int. Cl.[5] C12M 1/16; B32B 23/08; C12Q 1/24
U.S. Cl. 435—299 6 Claims



1. A culture medium device for culturing bacteria, said device comprising

a) hydrophilic sheet means having top and bottom surfaces;

b) a final culture medium comprising a gel agent or gelatinizer, a culturing nutrient for said bacteria, and water; said final culture medium being dispersed atop and partially absorbed by said hydrophilic sheet means and solidified thereon without being dried such that the final culture medium and hydrophilic sheet means are wet;

c) lower sheet means for covering the bottom surface of said hydrophilic sheet means and for reinforcing the same;

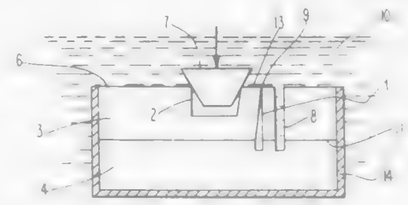
d) upper sheet means for covering the top surface of the hydrophilic sheet means with the final culture medium dispersed thereon; said upper and lower sheet mans being water repellant to maintain the wetness of the hydrophilic sheet means and the final culture medium whereby the bacteria can be cultured in the final culture medium without the addition of water prior to culturing.

5,147,802

PROCESS FOR EVALUATING CRACK PROPAGATION DUE TO CORROSION

Robert G. Aspden, Franklin Township, Westmoreland County, and Thomas G. Bengel, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 18, 1990, Ser. No. 629,260
Int. Cl.[5] G01N 17/00, 17/04
U.S. Cl. 436—6 4 Claims



1. A process of testing the corrosiveness of chemicals on a cracked surface comprising:

providing a test specimen which is comprised of a support base; a cladding layer deposited upon said support base and creating an interface between said support base and said cladding layer; a first slot cut into a portion of said cladding layer and not extending to the edge of said cladding layer, which creates a surface gap; and a second slot cut adjacent to said first slot and into a portion of said cladding layer and not extending to the edge of said cladding layer;

inserting a wedge into said second slot for partially closing said surface gap and thereby creating a surface crack;

supplying a corrodant to said test specimen for a test time period and

determining corrosion of said test specimen.

5,147,803

METHOD AND COMPOSITION FOR STABILIZING BLOOD COAGULATION FACTORS AND BLOOD CONTROL PLASMAS CONTAINING THE COMPOSITION

Masayasu Enomoto, Takatsuki, Japan, assignor to Nippon Shoji Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1989, Ser. No. 406,247
Claims priority, application Japan, Sep. 12, 1988, 63-227940
Int. Cl.[5] G01N 31/72, 31/86
U.S. Cl. 436—16 12 Claims

1. A method for stabilizing blood coagulation factors which comprises adding a stabilizer selected from the group consisting of glycylglycine and glycylglycylglycine to blood or plasma in a final concentration of 0.1 to 4.0% (w/v) such that the stabilizer does not substantially prolong blood coagulation time.

5. A control plasma comprising:

a plasma component which contains at least one blood coagulation factor; and

a stabilizer of blood coagulation factors, selected from the group consisting of glycylglycine and glycylglycylglycine, the stabilizer being present in the control plasma in a concentration of 0.1 to 4.0% (w/v) such that the stabilizer does not substantially prolong blood coagulation time.

5,147,804

Patent Not Issued For This Number

5,147,805

METHOD AND KIT FOR DETERMINING THE FUNCTIONAL ACTIVITY OF PROTEIN S IN HUMAN PLASMA

Luigi Preda, Verano Brianza, and Antonio Lombardi, Cinisello Balsamo, both of Italy, assignor to Instrumentation Laboratory S.r.l., Milan, Italy

Filed Jun. 29, 1990, Ser. No. 548,224
Claims priority, application Italy, Jul. 7, 1989, 21128 A/89
Int. Cl.[5] G01N *3./68, 33/86*
U.S. Cl. 436—86 14 Claims

1. A method for determining the activity of protein S in a human plasma sample comprising combining the plasma sample with activated substrate plasma to form a mixture, then combining the mixture with bovine thromboplastin in the presence of calcium ions to initiate a coagulation reaction and measuring a parameter related to the time within which the coagulation reaction occurs.

5,147,806

METHOD AND APPARATUS FOR CONDUCTING ELECTROCHEMILUMINESCENCE MEASUREMENTS

Ralph A. Kamin; Lee O. Hall, and Jonathan K. Leland, all of Gaithersburg, Md., assignors to Igen, Inc., Rockville, Md.

Continuation of Ser. No. 570,226, Aug. 21, 1990, abandoned, which is a continuation of Ser. No. 188,258, Apr. 29, 1988, abandoned. This application Sep. 27, 1991, Ser. No. 773,971
Int. Cl.[5] G01N *21/76*
U.S. Cl. 436—149 31 Claims

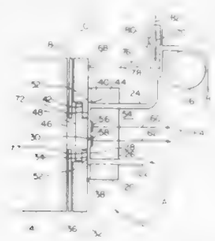
1. A method of conducting an assay by measuring the luminescence emitted by an electrochemiluminescent moiety in a solution and being especially adapted for the assay of a biological material comprising the steps of

(a) cleaning and/or conditioning a working electrode by applying an initializing voltage waveform to the working electrode in the presence of one or more initializing solutions to obtain a specific surface condition on said working electrode;

(b) maintaining the specific surface condition of the working electrode by applying a preoperative voltage waveform to the working electrode until the initiation of the measurement step (d); and

(c) measuring the electrochemiluminescence emitted by said electrochemiluminescent moiety by

(i) activating the electrochemiluminescent moiety in solution by applying an electrochemiluminescence-inducing



voltage waveform to the working electrode in the presence of the moiety and

(ii) measuring the luminescence emitted by the electrochemiluminescent moiety.

5,147,807

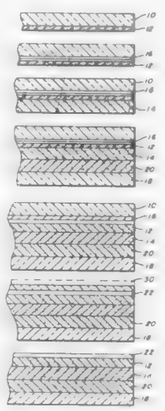
Patent Not Issued For This Number

5,147,808

HIGH ENERGY ION IMPLANTED SILICON ON INSULATOR STRUCTURE

Peter P. Pronko, Kettering, Ohio, assignor to Universal Energy Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 266,444, Nov. 2, 1988. This application Apr. 12, 1990, Ser. No. 509,252
Int. Cl.[5] H01L *21/302, 21/265*
U.S. Cl. 437—21 13 Claims



1. A method of preparing a silicon on insulator structure having a first insulator layer, a quality thermal oxide layer, a high quality epiless silicon layer coupled to said quality thermal oxide and said high quality silicon layer derived from an as received intrinsic wafer of silicon substrate material, comprising the steps of:

(a) implanting MeV energy range dopant ions in a first surface of said wafer of silicon substrate material, said implanted ions forming a single type of uncompensated dopant atom layer therein;

(b) forming a quality thermal oxide layer on said silicon substrate material;

(c) forming said first insulator layer on said quality thermal oxide;

(d) coupling a second insulator layer to said first insulator layer, a passive silicon substrate coupled to said second insulator layer;

(e) etching with a first etchant said silicon substrate material until reaching said dopant atom layer; and

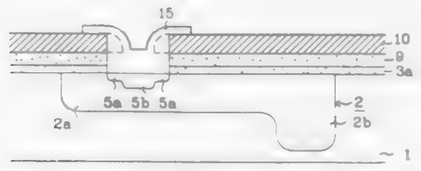
(f) etching with a second etchant said dopant atom layer to remove substantially all of said dopant layer, leaving a high quality epiless silicon on said quality oxide coupled to said first insulator layer, said high quality oxide formed by an epiless process.

5,147,809

METHOD OF PRODUCING A BIPOLAR TRANSISTOR WITH A LATERALLY GRADED EMITTER (LGE) EMPLOYING A REFILL METHOD OF POLYCRYSTALLINE SILICON

Tae-Young Won; Seog-Heon Han; Moon-Ho Kim, all of Seoul, and Jang-Man Ko, Inchon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Aug. 20, 1991, Ser. No. 747,634
Claims priority, application Rep. of Korea, Feb. 21, 1991, 91-2805
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 6 Claims



1. A method for manufacturing a bipolar transistor semiconductor device having a laterally graded emitter, the method comprising the steps of:

forming an epitaxial layer disposed on a first conductivity type semiconductor substrate, said epitaxial layer being of a second conductivity type;

forming a base region of the second conductivity type in said epitaxial layer;

growing a first oxide layer on said epitaxial layer;

growing a second oxide layer on said first oxide layer;

forming a nitride layer over said second oxide layer;

etching a predetermined region of said nitride layer to form an emitter window;

depositing polycrystalline silicon of a low concentration polycrystalline silicon within the emitter window to form sidewalls of low concentration polycrystalline silicon therein by using a photolithography mask pattern,

etching the portion of said first and second oxide layers disposed below the surface of said emitter window, including portions below said sidewalls, to form a deeper emitter window;

filling said deeper emitter window, defined by the window area around the periphery of said sidewalls, with a polycrystalline silicon material;

ion implanting a high impurity concentration into said filled deeper emitter window, and forming an emitter electrode region having high concentration polycrystalline silicon using a photolithography process; and

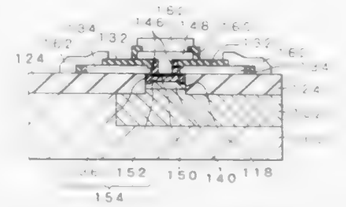
diffusing, using a thermal annealing process, an emitter diffusion region into the base region formed in said epitaxial layer.

5,147,810

PROCESS FOR PRODUCING SEMICONDUCTOR DEVICE

Kenichi Suzuki, Minato, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 639,064
Claims priority, application Japan, Jan. 9, 1990, 2-989
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 25 Claims



1. A process for producing a semiconductor device in an integrated circuit, the semiconductor device having therein first second principal electrode regions as well as a control electrode region, comprising the step of:

(a) forming a patterned structure on a top surface of a monocrystalline or single crystal silicon foundation through an oxidation-resistant film, the patterned structure having an island-like portion of a first polycrystalline silicon and a first thermal oxide film on the island-like portion;

(b) forming a raised portion used to form respective electrode regions therein by utilizing etching effective a top surface of the oxidation-resistant film down to the foundation partially in a thickness-wise direction thereof except for an area under the raised portion, while using the patterned structure as a mask;

(c) forming a first insulating region around the raised portion;

(d) changing the first polycrystalline silicon of the island-like portion to a second thermal oxide film by the thermal oxidation treatment after the first thermal oxide film is removed, said second thermal oxide film being in the condition in which the peripheral area of a remaining oxidation-resistant film surrounding the second thermal oxide film is exposed;

(e) removing the exposed peripheral area of the oxidation-resistant film in order to expose the peripheral area of the top surface of the raised portion;

(f) forming a second polycrystalline silicon pattern layer coming in contact with the exposed peripheral area of the top surface and extending from a sideface of said second thermal oxide film and the remaining oxidation-resistant film onto the first insulating region, said second polycrystalline silicon pattern layer containing a first conductive type impurity at a high concentration;

(g) carrying out a thermal treatment to the second polycrystalline silicon pattern layer after the second thermal oxide film is removed, in order to form a third thermal oxide film on the surface of the second polycrystalline silicon pattern layer and a remaining portion thereof to be used as a control electrode, during which thermal treatment the first conductive type impurity is thermally diffused from the second polycrystalline silicon pattern layer into the peripheral area of the raised portion to form a low resistance regions(s) therein;

(h) removing the remaining oxidation-resistant film to expose the top surface of the raised portion;

(i) doping an impurity of a first conductive type into the raised portion from the top surface thereof to form a doped region(s) surrounded by the low resistance region(s) in the raised portion;

(j) forming a sidewall layer of a second insulating film on the top surface of the raised portion and on a sideface of the

control electrode and of the third thermal oxide film, so as to define an impurity diffused region within the doped region(s);

(k) forming a third polycrystalline silicon pattern layer on the exposed area of the top surface of the raised portion, the third polycrystalline silicon pattern layer containing therein a second conductive type impurity at a high concentration; and

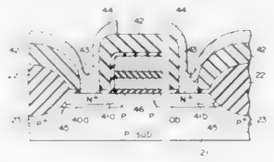
(l) thermally diffusing the second conductive type impurity from the third polycrystalline silicon pattern layer into the doped region(s) to form the impurity diffused region, thereby obtaining the impurity diffused region serving as the first principal electrode region, the low resistance region and the remaining portion of the doped region(s) serving as the control electrode region, and a remaining region of the raised portion under the control electrode region serving as the second principal electrode region.

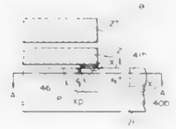
5,147,811

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE BY CONTROLLING THE PROFILE OF THE DENSITY OF P-TYPE IMPURITIES IN THE SOURCE/DRAIN REGIONS

Eiji Sakagami, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1991, Ser. No. 666,912
Claims priority, application Japan, Mar. 13, 1990, 2-61531
Int. Cl.[5] H01L *21. 22. 21/266*
U.S. Cl. 437—35 **8 Claims**





1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a semiconductor element region on a semiconductor substrate;

forming a first insulation layer on a resulting semiconductor structure;

forming a first conductive layer on said first insulation layer;

forming a second insulation layer on said first conductive layer;

forming a second conductive layer on said second insulation layer;

patterning said insulation and conductive layers to form a floating gate electrode and a control gate electrode;

selectively injecting ions of an impurity having a first conductivity type into said element region at an angle of at least 8° relative to a normal of an upper surface of said element region;

selectively injecting ions of an impurity having a second conductivity type into said element region; and

activating said impurities of the second conductivity type to form a source region and a drain region and a said impurities of the first conductivity type to form a pocket region adjacent to an edge of said drain region,

wherein the step of injecting ions having an impurity of the first conductivity type is governed by the expression

$$X_p \cdot \tan\theta \geq X_{jl}$$

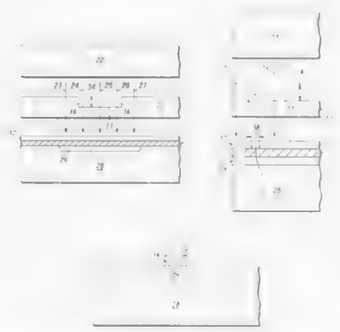
where X_p designates a mean projected range of the ions injected into said element region, θ designates the angle at which the ions are injected relative to the normal of the upper surface of said element region, and X_{jl} designates a distance that the edge of said drain region extends under said floating gate electrode.

5,147,812

FABRICATION METHOD FOR A SUB-MICRON GEOMETRY SEMICONDUCTOR DEVICE

James G. Gilbert, Tempe; Fourmun Lee, Chandler, and Thomas Zirkle, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1992, Ser. No. 861,734
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—41 **20 Claims**



1. A fabrication method for a sub-micron geometry semiconductor device comprising:

identifying a fabrication area on a semiconductor wafer;

implanting a dopant in the fabrication area;

placing a gate material on the semiconductor wafer over the fabrication area;

placing a light sensitive material on the gate material;

providing an optical exposure system for exposing light sensitive material;

providing a chromeless mask transmissive to light from the optical exposure system which has a modified area for phase shifting light;

aligning the optical exposure system to the chromeless mask;

aligning the chromeless mask to the semiconductor wafer;

exposing light sensitive material on the semiconductor wafer with light from the optical exposure system which passes through the chromeless mask to the semiconductor wafer surface;

forming a sub-micron non-exposed line on the light sensitive material using destructive interference of diffracted light due to phase shift differences projected from the chromeless mask, wherein the sub-micron non-exposed line of light sensitive material forms a closed loop;

removing the exposed light sensitive material;

removing gate material which is not protected by the non-exposed line of light sensitive material;

removing the non-exposed light sensitive material, thereby leaving a sub-micron gate on the semiconductor wafer formed in a closed loop; and

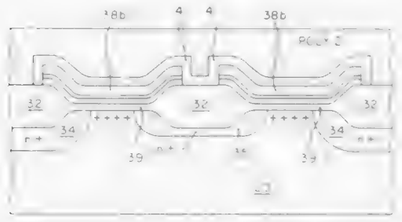
forming a source and drain for the semiconductor device which are adjacent to the sub-micron gate.

5,147,813

ERASE PERFORMANCE IMPROVEMENT VIA DUAL FLOATING GATE PROCESSING

Been-Jon Woo, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 567,606, Aug. 15, 1990, abandoned.
This application Oct. 29, 1991, Ser. No. 784,134
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—43 **23 Claims**



1. A process for forming a non-volatile memory cell which includes a control gate, a floating gate for storage of electrical charge, an intergate dielectric layer between said control gate and said floating gate, a substrate, and a tunnel oxide between said floating gate and said substrate wherein said floating gate is formed over said tunnel oxide by a method comprising the steps of:

depositing a first polysilicon layer over said tunnel oxide;

forming an insulative layer over said first polysilicon layer;

depositing a second polysilicon layer over said insulative layer; and

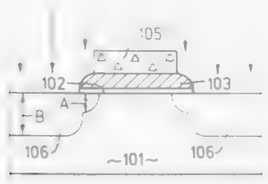
introducing a dopant into said second polysilicon layer to form said floating gate comprising said first polysilicon layer, said insulative layer and said second polysilicon layer.

5,147,814

METHOD OF MANUFACTURING AN LDDFET HAVING AN INVERTED-T SHAPED GATE ELECTRODE

Masahiro Takeuchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 500,200, Mar. 27, 1990, Pat. No. 5,097,300.
This application Jul. 22, 1991, Ser. No. 733,643
Claims priority, application Japan, Mar. 28, 1989, 1-76108; Mar. 28, 1989, 1-76109; Feb. 20, 1990, 2-38757
Int. Cl.[5] H01L *21/28. 21/336*
U.S. Cl. 437—44 **6 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

providing a substrate composed of a semiconductor material of a first conductivity type, the substrate having an outer surface;

forming a first insulating film on the outer surface of the substrate;

forming a first conductive film on the first insulating film and forming a second conductive film on the first conductive film, each conductive film having two opposed edges;

forming the first and second conductive film into an MOS transistor gate electrode having a defined shape including two opposed sides, respective portions of which sides are defined by the two opposed edges of the conductive films;

effecting thermal annealing of the gate electrode for causing the opposed edges of the second conductive film to be spaced inwardly of the opposed edges of the first conductive film; and

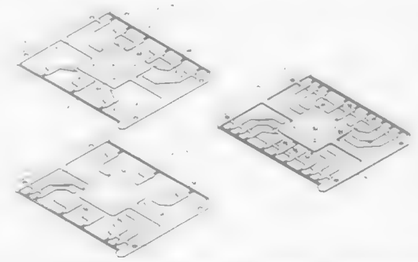
performing ion implantation of impurity ions of a second conductivity type, opposite to the first conductivity type, into the substrate, via the outer surface, with the gate electrode acting as a mask with respect to the impurity ions, said step of performing ion implantation being carried out with a type of impurity and with an ion accelerating voltage selected such that the impurity ions cannot traverse a path through both the first conductive film and the second conductive film but can traverse a path through only the first conductive film.

5,147,815

METHOD FOR FABRICATING A MULTICHIP SEMICONDUCTOR DEVICE HAVING TWO INTERDIGITATED LEADFRAMES

James J. Casto, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 552,759, May 14, 1990, abandoned.
This application Mar. 1, 1991, Ser. No. 663,223
Int. Cl.[5] H01L *21/56, 21/58. 21/60*
U.S. Cl. 437—51 **12 Claims**



1. A method for fabricating a multichip semiconductor device comprising the steps of:

providing first and second leadframes, each having a plurality of conductive lead members and each lead member of each leadframe having a partial dam bar extending from a side of said lead member;

electrically coupling first and second semiconductor dies to said pluralities of conductive lead members of said first and second leadframes, respectively, said first and second semiconductor dies each having a face surface with active circuitry formed thereon and a back surface opposite said face surface;

positioning said first and second leadframes with said first and second semiconductor dies electrically coupled thereto in a stacked relationship such that said first and second pluralities of conductive lead members of said first and second leadframes are interdigitated and all of said partial dam bars act together to form. in composite, a substantially continuous dam bar; and

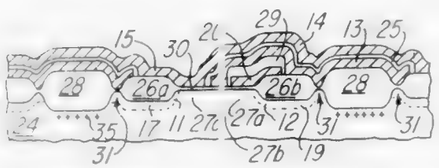
encapsulating said first and second semiconductor dies and inner portions of all of said conductive lead members in a protective body member such that outer portions of all of said conductive lead members and all of said partial dam bars extend from said package body essentially in a single plane.

5,147,816

METHOD OF MAKING NONVOLATILE MEMORY ARRAY HAVING CELLS WITH TWO TUNELLING WINDOWS

Manzur Gill, Arcola, and Theodore D. Lindgren, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 589,347, Sep. 28, 1990, Pat. No. 5,103,273.
This application Jul. 26, 1991, Ser. No. 736,338
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 6 Claims



1. A method for fabricating a nonvolatile memory array at a face of a semiconductor layer of a first conductivity-type, comprising:

selectively doping said semiconductor layer with a dopant of a second conductivity-type opposite said first conductivity-type to create pairs of source-column lines and drain-column lines, each said drain-column line in a pair spaced from each said source-column line in said pair by first, second and third sub-channels, said first sub-channel adjacent said drain-column line, said second sub-channel adjacent said source-column line;

differentially growing a first thermal insulator region over each said source-column line and a second thermal insulator region over each said drain-column line;

forming first and second tunnelling windows, each said first tunnelling window formed on an edge of said source-column line opposite said second sub-channel, each said second tunnelling window formed on an edge of said drain-column line opposite said first sub-channel;

forming a first conductive layer and a first insulator layer over said face, said first conductive layer insulated from said sub-channels;

selectively forming a second insulator layer over said first insulator layer;

selectively etching said first conductive layer, said first insulator layer and said second insulator layer to define field-plate lines, field-plate insulators, floating-gate strips and inter-level-insulator strips, each said field-plate line and each said field plate insulator formed over at least a part of said second thermal insulator region and over said first sub-channel of a said pair, each said floating-gate strip and each said inter-level insulator strip formed over at least said first thermal insulator region, over said second sub-channel of said pair, over said first tunnelling window of said pair, and over said second tunnelling window of an adjacent said pair;

forming a row-line/control-gate layer insulated from said floating-gate strips and from said third sub-channels;

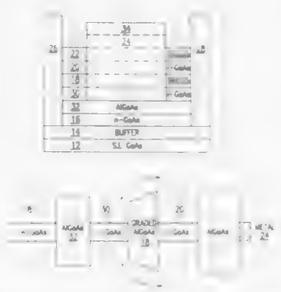
forming row-lines/control-gates and floating gates from said row-line/control-gate layer and from said floating-gate strips.

5,147,817

METHOD FOR FORMING PROGRAMMABLE RESISTIVE ELEMENT

Gary A. Frazier, and Robert T. Bate, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 16, 1990, Ser. No. 614,889
Int. Cl.[5] H01L *21/72, 21/203*
U.S. Cl. 437—52 2 Claims



1. A method for forming a programmable resistive element, comprising the steps of:

forming a channel region comprising a layer of gallium arsenide;

forming a trapezoidal programming barrier disposed outwardly from said channel region;

forming a storage gate disposed outwardly from said programming barrier comprising a layer of intrinsic gallium arsenide;

forming an insulator disposed outwardly from said storage gate;

forming a control gate disposed outwardly from said insulator; and

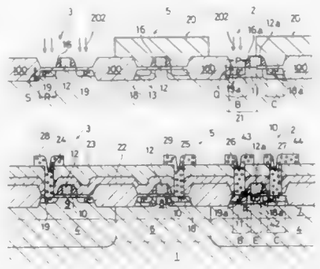
forming first and second spaced apart contacts to contact said channel, wherein said step of forming a programming barrier comprised the step of forming a layer of composition modulated aluminum-gallium-arsenide.

5,147,818

METHOD FOR MANUFACTURING A BICMOS SEMICONDUCTOR DEVICE HAVING A LATERAL BIPOLAR TRANSISTOR

Satoshi Hikida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Nov. 4, 1991, Ser. No. 787,404
Claims priority, application Japan, Nov. 8, 1990, 2-304837
Int. Cl.[5] H01L *21/331*
U.S. Cl. 437—57 9 Claims



1. A method for manufacturing a semiconductor device in which a bipolar transistor and a CMOS transistor are formed on a first conductive semiconductor substrate, comprising the steps of;

(i) determining a bipolar transistor formation region, an n-channel MOS transistor formation region and a p-channel MOS transistor formation region by an isolation oxide film on the first conductive semiconductor substrate, then thermally oxidizing the whole surface of the semiconductor substrate including the isolation oxide film so as to form a gate oxide film over the three regions, and injecting first conductive impurities in the bipolar transistor formation region at a low density so as to form an active base layer,

(ii) opening the gate oxide film in the bipolar transistor formation region by a predetermined pattern so as to form a gate oxide film opening on the active base layer,

(iii) forming a conductive film for gate formation having second conductive impurities doped at a high density over the semiconductor substrate including the opening, then patterning the conductive film so as to form a gate in the n-channel and p-channel MOS transistor formation regions, and simultaneously forming a gate in the bipolar transistor formation region over a gate oxide film region remaining when forming the opening, and an opening region on the active base layer,

(iv) forming a source-drain in the n-channel MOS transistor formation region, and simultaneously forming a collector electrode pullout region in the gate oxide film region remaining on an active base layer surface in the bipolar transistor formation region,

(v) forming a source-drain in the p-channel MOS transistor formation region, and simultaneously forming a base electrode pullout region in the opening region on the active base layer surface which is opposed to the collector electrode pullout region with a gate interposed in the bipolar transistor formation region,

(vi) laminating a layer insulating film over the semiconductor substrate including the isolation oxide film, gate, collector electrode pullout region and base electrode pullout region, and

(vii) carrying out a heat treatment so as to reflow the layer insulating film, and automatically doping the second conductive impurities from the gate to the active base layer in the bipolar transistor formation region by the heat treatment so as to form an emitter region on the active base layer surface just below the gate.

5,147,819

SEMICONDUCTOR METALLIZATION METHOD

Chang Yu; Trung T. Doan, and Gurtej S. Sandhu, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 21, 1991, Ser. No. 659,866
Int. Cl.[5] H01L *21/26*
U.S. Cl. 437—173 4 Claims

1. In a sputtering process of forming an aluminum alloy layer of predetermined thickness on a semiconductor wafer to improve step coverage by filling contact openings which have a defined diameter, a method of lowering required laser fluence and widening the laser planarization process window in achieving a desired planarization effect, the method comprising the following sequential steps:

chemical vapor depositing a layer of elemental aluminum atop the wafer to a thickness of from 5% to 35% of the defined contact diameter;

sputtering a layer of an aluminum alloy atop the chemical vapor deposited layer of elemental aluminum to a thickness which results in the combination of the chemical vapor deposited and sputtered layers having substantially the predetermined overall layer thickness; and

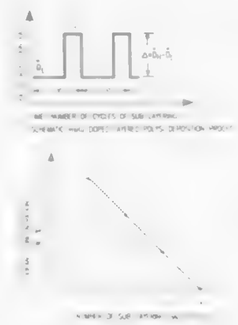
combining and intermixing the sputtered aluminum alloy layer with the chemical vapor deposited aluminum layer to form an overall homogenous aluminum alloy layer by applying laser energy to the sputtered aluminum alloy layer, the application of energy also filling contact openings and planarizing the overall homogenous alloy layer, the sequential steps of applying CVD aluminum to 5% to 35% of the contact diameter and sputtering the aluminum alloy effecting a lowering of required laser fluence and a widening of the laser planarization process window than would otherwise be required for planarizing a sputtered aluminum alloy layer.

5,147,820

SILICIDE FORMATION ON POLYSILICON

Sailesh Chittipeddi, Whitehall; Pradip K. Roy, and Ankineedu Velaga, both of Allentown, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1991, Ser. No. 749,762
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—193 15 Claims



1. A method of making a semiconductor device comprising the steps of:

(1) forming a gate dielectric layer on a semiconductor body; and

(2) forming a gate electrode on said gate dielectric layer, wherein said gate electrode comprises a doped silicon layer and an overlying metal silicide layer;

characterized in that said step of forming a gate electrode includes the steps of:

(3) depositing a first silicon sub-layer at a first deposition rate, and depositing a second silicon sub-layer at a second deposition rate that is different than said first rate;

(4) including a dopant in said first sub-layer at a first concentration; and including a dopant in said second sub-layer at a second concentration that is less than said first concentration, and

(5) forming said metal silicide layer.

5,147,821

METHOD FOR MAKING A THERMALLY ENHANCED SEMICONDUCTOR DEVICE BY HOLDING A LEADFRAME AGAINST A HEATSINK THROUGH VACUUM SUCTION IN A MOLDING OPERATION

Michael B. McShane; James J. Casto, and Bennett A. Joiner, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 589,465, Sep. 28, 1990, Pat. No. 5,105,259.
This application Oct. 31, 1991, Ser. No. 786,205
Int. Cl.[5] H01L *21/56, 21/58, 21/60, 21/603*
U.S. Cl. 437—212 17 Claims

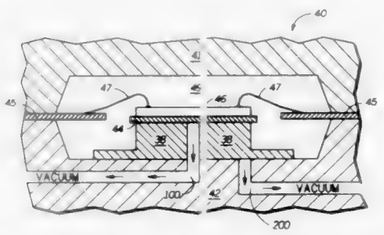
8. A method for making an encapsulated thermally enhanced semiconductor device, comprising the steps of:

providing a leadframe having a semiconductor die attached to a mounting surface of the leadframe;

providing a heat sink having an opening therein which extends through the heat sink;

positioning the leadframe with the semiconductor die attached thereto adjacent the heat sink such that the mounting surface of the leadframe covers the opening in the heat sink;

applying a vacuum to the opening in the heat sink to pull the mounting surface in close proximity to the heat sink; and



encapsulating the semiconductor die and portions of the leadframe to form a package body in which the heat sink is secured.

5,147,822

PLASMA PROCESSING METHOD FOR IMPROVING A PACKAGE OF A SEMICONDUCTOR DEVICE

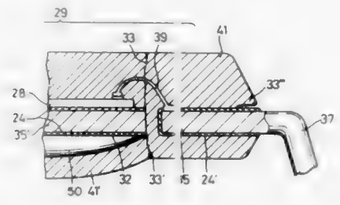
Shunpei Yamazaki, Tokyo; Mitsunori Tsuchiya; Kazuo Urata, both of Atsugi; Itaru Koyama, Hatano; Shinji Imatou, Atsugi; Shigenori Hayashi, Atsugi; Naoki Hirose, Atsugi; Mari Sasaki, Atsugi; Noriya Ishida, Atsugi, and Kouhei Wada, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 397,866, Aug. 24, 1989, abandoned. This application Feb. 25, 1991, Ser. No. 667,231

Claims priority, application Japan, Aug. 26, 1988, 63-212885; Oct. 17, 1988, 63-261961; Oct. 17, 1988, 63-261962

Int. Cl.[5] H01L *21/56*

U.S. Cl. 437—215 **11 Claims**



1. In a process of manufacturing an electronic device which includes a semiconductor chip packaged within an organic resin, the improvement comprising the steps of:

placing said electronic device in a vacuum chamber,

evacuating said vacuum chamber by using a vacuum pump,

introducing a gas selected from the group consisting of argon, neon, helium, krypton, nitrogen fluorides, carbon fluorides and nitrogen to said vacuum chamber,

inputting energy to said vacuum chamber in order to generate a plasma from said gas and

then carrying out a plasma processing in the vacuum chamber on said electronic device including said organic resin by virtue of said plasma.

5,147,823

METHOD FOR FORMING AN ULTRAFINE METAL PATTERN USING AN ELECTRON BEAM

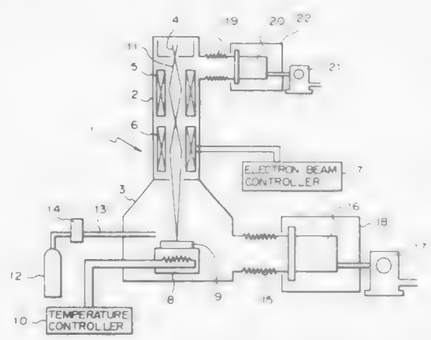
Akira Ishibashi, Kanagawa; Yoshifumi Mori, Chiba, and Kenji Funato, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 412,479, Sep. 26, 1989, abandoned. This application May 22, 1991, Ser. No. 707,236

Claims priority, application Japan, Sep. 20, 1988, 63-245224; Oct. 21, 1988, 63-265622

Int. Cl.[5] H01L *21/00, 21/02, 21/306*

U.S. Cl. 437—225 **5 Claims**



1. A method for forming an ultrafine metal pattern, comprising the steps of:

providing a substrate on which a metal film is formed, said substrate and metal film being provided in a vacuum specimen chamber;

introducing a gaseous negative type resist for an electron beam into the specimen chamber, a vapor pressure of the negative type resist being in a range from 10^{-7} to 10^{-5} Torr;

providing a vacuum in said specimen chamber, and forming a negative type resist molecular layer comprising negative type resist molecules absorbed on a surface of the metal film;

irradiation an electron beam whose beam diameter is finely converged to approximately 100 Å or less onto the metal film in the gaseous negative type resist atmosphere while scanning a desired pattern, an accelerating voltage of the electron beam being in a range from 0.5 to approximately 6 kV, and having a beam current in a range from 10^{-13} to 10^{-7} A;

molecules in said negative type resist molecular layer where said electron beam is irradiated causing a cross linking reaction;

repetitively executing scanning of the electron beam for said desired pattern until a thickness of the desired pattern which was initially irradiated and comprising the negative type resist molecules which caused the cross linking reaction reaches a desired thickness;

selectively removing portions of the negative type resist molecular layer to which the electron beam was not irradiated by a wet process using a solvent for the negative type resist, a resist pattern remaining which comprises the negative type resist molecules which caused the cross linking reaction, and a width of said resist pattern being substantially equal to said beam diameter of the electron beam;

aniostropically etching the metal film while suing the resist pattern as a mask so as to form a metal ultrafine line of 100 Å or less; and

removing the resist pattern by a wet process using a solvent.

5,147,824

SEMICONDUCTOR WAFER

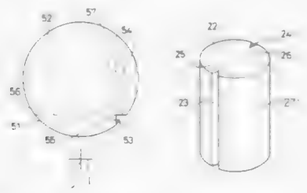
Takao Yasue, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 462,525, Jan. 9, 1990, Pat. No. 5,060,043. This application Aug. 16, 1991, Ser. No. 745,803

Claims priority, application Japan, Jun. 26, 1989, 1-163534

Int. Cl.[5] H01L *21/304*

U.S. Cl. 437—226 **3 Claims**



1. A method of manufacturing a semiconductor wafer having a mark formed and oriented for identifying a specified crystal orientation, comprising the steps of:

preparing a cylindrical bar member formed of a material for a semiconductor wafer;

forming a notch which is to be said mark along a generating line of said bar member, said notch having a shape defined by two orthogonally intersecting surfaces oriented with respect to said crystal orientation; and

slicing the bar member across said notch, to form said semiconductor wafer.

5,147,825

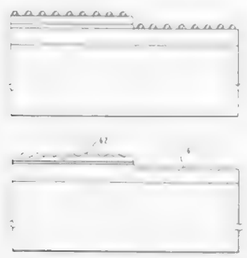
PHOTONIC-INTEGRATED-CIRCUIT FABRICATION PROCESS

Thomas L. Koch, Holmdel, and Uziel Koren, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Aug. 26, 1988, Ser. No. 237,251

Int. Cl.[5] H01L *21/302*

U.S. Cl. 437—228 **7 Claims**



1. A method of etching a first, patterned surface adjacent to a second surface, which second surface remains substantially unetched during the etching, comprising

forming a second-surface-masking-material over the second surface,

forming a corrugated mask over both the first surface and the second-surface-masking-material to form first and second masked surfaces, respectively, and

exposing both the first and second masked surfaces to an etchant,

THE INVENTION CHARACTERIZED IN THAT:

the said first and second masked surfaces etch at substantially the same rate when exposed to the said etchant,

whereby the said first surface is uniformly patterned without any substantial discontinuity in the pattern in regions of the first surface adjacent to the second surface.

5,147,826

LOW TEMPERATURE CRYSTALLIZATION AND PATTERING OF AMORPHOUS SILICON FILMS

Gang Liu; Ramesh H. Kakkad, and Stephen J. Fonash, all of State College, Pa., assignors to The Pennsylvania Research Corporation, University Park, Pa.

Filed Aug. 6, 1990, Ser. No. 563,232

Int. Cl.[5] H01L *21/324*

U.S. Cl. 437—233 **11 Claims**

10. A method for producing a polycrystalline silicon film, comprising the steps of:

a. disposing a thin discontinuous film of a nucleating site forming material in contact with a surface of an amorphous silicon film; and

b. annealing the films by heating said films to a temperature below that which would anneal said amorphous silicon film without said film of nucleating site material in contact therewith, whereby said nucleating site forming material allows formation of said polycrystalline silicon film at a lower anneal temperature.

5,147,827

METHOD FOR PRODUCING A PASSIVATION FILM OF INP COMPOUND SEMICONDUCTOR

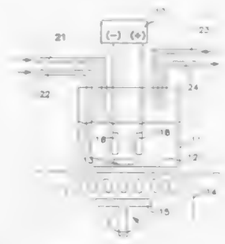
Toyoji Chino, Toyonaka; Kenichi Matsuda, Moriguchi, and Shibatah Jun, Kawachinagano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 6, 1991, Ser. No. 711,023

Claims priority, application Japan, Jun. 6, 1990, 2-147806

Int. Cl.[5] H01L *21/208*

U.S. Cl. 437—237 **2 Claims**



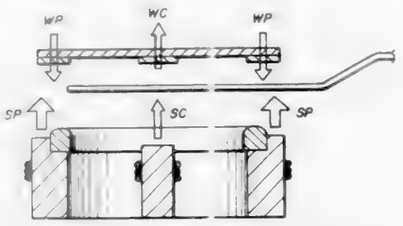
1. A method for producing a passivation film on the surface of a semiconductor device including an InP compound semiconductor, comprising the steps of:

a. providing a solution of hydrogen peroxide containing metallic ions of iron, copper, chromium or cobalt, the concentration of the metallic ions in the solution being between 250 and 2000 ppm, the temperature of the solution being controlled between 50° and 115° C.; and

b. soaking a semiconductor device including said InP compound semiconductor in the solution;

whereby a passivation film is formed in the solution on the surface of the semiconductor device, and the passivation film includes an oxide of the InP compound in the semiconductor device, and an oxide and a hydroxide of the metallic ions.

5,147,828
METHOD OF HANDLING MAGNETIC SEMICONDUCTOR WAFERS
Peter Ebbing, Los Altos, and Jack Ford, San Jose, both of Calif., assignors to Applied Materials Inc., Santa Clara, Calif.
Filed Dec. 14, 1989, Ser. No. 450,779
Int. Cl.[5] H01L 21/00, 21/68
U.S. Cl. 437—250 6 Claims



1. The method of handling magnetic semiconductor wafers at a wafer processing station comprising the steps of:
providing a semiconductor wafer having a magnetic material on the backside thereof
providing a resilient seating means at the processing station for receiving and supporting the wafer during wafer processing;
establishing a magnetic field between the seating means and the magnetic material on the wafer for urging the wafer onto the seating means; and
seating the wafer onto the seating means thereby forming an area contact therebetween.

5,147,829
SOL-GEL DERIVED SiO_2/OXIDE POWDER COMPOSITIES AND THEIR PRODUCTION
Larry L. Hench, Gainesville, Fla., and Soon C. Park, Round Rock, Tex., assignors to University of Florida Research Foundation, Gainesville, Fla.
Filed Apr. 19, 1989, Ser. No. 342,697
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] B01J 13/00; C03C 3/06
U.S. Cl. 501—12 19 Claims

1. A method of making a SiO_2 gel/oxide powder composite comprising the steps of:
(1) preparing a sol containing SiO_2 with oxide powder dispersed therein in the presence of a drying control chemical additive,
(2) gelling the sol to produce a monolithic SiO_2 gel matrix having homogeneously distributed therein the oxide powder, and
(3) drying the monolithic SiO_2 gel/oxide powder composite, wherein the dried gel matrix of the composite is crack-free and has a surface area in the range of 600 m^2/g to 1100 m^2/g.

2. The method of claim 1 including the step of densifying the SiO_2 gel/oxide powder composite.

5,147,830
COMPOSITION AND METHOD FOR MANUFACTURING STEEL-CONTAINMENT EQUIPMENT
Subrata Banerjee, Glen Ellyn, and Charles W. Connors, Jr., Chicago, both of Ill., assignors to Magneco/Metrel, Inc., Addison, Ill.
Continuation of Ser. No. 527,033, May 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 424,950, Oct. 23, 1989, abandoned. This application Nov. 21, 1991, Ser. No. 798,347
Int. Cl.[5] C04B 35/52, 35/56
U.S. Cl. 501—89 19 Claims

1. A method for manufacturing steel containment equipment, comprising the steps of:
forming a pumpable casting composition by mixing a compound comprising 55–90% by weight of a granular base material selected from the group consisting of calcined clay, mullite, brown fused alumina, tabular alumina and mixtures thereof, 5–20% by weight of calcined alumina, and 8–14% by weight of a silica binder formed from a dispersion of 15–70% by weight colloidal silica in water, the colloidal silica having an average particle diameter of 4–100 millimicrons;
transporting the casting composition to a mold assembly using a concrete pump; and
molding the casting composition to form a steel containment device.

5,147,831
METHOD FOR PRODUCING A FINE GRAINED POWDER CONSISTING OF NITRIDES AND CARBONITRIDES OF TITANIUM
Hans Zeiringer, Carinthia, Austria, assignor to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria
Filed Feb. 27, 1991, Ser. No. 661,866
Claims priority, application Austria, Mar. 14, 1990, 607/90
Int. Cl.[5] C04B 35/58
U.S. Cl. 501—96 12 Claims

1. A method for producing a fine-grained powder consisting essentially of nitrides and carbonitrides of titanium, which comprises the steps of
(a) introducing a reaction mixture essentially consisting of oxides of titanium and a carbonaceous material into a reactor,
(b) maintaining a nitrogen atmosphere in the reactor at a subatmospheric pressure,
(c) heating the reaction mixture in the reactor to a temperature between 800° C. and 2000° C. to evolve gaseous reaction products,
(d) keeping the temperature within a range of between 1400° C. and 1800° C. while simultaneously removing the gaseous reaction products and contacting the reaction mixture with nitrogen or a nitrogen-evolving gas to obtain a solid reaction product, and
(e) cooling the solid reaction product.

5,147,832
THERMAL CONDUCTIVE COLORED ALUMINUM NITRIDE SINTERED BODY AND METHOD OF PREPARING THE SAME
Kouhei Shimoda; Takao Maeda; Kouichi Sogabe, and Masaya Miyake, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Jul. 31, 1991, Ser. No. 738,461
Claims priority, application Japan, Aug. 7, 1990, 2-210022
Int. Cl.[5] C04B 35/58
U.S. Cl. 501—96 8 Claims

1. A thermal conductive aluminum nitride sintered body, comprising: aluminum nitride 100 parts by weight, carbon within the range of at least 0.005 to not more than 0.5 parts by weight of carbon, a boron compound within the range of 0.01 to 1.0 parts by weight in terms of the simple substance of boron, a rare earth aluminum oxide within the range of 0.01 to 15 parts by weight of said rare earth aluminum oxide in terms of the simple substance of a rare earth element, and at least one compound selected from the group consisting of compounds containing elements belonging to groups IVB, VB and VIB of the periodic table, said compound being present within the range of 0.01 to 15 parts by weight interms of the simple substance of the element contained in said compound, said thermal conductive aluminum nitride sintered body having a thermal conductivity of at least 100 W/m·K and not more than 270 W/m·K at room temperature, said sintered body having a color within the range of gray to black.

4. A method of producing a thermal conductive aluminum nitride sintered body having a color within the range from gray to black and a thermal conductivity within the range of 100 to 270 W/m·K at room temperature, said method comprising the following steps:
mixing 100 parts by weight of aluminum nitride with the following components, at least 0.01 parts by weight and not more than 5 parts by weight of carbon, boron oxide within the range of 0.01 to 1.0 parts by weight of boron oxide in terms of the simple substance of boron, at least 0.01 parts by weight and not more than 15 parts by weight of an oxide of a rare earth element in terms of the simple substance of said rare earth element, and at least 0.01 parts by weight and not more than 15 parts by weight of at least one compound selected from the group consisting of oxides, carbides, and nitrides of elements belonging to the groups IVB, VB and VIB of the periodic table in terms of the simple substance of the element contained in said compound, to form a mixture; shaping said mixture into a prescribed configuration for obtaining a compact; and
firing said compact in a non-oxidizing atmosphere containing at least 10 percent by volume of nitrogen at a temperature of at least 1500° C. and not more than 2100° C.

5,147,833
ALUMINA-ZIRCONIA CERAMIC
William R. Manning, Richmond, Mich., and Terrence K. Brog, Littleton, Colo., assignors to Champion Spark Plug Company, Toledo, Ohio
Continuation of Ser. No. 399,143, Aug. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 287,693, Dec. 20, 1988, abandoned, which is a continuation of Ser. No. 76,439, Jul. 22, 1987, abandoned. This application Apr. 5, 1991, Ser. No. 682,852
Int. Cl.[5] C04B 35/10, 35/48, 35/49
U.S. Cl. 501—105 7 Claims

1. A ceramic article produced by firing a shape pressed from a ceramic batch which consists of from 6 to 50 percent of particulate ZrO_2 having an ultimate particle size less than 2 μm, from 50 to 94 percent of particulate Al_2O_3, from ¼ to 3 percent of MnO_2 and from ¼ to 3 percent of TiO_2 to a temperature sufficiently high to mature the ceramic but not sufficiently high to cause a degradation of the strength thereof.

5,147,834
GUNNING COMPOSITION
Subrata Banerjee, Wheaton, Ill., assignor to Magneco/Metrel, Inc., Addison, Ill.
Continuation of Ser. No. 545,406, Jun. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 393,990, Aug. 15, 1989, abandoned. This application Aug. 19, 1991, Ser. No. 749,620
Int. Cl.[5] C04B 35/52
U.S. Cl. 501—129 13 Claims

1. A gunning composition for repairing and maintaining equipment used for containing and processing molten steel, consisting essentially of:
at least about 60 weight percent of a refractory base material selected from the group consisting of calcined clay, mullite, brown fused alumina, tabular alumina and combinations thereof;
greater than 10 to not more than 20 weight percent silicon carbide;
about 7 to about 15 weight percent ball clay;
about 5 to about 8 weight percent silicon metal;
greater than 5 to not more than 10 weight percent graphite; and
about 4 to about 8 weight percent of a binder formed from 15–70 weight percent colloidal silica in an aqueous medium, the colloidal silica having an average diameter of 4–100 millimicrons.

5,147,835
COMPOSITE TITANATE ALUMINATE DIELECTRIC MATERIAL
Agnes A. Franzak, and Wei-Yean Howng, both of Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 5, 1991, Ser. No. 664,697
Int. Cl.[5] C04B 35/44, 35/46
U.S. Cl. 501—134 4 Claims

1. A process for forming a dense dielectric body composed of a composite oxide material characterized by the empirical formula

$$(MgO)_a(CaO)_b(TiO_2)_c(Al_2O_3)_d$$

wherein a,b,c and d are mole fractions and a+b+c+d=1 and further wherein a is between about 0.36 and 0.47 mole fraction, b is between about 0.023 and 0.03, c is between about 0.386 and 0.50 and d is between about 0.05 and 0.23, said process comprising
calcining a first mixture of a powdered calcium oxide precursor composed of a compound selected from the group consisting of calcium oxide and calcium compounds thermally decomposable to form calcium oxide, a powdered magnesium oxide precursor composed of a compound selected from the group consisting of magnesium oxide and magnesium compounds thermally decomposable to form magnesium oxide, and a powdered titanium oxide precursor composed of a compound selected from the group consisting of titanium oxide and titanium compounds thermally decomposable to form titanium oxide, said calcining being carried out for a time and at a temperature sufficient to produce a composite titanate powder composed predominantly of compounds of calcium titanate and magnesium titanate,
blending the titanate powder and a powdered aluminum oxide precursor to obtain a second powder mixture, said aluminum oxide precursor being composed of a compound selected from the group consisting of aluminum oxide and aluminum compounds thermally decomposable to form aluminum oxide, and
compacting and sintering the second powder mixture to produce an integrally bonded body, said sintering being carried out at a temperature and for a time sufficient to substantially react the alumina to form aluminate compounds within the body.

5,147,836
CATALYTIC CRACKING CATALYSTS
Wu-Cheng Cheng, Ellicott City, and John A. Rudesill, Columbia, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Oct. 18, 1991, Ser. No. 780,680
Int. Cl.[5] B01J 29/08, 21/12, 21/16
U.S. Cl. 502—64 13 Claims

1. A catalytic cracking catalyst composition which comprises a molecular sieve dispersed in an inorganic oxide matrix and silica modified bayerite and/or eta alumina that contains from about 0.5 to 10 weight percent SiO_2.

5. The composition of claim 1 which contains from about 2

to 40 weight percent silica modified bayerite and/or eta alumina, from about 5 to 50 weight percent synthetic faujasite, from about 10 to 60 weight percent clay, and from about 10 to 30 weight percent of an inorganic oxide binder selected from the group consisting of silica, alumina and silica-alumina, hydrogels and sols.

5,147,837

TITANIA CONTAINING DEHYDROGENATION CATALYSTS

Ralph M. Dessau, Edison, N.J., and Ying-Yen P. Tsao, Lahaska, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 22, 1990, Ser. No. 600,889
Int. Cl.[5] B01J 21/06, 29/04
U.S. Cl. 502—66 33 Claims

1. A non-acidic catalyst comprising
an amount of titanium in combination with a non-acidic catalyst comprising
dehydrogenation/hydrogenation metal and a non-acidic microporous crystalline material,
wherein the amount of the titanium is effective to reduce the aging of said non-acidic composition, under paraffin dehydrogenation conditions.

6. The catalyst of claim 1, wherein the material has an X-ray pattern of a zeolite.

7. The catalyst of claim 1, wherein the dehydrogenation/hydrogenation metal is a Group VIII metal

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5,147,838

TEMPERATURE PROGRAMMED SYNTHESIS OR CRYSTALLINE POROUS CHALCOGENIDES

David O. Marler, Deptford; John P. McWilliams, Woodbury, both of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 91,613, Aug. 31, 1987, abandoned. This application Jul. 24, 199 , Ser. No. 735,383
Int. Cl.[5] B01J 29/06
U.S. Cl. 502—71 14 Claims

1. A method for synthesizing a crystalline porous chalcogenide exhibiting a characteristic X-ray diffraction pattern consisting essentially of (i) preparing a batch reaction mixture in a single vessel, said mixture capable of forming said crystalline material, (ii) maintaining said mixture at a temperature of from about 180° F. to about 250° F. until nucleation of crystals has commenced, (iii) maintaining said mixture at a temperature of from about 270° F. to about 350° F. for about 24 to 300 hours until crystallization is complete, and (iv) recovering said crystalline material from step (ii) said crystalline material having a uniformity of crystal size within the range of about 0.2 micron to about 0.5 micron.

5,147,839

PRODUCTION OF α-OLEFIN POLYMERS

Takashi Fujita, and Toshihiko Sugano, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 651,946
Claims priority, application Japan, Feb. 8, 1990, 2-28755
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[5] C08F 4/656
U.S. Cl. 502—119 8 Claims

1. A solid catalyst component for Ziegler catalysts obtained by contacting the following Sub components (i) to (iv):
Sub-component (i) which is a solid catalyst component for Ziegler catalysts comprising titanium, magnesium and a halogen as the essential components;
Sub-component (ii) which is a hydrocarbyl hydrocarbyloxysilane having a plurality of bonds represented by the formula: $SiOR^1$, wherein R^1 indicates a hydrocarbyl group of 1 to 8 carbon atoms,
Sub-component (iii) which is a vinylalkylsilane; and
Sub-component (iv) which is an organometal compound of a metal of Groups I to III of the Periodic Table.

5,147,840

CATALYST COMPOSITIONS

Abe W. de Jong, and Johannes J. Keijsper, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1991, Ser. No. 767,702
Claims priority, application Netherlands, Oct. 12, 1990, 9002223
Int. Cl.[5] B01J 31/04
U.S. Cl. 502—167 17 Claims

1. A catalyst composition useful in the preparation of a polymer composition comprising:
A) a group VIII metal;
B) a phosphorus or a nitrogen bidentate ligand containing:
(i) an (R_1) X group, wherein said said X atom is linked via a non-aromatic double bond to a carbon atom of a hydrocarbon bridge group R which forms the bridge between two X-containing groups and additionally containing:
(ii) a second X-containing group selected from
(a) an (R_2) X group wherein the X atom of which is linked via a double bond to a carbon atom of the hydrocarbon bridge group R, or
(b) an $(R_2)(R_3)$ X group, wherein the X group of which is liked via a single bond to a carbon atom of the hydrocarbon bridge group R,
wherein X in the aforesaid X-containing groups represents a phosphorus or nitrogen atom and wherein R_1 is a monovalent hydrocarbon group and R_2 and R_3 represent identical or different hydrocarbon groups which may be the same as the monovalent hydrocarbon group represented by R_1.

5,147,841

METHOD FOR THE PREPARATION OF METAL COLLOIDS IN INVERSE MICELLES AND PRODUCT PREFERRED BY THE METHOD

Jess P. Wilcoxon, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 23, 1990, Ser. No. 617,325
Int. Cl.[5] B01J 31/02, 31/12, 13/00
U.S. Cl. 502—173 36 Claims

1. A method for producing colloidal metal particles, comprising the steps of:
forming a homogeneous inverse micelle solution of a metal salt in a metal-salt organic solvent containing a surfactant, and
reducing the metal salt such that colloidal elemental metal particles are formed.

5,147,842

EXHAUST GAS-PURIFYING CATALYST AND PROCESS FOR PREPARATION THEREOF

Masaki Funabiki, Mishima; Kunihide Kayano, and Teiji Yamada, both of Numazu, all of Japan, assignors to N.E. Chemcat Corporation, Tokyo, Japan

PCT No. PCT/JP90/00752, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO90/14887, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 8, 1990, Ser. No. 655,415
Claims priority, application Japan, Jun. 9, 1989, 1-145491
Int. Cl.[5] B01J 21/04, 21/06, 23/10, 23/40
U.S. Cl. 502—304 28 Claims

1. An exhaust gas-purifying catalyst which has a structure to have at least two catalyst component-containing layers on a support having a monolithic structure, and wherein, as the catalyst components, the inner catalyst component-containing layer contains at least one element of the platinum group, activated alumina and cerium oxide, the outer catalyst component-containing layer contains at least one element of the platinum group and activated alumina, and at least one of the inner catalyst component-containing layer and the outer catalyst component-containing layer further contains a coprecipitated ceria-stabilized zirconia.

5,147,843

POLYVINYL ALCOHOL AND POLYVINYL PYRROLIDONE MIXTURES AS DYE-DONOR SUBBING LAYERS FOR THERMAL DYE TRANSFER

George B. Bodem, Pittsford, and Karen M. Kosydar, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1991, Ser. No. 700,988
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 13 Claims

6. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein a hydrophilic dye-barrier/subbing layer is located between said dye layer and said support, said dye-barrier/subbing layer comprising a mixture of
a) polyvinyl alcohol from about 15 to about 35 weight-percent, and
b) polyvinyl-pyrrolidone from about 65 to about 85 weight-percent of said mixture.

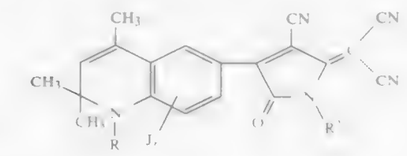
5,147,844

MIXTURE ON CYAN AND YELLOW DYES TO FORM A GREEN HUE FOR COLOR FILTER ARRAY ELEMENT

Helmut Weber, and Leslie Shuttleworth, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 14, 1991, Ser. No. 716,031
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 20 Claims

11. A process of forming a color filter array element comprising:
a) imagewise-heating a dye-donor element comprising a support having thereon a dye layer, and
b) transferring portions of said dye layer to a dye-receiving element comprising a support having thereon a dye-receiving layer,
said imagewise-heating being done in such a way as to produce a repeating pattern of colorants, one of the colorants being a mixture of a yellow dye and a cyan dye to form a green hue, said cyan dye having the formula:



wherein:
R represents hydrogen; a substituted or unsubstituted alkyl group having from 1 to about 8 carbon atoms; a cycloalkyl group having from about 5 to about 8 carbon atoms; a substituted or unsubstituted alkenyl group having from about 2 to about 8 carbon atoms; or a substituted or unsubstituted aralkyl group having from 7 to about 14 carbon atoms;
R^1 represents R; a substituted or unsubstituted acyl group having from 2 to about 9 carbon atoms; a substituted or unsubstituted aroyl group having from about 7 to about 18 carbon atoms; or a substituted or unsubstituted heteroaroyl group having from about 2 to about 10 carbon atoms;
each J independently represents hydrogen; halogen; or a substituted or unsubstituted alkyl or alkoxy group having from 1 to about 6 carbon atoms; and
n is from 1 to 3.

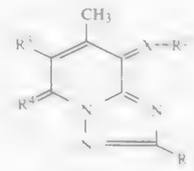
5,147,845

TRIAZOLOPYRIDINE DYES AND THERMAL TRANSFER OF METHINE DYES

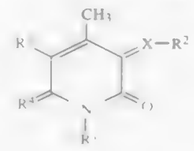
Ruediger Sens, Mannheim; Ernst Schefczik, Ludwigshafen; Karl-Heinz Etzbach, Frankenthal; Gunther Lamm, Hassloch; Helmut Reichelt, Neustadt, and Matthias Wiesenfeldt, Mutterstadt, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 569,914, Aug. 20, 1990, Pat. No. 5,079,365.
This application Aug. 9, 1991, Ser. No. 743,191
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1989, 3929698
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 2 Claims

1. A process for transferring a methine dye from a transfer to plastic-coated paper comprising treating with an energy source a transfer on which there is or are situated one or more dyes of the formula I and/or Ia



(I)



(Ia)

where
R^1 is C_1–C_{20}-alkyl, which may be substituted and interrupted by one or more oxygen atoms, or is substituted or unsubstituted phenyl or hydroxyl,
R^2 is a 5- or 6-membered carbocyclic or heterocyclic ring which may be substituted and benzofused,
R^3 is cyano, carbamoyl, carboxyl or C_1–C_4alkoxycarbonyl,
R^4 is oxygen or a radical of the formula

where L^1 is in each case C_1–C_8-alkyl which may be interrupted by 1 or 2 oxygen atoms, and
X is CH or nitrogen.

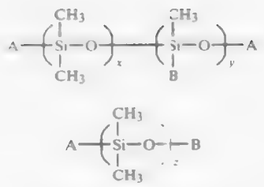
5,147,846

SURFACTANT FOR USE IN THERMAL DYE TRANSFER RECEIVING ELEMENT SUBBING LAYER

Daniel J. Harrison, Pittsford; Michael W. Orem, Rochester, and Michael J. Corrigan, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 632,295, Dec. 21, 1990, abandoned. This application Feb. 20, 1991, Ser. No. 658,117
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 20 Claims

11. A receiving element for thermal dye transfer comprising a support having thereon a cushion layer, a dye image-receiving layer, and a subbing layer between the cushion layer and the dye image-receiving layer, wherein the subbing layer includes a hydroxylated siloxane polymer surfactant having random recurring units of the following structures I or II:



(I)

(II)

wherein A is $-CH_3$ or B, B is a C_1 to C_{10} straight chain or branched primary or secondary hydroxy terminated alkylene group, and x, y, and z are such as to provide from 1 to about 20 hydroxyl groups per polymer molecule and a molecular weight of from about 1,000 to about 20,000.

5,147,847

METHOD FOR MANUFACTURING A PIPE UTILIZING A SUPERCONDUCTING CERAMIC MATERIAL

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 167,912, Mar. 14, 1988, Pat. No. 5,044,406. This application Mar. 11, 1991, Ser. No. 666,925

Claims priority, application Japan, Mar. 18, 1987, 62-63391; Mar. 18, 1987, 62-63392

Int. Cl.[5] B05D *5/12, 7/22*

U.S. Cl. 505—1 3 Claims

1. A method for manufacturing a pipe from a superconducting ceramic material comprising the step of:

providing a hollow supporting body of a metal or a metallic alloy having a hollow inside section therein;

introducing into the hollow inside section of the hollow supporting body a liquid in to which is mixed a superconducting ceramic powder material comprising an oxidized copper material;

drying the above liquid, so that the superconducting ceramic material is coated on the inside of the supporting body with a hollow space kept therein; wherein the liquid is a solvent for the superconducting ceramic powder material and does not destroy the superconductivity of the superconducting ceramic material coated on the inside of the supporting body; and

firing the supporting body and the ceramic material in an oxidizing atmosphere.

5,147,848

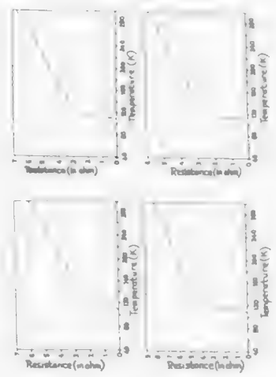
PRECIPITATION PROCESS FOR FORMING BI-PB-SR-CA-CU-O SUPERCONDUCTORS BY DISSOLVING NITRATE SALTS IN ACID AND ADDING A SOLUTION OF TRIETHYLAMINE AND OXALIC ACID

Chau-Ting Chang, Hsinchu; Cheng-Yei Shei, San Chung, and Ru-Shi Liu, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Jul. 11, 1990, Ser. No. 551,629

Int. Cl.[5] H01L *39/12*

U.S. Cl. 505—1 3 Claims



1. A process for synthesizing high temperature oxide superconductor of Bi-Pb-Sr-Ca-Cu-O type comprising:

(a) dissolving nitrate salts of Bi, Pb, Sr, Ca and Cu in nitric acid solution (>1.5M);

(b) adding the obtained solution of (a) into an aqueous solution of triethylamine/oxalic acid (with molar ratio 1-3) component precipitant is readily obtained;

(c) calcining the product obtained in (b) at 750° C.–800° C. for 10 hours to obtain the superconducting powder for further applications.

5,147,849

ELECTRODE FOR ELECTRICAL CONNECTION TO OXIDE SUPERCONDUCTOR AND METHOD FOR FORMING THE SAME

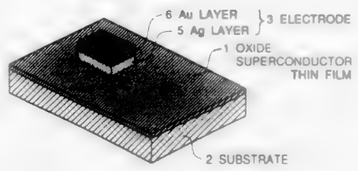
Saburo Tanaka; Hideo Itozaki, and Shuji Yazu, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 20, 1990, Ser. No. 585,548

Claims priority, application Japan, Sep. 20, 1989, 1-244316; Oct. 6, 1989, 1-261492

Int. Cl.[5] H01L *39/12*

U.S. Cl. 505—1 2 Claims



2. A metal electrode formed on an oxide superconductor thin film for electric connection to the oxide superconductor, the metal electrode including a first layer of Ag in direct contact with the oxide superconductor, and a second layer formed on said first layer, said second layer being formed of noble metal excluding Ag, wherein a thickness of said first layer of Ag is in a range of 0.01 μm to 1 μm and a thickness of the second layer of noble metal excluding Ag is in a range of 0.05 μm to 1 μm.

5,147,850

METHOD FOR INCREASING TC OF OXIDE SUPERCONDUCTORS

Nobuji Kishimoto, Osaka, Japan, and Hiroshi Yamamoto, College Station, Tex., assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Apr. 3, 1991, Ser. No. 680,076

Claims priority, application Japan, Apr. 3, 1990, 2-89782

Int. Cl.[5] B05D *5/12*

U.S. Cl. 505—1 7 Claims

1. A process for producing an oxide superconductor, in which an intermediate product or a product demonstrating superconducting property in a production step for an oxide superconductor is treated for the purpose of increasing Tc with a solution containing a compound having a reducing or oxidizing function, wherein said compound having a reducing function is at least one member of the group consisting of a compound having two or more enolic hydroxy groups, a cycloaliphatic polyhydric alcohol compound or an inorganic type reducing compound, wherein said compound having an oxidizing function is at least one member of the group consisting of quinones and cycloaliphatic carbonyl compounds, and wherein said treating is achieved by at least one process selected from the group consisting of soaking and spraying.

5,147,851

SUPERCONDUCTING THICK FILM CIRCUIT BOARD, PRODUCTION THEREOF, THICK FILM SUPERCONDUCTOR AND PRODUCTION THEREOF

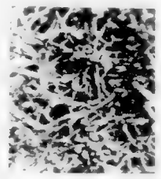
Shozo Yamana, Hitachi; Hideji Kuwajima, Katsuta; Minoru Ishihara, Katsuta; Keiji Sumiya, Katsuta; Toranosuke Ashizawa, Katsuta, and Shuichiro Shimoda, Katsuta, all of Japan, assignors to Hitachi Chemical Company Ltd.

Filed Oct. 30, 1989, Ser. No. 428,946

Claims priority, application Japan, Nov. 2, 1988, 63-277968; Feb. 15, 1989, 1-33708; Oct. 11, 1989, 1-264665

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 6 Claims



1. A superconducting thick film circuit board comprising a zirconia substrate stabilized by the addition of a stabilizer selected from the group consisting of yttrium oxide, cerium oxide and calcium oxide, a coating of a composite of silver and platinum formed on the substrate, and formed thereon a superconducting composite layer containing crystals and comprising a superconductor made of a compound of the formula: M-Ba-Cu-O, wherein M is Y or Er and wherein an atomic ratio of M:Ba:Cu is $1\pm0.1:2\pm0.2:3\pm0.3$, said crystals having a rod shape and said coating of a composite of silver and platinum almost penetrating into said superconducting composite layer.

5,147,852

REDUCTION OF SEEPAGE LOSSES IN WELL WORKING COMPOSITIONS

Jack C. Cowan, Lafayette, La.; Roy F. House, Houston, Tex., and Andreé H. Harrington, Lafayette, La., assignors to Venture Innovations, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 659,178, Feb. 22, 1991, Pat. No. 5,076,944, which is a continuation-in-part of Ser. No. 421,751, Oct. 16, 1989, Pat. No. 5,004,553, and Ser. No. 624,631, Dec. 10, 1990, Pat. No. 5,071,575, which is a continuation-in-part of Ser. No. 421,751, Oct. 16, 1989, Pat. No. 5,004,553. This application Sep. 30, 1991, Ser. No. 767,866

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[5] C09K *7/00*

U.S. Cl. 507—104 16 Claims

1. An additive for decreasing the seepage loss of a fluid from a well working fluid in contact with a permeable formation which comprises a cellulosic material selected from the group consisting of oat hulls, paper, bagasse, peat, corn cobs, kenaf, rice hulls, rice bran, straw, cottonseed hulls, soybean hulls, and mixtures thereof, provided that the cellulosic material has the particle size distribution PSD#1 or PSD#2; wherein PSD#1 is as follows: >590 microns <20%, <590 microns and >250 microns=0%–100%, <250 microns and >149 microns=0%–100%, <149 microns and >74 microns=0%–60%, <74 microns=0%–60%, and <590 microns and >149 microns ≧15%; and wherein PSD#2 is as follows: >590 microns <10%, <590 microns and >250 microns=0%–30%, <250 microns and >149 microns=0%–30%, <149 microns and >74 microns ≧15%, and <74 microns=0%–70%; the particle size being determined by dry sieve analysis after admixing the cellulosic material with 3% of fumed silica.

5,147,853

INFECTION PROTECTANT

Shunichi Dosako, Urawa; Hiroko Kusano, Tokorozawa; Eiki Deya, Sayama, and Tadashi Idota, Kawagoe, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Continuation of Ser. No. 191,252, May 6, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 604,333

Claims priority, application Japan, May 15, 1987, 62-118612

Int. Cl.[5] A61K *37/16, 33/42;* C07K *15/14*

U.S. Cl. 514—7 1 Claim

1. A method for protection against gastrointestinal bacteria. Epstein-Barr virus and influenza viruses that comprises administering an effective amount of an isolated and purified sialic acid-conjugated protein derived from cow milk to a patient in need thereof wherein said sialic acid-conjugated protein is a κ-casein.

5,147,854

TGF-B COMPOSITIONS AND METHOD

Michael J. Newman, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 22, 1990, Ser. No. 527,215

Int. Cl.[5] A61K *37/36*

U.S. Cl. 514—12 16 Claims

1. A method for treating neoplastic diseases in a host which method comprises treating such host with synergistically effective doses of transforming growth factor beta 1 (TGF-β1) and a polyunsaturated fatty acid (PUFA) or derivative.

5,147,855

CONJUGATES OF VIP AND ACTIVE FRAGMENTS THEREOF WITH HYDROPHOBIC MOIETIES AND TOPICAL COMPOSITIONS FOR MALE IMPOTENCE

Illana Gozes, Ness Ziona, and Mattityahu Fridkin, Rehovot, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Jul. 7, 1989, Ser. No. 376,559
Claims priority, application Israel, Jul. 8, 1988, 87055
Int. Cl.[5] C07K *7/10, 7/08;* A61K *37/02*
U.S. Cl. 514—12 8 Claims

1. A transdermally effective pharmaceutical composition for topical application for the treatment of male impotence which comprises as active ingredient a physiologically effective quantity of a conjugate of vasoactive intestinal peptide (VIP) or an active fragment thereof, said active fragment having activity whereby injection of such fragment induces erection in a man, coupled to a hydrophobic moiety.

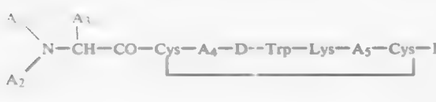
5,147,856

METHOD FOR INHIBITING BLOOD VESSEL BLOCKAGE USING OCTAPEPTIDE COMPOSITIONS

Peter W. Ramwell, McLean, Va., and Pierre Braquet, Garches, France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), Paris, France

Filed Mar. 28, 1989, Ser. No. 329,854
Claims priority, application United Kingdom, Jun. 3, 1988, 8813160
Int. Cl.[5] C07K *7/26*
U.S. Cl. 514—16 15 Claims

1. A method for inhibiting blood vessel blockage in a mammal, which comprises: administering to a mammal an effective blood vessel blockage inhibiting amount of an octapeptide having the formula



$$L—A_7—Z$$

wherein each A_1 and A_2, independently, in H, C_{1-12} alkyl, C_{7-10} phenylalkyl, R_1CO wherein R_1 is C_{1-20} alkenyl, C_{3-20} alkenyl, C_{3-20} alkinyl, phenyl, naphthyl, or C_{7-100} phenylalkyl, or R_2OCO wherein R_2 is C_{1-11} alkyl or C_{7-20} phenylalkyl, provided that when one of A_1 or A_2 is R_1CO or R_2OCO, the other must be H; A_3 is CH_2A_6 wherein A_6 is pentafluorophenyl, naphthyl, pyridyl, or phenyl; A_4 is o-, m- or, p-substituted X-Phe wherein X is a halogen, H, NH_2, NO_2, OH, or C_{1-13} alkyl, pentafluoro-Phe, β-Nal or Tyr; A_5 is Thr, Ser, Phe, Val, α-aminobutyric acid, or Ile; A_7 is Thr, Trp, or β-Nal and can be either the D- or L-isomer; and Z is NH_2 or OH; or a pharmaceutically acceptable salt thereof.

5,147,857

GLYCOLIC ACID DERIVATIVES

Peter Raddatz, Darmstadt; Claus J. Schmitges, Gross-Umstadt, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 18, 1991 Ser. No. 670,677
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1990, 4008403
Int. Cl.[5] A61K *37/00;* C07D *413/00, 265/30*
U.S. Cl. 514—19 20 Claims

1. A glycolic acid compound of the formula I

$$X—O—CR^1R^2—CO—Y—N^3—CHR^4—CR^5—CH_2—CR^6R^7—Z$$

wherein

X is H, 4-BOC-amino-piperidinocarbonyl, 4-aminopiperidinocarbonyl or morpholino-carbonyl;
Y is 0 or 1 amino acid reside selected from the group comprising His, Leu and S-A-Cys;
Z is $—CH_2—NH—SO_2R^{14}$, $—CH_2—NH—COR^{14}$, $—CH_2—NH—CO—NH—R^{14}$ or $—CH_2—NH—CS—NH—R^{14}$;
R^1, R^3 and R^7 and each H;
R^2 is benzyl;
R^4 is cyclohexylmethyl;
R^5 is (H, OH);
R^6 and R^{14} are each independently H or A; and
A is alkyl having 1–4 C atoms.

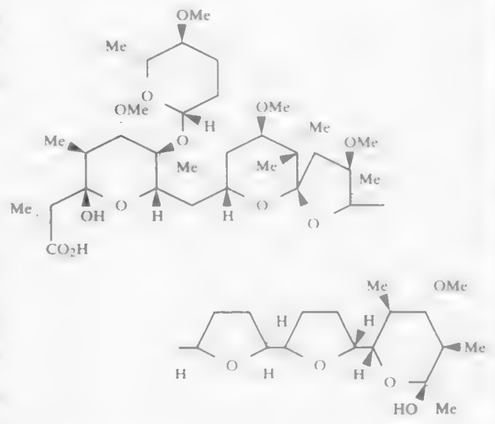
5,147,858

ACIDIC POLYCYCLIC ETHER USEFUL AS AN ANTICOCCIDIAL AGENT AND AS A GROWTH PROMOTANT

John P. Dirlam, Gales Ferry; Walter P. Cullen, East Lyme, both of Conn.; Hiroshi Maeda, and Junsuke Tone, both of Chita, Japan, assignors to Pfizer Inc, New York, N.Y.

PCT No. PCT/US87/03095, § 371 Date Apr. 16, 1990, § 102(e) Date Apr. 16, 1990
PCT Filed Nov. 20, 1987, Ser. No. 487,947
Int. Cl.[5] A61K *31/71;* C07H *17/04*
U.S. Cl. 514—23 7 Claims

1. A compound of the absolute stereochemical formula



wherein Me represents CH_3, or a pharmaceutically acceptable cationic salt thereof.

5,147,859

COMPLEXES OF GLYCERRHETINIC ACID WITH PHOSPHOLIPIDS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Ezio Bombardelli; Gianfranco Patri, and Roberto Pozzi, all of Milan, Italy, assignors to Indena S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 514,126, Apr. 25, 1990, abandoned, which is a continuation of Ser. No. 158,577, Feb. 22, 1988, abandoned. This application Jan. 15, 1991, Ser. No. 641,291
Claims priority, application Italy, Feb. 26, 1987, 19496 A/87
Int. Cl.[5] A61K *31/705, 31/575, 9/127*
U.S. Cl. 514—26 6 Claims

1. A complex of glycyrrhetinic acid with a phospholipid wherein the molar ratio of said phospholipid to glycycrrhetinic acid is between 0.5 and 2 and wherein said phospholipid is a member selected from the group consisting of soy lecithins, phospholipids from bovine or swine brain or cutis, phosphatidylcholine, phosphatidylserine, phosphatidylethanolamine, said phospholipid having the formula

wherein R and R_1 are the same or different and each is a member selected from the group of the acyl group from palmitic, stearic, oleic, linoleic and linolenic acids and R_2 is the residue from chlorine, ethanolamine or serine.

6. The method of treating an animal having inflammation which consists of administering to said animal an anti-inflammatory effective amount of a complex of glycyrrhetinic acid with a phospholipid wherein the molar ratio of said phospholipid to glycyrrhetinic acid is between 0.5 and 2 and wherein said phospholipid is a member selected from the group consisting of soy lecithins, phospholipids from bovine or swine brain or cutis, phosphatidylcholine, phosphatidylserine, phosphatidylethanolamine, said phospholipid having the formula

wherein R and R_2 are the same or different and each is a member selected from the group of the acyl group from palmitic, stearic, oleic, linoleic and linolenic acids and R_2 is the residue from chlorine, ethanolamine or serine.

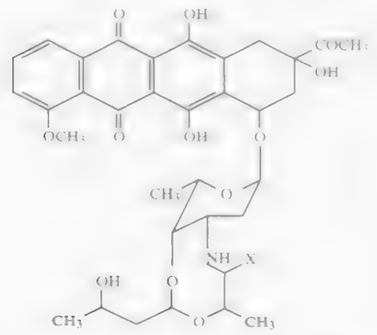
5,147,860

TAN-1120, ITS DERIVATIVES, PRODUCTION AND USE THEREOF

Tsuneo Kanamaru, Takatsuki; Yukimasa Nozaki, Ikeda, and Masayuki Muroi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 7, 1989, Ser. No. 447,519
Claims priority, application Japan, Dec. 27, 1988, 63-332195; Feb. 20, 1989, 1-41033; Jul. 10, 1989, 1-178634
Int. Cl.[5] A61K *31/71;* C07H *15/252*
U.S. Cl. 514—34 3 Claims

1. A method for the treatment of a disease caused by abnormally increased angiogenesis in a mammal, which comprises administering to mammal in need of such treatment an angiostatic effective amount of a compound of the formula:



wherein X is hydroxyl group or hydrogen atom, or a pharmaceutically acceptable salt thereof.

5,147,861

ESTERS OF ALGINIC ACID

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia S.p.A., Abano Terme, Italy

Division of Ser. No. 722,398, Jun. 20, 1991, which is a continuation of Ser. No. 66,133, Jun. 24, 1987, abandoned. This application Sep. 18, 1991, Ser. No. 761,511
Int. Cl.[5] A61K *9/70, 31/215, 31/725*
U.S. Cl. 514—54 8 Claims

1. Sanitary or surgical article consisting essentially of at least one total ester of alginic acid with an aliphatic alcohol with a maximum of 34 carbon atoms or with an araliphatic alcohol with only one benzene ring and in which the aliphatic chain has a maximum of 4 carbon atoms.

5,147,862

COMPOSITION AND PROCESS TO ENHANCE THE EFFICACY OF A FISH VACCINE

Libor Nikl, and Lawrence Albright, both of Burnaby, Canada, assignors to Taito Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 313,033
Int. Cl.[5] A61K *31/715*
U.S. Cl. 514—54 9 Claims

1. A method to enhance the efficacy of a fish vaccine that comprises administering to a fish treated with the vaccine a β-1,3-glucan having a β-1,3-linked main chain with β-1,6-linked single glucose side chains.

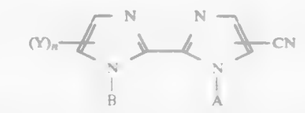
5,147,863

2,2'-BI-1H-IMIDAZOLES

Donald P. Matthews, West Chester; Jeffrey P. Whitten, Cincinnati, and James R. McCarthy, West Chester, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 213,552, Jun. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 922,331, Oct. 30, 1986, abandoned, and Ser. No. 801,458, Nov. 25, 1985, abandoned. This application Oct. 17, 1990, Ser. No. 600,295
Int. Cl.[5] A61K *31/695, 31/44, 31/415;* C07D *403/00*
U.S. Cl. 514—63 14 Claims

1. A compound of the formula



the tautomers thereof, or a pharmaceutically acceptable salt thereof, wherein

N is 1 or 2; when n is 1, Y is hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy, CF_3, 2-, 3-, or 4-pyridyl, $COOR^1$, $CONH_2$, $—S(O)_mR^2$ phenyl and R-substituted phenyl with R being hydrogen, C_{1-6} alkyl, halogeno, nitro, amino, C_{1-6} alkoxy, CF_3 or $—S(O)_mR^2$; and when n is 2, Y is hydrogen, halogen or C_{1-6} alkyl; R^1 is hydrogen or C_{1-6} alkyl; R^2 is C_{1-6} alkyl; m is zero, one or two;
A is hydrogen or C_{1-6} alkyl;
B is hydrogen or methyl, ethyl, vinyl, phenyl or benzyl with the proviso that at least one of A or B is hydrogen.

5,147,864

BIS-ARYLPHOSPHATE ESTER ANTAGONISTS OF PLATELET ACTIVATING FACTOR

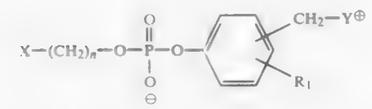
Allan Wissner, Ardsley; Kenneth Green, Yorktown Heights, both of N.Y., and Robert E. Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 286,193, Dec. 19, 1988, Pat. No. 4,983,592. This application Oct. 18, 1990, Ser. No. 599,580

Int. Cl.[5] A61K *31/675*

U.S. Cl. 514—82 17 Claims

1. A compound of the formula:



wherein:

X is a phenyl or naphthyl ring optionally substituted in any position with one to four substituents of;

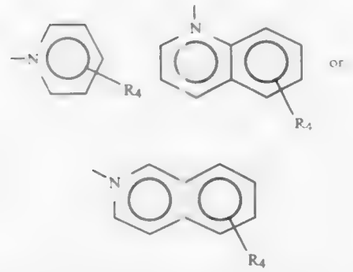
(i) —R_2, wherein R_2 is C_1–C_{25} alkyl, C_1–C_{25} alkenyl, C_1–C_{25} alkoxy, C_1–C_{25} thioalkyl, C_1–C_{25} alkenyloxy, phenyl, phenoxy, substituted phenyl or substituted phenoxy wherein the substituents are C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen and trifluoromethyl;

(ii) hydrogen, halogen, trifluoromethyl, cyano and nitro;

(iii) —CO_2R_3, —$CONHR_3$, —CHO, $OCONHR_3$, and —$NHCOR_3$ wherein R_3 is C_1–C_{25} alkyl, C_1–C_{25} alkenyl, phenyl or substituted phenyl wherein the substituents are C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen or trifluoromethyl;

R_1 is one to four substituents on the aromatic ring which may be in any position and are hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy or halogen;

—CH_2—Y is a single substituent of the aromatic ring which may occupy any position where Y is



wherein R_4 represents one to four non-hindered substituents of the heterocyclic ring which may occupy a non-hetero atom position and is C_1–C_5 alkyl with the proviso that when y is pyridine it may not be substituted with tetratert butyl, C_1–C_5 alkoxy, hydrogen or halogen; and when y is quinoline or isoquinoline R_4 can occupy any position on either ring; and n is the integer 0 or 1.

5,147,865

PHOSPHONOPYRROLIDINE- AND PIPERIDINE-CONTAINING PSEUDOPEPTIDES OF THE STATIN TYPE, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS AGAINST RETROVIRUSES

Dieter Häbich; Jutta Hansen, both of Wuppertal, and Arnold Paessens, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

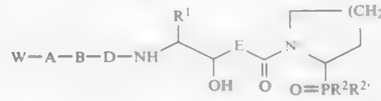
Filed Aug. 15, 1991, Ser. No. 746,272

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1990, 4026614

Int. Cl.[5] A61K *37/16, 31/675*

U.S. Cl. 514—91 4 Claims

1. Phosphonopyrrolidine- and piperidine-containing pseudopeptides of the general formula (I)



(I)

in which

W

represents hydrogen or a typical amino protecting group, or

represents straight-chain or branched alkyl or alkenyl in each case having up to 6 carbon atoms, which are optionally substituted by aryl having 6 to 10 carbon atoms, or

represents a group of the formula R^3—CO—, R^5R^4N–CO— oe R^6—SO_2—, in which

R^3

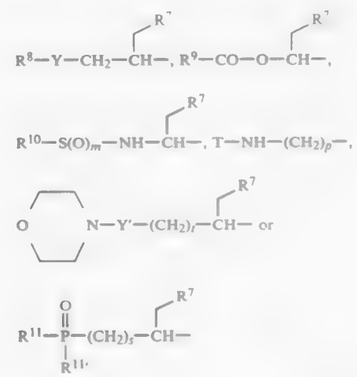
denotes hydrogen, trifluoromethyl or straight-chain or branched alkoxy having up to 8 carbon atoms or alkyl having up to 18 carbon atoms, each of which is optionally monosubstituted or disubstituted by aryl having 6 to 10 carbon atoms or pyridyl, or

denotes aryl having 6 to 10 carbon atoms, which is optionally substituted by halogen, trifluoromethyl, trifluoromethoxy or by straight-chain or branched alkyl having up to 8 carbon atoms,

denotes cycloalkyl having 3 to 7 carbon atoms, or

denotes quinolyl, indolyl, pyridyl, morpholino or piperazinyl, or

denotes a radical of the formula



in which

R^7 denotes phenyl or naphthyl,

R^8, R^9 and R^{10} are identical or different and denote straight-chain or branched alkyl having up to 17 carbon atoms, which is optionally substituted by phenyl or naphthyl, or denote aryl having 6 to 10 carbon atoms, which is in turn substituted by alkyl having up to 4 carbon atoms,

m denotes a number 0, 1 or 2,

T denotes morpholino or cyclohexyl,

p denotes a number 1, 2 or 3,

Y and Y′ are identical or different and denote the CO or SO_2 group,

t denotes a number 0 or 1,

R^{11} and $R^{11'}$ are identical or different and denote hydroxyl or alkoxy having up to 8 carbon atoms,

s denotes a number 1 or 2,

R^4 and R^5 are identical or different and

denote hydrogen or

denote aryl having 6 to 10 carbon atoms, which is optionally substituted by straight-chain or branched alkyl having up to 6 carbon atoms or halogen, or

denote cycloalkyl having 3 to 7 carbon atoms, or

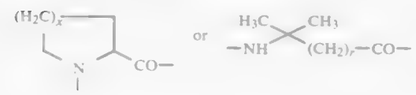
denote straight-chain or branched alkyl having up to 18 carbon atoms,

R^6 denotes straight-chain or branched alkyl having up to 4 carbon atoms or phenyl which can in turn be substituted by methyl,

A, B D are identical or different and

represent a direct bond or

represent a radical of the formula



in which

x denotes the number 1 or 2 and

r denotes the number 0 or 1, or

represent a group of the formula

in which

z denotes the number 0 or 1,

R^{12} denotes hydrogen or straight-chain or branched alkyl having up to 4 carbon atoms,

R^{13} denotes hydrogen, cycloalkyl having 3 to 8 carbon atoms or aryl having 6 to 10 carbon atoms, or denotes straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted by methylthio, hydroxyl, mercapto, guanidyl or by a group of the formula —$NR^{14}R^{15}$ or R^{16}—OC—, in which

R^{14} and R^{15} are identical or different and denote hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl, and

R^{16} denotes hydroxyl, benzyloxy, alkoxy having up to 6 carbon atoms or the above-mentioned group —$NR^{14}R^{15}$,

or which is optionally substituted by cycloalkyl having 3 to 8 carbon atoms or by aryl having 6 to 10 carbon atoms, which in turn is substituted by hydroxyl, halogen, nitro, alkoxy having up to 8 carbon atoms or by the group —$NR^{14}R^{15}$, in which

R^{14} and R^{15} have the abovementioned meaning, or which is optionally substituted by a 5- or 6-membered nitrogen-containing heterocycle or indolyl, in which the corresponding —NH functions are optionally protected by alkyl having up to 6 carbon atoms or by an amino protecting group,

R^1 represents straight-chain or branched alkyl or alkenyl having up to 10 carbon atoms, which are optionally substituted by cycloalkyl having 3 to 8 carbon atoms or by aryl having 6 to 10 carbon atoms, which can in turn be substituted by halogen, nitro, hydroxyl, amino or straight-chain or branched alkoxy having up to 4 carbon atoms,

n represents the number 1 or 2,

R^2 and $R^{2'}$ are identical or different and

represent hydroxyl or alkoxy having up to 8 carbon atoms, and

E represents a radical of the formula CH_2, CF_2, or CH—OR^{17}, in which

R^{17} denotes hydrogen or straight-chain or branched alkyl having up to 4 carbon atoms,

and their physiologically acceptable salts.

5,147,866

1,2-DIAMINO-CYCLOBUTEN-3,4-DIONE DERIVATIVES

Geoffrey Stemp, Harlow, and Gordon Burrell, Ulverston, both of England, assignors to Beecham Group p.l.c., England

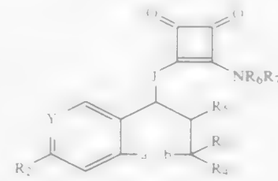
Filed Oct. 29, 1990, Ser. No. 604,874

Claims priority, application United Kingdom, Oct. 30, 1989, 8924373

Int. Cl.[5] A61K *31/665, 31/35;* C07D *311/22, 311/04*

U.S. Cl. 514—100 10 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein

a and b together form an —O— or —CH_2— linkage or a bond;

Y is C—R_1

wherein

either one of R_1 and R_2 is hydrogen and the other is nitro, cyano, halo, —CF_3, C_2F_5, formyl, aldoxime, CF_3O, NO-$_2$—CH=CH—, NC—CH=CH—; or R_xX— wherein R_x is C_1 to C_6 alkyl, phenyl or furyl said phenyl or furyl each being optionally substituted by one, two or three of C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro, halo, CF_3 and cyano; and X is C=O, O.C=O, C=O.O, CHOH, SO, SO_2, O.SO, O.SO_2, CONH, O.CONH, CO—CH=CH, C=NHOH, C=NNH_2; or R_yR_zNH—, wherein R_y and R_z are independently hydrogen or C_1 to C_6 alkyl and Z is C=O, SO or SO_2; or $(R_wO)_2P(O)W$, wherein R_w is hydrogen or C_1 to C_6 alkyl and W is O or a bond; or R_1 is a C_3 to C_8 cycloalkyl group or a C_1 to C_6 alkyl optionally substituted by R_9 which is hydrogen, C_1 to C_6 alkoxy, amino optionally substituted by one or two C_1 to C_6 alkyl, C_1 to C_7 alkanoylamino, C_3 to C_8 cycloalkyloxy or C_3 to C_8 cycloalkylamino and R_2 is hydrogen; or

one of R_1 and R_2 is nitro, cyano or C_1 to C_3 alkylcarbonyl and the other is a nitro, cyano, halo, C_1 to C_3 alkylcarbonyl, methoxy or amino optionally substituted by one or two C_1 to C_6 alkyl or by C_2 to C_7 alkanoyl; or

either one of R_3 and R_4 is hydrogen or C_1 to C_4 alkyl and the other is C_1 to C_4 alkyl; or

R_3 and R_4 togehter are C_2 to C_5 polymethylene;

R_5 is hydrogen, hydroxy, C_1 to C_6 alkoxy or $C_1$to C_7 acyloxy or ONO_2;

R_6 and R_7 are independently hydrogen, $C_1$to C_6 alkyl; or (when R_6 is hydrogen), then R_7 is allyl, propargyl or C_3 to C_6 cycloalkyl;

J is O or NR_8 wherein R_8 is hydrogen or C_1 to C_6 alkyl.

5,147,867

PHOSPHORUS CONTAINING ENZYME INHIBITORS

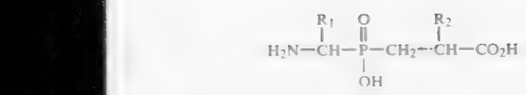
William H. Parsons, Rahway; William R. Schoen, Edison, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 762,785, Sep. 19, 1991, abandoned, which is a continuation of Ser. No. 395,310, Aug. 17, 1989, abandoned, which is a continuation of Ser. No. 264,229, Oct. 28, 1988, abandoned. This application Jan. 21, 1992, Ser. No. 824,738

Int. Cl.[5] C07F *9/30, 9/32* A01N *31/02, 57/12*

U.S. Cl. 514—114 7 Claims

1. A method of treatment for bacterial infections which comprises administering to a host a therapeutically effective amount of a DHP-inhibiting compound of Formula I, in combination with a therapeutically effective amount of a carbapenem or penem antibiotic:



I

wherein:

R_1 is

(a) C_2–C_{12} linear or branched unsubstituted alkyl;

(b) C_1–C_{12} linear or branched substituted alkyl;

(c) C_2–C_{12} linear or branched monoalkenyl;

(d) C_2–C_{12} linear or branched alkynyl;

(e) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the aryl moiety is C_6–C_{12};

(f) C_4–C_{10} cycloalkylalkyl;

(g) C_3–C_7 cycloalkyl;

wherein said above values for R_1, excluding (a), can be substituted by one or more: C_1–C_4 alkoxy, C_3–C_6 cycloalkyloxy, C_3–C_6 cycloalkylthio, C_6–C_{12} aryloxy, C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{10} aralkyloxy, C_7–C_{16} aralkylthio;

R_2 is

(a) H or C_1–C_{12} linear or branched alkyl;

(b) C_2–C_{12} linear or branched monoalkenyl;

(c) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the aryl moiety is C_6–C_{12};

(d) C_4–C_{10} cycloalkylalkyl;

(e) C_3–C_7 cycloalkyl;

(f) heterocyclic alkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the heterocyclyl ring is 5–6 membered, optionally fused with a benzene ring, fully aromatic, containing 1–2: O, N or S heteroatoms; wherein said above values for R_2 can be substituted by one or more: halo, hydroxy, carboxy, C_1–C_4 alkoxycarbonyl, C_7–C_{16} arylalkoxycarbonyl, C_3–C_7 cycloalkyl, C_1–C_4 alkoxy, C_6–C_{12} aryloxy, C_3–C_6 cycloalkyloxy, C_3–C_6 cycloalkylthio, amino, mono- or di-C_1–C_8 alkylamino, thio, C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{16} aralkylthio, or the radical —S—$(CH_2)_n$—$CH(NH_2)COOH$, and including DHP-inhibiting stereoisomers and racemates thereof Structure

5,147,868

THIENAMYCIN RENAL PEPTIDASE INHIBITORS

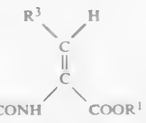
Donald W. Graham, Mountainside; Edward F. Rogers, Middletown, and Frederick M. Kahan, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 641,317, Jan. 14, 1991, abandoned, which is a continuation of Ser. No. 244,527, Sep. 9, 1988, abandoned, which is a continuation of Ser. No. 878,391, Jun. 19, 1986, abandoned, which is a continuation of Ser. No. 748,300, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 465,577, Feb. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 50,233, Jun. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 927,212, Jul. 24, 1978, abandoned. This application Feb. 19, 1992, Ser. No. 839,725

Int. Cl.[5] C07C *233/63, 233/48, 233/47*

U.S. Cl. 514—119 24 Claims

1. A compound of the formula



R1 is hydrogen or a pharmaceutically acceptable cation;

R2 is X or Y

wherein

X is unsubstituted or substituted branched or linear alkyl of three to ten carbon atoms wherein a non-terminal methylene can be replaced by oxygen, sulfur or SO2, where said substituents are selected from the group consisting of halogen or cycloalkyl of three to six carbon atoms, with the proviso that, when said alkyl is substituted by said cycloalkyl, X is not more than ten total carbon atoms, with the further proviso that not more than six hydrogens of said alkyl can be substituted by said halogen, and with the further proviso that the carbon adjacent to the carbonyl cannot be tertiary;

Y is cycloalkyl of three to six carbon atoms, unsubstituted or substituted with one or two substituents where said substituents are selected from the group consisting of halogen or alkyl of one to four carbon atoms, with the proviso that, when said cycloalkyl is substituted by said alkyl, Y is not more than ten total carbon atoms;

R^3 is unsubstituted or substituted two to fifteen carbon alkyl wherein said substituent is halogen, and wherein a non-terminal methylene can be replaced by oxygen, sulfur or SO_2 and wherein the terminal carbon of said alkyl can be substituted by a moiety selected from the group consisting of amino, ureido, amidino, guanidino, one to four carbon alkylamino, dialkylamino of one to four carbons per alkyl substituent, trialkylammonium, quaternary hydroxyalkyldialkylammonium, acylamino, phosphonylalkylamino, hydroxyalkylamino, formamidino, alkylamidino, N,N-dialkylguanidino, hydroxyl, alkylcarbonyloxy, alkoxycarbonyl, carbamoyl, N,N dialkylcarbamoyl, thiol, acylthio, carboxy, phosphono, cyano, L-2-amino-2-carboxyethylthio or N-methyl-N-carboxymethylamino, with the proviso that no more than six hydrogens of said one to fifteen carbon alkyl can be substituted by halogen, with the further proviso that when R^3 is straight chain lower alkyl of one to four carbon atoms, R^2 cannot be straight chain lower alkyl of one to four carbon atoms, with the further proviso that the compound of the structural formula given above has the Z stereoconfiguration.

5,147,869

ZOOTECHNICAL COMPOSITIONS

Jean A. Grandadam, Saint-Maur des Fosses, France, assignor to Roussel Uclaf, Paris, France

Continuation of Ser. No. 359,962, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 131,729, Dec. 11, 1987, Pat. No. 4,900,735. This application Jun. 11, 1991, Ser. No. 713,696

Int. Cl.[5] A61K *31/56;* A01N *45/00*

U.S. Cl. 514—170 10 Claims

1. A zootechnical association comprising a) 10 to 1,000 mg of salbutamol and b) 5 to 50 mg/kg of animal weight of trenbolone acetate in the form of an implant.

5,147,870

SUBSTITUTED AZACYCLOHEXYL DERIVATIVES

Wilhelm Kump, Biel-Benken, Switzerland, and Keith A. Menear, Horsham, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

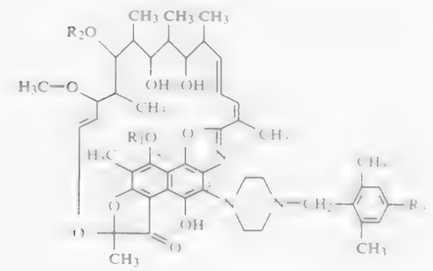
Continuation of Ser. No. 392,625, filed as PCT/CH/00198, Oct. 21, 1988, abandoned. This application Oct. 18, 1991, Ser. No. 781,638

Claims priority, application United Kingdom, Oct. 27, 1987, 8725118; Switzerland, Jun. 30, 1988, 2500/88-3

Int. Cl.[5] C07D *521/00;* A61K *31/395*

U.S. Cl. 514—783 11 Claims

1. A compound of the formula



(I)

which is a derivative of rifamycin SV, in which:

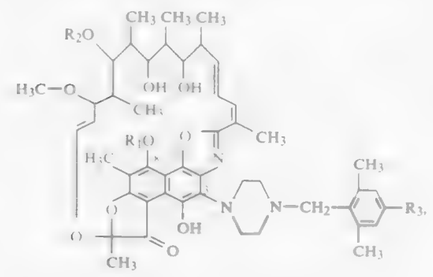
R_1 is hydrogen or tri-C_1–C_7alkylacetyl;

R_2 is hydrogen or acetyl; and

R_3 is C_1–C_7alkyl;

or a pharmaceutically acceptable salt thereof.

11. A method for the treatment of hyperlipidemia and arteriosclerosis, which comprises administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula



(I)

which is a derivative of rifamycin SV, in which:

R_1 is hydrogen or tri-C_1–C_7alkylacetyl;

R_2 is hydrogen or acetyl; and

R_3 is C_1–C_7alkyl;

or a pharmaceutically acceptable salt thereof.

5,147,871

ANTI-BACTERIAL CEPHALOSPORIN COMPOUNDS

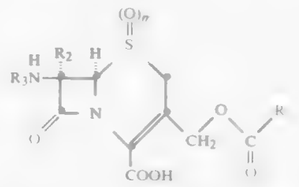
Harry A. Albrecht, Towaco; Ka-Kong Chan, Hopatcong; Dennis D. Keith, Montclair, all of N.J.; Rudolf L. Then, Weil, Fed. Rep. of Germany, and Manfred Weigele, North Caldwell, N.J., assignors to Hoffman La-Roche, Inc., Nutley, N.J.

Continuation of Ser. No. 68,092, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 881,555, Jul. 3, 1986, abandoned. This application Dec. 5, 1991, Ser. No. 803,757

Int. Cl.[5] C07D *501/26;* A61K *31/545*

U.S. Cl. 514—202 45 Claims

1. A compound of the formula



I

wherein R, is quinolonyl or azaquinolonyl group which can be unsubstituted or substituted; group R_2 is selected from the group consisting of hydrogen, lower alkoxy, amino, lower alkylthio and amido; R_3 is an acyl group derived from a carboxylic acid; and m is 0, 1, 2, or a readily hydrolyzable ester or salt of the compound, or hydrate of the compound, ester or salt.

5,147,872

TREATMENT OF IMMUNOLOGICALLY BASED DISORDERS, SPECIFICALLY PSORIASIS

Daniel H. Golwyn, P.O. Box 151408, Altamonte Springs, Fla. 32715-1408

Continuation-in-part of Ser. No. 59,899, Jun. 9, 1987, Pat. No. 5,017,575. This application Jun. 19, 1990, Ser. No. 540,538

Int. Cl.[5] A01N *43/62;* A61K *31/55*

U.S. Cl. 514—219 9 Claims

1. A method of treating patients having a human leukocyte antigen (HLA) related disorder, with symptoms of psoriasis, comprising orally administering to such a patient an amount of the triazolothienodiazepine alprazolam effective to alleviate such psoriasis symptoms.

5,147,873

AMINO-SUBSTITUTED BRIDGED AZABICYCLIC QUINOLONE CARBOXYLIC ACIDS AND ESTERS

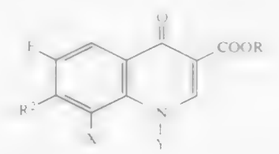
Edward F. Kleinman, Pawcatuck, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of PCT/US88/029081 Aug. 23, 1988. This application Feb. 15, 1991, Ser. No. 651,355

Int. Cl.[5] A61K *31/535, 31/47;* C07D *401/10, 498/06*

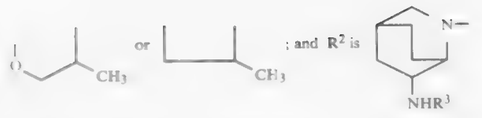
U.S. Cl. 514—230.2 21 Claims

1. A compound of formula



wherein R^1 is hydrogen, C_1–C_6 alkyl, or a pharmaceutically acceptable cation;

Y is cyclopropyl, ethyl or p-fluorophenyl, and X is hydrogen or fluoro, or X and Y taken together form a group



wherein R^3 is hydrogen or C_1–C_4 alkyl; or a pharmaceutically acceptable salt thereof.

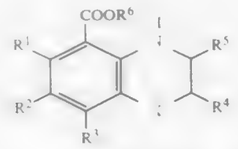
5,147,874

CYCLIC ANTHRANILIC ACID DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Eisuke Kojima, Koga; Shizuyoshi Fujimori, Nogi, and Katsuya Awano, Oyama, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 249,996, Sep. 27, 1988, Pat. No. 4,956,372.
This application Jul. 31, 1990, Ser. No. 560,775
Claims priority, application Japan, Oct. 2, 1987, 62-249608; Jan. 19, 1988, 63-8793; Sep. 22, 1988, 63-236295
Int. Cl.[5] A61K *31/395*, C07D *265/36*
U.S. Cl. 514—238.2 2 Claims

1. Cyclic anthranilic acid derivatives of the following formula (I),



wherein R^1, R^2 and R^3 each independently indicate a hydrogen atom halogen atom, lower alkyl group having 1 to 3 carbon atoms, lower alkoxy group having 1 to 3 carbon atoms, amino group, nitro group, hydroxy group, sulfonamide group. trifluromethyl group, cyano group, carboxyl group, carbamoyl groups, acetyl group, benzoylmethyl group which may be substituted, methylthio group, phenylethynyl group which may be substituted, ethynyl group which may be substituted, alkanoylamino group having 1 to 3 carbon atoms, benzoylamino group which may be substituted, alkylsulfonylamino group having 1 to 3 carbon atoms or phenylsulfonylamino group which may be substituted; R^4 and R^5 each independently indicate a hydrogen atom, lower alkyl group having 1 to 3 carbon atoms, cyano group, carboxyl group, hydroxymethyl group, phenyl group which may be substituted or benzyl group; wherein said substituents are 1 to 3 members of the group consisting of halogen atom, lower alkyl group, lower alkoxy group and hydroxy group; provided that R^1, R^2, R^3, R^4 and R^5 are not simultaneously hydrogen; R^6 indicates a hydrogen atom, lower alkyl group having 1 to 3 carbon atoms or benzyl group; X indicates an oxygen atom; their acid or alkali salts thereof.

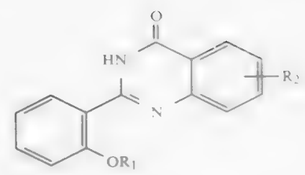
5,147,875

2-(SUBSTITUTED PHENYL)-4 OXO-QUINAZOLINES

William J. Coates, Welwyn Garden City, England, and Lawrence I. Kruse, Malvern, Pa., assignors to Sanshin Kogyo Kabishiki Kaisha, Japan

Filed Nov. 30, 1989, Ser. No. 443,986
Claims priority, application United Kingdom, Nov. 30, 1988, 8827988
Int. Cl.[5] A61K *31/505*; C07D *239/91*
U.S. Cl. 514—259 9 Claims

9. A method of effecting bronchodilation in a host in need thereof by administration of a non-toxic but effective amount of a compound of the formula (1)



(1)

or a pharmaceutically acceptable salt thereof, wherein

R^1 is C_{1-6}alkyl, C_{2-6}alkenyl, C_{3-5}cycloalkylC_{1-4}alkyl, phenyl C_{1-4}alkyl or C_{1-4}alkyl substituted by 1 to 6 fluoro groups;

R^2 is hydrogen, C_{1-6}alkyl, C_{1-6} alkylthio, C_{1-6}alkoxy, nitro or $—NR^3R^4$; and

R^3 and R^4 are independently hydrogen or C_{1-4}alkyl optionally substituted by hydroxy provided that the carbon atom adjacent to the nitrogen atom is not substituted by hydroxy.

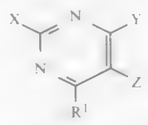
5,147,876

2,6-DI,2,4,6-, 2,5,6-TRI AND 2,4,5,6-TETRA-SUBSTITUTED PYRIMIDINES, THEIR PHARMACEUTICALLY ACCEPTABLE SALTS, PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND THEIR USE IN THE TREATMENT OF NEUROLOGICAL DISEASES

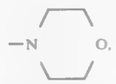
Akira Mizuchi; Kazutoshi Horikomi; Tadayuki Sasaki, all of Mobara; Akira Awaya, Yokohama; Ikuo Tomino, Ohtake; Mitsuyuki Takesue, Yamaguchi, and Noriaki Kihara, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 29, 1989, Ser. No. 459,376
Claims priority, application Japan, Dec. 29, 1988, 63-333670; Feb. 23, 1989, 1-41728; Feb. 23, 1989, 1-41729
Int. Cl.[5] A61K *31/505, 31/535, 31/495, 31/53*; C07D *253/00, 403/00, 401/00, 413/00*
U.S. Cl. 514—275 9 Claims

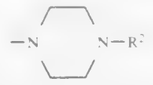
1. A pyrimidine represented by the following formula (1), or its pharmaceutically acceptable salt,



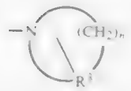
wherein R^1 represents a hydrogen atom or a lower alkyl group; X represents a group of the formula



a group of the formula

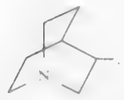


in which R^2 represents a hydrogen atom, a lower alkyl group, a phenyl group, a benzyl group or an alpha-(p-chlorophenyl)benzyl group, a group of the formula

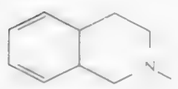


in which R^3 corresponds to one or at least two identical or different substituents replacing one or at least two hydrogen atoms of identical or different methylene groups, and represents hydrogen, a lower alkyl group, a hydroxyl group, a phenyl group optionally substituted by nitro, a benzyl group, a benzoyloxy group, a benzoylamino group, a lower alkylamino group, a di-lower alkylamino group, the $HO(C_6H_5)_2C—$ group, a piperidino group, a hydroxy(lower alkyl) group, the $C_6H_5SO_2O—$ group, a benzoyl group optionally substituted by halogen, a lower alkylsulfonylamide group or a lower alkoxycarbonyl group, and n is a number of 4, 5, 6 or 7, a group of the formula

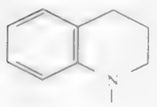
in which R^4 represents a hydrogen atom, a lower alkyl group or a benzyl group, and R^5 represents a lower alkyl group, a lower acyl group, a 2-furoyl group, a benzyl group, a 4-piperidyl group optionally substituted by benzoyl, a phenethyl group, the



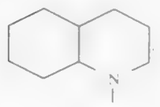
or a benzoyl group optionally substituted by halogen or nitro, a group of the



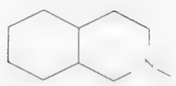
a group of the formula



group of the formula



or a group of the formula



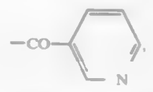
Y represents a group of the formula

$—CH_2R^9$

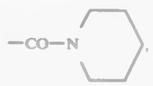
wherein R^9 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group, or a di-lower alkylamino group,

a group of the formula

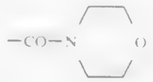
wherein R^6 represents a hydrogen atom, a lower alkyl group, a phenyl group, a benzyl group, a lower alkoxy group or a 2-(N,N-dimethylamino)ethyl group, and R^7 represents a lower alkyl group, a lower acyl group, a cyclohexylcarbonyl group, a 2-furoyl group, a lower alkoxycarbonyl group, a cinnamoyl group, a benzyl group, lower alkoxy-lower alkyl-carbonyl group, a benzylcarbonyl group, a tosyl group, a phenoxyacetyl group, a di-lower alkyl-carbamoyl group, a 2-thenoyl group, a group o the formula



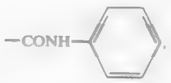
a group of the formula



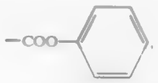
a group of the formula



a group of the formula

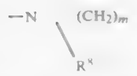


a group of the formula

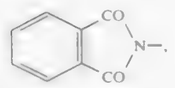


a 4-lower alkylpiperazyl group, or a benzoyl group optionally substituted by halogen, nitro, lower alkyl, lower

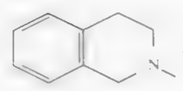
alkoxy, amino, benzoylamino or phenyl, provided that when R^6 is a hydrogen atom, R^7 is a benzoyl group, a group of the formula



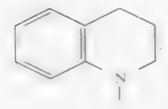
wherein R^8 corresponds to a substituent replacing the hydrogen atom of the methylene group, and represents a hydrogen atom, a lower alkyl group, a phenyl group or a benzyl group, and m is a number of 4, 5, 6 or 7, a group of the formula



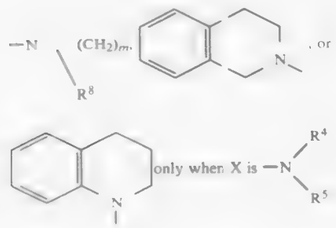
a group of the formula



or a group of the formula



and Z represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkyoxycarbonyl group; provided that Y represents $-CH_2R^9$ only when Z is a lower alkoxycarbonyl group; that R^4 represents a hydrogen atom R^5 is a lower alkyl group, a lower acyl group, a 2-furoyl group, a benzyl group, a phenethyl group or a benzoyl group optionally substituted by halogen or nitro only when Y is CH_2R^9 and Z is a lower alkoxy carbonyl group; that Y can be



and R^4 is a lower alkyl group.

5,147,877

SEMI-SYNTHETIC IMMUNOSUPPRESSIVE MACROLIDES

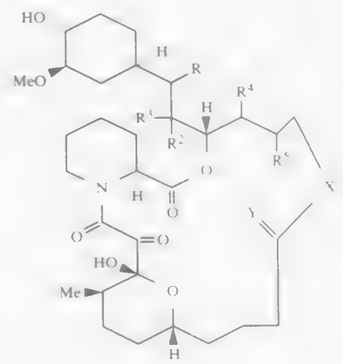
Mark Goulet, Westfield, N.J., assignor to Merck & Co. Inc., Rahway, N.J.

Continuation of Ser. No. 687,366, Apr. 18, 1991, abandoned. This application Sep. 12, 1991, Ser. No. 759,746

Int. Cl.[5] A61K *31/395, 31/695;* C07D *498/16*

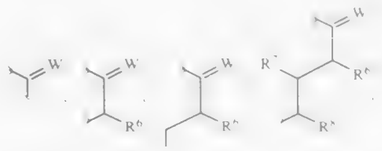
U.S. Cl. 514—291 13 Claims

1. A compound of formula I:



or a pharmaceutically acceptable salt thereof, wherein:

X is selected from:



or forms a single bond;

W is O, (H, OH), or (H, H);

Y is O, (H, OH, or (H, H);

R^1 and R^2 are hydrogen or taken together form a double bond;

R^3 is hydrogen or methyl;

R^4 is selected from:

(1) hydrogen, or

(2) C_{1-6} alkyl, unsubstituted or substituted with one or more of:

(a) C_{1-6} alkoxy,

(b) phenyl, unsubstituted or substituted with C_{1-6} alkyl,

R^5 is hydrogen or hydroxy;

R^6 is selected from:

(1) hydrogen;

(2) C_{1-6} alkyl, unsubstituted or substituted with one or more of:

(a) C_{1-6} alkoxy,

(b) phenyl, unsubstituted or substituted with C_{1-6} alkyl,

(3) C_{2-6} alkenyl; and

R^7 and R^8 are hydrogen or taken together from a double bond.

13. A method for the modification of treatment with an FK-506-type immunosuppressant comprising the administration to a mammalian species in need of such modification of an effective amount of the compound of claim 1.

5,147,878

AMINOALKOXYPHENYL DERIVATIVES, PROCESS OF PREPARATION AND COMPOSITIONS CONTAINING THE SAME

Jean Gubin, and Pierre Chatelain, both of Brussels, Belgium, assignors to Sanofi, Paris, France

Continuation-in-part of Ser. No. 306,500, Feb. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 82,554, Aug. 7, 1987, Pat. No. 4,957,925, which is a continuation-in-part of Ser. No. 6,233, Jan. 23, 1987, abandoned. This application Apr. 19, 1990, Ser. No. 511,095

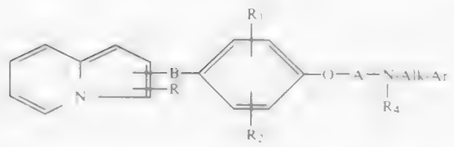
Claims priority, application France, Feb. 14, 1986, 86 02045

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.[5] C07D *471/04;* A61K *31/44, 31/34, 31/40*

U.S. Cl. 514—299 14 Claims

1. An aminoalkoxyphenyl compound of formula:



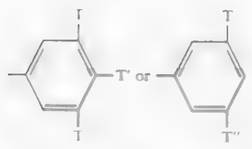
its N-oxide derivative and pharmaceutically acceptable salts in which:

B represents a —S—, —SO— or —SO_2— group;

R_1 and R_2, which are identical or different, each denote hydrogen, a methyl or ethyl radical or a halogen atom;

A denotes a straight- or branched-alkylene radical having from 2 to 5 carbon atoms or a 2-hydroxypropylene radical in which the hydroxy is optionally substituted by a lower alkyl radical, having from 1 to 5 carbon atoms;

Ar denotes a phenyl group of formula:



in which T, T' and T'', which are identical or different, each represent a halogen atom, or a lower alkyl or lower alkoxy group;

R_4 denotes hydrogen or an alkyl radical;

Alk denotes a single bond or a straight- or branched-alkylene radical having from 1 to 5 carbon atoms; and

R in the α position with respect to the methyne group attached to the -β- group represents hydrogen, an alkyl radical having from 1 to 8 carbon atoms, a cycloalkyl radical having from 3 to 6 carbon atoms, a benzyl radical or a phenyl radical optionally substituted with one or more substituents, which may be identical or different, selected from halogen atoms and from C_1–C_4 alkoxy and nitro, as well as its pharmaceutically acceptable salts and N-oxide.

5,147,879

O-(3-AMINO-2-HYDROXYPROPYL)-HYDROXIMIC ACID HALIDES AND PROCESS FOR PREPARING THE SAME

Péter L. Nagy; Béla Balázs; Mária Boross; Jenö Szilbereky; Gizella Zeila; Lajos Ábrahám; György Blaskó; Béla Gachályi; Attila Almási, and Gábor Német, all of Budapest, Hungary, assignors to Biorex Kutato-Fejleszto Kft, Budapest, Hungary

PCT No. PCT/HU89/00048, § 371 Date Jun. 28, 1990, § 102(e) Date Jun. 28, 1990, PCT Pub. No. WO90/04584, PCT Pub. Date May 3, 1990

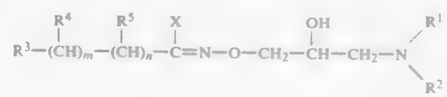
PCT Filed Oct. 19, 1989, Ser. No. 499,318

Claims priority, application Hungary, Oct. 20, 1988, 5405/88

Int. Cl.[5] A61K *31/445;* C07D *211/04*

U.S. Cl. 514—318 4 Claims

1. Hydroximic acid derivatives of formula (I)



and the salts thereof wherein

X is selected from the group consisting of fluoro, chloro, bromo and iodo,

R^1 is hydrogen or C_{1-5} alkyl,

R^2 is C_{1-5} alkyl or C_{5-7} cycloalkyl or

R^1 and R^2, when taken together with the adjacent nitrogen, form a 5 to 8 membered saturated ring,

R^3 is hydrogen, phenyl, naphthyl or pyridyl optionally substituted with one or more halo or alkoxy,

R^4 is hydrogen or phenyl,

R^5 is hydrogen or phenyl,

m is 0, 1 or 2 and

n is 0, 1 or 2.

5,147,880

BENZO[A]FLUORENE COMPOUNDS

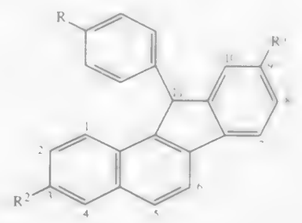
Charles D. Jones, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 22, 1991, Ser. No. 733,529

Int. Cl.[5] A61K *31/445;* C07C *211/31;* C07D *211/00*

U.S. Cl. 514—319 18 Claims

1. A compound of the formula



wherein R represents hydroxy or —O—$(CH_2)_nN(R^3)$ (R^4); R^1 represents hydrogen, hydroxy, C_1–C_3 alkoxy, halo, or —COR^5; R^2 represents hydrogen, hydroxy, C_1–C_3 alkoxy, or —COR^5; n represents 1–3; R^3 and R^4 independently represent C_1–C_4 n- or sec-alkyl; or R^3 and R^4 combine to represent butylene, pentylene or hexylene; R^5 represents C_1–C_5 alkyl, phenyl, or phenyl substituted with 1 or 2 groups chosen from halo, C_1–C_3 alkyl, hydroxy, and C_1–C_3 alkoxy;

and the physiologically acceptable acid addition salts thereof.

5,147,881

4-(1,2-BENZISOXAZOLYL)PIPERIDINE ANTIPSYCHOTIC AGENTS

Harry R. Howard, Jr., Groton, Conn., assignor to Pfizer Inc, New York, N.Y.

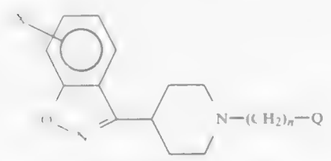
Filed Nov. 14, 1990, Ser. No. 612,776

Int. Cl.[5] A61K *31/445;* **C07D** *413/14*

U.S. Cl. 514—321 **7 Claims**

1. A 4-(1,2-Benzisoxazolyl)-piperidine compound of the formula

Formula I

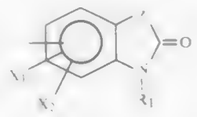


and the pharmaceutically acceptable base salts thereof; wherein

X is H, halo, C_1–C_4 alkyl, C_1–C_4 alkoxyl or CF_3;

n is 2, 3 or 4; and

Q is



wherein Z is CR_2R_3, R_1, R_2 and R_3, are H, or C_1–C_4 alkyl; and X_1 and X_2 are H or halo.

5,147,882

CYCLOPHANES, PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS AND PROCESSES FOR PREPARING THEM

Manfred Psiorz, Ingelheim am Rhein, and Volker Trach, Biberach, both of Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

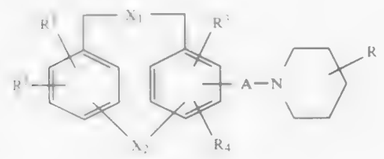
Filed Mar. 28, 1991, Ser. No. 678,556

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010531

Int. Cl.[5] A61K *31/445,* **C07D** *211/06*

U.S. Cl. 514—325 **16 Claims**

1. A cyclophane of the formula



wherein

X_1 and X_2, which may be identical or different, each represent a straight-chained C_{2-4}-alkylene or alkenylene group,

A represents a straight-chained C_{1-6}-alkylene group, a $—Y_1—A_1—$ or $—Y_2—A_2—$ group, wherein

Y_1 represents an oxygen atom or a sulphenyl, sulphinyl or sulphonyl group,

A_1 represents a straight-chained C_{2-4}-alkylene group,

Y_2 represents an ethenylene or ethynylene group and

A_2 represents a straight-chained C_{1-3}-alkylene group, wherein the groups A_1 and A_2 are linked to the piperidinyl moiety and the carbon structure of the groups A, A_1 and A_2 may additionally be substituted by one or two methyl groups,

R_1, R_2, R_3 and R_4, which may be identical or different, each represent a hydrogen or halogen atom or an alkyl, hydroxy, alkoxy or alkylsulphonyloxy group each having 1 to 3carbon atoms in the alkyl part; and

R represents a hydrogen, hydroxy, alkoxy, carboxy, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl group or a C_{1-5} alkyl group which may be substituted by a hydroxy, alkoxy, alkanoyloxy, cyano, carboxy, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, amino, alkylamino, dialkylamino, alkanoylamino, alkylsulphonylamino, N-alkanoylalkylamino or N-alkylsulphonyl-alkylamino group, wherein, unless otherwise specified, the alkyl, alkoxy and alkanoyl moieties may each contain 1 to 3 carbon atoms,

the enantiomers, diastereomers or addition salts thereof.

5,147,883

ACYLBENZOXAZOLINONES COMPOUNDS

Hocine Aichaioui, Lille; Daniel Lesieur, Gondecourt; Charles Lespagnol, Lambersart; Michelle Devissaguet, and Beatrice Guardiola, both of Neuilly Sur Seine, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed May 31, 1991, Ser. No. 708,515

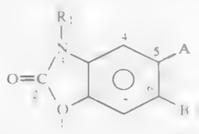
Claims priority, application France, Jun. 22, 1990, 90 07812

Int. Cl.[5] A61K *31/42;* **C07D** *263/58*

U.S. Cl. 514—338 **9 Claims**

1. The compound selected from those having the formula (I):

(I)



in which:

R_1 represents a hydrogen atom or a lower alkyl group, and

(1) A represents a hydrogen atom, and in this case B represents a group CO—G, G being selected from:

a heteroaryl group selected from furan, indole, pyrrole, pyridine, quinoline, isoquinoline and benzofuran, optionally substituted with one or more lower alkyl or lower alkoxy groups or a halogen atom,

a linear or branched lower alkyl group substituted with a carboxyl group,

a linear or branched lower alkenyl group substituted with a carboxyl group, and

a phenyl or naphthyl group substituted with a carboxyl group,

or (2) A forms with B a group $CO(CH_2)_nCH(CH_3)$ with n being an integer equal to 1, 2, 3 or 4, the CO group being attached to the aromatic ring of the benzoxazolinone at the 5- or 6-position,

as well as, where appropriate, its isomers and, when the compound of formula (I) possesses a carboxylic acid group, its addition salts within a pharmaceutically acceptable base, and, when the compound of formula (I) contains a basic group, its addition salts with a pharmaceutically acceptable acid, it being understood that lower alkyl, lower alkoxy and lower alkenyl mean linear or branched groups comprising 1 to 6 carbon atoms inclusive.

5,147,884

PRESERVATIVE FOR AQUEOUS PRODUCTS AND SYSTEMS

Karl-Heinz Diehl, Norderstedt, and Peter Oltmanns, Hamburg, both of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 12, 1990, Ser. No. 479,126

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1989, 3904099

Int. Cl.[5] A01N *43/71, 43/78, 43/80, 31/00*

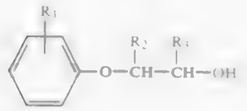
U.S. Cl. 514—365 **18 Claims**

1. An antimicrobial composition for preserving products and systems containing an aqueous phase comprising in admixture

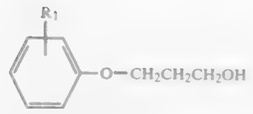
a) from about 10 to about 60% by weight of tert.-butyl hydroperoxide;

b) from about 3 to about 50% by weight of at least one monophenylglycol ether of the general formulas I and II:

I



II



where R_1 is hydrogen or n-alkyl having from 1 to 3 carbon atoms, and R_2 and R_3 independently are hydrogen or methyl; and

c) from 0 to about 85% by weight of a diluent.

5,147,885

N-AMINO BICYCLIC COMPOUNDS

Heather Giles; Alan D. Robertson; Michael G. Kelly, and Leff, Paul, all of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangel Park, N.C.

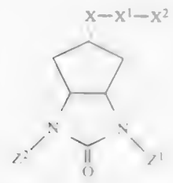
Filed May 23, 1991, Ser. No. 704,436

Claims priority, application United Kingdom, May 24, 1990, 9011589

Int. Cl.[5] A61K *31/415, 31/41;* **C07D** *235/02, 257/04*

U.S. Cl. 514—381 **9 Claims**

1. A compound of the formula:



wherein

X is a sulfur atom or oxygen atom or a group $—NR^1—$ or $—CR^1R^2—$, in the alpha- or beta-configuration, where R^1 and R^2 are hydrogen or straight or branched C_{1-5} alkyl;

X^1 is a C_{1-5} straight chain or branched alkylene group, a C_{3-5} straight chain or branched alkenylene group or a substituted or unsubstituted C_6 or C_{10} aromatic group, the optional substituents on the aromatic group being one or more of C_{1-4} alkyl, C_{1-4} alkoxy, nitro, halo and trihalomethyl;

X^2 is a cyano, carboxyl, carboxamide, hydroxymethyl, C_{2-5} alkoxycarbonyl, or 5-tetrazolyl group;

Z^1 is a group selected from $—NH—CH_2—R^3$ and $—N=CH—R^3$ wherein R^3 is a group selected from $—CO—Y$ and $—CH(Y^1)Y$, Y being a group selected from C_{3-8} alkyl, C_{3-8} alkenyl, phenyl-C_{1-4} alkyl and phenyl, wherein the phenyl group in both cases is optionally substituted by one or more groups independently selected from C_{1-4} alkyl, C_{1-4} alkoxy, nitro, halo and trihalomethyl, cycloalkyl of from 4 to 8 carbon atoms and Y^1 being a group selected from hydroxy, hydrogen, C_{1-4} alkoxy and C_{1-5} alkanoyloxy;

Z^2 is hydrogen, a C_{1-12} straight or branched alkyl, C_{2-12} alkenyl or alkynyl, C_6 or C_{10} aryl or C_6 or C_{10} aryl-C_{1-12} alkyl wherein the aryl group is optionally substituted by one or more groups independently selected from phenyl, C_{1-4} alkyl, C_{1-4} alkoxy, nitro, halo and trihalomethyl, or cycloalkyl of from 3 to 5 carbon atoms;

or a salt or an ester thereof.

5,147,886

TRIAZOLE DERIVATIVES AND A COMPOSITION FOR TREATING MYCOSES

Minoru Tokizawa; Yoshihiko Kanamaru, both of Narita; Masaru Matsumoto, Tomisato; Takemitsu Asaoka, Narita; Hideaki Matsuda, Abiko; Tadayuki Kuraishi, Chiba; Kazunori Maebashi, Narashino; Naokata Taido, Funabashi, and Ryuichi Kawahara, Ichikawa, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1990, Ser. No. 626,545

Claims priority, application Japan, Dec. 25, 1989, 1-335946; Oct. 9, 1990, 2-270783

Int. Cl.[5] A61K *31/41;* **C07D** *249/08*

U.S. Cl. 514—383 **2 Claims**

1. A triazole derivative of formula (I),

wherein R^1 and R^2 represent a hydrogen atom or a lower alkyl group, or R^1 and R^2 together form a lower alkylene group, R^3 represents methyl, and n denotes an integer of 0 to 2, provided that R^1 and R^2 are not both a hydrogen atom at the same time, and a salt thereof.

5,147,887

FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 567,472, Aug. 14, 1990, Pat. No. 5,063,241, which is a division of Ser. No. 439,896, Nov. 20, 1989, Pat. No. 4,970,223, which is a continuation of Ser. No. 801,549, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 646,591, Aug. 31, 1984, abandoned. This application Jun. 6, 1991, Ser. No. 711,671

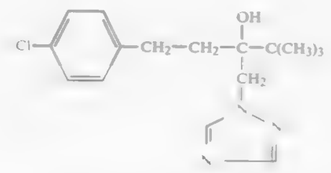
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333411

Int. Cl.[5] A01N *43/52, 43/64*

U.S. Cl. 514—383 **2 Claims**

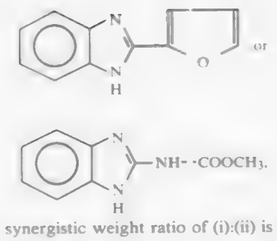
1. A fungicidal composition comprising a synergistic fungicidally effective amount of the mixture of

(i)



and

(ii) at least one benzimidazole derivative of the formula



wherein the synergistic weight ratio of (i):(ii) is about 1:1.

5,147,888

N-TERMINAL INDOLYY INDOLYLALKYLAMINODIOL β-AMINO ACID DERIVATIVES

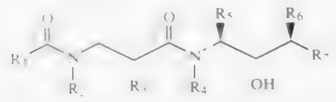
Gunnar J. Hanson, Skokie; John S. Baran, Winnetka; Dave Weissing, Lisle, and Mark Russell, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 445,257, Dec. 4, 1989, abandoned. This application Sep. 16, 1991, Ser. No. 760,836

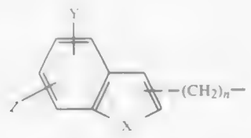
Int. Cl.[5] A61K *31/40;* C07D *209/42*

U.S. Cl. 514—419 18 Claims

1. Compound of the formula



wherein R_1 is selected from heteroaryl and heteroaralkyl groups represented by



wherein X is selected from >N-alkyl and >NH; wherein each of Y and Z is independently selected from hydrido, lower alkyl, hydroxy, halo, alkoxy, carboxy, amino, alkylamino, dialkylamino, aryl, sulfhydryl and thioalkyl; wherein n is a number selected from zero through five, inclusive; wherein each of R_2 and R_4 is independently selected from hydrido and lower alkyl; wherein R_3 is selected from hydrido, alkyl, benzyl, cycloalkyl, cycloalkylalkyl, alkoxyalkyl and alkylthioalkyl; wherein R_5 is selected from cycloalkyl, phenyl, lower alkyl, cycloalkylalkyl and phenylalkyl; wherein R_6 is selected from hydrido, hydroxy, alkoxy, amino, alkylamino, dialkylamino, lower alkyl and cycloalkyl; wherein R_7 is selected from hydrido, alkyl, haloalkyl, cycloalkylalkyl, alkylcycloalkyl, alkylcycloalkenyl and alkoxycarbonyl; wherein R_6 and R_7 may be taken together to form a carbocyclic ring consisting of from three to eight ring members; and wherein any of the foregoing R_1 through R_7 substituents having a substitutable position may be substituted with one or more groups selected from alkyl, alkoxy, halo, haloalkyl, alkenyl, alkynyl and cyano; or a pharmaceutically-acceptable salt thereof.

5,147,889

2-HYDROXY-3-(ARYL-ALKANOYL)-BENZO[B]THIOPHENES AND COMPOSITIONS THEREOF

Pier G. Ferrini, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

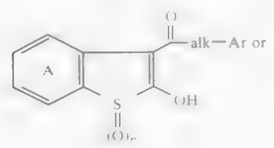
Division of Ser. No. 467,088, Jan. 18, 1990, Pat. No. 5,051,421, which is a division of Ser. No. 324,367, Mar. 15, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 722,080

Claims priority, application Switzerland, Mar. 16, 1988, 998/88

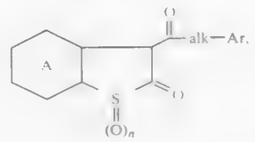
Int. Cl.[5] A61K *31/38;* C07D *333/64*

U.S. Cl. 514—443 19 Claims

1. A benzothiophene of the formula



(I)



(Ia)

respectively, or a salt thereof, in which n is 0, 1, or 2; alk is lower alkylene; Ar is phenyl, naphthyl, furyl, or thienyl, each of which is unsubstituted or is mono- or poly-substituted by lower alkyl, halo-lower alkyl, halogen and/or by nitro; and the ring A is unsubstituted or is mono- or poly-substituted by lower alkyl, lower alkoxy, lower alkythio, lower alkanesulfinyl, lower alkane sulfonyl, halo-lower alkyl, halogen and/or by nitro.

5,147,890

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 3-IODO-2-PROPYNYL-BUTYL CARBAMATE AND N,N-DIMETHYL-N'-PHENYL-(N'-FLUORODICHLOROMETHYLTHIO) SULFAMIDE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 16, 1991, Ser. No. 808,308

Int. Cl.[5] A01N *41/02, 47/10*

U.S. Cl. 514—479 7 Claims

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 3-iodo-2-propynyl-butyl carbamate and (b) N,N-di-methyl-N'-phenyl-(N'-fluorodichloromethylthio) sulfamide wherein the weight ratio of (a):(b) is from about 1:35.75 to 1.8:1.

5,147,891

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 3-IODO-2-PROPYNYL-BUTYL CARBAMATE AND PHENYL-(2-CYANO-2-CHLOROVINYL) SULFONE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 16, 1991, Ser. No. 808,306

Int. Cl.[5] A01N *37/34, 47/10*

U.S. Cl. 514—479 7 Claims

1. A bacterial inhibiting composition comprising a synergistic mixture of (a) 3-iodo-2-propynyl-butyl carbamate and (b) phenyl-(2-cyano-2-chlorovinyl) sulfone wherein the weight ratio of of (a):(b) is from about 1:18 to 28:1.

5,147,892

BENZYL KETONES AND FUNGICIDES CONTAINING THEM

Horst Wingert; Hubert Sauter, both of Mannheim; Franz Roehl, Ludwigshafen; Reinhard Doetzer, Weinheim; Gisela Lorenz, Neustadt, and Eberhard Ammermann, Ludswigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

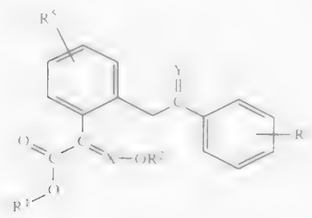
Filed Jun. 27, 1991, Ser. No. 722,504

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020397

Int. Cl.[5] A01N *37/34;* A61K *31/257*

U.S. Cl. 514—522 6 Claims

1. A benzyl ketone of the formula I



(I)

where

X is CH or N,

Y is O or NR^4,

R^1 and R^2 are each H or C_1-C_4-alkyl,

R^3 is H, halogen, cyano, nitro, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, halo-C_1-C_2-alkyl, aryl-C_1-C_2-alkyl, aryl-C_1-C_2-alkoxy, aryloxy or aryl, and the aryl groups in turn may be substituted by from one to three of the radicals halogen, cyano, nitro, C_1-C_6-alkyl, C_1-C_6-alkoxy or halo-C_1-C_2-alkyl,

R^4 is OH, C_1-C_6-alkoxy or aryl-C_1-C_2-alkoxy and

R^5 is H, methyl, halogen or methoxy.

5,147,893

CYCLIC PHENOLIC THIOETHERS

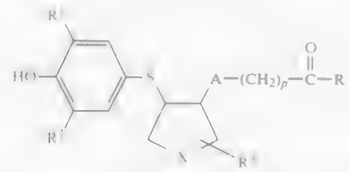
Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 9, 1991, Ser. No. 697,849

Int. Cl.[5] C07C *69/738, 65/40*

U.S. Cl. 514—530 22 Claims

1. A compound of the formula:



wherein R^1 and R^2 are the same or different and independently represent tert-alkyl or phenyl; R^3 represents hydrogen or alkyl; X represents $-(CH_2)_w-B-(CH_2)_y-$ wherein B represents CH_2 and w and y can each independently be an integer from 0 to 3 with the proviso that the sum of w+y is equal to or less than 3; A represents O or $S(O)_n$ wherein n is 0, 1, or 2; p is an integer from 0 to 4; and R represents:

OH;

OR^4 wherein R^4 is alkyl of 1 to 4 carbon atoms; or

$(CH_2)_tCOOR^7$ wherein t is an integer from 1 to 4 and R^7 is hydrogen or alkyl of 1 to 4 carbon atoms;

or a pharmaceutically acceptable salt thereof.

5,147,894

POLYPHENYLENE OXIDE-RECYCLED POLYSTYRENE COMPOSITION AND METHOD

Richard C. Bopp, West Coxsackie, and Daniel L. Roberts, Albany, both of N.Y., assignors to General Electric Co., Selkirk, N.Y.

Filed Feb. 12, 1990, Ser. No. 478,099

Int. Cl.[5] C08J *9/00, 11/04*

U.S. Cl. 521—40.5 8 Claims

1. A method for forming a cellular foam material, which comprises:

a) melt-compounding a polyphenylene oxide polymer and a recycled polystyrene material, wherein the polystyrene is bromine-modified and exhibits a melt flow index greater than about 25 when devolatized by heating above its glass transition temperature; and

b) extruding the melt-compounded composition of step (a) with a blowing agent to form the cellular foam.

5,147,895

HIGHLY POROUS COMPRESSIBLE POLYMERIC POWDERS

O. Richard Hughes, Chatham, and Dieter Kurschus, Bayville, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 19, 1991, Ser. No. 810,611

Int. Cl.[5] C08J *9/28, 9/30, 9/32*

U.S. Cl. 521—64 20 Claims

1. A process of producing a highly porous powder from a polymeric material comprising the steps of:

(a) forming a polymer solution in a solvent;

(b) atomizing said polymer solution to form a first directed aerosol jet of droplets of said solution;

(c) simultaneously with said step of atomizing said solution into droplets, atomizing a liquid non-solvent to form a second directed, aerosol jet formed of droplets of said liquid non-solvent, said first and second directed jets being coincident so that they cooperate to form an aerosol aggregation zone where the droplets of polymer solution associate with the liquid non-solvent so as to aggregate; and

(d) collecting the aggregated droplets such that sufficient liquid non-solvent is present to precipitate the polymer from the solvent into a highly porous powder.

5,147,896

FOAM BLOWING AGENT COMPOSITION AND PROCESS FOR PRODUCING FOAMS

Robert O. York, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1991, Ser. No. 702,285
Int. Cl.[5] C08J *9/14*
U.S. Cl. 521—79 1 Claim

1. A process for producing a closed-cell polymer foam comprising heating a polystyrene resin to a temperature sufficient to provide a molten polymer; adding and mixing 1,1-difluoroethane, as blowing agent, with said molten polymer to provide a plasticized mixture; heating the mixture to a temperature and applying a pressure such that the plasticized mixture does not foam; thereafter, reducing the temperature of the mixture to increase its viscosity; extruding the plasticized mixture into a zone at a temperature and pressure sufficient to permit foaming.

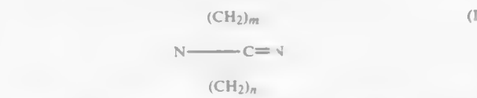
5,147,897

METHOD FOR PRODUCING NON-YELLOWING POLYURETHANE UREA FOAM

Kiyotake Morimoto, Koshigaya; Yasushi Takagi, Tokyo; Isao Kato, Tokyo, and Masahiko Nakata, Tokyo, all of Japan, assignors to Nisshinbo Industries Inc., Tokyo, Japan

Filed Aug. 26, 1991, Ser. No. 749,600
Claims priority, application Japan, Aug. 27, 1990, 2-222386; Jan. 11, 1991, 3-12554
Int. Cl.[5] C08G *9/00*
U.S. Cl. 521—125 7 Claims

1. A method for producing a non-yellowing polyurethane urea foam, which comprises reacting (1) an isocyanate-terminated prepolymer, the prepolymer obtained by the addition reaction of a polyol having a number average molecular weight of 100 to 5,000 and containing on the aver 2 to 3 functional groups with an aliphatic polyisocyanate in an amount of 1.4 to 2.6 times the hydroxyl equivalent, with (2) water in an amount of 0.4 to 5 times the isocyanate equivalent in the presence of, per 100 parts by weight of the prepolymer, either (3)(a) 0.1 to 5 parts by weight of a potassium or sodium salt of a C_2–C_{10} alkanoic acid or (3)(b) 0. to 10 parts by weight of a diazabicycloalkene represented by the formula (I)



(I)

wherein m is an integer of 3 to 7 and n is an integer of 2 to 4, or its organic acid salt.

5,147,898

PROCESS FOR PRODUCING A RIGID FOAM

Joichi Saito, Yokohama, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan

PCT No. PCT/JP90/00588, § 371 Date Mar. 11, 1991, § 102(e) Date Mar. 11, 1991, PCT Pub. No. WO90/13585, PCT Pub. Date Nov. 15, 1990
PCT Filed May 9, 1990 Ser. No. 635,592
Claims priority, application Japan, May 10, 1989, 1-114976
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—131 8 Claims

1. A process for producing a rigid foam by reacting an active hydrogen compound and a polyisocyanate compound in the presence of a halogenated hydrocarbon blowing agent and an assisting agent, characterized in that the whole or part of the active hydrogen compound is a polyether polyol containing in its molecular structure a neutral salt or an alkoxide, said polyether polyol having a hydroxyl value of from 200 to 800.

5,147,899

PROCESS FOR PRODUCING A FOAMED POLYVINYL ALCOHOL FILM

Akihide Sato, and Tokio Niikuni, both of Yokkaicho, Japan, assignors to Mitsubishi Kasei Vinyl Company, Tokyo, Japan

Continuation of Ser. No. 393,773, Aug. 15, 1989, abandoned.
This application Aug. 12, 1991, Ser. No. 745,980
Claims priority, application Japan, Aug. 22, 1988, 63-207691
Int. Cl.[5] C08F *16/06*; C08J *9/00*
U.S. Cl. 521—141 2 Claims

1. A mechanically foamed polyvinyl alcohol film which is easily soluble in water at a temperature of 40° C., consisting essentially of a polyvinyl alcohol and a plasticizer in an amount of from 5 to 80 parts by weight per 100 parts in weight of polyvinyl alcohol, wherein the foaming ratio of the foamed film is in the range of from 2 to 5.

5,147,900

ENERGY-INDUCED DUAL CURABLE COMPOSITIONS

Michael C. Palazzotto, St. Paul; Katherine A. Brown-Wensley, Lake Elmo, and Robert J. DeVoe, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 90,694, Aug. 28, 1987, Pat. No. 4,950,696.
This application Apr. 24, 1990, Ser. No. 513,610
Int. Cl.[5] C08F *2/50, 59/68, 4/42*; G03C *1/725*
U.S. Cl. 522—25 22 Claims

1. An energy polymerizable composition comprising
a) least one ethylenically-unsaturated monomer
b) at least one epoxy monomer different from the monomer in a)
c) a curing agent comprising
(1) an organometallic compound, and
(2) an onium salt,

wherein said organometallic compound has the formula,

$$L^1L^2L^3M$$

wherein

L^1 represents none, or 1 to 12 ligands contributing pi-electrons that can be the same or different ligand selected from substituted and unsubstituted acyclic and cyclic unsaturated compounds and groups and substituted and unsubstituted carbocyclic aromatic and heterocyclic aromatic compounds, each capable of contributing 2 to 24 pi-electrons to the valence shell of M;

L^2 represents none, or 1 to 24 ligands that can be the same or different contributing an even number of sigma-electrons selected from mono-, di-, and tri-dentate ligands, each donating 2, 4, or 6 sigma-electrons to the valence shell of M;

L^3 represents none, or 1 to 12 ligands that can be the same or different, each contributing no more than one sigma-electron each to the valence shell of each M;

Ligands L^1, L^2, and L^3 can be bridging or non-bridging ligands;

M represents 1 to 4 of the same or different metal atoms selected from the elements of Periodic Groups IVB, VB, VIB, VIIB, and VIII; with the proviso that said organometallic compound contains at least one of a metal-metal sigma bond and L^3; and with the proviso that L^1, L^2, L^3, and M are chosen so as to achieve a stable configuration.

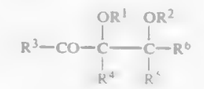
5,147,901

PROPIONPHENONE DERIVATIVES AS PHOTOINITIATORS FOR PHOTOPOLYMERIZATION

Werner Rutsch, Fribourg; Rudolf Kirchmayr, Aesch; Rinaldo Hüsler, Basel, and Kurt Dietliker, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 245,088, Sep. 16, 1988, abandoned, which is a division of Ser. No. 880,654, Jun. 30, 1986, Pat. No. 4,795,766, which is a continuation of Ser. No. 756,912, Jul. 17, 1985, abandoned, which is a continuation of Ser. No. 534,954, Sep. 22, 1983, abandoned. This application Sep. 22, 1989, Ser. No. 411,436
Claims priority, application Switzerland, Oct. 1, 1982, 5807/82
Int. Cl.[5] C08F *2/50, 4/72, 20/20*
U.S. Cl. 522—42 8 Claims

1. A photopolymerizable composition comprising
(a) at least one ethylenically unsaturated photopolymerizable compound, and
(b) a compound of formula I



(I)

in which
R^1 is hydrogen,
R^2 is $—Si(CH_3)_3$,
R^3 is phenyl, or said phenyl substituted by one or more —Cl, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio; or R^3 is benzoylphenyl, phenoxyphenyl or phenylthiophenyl,
R^4 is C_1–C_4-alkyl, phenyl or phenyl substituted by one or more —Cl, C_1–C_4-alkyl or C_1–C_4-alkoxy,
R^5 is hydrogen or C_1–C_4-alkyl, or R^4 and R^5 together are trimethylene or tetramethylene, and
R^6 is hydrogen, C_1–C_4-alkyl, $—CCl_3$ or phenyl.

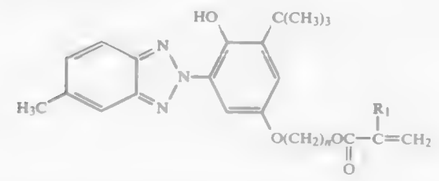
5,147,902

ULTRAVIOLET LIGHT ABSORBING OCULAR LENS

Makoto Ichikawa; Kazuharu Niwa, and Kazuhiko Nakada, all of Nagoya, Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Nov. 26, 1991, Ser. No. 798,205
Claims priority, application Japan, Nov. 26, 1990, 2-323835
Int. Cl.[5] C07D *249/20*
U.S. Cl. 523—106 9 Claims

4. An ultraviolet light absorbing intraocular lens comprising a vinyl type copolymer containing from 0.01 to 0.5% by weight of a benzotriazole type ultraviolet light absorbing monomer as chemically bonded therewith and from 0.0001 to 0.1% by weight of a coloring matter, said ultraviolet light absorbing monomer having the formula:



(wherein R_1 is H or CH_3 and n is 2 or 3).

5,147,903

DENTAL MATERIALS

Wolfgang Podszun, Cologne, and Fritjof Bley, Achberg-Liebenweiler, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 362,722, Jun. 7, 1989, abandoned. This application Apr. 8, 1991, Ser. No. 681,815
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820498
The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.
Int. Cl.[5] C08F *265/04*; A61C *13/00*
U.S. Cl. 523—115 5 Claims

1. A composition suitable for forming a dental component, consisting essentially of methacrylates and from 0.1 to 10 parts by weight of one or more additives, the methacrylates consisting essentially of about (a) 5 to 35 parts of a filler comprising a polymeric crosslinked (meth)-acrtylate having a particle size of about 0.01 to 10 μm, a degree of swelling of about 100 to 2,000% by weight and a degree of crosslinking of about 50 to 100% by weight, in each case based on the polymer, and (b) 40 to 90 parts of a (meth)-acrylate which can form crosslinkages.

5,147,904

OPEN-PORED MOLDINGS, A PROCESS FOR THEIR PRODUCTION AND USE THEREOF

Peter Jochum; Oswald Gasser, both of Seefeld; Manfred Holupirek, Grafrath; Erich Wanek, Seefeld; Rainer Guggenberger, Hersching; Klaus-Peter Stefan, Seefeld, and Klaus Ellrich, Wörthsee, all of Fed. Rep. of Germany, assignors to Thera Patent GmbH & Co. KG, Seefeld, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 570,808
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927984
Int. Cl.[5] A61F *2/28*
U.S. Cl. 523—115 11 Claims

1. An open-pored molding containing the product of the foaming and setting of
(a) an aluminum fluorosilicate glass,
(b) at least one polycarboxylic acid with an average molecular weight of >500,
(c) a foaming agent, other than carbonates and/or hydrogencarbonates,
(d) optionally a chelating agent and
(e) water,

in which the total pore volume (V_p) of the molding is 30 to 70% by volume.

5,147,905

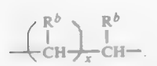
ADVANCED AND UNADVANCED COMPOSITIONS, NUCLEOPHILIC DERIVATIVES THEREOF AND CURABLE AND COATING COMPOSITIONS THEREOF

Robert A. Dubois, Houston; Duane S. Treybig, Lake Jackson; Allyson Malzman, Lake Jackson; Poag S. Sheih, Lake Jackson, and Alan R. Whetten, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

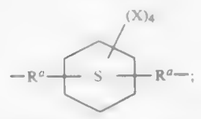
Filed May 1, 1991, Ser. No. 691,881
Int. Cl.[5] C08K *3/20*; C08L *63/02*; C08G *65/10, 59/06*
U.S. Cl. 523—404 5 Claims

1. An acidified advanced resin comprising the product resulting from reacting a composition comprising
(A) at least one nucleophilic compound;
(B) at least one advanced resin comprising the product prepared by reacting
(1) at least one diglycidyl ether of a compound containing an average of more than one but not more than two phenolic hydroxyl groups per molecule; with
(2) at least one compound containing an average of more than one but not more than two phenolic hydroxyl groups per molecule;
wherein components (1) and (2) are employed in amounts which provide a ratio of phenolic hydroxyl groups per

epoxide group of from 0.5:1 to 0.95:1; and characterized in that at least one of the components (1) or (2) contains at least one —O—R^1—O— group or —(O—CH_2—CHR^2-)$_n$—O— group as a bridge between two groups selected independently from the group consisting of (1) a saturated or unsaturated cycloaliphatic group, (2) an aromatic group, (3) a group represented by the formula



or (4) a group represented by the formula



wherein each R^a is independently a divalent hydrocarbyl group having from 1 to 6 carbon atoms; each R^b is independently hydrogen or a monovalent hydrocarbyl group having from 1 to 6 carbon atoms; R^1 is a divalent hydrocarbyl group having from 1 to 36 carbon atoms; R^2 is hydrogen, methyl, ethyl or phenyl; each X is independently hydrogen, a halogen, —SO—R^4, —SO_2—R^4, —CO—R^4, —CO—O—R^4, —O—CO—R^4, —S—R^4, —OR^4, or —R^4; R^4 is a monovalent hydrocarbyl group having from 1 to 12 carbon atoms; n has a value from 1 to 10; and x has a value from 2 to 19; and

(C) at least one Bronsted acid.

5,147,906

CATIONICALLY ELECTRODEPOSITABLE RESIN COMPOSITION BASED ON 4-VINYLCYCLOHEXENE-1-OXIDE

Reiziro Nishida, and Akira Tominaga, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Kanagawa, Japan

Division of Ser. No. 504,905, Apr. 5, 1990, Pat. No. 5,089,542. This application Jul. 25, 1991, Ser. No. 741,854

Claims priority, application Japan, Apr. 7, 1989, 1-86933

Int. Cl.[5] C08G *59/02*; C07D *303/12*; C08L *63/00*

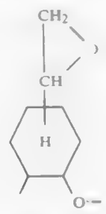
U.S. Cl. 523—410 19 Claims

1. A cationically electrodeposition paint composition containing as main components

(i) at least one cationic resin selected from the group consisting of primary hydroxyl group-containing cationic resins (X) and (Y), and

(II) a curing agent (Z),

said primary hydroxyl group-containing cationic resin (X) being obtained by reacting an epoxy resin (A) having at least three epoxy group-containing functional groups represented by the following structural formula (I)



(I)

with a primary or secondary amine compound (B) containing primary hydroxyl group, and said primary hydroxyl group-containing cationic resin (Y) being obtained by reacting the epoxy resin (A) with the amine compound (B) and further with a phenol compound (C) having at least one phenolic hydroxyl group in the molecule.

5,147,907

PROCESS OF PRODUCING AQUEOUS POLYMER DISPERSIONS

Günter Rinck, Frankfurt; Knut Möller, Neuberg; Sigismund Füllert, Frankfurt; Frank Krause, Kleve, all of Fed. Rep. of Germany, and Helmut Koch, Tervuren, Belgium, assignors to Synthomer Chemie GmbH, Frankfurt am Main, Fed. Rep. of Germany and Cerestar Holding B.V., Sas Van Gent, Netherlands

Filed Jul. 10, 1990, Ser. No. 550,630

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1989, 3922784

Int. Cl.[5] C08L *3/02*

U.S. Cl. 524—48 21 Claims

1. A process for the production of an aqueous polymer dispersion comprising:

polymerizing an ethylenically unsaturated diene monomer or a mixture of monomers consisting of

20% to 100% by weight of a diene monomer,

0% to 80% by weight of a vinyl-aromatic monomer, and

0% to 50% by weight of an ethylenically unsaturated monomer,

by means of one or more free radical initiators in the presence of an aqueous dextrin solution or dispersion containing 10 parts to 200 parts by weight dextrins, wherein the content of said dextrins having a molecular weight in excess of 5000 is at least 50% by weight and the content of said dextrins having a molecular weight in excess of 10,000 is not in excess of 5% by weight of the dextrin component.

5,147,908

CATIONIC POLYVINYL ALCOHOL BINDER ADDITIVE

William C. Floyd, Chester, and Louis R. Dragner, Rock Hill, both of S.C., assignors to Sequa Chemicals Inc., Chester, S.C.

Filed Sep. 24, 1990, Ser. No. 587,012

Int. Cl.[5] C08L *3/04*

U.S. Cl. 524—49 24 Claims

1. A cationic polyvinyl alcohol binder additive comprising: reaction product of an aqueous solution of a blocked glyoxal resin, a cationic water-soluble aldehyde reactive polymer and a polyvinyl alcohol polymer.

5,147,909

SUBSTITUTED 1,3,2-BENZOXAZAPHOSPHOLIDINES AND STABILIZED COMPOSITIONS

Paul A. Odorisio, Edgewater, N.J.; Stephen D. Pastor, and James L. Hyun, both of Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 572,749, Aug. 23, 1990, Pat. No. 5,075,483. This application Sep. 23, 1991, Ser. No. 764,021

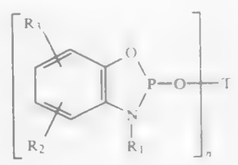
Int. Cl.[5] C08K *5/5399*

U.S. Cl. 524—94 16 Claims

1. A stabilized composition which comprises

(a) an organic material subject to oxidative, thermal or actinic degradation, and

(b) an effective stabilizing amount of a compound of formula I



(I)

wherein

n is an integer from 1 to 4,

R_1, R_2 and R_3 are independently hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms or said phenylalkyl substituted on the phenyl ring by alkyl of 1 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms, and T is an n-valent aliphatic or aromatic radical,

when n is 1, T is alkyl of 8 to 20 carbon atoms, said alkyl interrupted by one to nine —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —$CONR_4$—or —NR_5— or mixtures thereof where R_4 and R_5 independently have the same definitions as R_1, or T is aryl of 6 to 10 carbon atoms or said aryl substituted by one, two or three alkyl of 1 to 12 carbon atoms or said aryl substituted by —$(CH_2)_k$—$COOR_6$ where k is 0, 1, or 2, and R_6 is alkyl of 1 to 20 carbon atoms, or T is phenylalkyl of 7 to 15 carbon atoms or where the alkyl is interrupted by one or two —O—, —S—, —SO— or —SO_2—, or where the phenyl ring is substituted by one, two or three alkyl of 1 to 12 carbon atoms,

when n is 2, T is a straight or branched chain alkylene of 2 to 31 carbon atoms, said alkylene interrupted by one to seven —O—, —S—, —SO— or —SO_2— moieties, cycloalkylene of 6 to 12 carbon atoms, phenylene, phenylene substituted by one to four alkyl groups of 1 to 4 carbon atoms, xylylene, or phenylene-E-phenylene where E is a direct bond, methylene, alkylidene of 2 to 8 carbon atoms, —O—, —S—, —SO—, —SO_2—, —CO— or —NR_5,

when n is 3, T is alkanetriyl of 3 to 6 carbon atoms or benzenetriyl, and

when n is 4, T is alkanetetrayl of 4 to 6 carbon atoms.

5,147,910

COMPOSITIONS STABILIZED WITH 3H-1,3,2-OXOZAPHOSPHOLIDINES

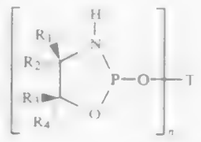
Paul A. Odorisio, Edgewater, N.J.; James L. Hyun, Danbury, Conn.; Sai P. Shum, Hawthorne, and Raymond Seltzer, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 572,747, Aug. 23, 1990, Pat. No. 5,075,484. This application Sep. 23, 1991, Ser. No. 764,262

Int. Cl.[5] C08K *5/5399*

U.S. Cl. 524—95 12 Claims

1. A stabilized composition which comprises (a) an organic material subject to oxidative, thermal or actinic degradation, and (b) an effective stabilizing amount of a compound of formula I



(I)

wherein

R_1, R_2, R_3 and R_4 are independently hydrogen, alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms or said phenylalkyl substituted on the phenyl ring by one or two alkyl of 1 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms, or R_1 and R_2 together; or R_3 and R_4 together; or one of R_1 or R_2 together with one of R_3 or R_4 together; with the ring carbon atom or atoms to which they are attached form a cycloalkyl ring of 5 to 6 carbon atoms;

n is an integer from 1 to 4,

T is an n-valent aliphatic or aromatic radical,

when n is 1, T is alkyl of 1 to 20 carbon atoms, said alkyl interrupted by one to nine —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —NR— or mixtures thereof where R has the same definition as R_1; or T is aryl of 6 to 10 carbon atoms or said aryl substituted by one, two or three alkyl of 1 to 12 carbon atoms, or said aryl substituted by —$(CH_2)_k$—$COOR_8$ where k is 0, 1 or 2 and R_8 is hydrogen or alkyl of 1 to 20 carbon atoms; or T is phenylalkyl of 7 to 15 carbon atoms or where the alkyl is interrupted by one or two —O—, —S—, —SO— or —SO_2—, or where the phenyl ring is substituted by one, two or three alkyl of 1 to 12 carbon atoms;

when n is 2, T is straight or branched chain alkylene of 2 to 31 carbon atoms, said alkylene interrupted by one to seven —O—, —S—, —SO— or —SO_2— moieties, cycloalkylene of 6 to 12 carbon atoms, phenylene, phenylene substituted by one to four alkyl groups of 1 to 4 carbon atoms, xylylene or phenylene-E-phenylene where E is a direct bond, methylene, alkylidene of 2 to 8 carbon atoms, —O—, —S—, —SO—, —SO_2—, —CO— or —NR—;

when n is 3, T is alkanetriyl of 3 to 8 carbon atoms or benzenetriyl; and

when n is 4, T is alkanetetrayl of 4 to 6 carbon atoms.

5,147,911

COMPOSITIONS STABILIZED WITH POLY-1,3,2-OXAZAPHOSPHOLIDINES

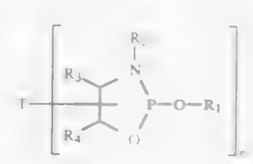
Peter Hofmann, Basel, Switzerland; Paul A. Odorisio, Edgewater, N.J.; Glen T. Cunkle, Stamford, Conn., and Don Sabrsula, Peekskill, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 572,729, Aug. 23, 1990, Pat. No. 5,075,481. This application Sep. 23, 1991, Ser. No. 764,022

Int. Cl.[5] C08K *5/5399*

U.S. Cl. 524—95 11 Claims

1. A stabilized composition which comprises (a) an organic material subject to oxidative, thermal or actinic degradation, and (b) an effective stabilizing amount of a poly-1,3,2-oxazaphospholidine compound of formula I

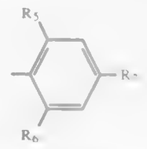


(I)

wherein

n is an integer from 2 to 4,

R_1 is alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, said phenylalkyl substituted on the phenyl ring by one or two alkyl groups of 1 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or a radical of formula II



(II)

R_2, R_3 and R_4 are independently hydrogen, alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, said phenylalkyl substituted on the phenyl ring by one or two alkyl groups of 1 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl groups of 1 to 12 carbon atoms, or

R_3 and R_4 together are straight or branched chain alkylene

of 3 to 6 carbon atoms so that with the two ring carbon atoms to which they are attached, they form a cycloalkyl ring of 5 to 6 carbon atoms,

R_5 and R_6 are independently hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms or said phenylalkyl substituted on the phenyl ring by one or two alkyl groups of 1 to 12 carbon atoms,

R_7 is hydrogen, alkyl of 1 to 18 carbon atoms or a group of the formula $—(CH_2)_kCOOR_8$ where k is 0, 1 or 2, and R_8 is hydrogen or alkyl of 1 to 20 carbon atoms, and

when n is 2, T is a direct bond, —O—, —S—, —SO—, $—SO_2—$, —CO— or —NR— where R is alkyl of 1 to 8 carbon atoms, or

when n is 2–4, T is an n-valent aliphatic hydrocarbon radical containing 1 to 20 carbon atoms, which radical is linear or branched, or which radical is interrupted by one or more moieties selected from the group consisting of —O—, —S—, —SO—, $—SO_2—$, —CO—, —NR—, phenylene and mixtures thereof, where R is alkyl of 1 to 8 carbon atoms.

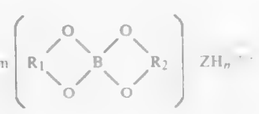
5,147,914

USE OF SPIROCYCLIC BORIC ACID ESTERS AS FLAME RETARDANTS IN PLASTICS

Heinrich Horacek, Linz, Austria, assignor to Chemie Linz Gesellschaft m.b.H., Linz, Austria

Filed Apr. 3, 1991, Ser. No. 678,939
Claims priority, application Austria, Apr. 24, 1990, 945/90
Int. Cl.[5] C08K 5/55
U.S. Cl. 524—185 10 Claims

1. A plastic composition containing a plastic and a flame retardant amount of halogen free spirocyclic boric acid esters of the formula I



where R_1 and R_2 either independently of one another denote divalent radicals of alcohols having 2 to 6 OH groups, or together denote the tetravalent radical of pentaerythritol, Z denotes an N base and m denotes an integer from 1 to 3.

5,147,915

ALKALI-SOLUBLE HYDROPHILIC POLYMER COATINGS

Glenn C. Calhoun, Mt. Pleasant; Robert W. Stackman, and Michael E. Klinkhammer, both of Caledonia, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 558,351, Jul. 26, 1990, Pat. No. 5,093,396.
This application Sep. 13, 1991, Ser. No. 759,253
Int. Cl.[5] C08K 5/19, 5/17
U.S. Cl. 524—204 9 Claims

1. In combination with a fog-susceptible substrate, an alkali-soluble polymeric coating formulation, comprising:

a volatile, aqueous carrier;

an alkali-soluble hydrophilic solution polymerized polymer having a number-average molecular weight of at least about 10,000 and being present in the aqueous carrier;

an alkali-soluble multivalent metal ion-containing bond-forming agent in the aqueous carrier; and

an effective amount of a volatile alkali ingredient, in the aqueous carrier, for dissolving both the hydrophilic polymer as well as the multivalent metal ion-containing bond-forming agent,

wherein the relative amounts of hydrophilic polymer and multivalent metal ion-containing bond-forming agent, in the aqueous carrier, are effective for forming a fog-resistant, alkali-soluble quasi cross-linked polymeric coating on the substrate upon application of the alkali-soluble polymeric coating formulation onto the substrate and evaporation of the volatile carrier therefrom.

5,147,916

HOT-MELT SILICONE PRESSURE SENSITIVE ADHESIVE COMPOSITION AND RELATED METHODS AND ARTICLES

Randall P. Sweet, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 21, 1990, Ser. No. 485,015
Int. Cl.[5] C08K 5/24
U.S. Cl. 524—266 6 Claims

1. A hot-melt silicone pressure sensitive adhesive composition having a flashpoint below 100° F., comprising a mixture of

(i) from about 40 to about 70 parts by weight of a trimethylsilyl-endblocked benzene-soluble resinous copolymer containing silicon-bonded hydroxyl radicals and consisting essentially of triorganosiloxy units of the formula $R_3SiO_{\frac{1}{2}}$ and a tetrafunctional siloxy units of the formula $SiO_{4/2}$ in a ratio of about 0.6 to 0.9 triorganosiloxy units for each tetrafunctional siloxy unit present in the copolymer, wherein R is a monovalent organic radical independently selected from the group consisting of hydrocarbon radicals of from 1 to 6 inclusive carbon atoms and

(ii) from about 30 to about 60 parts by weight of a silanol-endstopped polydimethylsiloxane fluid, wherein the total parts by weight of the resinous copolymer and the polydimethylsiloxane fluid equals 100 parts, said mixture being blended with

(iii) from about 0.5 to about 10 weight percent, based on the total weight of the resinous copolymer and polydimethylsiloxane fluid, of a hydrocarbon selected from the group consisting of light mineral oil, heavy mineral oil, and mixtures thereof.

5,147,917

HALOGENATED RESIN COMPOSITION

Yuji Sugawara, Kuwana, and Shinji Kobe, Omiya, both of Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,026
Claims priority, application Japan, Mar. 15, 1990, 2-65154
Int. Cl.[5] C08K 5/13, 5/41, 5/07, 3/10
U.S. Cl. 524—357 9 Claims

1. A stabilized halogenated resin composition which comprises 100 parts by weight of a halogenated resin in admixture with (a) 0.05 to 10 parts by weight of at least one overbased alkaline earth metal carboxylate/carbonate complex and (b) 0.001 to 5 parts by weight of at least one β-diketone compound or a metal salt thereof.

5,147,918

LOW WEAR POLYAMIDE COMPOSITIONS CONTAINING ALUMINOSILICATE CERAMIC FIBER

Karen L. Price, Florence, Ky., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jun. 12, 1991, Ser. No. 713,522
Int. Cl.[5] C08K 3/34
U.S. Cl. 524—442 30 Claims

1. A polyamide molding composition exhibiting high mechanical strength and low wear properties comprising, based on the total weight of the composition:

(a) between about 10 to about 15 weight percent of an aluminosilicate ceramic fiber comprising from about 43 to about 48 weight percent Al_2O_3 and from about 54 to about 50 weight percent of SiO_2 based on the total weight of the aluminosilicate ceramic fiber; and

(b) between about 90 to about 85 weight percent of nylon 66; and

wherein the Taber Abrasion value of the polyamide molding composition is no greater than about 6 when subjected to ASTM test D4060–84 using a CS-17 abrasive wheel and 1000 gram weight.

5,147,919

REINFORCING MATERIAL COMPRISING E-POLYCAPROLACTONE AND PULVERIZED FUEL ASH

Brian Arnold, Leicestershire, England, assignor to British United Shoe Machinery Ltd., Leicester, England

Filed Jun. 13, 1989, Ser. No. 365,340
Claims priority, application United Kingdom, Jul. 1, 1988, 8815686
Int. Cl.[5] C08K 3/34
U.S. Cl. 524—444 8 Claims

1. A reinforcing material which comprises an E-polycaprolactone binder in admixture with a filler, said filler being pulverized fuel ash, said mixture comprising from 50 to 95% by weight of polycaprolactone, from 5 to 45% by weight of pulverized fuel ash and from 0 to 10% by weight of other fillers and/or diluents and wherein said polycaprolactone has as molecular weight of 40,000 to 60,000.

5,147,920

POLYMER MIXTURE COMPRISING POLYESTER, GLASS FIBRES, FLAME-RETARDANT AND FILLER; ARTICLES FORMED THEREFROM

Theodorus A. M. Dekkers; Wilhelmus J. L. A. Hamersma, both of Bergen op Zoom, Netherlands, and Farshid Tabankia, Brasschaat, Belgium, assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 25, 1990, Ser. No. 514,469
Claims priority, application Netherlands, Apr. 27, 1989, 8901054
Int. Cl.[5] C08K 3/34
U.S. Cl. 524—451 19 Claims

1. A polymer mixture which comprises A. a polyester having units derived from an alkanediol and an aromatic dicarboxylic acid, B. glass fibres, C. a brominated polystyrene compound as a flameretardant, and D. talcum, characterised in that the polymer mixture comprises milled glass fibres as constituent B.

5,147,921

NEW POWDERED SUPERABSORBENTS, CONTAINING SILICA, THEIR PREPARATION PROCESS AND THEIR USE

Paul Mallo, Chatou, France, assignor to Societe Francaise Hoechst, Puteaus, France

Filed Jun. 25, 1991, Ser. No. 720,648
Claims priority, application France, Aug. 14, 1990, 90 10338
Int. Cl.[5] C08K 3/36; C08L 33/02
U.S. Cl. 524—493 7 Claims

1. Hydrophilic powdered superabsorbents which are insoluble in water, comprising by weight in the dry state, from about 1 to about 45% of colloidal silica wherein non-agglomerated particles of said colloidal silica have an average diameter of about 9 to about 50 nanometers, and from about 99 to about 55% of a cross-linked polymer based on free acrylic acid wherein at least a portion of said acrylic acid is salified by sodium or potassium.

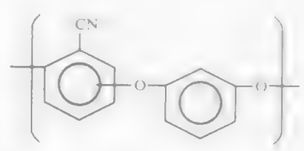
5,147,922

RESIN COMPOSITION

Tomoyoshi Murakami, Chiba, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1990, Ser. No. 570,883
Claims priority, application Japan, Sep. 4, 1989, 1-227597
Int. Cl.[5] C08K 3/04
U.S. Cl. 524—496 20 Claims

1. A resin composition, comprising: (A) a polycyanoarylether consisting essentially of the repeating unit represented by the following general formula (I)



(I)

and having a reduced viscosity of at least 0.6 dl/g as measured at 60° C. in p-chlorophenol at a concentration of 0.2 g/dl and (B) a carbonized phenolic resin.

5,147,922

THERMOTROPIC BIPHILIC HYDROGELS AND HYDROPLASTICS

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 620,223, Nov. 29, 1990, Pat. No. 5,104,954, which is a continuation-in-part of Ser. No. 343,979, Apr. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 200,212, May 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 105,070, Oct. 5, 1987, abandoned. This application Feb. 3, 1992, Ser. No. 830,141

Int. Cl.[5] C08L *39/00*

U.S. Cl. 524—555 25 Claims

1. A composition exhibiting a reversible temperature dependent clear to opaque transition and a Lower Critical Solution Temperature between 1° C. and 95° C., which comprises

(A) 10 to 99.8% by weight of water, and

(b) 90 to 0.2% by weight of a crosslinked or linear water-swellable random copolymer which comprises the copolymerization product of

(a) 20 to 85% by weight of N,N dimethylacrylamide;

(b) 15 to 80% by weight of an aliphatic, cycloaliphatic, aromatic or alkaromatic hydrocarbyl acrylate with 1 to 18 carbon atoms in the hydrocarbyl moiety, or an alkoxy- or poly(alkoxy)ethyl acrylate with 2 to 5 carbon atoms in the alkoxy moiety, or mixtures thereof,

(c) 0 to 5% by weight of a polyolefinic crosslinking monomer, and

(d) 0 to 20% by weight of one or more monoolefinic monomers other than the acrylates of component (b),

with the proviso, that if component (c) is greater than zero, component (d) is zero and component (a) is 20 to 55% by weight and the equilibrium water content of the crosslinked polymer is 12 to 55% by weight of the swollen gel, and with the further proviso that if component (b) is methyl, ethyl, propyl or butyl acrylate, the polymer is uncrosslinked (c=zero).

5,147,924

SELECTIVELY SOLUBLE, PROTECTIVE COATING COMPOSITIONS DERIVED FROM VINYL ACETATE/MONOALKYL MALEATE COPOLYMERS

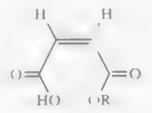
Dennis Sagl, Macungie, and Menas S. Vratsanos, Breinigsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 19, 1991, Ser. No. 657,920

Int. Cl.[5] C08L *33/06;* C08F *218/08, 220/12*

U.S. Cl. 524—559 12 Claims

1. A composition suitable for forming a temporary, selectively soluble protective coating upon a substrate, wherein the protective coating is substantially insoluble in an aqueous acidic solution while being capable of removal of dissolution in an aqueous alkaline solution, the composition consisting of a vehicle having dispersed therein a copolymer consisting of 35 to 80 weight percent vinyl acetate and from 20 to 65 weight percent of a monoalkyl maleate represented by the formula:



wherein R is selected from a primary, secondary or tertiary alkyl having from 1 to 4 carbon atoms.

5,147,925

PRODUCTION OF POLYURETHANE POLYMERS, THE POLYMERS SO PRODUCED, AND COMPOSITIONS CONTAINING THEM

David A. Pears, Grindlaan, and Martinus P. J. Heuts, Echt, both of Netherlands, assignors to Imperial Chemical Industries PLC, London, England and ICI Resins BV, Waalwijk, Netherlands

Filed Feb. 14, 1991, Ser. No. 654,976

Claims priority, application United Kingdom, Feb. 14, 1990, 9003349; Sep. 20, 1990, 9020572; Sep. 20, 1990, 9020573

Int. Cl.[5] C08G *18/12*

U.S. Cl. 524—589 32 Claims

1. Process for the production of a polyurethane polymer having desired chain-pendant or in-chain groups, denoted by Y, which process comprises:

1) converting terminal isocyanate groups of an isocyanate-terminated polyurethane prepolymer to groups providing carbon- or nitrogen-bound —NH_2 and/or —NH— groups which are reactable with enolic carbonyl groups, thereby to form a modified prepolymer, and

2) chain-extending modified prepolymer formed in 1) with at least one compound which has at least two independently reactable enolic carbonyl groups, which compound also has at least one group Y which becomes chain-pendant or in-chain in the chain-extended polymer, and wherein by an enolic carbonyl group is meant a carbonyl group having enolic character by virtue of being bonded to an alpha methylene or methine group which is itself bonded alpha to an electron withdrawing group.

5,147,926

CROSSLINKABLE AQUEOUS POLYURETHANE DISPERSIONS HAVING A LONG SHELF LIFE

Georg Meichsner, Lampertheim, and Rainer Blum, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Lacke+Farben Aktiengesellschaft, Muenster, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,527

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 3837519

Int. Cl.[5] C08J *3/205, 3/24;* C08L *75/00*

U.S. Cl. 524—591 12 Claims

1. A crosslinkable aqueous polyurethane dispersion having a long shelf life which comprises:

A) polyurethanes which have carbonyl groups, are dispersed in water in the presence of ammonia or of organic amines and are obtained by reacting

a) organic polyisocyanates with

b) compounds which contain one or more active hydrogen atoms and one or more salt groups or one or more groups capable of salt formation and

c) carbonyl-containing mono- and/or polyalcohols, and

B) polyhydrazides.

5,147,927

ROOM-TEMPERATURE, MOISTURE-CURABLE, PRIMERLESS, POLYURETHANE-BASED ADHESIVE COMPOSITION AND METHOD

Jamil Baghdachi, Northville; Keith H. Mahoney, Grosse Pointe City, and Glenn E. Martin, Farmington Hills, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

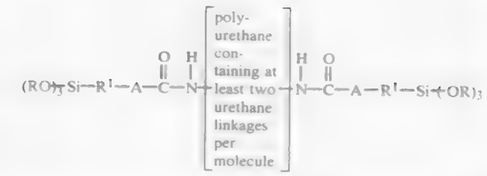
Continuation-in-part of Ser. No. 303,420, Jan. 27, 1989, abandoned. This application Mar. 29, 1991, Ser. No. 715,096

Int. Cl.[5] C08K *5/49*

U.S. Cl. 524—710 11 Claims

1. A one-component, primerless, moisture-curable sealant composition for bonding glass directly to electrocoated metal substrates comprising a mixture of:

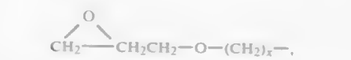
(a) a silane-terminated polyurethane polymer of the formula



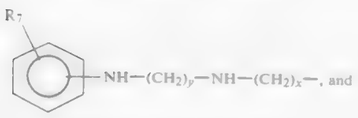
wherein R is lower alkyl of from 1 to 6 carbon atoms; R^1 is a divalent bridging radical selected from the group consisting of divalent hydrocarbon radicals, divalent hydrocarbon ether radicals, and divalent hydrocarbon amino radicals; and A is —S— or —NR^2— where R^2 is hydrogen or alkyl of from one to six carbon atoms; and

(b) a substituted trimethoxy silane electrocoat adhesion promoter comprising a trimethoxy silane base of the formula:

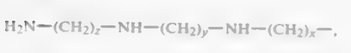
wherein R^3, R^4, and R^5 may be the same or different and are alkyl or alkoxyl of from one to four carbon atoms, and wherein B is at least one member selected from the group consisting of:



(1)



(2)



(3)

wherein R^7 is alkyl of one to four carbon atoms or alkylene of one to four carbon atoms; and x, y, and z each independently represents an integer of from one to six.

5,147,928

PREPARATION OF PROPYLENE-ETHYLENE COPOLYMERS

Juergen Kerth, 15 Wattenheimer Strasse, 6719 Carlsberg; Harald Schwager, 7 Ziegelofenweg, 6720 Speyer, and Ralf Zolk, 7 Weinbietstrasse, 6714 Weisenheim, all of Fed. Rep. of Germany

Continuation of Ser. No. 476,804, Feb. 8, 1990. This application Feb. 25, 1991, Ser. No. 660,252

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1989, 3904079

Int. Cl.[5] C08F *297/08*

U.S. Cl. 525—53 2 Claims

1. A process for preparing a propylene-ethylene copolymer in an agitated bed of solids by first polymerizing propylene from the gas phase in a first polymerization zone at 20–40 bar and 60°–60° C. by addition of a Ziegler-Natta catalyst system, and copolymerizing in a second polymerization zone at 7–35 bar and 40°70° C. the finely divided polymer from the first polymerization zone with a mixture of olefins, which comprises copolymerizing in the second polymerization zone the finely divided polymer from the first polymerization zone with a mixture of propylene, ethylene and a further α-olefin of from 4 to 10 carbon atoms, setting the ratio of the partial pressures between propylene and ethylene within the range from 100:20 to 100:120 and that of the partial pressures between propylene and the further α-olefin within the range from 100:1 to 100:20, setting the pressure in the second polymerization zone at at least 5 bar below the pressure in the first polymerization zone, and determining the weight ratio between the monomers reacted in the first polymerization zone and those reacted in the second polymerization zone in such a way that said weight ratio is within the range from 100:10 to 100:50.

5,147,929

PROCESS FOR MILD ESTERIFICATION OF A CARBOXYLIC ACID WITH AN ALCOHOL COMPONENT

Birgit Blankemeyer-Menge, and Ronald Frank, both of Braunschweig, Fed. Rep. of Germany, assignors to Gesellschaft fur Biotechnologische Forschung GmbH, Braunschweig, Fed. Rep. of Germany

Filed Aug. 29, 1990, Ser. No. 574,456

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1989, 3928564

Int. Cl.[5] C08F *283/00;* C08C *229/08, 67/08*

U.S. Cl. 525—54.11 6 Claims

1. A process for mild esterification of a carboxylic acid with an alcohol component in the presence of 2,4,6-mesitylene-1-sulfonyl-3-nitro-1,2,4-triazolide (MSNT) and a base, which comprises carrying out the esterification in the presence of N-methylimidazole (MeIm) in an aprotic and non-basic solvent.

5,147,930

POLYMER BLENDS WITH ENHANCED PROPERTIES

Edward E. La Fleur, Warminster; Robert M. Amici, Doylestown, both of Pa.; William T. Freed, Stockton, N.J.; William J. Work, Huntingdon Valley, Pa., and William G. Carson, Moorestown, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 16, 1989, Ser. No. 438,371

Int. Cl.[5] C08F *16/06;* C08L *29/04*

U.S. Cl. 525—57 22 Claims

1. A gas-barrier polymer blend comprising

a) from about 20% to about 95% by weight of a first polymer containing at least 50 mole percent mers of one or both of lower alkyl (meth)acrylates and glutarimides and forming a continuous phase, and

b) from about 2.5% to about 40% by weight of a second polymer having at least 50 mole percent vinyl alcohol mers which is either miscible with, or forms a discontinuous phase in, the continuous phase,

wherein the permeability to oxygen of the blend is 10% or less of the permeability of the first polymer alone

5,147,931

THERMOPLASTIC RESIN COMPOSITION

Masato Sakuma; Yuji Fujita; Kissho Kitano; Yukihiko Yagi; Masao Sakaizawa, all of Saitama, and Noburo Yamamoto, Tokyo, all of Japan, assignors to Tonen Sekiyukageku, K.K., Tokyo, Japan

Continuation of Ser. No. 455,039, Dec. 22, 1989, abandoned, which is a continuation of Ser. No. 283,164, Dec. 9, 1988, abandoned, which is a continuation of Ser. No. 143,555, filed as PCT/JP87/00248, Apr. 17, 1987, abandoned. This application Jun. 14, 1991, Ser. No. 715,872

Claims priority, application Japan, Apr. 14, 1986, 61-84264

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—66 12 Claims

1. A thermoplastic composition which comprises:

(A) 1 to 98 parts by weight of a crystalline polyolefin selected from one or more of the group consisting of homopolymers of C_3–C_6 alpha olefins and copolymers of two or more C_3–C_6 alpha olefins;

(B) 40 to 49 parts by weight of a modified polyolefin pre-

pared by reacting a crystalline polyolefin as defined in (A) with an unsaturated carboxylic acid or derivative thereof;
(C) 1 to 98 parts by weight of polyamide
(D) 5 to 50 parts by weight of an ethylene-alpha-olefin copolymer having a degree of crystallinity lower than 40%, that has been modified by reacting said copolymer with an unsaturated carboxylic acid or its derivative;
(E) 0.5–5 molar equivalents of the total of said unsaturated carboxylic and or derivative thereof reacted with said modified polyolefin of element (B) and with said copolymer element (D), of a metal compound selected from the group consisting of carboxylates, hydroxides and oxides of Group I, II and III metals and wherein said parts by weight of (A), (B) and (C) sum to 100 parts by weight.

5,147,932
POLYOLEFIN COMPOSITIONS WITH IMPROVED IMPACT STRENGTH

Casmir S. Ilenda, Hulmevill; David L. Dunkelberger, Newtown, and Dennis J. Labanoski, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 616,485, Nov. 21, 1990, Pat. No. 5,109,066, which is a continuation-in-part of Ser. No. 315,501, Mar. 1, 1989, Pat. No. 4,957,974. This application Jan. 31, 1992, Ser. No. 831,160
Int. Cl.[5] C08L *51/06;* **B29D** *22/00*
U.S. Cl. 525—71 2 Claims

1. A process for improving the impact strength of a polyolefin which comprises adding a polymeric blend comprising an acrylic core-shell modifier and a copolymeric compatibilizer, wherein said compatibilizer is comprised of:
(i) a non-polar polyolefin trunk selected from the group consisting of polyethylene, polypropylene, polybutylene, poly(4-methylpentene), copolymers of said olefins with each other, and one or more copolymers of said olefins with minor amounts of 1-alkenes, vinyl esters, vinyl chloride, (meth)acrylic ester, and (meth)acrylic acid, said trunk having a Mw of between about 50,000 and 1,000,000; and
(ii) at least one methacrylate chain grafted with a covalent bond to said trunk having a weight ratio with said trunk of from about 1:9 to about 4:1, said chain being a polymer derived from at least about 80% of a monomer of a methacrylic ester of the formula $CH_2{=}C(CH_3)COOR$, where R is alkyl, aryl, substitutec alkyl, substituted aryl, or substituted alkaryl, and less than about 20% of an acrylic or styrenic monomer copolymerizable with the methacrylic ester, said chain having a Mw of from about 20,000 to 200,000.

5,147,933
POLYPROPYLENE RESIN COMPOSITION

Junji Koizumi, and Yoshito Yazaki, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 24, 1991, Ser. No. 689,171
Claims priority, application Japan, Apr. 27, 1990, 2-112000
Int. Cl.[5] C08L *53/00*
U.S. Cl. 525—89 6 Claims

1. A polypropylene resin composition comprising
(a) 50 to 90 wt % of a blend comprising a crystalline ethylene-propylene block copolymer (X) having an MFR of from 10 to 40 g/10 min, an elongation at break of 70% or more and a flexural modulus of 15,000 kg/cm^2 or more and a crystalline ethylene-propylene block copolymer (Y) having an MFR of from 5 to 15 g/10 min, an elongation at break of 500% or more in a blending weight ratio of (X)/(Y) of from 9/1 to 1/9, said block copolymer (X) having a higher flexural modulus and lower elangation at break than said block copolymer (Y);
(b) 5 to 25 wt % of ethylene-propylene copolymer rubber having a Mooney Viscosity, ML_{1+4} (100° C.), of from 10 to 90; and
(c) 5 to 25 wt % of a high-density polyethylene having an MFR of from 1 to 20 g/10 min.

5,147,934
THERMOSETTING POWDERY COATING COMPOSITION

Haruki Ito, Chigasaki; Kenzou Maeda, Yokohama; Nobuyuki Miyazaki, Yokohama; Masao Unoki, Yokohama; Chiaki Sagawa, Tokyo, and Motoi Kamba, Yokohama, all of Japan, assignors to Nippon Oil and Fats Company, Limited and Asahi Glass Company Ltd., both of Tokyo, Japan

Continuation of Ser. No. 224,054, Jul. 25, 1988, abandoned. This application Oct. 30, 1990, Ser. No. 607,610
Claims priority, application Japan, Jul. 31, 1987, 62-192816
Int. Cl.[5] C08L *67/02*
U.S. Cl. 525—124 14 Claims

1. A thermosetting powdery coating composition which comprises, in admixture:
(A) from 40 to 98 parts by weight of a fluorine-containing copolymer comprising a monomeric moiety derived from a fluoroolefin compound and having hydroxyl groups as the crosslinkable reactive groups of which the content of fluorine is at least 10% by weight, the intrinsic viscosity determined at 30° C. in tetrahydrofuran is in the range from 0.05 to 2 dl/g, the glass transition temperature is in the range from 35° C. to 120° C. and the weight loss by heating does not exceed 2%; and
(B) from 60 to 2 parts by weight of a blocked isocyanate compound as the curing agent capable of forming crosslinks by reacting with the crosslinkable reactive groups in the fluorine-containing copolymer.

5,147,935
STABILIZED COMPOSITIONS BASED ON POLYAMIDES AND OBJECTS MANUFACTURED FROM THESE COMPOSITIONS

Sophie Volmer, and Dominique Debecker, both of Brussels, Belgium, assignors to Solvay S.A., Brussels, Belgium

Filed Feb. 20, 1991, Ser. No. 658,312
Claims priority, application Belgium, Feb. 23, 1990, 09000211
Int. Cl.[5] C08K *5/51, 3/20*
U.S. Cl. 524—152 10 Claims

1. A stabilised polyamide composition, containing
(a) a symmetrical triaryl phosphite,
(b) an alkylhydroxyphenylalkanoic acid amide and;
(c) an alkylhydroxyphenylalkanoylhydrazine.

5,147,936
LLDPE FILMS BY BLENDING WITH SPECIFIC POLYPROPYLENES

Perla N. Peszkin, Santa Clara, Calif., and Pradeep P. Shirodkar, Somerset, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 8, 1991, Ser. No. 681,249
Int. Cl.[5] C08L *23/12*
U.S. Cl. 525—240 16 Claims

1. A polymer blend comprising from about 2 to about 20 weight percent polypropylene (PP) homopolymer having an isotaciticity of from about 70% to about 90% and a cross-over modulus of from about 2E5 to about 1E6 poises and from about 98 to about 80 weight percent linear low density polyethylene (LLDPE) the blend having a viscosity ratio of LLDPE to PP greater than about 3 and a ratio of melt index (MI) of PP to melt index (MI) of LLDPE greater than 3.

5,147,937
PROCESS FOR MAKING CONTROLLED, UNIFORM-SIZED PARTICLES IN THE 1 TO 50 MICROMETER RANGE

Mark S. Frazza, Philadelphia; Kim S. Ho, Richboro; Alexander Kowalski, Plymouth Meeting; Robert R. Raney, Newtown Square, and Martin Vogel, Jenkintown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 497,377, Mar. 22, 1990, abandoned. This application Mar. 1, 1991, Ser. No. 662,872
Int. Cl.[5] C08F *2/20*
U.S. Cl. 525—243 22 Claims

1. A process for making uniformly sized polymer particles having a selected final particle size within the range of 1–50 μm which comprises the steps of
a) combining a free-radical-polymerizable, water-insoluble monomer or mixture of such monomers with an aqueous dispersion of seed polymer particles, at a rate such that an amount of monomer or mixture of monomers equal to the total initial weight of the seed polymer particles is combined with the dispersion over a period of from about 45 to about 120 minutes, in the presence of a dispersion stabilizer and an oil-soluble, free-radical polymerization initiator at a temperature at least as high as that at which the initiator is activated, until sufficient monomer or mixture of monomers has been combined to grow the particles to a selected intermediate size,
b) maintaining the temperature of the combined monomer and particles at least as high as that at which the initiator is activated, until sufficient monomer or mixture of monomers has been combined to grow the particles to a selected size, and
c) continuing to maintain the temperature of the combined monomer and particles at least as high as that at which the initiator is activated until all the monomer is polymerized, these steps being repeated until the selected intermediate size is equal to the selected final particle size.

5,147,938
ACRYLATE ADHESIVES CONTAINING POLYMERIZABLE FLUOROCHEMICAL SURFACTANTS

Douglas H. Kuller, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 2, 1991, Ser. No. 679,431
Int. Cl.[5] C08F *2/50, 14/18, 259/08*
U.S. Cl. 525—276 35 Claims

1. A polymeric adhesive composition comprising:
(a) a major amount of polymerized units derived from an acrylate-containing mixture comprising the monomeric components of an acrylate-based pressure-sensitive adhesive; and
(b) a minor amount of polymerized units derived from a polymerizable, organic-soluble, oligomeric fluorochemical surfactant comprising one or more fluorinated oligomers, each comprising at least two pendent flouroaliphatic groups, at least two organic-solubilizing groups, and at least one pendent polymerizable olefinic group.

5,147,939
UNSATURATED, ELASTOMERIC, ASYMMETRICALLY COUPLED BLOCK COPOLYMER, A SINGLE BATCH PROCESS FOR ITS MANUFACTURE AND ITS USE FOR THE PRODUCTION OF TIRE COMPONENTS

Walter Hellermann, Dorsten; Christoph Herrmann; Karl-Heinz Nordsiek, both of Marl; Jürgen Wolpers, Haltern, and Hans-Bernd Fuchs, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 4, 1989, Ser. No. 416,978
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833760
Int. Cl.[5] C08F *297/02, 297/04;* **B60C** *11/00*
U.S. Cl. 525—314 4 Claims

1. An unsaturated, elastomeric, asymmetrically coupled block copolymer of the formula (I):

$$(A{-}B)_n{-}X{-}(B)_m \quad (I)$$

wherein block A is a block of polybutadiene having an 8 to 60% content of uniformly distributed vinyl groups and block B is a homopolymer of isoprene or a copolymer of at least 10% isoprene units with 0 to 60% butadiene units and up to 45% styrene units, X is a radical of a polyfunctional coupling agent having a functionality of at least 3, and $(m{-}n) \geqq 0$ while $(m+n)$ ranges from 3 to 25 and n is a positive number.

5,147,940
POLYMERIC OPAQUE PARTICLES AND PROCESS FOR MAKING SAME

John Biale, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 248,783, Sep. 23, 1988, Pat. No. 5,026,782. This application Apr. 8, 1991, Ser. No. 682,740
Int. Cl.[5] C08F *259/04, 259/06;* **B32B** *27/10*
U.S. Cl. 525—317 11 Claims

1. An opaque core/shell polymer comprising:
(a) a non-swellable core polymer having an outer surface, a crystalline structure, and comprising one or more vinylidene halide monomers selected from the group consisting of vinylidene chloride and vinylidene bromide, the concentration of the vinylidene halide monomers being at least about 60 weight percent based on the total weight of the core polymer; and
(b) a shell polymer in physical contact with and covering at least a part of the outer surface of the core polymer, the shell polymer having a composition that is different from the composition of the core polymer and a T_g of at least about 50° C.,
wherein the non-swellable core polymer swells less than about 10 percent by volume when the core polymer is contacted with an acid or a base, the shell polymer comprises methyl methacrylate and about 4 to about 7 weight percent butyl acrylate, and the weight percent of the core polymer, based upon the total weight of the opaque polymer, is less than the weight percent of the shell polymer.

5,147,941
DENTURE ADHESIVE

Mohammed Tazi, Wayne; Robert B. Login, Oakland; Krystyna Plochocka, Scotch Plains; Rama K. Haldar, Randolph; Balgopal Gangadharan, Caldwell, and William E. Prosise, Ramsey, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Continuation of Ser. No. 505,616, Apr. 6, 1990. This application Nov. 1, 1991, Ser. No. 786,638
Int. Cl.[5] C08F *20/08*
U.S. Cl. 525—327.8 7 Claims

1. A denture adhesive composition consisting essentially of about 5 to 50 weight percent of a mixed, partial salt of a copolymer of (a) about 20 to 60 mole percent of maleic anhydride, (b) about 40 to 80 mole percent of acrylic acid or methacrylic acid, and (c) 0 to 25 mole percent of a C_1–C_4 alkyl vinyl

ether, said copolymer having a weight average molecular weight of about 100,000 to 400,000, and a base carrier which is a water soluble or partially water soluble hydrophilic carrier capable of swelling upon exposure to water to form a mucilaginous mass, and wherein the sum total of cations in the mixed partial salt is sufficient to give a degree of neutralization of from 0.5 to 0.95 of the total initial carboxyl groups in the copolymer.

5,147,942

THERMOPLASTIC RESIN COMPOSITION

Hiroomi Abe; Taichi Nishio; Yasuhirou Suzuki; Takeshi Sanada, and Masahiro Kakugo, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 8, 1990, Ser. No. 476,687
Claims priority, application Japan, Feb. 9, 1989, 1-31493
Int. Cl.[5] C08G 65/48; C08L 71/12, 77/00
U.S. Cl. 525—397 4 Claims

1. A thermoplastic resin composition which comprises:

(A) 5–95% by weight of a polyamide resin which has a relative viscosity of 3.1–4.5 and has a ratio α of terminal amino group to terminal carboxyl group of $0<\alpha\leqq 0.99$ and

(B) 95–5% by weight of a modified polyphenylene ether resin, modified with a compound having at least one functional group in its molecule, or a mixture of said modified polyphenylene ether resin and a polyphenylene ether resin.

5,147,943

BIPHENYTETRACARBOXYLIC ACID-DERIVED POLYIMIDES WITH POLYEPOXIDES

Hiroshi Inoue, and Tetsuji Hirano, both of Hirakata, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jan. 19, 1990, Ser. No. 467,549
Claims priority, application Japan, Jan. 20, 1989, 1-9867
Int. Cl.[5] C08L 63/02, 63/04, 63/08, 79/08
U.S. Cl. 525—423 17 Claims

1. A thermosetting resin composition comprising:

(A) at least one modified imide oligomer having terminal hydroxyl groups, which oligomer is a reaction product of (a) a tetracarboxylic acid component consisting essentially of (i) 70 to 100 molar % of a principal acid ingredient consisting of at least one member selected from the group consisting of biphenyltetracarboxylic acids, and dianhydrides, esters and salts thereof and (ii) 0 to 30 molar % of an additional acid ingredient consisting of at least one member selected from aliphatic to tetracarboxylic acids and other aromatic tetracarboxylic acids than biphenyltetracarboxylic acids, and dianhydrides, esters and salts thereof, with (b) an amine component consisting essentially of (iii) a principal diamine ingredient consisting of at least one aromatic diamine compound and (iv) a modifying monoamine ingredient consisting of at least one monoamine compound having at least one hydroxyl group, in a reaction medium, is provided with imide structures and terminal hydroxyl groups and exhibits a logarithmic viscosity number of from 0.01 to 1 determined at a concentration of 0.5 g/100 ml in a solvent consisting of N,N-dimethylacetamide at a temperature of 30° C.; and

(B) at least one organic compound having at least two epoxy groups.

5,147,944

POLYAMIDE RESIN, AND POLYAMIDE RESIN COMPOSITIONS

Yuji Takeda, Austin, Tex., assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 596,913
Int. Cl.[5] C08L 77/00
U.S. Cl. 525—432 24 Claims

1. A polyamide resin which comprises the product of a molten reaction of a mixture composed of 10–90% by weight of a polyamide (A1) from xylylenediamine and a C_6–C_{20} α,ω-linear aliphatic dibasic acid and 90–10% by weight of polyamide-6 (A2), and which has either

a single glass transition temperature differing from that of both (A1) and (A2), or

two glass transition temperatures both differing from those of (A1) and (A2), the difference between the two temperatures being less than 10° C., (the glass transition temperature being measured by DSC process at a temperature rise rate of 20° C./min).

5,147,945

ORGANOSILICON POLYMERS AND PREPOLYMERS COMPRISING A COUPLING MONOMER

Andrew B. Woodside, Wilmington, and Raymond T. Lieberiet, New Castle, both of Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 31, 1990, Ser. No. 636,046
Int. Cl.[5] C08F 283/00
U.S. Cl. 525—475 24 Claims

1. A crosslinked or crosslinkable organosilicon polymer or prepolymer comprising either (i) alternating (a) cyclic polysiloxane or tetrahedral siloxysilane residues and (b) polycyclic hydrocarbon residues derived from polycyclic polyenes having at least two non-aromatic, non-conjugated carbon-carbon double bonds in their rings linked through carbon to silicon bonds, wherein at least one of the cyclic polysiloxanes or tetrahedral siloxysilanes (a) or the polycyclic polyenes (b) used to form the polymer or prepolymer has three or more reactive sites; or (ii) a linear poly(organohydrosiloxane) polymer having at least 30% of its ≡SiH groups reacted to hydrocarbon residues derived from polycyclic polyenes having at least two non-aromatic, non-conjugated carbon-carbon double bonds in their rings; wherein the polymer or prepolymer further comprises a coupling monomer having at least one carbon-carbon double bond which reacts with ≡SiH during hydrosilation.

5,147,946

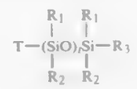
VINYL ETHER SILOXANE COPOLYMERIC COMPOSITION

Kou-Chang Liu, Wayne, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Filed Mar. 11, 1991, Ser. No. 667,140
Int. Cl.[5] C08F 283/12
U.S. Cl. 525—479 8 Claims

1. The copolymerizable composition comprising a polymerization initiator and, as active film forming ingredients between about 15 and about 40 percent by weight of a cyclic polyvinyl ether having the formula

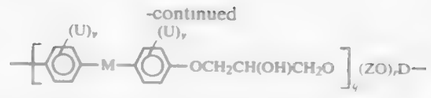
and between about 60 and about 85 percent by weight of a hydroxy containing vinyl ether siloxane of the formula



wherein A is a saturated or unsaturated cyclic moiety having a 5 to 8 membered ring; n has a value of from 3 to 8; X and X′ are each individually oxygen, sulfur, or NR where R is hydrogen or lower alkyl; B is alkylene having from 2 to 20 carbon atoms optionally containing C_2 to C_3 alkoxylation; R_1 and R_2 are lower alkyl; t has a value of from 1 to 100;

T is $CH_2{=}CHO(YO)_mCH_2CH(OH)CH_2O{-}$

-continued



where Y is alkylene or alkylenephenylene optionally substituted with fluorine; m has a value of from 1 to 10; U is halogen or loweralkyl; v has a value of from 0 to 4; M is —CH_2— or

q has a value of from 0 to 20; Z is C_2 to C_3 alkylene; r has a value of from 0 to 20; D is alkylene or alkylenephenylene and R_3 is the same as T or is C_1 to C_{20} alkyl.

5,147,947

POLYORGANOSILOXANE SERIES THERMOPLASTIC RESIN AND COMPOSITION THEREOF

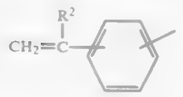
Yuji Yamamoto; Takashi Kurata; Kazuyoshi Nakazawa; Yusuke Tsuda, all of Tokyo; Junichiro Watanabe, Gunma; Makoto Matsumoto, Gunma; Akitsugu Kurita, Gunma, and Yuichi Funahashi, Gunma, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,551
Claims priority, application Japan, Oct. 31, 1988, 63-274727; Oct. 31, 1988, 63-274728; Nov. 8, 1988, 63-281603; Nov. 18, 1988, 63-290128
Int. Cl.[5] C08F 283/12
U.S. Cl. 525—479 15 Claims

1. A polyorganosiloxane series thermoplastic resin comprising a graft copolymer (V) obtained by graft polymerizing at least one kind of a vinyl monomer (IV) to a modified polyorganosiloxane (III) obtained by condensing a mixture consisting essentially of from 90 to 99.9% by weight of an organosiloxane (I) having a structure unit represented by the following formula (A)

$$R^1{}_nSiO_{(4-n)/2} \quad (A)$$

wherein R^1 represents a monovalent hydrocarbon group or a monovalent hydrocarbon group substituted by halogen, cyano or a UV absorbing group, and n represents 0 or an integer of from 1 to 3, with from 10 to 0.2% by weight of a graft crosslinking agent (II) having both an unsaturated group represented by the following formula (B)



wherein R^2 represents a hydrogen atom or an alkyl group having form 1 to 6 carbon atoms, and an alkoxysilyl group.

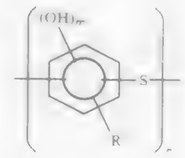
5,147,948

METHOD FOR POLYMERIZING VINYL CHLORIDE WHILE INHIBITING ADHESION TO THE POLYMERIZATION REACTOR WITH COATING FROM POLY(HYDRICPHENOL SULFIDE)

Seiichi Masuko; Ichisaburo Nakamura; Keiichi Fukuda, all of Osaka; Yasuyuki Hatakeyama, Osaka; Akihiro Yamaguchi, Kanagawa, and Keizaburo Yamaguchi, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,932
Claims priority, application Japan, Dec. 28, 1989, 1-338206
Int. Cl.[5] C08F 2/20
U.S. Cl. 526—62 10 Claims

1. A method for polymerizing vinyl chloride which comprises polymerizing vinyl chloride in an aqueous medium wherein the inner wall of a polymerizer and parts of devices which come in contact with the monomer during the polymerization are coated, prior to the polymerization, with a reaction product having a molecular weight ranging from 500 to 100,000 obtained by condensing a polyhydric phenol and sulfur dichloride in the presence of a Lewis acid as a catalyst, said reaction product being represented by the following general formula:



wherein R represents a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; m is an integer of 2 or 3; and n is an integer ranging from 4 to 700.

5,147,949

POLYMERIZATION PROCESS USING A SILICA GEL SUPPORTED METALLOCENE-ALUMOXANE CATALYST

Main Chang, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 567,489, Aug. 14, 1990, Pat. No. 5,086,025, which is a division of Ser. No. 174,668, Mar. 29, 1988, Pat. No. 5,008,228. This application Oct. 18, 1991, Ser. No. 781,041
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] C08F 4/42
U.S. Cl. 526—129 10 Claims

1. A process for polymerizing α-olefins either alone or in combination with one or more olefins, said process comprising contacting said α-olefins either alone or in combination with one or more other olefins in the presence of a supported metallocene alumoxane catalyst obtained by:

(a) adding a water-impregnated catalyst support to a stirred solution of an aluminum trialkyl in an amount sufficient to provide a mole ratio of aluminum trialkyl to water of from about 10:1 to about 1:1 and allowing the mixture to react; and

(b) adding a metallocene of a transistion metal of the Periodic Table of Elements to the reacted mixture in an amount sufficient to provide on said catalyst support a mole ratio of aluminum to transition metal of from about 1000:1 to about 1:1.

5,147,950
IN-MOLD POLMERIZATIC N OF CYCLIC OLEFINS WITH BOROHYDRI DE COCATALYST
Donald R. Kelsey, Fulshear, Tex., assignor to Shell Oil Company, Houston, Tex.
Division of Ser. No. 560,261, Jul 30, 1990, Pat. No. 5,071,812, which is a continuation of Ser. No. 331,560, Mar. 31, 1989, abandoned. This application Aug. 8, 1991, Ser. No. 742,779
Int. Cl.[5] C0 G 61/08
U.S. Cl. 526—134 14 Claims

1. A process for in-mold poly merization of a cyclic olefin which comprises
(a) introducing into a mold a reaction mixture comprising the cyclic olefin, a catalys comprising an aryloxy-substituted tungsten or molyb denum compound and from about 0.5 to about 20 mol s per mole of the transition metal compound of a boroh dride which is represented by the formula $[R_3P]_2[M^+]BH_4^-$, in which each R is independently selected from C_{1-20} hydrocarbyl and M^+ is selected from copper and a mmonium, and
(b) maintaining the reaction mixture under polymerization conditions for a time suffic ent for polymerization of the cyclic olefin and formation of a molded article.

5,147,951
METHOD FOR PREPA RING ULTRA HIGH MOLECULAR WEIGH COPOLYMERS OF CONJUGATED DIENES AND AROMATIC VINYL COMPO UNDS
Jung W. Kang, Clinton; Gary 3. Seaver, Canal Fulton, and Takatsugu Hashimoto, Akron, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Sep. 21, 1990. Ser. No. 586,058
Int. Cl.[5] C08F 4/48, 212/08
U.S. Cl. 526—173 6 Claims

1. A method for preparing ultra high molecular weight copolymer compositions of 1, -conjugated dienes and aromatic vinyl compounds which comprises polymerizing a 1,3-conjugated diene and a vinyl ar omatic compound in a hydrocarbon solvent in the presence of a trimetalated 1-alkyne catalyst which comprises the reacti on product of a 1-alkyne containing at least 4 carbon atoms, an organometallic compound R^oM and a 1,3-conjugated dien prepared at a temperature of at least about 70° C., and where n R^o is an aliphatic or cycloaliphatic group, M is an alkali m tal, the mole ratio of R^oM to 1-alkyne is about 3:1, and the m le ratio of conjugated diene to 1-alkyne is from about 2:1 to ab out 30:1.

5,147 952
PROCESS FOR PRODUCI G MACROMOLECULAR MONO MER
Yoshio Mori, Gifu; Makoto Wa anabe; Kishiro Azuma, both of Tokai, and Shiro Kojima, Yo ohama, all of Japan, assignors to Tosgosei Chemical Industr Co., Ltd., Tokyo, Japan
Filed Aug. 27, 199 , Ser. No. 750,337
Claims priority, application J pan, Aug. 28, 1990, 2-226234
Int. Cl.[5] C 08F 4/00
U.S. Cl. 526—220 4 Claims

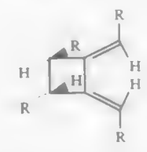
1. A process for producing a macromolecular monomer, which comprises anionic poly merization of a (meth)acrylic acid ester monomer by using, s a polymerization initiator, a compound represented by the ollowing general formula [I]:

[I]

wherein M^+ is a quaternary a monium ion; ϕ is a phenylene group; R_1 and R_2 are each an electron withdrawing group stabilizing the carbanion C^-, or one of them is said electron withdrawing group and the other is an alkyl group of 1–6 carbon atoms; and n is an integer of 0–6.

5,147,953
DIALKYLIDENECYCLOBUTANE/BISIMIDE COMPOSITIONS
Larry Steven Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Jul. 22, 1991, Ser. No. 733,947
Int. Cl.[5] C08F 12/32
U.S. Cl. 526—262 24 Claims

1. A composition comprising
(a) a polyimide having at least two dienophilic groups per molecule; and
(b) a 1,2-dialkylidenecyclobutane which can be represented by the structural formula



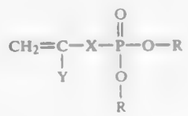
in which each R is selected independently from hydrogen, C_{1-10} alkyl, halo, aryl, alkoxy, aryloxy, alkylthio, arylthio and dialkylamino.

5,147,954
4-(N-BENZYL-N-METHYLAMINO)PYRIDINE ACID SALTS AND USE IN PREPARATION OF POLYMER-SUPPORTED CATALYSTS
Donald W. McQuigg; Edward E. Sowers, both of Mooresville; Gerald L. Goe, Greenwood; Eric F. V. Scriven, Greenwood, and James G. Keay, Indianapolis, all of Ind., assignors to Reilly Industries Inc., Indianapolis, Ind.
Division of Ser. No. 352,980, May 17, 1989, Pat. No. 4,968,806, which is a continuation-in-part of Ser. No. 247,152, Sep. 21, 1988, abandoned. This application Nov. 5, 1990, Ser. No. 609,393
Int. Cl.[5] C08F 26/06
U.S. Cl. 526—265 20 Claims

1. A process for preparing a polymer having substituted aminopyridine groups comprising neutralizing a vinyl-substituted 4-(N-benzyl-N-methylamino)pyridine acid salt with a suitable base followed by polymerization of an organic phase containing the resultant free base monomer.

5,147,955
PHOSPHORUS CONTAINING POLYMERS
Christian Lindner, Cologne, and Siegfried Korte, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany
Filed Jul. 15, 1991, Ser. No. 729,995
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 4023818
Int. Cl.[5] C08F 34/02
U.S. Cl. 526—271 5 Claims

1. Copolymers of
a) phosphonic acid derivatives corresponding to formula (I)



(I)

wherein
Y represents H Or CH_3,

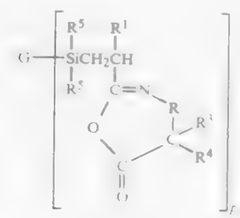
X represents a single bond or $—CH_2—$,
R represents an aryl, alkyl,
b) maleic anhydride and
c) a polymerizable compound containing two or more allyl or methallyl groups in the molecule.

5,147,956
ABSORBENT PRODUCTS AND THEIR MANUFACTURE
Adrian S. Allen, North Yorkshire, England, assignor to Allied Colloids Ltd., England
Continuation-in-part of Ser. No. 123,572, Nov. 20, 1987, Pat. No. 4,992,172. This application May 9, 1990, Ser. No. 521,336
Claims priority, application United Kingdom, May 10, 1989, 8910788
Int. Cl.[5] C08F 220/26
U.S. Cl. 526—318.42 14 Claims

1. A water absorbent, water insoluble, polymeric element having a gel capacity of at least 50 grams deionised water per gram dry polymer and that has been made by a process comprising providing a solution of a water soluble, substantially linear, polymer that has been made by copolymerisation of a water soluble blend of monoethylenically unsaturated monomers comprising at least 50% by weight carboxylic monomer that provides carboxyl groups and 0.1 to 15% by weight hydroxylic monomer that provides hydroxyl groups and that has the formula $CHR^1{=}CR^2—Y—M_1—H$ where R^1 is hydrogen or carboxy, R^2 is hydrogen, carboxy or methyl, Y is O, CH_2O or COO, M is alkyleneoxy and a is at least 5, shaping the solution by a shaping step selected from extrusion, coating, impregnation and foaming to shape the linear polymer into the shape of the desired element, and then heating the shaped element to cause the said carboxylic and hydroxylic groups to react in the shaped element to form cross linkages of the formula $—Y—M_a—OCO—$ where Y, M and a are as defined above.

5,147,957
HYDROSILATED AZLACTONE FUNCTIONAL SILICON CONTAINING COMPOUNDS AND DERIVATIVES THEREOF
Kanta Kumar, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 410,932, Sep. 22, 1989, abandoned. This application Jun. 1, 1990, Ser. No. 531,849
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—15 36 Claims

1. An azlactone-functional silicon containing compound having the formula:



wherein
G is hydrogen, halogen, or any monomeric group free of alipholic unsaturation or any polymeric group free of aliphatic unsaturation and having combining power of p,
p is an integer having a value of 1 to 50,
R^1 is hydrogen, halo, or an alkyl group having 1 to 6 carbon atoms,
R^2 is a covalent bond, a straight chain or branched alkylene group having 1 to 8 carbon atoms, or a phenylene group,
R^3 and R^4 are independently hydrogen, an alkyl or cycloalkyl group having 1 to 12 carbon atoms, aryl or aralkyl group having 6 to 12 carbon atoms, or R^3 and R^4 taken together with the carbon atoms to which they are attached to form a 5- to 12-membered carbocyclic ring, and
R^5 is independently hydrogen or a monovalent organic group free of aliphatic unsaturation and having 1 to 50 carbon atoms.

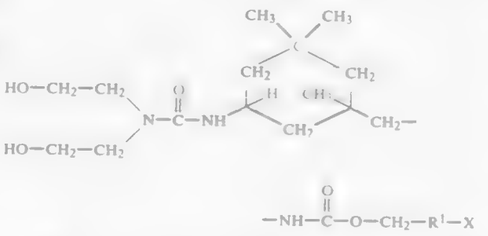
5,147,958
Patent Not Issued For This Number

5,147,959
OPTICAL RESIN ARTICLES
Shinobu Nishimoto, Moriyama; Eisuke Hirakawa, Kyoto; Minoru Fukuzawa, Kohka; Takashi Kato, Kashiwara, and Akio Tani, Habikino, all of Japan, assignors to Kabushiki Kaisha Alpha Giken and Osaka Yuki Kagako Kogyo Kabushiki Kaisha, both of Osaka, Japan
Filed Feb. 8, 1991, Ser. No. 652,683
Int. Cl.[5] C08G 18/58, 18/68; C08L 75/04; G02B 3/00
U.S. Cl. 528—48 1 Claim

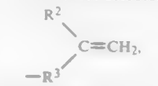
1. A plastic lens which is a three dimensional reaction product cast from a mold composition comprising a tetrahalobisphenol A epichlorohydrin polycondensate-(meth) acrylic acid adduct (A), a polyisocyanate compound (B), a reactive diluent (C) selected from the group consisting of styrenic monomers and ester monomers, and a phenolic compound (D) selected from the group consisting of 0-phenylphenol, styrenated phenol, tribenzylphenol and o-phenylphenol glycidyl ether.

5,147,960
HETEROFUNCTIONAL DIOLS AND POLYURETHANE ELASTOMERS MANUFACTURED THEREFROM
Uwe Keppeler, 22 Ungsteiner Strasse, 6700 Ludwigshafen, and Michael Bobrich, 3 In den Muehlgaerten, 6737 Boehl-Iggelheim, both of Fed. Rep. of Germany
Filed Aug. 2, 1990. Ser. No. 561,612
Claims priority, application Japan, Aug. 22, 1989, 3927630
Int. Cl.[5] C08G 18/67
U.S. Cl. 528—75 1 Claim

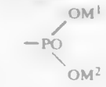
1. A diol of the formula



in which
R^1 is a straight-chain or branched-chain or cyclic radical having from 1 to 40 carbon atoms, the weight of the carbon atoms being from 20 to 86% of the weight of the R^1 radical;
X is a radical selected form the group consisting of



$—NO_2$; tertiary amine, quaternary amine, $—SO_3M$, $—OSO_3M$, —COOM and

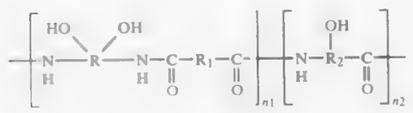


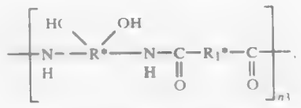
wherein
R^2 is H or CH_3;
R^3 is —O—, —O—CH_2—or

M is H, Li Na K or ammonium; and M^1 and M^2 are the same or different and stand for H, Li, K or alkyl.

5,147,961
PREPARATION OF HYDROXYPOLYAMIDES
Helmut Ahne, Roettenbach; Peter Baeuerlein, Schillingsfuerst, and Albert Hammerschmidt, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Division of Ser. No. 501,169, Mar. 29, 1990. This application Oct. 9, 1991, Ser. No. 773,720
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911210
Int. Cl.[5] C08G *63/00*
U.S. Cl. 528—182 **6 Claims**

1. A method for preparing hydroxypolyamides having the following structure:

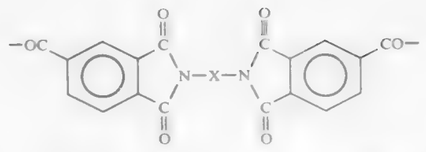




where R, R*, R_1, R^*_1 and R_2 are aromatic groups and where:
n_1 and n_2=1 to 100, n_3=0 or
n_2=1 to 100, n_1 and n_3=0 or
n_1, n_2 and n_3=1 to 100, where at least one of the following holds: R is other than R*, and R_1 is other than R^*_1, or
n_1 and n_3=1 to 100, n_2=0, where at least one of the following holds: R is other than R*, and R_1 is other than R^*_1, comprising the step of reacting one of:
(a) at least one aromatic amino hydroxy carboxylic acid, or
(b) at least one aromatic diaminodihydroxy compound, at least one aromatic dicarboxylic acid and at least one aromatic amino hydroxy carboxylic acid, in the presence of 1-ethoxycarbonyl-2-ethoxy-1,2-dihydroquinoline, 1,1'-carbonyldioxy di-1,2,3-benzotriazole or dicyclohexyl carbodiimide/ hydroxy-1,2,3-benzotriazole.

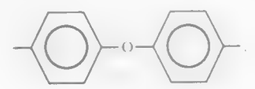
5,147,962
MELT-PROCESSABLE COPOLYESTERIMIDE COMPOSED OF BIS-TRIMELLITIMIDE UNITS
Hiroka Tanisake; Koji Yamamoto; Takeshi Koyama; Shunichi Shinohara; Kazunobu Maruo and Tsukasa Toki, all of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Filed Sep. 4, 1990, Ser. No. 578,004
Claims priority, application Japan, Sep. 4, 1989, 1-228684
Int. Cl.[5] C08G *73/16*
U.S. Cl. 528—170 **8 Claims**

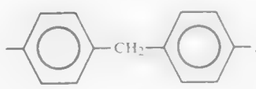
1. A melt-processable copolyesterimide composed substantially of:
(A) a structural unit expressed by the formula (I) below,



(I)

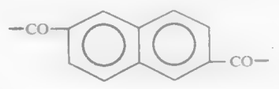
wherein X is selected from the group consisting of





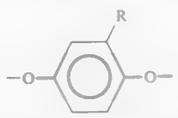
and

a structural unit expressed by formula (II) below



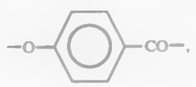
(II)

a structural unit expressed by formula (III) below



(III)

wherein R is selected from the group consisting of hydrogen atom, chlorine atom, methyl group and phenyl group,
and a structural unit expressed by formula (IV) below



(IV)

(B) the sum of above structural units of formulae (I) and (II) is present in substantially equimolar amount to the structural unit of formula (III),
the structural unit of formula (I) comprises 5–20 mol % of the sum of the structural units of formulae (I) and (II), and
the structural unit of formula (IV) comprises 15–75 mol % of the sum of structural units of formulae (I), (II), (III) and (IV), and
(C) the logarithmic viscosity of the copolyesterimide as measured in pentafluorophenol at a concentration of 0.16 g/dl and at 60° C. is at least 0.8 dl/g.

5,147,963
PROCESS FOR THE PRODUCTION OF AMORPHOUS METHYL VINYL ETHER HOMOPOLYMERS HAVING A HIGH MOLECULAR WEIGHT AND NARROW MOLECULAR WEIGHT DISTRIBUTION
Krystyna Plochocka, Scotch Plains, and Mohammed Tazi, Wayne, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.
Filed Oct. 16, 1989, Ser. No. 422,322
Int. Cl.[5] C08F *116/14*
U.S. Cl. 526—332 **18 Claims**

1. A process for the production of homopolymers of methyl vinyl ether wherein the polymer product has a weight average molecular weight, $\overline{MW}_w$, above 110,000 and up to 200,000, a number average molecular weight, $\overline{MW}_n$, of above 60,000 and up to about 100,000, with a molecular weight distribution, $\overline{MW}_w/\overline{MW}_n$, of less than 2.0 by cationic polymerizaiton of methyl vinyl ether monomer in the presence of a cationic polymerization initiator which comprises:
carrying out the homopolymerization at a temperature of about −20° to 50° C. under the pressure of an added inert gas of about 20 to 100 psi such that the methyl vinyl ether vapor is effectively absorbed into the liquid phase during the polymerization, in the substantial absence of a solvent for methyl vinyl ether other than the minimum amount of solvent for the initiator, which homopolymerization is carried forward to about a 50 to 90% conversion of monomer into homopolymer thereby allowing residual monomer to function as an in situ solvent for the formed homopolymer product which is a viscous, concentrated solution of amorphous methyl vinyl ether homopolymer in substantially residual methyl vinyl ether.

5,147,964
METHOD FOR REDUCING FLUID LOSS FROM OILFIELD CEMENT SLURRIES USING VINYL GRAFTED WATTLE TANNIN
David A. Huddleston, Sugar Land; Robert K. Gabel, Houston, and Charles D. Williamson, Sugar Land, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.
Continuation-in-part of Ser. No. 598,059, Oct. 15, 1990, Pat. No. 5,134,215. This application Apr. 23, 1991, Ser. No. 690,044
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] C08H *5/02*
U.S. Cl. 527—400 **10 Claims**

6. An oil well cement composition comprising:
cement;
water; and
a vinyl grafted wattle tannin fluid loss additive comprising a wattle tannin grafted with at least one vinyl monomer selected from the group consisting of: 2-acrylamido-2-methylpropanesulfonic acid and acrylamide, wherein said wattle tannin is present in an amount of between 0.05 to 14 weight percent, said 2-acrylamido-2-methylpropanesulfonic acid is present in an amount of between 68 to 99.95 percent, and acrylamide is present in an amount of between 0 to 18 percent, wherein said vinyl grafted wattle tannin has a weight average molecular weight in the range between 90,000 to 5,000,000.

5,147,965
METHOD FOR THE PREPARATION OF A HIGHER ALKOXY-SUBSTITUTED ORGANOPOLYSILOXANE
Shoji Ichinohe, and Syuichi Arai, both of Gunma, Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan
Filed Sep. 13, 1991, Ser. No. 759,342
Claims priority, application Japan, Sep. 14, 1990, 2-245944
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—12 **15 Claims**

1. A method for the preparation of a higher alkoxy-substituted diorganopolysiloxane represented by the general formula

wherein R^2 in each case is, independently, an unsubstituted or substituted monovalent hydrocarbon group having 1 to 15 carbon atoms; at least one of the R^3 groups is an alkoxy group of the formula R^4O, with R^4 being an alkyl group having 4 to 30 carbon atoms, and the remaining R^3 groups, if any, are each independently an unsubstituted or substituted monovalent hydrocarbon having 1 to 15 carbon atoms; and the subscripts p and q are each zero or a positive integer,
with the proviso that q is not zero when the R^3 groups at the molecular chain ends are both monovalent hydrocarbon groups,
which method comprises:
(a) mixing an organohydrogenpolysiloxane represented by the general formula

in which R^2 has the same meaning as defined above, R^1 is in each case a hydrogen atom directly bonded to the silicon atom or an unsubstituted or substituted monovalent hydrocarbon having 1 to 15 carbon atoms; and the subscripts m and n are each zero or a positive integer, with the provisos that at least one of the R^1 groups is a silicon-bonded hydrogen atom when the subscript n is zero, and the subscript n is not zero when the two R^1 groups are simultaneously monovalent hydrocarbon groups, an aliphatic alcohol represented by the general formula

R^4OH,

in which R^4 is an alkyl group having 4 to 30 carbon atoms, a platinum compound and an organic acid to form a reaction mixture; and
(b) heating said reaction mixture.

5,147,966
POLYIMIDE MOLDING POWDER, COATING, ADHESIVE AND MATRIX RESIN
Terry L. St. Clair, Poquoson, and Donald J. Progar, Yorktown, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Jul. 31, 1990, Ser. No. 560,717
Int. Cl.[5] C08G *73/10, 69/26, 63/00*
U.S. Cl. 528—188 **18 Claims**

1. A high temperature polyimide composition prepared by reacting 4,4'-oxydiphthalic anhydride and 3,4'-oxydianiline.

5,147,967

HIGH STRENGTH POLYMER OF HYDROQUINONE POLY(ISO-TEREPHTHALATE) CONTAINING RESIDUES OF P-HYDROXYBENZOIC ACID

Brian A. Stern, Evans, Ga.; Markus Matzner, Edison, N.J.; Richard Layton, Augusta, Ga. Paul J. Huspeni, North Augusta, S.C.; Paul D. Frayer, Martinez, Ga., and James W. Cleary, Neenah, Wis., assignors to Amoco Corporation, Chicago, Ill.

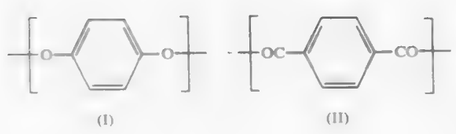
PCT No. PCT/US89/04331, § 371 Date Jun. 4, 1990, § 102(e) Date Jun. 4, 1990

Continuation-in-part of Ser. No. 255,670, Oct. 11, 1988, and a continuation-in-part of Ser. No. 255,632, Oct. 11, 1988. This PCT application Oct. 10, 1989, Ser. No. 499,483

Int. Cl.[5] C08G *63/02, 63/00*

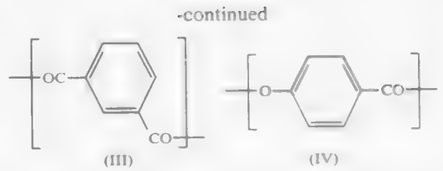
U.S. Cl. 528—193 10 Claims

1. A high modulus, high strength, melt-processible polyester consisting essentially of recurring units (I), (II), (III) and (IV):



(I) (II)

-continued



(III) (IV)

wherein said polyester has a melting point in the range of from about 250° to 360° C.

5,147,968

ELECTROMAGNETIC RADIATION ABSORBERS AND MODULATORS COMPRISING POLYANILINE

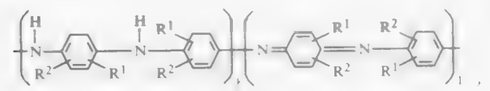
Arthur J. Epstein, Bexley; John M. Ginder, Columbus; Mitchell G. Roe, Columbus, and Hamid Hajiseyedjavadi, Columbus, all of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 193,964, May 13, 1988, Pat. No. 5,079,334. This application Sep. 23, 1991, Ser. No. 764,236

Int. Cl.[5] C08G *65/38;* B05D *3/06, 3/14*

U.S. Cl. 528—210 5 Claims

1. A composition for absorbing electromagnetic radiation, wherein said electromagnetic radiation possesses a wavelength generally in the range of from about 1000 Angstroms to about 50 meters, wherein said composition comprises a polyaniline composition of the formula



where y can be equal to or greater than zero, and R^1 and R^2 are independently selected from the group consisting of H, $—OCH_3$, $—CH_3$, —F, —Cl, —Br, —I, $—NR^3_2$, $—NHCOR^3$, —OH, $—O^-$, $—SR^3$, $—OR^3$, $—OCOR^3$, $—NO_2$, —COOH, $—COOR^3$, $—COR^3$, —CHO, and —CN, where R^3 is a C_1 to C_8 alkyl, aryl or aralkyl group.

5,147,969

MUSICAL TONE CONTROL APPARATUS

Teruo Hiyoshi; Akira Nakada; Hideo Suzuki; Mamoru Kinpara, and Kunihiko Watanabe, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Division of Ser. No. 532,020, May 29, 1990, which is a continuation of Ser. No. 114,611, Oct. 29, 1987, abandoned. This application May 1, 1991, Ser. No. 694,126

Claims priority, application Japan, Oct. 31, 1986, 61-259806; Nov. 12, 1986, 61-269385; Nov. 20, 1986, 61-277059

Int. Cl.[5] G10H *1/00*

U.S. Cl. 84—600 3 Claims

1. A musical tone control apparatus comprising:

(a) detecting means for detecting position on a player to which a certain pressure is given by touching or beating movement, wherein said detecting means includes a plurality of touch switches which are mounted at several portions of the player and activated when a predetermined pressure is given thereto, said touch switches being electrically arranged in a matrix, and means for scanning said switches at a predetermined cycle so that a coordinate of a touch switch to which the predetermined pressure is applied is detected; and

(b) means for generating musical tone control data based on a detecting result of said detecting means, said musical tone control data controlling a musical tone signal.

5,147,970

ELECTRONIC MUSICAL INSTRUMENT FOR GENERATING MUSICAL TONES ON THE BASIS OF CHARACTERISTICS OF INPUT WAVEFORM SIGNAL

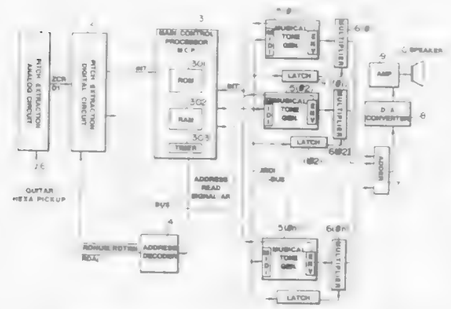
Katsuhiko Obata, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1990, Ser. No. 558,818

Claims priority, application Japan, Aug. 11, 1989, 1-208643; Aug. 11, 1989, 1-208644

Int. Cl.[5] G10H *1/02, 1/20, 3/18*

U.S. Cl. 84—603 8 Claims



1. An electronic musical instrument, comprising:

envelope extraction means for extracting an envelope signal from an input waveform signal;

musical tone generation means including means for generating a musical tone signal, and preset envelope generation

musical tone generation means including means for generating a musical tone signal, and preset envelope generation means for generating a preset envelope signal to impart an envelope characteristic to the generated musical tone signal;

envelope control means for (a) imparting, between a generation start timing and a sustain state start timing of the musical tone signal, a constant value to the musical tone signal to which the preset envelope signal has been imparted and (b) imparting, from said sustain start timing of the musical tone signal, the envelope signal extracted by said envelope extraction means to the musical tone signal to which the preset envelope signal has been imparted;

wherein said envelope extraction means includes:

(a) peak value detection means for sequentially detecting peak values for a digital waveform signal obtained by digitizing said input waveform signal after the sustain start timing of the musical tone signal;

(b) average value calculation means for calculating average values of a present peak value detected by said peak value detection means and at least one previous peak value; and

(c) envelope signal calculating means for calculating ratios as said extracted envelope signal by dividing the average values successively output from said average value calculation means by the average value at the sustain start timing, and said constant value which is imparted to the musical tone signal between the generation start timing and the sustain start timing being equal to the ratio at the sustain start timing.

5,147,971

BASE AND OBTURATING RING ARRANGEMENT

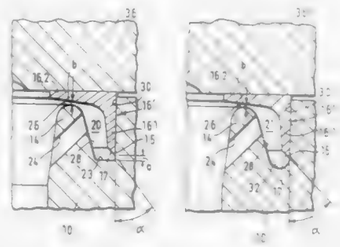
Rolf Bartolles, Korschenbroich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 30, 1991, Ser. No. 647,746

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1990, 4006215

Int. Cl.[5] F41A *3/74*

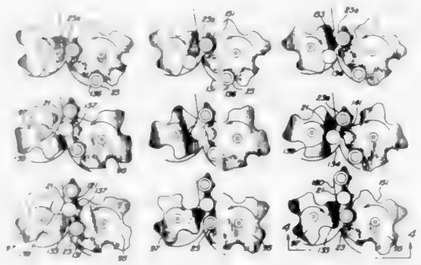
U.S. Cl. 89—26 17 Claims



1. In an obturating arrangement for the breech end of a barrel of a gun having a wedge type breechblock, said arrangement including a base ring having an end surface with an annular recess whose inner wall is delimited by an axially extending bead of said ring and whose outer wall extends substantially parallel to a longitudinal axis of said ring, and a right-angled obturating ring having first and second arms whose respective exterior surfaces are flat and are substantially perpendicular, with said first arm extending into said recess and having its said exterior surface abutting said outer surface of said recess, and with said second arm extending radially inwardly from said first arm beyond an outer end of said bead so that its said exterior surface can lie against an insert of a wedge type breechblock to provide obturation; the improvement wherein: said end of said bead is configured as an abutment for, and normally abuts, said second arm of said obturating ring, and the length of said first arm is such that a free end

of said first arm is axially spaced from a base surface of said recess.

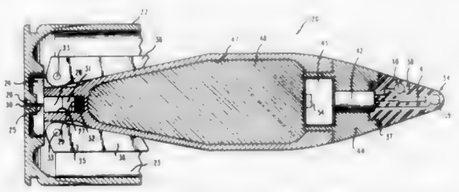
5,147,972
PARALLEL PATH SINGLE BAY AMMUNITION FEED SYSTEM
Richard L. Hagen, Villa Park, and William W. Thompson, Fountain Valley, both of Calif. assignors to North American Dynamics, Tustin, Calif.
Division of Ser. No. 534,678, Jun 6, 1990. This application Oct. 22, 1991, Ser. No. 780,920
The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.
Int. Cl.[5] F41A *9/61*
U.S. Cl. 89—33.16 **8 Claims**



1. In an ammunition feed apparatus for conveying rounds of ammunition, the improvement comprising:
a first rotor means for continuous rotation about a first axis and having a perimeter containing a plurality of first pockets for receiving and at least partially encompassing said rounds, each first pocket being separated from the next by a surface contoured to contact and guide said rounds; and
a second rotor means for continuous rotation about a second axis simultaneously and in synchronism with rotation of said first rotor means and in a direction opposite thereto, said second rotor means having a perimeter containing a number of second pockets for receiving rounds, each said second pocket being separated from the next by a surface contoured to guide rounds
the axis of said second rotor means being disposed adjacent the axis of said first rotor means such that rounds successively carried in a plurality of the pockets of said first rotor means are successively guided by a respective contoured surface of said second rotor means.

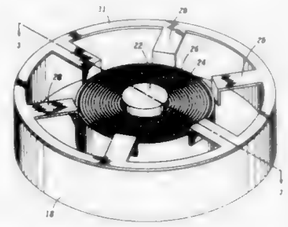
5,147,973
MULTI-OPTION FUZE SYSTEM
Richard T. Ziemba, Burlington, Vt., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 9, 1991 Ser. No. 805,354
Int. Cl.[5] F42C *13/04*
U.S. Cl. 102—214 **14 Claims**

1. A launchable projectile containing an HE warhead comprising:
a round having a forward section, a base section with a booster cavity therein and an HE cavity located between said sections;
an HE charge positioned in said HE cavity;
a booster charge positioned in said booster cavity;
a time fuze mounted on said base section having means for firing said booster charge a predetermined time period after said warhead is launched; and
a normally disabled proximity fuze mounted on said forward section having enable means for enabling said proximity fuze in response to said firing of said booster charge, a proximity detection means for detecting proximate targets, and a detonator means responsive to said detection



means for detonating said HE charge upon the detection of a proximate target by said detection means.

5,147,974
UNWINDING RIBBON SAFING AND ARMING DEVICE
Monty W. Bai, Scottsdale; Danny E. Minks, Phoenix, and Alfred B. Meyer, Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Nov. 6, 1990, Ser. No. 609,677
Int. Cl.[5] F42C *15/23, 15/26*
U.S. Cl. 102—238 **28 Claims**

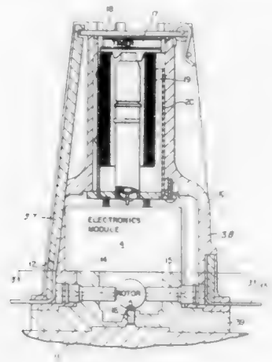


1. A control system for a projectile, including in combination:
antenna means;
electronic assembly means coupled to the antenna means;
a battery coupled to the electronic assembly means;
safing and arming means coupled to the electronic assembly means; the safing and arming means having a housing; a barrier forming an obstruction between a detonator and a detonator booster, the barrier being completely removable from between the detonator and the detonator booster under the action of a spin on the barrier; locking means which lock the barrier in a position forming the obstruction until released, the locking means including a spring means operating to release the barrier; timing means which trigger the release of the barrier at a predetermined time after the initiation of an acceleration; and restraining means which disengage the locking means on the acceleration;
the detonator coupled to the safing and arming means; and
the detonator booster coupled to the detonator.

5,147,975
REMOTELY SETTABLE, MULTI-OUTPUT, ELECTRONIC TIME FUZE AND METHOD OF OPERATION
Arnold S. Munach, Rockville, and Alvin J. Auerbach, Silver Spring, both of Md., assignors to The United State of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 20, 1981, Ser. No. 255,909
Int. Cl.[5] F42C *15/40*
U.S. Cl. 102—264 **11 Claims**

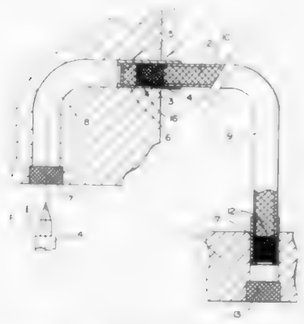
1. An electronic fuze for ordnance comprising electronic

means to ignite a plurality of detonators each with an explosive train lead, said detonators including at least first and second detonators to be fired sequentially each in a predetermined direction to achieve a plurality of mechanical and explosive operations, wherein each of said multiple detonators is associ-



ated with a separate explosive train operatively connected to a separate explosive means through each separate explosive train lead, and where the plurality of detonators are located in ports of a rotatable rotor and where each adjacent detonator port is oriented in a direction of fire that is different from each adjacent detonator.

5,147,976
IGNITION SYSTEM FOR A PYROTECHNIC COMPOSITION
René L. Laurensou, and Richard Vinau, both of Bourges, France, assignors to Giat Industries, France
Filed Jul. 15, 1991, Ser. No. 729,542
Claims priority, application France, Jul. 27, 1990, 90 09604
Int. Cl.[5] F42D *1/04*; C06C *9/00*; F42B *3/11*; F42C *19/08*
U.S. Cl. 102—275.3 **10 Claims**



1. The ingnition system (1) for a pyrotechnic composition comprising, placed in a housing (3), an ignition relay (4) which is in contact with the pyrotechnic composition (2), characterized in that the housing (3) is closed by a lattice (5) in contact with a flame-sensitive composition (6) itself in contact with the ignition relay (4).

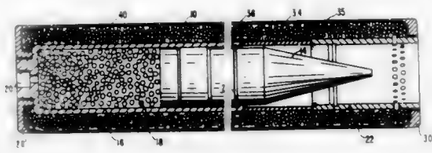
5,147,977
DEVICE FOR THE DETECTION OF OBJECTS AND THE RELEASE OF FIRING FOR GROUND-TO-AIR MINES TO BE FIRED IN THE HELICOPTER COMBAT
Curt Reichert, Heimbach, Fed. Rep. of Germany, assignor to SenSys AG, Im Ziel, Switzerland
Filed Aug. 17, 1990, Ser. No. 569,185
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927663
Int. Cl.[5] F42C *13/06*
U.S. Cl. 102—427 **5 Claims**

1. A device for detecting flying objects and for causing a ground-to-air mine to be fired at them, said device being suitable for helicopter combat, comprising
a microphone which detects noise including noise generated by a helicopter,
an infrared sensor having a directional characteristic which is within a firing cone of said ground-to-air mine, and
electronic evaluation means for receiving electrical signals generated by said microphone and said infrared sensor, for separating said electrical signals received from said microphone into a first band corresponding to noise having a frequency in the range of 5–40 Hz and a second band corresponding to noise having a frequency in the range of 200–1000 Hz, and for causing said ground-to-air mine to be fired only if electrical signals from said first and second bands and said electrical signals from said infrared sensor are simultaneously present above respective predetermined threshold levels.

5,147,978
MAIN PROPELLANT IGNITION LINER FOR CASED TELESCOPED AMMUNITION
James R. Northrup, and Brian B. Tasson, both of Maple Grove, Minn., assignors to Alliant Techsystems Inc., Edina, Minn.
Continuation of Ser. No. 580,391, Sep. 10, 1990, Pat. No. 5,048,422. This application Aug. 19, 1991, Ser. No. 747,011
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] F42B *5/045*
U.S. Cl. 102—434 **1 Claim**

1. A cased telescoped ammunition comprising in combination:
a imperforate control tube with an axial passageway housing a projectile and a first propellant disposed in said housing on one side of said projectile;
an outer casing surrounding said control tube and radially spaced therefrom;
a second propellant in the space between said control tube and said outer casing;
a tubular liner made of an energetic material disposed so that

it contacts and extends along said passageway from an end of said control tube on the other side of said projectile and separates said second propellant from said passageway; and



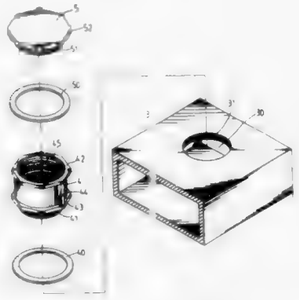
said control tube, said projectile and said tubular liner arranged so that ignition of said first propellant forces said projectile along said axial passageway and ignition products of said first propellant ignite said second propellant by way of said liner made of an energetic material after said projectile passes the end of the control tube.

5,147,979

THREADLESS FLOOR ELECTRIC WIRE JUNCTION BOX WITH WATER-PROOF PROTECTION

Chin-Hui Yang, 4F, No. 2, Lane 409, Chung Cheng Rd., Hsin Tien City, Taipei Hsien, Taiwan

Filed Dec. 12, 1990, Ser. No. 626,143
Int. Cl.[5] H02G *3/28*
U.S. Cl. 174—48 2 Claims



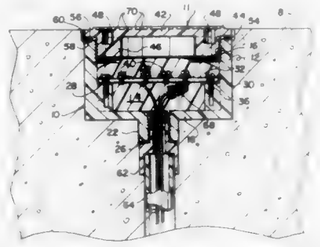
1. A floor electric wire junction box with water-proof protection for distribution of electric wire comprising a threadless wiring box having at least one wire conduit attached thereto, said wiring conduit having a bolt hole, a plug assembly fastened in said bolt hole and a gasket ring interposed between said bolt hole and said plug assembly; said plug assembly including at least one tubular plug covered with a cap; said tubular plug having a top with a first polygonal flange, a middle with a second polygonal flange, two unitary ribs longitudinally disposed between said first and second polygonal flanges at opposite locations on said tubular plug, a bottom with a connecting end for fastening in said bolt hole through a screw joint, and an inner threaded portion; said cap having an outer threaded portion for screwing in said inner thread portion of said tubular plug, a top surface covering said first polygonal flange of said tubular plug; said top surface having a plurality of projecting edges respectively spaced from one another at equal intervals; and a gasket ring interposed between said tubular plug and said cap

5,147,980

SWIMMING POOL FLUSH MOUNT JUNCTION BOX

Robert A. Ferguson, Jr., 1973 Briarwood St., Dunedin, Fla. 34698

Filed Feb. 19, 1991, Ser. No. 657,491
Int. Cl.[5] H02G *3/12*
U.S. Cl. 174—37 20 Claims



1. A junction box adapted for flush mounting and for connecting electrical fixtures of swimming pools and the like, comprising:

a plastic, non-corrosive housing having a side wall defining an interior chamber with an upper opening, a bottom wall connected to the side wall and closing a bottom of the chamber and a pair of spaced apart projections extending downwardly from the bottom wall, each projection having an axial bore therein extending through the bottom wall into the chamber for the passage of conductors into the chamber through the projections;

means defining at least one grounding bar seat in the chamber positioned at an intermediate location between the bottom wall and the upper opening;

an electrically conductive grounding bar connected to the at least one seat for fixing the grounding bar in the chamber;

a plastic, non-corrosive lid detachably connected to the housing at the upper opening; and

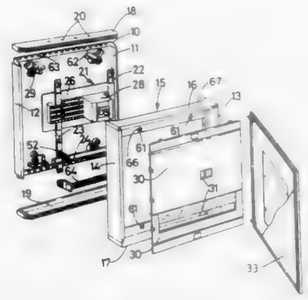
a water tight seal between the lid and the housing for sealing the upper opening when the lid is engaged to the housing.

5,147,981

LOW VOLTAGE ELECTRICAL SWITCHGEAR CABINET

Jacques Buet; Robert Chambron, both of St. Pierre D'Albigny; Jean-Marc Bonnet, Barberaz, and Emile Grosset-Janin, Montmelian, all of France, assignors to Merlin Gerin, Meylan, France

Filed Jun. 21, 1991, Ser. No. 718,789
Claims priority, application France, Jul. 2, 1990, 90 08442
Int. Cl.[5] H05K *5/00*
U.S. Cl. 174—52.1 9 Claims



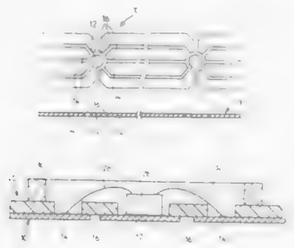
1. A parallelipipedic cabinet for housing electrical switchgear having a front part with an operated handle, comprising a top panel, a bottom panel, a metal back plate having two side faces folded forwards into a bracket to present front edges, an H-shaped frame with profiled transverse rails for fixing the switchgear and uprights on which the rails are fixed, said uprights being fixed to said back plate, an enclosure in the form of a rectangular frame of the same size as the back plate and secured by screws to the back plate to surround the frame, said enclosure having a front plate opposite the back plate of the cabinet, and top and bottom plates having recessed portions thereby defining an area between said back plate and said top and bottom plates for cables to pass through, said front plate having an aperture for the front part of the switchgear with the operating handle to pass through and at least one blanking plate inserted between the enclosure and back plate to blank off the top and/or bottom panel of the cabinet, the at least one blanking plate having a front edge which in the assembled position protrudes out from the front edges of the two folded side faces and is flush with or protrudes frontwards from the plane containing the profiled rails, the length of the profiled rails is less than the distance between the two side faces to provide a space in the form of a trunking between the ends of the profiled rails and the two side faces to run the cables, and the front edges of the two side faces are set back from the plane containing the profiled rails.

5,147,982

ENCAPSULATION OF ELECTRONIC MODULES

Francis Steffen, Rousset, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Division of Ser. No. 504,961, Apr. 5, 1990, Pat. No. 5,041,395. This application Apr. 10, 1991, Ser. No. 683,071
Claims priority, application France, Apr. 7, 1989, 89 04581
Int. Cl.[5] H01L *23/28*
U.S. Cl. 174—52.2 13 Claims



1. A micromodule for the encapsulation of integrated circuits, comprising a punched metal grid, a strip of perforated dielectric screen transferred to the punched grid, the perforations of the screen covering conductive zones of the punched grid without covering interstices between these zones, an integrated circuit chip being placed in a perforation of the screen and being electrically connected to conductive zones located in other perforations of the strip.

5,147,983

SIX PHASE DISTRIBUTION POWERLINE

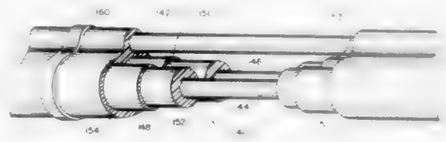
James R. Ashley, 2523 Lake Ellen La., Tampa, Fla. 33618

Division of Ser. No. 633,459, Dec. 24, 1990. This application Sep. 16, 1991, Ser. No. 762,566
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—104 10 Claims

5. A composite cable for transmitting electric power at high voltage comprising a pair of parallel generally-coaxial cables, each said generally-coaxial cable comprising

an axially positioned first metallic conductor surrounded by a first dielectric material and,

a plurality of coaxial segments of a second metallic conductor, each said segment being located at a predetermined radial distance from said first conductor, each said segment being spaced apart from an adjacent said segment along said axis by at least a predetermined axial distance,



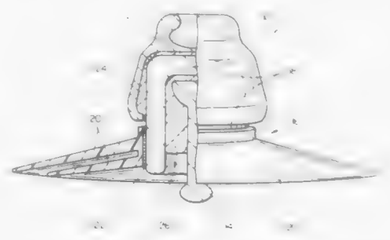
and each said segment being coaxially surrounded by a second dielectric material.

5,147,984

CAP AND PIN INSULATOR

Linas Mazeika, and John A. Midgley, both of San Carlos, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 4, 1990, Ser. No. 622,044
Int. Cl.[5] H01B *17/06*
U.S. Cl. 174—182 36 Claims



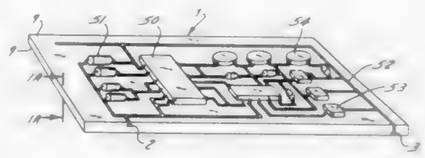
1. A cap and pin insulator member comprising a porcelain head and at least one polymeric shed secured to the porcelain head, each such shed being composed entirely of an insulating polymeric compound.

5,147,985

SHEET BATTERIES AS SUBSTRATE FOR ELECTRONIC CIRCUIT

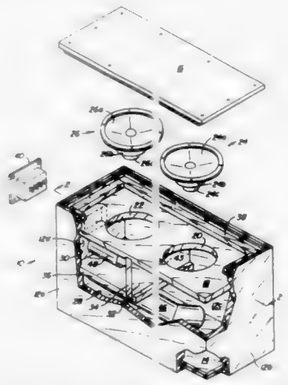
Denyse DuBrucq, West Allis, Wis., assignor to The Scabbard Corporation, West Allis, Wis.

Division of Ser. No. 567,194, Aug. 14, 1990. This application Jan. 10, 1992, Ser. No. 819,482
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—260 16 Claims



1. An electronic device comprising a sheet battery having a power layer and a ground layer with their outer surfaces covered by an insulating layer to serve as an electronic circuit substrate, and electronic circuitry placed directly on an outer surface of the sheet battery.

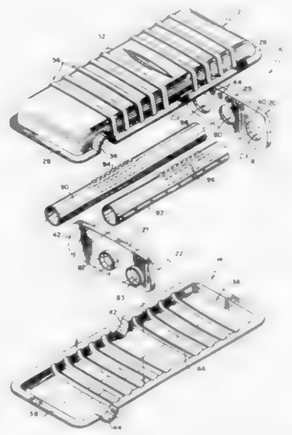
5,147,986
SUBWOOFER SPEAKER SYSTEM
Lloyd W. Cockrum, Weatherford and Christopher Kline, Bedford, both of Tex., assignors to Tandy Corporation, Ft. Worth, Tex.
Filed Dec. 3, 1990, Ser. No. 621,498
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—145 34 Claims



1. A speaker apparatus for providing acoustic energy comprising:
an enclosure having walls defining an interior of the enclosure and an exterior of the enclosure, and which includes first, second, and third chambers;
a first drivable speaker acoustically coupling said first chamber with said third chamber;
a second drivable speaker acoustically coupling said second chamber with said third chamber;
a first port acoustically coupling said first chamber to the exterior of said enclosure; and
a second port acoustically coupling said second chamber to one of said first chamber and the exterior of said enclosure

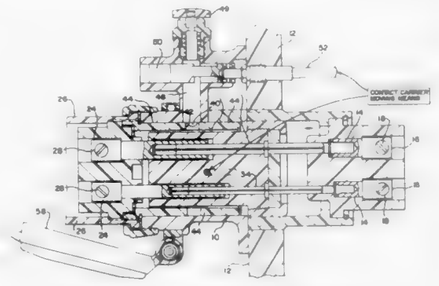
5,147,987
MUFFLER ASSEMBLY
Larry E. Richardson, Columbus; David W. Strickland, Elizabethtown; Frank L. Zagar, Seymour, and Richard C. Wilcox, Columbus, all of Ind., assignors to Arvin Industries, Inc., Columbus, Ind.
Continuation-in-part of Ser. No. 345,141, Apr. 28, 1989, Pat. No. 4,941,545. This application Jun. 27, 1990, Ser. No. 544,408
Int. Cl.[5] F01N *1/08*
U.S. Cl. 181—264 18 Claims

1. A muffler assembly comprising
top and bottom stamp-formed shell halves having a plurality of indentations, the shell halves being joined together to define a muffler chamber therebetween having an inlet and outlet,
first and second drop-in baffles disposed in the muffler chamber to partition the muffler chamber into first, second, and third chambers therein, with the second and third chambers formed to lie at opposite ends of the muffler chamber positioning the first chamber therebetween, and the first and second drop-in baffles being held in place within the muffler chamber by fitted insertion into the indentations opening into the muffler chamber, with each baffle being formed to include a plurality of apertures extending therethrough, and
separate first and second exhaust tubes disposed in the muffler chamber and arranged in spaced-apart relation to bridge the first chamber and extend through an aperture formed in each of the first and second drop-in baffles to



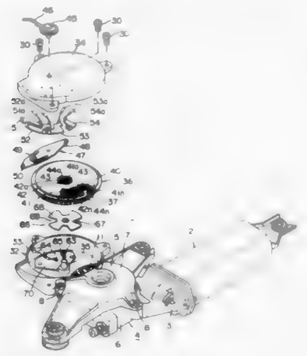
interconnect the spaced-apart second and third chambers in fluid communication.

5,147,988
SWITCHING ELECTRICAL RECEPTACLE
Arthur I. Appleton, 22 Indian Creek Island, Miami Beach, Fla. 33154
Continuation of Ser. No. 527,055, May 22, 1990. This application Sep. 16, 1991, Ser. No. 760,811
Int. Cl.[5] H01R *33/96*
U.S. Cl. 200—51.09 3 Claims



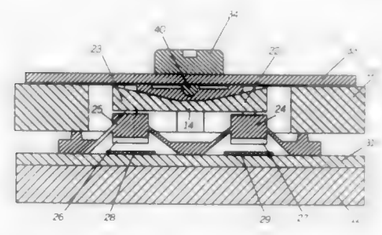
1. A switching electrical receptacle, comprising:
a. a substantially cylindrical electrical contact, the contact being split and internally-spring loaded;
b. a frame supporting the contact;
c. a contact carrier receiving the contact and capable of moving with the contact along an axis, the contact carrier sliding with respect to the frame;
d. a first fixed terminal permanently secured to the frame and connectible to an electrical power line, the first fixed terminal aligned with the axis;
e. a second fixed terminal connectible to an electrical plug, and secured to the frame and aligned with the axis during switching operation of the receptacle; and
f. means for moving the contact carrier axially so that the contact remains in electrical contact with the second fixed terminal at all times, exerting radial forces thereon, while making and breaking electrical contact with the first fixed terminal, exerting radial forces on the first fixed terminal when in electrical contact therewith.

5,147,989
ROTARY POSITION DETECTOR
Humio Ito, Yabuzuka, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan
Filed Apr. 16, 1990, Ser. No. 509,994
Claims priority, application Japan, Apr. 17, 1989, 1-44920[U]
Int. Cl.[5] H01H *43/00*; B60J *7/02*
U.S. Cl. 200—11 R 14 Claims



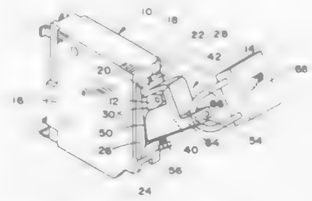
1. A rotary position detector comprising:
a rotary disk rotatable in association with a rotator to be detected;
a guide track constructed such that a plurality of annular tracks arranged at an upper surface of the rotary disk concentrically with a rotary center of the rotary disk are connected to each other by connection tracks laid in the radial direction between the annular tracks adjoining each other in the radial direction;
a plate opposed to said guide track, which is provided with a slider movable outwardly and inwardly in the radial direction being guided along said guide track in association with the rotation of said rotary disk; and
a means for detecting a portion of movement of said plate in accordance with the movement of said slider.

5,147,990
INTEGRAL SLIDE SWITCH
Vito Dionisio, Jr., Sunrise; William M. Bradford, Davie; David H. Karl, Tamarac, and Peter B. Gilmore, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 1, 1991, Ser. No. 677,911
Int. Cl.[5] H01H *15/00*
U.S. Cl. 200—16 R 16 Claims



1. A slide switch, comprising:
a substrate;
an elastomeric keypad mounted on the substrate;
a housing with an aperture enclosing the substrate and keypad, a portion of said housing being located above said keypad and having at least one torsion bar within the aperture;
a cantilever beam integrally formed within said housing aperture and coupled perpendicularly to the torsion bar; and
a horizontal slide actuator means constructed to slide over said cantilever beam for substantially vertically biasing said cantilever beam toward said keypad to selectively engage a key on the keypad.

5,147,991
ELECTRICAL SWITCH LOCKING SYSTEM
Nathaniel Jordan, Sr., 1266 Springwood Cir., Winston-Salem, N.C. 27107
Filed Jul. 22, 1991, Ser. No. 733,466
Int. Cl.[5] H01H *27/10*
U.S. Cl. 200—43.14 6 Claims



4. In a switch handle holding assembly, a one-piece blocking means defining a first portion having opposed, generally parallel surfaces defining a recess for receiving a switch handle therebetween, said blocking means having an integral second portion having opposed surfaces defining an elongated slot therein, said blocking means having a third integral portion defining a threaded opening extending therethrough from said recess to said slot, said threaded opening extending generally perpendicular to said first portion opposed surfaces and to said elongated slot, a threaded fastener received within said threaded opening for selective displacement into and out of gripping engagement with a switch handle positioned within said recess, said blocking means having a fourth integral portion defining a lock receiving opening therein, a slide member retained in said elongated slot for displacement therein, said slide member defining a lock receiving opening therein, said slide capable of being displaced between a first position wherein said lock receiving opening therein is not aligned with said fourth portion lock receiving opening to permit access to the threaded fastener, and a second position wherein said lock receiving opening is aligned with said fourth portion lock receiving opening for receiving the shackle of a padlock therethrough to prevent access to said threaded fastener.

5,147,992
JACK ASSEMBLY
Byron Eriksen, Minneapolis, and Bruce Ogren, Edina, both of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 536,966, Jun. 12, 1990, abandoned. This application May 24, 1991, Ser. No. 708,083
Int. Cl.[5] H01R *33/96*
U.S. Cl. 200—51.1 11 Claims

1. A switch coax jack comprising:
a jack housing;
first and second spaced apart electrical signal conducting means disposed within said housing;
at least a first port formed in said jack housing and sized to receive a jack plug to be inserted through said port and into said housing with said plug in electrical communication with said first electrical signal conducting means;
a switch assembly for electrically connecting said first and second conducting means when a plug is absent from said first port and for breaking electrical connection between

said first and second conducting means when the plug is inserted into said first port;

said switch assembly including a normal spring of electrically material with said normal spring having a first portion biased into releasable electrical contact with said first conducting means and a second portion in electrical contact with said second conducting means;

said switch assembly further including urging means for urging said first portion away from said first conducting means in response to an insertion of a plug into said first port with said urging means applying an urging force on said first portion at a first predetermined location;

said switch assembly including means for retaining said normal spring in said jack housing with said normal spring having a portion held in a fixed location;

said normal spring first portion resiliently deformable from said fixed location to said predetermined location in response to said urging force, said first portion presenting a spring surface of predetermined shape as said first portion is deformed in response to an urging force in an absence of restraints opposing said first portion assuming said predetermined shape; and

said switch assembly including a support surface opposing said first portion as said first portion is deformed, said support surface selected to be complementary to said predetermined shape and positioned to oppose and abut said spring surface as said spring surface is urged to said predetermined shape with said support surface positioned to complementarily mate with said spring surface in said predetermined shape.

5,147,993

ELECTRIC RANGE HAVING A MICROWAVE TRAP

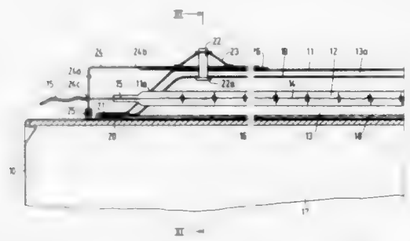
Walter Braun; Günter Bopp, both of Schorndorf, and Dieter Grimm, Pluderhausen, all of Fed. Rep. of Germany, assignors to Whirlpool International B.V., Eindhoven, Netherlands

Filed Sep. 21, 1990, Ser. No. 587,313

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1989, 3931859

Int. Cl.[5] H05B 6/76

U.S. Cl. 219—10.55 B **18 Claims**



1. An electric range having a cooking space for cooking food by applying thermal and/or microwave energy, a thermal-energy source being arranged in an upper part of a cooking space (17) defined by a housing (10), the thermal-energy source being provided with a reflector and being separated from the cooking space by a metal grid having an electrically conductive connection with the reflector, the electric range comprising a hood (11) formed on the housing (10), the reflector (19) arranged in the hood (11) to form a gap (13a) relative to the hood (11) and being connected to the flat metal grid (18), via a flat peripheral portion (20), and the reflector (19) being secured to the housing (10, 21) in an insulated manner to form a capacitive microwave trap between the housing (10, 21) and the flat peripheral portion (20).

5,147,994

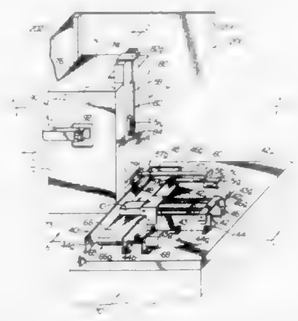
MICROWAVE VENDING MACHINE

Donald P. Smith; Michael J. Dobie, both of Dallas; Alden B. Sparman, Sr., and John R. Norris, both of Plano, all of Tex., assignors to Patentsmith Corporation, Dallas, Tex.

Filed Jan. 10, 1990, Ser. No. 463,279

Int. Cl.[5] B23K 15/10

U.S. Cl. 219—10.55 R **33 Claims**



1. A microwave oven comprising: a cabinet having an interior; means dividing the interior of the cabinet into a cooking chamber, a conditioning chamber and a food storage chamber; means to open a food product container, for moving said food product container from said food storage chamber to said cooking chamber; and means adapted to move said food product container out of said cooking chamber and to close said food product container after being removed from said cooking chamber circulating means in said conditioning chamber to recirculate air from the conditioning chamber through said cooking chamber; air dispensing means operably connected to said circulating means, said dispensing means being adapted to project a stream of air into said cooking chamber; means movably supporting said air dispensing means to change the direction in which said air stream is projected into said cooking chamber; and microwave heating means communicating with said cooking chamber.

5,147,995

DISCHARGING CIRCUIT ARRANGEMENT FOR AN ELECTRICAL DISCHARGING MACHINE

Ya-Chien Chung, and Huann-Jen Yang, both of Hsin chu shien, Taiwan, assignors to Industrial Technology Research Institute, Hsin Chu, Taiwan

Filed Apr. 30, 1991, Ser. No. 693,559

Int. Cl.[5] B23H 1/02

U.S. Cl. 219—69.13 **3 Claims**

1. An electrical circuit for controlling a discharge current waveform in an electrical discharge cutting apparatus, said circuit comprising:

a voltage power supply;

a switch element having a first end connected to a positive output of said voltage power supply;

a wire electrode having an end connected to a negative output of said voltage power supply;

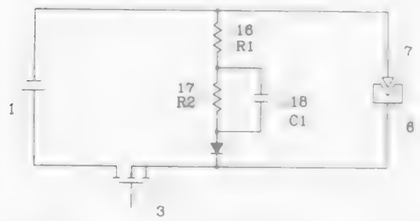
a workpiece connected to a second end of said switch element, said workpiece disposed proximate said electrode to form a working gap therebetween;

a diode having a cathode connected to said second end of said switch element;

a first resistor having a first end connected to said negative output of said voltage power supply;

a second resistor having a first end connected to a second end of said first resistor and a second end connected to an anode of said diode;

a capacitor connected in parallel with said second resistor;



whereby said circuit forms a triangular discharge current waveform having,

an ascending component when said switching element is closed ascending to a peak current value at a rate given by (Vp−Vg) /L where Vp is a voltage of said voltage power supply, Vg is a voltage of said gap, and L is an inductance of said circuit when said switch element is closed,

a descending component when said switching element is open descending at a rate given by (R1 * Ip) /L where R1 is a resistance value of said first resistor, Ip is a peak current value, and L is said inductance,

whereby said triangular waveform increases a cutting rate of said apparatus.

5,147,996

TOOL JOINT

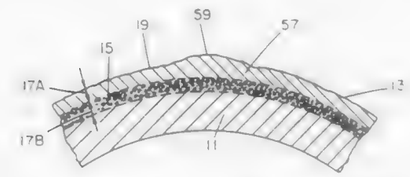
Frank J. Carlin, Houston, Tex., assignor to Grant TFW, Inc., Houston, Tex.

Continuation of Ser. No. 408,074, Sep. 15, 1989, Pat. No. 5,010,225. This application Apr. 18, 1991, Ser. No. 687,438

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] B23K 9/04

U.S. Cl. 219—76.14 **1 Claim**



1. A tool joint for earth boring drill pipe, comprising:

A metallic cylindrical housing adaptable at at least one end for securement to a drill pipe member; and

an outerface around the exterior of said housing, a portion of said face having hardfacing comprising tungsten carbide granules in an alloy steel matrix, the hardfacing extending outwardly of said housing no more than substantially the outer diameter of the housing, said hardfacing having no tungsten carbide granules within said substantially outer diameter of the housing.

5,147,997

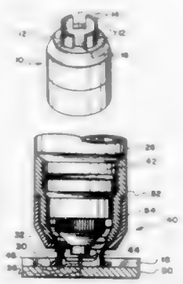
STAND-OFF CUP FOR TORCH

Randy G. Haberman, Burbank, Calif., assignor to Delaware Capital Formation, Inc., Burbank, Calif.

Filed Jun. 21, 1991, Ser. No. 718,725

Int. Cl.[5] B23K 9/00

U.S. Cl. 219—121.5 **11 Claims**



1. Stand-off cup for torch comprising: a cup-shaped body having

a posterior portion with means for securely fitting the body over a torch tip,

an anterior portion terminating in a series of castellations; and

a circular ring at the distal end of said castellations;

whereby the torch tip may be guided around the edge of a template with said ring touching the template and maintaining even spacing of the tip from the template.

5,147,998

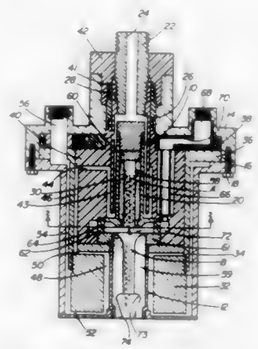
HIGH ENTHALPY PLASMA TORCH

Peter Tsantrizos, Ville St-Pierre; Raynald Lachance, Pincourt; Bruce Hehshaw, Rigaud, and Lakis T. Mavropoulos, Montreal, all of Canada, assignors to Noranda Inc., Toronto, Canada

Filed May 29, 1992, Ser. No. 707,009

Int. Cl.[5] B23K 9/00

U.S. Cl. 219—121.5 **5 Claims**



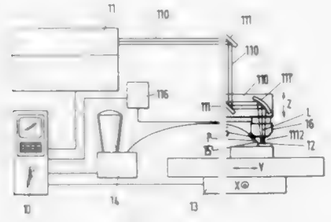
1. A plasma torch comprising:

a) a torch housing;

b) a rear tubular anode electrode and a front tubular cathode electrode coaxially mounted within said housing with a gap therebetween, both electrodes being fabricated from copper having tubular inserts of refractory material forming the arcing surfaces, the front cathode electrode including a cup shaped exit portion comprising an expansion followed by a constriction, the expansion being used to provide a stable arc attachment and the constriction to

prevent materials from the surrounding environment from entering the electrode region and both the expansion and constriction being used to create a plasma gas back pressure for improving rotation of the arc inside the electrodes of the torch thus minimizing electrode erosion;
c) a vortex generator for introducing a tangential flow of gas in opposite direction into said tubular electrodes through the gap between the two electrodes; and
d) a cooling system for cooling the tubular electrodes.

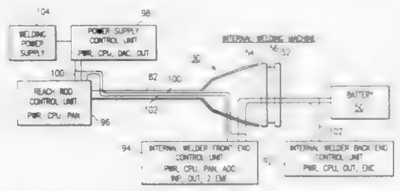
5,147,999
LASER WELDING DEVICE
Roger Dekumbis, Zurich; Charles Marsden, and Jean-Daniel Wagniere, both of Lausanne, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Dec. 17, 1990, Ser. No. 628,399
Claims priority, application Switzerland, Dec. 27, 1989, 4058/89
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.63 **21 Claims**



1. A laser welding device comprising
means for directing a laser beam along a first axis onto an operating area of a workpiece;
means for moving said laser beam and said workpiece relative to each other to effect a relative movement of said beam along a second axis, said first axis and said second axis intersecting at a point of incidence of said laser beam on a surface of said workpiece;
a nozzle for directing a gas with or without a powdery coating material towards said operating area of said workpiece along a third axis disposed in a plane spaced from said point of incidence; and
means for controlling the position of said nozzle relative to said operating area during relative movement between said beam and said workpiece.

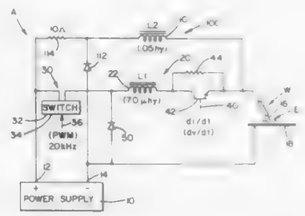
5,148,000
DISTRIBUTED PROCESSING CONTROL SYSTEM FOR AUTOMATIC WELDING OPERATION
Paul A. Tews, Cypress, Tex., assignor to CRC-Evans Pipeline International, Inc., Houston, Tex.
PCT No. PCT/US90/00020, § 371 Date Jan. 4, 1990, § 102(e) Date Jan. 4, 1990, PCT Pub. No. WO90/00020, PCT Pub. Date Dec. 29, 1989
PCT Filed Jan. 4, 1990, Ser. No. 460,841
Int. Cl.[5] B23K *9/10*
U.S. Cl. 219—125.11 **23 Claims**

5. A control system for a welding machine which performs a plurality of functional operations including positioning a welder along a path, providing power for a welding arc, supplying a shielding gas and feeding an electrode wire, the control system comprising:
a communication link,
a plurality of microprocessor control units each connected to communicate via said communication link,
a plurality of said microprocessor control units each connected to operate associated apparatus that carries out at least one of said functional operations,
at least one of said microprocessor control units for receiving commands via said communication link, said commands causing said receiving microprocessor control unit to direct the operation of the associated apparatus to carry out a corresponding functional operation,
a control panel for generating control signals corresponding respectively to said functional operations,
at least one of said microprocessor control units connected to said control panel for receiving control signals and producing corresponding commands for transmission via said communication link to ones of said microprocessor control units,



each of said microprocessor control units having a corresponding switch with multiple settings,
each of said microprocessor control units having a corresponding program memory, and
a single program having different segments, each said program segment being carried out by one said microprocessor control unit, said program segment for controlling a microprocessor control unit to carry outer the operations associated therewith, said single program being loaded into each said program memory, and wherein said program identifies the segments thereof for execution by reference to a setting of said switches.

5,148,001
SYSTEM AND METHOD OF SHORT CIRCUITING ARC WELDING
Elliott K. Stava, Brecksville, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 404,769, Sep. 8, 1989, Pat. No. 4,972,064, and Ser. No. 475,555, Feb. 6, 1990, Pat. No. 5,001,326, which is a continuation-in-part of Ser. No. 404,769, Sep. 8, 1989, Pat. No. 4,972,064, which is a division of Ser. No. 270,766, Nov. 14, 1988, Pat. No. 4,866,247, which is a continuation-in-part of Ser. No. 135,832, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 940,580, Dec. 11, 1986, Pat. No. 4,717,807. This application Sep. 4, 1990, Ser. No. 577,105
Int. Cl.[5] B23K *9/09*
U.S. Cl. 219—137 PS **46 Claims**



33. A method of short circuiting arc welding comprising the steps of:
(a) providing a work station with a consumable electrode and a workpiece;
(b) providing a D.C. power supply with a positive and a negative output terminal;
(c) applying a welding current with a given time-based

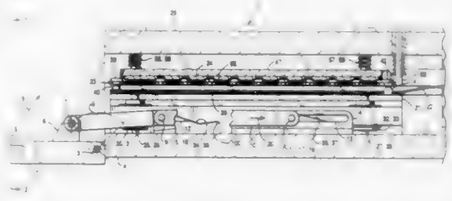
profile across said work station while said electrode is short circuited and while said electrode is spaced from said workpiece;
(d) creating first inductive reactance in series with said current control means and said work station whereby said welding current follows said time-based profile in accordance with said first inductive reactance;
(e) applying a constant and a continuous background current across said work station;
(f) creating a second inductive reactance substantially greater than said first inductive reactance for driving said background current across said work station; and,
(g) controlling the background current flowing continuously from said power supply to said work station through said second inductive reactance to a value between the range of 5–10 amperes.

5,148,002
MULTI-FUNCTIONAL GARMENT SYSTEM
David D. Kuo, 17525 NW. Woodmere Ct., Beaverton, Oreg. 97006, and Chung S. Chan, 16165 SW. Rosa Rd., Aloha, Oreg. 97007
Filed Mar. 14, 1991, Ser. No. 669,073
Int. Cl.[5] H05B *3/34*
U.S. Cl. 219—211 **17 Claims**

1. A multi-functional garment system wearable by a user comprising:
a jacket-like outer shell garment;
an inflatable insulation module detachably connectable to an interim surface of the outer shell garment and sized to fit within the outer shell garment;
fastening means in the outer shell garment for detachably connecting the insulation module;
an electric heating module detachably connectable to an interior surface of the insulation module for warming the user;
fastening means disposed on the interior surface of the insulation module for detachably connecting the heating module;
input means connectable to the user's person for providing a physiological input parameter; and
an electronic control module detachably connectable to the outer shell garment and connectable to the input means and to the heating module for monitoring the input means and for controlling the heating module responsive to the physiological input parameter.

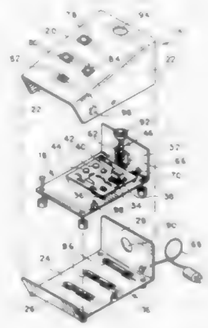
5,148,003
MODULAR TEST OVEN
Javad Haj-Ali-Ahmadi, Austin; Jerome A. Frankeny, Taylor; Richard F. Frankeny, Austin; Adolph B. Habich, Georgetown; Karl Hermann, Austin, and Ronald E. Hunt, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 28, 1990, Ser. No. 619,369
Int. Cl.[5] H05B *1/00*
U.S. Cl. 219—388 **14 Claims**

1. An oven for testing a plurality of integrated circuits, comprising:
means for receiving a production level carrier substrate, said carrier substrate having integrated circuits non-permanently affixed thereto;
means for testing said non-permanently affixed integrated circuits;



means for permanently affixing said integrated circuits to said production level carrier substrate upon successful testing of each said integrated circuits
and means for heating said integrated circuits; each said means being located within said oven.

5,148,004
CONTAMINATED NEEDLE STERILIZER
William A. Gettig, and Larry E. Shook, both of Millheim, Pa., assignors to Gettig Technologies, Inc., Spring Mills, Pa.
Filed Sep. 6, 1990, Ser. No. 578,283
Int. Cl.[5] H05B *3/64*
U.S. Cl. 219—390 **9 Claims**



1. An apparatus for sterilizing and incapacitating for further use, contaminated needle assemblies including an elongated cannula affixed to an enlarged hub, comprising:
an elongated heating tube of dielectric composition having opposite open top and bottom walls and defining interior and exterior peripheries, said interior periphery providing an axial central bore within said tube, said tube exterior periphery defining an O.D. of substantially 0.250 inches and said tube interior periphery defining an I.D. of substantially 0.150 inches, said heating tube bore I.D. permitting the entrance of a needle cannula while precluding the entrance of an attached needle hub as the hub abuts said heating tube top wall,
resistance heating wires encircling said heating tube exterior periphery, a coating of dielectric composition overlying said heating wires,
power, control and timer means operable to regulate the application of electrical current to said heating wires,
said control means including means sensing the temperature within said tube bore and operable to permit said heating wires to heat said tube until air within said tube bore reaches a perdetermined level of at least 900 degrees F.,
said timer means including a first timer monitoring the appli-

cation of electrical current to said heating wires and interrupting this application of electrical current if the temperature of air within said tube bore has not reached said predetermined level within a prescribed time interval,

a second timer operable upon attainment of said predetermined temperature within said first timer prescribed time interval to allow continuation of the application of electrical current to said heating wires for a second prescribed time interval representing a heat soak phase,

separate signal means respectively operable in consonance with the operation of said first and second timers to indicate to a user the status of said timers and thus the application of electrical current to said heating wires, whereby with the insertion of a needle cannula into said tube bore with its affixed hub abutting said tube top wall and following expiration of said second prescribed time interval, said cannula is ridden of bioburden, has been annealed and exhibits a blackened appearance clearly indicating its treated condition.

5,148,005

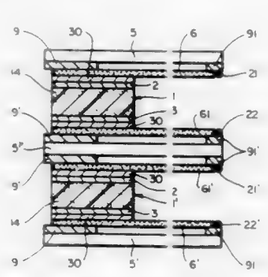
COMPOSITE CIRCUIT PROTECTION DEVICES

Shou-Mean Fang, Union City; David A. Horsma; Guillaume Peronnet, both of Palo Alto, all of Calif.; Timothy E. Fahey, Williamsport, Pa.; Andrew N. Au, Fremont, and William D. Carlomagno, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 124,696, Nov. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 115,089, Oct. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 754,807, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 628,945, Jul. 10, 1984, abandoned. This application Dec. 2, 1989, Ser. No. 455,715

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—505 **16 Claims**



1. Electrical apparatus which comprises

(1) a laminar substrate which (i) comprises a first laminar surface and a second laminar surface, and (ii) is electrically insulating;

(2) a first electrical component which (i) is physically adjacent to the first laminar surface of the substrate and is mounted directly thereto, and (ii) has a resistance R_1, said first component comprising

(a) a laminar PTC element composed of a conductive polymer which exhibits PTC behavior with a switching temperature Ts, and

(b) at least two laminar electrodes which can be connected to a source of electrical power so that current passes between the electrodes through the PTC element;

(3) a second electrical component which

(a) is physically adjacent to the first laminar surface of the substrate and is mounted directly thereto,

(b) is in good thermal contact with the PTC element,

(c) is electrically connected in series to the first component, and

(d) has a resistance R_2; and

(4) an electrical lead which electrically connects the first and second components.

5,148,006

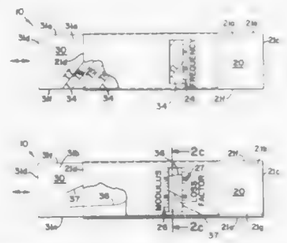
MECHANICAL DEVICE FOR DETERMINING THE MODULUS AND LOSS FACTOR OF A DAMPING MATERIAL BASED UPON TEMPERATURE AND FREQUENCY

William A. Driscoll, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 30, 1989, Ser. No. 428,873

Int. Cl.[5] G06G *1/02*

U.S. Cl. 235—70 R **20 Claims**



1. A mechanical device for storage and retrieval of a modulus value and a loss factor value for a selected damping material based upon temperature and frequency variables, which comprises:

(a) a first member having thereon (i) a scale of a first variable, (ii) depiction of modulus values of at least one damping material as a variable of temperature and frequency, and (iii) depiction of loss factor values of at least one damping material as a variable of temperature and frequency, and

(b) a second member restrainably movable with respect to the first member and having thereon (i) a scale of a second variable, and (ii) at least one means for locating said modulus value and said loss factor value from the modulus and loss factor values provided on the first member,

(c) wherein the first and second variable includes one temperature scale and one frequency scale, and

(d) wherein the first member and second member are mated such that coupling of a temperature value and a frequency value by movement of the first member and the second member relative to one another results in identification of the modulus value and loss factor value of the damping material by the locating means at the coupled temperature value and frequency value

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5,148,007

METHOD FOR GENERATING RANDOM NUMBER FOR THE ENCODED TRANSMISSION OF DATA

Dietrich Kruse, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 490,439, Mar. 8, 1990, abandoned. This application Oct. 1, 1991, Ser. No. 769,491

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907527

Int. Cl.[5] G06K *5/00*; **G06F** *15/30*

U.S. Cl. 235—382 **1 Claim**

1. A method for generating a random number of encoded transmission of data for mutual authentication of two subscribers in a data exchange system using processor chip cards, comprising the steps of:

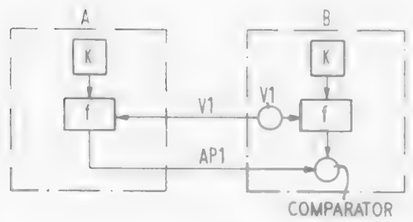
a) providing for each of at least a first subscriber and a second subscriber, random number generator for generating a random number from a starting value, the random number generator connected to a memory means for storing the generated random number, logic means for logically combining the stored random number with an authorization parameter to produce a new starting value, function means for forming the authorization parameter from a stored cipher, a ciphering algorithm and an externally received random number, and comparator means for comparing the formed authorization parameter with an externally received authorization parameter;

b) a first subscriber generating a first random number with its respective random number generator from a starting value previously stored at the first subscriber and storing this first random number in its respective memory means;

c) the first subscriber transmitting the first random number to a second subscriber and, using a ciphering algorithm, using a cipher that is stored at the first subscriber and using the first random number, the first subscriber generating with its respective function means a first authorization parameter;

d) the second subscriber, using the first random number transmitted from the first subscriber, using the cipher that is stored at the second subscriber and using the ciphering algorithm, also generating with its respective function means the first authorization parameter and transmitting the first authorization parameter to the first subscriber for comparison by the comparator means of the first subscriber;

d) from a second random number most recently generated and stored at the second subscriber and from the first authorization parameter, the second subscriber forming a starting value for the random number generator at the second subscriber by means of a logical operation performed by its respective logic means;



f) the second subscriber generating a second random number with its respective random number generator from the starting value formed in the step e), storing the second random number in its respective memory means and transmitting the second random number to the first subscriber;

g) both subscribers generating a second authorization parameter from the second random number, from the cipher and from the ciphering algorithm with their respective function means;

h) the first subscriber transmitting the second authorization parameter to the second subscriber for comparison by the comparator means of the second subscriber and forming a new starting value for the random number generator of the first subscriber from the stored, first random number and from the second authorization parameter by logical operation performed by the logic means of the first subscriber and storing the new starting value; and

i) the first subscriber identifying the second subscriber by means of a valid comparison of the first authorization parameter generated by the first subscriber and of the first authorization parameter received by the first subscriber from the second subscriber, and the second subscriber identifying the first subscriber by means of a valid comparison in the comparator at the second subscriber of the second authorization parameter generated by the second subscriber and of the second authorization parameter received by the second subscriber from the first subscriber.

5,148,008

MARK READING DEVICE WITH CYCLICLY VARYING POWER

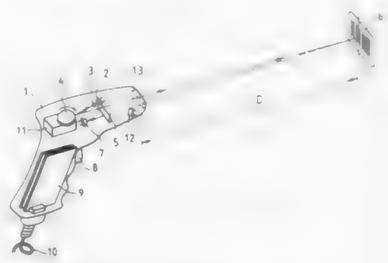
Shinya Takenaka, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 460,523, Jan. 3, 1990, now Defensive Publication No.

Claims priority, application Japan, Jan. 10, 1989, 1-4015

Int. Cl.[5] G06K *7/10*; **H01J** *3/14, 5/16, 40/14*

U.S. Cl. 235—455 **2 Claims**



1. A mark device comprising:

a laser oscillating unit outputting a laser beam;

deflecting means for cyclicly deflecting said laser beam through a predetermined scan angle to an abject surface;

receiving means for reading said laser beam upon reflection from said object surface;

scan detecting means for outputting a scan termination signal after each of said cyclical defections of said laser beam by said deflecting means; and

controller means for varying output energy of said laser beam in response to said scan termination signal, said controller means varying said output energy by a step in response to each of said scan termination signals, said output energy, emitted between receipt of any two consecutive scan termination signals by said controller means, having a constant magnitude independent of an amount of laser beam energy reflected from said object surface.

5,148,009

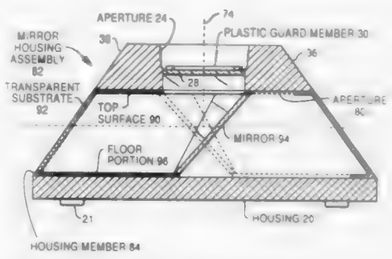
BAR CODE SCANNING APPARATUS

Joseph M. Lindacher, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 10, 1990, Ser. No. 625,324

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—462 **16 Claims**



1. A scanning system for scanning coded indicia comprising:

a housing member having a top supporting surface and oppositely located side surface portions;

said housing member further including a first aperture extending horizontally through said housing member and through said oppositely located side surface portions;

deflecting means mounted intermediate the ends of said first

aperture for movement between first and second deflecting positions within said first aperture at an angle to said top supporting surface;

said top supporting surface including a second aperture extending in a vertical direction to be in communication with said deflecting means; and

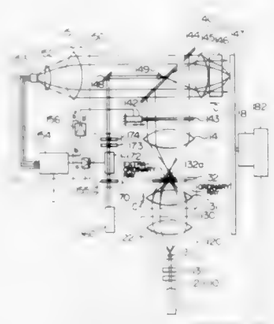
a source of scanning light beam positioned within said second aperture for projecting scanning light beams at said deflecting means whereby the scanning light beams are deflected by said deflecting means in a first direction through said first aperture when in said first deflecting position and in a second direction through said first aperture which is apposite to said first direction when in said second deflecting position for scanning coded indicia positioned adjacent the ends of said first aperture.

5,148,010

AUTOMATIC FOCUSING APPARATUS AND METHOD INCLUDES A PHOTOREFRACTIVE CRYSTAL HAVING A LENS EFFECT

Sadao Mori, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 1, 1991, Ser. No. 694,368
Claims priority, application Japan, May 2, 1990, 2-115093
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.5 **24 Claims**



1. An automatic focusing apparatus comprising:

a light source for outputting an optical beam to be focused;

a focusing optical system for focusing the optical beam to be focused onto a focusing position by using a photorefractive crystal having a lens effect;

a refractive-index distribution forming beam forming means for forming a refractive-index distribution forming beam having a predetermined intensity distribution and outputting the beam onto said photorefractive crystal to generate a lens effect in said photorefractive crystal;

control beam outputting means for outputting a control beam onto said photorefractive crystal to control the lens effect caused by the refractive-index distribution generated in said photorefractive crystal; and

means for controlling said control beam outputting means.

5,148,011

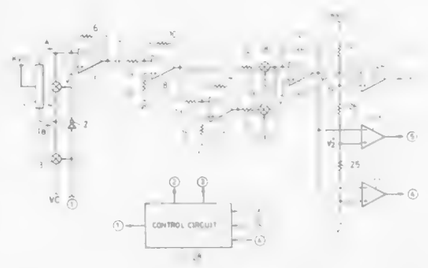
DISTANCE MEASURING APPARATUS USING INTEGRATION OF REFLECTED LIGHT AND OBTAINING A PLURALITY OF DISTANCE SIGNALS

Hideo Taka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1990, Ser. No. 591,755
Claims priority, application Japan, Oct. 3, 1989, 1-257164
Int. Cl.[5] G03B *3/00*, **G01C** *3/00*
U.S. Cl. 250—201.6 **8 Claims**

6. A distance measuring apparatus of the type which measures the distance to an object by projecting a distance measurement light to the object, receiving a reflection of said distance measurement light thus projected, and performing integration on a light reception signal corresponding to the reflection thus received, said distance measuring apparatus comprising:

(a) a judging means for making a judgment as to whether accuracy in distance measurement can be provided on the basis of an integration output from said integration means, and



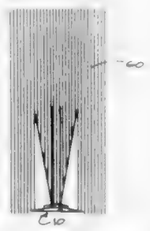
(c) a process circuit which obtains the distance through calculations for obtaining the distance on the basis of the output from said integration means when said judging means concludes that accuracy in distance measurement can be provided, and, obtains a plurality of distance signals through a process different from said calculations for obtaining the distance when said judging means concludes that accuracy in distance measurement cannot be provided.

5,148,012

SOLAR TRACKING DEVICE HAVING THREE SENSORS SEPARATED BY FOUR SEMICIRCULAR VANES

James R. Carter, Belmont, Miss., assignor to C & A Technology, Belmont, Miss.

Filed Oct. 15, 1991, Ser. No. 776,577
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—203 H **7 Claims**



1. A solar tracking device for use in conjunction with a solar energy collection apparatus, said tracking device comprising;

a photoelectric sensor assembly having four vanes separating three photoelectric sensors, with said vanes and photoelectric sensors being mounted upon a common surface in a manner which allows only one of said photoelectric sensors to be illuminated by the source of the greatest amount of solar flux at any given moment in time,

a parallel combination of three electric circuits, whereby the passage of electric current through said electric circuits is governed by the amount of solar radiation impacting said photoelectric sensors, and

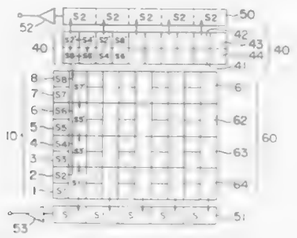
means for converting said electric current into mechanical control of a rheostat which controls the movement of a solar energy collection apparatus.

5,148,013

SOLID STATE IMAGING DEVICE AND METHOD OF DRIVING THE SAME

Tetsuo Yamada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 3, 1991, Ser. No. 725,682
Claims priority, application Japan, Jul. 4, 1990, 2-176612
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 **10 Claims**



1. A solid-state imaging device comprising:

a photosensitive unit comprised of a plurality of photosensitive element trains arranged in a row direction, each of said photosensitive element trains comprising a plurality of photosensitive elements arranged in a column direction with two pixels constituting one line of an image being as a unit,

column direction charge transfer means arranged adjacent to said respective photosensitive element trains, and adapted to receive signal charges produced at photosensitive pixels corresponding one pixel and the other pixel of said two pixels constituting one line to transfer them in first and second column directions opposite to each other, respectively,

first row direction charge transfer means provided at one side transfer end position of said column direction charge transfer means, and for transferring, in a row direction, signal charges produced at the photosensitive element corresponding to one pixel of said two pixels constituting one line transferred by said column direction charge transfer means,

second row direction charge transfer means provided at the other side transfer end position of said column direction charge transfer means, and for transferring, in said row direction, signal charges produced at the photosensitive element corresponding to the other pixel of said two pixels, constituting one line transferred by said column direction charge transfer means, and

transfer order conversion means for reversing the transfer order in a column direction of a signal charge train transferred by said column direction charge transfer means into one of an intermediate region between said column direction charge transfer means and said first row direction charge transfer means and an intermediate region between said column direction charge transfer means and said second row direction charge transfer means.

5,148,014

MIRROR SYSTEM WITH REMOTELY ACTUATED CONTINUOUSLY VARIABLE REFLECTANT MIRRORS

Niall R. Lynam, and Dale M. Roberts, both of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

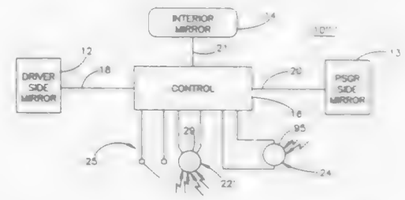
Continuation-in-part of Ser. No. 565,652, Aug. 10, 1990, Pat. No. 5,122,647. This application Nov. 19, 1990, Ser. No. 615,228
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 AL **79 Claims**

1. A rearview mirror system for a vehicle comprising:

a reflective element having a controllable variable reflectivity;

a control that is adapted to establishing the level of reflectivity of said reflective element;

a first input device for said control that is adapted to causing said control to establish a first level of reflectivity of said reflective element at a comfort level that is a function of ambient light levels, said level of reflectivity being selected from a continuously variable first range of reflectivity values,



a user operable second input device for said control that is selectively actuatable by a user in order to cause said control to establish a second level of reflectivity of said reflective element that is greater than said first level, wherein actuation of said second input device selectively overrides said first input device when actuated; and

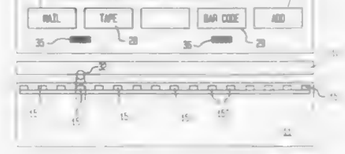
wherein said control returns the level of reflectivity of said reflective element to the level of reflectivity established by said first input device upon deactuation of said second input device.

5,148,015

TOUCH SWITCH INPUT DEVICE FOR COMPUTER SYSTEM

Donald T. Dolan, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 633,724
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 **10 Claims**



1. In a computerized system having a monitor, first means for displaying on the monitor plural items each representing one of a plurality of functions to be executed by the computer, second means in response to a user-generated selection signal to indicate on the monitor a selection of a particular function desired to be made by the user, and third means in response to a user-generated execution signal to execute the selected function;

the improvement comprising means in response to a user's object's touch to generate both the selection and execution signals, said means comprising:

(a) a plurality of optical sensors, each of said sensors comprising a radiation emitter and an adjacent radiation detector positioned to receive and detect radiation generated by the emitter and reflected from a user's object's touch for generating said selection signal,

(b) switch means having actuation member responsive to actuation by the user for generating said execution signal, said actuation member being positioned such that it can be

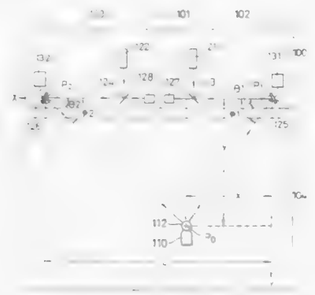
actuated by the user to generate said execution signal by the same object touch that generates the selection signal.

5,148,016

OPTICAL COORDINATE INPUT APPARATUS AND POSITION INDICATOR THEREOF

Azuma Murakami, and Norio Saito, both of Kitakatsushika, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Continuation-in-part of Ser. No. 426,296, Oct. 25, 1989, abandoned. This application Oct. 2 1990, Ser. No. 591,516
Claims priority, application Japan, Oct. 26, 1988, 63-270519; May 22, 1989, 1-58156; Jun. 1, 1989 1-139887
Int. Cl.[5] G04V 9/04
U.S. Cl. 250—221 75 Claims



1. An optical coordinate input apparatus comprising:

a position indicator having a mirror portion with mirrored surfaces in planes perpendicular to plane XY over which the position indicator is movable, the mirrored surfaces being substantially equidistant from a central axis extending perpendicular to the plane XY;

a light source for emitting laser beams;

a first rotary mirror having a rotational axis perpendicular to the plane XY;

a second rotary mirror disposed at a position removed from said first rotary mirror by a known distance and having a rotational axis perpendicular to the plane XY;

an optical system for directing said laser beams emitted from said light source to be incident on said first rotary mirror and said second rotary mirror;

a first photosensor for detecting said laser beam which is (a) incident on said first rotary mirror, (b) reflected by said first rotary mirror and a mirrored surface of said position indicator to traverse the same optical path as one of the laser beams incident on said mirrored surface, and (c) incident on said first rotary mirror before being reflected so as to be thus detected;

a second photosensor for detecting said laser beam which is (a) incident on said second rotary mirror, (b) reflected by said second rotary mirror and a mirrored surface of said position indicator to traverse the same optical path as another of the laser beams incident on said mirrored surface, and (c) incident on said second rotary mirror before being reflected so as to be thus detected;

angle detection means for detecting the rotational angles of said first rotary mirror and said second rotary mirror; and

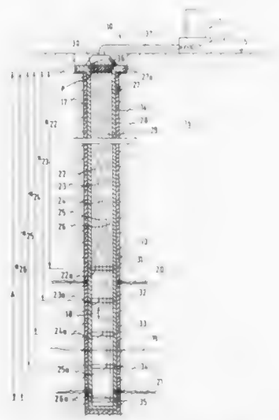
coordinate calculating means for calculating a coordinate of a central position of said mirrored surface of said position indicator in accordance with an output signal from said first photosensor, an output signal from said second photosensor, and in response to the detected angles and the known distance.

5,148,017

APPARATUS FOR DETECTING CHANGES OF LENGTH IN A MEDIUM EMPLOYING DIFFERENT FIBER LENGTH

Reinhard Wolff, and Hans-Joachim Miesseler, both of Cologne, Fed. Rep. of Germany, assignors to Strabab Bau-AG, Cologne, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,980
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018740
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.14 8 Claims



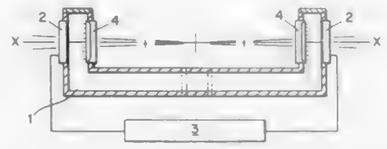
1. Apparatus for detecting changes of length in a medium along a measuring path through that medium, including a plurality of lightwave conductors following the measuring path each to different extent from a reference position, each such lightwave conductor having a reflecting end remote from said reference position and a lightwave conductor carrier member following said measuring path, and having said reflecting ends of the lightwave conductors secured thereto at said different distances, said carrier member being for fixed connection to said medium along the length of the measuring path.

5,148,018

LASER BEAM LEVELLING DEVICE

Hans-Rudolf Ammann, Amriswil, Switzerland, assignor to Ammann Lasertechnik AG, Amriswil, Switzerland

Filed Mar. 21, 1991, Ser. No. 673,024
Claims priority, application Switzerland, Mar. 27, 1990, 1013/90
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—231.1 8 Claims



1. A laser beam levelling device comprising: a first vessel and a second vessel, each vessel having a U-shaped cross section defined by a base and a pair of arms extending from the base, each vessel containing a liquid which occupies the base of the U and extends partially up the arms of the U, the base of said second vessel extending along an axis which intersects at

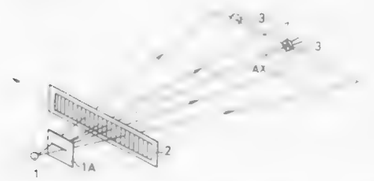
right angles an axis along which the base of the first vessel extends; light emitting means positioned to emit light toward each arm of each vessel and disposed so that the light passes through said arms of the vessels and at least one optical sensor positioined at each arm of each U-shaped vessel and disposed to receive light that passes through said arm of the vessel from the light emitting means for detecting the height of the liquid level in the respective arms of the vessel, said sensors providing respective output height signals indicative of detected liquid levels in the respective arms; evaluating means connected with the sensors for comparing the respective output height signals with liquid level values stored within the evaluating means for providing height difference signals based upon a comparison of the output height signals and the stored liquid level values, as a result of which comparison the inclination of the vessel can be determined; and means for adjusting the inclination of said vessels and hence of the device in response to height difference signals from the evaluating means.

5,148,019

MOVING AMOUNT DETECTING METHOD USING A SHADOW PICTURE DIFFRACTION INTERFERENCE PATTERN

Hiroshi Kobayashi, Kodaira; Haruhiko Machida; Jun Akedo, both of Tokyo, and Tomoyuki Yamaguchi, Chiba, all of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Dec. 19, 1990, Ser. No. 631,093
Claims priority, application Japan, Dec. 22, 1989, 1-333650
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—231.14 7 Claims



1. A method for detecting a moving amount of a detected body having a monoperiodic structure by irradiating the detected body with light emitted from a light source and detecting light reflected from the detected body or light transmitted therethrough with a photodetector, said method comprising the steps of:

emitting incoherent light from the light source through an opening of a light-interruption plate;

irradiating the detected body with said incoherent light to obtain a divergent transmitted or reflected light beam;

forming a shadow picture diffraction-interference pattern from said divergent transmitted or reflected light beam; and

detecting a moving amount of the detected body by detecting with the photodetector a moving amount of said shadow picture diffraction-interference pattern caused by a movement of said detected body in a direction crossing the irradiated light beam.

5,148,020

OPTICAL ENCODER WITH PHOTODETECTORS OF WIDTH EQUAL TO AND ONE-HALF OF CODE WHEEL'S WINDOW AND SPOKE WIDTH

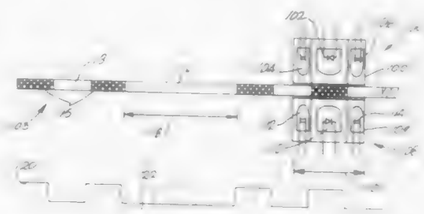
Akihiro Machida, Komae, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 17, 1991, Ser. No. 686,677
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—231.16 20 Claims

1. Encoding means for digitally representing a spatial position of a rotatable shaft, comprising:

illumination means for radiating light;

light interruption means for selectively transmitting or blocking the light from the illumination means, comprising means defined therein for transmitting a first predetermined width of the light, and for blocking a second predetermined width of the light, wherein the first and second predetermined widths are equal; and



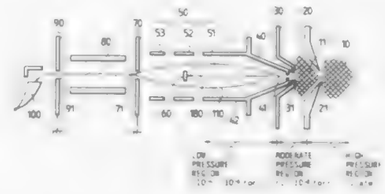
first, second, and third detection means for responding to the illumination means and the light interruption means, and in response thereto, for producing an output signal indicative of the position of the rotatable shaft, the first detection means having a width equal to the first predetermined width, and the second and third detection means each having a width equal to one-half of the first predetermined width.

5,148,021

MASS SPECTROMETER USING PLASMA ION SOURCE

Yukio Okamoto, Sagamihara; Satoshi Shimura, Kokubunji; Konosuke Oishi, Mito; Masataka Koga, Katsuta; Makoto Yasuda, Kodaira, and Takahashi Iino, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 630,554
Claims priority, application Japan, Dec. 25, 1989, 1-332720
Int. Cl.[5] B01D 59/44; H01J 49/00
U.S. Cl. 250—288 14 Claims



1. A mass spectrometer using a plasma ion source comprising:

a plasma generation system for generating a plasma including the composition of a sample;

an ion beam formation system for forming a beam of ions generated in said plasma, said ion beam formation system including an ion extraction electrode for extracting ions from said plasma and an ion acceleration electrode for accelerating the extracted ions;

a mass spectrometry system for performing mass spectrometry of the ion beam;

an ion detection system for detecting the ions subjected to the mass spectrometry;

a lens system including first, second and third cylindrical electrodes, provided between said ion beam formation system and said mass spectrometry system for first diverging and then converging the ion beam from said ion beam formation system; and

a photon stopper, comprising a disk-shaped metal plate, provided on the central axis of the ion beam in the region where the ion beam is diverged by said lens system, for

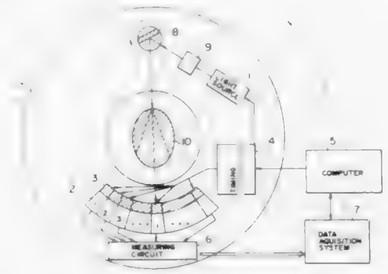
cutting off the photons traveling from said plasma straight along the central axis of the ion beam.

5,148,022

METHOD FOR OPTICALLY IN SPECTING HUMAN BODY AND APPARATUS FOR THE SAME

Fumio Kawaguchi, Tokyo; Hiroshi Takeuchi, Matsudo; Yasuhiro Mitsui, Fuchu; Yoshitoshi Ito, Ome, and Munetaka Haida, Isehara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1990, Ser No. 479,171
Claims priority, application Japan, Feb. 15, 1989, 1-035441
Int. Cl.[5] G01N *21/59*
U.S. Cl. 250—341 16 Claims



1. A method for optically inspecting a human body to be inspected comprising the steps of:

a) radiating a first light pulse of a first wavelength from a radiating spot to said human body and detecting the first light pulse transmitted through said human body at least at a specific light-reception spot, said first wavelength being selected within a wavelength range from a visible wavelength to an infrared wavelength and being overlapped with an absorption wavelength band specific to metabolic materials contained in said human body to be inspected;

b) radiating a second light pulse of a second wavelength from said radiating spot to said human body to be inspected and detecting the second light pulse transmitted through said human body at least at said specific light-reception spot, said second wavelength being close to said first wavelength so that light attenuation due to light scattering in said human body to be inspected utilizing said second wavelength is substantially the same as light attenuation due to light scattering in said human body to be inspected utilizing said first wavelength;

c) respectively extracting integrated values of light pulse transmission at said first and second wavelengths detected at least at said light-reception spot within a specific time gate;

d) computing a ratio of said integrated value of the light pulse transmission at said first wavelength to that of the light pulse transmission at said second wavelength;

e) iteratively executing said steps a), b), c), and d) as said radiating spot and said light-radiating spot are changed in succession, for obtaining pieces of projection data from said ratio of integrated values being successively provided; and

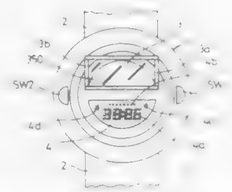
f) reconstructing an image bou distribution of absorbed light in said human body from said pieces of projection data.

5,148,023

ULTRAVIOLET RAY MEASURING APPARATUS FOR PREDICTING SUNBURN LEVEL AND FOR OBTAINING SPF VALUES OF COSMETICS

Mutsumi Hayashi, Otsu; Ryoji Takamura, Shiga; Chikayasu Yamazaki, Otsu; Minoru Ueda, and Ichiro Kumo, both of Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 506,240
Claims priority, application Japan, Apr. 12, 1989, 1-42601[U]
Int. Cl.[5] G01J *1/42*
U.S. Cl. 250—372 15 Claims



1. An ultraviolet ray measuring apparatus comprising:

first photoelectric converting means having a first light-receiving face and a spectral sensitivity at least in an ultraviolet band of light received from said first light-receiving face, for outputting an electric signal according to an intensity of received light;

second photoelectric converting means having a second light-receiving face and substantially the same spectral sensitivity as said first photoelectric converting means, for outputting an electric signal according to an intensity of received light;

first optical filter means, arranged in front of said second light-receiving face of said second photoelectric converting means, for shielding only light of at least a part of said ultraviolet band;

second optical filter means, arranged in front of said first and second light-receiving faces and having a main transmitting band in said ultraviolet band and a sub-transmitting band on a longer wavelength side than said ultraviolet band, for passing only light having a wavelength of said main transmitting band and sub-transmitting band;

means for receiving a light shielding substance, said receiving means comprising a light transmitting plate detachably arranged in front of said second optical filter means and having a transmitting band at least in said ultraviolet band, for passing light having a wavelength of said transmitting band;

arithmetic operation means for computing at least a light intensity in accordance with a difference between said electric signals of said first and second photoelectric converting means; and

display means for displaying a computation result supplied from said arithmetic operation means.

5,148,024

ION BEAM PROCESSING APPARATUS AND GAS GUN THEREFOR

Chugo Watanabe, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,447
Claims priority, application Japan, Mar. 28, 1990, 2-32522
Int. Cl.[5] C23C *16/04*; G21G *5/00*
U.S. Cl. 250—492.2 7 Claims

1. A gas gun for an ion beam processing apparatus said gun comprising:

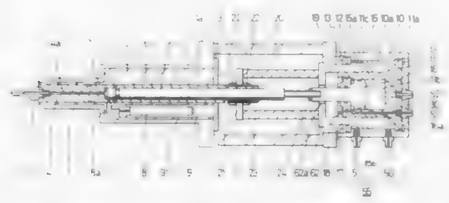
means defining a first cylinder;

a first piston disposed in said first cylinder for movement along a longitudinal axis;

means defining a second cylinder;

a second piston disposed in said second cylinder for movement parallel to the longitudinal axis;

a nozzle means including a nozzle and an intermediate rod carrying said nozzle and providing a flow path to said nozzle, said intermediate rod having a valve bore and being coupled to said first piston for movement therewith; and



a valve rod seated in said valve bore, coupled to said second piston for movement therewith and movable parallel to the longitudinal axis between a closing position in which said flow path is blocked and an opening position in which said flow path is open.

5,148,025

IN SITU COMPOSITION ANALYSIS DURING GROWTH VAPOR DEPOSITION

Channing C. Ahn, 3055 Oneida St., Pasadena, Calif. 91107, and Harry A. Atwater, 390 Redwood Dr., Pasadena, Calif. 91105

Filed Jan. 18, 1991, Ser. No. 643,523
Int. Cl.[5] H01J *47/00, 37/00*
U.S. Cl. 250—305 6 Claims

4. Apparatus for analyzing materials, comprising:

means for applying a beam of electrons incident upon a material being grown by vapor deposition; and

means for analyzing the material in accordance with electron energy levels in the scattered incident electron beam reflected therefrom.

5,148,026

SCANNING PROBE MICROSCOPY

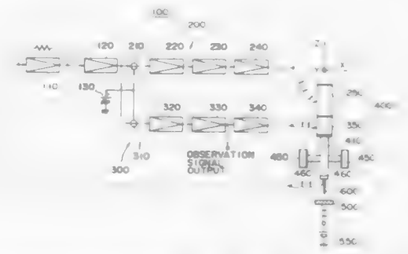
Miyoko Watanabe, and Kuniyoshi Tanaka, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 19, 1991, Ser. No. 794,229
Claims priority, application Japan, Nov. 20, 1990, 2-312904; Mar. 20, 1991, 3-56871
Int. Cl.[5] H01J *37/00*
U.S. Cl. 250—306 11 Claims

1. A scanning probe microscopy comprising:

a probe arranged to oppose a surface of a sample;

gap length control means for keeping a gap length between said probe and the sample constant, said gap length control means including at least two actuators for moving said probe and the sample relative to each other in a first direction in accordance with a sum of displacement amounts of said actuators, and at least two control systems, arranged in correspondence with said actuators and having different driving time constants, for driving the corresponding actuators in response to changes in gap length between said probe and the sample; and



scanning means for causing said probe to scan the surface of the sample by moving said probe and the sample relative to each other in second and third directions parallel to the surface of the sample.

5,148,027

METHOD OF MICROAREA ANALYSIS WITH A FOCUSED CESIUM ION BEAM

Kaoru Umemura, Kokubunji; Hiroyasu Schichi, Koganei, and Tohru Ishitani, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,299
Claims priority, application Japan, Feb. 23, 1990, 2-41006
Int. Cl.[5] H01J *37/256*
U.S. Cl. 250—309 31 Claims

1. A method of producing a focused cesium ion beam, comprising the steps of:

providing a sample to be irradiated by a cesium ion beam;

producing, by ion emission, a cesium ion beam from an ion source including a material at least containing cesium to maintain a total ion current of not greater than 5 μA while the sample is being irradiated by the ion beam; and

thereafter focusing the cesium ion beam.

5,148,028

MECHANISM FOR FEEDING RADIATION IMAGE STORAGE PANEL FROM CASSETTE TO READ-OUT MEANS

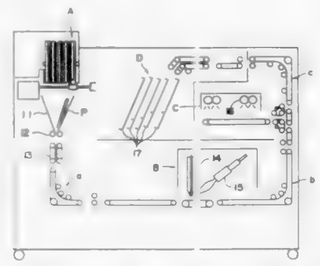
Hiroshi Ono, Hadano, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 634,817, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 534,374, Jun. 7, 1990, abandoned, which is a continuation of Ser. No. 445,102, Dec. 7, 1989, abandoned, which is a continuation of Ser. No. 330,949, Mar. 27, 1989, abandoned, which is a continuation of Ser. No. 219,847, Jul. 11, 1988, abandoned, which is a continuation of Ser. No. 39,691, Apr. 20, 1987, abandoned. This application Aug. 13, 1991, Ser. No. 747,473

Claims priority, application Japan Apr. 19, 1986, 61-90611

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—327.2 3 Claims



1. A mechanism for feeding a radiation image storage panel from a cassette to a read-out means, comprising:

a cassette for keeping therein a radiation image storage panel which is provided with a panel release part which is closed by a lock but opened when the lock is opened by a predetermined action;

a tray which receives thereon plural radiation image storage panels in such manner that the panel release part of each cassette is positioned downward;

a cassette lock release means having a means to give the predetermined action to the cassette to open the panel release part so that the radiation image storage panel kept therein is released and dropped down;

a moving means for moving the tray or the cassette lock release means so that the cassette lock release means is arranged at a position where the cassette lock release means applies to the panel release part of any desired cassette the predetermined action to open the panel release part; and

a guide member for receiving the dropped panel and guiding the panel to the read-out means.

5,148,029

IMPROVED SEAL SCINTILLATION CAMERA MODULE AND METHOD OF MAKING IT

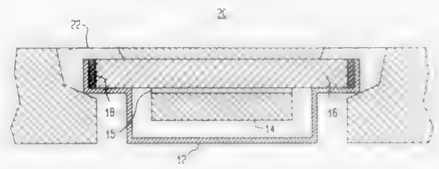
Dennis E. Persyk, Barrington; Ivan Jazbec, Wilmette, and Albrecht H. Enders, Palatine, all of Ill., assignors to Siemens Gammasonics, Inc., Hoffman Estates, Ill.

Filed Sep. 23, 1991, Ser. No. 763,709

Int. Cl.[5] G01T *1/164*

U.S. Cl. 250—361 R 13 Claims

1. A scintillation crystal module for use in a scintillation camera and being of a type in which a crystal is contained in backcap closed off by a glass window and in which an internal seal fills a gap between the window and the backcap, the scintillation crystal module comprising an external seal of moisture-impervious material attached to the outer surface of



the module on the backcap and window and bridging across the seal-filled gap therebetween.

5,148,030

RADIATION IMAGE DETECTING APPARATUS USING ADDRESS CODED SIGNALS

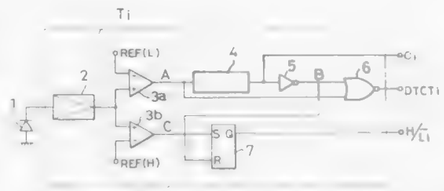
Motosada Kiri, Kyoto, and Susumu Adachi, Ibaraki, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Apr. 29, 1991, Ser. No. 692,418

Claims priority, application Japan, Apr. 27, 1990, 2-113448

Int. Cl.[5] G01T *23/02*

U.S. Cl. 250—370.09 2 Claims



1. A radiation image detecting apparatus having a radiation receiving component thereof composed of arrayed pixel-forming radiation detectors, said apparatus comprising:

a plurality of signal processing circuits;

a coding circuit for coding pulsed output signals of said radiation detectors with respect to the respect to the position of a radiation detector irradiated with a photon; and

two OR gates coupled to said signal processing circuits, each of said signal processing circuits comprising:

an amplifier means coupled to one of said radiation detectors for amplifying the output signals thereof;

a low level comparator means coupled to an output of said amplifier means for determining a low level output therefrom;

a high level comparator means coupled to said output of said amplifier means for determining a high level output therefrom, wherein said low level comparator supplies both an address forming signal to said coding circuit and a photo detection signal to one of said two OR gates, while said high level comparator supplies an energy level judging signal to the other of said two OR gates, each OR gate outputting to each radiation detector a common photon detection signal and energy level judging signal.

5,148,031

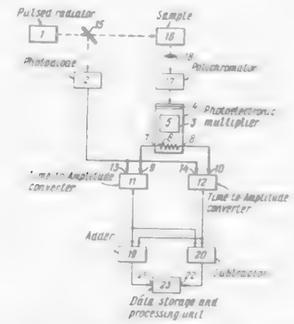
DEVICE FOR OBTAINING SPATIAL AND TIME CHARACTERISTICS OF A WEAK OPTICAL RADIATION FROM AN OBJECT

Valei F. Kamalov, ulitsa Ramenka, 9, korpus 1, kv. 17; Bulat N. Toleutaev, Leninskie gory, MGU, korpus D, komnata 332; Alexandr P. Shkurinov, Lomonosovsky prospekt, 23, kv. 413, all of Moscow; Mikhail R. Ainbund, ulitsa Manchesterskaya, 6, kv. 10, and Georgy A. Menshikov, prospekt Bolshevikov, 3, korpus 1, kv. 15, both of Leningrad, all of U.S.S.R.

Filed Jun. 18, 1991, Ser. No. 717,076

Int. Cl.[5] G01N *21/64*

U.S. Cl. 250—458.1 1 Claim



1. A device for obtaining spatial and time characteristics of a weak optical radiation from an object, comprising:

a holder for the test object,

an optical pulsed radiator for irradiating said object to produce a weak optical radiation from the object,

a photoelectronic multiplier with an anode formed by a delay line having a first end and a second end, for conversion of said weak optical radiation to electric signals,

an electric pulse generator for generating pulses synchronous with the pulses of said optical radiator, said generator including an output,

a first time-to-amplitude converter having a first input connected to said output of said generator, a second input connected to said first end of said delay line, and an output,

a second time-to-amplitude converter having a first input connected to said output of said generator, a second input connected to said second end of said delay line, and an output,

an adder circuit having a first input connected to said output of said first time-to-amplitude converter, a second input connected to said output of the second time-to-amplitude converter, and an output,

a subtractor circuit having a first input connected to said output of said first time-to-amplitude converter, a second input connected to said output of said second time-to-amplitude converter, and an output, and

a data storage and processing unit having a first input connected to said output of said adder circuit, and a second input connected to said output of said subtractor circuit.

5,148,032

RADIATION EMITTING DEVICE WITH MOVEABLE APERTURE PLATE

Fancisco Hernandez, Concord, Calif., assignor to Siemens Medical Laboratories, Inc., Concord, Calif.

Filed Jun. 28, 1991, Ser. No. 723,000

Int. Cl.[5] G21F *5/04*

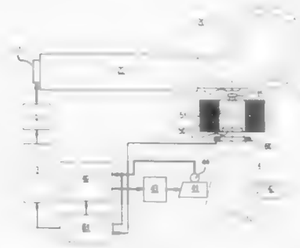
U.S. Cl. 250—492.1 5 Claims

1. A radiation emitting device for irradiating an object with a radiation beam, said radiation emitting device comprising:

a radiation source for generating a radiation beam, said source including a pulse generating unit for generating pulses and wherein variation of the pulse repetition frequency of said pulses varies the dose rate of said radiation beam;

an aperture plate arrangement located in the trajectory of said radiation beam between said radiation source and said object and including a plurality of plates for determining a radiation field at said object;

a drive control unit coupled to said aperture plate arrangement for moving at least one plate of said plurality of plates at a constant speed;



a dose rate measuring unit located in the trajectory of said radiation beam for measuring the dose rate of said radiation beam; and

a dose control unit coupled to said radiation source, said dose rate measuring unit and to said drive control unit for varying the pulse repetition rate of said pulses, and hence the dose rate of said radiation beam during irradiation in correlation with the movement of said plate at constant speed.

5,148,033

ELECTRON BEAM EXPOSURE DEVICE AND EXPOSURE METHOD USING THE SAME

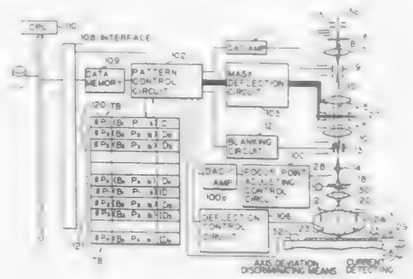
Akio Yamada, Kawasaki, and Kiichi Sakamoto, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 590,798, Oct. 1, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 769,343

Claims priority, application Japan, Sep. 30, 1989, 1-253763

Int. Cl.[5] H01J *37/302*

U.S. Cl. 250—492.2 25 Claims



1. An electron beam exposure device having a center axis and comprising:

an electron gun, a mask plate provided with a plurality of apertures configured in accordance with a plurality of respective patterns, each pattern aperture having a specific shape, for forming a corresponding cross-sectional shape of an electron beam composed of charged particles when selectively irradiated thereon, deflecting means provided both on a first side of said mask plate onto which said beam is irradiated and on a second side thereof from

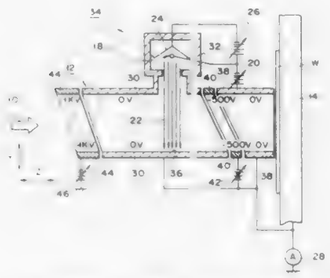
which said beam is emitted, for deflecting said beam from an original axis thereof so as to pass through a selected one of said apertures provided on said mask plate, and for deflecting again said beam after passing through said selected aperture so as to return said beam to said original axis thereof, a sample holding means for holding a sample, a focus point adjusting means provided between said mask plate and sample holding means, and a control means for controlling said focus point adjusting means, wherein said focus point adjusting means further comprises processing means for processing focus point adjusting condition data associated with each pattern utilizing a predetermined relationship between the cross-sectional area of the aperture of each pattern, as selected for use in an exposure, and a specific focus point adjusting value with respect to each said selected and used pattern, and supplying means for supplying information of said focus point adjusting condition data thus obtained to said focus point adjusting means.

5,148,034

ION IMPLANTATION METHOD

Yukio Koike, Nirasaki, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,236
Claims priority, application Japan, Apr. 21, 1989, 1-102859
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.2 12 Claims



1. An ion implantation method, comprising:

supplying neutralizing electrons to a passage through which a positive ion beam passes, while forming a first barrier of negative electrostatic potential in a region of the passage between where the neutralizing electrons are generated, and an object to be implanted, and

setting the potential of the first negative electrostatic barrier lower than the negative potential corresponding to energy held in most of the neutralizing electrons, when said positive ion beam is not present in said passage;

generating thermoelectrons in a recessed region of an ion implantation apparatus, said recessed region being recessed from a drift region through which an ion beam of said apparatus passes, thereby blocking thermoelectrons generated in said recessed region from said object to be implanted;

impacting the thermoelectrons onto a surface, thereby emitting secondary electrons; and

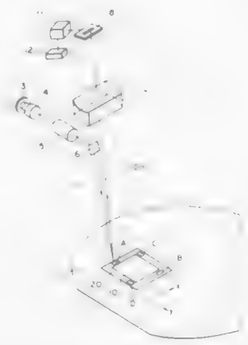
whereby when the positive ion beam is not passed through the passage, most of the neutralizing electrons cannot cross the first barrier of negative of electrostatic potential and when the positive ion beam is passed through the passage, most of the neutralizing electrons can cross the first barrier, following the positive ion beam, to shower over the object.

5,148,035

POSITION DETECTING METHOD AND APPARATUS

Jun Hattori, Zama, and Shigeyuki Suda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 692,975, Apr. 29, 1991, abandoned, which is a continuation of Ser. No. 403,881, Sep. 7, 1989, abandoned. This application Nov. 12, 1991, Ser. No. 789,630
Claims priority, application Japan, Sep. 9, 1988, 63-225803; Aug. 14, 1989, 1-209924
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 19 Claims



1. A device for detecting a positional relationship between first and second objects opposed in an opposing direction, with respect to a first direction perpendicular to the opposing direction, said device comprising:

light source means for projecting light to illuminate the first and second objects;

photodetecting means for receiving light from the illuminated first and second objects, said photodetecting means comprising means for detecting a position of incidence of the light upon a predetermined plane, which position changes with a change in the positional relationship between the first and second objects with respect to the first direction and with respect to a second direction which is perpendicular to both the opposing direction and to the first direction;

position detecting means for detecting the positional relationship between the first and second objects, with respect to the second direction; and

means for determining the positional relationship between the first and second objects with respect to the first direction, on the basis of the detection by said photodetecting means and by said position detecting means.

5,148,036

MULTI-AXIS WAFER POSITION DETECTING SYSTEM USING A MARK HAVING OPTICAL POWER

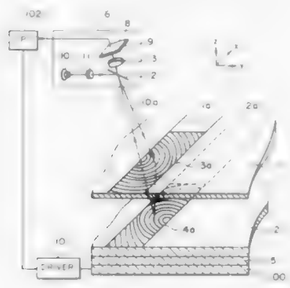
Masakazu Matsugu, Atsugi, and Kenji Saitoh, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 732,357, Jul. 18, 1991, abandoned, which is a continuation of Ser. No. 553,314, Jul. 17, 1990, abandoned. This application Feb. 18, 1992, Ser. No. 835,062
Claims priority, application Japan, Jul. 18, 1989, 1-186936
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 46 Claims

1. A position detection system for detecting the position of a substrate having a surface, with respect to a first direction perpendicular to the surface of the substrate and a second direction perpendicular to the first direction, by use of a mark formed on the substrate and having an optical power, said system comprising:

directing means for directing a radiation beam to the mark so that the radiation beam is deflected by the mark;

a sensor for receiving the radiation beam deflected by the mark, wherein the position of the radiation beam incident on said sensor is shiftable in a third direction in accordance with the position of the substrate with respect to the first direction and also is shiftable in a fourth direction, perpendicular to the third direction, in accordance with the position of the substrate with respect to the second direction, and wherein the mark is provided by a pattern



having a predetermined power with respect to said second direction and having substantially no power with respect to a fifth direction orthogonal to both of said first and second directions; and

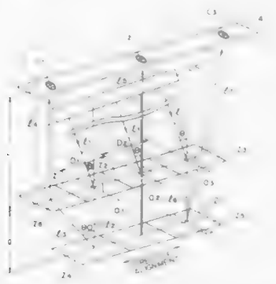
detecting means for detecting the position of the substrate with respect to the first and second directions on the basis of an output of said sensor corresponding to the position of incidence of the radiation beam upon said sensor.

5,148,037

POSITION DETECTING METHOD AND APPARATUS

Shigeyuki Suda, Yokohama; Sakae Houryu, and Noriyuki Nose, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 403,936, Sep. 7, 1989, abandoned. This application Mar. 26, 1991, Ser. No. 675,059
Claims priority, application Japan, Sep. 9, 1988, 63-225804
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 17 Claims



1. A device for detecting a positional relationship between first and second objects, said device comprising:

light source means for projecting light to irradiate the first and second objects;

photodetecting means for detecting light from the first and second objects irradiated with the light projected from said light source means, said detecting means comprising means for detecting first detected light whose position of incidence upon a predetermined plane is dependent upon the positional relationship of the first and second objects in a direction along an interval therebetween and in a direction perpendicular to the interval, means for detecting second detected light whose position of incidence upon the predetermined plane is dependent upon the positional relationship of the first and second objects in the direction of the interval therebetween, and means for detecting third detected light whose position of incidence upon the predetermined plane is independent of the positional relationship of the first and second objects in both the direction of the interval and the direction perpendicular to the interval; and

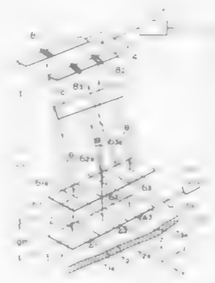
positional relationship detecting means for detecting the positional relationship of the first and second objects in the direction of the interval and in the direction perpendicular to the interval, on the basis of the detection by said photodetecting means.

5,148,038

DEVICE FOR DETECTING POSITIONAL RELATIONSHIP BETWEEN TWO OBJECTS

Noriyuki Nose, Machida, and Naoto Abe, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 684,497, Apr. 15, 1991, abandoned, which is a continuation of Ser. No. 404,106, Sep. 7, 1989, abandoned. This application Dec. 10, 1991, Ser. No. 804,514
Claims priority, application Japan, Sep. 9, 1988, 63-225809; Sep. 9, 1988, 63-226006; Aug. 14, 1989, 1-209928
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 21 Claims



1. A method of detecting a relative position of, and a gap between, opposed first and second substrates, wherein the first substrate is provided with a first pattern having a positive power and a second pattern having a negative power, while the second substrate is provided with a first mark having a negative power and a second mark having a positive power, said method comprising the steps of:

projecting a radiation beam to the first and second substrates to form a first beam pattern on a predetermined plane with the first pattern and the first mark, while a second beam pattern is formed on the predetermined plane with the second pattern and the second mark;

determining the relative position of the first and second substrates on the basis of an interval between the first and second beam patterns formed on the predetermined plane; and

determining the gap between the first and second substrates on the basis of the position of the first beam pattern on the predetermined plane.

5,148,039

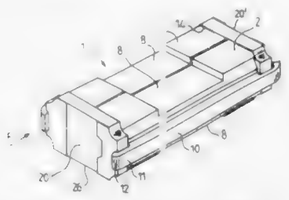
PHOTOCOUPLER HOUSING SUITABLE FOR SURFACE MOUNTING TO A CIRCUIT BOARD

Jacques C. Thillays, Herouville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1990, Ser. No. 623,869
Claims priority, application France, Dec. 29, 1989, 89 17453
Int. Cl.[5] G02B *27/00*
U.S. Cl. 250—551 12 Claims

1. A photocoupler comprising a first support carrying on a

surface thereof a phototransmitter, a second support carrying on a surface thereof a photoreceiver element, and an electrically insulating housing in which the first and second supports are assembled in such a way that the faces on which the respective elements are provided face one another, wherein the first and second support are constructed from an electrically insulating material, are assembled on opposite sides of a longitudinal direction of the housing and have a lateral surface lying in an outer surface of the photocoupler on which lateral surface two conductor tracks are provided that are in electrical contact with the respective elements and which tracks permit the surface mounting of the photocoupler.

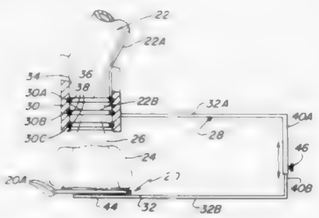


5,148,040

RADIATION BLOCKING DEVICE AND METHOD OF USE WITH RADIATION DETECTING PROBE

Robin A. Wise, Jr., Morgan Hill, Calif., and Robert G. Carroll, Largo, Fla., assignors to Care Wise Medical Products Corp., Morgan Hill, Calif.

Filed Jul. 11, 1991, Ser. No. 728,509
Int. Cl.[5] G21F *3/00*
U.S. Cl. 250—515.1 **21 Claims**



1. A shield for use with a radiation detecting probe to effect the detection, localization, imaging or mapping of radiation in a first, internal portion of the body of a living being by use of a radiation detecting probe, said probe having a field of view, said shield comprising a sheet formed of a radiation blocking material and sized to be readily located within a space in the body of the being so that said first, internal portion is interposed between remainder said shield and said probe, with said shield filling up a substantial portion of the field of view, thereby blocking radiation from sources behind said shield.

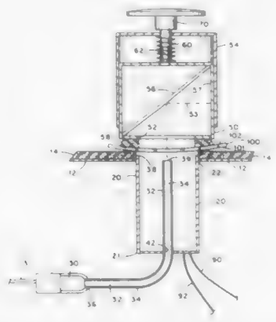
5,148,041

REFLECTOMETER

Herbert Wertheim, Coral Gables; Hernan Bormey, and Carlos Bormey, both of Miami, all of Fla., assignors to Brain Power, Inc., Miama, Fla.

Filed Feb. 7, 1991, Ser. No. 652,016
Int. Cl.[5] G01B *9/00*
U.S. Cl. 250—571 **12 Claims**

1. A reflection meter for measuring the reflection of light from a surface comprising;
a chamber;
a light source for producing light inside said chamber and directing the light in a direction toward the surface to produce reflected light from the surface;
a window formed in said chamber for being positioned adjacent to the surface, for transmitting light from the light source to the surface, and for receiving light reflected from the surface;
a detector for detecting the reflected light and producing a detect signal corresponding to the intensity of the light reflected from the surface, said detector being positioned out of the path of the light produced by the light source



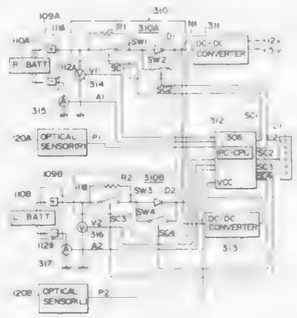
and being disposed in the path of the light reflected from the surface, said light source extending through said detector; and
an apparatus for receiving the detect signal and producing a display signal representative of the detect signal and indicating the intensity of the light received by the photoelectric detector.

5,148,042

SMALL ELECTRONIC DEVICE CAPABLE OF SWITCHING BATTERIES BY RELEASING A BATTERY LOCKING MECHANISM

Masayo Nakazoe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 6, 1990, Ser. No. 578,235
Claims priority, application Japan, Dec. 29, 1989, 1-343064
Int. Cl.[5] H02J *9/06*
U.S. Cl. 307—65 **19 Claims**



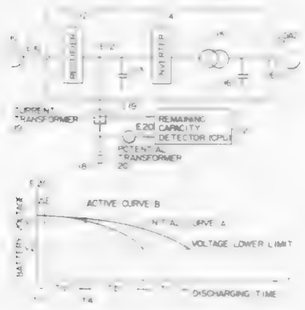
1. An electronic device comprising:
a main body having a plurality of mounting portions;
a plurality of batteries respectively detachably mounted on said plurality of mounting portions;
a plurality of locking means for locking said batteries on their corresponding mounting portions;
a plurality of releasing means for releasing said plurality of locking means while said batteries are mounted on said mounting portions;
first detecting means for detecting whether each of said locking means has been released by its corresponding releasing means;
a switching circuit, including a plurality of first switches, for connecting said plurality of batteries to a power supply node; and
switch control means for controlling said plurality of first switches to that one of the batteries is connected to the power supply node, and for switching from an off state to an on state the first switch corresponding to one of the other batteries when the first detecting means detects that the locking means corresponding to the battery connected to the power supply node is released.

5,148,043

UNINTERRUPTIBLE POWER SUPPLY DIAGNOSING REMAINING BATTERY CAPACITY DURING NORMAL EXTERNAL POWER SOURCE OPERATION

Akio Hirata, Fuchu; Yoshiaki Miyazawa, Hachioji, and Michiro Yamazaki, Fuchu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 23, 1990, Ser. No. 555,762
Claims priority, application Japan, Jul. 25, 1989, 1-191840; Sep. 29, 1989, 1-252152
Int. Cl.[5] H02J *7/04, 9/06*
U.S. Cl. 307—66 **17 Claims**



1. A power supply, which is energized by at least one of an external power source and a battery, and supplies electric power to a load, comprising:
means for detecting a battery voltage generated by the battery;
means for detecting an amount of electric charges discharged from the battery when the power supply is energized by the battery; and
means for detecting a remaining capacity of the battery in accordance with a change in the battery voltage when the external power source is free of power failure;
wherein said battery voltage change is a difference between an initial voltage of the battery and an active voltage of the battery obtained when the battery is discharged by a predetermined current for a predetermined period of time.

5,148,044

STRUCTURE OF MULTIPLEX CONNECTOR

Chen Yung-Chaun, No. 98, Chun Jih Road, Taoyuan City, Taipei, Taiwan

Filed Feb. 27, 1990, Ser. No. 485,507
Int. Cl.[5] H05B *39/04*
U.S. Cl. 307—140 **4 Claims**

1. A multiplex connector, comprising:
means including a pyroelectric infrared detector for detecting changes in ambient temperature;
a bandpass amplifier having an input terminal connected to an output pole of said pyroelectric infrared detector;
a window-limited comparator circuit including a first comparator having an input terminal connected to an output terminal of said bandpass amplifier;
a timer circuit including a second comparator having an input terminal connected to an output terminal of said window-limited comparator circuit;
a third comparator having an input terminal connected to an output terminal of a photoelectric element, an output terminal of said third comparator being connected to a second input terminal of said second comparator;
a triac and a rectifier circuit connected in series with a load;
means including an electronic switching circuit connected between an output terminal of said second comparator and said triac for triggering said triac when said second comparator is switched on, said rectifier circuit including a full-wave and a current limiting resistor connected between said triac and said load respectively to turn said load on and off when said second comparator is switched on and off in response to signals detected by said infrared detector;

a first voltage regulator having an input terminal connected to an output terminal of said rectifier circuit and said electronic switching circuit, and a second regulator having an input terminal connected to an output terminal of said first regulator and an output connected to a second pole of said pyroelectric infrared detector to form a loop, wherein said triac includes a gate connected to a shunt point of said rectifier circuit, said triac comprising two electric poles which are triggered to shunt a voltage produced by the closing and opening of a transistor of said electric switching circuit, said transistor therefore being controlled by said loop, so as to provide said load with a working voltage; and
means including said photoelectric element and a variable resistor, said variable resistor being connected in series between said photoelectric element and an input of said third comparator for providing a reference potential which determines an intensity of light required to switch on said third comparator.

5,148,045

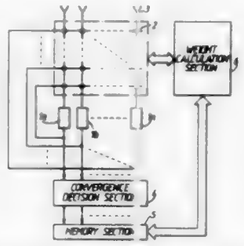
APPARATUS AND METHOD FOR ASSIGNING A PLURALITY OF ELEMENTS TO A PLURALITY OF CELLS

Shigeru Oyanagi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 19, 1991, Ser. No. 656,682
Claims priority, application Japan, Feb. 27, 1990, 2-044491
Int. Cl.[5] G06G *7/12*
U.S. Cl. 307—201 **18 Claims**

1. An apparatus for assigning plural elements to plural cells, comprising:
a plurality of neurons corresponding in number to the elements, wherein the neurons generate an output signal by operating on an input signal;
network interconnecting means for interconnecting said plurality of neurons;
activating means for setting a weight of connection between the neurons interconnected by the network interconnect-

ing means, for activating the network interconnecting means for each neuron by providing as an input signal for each neuron a sum of the product of each of the output signals of the neurons and a corresponding weight of connection between the neurons, and for generating the output signal from each neuron, wherein the output signals from said plurality of neurons are used to identify the



cells to which the corresponding elements are to be assigned;

changing means for changing the weights of connection between the neurons when the output signals of the neurons converge; and

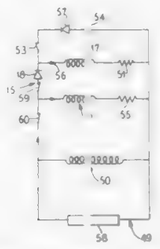
reactivating means for reactivating the network interconnecting means whenever the weights of connection between the neurons are changed.

5,148,046

SUPERCONDUCTIVE SWITCHING DEVICE AND METHOD OF USE

Mohamed A. Hilal, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 9, 1990, Ser. No. 594,728
Int. Cl.[5] H03K *17/92*
U.S. Cl. 307—245 35 Claims



1. A superconductive switching device which requires a relatively small first current to switch, the switching device comprising:

a) superconductive gate means having a non-superconductive normal state and a conductive state which permits a second current to flow through the gate means without substantial electrical resistance; and

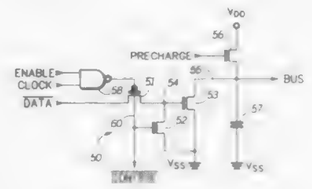
b) superconductive trigger means in magnetic and parallel electrical communication with the gate means such that when the first current flows through the trigger means a magnetic field is generated which puts the gate means in its non-superconductive normal state and the second current from the gate means diverts to the trigger means and renders the trigger means non-superconductive.

5,148,047

CMOS BUS DRIVER CIRCUIT WITH IMPROVED SPEED

Thomas S. Spohrer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 536,375, Jun. 11, 1990, abandoned.
This application Feb. 14, 1992, Ser. No. 835,114
Int. Cl.[5] H03K *17/56, 3/26*
U.S. Cl. 307—246 8 Claims



1. A circuit comprising:

a data bus line;

means for precharging said data bus line;

means for receiving a data signal;

a first P-channel transistor coupled to said means for receiving said data signal, having a first current electrode for receiving said data signal, a control electrode for receiving a control signal, and a second current electrode;

a second transistor having a first current electrode coupled to said second current electrode of said first transistor, a control electrode for receiving said control signal, and a second current electrode coupled to a power supply voltage terminal; and

a third transistor having a first current electrode coupled to said data bus line, a control electrode coupled to said second current electrode of said first transistor, and a second current electrode coupled to said power supply voltage terminal.

5,148,048

CMOS OUTPUT CIRCUIT HAVING CONTROLLED SLOPE

Masayuki Kawasaki, and Kiyomitsu Takatani, both of Ooita, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 3, 1991, Ser. No. 709,385
Claims priority, application Japan, Jun. 4, 1990, 2-144411
Int. Cl.[5] H03B *1/04;* H03K *5/12*
U.S. Cl. 307—263 4 Claims

1. A CMOS output circuit comprising:

a first power supply of high potential;

a second power supply of low potential;

a signal output terminal;

a first MOS transistor of a P-channel type having a source, a drain and a gate, said source being connected to said first power supply;

a second MOS transistor of a P-channel type having a source, a drain and a gate, said source connected to the drain of said first MOS transistor, said drain being connected to said signal output terminal;

a third MOS transistor of an N-channel type having a source, a drain and a gate, said source being connected to said second power supply;

a fourth MOS transistor of an N-channel type having a source, a drain and a gate, said source connected to the drain of said third MOS transistor, said drain connected to said signal output terminal wherein each said gate of said first, second, third and fourth MOS transistor receives a first or a second input signal;

a first diode having an anode connected to the source of said first MOS transistor, and a cathode connected to the drain of said first MOS transistor; and

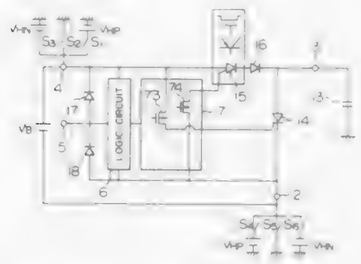
a second diode having an anode connected to the drain of said third MOS transistor, and a cathode connected to the source of said third MOS transistor.

5,148,049

CIRCUIT FOR DRIVING A CAPACITIVE LOAD UTILIZING THYRISTORS

Mitsuhiko Okutsu, Katsuta; Kenji Abe, Hitachi, and Tadaaki Kariya, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Ltd., Ibaraki, both of, Japan

Filed Sep. 11, 1989, Ser. No. 405,230
Claims priority, application Japan, Sep. 20, 1988, 63-233433
Int. Cl.[5] H03K *3/26, 17/51*
U.S. Cl. 307—270 9 Claims



1. A driving circuit comprising:

a first power source terminal;

a second power source terminal;

an input terminal;

an output terminal, with which a capacitive load is connected;

a source side thyristor having first and second main current terminals and an anode gate terminal, and supplying current to said load;

a sink side thyristor having first and second main current terminals and a cathode gate terminal, and drawing-out current from said load; and

a control section connected between said first power source terminal and said second power source terminal,

wherein said first main current terminal of said source side thyristor is connected with aid first power source terminal, said second main current terminal of said source side thyristor is connected with aid output terminal through a PN junction element, and said anode gate terminal of said source side thyristor is connected with said first power source terminal thereof through a first switching element and with said power source terminal thereof through a second switching element, and wherein said first main current terminal of said sink side thyristor is connected with said output terminal, said second main current terminal of said sink side thyristor is connected with said second power source terminal, and said cathode gate terminal of said sink side thyristor is connected with said first power source terminal through a third switching element and with said second power source terminal through a fourth switching element, respectively,

wherein said control section is connected with said first, second, third and fourth switching elements and said input terminal so that said first, second, third and fourth switching elements are each controlled by said control section in response to an input signal on said input terminal, and

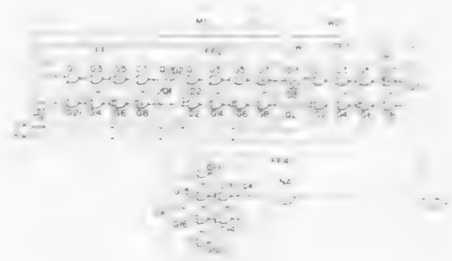
wherein aid first power source terminal is held at a potential higher than said second power source terminal, and the potential difference between said two power source terminals is sufficiently great to drive said control section.

5,148,050

VARIABLE FREQUENCY-DIVIDING CIRCUIT

Nobuo Koide, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1991, Ser. No. 747,710
Claims priority, application Japan, Aug. 23, 1990, 2-219936
Int. Cl.[5] H03L *7/00*
U.S. Cl. 307—271 17 Claims



7. A variable frequency-dividing circuit comprising:

a frequency-dividing circuit for frequency-dividing an input signal according to a clock signal and for generating a frequency-divided signal, said frequency-dividing circuit including a first gate circuit responsive to said input signal, the first gate circuit including an output stage having a field effect transistor having a first channel width and a first current-driving performance, and a second gate circuit for generating said frequency-divided signal, the second gate circuit including an output stage having a field effect transistor having a second channel width greater than the first channel width and a second current-driving performance two to four times greater than the first current driving performance; and

feedback circuit means for feeding a signal from said second gate circuit to said first gate circuit.

5,148,051

POWER UP CIRCUIT

Kevin E. Deierling, and Louis Rodriguez, both of Dallas, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 14, 1990, Ser. No. 628,693
Int. Cl.[5] H03K *17/20*
U.S. Cl. 307—272.3 18 Claims

1. A CMOS integrated circuit, comprising:

a first pull-up device connected to source current to a first node,

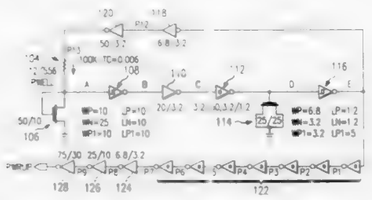
a reference-voltage current path, connected to hold the potential of said first node to at most a predetermined reference voltage,

an inverting logic stage connected to receive the potential of said first node as an input thereto;

an integration capacitor, and a second pull-up device connected to source current to said integration capacitor as soon as said inverting logic stage provides a "high" output voltage;

a thresholding logic stage, configured to initially assume a first logical state at power-up, and connected to switch from said first state to a second state whenever said capacitor has been charged to a predetermined threshold level; and

an output buffer chain, comprising one or more output



buffer stages, which is operatively connected to drive a power-up warning signal line high when said thresholding logic stage is in said first state, but not when said thresholding logic stage is in said second state;

said first pull-up being operatively connected to stop sourcing current when said thresholding logic stage switches to said second state.

5,148,052

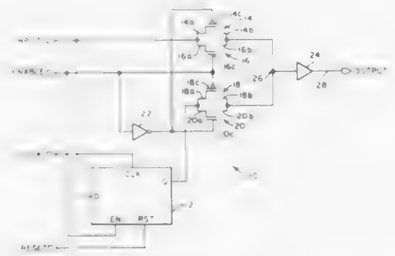
RECIRCULATING TRANSPARENT LATCH EMPLOYING A MULTIPLEXING CIRCUIT

Krishna M. Yellamilli, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 10, 1991, Ser. No. 774,795

Int. Cl.[5] H03K *3/26, 11/687*

U.S. Cl. 307—279 **11 Claims**



1. A data latching circuit comprising.

a transparent latch circuit having an input signal and an output signal and that is responsive to a control signal so that the output signal tracks the input signal when the control signal is asserted and latches the output signal when the control signal is deasserted;

a multiplexing circuit having a first mux input coupled to the input signal of the transparent latch circuit and a second mux input coupled to the output signal of the transparent latch circuit, the multiplexing circuit further receiving the control signal for selectively coupling the first mux input to a mux output when the control signal is asserted and the second mux input to the mux output when the control signal is deasserted.

5,148,053

SAFETY DEVICE FOR POWERED MACHINERY

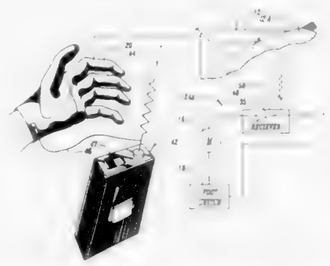
Gerald N. Dubois, III, Pleasant Hill, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation of Ser. No. 419,124, Oct. 10, 1989, Pat. No. 5,025,175. This application Feb. 21, 1991, Ser. No. 659,514

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] F16P *3/00;* **B26D** *7/22*

U.S. Cl. 307—328 **2 Claims**



1. A safety means for a meat skinning machine comprising a rotationally powered gripping roll means which functions in conjunction with a cutting knife to sever the skin from a portion of meat, comprising,

a safety glove adapted for wearing by a machine operator, said glove having an electroconducting surface,

an electrically powered skinning machine having a frame, a rotationally powered gripping roll means on said frame,

a radio signal receiver actuated control means on said meat skinning machine to control the rotation of said gripping roll by allowing rotation thereof during reception of a radio signal, and stopping rotation thereof when said radio signal is interrupted,

a radio signal transmitter means connected to said electroconducting surface of said glove so that when said electroconducting surface is grounded to said skinning machine, any radio signal emitted by said transmitter means will be interrupted and said control means will stop rotation of said gripping roll.

5,148,054

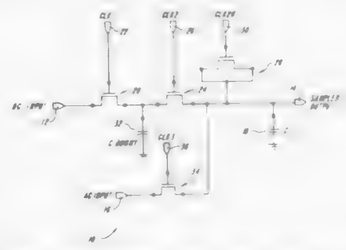
HIGH ACCURACY MOSFET-SWITCHED SAMPLING CIRCUIT

Michael J. Demler, Mansfield, Mass., assignor to Unitrode Corporation, Billerica, Mass.

Filed Aug. 7, 1991, Ser. No. 741,549

Int. Cl.[5] H03K *17/16, 17/687*

U.S. Cl. 307—352 **20 Claims**



1. A circuit compensating charge feedthrough error in the form of unwanted currents produced as a switching MOSFET in a DC input signal path defined between a DC input terminal and a load is cyclically switched to its "off" condition from its "on" condition in order to enable a DC input signal applied to the DC input terminal to be sampled onto the load, which unwanted currents would otherwise corrupt the accuracy with which an AC input signal is able to be sampled onto the same load along an AC input signal path defined between an AC input signal terminal and the same load, comprising:

first means in the DC input signal path for feeding a preselected portion less than unity of the feedforward charge feedthrough error of the switching MOSFET to the load;

second means including an isolating MOSFET in the DC input signal path cooperative with the first means for electrically isolating the first means from the AC input signal path, the isolating MOSFET producing feedforward charge feedthrough error to the load as it is switched to its "off" condition from its "on" condition; and

third means cooperative with the first and second means for exactly compensating the load for the feedforward charge feedthrough error of the isolating MOSFET of the second means.

5,148,055

HOLDING CIRCUIT FOR PROVIDING A LARGE TIME CONSTANT BY USING A BASE CURRENT TO CHARGE THE CAPACITOR

Kazunori Nohara, Osaka, Japan, assignor to Sanyo Electric Co., Ltd, Moriguchi, Japan

Filed Nov. 19, 1991, Ser. No. 794,143

Claims priority, application Japan, Nov. 19, 1990, 2-313472; Nov. 9, 1991, 3-344175

Int. Cl.[5] H03K *5/159, 5/153*

U.S. Cl. 307—353 **7 Claims**

1. A holding circuit, comprising:

a differential amplifier in which a reference voltage is applied to a first input terminal and a voltage to be held is applied to a second input terminal;

a first transistor whose conducting state is controlled by current which flows in response to a difference in two input voltages of the differential amplifier;

a second transistor whose collector current is controlled by collector current of said first transistor wherein the collector currents of said transistors are approximately equal in magnitude;

a capacitor connected with the base of said second transistor at one terminal and charged by the base current; and

a discharge circuit connected with said one terminal of said capacitor.

5,148,056

OUTPUT BUFFER CIRCUIT

Kevin W. Glass, San Jose, and Ashok Nagarajan, Fremont, both of Calif., assignors to MOS Electronics Corp., Sunnyvale, Calif.

Filed Mar. 27, 1991, Ser. No. 676,780

Int. Cl.[5] H03K *17/16, 17/687*

U.S. Cl. 307—443 **9 Claims**

1. An output buffer circuit comprising:

an input terminal;

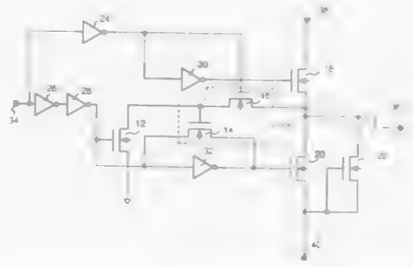
an output terminal;

a first supply terminal for providing a first reference voltage;

a second supply terminal for providing a second reference voltage;

a first field-effect-transistor having a drain terminal coupled to said first supply terminal, a source terminal coupled to said output terminal, and a gate terminal coupled to said input terminal;

a second field-effect-transistor having a drain terminal coupled to said output terminal, a source terminal coupled to said second supply terminal, and a gate terminal; and



feedback means coupled to said input terminal and to said output terminal, said feedback means including:

a third field-effect-transistor having a first terminal coupled to said output terminal, a gate terminal coupled to said input terminal, and a second terminal; and

a fourth field-effect-transistor having a first terminal coupled to said gate terminal of said second field-effect-transistor, and a gate terminal coupled to the second terminal of said third transistor.

5,148,057

CIRCUIT APPARATUS FOR DETECTING PRECEDING VALUE ONE

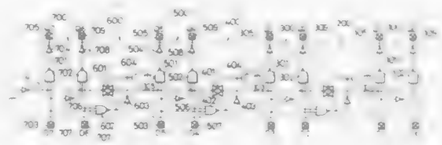
Yoshitsugu Kitora, Ikeda, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 15, 1991, Ser. No. 700,511

Claims priority, application Japan, Jun. 6, 1990, 2-148006

Int. Cl.[5] H03K *19/01*

U.S. Cl. 307—443 **3 Claims**

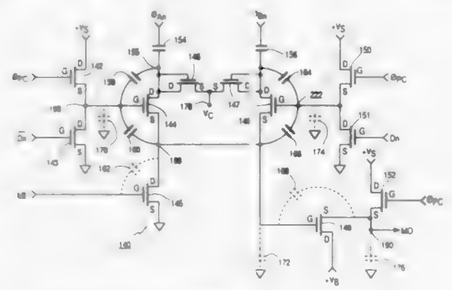


1. A circuit apparatus for detecting a preceding value "1", comprising:

a preceding value "1" detecting circuit for dividing detected data constructed by plural bits into blocks every plural bits from an upper bit side, said preceding value "1" detecting circuit detecting the preceding value "1" by bit data supplied every divided block and a detecting signal indicative of value "1"; and

a value "1" detecting signal transmitting circuit for detecting whether all the bit data supplied to said preceding value "1" detecting circuit at the preceding stage show value "0" or not, said value "1" detecting signal transmitting circuit transmitting the detecting signal indicative of value "1" as a basis of the detection of the preceding value "1" to said preceding value "1" detecting circuit at the next stage on the basis of detected results.

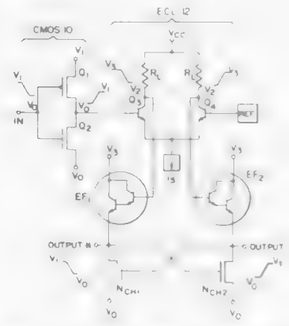
5,148,058
LOGIC CIRCUITS AS FOR AMORPHOUS SILICON SELF-SCANNED MATRIX ARRAYS
Roger G. Stewart, Neshanic Station, N.J., assignor to Thomson, S.A., France
Filed Dec. 3, 1990, Ser. No. 620,682
Int. Cl.[5] H03K 19/096, 19/20
U.S. Cl. 307—453 11 Claims



1. A logic circuit comprising:
a source of supply potential;
a source of first and second control signals;
a source of third control signal
a capacitor;
first and second transistors respectively having first and second electrodes and a principal conduction path therebetween, and having respective control electrodes, the first electrode of said first transistor being coupled to the second electrode of the second transistor and forming an output terminal thereat, the first electrode of said second transistor being coupled to said source of supply potential, and said capacitor being coupled between the second electrode of said first transistor and said source of third control signal;
means for applying said first and second control signals to the control electrodes of said first and second transistors respectively;
selectively conductive means, coupled to the second electrode of said first transistor, for preventing potentials occurring at the second electrode of said first transistor from exceeding a predetermined amplitude.

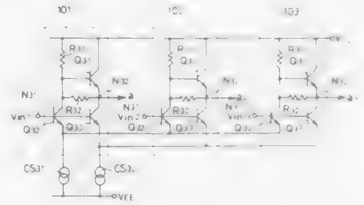
5,148,059
CMOS AND ECL LOGIC CIRCUIT REQUIRING NO INTERFACE CIRCUITRY
Chih-Liang Chen, Briarcliff; Peter W. Cook, Mount Kisco, and Lewis M. Terman, South Salem, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 2, 1991, Ser. No. 679,363
Int. Cl.[5] H03K 19/092, 19/086
U.S. Cl. 307—475 20 Claims

1. An emitter-coupled logic circuit for directly coupling to a CMOS circuit, comprising:
input node means for receiving an input signal from a CMOS circuit operating between a first potential V_0 and a second potential V_1;
means, coupled to the input node means and responsive to the received signal, for generating an intermediate electrical signal that swings between a third potential V_2 and a fourth potential V_3, wherein V_3 is equal to approximately $V_2+(V_1-V_0)$; and
output node means, having an input coupled to an output of the generating means, for outputting, in response to the



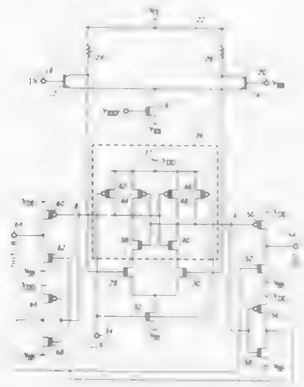
intermediate electrical signal swinging between V_2 and V_3, a first output signal that swings between V_0 and V_1.

5,148,060
ECL INPUT BUFFER FOR BICMOS
Atsushi Ohba, and Shigeki Ohbayashi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 7, 1990, Ser. No. 624,092
Claims priority, application Japan, Dec. 14, 1989, 1-326284; Jun. 18, 1990, 2-160214
Int. Cl.[5] H03K 19/092, 19/086
U.S. Cl. 307—475 18 Claims



1. A semiconductor integrated circuit connected to a voltage source for providing a predetermined voltage (V_{CC}), comprising
a plurality of buffer circuit means, a first constant current source and a second constant current source,
each of said plurality of buffer circuit means comprising
an input node for receiving an input signal,
an output node from which an output signal is derived,
a first transistor, coupled between said voltage source and said output node, having a control terminal,
a first resistance means connected between said voltage source and said control terminal of said first transistor,
a second resistance means connected between said output node and said control terminal of said first transistor,
a second transistor connected between said control terminal of said first transistor and said first constant current source, having a control terminal connected to said input node, and
a third transistor connected between said output node and said second constant current source, having a control terminal receiving a signal in phase with said input signal.

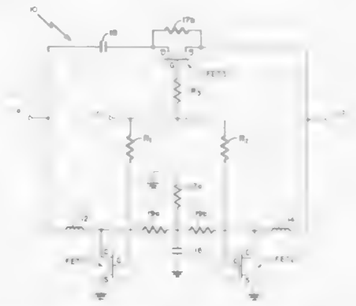
5,148,061
ECL TO CMOS TRANSLATION AND LATCH LOGIC CIRCUIT
Paul Hsueh, Chandler; Douglas Smith, Mesa, both of Ariz., and Gerald B. Hershkowitz, Ramat-Gan, Israel, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 27, 1991, Ser. No. 661,152
Int. Cl.[5] H03K 19/092, 19/096
U.S. Cl. 307—475 15 Claims



12. An integrated memory circuit including an ECL input logic signal to CMOS output logic translation and latch circuit wherein said translation and latch circuit comprises:
input buffer means responsive to ECL input logic signals for providing differential ECL logic output signals;
circuit means responsive both to applied clock pulses and said differential ECL logic output signals for providing first and second CMOS control signals at first and second outputs thereof and for latching said CMOS control signals to a predetermined logic level during the absence of said applied clock pulses;
inverter circuit means responsive to said first and second CMOS control signals for providing first and second complementary control signals; and
output circuit means responsive to said first and second CMOS control signals and said first and second control signals for providing first and second complementary CMOS output logic signals at first and second outputs of the translation and latch circuit, said inverter circuit means causing said CMOS output logic signals to be latched at their predetermined logic level states between said applied pulses.

5,148,062
SIMPLIFIED PHASE SHIFTER CIRCUIT
Marc E. Goldfarb, Atkinson, N.H., assignor to Raytheon Company, Lexington, Mass.
Filed Dec. 19, 1991, Ser. No. 810,616
Int. Cl.[5] H03L 7/00; H03B 1/00; H03K 17/687; H03H 7/20
U.S. Cl. 307—511 5 Claims

1. A phase shifter network comprising:
a pair of inductors, each one thereof having a first end serially coupled to a common junction;
a capacitor element coupled in shunt between a reference potential and the common junction;
a first switching device having one input thereof coupled to the common junction and the first end of a first one of the pair of inductor elements and a second input thereof coupled to the reference potential;
a second switching device having one input thereof coupled to the common junction and the first end of a second one of the inductor elements and a second input thereof coupled to the reference potential;
a second capacitor having a first electrode coupled to an input terminal network; and
a transistor having a pair of electrodes with a first one of the electrodes of the transistor coupled to a second electrode



of said second capacitor and a second one of said electrodes of the transistor being coupled to an output terminal network with a control electrode of said transistor being coupled to control electrodes of said first and second switching devices and to a common control terminal of the network.

5,148,063
SENSE AMPLIFIER CIRCUIT USING DUMMY MEMORY CELLS
Yasuhiro Hotta, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 20, 1991, Ser. No. 658,039
Claims priority, application Japan, Feb. 21, 1990, 2-40082
Int. Cl.[5] G11C 7/00
U.S. Cl. 307—530 2 Claims

1. A sense amplifier circuit for detecting whether a logic state of a detected memory cell including a transistor is "1" or "0" via a data line connected to the transistor, comprising:
a first dummy memory cell including a first transistor which has characteristics identical to the "1" logic state characteristics of the detected memory cell;
a second dummy memory cell including a second transistor which has characteristics identical to the "0" logic state characteristics of the detected memory cell;
a first reference line which is connected to the first dummy memory cell and to which is applied a reference potential of a level corresponding to the characteristics of the first transistor of the first dummy memory cell;
a second reference line which is connected to the second dummy memory cell and to which is applied a reference potential of a level corresponding to the characteristics of the second transistor of the second dummy memory cell; and
a differential amplifier circuit which receives signals from

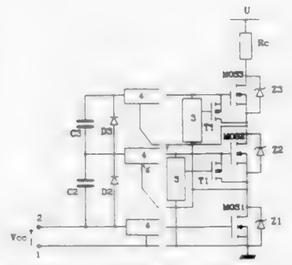
the data line connected to the detected memory cell and the first and second reference lines as a differential input, and outputs either a high level or a low level according to the logic state of the detected memory cell based on the potential of the first or second reference line, the potential selected being that which differs from the potential of the data line.

5,148,054

MEDIUM VOLTAGE STATIC SWITCH

Antoine Kevorkian, Grenoble; Claude Raulet, Ecully, and Gérard Rojat, Chaponost, all of France, assignors to Merlin Gerin, Meylan, France

Filed Mar. 4, 1991, Ser. No. 664,304
Claims priority, application France, Mar. 16, 1990, 90 03508
Int. Cl.[5] H03K *17/60*
U.S. Cl. 307—571 **9 Claims**



1. A medium voltage static switch comprising: a plurality of voltage-controlable semi-conductor devices, each semi-conductor device comprising a gate, a source and a drain, connected in series with a load impedance to the terminals of a voltage supply, and a control device comprising a plurality of successive stages, each stage comprising one of the semi-conductor devices, wherein the control device comprises a single control input formed by first and second control terminals respectively connected to the source and gate of the semi-conductor device of a first stage of the successive stages, and a capacitance is connected in parallel with a diode between the gates of the semi-conductor devices of adjacent stages, said diodes being reverse polarized when the switch is open, and wherein each successive stage above the first stage includes a detection circuit, to whose input a voltage is applied that is representative of the drain-to-source voltage of the semi-conductor device of a preceding stage, and a detection circuit semi-conductor device, connected between the source and gate of the semi-conductor device of the respective stage and having a gate connected to the output of the detection circuit of the respective stage, wherein the detection circuit semi-conductor device is turned off when the drain-to-source voltage applied to the input of the detect circuit exceeds a preset threshold.

5,148,065

CURRENT STEERING CIRCUITS AND METHODS WITH REDUCED CAPACITIVE EFFECTS

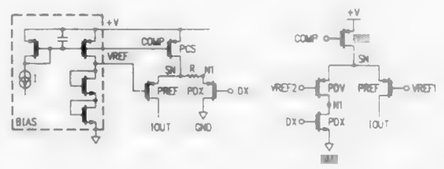
William R. Krenik, Garland, and Louis J. Izzi, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1991, Ser. No. 723,089
Int. Cl.[5] H03K *3/01*
U.S. Cl. 307—572 **35 Claims**

1. A reduced-capacitance current steering circuit configured to reduce data-switching-induced capacitive effects, comprising:

a current steering circuit including a current source biased to feed a substantially constant current into a summing node, where the current is steered either to an output leg or to a ground leg;

a data-switched device coupled into one of the circuit legs for controlling the current steering operation in response to a data switching signal;



a voltage-controlled device, coupled into the other circuit leg, for receiving a control voltage signal such that it switches cooperatively with said data-switched device;

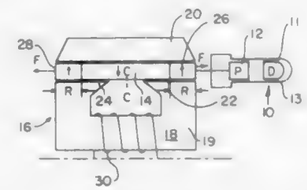
a compensation device coupled into either said output leg or said ground leg so as to reduce data-switching-induced capacitive effects, and associated voltage perturbations, at said summing node.

5,148,066

LINEAR GENERATOR OR MOTOR WITH INTEGRAL MAGNETIC SPRING

William T. Beale, and Robert W. Redlich, both of Athens, Ohio, assignors to Sunpower, Inc., Athens, Ohio

Filed Aug. 19, 1991, Ser. No. 752,270
Int. Cl.[5] F25B *9/14*; **F01B** *29/10*
U.S. Cl. 310—17 **10 Claims**



1. An improved thermomechanical transducer having a reciprocating piston drivingly linked to a main magnet for reciprocating the main magnet along a reciprocation, path through at least two gaps defined by at least two pairs of opposed pole faces, the gaps being formed in a low reluctance flux loop, the main magnet being polarized across the gap, the improvement comprising a pair of secondary magnets mounted to the main magnet in the reciprocation path and symmetrically positioned on opposite sides of the main magnet, the secondary magnets both polarized oppositely to the main magnet.

5,148,067

LATCHING LINEAR MOTOR

Laurence LaSota, 15745 N. Park, East Detroit, Mich. 48021

Filed Jul. 1, 1991, Ser. No. 724,595
Int. Cl.[5] H02K *41/02, 7/06, 33/02, 35/02*
U.S. Cl. 310—24 **12 Claims**

1. A linear motor comprising:

a linearly movable output member;

an electromagnetic solenoid formed of a core and a coil, a plunger movably disposed within the core and movable from a first extended position with respect to the core and a second position in which the plunger is drawn into the core by magnetic attraction with the core when electric current is applied to the coil, the plunger being movable a predetermined distance from the first to the second position;

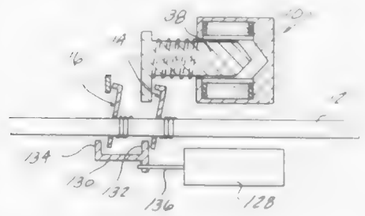
means for moving the plunger to the first extended position;

means, responsive to movement of the plunger from the first to the second position, for engaging and advancing the output member a distance substantially equal to the predetermined distance of movement of the plunger, the engaging and advancing means including:

first unidirectional latch means coupled to the output member and movable between a first position freely movable with respect to the output member and a second position in which the first latch means is fixedly engaged with the output member; and

means for normally biasing the first unidirectional latch means to the first position;

the plunger being engageable with the first latch means and overcoming the force of the biasing means for moving the first latch means to the second position into fixed engagement with the output member when the plunger moves from the first to the second positions to advance the first latch means and the output member fixedly connected thereto a distance substantially equal



to the predetermined distance of movement of the plunger;

means, coupled to the output member, for retaining the output member in an incremental advance position while the plunger is moving from the second to the first positions, the retaining means including:

second unidirectional latch means coupled to the output member and movable between a first position freely movable with respect to the output member and a second position fixedly engaged with the output member;

a stop fixedly mounted on the linear motor; and

biasing means for urging the second latch means to a second position into engagement with the stop to prevent the output member from moving in a direction opposite from the incremental advance direction of movement of the output member; and

a selectively energizable unlatch member movably engaged with at least the second latch means for moving at least the second latch means to the first position, when activated, to allow movement of the output member in a direction opposite from the incremental advance direction of movement of the output member.

5,148,068

ELECTROMAGNETIC ACTUATOR FOR MOVING AN OBJECT

Takeo Kushida, Saitama, and Toshiro Higuchi, Kanagawa, both of Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Oct. 4, 1991, Ser. No. 771,354
Claims priority, application Japan, Oct. 9, 1990, 2-271435
Int. Cl.[5] H02K *37/00, 7/06*
U.S. Cl. 310—46 **14 Claims**

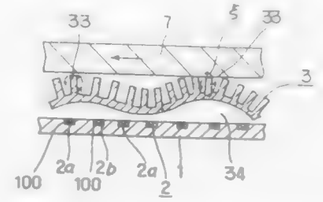
1. An actuator for moving an object, comprising:

a rigid substrate (**1**) made of a magnetic material;

a plurality of coils (**2**) disposed on the surface of said substrate (**1**);

drive power sources (A, A') connected to said plurality of coils (**2**) and which apply an AC voltage as phased-shifted at times and positions to said plurality of coils (**2**), thereby producing a moving magnetic field; and

a flexible resilient plate (**3**) disposed as moving path on said substrate (**1**), wholly or partially made of a magnetic material;



the magnetic force imparted to the magnetic material of said flexible resilient plate (**3**) from said moving magnetic field of said plurality of coils (**2**) producing a traveling wave in said flexible resilient plate (**3**).

5,148,069

RECESSED ROTATION DETECTORS FOR BRUSHLESS MOTORS

Tomoharu Nonaka; Hiroshi Makino; Masahiro Takahashi; Teiji Sata, and Daisuke Yoshino, all of Kanagawa, Japan, assignors to Fuji Xerox Corporation Ltd., Tokyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,368
Int. Cl.[5] H02K *21/14, 29/14*
U.S. Cl. 310—68 R **5 Claims**

1. An electric motor comprising:

a housing;

a magnetic yoke;

a shaft mounted in said housing;

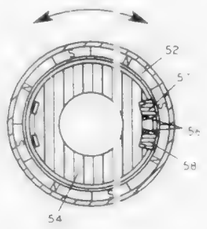
a sleeve mounted for rotation on said shaft, forming a gap around said shaft;

a stator core secured to said housing for carrying toroidal coils wound thereon;

a magnet secured by the magnetic yoke to an outer cylindrical wall of said rotary sleeve and disposed across an air gap from the stator core so as to constitute a part of a rotor, and

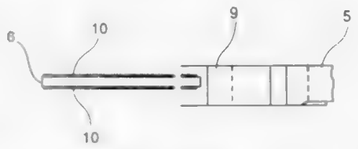
magnetic flux detection elements for detecting changes in magnetic polarity of the magnet so as to control a current flowing in the toroidal coils, the stator core having niches disposed at one axial end, the number of the niches being selected so as to be not less than that of the magnetic flux detection elements, the niches being selected with respect to the stator core to maintain magnetic symmetry to the toroidal coils, the magnetic flux detection elements being provided inside the niches respectively so as to minimize the adverse effects of the magnetic flux leakage from the torodial coils.

5,148,070
APPARATUS FOR COMMUTATION OF AN ELECTRIC MOTOR
Jesse C. Frye, Cliffside, N.C., and Scott G. Bradshaw, Chester, Va., assignors to Platt Saco Lowell Corporation, Greenville, S.C.
Filed Aug. 30, 1991, Ser. No. 752,734
Int. Cl.[5] H02K *11/00, 19/24*
U.S. Cl. 310—168 4 Claims



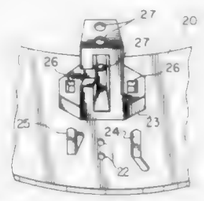
1. In a three-phase variable reluctance motor having a rotor with 4 rotor poles, a stator with 6 stator poles, windings on each of the stator poles, sensed means disposed around the axis of rotation of the rotor and fixed for rotation with the rotor and rotor poles, sensing means stationary with the stator and adjacent the path of movement of the rotor to detect the rotor sensed means and to provide an indicating signal of the position of the rotor poles relative to the stator poles; the improvement therein wherein said sensed means comprises 4 sets of elements, each set located within an arcuate length of 90°, each of the sets having two sensed portions each sensed portion having a leading edge in the direction of rotation, with the leading edges of all the sensed portions of the sets being separated by consistently alternating arcuate lengths of 30° and 60°, and said sensing means comprises 2 sensors, the sensors being arcuately separated by 30° times n, where n is 1, 2, 4, or 5.

5,148,071
SWING-TYPE ACTUATOR WITH THIN REINFORCED MOVABLE COIL
Fumihiko Takahashi, Menuma, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan
Filed Mar. 20, 1991, Ser. No. 672,436
Claims priority, application Japan, Mar. 22, 1990, 2-29329[U]
Int. Cl.[5] H02K *23/26, 33/16;* G11B *5/55*
U.S. Cl. 310—208 8 Claims



1. A swing-type actuator comprising:
(a) a housing comprising a pair of yokes opposing each other and a permanent magnet attached to at least one of said yokes for defining a magnetic gap therebetween;
(b) a coil having a thickness to be movable through said gap and including a periphery;
(c) a hold member encompassing the periphery of said coil;
(d) a swingable arm having one end to which said hold member encompassing the periphery of the movable coil is fixed and another end to which a function member is fixable, said movable coil being swingable in said magnetic gap by said arm, said hold member being made of a thermoplastic resin and molded integrally with said movable coil and said arm, said hold member having substantially the same thickness as that of said movable coil; and
(e) means for stiffening said coil against deformation in the direction of swinging movement, said stiffening means including a thin non-magnetic plate adhered to at least part of a surface of said movable coil facing said permanent magnet.

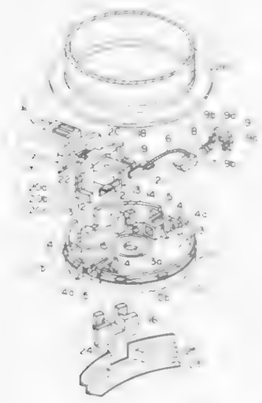
5,148,072
BRUSH HOLDING DEVICE
Shigeru Shiroyama, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Jun. 27, 1990, Ser. No. 544,781
Claims priority, application Japan, Jun. 28, 1989, 1-76960[U]
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—239 3 Claims



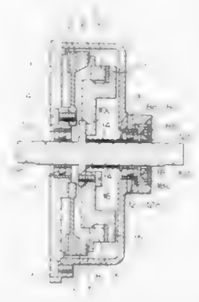
1. A brush holding device, comprising:
a base plate, having a plurality of first holes, wherein said base plate is a formed steel plate;
a plurality of brush holding frames having a plurality of second holes and a plurality of projections made up of an electrically insulating synthetic resin material and secured to said base plate;
a means disposed within said second holes for securing said brush holding frames to said base plate so as to permit said projections to be inserted in corresponding said first holes, thereby preventing inadvertent radial and circumferential movement of said holding frames with respect to said base plate; and
a plurality of brushes individually held in said brush holding frames.

5,148,073
WIRING DEVICE IN DIRECT CURRENT MACHINE
Masayuki Tamura, Ohta, Japan, assignor to Mitsuba Electric Manufacturing Co. Ltd., Gunma, Japan
Filed Dec. 3, 1990, Ser. No. 624,884
Claims priority, application Japan, Dec. 4, 1989, 1-140470[U]
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—239 18 Claims

1. A wiring device of a direct current machine, comprising:
a substantially disk-shaped brush holder;
a plurality of brush boxes connected to said disk-shaped brush holder arranged circumferentially at intervals;
a plurality of brushes equal in number to said plurality of brush boxes;
side walls expandingly formed on an edge of said brush holder, said side walls connecting adjacent ones of said brush boxes to each other, one of said side walls including a cutaway portion;
engageable portions expandingly formed between said cutaway portion and said brush boxes, said engageable portions being connected to said brush holder; and
a coupler including a pair of lead terminals embedded therein, pigtails connected to said lead terminals and a forward end portion, said forward end portion engaging said engageable portions to connect said coupler to said brush holder, said lead terminals projecting from said forward end of said coupler, said lead terminals for feeding electric power to said pigtails, each of said pigtails being connected to one of said brushes, each of said brushes being received in said brush boxes, said brush holder and said coupler being clamped together by an end bracket and a yoke with said cutaway portion positioning said coupler relative to said brush holder.

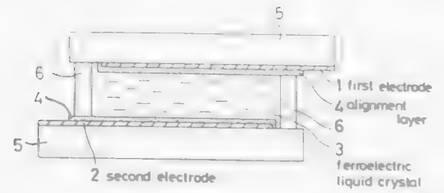


5,148,075
VIBRATION WAVE DRIVEN MOTOR
Takayuki Shirasaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1991, Ser. No. 676,369
Claims priority, application Japan, Mar. 28, 1990, 2-79686
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 10 Claims



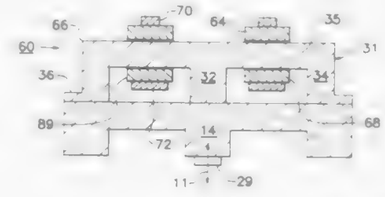
1. A vibration wave driven motor comprising:
a vibration member for generating a vibration wave in response to an applied signal; and
a contact member having a contact surface which contacts the vibration member, said vibration wave creating relative movement between said vibration member and said contact member, the contact surface of said contact member being made of a non-fiber type compound resin having an M-type Rockwell hardness of 80–110 and said vibration member being made of a stainless steel having a C-type Rockwell hardness (H_RC) of 35–44.

5,148,074
PIEZOELECTRIC DEVICE AND RELATED CONVERTING DEVICES
Masanori Fujita; Shinichi Okamoto, and Hirokazu Ono, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Division of Ser. No. 400,612, Aug. 30, 1989, abandoned. This application Feb. 5, 1991, Ser. No. 650,840
Claims priority, application Japan, Aug. 31, 1988, 63-217690
The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—311 8 Claims



1. A method for converting electric energy to mechanical energy comprising applying an AC voltage to a ferroelectric piezoelectric liquid crystal panel device comprising a first electrode; a second electrode disposed in opposing relation to said first electrode; a ferroelectric liquid crystal interposed between said first and second electrodes; and at least one alignment layer formed between said ferroelectric liquid crystal and at least one of said first electrode and said second electrode, said alignment layer being aligned, and deriving said mechanical energy from said liquid crystal panel device.

5,148,076
APPARATUS FOR THERMAL TUNING OF PATH LENGTH CONTROL DRIVERS
Steven C. Albers, Shoreview; Timothy J. Callaghan, Roseville; Bruce A. Seiber, Arden Hills; Theodore A. Toth, Fridley; Robert W. Derry, Stacy, and Theodore J. Podgorski, St. Paul, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 9, 1991, Ser. No. 682,840
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 23 Claims



1. A path length control driver apparatus comprising:
(a) a first central member having first and second opposite ends;
(b) a first outer rim member;
(c) a first flexible annular diaphragm area having first and second opposite sides, the first flexible annular diaphragm area being between and integral with the first central member and the first outer rim member;
(d) a central axis passing centrally through the first and second opposite ends of the first central member;
(e) a first piezoelectric means having first and second opposing sides wherein the first side of the first piezoelectric

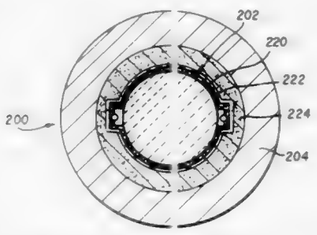
means is rigidly affixed to the first flexible annular diaphragm area's first side;
(f) a second piezoelectric means having first and second opposing sides wherein the first side of the second piezoelectric means is rigidly affixed to the first flexible annular diaphragm area's second side;
(g) a first electrode rigidly affixed to the second side of the first piezoelectric means; and
(h) a second electrode rigidly affixed to the second side of the second piezoelectric means, wherein the first and second electrodes having selected shapes of different sizes to provide a selected temperature sensitivity of movement of the central member along the central axis.

5,148,077

COATING SURROUNDING A PIEZOELECTRIC SOLID STATE MOTOR STACK

Charles E. Grawey, Peoria, and Curtis C. Kelley, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 28, 1990, Ser. No. 589,850
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 **10 Claims**



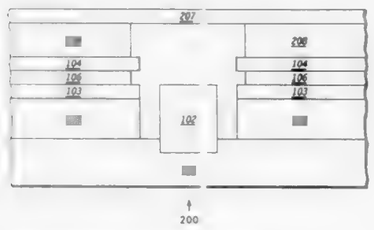
1. An encapsulated piezoelectric solid state motor stack having a plurality of disks interleaved with electrodes, comprising:
first means for encapsulating the stack;
second means for encasing the combination of said first means and the stack; and
third means sandwiched between said first and second means for reducing friction between said combination and said second means induced by an axial displacement produced between first and second end surfaces of the stack when the electrodes are biased by a source of electrical potential.

5,148,078

FIELD EMISSION DEVICE EMPLOYING A CONCENTRIC POST

Robert C. Kane, Woodstock, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1990, Ser. No. 575,104
Int. Cl.[5] H01J *1/30, 19/24*
U.S. Cl. 313—307 **8 Claims**



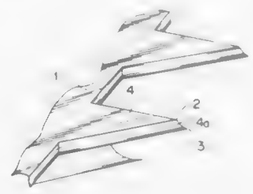
6. A field emission device comprising:
a substrate having a surface;
a plurality of patterned central post conductive stripes disposed on said surface and having disposed thereon a plurality of central post electrodes, said central post electrodes extending from said substrate surface;
a first insulator layer disposed on said substrate surface and further disposed in a substantially annular and concentric fashion about said plurality of central post electrodes;
a conductive emitter layer disposed on said first insulator layer and further disposed as a plurality of stripes with annular openings substantially surrounding said plurality of central post electrodes;
a second insulator layer disposed on said conductive emitter layer in a substantially annular and concentric fashion about said plurality of central post electrodes;
a plurality of gate electrode stripes disposed on said second insulator layer in a substantially annular and concentric fashion about said central post electrodes;
a third insulator layer disposed on said gate electrode stripes and further disposed in a substantially annular and concentric fashion about said central post electrodes; and
an anode electrode layer disposed non-coplanar with said gate electrode stripes.

5,148,079

PLANAR TYPE COLD CATHODE WITH SHARP TIP ENDS AND MANUFACTURING METHOD THEREFOR

Hiroyuki Kado, and Masanori Watanabe, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 1, 1991, Ser. No. 662,574
Claims priority, application Japan, Mar. 1, 1990, 2-049770
Int. Cl.[5] H01J *1/02, 1/30*
U.S. Cl. 313—309 **2 Claims**



1. A planar type cold cathode-anode structure for generating electron field emission which includes a planar cold cathode having planar surfaces spaced in the direction of the thickness thereof, and an anode, said cathode and said anode being formed on a substrate of an electrically insulating material so as to confront each other, said substrate having a concavity therein, said cold cathode having substantially triangular convex portions projecting over the edge of said concavity toward said anode, each convex portion of said cathode having two tip ends defined by said planar surfaces and ends of a tip edge extending between said planar surfaces at the apex of the triangular convex portion, at least one tip end of each said convex portion having a radius of curvature of no more than 0.1 μm, and said one tip end of each said convex portion protruding toward said anode farther than the other tip end of each said convex portion.

5,148,080

INCANDESCENT LAMP FILAMENT INCORPORATING HAFNIUM

Ray J. Van Thyne, Inverness, Ill., assignor to Hilux Development, Alsip, Ill.

Filed Jan. 16, 1990, Ser. No. 465,415
Int. Cl.[5] H01J *1/14*
U.S. Cl. 313—345 **27 Claims**

1. An incandescent lamp filament having a substoichiometric

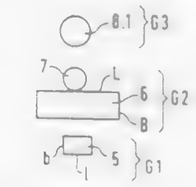
nitrided surface layer containing at least about 20% by weight hafnium exhibiting an emissivity in the visible light spectrum substantially higher than that of tungsten.

5,148,081

IN-LINE COLOR PICTURE TUBE

Werner Neumann, Denkendorf; Hans Reule, Wendlingen, and Werner Wolffram, Kirchheim, all of Fed. Rep. of Germany, assignors to Nokia Unterhaltungselektronik GmbH, Pforzheim, Fed. Rep. of Germany

PCT. No. PCT/EP89/01029 § 371, Date: Feb. 28, 1991, § 102(e) Date: Feb. 28, 1991, PCT Pub. No.: WO90/03042, PCT Pub. Date: Mar. 22, 1990
PCT filed Sep. 4, 1989, Feb. 28, 1991, Ser. No. 655,446
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829794
Int. Cl.[5] H01J *29/48*
U.S. Cl. 313—414 **20 Claims**



1. An in-line colour picture tube with a self-converging deflection system and an electron-beam formation system comprising three beam systems arranged side by side, each of the beam systems comprising a cathode, a first, a second and a third grid and at least one further grid, where one of the said grids is designed as an anode and each grid is provided with an aperture for each of the three beam systems and where:
the aperture (5) for each electron beam in the first grid (G1) is designed to be of elongated and especially rectangular shape and the longer side (1) of the said aperture (5) runs in the in-line direction
the ratio between the longer and the shorter sides of the apertures (5) of the first grid (G1) amounts to between 1.0:0.8 and 1.0:0.96
the aperture (6) for each electron beam on the side of the second grid (G2) facing the first grid (G1) is designed to be right-angled and the longer side (L) of the said aperture (6) runs in the in-line direction
ratio between the sides of the right-angled aperture (6) of the second grid (G2) is equal to or greater than 2 (two)
the shorter side (B) of the aperture (6) of the second grid (G2) is equal to about 1.0 to 1.4 times the shorter side (b) of the aperture (5) of the first grid (G1)
the aperture (7) for each electron beam on the side of the second grid (G2) facing away from the first grid (G1) is designed to be of circular shape
the apertures (8.1, 8.2, 8.3, 8.4) for each electron beam in the third grid (G3) and the aperture (9) for each electron beam in the fourth grid (G4) and of any further grids are designed to be of circular shape.

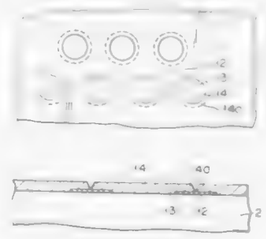
5,148,082

COLOR PICTURE TUBE WITH LIGHT ABSORBING LAYER ON SCREEN

Takeo Itou, Kumagaya; Hidemi Matsuda, Oomiya; Hajime Tanaka, Fujioka, and Kazuhiko Shimizu, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 551,008, Jul. 11, 1990, abandoned. This application Feb. 13, 1992, Ser. No. 833,826
Claims priority, application Japan, Jul. 11, 1989, 1-178220
Int. Cl.[5] H01J *29/30, 29/32*
U.S. Cl. 313—466 **4 Claims**

1. A color picture tube comprising:
an envelope including a front panel;
a phosphor screen formed on the inner surface of the front panel; said phosphor screen including a light absorbing layer having a plurality of holes and phosphor layers formed in the holes and partially overlapping the light absorbing layer; and where the transmittance T of the light absorbing layer, the ratio a of the area of a light emitting region in a portion where the light absorbing layer overlaps the phosphor layers to the area of the phosphor screen, the ratio b of the area of the light absorbing layer to the area of the phosphor screen, and the ratio



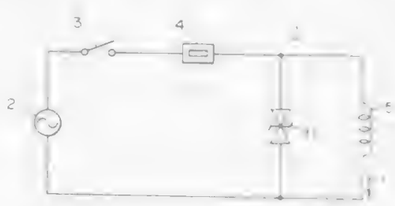
r of the area of the light emitting region in the holes to the area of the holes satisfy the following relational expressions: $1/T \geqq \frac{1}{2}\{(rb/a)-[a/(1-b)r]\}$ and $BCP=\{1+[a/(1-b)r]T\}/\{1+[b/(1-b)]T^2\} \geqq 1.06$ where the transmittance T is within a range of 0.2 to 0.7 and BCP, a color picture tube brightness contrast relation, indicates that for a BCP value greater than one color picture tube brightness can be increased without lowering contrast; and
an electron gun arranged in the envelope.

5,148,083

DEMAGNETIZER

Hideo Hatada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 540,707
Claims priority, application Japan, Jun. 20, 1989, 1-159298
Int. Cl.[5] H01J *29/06*
U.S. Cl. 315—8 **4 Claims**



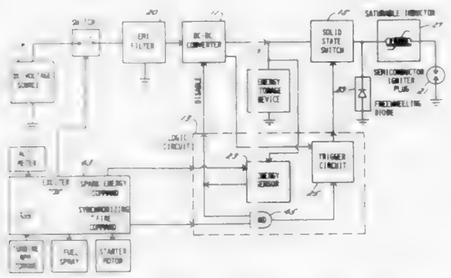
1. A demagnetizer for generating a degauss magnetic field to a cathode-ray tube by supplying an output of an AC power supply to a degauss coil via a thermistor of positive characteristic, wherein a voltage-dependent resistance element is connected directly in parallel with said degauss coil and wherein said thermistor is connected in series with the combination of said resistance element and said degauss coil.

5,148,084

APPARATUS AND METHOD FOR PROVIDING IGNITION TO A TURBINE ENGINE

John R. Frus, Rockford, Ill., assignor to Unison Industries, Inc., Jacksonville, Fla.

Division of Ser. No. 271,723, Nov. 15, 1988. This application Feb. 23, 1990, Ser. No. 483,939
Int. Cl.[5] H01K 7/00; H05B 37/02; F02P 15/08
U.S. Cl. 315—76 7 Claims



1. In a system for igniting engine fuel using a unipolar ignition having a storage device for delivering energy to a spark gap device by way of an inductor wound about a magnetically saturable core connected in series with said spark gap device and a unidirectional device connected in parallel with said series connected inductor and spark gap device, a method comprising the steps of:

delivering energy to said storage device;

transferring said predetermined amount of energy from said storage device to said series connected inductor and spark gap device;

applying a high D.C. voltage across said spark gap for a sufficient time to create a plasma;

allowing a relative low D.C. current to initially flow through said plasma and inductor so as to saturate said magnetically saturable core and thereafter allowing a high D.C. current flow through said plasma;

conducting energy from said storage device and through said inductor and spark gap device and collecting energy in said inductor until virtually all energy has left said storage device; and

providing for the virtual instantaneous reversal of the polarity of said inductor when all energy has left said storage device such that the energy stored in said inductor is released through said spark gap device and said unidirectional device.

5,148,085

ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP

Anthony Kroes, Eindhoven, Netherlands, assignor to North American Philips Corporation, New York, N.Y.

Filed Jan. 31, 1991, Ser. No. 649,086
Claims priority, application Netherlands, Feb. 2, 1990, 9000259
Int. Cl.[5] H05B 41/10, 41/24
U.S. Cl. 315—248 10 Claims

6. An electrodeless low-pressure discharge lamp, comprising:

a discharge vessel sealed in a vacuum-tight manner and having a discharge space containing an ionizable vapor and rare gas, the discharge vessel having an inwardly extending protuberance defining an exterior cavity in said discharge vessel;

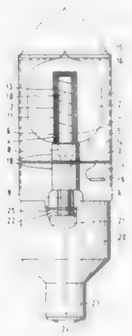
an outer bulb surrounding said discharge vessel and having an inwardly extending protuberance defining an exterior cavity in said outer bulb, said bulb protuberance projecting into the protuberance of said discharge vessel for substantially its entire length;

a body of soft magnetic material and an electric coil surrounding said body, both disposed within said protuberance of said outer bulb;

a housing connected to said discharge vessel and carrying a lamp cap with contacts;

a supply unit arranged in said housing and comprising a frequency converter having an output frequency of at least 1 MHz and being connected to the contacts at the lamp cap and to the electrical coil; and

means for thermally insulating said core of magnetic material from said discharge vessel, said means comprising a tube of electrically insulating material disposed between said protuberance of said outer bulb and said coil with clearance therebetween, said tube being closed at one end and open at its opposite end near said end portion of said outer bulb.

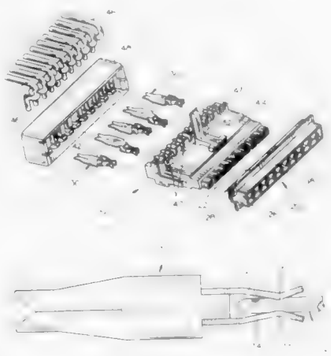


5,148,086

MEANS FOR SECURING INSULATION DISPLACEMENT TERMINALS TO LEADS EXTENDING FROM A FLUORESCENT LIGHT BALLAST

Larry J. Costa, Danville, Ill., assignor to Valmont Industries, Inc., Valley, Nebr.

Continuation-in-part of Ser. No. 549,265, Jul. 6, 1990, Pat. No. 5,023,520. This application Nov. 29, 1990, Ser. No. 620,360
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] H05K 5/00
U.S. Cl. 315—276 1 Claim



1. In combination,

a ballast for a fluorescent light including a case portion having the ballast components positioned therein and a base secured to said case portion, at least some of said ballast components having an elongated conductor extending therefrom, said case portion including opposite ends, one end of said case portion having an opening formed therein,

an internal connector housing means positioned in said opening and having an inner end positioned in said case portion and an outer end positioned outwardly of said case portion, said internal connector means having a plurality of elongated openings formed therein which receive the elongated conductors extending therethrough,

an external connector housing means having inner and outer ends and having its inner end positioned adjacent the outer end of said internal connector housing means,

a plurality of connector terminals in said external connector housing means having inner and outer means,

the inner ends of said connector terminals being selectively removably secured to predetermined conductors,

the outer ends of said connector terminals adapted to have service leads selectively removably secured thereto,

and a lead wire retainer means at the outer end of said external connector housing means for retaining the service leads in said connector terminals,

each of said connector terminals comprising a flat outer end portion and a pair of upstanding spring clips positioned inwardly thereof,

each of said spring clips having opposing V-shaped portions thereon adapted to engage predetermined conductors,

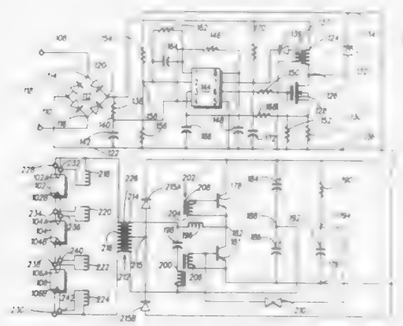
each of said predetermined conductors having a detent means formed therein which receives the V-shaped portions of said spring clips.

5,148,087

CIRCUIT FOR DRIVING A GAS DISCHARGE LAMP LOAD

Mihail S. Moisin, Lake Forest, and John G. Konopka, Barrington, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 28, 1991, Ser. No. 705,864
Int. Cl.[5] H05B 37/00
U.S. Cl. 315—291 16 Claims



1. A circuit for driving a gas discharge lamp load, the circuit comprising:

input terminals for connection to a supply voltage source having a predetermined nominal voltage level;

output terminals for connection to the gas discharge lamp load;

oscillator means coupled to the input terminals and to the output terminals for producing a high-frequency output voltage for application to the gas discharge lamp load;

power control means coupled to the input terminals and to the oscillator means for controlling the power drawn by the circuit from the supply voltage source, the power control means comprising:

power reducing means for reducing the power drawn by the circuit when the voltage level of the supply voltage source falls below a first predetermined level less than the nominal level of the supply voltage source; and

regulator means for regulating to a substantially constant value the power drawn by the circuit when the voltage level of the supply voltage source is above the first predetermined level, the regulator means comprising current mode control means and an impedance connected therewith, the impedance having a predetermined value which determines the substantially constant value of the power drawn by the circuit when the voltage level of the supply voltage source is above the first predetermined level

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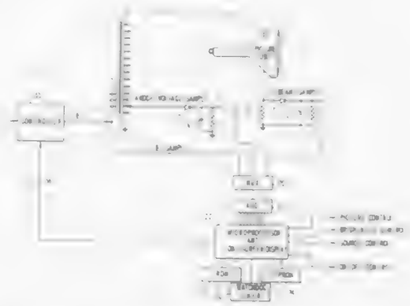
5,148,088

LIMITING X-RAY PRODUCTION IN AN OPERATING CRT

Forest E. Jernigan, Morristown, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 1, 1991, Ser. No. 769,612
Int. Cl.[5] H01J 29/70
U.S. Cl. 315—411 22 Claims



1. A method of preventing excessive X-ray production from a cathode ray tube (CRT) operating in an apparatus, said method comprising the steps:

continually measuring operating parameters of the CRT that are correlated with X-ray production by the CRT during its operation, said operating parameters including at least a voltage on an anode of said CRT, and a beam current of said CRT;

continually comparing the measured operating parameter values during CRT operation with predetermined values of the operating parameters; and

adjusting various operation controls for the CRT to maintain the operating parameters below certain predetermined limit values corresponding to the limits of permissible X-ray production by the CRT, said operation controls include picture (or contrast) control, picture brightness, supply voltage, the color video broadcast signal (CVBS) input, and the high voltage.

5,148,089

METHOD AND APPARATUS FOR CONTROLLING MOTORS

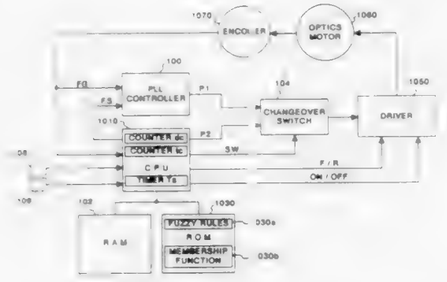
Hideki Adachi, Kawasaki; Mitsuharu Takizawa, Fuchu; Miho Nakayama, Tokyo; Taisei Fukada, Yokohama; Shinichi Nakamura, Kawasaki; Satoshi Kuroyanagi, Nishimine; Hisatsugu Tahara, Kawasaki; Hiroshi Ozaki, Tokyo, and Masanori Miyata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1990, Ser. No. 574,451

Claims priority, application Japan, Aug. 31, 1989, 1-222801; Aug. 31, 1989, 1-222802; Aug. 31, 1989, 1-222804; Aug. 31, 1989, 1-222805; Aug. 31, 1989, 1-222806; Aug. 31, 1989, 1-222808; Aug. 31, 1989, 1-222809

Int. Cl.[5] G03C *15/32*

U.S. Cl. 318—66 55 Claims



1. A method of controlling a motor when the motor is in a transitional period, comprising the steps of:

calculating a control variable of velocity by fuzzy inferential reasoning from an ambiguous relationship between a control variable of velocity and at least one status variable from among the rotational velocity of the motor and the position of an object moved by the motor;

controlling the motor based on said calculated control variable of velocity when the motor is in the transitional period; and

controlling the motor by a control method other than fuzzy inferential reasoning when the motor is undergoing steady rotation.

5,148,090

VARIABLE RELUCTANCE TYPE AC SERVO MOTOR

Hideaki Oku, and Takeshi Nakamura, both of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

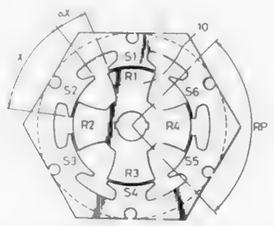
PCT No. PCT/JP89/00981, § 371 Date May 23, 1990, § 102(e) Date May 23, 1990, PCT Pub. No. WO90/03685, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 28, 1989, Ser. No. 476,446

Claims priority, application Japan, Sep. 28, 1988, 63-240945

Int. Cl.[5] H02P *7/36*

U.S. Cl. 318—107 6 Claims



1. A variable reluctance type AC servo motor comprising:

a stator having a plurality of salient poles, each said stator salient pole having a substantially rectangular surface area;

a rotor having a plurality of salient poles opposing said stator salient poles, each said rotor salient pole having a surface area opposing said stator salient poles shaped such that, upon rotation of said rotor, the surface area of each rotor salient pole opposing a stator salient pole varies continuously in a sinusoidal manner; and

means for applying AC singe wave excitation currents to windings of said stator poles;

wherein the number of m of phases of excitation currents is at least 3, the number of poles of said rotor is an integer n and the number of poles of said stator is r-m, n being a whole multiple of the number r but not a whole multiple of r-m; and

wherein the m phase currents have a period Hz equal to twice a period of fluctuation of magnetic permeance caused by rotation of the rotor, and a conductance phase between adjoining stator poles is shifted $2n\ \pi/(r\text{-}m)$ at each phase of magnetic permeance fluctuation, whereby torque ripple is eliminated.

5,148,091

ARRANGEMENT FOR BRINGING THE TOOL-CARRYING END OF A ROBOT BEAM TO A DESIRED ONE OF A PLURALITY OF POSSIBLE PREDETERMINED POSITIONS

Fredrik B. B. Lagercrantz, Nässelvägen 1, 193 00 Sigtuna, Sweden

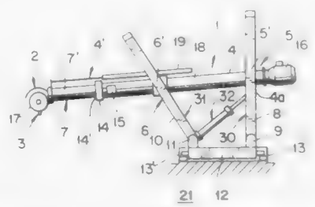
PCT No. PCT/SE89/00685, § 371 Date May 17, 1991, § 102(e) Date May 17, 1991, PCT Pub. No. WO90/06214, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 24, 1989, Ser. No. 689,791

Claims priority, application Sweden, Nov. 28, 1988, 8804305

Int. Cl.[5] G05B *19/10*

U.S. Cl. 318—568.11 20 Claims



1. An arrangement for bringing the tool-carrying end of a robot beam (**4**) to one desired position of a plurality of possible, predetermined positions, characterized in that the arrangement comprises two beam-holding devices (**5, 6**) which are intended to support the beam (**4**) at given mutually-space locations along its length and which are journalled (**5, 6**) to said beam at said locations, at least one of said beam-holding devices (**6**) being slideably mounted for movement along a first elongated beam-positioning arm (**10**); and in that one end (**11**) of said first arm (**10**) is pivotally connected to a stand (**12**) which is moveable along a fixed path, the arrangement being such that a pivotal movement of said first arm (**10**) and a movement of said at least one holding-device (**6**) along said arm (**10**) will result in a commensurate change in the positional setting of the tool-carrying end of said beam.

5,148,092

STEPPING MOTOR DRIVING CIRCUIT HAVING FAILSAFE FUNCTION

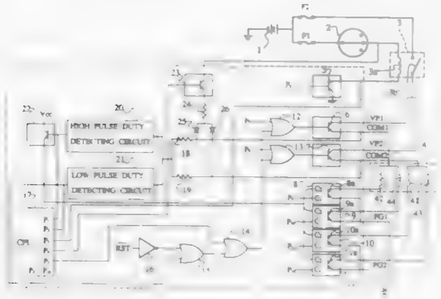
Yukihisa Ishii, and Shinichi Inagawa, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 25, 1991, Ser. No. 736,032

Claims priority, application Japan, Aug. 9, 1990, 2-212230

Int. Cl.[5] H02P *8/00*

U.S. Cl. 318—696 3 Claims



1. A driving circuit for driving a stepping motor having a plurality of excitation coils having different phases, comprising:

a plurality of excitation transistors for driving said excitation coils of said stepping motor, respectively;

at least one chopping transistor for effecting chopping control of current flowing to said excitation coils;

control means for supplying at least one control signal to said at least one chopping transistor;

detecting means for detecting whether said at least one control signal has a pulse duty factor thereof falling outside a predetermined range defined by predetermined upper and lower limit values; and

interrupting means responsive to output from said detecting means for forcedly interrupting said supply of current to said stepping motor when said detecting means detects that said pulse duty factor falls outside said predetermined range.

5,148,093

SYSTEM FOR CONTROLLING AC EXCITED SYNCHRONOUS MACHINE

Akira Bando; Shigehiro Kayukawa, both of Hitachi; Toshio Taguchi, Ibaraki, and Yasuteru Ohno, Kobe, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,153

Claims priority, application Japan, Sep. 22, 1989, 1-245240

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—723 4 Claims

1. A control system for an AC excited synchronous machine comprising:

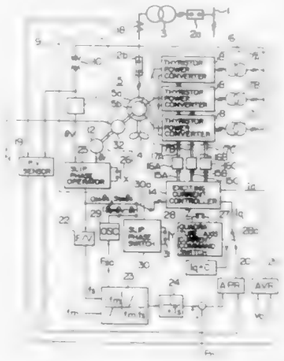
an AC excited synchronous machine having an armature winding connected to an AC power system and an exciting winding to which AC exciting power is supplied from said AC power system through a frequency converting means;

first phase signal generating means for generating a slip phase signal corresponding to a difference between a voltage phase of the AC power system and a rotary phase of said AC excited synchronous machine;

exciting current computing means for computing an exciting current command value on the basis of a quadrature-axis current component command value having the same phase as said slip phase signal from said first phase signal generating means and a direct-axis current component command value having a phase lag of 90 degrees with respect to said slip phase signal;

second phase signal generating means for generating a sinusoidal wave signal having a predetermined frequency;

phase signal switching means for switching from an output of said first phase signal generating means to an output of said second phase signal generating means and outputting said output of said second phase signal generating means to said frequency converting means; and



command value switching means for switching said quadrature-axis current component command value to a predetermined value;

wherein said phase signal switching means and said command value switching means are operated at the same time and said frequency converting means is controlled by said exciting current command value to controllably drive said AC excited synchronous machine.

5,148,094

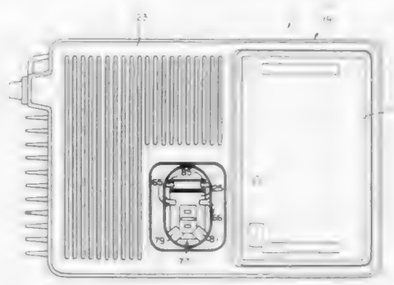
CHARGER WITH UNIVERSAL BATTERY PACK RECEPTACLE

James R. Parks, Timonium; Roderick F. Bunyea, Westminster; John R. Dixon, Hampstead, and Robert A. Meloni, Baltimore, all of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 10, 1990, Ser. No. 566,028

Int. Cl.[5] H01M *10/46*

U.S. Cl. 320—2 21 Claims



1. A battery charger comprising:

a housing having a wall;

a receptacle for alternatively receiving a plurality of battery packs having different cross-sectional areas, said receptacle having a sidewall and an opening formed in the housing wall and circumscribing a first area, the area of the opening corresponding approximately to the transverse cross-sectional area of a first of the plurality of packs;

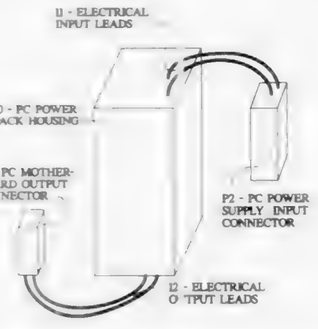
electrical contacts in the receptacle for electrically contacting the respective terminals of the plurality of packs; and
a pack locator in the receptacle and spaced from the electrical contacts, said locator for biasing a second of the plurality of packs into a location in the receptacle to contact the electrical contacts, said locator being resiliently retractable when the first pack having a transverse cross-sectional area less than the area of the receptacle opening.

5,148,095

PERMANENT POWER PACK FOR COMPUTER CLOCK AND BATTERY BACKED MEMORY

Ronald R. Miller, 2520 Malone Pl., Santa Clara, Calif. 95050; Shelton W. Riggs, 987 E. Homestead Rd., and Phil Rozario, 1715 Banff Dr., both of Sunnyvale Calif. 94087

Filed May 30, 1991, Ser. No. 707,688
Int. Cl.[5] H01M *10/44*
U.S. Cl. 320—22 6 Claims



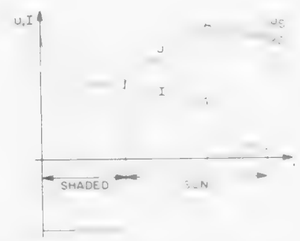
1. A permanent power pack operable from a power supply of a personal computer for providing steady, non-exhaustible electrical power to both a computer clock and a computer system configuration memory comprising
an electronic circuit including input means to receive operational energy from a DC output of said computer power supply, and maintenance means to maintain charge on a rechargeable battery only when said power supply is activated, and output means to supply electrical energy to said computer clock and said computer system configuration memory when said computer power supply is deactivated, wherein
[a] said rechargeable battery is electrically connected to said maintenance means of said electronic circuit, and
[b] a housing means hold both said rechargeable battery and said electronic circuit together, and
[c] external input electrical leads are attached to an input power supply connector from said input means of said electronic circuit within said housing and external output electrical leads are attached to an output connector from said output means of said electronic circuit within said housing, and said input power supply connector is mechanically mated and electrically attachable to an original disk drive DC output power connector from said DC computer power supply, whereby said permanent power pack eliminates a non-rechargable, disposable, consumer replaceable computer clock battery.

5,148,096

CHARGING METHOD FOR BATTERIES

Wolfgang Denzinger, Friedrichshafen, Fed. Rep. of Germany, assignor to Dornier GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1991, Ser. No. 710,050
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1990, 4018223
Int. Cl.[5] H02J *7/04, 7/16*
U.S. Cl. 320—32 3 Claims



1. A charging method for batteries comprising:
a first phase being a constant current charging up to a given value of a battery voltage U; and
a second phase in which the battery voltage U is limited as a function of a charging current i_L, the following relationship existing between the battery voltage U and the charging current i_L:

$$U = U_o + \Delta U$$

wherein
U_o=current-independent part of the battery voltage U,
ΔU=current-dependent part of the battery voltage U

$$\Delta U = f \cdot i_L \cdot R_i$$

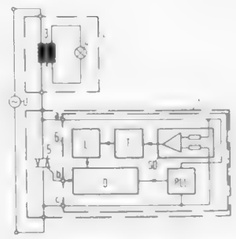
with
f=factor smaller than 1
i_L=charging current
R_i=internal resistance of the battery.
2. The method of claim 1, wherein f is between 0.5 and 1.

5,148,097

APPARATUS FOR STEPLESS CONTROL OF ELECTRIC LOADS BY THE PHASE ANGLE PRINCIPLE AND BRIGHTNESS CONTROLLER USING THE APPARATUS

Dieter Draxelmayr, Villach, Austria, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 17, 1991, Ser. No. 686,753
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1990, 4012254
Int. Cl.[5] G05F *5/02*
U.S. Cl. 323—237 2 Claims



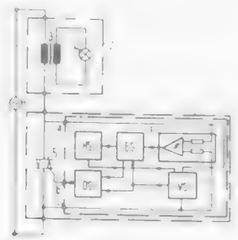
1. An apparatus for stepless control of electric loads by the phase angle principle, comprising a semiconductor switch element, a trigger circuit connected to said semiconductor switch element for furnishing turn-on pulses for triggering said semiconductor switch element, said trigger circuit including at least one current flow detector, a turn-on pulse pregenerator circuit connected to said at least one current flow detector, a switch and driver unit connected to said turn-on pulse pregenerator circuit, and a time-dependent circuit element connected to said at least one current flow detector, said current flow detector and said time-dependent circuit element providing means for comparing an on-state angle of each current half-wave with a maximum allowable limit value of an on-state angle, and means for preventing a further triggering of said semiconductor switch element if the maximum allowable limit value of the on-state angle is exceeded.

5,148,098

APPARATUS FOR STEPLESS CONTROL OF ELECTRIC LOADS BY THE PHASE ANGLE PRINCIPLE AND BRIGHTNESS CONTROLLER USING THE APPARATUS

Dieter Draxelmayr, Villach, Austria, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 17, 1991, Ser. No. 686,619
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1990, 4012255
Int. Cl.[5] G05F *5/02*
U.S. Cl. 323—237 10 Claims



1. An apparatus for stepless control of electric loads by the phase-angle principle, comprising a semiconductor switch element; and a trigger circuit connected to said semiconductor switch element for furnishing turn-on pulses for triggering said semiconductor switch element; said trigger circuit including at least one detector for detecting a polarity of an instantaneous value of an alternating voltage to be switched and issuing an output signal, a turn-on pulse pregenerator circuit connected to said at least one detector for furnishing turn-on pulse suggestions, a switch and driver unit connected to said turn-on pulse pregenerator circuit, and a decision stage connected to said at least one detector and to said turn-on pulse pregenerator circuit for selectively allowing and preventing the turn-on pulse suggestions furnished by said turn-on pulse pregenerator circuit to be switched through to said semiconductor switch element, as a function of whether the output signal issued by said at least one detector has changed its polarity between two of the turn-on pulse suggestions furnished by said turn-on pulse pregenerator circuit.

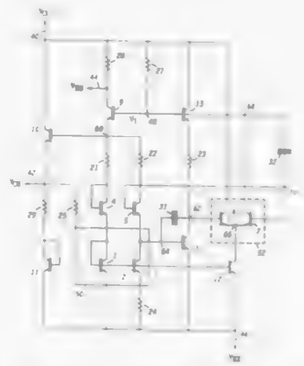
5,148,099

RADIATION HARDENED BANDGAP REFERENCE VOLTAGE GENERATOR AND METHOD

Richard H. Ong, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1991, Ser. No. 678,375
Int. Cl.[5] G05F *3/20*
U.S. Cl. 323—314 17 Claims

9. A temperature and voltage compensating bandgap reference voltage generator comprising:
first voltage supply means;
bias means coupled to the first voltage supply means;
output means coupled to the bias means at a first junction and coupled to a second junction;
cell means for maintaining a constant voltage output from the output means;
low-voltage capable tracking means coupled to the cell means at a first cell junction and to the first junction;
compensating means coupled to the second junction, coupled to the cell means, and coupled to the low-voltage capable tracking means to maintain the constant voltage output;
shunt means coupled to the low-voltage capable tracking



means, coupled to the first junction, and coupled to the cell means to provide a current bypass;
second voltage supply means coupled to the cell means, coupled to the low-voltage capable tracking means, and coupled to the shunt means;
third voltage supply means coupled to the compensating means and coupled to the second voltage supply means at a third junction; and
epi ring means coupled to the third voltage supply means through a second resistor, the epi ring means for decreasing radiation susceptibility in the bandgap reference voltage generator.

5,148,100

HANDLER USED IN TESTING SYSTEM FOR SEMICONDUCTOR DEVICES

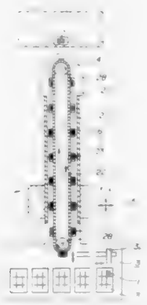
Takashi Sekiba, Murata, Japan, assignor to Fujitsu Miyagi Electronics Limited, Miyagi, Japan

Filed Sep. 10, 1991, Ser. No. 757,405
Claims priority, application Japan, Sep. 14, 1990, 2-244637
Int. Cl.[5] G01R *31/26;* B65G *47/00*
U.S. Cl. 324—158 F 18 Claims

1. A handler for supplying a semiconductor device to a test head which is separated from said handler and used to measure an electrical characteristic of the semiconductor device and for receiving a semiconductor device whose electrical characteristic has been measured by said test head, said handler comprising:
an arm shaped conveyer unit for conveying a semiconductor device from a first end thereof to a second end thereof and vice versa;
a loader/unloader unit which is provided at the first end of said conveyer unit;
a setting unit which is provided at the second end of said conveyer unit; and
an adjusting unit for adjusting said setting unit on a testing position which is a predetermined position with respect to said test head,
wherein said conveyer unit comprises a ring shaped conveyer belt which is rotated between the first end of said conveyer unit and the second end thereof, and a plurality

of holders each of which is fi ed on an outer surface of said conveyer belt and holds th : semiconductor device, so that each of said holders is circ lated between the first end of said conveyer unit and the second end thereof by a rotation of said conveyer belt,

wherein said loader/unloader u it comprises first storage means for storing a non-tested semiconductor device which is a semiconductor devi e whose electrical characteristic has not been measured by said test head yet, second storage means for storing a tested semiconductor device which is a semiconductor device whose electrical characteristic has been measu ed by said test head, and



moving means for moving the non-tested semiconductor device from said first storage means to said conveyer unit and for moving the tested semiconductor device, which has been conveyed by said co nveyer unit to the first end thereof, from said conveyer unit to said second storage means, and

wherein said setting unit comp ises means for setting the non-tested semiconductor dev ice which is conveyed by said conveyer unit to the seco nd end thereof on said test head and for returning the tested semiconductor device from said test head to said co nveyer unit, said conveyer unit then conveying the tested semiconductor device from the second end thereof to the first end thereof.

5,148,10 .

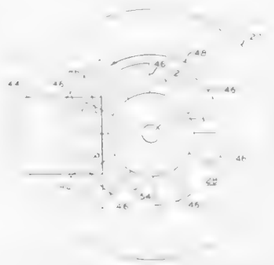
METHOD AND APPARATUS FOR DETECTING AND COMPENSATING FOR REVERSE ROTATION AND CREEP OF EDDY CURRENT DISK

Richard A. Balch, North Hampton and David D. Elmore, Somersworth, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Continuation of Ser. No. 505,204, Apr. 5, 1990, abandoned. This application Mar. 18, 1991, Ser. No. 670,512

Int. Cl.[5] G01R *11/17, 11/32*

U.S. Cl. 324—137 **31 Claims**



1. In an electronic energy meter for metering electric energy consumption including an eddy current disk rotating in response to energy consumed by the load being metered and provided with one or more anti-creep holes, and a castellated disk including multiple teeth about its periphery coupled for rotation with the eddy current disk and rotating between two pairs of emitters and detectors positioned on either side of the castellated disk with the arcuate width of said teeth being less than the distance between adjacent pairs of said two pairs of emitters and detectors such that rotation of the teeth of the castellated disk interrupts the transmission beams between the two emitter/detector pairs, a method of correcting for inaccuracies in the energy meter microprocessor output which result from eddy current disk reverse rotation in response to pull-back, creep or tampering comprising:

detecting the state of transmission of at least two emitter/detector pairs, said state of transmission being whether a detector is receiving a transmission from its paired emitter;

generating signals in response to each change in the state of transmission between said at least two emitter/detector pairs;

storing and comparing said signals over successive states of transmission;

generating and counting pulses in response to the change in the state of transmission between the at least two emitter/detector pairs only when there has been no repetition of a state in three successive changes of the state of the transmission;

detecting an initial reversal of the rotation of said eddy current disk to the reverse direction of rotation upon a repetition in a sequence of three states of the previous state upon the detection of the next state;

storing the reverse rotation pulses generated during rotation in the reverse direction; and

subtracting pulses from the stored reverse rotation pulses upon detection of a subsequent reversal of rotation of said eddy current disk to the forward rotation direction.

5,148,102

APPARATUS FOR THE ELECTRICAL FUNCTION TESTING OF WIRING MATRICES, PARTICULARLY OF PRINTED CIRCUIT BOARDS

Thomas Rose, and Detlef Hoffmann, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

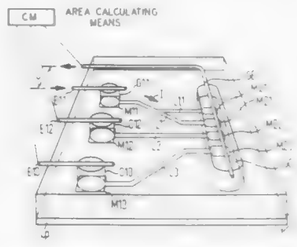
PCT No. PCT/DE90/00641, § 371 Date Oct. 10, 1991, § 102(e) Date Oct. 10, 1991, PCT Pub. No. WO91/02986, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 22, 1990, Ser. No. 768,632

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1989, 3927842

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—158 F **4 Claims**



1. An apparatus for the electrical function testing of wiring matrices that comprise a plurality of first measuring locations arranged at a relatively great spacing from one another and comprise at least one group of second measuring locations arranged at a finer spacing from one another, the apparatus comprising:

a carrier plate that can be put in place onto the wiring matrices,

first gas discharge channels in said carrier plate allocated to the first measuring locations, each of said gas discharge channels being provided with first electrodes, and

a group gas discharge channel in said carrier plate allocated to the group of second measuring locations, said group gas discharge channel being provided with a group electrode

so that at least respectively two selected measuring locations of a wiring matrix can be ionically contacted via the allocated gas discharge channels and their electrodes.

5,148,103

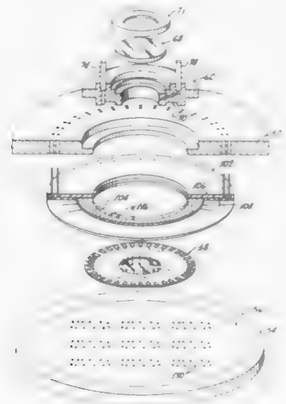
APPARATUS FOR TESTING INTEGRATED CIRCUITS

John Pasiecznik, Jr., Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 31, 1990, Ser. No. 606,676

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—158 P **15 Claims**



15. Apparatus for testing integrated circuit chips comprising:

a fixture mounting plate having test circuitry connections,

a gas chamber housing mounted to said fixture mounting plate,

an annular circuit board carried by said fixture mounting plate and having an internal aperture receiving a portion of said gas chamber housing, said circuit board having a plurality of electrical conductors,

an annular elastomeric member carried by said circuit board and having elastomeric member connector elements connected to said circuit board electrical conductors,

a probe including:

a flexible probe body having first and second sides,

probe contact elements on said first probe side, and

probe connector pads on said second probe side electrically connected to said probe contact elements, said probe connector pads being in contact with and pressing against said elastomeric member connector elements,

vacuum means extending into said gas chamber housing having a vacuum aperture adjacent said probe body for attaching said probe body to said mounting plate and circuit board with said probe connector pads in contact with and pressed against said elastomeric member connector elements,

said gas chamber housing having an opening in contact with said second probe side, and

means for introducing gas under pressure into said gas chamber housing to press said probe body away from said gas chamber housing.

5,148,104

HUB UNIT WITH PULSE ROTOR AND COVER MOUNTED SENSOR FOR SENSING ROTATIONAL SPEED

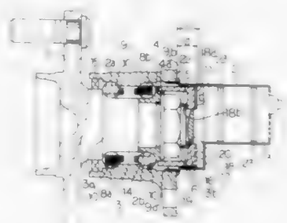
Shuuichi Ishikawa, Nakai, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1991, Ser. No. 679,782

Claims priority, application Japan, Apr. 9, 1990, 2-37299[U]

Int. Cl.[5] G01P *3/44;* **F16C** *32/00, 19/00*

U.S. Cl. 324—173 **7 Claims**



1. A hub unit for sensing rotational speed for use with a suspension system, comprising:

a hub including an axially outer end section having an outer flange for securing a wheel, a middle section having a radially outer peripheral surface on which a radially outwardly facing inner ring track is formed, and an axially inner end section having a first portion with a male thread thereon and a second portion extending in an axial direction of the hub from said first portion and having an outer diameter smaller than a minor diameter of said male thread;

an inner ring member externally secured on the radially outer peripheral surface of the middle section of the hub and having an axially inner end surface and a radially outer peripheral surface partially forming said radially outwardly facing inner ring track;

a nut secured on said first portion of said inner end section so as to apply pressure to the inner end surface of the inner ring member to secure the inner ring member in a predetermined position on said radially outer peripheral surface of said middle section, said second portion projecting from said nut in said axial direction;

an outer ring member having a central opening receiving said middle section, said inner ring member and said nut, said outer ring member having an axially inner end face, a radially inner peripheral surface on which a plurality of radially inwardly facing outer ring tracks are formed, and a radially outer peripheral surface on which a mounting section of said outer ring member is formed for support by the suspension system;

a plurality of rolling members provided between the hub and the outer ring member;

a pulse rotor having a radially inwardly extending flange portion with a circular hole therein and a cylindrical portion connected to said flange portion and having an axially outer opening, and the radially outer peripheral surface of the inner ring member being fitted into said axially outer opening of said cylindrical portion.

a sensor supported on the outer ring member so as to face the pulse rotor in said axial direction;

a cover mounted to said outer ring member and having an axially outer end section with an opening formed therein and a stop projection formed thereon;

said radially inwardly extending flange portion of said pulse rotor having a first end face which faces said nut and a second end face which faces said sensor;

said second portion of said inner end section of said hub being fitted into said circular hole of said flange portion of said pulse rotor such that a distance is provided between said inner end face of said outer ring member and said

second end face of said flange portion of said pulse rotor and a gap is formed between a radial shoulder of said first portion of said inner end section of said hub and said first end face of said flange portion so that said pulse rotor is secured on said inner end section of the hub to a specified position and said sensor is maintained and secured in said cover such that said axially outer end section of said cover adjacent said central opening is fitted into said outer ring member with said stop projection abutting against said inner end face of said outer ring outer member whereby a mounting position of said cover relative to said outer ring member is controlled.

5,148,105

ELECTROMAGNETIC ROTATION SENSOR

Takamichi Okada, Hanno, Japan, assignor to Shindengen Electric Manufacturing Co., Ltd., Japan

Filed Dec. 13, 1991, Ser. No. 806,260

Claims priority, application Japan, Dec. 25, 1990, 2-404128[U]

Int. Cl.[5] G01B *7/30;* **G01P** *3/488*

U.S. Cl. 324—207.14 **5 Claims**

1. In an electromagnetic rotation sensor comprising: (i) a sensor portion for detecting a rotational speed of a rotating member through a detection gear connected to said rotating member; (ii) a connector portion having a contact for connection to an external circuit which contact is exposed at an outer surface of said sensor portion, said sensor portion and said connector portion being molded of a resin integrally with each other to provide a resin-molded structure; and (iii) a cover fixedly receiving said resin-molded structure in such a manner that said cover covers said sensor portion and said detection gear, with said connector portion exposed to the outside of said cover;

the improvement wherein a primary molded portion is molded of a resin to provide said sensor portion, with said contact exposed to the outside of said primary molded portion; said primary molded portion is inserted into said cover, with said contact extending outwardly of said cover through a sensor portion-positioning hole formed through a wall of said cover; and a secondary molded portion is molded of a resin to form said connector portion on said primary molded portion in such a manner that a peripheral edge portion of said sensor portion-positioning hole is fixedly held between said primary molded portion and said secondary molded portion and that a socket portion enclosing said exposed contact and adapted to receive a mating connector is formed at said connector portion.

5,148,106

ANGLE DETECTION SENSOR WITH SETTING OF RATIO OF MAGNETIC FORCES OF ROTATING MAGNET AND BIAS MAGNET

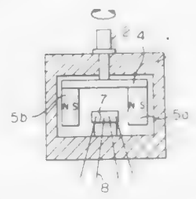
Hiromasa Ozawa, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jun. 5, 1991, Ser. No. 710,634

Claims priority, application Japan, Jul. 6, 1990, 2-180209

Int. Cl.[5] G01B *7/30;* **G01R** *33/06*

U.S. Cl. 324—207.21 **5 Claims**



1. An angle detection sensor comprising:

a planar, magnetoresistive, magnetic field sensing element in which a bias magnet is laminated on a magnetic pattern resistance layer of a thin film ferromagnetic material;

a rotatably supported rotation shaft spaced from said magnetoresistive element and rotatable about a center line of said magnetoresistive element, which center line is orthogonal to the plane of said magnetoresistive element; and

a permanent magnet fixed to said rotation shaft for rotation about said center line of the magnetoresistive element;

wherein when a rotation angle of the permanent magnet is greater than a predetermined amount, a ratio of a first magnetic force of said permanent magnet to a second magnetic force of said bias magnet is set to be smaller than 1; and

wherein when a rotation angle of the permanent magnet is less than a predetermined amount, the ratio of the first magnetic force to the second magnetic force is set to be larger than 1.

5,148,107

INDUCTIVE PROXIMITY SWITCH MEANS AND METHOD

Eugene P. Finger, Brewster, N.Y.; Bernard W. Jalbert, Richboro, Pa., and Thomas A. Penkalski, Broad View Heights, Ohio, assignors to Yale Materials Handling Corporation, Flemington, N.J.

Continuation of Ser. No. 282,611, Dec. 12, 1988, abandoned. This application Sep. 20, 1990, Ser. No. 590,311

Int. Cl.[5] G01B *7/14*

U.S. Cl. 324—207.26 **30 Claims**

1. An inductive switch, comprising:

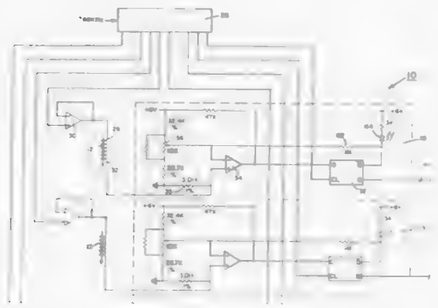
(a) inductor means;

(b) actuator means movable with respect to said inductor means, said movement affecting the value of inductance of said inductor means;

(c) means to apply an electrical pulse of a selected duration to said inductor means;

(d) means to measure the level of current directly from said inductor means a selected time interval after the initiation of said electrical pulse and to provide a switching signal

output when said level of current is above a predetermined value; and



(e) said means to measure remains directly connected to said inductor means until said level of current is measured.

5,148,108

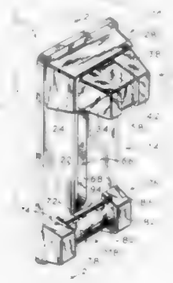
STUD FINDER WITH LEVEL INDICATOR

Jean G. Dufour, Quebec, Canada, assignor to Johnson Level & Tool Mfg. Co., Inc., Mequon, Wis.

Filed Mar. 14, 1991, Ser. No. 669,389

Int. Cl.[5] B43L *7/00;* **G01C** *9/00, 17/02*

U.S. Cl. 324—226 **7 Claims**



1. A stud finder, comprising:

a base member defining a front surface and a rear surface adapted for placement against a wall;

a magnetic subassembly mounted to the base member for detecting a point at which a stud is located in a wall by detecting the presence of a ferrous metal object; and

a level vial mounted to the base member for providing an indication to the user of the orientation of the base member relative to vertical from the point at which the stud is located, wherein the level vial is mounted to the base member such that a central portion of the vial is visible when the rear surface of the base member is placed against a wall, and wherein the vial is mounted to the base member by means of a pair of spaced apart vial mounting structures provided on the base member, for engaging the ends of the vial and securing the vial to the base member, each vial mounting structure comprising a pair of walls extending forwardly from the front surface of the base member and defining an open cavity which opens onto the rear surface of the base member, the cavity being adapted to receive an end portion of the vial, and further comprising vial securing means provided in each cavity for securing the end portion of the vial within the cavity.

5,148,109

MAGNETIC RESONANCE IMAGING METHOD AND SYSTEM THEREFOR

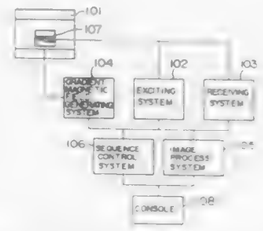
Atsushi Takane; Yoshiyuki Miyamoto, both of Katsuta; Ryuzaburo Takeda, Mito, and Koichi Sano, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 579,531

Claims priority, application Japan, Sep. 13, 1989, 1-235678

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **14 Claims**



1. A method for imaging a brain surface structure utilizing a MRI system, comprising the steps of:

selecting a pixel to be imaged at a brain surface of the brain surface structure;

acquiring a time-reversed fee induction decay (FID) signal which corresponds to an enhanced spin-spin relaxation time (T2) from the pixel to be imaged by using a gradient echo method; and

imaging the brain surface structure in accordance with the signal.

5,148,110

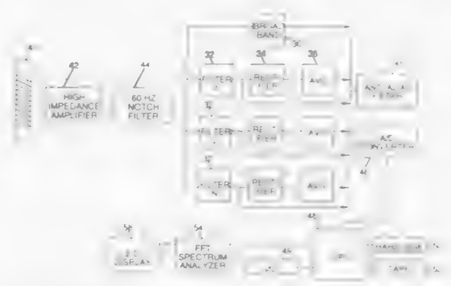
METHOD AND APPARATUS FOR PASSIVELY DETECTING THE DEPTH AND LOCATION OF A SPATIAL OR TEMPORAL ANOMALY BY MONITORING A TIME VARYING SIGNAL EMANATING FROM THE EARTHS SURFACE

Ronald L. Helms, 10165 Palmer Dr., Oakton, Va. 22124

Filed Mar. 2, 1990, Ser. No. 487,127

Int. Cl.[5] G01V *3/08;* **G01W** *1/16;* **G01R** *19/00, 23/00*

U.S. Cl. 324—323 **21 Claims**



1. A method of passively determining the depth of a spatial or temporal anomaly occurring beneath the terrain or water surface of the earth and in the vicinity of a location of interest, comprising the steps of:

passively monitoring a time-varying signal from a source emanating from the earth;

measuring the amplitude or modulation changes in said time-varying signal in the form of a broad spectrum of frequency data for variations indicative of a spatial or temporal anomaly;

recording said data in a recording medium;

processing said data to produce a sequential frequency spectra of said time-varying signals within a frequency band of interest, wherein each frequency spectra is representative of a particular depth; and

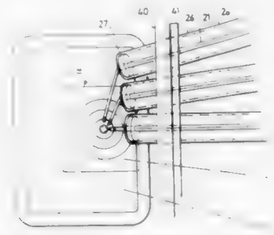
identifying the location of said spatial or temporal anomaly with said processed data.

5,148,1 1

ELECTROMAGNETIC PULSE SIMULATOR

Joseph Shiloh, Haifa, and Avner Rosenberg, Beit Shearim, both of Israel, assignors to State of Israel, Ministry of Defense, Rafael-Armament Development Authority, Haifa, Israel

Filed Mar. 25, 1991, Ser. No. 674,265
Claims priority, application Israel, Apr. 27, 1990, 94232
Int. Cl.[5] H03K *1/01, 3/04*
U.S. Cl. 328—65 20 Claims



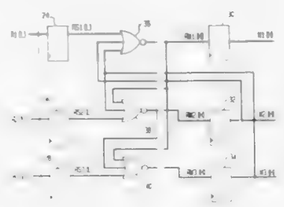
1. Electrical apparatus particularly useful as an electromagnetic pulse simulator including a pair of large-area electrodes mounted in spaced apart relation, and a high voltage generator electrically connected to the two electrodes to apply a high voltage between them; characterized in that the electrical connection of said high-voltage generator and at least one electrode comprises a plurality of electrical conductors in mutually-spaced relation with each conductor being enclosed within an insulating sheath filled with an insulating gas under pressure, said electrical conductors being electrically connected in parallel between said high-voltage generator and said one electrode.

5,148,12

EFFICIENT ARBITER

Richard A. Gahan, Clonmel, Ireland, assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1991, Ser. No. 723,055
Int. Cl.[5] H03K *5/20*
U.S. Cl. 328—110 8 Claims



1. A logic circuit for generating a set of output signals in response to and as a function of a set of input signals, the circuit comprising:

a set of N logic gates, each having N inputs, with one of the N inputs being used for application of one of the set of input signals, and an output;

a set of N state elements, each one of the state elements having an input coupled to the output of a corresponding one of the N logic gates, and an output to provide one of the set of output signals;

for each nth logic gate of the N logic gates, each of (N-n) remaining inputs, when n<N, is coupled to the output of a corresponding one of the n+1th to Nth state elements of the N state elements and each of n-1 remaining inputs, when n>1, is coupled to the output of a corresponding one of the 1st to (n-1)th logic gates;

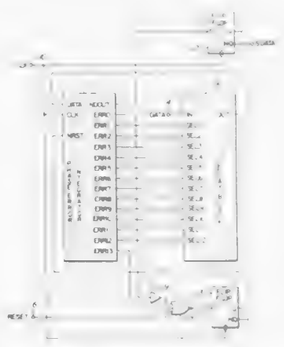
such that the set of output signals is a function of the set of input signals and the output of the set of N logic gates.

5,148,113

CLOCK PHASE ALIGNMENT

Mark S. Wight, Ottawa; Valerie A. Van Alstine, Nepean, and Gwendolyn K. Harris, Ottawa, all of Canada, assignors to Northern Telecom Ltd., Quebec, Canada

Filed Nov. 29, 1990, Ser. No. 620,884
Int. Cl.[5] H03K *5/13*
U.S. Cl. 328—155 10 Claims



1. A phase error integrator for determining the phase error between an NRZ data signal and a clock signal frequency locked to the data signal comprising a data input and a clock input, means for comparing the phase of said NRZ data signal applied to the data input with said clock signal applied to the clock input and deriving at N outputs a digital phase error output signal which at any point in time comprises a chain of N digits made up of M digits of a first binary sense (i.e. 1 or 0) followed by P digits of a second binary sense where M plus P equals N, the chain shifting the first binary sense digits right when the error between the data signal and the clock signal is in one sense (i.e. positive or negative) and the chain shifting the second binary sense digits left when the error is in the opposite sense.

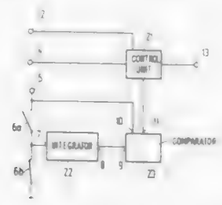
5,148,114

FM DEMODULATOR

Hans-Jürgen Kühn, Buchholz, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 24, 1991, Ser. No. 782,046
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 4034050
Int. Cl.[5] H03D *3/00*
U.S. Cl. 329—341 6 Claims

1. An FM demodulator comprising a limiter in which a frequency-modulated FM signal to be demodulated is limited, and a marker pulse generator generating marker pulses in dependence upon the limited FM signal, said marker pulses being applied to a low-pass filter whose output signal represents the demodulated signal, characterized in that the marker pulse generator comprises an integrator which is succeeded by a comparator, in that at the start of each positive and/or negative edge of the limited FM signal, a marker pulse is started and a first reference signal is applied to the integrator input until the next positive or the next negative edge of a reference clock signal appears, in that the first reference signal and a second reference signal are subsequently applied to the integrator input in dependence upon the reference clock signal in such a predetermined sequence that the integrated signals applied to



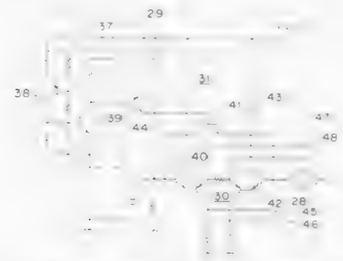
the integrator in the course of the sequence yield the value of zero, and in that within the sequence the first signal is finally applied to the integrator input, and in that the started marker pulse is terminated, the running predetermined sequence is interrupted and the signal applied to the integrator input is blocked as soon as the comparator detects that a comparison voltage present at the integrator output before the start of the marker pulse is reached again.

5,148,115

LOAD CONNECTION STATE DETECTOR CIRCUIT

Hiroshi Koakutsu, and Kouji Tatani, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 18, 1991, Ser. No. 687,157
Claims priority, application Japan, Apr. 19, 1990, 2-103335; Oct. 24, 1990, 2-287480
Int. Cl.[5] H03F *1/02, 3/68*
U.S. Cl. 330—2 8 Claims



6. An offset voltage generator circuit comprising: an amplifier circuit including a first transistor having an input signal applied to the base thereof and a second transistor having a reference voltage applied to the base thereof for feeding signals obtained on the collectors of said first and second transistors to later stages;

an offset voltage generation section connected between the bases of said first and second transistors;

an input circuit for applying an input signal to the base of said first transistor;

a control circuit for generating a control signal to perform on/off control of said offset voltage generation section and said input circuit in the opposite direction with respect to each other; and

a switch for changing over said control circuit,

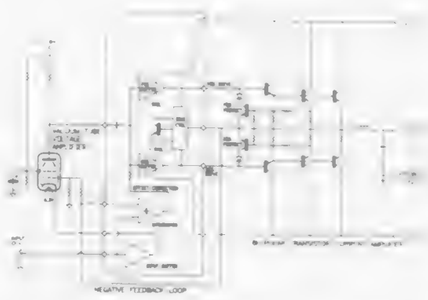
wherein said amplifier circuit amplifies the input signal applied from said input circuit to produce an amplified output when said switch is in a first state while develops an offset voltage at the output thereof in response to the operation of said offset voltage generation section when said switch is in a second state.

5,148,116

ENHANCED VACUUM TUBE POWER AMPLIFIER

John M. Robinson, 27731 Jayseel St., Tujunga, Calif. 91042

Filed Sep. 4, 1991, Ser. No. 754,714
Int. Cl.[5] H03F *5/00*
U.S. Cl. 330—3 1 Claim



1. An improved audio power amplifier comprising:

an audio input:

A. A level control and an input buffer receiving said audio input and applying it to a vacuum tube voltage amplifier producing a signal equal in amplitude to the output signal;

B. A dual complimentary buffer array which receives the voltage amplifier signal and produces the POS DRIVE and NEG DRIVE signals at the same amplitude but at a lower impedance level;

C. A driver stage which again lowers the impedance of the above signals;

D. A bi-polar power transistor output stage which supplies the actual current to the loudspeaker load;

E. An offset servo stage which serves to compensate for inequalities within the amplifier circuitry, while preserving the average D.C. level of the input;

F. A bias control stage to control thermal runaway, and to afford the benefits of Class B operation in the input stage while lowering crossover distortion to an acceptable level;

G. Positive side and negative side overcurrent protection circuitry to protect against an output short condition.

5,148,117

ADAPTIVE FEED-FORWARD METHOD AND APPARATUS FOR AMPLIFIER NOISE REDUCTION

Ashok K. Talwar, Westlake Village, Calif., assignor to American Nucleonics Corporation, Westlake Village, Calif.

Filed Nov. 25, 1991, Ser. No. 797,788
Int. Cl.[5] H03F *1/32*
U.S. Cl. 330—151 8 Claims

1. An adaptive feed-forward network for connection to an amplifier and for reducing noise and distortion generated by the amplifier, the amplifier having an input on which is provided a substantially distortion free input signal and an output on which is generated by the amplifier an output signal comprising an amplified input signal component and a noise and distortion component, the adaptive feed-forward network comprising:

a first directional coupler, the input signal being provided to the first directional coupler, the first directional coupler having an output and generating thereon a reference signal corresponding to the input signal;

a second directional coupler, the amplifier output signal being provided to the second directional coupler, the second directional coupler having an output and generat-

ing thereon a sample signal having an amplified input signal component and a noise and distortion component corresponding to the amplifier output signal;

a third directional coupler, the sample signal being provided to the third directional coupler, the third directional coupler having an input and an output;

a fourth directional coupler, the fourth directional coupler being electrically coupled to the output of the third directional coupler, the fourth directional coupler having an output on which is provided a portion of the sample signal;

an interference canceller, the interference canceller having a reference input and a sample input, the reference input receiving the reference signal from the first directional coupler and the sample input receiving the sample signal from the third directional coupler, the interference canceller further having an output and generating thereon a cancellation signal, the cancellation signal being substantially equal to and opposite in phase to the input signal component of the sample signal, the cancellation signal being provided to the input of the fourth directional coupler, the fourth directional coupler effectively combining the sample signal with the cancellation signal so as to eliminate substantially the input signal component from the sample signal thereby providing an error signal substantially consisting of only the noise and distortion component of the sample signal; and

a fifth directional coupler, the fifth directional coupler being electrically coupled to the output of the fourth directional coupler and to the amplifier output, the error signal and the amplifier output signal being provided to the fifth directional coupler, the fifth directional coupler effectively subtracting the error signal from the amplifier output signal thereby leaving substantially only the amplified input signal component remaining in the amplifier output signal.

5,148,118

LEVEL SHIFT CIRCUIT WITH GAIN ENHANCEMENT

Robert C. Dobkin, Monte Sereno and John W. Wright, Los Altos, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

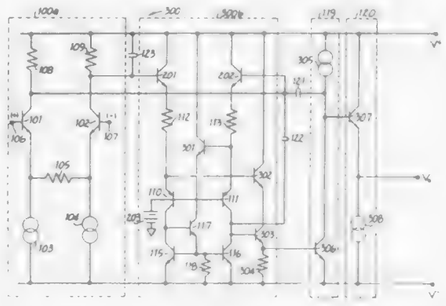
Filed Mar. 22, 1991, Ser. No. 673,475
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—252 **17 Claims**

1. In an amplifier circuit, a level shifting stage having first and second input terminals and a third terminal, the stage comprising:

voltage follower means connected to the first and second input terminals for providing high input impedance, low output impedance unity-gain amplification of voltage signals applied respectively to the first and second input terminals, the voltage signals being provided by the voltage follower means to first and second voltage follower output terminals;

transconductance means connected to the first and second voltage follower output terminals for conducting, between the output terminals of the voltage follower means and first and second outputs of the transconductance means, first and second currents having magnitudes that vary non-differentially in substantial proportion with variations in the voltage signals at the first and second voltage follower output terminals respectively; and

a current mirror having a first current sink input coupled to the first output of the transconductance means, and a second current sink input coupled to the second output of the transconductance means and to the third terminal, whereby an output current is generated at the third terminal.

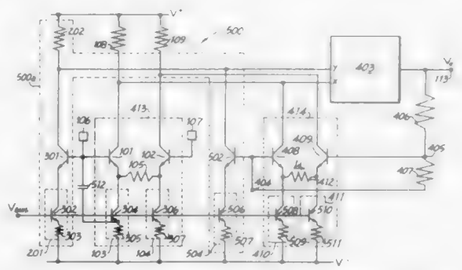


5,148,119

PRECISE REFERENCE VOLTAGE GENERATOR FOR FEEDFORWARD COMPENSATED AMPLIFIERS

John W. Wright, Los Altos, and Robert C. Dobkin, Monte Sereno, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Filed Mar. 22, 1991, Ser. No. 673,466
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—259 **28 Claims**



1. In an amplifier circuit including a differential input stage having an output terminal, and a second stage having first and second input terminals and an output terminal, the output terminal of the input stage being coupled to the first input terminal of the second stage to supply an input voltage having a non-signal dc component to the second stage, a reference voltage circuit comprising:

first means, having an input terminal connected to an input terminal of the differential input stage and an output terminal, for generating at the first means output terminal a reference voltage substantially equal to the non-signal dc component of the input voltage supplied to the first input terminal of the second stage; and

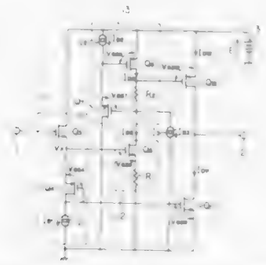
second means for supplying the reference voltage to the second input terminal of the second stage.

5,148,120

CLASS-AB PUSH-PULL DRIVE CIRCUIT

Kenji Kano; Yusuke Yamada; Masao Arimoto, all of Itami, and Shoji Uehata, Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 717,060
Claims priority, application Japan, Jul. 16, 1990, 2-189908
Int. Cl.[5] H03F *3/26*
U.S. Cl. 330—264 **10 Claims**



1. A class-AB push-pull drive circuit, comprising:

first and second power terminals for applying different first and second power potentials, respectively;

input and output terminals supplied with input and output signals, respectively;

a first transistor one electrode of which is connected to said output terminal, the other electrode of which is connected to said first power terminal, and a control electrode of which is coupled to said input terminal and is supplied with voltage corresponding to voltage of said input signal, conduction of the first transistor being controlled in accordance with a potential difference between the control electrode thereof and the other electrode thereof;

a second transistor opposite in polarity to said first transistor, one electrode of which is connected to said output terminal, and the other electrode of which is connected to said second power terminal, conduction of the second transistor being controlled in accordance with a potential difference between a control electrode thereof and the other electrode thereof;

a voltage-to-current converter coupled to said input terminal for generating current corresponding to the voltage of said input signal; and

a current-to-voltage converter connected between an output of said voltage-to-current converter and the control electrode of said second transistor for converting said current into voltage to supply the voltage to the control electrode of said second transistor,

wherein conversion characteristics of said voltage-to-current converter and said current-to-voltage converter are established so that a potential difference between the control electrodes of said first and second transistors is held constant independently of the voltage of said input signal.

5,148,121

AMPLIFIER CIRCUIT DESIGNED FOR USE IN A BIPOLAR INTEGRATED CIRCUIT, FOR AMPLIFYING AN INPUT SIGNAL SELECTED BY A SWITCH CIRCUIT

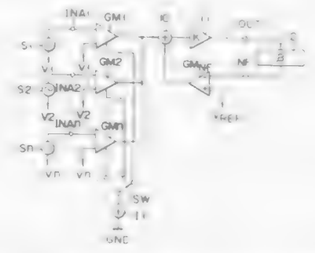
Noriaki Uchida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

PCT No. PCT/JP90/01311, § 371 Date Jun. 10, 1991, § 102(e) Date Jun. 10, 1991
PCT Filed Oct. 11, 1990, Ser. No. 688,495
Claims priority, application Japan, Oct. 11, 1989, 1-263114
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—295 **3 Claims**

1. An amplifier circuit having a plurality of input voltage-to-current converting amplifiers, each having two input terminals, one of which is coupled to an input-signal source having a DC potential source, and the other of which is connected to the DC potential source, said input amplifiers having output terminals connected together, and having applied thereto different DC voltages from the DC potential source, said amplifier circuit comprising:

an adder circuit having two input terminals, one of which is connected to receive the current output flowing from a node of the output terminals of the input voltage-to-current converting amplifiers;

an additional current-to-voltage converting amplifier connected to receive the current output by said adder circuit, for converting the current into a voltage;



a feedback voltage-to-current converting amplifier circuit having two input terminals, one of which is connected to receive an output applied from said additional current-to-voltage converting amplifeir through a feedback circuit, and the other of which is connected to receive a reference potential, for generating and supplying a current to the other input terminal of said adder circuit; and

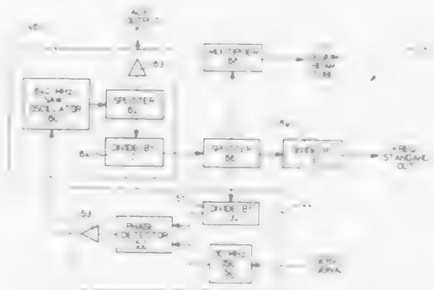
a switch circuit for selecting and connecting one of said input voltage-to-current amplifiers to an operation current source.

5,148,122

ATOMIC BEAM FREQUENCY STANDARD HAVING RF CHAIN WITH HIGHER FREQUENCY OSCILLATOR

Richard Karlquist, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 1, 1991, Ser. No. 738,764
Int. Cl.[5] H03L *7/26*
U.S. Cl. 331—3 **7 Claims**



1. An RF chain for supplying a high-frequency signal to an atomic beam tube and for generating a standard frequency signal, said high-frequency signal being determined by a servo signal coupled to said RF chain, said RF chain comprising:

first oscillator means for generating a first signal having a frequency at least twice that of said standard frequency signal, the frequency of said first signal being responsive to a first control signal;

means for receiving a servo signal and for generating said first control signal therefrom;

output means for generating said standard frequency signal from said first signal, said output means comprising means for dividing said frequency of said first signal by an integer; and

frequency multiplication means for generating said high-frequency signal from said first signal.

5,148,123

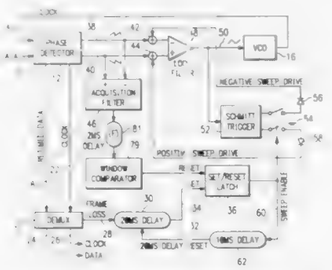
NEGATIVE FEEDBACK CONTROL LOOP ACQUISITION AID

Gordon W. Ries, Plano, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Nov. 4, 1991, Ser. No. 787,506

Int. Cl.[5] H03L 7/12

U.S. Cl. 331—4 **5 Claims**



1. A method of acquiring phase lock in a phase lock system including a phase detector, a loop filter and a VCO (controlled oscillator) which is periodically swept in frequency when an out-of-lock condition is detected comprising the steps of:

filtering an output of a phase detector portion of the phase lock loop to remove beat frequency signals;

differentiating the filtered output; and

interrupting any periodic sweep frequency action on the part of a VCO portion of the phase lock loop if the differentiated output exceeds a given value.

5,148,124

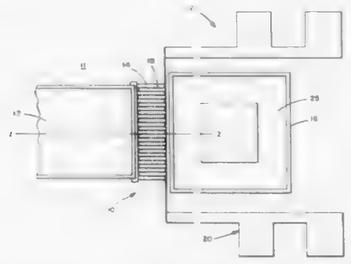
MONOLITHIC MICROWAVE INTEGRATED CIRCUIT NOISE GENERATOR AND VARIABLE RESISTANCE DEVICE

Miles E. Goff, Carlisle, Mass., assignor to Lockheed Sanders, Inc., Nashua, N.H.

Filed Oct. 3, 1991, Ser. No. 771,271

Int. Cl.[5] H01P 1/22; H01C 7/13; H03B 29/00, 3/16

U.S. Cl. 331—78 **20 Claims**



1. A monolithic microwave integrated circuit device for generating a noise signal, comprising:

a monolithic integrated circuit substrate;

a microwave transmission line formed on the substrate;

semiconductor resistor means formed in the substrate and electrically coupled to the transmission line for producing a noise signal therein in response to the application of heat to the semiconductor resistor means;

an electrically insulating dielectric layer deposited over the semiconductor resistor means;

an integrated circuit heating element formed on top of the dielectric layer and in sufficiently close proximity to the semiconductor resistor means to be thermally coupled thereto through the dielectric layer; and

means for applying electrical energy to the heating element for causing the semiconductor resistor means to produce a noise signal.

5,148,125

DIELECTRIC CONSTANT MONITOR

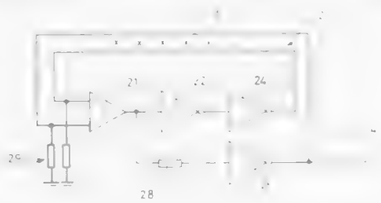
Ian M. Woodhead, and Stephen J. J. Hirsch, both of Christchurch, New Zealand, assignors to Lincoln College, Christchurch, New Zealand

Division of Ser. No. 485,747, Mar. 1, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 721,921

Claims priority, application New Zealand, Mar. 3, 1989, 2-28210

Int. Cl.[5] G01R 27/00

U.S. Cl. 331—135 **9 Claims**



1. Apparatus for monitoring the dielectric constant of a material comprising:

an amplifier having input and output ports,

a transmission line connected at one end to the amplifier input and at the other end to the amplifier output forming a feedback loop, and

output means connected to the loop; wherein

the transmission line is embedded at least partly in the material when monitoring takes place,

an electrical signal propagates one-way along the transmission line and through the amplifier in passing around the loop,

the signal is inverted on each passage around the loop to sustain an electrical oscillation at a frequency determined in part by the propagation delay of the transmission line, and

the oscillation frequency is used by the output means to provide a measure of the dielectric constant of the material.

5,148,126

CAPACITANCE SENSOR CIRCUIT AND METHOD FOR MEASURING CAPACITANCE AND SMALL CHANGES IN CAPACITANCE

Mark E. Spencer, Mesa, Ariz., assignor to Sentech Corporation, Tempe, Ariz.

Filed Dec. 13, 1991, Ser. No. 808,179

Int. Cl.[5] H03B 5/00

U.S. Cl. 331—135 **38 Claims**

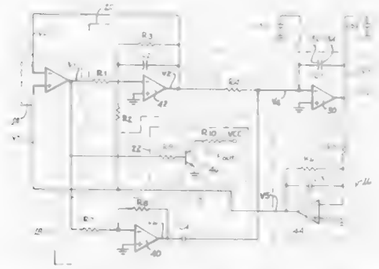
1. An oscillator circuit for measuring capacitance and small changes in capacitance comprising, in combination:

a capacitor having a capacitance to be measured;

means for generating an output signal that is proportional to the integral over time of an exponential current flowing through said capacitor;

means coupled to said generating means for inverting said output signal;

means coupled to said inverting means for switching a bistable signal at a frequency that is inversely proportional to said capacitance to thereby provide an indication of the value of said capacitance; and



means coupled to said switching means, coupled to said inverting means and coupled to said generating means for summing an output of said switching means and an output of said inverting means.

5,148,127

BIPHASE SHIFT KEYING MODULATION CIRCUIT HAVING CONSTANT ENVELOPE CHARACTERISTICS

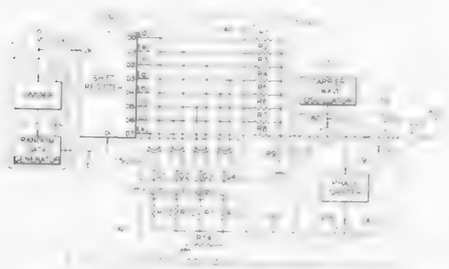
Byoung-Jin Cheon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 3, 1991, Ser. No. 770,240

Claims priority, application Rep. of Korea, Oct. 8, 1990, 15940

Int. Cl.[5] H04L 27/20

U.S. Cl. 332—104 **11 Claims**



1. A biphase shift keying (BPSK) modulation circuit for a digital data transmission system, comprising:

a clock input receiving a system clock;

data generation means, connected to receive the system clock, for providing random digital data in synchronization with the system clock, said random digital data being divided from the system clock;

data conversion means, connected to receive the system clock and an output of said data generation means, for providing an in-phase signal component and a quadra-phase signal component in synchronization with the system clock, said in-phase and quadra-phase signal components being of step waveform; and

modulation means, connected to receive both the in-phase and quadra-phase signal components from said data conversion means, for providing a phase modulation signal of constant envelope on a give carrier-wave signal for the digital data transmission, said in-phase signal component being processed in a double-balanced modulation with the carrier-wave and said quadra-phase signal component being processed in a single-balanced modulation with a phase-shifted signal of the carrier-wave, wherein both of said double-balanced modulation signal and said single-balanced modulation signal are added to each other.

5,148,128

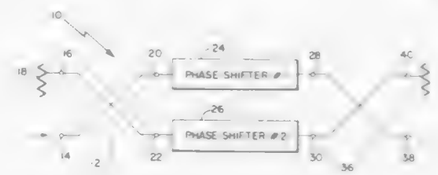
RF DIGITAL PHASE SHIFT MODULATORS

Shamsur R. Mazumder, Northborough, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 25, 1991, Ser. No. 782,932

Int. Cl.[5] H04L 27/00

U.S. Cl. 332—103 **9 Claims**



1. An RF digital phase shift modulator comprising:

first quadrature hybrid means, having amplitude and phase characteristics for providing first and second signal paths having a differential phase shift of substantially 90°;

first phase shifting means, disposed in said first signal path for providing a selectable different phase shift characteristic to said first signal path;

second phase shifting means, disposed in said second signal path for providing a selectable differential phase shift characteristic to said second signal path; and

second quadrature hybrid means, having amplitude and phase characteristics substantially the same as said amplitude and phase characteristics of said first quadrature hybrid coupled to said first and second signal paths for combining said first and second signal paths with a differential phase shift of substantially 90° therebetween.

5,148,129

MICROWAVE PULSE COMPRESSION FROM A STORAGE CAVITY WITH LASER-INDUCED SWITCHING

Paul R. Bolton, Menlo Park, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 527,526, May 23, 1990, abandoned. This application Jun. 20, 1991, Ser. No. 723,731

Int. Cl.[5] H03K 5/01; H01P 1/00

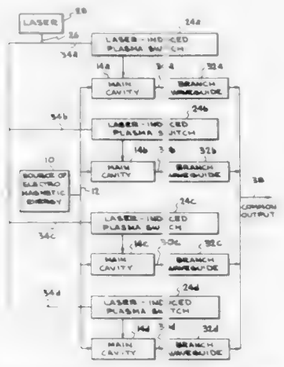
U.S. Cl. 333—20 **18 Claims**

1. A pulse compression system that compresses electromagnetic energy from a microwave source, comprising:

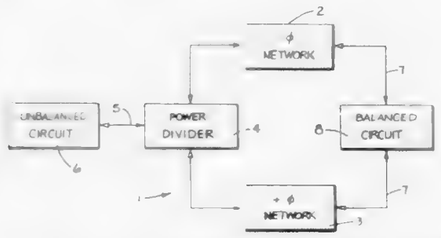
a microwave cavity including a main cavity coupled to the microwave source, said microwave cavity having a configuration suitable for storing microwave energy in the main cavity in substantially a single mode, said main cavity defining nodes and antinodes of the single mode; and,

a switch, including means for applying laser energy in the main cavity proximate to an antinode of the single mode, said switch comprising a switching gas positioned so that the laser energy interacts with the switching gas proximate to an antinode of the standing wave pattern, said switching gas comprising a main gas and an impurity gas wherein the impurity gas is suitable for pumping to an excited bu non-ionized energy level by the laser energy so

that the switching gas is ionized by the microwave energy in the cavity when the microwave energy reaches a predetermined level to switch the microwave energy out of the main cavity.

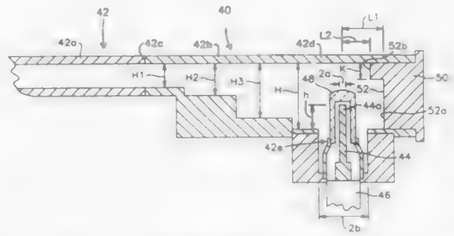


5,148,130
WIDEBAND MICROSTRIP UHF BALUN
James L. Dietrich, 1642 N. Baltimore Ave., Derby, Kans. 67037
Filed Jun. 7, 1990, Ser. No. 534,548
Int. Cl.[5] H03H 7/42; H01P 5/10
U.S. Cl. 333—25 16 Claims



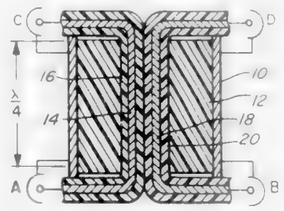
1. A balun for converting between unbalanced and balanced signals over a selected operating band and comprising:
(a) a positive phase shift network causing a phase shift between opposite ends of said positive network of substantially +90° at a band center of said operating band;
(b) a negative phase shift network causing a phase shift between opposite ends of said negative network of substantially -90° at said band center;
(c) said networks being coupled at one end of each to form an unbalanced port;
(d) opposite ends respectively of said networks forming a balanced port thereacross; and
(e) said networks being configured to have substantially linear phase shift variations through said operating band in which said operating band is in excess of an octave whereby a substantially constant phase differential occurs between respective ends of said networks over said operating band.

5,148,131
COAXIAL-TO-WAVEGUIDE TRANSDUCER WITH IMPROVED MATCHING
Kurt Amboss, Pacific Palisades, and Stephen L. Hart, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 11, 1991, Ser. No. 714,550
Int. Cl.[5] H01P 5/103
U.S. Cl. 333—26 12 Claims



10. A coaxial-to-waveguide transducer, comprising:
a waveguide including an elongated tubular wall having an end;
a coaxial cable including a center conductor having an end portion which protrudes transversely into the waveguide through the tubular wall adjacent to said end thereof; and
a stepped wall which closes said end of the tubular wall, said stepped wall including first and second block-shaped step portions, said first block-shaped step portion protruding axially into the waveguide further than said second block-shaped step portion.

5,148,132
MICROWAVE COUPLER
Harry F. Chapell, Maynard, Mass., assignor to Sage Laboratories, Inc., Natick, Mass.
Filed Jan. 29, 1991, Ser. No. 647,479
Int. Cl.[5] H01P 5/18
U.S. Cl. 333—115 35 Claims

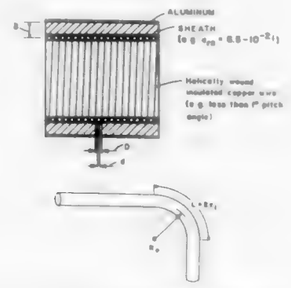


1. A microwave coupled line device comprising:
a circuit board having electrically conductive circuit pads disposed thereon;
a microwave coupler positioned on the circuit board and having an outer conductor and a pair of proximately positioned wire-like inner conductors, at least one of the inner conductors having insulation thereon, the inner conductors being separated from the outer conductor by a sleeve adapted to allow the inner conductors to pass therethrough in substantial contact with each other, and the inner conductors being separated from each other only by the thickness of the insulation therebetween, and the sleeve including a pathway to guide the inner conductors to each of opposing open ends of the outer conductor;
the sleeve comprising a dielectric material surrounding and in contact with the pair of inner conductors that is electrically insulating and includes a coefficient of linear thermal expansion that is no more than 1.5 times of the outer conductor in a microwave coupler operating temperature range; and
the inner conductors extending at angles from the opposing ends of the outer conductor and the inner conductors being connected to the circuit pads and defining a substantially direct path from the outer conductor to the circuit pads and the inner conductors being substantially free of slack.

5,148,133
QUALITY FACTOR IMPROVEMENT FOR FILTER APPLICATIONS
Joseph A. Zennamo, Jr., Skaneateles, and Gary J. Clark, Constantia, both of N.Y., assignors to Eagle Comtronics, Inc., Clay, N.Y.
Filed May 29, 1991, Ser. No. 707,070
Int. Cl.[5] H03H 7/00
U.S. Cl. 333—175 11 Claims

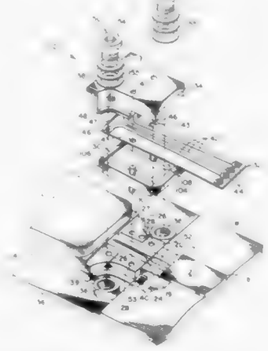
1. A filter comprising: an input terminal and an output terminal; a first network, including at least two series capacitors connected to at least two inductors and at least one capacitor arranged in parallel, coupled to the input terminal and electrical ground; a second network and a third network connected in parallel and coupled to the input terminal and the output terminal, wherein the second network includes at least two inductors coupled in parallel and the third network includes at least one capacitor connected in series to at least two parallel inductors.

5,148,134
OPTIMIZED DESIGN FOR TE_{01} MODE CIRCULAR WAVEGUIDE CONNECTED TO A BEND SECTION
Jerry A. Krill, Ellicott City; Melrose M. Jesurun, Silver Spring, and William H. Zinger, Columbia, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.
Division of Ser. No. 310,193, Feb. 13, 1989, Pat. No. 5,046,016.
This application Mar. 29, 1991, Ser. No. 677,033
Int. Cl.[5] H01P 3/127, 1/02
U.S. Cl. 333—242 8 Claims



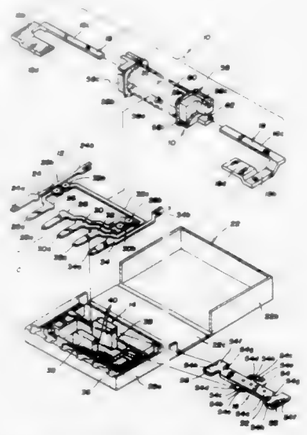
1. A circular overmoded waveguide structure of the sheathed-helix type designed for operation with an electromagnetic signal at a predetermined operating frequency and including at least one straight section connected to at least one bend section,
said sheathed-helix waveguide operating in an overmoded condition and supporting the TE_{01} mode associated with said electromagnetic signal, and comprising a wound helix of conductive wire of selected wire diameter coated with insulation of selected diameter disposed within a dielectric sheath and an outer conductor layer disposed outside of and surrounding said dielectric sheath, said helix wire having a conductivity being substantially greater than a conductivity associated with said outer conductor layer,
said wound helix having a diameter defining an inside diameter of said waveguide measured at a cross-section of said waveguide, said inside diameter being within the range 1.75 to 2.0 wavelengths at said electromagnetic signal operating frequency,
said dielectric sheath having a thickness within the range 7.5% to 10% of an inside radius of said waveguide and comprising a dielectric material with a complex dielectric constant having both real and imaginary parts, said real part being within the range 2 to 11 and said imaginary part being within the range −0.001 to −0.1, and
said at least one bend section having a bend length of approximately 16 to 17 times the inside diameter of said helix.

5,148,135
ELECTRONIC HARDWARE PACKAGE
Adolph J. Stein, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1991, Ser. No. 754,865
Int. Cl.[5] H01P 5/00
U.S. Cl. 333—246 20 Claims



1. Apparatus comprising:
a) a base having a surface with a first RF signal trace disposed on the surface;
b) an RF package disposed on the base, said package having a surface with a second RF signal trace disposed on the surface, the first RF signal trace being disposed adjacent the second RF signal trace; and
c) means, including a block of elastic material disposed over said first and second RF signal traces having a metal conductor partially embedded in the elastic material, said metal conductor being disposed in contact with the first RF signal trace and with the second RF signal trace, for electrically connecting the first and second RF signal traces.

5,148,136
FLAT ELECTROMAGNETIC RELAY
Richard L. Kidd, Stow, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 19, 1991, Ser. No. 747,234
Int. Cl.[5] H01H 51/22
U.S. Cl. 335—78 18 Claims



1. In a flat electromagnetic relay having at least six circuit leads that respectively provide at least six, coplanar, evenly spaced male terminal blades, the circuit-leads including a first pair of normally open circuit leads having a first pair of said terminal blades, a second pair of normally closed circuit leads having a second pair of terminal blades; and a pair of energizing circuit leads having a third pair of said terminal blades, the first and second pairs of circuit leads having respective ones of first and second pairs of stationary contacts that are next to each other, an armature assembly that is pivotally mounted for movement between first and second operative positions and that include movable contact bars at opposite ends so that one contact bar bridges the first pair of contacts in the first operative position and the other contact bar bridges the second pair of contacts in the second operative position, a coil assembly electrically connected to the pair of energizing leads, an electromagnetic frame comprising a core leg which is inside a coil of the coil assembly and wings that are adjacent opposite ends of the armature assembly, the coil assembly when energized positioning the armature assembly in one of the first and second operative positions, and spring means biasing the armature assembly in another of the first and second operative positions, the improvement comprising:

the first, second and third pairs of the male terminal blades having their respective male terminal blades on opposite sides of and equidistant from an imaginary centerline of the relay that is parallel to the male terminal blades.

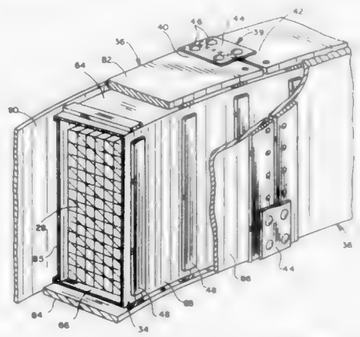
5,148,137
CONTAINMENT VESSEL FOR USE WITH A PULSED MAGNET SYSTEM AND METHOD OF MANUFACTURING SAME
John R. Purcell, San Diego; Stanley C. Burnett, Cardiff by the Sea, and Lewis R. Creedon, San Diego, all of Calif., assignors to Advanced Cryo Magnetics, Inc., San Diego, Calif.
Division of Ser. No. 439,422, Nov. 20, 1989. This application Mar. 15, 1991, Ser. No. 669,804
Int. Cl.[5] H01F 7/04; 1/00; F25B 19/00
U.S. Cl. 335—301 6 Claims

1. A helium containment vessel adapted for use in a pulsed magnet system including a superconducting coil the current in which is periodically ramped up and down, said vessel comprising:

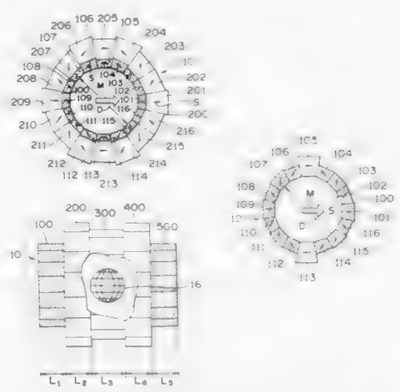
a relatively thin metallic inner tube for holding said superconducting coil and liquid helium, said inner tube providing a vacuum seal;

a relatively thick outer tube encompassing said inner tube, said outer tube being predominantly metallic and having a first metallic end, a second metallic end which does not overlap said first end, and a joint of insulative material joining said ends; and

a relatively rigid insulative spacer means disposed between said inner and outer tubes and in contact with said tubes so that said tubes do not contact each other, said spacer means transmitting forces from said inner tube to said outer tube whereby said outer tube provides structural support for said inner tube.



5,148,138
CYLINDRICAL MAGNET APPARATUS SUITABLE FOR NMR IMAGING
Koji Miyata, Fukui, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Oct. 4, 1991, Ser. No. 771,102
Claims priority, application Japan, Oct. 4, 1990, 2-267446; Oct. 4, 1990, 2-267447; Oct. 4, 1990, 2-267448
Int. Cl.[5] H01F 7/02
U.S. Cl. 335—302 21 Claims



1. A cylindrical magnet apparatus suitable for use in NMR imaging, the apparatus having an assembly of a plurality of dipole ring magnets having substantially the same inner diameter in a coaxially juxtaposed arrangement, each of the dipole ring magnets being constructed of a plurality of segments

which are arranged annularly, each of the segments being an anisotropic magnet block with has a trapezoidal cross-sectional shape and is magnetized in a suitable direction before constructing the dipole ring magnet such that a magnetic field in a predetermined direction is produced in the hole of each dipole ring magnet,

characterized in that in each of said segments of each of said dipole ring magnets an end part on the radially inner side of the ring magnet is made of a rare earth alloy magnet whereas the remaining part of the segment is made of a ferrite magnet.

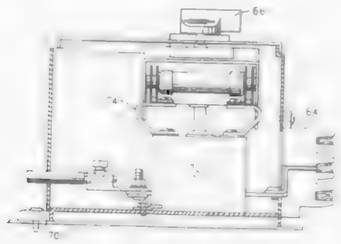
8. A cylindrical magnet apparatus suitable for use in NMR imaging, the apparatus having an assembly of at least three dipole ring magnets having substantially the same inner diameter in a coaxially juxtaposed arrangement, each of the dipole ring magnets being constructed of a plurality of segments which are arranged annularly, each of the segments being an anisotropic magnet block which has a trapezoidal cross-sectional shape and is magnetized in a suitable direction before constructing the dipole ring magnet such that a magnetic field in a predetermined direction is produced in the hole of each dipole ring magnet,

characterized in that in one of said dipole ring magnets which is positioned at one end of said assembly and in another of said dipole ring magnets which is positioned at the opposite end of said assembly each of said segments is made of a rare earth alloy magnet whereas in each of the remaining dipole ring magnets each of said segments is made of a ferrite magnet.

15. A cylindrical magnet apparatus suitable for use in NMR imaging, the apparatus having an assembly of a plurality of dipole ring magnets having substantially the same inner diameter in a coaxially juxtaposed arrangement, each of the dipole ring magnets being constructed of a plurality of segments which are arranged annularly, each of the segments being an anisotropic magnet block which has a trapezoidal cross-sectional shape and is magnetized in a suitable direction before constructing the dipole ring magnet such that a magnetic field in a predetermined direction is produced in the hole of each dipole ring magnet,

characterized in that among said segments of each of said dipole ring magnets only two segments in which the direction of magnetization is parallel to said predetermined direction of the magnetic field produced in the hole of each dipole ring magnet are made of a ferrite magnet whereas the remaining segments are made of a rare earth alloy magnet.

5,148,139
FUSE SWITCH UNIT FOR PANELBOARDS
Phillip J. Dingle, Oxfordshire; Raymond W. Thomas, and Kenneth Neill, both of Swindon, all of United Kingdom, assignors to Square D Company, Palatine, Ill.
Filed Jun. 28, 1991, Ser. No. 723,369
Int. Cl.[5] H01H 85/00; H02B 1/18
U.S. Cl. 337—6 3 Claims



1. A switch unit comprising:

a) a housing of generally rectangular form, the housing having a number of faces;

b) an inlet terminal positioned on one of said faces of the housing for resilient engagement with a busbar;

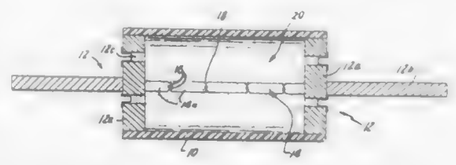
c) separable switch contacts electrically coupled with said inlet terminal;

d) a switch mechanism positioned within the housing, said switch mechanism including an operating handle, operable to open and close said contracts in a quick make or break manner;

e) an outlet terminal electrically coupled to said switch mechanism; and

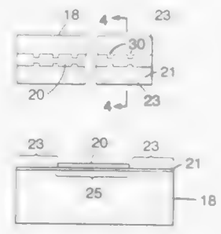
f) link means positioned within the housing, said link means mounted on said switch mechanism and the operating handle, said link means being electrically coupled in series with said inlet terminal, separable contacts and outlet terminal.

5,148,140
ELECTRICAL FUSES HAVING IMPROVED SHORT-CIRCUIT INTERRUPTIONS CHARACTERISTICS
Michel Goldstein, Randolph Township, N.J., assignor to Brush Fuses, Inc., Des Plaines, Ill.
Filed Apr. 27, 1990, Ser. No. 515,211
Int. Cl.[5] H01H 85/04, 85/18
U.S. Cl. 337—158 20 Claims



1. A fuse having a fuse link, terminals interconnected by the fuse link, an enclosure about said fuse link and a filler about said link in said enclosure, said filler comprising grains of sand having a shiny coating on the grains, the coating also bonding the grains together

5,148,141
FUSE WITH THIN FILM FUSIBLE ELEMENT SUPPORTED ON A SUBSTRATE
David E. Suuronen, Newburyport, Mass., assignor to Gould Inc., Eastlake, Ohio
Filed Jan. 3, 1991, Ser. No. 637,139
Int. Cl.[5] H01H 85/04
U.S. Cl. 337—297 28 Claims



1. A fusible element component for use in an electrical fuse, said component comprising,

a substrate made of insulative material and having a substrate surface,

a fusible element made of a thin film of conductive material that is supported on said substrate, overlies a fusible element support area of said substrate surface, and provides a conductive path during normal current conditions, and

a resistance element of resistance element material that is

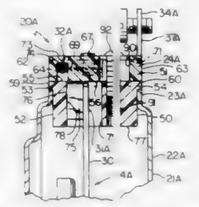
supported on said substrate, overlies a resistance element support area of said substrate surface that is a different area of said substrate surface than said fusible element support area, and is electrically in parallel to said fusible element to provide a shunt path during clearing of said fusible element during overcurrent conditions.

5,148,142

TEMPERATURE OPERATED SWITCH CONSTRUCTION, TERMINAL BLOCK THEREFOR AND METHODS OF MAKING THE SAME

Thomas M. Buckshaw, Indiana, and Joseph J. Erdelsky, Jeannette, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 19, 1991, Ser. No. 688,157
Int. Cl.[5] H01H *37/36, 87/00*
U.S. Cl. 337—329 **8 Claims**



1. In a temperature operated switch construction comprising a housing means, a movable switch arm carried in said housing means, temperature actuated means disposed in said housing means and being operatively interconnected to said switch arm to cause movement of said arm between operating positions thereof in relation to the temperature being sensed by said temperature actuated means, said housing means comprising a main part and a removable terminal block carried by said main part, said terminal block carrying a switch means that is operatively associated with said switch arm so that said switch means is in a first condition thereof when said switch arm is in a first operating position thereof and said switch means is in a second condition thereof when said switch arm is in a second operating position thereof, the improvement wherein said switch means comprises a reed switch means and wherein said switch arm carries a magnet means for operating said reed switch means to said conditions thereof as said switch arm is moved to said positions thereof, said terminal block having spaced apart stop means that are respectively engaged by said switch arm and thereby determine said positions thereof, said terminal block comprising two parts adjustably secured together whereby the position of one of said parts can be adjusted relative to the other of said parts, said reed switch means being carried by one of said parts of said terminal block, the other of said parts of said terminal block having said stop means, said other of said parts of said terminal block having an opening therethrough that defines two facing and spaced apart surface means, said two surface means comprising said stop means, said reed switch means having a longitudinal axis and being carried by said one of said parts of said terminal block so that said axis thereof is generally parallel to said surface means.

5,148,143

PRECISION THICK FILM ELEMENTS

Bernard Greenstein, Glenview, Ill., assignor to Beltone Electronics Corporation, Chicago, Ill.

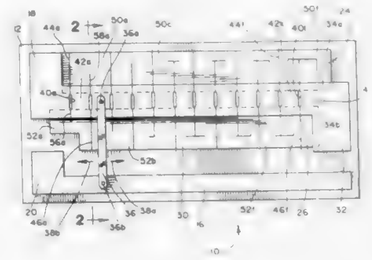
Continuation-in-part of Ser. No. 685,453, Apr. 12, 1991. This application Jun. 4, 1991, Ser. No. 710,161
Int. Cl.[5] H01C *10/10*
U.S. Cl. 338—195 **11 Claims**

1. A precision low power resistive element having a predetermined value comprising:

an insulating substrate;

a conductive layer deposited on a portion of said substrate;

a resistive layer deposited on a portion of said substrate with said two layers overlapping in part and with said conductive layer having first and second non-overlapping regions



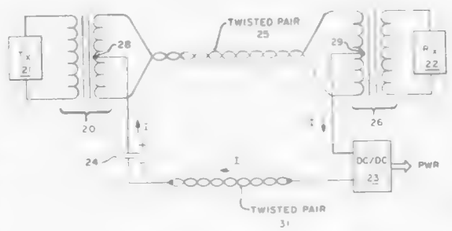
electrically separated from one another by at least one scribed non-conducting line extending across said conductive layer and into said resistive layer a predetermined amount thereby providing the predetermined resistive value between said regions.

5,148,144

DATA COMMUNICATION NETWORK PROVIDING POWER AND MESSAGE INFORMATION

Philip H. Sutterlin, San Jose; William R. Bemiss, San Mateo, and G. Michael Hey, Palo Alto, all of Calif., assignors to Echelon Systems Corporation, Palo Alto, Calif.

Filed Mar. 28, 1991, Ser. No. 678,525
Int. Cl.[5] H04M *11/04*
U.S. Cl. 340—310 A **14 Claims**



1. A data communication system for delivering power and message information from a transmitter to a receiver, said system comprising:

first and second transformers coupled to said transmitter and receiver, respectively, each of said transformers having a centertap connection to its secondary winding;

DC voltage supply means for producing a predetermined potential, said supply means having a first voltage terminal coupled to said centertap connection associated with said first transformer, and a second voltage terminal;

a first cable coupling said first and said second transformers to each other, thereby providing an AC communications path;

means for converting said predetermined potential to a regulated supply voltage for use by said receiver, said converter means being coupled to said centertap connection associated with said second transformer;

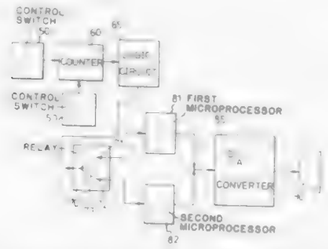
a second cable coupling said second voltage terminal of said supply means to said converter means, thereby providing a path for DC current to flow through said first and second cables, said DC current being divided within said secondary windings such that the net DC flux present within said transformers is substantially eliminated.

5,148,145

AUTOMOBILE ELECTRONIC ALARM DEVICE

Grant Tsao, No. 2, Lane 230, Ta-Tung S. Road, San-Chung City, Taipei Hsien, Taiwan

Filed May 13, 1991, Ser. No. 698,698
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—429 **7 Claims**



1. An electronic alarm device to be installed in an automobile having a license plate, comprising:

a detecting means including at least one control switch means provided on the automobile and actuated whenever an attempt to burglarize or steal the automobile is initiated, said control switch means remaining in an actuated state for as long as the attempt to burglarize or steal the automobile is ongoing; and

a sound generating means actuated by said detecting means and alternatingly producing an alarm sound signal and a speech sound signal corresponding to a combination of the digits found in the license plate of the automobile for as long as said control switch means is in the actuated state

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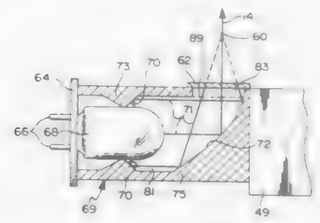
5,148,146

HIGH BRIGHTNESS TELLTALE FOR A HEAD-UP DISPLAY

Morgan D. Murphy, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Jun. 17, 1991, Ser. No. 716,165
Int. Cl.[5] G02B *27/10*
U.S. Cl. 340—461 **12 Claims**



1. A head up display apparatus, comprising:

a head up display housing in which is mounted an image source; and

a combiner located in a path of light from the image source so that the combiner projects a projected image of the image source perceivable by an operator's eye, wherein

within the head up display housing, the image source comprises a first high brightness telltale, comprising (a) a telltale housing defining a cavity and an aperture, the telltale housing having an inner reflective surface with a curved shape having a focal point outside the telltale housing such that the aperture is located between the curved surface and the focal point, (b) means for sourcing light mounted within the telltale housing and emitting light, including light which travels substantially parallel to a plane of the aperture wherein the light is reflected off of the inner reflective surface and through the aperture in a manner in which the light has a substantial focus at the focal point, and (c) means for providing a graphics symbol, mounted at the aperture, wherein the graphics symbol is brightly lit to be projected.

5,148,147

VEHICLE DECELERATION MEASUREMENT SYSTEM

Arthur L. Kobres, 18510 Lake Shore Dr., Lutz, Fla. 33549

Filed Dec. 3, 1990, Ser. No. 623,183
Int. Cl.[5] B60Q *1/90*
U.S. Cl. 340—464 **2 Claims**

2. A deceleration measuring and indicating system for a motor vehicle that includes a rotating member comprising;

a sensing means for detecting angular velocity of said rotating member, said sensing means comprising a transducer for generating pulses representative of the angular velocity of said rotating member;

a phase locked loop frequency to voltage converter for receiving pulses generated from said transducer and outputting signals that are a linear representation of vehicle speed;

computation means for receiving the output signals from the phase locked loop frequency to voltage converter and generating first and second deceleration signals, said computation means comprising means responsive to said linear output signals for selected voltage transitions, a deceleration detector comparator adapted to respond to a selected negative voltage transition for outputting an enable signal, a voltage to frequency converter adapted to gauge extent of said selected voltage transitions and producing a warning rate logic signal;

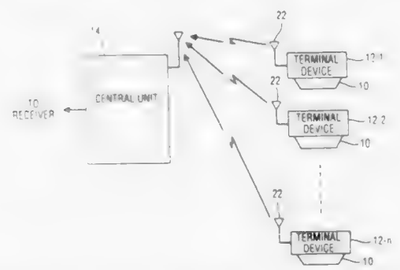
stop detect means that is responsive to the transducer's generated pulses for producing a vehicle stop logic signal, said stop detect means comprising a first monostable multivibrator adapted to time out in response to loss of pulses generated by said transducer thereby generating a vehicle stop logic signal;

output amplifier means for controlling the energization of a plurality of indicators, said indicators being red and amber in color, said output amplifier means comprising a clamping means for automatically grounding said warning rate logic signal upon detection of said vehicle stop logic signal, and a control switching means for controlling energization of said plural indicators, said control switching means comprising a transistor operatively connected to a relay;

and whereby said output amplifier means, in response, to both the enable signal and the warning rate logic signal energizes said amber indicators alternately, at a rate directly proportional to a rate of the warning rate logic signal;

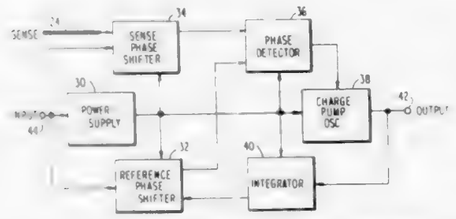
whereby said output amplifier means, in response to a vehicle stop logic signal inhibits energization of the amber indicators while allowing the red indicators to be energized.

5,148,148
RADIO ALARM SYSTEM
Hiroshi Shima, Machida, and Hajime Shimizu, Yamato, both of Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1990, Ser. No. 631,352
Claims priority, application Japan, Dec. 28, 1989, 1-340705; Dec. 28, 1989, 1-340706; Dec. 28, 1989, 1-340708; Feb. 28, 1990, 2-48425
Int. Cl.[5] G08B 1/08
U.S. Cl. 340—539 7 Claims



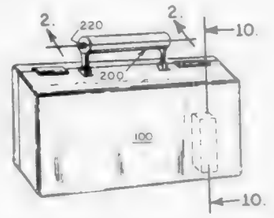
1. A radio alarm system comprising a plurality of terminal devices each of which is connected to a detector for detecting any abnormal state and each of which is adapted to transmit information in the form of a radio signal based on a detection signal from said detector, and a central unit adapted to receive and decode the radio signal from said terminal device and to give an alarm;
each of said terminal devices comprising:
channel searching means adapted to perform, when transmitting information, carrier sensing successively on a plurality of transmission channels previously allocated thereto, in a predetermined sequence and over a preset delay time, thereby selecting a free channel which is not being used by any other terminal device; and
transmission control means adapted to transmit said information, along with the terminal device address, in a continuous manner to said central unit through the channel selected by said channel searching means, by repeating a cycle of a predetermined transmission period and a predetermined rest period.

5,148,149
DIFFERENTIAL DELAY INTRUSION DETECTION SENSORY SYSTEM
David J. Campbell, Baltimore, and Kenneth I. DeWitt, Phoenix, both of Md., assignors to Allied Security Devices, Inc., Dickerson, Md.
Filed Jan. 31, 1991, Ser. No. 648,766
Int. Cl.[5] G01B 13/26
U.S. Cl. 340—562 20 Claims



1. An electromagnetic intrusion sensor for sensing the presence of an object in accordance with a frequency of a sensor output signal, said sensor comprising:
a sensing element (24);
a first phase shifter circuit (34) for phase shifting an input signal in accordance with a capacitance of said sensing element so as to output a sense signal;
a second phase shifter circuit (32) for outputting a reference signal having a fixed delay relative to said input signal;
a phase detector circuit (36), coupled to receive said sense and reference signals, for providing a detector output signal having a duty cycle representing the phase differential between said sense and reference signals; and
oscillatory means (38), coupled to receive said detector output signal, for providing the sensor output signal, the sensor output signal having a frequency which changes in accordance with the duty cycle of the detector output signal so that when the object is disposed within a predetermined range of said sensing element the capacitance thereof changes causing the duty cycle of the detector output signal to change, thereby changing the frequency of said sensor output signal.

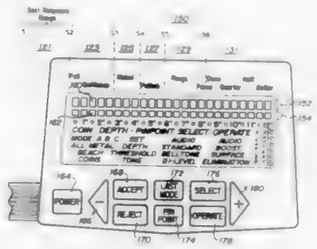
5,148,150
COMPACT SECURITY ALARM CIRCUITRY AND APPARATUS FOR PORTABLE CONTAINERS
Irving S. White, Los Angeles, and Irving Moskovitz, Pacific Palisades, both of Calif., assignors to Cra West Incorporation, Los Angeles, Calif.
Filed Jan. 7, 1991, Ser. No. 637,672
Int. Cl.[5] G08B 13/14
U.S. Cl. 340—571 20 Claims



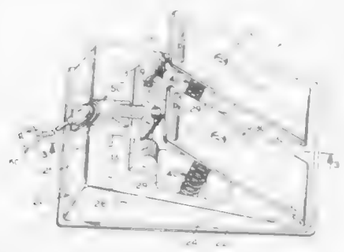
1. A compact security alarm circuitry and apparatus built into the handle of a briefcase comprising:
a. a DC power source having a positive terminal and a negative terminal;
b. an auditory sounder connected to said positive terminal of said DC power source;
c. a manual switch connected to said negative terminal of said DC power source; and
d. a sensor device connected between said manual switch and said auditory sounder where the sensor device can detect the position change of the handle of the briefcase and switch on;
e. whereby when said manual switch is switched on, if the position of the handle of the briefcase is changed, said sensor device will switch on and said auditory sounder will be activated and provide an auditory alert signal.

5,148,151
METAL DETECTOR HAVING TARGET CHARACTERIZATION AND SEARCH CLASSIFICATION
Robert J. Podhrasky, Dallas, Tex., assignor to Garrett Electronics, Inc., Garland, Tex.
Filed Jun. 20, 1990, Ser. No. 541,151
Int. Cl.[5] G08B 13/14
U.S. Cl. 340—572 7 Claims

1. A target characterization display for a metal detector which produces a detection signal for objects in a region of the detector, comprising:
a first set of arrayed display segments each having first and second display states,
a discrimination memory having respective storage locations therein corresponding to each of said display segments in said first set, each discrimination memory storage location corresponding to a unique signal parameter for metal detector targets and wherein the value stored in each of said discrimination memory storage locations controls the display state for the corresponding display segment,
a second set of arrayed display segments each having first and second display states, said second set of display segments positioned proximate said first set of display segments and having a correspondence between the segments of said first set and said second set, and
a target memory having respective storage locations therein for each of said display segments in said second set, wherein the values in said target memory storage locations are derived from phase detected signals and wherein the value in each of said target memory storage locations controls the display state for the corresponding display segment.

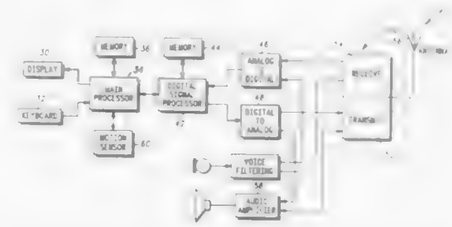


5,148,152
FOOT PEDAL CONTROL MECHANISM FOR COMPUTERS
Duane H. Stueckle, 200 Parkway Dr., Boise, Id. 83706, and Duane L. Allen, 411 S. 15th Ave., Unit F, Nampa, Id. 83651
Filed Jan. 11, 1991, Ser. No. 640,160
Int. Cl.[5] G09G 5/00
U.S. Cl. 340—706 6 Claims



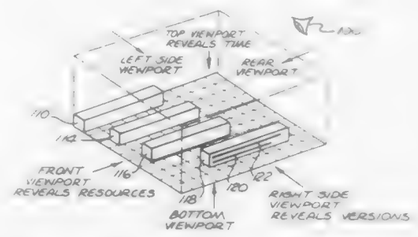
1. Foot pedal control apparatus for computer control comprising:
a housing;
a pair of foot pedals, each of said foot pedals pivotally mounted to said housing;
bias means extending between said housing and each of said pedals for biasing each of said pedals away from said housing;
a potentiometer mounted to said housing, said potentiometer provided with a rotatable shaft;
means for electrically connecting said potentiometer to a computer; and
a cable having ends of which are connected to each of said pedals and a central portion which is connected to said shaft of said potentiometer for rotating the shaft in a selected direction upon the depression of one of said foot pedals for controlling potentiometer input to a computer.

5,148,153
AUTOMATIC SCREEN BLANKING IN A MOBILE RADIO DATA TERMINAL
William D. Haymond, Surrey, Canada, assignor to Motorola Inc., Schaumburg, Ill.
Filed Dec. 20, 1990, Ser. No. 630,664
Int. Cl.[5] G09G 1/28; H04N 1/42
U.S. Cl. 340—711 10 Claims



1. An improved radio data terminal device capable of radio data communication with integral keyboard and visual display suitable for vehicular use wherein screen blanking and keyboard input deactivation is effected automatically during vehicular motion, comprising in combination:
visual display means for displaying alphanumeric data information;
keyboard means for inputting said alphanumeric data information;
means for detecting vehicular motion;
means responsive to said means for detecting vehicular motion to automatically deactivate both the visual display and the keyboard during said detected vehicular motion; and
means for audibly announcing any receipt of a message by the data processing device during those times when vehicular motion is being detected and said visual display and keyboard means are in the deactivated mode.

5,148,154
MULTI-DIMENSIONAL USER INTERFACE
Michael T. MacKay, Vallejo; Robert J. Berger, Menlo Park; Robert Duffy, Milpitas, and Ted E. Langford, Fremont, all of Calif., assignors to Sony Corporation of America, Park Ridge, N.J.
Filed Dec. 4, 1990, Ser. No. 622,821
Int. Cl.[5] G09G 3/02
U.S. Cl. 340—712 56 Claims



1. A computer controlled display system including at least one Central Processing Unit (CPU), said CPU coupled to a display for displaying data, and user input means, said display system further coupled to a plurality of system resources having defined attributes, said display system comprising:
a user interface for display by said display means, said user interface for displaying representations of resources cou-

pled to said display system with which a user interacts through said user input means;

said representations of said resources comprising at least three dimensions and being arranged in a venue of at least three dimensions, each of said dimensions corresponding to an attribute of said resources, said venue may be viewed using said interface from a plurality of view ports, such that viewing said representations of said resources from different view ports results in the display of different attributes of said resources

said representations of said resources being arranged in said venue such that each of said representations is disposed relative to one another in time and space within said venue;

manipulation means coupled to said user input means for selectively positioning said representations of said resources within said venue.

5,148,155

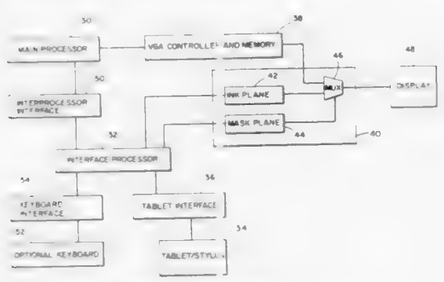
COMPUTER WITH TABLET INPUT TO STANDARD PROGRAMS

Patricia A. Martin, Groton; Jonathan T. Huntington, II, Salem, both of Mass.; J. Michael McNally, Derry, N.H.; David M. Barrett, Tyngsboro, and Jean R. Ward, Arlington, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Nov. 13, 1990, Ser. No. 613,324

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—712 **6 Claims**



1. A computer system comprising:

(A) a main processor for running pre-existing programs;

(B) a display screen;

(C) a main display buffer, coupled to the main processor, for receiving display data for a main display image generated by the pre-existing programs;

(D) a pointer-type input device, including a stylus, which generates pointing data when a user of the system moves the stylus across the surface of the display screen;

(E) an overlay display buffer for receiving data for an overlay display image;

(F) a display multiplexer for receiving data from the main display buffer and from the overlay display buffer and for providing data to the display screen to generate a display that is a combination of the main display image and the overlay display image; and

(G) an interface processor,

(1) connected to provide keystroke data to the main processor,

(2) connected to receive data from the pointer-type input device, and

(3) connected to provide display data to the overlay display buffer,

for implementing at least one simulated device that a user of the system controls with the pointer-type input device and that is displayed to the user by means of the overlay display buffer.

5,148,156

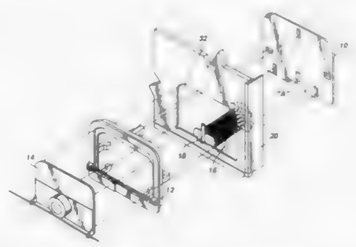
ELECTRONIC DISPLAY DEVICE HAVING A PLURALITY OF PIXEL ELEMENTS

Terrence D. Huber; Duane B. Kutsch, both of Spokane, and Donald R. Skinfill, Veradale, all of Wash., assignors to American Electronic Sign Company, Spokane, Wash.

Filed Jun. 6, 1990, Ser. No. 533,740

Int. Cl.[5] G09G *3/20*

U.S. Cl. 340—783 **13 Claims**



1. An electronic display device, comprising

a substrate having a plurality of holes provided therein arranged in rows and columns;

a pixel element provided in each of said holes, said pixel element comprising:

a translucent member abutting against a back side of said substrate and covering one of said holes;

a mounting bracket abutting against a front side of said substrate, said bracket having fastening means extending through said one hole of said substrate and connecting to said translucent member for securing said translucent member to said substrate;

a flap pivotally secured to said bracket about a pivot axis, one side of said flap having a non-reflective surface and the other side of said flap having a reflective surface, said flap being pivotable from a first position where said non-reflective surface faces outwardly therefrom to a second position, approximately 180° from said first position, where said reflective surface faces outwardly therefrom;

a magnet disposed on said flap;

an electromagnet secured to the back side of said substrate, said electromagnet having a pole piece disposed axially therein and extending into said translucent member; and

means for supplying an electric current to said electromagnet so as to alternatively energize said pole piece to be a south pole piece or a north pole piece;

wherein when said pole piece is energized to be one of a north pole piece and a south pole piece said flap is pivoted to said first position and when said pole piece is energized to be the other of said north pole piece and south pole piece said flap is pivoted to said second position.

5,148,157

SPATIAL LIGHT MODULATOR WITH FULL COMPLEX LIGHT MODULATION CAPABILITY

James M. Florence, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1990, Ser. No. 590,405

Int. Cl.[5] G09G *3/34*

U.S. Cl. 340—783 **5 Claims**

1. A method for full complex modulation of light comprising the following:

a) dividing a picture element into a number of modulating elements;

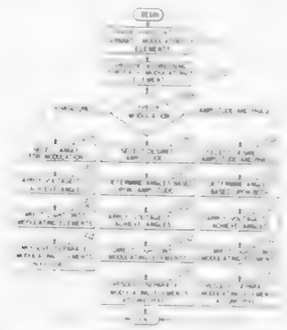
b) providing addressing circuitry for each of said modulating elements;

c) selecting a net phase and amplitude of modulation;

d) calculating angles to achieve said net phase and said amplitude of modulation;

e) addressing said modulating elements to achieve said angles for independent control of said amplitude and net phase in the picture element response; and

f) resolving said modulation elements as said picture element



5,148,158

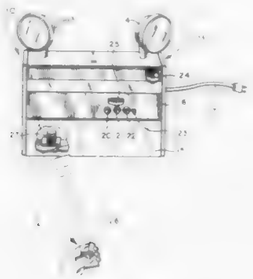
EMERGENCY LIGHTING UNIT HAVING REMOTE TEST CAPABILITY

Nikunj Shah, Hoffman Estates, Ill., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 172,551, Mar. 24, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 467,349

Int. Cl.[5] G08C *17/00;* **G08B** *29/00;* **H02J** *9/00, 7/00*

U.S. Cl. 340—825.17 **1 Claim**



1. A stand-alone emergency lighting unit operable upon loss of voltage on a monitored AC line, and in conjunction with an external hand-held transmitter unit providing consecutive user-initiated first and second momentary wireless test signals defining a desired test period, comprising:

a housing adapted for mounting on a supporting surface;

illumination means including at least one flood lamp for providing illumination in the vicinity of the housing;

rechargeable battery means in said housing for powering said flood lamp;

rectifier means within said housing operable from the monitored AC line for recharging said battery means, said rectifier means including a supply circuit connected to the monitored AC line;

monitoring circuit means within said housing for monitoring the application of AC line current to said rectifier means and for producing a control effect in the absence thereof;

switch means within said housing responsive to said control effect connecting said battery means to said flood lamp to power said lamp upon loss of voltage on the monitored AC line;

bistable circuit means including detector means within said housing responsive to said consecutive first and second externally generated momentary test signals for interrupting the application of line current to said rectifier means upon receipt of said first momentary test signal whereby said battery is caused to supply current to said illumination means, and for restoring the application of line current to said rectifier means upon receipt of said second momentary test signal whereby the supply of battery current to said illumination means is discontinued, said momentary test signals thereby providing said desired test period; and

said bistable circuit means in the absence of said second momentary test signal restoring the application of line current to said rectifier means following a predetermined period of time after said first test signal whereby the supply of battery current to said illumination means is discontinued, said first test signal thereby automatically providing a default test period of finite duration.

5,148,159

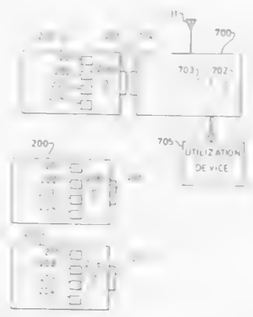
REMOTE CONTROL SYSTEM WITH TEACH/LEARN SETTING OF IDENTIFICATION CODE

John Clark, Ann Arbor; Brian J. Martel, Walled Lake, and James S. Murray, Redford, all of Mich., assignors to Stanley Electronics, Novi, Mich.

Filed Apr. 26, 1989, Ser. No. 343,921

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.22 **24 Claims**



1. A remote control system comprising:

at least one portable unit, each portable unit including

a control input means for activating a control state from a set of at least one control state,

at least one portable unit identification code memory, each portable unit identification code memory corresponding to one of said set of at least one control state for storing a corresponding identification code therein,

a radio frequency transmitter connected to said control input means and said at least one portable unit identification code memory for transmitting a radio frequency signal encoded with said identification code stored in said portable unit identification code memory corresponding to said activated control state upon activation of one of said set of at least one control state via said control input means,

an asynchronous communications reception port for asynchronously receiving data,

an identification code learning means connected to said at least one portable unit identification code memory and said asynchronous communications reception port for storing an identification code in one of said at least one portable unit identification code memory corresponding to data received via said asynchronous communications reception port, and

a memory reset means connected to said at least one portable unit identification code memory for storing a predetermined reset identification code in a selected one of

said at least portable unit identification code memory when activated; and

a base unit including

a base unit identification code memory for storing an identification code therein,

a radio frequency receiver connected to said base unit identification code memory for receiving said encoded radio frequency signal and generating a function signal only if said encoded radio frequency signal is encoded with said identification code stored in said base unit identification code memory,

an asynchronous communications transmission port capable of mating with said asynchronous communications reception port for asynchronously transmitting data,

an identification code teaching means connected to said base unit identification code memory and said asynchronous communications port for transmitting said base unit identification code stored in said base unit identification code memory via said asynchronous communications transmission port, and

an identification code selection means connected to said base unit identification code memory and not activated in conjunction with the activation of said identification code teaching means for selecting an identification code for storage in said base unit identification code memory, said base unit identification code selection means further including a memory reset means for resetting said base unit identification code to said predetermined reset identification code;

whereby said identification code stored in said base unit identification code memory is taught to one of said at least one portable unit by connection of said asynchronous communications transmission port to said asynchronous communications reception port and activation of said identification code learning means and said identification code teaching means.

5,148,160

RADIO COMMUNICATION APPARATUS FOR RAPIDLY KNOWING WHETHER THE APPARATUS IS WITHIN OR OUT OF A SERVICE AREA

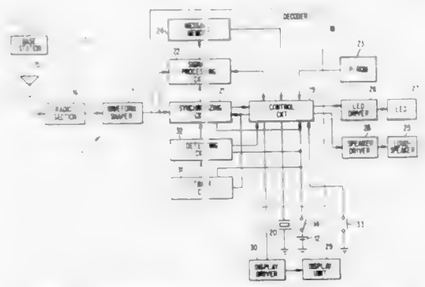
Kazuhiro Kudoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1990, Ser. No. 553,844

Claims priority, application Japan, Jul. 18, 1989, 1-184915

Int. Cl.[5] H04B *7/00*

U.S. Cl. 340—825.44 **4 Claims**



1. A radio communication apparatus for receiving radio signals at a predetermined period when supplied with an electric power from a power source, each of said radio signals carrying a synchronization signal and an additional signal succeeding said synchronization signal,

said apparatus comprising:

a switch having an on state and an off state and connected to said power source;

first processing means, connected to said switch, for processing each of said radio signals into said synchronization and said additional signals when said switch is put in said on state;

clock generating means, connected to said switch, for generating a timing clock signal when said switch is put in said on state;

synchronizing means, connected to said switch, said first processing means and said clock generating means, for synchronizing said timing clock signal with said synchronization signal so as to produce a synchronized clock signal when said switch is put in said on state; and

second processing means, connected to said switch, said first processing means and said synchronizing means, for processing said additional signal into a processed signal by using said synchronized clock signal when said switch is put in said on state;

timer means, connected to said switch, for timing a preselected time interval substantially equal to said predetermined period from a time instant at which said switch is turned from said off state to said on state, said timer means producing a time-out signal when said timer means times said preselected time interval;

detecting means, connected to said switch, said synchronizing means and said timer means, for detecting, when said switch is put in said on state, a time at which said timing clock signal becomes said synchronized clock signal, said detecting means producing a detection signal when said detecting means detects said time before reception of said time-out signal, said detecting means producing, when said detecting means does not detect said time before reception of said time-out signal, said time-out signal as a non-detection signal; and

announcing means connected to said switch and said detecting means for announcing, in response to said detection signal and said non-detection signal when said switch is put in said on state, that said apparatus is in one of synchronized state and an unsynchronized state, respectively.

5,148,161

DIGITAL SIGNAL PROCESSOR FOR FIXED AND FLOATING POINT DATA

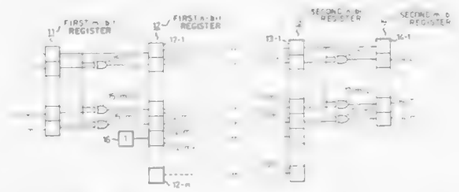
Kazuya Sako, Kakogawa; Masaaki Nagami, and Shoji Fujimoto, both of Kobe, all of Japan, assignors to Fujitsu Ten Limited, Hyogo, Japan

Filed Apr. 14, 1989, Ser. No. 338,894

Claims priority, application Japan, Apr. 18, 1988, 63-93349

Int. Cl.[5] H03M *7/24*

U.S. Cl. 341—93 **13 Claims**



9. A digital signal processor comprising:

a first m-bits register having m number of bits for storing an integer coded in a Binary Two's complement code;

a first n-bits register having n number of bits for storing an integer coded in Sign Magnitude Binary code;

first exclusive OR gates wherein one input of each of said first exclusive OR gates is connected to a sign bit in said first m-bits register and the other inputs of each of said first exclusive OR gates are connected to m-1 bits in said first m-bits register, except for the sign bit, respectively;

a second n-bits register having n number of bits for storing an integer coded in Sign Magnitude Binary code;

a second m-bits register having m number of bits for storing an integer coded in a Binary Two's Complement code wherein $m<n$; and

second exclusive OR gates wherein one input of each of said second exclusive OR gates is connected to a sign bit in said second n-bits register and the other inputs of each of said second exclusive OR gates are connected to said m-1 bits in said second n-bits register, respectively; and

a logic "1" providing means for providing a logic "1", wherein

the sign bit in said first m-bits register is connected to an input of a sign bit in said first n-bits register,

outputs of said first exclusive OR gates are connected to inputs of m-1 bits in said first n-bits register, except for a) the sign bit of said first n-bits register and b) the least significant bit of said first n-bits register, respectively,

an output of said logic "1" providing means is connected to an input of a bit which is a less significant bit next to the least significant bit of said m-1 bits in said first n-bits register,

the sign bit in said second n-bits register is connected to an input of a sign bit in said second m-bits register, and

outputs of said second exclusive OR gates are connected to inputs of m-1 bits in said second m-bits register, except for the sign bit in said second m-bits register, respectively.

5,148,162

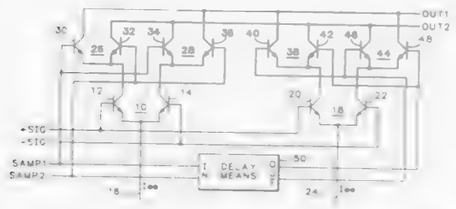
ANALOG-TO-DIGITAL CONVERTER COMPARATOR CIRCUIT UTILIZING A REVERSE POLARITY SAMPLING TECHNIQUE

Philip S. Crosby, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Apr. 9, 1991, Ser. No. 682,498

Int. Cl.[5] H03M *1/20*

U.S. Cl. 341—122 **20 Claims**



1. An A/D converter element for sampling an input signal, said element comprising:

first means for receiving an input comparison signal,

second means for receiving said input comparison signal,

means for normally combining outputs of said first means and said second means subtractively,

means for producing inversion in operation between said first means and said second means for a predetermined time period during which said outputs combine additively, and

latch means for receiving said combined output and responding thereto for assuming a stable state in accordance with said comparison signal.

5,148,163

DIGITAL TO ANALOG CONVERSION CIRCUIT WITH DITHER AND OVERFLOW PREVENTION

Paul Frindle, Charlbury, England, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 25, 1991, Ser. No. 765,268

Claims priority, application United Kingdom, Nov. 15, 1990, 9024819

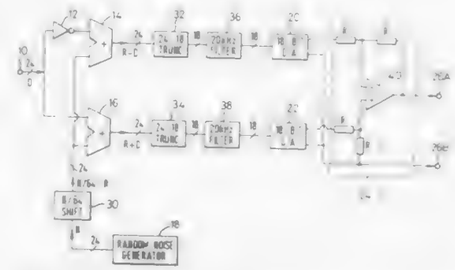
Int. Cl.[5] H03M *1/20*

U.S. Cl. 341—131 **16 Claims**

1. A circuit for converting an input digital signal having a plurality of bits into an analog representation thereof, the circuit comprising:

means for separating the input digital signal into first and second digital signals;

means for combining a digital random noise signal having a plurality of bits with each of the first and second digital signals to form respective first and second combined digital signals such that the first combined digital signal represents the sum of the digital random noise signal and the input digital signal, and the second combined digital signal represents the difference between the digital random noise signal and the input digital signal;



digital truncating means for reducing the bit number of the first and second combined digital signals to form respective first and second truncated digital signals;

means for digital-to-analog converting each of the first and second truncated digital signals to form respective first and second converted analog signals; and

means for subtracting the first and second converted analog signals so as to remove the random noise signal components thereof and to provide an analog representation of the input digital signal.

5,148,164

CURRENT GENERATING DEVICE FOR COMPLEMENTARILY GENERATING TWO CURRENTS OF DIFFERENT MAGNITUDES IN RESPONSE TO ONE-BIT DATA

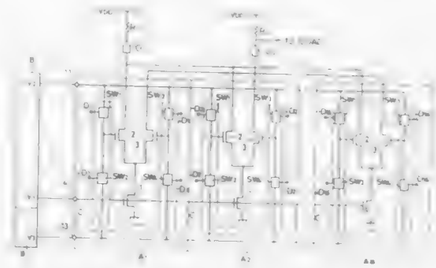
Yasuyuki Nakamura, and Toshio Kumamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1991, Ser. No. 685,411

Claims priority, application Japan, Apr. 23, 1990, 2-107195

Int. Cl.[5] H03M *1/80*

U.S. Cl. 341—136 **12 Claims**



1. A current generating device for complementarily generating two different currents having different magnitudes in response to one-bit data, comprising:

constant current generating means for generating a current having a predetermined magnitude;

first and second switching means for complementarily gen-

erating an ON state which allows passage of the current with the predetermined magnitude generated by said constant current generating means and an OFF state which prevents the passage of the current with the predetermined magnitude;

first control signal generating means for generating a first control signal for turning on said first and second switching means;

second control signal generating means for generating a second control signal of a level substantially equal to a cutoff voltage at which said first and second switching means can be turned off;

supply means responsive to said one-bit data for complementarily applying said first and second control signals generated by said first and second control signal generating means to said first and second switching means; and

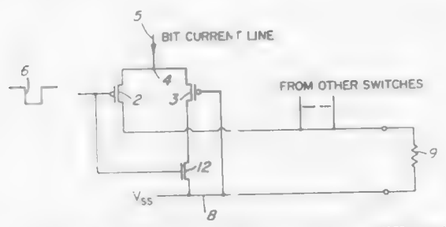
first and second output means for outputting respective currents from said first and second switching means, respectively.

5,148,165

CMOS DIGITAL TO ANALOG SIGNAL CONVERTER CIRCUIT

Richard S. Phillips, Constance Bay, Canada, assignor to Mosaid, Inc., Kanata, Canada

Filed Dec. 15, 1989, Ser. No. 451,225
Claims priority, application Canada, Aug. 18, 1989, 608742
Int. Cl.[5] H03K *19/017, 19/094*
U.S. Cl. 341—136 **7 Claims**



1. A digital to analog converter comprising a differential amplifier formed of a pair of similar conductivity type field effect transistors, one transistor being connected to a load for driving the load in synchronism with a digital input signal, means for applying a reference voltage to the gate of the second transistor, and a third field effect transistor of conductivity type complementary to said one transistor, connected with its source-drain circuit in series with the source-drain circuit of the second transistor to a second reference voltage, and means for driving the gates of said one and third transistors together synchronously and with said digital input signal to cause said one and third transistors to reciprocally and synchronously conduct and cut off, thus ensuring substantially no current flow in the second transistor while the first transistor is conducting.

5,148,166

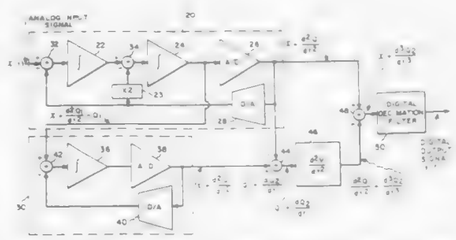
THIRD ORDER SIGMA DELTA OVERSAMPLED ANALOG-TO-DIGITAL CONVERTER NETWORK WITH LOW COMPONENT SENSITIVITY

David B. Ribner, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 505,384, Apr. 6, 1990, abandoned, and Ser. No. 513,452, Apr. 23, 1990, Pat. No. 5,103,229. This application Jul. 10, 1990, Ser. No. 550,763
Int. Cl.[5] H03M *3/00*
U.S. Cl. 341—143 **32 Claims**

1. A third-order sigma-delta analog-to-digital converter network, comprising:

a second-order modulator comprising first and second integrators coupled in cascade such that the output of said first integrator is coupled to the input of said second integrator, said first integrator being adapted to receive an analog input signal, and a first analog-to-digital converter coupled to the output of said second integrator, said first analog-to-digital converter being adapted to convert an analog output signal from said second integrator into a first digital output signal corresponding to said analog input signal plus a second-order differential quantization noise component, said analog output signal corresponding to said first digital output signal less quantization noise of said second-order modulator;



a first-order modulator comprising a third integrator, means coupling the output of said second integrator to the input of said third integrator, and a second analog-to-digital converter coupled to the output of said third integrator for converting said analog output signal of said second integrator into a second digital output signal corresponding to said analog output signal plus a first-order differential quantization noise component; and

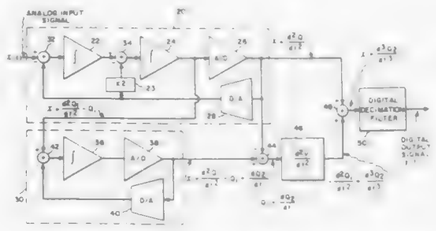
means for combining said first and second digital output signals of said second-order and first-order modulators to generate a digital output signal corresponding to said analog input signal essentially free of quantization noise from said second-order modulator.

5,148,167

SIGMA-DELTA OVERSAMPLED ANALOG-TO-DIGITAL CONVERTER NETWORK WITH CHOPPER STABILIZATION

David B. Ribner, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 550,763, Jul. 10, 1990, and a continuation-in-part of Ser. No. 505,384, Apr. 6, 1990, abandoned, and a continuation-in-part of Ser. No. 513,452, Apr. 23, 1990. This application Jan. 24, 1991, Ser. No. 645,157
Int. Cl.[5] H03M *3/00*
U.S. Cl. 341—143 **5 Claims**



1. In an oversampling analog-to-digital converter having a sigma-delta modulator followed in cascade by a decimation filter; the decimation filter supplying digital output signals for said oversampling analog-to-digital converter at an output rate that is a submultiple 1/R of an oversampling rate at which digital samples of an input signal for said decimation filter are supplied, R being an integer at least four; the sigma-delta modulator having therewithin a chopper-stabilized amplifier connected as a Miller integrator for generating an integrator output signal that is the time integral of an error signal, means for quantizing said integrator output signal to generate at an oversampling rate digital samples of the input signal for said decimation filter, a digital-to-analog converter for generating an analog feedback signal corresponding to the digitized input signal for said decimation filter, and means for differentially combining said analog feedback signal with an analog input signal for said oversampling analog-to-digital converter thereby to generate said error signal; an improvement comprising:

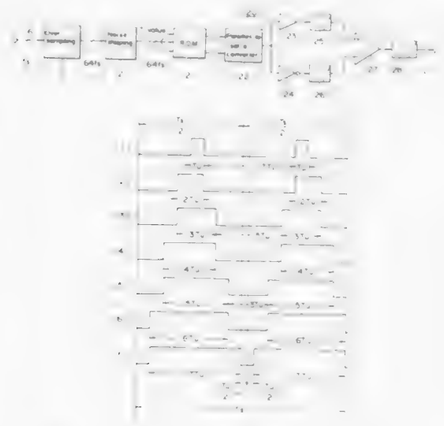
means for operating said chopper-stabilized amplifier at a chopping rate lower than half said oversampling rate and higher than said output rate.

5,148,168

DIGITAL-TO-ANALOG CONVERTER USING PULSE-WIDTH MODULATION

Toshihiko Masuda, and Masaaki Ueki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1991, Ser. No. 693,373
Claims priority, application Japan, May 16, 1990, 2-125856
Int. Cl.[5] H03M *1/82*
U.S. Cl. 341—152 **4 Claims**



1. A digital-to-analog converter for converting input digital data having a predetermined sampling period into an analog signal, comprising:

pulse-width modulated signal generation means for generating a pulse-width modulated signal having a pulse width corresponding to said input digital data; and

low-pass filter means for eliminating high-frequency components of said pulse-width modulated signal to thereby output said analog signal; wherein

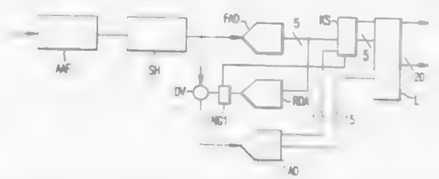
said pulse-width modulated signal generation means is operative to divide the sampling period of said input digital data into an integral even number of divided sampling periods and to generate a pulse-width modulated signal in each divided sampling period, said sampling period including at least two pulses having equal pulse widths symmetrically arranged about a point a predetermined interval from the center of said sampling period and corresponding to said input digital data.

5,148,169

METHOD AND APPARATUS FOR CONVERSION OF THE SAMPLED SIGNAL OF AN ANALOG INPUT SIGNAL

C. David Bustance; Paul Lidbetter, both of Royston, and John Lancaster, Fulbourn, all of Great Britain, assignors to Siemens Aktiengesellschaft Österreich, Austria

Filed May 20, 1991, Ser. No. 663,844
Claims priority, application European Pat. Off., Sep. 29, 1988, 88309066.4
Int. Cl.[5] H03M *1/14, 1/68*
U.S. Cl. 341—156 **5 Claims**



1. A method for converting a sampled signal of an analog input signal to a digital output signal that is L data bits in length comprising the steps of:

converting the sampled signal to a digital reference signal of M<L data bits in length only during a sampling period that is a portion of a work cycle;

maintaining said digital reference signal until a subsequent sampling period;

converting the digital reference signal back to an analog reference signal;

subtracting the analog reference signal from the sampled signal to form a difference signal, said subtracting being suppressed if a level of the sampled signal falls below a minimum quantization level for converting the sampled signal to a digital reference signal;

amplifying and converting the difference signal to a digital partial signal of N data bits in length, where M<N<L; and

summing the digital reference signal and the signal partial signal to yield the digital output having L data bits, said output signal having most significant bits formed by the digital reference signal and least significant bits formed by the digital partial signal, wherein a sum of a number of data bits of the digital reference signal and the partial signal is not less than a number of data bits of the digital output signal.

5,148,170

HIGH RESOLUTION ANALOGUE-TO-DIGITAL CONVERTER

Hans Leopold; Paul O'Leary, both of Graz; Manfred Pacher, Lannach; Robert Roehrer, and Gunter Winkler, both of Graz, all of Austria, assignors to Austria Mikro Systeme Internationale Gesellschaft m.b.H., Unterpremstatten, Austria

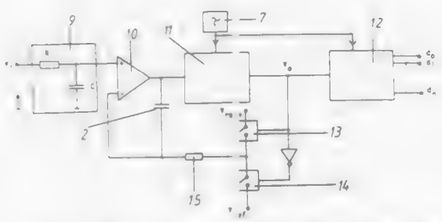
Continuation of Ser. No. 562,552, Aug. 3, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 813,054
Claims priority, application European Pat. Off., Apr. 19, 1990, 90890123.4
Int. Cl.[5] H03M *1/60*
U.S. Cl. 341—157 **10 Claims**

1. An analog-to-digital converter, having an analog voltage input and a digital output, comprising:

a charge balancing differential integrator, comprising a differential amplifier and an integrator capacitor, said differential amplifier having a non-inverting input serving as said analog voltage input of the analog-to-digital converter, said integrator capacitor connected between an inverting input of the differential amplifier and a voltage output of said differential amplifier and an integrator resistor connected to the inverting input of said differen-

tial amplifier, the other end of said integrator resistor forming a negative input of the differential integrator, another capacitor connected between a noninverting input of the differential amplifier and ground and another resistor connected between the analog voltage input and the noninverting input of the differential amplifier;

pulse width modulator means, having a signal input, a clock input and an output, for outputting a pulse width modulated signal at each of its cycles of operation, said pulse width output at each said cycle having a period fixed by a system cycle clock signal input onto said clock input, said pulse width modulated signal having a quantized pulse width indicative of said voltage output of said differential amplifier received on said signal input and quantized to one of a defined plurality of values which gives the best possible charge balancing in said integrator capacitor, wherein said pulse width modulator means comprises a periodic ramp signal generator, a voltage of a periodic ramp signal output from the periodic ramp signal generator being compared with said voltage output of the differ-



ential amplifier a predetermined number of times during each said period of the pulse width modulated signal;

means for feeding back said pulse-width modulated signal to said inverting input of said differential amplifier;

said charge balancing differential integrator producing a residual charge indicative of a difference between said quantized pulse width and perfect charge balance over plural cycles of said pulse width modulator means, until said residual charge accumulates sufficiently over said plural cycles to cause said pulse width modulator means to generate another quantized pulse width based on adjustment by said residual charge; and

a digital encoding means for monitoring a plurality of outputs of said pulse width modulator means over a plurality of said cycles for producing and outputting a digital value onto said digital output of the analog-to-digital converter which is indicative of both a) said pulse width of said pulse width modulated signal and b) the frequency of occurrence of said quantized pulse width and said another quantized pulse width, over said plurality of cycles.

5,148,171

MULTISLOPE CONTINUOUSLY INTEGRATING ANALOG TO DIGITAL CONVERTER

Leon Blumberg, Hockessin, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 25, 1991 Ser. No. 735,592

Int. Cl.[5] **H03M** *1/50*

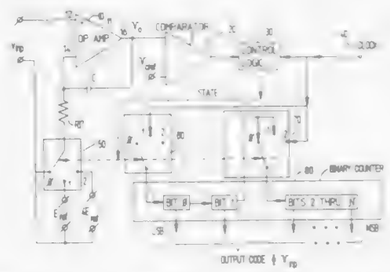
U.S. Cl. 341—168 **8 Claims**

1. A multislope continuously integrating analog-to-digital converter for converting an analog input signal into a digital output signal, comprising:

reference voltage generating means for sequentially generating a plurality of reference voltages of increasing magnitude; and

integrating means having a first input coupled to said generating means and a second input coupled to said analog input signal, said integrating means generating an output corresponding to the difference between said input signal and said sequentially generated reference voltages; and

zero crossing detector means for producing a zero integrator output signal when said integrator output equals zero, wherein said reference voltages are sequentially applied to said input circuit for predetermined time periods until the occurrence of said zero integrator output signal; and



timing means for generating a plurality of count signals corresponding to the duration in which each of said reference voltages are applied to said input circuit, wherein, a weighting factor, corresponding to the magnitude of said applied reference voltage, is employed for weighting the magnitude of the count signal, and wherein, said digital output signal corresponds to the weighted value of said count signal.

5,148,172

ABSORBING COATING, ITS PROCESS OF MANUFACTURE AND COVERING OBTAINED WITH THE AID OF THIS COATING

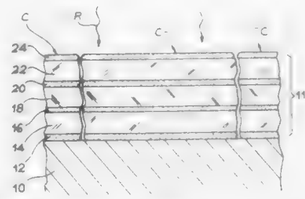
Pierre Kumurdjian, St Cheron, France, assignor to Commissariat A l'Energie Atomique, Paris, France

Filed Jan. 13, 1989, Ser. No. 300,649

Claims priority, application France, Jan. 18, 1988, 88 00495

Int. Cl.[5] **H01Q** *17/00*

U.S. Cl. 342—1 **12 Claims**



1. Coating comprising a binder (**34**) and a load including chips with at least one thin layer capable of absorbing a electromagnetic radiation and wherein the thin layer is a stack of thin layers (**12, 14, . . . , 22, 24**), this stack being capable of absorbing the electromagnetic radiation.

5,148,173

MILLIMETER WAVE SCREENING CLOUD AND METHOD

William G. Rouse, Aberdeen, Md.; Connie S. Kilgore, Delta, Pa.; Ronald E. Rhea, Bel Air; Michael J. Burnham, Kingsville, both of Md., and Benjamin G. Wachob, Boulder, Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 15, 1991, Ser. No. 687,113

Int. Cl.[5] **F42B** *12/70;* **H01Q** *17/00*

U.S. Cl. 342—3 **3 Claims**

1. In an improved method of screening against millimeter wave transmission, the improvement comprising injecting into the atmosphere a screening cloud of fine particles comprised of carbon compositions selected from the group consisting of graphitized carbon fibers and polyacrylonitrile based precursors including cutting said fibers to one half the wavelength of the desired frequency to be screened, said particles are epoxy sized and desized and of a particular size of about 3 to about 7 microns in diameter, forming said cloud by bursting a compacted generally cohesive solid mass of said particles in the atmosphere by a high explosive charge within said compacted mass of said carbon composition to thereby aerosolize and disperse said particles in the atmosphere.

5,148,174

SELECTIVE RECEPTION OF CARRIER-FREE RADAR SIGNALS WITH LARGE RELATIVE BANDWIDTH

Henning F. Harmuth, Potomac, Md., assignor to Geophysical Survey Systems, Inc., North Salem, N.H.

Filed Feb. 13, 1991, Ser. No. 654,498

Int. Cl.[5] **G01S** *7/28*

U.S. Cl. 342—21 **13 Claims**

1. In a radar transmission system having means for transmitting into a medium an electromagnetic signal comprising a plurality of positive-going and negative-going pulses, without a sinusoidal carrier as a fine structure marking, in a pattern of pulses that form a signal with coarse structure marking which is long compared to each of said pulses, the improvement comprising:

means for supplying to the means for transmitting, a sequence of positive-going and negative-going pulses in a pattern of non-continguous pulses.

5,148,175

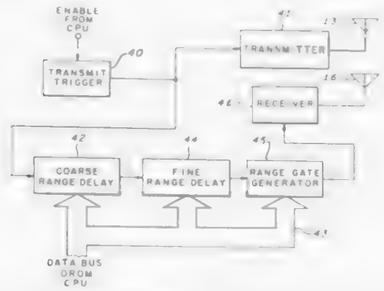
HIGH RESOLUTION VARIABLE RANGE GATE GENERATOR WITH PROGRAMMABLE TIMING

Thomas M. Woolfolk, Gordonsville, Va., assignor to Sperry Marine Inc., Charlottesville, Va.

Filed Jul. 5, 1991, Ser. No. 726,064

Int. Cl.[5] **G01S** *13/18*

U.S. Cl. 342—95 **7 Claims**



1. In a radar system having a transmitter activated by a trigger pulse and a receiver including range gate generator apparatus for generating a range gate of predetermined width following a controllable time interval after an occurrence of said trigger pulse, said range gate utilized to enable said receiver, said controllable time interval being controllable by a first digital signal, said range gate apparatus comprising

first programmable delay line means coupled to receive said trigger pulse and responsive to said first digital signal for propagating said trigger pulse along said first programmable delay line means to delay said trigger pulse in accordance with said first digital signal so as to provide a delayed trigger pulse delayed by said controllable time interval, and

range gate generator means coupled to said first programmable delay line means and responsive to said delayed trigger pulse for generating said range gate upon the occurrence of said delayed trigger pulse.

5,148,176

MEASURING DEVICE

Timothy A. Beattie, Eltham, and Jeffrey J. Felice, Matraville, both of Australia, assignors to ICI Australia Operations Proprietary Limited, Australia

Filed Jul. 12, 1991, Ser. No. 728,872

Claims priority, application Australia, Jul. 13, 1990, PK1168

Int. Cl.[5] **G01S** *13/50, 15/50;* **E21C** *41/26*

U.S. Cl. 342—104 **12 Claims**

7. An ultrasonic device adapted to measure face velocity of blast faces in blasting operations wherein said ultrasonic device comprises an ultrasonic generator, a transmitting device, a receiving device and a signal analysing means wherein the transmitting device transmits ultrasonic radiation and the receiving device receives the radiation after it has been reflected from the blast face and the signal analysing means comprises an amplifier having a response curve which is flat to within 2% tolerance from 900 Hz to 15 kHz and flat to within 5% tolerance from 500 Hz to 25 kHz.

5,148,177

IN-FURNACE LEVEL METER AND ANTENNA THEREFORE

Akio Nagamune; Kouichi Tezuka; Yoshiyuki Kanao, and Isamu Komine, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 660,299

Claims priority, application Japan, Feb. 26, 1990, 2-42444; Apr. 24, 1990, 2-106481

Int. Cl.[5] **G01F** *23/00*

U.S. Cl. 342—124 **11 Claims**

1. An in-furnace level meter comprising:

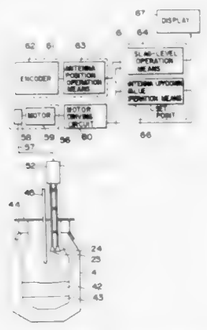
a microwave radar having transmission and reception antenna to be inserted in a furnace, for supplying a microwave signal to said transmission antenna, for calculating a distanc between the antenna and a slag surface in said furnace on the basis of said microwave signal reflected from said slag surface and received by said reception antenna, and for outputting the result of said calculation as an output signal of a level measurement value;

an antenna moving means for moving said transmission and reception antennas inserted in said furnace in an upward or downward direction in response to an antenna up/-down control signal;

an antenna position measuring means for measuring an antenna position to thereby provide an antenna position signal; and

a signal processing section for calculating an in-furnace slag

level position on the basis of said level measurement value signal of said microwave radar and said antenna position signal of said antenna position measuring means, and for calculating an antenna movement distance by comparing



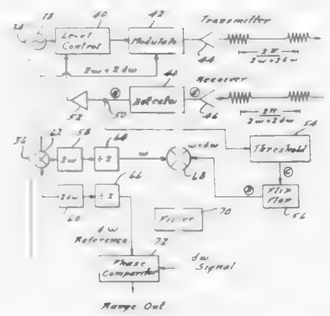
said in-furnace slag level position with a set point or upper-limit and lower-limit set points to supply said antenna movement distance as said antenna up/down control signal to said antenna moving means.

5,148,178

PRECISION RANGING SYSTEM

William C. Holzer, and Arthur H. Hardy, Jr., both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Oct. 11, 1988, Ser. No. 255,308
Int. Cl.[5] G01S 9/06
U.S. Cl. 342—127 **21 Claims**



1. A method for determining the range to a target comprising;

reflecting a first burst of continuous wave energy from said target;

receiving said first burst and generating a second burst of continuous wave energy at an energy level determined by the strength of said first received burst;

reflecting said second burst from said target;

receiving said second burst and determining a phase difference between said generated second burst and said second received burst by determining a time at which said second burst crosses a predetermined threshold; and

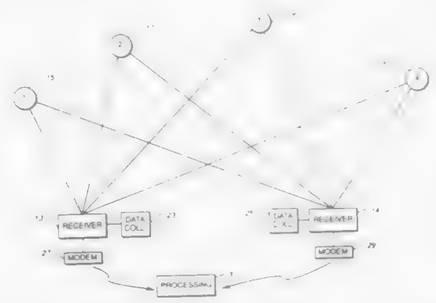
determining the range to said target in accordance with said phase difference.

5,148,179

DIFFERENTIAL POSITION DETERMINATION USING SATELLITES

Michael T. Allison, Santa Clara, Calif., assignor to Trimble Navigation, Sunnyvale, Calif.

Filed Jun. 27, 1991, Ser. No. 722,512
Int. Cl.[5] H04B 7/185; G01S 5/02
U.S. Cl. 342—357 **15 Claims**



1. A method for determining the position of a radio signal receiver located on or above the Earth's surface, the method comprising the steps of:

(1) providing a roving receiver whose position is to be determined at a sequence of predetermined times;

(2) providing a reference receiver whose position is known with sufficient accuracy at the sequence of predetermined times;

(3) providing a plurality of n satellites ($n \geq 4$), numbered $j=1,2,\ldots,n$, at predetermined heights above the Earth's surface, where each satellite transmits a predetermined signal at a predetermined sequence of times at each of two carrier frequencies $f=f_{L1}$ and $f=f_{L2}$;

(4) determining a plurality of n theoretical distance values $R_{1,1},R_{2,1},\ldots,R_{n,1}$ from each of the satellites to the roving receiver at the sequence of predetermined times, where each theoretical distance value is determined from a knowledge of the position of a satellite and an approximate knowledge of the position of the roving receiver;

(5) determining a plurality of n theoretical distance values $R_{1,2},R_{2,2},\ldots,R_{n,2}$ from each of the satellites to the reference receiver at the sequence of predetermined times, where each theoretical distance value is determined from a knowledge of the position of a satellite and of the position of the reference receiver, where the position of the reference receiver is known with sufficient accuracy at each of the predetermined sequence of times;

(6) forming theoretical range double difference values $\Delta R_{i,i';j,j'}$ ($i,i'=1,2$; $i=i'$; $j,j'=2,3,4$; $j=j'$), defined by the relations

$$\Delta R_{i,i';j,j'}=(R_{i,j}-R_{i',j})-(R_{i,j'}-R_{i',j'})$$

for the pair of satellites i and i' and the pair of receivers j and j';

(7) determining a characteristic wavelength $\lambda\Delta=c/(f_{L1}-f_{L2})$, where c is the velocity of light;

(8) measuring first and second phase variables, denoted $\beta_{a,b;Lk}$ ($k=1$ and 2) from observations of the phase of a signal sent by transmitter number a and received by receiver number b ($a=i$ or i'; $b=j$ or j') with carrier frequency $f=f_{Lk}$;

(9) forming a third phase variable $\beta_{\Delta a,b}=\beta_{a,b;L1}-\beta_{a,b;L2}$;

(10) forming a fourth phase variable $\phi_{\Delta i,i';j,j'}$ defined by the relations

$$\phi_{\Delta i,i';j,j'}=(\beta_{\Delta i,j}-\beta_{\Delta i',j})-(\beta_{\Delta i,j'}-\beta_{\Delta i',j'})$$

for the pair of satellites i and i' and the pair of receivers j and j';

(11) measuring a pseudorange $\rho_{a,b;Lk}=c(t^b-t_a)$, where t_a is the uncorrected time a given signal is transmitted by satellite a, t^b is the uncorrected time the given signal is received by receiver b, c is the speed of light, and the satellite transmits the given signal using the carrier frequency $f=f_{Lk}$ ($a=i,i';b=j,j'$; $k=1$ or 2);

(12) forming unfiltered pseudorange double difference values $\Delta\rho_{i,i';j,j';Lk}$ defined by the relations

$$\Delta\rho_{i,i';j,j';Lk}=(\rho_{i,j;Lk}-\rho_{i',j;Lk})-(\rho_{i,j';Lk}-\rho_{i',j';Lk});$$

(13) determining a fifth phase variable $N_{i,i';j,j'}$ by the relations

$$N_{i,i';j,j'}=\Delta\rho_{i,i';j,j';Lk}/\lambda\Delta+\phi_{\Delta i,i';j,j'}$$

with $i=1$, $j=1$ and $j'=2$;

(14) determining the values of the $n-1$ fifth phase variables $N_{1,i';1,2}$ ($i'=2,\ldots,n$) for a sequence of samples determined at the predetermined sequence of times;

(15) filtering the sequence of samples of the fifth phase variables $N_{1,i';1,2}$ for each value of $i'=2,\ldots,n$ to determine a filtered fifth phase variable $N_{1,i';1,2}(f)$, in order to remove or minimize the effects of noise on the fifth phase variable; and

(16) solving the $n-1$ simultaneous equations given by

$$\phi_{\Delta 1,i';1,2}=-\Delta R_{1,i';1,2}/\lambda_\Delta+N_{1,i';1,2}(f),\ (i'=2,\ldots,n)$$

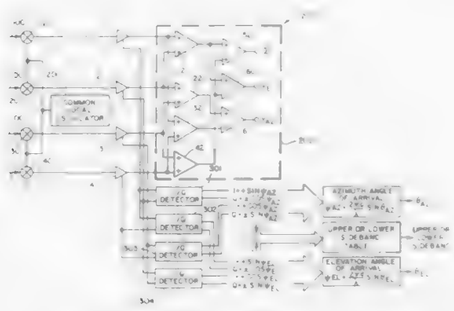
to obtain position coordinates (x_1,y_1,z_1) of the roving receiver when the coordinates (x_2,y_2,z_2) of the reference receiver are known are known with sufficient accuracy.

5,148,180

METHOD AND APPARATUS FOR PASSIVE DIRECTION FINDING WITH SIDEBAND DETERMINATION

Ralph K. Beyer, and Robert E. Hunt, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 15, 1991, Ser. No. 729,741
Int. Cl.[5] G01S 5/04
U.S. Cl. 342—437 **8 Claims**



	UPPER SIDEBAND	LOWER SIDEBAND
I/Q DETECTOR 301	$I=+\sin\psi_{AZ}$	$I=+\sin\psi_{AZ}$
	$Q=+\cos\psi_{AZ}$	$Q=-\cos\psi_{AZ}$
I/Q DETECTOR 302	$I=+\sin\psi_{EL}$	$I=+\sin\psi_{EL}$
	$Q=+\cos\psi_{EL}$	$Q=-\cos\psi_{EL}$
I/Q DETECTOR 303	$I=+\cos\psi_{AZ}$	$I=+\cos\psi_{AZ}$
	$Q=+\sin\psi_{AZ}$	$Q=-\sin\psi_{AZ}$
I/Q DETECTOR 304	$I=+\cos\psi_{EL}$	$I=+\cos\psi_{EL}$
	$Q=+\sin\psi_{EL}$	$Q=-\sin\psi_{EL}$

and

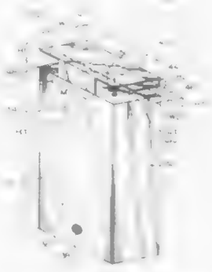
generating the angle of arrival of the incoming radio signal with respect to the boresight of the receiver from said electrical phase differences using the equation $\psi_{AZ}=(2\pi D/\lambda)\ \mathrm{SIN}\phi_{AZ}$ to calculate the azimuth angle of arrival ϕ_{AZ} and the equation $\psi_{EL}=(2\pi D/\lambda)\ \mathrm{SIN}\phi_{EL}$ to calculate the elevation angle of arrival ϕ_{EL}.

5,148,181

MOBILE RADIO COMMUNICATION APPARATUS

Yukio Yokoyama, and Takao Ono, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 624,599
Claims priority, application Japan, Dec. 11, 1989, 1-318788
Int. Cl.[5] H01Q 1/24
U.S. Cl. 343—702 **6 Claims**



1. A mobile radio communication apparatus comprising:

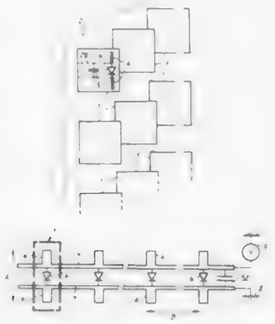
a casing having an earpiece, a mouthpiece and an operating section arranged on a first surface thereof;

an antenna mounted on an upper surface of said casing and including a first conductive plate parallel to and spaced apart from the upper surface by a predetermined distance and having a length L_1, a second conductive plate extending perpendicularly from the first conductive plate and having a height H_2, and a third conductive plate extending perpendicularly from the second conductive plate and parallel to the first conductive plate;

a short-circuiting plate extending perpendicularly from one side of the first conductive plate by a height H_1, and having a length M as measured in a direction parallel to the length L_1, said short-circuiting plate having an end thereof connected and affixed to an upper end of the upper surface of said casing and

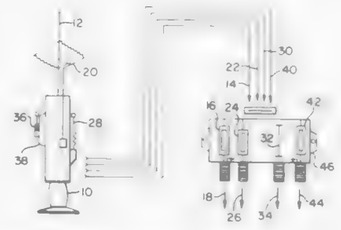
a feed conductor connected to said antenna.

5,148,182
PHASED REFLECTOR ARRAY AND AN ANTENNA INCLUDING SUCH AN ARRAY
François Gautier, St. Germain en Laye, and Yves Commault, Paris, both of France, assignors to Thomson-CSF, Paris, France
Continuation of Ser. No. 24,323, Mar. 10, 1987, abandoned. This application Aug. 13, 1990, Ser. No. 566,546
Claims priority, application France, Mar. 14, 1986, 86 03648
Int. Cl.[5] H01Q *21/12*
U.S. Cl. 343—754 14 Claims



1. Apparatus for intercepting incident electromagnetic wave energy with a given wavelength and reflecting such wave energy with a controlled direction, comprising
conductive means for forming a ground plane,
a semiconductive wafer having a front and a back surface supported on the ground plane with its back surface adjacent the conductive means,
an array of separate dipoles each having two legs and arranged on said front surface along regularly spaced rows and columns, the legs of each dipole being parallel to said columns and the distance between adjacent rows and between adjacent columns being of the order of half said wavelength,
a plurality of conductive strips disposed on said front surface of the semiconductive wafer and parallel to said rows, one of the two legs of each of the dipoles aligned along a given row being electrically connected to one another by one of said strips and formed in said one strip, the other of the legs of each of said dipoles aligned along said given row being electrically connected to one another by an adjacent strip and formed in said adjacent strip,
a plurality of junction diodes, at least one being connected between the two legs of each separate dipole, and
biasing means, connected to each of said diodes through said conductive strips, for applying to said diodes a biasing voltage for controlling the reactive impedance of said diodes between a short-circuit value and a value matched to said incident electromagnetic wave energy, thereby controlling the amount of said incident electromagnetic wave energy reflected by the respective dipole associated with a respective diode from a maximal value to a minimal value, respectively,
the portion of the incident electromagnetic wave energy not reflected by said respective dipole being transmitted to the ground plane and then reflected by said ground plane after impinging it,
the portion of the incident electromagnetic energy reflected by said respective dipole and the portion thereof reflected by said ground plane combining together in an electromagnetic wave locally exhibiting a controlled variable phase shift depending on the relative amount of the respectively reflected portions.

5,148,183
FOUR-WAY ANTENNA
Alfredo Aldama, Miami, Fla., assignor to Algira Primo Inc., Brooklyn, N.Y.
Filed Jun. 1, 1990, Ser. No. 532,036
Int. Cl.[5] H01Q *21/00*
U.S. Cl. 343—853 10 Claims



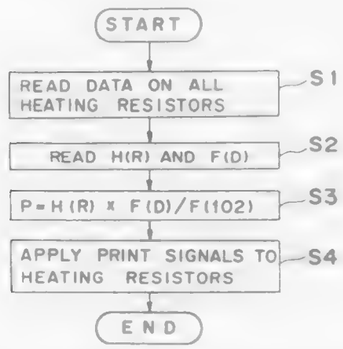
1. A three-way antenna system comprising:
an antenna body having a top and at least one side;
a first antenna mounted at the top of said antenna body for receiving VHF signals with an electromagnetic frequency of 30 to 300 MHz;
a second antenna and a third antenna selected from the group consisting of:
a radio antenna mounted at the top of said antenna body for receiving signals with an electromagnetic frequency of 525 to 1700 kHz and 88 to 108 MHz,
a telephone antenna mounted on the side of said antenna body for sending and receiving signals with an electromagnetic frequency of 3 to 5 MHz, and
a CB antenna mounted on the side of said antenna body for sending and receiving signals with an electromagnetic frequency of 26 to 28 MHz;
means for transmitting said electromagnetic signals received by said first, second and third antennae between said antennae and first, second and third receivers, the first, second and third receivers corresponding to the first, second and third antennae, respectively, wherein said means for transmitting includes a distributor box coupled between said antennae and the receivers; and
means for isolating said antennae from each other so that there is no interference between said electromagnetic signals sent and received from each of said antennae.

5,148,184
METHOD OF CONTROLLING PRINTED DENSITY IN THERMAL TRANSFER RECORDING
Yoshihisa Fujiwara, Kadoma, and Hirokazu Genno, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Apr. 19, 1991, Ser. No. 687,968
Claims priority, application Japan, Apr. 23, 1990, 2-107220
Int. Cl.[5] G01D *9/00, 15/00*
U.S. Cl. 346—1.1 9 Claims

1. A method of controlling printed density by producing a desired printed density in a thermal transfer recording apparatus in which a platen roller and a thermal head having a plurality of heating resistors confronting the platen roller are brought into pressing contact with each other and a recording medium and an ink sheet are overlapped and inserted between the platen roller and the thermal head such that ink of the ink sheet is transferred onto the recording medium, comprising the steps of:
storing a set of first data values with each value of the set representing for each of a plurality of densities a sum of absolute values of differences between a reference density corresponding to each of the said plurality of densities and actual printed densities to be produced by the respective heating resistors,

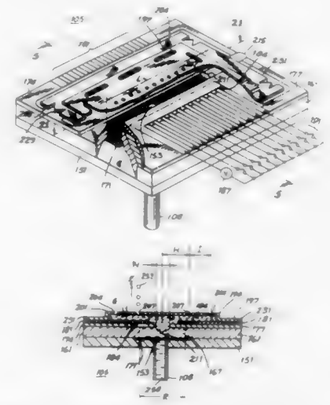
obtaining, by inputting gradational transfer data to said first data, fourth data representing said sum of absolute values at the density of the inputted gradational transfer data;
obtaining an amount of density correction for each of the heating resistors respectively at the gradational transfer data by multiplying third data representing the differences between a specific reference density selected from one of said plurality of densities and the actual printed densities of the respective heating resistors at a specific one of said plurality of densities by a ratio of said fourth data to second data corresponding to one of said set of said first data at the specific one of the densities; and
correcting the gradational transfer data by the amounts of density correction so as to drive the heating resistors on the basis of the gradational transfer data subjected to density correction such that transfer recording is performed.

3. An apparatus for controlling printed density in thermal transfer recording, comprising:
a thermal head unit having a plurality of heating resistors confronting a platen roller to be brought into pressing contact with said platen roller;
an overlapped recording medium and an ink sheet for insertion between said platen roller and said thermal head unit, actuation of a heating resistor transferring ink of the ink sheet onto the recording medium;



memory circuit means for storing gradational transfer data without density correction at a plurality of densities each applied to all the heating resistors uniformly;
means for storing a set of first data values representing a sum of absolute values of differences between a reference density corresponding to each of the plurality of densities and actual printed densities of the respective heating resistors,
means for storing third data representing the differences between a reference density corresponding to each of said plurality of densities and actual printed densities of the respective heating resistors at a specific one of the densities.
means for producing second data representing said first data at the specific one of the densities;
means for producing fourth data representing said first data at the gradational transfer data without density correction from said memory circuit means;
means for obtaining amounts of density correction for the heating resistors, respectively at the gradational transfer data without density correction based on said second, third and fourth data; and
pulse generating circuit means for applying to said thermal head, a pulse signal determined based on the transfer density.

5,148,185
INK JET RECORDING APPARATUS FOR EJECTING DROPLETS OF INK THROUGH PROMOTION OF CAPILLARY ACTION
Nobumasa Abe; Kiyoharu Momose; Koji Watanabe; Yuichi Nakamura; Tsuneo Handa, and Mitsutaka Nishikawa, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 499,233, Mar. 26, 1990, abandoned, which is a division of Ser. No. 60,206, Jun. 10, 1987, Pat. No. 4,914,562. This application Mar. 28, 1991, Ser. No. 677,024
Claims priority, application Japan, Jun. 10, 1986, 61-134187; Jun. 25, 1986, 61-148651; Jul. 15, 1986, 61-165751; Aug. 7, 1986, 61-185570; Sep. 11, 1986, 61-214322; Sep. 29, 1986, 61-230748
Int. Cl.[5] B41J *2/05, 2/175*
U.S. Cl. 346—1.1 15 Claims



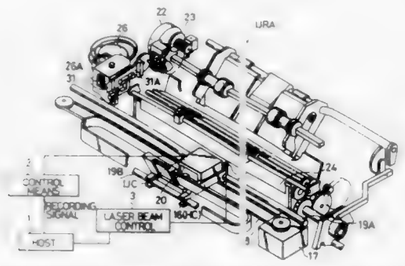
1. A method of ejecting droplets of ink from a plurality of nozzles of an ink jet recording apparatus, said apparatus including a nozzle plate having said plurality of nozzles, the method comprising the steps of:
storing ink in second reservoir means having a third cross-sectional area;
supplying said ink to first reservoir means through a slit of a supporting member, said slit having a second cross-sectional area wherein, said second reservoir means being in fluid communication with said slit;
storing ink supplied through said slit in said first reservoir means, said first reservoir means having a first cross-sectional area; and
applying pressure to said ink stored in said first reservoir means for ejection of said droplets of ink through said plurality of nozzles;
wherein said first cross-sectional area is smaller than said second cross-sectional area and said second cross-sectional area is smaller than said third cross-sectional area for promoting capillary action in ejecting droplets of ink through said plurality of nozzles.

5,148,186
INK JET RECORDING METHOD
Shinichi Tochihara, Hadano; Osamu Nishiwaki, Atsugi, and Kazuo Iwata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 488,229, Mar. 5, 1990, abandoned. This application May 8, 1991, Ser. No. 700,055
Claims priority, application Japan, Mar. 3, 1989, 1-51087
Int. Cl.[5] B41J *2/04*
U.S. Cl. 346—1.1 2 Claims

1. An ink jet recording method wherein an ink is discharged

from an ink discharge opening in accordance with a discharging signal to effect recording, which comprises:

driving an ink droplet volume discharging means to provide an ink droplet as discharged from the ink discharge opening in accordance with the discharging signal having a volume of no greater than 40 pl and



irradiating the discharged ink droplet with a laser to provide a temperature of the ink droplet at an ink deposition point on a recording medium to which the recording is effected of at least 60° C.

5,148,187

PRINTING APPARATUS WITH MECHANISM PRECISELY DEFINING PRINTING START POSITION

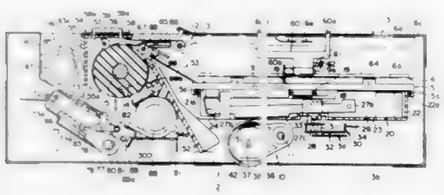
Katsuhisa Ono, Sagamihara; Yasuhito Eguchi, Ebina; Mitsuyoshi Shindo, Yokohama, and Hiroshi Katsuno, Yamato, all of Japan, assignors to Sony Corporation, Japan

Filed Oct. 31, 1988, Ser. No. 264,521

Claims priority, application Japan, Nov. 5, 1987, 62-279564; Oct. 17, 1988, 63-261072

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—76 PH **12 Claims**



6. A printing apparatus for printing an image on a sheet of printing medium having a length, a printing surface, and a reverse surface opposite said printing surface comprising:

a platen rotatable in a predetermined direction, provided at a printing station, about which said sheet is wound during a printing operation;

a tray having a bottom, for storing a stack of printing medium sheets, and having an opening in the bottom of the tray so as to expose the reverse surface of a lowermost sheet of the stack of the printing medium sheets; and

feeding means, provided under said tray, for feeding said lowermost printing medium sheet exposed in said opening toward said platen,

wherein the platen has a circumference smaller than the length of said sheet by a predetermined value.

5,148,188

THERMAL HEAD

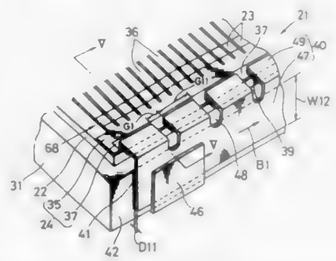
Shigenori Ota, Aira; Masataka Uchiyama, and Tsuyoshi Yasutomi, both of Kokubu, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed May 17, 1990, Ser. No. 525,132

Claims priority, application Japan, Aug. 31, 1989, 1-226856

Int. Cl.[5] B41J *2/325*

U.S. Cl. 346—76 PH **15 Claims**



1. A thermal head provided with a first surface having an edge, and a second surface extending from the edge of the first surface, the thermal head comprisign:

an electrically insulating substrate;

a plurality of heating elements supported by the substrate;

a plurality of individual electrodes, each individual electrode being connected to a respective heating element;

a common electrode line commonly connected with each heating element of the plurality of heating elements;

an L-shaped electrically conductive member having a first portion extending adjacent to the first surface and a second portion extending adjacent to the second surface, the first portion of the L-shaped conductive member defining a plurality of blanking parts; and

a layer of hot melt conductor material disposed between the first portion of the L-shaped conductive member and the common electrode line for electrically coupling the first portion of the L-shaped conductive member to the common electrode line, wherein excess hot melt conductor material from the layer flows into the plural blanking part.

5,148,189

THERMAL PRINT HEAD

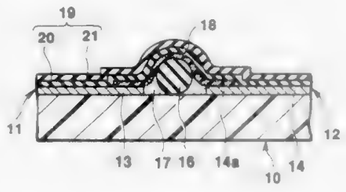
Osamu Kuwabara; Jiro Mutoh, and Akihiko Abe, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,225

Claims priority, application Japan, May 30, 1990, 2-138577

Int. Cl.[5] E01D *15/10*

U.S. Cl. 346—76 PH **18 Claims**



1. A thermal print head comprising:

a substrate;

a plurality of selective electrodes formed on said substrate, each of said selective electrodes having an edge;

a common electrode formed on said substrate at a distance from respective edges of said selective electrodes;

a fiber, formed as a string-like member, mounted on said substrate at a position between said common electrode and the edges of all of said selective electrodes, said fiber projecting to a position higher than top surfaces of said common and selective electrodes;

an adhesive fixedly connecting said fiber to said substrate, and said adhesive having a top surface which is upwardly inclined toward the fiber; and

heat resistive means having portions each overlying said fiber and said adhesive, for electrically connecting each of said selective electrodes to said common electrode.

5,148,190

SCANNING OPTICAL SYSTEM WITH PLURAL FOCUSING UNITS

Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogya K.K., Tokyo, Japan

Filed Dec. 19, 1990, Ser. No. 629,951

Claims priority, application Japan, Dec. 19, 1989, 1-146817[U]

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 **11 Claims**

1. A scanning optical system which comprises:

a light source unit emitting generally parallel rays of light;

a deflector that deflects the rays of light issuing from the light source unit;

a first focusing optical unit that is provided between the light source unit and the deflector, said first optical unit having power in a direction perpendicular to the direction in which the rays of light are to be deflected, the principal point thereof being interposed between said optical unit and said light source unit, and focusing the incident rays of light from said light source unit to form a line image at a point close to the deflector; and

a second focusing optical unit focusing the deflected rays of light on an object to be scanned, said second focusing unit being interposed between said deflector and the object to be scanned.

5,148,191

INK JET HEAD HAVING HEAT GENERATING RESISTOR MADE OF NON-SINGLE CRYSTALLINE SUBSTANCE CONTAINING IR, TA AND AL AND INK JET APPARATUS HAVING SUCH INK JET HEAD

Kenji Hasegawa; Atsushi Shiozaki; Isao Kimura, all of Kawasaki, and Kouichi Touma, Tachikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP90/00256, § 371 Date Oct. 23, 1990, § 102(e) Date Oct. 23, 1990, PCT Pub. No. WO90/09887, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 28, 1990, Ser. No. 601,714

Claims priority, application Japan, Feb. 28, 1989, 1-46769

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—140 R **26 Claims**

1. An ink jet head which includes an electrothermal converting body having a heat generating resistor which generates, upon energization, heat energy to be directly applied to ink on a heat acting face to discharge the ink, characterized in that said heat generating resistor is formed from a non-single crystalline material consisting essentially of Ir, Ta and Al at the following respective composition rates:

28 atom percent ≦ Ir ≦ 90 atom percent,

5 atom percent ≦ Ta ≦ 65 atom percent, and

1 atom percent ≦ Al ≦ 45 atom percent.

5,148,192

LIQUID JET RECORDING HEAD WITH NONLINEAR LIQUID PASSAGES AND LIQUID JET RECORDING APPARATUS HAVING SAME

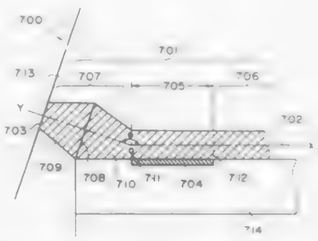
Masaaki Izumida, Kawasaki; Koichi Sato, Yokohama; Shigeaki Tanaka, Kawasaki; Tsuguhiro Fukuda, Yokohama; Nobuyuki Kuwabara, Tokyo; Akira Goto; Takashi Watanabe, both of Yokohama; Kunihiko Maeoka, Kawasaki; Hiroshi Sugitani, Machida; Yoshifumi Hattori, Yamato; Masami Ikeda, Tokyo; Asao Saito, Yokohama; Kazuaki Masuda, Sagamihara; Akio Saito, Hadano, and Tsuyoshi Orikasa, Kasukabe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1990, Ser. No. 583,167

Claims priority, application Japan, Sep. 18, 1989, 1-241049; Sep. 18, 1989, 1-241050

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—140 R **9 Claims**



1. A liquid jet recording head comprising:

heat generating means for producing a bubble to eject liquid from the recording head;

a heat acting zone in which heat generated by said heat generating means produces a bubble in the liquid;

a liquid supply passage adjacent said heat acting zone and having a liquid supply opening, with a center, for supplying liquid to said heat acting zone; and

a liquid ejection passage adjacent said heat acting zone and having an orifice, with a center, through which the liquid is ejected, said liquid ejection passage including a diverging portion followed by a converging portion in a direction extending from said heat acting zone to said orifice;

wherein a first center line passing through said center of said liquid supply opening and along a direction of the supply

of liquid from said liquid supply passage to said heating acting zone crosses a wall of said converging portion of said liquid ejection passage.

5,148,193

METHOD FOR SURFACE TREATMENT OF INK JET RECORDING HEAD

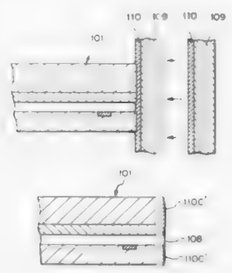
Tadayoshi Inamoto, Machida; Haruo Uehara, Yokohama; Hiromichi Noguchi, Atsugi; Akihiko Shimomura, Tokyo, and Eiko Moriyama, Hachioji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 415,467, Oct. 2, 1989, abandoned, which is a continuation of Ser. No. 119,738, Nov. 12, 1987, abandoned. This application Dec. 2, 1990, Ser. No. 630,760

Claims priority, application Japan, Nov. 13, 1986, 61-268493; Nov. 13, 1986, 61-268494; Nov. 13, 1986, 61-268496

Int. Cl.[5] B41J 2/14

U.S. Cl. 346—1.1 **54 Claims**



1. A method for surface treatment of an ink jet recording head having an ink discharging opening surface with ink discharging openings, said method comprising the steps of:

providing a liquid surface treating agent in the form of a film on a support;

adhering the film to the ink discharging opening surface; and

removing the support to remove portions of the surface treating agent corresponding to the ink discharging openings and leave the adhered surfaced treating agent on the ink discharging opening surface.

5,148,194

INK JET RECORDING APPARATUS WITH ENGAGING MEMBERS FOR PRECISELY POSITIONING ADJACENT HEADS

Naohito Asai, Hiratsuka, and Kazuaki Masuda, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 319,849, Mar. 6, 1989, abandoned, which is a continuation of Ser. No. 53,544, May 26, 1987, abandoned, which is a continuation of Ser. No. 759,883, Jul. 29, 1985, abandoned. This application Dec. 19, 1990, Ser. No. 629,038

Claims priority, application Japan, Aug. 6, 1984, 59-163897; Oct. 9, 1984, 59-151833[U]; Oct. 9, 1984, 59-210554

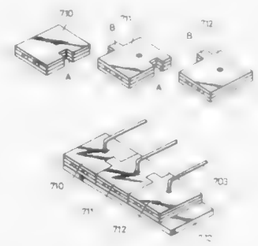
Int. Cl.[5] B41J 2/01

U.S. Cl. 346—140 R **15 Claims**

1. An ink jet recording apparatus for performing color recording by discharging different kinds of ink, the apparatus comprising:

a plurality of adjacent recording heads, each having at least one discharge port for discharging a kind of ink and an ink containing member for containing ink to be supplied to said discharge port; and

engaging means having engaging portions disposed on each said recording head at a different position thereof for each said recording head, wherein said engaging means locates all of said recording heads at particular positions relative to the other said recording heads, with said discharge



ports of all of said recording heads positioned precisely with respect to each other.

5,148,195

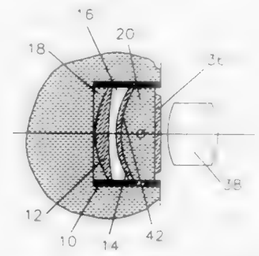
LENS SYSTEM HAVING PREDETERMINED FOCUSING POWER IN DIFFERENT MEDIUMS, SUCH AS AIR AND WATER, FOR PROVIDING A CLOSE UP LENS WHICH MAY BE ATTACHED TO A CAMERA EITHER IN AIR OR UNDERWATER

Richard E. Albrecht, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1991, Ser. No. 687,367

Int. Cl.[5] G03B 17/08

U.S. Cl. 354—64 **14 Claims**



1. A lens system having predetermined focusing power when used in different mediums having different indexes of refraction, said system comprising a plurality of lenses having surfaces where light undergoes refraction, a holder for said lenses defining closed and open chambers adjacent different ones of said surfaces, on of said chambers being sealed and always containing one of said different mediums, and another of said chambers being open to receive and contain whichever of said different mediums in which said lens system is disposed.

5,148,196

SYSTEM FOR CREATING CUSTOM-MADE MINIATURES

Donald Spector, 380 Mountain Dr., Union City, N.J. 07087

Filed Jun. 6, 1991, Ser. No. 711,207

Int. Cl.[5] G03B 41/00

U.S. Cl. 354—75 **7 Claims**

1. A system for converting a printable sheet of heat-shrinkable, synthetic plastic film material having predetermined dimensions into a custom-made miniature of a selected individual, said system comprising:

(a) means to create a two-dimensional image of said individual;

(b) means to print said image on said sheet in a scale appropriate to the dimensions of the sheet;

(c) means to subject said sheet to an elevated temperature for a period sufficient to cause said sheet to shrink and thicken

to produce a substrate on which is printed a reduced scale image of said individual; and

(d) means to cool and cure said substrate to create said miniature.

5,148,197

DATA PRINTING APPARATUS FOR CAMERA

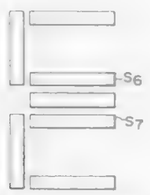
Keiji Kunishige, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1990, Ser. No. 626,470

Claims priority, application Japan, Dec. 21, 1989, 1-332156

Int. Cl.[5] G03B 17/24

U.S. Cl. 354—106 **18 Claims**



1. A data printing apparatus comprising:

data input means;

film feed means for feeding a film by a driving operation of a motor;

film feed amount detection means for detecting a feed amount of the film;

three light-emitting segments arranged at substantially equal intervals and arranged substantially parallel to a feed direction of the film;

two light-emitting segments arranged substantially perpendicular to the feed direction of the film;

an optical path for guiding light from said light-light-emitting segments to a film surface; and

emission control means for selectively turning on said light-emitting segments during a feed operation of the film on the basis of an output from said film feed amount detection means, and an output from said data input means;

said emission control means including means for selectively turning on said two light-emitting segments at three positions including a first position where said two light-emitting segments are located at a left portion of a numeral, a second position where said two light-emitting segments are located at a right portion of the numeral, and an intermediate position between the first and second positions during the feed operation of the film in accordance with the output from said data input means;

wherein a data numeral is formed on a film surface by said selectively turning on of said three and two light-emitting segments.

5,148,198

LENS-FITTED PHOTOGRAPHIC FILM UNIT, A PROCESSOR FOR PROCESSING THE SAME, AND A PROCESSING SYSTEM THEREFOR

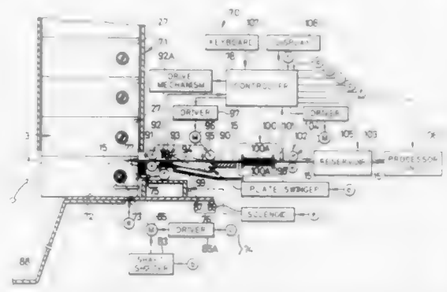
Keisuke Shiba, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 4, 1991, Ser. No. 710,225

Claims priority, application Japan, Jun. 4, 1990, 2-146021

Int. Cl.[5] G03B 3/08

U.S. Cl. 354—319 **12 Claims**



1. A photographic processing system comprising a photographic film unit and a processor for subjecting said film unit to processing;

said photographic film unit being preloaded with an unexposed photographic film, and including:

a) an exposure station for exposing said unexposed film;

b) a film supplying chamber disposed beside said exposure station for containing said unexposed film wound in a roll with a film leader wound internally;

c) a film take-up chamber disposed on a side opposite to said films supplying chamber with respect to said exposure station, in which a spool is contained rotatably, on which spool said film subjected to exposure is wound after passage through an entrance of said film take-up chamber when said spool is rotated in a first direction;

d) a shutter and a taking lens disposed in front of said exposure station;

e) a film wind-up mechanism for rotating said spool so as to feed said film frame by frame;

f) a film outlet formed on said film take-up chamber for passing said film leader toward an outside of said film unit when said spool is rotated in a second direction opposite to said first direction after winding said film leader in said film take-up chamber; and

g) a light shielding member provided with said film outlet for shielding an inside of said film take-up chamber from light; and

said processor including:

A) film unit holding means for being loaded with said film unit;

B) a processor unit for processing said exposed film;

C) control means for controlling said processor unit;

D) spool rotating means for rotating said spool in said film unit loaded in said film unit holding means in said second direction in accordance with an output from said control means; and

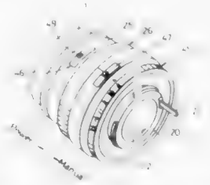
E) film transporting means for transporting said film leader to said processor unit in accordance with an output from said control means, said film leader being let out of said film outlet.

5,148,199

MOTOR-DRIVEN ZOOM LENS BARREL

Shinsuke Kohmoto; Tetsuo Sekiguchi, and Takuji Hamasaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1991, Ser. No. 651,555
Claims priority, application Japan, Feb. 8, 1990, 2-28902; Feb. 8, 1990, 2-28903
Int. Cl.[5] G03B 3/10
U.S. Cl. 354—195.1 20 Claims



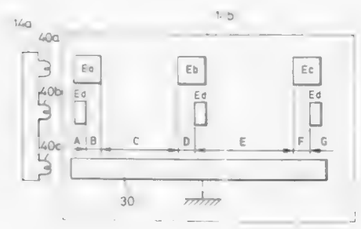
1. A motor-driven zoom lens barrel comprising:
a zoom motor;
a powered zooming mechanism which varies the focal length of a taking lens in accordance with the rotation of the zoom motor in the forward and reverse direction;
a zoom operation ring which can be rotated for controlling zooming;
rotational direction control means for rotating said zoom motor in the forward and reverse directions in accordance with the rotation of said zoom operation ring in the forward and reverse direction from a neutral position;
speed control means for controlling the rotational speed of said zoom motor in accordance with the angular displacement of said zoom operation ring from the neutral position; and
a returning mechanism which returns said zoom operation ring to a neutral position when no operational force is applied to said zoom operation ring, said zoom operation ring supported so as to move in the optical axis direction of the zoom lens barrel.

5,148,200

METHOD AND APPARATUS FOR DRIVING THE TAKING LENS SYSTEM OF A CAMERA

Minoru Takahashi, and Mitsuo Yokota, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 28, 1991, Ser. No. 662,245
Claims priority, application Japan, Feb. 28, 1990, 2-48754; Feb. 28, 1990, 2-48755; Feb. 28, 1990, 2-48756; Mar. 5, 1990, 2-51755
Int. Cl.[5] G03B 1/18
U.S. Cl. 354—195.1 26 Claims



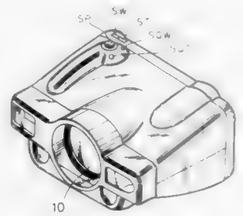
21. A lens driving apparatus for changing over the focal length of a taking lens system comprising:
a movable lens barrel;
a reversible motor driven to move said movable lens barrel back and forth along the optical axis of said taking lens system for changing over the focal length;
a transmission mechanism for transmitting rotational power of said motor to said lens barrel; and
an encoder for detecting the position of said taking lens system, said encoder having a brush and a contact array including a first column of contacts, a first end of each contact of said first column corresponding to a focal length position of said taking lens system in the direction of said optical axis, said contact array further including a second column of contacts, a first end of each contact of said second column being displaced in an axial direction from said first end of an adjacent contact of said first column and being located at a position at which the speed of said motor is lowered.

5,148,201

ZOOMING CONTROL APPARATUS FOR A CAMERA

Takao Umetsu, and Shunji Nishimura, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 23, 1991, Ser. No. 704,974
Claims priority, application Japan, May 28, 1990, 2-137634
Int. Cl.[5] G03B 1/18, 3/00
U.S. Cl. 354—195.1 16 Claims



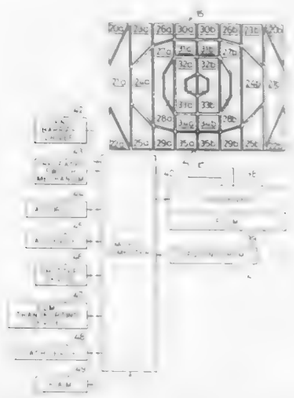
13. A zooming control apparatus for a camera for zooming a zoom lens to change the focal length thereof as desired, comprising:
a motor for moving said zoom lens;
a first switch operable for zooming said zoom lens at a first speed in a direction of telephotography;
a second switch operable for zooming said zoom lens at said first speed in a direction of wide-angle photography;
a third switch operable for zooming said zoom lens at a second speed lower than said first speed in said direction of telephotography;
a fourth switch operable for zooming said zoom lens at said second speed in said direction of wide-angle photography;
a CPU for scanning the condition of operation of said first to fourth switches and for generating a motor control signal according to the said switch being operated;
a driver for supplying said motor with one of four driving electric currents differing as to pulse duty factor in accordance with said motor control signal;
an encoder for detecting the position of said zoom lens, said motor being stopped from being supplied with said driving currents even during operation of said first to fourth switches when said CPU judges that said zoom lens is in one of the limit positions of telephotography or wide-angle photography by referring to a signal supplied by said encoder; and
a time for measuring time elapsed since a beginning of zooming, said CPU supplying said motor with current of the highest pulse duty factor of said first to fourth driving currents for increasing the rotary torque of said motor when said CPU judges that said zoom lens has a position different from said limit positions of telephotography and wide-angle photography even after the lapse of a predetermined period of time by referring to said elapsed time, while said zoom lens is zoomed by supplying said motor with a current of less than the highest pulse duty factor of said first to fourth driving currents.

5,148,202

DISPLAY DEVICE WITHIN FINDER FOR CAMERA

Yukata Yoshida, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 543,653, Jun. 26, 1990, abandoned.
This application Apr. 26, 1991, Ser. No. 696,292
Claims priority, application Japan, Jun. 30, 1989, 1-170823; Jul. 13, 1989, 1-181442
Int. Cl.[5] G03B 13/10
U.S. Cl. 354—222 26 Claims



1. A display device for a camera, comprising
a finder for observing a subject to be photographed;
an electro-optical display panel whose light transmittance changes with application of an electric signal, said electro-optical display panel being disposed within said finder so as to constitute at least a partial view area in an optical path of said finder; and
control means for supplying said electric signal to said electro-optical display panel in order to switch said electro-optical panel between a first condition in which the panel is either continuously light intercepting or winking by being periodically switched between light transmitting and light intercepting states while a lens barrier for covering a taking lens of the camera is closed and a second condition in which the panel is in a continuously light transmitting state while said lens barrier is open.

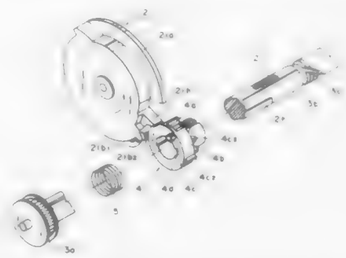
5,148,203

INK JET RECORDING APPARATUS INCLUDING A DRIVE MECHANISM FOR AN INK EJECTION RECOVERY SYSTEMS

Hirofumi Hirano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1990, Ser. No. 583,310
Claims priority, application Japan, Sep. 18, 1989, 1-241076; Sep. 18, 1989, 1-241077
Int. Cl.[5] B41J 2/05
U.S. Cl. 346—140 R 5 Claims

1. An ink jet recording apparatus, comprising:
a recording head;
a shaft for receiving a rotational driving force;
a clutch gear mounted on said shaft, said clutch gear being rotated by rotation of said shaft and being movable in a longitudinal direction of said shaft;
a transmission gear engageable with said clutch gear in accordance with translational movement and rotation of said clutch gear, wherein a predetermined mechanism is operated by rotation of said transmission gear upon engagement with said clutch gear after a translational movement and rotation of said clutch gear, wherein
said clutch gear includes:
a flange disposed at a position engageable with a portion of said transmission gear to prevent rotation of said transmission gear before the translational movement of said clutch gear for the engagement with said transmission gear;



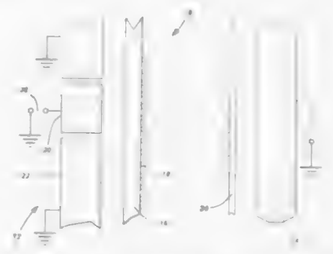
a starting tooth for engagement with a predetermined tooth of said transmission gear in accordance with the translational movement and rotation of said clutch gear; and
a non-engagement portion positioned adjacent said transmission gear before the engagement of said starting tooth with said predetermined tooth.

5,148,204

APERTURELESS DIRECT ELECTRONIC PRINTING

Ivan Rezanka, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1991, Ser. No. 661,961
Int. Cl.[5] G01D 15/06
U.S. Cl. 346—153.1 6 Claims



1. Apertureless direct electrostatic printing apparatus, said apparatus comprising:
a supply of toner;
an image receiving substrate, said supply of toner and said image receiving substrate being positioned with a gap therebetween; and
an electrode array for effecting imagewise transfer of toner across said gap with a minimum loss in image resolution; and
means for selectively effecting localized, alternating electrostatic fields about the electrodes of said array which fields vary in time such that the approximate impulse relation 1:2 is maintained between a first forward directing pulse and a subsequent reverse pulse.

5,148,205

OPHTHALMIC LENS HAVING A CHANGING REFRACTIVE INDEX

Günther Guilino; Helmut Altheimer, and Herbert Pfeiffer, all of München, Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Fed. Rep. of Germany

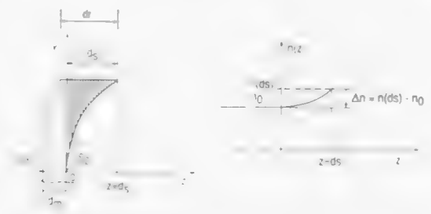
PCT No. PCT/DE89/00410, § 371 Date Feb. 22, 1990, § 102(e) Date Feb. 22, 1990, PCT Pub. No. WO89/12841, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 22, 1989 Ser. No. 490,700

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3821079; Jan. 21, 1989, 3901775

Int. Cl.[5] G02C *7/02*

U.S. Cl. 351—159 21 Claims



1. An ophthalmic lens having a front concave surface and an eye-facing concave surface and a varying refractive index for enabling correction of aberrations including astigmatism, comprising at least one system of parallel surfaces at given levels (n,(x,y,z)=const.) having a constant refractive index, which are spaced the same distance at all points in a direction normal to the parallel surfaces, and which, respectively extend so as to intersect the axis connecting lens apexes (S_1, S_2) of the front surface and the eye-facing surface at a distance A from the next lens apex, for which the following equation is valid:

$$A \leq 20^{\circ} \; L_{n(x,y,z)=const}$$

$L_{n(x,y,z)=const.}$ being the length of a boundary line in a lens section between a zone having constant refractive power and a zone having varying refractive power.

5,148,206

AUTOMATIC FILM PROCESSOR USING ULTRASONIC WAVE GENERATORS

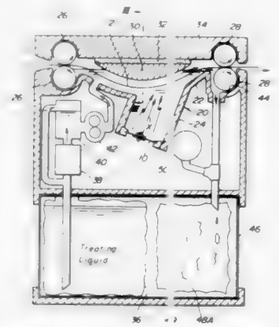
Shinichi Shidara, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1989, Ser. No. 417,407

Claims priority, application Japan, Oct. 7, 1988, 63-251845; Dec. 28, 1988, 63-328980

Int. Cl.[5] G03D *3/04, 3/08*

U.S. Cl. 354—298 11 Claims



1. An automatic film processor for continuously developing an exposed film by passing said film successively through plural treating stations including developing, fixing and rinsing stations, which comprises:

an ultrasonic wave generating means provided in at least one of said plural treating stations for applying ultrasonic vibrations to said film, said film being moved along a pass extending in the close range of a sound wave field including the remotest position at which an output sound pressure from said ultrasonic wave generating means takes the maximum amplitude, and said film having its face impinged by the ultrasonic wave generated by said ultrasonic wave generating means such that said face is not perpendicular to the direction along which said ultrasonic wave has its maximum directivity, whereby said film is moved across an area applied with the ultrasonic vibrations by a distance which covers more than one cycle of the ultrasonic vibration to exclude uneven processing due to the change in amplitude of the ultrasonic vibration.

5,148,207

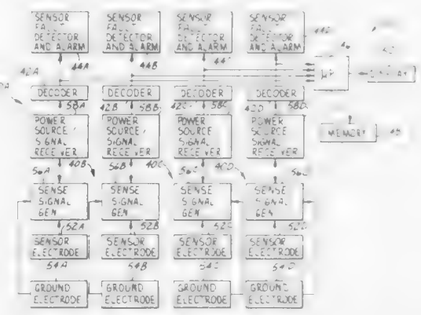
CAPACITIVE FILM POSITION SENSING SYSTEM FOR A FILM PROCESSOR

Steven W. Tanamachi, Lauderdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1991, Ser. No. 687,285

Int. Cl.[5] G03D *3/08*

U.S. Cl. 354—322 23 Claims



1. A media position sensing system for use in conjunction with a media processor of the type including a first processing tank for holding a first bath of conductive media processing liquid, comprising:

a first sensing electrode adjacent to the processing tank;

a first ground electrode within the tank, for making electrical contact with the first bath of processing liquid in the tank; and

a first capacitive media sensor circuit coupled between the ground and sensing electrodes, for providing sensed media signals representative of the presence of media between the first sensing electrode and first bath of processing liquid as a function of the capacitance between the first ground electrode and first sensing electrode.

5,148,208

DISPOSABLE CONTAINER FOR DISPENSING OF PHOTOGRAPHIC DEVELOPING LIQUIDS

Donald H. Klosterboer, Escondido; Jerry M. Owens, and Aubrey E. Thompson, both of San Diego, all of Calif., assignors to Anacomp, Inc., Atlanta, Ga.

Filed Jul. 20, 1990, Ser. No. 556,124

Int. Cl.[5] G03D *3/02*

U.S. Cl. 354—324 26 Claims

1. A container for liquids, the container mountable to an external device presenting a mount, flow communicative with the external device through ports within a portal surface of the external device; and

heatable by a heating surface of the external device,

the container comprising:

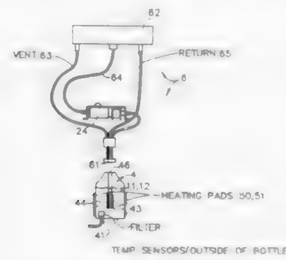
a body substantially in the shape of a bottle, the body defining

a liquid reservoir,

a first surface in substantial conformity with the heating surface of the external device,

a second surface defining ports in substantial correspondence with the ports of the external device's portal surface,

a third surface for engaging the external mount so that the



second surface is held tight to the external device's portal surface, with its ports in fluid-tight flow communication with the corresponding ports of the external device's portal surface and,

wherein the body's second surface defines

a central aperture that flow connects to the body's reservoir;

a first annular section, located about the central aperture, having an outer surface contour to which a fluid-tight compressive seal may be made;

a next outermost, second, annular section having at least one orifice that flow connects to the body's reservoir; and

a next outermost, third, annular section having an outer surface contour to which a fluid-tight compressive seal may be made.

5,148,209

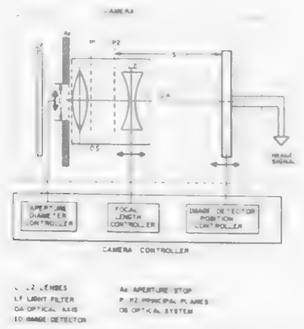
PASSIVE RANGING AND RAPID AUTOFOCUSING

Muralidhara Subbarao, Setauket, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jul. 12, 1990, Ser. No. 551,933

Int. Cl.[5] B03B *13/36*

U.S. Cl. 354—400 20 Claims



1. A method of determining the distance of an object from a camera system wherein no Fourier transforms are computed, said camera system having an aperture through which light enters, an image detector, an image forming optical system having a first and a second principal plane and a focal length, said second principal plane being arranged closer to said image detector than said first principal plane, a light filter, a camera controller, and an image processor being operatively connected to said image detector and to said camera controller, said method comprising:

a) setting said camera system to a first set of camera parameters including at least one of:

i) distance(s) between said second principal plane and said image detector,

ii) diameter (D) of said camera aperture,

iii) focal length (f) of said camera system, and

iv) spectral light transmission characteristic (λ) of said light filter;

b) forming a first image of said object with said image forming optical system;

c) recording said first image in said image detector as a first digital image;

d) setting said camera system to a second set of camera parameters including at least one of:

i) distance(s) between said second principal plane and said image detector,

ii) diameter (D) of said camera aperture,

iii) focal length (f) of said camera system, and

iv) spectral light transmission characteristic (λ) of said light filter;

e) forming a second image of said object with said image forming optical system;

f) recording said second image in said image detector as a second digital image;

g) supplying said first digital image to an image normalization means, said image normalization means preprocessing said first digital image to provide a first normalized image, said first normalized image being related to a first point spread function of said camera system by a convolution operation;

h) supplying said second digital image to said image normalization means, said image normalization means preprocessing said second digital image to provide a second normalized image, said second normalized image being related to a second point spread function of said camera system by a convolution operation;

i) providing said first normalized image to a set of differentiators, said set of differentiators providing as output a first set of image derivative values;

j) providing said second normalized image to said set of differentiators, said set of differentiators providing as output a second set of image derivative values;

k) transmitting said first set of camera parameters, said second set of camera parameters, said first set of image derivative values and said second set of image derivative values to an equation solving means, said equation solving means being capable of solving a first mathematical relationship to obtain a first set of solutions, said first mathematical relationship including a first expression for a focused image in terms of said first set of camera parameters and said first set of image derivative values, said first mathematical relationship including a second expression for a focused image in terms of said second set of camera parameters and said second set of image derivatives, said first set of solutions for said first mathematical relationship representing the distance of said object from said camera system;

l) setting said camera system to a third set of camera parameters including at least one of:

i) distance (s) between said second principal plane and said image detector,

ii) diameter (D) of said camera aperture,

iii) focal length (*f*) of said camera system, and

iv) spectral light transmission characteristic (λ) of said light filter;

m) forming a third image of said object with said image forming optical system;

n) recording said third image in said image detector as a third digital image;

o) supplying said third digital image to said image normalization means, said image normalization means preprocessing said third digital image to provide a third normalized image, said third normalized image being related to a third point spread function of said camera system by a convolution operation;

p) providing said third normalized image to said set of differentiators, said set of differentiators providing as output a third set of image derivative values;

q) transmitting said second set of camera parameters, said third set of camera parameters, said second set of image derivative values and said third set of image derivative values to said equation solving means, said equation solving means being capable of solving a second mathematical relationship to obtain a second set of solutions, said second mathematical relationship including said second expression for a focused image in terms of said second set of camera parameters and said second set of image derivatives, said second mathematical relationship including a third expression for a focused image in terms of said third set of camera parameters and said third set of image derivatives, said second set of solutions for said mathematical relationship representing the distance of said object from said camera system;

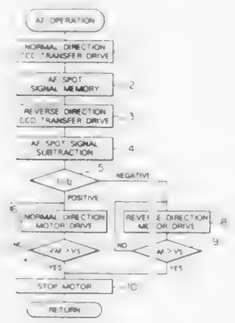
r) providing said first set of solutions and said second set of solutions to a set intersection means, said set intersection means being capable of comparing said first set of solutions and said second set of solutions to determine a common value representing said distance of said object from said camera system.

5,148,210

AUTOMATIC FOCUSING APPARATUS

Takashi Minaki; Yukinori Koizumi and Masashi Saito, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 665,783
Claims priority, application Japan, Mar. 29, 1990, 2-81829
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—403 **5 Claims**



1. An automatic focusing apparatus for driving an optical means to focus on an object, comprising;

means for reading an image of said object,

means for driving said reading means so that a first image signal is outputted from said reading means in a normal direction and a second image signal is outputted from said reading means in a reversal direction,

said optical means for forming said image on said reading means, and

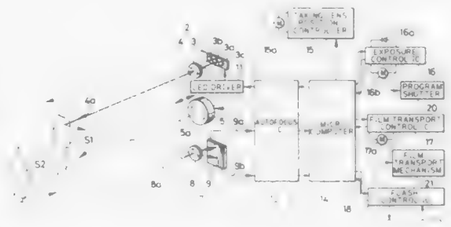
means for controlling said optical means in accordance with said first image signal and said second image signal so that said optical means forms said image on said reading means in focus.

5,148,211

STABILIZED RANGE FINDER FOR USE WITH AN ELECTRONICALLY CONTROLLED CAMERA

Takaaki Kotani; Seiji Takada, both of Tokyo; Shigenori Goto, and Tatsuo Saito, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1990, Ser. No. 600,821
Claims priority, application Japan, Oct. 20, 1989, 1-274646; Oct. 20, 1989, 1-274647; Oct. 20, 1989, 1-274664; Jan. 22, 1990, 2-12312; Mar. 27, 1990, 2-78345; Mar. 27, 1990, 2-78346
Int. Cl.[5] G03B *13/36; G01C 3/08*
U.S. Cl. 354—403 **12 Claims**



1. A stabilized range finding device for an electronically controlled camera of the type having light projector means for projecting light toward an object to be photographed, light receiver means for receiving light reflected from the object and for outputting two channel signals changing in accordance with the intensity and incident position of the reflected light, and calculating means for calculating a distance datum on the basis of the two channel signals, the range finding device comprising:

(a) a plurality of light emitting diodes as said light projecting means, each driven during sequential intervals to project emitted light toward different areas of said object and each driven to emit a first predetermined number of times during its driven interval;

(b) a position sensitive detector included within said light receiver means for outputting said two channel signals;

(c) a microcomputer as said calculating means for executing a photographic image taking sequence;

(d) means for linearly amplifying said tow channel signals and for outputting said two channel signals as analog signals;

(e) means for A/D converting said two channel analog signals into digital signals and for sending said digital signals for respective channels to said calculating means; and

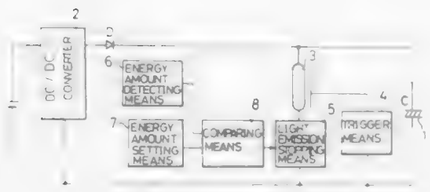
(f) stabilizing means controlled by said calculating means for invalidating said digital signals produced prior to a second lesser predetermined number of times.

5,148,212

FLASH CONTROL BASED ON CALCULATED REQUIRED FLASH ENERGY

Yoshio Serikawa, Ageo; Susumu Iguchi, Kawasaki; Akira Ueno, Tokyo; Hiroshi Takeda, Funabashi; Shigeru Mitsu, Kawasaki; Kenji Koyama; Yukihisa Narazaki, both of Yokohama, and Yoshihiko Shimura, Ichikawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 643,480
Claims priority, application Japan, Jan. 23, 1990, 2-4301[U]; Jan. 23, 1990, 2-11815; Jan. 23, 1990, 2-11816; Jan. 23, 1990, 2-11817; Feb. 14, 1990, 2-31539; Mar. 5, 1990, 2-51908; Mar. 5, 1990, 2-51909; Mar. 9, 1990, 2-59755; Oct. 25, 1990, 2-285885
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—416 **17 Claims**



1. A flashing apparatus of an automatic light-adjusting type for illuminating a photographed object by discharging a charge charged to a main capacitor in a light emitting tube, the flashing apparatus comprising:

energy amount detecting means for detecting an energy amount applied to the light emitting tube from the main capacitor, including voltage detecting means for detecting a voltage applied to the light emitting tube from the main capacitor, electric current detecting means for detecting an electric current flowing through said light emitting tube, multiplying means for multiplying the detected voltage by the detected electric current, and integrating means for integrating the multiplied results;

energy amount setting means for setting an amount of discharged energy of the main capacitor corresponding to a quantity of light required to illuminate the photographed object, including light quantity calculating means for calculating a quantity of light required to illuminate the photographed object based on photographing information such as information of a distance from a camera to the photographed object, sensitivity information of a film, diaphragm information, and voltage-current integrated value calculating means for calculating an integrated value of a product of an electric current and a voltage applied to said light emitting tube and corresponding to the calculated quantity of light;

comparing means for comparing the energy amount detected by said energy amount detecting means with the energy amount set by said energy amount setting means, including means for comparing an output of said integrating means with an output of said voltage-current integrated value calculating means and outputting a signal when both outputs are in conformity with each other; and

light emission stopping means for stopping light emission of said light emitting tube according to said signal outputted from said comparing means when said comparing means detects that the discharged energy amount of said main capacitor is in conformity with the set amount of said energy amount setting means after the light emission is started.

5,148,213

PRINTING METHOD FOR PHOTOGRAPHIC PRINTER

Takaaki Terashita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1991, Ser. No. 779,899
Claims priority, application Japan, Oct. 24, 1990, 2-286189
Int. Cl.[5] G03B *27/80*
U.S. Cl. 355—38 **16 Claims**

1. A printing method for a photographic printer for printing an image by conducting at an identical or proximate position photometry effected by dividing an image frame into a multiplicity of segments and exposure based on data obtained by photometry, comprising the steps of:

repeating the process of effecting photometry by dividing the image frame into the multiplicity of segments by consecutively advancing the image frame, and of selecting and storing data necessary for determination of exposure amount, until the number of items of the data stored reaches a predetermined value or more; and

positioning an image frame to be printed in an exposing position when the number of items of the data stored has reached the predetermined value or more, and effecting exposure on the basis of photometric data on the image frame to be printed and the stored data.

5,148,214

ALIGNMENT AND EXPOSURE APPARATUS

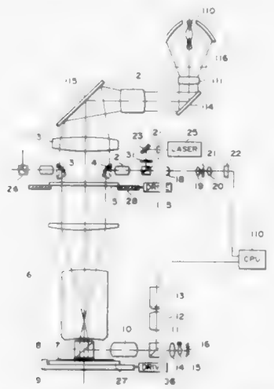
Masakatsu Ohta, Yokohama; Hideki Ina, Kawasaki, and Akiyoshi Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 577,077, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 453,175, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 284,857, Dec. 13, 1988, abandoned, which is a continuation of Ser. No. 46,466, May 6, 1987, abandoned. This application Sep. 17, 1991, Ser. No. 759,953
Claims priority, application Japan, May 9, 1986, 61-104841
Int. Cl.[5] G03B *27/42, 27/70*
U.S. Cl. 355—43 **34 Claims**

1. A mark detecting device usable in an alignment and exposure apparatus for aligning an alignment mark of a mask with an alignment mark of a wafer and for exposing a resist layer provided on the surface of the wafer to a pattern of the mask with radiation, said device comprising:

detecting means for detecting light from the wafer, said detecting means including (i) photodetecting means for detecting light and (ii) wavelength selecting means disposed in a path of light from the wafer to said photodetecting means, so as to allow introduction of light of a predetermined wavelength into said path of light from outside said path of light to illuminate the wafer; and

latent image forming means for forming a latent image of the alignment mark of the mask in a portion of the resist layer provided on the surface of the wafer, said latent image forming means being arranged, for the formation of the latent image, to direct to the wafer the light of said predetermined wavelength from the outside of said path of light



and by way of the mask and said wavelength selecting means;

wherein said photodetecting means is effective to detect the light from the wafer to detect the alignment mark of the wafer and the latent image of the alignment mark of the mask.

5,148,215

MAGAZINE UNIT OF IMAGE RECORDING APPARATUS FOR ACCOMMODATING IMAGE RECORDING MEDIUM

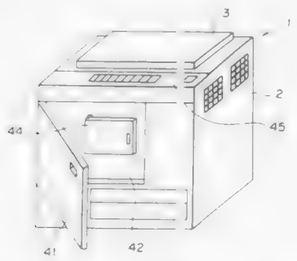
Tatsuya Shindo, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 15, 1991, Ser. No. 794,119

Claims priority, application Japan, Nov. 16, 1990, 2-120564[U]

Int. Cl.[5] G03B *27/58*

U.S. Cl. 355—72 **10 Claims**



1. A magazine unit, for an image recording medium, of an image recording apparatus comprising an outer housing at which an opening is formed, said magazine unit comprising:

a magazine body to be mounted in the housing of the image recording apparatus through the opening;

a first winding shaft around which a sheet-like image recording medium before use is wound, said first winding shaft being detachably mounted to the magazine body; and

a second winding shaft around which the sheet-like image recording medium after the use from the first winding shaft is to be taken up, said second winding shaft being detachably mounted to the magazine body, said first and second winding shafts having substantially the same structure so as to be used commonly.

5,148,216

CARTRIDGE FOR CONTAINING FILM PAPERS AND PRINTING PAPERS AND A COLOR VIDEO PRINTER USING THE CARTRIDGE

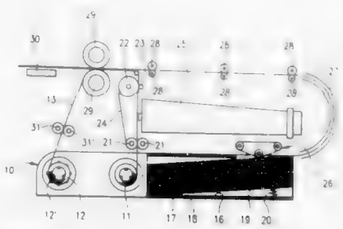
Hyun K. Park, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 25, 1991, Ser. No. 674,220

Claims priority, application Rep. of Korea, Mar. 24, 1990, 3470/1990

Int. Cl.[5] G03B *27/58*

U.S. Cl. 355—72 **15 Claims**



1. A cartridge for a color printer, the cartridge comprising:

a cartridge body having a film paper section and a printing paper section, the film paper section and the printing paper section being side-by-side in the cartridge body, the cartridge body with the film paper section and the printing paper section being a single, one piece structure;

a supply reel and a take-up reel mounted in the film paper section of the cartridge body, the supply reel supplying film paper and the take-up reel receiving the film paper;

a discharge hole and an inlet hole formed on a top side of the cartridge body, film paper being discharged from the cartridge body through the discharge hole and being returned to the cartridge body through the inlet hole; and

a container positioned in the printing paper section of the cartridge body for holding printing papers.

5,148,217

ELECTROSTATOGRAPHIC COPIER/PRINTER DENSITOMETER INSENSITIVE TO POWER SUPPLY VARIATIONS

David D. Almeter, Rochester, and William A. Resch, III, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1991, Ser. No. 719,452

Int. Cl.[5] G03G *15/00*

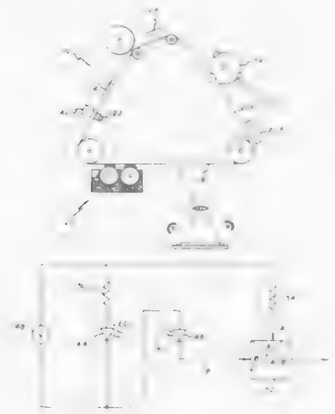
U.S. Cl. 355—203 **8 Claims**

1. A densitometer comprising:

a voltage source;

first means powered by said voltage source for generating an output signal which is a function of a measured density and of the voltage of said source;

second means for directly monitoring the voltage of said source to generate an output signal which is a function of the voltage of said source; and



third means powered by said source for producing a signal which is substantially proportional to the ratio of the outputs of the first and second means.

5,148,218

IMAGE FORMING APPARATUS WITH A HUMIDITY DETECTOR

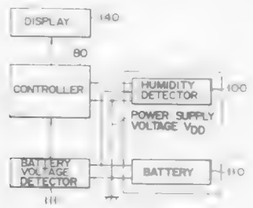
Rintaro Nakane, Yokohama; Jiro Egawa, Yokosuka; Naruhito Yoshida; Toshihiro Kasai, both of Yokohama; Kunihiko Miura, Hiratsuka; Shinya Tomura, Yamato, and Mitsuaki Kohyama, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 25, 1991, Ser. No. 720,683

Claims priority, application Japan, Jul. 3, 1990, 2-174507

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—208 **3 Claims**



1. An image forming apparatus comprising:

an image forming means for forming an image on an image bearing member;

a humidity detecting unit detachably mounted to said image forming means for detecting the humidity in the vicinity of said image forming means and converting the detected humidity into a voltage value corresponding to the relative humidity;

means for adjusting the image forming conditions of said image forming means in accordance with a relative humidity detected by said humidity detecting means; and

time detecting means for detecting the time for replacement of said humidity detecting means.

5,148,219

IMAGE FORMING APPARATUS WITH DEVELOPING AND CLEANING SYSTEM

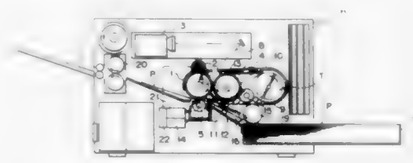
Mitsuaki Kobyama, Higashikurume, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 31, 1990, Ser. No. 531,245

Claims priority, application Japan, May 31, 1989, 1-138844

Int. Cl.[5] G03G *15/24*

U.S. Cl. 355—219 **16 Claims**



1. An image forming apparatus comprising:

means for forming a latent image on an image carrying body;

means, constituted within a single unit, for developing the latent image with a developing agent, and for simultaneously removing the developing agent remaining on the image carrying body while the latent image is developed;

means for transferring the developed image from the image carrying body to a sheet-like material; and

disordering and charging means for disordering the developing agent remaining on the image carrying body after transfer of the developed image by the transfer means, so as to render the developing image unreadable or nonpatterned, and for charging the image carrying body at a predetermined potential while the developing agent remaining on the image carrying body is disordered, said disordering and charging means consisting essentially of a single brush positioned for contact with said image carrying body.

5,148,220

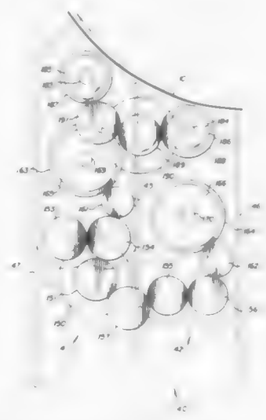
TONING STATION DRIVE FOR IMAGE-FORMING APPARATUS

Thomas K. Hilbert, Spencerport, and James R. Carey, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 7, 1991, Ser. No. 712,225

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 **7 Claims**



1. An image-forming apparatus comprising:

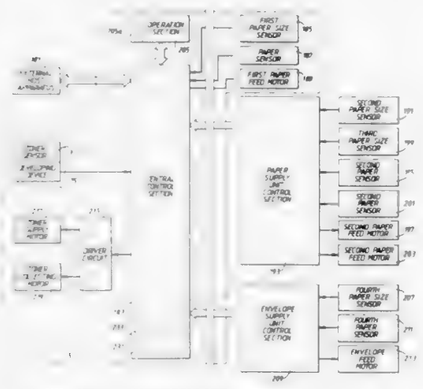
a first development station having a first applicator for applying toner to an electrostatic image,
a second development station having a second applicator for applying toner to an electrostatic image, and
a reversible motor connected to said first and second applicators through first and second connecting means, respectively, said first and second connecting means driving only the first applicator when said motor is driven in a forward direction and only the second applicator when said motor is driven in a reverse direction.

5,148,221

IMAGE FORMING APPARATUS WITH TONER DENSITY CONTROL BASED ON THE MEDIUM SUPPLIED

Masami Gokita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1991, Ser. No. 676,109
Claims priority, application Japan, Mar. 31, 1990, 2-085654
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 **18 Claims**



1. An image forming apparatus comprising:
means for selectively supplying a first image forming medium and a second image forming medium different from the first image forming medium;
image forming means, including a developing device in which a two component developing agent including a toner and a carrier is stored at a prescribed toner density, for forming a visible image on one of the first image forming medium and the second image forming medium with the toner;
means for storing the toner of the two component developing agent;
toner supplying means for replenishing the toner in the storing means to the developing device;
means for respectively counting the number of first image forming mediums and second image forming mediums supplied to the image forming means;
memory means for storing data of a relationship of a prescribed voltage value data against the number of first image forming medium (Cp) supplied to the image forming means and the number of second image forming mediums (Ce) supplied to the image forming means, the prescribed voltage value data being proportional to changes in the toner density in the developing device;
means for estimating the toner density in the developing device based on the respective count value of first and second image forming mediums in the counting means and the data in the memory means; and
control means responsive to the estimating means for activating the toner supply means to regulate the toner density in the developing device.

5,148,222

LIQUID DEVELOPER SYSTEM

Ishaiau Lior, Nes Ziona, and Itzhak Ashkenazi, Gibton, both of Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands

Filed Aug. 22, 1990, Ser. No. 570,776
Int. Cl.[5] G03G *15/10*
U.S. Cl. 355—256 **34 Claims**

1. Liquid toner imaging apparatus comprising:
an image bearing surface;
means for developing an image on the image bearing surface using a liquid toner including carrier liquid and pigmented particles; and
means for transferring a developed image from the image bearing surface to a substrate,
wherein the means for developing comprises:
a developer electrode having a movable developer surface whereby portions of the developer surface sequentially come into propinquity with the image bearing surface and subsequently leave propinquity therewith, each portion forming a development region during its propinquity, the developer surface having a given width in the direction perpendicular to its motion; and
a single stationary nozzle having a width substantially narrower than the given width of the developer surface, or a plurality of nozzles each of which has a width substantially narrower than the given width of the developer surface, and spaced at least 8.4 mm from each other, for providing liquid toner of a given color to the development region by supplying the liquid toner onto a portion of the development electrode.

5,148,223

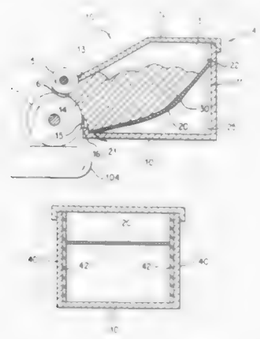
DEVELOPER DISPENSER HAVING A DEVELOPER MOVER FOR TRANSPORTING DEVELOPER

Stephen D. Cipolla, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1990, Ser. No. 614,263
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—260 **12 Claims**

1. A developer dispenser comprising:
a a substantially enclosed and rigid housing having a side wall with an opening therein, two end walls, and a compliant sealing surface attached to each of said end walls;
b. a flexible developer mover disposed within said housing, said developer mover having:
i. a first edge pivotably secured within said housing;
ii. a second edge in sliding contact with a first portion of said side wall;
iii. parallel edges connecting said first edge and said second edge, said parallel edges being in slidably sealing engagement with said compliant sealing surfaces;

iv. a first surface facing said first portion of said side wall; and
v. a second surface for engaging the developer material, said developer mover dividing said housing into a first, developer reservoir region bounded by said second surface of said developer mover and said side wall and being in fluid communication with said opening and a second region bounded by said first surface and said side wall, said developer mover configured for assuming a first, unflexed position when said housing contains



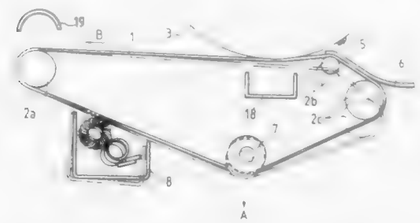
no developer material, for flexing about an axis parallel to said side wall, and for displacing said first surface to a second position when said housing is filled with developer in which said first surface conforms approximately to said first portion of said side wall and said second region has a volume much less than when said developer mover is in said first position, said developer mover urging the developer toward said opening, and flexing toward said first position as developer is dispensed through said opening.

5,148,224

THIN LAYER COATED ENDLESS BELT OF AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Masato Yamada; Junzi Shirakawa, and Kazuo Uno, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1991, Ser. No. 693,649
Claims priority, application Japan, May 25, 1990, 2-135744
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—271 **2 Claims**



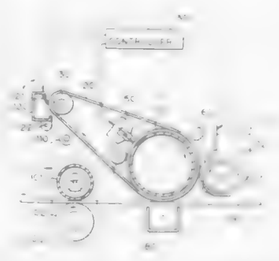
1. An endless belt of an electrophotographic printing machine which pushes photosensitive material against a recording medium onto which an image is to be transferred, said endless belt being laid over two rollers and being 10° to 10^{14} Ω.cm in volume resistivity and comprising: an inner surface, an outer surface and a thin protective layer covering the inner and outer surfaces, wherein said thin protective layer comprises a fluorolatex coating 20 μm in thickness and about 10^{13} Ω.cm in electrical resistance.

5,148,225

ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS

Takayuki Takeda, and Shinichi Itoh, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1991, Ser. No. 722,215
Claims priority, application Japan, Jul. 3, 1990, 2-174387
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—272 **7 Claims**



1. An electrophotographic process comprising the following consecutive steps:
electrically charging an electrostatic latent-image bearing member;
exposing a surface of the electrostatic latent-image bearing member to light corresponding to image information to be recorded, whereby an electrostatic latent image is formed on the surface of the electrostatic latent-image bearing member;
developing the electrostatic latent image from an outer side of a transparent, toner-image bearing member arranged in close contact with the electrostatic latent-image bearing member so that a toner image corresponding to the electrostatic latent image is formed on the toner-image bearing member;
fusing the toner image at a station where the toner-image bearing member is apart from the electrostatic latent-image bearing member, thereby forming a master;
electrically charging the electrostatic latent-image bearing member again;
bringing the master into close contact with the electrostatic latent-image bearing member and subjecting the electrostatic latent-image bearing member to full-surface exposure from an outer side of the master, whereby an electrostatic latent image corresponding to the fused toner image is formed on the surface of the electrostatic latent-image bearing member;
developing the last-mentioned electrostatic latent image from the outer side of the master to form, on the master, a toner image corresponding to the fused toner image; and
transferring the toner image from the master onto a support member and then fixing the toner image so transferred.

5,148,226

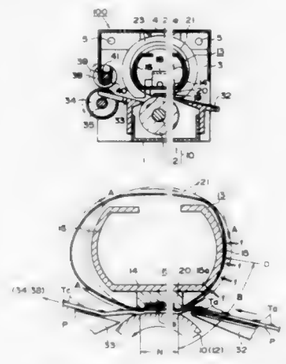
HEATING APPARATUS USING ENDLESS FILM

Takeshi Setoriyama, and Akira Kuroda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 712,573, Jun. 10, 1991, abandoned. This application Jan. 21, 1992, Ser. No. 825,789
Claims priority, application Japan, Jun. 11, 1990, 1-153603; Jun. 11, 1990, 1-153604; Jun. 11, 1990, 1-153606; Jun. 11, 1990, 1-153609
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—290 **29 Claims**

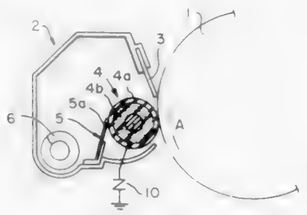
1. An image heating apparatus, comprising:
a heater;
a film movable together with a recording material;
a driving rotatable member cooperative with said film to form a nip therebetween, whereby an image on the re-

cording material being passed through the nip is heated by heat from said heater throug! said film;



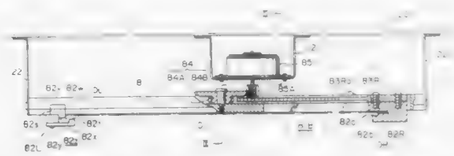
wherein said driving member has a circumferential length which increases toward long tudinal ends thereof.

5,148,227
CLEANING ROLLER AND CLEANING APPARATUS
Hisaaki Senba, and Makoto Jinzai, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 551,307, Jul. 12, 1990, abandoned. This application Feb. 21, 1992, Ser. No. 837,603
Claims priority, application Japan, Jul. 13, 1989, 1-179120
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—296 31 Claims



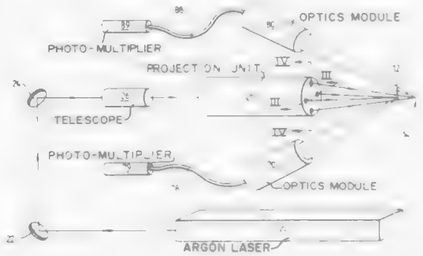
1. A cleaning apparatus for cleaning a movable image bearing member, comprising:
a rotary cleaning member arranged to be pressed against said image bearing member for removing residual toner from said image bearing member,
wherein said rotary cleaning member comprises a surface insulating layer, a core member, and a conductive layer arranged between said surface insulating layer and said core member, and
wherein said conductive layer is directly grounded to dissipate electrical charge from said insulating layer.

5,148,228
IMAGE RECORDING APPARATUS
Masatoshi Takano, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 422,593, Oct. 17, 1989, abandoned. This application Apr. 24, 1991, Ser. No. 689,110
Claims priority, application Japan, Oct. 17, 1988, 63-135253[U]
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] G03B *21/00*
U.S. Cl. 355—308 4 Claims



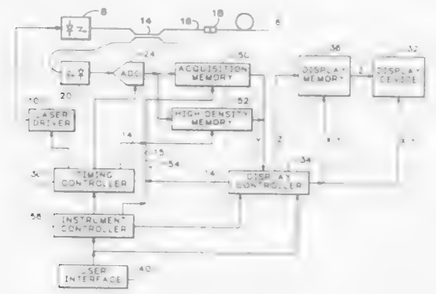
1. An image recording apparatus wherein a recording medium is fed in a predetermined feed path, comprising a pair of edge holders opposedly arranged about said feed path for holding edge portions of said recording medium, one of said edge holders being provided with an edge holding space extending along said feed path and having a shape to force the recording medium to conform to a substantially S-shaped sectional configuration.

5,148,229
LASER VELOCIMETRY TECHNIQUE FOR MEASURING THE THREE DIMENSIONAL VELOCITY COMPONENTS OF A PARTICLE IN A FLUID FLOW
Stephen S. Wiseall, Derby, England, assignor to Rolls-Royce plc, London, England
Continuation-in-part of Ser. No. 498,894, Mar. 26, 1990, abandoned. This application Feb. 8, 1991, Ser. No. 652,030
Claims priority, application United Kingdom, May 6, 1989, 8910460
Int. Cl.[5] G01P *3/36*
U.S. Cl. 356—28 4 Claims



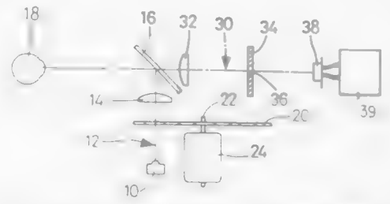
1. A method of measuring three components of velocity of a particle in a fluid flow comprising the steps of,
generating a first and a second probe volume,
each of said probe volumes having a pattern of fringes of known spacing and orientation formed by the interference of two coherent beams of radiation,
the first and second probe volumes being physically separated by a distance which is small compared to any spatial velocity changes in the fluid flow,
introducing an at least one particle into the fluid flow such that the particle on passing through the first and second probe volumes scatters radiation from the fringes,
detecting the frequency change of the radiation scattered from the first probe volume which is directly proportional to the first component of the particle velocity perpendicular to the fringes in the first probe volume and detecting the frequency change of the radiation scattered from the second probe volume which is directly proportional to the second component of the particle velocity perpendicular to the fringes in the second probe volume,
and measuring the time each particle takes to travel from the centre of the first probe volume to the centre of the second probe volume from which the magnitude of the radial component of the particle velocity is calculated for derivation of the third component of the particle velocity.

5,148,230
MEASUREMENT APPARATUS HAVING IMPROVED SAMPLE DENSITY USING NESTED DATA ACQUISITIONS
Richard I. Lane, Bend; Glenn Bateman, Redmond; Josef L. Mader, Bend, all of Oreg., and Ronald J. Bremer, Vancouver, Wash., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed Apr. 25, 1990, Ser. No. 514,396
Int. Cl.[5] G01N *21/88;* G09G *1/02*
U.S. Cl. 356—73.1 9 Claims



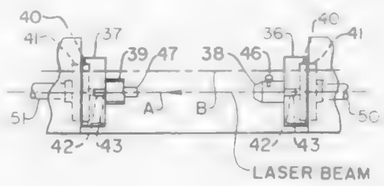
1. A measurement apparatus for acquiring data from the output of a device under test for displaying on a display device having n display locations distributed along a display axis comprising:
an acquisition system having means for sampling the output of the device under test over first and second timed intervals to respectively acquire first and second sets of data samples, N and N1, (N and N1 being greater than n) wherein N1 has a sample density greater than N and the time interval of N1 is within the time interval of N, the sets of N and N1 data samples being stored at addressable locations in respective first and second storage domains with the boundaries of the address locations being a function of the interval times;
means for selecting a set of n display samples from the stored set of N data samples that are uniformly spaced over all or a portion of the set of N data samples for displaying on the display device; and
means operable on the acquisition system for acquiring and storing the second set of data samples N1 as a function of the selecting means selecting a set of N data samples having adjacent address locations for the set of uniformly spaced n display samples, the boundaries of the adjacent address locations of the selected set of N data samples defining a minimum timing interval for the set of N1 data samples.

5,148,231
APPARATUS FOR MEASURING A REFRACTING POWER OF AN OPTICAL SYSTEM
Shinji Ishiguro, and Toshiharu Morino, both of Nagoya, Japan, assignors to Tomey Corp., Nagoya, Japan
Filed Jun. 26, 1991, Ser. No. 721,292
Claims priority, application Japan, Jun. 26, 1990, 2-167315
Int. Cl.[5] G01B *9/00;* A61B *3/10*
U.S. Cl. 356—126 3 Claims



1. An apparatus for measuring a refracting power of an optical system which comprises:
a beam projecting optical system which projects a predetermined moving luminous flux to an optical system to be inspected;
a beam condensing optical system in which a photoelectric conversion element receives a luminous flux transmitted through the optical system to be inspected; and
a processing system which obtains the refracting power of the optical system to be inspected, based on an output from the beam condensing optical system;
wherein a rotating plate having at least one tooth of a converging shape, which is protruded outwardly from a center of the rotating plate, is disposed in a beam path of the beam projecting system such that said at least one tooth passes through the beam path as said rotating plate rotates; and
wherein said at lest one tooth includes two sides which are inclined at different angles from one another with respect to a moving direction of the tooth such that a luminous flux is produced as said rotating plate rotates to pass said tooth through the beam path with the tooth thereby intermittently blocking the beam path, said luminous flux irradiating the optical system to be inspected.

5,148,232
LASER APPARATUS AND METHOD FOR ALIGNING A CRANKPIN GRINDING MACHINE
David H. Duey, Westland, and John A. Battista, Northville, both of Mich., assignors to Intra Corporation, Westland, Mich.
Filed Jan. 28, 1991, Ser. No. 646,407
Int. Cl.[5] G01B *11/26;* G01C *1/00*
U.S. Cl. 356—152 13 Claims



1. An apparatus (for aligning a crankpin grinding machine of the type having a pair of opposite facing workheads **24, 49** for mounting a crankshaft **21** between said workheads on its end journals and rotating the crankshaft about an axis A passing through selected crankpins during the grinding of the selected

crankpins and an indexing device **33** in one of said workheads for indexing the crankshaft about the axis of the end journals to position and grind other selected crankpins), comprising: a laser **38**, projecting a narrow collimated beam of light E onto a target, a target **39** intercepting said laser beam, said target producing output signals which are indicative of the position of said laser beam on said target; a first adapter **36** for mounting said laser on the axis of a spindle of a first workhead of a crankpin grinding machine; a second adapter **37** for mounting said target on the axis of a spindle of a second workhead which is opposite said first workhead to intercept said laser beam when said laser is mounted in said first adapter mounted on said first workhead to align said spindles; a third adapter for mounting said target on a first workholder mounted on said second workhead to intercept said laser beam when said laser is mounted in said first adapter mounted on said first workhead to align said first workholder with said spindle of said first workhead; a fourth adapter for mounting said target on a second workholder mounted on said first workhead to intercept said laser beam when said laser is mounted in said third adapter mounted on said second workhead to align said first workholder with said second workholder; a fifth adapter for mounting said target on said second workholder, said fifth adapter being rotatable about an axis which is offset from said spindles to intercept said laser beam when said laser is mounted in said third adapter mounted on said first workholder to align an indexing unit of said second workholder with said first workholder; and a means **48** operatively connected to said target for processing said output of said target to enable an operator to perform said alignments of said machine.

5,148,233

OPTICAL ATTENUATOR AND OPTICAL POWER METER CALIBRATION SYSTEMS WITH OPTICAL-PULSE CONVERSION AND AVERAGING

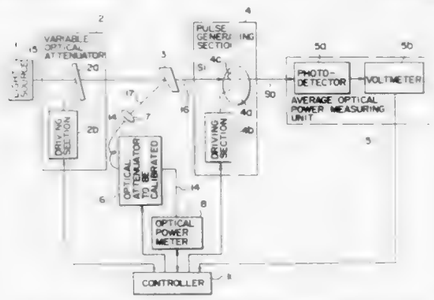
Takayuki Imamura, Kawasaki, and Yuji Ohuchi, Atsugi, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Oct. 25, 1990, Ser. No. 603,884

Claims priority, application Japan, Oct. 31, 1989, 1-284106; Mar. 30, 1990, 2-86975

Int. Cl.[5] G01J *1/00*

U.S. Cl. 356—243 23 Claims



1. An optical attenuation calibration apparatus comprising:

a light source;

optical path changing means, connected to said light source through a first optical path for outputting light to one of a second and a third optical path;

a variable optical attenuator arranged on the first optical path;

pulse generating means, arranged on either one of the first and second optical paths, for receiving light and outputting first and second optical pulse trains having different values of a period Tf and of a light passing time Tw (Tw≦Tf) per period Tf;

photodetecting means for measuring an average optical power of each of the first and second optical pulse trains which have propagated in the second optical path; and

an optical power meter for measuring an optical power from an object to be calibrated which is arranged on the third optical path,

wherein optical attenuations of said variable optical attenuator and of said object are sequentially calibrated by using a ratio between the average optical powers of the first and second optical pulse trains which are measured by said photodetecting means as a standard attenuation.

5,148,234

METHOD AND DEVICE FOR ANALYZING SAMPLES BY MEANS OF ATOMIC ABSORPTION SPECTROSCOPY

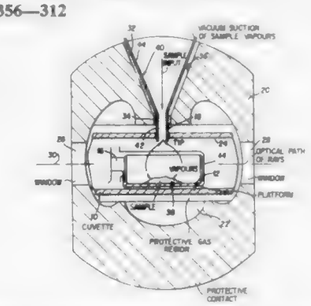
Rolf Tamm, Salem; Guenther Roedel, Owingen, and Klaus Rogasch, Uhldingen-Muhlhofen, Fed. Rep. of Germany, assignors to Bodenseewerk Perkin Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 5, 1991, Ser. No. 681,240

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1990, 4011338

Int. Cl.[5] G01J *3/30*; G01N *21/74*

U.S. Cl. 356—312 19 Claims



1. Method for analyzing samples by means of atomic absorption spectroscopy using electrothermal atomization of the samples, comprising the method steps of:

(a) introducing a liquid sample into a furnace containing a lateral opening;

(b) inserting a suction tube into said lateral opening of said furnace;

(c) connecting said suction tube to a vacuum source;

(d) thereafter, heating the furnace to a predetermined drying temperature for drying the liquid sample introduced into said furnace;

(e) during said step of heating said furnace to said predetermined drying temperature, sucking off vapors formed in the furnace, through said suction tube under the action of said vacuum source;

(f) subsequently heating said furnace to a predetermined atomizing temperature for forming a cloud of atoms in the furnace from the dried sample;

(g) directing a measuring light beam containing resonance spectral lines of a desired element through the cloud of atoms; and

(h) measuring the atomic absorption of said measuring light beam by the atoms of the desired element in said cloud of atoms.

5,148,235

MICHELSON INTERFEROMETER FOR PRODUCING OPTICAL PATH DIFFERENCES BY ROTATING CORNER CUBE RETROREFLECTORS

Volker Tank, Eching; Helmut Dietl; Peter Haschberger, both of München, and Oliver Mayer, Neubiberg, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fur Luft- und Raumfahrt, Cologne, Fed. Rep. of Germany

Filed Feb. 21, 1991, Ser. No. 658,600

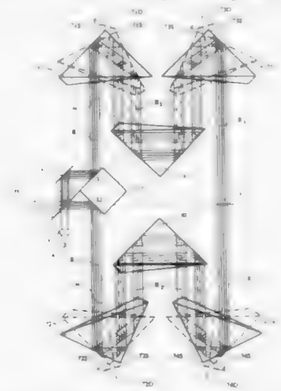
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005491; Apr. 26, 1990, 4013399

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—346 5 Claims

1. A modular Michelson interferometer for producing optical path differences comprising a first rotating retroreflector

(71), a beam splitter (1), a deflection mirror (2), an externally silvered corner mirror (3) having a first plane mirror and a



second plane mirror offset 90° with respect to each other, a bilaterally silvered plane-parallel plate (4), a collective lens (5) and a radiation detector (6), wherein

from the beam splitter (1), the deflection mirror (2), the externally silvered corner mirror (3), the collective lens (5) and the radiation detector (6), an input/output module (M1) is formed in which the first plane mirror (31) of the corner mirror (3) aligns with the beam splitter (1) which is arranged parallel to the deflection mirror (2) and at the same time at an angle of 45° to a symmetry plane (I) whilst the second plane mirror (32) of the corner mirror (3) is arranged perpendicularly to the beam splitter (1),

from the first rotating retroreflector (71), a second rotating retroreflector (72) and two additional retroreflectors (81, 82), an intermediate module (M2) is formed in which the first and the second rotating retroreflectors (71, 72) arranged mirror-inverted with respect to the symmetry plane (I) face each other with their apertures, in which the two additional retroreflectors (81, 82) likewise arranged mirror-inverted with respect to the symmetry plane (I) face each other with their rear sides and have their respective input-side aperture halves aligned with one of the output-side aperture halves of the first and second rotating retroreflectors (71 72), and in which rotation axes (71D, 72D) of the first and second rotating retroreflectors (71, 72) are each offset laterally by the same distance with respect to centres (71S, 72S) of the first and second rotating retroreflectors (71, 72) and inclined at an angle (α) to an optical axis of the first rotating retroreflector (71), and of the second rotating retroreflector (72) respectively from two further rotating retroflectors (73, 74) and from the bilaterally silvered plane-parallel plate (4), a termination module (M3) is formed in which the two further rotating retroreflectors (73, 74) arranged mirror-inverted with respect to the symmetry plane (I) are associated with each other with their apertures, in which a respective output-side half of the two further rotating retroreflectors (73, 74) is arranged opposite a corresponding reflecting surface of the plane-parallel plate (4) lying in the symmetry plane (I), and in which rotation axes (73D, 74D) of the two further rotating retroreflectors (73, 74) are each offset laterally by the same distance (d) with respect to the centres (73S, 74S) of the two further rotating retroreflectors (73, 74) and inclined at an angle (α) to the respective optical axis of the rotating retroreflectors (73, 74), and

wherein the input/output module (M1), the intermediate module (M2) and the termination module (M3) are combined in a fixed connection to an interferometer in such a manner that the plane mirrors (31, 32) of the corner mirror (3) of the input/output module (M1) offset 90° with respect to each other are each arranged opposite a respective input-side half of the two rotating retroreflectors (71, 72) of the intermediate module (M2) and between said retroreflectors (71, 72), and the two rotating retroreflectors (71, 72) of the intermediate module (M2) are arranged directly next to and adjacent the two further rotating retroreflectors (73, 74) of the termination module (M3) in such a manner that the output-side aperture halves of the two stationary retroreflectors (81, 82) are aligned opposite the input-side aperture halves of the two further rotating retroreflectors (73, 74) of the termination module (M3), the respective adjacent rotating retroreflectors (71, 73; 72, 74) of the modules (M1, M2, M3) fixedly connected to each other being in operation in-phase with respect to their rotational angle position and rotating in opposite phase of 180° with respect to the corresponding opposite retroreflectors (71, 72; 73, 74).

5,148,236

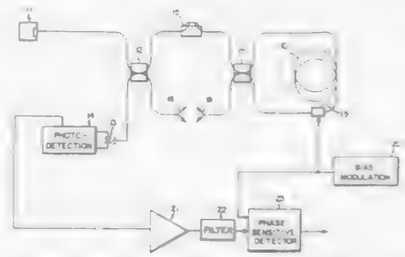
DEMODULATION REFERENCE SIGNAL SOURCE

James Blake; Preston Dane, and Rudolf Dankwort, all of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 18, 1990, Ser. No. 539,634

Int. Cl.[5] G01C *19/72*

U.S. Cl. 356—350 32 Claims



1. An information retrieval system for extracting information from a pair of substantially coherent electromagnetic waves represented by phase differences therebetween each of which is incident on a photodetector means, said pair of substantially coherent electromagnetic waves being provided by a source generation means with further phase differences provided therebetween varying at a modulation frequency due to each being phase modulated, said photodetector means being capable of providing an output signal at an output thereof representing said pair of substantially coherent electromagnetic waves as incident thereon and also representing any further processing phase shifts due to either of said source generation means and said photodectector means, said information retrieval system comprising:

a demodulator means having an information signal input electrically connected to said photodetector means output, and having a reference signal input and an output, said demodulator means being capable of providing at said output thereof and output signal substantially free of frequency components at said modulation frequency corresponding to an input signal provided at said information signal input thereof having a substantial signal component therein at said modulation frequency if a reference signal at said modulation frequency having a selected phase relationship with said input signal modulation frequency component is provided at said reference signal input thereof;

a phase shift detection means having an input electrically connected to said photodectector means output, and having an output, said phase shift detection means being capable of providing at said output thereof an output signal containing a representation of selected events in input signals provided at said information signal input of said demodulator means repeated substantially at said modulation frequency as an indication of that said processing phase shift occurring therein; and

a reference signal supply means having an input electrically connected to said phase shift detection means output, and having an output electrically connected to said demodulator means reference signal input, said reference signal supply means being capable of providing at said output thereof an output signal with a phase determined at least in part by input signals provided at said input thereof.

5,148,217

RING LASER GYRO WITH AN ABSORBER MEDIUM WITH THE LASER CAVITY

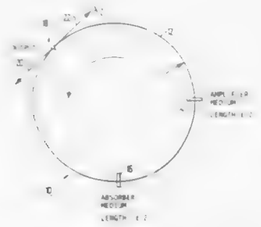
Fritz P. Schaefer, Goettingen, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e. V., Fed. Rep. of Germany

Filed Jun. 28, 1990, Ser. No. 545,391

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921424

Int. Cl.[5] G01C *19/66*

U.S. Cl. 356—350 8 Claims



1. A ring laser gyro comprising:

a) a loop-shaped laser resonator cavity subject to rotation in space;

b) laser generation means for generating two opposed laser oscillation pulses of nominally similar frequencies and circulating in opposing directions in said laser cavity said laser pulses each having a frequency parameter and a wavelength parameter and said laser generation means having:

i) an active laser medium positioned within said laser cavity; and

ii) a pumping energy source for said active laser medium;

c) a detector device for measuring changes in at least one of said parameters of each of said laser oscillation pulses as a function of a full rotation in space of said resonator; and

d) fixing means for fixing a standing wave in said resonator said fixing means containing a saturable absorber medium through which said laser pulses pass;

said standing wave being the result of interaction between said opposed laser oscillation pulses and being stationary relative to said rotatable resonator.

5,148,238

HOT KILN ALIGNMENT SYSTEM

Walter M. Gebhart, 72 Tapscott Rd., Unit 2, Scarborough, Ontario, Canada M1B 3G7

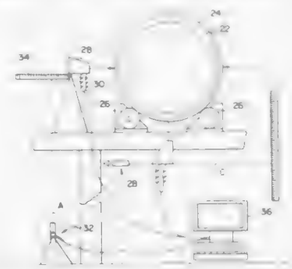
Continuation of Ser. No. 514,483, Apr. 25, 1990. This application Sep. 21, 1990, Ser. No. 586,485

Claims priority, application Canada, Sep. 29, 1989, 614456

Int. Cl.[5] G01B *11/14*

U.S. Cl. 356—375 3 Claims

1. Apparatus for determining the location of a body having a generally circular annular surface, during rotation thereof, comprising a diode laser distance measuring instrument for measuring distance from a predetermined location to an adjacent surface portion of the body positioned normally thereto, datum plane generating means comprising alignment target means in combination with theodolite instrument means for establishing a predetermined datum plane, location instrument means positionable precisely relative to said datum plane and moveable about a predetermined axis normal to said datum plane, indexed locating means extending normal to said plane in predetermined indexed relation with said diode laser and readable by said location instrument means, whereby the projected distance from the surface of said body to said datum plane comprises the algebraic sum of the readings of said diode laser and said location instrument means.



5,148,239

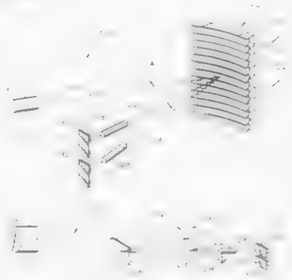
HIGH PERFORMANCE ABSORBANCE DETECTOR WITH FLASHLAMP AND COMPACT FOLDED OPTICS SYSTEM

Haakon T. Magnussen, Jr., Orinda, and Roy P. Moeller, Hayward, both of Calif., assignors to Rainin Instrument Co., Inc., Emeryville, Calif.

Filed Jul. 17, 1990, Ser. No. 554,247

Int. Cl.[5] G01N *21/27*; G01J *3/42*

U.S. Cl. 356—435 15 Claims



1. A high performance absorbance detector, comprising:

a light source;

optic means responsive to incident light from the source and including a reflecting beam splitter comprising a plurality of sets of small mirrors interspersed as a series of mirrors facing incident light from the source, the mirrors of each set extending at different common angles relative to the incident light such that each set of mirrors develops a different reflected beam, one of which comprises a sample beam and another of which comprises a reference beam, each mirror having a width of greater than 0.15 mm and the splitter positioned relative to the source such that each mirror has a viewing angle to the source which differs from that of its adjacent mirrors by 1 degree or less;

a sample flow cell for passing the sample beam; and

photo detecting means for separately detecting the sample beam passing through the flow cell and the reference beam.

5,148,240

HIGH VOLTAGE, HIGH SPEED SCHOTTKY SEMICONDUCTOR DEVICE AND METHOD OF FABRICATION

Koji Ohtsuka, Shiki; Yoshiro Kutsuzawa, Asaka; Kimio Ogata, Higashimatsuyama, and Hideyuki Ichinosawa, Tokyo, all of Japan, assignors to Sanken Electric Co., Ltd., Saitama, Japan

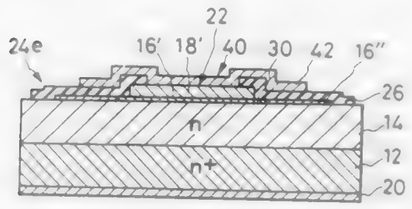
Continuation of Ser. No. 277,333, Nov. 29, 1988. This application Dec. 14, 1990, Ser. No. 628,374

Claims priority, application Japan, Dec. 4, 1987, 62-307196

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] H01L *29/48, 29/56, 29/40*

U.S. Cl. 357—15 8 Claims



1. A high voltage, high speed Schottky semiconductor device comprising:

(a) a semiconductor region;

(b) a barrier metal electrode formed on the semiconductor region to create a Schottky barrier therebetween;

(c) a resistive layer formed on the semiconductor region so as to surround the barrier metal electrode and electrically connected to the barrier metal electrode, the resistive layer being of oxidized titanium, having a higher sheet resistance than the barrier metal electrode and being capable of creating a Schottky barrier between the resistive layer and the semiconductor region, the sheet resistance of the resistive layer being from 10 kilohms to 5000 megohms per square; and

(d) an insulating layer formed on the resistive layer.

5,148,241

METHOD OF MANUFACTURING A SCHOTTKY DIODE DEVICE

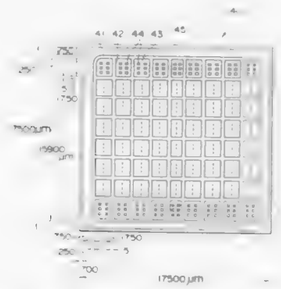
Naomasa Sugita, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 12, 1990, Ser. No. 626,460

Claims priority, application Japan, Dec. 15, 1989, 1-325394

Int. Cl.[5] H01L *29/48*

U.S. Cl. 357—15 13 Claims



1. A Schottky diode device comprising:

a semiconductor substrate of a first conductivity type;

an annular insulating layer on the substrate and defining a device region therewithin;

a first annular isolation region of a second conductivity type opposite to the first conductivity type, in the device region along the annular insulating layer;

a second isolation region of the second conductivity type, dividing the device region into a plurality of unit regions each having a maximum width of not more than 500 μm, and spacing the unit regions apart from each other;

a plurality of semiconductor regions of the second conductivity type, multiple ones of the plurality of semiconductor regions being arranged in each unit region, said semiconductor regions being spaced apart from the second isolation and being spaced at a predetermined pitch apart from each other; and

a barrier metal layer contacting the semiconductor regions to electrically connect them in parallel.

5,148,242

ELECTRON-WAVE COUPLED SEMICONDUCTOR SWITCHING DEVICE

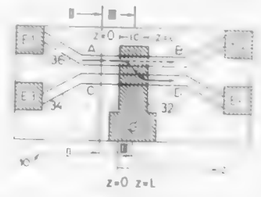
Noriaki Tsukaka, and Klaus Ploog, both of Stuttgart, Fed. Rep. of Germany, assignors to Max Planck Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Jan. 22, 1991, Ser. No. 645,064

Claims priority, application European Pat. Off., Jan. 23, 1990, 90101333.4

Int. Cl.[5] H01L *29/161*

U.S. Cl. 357—16 29 Claims



1. An electron-wave coupled semiconductor device, in particular a semiconductor switching device, comprising a first layer of semiconductor material having a first bandgap, a second layer of semiconductor material formed on said first semiconductor layer and having a second bandgap greater than the first said bandgap, first and second electron waveguides formed alongside but spaced apart from each other in the first semiconductor layer adjacent the boundary between said first layer and said second layer, a gate region extending over said second layer transverse to and over said electron waveguides, first contact means providing input connections to said first and second electron waveguides on one side of said gate region and further contact means providing separate output connections from said first and second electron waveguides on the opposite side of the gate region from said first contact means, wherein the dimension of the electron waveguides under said gate region, both along and transverse to said electron waveguides and also the dimension between said electron waveguides is smaller than the elastic means free path for electrons at the operating temperature of the device.

5,148,243

OPTICAL ISOLATOR WITH ENCAPSULATION

Stephen P. Merrick, Sunnyvale, and Robert W. Teichner, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 365,148, Jun. 9, 1989, abandoned, which is a division of Ser. No. 76,094, Jul. 21, 1987, Pat. No. 4,863,806, which is a division of Ser. No. 748,520, Jun. 25, 1985, Pat. No. 4,694,183. This application Jun. 26, 1991, Ser. No. 721,069

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 7 Claims

1. An optical isolator which is fabricated upon a lead frame

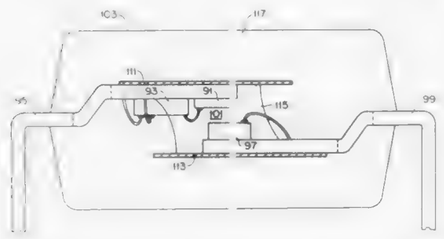
having two side rails, in accordance with a process having the steps of:

down setting an LED attachment portion of the lead frame and a photodiode attachment portion of the lead frame to a downset plane substantially parallel to the plane of the side rails and located therebelow a predetermined downset distance;

attaching a photodiode die to a photodiode lead of the downset photodiode attachment portion;

attaching an LED die to an LED lead of the downset LED attachment portion;

rotating one of the attachment portions approximately 180° about an axis in the side rail plane which connects the side rails and thereby positioning the LED die proximate the



photodiode die and separated therefrom by an isolation gap substantially equal to twice the downset distance minus the sum of the thicknesses of the LED and photodiode dice;

applying a first sheet to a backside of the LED lead opposite the isolation gap;

applying a second sheet to a backside of the photodiode lead opposite the isolation gap;

filling a cavity between the first and second sheets with an optically transparent material such that the isolation gap is filled with the material;

creating an encapsulating body about the optical isolator; and

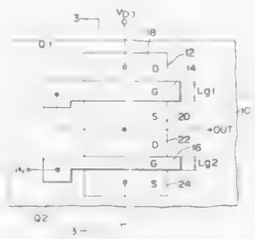
finishing the lead frame protruding from the body.

5,148,244

ENHANCEMENT-FET AND DEPLETION-FET WITH DIFFERENT GATE LENGTH FORMED IN COMPOUND SEMICONDUCTOR SUBSTRATE

Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 11, 1991 Ser. No. 653,294
Claims priority, application Japan, Feb. 14, 1990, 2-32698
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **11 Claims**



1. A semiconductor integrated circuit comprising:

an enhancement transistor having a gate and a current path and serving as a switch, the gate of said enhancement transistor having a first gate length and a first gate width; and

a depletion transistor having a gate and a current path and serving as a load, the gate of said depletion transistor having a second gate length and a second gate width;

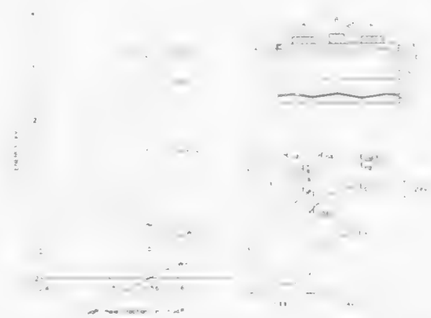
the current path of said enhancement transistor connected in series with the current path of said depletion transistor, the second gate length of said depletion transistor being greater than the first gate length of said enhancement transistor, and the second gate width of said depletion transistor being substantially equal to the first gate width of said enhancement transistor.

5,148,245

SEMICONDUCTOR DEVICE HAVING A SELECTIVELY DOPED HETEROSTRUCTURE

Masahiko Takikawa, Yokohama, and Yuji Awano, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 551,325, Jul. 12, 1990, abandoned. This application Sep. 10, 1991, Ser. No. 758,363
Claims priority, application Japan, Jul. 12, 1989, 1-178070
Int. Cl.[5] H01L *29/205, 29/80*
U.S. Cl. 357—22 **4 Claims**



1. A semiconductor device having a selectively doped heterostructure, comprising:

a semiconductor substrate having a top surface;

a channel layer of an undoped semiconductor material having a top surface, being provided on the top surface of the semiconductor substrate;

a carrier supplying layer of a doped semiconductor material having a top surface, being provided on the top surface of the channel layer for supplying carriers, said channel layer and said carrier supplying layer forming a heterojunction interface at a boundary between the channel layer and the carrier supplying layer with a two-dimensional electron gas formed in the channel layer along the heterojunction interface;

said doped semiconductor material forming the carrier supplying layer and said undoped semiconductor material forming the channel layer having respective compositions determined such that the Γ valley of the conduction band of the carrier supplying layer has an energy level higher than a corresponding energy level of the Γ valley of the conduction band of the channel layer at the heterojunction interface, the L valley of the conduction band of the carrier supplying layer has an energy level higher than corresponding energy level of the L valley of the conduction band of the channel layer at the heterojunction interface, the X valley of the conduction band of the carrier supplying layer has an energy level higher than a corresponding energy level of the X valley of the conduction band at the heterojunction interface, the energy level of the Γ valley of the conduction band of the carrier supplying layer is equal to or higher than the energy level of the

L valley of the conduction band of the channel layer at the heterojunction interface, and the energy level of the L valley of the conduction band of the carrier supplying is equal to of higher than the energy level of the X valley of the conduction band of the channel layer at the heterojunction interface;

a first electrode provided on the top surface of the carrier supplying layer for injecting carriers into the two-dimensional electron gas through the carrier supplying layer;

a second electrode provided on the top surface of the carrier supplying layer with a separation from the first electrode, for collecting the carriers injected through the first electrode which flow through the two-dimensional electron gas to the second electrode; and

control electrode means provided on the top surface of the carrier supplying layer between the first electrode and the second electrode, for controlling a flow of the carriers injected through the first electrode means which flow through the two-dimensional electron gas,

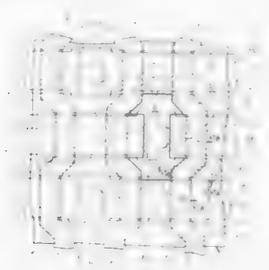
said doped semiconductor material forming the carrier supplying layer comprising gallium indium phosphide having a composition represented as $In_{0.44}Ga_{0.56}P$ and the channel layer comprising gallium arsenide.

5,148,246

CELL ARRAY OF A NON-VOLATILE SEMICONDUCTOR MEMORY DEVICES

Taiji Ema, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 22, 1991, Ser. No. 704,048
Claims priority, application Japan, May 22, 1990, 2-131713
Int. Cl.[5] H01L *29/68, 27/10, 27/15*
U.S. Cl. 357—23.5 **23 Claims**



1. A cell array of non-volatile memory semiconductor memory devices, comprising:

a semiconductor substrate having a first conduction type;

a first insulating film formed on said semiconductor substrate;

a plurality of active regions formed in said semiconductor substrate, each of said active regions having a second conduction type opposite to said first conduction type;

a second insulating film formed on said active regions;

a plurality of floating gate electrodes formed on said second insulating film;

a third insulating film covering said floating gate electrodes;

a plurality of control gate electrodes formed on said third insulating film and which run above said floating gate electrodes;

each of said active regions having a substantially H-shaped planar surface configuration close to four respective and adjacent said floating gate electrodes, each said H-shaped active region, the respective portions of the four adjacent floating and control gate electrodes at the four free ends of the H-shape thereof, and the respective portions of the further, four adjacent H-shaped active regions defining four adjacent and symmetrically disposed transistors;

a fourth insulating film covering said control gate electrodes; and

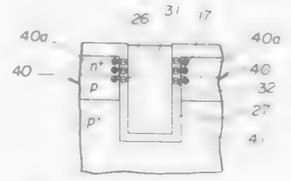
plurality bit lines formed on the fourth insulating film, each bit line being electrically connected to corresponding predetermined said active regions at respective positions, each position being located symmetrically with respect to the four adjacent and symmetrically located transistors.

5,148,247

SEMICONDUCTOR DEVICE HAVING TRENCH ISOLATION

Takao Miura, Tokyo, and Kazunori Imaoka, Komae, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 297,469, Jan. 17, 1989, abandoned. This application Sep. 5, 1991, Ser. No. 755,596
Claims priority, application Japan, Jan. 21, 1988, 63-9458
Int. Cl.[5] H01L *29/68*
U.S. Cl. 357—23.6 **23 Claims**



1. A semiconductor device having a trench isolation structure comprising:

a substrate made of a first type semiconductor, said first type semiconductor being one of n-type and p-type semiconductors;

an active layer formed on said substrate and also made of at least one of the first type semiconductor and a second type semiconductor, said second type semiconductor being opposite said first type semiconductor;

a trench which penetrates said active layer and reaches a portion of said substrate, wherein a pn junction contacts a side surface of said trench; and

an insulator layer formed within said trench and formed substantially around a peripheral portion of said trench,

said active layer having a region in which elements of the semiconductor device are formed,

said insulator layer penetrating, along with said trench, said active layer and a portion of said substrate, and having charges trapped in only a predetermined portion thereof in a vicinity of said region, said charges being trapped in a portion of said insulator layer which covers said pn junction at said side surface of said trench, and wherein a portion of said insulator layer above said active layer outside said trench is free from said trapped charges,

said predetermined portion of said insulator layer having a depth which is greater than a depth of said region of said active layer.

5,148,248

DUAL DIELECTRIC FIELD EFFECT TRANSISTORS FOR PROTECTED GATE STRUCTURES FOR IMPROVED YIELD AND PERFORMANCE IN THIN FILM TRANSISTOR MATRIX ADDRESSED LIQUID CRYSTAL DISPLAYS

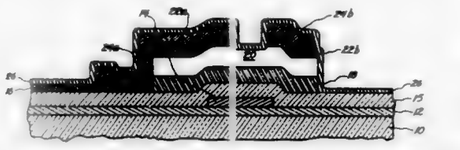
George E. Possin, Schenectady; Harold G. Parks, Scotia, and Jack D. Kingsley, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 104,918, Oct. 6, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 303,091
Int. Cl.[5] H01L *27/01, 27/12, 29/34*
U.S. Cl. 357—23.7 **8 Claims**

1. A cell structure for matrix addressed liquid crystal displays, said structure comprising:

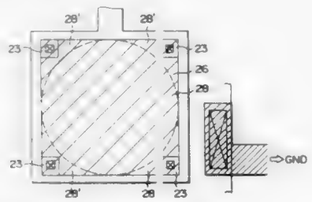
an insulative substrate;

a gate metallization layer disposed on said insulative substrate in a pattern including a gate drive line and a gate electrode;
a layer of silicon oxide disposed over said insulative substrate and over said gate metallization layer and in contact therewith, said silicon oxide layer extending over substantially the entire surface of said insulative substrate having the patterned gate metallization layer disposed thereon;
an island structure including a single layer of protective insulative material other than silicon oxide, said insulative material being patterned to overlie a portion of said silicon oxide layer and be in contact therewith, a layer of intrinsic amorphous silicon disposed over and contacting said protective insulating material layer, and a layer of N^+ amorphous silicon disposed over and contacting said



intrinsic amorphous silicon layer, said island exhibiting an electrical channel in said intrinsic amorphous silicon layer, said channel being disposed over said gate electrode of said gate metallization layer so as to form a field effect transistor device having a source and a drain;
a pixel electrode disposed on said silicon oxide layer adjacent to said island structure said silicon oxide layer being formed without any via openings formed therein proximate to said pixel electrode to intentionally avoid a short-circuit between said gate electrode and said pixel electrode; and
a source/drain metallization layer disposed over said island structure, said silicon oxide and said pixel electrode and patterned to connect one of said source and drain of said field effect transistor device to said pixel electrode and the other of said source and drain to a data drive line.

5,148,249
SEMICONDUCTOR PROTECTION DEVICE
Takeshi Koyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 21, 1989, Ser. No. 326,343
Claims priority, application Japan, Apr. 14, 1988, 63-90213
Int. Cl.[5] H01L *29/78, 29/74*
U.S. Cl. 357—23.13 **2 Claims**



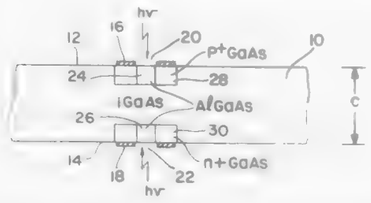
1. A semiconductor device including an element constituting a protection diode for providing protection against a negative surge voltage, said element comprising:
a first region of first conductivity type, formed on a semiconductor substrate, said first region having a major surface area and a given impurity concentration;
an insulating layer formed on said first region of the first conductivity type;
an rectangular interconnection pad formed on the insulating layer and containing a substantially circular effective bonding portion positioned in the center of said pad and a noneffective bonding portion which constitutes the remaining portion of said pad upon formation of the effective bonding portion and consists of the corner regions of said pad;
a second region of said first conductivity type, formed in the major surface area of said first region, overlapping the noneffective bonding portion of said pad, and electrically connected to said pad, said second region having an impurity concentration higher than that of said first region and formed beneath each of the corner regions of said pad;
an area of second conductivity type, formed in said first region; and
an electrode formed over said second conductivity type area via the insulating layer and electrically connected to said second conductivity type area.

5,148,250
BIPOLAR TRANSISTOR AS PROTECTIVE ELEMENT FOR INTEGRATED CIRCUITS
Josef Winnerl, and Xaver Guggenmos, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 389,859, Aug. 4, 1989, abandoned. This application Mar. 18, 1991, Ser. No. 671,151
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827801
Int. Cl.[5] H01L *29/06, 29/78, 29/68*
U.S. Cl. 357—23.13 **14 Claims**

1. A protective element for protecting an integrated circuit from excessive voltages wherein said integrated circuit is formed in a substrate of a first conductivity type and includes an input/output line, the protective element comprising:
a MOS field effect transistor having a gate and source and drain zones, one of said source and drain zones being coupled to a first reference voltage, and said gate and the other of said source and drain zones being coupled to said input/output line such that said MOS field effect transistor rapidly activates upon the presence of a preselected excessive voltage on said input/output line to shunt said excessive voltage to said first reference voltage; and
a parasitic bipolar transistor formed in said substrate with said MOS field effect transistor and having a collector, a base, and first and second emitter zones, said source and drain zones of said MOS field effect transistor being said first and second emitter zones, said base and said first emitter zone being coupled to said first reference voltage, said collector being coupled to a second reference voltage, and said second emitter zone being coupled to said input/output line such that no substrate current triggering "latch-up" is generated.

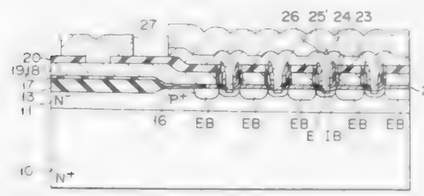
5,148,251
PHOTOCONDUCTIVE AVALANCHE GAAS SWITCH
Anderson H. Kim, Toms River; Maurice Weiner, Ocean, both of N.J.; Louis J. Jasper, Jr., Fulton, Md., and Robert J. Youmans, Brick, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 25, 1991, Ser. No. 797,592
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **9 Claims**

1. A photoconductive switch device, comprising:
a substrate of semiconductor material of relatively high resistivity and which is responsive to optical energy of a predetermined wavelength to switch from a semi-insulating state to a quasi-metallic state, said substrate being of a predetermined thickness for supporting an avalanche mode of operation;
a pair of semiconductor optical window regions formed in said substrate adjacent two opposing outer surfaces thereof;
respective doped semiconductor regions in said substrate



adjacent said outer surfaces surrounding said window regions; and
a pair of metallization patterns formed on said outer surfaces over said highly doped regions and having at least one aperture therein to said optical window regions for coupling optical energy into said substrate through said window regions thereby providing a double sided illumination device which will create the lowest carrier density at the center of the substrate to generate a condition for the avalanche mode of operation.

5,148,252
DIPOLAR TRANSISTOR
Shin-ichi Taka, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 649,899, Feb. 1, 1992, abandoned. This application Feb. 18, 1992, Ser. No. 837,099
Claims priority, application Japan, Feb. 13, 1990, 2-29687
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—34 **11 Claims**

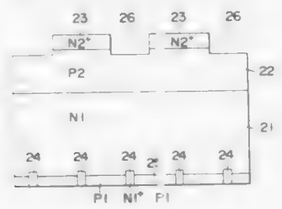


1. A bipolar transistor comprising:
a semiconductor substrate of a first conductivity type;
an external base region of a second conductivity type, said external base region being on a major surface of said semiconductor substrate;
a plurality of internal base regions of the second conductivity type on the major surface of said semiconductor substrate, each of said internal base regions being surrounded by said external base region, and said external base region having a higher impurity concentration than each of said internal base regions;
emitter regions of the first conductivity type respectively in said internal base regions;
a first insulating layer on the major surface of said semiconductor substrate and extending outward from an outer peripheral portion of said external base region and defining openings therein;
a base electrode extraction layer on said external base region, said base electrode extraction layer contacting with portion of said external base region between two of said internal base regions, and said base electrode extraction layer having a width equal to the distance between said two of said internal base regions;
an insulating film on said base electrode extraction layer;
a second insulating layer on side wall portions of said base electrode extraction layer adjacent to said emitter regions, and on a portion of the major surface of said semiconductor substrate extending from the side wall portions to said emitter regions; and
an emitter electrode extraction layer on said second insulating layer and contacting with said emitter regions.

5,148,253
LIGHT-TRIGGERED SWITCHING CIRCUIT
Akihiro Kimura, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 513,972, Apr. 24, 1990, abandoned. This application Aug. 7, 1991, Ser. No. 742,583
Claims priority, application Japan, Apr. 28, 1989, 1-107563
Int. Cl.[5] H01L *29/74, 27/14;* **H03K** *17/292, 17/60*
U.S. Cl. 357—38 **28 Claims**

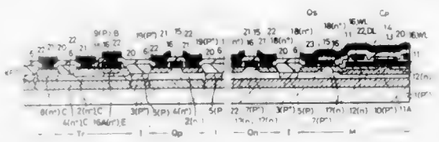
1. An optical radiation-triggered switching circuit, adapted for receiving a first radiation having an intensity of at least a first level and less than a second level and for receiving a second radiation having an intensity of at least the second level, comprising:
a PNPN element, including a P-type emitter layer, an N-type base layer juxtaposed to the P-type emitter layer, a P-type base layer juxtaposed to the N-type base layer, and an N-type emitter layer juxtaposed to the P-type base layer, the PNPN element being triggerable by either the first radiation or the second radiation;
a resistor connected between the P-type base layer and the N-type emitter layer; and
means, coupled between the P-type emitter layer and the N-type emitter layer, for controlling the PNPN element including
first means for enabling the PNPN element to trigger only when a voltage between the P-type emitter layer and the N-type emitter layer if lower than a predetermined value when the first radiation is received by the switching circuit, and
second means for enabling the PNPN element to trigger independently of whether the voltage between the P-type emitter layer and the N-type emitter layer is lower than the predetermined value when the second radiation is received by the switching circuit.

5,148,254
FINELY CONTROLLED SEMICONDUCTOR DEVICE
Hideo Matsuda; Takashi Fujiwara, both of Yokohama, and Takeomi Yoshida, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 403,871, Sep. 7, 1989, abandoned. This application Dec. 28, 1991, Ser. No. 633,186
Claims priority, application Japan, Oct. 4, 1988, 63-250456
Int. Cl.[5] H01L 29/74
U.S. Cl. 357—38 10 Claims



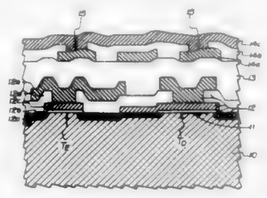
1. A semiconductor device comprising:
a substrate of a first conductivity type having first and second surfaces;
a first layer of a second conductivity type on the first surface of said substrate, the first layer having a first thickness;
a second layer of the first conductivity type on said first layer;
a third layer of the first conductivity type patterned on the second surface of said substrate; and
a fourth layer of the second conductivity type having a first surface on the second surface of said substrate, a second surface, and a thickness between the first and second surfaces of said fourth layer within the range of 5 to 20 μm and smaller than the first thickness.

5,148,255
SEMICONDUCTOR MEMORY DEVICE
Shinji Nakazato; Hideaki Uchida; Yoshikazu Saito; Masahiro Yamamura, all of Takasaki; Yutaka Kobayashi, Katsuta; Takahide Ikeda, Tokorozawa; Ryoichi Hori, Tokyo; Goro Kitsukawa, Tokyo; Kiyoo Itoh, Tokyo, all of Japan; Nobuo Tanba, Palo Alto, Calif.; Takao Watanabe, New Haven, Conn.; Katsuhiro Shimohigashi and Noriyuki Homma, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 262,031, Oct. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 889,405, Aug. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 87,256, Jul. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 29,681, Mar. 24, 1987, abandoned. This application Jan. 23, 1991, Ser. No. 645,351
Claims priority, application Japan, Sep. 25, 1985, 60-209971; Nov. 20, 1985, 60-258506; Mar. 23, 1986, 61-65696; Mar. 24, 1986, 61-64055; Aug. 1, 1986, 61-179913; Dec. 11, 1986 PCT/JP86/00579
Int. Cl.[5] H01L 27/12, 29/68, 29/72
U.S. Cl. 357—43 59 Claims



1. A memory device comprising:
a semiconductor substrate of a first conductivity type;
a semiconductor layer on said semiconductor substrate, the semiconductor layer having a main surface;
a memory array formed on said main surface of said semiconductor layer and including a plurality of MOS memory cells, the memory cells being adapted to hold information;
a bipolar transistor formed on said main surface of said semiconductor layer;
a buried layer provided under said memory array and being disposed between said semiconductor substrate and said semiconductor layer, said buried layer being of the same conductivity type as that of said semiconductor substrate and having an impurity concentration higher than that of said semiconductor substrate; and
a further semiconductor region formed in said semiconductor layer between said memory array and said bipolar transistor, wherein said further semiconductor region contacts said buried layer and extends up to the main surface of said semiconductor layer.

5,148,256
DIGITAL COMPUTER HAVING AN INTERCONNECT MECHANISM STACKED ABOVE A SEMICONDUCTOR SUBSTRATE
Hanan Potash, La Jolla; Melvyn E. Genter, and Bruce B. Rosener, both of San Diego, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.
Filed Feb. 23, 1981, Ser. No. 237,429
The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.
Int. Cl.[5] H01L 27/10
U.S. Cl. 357—45 10 Claims

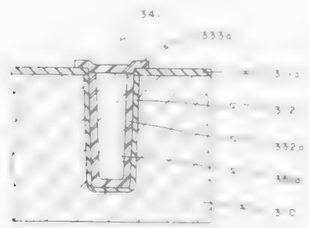


1. A digital device having an interconnect matrix stacked above a semiconductor substrate comprised of:
a plurality of storage means intergrated into a surface of said substrate for storing operands and control signals;
an insulating layer over said storage means and said surface;
said storage means having inputs and outputs penetrating through said insulating layer; and
a nonmagnetic interconnect matrix on said insulating layer including a plurality of spaced-apart input buses and output buses on said insulating layer coupled respectively to said inputs and outputs of said storage means;
said interconnect matrix further including a plurality of nonmagnetic three-terminal logic gates on said insulating layer for receiving said operands from said input buses on a first one of said terminals, receiving said control signals on a second one of said terminals, and selectively passing said received operands through a third of said terminals, to said output buses in response to said control signals.

5,148,257
SEMICONDUCTOR DEVICE HAVING U-GROOVE
Shuji Kishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 13, 1990, Ser. No. 627,034
Claims priority, application Japan, Dec. 20, 1989, 1-332055
Int. Cl.[5] H01L 27/12
U.S. Cl. 357—49 8 Claims

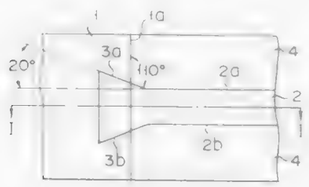
1. A semiconductor device comprising:
a semiconductor substrate having a major surface;
a U-groove formed in said substrate and extending inwardly from said major surface said U-groove being composed of a side wall and a bottom;

a silicon oxide film formed on and attached to all parts of said side wall and of said bottom of said U-groove;
a first silicon nitride film formed on said silicon oxide film to cover the entire surface of said silicon oxide film in said U-groove;



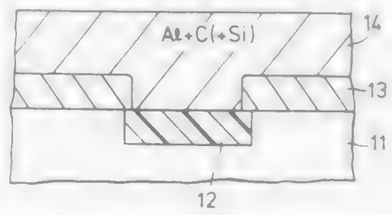
a polysilicon layer formed on said first silicon nitride film within said U-groove and entirely filling said U-groove so that said polysilicon layer forms an exposed upper surface near the level of said major surface of said substrate; and
a second silicon nitride film attached directly to all parts of said exposed upper surface of said polysilicon layer.

5,148,258
SEMICONDUCTOR DEVICE HAVING JUNCTION STRUCTURE OF A PLURALITY OF ELEMENT ISOLATION REGIONS
Shigeru Morita, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 26, 1990, Ser. No. 633,801
Claims priority, application Japan, Dec. 27, 1989, 1-336657
Int. Cl.[5] H01L 27/12, 27/02, 29/06
U.S. Cl. 357—49 19 Claims



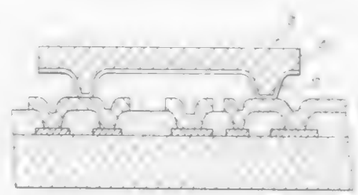
1. A semiconductor device comprising:
an element region on a major surface of a semiconductor substrate,
a first element isolation region; and
a second element isolation region for electrically isolating said element region, having a side exposed to the element region, and defining an obtuse angle, in a plane parallel to the major surface, between a first side of said first element isolation region and each side of said second element isolation region that crosses the first side.

5,148,259
SEMICONDUCTOR DEVICE HAVING THIN FILM WIRING LAYER OF ALUMINUM CONTAINING CARBON
Takashi Kato, Sagamihara; Takashi Ito, Kawasaki, and Mamoru Maeda, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 86,623, Aug. 18, 1987, abandoned. This application Jul. 31, 1991, Ser. No. 740,872
Claims priority, application Japan, Aug. 19, 1986, 61-193445; Aug. 19, 1986, 61-193446; Aug. 19, 1986, 61-193447
Int. Cl.[5] H01L 23/48
U.S. Cl. 357—67 11 Claims



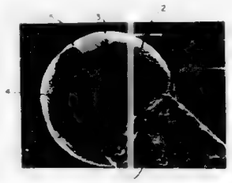
1. A semiconductor device comprising:
a first layer; and
a second layer formed on said first layer,
said second layer being a thin film wiring layer made of aluminum containing at least carbon, wherein
the aluminum containing carbon has a grain size which is less than or equal to 100 nm in said second layer.

5,148,260
SEMICONDUCTOR DEVICE HAVING AN IMPROVED AIR-BRIDGE LEAD STRUCTURE
Tomotoshi Inoue, Kanagawa; Toshiyuki Terada, Tokyo, and Kenichi Tomita, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 7, 1990, Ser. No. 578,436
Claims priority, application Japan, Sep. 7, 1989, 1-230485
Int. Cl.[5] H01L 23/50, 23/54
U.S. Cl. 357—67 10 Claims



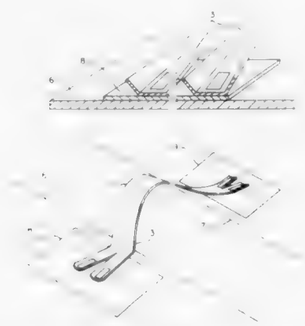
1. A semiconductor device having an air-bridge lead structure comprising:
a semiconductor substrate having a surface;
a plurality of electrodes formed on the surface of said semiconductor substrate; and
an air-bridge lead electrically connected between said plural electrodes, said air-bridge lead having at least a first metal layer and a second metal layer, said first metal layer being integrally formed over an entire bottom length of said air-bridge lead and said second metal layer being formed on top of said first metal layer, said first metal layer having a Young's modulus higher than that of said second metal layer, and said second metal layer having a specific electric resistance lower than that of said first metal layer

5,148,261
THERMOCOMPRESSION BONDING IN INTEGRATED CIRCUIT PACKAGING
Sung K. Kang, Chappaqua; Michael J. Palmer, Walden, both of N.Y.; Timothy C. Reiley, Los Gatos, Calif., and Robert D. Topa, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 398,799, Aug. 29, 1989, Pat. No. 5,006,917.
This application Jan. 28, 1991, Ser. No. 646,413
Int. Cl.[5] H01L 23/54
U.S. Cl. 357—67 10 Claims



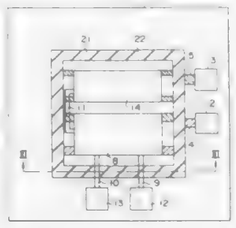
1. An intermediate manufacturing member for a thermocompressively bondable contact in integrated circuit packaging comprising in combination
a conductor member, on one end thereof, at least a deformable layer of a uniform consistency metal taken from the group of Au, Pd, Ag, Ir and Ni,
said deformable layer having
a hardness on the Knoop scale in the range of that of Au which is approximately 90, and
a surface morphology of ridges having a spacing of approximately ½ the thickness of the combination of said conductor and a pad to which said conductor is bonded and a depth between ridges in a range from ¼ to ½ the thickness of said pad.

5,148,262
RELIABLE SUPERCONDUCTING LINK FOR SUPERCONDUCTING THIN FILM COMPONENTS WITH U-SHAPED END PORTIONS
Antti I. Ahonen, Helsinki; Matti J. Kajola, Espoo, and Juha T. A. Simola, Helsinki, all of Finland, assignors to Neuromag Oy, Finland
Filed Jul. 1, 1991, Ser. No. 723,934
Claims priority, application Finland, Aug. 17, 1990, 904071
Int. Cl.[5] H01L 23/48, 29/44, 49/00; H01B 12/00
U.S. Cl. 357—68 7 Claims



1. A superconducting link for connecting a bonding pad to a superconducting, thin film component, or connecting two superconducting, thin film components, said link being formed of an elongated strip of thin, soft, superconducting material and having a medial portion interposed between end portions, said end portions being suitable for connection to a bonding pad or superconducting, thin film component, the material in said medial portion being flat in a direction transverse to the direction of elongation of said strip, said medial portion being bent in the direction of elongation of said strip for being deformable responsive to thermally generated stresses in said link, the material in said end portions having a U-shape in a direction transverse to the direction of elongation of said strip for rendering said end portions stiff along the direction of elongation of said strip, said stiff end portions resisting separation of said link from a bonding pad or superconducting, thin film component, and said medial portion absorbing thermally generated stresses to prevent their application to the connection formed at said end portions.

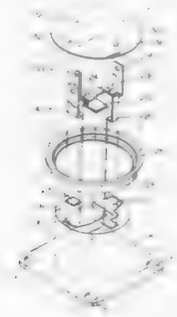
5,148,263
SEMICONDUCTOR DEVICE HAVING A MULTI-LAYER INTERCONNECT STRUCTURE
Tsuneo Hamai, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 448,360, Dec. 11, 1989, abandoned.
This application Apr. 12, 1991, Ser. No. 684,151
Claims priority, application Japan, Dec. 16, 1988, 63-318245
Int. Cl.[5] H01L 23/48, 29/46, 29/54, 29/62
U.S. Cl. 357—71 3 Claims



1. A semiconductor device having a multi-layer metal interconnect structure comprising:
at least three metal interconnect layers formed over a substrate;
a first metal interconnect layer constituting a first power supply line, wherein said first power supply line comprises a plurality of interconnect layers; and
a second metal interconnect layer vertically aligned with and separated from the first metal interconnect layer, and constituting a second power supply line.
the first and second power supply lines each being a closed trunk line for applying voltages to said device.

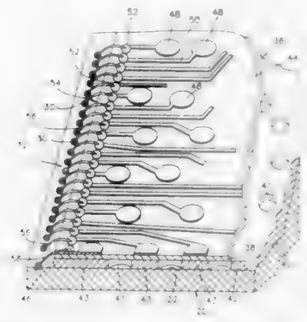
5,148,264
HIGH CURRENT HERMETIC PACKAGE
Robert J. Satriano, Hackettstown, N.J., assignor to Harris Semiconductor Patents, Inc., Melbourne, Fla.
Filed May 2, 1990, Ser. No. 517,799
Int. Cl.[5] H01L 23/02
U.S. Cl. 357—74 12 Claims

1. A package for hermetically sealing an electron device, comprising:
a metal header made of copper and having a substantially flat under surface and a substantially flat upper surface;
an insulating disk of beryllium oxide affixed to said upper surface of said header by brazing, said insulating disk having conductive patterns of copper formed on the upper side thereof for mounting said electronic device and connection leads for said electronic device;
flat connection leads respectively brazed to said conductive pattern;
a steel barrel having upper and lower generally cylindrical portions of respectively greater and smaller internal diameters and having a circumferential step therebetween forming a shoulder, a over edge of the lower portion of said barrel being attached to said upper surface of said header by brazing so as to form a hermetic seal therewith and so as to surround and contain said insulating disk within said lower portion of said barrel;
a ceramic lid having a diameter slightly less than that of said upper portion, hermetically sealed to said shoulder via said ceramic lid having a circumference plated with nickel



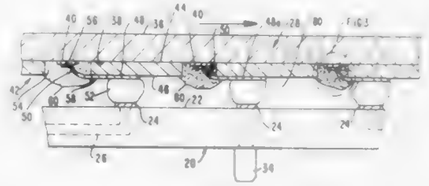
plated lithium molybdate and being attached by soldering at said circumference to said barrel, said ceramic lid having slots therein through which said connection leads pass, said slots being peripherally plated with nickel plated lithium molybdate and being respectively soldered to said leads to form a hermetic seal therewith; and
said electronic device being mounted on said conductive pattern of copper on said insulating disk.

5,148,265
SEMICONDUCTOR CHIP ASSEMBLIES WITH FAN-IN LEADS
Igor Y. Khandros, Peekskill, and Thomas H. DiStefano, Bronxville, both of N.Y., assignors to IST Associates, Inc., Elmsford, N.Y.
Continuation-in-part of Ser. No. 586,758, Sep. 24, 1990. This application Mar. 21, 1991, Ser. No. 673,020
Int. Cl.[5] H01L 23/12, 23/14
U.S. Cl. 357—80 50 Claims



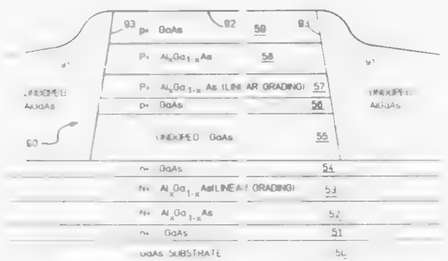
1. A semiconductor chip assembly comprising:
(a) a semiconductor chip having a front surface defining the top of the chip, said front surface including a central region and a peripheral region surrounding said central region, whereby said central region is disposed inwardly of said peripheral region, said chip having a plurality of peripheral contacts disposed in said peripheral region of said front surface;
(b) a sheetlike dielectric interposer overlying said central region of said chip front surface, said interposer having a first surface facing toward said chip and a second surface facing away from said chip, said interposer having outward edges disposed inwardly of said peripheral contacts;
(c) a plurality of central terminals disposed on said interposer and overlying said central region of said chip front surface, said central terminals facing away from said chip and being exposed at said second surface of said interposer for interconnection to a substrate; and
(d) a plurality of peripheral contact leads connecting at least some of said peripheral contacts and at lest some of said central terminals, each said peripheral contact lead having a central terminal end overlying said interposer and connected to one of said central terminals and a contact end projecting outwardly beyond one of said edges of said interposer and connected to one of said peripheral contacts, whereby each said peripheral contact lead extends inwardly from one of said peripheral contacts to one of said central terminals on said interposer, said central terminals being movable with respect to said contacts so as to compensate for thermal expansion of said chip.

5,148,266
SEMICONDUCTOR CHIP ASSEMBLIES HAVING INTERPOSER AND FLEXIBLE LEAD
Igor Y. Khandros, Peekskill, and Thomas H. DiStefano, Bronxville, both of N.Y., assignors to IST Associates, Inc., Elmsford, N.Y.
Filed Sep. 24, 1990, Ser. No. 586,758
Int. Cl.[5] H01L 23/12, 23/14
U.S. Cl. 357—80 25 Claims



1. A semiconductor chip assembly comprising:
(a) a semiconductor chip having a front surface and a plurality of contacts disposed in a pattern on said front surface, said pattern encompassing a contact pattern area on said front surface;
(b) a sheetlike dielectric interposer overlying said front surface of said chip, said interposer having a first surface facing toward said chip and a second surface facing away from said chip, an area of said interposer overlying said contact pattern area of said chip, said interposer having apertures extending from said first surface to said second surface;
(c) a plurality of terminals disposed in a pattern on said second surface of said interposer, at least some of said terminals being disposed in said area of said interposer overlying said contact pattern area, each such terminal being associated with one of said contacts on said chip; and
(d) a flexible conductive lead extending between each said terminal and the associated one of said contacts, each such lead extending through one of said apertures, each said lead having a contact end connected to the associated contact and a terminal end connected to the associated terminal, said terminals being moveable relative to the contact ends of said leads so as to compensate for thermal expansion of said chip.

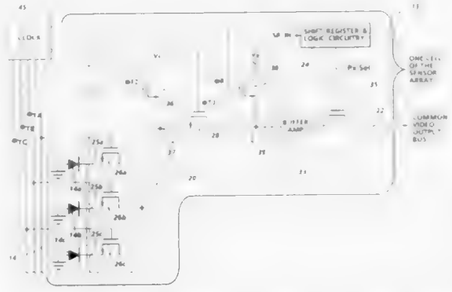
5,148,257
DOUBLE HETEROSTRUCTURE STEP RECOVERY DIODE WITH INTERNAL DRIFT FIELD
Michael R. Ty Tan, Mountain View; Shih Y. Wang, and John L. Moll, both of Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of Ser. No. 404,306, Sep. 8, 1989, abandoned. This application May 31, 1991, Ser. No. 708,950
Int. Cl.[5] H01L 29/163, 29/203, 29/36, 29/86
U.S. Cl. 357—16 22 Claims



1. A double heterostructure step recovery diode comprising:
an intrinsic charge storage region;
a wide bandgap p-type region having wider bandgap than the charge storage region and forming a heterojunction therewith;
a wide bandgap n-type region having a wider bandgap than the charge storage region and forming a heterojunction therewith; and
a graded bandgap region between the intrinsic region and one of the wide bandgap regions, characterized by a generally continuous gradation in bandgap between the bandgap of the intrinsic region and that of the wide bandgap region,
application of a forward bias voltage across the diode resulting in an accumulation of charge carriers in the charge storage region and a low impedance through the diode, and
switching the polarity of the voltage to a reverse bias resulting in a sweeping of the charge carriers out of the charge storage region, during which the impedance through the diode remains low, and then in a step recovery which takes place when substantially all the charge carriers have been swept out of the charge storage region, during which the impedance abruptly increases.

5,148,268
MULTIPLEXING ARRANGEMENT FOR CONTROLLING DATA PRODUCED BY A COLOR IMAGES SENSOR ARRAY
Jagdish C. Tandon, Fairport; Yungran Choi, Webster, and Scott L. Tewinkle, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 26, 1991, Ser. No. 692,097
Int. Cl.[5] H04N 9/04, 5/335
U.S. Cl. 358—41 15 Claims

1. A process for transferring image charges from color sensor chips, in which said sensor chips have a first array of sensors depicting one color, a second array of sensors depicting a second color and a third array of sensors depicting a third color; a common output bus to which image charges accumulated by said first array of sensors are transferred to during ½ of an integration period, to which image charge from said second array of sensors are transferred to during ½ of an integration period, and to which image charge from said third array of sensors are transferred to during ½ of an integration period; a two stage transfer circuit coupling each of said sensors on a chip with said output bus, said two stage transfer circuit having a first first-stage transistor for every sensor in said first array of sensors disposed in series with a common second-stage transistor, a second first-stage transistor for every sensor in said second array of sensors disposed in series with said common second-stage transistor, and a third first-stage transistor for every sensor in said third array of sensors disposed in series connection with said common second-stage transistor; and an amplifier between said common second-stage transistor and said output bus for amplifying the image charges output by said sensors, comprising the steps of:
a) providing a bias charge for application to a node between said first first-stage transistor and said common second-stage transistors of said two stage transfer circuits for use in setting the bias charge on said first array of sensors;
b) concurrently applying a bias charge transfer pulse to said first first-stage transistor of each of said two stage transfer circuits, said first first-stage transistors operable as metering gates to inject a limited amount of said bias charge on said first array of sensors independently of the first first-stage transistors threshold voltages;
c) applying a reset voltage to a node between said common second transistor and said amplifier of each of said two stage transfer circuits at the input of said amplifiers to reset said amplifiers for transfer of the image signal charges from said first array of sensors to said amplifiers;
d) thereafter, applying an image signal charge transfer pulse having an amplitude different from the amplitude of said bias charge transfer pulse to said first first-stage and said

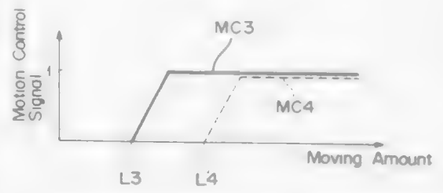


common second transistors of said two stage transfer circuits to pass the image signal charges accumulated on said first array of sensors to said amplifiers for amplification and transfer to said output bus;
e) providing a bias charge for application to a node between said second first-stage transistor and said common second-stage transistors of said two stage transfer circuits for use in setting the bias charge on said second array of sensors;
f) concurrently applying a bias charge transfer pulse to said second first-stage transistor of each of said two stage transfer circuits so that said second first-stage transistors function as metering gates to inject a limited amount of said bias charge on said second array of sensors independently of said second first-stage transistors threshold voltages;
g) applying a reset voltage to a node between said common second transistor and said amplifier of each of said two stage transfer circuits at the input of said amplifiers to reset said amplifiers for transfer of the image signal charges from said first array of sensors to said amplifiers;
h) thereafter, applying an image signal charge transfer pulse having an amplitude different from the amplitude of said bias charge transfer pulse to said second first-stage and said common second transistors of said two stage transfer circuits to pass the image signal charges accumulated on said second array of sensors to said amplifiers for amplification and transfer to said output bus;
i) providing a bias charge for application to a node between said third first-stage transistor and said common second-stage transistors of said two stage transfer circuits for use in setting the bias charge on said third array of sensors;
j) concurrently applying a bias charge transfer pulse to said third first-stage transistor of each of said two stage transfer circuits so that said third first-stage transistors function as metering gates to inject a limited amount of said bias charge on said third array of sensors independently of said third first-stage transistor threshold voltages;
k) applying a reset voltage to a node between said common second transistor and said amplifier of each of said two stage transfer circuits at the input of said amplifiers to reset said amplifiers for transfer of the image signal charges from said third array of sensors to said amplifiers; and
l) thereafter, applying an image signal charge transfer pulse having an amplitude different from the amplitude of said bias charge transfer pulse to said third first-stage and said common second transistors of said two stage transfer circuits to pass the image signal charges accumulated on said third array of sensors to said amplifiers for amplification and transfer to said output bus.

5,148,269
MOTION VECTOR PROCESSING DEVICE
Gerard de Haan, and Hendrik Huijgen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 10, 1991, Ser. No. 727,745
Claims priority, application European Pat. Off., Jul. 20, 1990, 90201976
Int. Cl.[5] H04N 7/01
U.S. Cl. 358—105 7 Claims

1. Motion vector processing device for processing motion vectors corresponding to pictures being subdivided into a plurality of blocks, for each block a motion vector being available, comprising:
means for providing x and y motion vector components of a given block and of blocks adjacent to said given block;
means coupled to said providing means for supplying, for each subblock of a number of subblocks together forming said given block, x and y motion vector components selected from said x and y motion vector components of said given block and from the x and y motion vector components of two blocks adjacent to said subblock; and
means for creating for each subblock, x and y motion vector components based on said selected motion vector components.

5,148,270
TELEVISION SIGNAL RECEIVING APPARATUS
Ikuo Someya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 21, 1991, Ser. No. 658,670
Claims priority, application Japan, Feb. 26, 1990, 2-45194
Int. Cl.[5] H04N 7/12, 7/18
U.S. Cl. 358—133 3 Claims

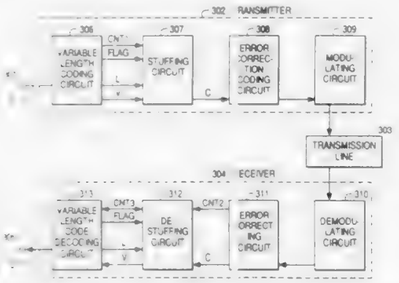


1. A decoding apparatus for decoding a transmitted encoded MUSE image signal having an associated temporal frequency, said apparatus comprising:
first interpolating means operative for processing said encoded image signal as a still image signal so as to obtain a first image signal for supply from said apparatus when the temporal frequency of said encoded image signal has a value less than a first predetermined value so as to lie in a relatively low temporal frequency region of a motion frequency band;
second interpolating means operative for processing said encoded image signal as a moving image signal so as to obtain a second image signal for supply from said apparatus when the temporal frequency of said encoded image signal has a value higher than a second predetermined value and less than a third predetermined value so as to lie in a relatively high temporal frequency region of said motion frequency band;
third interpolating means operative for processing said encoded image signal as a middle image signal so as to obtain a third image signal for supply from said apparatus when the temporal frequency of said encoded image signal has a value between said first predetermined value and said second predetermined value so as to lie in a middle temporal frequency region of said motion frequency band; and
summation mixing means for mixing overlapping portions between said first image signal and said third image signal and between said second image signal and said third image signal.

5,148,271
METHOD FOR TRANSMISSION OF VARIABLE LENGTH CODE AND APPARATUS FOR CODING A VIDEO SIGNAL
Shiro Kato, Hirakata; Tatsuro Juri, Osaka, and Masakazu Nishino, Kashiwara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 17, 1991, Ser. No. 686,388
Claims priority, application Japan, Apr. 17, 1990, 2-101298; Feb. 6, 1991, 3-15190
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—133 14 Claims

1. A method for transmission of two groups of variable length code words which are allocated into a data storage field having a given bit length, comprises:
a first step of allocating the variable length code words of

the first group into the data storage field in a sequence from the front end towards the rear end; and



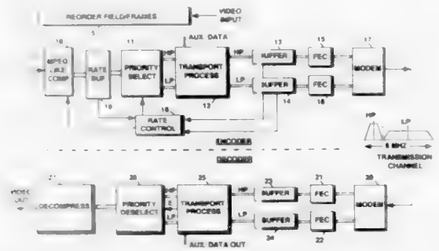
a second step of allocating the variable length code words of the second group into the data storage field in a reverse sequence from the rear end towards the front end.

5,148,272

APPARATUS FOR RECOMBINING PRIORITIZED VIDEO DATA

Alfonse A. Acampora, Staten Island, N.Y.; Joel W. Zdepski, Lebanon, and Robert J. Siracusa, Lawrenceville, both of N.J., assignors to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Feb. 27, 1991, Ser. No. 661,994
Int. Cl.[5] H04N *7/12, 5/2, 7/04*
U.S. Cl. 358—133 **17 Claims**



1. In a television processing system for decoding compressed video signal encoded in such fashion that data of greater and lesser importance for image reproduction are transmitted as high and low priority data in high and low priority channels respectively, said data including variable length codewords CW of differing types, said types occurring in a predetermined sequence of blocks of data, with data from respective blocks occurring in both said high and low priority channels, and wherein the data of said high and low priority channels are conveyed in respective transport packets having header data including block identifiers, and the header data of the high priority channel transport packets including codewords CW#j identifying numbers of codewords included in groups of one of said types, apparatus for combining said data from said high and low priority channels into a single data stream comprising:

first means, responsive to received signal, for providing said high and low priority data with header data excised, and for providing said header data

second means responsive to said high priority data and said header data from said high priority channel for variable length decoding said high priority codewords CW to establish demarcation between respective codewords, and to identify respective types of said codewords;

third means responsive to said low priority data and said header data from said low priority channel for variable length decoding said low priority codewords CW to establish demarcation between respective codewords, and to identify respective types of said codewords;

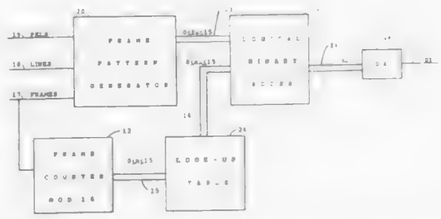
fourth means, responsive to said header data, for identifying corresponding blocks of high and low priority data, and providing as said single data stream, high priority data codewords for a block through codeword number CW#j, then low priority data for the same block.

5,148,273

TELEVISION SYSTEMS TRANSMITTING DITHER-QUANTIZED SIGNALS

Bernard Lippel, West Long Branch, N.J., assignor to Quanticon Inc., West Long Branch, N.J.

Continuation-in-part of Ser. No. 282,471, Dec. 9, 1988, abandoned, and a continuation-in-part of Ser. No. 180,344, Dec. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 779,254, Sep. 23, 1985, Pat. No. 4,758,893. This application Jan. 4, 1990, Ser. No. 461,009
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—138 **20 Claims**



1. A system for transmitting television information comprising:

means for deriving a signal corresponding to a video component;

means for producing a stream of dither samples corresponding to a multiphase dither wherein the frame patterns for two successive frames are identical except for relative displacement of the patterns horizontally, vertically, or diagonally with magnitude equal to the corresponding horizontal, vertical or diagonal spacing between pels on the scanning raster;

means for combining dither samples of said stream with samples of said video component; and

means for quantizing the combined signal according to discrete quantum levels.

5,148,274

PAM SIGNALS MODULATION WITH MAPPINGS TO IMPROVE UTILIZATION OF AVAILABLE TRANSMISSION CAPACITY

Scott C. Knauer, Mountainside; Arun N. Netravali, Westfield; Eric D. Petajan, and Peter H. Westerink, both of Millburn, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 19, 1990, Ser. No. 495,526
Int. Cl.[5] H04N *7/04, 7/12*
U.S. Cl. 358—141 **22 Claims**

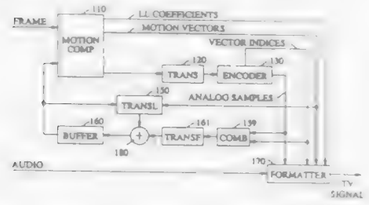
14. A method for developing video transmission signals comprising the steps of:

developing a plurality of signals to be transmitted;

selecting those of said plurality of signals that match a preselected amplitude criterion;

modifying those of said plurality of signals that were selected in said step of selecting to form thereby a plurality of unmodified and modified signals; and

transmitting said plurality of unmodified and modified signals.



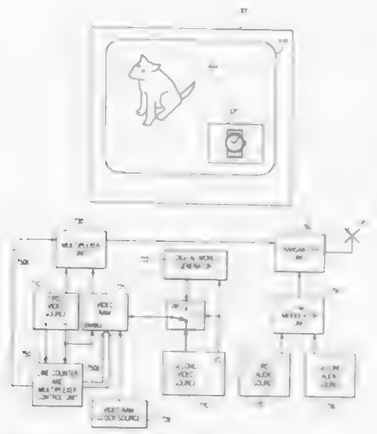
wherein said step of modifying performs a "one to many" mapping when a signal of said plurality of signals has an amplitude greater than a preselected threshold.

5,148,275

SECOND VIDEO PROGRAM

Harold Blatter, Indianapolis, and Billy W. Beyers, Jr., Greenfield, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Nov. 15, 1990, Ser. No. 613,033
Int. Cl.[5] H04N *7/04, 5/262, 5/272*
U.S. Cl. 358—147 **13 Claims**



1. A television receiver, comprising:

tuner means for receiving RF signals, said tuner means selecting a particular RF signal from a plurality of RF signals in response to a control signal;

control means for generating said control signal for causing said tuner means to select said particular RF signal;

video processing means coupled to said tuner means for receiving said selected RF signal and producing a first baseband video signal for a first television program therefrom, said first baseband video signal being encoded in a standard television format and having a portion containing a predetermined amount of a second baseband video signal, said predetermined amount of said second baseband signal also being encoded in a standard television format;

picture-in-picture processing means coupled to said video processing means for receiving said first baseband video signal, and for producing a signal which when displayed on a display means produces an image containing an inset picture area within a main picture area;

means for selecting said predetermined amount of said second baseband video signal from said first baseband video signal including a video line acquisition means comprising a counter means and a line detector means;

memory means for storing and accumulating data representative of recurring ones of said predetermined amount of said second baseband video signal to form an image of a second video program;

means for reading said data representing said second video program image from said memory means for display within one of said main picture area and said inset area; and

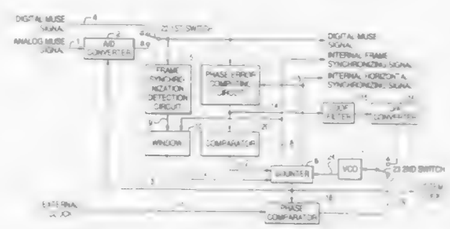
means for detecting, and processing audio signals, corresponding to a second audio program, said second audio program being associated with said second video program.

5,148,276

SYNCHRONOUS SIGNAL GENERATOR FOR THE MUSE SIGNAL

Shigeru Furumiya, Katano; Yoshinari Takemura, Settsu, and Hiromu Kitaura, Osakasayama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 30, 1990, Ser. No. 620,194
Claims priority, application Japan, Dec. 5, 1989, 1-314359
Int. Cl.[5] H04N *5/08, 5/04*
U.S. Cl. 358—153 **2 Claims**



2. A synchronous signal generator for generating a signal which is synchronous with a digital MUSE signal comprising:

a frame synchronization detection circuit for detecting a frame synchronizing signal from a digital MUSE signal;

a voltage-controlled oscillator whose oscillating frequency is controlled by a control voltage input thereto so as to output a master clock signal;

a counter for generating a system clock, an internal horizontal synchronizing signal and an internal frame synchronizing signal by frequency-dividing said master clock signal, the counter being resettable to effect either a frame reset or a horizontal reset;

a window circuit for generating a frame reset signal for resetting said counter when a phase difference between the frame synchronizing signal detected by said frame synchronization detection circuit and the internal frame synchronizing signal outputted from said counter exceeds a predetermined value;

a phase error computing circuit for computing a sampling phase error of said digital MUSE signal with the internal horizontal synchronizing signal outputted from said counter as the reference and for outputting the computed sampling phase error;

a comparator for generating a horizontal reset signal for resetting said counter when an output from said phase error computing circuit exceeds a predetermined allowable value; and

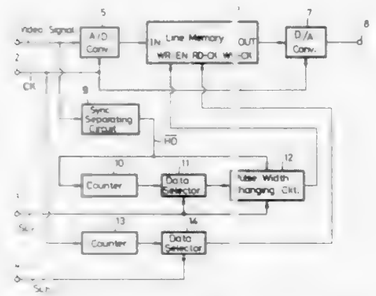
a phase comparator for detecting a phase difference between an external clock and said system clock and for supplying said control voltage, which is indicative of the detected phase difference, to said voltage-controlled oscillator, thus effecting the generation of a signal which is synchronous with the digital MUSE signal.

5,148,277

MOSAIC EFFECT GENERATING APPARATUS

Masafumi Kurashige, Tokyo, and Tetsuya Harada, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 592,254
Claims priority, application Japan, Oct. 7, 1989, 1-262760
Int. Cl.[5] H04N *9/74, 5/262, 5/272*
U.S. Cl. 358—160 6 Claims



1. An apparatus for generating a mosaic effect in an incoming video signal composed of successive horizontal line intervals which, as displayed, are vertically aligned comprising:

at least one single-line memory means constituted by a first-in, first-out (FIFO) memory and having an input for receiving said incoming video signal and an output from which a mosaic effect signal can be derived;

clock signal generating means supplied with a reference clock signal at a predetermined frequency and which generates a control clock signal having a frequency which is a fraction of said predetermined frequency of said reference clock and for supplying said control clock signal to each said single-line memory means as a write clock signal and a read clock signal; and

write control means for supplying to each said single-line memory means an enabling signal which enables said incoming video signal to be written in said single-line memory means only during selected portions of each horizontal line interval of a selected plurality of said successive horizontal line intervals of said incoming video signal.

5,148,278

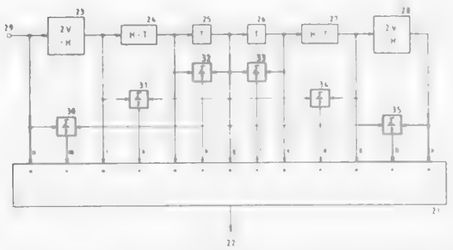
FILTER CIRCUIT OF THE MEDIAN TYPE FOR VIDEO SIGNALS

Gerhard Wischermann, Weiterstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 11, 1991, Ser. No. 640,102
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001552
Int. Cl.[5] H04N *5/14, 5/208*
U.S. Cl. 358—167 6 Claims

1. A filter circuit for video signals of the median selector type comprising, in addition to a median selector provided for selecting a median pixel from a group of simultaneously presented pixels,

a digital processing circuit having an input, having a chain of delay units and having a multiplicity of outputs, said outputs being separated from each other by at least one delay unit of the chain and connected for simultaneously presenting at said outputs, respectively, pixel values successively received at predetermined intervals, said digital processing circuit also having interpolation summing circuits respectively connected between at least two pairs of said outputs for supplying interpolated pixel values at additional outputs, said delay units and interpolating circuits being respectively of delay times and of interpolating connections selected for simultaneously presenting to said median selector, in addition to the value of a first pixel to be processed by said median selector, values obtained by



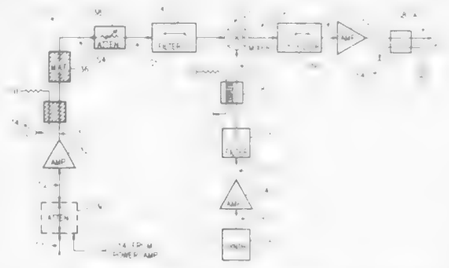
interpolation between said value of said first pixel to be processed and, respectively, two nearest neighboring pixels in the vertical direction and two nearest neighboring pixels in the time-wise direction.

5,148,279

FIFTY CHANNEL TELEVISION TRANSMITTER

William D. Gabor, 7523 S. Leewynn Dr., Sarasota, Fla. 34240

Filed Mar. 18, 1991, Ser. No. 671,061
Int. Cl.[5] H04N *5/38*
U.S. Cl. 358—186 14 Claims



1. A device that simultaneously transmits a plurality of television channels, comprising;

a local oscillator that generates a predetermined frequency;

a mixer having an input port, a local oscillator port in electrical communication with said local oscillator, and an output port;

a microwave absorption filter electrically disposed between a source of television signals and the input port of said mixer;

a bandpass filter electrically disposed between the output port of said mixer and a transmitting antenna;

said bandpass filter having a rejection trap for the predetermined frequency generated by said local oscillator;

whereby said mixer converts the television signals to microwave side bands for transmission over an antenna;

whereby said absorption filter protects said source of television signals from intermodulation by said predetermined frequency of said local oscillator; and

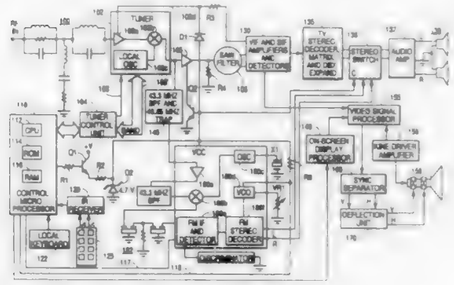
whereby said bandpass filter and said rejection trap prevent said predetermined local oscillator frequency from being transmitted by said antenna.

5,148,280

STEREO FM RADIO IN A TELEVISION RECEIVER

Leroy S. Wignot, and Kevin E. Nortrup, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 6, 1990, Ser. No. 561,588
The portion of the term of this patent subsequent to Sep. 8, 2009, has been disclaimed.
Int. Cl.[5] H04N *5/50*
U.S. Cl. 358—191.1 8 Claims



1. A television receiver, comprising:

tuner means for operating in a first mode for receiving television RF signals, said tuner means selecting a particular television RF signal from a plurality of television RF signals in response to a control signal;

said tuner means also operating in a second mode as a first frequency conversion stage for a double conversion broadcast FM radio signal receiver, for receiving broadcast FM radio RF signals, said tuner means selecting a particular broadcast FM radio RF signal from a plurality of broadcast FM radio RF signals in response to said control signal, and for converting said particular broadcast FM radio RF signal to a first intermediate frequency;

control means for generating said control signal for causing said tuner means to select one of said particular television RF signal and said particular broadcast FM radio RF signal;

a second frequency conversion stage of said double conversion broadcast FM radio signal receiver, said second frequency conversion stage receiving said broadcast FM radio signal at said first intermediate frequency and converting said broadcast FM radio signal at said first intermediate frequency to a second intermediate frequency, said second intermediate frequency being other than a television intercarrier sound intermediate frequency; and

means for demodulating audio signals from said broadcast FM radio signal at said second intermediate frequency.

5,148,281

IRIS STABILIZER FOR AUTOMATIC VIDEO CAMERA

Takashi Nakamura, and Yoshikazu Nishimura, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

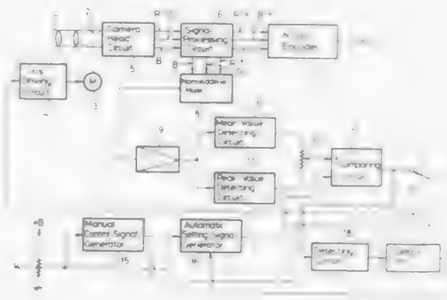
Filed Feb. 19, 1991, Ser. No. 656,850
Claims priority, application Japan, Mar. 24, 1990, 2-74987
Int. Cl.[5] H04N *5/238, 5/225*
U.S. Cl. 358—228 6 Claims

1. An iris control apparatus for a video camera comprising:

manual control means for manually controlling an iris of the video camera in a manual mode by means of a manual adjuster, the state of said iris in said manual mode accordingly depending on the state of said manual adjuster;

automatic control means for automatically controlling said iris in an automatic mode in accordance with a detected level of a video signal from an image pickup element, wherein said automatically controlling is performed in a manner that the state of said iris is changed to where said detected level becomes a reference level;

change-over means selectively activated by a user of the video camera for selecting between operation by said manual control means in said manual mode and operation



by said automatic control means in said automatic mode; and

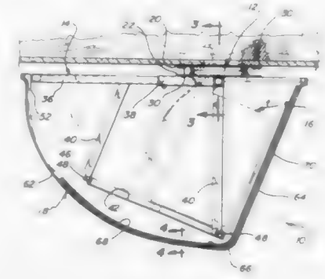
preventing means for preventing the state of said iris from being changed when said change-over means is activated to switch between said manual and automatic modes.

5,148,282

SUPPORT STRUCTURE FOR TELEVISION MONITOR

Marty Sedighzadeh, 11504 W. Berry Pl., Littleton, Colo. 80127

Filed Jul. 18, 1990, Ser. No. 554,701
Int. Cl.[5] H04N *5/655*
U.S. Cl. 358—249 9 Claims



1. A support structure for a television monitor comprising in combination,

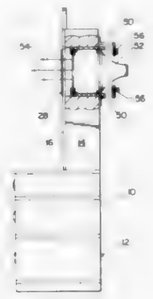
anchor means adapted to be secured to a ceiling,

a framework secured to and suspended from said anchor means, said framework including a tray spaced beneath said anchor means and adapted to form a seat upon which a television monitor can be supported, and a system of frame members linking the tray to the anchor means to hold the tray in a predetermined position relative to said anchor means, said frame members including horizontal frame members extending from said anchor means and defining a T-shaped configuration and suspension frame members depending from said horizontal frame members and interconnecting the horizontal frame members with the tray.

5,148,283
METHOD AND APPARATUS FOR DRESSER VIDEO IMAGES

Franklin A. Taddeo, 533 Monongahela Ave., Glassport, Pa. 15045

Filed Mar. 30, 1990, Ser. No. 501,860
Int. Cl.[5] H04N 5/64
U.S. Cl. 358—254 15 Claims



1. A mirror and video image transmitter in combination and comprising:
a. a dresser comprising a chest of drawers with a frame;
b. a mirror mounted on said frame and having a back side and a front side;
c. said mirror comprised of a semi-transparent portion allowing light to be partially transmitted through said mirror from either side of said mirror;
d. a video image transmitter having means for receiving input video signals and transmitting a video image therefrom;
e. mounting means connected to said frame for mounting said video image transmitter adjacent to and facing the back side of said semi-transparent portion of said mirror, so that said video images may be transmitted through said mirror from said back side of said mirror; and
f. means for controlling the amount of light on both sides of said mirror so that when said transmitter is on, the image transmitted may be seen on the semi-transparent portion of the front side of said mirror, and when the transmitter is off, the semi-transparent portion of the front side of said mirror will appear to be a fully reflective mirror.

5,148,284
DATA RECOVERY DEVICE FOR PRINTER

Tomoyuki Nishikawa, Matsudo; Masahiro Kita, Tokyo; Takaaki Yano, Kawagoe; Tatsuya Yoshida, Shimooshi; Ryoji Honda, Hizaori; Kiyoshi Negishi, Tsurugashima; Tsutomu Sato, Tokyo, and Shoji Kamasako, Tsurugashima, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,548
Claims priority, application Japan, Nov. 10, 1989, 1-293712; Apr. 11, 1990, 2-98225
Int. Cl.[5] H04N 1/32; 1/23, 1/21
U.S. Cl. 358—296 11 Claims

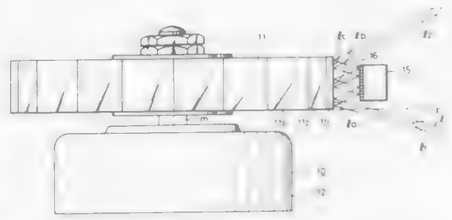
1. A data recovery device employed in a printer using a continuous form recording medium for reprinting data after printing has been interrupted, said device comprising:
counting means for counting a number of printed pages remaining in a predetermined area of a feed path of said recording medium;
a plurality of data storing means for storing printing data on a page basis, a number of said plurality of data storing means being larger than at least a maximum number of pages that can remain in said printer;
printing means for sequentially reading printing data stored in said data storing means and printing said printing data onto corresponding pages of said recording medium; and
control means for restarting sequentially printing data stored

in one of said data storing means, said one of said data storing means is identified based on the number of the pages counted by said counting means after printing executed by said printing means has been interrupted.

5,148,285
IMAGE DISPLAY APPARATUS WITH INCREASED RASTER SCAN RATE OF LASER BEAMS

Yasuaki Nakane, Miyagi; Senri Miyaoka, Kanagawa; Sakuya Tamada, Tokyo; Hiroshi Nakayama, Miyagi; Junichi Iwai, Tokyo, and Shuichi Igarashi, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 452,614
Claims priority, application Japan, Dec. 21, 1988, 63-322698; Dec. 22, 1988, 63-324557
Int. Cl.[5] H04N 5/74
U.S. Cl. 358—231 11 Claims



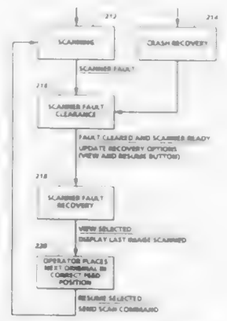
1. An image display apparatus comprising:
(a) a light beam source for generating light beams;
(b) modulation means for modulating said light beams by the image signals to be projected;
(c) deflection means for deflecting said modulated light beams, said deflection means including polygon mirror means rotatable about an axis of rotation which is perpendicular to a rotational imaginary plane, and a plurality of mirror surfaces each being substantially perpendicular to the rotational imaginary plane, and auxiliary reflection means provided near said polygon mirror means such that the modulated light beams are reflected from said polygon mirror means to said auxiliary reflection means and back toward said polygon mirror means;

(d) means for supplying said modulated light beans to said polygon mirror means, the modulated light beans being supplied obliquely relative to the rotational imaginary plane of the polygon mirror means, such that said modulated light beams incident upon said polygon mirror means are reflected at least three times by said polygon mirror means; and
(e) projection means for projecting said modulated and deflected light beams from said deflection means on a screen or the like.

5,148,286
METHOD AND APPARATUS FOR OPERATING AN ELECTRONIC REPROGRAPHIC PRINTING SYSTEM UPON SCAN INTERRUPTION

Kurt T. Knodt, Rochester; Herbert J. Raymor, Holcomb; Gerald L. Coy, Rochester; James R. Graves, Ontario; Randall P. Cole, Penfield, and John F. Gauronski, Rochester, all of N.Y., assignors to Xerox Corporation, Fairfield, Conn.

Filed Sep. 28, 1990, Ser. No. 589,541
Int. Cl.[5] H04N 1/21, 1/32; G03G 21/00
U.S. Cl. 358—296 24 Claims



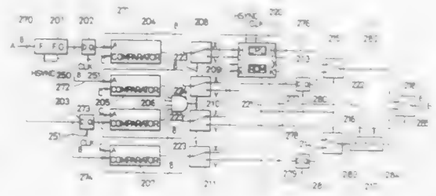
1. A method for operating an electronic reprographic system, comprising the steps of:
scanning a set of original documents which comprise a job to be printed;
electronically storing in memory images of the scanned documents;
converting the images to electronic pages for printing;
monitoring the system for any interruption in scanning prior to completion of scanning of the job;
retaining the images of successfully scanned documents in operator accessible memory upon detection of the scanning interruption to enable access to the stored images when scanning of said set has been interrupted prior to completion of the job; and
displaying a last image stored in memory when the interruption in scanning is detected.

5,148,287
IMAGE PROCESSING APPARATUS WITH GOOD HIGHLIGHT REPRODUCTION

Kazuhisa Kemmochi, Yokohama, and Yukio Nagase, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 423,383
Claims priority, application Japan, Oct. 20, 1988, 63-262825; Jan. 23, 1989, 1-011850
Int. Cl.[5] H04N 1/23
U.S. Cl. 358—298 15 Claims

1. An image processing apparatus comprising:
dividing means for dividing input multi-level image data into blocks, each of which has a plurality of pixels;
comparing means or comparing, for each block, data of a plurality of pixels in the block with a predetermined datum;
converting means for converting data of a plurality of pixels in the block in accordance with a comparison result obtained by said comparing means and for concentrating a density of the block to a predetermined position in the block; and
output means for outputting multi-level pixel data converted by said converting means.



5,148,288
STANDARDIZED COLOR CALIBRATION OF ELECTRONIC IMAGERY

Eric C. Hannah, Mill Valley, Calif., assignor to Savitar, Inc., San Francisco, Calif.

Filed Aug. 29, 1990, Ser. No. 574,899
Int. Cl.[5] H04N 1/46, 1/23; G01J 3/40, 3/46; G02F 21/27
U.S. Cl. 358—298 20 Claims

1. A system for recording a standardized color image of an object, comprising:
means for forming an image of the object on a plurality of red (r), green (g) and blue (b) detectors, said detectors producing r, g, and b signals characterizing said image as a plurality of r, g, and b pixels;
means for recording said r, g, and b signals;
means for generating color calibration data including a spectrum of a light source illuminating the object, said color calibration means further including means for generating CIE X, Y, and Z values of said light source as a function of luminance and said CIE X, Y, and Z value generating means including means for providing a gray-scale representation of said light-source, means for recording responses of said r, g, and b detectors for a plurality of different values in said gray scale; and
means for transforming said recorded r, g, and b signals into equivalent CIE X, Y, and Z values for the object as illuminated by the light source using said color calibration data.

5,148,289

IMAGE FORMING APPARATUS

Masaaki Nishiyama, Toyohashi, and Shigeo Ogino, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 17, 1990, Ser. No. 553,384
Claims priority, application Japan, Jul. 17, 1989, 1-185265
Int. Cl.[5] H04N *1/29*; G03B *15/01*
U.S. Cl. 358—300 17 Claims

1. An image forming apparatus for forming an image on a recording medium by projecting a laser beam thereon including the following;

a reader means for reading a document image and outputting first image data, said first image data being digital data each of which is comprised of bits of a first number and representing a density of said document image with a plurality of gradation degrees,

a correction means for correcting a gradation characteristic of said first image data and outputting second image data, said second image data being digital data each of which is comprised of bits of a second number and representing the density of said document image with a plurality of gradation degrees and said second number being larger than said first number,

a digital to analog conversion means for converting said second image data to analog data and outputting them as third image data, and

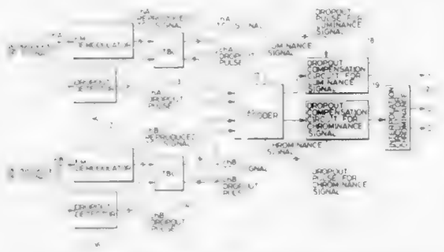
a driving means for supplying an energizing electric current to a laser emitting device responsive to said third image data.

5,148,290

VIDEO SIGNAL RECORDING/REPRODUCTION DEVICE HAVING DROPOUT COMPENSATION FUNCTION

Takayoshi Yamaguchi, Nagareyama, and Masaru Yoshida, Kashiwa, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 15, 1991, Ser. No. 641,148
Claims priority, application Japan, Jan. 17, 1990, 2-9067
Int. Cl.[5] H04N *9/88*
U.S. Cl. 358—314 4 Claims



1. A video signal recording/reproduction device for recording and reproducing a 2-channel TCI signal obtained by time-divisionally multiplexing a luminance signal and a line sequential processed chrominance signal within one horizontal period, comprising:

means for reproducing a TCI signal for each channel from a recording medium,

dropout detecting means for detecting the section where dropout occurs in the reproduced TCI signal of each channel to generate a dropout detection signal indicating the corresponding dropout section of each channel,

time-base correcting means for time-base correcting the reproduced TCI signal of each channel and the corresponding dropout detection signal of each channel,

decode means for decoding the reproduced, time-base corrected TCI signal of each channel to restore said luminance signal and said chrominance signal, and for decoding said time-base corrected dropout detection signal of each channel to generate a luminance dropout signal indicating a dropout section of a luminance signal and a chrominance dropout signal indicating a dropout section of a chrominance signal,

luminance dropout compensation means responsive to said luminance dropout signal for compensating for the dropout section of said luminance signal restored by said decode means, and

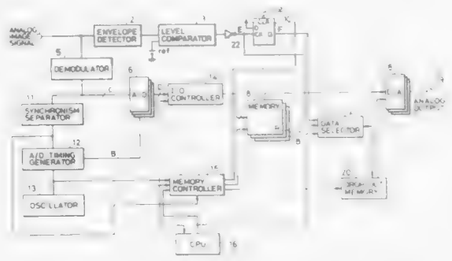
chrominance dropout compensation means responsive to said chrominance dropout signal for compensating for the dropout section of said chrominance signal restored by said decode means.

5,148,291

APPARATUS FOR DISPLAYING IMAGE SIGNAL DROP-OUT

Norio Kimura, Tokyo; Tomishige Taguchi, Urawa; Tsuguhide Sakata, Machida; Kunio Tsuruno, Tokyo, and Masahiro Takei, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 506,992, Apr. 10, 1990, abandoned, which is a continuation of Ser. No. 346,304, May 2, 1989, abandoned, which is a continuation of Ser. No. 49,514, May 14, 1987, abandoned. This application Sep. 23, 1991, Ser. No. 764,074
Claims priority, application Japan, May 21, 1986, 61-116382; May 21, 1986, 61-1169891
Int. Cl.[5] H04N *5/91*
U.S. Cl. 358—336 32 Claims



17. An image signal compensating apparatus comprising:

a) area memory means for storing an image signal of a picture image of a predetermined area;

b) detection means for detecting drop-outs of the image signal and for generating a detection signal representing detection of such a drop-out; and

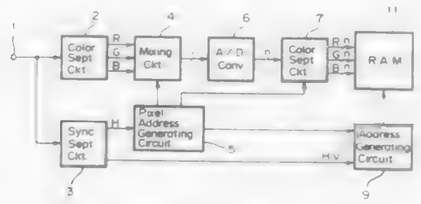
c) writing means for writing, responsive to the detection signal, a predetermined identification signal into a position which is an edge portion of a storing area of said area memory means and an end portion of a line where the drop-out is detected.

5,148,292

APPARATUS FOR EFFECTIVELY COMPRESSING VIDEO DATA REPRESENTING A RELATIVELY SIMPLE IMAGE HAVING STRONG AREA CORRELATION

Ken Kutaragi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 28, 1991, Ser. No. 646,225
Claims priority, application Japan, Jan. 31, 1990, 2-21115
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—433 11 Claims



1. A video data processing apparatus comprising:

a) means for dividing a picture image into a predetermined number of picture blocks, each picture block being comprised of lines of picture elements;

b) scanning means for scanning in a particular scanning direction the picture elements of each picture block from a predetermined point in the scanned block;

c) determining means for determining the number of successive picture elements having the same content during a scan in the scanning direction;

d) means for reversing the scanning direction in a picture block at every line; and

e) means responsive to said scanning and determining means for generating data indicative of video data of a picture element and the number of succeeding picture elements in a picture block having the same video data.

5,148,293

IMAGE FORMING APPARATUS CONTAINING ERASABLE FONT PATTERN

Hiroki Miyachi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1991, Ser. No. 654,583
Claims priority, application Japan, Feb. 14, 1990, 2-31472
Int. Cl.[5] H04N *1/21*
U.S. Cl. 358—444 8 Claims

1. A data processing apparatus comprising:

means for receiving data to be processed from a host apparatus;

first memory means for storing a plurality of character patterns including a basic font pattern and modified font patterns

means for forming a bit image data from the received data, using the character patterns stored in said first memory means;

second memory means for storing the bit image data formed by said forming means; and

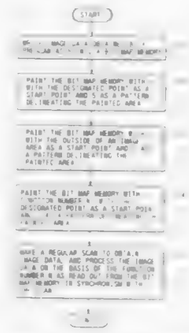
means for changing a specific portion of said first memory means to an additional storage area for storing the formed bit image data when said second memory means is filled up by the formed bit image data formed by said forming means, said specific portion having a storing part for storing a modified font pattern not used for the formed bit image data.

5,148,294

IMAGE PROCESSING APPARATUS AND METHOD FOR PAINTING A MEMORY WITH PLURAL COLORS

Toshio Kurogane; Nagaoka Daiji, and Hiroshi Sekine, all of Kanagawa, Japan, assignors to Fuji Xerox Corporation, Ltd., Tokyo, Japan

Filed Jan. 25, 1990, Ser. No. 470,352
Claims priority, application Japan, Jan. 27, 1989, 1-18876; Jun. 29, 1989, 1-169247
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—448 20 Claims



1. An image processing method comprising the steps of:

writing image data obtained by prescanning an image of an original, as first data, into a memory;

painting the memory with second data, using a designated point in an area of the original as a start point of the painting and using the first data as a pattern tending to delineate the area painted with the second data;

painting the memory with third data, using its start point existing outside the area of the original and using the second data to delineate the area painted with the third data; and

for an area subjected to a first image processing, painting the memory with fourth data, using the designated point as a start point of the painting and using the third data to delineate the area painted with the fourth data;

replacing the first data with an initial value of the memory;

for an are subjected to a second image processing, painting the memory with fourth data, using the designated point as a start point of the painting and using the third and first data as borders of the area painted with the fourth data; and

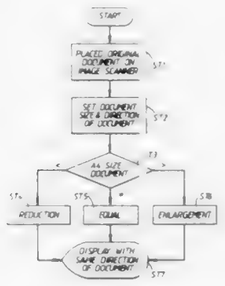
reading the contest from the memory in synchronism with the reading of the image on the original by a regular scan, and processing the read image data of the original in a predetermined manner on the basis of the fourth data as read.

5,148,29[illegible]

INFORMATION PROCESS[illegible]ING APPARATUS

Jun Matsubara, Kanagawa, Japan, a signor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 441,448, Nov. 27, 1989, abandoned.
This application Jul. 22, 199[illegible], Ser. No. 733,964
Claims priority, application Japan, Nov. 30, 1988, 63-303680
Int. Cl.[5] H04N *1/387*
U.S. Cl. 358—451 5 Claims



1. An information processing ap[illegible]aratus, comprising:
first means for inputting image i[illegible]formation;
second means for inputting an [illegible]ndication of whether the image information, input by t[illegible]e first means, has either a vertical format with a width s[illegible]aller than the vertical or a horizontal format with a wid[illegible]h larger than the vertical length;
third means for inputting a size v[illegible]alue defined by the vertical length and the width of the in[illegible]age information;
means, including a square screen having four equal sides, for displaying the input image inf[illegible]rmation while maintaining the vertical or horizontal form[illegible]t of the image information input by the second means;
means for comparing, before dis[illegible]playing the image information on the square screen, bet[illegible]veen a value of the vertical length corresponding to the s[illegible]te value input by the third means and a reference value c[illegible]orresponding to a length of the side of the square screen[illegible]when the vertical format is input by the second means, a[illegible]nd between a value of the width corresponding to the si[illegible]te value input by the third means and the reference value[illegible]when the horizontal format is input by the second means; and
means for modifying the size [illegible]of the image information, before displaying the image [illegible]nformation on the square screen, to reduce the size of th[illegible]e image information using a predetermined reduction rati[illegible]o when the result of the comparison by the comparin[illegible]g means indicates that the value of the vertical length i[illegible]s larger than the reference value, or to enlarge the size of [illegible]he image information using a predetermined magnificatio[illegible]n ratio when the result of the comparison by the comparin[illegible]g means indicates that the value of the width is smaller t[illegible]han the reference value, for both of the vertical and horiz[illegible]ontal formats to display the input information within the [illegible]quare screen of the display means.

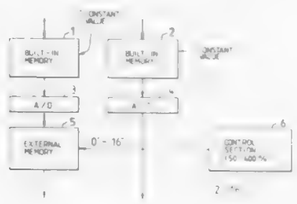
5,148,29[illegible]

ORIGINAL DOCUMENT RI[illegible]ADING APPARATUS

Izumi Takashima, Kanagawa, Japa[illegible], assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 289,139, Dec. 23, 1988, abandoned.
This application Dec. 31, 1[illegible]90, Ser. No. 634,808
Claims priority, application Japa[illegible]n, Dec. 25, 1987, 62-333520
Int. Cl.[5] H04[illegible] *1/04*
U.S. Cl. 358—482 3 Claims

1. An original document readin[illegible] apparatus, comprising:
a plurality of line sensors arrang[illegible]ed in a uniformly staggered array in a scanning direction, each of said plurality of line sensors including:
a plurality of light receiving elements producing an image signal;
a plurality of analog image signal storing means for storing said image signal and for delaying output of said image signal according to a delay value;



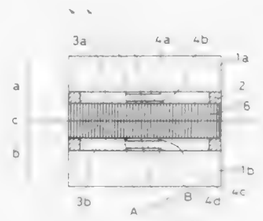
wherein each of said analog image signal storing means has a delay value equal to a delay value of at least one other of said analog image signal storing means;
analog to digital converting means for converting said image signal from said analog image signal storing means to a digital signal; and
external memory means for storing said digital signal received from said analog to digital converting means according to a variable delay value.

5,148,297

LIQUID CRYSTAL DISPLAY DEVICE HAVING AN OPTICAL FIBER SUBSTRATE INCLUDING FIBERS WHOSE PERIPHERY IS COATED WITH A CONDUCTIVE MATERIAL

Yutaka Ishii; Naofumi Kimura; Seiichi Mitsui, and Mariko Ban, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 12, 1991, Ser. No. 728,976
Claims priority, application Japan, Jul. 12, 1990, 2-185787
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—53 9 Claims



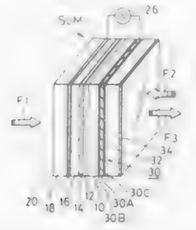
1. A liquid crystal display device comprising:
a plurality of liquid crystal layers;
an optical fiber substrate interposed therebetween;
a pair of transparent substrates disposed on the top and the bottom of the plurality of liquid crystal layers, electrodes of the same pattern disposed on both side of the optical fiber sustrate; and
electrodes disposed on the inner sides of the pair of transparent substrates,
wherein the optical fiber substrate is formed of an aggregate of optical fibers arranged so that a ray of light incident upon the optical fiber substrate perpendicularly passes therethrough, whereby the aberration of a display image of the plurality of liquid crystal layers caused by the difference of a viewing angle can be prevented.

5,148,298

SPATIAL LIGHT MODULATOR

Masanobu Shigeta, Yokosuka; Shigeo Shimizu, Yokohama; Nozomu Ohkouchi; Hiromitsu Takenaka, both of Yokosuka, and Toshio Konno, Hoya, all of Japan, assignors to Victor Company of Japan, Yokohama, Japan

Filed Mar. 21, 1991, Ser. No. 672,954
Claims priority, application Japan, Mar. 27, 1990, 2-80364; Sep. 30, 1990, 2-262619
Int. Cl.[5] G02F *1/135, 1/1333, 1/1334*
U.S. Cl. 359—72 11 Claims



2. Spatial light modulator having a laminated structure of multiple layers comprising:
a photoconductive layer;
an optical modulation layer;
a pair of first and second electrode means interposing said photoconductive layer and said optical modulation layer; and
a pair of first and second substrate means interposing said pair of first and second electrode means,
said first electrode means introducing a writing light to said photoconductive layer through said first substrate means for writing information and said second electrode means introducing a reading light to said optical modulation layer through said second substrate means for reading out the information, a thickness of said second electrode means having a predetermined relationship with a wavelength of said reading light which is incident to said second electrode means, wherein said second electrode means comprises an electrode layer and an intermediate layer means disposed between said electrode layer and said second substrate means, said electrode layer having a first refractive index, said second substrate means having a second refractive index, a refractive index of said intermediate layer means being determined to be in between said first and second refractive indices, a thickness of said intermediate layer means having an additionally predetermined relationship with the wavelength of said reading light.

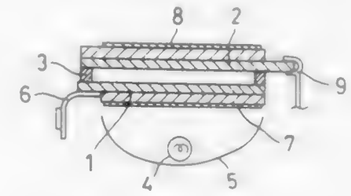
5,148,299

LIQUID CRYSTAL DISPLAY DEVICE HAVING CONNECTING MEANS FOR CONNECTING THE TRANSPARENT ELECTRODE OF THE COMPENSATING CELL TO GROUND POTENTIAL FOR PREVENTING EXTERIOR STATIC ELECTRICITY

Toshiyuki Terada, Tokyo, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1991, Ser. No. 744,429
Claims priority, application Japan, Aug. 20, 1990, 2-86861[U]
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—73 4 Claims

1. A double-layered type super-twisted nematic liquid crystal display device, comprising:
a display cell;
a compensating cell laminated on said display cell with a spacer interposed therebetween to define a space between said display cell and said compensating cell;
said compensating cell comprising at least one glass substrate having opposed surfaces, and said compensating cell being arranged on a front surface side of said display device;
said display cell being arranged on a rear surface side of said display device;
illuminating means arranged on the rear surface side of said display cell for illuminating said display cell, said illuminating means comprising a light source and a reflector for



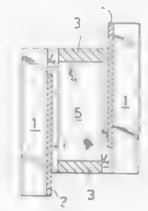
reflecting light from said light source toward said display cell;
a transparent electrode formed over the whole of at least one of said opposed surfaces of said at least one glass substrate of said compensating cell; and
connecting means for connecting said transparent electrode to ground potential.

5,148,300

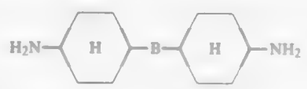
LIQUID CRYSTAL DISPLAY DEVICE

Shigeaki Mizushima, Ikoma; Tatsuo Shimasaki, Uji; Tuneo Nakamura, and Noriko Watanabe, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1989, Ser. No. 360,151
Claims priority, application Japan, Jun. 1, 1988, 63-134935
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—76 20 Claims



1. A twisted nematic liquid crystal display device which comprises a pair oppositely facing electrode substrates each formed with an alignment film on the surface thereof and liquid crystals in a state of twisted orientation filling the space between said electrode substrates, wherein the alignment film is formed from an alicyclic or aromatic polyimide obtained by polycondensation of an alicyclic or aromatic tetracarboxylic acid with an alicyclic diamine having the formula (IV):



(IV)

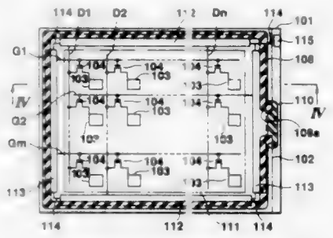
wherein B represents an oxygen atom.

5,148,301

LIQUID CRYSTAL DISPLAY DEVICE HAVING A DRIVING CIRCUIT INSIDE THE SEAL BOUNDARY

Takeshi Sawatsubashi, Hachioji; Atsushi Mawatari, Hamura, and Hiroyuki Okimoto, Hino, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 659,749
Claims priority, application Japan, Feb. 27, 1990, 2-18227[U]; May 1, 1990, 2-45085[U]
Int. Cl.[5] G02F *1/1337, 1/1339*
U.S. Cl. 359—80 11 Claims



1. A liquid crystal display device comprising:
a first substrate comprising a transparent material;
a common electrode formed on said first substrate;
a second substrate arranged parallel to said first substrate and spaced apart from said first substrate by a predetermined distance;
a plurality of pixel electrodes formed on said second substrate for defining a display region opposing said common electrode;
signal supplying leads electrically coupled to said pixel electrodes, for supplying a driving signal thereto;
a seal member, formed between said first and second substrates at a peripheral portion surrounding said display region, for fixing said first and second substrates together;
a driving circuit, formed between an outer edge of said display region and an outer edge of said seal member and electrically connected to said signal supplying leads, for supplying a driving signal to said pixel electrodes through said signal supplying leads in response to externally input display data; and
a liquid crystal material sealed in an internal space defined by said first and second substrates and said seal member, said liquid crystal material surrounding at least a portion of said driving circuit.

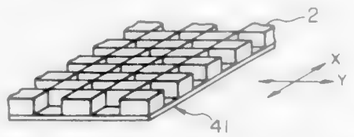
5,148,302

OPTICAL MODULATION ELEMENT HAVING TWO-DIMENSIONAL PHASE TYPE DIFFRACTION GRATING

Akihiko Nagano; Etsuro Kishi; Ryoji Fujiwara; Yukitoshi Ohkubo; Michiyo Nishimura; Hajime Sakata; Takayuki Ishii, and Masato Yamanobe, all of c/o Canon Kabushiki Kaisha 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 587,160, Sep. 21, 1990, abandoned, which is a continuation of Ser. No. 36,552, Apr. 9, 1987, abandoned. This application Oct. 7, 1991, Ser. No. 771,532
Claims priority, application Japan, Apr. 10, 1986, 60-82522; Jun. 12, 1986, 60-136869; Apr. 7, 1987, 61-85266; Apr. 7, 1987, 61-85267
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—95 29 Claims

1. An optical modulation element comprising:
a first substrate;
a second substrate arranged at a position separated from said first substrate at a predetermined distance;
a pattern defining recesses formed between said first and second substrates, said pattern having a periodic construction forming recesses in a first direction in one plane and forming recesses in a second direction which is different from said first direction and on the same plane as the recesses in said first direction; and
an optical anisotropic medium which is sealed in the recesses of said pattern, a first portion of said medium being sealed by the recesses extending in said first direction and a



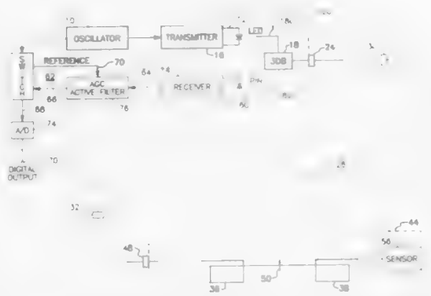
second portion being sealed by the recesses extending in said second direction, said anisotropic medium having optical axes having directions which are defined according to said first and second directions and differ from each other, whereby said medium and said pattern together form a phase-type diffraction grating.

5,148,303

DELAY LINE FIBER OPTIC SENSOR

James R. Biard, Richardson, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 31, 1991, Ser. No. 648,076
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—170 4 Claims



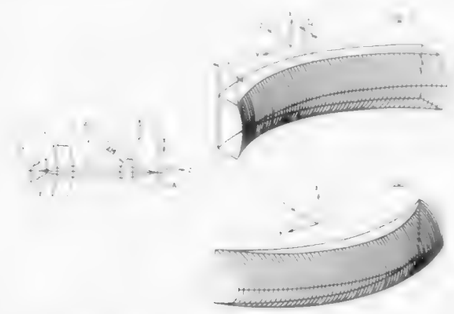
1. Apparatus for providing an indication of a sensed parameter comprising:
an optical fiber having first and second ends;
transmitting means for injecting an energy pulse into the first end of said optical fiber;
a reference mirror located in said optical fiber at a predetermined distance from the second end thereof and separating said optical fiber into first and second segments, said reference mirror being adapted to reflect a first portion of said energy pulse injected into the first end of said optical fiber and to allow a portion of the energy to pass into the second portion of said optical fiber, said first segment comprising a first fiber optic delay line, said second segment comprising a second fiber optic delay line;
a sensor at the second end of said optical fiber, said sensor including means for variably reflecting a second portion of the energy emerging from the second end of said optical fiber back into the second end thereof, the reflectivity of the reflective means being variable in response to a sensed parameter, said fiber comprising a means for temporally displacing said second portion from said first portion; and
receiver means associated with the first end of said optical fiber for receiving energy emerging from the first end thereof, said receiver means being adapted to compare the amplitudes of reflections of said first portion of a transmitted energy pulse from said reference mirror and said second portion from the reflective means of said sensor, whereby the parameter sensed by said sensor is indicated at said receiver regardless of variation in attenuation of energy by said optical fiber.

5,148,304

OPTICAL BEAM SCANNING SYSTEM

Motonobu Kawabata, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Feb. 22, 1991, Ser. No. 660,139
Claims priority, application Japan, Feb. 28, 1990, 2-49916
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—207 7 Claims



1. An optical beam scanning system, comprising:
a light source for emitting a light beam;
a deflector for deflecting the light beam in a first direction;
a first optical system for converging the light beam onto said deflector in a second direction, the second direction being perpendicular to the first direction; and
a second optical system for focussing the light beam deflected by said deflector on a surface to be scanned, said second optical system comprising a scanning lens and an anamorphic lens, said scanning lens being located between said anamorphic lens and said deflector, said anamorphic lens having a first surface which is finished according to the following expression:

$$Z = \frac{c_x \cdot X^2 + c_y \cdot Y^2}{1 + \sqrt{1 - c_x^2 \cdot X^2 - c_y^2 \cdot Y^2}}$$

where symbols X, Y and Z represent distances from an original point along the first, the second and a third directions, respectively, the third direction being perpendicular to both the first and the second directions, the original point being of the intersection at which said first surface and an optical axis of said second optical system cross each other, and symbols c_y and c_x represent inverse numbers of radii of curvature of said first surface on the optical axis in the first and the second directions, respectively.

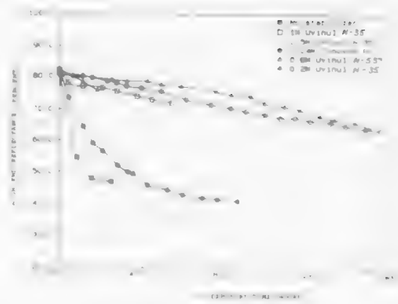
5,148,305

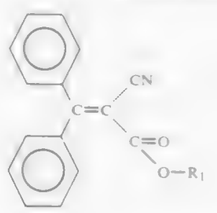
UV-STABILIZED COMPOSITIONS AND METHODS

Harlan J. Byker, Zeeland, Mich., assignor to Gentex Corporation, Zeeland, Mich.

Filed Apr. 30, 1990, Ser. No. 515,511
Int. Cl.[5] G02F *1/01*
U.S. Cl. 359—265 29 Claims

1. A solution which comprises (a) a non-aqueous solvent, which is suitable for a medium of variable transmittance in a solution-phase electrochromic device, and (b) a compound of Formula I





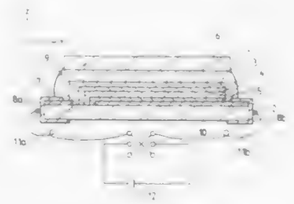
wherein R_1 is alkyl of 1 to 20 carbon atoms.

5,148,306

ELECTROCHROMIC DEVICE WITH SPECIFIC RESISTANCES

Masayuki Yamada, Yokosuka, and Yoshijiro Ushio, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 391,025, Aug. 9, 1989, abandoned. This application Nov. 21, 1991, Ser. No. 798,368
Claims priority, application Japan, Aug. 17, 1988, 63-203285; Feb. 8, 1989, 1-28970
Int. Cl.[5] G02L *1/01*
U.S. Cl. 359—271 12 Claims



1. An electrochromic device comprising:
a first electrode layer;
an intermediate layer including an electrochromic layer;
a second electrode layer, said first electrode layer, said intermediate layer and said second electrode layer being laminated in succession; and
an electrode member connected to one of said first and second electrode layers and extending in a predetermined direction transverse to the direction of lamination of said first electrode layer, said intermediate layer and said second electrode layer;
wherein the resistance R_1, R_2 respectively of said first and second electrode layers and the internal resistance R_3 of said intermediate layer satisfy the following condition:

$$\frac{R_1 + R_2}{10} < R_3$$

and resistances R_1, R_2 and R_3 being defined as follows:

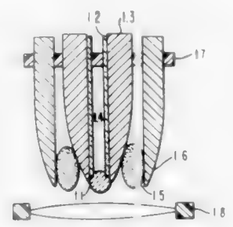
$$R_1 \quad \frac{\rho_1 \cdot S}{d_1 \cdot l^2}$$

$$R_2 \quad \frac{\rho_2 \cdot S}{d_2 \cdot l^2}$$

$$R_3 = \frac{\rho_1 \cdot d_3}{S}$$

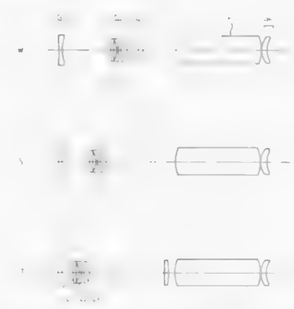
wherein
ρ_1: resistivity of said first electrode layer;
ρ_2: resistivity of said second electrode layer;
ρ_3: ion resistivity of said intermediate layer;
d_1: thickness of said first electrode layer;
d_2: thickness of said second electrode layer;
d_3: thickness of said intermediate layer;
l: shortest of respective lengths, in said predetermined direction, of the electrode layer other than said one electrode layer, said electrode member and said intermediate layer; and
S: superposed area of said first electrode layer, said intermediate layer and said second electrode layer, as viewed along the direction of lamination thereof.

5,148,307
NANOMETER DIMENSION OPTICAL DEVICE WITH MICROIMAGING AND NANOILLUMINATION CAPABILITIES
Raoul Kopelman, 1065 Heatherway, Ann Arbor, Mich. 48104, and Aaron Lewis, 38 Woodcrest Ave., Ithaca, N.Y. 14850
Filed Jul. 14, 1989, Ser. No. 380,099
Claims priority, application Israel, Jul. 17, 1988, 87139
Int. Cl.[5] G02B *21/06*
U.S. Cl. 359—385 17 Claims



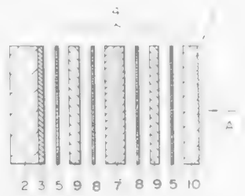
1. An optical device for producing radiation in nanometer dimensions, comprising:
a tapered pipette of electrically nonconductive material, said pipette having a central aperture having a tip with an inner diameter of less than about 20 nm;
an opaque coating on the exterior surface of said pipette;
an active, radiation-sensitive material confined in the tip of said pipette; and
means activating said material to produce light radiation substantially confined to the dimension of said tip.

5,148,308
REAL IMAGE TYPE VARI-FOCAL VIEWFINDER
Yuji Miyauchi, Kanagawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jul. 26, 1990, Ser. No. 558,314
Claims priority, application Japan, Jul. 26, 1989, 1-195409
Int. Cl.[5] G02B *23/14, 15/14*
U.S. Cl. 359—432 10 Claims



1. A real image type vari-focal viewfinder comprising:
an objective lens system for forming a real image of an object, said objective lens system including a plurality of lens units,
an image erecting lens system for erecting said real image, and
an eyepiece lens system for permitting observation of said erect image,
wherein at least one of the lens units of said objective lens system is movable along the optical axis so that focal length of vari-focal viewfinder is varied, and
wherein parallax is corrected by shifting said at least one movable lens unit.

5,148,309
REFLECTIVE TYPE SCREEN
Chihiko Yamada, Tokyo; Teruo Suzuki, Ageo; Tsutomu Yoshida, Matsudo, and Shinji Kubota, Ohmiya, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan
Filed Dec. 11, 1991, Ser. No. 805,155
Claims priority, application Japan, Dec. 14, 1990, 2-410935; Mar. 29, 1991, 3-92734; Mar. 29, 1991, 3-92735; Apr. 18, 1991, 3-112125
Int. Cl.[5] G03B *21/56*
U.S. Cl. 359—443 4 Claims



1. A reflective type screen comprising:
a reflective surface layer to which an incident light containing a polarized light is irradiated and from which the reflected light having the same polarization direction as that of said incident light is irradiated to build a projected image,
a polarizing plate layer located in front of said reflective surface layer and having a permeation axis extending in the same direction as the polarization direction of said incident light, and

a diffusion layer located in front of said polarizing plate layer wherein said reflective surface layer, said polarizing plate layer and said diffusion layer are laminated together to form an integral structure.

5,148,310
ROTATING FLAT SCREEN FULLY ADDRESSABLE VOLUME DISPLAY SYSTEM
Robert G. Batchko, 1850 Midland, Highland Park, Ill. 60035
Filed Aug. 30, 1990, Ser. No. 575,071
Int. Cl.[5] G02B *27/22*
U.S. Cl. 359—479 48 Claims

1. A rotating flat screen fully addressable volume display system comprising:
a. scanning means for providing a two-dimensional scanned image of light;
b. a display screen defining a plane;
c. screen rotation means for rotating said display screen about an axis of rotation coincidental to said plane;
d. rotating reflector means for receiving said scanned image and reflecting said scanned image onto said display screen to form a three-dimensional fully addressable image; and
e. means for rotating said reflector means about said axis of rotation of said screen.

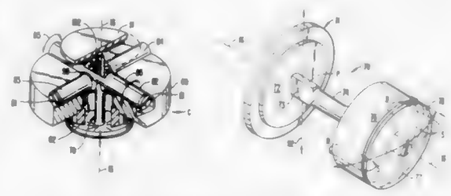
5,148,311
NON-FOGGING TRANSPARENT COATINGS
Ellington M. Beavers, Meadowbrook, and Karen M. Lowry, Jenkintown, both of Pa., assignors to Beacon Research, Inc., Glenside, Pa.
Filed Jun. 19, 1991, Ser. No. 717,491
Int. Cl.[5] A61F *2/16*
U.S. Cl. 359—507 19 Claims

11. A lens having a transparent, hydrophilic, non-fogging coating, the coated lens being prepared by the steps of:
a) coating the lens with a solution of a polymer having a plurality of functional groups capable of chemically reacting with a mucopolysaccharide, and manifesting a high degree of adhesion to the lens, wherein the latter solution includes about 0.1-10% ethylenedinitrilo-tetrakis-(2-hydroxypropane),
b) removing solvent from said solution, so as to form a first continuous film,
c) applying as a second coat an aqueous solution of a mucopolysaccharide, wherein the mucopolysaccharide solution includes about 0.1-5% ethylenedinitrilo-tetrakis-(2-hydroxypropane), the mucopolysaccharide solution also containing about 0.1-1% of desulfated heparin and about 0.1-5% of dimethyl sulfoxide,
d) removing water from said second coat so as to form a second continuous film, and
e) chemically joining said first and second films so as to effect an interlaminar graft, wherein both films retain their individual integrity.

5,148,312
CLEANING APPARATUS FOR REMOVING FOREIGN SUBSTANCES FROM A SURFACE VARIOUSLY INCLUDING A CURVED MEMBER, EXPANDING-CONTRACTING VIBRATOR MEANS, AND SPACER MEANS INCLUDING A THROUGH HOLE OR A DEPRESSED REGION
Taneichi Kawai, Anjo; Naofumi Fujie, Nagoya; Tomoaki Imaizumi, Aichi, and Koji Ito, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Feb. 6, 1990, Ser. No. 475,981
Claims priority, application Japan, Feb. 9, 1989, 1-32301; Feb. 10, 1989, 1-32063; Mar. 17, 1989, 1-67170
Int. Cl.[5] B60R *1/06*; G02B *7/182*
U.S. Cl. 359—507 18 Claims

1. Cleaning apparatus for removing foreign substances from a generally planar member comprising:
vibrator means for producing vibration to vibrate the generally planar member;
spacer means for spacing the vibrator means from the planar member and for transferring the vibration of the vibrator means to the planar member, said spacer means being fixed to the generally planar member and being located between the generally planar member and the vibrator means, said spacer means defining an open space and said open space being positioned between the vibrator means and the generally planar member; and
means for expanding and contracting the vibrator means in a radial direction with respect to a center of the vibrator means to vibrate the vibrator means.

5,148,313
STABILIZER CELL FOR INERTIAL OPTICAL STABILIZER
Arnold J. Schwemin, P.O. Box 1005, Twain Harte, Calif. 95383
Filed Jul. 16, 1991, Ser. No. 730,369
Int. Cl.[5] G02B *27/64*
U.S. Cl. 359—555 3 Claims



1. An improved stabilizer cell for an optical instrument for

acting with an optical train affixed to said instrument for stabilizing an image relative to said instrument upon accidental angular motion of said instrument, said stabilizer cell comprising:

a stabilizer cell body;

a mirror assembly including a mirror, a counter weight, and a support point at the neutral inertial axis there between;

said counter weight being conductive and non magnetic and given a spherical shape relative to the mirror assembly support point;

an adjustable magnetic field mounted to said cell in the path of motion of said counter weight for adjustable damping of said mirror assembly motion;

a mirror assembly support having first and second distal ends and a mirror assembly support interval there between for permitting relative movement of said mirror assembly mounted at said support point within said mirror assembly support interval;

a first wire mounted to said mirror assembly support at both distal ends and placed under high tension, said first wire connected to said mirror assembly at said support point at a position between said distal ends and disposed at substantial right angles to the optical axis of the stabilizer from said mirror assembly support for torsional movement only of said mirror assembly with respect to said mirror assembly support at said mirror assembly support interval;

a second wire mounted to said stabilizer cell body at both distal ends and placed under high tension, said second wire connected to said mirror assembly support and connected substantially orthogonally to the optical axis of the stabilizer and said first wire for torsional movement only of said mirror support assembly with respect to said stabilizer cell body whereby said mirror can undergo spaced reference stabilizing motion upon motion of said optical instrument.

5,148,314

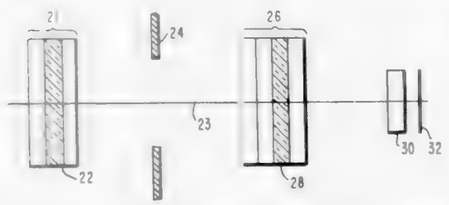
OPTICAL SYSTEMS EMPLOYING REFRACTIVE AND DIFFRACTIVE OPTICAL ELEMENTS TO CORRECT FOR CHROMATIC ABERRATION

Chungte W. Chen, 33 Allegheny, Irvine, Calif. 92720

Filed Jun. 6, 1991, Ser. No. 710,859

Int. Cl.[5] G02B *5/00*

U.S. Cl. 359—642 10 Claims



1. An optical structure that forms an image and comprises a combination of a plurality of refractive type optical elements and at least one diffractive type element wherein the chromatic aberrational contributions of said refractive type optical elements having characteristics with one algebraic sense and the chromatic aberrational contributions of said diffractive optical type elements having characteristics opposite with respect to said algebraic sense are essentially cancelled out by means of suitable arrangement and relative location of said optical elements plus suitable distribution of optical power among said optical elements of said structure so as to minimize net chromatic aberrational effects in said image.

5,148,315

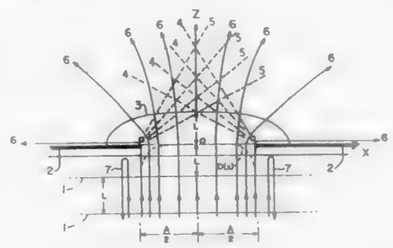
METHOD AND MEANS TO CANCEL DIFFRACTION EFFECTS FROM RADIATION FIELDS

Vladimir F. Tamari, 4-2-8-C26, Komazawa, Setagayaku, Tokyo, Japan 154 , assignor to Vladimir F. Tamari, Tokyo, Japan

Continuation-in-part of Ser. No. 7,971, Jan. 28, 1987, abandoned. This application Jun. 17, 1988, Ser. No. 208,400

Int. Cl.[5] G02B *27/42*

U.S. Cl. 359—558 5 Claims



1. A method to cancel or minimize diffraction effects for an optical or other electromagnetic wave-field emitted, transmitted or reflected by or from any device or instrument, where said wave-field suffers from diffraction effects due to its being limited by the size of an emitting, transmitting or reflecting device, pupil or aperture, hereafter to be referred to as the aperture, wherein the path length which an approaching wavefront of said wave-field needs to traverse in order to reach an aperture plane is altered, so that the same wavefront retains its original shape everywhere within said aperture, except in the region of an edge of said aperture, whereby the said wavefront is caused to have a raised and smoothly raised edge or lip continuous with and tangential to the said wavefront, and normal to said aperture plane at the outer edge of said lip, so that along any line segment(s) lying in said aperture plane and normal to and measured from the said aperture edge, the path alteration function D(s) measured normal to said aperture plane, is zero at said aperture edge, and increases continuously and smoothly to form a rounded or curved corner, reaching a maximum value equal to or larger than a wavelength of said wave-field, where said corner joins with said original wavefront's profile, and retaining the said constant maximum value everywhere in the said aperture except at said curved corners, whereby the result of said alteration function D(s) in said path length is to refocus the said wavefront so that said wave-field will leave said aperture in its geometrical or undiffracted form, thereby increasing the gain or directivity of the said field if it is an unfocused beam, or increasing the resolution beyond the diffraction limits, thereby achieving superresolution in the case of focused fields.

5,148,316

AVERAGED AMPLITUDE ENCODED PHASE-ONLY FILTERS FOR USE IN FOURIER TRANSFORM OPTICAL CORRELATORS

Joseph L. Horner, Belmont, Mass., and Mary A. Flavin, Satellite Beach, Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

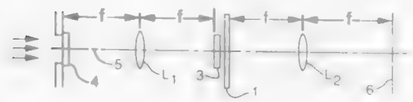
Continuation-in-part of Ser. No. 416,757, Oct. 3, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,473

Int. Cl.[5] G02B *27/46*; G03H *1/16*; G06E *3/00*

U.S. Cl. 359—561 12 Claims

1. In an optical correlator having first Fourier transform means for producing the Fourier transform of an input image, at a Fourier transform filter plane; a phase only reference filter positioned within said Fourier transform plane and second Fourier transform means for producing a correlation response signal, the improvement comprising:

an averaged amplitude mask optically co-acting with said phase only reference filter, said averaged amplitude mask representing the averaged amplitude of the Fourier transform, exclusive of phase, of a plurality of intensity normalized images within a homogenous class of images to be identified by said correlator.



5,148,317

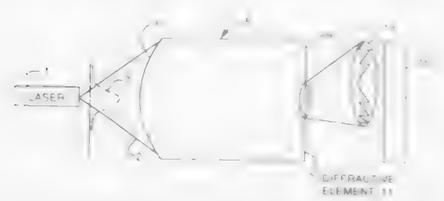
DIFFRACTIVE OPTICAL ELEMENT FOR COLLIMATING AND REDISTRIBUTING GAUSSIAN INPUT BEAM

James S. Foresi, Brookline, Mass., assignor to The United States of America as represented by the Secretary of the Air Force Washington, D.C.

Filed Jun. 24, 1991, Ser. No. 720,150

Int. Cl.[5] G02B *27/30, 27/44, 3/08*

U.S. Cl. 359—566 8 Claims



1. An optical element for producing a collimated output beam having a uniform intensity profile from a divergent input beam having a Gaussian intensity profile, said optical element comprising:

(a) a single convex-plano lens having a convex surface portion for producing a convergent beam from the divergent input beam directed thereat and a flat plano surface portion; and

(b) binary-optic diffraction means formed within the flat plano surface portion of the single convex-plano lens for collimating the convergent beam produced by said convex surface while at the same time redistributing said input beam to produce a uniform intensity output beam.

5,148,318

OPTICAL PULSE WAVEFORM SHAPER

Tatsuki Okamoto; Shigeo Ueguri; Kazuhiko Hara; Akihiko Iwata, and Yoshihiro Ueda, all of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

PCT No. PCT/JP88/00507, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO88/09521, PCT Pub. Date Dec. 1, 1988

PCT Filed May 26, 1988, Ser. No. 309,728

Claims priority, application Japan, May 29, 1987, 62-136699; Aug. 13, 1987, 62-200899

Int. Cl.[5] G02B *27/10*

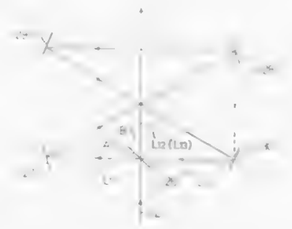
U.S. Cl. 359—629 3 Claims

1. An optical pulse waveform shaper comprising:

a beam splitter for splitting an input optical pulse beam into a reflected optical pulse beam having an optical axis perpendicular to said input optical pulse beam and a transmitted optical pulse beam having an optical axis parallel to said input optical pulse beam; and

at least three reflectors optically aligned with one another to form an optical path therebetween thereby defining an optical plane and disposed so as to direct said reflected optical pulse beam such that said optical axes of said reflected and transmitted optical pulse beams agree to thereby combine said reflected and transmitted optical pulse beams through said beam splitter to form an output optical pulse beam,

said output optical pulse beam being parallel to not only said optical plane but also said input optical pulse beam,



said reflected or transmitted optical pulse beam intersecting said transmitted optical pulse beam at least twice before it is combined with said transmitted optical pulse beam, thereby minimizing said optical pulse waveform shaper.

5,148,319

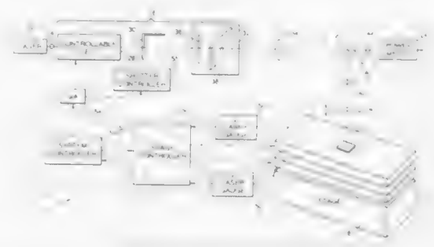
SYSTEM FOR FABRICATING MICRO OPTICAL ELEMENTS

Edward Gratrix, Trumbull, and Charles Zarowin, Rowayton, both of Conn., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 25, 1991, Ser. No. 660,385

Int. Cl.[5] G03C *5/00*

U.S. Cl. 359—642 13 Claims



1. A system for fabricating optical elements, said system comprising:

a source of optical radiation, said source providing an optical beam, said beam defining an optical beam path;

means, disposed in said optical path, for controlling the intensity of said optical radiation, said intensity controlling means including an externally controllable Pockels cell, a shutter disposed in said optical beam path, a spatial filter disposed in said optical beam path distal said shutter and a beam collimator disposed in said beam path subsequent said spatial filter;

means for supporting a substrate of photosensitive material;

means for focusing said optical radiation; and

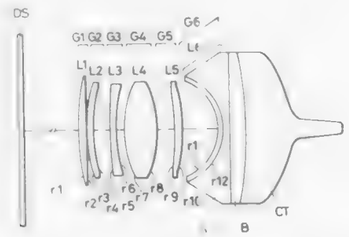
means for providing relative motion between said substrate and said focussed optical radiation means in accordance with a preselected pattern, said preselected pattern being defined by an optical radiation intensity map of at least one optical element.

5,148,32[illegible]

PROJECTION LENS

Eiichi Toide, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1991, Ser. No. 689,507
Claims priority, application Japan, Apr. 23, 1990, 2-107927; Dec. 27, 1990, 2-417490
Int. Cl.[5] G02B 9/52, 13/18
U.S. Cl. 359—649 33 Claims



1. A projection lens system for projecting an enlargement, on a display screen, of an image appearing on a faceplate of a cathode ray tube, comprising six lens groups, the first group from an end closest to the display being in the form of a positive meniscus, the second group being positive and convex to the display screen, the third group being negative, the fourth group being bi-convex, the fifth group being positive, and the sixth group having a negative power of refraction surface, each of the second and fifth groups including a plastic lens element having at least one aspheric surface, wherein the following conditions are satisfied:

$$0.15 < f/f_1 < 0.35$$

$$-0.45 < f/f_3 < -0.30$$

$$1.00 < f/f_4 < 1.15$$

$$-0.90 < f/f_6 < -0.85$$

where
f represents a focal length of the overall projection lens system,
f_1 represents a focal length of the first group,
f_3 represents a focal length of the third group,
f_4 represents a focal length of the fourth group, and
f_6 represents a focal length of the sixth group.

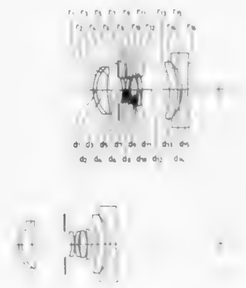
5,148,2[illegible]21

COMPACT ZOOM LENS SYSTEM

Hisashi Goto; Masaki Imaizumi, and Shigeru Kato, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,658
Claims priority, application Japan, Mar. 30, 1990, 2-81027
Int. Cl.[5] G02B 5/14, 13/18
U.S. Cl. 359—689 11 Claims

1. A zoom lens system comprising, in order from the object side:
a first lens unit having a positive refractive power,
an aperture stop,
a second lens unit having a positive refractive power, and
a third lens unit having a negative refractive power,
wherein said zoom lens system performs variation of focal length from the wide position to the tele position by moving said first lens unit and said third lens unit toward the object side, and displacing said second lens unit and said aperture stop integrally so as to widen an airspace reserved between the first lens unit and the second lens unit, and so as to narrow an airspace reserved between the second lens unit and the third lens unit, and
wherein said zoom lens system satisfies the following condition (1):



$$0.09 < D_1/IH < 0.32 \quad (1)$$

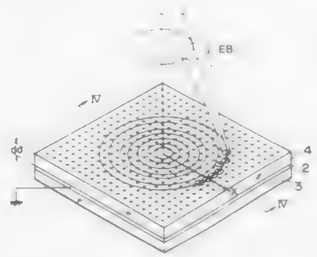
wherein the reference symbol D' represents the thickness of the first lens unit and the reference symbol IH designates the length equal to half the diagonal line of the image surface.

5,148,322

MICRO ASPHERICAL LENS AND FABRICATING METHOD THEREFOR AND OPTICAL DEVICE

Shigeru Aoyama, Takatsuki; Tsukasa Yamashita, Nara, and Shiro Ogata, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 9, 1989, Ser. No. 434,029
Int. Cl.[5] G02B 3/02; B29D 11/00
U.S. Cl. 359—708 6 Claims



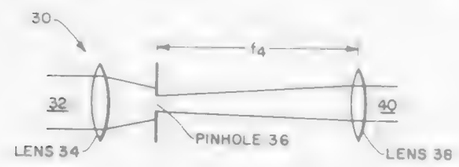
1. A method of fabricating a micro aspherical lens, comprising the steps of:
applying an electron-beam resist on a substrate on which a micro aspherical lens is to be fabricated so as to have a thickness larger than the maximum thickness of the micro aspherical lens to be fabricated,
writing a predetermined pattern on said resist using an electron-beam lithography system so as to irradiate an electron beam in amounts of irradiation corresponding to the thickness of the micro aspherical lens to be fabricated, and
thereafter developing the resist, thereby to fabricate a micro aspherical lens made of the remaining resist or the prototype thereof.

5,148,323

LOCAL REFERENCE BEAM GENERATOR

Blair F. Campbell, Malibu; Richard B. Holmes, Woodland Hills; Sam S. Ma, Agoura, and Dennis M. Guthals, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Aug. 9, 1991, Ser. No. 743,054
Int. Cl.[5] G06K 9/08
U.S. Cl. 359—738 21 Claims



MODIFIED SPATIAL FILTER

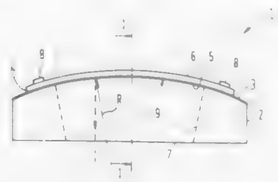
13. An apparatus for filtering an incident beam of light comprising:
a first lens having a first focal length;
a pinhole having an opening of a predetermined size, said pinhole being spaced from said first lens by a first separation distance, said first separation distance being different from said first focal length by some fraction of said first focal length; and
a second lens having a second focal length, said second lens being spaced from said pinhole by a distance substantially equal to said second focal length;
wherein said first lens, said pinhole and said second lens define an optical path and wherein a portion of said incident beam of light passing through said first lens, said pinhole and said second lens along said optical path forms a substantially plane wave beam of light.

5,148,324

MIRROR UNIT

Willem D. Van Amstel, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 26, 1991, Ser. No. 814,336
Claims priority, application Netherlands, Jan. 25, 1991, 9100121
Int. Cl.[5] G02B 5/10
U.S. Cl. 359—839 5 Claims



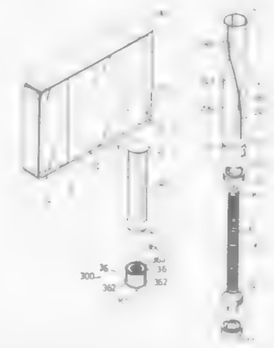
1. A mirror unit comprising a fixed mirror holder having at least one curved support surface and comprising at least one flexible mirror having a mirror side and a rear side, at least a portion of the mirror side forming a functional mirror surface, while the mirror is fixed to the mirror holder and lies against the support surface of the mirror holder under elastic deformation, characterized in that the mirror rests with the mirror side directly on the support surface without an intermediate layer and the mirror holder is provided with a slotted shaft, the mirror having an uncovered, exposed region at the mirror side which is optically directly accessible for optical radiation and which acts as the functional mirror surface.

5,148,325

VEHICULAR EXTERNAL MIRROR ASSEMBLY

Min-Chih Wang, No. 35, Kuo-Min-Hsin Ts'un, Feng-Yuan City, Taichung Hsien, Taiwan

Filed Dec. 11, 1991, Ser. No. 805,530
Int. Cl.[5] G02B 7/18
U.S. Cl. 359—841 5 Claims



1. an external mirror assembly of a vehicle comprising a casing having a mirror unit mounted thereto and an upright tubular member provided therein and extending along one side of said casing, said tubular member having a closed top end, an open bottom end and a cylindrical inner face; characterized by said external mirror assembly further comprising:
an upright first tube having a first open top end, a first open bottom end fixed to said vehicle and a first side wall, said first side wall having a twisted oblique elongated slot extending longitudinally between said first open top and bottom ends; said tubular member of said casing being slidably sleeved onto said first tube;
a threaded rotatable shaft mounted in said first tube and having an upper and a lower end;
an elevating unit for lifting and turning said casing slidably mounted to said rotatable shaft and confined in said first tube, said elevating unit including an annular member threadably engaging said rotatable shaft, said annular member having a radial stud projecting therefrom, extending through said elongated slot slidably to engage the same and being connected to said tubular member of said casing; and
an electrical driving unit connected to said lower end of said rotatable shaft to rotate said rotatable shaft, said electrical driving unit including a motor and a gear assembly interconnecting said lower end of said rotatable shaft and said motor.

5,148,326

MIRROR FOR CHANGING THE GEOMETRICAL FORM OF A LIGHT BEAM

Gerhard Hohberg, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

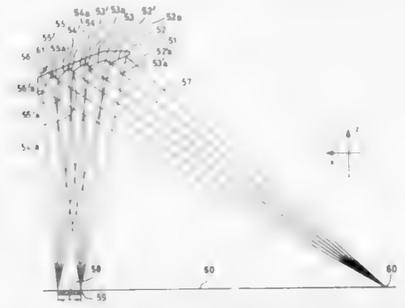
Filed Jul. 29, 1991, Ser. No. 737,448
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 4023904
Int. Cl.[5] G02B 5/08; B23K 26/00
U.S. Cl. 359—853 10 Claims

1. A mirror for changing the geometric form of a laser light beam reflected onto an object having a surface region thereon which has a line-shaped to strip-shaped configuration, the mirror comprising:
body means having a plurality of mirror surface segments formed therein with each of said mirror surface segments being a portion of a body defining a surface of revolution; said surfaces of revolution defining respective rotation axes

which are at least approximately superposed on said surface region of said object;

said mirror surface segments having respective sizes selected so as to cause respective zones of said light beam to simultaneously impinge on several of said mirror surface segments;

said mirror surface segments being formed and positioned relative to each other so that each of said zones is reflected



only once by the surface segment corresponding thereto and is directed onto said region of said object such that the laser light of all of said zones is at least partially superposed in said surface region so as to obtain a concentrated illumination thereof for performing work on said object; and,

said mirror surface segments being spatially offset one from the other.

5,148,327

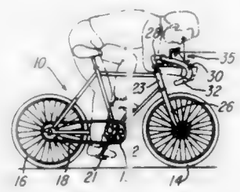
FORWARD VIEW MIRROR SYSTEM FOR BICYCLES

Miguel Gaxiola, Jr., 1352 Joyce Dr., Xenia, Ohio 45385

Filed Jun. 10, 1991, Ser. No. 712,566

Int. Cl.[5] B62J *29/00;* **G01B** *7/18;* **B60R** *1/10*

U.S. Cl. 359—855 **12 Claims**



1. In combination with a bicycle having a frame and a pair of wheels defining a center plane and a handlebar supported by a support post within the center plane, a forward view mirror system for permitting a rider to have a continuous head-down streamlined position, comprising a flat first mirror having front and rear surfaces, a first support arm having an upper end portion and a lower end portion means including a first plate member for connecting said rear surface of said first mirror to said upper end portion of said first support arm and providing for adjustable tilting of said first mirror relative to said first support arm, a flat second mirror having front and rear surfaces, a second support arm having a forward end portion and a rearward end portion, means including a second plate member for connecting said rear surface of said second mirror to said forward end portion of said second support arm and providing for adjustable tilting of said second mirror relative to said second support arm, a third support arm having a forward end portion and a rearward end portion, first connecting means for connecting said lower end portion of said first support arm to said rearward end portion of said second support arm and to said forward end portion of said third support arm, second connecting means for connecting said rearward end portion of said third support arm to said handlebar support post and for supporting said first, second and third support arms within the center plane with said first and second mirrors extending perpendicular to the center plane, said first, second and third support arms projecting forwardly of said handlebar support post and with said first mirror positioned above and rearwardly of said second mirror, and said first and second connecting means providing for adjustably tilting said first and second support arms within the center plane.

5,148,328

PCM AUDIO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS WITH RECORDING-MODE IDENTIFYING SIGNAL

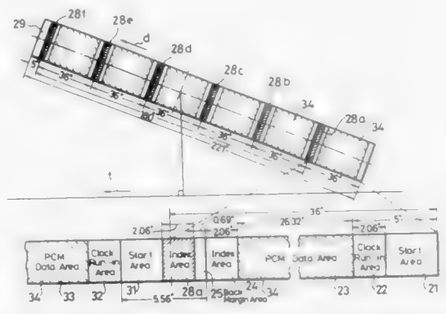
Shinji Kakuyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 315,175, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 873,495, Jun. 12, 1986, abandoned. This application Jun. 22, 1990, Ser. No. 543,037

Claims priority, application Japan, Jun. 13, 1985, 60-128477

Int. Cl.[5] G11B *5/02, 5/00*

U.S. Cl. 360—27 **1 Claim**



1. A PCM audio signal recording and/or reproducing apparatus comprising, in combination;

a pair of rotary heads having the recording azimuth of gaps different from each other for scanning obliquely the longitudinal direction of a tape in successive scanning periods, with each scanning period being separated into a plurality of successive signal periods,

means for recording a PCM audio signal on any one or more track channels of a plurality of track channels,

each said one track channel corresponding to the alignment of respective segment tracks with said rotary head during corresponding segment periods of each of said scanning periods,

means for recording a set of auto-tracking pilot signals in the substantially lower band area of said PCM audio signal,

said identifying signal and said PCM audio signal being superimposed upon each other in such a relation that said identifying signal is allocated between the band of said auto-tracking pilot signal and the peak band of said PCM audio signal,

said means for recording being operative to record said PCM audio signal and said identifying signal in spaced-apart segment tracks on said tape, whereby the several segment periods of each scanning period are individually identifiable as said rotary heads scan said tape,

means for selectively recording an index signal between adjacent segment tracks, for selectively identifying a PCM audio signal location at a given segment period only when the user of said apparatus so desires for facilitating segment review, or editing,

an additional rotary head having a similar azimuth gap as one of said recording heads, and

detecting means connected to one of said rotary heads and said additional rotary head for developing a signal in response to detection of said identifying signal within said segment period, said detecting means having a band pass filter with a pass band including the frequency of said identifying signal and a detector connected to said filter for producing a signal in response to the output of said filter.

5,148,329

MAGNETIC RECORDING/REPRODUCING CIRCUIT SYSTEM INCLUDING A TEMPERATURE CONTROLLED AMPLITUDE CONTROL CIRCUIT FOR A VIDEO SIGNAL

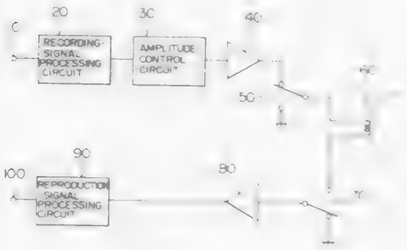
Hiroto Yamauchi, and Tomishige Yatsugi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,033

Claims priority, application Japan, Mar. 7, 1990, 2-53801

Int. Cl.[5] G11B *5/02*

U.S. Cl. 360—19.1 **10 Claims**



1. A magnetic recording/reproducing circuit system wherein a video recording signal and voice recording signal are supplied to a magnetic head to be written as superimposed on surface and deep layers of a magnetic recording medium in a record mode and to be reproduced from the recording medium in a reproduction mode, said system comprising an amplitude control circuit for detecting an ambient temperature and controlling a current value indicative of the video recording signal to have an optimum value for the detected temperature.

5,148,330

METHOD OF AND ARRANGEMENT FOR OBTAINING PRERECORDED DIGITAL MUSIC CASSETTES

Jozef M. Duurland, and Johannes J. Roering, both of Baarn, Netherlands, assignors to Polygram International Holding B. V., Baarn, Netherlands

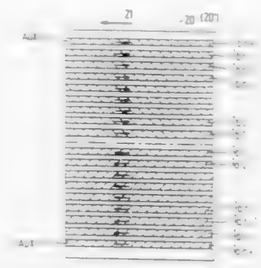
Filed Apr. 16, 1991, Ser. No. 686,329

Claims priority, application Netherlands, May 1, 1990, 9001038

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—40 **31 Claims**

1. A method of manufacturing a prerecorded digital audio recording medium, such as a magnetic recording medium accommodated in a digital audio cassette, the method comprising the recording of a digital audio signal on a recording medium, the digital audio signal first being reproduced from a master medium and stored in a digital storage medium at a specific first bit rate, after which it is read from the digital storage medium and recorded on the recording medium at a specific second bit rate, characterized in that the digital audio signal is recorded in a track on the master medium as a first digital information signal in the form of channel words of n data bits each, which channel words of n data bits each are obtained after modulation of information words of m data bits in the digital audio signal so as to form the channel words of n data bits each, where $n>m$, in that in a first signal processing step after the reproduction of the first digital information signal from the master medium and prior to the storage in the digital storage medium the first digital information signal is demodulated to form a second digital information signal, the channel words of n data bits each in the first digital information signal being converted into information words of m data bits in the second digital information signal, after which the second digital information signal is stored in the digital storage medium, in that in a second signal processing step, after the second digital



information signal has been read from the digital storage medium and prior to recording on the recording medium, the second digital information signal is modulated to form a third digital information signal, the information words of m data bits in the second digital information signal being converted into channel words of n data bits in the third digital information signal, after which the third digital information signal is recorded on the recording medium.

5,148,331

ROTARY HEAD TYPE RECORDING AND REPRODUCING APPARATUS FOR INFORMATION AND ADDITIONAL CODES

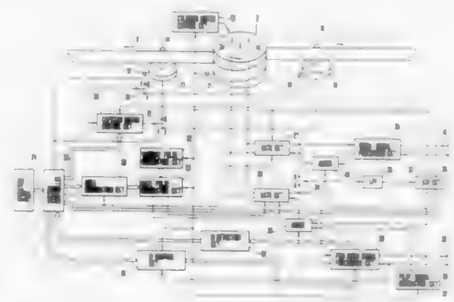
Motokazu Kashida, Tokyo; Masahiro Takei, Kanagawa; Kouji Takahashi, Kanagawa, and Kenichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 323,090, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 820,680, Jan. 21, 1986, abandoned. This application Oct. 19, 1990, Ser. No. 600,133

Claims priority, application Japan, Jan. 25, 1985, 60-013179; Jan. 25, 1985, 60-013180

Int. Cl.[5] G11B *5/584, 5/02, 15/467*

U.S. Cl. 360—77.15 **14 Claims**



3. A rotary head type recording and reproducing apparatus, comprising:

a) recording means for recording signals while forming many recording tracks in parallel on a tape-shaped recording medium, said signals including main digital information codes and additional codes, said recording means being arranged to record said additional codes at a predetermined part in each of said tracks, and to record said

main digital information code at another part in each of said tracks;

b) reproducing means for reproducing signals from said recording medium, said reproducing means including at least one rotary head;

c) moving means which is capable of longitudinally moving said tape-shaped recording medium at a first speed and at a second speed which is faster than said first speed;

d) means for forming a tracking error signal by using signals reproduced by said rotary head;

e) sampling means for periodically sampling said tracking error signal only at timings within a period during which said rotary head traces the predetermined part;

f) control means for controlling a relative position of said recording medium and said rotary head according to said tracking error signal sampled by said sampling means; and

g) mode setting means for setting the apparatus between a plurality of modes including first and second modes, in which in said first mode, said moving means moves said recording medium at the first speed and said reproducing means reproduces said main digital information codes and said additional codes, while in said second mode, said moving means moves said recording medium at the second speed, said reproducing means reproduces only said additional codes, and said sampling means samples said tracking error signal at a timing within a period during which said rotary head traces the predetermined part.

5,148,332

AUTOMATIC CASSETTE TAPE RECORDING AND REPRODUCING APPARATUS WITH A PIVOTABLE MAGAZINE HOLDER

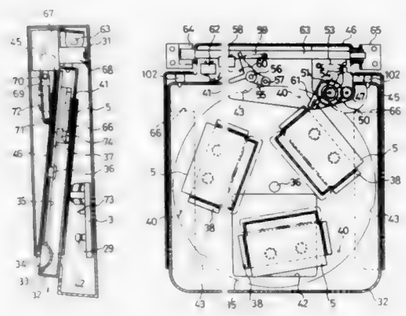
Masami Tomita; Seiji Kishikawa, and Yoshinori Kakuta, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,990

Claims priority, application Japan, Mar. 20, 1989, 1-68009; Mar. 20, 1989, 1-68014; Aug. 11, 1989, 1-209029

Int. Cl.[5] G11B *17/68, 15/675*

U.S. Cl. 360—92 **7 Claims**



1. A cassette tape recording/reproducing apparatus comprising:

a magazine for removably housing a plurality of cassettes within cassette holders, said magazine having a turntable mounted therein upon a shaft fixed within said magazine, said cassette holders being secured to said turntable; and

recording/reproducing means, for recording and reproducing data on and from said plurality of cassettes, said recording/reproducing means being disposed within a housing and comprising

a first wall defining an opening adjacent a top portion of the housing, said magazine being insertable into said recording/reproducing means through the opening,

head means, mounted in a lower portion of said housing, for recording and reproducing data on and from said plurality of cassettes,

magazine holder means, pivotably mounted about an axis extending adjacent a second wall, which is opposite said first wall, for holding and selectively positioning said magazine within said recording/reproducing means, and

solenoid means, for directly urging said magazine holder means downward pivotably about said axis towards said lower portion of said housing to position a selected one of said plurality of cassettes downward into contact with said head means.

5,148,333

METHOD FOR RECORDING AND/OR REPRODUCING A SIGNAL

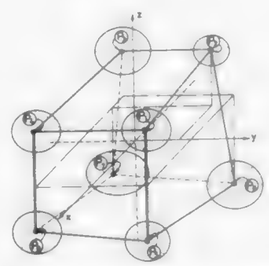
Yoshihide Shinpuku, Kanagawa, Japan, assignor to Sony Corp., Japan

Filed Dec. 12, 1989, Ser. No. 449,001

Claims priority, application Japan, Dec. 21, 1988, 63-322699; May 9, 1989, 1-115786; May 29, 1989, 1-135007

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—40 **6 Claims**



1. A method for recording digital data comprising the steps of:

arranging on a recording medium three kinds of regions, the first region is a magnetization region in which a magnetization is made in a certain direction, the second region is a magnetization region in which a magnetization is effected in an opposite direction to the first region, and the third region is a magnetization region in which a magnetization is effected randomly;

recording digital data in correspondence with said three kinds of region; and

further comprising the step of converting predetermined binary data of m bits of predetermined three-value data of L bits, wherein said converted three-value data has consecutive codes having a predetermined number of bits other than "0," a number of "0" bits less than said predetermined number, and a number less than L in which inverted bits are alternately repeated.

5,148,334

PHASE SYNCHRONIZATION CIRCUIT

Takikazu Takeuchi; Hiroyuki Yokohara; Takuji Ogawa, and Noboru Sakurai, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Peripherals Co., Ltd., Odawara, both of, Japan

Filed Dec. 1, 1989, Ser. No. 444,764

Claims priority, application Japan, Dec. 5, 1988, 63-305936

Int. Cl.[5] G11B *5/09*

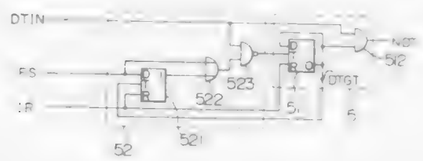
U.S. Cl. 360—51 **4 Claims**

1. A phase sync circuit comprising:

means for extracting every other pulse of an input pulse signal containing alternate phase-advanced and phase-delayed pulses;

means for correcting the phase of an output pulse in accordance with a phase difference signal and for generating an output pulse in phase with the input pulse signal; and

means, connected to the extraction means and the output pulse generation means, for comparing the phase of the



pulse extracted by the extraction means with that of the output pulse produced from the output pulse generation means and generating a phase difference signal in accordance with the result of comparison.

5,148,335

MULTILEVEL OPTICAL RECORDING ARRANGEMENT

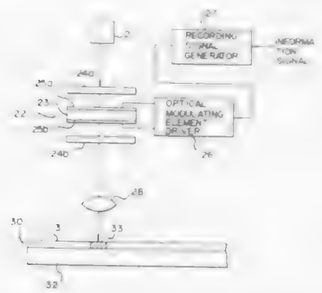
Toshio Kudo, and Toshiaki Niitsu, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 443,080, Nov. 27, 1989, abandoned, which is a continuation of Ser. No. 170,722, Mar. 21, 1988, abandoned. This application May 10, 1990, Ser. No. 522,502

Claims priority, application Japan, Mar. 25, 1987, 62-69160; Mar. 19, 1988, 63-66781

Int. Cl.[5] G11B *5/02*

U.S. Cl. 369—59 **24 Claims**



1. A method of recording information on an optical information recording medium having a recording layer, the recording layer being made of a material in which phase transition can occur upon radiation of an optical beam by means of a heat mode, the method comprising:

selectively irradiating said recording layer with an optical beam onto sections of the recording layer in which information is to be recorded;

changing the output power of the optical beam irradiating the sections of the recording layer in a multilevel manner in accordance with information to be recorded; and

forming each of the sections of the recording layer in which information is to be recorded in such a manner as to exhibit a selected one of at least three different phase transition amounts in accordance with the output power of the optical beam,

wherein the optical characteristics of the beam irradiated sections of the recording layer are changed according to the power of the irradiated optical beam and exhibit selected ones of at least three different optical characteristics corresponding to the information to be recorded.

5,148,336

MAGNETIC RECORDING AND REPRODUCING APPARATUS

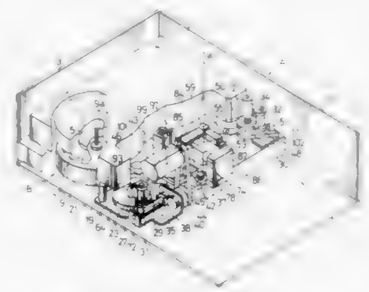
Shigemi Asai; Masanobu Furukawa; Shigeaki Kakiwaki; Tadashi Iwamatsu, and Tohru Okuda, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1990, Ser. No. 604,624

Claims priority, application Japan, Nov. 1, 1989, 1-287084

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—95 **23 Claims**



1. A magnetic recording and reproducing apparatus for recording and reproducing information data on or from a magnetic tape driven by means of reels, said apparatus including a cassette capable of storing said magnetic tape, comprising:

means for pulling or storing said magnetic tape out of or in said cassette, said pulling or storing means including a pair of guide rollers for restricting a running path of said magnetic tape, said pair of guide rollers capable of moving between an unloading position and a loading position, and

a magnetic head for recording and reproducing information data on or from said magnetic tape when the running path of said magnetic tape is restricted by means of said pair of guide rollers at the loading position.

5,148,337

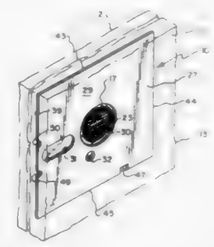
CONTROLLED RATE ADSORBENT AND DISC DRIVE STABILIZING UNIT

John S. Cullen, Buffalo; Samuel A. Incorvia, Tonawanda, and Christopher S. Nigon, Orchard Park, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Sep. 20, 1990, Ser. No. 585,172

Int. Cl.[5] G11B *33/14*

U.S. Cl. 360—97.04 **6 Claims**



1. A combined controlled rate adsorbent and computer disc drive stabilizing unit in the shape of a computer disc for placement into a disc drive in the position normally occupied by a computer disc for stabilizing the disc drive during transit comprising a sheet of adsorbent material, casing means of porous material encasing said sheet of adsorbent material and having a predetermined water vapor transmission rate for controlling the water vapor adsorption rate of said adsorbent material so

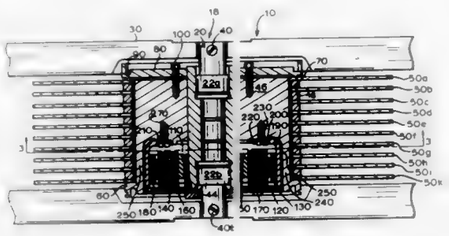
that exposure of said controlled ate adsorbent unit to high humidity atmospheric conditions vill not prevent said adsorbent unit from remaining active fo prolonged periods of time, self-sustaining jacket means in th shape of a computer disc envelope and of a size for fitting into said disc drive in the manner of a computer disc, said jacket means enveloping said casing means, and opening mea s in said jacket means for permitting said casing means to communicate with the atmosphere to permit said sheet of adsorbent material encased therein to adsorb water vapor therefrom.

5,148,338

DISK DRIVE SPINDLE HUB ASSEMBLY

Tave J. Frugé, Colorado Spring , Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 14, 1990, Ser. No. 612,768
Int. Cl.[5] G11B *17/04*
U.S. Cl. 360—98.07 **12 Claims**



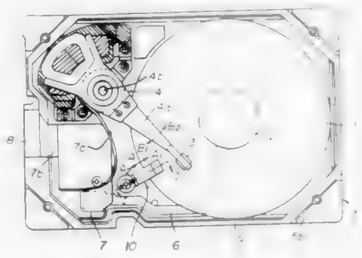
1. A disk drive comprising:
a spindle bearing arrangemen defining an axis of rotation, said spindle bearing arrangement having a stationary portion and a rotatable por ion;
means for mounting and supporting said spindle bearing arrangement within said disk drive;
a spindle hub having an outer surface and a generally cylindrically shaped cavity with in the confines of said outer surface, said cavity having a predetermined diameter defining an inside cavity wall
means for fixedly attaching sa d spindle hub to said rotatable portion of said spindle bea ing arrangement;
sleeve means having a gener lly cylindrically shaped body portion provided with an inside wall and an outside wall, said outside wall having a diameter less than the predetermined diameter of said cavity, said sleeve means being made from a material with a coefficient of thermal expansion distinct from that of the material of said spindle hub;
permanent magnet means attached to the inside wall of said sleeve means;
stator means located within said sleeve means and fixedly attached to said stationary portion of said spindle bearing arrangement, said stator means being constructed and configured for interaction with said permanent magnet means;
means formed on at least one of said cavity and said sleeve means for fixedly attaching said sleeve means to said spindle hub within said cavity and for maintaining radial spacing between the inside cavity wall and the outside wall of the body portion of said sleeve means sufficient to allow for unconstrained thermal expansion of said spindle hub and said sleeve means relative to each other and prevent contact between said inside wall of said cavity and the outside wall of said body portion.

5,148,339

MAGNETIC DISK STORAGE

Kobun Yoshida, Sayama, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 612,414
Claims priority, application Japan, Nov. 13, 1989, 1-294302
Int. Cl.[5] G11B *5/54*
U.S. Cl. 360—105 **8 Claims**



1. A magnetic disk storage apparatus comprising:
a magnetic disk;
rotating means for rotating said magnetic disk;
a magnetic head for recording information on said magnetic disk and reproducing information therefrom while said magnetic disk is being rotated by said rotating means;
a head actuator, pivotably mounted on a base, for moving said magnetic head mounted on a head arm in a direction approximately radial to said magnetic disk;
a head arm holding member, mounted on said base, having a head arm holding part which holds said magnetic head arm with said magnetic head at a predetermined position apart from said magnetic disk before said rotating means stops rotating,
a position adjusting mechanism for moving said head arm holding part in order to position said head arm holding part at said predetermined position; and
a fixing mechanism for fixing said head holding arm part at said predetermined position after said position adjusting mechanism has positioned said head holding arm part at said predetermined position, said magnetic head not coming into any contact with said magnetic disk while said magnetic head is being moved to said predetermined position by said head actuator, and said head holding member, in which said head holding arm part is fixed at said predetermined position by said fixing mechanism, covering no recordable region on said magnetic disk, wherein said position adjusting mechanism comprises means for moving said head arm holding part in a direction approximately radial to said magnetic disk in order to position said head holding arm part as said predetermined position.

5,148,340

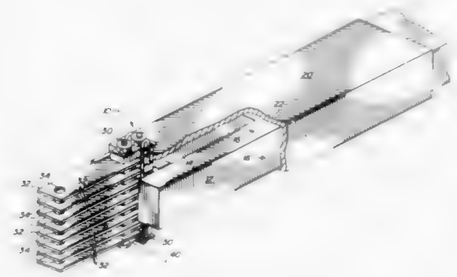
BIFURCATED AIR BEARING ACTUATOR ASSEMBLY FOR A DISK DRIVE SYSTEM

Robert B. Watrous, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 18, 1990, Ser. No. 510,484
Int. Cl.[5] G11B *5/55, 21/08, 5/54*
U.S. Cl. 360—106 **27 Claims**

1. An actuator system comprising:
a stator having a gas bearing outer surface, a first end of the stator for positioning proximate a data storage disk, the first end having a slotted section;
a slider sized to fit around the outer surface of the stator for linear movement along said gas bearing outer surface; and

a transducer arm assembly attached to said slider and sized to fit within the slotted section such that the transducer



arm assembly is positioned within the slotted section when the slider is fully retracted.

5,148,341

READ-WRITE DEVICE FOR DATA PROCESSING WITH MAGNETIC INFORMATION CARRIERS

Christian Fehrenbach, Schonach; Günter Ketterer, Unterkirnach, and Wolfgang Schlassus, VS-Villingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,056
Claims priority, application European Pat. Off., Nov. 24, 1987, 87730156.4
Int. Cl.[5] G11B *5/55, 21/10*
U.S. Cl. 360—106 **32 Claims**

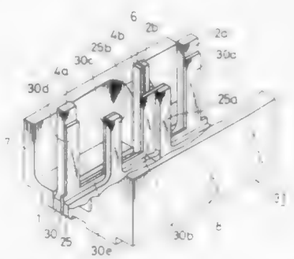
1. A data processing device using a magnetic information carrier comprising
a read-write head operating under a relative motion occurring between the informaiton carrier and the read-write head during processing;
a slide;
a drive connection attached to the slide;
a motor connected to the slide by the drive connection and driving the slide, where the drive connection between the slide and the motor is tightly engaging in the direction of the slide motion and where the read-write head is settable to a precise position with resilient restoring forces maintaining such position in a direction of motion perpendicular to a surface of the information carrier;
a holder mounted to the slide and including resilient means supporting the read-write head disposed on the slide; said holder comprising
two spring supported bearing guides disposed on the holder at a distance from each other in the directions of motion of the slide, where the bearing guides are springing in a direction perpendicular to the directions of motion of the slide;
wherein the spring supported bearing guides are tiltably supporting the holder in a plane perpendicular to the information carrier surface at the spring supported bearing guides;
a bearing cup disposed in the spring supported bearing guide in each case;
a rigid bearing pin attached in the middle of the bearing cup;
a compression spring resting on a base in the bearing cup; a bearing bush guided on the bearing pin and wherein the compression spring is supported by the bearing bush.

5,148,342

MAGNETIC HEAD HAVING A FILLER PLATE ARRANGED BETWEEN TWO MAGNETIC CORE ASSEMBLIES

Minoru Kato, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed Jul. 26, 1990, Ser. No. 557,770
Claims priority, application Japan, Aug. 3, 1989, 1-200395
Int. Cl.[5] G11B *5/29, 5/147*
U.S. Cl. 360—121 **20 Claims**



1. A magnetic head, comprising:
(a) a first front core assembly having a first planar surface having a first shape, said first front core assembly including at least two magnetic cores;
(b) first back core means connected to said first front core assembly;
(c) a second front core assembly having a second planar surface, the shape of said second front core assembly being different from the shape of said first front core assembly, said second front core assembly being arranged parallel to said first front core assembly;
(d) second back core means connected to said second front core assembly, said second front core assembly and said second back core means constituting a recording/reproduction magnetic core; and
(e) a planar filler plate having a shape which substantially corresponds to and is coextensive with the combined shape of said first and second planar surfaces superimposed on each other, said filler plate being interposed between said first and second front core assemblies so as to be aligned in parallel therewith, whereby the coextensive connecting area between the filler plate and two core assemblies provides a more extensive bonding surface.

5,148,343

MAGNETIC HEAD WITH CONTACT GAP

Naoto Sugawara, Fukushima, and Yoichi Muratomi, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

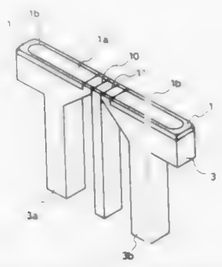
Filed Mar. 8, 1990, Ser. No. 490,763
Claims priority, application Japan, Mar. 10, 1989, 1-58845
Int. Cl.[5] G11B *5/60, 5/265, 5/187, 5/127*
U.S. Cl. 360—122 **20 Claims**

1. A magnetic head comprising:
a head core having a top surface defining a raised central portion with a substantially flat contact surface for contact with a moving magnetic record medium and the raised central portion including two magnetic gaps and

being divided transversely to a direction of magnetic record medium motion by the magnetic gaps;

the top surface further defining a pair of stepped top portions each having a surface that is recessed relative to the contact surface of the raised central portion and that is substantially parallel thereto, the stepped top portions being upon opposing sides of the raised central portion and extending therefrom along the direction of magnetic record medium motion and the stepped top portions being remote from the magnetic gaps;

a pair of legs projecting opposite and remote from the top surface and integrally formed with the head core, the legs having free ends remote from the magnetic gaps and the



legs being separated from each other along a major length thereof, the legs being spaced along the major length at a distance that is equal to or greater than the length of three raised central portion along a direction of magnetic medium motion;

a third core leg disposed between said pair of legs and defining therewith said two magnetic gaps; and

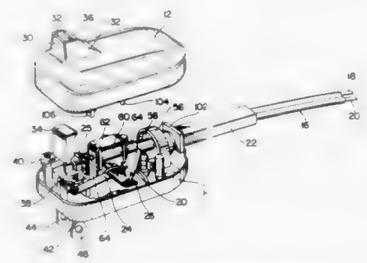
a pair of sections of an abrasion resistant laminar slider provided on the surface of each of the stepped top portions such that magnetic record medium contact surfaces of the laminar slider sections are flush with and parallel to the contact surface of the raised central portion to form a slider surface.

5,148,344

APPLIANCE LEAKAGE CURRENT INTERRUPTER

Chepur P. Rao, North Kingstown; Juan J. Barrena, Providence; Victor V. Aromin, West Warwick, and John J. Astley, Barrington, all of R.I., assignors to Tower Manufacturing Corporation, Providence, R.I.

Filed Aug. 6, 1990, Ser. No. 567,771
Int. Cl.[5] H02H *3/16*
U.S. Cl. 361—42 6 Claims



1. An electrical connector for small appliances, said connector comprising a housing having a reset member slidably mounted therein, first resilient means biasing said reset member in a first direction, fixed contact means mounted in said housing, movable contact means mounted in said housing, second resilient means biasing said movable contacts away from said fixed contacts in a second direction opposite to said first direction, latching means coupling said movable contacts to said reset member wherein said first resilient means override said second resilient means to urge said movable contacts into engagement with said fixed contacts to permit current flow to the appliance, means responsive to the presence of a ground fault in the connector for moving said latching means to an unlatched position, wherein said first resilient means cause the reset member to move in said first direction, and said second resilient means cause said movable contacts to move in said second direction away from said fixed contacts to interrupt current flow to the appliance, said reset member comprising a button portion extending outwardly from said housing by a predetermined amount when said latching means is in its coupling mode, said button portion automatically moving to a more pronounced outward position when said latching means has moved to its unlatched mode, thereby visually signalling interruption of current flow to the appliance, said button portion being manually depressible to a position closer to the housing than said predetermined distance in order to permit said latching means to again assume its coupling mode whereby release of said button portion permits said first resilient means to once again urge said movable contacts into engagement with said fixed contacts to resume current flow to the appliance, said connector further comprising a guard wall extending outwardly form said housing in close proximity to a peripheral portion of said button portion, the outer edge of said wall being substantially flush with the outer end of said button portion when the latter is at its normal predetermined distance from said housing, whereby said wall protects said button portion against undesirable or accidental manipulation and breakage.

5,148,345

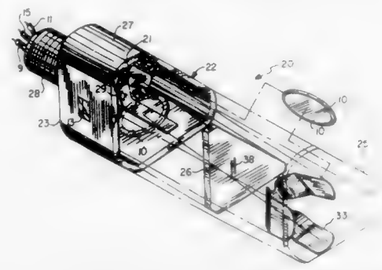
PREPACKAGED ELECTRICAL TRANSIENT SURGE PROTECTION

Edward F. Allina, 605 Capri Blvd., Treasure Island, Fla. 33706

Continuation-in-part of Ser. No. 286,446, Dec. 19, 1988, Pat. No. 4,907,119, which is a continuation-in-part of Ser. No. 923,524, Oct. 28, 1986, Pat. No. 4,931,895, and a continuation-in-part of Ser. No. 123,419, Jan. 12, 1988, Pat. No. 4,901,187, and a continuation-in-part of Ser. No. 185,584, Apr. 22, 1988, abandoned, and a continuation-in-part of Ser. No. 185,587, Apr. 22, 1988, Pat. No. 4,866,560. This application Mar. 5, 1990, Ser. No. 488,677

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—104 4 Claims



1. In a method of preventing transient electrical surges, received in a circuit from an upstream power source, from going downstream, including shunting resulting surge currents to ground via over-voltage means including a disklike varistor with a conductive face,

the improvement comprising

providing a housing substantially surrounding such over-voltage means, having at least one sidewall and furnished with leads from the power source, and juxtaposing such varistor face adjacent the sidewall; and

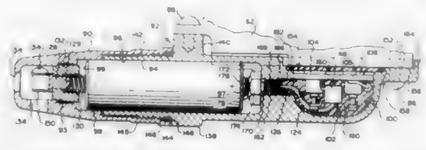
providing, between the power source and the over-voltage means, conductive fusible means including a distributed-resistance fuse link having its electrical resistance distributed substantially evenly along its length, establishing electrical contact of a side of such fuse link with such varistor face, and sandwiching an end portion of such distributed-resistance fuse link between such face of the varistor and such sidewall.

5,148,346

EMI PROTECTED WATER-ACTIVATED PRESSURIZED GAS RELEASE APPARATUS

Carlton W. Naab, Safety Harbor, and Wayne T. Thompson, Pinellis Park, both of Fla., assignors to Conax Florida Corporation, St. Petersburg, Fla.

Filed Sep. 20, 1991, Ser. No. 763,743
Int. Cl.[5] F23Q *7/02*
U.S. Cl. 361—251 12 Claims



1. Apparatus for supplying electrical energy for firing a primer when water is detected comprising a single piece casing of electrically conductive material including bore means for receiving a battery means and further including cavity means, electric circuit means disposed at least partially in said cavity means, means defining an opening in said casing to said cavity means, said opening means including a surface peripheral of the opening for engaging a complementary surface of a housing of electrically conductive material for the primer and thereby providing an interface for attachment of the primer housing to said electric circuit casing, said electric circuit casing including a portion which extends from said opening means surface along and external of the periphery of the interface to overlap the interface and said primer housing to prevent the entrance of electromagnetic radiation between said electric circuit casing and the primer housing at the interface, passage means interconnecting said bore means and said cavity means, said electric circuit means including an electrically conductive means extending into said passage means for electrically connecting to one terminal of the battery means, sensor means for electrically connecting the other terminal of the battery means to ground upon immersion of the apparatus in water to thereby complete a circuit for firing of the primer, and electromagnetic interference filter means having at least one capacitor in said passage means and electrically connected to said conductive means for conducting electromagnetic interference radiation through said at least one capacitor to ground.

5,148,347

POLYMER-ENCASED ELECTRICAL CAPACITOR WITH PRESSURE SENSITIVE CIRCUIT INTERRUPTER

Michael E. Cox, Seekonk, Mass.; Corrado Albertazzi, Bologna, Italy; Heinz H. Findeisen, Milford, and Russell E. Minkwitz, Jr., Walpole, both of Mass., assignors to Aerovox Incorporated, New Bedford, Mass.

Filed May 9, 1990, Ser. No. 520,874
Int. Cl.[5] H01G *1/06*
U.S. Cl. 361—272 15 Claims

7. An electrical capacitor comprising:

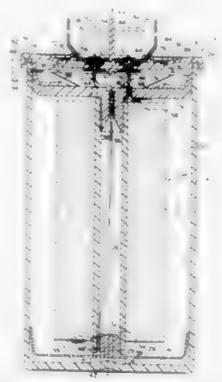
a polymer case with polymer walls,

a polymer cover connected to and sealing one end of said polymer case, said polymer cover having a movable region that moves outwardly in a longitudinal direction in response to an overpressure condition within said polymer case;

a capacitor element disposed in said case, said capacitor element immersed in a liquid insulating material;

one or more electrical connectors mounted on said movable region of said polymer cover;

a retainer disk connected to an end of said capacitor element closest to said cover, said retainer disk spaced longitudinally from said cover by a predetermined gap, said re-



tainer disk, polymer case, capacitor element, and cover being shaped and configured so that said capacitor element can move longitudinally toward said cover unimpeded by said polymer case until said gap is reduced to zero and is thereafter prevented from further such movement by contact with said cover; and

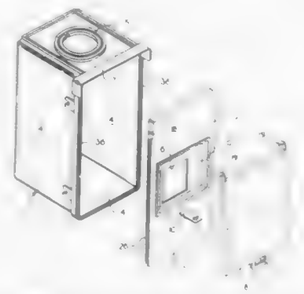
one or more electrical conductors connecting said capacitor element to said electrical connectors, said conductors extending through holes in said retainer disk.

5,148,348

POLYMERIC ENCLOSURE FOR ELECTRICAL APPARATUS

Percy A. White, Clinton, Miss., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 17, 1991, Ser. No. 716,185
Int. Cl.[5] H02B *1/04*
U.S. Cl. 361—356 12 Claims



1. A non-metallic enclosure for electrical apparatus, comprising:

a) a molded, electrically insulative housing having a backwall and integrally formed, upstanding sidewalls;

b) a molded insulative cover attached to the housing and engaging the upstanding sidewalls, the cover having an opening over which a door may be placed;

c) a door sized to fit over the opening and pivotably connected to the cover by at least one pivotable connector; and

d) a hood attached to the housing such that the at least one pivotable connector is behind the hood so that the door can only be nondestructively removed by removing the cover from the housing.

5,148,349

ELECTRONIC PART MOUNTABLE ON THE SURFACE OF A PRINTED CIRCUIT BOARD AND METHOD OF MOUNTING THE SAME

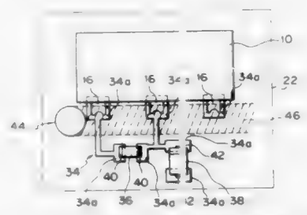
Hiroshi Kogure, and Hidehiko Norimatsu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 4, 1991, Ser. No. 637,557

Claims priority, application Japan, Jan. 8, 1990, 2-1802; Jan. 8, 1990, 2-1805; Feb. 19, 1990, 2-38885

Int. Cl.[5] H05K 7/20, H01L 23/16

U.S. Cl. 361—383 7 Claims



4. A structure of an electronic part mountable on a surface of a printed circuit board comprising:

a cover accommodating therein circuitry of said part;

a plurality of connecting terminals extending out from said cover for connecting said circuitry to said printed circuit board; and

a heat radiating member for radiating heat while said electronic part is in operation, said heat radiating member comprising a connecting portion to be connected to said printed circuit board and a body portion to be connected to said cover;

wherein said plurality of connecting terminals each are soldered to a land of a pattern provided on said printed circuit board by a laser beam, and

further comprising an inhibition zone extending over a particular area of said printed circuit board to be swept by a laser beam which solders said plurality of terminals to said lands and having a width greater than a diameter of a beam spot of said laser beam, electronic parts other than said electronic part being inhibited from being arranged in said inhibition zone.

5,148,350

PORTABLE ELECTRONICS APPARATUS HOUSING AND CHASSIS

Huen S. Chan; Chee S. Leong, and Dah C. Lim, all of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 23, 1990, Ser. No. 513,135

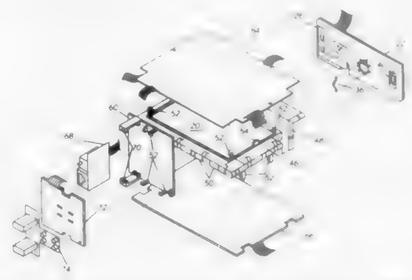
Int. Cl.[5] H05K 7/20

U.S. Cl. 361—386 12 Claims

1. A screw-less housing for portable electronic apparatus containing at least one power transistor, the housing comprising:

an external heatsink formed as a portion of the housing and defining an inner contact surface of the housing; and

at least one cam surface formed within said housing in juxtaposition to the inner contact surface so as to allow the insertion, between the cam surface and the inner contact surface, of a member mounting the at least one power transistor, the cam surface being formed to urge the power transistor into heat conducting contact with the



inner contact surface when the member is inserted between the cam surface and the inner contact surface.

5,148,351

COOLING APPARATUS FOR ENCLOSED CURRENT LIMITING FUSES

Janak R. Patel, Tinley Park, Ill., assignor to G & W Electric Company, Blue Island, Ill.

Filed May 2, 1991, Ser. No. 694,566

Int. Cl.[5] H01H 85/02; H02B 9/00

U.S. Cl. 361—388 8 Claims

1. An electric fuse and enclosure assembly comprising:

an electric fuse having a tubular housing with an outer surface;

at least one cooling ring disposed about said fuse housing, having an annular body of resilient thermally conductive dielectric material defining an exterior surface and an interior bore wall which receives the electric fuse therethrough and directly engages the outer surface of the fuse housing to conduct heat away therefrom;

the annular body defining at least one axially extending recess means remote from the bore wall for air flow along the annular body;

enclosure means surrounding the fuse, having a generally hollow tubular enclosure with an interior surface and an open end communicating with the hollow interior of the tubular enclosure; and

said annular body having an outer periphery which is telescopically inserted into the open end of the enclosure means with the annular body exterior surface in contact with the enclosure interior surface so as to conduct heat between the fuse and enclosure.

5,148,352

U-SHAPED MOUNTING MODULE FOR MOUNTING COMPONENTS OF AN INFORMATION PROCESSING MACHINE

Omar Sekouri, Paris, and Gilles Jardet, Chilly Mazarin, both of France, assignors to Bull, S.A., Paris, France

Filed Oct. 5, 1990, Ser. No. 592,461

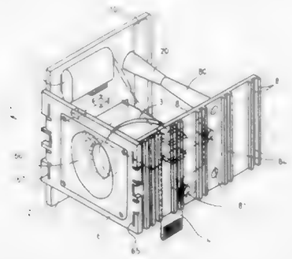
Claims priority, application France, Oct. 5, 1989, 89 13035

Int. Cl.[5] H05K 7/14

U.S. Cl. 361—391 9 Claims

1. A mounting module for mounting components thereon and adapted to be mounted in a computer, said mounting module comprising a central surface (6) and two other surfaces

(2, 8) said central surface and said two other surfaces being of a single piece of material, said mounting module further comprising means for connecting the central surface (6) to said two other surfaces (2, 8) so as to form a U-shaped cross-section, said means for connecting comprising a plurality of tabs on said two other surfaces, and means disposed on said central surface for engaging said tabs in such a manner that after assembly said



module has said U-shaped cross section, said two other surfaces forming first and second side surfaces (2, 8), of the module, said module further comprising half-struts (20, 80) integrally attached to each of said first and second side surfaces (2, 8) and adapted to engage each other for spacing said first and second side surfaces, said first side surface (2) including hook means (21, 22) for mounting to a support plate.

5,148,353

MOUNTING SYSTEM FOR INSTALLATION OF COMMUNICATION BOXES HAVING A CONVEX BOTTOM POST AND A RIGID TOP POST

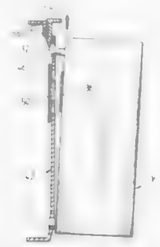
Stuart K. Morgan, Westford; Lawrence Bibeau, Worcester; Michael Romm, Brighton; Gary V. Vacon, Melrose, and John A. Visser, Wakefield, all of Mass., assignors to Digital Equipment Corporation, Hudson, Mass.

Continuation of Ser. No. 546,552, Jun. 29, 1990, abandoned.

This application Dec. 10, 1991, Ser. No. 807,961

Int. Cl.[5] H05K 7/16, 5/02; H01R 4/52

U.S. Cl. 361—391 11 Claims



1. A modular, wall-mountable system for mounting system blocks in a computer network, said system comprising:

a. a system block comprising

i. a casing having a face,

ii. a bottom hook being rigidly coupled to the casing and extending outwardly from the casing fae in a given direction, the hook having a downwardly-facing concave pivot surface,

iii. a top post being rigidly coupled to the casing and extending outwardly from the casing face in said given direction, the top post having a retaining surface substantially parallel to the casing face, and

iv. a connector located on the casing face, and

b. a wall-mountable track having a plurality of track slots to accommodate a plurality of system blocks, each track slot comprising

i. a support frame having defined therein a lower mating aperture configured to receive the hook and bounded on a side by a convex upwardly-facing edge of the support frame, the edge being curved to substantially match the pivot surface of the hook,

ii. an upper mating aperture in the support frame configured to receive the post,

iii. a locking slide slidably mounted on the support frame, the locking slide having a first position and a second position, with the locking slide in the first position permitting the insertion of the post into and removal from the upper mating aperture and with the locking slide in the second position preventing the removal of the post from the upper mating aperture by engaging the top post retaining surface,

iv. a biasing spring disposed between the support frame and locking slide, the biasing spring serving to bias the locking slide to the second position and,

v. a complementary connector located on the support frame and being adapted to couple to the connector on the casing face.

5,148,354

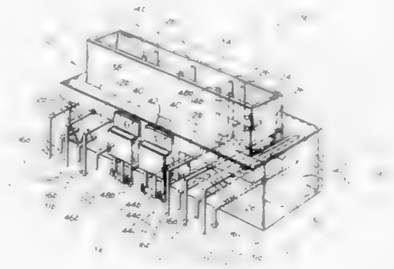
CONNECTOR FOR USE WITH A PRINTED CIRCUIT BOARD

Gregory A. Roth, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 29, 1990, Ser. No. 530,045

Int. Cl.[5] H05K 7/02

U.S. Cl. 361—400 29 Claims

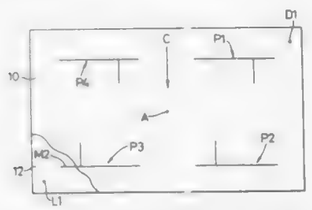


1. A connector/high current device assembly capable of being connected to a printed circuit board having circuit paths thereon comprising:

at least one high current device having a plurality of lead pins extending therefrom; and

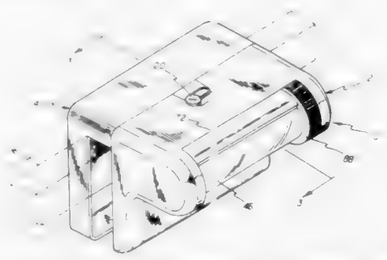
a connector capable of being connected to said printed circuit board and mounting said at least one high current device thereto without high current conducted through said device passing through said circuit paths on said printed circuit board, said connector including a housing, port means located in said housing for removably receiving at least one connecting device, and a plurality of device conductors mounted in said housing, each of said device conductors having a first end extending into said port means and connecting with said at least one connecting device with said at least one connecting device received within said port means and a second end extending from said housing, said second end of each of said device conductors being connected directly to one of said lead pins to connected said at least one high current device directly through said connector so that high current conducted through said at least one high current device does not pass through said circuit paths on said printed circuit board.

5,148,355
METHOD FOR MAKING PRINTED CIRCUITS
John M. Lowe, Leicester, and Joseph Devonport, Leicestershire, both of United Kingdom, assignors to Technology Applications Company Limited, Isle of Man, Isle of Man
PCT No. PCT/GB89/01536, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO90/07858, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 22, 1989, Ser. No. 585,070
Claims priority, application United Kingdom, Dec. 24, 1988, 8830251; Dec. 18, 1989, 8928563
Int. Cl.[5] H05K *1/04* C23C *3/02*
U.S. Cl. 361—410 12 Claims



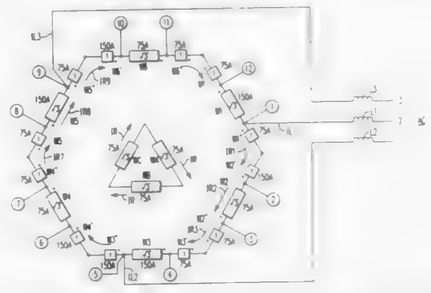
11. A printed circuit on a substrate comprising at least one set of electrical conductors carried on a surface of the substrate, a layer of an insulating polymer applied on a portion of said surface and bridging a first electrical conductor, a bridging electrical conductor carried on the surface of said bridging layer of insulating polymer so that it is insulated from said first electrical conductor but in electrical contact with at least a second electrical conductor and a third electrical conductor at opposite sides of said first electrical conductor, resistors formed by depositing a controlled amount of resistive ink and capacitors produced by printing conductive layers separated by insulating layers.

5,148,356
CRIB LIGHT
T. Brent Freese, Westminster, and Joseph E. Janicke, Eldorado Springs, both of Colo., assignors to Gerry Baby Products Company, Denver, Colo.
Filed Aug. 30, 1991, Ser. No. 753,094
Int. Cl.[5] A47B *23/06*
U.S. Cl. 362—130 12 Claims



1. A light adapted to be mounted to a crib having a horizontally extending crib rail or to a vertical wall surface, said light comprising:
a front housing assembly defining a front and a rear side and including means for supporting a light source,
a back plate portion located at said rear side of said front housing assembly,
means defining a back plate aperture in said back plate portion,
a rear housing portion for use in mounting said light to said crib rail, said rear housing portion including a horizontal extension for engaging said front housing assembly and a vertical extension extending substantially perpendicularly from said horizontal extension,
means defining a clamping aperture in said vertical extension, and
wherein said horizontal extension may be engaged with said front housing assembly and positioned in contact with an upper surface of said crib rail with said clamping aperture aligned with said back plate aperture such that a fastener may be positioned through said clamping aperture and said back plate aperture to draw said vertical extension of said rear housing toward said back plate portion and thereby hold said light in position on said crib rail.

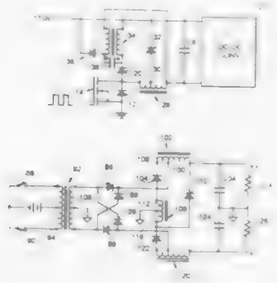
5,148,357
AUTO-CONNECTED HEXAGON TRANSFORMER FOR A 12-PULSE CONVERTER
Derek A. Paice, Palm Harbor, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 7, 1991, Ser. No. 772,504
Int. Cl.[5] H02M *7/00, 7/06*
U.S. Cl. 363—5 6 Claims



1. In a 12-pulse static converter for converting three-phase alternating current (AC) power into direct current (DC) across a positive and a negative DC output terminal, with a polygonal succession of windings forming a regular hexagon with hexagon windings and with 12 rectifying devices equally distributed about 12 successive tappings from said windings and at 30 degrees to one another; the combination of:
three AC input terminals connected to said hexagon windings at 120 degrees to one another; and
a set of three windings symmetrically and centrally disposed within said hexagon windings and coupled thereto in a delta mode;
each of said hexagon windings including a central winding means disposed between two equally placed side windings of lesser ampere-turn ratio for cooperating with said three windings on said delta mode to reduce harmonic current in said direct current.

5,148,358
RECTIFIER COMMUTATION CURRENT SPIKE SUPPRESSOR
Earl M. Estes, Jr., Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 3, 1991, Ser. No. 679,965
Int. Cl.[5] H02M *7/06, 3/155*
U.S. Cl. 363—24 7 Claims

1. A circuit for reducing the commutation transient in a switch-driven rectifier applied to a load via a continuously conducting energy storage inductor, comprising:
a further inductor and rectifier means interconnected with the switch-driven rectifier to cyclically capture rectifier commutation energy and restore it to the circuit;
said storage inductor is serially connected in a current path between the switch and a first load terminal; the further inductor has first and second windings, the first winding serially connected through the switch-driven rectifier between the switch and storage inductor connection and a second load terminal; a capacitor shunting the further inductor first and second windings; a diode connecting the common point of the capacitor and further inductor sec-

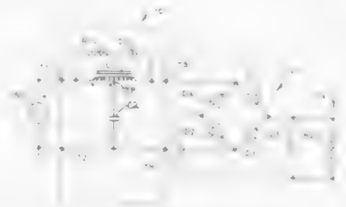


ond winding with a second load terminal; a second diode interconnecting a tap on the first inductor with the second load terminal; and the further inductor first winding having one end connected to the second load terminal and one end of the second winding interconnected with the load first terminal.

5,148,359
NETWORK FOR OBTAINING HIGH POWER AND LOW TOTAL HARMONIC DISTORTION
Long T. Nguyen, Salem, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Filed Dec. 23, 1991, Ser. No. 812,089
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—48 14 Claims

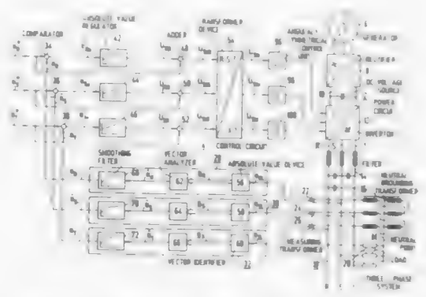
1. A power supply arrangement having a high power factor and low total harmonic distortion, said power supply circuit comprising:
a DC power supply having AC input terminals and DC output terminals and including rectifier means and filter capacitor means;
an inductor connected in series with one of said AC input terminals of said DC power supply;
a resistor and a first network capacitor connected in series; the series combination of said resistor and said first network capacitor being connected in parallel with said inductor;
a second network capacitor connected in shunt with said AC input terminals of said DC power supply; and
means for connecting said power supply arrangement to an AC power supply.

5,148,360
FOURTH ORDER DAMPED LOWPASS FILTER FOR OBTAINING HIGH POWER FACTOR AND LOW TOTAL HARMONIC DISTORTION
Long T. Nguyen, Salem, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Filed Jan. 29, 1992, Ser. No. 828,549
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—48 20 Claims



1. A power supply arrangement having a high power factor and low total harmonic distortion, said power supply arrangement comprising:
a DC power supply having a pair of AC input terminals;
a series combination of a resistor and a first capacitor connected in series with one of said AC input terminals of said DC power supply;
an inductor having at least one tap and connected in parallel with said series combination of said resistor and said first capacitor;
a second capacitor connected between said at least one tap of said inductor and the other of said AC input terminals of said DC power supply; and
means for connection to an AC power supply.

5,148,361
METHOD AND DEVICE FOR BALANCING THE CIRCUITS OF A THREE-PHASE SYSTEM
Rüdiger Braun, and Wilhelm Forstbauer, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Aug. 8, 1991, Ser. No. 742,026
Claims priority, application European Pat. Off., Aug. 16, 1990, 90115700.8
Int. Cl.[5] H02M *7/48*
U.S. Cl. 363—95 3 Claims



1. A method for balancing a three-phase system that is produced by an invertor from a d.c. voltage source, which invertor has an output (R', S', T') equipped with a filter with an added on neutral grounding transformer, said method comprising the steps of:
a) forming a plurality of rotational vectors (u_R, u_S, u_T) from a plurality of measured phase-to-phase voltages (u_{RL}, u_{SL}, u_{TL}) of the three-phase system;

b) calculating a plurality of absolute values ($\hat{u}_R$, $\hat{u}_S$, $\hat{u}_T$) from said plurality of rotational vectors ($\underline{u}_R$, $\underline{u}_S$, $\underline{u}_T$);
c) comparing the plurality of absolute values ($\hat{u}_R$, $\hat{u}_S$, $\hat{u}_T$) to a plurality of setpoints of said absolute values ($\hat{u}^*_R$, $\hat{u}^*_S$, $\hat{u}^*_T$) and producing a first, second and third phase-to-phase voltage manipulated variable (u_{StR}, u_{StS}, u_{StT}) from said comparing;
d) transforming the first, second and third phase-to-phase voltage manipulated variable (U_{StR}, U_{StS}, U_{StT}) to a first, second and third phase-to-neutral voltage manipulated variable ($U_{St\prime}$, $U_{St\prime\prime}$, $U_{St\prime\prime\prime}$) respectively, according to Equation I:

EQUATION I

$$U_{St\prime} = \frac{1}{\sqrt{3}} U_{StR} + \frac{1}{\sqrt{3}} U_{StS} - \frac{1}{\sqrt{3}} U_{StT}$$

$$U_{St\prime\prime} = \frac{1}{\sqrt{3}} U_{StS} + \frac{1}{\sqrt{3}} U_{StT} - \frac{1}{\sqrt{3}} U_{StR}$$

$$U_{St\prime\prime\prime} = \frac{1}{\sqrt{3}} U_{StT} + \frac{1}{\sqrt{3}} U_{StR} - \frac{1}{\sqrt{3}} U_{StS}$$

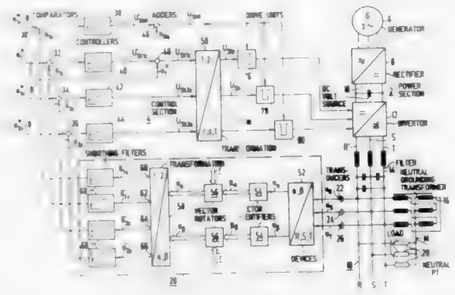
and
e) feeding the first, second, and third phase-to-neutral voltage manipulated variables ($U_{St\prime}$, $U_{St\prime\prime}$, $U_{St\prime\prime\prime}$) to a first, second, and third angularly symmetrical control unit, respectively; and
f) controlling the inverter by said first, second and third angularly symmetrical control units.

5,148,362

METHOD AND DEVICE FOR BALANCING A THREE-PHASE SYSTEM

Rüdiger Braun, and Wilhelm Forsbauer, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 8, 1991, Ser. No. 742,293
Claims priority, application European Pat. Off., Aug. 16, 1990, 90115699.2
Int. Cl.[5] H02M 7/48
U.S. Cl. 363—95 **8 Claims**



1. A method for balancing a three-phase system formed by means of an invertor from a direct-current (dc) voltage source, an output of the invertor having a filter followed by a neutral grounding transformer, said method comprising the steps of:
a) determining a first, second and third measured voltage (u_R, u_S, u_T) of the three-phase system;
b) transforming the first, second and third measured voltages (u_R, u_S, u_T) into a first and second voltage component (u_α, u_β),
c) forming a first and second rotational vector (u_α, u_β) from said first and second voltage components (u_α, u_β), respectively;
d) converting said first and second rotational vectors (u_α, u_β) into a first and second vector ($\bar{u}_\alpha$, $\bar{u}_\beta$), respectively, by means of a reference vector (r);
e) transforming said first and second vectors ($\bar{u}_\alpha$, $\bar{u}_\beta$) into a first and second positive phase-sequence system component ($\bar{u}_{1s}$, $\bar{u}_{1c}$), respectively, and into a first and second negative phase-sequence system component ($\bar{u}_{2c}$, $\bar{u}_{2s}$), respectively;
f) controlling said first and second positive and negative phase-sequence system components ($\bar{u}_{1s}$, $\bar{u}_{1c}$, $\bar{u}_{2c}$, $\bar{u}_{2s}$) on the basis of a first, second, third and fourth predetermined reference value ($\hat{u}_{1s}^*$, $\hat{u}_1^*$, $\hat{u}_{2c}^*$, $\hat{u}_{2s}^*$) in such a way that said first positive phase-sequence system component ($\bar{u}_{1s}$) and said first and second negative phase-sequence system components ($\bar{u}_{2c}$, $\bar{u}_{2s}$) are held to zero, while said second positive phase-sequence system component ($\bar{u}_{1c}$) is not held to zero;
g) forming a first positive phase-sequence system manipulated variable (U_{St1c}) and a first and second negative phase-sequence system manipulated variable (U_{St2c}, U_{St2s}) from said second, third and fourth predetermined reference values ($\hat{u}_1^*$, $\hat{u}_{2c}$, $\hat{u}_{2s}^*$), from said second positive phase-sequence system component ($\bar{u}_{1c}$) and from said first and second negative phase-sequence system components ($\bar{u}_{2c}$, $\bar{u}_{2s}$);
h) forming a positive phase-sequence phase manipulated variable ($U_{St\prime\prime}$) from said first predetermined reference value ($\hat{u}_{1s}^*$), from said first positive phase-sequence system component ($\bar{u}_{1s}$) and from a first precontrol value ($U_{R\prime\prime}$);
i) transforming said first positive phase-sequence system manipulated variable (U_{St1c}) and said first and second negative phase-sequence system manipulated variables (U_{St2c}, U_{St2s}) into a first, second and third phase-to-neutral manipulated variable ($U_{St\prime}$, $U_{St\prime\prime}$, $U_{St\prime\prime\prime}$) according to an Equation I, an Equation II, and an Equation III;

$$U_{St\prime} = U_{St1c} + 2U_{St2c} \qquad \text{Equation I}$$

$$U_{St\prime\prime} = U_{St1c} - U_{St2c} - \sqrt{3}\cdot U_{St2s} \qquad \text{Equation II}$$

$$U_{St\prime\prime\prime} = U_{St1c} - U_{St2c} + \sqrt{3}\cdot U_{St2s} \qquad \text{Equation III}$$

j) routing said first, second and third phase-to-neutral voltage manipulated variables ($U_{St\prime}$, $U_{St\prime\prime}$, $U_{St\prime\prime\prime}$) to a first, second and third angularly symmetrical drive unit, respectively; and
k) controlling a phase relation of said first, second and third angularly symmetrical drive units by said positive phase-sequence phase manipulated variable ($U_{St\prime\prime}$).

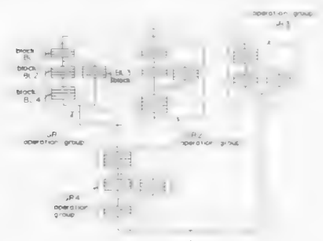
5,148,363

BREAKDOWN DIAGNOSING METHOD OF PRODUCTION LINE

Shunji Sakamoto, and Toshihiko Hoshino, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 26, 1990, Ser. No. 498,744
Claims priority, application Japan, Mar. 25, 1989, 1-072248; Dec. 11, 1989, 1-321063; Feb. 9, 1990, 2-030379
Int. Cl.[5] G06F 15/46
U.S. Cl. 364—143 **18 Claims**

1. A breakdown diagnosing method of equipment in a production line having a plurality of stations which are sequentially controlled to execute a plurality of operations in a predetermined order, comprising the steps of:
dividing the operations executed by said plurality of stations into a plurality of operation blocks, each operation block defining discrete series of operations which are executed among the plurality of stations independently from a discrete series of operations defined by each other operation block during a normal operating state of said equipment;
dividing each of said plurality of operation blocks into a plurality of operation steps,
measuring an operation time expended from a start to a completion of a series of operation steps of each operation block;
storing an indication of the completion of each operation step in said each operation block;
comparing said measured operation time with a reference operation time for each operation block, and



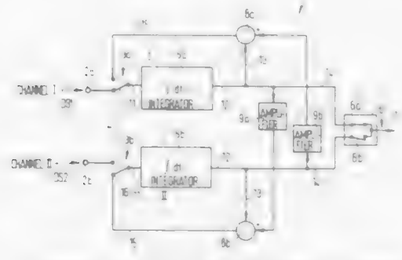
specifying an abnormal operation step in any of said operation blocks in response to an excessive time difference time obtained in said comparing step and with reference to the operation step completion indication stored in said storing step.

5,148,364

REDUNDANT MULTI-CHANNEL CLOSED LOOP CONTROL DEVICE WITH ANALOG INTEGRATORS

Wolfgang Scherer, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 604,826
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3935958
Int. Cl.[5] G05B 9/02
U.S. Cl. 364—187 **8 Claims**



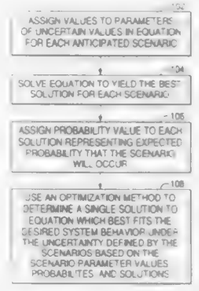
1. A redundant closed loop control circuit, comprising a plurality of signal processing channels for processing a deviation signal through any one of said channels to provide a control output signal at an output of said one channel forming an operating channel while at least one other channel forms a standby channel, each channel comprising a signal integrator having an integrator input and an integrator output, a summing circuit having at least one positive input, a negative input and a sum output, channel input switching means for supplying said deviation signal to a respective one of said integrator inputs, channel output switching means for outputting said control output signal, first circuit means connecting each integrator output to said negative input of its own summing circuit, second circuit means connecting each integrator output to its respective channel output switching means, third circuit means for connecting each integrator output to said positive input of said summing circuit in another of said signal processing channels, and fourth circuit means for connecting said sum output to said channel input switching means for supplying a sum signal to at least one integrator input in a standby channel, wherein said operating channel receives said deviation signal at its integrator input, while all other integrator inputs receive said sum signal formed of their own output signal at said negative input and of other integrator output signals at said positive input of said summing circuits.

5,148,365

SCENARIO OPTIMIZATION

Ron S. Dembo, 398 Markham Street, Toronto, Ontario, Canada M6G 2K9

Filed Aug. 15, 1989, Ser. No. 394,081
Int. Cl.[5] G06F 15/20
U.S. Cl. 364—402 **18 Claims**



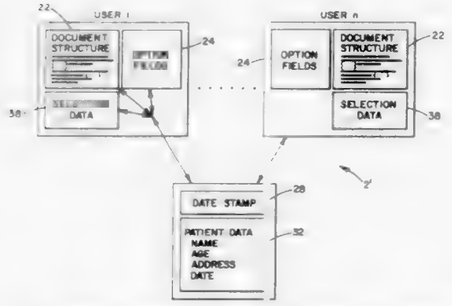
1. A system for allocating available resources in a physical system defined by a mathematical model having at least one parameter of uncertain value to satisfy uncertain levels in a set of demands on said available resources and meet a predetermined set of objectives based on foreseeable future changes of said levels, said system comprising:
resource allocation determining means having input means and memory means, said resource allocation determining means:
i) receiving values for said at least one parameter of uncertain value based on scenarios of said set of demands that may or are expected to occur via said input means;
ii) solving the mathematical model using said values for said at least one parameter for each of said scenarios to yield a best scenario solution of that mathematical model for each scenario;
iii) receiving a probability value for each scenario solution, said probability value representing the likelihood that the scenario will occur;
iv) determining a single solution to the mathematical model which best tracks the desired system behavior under all possible scenarios relative to the probabilities assigned to the scenarios;
output means connected to said resource allocation determining means, said output means providing a physical indication as to how the available resources should be allocated in said physical system based on said single solution to satisfy said set of demands and meet said set of objectives; and
means for adjusting the physical system in accordance with the physical indication.

5,148,366

COMPUTER-ASSISTED DOCUMENTATION SYSTEM FOR ENHANCING OR REPLACING THE PROCESS OF DICTATING AND TRANSCRIBING

Ken Buchanan, Eagan, and John A. Dowdle, St. Paul, both of Minn., assignors to Medical Documenting Systems, Inc., St. Paul, Minn.

Filed Oct. 16, 1989, Ser No. 422,139
Int. Cl.[5] G06F *15/10, 15/20*
U.S. Cl. 364—419 31 Claims



1. A computer-assisted documentation system for enhancing or replacing the process of dictating and transcribing in the generation of a document, comprising:

(a) a document database, comprising:

(i) first database means for processing one or more user-definable document structures to be used as templates for the generation of a document, wherein each document structure is associated with a particular document style, each document structure comprising:

a) a plurality of phrase fields for electronically storing user-definable phrases;

b) a plurality of option-text fields; and

c) field linkage means for linking phrase fields to option-text fields;

(ii) second database means for accessing option-text lists associated with said option-text fields, wherein each option-text list comprises one or more user-definable option-text expressions; and

(iii) third database means for processing at least one selection data file, wherein each of said selection data fields is associated with a particular document structure and a particular matter identifier and wherein each of said selection data fields comprises pointers to option-text expressions within said option-text lists;

b) user interface means for manipulating data within the document database, the user interface means comprising:

(i) display means for displaying a menu of option-text expressions associated with a particular option-text list; and

(ii) selecting means for selecting preferred option-text expressions from the menu of option-text expressions displayed by the display means, said selecting means comprising selection data interface means for storing, in the selection data file associated with the document structure and matter identifier corresponding to the document to be generated, a pointer associated with each option-text expression selected; and

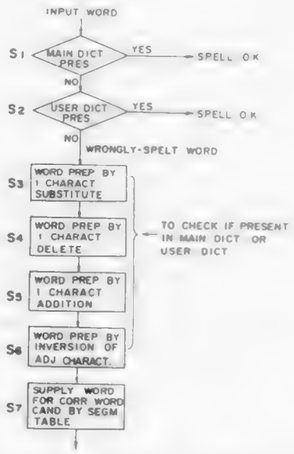
(c) document generation means comprising option-text expression control means for generating, as a function of matter identifier, document structure and selection data file, a document in which the selected preferred option-text expressions are inserted into the appropriate option-text fields.

5,148,367

EUROPEAN LANGUAGE PROCESSING MACHINE WITH A SPELLING CORRECTION FUNCTION

Keizo Saito, Soraku; Kazuhiko Matsuo, and Hiroko Murai, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 313,493, Feb. 22, 1989, abandoned.
This application Dec. 17, 1990, Ser. No. 627,927
Claims priority, application Japan, Feb. 23, 1988, 63-40162
Int. Cl.[5] G06F *5/00*
U.S. Cl. 364—419 6 Claims



1. A word processing apparatus equipped with a spelling correction portion, comprising:

input means for inputting character information;

memory means, operatively connected to said input means for storing the character information inputted by said input means;

a control apparatus operatively connected to said memory means; and

dictionary means, operatively connected to said memory means, for storing a main dictionary and a probability table indicative of a relationship between two arbitrary characters and a frequency of appearance thereof as neighboring characters;

said control apparatus including,

character string discrimination means for judging whether a character string stored in said memory means is contained in said main dictionary,

output means for outputting the character string, when the character string discrimination means judges that character string is contained in the main dictionary, and

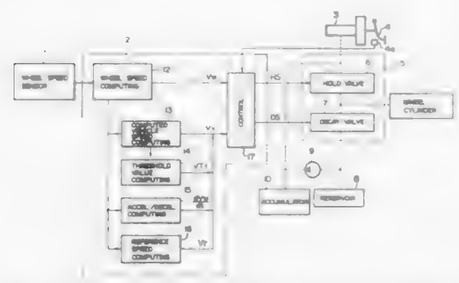
character addition and discrimination means responsive to the character string discrimination means for selecting a correct word for outputting by adding one character at a time into a character string containing an error, the added character being selected based on a highest frequency of appearance order established in said probability table until a character string with the added character is identified as being contained in said main dictionary, and upon being identified as being contained in said main dictionary, said character string with the added character is then outputted by said output means, wherein said probability table includes the letters of the alphabet A to Z, listed in sequence from A to Z in a vertical row and in a horizontal row there are letters of the alphabet, so that the frequency of appearance is an intersection of specific letters from each row.

5,148,368

ANTI-LOCK CONTROL SYSTEM FOR MOTOR VEHICLES

Satomi Okubo, Kuki, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,733
Claims priority, application Japan, Aug. 8, 1989, 1-203827
Int. Cl.[5] B60T *8/58*
U.S. Cl. 364—426.02 7 Claims



1. An anti-lock control system for a motor vehicle wherein brake hydraulic pressure is increased, held or reduced based on changes in wheel speeds when braked, thereby preventing the wheels from being locked, said system comprising:

rough-road judging means (21, 22, 23, 24, 25) for making judgment as to whether or not the motor vehicle is running on a rough road;

means (26, 27) adapted when said rough-road judging means (21, 22, 23, 24, 25) judges that the motor vehicle is running on a rough road, to make, in response thereto, reduction gradient of the brake hydraulic pressure lower than that for a case where rough-road judgment is not made by said rough-road judging means (21, 22, 23, 24, 25), means (13) for computing a computed vehicle speed Vv proximate to the actual vehicle speed on the basis of four wheel speeds representing rotating speeds of the four wheels of the motor vehicle respectively; and

threshold value computing means (14) for computing a threshold value VT1 which follows the computed vehicle speed Vv with a predetermined speed difference ΔV1 (VT1=Vv−ΔV1).

5,148,369

AIR-FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Masanobu Uchinami; Toshihisa Takahashi; Ryoji Nishiyama, all of Himeji; Hiroyoshi Suzuki, Amagasaki, and Shinichi Nishida, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 418,736, Oct. 3, 1989, abandoned, which is a continuation of Ser. No. 223,030, Jul. 22, 1988, abandoned. This application May 1, 1991, Ser. No. 693,066
Claims priority, application Japan, Aug. 8, 1987, 62-198559
Int. Cl.[5] F02D *41/14*
U.S. Cl. 364—431.06 11 Claims

1. An air-fuel ratio control apparatus for controlling a fuel supply means in a fuel-injected internal combustion engine comprising:

an exhaust gas sensor for detecting the actual air-fuel ratio and for outputting a signal indicative of said actual air-fuel ratio;

means for detecting the actual load on said engine;

means for detecting the RPM of said engine;

a memory storing data of basic target air-fuel ratio in which the load and the RPM are used as parameters;

means for reading the basic target air-fuel ratio from the memory to obtain a corrected target air-fuel ratio by calculation,

means for producing a feedback control signal based upon the difference between the target air-fuel ratio and the actual air-fuel ratio based upon said signal produced from said exhaust gas sensor, and

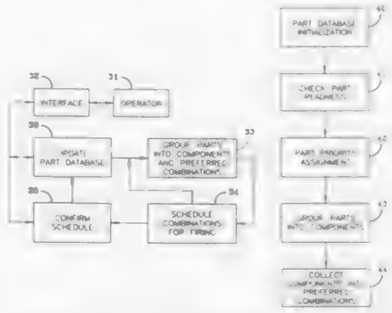
means for producing a signal for adjusting said injection system so as to alter the air-fuel ratio in a series of gradual step like changes depending on the lapse of time and the difference between said detected ratio and said optimum ratio.

5,148,370

EXPERT SYSTEM AND METHOD FOR BATCH PRODUCTION SCHEDULING AND PLANNING

Maria Litt, Cleveland Hts.; Jack C. Chung; Gary G. Leininger, both of Solon, and David C. Bond, University Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 63,183, Jun. 17, 1987, abandoned. This application Jun. 26, 1991, Ser. No. 725,224
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—468 45 Claims



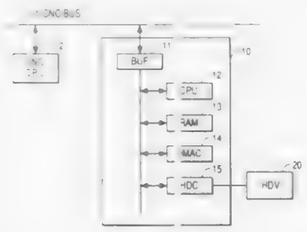
1. A method for batch scheduling and manufacturing of a plurality of parts by at least one parts processor, the parts having a plurality of delivery dates and the parts and parts processor having a plurality of production constraints variable during manufacture, comprising:

creating a knowledge base of select characteristics of the parts processor and parameters of the parts;

generating a plurality of rules expressing a scheduling and planning strategy that substantially satisfies parts delivery dates and meets the production constraints;

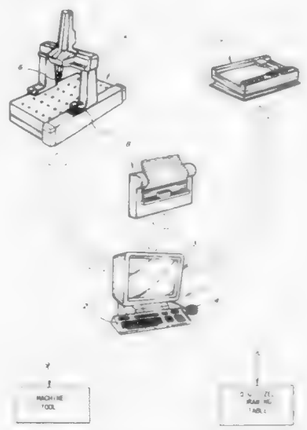
preparing parts for manufacture by the parts processor;
combining parts suitable for simultaneous processing by the parts processor into all possible preferred combinations by applying a first plurality of said rules to said knowledge base;
scheduling said preferred combinations for manufacture in batches by applying a second plurality of said rules to said knowledge base;
collecting a plurality of said prepared parts in a first batch and loading said first batch in the parts processor;
operating said parts processor to at least partially manufacture said first batch and thereafter inspecting said first batch for acceptable manufacture; and,
manufacturing the remaining said preferred combinations in said scheduled batches, including the steps of repeating said step of combining parts suitable for simultaneous processing and said step of scheduling said preferred combinations where said manufacture of parts is unacceptable.

5,148,371
HIGH-SPEED MACHINING SYSTEM
Mitsuo Kurakake, Tokyo, and Jiro Kinoshita, Minamitsuru, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
Continuation of Ser. No. 342,533 filed as PCT/JP88/00876, Aug. 31, 1988, abandoned.
Filed Jun. 20, 1991, Ser. No. 722,402
Claims priority, application Japan, Sep. 2, 1987, 62-220014
Int. Cl.[5] G05B *19/403*
U.S. Cl. 364—474.01 **2 Claims**



1. A method of executing a pulse distribution of a machine program for a numerical control apparatus at high speed, the method comprising:
a) storing the machining program for the numerical control apparatus in a hard disk;
b) transferring the machining program from the hard disk to a RAM of a hard disk control circuit by a direct memory access circuit;
c) converting the machining program into minute amounts of movement for each axis;
d) storing the minute amounts of movement in the RAM;
e) transferring the minute amounts of movement to the numerical control apparatus; and
f) executing a pulse distribution of the minute amounts of movement.

5,148,372
INTERACTIVE GRAPHIC SYSTEM FOR THE MATHEMATICAL REPRESENTATION OF PHYSICAL MODELS
Roberto Maiocco; Luciano Bassadonna, and Renato De Alessi, all of Turin, Italy, assignors to D.E.A. Digital Electronic Automation S.p.A., Turin, Italy
Continuation of Ser. No. 249,803, Sep. 27, 1988, Pat. No. 4,979,224. This application Oct. 6, 1988, Ser. No. 254,351
Claims priority, application Italy, Oct. 6, 1987, 67848 A/87
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.24 **8 Claims**

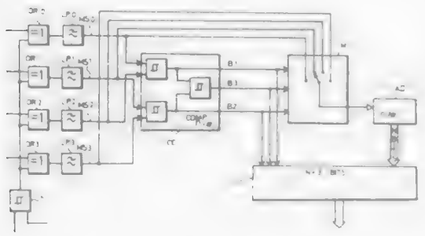


1. An interactive system for the mathematical representation of physical models, characterized by the fact that it comprises at least one measuring robot or machine, means for processing and receiving information on at least initial identification points of said model and for providing automatic signals for the detection of information on additional points on said model by means of said measuring robot or machine, and second means for processing said information to produce said mathematical representation of said model, said means for processing said information including means for mathematically constructing the curves of boundaries approximating the projection of said initial identification points of said model and said additional points, and means for mathematically constructing an extended surface between said boundary curves.

5,148,373
METHOD AND AN ARRANGEMENT FOR ACCURATE DIGITAL DETERMINATION OF THE TIME OR PHASE POSITION OF A SIGNAL PULSE TRAIN
Paul W. Dent, Stehag, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Mar. 30, 1990, Ser. No. 501,766
Claims priority, application Sweden, Apr. 20, 1989, 8901441
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—484 **9 Claims**

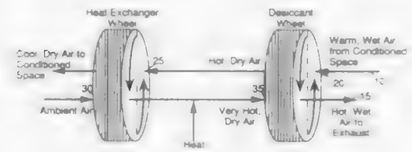
1. A method for accurate digital determination of the time or phase position of a signal pulse-train in a telecommunication system comprising the steps of:
forming a square-wave pulse-train from the signal pulse-train,
comparing the square-wave pulse-train with a plurality of mutually time-displaced square-wave reference signals to form a plurality of new signals having mark/space ratios in dependence on said comparisons;
mutually comparing the plurality of new signals in a MIN of MAX operation to coarsely determine the time or phase position of the signal pulse-train;

selecting the new signal whose mark/space ratio lies nearest to a predetermined mark/space ratio;
converting the selected new signal to digital form;
applying the coarsely determined time or phase position of the signal pulse-train and the digitized selected new signal to a code converter for producing a binary code value representing the time or phase position of the signal pulse-train,



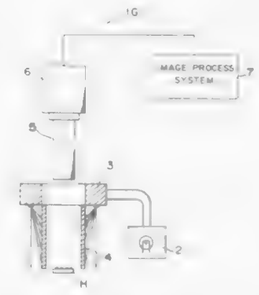
wherein the binary code value can be corrected in respect of systematic deviations resulting from frequency differences among the pulse-train's frequency, the reference signals' frequency and/or a sampling frequency of the pulse-train, by addition/subtraction of a predetermined numerical sequence.

5,148,374
DESICCANT SPACE CONDITIONING CONTROL SYSTEM AND METHOD
James A. Coellner, Philadelphia, Pa., assignor to ICC Technologies, Inc., Philadelphia, Pa.
Filed Jun. 19, 1990, Ser. No. 540,547
Int. Cl.[5] A01D *43/02*
U.S. Cl. 364—505 **12 Claims**



1. A method for controlling a wheel-based fluid medium mass transfer system having controllable fluid flow rates, controllable regeneration fluid flow temperature, controllable regeneration pressure, and controllable wheel rotational speed, comprising the steps of:
(a) sensing at predetermined intervals a predetermined set of operating parameters selected from the group of wheel inlet temperatures, wheel outlet temperatures, fluid stream flow rates, wheel inlet pressures, wheel outlet pressures, and wheel rotational speeds, to produce signals representative of the physical state of said system;
(b) storing said signals as values in the random access memory of a computer;
(c) calculating at least one mass capacity ratio representative of the physical state and efficiency of said system from said stored values;
(d) storing said mass capacity ratio as a value in the random access memory of a computer;
(e) sending a control signal to a predetermined one of a group of control means which respectively control fluid flow rates, regeneration fluid flow temperature, regeneration pressure, and sorbent wheel rotational speed;
(f) repeating steps (a) through (e) and comparing the later-stored mass capacity ratio to the earlier-stored mass capacity ratio to determine whether said later-stored ratio is greater; and
(g) if said later-stored ratio is greater, repeating steps (a) through (f) after said predetermined interval;
(h) if said later-stored ratio is not greater, repeating steps (a) through (f) after said predetermined interval, sending a different control signal in step (e) from that sent in the prior cycle.

5,148,375
SOLDERING APPEARANCE INSPECTION APPARATUS
Kinji Horikami, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 15, 1990, Ser. No. 613,990
Claims priority, application Japan, Nov. 17, 1989, 1-300443
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—552 **4 Claims**



1. A soldering appearance inspection apparatus for detecting a faulty soldering at a soldered portion on a printed circuit board, said inspection apparatus comprising:
illuminating means for illuminating the soldered portion;
image pickup means for picking up an image of the soldered portion; and
image processing means for (1) receiving the image picked up by said image pickup means, effecting a Hough conversion of a differentiation image of the picked up image to obtain a density distribution of the picked up image, and discriminating as a solder edge a location in which the density distribution changes from a region of equal density to a region of non-equal density, (2) determining, from the thus discriminated soldered edge, a region of the soldered portion from the picked up image, (3) determining a ratio of a size of a subregion of the soldered portion in which light illuminated thereon is subjected to regular reflection to a size of the region of the soldered portion, and (4) judging a faulty state of the soldering at the soldered portion based on the thus determined ratio.

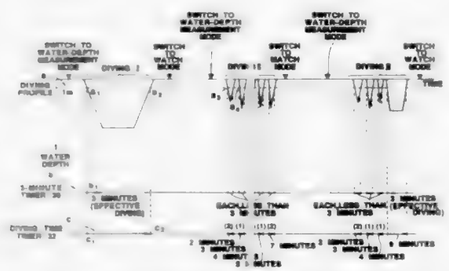
5,148,376
PRESSURE INSTRUMENT WITH DEPTH/ALTITUDE AND TIME DISPLAY
Hiroshi Sato, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 10, 1990, Ser. No. 551,134
Claims priority, application Japan, Jul. 12, 1989, 1-178154; Dec. 19, 1989, 1-145382[U]; Mar. 15, 1990, 2-65708
Int. Cl.[5] G04B *47/06;* **G01F** *23/14;* **G01N** *7/00*
U.S. Cl. 364—558 **35 Claims**

25. A pressure instrument comprising:
pressure detecting means for detecting external pressure outside of the pressure instrument;
externally operated switch means for setting a reference pressure;
reference pressure storing means for storing the reference

pressure which is detected by said pressure detecting means when said switch means is operated;

water-depth data generating means for generating water-depth data corresponding to a difference between the external pressure detected by said pressure detecting means and said reference pressure;

abnormal water-depth data judging means for judging



whether or not water-depth data generated by said water-depth data generating means falls into a predetermined range; and

reference pressure changing means for changing the reference pressure on the basis of pressure detected by said pressure detecting means when said abnormal water-depth data judging means judges that the water-depth data does not fall into the predetermined range.

5,148,377

COORDINATE MEASURING SYSTEM

Gregory J. McDonald, 10/39 Marigold St., Revesby, Australia

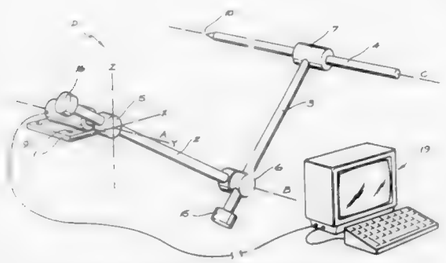
PCT No. PCT/AU87/00420, § 371 Date Jun. 12, 1989, § 102(e) Date Jun. 12, 1989, PCT Pub. No. WO88/04404, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 10, 1987 Ser. No. 378,238

Claims priority, application Australia, Dec. 10, 1986, PH9446

Int. Cl.[5] G01B *21/00*

U.S. Cl. 364—560 **10 Claims**



1. A three-dimensional coordinate measuring system comprising an articulated device including a base member adapted to be fixed to, or relative to, a body relative to which coordinates are to be measured, a first arm rotatable about a first axis relative to the base, a second arm rotatable about a second axis relative to the first arm, a third arm slidingly engaged to said second arm along a third axis, said first, second and third axes being approximately parallel, first second and third electrical pulse generating rotary encoders two of which respectively measuring rotary displacement of the first arm about the base and the second arm about the first arm and the third encoder being driven by a wheel frictionally engaging the third arm with the encoder fixed within the second arm so as to measure relative translation of the third arm relative to the second arm, and a microprocessor held within the base and programmed to collect and retain a set of summed pulsed values being the algebraic sum of pulses initiated by the three rotary encoders since their last initiation, the system further including a host computer communicating with the microprocessor and obtaining therefrom upon request by the host computer, when initiated by a user of the system, the current set of summed pulses values, performing on the set of summed pulsed values a mathematical transformation so as to produce an output being the coordinates of a probe end of the third arm at the time of request of the set of summed pulsed values and wherein the mathematical transformation is modified by a set of error terms so as to produce a coordinate output being electronically corrected in order to correct inaccuracies resulting from non-perfect construction of the articulated device.

7. A coordinate measuring system comprising a device including a plurality of rigid members each attached to another providing a mechanical linkage which includes a base adapted to be fixed relative to an article to be measured and a measurement end movable to points in at least two configurations of the mechanical linkage three-dimensionally about the base, and measuring signal means producing electrical signals indicative of the relative position or orientation of respective adjoining pairs of rigid members, and processing means receiving said signals, maintaining a set of signal values indicating relative positions or orientations of adjoining pairs of rigid members, and on demand initiated by a device user the set of signal values is electronically processed by a mathematical operation by the processing means so as to transform the values into measured coordinates, the mathematical operation including a transformation using mathematical parameters based on nominal dimensions and alignments of the rigid members and modified by a set of programmable error terms,

wherein the error terms modify the transform so as to minimize the summed discrepancy between calculated positional relationships of measured coordinates and their corresponding and actual positional relationship.

5,148,378

SENSOR CONTROLLER SYSTEM

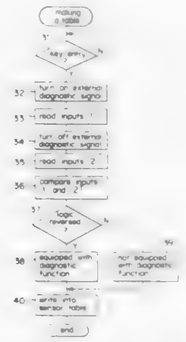
Masahiko Shibayama, Otsu; Hiroichi Kuroda, Nagaokakyo; Seiji Shimada, Kameoka, and Umekichi Kai, Kyoto, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Continuation of Ser. No. 524,317, May 17, 1990, abandoned, which is a continuation of Ser. No. 437,559, Nov. 17, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,713

Claims priority, application Japan, Nov. 18, 1988, 63-292964; Nov. 25, 1988, 63-299079; Nov. 25, 1988, 63-299081

Int. Cl.[5] G06F *15/46;* **G01B** *21/00*

U.S. Cl. 364—571.07 **8 Claims**



1. A sensor controller system, comprising:

a plurality of sensors for producing detection signals;

a sensor controller for receiving outputs from said sensors and producing an evaluation signal for an external circuit;

diagnostic signal generating means for supplying a diagnostic signal to each of the sensors;

storage means for storing a sensor output table listing expected changes in outputs of said sensors when said diagnostic signal is supplied to said sensors; and

sensor evaluation means for evaluating the soundness of each of said sensors by comparing changes in actual outputs from said sensors with said changes in outputs listed in said sensor output table when the diagnostic signal is supplied to the sensor.

5,148,379

METHOD FOR AUTOMATICALLY GENERATING A SIMULATION PROGRAM FOR A PHYSICAL PHENOMENON GOVERNED BY A PARTIAL DIFFERENTIAL EQUATION, WITH SIMPLIFIED INPUT PROCEDURE AND DEBUG PROCEDURE

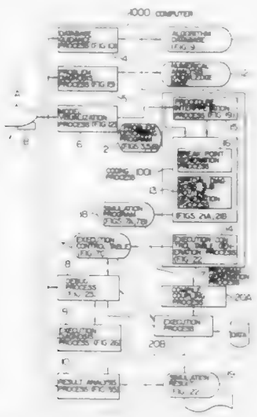
Chisato Konno, Inagi; Ohata: Tadashi, Higashimurayama; Mitsuyoshi Igai, Hino; Yukio Umetani, Hachioji, and Michiru Yamabe, Hino, all of Japan, assignors to Hitachi Ltd. and Hitachi VLSI Engineering Corporation, both of Tokyo, Japan

Filed Nov. 30, 1989, Ser. No. 443,252

Claims priority, application Japan, Dec. 2, 1988, 63-304154

Int. Cl.[5] G06F *15/328*

U.S. Cl. 364—578 **31 Claims**



1. A method for generating a program, by a computer, for simulating a physical phenomenon governed by a partial differential equation, comprising the steps of:

(a) selecting, in response to a set of search keys input by an operator, a desired numerical calculation algorithm scheme from a plurality of numerical calculation algorithm schemes for numerical simulation of physical phenomena governed by partial differential equations, the set of search keys describing attributes of the desired numerical calculation algorithm scheme and being selected by the operator from a plurality of search keys describing attributes of the plurality of numerical calculation algorithm schemes;

(b) selecting a program portion describing the selected numerical calculation algorithm scheme from a plurality of stored program portions describing respective ones of said plurality of numerical calculation algorithm schemes;

(c) inputting a program portion describing at least a region of calculation and a boundary condition, the region of calculation and the boundary condition being designated by the operator; and

(d) generating, from a problem describing program formed by said selected program portion and said input program portion, a simulation program for obtaining, in accordance with said selected numerical calculation algorithm scheme, a solution of the partial differential equation which meets the boundary condition in said region of calculation.

5,148,380

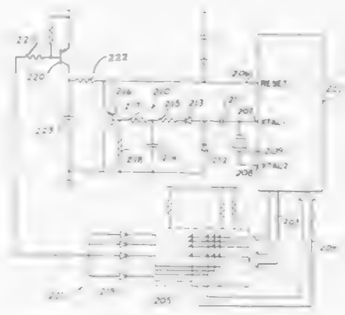
METHOD AND APPARATUS FOR CONSERVING POWER IN A DATA PROCESSING SYSTEM

Steve Lin, Taipei; Keat Kao, Keelung, and Robert Hsu, Taipei Hsien, all of Taiwan, assignors to Acer Incoporated, Taiwan

Filed Aug. 27, 1990, Ser. No. 573,628

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—707 **13 Claims**



1. An apparatus for conserving power in a data processing system, said apparatus comprising:

(a) an oscillator;

(b) a microprocessor connected to the oscillator, the microprocessor having a programmable standby mode and a circuit responsive to said standby mode for disabling the oscillator;

(c) a sensor circuit having an input and an output for generating a reset signal in response to a predefined activity in said processing system to reset said microprocessor from said standby mode, the input coupled to receive a signal indicating a predefined activity, and the output coupled to the microprocessor; and

(d) a signal generator having a generator input and a generator output, said signal generator responsive to signals from said oscillator for disabling said reset signal, the generator input coupled to the oscillator and the generator output coupled to the microprocessor.

5,148,381

ONE-DIMENSIONAL INTERPOLATION CIRCUIT AND METHOD BASED ON MODIFICATION OF A PARALLEL MULTIPLIER

David L. Sprague, Trenton, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 7, 1991, Ser. No. 651,738

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—723 **42 Claims**

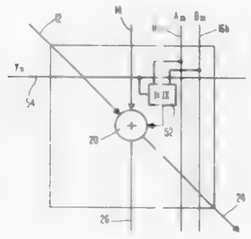
1. An interpolator having means for receiving a first input value having first input value bits, a second input value having second input value bits, and an interpolation weight term having interpolation weight bits, to interpolate said first and second input values and provide an interpolation output value, said interpolator being formed of a plurality of interpolator cells, each interpolation cell having summing means for providing a summing means output value in accordance with summing means input values applied to said summing means, comprising:

respective selection means coupled to each of said summing means for receiving a first input value bit, a second input value bit, and an interpolation weight bit to provide a selected output signal representative of a selected one of

said first and second input value bits in accordance with said interpolation weight bit;

means for applying said selected output signal to said summing means to provide a summing means output value representative of said interpolation output value; and,

a one-dimensional interpolator array of said interpolator



cells arranged in array rows and array columns, an array row having a plurality of horizontally adjacent interpolator cells and an array column having a plurality of vertically adjacent interpolator cells, and an interpolator cell having diagonally adjacent interpolator cells wherein a diagonally adjacent interpolator cell is disposed in a differing array row and in a differing array column.

5,148,382

INFINITE IMPULSE RESPONSE DIGITAL FILTER

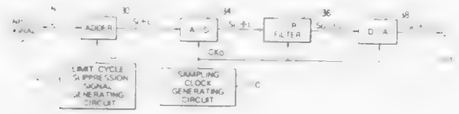
Takahiko Kishi, Tokyo, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,155

Claims priority, application Japan, Jun. 8, 1989, 1-146478

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—724.03 **5 Claims**



1. A digital filter comprising:

an IIR digital filter;

limit cycle suppression signal generating means for generating an AC limit cycle suppression signal whose amplitude level is larger than a critical input amplitude level in a dead band range due to occurrence of zero-input limit cycle; and

adding (subtracting) means for adding (subtracting) an input signal to be supplied to the IIR digital filter and the limit cycle suppression signal and for inputting the addition (subtraction) result signal to the IIR digital filter through a digitalization.

5,148,383

DIGITAL TRANSVERSAL FILTER

Kevin A. Jaeger, Glen Ellen, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1990, Ser. No. 631,825

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—724.16 **19 Claims**

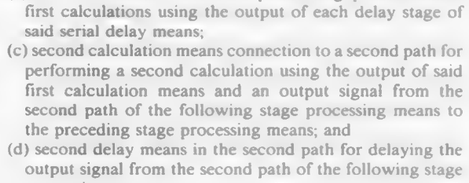
1. A digital transversal filter comprising:

first and second delay lines, each having a data input terminal, a clock input terminal and a plurality of stages, wherein, for each of the delay lines, at least two adjacent stages of the respective delay line are clocked by a clock signal applied to the respective clock input terminal to shift digital data through the respective delay line, at least selected stages of the delay line each providing a respective output;

means for applying a digital data signal to the data input terminal of the first delay line;

means for phase shifting the digital data signal to form a phase shifted digital data signal and applying the phase shifted digital data signal to the data input terminal of the second delay line;

means for applying first and second clock signals to the clock input terminals of the first and second delay lines, respectively, wherein the first and second clock signals



correspond in frequency but differ in phase with respect to one another;

means for weighting the outputs of the stages of the first and second delay lines; and

means for summing the weighted outputs of the stages of the first and second delay lines to synthesize a summed output;

said first mentioned digital data signal having a data clocking rate, said first and second clock signals having a delay line clocking rate, and said data clocking rate being slower than said delay line clocking rate.

5,148,384

SIGNAL PROCESSING INTEGRATED CIRCUIT

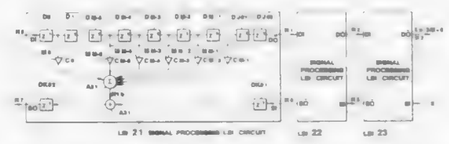
Yuji Ikegaya; Shinichi Sakai; Yuji Kakubo, and Yusuke Konagai, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Aug. 2, 1990, Ser. No. 561,914

Claims priority, application Japan, Aug. 4, 1989, 1-202634

Int. Cl.[5] G06F *15/336*

U.S. Cl. 364—728.01 **4 Claims**



1. A signal processing integrated circuit for carrying out convolution calculations made up of a plurality of processing means for signal processing, each being cascade-connected to a preceding stage and a following stage processing means to thereby form at least two inner data paths each having a reverse flow direction, wherein each of the processing means comprises:

(a) delay means having multiple delay stages in a first data path for delaying an information signal;

(b) first calculation means for performing predetermined first calculations using the output of each delay stage of said serial delay means;

(c) second calculation means connection to a second path for performing a second calculation using the output of said first calculation means and an output signal from the second path of the following stage processing means to the preceding stage processing means; and

(d) second delay means in the second path for delaying the output signal from the second path of the following stage processing means

wherein

a) the first data path of each processing means produces a first output signal;

b) the second path of each processing means has an input for receiving a second input signal and an output for providing a second output signal and the second signal applied to the input of the second path of the final stage processing means has a value of zero; and

each processing means further comprises:

c) output delay means for delaying the first output signal by a predetermined delay interval; and

d) calculation signal delay means for delaying signals in the second path between the input of the second path and the second calculation means and between the second calculation means and the output of the second path by a total delay interval equal to the predetermined delay interval.

5,148,385

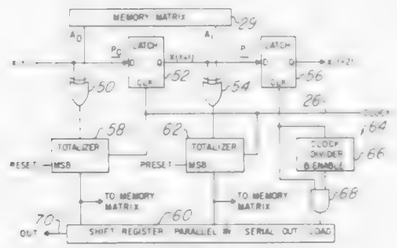
SERIAL SYSTOLIC PROCESSOR

Gary A. Frazier, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 10,619, Feb. 4, 1987, abandoned. This application Jun. 14, 1991, Ser. No. 715,721

Int. Cl.[5] G06F *15/336, 7/38*

U.S. Cl. 364—728.07 **29 Claims**



1. A digital computational device, comprising:

a digital memory for storing a plurality of digital coefficients, said memory arranged into rows and columns, and including a plurality of outputs through which a selected row of said coefficients can be simultaneously read;

means for establishing in said memory coefficients corresponding to an autocorrelation matrix;

a plurality of logic circuits, each having a first input and an output, said first inputs and outputs thereof being connected together such that said logic circuits are series connected to process a serial data stream of plural data elements, each of said logic circuits further including a second input connected to a respective said output of said memory;

means for clocking said memory and said logic circuits so that the data elements of said data stream are serially shifted through said logic circuits and said coefficients are read from said memory, whereby said coefficients and each said data element can be processed by said logic circuits to perform associative memory functions;

wherein each of said logic circuits includes a shift register means for shifting said data elements from the first input thereof to the output thereof in response to said clocking means;

wherein said shift register means shifts the data elements through each of said logic circuits without changing said data elements;

further including means for performing a digital computational of the data elements and said digital coefficients output by said memory; and

wherein said means for performing performs an EXCLUSIVE-OR function.

5,148,386

ADDER-SUBTRACTER FOR SIGNED ABSOLUTE VALUES

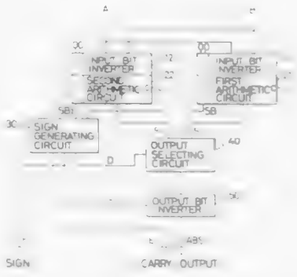
Chikaharo Hori, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 5, 1990, Ser. No. 533,146

Claims priority, application Japan, Jun. 6, 1989, 1-142233

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—768 **12 Claims**



1. An adder-subtracter for signed absolute values in which addition or subtraction of signed absolute values is executed in two's complement representation form and an executed result is output as a signed absolute value, the adder-subtracter comprising:

a first arithmetic circuit for executing an ordinary subtractive operation in said two's complement representation form in which 1 is added to an addition result between an invverted subtrahend and a minuend in subtraction;

a second arithmetic circuit for executing addition between an inverted subtrahend and a minuend in subtraction without adding 1 to an executed result;

a sign-generating circuit, coupled to said first and second arithmetic circuits, for determining a sign of a subtraction result in said first arithmetic circuit and said second arithmetic circuit;

an output-selecting circuit for selecting either one of two outputs from said first and second arithmetic circuits, according to an output from said sign-generating circuit; and

an output inverter for executing bit-inversion of an output from said output-selecting circuit, according to another output from said sign-generating circuit.

5,148,387

LOGIC CIRCUIT AND DATA PROCESSING APPARATUS USING THE SAME

Kazuo Yano, Hachioji; Koichiro Ishibashi, Tokyo; Tetsuya Nakagawa, Koganei; Katsuhiro Shimohigashi, Musashimurayama, and Osamu Minato, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1990, Ser. No. 480,674

Claims priority, application Japan, Feb. 22, 1989, 1-040228

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—784 **8 Claims**

1. A logic circuit, comprising:

(1) first to sixth switching elements, each of which includes a first electrode, a second electrode and a control input electrode and in each of which electrical conduction and non-conduction between said first electrode and said second electrode are controlled in dependence on the signal levels supplied to said control input electrode; and

(2) first to fifth nodes;

wherein a current path between said first electrode and said second electrode of said first switching element is connected between said first node and said third node,

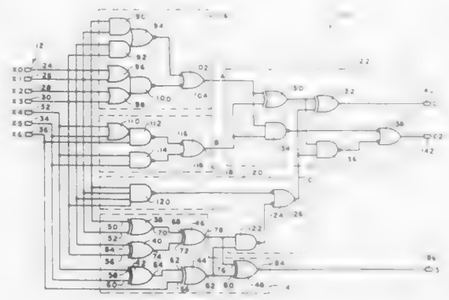
wherein a current path between said first electrode and said

second electrode of said second switching element is connected between said first node and said fourth node,
wherein a current path between said first electrode and said second electrode of said third switching element is connected between said second node and said third node,
wherein a current path between said first electrode and said second electrode of said fourth switching element is connected between said second node and said fourth node,
wherein a current path between said first electrode and said second electrode of said fifth switching element is connected between said third node and said fifth node,
wherein a current path between said first electrode and said second electrode of said sixth switching element is connected between said fourth node and said fifth node,
wherein a first input signal is supplied to said first node,

wherein a second input signal is supplied to said control input electrode of said first switching element and to said control input electrode of said fourth switching element,
wherein a signal having a phase opposite to that of said second input signal is supplied to said control input electrode of said second switching element and to said control input electrode of said third switching element,
wherein a third input signal is supplied to said second node,
wherein one signal selected from said first, second and third input signals is supplied to said control input electrode of said fifth switching element,
wherein a signal having a phase opposite to that of said signal supplied to said control input electrode of said fifth switching element is supplied to said control input electrode of said sixth switching element; and
wherein a signal related to said first, second and third input signals is generated from said fifth node.

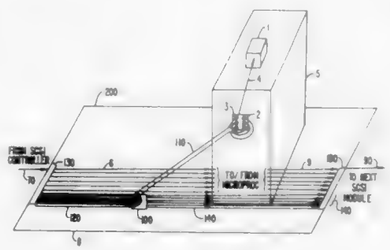
5,148,388
7 TO 3 COUNTER CIRCUIT
Vijay Parmar, and Mayur Mehta, both of Austin, Tex., assignors to Advanced Micro Devices, Inc. Sunnyvale, Calif.
Filed May 17, 1991, Ser. No. 702,594
Int. Cl.[5] G06F *7/50*
U.S. Cl. 364—786 **10 Claims**

1. A 7 to 3 counter for adding seven digital inputs all having a weight X and providing a three-bit sum of said inputs including a sum bit having a weight X a first carry bit having a weight 2X and a second carry bit having a weight 4X, said counter comprising:
input means consisting of seven inputs arranged in consecutive order for receiving a binary 1 or a binary 0 input signal level at each of said inputs;
first circuit means coupled to all said inputs and including a sum output for providing at said sum output said sum bit responsive to the binary levels of said inputs;
second circuit means coupled to the first four inputs of said inputs and including a first intermediate carry output for providing a first intermediate carry bit at said first intermediate carry output responsive to the binary levels of said first four inputs;
third circuit means coupled to the last three inputs of said inputs and including a second intermediate carry output for providing a second intermediate carry bit at said second intermediate carry output responsive to the binary levels of said last three inputs;



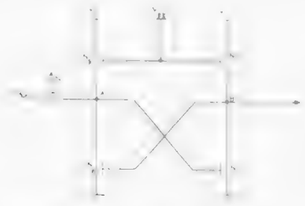
fourth circuit means coupled to all said inputs and including a third intermediate carry output for providing a third intermediate carry bit at said third intermediate carry output responsive to the binary levels of said inputs; and
full adder means coupled to said first, second, and third intermediate carry outputs and including a first carry output and a second carry output for providing said first carry bit at said first carry output and said second carry bit at said second carry output responsive to the binary levels of said first, second, and third intermediate carry bits.

5,148,389
MODULAR EXPANSION BUS CONFIGURATION
Jodie K. Hughes, San Jose, Calif., assignor to Convergent Technologies, Inc., San Jose, Calif.
Filed Apr. 5, 1988, Ser. No. 177,704
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—800 **8 Claims**



1. A modular computer system comprising:
a controller module;
a bus connected to said controller module;
a plurality of serially connected expansion modules coupled to said bus following said controller module,
each said expansion module having address input means for receiving a bus address from a preceding module, means for generating a next module address from the address supplied to the address input means, and address output means for supplying the next module address to the bus for receipt by a next succeeding module,
said controller module including means for generating the bus address of a first one of said plurality of serially connected modules, and address output means for coupling the first module address to the bus for receipt by said first one of said plurality of serially connected modules whereby the address of the first one of said modules is generated by said controller and the addresses of the remaining ones of said expansion modules are each generated by a preceding expansion module.

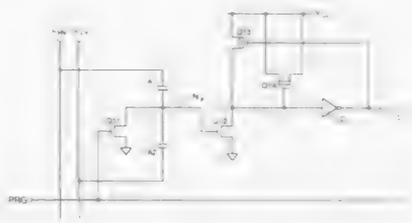
5,148,390
MEMORY CELL WITH KNOWN STATE ON POWER UP
Hung-Cheng Hsieh, Sunnyvale, Calif., assignor to XILINX, Inc., San Jose, Calif.
Continuation of Ser. No. 544,071, Jun. 26, 1990, abandoned, which is a continuation of Ser. No. 328,840, Mar. 17, 1989, abandoned, which is a division of Ser. No. 201,509, Jun. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 777,670, Sep. 19, 1985, Pat. No. 4,750,155. This application May 24, 1991, Ser. No. 707,264
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—95 **12 Claims**



1. A memory circuit comprising:
a first memory transistor and a second memory transistor;
a first load transistor and a second load transistor;
each of said memory and load transistors having a channel, a gate, a source, and a drain, said gate controlling conductivity of said channel between said source and said drain;
means for connecting said drain of said first memory transistor, said drain of said first load transistor, and said gate of second memory transistor together;
means for connecting said drain of said second memory transistor, said drain of said second load transistor, and said gate of said first memory transistor together;
means for connecting said gates of said first and second load transistors to a first voltage supply;
means for connecting said sources of said first and second load transistors to a second voltage supply;
means for connecting said sources of said first and second memory transistors to a third voltage supply;
wherein a threshold voltage of said first load transistor is selected to be sufficiently lower than a threshold voltage of said second load transistor that upon power-up said drain of said first memory transistor provides a logical one and said drain of said second memory transistor provides a logical zero;
said channel of said first load transistor being doped less heavily than said channel of said second load transistor.

5,148,391
NONVOLATILE, ZERO-POWER MEMORY CELL CONSTRUCTED WITH CAPACITOR-LIKE ANTIFUSES OPERABLE AT LESS THAN POWER SUPPLY VOLTAGE
Paul S. Zagar, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Feb. 14, 1992, Ser. No. 837,175
Int. Cl.[5] G41C *17/00*
U.S. Cl. 365—96 **31 Claims**

1. A one-time, shortable-element programmable, nonvolatile, zero-power memory cell comprising:
a programmable node;
a first antifuse connected between said programmable node and a high-voltage line, said high-voltage line being at a potential during normal operation which is less than a power supply voltage, said power supply voltage being equivalent to a high CMOS logic level;
a second antifuse connected between said programmable node and a low-voltage line, said low-voltage line being at



a potential during normal operation which corresponds to ground potential;
a first field-effect transistor (FET) through which said programmable node may be set to ground potential; and
a voltage translator circiut for converting the voltages at said programmable node to CMOS low and high logic levels

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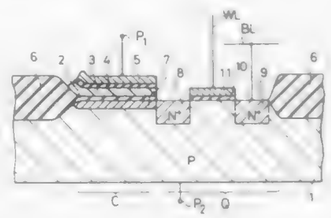
5,148,392
SEMICONDUCTOR MEMORY DEVICE
Tetsuro Matsumoto, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 448,357, Dec. 11, 1989, which is a continuation of Ser. No. 174,974, Mar. 29, 1988, Pat. No. 4,887,237, which is a division of Ser. No. 925,223, Oct. 31, 1986, Pat. No. 4,740,920, which is a division of Ser. No. 530,079, Sep. 7, 1983, Pat. No. 4,638,460. This application Feb. 1, 1991, Ser. No. 649,499
Claims priority, application Japan, Sep. 22, 1982, 57-163888
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—149 **12 Claims**



1. A semiconductor memory device comprising:
a dynamic memory cell which includes a series connection comprising a switching MISFET and a storage capacitor coupled in series, said storage capacitor comprising a first electrode, a silicon oxide film formed over said first electrode, a film which is formed over said silicon oxide film and which has higher permittivity than said silicon oxide film, a second silicon oxide film formed over said high permittivity film, and a second electrode formed over said second silicon oxide film;
a bit line which is coupled to one end of said series connection and which supplies a signal voltage having a predetermined maximum value V_H and a predetermined minimum value V_L to said dynamic memory cell; and
a terminal which is coupled to another end of said series connection and which supplies a voltage substantially equal to $(V_H+V_L)/2$ to said another end of said series connection so that a voltage applied across said first elec-

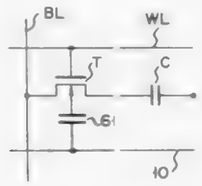
trode and said second electrode will be as small as possible relative to both V_H and V_L.

5,148,393

MOS DYNAMIC SEMICONDUCTOR MEMORY CELL

Tohru Furuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 6, 1989, Ser. No. 375,909
Claims priority, application Japan, Jul. 7, 1988, 63-169930
Int. Cl.[5] G11C 7/00, 11/407
U.S. Cl. 365—149 11 Claims



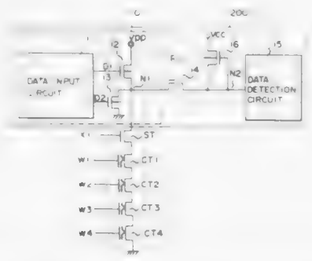
1. A semiconductor memory comprising:
a bit line and a word line;
a substrate potential line;
a memory cell including a capacitor element, and a MOS transistor having a drain, a source, a gate, and a back gate, one of said drain and said source being connected to said capacitor element, the other of said drain and said source being connected to said bit line, said gate being connected to said word line, and said back gate being connected to said substrate potential line; and
a potential switching device, connected to said substrate potential line, for selectively switching a potential of said back gate of said MOS transistor.

5,148,394

ELECTRICALLY PROGRAMMABLE NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH NAND CELL STRUCTURE

Hiroshi Iwahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 212,699, Jun. 28, 1988, Pat. No. 5,008,856. This application Apr. 16, 1991, Ser. No. 685,650
Int. Cl.[5] G11C 11/40
U.S. Cl. 365—185 25 Claims



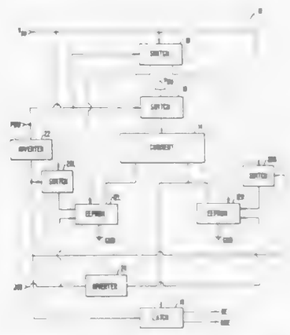
1. A nonvolatile semiconductor memory device comprising:
a memory cell array comprising memory cells arranged in matrix form having row lines and column lines, each memory cell including cell transistors connected in series, and each of the cell transistors having a control gate, a floating gate, a channel region and an insulation film between the floating gate and the channel region, for electrically storing data by using charges stored in the floating gate, each memory cell having a first terminal and a second terminal, the first terminals of the memory cells in the same column being commonly connected to one of the column lines, the second terminals of the memory cells being connected to a reference potential, and the control gates of the cell transistors in the same row being commonly connected to one of the row lines;
row selection means for selecting one of the row lines in response to a row selection signal;
column selection means for selecting one of the column lines in response to a column selection signal; and
data programming means for selectively storing data into the cell transistors by one of injecting electrons through the insulation film into the floating gate by utilizing a tunnel effect, and emitting electrons through the insulation film from the floating gate by utilizing a tunnel effect.

5,148,395

DUAL EEPROM CELL WITH CURRENT MIRROR DIFFERENTIAL READ

David K. Sowards, Santa Clara, Calif., assignor to Exar Corporation, San Jose, Calif.

Filed Apr. 26, 1989, Ser. No. 343,974
Int. Cl.[5] G11C 16/04
U.S. Cl. 365—185 2 Claims



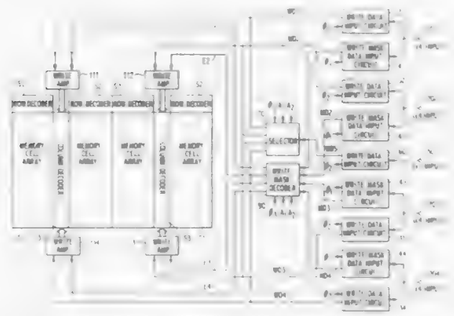
1. An EEPROM memory device comprising:
a. a first EEPROM transistor block having at least one EEPROM transistor, said at least one transistor having a source, drain, and gate;
b. a second EEPROM transistor block having at least one EEPROM transistor, said at least one transistor having a source, drain, and gate;
c. a current mirror having a first leg coupled to the source of said at least one EEPROM transistor in the first EEPROM transistor block and a second leg coupled to the source of the EEPROM transistor in the second EEPROM transistor block;
d. means, coupled to at least one of the legs of the current mirror, for detecting a voltage difference between the EEPROM transistor blocks;
e. first switching means, coupled to the gate of each of the EEPROM transistors, for charging one of the EEPROM transistor blocks;
f. second switching means, coupled to the drain of each of the EEPROM transistors, for discharging the other EEPROM transistor block not charged by said first switching means;
g. means for disabling the current mirror; and
h. first input means, coupled to the means for disabling the current mirror, for indicating when the current mirror should be disabled, wherein said first input means is also coupled to the first switching means for indicating when the first switching means should be activated to allow charging of a selected EEPROM transistor block.

5,148,396

SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY ENABLING MEMORY WRITE MASKING

Kazuhiro Nakada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1990, Ser. No. 485,693
Claims priority, application Japan, Feb. 27, 1989, 1-45824
Int. Cl.[5] G11C 7/00, 8/00
U.S. Cl. 365—189.03 4 Claims



1. A semiconductor memory device operable in a one-bit input and output mode as well as multi-bit input and output mode, and for execution of a memory write masking function, said semiconductor memory device comprising:
a memory cell array subdivided spatially into a plurality of memory cell array parts;
a plurality of write amplifiers for operatively performing a data write operation to said memory cell array, the number of write amplifiers included being equal to that of the number of said memory cell array parts, and the write amplifiers being arranged in the vicinity of the respective memory cell array parts;
a plurality of write data lines, each being connected to one of said write amplifiers for supplying a write data thereto;
a plurality of write amplifier enable signal lines, each being connected to one of said write amplifiers for controlling the activation of said write amplifier;
receiving means for receiving external write mask data designating a write mask for each bit at the time of said multi-bit input and output mode configuration;
supply means, connected to said receiving means and said write amplifier enable signal line, for supplying said external write mask data received by said receiving means to said write amplifier enable signal lines at the time of said multi-bit input and output mode configuration, said supply means being arranged in the vicinity of said receiving means, said supply means including selection means for selecting one of said write amplifier enable signal lines at the time of said one-bit input and output mode configuration and for outputting said write mask data to said write amplifier enable signal lines at the time of said multi-bit input and output mode configuration, said selection means including a write mask decoder which decodes external address signals and activates one of said write amplifier enable signal lines at the time of said one-bit input and output mode configuration, and outputs said write mask data from said receiving means to said write amplifier enable signal lines at the time of said multi-bit input and output mode configuration; and
means for receiving a control signal for designating the difference between said one-bit input and output mode configuration and said multi-bit input and output mode configuration.

5,148,397

SEMICONDUCTOR MEMORY WITH EXTERNALLY CONTROLLED DUMMY COMPARATOR

Hitoshi Kokubun, Tokyo, Japan, assignor to Oki Electric Industry Co. Ltd., Japan

Continuation-in-part of Ser. No. 492,946, Mar. 13, 1990, abandoned. This application Mar. 4, 1991, Ser. No. 664,404
Claims priority, application Japan, Mar. 16, 1989, 1-64198
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—189.07 22 Claims

1. A method for evaluating a memory cell of a semiconductor memory device, the method comprising the steps of:
preparing the semiconductor memory device employing the memory cell and a dummy cell, said memory device having an input terminal coupled to the dummy cell, said memory and dummy cells each having a respective gate electrode, the gate electrode of said dummy cell being coupled to said input terminal;
writing a logic ZERO into the memory cell;
applying a first voltage to the gate electrode of the memory cell so that the memory cell develops a first current therein;
externally applying a second voltage to the gate electrode of the dummy cell through said input terminal so that the dummy cell develops a second current therein; and
externally increasing the value of the second voltage until the second current just exceeds the first current at a first time, whereby the value of the second voltage at the first time can be obtained as a characteristic value of the memory cell of the semiconductor memory.

5,148,398

SEMICONDUCTOR MEMORY DEVICE WITH BUILT-IN TEST CIRCUIT AND METHOD FOR TESTING THE SAME

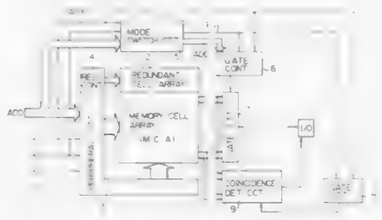
Tohru Kohno, Chiba, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 3, 1990, Ser. No. 553,027
Claims priority, application Japan, Jul. 4, 1989, 1-171283
Int. Cl.[5] G11C 13/00
U.S. Cl. 365—201 15 Claims

1. A semiconductor memory device having normal and test modes, comprising:
a memory cell array divided into a plurality of memory blocks each having memory cells arranged in rows and columns;
write/read control circuit operatively connected to said memory cell array and responsive to external address signals and control signals, for writing identical data in each of said memory cells of said memory cell array and, in said test mode, for simultaneously reading data of one bit from each of said plurality of memory blocks.
a gate circuit operatively connected to said memory cell array, for passing, under given conditions, data of a plural-

ity of bits read from said plurality of memory blocks in said test mode;

a test circuit operatively connected to said memory cell array, write/read control circuit and gate circuit, a) for detecting coincidence or non coincidence of a plurality of



said simultaneously read bits, b) for outputting a result of the detection and c) when the result is the non-coincidence, for controlling said gate circuit to sequentially output said plurality of bits bit by bit; and

terminal means for outputting the plurality of sequentially output bits.

5,148,399

SENSE AMPLIFIER CIRCUITRY SELECTIVELY SEPARABLE FROM BIT LINES FOR DYNAMIC RANDOM ACCESS MEMORY

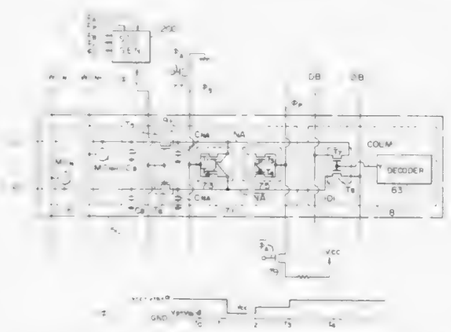
Shizuo Cho, and Junichi Suyama, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 372,880, Jun. 28, 1989, abandoned. This application May 31, 1991, Ser. No. 709,808

Claims priority, application Japan, Jun. 28, 1988, 63-159768

Int. Cl.[5] G11C *11/407*

U.S. Cl. 365—205 **11 Claims**



1. An integrated circuit memory device comprising:

a memory cell for storing data therein in the form of either a logic ONE or ZERO level;

a sense amplifier having first and second sense amplifier nodes for sensing the data stored in said memory cell in a sense operation;

a word line for selecting said memory cell at a given time prior to the sense operation;

a pair of first and second bit lines on which a potential is maintained at a predetermined precharge potential substantially in the middle of a power source potential level and a ground potential level prior to the given time;

said memory cell being coupled to said first bit line to change the potential on said first bit line from the predetermined precharge potential in accordance with the data stored therein when said memory cell is selected by said word line;

a first transistor for selectively coupling said first bit line with said first sense amplifier node, said first transistor having a first gate electrode and having a potential threshold;

a second transistor for selectively coupling said second bit line with said second sense amplifier node, said second transistor having a second gate electrode and having said potential threshold; and

a voltage applying circuit for commonly applying a first voltage to the first and second gate electrodes, the first voltage having a magnitude, less than the power source potential level and between a potential corresponding to said potential threshold and a potential equal to the sum of the potential corresponding to said potential threshold and the precharge potential at the beginning of the sense operation, so that said first transistor is operative to decouple the first sense amplifier node from said first bit line when said memory cell stores the logic ONE level while said second transistor connects the second sense amplifier node with said second bit line, and said second transistor is operative to decouple the second sense amplifier node from said second bit line when said memory cell stores the logic ZERO level while said first transistor connects the first sense amplifier node with said first bit line.

5,148,400

SEMICONDUCTOR MEMORY CIRCUIT HAVING AN IMPROVED RESTORING CONTROL CIRCUIT

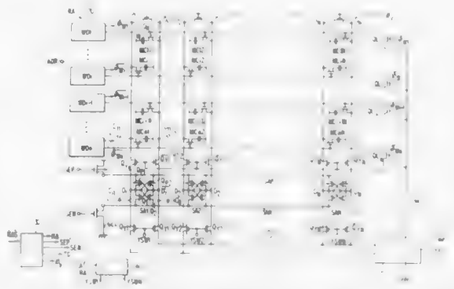
Takeo Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 451,688, Dec. 18, 1989, abandoned. This application Jan. 23, 1991, Ser. No. 644,865

Claims priority, application Japan, Dec. 16, 1988, 63-317827

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—222 **8 Claims**



1. A semiconductor memory circuit, comprising: means for receiving a control signal which assumes a first level during a first period from a first time point to a second time point and a second level during the second period, a pair of bit lines, a plurality of word lines intersecting with said bit lines, a plurality of dynamic type memory cells coupled to said bit lines and said word lines, a word selection circuit for operatively selecting one of said word lines, a sense amplifier having a pair of sense nodes, said sense amplifier operatively amplifying potentials at said sense nodes to high and low voltages respectively, a pair of transfer gates coupled between said pair of bit lines and said pair of sense nodes, an equalize circuit for operatively setting said pair of bit lines at a predetermined voltage, a selective output circuit coupled to said pair of sense nodes for operatively generating an output signal, and a control circuit responsive to said control signal for controlling said word selection circuit, said pair of transfer gates, said sense amplifier, said equalizer circuit and said selective output circuit such that said equalizing circuit is disenabled first after said first time point and thereafter said word selection circuit and said pair of transfer gates are sequentially enabled and disenabled, respectively, and subsequently said sense amplifier is enabled and thereafter said selective output circuit is enabled before said second time point, and after said second time point said pair of transfer gates are enabled and thereafter said word selection circuit and said sense amplifier are disenabled and thereafter said equalize circuit is enabled.

5,148,401

DRAM WITH SPLIT WORD LINES

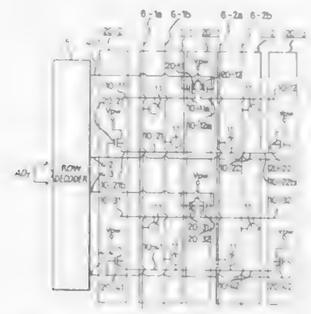
Yoshimasa Sekino, and Yoshihiro Murashima, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 473,928, Feb. 1, 1990, abandoned. This application Sep. 18, 1991, Ser. No. 762,548

Claims priority, application Japan, Feb. 2, 1989, 1-24242

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—230.03 **41 Claims**



20. A dynamic random access memory of a split word line configuration, comprising:

first and second memory cell arrays having first sides adjacent each other and second sides opposite each other;

word lines extending through the first and the second memory cell arrays, each word line being split into first and second sections aligned with each other, respectively extending through the first and the second memory cell arrays, and having inner and outer ends, the inner ends being adjacent to each other and the outer ends opposite each other;

a first block of word line drive transistors provided between said first side of the first and the second memory cell arrays;

a second block of word line drive transistors disposed adjacent said second side of the first memory cell array; and

a third block of word line drive transistors disposed adjacent said second side of the second memory cell array;

the first and the second sections of the word lines in said first memory cell array and said second memory cell array alternate in a sequence having inner ends extending into said first block of word line drive transistors and being connected to the word line drive transistors provided therein, and having said outer ends of the first and the second sections of the word lines in said first memory cell array and said second memory cell array extending into said second block of word line drive transistors and said third block of word line drive transistors, respectively, and being connected to the word line drive transistors provided therein.

5,148,402

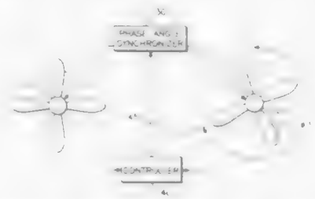
METHOD FOR REDUCING AIRCRAFT CABIN NOISE AND VIBRATION

Bernard Magliozzi, West Suffield, and Frederick B. Metzger, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1990, Ser. No. 633,719

Int. Cl.[5] H04R *27/00*; **B64C** *11/50*

U.S. Cl. 364—574 **8 Claims**



1. A method for phase synchronizing the rotation of a first propeller and a second propeller of an aircraft, each of said propellers having N number of blades, so as to reduce both noise and vibration in the passenger cabin of the aircraft, said method comprising:

a. selecting as a first phase angle, $\phi 1$, that phase angle offset between the blades of said first propeller and the blades of said second propeller lying in the range from 0 to less than 360/N degrees at which minimum cabin noise is generated;

b. selecting as a second phase angle, $\phi 2$, that phase angle offset between the blades of said first propeller and the blades of said second propeller lying in the range from 0 to less than 360 degrees at which minimum cabin vibration is generated;

c. determining a third phase angle, $\phi 3$, selected from the group of the N phase angles defined by $\phi 1 + K(360/N)$, wherein K ranges in integer steps from 0 to N−1, for which the absolute value of the difference between $\phi 3$ and $\phi 2$ is minimum; and

d. maintaining the phase angle offset between the blades of the first propeller and the blades of the second propeller about equal to the phase angle $\phi 3$.

5,148,403

PRODUCTION OF PRERECORDED TAPE CASSETTES

John P. Gardner, Glos, United Kingdom, assignor to Sony Magnescale, Inc., Tokyo, Japan

Continuation of Ser. No. 150,060, Jan. 29, 1988, abandoned. This application Jul. 16, 1991, Ser. No. 731,290

Claims priority, application United Kingdom, Jan. 29, 1987, 8701983; Sep. 10, 1987, 8721314; Nov. 20, 1987, 8727275; Dec. 24, 1987, 8730168

Int. Cl.[5] G11B *3/86*

U.S. Cl. 360—15 **39 Claims**

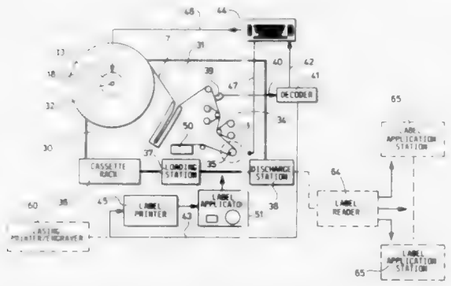
1. A method of recording magnetic video tape for subsequent loading into cassettes, comprising:

transporting said video tape in a first tape transport direction,

recording programme signals representing programme material along sections of tape while being transported in said first tape transport direction,

recording data signals representing data related to said programme material along the synchronisation track of the said video tape immediately after recording the programme material to which said data signals relate, said data signals being recorded between successive said programme signals while said tape is being transported in said first tape transport direction, said data signals being in the form of asynchronous modulation of the regularly occurring video synchronisation signal of the video synchronisation track such that when said tape is transported in a

tape transport direction opposite said first tape transport direction said data signals are detectable by transducer means to generate signals representative of said programme material recorded on the immediately following section of tape.



5,148,404

TRANSPONDER AND METHOD FOR THE PRODUCTION THEREOF

Henk Hilferink, Diepenheim; Anne A. Tip, Hengelo, and Henk Velten, Enter, all of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 9, 1991, Ser. No. 773,837

Claims priority, application Netherlands, Oct. 9, 1990, 9002191

Int. Cl.[5] H04B *1/59*

U.S. Cl. 367—2 **12 Claims**

1. Transponder comprising a closed glass casing in which electrical components are placed, characterised in that the glass incorporates iron oxide.

5,148,405

METHOD FOR MONITORING ACOUSTIC EMISSIONS

Ronald M. Belchamber, Berkshire; Derek Brister; Michael P. Collins, both of Middlesex; John Hill, Surrey, all of United Kingdom; Robert Watkins, Leidschendam, Netherlands, and Douglas G. Wood, Berkshire, England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 716,430, Jun. 17, 1991, abandoned. This application Feb. 10, 1992, Ser. No. 833,572

Claims priority, application United Kingdom, Jun. 27, 1990, 9014251

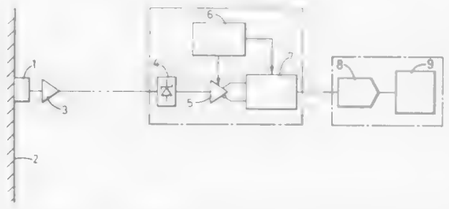
Int. Cl.[5] G01N *29/02*

U.S. Cl. 367—13 **8 Claims**

1. A non-intrusive method for the determination of characteristics of slug flow in a multiphase flow pipeline wherein the method comprises the steps of:

(a) detecting the acoustic emissions from the pipeline in the ultrasonic frequency range by means of at least one sound transducer, the output from which is an analogue electrical signal, wherein the transducer is in direct contact with the external wall of the pipeline,

(b) converting the analogue signal to a digital signal, and



(c) analyzing the digital signal to determine the characteristics of the slug flow.

5,148,406

METHOD FOR SIMULTANEOUS COLLECTION OF SEISMIC DATA FROM SHALLOW AND DEEP TARGETS

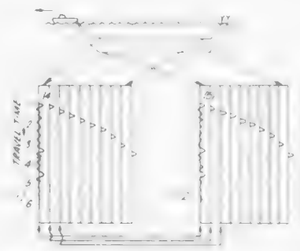
Munday Brink, Drammen, and Jan Gateman, Lysaker, both of Norway, assignors to Geco A.S., Stavanger, Norway

Filed May 25, 1990, Ser. No. 528,213

Claims priority, application Norway, May 31, 1989, 892209

Int. Cl.[5] G01Y *1/24, 1/38*

U.S. Cl. 367—22 **8 Claims**



1. In a method for simultaneous collection of seismic data of shallow and deep targets, wherein at least two seismic streamers are towed by a vessel at a different water depth, and only one acoustic source for the seismic signals is used, the improvement comprising:

weighting seismic data recorded by different seismic streamers with a weight which is made dependent on two-way travel time recorded by the respective steamers so that data from at least one streamer positioned at the least water depth receives a weight decreasing with travel time, and data from a corresponding number of streamers at a greater water depth receive a weight increasing with travel time; and

mixing said seismic data from said different seismic streamers.

5,148,407

METHOD FOR VERTICAL SEISMIC PROFILING

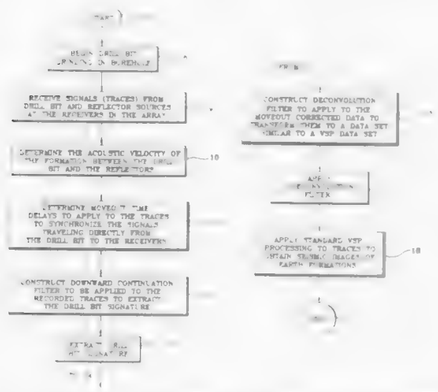
Jakob B. U. Haldorsen, Cambridge, England; Paul A. Farmer, Hinna, Norway, and James F. Desler, Kingwood, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 443,095, Nov. 27, 1989, abandoned, which is a continuation of Ser. No. 200,211, May 31, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 604,914

Claims priority, application Norway, Jun. 2, 1987, 872316

Int. Cl.[5] G01V *1/28, 1/36*

U.S. Cl. 367—32 **23 Claims**



1. A method of vertical seismic profiling of earth formations in which a bore hole is drilled through the formation by a drill bit, which acts as a continuous, time-extended, non-impulsive source of acoustic energy comprising the steps of:

gathering data from seismic traces with a plurality of receivers forming an array on the earth surface;

performing velocity analysis on the seismic traces to obtain a velocity of the earth formation between the drill bit and the receivers and to apply movement corrections to each of the traces gathered by the plurality of receivers;

constructing a downward continuation filter for the seismic traces to obtain an estimate of the source drill bit signature by determining a spatial average of the moveout-connected traces, thereby obtaining an estimate of the source drill bit signature; and

extracting the source drill bit signature from the seismic traces using the downward continuation filter where the spatial average of the moveout-corrected traces follows the form:

$$f(\omega) = \frac{1}{M} \sum_{m=1}^{M} S_m(\omega)\, e^{-} \quad \text{(illegible)}$$

where, N is the total number of traces, $S_m(W)$ are the downgoing waves in earth formation between the receivers and the reflecting interface, and t_m is the moveout time.

5,148,408

ACOUSTIC DATA TRANSMISSION METHOD

H. Gerard Matthews, Haddam, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Nov. 5, 1990, Ser. No. 609,471

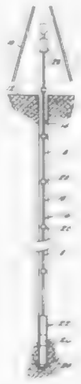
Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—82 **14 Claims**

1. A method for acoustically transmitting data through a drillstring having a plurality of drill pipe sections connected end-to-end by joints from a first location on the drillstring to a second location toward the opposite end of the drillstring, the length and cross-sectional area of the drill pipe sections being different from the length and cross-sectional area of the joints, at least one first acoustic transmitter/receiver pair being located at the first location and at least one second acoustic transmitter/receiver pair being located at the second location, the method comprising the steps of:

(1) generating from said first transmitter/receiver pair a plurality of first data free signals in at least one passband of the drillstring;

(2) transmitting said first data free signals through the drillstring from said first location to said second transmitter/receiver pair at said second location;



(3) detecting said first data free signals at said second transmitter/receiver pair, said detected first data free signals corresponding to optimum frequencies;

(4) generating from said second transmitter/receiver pair data signals having a frequency content corresponding to said optimum frequencies;

(5) transmitting said data signals through the drillstring from said second location to said first transmitter/receiver pair; and

(6) detecting the data signals at said first location.

5,148,409

ULTRASONIC GROUND SPEEDOMETER UTILIZING DOPPLER EFFECT

Hiroshi Kobayashi; Masami Negishi, and Toshiya Kimura, all of Kanagawa, Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 513,658, Apr. 24, 1990, Pat. No. 5,097,453. This application Sep. 6, 1991, Ser. No. 755,707

Claims priority, application Japan, Apr. 28, 1989, 1-107320

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—91 **4 Claims**

1. An ultrasonic ground speedometer utilizing Doppler effect comprising:

ultrasonic transmitting means for outputting an ultrasonic wave at a predetermined angle against a road surface,

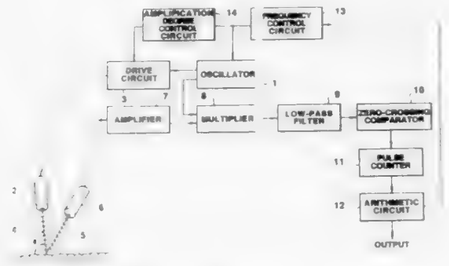
ultrasonic receiving means for receiving a reflected ultrasonic wave caused by reflection of the output ultrasonic wave from the road surface;

arithmetic means for deriving ground speed from Doppler shift between the frequencies of the output ultrasonic wave from said ultrasonic transmitting means and the reflected ultrasonic wave received by said ultrasonic receiving means;

means for controlling the output ultrasonic wave frequency to keep the reflected ultrasonic wave frequency represented by the sum of the output ultrasonic wave frequency and the Doppler shift to a constant value in response to

change in the ground speed derived by said arithmetic means;

wherein said ultrasonic receiving means includes a resonance type ultrasonic transducer having a resonance point in the vicinity of said reflected ultrasonic wave frequency, and



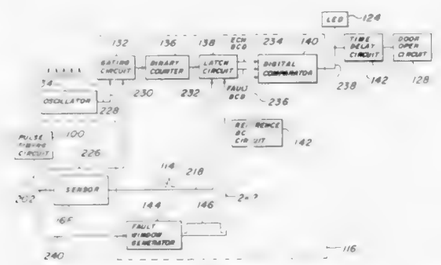
wherein said ultrasonic transmitting means includes an ultrasonic transducer having a flat sensitivity ultrasonic transducer having a flat frequency/sensitivity characteristic over a relatively wide frequency range obtained by subtracting and adding the Doppler shift from and to a resonance frequency of said ultrasonic receiving means.

5,148,411

SONAR DETECTOR FOR EXITING PASSENGERS

Gerald Kuhn, 12461 Popash Ct., North Fort Myers, Fla. 33903

Filed Dec. 18, 1991, Ser. No. 809,798
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—96 19 Claims



1. A system for detecting passengers exiting from a public conveyance, said system comprising:

(a) at least one sonar sensor with a transducer which transmits sound waves and receives reflected sound waves, located at an unattended exit door of said conveyance;

(b) a means for determining whether a passenger is located at said exit door for exiting;

(c) means for operating said door when said passenger is detected;

(d) means to prevent spurious echoes and spurious reflections from activating said means for operating said door;

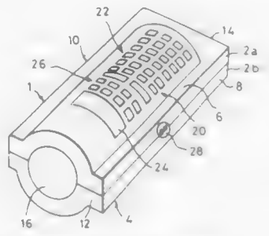
(e) means for detecting, with a single sensor, the presence of a passenger at said exit door who is too close to said sensor to produce a detectable echo

5,148,411

DISTANCE MEASUREMENT DEVICE

Ram Shalvi, Hong Kong, Hong Kong, assignor to Solar Wide Industrial Ltd., Hong Kong

Filed Apr. 1, 1991, Ser. No. 679,979
Claims priority, application United Kingdom, Jun. 2, 1989, 8912643
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—108 6 Claims



1. A distance measuring device including:

a casing bearing a visual display and incorporating therein: a transducer for transmitting and directing signals externally of the casing towards a selected surface; first means for receiving the signals reflected from the selected surface; second, circuit means for measuring distance to such a selected surface by monitoring the transmission of the signals and receipt thereof and determining the distance to the selected surface in accordance with time elapsed between transmission and receipt of such signals; third means for displaying the calculated distance; fourth means for storing at least two such displayed distances measured at right angles to each other, and fifth means for effecting multiplication of stored measurements and displaying the product; and

the device further comprising manually operable keys on the casing, the keys including: a key for effecting operation of the first, second and third means whereby a distance is measured and displayed; at least one further key for effecting operation of the fourth means whereby a displayed distance measurement is stored; and at least further one key for effecting operation of the fifth means whereby multiplication of stored measurements is effected and the product is displayed.

5,148,412

DIVER GUIDANCE METHOD AND SYSTEM

Robert B. Suggs, New Iberia, La., assignor to American Oilfield Divers, Inc., Broussard, La.

Continuation-in-part of Ser. No. 658,706, Feb. 21, 1991, Pat. No. 5,079,753. This application Jul. 10, 1991, Ser. No. 729,715
Int. Cl.[5] H04B *11/00*
U.S. Cl. 367—131 31 Claims

31. A system to provide visual aids to a diver in an underwater area for enabling said diver to navigate with reference to submerged objects within said area that are depicted in a pre-existing map of said underwater area, said map having been developed before said diver entered said underwater area, comprising:

(a) means carried by said diver to emit acoustic energy;

(b) means for detecting said acoustic energy to generate signals which indicate the underwater location of said diver within said area;

(c) means for scanning said underwater area with sonar energy to generate signals which indicate the underwater location of submerged objects within said area;

(d) means for producing signals which represent said map;

(e) means for combining said diver location signals, said object location signals and said map representation signals; and

(f) monitor means carried by said diver and connected to said combining means for converting said combined signals to visible indicators of said diver location and said

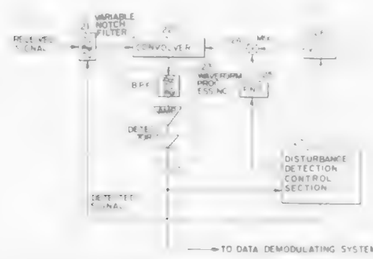
object location, and to a visible graphical representation of said map, all of which are concurrently displayed in superposed fashion on said monitor means.

5,148,413

NARROW BAND DISTURBING WAVE DETECTING DEVICE

Mamoru Endo, and Yoshitaka Uchida, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1992, Ser. No. 836,988
Claims priority, application Japan, Feb. 25, 1991, 3-53444
Int. Cl.[5] H04B *15/00*
U.S. Cl. 367—135 4 Claims



1. A narrow band disturbing wave detecting device comprising:

a surface acoustic wave convolver;

a variable notch filter, to which a received signal is inputted and which supplies an output signal to one of two input transducers of said surface acoustic wave convolver and at the same time removes a band signal corresponding to a first control signal from said received signal;

a variable frequency signal generator, whose output frequency varies, depending on a second control signal, and which supplies an output signal to the other transducer of said surface acoustic wave convolver; and

disturbance detection control means, to which an output signal from said convolver is inputted and which outputs said first and said second control signal;

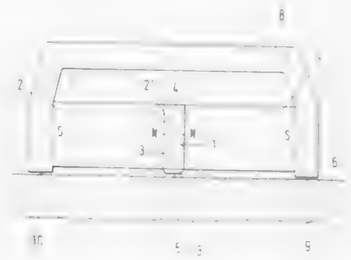
wherein said disturbance detection control means includes first means for generating said second control signal sweeping an output frequency of said variable frequency signal generator; comparing means for comparing the signal inputted from said convolver with a predetermined value to know whether the former exceeds the latter or not, and second means for generating said first control signal, depending on a result of said comparing means.

5,148,414

ELECTRODYNAMIC ULTRASONIC TRANSDUCER

Alfred Graff, Essen, and Michael Wächter, Ratingen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 1, 1991, Ser. No. 786,254
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1990, 4035592
Int. Cl.[5] H04R *23/00*
U.S. Cl. 367—140 5 Claims



1. An electrodynamic ultrasonic transducer for testing a workpiece comprising:

a) a pair of spaced permanent magnets each having a first pole surface of the same polarity facing each other, said pole surfaces having a cross-section;

b) means within said space between said permanent magnets for concentrating the magnetic lines of flux from said magnets, concentrating means being displaced from said permanent magnets toward said workpiece and having a cross-sectional area which is disposed parallel to said pole surfaces and which is smaller than said cross-sections of said permanent magnets so as to leave a remaining space;

c) a non-ferromagnetic member disposed within said remaining space and partially surrounding said concentrating means; and

d) a transducer coil on said concentrating means so as to face said workpiece when said transducer is in use.

5,148,415

MAGNETO-OPTICAL DISC APPARATUS HAVING HEAD-DISC DISTANCE CONTROL

Koichi Takeuchi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 16, 1991, Ser. No. 760,591
Claims priority, application Japan, Sep. 20, 1990, 2-252567
Int. Cl.[5] G11B *13/04, 11/10, 11/12*
U.S. Cl. 369—13 10 Claims

1. A magneto-optical disc apparatus, comprising:

a magnetic head for generating a magnetic field to a magneto-optical recording disc, said magnetic head being movable in a direction to and from said magneto-optical disc;

detecting means having an output for detecting optically the distance between said magneto-optical disc and said magnetic head;

checking means having an input connected to the output of the detecting means and having an output for checking whether the detected output of said detecting means is within a predetermined range;

a sample-hold circuit having an input connected to the output of the detecting means and having a control input connected to the output of the checking means and having

an output for sample-holding the detected output of said detecting means; and

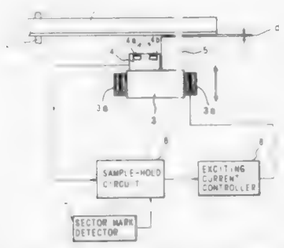
controlling means having an input connected to the output of the sample-hold circuit for controlling the position of said magnetic head on the basis of the detected output of said detecting means so that the distance between said magneto-optical disc and said magnetic head may be constant: wherein

in the case where the detected output of said detecting means becomes beyond said predetermined range, said controlling means controls the position of said magnetic head on the basis of the detected output sample-held in said sample-hold circuit immediately before the time when said detected output becomes beyond said predetermined range.

6. A magneto-optical disc apparatus, comprising:

a magnetic head for generating a magnetic field to a magneto-optical recording disc, said magnetic head being movable in a direction to and from said magneto-optical disc;

distance detecting means having an output for detecting



optically the distance between said magneto-optical disc and said magnetic head;

sector mark detecting means for detecting a sector mark of said magneto-optical disc;

a sample-hold circuit having an input connected to the output of the detecting means and having a control input connected to the output of the sector mark detecting means and having an output for sample-holding the detected output of said distance detecting means; and

controlling means having an input connected to the output of the sample-hold circuit for controlling the position of said magnetic head on the basis of the detected output of said distance detecting means so that the distance between said magneto-optical disc and said magnetic head may be constant; wherein

in the case where said sector mark detecting means detects a sector mark, said controlling means controls the position of said magnetic head on the basis of the detected output sample-held in said sample-hold circuit immediately before the time when said sector mark detecting means detects said sector mark.

5,148,416

SIGNAL PROCESSING CIRCUIT FOR MAGNETOOPTICAL RECORD/REPRODUCING APPARATUS

Shunji Hoshino, Yokohama, and Hiroya Ohkuma, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,749

Claims priority, application Japan, Jun. 5, 1989, 1-142376; Oct. 14, 1989, 1-267509

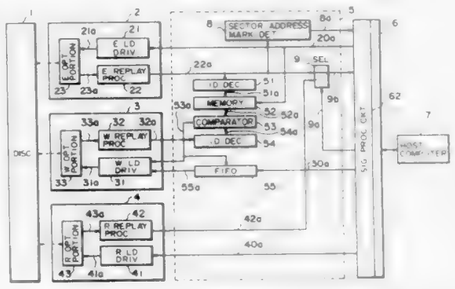
Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—32 **7 Claims**

1. Optical recording/reproducing apparatus having an optical recording medium that is moved relative to an erasing head and to a recording head which are positioned so that a point on said medium passes said erasing head before passing said recording head, said erasing head being capable of reproducing signals recorded on said medium as well as erasing signals recorded on said medium, and said recording head being capable of reproducing signals recorded on said medium as well as recording signals on said medium, said apparatus comprising:

means including a first memory for storing an identification component of a signal reproduced by said erasing head in order to designate a portion on said medium at which erasure starts;

means including a second memory for storing data to be recorded on said medium by said recording head;



comparator means for comparing an identification component of a signal reproduced by said recording head with an identification component stored in said first memory and for producing an output signal when the compared identification components are the same; and

means responsive to said output signal for supplying the data stored in said second memory to said recording head for recording.

5,148,417

TRACKING JUMP COMPENSATOR FOR OPTICAL DISC REPRODUCING APPARATUS

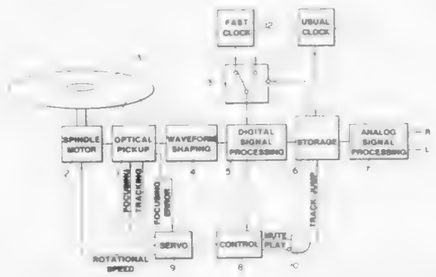
Alan Wong, Tokyo; Katsuya Hori, and Tadao Yoshida, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 513,224

Claims priority, application Japan, May 31, 1989, 1-138220

Int. Cl.[5] G11B *17/22*

U.S. Cl. 369—32 **5 Claims**



1. An optical disk reproducing apparatus in which an optical disk is rotated at a first rotational speed on the basis of a first master clock signal and a light spot is irradiated on said optical disk for reproducing digital data comprising:

memory means into and from which digital data reproduced from said optical disc are sequentially written and read out, respectively,

track jump detection means detecting a track jump of said light spot during reproduction from a desired position to an undesired position on said optical disk caused by an external mechanical shock and for generating a track jump detection signal,

resetting means for resetting said light spot to a position just ahead of said track jump upon receiving said track jump detection signal from said track jump detection means,

second master clock generating means for generating a second master clock signal of a higher frequency than said first master clock signal, and

control means for continuously reading out digital data stored in said memory means on the basis of said first master clock signal on detection of a track jump by said track jump detection means, said control means causing rotation of said optical disk at a second rotational speed higher than said first rotational speed on the basis of said second master clock signal for a predetermined period after resetting of said light spot by said resetting means and writing the reproduced digital data in said memory means on the basis of said second master clock signal,

wherein said memory means includes a RAM for storing said digital data in a predetermined address, a write generating means selectively supplied with said first or second master clock signals for generating write addresses for writing in said RAM, read address generating means supplied with said first master clock signal for generating readout addresses for reading from said RAM, said readout addresses being the same addresses as the write addresses generated by said write generating means with a delay of a predetermined period longer than a time period necessary for resetting said light spot by said resetting means, and address comparison means for comparing write addresses generated by said write address generating means with readout addresses generated by said readout address generating means and responsive to a compared difference therebetween to generate a control signal for selecting said first or second master clock signals supplied to said write address generating means.

5,148,418

DISC RECORDING APPARATUS

Katsuaki Tsurushima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 422,062, Oct. 16, 1989, abandoned.

This application Jan. 30, 1992, Ser. No. 827,891

Claims priority, application Japan, Oct. 20, 1988, 63-265182

Int. Cl.[5] G11B *27/22*

U.S. Cl. 369—32 **11 Claims**

1. A disc recording apparatus for recording information onto a disc, wherein the disc has a data area for recording data in a predetermined position, and a control information area for recording control information for use in accessing a head to the predetermined position, comprising:

state conversion means for converting the disc recording apparatus from a first state in which recording is executed, into a second state in which loading of the disc from the disc recording apparatus is executed; and

control means connected to the state conversion means for inhibiting the state conversion means from converting the disc recording apparatus into the second state if the control information is not recorded in the control information area during the first state.

5,148,419

AUTO-PLAYING APPARATUS

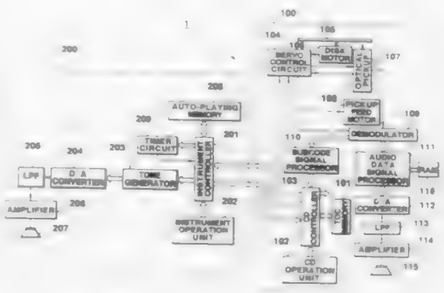
Satoru Koguchi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 574,694

Claims priority, application Japan, Sep. 4, 1989, 1-228678

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—32 **11 Claims**



1. An auto-playing apparatus comprising:

input means for inputting auto-playing data;

memory means, connected to said input means, for storing the auto-playing data input by said input means;

auto-playing means, connected to said memory means, for reading out the auto-playing data from said memory means to sequentially generate corresponding musical tone signals, and for performing an auto-play operation;

setting means for setting a storage mode for storing the auto-playing data in said memory means;

instruction means for instructing a start of an auto-playing operation;

a recording medium for recording audio data;

reproduction means, connected to said recording medium, for reproducing the audio data from said recording medium;

detection means, connected to said reproduction means, for detecting position data associated with a present reproduction position of said recording medium which is being reproduced by said reproduction means;

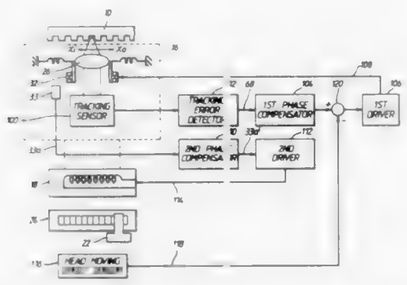
control means, connected to said auto-playing means, said reproduction means, and said detection means, for executing (i) a control operation for, when the storage mode is set by said setting means, fetching the position data associated with the present reproduction position of said recording medium when input of the auto-playing data is started at said input means from said detection means, and causing said memory means to store the position data, (ii) a control operation for, when the storage mode is set by said setting means, causing said memory means to store auto-playing data sequentially input by said input means, (iii) a control operation for, when said instruction means instructs to start the auto-playing operation, reading out the position data from said memory means, comparing the readout position data with present position data of said recording medium which is detected by said detection means, sequentially reading out the auto-playing data from said memory means when a coincidence between the two data is detected, and causing said auto-playing means to start the auto-play operation.

5,148,420

RECORDING INFORMATION APPARATUS HAVING A HEAD SPEED DETECTOR

Mikio Yamamuro, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 28, 1990, Ser. No. 589,546
Claims priority, application Japan, Oct. 3, 1989, 1-257098
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.11 7 Claims



1. A recording information apparatus for a recording medium having a track previously formed on the recording medium comprising:

movable means for projecting a light beam on the recording medium;

movable means for carrying the light projecting means;

means for receiving reflected light from the recording medium and providing a reproduced signal indicative thereof;

means for generating a tracking error signal indicative of a deviation of the light beam from the center of a predetermined track in response to the reproduced signal from the light receiving means;

first detecting means for detecting a moving speed of the carrying means and providing a speed signal indicative thereof;

adding means, connected to receive the tracking error signal and the speed signal, for producing an output signal representing a difference between the tracking error signal and the speed signal; and

first moving means for moving the light projecting means in a direction perpendicular to the track in response to the output signal from the adding means.

5,148,421

OPTICAL HEAD

Isao Satoh, Neyagawa; Sadao Mizuno, Ibaraki, and Noboru Itoh, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 16, 1991, Ser. No. 685,409
Claims priority, application Japan, Apr. 20, 1990, 2-106157; Nov. 27, 1990, 2-328715
Int. Cl.[5] G11B 7/26
U.S. Cl. 369—44.23 4 Claims

1. An optical disc recording-reproducing apparatus comprising:

laser light emitting means for emitting laser light,

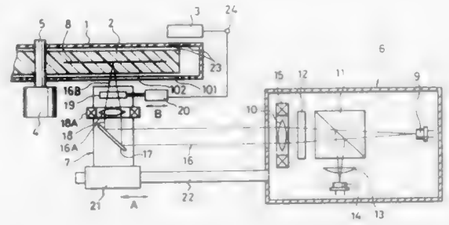
collimating means for collimating said laser light emitted by said laser light emitting means,

focusing means for focusing said laser light collimated by said collimating means on a recording area of a first optical disc having a first substrate of a first thickness (t1) and a first refractive index (n1) or a second optical disc having a second substrate of a second thickness (t2) and a second refractive index (n2),

a beam splitter for separating laser light reflected from said recording area of said first optical disc or said second optical disc,

laser light sensing means for detecting laser light separated by said beam splitter,

at least one optical plate for correcting aberration of said focusing means, having a thickness (t3) equal to a difference (n1·t1−n2·t2) between the product of said first refractive index (n1) multiplied by said first thickness (t1)



and the product of said second refractive index (n2) multiplied by said second thickness (t2) divided by a refractive index (n3) of said optical plate, and

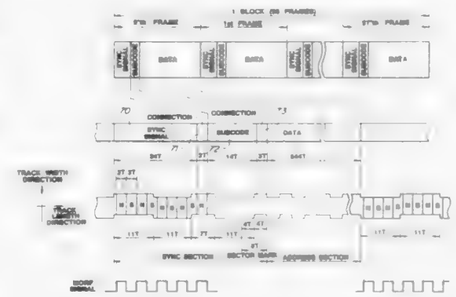
actuator means for positioning said optical plate between said optical disc and said focusing means or for removing said optical plate therefrom.

5,148,422

OPTICAL RECORDING MEDIUM HAVING A DATA RECORDING TRACK WITH OFFSET DATA STORING REGIONS

Yoichiro Sako, Chiba, and Tamotsu Yamagami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 21, 1990, Ser. No. 570,432
Claims priority, application Japan, Aug. 25, 1989, 1-219412; Aug. 25, 1989, 1-219414; Aug. 31, 1989, 1-225313
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.26 14 Claims



1. An optical recording medium for storing optically readable data, comprising at least one preformed recording track of predetermined width and extending in a predetermined recording direction,

said recording track having a recordable region extending in said predetermined recording direction for holding first data containing clock signal components therein,

said recording track being provided with predetermined offset portions extending in the direction of the width thereof representing second, offset recorded data, at least some of said predetermined offset portions being positioned along the predetermined recording direction at locations corresponding with portions of the recordable region holding at least some of said first data such that the offset recorded data held by said at least some of said predetermined offset portions and said at least some of said first data are simultaneously reproducible by a single beam of light,

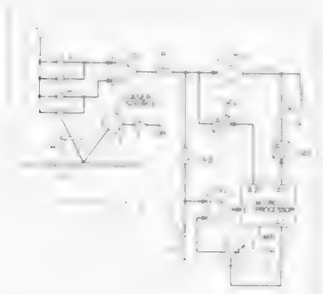
said offset portions being formed such that the offset recorded data has a frequency when reproduced upon scanning said recording track related by an integer ratio with respect to the clock signal components of said first data.

5,148,423

METHOD OF AND CIRCUITRY FOR COMPENSATING OFFSET VOLTAGES IN A FOCUSING AND/OR TRACKING CIRCUIT

Günter Gleim, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenninger, Fed. Rep. of Germany

Continuation of Ser. No. 378,252, Jul. 11, 1989, abandoned. This application Sep. 30, 1991, Ser. No. 769,331
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824039
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.29 18 Claims



1. A method for compensating offset voltages selectively in a focusing circuit that focuses a beam from a source of light on a recording medium and in a tracking circuit that positions a beam of light on data storage tracks on a recording medium, comprising the steps: directing a beam of light to a recording medium and reflecting the beam of light from said recording medium; directing the reflected beam of light onto a photodetector having a plurality of photodiodes with output voltages; taking the difference between said output voltages for generating an error signal from said output voltages; illuminating said photodiodes; adding a first compensation parameter to said error signal in open or closed state of the circuit selected to form a sum of said first compensation parameter and said error signal; varying said first compensation parameter until said sum is substantially equal to a first reference; closing thereafter selectively said focusing circuit and tracking circuit; comparing said error signal with a second reference; supplying a second compensation parameter selectively to controls in said focusing circuit and said tracking circuit; and varying said second compensation parameter until said error signal is substantially equal to said second reference.

5,148,424

DETRACK DETECTING SYSTEM IN AN OPTICAL RECORDING/REPRODUCING APPARATUS

Shigeaki Wachi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 27, 1990, Ser. No. 499,641
Claims priority, application Japan, Apr. 14, 1989, 1-93028
Int. Cl.[5] G11B 7/08, 7/125
U.S. Cl. 369—44.37 8 Claims

1. A detrack detecting system in an optical recording/reproducing apparatus in which recording and reproducing of data are performed by irradiating beam spots onto an optical disc, comprising:

means for irradiating a first beam spot which follows a center of a data recording track;

means for irradiating second and third beam spots at positions which are respectively spaced away from the first beam spot by a predetermined distance on the inner circumferential side and the outer circumferential side in the radial direction of said optical disc;

first, second and third photodetectors for detecting reflected lights from the first, second and third beam spots, respectively, and producing first, second and third tracking error signals, respectively,

first, second third and fourth signal adders; and polarity detecting means, wherein:

said first signal adder combines said second and third tracking error signals, said second adder combines the first tracking error signal and an output derived from said first adder, said third adder forms a first composite tracking error signal by combining an output derived from said adder, and said fourth adder forms a second composite tracking error signal by combining an output derived from said third tracking error signal and an output from said second added and;

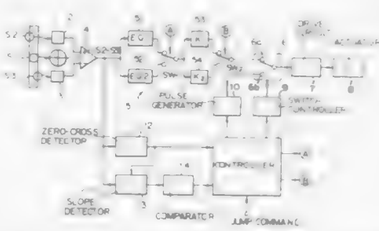
said polarity detecting means is responsive to outputs of said third and fourth adders for detecting a detracking state on the basis of the polarities of said first and second composite tracking error signals.

5,148,425

OVERSHOOT MINIMIZING TRACKING SERVO APPARATUS

Haruyasu Sakata, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 10, 1989, Ser. No. 418,870
Claims priority, application Japan, Oct. 11, 1988, 63-255385
Int. Cl.[5] G11B 21/10, 7/08
U.S. Cl. 369—44.25 4 Claims



1. A tracking servo apparatus having error signal generating means for generating a tracking error signal corresponding to a deviation of an information reading spot with respect to the record track of an information recording disk in the radial direction of the disk, signal processing means with a predetermined equalizer characteristic and gain for processing said tracking error signal, pulse generating means for generating an accelerating pulse responding to a jump command and gener-

ating a decelerating pulse at a predetermined timing in a track jump operation, and drive means for shifting said information reading spot in the radial direction of the disk responding to said tracking error signal passed through said signal processing means or said accelerating pulse and decelerating pulse, further comprising:

first detection means for detecting an amount of change per unit time in the level of said tracking error signal when said information reading spot passes a position on said record track at its center after said decelerating pulse has been generated;

second detection means for detecting that said amount of change exceeds a reference value; and

control means for changing at least one of said equalizer characteristic and gain for a predetermined period from the detection by said second detection means.

5,148,426

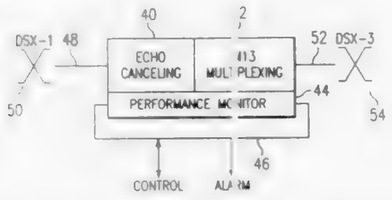
INTEGRATED ECHO CANCELING MULTIPLEXOR

Kishan Shenoi, Milpitas; Paul P. Yang, Cupertino, and Terrence G. Sopira, Mountainview, all of Calif., assignors to DSC Communications Corporation, Plano, Tex.

Filed Jun. 8, 1990, Ser. No. 535,123

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—32.1 **16 Claims**



7. An integrated echo canceling multiplexor, comprising:

first multiplex-demultiplexing circuit for receiving DS3 signals and converting said DS3 signals to DS1 digital logic signals;

an echo canceling circuit coupled to said first multiplex-demultiplexing circuit for receiving said DS1 digital logic signals and producing echo-free DS1 digital logic signals; and

a second multiplex-demultiplexing circuit coupled to said echo canceling circuit for receiving said echo-free DS1 digital logic signals and producing DS3 signals for transmission.

5,148,427

NON-LINEAR ECHO CANCELLER

Kenneth G. Buttle, Orangevale, and Hiroshi Takatori, Sacramento, both of Calif., assignors to Level One Communications, Inc., Folsom, Calif.

Filed Apr. 10, 1990, Ser. No. 507,595

Int. Cl.[5] H04B *3/23*

U.S. Cl. 370—32.1 **17 Claims**

1. A subscriber line circuit employing adaptive echo cancelling, comprising:

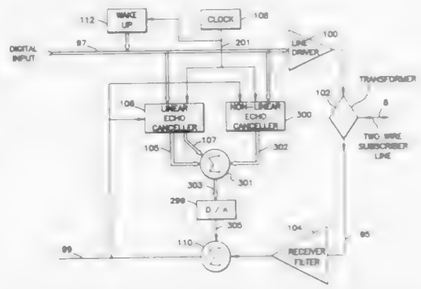
(a) a wake up circuit for providing a predetermined N-bit wide digital pattern coupled to an input of a first digital to analog (D/A) converter having an output coupled to a line driver for converting the digital pattern to an analog signal, the line driver being coupled to a transformer for applying the analog signal to a subscriber line, the N-bit wide digital pattern also being coupled to inputs of a linear and a nonlinear echo canceller wherein both linear and nonlinear cancellers have outputs for providing echo cancelling signals;

(b) means for selectively enabling the linear echo canceller by the wake up circuit at a predetermined time t_0 and means for selectively enabling the nonlinear echo canceller by the wake up circuit at a later predetermined time t_1, the time t_1 corresponding to a period of time when the linear echo canceller substantially reaches convergence;

(c) a digital summation network having input means for summing the linear and nonlinear echo cancelling output signals and having an output for providing a digital composite sum;

(d) a second digital to analog (D/A) circuit having an input coupled to the digital composite sum and having an output for providing a resultant analog signal;

(e) a receiver filter having an input coupled through the



transformer to the subscriber line for receiving signals from the subscriber line, the receiver filter having means for eradicating a residual echo signal occurring from prior baud transmissions on the subscriber line and output means for providing a filtered signal; and

(f) an analog summation network having input means for summing the filtered signal from the output means of the receiver filter in a subtractive relation with the output of the second D/A converter, the output of the second D/A converter representative of echo cancelling signals, and the analog summation network having an output for providing received signals substantially free from echoes.

5,148,428

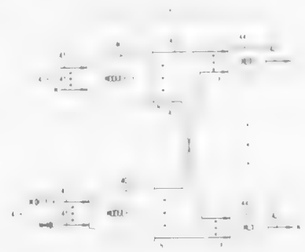
MODULAR ARCHITECTURE FOR VERY LARGE PACKET SWITCH

Tony T. Lee, Bridgewater Township, Somerset County, N.J., assignor to Bell Communictions Research, Inc., Livingston, N.J.

Continuation of Ser. No. 345,983, May 2, 1989, abandoned. This application Mar. 11, 1991, Ser. No. 670,455

Int. Cl.[5] H04J *3/02, 3/26*

U.S. Cl. 370—60 **25 Claims**



1. A packet switch comprising

N inputs ($N>1$),

N outputs,

K ($1<K<N$) switch modules each of which has $M=N/K$ inputs and at least N outputs and

N means each for connecting corresponding outputs of said switch modules with one of said N outputs of said packet switch and for combining all packets from said corresponding outputs with one of said N outputs of said packet switch, where M, N, and K are integers.

5,148,429

VOICE DATA TRANSMISSION SYSTEM AND METHOD

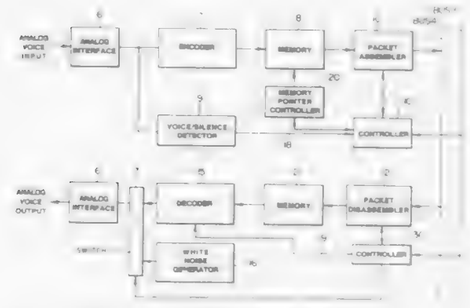
Norimasa Kudo, Kawasaki, and Akira Watanabe, Hachioji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1989, Ser. No. 426,379

Claims priority, application Japan, Oct. 27, 1988, 63-271602; Jan. 24, 1989, 1-14900

Int. Cl.[5] H04J *3/24*

U.S. Cl. 370—9.42 **14 Claims**



8. A method of transmitting voice data in which a voice signal is divided into a plurality of data blocks, the data blocks being prepared into packet data and the packet data being asynchronously transmitted, said method comprising the steps of:

sequentially storing said data blocks;

detecting a change in the voice signal from a voice absence part to a voice presence part; and

transmitting in packet form, when said change from the voice absence part to the voice presence part is detected in the detecting step, on a burst basis, a predetermined number of data blocks stored in the storing step prior to detection of said change, at a transmission rate faster than a usual transmission rate.

5,148,430

TRANSMITTER/RECEIVER FOR GENERATING TRANSMITTING DATA SIGNAL IN SYNCHRONIZATION WITH RECEIVED DATA SIGNAL

Hiroshi Kuranaga, and Kouji Gotou, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,825

Claims priority, application Japan, Jun. 5, 1990, 2-148182

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—100.1 **11 Claims**

1. A transmitter/receiver connected to a receiving bus line and a transmitting bus line comprising:

receiving means for receiving a data signal through said receiving bus line and generating a received data signal;

means for generating a periodical timing signal in synchronization with the received data signal;

means, responsive to the generated periodical timing signal, for providing a transmitting data signal;

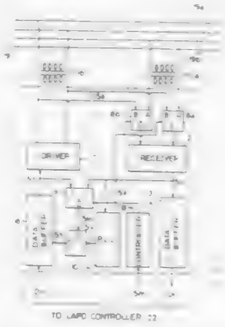
means for transmitting the transmitting data signal through said transmitting bus line;

means responsive to an applied mode designation signal for

(i) triggering the means for providing to input a test data signal to said transmitting means, and

(ii) selectively providing the receiving means with the signal transmitted by said means for transmitting in response to said test data signal, to provide a test input to signal said receiving means;

phase difference detecting means connected to said means for transmitting and receiving means for detecting the phase difference between the test data signal input to said means for transmitting and the output of the receiving means produced in response to the test input signal; and



timing control means responsive to said phase difference detecting means for controlling the timing of the periodical timing signal generated from said means for generating a periodical timing signal during subsequent transmitter/-receiver operations when said mode designation signal is not applied.

5,148,431

SPEECH SIGNAL DECODING APPARATUS WITH ERROR DETECTION AND CORRECTION

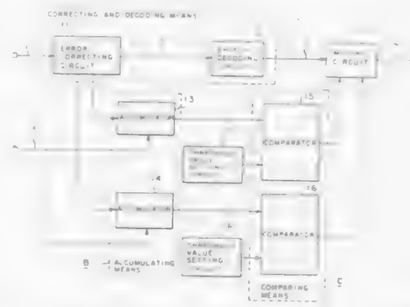
Ryoji Hayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 477,369

Claims priority, application Japan, May 15, 1989, 1-118637

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—5.1 **2 Claims**



1. A speech decoder in which voice data are received in sequential signal frames for decoding comprising:

a correcting and decoding means for detecting and decoding error-correcting codes and error detecting codes in each sequentially received signal frame and correcting any correctable transmission errors in said received signal frame and for decoding the resulting error-corrected signal into decoded speech;

an accumulating means connected to said correcting and decoding means for accumulating the number of the error-correcting codes which are corrected by said correcting and decoding means in said received signal frame as well as the number of error-detecting codes detected by said

correcting and decoding means in said received signal frame;

a comparing means connected to receive the output of said accumulating means for comparing each of the accumulated results of said accumulating means with respective threshold values which are set in advance as upper limits; and

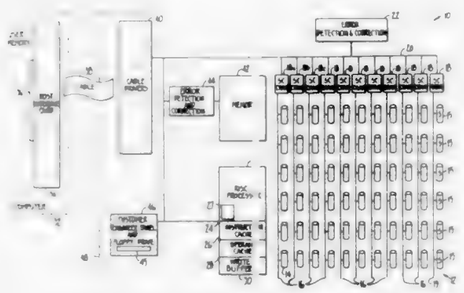
a muting means connected to be activated by said comparing means for muting the entire decoded speech output data of each of said received signal frames in which said accumulated results for such frame exceed said respective threshold values from the decoded speech data which is output by said correcting and decoding means in accordance with each of comparison results of said comparing means.

5,148,432

ARRAYED DISK DRIVE SYSTEM AND METHOD

David W. Gordon; David C. Stallmo; David M. Warner; William A. Brant, all of Boulder, and Walter A. Hubis, Louisville, all of Colo., assignors to Array Technology Corporation, Boulder, Colo.

Continuation of Ser. No. 270,713, Nov. 14, 1988, abandoned. This application Sep. 3, 1991, Ser. No. 758,393
Int. Cl.[5] G06F *11/10, 11/20*
U.S. Cl. 371—10.1 57 Claims



1. An arrayed disk drive system for providing memory to a computer comprising:

a plurality of disk drives configured to form an array, said arrayed disk drives coupled to a plurality of channels, each channel accessing a plurality of disk drives, and each of the arrayed disk drives having a plurality of sectors;

disk controlling means, coupled to communicate with the channels, (a) for grouping the disk drives to define one or more logical groups each of which appears to the computer as a single disk drive so that the arrayed disk drives appear to the computer as any conceivable arrangement of disk drives, whereby the arrayed disk drive may appear to the computer as the plurality of disk drives, or as one large disk drive comprised of all the arrayed disk drives, or any combination in between, and (b) for controlling the transfer of data between the computer and the disk drives in accordance with the grouping;

means for providing a plurality of levels of data loss protection on data read or written by the computer to the arrayed disk drives; and

means controlled by the disk controlling means for selectively enabling from none to the plurality of levels of data loss protection to operate on data being read or written from the arrayed disk drives

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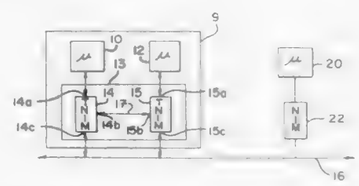
5,148,433

TRANSFER NETWORK INTERFACE

David K. Johnson, Waukesha, and Mark S. Weber, Germantown, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Mar. 13, 1989, Ser. No. 322,590
Int. Cl.[5] G06F *11/20*
U.S. Cl. 371—11.3 8 Claims



1. For a redundant processor system having first and second processor based devices, the redundant processor system communicatively coupled to at least one other remote processor based device by means of a data communication network, said data communication network conveying blocks of data to designated addresses, wherein said first processor based device operates on active status and said second processor based device operates on backup status until a switch occurs, said switch using said second processor based device to operate on active satus, a transfer network interface device for permitting continuous communication between either of said first and second processor based devices and said remote processor based device, the transfer network interface device comprising:

(a) first and second transfer network interface modules, each communicatively coupled between a respective one of said first and second processor based devices and the data communication network for transferring data between said respective fist and second processor based device and said data communication network, wherein each of said first and second transfer network interface modules has a thumbwheel switch for setting both of a unique address and a mutually common address on the data communication network;

(b) said first transfer network interface module including means continuously responsive to data blocks addressed to its unique address, and responsive to data blocks addressed to its common address when said first processor based device is active; and

(c) said second transfer network interface module including means continuously responsive to data blocks addressed to its unique address, and responsive to data blocks addressed to its common address when said second processor based device is active.

5,148,434

DIGITAL DATA GENERATOR

Mark W. Richardson, Saint-Victor sur Loire, France, assignor to Schlumberger Industries, S.A., Paris, France

Filed May 7, 1990, Ser. No. 519,883
Claims priority, application France, May 10, 1989, 89 06130
Int. Cl.[5] H04J *3/14;* G06F *11/22, 11/26*
U.S. Cl. 371—20.1 10 Claims

1. A digital data generator for producing an output data stream in accordance with a frame format in accordance with a telecommunications standard, wherein the generator comprises:

addressable memory means for recording data words, each address of said memory means being representative of a bit position in a frame, each bit of each data word representing the state of a corresponding signal of a plurality of

control signals at the position in the frame associated with the address of the data word;

addressing means for addressing the memory device incrementally from a predetermined value in response to a clock;

at least one of the control signals being representative of

frame length and being applied to the addressing means in order to cause addressing of the memory device to recommence from the predetermined value;

a sequence generator for producing a sequence data signal in response to at least one control signal; and

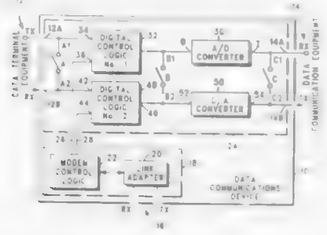
logic means for combining the sequence data signal with at least one control signal to provide the output data stream.

5,148,435

TESTABLE MODEM AND DATA COMMUNICATIONS NETWORK

Robert E. Ray, Jr., and Dean Y. Hodge, both of Madison, Ala., assignors to Universal Data Systems, Inc., Huntsville, Ala.

Filed May 3, 1990, Ser. No. 518,365
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—20.5 29 Claims



1. A testable data communications device having a data terminal equipment port, a data communication equipment port, and a control signal port, said testable data communications device coupling information between a data terminal equipment device coupled to said data terminal equipment port and a communications channel coupled to said data communication equipment port, said testable data communications device communicating with a network management system controller through said control signal port over a control channel, said data communications device comprising:

coupling means, coupled to said control signal port, for coupling information signals between said network system controller and said testable data communications device via said control channel through said control signal port;

data communication means coupled to the coupling means for coupling information signals from said data terminal equipment device to said communications channel; for coupling information from said communications channel to said data terminal equipment device, and, in response to control signals from said network management system controller received by said coupling means at said control signal port:

a) for coupling information signals at said control signal port through said data communications means to said communications channel;

b) for coupling information signals on said communications channel through said data communications means to said control signal port; and

c) for coupling a first information signal received through said control signal port through a coupling circuit through said data communications means, said first information signal being processed by said data communications means which generates a second information signal based on said first information signal, said second information signal looping back through the data communications means which generates a third information signal, said third information signal returning through said coupling circuit to said control signal port;

said data communications means further including means for routing test information signals through said data communications means.

5,148,436

CIRCUIT FOR DETECTING FALSE READ DATA FROM EPROM

Tadashi Usami, Hino, and Masahiro Kosuge, Kawasaki, both of Japan, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1990, Ser. No. 597,243
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—21.1 10 Claims

3. A circuit for detecting false read data in an EPROM comprising at least first, second and third transistors being coupled in series between a voltage supply and a reference point and the third transistor being coupled in parallel with the series connected first and second transistors and one or more logic elements being coupled to the drains of the first and third transistors for determining the operation thereof, by means of a predetermined output signal, in response to a read signal applied to the gates of all three transistors.

5,148,437

LASER PUMPED ATOMIC FREQUENCY STANDARD WITH HIGH FREQUENCY STABILITY

Motoichi Ohtsu, Yamato, Japan, assignor to Anritsu Corporation, Tokyo, Japan

Continuation of Ser. No. 570,296, Aug. 20, 1990. This application Aug. 29, 1991, Ser. No. 754,268
Claims priority, application Japan, Aug. 21, 1989, 1-214700
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—32 18 Claims

1. An atomic frequency standard comprising:

a double resonance section for causing a double resonance between light and a microwave with respect to a specific atom;

laser means for emitting a laser beam with a predetermined frequency, serving as pumping light, to said double resonance section;

voltage-controlled oscillator means for oscillating a predetermined frequency signal that is the origin of said microwave;

low frequency signal oscillator means for generating a modulation signal and a low frequency signal to be a reference signal;

microwave generator means for generating a microwave

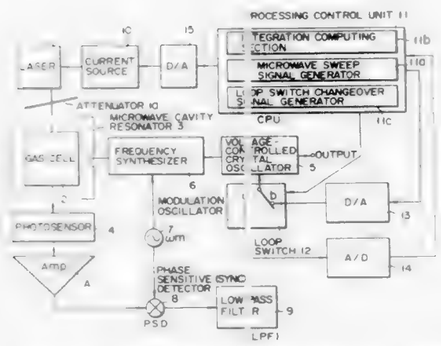
acquired by subjecting said predetermined frequency signal to multiplication and at least one phase and frequency modulation in accordance with said predetermined frequency signal from said voltage-controlled oscillator means and said modulation signal from said low frequency generator means, and applying said microwave to said double resonance section;

photosensor means for detecting a component of said laser beam modulated by said double resonance section;

phase sensitive detector means for detecting a level and phase of an output signal of said photosensor means with said reference signal from said low frequency signal oscillator means;

sweep signal generator means for generating a sweep signal for sweeping the frequency of said microwave;

switching means, having first and second nodes to be mutually switched from one mode to the other, for feeding an output signal from said phase sensitive detector means back to said voltage-controlled oscillator means when switched to said first node, and supplying said sweep signal from said sweep signal generator means to said voltage-controlled oscillator means to permit substantial



sweeping of the frequency of said microwave emitted from said microwave generator means when switched to said second node; and

shift detection/compensation means, which operates in a state where said switching means is set to said second node, for detecting a light shift variation which is produced when the microwave and the laser beam are simultaneously irradiated onto the same specific atom and an electric field of the laser beam causes a shift in a resonance frequency of transient energy level which serves as a standard of the frequency of the microwave and which is dependent on both the frequency and power of the light beam, thereby to substantially detect an amount of shift of a microwave resonance frequency in said double resonance section in accordance with the output signal from said phase sensitive detector means, and for compensating for the light shift variation, thereby feeding a laser frequency compensation signal to cancel out said detected amount of shift back to said laser means,

wherein a self adjusting system of said atomic frequency standard is triggered to suppress long-period frequency instability due to the light shift.

5,148,438

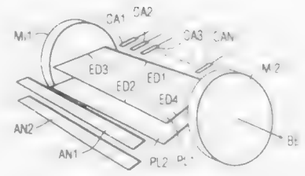
GAS LASER WITH DISCHARGE IN TWO-DIMENSIONAL WAVEGUIDE

John L. Remo, St. James, and Gerhard Schaefer, Melville, both of N.Y., assignors to Quantametrics Inc., St. James, N.Y.

Continuation of Ser. No. 279,674, Dec. 5, 1988, abandoned. This application Jul. 23, 1991, Ser. No. 735,173

Int. Cl.[5] **H01S** *3/03*

U.S. Cl. 372—37 **43 Claims**



1. A gas laser, comprising:

a structure forming a pair of substantially parallel surfaces facing each other and defining a space between the surfaces;

said structure including an optical resonating arrangement having an optical axis parallel to and between the surfaces;

control means for producing a discharge between the surfaces and for causing the discharge to move back and forth within the space;

said resonating arrangement including an active medium and forming a resonant cavity with said medium;

said structure including means for containing said medium and pumping means; and

said control means including energy abstracting means.

5,148,439

SEMICONDUCTOR LASER

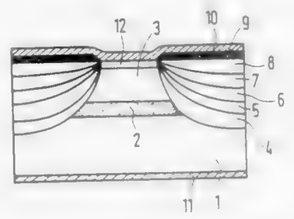
Klaus Wünstel, Schwieberdingen, and Reinold Weinmann, Esslingen, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Aug. 24, 1990, Ser. No. 571,994

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1989, 3929312

Int. Cl.[5] **H01S** *3/19*

U.S. Cl. 372—46 **3 Claims**



1. In a semiconductor laser, a layer structure comprising: at least one active region and at least one semi-insulating region and a semiconductor substrate, said at least one active region extending over part of the surface of the semiconductor substrate, and said at least one semi-insulating layer being disposed on both sides of the active region, wherein on both sides of the active region at least one n-type layer and one p-type layer are additionally provided upon another adjacent to said at least one semi-insulating layer, said layer structure having two or more pairs of superimposed n- and p-type layers and a single semi-insulating layer.

5,148,440

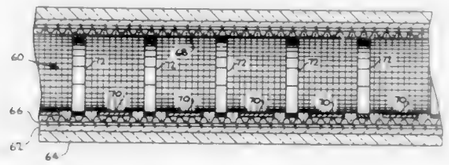
WICK FOR METAL VAPOR LASER

David B. Duncan, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 25, 1983, Ser. No. 554,869

Int. Cl.[5] **H01S** *3/03, 3/02*

U.S. Cl. 372—56 **20 Claims**



1. A wick for a metal vapor laser comprising:

a refractory metal cylinder, and

means operatively associated with the cylinder to constantly renew a surface coating on the inside surface of the cylinder to enhance wicking action and to control the chemical environment to reduce contamination of the surface.

5,148,441

SOLID STATE LASER

Masanori Itai, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Japan

Filed May 24, 1991, Ser. No. 705,582

Claims priority, application Japan, May 25, 1990, 2-134120; May 28, 1990, 2-135388

Int. Cl.[5] **H01S** *3/091, 3/092*

U.S. Cl. 372—70 **16 Claims**

1. A solid state laser comprising:

(a) a plurality of laser generating means (**40, 41, 42, 43, 44, 45**) for generating laser lights (L2);

(b) a plurality of laser medium means (**21, 105, 106**) arranged relative to a plurality of the laser generating means (**40, 41, 42, 43, 44, 45**);

(c) the laser medium means (**21, 105, 106**) arranged for defining a zigzag reflected optical path (LP) in such a manner that the laser light (L2) or the laser lights (L2) from the laser generating means (**40, 41, 42**) are directed in a first direction along the zigzag reflected optical path (LP) and the laser light (L2) from the rest of the laser generating means (**43, 44, 45**) are directed in a second direction opposed to the first direction along the zigzag reflected optical path (LP) when imparting the laser lights (L2) to the laser medium means (**21, 105, 106**) along the zigzag reflected optical path (LP);

(d) the laser medium means (**21, 105, 106**) being arranged for directing the laser light (L2) reflected by one of the laser medium means (**21, 105, 106**) to one of the rest of the laser medium means (**21, 105, 106**); and

(e) an optical means (**60, 61**) for performing oscillating and exiting operations of a laser light (L1) produced along the zigzag reflected optical path (LP) when imparting the laser lights (L2) to the laser medium means (**21, 105, 10**) along the zigzag reflected optical path (LP), thereby producing a high power output light (L3).

5,148,442

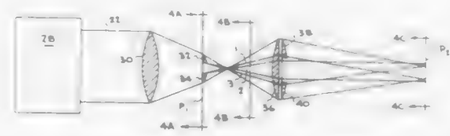
DYE LASING ARRANGEMENT INCLUDING AN OPTICAL ASSEMBLY FOR ALTERING THE CROSS-SECTION OF ITS PUMPING BEAM AND METHOD

Richard W. O'Neil, Pleasanton, Calif., and William C. Sweatt, Alburquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Continuation of Ser. No. 915,204, Sep. 30, 1986, abandoned. This application Jun. 8, 1989, Ser. No. 363,310

Int. Cl.[5] **H01S** *8/09;* **B23K** *29/00*

U.S. Cl. 372—71 **22 Claims**



1. In a lasing arrangement in which a continuous stream of dye is caused to flow through a lasing zone in a cooperating due chamber while said lasing zone is being illuminated by a pumping beam having an initially produced cross-sectional configuration, which beam is directed through a dye chamber window into said lasing zone causing the dye therein to lase and thereby produce or amplify a dye beam, an optical assembly for altering said initially produced cross-sectional configuration of said pumping beam such that said pumping beam enters said dye chamber with an altered cross-sectional configuration corresponding generally to the cross-sectional configuration of said dye chamber window, said optical assembly comprising:

(a) first optical means acting on said initially produced cross-sectional configuration of said pumping beam for separating said pumping beam into a plurality of separated segments, each of said segments having a portion which is entirely separate, non contiguous and non overlapping with adjacent segments, each of said separated segments propogating axially in the direction of said pumping beam and eventually converging; and

(b) second optical means, separated from said first optical means for recombing said segments to produce a recombined pumping beam having said altered cross-sectional configuration corresponding generally to said cross-sectional configuration of said dye chamber window, wherein said entirely separate portions permit fine tuning of each of said segments.

5,148,443

LASER

Keming Du; Peter Loosen, both of Aachen, and Gerd Herziger, Roetgen-Rott, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V., Fed. Rep. of Germany

PCT No. PCT/DE89/00250, § 371 Date Dec. 17, 1990, § 102(e) Date Dec. 17, 1990, PCT Pub. No. WO89/10642, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 21, 1989, Ser. No. 601,757

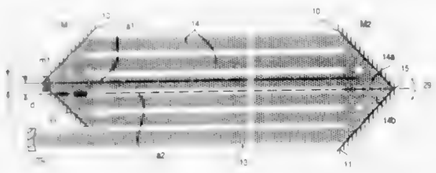
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813572

Int. Cl.[5] **H01S** *3/081*

U.S. Cl. 372—93 **16 Claims**

1. Laser with a laser beam path multiply folded by two cavity resonator end mirrors associated with at least one reflector configured for retroreflectively folding the laser beam and

whose axis is displaced parallel to the axis of a second reflector, wherein the beam path is caused to be folded at least twice by



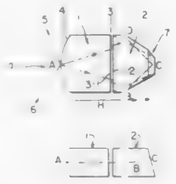
the retroreflective reflector to form parallel beam paths in at least two-dimensions.

5,148,444

TUNABLE SINGLE-FREQUENCY RING LASER

Josef Berger, Santa Clara, Calif., assignor to Harmonic Lightwaves, Inc., Santa Clara, Calif.

Filed Aug. 18, 1988, Ser. No. 234,188
Int. Cl.[5] H01S *3/083*
U.S. Cl. 372—94 **154 Claims**



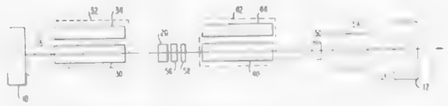
1. A non-monolithic laser resonator comprising:
a first piece;
a second piece, separated by a gap of width Wg from the first piece;
at least one of said first and second pieces being a material capable of lasing;
at least one of said first and second pieces being a material capable of producing Faraday rotation of an optical beam traveling therein;
means for defining, within a region consisting of the first and second pieces and the gap between these two pieces, a resonant unidirectional ring that includes either:
at least four reflection vertices comprising:
a first reflection vertice in said first piece; and
a first and second refraction at the interface between said first and second pieces, such that said first refraction is located closer to said second reflection vertice than said second reflection vertice is to said fourth reflection vertice, and such that said second refraction is located closer to said third reflection vertice than said third reflection vertice is to said fourth reflection vertice; or at least two out of plane refraction and two reflection vertices;
input means for receiving an input beam of light into said ring to pump the laser; and
output means for extracting an output laser beam from light in said unidirectional ring.

5,148,445

HIGH POWER ND:YLF SOLID STATE LASERS

Kuo-Ching Liu, Setauket; Sten Tornegard, and Michael Rhoades, both of Smithtown, all of N.Y., assignors to Quantronix Corp., Smithtown, N.Y.

Continuation-in-part of Ser. No. 421,585, Oct. 16, 1989, which is a continuation-in-part of Ser. No. 342,410, Apr. 24, 1989. This application Sep. 26, 1990, Ser. No. 588,999
Int. Cl.[5] H01S *3/082*
U.S. Cl. 372—97 **12 Claims**



1. A solid state laser comprising:
a first energy reflecting means having a first predetermined radius of curvature and a second energy reflecting means having a second predetermined radius of curvature disposed facing each other along a laser axis and separated by a predetermined separation;
lens means coaxially disposed at a predetermined position between the first and second energy reflecting means and defining, with the first and second energy reflecting means, a laser resonator, the lens means having a predetermined focal power;
a first pumping chamber disposed between the first energy reflecting means and the lens means, including a first solid state uniaxial crystal laser rod coaxially positioned within the laser resonator, the first laser rod having a predefined crystal axis; and
a second pumping chamber disposed between the second energy reflecting means and the lens means, including a second solid state uniaxial crystal laser rod coaxially positioned within the laser resonator, the second laser rod having a predefined crystal axis;
wherein the predetermined separation, and first and second predetermined radii of curvature, and predetermined position, and predetermined focal power are selected so that a TEM_{00} mode laser beam diameter within the laser resonator at the first and second laser rods is a substantial fraction of the diameter of the laser rods,
wherein the laser rods are aligned so that the predefined crystal axis in the first rod is rotated by 90° about the laser axis with respect to the predefined crystal axis of the second rod;
further comprising means between the laser rods for rotating only a particular beam polarization 90° as the beam passes between the laser rods.

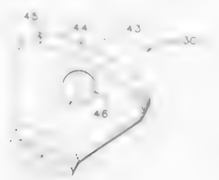
5,148,446

LASER OBJECTIVE LENS SHIELD

David Radich, Lake Oswego, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Jun. 7, 1991, Ser. No. 711,832
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—109 **4 Claims**

1. An apparatus for protecting the objective lens of a laser from being impacted by ejecta from a target object comprising:
a hollow conical structure having a base that mounts adjacent to the laser and a truncated tip, the structure having an axis aligned with the lasing axis of the laser with openings in the base and truncated tip along the axis, the hollow conical structure including a plenum chamber along a portion of the wall having orifices orthogonal to the axis and means for coupling the plenum chamber to a source of pressurized fluid, and also including an exhaust aperture in



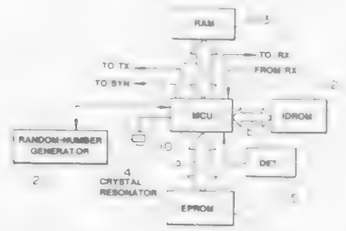
the wall opposite the orifices to provide for laminar fluid flow transverse to the lasing axis; and
means for securing the hollow conical structure to the laser.

5,148,447

CONTROL DEVICE IN TRANSCEIVER

Koichi Ito, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1988, Ser. No. 249,755
Claims priority, application Japan, Sep. 30, 1987, 62-246782
Int. Cl.[5] H04B *1/38*
U.S. Cl. 375—7 **15 Claims**



1. A control device in a transceiver, said control device coupled to at least one of a transmitter and a receiver in said transceiver and capable of controlling processing steps for establishing a radio communication link between said transceiver and a partner transceiver, comprising:
a clock source for generating a clock signal having a predetermined frequency;
control means for performing a predetermined periodic operation by repetitively executing a plurality of said processing steps in synchronism with said clock signal generated at said clock source; and
period adjusting means for changing a period of said periodic operation performed by said control means, such that said period is not constant.

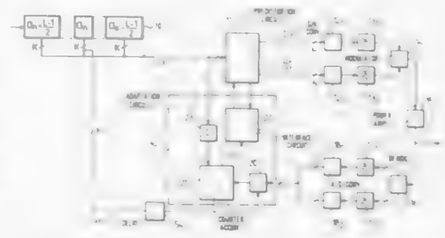
5,148,448

ADAPTIVE PREDISTORTION CIRCUIT WITH MEMORY

Georges Karam, Paris, and Hikmet Sari, Creteil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1990, Ser. No. 494,088
Claims priority, application France, Mar. 14, 1989, 89 03306
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—60 **19 Claims**

1. An adaptive predistortion circuit with memory for a digital transmission system which transmits input data to be represented by points of a signal constellation C and which occur at the rate of a symbol clock having a period T, and wherein a modulator and a power amplifier coupled to the predistortion circuit distort the signal by creating smeared spots (clouds) in the constellation, the circuit comprising:
a predistortion circuit for predistorting in the reverse sense in-phase and quadrature input data symbols $a_n=(a'_n, a''_n)$ prior to their entering the power amplifier in order to transmit expected levels, the predistortion circuit simultaneously taking into account a number L of received input symbols $a_{n+(L-1)/2} \cdots a_n \cdots a_{n-(L-1)/2}$ which are temporarily stored in a memory comprising input shift registers,
a demodulator for deriving in-phase data symbols (y'_n) and quadrature data symbols (y''_n),
an adaptation circuit for continuously adapting the predistortion circuit to a stream of input data symbols and comprising a comparator circuit that compares the in-phase (a'_n) and quadrature (a''_n) input data symbols with the



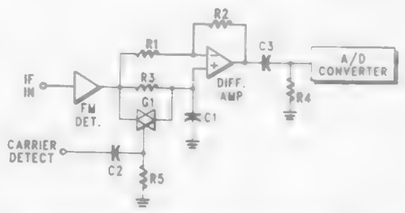
demodulated in-phase (y'_n) and the demodulated quadrature (y''_n) data symbols, and an interface circuit for continuously updating the predistortion circuit in response to an output signal of the comparator circuit, characterized in that the adaptation circuit further comprises, coupled between the comparator circuit and the interface circuit, a set of counters/accumulators which determine the center of gravity of each smeared spot (cloud) of the received constellation by calculating a set of means errors that is used to adapt the predistortion circuit, and
a first filter F_e connected before the modulator and operating on the in-phase and quadrature paths and a second filter F_r connected after the demodulator and also operating on the in-phase and quadrature paths and in a manner such that the product of the filtering performed by the first and second filters F_e and F_r corresponds to a Nyquist filtering.

5,148,449

CENTERING MULTI-LEVEL DATA

Gary A. Cannalte, Hoffman Estates, and Dennis E. Burke, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 26, 1989, Ser. No. 358,295
Int. Cl.[5] H04L *25/06*
U.S. Cl. 375—76 **20 Claims**



1. A method of centering data for data detection comprising:
determining unmodulated carrier frequency error, and

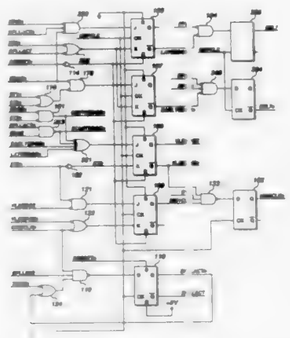
pre-adjusting the data detection process to compensate for that error throughout the ensuing data detection.

5,148,450

DIGITAL PHASE-LOCKED LOOP

Robert J. Hollyer, Los Altos, Calif. assignor to Apple Computer, Inc., Cupertino, Calif.

Filed May 15, 1990, Ser. No. 524,221
Int. Cl.[5] H03D *3/22*
U.S. Cl. 375—81 9 Claims



7. A method for maintaining synchronization of an FM encoded data signal having a contiguous series of bit cells and having a predetermined nominal data rate comprising the steps of:

(a) providing a clock signal having a frequency of 2n times the nominal data rate, where n is an odd integer:

(b) dividing each data bit cell into 2n contiguous states:

(c) detecting a transition of the data signal;

(d) determining if the detected data signal transition is detected within a valid state:

(e) extending one of the states if the detected data signal transition is detected earlier than a nominal arrival time: and

(f) deleting said one of the states if the detected data signal transition is detected later than said nominal arrival time.

5,148,451

CARRIER REGENERATION DEVICE CORRECTLY OPERABLE IN MOBILE SATELLITE COMMUNICATION

Susumu Otani, and Motoya Iwasaki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 9, 1990, Ser. No. 612,087
Claims priority, application Japan, Nov. 10, 1989, 1-291320
Int. Cl.[5] H04L *27/06*
U.S. Cl. 375—97 6 Claims

1. A carrier regenerating device for regenerating a regenerated carrier signal from a modulated overall signal having a frame period and comprising a modulated data signal and modulated unique words which are periodically interspersed in said modulated data signal, said carrier regenerating device comprising:

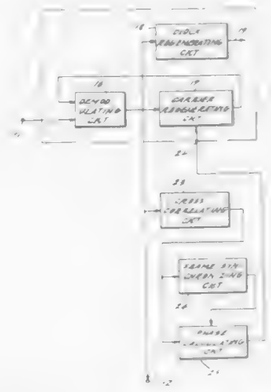
a demodulating circuit for using said regenerated carrier signal in demodulating said modulated overall signal to produce a demodulated overall signal comprising a demodulated data signal and demodulated unique words;

a carrier regenerating circuit for recovering a recovered carrier signal from said demodulated overall signal;

a cross-correlating circuit for calculating a cross-correlation coefficient between said demodulated overall signal and a locally known unique word;

a frame synchronizing circuit for using said cross-correlation coefficient in producing an aperture signal which defines aperture intervals at said frame period when said cross-correlation coefficient is lower than a predetermined threshold value;

a phase error calculating circuit for using said cross-correlation coefficient in calculating a phase error which said



recovered carrier signal has relative to said regenerated carrier signal; and

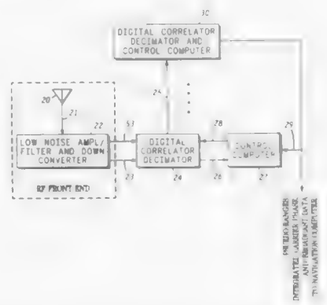
correction setting means for using said aperture signal in setting said phase error at said aperture intervals in said carrier regenerating circuit to make said recovered carrier signal become said regenerated carrier signal.

5,148,452

GLOBAL POSITIONING SYSTEM DIGITAL RECEIVER

Howard L. Kennedy, Phoenix, and Thomas M. King, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1990, Ser. No. 636,168
Int. Cl.[5] H03D *3/02*; H04L *27/06*
U.S. Cl. 375—96 29 Claims



1. A digital Global Positioning System (GPS) receiver for receiving a plurality of coded satellite signals from a plurality of satellites, said signals exhibiting Doppler shifting, said receiver comprising:

means for down converting said coded satellite signals to intermediate frequency signals;

said means for down converting including:

antenna means for receiving said coded satellite signals;

mixer means connected to said antenna means, said mixer means for converting said coded satellite signals of a particular frequency to said intermediate frequency signals;

phase lock loop means connected to said mixer means, said phase lock loop means for providing a phase correcting voltage signal representing the phase error between a scaled frequency of a voltage controlled oscillator stable and a reference oscillator signal; and

voltage controlled oscillator means operating at L-band and operating in response to the phase correcting voltage signal of said phase lock loop means to produce a first mixer signal, said voltage controlled oscillator means being connected to said phase lock loop means; and

said phase lock loop means for providing a second mixer signal;

A/D means coupled to said means for converting, said A/D means for simultaneously translating said intermediate frequency signals for said plurality of coded satellite signals to a plurality of digital signals;

correlation means coupled to said A/D means, said correlation means for simultaneously separating each of said plurality of digital signals corresponding to each said satellite to provide "I" and "Q" channel information signals;

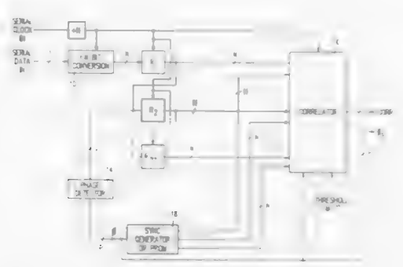
processor means coupled to said correlation means, said processor means for retrieving information transmitted from each of said satellites in response to said "I" and "Q" channel information signals.

5,148,453

PARALLEL SYNC DETECTION

Paul S. Newby, Toronto, and Wayne H. Cannon, Nobbleton, both of Canada, assignors to The Institute for Space and Terrestrial Science, North York, Canada

Filed May 2, 1991, Ser. No. 694,986
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—116 9 Claims



1. A signal for detecting a digital sync word of M bits in a serial signal, comprising:

a) means for receiving and converting said serial signal into a parallel signal having N bits; where M = KN, and K is an integer;

b) means for storing K + 1 successive N-bit sequences of said parallel signal;

c) means for detecting phase location of said digital sync word in said K + 1 successive N-bit sequences, and generating a digital phase signal responsive thereto;

d) means for receiving said digital phase signal and in response generating a phase shifted correct version of said digital sync word; and

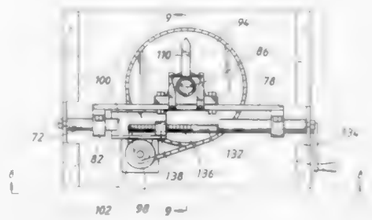
e) means for receiving and comparing KN of said K + 1 successive N-bit sequences in parallel to said phase shifted correct version of said digital sync word, and in the event said N-bit sequences of said parallel signal correlate with said correct version of said digital sync word then generating an output signal indicative of detection of said sync word in said serial signal.

5,148,454

APPARATUS FOR CONDUCTING CRANIAL X-RAY TOMOGRAPHY AND RADIOGRAPHY

George W. Coffman, 12307 Rip Van Winkle, Houston, Tex. 77024-4945

Filed Aug. 27, 1991, Ser. No. 750,510
Int. Cl.[5] A61B *6/14*
U.S. Cl. 378—40 27 Claims



1. A method for cranial X-ray tomography and radiography that is accomplished through utilization of an imaging assembly including an X-ray source and X-ray film holder that are disposed in spaced, opposed relation, said imaging assembly being fixedly supported by a substantially horizontal, rotatable and laterally movable shaft projecting from a housing and thus being rotatable by said shaft about a generally horizontal axis located intermediate said X-ray source and X-ray film holder such that X-ray film of said X-ray film holder is intersected by the beam of radiation emitted by said X-ray source, said method comprising:

(a) positioning a cranial anatomical site of interest at a fixed location with respect to an "X" cartesian axis such that upon energization of said x-ray source, a beam of radiation from said X-ray source is projected through said cranial anatomical site of interest and said "x" axis to said X-ray film;

(b) controllably rotating said shaft and said imaging assembly fixedly supported thereby about said generally horizontal axis while said X-ray source is energized, thus obtaining an X-ray exposure on said X-ray film representing a tomographic section of said cranial anatomical site of interest; and

(c) selectively moving said shaft and thus said generally horizontal axis laterally between successive X-ray exposures of said X-ray film, while said cranial anatomical site of interest is maintained at said fixed location, whereby multiple X-ray tomographic images are obtained, each image representing a different tomographic section of said cranial anatomical site of interest.

5,148,455

BONE DENSITOMETER

Jay A. Stein, Framingham, Mass., assignor to Hologic, Inc., Waltham, Mass.

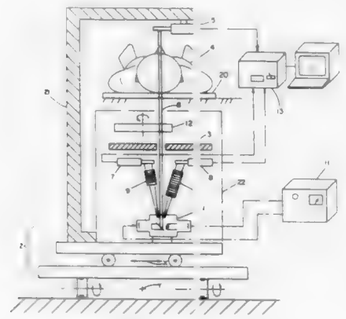
Continuation of Ser. No. 517,375, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 885,098, Jul. 14, 1986, Pat. No. 4,947,414. This application May 28, 1991, Ser. No. 708,104
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] G01B *15/02*
U.S. Cl. 378—55 16 Claims

1. A bone densitometer for measuring bone density of a patient comprising an x-ray system that includes the assembly of an x-ray tube having a power supply, a pencil beam collimator arranged to form and direct a pencil beam of x-rays through the patient and detector means aligned with the collimator on the opposite side of the patient from said collimator to detect x-rays attenuated by the patient, drive means for causing relative movement in X and Y directions between said patient and said assembly of said x-ray tube, pencil beam colli-

mator and detector means to produce an X-Y raster scan of the patient,

said system constructed to provide, at each region of the patient being scanned, outputs of said detector means corresponding to two substantially different x-ray energies passing through the patient, and

signal processing means responsive to said outputs of said detector means to provide a representation of bone density of the patient,



wherein said power supply is constructed to apply alternate high and low voltage levels to said x-ray tube to supply high and low level x-ray energies in alternate fashion, and

control means for the alternation of said voltage produces a frequency of alternation related to the speed of traverse produced by said drive means to the width of the pencil beam produced by said collimator, such that at least one pair of high and low level x-ray energy exposures occurs during the time period during which the pencil beam traverses relative to said patient a distance equal to about one beam width.

5,148,456

APPARATUS FOR TESTING WORKPIECES, IN PARTICULAR AUTOMOTIVE VEHICLE TIRES, BY MEANS OF X-RAYS

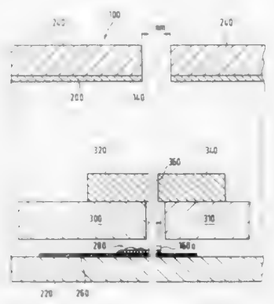
Horst Steffel, Am Fürstenhof 9, 2401 Gross Grönau, Fed. Rep. of Germany

Filed Feb. 1, 1991, Ser. No. 649,835

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1990, 102379

Int. Cl.[5] G01B *15/06*

U.S. Cl. 378—61 **8 Claims**



1. Apparatus for testing a workpiece by means of x-rays, wherein at least a linear array of x-ray sensitive diode and associated electronics is located in a hermetically sealed elongated housing including an elongated first through-slot extending parallel to the diode array and covered by an x-ray transmissive material, and a scanning means is provided for scanning the diodes at a predetermined variable frequency in order to store the output signals of the diodes and to reproduce them by monitoring means, with one scanning line for each scanning sequence being generated on the monitoring means, characterized in that the diodes are spaced from each other so as to obtain a high resolution and to make visible re-enforcements in the workpiece, the spacing distance being 0.5 mm or less, and in that a shield of x-ray absorbing material is located within the housing closely adjacent to the diode array, said shield defining a second through-slot aligned to said first through-slot and to said diode array, said second through-slot having a width smaller than that of said first through-slot and smaller than the extent (X) of the receiving surfaces of the diodes in a direction transversely to the diode array so as to improve the resolution of the array and to protect the electronic circuitry.

5,148,457

SYSTEM FOR ANALYZING METAL IMPURITY ON THE SURFACE OF A SINGLE CRYSTAL SEMICONDUCTOR BY USING TOTAL REFLECTION OF X-RAYS FLUORESCENCE

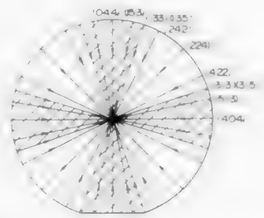
Atsuko Kubota, Yokohama; Norihiko Tsuchiya, Tokyo; Shuichi Samata, Yokohama; Yoshiaki Matsushita, Yokohama, and Mokuji Kageyama, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 27, 1991, Ser. No. 719,706

Claims priority, application Japan, Jun. 28, 1990, 2-170687; Apr. 17, 1991, 3-85469

Int. Cl.[5] G01N *23/223*

U.S. Cl. 378—70 **6 Claims**



1. A system for carrying out an analysis with respect to a metal impurity on the surface of a single crystal semiconductor by using total reflection of an X-ray fluorescence

said system comprising:

incident means for allowing X-ray to be incident onto the surface of the single crystal semiconductor serving as a measurement sample to be analyzed at an incident angle less than a total reflection angle as a critical angle peculiar to a material constituting said semiconductor;

fixing means wherein when it is assumed that said semiconductor surface is partitioned by a lattice having a specific interval d, and that a wavelength of said X-ray caused to be incident by said incident means is λ, an incident angle that said X-ray and said semiconductor surface form is θ, and an arbitrary integer is n, said fixing means for movably mounting said crystal to fix a crystal orientation of said semiconductor with respect to said X-ray so as to satisfy the condition of "$2d \sin \theta \neq n\lambda$";

positioning means for allowing sample points to which said X-ray is incident to be subjected to positioning by horizontally moving said semiconductor so as to satisfy said condition of "$2d \sin \theta \neq n\lambda$"; and

analyzing means for measuring a light quantity of a fluorescent X-ray generated as the result of the fact that said X-ray incident at said incident angle excites atoms at the surface of said single crystal semiconductor to thereby analyze a quantity of the metal impurity attached on said semiconductor surface under the condition where the

Bragg reflection causing measurement noises does not take place.

5,148,458

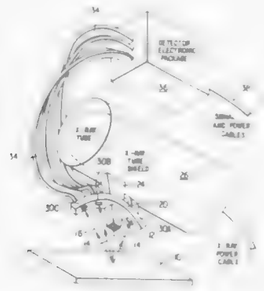
METHOD AND APPARATUS FOR SIMULTANEOUS PHASE COMPOSITION AND RESIDUAL STRESS MEASUREMENT BY X-RAY DIFFRACTION

Clayton Ruud, 331 First Ave., P.O. Box 459, Lemont, Pa. 16851-0459

Continuation of Ser. No. 467,007, Jan. 18, 1990, abandoned. This application May 16, 1991, Ser. No. 702,123

Int. Cl.[5] G01N *23/20*

U.S. Cl. 378—72 **5 Claims**



1. An apparatus for enabling the simultaneous measurement of residual stresses in one or more crystalline phases as well as measuring the crystalline phase composition of an irradiated area of a material using x-ray diffraction, including first, second, and third position-sensitive x-ray detectors fixedly mounted along a circular arc, an x-ray source for directing an incident beam of x-rays towards the center of said circular arc, means for analyzing the distribution spectra detected by each of these detectors of the diffracted x-rays from a polycrystalline sample at the center of said arc.

5,148,459

POWER SOURCE DEVICE FOR X-RAY SYSTEM

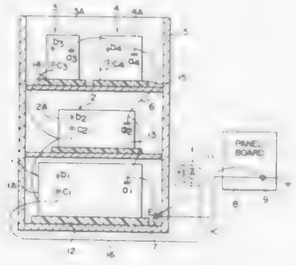
Mitsuru Yahata, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 586,379, Sep. 21, 1990, abandoned, which is a continuation of Ser. No. 251,600, Sep. 30, 1988, abandoned. This application Dec. 16, 1991, Ser. No. 807,645

Claims priority, application Japan, Sep. 30, 1987, 62-243904

Int. Cl.[5] H05G *1/20*

U.S. Cl. 378—105 **7 Claims**



1. A power source device for applying a high voltage to an X-ray tube, comprising:

a high voltage circuit unit, a high frequency inverter circuit unit, a chopper circuit unit and a rectifying/smoothing circuit unit, each said circuit unit being electrically connected, having a ground potential point, and being mounted on an individual metal chassis;

a metal casing in which each said metal chassis is supported;

a ground terminal for and electrically connected to said metal casing;

an electrically insulating member disposed between each said metal chassis and said metal casing for electrically insulating each said metal chassis from said metal casing;

a first ground cable for connecting each said ground potential point of each said circuit unit to the ground terminal of said metal casing;

a panel board for supplying a power source voltage from a voltage supply, said panel board having a ground terminal;

a second ground cable connecting the chassis of said circuit unit to the ground terminal of said panel board; and

a third ground cable connecting the ground terminal of said casing to the ground terminal of said panel board.

5,148,460

AUTOMATIC X-RAY EXPOSURE UNIT

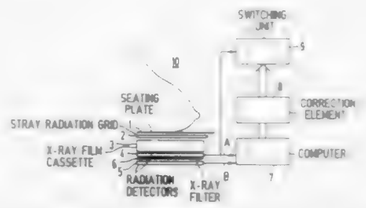
Horst Aichinger, Fuerth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 23, 1991, Ser. No. 734,565

Claims priority, application European Pat. Off., Aug. 24, 1990, 90116267.7

Int. Cl.[5] H05G *1/44*

U.S. Cl. 378—108 **1 Claim**



1. An automatic x-ray exposure unit, for use with a source of x-radiation, said automatic exposure unit comprising:

first and second radiation detectors disposed in sequence and in registry in a radiation propagation direction following an examination space, each radiation detector consisting of a matrix of detector elements also in registry with respective detector elements in registry forming a plurality of detector element pairs, each detector element generating an output signal corresponding to the intensity of radiation thereon;

computer means connected to each of said detector element pairs for calculating a quotient of the output signals of each detector element in each detector element pair; and

means for automatically selecting a measuring field for an x-ray exposure which includes only those detector element pairs having a quotient above a predetermined threshold.

5,148,46

CIRCUITS RESPONSIVE TO AND CONTROLLING CHARGED PARTICLES

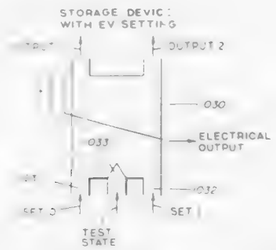
Kenneth R. Shoulders, Austin, Tex., assignor to Jupiter Toy Co., Austin, Tex.

Continuation of Ser. No. 523,294, May 14, 1990, Pat. No. 5,054,047, which is a continuation of Ser. No. 183,506, May 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 137,244, Jan. 6, 1988, abandoned. This application Apr. 12, 1991, Ser. No. 684,401

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.[5] H01L *1/46*

U.S. Cl. 378—119 66 Claims



18. An electronic device comprising means for generating plural contained bundles of charged particles and for causing the bundles to propagate along a path, said path including a region having an input port and an output port for said bundles, and means in the path between said input and output ports for controlling the propagation of the bundles between said ports.

5,148,462

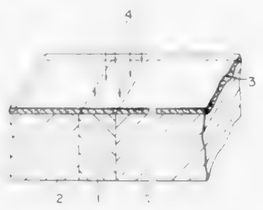
HIGH EFFICIENCY X-RAY ANODE SOURCES

Boris Spitsyn; Valery Efanov; Leonid Bouilov; Alexander Alekseenko; Anantolij Botev, all of Moscow, U.S.S.R., and Terje Skotheim, Shoreham, N.Y., assignors to Moltech Corporation, Stony Brook, N.Y.

Filed Apr. 8, 1991, Ser. No. 682,146

Int. Cl.[5] H01L *35/08*

U.S. Cl. 378—143 6 Claims



1. An x-ray micromodule comprising a layer of target material (1) sandwiched between diamond layers (2).

5,148,463

ADHERENT FOCAL TRACK STRUCTURES FOR X-RAY TARGET ANODES HAVING DIFFUSION BARRIER FILM THEREIN AND METHOD OF PREPARATION THEREOF

David W. Woodruff, Clifton Park, and Minyoung Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

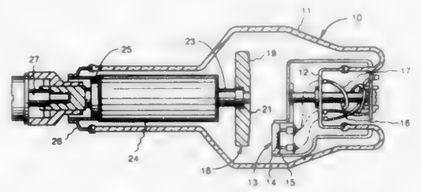
Filed Nov. 4, 1991, Ser. No. 787,459

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—144 7 Claims

1. An improved x-ray tube anode comprising:

a graphite anode body having a focal track region for impingement by electrons to produce x-rays;



a microcracked diffusion barrier layer disposed on said region; and

an anode target layer disposed on top of said barrier layer.

5,148,464

APPARATUS FOR WRITING INFORMATION ON X-RAY FILMS

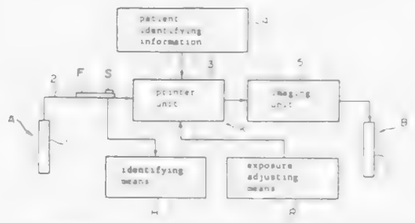
Iku Metoki, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,853

Claims priority, application Japan, Dec. 11, 1989, 1-321098

Int. Cl.[5] H05G *1/28*

U.S. Cl. 378—165 12 Claims



1. An apparatus for writing desired information on a plurality of X-ray films having different photographic exposure characteristics, comprising:

identification means for automatically identifying a photographic exposure characteristic of each of said plurality of X-ray films;

controllable writing means for writing desired information on a predetermined portion of a selected one of said X-ray films by exposing said predetermined portion of said selected one of said X-ray films to energy source means including said information; and

adjusting means for adjusting the controllable writing means to control the exposing of the selected one of said plurality of X-ray films based on the identified exposure characteristic of the selected one of said X-ray films by said identification means so that the desired information written on each of said plurality of X-ray films is controlled to be within a predetermined machine readable range, thereby facilitating reading, storage and retrieval of said X-ray films having said desired information thereon.

5,148,465

X-RAY EXAMINATION APPARATUS AND FILTER SUITABLE FOR USE THEREIN

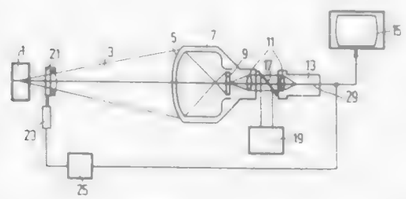
Jakob W. Mulder, Eindhoven, Netherlands, and Goedele A. M. Sibbens, Turnhout, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1991, Ser. No. 682,807

Claims priority, application Netherlands, Apr. 17, 1990, 9000896

Int. Cl.[5] G21K *1/10*

U.S. Cl. 378—156 17 Claims



1. An X-ray examination apparatus comprising an X-ray source and a detector for detecting a beam of X-rays transmitted by the X-ray source for forming an X-ray image, an X-ray absorbing filter between the X-ray source and the X-ray detector, said filter including a liquid reservoir adapted for placement in the X-ray beam and having a first and second wall, at least the first wall being flexible, said first and second walls for receiving said liquid reservoir therebetween and having a wall spacing which decreases from the reservoir center to the reservoir edges, said wall spacing being dimensioned to reduce vignetting in response to irradiation of the detector by a uniform X-ray beam.

5,148,466

DEVICE FOR INSTALLING MAMMOGRAPHY CARTRIDGES OF DIFFERENT FORMATS

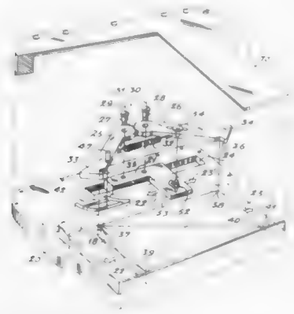
Claude Fajac, Paris, France, assignor to General Electric CGR S.A., Issy les Molineaux, France

Filed Mar. 4, 1991, Ser. No. 663,461

Claims priority, application France, Mar. 8, 1990, 90 02932

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—167 10 Claims



1. A device for installing X-ray sensitive film cartridges of different formats on a plate, the device comprising:

a lever carriage capable of moving in a slot parallel to the direction along with said film cartridge is installed on said plate;

two pivotable levers movable in rotation and carried by said carriage, with the rotary motions of the levers being equal and opposite, the ends of said levers being designed to resiliently hold two corners of said film cartridge;

at least one first groove formed on said plate;

at least one first peg fixed to one of said two levers and co-operating with said first groove, the path followed by said first groove being designed to allow said levers to rotate to adapt the distance between them to the size of said cartridge, and to allow said cartridge to be displaced over said plate.

5,148,467

X-RAY SOURCE HOLDING APPARATUS

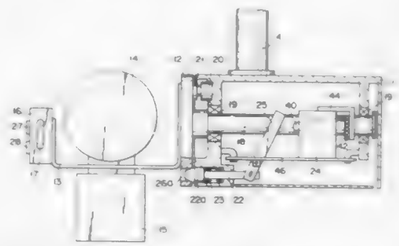
Hiroaki Sato, and Syunichiro Nishigaki, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 1, 1991, Ser. No. 678,238

Claims priority, application Japan, Apr. 3, 1990, 2-87481

Int. Cl.[5] H05G *1/02*

U.S. Cl. 378—197 20 Claims



1. An X-ray source holding apparatus, comprising:

a holding unit which movably holds an X-ray source;

a lock mechanism for inhibiting the movement of said X-ray source; unlock means for disengaging said lock mechanism so as to allow the movement of said X-ray source; and

control means for energizing said unlock means during a predetermined period of time upon reception of a command which is externally supplied.

5,148,468

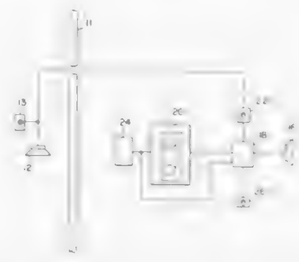
DOOR ANSWERING SYSTEM

Paul J. T. Marrick; Gregory J. Arnold, both of 749 S. Lemay #249, Fort Collins, Colo. 80524, and Rudolph A. Sauter, 4746 Evening Cove Rd., Ladysmith, B.C. VOR2E0, Canada

Filed Oct. 24, 1990, Ser. No. 602,471

Int. Cl.[5] H04M *9/02*, *11/00*

U.S. Cl. 379—56 6 Claims



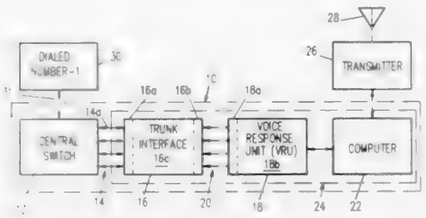
1. A door answering system which enables the occupant of a structure to provide a pre-recorded message to a visitor who has approached the entrance of said structure; wherein said system comprises:

(a) first speaker means accessible at said entrance;

(b) first switch means accessible at said entrance;

(c) recorder means located in eriorly of said structure; said recorder means including said pre-recorded message;
wherein actuation of said first switch means by said visitor activates said recorder means for transmitting said pre-recorded message through said first speaker means, wherein said first speaker means is operatively connected to said recorder means by means of a radio transmitter.

5,148,469
DIRECT PAGER ACCESS WITH FULL NUMBER DIAL NG
Gary A. Price, Beaverton, Oreg., assignor to Seiko Corp. and Seiko Epson Corp., both of, Japan
Filed Jul. 5, 1990, Ser. No. 549,212
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—57 8 Claims



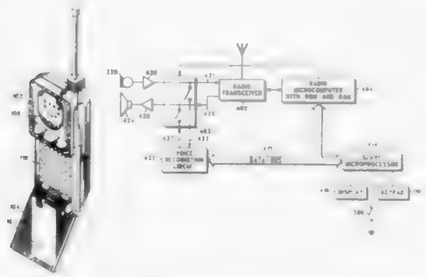
1. A pager access system for selectively transmitting messages from callers through a telephone company central switch to a plurality of individually addressed receivers, each of said receivers having a seven digit identification number, said central office switch having, (a) a plurality of general purpose telephone lines adapted for connection to telephone handsets, (b) means for recognizing telephone numbers dialed by handsets connected to the general purpose telephone lines, (c) a plurality of DID (direct inward dial) trunk lines, said DID trunk lines having telephone numbers associated therewith which are identical to the receiver seven digit identification numbers, and (d) a plurality of loop start trunk lines, the pager access system comprising, in combination:
a computer which assembles messages in a specific format for transmission to specific receivers;
a trunk interface module having (a) input ports connected to the DID trunk lines, (b) means operative, when a DID trunk line is activated, for obtaining from the central switch the seven digit called telephone numbers dialed by the handset, which caused the line to be activated, (c) output ports, (d) output lines, and (e) means operative when an input line is activated for activating an output line and for generating on said output line a dual-tone, multifrequency (DTMF) signal representing the called number;
a voice response unit (VRU) for generating voice prompts, accepting said DTMF input signals, and for sending signals to said computer in response to said DTMF signals, said VRU having (a) plural input ports, (b) means connecting a first plurality of said input ports to the output ports of said trunk interface module, (c) means connecting a second plurality of said input ports to said loop start trunk lines, (d) means activated when an input port is activated for generating a series of voice prompts and for accepting a series of DTMF signals representing commands, said voice prompts being given only if the associated DTMF command is not received, the first voice prompt asking for the identification number of the receiver which the caller desires to contact;
whereby said VRU transmits one set of prompts to a caller connected thereto through said trunk interface module and another set of prompts to a subscriber connected thereto through said loop start trunk lines, whereby a particular receiver can be contacted either by calling a DID telephone number or by calling a telephone number which connects to a loop start trunk line, wherein the caller is required to enter the receiver's identification number when connected to the VRU through a loop start trunk line.

5,148,470
RADIO TELEPHONE APPARATUS HAVING AN INSTANTANEOUS CONVERSATION FUNCTION
Kazuo Kobayashi; Akio Toki; Koichi Ito, and Hisanori Kuroki, all of Hino, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 17, 1990, Ser. No. 583,486
Claims priority, application Japan, Sep. 22, 1989, 1-246885
Int. Cl.[5] H04M *11/10*
U.S. Cl. 379—58 13 Claims

1. A radio telephone apparatus comprising:
a base unit connected to a wire line;
a radio telephone unit connected to said base unit via a radio communication link;
mounting means for mounting said radio telephone unit thereon;
detecting means for detecting that said radio telephone unit has been lifted off said mounting means;
a talk commencing/terminating key for inputting a command for commencing a conversation when said talk commencing/terminating key is operated in a standby state and for inputting a command for terminating the conversation when said talk commencing/terminating key is operated in a conversation state;
means for establishing the conversation state by means of a detected output of said detecting means in the standby state or by an input of a conversation commencing command through the operation of said talk commencing/terminating key; and
time guard means for invalidating an input operation of said talk commencing/terminating key during a preset time if the conversation state is established through a detected output of said detecting means in the standby state.

5,148,471
COMMUNICATIONS DEVICE WITH VOICE RECOGNITION AND MOVABLE ELEMENT CONTROL INTERFACE
Michael P. Metroka, Algonquin, and Robert K. Krolopp, Lisle, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 20, 1989, Ser. No. 439,993
Int. Cl.[5] H04M *11/00, 1/64*
U.S. Cl. 379—58 2 Claims

1. A portable radiotelephone apparatus having a voice recognition circuit and further having a housing with a movable member and a fixed member having an earpiece electroacoustic transducer disposed therein, the movable member having a contracted first position and an extended second position, the portable radiotelephone apparatus comprising:
means for producing an off-hook signal in the portable radiotelephone apparatus when the movable member is in the second position;
means, responsive to said off-hook signal, for activating the voice recognition circuit;
means for producing an on-hook signal in the portable radiotelephone apparatus if the movable member is in the first position;

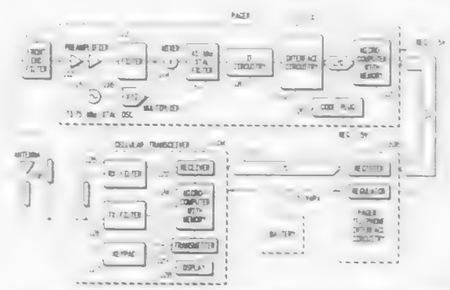


means for initiating a telephone call after said off-hook signal has been produced; and
means for deactivating an activated voice recognition circuit but maintaining said telephone call when the movable member is placed in the first position and subsequently returned to the second position within a predetermined period of time.

5,148,472
CELLULAR TELEPHONE CALL ADMINISTRATION SYSTEM
David E. Freese, 35 Baroness La., Laguna Niguel, Calif. 92677; David A. Miller, 25652 Rimgate Dr. Apt. #13A, El Toro, Calif. 92630, and Mark J. Nielsen, 6533 N. Campbell, Chicago, Ill. 60645
Filed Dec. 5, 1990, Ser. No. 622,508
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—59 3 Claims

1. A cellular telephone call administration system for a cellular telephone switching system which comprises: a switch for providing communication service to a plurality of cellular sets; means for generating and transmitting detailed call records of calls processed by the switch to a data output port; and an administrative port for receiving control signals for selectively activating and deactivating service to identified cellular sets;
CHARACTERIZED IN THAT:
the call administration system comprises:
memory means comprising a plurality of service class data files assigned respectively to corresponding system service classes;
means coupled to said data output port for assigning detailed call records appearing at said data output port into a plurality of system service classes; and for storing records corresponding to each of said detailed call records in the data file of the service class assigned to the call record;
means for automatically distributing the contents of said service class data files; and
means for automatically generating said control signals for selectively activating and deactivating cellular sets for service by said cellular switch.

5,148,473
PAGER AND RADIOTELEPHONE APPARATUS
Joseph C. Freeland, Lindenhurst, and David M. Hess, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 575,473, Aug. 30, 1991, abandoned.
This application Oct. 15, 1991, Ser. No. 773,759
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—59 5 Claims



2. A pager and radiotelephone apparatus for communicating radiotelephone call signals on radiotelephone channels and receiving paging signals on a paging radio channel, the pager and radiotelephone apparatus comprising:
an antenna for receiving the paging signals and communicating the radiotelephone call signals;
pager means having first filter means coupled to the antenna for receiving paging signals on the paging radio channel and having memory means for storing the received paging signals, each paging signal having a telephone number with at least one digit, the pager means further providing an indication signal when each paging signal has been received, and the pager means being responsive to a first control signal for reading out the stored telephone numbers and being responsive to a second control signal for clearing the memory means;
cellular transceiver means coupled to the pager means, having at least a send pushbutton and a recall pushbutton, and having second filter means coupled to the antenna for receiving radiotelephone call signals on the cellular radio channels, the cellular transceiver means responsive to each indication signal for counting the number of paging signals received, and the cellular transceiver means responsive to activation of the recall pushbutton for generating the first control signal to enable the pager means to read out from the memory means the counted number of stored telephone numbers and thereafter generating the second control signal to enable the pager means to clear the memory means, and the cellular transceiver means responsive to activation of the send pushbutton for transmitting radiotelephone call signals using one of the read out telephone numbers;
a power source for generating a predetermined voltage to power the cellular transceiver means; and
interface circuitry, connected to the pager means, the cellular transceiver means, and the power source, the interface circuitry having regulation means for regulating the predetermined voltage to a lower voltage to power the pager means, the interface circuitry additionally having a mem-

ory register for temporarily storing the telephone numbers read out from the memory means.

5,148,47·
INTERACTIVE VAl UE-ADDED TELECOMMUNICATIONS SY STEM AND METHOD

Nancy Haralambopoulos; Costa Ha ralambopoulos, both of 709 English Rd., Rochester, N.Y. 14616; James R. Mills, 2500 East Ave. (Apt. No. 7X), Rochester, N.Y. 14610, and Harold A. Gell, Jr., 13720 Lockdale Rd. Silver Spring, Md. 20906

Filed Aug. 21, 1991, S r. No. 748,178
Int. Cl.[5] H04M *15/10, 15/18*
U.S. Cl. 379—111 20 Claims

1. A method of operating a sy tem for billing a caller for value-added charges incurred dur ng a call made over a communication network to a provid r of services or products, including the steps of:

answering a telephone call fron said caller;

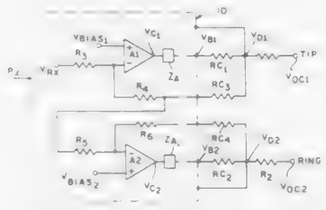
establishing an additional telep one path onto the existing connection made by answerin g said call from said caller; and

directing said caller to dial a n mber to complete initiation of a telephone call over said a ldditional telephone path and said existing connection to a predetermined value-added telephone number.

5,148,4· 5
REDUCED CONTACT RES ISTANCE ON A SLIC

Thomas P. Warwick, Melbourne, nd Robert Rood, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 6, 1990, S r. No. 505,899
Int. Cl.[5] H04M *19/00*
U.S. Cl. 379—399 16 Claims



13. A subscriber line interface circuit for connecting a subscriber to a telephone exchange comprising:

a tip amplifier, having an input and output, for driving a tip line;

first contact means for connecting said output of said tip amplifier to said tip line;

a first feedback resistor having a first terminal connected to said input of said tip amplifier and a second terminal;

second contact means for connecting said second terminal of said first feedback resistor to said tip line distinct from said first contact means to form a Kelvin contact;

a first balance resistor connected to said first and second contact means and to be connected in series to said tip line

a ring amplifier, having an input and an output, for driving a ring line;

third contact means for connecting said output of said ring amplifier to said ring line;

a second feedback resistor having a first terminal connected to said input of said ring amplifier and a second terminal;

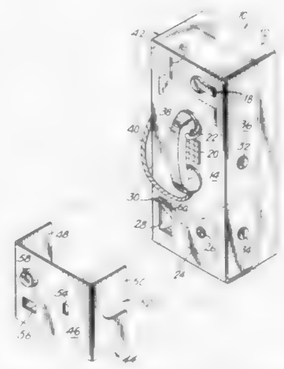
fourth contact means for connecting said second terminal of said second feedback resistor to said ring line distinct from said third contact means to form a Kelvin contact; and

a second balance resistor connected to said third and fourth contact means and to be connected in series to said ring line.

5,148,476
TELEPHONE ANTI-THEFT DEVICE

Fredrick Zausner, Port Washington, N.Y., assignor to Wolder, Gross & Bondell, New York, N.Y.

Filed May 21, 1990, Ser. No. 526,514
Int. Cl.[5] H04M *17/00*
U.S. Cl. 379—437 4 Claims



1. A protective cover for the coinbox-containing portion of a pay telephone of generally box-like construction, comprising a front panel flanked by a pair of parallel, rearwardly-extending side wall panels to define a generally U-shaped construction, said construction adapted and arranged to closely abut the front and side panels of the telephone, said front panel being adapted to be permanently fastened to the coinbox cover of the telephone, and further having means located thereon to allow operation of and access to the coin return system of said telephone and to permit access to the coinbox removal means of said telephone.

5,148,477
METHOD AND APPARATUS FOR DETECTING AND QUANTIFYING MOTION OF A BODY PART

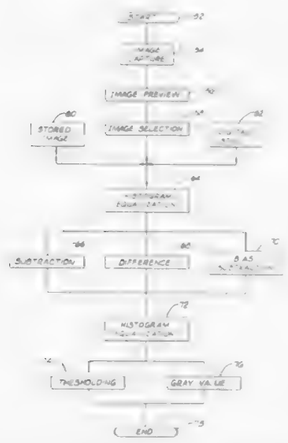
John G. H. Neely, Edmond, and John Y. Cheung, Oklahoma City, both of Okla., assignors to Board of Regents of the University of Oklahoma, Norman, Okla.

Filed Aug. 24, 1990, Ser. No. 573,502
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—6 62 Claims

1. A method for detecting facial motion of at least a portion of an individual's face comprising:

producing a digitized frame of the individual's face in a reference position of the individual's face, identified as a digitized control frame;

producing a digitized frame of the individual's face in a moved position of the individual's face, different from the position of the individual's face in the reference position, identified as a digitized changed frame, where the moved



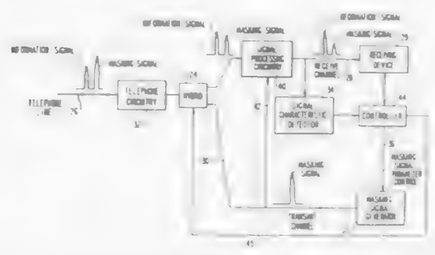
position is produced substantially by facial musculature movements of the individual; and

comparing the digitized control frame with the digitized changed frame and determining shape changes over a defined surface area of the the individual's face from the reference position to the moved postion.

5,148,478
SYSTEM AND METHOD FOR COMMUNICATIONS SECURITY PROTECTION

John M. Saltwick, Phoenix, and Dean Scarinci, Glendale, both of Ariz., assignors to Syntellect Inc., Phoenix, Ariz.

Continuation of Ser. No. 354,261, May 19, 1989. This application Dec. 17, 1990, Ser. No. 628,701
Int. Cl.[5] H04K *1/02*
U.S. Cl. 380—6 84 Claims



1. In a communications system for interconnecting first and second sites over a two-direction line, wherein standard tone encoded information signals are transmitted over said line in at least one direction from said first site to said second site, apparatus for preventing intelligible interception of said information signals but allowing intelligible reception of said tone encoded information signals at said second site comprising:

means disposed solely at said second site for injecting a masking signal on said line; and

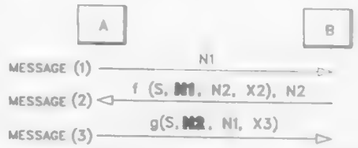
means at said second site for extracting tone encoded information signals received on said line from said first site which are superimposed on said masking signal;

said apparatus having no part thereof at said first site.

5,148,479
AUTHENTICATION PROTOCOLS IN COMMUNICATION NETWORKS

Raymond F. Bird, Durham, N.C.; Inder S. Gopal, Fort Lee, N.J.; Philippe A. Janson, Waedenswil, Switzerland; Shay Kutten, Rockaway, N.J.; Refik A. Molva, Zurich, Switzerland, and Marcel M. Yung, New York, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 20, 1991, Ser. No. 672,226
Int. Cl.[5] H04K *1/00, 9/00*
U.S. Cl. 380—23 28 Claims



1. A method of authenticating a user on a communications connection in a network, comprising the steps of

transmitting a first challenge N1 from a first user A to a second user B,

transmitting a first response to the first challenge from the second user to the first user,

verifying at the first user that the first response is correct, said first response being of the minimum form

f(S1, N1, D1),

wherein S1 is a shared secret between the first and second users, D1 is an indication of the direction of flow of the message containing f( ) and f( ) is a function selected such that

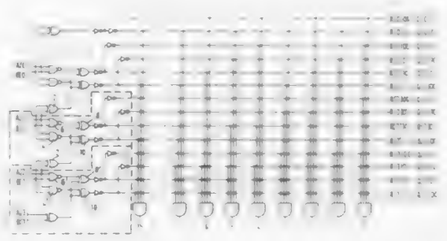
$f(S1, N1', D1', \quad) = f(S1, N1, D1, \quad)$

cannot be solved for N1′ without knowledge of S1, wherein f′( ), N1′ and D1′ represent expressions on a reference connection.

5,148,480
DECODER

Richard M. Forsyth, Bristol, United Kingdom, assignor to Inmos Limited, Bristol, England

Filed Jan. 31, 1991, Ser. No. 648,209
Claims priority, application United Kingdom, Feb. 14, 1990, 9003322
Int. Cl.[5] G06F *7/50*
U.S. Cl. 380—28 14 Claims



4. A decoder having first and second inputs and a plurality of outputs, each associated with a particular output value, and having selection circuitry coupled between said first and sec-

ond inputs and arranged to select one of said outputs based on a relationship between first and second n-bit binary numbers supplied to said first and second inputs respectively, said selecting circuitry comprising:

a plurality of logic circuits, each comprising:

a NAND gate having first and second inputs for receiving the i−1th bit of each of said n-bit binary numbers, where i is an index ranging from 1 to n wherein each value in that range is associated with a corresponding one of said logic circuits;

a NOR gate having first and second inputs for receiving the i−1th bit of each binary number;

first and second exclusive OR gates, the first exclusive OR gate having a first input coupled to the output of the NOR gate and a second input coupled to the output of the second exclusive OR gate, the inputs to which include the ith bit of each of said n-bit binary numbers; and

a third exclusive OR gate having a first input coupled to the output of the NAND gate and a second input coupled to the output of the second exclusive OR gate, a first inverter coupled to the output of the first exclusive OR gate, a second inverter coupled to the output of the third exclusive OR gate, the outputs of the first and second inverters directly providing respectively two output signals of the logic circuit and being inverted to provide two further output signals of the logic circuit so as to provide a set of output signals associated with each output value of the decoder; and

a plurality of AND gates associated respectively with the outputs of the decoder and each arranged to receive one of said sets of output signals associated with each output value of the decoder.

5,148,481

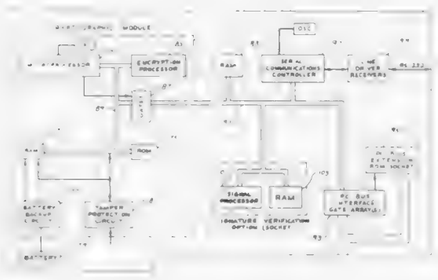
TRANSACTION SYSTEM SECURITY METHOD AND APPARATUS

Dennis G. Abraham, Concord; Steven G. Aden, Charlotte; Todd W. Arnold, Charlotte; Steven W. Neckyfarow, Charlotte, and William S. Rohland, Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 418,068, Oct. 6, 1989, Pat. No. 5,048,085. This application Jul. 1, 1991, Ser. No. 723,875

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—46 **2 Claims**



1. The method of communicating a secure boolean response comprising the steps of:

a) generating a random number in a security device;

b) encrypting said random number under a key;

c) sending said encrypted random number to another security device;

d) decrypting said encrypted random number in said another security device:

e) modifying said random number by a first function if said response is true:

f) modifying said random number by a second function if said response is false:

g) encrypting said modified random number;

h) sending said encrypted modified random number to said first security device;

i) decrypting said encrypted modified random number at said first security device: and

j) comparing said modified random number with said random number to determine said response.

5,148,482

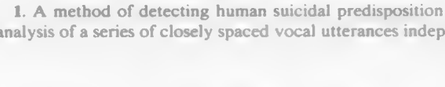
LAYERED SESSION DATA UNIT FRAME

Paul M. Bocci, Roselle; Alan L. Wilson, Hoffman Estates, and Walter F. Anderson, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1991, Ser. No. 707,475

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—48 **24 Claims**



19. An RF communication unit arranged to communicate with a base radio station by transmitting signals over an RF channel **16**, the signals arranged to form one or more frames, and where the RF communication unit comprises information to be transmitted, the information comprising a link control field, an encryption field and a user field, wherein the user information is encrypted, the RF communications unit arranged for forming a frame, the frame comprising:

a plurality of data units, each containing information fields containing user information;

a first group of said plurality of data units including link control information for the purpose of addressing arranged in sub-fields that are imbedded in the information fields of the member data units; and

a second group of said plurality of data units including encryption information arranged in sub-fields that are imbedded in the information fields of the member data units.

5,148,483

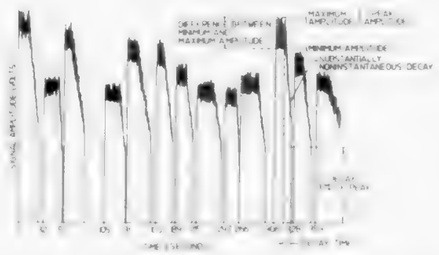
METHOD FOR DETECTING SUICIDAL PREDISPOSITION

Stephen E. Silverman, 16 N. Calvin Rd., Weston, Conn. 06883

Continuation of Ser. No. 53,949, May 26, 1987, abandoned, which is a continuation of Ser. No. 522,398, Aug. 11, 1983, Pat. No. 4,675,904. This application Oct. 18, 1990, Ser. No. 599,815

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—41 **21 Claims**



1. A method of detecting human suicidal predisposition by analysis of a series of closely spaced vocal utterances independently of linguistic content of the utterances, including the steps of:

a. converting the utterances into an electrical signal having time varying amplitude and frequency which are representative thereof;

b. filtering frequency components of said signal above and below preselected frequencies to obtain a signal within said preselected frequencies;

c. filtering non-repetitive components, having amplitude above about 90% of average amplitude of the signal, out of the signal;

d. filtering repetitive components, having frequency outside about 90% frequency bandwidth of the signal, out of the signal;

e. identifying as suicidally predisposed a person from whom said vocal utterances emanated if difference between minimum and maximum amplitude of the signal is low relative to difference between minimum and maximum amplitude of a comparison signal from persons known not to be suicidally predisposed.

5,148,484

SIGNAL PROCESSING APPARATUS FOR SEPARATING VOICE AND NON-VOICE AUDIO SIGNALS CONTAINED IN A SAME MIXED AUDIO SIGNAL

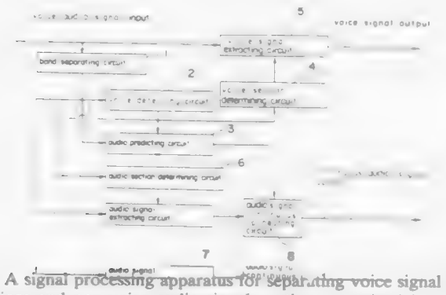
Joji Kane, Nara, and Akira Nohara, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 15, 1991, Ser. No. 700,465

Claims priority, application Japan, May 28, 1990, 2-138064

Int. Cl.[5] G10L *3/00*

U.S. Cl. 381—46 **2 Claims**



1. A signal processing apparatus for separating voice signal portions and non-voice audio signal portions contained in a mixed audio signal, said apparatus comprising:

an input and first and second outputs;

band separation means, operatively coupled to said input, for receiving and channel dividing the mixed audio signal and for outputting a thus channel divided mixed audio signal;

voice signal detecting means, operatively coupled to said band separation means, for detecting voice signals within the channel divided mixed audio signal;

voice segment determining means, operatively coupled to said voice signal detecting means, for determining voice segments of the channel divided mixed audio signal which correspond to the voice signals detected by said voice signal detecting means;

voice signal extracting means, operatively coupled to said input and said voice segment determining means and said first output, for extracting and outputting on said first output the voice signal portions of the mixed audio signal which correspond to the voice segments determined by said voice segment determining means;

non-voice audio signal predicting means, operatively coupled to said band separation means and said voice signal detecting means, for predicting non-voice audio signals contained in the voice signal portions of the channel divided mixed audio signal based on non-voice audio signal portions of the channel divided mixed audio signal output by said band separation means;

non-voice segment determining means, operatively coupled to said voice signal detecting means, for determining non-voice audio segments of the channel divided mixed audio signal which do not correspond to the voice signals detected by said voice signal detecting means;

non-voice extracting means, operatively coupled to said band separation means and said non-voice segment determining means, for extracting and outputting the non-voice audio signal portions contained in the mixed audio signal which correspond to the non-voice audio segments determined by said non-voice segment determining means; and

combining means, operatively coupled to said non-voice audio signal predicting means and said non-voice signal extracting means and said second output, for combining and outputting on said second output the non-voice audio signals predicted by said non-voice audio signal predicting means and the non-voice audio signal portions output by said non-voice audio signal extracting means.

5,148,485

ENCRYPTON SYSTEM FOR DIGITAL CELLULAR COMMUNICATIONS

Paul Dent, Stehag, Sweden, assignor to Ericsson GE Mobile Communications Holding, Inc., Paramus, N.J.

Continuation of Ser. No. 556,358, Jul. 20, 1990, abandoned. This application May 31, 1991, Ser. No. 708,876

Int. Cl.[5] H04L *9/02*

U.S. Cl. 380—46 **69 Claims**

1. A method of generating a pseudo-random bit sequence for use in enciphering digital data in which said bit sequence is a function of a plurality of selected key bits, said method comprising:

generating a plurality of multi-bit values each of which is a function of at least some of said selected key bits;

storing each of said plurality of multi-bit values in a discrete location in a memory;

storing each of a plurality of multi-bit values in a look-up table;

generating a sequence of values in a register having a present value at a particular moment by changing the present value contained in said register in response to each cycle of operation;

cyclically calculating a sequence of multi-bit values in accordance with a first preselected algorithm each of which values is a function of at least one of the multi-bit values stored in either said look-up table or in said memory and at least part of the value contained in said register;

cyclically resetting the present value contained in said register with a value obtained as a result of each calculation;

cyclically calculating a multi-bit keyword which is a function of a value obtained as a result of each multi-bit value calculation; and

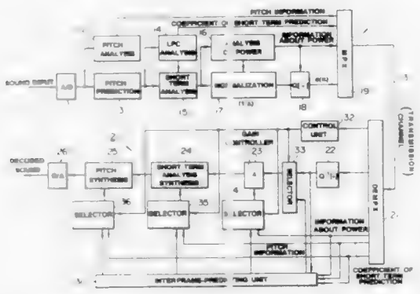
sequentially combining at least some of said multi-bit keywords into said pseudo-random bit sequence.

5,148,485

VOICE DECODING DEVICE

Norimasa Kudoh, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 293,847, Jan. 5, 1989, abandoned. This application May 9, 1991, Ser. No. 700,321
Claims priority, application Japan, Mar. 30, 1988, 63-74544
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—36 21 Claims



1. A voice decoding device in which a voice signal sampled at a predetermined period is compression-coded into pitch information, a coefficient of short term prediction, power information, and a normalized prediction residual signal, in a frame unit consisting of a predetermined number of samplings, where the compression-coded voice signal transmitted in the form of packets is decoded, said device comprising:

extracting means for extracting pitch information, a co-efficient of short term prediction, power information, and a normalized prediction residual signal from a received packet;

interframe predicting means for predicting pitch information, a coefficient of short term prediction, power information, and a normalized prediction residual signal to be received next from pitch information, a coefficient of short term prediction, power information and a normalized prediction residual signal contained in a plurality of packets received in the past and at present,

detection means for monitoring a time period between the reception of a packet and reception of a next packet, and for detecting an absence of a packet when the time period exceeds a predetermined value;

selection means for selecting pitch information, the coefficient of short term prediction, the power information, and the normalized prediction residual signal extracted by the extracting means, when the absence of a packet is not detected, and for selecting the pitch information, the coefficient of short term prediction, the power information, and the normalized prediction residual signal predicted by the interframe predicting means when the absence of a packet is detected; and

decoding means for decoding the voice signal based on the pitch information, the coefficient of short term prediction, the power information, and the normalized prediction residual signal selected by the selection means.

5,148,487

AUDIO SUBBAND ENCODED SIGNAL DECODER

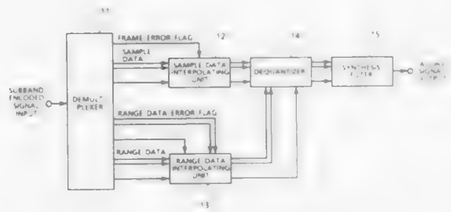
Kiyotaka Nagai, and Yasushi Nakajima, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 20, 1991, Ser. No. 658,304
Claims priority, application Japan, Feb. 26, 1990, 2-044906; Feb. 28, 1990, 2-047590
Int. Cl.[5] H04L 1/00
U.S. Cl. 381—46 3 Claims

1. An audio subband encoded signal decoder which decodes a subband encoded signal composed of frames including range data indicative of the maximum signal level of each frame, sample data indicative of signal data, and error detection and/or correction data to thereby reproduce an audio signal, comprising:

a demultiplexer for separating the subband encoded signal, detecting or correcting an error, if any, in the encoded signal; and outputting, for each subband, sample data, range data, a range data error flag indicative of an uncorrectable error in the range data of that subband;

a range data interpolating unit for outputting the range data as it is from said demultiplexer, if there is no error in the range data using a range data error flag for each subband; outputting the range data interpolated with the range data



of the previous frame and the following frame, if there is an error in the range data of the current frame and no error in the range data of the following frame; and attenuating and outputting the level of the range data of the previous frame if there is an error in the range data of the current frame and the following frame;

a dequantizer for performing, for each subband, dequantization and denormalization using sample data from said demultiplexer and range data from said range data interpolating unit; and outputting the signals of the frames of the respective subbands; and

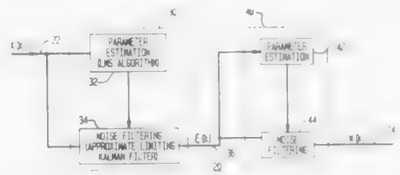
a synthesis filter for synthesizing the respective signals of the frames of the subbands to reproduce an audio signal.

5,148,488

METHOD AND FILTER FOR ENHANCING A NOISY SPEECH SIGNAL

Walter Y. Chen, Brookside, N.J., and Richard A. Haddad, Tuxedo, N.Y., assignors to NYNEX Corporation, White Plains, N.Y.

Filed Nov. 17, 1989, Ser. No. 438,610
Int. Cl.[5] G10L 3/02; G06F 15/31
U.S. Cl. 381—47 9 Claims



1. A method to be carried out on line for enhancing a noisy speech signal comprising the steps of

in a first time domain filtering step, applying an adaptive least means square algorithm to said noisy speech signal to obtain a set of model parameters from said noisy speech signal, and

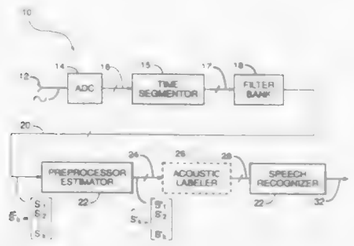
in a second time domain filtering step, utilizing said model parameters to apply an approximate limiting Kalman filtering algorithm to said noisy speech signal on line to obtain an enhanced speech signal.

5,148,489

METHOD FOR SPECTRAL ESTIMATION TO IMPROVE NOISE ROBUSTNESS FOR SPEECH RECOGNITION

Adoram Erell, Ramat Aviv, Israel, and Mitchel Weintraub, Fremont, Calif., assignors to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 486,462, Feb. 28, 1990, abandoned.
This application Mar. 9, 1992, Ser. No. 847,875
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—47 15 Claims



1. In a speech recognition system for responding to signals representative of digitized speech, a method for preprocessing a noisy speech signal to estimate a clean speech signal, comprising the steps of:

categorizing each time-invariant segment of digitized speech and noise into a noisy speech vector, each element of said noisy speech vector representing one frequency channel of speech information in the presence of noise, said noise being assumed to be additive, time invariant and uncorrelated to the frequency domain;

estimating a clean speech signal comprising a clean speech vector for each said element from said noisy speech vector by

(1) determining the probability distribution of clean speech by applying the noisy speech vector to a mixture model composed of a mixture of components, each component representing a different speech class assuming different frequency channels are uncorrelated within each class,

(2) modelling the conditional probability function of a vector of noisy speech around a vector of clean speech as uncorrelated at different frequency channels; and

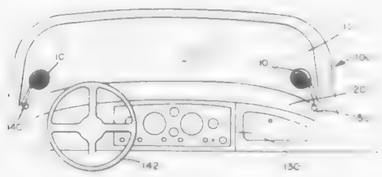
storing the estimated clean speech signal in memory.

5,148,490

SPEAKER WITH TWEETER ASSEMBLY MOUNTED TO THE INTERIOR OF THE WINDSHIELD OF A VEHICLE

Gary T. Draffen, Rancho Palos Verdes, Calif., assignor to Culver Electronic Sales, Inc., Gardena, Calif.

Filed Oct. 1, 1990, Ser. No. 590,782
Int. Cl.[5] H04B 1/00
U.S. Cl. 381—86 19 Claims



1. A tweeter assembly mounted to the interior of the windshield of a vehicle comprising:

a. a shell support member having a rear surface and an interior chamber for housing a tweeter;

b. a tweeter rotatably mounted within the interior chamber of the shell support member;

c. said tweeter having a covering grill;

d. means for enabling the tweeter and its covering grill to rotate relative to said shell support member;

e. means for mounting the rear surface of said shell support member to the interior of the windshield; and

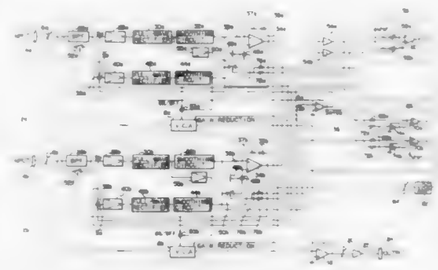
f. means for connecting the tweeter to audio electronic components located within the vehicle.

5,148,491

AUTOMATIC MIXER APPARATUS

Sinji Sakamoto, Hyogo, and Kenichi Furukawa, Osaka, both of Japan, assignors to Toa Corporation, Japan

Filed Aug. 30, 1990, Ser. No. 575,243
Claims priority, application Japan, Oct. 13, 1989, 1-266985; Oct. 13, 1989, 1-266986
Int. Cl.[5] H04B 1/00; H04R 3/00, 29/00; H03G 3/00
U.S. Cl. 381—119 5 Claims



1. An automatic mixer apparatus comprising:

a plurality of input terminals for receiving respective aural signals;

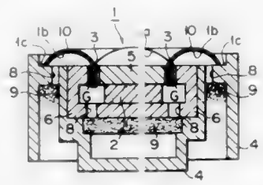
a plurality of channels connected to said respective input terminals, each of said channels including first detecting means for detecting a level of said respective one aural signal input to the corresponding input terminal and to produce a detected signal level, first comparator means for comparing said detected signal level from said first detecting means with a level of a reference signal and outputting a comparison signal when the detected signal level is higher than the reference signal level, and gain controllable transfer gate means for selectively transferring said aural signal in response to said comparison signal from said first comparator means;

gain control means connected to receive said comparison signals from said first comparator means of said channels for controlling the gains of said transfer gate means of said channels in accordance with the number of received comparison signals, said gain control means comprising a variable voltage generator for generating a voltage variable in accordance with the number of said comparison signals, and a log-amplifier for log-amplifying said voltage from said generator and outputting gain control signals to said transfer gate means of said channels;

mixing means for mixing signals from said transfer gate means of said channels; and

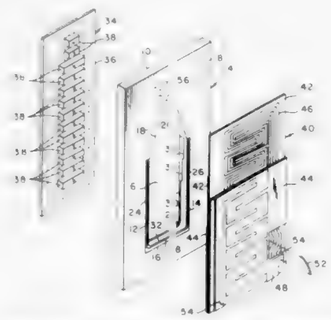
an output terminal for outputting the mixed signal from said mixing means.

5,148,492
DIAPHRAGM OF DYNAMIC MICROPHONE
Shigeru Uzawa, Tokyo, and Yoshio Kikuti, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Audio-Technica, Japan
Filed Mar. 14, 1991, Ser. No. 669,035
Claims priority, application Japan, May 22, 1990, 2-53164[U]
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—177 3 Claims



1. A dynamic microphone comprising:
a casing;
a diaphragm which is arranged in front of the casing and can vibrate in accordance with a vibration from a sound source and having a center dome as a center portion of the diaphragm and an edge portion as an outer peripheral portion of the center dome
a magnet having a front surface and a rear surface, said magnet located behind the diaphragm;
a pole piece joined between the front surface of the magnet and the diaphragm;
a yoke plate joined to the rear surface of the magnet;
a voice coil which is arranged in a narrow gap between the outer peripheral surface of the pole piece and the yoke plate and is joined to the diaphragm so as to transverse a magnetic field formed by the magnet and can vibrate in an integrated manner with the diaphragm;
damping means which is constructed in a manner such that a number of peripheral treatment agents are applied to form a plurality of dots onto either one of the front surface or the back surface of the portions of the diaphragm excluding the center dome portion.

5,148,493
LOUDSPEAKER STRUCTURE
Paul F. Bruney, 12812 Meadowood Dr., Silver Spring, Md. 20904
Division of Ser. No. 245,915, Sep. 19, 1988, Pat. No. 4,939,784.
This application Feb. 21, 1990, Ser. No. 482,801
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—203 3 Claims

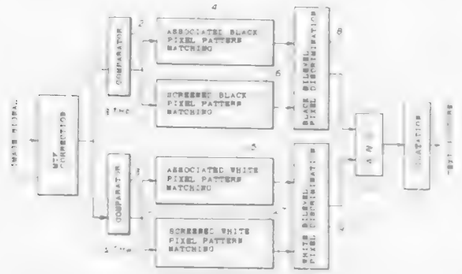


1. A loudspeaker for producing three dimensional stereo reproduction, comprising
(a) a housing containing a tapered opening;
(b) a generally planar diaphragm mounted on said housing and extending across said opening; and
(c) a plurality of vertically spaced drivers connected with said diaphragm and adapted for connection with a source of sound signal currents, each of said drivers being operable for reproducing sound within a separate and distinct frequency range above 1400 Hz, said drivers each having an operating width across said opening which determines the maximum desired wavelength of sound frequencies reproduced thereby, whereby said drivers emanate directional sound beams for improved three-dimensional sound reproduction.

5,148,494
PROCESS FOR AUTOMATIC PLOTTING AND ASSISTANCE INTERPRETATION OF SEISMIC CROSS-SECTIONS IN PARTICULAR USING IMAGE ANALYSIS TECHNIQUES
Naamen Keskes, Lons, France, assignor to Societe Nationale Elf Aquitaine, Courbevoie, France
PCT No. PCT/FR90/00303, § 371 Date Feb. 28, 1991, § 102(e) Date Feb. 28, 1991, PCT Pub. No. WO90/13831, PCT Pub. Date Nov. 15, 1990
PCT Filed Apr. 26, 1990, Ser. No. 623,727
Claims priority, application France, Apr. 28, 1989, 89 05741
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 12 Claims

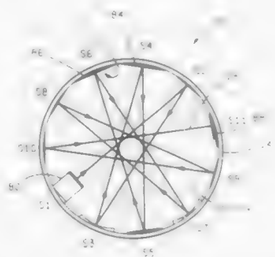
1. A process for plotting lineations and for identifying areas of the lineations with similar features of two-dimensional images representing values which are measured by a parameter along two axes and are organized along the lineations, to facilitate analysis of the two-dimensional images, comprising the steps of:
(a) reading said values from magnetic media to obtain the two dimensional images containing the organized lineations and plotting the lineations;
(b) breaking down each plotted lineation into contiguous curved segments utilizing a microcomputer, including a central processing unit, such that a greatest distance between one point of each of the contiguous curved segments and a straight line segment joining the two ends thereof does not exceed a predetermined value and storing the contiguous curved segments in a memory;
(c) allocating to each of the contiguous curved segments at least one range, characterizing all the values of the parameter associated with each of the contiguous curved segments; and
(d) displaying all the contiguous curved segments for which at least one of the ranges belongs to a given predetermined interval for the two-dimensional images, on a screen in order to facilitate analysis of the two-dimensional images.

5,148,495
LINE REGION SEGMENTATION METHOD
Kaoru Imao, Yokohama, and Satoshi Ohuchi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan
Filed May 15, 1991, Ser. No. 700,421
Claims priority, application Japan, May 25, 1990, 2-134054
Int. Cl.[5] G06K 9/34
U.S. Cl. 382—9 10 Claims



1. A line region segmentation method comprising the steps of:
grouping pixels of an input image described by image signals into three sets of black, gray and white pixels;
performing a first pattern matching of black pixels included in a given region of said input image with a first set of predetermined matrix patterns on the basis of said image signals to determine whether a black pixel among said set of black pixels is closely associated with other pixels of said set of black pixels for each pixel of said set of black pixels;
performing a second pattern matching of black pixels included in a given region of said input image with a second set of predetermined matrix patterns on the basis of said image signals to determine whether a black pixel among said set of black pixels is one of screened black pixels in said input image for each pixel of said set of black pixels;
making a determination as to whether the number of black pixels included in a given region that are determined as being associated black pixels and determined as being non-screened black pixels is greater than a predetermined reference value, so that it is decided that a black pixel being considered in said given region is one of black bilevel pixels when said number of black pixels is greater than said predetermined reference value;
performing a third pattern matching of white pixels included in a given region of said input image with a third set of predetermined matrix patterns on the basis of said image signals to determine whether a white pixel among said set of white pixels is closely associated with other pixels of said set of white pixels for each pixel of said set of white pixels;
making a determination as to whether the number of white pixels included in a given region that are determined as being associated white pixels is greater than a predetermined reference value, so that it is decided that a white pixel being considered in said given region is one of white bilevel pixels when said number of white pixels is greater than said predetermined reference value; and
making a line region discrimination by determining whether a pixel being considered in a given block of said input image is one of bilevel pixels by checking if the number of the thus decided black bilevel pixels included in said given block is greater than a predetermined number and if the number of the thus decided white bilevel pixels included in said given block is greater than a predetermined number.

5,148,496
OPTICAL CORRELATOR WITH SYMMETRIC REFLECTIVE OPTICS
Robert H. Anderson, Long Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Dec. 24, 1990, Ser. No. 632,934
Int. Cl.[5] G06K 9/64
U.S. Cl. 382—42 24 Claims



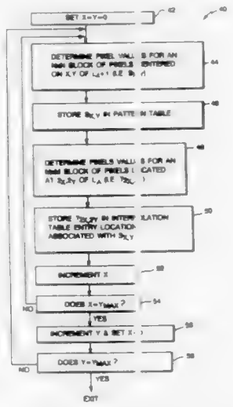
1. A discoid optical correlator system for the detection and identification of an unknown object where the object is represented at an input station of the system, imaged at a subsequent filter station in the Fourier transform plane, then detected and identified at a detector station CHARACTERIZED IN THAT the discoid optical correlator system comprises:
a) system support means having a perimeter region that defines a number (n) of system stations which are equidistantly spaced apart,
b) respective ones of reflective optical component means positioned at selected and associated ones of a number (n−2) of said system stations to affect a beam of electromagnetic radiation impinging thereon, said reflective optical component means include an input means and a filter means responsive to an input signal representing an unknown object, and to the Fourier transform output of said input means, respectively,
c) electromagnetic radiation source means positioned at one of said non-selected system stations generating a beam of electromagnetic radiation for the system, and
d) electromagnetic radiation detector means positioned at the other of said non-selected system stations responsive to said resulting beam of electromagnetic radiation subsequent to said reflective optical component means affect,
e) said source means, reflective optical component means, and said detector means develop an optical path within said support means traversed by said beam of electromagnetic radiation so that the unknown object is optically detected and identified.

5,148,497
FRACTAL-BASED IMAGE COMPRESSION AND INTERPOLATION
Alex P. Pentland, Cambridge; Eero P. Simoncelli, Somerville, and Thomas P. Stephenson, Boston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 479,759, Feb. 14, 1990, abandoned.
This application Oct. 10, 1991, Ser. No. 773,779
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—54 36 Claims

1. An image interpolator for converting an original image into an enhanced image, the interpolator comprising:
rule logic for embodying a rule specifying how pixel patterns associated with first subband immage data transform into corresponding pixel patterns associated with second subband image data, said first and second subband image data being spatial frequency subband image data derived from a reference image that is generated by a single sensor; and
conversion logic for generating the enhanced image from

the original image based upon said rule, wherein said conversion logic comprises:

means for generating high resolution subband image data



from the second subband image data in accordance with said rule; and

means for combining the original image with the high resolution image data to generate the enhanced image.

5,148,498

IMAGE CODING APPARATUS AND METHOD UTILIZING SEPARABLE TRANSFORMATIONS

Howard L. Resnikoff, Winchester; David Pollen, Lexington; David C. P. Linden, Cambridge, and Wayne M. Lawton, Somerville, all of Mass., assignors to Aware, Inc., Cambridge, Mass.

Filed Aug. 1, 1990, Ser. No. 561,449
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—54 **14 Claims**

1. An apparatus for compressing an image comprising a two-dimensional array of pixel intensity values, said apparatus comprising:

image storage means comprising means for storing said array of pixel intensity values as a plurality of rows and columns;

linear filtering means for filtering a one-dimensional sequence of digital values to generate a low-frequency array representing the low-frequency components of said one-dimensional sequence and two or more high-frequency arrays representing high-frequency components of said one-dimensional sequence, said linear filtering means comprising means for convolving said one-dimensional signal with three or more sequences of filter coefficients ${}^{i}a_p$ wherein

$$\sum_p {}^{i}a_p = M\delta_{i,0},$$

M is an integer greater than 2, i runs from 0 to the total number of high-frequency arrays so generated, and said low-frequency array is generated by convolving said one-dimensional sequence with the filter coefficient ${}^{0}a_p$;

row processing means for causing said linear filtering means to process each said row in said image storage means to generate a low-frequency row array comprising a two-dimensional array of digital values organized as a plutality of rows and columns and a plurality of high-frequency rows arrays, each said high-frequency row array comprising a two-dimensional array of digital values organized as a plurality of rows and columns; and

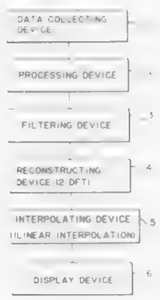
column processing means for causing said linear filtering means to process each said column in said low-frequency row array to generate a low-frequency column array representing the low spatial frequency information in said image.

5,148,499

IMAGE RECONSTRUCTION PROCESS AND APPARATUS USING INTERPOLATED IMAGE RECONSTRUCTED DATA

Shigeru Matsumura, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

Continuation of Ser. No. 635,491, filed as PCT/JP89/00655, Jun. 29, 1989, abandoned.
This application Nov. 7, 1991, Ser. No. 789,459
Claims priority, application Japan, Jun. 30, 1988, 63-163097
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—54 **6 Claims**



1. An image reconstruction method for an X-ray CT or MRI system comprising an image reconstructing apparatus for processing image data in frequency space, data collector means for collecting image data of a subject being examined, and processing means for transforming the image data of the subject to image data on a 2-dimensional Fourier plane, wherein the method comprises the steps of

filtering said image on said 2-dimensional Fourier plane obtained from said processing means using a filter means having a frequency characteristic which is an inverse of the following amplitude transmitting function Am(δ):

$$Am(\delta) = (Rm^2 + Im^2)^{\frac{1}{2}} = [1 - 4\delta(1-\delta)\sin^2(\pi m/N)]^{\frac{1}{2}}$$

wherein Rm is the real part of the amplitude transmitting function, Im is the imaginary part of the amplitude transmitting function or M/N is the frequency represented in a discrete system, and m=N/2 is the Nyquist frequency;

image reconstructing the filtered data obtained from said filtering step, and generating high frequency intensified image reconstructed items of data;

interpolating the high frequency intensified image reconstructed items of data at points located ¼ and ¾ between adjacent items of data and outputting the obtained interpolated items of data; and

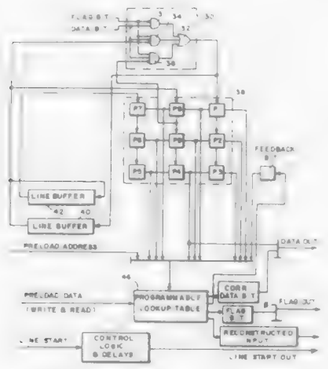
forming a two fold enlarged image using only the interpolated items of data so that said two fold enlarged image is substantially free of frequency distortion.

5,148,500

MORPHOLOGICAL PROCESSING SYSTEM

Richard P. Belanger, Carlisle, Mass., assignor to AOI Systems, Inc., Lowell, Mass.

Filed Jan. 24, 1991, Ser. No. 645,194
Int. Cl.[5] G06K *9/44*
U.S. Cl. 382—55 **10 Claims**



7. An image processing element comprising:

means for receiving over a series of consecutive time periods a stream of data bits representative of a 2-dimensional image, each data bit being received in one of said time periods;

means for receiving flag bits from an adjacent image processing element;

logic means for generating a corrected data bit in response at least to a data bit from said data bit receiving means and a flag bit from said flag bit receiving means;

n parallel arrays of registers, where n is an integer;

a plurality of line buffers connected with said n parallel arrays of registers such that said n parallel arrays hold a window of corrected data bits; and

a lookup table for generating a data bit, a flag bit and a new feedback bit in response to said window of corrected data bits and an old feedback bit generated by said lookup table in the previous time period.

5,148,501

SCALAR DATA PROCESSING METHOD AND APPARATUS

Hajime Enomoto, Funabashi, and Isao Miyamura, Niigata, both of Japan, assignors to Fujitsu Limited, Japan

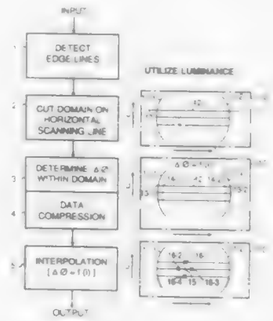
Filed Mar. 8, 1991, Ser. No. 666,712
Claims priority, application Japan, Mar. 16, 1990, 2-066149
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—56 **16 Claims**

1. A scalar data processing method for compressing two-dimensional scalar data defined on a two-dimensional surface having a horizontal direction and a vertical direction and for reconstructing said two-dimensional scalar data based on said compressed data, comprising the steps of:

(a) detecting edge lines of said two-dimensional scalar data, said edge lines being detected when a change in value of said two-dimensional scalar data between adjacent points on said two-dimensional surface is larger than a predetermined threshold value;

(b) cutting a domain on a horizontal line intersecting said edge lines and between said edge lines;

(c) determining a function as an approximation of a Laplacian of said two-dimensional scalar data at each point in said domain;



(d) compressing said two-dimensional scalar data by replacing aid two-dimensional scalar data at every point with scalar data at said edge lines, scalar data for providing gradients of said two-dimensional scalar data on said edge lines, and said function, to produce replaced data; and

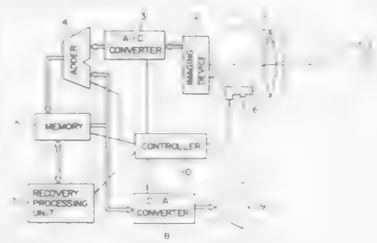
(e) reconstructing said two-dimensional scalar data by interpolating said two-dimensional scalar data based on said scalar data at said edge lines, scalar data for providing gradients of said two-dimensional scalar data on said edge lines, and said function obtained in said compressing step.

5,148,502

OPTICAL IMAGE INPUT/OUTPUT APPARATUS FOR OBJECTS HAVING A LARGE FOCAL DEPTH

Junpei Tsujiuchi; Toshio Honda; Nagaaki Ohyama; Tatsuo Nagasaki, all of Yokohama, and Susumu Kikuchi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 312,021, Feb. 16, 1989, abandoned.
This application Oct. 9, 1991, Ser. No. 776,705
Claims priority, application Japan, Feb. 23, 1988, 63-39936; Oct. 3, 1988, 63-249431
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—54 **13 Claims**



1. An image input/output apparatus including an optical image forming system, comprising:

focusing means for performing in-focus operations on a plurality of different object planes;

image inputting means for inputting a plurality of images focused on the different object planes by said focusing means;

weighting coefficient calculating means for calculating a weighting coefficient by which to most equalize degraded conditions of the image on each of said object planes in an image which is formed by weighting and adding said plurality of input images based on characteristics of the optical image forming system, and a focusing condition set by said focusing means when said plurality of images are input by said image inputting means;

weighting and adding means for weighting all of said images input by said image inputting means by said weighting coefficient calculated by said weighting coefficient calculating means, and for adding up the weighted images; and

spatial frequency filtering means for spatial-frequency-filtering the images having been weighted and added by said weighting and adding means so as to recover spatial frequency components having been degraded by said weighting and adding.

5,148,503

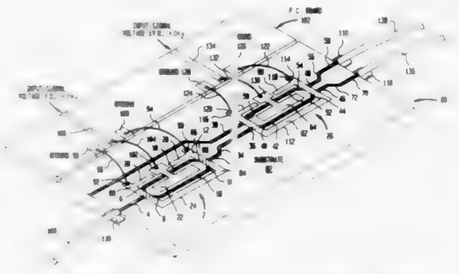
APPARATUS AND METHOD FOR LINEARIZED CASCADE COUPLED INTEGRATED OPTICAL MODULATOR

Halvor Skeie, San Jose, Calif., assignor to Crystal Technology, Inc, Palo Alto, Calif.

Filed May 29, 1991, Ser. No. 706,911

Int. Cl.[5] G02B 6/10; G02F 1/00

U.S. Cl. 385—3 **23 Claims**



1. An integrated electro-optical modulator for providing a linearly modulated light signal, comprising:

a substrate;

a plurality of Mach-Zehnder type interferometric modulators formed on said substrate and coupled in cascade, each of said modulators including a plurality of electrode means for continuous connection to a source of reference potential, for receiving a modulating voltage, and for continuous connection to a DC bias voltage, respectively;

a first one in a chain of said cascaded modulators further including an input waveguide segment for receiving an input light signal; and

a last one of the chain of said cascaded modulators including an output waveguide segment providing an output light signal, whereby the levels of said DC bias voltages are predetermined for maximizing the linearity of a modulated output light signal.

5,148,504

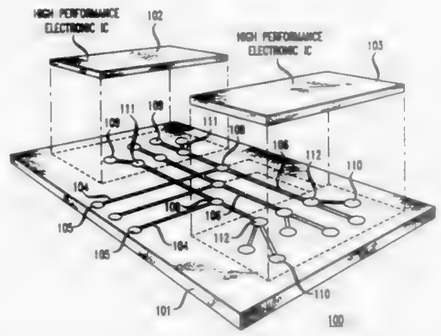
OPTICAL INTEGRATED CIRCUIT DESIGNED TO OPERATE BY USE OF PHOTONS

Anthony F. J. Levi, Summit; Samuel L. McCall, Chatham, and Richart E. Slusher, Lebanon, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 16, 1991, Ser. No. 777,888

Int. Cl.[5] G02B 6/12

U.S. Cl. 385—14 **22 Claims**



1. Apparatus comprising an integrated circuit chip portion which is designed to operate by use of photons within the wavelength range of from 0.3 μm to 10.0 μm as measured in vacuum, said portion comprising a full functioning optical integrated circuit including a substrate supporting photonic devices including "active" devices, for modifying some property of such photons temporally in response to modifying energy and "passive" devices comprising devices serving as transmission paths for such photons, at least some of said paths being optically connected with active devices, in that said full functioning optical circuit performs at least three photon-governing functions, selected from the group consisting of transport, redirection, combination, splitting, modulation, and amplification, the said integrated circuit being provided with output means for coupling photonic energy from said portion, characterized in that: at least 50% of said active and passive devices are of a functional layer thickness as measured orthogonal to a plane of transmission path direction, of mathematical value in accordance with the equation,

$$T \leq \frac{\lambda_0}{2\sqrt{n_D^2 - n_S^2}}$$

in which:

T=functional layer thickness

λ_0=wavelength as measured in vacuum

n_D=the average value of bulk refractive index for the functional layer

n_S=the effective average value of bulk refractive index for the surrounding material about the said devices; and

in that the index contrast, defined as the numerical value of the fraction, n_D/n_S, is at least equal to 1.5,

thereby permitting small attained spacing values, between devices consistent with minimum permitted unwanted signal coupling.

5,148,505

OPTICAL SEMICONDUCTOR WAVEGUIDE SWITCH

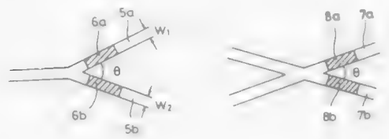
Hisaharu Yanagawa; Yoshiyuki Kamata; Ken Ueki, and Hidehisa Miyazawa, all of Tokyo, Japan, assignors to The Fukukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 428,929, Oct. 30, 1989, Pat. No. 5,033,811. This application Apr. 17, 1991, Ser. No. 686,610

Claims priority, application Japan, Nov. 4, 1988, 63-277473; May 23, 1989, 1-127884; Jul. 14, 1989, 1-180427; Sep. 5, 1989, 1-228326; Sep. 8, 1989, 1-233502

Int. Cl.[5] G02B 6/26

U.S. Cl. 385—16 **14 Claims**



1. An optical switch comprising:

at least one input optical semiconductor waveguide;

two output optical semiconductor waveguides connected at a branch point to said input optical waveguide and diverging from said branch point with a preset angle θ (degrees) therebetween; and

refractive index controlling means disposed in position on at least one of said output optical waveguides and apart from said branch point, said refractive index controlling means comprising an electrode for effecting one of current injection and voltage application, said electrode having a length sufficiently long to substantially prevent leaking of light from the other of said output optical waveguides to said at least one output optical waveguide on which the electrode is disposed while the light passes through said other output optical waveguide, such that the light is significantly weak when the light goes out of said at least one output optical waveguide, thereby electrically reducing the refractive index of said at least one of said output optical waveguides on which the electrode is disposed.

5,148,506

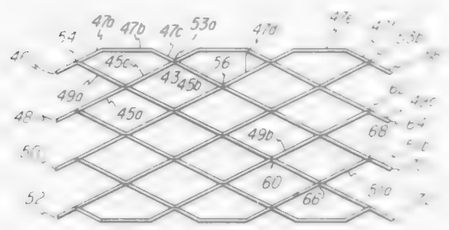
OPTICAL CROSSBAR SWITCH

T. Gus McDonald, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 742,450, Aug. 5, 1991, abandoned, which is a continuation of Ser. No. 691,763, Apr. 26, 1991, abandoned. This application Dec. 10, 1991, Ser. No. 807,954

Int. Cl.[5] G02B 6/00, 6/36

U.S. Cl. 385—16 **8 Claims**



1. A switching device comprising:

a. a substrate;

b. a waveguide structure upon said substrate comprising at least one input port and one output port, said waveguide structure having at least one gap in said waveguide located between said input port and said output port;

c. a metal element located above said gap suspended from at least one hinge, said metal element further comprising a vertical metal structure attached to the underside of said metal element; and

d at least one electrode located adjacent said gap, operable to be electrically addressed and cause the deflection of said metal element and vertical metal structure.

5,148,507

OPTICAL WAVEGUIDE DEVICE WITH TWO PREDETERMINED WAVELENGTH, POLARIZATION INDEPENDENT, DIRECTIONAL COUPLER SWITCHES

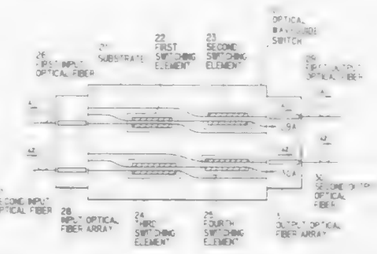
Yasuhisa Tanisawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 726,793

Claims priority, application Japan, Jul. 6, 1990, 2-177350; Aug. 31, 1990, 2-228043

Int. Cl.[5] G02B 6/10

U.S. Cl. 385—41 **5 Claims**



1. An optical waveguide device, comprising:

a plurality of optical directional coupler switches provided on a substrate, each of said optical directional coupler switches being provided with a pair of parallel waveguides;

means for applying a voltage across said parallel waveguides; and

light input and output terminals coupled to said optical directional coupler switches, wherein:

at least a first one of said optical directional coupler switches operates independently of a polarization of light having a first predetermined wavelength by defining a width of said parallel waveguides and a distance therebetween being equal to first predetermined values, and at least a second one of said optical directional coupler switches operates independently of the polarization of light having a second predetermined wavelength by defining a width of said parallel waveguides and a distance therebetween being equal to second predetermined values, said parallel waveguides of said first and second one of said optical directional coupler switches being provided by diffusing films of the same thickness deposited in a predetermined pattern on said substrate thereinto by a predetermined diffusing condition.

5,148,508

OPTICAL COUPLER HOUSING

Yellapu Anjan; Sam Habbel, both of Scottsdale, and Joseph F. Straceski, Phoenix, all of Ariz., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jul. 25, 1991, Ser. No. 735,595

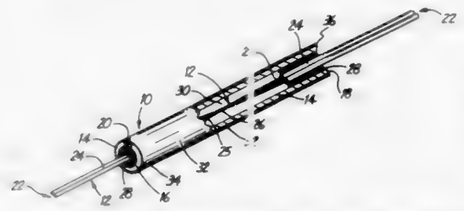
Int. Cl.[5] G02B 6/26

U.S. Cl. 385—51 **17 Claims**

1. A housing for an optical fiber directional coupler formed of a plurality of optical fibers having a coupled portion at which electromagnetic waves can be coupled therebetween and at least one excess portion of an optical fiber extending beyond said coupled portion, said housing comprising:

a primary protective body having a receiving space therein and having a slot means therein providing access to said

receiving space from outside, said receiving space extending into said primary protective body past said slot, said coupled portion of a said coupler to be housed being positioned in said receiving space; and



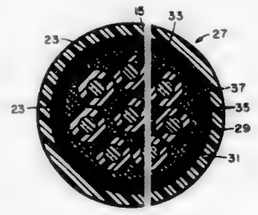
a support material at least partially about said coupled portion of said coupler and extending in said receiving space to said primary protective body, said support material being resilient and having an index of refraction less than that of said coupled portion.

5,148,509

COMPOSITE BUFFER OPTICAL FIBER CABLES

Rengan Kannabiran, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Mar. 25, 1991, Ser. No. 674,796
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—109 24 Claims



7. A multifiber cable having a longitudinal axis which comprises:

(a) a plurality of optical waveguide fibers, each said fiber including an outer coating having a diameter of less than or equal to about 250 μm, the combined cross-sectional areas of the fibers being A_1;

(b) a layer of aramid fiber surrounding the plurality of optical waveguide fibers, said layer having an inner surface and said inner surface having a cross-sectional area in a direction orthogonal to the longitudinal axis of A_2, the ratio of A_1 to A_2 being at least about 0.4;

(c) fill compound in contact with the inner surface of the layer of aramid fiber and with the optical waveguide fibers, said fill compound substantially filling the space between the optical waveguide fibers and the inner surface of the layer of aramid fiber; and

(d) a plastic jacket surrounding the layer of aramid fiber.

5,148,510

OPTICAL FIBER MADE OF GALLIOBISMUTHATE GLASSES AND OPTICAL DEVICES USING SAME

Nicholas F. Borrelli, Elmira; William H. Dumbaugh, Jr., Painted Post; Doublas W. Hall, Corning; Josef C. Lapp, Corning; Mark A. Newhouse, Corning; Mark L. Powley, Corning, and David L. Weidman, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 618,938, Nov. 28, 1990, Pat. No. 5,093,287.
This application Nov. 18, 1991, Ser. No. 793,565
Int. Cl.[5] G02B 6/00; H03F 7/00; C03C 3/12; G01B 9/02
U.S. Cl. 385—142 9 Claims

1. In a light guiding fiber consisting of a core portion and a cladding portion, the improvement comprising said core portion being composed of a glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 42–48% PbO, 33–44% Bi_2O_3, 10–15% Ga_2O_3, and up to 15% total of at least one member selected from the group in the indicated proportion consisting of up to 5% SiO_2 and/or GeO_2 and up to 15% Tl_2O, and said cladding portion being composed of a glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 42–48% PbO, 33–44% Bi_2O_3, 10–15% Ga_2O_3, and up to 15% total of at least one member selected from the group in the indicated proportion consisting of up to 5% SiO_2 and/or GeC_2 and up to 15% Tl_2O such that said cladding and core portions are sufficiently dissimilar in composition to achieve a desired difference in refractive index therebetween.

5,148,511

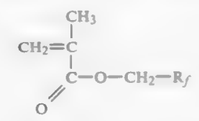
LOW REFRACTIVE INDEX PLASTICS FOR OPTICAL FIBER CLADDING

Patricia M. Savu, Maplewood, Minn., and Jerome W. McAllister, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 4, 1991, Ser. No. 787,107
Int. Cl.[5] G02B 6/00
U.S. Cl. 385—145 23 Claims

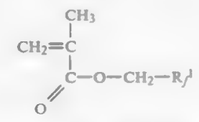
12. An optical fiber comprising a core coated with a cladding composition having a lower refractive index than the core, said cladding composition comprising:

(a) about 10% to 80% by weight of polymerizable fluorine-containing methacrylic monomer (A) or a mixture of polymerization fluorine-containing methacrylic monomer (A) and fluorine-containing methacrylic monomer (B), and monomer (A) can be represented by the formula



Monomer (A)

wherein R_f is a perfluorocycloaliphatic or a perfluoroalkoxy group, having at least 6 carbon atoms and at least 11 florine atoms, and R_f indicates that the group is fully fluorinated, that is, all hydrogen atoms in the group are substituted with fluorine atoms, and monomer (B), if present, is present in an amount of up to 50% by weight of the mixture and can be represented by the formula



Monomer (B)

wherein R^1_f is a perfluoroaliphatic, perfluorocycloaliphatic or perfluoroalkoxy group, having at least 6 carbon atoms and at least 11 fluorine atoms, and R^1_f indicates that the group is fully fluorinated, that is, all hydrogen atoms in the group are substituted with fluorine atoms; and

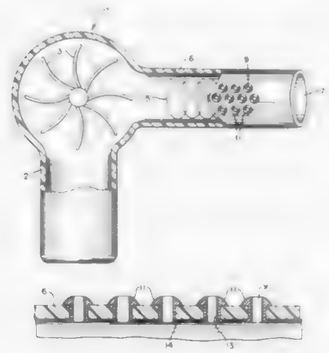
(b) about 20% to 90% by weight of methyl methacrylate.

5,148,512

HAIR DRYER WITH AIR DELIVERY SHROUD PROVIDING SMALL EXHAUST OPENINGS HAVING METALLIC HEAT TRANSFER MEANS

James L. Owens, 77-14 113th St., Apt. 5-0, Forest Hills, N.Y. 11375

Filed Aug. 3, 1990, Ser. No. 562,483
Int. Cl.[5] A45D 20/00; F24H 1/10; H05B 1/00
U.S. Cl. 392—383 13 Claims



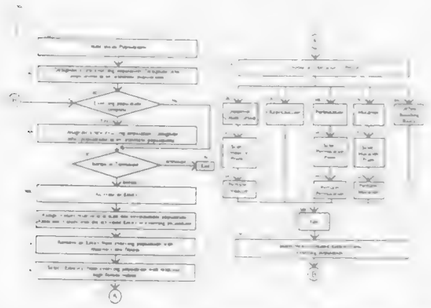
1. A hair dryer having means for blowing air; an electrical heater for heating the blown air, and a shroud surrounding said heater for providing passage of the heated air therethrough, the improvement which comprises a plurality of air exhaust orifices in a part of said shroud for discharge of blown, heated air therethrough to the exterior of the shroud, metallic secondary heat transfer means associated with said orifices for improving the transfer of heat to the exterior of the shroud, an air exhaust opening in said shroud, said opening having a diameter that is larger than the diameter of each of said orifices, said exhaust opening being disposed downstream of said orifices, and being partially covered by an air flow constrictor.

5,148,513

NON-LINEAR GENETIC PROCESS FOR USE WITH PLURAL CO-EVOLVING POPULATIONS

John R. Koza, 25372 La Rena La., Los Altos Hills, Calif. 94022, and James P. Rice, Redwood City, Calif., assignors to John R. Koza, Los Altos Hills, Calif.

Continuation-in-part of Ser. No. 500,791, Mar. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 196,973, May 20, 1988, Pat. No. 4,935,877. This application Sep. 18, 1990, Ser. No. 584,259
Int. Cl.[5] G06F 15/00
U.S. Cl. 395—13 45 Claims



1. In a parallel processing computer system having at least one processor, a memory, and a plurality of populations of programs of various sizes and structures and wherein more than one program can be executed simultaneously, a group of parallel processes for problem solving wherein more than one parallel process of said group of parallel processes can be performed simultaneously, each parallel process of said group of parallel processes comprising the steps of:

(i) designating one of said plurality of populations as the evolving population wherein the remaining populations of said plurality of populations are designated co-evolving environmental populations;

(ii) iterating a series of steps, said series of steps including:

a) assigning a fitness value to a program of said evolving population and associating said fitness value with a corresponding program, said fitness value indicative of the relative fitness of said corresponding program in relation to said co-evolving environmental populations;

b) selecting at least one program from said evolving population using selection criteria, said selection criteria based on said fitness value associated with each said program, said selection criteria preferring each said program having a relatively high associated fitness value over each said program having a relatively low associated fitness value;

c) choosing and performing an operation, wherein said chosen operation is one of the operations of crossover or reproduction;

d) creating, if said operation is crossover, at least one new program by crossover using a group of programs from said evolving population, said group of programs comprising said selected program and at least one other program from said evolving population, such that any new program created by crossover comprises at least a portion of said selected program and at least a portion of said other program, said new program capable of differing in size and structure from said selected program and said other program;

e) reproducing, if said chosen operation is reproduction, said selected program in said evolving population, such that said selected program remains unchanged; and

f) adding said new program to said evolving population; and

(iii) terminating when a solution is found.

5,148,514

NEURAL NETWORK INTEGRATED CIRCUIT DEVICE HAVING SELF-ORGANIZING FUNCTION

Yutaka Arima; Ichiro Tomioka, and Toshiaki Hanibuchi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 515,476
Claims priority, application Japan, May 15, 1989, 1-121916; Sep. 19, 1989, 1-242998
Int. Cl.[5] G06F 7/00
U.S. Cl. 395—24 45 Claims

1. An integrated circuit device having a learning function, being modelled on nerve cells, comprising:

a plurality of nerve cell representing units simulating functions of nerve cell bodies;

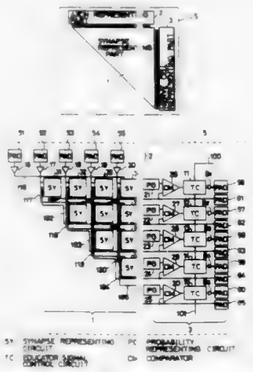
a plurality of axon representing signal lines each receiving a signal indicating a state of an associated nerve cell representing unit;

a plurality of dendrite representing signal lines provided in correspondence to respective ones of said plurality of nerve cell representing units for transferring signals to corresponding nerve cell representing units; and

a plurality of synapse representing units provided on respective ones of crosspoints between said plurality of axon representing signal lines and said plurality of dendrite representing signal lines for coupling related axon representing signal lines with related dendrite representing signal lines with specific synapse representing loads, said specific synapse representing loads of respective synapse

representing units being set at optimum values in learning of said integrated circuit device,

said plurality of synapse representing units being arrayed to be at lest substantially in the form of a first right triangle,



said right triangle having first and second sides other than its hypotenuse,

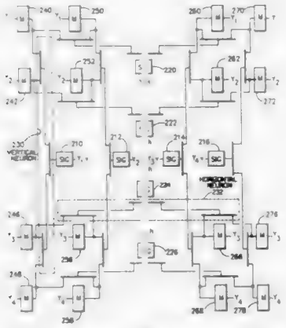
said plurality of nerve cell representing units being arranged in the form of a column along said first side of said first right triangle.

5,148,515

SCALABLE NEURAL ARRAY PROCESSOR AND METHOD

Stamatis Vassiliadis, Vestal, and Gerald G. Pechanek, Endwell, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 526,866, May 22, 1990, Pat. No. 5,065,339.
This application Aug. 5, 1991, Ser. No. 740,266
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—27 **3 Claims**



1. A method of operating a scalable neural array processor, said processor including an array of multipliers and a plurality of orthogonal sets of vertical and horizontal adder trees and activity generators, the method comprising the steps of:

cyclically defining computation states and communication states;

responsive to a first computation state, operating said multipliers to generate a first set of weighted neuron values;

responsive to a first communication state, operating said vertical adder trees responsive to said first set of weighted neuron values to produce first summations of said weighted neuron values;

responsive to a second computation state, operating said vertical activity generators responsive to said first summations to generate vertical neuron values;

responsive to a second communication state, operating said vertical adder trees to communicate said vertical neuron values back to the inputs of said multipliers;

responsive to a third computation state, operating said multipliers responsive to said vertical neuron values to generate a second set of weighted neuron values;

responsive to a third communication state, operating said horizontal adder trees to produce second summations of said second set of weighted neuron values;

responsive to a fourth computation state, operating said horizontal activity generators responsive to said second summations to generate horizontal neuron values; and

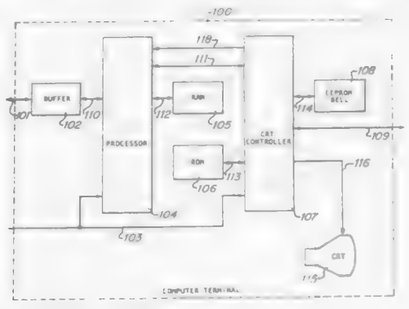
responsive to a fourth communication state, operating said horizontal adder trees to communicate said horizontal neuron values back to the inputs of said multipliers.

5,148,516

EFFICIENT COMPUTER TERMINAL SYSTEM UTILIZING A SINGLE SLAVE PROCESSOR

Joseph H. Hassoun, Roseville, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 30, 1988, Ser. No. 238,235
Int. Cl.[5] G06F *9/24*
U.S. Cl. 395—100 **3 Claims**



1. A computer terminal comprising:

a CRT display;

a slave processor;

random access memory coupled to the slave processor and accessible only by the slave processor;

non-volatile read-only memory; and

CRT control means, coupled to the CRT display, to the non-volatile read-only memory and to the slave processor, for sending display information to the CRT display and for sending control signals to the slave processor, the CRT control means including

means for, upon an initialization of the computer terminal, down loading programming code for execution by the slave processor from the non-volatile read-only memory through the slave processor the random access memory,

a screen buffer with sufficient memory to contain data for a full screen to be displayed on the CRT display,

processor interface means, coupled to the screen buffer, for interfacing with the slave processor and placing data from the slave processor into the screen buffer,

row buffer with sufficient memory to contain two character rows of CRT screen display, and

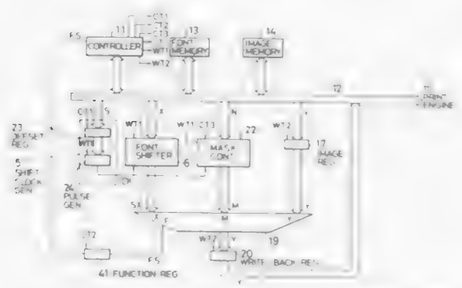
remote controller means, coupled to the screen buffer and to the row buffer, for transferring one character row of screen display from the screen buffer to the row buffer, the remote controller means being coupled directly to the slave processor and to a reset line, and the remote controller means including a state machine which upon receipt of a reset signal over the reset line causes programming code for execution by the slave processor from the read-only memory to be transferred from the read-only memory to the slave processor.

5,148,517

PRINT DATA GENERATOR

Masahiro Suzuki, and Masato Nagata, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 454,038
Claims priority, application Japan, Dec. 26, 1988, 63-326265
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—115 **8 Claims**



1. A print data generator for modifying bit-mapped image data according to bit-mapped font data, comprising:

an image memory for storing image words, each word consisting of L bits;

a font memory for storing font words each word consisting of L bits, with the number of words in each line of a font being (N−1);

a number selecting controller for selecting a bit offset number S representing a bit offset between said image words and said font words, and a width number W which is one greater than the number of font words (N−1) per line;

a shift clock generator for receiving said offset number S from said number selecting controller and repeatedly generating series of shift clock pulses comprising S pulses each;

a font shifter for receiving (N−1) successive font words from said font memory and receiving said series of S shift clock pulses from said shift clock generator, and generating shifted font words,

the last shifted font word in each line comprising S bits at the tail of the last font word for the S bits at the head of the shifted font word;

the first shifted font word in each line comprising (L−S) bits at the head of the first font word for the (L−S) bits at the tail of the shifted font word;

the shifted font words other than the first and last shifted font words each consisting of (L−S) bits at the head of one received font word for the tail of the shifted font word and S bits at the tail of the preceding received font word for the head of the shifted font word;

a mask control data source for receiving said series of S shift clock pulses from said shift clock generator and generating source mask control words comprising S disable bits followed exclusively by enable bits;

a mask control data converter for receiving data indicative of the width number N from said number selecting controller, receiving said source mask control words from said mask control data source, and generating converted mask control words by passing the first source mask control word through unaltered, substituting all enable bits for the next (N−2) source mask control words, and inverting the Nth source mask control word; and

an arithmetic-logic unit for receiving an image word from said image memory, a shifted font word from said font shifter, and a converted mask control word from said mask control data converter, and using said font word to modify bits of said image word that correspond to enable bits in said converted mask control word, thereby creating a modified image word; and

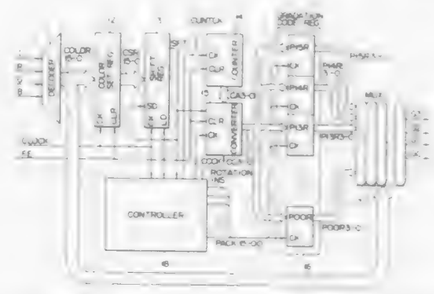
means for transferring said modified image word to said image memory.

5,148,518

COMPUTER SYSTEM WITH MONOCHROME DISPLAY UNIT CAPABLE OF CONVERTING COLOR CODE TO GRADATION CODE

Akifumi Inoue, Fussa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 262,641, Oct. 26, 1988, abandoned.
This application Mar. 25, 1991, Ser. No. 675,112
Claims priority, application Japan, Oct. 31, 1987, 62-276023
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—131 **31 Claims**



1. An apparatus for displaying a received signal representing a frame of data on a monochrome-display, the signal having a plurality of pixels represented by color codes, comprising:

means for detecting the number of color codes occurring in one frame of display data of the signal;

means for generating rom the number a set of gradation codes having a substantially uniform difference between adjacent gradation codes, the difference being a function of the number of colors detected by the detecting means;

means for storing the set of gradation codes; and

means, responsive to the signal and to the storing means, for applying a gradation code to the display in response to a color code.

5,148,519

METHOD FOR GENERATING PATTERNS BASED ON OUTLINE DATA

Takatoshi Ishii, Tokyo, Japan, assignor to ASCII Corporation, Tokyo, Japan

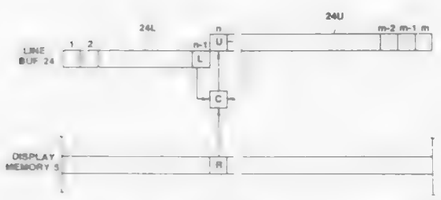
Filed Feb. 3, 1989, Ser. No. 306,328
Claims priority, application Japan, Feb. 4, 1988, 63-24822; Dec. 16, 1988, 63-318228
Int. Cl.[5] G06F *5/62*
U.S. Cl. 395—141 **2 Claims**

1. A method for generating character patterns and/or figure patterns using a display memory means for storing character data and/or figure data of 1 bit for each pixel on a screen as information indicating outlines of character and/or figures to be displayed, and reading the stored character data and/or figure data from said display memory means consecutively to generate dot data corresponding to character patterns and/or figure patterns to be displayed on the basis of said character data and/or figure data, said character patterns and/or figure patterns having an upper portion that is contiguous with a lower portion, wherein said character patterns and/or figure patterns do not have the upper portion sloping down to the left and the lower portion sloping down to the right,

said method for generating cha.acter patterns and/or figure patterns utilizing a line-buffer means containing data relating to pixels on a current scan line as well as on the scan line directly above thereof,

said method for generating cha.acter patterns and/or figure patterns comprising the steps of:

reading character data and/or f gure data indicating outlines of characters and/or figures t.o be displayed, the character



and/or figure data correspor.ding to a current displaying pixel from said display mem.ory means;

reading buffer data relating to said scan line and line directly above thereof from said line buffer means;

generating said dot data by per.forming logical computation on said character data and/.or figure data corresponding to current pixel and line-buffer data relating to said scan lines; and

writing said dot data to said line-buffer.

5,148,520

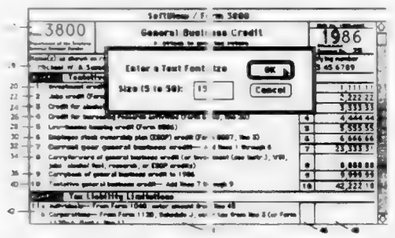
DETERMINING THE LOCAT.ONS OF THE CONTENTS OF BORDERED AREAS OF A GENERIC FORM

Michael W. Morgan, Camarillo, Calif., assignor to ChipSoft CA, Corp., San Diego, Calif.

Division of Ser. No. 292,611, Dec. 30, 1988. This application Sep. 21, 1990, Ser. No. 586,546

Int. Cl.[5] **G0.F** *15/72*

U.S. Cl. 395—148 **58 Claims**



1. A method in a computer s.stem for dynamically placing contents within a bordered area of a generic form, said generic form characterized as a two-dim.nsional space partitioned into a plurality of said bordered area.s, each of said bordered areas having top, bottom, left, and rig.t boundary locations, each of said bordered areas included .n a nonoverlapping manner within a larger bordered area of said generic form, if any, and said contents of each of said bor.ered areas comprising one or more nonoverlapping smaller b.rdered areas or text, said text comprising none, one, or more .ines of characters, whereby a hierarchial structure of said b.rdered areas of said generic form is established by said com.uter system, said method for dynamically placing said conte.ts of said bordered area comprising the steps of:

obtaining said locations of sa.d top, bottom, left, and right boundaries of said bordere. area,

determining whether said c.ntents of said bordered area includes said one or more smaller bordered areas or said text,

if said contents of said bordered area includes said text, determining whether said text is aligned to said top or said bottom boundary of said bordered area, and placing said text within said bordered area taking into account whether said text is aligned to said top or said bottom boundary of said bordered area,

if said contents of said bordered area includes said smaller bordered areas, determining whether said included smaller bordered areas are arranged wtihin said bordered area horizontally or vertically,

if said included smaller bordered areas are horizontally arranged, determining the location of said left and right boundaries for each of said included smaller bordered areas and placing said left and said right boundaries of said included smaller bordered areas at said determined locations, placing said top boundary for each of said included smaller bordered areas so as to be aligned to said top boundary of said bordered area and placing said bottom boundary for each of said included smaller bordered areas so as to be aligned to said bottom boundary of said bordered area,

if said included smaller bordered areas are vertically arranged, determining the location of said top and said bottom boundaries for each of said included smaller bordered areas and placing said top and said bottom boundaries of said included smaller bordered areas at said determined locations, placing said left boundary of each of said included smaller bordered areas so as to be aligned to said left boundary of said bordered area and placing said right boundary of each of said included smaller bordered areas so as to be aligned to said right boundary of said bordered area.

5,148,521

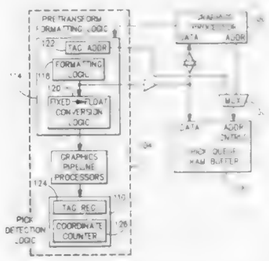
PICK DATA QUEUE FOR PIPELINED GRAPHICS SYSTEM

Timothy J. Ebbers, Shokan, and Daniel G. Gibbons, Ulster Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1989, Ser. No. 425,776

Int. Cl.[5] **G06F** *15/20*

U.S. Cl. 395—155 **14 Claims**



1. a graphics display system for displaying on a display device an image generated based on graphics orders, said system having operator selection means allowing operator selection of a specific object in said image on said display device, said graphics orders having no hierarchical arrangement; said image being generated using pipeline processors, said graphics orders being supplied to said pipeline processors for conversion of said image, the system comprising:

means for generating pick data from said graphics orders;

memory means for storing said pick data, said memory means being accessed by a tag address;

transmitting means for passing said tag address through said pipeline processors;

pick detection means for determining when portion of said image is selected by said operator selection;

means for communicating to a graphics processor said operator selection;

said pick detection means having register means for storing the tag address associated with each graphics order and loaded from said transmitting means, and a counter means for counting each coordinate contained in a graphics order;

wherein said graphics processor accesses said register means and counter means and uses their contents to address said memory means when an operator selection has occurred.

5,148,522

INFORMATION RETRIEVAL APPARATUS AND INTERFACE FOR RETRIEVAL OF MAPPING INFORMATION UTILIZING HAND-DRAWN RETRIEVAL REQUESTS

Akio Okazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 470,409, Jan. 29, 1990, abandoned, which is a continuation of Ser. No. 169,479, Mar. 17, 1988, abandoned. This application Feb. 19, 1991, Ser. No. 656,040

Claims priority, application Japan, Mar. 17, 1987, 62-60120

Int. Cl.[5] **G06F** *3/14*

U.S. Cl. 395—161 **9 Claims**

1. An information retrieval apparatus for retrieving a map, comprising:

an interface for entering a hand-drawn retrieval request, said hand-drawn retrieval request being formed of an object to be retrieved and other elements which are represented by at least a hand-drawn diagram, and representing a spatial positional relationship between the object and the other elements, said hand-drawn diagram comprising characters, a mark and a line, said characters representing at least one of names associated with the other elements and designations representing a direction of the hand-drawn diagram and a unit distance of the hand-drawn diagram, said mark being associated with the object and the other elements, said line being associated with the other elements and a length of the unit distance, said interface comprising entry means for entering said hand-drawn retrieval request, and retrieval request interpreting means for receiving said hand-drawn retrieval request, collating the object and the other elements in the hand-drawn diagram with a words dictionary and interpreting the spatial positional relationship between said object and said other elements based on coordinates of the object and the other elements to form a retrieval condition;

data base means for storing specific map data related to said object and said other elements;

retrieval executing means for executing an information retrieval based on said retrieval condition formed by said retrieval request interpreting means and the specific map data of said data base means, and outputting a desired retrieval result of the map around the object to be retrieved; and

display means for displaying the desired retrieval result.

5,148,523

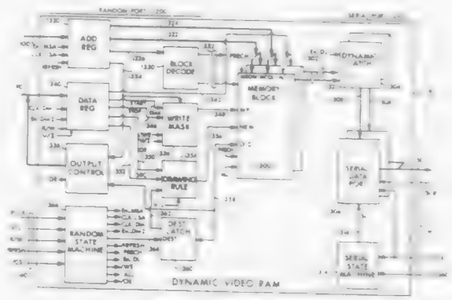
DYNAMIC VIDEO RAM INCORPORATIONG ON CHIP LINE MODIFICATION

Roy E. Harlin, and Richard A. Herrington, both of Fort Collins, Colo., assignors to Solbourne Computer, Inc., Longmont, Colo.

Filed Nov. 29, 1988, Ser. No. 278,333

Int. Cl.[5] **G09G** *1/02*; **G06F** *15/66*

U.S. Cl. 395—164 **12 Claims**



1. A method for logically modifying stored information in a dynamic video random access memory placed on a single integrated circuit chip, said integrated circuit chip being connected to a bus (**90**, **100**, **140**), said bus delivering an address for a line of stored information, a drawing rule used to modify the line of stored information, START and STOP bit locations in said line of stored information and a read/write cycle, said method comprising the steps of:

receiving on the integrated circuit chip from the bus and during a first time interval of the write portion of said read/write cycle:

(a) the address for said line of stored information in the dynamic video random access memory to be modified,

(b) the drawing rule containing a logical operation for modifying the line of stored information,

(c) the START and STOP bit locations for modifying the line of stored information between identified beginning and ending bit locations,

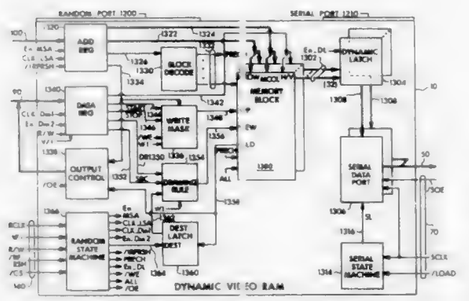
receiving on the integrated circuit chip from the bus and during a second time interval of said write portion of said read/write cycle following the first time interval source data to be logically combined with the line of stored information,

addressing the dynamic video random access memory during said second time interval with the received address to read out said line of stored information,

logically combining on the integrated circuit chip and during a third time interval of said write portion of said read/write cycle following the second time interval the read out line of stored information with the source data based upon the received drawing rule, and

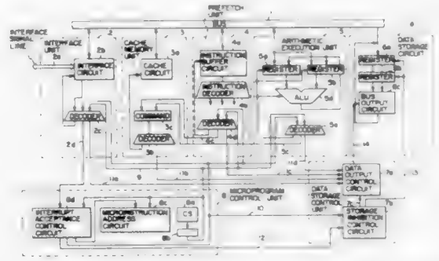
writing into the dynamic video random access memory during a fourth time interval of said write portion of said read/write cycle following the third time interval the logically combined line of information between the START and STOP bit locations so as to fully modify the addressed line of stored information during the read/write cycle.

5,148,124
DYNAMIC VIDEO RAM INCORPORATING ON CHIP VECTOR/IMAGE MODE LINE MODIFICATION
Roy E. Hartin, and Richard A. Herrington, both of Fort Collins, Colo., assignors to Solbourne Computer, Inc., Longmont, Colo.
Filed Nov. 29, 1988, Ser. No. 277,687
Int. Cl.[5] G06F *12/02*
U.S. Cl. 395—166 **34 Claims**



1. An architecture for addressing and modifying vectors in a dynamic video random access memory placed on an integrated circuit chip, said dynamic video random access memory being connected to a bus (**90, 100**), said bus delivering vector addresses, source data, drawing rules and START and STOP locations, said source data being new data to be used to modify an addressed vector, said START and STOP locations defining the portion of said addressed vector to be modified, and said drawing rule being the logical operation combining said source data with said data portion between said START and STOP locations of said addressed vector, said architecture on said integrated circuit chip comprising:
a memory (**1300**) for storing vectors of video information, said memory having a plurality of "n"×"m" bit pages (PG), each of said pages having defined page column (PC) and page row (PR) locations in said memory, each said page containing a plurality of horizontal (**610**) and vertical (600) vectors, each said horizontal vector being defined by a vector row location in said page and each said vertical vector being defined by a vector column in said page,
address means (**1360**) connected to said bus for receiving the address of a horizontal or vertical vector in a page of said memory to be modified, said address comprising:
(a) a first plurality of bits for defining the page row of said addressed page,
(b) a second plurality of bits for defining the page column of said addressed page, and
(c) a third plurality of bits for defining the addressed vector in said addressed page,
data means (**1340**) connected to said bus for receiving said source data, and
control means (**1366, 1360, 1354, 1336**) connected to said memory, said address means, and said data means for modifying the stored video information with said source data at the addressed vector in said memory wherein said data means further receives said drawing rule from said bus, said drawing rule being used by said control means to modify said line of stored video information between said START and STOP locations.

5,148,525
MICROPROGRAM-CONTROLLED TYPE BUS CONTROL CIRCUIT
Shinji Ohga, Tokyo, and Takumi Yamazaki, Ibaragi, both of Japan, assignors to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 501,966, Mar. 30, 1990, abandoned, which is a continuation of Ser. No. 277,349, Nov. 29, 1988, abandoned. This application Jan. 9, 1992, Ser. No. 817,997
Claims priority, application Japan, Nov. 30, 1987, 62-303551
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—250 **7 Claims**

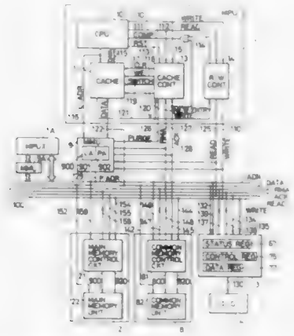


1. A bus control circuit in a central processing unit, said bus control circuit comprising:
a bus for transferring data among a plurality of operational units of said central processing unit, connected to said bus;
a data storage circuit, connected to said bus, for intake and storage of said data from said bus at each clock period and for outputting last stored data of said data to said bus; and
a data-storage-control circuit, connected to said data storage circuit, for monitoring a microinstruction execution level signal from a microprogram control unit of said central processing unit, for monitoring a microinstruction-execution-inhibiting signal from said control unit, and for monitoring a bus drive signal from each of said operational units, said signals indicating when execution of a microinstruction is inhibited in said central processing unit and when, at a subsequent time, execution of said microinstruction is resumed, and for outputting to said data storage circuit a first command to inhibit said intake of said data from said bus into said data storage circuit when said signals indicate that said execution of said microinstruciton is inhibited and for outputting to said data storage circuit a second command to output said last stored data to said bus from said data storage circuit at said subsequent time when said signals indicate that said execution of said microinstruciton is resumed.

5,148,526
DATA PROCESSING SYSTEM WITH AN ENHANCED CACHE MEMORY CONTROL
Tadahiko Nishimukai, Sagamihara; Atsushi Hasegawa, Koganei, and Masaru Matsumura, Hachioji, all of Japan, assignors to Hitachi Ltd. and Hitachi Micro Computer Engineering Ltd., both of Tokyo, Japan
Continuation of Ser. No. 694,126, Jan. 23, 1985, abandoned. This application Apr. 8, 1988, Ser. No. 183,401
Claims priority, application Japan, Jan. 23, 1984, 59-8572; Jun. 1, 1984, 59-110764
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—275 **25 Claims**

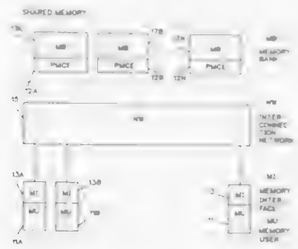
1. A data processing system comprising:
a microprocessor which includes a central processing unit for executing an instruction and for generating addresses in accordance with a memory mapped I/O system, a cache memory coupled to said central processing unit for storing data and a cache memory control circuit coupled to said cache memory for inhibiting a write operation of said cache memory in response to a control signal;

a main memory for storing data;
an input/output device;
an input/output control circuit connected to said microprocessor and said input/output device and including a storing circuit storing information which relates to the operation of said input/output device; and



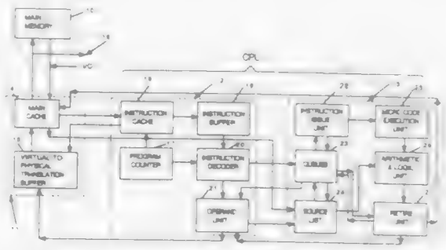
a control signal generator generating said control signal in response to an address signal from said microprocessor, which address signal identifies said input/output control circuit, and applying said control signal to said cache memory control circuit when an access of said storing circuit is requested by said address signal from said microprocessor.

5,148,527
INTERFACE FOR INDEPENDENTLY ESTABLISHING A LINK AND TRANSMITTING HIGH LEVEL COMMANDS INCLUDING LOGICAL ADDRESSES FROM DEDICATED MICROPROCESSOR TO SHARED INTELLIGENT MEMORY
Claude Basso, Nice; Gerald Lebizay, Vence; Jean-Marie Munier, Cagnes Sur Mer, and Andre Pauporte, La Colle sur Loup, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 22, 1989, Ser. No. 440,569
Claims priority, application European Pat. Off., Dec. 23, 1988, 88480102
Int. Cl.[5] G06F *13/00, 12/08*
U.S. Cl. 395—325 **7 Claims**



1. A device for interconnecting processors of a plurality of memory users MU linked through an interconnection network NW to a shared memory PM comprising a plurality of memory banks MB defining a globally shared memory space, said device comprising:
means for presenting to said memory banks MB through said network NW a set of high level commands issued by the memory users MU for storing and retrieving records into or from said memory space, said high level commands utilizing only logical addresses (LRA) of said records, and
means, physically integrated in each memory bank MB, for retrieving the physical addresses of said records according to their logical addresses LRA and executing said high level commands, and wherein,
said means for presenting to said memory banks a set of high level commands, comprises a plurality of memory interfaces MI dedicated to their respective users MU, a given memory interface MI processing each command request from its associated memory user MU by executing the steps of:
(a) reading a memory control word MCW including a high level command and a logical address from a user's local memory LM;
(b) decoding said high level command;
(c) selecting independently one of the memory banks MB;
(d) establishing a connection through the interconnection network NW to the selected memory bank MB;
(e) sending the high level command including said logical address to said selected memory bank MB; and
(f) releasing the connection to said memory bank MB upon receipt of a command response (MSW) from the memory bank MB.

5,148,528
METHOD AND APPARATUS FOR SIMULTANEOUSLY DECODING THREE OPERANDS IN A VARIABLE LENGTH INSTRUCTION WHEN ONE OF THE OPERANDS IS ALSO OF VARIABLE LENGTH
David B. Fite, Northboro; John E. Murray, Acton, and Tryggve Fossum, Northboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Feb. 3, 1989, Ser. No. 307,347
Int. Cl.[5] G06F *9/34*
U.S. Cl. 395—375 **31 Claims**



1. A data processing unit for processing variable length instructions having respective operation codes and respective sequences of multiple specifiers, and operation codes defining operations upon operands including source operands which are read during an operation and destination operands that are changed by an operation, said specifiers providing information for locating said operands, said specifiers having operand addressing modes independent from the operation codes, said data processing unit comprising, in combination,
a) instruction buffer means for receiving an operation code and a respective sequence of multiple specifiers of a variable length instruction to be simultaneously decoded,
b) instruction decoding means connected to said instruction buffer means for simultaneously decoding a first operand specifier in said respective sequence of multiple specifiers of said variable length instruction to obtain first information for locating a first source operand, a second operand specifier in said respective sequence of multiple specifiers of said variable length instruction to obtain second information for locating a second source operand, and a third operand specifier in said respective sequence of multiple specifiers of said variable length instruction to obtain third information for locating a destination operand,
c) operand fetching means responsive to the first and second

information obtained by said instruction decoding means for fetching the first and second operands, and

d) execution means for performing the operation indicated by the operation code received in said instruction buffer means upon the source operands fetched by said operand fetching means and changing the destination operand at the location specified by the information provided by the third instruction decoding means,

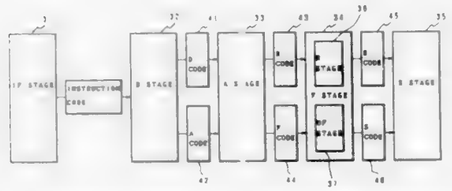
wherein said instruction decoding means includes means for decoding a complex specifier having a length dependent upon the addressing mode of said complex specifier, and for simultaneously decoding said first source specifier, said second source specifier, and said destination specifier when any one of said first source specifier, said second source specifier, and said destination specifier is said complex specifier.

5,148,529

PIPELINED MULTI-STAGE DATA PROCESSOR INCLUDING AN OPERAND BYPASS MECHANISM

Tatsuya Ueda, and Toyohiko Yoshida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,104
Claims priority, application Japan, Feb. 24, 1988, 63-41086
Int. Cl.[5] G06F *9/38*
U.S. Cl. 395—375 20 Claims



1. A pipelined multi-stage data processor that receives instructions for performing operations and stores data operands, fetched from a memory, in a designated means, comprising:

a fetch stage, responsive to an instruction, for fetching a data operand from said memory to said designated means and for providing said fetched data operand;

an execution stage, responsive to said fetched data operand provided from said fetch stage, for accessing a location in said memory; and

means for controlling said fetch stage and said execution stage, said controlling means comprising:

bypass means for providing a bypass enable signal when a request for fetching from said fetch stage and a request for writing a particular data from said execution stage are simultaneously received by said controlling means with respect to an identical location with a specified address in said memory, and

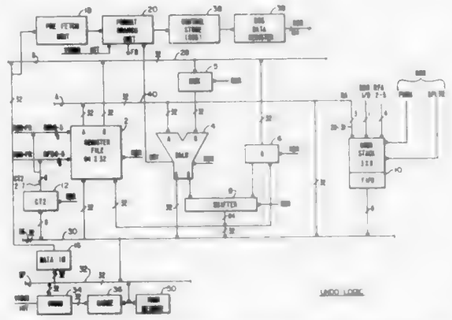
means, responsive to said bypass enable signal, for causing said particular data to be written into said identical location and said designated means, so that said fetch stage completes fetching without actually accessing said identical location in said memory

5,148,530

METHOD FOR REEXECUTING INSTRUCTION BY ALTERING HIGH BITS OF INSTRUCTION ADDRESS BASED UPON RESULT OF A SUBTRACTION OPERATION WITH STORED LOW BITS

Thomas F. Joyce, Westford, Mass.; Richard P. Kelly, Nashua, N.H., and Jian-Kuo Shen, Belmont, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Division of Ser. No. 52108, May 19, 1987, Pat. No. 4,901,222.
This application Sep. 6, 1989, Ser. No. 403,554
Int. Cl.[5] G06F *9/00, 9/32*
U.S. Cl. 395—375 3 Claims



1. A method of initializing an instruction in a data processing system if execution of the instruction is interrupted following modification of the instruction address by a first predetermined amount and storage of the modified address in a first register, characterized by:

a) storing a lower order portion of said instruction address in a second register concurrently with said modification;

b) following said interruption, retrieving said lower order portion from said second register and the lower order portion of the modified instruction address from said first register and performing a subtraction operation on said lower order portions;

c) performing a test to determine whether a carry occurred as a result of said subtraction operation;

d) modifying by a second predetermined amount the higher order portion of said modified instruction address if said test determines a particular result; and

e) concatentating the higher order portion of said modified instruction address and the lower order portion of the instruction address held in said second register.

5,148,531

SYSTEM FOR EXECUTING A CONDITIONAL STATEMENT WITHOUT READING PROGRAM DATA PART THAT DOES NOT SATISFY THE CONDITIONAL CLAUSE

Naoki Shiraishi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1989, Ser. No. 331,650
Claims priority, application Japan, Mar. 31, 1988, 63-81994; Apr. 14, 1988, 63-92105
Int. Cl.[5] G06F *9/06, 9/22, 9/305*
U.S. Cl. 395—375 6 Claims

1. A stored program computer comprising:

input means for entering program data which includes one or more conditional statements, said one or more conditional statement each including a conditional clause, a first clause which is to be executed based upon satisfaction of said conditional clause, and a second clause which is to be executed based upon nonsatisfaction of said conditional clause;

memory means for storing said program data;

addressing means for assigning an address of said memory means so that program data stored in said assigned address is read out;

executing means for executing the program data read out from the address assigned by said addressing means;

detecting means for detecting when a conditional statement is to be executed and for detecting which clause within

said conditional statement is not to be executed, said detected clause including a key word; and

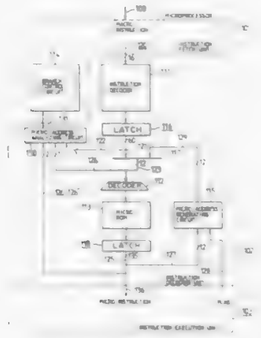
jump means for controlling said addressing means to change the assigned address to another address, when said detecting means has detected the clause which is not to be executed, said another address being calculated using a predetermined value contained in said conditional statement.

5,148,532

PIPELINE PROCESSOR WITH PREFETCH CIRCUIT

Susumu Narita; Makoto Hanawa, both of Kokubunji; Tadahiko Nishimukai, Sagamihara, and Tetsuhiko Okada, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 289,202, Dec. 23, 1988, abandoned.
This application Nov. 7, 1990, Ser. No. 611,484
Claims priority, application Japan, Dec. 25, 1987, 62-327142
Int. Cl.[5] G06F *9/30, 9/40, 9/38*
U.S. Cl. 395—375 10 Claims



1. A data processing apparatus comprising:

(1) an instruction fetch unit for fetching an instruction stored in a memory means;

(2) an instruction decoding unit for decoding the instruction fetched by said instruction fetch unit; and

(3) an instruction execution unit controlled by said instruction decoding unit,

wherein said instruction fetch unit includes

(1a) a branch control circuit for fetching a branch target instruction stored in said memory means in response to a branch request signal from said instruction decoding unit,

wherein said instruction decoding unit includes:

(2b) an instruction decoder for generating micro-addresses in response to the instruction fetched by said instruction fetch unit;

(2b) a micro-program storing memory responsive to the micro-address generated by said instruction decoder for generating both a micro-instruction for controlling said instruction execution unit and subsequent micro-address information relating to the micro-address of a subsequent micro-instruction to be executed after said micro-instruction; and

(2c) a micro-address generating circuit for generating a subsequent micro-address in response to at least both the subsequent micro-address information generated from said micro-program storing memory and information relating to the instruction execution result generated from said instruction execution unit,

wherein the instruction decoder of said instruction decoding unit generates a first of an ordered set of micro-addresses for a conditional branch in response to a conditional branch instruction fetched from said instruction fetch unit,

wherein the micro-program storing memory of said instruction decoding unit responds to said first of the ordered set of micro-addresses for said conditional branch an outputs both information relating to the conditional branch and information first memory further micro-addresses as a to the first

wherein the instruction decoding unit address and outputs information a second micro-instruction, and the storing memory further outputs a third a subsequent micro-address subsequent micro-address,

wherein the micro-program storing memory instruction decoding unit responds to said address and outputs information requesting a instruction decoding as a third micro-instruction,

wherein said micro-address generating circuit determines whether the condition of the conditional branch is satisfied based on both the information relating to said conditional discrimination in said first micro-instruction and the information relating to the instruction execution result generated from said instruction execution unit and generates said second micro-address as a subsequent micro-address in response to determining satisfaction of the conditional branch condition, and said micro-address generating circuit further generates said third micro-address as a subsequent micro-address in response to nonsatisfaction of the condition, and

wherein said instruction decoding unit further includes:

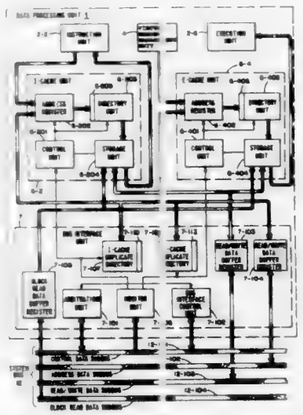
(2d) a signal analyzing circuit for generating said branch request signal to control the branch control circuit of said instruction fetch unit when said branch ready request information was generated from said micro-program storing memory and when said second micro-address was generated from said micro-address generating circuit in response to determining satisfaction of said conditional branch condition.

5,148,433

APPARATUS AND METHOD FOR DATA GROUP COHERENCY IN A TIGHTLY COUPLED DATA PROCESSING SYSTEM WITH PLURAL EXECUTION AND DATA CACHE UNITS

Thomas F. Joyce, Westford; Robert C. Miller, Braintree, both of Mass., and Marc C. Vogt, Nashua, N.H., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Jan. 5, 1989, Ser. No. 294,534
Int. Cl.[5] G06F *12/12*
U.S. Cl. 395—425 20 Claims



1. A data processing system having a plurality of tightly coupled data processing units, said data processing system comprising:

a system bus;

a memory unit coupled to said system bus;

a plurality of data processing units coupled to said system bus, each data processing unit including:

an instruction unit for retrieving and preparing instructions for execution;

an instruction cache unit for storing instructions to be executed by said data processing unit, said instruction cache unit having an instruction directory, each location of said instruction directory storing an address and a valid/invalid signal for a related instruction stored in said instruction cache unit;

an execution unit responsive to said instruction unit for operating on operands;

an execution cache unit for storing said operands, said execution cache unit having an execution directory, each location of said execution directory storing an address and a valid/invalid signal of a related operand stored in said execution cache unit; and

an interface unit coupled to said system bus for asynchronous exchange of signals therewith, said interface unit coupled to said instruction cache unit and said execution cache unit for retrieving instructions and operands required by said data processing unit for execution of a program when not stored in said instruction cache memory unit or said execution cache unit, said interface unit having:

an instruction cache duplicate directory duplicating address and valid/invalid signals stored in said instruction directory,

an execution cache duplicate directory duplicating address and valid/invalid signals stored in said execution directly, and

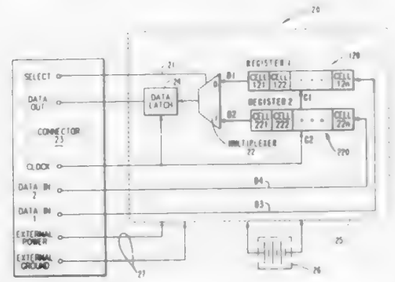
monitor means responsive to signals transmitted on said system but for storing an invalid signal in directories and duplicate directories in a data processing system when an address stored in said directories and duplicate directories is applied to said system bus in association with a store operation into said memory unit by a data processing unit not having said monitor unit.

5,148,534

HARDWARE CARTRIDGE REPRESENTING VERIFIABLE, USE-ONCE AUTHORIZATION

Laim D. Comerford, Carmel, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 927,297, Nov. 5, 1986, abandoned. This application Apr. 3, 1991, Ser. No. 680,798
Int. Cl.[5] G06F *12/14*
U.S. Cl. 395—425 10 Claims



1. A physically secure forgery-resistant authorization device comprising:

storage means for retaining stored information comprising first and second data subsets, each of said subsets comprising an equal quantum of data,

a connector with an output terminal and a select terminal,

first means responsive to select information represented at said select terminal and to said storage means for selecting and coupling to said output terminal signals representative of only a portion of said first and second data subsets and for simultaneously destroying that data from said subsets not coupled to said output terminal,

wherein said first means further includes means for destroying said selected stored information, said means for destroying operating along with said first means so that after said selected information is output from said output terminal said device no longer retains either said selected or said unselected stored information.

5,148,535

NON-BUS REQUEST REFRESH SYSTEM FOR SHORTENING REFRESH TIMING

Jerry L. Ballard, Aledo, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Aug. 31, 1989, Ser. No. 401,343
Int. Cl.[5] G06F *13/14, 12/00*; G11C *8/00*
U.S. Cl. 395—425 3 Claims

3. In a computer including a CPU, a bus, a bus controller having a status signal input, a memory address latch, and a memory, where data is transferred between the CPU and memory via the bus during a CPU bus cycle, and where the beginning of the CPU bus cycle and type of CPU bus cycle is signalled by the CPU asserting a status signal which is transferred to the bus controller and address signals which are transferred to the memory address latch and the end of the CPU bus cycle is signalled by resetting a first signal, and where the requirement of a memory refresh operation is signalled by setting a second signal, an improved system for refreshing memory comprising:

a first latch having a data input that receives the status signal from the CPU, a latch input that receives a first latch signal, an output enable input that receives an output enable signal, and a data output, said first latch for latching said received status signal when said first latch signal is set and for outputting said latched status signal when said output enable signal is reset;

a multiplexer having a first input for receiving the status signals from the CPU, a second input coupled to the data output of said first latch, a select input for receiving a select signal and an output that couples the bus controller status signal input to the first input when said select signal is reset and to the second input when said select signal is set:

a second latch having a data input that receives the address signals from the CPU, a latch input that receives a second latch signal, an output enable input that receives an output enable signal, and a data output, said second latch for latching said received address signals when said second latch signal is set and for outputting said latched address signals when said output enable signal is reset;

means, having an output enable input that receives said output enable signal, for providing a refresh address when said output enable signal is set;

means for setting said output enable signal and for setting said select signal to start a refresh operation when said first signal is set subsequent to the setting of said second signal:

means for setting said first and second latch signals to store the status and latch signals if the CPU asserts the status signals during said refresh operation to signal the beginning of a new CPU bus cycle;

means for resetting said output enable signal when said started refresh operation is finished to transfer said latched status signal to the bus controller and said latched address signals to the address latch to start a delayed CPU bus cycle: and

means for delaying resetting said third signal until said refresh operation and said delayed CPU bus cycle are completed.

5,148,536

PIPELINE HAVING AN INTEGRAL CACHE WHICH PROCESSES CACHE MISSES AND LOADS DATA IN PARALLEL

Richard T. Witek, Littleton; Douglas D. Williams, Pepperell; Timothy J. Stanley, Leominster; David M. Fenwick, Chelmsford; Douglas J. Burns, Billerica; Rebecca L. Stamm, Newton, and Richard Heye, Somerville, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 25, 1988, Ser. No. 224,483
Int. Cl.[5] G06F *9/38*
U.S. Cl. 395—425 27 Claims

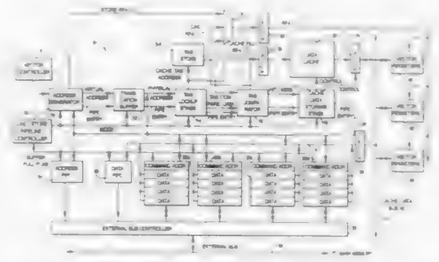
1. A load/store pipeline in a vector processor for loading data entries to registers and storing data entries from said registers, the pipeline comprising:

a cache memory for storing data entries;

a data loading device which loads data entries from said cache memory to said registers and which stores data from said registers into said cache memory with loading and storing data entries from and to said cache memory being pipelined;

a determining device which determines when one of said data entries is a miss;

a plurality of read miss buffers coupled to said miss determining device which store command addresses corresponding to said missed data entries and store data entries from out of said pipeline independently of the pipelining of data entries to and from the registers of the vector processor, said stored data entries corresponding to said command addresses;



a controller utilizing said stored command addresses to obtain and store said corresponding missed data entries in said read miss buffers independently of the pipelining of data entries to and from the registers; and

a filling device, in parallel with said data loading device, which fills the cache memory with said stored data entries and writes said stored data entries to said registers.

said data loading device continuing to operate when said determining device determines one of said data entries is a miss.

5,148,537

METHOD AND APPARATUS FOR EFFECTING AN INTRA-CACHE DATA TRANSFER

Jay S. Belsan, 5646 Magnolia Rd., Nederland, Colo. 80466

Filed May 2, 1989, Ser. No. 346,470
Int. Cl.[5] G06F *12/00, 13/00*
U.S. Cl. 395—425 18 Claims

1. Apparatus for transferring data between different areas of a memory, said apparatus comprising;

a plurality of ports connected to said memory,

a memory reading means in each port,

a memory writing means in each port,

a plurality of loopback switching means each of which is individual to a different one of said ports,

each one of said loopback switching means being effective for establishing a loopback communication path connecting said reading means of one of said ports with said writing means of said one port,

means for controlling said reading means of said one port to read data out of a first area of said memory,

means for applying said data read out of said first area from said reading means of said one port to said writing means of said one port via a loopback path established by said one loopback switching means, and

means for operating said writing means of said one port to write said data received from said established loopback path into a second area of said memory.

5,148,538

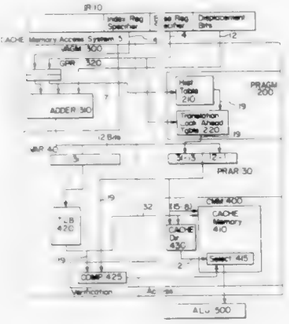
TRANSLATION LOOK AHEAD BASED CACHE ACCESS

Joseph O. Celtruda, Hopewell Junction; Kein A. Hua, West Hurley; Anderson H. Hunt, Kingston; Lishing Liu, Pleasantville; Jih-Kwon Peir, Fishkill; David R. Pruett, Saugerties, and Joseph L. Temple, III, Hurley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1989, Ser. No. 424,496

Int. Cl.[5] G06F *13/38, 12/10*

U.S. Cl. 395—425 16 Claims



1. A method of address generation for retrieving data bits from a memory comprising:

receiving an instruction from a processor, said instruction requiring data from said memory, said instruction containing a base register identifier, an index register identifier, and displacement bits;

adding said displacement bits to a value contained within an index register specified by said index register identifier and to a current address contained in a base register specified by said base register identifier, said addition producing a virtual address having page address bits and page offset bits;

storing a plurality of current addresses and a first plurality of real addresses in a history table, where each current address of said plurality of current addresses corresponds to one real address of said first plurality of real addresses;

matching said current address from said base register with one of said plurality of current addresses contained in said history table;

selecting a first real address corresponding to said matched current address from said history table;

concatenating said first real address with said page offset bits of said virtual address to form a predicted real address;

retrieving a first plurality of data bits from said predicted real address location within said memory;

matching said virtual address with one of a plurality of virtual addresses contained in a translation look aside buffer, said translation look aside buffer having a second plurality of real addresses corresponding to said plurality of virtual addresses;

selecting a second real address from said translation look aside buffer corresponding to said matched virtual address;

comparing said predicted real address to said second real address;

transmitting said first plurality of data bits to an arithmetic logic unit when said comparison between said predicted real address and said second real address matches;

retrieving a second plurality of data bits from a memory location specified by said second real address when said comparison between said predicted real address and said second real address does not match;

transmitting said second plurality of data bits to said arithmetic logic unit when said comparison between said predicted real address and said second real address does not match; and

updating said history table with said second real address when said comparison between said predicted real address and said second real address does not match.

5,148,539

ADDRESS BUS CONTROL APPARATUS

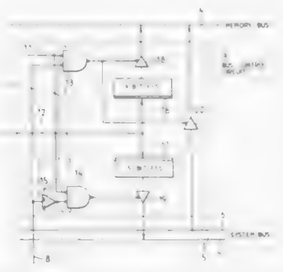
Hiromichi Enomoto, Hadano; Kazushi Kobayashi, Ebina; Masami Jikihara, Yamato, and Norihisa Amako, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 256,402, Oct. 11, 1988, abandoned. This application Jun. 4, 1991, Ser. No. 711,254

Claims priority, application Japan, Oct. 16, 1987, 62-259585; Feb. 24, 1988, 63-41753

Int. Cl.[5] G06F *12/00*

U.S. Cl. 395—425 12 Claims



1. An address bus control apparatus for a data processing system having a first address bus, a second address bus with a width smaller than that of said first address bus, a processor and a memory unit connected with said first address bus, and a plurality of input/output units connected with said second address bus, at least one of said plurality of input/output units being an accessing unit which accesses said memory unit or another one of said input/output units by generating bus identifying information which identifies at least one of said address buses to which the accessed memory unit or another one of said input/output units is connected and generating address information whose width is not larger than the width of said second address bus, said address bus control apparatus comprising:

signal receiving means connected with said accessing unit for receiving said bus identifying information;

first storing means for storing first predetermined address information having a width corresponding to a predetermined difference between the address information width of said accessing unit and the width of said first address bus; and

first address information transmitting means connected with said first and second address buses, said signal receiving means, and said first storing means and responsive to said bus identifying information for transmitting said first predetermined address information from said first storing means and the address information generated by said accessing unit from said second address bus, respectively, onto said first address bus when said bus identifying information identifies said first address bus.

5,148,540

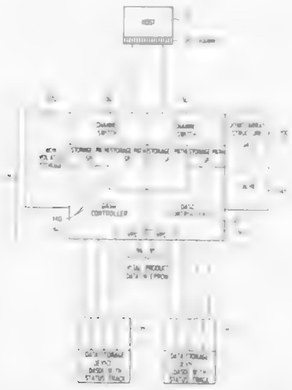
SYSTEM WITH BACKUP OF DATA STORAGE STATUS AND DEVICE IDENTIFICATION FOR ENABLING SYSTEM RECOVERY AFTER POWERLOSS

Brent C. Beardsley, Tucson, Ariz.; Lawrence H. Boulia, Gaithersburg, Md., and Robert H. Vosacek, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 87,331, Aug. 20, 1987, abandoned. This application Mar. 7, 1990, Ser. No. 489,888

Int. Cl.[5] G06F *1/30*

U.S. Cl. 395—575 10 Claims



1. A method of retaining information about a data storage subsystem of a data processing system across power downs, said data storage subsystem including a plurality of data storage devices, a controller attached to a host system in said data processing system, said controller including a pair of data storage device controllers and a memory containing vital product data and a joint array structure initialized by said vital product data on initial microprogram load, said vital product data being stored in nonvolatile memory, said data storage device controllers being connected to respective strings of data storage devices, each of said data storage devices being of the same type and having a plurality of data tracks and a status track, said method being performed by said controller transparently to said host system and comprising the steps of:

writing on said status track of each said data storage device identification and status information for the device;

selecting two of said data storage devices and additionally writing global subsystem status on said status track, said global subsystem status containing information pertaining to all components of the subsystem, including a device number and a subsystem identification number of each data storage devices, said global status pointer being stored in said nonvolatile memory, said joint array structure when initialized containing said address information by which the selected data storage devices are known to the host;

when the subsystem is initialized, performing an initial microprogram load to establish an operational data path between attaching channels of said data storage device controllers and said data storage devices;

reading the global subsystem status information from each of the two selected data storage devices and, when valid and current global subsystem status is identified, writing said valid and current global subsystem status to the status track of both said data storage devices to insure the information is consistent on both of the devices;

as data storage devices become available, reading the device number and subsystem identification number of each data storage device and checking said numbers against the global devices information to ensure that said data storage devices are correctly attached; and

notifying the host of available storage paths to said plurality of data storage devices.

5,148,541

MULTILINGUAL DATABASE SYSTEM INCLUDING SORTING DATA USING A MASTER UNIVERSAL SORT ORDER FOR ALL LANGUAGES

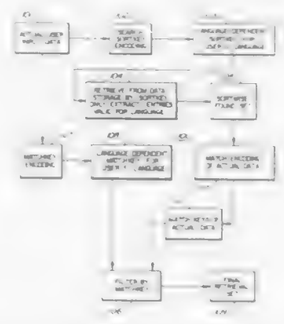
Eddy Lee; Mervyn G. D'Cruz, and Eugene Kulinek, all of Ontario, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 133,768, Dec. 16, 1987, abandoned. This application Nov. 3, 1989, Ser. No. 481,642

Claims priority, application Canada, Sep. 28, 1987, 548048

Int. Cl.[5] G06F *7/08, 15/40*

U.S. Cl. 395—600 14 Claims



10. A computer implemented method of operation for a multilingual ordered database having a data store for storing multilingual data, and an index of index sort keys for facilitating access to said data store, said computer implemented method, including the insertion of data into, and the extraction of data from, said database, comprising the following steps:

a) accepting first input data to be stored in said database;

b) storing said first input data in a known location in said data store;

c) encoding at least a portion of said first input data via sort encoding tables, such that one index sort key is formed per language supported;

d) inserting said index sort keys stored in said index have the same numerical value as does a newly encoded index sort key, then the data corresponding to all said index sort keys having said same numerical value, is extracted from said data store and is encoded using an accent priority encoding table;

f) all the index sort keys of step (e) are then sorted in the numerical order indicated by the accent encoding table and are then stored in said index in said order;

g) accepting second input data, the presence of which is to be searched for in said database;

h) encoding said second input data via a sort encoding table corresponding to the language of said user to produce a search sort key;

i) comparing said search sort key with the index sort keys of said index to find any index sort keys in said index that are identical to said search sort key and extracting, as found data, data from said data store corresponding to any index sort keys that are identical to said search sort key;

j) encoding at least a portion of each data entry extracted during step (i) and also encoding said second input data via a match encoding table corresponding to the language of said user to produce encoded match keys;

k) comparing the match key corresponding to said second input data with the match keys corresponding to said second input data with the match keys corresponding to

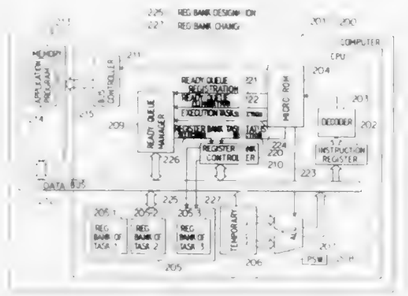
said found data to find any that are identical, and extracting data from said data store corresponding to any match keys from said found data that are identical to the match key corresponding to said second input data.

5,148,542

MULTITASK PROCESSING APPARATUS UTILIZING A CENTRAL PROCESSING UNIT EQUIPPED WITH A MICRO-PROGRAM MEMORY WHICH CONTAINS NO SOFTWARE INSTRUCTIONS

Hajime Sakuma, and Hiroko Shinohara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 377,801, Jul. 10, 1989, abandoned, which is a continuation of Ser. No. 90,278, Aug. 28, 1987, abandoned. This application May 1 1990, Ser. No. 517,402
Claims priority, application Japan, Aug. 28, 1986, 61-203007; Apr. 15, 1987, 62-93663
Int. Cl.[5] G06F *9/22, 9/30*
U.S. Cl. 395—700 **7 Claims**



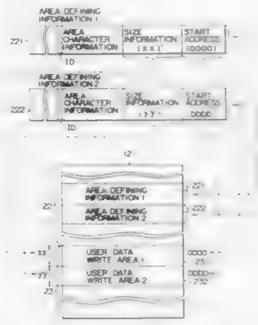
1. A multitask processing apparatus comprising:
a data bus;
a main memory coupled to said data bus and including a plurality of task control blocks each storing a status of a corresponding task; and
a central processing unit including
an execution unit coupled to said data bus,
a ready queue managing means coupled to said data bus, for registering and eliminating a task in an executable state,
a task control block address generating means for generating an address of a task control block of said main memory,
an instruction decoder, coupled to said data bus to receive an instruction through said data bus, generating an address of a microprogram corresponding to a received instruction, and
a microprogram memory, coupled to said instruction decoder to receive said address of said microprogram, generating control signals for said execution unit, for said ready queue managing means and for said task control block address generating means;
wherein a processing demand to a real time operating system required for execution of multitask processing is given through said data bus as an exclusive instruction including task identification information such that said instruction decoder generates an address of said microprogram corresponding to a received exclusive instruction, and said microprogram memory responds to said address supplied from said instruction decoder and generates control signals for said execution unit, for said ready queue managing means and for said task control block address generating means such that a task status is read out from a task control block designated by said task identification information under the control of said task control block address generating means, and is modified by said execution unit and then rewritten to the same task control block, and a task designated by said task identification information is registered as an executable task in said ready queue managing means, and thereafter, a task to be executed next is selected from said ready queue managing means, and
wherein said real time operating system is implemented by hardware resources and microprograms stored in said microprogram memory without using a program composed of a combination of instructions to perform a system call.

5,148,543

IC CARD WITH A STORED DATA CHANGE INHIBITION FUNCTION

Masuo Tamada, Yokohama, and Tsutomu Tanaka, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 9, 1989, Ser. No. 321,641
Claims priority, application Japan, Mar. 14, 1988, 63-59906
Int. Cl.[5] G06F *3/02, 9/06, 12/14, 13/16*
U.S. Cl. 395—700 **19 Claims**



1. An IC card removeably connectable to an external device for receiving/transmitting data, the IC card comprising:
an IC card body having a surface;
key input means, provided on the IC card body surface, for inputting data, a data reading command and a data writing command in response to user key input operations;
contact means provided on the IC card body surface for connecting the IC card to an external device for receiving data therefrom;
memory means for storing the received data, the memory means having a storage area divided into a plurality of data storage areas each for storing data corresponding to a desired object and an identification information storage area for storing a first identification information representing whether data stored in a corresponding one of the data storage areas can be read and for storing a second identification information representing whether data can be written into the memory means;
identifying means for identifying in accordance with the first identification information whether reading of data from one of the data storage areas corresponding to a desired object is possibly when a data reading command is input from the key input means, and for identifying in accordance with the second identification information whether writing of data to one of the data storage areas corresponding to a desired object is possible when a data writing command is input from the key input means;
data writing means for writing the received data into the data storage areas of the memory means and for writing data, in accordance with an input from the key input means, into a data storage area corresponding to a desired object when the identifying means identifies that writing of data to the data storage area corresponding to the desired object is possible;
data reading means for reading data from the one of the data storage areas corresponding to a desired object when the identifying means identifies that reading of data from the one of the data storage areas corresponding to the desired object is possible;
display means formed on the IC card body surface for displaying the data read by the data reading means; and
read out inhibition means for inhibiting reading of data from the one of the data storage areas corresponding to the desired object when the identifying means identifies that reading of data from the one of the data storage areas corresponding to the desired object is not possible

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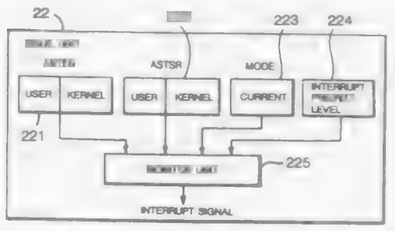
5,148,544

APPARATUS AND METHOD FOR CONTROL OF ASYNCHRONOUS PROGRAM INTERRUPT EVENTS IN A DATA PROCESSING SYSTEM

David N. Cutler, Bellevue; David A. Orbits, Redmond, both of Wash.; Dileep Bhandarkar, Shrewsbury, Mass.; Wayne Cardoza, Merrimack, N.H., and Richard T. Witek, Littleton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 69,436, Jul. 1, 1987, abandoned. This application May 17, 1991, Ser. No. 704,710
Int. Cl.[5] G06F *9/46, 9/00*
U.S. Cl. 395—725 **22 Claims**



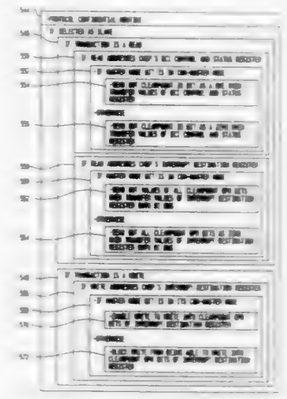
1. An apparatus for responding to interrupt conditions that occur in a data processing system having a kernel mode of operation for executing privileged and nonprivilege instructions of a currently executing program and a user mode of operation for executing nonprivileged instructions of said currently executing program, comprising:
first register means having a first storage element corresponding to said user mode of operation and a second storage element corresponding to said kernel mode of operation;
means, responsive to execution of an instruction in the currently executing program, for generating an enabling signal corresponding to one of said modes of operation and indicating that said mode of operation is enabled to be interrupted in response to one or said interrupt conditions, and for storing said enabling signal in the storage element of said first register means that corresponds to the mode to which said enabling signal corresponds;
second register means having a first storage element corresponding to said user mode of operation and a second storage element corresponding to said kernel mode of operation;
means, responsive to execution of a control program, for generating an interrupt condition present signal that corresponds to one of said modes of operation and indicates that one of said interrupt conditions has occurred in said mode of operation, and for storing said interrupt condition present signal in the storage element of said second register means that corresponds to the mode to which said condition present signal corresponds;
means, responsive to said currently executing program, for generating a signal designating a mode of operation of said currently executing program;
third register means for storing said signal designating said mode of operation; and
monitor means connected to said first, second, and third register means, for generating an interrupt signal when said first, second, and third register means have signals stored therein corresponding to the same mode of operation.

5,148,545

BUS DEVICE WHICH PERFORMS PROTOCOL CONFIDENTIAL TRANSACTIONS

William C. Herbst, Franklin; Lauren D. Baker, Westford, and Gary W. Stevens, Whitinsville, all of Mass., assignors to Clearpoint Research Corporation, Hopkinton, Mass.

Filed Jul. 21, 1989, Ser. No. 384,128
Int. Cl.[5] G06F *13/36, 12/14*
U.S. Cl. 395—725 **3 Claims**



1. A bus device of a first type which uses a first arbitration protocol when it seeks to obtain control of the bus, and which is connected to a communications bus of a computer system, which bus includes clock lines for defining a succession of bus cycles, a BUSY line indicating when the bus is involved in a transaction, a plurality of data lines for carrying addresses, data and arbitration bits, and a plurality of information lines for carrying commands and other information, said computer system having one or more other bus devices connected to the bus, including zero or more additional first-type bus devices and one or more bus devices of a second type, which second-type devices use a second arbitration protocol when they seek to obtain control of the bus, according to which each second-type device seeking to obtain control of the bus asserts an arbitration bit identifying the priority of that second-type device during an arbitration bus cycle in either a high priority half of the data bus or a low priority half of the bus, but not in both said halves during one arbitration, so that when an arbitration takes place among one or more of said second-type devices a pattern of zero or more bits will be asserted in said high priority half of said data bus and a different pattern of zero or more bits will be asserted in said low priority half of said data bus, said first-type bus device comprising:
protocol specific memory means for storing information;
first-type arbitration means for preventing first-type devices and second-type devices from arbitrating during the same arbitration bus cycle, and for, when said first-type bus device seeks to obtain control of the bus, asserting an arbitration bit identifying the priority of said first-type device in both said high and low priority halves of the bus at one during an arbitration cycle, so that when one or more first-type devices arbitrate identical patterns of one or more bits will be asserted in both said high priority and low priority halves of the data bus;

master-mode bit means for representing two states, a first-type master mode and a second-type master mode;
master-mode bit setting means including:
BUSY-edge detecting means for monitoring said BUSY line and asserting a BUSY-edge signal for a given cycle when said BUSY line is asserted in said given cycle and not asserted in the immediately prior cycle;
means for monitoring the data lines and for asserting a data lines busy signal for a given cycle when one or more of said data lines are asserted in said given cycle;
means for asserting a prior data line busy signal during a given cycle when the data line busy signal was asserted for the prior cycle;
means for monitoring the information lines and for generating an information lines idle signal for a given cycle if the information lines are idle for that cycle;
means for comparing the pattern of asserted bits in the top priority half of the data lines with the pattern of asserted bits in the bottom priority half of the data lines for a given cycle, and for asserting a match signal for said given cycle when the patterns of asserted bits in both halves are identical;
means for saving the value of the match signal for a given cycle during the next cycle as the prior match signal;
means for responding to a BUSY-edge signal for a given
setting an arbitration/loop back flag for said given cycle when a data lines busy signal and an information lines idle signals are both generated for said given cycle;
setting said master-mode bit to a second-type master mode when said arbitration/loop-back flag is set from a previous cycle;
setting said master-mode bit to the first-type master mode in response to both said prior data lines busy signal and said prior match signal being asserted for said given cycle, indicating data lines were asserted during the previous cycle and that the patterns of asserted bits in both halves of the data lines in that prior cycle were identical, and
setting said master-mode bit to said second-type master mode in response to said prior data lines busy signal being asserted and said prior match signal not being asserted for said given cycle, indicating data lines were asserted during the previous cycle, but that the patterns of asserted bits in both halves of the data lines in that prior cycle were not identical;
slave response means, for, when said first-type device is a slave device in a transaction addressed by a bus master to said protocol specific memory of the first-type device, denying said bus master the ability to access the information stored in said protocol specific memory when said master mode bit is in its second-type master mode and allowing it the ability to access that information when said master mode bit is in its first-type mode.

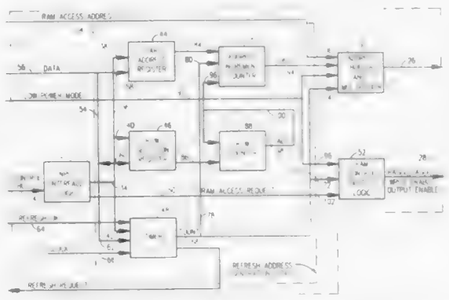
5,148,546

METHOD AND SYSTEM FOR MINIMIZING POWER DEMANDS ON PORTABLE COMPUTERS AND THE LIKE BY REFRESHING SELECTED DRAM CELLS

Greg A. Blodgett, 11135 Bridgetower Dr., Boise, Id. 83709

Continuation of Ser. No. 689,163 Apr. 22, 1991, abandoned. This application Feb. 19, 1992, Ser. No. 836,536
Int. Cl.[5] G11C *14/00*
U.S. Cl. 395—750 **11 Claims**

1. A method for conserving power during the operation of a personal computer having a certain amount of random access memory (RAM) therein defined by a predetermined number of rows of memory elements or cells located on a single RAM semiconductor chip, said method comprising the steps of:
a. reading a computer program to ascertain how much RAM memory is required thereby, and
b. refreshing a selected fraction or subset of the total number of rows in a single RAM memory chip as required by said computer program in above, but less than the total number of rows of elements or cells in one or more RAM memory chips in order to conserve power, and



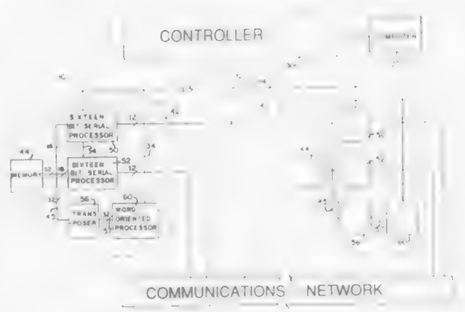
c. refreshing at a controlled refresh frequency corresponding to an operational power level sufficient to prevent any within any of said selected rows in said RAM memory from losing data stored therein.

5,148,547

METHOD AND APPARATUS FOR INTERFACING BIT-SERIAL PARALLEL PROCESSORS TO A COPROCESSOR

Brewster A. Kahle, Somerville; David C. Douglas, Boston; Alexander Vasilevsky, Watertown, all of Mass.; David P. Christman, Newport, Vt.; Shaw W. Yang, Waltham, and Kenneth W. Crouch, Cambridge, both of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Continuation of Ser. No. 179,020, Apr. 8, 1988, abandoned. This application May 17, 1991, Ser. No. 704,688
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—800 **14 Claims**



1. A parallel processor comprising:
a plurality of word-oriented processors,
for each word-oriented processor, at least one means having n bit-serial inputs and an m-bit parallel output for performing transpose operations between said inputs and said output, said parallel output being provided to an input to said word-oriented processor,
for each of the n bit-serial inputs, a bit-serial processor connected thereto, all of said bit-serial processors operating in parallel in a single-instruction-stream, multiple-data-stream environment, and
for each bit-serial processor, a serial memory connected thereto.

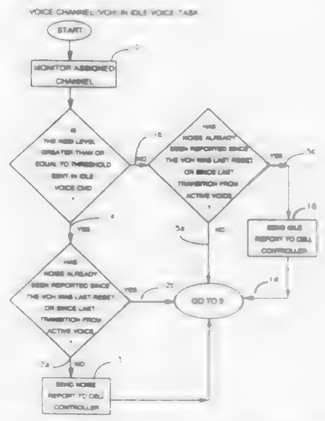
5,148,548

METHOD OF MONITORING CELLULAR RADIO CHANNELS TO AVOID ADJACENT AND CO-CHANNEL INTERFERENCE

Paul S. Meche, Richardson, and Eugenie M. Chaplain, Plano, both of, assignors to Northern Telecom Limited, Montreal, Canada

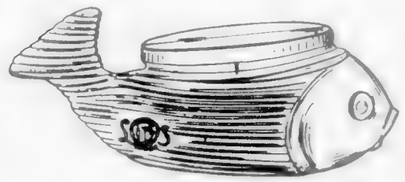
Filed Dec. 19, 1989, Ser. No. 452,341
Int. Cl.[5] H04Q *7/00;* **H04B** *15/00*
U.S. Cl. 455—34.1 **5 Claims**

1. A method of allocating voice channels stored in an idle queue so as to minimize co-channel and adjacent channel interference, the method comprising the steps of:
a) monitoring at a base station an idle voice channel stored in said idle queue;
b) measuring at the base station the RSSI level of the idle voice channel and on channels adjacent the idle voice channel;
c) sending an idle voice message from the base station to a cell controller if the RSSI level is less than a threshold T1, indicating that the idle voice channel can be allocated;
d) sending a noise message to said cell controller if noise having an RSSI level greater than or equal to the threshold T1 is detected, indicating that the idle voice channel cannot be allocated;
e) storing the idle voice channel in a co-channel interference queue if noise having a RSSI level greater than or equal to the threshold T1 was measured on a co-channel;
f) storing the idle voice channel in an adjacent channel interference queue if noise having a RSSI level greater than or equal to the threshold T1 was measured on an adjacent channel; and



g) holding said idle voice channel in either of said co-channel or adjacent channel interferences queues until the RSSI level measured on the channel is less than the threshold T1.

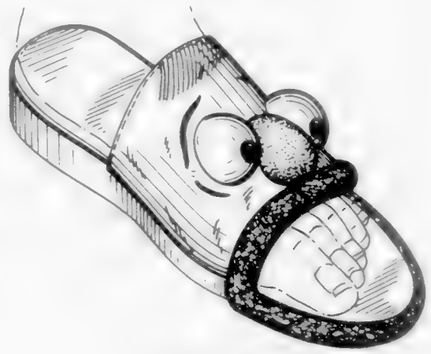
329,319
PRALINE OR SIMILAR ARTICLE
Marika Kesdekoglu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Aug. 14, 1989, Ser. No. 393,713
Claims priority, application Hague, Feb. 13, 1989, 12.819
Term of patent 14 years
U.S. Cl. D1—107



329,320
CHOCOLATE CANDY
Marika Kesdekoglu, Brussels, Belgium, assignor to S. A. Confiserie Leonidas, Brussels, Belgium
Filed Apr. 3, 1990, Ser. No. 504,269
Claims priority, application Hague, Oct. 3, 1989, DM/014749
Term of patent 14 years
U.S. Cl. D1—108

329,321
HEAD DRESS
Robert Ringwood, Devon, England, assignor to DC Comics Inc., New York, N.Y.
Filed Oct. 18, 1989, Ser. No. 423,107
Claims priority, application United Kingdom, Apr. 18, 1989, 1058767
Term of patent 14 years
U.S. Cl. D2—250

329,322
NOVELTY SANDAL
Jerry H. Wartell, 455 E. 14th St., New York, N.Y. 10009
Filed Sep. 11, 1990, Ser. No. 580,511
Term of patent 14 years
U.S. Cl. D2—279

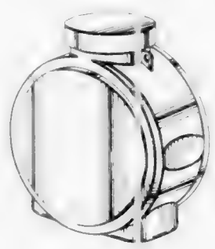


329,323
SHOE UPPER
Bruce E. Rogers, Portland, and Michael A. Aveni, Lake Oswego, both of Oreg., assignors to Nike, Inc. and Nike International, Ltd., Beaverton, Ohio
Filed Jul. 3, 1991, Ser. No. 725,250
Term of patent 14 years
U.S. Cl. D2—314

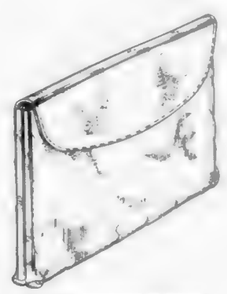
329,324
SOCK
Pamela Stokely, Hudson, N.C., assignor to Willard Industries, Inc., St. Louis Park, Minn.
Filed Jun. 25, 1990, Ser. No. 543,190
Term of patent 14 years
U.S. Cl. D2—334

329,325
COMBINED PUNCH EMBROIDERY AND RUG HOOKING TOOL
Quentin R. Gilbert, Jr., and Linda J. Kortz, both of Northampton County, Pa., assignors to DK-1 Ltd, Norcross, Ga.
Filed Apr. 27, 1990, Ser. No. 515,278
Term of patent 14 years
U.S. Cl. D3—28

329,326
BEVERAGE CONTAINER
John D. Sheehy, 510 W. 85th Ter. Kansas City, Mo. 64114; David L. Johnson, 8012 Lee Blvd., Leawood, Kans. 66209, and Danny W. Johnson, 2113 Lemans Ct., Carrollton, Tex. 75006
Filed Apr. 22, 1991, Ser. No. 688,350
Term of patent 14 years
U.S. Cl. D3—30.1



329,327
CARRYING CASE FOR FIREARMS
James O. Holtzclaw, Jr., Broomfield, Colo., assignor to The Hunter Company, Westminster, Colo.
Filed Feb. 22, 1990, Ser. No. 483,950
Term of patent 14 years
U.S. Cl. D3—38

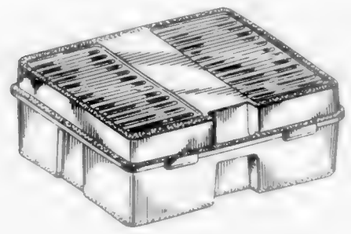


329,328
CASE FOR FEMININE HYGIENE PRODUCTS
Chandra D. Stephens, P.O. Box 725082, Atlanta, Ga. 30339
Continuation-in-part of Ser. No. 387,990, Aug. 1, 1989, Pat. No. 4,964,526. This application Oct. 22, 1990, Ser. No. 602,074
Term of patent 14 years
U.S. Cl. D3—39

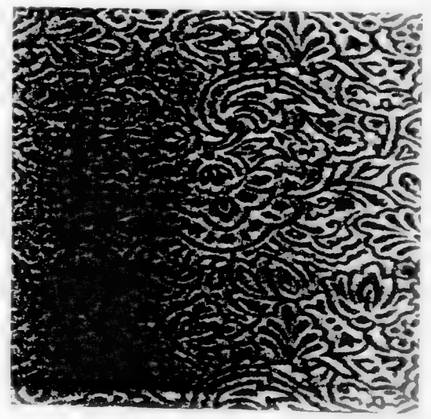
329,329
DUFFLE BAG
Harvey J. Bomes, and Jack L. Barber, both of Baltimore, Md., assignors to The Baltimore Luggage Company, Baltimore, Md.
Filed Sep. 12, 1990, Ser. No. 581,099
Term of patent 14 years
U.S. Cl. D3—71

329,330
TWO-POUCH SATCHEL
Roger Pardo, Paris, France, assignor to Louis V. Malletier, Paris, France
Filed Mar. 27, 1989, Ser. No. 329,070
Claims priority, application Hague, Sep. 26, 1988, DMA/000837
Term of patent 14 years
U.S. Cl. D3—76

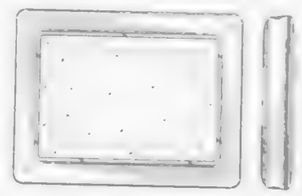
329,331
STORAGE BOX
Jody A. Hobson, Rocky River, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 31, 1990, Ser. No. 636,376
Term of patent 14 years
U.S. Cl. D3—78



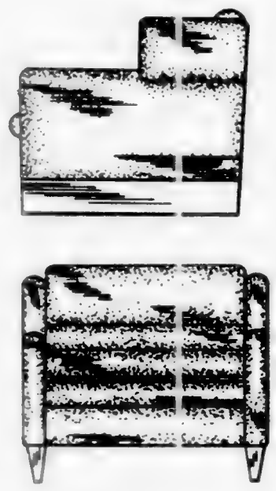
329,332
FABRIC
Leon Bressler, Paris, France, assignor to Jeanne Lanvin, Paris, France
Filed Mar. 16, 1990, Ser. No. 494,518
Claims priority, application World Int. Prop. O., Sep. 28, 1989, DM-014666
Term of patent 14 years
U.S. Cl. D5—37



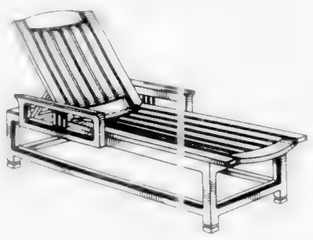
329,333
COMBINED FRAME AND CONTAINER FOR PICTURES
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Continuation-in-part of Ser. No. 933,179, Nov. 21, 1986, abandoned, and a continuation-in-part of Ser. No. 17,797, Feb. 24, 1987, Pat. No. D. 309,679, and a continuation-in-part of Ser. No. 36,841, Apr. 9, 1987, Pat. No. D. 304,884, and a continuation-in-part of Ser. No. 276,435, Nov. 23, 1988, abandoned. This application Mar. 2, 1989, Ser. No. 318,194
Claims priority, application World Int. Prop. O., May 26, 1988, DM/011027
Term of patent 14 years
U.S. Cl. D6—300



329,334
SEAT
Robert D. Kleinschmidt, Chicago, Ill. assignor to DO3 Systems, Inc., Cleveland, Ohio
Filed Aug. 24, 1987, Ser. No. 88,212
Term of patent 14 years
U.S. Cl. D6—334



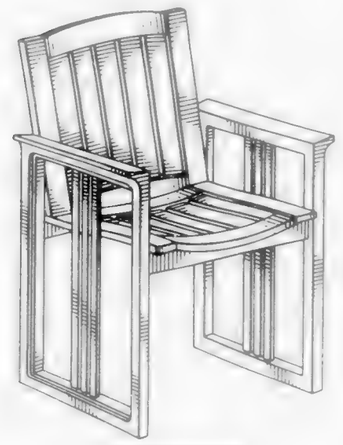
329,335
CHAISE LOUNGE
Neil M. Komai, 5019 Golden West. Temple City, Calif. 91780, and Joseph D. Ricchio, Jr., 7119 Mezzanine Way, Long Beach, Calif. 90808
Filed Jul. 13, 1989, Ser. No. 379,535
Term of patent 14 years
U.S. Cl. D6—361



329,336
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex, Oyonnax Cedex, France
Filed May 18, 1989, Ser. No. 353,514
Claims priority, application Int'l Pat. Institute, Nov. 28, 1988, DMA000890
The portion of the term of this patent subsequent to Apr. 14, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—370

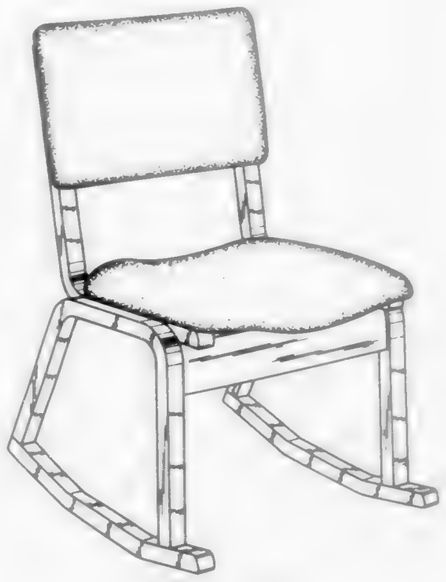
329,337
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex, Oyonnax Cedex, France
Filed May 18, 1989, Ser. No. 353,515
Claims priority, application Int'l Pat. Institute, Nov. 28, 1988, DMA000890
The portion of the term of this patent subsequent to Apr. 14, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—370

329,338
CHAIR
Neil M. Komai, 5019 Golden West, Temple City, Calif. 91780, and Joseph D. Ricchio, Jr., 7119 Mezzanine Way, Long Beach, Calif. 90808
Filed Jul. 13, 1989, Ser. No. 379,531
Term of patent 14 years
U.S. Cl. D6—370

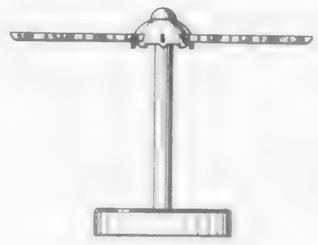


329,339
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex, Oyonnax Cedex, France
Filed Sep. 18, 1989, Ser. No. 408,305
Claims priority, application Benelux, Mar. 16, 1989, DMA/000967
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—370

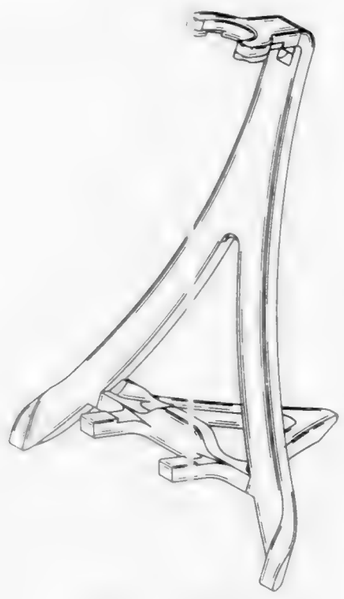
329,340
CHAIR
Virgil Miller, Archbold, Ohio, assignor to Sauder Manufacturing Co., Archbold, Ohio
Filed Oct. 10, 1989, Ser. No. 419,437
Term of patent 14 years
U.S. Cl. D6—373



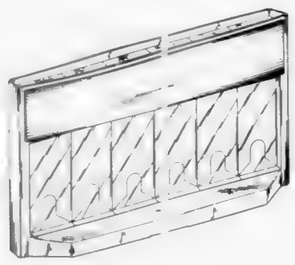
329,341
EARRING CAROUSEL
Flora B. Rhodes, 3929 Maple St., Ventura, Calif. 93003
Filed Oct. 29, 1990, Ser. No. 605,182
Term of patent 14 years
U.S. Cl. D6—457



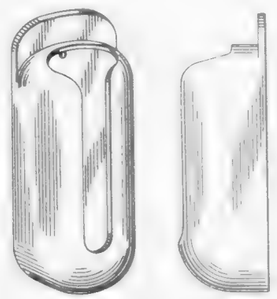
329,34 :
STRINGED MUSICAL INSTRUMENT STAND
Darrell A. Schoenig, Fort Collins, Colo., assignor to Ultimate Support Systems, Inc., Fort Collins, Colo.
Filed Jul. 5, 1990, Ser. No. 548,756
Term of patent 14 years
U.S. Cl. D06—466



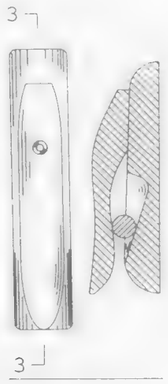
329,3 3
SIX COLUMN COUNTER DISPLAY
Dennis L. Oldorf, 8178 Round Hills Cir., Las Vegas, Nev. 89113
Filed Feb. 15, 1990, Ser. No. 481,464
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—515



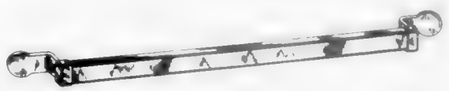
329,344
COMBINED STORAGE AND DISPENSING RECEPTABLE FOR PLASTIC BAGS
Louis D. Carillo, 1 Crucillo, Rancho Santa Margarita, Calif. 92688
Filed Apr. 10, 1990, Ser. No. 508,101
Term of patent 14 years
U.S. Cl. D6—515



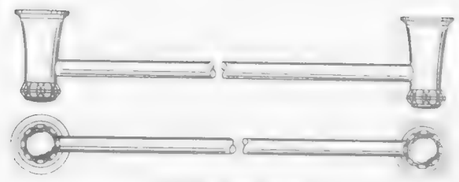
329,345
TOWEL HOLDER
John F. Bush, Rte. 6, Box 110-B, Pittsburg, Tex. 75686
Filed Oct. 18, 1990, Ser. No. 600,961
Term of patent 14 years
U.S. Cl. D6—547



329,346
TOWEL BAR
William C. McKeone, and Mary J. Reid, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Continuation of Ser. No. 332,305, Mar. 31, 1989, abandoned.
This application Jan. 26, 1990, Ser. No. 476,100
Term of patent 14 years
U.S. Cl. D6—549

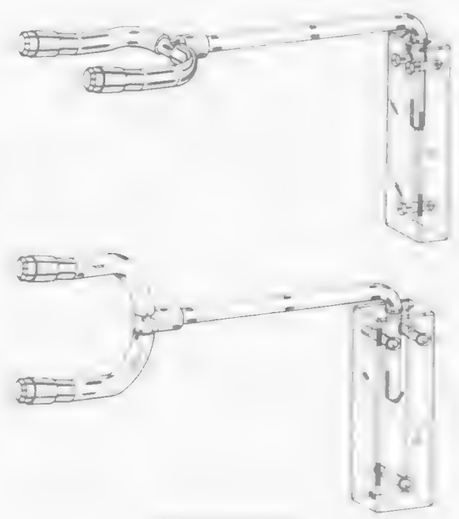


329,347
TOWEL BAR
Ricardo J. Gomes, Santa Monica, Calif., assignor to Emhart Inc., Newark, Del.
Filed Apr. 19, 1990, Ser. No. 511,491
Term of patent 14 years
U.S. Cl. D6—549

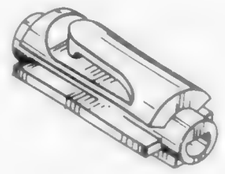


329,348
ARTICLE STORAGE ASSEMBLY
Susan K. Cambria, 576 Broadview Rd., Orange, Conn. 06477
Filed Nov. 20, 1990, Ser. No. 617,052
Term of patent 14 years
U.S. Cl. D6—553

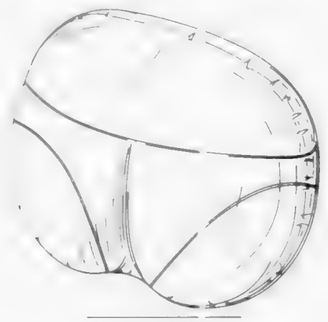
329,349
WALL MOUNTING BRACKET FOR A MUSICAL INSTRUMENT
John D. Moreno, 415 Old Ventura Ave., Oak View, Calif. 93022
Filed Nov. 15, 1990, Ser. No. 613,305
Term of patent 14 years
U.S. Cl. D6—567



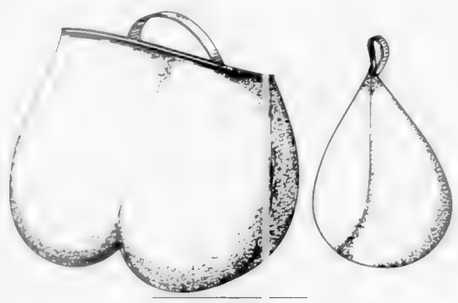
329,350
CORD LOCK FOR A VENETIAN BLIND LIFT CORD
Be-Suo Jian, No. 32-1, Hsin Sheng Road, Fu Pao Hs'un, Fu Hsin Hsiang, Changhua Hsien, Taiwan
Filed Oct. 18, 1989, Ser. No. 423,162
Term of patent 14 years
U.S. Cl. D6—580



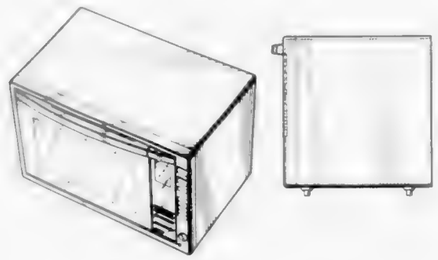
329,351
CUSHION
Mary R. Ezpeleta, 112 Dascomb Rd., Andover, Mass. 01810
Continuation-in-part of Ser. No. 57[illegible],257, Aug. 29, 1990. This application Apr. 9, 1991, Ser. No. 682,716
Term of patent 14 years
U.S. Cl. D6—597



329,352
CUSHION
Mary R. Ezpeleta, 112 Dascomb Rd., Andover, Mass. 01810
Filed Aug. 29, 1990, Ser. No. 574,257
Term of patent 14 years
U.S. Cl. D6—601



329,353
MICROWAVE OVEN
Hiromichi Yamada, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 4, 1991, Ser. No. 663,641
Term of patent 14 years
U.S. Cl. D7—351

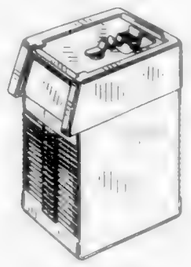


329,354
COFFEE DISPENSER FOR ESPRESSO MACHINE
Martin Mejia, and Fausto Del Monte, both of 323 68th St., Guttenberg, N.J. 07093
Filed Sep. 21, 1990, Ser. No. 586,707
Term of patent 14 years
U.S. Cl. D7—399

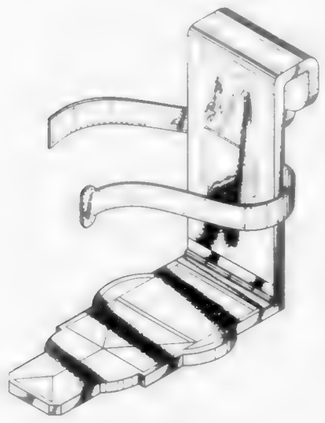
329,355
INFANT'S DRINKING MUG
Toshikazu Yagi, Osaka, Japan, assignor to Jex Co., Ltd., Osaka, Japan
Filed Feb. 14, 1991, Ser. No. 655,905
Claims priority, application Japan, Aug. 21, 1990, 2-28126
Term of patent 14 years
U.S. Cl. D7—511

329,356
PLATE
Bernard Scherer, Luxembourg, Luxembourg, assignor to Villeroy & Boch S.a.r.l., Luxembourg, Luxembourg
Filed Oct. 27, 1989, Ser. No. 428,319
Term of patent 14 years
U.S. Cl. D7—575

329,357
BEVERAGE CONTAINER HOLDER
Steven Lebensfeld, Woodsburgh, N.Y., assignor to Toymax Inc., Cedarhurst, N.Y.
Filed Oct. 10, 1990, Ser. No. 595,923
Term of patent 14 years
U.S. Cl. D7—620

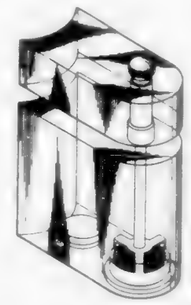


329,358
CUP HOLDER FOR USE IN A VEHICLE
Edmundo Espinosa, Jr., 413 E. Fullerton, Glendale Heights, Ill. 60139
Filed Dec. 7, 1990, Ser. No. 623,541
Term of patent 14 years
U.S. Cl. D7—620



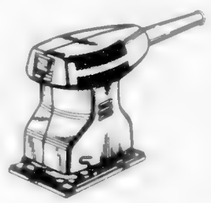
329,359
BARTENDER UTENSIL ORGANIZER
Harald I. Eggen, 5415 Fox Lake Rd., McHenry, Ill. 60050
Filed Nov. 13, 1990, Ser. No. 611,953
Term of patent 14 years
U.S. Cl. D7—637

329,360
PEPPER MILL
Hua-Te Wu, Tainan, Taiwan, assignor to Yiena Lih Enterprise Co., Ltd., Tainan, Taiwan
Filed Jun. 12, 1990, Ser. No. 537,103
Term of patent 14 years
U.S. Cl. D7—679

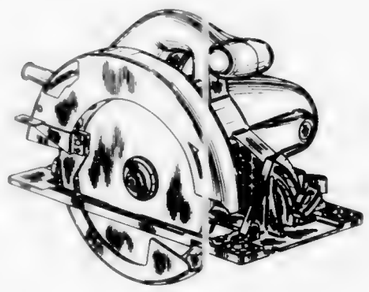


329,361
COMBINED CORDLESS POWER RATCHET AND CHARGING STAND
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed Jul. 17, 1989, Ser. No. 380,274
Term of patent 14 years
U.S. Cl. D8—61

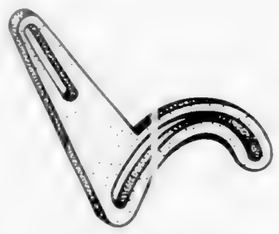
329,362
PORTABLE ELECTRIC SANDER
Toshiaki Saito, Tokyo, and Masaharu Narisue, Hiroshima, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Apr. 23, 1990, Ser. No. 513,513
Claims priority, application Japan, Nov. 16, 1989, 1-41805
Term of patent 14 years
U.S. Cl. D8—62



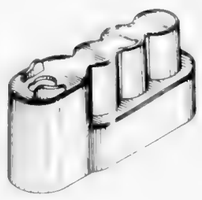
329,363
PORTABLE CIRCULAR SAW
Yuichiro Sasaki, and Hiroshi Sato, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan
Filed Apr. 18, 1990, Ser. No. 510,917
Claims priority, application Japan, Oct. 20, 1989, 1-38441
Term of patent 14 years
U.S. Cl. D8—66



329,364
IMPELLER HOLDING TOOL
Carl D. Schuerg, 5 Whitetale La., Sweeney, Tex. 77480, and Wendell O. Puderbaugh, Rte. 1 Box 577, Summerville, Tex. 77879
Filed Oct. 18, 1989, Ser. No. 423,094
Term of patent 14 years
U.S. Cl. D8—71

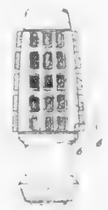


329,365
SOLDERING TIP REMOVING TOOL OR THE LIKE
William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265, and Robert E. Dallons, 6625 Tamarind, Agoura, Calif. 91301
Filed Feb. 26, 1990, Ser. No. 485,079
Term of patent 14 years
U.S. Cl. D8—71

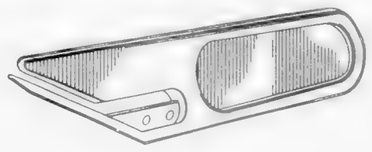


329,366
MULTI-PURPOSE HATCHET
Sidiram Ragoonath, 1809 W. Bennett, Apt. 217-A, Dallas, Tex. 75206
Filed Jan. 11, 1991, Ser. No. 621,903
Term of patent 14 years
U.S. Cl. D8—76

329,367
SCREWDRIVER HANDLE
Richard J. Landy, Castaic, Calif., assignor to Allied International, Sylmar, Calif.
Filed Apr. 25, 1990, Ser. No. 514,532
Term of patent 14 years
U.S. Cl. D8—83

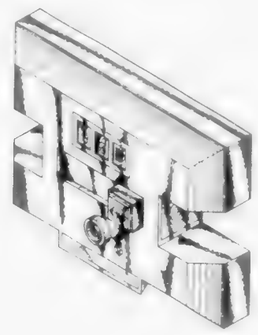


329,368
LETTER-OPENER
Sylvain Desrochers, 1000 Marlboro, Apt. 209, Mont Royal, Quebec, Canada H4P 1C1
Filed Dec. 17, 1990, Ser. No. 628,673
Claims priority, application Canada, May 11, 1990, 05-11-90-2
Term of patent 14 years
U.S. Cl. D8—102

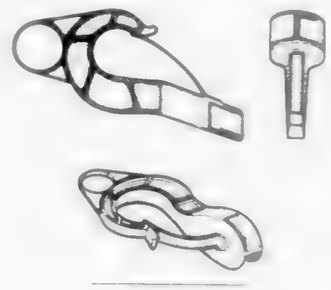


329,369
DOOR HANDLE
Timm Martin, Glenview, Ill., and Bruce A. Hagemeyer, Pella, Iowa, assignors to Rolscreen Company, Pella, Iowa
Continuation-in-part of Ser. No. 586,732, Sep. 24, 1990. This application Dec. 17, 1990, Ser. No. 628,678
Term of patent 14 years
U.S. Cl. D8—302

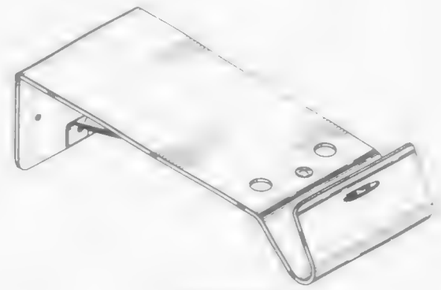
329,370
DEADBOLT LOCK ASSEMBLY FOR MOUNTING ON THE INSIDE OF AN AUTOMOBILE DOOR
Arcel R. Manning, 2756 Avalon St., Riverside, Calif. 92509
Filed Jul. 25, 1990, Ser. No. 558,175
Term of patent 14 years
U.S. Cl. D8—331



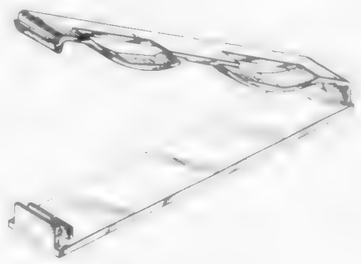
329,371
PLASTIC HOOK FOR USE TO RELEASABLY ATTACH OPPOSITE ENDS OF AN ELASTIC CORD
Hui-Chuan Jou, No. 11, Lane 436, Chung Shan Road, Sec. 1, Changhua, Taiwan
Filed Nov. 16, 1990, Ser. No. 614,755
Term of patent 14 years
U.S. Cl. D8—367



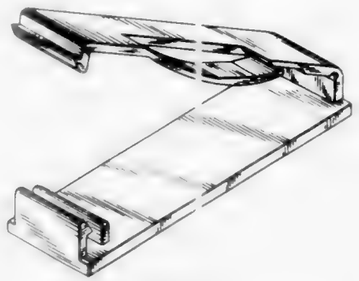
329,372
BRACKET FOR A BICYCLE
Erich E. Wilms, 931 Marguerite La., Carlsbad, Calif. 92008
Filed Jan. 9, 1991, Ser. No. 639,580
Term of patent 14 years
U.S. Cl. D8—380



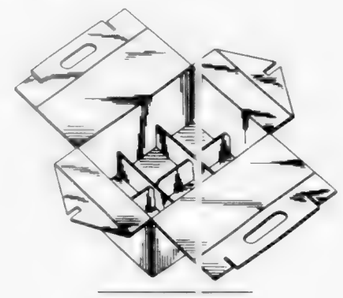
329,373
CLIP FOR FLAT CABLE
Hiromitsu Kaga, Tsukui, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Sep. 11, 1990, Ser. No. 580,626
Term of patent 14 years
U.S. Cl. D8—394



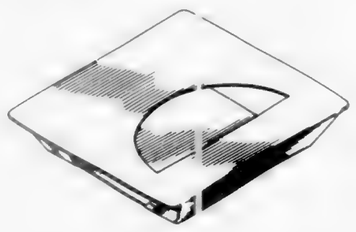
329,374
CLIP FOR FLAT CABLE
Hiromitsu Kaga, Tsukui, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Sep. 11, 1990, Ser. No. 580,627
Term of patent 14 years
U.S. Cl. D8—394



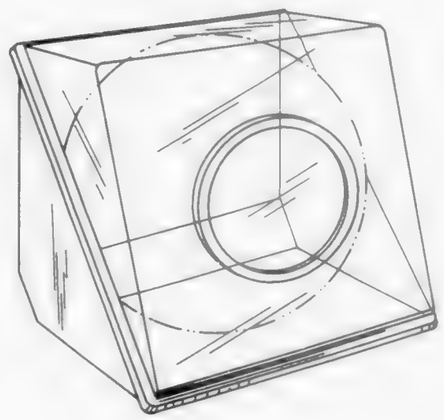
329,375
CONTAINER FOR SMALL ARTICLES
Bo A. Bergman, Erikslund, Sweden, assignor to Mittpac AB, Erikslund, Sweden
Filed Jun. 22, 1990, Ser. No. 542,405
Claims priority, application Sweden, Jan. 19, 1990, 90-0115
Term of patent 14 years
U.S. Cl. D9—346



329,376
MICROWAVEABLE PACKAGE
Stephen Burd, Zeeland, Mich., assignor to Bil Mar Foods, Inc., Zeeland, Mich.
Filed Aug. 1, 1990, Ser. No. 561,306
Term of patent 14 years
U.S. Cl. D9—418



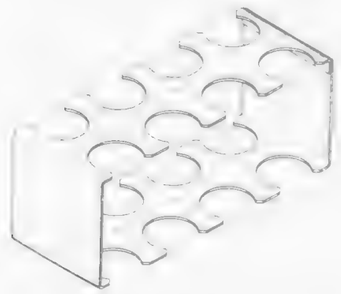
329,377
BALL PACKAGE
David Cortelli, Suffield, Conn.; Frank Carter, Wilbraham, and Kenneth W. Pratt, Ware, both of Mass., assignors to Seneca Sports Inc., Milford, Mass.
Filed Nov. 19, 1990, Ser. No. 615,648
Term of patent 14 years
U.S. Cl. D9—418



329,378
MERCHANDIZING DISPLAY BIN FOR BEVERAGE CANS
Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Apr. 20, 1990, Ser. No. 511,520
Term of patent 14 years
U.S. Cl. D9—430

329,379
TUBE HEAD
Lise W. Jorgensen, Woodbury, and Donald P. Losier, Westport, both of Conn., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 10, 1990, Ser. No. 595,936
Term of patent 14 years
U.S. Cl. D9—434

329,380
PACKAGING CLIP
Raymond W. Hazlett, Sugar Grove; Antonino Araujo, Upper Arlington, and Paul A. Pezzoli, Worthington, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Dec. 13, 1990, Ser. No. 626,876
Term of patent 14 years
U.S. Cl. D9—455

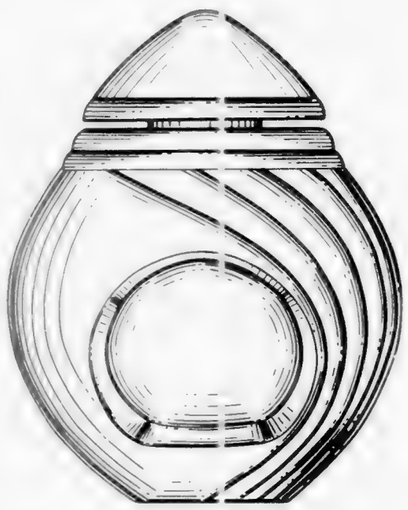


329,381
COMBINED BOTTLE AND DISPENSING CAP
Marissa A. Klapwald, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 19, 1990, Ser. No. 511,031
Term of patent 14 years
U.S. Cl. D9—525

329,382
PERFUME BOTTLE
Alain Boucheron, Paris, France, assignor to P C I Parfums et Cosmetiques International, Paris, France
Filed Apr. 14, 1989, Ser. No. 339,244
Claims priority, application France, Oct. 18, 1988, 886454
Term of patent 14 years
U.S. Cl. D9—521

329,383
PERFUME BOTTLE
Alain Boucheron, Paris, France, assignor to P C I Parfums et Cosmetiques International, Paris, France
Filed Apr. 14, 1989, Ser. No. 339,243
Claims priority, application France, Oct. 18, 1988, 886454
Term of patent 14 years
U.S. Cl. D9—529

329,384
PERFUME BOTTLE
Alain Boucheron, Paris, France, assignor to PCI Parfums et Cosmetiques International, Paris, France
Filed Apr. 14, 1989, Ser. No. 339,245
Claims priority, application France, Oct. 18, 1988, 886454
Term of patent 14 years
U.S. Cl. D9—544

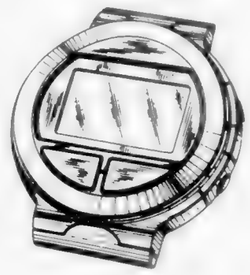


329,385
BOTTLE
Luis M. Alves Machado Guedes, Oporto, Portugal, assignor to Aveleda - Sociedade Agricola E Comercial Da Quinta Da Aveleda, S.A., Penafiel, Portugal
Filed Jul. 10, 1990, Ser. No. 550,363
Term of patent 14 years
U.S. Cl. D9—550

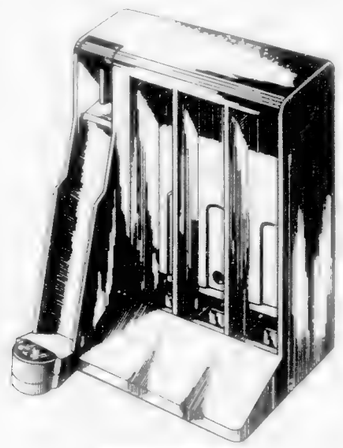
329,386
WATCH CASE
Eddy Burgener, Moutier, Switzerland, assignor to Roventa Henex SA, Bienne, Switzerland
Filed Oct. 10, 1989, Ser. No. 420,129
Claims priority, application World Int. Prop. O., Apr. 12, 1989, DMA/000981
Term of patent 14 years
U.S. Cl. D10—30

329,387
TIMEPIECE BODY
Koichi Takahashi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Jun. 20, 1990, Ser. No. 541,247
Claims priority, application Japan, Dec. 20, 1989, 1-46544
Term of patent 14 years
U.S. Cl. D10—30

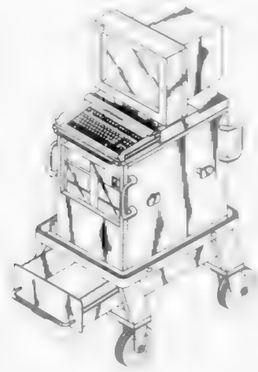
329,388
TIMEPIECE BODY
Koichi Takahashi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Jun. 21, 1990, Ser. No. 541,424
Claims priority, application Japan, Dec. 22, 1989, 1-46947
Term of patent 14 years
U.S. Cl. D10—30



329,389
EXAMINATION ROOM STAND FOR A RADIATION THERMOMETER
David M. Hines, Orange, Calif., assignor to Thermoscan, Inc., San Diego, Calif.
Filed Sep. 13, 1990, Ser. No. 581,969
Term of patent 14 years
U.S. Cl. D10—60

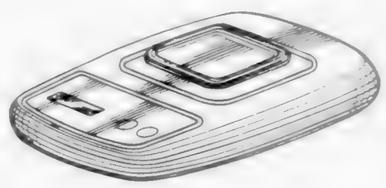


329,390
AUTOMOTIVE TEST TERMINAL
Pedro M. Alfonso, Delray Beach; Pedro E. Fernandez; John C. Irwin, both of Boca Raton, all of Fla.; Randall W. Martin, The Woodlands, Tex.; Robert W. Montedonico, Englewood, Fla.; Kenneth C. Musgrave, Atlanta, Ga., and Mark S. Small, Delray Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 30, 1990, Ser. No. 567,443
Term of patent 14 years
U.S. Cl. D10—75



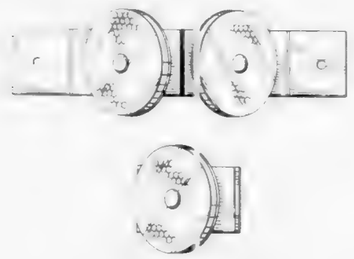
329,391
MOBILE DETECTOR FOR EXPLOSIVES AND DRUGS
Edward E. A. Bromberg, Peabody; Dale N. Larson, Brookline; David A. Sutton, Lexington, and Michel D. Arney, Roslindale, all of Mass., assignors to Thermedics Inc., Woburn, Mass.
Filed Jan. 3, 1989, Ser. No. 293,150
Term of patent 14 years
U.S. Cl. D10—81

329,392
MINIATURE GEM WEIGHING SCALE
Soji Kurata, Saitama, Japan, assignor to Tanita Corporation, Tokyo, Japan
Filed Oct. 12, 1990, Ser. No. 597,750
Claims priority, application Japan, May 15, 1990, 2-16062
Term of patent 14 years
U.S. Cl. D10—91

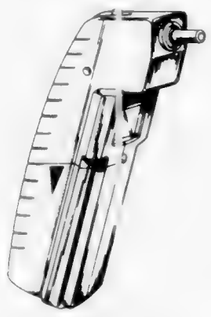


329,393
SMOKE DETECTOR
G. Byron Hawkins, III, 840 Foxcroft Trail, Marietta, Ga. 30067
Filed Aug. 31, 1990, Ser. No. 576,709
Term of patent 14 years
U.S. Cl. D10—106

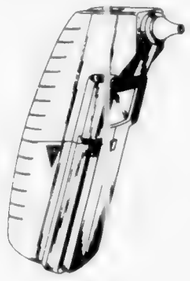
329,394
REFLECTOR UNIT FOR TRAILERS OR THE LIKE
Paul E. Parsons, Milford, Del., and Cathy L. Slama, Turlock, Calif., assignors to Conagra, Inc., Omaha, Nebr.
Filed Aug. 7, 1990, Ser. No. 563,966
Term of patent 14 years
U.S. Cl. D10—111



329,395
RADIATION THERMOMETER
Spencer L. Mackay, Agoura Hills, Calif., assignor to Thermoscan Inc., San Diego, Calif.
Filed Sep. 13, 1990, Ser. No. 582,606
Term of patent 14 years
U.S. Cl. D10—57

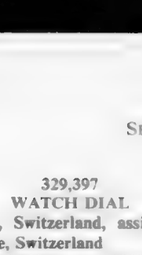


329,396
RADIATION THERMOMETER
Spencer L. Mackay, Agoura Hills, Calif., assignor to Thermoscan Inc., San Diego, Calif.
Filed Sep. 13, 1990, Ser. No. 583,342
Term of patent 14 years
U.S. Cl. D10—57



329,397
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Division of Ser. No. 509,138, Apr. 6, 1990, Pat. No. D. 321,838, which is a division of Ser. No. 351,553, May 15, 1989, Pat. No. D. 311,149, which is a division of Ser. No. 904,301, Sep. 5, 1986, Pat. No. D. 302,399. This application Oct. 15, 1991, Ser. No. 776,483
Claims priority, application World Int. Prop. O., Mar. 25, 1986, DM/006689
Term of patent 14 years
U.S. Cl. D10—126

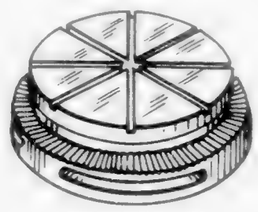
329,398
CLOCK PENDULUM
Hisako Sugano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jan. 31, 1990, Ser. No. 473,207
Term of patent 14 years
U.S. Cl. D10—130



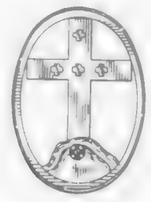
329,399
BRACELET
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.P.A., Rome, Italy
Filed Jun. 13, 1990, Ser. No. 537,290
Term of patent 14 years
U.S. Cl. D11—6

329,400
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.P.A., Rome, Italy
Filed Dec. 18, 1990, Ser. No. 629,205
Claims priority, application Int'l Pat. Institute, Jul. 3, 1990, DM/017.067
Term of patent 14 years
U.S. Cl. D11—6

329,401
JEWELRY LINK
Meang Chia, and Cheo Chia, both of 412 W. 6th St., Ste. #1104, Los Angeles, Calif. 90014
Filed Jun. 4, 1990, Ser. No. 532,516
Term of patent 14 years
U.S. Cl. D11—93



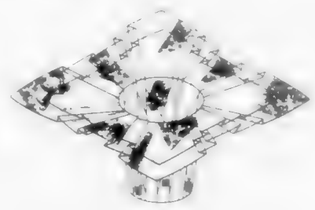
329,402
PENDANT OR SIMILAR ARTICLE
Marvin Zears, R.R. #2, Forrest Dr., Metamora, Ill. 61548
Filed Feb. 22, 1990, Ser. No. 483,009
Term of patent 14 years
U.S. Cl. D11—96



329,403
SAILOR BOY FIGURINE
Theodore F. Trefsgar, 160 W. Wayne Ave., Hatfield, Pa. 19440
Filed Feb. 5, 1990, Ser. No. 475,097
Term of patent 14 years
U.S. Cl. D11—131

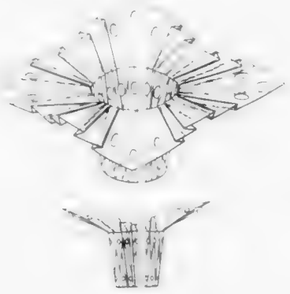
329,404
SERVICEMAN FIGURINE
Theodore F. Trefsgar, 160 W. Wayne Ave., Hatfield, Pa. 19440
Filed Feb. 5, 1990, Ser. No. 475,098
Term of patent 14 years
U.S. Cl. D11—131

329,405
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Division of Ser. No. 357,103, May 25, 1989, Pat. No. D. 319,991, which is a continuation-in-part of Ser. No. 108,316, Oct. 13, 1987, Pat. No. D. 316,838, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. D. 293,224. This application Oct. 24, 1990, Ser. No. 603,825
Term of patent 14 years
U.S. Cl. D11—149

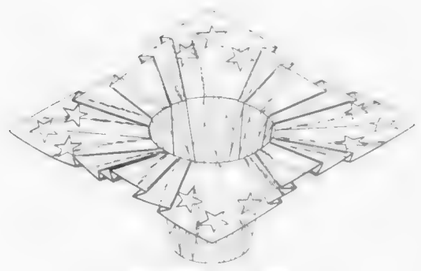


329,406
PLANT CONTAINER
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex, Oyonnax Cedex, France
Filed Oct. 16, 1989, Ser. No. 421,736
Claims priority, application Int' Pat. Institute, Apr. 17, 1989, DMA000989
Term of patent 14 years
U.S. Cl. D11—153

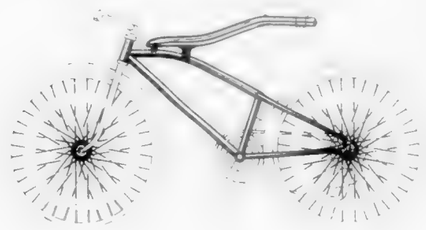
329,407
FLOWER POT COVER
Donald E. Weder, Highland, Ill.; Erwin H. Weder, deceased, late of Highland, Ill. by Donald E. Weder, legal co-representative; by Wanda M. Weder, legal co-representative, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 108,315, Oct. 13, 1987, Pat. No. Des. 319,034, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. D. 293,224. This application Oct. 25, 1988, Ser. No. 262,663
The portion of the term of this patent subsequent to Aug. 13, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



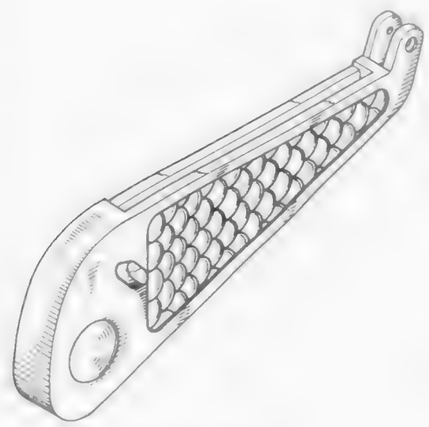
329,408
FLOWER POT COVER
Donald E. Weder, Highland, Ill.; Erwin H. Weder deceased late of Highland, Ill., by Donald E. Weder, legal co-representative, by Wanda M. Weder, legal co-representative, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Division of Ser. No. 108,315, Oct. 13, 1987, Pat. No. D. 319,034, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. D. 293,224. This application Jan. 31, 1991, Ser. No. 653,434
Term of patent 14 years
U.S. Cl. D11—164



329,409
BICYCLE FRAME
James D. Allsop, Bellingham; Paul Barkley, both of Bellingham, and David E. Calapp, Bellevue, all of Wash., assignors to Allsop, Inc., Bellingham, Wash.
Continuation-in-part of Ser. No. 333,891, Apr. 7, 1989, Pat. No. 4,934,724, and a continuation-in-part of Ser. No. 440,732, Nov. 22, 1989, Pat. No. Des. 324,836. This application Apr. 25, 1990, Ser. No. 514,363
The portion of the term of this patent subsequent to Mar. 24, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—111



329,410
BABY CARRIAGE HANDLE
Min-Tai Huang, No. 28-1, Na Pa Lin, Hsin Hua Chen, Tainan Hsien, Taiwan
Filed Dec. 7, 1989, Ser. No. 448,141
Term of patent 14 years
U.S. Cl. D12—133

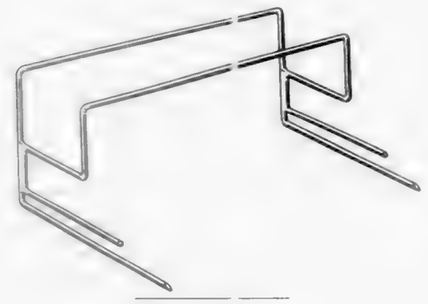


329,411
TIRE
Timothy J. Lassan, Kent, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Aug. 29, 1990, Ser. No. 575,521
Term of patent 14 years
U.S. Cl. D12—147

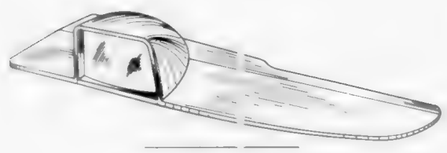
329,412
PNEUMATIC TIRE TREAD AND BUTTRESS
Paul B. Maxwell, Stow, Ohio, and Darrell E. Covert, Strassen, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 4, 1991, Ser. No. 652,892
Term of patent 14 years
U.S. Cl. D12—147

329,413
TIRE
Graeme A. Chandler, Morley, Australia, assignor to Altrack Limited, West Perth, Australia
Filed Nov. 14, 1990, Ser. No. 612,895
Claims priority, application Australia, May 14, 1990, 1445/90
Term of patent 14 years
U.S. Cl. D12—151

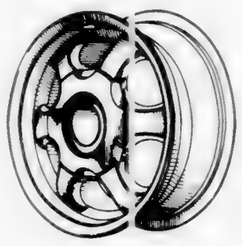
329,414
ARTICLE HOLDER FOR A VEHICLE
Paul A. Herzig, 11059 Alscot La., Whitehouse, Ohio 43571
Filed Apr. 30, 1990, Ser. No. 516,229
Term of patent 14 years
U.S. Cl. D12—157



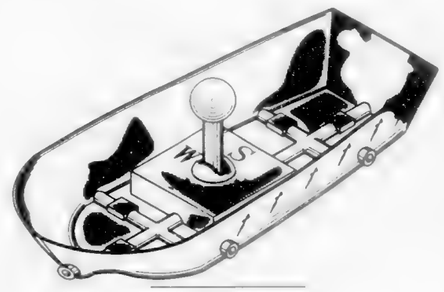
329,415
AUXILIARY REAR VIEW MIRROR FOR ATTACHMENT TO A VEHICLE EXTERIOR REAR VIEW MIRROR
Young S. Rhoo, Dong Seoul Hanyang, Apt. 2-308, Dapshipri, 2-dong 41, Dongdaemoon-gu, Seoul, Rep. of Korea
Filed Oct. 29, 1990, Ser. No. 605,465
Term of patent 14 years
U.S. Cl. D12—187



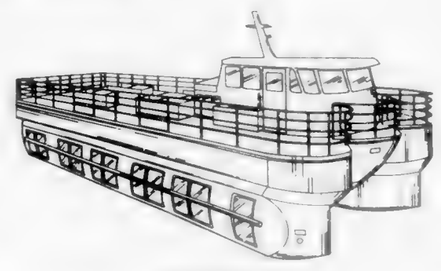
329,416
VEHICLE WHEEL
Martin Braungart, and Franz Schwenk, both of Alpirsbach, Fed. Rep. of Germany, assignors to BBS kfz. Technik AG, Schiltach, Fed. Rep. of Germany
Filed Sep. 11, 1990, Ser. No. 580,510
Term of patent 14 years
U.S. Cl. D12—209



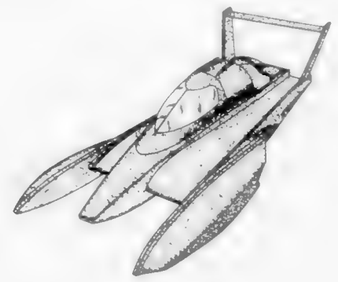
329,417
CANOE WITH JOYSTICK CONTROLLER ATTACHED
David J. Stricklin, 214 S. 5th St., Carmi, Ill. 62821
Filed Jan. 10, 1990, Ser. No. 463,951
Term of patent 14 years
U.S. Cl. D12—302



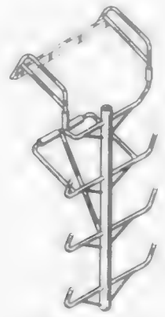
329,418
MULTIPLE HULLED BOAT
Curtiss E. Jackson, Agoura Hills, Calif., assignor to Corporate E-Ticket, Inc., Westlake Village, Calif.
Filed Aug. 20, 1990, Ser. No. 569,276
Term of patent 14 years
U.S. Cl. D12—304



329,419
HYDRO SPEEDBOAT
William E. Thomas, Jr., deceased, late of Alta Loma, and by Karen M. Thomas, heir, 7184 Teak Way, Alta Loma, Calif. 91701
Filed Jun. 28, 1990, Ser. No. 545,185
Term of patent 14 years
U.S. Cl. D12—309



329,420
MOTORBOAT-LADDER
Masayoshi Tsuchiya, 6-13-4, Mukoudai-chou, Tanashi-shi, Tokyo, Japan
Filed Apr. 18, 1990, Ser. No. 510,794
Term of patent 14 years
U.S. Cl. D12—317

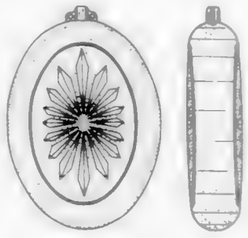


329,421
PAIR OF VORTEX GENERATING FINS FOR A MOTOR BOAT
Charles N. Brans, P.O. Box 1, Niwot, Colo. 80544-0001
Filed Jul. 27, 1990, Ser. No. 558,420
Term of patent 14 years
U.S. Cl. D12—317

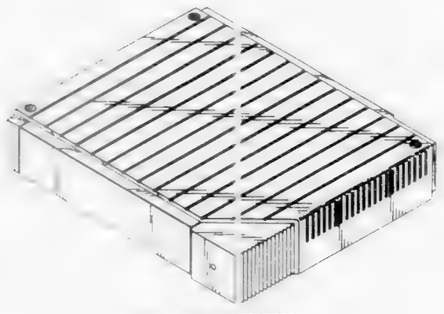
329,422
ELECTRICAL PLUG RECEPTACLE
Shiori Fujiyoshi, Kanagawa, Japan, assignor to Jimbo Electric Co., Ltd., Tokyo, Japan
Filed May 21, 1990, Ser. No. 525,657
Claims priority, application Japan, Dec. 6, 1989, 1-44381
Term of patent 14 years
U.S. Cl. D13—137

329,423
MULTIPLE ELECTRICAL OUTLET ADAPTER
Daniel H. V. Lau, Carmel, Ind., assignor to Pacomex Industries, Inc., Indianapolis, Ind.
Filed Nov. 19, 1990, Ser. No. 615,649
The portion of the term of this patent subsequent to Mar. 26, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—143

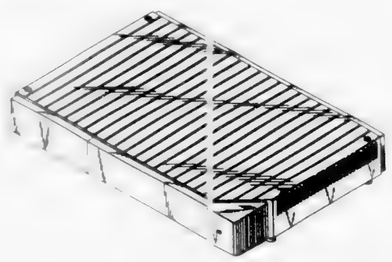
329,424
PNEUMATIC ACTUATOR FOR AN ELECTRICAL SWITCH
Raymond J. Niemczura, Mentor; Victor M. Selig, Cleveland Heights, and Karen A. Davis, Mentor, all of Ohio, assignors to Tridelta Industries, Mentor, Ohio
Filed Nov. 29, 1990, Ser. No. 619,717
Term of patent 14 years
U.S. Cl. D13—174



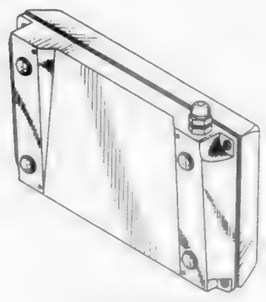
329,425
MULTIPLEXER
Adrian P. Hutton, Ipswich, England, assignor to British Telecommunications public limited company, London, England
Filed Oct. 6, 1989, Ser. No. 417,778
Claims priority, application United Kingdom, Apr. 6, 1989, 1055430
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—184



329,426
MULTIPLEXER
Adrian Hutton, Ipswich, England, assignor to British Telecommunications public limited company, London, England
Filed Oct. 6, 1989, Ser. No. 417,857
Claims priority, application United Kingdom, Apr. 6, 1989, 1055431
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—184

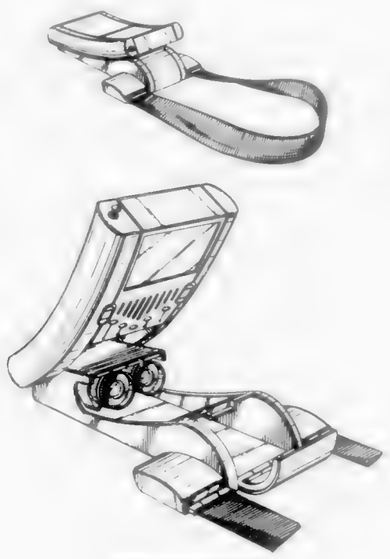


329,427
PORTABLE COMPACT DATA TERMINAL
Larry J. St. Peter, Mill Creek; Mark W. Shurtleff; Jeffrey T. Morovich, both of Seattle; Melody L. Mistlin; Douglas E. Nemitz, both of Bothell, and John L. Lengenfelder, Snohomish, all of Wash., assignors to Maple Systems, Inc., Bothell, Wash.
Filed May 25, 1990, Ser. No. 529,164
Term of patent 14 years
U.S. Cl. D14—100



329,428
FACSIMILE
Toshiya Yoshida; Masaki Hara; Masato Goto, all of Kanagawa, and Katsunori Takagi, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 4, 1990, Ser. No. 460,725
Claims priority, application Japan, Jul. 13, 1989, 1-25937
Term of patent 14 years
U.S. Cl. D14—118

329,429
COMBINED TELEVISION, RADIO AND BINOCULARS
Thomas M. Sandberg, Minneapolis, and Johannes N. Gaston, Minnetonka, both of Minn., assignors to The Kenyon Consortium, Minneapolis, Minn.
Filed Feb. 27, 1990, Ser. No. 487,761
Term of patent 14 years
U.S. Cl. D14—129



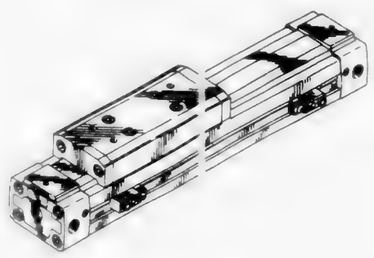
329,430
TELEPHONE SET OR SIMILAR ARTICLE
Shu-Wen Tung, 3F, No. 2, Alley 11, Lane 203, Fu-Der 1 Rd., Hsichih, Taipei Hsien, Taiwan
Filed Aug. 30, 1991, Ser. No. 752,323
Term of patent 14 years
U.S. Cl. D14—150

329,431
TRANSMITTER
Neil Wood, P.O. Box 1693, Waycross, Ga. 31501
Filed Apr. 25, 1989, Ser. No. 343,122
Term of patent 14 years
U.S. Cl. D14—155

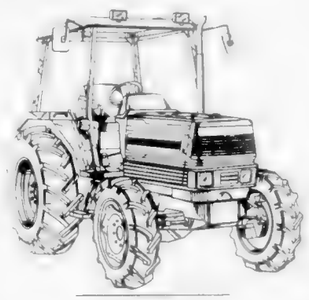
329,432
MICROPHONE AND SUPPORT THEREFOR
Paul J. Dewees; Richard W. Dewees, both of Prairie Village, Kans., and Milton N. Lanford, Morrilton, Ark., assignors to Missouri Auction School, Inc., Kansas City, Mo.
Filed Mar. 19, 1990, Ser. No. 495,222
Term of patent 14 years
U.S. Cl. D14—225

329,433
ANTENNA MAST
James W. Wilson, Henderson, Nev., assignor to Wilson Antenna Inc., Las Vegas, Nev.
Filed Mar. 3, 1989, Ser. No. 318,805
Term of patent 14 years
U.S. Cl. D14—234

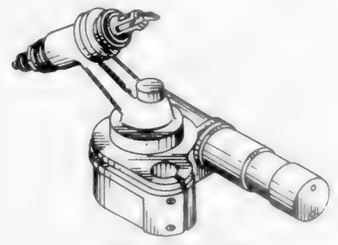
329,434
COMBINED RODLESS FLUID PRESSURE CYLINDER AND SWITCH INSTALLATIONS
Shigehiro Toyoda, 465, Arai, Misaki-cho, Hashima-shi, Gifu-ken; Junji Mutsuura, 53, Aza Fujitsuka, Oaza Murakuno, Kounan-shi, Aichi-ken; Masatoshi Shiino, 16, Kakami Yamanomae-cho 2-chome, Kakamigahara-shi, Gifu-ken, and Hisanobu Niwa, 11-16, Oaza Koga 2-chome, Komaki-shi, Aichi-ken, all of Japan
Filed Mar. 30, 1989, Ser. No. 330,734
Claims priority, application Japan, Sep. 30, 1988, 63-38448
The portion of the term of this patent subsequent to Jul. 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—5



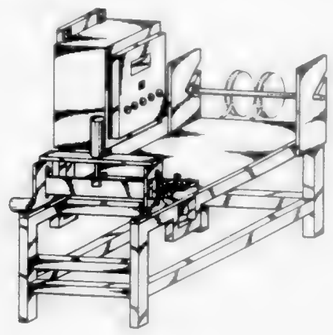
329,435
AGRICULTURAL TRACTOR
Hisato Katoh; Kenichi Sato, and Seiichi Takahashi, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan
Filed May 3, 1989, Ser. No. 346,820
Term of patent 14 years
U.S. Cl. D15—23



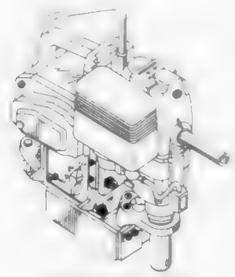
329,436
LEAD WIRE POWER CUTTER
Masayuki Saito, Maizuru, Japan, assignor to Nitto Seiko Co., Ltd., Ayabe, Japan
Filed Sep. 27, 1989, Ser. No. 413,655
Claims priority, application Japan, Jul. 17, 1989, 1-26541
Term of patent 14 years
U.S. Cl. D15—127



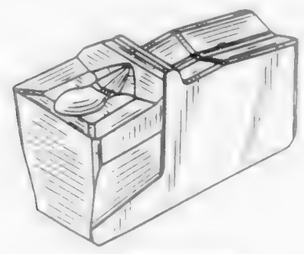
329,437
STRIP CUTTING MACHINE
Juergen M. Pampus, 3131 Shadowglen Way, Colorado Springs, Colo. 80918
Filed Jun. 15, 1990, Ser. No. 538,507
Term of patent 14 years
U.S. Cl. D15—127



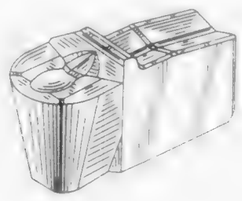
329,438
PORTABLE DRILL
Osamu Asano; Michihiro Shouji; Masunari Kowada, and Toshio Mikiya, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Dec. 19, 1990, Ser. No. 631,056
Claims priority, application Japan, Jun. 25, 1990, 2-21199
Term of patent 14 years
U.S. Cl. D15—132



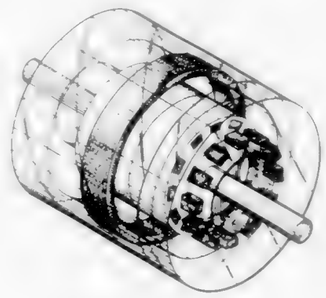
329,439
CUTOFF INSERT
Lars-Erik Gustafsson, Sandviken, Sweden, and Lars T. Pettersson, Glen Rock, N.J., assignors to Sandvik AB, Sandviken, Sweden
Filed Oct. 10, 1989, Ser. No. 418,463
Term of patent 14 years
U.S. Cl. D15—139



329,440
CUTOFF INSERT
Lars-Erik Gustafsson, Sandviken, Sweden, and Lars T. Pettersson, Glen Rock, N.J., assignors to Sandvik AB, Sandviken, Sweden
Filed Oct. 10, 1989, Ser. No. 418,470
Term of patent 14 years
U.S. Cl. D15—139

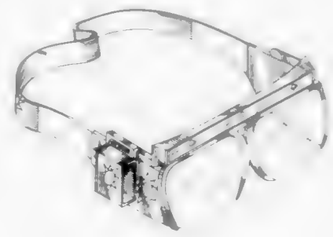


329,441
MAGNETICALLY OPERATED FRICTIONLESS BEARING ASSEMBLY
Norman D. Yee, 955-14th Ave., Honolulu, Hi. 96816
Filed Jul. 14, 1989, Ser. No. 379,906
Term of patent 14 years
U.S. Cl. D15—143

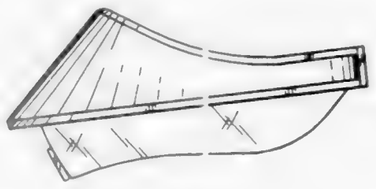


329,442
EYEGLASSES
James H. Jannard, San Juan Capistrano, Calif., assignor to Oakley, Inc., Irvine, Calif.
Filed Mar. 30, 1990, Ser. No. 503,173
Term of patent 14 years
U.S. Cl. D16—102

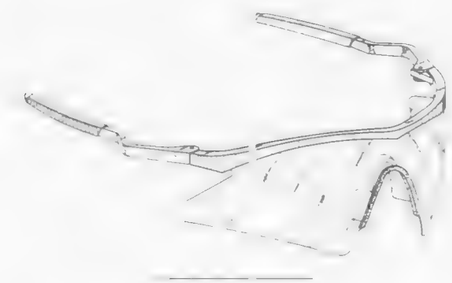
329,443
LIGHTED SAFETY GLASSES
Stephen A. Vasko, Jr., 118 N. Holland Ave., Rankin, Pa. 15104
Filed Jun. 26, 1990, Ser. No. 544,154
Term of patent 14 years
U.S. Cl. D16—102



329,444
COMBINED VISOR AND EYE SHIELD
Robert A. Rauch, 21621 Fernleaf, El Toro, Calif. 92630
Continuation-in-part of Ser. No. 495,056, Mar. 16, 1990. This application Sep. 11, 1990, Ser. No. 579,140
Term of patent 14 years
U.S. Cl. D16—110

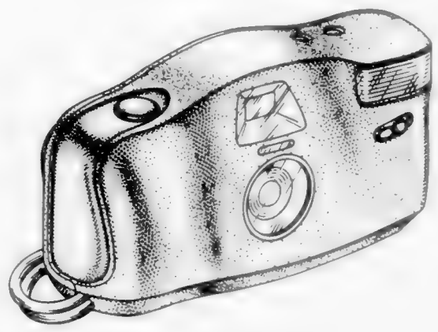


329,445
EYEGLASSES
James H. Jannard, San Juan Capistrano, Calif., assignor to Oakley, Inc., Irvine, Calif.
Filed Sep. 17, 1990, Ser. No. 583,990
Term of patent 14 years
U.S. Cl. D16—116



329,446
NOSE PIECE FOR USE WITH EYEGLASSES
Tohru Negishi, 264-2, Bonsai-cho, Ohmiya-shi Saitama-ken, Japan
Continuation of Ser. No. 190,219, May 4, 1988, abandoned. This application May 3, 1991, Ser. No. 697,503
Term of patent 14 years
U.S. Cl. D16—126

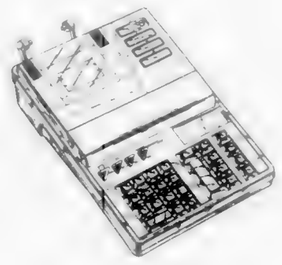
329,447
PHOTOGRAPHIC CAMERA
John K. McBride, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 14, 1990, Ser. No. 641,018
Term of patent 14 years
U.S. Cl. D16—209



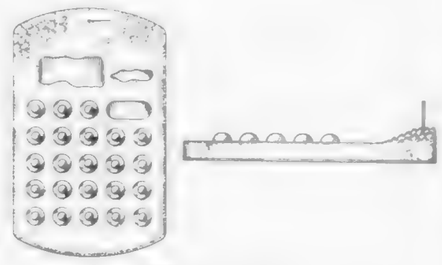
329,448
TRANSPARENCY VIEWER
Allen K. W. Lo, 5022 Hidden Branches Dr., Dunwoody, Ga. 30338
Filed Mar. 23, 1989, Ser. No. 327,588
The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—229

329,449
CAMERA STABILIZING SUPPORT
Garrett W. Brown, 515 Addison Ct., Philadelphia, Pa. 19147; Gerald Skulley, and Robert J. Hayes, both of Worthington, Ohio, assignors to Garrett W. Brown, Philadelphia, Pa.
Filed Mar. 21, 1990, Ser. No. 497,123
Term of patent 14 years
U.S. Cl. D16—243

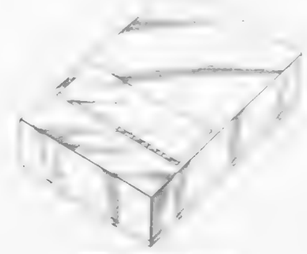
329,450
CALCULATOR
Klaus-Diether Krause, Dietenhofen, and Florian Stolzenberger, Altenthann, both of Fed. Rep. of Germany, assignors to Ta Triumph-Adler, Nuremberg, Fed. Rep. of Germany
Filed Sep. 25, 1990, Ser. No. 587,910
Claims priority, application Int'l Pat. Institute, Mar. 26, 1990. DM/016.248
Term of patent 14 years
U.S. Cl. D18—7



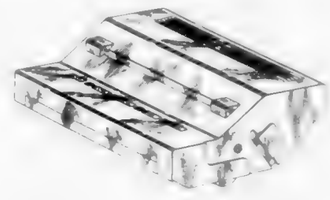
329,451
CALCULATOR
Michael Chen, and Chiou-Shing Chen, both of Taipei-Hsien, Taiwan, assignors to Alcraft, Inc., Pawtucket, R.I.
Filed Oct. 19, 1990, Ser. No. 600,506
Claims priority, application Taiwan, Aug. 16, 1990, 79305394
Term of patent 14 years
U.S. Cl. D18—7



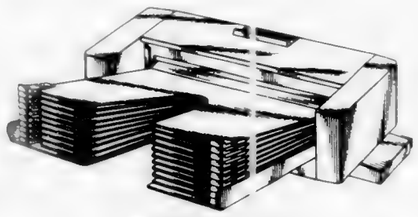
329,452
VIDEO ADAPTER FOR COPYING MACHINE
Takeshi Komada, Yokohama; Hisakazu Shimizu; Yosuke Ohsawa, both of Tokyo, and Mitsuru Sakurai, Musashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 24, 1990, Ser. No. 632,754
Claims priority, application Japan, Jul. 19, 1990, 2-24614
Term of patent 14 years
U.S. Cl. D18—40



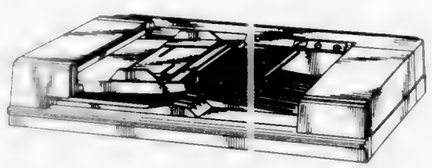
329,453
IMAGE FORMING APPARATUS
Naoki Tashiro, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 10, 1990, Ser. No. 624,677
Claims priority, application Japan, Jun. 12, 1990, 2-19974
Term of patent 14 years
U.S. Cl. D18—43



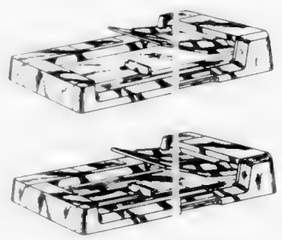
329,454
SORTER FOR A COPYING MACHINE
Shinichi Sugihara, Osaka; Akishige Sai, Hyogo; Shigeo Hiraoka; Kunio Yamada, both of Osaka; Eiji Fujita, and Masahiko Moriwaki, both of Tochigi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 10, 1990, Ser. No. 550,780
Claims priority, application Japan, Mar. 5, 1990, 2-7125
Term of patent 14 years
U.S. Cl. D18—48



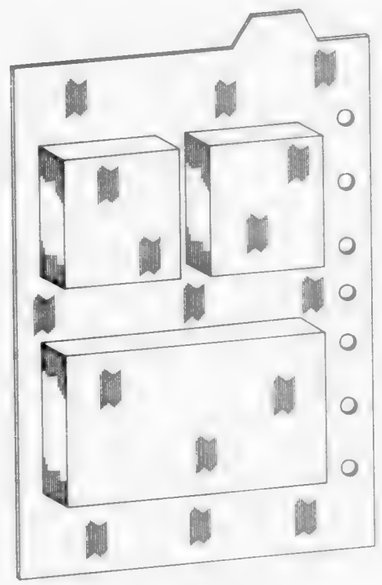
329,455
DOCUMENT FEEDER FOR A COPYING MACHINE
Shinichi Sugihara, Osaka; Akishige Sai, Hyogo; Shigeo Hiraoka; Kunio Yamada, both of Osaka; Eiji Fujita, and Masahiko Moriwaki, both of Tochigi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 10, 1990, Ser. No. 550,781
Claims priority, application Japan, Jan. 12, 1990, 2-648
Term of patent 14 years
U.S. Cl. D18—49



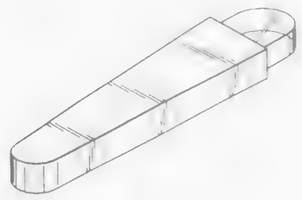
329,456
AUTO DOCUMENT FEEDER
Yasushi Kamezaki, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Sep. 19, 1990, Ser. No. 584,965
Claims priority, application Japan, Mar. 20, 1990, 2-9333; Jun. 1, 1990, 2-18615
Term of patent 14 years
U.S. Cl. D18—49



329,457
INDEX SHEET WITH INTEGRALLY ATTACHED NOTEPADS OF VARYING SIZE
William A. Westover, 401 Sudbury Ct., Midland, Mich. 48640, and Leonard J. Wozniak, P.O. Box 1653, Midland, Mich. 48641-1653
Filed Apr. 9, 1990, Ser. No. 506,234
Term of patent 14 years
U.S. Cl. D19—2



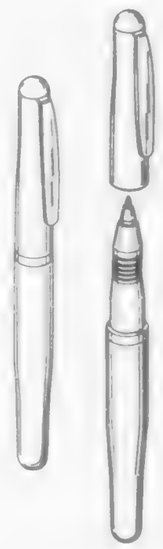
329,458
WRITING INSTRUMENT
Mathieu J. Ellis, 4601 E. 18th St., No. 121, Vancouver, Wash. 98671
Filed Oct. 5, 1990, Ser. No. 593,630
Term of patent 14 years
U.S. Cl. D19—46



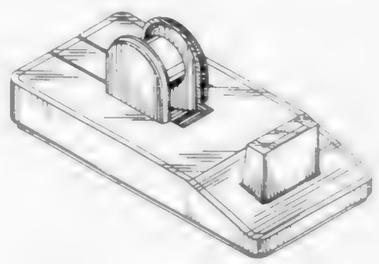
329,459
COMBINED WRITING INSTRUMENT AND ROLLED PAPER DISPENSER
John A. Sullivan, 13903 Crossing Way West, Edmond, Okla. 73013
Filed Nov. 1, 1990, Ser. No. 607,489
Term of patent 14 years
U.S. Cl. D19—36

329,460
CASING FOR A WRITING INSTRUMENT
Xavier Rousseau, Paris, France, assignor to Societe Nouvelle Chaumet S.A., Paris, France
Filed Nov. 15, 1990, Ser. No. 613,376
Term of patent 14 years
U.S. Cl. D19—46

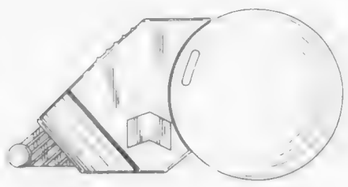
329,461
BALL POINT PEN
Kuzunori Katami, Tokyo, Japan, assignor to Tombow Pencil Co., Ltd., Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 508,011
Claims priority, application Japan, Oct. 19, 1989, 1-38241
Term of patent 14 years
U.S. Cl. D19—51



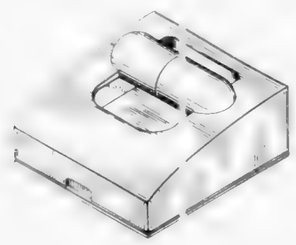
329,462
TAPE DISPENSER
Charles E. Bain, 210 N. 3rd. St., West Dundee, Ill. 60118
Filed Apr. 17, 1990, Ser. No. 511,593
Term of patent 14 years
U.S. Cl. D19—69



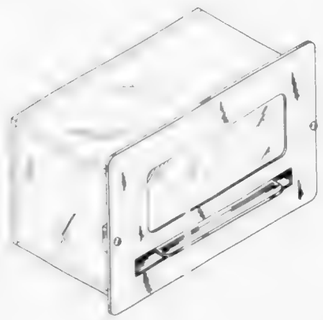
329,463
COMBINED DISPENSER AND APPLICATOR FOR ADHESIVE STRIP MATERIAL
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Aug. 7, 1990, Ser. No. 563,998
Claims priority, application World Int. Prop. O., Feb. 8, 1990, DMA/001184
Term of patent 14 years
U.S. Cl. D19—69



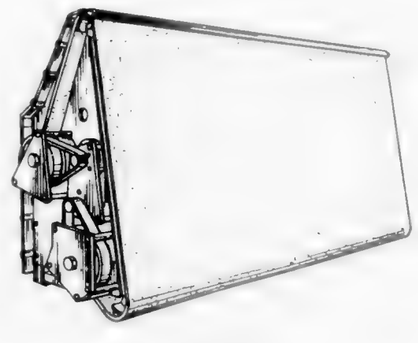
329,464
PAPER CLIP DISPENSER
James Hu, Taipei, Taiwan, assignor to Pro Eton Corporation, Taiwan
Filed Dec. 27, 1990, Ser. No. 634,304
Term of patent 14 years
U.S. Cl. D19—75



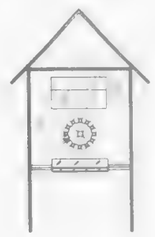
329,465
DRINKING STRAW DISPENSER
Allan J. Kastanek, 5870 Ridge Creek Rd., Shoreview, Minn. 55413
Filed Mar. 5, 1990, Ser. No. 487,815
Term of patent 14 years
U.S. Cl. D20—8



329,466
SUPPORT MODULE FOR MOBILE ADVERTISING DISPLAYS FOR SPORTING ARENAS
D. Jose M. G. Martin, Madrid, Spain, assignor to Dorna Sports Promotion, Inc., New York, N.N.
Filed Jun. 19, 1990, Ser. No. 541,245
Claims priority, application Spain, Dec. 19, 1989, 120.732
Term of patent 14 years
U.S. Cl. D20—10

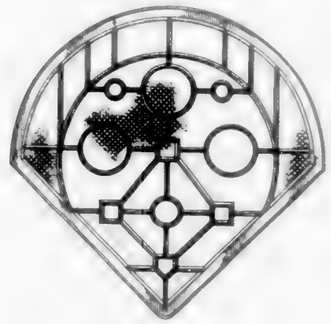


329,467
DATA BOX FOR REAL ESTATE LISTING INFORMATION
Winton N. Petersen, 6343 Safford Ter., North Port, Fla. 34287
Filed Aug. 15, 1990, Ser. No. 567,551
Term of patent 14 years
U.S. Cl. D20—41

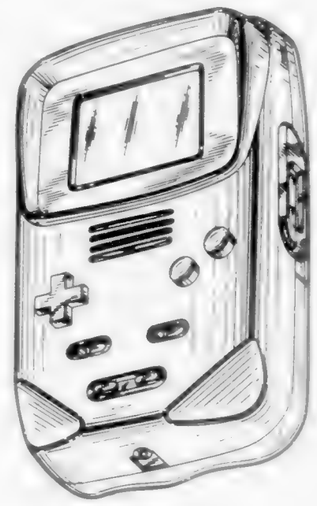


329,468
COMBINED ADVERTISING SIGN AND BUSINESS CARD FOR HANGING ON A DOOR KNOB
John S. Hatt, 2200 Wilson Blvd. - 26, Ste. #190, Arlington, Va. 22201
Filed Apr. 4, 1990, Ser. No. 504,281
Term of patent 14 years
U.S. Cl. D20—42

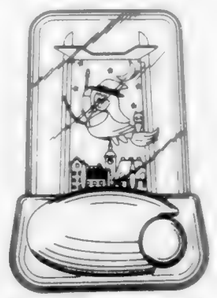
329,469
DART BOARD BASEBALL GAME
Irving H. Franklin, Brockton; Larry J. Franklin, Chestnut Hill, and Kurt M. Gluck, North Easton, all of Mass., assignors to Franklin Sports Industries, Inc., Stoughton, Mass.
Filed Apr. 5, 1990, Ser. No. 505,649
Term of patent 14 years
U.S. Cl. D21—6



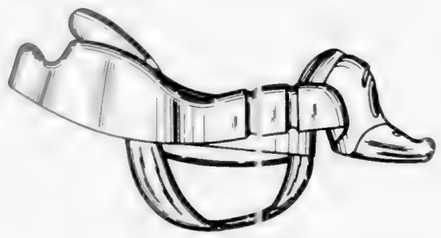
329,470
ELECTRONIC GAME HOUSING
Isao Kaneko, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo and Hudson Soft Co., Ltd., Sapporo, both of, Japan
Filed Jul. 17, 1990, Ser. No. 553,504
Claims priority, application Japan, Jan. 18, 1990, 2-998
Term of patent 14 years
U.S. Cl. D21—13



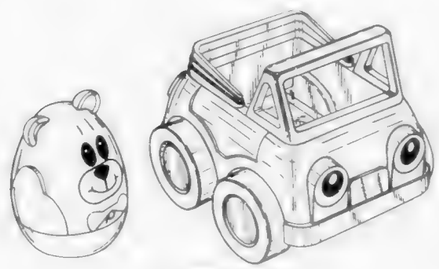
329,471
WATER GAME
Chieko Nakazawa, and Michiaki Tomimatsu, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Feb. 13, 1991, Ser. No. 654,912
Claims priority, application Japan, Aug. 13, 1990, 2-27478
Term of patent 14 years
U.S. Cl. D21—59



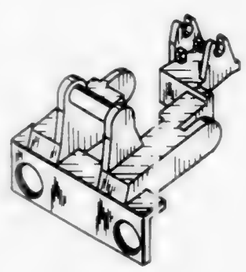
329,472
DUCK NOVELTY JUMPER
Paul K. Meeker, Aurora, and William R. Gibson, Canton, both of Ohio, assignors to Lisco, Inc., Tampa, Fla.
Filed Jul. 22, 1991, Ser. No. 734,371
Term of patent 14 years
U.S. Cl. D21—73



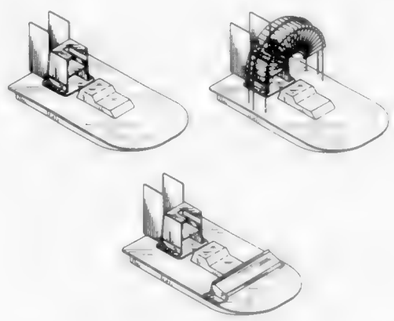
329,473
GRAB FOR A TOY CRANE
Kim Pagel, Vandel, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,958
Term of patent 14 years
U.S. Cl. D21—108



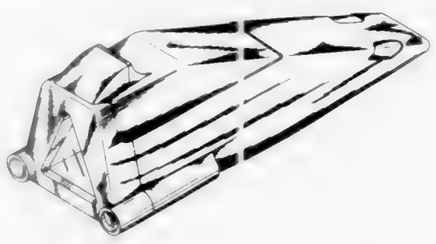
329,475
TOY AUTOMOBILE
Ian T. Revell, Knutsford, Great Britain, assignor to Kiddicraft Limited, Berkshire, England
Filed Jul. 10, 1991, Ser. No. 728,085
Claims priority, application United Kingdom, Jan. 11, 1991, 2012279
Term of patent 14 years
U.S. Cl. D21—128



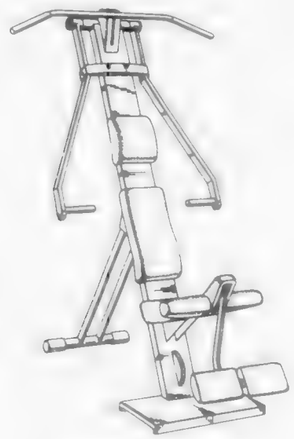
329,476
TOY AIR BOAT
Carl E. Strickland, Winter Haven, and Robert C. Strickland, Auburndale, both of Fla., assignors to S&S Hobbies and R/C Design, Inc., Lakeland, Fla.
Filed Mar. 27, 1990, Ser. No. 500,271
Term of patent 14 years
U.S. Cl. D21—130



329,474
TOY TIME TUNNEL OR SIMILAR ARTICLE
Yu-Shun Chang, No. 10, Lane 105, Pao Chin St., Taipei, Taiwan
Filed Dec. 26, 1989, Ser. No. 456,284
Term of patent 14 years
U.S. Cl. D21—109

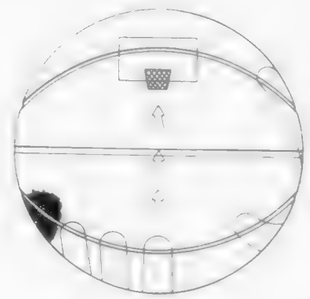


329,477
PHYSICAL EXERCISER
Kari Lehtonen, Paimio, Finland, assignor to Tunturipyora OY, Turku, Finland
Filed Aug. 6, 1990, Ser. No. 562,963
Claims priority, application Finland, Feb. 7, 1990, 111/90
Term of patent 14 years
U.S. Cl. D21—195

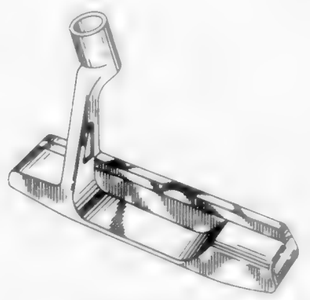


329,478
CLIMBING EXERCISER
Shui-Mu Wang, No. 25, Huan-Kung Rd., Yung-Kang Hsiang, Tainan Hsien, Taiwan
Continuation-in-part of Ser. No. 511,384, Apr. 19, 1990, Pat. No. Des. 323,008. This application Sep. 12, 1990, Ser. No. 581,106
Claims priority, application Taiwan, Aug. 11, 1990, 793100255
Term of patent 14 years
U.S. Cl. D21—195

329,479
TRAINING AID BASKETBALL FOR LEFT HAND
Roy G. Williams, 6048 Pimlico Ct., Tallahassee, Fla. 32308
Filed Dec. 26, 1989, Ser. No. 456,280
The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—204



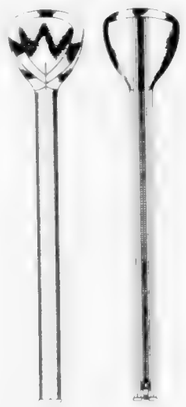
329,480
PUTTER TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Oct. 2, 1989, Ser. No. 415,529
Term of patent 14 years
U.S. Cl. D21—217



329,481
IRON GOLF CLUB HEAD
James R. Hunt, 108 Jyro La., Carencro, La. 70520
Filed May 30, 1989, Ser. No. 358,188
Term of patent 14 years
U.S. Cl. D21—220

329,482
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Nov. 8, 1989, Ser. No. 433,188
Term of patent 14 years
U.S. Cl. D21—220

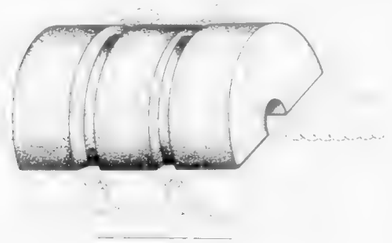
329,483
GOLF CLUB HEAD COVER
Jeffrey C. Herold, Glendale, Calif., assignor to West Coast Trends, Inc., Burbank, Calif.
Filed Jun. 22, 1990, Ser. No. 542,402
Term of patent 14 years
U.S. Cl. D21—221



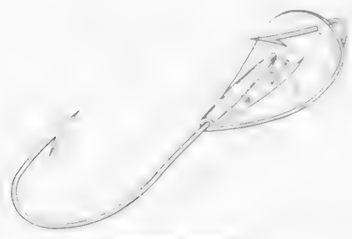
329,484
SKIING ACCESSORY
Walter Dandy, III, and Tony Nespor, both of Baltimore, Md., assignors to Ski Technology Holdings, Inc., Baltimore, Md.
Filed Jan. 22, 1991, Ser. No. 645,006
Term of patent 14 years
U.S. Cl. D21—230

329,485
GOLF BALL WASHER
Fred Hollinger, Kings Park, N.Y., assignor to E & B Giftware, Inc., Mount Vernon, N.Y.
Filed Apr. 6, 1989, Ser. No. 334,873
Term of patent 14 years
U.S. Cl. D21—234

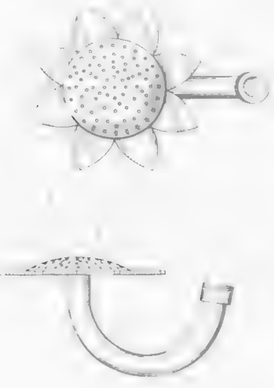
329,486
FLOAT FOR ROPES AND THE LIKE
David E. Park, 426 Bon-Aire Ave., New Castle, Pa. 16105
Filed Jan. 28, 1991, Ser. No. 646,343
Term of patent 14 years
U.S. Cl. D21—237



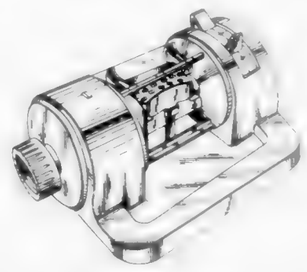
329,487
WEEDLESS FISHING HOOK
Richard Pruiksma, 277 Union Ave., Clifton, N.J. 07011
Filed Jan. 18, 1990, Ser. No. 466,736
Term of patent 14 years
U.S. Cl. D22—144



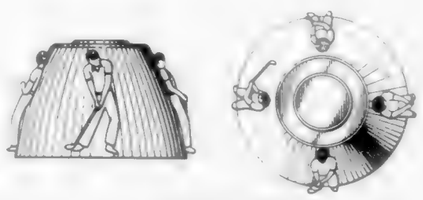
329,488
SPRAY HEAD FOR ATTACHMENT TO A FAUCET
Rosalie C. Santagada, P.O. Box 26201, Sacramento, Calif. 95826
Filed Nov. 23, 1987, Ser. No. 94,435
Term of patent 14 years
U.S. Cl. D23—213



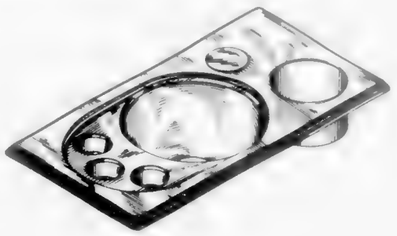
329,489
OSCILLATING LAWN SPRINKLER
Melvin H. M. Best, Topanga; Aaron D. DeLaby, Diamond Bar; Randy J. Cooper, Santa Ana; Craig E. Beal, Bonsall, and Glenn I. Beal, Vista, all of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Glendora, Calif.
Filed Apr. 22, 1991, Ser. No. 689,611
Term of patent 14 years
U.S. Cl. D23—216



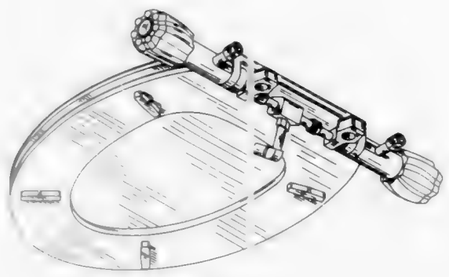
329,490
FAUCET HANDLE
Graham H. Paterson, Wilmington, Del., and Barbara E. MacKenzie, Dollard des Ormeauz, Canada, assignors to Speakman Company, Wilmington, Del.
Filed Jan. 16, 1990, Ser. No. 465,006
Term of patent 14 years
U.S. Cl. D23—251



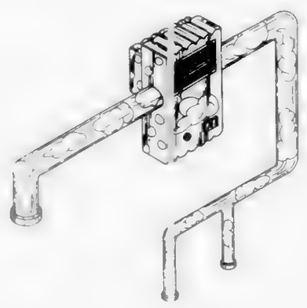
329,491
SINK
Thomas A. Bonnell, Sheboygan, Wis., and Gayle L. Engloff, Rockford, Ill., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 332,667, Mar. 31, 1989, Pat. No. D. 325,430. This application Dec. 20, 1991, Ser. No. 812,375
Term of patent 14 years
U.S. Cl. D23—284



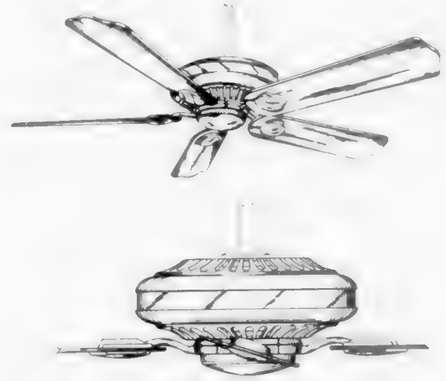
329,492
COMBINED BIDET, TOILET SEAT, AND TOILET SEAT COVER
H. W. New, 25188 Marion Unit F-409, Punta Gorda, Fla. 33950
Filed Jun. 25, 1990, Ser. No. 543,110
Term of patent 14 years
U.S. Cl. D23—295



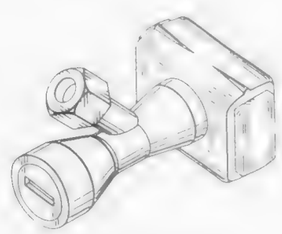
329,493
SCENTED CENTRAL AIR UNIT
Jose Gonzalez, 1913 Lantana Ct., Virginia Beach, Va. 23456
Filed Aug. 23, 1990, Ser. No. 570,712
Term of patent 14 years
U.S. Cl. D23—366



329,494
COMBINED ELECTRIC FAN AND LIGHT
Richard M. Holbrook, Redondo Beach, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Sep. 19, 1991, Ser. No. 763,058
Term of patent 14 years
U.S. Cl. D23—377

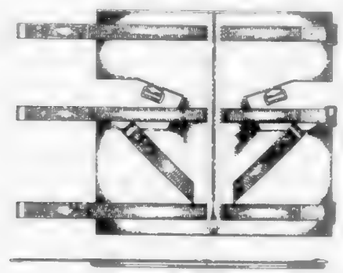


329,495
COUPLING FOR A MEDICAL AGENT TANK
Naoyuki Kotake, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Jul. 3, 1990, Ser. No. 547,156
Claims priority, application Japan, Jan. 10, 1990, 2-159
Term of patent 14 years
U.S. Cl. D24—129

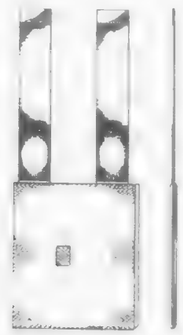


329,496
NEEDLE DEPTH GAUGE
Geoffrey Wotton, Goleta, Calif., assignor to Celia Clarke, Goleta, Calif.
Filed Feb. 20, 1990, Ser. No. 482,661
Term of patent 14 years
U.S. Cl. D24—140

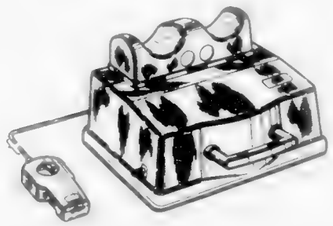
329,497
THERAPEUTIC KNEE PAD
Daniel Pryor, 6860 Lexington Ave., Los Angeles, Calif. 90038
Filed Jun. 29, 1990, Ser. No. 545,978
Term of patent 14 years
U.S. Cl. D24—206



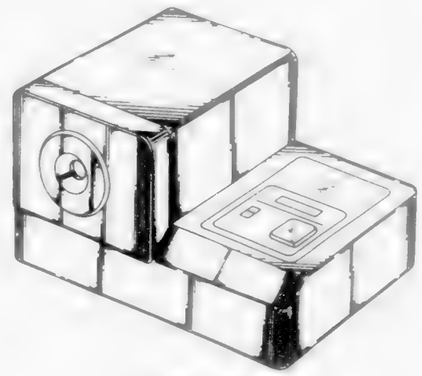
329,498
THERAPEUTIC FOOT PAD
Daniel Pryor, 6860 Lexington Ave., Los Angeles, Calif. 90038
Filed Jun. 29, 1990, Ser. No. 545,979
Term of patent 14 years
U.S. Cl. D24—206



329,499
ELECTRIC FOOT MASSAGER
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan
Filed Jun. 20, 1990, Ser. No. 540,803
Term of patent 14 years
U.S. Cl. D24—213

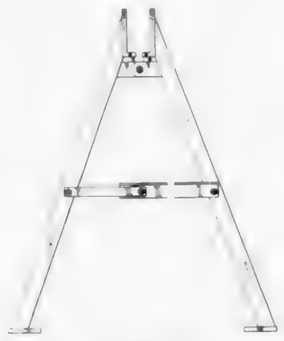


329,500
HEAT STERILIZER FOR MEDICAL TUBE JOINT
Tetsuya Arioka, Tokyo; Hiroshi Yokoyama, Yamanashi, and Hidesato Kizaki, Tokyo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 9, 1990, Ser. No. 491,605
Claims priority, application Japan, Sep. 14, 1989, 1-33503
Term of patent 14 years
U.S. Cl. D24—217



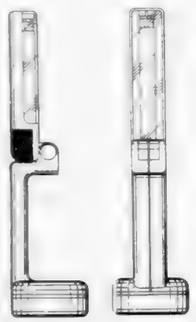
329,501
SPORTSMAN'S FOLDABLE STAND
Dale A. Friesenhahn, 13265 IH35 North, No. 6, San Antonio, Tex. 78233
Filed Feb. 21, 1989, Ser. No. 312,232
Term of patent 14 years
U.S. Cl. D25—62

329,502
COLLAPSIBLE LEG FOR A SAWHORSE
Thomas Grill, P.O. Box 4282, Enterprise, Fla. 32725
Filed Mar. 9, 1990, Ser. No. 490,960
Term of patent 14 years
U.S. Cl. D25—67

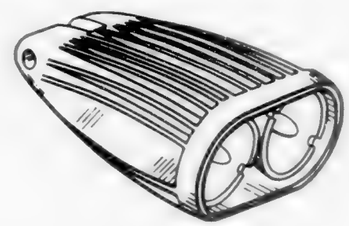


329,503
SIDE RAIL EXTRUSION FOR A WINDOW
Leon F. Slocomb, Jr., Wilmington, Del., assignor to Slocomb Industries, Wilmington, Del.
Filed Jul. 31, 1990, Ser. No. 560,897
Term of patent 14 years
U.S. Cl. D25—123

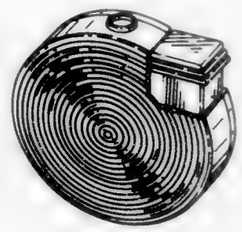
329,504
MULTIPURPOSE FLUORESCENT LANTERN
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Hong Kong, Hong Kong
Filed Oct. 16, 1990, Ser. No. 598,898
Claims priority, application United Kingdom, May 30, 1990, 2007195
Term of patent 14 years
U.S. Cl. D26—42



329,505
DUAL LAMP LIGHT FIXTURE HEAD
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Jul. 10, 1989, Ser. No. 377,915
The portion of the term of this patent subsequent to Dec. 31, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—63

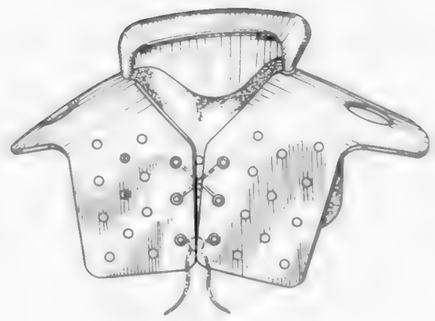


329,506
LIGHTER
Paolo Bulgari, Rome, Italy, assignor to Bulgari Time (Switzerland) S.A., Geneva, Switzerland
Filed Nov. 30, 1990, Ser. No. 621,723
Claims priority, application Hague, Aug. 10, 1990, DM/017.378
Term of patent 14 years
U.S. Cl. D27—154

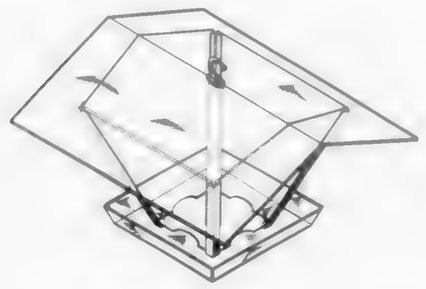


329,507
HAIR DRYER STAND
Jurgen Assmann, Michelbach, Fed. Rep. of Germany, assignor to WIK Elektro Hausgeraete, Michelbach, Fed. Rep. of Germany
Filed Feb. 9, 1990, Ser. No. 477,660
Term of patent 14 years
U.S. Cl. D28—18

329,508
NECK, CHEST AND SHOULDER PROTECTOR
Jeffrey D. Fair, 4801 N. Britton, Stillwater, Okla. 74075
Filed Feb. 14, 1990, Ser. No. 480,200
Term of patent 14 years
U.S. Cl. D29—11



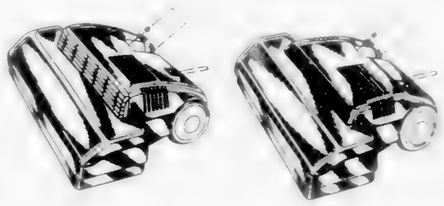
329,509
BIRD FEEDER
Joseph H. Burleigh, 50 Lawndale Ave., Franklin, N.H. 03235
Filed Sep. 4, 1991, Ser. No. 753,701
Term of patent 14 years
U.S. Cl. D30—124



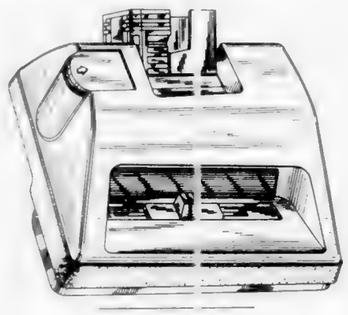
329,510
HAND HELD ELECTRIC PROD
Hsiung Lin, No. 25, Lane 152, Kun-Yang St., Taipei City, Taiwan
Filed Oct. 26, 1990, Ser. No. 605,179
Term of patent 14 years
U.S. Cl. D30—156

329,511
COMBINED VACUUM CLEANER TOOL AND HOSE RACK
Darwin T. McKnight, Louisville, Ohio, assignor to The Hoover Company, North Canton
Filed Jan. 4, 1991, Ser. No. 638,406
Term of patent 14 years
U.S. Cl. D32—31

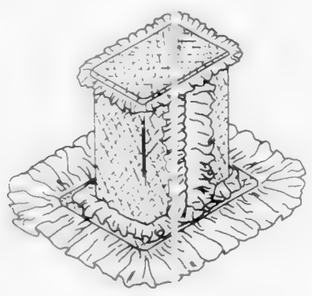
329,512
POWER NOZZLE FOR A VACUUM CLEANER
Darwin T. McKnight, Louisville, and David W. Moine, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed Jun. 26, 1989, Ser. No. 372,303
Term of patent 14 years
U.S. Cl. D32—32



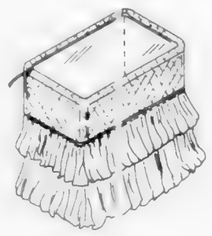
329,51
SUCTION CLEANER NOZZLE
Milton G. Kieft, and John D. Essex, both of North Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed Apr. 2, 1990, Ser. No. 502,662
Term of patent 14 years
U.S. Cl. D32—32



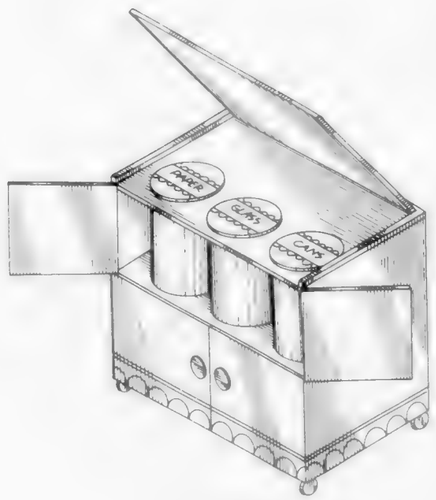
329,514
REFUSE CONTAINER COVER
Mimi Isaac, 7855 Birchmont Dr., University City, Mo. 63130
Filed Jun. 28, 1989, Ser. No. 372,949
Term of patent 14 years
U.S. Cl. D34—4



329,515
REFUSE CONTAINER COVER
Mimi Isaac, 7855 Birchmont Dr. University City, Mo. 63130
Filed Jun. 28, 1989, Ser. No. 362,859
Term of patent 14 years
U.S. Cl. D34—4

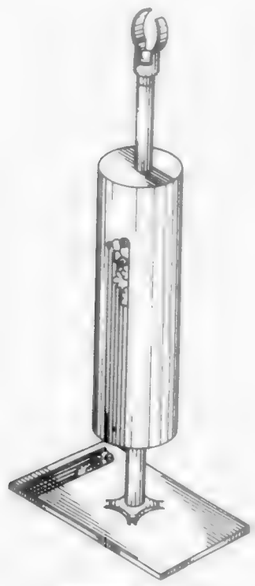


329,516
COMBINED CUTTING BOARD AND MULTIPLE COMPARTMENT TRASH CABINET
Jessica Bailly, 45 West St., Closter, N.J. 07624-1226
Filed May 8, 1990, Ser. No. 520,391
Term of patent 14 years
U.S. Cl. D34—5

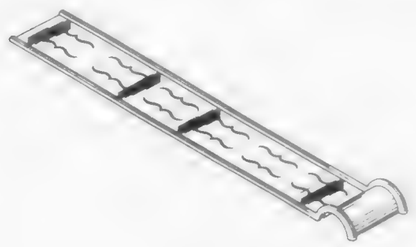


329,517
BOTTLE CARRIER
Bob F. Vavla, 11058 Silver Run, Moreno Valley, Calif. 92387
Filed Oct. 19, 1990, Ser. No. 600,084
Term of patent 14 years
U.S. Cl. D34—28

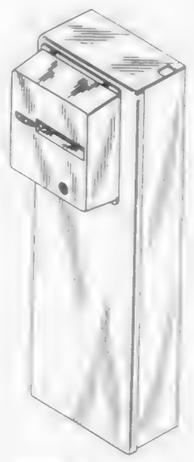
329,518
MOTORCYCLE JACK
Mary Selvey, 4050 W. Rovey Ave., Phoenix, Ariz. 85019-1636
Filed Jan. 2, 1990, Ser. No. 459,584
Term of patent 14 years
U.S. Cl. D34—31



329,519
RAMP
Kermit Holloway, Jr., Rte. 1 Box 117-E, Oakvale, Miss. 39656
Filed Jun. 27, 1990, Ser. No. 544,354
Term of patent 14 years
U.S. Cl. D34—32



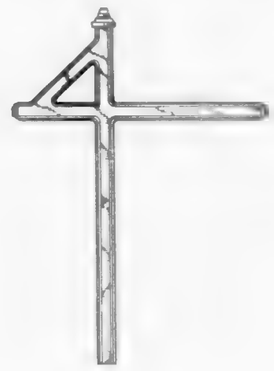
329,520
CURRENCY DISCRIMINATING MACHINE
Koji Yukimoto; Hiroshi Hayashi, both of Sakado, and Yukio Ito, Niiza, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Japan
Filed Jul. 22, 1988, Ser. No. 223,215
Claims priority, application Japan, Feb. 3, 1988, 63-3753
The portion of the term of this patent subsequent to May 2, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D99—28



329,521
CURRENCY DISCRIMINATING MACHINE
Koji Yukimoto; Hiroshi Hayashi, both of Sakado, and Yukio Ito, Niiza, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Japan
Filed Jul. 22, 1988, Ser. No. 223,216
Claims priority, application Japan, Feb. 3, 1988, 63-3751
The portion of the term of this patent subsequent to May 21, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D99—28

329,522
CURRENCY DISCRIMINATING MACHINE
Koji Yukimoto; Hiroshi Hayashi, both of Sakado, and Yukio Ito, Niiza, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Japan
Filed Jul. 22, 1988, Ser. No. 223,217
Claims priority, application Japan, Feb. 3, 1988, 63-3775
The portion of the term of this patent subsequent to May 21, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D99—28

329,523
MAILBOX AND SIGN POST
Dennis J. Ward, 1062 Gilbert St., Flint, Mich. 48532
Filed Jul. 27, 1989, Ser. No. 385,486
Term of patent 14 years
U.S. Cl. D99—32



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TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Kuwabara, Osamu; Mutoh, Jiro; and Abe, Akihiko, 5,148,189, Cl 346-76.0PH
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takeshi; and Kakugo, Masahiro, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition. 5,147,942, Cl. 525-397.000.
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Abe, Nobumasa; Momose, Kiyoharu; Watanabe, Koji; Nakamura, Yuichi; Handa, Tsuneo; and Nishikawa, Mitsutaka, to Seiko Epson Corporation. Ink jet recording apparatus for ejecting droplets of ink through promotion of capillary action. 5,148,185, Cl. 346-1.100
Abraham, Dennis G.; Aden, Steven G.; Arnold, Todd W.; Neckyfarow, Steven W.; and Rohland, William S., to International Business Machines Corporation. Transaction system security method and apparatus. 5,148,481, Cl. 380-46.000.
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Ackerman, John P.; Battles, James E.; Johnson, Terry R.; Miller, William E.; and Pierce, R. Dean, to United States of America, Energy. Magnesium transport extraction of transuranium elements from LWR fuel. 5,147,616, Cl. 423-5.000
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Aichaioui, Hocine; Lesieur, Daniel; Lespagnol, Charles; Devissaguet, Michelle; and Guardiola, Beatrice, to Adir et Compagnie. Acylbenzoxazolinones compounds. 5,147,883, Cl. 514-338.000
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Akedo, Jun: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Akedo, Jun; and Yamaguchi, Tomoyuki, 5,148,019, Cl. 250-231.140
Akiyama, Tetsuya: *See*—
Furukawa, Shigeaki; Ohta, Takeo; Akiyama, Tetsuya; and Isomura, Hidemi, 5,147,701, Cl. 428-64.000
Aktins, Don C.: *See*—
Sechler, Lee G.; Eckert, Robert L.; and Aktins, Don C., 5,147,039, Cl. 206-386.000

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Berkhout, Hendrik C. and Willerius, Paul A., 5,147,150, Cl. 405-258.000

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Albert-Frankenthal AG: *See—*
Stab, Rudolf, 5,147,276, Cl. 493-444.000

Albert Handtmann Maschinenfabrik GmbH & Co. KG: *See—*
Staudenrausch, Georg, 5,147,23[illegible], Cl. 452-47.000

Albertazzi, Corrado: *See—*
Cox, Michael E.; Albertazzi, Corrado; Findeisen, Heinz H.; and Minkwitz, Russell E., Jr., 5,148,347, Cl. 361-272.000

Albrecht, Harry A.; Chan, Ka-Kong; Keith, Dennis D.; Then, Rudolf L.; and Weigele, Manfred, to Hoffmann La-Roche, Inc. Anti-bacterial cephalosporin compounds. 5,147,871, Cl. 514-202.000

Albrecht, Richard E., to Eastman Kodak Company. Lens system having predetermined focusing power in different mediums, such as air and water, for providing a close up lens which may be attached to a camera either in air or underwater. 5,148,195, Cl. 354-64.000

Albright, Lawrence: *See—*
Nikl, Libor; and Albright, Lawrence, 5,147,862, Cl. 514-54.000

Alcan Aluminum Corporation: *See—*
Wollam, Carl A., 5,147,462, Cl. 118-679.000.

Alcan International Limited: *See—*
Lapp, Steven P., 5,147,736, Cl. 29-27.000

Alcatel Network Systems, Inc.: *See—*
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Alcon Surgical, Inc.: *See—*
Van Noy, Stephen J.; Patel, Arubhai S.; and Carncross, Thomas, 5,147,393, Cl. 623-6.000

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Hanson, Chris A., 5,147,685, Cl. 428-189.000.

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Spitsyn, Boris; Efanov, Valery; Boulov, Leonid; Aleksenko, Alexander; Botev, Anantolij; and Skotheim, Terje, 5,148,462, Cl. 378-143.000

Alexandrovich, Peter S.; and Wilson, John C., to Eastman Kodak Company. Toners and developer containing n-substituted quinolinium salts as charge control agents. 5,147,749, Cl. 430-110.000

Alfa-Lavel Separation AB: *See—*
Carlsson, Claes-Goran; Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Moberg, Hans; and Nabo, Olle, 5,147,280, Cl. 494-56.000

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Kahrs, Manfred; Kunze, Lothar; Baier, Joachim; Kunz, Gerhard; Moeller, Bernhard; Beer, Wilhelm; Krines, Hans-G.; and Schudt, Gerhardt, 5,147,007, Cl. 180-32.000

Algira Primo Inc.: *See—*
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Allen, Adrian S., 5,147,956, Cl. 526-318.420.

Allied Security Devices, Inc.: *See—*
Campbell, David J.; and DeWitt, Kenneth I., 5,148,149, Cl. 340-562.000

Allied-Signal Inc.: *See—*
Fish, Gordon E., 5,146,790, Cl. 73-862.336

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Allison, Michael T., to Trimble Navigation. Differential position determination using satellites. 5,148,179, Cl. 342-357.000.

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Nagy, Peter L.; Balaazs, Bela; Boross, Maria; Szilbereky, Jeno; Zsila, Gizella; Abraham, Lajos; Blasko, Gyorgy; Gachalyi, Bela; Almasi, Attila; and Nemet, Gabor, 5,147,879, Cl. 514-318.000

Almeter, David D.; and Resch, William A., III, to Eastman Kodak Company. Electrostatographic copier/printer densitometer insensitive to power supply variations. 5,148,217, Cl. 355-203.000.

Alquie, Bernard; Kohler, Norbert; and Wild, Marcel, to Societe Nationale Elf Aquitaine. Hydrophil[illegible] polymer gel water sealing process. 5,146,985, Cl. 166-270.000.

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Angelo, Arthur, to Intertrack Management, Inc. Two-part clamp for connecting intersecting I-beams. 5,146,724, Cl. 52-299.000

Angra, Padam K.: *See—*
Sacripante, Guerino G.; Veregin, Richard P. N.; Ong, Beng S.; and Angra, Padam K., 5,147,744, Cl. 430-39.000

Anjan, Yellapu; Habbel, Sam; and Straceski, Joseph F., to Honeywell, Inc. Optical coupler housing. 5,148,508, Cl. 385-51.000.

Annovazzi, Lorella; and Arpino, Fabio, to Industrie Magneti Marelli SpA. Support housing for an electric starter motor for an internal combustion engine. 5,146,797, Cl. 74-6.000.

Anritsu Corporation: *See—*
Imamura, Takayuki; and Ohuchi, Yuji, 5,148,233, Cl. 356-243.000
Ohtsu, Motoichi, 5,148,437, Cl. 372-32.000

Antila, Kari, to Safematic Oy. Lubricating grease doser arrangement with improved flow control, for preventing lubricant oil-hardener separation. 5,147,016, Cl. 184-7.400.

Antropov, Gennady M.: *See—*
Fedorov, Svyatoslav N.; Linnik, Leonid F.; Antropov, Gennady M.; Shigina, Nina A.; Nikitenko, Vladimir I.; Arnautov, Leonid N.; Stromakov, Alexandr P.; Boldysheva, Irina A.; Oreshkin, Valery P.; and Chernyakov, Lev A., 5,147,284, Cl. 600-9.000.

AOI Systems, Inc.: *See—*
Belanger, Richard P., 5,148,500, Cl. 382-55.000

Aoki, Junji: *See—*
Koike, Hideki; and Aoki, Junji, 5,147,426, Cl. 55-270.000.

Aoshima, Kazuyuki: *See—*
Torii, Shuji; Nozaki, Hiromichi; Aoshima, Kazuyuki; and Matsui, Norimasa, 5,147,494, Cl. 156-417.000

Aoyagi, Juuro. Seal. 5,147,702, Cl. 428-65.000

Aoyama, Shigeru; Yamashita, Tsukasa; and Ogata, Shiro, to Omron Tateisi Electronics Co. Micro aspherical lens and fabricating method therefor and optical device. 5,148,322, Cl. 359-708.000.

Apple Computer, Inc.: *See—*
Hollyer, Robert J., 5,148,450, Cl. 375-81.000.

Appleton, Arthur I. Switching electrical receptacle. 5,147,988, Cl. 200-51.090

Appleton Papers Inc.: *See—*
Wadzinski, Michael J., 5,146,829, Cl. 83-620.000

Applied Materials, Inc.: *See—*
Ebbing, Peter; and Ford, Jack, 5,147,828, Cl. 437-250.000
Szwejkowski, Chester; Latchford, Ian S.; Namose, Isamu; and Tsuchida, Kazumi, 5,147,499, Cl. 156-643.000

Aprigliano, Louis F.: *See—*
Gilmore, Charles M.; Skelton, Earl F.; Aprigliano, Louis F.; and Qadri, Syed B., 5,147,731, Cl. 428-633.000

APT Controls Limited: *See—*
Farrell, Peter J., 5,146,800, Cl. 74-100.100.

Ara, Katsutoshi; Igarashi, Kazuaki; Saeki, Katsuhisa; and Ito, Susumu, to Kao Corporation. Alkaline pullulanase from Bacillus sp. FERM P-10887. 5,147,795, Cl. 435-210.000

Ara, Katsutoshi; Saeki, Katsuhisa; Igarashi, Kazuaki; and Ito, Susumu, to Kao Corporation. Alkaline pullulanase Y having α-amylase activity. 5,147,796, Cl. 435-210.000

Arai, Syuichi: *See—*
Ichinohe, Shoji; and Arai, Syuichi, 5,147,965, Cl. 528-12.000.

Araps, Constance J.; Casey, Jon A.; Divakaruni, Renuka S.; Kandetzke, Steven M.; and Lotsko, Catherine A., to International Business Machines Corporation. Phenyl-endcapped depolymerizable polymer 5,147,741, Cl. 430-5.000

Ariki, Shigeru: *See—*
Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi; Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000

Arima, Yutaka; Tomioka, Ichiro; and Hanibuchi, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Neural network integrated circuit device having self-organizing function. 5,148,514, Cl. 395-24.000

Arimoto, Masao: *See—*
Kano, Kenji; Yamada, Yusuke; Arimoto, Masao; and Uehata, Shoji, 5,148,120, Cl. 330-264.000

Arlo Mecanaids Limited: *See—*
Richards, Derek J., 5,146,638, Cl. 4-562.100.

Armstrong, Robert N.: *See—*
Hodan, John A.; Armstrong, Robert N.; and First, Robert E., 5,147,197, Cl. 425-192.00S.

Arnautov, Leonid N.: *See—*
Fedorov, Svyatoslav N.; Linnik, Leonid F.; Antropov, Gennady M.; Shigina, Nina A.; Nikitenko, Vladimir I.; Arnautov, Leonid N.; Stromakov, Alexandr P.; Boldysheva, Irina A.; Oreshkin, Valery P.; and Chernyakov, Lev A., 5,147,284, Cl. 600-9.000

Arneodo, Jacques: *See—*
Azema, Alain; Botineau, Jean; and Moulin, Gerard, 5,147,352, Cl. 606-5.000

Arnold, Brian, to British United Shoe Machinery Ltd. Reinforcing material comprising E-polycaprolactone and pulverized fuel ash 5,147,919, Cl. 524-444.000

Arnold, Gregory J.: *See—*
Marrick, Paul J. T.; Arnold, Gregory J.; and Sauter, Rudolph A 5,148,468, Cl. 379-56.000.

Arnold, Todd W.: *See—*
Abraham, Dennis G.; Aden, Steven G., Arnold, Todd W.; Neckyfarow, Steven W.; and Rohland, William S., 5,148,481, Cl 380-46.000

Aromin, Victor V.: *See—*
Rao, Chepur P.; Barrena, Juan J.; Aromin, Victor V.; and Astley John J., 5,148,344, Cl. 361-42.000

Arpino, Fabio: *See—*
Annovazzi, Lorella; and Arpino, Fabio, 5,146,797, Cl. 74-6.000

Array Technology Corporation: *See—*
Gordon, David W.; Stallmo, David C.; Warner, David M.; Brant William A.; and Hubis, Walter A., 5,148,432, Cl. 371-10.100.

Arroyo, Nestor A.; Stark, Casper F.; and Augustin, Raymond W., to Pfizer Hospital Products Group, Inc. Pressurization of bone cement surrounding an endoprosthesis. 5,147,366, Cl. 606-94.000

Arvin Industries, Inc.: *See—*
Richardson, Larry E.; Strickland, David W.; and Zagar, Frank L 5,147,987, Cl. 181-264.000

Asada, Shigeo: *See—*
Hino, Heijiro; and Asada, Shigeo, 5,147,457, Cl. 106-19.000

Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Sugawara, Yuji; and Kobe, Shinji, 5,147,917, Cl. 524-357.000

Asahi Glass Company Ltd.: *See—*
Ito, Haruki; Maeda, Kenzou; Miyazaki, Nobuyuki; Unoki, Masao Sagawa, Chiaki; and Kamba, Motoi, 5,147,934, Cl. 525-124.000
Saito, Joichi, 5,147,898, Cl. 521-131.000

Asahi Kogaku Kogya K.K.: *See—*
Iizuka, Takashi, 5,148,190, Cl. 346-108.000

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kohmoto, Shinsuke; Sekiguchi, Tetsuo; and Hamasaki, Takun 5,148,199, Cl. 354-195.100.
Nishikawa, Tomoyuki; Kita, Masahiro; Yano, Takaaki; Yoshida, Tatsuya; Honda, Ryoji; Negishi, Kiyoshi, Sato, Tsutomu, and Kamasako, Shoji, 5,148,284, Cl. 358-296.000
Ojima, Satoshi; and Matsuzaki, Hiromi, 5,147,361, Cl. 606-61.000
Takano, Masatoshi, 5,148,228, Cl. 355-308.000

Asai, Naohito; and Masuda, Kazuaki, to Canon Kabushiki Kaisha. Ink jet recording apparatus with engaging members for precisely positioning adjacent heads. 5,148,194, Cl. 346-140.00R

Asai, Shigemi; Furukawa, Masanobu; Kakiwaki, Shigeaki; Iwamatsu, Tadashi; and Okuda, Tohru, to Sharp Kabushiki Kaisha. Magnetic recording and reproducing apparatus. 5,148,336, Cl. 360-95.000

Asano, Hiroshi: *See—*
Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Sasaki, Hiroshi; Yamaguchi, Hiroshi Ishigami, Kazuhiro; and Takenouchi, Shinich, 5,146,891, Cl 123-325.000

Asano, Hiroyuki: *See—*
Ishikawa, Toichi; and Asano, Hiroyuki, 5,147,319, Cl. 604-174.000

Asaoka, Takemitsu: *See—*
Tokizawa, Minoru; Kanamaru, Yoshihiko; Matsumoto, Masaru, Asaoka, Takemitsu; Matsuda, Hideaki; Kuraishi, Tadayuki; Maebashi, Kazunori; Taido, Naokata; and Kawahara, Kyuichi 5,147,886, Cl. 514-383.000

Asay, Roger H.: *See—*
Roofthooft, Roger L. A.; and Asay, Roger H., 5,147,597, Cl 376-305.000.

ASCII Corporation: *See—*
Ishii, Takatoshi, 5,148,519, Cl. 395-141.000

Asea Brown Boveri, Ltd.: *See—*
Knopfel, Hans-Peter; Pelet, Claude; and Peter, Hans, 5,147,200, Cl 431-11.000

Ashizawa, Toranosuke: *See—*
Yamana, Shozo; Kuwajima, Hideji; Ishihara, Minoru; Sumiya, Keiji; Ashizawa, Toranosuke; and Shimoda, Shuichiro 5,147,851, Cl. 505-1.000

Ashkenazi, Itzhak: *See—*
Lior, Ishaiau; and Ashkenazi, Itzhak, 5,148,222, Cl. 355-256.000

Ashland Oil, Inc.: *See—*
Hettinger, William P., 5,147,527, Cl. 208-120.000

Ashley, James R. Six phase distribution powerline. 5,147,983, Cl. 174-104.000.

Aspden, Robert G.; and Bengel, Thomas G., to Westinghouse Electric Corp. Process for evaluating crack propagation due to corrosion 5,147,802, Cl. 436-6.000.

Assink, Kenneth; and Weener, Mitchell J., to J. R. Automation Technologies, Inc. Staple forming and stapling machine. 5,147,080, Cl 227-82.000

Astley, John J.: *See—*
Rao, Chepur P.; Barrena, Juan J.; Aromin, Victor V., and Astley John J., 5,148,344, Cl. 361-42.000

Astra Pharmaceutical Products Inc.: *See—*
Skakoon, James G.; Kern, Steven E.; and Lombardi, William V 5,147,324, Cl. 604-192.000

AT&T Bell Laboratories: *See—*
Chittipeddi, Sailesh; Roy, Pradip K., and Velaga, Ankineedu 5,147,820, Cl. 437-193.000
Edmonston, Don R.; and Huff, Richard G., 5,147,432, Cl. 65-3.110
Knauer, Scott C.; Netravali, Arun N.; Petajan, Eric D., and Westerink, Peter H., 5,148,274, Cl. 358-141.000
Knepper, Jonathan D.; Masavage, Gerald J.; and Solomon, Philip A., 5,146,661, Cl. 29-25.010

Levi, Anthony F. J.; McCall, Samuel L.; and Slusher, Richart E., 5,148,504, Cl. 385-14.000
Petisce, James R., 5,147,433, Cl. 623-3.110.
Atkins, Robert C. Evaporative cooling system for buildings. 5,146,762, Cl. 62-171.000
Atlantic Richfield Company: *See—*
Montgomery, Carl T., 5,147,111, Cl. 299-16.000
Atlas Copco Tools AB: *See—*
Schoeps, Knut C., 5,147,245, Cl. 464-25.000
Atwater, Harry A.: *See—*
Ahn, Channing C.; and Atwater, Harry A., 5,148,025, Cl. 250-305.000
Atwood, Beth: *See—*
Pouletty, Philippe; Atwood, Beth; and Rommler, David, 5,147,780, Cl. 435-7.100
Au, Andrew N.: *See—*
Fang, Shou-Mean; Horsma, David A.; Peronnet, Guillaume, Fahey, Timothy E.; Au, Andrew N.; and Carlomagno, William D., 5,148,005, Cl. 219-505.000.
Audibert, Francois: *See—*
Perthuis, Edmond; and Audibert, Francois, 5,147,199, Cl. 431-10.000
Auerbach, Alvin J.: *See—*
Munach, Arnold S.; and Auerbach, Alvin J., 5,147,975, Cl. 102-264.000
August Lotz Co., Inc.: *See—*
Barton, Mark S.; Bandach, Kurt J.; and Schlichter, Mark E., 5,146,640, Cl. 5-47.000
Augustin, Raymond W.: *See—*
Arroyo, Nestor A.; Stark, Casper F.; and Augustin, Raymond W., 5,147,366, Cl. 606-94.000.
Austin, Jerry L.: *See—*
Fetter, Richard H., Jr.; Austin, Jerry L.; and Hewitt, Robert A., 5,146,831, Cl. 83-698.000.
Austin, R Russel, to Viratec Thin Films, Inc. Multilayer anti-reflection coating using zinc oxide to provide ultraviolet blocking. 5,147,125, Cl. 359-359.000
Austria Mikro Systeme Internationale Gesellschaft m.b.H.: *See—*
Leopold, Hans; O'Leary, Paul; Pilcher, Manfred; Roehrer, Robert; and Winkler, Gunter, 5,148,170, Cl. 341-157.000.
Averette, Julius P., to Dynatech Precision Sampling Corporation. Solids and semi-solids sampling apparatus, method, and fluid injection apparatus. 5,147,551, Cl. 210-640.00[illegible].
Awano, Katsuya: *See—*
Kojima, Eisuke; Fujimori, Shinyoshi; and Awano, Katsuya, 5,147,874, Cl. 514-238.200.
Awano, Yuji: *See—*
Takikawa, Masahiko; and Awano, Yuji, 5,148,245, Cl. 357-22.000.
Aware, Inc.: *See—*
Resnikoff, Howard L.; Pollen, David; Linden, David C. P.; and Lawton, Wayne M., 5,148,498, Cl. 382-54.000
Awaya, Akira: *See—*
Mizuchi, Akira; Horikomi, Kazuyoshi; Sasaki, Tadayuki; Awaya, Akira; Tomino, Ikuo; Takesue, Mitsuyuki; and Kihara, Noriaki, 5,147,876, Cl. 514-275.000
Azema, Alain; Botineau, Jean; and Moulin, Gerard, to Azema, Alain; Arneodo, Jacques; Botineau, Jean; Crozafon, Philippe; and Moulin, Gerard. Optical system for use in a surgical apparatus. 5,147,352, Cl. 606-5.000
AZO GmbH & Co.: *See—*
Link, Otmar, 5,147,152, Cl. 406-1.000
Azuma, Kishiro: *See—*
Mori, Yoshio; Watanabe, Makoto; Azuma, Kishiro; and Kojima, Shiro, 5,147,952, Cl. 526-220.00[illegible]0
Babbitt, Terry, Braunshteyn, Michael S.; Gillespie, Andrew J.; Jones, Donald H.; Keen, Billy J., Jr.; Raynor, Robert H.; Ritt, Renzer R.; and Talley, Robert E., to Philip Morris Incorporated. Method and apparatus for cutting, forming, and inserting cups into tubes. 5,146,666, Cl. 29-429.000.
Babcock & Wilcox Company, The: *See—*
Gossler, E. Thomas; and Paul, Michael A., 5,147,174, Cl. 414-730.000
Babineau, James W.: *See—*
Weisgerber, Thomas W.; Zurask, Jeffery A.; Babineau, James W.; and McDonald, Brian P., 5,148,004, Cl. 180-53.600
Bachle, Wilfred H., to United States of America, Air Force. Dual laser beam angular separation control apparatus. 5,147,126, Cl. 359-862.000.
Bachler, Gary A., to Rogers Corporation. Flexible printed circuit with raised contacts. 5,147,208, Cl. 439-67.000
Bacques, Jean-Yves; and Coalier, Guy, to Otor. Machine for producing polygonal cases. 5,147,271, Cl. 493-176.000.
Badstieber, Johann, to Maier, Josef. Connecting formwork panels 5,146,816, Cl. 81-487.000
Baeuerlein, Peter: *See—*
Ahne, Hellmut; Baeuerlein, Peter; and Hammerschmidt, Albert, 5,147,961, Cl. 528-182.000
Baghdachi, Jamil; Mahoney, Keith H.; and Martin, Glenn E., to BASF Corporation. Room-temperature, moisture-curable, primerless, polyurethane-based adhesive composition and method. 5,147,927, Cl. 524-710.000
Bai, Monty W.; Minks, Danny E.; and Meyer, Alfred B., to Motorola Inc. Unwinding ribbon safing and arming device. 5,147,974, Cl. 102-238.000
Baier, Joachim: *See—*
Kahrs, Manfred; Kunze, Lothar; Baier, Joachim; Kunz, Gerhard; Moeller, Bernhard; Beer, Wilhelm; Krines, Hans-G.; and Schudt, Gerhardt, 5,147,007, Cl. 180-132.000
Baier, Kathleen G.: *See—*
MacGilp, Neil A.; Baier, Kathleen G.; Girardot, Richard M.; and Torres, Efrain, 5,147,574, Cl. 252-108.000.
Baier, Wolfgang; and Kurz, Walter, to Fichtel & Sachs AG. Torque transmission unit for the drive connection of a secondary unit with an internal combustion engine. 5,147,254, Cl. 475-121.000.
Baird, Charles J.: *See—*
Wixey, Barry D.; Kapton, Kenneth; Wilson, Raymond L.; and Baird, Charles J., 5,146,807, Cl. 74-479.000
Baker Hughes Incorporated: *See—*
Baugh, John L., 5,146,992, Cl. 166-383.000
Shapiro, Ascher H., 5,147,277, Cl. 494-53.000.
Wiser, Helma S.; and Radford, Steven R., 5,146,999, Cl. 175-254.000
Baker, Josefina T.; Ly, Peter U.; and Olivet, Eli Z., to SmithKline Diagnostics, Inc. Test for fecal occult blood. 5,147,804, Cl. 436-66.000.
Baker, Lauren D.: *See—*
Herbst, William C.; Baker, Lauren D.; and Stevens, Gary W., 5,148,545, Cl. 395-725.000.
Baker, Richard W.: *See—*
Wijmans, Johannes G.; Kaschemekat, Jurgen; and Baker, Richard W., 5,147,550, Cl. 210-640.000
Bakhos, Youssef G. Shaving apparatus and method. 5,146,680, Cl. 30-90.000
Bakker, Dirkjan; and Ponec-Waelsch, Maria, to H.C. Implants B.V. Artificial skin. 5,147,401, Cl. 623-15.000
Balaazs, Bela: *See—*
Nagy, Peter L.; Balaazs, Bela; Boross, Maria; Szilbereky, Jeno; Zsila, Gizella; Abraham, Lajos; Blasko, Gyorgy; Gachalyi, Bela; Almasi, Attila; and Nemet, Gabor, 5,147,879, Cl. 514-318.000
Balch, Richard A.; and Elmore, David D., to General Electric Company. Method and apparatus for detecting and compensating for reverse rotation and creep of eddy current disk. 5,148,101, Cl. 324-137.000
Ballard, James G.; and Wisner, Craig A., to Hein-Werner Corporation. Chain liner. 5,146,775, Cl. 72-447.000.
Ballard, Jerry L., to Tandy Corporation. Non-bus request refresh system for shortening refresh timing. 5,148,535, Cl. 395-425.000.
Balsimo, William V.: *See—*
Hagen, Donald F.; Markell, Craig G.; Balsimo, William V.; and Errede, Louis A., 5,147,539, Cl. 210-198.300.
Bamburak, Robert; and Degnan, Robert, to Degnan, Robert. Protective cover for surfboard. 5,147,235, Cl. 441-79.000.
Ban, Mariko: *See—*
Ishii, Yutaka; Kimura, Naofumi; Mitsui, Seiichi; and Ban, Mariko, 5,148,297, Cl. 359-53.000
Ban, Shigeru: *See—*
Saito, Masao; Ban, Shigeru; Takita, Yoshio; Mihara, Yoshiki; and Takahashi, Shinichi, 5,146,719, Cl. 52-80.000.
Ban, Takashi: *See—*
Suzuki, Shinichi; Ban, Takashi; Izumi, Yuji; Yoshida, Tetsuo; and Fukanuma, Tetsuhiko, 5,147,192, Cl. 418-55.300.
Ban, Yasutaka; and Tokitomo, Kazuo, to Fujitsu Limited. Photomask and fabrication of the same. 5,147,742, Cl. 430-5.000
Bandach, Kurt J.: *See—*
Barton, Mark S.; Bandach, Kurt J.; and Schlichter, Mark E., 5,146,640, Cl. 5-47.000
Bando, Akira; Kayukawa, Shigehiro; Taguchi, Toshio; and Ohno, Yasuteru, to Hitachi, Ltd. System for controlling AC excited synchronous machine. 5,148,093, Cl. 318-723.000
Bando Kiko Co., Ltd.: *See—*
Bando, Shigeru, 5,146,715, Cl. 51-165.770.
Bando, Shigeru, to Bando Kiko Co., Ltd. Apparatus for grinding a peripheral edge of a glass sheet. 5,146,715, Cl. 51-165.770.
Banerjee, Subrata; and Connors, Charles W., Jr., to Magneco/Metrel, Inc. Composition and method for manufacturing steel-containment equipment. 5,147,830, Cl. 501-89.000
Banerjee, Subrata, to Magneco/Metrel, Inc. Gunning composition. 5,147,834, Cl. 501-129.000
Banner Gelatin Products Corp.: *See—*
Sadek, Hani; and Dietel, Gregory L., 5,146,730, Cl. 53-454.000
Bannert, Christian. Method of improving the adhesiveness of gels to mucosae. 5,147,648, Cl. 424-435.000.
Baran, John S.: *See—*
Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,147,888, Cl. 514-419.000
Barclay, Brian L.: *See—*
Place, Virgil A.; Wong, Patrick S. L.; Barclay, Brian L.; and Childers, Jerry D., 5,147,654, Cl. 424-473.000.
Barfield, Tony: *See—*
Sabbaghian, Mehdy; Barfield, Tony; Schiele, Patrick; Newton, David W.; Lormand, Gregory J.; and Schwartzberg, Glen J., 5,147,379, Cl. 606-206.000
Barmag AG: *See—*
Lorenz, Hellmut, 5,146,739, Cl. 57-264.000
Barnes, Monica L. Rinse shield. 5,146,629, Cl. 2-174.000.
Barnowski, Ulrich, to Paul Hammelmann Maschinenfabrik GmbH Pressure pump with sealing sleeve between head and chamber. 5,147,189, Cl. 417-567.000

Baron, Kenneth S.; Custer, Milton F.; and Hegedus, Andreas G., to Hexcel Corporation. Ceramic reinforced glass matrix. 5,147,721, Cl. 428-365.000
Barrena, Juan J.: *See—*
Rao, Chepur P.; Barrena, Juan J.; Aromin, Victor V., and Astley, John J., 5,148,344, Cl. 361-42.000
Barrett, David M.: *See—*
Martin, Patricia A.; Huntington, Jonathan T. II; McNally, J Michael; Barrett, David M.; and Ward, Jean R., 5,148,155, Cl. 340-712.000
Barsomian, Janet M.: *See—*
Polisson, Carol; and Barsomian, Janet M., 5,147,794, Cl. 435-199.000
Barta, Raymond D.: *See—*
Demura, Michael; LaCombe, James; Novak, Roger A.; and Barta, Raymond D., 5,147,278, Cl. 493-439.000.
Bartelt, Robert D.; Belson, William W., III; Bruno, Michael R.; and Boyd, Robert M., to Bruno, Michael Roman. Reinforced vehicle rear gate with optional hydraulic operation. 5,147,106, Cl. 296-202.000
Barten, Brian L.: *See—*
Halstead, Gary A.; Irish, Michael J.; and Barten, Brian L., 5,147,083, Cl. 228-42.000
Bartholomew, James; and Gentile, Dino M. Mobile airborne air cleaning station. 5,147,429, Cl. 55-356.000
Bartl, Max: *See—*
Strehler, Richard; and Bartl, Max, 5,147,255, Cl. 475-311.000
Bartlett, Philip D.: *See—*
Lima, William; Lind, Earl V.; Bartlett, Philip D.; and McGrath, Michael R., 5,147,060, Cl. 220-288.000
Bartolles, Rolf, to Rheinmetall GmbH. Base and obturating ring arrangement. 5,147,971, Cl. 89-26.000.
Barton, Mark S.; Bandach, Kurt J.; and Schlichter, Mark E., to August Lotz Co., Inc. Latching assembly for a convertible sofa bed. 5,146,640, Cl. 5-47.000
Bartsch, Georg A. W.: *See—*
Van Hooreweder, Godwin; Bartsch, Georg A. W., Hesse, Klaus-Dieter; and Rasch, Ulf, 5,147,019, Cl. 190-18.00A
Basadonna, Luciano: *See—*
Maiocco, Roberto; Basadonna, Luciano; and De Alessi, Renato, 5,148,372, Cl. 364-474.240
BASF Aktiengesellschaft: *See—*
Kurtz, Karl-Rudolf; Koch, Horst; and Telser, Thomas, 5,147,757 Cl. 430-270.000
Oppenlaender, Knut; Wegner, Brigette; Stork, Karl; Frosch, Franz; and Wekel, Hans-Ulrich, 5,147,644, Cl. 424-401.000.
Sens, Ruediger; Schefczik, Ernst; Etzbach, Karl-Heinz; Lamm, Gunther; Reichelt, Helmut; and Wiesenfeldt, Matthias, 5,147,845, Cl. 503-227.000
Wingert, Horst; Sauter, Hubert; Roehl, Franz; Doetzer, Reinhard, Lorenz, Gisela; and Ammermann, Eberhard, 5,147,892, Cl. 514-522.000
Wolf, Bernd; Theobald, Hans; Zombik, Winfried; Goetz, Norbert; Wild, Jochen; Harreus, Albrecht; Hofmeister, Peter; Kuenast, Christoph; and DeKramer, Jacobus J., 5,147,645, Cl. 424-405.000
BASF Corporation: *See—*
Baghdachi, Jamil; Mahoney, Keith H.; and Martin, Glenn E., 5,147,927, Cl. 524-710.000
Hodan, John A.; Armstrong, Robert N.; and First, Robert E., 5,147,197, Cl. 425-192.00S
Panush, Sol; and Gelmini, James M., 5,147,453, Cl. 106-1.190
BASF K&F Corporation: *See—*
Eilerman, Robert G.; Christenson, Philip A.; Yurecko, John M., Jr.; Mild, Frank; and Kucharski, Peter E., 5,147,463, Cl. 131-277.000
BASF Lacke+Farben Aktiengesellschaft: *See—*
Meichsner, Georg; and Blum, Rainer, 5,147,926, Cl. 524-591.000.
Baskett, Theodore N. Hinged support assembly for dumping-type rain gutters. 5,146,718, Cl. 52-11.000.
Basso, Claude; Lebizay, Gerald; Munier, Jean-Marie; and Pauporte, Andre, to International Business Machines Corporation. Interface for independently establishing a link and transmitting high level commands including logical addresses from dedicated microprocessor to shared intelligent memory. 5,148,527, Cl. 395-325.000.
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Bowne, Arlyce T., to Eastman Kodak Company. Photographic element with 2-equivalent 5-pyrazolone and competitor for oxidized developing agent. 5,147,764, Cl. 430-372.000

Boyd, Lawrence M., to Dow Corning Wright Corporation. Implantable prosthetic device and tethered inflation valve for volume 5,146,933, Cl. 128-899.000

Boyd, Robert M.: *See*—
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Braathen, Thor F. Resistance reel for an exerciser. 5,147,264, Cl 482-118.000

Brack-Kaiser, Carol L.: *See*—
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Bradley, Guy M.; and Stone, Todd D., to Petrolite Corporation. Process for the continuous production of high-internal-phase-ratio emulsions. 5,147,134, Cl. 366-150.000

Bradshaw, Scott G.: *See*—
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Bradshaw, Timothy J.: *See*—
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Brain Power, Inc.: *See*—
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Bramblett, John D., to Broken Hill Proprietary Company Limited, The Electro-slag casting apparatus and method. 5,146,976, Cl 164-470.000

Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, to Bayer Aktiengesellschaft. Fungicidal agents. 5,147,887, Cl. 514-383.000

Brannon, James K. Intravenous access devices. 5,147,329, Cl 604-231.000

Bransch, Edward J. Turbine pump with multistage venting of lubricating fluid flow. 5,147,179, Cl. 415-168.200

Brant, Patrick; and German, Paul M., to Exxon Chemical Patents Inc Thermoplastic films for use in stretch/cling applications. 5,147,708 Cl. 428-213.000

Brant, William A.: *See*—
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Braquet, Pierre: *See*—
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Braun, Walter; Bopp, Gunter; and Gumm, Dieter, to Whirlpool International B.V. Electric range having a microwave trap. 5,147,993, Cl. 219-10.55B

Braunshteyn, Michael S.: *See—*
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Breault, Ronald W.: *See—*
Mathur, Virendra K.; Breault, Ronald W.; McLarnon, Christopher R.; and Medror, Frank G., 5,147,516, Cl. 204-177.000

Breitmeier, Ulrich O., to Focus Messtechnik GmbH & Co KG. Scanning head. 5,146,690, Cl. 33-551.000.

Bremer, Ronald J.: *See—*
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Bressler, Mark; and Blank, Stephen. Female urine collection apparatus. 5,146,637, Cl. 4-445.000.

Breuer, Hans-Jurgen: *See—*
Maus, Wolfgang; Swars, Helmut Breuer, Hans-Jurgen; and Cyron, Theodor, 5,146,743, Cl. 60-274.000

Bridgestone Corporation: *See—*
Kawabe, Hiroshi; and Watanabe, Toshiyuki, 5,146,969, Cl. 157-1.100
Mouri, Hiroshi; Kawaguchi, Yasuyoshi; Ishii, Michio; Iwafune, Seiichiro; and Iwata, Toshiro, 5,147,477, Cl. 152-209.00R.

Bridgestone/Firestone, Inc.: *See—*
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Friedman, Peter L.; Wang, Paul; and Cravalho, Ernest G., 5,147,355, Cl. 606-23.000.

Brink, Munday; and Gateman, Jan, to Geco A.S. Method for simultaneous collection of seismic data from shallow and deep targets. 5,148,406, Cl. 367-22.000

Brinker International, Inc.: *See—*
Romano, Philip J., 5,146,842, Cl. 99-421.00V.

Brinkman, Norman D.; Dasch, Cameron J.; Rockwell, Lynn A.; and Hopper, Daniel H., to General Motors Corporation; and Delco Electronics Corporation. Method and apparatus for cold starting a spark ignited internal combustion engine fueled with an alcohol-based fuel mixture. 5,146,882, Cl. 123-179.500.

Brisbane, Roger M.: *See—*
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Bristol, Alexander C. Invisible flat top mold blank and method for manufacturing same. 5,147,437, Cl. 65-102.000

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Brocks, Dietrich; Timpl, Rupert; and Paulsson, Mats, to Hoechst Aktiengesellschaft. Process for the isolation of basement membrane proteins from human and animal tissues. 5,147,782, Cl. 435-7.210.

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Brophey, Robert W.; and Kadwell, Robert J. Controlling cone of depression in a well by microprocessor control of modulating valve 5,147,559, Cl. 210-744.000

Brother Kogyo Kabushiki Kaisha: *See—*
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Brown, Alan W. Nucleus splitter. 5,147,368, Cl. 606-107.000

Brown, Galen K.: *See—*
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Brown, Sam J. Variable centerline sight. 5,146,686, Cl. 33-264.000.

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Browning, Jovona C.; and Harvey, Vernon B., to NCR Corporation. Distribution label. 5,147,699, Cl. 428-40.000

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Bruce, Mary L.; Harris, Larell; and McMarlin, Robert M., to Pittsburgh Corning Corporation. Spacer member for construction elements. 5,146,725, Cl. 52-308.000

Bruckner, George F. Hand protector for pugilistic sports. 5,146,624, Cl. 2-18.000.

Bruder, Wolfgang; Biervert, Klaus; and Meybrink, Jurgen, to Durkopp Adler AG. Method of cutting blanks from webs of material. 5,146,821, Cl. 83-40.000

Bruestle, Claus, to Dr. Ing. h.c.F. Porsche AG. Exhaust gas turbocharger on an internal-combustion engine. 5,146,752, Cl. 60-602.000.

Brug, Byron L., to Brug, Byron Lance; and Kirk, Dennis Brian. Heel-binding device. 5,147,234, Cl. 441-70.000.

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Bruggemann, Horst; Freitag, Dieter; Meier, Lothar; Lindner, Christian; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. Molding compositions of low double refraction. 5,147,700, Cl. 428-64.000.

Bruney, Paul F. Loudspeaker structure. 5,148,493, Cl. 381-203.000.

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Bruno, Michael Roman: *See—*
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BTS Broadcast Television Systems GmbH: *See—*
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Buchanan, Ken; and Dowdle, John A., to Medical Documenting Systems, Inc. Computer-assisted documentation system for enhancing or replacing the process of dictating and transcribing. 5,148,366, Cl. 364-419.000

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Buckshaw, Thomas M.; and Erdelsky, Joseph J., to Robertshaw Controls Company. Temperature operated switch construction, terminal block therefor and methods of making the same. 5,148,142, Cl. 337-329.000

Buessinger, Pierre, to Somex Mulhouse S.A. Revolving head for machine-tool. 5,146,663, Cl. 29-40.000.

Buet, Jacques; Chambron, Robert; Bonnet, Jean-Marc; and Grosset-Janin, Emile, to Merlin Gerin. Low voltage electrical switchgear cabinet. 5,147,981, Cl. 174-52.100

Bugler, Thomas W., III; and Kinney, Ohler L., Jr., to Marley Cooling Tower Company, The. Non-clogging film fill assembly for counter-flow water cooling tower. 5,147,583, Cl. 261-112.200.

Bugnet, Bernard; Doniat, Denis; and Rouget, Robert, to Sorapec S.A. Method and apparatus for pasting a porous plate. 5,146,958, Cl. 141-1.100

Buhl, Horst: *See—*
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Burge, Scott R.; and Burge, Russell. Device for sampling and stripping volatile chemicals within wells. 5,147,561, Cl. 210-747.000

Burgos, Iris; Dunn, Leroy; and Husni, Altan, to Slocomb Industries, Inc. Programmable controlled winder. 5,146,956, Cl. 140-89.000

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Page, Martin J.; and Rodgers, Brian C., 5,147,788, Cl. 435-69.100.

Bursuker, Isia; Carlino, Joseph A.; Neddermann, Kim; Schacter, Bernice; Ellingsworth, Larry; and Spitalny, George. Repopulation of macrophages and granulocytes using transforming growth factor-beta. 5,147,799, Cl. 435-240.100

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Buschbom, Floyd E., to Van Dale, Inc. Impeller assembly. 5,147,030, Cl. 198-642.000.

Bush, James H., to Lubrizol Corporation, The. Flotation composition using a mixture of collectors. 5,147,572, Cl. 252-61.000.

Bustance, C. David; Lidbetter, Paul; and Lancaster, John, to Siemens Aktiengesellschaft Osterreich. Method and apparatus for conversion of the sampled signal of an analog input signal. 5,148,169, Cl. 341-156.000

Buttle, Kenneth G.; and Takatori, Hiroshi, to Level One Communications, Inc. Non-linear echo canceller. 5,148,427, Cl. 370-32.100.

Buxton, Aldene H. Movable thumb brace. 5,147,285, Cl. 602-22.000

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Cade, Neil A.; Lee, Rosemary A.; Patel, Chandrakant; and Williams, Helen A., to General Electric Company, p.l.c., The. Electronic devices. 5,147,501, Cl. 156-656.000.

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Campbell, David J.; and DeWitt, Kenneth I., to Allied Security Devices, Inc. Differential delay intrusion detection sensory system 5,148,149, Cl. 340-562.000.

Campbell, Louis A., to Carbomedics, Inc. Heart valve prosthesis with improved bi-leaflet pivot design. 5,147,390, Cl. 623-2.000.

Cancio, Leopoldo V.; Snyder, James R.; and Wu, Pai-Chuan, to Clopay Corporation. Coextruded multi-layer thermoplastic sheet material having one layer with high modulus for repositioning tape-tab fasteners thereon, absorbant articles and methods. 5,147,346, Cl. 604-389.000

Candiracci, Angelo, to Monolite S.r.l. Wall panel with thermoacoustic insulation characteristics. 5,146,721, Cl. 52-144.000

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Capotosto, Rosario; and Capotosto, Michael. Self-guidable drill housing. 5,147,162, Cl. 408-110.000

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Castillenti, Thomas A. Laparoscopic trocar with self-locking port sleeve. 5,147,316, Cl. 604-164.000

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Chan, Samuel W.: *See—*
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Dearing, David. Helmet cooling system. 5,146,757, Cl. 62-61.000

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Decor, Jean-Pierre; and Borrod, Guy, to Rhone Poulenc Agrochimie. Herbicidal compositions based on a glyphosate herbicide and acifluorfen. 5,147,444, Cl. 71-86.000

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de Haan, Gerard; and Huijgen, Hendrik, to U.S. Philips Corporation. Motion vector processing device. 5,148,269, Cl. 358-105.000

Dehari, Tomoshige, to Ryobi Ltd. Motor-driven chop saw having improved lower blade guard arrangement. 5,146,825, Cl. 83-397.000

Deierling, Kevin E.; and Rodriguez, Louis, to Dallas Semiconductor Corporation. Power up circuit. 5,148,951, Cl. 307-272.300

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Dembo, Ron S. Scenario optimization. 5,148,365, Cl. 364-402.000

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Dent, Paul, to Ericsson GE Mobile Communications Holding, Inc. Encrypton system for digital cellular communications. 5,148,485, Cl. 380-46.000

Dent, Paul W., to Telefonaktiebolaget L M Ericsson. Method and an arrangement for accurate digital determination of the time or phase position of a signal pulse train. 5,148,373, Cl. 364-484.000

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DeRosa, Thomas F.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., to Texaco Inc. Dispersant, VI improver, additive and lubricating oil composition containing same. 5,147,571, Cl. 252-51.50R.

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Diehr, Hans-Joachim; Kuck, Karl-Heinz; Paulus, Wilfried; and Schmitt, Hans-Georg, to Bayer Aktiengesellschaft. Microbicidal agents. 5,147,443, Cl. 71-67.000

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Digital Equipment Corporation: *See—*
Cutler, David N.; Orbits, David A.; Bhandarkar, Dileep; Cardoza, Wayne; and Witek, Richard T., 5,148,544, Cl. 395-725.000
Fite, David B.; Murray, John E.; and Fossum, Tryggve, 5,148,528, Cl. 395-375.000
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Witek, Richard T.; Williams, Douglas D.; Stanley, Timothy J.; Fenwick, David M.; Burns, Douglas J.; Stamm, Rebecca L.; and Heye, Richard, 5,148,536, Cl. 395-425.000

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Dingle, Phillip J.; Thomas, Raymond W.; and Neill, Kenneth, to Square D Company. Fuse switch unit for panelboards. 5,148,139, Cl. 337-6.000.

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Hanagata, Haruo; Suzuki, Tsukasa; Yanagida, Kazuo; and Igarashi, Hidesato, 5,147,515, Cl. 204-164.000.

Dirksing, Robert S., to Procter & Gamble Company, The. Toothbrush employing resiliently buckling arch to indicate excessive brushing pressure. 5,146,645, Cl. 15-167.100

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Bird, K. J. H.; Crossdale, G. W.; and Livingston, J. W., 5,147,615, Cl. 422-261.000

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Hvolka, Dusan J., 5,147,011, Cl. 180-234.000

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Dobkin, Robert C.; and Wright, John W., to Linear Technology Corporation. Level shift circuit with gain enhancement. 5,148,118, Cl. 330-252.000

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Wingert, Horst; Sauter, Hubert, Roehl, Franz; Doetzer, Reinhard; Lorenz, Gisela; and Ammermann, Eberhard, 5,147,892, Cl. 514-522.000

Dohrer, Gregory L.; Holler, Michael D.; and Nichols, Dwyane B., to Paragon Films Incorporated. Stretch film with reduced noise and neck. 5,147,709, Cl. 428-213.000

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Nguyen, Xuan T., 5,147,503, Cl. 162-7.000

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Doniat, Denis: *See—*
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Donnelly Corporation: *See—*
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Whitekettle, Wilson K.; and Donofrio, Deborah K., 5,147,890, Cl. 514-479.000

Donohue, Patrick T. Punching bag construction and suspension. 5,147,258, Cl. 482-87.000.

Doonan, Barbara B.; Bertkau, Geoffrey H.; Hayes, Dennis F.; Sabella, Frank; and Skiff, Ronald H., to Kraft General Foods, Inc. Removal of malic acid from coffee by fermentation. 5,147,666, Cl. 426-45.000

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Dornier Medizin Technik: *See—*
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Dottor, Giambattista; and Cimetta, Silvano, to Industrie Zanussi S.p.A. Steam condensation device in a dryer or combination washer/dryer. 5,146,693, Cl. 34-77.000

Doucette, Thomas H., to Becton, Dickinson and Company. Multidimensional surgical blade holder and blade combination. 5,146,685, Cl. 30-330.000.

Dougal, Stephen W. Salt level monitoring device for water softeners. 5,147,531, Cl. 210-91.000

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Douglas, James M. Thermal transfer device. 5,147,495, Cl. 156-540.000.

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Dow Chemical Company, The: *See—*
Deblander, Jean-Philippe, 5,147,481, Cl. 156-71.000
Dubois, Robert A.; Treybig, Duane S.; Malzman, Allyson; Sheth, Pong S.; and Whetten, Alan R., 5,147,905, Cl. 523-404.000.
Mikucki, Barry A.; and Hillis, James E., 5,147,450, Cl. 75-601.000

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Dow Corning Wright Corporation: *See—*
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Kanzaki, Toshihiro; Sugawara, Akira; Amatsu, Isamu; and Hatakeyama, Kouichi, 5,147,469, Cl. 148-684.000
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Demura, Michael; LaCombe, James; Novak, Roger A.; and Barta, Raymond D., 5,147,278, Cl. 493-439.000

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Dragner, Louis R.: *See—*
Floyd, William C.; and Dragner, Louis R., 5,147,908, Cl. 524-49.000

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Draxelmayr, Dieter, to Siemens Aktiengesellschaft. Apparatus for stepless control of electric loads by the phase angle principle and brightness controller using the apparatus. 5,148,097, Cl. 323-237.000.

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Hays, David R., 5,147,012, Cl. 181-211.000

Driscoll, James N.; and Bieber, Thomas E., to Bell & Howell Phillipsburg Company. Roller-accumulator for sheets. 5,147,092, Cl. 271-184.000.

Driscoll, William A., to Minnesota Mining and Manufacturing Company. Mechanical device for determining the modulus and loss factor of a damping material based upon temperature and frequency. 5,148,006, Cl. 235-70.00R.

DSC Communications Corporation: *See—*
Shenoi, Kishan; Yang, Paul P.; and Sopira, Terrence G., 5,148,426, Cl. 370-32.100

Du, Keming; Loosen, Peter; and Herziger, Gerd, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V. Laser. 5,148,443, Cl. 372-93.000

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Glajch, Joseph L.; Loomis, Gar L.; and Mahler, Walter, 5,147,631, Cl. 424-9.000

Dubik, Andre S. Apparatus for the automatic dispensing of products, especially of food products, if necessary reheated. 5,147,069, Cl. 221-79.000

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Dubois, Robert A.; Treybig, Duane S.; Malzman, Allyson; Sheih, Pong S.; and Whetten, Alan R., to Dow Chemical Company, The. Advanced and unadvanced compositions, nucleophilic derivatives thereof and curable and coating compositions thereof. 5,147,905, Cl. 523-404.000

Dubousset, Jean, to Societe de Fabrication de Materiel Orthopedique Osteosynthesis device for the correction of spinal curvatures 5,147,360, Cl. 606-61.000

Dubowik, John M.; Ulrich, Karl T.; and Nemirow, Michael A., to General Mills, Inc. Dual textured food piece fabrication apparatus 5,146,844, Cl. 99-450.600

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Ducote, Wayne E. Utility cage for a pickup truck. 5,147,103, Cl. 296-37.600.

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Fladung, Ruediger, 5,147,304, Cl. 604-110.000

Duey, David H.; and Battista, John A. to Intra Corporation. Laser apparatus and method for aligning a crankpin grinding machine. 5,148,232, Cl. 356-152.000

Duffy, Joseph J.; Potter, Jerry F.; Roth, Elwood A.; Samant, Kalika R.; Thek, Richard E.; and Todd, Maurice C., to Du Pont de Nemours, E. I., and Company. Process and apparatus for tow cross-section measurement and control. 5,146,651, Cl. 19-65.00T

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MacKay, Michael T.; Berger, Robert J.; Duffy, Robert; and Langford, Ted E., 5,148,154, Cl. 340-7 2.000

Dufour, Henri. Apparatus for recovering liquid from liquid-filled containers. 5,146,848, Cl. 100-53.000

Dufour, Jean G., to Johnson Level & Tool Mfg. Co., Inc. Stud finder with level indicator. 5,148,108, Cl. 32- -226.000

Dugan, Billy G. Illuminated sign. 5,146, 04, Cl. 40-552.000

Dukart, Anton: *See*—
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Grossa, Mario, 5,147,743, Cl. 430-7 .000
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Lin, Perry H., 5,147,704, Cl. 428-97 000
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Dyer, Paul N.: *See*—
Garg, Diwakar; Lynn, Sui-Yuan; Impietro, Robert L.; Wrecsics, Ernest L.; and Dyer, Paul N., 5, 47,687, Cl. 427-249.000

Dyer, Richard H., Jr. Refuse carrier. 5 47,102, Cl. 294-152.000

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Deshpande, Vikas M.; and Walts, John M., 5,147,634, Cl. 424-70.000
Despard, Peter J.; Forster, Donald M.; and Guyette, Gregory P., 5,147,545, Cl. 210-445.000
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Hromas, Joe C.; Edwards, A. Glen; and Huber, Klaus B., 5,146,983, Cl. 166-65.100

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Egyud, Laszlo G., to Cell Research Corporation. Autobiotics and their use in eliminating nonself cells in vivo. 5,147,652, Cl. 424-450.000

Ehrhart, Karl-Josef: *See*—
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Eilerman, Robert G.; Christenson, Philip A.; Yurecko, John M., Jr.; Mild, Frank; and Kucharski, Peter E., to BASF K&F Corporation. Cyclic acetals. 5,147,463, Cl. 131-277.000.

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Ellison, Russell P., Jr. Composite building system and method of manufacturing same and components therefor. 5,146,726, Cl. 52-320.000

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Dikeman, Cary, 5,147,313, Cl. 604-153.000

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Bezwada, Rao S.; and Hunter, Alastair W., 5,147,383. Cl 606-231.000.
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Hoffa, Jack L., 5,146,673, Cl. 29-828.000.

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Exportech Company, Inc.: *See*—
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Fajac, Claude, to General Electric CGR S.A. Device for installing mammography cartridges of different formats. 5,148,466, Cl 378-167.000

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Regan, Richard B., 5,147,075, Cl. 222-402.150.

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Fehrenbach, Christian; Ketterer, Gunter; and Schlassus, Wolfgang, to Mannesmann Aktiengesellschaft. Read-write device for data processing with magnetic information carriers. 5,148,341, Cl. 360-106.000

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First, Robert E.: *See—*
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Fish, Gordon E., to Allied-Signal Inc Torque sensor. 5,146,790, Cl. 73-862.336.

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FMC Corporation: *See—*
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Focqueur, Herve ; Jumel, Bernard; Paquin, Jacques; and Naudin, Jacky, to Valeo. Device with torsion damping by resilient plates, especially for an automotive vehicle. 5,147,246, Cl. 464-59.000

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Fodor, Ludovic, to Du Pont de Nemours, E. I., and Company. Stabilized, aqueous hydrazide solutions for photographic elements. 5,147,756, Cl. 430-264.000

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Fonash, Stephen J.: *See—*
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Ford, Allen G., to United States of America, Navy. Air cushion displacement hull water vehicle. 5,146,863, Cl. 114-67.00A

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Ford, Richard G.: *See—*
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Forrester, Brett R. Vehicle wheel knockoff 5,147,112, Cl. 301-37.0SC.

Forstbauer, Wilhelm: *See—*
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Braun, Rudiger; and Forstbauer, Wilhelm, 5,148,362, Cl 363-95.000

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Forsyth, Richard M., to Inmos Limited. Decoder. 5,148,480, Cl. 380-28.000

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Fournel, Michael A.: *See—*
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Frankel, Edward B. Device for retrieving and securely storing balls 5,147,100, Cl. 294-19.200

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Franzak, Agnes A.; and Howng, Wei-Yean, to Motorola, Inc. Composite titanate aluminate dielectric material. 5,147,835, Cl. 501-134.000

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Frazza, Mark S.; Ho, Kim S.; Kowalski, Alexander; Raney, Robert R.; and Vogel, Martin, to Rohm and Haas Company. Process for making controlled, uniform-sized particles in the 1 to 50 micrometer range 5,147,937, Cl. 525-243.000

Freed, William T.: *See—*
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Freese, T. Brent; and Janicke, Joseph E., to Gerry Baby Products Company. Crib light. 5,148,356, Cl. 362-130.000

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Frejborg, Frey, to A. Ahlstrom Corporation. Rotating element for a screening apparatus with a contour surface produced by a plurality of protrusions in the direction of the axial length of the cylindrical rotor 5,147,543, Cl. 210-413.000

Fresenius AG: *See—*
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Frindle, Paul, to Sony Corporation. Digital to analog conversion circuit with dither and overflow prevention. 5,148,163, Cl. 341-131.000.

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Fruchter, Jonathan S.: *See—*
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Fruge, Tave J., to Digital Equipment Corporation. Disk drive spindle hub assembly. 5,148,338, Cl. 360-98.070.

Frus, John R., to Unison Industries, Inc. Apparatus and method for providing ignition to a turbine engine. 5,148,084, Cl. 315-76.000.

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Fujikake, Yohichi: *See—*
Sugimoto, Takao; Nishimura, Takehiro; Fujikake, Yohichi; and Yamaguchi, Akiomi, 5,146,779, Cl. 73-81.000

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Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma Mikio; and Kato, Yasuyuki, 5,147,434, Cl. 65-12.000

Fujimori, Shizuyoshi: *See—*
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Fujimoto, Hiroshi: *See—*
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Fujimoto, Naoshi: *See—*
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Fujimoto, Shoji: *See—*
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Fujino, Toshihiro: *See—*
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Fujita, Masanori; Okamoto, Shinichi; and Ono, Hirokazu, to Seikosha Co., Ltd. Piezoelectric device and related converting devices 5,148,074, Cl. 310-311.000.

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Fujita, Toshio: *See—*
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Fujita, Yuji: *See—*
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Fujitsu Limited: *See—*
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Enomoto, Hajime; and Miyamura, Isao, 5,148,501, Cl. 382-56.000

Igarashi, Takeshi, 5,147,461, Cl. 11[illegible]666.000
Kato, Takashi; Ito, Takashi; and Maeda, Mamoru, 5,148,259, Cl 357-67.000
Kohno, Tohru, 5,148,398, Cl. 365-201.000
Miura, Takao; and Imaoka, Kazunori, 5,148,247, Cl. 357-23.600
Takikawa, Masahiko; and Awano, Yuji, 5,148,245, Cl. 357-22.000
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Fujitsu Ten Limited: *See*—
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Fujiwara, Masakatsu: *See*—
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Fujiwara, Ryoji: *See*—
Nagano, Akihiko; Kishi, Etsuro; Fujiwara, Ryoji; Ohkubo, Yukitoshi; Nishimura, Michiyo; Sakata, Hajime; Ishii, Takayuki; and Yamanobe, Masato, 5,148,302, C[illegible]. 359-95.000.

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Matsuda, Hideo; Fujiwara, Takashi; and Yoshida, Takeomi, 5,148,254, Cl. 357-38.000

Fujiwara, Yoshihisa; and Genno, Hirokazu, to Sanyo Electric Co., Ltd. Method of controlling printed density in thermal transfer recording. 5,148,184, Cl. 346-1.100

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Adachi, Hideki; Takizawa, Mitsuharu; Nakayama, Miho; Fukada, Taisei; Nakamura, Shinichi; Kuroyanagi, Satoshi; Tahara, Hisatsugu, Ozaki, Hiroshi; and Mizuta, Masanori, 5,148,089, Cl. 318-66.000

Fukanuma, Tetsuhiko: *See*—
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Fukuda, Keiichi: *See*—
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Fukuda, Tsuguhiro: *See*—
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Maruda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl 346-140.00R.

Fukukawa Electric Co., Ltd., The: *See*—
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Fukuma, Takao; Tsukamoto, Keisuke; Takaoka, Toshio; and Yamasaki, Hirofumi, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control device for an engine. 5,146,885, Cl. 23-308.000

Fukumoto, Takaaki: *See*—
Ohmori, Toshiaki; Kanno, Itaru; and Fukumoto, Takaaki, 5,147,466, Cl. 134-7.000

Fukuzawa, Minoru: *See*—
Nishimoto, Shinobu; Hirakawa, Eisuke; Fukuzawa, Minoru; Kato, Takashi; and Tani, Akio, 5,147,[illegible]59, Cl. 528-48.000.

Fuller, Robert; and Pasek, David. Apparatus for thawing frozen food 5,146,843, Cl. 99-483.000

Fullert, Sigismund: *See*—
Rinck, Gunter; Moller, Knut; Fullert, Sigismund; Krause, Frank; and Koch, Helmut, 5,147,907, Cl. 524-48.000

Funabiki, Masaki; Kayano, Kunihide; and Yamada, Teiji, to N.E. Chemcat Corporation. Exhaust gas-purifying catalyst and process for preparation thereof. 5,147,842, Cl. 502-304.000

Funada, Hitoshi; and Numauchi, Hiromitsu, to Komori Corporation. Method for controlling impression-on operations for an intaglio printing press and a device thereof. 5,146,850, Cl. 101-153.000.

Funahashi, Yuichi: *See*—
Yamamoto, Yuji, Kurata, Takashi; Nakazawa, Kazuyoshi; Tsuda, Yusuke; Watanabe, Junichiro, Matsumoto, Makoto; Kurita, Akitsugu; and Funahashi, Yuichi, 5,147,947, Cl. 525-479.000.

Funato, Kazuo: *See*—
Tamehiro, Hiroshi; Chiziiwa, Rikio; Sakumoto, Yoshifumi; Funato, Kazuo, Yoshida, Yuzuru; and Keira, Koichiro, 5,147,474, Cl 148-320.000

Funato, Kenji: *See*—
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Funk, Ruben A.; and Twigg, Richard D., to Minnesota Mining and Manufacturing Company. Zero insertion pressure test socket for pin grid array electronic packages. 5,147,213, Cl. 439-266.000.

Fuqua Industries, Inc.: *See*—
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Furcht, Leo T.: *See*—
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Furcsik, Susan, to American Maize-Products Company. Process for improving the shelf life of baked goods. 5,147,665, Cl. 426-19.000

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Furong Mineral Bureau: *See*—
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Furukawa Aluminum Co., Ltd.: *See*—
Negishi, Yoshio, 5,146,975, Cl. 164-436.000

Furukawa, Kenichi: *See*—
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Furukawa, Masanobu: *See*—
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Furukawa, Shigeaki; Ohta, Takeo; Akiyama, Tetsuya; and Isomura, Hidemi, to Matsushita Electric Industrial Co., Ltd. Information recording medium. 5,147,701, Cl. 428-64.000.

Furukawa, Yasuhiro; and Takahashi, Kihei, to Yoshida Kogyo K.K. Apparatus for continuous manufacturing of injection molded articles. 5,147,658, Cl. 425-127.000

Furumiya, Shigeru; Takemura, Yoshinari; and Kitaura, Hiromu, to Matsushita Electric Industrial Co., Ltd. Synchronous signal generator for the muse signal. 5,148,276, Cl. 358-153.000

Furuyama, Tohru, to Kabushiki Kaisha Toshiba. MOS dynamic semiconductor memory cell. 5,148,393, Cl. 365-149.000.

Futamata, Manabu: *See*—
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Hanson, Gunnar J.; Baran, John S.; Weissing, Dave; and Russell, Mark, 5,147,888, Cl. 514-419.000
Mueller, Richard A.; and Partis, Richard A., 5,147,893, Cl 514-530.000

G & W Electric Company: *See*—
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Gabel, Robert K.: *See*—
Huddleston, David A.; Gabel, Robert K.; and Williamson, Charles D., 5,147,964, Cl. 527-400.000.

Gabor, William D. Fifty channel television transmitter. 5,148,279, Cl. 358-186.000.

Gachalyi, Bela: *See*—
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Gaertner, Dean J., to PPG Industries, Inc. Bushing assembly for making glass fibers. 5,147,431, Cl. 65-1.000.

Gage, Dennis R.; Lodge, Richard W.; Cammarn, Stephen R.; and Wong, Vincent Y., to Procter & Gamble Company, The. Process for making extrusion cooked snack chips. 5,147,675, Cl. 426-549.000.

Gahan, Richard A., to Digital Equipment Corporation. Efficient arbiter. 5,148,112, Cl. 328-110.000.

Gainer, William C., Jr. Apparatus and method for thrusting a cover over a target area. 5,146,996, Cl. 169-49.000.

Gaiser, Hans: *See*—
Paysan, Heinz-Wilhelm; Grimm, Wolfgang; Schurle, Hermann; Gaiser, Hans; and Gutbrod, Heinz, 5,146,623, Cl. 2-12.000.

Gajewski, Kenneth J.; and Meyer, John H., to Ford Motor Company. Lamination of semi-rigid material between glass. 5,147,485, Cl. 156-104.000

Gallenschutz Metallbau GmbH: *See*—
Gallenschutz, Thomas; Vogel, Hermann; and Hochstuhl, Erwin, 5,146,711, Cl. 49-46.000

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Gangadharan, Balgopal: *See*—
Tazi, Mohammed; Login, Robert B.; Plochocka, Krystyna; Haldar, Rama K.; Gangadharan, Balgopal; and Prosise, William E., 5,147,941, Cl. 525-327.800

Gansel, Eduard: *See*—
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Gard, Ivan E., Jr.; Gonzalez, Jose M., Jr.; and Ciarlante, Dennis R., to Ecogen Inc. Strains of *Bacillus thuringiensis* insecticidal compositions containing the same. 5,147,640, Cl. 424-93.00A.

Gardner, John P., to Sony Magnescale, Inc. Production of prerecorded tape cassettes. 5,148,403, Cl. 360-15.000.

Garg, Diwakar; Lynn, Sui-Yuan; Iampietro, Robert L.; Wrecsics, Ernest L.; and Dyer, Paul N., to Diamonex, Inc. Hot filament CVD of thick, adherent and coherent polycrystalline diamond films. 5,147,687, Cl. 427-249.000.

Garrett Electronics, Inc.: *See*—
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Gasser, Ingo: *See*—
Grass, Alfred; and Gasser, Ingo, 5,147,124, Cl. 312-348.400

Gasser, Oswald: *See*—
Jochum, Peter; Gasser, Oswald; Holupirek, Manfred; Wanek, Erich; Guggenberger, Rainer; Stefan, Klaus-Peter; and Ellrich, Klaus, 5,147,904, Cl. 523-115.000

Gastle, James E.: *See*—
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Gastle, Thomas H.; and Gastle, James E. Veterinary surgery table 5,146,635, Cl. 5-620.000

Gateman, Jan: *See*—
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Gaterud, Mark T.: *See*—
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Gauronski, John F.: *See*—
Knodt, Kurt T.; Raymor, Herbert J.; Coy, Gerald L.; Graves, James R.; Cole, Randall P.; and Gauronski, John F., 5,148,286, Cl. 358-296.000.

Gautier, Francois; and Commault, Yves, to Thomson-CSF. Phased reflector array and an antenna including such an array. 5,148,182, Cl 343-754.000

Gavend, Gerard: *See*—
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Gawve, Warren L.: *See*—
Lyon, Peter A.; and Gawve, Warren L., 5,146,847, Cl. 100-2.000.

Gaxiola, Miguel, Jr. Forward view mirror system for bicycles. 5,148,327, Cl. 359-855.000

Gebhart, Walter M. Hot kiln alignment system. 5,146,795, Cl 73-865.900

Gebhart, Walter M. Hot kiln alignment system. 5,148,238, Cl. 356-375.000.

Geco A.S.: *See*—
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Gehres, Clint E.: *See*—
Conley, Ralph F., Jr.; and Gehres, Clint E., 5,146,859, Cl. 112-114.000

Geiger, Rudi: *See*—
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Geiser, Markus; and Vandevoir, Claude, to Sameca SA. Guide-bar device for automatic lathe and method of fabrication thereof 5,146,819, Cl. 82-127.000

Gelbart, William Z.: *See*—
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Gell, Harold A., Jr.: *See*—
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Gelmini, James M.: *See*—
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Genentech, Inc.: *See*—
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General Electric Company: *See*—
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Balch, Richard A.; and Elmore, David D., 5,148,101, Cl 324-137.000
Bopp, Richard C.; and Lassor, Richard D., 5,147,710, Cl. 428-213.000
Bopp, Richard C.; and Roberts, Daniel L., 5,147,894, Cl. 521-40.500
Dekkers, Theodorus A. M.; Hamersma, Wilhelmus J. L. A.; and Tabankia, Farshid, 5,147,920, Cl. 524-451.000
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Ribner, David B., 5,148,166, Cl. 341-143.000
Ribner, David B., 5,148,167, Cl. 341-143.000
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General Electric Company, p.l.c., The: *See*—
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General Mills, Inc.: *See*—
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General Motors Corporation: *See*—
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Cummings, Larry D.; and Eros, Peter S., 5,146,763, Cl. 62-228.100
Gluchowski, Paul L.; Haltiner, Karl J., Jr.; Savini, David G.; Brisbane, Roger M.; and Smith, Daniel F., 5,146,887, Cl 123-337.000
Halstead, Gary A.; Irish, Michael J.; and Barten, Brian L., 5,147,083, Cl. 228-42.000
Harkrader, Ronald L.; and Zebehazy, Thomas C., 5,146,805, Cl. 74-473.0SW
Hlavaty, David G., 5,146,712, Cl. 49-118.000
Hovarter, Len A., 5,147,190, Cl. 417-571.000
Jones, Grady D., 5,146,901, Cl. 123-516.000.
Kadle, Prasad S.; Frombgen, Barry J.; and Telesz, John P., 5,146,767, Cl. 62-474.000
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Klemen, Donald, 5,147,181, Cl. 416-223.00R.
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Leppek, Kevin G.; and Hogan, Martin A., 5,147,115, Cl. 303-105.000
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Neale, Frank T., III; Von Schwerdtner, Detlev H.; and Yurtin, John A., 5,147,217, Cl. 439-403.000
Nestor, Charles R., 5,147,229, Cl. 439-843.000
Nisonger, Robert L.; and Topping, Richard W., 5,147,113, Cl 303-9.730
Parker, Donald L.; Newton, Jerry L.; Reuter, David F.; and Huntzicker, Fred W., 5,147,116, Cl. 303-115.0EC.
Plyler, Robert G.; Serbin, Bruce J.; and Sech, Bruce N., 5,147,230, Cl. 439-843.000
Potter, Michael A., 5,146,753, Cl. 60-602.000
Quinn, James F., 5,147,117, Cl. 303-115.0EC.
Reuter, David F.; Downs, Thomas C.; and Greywitt, Alisa A., 5,147,118, Cl. 303-115.0EC.
Weisgerber, Thomas W.; Zuraski, Jeffery A.; Babineau, James W and McDonald, Brian P., 5,147,004, Cl. 180-53.600

General Motors France: *See*—
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Genez, Andree L.: *See*—
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Genicom Corporation: *See*—
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Genno, Hirokazu: *See*—
Fujiwara, Yoshihisa; and Genno, Hirokazu, 5,148,184, Cl 346-1.100

Genter, Melvyn E.: *See*—
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Gentex Corporation: *See*—
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Gentile, Dino M.: *See*—
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George, Bengt-Goran, to ABB Stal AB. Power plan with a screw conveyor ash cooler. 5,146,856, Cl. 110-171.000

George Ford & Sons, Inc.: *See*—
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George Koch Sons, Inc.: *See*—
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Gerdes, Carsten: *See*—
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Gerry Baby Products Company: *See*—
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Gertzman, Arthur A.; and Gaterud, Mark T., to Ethicon, Inc. Elastomeric surgical sutures comprising segmented copolyether/esters 5,147,382, Cl. 606-228.000

Gesellschaft fur Biotechnologische Forschung GmbH: *See*—
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Gettel, Roger W., to Ford Motor Company. Rotary vane pump having enhanced cold start priming. 5,147,183, Cl. 417-300.000

Gettig Technologies, Inc.: *See*—
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Gettig, William A.; and Shook, Larry E., to Gettig Technologies, Inc Contaminated needle sterilizer. 5,148,004, Cl. 219-390.000.

Giannini, Peter T.; and Currie, Dennis H. Pressure infusion system 5,147,310, Cl. 604-141.000

Giat Industries: *See*—
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Gibbons, Daniel G.: *See*—
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Gibbs, Peter E. Safety clamp appliance. 5,146,655, Cl. 24-134.00R

Gibson, Nigel. Router attachment. 5,146,965, Cl. 144-372.000.

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Gilbert, James G.; Lee, Fourmun; and Zirkle, Thomas, to Motorola, Inc. Fabrication method for a sub-micron geometry semiconductor device. 5,147,812, Cl. 437-41.000

Gilberts, Alexander G.; Kaczmarek, Richard; Paluch, Edward S.; and Volk, Thomas G., to Reliance Comm/Tec Corporation. Reusable terminal locking cap. 5,147,219, Cl. 439-521.000

Giles, Edwin Q.: *See*—
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Glass, Kevin W.; and Nagarajan, Ashok, to MOS Electronics Corp. Output buffer circuit. 5,148,056, Cl. 307-443.000.
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Mayer, Robert W.; Nowakowski, James B.; Pusey, Bruce A.; and Shah, Kashyap H., 5,146,974, Cl 164-309.000
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Goff, Miles E., to Lockheed Sanders Inc. Monolithic microwave integrated circuit noise generator and variable resistance device 5,148,124, Cl. 331-78.000.
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Kwan, David C. K.; Wai, Ma H.; Liebensfeld, Steven; and Goldberg, Harvey, 5,147,237, Cl. 446-297.000
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Goldschmidt, S. A. Passive rodent control system. 5,146,867, Cl. 116-22.00A
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White, Charles N.; and Goldsmith, Riley G., 5,147,148, Cl. 405-199.000
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Golenski, Stephen S. Computerized system for training engine maintenance personnel. 5,147,206, Cl. 434-219.000
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Gonzalez, Jose M., Jr.: *See*—
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Jaffee, Richard M.; Moll, William F.; and Goss, G. Robert, 5,146,877, Cl. 119-172.000
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Goto, Akira: *See*—
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R.
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Goto, Masatoshi; Fujita, Yoshihiro; and Nakamura, Shigeru, to Fuji Photo Film Co., Ltd. Process comprising bleaching, bleach-fix and fixing silver halide color photographic material. 5,147,765, Cl. 430-376.000
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Gould, John C. Collector card device for stamp collectors. 5,147,043, Cl. 206-457.000
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Gozes, Illana; and Fridkin, Matityahu, to Yeda Research and Development Co. Ltd. Conjugates of VIP and active fragments thereof with hydrophobic moieties and topical compositions for male impotence. 5,147,855, Cl. 514-12.000
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Shaefer, Thomas J., 5,147,188, Cl. 417-511.000.
Graff, Alfred; and Wachter, Michael, to Mannesmann Aktiengesellschaft. Electrodynamic ultrasonic transducer. 5,148,414, Cl. 367-140.000
Grafius, Gerald R., to American Sterilizer Company. Hydraulic door operating system for autoclaves and sterilizers. 5,146,713, Cl. 49-255.000
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Grahl, Keith M.; and Mullens, Larry R., to Rheem Manufacturing Company. NO_x reducing device for fuel-fired heating appliances. 5,146,910, Cl. 126-110.00R
Grandadam, Jean A., to Roussel Uclaf. Zootechnical compositions 5,147,869, Cl. 514-170.000
Granger, Maurice. Unit to simultaneously dispense and cut strips of rolled up materials. 5,146,830, Cl. 83-649.000
Granger, Maurice. Device destined to automatically dispense wiping materials of a concertina form consisting of rolled up strips. 5,147,279, Cl. 493-448.000
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Carlin, Frank J., 5,147,996, Cl. 219-76.140.
Grass AG: *See*—
Grass, Alfred; and Gasser, Ingo, 5,147,124, Cl. 312-348.400
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Green, Kenneth: *See*—
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Greenwood, Frank D.; and Kobielski, Kazimir. Drywall construction 5,146,723, Cl. 52-287.000
Greifeneder, Karl; and Truckenmuller, Kurt, to Amann und Sohne GmbH & Co. Thread having looped effect yarn intermingled with multi-filament core yarn. 5,146,738, Cl. 57-207.000.
Greig, Kevin M.: *See*—
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Grenner, Gerd, to PB Diagnostic Systems, Inc. Assay element 5,147,609, Cl. 422-58.000.
Grewe, Hans; and Schlump, Wolfgang, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Process for production of metal-metalmetalloid powders with their articles having ultramicrocrystalline to nanocrystalline structure. 5,147,449, Cl. 75-354.000.
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Grigson, Walter W.: *See*—
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Gross, Cindy J.: *See*—
Feng, Paul; Wratten, Stephen J.; Winzenburger, Peggy A.; Gross, Cindy J.; and Flaherty, Dennis K., 5,147,786, Cl. 435-7.940.
Gross, Theodore D.; and Rayner, Keith. Tachistoscope and method of use thereof for teaching, particularly of reading and spelling 5,147,205, Cl. 434-169.000
Grossa, Mario, to Du Pont de Nemours, E. I., and Company. Process for the preparation of optical color filters. 5,147,743, Cl. 430-7.000
Grosser, Frank R.: *See*—
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Grosset-Janin, Emile: *See*—
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Aichaioui, Hocine; Lesieur, Daniel; Lespagnol, Charles; Devissaguet, Michelle; and Guardiola, Beatrice, 5,147,883, Cl. 514-338.000
Gubich, Stephen J. Device for puckering the flesh to facilitate injections. 5,147,306, Cl. 604-115.000
Gubin, Jean; and Chatelain, Pierre, to Sanofi. Aminoalkoxyphenyl derivatives, process of preparation and compositions containing the same. 5,147,878, Cl. 514-299.000
Guettler, Phillip G.; and Ritten, Robert G., to Sandscape Inc. Golf course construction and maintenance methods. 5,147,156, Cl 406-197.000
Guggenberger, Rainer: *See*—
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Guilino, Gunther; Altheimer, Helmut; and Pfeiffer, Herbert, to Optische Werke G. Rodenstock. Ophthalmic lens having a changing refractive index. 5,148,205, Cl. 351-159.000.
Gulistan, Bulent. Method for manufacturing part for floating nut assembly. 5,146,668, Cl. 29-525.000
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Niwa, Katsuhiro; Shimoyama, Tsuguhiro; Tabushi, Katsumi; and Anazawa, Toshio, 5,146,860, Cl. 112-121.270
Gutbrod, Heinz: *See*—
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Gutner, Kenneth H. Drawer slide and guide assembly. 5,147,138, Cl 384-21.000
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Haberman, Randy G., to Delaware Capital Formation, Inc. Stand-off cup for torch. 5,147,997, Cl. 219-121.500
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Habich, Dieter; Hansen, Jutta; and Paessens, Arnold, to Bayer Aktiengesellschaft. Phosphonopyrrolidine- and piperidine-containing pseudopeptides of the statin type, a process for their preparation and their use as medicaments against retroviruses. 5,147,865, Cl 514-91.000
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Hagan, John V. Disposable coffeemaker filter with drawstring. 5,147,540, Cl. 210-232.000
Hagen, Donald F.; Markell, Craig G.; Balsimo, William V.; and Errede, Louis A., to Minnesota Mining and Manufacturing Company. Controlled pore composite polytetrafluoroethylene article. 5,147,539, Cl 210-198.300.
Hagen, Richard L.; and Thompson, William W., to North American Dynamics. Parallel path single bay ammunition feed system 5,147,972, Cl. 89-33.160
Haghkar, Cyrus. Elongate vegetable skin cleaner apparatus. 5,146,681, Cl. 30-123.500
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Halpern, B. David: *See*—
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Halstead, Gary A.; Irish, Michael J.; and Barten, Brian L., to General Motors Corporation. Method and apparatus for convection brazing of aluminum heat exchangers. 5,147,08[illegible], Cl. 228-42.000

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Hamada, Fumio. Umbrella cover comprising extensible cylindrical roll. 5,146,940, Cl. 135-34.200.

Hamada, Yoshikazu; and Ogino, Yozo, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Vehicle door lock device. 5,146,772, Cl. 70-264.000

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Hammond, Alan W.; and Chatterjee, Debi K., to Life Technologies, Inc. Host expressing NgoAIII restriction endonuclease and modification methylase from neisseria. 5,147,800, Cl. 435-252.300

Hampton, Ronald S., Sr. Composition and method for cleaning and lubricating hair shears. 5,147,575, Cl. 52-171.000

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Hanawa, Makoto: *See*—
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Hannah, Eric C., to Savitar, Inc. Standardized color calibration of electronic imagery. 5,148,288, Cl. 358-298.000

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Hansen, Jutta: *See*—
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Wight, Mark S.; Van Alstine, Valerie A.; and Harris, Gwendolyn K., 5,148,113, Cl. 328-155.000

Harris, Jonathan L. Sock storage and dispensing apparatus. 5,147,119, Cl. 312-49.000

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Hartley, Jeffrey W.; and Zenner, Burch E., to Crane Plastics Company. Temperature cycling test chambers. 5,147,136, Cl. 374-57.000

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Nishimukai, Tadahiko; Hasegawa, Atsushi; and Matsumura, Masaru, 5,148,526, Cl. 395-275.000

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Hashimoto, Mituhiro: *See*—
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Kanzaki, Toshihiro; Sugawara, Akira; Amatsu, Isamu; and Hatakeyama, Kouichi, 5,147,469, Cl. 148-684.000

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Havran, Thomas P., to Chick Master Incubator Company. Incubator and hatcher tray. 5,146,871, Cl. 119-43.000

Hawkes, Daniel J.; Webb, Leslie J.; and Anderson, Douglas E., to BWE Limited. Cold pressure welding method and machine. 5,147,085, Cl. 228-115.000

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Sato, Tetsuya; Kanome, Osamu; Yoshino, Hitoshi; Kamitakahara, Hirofumi; Hayashi, Hisanori; and Santoh, Tsuyoshi, 5,147,592 Cl. 264-167.000

Hayashi, Mutsumi; Takamura, Ryoji; Yamazaki, Chikayasu; Ueda, Minoru; and Kumo, Ichiro, to Toray Industries, Inc. Ultraviolet ray measuring apparatus for predicting sunburn level and for obtaining SPF values of cosmetics. 5,148,023, Cl. 250-372.000

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Yamazaki, Shunpei; Tsuchiya, Mitsunori; Urata, Kazuo; Koyama, Itaru; Imatou, Shinji; Hayashi, Shigenori; Hirose, Naoki; Sasaki, Mari; Ishida, Noriya; and Wada, Kouhei, 5,147,822, Cl. 437-215.000

Hayes, Dennis F.: *See*—
Doonan, Barbara B.; Bertkau, Geoffrey H.; Hayes, Dennis F. Sabella, Frank; and Skiff, Ronald H., 5,147,666, Cl. 426-45.000.

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Heather, Campbell S. N. Carrier device for containers. 5,147,079, Cl. 224-148.000

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Ritter, Helmut, 5,146,660, Cl. 28-274.000

Hebert, John D.: *See*—
Terwilliger, Richard A.; Hebert, John D.; and Hall, Jack, 5,146,921, Cl. 128-754.000

Heck, Alfred, to Filterwerk Mann & Hummel GmbH. Process for treating wastes from the machining of ferromagnetic materials 5,147,554, Cl. 210-695.000

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Hedenberg, Rolf P., 5,146,840, Cl. 99-328.000.

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Hegedus, Andreas G.: *See*—
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Heilmann, Klaus; Mathieu, Bernd; Rink, Michael; and Weber, Wolfram to Fresenius AG. Apparatus for sterilizing a medical unit 5,147,613 Cl. 422-116.000

Heimerl, Albert; and Kartheus, Holger, to Beiersdorf AG. Surgical clip. 5,147,381, Cl. 606-219.000.

Hein, Norman W.: *See*—
Craig, Steven M.; Warren, Douglas H.; Sandora, Lee M.; Masecar, Robert R.; Hein, Norman W.; and Hunter, Andrew F., 5,147,149, Cl. 405-223.100

Hein-Werner Corporation: *See*—
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Heindl, Anette; Schaulin, Rudolf; and Stockhorst, Thomas, to Ciba-Geigy Corporation. Process for the end-to-end dyeing of cellulosic fibres: desalted direct dye and migration inhibitor. 5,147,410, Cl. 8-555.000

Heinrich, Gunter: *See*—
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Helena Laboratories Corporation: *See*—
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Hellermann, Walter; Herrmann, Christoph; Nordsiek, Karl-Heinz; Wolpers, Jurgen; and Fuchs, Hans-Bernd, to Huels Aktiengesellschaft. Unsaturated, elastomeric, asymmetrically coupled block copolymer, a single batch process for its manufacture and its use for the production of tire components. 5,147,939, Cl. 525-314.000

Hellmuth, Kathleen M.: *See*—
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Hellweg, Siegfried, to H. L. Fisher Mfg. Co., Inc. Can trimming apparatus. 5,146,818, Cl. 82-58.000.

Helms, Ronald L. Method and apparatus for passively detecting the depth and location of a spatial or temporal anomaly by monitoring a time varying signal emanating from the earths surface. 5,148,110, Cl. 324-323.000

Hemmerich, Karl J.; and Kraus, Henry D., to Biosafety Systems, Inc. Apparatus for priming a hypodermic needle with hazardous fluid 5,147,309, Cl. 604-122.000

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Henricson, Kaj; and Pikka, Olavi, to A. Ahlstrom Corporation. Apparatus for treating pulp in a pressurized state. 5,147,504, Cl. 162-55.000

Henry, Robert L.: *See*—
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Herb, Carl C.: *See*—
Inglis, Stephen C.; and Herb, Carl C., 5,147,243, Cl. 454-323.000

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Woodside, Andrew B., 5,147,945, Cl. 525-475.000

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Herman, Norman L. Process of producing soft elastic gelatin capsules 5,146,758, Cl. 62-62.000

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Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See*—
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Hermann, Karl: *See—*
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Haj-Ali-Ahmadi, Javad; Frankeny, Jerome A.; Frankeny, Richard F.; Habich, Adolph B.; Hermann, Karl; and Hunt, Ronald E., 5,148,003, Cl. 219-388.000.
Hernandez, Ernesto; and Rigsby, James A., to Cordis Corporation. Biopsy forceps device having improved locking means. 5,147,380, Cl. 606-207.000.
Hernandez, Fancisco, to Siemens Medical Laboratories, Inc. Radiation emitting device with moveable aperture plate. 5,148,032, Cl. 250-492.100.
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Van Hooreweder, Godwin; Bartsch, Georg A. W.; Hesse, Klaus-Dieter; and Rasch, Ulf, 5,147,019, Cl. 190-18.00A.
Hettinger, William P., to Ashland Oil, Inc. Magnetic separation of high metals containing catalysts into low, intermediate and high metals and activity catalyst. 5,147,527, Cl. 208-120.000.
Heuberger, Erich; and Ehrhart, Karl-Josef. Paper pack container with internal bag for receiving fluids. 5,147,062, Cl. 220-410.000.
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Heutmaker, Michael E.: *See—*
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Hexcel Corporation: *See—*
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Heyman, Joseph S., to United States of America, National Aeronautics and Space Administration. Acoustoporesis method and apparatus. 5,147,562, Cl. 210-748.000.
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Hi-Tech Handler Corp.: *See—*
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Hies, Henry; Moller, Wolfgang; Dichtelmuller, Herbert; and Stephan, Wolfgang, to Biotest Pharma GmbH. Colostrum filtered sterile. 5,147,548, Cl. 210-639.000.
Hifumi, Emi: *See—*
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Hikake, Norio, to Canon Kabushiki Kaisha. Process for producing toner for developing electrostatic image. 5,147,753, Cl. 430-137.000.
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Hilal, Mohamed A., to Wisconsin Alumni Research Foundation. Superconductive switching device and method of use. 5,148,046, Cl. 307-245.000.
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Hilferink, Henk; Tip, Anne A.; and Velten, Henk, to Texas Instruments Incorporated. Transponder and method for the production thereof. 5,148,404, Cl. 367-2.000.
Hill, John: *See—*
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Hill, Robert G. Self temperature limiting electrical-conducting composite. 5,147,580, Cl. 252-506.000.
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Hino, Heijiro; and Asada, Shigeo, to Fuekinori Kogyo Kabushiki Kaisha. Correction stick. 5,147,457, Cl. 106-19.000.
Hipkins, Edward C., Jr. Washer insert for bearing plate. 5,147,151, Cl. 405-259.100.
Hirai, Junichi: *See—*
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Hirakawa, Eisuke: *See—*
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Hirano, Hirofumi, to Canon Kabushiki Kaisha. Ink jet recording apparatus including a drive mechanism for an ink ejection recovery systems. 5,148,203, Cl. 346-140.00R.
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Hirata, Teruo: *See—*
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Hiromoto, Shuji; Kitamura, Roh; Yoshino, Fumitaka; Kamisaku, Takeshi; and Takehana, Toshihiro, to NHK Spring Co., Ltd. Suspension system for a vehicle. 5,147,097, Cl. 280-691.000.
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Yamazaki, Shunpei; Tsuchiya, Mitsunori; Urata, Kazuo; Koyama, Itaru; Imatou, Shinji; Hayashi, Shigenori; Hirose, Naoki; Sasaki, Mari; Ishida, Noriya; and Wada, Kouhei, 5,147,822, Cl. 437-215.000.
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Woodhead, Ian M.; and Hirsch, Stephen J. J., 5,148,125, Cl. 331-135.000.
Hirsoe, Kunihiro: *See—*
Miyahara, Yoshiki; Kasetani, Satoshi; Nishimura, Shigetaka; Hirsoe, Kunihiro; Inoue, Takashi; and Nogi, Takashi, 5,147,712, Cl. 428-224.000.
Hisano, Seiichi: *See—*
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,147,473, Cl. 148-302.000.
Hishiyama, Sadao: *See—*
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao; Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki; Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki; and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000.
Hitachi Automotive Engineering Co., Ltd.: *See—*
Itakura, Tomiya; and Kamifuji, Hiroshi, 5,146,898, Cl. 123-492.000.
Hitachi Chemical Company Ltd.: *See—*
Yamana, Shozo; Kuwajima, Hideji; Ishihara, Minoru; Sumiya, Keiji; Ashizawa, Toranosuke; and Shimoda, Shuichiro, 5,147,851, Cl. 505-1.000.
Hitachi Computer Peripherals Co., Ltd.: *See—*
Takeuchi, Takikazu; Yokohara, Hiroyuki; Ogawa, Takuji; and Sakurai, Noboru, 5,148,334, Cl. 360-51.000.

Hitachi Construction Machinery Co., Ltd.: *See—*
Sugiyama, Genroku; and Hirata, Toichi, 5,146,747, Cl. 60-452.000.
Hitachi Engineering Ltd.: *See—*
Okutsu, Mitsuhiko; Abe, Kenji; and Kariya, Tadaaki, 5,148,049, Cl. 307-270.000.
Hitachi Koki Co., Ltd.: *See—*
Yamada, Masato; Shirakawa, Junzi; and Uno, Kazuo, 5,148,224, Cl. 355-271.000.
Hitachi, Ltd.: *See—*
Bando, Akira; Kayukawa, Shigehiro; Taguchi, Toshio; and Ohno, Yasuteru, 5,148,093, Cl. 318-723.000.
Enomoto, Hiromichi; Kobayashi, Kazushi; Jikihara, Masami; and Amako, Norihisa, 5,148,539, Cl. 395-425.000.
Itakura, Tomiya; and Kamifuji, Hiroshi, 5,146,898, Cl. 123-492.000.
Kawaguchi, Fumio; Takeuchi, Hiroshi; Mitsui, Yasuhiro; Ito, Yoshitoshi; and Haida, Munetaka, 5,148,022, Cl. 250-341.000.
Konno, Chisato; Ohata: Tadashi; Igai, Mitsuyoshi; Umetani, Yukio and Yamabe, Michiru, 5,148,379, Cl. 364-578.000.
Matsumoto, Tetsuro, 5,148,392, Cl. 365-149.000.
Mori, Sadao, 5,148,010, Cl. 250-201.500.
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikazu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,148,255, Cl. 357-43.000.
Narita, Susumu; Hanawa, Makoto; Nishimukai, Tadahiko; and Okada, Tetsuhiko, 5,148,532, Cl. 395-375.000.
Nishimukai, Tadahiko; Hasegawa, Atsushi; and Matsumura, Masaru, 5,148,526, Cl. 395-275.000.
Okamoto, Yukio; Shimura, Satoshi; Oishi, Konosuke; Koga, Masataka; Yasuda, Makoto; and Iino, Takahashi, 5,148,021, Cl. 250-288.000.
Okutsu, Mitsuhiko; Abe, Kenji; and Kariya, Tadaaki, 5,148,049, Cl. 307-270.000.
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao; Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki; Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki; and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000.
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, 5,147,500, Cl. 156-643.000.
Takane, Atsushi; Miyamoto, Yoshiyuki; Takeda, Ryuzaburo; and Sano, Koichi, 5,148,109, Cl. 324-309.000.
Takeuchi, Takikazu; Yokohara, Hiroyuki; Ogawa, Takuji; and Sakurai, Noboru, 5,148,334, Cl. 360-51.000.
Umemura, Kaoru; Schichi, Hiroyasu; and Ishitani, Tohru, 5,148,027, Cl. 250-309.000.
Watanabe, Miyoko; and Mitsumaki, Hiroshi, 5,147,610, Cl. 422-64.000.
Yamauchi, Hiroto; and Yatsugi, Tomishige, 5,148,329, Cl. 360-19.100.
Yano, Kazuo; Ishibashi, Koichiro; Nakagawa, Tetsuya; Shimohigashi, Katsuhiro; and Minato, Osamu, 5,148,387, Cl. 364-784.000.
Hitachi Metals, Ltd.: *See—*
Nakamura, Shuichi; Sasaki, Hakaru; and Watanabe, Rikizo, 5,147,470, Cl. 148-677.000.
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Hitachi Micro Computer Engineering Ltd.: *See—*
Nishimukai, Tadahiko; Hasegawa, Atsushi; and Matsumura, Masaru, 5,148,526, Cl. 395-275.000.
Hitachi Techno Engineering Co., Ltd.: *See—*
Mishina, Haruo; and Yamama, Shinya, 5,146,694, Cl. 34-78.000.
Hitachi VLSI Engineering Corporation: *See—*
Konno, Chisato; Ohata: Tadashi; Igai, Mitsuyoshi; Umetani, Yukio; and Yamabe, Michiru, 5,148,379, Cl. 364-578.000.
Hitchiner Manufacturing Co., Inc.: *See—*
Chandley, George D., 5,146,973, Cl. 164-63.000.
Hitomi, Mitsuo: *See—*
Hattori, Toshihiko; Hitomi, Mitsuo; Tanaka, Toshimitsu; and Yamagata, Naoyuki, 5,146,897, Cl. 123-470.000.
Hix, Clifford A., to Hix Corporation. Linkage for heat transfer machine. 5,147,496, Cl. 156-583.800.
Hix Corporation: *See—*
Hix, Clifford A., 5,147,496, Cl. 156-583.800.
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Hideo; Kinpara, Mamoru; and Watanabe, Kunihiko, to Yamaha Corporation. Musical tone control apparatus. 5,147,969, Cl. 84-600.000.
Hlavacek, Marc; Dodds, John; and Bauer, Jean-Michel, to Le Carbone Lorraine. Method of and apparatus for cleaning filters in tangential microfiltration. 5,147,552, Cl. 210-650.000.
Hlavaty, David G., to General Motors Corporation. Power sliding window for truck cab. 5,146,712, Cl. 49-118.000.
Ho, Kim S.: *See—*
Frazza, Mark S.; Ho, Kim S.; Kowalski, Alexander; Raney, Robert R.; and Vogel, Martin, 5,147,937, Cl. 525-243.000.
Hobson, Don R.; and Kinney, Edwin L. Hoof pack of polyolefin fiber and pine tar. 5,147,651, Cl. 424-443.000.
Hobson, Marshall S.: *See—*
Dalbec, Charles E.; and Hobson, Marshall S., 5,147,713, Cl. 428-229.000.
Hochiki Kabushiki Kaisha. *See—*
Shima, Hiroshi; and Shimizu, Hajime, 5,148,148, Cl. 340-539.000.
Hochstuhl, Erwin: *See—*
Gallenschutz, Thomas; Vogel, Hermann; and Hochstuhl, Erwin, 5,146,711, Cl. 49-46.000.
Hodan, John A.; Armstrong, Robert N.; and First, Robert E., to BASF Corporation. Sealing plate for a spinnerette assembly. 5,147,197, Cl. 425-192.00S.
Hodge, Dean Y.: *See—*
Ray, Robert E., Jr.; and Hodge, Dean Y., 5,148,435, Cl. 371-20.500.
Hoebener, Karl G.: *See—*
Behun, John R.; Call, Anson J.; Cappo, Francis F.; Cole, Marie S., Hoebener, Karl G.; Klingel, Bruno T.; and Milliken, John C., 5,147,084, Cl. 228-56.300.
Hoechst Aktiengesellschaft: *See—*
Brocks, Dietrich; Timpl, Rupert; and Paulsson, Mats, 5,147,782, Cl. 435-7.210.
Faust, Horst; Hultzsch, Guenter; and Nies, Reinhard, 5,147,690, Cl. 427-372.200.
Gitzel, Jorg; Macholdt, Hans-Tobias; and Knaup, Wolfgang, 5,147,748, Cl. 430-110.000.
Lotz, Andreas; Pries, Hans-Dieter; Wohner, Gerhard; and Scheuermann, Stefan E., 5,147,642, Cl. 424-94.610.
Tapper, Alexander; Buhl, Horst; and Holz, Josef, 5,147,625, Cl. 423-316.000.
Hoechst Celanese Corp.: *See—*
Hughes, O. Richard; and Kurschus, Dieter, 5,147,895, Cl. 521-64.000.
Price, Karen L., 5,147,918, Cl. 524-442.000.
Hoffa, Jack L., to Eubanks Engineering Company. Multiple blade set strip process for cable and wire. 5,146,673, Cl. 29-828.000.
Hoffman, Harry O., to Hoffman, Harry O.; and Kathleen A. Hoffman. Building plywood product and method. 5,147,486, Cl. 156-154.000.
Hoffmann, Detlef: *See—*
Rose, Thomas; and Hoffmann, Detlef, 5,148,102, Cl. 324-158.00F.
Hoffmann La-Roche, Inc.: *See—*
Albrecht, Harry A.; Chan, Ka-Kong; Keith, Dennis D.; Then Rudolf L.; and Weigele, Manfred, 5,147,871, Cl. 514-202.000.
Newman, Michael J., 5,147,854, Cl. 514-12.000.
Hofmann, Peter; Odorisio, Paul A.; Cunkle, Glen T.; and Sabrsula, Don, to Ciba-Geigy Corporation. Compositions stabilized with poly-1,3,2-oxazaphospholidines. 5,147,911, Cl. 524-95.000.
Hofmeister, Peter: *See—*
Wolf, Bernd; Theobald, Hans; Zombik, Winfried; Goetz, Norbert; Wild, Jochen; Harreus, Albrecht; Hofmeister, Peter; Kuenast, Christoph; and DeKramer, Jacobus J., 5,147,645, Cl. 424-405.000.
Hogan, Martin A.: *See—*
Leppek, Kevin G.; and Hogan, Martin A., 5,147,115, Cl. 303-105.000.
Hoge, Carl E.: *See—*
Patterson, Timothy P.; and Hoge, Carl E., 5,147,210, Cl. 439-91.000.
Hohberg, Gerhard, to Carl-Zeiss-Stiftung. Mirror for changing the geometrical form of a light beam. 5,148,326, Cl. 359-853.000.
Hohn, David C., to Board of Regents, The University of Texas System. Valved arterial catheter. 5,147,318, Cl. 604-174.000.
Hollander, Zeev: *See—*
Rishpon, Judith; Rosen, Ilana; and Hollander, Zeev, 5,147,781, Cl. 435-7.400.
Holler, Michael D.: *See—*
Dohrer, Gregory L.; Holler, Michael D.; and Nichols, Dwvane B., 5,147,709, Cl. 428-213.000.
Hollister Incorporated: *See—*
Lavender, Michael R., 5,147,340, Cl. 604-344.000.
Hollyer, Robert J., to Apple Computer, Inc. Digital phase-locked loop. 5,148,450, Cl. 375-81.000.
Holman, Curtis W.; and Moser, Bobby A. Rail anchor remover. 5,146,677, Cl. 29-243.500.
Holmberg, Hakan, to Sandvik AB. High strength stainless steel. 5,147,475, Cl. 148-327.000.
Holmes, David: *See—*
Gray, George W.; Toyne, Kenneth J.; Lacey, David; Holmes, David; and Scroston, Richard M., 5,147,577, Cl. 252-299.620.
Holmes, Richard B.: *See—*
Campbell, Blair F.; Holmes, Richard B.; Ma, Sam S.; and Guthals, Dennis M., 5,148,323, Cl. 359-738.000.
Holmes, William C., to Emerson Apparatus Co., Inc. Method and apparatus for precision cutting of corrugated paperboard specimens. 5,146,823, Cl. 83-56.000.
Holmwood, Graham: *See—*
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,147,887, Cl. 514-383.000.
Hologic, Inc.: *See—*
Stein, Jay A., 5,148,455, Cl. 378-55.000.
Holupirek, Manfred: *See—*
Jochum, Peter; Gasser, Oswald; Holupirek, Manfred; Wanek, Erich; Guggenberger, Rainer; Stefan, Klaus-Peter; and Ellrich, Klaus, 5,147,904, Cl. 523-115.000.
Holz, Josef: *See—*
Tapper, Alexander; Buhl, Horst; and Holz, Josef, 5,147,625, Cl. 423-316.000.
Holzer, William C.; and Hardy, Arthur H., Jr., to Santa Barbara Research Center. Precision ranging system. 5,148,178, Cl. 342-127.000.
Holzner, Charles R., Sr.; and Voth, Allen J., to Steiner Company, Inc. Turbo air freshener. 5,147,582, Cl. 261-30.000.
Homeo International Inc.: *See—*
Rouse, Geoffrey O., 5,146,989, Cl. 166-339.000.
Homma, Noriyuki: *See—*
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikazu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi;

Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,148,255, Cl. 357-43.000

Hommen, Winfried; Stauble, Georg; Storzinger, Thomas; Wieser, Tiberius; and Wissler, Thomas, to Knorr-Bremse AG. Electrically controllable pressure medium brake for vehicles. 5,147,114, Cl. 303-15.000

Honda Giken Kogyo K.K.: *See*—
Ishii, Yukihisa; and Inagawa, Shinichi, 5,148,092, Cl. 318-696.000

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Agatsuma, Eiji, 5,146,906, Cl. 123-64.000.

Honda, Hisashi; and Yuge, Yoji, to Toshiba Lighting & Technology Corporation. Liquid crystal display apparatus. 5,147,127, Cl. 362-23.000

Honda, Ryoji: *See*—
Nishikawa, Tomoyuki; Kita, Masaaki; Yano, Takaaki; Yoshida, Tatsuya; Honda, Ryoji; Negishi, Kiyoshi; Sato, Tsutomu; and Kamasako, Shoji, 5,148,284, Cl. 358-296.000.

Honda, Toshio: *See*—
Tsujiuchi, Junpei; Honda, Toshio; Ohyama, Nagaaki; Nagasaki, Tatsuo; and Kikuchi, Susumu, 5,148,502, Cl. 382-54.000.

Honeywell Inc.: *See*—
Albers, Steven C.; Callaghan, Timothy J.; Seiber, Bruce A.; Toth, Theodore A.; Derry, Robert W. and Podgorski, Theodore J., 5,148,076, Cl. 310-323.000
Anjan, Yellapu; Habbel, Sam; and Staraceski, Joseph F., 5,148,508, Cl. 385-51.000
Beard, Kirby W., 5,147,739, Cl. 428-194.000.
Biard, James R., 5,148,303, Cl. 359-170.000
Blake, James; Dane, Preston; and Dunkwort, Rudolf, 5,148,236, Cl. 356-350.000

Honig, Jordan: *See*—
Hudson, Derek; Honig, Jordan; Cook, Ronald M.; and Ng, Douglas J., 5,147,608, Cl. 422-63.000

Hoover Universal, Inc.: *See*—
Marshall, Dennis L.; Tekkanat, Bora; and McKinney, Bryan L., 5,147,057, Cl. 220-268.000

Hopkins, P. Donald: *See*—
Kukes, Simon G.; Clark, Frederick T.; and Hopkins, P. Donald, 5,147,526, Cl. 208-111.000

Hopper, Daniel H.: *See*—
Brinkman, Norman D.; Dasch, Cameron J.; Rockwell, Lynn A.; and Hopper, Daniel H., 5,146,88 , Cl. 123-179.500.

Horacek, Heinrich, to Chemie Linz Gesellschaft m.b.H. Use of spirocyclic boric acid esters as flame retardants in plastics. 5,147,914, Cl. 524-185.000.

Hori, Chikaharo, to Kabushiki Kaisha Toshiba. Adder-subtracter for signed absolute values. 5,148,386, Cl. 364-768.000

Hori, Katsuya: *See*—
Wong, Alan; Hori, Katsuya; and Yoshida, Tadao, 5,148,417, Cl. 369-32.000

Hori, Ryoichi: *See*—
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikazu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,148,255, Cl. 357-43.000

Horiba, Ltd.: *See*—
Koike, Hideki; and Aoki, Junji, 5,147,426, Cl. 55-270.000

Horikami, Kinji, to Matsushita Electric Industrial Co., Ltd. Soldering appearance inspection apparatus. 5,148,375, Cl. 364-552.000

Horikomi, Kazutoshi: *See*—
Mizuchi, Akira; Horikomi, Kazutoshi; Sasaki, Tadayuki; Awaya, Akira; Tomino, Ikuo; Takesue, Mitsuyuki; and Kihara, Noriaki, 5,147,876, Cl. 514-275.000.

Hornby, Michael J.: *See*—
Imoehl, William J.; and Hornby, Michael J., 5,146,896, Cl. 123-470.000

Horner, Joseph L.; and Flavin, Mary A., to United States of America, Air Force. Averaged amplitude encoded phase-only filters for use in Fourier transform optical correlators. 5,148,316, Cl. 359-561.000.

Horsma, David A.: *See*—
Fang, Shou-Mean; Horsma, David A.; Peronnet, Guillaume; Fahey, Timothy E.; Au, Andrew N.; and Carlomagno, William D., 5,148,005, Cl. 219-505.000

Horton, Kenneth W.: *See*—
Shank, Peter J.; and Horton, Kenneth W., 5,147,317, Cl. 604-164.000

Horton, Ralph M.: *See*—
Chow, Jacob; Horton, Ralph M.; and Jones, Mark L., 5,147,001, Cl. 175-428.000

Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 5,146,808, Cl. 74-531.000.

Hoshino, Shunji; and Ohkuma, Hiroya, to Nikon Corporation. Signal processing circuit for magnetooptical record/reproducing apparatus 5,148,416, Cl. 369-32.000

Hoshino, Toshihiko: *See*—
Sakamoto, Shunji; and Hoshino, Toshihiko, 5,148,363, Cl. 364-143.000

Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Angle adjusting mechanism for an article support. 5,146,8 8, Cl. 74-531.000

Hoshinoughi, Susumu; Yoshida, Akio; and Kawazu, Akinobu, to Mitsubishi Denki Kabushiki Kaisha. Method of exposing printed wiring boards having through holes. 5,147, 60, Cl. 430-296.000.

Hosoya, Yukiteru: *See*—
Sato, Masaei; and Hosoya, Yukiteru, 5,146,799, Cl. 74-89.140.

Hosseini, Javad, to Caterpillar Inc. Automatic ride control. 5,147,172, Cl. 414-719.000.

Hotea, Gheorghe; and Hass, Jurgen, to AMP Incorporated. Sealed electrical connector. 5,147,222, Cl. 439-589.000

Hotta, Yasuhiro, to Sharp Kabushiki Kaisha. Sense amplifier circuit using dummy memory cells. 5,148,063, Cl. 307-530.000.

Hougham, Gareth G.: *See*—
Chance, Dudley A.; Hougham, Gareth G.; and Goland, David B., 5,147,484, Cl. 156-89.000

Houghton, Kenneth S.: *See*—
Deevi, Seetharama C.; Deevi, Sarojini; Hajaligol, Mohammad R.; and Houghton, Kenneth S., 5,146,934, Cl. 131-359.000

Houryu, Sakae: *See*—
Suda, Shigeyuki; Houryu, Sakae; and Nose, Noriyuki, 5,148,037, Cl. 250-548.000

House, Roy F.: *See*—
Cowan, Jack C.; House, Roy F.; and Harrington, Andree H., 5,147,852, Cl. 507-104.000

Houston, Michelle L.; and Greig, Kevin M., to Zimmer, Inc. Femoral component for a knee joint prosthesis having a modular cam and stem. 5,147,406, Cl. 623-20.000

Hovarter, Len A., to General Motors Corporation. Increased efficiency valve system for a fluid pumping assembly. 5,147,190, Cl. 417-571.000.

Howard, Harry R., Jr., to Pfizer Inc. 4-(1,2-benzisoxazolyl)piperidine antipsychotic agents. 5,147,881, Cl. 514-321.000

Howng, Wei-Yean: *See*—
Franzak, Agnes A.; and Howng, Wei-Yean, 5,147,835, Cl. 501-134.000.

Hoy, Robert W.: *See*—
Ellison, James R.; and Hoy, Robert W., 5,147,714, Cl. 428-254.000.

Hoya Corporation: *See*—
Kageyama, Mayumi; Sawamoto, Takeyuki; Tarumi, Niro; and Sakai, Hiroshi, 5,147,396, Cl. 623-6.000

Hromas, Joe C.; Edwards, A. Glen; and Huber, Klaus B., to Schlumberger Technology Corporation. Hydrostatic setting tool including a selectively operable apparatus initially blocking an orifice disposed between two chambers and opening in response to a signal. 5,146,983, Cl. 166-65.100

Hsieh, Hung-Cheng, to XILINX, Inc. Memory cell with known state on power up. 5,148,390, Cl. 365-95.000.

Hsu, Charles J. Oil and/or water detection apparatus. 5,146,778, Cl. 73-61.410.

Hsu, Robert: *See*—
Lin, Steve; Kao, Kent; and Hsu, Robert, 5,148,380, Cl. 364-707.000

Hsueh, Paul; Smith, Douglas; and Hershkowitz, Gerald B., to Motorola, Inc. ECL to CMOS translation and latch logic circuit. 5,148,061, Cl. 307-475.000.

Hua, Kein A.: *See*—
Celtruda, Joseph O.; Hua, Kein A.; Hunt, Anderson H.; Liu, Lishing; Peir, Jih-Kwon; Pruett, David R.; and Temple, Joseph L., III, 5,148,538, Cl. 395-425.000

Huang, Hong-Yuan; and Huang, Kuo-Feng. Wrap film cutter 5,146,828, Cl. 83-570.000

Huang, Kuo-Feng: *See*—
Huang, Hong-Yuan; and Huang, Kuo-Feng, 5,146,828, Cl. 83-570.000.

Huang, Ming-Tai. Device for attaching a seat to a stroller. 5,146,656, Cl. 24-265.00C

Huang, Yung-Hsiang; Soerens, Dave A.; Lachapell, Ruth A.; and Linker, Paul M., III, to Kimberly-Clark Corporation. Disposable garment having a refastenable adhesive taping system. 5,147,347, Cl. 604-390.000

Huber, Klaus B.: *See*—
Hromas, Joe C.; Edwards, A. Glen; and Huber, Klaus B., 5,146,983, Cl. 166-65.100.

Huber, Terrence D.; Kutsch, Duane B.; and Skinfill, Donald R., to American Electronic Sign Company. Electronic display device having a plurality of pixel elements. 5,148,156, Cl. 340-783.000.

Hubis, Walter A.: *See*—
Gordon, David W.; Stallmo, David C.; Warner, David M.; Brant, William A.; and Hubis, Walter A., 5,148,432, Cl. 371-10.100.

Huck Manufacturing Co.: *See*—
Rosier, Hendrik E., 5,146,773, Cl. 72-391.400.

Huddleston, David A.; Gabel, Robert K.; and Williamson, Charles D., to Nalco Chemical Company. Method for reducing fluid loss from oilfield cement slurries using vinyl grafted wattle tannin. 5,147,964, Cl. 527-400.000.

Hudson, Derek; Honig, Jordan; Cook, Ronald M.; and Ng, Douglas J., to Millipore Corporation. Apparatus and process for performing repetitive chemical processing. 5,147,608, Cl. 422-63.000

Hudson, Peter W., to Hallis Hudson Group Limited. Mounting bracket 5,146,648, Cl. 16-94.00R

Hueber, Joseph, to Sulzer Brothers Limited. Driving and supply unit for a cooler. 5,147,425, Cl. 55-230.000

Huels Aktiengesellschaft: *See*—
Hellermann, Walter; Herrmann, Christoph; Nordsiek, Karl-Heinz; Wolpers, Jurgen; and Fuchs, Hans-Bernd, 5,147,939, Cl. 525-314.000

Huff, Richard G.: *See*—
Edmonston, Don R.; and Huff, Richard G., 5,147,432, Cl. 65-3.110.

Hughes Aircraft Company: *See*—
Amboss, Kurt; and Hart, Stephen L., 5,148,131, Cl. 333-26.000.
Estes, Earl M., Jr., 5,148,358, Cl. 363-24.000.
Gratrix, Edward; and Zarowin, Charles, 5,148,319, Cl. 359-642.000
Pasiecznik, John, Jr., 5,148,103, Cl. 324-158.00P

Hughes, Jodie K., to Convergent Technologies, Inc. Modular expansion bus configuration. 5,148,389, Cl. 395-800.000

Hughes, Joel J., to Container Products Corporation. Robotic decontamination apparatus. 5,147,002, Cl. 180-6.500.

Hughes, O. Richard; and Kurschus, Dieter, to Hoechst Celanese Corp. Highly porous compressible polymeric powders. 5,147,895, Cl. 521-64.000.

Huijgen, Hendrik: *See*—
de Haan, Gerard; and Huijgen, Hendrik, 5,148,269, Cl. 358-105.000.

Hulkkonen, Tuomo, to A. Ahlstrom Corporation. Boiler and a supported heat transfer bank. 5,146,878, Cl. 122-510.000

Hultzsch, Guenter: *See*—
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Hunt, Anderson H.: *See*—
Celtruda, Joseph O.; Hua, Kein A.; Hunt, Anderson H.; Liu, Lishing; Peir, Jih-Kwon; Pruett, David R.; and Temple, Joseph L. III, 5,148,538, Cl. 395-425.000

Hunt Holdings, Inc.: *See*—
Staniszewski, Tadeusz, 5,147,275, Cl. 493-416.000.

Hunt, Lewis. Three zone bed cover with an inflatable human form 5,146,634, Cl. 5-486.000

Hunt, Robert E.: *See*—
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Hunter, Andrew F.: *See*—
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Parker, Donald L.; Newton, Jerry L.; Reuter, David F.; and Huntzicker, Fred W., 5,147,116, Cl. 303-115.0EC.

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Strehler, Richard; and Bartl, Max, 5,147,255, Cl. 475-311.000.

Husler, Rinaldo: *See*—
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Garg, Diwakar; Lynn, Sui-Yuan; Iampietro, Robert L.; Wrecsics, Ernest L.; and Dyer, Paul N., 5,147,687, Cl. 427-249.000

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ICI Australia Operations Proprietary Limited: *See*—
Beattie, Timothy A.; and Felice, Jeffrey J., 5,148,176, Cl. 342-104.000

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Ramakers, Hubert-Pierre-Eugene, 5,147,633, Cl. 424-56.000

ICI Resins BV: *See*—
Pears, David A.; and Heuts, Martinus P. J., 5,147,925, Cl. 524-589.000.

Ideal Instruments, Inc.: *See*—
Stewart, R. Glen, 5,147,295, Cl. 604-61.000.

Idemitsu Kosan Co., Ltd.: *See*—
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Bernhardt, Bruno, 5,147,535, Cl. 210-138.000

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Kamin, Ralph A.; Hall, Lee O.; and Leland, Jonathan K., 5,147,806, Cl. 436-149.000.

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Iida, Hiroshi; Kuriki, Kyoichi; and Kuninaka, Hitoshi, to NEC Corporation. Ion thruster for interplanetary space mission. 5,146,742, Cl. 60-202.000

Iida, Shigeki: *See*—
Takiguchi, Yasuyuki; Iida, Shigeki; and Toyooka, Takehiro 5,147,682, Cl. 427-58.000

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Ijiri, Masaaki: *See*—
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Ilenda, Casmir S.; Dunkelberger, David L.; and Labanoski, Dennis J., to Rohm and Haas Company. Polyolefin compositions with improved impact strength. 5,147,932, Cl. 525-71.000

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Frano, Francis G., 5,146,657, Cl. 24-265.00H

Imaizumi, Masaki. *See*—
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Imaizumi, Tomoaki: *See*—
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Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 5,146,789, Cl. 73-861.910

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Imanishi, Masaharu: *See*—
Sato, Tadashi, Imanishi, Masaharu; and Iwai, Katsuhiko, 5,146,862, Cl. 112-275.000

Imao, Kaoru; and Ohuchi, Satoshi, to Ricoh Company, Ltd. Line region segmentation method. 5,148,49 , Cl. 382-9.000

Imaoka, Kazunori: *See*—
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Imatou, Shinji: *See*—
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Imken, Ronald L.: *See*—
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Imperial Chemical Industries PLC: *See*—
Beck, Michael W.; and Flanagan, John, 5,147,476, Cl. 149-37.000
Lansbury, Robert C.; and Mitchell, Douglas L., 5,147,696, Cl. 428-36.400.
Pears, David A.; and Heuts, Martinus P. J., 5,147,925, Cl. 524-589.000

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Ota, Yorito; Inada, Masanori, and Yanagihara, Manabu, 5,147,775, Cl. 437-31.000

Inagaki, Yoshitaka; Suzuki, Akira; and Mushika, Sadahiko, to Aisin Seiki K.K. Pumping drive unit, 5,147,092, Cl. 623-3.000

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Ishii, Yukihisa; and Inagawa, Shinichi, 5,148,092, Cl. 318-696.000

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Incorvia, Samuel A.: *See*—
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Indena S.p.A.: *See*—
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Chang, Chau-Ting; Shei, Cheng-Yeu; and Liu, Ru-Shi, 5,147,848, Cl. 505-1.000
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Infilco Degremont Inc.: *See*—
Nichols, William R., 5,147,560, Cl. 210-745.000

Ing. Erich Pfeiffer Gmbh & Co. KG: *See*—
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Inglis, Stephen C.; and Herb, Carl C., to Carrier Corporation. Air terminal apparatus, 5,147,243, Cl. 454-323.000

Inmos Limited: *See*—
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Inoue, Akifumi, to Kabushiki Kaisha Toshiba. Computer system with monochrome display unit capable of converting color code to gradation code. 5,148,518, Cl. 395-131.000

Inoue, Atsushi: *See*—
Ogawa, Takahiro; Inoue, Atsushi; Koga, Kazuhiko; Ito, Kiyotaka; and Ueta, Yutaka, 5,146,671, Cl. 29-603.000

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Miyahara, Yoshiki; Kasetani, Satoshi; Nishimura, Shigetaka; Hirsoe, Kunihiro; Inoue, Takashi; and Nogi, Takashi, 5,147,712, Cl. 428-224.000

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Newby, Paul S.; and Cannon, Wayne H., 5,148,453, Cl. 375-116.000

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Xiong, Tian-Yu, 5,147,201, Cl. 431-326.000

Instrumentarium Corp.: *See*—
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Intermedics Orthopedics, Inc.: *See*—
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International Business Machines Corporation: *See*—
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Araps, Constance J.; Casey, Jon A.; Divakaruni, Renuka S.; Kandetzke, Steven M.; and Lotsko, Catherine A., 5,147,741, Cl. 430-5.000
Basso, Claude; Lebizay, Gerald; Munier, Jean-Marie; and Pauporte, Andre, 5,148,527, Cl. 395-325.000
Beardsley, Brent C.; Boulia, Lawrence H.; and Vosacek, Robert H., 5,148,540, Cl. 395-575.000
Behun, John R.; Call, Anson J.; Cappo, Francis F.; Cole, Marie S.; Hoebener, Karl G.; Klingel, Bruno T.; and Milliken, John C., 5,147,084, Cl. 228-56.300.
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International Pipe Machinery Corporation: *See*—
Adly, Tarek A., 5,147,196, Cl. 425-145.000

International Seaboard Corp.: *See*—
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Intertrack Management, Inc.: *See*—
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Intra Corporation: *See*—
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Irish, Michael J.: *See*—
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Ishihara Sangyo Kaisha, Ltd.: *See*—
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Ishii, Kazuo: *See*—
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Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi, Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000

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Mouri, Hiroshi; Kawaguchi, Yasuyoshi; Ishii, Michio; Iwafune, Seiichiro; and Iwata, Toshiro, 5,147,477, Cl. 152-209.00R

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Ishikawa, Shuuichi, to Nippon Seiko Kabushiki Kaisha. Hub unit with pulse rotor and cover mounted sensor for sensing rotational speed, 5,148,104, Cl. 324-173.000.

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Ishitani, Tohru: *See*—
Umemura, Kaoru; Schichi, Hiroyasu; and Ishitani, Tohru, 5,148,027, Cl. 250-309.000

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Kobayashi, Kazuo; Toki, Akio; Ito, Koichi; and Kuroki, Hisanori, 5,148,470, Cl. 379-58.000

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Kawai, Taneichi; Fujie, Naofumi; Imaizumi, Tomoaki; and Ito, Koji, 5,148,312, Cl. 359-507.000

Ito, Paul H., to Rockwell International Corporation. Low power tiltmeter electronics with compensation for bubble level fluid temperature, 5,146,688, Cl. 33-366.000

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Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,147,265, Cl. 482-119.000.

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Mouri, Hiroshi; Kawaguchi, Yasuyoshi; Ishii, Michio; Iwafune, Seiichiro; and Iwata, Toshiro, 5,147,477, Cl. 152-209.00R

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Iwai, Katsuhiko: *See*—
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Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, to Canon Kabushiki Kaisha. Liquid jet recording head with nonlinear liquid passages and liquid jet recording apparatus having same 5,148,192, Cl. 346-140.00R

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Jain, Adish; Meistrick, Zdenek S.; and Pitzi, Vincent J., 5,146,754, Cl. 60-602.000.

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Jardet, Gilles: *See*—
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Jasper, Louis J., Jr.: *See*—
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Persyk, Dennis E.; Jazbec, Ivan; and Enders, Albrecht H., 5,148,029, Cl. 250-361.00R.

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Kajima Corporation: *See*—
Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi; Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000
Saito, Masao; Ban, Shigeru; Takita, Yoshio; Mihara, Yoshiki; and Takahashi, Shinichi, 5,146,719, Cl. 52-80.000

Kajiwara, Kunio: *See*—
Tanaka, Takeshi; and Kajiwara, Kunio, 5,146,899, Cl. 123-494.000

Kajiyama, Kazuyuki: *See*—
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 5,147,661, Cl. 425-150.000

Kajola, Matti J.: *See*—
Ahonen, Antti I.; Kajola, Matti J.; and Simola, Juha T. A., 5,148,262, Cl. 357-68.000

Kakiwaki, Shigeaki: *See*—
Asai, Shigemi; Furukawa, Masanobu; Kakiwaki, Shigeaki; Iwamatsu, Tadashi; and Okuda, Tohru, 5,148,336, Cl. 360-95.000

Kakkad, Ramesh H.: *See*—
Liu, Gang; Kakkad, Ramesh H.; and Fonash, Stephen J., 5,147,826, Cl. 437-233.000

Kako, Kunio: *See*—
Shimura, Seiji; Sugiya, Masashi; Hara, Yoshifusa; Kako, Kunio; and Saito, Akira, 5,147,409, Cl. 8-128.100

Kakubo, Yuji: *See*—
Ikegaya, Yuji; Sakai, Shinichi; Kakubo, Yuji; and Konagai, Yusuke, 5,148,384, Cl. 364-728.010

Kakugo, Masahiro: *See*—
Abe, Hiroomi; Nishio, Taichi, Suzuki, Yasurou; Sanada, Takeshi; and Kakugo, Masahiro, 5,147,942, Cl. 525-397.000

Kakuta, Yoshinori: *See*—
Tomita, Masami; Kishikawa, Seiji; and Kakuta, Yoshinori, 5,148,332, Cl. 360-92.000

Kakuyama, Shinji, to Sony Corporation. PCM audio signal recording and/or reproducing apparatus with recording-mode identifying signal. 5,148,328, Cl. 360-27.000

Kallenbach, Lyle R.: *See*—
Herd, Melvin D.; and Kallenbach, Lyle R., 5,147,719, Cl. 428-332.000

Kallok, Michael J.; and Markowitz, H. Toby, to Medtronic, Inc. Demand apnea control of central and obstructive sleep apnea. 5,146,918 Cl. 128-419.00G

Kalman, Istvan: *See*—
Nemeth, Peter; Dancs, Tibor; Simmons, Robert L.; and Kalman, Istvan, 5,146,820, Cl. 83-37.000

Kalz, Dietmar: *See*—
Klinksiek, Bernd; Kalz, Dietmar; Gerdes, Carsten; Kummeler, Ferdinand; Heinrich, Gunter; Reizlein, Karl; and Zimmermann, Manfred, 5,147,412, Cl. 23-293.00R

Kam-Ng, Mamie: *See*—
Tsaur, Allen K.; and Kam-Ng, Mamie, 5,147,771, Cl. 430-569.000
Tsaur, Allen K.; and Kam-Ng, Mamie, 5,147,772, Cl. 430-569.000
Tsaur, Allen K., and Kam-Ng, Mamie, 5,147,773, Cl. 430-569.000

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Kamasako, Shoji: *See*—
Nishikawa, Tomoyuki; Kita, Masahiro; Yano, Takaaki; Yoshida, Tatsuya; Honda, Ryoji; Negishi, Kiyoshi; Sato, Tsutomu; and Kamasako, Shoji, 5,148,284, Cl. 358-296.000

Kamata, Yoshiyuki: *See*—
Yanagawa, Hisaharu; Kamata, Yoshiyuki; Ueki, Ken; and Miyazawa, Hidehisa, 5,148,505, Cl. 385-16.000

Kamba, Motoi: *See*—
Ito, Haruki; Maeda, Kenzou; Miyazaki, Nobuyuki; Unoki, Masao, Sagawa, Chiaki; and Kamba, Motoi, 5,147,934, Cl. 525-124.000

Kamei, Toshiaki: *See*—
Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi; Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000

Kamifuji, Hiroshi: *See*—
Itakura, Tomiya; and Kamifuji, Hiroshi, 5,146,898, Cl. 123-492.000

Kamikanda, Osamu: *See*—
Nozawa, Toshihisa; Kamikanda, Osamu; Yoshida, Yukimasa; and Okano, Haruo, 5,147,497, Cl. 156-626.000

Kamin, Ralph A.; Hall, Lee O.; and Leland, Jonathan K., to Igen, Inc. Method and apparatus for conducting electrochemiluminescence measurements. 5,147,806, Cl. 436-149.000.

Kamioka, Nobuo: *See*—
Okura, Akimitsu; Chou, Toushoku; and Kamioka, Nobuo, 5,147,588, Cl. 264-29.700

Kamisaku, Takeshi: *See*—
Hiromoto, Shuji; Kitamura, Roh; Yoshino, Fumitaka; Kamisaku, Takeshi; and Takehana, Toshihiro, 5,147,097, Cl. 280-691.000

Kamitakahara, Hirofumi, to Canon Kabushiki Kaisha. Process for producing molding stamper for data recording medium substrate. 5,147,763, Cl. 430-320.000

Kamitakahara, Hirofumi: *See*—
Sato, Tetsuya; Kanome, Osamu; Yoshino, Hitoshi; Kamitakahara, Hirofumi; Hayashi, Hisanori; and Santoh, Tsuyoshi, 5,147,592, Cl. 264-167.000

Kan, William. Irradiation loading apparatus. 5,147,282, Cl. 600-1.000.

Kanamaru, Tsuneo; Nozaki, Yukimasa; and Muroi, Masayuki, to Takeda Chemical Industries, Ltd. TA N-1120, its derivatives, production and use thereof. 5,147,860, Cl. 514-34.000

Kanamaru, Yoshihiko: *See*—
Tokizawa, Minoru; Kanamaru, Yoshihiko; Matsumoto, Masaru; Asaoka, Takemitsu; Matsuda, Hideaki; Kuraishi, Tadayuki; Maebashi, Kazunori; Taido, Naokata; and Kawahara, Ryuichi, 5,147,886, Cl. 514-383.000

Kanao, Yoshiyuki: *See*—
Nagamune, Akio; Tezuka, Kouichi; Kanao, Yoshiyuki; and Komine, Isamu, 5,148,177, Cl. 342-124.000

Kanaya, Kazuo: *See*—
Kiyoura, Tadamitsu; Ajioka, Masanobu; Fujimoto, Naoshi; Suzuki, Toshihide; Kogure, Yasuo; Nagayama, Tokio; and Kanaya, Kazuo, 5,147,624, Cl. 423-502.00

Kandetzke, Steven M.: *See*—
Araps, Constance J.; Casey, Jon A.; Divakaruni, Renuka S.; Kandetzke, Steven M.; and Lotsko, Catherine A., 5,147,741, Cl. 430-5.000

Kane, Joji; and Nohara, Akira, to Matsushita Electric Industrial Co., Ltd. Signal processing apparatus for separating voice and non-voice audio signals contained in a same mixed audio signal. 5,148,484, Cl. 381-46.000

Kane, Patricia B.; and Halvorson, June G. Systems for collecting urine and other body fluids. 5,147,342, Cl. 604-356.000

Kane, Robert C., to Motorola, Inc. Field emission device employing a concentric post. 5,148,078, Cl. 313-309.000

Kang, Jung W.; Seaver, Gary B.; and Hashimoto, Takatsugu, to Bridgestone/Firestone, Inc. Method for preparing ultra high molecular weight copolymers of conjugated dienes and aromatic vinyl compounds. 5,147,951, Cl. 526-173.000.

Kang, Sung K.; Palmer, Michael J.; Heiley, Timothy C.; and Topa, Robert D., to International Business Machines Corporation. Thermo-compression bonding in integrated circuit packaging. 5,148,261, Cl. 357-67.000

Kannabiran, Rengan, to Corning Incorporated. Composite buffer optical fiber cables. 5,148,509, Cl. 385-109.000

Kanno, Itaru: *See*—
Ohmori, Toshiaki; Kanno, Itaru; and Fukumoto, Takaaki, 5,147,466, Cl. 134-7.000

Kano, Kenji; Yamada, Yusuke; Arimoto, Masao; and Uehata, Shoji, to Mitsubishi Denki Kabushiki Kaisha. Class-AB push-pull drive circuit. 5,148,120, Cl. 330-264.000

Kanome, Osamu: *See*—
Sato, Tetsuya; Kanome, Osamu; Yoshino, Hitoshi; Kamitakahara, Hirofumi; Hayashi, Hisanori; and Santoh, Tsuyoshi, 5,147,592, Cl. 264-167.000

Kansai Paint Co., Ltd.: *See*—
Nishida, Reizirо; and Tominaga, Akira, 5,147,906, Cl. 523-410.000

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Okada, Hideaki, 5,146,748, Cl. 60-54.000

Kanzaki, Mitsuru: *See*—
Takeuchi, Masaki; Yasuda, Mitsuhiro; and Kanzaki, Mitsuru, 5,147,445, Cl. 71-92.000

Kanzaki, Toshihiro; Sugawara, Akira; Amatsu, Isamu; and Hatakeyama, Kouichi, to Dowa Mining Co. Ltd. Process for producing copper-based alloys having high strength and high electric conductivity. 5,147,469, Cl. 148-684.000

Kao Corporation: *See*—
Ara, Katsutoshi; Igarashi, Kazuaki; Saeki, Katsuhisa; and Ito, Susumu, 5,147,795, Cl. 435-210.00
Ara, Katsutoshi; Saeki, Katsuhisa; Igarashi, Kazuaki; and Ito, Susumu, 5,147,796, Cl. 435-210.00

Kao, Kent: *See*—
Lin, Steve; Kao, Kent; and Hsu, Robert, 5,148,380, Cl. 364-707.000

Kapak Corporation: *See*—
Richison, Cecil; and Bell, Gary M., 5,147,272, Cl. 493-195.000.

Kapil, Sushil K., to Westinghouse Electric Corp. Nuclear reactor core having nuclear fuel and composite burnable absorber arranged for power peaking and moderator temperature coefficient control. 5,147,598, Cl. 376-419.000

Kaplan, Donald S.; Kennedy, John; and Muth, Ross R., to United States Surgical Corporation. Connective tissue prosthesis. 5,147,400, Cl. 623-13.000

Kapton, Kenneth: *See*—
Wixey, Barry D.; Kapton, Kenneth; Wilson, Raymond L.; and Baird, Charles J., 5,146,807, Cl. 74-479.000.

Karam, Georges; and Sari, Hikmet, to U.S. Philips Corporation. Adaptive predistortion circuit with memory. 5,148,448, Cl. 375-60.000

Kariya, Tadaaki: *See*—
Okutsu, Mitsuhiko; Abe, Kenji; and Kariya, Tadaaki, 5,148,049, Cl. 307-270.000

Karl, David H.: *See*—
Dionisio, Vito, Jr.; Bradford, William M.; Karl, David H.; and Gilmore, Peter B., 5,147,990, Cl. 200-16.00R.

Karl Lautenschlager GmbH & Co. KG: *See*—
Berger, Horst, 5,147,123, Cl. 312-348.100.

Karl Thomae GmbH: *See*—
Psiorz, Manfred; and Trach, Volker, 5,147,882, Cl. 514-325.000

Karlquist, Richard, to Hewlett-Packard Company. Atomic beam frequency standard having RF chain with higher frequency oscillator. 5,148,122, Cl. 331-3.000

Karo, Wolf: *See*—
Siepser, Steven B.; Halpern, B. David; and Karo, Wolf, 5,147,394, Cl. 623-6.000

Karpisek, Ladislav S. Container discharge side door. 5,147,061, Cl. 220-334.000

Kartheus, Holger: *See*—
Heimerl, Albert; and Kartheus, Holger, 5,147,381, Cl. 606-219.000

Kasai, Makoto, to Mitsuba Electric Manufacturing Co. Ltd. Hollow shaft. 5,147,144, Cl. 403-259.000

Kasai, Toshihiro: *See*—
Nakane, Rintaro; Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Miura, Kunihiko; Tomura, Shinya; and Kohyama, Mitsuaki, 5,148,218, Cl. 355-208.000

Kaschemekat, Jurgen: *See*—
Wijmans, Johannes G.; Kaschemekat, Jurgen; and Baker, Richard W., 5,147,550, Cl. 210-640.000

Kasetani, Satoshi: *See*—
Miyahara, Yoshiki; Kasetani, Satoshi; Nishimura, Shigetaka; Hirsoe, Kunihiro; Inoue, Takashi; and Nogi, Takashi, 5,147,712, Cl. 428-224.000

Kashida, Motokazu; Takei, Masahiro; Takahashi, Kouji; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Rotary head type recording and reproducing apparatus for information and additional codes. 5,148,331, Cl. 360-77.150.

Kasik, John P., to Stewart Systems, Inc. Continuous proofing and baking apparatus having magnetic conveyor system. 5,147,033, Cl. 198-803.600

Kathleen A. Hoffman: *See*—
Hoffman, Harry O., 5,147,486, Cl. 156-154.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Process for producing electrophotographic light-sensitive material. 5,147,752, Cl. 430-134.000

Kato Hatsujo Kaisha, Ltd.: *See*—
Ishikawa, Toichi; and Asano, Hiroyuki, 5,147,319, Cl. 604-174.000.

Kato, Isao: *See*—
Morimoto, Kiyotake; Takagi, Yasushi; Kato, Isao; and Nakata, Masahiko, 5,147,897, Cl. 521-125.000

Kato, Kiroyuki: *See*—
Morita, Toshiki; Nikawa, Takeshi, Kato, Kiroyuki; and Suzuki, Masashi, 5,147,143, Cl. 400-279.000

Kato, Minoru, to Canon Denshi Kabushiki Kaisha. Magnetic head having a filler plate arranged between two magnetic core assemblies. 5,148,342, Cl. 360-121.000

Kato, Shigeru: *See*—
Goto, Hisashi; Imaizumi, Masaki; and Kato, Shigeru, 5,148,321, Cl. 359-689.000

Kato, Shiro; Juri, Tatsuro; and Nishino, Masakazu, to Matsushita Electric Industrial Co., Ltd. Method for transmission of variable length code and apparatus for coding a video signal. 5,148,271, Cl. 358-133.000

Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, to Tokico Ltd. Turbine flowmeter. 5,146,789, Cl. 73-861.910.

Kato, Takashi; Ito, Takashi; and Maeda, Mamoru, to Fujitsu Limited. Semiconductor device having thin film wiring layer of aluminum containing carbon. 5,148,259, Cl. 357-67.000.

Kato, Takashi: *See*—
Nishimoto, Shinobu; Hirakawa, Etsuke; Fukuzawa, Minoru; Kato, Takashi; and Tani, Akio, 5,147,959, Cl. 528-48.000

Kato, Yasuyuki: *See*—
Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma, Mikio; and Kato, Yasuyuki, 5,147,434, Cl. 65-12.000.

Kato, Yuji: *See*—
Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Sasaki, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinich, 5,146,891, Cl. 123-325.000

Katoh, Kazunobu; and Okada, Hisashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,147,755, Cl. 430-264.000

Katoh, Kazunobu: *See*—
Okamura, Hisashi; Okada, Hisashi; Yagihara, Morio; and Katoh, Kazunobu, 5,147,754, Cl. 430-264.000.

Katoh, Shigeo: *See*—
Sada, Eizo; Katoh, Shigeo; Kondo, Akihiko; and Kishimura, Masaaki, 5,147,537, Cl. 210-198.200

Katsuno, Hiroshi: *See*—
Ono, Katsuhisa; Eguchi, Yasuhito; Shindo, Mitsuyoshi; and Katsuno, Hiroshi, 5,148,187, Cl. 346-76.0PH.

Kaufman, Benjamin J.: *See*—
DeRosa, Thomas F.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,147,569, Cl. 252-47.500.

DeRosa, Thomas F.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,147,571, Cl. 252-51.50R

Kawabata, Motonobu, to Dainippon Screen Mfg. Co., Ltd. Optical beam scanning system. 5,148,304, Cl. 359-207.000

Kawabe, Hiroshi; and Watanabe, Toshiyuki, to Bridgestone Corporation. Air filling apparatus for tire. 5,146,969, Cl. 157-1.100

Kawaguchi, Fumio; Takeuchi, Hiroshi; Mitsui, Yasuhiro; Ito, Yoshitoshi; and Haida, Munetaka, to Hitachi, Ltd. Method for optically inspecting human body and apparatus for the same. 5,148,022, Cl. 250-341.000

Kawaguchi, Tetsuo: *See*—
Uda, Taizo; Itoh, Yukikatsu; Kawaguchi, Tetsuo; Hifumi, Emi; Taniguchi, Naoyuki; Suzuki, Kenichiro; Ishikawa, Mutsuo; and Noji, Shirou, 5,147,783, Cl. 435-7.230

Kawaguchi, Yasuyoshi: *See*—
Mouri, Hiroshi; Kawaguchi, Yasuyoshi; Ishii, Michio; Iwafune, Seiichiro; and Iwata, Toshiro, 5,147,477, Cl. 152-209.00R

Kawahara, Ryuichi: *See*—
Tokizawa, Minoru; Kanamaru, Yoshihiko; Matsumoto, Masaru; Asaoka, Takemitsu; Matsuda, Hideaki; Kuraishi, Tadayuki; Maebashi, Kazunori; Taido, Naokata; and Kawahara, Ryuichi, 5,147,886, Cl. 514-383.000

Kawai, Kenji: *See*—
Maruyama, Takahiro; Ogawa, Toshiaki, Morita, Hiroshi; Ishida, Tomoaki; and Kawai, Kenji, 5,147,465, Cl. 134-1.000

Kawai, Takaji; and Handa, Kenichi, to Sanshin Kogyo Kabushiki Kaisha. Propeller driving system for marine propulsion unit. 5,147,231, Cl. 440-75.000

Kawai, Taneichi; Fujie, Naofumi; Imaizumi, Tomoaki; and Ito, Koji, to Aisin Seiki Kabushiki Kaisha. Cleaning apparatus for removing foreign substances from a surface variously including a curved member, expanding-contracting vibrator means, and spacer means including a through hole or a depressed region. 5,148,312, Cl. 359-507.000

Kawai, Yoshio: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 5,146,789, Cl. 73-861.910

Kawakami, Akira, to Konica Corporation. Magnetic recording medium comprising a magnetic layer and a backcoat layer. 5,147,720, Cl. 428-336.000

Kawakami, Hiroyoshi: *See*—
Tsuchida, Eishun; Nishide, Hiroyuki; and Kawakami, Hiroyoshi, 5,147,424, Cl. 55-158.000

Kawasaki, Masayuki, and Takatani, Kiyomitsu, to Kabushiki Kaisha Toshiba. CMOS output circuit having controlled slope. 5,148,048, Cl. 307-263.000

Kawasaki Steel Corporation: *See*—
Ogishi, Hideo; Takao, Kenji; Umino, Shigeru; and Yamato, Koji, 5,147,729, Cl. 428-623.000
Ogishi, Hideo; Umino, Shigeru; Takao, Kenji; Kimura, Hajime; and Yamato, Koji, 5,147,730, Cl. 428-623.000

Kawazu, Akinobu: *See*—
Hoshinoughi, Susumu; Yoshida, Akio; and Kawazu, Akinobu, 5,147,760, Cl. 430-296.000

Kayaba Kogyo Kabushikikaisha: *See*—
Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi, Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000

Kayano, Kunihide: *See*—
Funabiki, Masaki; Kayano, Kunihide; and Yamada, Teiji, 5,147,842, Cl. 502-304.000

Kayukawa, Shigehiro: *See*—
Bando, Akira; Kayukawa, Shigehiro; Taguchi, Toshio; and Ohno, Yasuteru, 5,148,093, Cl. 318-723.000

Keay, James G.: *See*—
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,147,954, Cl. 526-265.000

Keen, Billy J., Jr.: *See*—
Babbitt, Terry; Braunshteyn, Michael S.; Gillespie, Andrew J.; Jones, Donald H.; Keen, Billy J., Jr.; Raynor, Robert H., Ritt, Renzer R.; and Talley, Robert E., 5,146,666, Cl. 29-429.000

Keeper Co., Ltd.: *See*—
Torii, Shuji; Nozaki, Hiromichi; Aoshima, Kazuyuki; and Matsui, Norimasa, 5,147,494, Cl. 156-417.000

Keijsper, Johannes J.: *See*—
de Jong, Abe W.; and Keijsper, Johannes J., 5,147,840, Cl. 502-167.000

Keira, Koichiro: *See*—
Tamehiro, Hiroshi; Chiziiwa, Rikio; Sakumoto, Yoshifumi; Funato, Kazuo; Yoshida, Yuzuru; and Keira, Koichiro, 5,147,474, Cl. 148-320.000

Keirle, Trevor J.: *See*—
Cutchey, Christopher J.; and Keirle, Trevor J., 5,147,619, Cl. 423-148.000.

Keith, Dennis D.: *See*—
Albrecht, Harry A.; Chan, Ka-Kong; Keith, Dennis D.; Then, Rudolf L.; and Weigele, Manfred, 5,147,871, Cl. 514-202.000

Keith, Peter T.: *See*—
Euteneuer, Charles L.; and Keith, Peter T., 5,147,302, Cl. 604-103.000

Kellenberger, Stanley R., to Kimberly-Clark Corporation. Absorbent products containing hydrogels with ability to swell against pressure. 5,147,343, Cl. 604-368.000

Kelley, Kurtis C.: *See*—
Grawey, Charles E.; and Kelley, Kurtis C., 5,148,077, Cl. 310-328.000

Kelley, William J.; and Stern, Howard R., to Mattel, Inc. Tap dance doll. 5,147,238, Cl. 446-330.000

Kelly, Michael G.: *See*—
Giles, Heather; Robertson, Alan D.; Kelly, Michael G.; and Leff Paul, 5,147,885, Cl. 514-381.000

Kelly, Richard P.: *See*—
Joyce, Thomas F.; Kelly, Richard P.; and Shen, Jian-Kuo, 5,148,530, Cl. 395-375.000

Kelsey, Donald R., to Shell Oil Company. In-mold polmerization of cyclic olefins with borohydride cocatalyst. 5,147,950, Cl. 526-134.000

Kemmochi, Kazuhisa; and Nagase, Yukio, to Canon Kabushiki Kaisha. Image processing apparatus with good highlight reproduction. 5,148,287, Cl. 358-298.000

Kendall Company, The: *See*—
Wendell, Amy M.; and Cianci, James P., 5,147,336, Cl. 604-283.000

Kennedy, Howard L.; and King, Thomas M., to Motorola, Inc. Global positioning system digital receiver. 5,148,452, Cl. 375-96.000

Kennedy, John: *See*—
Kaplan, Donald S.; Kennedy, John; and Muth, Ross R., 5,147,400, Cl. 623-13.000

Keppeler, Uwe; and Bobrich, Michael. Heterofunctional diols and polyurethane elastomers manufactured therefrom. 5,147,960, Cl. 528-75.000

Kern, Steven E.: *See*—
Skakoon, James G.; Kern, Steven E.; and Lombardi, William V., 5,147,324, Cl. 604-192.000

Kerridge, David H.: *See*—
Williamson, Ian G.; and Kerridge, David H., 5,146,922, Cl. 128-774.000

Kerth, Juergen; Schwager, Harald; and Zolk, Ralf. Preparation of propylene-ethylene copolymers. 5,147,928, Cl. 525-53.000

Keskes, Naamen, to Societe Nationale Elf Aquitaine. Process for automatic plotting and assistance interpretation of seismic cross-sections in particular using image analysis techniques. 5,148,494, Cl. 382-1.000

Ketterer, Gunter: *See*—
Fehrenbach, Christian; Ketterer, Gunter; and Schlassus, Wolfgang, 5,148,341, Cl. 360-106.000

KEURO Maschinebau GmbH & Co. KG: *See*—
Stolzer, Armin; and Blust, Rudolf, 5,147,176, Cl. 414-786.000

Kevorkian, Antoine; Raulet, Claude; and Rojat, Gerard, to Merlin Gerin. Medium voltage static switch. 5,148,064, Cl. 307-571.000

Khandros, Igor Y.; and DiStefano, Thomas H., to IST Associates, Inc. Semiconductor chip assemblies with fan-in leads. 5,148,265, Cl. 357-80.000

Khandros, Igor Y.; and DiStefano, Thomas H., to IST Associates, Inc. Semiconductor chip assemblies having interposer and flexible lead. 5,148,266, Cl. 357-80.000

Khorsandian, Asphendiar; and Caldwell, Jenabe E. Holder and lock for oro-intubation. 5,146,913, Cl. 128-200.260.

Kidd, Richard L., to General Motors Corporation. Flat electromagnetic relay. 5,148,136, Cl. 335-78.000

Kidd, Steven A. Air scoop screen. 5,147,430, Cl. 55-385.300

Kidie Products, Inc.: *See*—
McLinden, Thomas; and Nowak, Ralph M., 5,147,099, Cl. 292-175.000

Kihara, Noriaki: *See*—
Mizuchi, Akira; Horikomi, Kazutoshi; Sasaki, Tadayuki; Awaya, Akira; Tomino, Ikuo; Takesue, Mitsuyuki, and Kihara, Noriaki, 5,147,876, Cl. 514-275.000

Kijima, Yoshio: *See*—
Ohtsuka, Akihito; and Kijima, Yoshio, 5,147,601, Cl. 419-25.000

Kikuchi, Shuichi; and Yanai, Takenori, to Murata Kikai Kabushiki Kaisha. Package palletizing system. 5,147,177, Cl. 414-788.300

Kikuchi, Susumu: *See*—
Tsujiuchi, Junpei; Honda, Toshio; Ohyama, Nagaaki; Nagasaki, Tatsuo; and Kikuchi, Susumu, 5,148,502, Cl. 382-54.000

Kikuti, Yoshio: *See*—
Uzawa, Shigeru; and Kikuti, Yoshio, 5,148,492, Cl. 381-177.000

Kile, Richard A.; Locati, Ronald P.; Smee, Joseph R., and Wood, Charles T., to AMP Incorporated. Shroud-to-board polarization and keying system. 5,147,225, Cl. 439-680.000

Kile, Richard A., to AMP Incorporated. Connector assembly and keyed alignment assist shroud therefor. 5,147,226, Cl. 439-680.000

Kilgore, Connie S.: *See*—
Rouse, William G.; Kilgore, Connie S.; Rhea, Ronald E., Burnham, Michael J.; and Wachob, Benjamin G., 5,148,173, Cl. 342-3.000

Kim, Anderson H.; Weiner, Maurice; Jasper, Louis J., Jr.; and Youmans, Robert J., to United States of America, Army. Photoconductive avalanche GaAs switch. 5,148,251, Cl. 357-30.000

Kim, Henry. Flat pack desoldering tool. 5,147,081, Cl. 228-51.000

Kim, Hilton S., to Hilton & Chris Enterprises. Oil well fire extinguisher having upper and lower external flame retardant-dispersing rings. 5,146,995, Cl. 169-48.000

Kim, Moon-Ho: *See*—
Won, Tae-Young; Han, Seog-Heon; Kim, Moon-Ho, and Ko Jang-Man, 5,147,809, Cl. 437-31.000

Kim, Soon Ja: *See*—
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Kim, Yong Hak; and Kim, Soon Ja. Therapeutic, portable bed provided with a water heating system. 5,146,633, Cl. 5-421.000

Kimberly-Clark Corporation: *See—*
Huang, Yung-Hsiang; Soerens, Da*e A.; Lachapell, Ruth A.; and Linker, Paul M., III, 5,147,347, Cl. 604-390.000
Kellenberger, Stanley R., 5,147,34*, Cl. 604-368.000
Kimura, Akihiro, to Kabushiki Kaisha *oshiba. Light-triggered switching circuit. 5,148,253, Cl. 357-38.000
Kimura, Hajime: *See—*
Ogishi, Hideo; Umino, Shigeru; Tai*ao, Kenji; Kimura, Hajime, and Yamato, Koji, 5,147,730, Cl. 428-623.000
Kimura, Isao: *See—*
Hasegawa, Kenji; Shiozaki, Atsu*hi; Kimura, Isao; and Touma, Kouichi, 5,148,191, Cl. 346-140.00R
Kimura, Naofumi: *See—*
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Kimura, Norio; Taguchi, Tomishige Sakata, Tsuguhide; Tsuruno, Kunio; and Takei, Masahiro, to Can*n Kabushiki Kaisha. Apparatus for displaying image signal drop-out 5,148,291, Cl. 358-336.000
Kimura, Toshiya: *See—*
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Kincaid, Larry: *See—*
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King, Thomas M.: *See—*
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Kingman, Kevin P. Water based ink *n foil and/or synthetic organic polymer. 5,147,706, Cl. 428-195.000
Kingsley, Jack D.: *See—*
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Kinney, Edwin L.: *See—*
Hobson, Don R.; and Kinney, Edw*n L., 5,147,651, Cl. 424-443.000
Kinney, Ohler L., Jr.: *See—*
Bugler, Thomas W., III; and Kin*ey, Ohler L., Jr., 5,147,583, Cl. 261-112.200
Kinoshita, Jiro: *See—*
Kurakake, Mitsuo; and Kinoshita, Jiro, 5,148,371, Cl. 364-474.010
Kinpara, Mamoru: *See—*
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Kinugawa Rubber Industrial Co., Ltd: *See—*
Ono, Tomohisa; Takahashi, Hitos*hi; and Yamaguchi, Toshiaki, 5,147,105, Cl. 296-146.00F
Kiovsky, Thomas E.; and Clark, Wendy L., to Standard Oil Company, The. Methanol fuel containing flame luminosity agent. 5,147,413, Cl. 44-328.000
Kirchmayr, Rudolf: *See—*
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Kiri, Motosada; and Adachi, Susumu, to Shimadzu Corporation. Radiation image detecting apparatus using address coded signals. 5,148,030, Cl. 250-370.090
Kirin Beer Kabushiki Kaisha: *See—*
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Kirk, Cecil K. Self contained recirculating powdering a vacuuming assembly. 5,146,868, Cl. 118-713.000
Kirk, Dennis Brian: *See—*
Brug, Byron L., 5,147,234, Cl. 441-70.000
Kirk, James R., to Rhone-Poulenc Chimie. Amino/polyoxyalkylenated polydiorganosiloxanes. 5,147,578, Cl. 252-358.000
Kiser, Thomas E., to Professional Supply, Inc. Environmental control in a confined workplace. 5,146,977, Cl. 165-15.000
Kishi, Etsuro: *See—*
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Kishi, Shuji, to NEC Corporation. Semiconductor device having U-groove. 5,148,257, Cl. 357-49.000
Kishi, Takahiko, to Kabushiki Kaisha Kenwood. Infinite impulse response digital filter. 5,148,382, Cl. 364-724.030.
Kishikawa, Seiji: *See—*
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Kishimura, Masaaki: *See—*
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Kita, Masahiro: *See—*
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Kita, Yasushi: *See—*
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Kitamura, Roh: *See—*
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Kitano, Kissho: *See—*
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Kitora, Yoshitsugu, to Ricoh Company, Ltd. Circuit apparatus for detecting preceding value one. 5,148,057, Cl. 307-443.000.
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Kiyoura, Tadamitsu; Ajioka, Masanobu; Fujimoto, Naoshi; Suzuki, Toshihide; Kogure, Yasuo; Nagayama, Tokio; and Kanaya, Kazuo, to Mitsui Toatsu Chemicals, Incorporated. Production process of chlorine. 5,147,624, Cl. 423-502.000
Kjellstrom, Bjorn. Compass. 5,146,687, Cl. 33-355.00R.
Klaeger, Joseph H. Wide swath mower and method of mowing. 5,146,733, Cl. 56-6.000
Klaver, Gerarda J.: *See—*
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Kleinman, Edward F., to Pfizer Inc. Amino-substituted bridged azabicyclic quinolone carboxylic acids and esters. 5,147,873, Cl. 514-230.200.
Klemen, Donald, to General Motors Corporation. Hydrodynamic retarder. 5,147,181, Cl. 416-223.00R
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Klinkstek, Bernd; Kalz, Dietmar; Gerdes, Carsten; Kummeler, Ferdinand, Heinrich, Gunter; Reizlein, Karl; and Zimmermann, Manfred, to Bayer Aktiengesellschaft. Production of dispersions of spherical particles by crystallization of emulsions. 5,147,412, Cl. 23-293.00R
Klosterboer, Donald H.; Owens, Jerry M.; and Thompson, Aubrey E., to Anacomp, Inc. Disposable container for dispensing of photographic developing liquids. 5,148,208, Cl. 354-324.000.
Knapp, Audenried W. Gluconic acid-based developer composition. 5,147,767, Cl. 430-435.000
Knauer, Scott C.; Netravali, Arun N.; Petajan, Eric D.; and Westerink, Peter H., to AT&T Bell Laboratories. PAM signals modulation with mappings to improve utilization of available transmission capacity. 5,148,274, Cl. 358-141.000
Knauf, Vic C.: *See—*
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Knaup, Wolfgang: *See—*
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Knecht, Siegfried; and Sakowski, Jurgen, to Maschinenfabrik Alfred Schmermund GmbH & Co. Apparatus for the packaging of cigarettes. 5,146,728, Cl. 53-136.100
Knepper, Jonathan D.; Masavage, Gerald J.; and Solomon, Philip A., to AT&T Bell Laboratories. Packaged device handling method and apparatus. 5,146,661, Cl. 29-25.010
Knight, Darryl A.: *See—*
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Knodt, Kurt T.; Raymor, Herbert J.; Coy, Gerald L.; Graves, James R., Cole, Randall P.; and Gauronski, John F., to Xerox Corporation. Method and apparatus for operating an electronic reprographic printing system upon scan interruption. 5,148,286, Cl. 358-296.000
Knoedler, Roy E.: *See—*
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Knopfel, Hans-Peter; Pelet, Claude; and Peter, Hans, to Asea Brown Boveri, Ltd. Method of operating a firing installation. 5,147,200, Cl. 431-11.000
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Koakutsu, Hiroshi; and Tatani, Kouji, to Sanyo Electric Co., Ltd. Load connection state detector circuit. 5,148,115, Cl. 330-2.000
Kobayashi, Hiroshi; Machida, Haruhiko; Akedo, Jun; and Yamaguchi, Tomoyuki, to Ricoh Company Ltd. Moving amount detecting method using a shadow picture diffraction interference pattern 5,148,019, Cl. 250-231.140
Kobayashi, Hiroshi; Negishi, Masami; and Kimura, Toshiya, to Nissan Motor Company, Ltd. Ultrasonic ground speedometer utilizing Doppler effect. 5,148,409, Cl. 367-91.000.
Kobayashi, Kazuo; Toki, Akio; Ito, Koichi; and Kuroki, Hisanori, to Kabushiki Kaisha Toshiba. Radio telephone apparatus having an instantaneous conversation function. 5,148,470, Cl. 379-58.000

Kobayashi, Kazushi: *See—*
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Kobayashi, Michihito: *See—*
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Kobres, Arthur L. Vehicle deceleration measurement system 5,148,147, Cl. 340-464.000.
Koch, Helmut: *See—*
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Koch, Horst: *See—*
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Koch Membrane Systems, Inc.: *See—*
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Koch, Rudolf: *See—*
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Koch, Thomas L.; and Koren, Uziel, to Bell Telephone Laboratories, Inc. Photonic-integrated-circuit fabrication process. 5,147,825, Cl 437-228.000
Koerner, Theodore A. W., Jr., to University of Iowa Research Foundation. Use of 2,5-anhydromannitol for control of pH during blood storage. 5,147,776, Cl. 435-2.000.
Koga, Kazuhiko: *See—*
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Kogel, Arne, to Ljungberg & Kogel. Blood cradle. 5,147,330, Cl 604-245.000.
Koguchi, Satoru, to Casio Computer Co., Ltd. Auto-playing apparatus 5,148,419, Cl. 369-32.000.
Kogure, Hiroshi; and Norimatsu, Hidehiko, to NEC Corporation. Electronic part mountable on the surface of a printed circuit board and method of mounting the same. 5,148,349, Cl. 361-383.000.
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Kohmoto, Shinsuke; Sekiguchi, Tetsuo; and Hamasaki, Takuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Motor-driven zoom lens barrel. 5,148,199, Cl. 354-195.100.
Kohno, Tohru, to Fujitsu Limited. Semiconductor memory device with built-in test circuit and method for testing the same. 5,148,398, Cl. 365-201.000
Kohyama, Mitsuaki, to Kabushiki Kaisha Toshiba. Image forming apparatus with developing and cleaning system. 5,148,219, Cl. 355-219.000.
Kohyama, Mitsuaki: *See—*
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Koide, Nobuo, to Kabushiki Kaisha Toshiba. Variable frequency-dividing circuit. 5,148,050, Cl. 307-271.000.
Koike, Hideki; and Aoki, Junji, to Horiba, Ltd. Centrifugal separator for preparing automotive exhaust gas for pollution testing with pressure compensation. 5,147,426, Cl. 55-270.000.
Koike, Ryouzou; and Hashimoto, Mituhiro, to Nitto Boseki Co., Ltd. Roving package wrapper. 5,147,040, Cl. 206-410.000.
Koike, Yukio, to Tokyo Electron Limited. Ion implantation method 5,148,034, Cl. 250-492.200.
Koiwa, Mitsuru: *See—*
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Koizumi, Junji; and Yazaki, Yoshito, to Toyoda Gosei Co., Ltd. Polypropylene resin composition. 5,147,933, Cl. 525-89.000.
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Kojima, Eisuke; Fujimori, Shizuyoshi; and Awano, Katsuya, to Kyorin Pharmaceutical Co., Ltd. Cyclic anthranilic acid derivatives and process for their preparation. 5,147,874, Cl. 514-238.200
Kojima, Narihito; Nagame, Hiroshi; Seto, Mitsuru; Rokutanzono, Takashi; and Nousho, Shinji, to Ricoh Company, Ltd. Electrophotographic photoconductor and electrophotographic copying process and apparatus using the photoconductor. 5,147,751, Cl. 430-125.000
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Komatsu, Fumito; and Shimokawa, Hiroyasu, to Nippon Steel Corporation. Slitter moving mechanism. 5,146,827, Cl. 83-482.000
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Konno, Chisato; Ohata: Tadashi; Igai, Mitsuyoshi; Umetani, Yukio; and Yamabe, Michiru, to Hitachi Ltd.; and Hitachi VLSI Engineering Corporation. Method for automatically generating a simulation program for a physical phenomenon governed by a partial differential equation, with simplified input procedure and debug proceoure. 5,148,379, Cl. 364-578.000.
Konno, Toshio: *See—*
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Koshi, Masaki; Yamada, Shouji; Watanabe, Akihiko; and Nemoto, Kouji, to Sumitomo Wiring System, Ltd.; and Koshi, Masaki. Anti-skid device for use on pneumatic tires for automotive vehicles 5,147,479, Cl. 152-216.000
Koslow, Evan E., to Koslow Technologies Corporation. Process for the production of materials and materials produced by the process 5,147,722, Cl. 428-402.000.
Koslow Technologies Corporation: *See—*
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Koyama, Itaru: *See—*
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Koyama, Takeshi, to Kabushiki Kaisha Toshiba. Semiconductor protection device. 5,148,249, Cl. 357-23.130.

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Koza, John R.; and Rice, James P., to Koza, John R. Non-linear genetic process for use with plural co-evolving populations. 5,148,513, Cl. 395-13.000

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Kraft, Kenneth N.: *See—*
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Kramer, Uwe: *See—*
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Krampe, Wolfgang; and Lieberoth-Leden, Bernd, to Robert Bosch GmbH. Method and arrangement for the open-loop and/or closed-loop control of the engine power of an internal combustion engine of a motor vehicle. 5,146,892, Cl. 123-399.000

Kraus, Henry D.: *See—*
Hemmerich, Karl J.; and Kraus, Henry D., 5,147,309, Cl. 604-122.000

Krause, Frank: *See—*
Rinck, Gunter; Moller, Knut; Fuellert, Sigismund; Krause, Frank; and Koch, Helmut, 5,147,907, Cl. 524-48.000

Krause, Ralf D.; and Moll, Helmut, to Siemens Aktiengesellschaft. Tool configuration for ultrasonic welding. 5,147,082, Cl. 228-1.100.

Krause, Wilbur. Combination bath, shower and bidet spout. 5,146,639, Cl 4-567.000

Krautkramer, Gerd: *See—*
Lais, Siegfried; and Krautkramer, Gerd, 5,146,865, Cl. 114-151.000

Krenik, William R.; and Izzi, Louis J., to Texas Instruments Incorporated. Current steering circuits and methods with reduced capacitive effects. 5,148,065, Cl. 307-572.000

Krieg, Ronald K., to RKK, Ltd. Method and apparatus for controlling the flow of crude oil from the earth. 5,146,987, Cl. 166-302.000

Krill, Jerry A.; Jesurun, Melrose M.; and Zinger, William H., to Johns Hopkins University, The. Optimized design for TE_{01} mode circular waveguide connected to a bend section. 5,148,134, Cl. 333-242.000

Krines, Hans-G.: *See—*
Kahrs, Manfred; Kunze, Lothar; Baier, Joachim; Kunz, Gerhard; Moeller, Bernhard; Beer, Wilhelm; Krines, Hans-G.; and Schudt, Gerhardt, 5,147,007, Cl. 180-132.000

Kroes, Anthony, to North American Philips Corporation. Electrodeless low-pressure discharge lamp. 5,148,085, Cl. 315-248.000

Krolopp, Robert K.: *See—*
Metroka, Michael P.; and Krolopp, Robert K., 5,148,471, Cl 379-58.000

Kronberg, James W. Solder for oxide layer-building metals and alloys. 5,147,471, Cl. 420-556.000

Krones AG Hermann Kronseder Maschinenfabrik: *See—*
Meindl, Theodor, 5,147,023, Cl 198-454.000

Kruse, Dietrich, to Siemens Aktiengesellschaft. Method for generating random number for the encoded transmission of data. 5,148,007, Cl. 235-382.000

Kruse, Lawrence I.: *See—*
Coates, William J.; and Kruse, Lawrence I., 5,147,875, Cl. 514-259.000

Ku, Ming-ho, to Tradebest International Corporation. Autonomous visual-attraction enhancement utilizing edge-illuminated panel 5,147,129, Cl. 362-106.000

Kubota, Akinori; Ijiri, Masaaki; and Kobayashi, Michihito, to Sumitomo Rubber Industries Limited. Apparatus for vulcanizing elastomer product. 5,147,656, Cl. 425-42.000

Kubota, Atsuko; Tsuchiya, Norihiko; Samata, Shuichi; Matsushita, Yoshiaki; and Kageyama, Mokuji, to Kabushiki Kaisha Toshiba. System for analyzing metal impurities on the surface of a single crystal semiconductor by using total reflection of X-rays fluorescence. 5,148,457, Cl. 378-70.000

Kubota, Shinji: *See—*
Yamada, Chihiko; Suzuki, Teruo; Yoshida, Tsutomu; and Kubota, Shinji, 5,148,309, Cl. 359-443.000

Kubota, Yoshinori; Sakanoue, Akira; and Kita, Yasushi, to Central Glass Company, Limited. Method for suppressing crystallization of fluoride glass articles by treatment with inorganic fluoride. 5,147,435, Cl. 65-30.100.

Kucharski, Peter E.: *See—*
Eilerman, Robert G.; Christenson, Philip A.; Yurecko, John M., Jr.; Mild, Frank; and Kucharski, Peter E., 5,147,463, Cl. 131-277.000.

Kuck, Karl-Heinz: *See—*
Diehr, Hans-Joachim; Kuck, Karl-Heinz; Paulus, Wilfried; and Schmitt, Hans-Georg, 5,147,443, Cl. 71-67.000

Kudo, Norimasa; and Watanabe, Akira, to Kabushiki Kaisha Toshiba. Voice data transmission system and method. 5,148,429, Cl. 370-9.420.

Kudo, Toshio; and Niitsu, Toshiaki, to Casio Computer Co., Ltd. Multilevel optical recording arrangement. 5,148,335, Cl. 369-59.000

Kudoh, Kazuhiro, to NEC Corporation. Radio communication apparatus for rapidly knowing whether the apparatus is within or out of a service area. 5,148,160, Cl. 340-825.440.

Kudoh, Norimasa, to Kabushiki Kaisha Toshiba. Voice decoding device. 5,148,486, Cl. 381-36.000

Kuenast, Christoph: *See—*
Wolf, Bernd; Theobald, Hans; Zombik, Winfried; Goetz, Norbert; Wild, Jochen; Harreus, Albrecht; Hofmeister, Peter; Kuenast, Christoph; and DeKramer, Jacobus J., 5,147,645, Cl 424-405.000

Kugler, Ralph W.: *See—*
Ahmed, Hassan J.; Beatty, John M.; and Kugler, Ralph W., 5,147,047, Cl. 209-538.000

Kuhn, Gerald. Sonar detector for exiting passengers. 5,148,410, Cl. 367-96.000

Kuhn, Hans-Jurgen, to U.S. Philips Corporation. FM demodulator 5,148,114, Cl. 329-341.000.

Kuhn, Peter; and Obrist, Frank, to TES Wankel Technische Forschungs-und Entwicklungsstelle Lindau GmbH. Rotary piston machine with a protuberance in the cylinder wall. 5,147,194, Cl 418-125.000

Kuhn, S.A.: *See—*
Gantzer, Jean-Paul, 5,146,737, Cl. 56-14.900

Kukes, Simon G.; Clark, Frederick T.; and Hopkins, P. Donald, to Amoco Corporation. Distillate hydrogenation. 5,147,526, Cl. 208-111.000

Kulinek, Eugene: *See—*
Lee, Eddy; D'Cruz, Mervyn G.; and Kulinek, Eugene, 5,148,541, Cl. 395-600.000

Kullas, Karen E.; and Newcomb, Bruce E., to C. R. Bard, Inc. Control handle with locking means for surgical irrigation. 5,147,292, Cl. 604-34.000

Kuller, Douglas H., to Minnesota Mining and Manufacturing Company. Acrylate adhesives containing polymerizable fluorochemical surfactants. 5,147,938, Cl. 525-276.000

Kumamoto, Toshio: *See—*
Nakamura, Yasuyuki; and Kumamoto, Toshio, 5,148,164, Cl. 341-136.000

Kumar, Kanta, to Minnesota Mining and Manufacturing Company. Hydrosilated azlactone functional silicon containing compounds and derivatives thereof. 5,147,957, Cl. 528-15.000

Kumasaka, Noriyuki: *See—*
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao; Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki; Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki; and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000.

Kume, Tateo; Shiraishi, Kazuhiro; Matsuda, Masahiko; and Okada, Toru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Variable compression ratio apparatus for internal combustion engine. 5,146,879, Cl. 123-48.00B

Kummeler, Ferdinand: *See—*
Klinksiek, Bernd; Kalz, Dietmar; Gerdes, Carsten; Kummeler, Ferdinand; Heinrich, Gunter; Reizlein, Karl; and Zimmermann, Manfred, 5,147,412, Cl. 23-293.00R

Kummer, Martin: *See—*
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Kumo, Ichiro: *See—*
Hayashi, Mutsumi; Takamura, Ryoji; Yamazaki, Chikayasu; Ueda, Minoru; and Kumo, Ichiro, 5,148,023, Cl. 250-372.000

Kump, Wilhelm; and Menear, Keith A., to Ciba-Geigy Corporation. Substituted azacyclohexyl derivatives. 5,147,870, Cl. 514-783.000.

Kumurdjian, Pierre, to Commissariat a l'Energie Atomique. Absorbing coating, its process of manufacture and covering obtained with the aid of this coating. 5,148,172, Cl. 342-1.000.

Kunewalder, Anthony P. Exercise aid. 5,147,267, Cl. 482-142.000.

Kuninaka, Hitoshi: *See—*
Iida, Hiroshi; Kuriki, Kyoichi; and Kuninaka, Hitoshi, 5,146,742, Cl. 60-202.000

Kunishige, Keiji, to Olympus Optical Co., Ltd. Data printing apparatus for camera. 5,148,197, Cl. 354-106.000.

Kunkle, Albert C.: *See—*
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Kunz, Gerhard: *See—*
Kahrs, Manfred; Kunze, Lothar; Baier, Joachim; Kunz, Gerhard; Moeller, Bernhard; Beer, Wilhelm, Krines, Hans-G.; and Schudt, Gerhardt, 5,147,007, Cl. 180-132.000

Kunze, Lothar: *See—*
Kahrs, Manfred; Kunze, Lothar; Baier, Joachim; Kunz, Gerhard; Moeller, Bernhard; Beer, Wilhelm; Krines, Hans-G.; and Schudt, Gerhardt, 5,147,007, Cl. 180-132.000

Kuo, David D.; and Chan, Chung S. Multi-functional garment system 5,148,002, Cl. 219-211.000.

Kuragasaki, Mutsuo; Sueoka, Yasuhiro; Equchi, Akira; and Makino, Tetsuo, to Beloit Corporation. Headbox for a papermaking machine with distribution tubes. 5,147,509, Cl. 162-343.000

Kuraishi, Tadayuki: *See—*
Tokizawa, Minoru; Kanamaru, Yoshihiko; Matsumoto, Masaru; Asaoka, Takemitsu; Matsuda, Hideaki; Kuraishi, Tadayuki; Maebashi, Kazunori; Taido, Naokata, and Kawahara, Ryuichi, 5,147,886, Cl. 514-383.000

Kurakake, Mitsuo; and Kinoshita, Jiro, to Fanuc Ltd. High-speed machining system. 5,148,371, Cl. 364-474.010

Kuranaga, Hiroshi; and Gotou, Kouji, to Mitsubishi Denki Kabushiki Kaisha. Transmitter/receiver for generating transmitting data signal in synchronization with received data signal. 5,148,430, Cl 370-100.100.

Kuraray Co., Ltd.: *See—*
Noda, Shuhei; and Hashimoto, Kiyoji, 5,146,822, Cl. 83-22.000

Kurashige, Masafumi; and Harada, Tetsuya, to Sony Corporation Mosaic effect generating apparatus. 5,148,277, Cl. 358-160.000

Kurata, Takashi: *See—*
Yamamoto, Yuji; Kurata, Takashi; Nakazawa, Kazuyoshi; Tsuda, Yusuke; Watanabe, Junichiro; Matsumoto, Makoto; Kurita, Akitsugu; and Funahashi, Yuichi, 5,147,947, Cl. 525-479.000

Kuriki, Kyoichi: *See—*
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Kurita, Akitsugu: *See—*
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Kuroda, Akira: *See—*
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Kuroda, Hiroichi: *See—*
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Kurogane, Toshio; Nagaoka Daiji; and Sekine, Hiroshi, to Fuji Xerox Corporation, Ltd. Image processing apparatus and method for painting a memory with plural colors. 5,148,294, Cl. 358-448.000

Kuroki, Hisanori: *See—*
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Kuroyanagi, Satoshi: *See—*
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Kurre, Paul G.: *See—*
Lewis, Michael L.; Kurre, Paul G.; Day, George B.; Fannin, Daniel G.; and Thomas, Roland C., 5,147,248, Cl. 474-166.000
Lewis, Michael L.; Kurre, Paul G.; Day, George B.; Fannin, Daniel G.; and Thomas, Roland C., 5,147,249, Cl. 474-168.000

Kurschus, Dieter: *See—*
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Kurtz, Karl-Rudolf; Koch, Horst, and Telser, Thomas, to BASF Aktiengesellschaft. Optically transparent polymer alloy and its use in molding materials, moldings, films, coatings, adhesives and photosensitive recording elements. 5,147,757, Cl. 430-270.000.

Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, to Kabushiki Kaisha Kobe Seiko Sho. Mold aligning device for a compression molding machine. 5,147,661, Cl. 425-150.000.

Kurz, Karl-Heinz. Device to be placed in the uterus. 5,146,931, Cl 128-833.000.

Kurz, Walter: *See—*
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Kusano, Hiroko: *See—*
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Kushida, Naoki: *See—*
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Kushida, Takeo; and Higuchi, Toshiro, to Zexel Corporation. Electromagnetic actuator for moving an object. 5,148,068, Cl. 310-46.000.

Kutaragi, Ken, to Sony Corporation. Apparatus for effectively compressing video data representing a relatively simple image having strong area correlation. 5,148,292, Cl. 358-433.000

Kutsch, Duane B.: *See—*
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Kutsuzawa, Yoshiro: *See—*
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Kutten, Shay: *See—*
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Kuwabara, Nobuyuki: *See—*
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi, Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R

Kuwabara, Osamu; Mutoh, Jiro; and Abe, Akihiko, to Casio Computer Co., Ltd. Thermal print head. 5,148,189, Cl. 346-76.0PH.

Kuwajima, Hideji: *See—*
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Kuzmuk, Jeffery S.: *See—*
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Kwan, David C. K.; Wai, Ma H.; Lebensfeld, Steven; and Goldberg, Harvey, to Toymax Inc. Toy audio device. 5,147,237, Cl 446-297.000

Kwon, Steven S.; Marsico, Michael A.; and Vadehra, Dharam V., to Nestec S.A. Beef flavor. 5,147,667, Cl. 426-56.000

Kyocera Corporation: *See—*
Ota, Shigenori; Uchiyama, Masataka; and Yasutomi, Tsuyoshi, 5,148,188, Cl. 346-76.0PH

Kyorin Pharmaceutical Co., Ltd.: *See—*
Kojima, Eisuke; Fujimori, Shizuyoshi; and Awano, Katsuya, 5,147,874, Cl. 514-238.200

Kyusyumetal Industry Co., Ltd.: *See—*
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L.A. Air Line, Inc.: *See—*
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La-Z-Boy Chair Company: *See—*
LaPointe, Larry P., 5,147,108, Cl. 297-85.000

Labanoski, Dennis J.: *See—*
Ilenda, Casmir S.; Dunkelberger, David L.; and Labanoski, Dennis J., 5,147,932, Cl. 525-71.000

Laboratory of Ionised Gases The Hebrew University of Jerusalem: *See—*
Weil, Daniel, 5,147,596, Cl. 376-134.000

Lacey, David: *See—*
Gray, George W.; Toyne, Kenneth J.; Lacey, David; Holmes, David; and Scroston, Richard M., 5,147,577, Cl. 252-299.620

Lachance, Raynald: *See—*
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Lachapell, Ruth A.: *See—*
Huang, Yung-Hsiang; Soerens, Dave A.; Lachapell, Ruth A.; and Linker, Paul M., III, 5,147,347, Cl 604-390.000

LaCombe, James: *See—*
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La Fleur, Edward E.; Amici, Robert M.; Freed, William T.; Work, William J.; and Carson, William G., to Rohm and Haas Company Polymer blends with enhanced properties. 5,147,930, Cl. 525-57.000

Laganis, Evan D.: *See—*
Smothers, William K.; Weed, Gregory C.; Laganis, Evan D.; and Lalka, George, 5,147,758, Cl. 430-281.000

Lagercrantz, Fredrik B. B. Arrangement for bringing the tool-carrying end of a robot beam to a desired one of a plurality of possible predetermined positions. 5,148,091, Cl. 318-568.110.

Lagerstedt, Torgny: *See—*
Carlsson, Claes-Goran; Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Moberg, Hans; and Nabo, Olle 5,147,280, Cl. 494-56.000

Lai, Hezhang: *See—*
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Lais, Siegfried; and Krautkramer, Gerd, to Schottel-Werft Joseph Becker GmbH & Co. KG. Water-jet propulsion system for ships which are intended to be used in shallow waters. 5,146,865, Cl 114-151.000

Lajoie, J.-Andre. Auxiliary punching device for punching machine 5,146,824, Cl. 83-90.000

Lakshminarayan, Udaykumar: *See—*
Marcus, Harris L.; and Lakshminarayan, Udaykumar, 5,147,587 Cl. 264-22.000

Lalka, George: *See—*
Smothers, William K.; Weed, Gregory C.; Laganis, Evan D.; and Lalka, George, 5,147,758, Cl. 430-281.000

Lamm, Gunther: *See—*
Sens, Ruediger; Schefczik, Ernst; Etzbach, Karl-Heinz; Lamm, Gunther; Reichelt, Helmut; and Wiesenfeldt, Matthias, 5,147,845 Cl. 503-227.000

Lampkin, Beatrice C.; Witte, David P.; Harris, Richard E.; and Liebermann, Michael A., to Children's Hospital Medical Center. Monophenotypic xenograft of megakaryocytic lineage and origin 5,147,798, Cl. 435-240.100

Lancaster, John: *See—*
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Lane, David J.: *See—*
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Lane, Ernest, to Carbomedics, Inc. Bioprosthetic heart valve with semi-permeable commissure posts and deformable leaflets. 5,147,391 Cl. 623-2.000

Lane, Richard I.; Bateman, Glenn; Mader, Josef L.; and Bremer, Ronald J., to Tektronix, Inc. Measurement apparatus having improved sample density using nested data acquisitions. 5,148,230, Cl 356-73.100

Lane, Rodney J., to Vaso Products Australia Pty Limited. Correction of incompetent venous valves. 5,147,389, Cl. 623-2.000.

Lang, Robert A., to Lin Pac, Inc. Method of applying a finishing layer in a corrugator line. 5,147,480, Cl. 156-64.000.

Lang, Stephen M.; and Webster, David F., to Smith and Nephew Associated Companies Limited. Medicated, low adherency wound dressings. 5,147,338, Cl. 604-304.000.

Langford, Nathanial P.; and Bishop, Daniel H., to Minnesota Mining and Manufacturing Company. Paint applicator. 5,146,646, Cl. 15-210.100.

Langford, Ted E.: *See*—
MacKay, Michael T.; Berger, Robert J.; Duffy, Robert; and Langford, Ted E., 5,148,154, Cl. 340-712.000.

Lansbury, Robert C.; and Mitchell, Douglas L., to Imperial Chemical Industries PLC. Multiple-layer polyolefin films. 5,147,696, Cl. 428-36.400.

LaPointe, Larry P., to La-Z-Boy Chair Company. Reclining sofa. 5,147,108, Cl. 297-85.000.

Lapp, Josef C.: *See*—
Borrelli, Nicholas F.; Dumbaugh, William H., Jr.; Hall, Doublas W.; Lapp, Josef C.; Newhouse, Mark A.; Powley, Mark L.; and Weidman, David L., 5,148,510, Cl. 385-142.000.

Lapp, Steven P., to Alcan International Limited. Metal/air fuel cell with electrolyte flow equalization manifold. 5,147,736, Cl. 429-27.000.

La Rocca, Mechelle. Pacifier tether for use in enhancing an infant's developmental reflexes. 5,147,384, Cl. 606-234.000.

La Rosa, Joachim A.; Ross, Joseph W.; and Heymann, Frank J., to Westinghouse Electric Corp. Seal ring retainer and guide ring for valve plug. 5,146,945, Cl. 137-315.000.

Larsen, Thor, to 3D International A/S. Power conversion machine with pistons rotating in pairs relative to each other in a spherical housing. 5,147,193, Cl. 418-68.000.

Larson, Marlow W., to Browning. Hold-back system for bowstring. 5,146,908, Cl. 124-88.000.

Larter, Stephen R.: *See*—
Stout, Scott A.; Lin, Rui; Recht, Gunnar W.; Senftle, Joseph T.; and Larter, Stephen R., 5,147,611, Cl. 422-78.000.

LaSota, Laurence. Latching linear motor. 5,148,067, Cl. 310-24.000.

Lassor, Richard D.: *See*—
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Latchford, Ian S.: *See*—
Szwejkowski, Chester; Latchford, Ian S.; Namose, Isamu; and Tsuchida, Kazumi, 5,147,499, Cl. 156-643.000.

LaTorre, Joseph: *See*—
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Laufer, Helmut: *See*—
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Laurensou, Rene L.; and Vinau, Richard, to Giat Industries. Ignition system for a pyrotechnic composition, 5,147,976, Cl. 102-275.300.

Lavender, Michael R., to Hollister Incorporated. Two-piece ostomy appliance. 5,147,340, Cl. 604-344.000.

Laverman, Royce J.; Winters, Philip J.; and Rinehart, Jeffrey K., to Chicago Bridge & Iron Technical Services Company. Volatile liquid storage system. 5,147,418, Cl. 55-16.000.

Lavin, John T., to BOC Group plc, The. Air separation. 5,146,756, Cl. 62-24.000.

LaVon, Gary D.: *See*—
Young, Gerald A.; LaVon, Gary D.; and Taylor, Gregory W., 5,147,345, Cl. 604-378.000.

Lawton, Wayne M.: *See*—
Resnikoff, Howard L.; Pollen, David; Linden, David C. P.; and Lawton, Wayne M., 5,148,498, Cl. 382-54.000.

Layton, Richard: *See*—
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Le Carbone Lorraine: *See*—
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Lebensfeld, Steven: *See*—
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Leber Corporation: *See*—
Rehfeld, Frederick L. J., 5,147,094, Cl. 277-144.000.

Lebizay, Gerald: *See*—
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Leckrone, Michael E.; Kagan, Jonathan; Knight, Darryl A.; and Gunseor, Larry A., to Eli Lilly and Company. Optical fiber rotational connector. 5,147,348, Cl. 606-16.000.

Lecouturier, Fabrice: *See*—
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Lederman, Frederick E., to General Motors Corporation. Multiple lip seal assembly with improved accuracy. 5,147,139, Cl. 384-486.000.

Ledevehat, Christian: *See*—
Colley, Robert; Lecouturier, Fabrice; and Ledevehat, Christian 5,147,695, Cl. 428-34.100.

Lee, Chia-Yu, to Sangara Industrial Co., Ltd. Swivel means for lighting fixture. 5,147,132, Cl. 362-426.000.

Lee, Ching-Cherng; and Davis, James E., to Du Pont de Nemours, E. I., and Company. Method for automatically processing magnetic solid phase reagents. 5,147,529, Cl. 210-695.000.

Lee, Eddy; D'Cruz, Mervyn G.; and Kulinek, Eugene, to Northern Telecom Limited. Multilingual ordered data retrieval system. 5,148,541, Cl. 395-600.000.

Lee, Fourmun: *See*—
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Lee, Minyoung: *See*—
Woodruff, David W.; and Lee, Minyoung, 5,148,463, Cl. 378-144.000.

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Light, William A., to Eastman Kodak Company. Transparent image-recording elements. 5,147,717, Cl. 428-327.000.

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Martin, Kenneth: *See—*
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Martin, Patricia A.; Huntington, Jonathan T., II; McNally, J. Michael Barrett, David M.; and Ward, Jean R., to Wang Laboratories, Inc. Computer with tablet input to standard programs. 5,148,155, Cl 340-712.000.

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Matthews, Donald P.; Whitten, Jeffrey P.; and McCarthy, James R., to Merrell Dow Pharmaceuticals Inc. 2,2'-bi-1H-imidazoles. 5,147,863, Cl. 514-63.000.
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Melas, Andreas A., to CVD, Inc. MOCVD of indium oxide and indium/tin oxide films on substrates. 5,147,688, Cl. 427-255.300
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Mendoza, Marco A. H.; and Niven, Malcolm. Device to facilitate artificial insemination of bovines and similar animals. 5,147,299, Cl 604-96.000
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Miles Inc.: *See*—
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Miller, Ronald R.; Riggs, Shelton W.; and Rozario, Phil. Permanent power pack for computer clock and battery backed memory 5,148,095, Cl. 320-22.000

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Mioduszewski, David: *See*—
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Mishina, Haruo; and Yamama, Shinya, to Hitachi Techno Engineering Co., Ltd. Vapor reflow type soldering apparatus. 5,146,694, Cl. 34-78.000

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Mitsuba Electric Manufacturing Co., Ltd.: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Mitsubishi Kasei Vinyl Company: *See*—
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Mitsubishi Materials Corporation: *See*—
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Mitsubishi Nuclear Fuel Co.: *See*—
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Mitsubishi Petrochemical Company Limited: *See*—
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Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
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Mitsui Petrochemical Industries, Ltd.: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
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Mitsui, Yasuhiro: *See*—
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Miura, Takao; and Imaoka, Kazunori, to Fujitsu Limited. Semiconductor device having trench isolation. 5,148,247, Cl. 357-23.600.

Miyabayashi, Takeshi, to Brother Kogyo Kabushiki Kaisha. Method of forming a throughhole in a sheet type storage battery. 5,147,482, Cl. 156-73.100.

Miyabe, Toshimasa: *See*—
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Miyachi, Hiroki, to Kabushiki Kaisha Toshiba. Image forming apparatus containing erasable font pattern. 5,148,293, Cl. 358-444.000.

Miyahara, Yoshiki; Kasetani, Satoshi; Nishimura, Shigetaka; Hirsoe, Kunihiro; Inoue, Takashi; and Nogi, Takashi, to Nippon Unicar Company Limited. Non-woven fabric. 5,147,712, Cl. 428-224.000

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Miyamoto, Kouichi: *See*—
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Miyamoto, Mitsuo: *See*—
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Miyamoto, Yoshiyuki: *See*—
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Miyamura, Isao: *See*—
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Miyata, Koji, to Shin-Etsu Chemical Co., Ltd. Cylindrical magnet apparatus suitable for NMR imaging. 5,148,138, Cl. 335-302.000

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Miyauchi, Yuji, to Olympus Optical Co., Ltd. Real image type varifocal viewfinder. 5,148,308, Cl. 359-432.000

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Miyazawa, Yoshiaki: *See*—
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Miyoshi, Sayoko: *See*—
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Mizuchi, Akira; Horikomi, Kazutoshi; Sasaki, Tadayuki; Awaya, Akira, Tomino, Ikuo; Takesue, Mitsuyuki; and Kihara, Noriaki, to Mitsui Petrochemical Industries, Ltd. 2,6-di,2,4,6-, 2,5,6-tri and 2,4,5,6-tetra-substituted pyrimidines, their pharmaceutically acceptable salts, pharmaceutical compositions containing same and their use in the treatment of neurological diseases. 5,147,876, Cl. 514-275.000

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Mizushima, Shigeaki; Shimasaki, Tatsuo; Nakamura, Tuneo; and Watanabe, Noriko, to Sharp Kabushiki Kaisha. Liquid crystal display device. 5,148,300, Cl. 359-76.000

Moberg, Hans: *See*—
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Chang, Clarence D.; and Lutner, John D., 5,147,626, Cl. 423-328.000
Chang, Clarence D.; and Lutner, John D., 5,147,627, Cl. 423-328.000
Dessau, Ralph M.; and Tsao, Ying-Yen P., 5,147,837, Cl. 502-66.000
Marler, David O.; McWilliams, John P.; and Vartuli, James C., 5,147,838, Cl. 502-71.000.
Paul, James M., 5,146,988, Cl. 166-312.000
Peszkin, Perla N.; and Shirodkar, Pradeep P., 5,147,936, Cl. 525-240.000.

Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Reaction vessel with a rocking base. 5,147,607, Cl. 422-57.000

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Moeller, Bernhard: *See*—
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Moffitt, Ronald D., to W. R. Grace & Co.-Conn. Extruding vinylidene chloride copolymer flexible packaging film. 5,147,594, Cl. 264-514.000

Moisin, Mihail S.; and Konopka, John G., to Motorola, Inc. Circuit for driving a gas discharge lamp load. 5,148,087, Cl. 315-291.000

Moisson, Rene : *See*—
Gillonnier, Claude; and Moisson, Rene , 5,147,664, Cl. 426-2.000

Moll, Helmut: *See*—
Krause, Ralf D.; and Moll, Helmut, 5,147,082, Cl. 228-1.100

Moll, John L.: *See*—
Ty Tan, Michael R.; Wang, Shih Y.; and Moll, John L., 5,148,267, Cl. 357-16.000

Moll, William F.: *See*—
Jaffee, Richard M.; Mc[illegible]; William F[illegible] 5,146,877, Cl. 137-172.000

Moller, Burkhard. *See*—
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Moller, Knut: *See*—
Rinck, Gunter; Moller, Knut; Fullert, Sigismund; Krause, Frank and Koch, Helmut, 5,147,907, Cl. 524-48.000

Moller, Wolfgang: *See*—
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Molnlycke AB: *See*—
Hansen, Kjell, 5,147,155, Cl. 406-191.000

Moltech Corporation: *See*—
Spitsyn, Boris; Efanov, Valery; Boulov, Leonid; Aleksenko, Alexander; Botev, Anantolij; and Skotheim, Terje, 5,148,462, Cl. 378-143.000.

Molva, Refik A.: *See*—
Bird, Raymond F.; Gopal, Inder S., Janson, Philippe A.; Kutten, Shay; Molva, Refik A.; and Yung, Marcel M., 5,148,479, Cl. 380-23.000

Momose, Kiyoharu: *See*—
Abe, Nobumasa; Momose, Kiyoharu; Watanabe, Koji; Nakamura Yuichi; Handa, Tsuneo; and Nishikawa, Mitsutaka, 5,148,185, Cl. 346-1.100.

Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, to Coatex S.A. Compatibility agent for aqueous polypigmentary suspensions containing hydrated calcium sulfate. 5,147,506, Cl. 162-135.000

Monnier, Philippe: *See*—
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Monsanto Company: *See*—
Feng, Paul; Wratten, Stephen J.; Winzenburger, Peggy A.; Gross Cindy J.; and Flaherty, Dennis K., 5,147,786, Cl. 435-7.940

Monsees, Claude E.: *See*—
Thomas, John T.; and Monsees, Claude E., 5,147,491, Cl. 156-251.000

Montague, Peter G.; and Van de Pas, Johannes C., to Lever Brothers Company, Division of Conopco, Inc. Liquid detergent composition in the form of lamellar droplets containing a deflocculating polymer 5,147,576, Cl. 252-174.000

Montgomery, Carl T., to Atlantic Richfield Company. Cavity induced stimulation method of coal degasification wells. 5,147,111, Cl. 299-16.000

Montgomery, Fredrick J., to BOC Group plc, The. Anesthetic vaporizers. 5,146,915, Cl. 128-203.140.

Moore, William P., to FR Polymers, Inc. Method of preparing fire retardant thermoplastic granules. 5,147,912, Cl. 524-101.000.

Moorehead, H. Robert, to C.R. Bard, Inc. Multi-valve catheter for improved reliability. 5,147,332, Cl. 604-247.000

Morehead, John: *See*—
Wilson, Kenneth J.; and Morehead, John, 5,146,832, Cl. 83-698.000.

Morgan, Brian J. Arrangement for the complementary interconnection of round table tops. 5,146,855, Cl. 108-64.000

Morgan, Michael W., to ChipSoft CA, Corp. Determining the locations of the contents of bordered areas of a generic form. 5,148,520, Cl 395-148.000

Morgan, Stuart K.; Bibeau, Lawrence; Romm, Michael; Vacon, Gary V.; and Visser, John A., to Digital Equipment Corporation. Mounting system for installation of communication boxes having a convex bottom post and a rigid top post. 5,148,353, Cl. 361-391.000

Mori, Sadao, to Hitachi, Ltd. Automatic focusing apparatus and method includes a photorefractive crystal having a lens effect. 5,148,010, Cl. 250-201.500

Mori, Shigeki, to Murata Kikai Kabushiki Kaisha. Spinning apparatus. 5,146,740, Cl. 57-328.000

Mori, Yoshifumi: *See*—
Ishibashi, Akira; Mori, Yoshifumi; and Funato, Kenji, 5,147,823, Cl 437-225.000

Mori, Yoshio; Watanabe, Makoto; Azuma, Kishiro; and Kojima, Shiro, to Toagosei Chemical Industry Co., Ltd. Process for producing macromolecular monomer. 5,147,752, Cl. 526-220.000

Morikawa, Sumio; and Zakoji, Nobuyuki, to Oyodokomatsu Company, Limited. Reinforcement cutter. 5,146,683, Cl. 30-134.000

Morimoto, Kiyotake; Takagi, Yasushi; Kato, Isao; and Nakata, Masahiko, to Nisshinbo Industries, Inc. Method for producing non-yellowing polyurethane urea foam. 5,147,897, Cl. 521-125.000

Morino, Toshiharu: *See*—
Ishiguro, Shinji; and Morino, Toshiharu, 5,148,231, Cl. 356-126.000

Morita, Hiroshi: *See*—
Maruyama, Takahiro; Ogawa, Toshiaki; Morita, Hiroshi; Ishida, Tomoaki; and Kawai, Kenji, 5,147,465, Cl. 134-1.000.

Morita Kagaku Kogyo Co., Ltd.: *See*—
Tatsuno, Toshio; Miyamoto, Mitsuo; Ohta, Yoshiharu; and Sawada, Koichi, 5,147,605, Cl. 422-37.000

Morita, Shigeru, to Kabushiki Kaisha Toshiba. Semiconductor device having junction structure of a plurality of element isolation regions. 5,148,258, Cl. 357-49.000

Morita, Toshiki; Nitkawa, Takeshi; Kato, Kiroyuki; and Suzuki, Masashi, to Brother Kogyo Kabushiki Kaisha. Printer carriage homing mechanism. 5,147,143, Cl. 400-279.000

Morita, Yutaka: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 5,146,719, Cl. 73-861.910

Moriyama, Eiko: *See*—
Inamoto, Tadayoshi; Uehara, Haruo; Noguchi, Hiromichi; Shimomura, Akihiko; and Moriyama, Eiko, 5,148,193, Cl. 346-1.100

Morrow, Cary J.; and Wallace, Jon S., to University of New Mexico. Enzyme catalyzed synthesis of polyesters. 5,147,791, Cl. 435-123.000.

MOS Electronics Corp.: *See*—
Glass, Kevin W.; and Nagarajan, Ashok, 5,148,056, Cl. 307-443.000.

Mosaid, Inc.: *See*—
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Moschel, Charles C.: *See*—
Olson, Keith R.; and Moschel, Charles C., 5,146,838, Cl 92-177.000

Moscrip, William M., to Wilkins, Gordon W. Magnetoelectric resonance engine. 5,146,750, Cl. 60-517.000

Moser, Bobby A.: *See*—
Holman, Curtis W.; and Moser, Bobby A., 5,146,677, Cl 29-243.500.

Moskovitz, Irving: *See*—
White, Irving S.; and Moskovitz, Irving, 5,148,150, Cl. 340-571.000

Moss, James P. Catheter for cholangiography. 5,147,334, Cl 604-264.000

Motorola Inc.: *See*—
Bai, Monty W.; Minks, Danny E.; and Meyer, Alfred B., 5,147,974, Cl. 102-238.000
Bocci, Paul M.; Wilson, Alan L.; and Anderson, Walter F., 5,148,482, Cl. 380-48.000
Cannalte, Gary A.; and Burke, Dennis E., 5,148,449, Cl. 375-76.000
Casto, James J., 5,147,815, Cl 437-51.000
Chan, Huen S.; Leong, Chee S.; and Lim, Dah C., 5,148,350, Cl 361-386.000
Dionisio, Vito, Jr.; Bradford, William M.; Karl, David H.; and Gilmore, Peter B., 5,147,99[illegible], Cl. 200-16.00R
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Hsueh, Paul; Smith, Douglas; and Hershkowitz, Gerald B. 5,148,061, Cl. 307-475.000.
Kane, Robert C., 5,148,078, Cl. 313-307.000
Kennedy, Howard L.; and King, Thomas M., 5,148,452, Cl 375-96.000
Legge, Ronald, 5,147,519, Cl. 204-192.290.
McShane, Michael B.; Cast, James J.; and Joiner, Bennett A., 5,147,821, Cl. 437-212.000
Metroka, Michael P.; and Krolopp, Robert K., 5,148,471, Cl 379-58.000.
Moisin, Mihail S.; and Konopka, John G., 5,148,087, Cl 315-291.000
Ong, Richard H., 5,148,099, Cl. 323-314.000
Spohrer, Thomas S., 5,148,047, Cl. 307-246.000
Usami, Tadashi; and Kosuge, Masahiro, 5,148,436, Cl. 371-21.100

Mott, Philip J., to Borg-Warner Automotive Transmission & Engine Components Corporation. Chain design. 5,147,250, Cl. 474-206.000

Moulin, Gerard: *See*—
Azema, Alain; Botineau, Jean; and Moulin, Gerard, 5,147,352, Cl 606-5.000

Mouri, Hiroshi; Kawaguchi, Yasuyoshi, Ishii, Michio; Iwafune, Seiichiro; and Iwata, Toshiro, to Bridgestone Corporation. Pneumatic tire having foamed tread rubber. 5,147,477, Cl. 152-209.00R

Mowry, Thomas E., to Teledyne Kinetics. Balanced pressure connector. 5,147,207, Cl. 439-66.000

MPJ Manufacturing Company, Inc.: *See*—
Romano, Michael, 5,146,966, Cl. 150-110.000.

Mrosko, John A.: *See*—
Lee, Stanley M.; Terry, Jimmy C.; and Mrosko, John A., 5,146,846, Cl. 99-620.000

MTU Motoren- und Turbinen-Union Muenchen GmbH: *See*—
Scherer, Wolfgang, 5,148,364, Cl. 364-187.000

Muccitelli, John A.: *See*—
Ciuba, Stanley J.; and Muccitelli, John A., 5,147,604, Cl 422-13.000

Muehlbauer, James H.: *See*—
Neeley, Thomas S.; Kraft, Kenneth N.; and Muehlbauer, James H., 5,147,422, Cl. 55-90.000

Mueller, Hubert: *See*—
Doster, Klaus; and Mueller, Hubert, 5,146,806, Cl. 74-477.000.

Mueller, Karl F., to Ciba-Geigy Corporation. Thermotropic biphilic hydrogels and hydroplastics. 5,147,923, Cl. 524-555.000

Mueller, King L. Pneumatic weight lift assist apparatus. 5,147,263, Cl 482-112.000

Mueller, Lawrence P. Grip system for hand tools and instruments. 5,146,810, Cl. 74-558.000.

Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Cyclic phenolic thioethers. 5,147,893, Cl. 514-530.000.

Mukai, Kiichiro: *See*—
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, 5,147,500, Cl. 156-643.000.

Mulder, Jakob W.; and Sibbens, Goedele A. M., to U.S. Philips Corporation. X-ray examination apparatus and filter suitable for use therein 5,148,465, Cl. 378-156.000.

Mullens, Larry R.: *See*—
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Muller, Joachim: *See*—
Blochle, Hans; Schilling, Rainer; Kummer, Martin; Gansel, Eduard; Schramm, Heribert; Eblen, Helmut; and Muller, Joachim, 5,146,682, Cl. 30-124.000

Muller, Rudolf R. M., to Multifastener Corporation. Die assembly for attaching a female element. 5,146,672, Cl. 29-798.000.

Multifastener Corporation: *See*—
Muller, Rudolf R. M., 5,146,672, Cl. 29-798.000

Multiform Desiccants, Inc.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Nigon, Christopher S., 5,148,337, Cl. 360-97.040.

Munach, Arnold S.; and Auerbach, Alvin J., to United States of America, Navy. Remotely settable, multi-output, electronic time fuze and method of operation. 5,147,975, Cl. 102-264.000

Munier, Jean-Marie: *See*—
Basso, Claude; Lebizay, Gerald; Munier, Jean-Marie; and Pauporte, Andre, 5,148,527, Cl. 395-325.000.

Munk, Werner G. Process of producing a reconstitutable solid lactic acid dried product. 5,147,668, Cl. 426-61.000

Murai, Hiroko: *See*—
Saito, Keizo; Matsuo, Kazuhiko; and Murai, Hiroko, 5,148,367, Cl 364-419.000

Murakami, Azuma; and Saito, Norio, to Wacom Co., Ltd. Optical coordinate input apparatus and position indicator thereof. 5,148,016, Cl. 250-221.000

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Murakami, Tomoyoshi, to Idemitsu Kosan Co., Ltd. Resin composition. 5,147,922, Cl. 524-496.000.

Murakami, Yasuo; Shirota, Shinichi; and Okita, Shigeru, to NSK Ltd. Ball-and-roller bearing. 5,147,140, Cl. 384-492.000.

Muranaka, Masaki: *See*—
Watanabe, Kikuo; Muranaka, Masaki; and Iwatsuki, Masayuki, 5,147,659, Cl. 425-145.000

Murashima, Yoshihiro: *See*—
Sekino, Yoshimasa; and Murashima, Yoshihiro, 5,148,401, Cl. 365-230.030

Murata, Kazue: *See*—
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Murata Kikai Kabushiki Kaisha: *See*—
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Muratomi, Yoichi: *See*—
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Muroi, Masayuki: *See*—
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Murphy, Charles F., III: *See*—
Jackson, Jerome E.; and Murphy, Charles F., III, 5,146,852, Cl 101-335.000

Murphy, Edward T.: *See*—
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Murphy, Morgan D., to Delco Electronics Corporation. High brightness telltale for a head-up display. 5,148,146, Cl. 340-461.000

Murray, James S.: *See*—
Clark, John; Martel, Brian J.; and Murray, James S., 5,148,159, Cl 340-825.220

Murray, John E.: *See*—
Fite, David B.; Murray, John E.; and Fossum, Tryggve, 5,148,528, Cl. 395-375.000.

Murray, Kenneth R.; and Yarris, William T., to Caterpillar Industrial Inc. Side shift carriage for a lift mast. 5,147,171, Cl. 414-671.000

Mushika, Sadahiko: *See*—
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Muth, Ross R.: *See*
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Mutoh, Jiro: *See*—
Kuwabara, Osamu; Mutoh, Jiro; and Abe, Akihiko, 5,148,189, Cl 346-76.0PH

Myers, Robert M.; and Stahl, Mark G., to Alza Corporation. Iontophoretic delivery device. 5,147,297, Cl. 604-20.000

MyriadLase, Inc.: *See*—
Everett, Royice D., 5,147,353, Cl. 606-15.000

N.E. Chemcat Corporation: *See*—
Funabiki, Masaki; Kayano, Kunihide; and Yamada, Teiji, 5,147,842 Cl. 502-304.000.

Naab, Carlton W.; and Thompson, Wayne T., to Conax Florida Corporation. EMI protected water-activated pressurized gas release apparatus. 5,148,346, Cl. 361-251.000.

Nabo, Olle: *See*—
Carlsson, Claes-Goran; Inge, Claes; Franzen, Peter; Lagerstedt, Torgny; Borgstrom, Leonard; Moberg, Hans; and Nabo, Olle 5,147,280, Cl. 494-56.000

Nachbar, Henry D., to United States of America, Energy. Rotary union for use with ultrasonic thickness measuring probe. 5,146,786, Cl 73-623.000

Nagai, Katsumi; and Nishimyou, Teruyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Loading/unloading control apparatus for industrial vehicles. 5,146,746, Cl. 60-445.000

Nagai, Kiyotaka; and Nakajima, Yasushi, to Matsushita Electric Industrial Co., Ltd. Audio subband encoded signal decoder. 5,148,487, Cl 381-46.000.

Nagame, Hiroshi: *See*—
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Nagami, Masaaki: *See*—
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Nagamune, Akio; Tezuka, Kouichi; Kanao, Yoshiyuki, and Komine, Isamu, to NKK Corporation. In-furnace level meter and antenna therefore. 5,148,177, Cl. 342-124.000

Nagano, Akihiko; Kishi, Etsuro; Fujiwara, Ryoji; Ohkubo, Yukitoshi, Nishimura, Michiyo; Sakata, Hajime; Ishii, Takayuki; and Yamanobe, Masato. Optical modulation element having two-dimensional phase type diffraction grating. 5,148,302, Cl. 359-95.000

Nagaoka Daiji: *See*—
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Nagarajan, Ashok: *See*—
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Nagasaki, Tatsuo: *See*—
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Nagasawa, Kenichi: *See*—
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Nagase, Yukio: *See*—
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Nagata, Kazuhisa: *See*—
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Nagata, Masato: *See*—
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Nagayama, Tokio: *See*—
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Nagy, Peter L.; Balaazs, Bela; Boross, Maria; Szilbereky, Jeno; Zsila, Gizella; Abraham, Lajos; Blasko, Gyorgy; Gachalyi, Bela; Almasi, Attila; and Nemet, Gabor, to Biorex Kutato-Fejleszto Kft. O-(3-amino-2-hydroxypropyl)-hydroximic acid halides and process for preparing the same. 5,147,879, Cl. 514-318.000

Naito, Shuzo: *See*—
Tokuda, Kimishiro; Oguri, Masaharu; and Naito, Shuzo, 5,146,858 Cl. 110-261.000

Naitou, Yukio: *See*—
Nishimura, Eiichi; Toda, Akihito; Sugiyama, Kazuhiko; and Naitou, Yukio, 5,147,493, Cl. 156-345.000

Nakada, Akira: *See*—
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Nakada, Kazuhiko. *See*—
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Nakada, Kazuhiro, to NEC Corporation. Semiconductor integrated circuit memory enabling memory write masking. 5,148,396, Cl 365-189.000

Nakagawa, Tetsuya: *See*—
Yano, Kazuo; Ishibashi, Koichiro; Nakagawa, Tetsuya; Shimohigashi, Katsuhiro; and Minato, Osamu, 5,148,387, Cl. 364-784.000

Nakajima, Kazuhiko. *See*—
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Nakajima, Shigeo. *See*—
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Nakajima, Shinji; and Miyabe, Toshimasa, to Suzuki Kabushiki Kaisha Storage box compartment means for a motorcycle. 5,147,077, Cl 224-32.00R

Nakajima, Yasushi. *See*—
Nagai, Kiyotaka; and Nakajima, Yasushi, 5,148,487, Cl. 381-46.000

Nakamura, Ichiro; and Tujiya, Hideki, to Olympus Optical Co., Ltd Medical instrument and valve to be mounted on a mount piece of that instrument. 5,147,305, Cl. 604-110.000

Nakamura, Ichisaburo: *See*—
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Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki, and Hashimoto, Masanori, to Nihon Shinku Gijutsu Kabushiki Kaisha. Magnetic recording media manufactured by a process in which a negative bias voltage is applied to the substrate during sputtering 5,147,734, Cl. 428-694.000

Nakamura, Shigeru: *See*—
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Nakamura, Shinichi: *See*—
Adachi, Hideki; Takizawa, Mitsuharu; Nakayama, Miho; Fukada, Taisei; Nakamura, Shinichi; Kuroyanagi, Satoshi; Tahara, Hisatsugu; Ozaki, Hiroshi; and Miyata, Masanori, 5,148,089, Cl 318-66.000

Nakamura, Shuichi; Sasaki, Hakaru; and Watanabe, Rikizo, to Hitachi Metals, Ltd. High strength lead frame material and method of producing the same. 5,147,470, Cl. 148-677.000

Nakamura, Takashi; and Nishimura, Yoshikazu, to Sony Corporation Iris stabilizer for automatic video camera. 5,148,281, Cl. 358-228.000

Nakamura, Takeshi. *See*—
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Nakamura, Tuneo: *See*—
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Nakamura, Yasuyuki; and Kumamoto, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Current generating device for complementarily generating two currents of different magnitudes in response to one-bit data. 5,148,164, Cl. 341-136.000

Nakamura, Yuichi: *See*—
Abe, Nobumasa; Momose, Kiyoharu; Watanabe, Koji; Nakamura Yuichi; Handa, Tsuneo; and Nishikawa, Mitsutaka, 5,148,185, Cl 346-1.100

Nakane, Rintaro; Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro, Miura, Kunihiko; Tomura, Shinya; and Kohyama, Mitsuaki, to Kabushiki Kaisha Toshiba. Image forming apparatus with a humidity detector. 5,148,218, Cl. 355-208.000

Nakane, Yasuaki; Miyaoka, Senri; Tamada, Sakuya; Nakayama, Hiroshi; Iwai, Junichi; and Igarashi, Shuichi, to Sony Corporation Image display apparatus with increased raster scan rate of laser beams 5,148,285, Cl. 358-231.000.

Nakanishi, Hideo, to Sanyo Chemical Industries, Ltd. Electrophotographic toner and charge controller therefor. 5,147,750, Cl 430-110.000.

Nakata, Masahiko: *See*—
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Nakaya, Hiroaki: *See*—
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Nakayama, Hiroshi: *See*—
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Nakayama, Miho: *See*—
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Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikazu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide, Hori, Ryoichi, Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao Shimohigashi, Katsuhiro; and Homma, Noriyuki, to Hitachi, Ltd Semiconductor memory device. 5,148,255, Cl. 357-43.000

Nakazawa, Kazuyoshi: *See—*
Yamamoto, Yuji; Kurata, Takashi; Nakazawa, Kazuyoshi; Tsuda, Yusuke; Watanabe, Junichiro; Matsumoto, Makoto; Kurita, Akitsugu; and Funahashi, Yuichi, 5,147,947, Cl. 525-479.000.

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Nakazoe, Masayo, to Kabushiki Kaisha Toshiba. Small electronic device capable of switching batteries by releasing a battery locking mechanism. 5,148,042, Cl. 307-65.000

Nalco Chemical Company: *See—*
Huddleston, David A.; Gabel, Robert K.; and Williamson, Charles D., 5,147,964, Cl. 527-400.000

Namose, Isamu: *See—*
Szwejkowski, Chester; Latchford, Ian S.; Namose, Isamu; and Tsuchida, Kazumi, 5,147,499, Cl. 156-643.000

Nanko, Norbert A.: *See—*
Beck, Andreas; and Nanko, Norbert A., 5,147,385, Cl. 623-1.000

Narazaki, Yukihisa: *See—*
Senkawa, Yoshio; Iguchi, Susumu; Ueno, Akira; Takeda, Hiroshi; Mitsu, Shigeru; Koyama, Kenji; Narazaki, Yukihisa; and Shimura, Yoshihiko, 5,148,21 , Cl. 354-416.000.

Narita, Susumu; Hanawa, Makoto; Nishimukai, Tadahiko; and Okada, Tetsuhiko, to Hitachi, Ltd. Pipeline processor with prefetch circuit 5,148,532, Cl. 395-375.000

Naruse, Humio: *See—*
Suwa, Hidenori; Ono, Shinichi; Hirano, Hiroyuki; and Naruse, Humio, 5,147,168, Cl. 414-21 .000

Nash Engineering Company, The: *See—*
Sweet, Douglas F., 5,147,508, Cl. 162-279.000

Nashimoto, Kiyoshi, to ANELVA Corporation. Apparatus for controlling temperature in the processing of a substrate. 5,147,498, Cl. 156-627.000

Nasstrom, Gunnar: *See—*
Nymark, Bernt; and Nasstrom, Gunnar, 5,147,372, Cl. 606-130.000

National Research Development Corporation: *See—*
Graham, Neil B., 5,147,646, Cl. 424-424.000
Turner, John J.; Turner, Mary J. A.; and Watt, Peter, 5,147,298, Cl. 604-79.000
Williamson, Ian G.; and Kenbridge, David H., 5,146,922, Cl. 128-774.000

National Semiconductor Corporation: *See—*
Bohannon, Kenneth W.; Srikrishna, Kuppuswamy; Sholing, Anthony F.; and Reder, Steven E., 5,146,869, Cl. 118-724.000

Naturin-Werk Becker & Co.: *See—*
Winkler, Bruno, 5,147,671, Cl. 426-140.000

Naudin, Jacky: *See—*
Focqueur, Herve ; Jumel, Bernard; Paquin, Jacques; and Naudin, Jacky, 5,147,246, Cl. 464-59.000

Nawata, Shinichi: *See—*
Iyyuin, Makoto; Tsuda, Akihiko; and Nawata, Shinichi, 5,147,697, Cl. 428-36.600

Naylor, David L.: *See—*
Blakeslee, William W., deceased; Davidson, Ronald A.; Giles, Edwin Q.; Menihan, Robert M.; Naylor, David L.; Pitbladdo, Richard B.; Schad, Martin F.; Sterner, Kevin B.; Trentelman, Jackson P.; and Watts, Jason S., 5,147,436, Cl. 65-33.000.

NCR Corporation: *See—*
Browning, Jovona C.; and Harvey, Vernon B., 5,147,699, Cl. 428-40.000
Lindacher, Joseph M., 5,148,009, Cl. 235-462.000

Neale, Frank T., III; Von Schwerdtner, Detlev H.; and Yurtin, John A., to General Motors Corporation. Electrical component package. 5,147,217, Cl. 439-403.000.

NEC Corporation: *See—*
Fujii, Takeo, 5,148,400, Cl. 36 -222.000.
Iida, Hiroshi; Kuriki, Kyoichi; and Kuninaka, Hitoshi, 5,146,742, Cl. 60-202.000
Kishi, Shuji, 5,148,257, Cl. 35 -49.000
Kogure, Hiroshi; and Nomatsu, Hidehiko, 5,148,349, Cl 361-383.000
Kudoh, Kazuhiro, 5,148,160, Cl. 340-825.440
Nakada, Kazuhiro, 5,148,396, Cl. 365-189.030
Ohga, Shinji; and Yamazaki, Takumi, 5,148,525, Cl. 395-250.000
Otani, Susumu; and Iwasaki, Hotoya, 5,148,451, Cl. 375-97.000
Sakuma, Hajime; and Shinohara, Hiroko, 5,148,542, Cl 395-700.000
Tanisawa, Yasuhisa, 5,148,50 Cl. 385-41.000
Yokoyama, Yukio; and Ono, Takao, 5,148,181, Cl. 343-702.000

Neckyfarow, Steven W.: *See—*
Abraham, Dennis G.; Aden, Steven G.; Arnold, Todd W.; Neckyfarow, Steven W.; and Rohland, William S., 5,148,481, Cl. 380-46.000

Neddermann, Kim: *See—*
Bursuker, Isia; Carlino, Joseph A.; Neddermann, Kim; Schacter, Bernice; Ellingsworth, Larry; and Spitalny, George, 5,147,799, Cl. 435-240.100.

Neeley, Thomas S., Kraft, Kenneth N.; and Muehlbauer, James H., to George Koch Sons, Inc. Paint spray booth. 5,147,422, Cl. 55-90.000.

Neely, John G. H.; and Cheung, John Y., to University of Oklahoma, Board of Regents of the. Method and apparatus for detecting and quantifying motion of a body part. 5,148,477, Cl. 382-6.000

Negishi, Kiyoshi: *See—*
Nishikawa, Tomoyuki; Kita, Masahiro; Yano, Takaaki; Yoshida, Tatsuya; Honda, Ryoji; Negishi, Kiyoshi; Sato, Tsutomu; and Kamasako, Shoji, 5,148,284, Cl. 358-296.000.

Negishi, Masami: *See—*
Kobayashi, Hiroshi; Negishi, Masami; and Kimura, Toshiya, 5,148,409, Cl. 367-91.000.

Negishi, Yoshio, to Furukawa Aluminum Co., Ltd. Width-variable mold device. 5,146,975, Cl. 164-436.000

Neill, Kenneth: *See—*
Dingle, Phillip J.; Thomas, Raymond W.; and Neill, Kenneth, 5,148,139, Cl. 337-6.000

Nelsen, Thomas S.: *See—*
Boutacoff, Theodore A.; Buzawa, David M.; and Nelsen, Thomas S., 5,147,354, Cl. 606-15.000

Nelson, Gullmar V., to Dadison Textron Inc. Directed fiber preforming. 5,147,653, Cl. 425-470.000.

Nemet, Gabor: *See—*
Nagy, Peter L.; Balaazs, Bela; Boross, Maria; Szilbereky, Jeno; Zsila, Gizella; Abraham, Lajos; Blasko, Gyorgy; Gachalyi, Bela; Almasi, Attila; and Nemet, Gabor, 5,147,879, Cl. 514-318.000

Nemeth, Peter; Dancs, Tibor; Simmons, Robert L.; and Kalman, Istvan, to Machine Design Service, Inc. Paper cutting apparatus and method 5,146,820, Cl. 83-37.000.

Nemirow, Michael A.: *See—*
Dubowik, John M.; Ulrich, Karl T.; and Nemirow, Michael A., 5,146,844, Cl. 99-450.600.

Nemoto, Kouji: *See—*
Koshi, Masaki; Yamada, Shouji; Watanabe, Akihiko; and Nemoto, Kouji, 5,147,479, Cl. 152-216.000.

Nemser, Stuart M., to Du Pont Canada Inc. Air-intake system for mobile engines. 5,147,417, Cl. 55-16.000.

NEOFORM S.n.c. di Bortolo Da Pra' & C.: *See—*
Da Pra', Bortolo, 5,146,649, Cl. 16-228.000.

Neotech AG: *See—*
Iff, Rene , 5,146,792, Cl. 73-863.860

Nestec S.A.: *See—*
Kwon, Steven S.; Marsico, Michael A.; and Vadehra, Dharam V., 5,147,667, Cl. 426-56.000
Wadell, Lars G. A., 5,147,029, Cl. 198-619.000.

Nestor, Charles R., to General Motors Corporation. High current electrical connector. 5,147,229, Cl. 439-843.000

Netravali, Arun N.: *See—*
Knauer, Scott C.; Netravali, Arun N.; Petajan, Eric D.; and Westerink, Peter H., 5,148,274, Cl. 358-141.000.

Nettleton, Harry W.: *See—*
Steele, Sandra L.; and Nettleton, Harry W., 5,146,625, Cl 2-102.000.

Neufeld, Terrence: *See—*
Lemieux, Richard; and Neufeld, Terrence, 5,147,041, Cl 206-449.000

Neumann, Horst: *See—*
Eschwey, ManfredNeumann; Horst; van Bonn, Rolf; and Neumann, Horst, 5,147,724, Cl. 428-409.000

Neumann, Werner; Reule, Hans; and Wolffram, Werner, to Nokia Unterhaltungselektronik GmbH. In-line color picture tube. 5,148,081, Cl. 313-414.000

Neuromag Oy: *See—*
Ahonen, Antti I.; Kajola, Matti J. and Simola, Juha T. A., 5,148,262, Cl. 357-68.000

New England Biolabs, Inc.: *See—*
Polisson, Carol; and Barsomian, Janet M., 5,147,794, Cl. 435-199.000

Newby, Paul S.; and Cannon, Wayne H., to Institute for Space and Terrestrial Science, The. Parallel sync detection. 5,148,453, Cl. 375-116.000.

Newcomb, Bruce E.: *See—*
Kullas, Karen E.; and Newcomb, Bruce E., 5,147,292, Cl. 604-34.000

Newcomer, Kevin L.; and Richter, Steve, to QED Environmental Systems, Inc. Floating layer recovery apparatus. 5,147,184, Cl 417-394.000

Newcomer, Kevin L.: *See—*
Niehaus, K. Lynn; Newcomer, Kevin L.; and Richter, Steven C., 5,147,185, Cl. 417-394.000.

Newhouse, Mark A.: *See—*
Borrelli, Nicholas F.; Dumbaugh, William H., Jr.; Hall, Doublas W.; Lapp, Josef C.; Newhouse, Mark A.; Powley, Mark L.; and Weidman, David L., 5,148,510, Cl. 385-142.000

Newman, Michael J., to Hoffmann-La Roche Inc. TGF-B compositions and method. 5,147,854, Cl. 514-12.000.

Newton, David W.: *See—*
Sabbaghian, Mehdy; Barfield, Tony; Schiele, Patrick; Newton, David W.; Lormand, Gregory J.; and Schwartzberg, Glen J., 5,147,379, Cl. 606-206.000

Newton, Jerry L.: *See—*
Parker, Donald L.; Newton, Jerry L.; Reuter, David F.; and Huntzicker, Fred W., 5,147,116, Cl. 303-115.0EC.

Ng, Douglas J.: *See—*
Hudson, Derek; Honig, Jordan; Cook, Ronald M.; and Ng, Douglas J., 5,147,608, Cl. 422-63.000.

Ng, Hilbert H. M., to Charlene Products, Inc. Hair coloring apparatus and method. 5,146,936, Cl. 132-208.000

Ngo, Kim Chi T.: *See—*
Zuckerwar, Allan J.; and Ngo, Kim Chi T., 5,146,780, Cl. 374-175.000.

Nguyen, Long T., to GTE Products Corporation. Network for obtaining high power and low total harmonic distortion. 5,148,359, Cl 363-48.000

Nguyen, Long T., to GTE Products Corporation. Fourth order damped lowpass filter for obtaining high power factor and low total harmonic distortion. 5,148,360, Cl. 363-48.000

Nguyen, Xuan T., to Domtar Inc. Recycling waste cellulosic material with sodium sulphide digestion. 5,147,503, Cl. 162-7.000

NHK Spring Co., Ltd.: *See—*
Hiromoto, Shuji; Kitamura, Roh; Yoshino, Fumitaka; Kamisaku Takeshi; and Takehana, Toshihiro, 5,147,097, Cl. 280-691.000.

Nichols, David. Fishing lure and method of manufacture. 5,146,707, Cl 43-42.530

Nichols, Dwyane B.. *See—*
Dohrer, Gregory L.; Holler, Michael D.; and Nichols, Dwyane B., 5,147,709, Cl. 428-213.000.

Nichols, William R., to Infilco Degremont Inc. Method for monitoring turbidity of waste liquid in backwashing filter beds. 5,147,560, Cl 210-745.000

Nicol, Ross S.: *See—*
McLachlan, Corran N. S.; Catchpole, Owen J.; and Nicol, Ross S 5,147,672, Cl. 426-241.000

Niedrach, Leonard W.. *See—*
Andresen, Peter L.; and Niedrach, Leonard W., 5,147,602, Cl 420-35.000

Niehaus, K. Lynn; Newcomer, Kevin L.; and Richter, Steven C., to QED Environmental Systems, Inc. Pump apparatus for fluid sampling and collection, and the like. 5,147,185, Cl. 417-394.000

Niehaus, K. Lynne: *See—*
Cordry, Kent E.; Niehaus, K. Lynne; and Mioduszewski, David 5,146,998, Cl. 175-21.000

Nielsen, Mark J.: *See—*
Freese, David E.; Miller, David A.; and Nielsen, Mark J 5,148,472, Cl. 379-59.000

Nies, Reinhard: *See—*
Faust, Horst; Hultzsch, Guenter; and Nies, Reinhard, 5,147,690, Cl 427-372.200

Nietupski, Raymond M.; Wilson, Stephen G.; Shah, Jyotsna; Chan, Samuel W.; Halbert, Donald N.; and Lane, David J., to Amoco Corporation. Probes and methods for the detection of salmonella. 5,147,778, Cl. 435-6.000

Nigon, Christopher S.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Nigon, Christopher S., 5,148,337, Cl. 360-97.040.

Nihon Heating Service Co., Ltd.: *See—*
Iseki, Tosiyuki, 5,146,709, Cl. 47-41.010.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani Noriaki; and Hashimoto, Masanori, 5,147,734, Cl. 428-694.000

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Suwa, Hidenori; Ono, Shinichi; Hirano, Hiroyuki; and Naruse Humio, 5,147,168, Cl. 414-217.000.

Nikawa, Takeshi: *See—*
Morita, Toshiki; Nikawa, Takeshi; Kato, Kiroyuki; and Suzuki Masashi, 5,147,143, Cl. 400-279.000
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; Nikawa Takeshi; and Suzuki, Masashi, 5,147,141, Cl. 400-124.000

Nikuni, Tokio: *See—*
Sato, Akihide; and Nikuni, Tokio, 5,147,899, Cl. 521-141.000

Nitsu, Toshiaki: *See—*
Kudo, Toshio; and Nitsu, Toshiaki, 5,148,335, Cl. 369-59.000

Nikitenko, Vladimir I.: *See—*
Fedorov, Svyatoslav N.; Linnik, Leonid F.; Antropov, Gennady M.; Shigina, Nina A.; Nikitenko, Vladimir I.; Arnautov, Leonid N.; Stromakov, Alexandr P.; Boldysheva, Irina A.; Oreshkin Valery P.; and Chernyakov, Lev A., 5,147,284, Cl. 600-9.000

Nikkiso Co., Ltd.: *See—*
Ito, Kazuyuki; Aizawa, Takeshi; and Tsuneda, Makoto, 5,147,187, Cl. 417-423.100.

Nikl, Horst. *See—*
Weissbrich, Alfons; Nikl, Horst, and Wahnschaffe, Nikolaus 5,147,006, Cl. 180-79.400.

Nikl, Libor; and Albright, Lawrence, to Taito Co., Ltd. Composition and process to enhance the efficacy of a fish vaccine. 5,147,862, Cl 514-54.000.

Nikolaus, Heinrich; and Paton, Robert, to Zahnradfabrik Friedrichshafen AG. Arrangement and method for operating a continuously variable drive unit in a motor vehicle. 5,146,812, Cl. 74-858.000

Nikon Corporation: *See—*
Hoshino, Shunji; and Ohkuma, Hiroya, 5,148,416, Cl. 369-32.000.
Yamada, Masayuki; and Ushio, Yoshijiro, 5,148,306, Cl 359-271.000

Nippon Air Brake Co., Ltd.: *See—*
Tamamori, Hideo, 5,146,952, Cl. 137-627.500.

Nippon Chemical Industrial Co., Ltd.: *See—*
Shimura, Seiji; Sugiya, Masashi; Hara, Yoshifusa; Kako, Kunio; and Saito, Akira, 5,147,409, Cl. 8-128.100

Nippon Conlux Co., Ltd.: *See—*
Maruyama, Yoshinori; and Ishida, Takeshi, 5,147,021, Cl 194-217.000

Nippon Oil Company, Limited: *See—*
Takiguchi, Yasuyuki; Iida, Shigeki; and Toyooka, Takehiro 5,147,682, Cl. 427-58.000

Nippon Oil and Fats Company, Limited: *See—*
Ito, Haruki; Maeda, Kenzou; Miyazaki, Nobuyuki, Unoki, Masao Sagawa, Chiaki; and Kamba, Motoi, 5,147,934, Cl. 525-124.000.

Nippon Seiko Kabushiki Kaisha. *See—*
Chikuma, Isamu; and Eda, Hiroshi, 5,147,009, Cl. 180-143.000
Ishikawa, Shuuichi, 5,148,104, Cl. 324-173.000

Nippon Shoji Kabushiki Kaisha: *See—*
Enomoto, Masayasu, 5,147,803, Cl. 436-16.000

Nippon Shokubai Co., Ltd.: *See—*
Kishimoto, Nobuji; and Yamamoto, Hiroshi, 5,147,850, Cl 505-1.000

Nippon Steel Corporation: *See—*
Komatsu, Fumito; and Shimokawa, Hiroyasu, 5,146,827, Cl 83-482.000
Sugimoto, Takao; Nishimura, Takehiro; Fujikake, Yohichi; and Yamaguchi, Akiomi, 5,146,779, Cl. 73-81.000.
Tamehiro, Hiroshi; Chiziiwa, Rikio; Sakumoto, Yoshifumi; Funato, Kazuo; Yoshida, Yuzuru; and Keira, Koichiro, 5,147,474, Cl 148-320.000

Nippon Telegraph & Telephone Corporation: *See—*
Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma Mikio; and Kato, Yasuyuki, 5,147,434, Cl. 65-12.000

Nippon Unicar Company Limited: *See—*
Miyahara, Yoshiki; Kasetani, Satoshi, Nishimura, Shigetaka, Hirsoe, Kunihiro; Inoue, Takashi; and Nogi, Takashi, 5,147,712, Cl. 428-224.000

Nishida, Reizirо; and Tominaga, Akira, to Kansai Paint Co., Ltd Cationically electrodepositable rein composition based on 4-vinylcyclohexene-1-oxide. 5,147,906, Cl. 523-410.000

Nishida, Shinichi. *See—*
Uchinami, Masanobu; Takahashi, Toshihisa; Nishiyama, Ryoji Suzuki, Hiroyoshi; and Nishida, Shinichi, 5,148,369, Cl 364-431.060

Nishide, Hiroyuki: *See—*
Tsuchida, Eishun; Nishide, Hiroyuki; and Kawakami, Hiroyoshi, 5,147,424, Cl. 55-158.000.

Nishigaki, Syunichiro: *See—*
Sato, Hiroaki; and Nishigaki, Syunichiro, 5,148,467, Cl 378-197.000.

Nishihara, Yukio; and Oharada, Akemi, to Okuno Chemical Industries Co., Ltd. Electrolessly solder plating composition. 5,147,454, Cl 106-1.220

Nishijima, Tamotsu; and Fujino, Toshihiro, to Yazaki Corporation Twisted wire manufacturing apparatus and concentric twisted wire manufacturing machine. 5,147,662, Cl. 425-500.000

Nishikawa, Mitsutaka. *See—*
Abe, Nobumasa; Momose, Kiyoharu; Watanabe, Koji; Nakamura Yuichi; Handa, Tsuneo; and Nishikawa, Mitsutaka, 5,148,185, Cl 346-1.100

Nishikawa, Tomoyuki; Kita, Masahiro; Yano, Takaaki, Yoshida, Tatsuya; Honda, Ryoji; Negishi, Kiyoshi; Sato, Tsutomu, and Kamasako, Shoji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Data recovery device for printer. 5,148,284, Cl. 358-296.000.

Nishimore, Masayoshi; Yoshida, Hiroshi; Tani, Masanori; Tanaka, Tadao; Fuji, Hiroshi; and Masuda, Hiroyuki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Jidosha Engineering Kabushiki Kaisha. Four-wheel vehicle steering apparatus. 5,147,008, Cl 180-140.000.

Nishimoto, Shinobu; Hirakawa, Eisuke; Fukuzawa, Minoru; Kato, Takashi; and Tani, Akio, to Kabushiki Kaisha Alpha Giken; and Osaka Yuki Kagako Kogyo Kabushiki Kaisha. Optical resin articles. 5,147,959, Cl. 528-48.000.

Nishimukai, Tadahiko; Hasegawa, Atsushi; and Matsumura, Masaru, to Hitachi Ltd.; and Hitachi Micro Computer Engineering Ltd. Data processing system with an enhanced cache memory control 5,148,526, Cl. 395-275.000.

Nishimukai, Tadahiko. *See—*
Narita, Susumu; Hanawa, Makoto; Nishimukai, Tadahiko; and Okada, Tetsuhiko, 5,148,532, Cl. 395-375.000.

Nishimura, Eiichi; Toda, Akihito; Sugiyama, Kazuhiko, and Naitou, Yukio, to Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. Plasma generating apparatus. 5,147,493, Cl. 156-345.000

Nishimura, Michiyo: *See—*
Nagano, Akihiko; Kishi, Etsuro; Fujiwara, Ryoji; Ohkubo, Yukitoshi; Nishimura, Michiyo; Sakata, Hajime; Ishii, Takayuki, and Yamanobe, Masato, 5,148,302, Cl. 359-95.000

Nishimura, Shigetaka: *See—*
Miyahara, Yoshiki; Kasetani, Satoshi; Nishimura, Shigetaka, Hirsoe, Kunihiro; Inoue, Takashi, and Nogi, Takashi, 5,147,712, Cl. 428-224.000

Nishimura, Shunji: *See—*
Umetsu, Takao; and Nishimura, Shunji, 5,148,201, Cl. 354-195.100

Nishimura, Takehiro: *See—*
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Nishimura, Yoshikazu: *See—*
Nakamura, Takashi; and Nishimura, Yoshikazu, 5,148,281, Cl 358-228.000

Nishimyou, Teruyuki: *See—*
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Nishino, Masakazu: *See—*
Kato, Shiro; Juri, Tatsuro; and Nishino, Masakazu, 5,148,271, Cl 358-133.000

Nishio, Taichi: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takeshi and Kakugo, Masahiro, 5,147,942, Cl. 525-397.000

Nishiwaki, Osamu: *See—*
Tochihara, Shinichi; Nishiwaki, Osamu; and Iwata, Kazuo, 5,148,186, Cl. 346-1.100

Nishiyama, Masaaki; and Ogino, Shigeo, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 5,148,289, Cl. 358-300.000.

Nishiyama, Ryoji: *See—*
Uchinami, Masanobu; Takahashi, Toshihisa; Nishiyama, Ryoji; Suzuki, Hiroyoshi; and Hishida, Shinichi, 5,148,369, Cl 364-431.060

Nisonger, Robert L.; and Topping, Richard W., to General Motors Corporation. Proportioning brake pressure valve responsive to steering system hydraulic pressure. 5,147,113, Cl. 303-9.730.

Nissan Motor Company, Ltd.: *See—*
Kobayashi, Hiroshi; Negishi, Masami; and Kimura, Toshiya, 5,148,409, Cl. 367-91.000
Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Sasaki, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinich, 5,146,891, Cl 123-325.000
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Sekiya, Yoshiki, 5,146,900, Cl 123-501.000
Torii, Shuji; Nozaki, Hiromichi; Aoshima, Kazuyuki; and Matsui, Norimasa, 5,147,494, Cl. 156-417.000

Nisshinbo Industries, Inc.: *See—*
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Nitto Boseki Co., Ltd.: *See—*
Koike, Ryouzou; and Hashimoto, Mituhiro, 5,147,040, Cl 206-410.000

Niven, Malcolm: *See—*
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Niwa, Katsuhiro; Shimoyama, Tsuguhiro; Tabushi, Katsumi; and Anazawa, Toshio, to Gunze Limited. Sewing and stacking apparatus. 5,146,860, Cl. 112-121.270.

Niwa, Kazuharu: *See—*
Ichikawa, Makoto; Niwa, Kazuharu; and Nakada, Kazuhiko, 5,147,902, Cl. 523-106.000.

Niwa, Naoki: *See—*
Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi; Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000.

NKK Corporation: *See—*
Nagamune, Akio; Tezuka, Kouichi; Kanao, Yoshiyuki; and Komine, Isamu, 5,148,177, Cl 342-124.000.

Noble, Philip C.; and Padgett, Mary Beth, to Pfizer Hospital Products Group, Inc. Prosthetic device and method of implantation. 5,147,408, Cl. 623-23.000

Nock, Nigel G.; Clarke, David H.; and Martin, John, to Sumitomo Rubber Industries, Ltd. Tire tread pattern having transverse grooves with interlocking noise baffles 5,147,478, Cl. 152-209.00R

Noda, Shuhei; and Hashimoto, Kinoji, to Kuraray Co., Ltd. Process for producing pellets. 5,146,822, Cl 83-22.000

Nogi, Takashi: *See—*
Miyahara, Yoshiki; Kasetani, Satoshi; Nishimura, Shigetaka; Hirsoe, Kunihiro; Inoue, Takashi; and Nogi, Takashi, 5,147,712, Cl. 428-224.000

Noguchi, Hiromichi: *See—*
Inamoto, Tadayoshi; Uehara, Haruo; Noguchi, Hiromichi; Shimomura, Akihiko; and Moriyama, Eiko, 5,148,193, Cl 346-1.100

Nohara, Akira: *See—*
Kane, Joji; and Nohara, Akira, 5,148,484, Cl. 381-46.000

Nohara, Kazunori, to Sanyo Electric Co., Ltd. Holding circuit for providing a large time constant by using a base current to charge the capacitor. 5,148,055, Cl. 307-353.000

Noji, Shirou: *See—*
Uda, Taizo; Itoh, Yukikatsu; Kawaguchi, Tetsuo; Hifumi, Emi; Taniguchi, Naoyuki; Suzuki, Keiichiro; Ishikawa, Mutsuo; and Noji, Shirou, 5,147,783, Cl 435-7.230.

Nokia Unterhaltungselektronik GmbH: *See—*
Neumann, Werner; Reule, Hans; and Wolffram, Werner, 5,148,081, Cl. 313-414.000

Nomura, Hironori; Shimakawa, Taiji; Matsura, Yoshinori; Yamamoto, Hiroki; and Ohnishi, Hirofumi, to Uni-Charm Corporation. Method of manufacturing disposable underpants by applying annular adhesive zones to the backsheet and top sheet for retaining elastic for leg holes 5,147,487, Cl. 156-164.000

Nonaka, Tomoharu; Makino, Hiroshi; Takahashi, Masahiro; Sata, Teiji; and Yoshino, Daisuke, to Fuji Xerox Corporation Ltd. Recessed rotation detectors for brushless motors. 5,148,069, Cl. 310-68.00R

Noranda Inc.: *See—*
Tsantrizos, Peter; Lachance, Raynald; Hehshaw, Bruce; and Mavropoulos, Lakis T., 5,147,798, Cl. 219-121.500.

NordicTrack, Inc.: *See—*
Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,147,265, Cl. 482-119.000

Nordsiek, Karl-Heinz: *See—*
Hellermann, Walter; Herrmann, Christoph; Nordsiek, Karl-Heinz; Wolpers, Jurgen; and Fuchs, Hans-Bernd, 5,147,939, Cl 525-314.000

Norimatsu, Hidehiko: *See—*
Kogure, Hiroshi; and Norimatsu, Hidehiko, 5,148,349, Cl 361-383.000

Norris, John R.: *See—*
Smith, Donald P.; Dobie, Michael J.; Sparman, Alden B., Sr.; and Norris, John R., 5,147,994, Cl. 219-10.55R.

Norsk Hydro A.S.: *See—*
Gronnevik, Oddbjorn, 5,147,270, Cl. 493-141.000
Nussbaum, Gilles; Deweirder, Damien; and Gjestland, Haavard T., 5,147,603, Cl. 420-409.000.

North American Dynamics: *See—*
Hagen, Richard L.; and Thompson, William W., 5,147,972, Cl 89-33.160

North American Philips Corporation: *See—*
Jernigan, Forest E., 5,148,088, Cl. 315-411.000.
Kroes, Anthony, 5,148,085, Cl. 315-248.000.

Northern Telecom Limited: *See—*
Lee, Eddy; D'Cruz, Mervyn G.; and Kulinek, Eugene, 5,148,541, Cl. 395-600.000
Meche, Paul S.; and Chaplain, Eugenie M., 5,148,548, Cl 455-34.100.
Wight, Mark S.; Van Alstine, Valerie A.; and Harris, Gwendolyn K., 5,148,113, Cl. 328-155.000.

Northrup, James R.; and Tasson, Brian B., to Alliant Techsystems Inc Main propellant ignition liner for cased telescoped ammunition 5,147,978, Cl. 102-434.000.

Northstar Industries, Inc.: *See—*
Flippo, Bobby K., 5,147,025, Cl. 198-782.000.

Norton Company: *See—*
Chow, Jacob; Horton, Ralph M.; and Jones, Mark L., 5,147,001, Cl 175-428.000

Nortrup, Kevin E.: *See—*
Wignot, Leroy S.; and Nortrup, Kevin E., 5,148,280, Cl 358-191.100

Norvic S.A.: *See—*
Kaalstad, Oscar, 5,147,000, Cl. 175-334.000.

Nose, Noriyuki; and Abe, Naoto, to Canon Kabushiki Kaisha. Device for detecting positional relationship between two objects. 5,148,038, Cl. 250-548.000

Nose, Noriyuki: *See—*
Suda, Shigeyuki; Houryu, Sakae; and Nose, Noriyuki, 5,148,037, Cl. 250-548.000.

Nousho, Shinji: *See—*
Kojima, Narihito; Nagame, Hiroshi; Seto, Mitsuru, Rokutanzono, Takashi; and Nousho, Shinji, 5,147,751, Cl. 430-125.000.

Novak, Roger A.: *See—*
Demura, Michael; LaCombe, James; Novak, Roger A.; and Barta Raymond D., 5,147,278, Cl. 493-439.000.

Nowak, Ralph M.: *See—*
McLinden, Thomas; and Nowak, Ralph M., 5,147,099, Cl 292-175.000

Nowakowski, James B.: *See—*
Mayer, Robert W.; Nowakowski, James B.; Pusey, Bruce A.; and Shah, Kashyap H., 5,146,974, Cl. 164-309.000

Nozaki, Hiromichi: *See—*
Torii, Shuji; Nozaki, Hiromichi; Aoshima, Kazuyuki; and Matsui, Norimasa, 5,147,494, Cl. 156-417.000

Nozaki, Yukimasa: *See—*
Kanamaru, Tsuneo; Nozaki, Yukimasa; and Muroi, Masayuki, 5,147,860, Cl. 514-34.000.

Nozawa, Toshihisa; Kamikanda, Osamu; Yoshida, Yukimasa; and Okano, Haruo, to Tokyo Electron Limited; and Kabushiki Kaisha Toshiba. Plasma apparatus, and method and system for extracting electrical signal of member to which high-frequency wave is applied. 5,147,497, Cl. 156-626.000.

NPF Nordisk Platformning AB: *See—*
Hansson, Soren, 5,146,727, Cl. 52-531.000.

NSK Ltd.: *See—*
Murakami, Yasuo; Shirota, Shinichi; and Okita, Shigeru, 5,147,140, Cl. 384-492.000

Nuclear Metals, Inc.: *See—*
Roberts, Peter R.; and Blout, James E., 5,147,448, Cl. 75-331.000

Numauchi, Hiromitsu: *See—*
Funada, Hitoshi; and Numauchi, Hiromitsu, 5,146,850, Cl. 101-153.000

Nussbaum, Gilles; Deweirder, Damien; and Gjestland, Haavard T., to Pechiney Electrometallurgie; and Norsk Hydro A.S. Rapidly solidified and worked high strength magnesium alloy containing strontium. 5,147,603, Cl. 420-409.000.

Nymark, Bernt; and Nasstrom, Gunnar. Biopsy arc means and the use of the same. 5,147,372, Cl. 606-130.000.

NYNEX Corporation: *See—*
Chen, Walter Y.; and Haddad, Richard A., 5,148,488, Cl. 381-47.000

Oakes, Fred T.: *See—*
Sutton, Richard C.; Danielson, Susan J.; Findlay, John B.; Oakes, Fred T.; Oenick, Marsha D. B.; Ponticello, Ignazio S.; and Warren, Harold C., III, 5,147,777, Cl. 435-5.000

Obata, Katsuhiko, to Casio Computer Co., Ltd. Electronic musical instrument for generating musical tones on the basis of characteristics of input waveform signal. 5,147,970, Cl. 84-603.000

Obrist, Frank: *See—*
Kuhn, Peter; and Obrist, Frank, 5,147,194, Cl. 418-125.000

Oda, Atsuhi, to Tochigifujisangyo Kabushiki Kaisha. Gear apparatus. 5,146,801, Cl. 74-417.000

Oder, Robin R.: *See—*
Chi, Sheng-Ming B.; and Oder, Robin R., 5,147,045, Cl. 209-9.000.

Odorisio, Paul A.; Pastor, Stephen D.; and Hyun, James L., to Ciba-Geigy Corporation. Substituted 1,3,2-benzoxazaphospholidines and stabilized compositions. 5,147,909, Cl. 524-94.000.

Odorisio, Paul A.; Hyun, James L.; Shum, Sai P.; and Seltzer, Raymond, to Ciba-Geigy Corporation. Compositions stabilized with 3H-1,3,2-oxoxaphospholidines. 5,147,910, Cl. 524-95.000

Odorisio, Paul A.: *See—*
Hofmann, Peter; Odorisio, Paul A.; Cunkle, Glen T.; and Sabrsula Don, 5,147,911, Cl. 524-95.000.

Oenick, Marsha D. B.: *See—*
Sutton, Richard C.; Danielson, Susan J.; Findlay, John B.; Oakes, Fred T.; Oenick, Marsha D. B.; Ponticello, Ignazio S.; and Warren, Harold C., III, 5,147,777, Cl. 435-5.000.

Ogata, Kimio: *See—*
Ohtsuka, Koji; Kutsuzawa, Yoshiro; Ogata, Kimio; and Ichinosawa, Hideyuki, 5,148,240, Cl. 357-15.000.

Ogata, Shiro: *See—*
Aoyama, Shigeru; Yamashita, Tsukasa; and Ogata, Shiro 5,148,322, Cl. 359-708.000

Ogawa, Kazufumi: *See—*
Tamura, Hideharu; and Ogawa, Kazufumi, 5,147,684, Cl 427-131.000.

Ogawa, Takahiro; Inoue, Atsushi; Koga, Kazuhiko; Ito, Kiyotaka; and Ueta, Yutaka, to Sanyo Electric Co., Ltd. Method of manufacturing floating type magnetic head. 5,146,671, Cl. 29-603.000.

Ogawa, Takuji: *See—*
Takeuchi, Takikazu; Yokohara, Hiroyuki; Ogawa, Takuji; and Sakurai, Noboru, 5,148,334, Cl. 360-51.000

Ogawa, Toshiaki: *See—*
Maruyama, Takahiro; Ogawa, Toshiaki; Morita, Hiroshi; Ishida, Tomoaki; and Kawai, Kenji, 5,147,465, Cl. 134-1.000.

Ogino, Shigeo: *See—*
Nishiyama, Masaaki; and Ogino, Shigeo, 5,148,289, Cl. 358-300.000.

Ogino, Yozo: *See—*
Hamada, Yoshikazu; and Ogino, Yozo, 5,146,772, Cl. 70-264.000

Ogiri, Hiroshi; Murata, Kazue; and Tanaka, Sadaaki, to Kabushiki Kaisha Matsui Seisakusho. On-line moisture control method for powdered or granular materials and a system for performing the method. 5,146,692, Cl. 34-12.000.

Ogishi, Hideo; Takao, Kenji; Umino, Shigeru; and Yamato, Koji, to Kawasaki Steel Corporation. Steel plate with organic coating having improved corrosion resistance in as-worked state. 5,147,729, Cl 428-623.000.

Ogishi, Hideo; Umino, Shigeru; Takao, Kenji; Kimura, Hajime; and Yamato, Koji, to Kawasaki Steel Corp.; and Dai Nippon Toryo Co., Ltd. Steel plate with organic coating having improved corrosion resistance. 5,147,730, Cl. 428-623.000

Ogren, Bruce: *See—*
Eriksen, Byron; and Ogren, Bruce, 5,147,992, Cl. 200-51.100.

Ogura, Takashi: *See—*
Tanaka, Koichi; Mikami, Akiyoshi; Taniguchi, Kouji; Okibayashi, Katsushi; Terada, Kousuke; Yamashita, Takuo; Ogura, Takashi; Nakaya, Hiroaki; Yoshida, Masaru; and Nakajima, Shigeo, 5,147,683, Cl. 427-69.000.

Oguri, Masaharu: *See—*
Tokuda, Kimishiro; Oguri, Masaharu; and Naito, Shuzo, 5,146,858, Cl. 110-261.000

O'Hara, Thomas M.: *See—*
Jansen, David W.; and O'Hara, Thomas M., 5,147,387, Cl 623-1.000

Oharada, Akemi: *See—*
Nishihara, Yukio; and Oharada, Akemi, 5,147,454, Cl. 106-1.220

Ohata, Tadashi: *See—*
Konno, Chisato; Ohata, Tadashi; Igai, Mitsuyoshi; Umetani, Yukio and Yamabe, Michiru, 5,148,379, Cl. 364-578.000.

Ohba, Atsushi; and Ohbayashi, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. ECL input buffer for BiCMOS. 5,148,060, Cl. 307-475.000

Ohbayashi, Shigeki: *See—*
Ohba, Atsushi; and Ohbayashi, Shigeki, 5,148,060, Cl. 307-475.000

OHG, Inc.: *See—*
Baverstock, Richard, 5,146,903, Cl. 123-527.000

Ohga, Shinji; and Yamazaki, Takumi, to NEC Corporation. Microprogram-controlled type bus control circuit. 5,148,525, Cl 395-250.000

Ohio Medical Instrument Company: *See—*
Comparetto, John E., 5,147,364, Cl. 606-85.000
Jewell, Brian; and Papadopoulos, Stephen M., 5,147,287, Cl 602-32.000

Ohio State University Research Foundation, The: *See—*
Epstein, Arthur J.; Ginder, John M.; Roe, Mitchell G.; and Hajiseyedjavadi, Hamid, 5,147,968, Cl. 528-210.000.

Ohishi, Michihiro, to Minnesota Mining and Manufacturing Company. Surface finishing tape and method of making the same. 5,147,416, Cl. 51-293.000

Ohkouchi, Nozomu: *See—*
Shigeta, Masanobu; Shimizu, Shigeo; Ohkouchi, Nozomu; Takenaka, Hiromitsu; and Konno, Toshio, 5,148,298, Cl 359-72.000

Ohkubo, Yukitoshi: *See—*
Nagano, Akihiko; Kishi, Etsuro; Fujiwara, Ryoji; Ohkubo, Yukitoshi; Nishimura, Michiyo; Sakata, Hajime; Ishii, Takayuki, and Yamanobe, Masato, 5,148,302, Cl. 359-95.000

Ohkuma, Hiroya: *See—*
Hoshino, Shunji; and Ohkuma, Hiroya, 5,148,416, Cl. 369-32.000.

Ohmori, Toshiaki; Kanno, Itaru; and Fukumoto, Takaaki, to Mitsubishi Denki Kabushiki Kaisha. Method of cleaning a surface by blasting the fine frozen particles against the surface. 5,147,466, Cl. 134-7.000.

Ohnishi, Hirofumi: *See—*
Nomura, Hironori; Shimakawa, Taiji; Matsura, Yoshinori; Yamamoto, Hiroki; and Ohnishi, Hirofumi, 5,147,487, Cl. 156-164.000

Ohno, Shigeru: *See—*
Waki, Kokichi; and Ohno, Shigeru, 5,147,770, Cl. 430-522.000

Ohno, Tomoyuki: *See—*
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao, Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki, Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki, and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000

Ohno, Yasuteru: *See—*
Bando, Akira; Kayukawa, Shigehiro; Taguchi, Toshio; and Ohno, Yasuteru, 5,148,093, Cl. 318-723.000.

Ohsawa, Toshio, to Mitsubishi Denki K.K. Apparatus for and a method of detecting combustion in an internal combustion engine. 5,146,893, Cl. 123-425.000

Ohta, Masakatsu; Ina, Hideki; and Suzuki, Akiyoshi, to Canon Kabushiki Kaisha. Alignment and exposure apparatus. 5,148,214, Cl 355-43.000

Ohta, Mitsura, to Brother Kogyo Kabushiki Kaisha. Powdered developer material having specific particle diameter distribution. 5,147,746, Cl. 430-106.000

Ohta, Takeo: *See—*
Furukawa, Shigeaki; Ohta, Takeo; Akiyama, Tetsuya; and Isomura, Hidemi, 5,147,701, Cl. 428-64.000

Ohta, Wasaburo. *See—*
Yagawara, Shinji; and Ohta, Wasaburo, 5,147,523, Cl. 204-424.000

Ohta, Yoshiharu: *See—*
Tatsuno, Toshio; Miyamoto, Mitsuo; Ohta, Yoshiharu; and Sawada, Koichi, 5,147,605, Cl. 422-37.000

Ohtawa, Shigeru; Onodera, Junichi; and Harada, Kouji, to Tokyo Ohka Kogyo Co., Ltd. Photopolymerizable compositions. 5,147,759, Cl 430-285.000

Ohtsu, Motoichi, to Anritsu Corporation. Laser pumped atomic frequency standard with high frequency stability. 5,148,437, Cl. 372-32.000

Ohtsuka, Akihito; and Kijima, Yoshio, to Sumitomo Metal Mining Co., Ltd. Process for manufacturing a soft magnetic body of an iron-nickel alloy. 5,147,601, Cl. 419-25.000.

Ohtsuka, Koji; Kutsuzawa, Yoshiro, Ogata, Kimio; and Ichinosawa, Hideyuki, to Sanken Electric Co., Ltd. High voltage, high speed schottky semiconductor device and method of fabrication. 5,148,240, Cl. 357-15.000

Ohuchi, Satoshi: *See—*
Imao, Kaoru; and Ohuchi, Satoshi, 5,148,495, Cl. 382-9.000

Ohuchi, Yuji: *See—*
Imamura, Takayuki; and Ohuchi, Yuji, 5,148,233, Cl. 356-243.000

Ohura, Masaki: *See—*
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki, Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki, and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000

Ohwada, Noriyoshi: *See—*
Eguchi, Toyoaki; Ohwada, Noriyoshi, Sagae, Yutaka; and Ito Katsumi, 5,146,759, Cl. 62-64.000

Ohyama, Nagaaki: *See—*
Tsujiuchi, Junpei; Honda, Toshio; Ohyama, Nagaaki; Nagasaki Tatsuo; and Kikuchi, Susumu, 5,148,502, Cl. 382-54.000

Oil-Dri Corporation of America: *See—*
Jaffee, Richard M.; Moll, William F.; and Goss, G. Robert 5,146,877, Cl. 119-172.000

Oishi, Konosuke. *See—*
Okamoto, Yukio; Shimura, Satoshi; Oishi, Konosuke; Koga Masataka; Yasuda, Makoto; and Iino, Takahashi, 5,148,021, Cl 250-288.000.

Ojima, Satoshi; and Matsuzaki, Hiromi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Vertebral connecting plate. 5,147,361, Cl. 606-61.000.

Okada, Hideaki, to Kanzaki Kokyukoki Mfg. Co., Ltd. Axle driving apparatus. 5,146,748, Cl. 60-454.000

Okada, Hisashi: *See—*
Katoh, Kazunobu; and Okada, Hisashi, 5,147,755, Cl. 430-264.000
Okamura, Hisashi; Okada, Hisashi; Yagihara, Morio; and Katoh Kazunobu, 5,147,754, Cl. 430-264.000

Okada, Takamichi, to Shindengen Electric Manufacturing Co. Ltd Electromagnetic rotation sensor. 5,148,105, Cl. 324-207.140

Okada, Tetsuhiko: *See—*
Narita, Susumu; Hanawa, Makoto; Nishimukai, Tadahiko and Okada, Tetsuhiko, 5,148,532, Cl. 395-375.000

Okada, Toru: *See—*
Kume, Tateo; Shiraishi, Kazuhiro; Matsuda, Masahiko; and Okada, Toru, 5,146,879, Cl. 123-48.00B.

Okamoto, Shinichi: *See—*
Fujita, Masanori; Okamoto, Shinichi; and Ono, Hirokazu, 5,148,074, Cl. 310-311.000

Okamoto, Tatsuki; Ueguri, Shigeo; Hara, Kazuhiko; Iwata, Akihiko, and Ueda, Yoshihiro, to Mitsubishi Denki K.K. Optical pulse waveform shaper. 5,148,318, Cl. 359-629.000

Okamoto, Yukio; Shimura, Satoshi; Oishi, Konosuke; Koga, Masataka, Yasuda, Makoto; and Iino, Takahashi, to Hitachi, Ltd. Mass spectrometer using plasma ion source. 5,148,021, Cl. 250-288.000.

Okamura, Hisashi; Okada, Hisashi; Yagihara, Morio; and Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,147,754, Cl. 430-264.000.

Okano, Haruo: *See—*
Nozawa, Toshihisa; Kamikanda, Osamu, Yoshida, Yukimasa; and Okano, Haruo, 5,147,497, Cl. 156-626.000.

Okazaki, Akio, to Kabushiki Kaisha Toshiba. Information retrieval apparatus and interface for retrieval of mapping information utilizing hand-drawn retrieval requests. 5,148,522, Cl. 395-161.000.

OKI Electric Industry Co., Ltd.: *See*—
Cho, Shizuo; and Suyama, Junichi 5,148,399, Cl. 365-205.000
Kokubun, Hitoshi, 5,148,397, Cl. 365-189.070
Sekino, Yoshimasa; and Murashima, Yoshihiro, 5,148,401, Cl. 365-230.030
Suzuki, Kenichi, 5,147,810, Cl. 437-31.000.
Suzuki, Masahiro; and Nagata, Masato, 5,148,517, Cl. 395-115.000
Takeda, Takayuki; and Itoh, Shinichi, 5,148,225, Cl. 355-272.000.

Okibayashi, Katsushi: *See*—
Tanaka, Koichi; Mikami, Akiyoshi Taniguchi, Kouji; Okibayashi, Katsushi; Terada, Kousuke; Yamashita, Takuo; Ogura, Takashi; Nakaya, Hiroaki; Yoshida, Masaru; and Nakajima, Shigeo, 5,147,683, Cl. 427-69.000

Okimoto, Hiroyuki: *See*—
Sawatsubashi, Takeshi; Mawatari, Atsushi; and Okimoto, Hiroyuki, 5,148,301, Cl. 359-80.000.

Okita, Shigeru: *See*—
Murakami, Yasuo; Shirota, Shinichi; and Okita, Shigeru, 5,147,140, Cl. 384-492.000

Oklahoma Medical Research Foundation: *See*—
Esmon, Charles T.; and Comp, Philip C., 5,147,638, Cl. 424-85.800

Oku, Hideaki; and Nakamura, Takeshi, to Fanuc Ltd. Variable reluctance type AC servo motor. 5,148,000, Cl. 318-107.000

Okubo, Satomi, to Akebono Brake Industry Co., Ltd. Anti-lock control system for motor vehicles. 5,148,361, Cl. 364-426.020.

Okuda, Tohru: *See*—
Asai, Shigemi; Furukawa, Masatoshi, Kakiwaki, Shigeaki; Iwamatsu, Tadashi; and Okuda, Tohru, 5,148,336, Cl. 360-95.000

Okudaira, Sadayuki: *See*—
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, 5,147,500, Cl. 156-643.000

Okuno Chemical Industries Co., Ltd: *See*—
Nishihara, Yukio; and Oharada, Akemi, 5,147,454, Cl. 106-1.220.

Okura, Akimitsu; Chou, Toushoku; and Kamioka, Nobuo, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Method of making carbon/carbon composite. 5,147,588, Cl. 264-29.700

Okutsu, Mitsuhiko; Abe, Kenji; and Hariya, Tadaaki, to Hitachi, Ltd.; and Hitachi Engineering Ltd. Circuit for driving a capacitive load utilizing thyristors. 5,148,049, Cl. 307-270.000.

O'Leary, Paul: *See*—
Leopold, Hans; O'Leary, Paul; Pacher, Manfred; Roehrer, Robert; and Winkler, Gunter, 5,148,170, Cl. 341-157.000

Olin Corporation: *See*—
Scardera, Michael; and Grosser, Frank R., 5,147,456, Cl. 106-18.330.

Olivet, Eli Z.: *See*—
Baker, Josefina T.; Ly, Peter U.; and Olivet, Eli Z., 5,147,804, Cl. 436-66.000

Olsen, Eskil H.; Lillelund, Stig; and Praenen, Robert H. C. M., to Dart Industries Inc. Seal with automatic release. 5,147,059, Cl. 220-281.000

Olson, Jeffrey A.; and Custer, Donald, Jr., to Outboard Marine Corporation. Internal combustion engine fuel supply system. 5,146,904, Cl. 123-533.000

Olson, Keith R.; and Moschel, Charles C., to Beloit Corporation. Piston apparatus for use in web pressing components in papermaking machinery. 5,146,838, Cl. 92-177.000

Olson, Stephen R.; and Tate, William J., to Caterpillar Inc. Method and apparatus for controlling a supplemental vehicle drive in response to slip in a main vehicle drive. 5,147,710, Cl. 180-197.000

Olson, Wayne L.; and Choate, Gary E., to Rose Manufacturing Company. Confined space entry apparatus. 5,147,013, Cl. 182-231.000

Oltmanns, Peter: *See*—
Diehl, Karl-Heinz; and Oltmanns, Peter, 5,147,884, Cl. 514-365.000

Olympus Optical Co., Ltd.: *See*—
Goto, Hisashi; Imaizumi, Masaki; and Kato, Shigeru, 5,148,321, Cl. 359-689.000
Kunishige, Keiji, 5,148,197, Cl. 354-106.000
Miyauchi, Yuji, 5,148,308, Cl. 359-432.000.
Nakamura, Ichiro; and Tujiya, Hideki, 5,147,305, Cl. 604-110.000
Tsujiuchi, Junpei; Honda, Toshio; Ohyama, Nagaaki; Nagasaki, Tatsuo; and Kikuchi, Susumu 5,148,502, Cl. 382-54.000

Omni Quest Corporation: *See*—
Chagnon, Mark S., 5,147,573, Cl. 252-62.520

Omron Corporation: *See*—
Shibayama, Masahiko; Kuroda, Hiroichi; Shimada, Seiji; and Kai, Umekichi, 5,148,378, Cl. 364-71.070.

Omron Tateisi Electronics Co.: *See*—
Aoyama, Shigeru; Yamashita, Tsukasa; and Ogata, Shiro, 5,148,322, Cl. 359-708.000.

Onan Corporation: *See*—
Swanson, Steven M.; Fanner, John C.; and Halstead, Nick V., 5,146,889, Cl. 123-376.000

O'Neil, Richard W.; and Sweatt, William C., to United States of America, Energy. Dye lasing arrangement including an optical assembly for altering the cross-section of its pumping beam and method. 5,148,442, Cl. 372-71.000.

Ong, Beng S.: *See*—
Sacripante, Guerino G.; Veregin, Richard P. N.; Ong, Beng S.; and Angra, Padam K., 5,147,744, Cl. 430-39.000

Ong, Richard H., to Motorola, Inc. Radiation hardened bandgap reference voltage generator and method. 5,148,099, Cl. 323-314.000.

Ono, Hirokazu: *See*—
Fujita, Masanori; Okamoto, Shinichi; and Ono, Hirokazu, 5,148,074, Cl. 310-311.000

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Carpenter, James H., 5,147,031, Cl. 198-750.000.

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Dohrer, Gregory L.; Holler, Michael D.; and Nichols, Dwyane B 5,147,709, Cl. 428-213.000

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Patel, Janak R., to G & W Electric Company. Cooling apparatus for enclosed current limiting fuses. 5,148,351, Cl. 361-388.000

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Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A., and Sandahl, Jeffrey E., to NordicTrack, Inc. Rotation-activated resistance device. 5,147,265, Cl. 482-119.000

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Pawlik, James A., to GTE Valenite Corporation. Adjustable leaf spring cartridge for face mills. 5,147,157, Cl. 407-36.000

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Paysan, Heinz-Wilhelm; Grimm, Wolfgang; Schurle, Hermann, Gaiser, Hans; and Gutbrod, Heinz, to Carl-Zeiss-Stiftung. Safety spectacles against laser radiation. 5,146,623, Cl. 2-12.000

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Pederson, Walter H. Lubricating system for an engine prior to start-up 5,147,014, Cl. 184-6.300

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Pelet, Claude: *See*—
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Penkalski, Thomas A.: *See—*
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Persyk, Dennis E.; Jazbec, Ivan; and Enders, Albrecht H., to Siemens Gammasonics, Inc. Improved seal scintillation camera module and method of making it. 5,148,029, Cl. 250-361.00R

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Pfeiffer, Herbert: *See—*
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Potash, Hanan; Genter, Melvyn E.; and Roesner, Bruce B., to Unisys Corporation. Digital computer having an interconnect mechanism stacked above a semiconductor substrate. 5,148,256, Cl. 357-45.000

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Psiorz, Manfred; and Trach, Volker, to Karl Thomae GmbH. Cyclophanes, pharmaceutical compositions containing these compounds and processes for preparing them. 5,147,882, Cl. 514-325.000

Pulley, John K.; and Stacher, George W., to Rockwell International Corporation. Titanium aluminide structure. 5,147,063, Cl. 220-454.000

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Purnell, Deborah L., to Betz Laboratories, Inc. One drum activator catalyzed paint detackification program. 5,147,558, Cl. 210-712.000

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Fehlmann, Wolfgang; Laufer, Helmut; and Eblen, Ewald, 5,146,895, Cl. 123-449.000
Jansche, Walter; Zabler, Erich; and Dukart, Anton, 5,146,783, Cl. 73-301.000
Krampe, Wolfgang; and Lieberoth-Leden, Bernd, 5,146,892, Cl. 123-399.000
Mannle, Erik; Lieberoth-Leden, Bernd; and Maisch, Wolfgang, 5,146,886, Cl. 123-325.000
Rembold, Helmut; and Linder, Ernst, 5,146,894, Cl. 123-447.000
Roberts, Dale M.: *See*—
Lynam, Niall R.; and Roberts, Dale M., 5,148,014, Cl. 250-214.0AL.
Roberts, Daniel L.: *See*—
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Roberts, Peter R.; and Blout, James E., to Nuclear Metals, Inc. Techniques for producing fine metal powder. 5,147,448, Cl. 75-331.000
Roberts Systems, Inc.: *See*—
Thomas, John T.; and Monsees, Claude E., 5,147,491, Cl. 156-251.000
Robertshaw Controls Company: *See*—
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Robertson, Alan D.: *See*—
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Robertson, James W., to AMP Incorporated. Molded latchable hinge. 5,146,650, Cl. 16-259.000.
Robinson, David B.; Adams, Daniel O.; Penny, William H.; and Voegele, Gerald G., to SciMed Life Systems, Inc. Balloon catheter inflation device. 5,147,300, Cl. 604-97.000
Robinson, Gerald D., to Rockwell International Corporation. Structure and process for fabricating conductive patterns having sub-half micron dimensions. 5,147,740, Cl. 430-5.000
Robinson, John M. Enhanced vacuum tube power amplifier. 5,148,116, Cl. 330-3.000
Robinson Nugent, Inc.: *See*—
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Rockwell International Corporation: *See*—
Campbell, Blair F.; Holmes, Richard B.; Ma, Sam S.; and Guthals, Dennis M., 5,148,323, Cl. 359-738.000
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Pulley, John K.; and Stacher, George W., 5,147,063, Cl. 220-454.000
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Rockwell, Lynn A.: *See*—
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Page, Martin J.; and Rodgers, Brian C., 5,147,788, Cl. 435-69.100
Rodgers, Michael C.; Medlock, D. William; and Byam, Matthew D., to Ransburg Corporation. Modular plastic color changer. 5,146,950, Cl. 137-563.000
Rodriguez, Louis: *See*—
Deierling, Kevin E.; and Rodriguez, Louis, 5,148,051, Cl. 307-272.300.
Roe, Mitchell G.: *See*—
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Roesner, Bruce B.: *See*—
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Rogers Corporation: *See*—
Bachler, Gary A., 5,147,208, Cl. 439-67.000
Rogers, Edward F.: *See*—
Graham, Donald W.; Rogers, Edward F.; and Kahan, Frederick M., 5,147,868, Cl. 514-119.000
Rogers, Gerald H. Easy latch and unlatch cam action trailer hitch. 5,147,096, Cl. 280-507.000
Rogers, Jack R., Jr., to Delaware Capital Formation, Inc. Method for well production. 5,146,991, Cl. 166-369.000.
Rohland, William S.: *See*—
Abraham, Dennis G.; Aden, Steven G.; Arnold, Todd W.; Neckyfarow, Steven W.; and Rohland, William S., 5,148,481, Cl. 380-46.000
Rohm and Haas Company: *See*—
Frazza, Mark S.; Ho, Kim S.; Kowalski, Alexander; Raney, Robert R.; and Vogel, Martin, 5,147,937, Cl. 525-243.000
Ilenda, Casmir S.; Dunkelberger, David L.; and Labanoski, Dennis J., 5,147,932, Cl. 525-71.000
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Rojat, Gerard: *See*—
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Roland, Max G., to Maromatic Company, Inc. Key reading method and apparatus. 5,146,689, Cl. 33-539.000
Rollings, Robert W.: *See*—
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Rolls-Royce plc: *See*—
Wiseall, Stephen S., 5,148,229, Cl. 356-28.000
Romano, Michael, to MPJ Manufacturing Company, Inc. Hoop-shaped handbag. 5,146,966, Cl. 150-110.000.
Romano, Philip J., to Brinker International, Inc. Rotisserie. 5,146,842, Cl. 99-421.00V.
Rombouts, Nico, to FMC Corporation. Conveyor system with driven balls, protectable against overloading. 5,147,032, Cl. 198-789.000
Romeo, Aurelio: *See*—
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Romm, Michael: *See*—
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Rooftiooft, Roger L. A.; and Asay, Roger H., to Electric Power Research Institute. Prestabilized chromium protective film to reduce radiation buildup. 5,147,597, Cl. 376-305.000.

Roosevelt, Andrew. Thoracic weightlifting bench. 5,147,260, Cl. 482-104.000

Rosado, Zonguie. Interchangeable decorative front piece for a garment 5,146,626, Cl. 2-105.000

Rose, Anthony T.; and Rose, Theresa M. Medical instrument. 5,147,357, Cl. 606-49.000

Rose, Gregory C.: *See—*
Carignan, Roger G.; and Rose, Gregory C., 5,147,386, Cl. 623-21.000

Rose Manufacturing Company: *See—*
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Rose, Theresa M.: *See—*
Rose, Anthony T.; and Rose, Theresa M., 5,147,357, Cl. 606-49.000

Rose, Thomas; and Hoffmann, Detlef, to Siemens Aktiengesellschaft Apparatus for the electrical function testing of wiring matrices, particularly of printed circuit boards. 5,148,102, Cl. 324-158.00F

Rosen, Ilana: *See—*
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Rosenberg, Avner: *See—*
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Rosier, Hendrik E., to Huck Manufacturing Co. Tapered rotatable offset nose assembly. 5,146,773, Cl. 72-391.400

Ross, Joseph W.: *See—*
La Rosa, Joachim A.; Ross, Joseph W.; and Heymann, Frank J., 5,146,945, Cl. 137-315.000.

Ross, Melvin A.: *See—*
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Roth, Elwood A.: *See—*
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Roth, Gregory A., to Ford Motor Company. Connector for use with a printed circuit board. 5,148,354, Cl. 361-400.000

Rottmann, Engelbert: Hauschild, Gilbert and Riedel, Christian, to Winkler & Duennebier Maschinenfabrik KG. Method and apparatus for producing stacks of interleaved material sheets. 5,147,273, Cl. 493-349.000

Rouget, Robert: *See—*
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Rouse, Geoffrey O., to Homco International Inc. Apparatus for recovering a wellhead. 5,146,989, Cl. 166-339.000

Rouse, William G.; Kilgore, Connie S.; Ichea, Ronald E.; Burnham, Michael J.; and Wachob, Benjamin G., to United States of America, Army. Millimeter wave screening cloud and method. 5,148,173, Cl 342-3.000

Roussel Uclaf: *See—*
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Roy, Pradip K.: *See—*
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Royal Institution for the Advancement of Learning (McGill University), The: *See—*
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Rozario, Phil: *See—*
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Rozsa, Istvan K., to Linko Enterprises, Inc. Process for the purification of gaseous streams. 5,147,620, Cl. 423-224.000

Ruana, Bruce M. Method of shaping a bicycle handlebar and apparatus therefore. 5,146,809, Cl. 74-551.900

Ruark, William W.; and Henry, Robert L., to General Electric Company, The. Stationary fine point diamond truening and dressing block and method of use. 5,146,909, Cl. 125-11.010.

Rudesill, John A.: *See—*
Cheng, Wu-Cheng; and Rudesill, John A., 5,147,836, Cl. 502-64.000

Rudin, Kenneth A., to Meyn USA, Inc. Multipiece poultry wing receiving wheel and method. 5,147,241, Cl. 452-169.000

Ruetten, Catherine: *See—*
Charlton, Steven C.; Rebec, Mihailo V.; and Ruetten, Catherine, 5,147,606, Cl. 422-56.000.

Rumore, Lynn; and Sapienza, Dolores, to Rumore, Lynn. Fingernail repair method. 5,146,935, Cl. 132-73.000

Runkel, Walter, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Damping valve with improved damping adjustment. 5,146,948, Cl. 137-493.800

Rush, Jonathan E.; and Linnander, Robert J., to James River Corporation of Virginia. Disposable cup lid having a tear-resistant straw slot. 5,147,065, Cl. 220-709.000

Russel, Matthew J., to Eastman Kodak Company. Apparatus for producing raised multiple color images. 5,147,745, Cl. 430-49.000

Russell, Mark: *See—*
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Russell-Stanley Corporation: *See—*
Lima, William; Lind, Earl V.; Bartlett, Philip D.; and McGrath, Michael R., 5,147,060, Cl. 220-288.000.

Rust, Fred. Releasable locking apparatus. 5,147,331, Cl. 292-246.000.

Rutsch, Werner; Kirchmayr, Rudolf; Husler, Rinaldo; and Dietliker, Kurt, to Ciba-Geigy Corporation. Propionphenone derivatives as photoinitiators for photopolymerization. 5,147,901, Cl. 522-42.000.

Rutter, Christopher C.; and Rebholz, James H., to Coca-Cola Company, The. Collapsible bag with evacuation passageway and method for making the same. 5,147,071, Cl. 222-92.000.

Ruud, Clayton. Method and apparatus for simultaneous phase composition and residual stress measurement by x-ray diffraction. 5,148,458, Cl. 378-72.000

Ruvio, Francesco. Female incontinent device. 5,147,301, Cl. 604-98.000.

Rymal, Theodore R., Jr. Waste water treatment system. 5,147,534, Cl 210-104.000.

Ryobi Ltd.: *See—*
Dehari, Tomoshige, 5,146,825, Cl. 83-397.000
Shiotani, Takeshi; and Miyamoto, Kouichi, 5,146,826, Cl. 83-468.200.

S. C. Johnson & Son, Inc.: *See—*
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Saarberg-Interplan Gesellschaft fur Rohstoff-, Energie- und Ingenieurtechnik mbH: *See—*
Spliethoff, Heinz; Moller, Burkhard; and Wolf, Bodo, 5,146,857, Cl 110-234.000.

Sabbaghian, Mehdy; Barfield, Tony; Schiele, Patrick; Newton, David W.; Lormand, Gregory J.; and Schwartzberg, Glen J., to Louisiana State University and Agricultural and Mechanical College. Insertion instrument for vena cava filter. 5,147,379, Cl. 606-206.000.

Sabella, Frank: *See—*
Doonan, Barbara B.; Bertkau, Geoffrey H.; Hayes, Dennis F. Sabella, Frank; and Skiff, Ronald H., 5,147,666, Cl. 426-45.000

Sabrsula, Don: *See—*
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Sachau, Gunther; Borgschulte, Katrin; and Pietsch, Hanns, to Beiersdorf Aktiengesellschaft. Hydrogel foams, and a process for their preparation. 5,147,344, Cl. 604-368.000

Sacripante, Guerino G.; Veregin, Richard P. N.; Ong, Beng S.; and Angra, Padam K., to Xerox Corporation. MICR processes with colored encapsulated compositions. 5,147,744, Cl. 430-39.000.

Sada, Eizo; Katoh, Shigeo; Kondo, Akihiko; and Kishimura, Masaaki, to Chisso Corporation. Carrier for affinity chromatography immobilized with antibodies. 5,147,537, Cl. 210-198.200.

Sadek, Hani; and Dietel, Gregory L., to Banner Gelatin Products Corp. Film-enrobed unitary-core medicament and the like. 5,146,730, Cl 53-454.000.

Saeki, Katsuhisa: *See—*
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Ara, Katsutoshi; Saeki, Katsuhisa; Igarashi, Kazuaki; and Ito Susumu, 5,147,796, Cl. 435-210.000

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Sagae, Yutaka: *See—*
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Sagawa, Chiaki: *See—*
Ito, Haruki; Maeda, Kenzou; Miyazaki, Nobuyuki; Unoki, Masao; Sagawa, Chiaki; and Kamba, Motoi, 5,147,934, Cl. 525-124.000

Sage Laboratories, Inc.: *See—*
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Sager, Scott J.: *See—*
Reed, Herbert M.; Sager, Scott J.; Grebenyuk, Alexander; and Torchia, Stephen F., 5,147,160, Cl. 408-3.000

Sagl, Dennis; and Vratsanos, Menas S., to Air Products and Chemicals, Inc. Selectively soluble, protective coating compositions derived from vinyl acetate/monoalkyl maleate copolymers. 5,147,924, Cl 524-559.000

Sahota, Harvinder. Balloon catheters. 5,147,377, Cl. 606-194.000.

St. Clair, Terry L.; and Progar, Donald J., to United States of America, National Aeronautics and Space Administration. Polyimide molding powder, coating, adhesive and matrix resin. 5,147,966, Cl 528-188.000

Saito, Akio: *See—*
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R.

Saito, Akira: *See—*
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Saito, Asao: *See—*
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R

Saito, Joichi, to Asahi Glass Company Ltd. Process for producing a rigid foam. 5,147,898, Cl. 521-131.000.

Saito, Keizo; Matsuo, Kazuhiko; and Murai, Hiroko, to Sharp Kabushiki Kaisha. European language processing machine with a spelling correction function. 5,148,367, Cl. 364-419.000

Saito, Masao; Ban, Shigeru; Takita, Yoshio; Mihara, Yoshiki; and Takahashi, Shinichi, to Saito, Masao; and Kajima Corporation. Space tension chord arch dome reinforced with tension members and method for building same. 5,146,719, Cl. 52-80.000.

Saito, Masashi: *See—*
Minaki, Takashi; Koizumi, Yukinori; and Saito, Masashi, 5,148,210, Cl. 354-403.000.

Saito, Norio: *See—*
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Saito, Tatsuo: *See—*
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Saito, Tetsuya: *See—*
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Saito, Yoshikazu: *See—*
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Saitoh, Kenji: *See—*
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Saka, Kazuhito: *See—*
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Sakagami, Eiji, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device by controlling the profile of the density of p-type impurities in the source/drain regions. 5,147,811, Cl 437-35.000

Sakai, Hiroshi: *See—*
Kageyama, Mayumi; Sawamoto, Takeyuki; Tarumi, Niro; and Sakai, Hiroshi, 5,147,396, Cl. 623-6.000

Sakai, Shinichi: *See—*
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Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; Niikawa, Takeshi; and Suzuki, Masashi, to Brother Kogyo Kabushiki Kaisha. Driver circuit for piezoelectric actuator, and dot-matrix head and printer using piezoelectric or other actuator having discharge control means 5,147,141, Cl. 400-124.000.

Sakaizawa, Masao: *See—*
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Sakakibara, Yasuo: *See—*
Sato, Katsuhiko; Sakakibara, Yasuo; and Miyazaki, Kohtaro, 5,146,861, Cl. 112-259.000

Sakakibara, Yoshio, to Fuji Photo Film Co., Ltd. Silver halide color photographic material containing magnetic recording element. 5,147,768, Cl. 430-501.000

Sakamoto, Kiichi: *See—*
Yamada, Akio; and Sakamoto, Kiichi, 5,148,033, Cl. 250-492.200

Sakamoto, Shunji; and Hoshino, Toshihiko, to Mazda Motor Corporation. Breakdown diagnosing method of production line 5,148,363, Cl. 364-143.000

Sakamoto, Sinji; and Furukawa, Kenichi, to Toa Corporation. Automatic mixer apparatus. 5,148,491, Cl. 381-119.000

Sakamoto, Yuji: *See—*
Suzuki, Akira; Sakamoto, Yuji; and Masuda, Yuko, 5,147,801, Cl. 435-299.000

Sakanoue, Akira: *See—*
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Sakata, Hajime: *See—*
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Sakata, Haruyasu, to Pioneer Electronic Corporation. Overshoot minimizing tracking servo apparatus. 5,148,425, Cl. 369-44.250.

Sakata, Tsuguhide: *See—*
Kimura, Norio; Taguchi, Tomishige; Sakata, Tsuguhide; Tsuruno, Kunio; and Takei, Masahiro, 5,148,291, Cl. 358-336.000.

Sako, Kazuya; Nagami, Masaaki; and Fujimoto, Shoji, to Fujitsu Ten Limited. Digital signal processor for fixed and floating point data 5,148,161, Cl. 341-93.000

Sako, Yoichiro; and Yamagami, Tamotsu, to Sony Corporation. Optical recording medium having a data recording track with offset data storing regions. 5,148,422, Cl. 369-44.260.

Sakowski, Jurgen: *See—*
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Sakuma, Hajime; and Shinohara, Hiroko, to NEC Corporation. Multitask processing apparatus utilizing a central processing unit equipped with a micro-program memory which contains no software instructions. 5,148,542, Cl. 395-700.000

Sakuma, Masato; Fujita, Yuji; Kitano, Kissho; Yagi, Yukihiko; Sakaizawa, Masao; and Yamamoto, Noburo, to Tonen Sekiyukageku, K.K. Thermoplastic resin composition. 5,147,931, Cl. 525-66.000

Sakumoto, Yoshifumi: *See—*
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Sakurai, Noboru: *See—*
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Salerno, Franco: *See—*
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Saltwick, John M.; and Scarinci, Dean, to Syntellect Inc. System and method for communications security protection. 5,148,478, Cl 380-6.000

Samant, Kalika R.: *See—*
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Samarov, Victor M., to Digital Equipment Corporation. Substrate to heatsink interface apparatus and method. 5,146,981, Cl. 165-185.000

Samata, Shuichi: *See—*
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Sameca SA: *See—*
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Samson, Jeffery T.; Knoedler, Roy E.; and Bertsch, Patrick M., to Gerry Baby Products Company. Diaper container. 5,147,055, Cl. 220-254.000

Samsonite Corporation: *See—*
Van Hooreweder, Godwin; Bartsch, Georg A. W.; Hesse, Klaus-Dieter; and Rasch, Ulf, 5,147,019, Cl. 190-18.00A.

Samsung Electronics Co., Ltd.: *See—*
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Sanada, Takeshi: *See—*
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Sanbonmatsu, Kiyomi: *See—*
Masuhara, Eiichi; Komiya, Shigeo; and Sanbonmatsu, Kiyomi, 5,147,202, Cl. 433-8.000

Sandahl, Jeffrey E.: *See—*
Pauls, Edward A.; Engel, Timothy S.; Heutmaker, Michael E.; Iverson, Robert A.; and Sandahl, Jeffrey E., 5,147,265, Cl 482-119.000

Sanderford, Bruce, to James River II, Inc. Apparatus and method for reducing plastic film neck-in. 5,147,595, Cl. 264-555.000

Sandhu, Gurtej S.: *See—*
Yu, Chang; Doan, Trung T.; and Sandhu, Gurtej S., 5,147,819, Cl 437-173.000

Sandora, Lee M.: *See—*
Craig, Steven M.; Warren, Douglas H.; Sandora, Lee M.; Masecar, Robert R.; Hein, Norman W.; and Hunter, Andrew F., 5,147,149, Cl. 405-223.100.

Sandscape Inc.: *See—*
Guettler, Phillip G.; and Ritten, Robert G., 5,147,156, Cl 406-197.000

Sandvik AB: *See—*
Holmberg, Hakan, 5,147,475, Cl. 148-327.000

Sangara Industrial Co., Ltd.: *See—*
Lee, Chia-Yu, 5,147,132, Cl. 362-426.000

Sangstat Medical Corporation: *See—*
Pouletty, Philippe; Atwood, Beth; and Rommler, David, 5,147,780, Cl. 435-7.100

Sanken Electric Co., Ltd.: *See—*
Ohtsuka, Koji; Kutsuzawa, Yoshiro; Ogata, Kimio; and Ichinosawa, Hideyuki, 5,148,240, Cl. 357-15.000

Sano, Koichi: *See—*
Takane, Atsushi; Miyamoto, Yoshiyuki; Takeda, Ryuzaburo; and Sano, Koichi, 5,148,109, Cl. 324-309.000

Sano, Tutomu: *See—*
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 5,147,661, Cl 425-150.000

Sanofi: *See—*
Gubin, Jean; and Chatelain, Pierre, 5,147,878, Cl. 514-299.000

Sanshin Kogyo Kabushiki Kaisha: *See—*
Coates, William J.; and Kruse, Lawrence I., 5,147,875, Cl 514-259.000

Sanshin Kogyo Kabushiki Kaisha: *See—*
Kawai, Takaji; and Handa, Kenichi, 5,147,231, Cl. 440-75.000

Santa Barbara Research Center: *See—*
Holzer, William C.; and Hardy, Arthur H., Jr., 5,148,178, Cl 342-127.000

Santoh, Tsuyoshi: *See—*
Sato, Tetsuya; Kanome, Osamu; Yoshino, Hitoshi; Kamitakahara, Hirofumi; Hayashi, Hisanori; and Santoh, Tsuyoshi, 5,147,592, Cl. 264-167.000

Sanyo Chemical Industries, Ltd.: *See—*
Nakanishi, Hideo, 5,147,750, Cl. 430-110.000.

Sanyo Electric Co., Ltd.: *See—*
Fujiwara, Yoshihisa; and Genno, Hirokazu, 5,148,184, Cl 346-1.100
Koakutsu, Hiroshi; and Tatani, Kouji, 5,148,115, Cl. 330-2.000
Nohara, Kazunori, 5,148,055, Cl. 307-353.000
Ogawa, Takahiro; Inoue, Atsushi; Koga, Kazuhiko; Ito, Kiyotaka, and Ueta, Yutaka, 5,146,671, Cl. 29-603.000
Yuuchi, Takahiro; Tsuchida, Yasuyuki; and Fujiwara, Masakatsu, 5,146,920, Cl. 128-423.00R

Sapienza, Dolores: *See—*
Rumore, Lynn; and Sapienza, Dolores, 5,146,935, Cl. 132-73.000

Sari, Hikmet: *See—*
Karam, Georges; and Sari, Hikmet, 5,148,448, Cl. 375-60.000

Sarrine, Robert J., to Helena Laboratories Corporation. Automatic electrophoresis apparatus and method. 5,147,522, Cl. 204-299.00R.

Sasaki, Hakaru: *See—*
Nakamura, Shuichi; Sasaki, Hakaru; and Watanabe, Rikizo, 5,147,470, Cl. 148-677.000

Sasaki, Hirokazu: *See—*
Ippommatsu, Masamichi; Hirano, Akira; and Sasaki, Hirokazu, 5,147,735, Cl. 429-17.000

Sasaki, Hiroshi: *See—*
Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Sasaki, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinich, 5,146,891, Cl. 123-325.000

Sasaki, Mari: *See—*
Yamazaki, Shunpei; Tsuchiya, Mitsunori; Urata, Kazuo; Koyama, Itaru; Imatou, Shinji; Hayashi, Shigenori; Hirose, Naoki; Sasaki, Mari; Ishida, Noriya; and Wada, Kouhei, 5,147,822, Cl. 437-215.000

Sasaki, Tadayuki: *See—*
Mizuchi, Akira; Horikomi, Kazutoshi; Sasaki, Tadayuki; Awaya, Akira; Tomino, Ikuo; Takesue, Mitsuyuki, and Kihara, Noriaki, 5,147,876, Cl. 514-275.000

Sata, Teiji: *See—*
Nonaka, Tomoharu; Makino, Hiroshi; Takahashi, Masahiro; Sata, Teiji; and Yoshino, Daisuke, 5,148,069, Cl. 310-68.00R

Sato, Akihide; and Nitkuni, Tokio, to Mitsubishi Kasei Vinyl Company. Process for producing a foamed polyvinyl alcohol film. 5,147,899, Cl. 521-141.000

Sato, Hiroaki; and Nishigaki, Syunichiro, to Kabushiki Kaisha Toshiba. X-ray source holding apparatus. 5,148,467, Cl. 378-197.000

Sato, Hiroshi, to Casio Computer Co., Ltd. Pressure instrument with depth/altitude and time display. 5,148,373, Cl. 364-558.000

Sato, Hiroshi: *See—*
Mallary, Michael L.; Ishibashi, Kazuo; and Sato, Hiroshi, 5,147,679, Cl. 427-48.000

Sato, Katsuhiko; Sakakibara, Yasuo; and Miyazaki, Kohtaro, to Brother Kogyo Kabushiki Kaisha. Sewing machine with a built-in driving motor. 5,146,861, Cl. 112-259.000

Sato, Koichi: *See—*
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R

Sato, Makoto, to Fuji Photo Film Co., Ltd. Cassette accommodating method and index card for cassette case. 5,146,729, Cl. 53-445.000

Sato, Masaei; and Hosoya, Yukiteru, to Mitsuba Electric Manufacturing Co., Ltd. Actuator in power antenna device. 5,146,799, Cl. 74-89.140.

Sato, Tadashi; Imanishi, Masaharu; and Iwai, Katsuhiko, to Matsushita Electric Industrial Co., Ltd.; and Yamato Mishin Seizo Kabushiki Kaisha. Sewing machine-driving apparatus. 5,146,862, Cl. 112-275.000

Sato, Tetsuya; Kanome, Osamu; Yoshino, Hitoshi; Kamitakahara, Hirofumi; Hayashi, Hisanori; and Santoh, Tsuyoshi, to Canon Kabushiki Kaisha. Process of and apparatus for preparing optical recording medium substrates. 5,147,592, Cl. 264-167.000

Sato, Tsutomu: *See—*
Nishikawa, Tomoyuki; Kita, Masahiro; Yano, Takaaki; Yoshida, Tatsuya; Honda, Ryoji; Negishi, Kiyoshi; Sato, Tsutomu; and Kamasako, Shoji, 5,148,284, Cl. 358-196.000

Sato, Yuichi: *See—*
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,147,473, Cl. 148-302.000

Satoh, Isao; Mizuno, Sadao, and Itoh, Noboru, to Matsushita Electric Industrial Co., Ltd. Optical head. 5,148,421, Cl. 369-44.230.

Satriano, Robert J., to Harris Semiconductor Patents, Inc. High current hermetic package. 5,148,264, Cl. 357-74.000

Sauder Woodworking Co.: *See—*
Short, Michael K., 5,147,122, Cl. 312-321.500

Sauter, Hubert: *See—*
Wingert, Horst; Sauter, Hubert; Roehl, Franz; Doetzer, Reinhard; Lorenz, Gisela; and Ammermann, Eberhard, 5,147,892, Cl. 514-522.000

Sauter, Rudolph A.: *See—*
Marrick, Paul J. T.; Arnold, Gregory ...; and Sauter, Rudolph A., 5,148,468, Cl. 379-56.000

Savall, Vincent; and Vital, Jean-Louis, to Degremont S.A. Oxidation and biological reduction reactor, biofiltration method and washing methods used in this reactor. 5,147,547, Cl. 210-605.000

Savidan, Henri, to General Motors France. Dual master cylinder with compensation. 5,146,751, Cl. 60-562.000

Savini, David G.: *See—*
Gluchowski, Paul L.; Haltiner, Karl J., Jr.; Savini, David G.; Brisbane, Roger M.; and Smith, Daniel F., 5,146,887, Cl. 123-337.000

Savitar, Inc.: *See—*
Hannah, Eric C., 5,148,288, Cl. 358-29[illegible].000

Savu, Patricia M., and McAllister, Jerome W., to Minnesota Mining and Manufacturing Company. Low refractive index plastics for optical fiber cladding. 5,148,511, Cl. 385-145.000

Sawada, Koichi: *See—*
Tatsuno, Toshio; Miyamoto, Mitsuo; Ohta, Yoshiharu; and Sawada, Koichi, 5,147,605, Cl. 422-37.000

Sawamoto, Kunifumi, to Nissan Motor Co., Ltd. Idle engine speed control apparatus. 5,146,888, Cl. 123-339.000.

Sawamoto, Takeyuki: *See—*
Kageyama, Mayumi; Sawamoto, Takeyuki; Tarumi, Niro; and Sakai, Hiroshi, 5,147,396, Cl. 623-6.000

Sawatsubashi, Takeshi; Mawatari, Atsushi; and Okimoto, Hiroyuki, to Casio Computer Co., Ltd. Liquid crystal display device having a driving circuit inside the seal boundary. 5,148,301, Cl. 359-80.000.

Sawazaki, Nobuyuki; Taruya, Masaaki; and Koiwa, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus having a current limiting function for an internal combustion engine. 5,146,907, Cl. 123-644.000

Sawhill, James A. Lumbar spine motion sensor. 5,146,929, Cl. 128-781.000

Scabbard Corporation, The: *See—*
DuBrucq, Denyse, 5,147,985, Cl. 174-260.000.

Scaglia, Enzo, to Scaglia SpA. Device to transfer roving packages with the roving pre-positioned. 5,147,026, Cl. 198-409.000.

Scaglia SpA: *See—*
Scaglia, Enzo, 5,147,026, Cl. 198-409.000

Scardera, Michael; and Grosser, Frank R., to Olin Corporation. Polyglycidol sulfated surfactants having antimicrobial activity. 5,147,456, Cl. 106-18.330

Scarinci, Dean: *See—*
Saltwick, John M.; and Scarinci, Dean, 5,148,478, Cl. 380-6.000.

Schacter, Bernice: *See—*
Bursuker, Isia; Carlino, Joseph A.; Neddermann, Kim; Schacter, Bernice; Ellingsworth, Larry; and Spitalny, George, 5,147,799, Cl. 435-240.100

Schad, Martin J.: *See—*
Blakeslee, William W., deceased; Davidson, Ronald A.; Giles, Edwin Q.; Menihan, Robert M.; Naylor, David L.; Pitbladdo, Richard B.; Schad, Martin J.; Sterner, Kevin B.; Trentelman, Jackson P.; and Watts, Jason S., 5,147,436, Cl. 65-33.000.

Schadeck, Mathew A. Pressurized vapor driven rotary engine. 5,147,191, Cl. 418-36.000

Schaefer, Fritz P., to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Ring laser gyro with an absorber medium with the laser cavity. 5,148,237, Cl. 356-350.000

Schaefer, Gerhard: *See—*
Remo, John L.; and Schaefer, Gerhard, 5,148,438, Cl. 372-37.000.

Schaub, Robert E.: *See—*
Wissner, Allan; Green, Kenneth; and Schaub, Robert E., 5,147,864, Cl. 514-82.000

Schaulin, Rudolf: *See—*
Heindl, Anette; Schaulin, Rudolf; and Stockhorst, Thomas, 5,147,410, Cl. 8-555.000

Schefczik, Ernst: *See—*
Sens, Ruediger; Schefczik, Ernst; Etzbach, Karl-Heinz; Lamm, Gunther; Reichelt, Helmut; and Wiesenfeldt, Matthias, 5,147,845, Cl. 503-227.000

Scheinpflug, Hans: *See—*
Brandes, Wilhelm; Hanssler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 5,147,887, Cl. 514-383.000

Schenfele, Robert D.: *See—*
Lewis, David F.; and Schenfele, Robert D., 5,147,787, Cl. 435-41.000

Scherer, Wolfgang, to MTU Motoren- und Turbinen-Union Muenchen GmbH. Redundant multi-channel closed loop control device with analog integrators. 5,148,364, Cl. 364-187.000

Scherman, Dale; Brown, Jim; and Carpenter, Gary, to Lucas Western Inc. Conveyor roller brake. 5,147,020, Cl. 193-35.00A.

Scheuermann, Stefan E.: *See—*
Lotz, Andreas; Pries, Hans-Dieter; Wohner, Gerhard; and Scheuermann, Stefan E., 5,147,642, Cl. 424-94.610

Schiavo, Pietro, to Ivalda S.p.A. Cotton swab with depth prevention mechanism. 5,147,288, Cl. 604-1.000

Schichi, Hiroyasu: *See—*
Umemura, Kaoru; Schichi, Hiroyasu; and Ishitani, Tohru, 5,148,027, Cl. 250-309.000

Schiele, Patrick: *See—*
Sabbaghian, Mehdy; Barfield, Tony; Schiele, Patrick; Newton, David W.; Lormand, Gregory J.; and Schwartzberg, Glen J., 5,147,379, Cl. 606-206.000

Schilling, Rainer: *See—*
Blochle, Hans; Schilling, Rainer; Kummer, Martin; Gansel, Eduard; Schramm, Heribert; Eblen, Helmut; and Muller, Joachim, 5,146,682, Cl. 30-124.000

Schlassus, Wolfgang: *See—*
Fehrenbach, Christian; Ketterer, Gunter; and Schlassus, Wolfgang, 5,148,341, Cl. 360-106.000

Schlichter, Mark E.: *See—*
Barton, Mark S.; Bandach, Kurt J.; and Schlichter, Mark E., 5,146,640, Cl. 5-47.000

Schlumberger Industries, S.A.: *See—*
Richardson, Mark W., 5,148,434, Cl. 371-20.100.

Schlumberger Technology Corporation: *See—*
Haldorsen, Jakob B. U.; Farmer, Paul A.; and Desler, James F., 5,148,407, Cl. 367-32.000
Hromas, Joe C.; Edwards, A. Glen; and Huber, Klaus B., 5,146,983, Cl. 166-65.100.

Schlump, Wolfgang: *See—*
Grewe, Hans; and Schlump, Wolfgang, 5,147,449, Cl. 75-354.000

Schmitges, Claus J.: *See—*
Raddatz, Peter; Schmitges, Claus J.; and Minck, Klaus-Otto, 5,147,857, Cl. 514-19.000

Schmitt, Gerhard: *See—*
Herbert, Peter; Mielke, Horst; and Schmitt, Gerhard, 5,147,415, Cl. 48-197.00R

Schmitt, Hans-Georg: *See—*
Diehr, Hans-Joachim; Kuck, Karl-Heinz; Paulus, Wilfried; and Schmitt, Hans-Georg, 5,147,443, Cl. 71-67.000.

Schneider (Europe) A.G.: *See—*
Beck, Andreas; and Nanko, Norbert A., 5,147,385, Cl. 623-1.000.

Schoeller, Siegmund. Apparatus for hinging a door to a door jamb. 5,146,961, Cl. 144-3.00R

Schoen, William R.: *See—*
Parsons, William H.; Schoen, William R.; and Patchett, Arthur A., 5,147,867, Cl. 514-114.000

Schoeps, Knut C., to Atlas Copco Tools AB. Hydraulic torque impulse generator. 5,147,245, Cl. 464-25.000

Schoofs, Gregory R.; and Schoofs, Richard J. Apparatus and method for air drying with reduced oxygen enrichment. 5,147,419, Cl. 55-33.000.

Schoofs, Richard J.: *See—*
Schoofs, Gregory R.; and Schoofs, Richard J., 5,147,419, Cl. 55-33.000

Schottel-Werft Joseph Becker GmbH & Co. KG: *See—*
Lais, Siegfried; and Krautkramer, Gerd, 5,146,865, Cl. 114-151.000.

Schramm, Heribert: *See—*
Blochle, Hans; Schilling, Rainer; Kummer, Martin; Gansel, Eduard; Schramm, Heribert; Eblen, Helmut; and Muller, Joachim, 5,146,682, Cl. 30-124.000

Schudt, Gerhardt: *See—*
Kahrs, Manfred; Kunze, Lothar; Baier, Joachim; Kunz, Gerhard; Moeller, Bernhard; Beer, Wilhelm; Krines, Hans-G.; and Schudt, Gerhardt, 5,147,007, Cl. 180-132.000

Schul, Jose. Colorant based on carminic acid, method of preparation, and method of coloring a foodstuff. 5,147,673, Cl. 426-250.000

Schumann, Rudolf, to Chemie AG Bitterfeld-Wolfen. Method for stabilizing phosphorus trichloride. 5,147,621, Cl. 423-265.000

Schumann, Rudolf, to Chemie AG Bitterfeld-Wolfen. Method for stabilizing phosphorus trichloride. 5,147,622, Cl. 423-265.000

Schurle, Hermann: *See—*
Paysan, Heinz-Wilhelm; Grimm, Wolfgang; Schurle, Hermann; Gaiser, Hans; and Gutbrod, Heinz, 5,146,623, Cl. 2-12.000

Schwager, Harald: *See—*
Kerth, Juergen; Schwager, Harald; and Zolk, Ralf, 5,147,928, Cl. 525-53.000

Schwartzberg, Glen J.: *See—*
Sabbaghian, Mehdy; Barfield, Tony; Schiele, Patrick; Newton, David W.; Lormand, Gregory J.; and Schwartzberg, Glen J., 5,147,379, Cl. 606-206.000

Schweinfurth, Hermann, to Jacobs Suchard AG. Method for continuously decaffeinating raw coffee. 5,147,674, Cl. 426-427.000

Schwemin, Arnold J. Stabilizer cell for inertial optical stabilizer. 5,148,313, Cl. 359-555.000

Schwendemann, Horst; and Joos, Friedwald, to E. Raff Maschinenbau GmbH. Ski holder. 5,147,049, Cl. 211-70.500

Schwenk, Walther: *See—*
List, Jorg; Schwenk, Walther; Dotsch, Winfried; and Liechti, Pierre, 5,147,135, Cl. 366-303.000

SciMed Life Systems, Inc.: *See—*
Euteneuer, Charles L.; and Keith, Peter T., 5,147,302, Cl. 604-103.000
Robinson, David B.; Adams, Daniel O.; Penny, William H.; and Voegele, Gerald G., 5,147,300, Cl. 604-97.000.

Scott, George W., III, to Cannondale Corporation. Folding tool for bicycles. 5,146,815, Cl. 81-437.000

Scott, Lowell, to Hamilton Air Products. Pressure regulation apparatus including cooperating valve member and air dam means. 5,147,154, Cl. 406-112.000

Scott, Michael S.: *See—*
Litwin, Stanley M.; Davis, Jeffrey L.; and Scott, Michael S., 5,147,209, Cl. 439-70.000

Scripps Clinic and Research Foundation: *See—*
Goodman, Michael G.; and Weigle, William O., 5,147,636, Cl. 424-85.400

Scriven, Eric F. V.: *See—*
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,147,954, Cl. 526-265.000

Scroston, Richard M.: *See—*
Gray, George W.; Toyne, Kenneth J.; Lacey, David; Holmes, David; and Scroston, Richard M., 5,147,577, Cl. 252-299.620.

Scrutton, Simon L.; and Shepherd, John V., to Esselte Pendaflex Corporation. Coloured images. 5,147,489, Cl. 156-235.000.

Seaver, Gary B.: *See—*
Kang, Jung W.; Seaver, Gary B.; and Hashimoto, Takatsugu, 5,147,951, Cl. 526-173.000

Sech, Bruce N.: *See—*
Plyler, Robert G.; Serbin, Bruce J.; and Sech, Bruce N., 5,147,230, Cl. 439-843.000

Sechler, Lee G.; Eckert, Robert L.; and Aktins, Don C., to Containment Corporation. Containment tray. 5,147,039, Cl. 206-386.000.

Seco Tools AB: *See—*
Riviere, Bertrand, 5,147,158, Cl. 407-113.000

Seconde, Jean-Francois; and Heurtebout, Gerard, to Sollac (Societe Anonyme). Easily opened metal lid for a container. 5,147,058, Cl. 220-276.000

Sedighzadeh, Marty. Support structure for television monitor. 5,148,282, Cl. 358-249.000.

Seiber, Bruce A.: *See—*
Albers, Steven C.; Callaghan, Timothy J.; Seiber, Bruce A.; Toth, Theodore A.; Derry, Robert W.; and Podgorski, Theodore J., 5,148,076, Cl. 310-323.000

Seidenberg, Jack W. Air/water delivery system for use with dental illumination devices. 5,147,203, Cl. 433-29.000

Seiko Corp.: *See—*
Price, Gary A., 5,148,469, Cl. 379-57.000

Seiko Epson Corporation: *See—*
Abe, Nobumasa; Momose, Kiyoharu; Watanabe, Koji; Nakamura, Yuichi; Handa, Tsuneo; and Nishikawa, Mitsutaka, 5,148,185, Cl. 346-1.100
Price, Gary A., 5,148,469, Cl. 379-57.000
Takeuchi, Masahiro, 5,147,814, Cl. 437-44.000

Seiko Instruments, Inc.: *See—*
Watanabe, Chugo, 5,148,024, Cl. 250-492.200.

Seikosha Co., Ltd.: *See—*
Fujita, Masanori; Okamoto, Shinichi; and Ono, Hirokazu, 5,148,074, Cl. 310-311.000

Seiwatz, Henry: *See—*
Papoulias, Sotiri A.; and Seiwatz, Henry, 5,147,718, Cl. 428-328.000

Sekiba, Takashi, to Fujitsu Miyagi Electronics Limited. Handler used in testing system for semiconductor devices. 5,148,100, Cl. 324-158.00F.

Sekiguchi, Tetsuo: *See—*
Kohmoto, Shinsuke; Sekiguchi, Tetsuo; and Hamasaki, Takuji, 5,148,199, Cl. 354-195.100.

Sekine, Hiroshi: *See—*
Kurogane, Toshio; Nagaoka Daiji; and Sekine, Hiroshi, 5,148,294, Cl. 358-448.000

Sekino, Yoshimasa; and Murashima, Yoshihiro, to Oki Electric Industry Co., Ltd. DRAM with split word lines. 5,148,401, Cl. 365-230.030

Sekiya, Yoshiki, to Nissan Motor Co., Ltd. Apparatus for treating exhaust particulates resulting from combustion in diesel engine. 5,146,900, Cl. 123-501.000

Sekouri, Omar; and Jardet, Gilles, to Bull, S.A. U-shaped mounting module for mounting components of an information processing machine. 5,148,352, Cl. 361-391.000

Seltzer, Raymond: *See—*
Odorisio, Paul A.; Hyun, James L.; Shum, Sai P.; and Seltzer, Raymond, 5,147,910, Cl. 524-95.000

Semiconductor Energy Laboratory Co., Ltd. *See—*
Yamazaki, Shunpei; Tsuchiya, Mitsunori; Urata, Kazuo; Koyama, Itaru; Imatou, Shinji; Hayashi, Shigenori; Hirose, Naoki; Sasaki, Mari; Ishida, Noriya; and Wada, Kouhei, 5,147,822, Cl. 437-215.000
Yamazaki, Shunpei, 5,147,847, Cl. 505-1.000

Sen, Prabir K.: *See—*
Agarwala, Vinod S.; Conte, Alfeo A., Jr.; Rajan, Krishnaswamy S.; and Sen, Prabir K., 5,147,567, Cl. 252-42.700

Senba, Hisaaki; and Jinzai, Makoto, to Canon Kabushiki Kaisha. Cleaning roller and cleaning apparatus. 5,148,227, Cl. 355-296.000

Senda, Masayasu: *See—*
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,147,473, Cl. 148-302.000

Senftle, Joseph T.: *See—*
Stout, Scott A., Lin, Rui; Recht, Gunnar W.; Senftle, Joseph T.; and Larter, Stephen R., 5,147,611, Cl. 422-78.000

Sens, Ruediger; Schefczik, Ernst; Etzbach, Karl-Heinz; Lamm, Gunther; Reichelt, Helmut; and Wiesenfeldt, Matthias, to BASF Aktiengesellschaft. Triazolopyridine dyes and thermal transfer of methine dyes. 5,147,845, Cl. 503-227.000

SenSys AG: *See—*
Reichert, Curt, 5,147,977, Cl. 102-427.000

Sentech Corporation: *See—*
Spencer, Mark E., 5,148,126, Cl. 331-135.000

Sepponen, Raimo E., to Instrumentarium Corp. Arrangement for examination of a material. 5,146,924, Cl. 128-653.200

Sequa Chemicals Inc.: *See—*
Floyd, William C.; and Dragner, Louis R., 5,147,908, Cl. 524-49.000

Serbin, Bruce J.: *See—*
Plyler, Robert G.; Serbin, Bruce J.; and Sech, Bruce N., 5,147,230, Cl. 439-843.000

Serikawa, Yoshio; Iguchi, Susumu; Ueno, Akira; Takeda, Hiroshi; Mitsu, Shigeru; Koyama, Kenji; Narazaki, Yukihisa; and Shimura, Yoshihiko, to Ricoh Company, Ltd. Flash control based on calculated required flash energy. 5,148,212, Cl. 354-416.000

Seto, Mitsuru: *See—*
Kojima, Narihito; Nagame, Hirosai; Seto, Mitsuru; Rokutanzono, Takashi; and Nousho, Shinji, 5,147,751, Cl. 430-125.000

Setoriyama, Takeshi; and Kuroda, Akira, to Canon Kabushiki Kaisha. Heating apparatus using endless film. 5,148,226, Cl. 355-290.000

Setterberg, John R., Jr.: *See—*
Pleasants, Charles W.; White, Pat M.; Fischer, Ronald J.; Harrison, Robert D., Jr.; and Setterberg, John R., Jr., 5,146,994, Cl. 166-387.000

Sextant Avionique: *See—*
Thomas, Isabelle; and Lefort, Pierre O., 5,146,787, Cl. 73-704.000

Sgourakes, George E.; and Koziol, Stanislaw, to Millipore Corporation. Fluid seal. 5,146,793, Cl. 73-864.210.

SGS-Thomson Microelectronics S.A.: *See—*
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Shalvi, Ram, to Solar Wide Industrial Ltd. Distance measurement device. 5,148,411, Cl. 367-108.000

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Shank, Peter J.; and Horton, Kenneth W. to C.R. Bard, Inc. Low friction varied radiopacity guidewire. 5,147,317, Cl. 604-164.000

Shapiro, Ascher H., to Baker Hughes Incorporated. Power-efficient liquid-solid separating centrifuge. 5,147,277, Cl. 494-53.000

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Asai, Shigemi, Furukawa, Masanobu, Kakiwaki, Shigeaki, Iwamatsu, Tadashi, and Okuda, Tohru, 5,148,336, Cl. 360-95.000
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Shemesh, Josef; and Gelbart, William Z. Rotating tool. 5,146,717, Cl. 51-392.000

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Joyce, Thomas F.; Kelly, Richard D.; and Shen, Jian-Kuo, 5,148,530, Cl. 395-375.000

Shenoi, Kishan; Yang, Paul P.; and Sopira, Terrence G., to DSC Communications Corporation. Integrated echo canceling multiplexor. 5,148,426, Cl. 370-32.100

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Scrutton, Simon L.; and Shepherd, John V., 5,147,489, Cl. 156-235.000

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Talonn, Daniel A.; and Ranford, Alan B., 5,147,326, Cl. 604-198.000
Walker, Clarence L.; Sunderland, Richard A.; and Davis, Mark A., 5,147,312, Cl. 604-153.000

Shiba, Keisuke, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film unit, a processor for processing the same, and a processing system therefor. 5,148,198, Cl. 354-319.000

Shibata, Jun. *See*—
Chino, Toyoji; Matsuda, Kenichi; and Shibata, Jun, 5,147,827, Cl. 437-237.000

Shibayama, Masahiko; Kuroda, Hiroichi; Shimada, Seiji; and Kai, Umekichi, to Omron Corporation. Sensor controller system. 5,148,378, Cl. 364-571.070

Shibazaki, Nobuo; and Saito, Tetsuya, to Canon Kabushiki Kaisha. Impact type recording apparatus having reduced impact sound during return of the hammer. 5,147,142, Cl. 400-167.000

Shidara, Shinichi, to Fuji Photo Film Co., Ltd. Automatic film processor using ultrasonic wave generators. 5,148,206, Cl. 354-298.000

Shigeta, Masanobu; Shimizu, Shigeo; Ohkouchi, Nozomu; Takenaka, Hiromitsu; and Konno, Toshio, to Victor Company of Japan. Spatial light modulator. 5,148,298, Cl. 359-72.000

Shigina, Nina A.. *See*—
Fedorov, Svyatoslav N.; Linnik, Leonid F.; Antropov, Gennady M.; Shigina, Nina A.; Nikitenko, Vladimir I.; Arnautov, Leonid N.; Stromakov, Alexandr P.; Boldysheva, Irina A.; Oreshkin, Valery P.; and Chernyakov, Lev A., 5,147,284, Cl. 600-9.000.

Shiloh, Joseph; and Rosenberg, Avner, to State of Israel, Ministry of Defense, Rafael-Armament Development Authority. Electromagnetic pulse simulator. 5,148,111, Cl. 328-65.000.

Shima, Hiroshi; and Shimizu, Hajime, to Hochiki Kabushiki Kaisha. Radio alarm system. 5,148,148, Cl. 340-539.000

Shimada, Seiji: *See*—
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Shimamoto, Noboru; Takamura, Tooru; and Handa, Ryuichi, to Shin-Etsu Chemical Co., Ltd. Method of producing cover-packing assembly for hard disk device. 5,147,691, Cl. 427-387.000

Shimanaka, Shigeki: *See*—
Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Sasaki, Hiroshi; Yamaguchi, Hiroshi, Ishigami, Kazuhiro; and Takenouchi, Shinich, 5,146,891, Cl. 123-325.000

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Shimizu, Hajime: *See*—
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Shimoda, Kouhei; Maeda, Takao; Sogabe, Kouichi; and Miyake, Masaya, to Sumitomo Electric Industries, Ltd. Thermal conductive colored aluminum nitride sintered body and method of preparing the same. 5,147,832, Cl. 501-96.000

Shimoda, Shuichiro: *See*—
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Shimura, Satoshi: *See*—
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Shimura, Seiji; Sugiya, Masashi; Hara, Yoshifusa; Kako, Kunio; and Saito, Akira, to Nippon Chemical Industrial Co., Ltd.; Koizumi Chemical Co., Ltd.; and Chiyoda Shoji Co., Ltd. Agent and method for treating wool fibers wherein the agent is tris(hydroxypropyl)-phosphine and/or alkylene oxide addition products thereof 5,147,409, Cl. 8-128.100

Shimura, Yoshihiko: *See*—
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Shin-Etsu Chemical Company Limited: *See*—
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Shin, Hyunkook; and Samuels, Sam L., to Du Pont de Nemours, E. I., and Company. Flash-spinning polymeric plexifilaments. 5,147,586 Cl. 264-13.000

Shindengen Electric Manufacturing Co., Ltd.: *See*—
Okada, Takamichi, 5,148,105, Cl. 324-207.140

Shindo, Mitsuyoshi: *See*—
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Shindo, Tatsuya, to Brother Kogyo Kabushiki Kaisha. Magazine unit of image recording apparatus for accommodating image recording medium. 5,148,215, Cl. 355-72.000

Shinohara, Hiroko: *See*—
Sakuma, Hajime; and Shinohara, Hiroko, 5,148,542, Cl. 395-700.000

Shinohara, Shunichi: *See*—
Tanisake, Hiroka; Yamamoto, Koji, Koyama, Takeshi; Shinohara, Shunichi; Maruo, Kazunobu; and Toki, Tsukasa, 5,147,962, Cl. 528-170.000

Shinpuku, Yoshihide, to Sony Corp. Method for recording and/or reproducing a signal. 5,148,333, Cl. 360-40.000.

Shiotani, Takeshi; and Miyamoto, Kouichi, to Ryobi Ltd. Circular saw device having variable cut-off angle. 5,146,826, Cl. 83-468.200

Shiozaki, Atsushi: *See*—
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Shiraishi, Kazuhiro: *See*—
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Shiraishi, Naoki, to Sharp Kabushiki Kaisha. System for executing a conditional statement without reading program data part that does not satisfy the conditional clause. 5,148,531, Cl. 395-375.000.

Shirakawa, Junzi: *See*—
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Shirakawa, Tsutomu: *See*—
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Shirasaki, Takayuki, to Canon Kabushiki Kaisha. Vibration wave driven motor. 5,148,075, Cl. 310-323.000

Shirasaki, Yoshinari: *See*—
Yamagata, Koichi; and Shirasaki, Yoshinari, 5,147,517, Cl. 204-180.100.

Shirodkar, Pradeep P.: *See*—
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Shirota, Shinichi: *See*—
Murakami, Yasuo; Shirota, Shinichi; and Okita, Shigeru, 5,147,140, Cl. 384-492.000

Shiroyama, Shigeru, to Mitsubishi Denki K.K. Brush holding device. 5,148,072, Cl. 310-239.000

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Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi; Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000

Shkurinov, Alexandr P.. *See*—
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Sholing, Anthony F.: *See*—
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Shook, Larry E.. *See*—
Gettig, William A.; and Shook, Larry E., 5,148,004, Cl. 219-390.000

Short, Michael K., to Sauder Woodworking Co. Tape storage rack 5,147,122, Cl. 312-321.500

Shotey, Michael J. Shroud for in-line electrical plug. 5,147,216, Cl. 439-367.000

Shoulders, Kenneth R., to Jupiter Toy Co. Circuits responsive to and controlling charged particles. 5,148,461, Cl. 378-119.000

Shum, Sai P.: *See*—
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Shurter, Roger P., to United States of America, Energy. Vacuum barrier for excimer lasers. 5,147,711, Cl. 428-216.000

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Sibbens, Goedele A. M.: *See*—
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Siemens Aktiengesellschaft: *See*—
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Draxelmayr, Dieter, 5,148,098, Cl. 323-237.000.
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Peter, Martin; and Reismann, Markus, 5,146,791, Cl. 73-862.490
Preidel, Walter; and Grossmann, Herbert, 5,147,590, Cl. 264-81.000
Rose, Thomas; and Hoffmann, Detlef, 5,148,102, Cl. 324-158.00F
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Siemens Aktiengesellschaft Osterreich: *See*—
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Siemens Automotive L.P.: *See*—
Imoehl, William J.; and Hornby, Michael J., 5,146,896, Cl. 123-470.000

Siemens Automotive Limited: *See*—
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Siemens Gammasonics, Inc.: *See*—
Persyk, Dennis E.; Jazbec, Ivan, and Enders, Albrecht H., 5,148,029, Cl. 250-361.00R

Siemens Medical Laboratories, Inc.: *See*—
Hernandez, Fancisco, 5,148,032, Cl. 250-492.100

Siepser, Steven B.; Halpern, B. David; and Karo, Wolf. High refractive index polymeric compositions suitable for use as expansile hydrogel intraocular lenses. 5,147,394, Cl. 623-6.000

Signoretto, Roberto, to Systel International S.p.A. Sorting line for processing envelopes, particularly for photographic laboratories 5,147,048, Cl. 209-698.000

Silagy, Howard. Combination individual finger and entire hand exerciser. 5,147,256, Cl. 482-47.000

Silverman, Stephen E. Method for detecting suicidal predisposition 5,148,483, Cl. 381-41.000

Simmons, Robert L.: *See*—
Nemeth, Peter; Dancs, Tibor; Simmons, Robert L.; and Kalman, Istvan, 5,146,820, Cl. 83-37.000

Simola, Juha T. A.: *See*—
Ahonen, Antti I.; Kajola, Matti J.; and Simola, Juha T. A., 5,148,262, Cl. 357-68.000

Simon, Dietolf; and Woost, Otmar, to Peroxid-Chemie GmbH Process for producing alkyltetrahydroanthrahydroquinones and working solutions containing them for producing hydrogen peroxide by the anthraquinone process. 5,147,628, Cl. 423-588.000

Simoncelli, Eero P.: *See*—
Pentland, Alex P.; Simoncelli, Eero P.; and Stephenson, Thomas P., 5,148,497, Cl. 382-54.000

Simplicity Inc.: *See*—
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Miles, Charles C., Jr.; Miles, Charles C., III, Sims, Emery S., III Parks, David T.; and Witte, Lee R., 5,147,232, Cl. 440-89.000

Singer, Andrew. Surgical needle and stylet with a guard. 5,147,308, Cl. 604-117.000

Siracusa, Robert J.: *See*—
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Skakoon, James G.; Kern, Steven E.; and Lombardi, William V., to C.R. Bard, Inc.; and Astra Pharmaceutical Products Inc. Prefilled syringe delivery system. 5,147,324, Cl. 604-192.000

Skeie, Halvor, to Crystal Technology, Inc. Apparatus and method for linearized cascade coupled integrated optical modulator 5,148,503, Cl. 385-3.000

Skelton, Daniel F. *See*—
McDermott, Thomas C., Jr.; and Skelton, Daniel F., 5,147,541, Cl. 210-321.740

Skelton, Earl F.: *See*—
Gilmore, Charles M.; Skelton, Earl F.; Aprigliano, Louis F., and Qadri, Syed B., 5,147,731, Cl. 428-633.000

Skiff, Ronald H.: *See*—
Doonan, Barbara B.; Bertkau, Geoffrey H.; Hayes, Dennis F.; Sabella, Frank, and Skiff, Ronald H., 5,147,666, Cl. 426-45.000

Skinfill, Donald R.: *See*—
Huber, Terrence D.; Kutsch, Duane B.; and Skinfill, Donald R., 5,148,156, Cl. 340-783.000

Skipper, Bobby R.; Hardy, Robert E.; and Kunkle, Albert C., to J. M. Huber Corporation. Structured pigment from high TiO_2/Fe_2O_3 kaolinite reject material. 5,147,458, Cl. 106-416.000

Skotheim, Terje: *See*—
Spitsyn, Boris; Efanov, Valery; Bouilov, Leonid; Aleksenko, Alexander; Botev, Anantoliy; and Skotheim, Terje, 5,148,462, Cl. 378-143.000

Skovron, Alan, to High Tech Auto Tools Pty. Ltd. Electric fuel injection cleaner apparatus and method. 5,147,464, Cl. 134-1.000

Slack, Victor E.: *See*—
Miller, Mitchell E.; and Slack, Victor E., 5,147,228, Cl. 439-741.000

Slocomb Industries, Inc.. *See*—
Burgos, Iris; Dunn, Leroy; and Husni, Altan, 5,146,956, Cl. 140-89.000

Slonina, Jean-Pierre, deceased (by Slonina, Marie-Noelle, Caroline Slonina, Frederic A. Slonina, Aurelie M. Slonina, legal representatives); and Hamann, Sylvie, to Biomasys. Rotationally operated device for atraumatic access to the blood circuit. 5,147,321, Cl. 604-175.000

Slonina, Marie-Noelle, Caroline Slonina, Frederic A. Slonina, Aurelie M. Slonina, legal representatives: *See*—
Slonina, Jean-Pierre, deceased; and Hamann, Sylvie, 5,147,321, Cl. 604-175.000

Slusher, Richart E.: *See*—
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Slysh, Paul. Laser assisted masking process. 5,147,680, Cl. 427-53.100

Smedley, William H.: *See—*
Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 5,147,323, Cl. 604-191.000

Smee, Joseph R.: *See—*
Kile, Richard A.; Locati, Ronald P.; Smee, Joseph R.; and Wood, Charles T., 5,147,225, Cl. 439-680.000

Smith, Dana C., to Uniflo Conveyor, Inc. Lift mechanism for installation and removal of press brake dies. 5,146,774, Cl. 72-446.000

Smith, Daniel F.: *See—*
Gluchowski, Paul L.; Haltiner, Karl J., Jr.; Savini, David G.; Brisbane, Roger M.; and Smith, Daniel F., 5,146,887, Cl. 123-337.000

Smith, Donald P.; Dobie, Michael J.; Sparman, Alden B., Sr.; and Norris, John R., to Patentsmith Corporation. Microwave vending machine. 5,147,994, Cl. 219-10.55R.

Smith, Douglas: *See—*
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Smith, Ivor S.; and Stafford, Timothy J., to Boston University, Trustees of. Therapeutic method for reducing chronic pain in a living subject 5,147,294, Cl. 604-49.000

Smith, James M.; and Busby, Peter W., to British Aerospace Public Limited Company. Missile tracking systems. 5,147,088, Cl. 244-3.110.

Smith, Martin C. Locking device for a video game electronic apparatus and method therefor. 5,146,769, Cl. 70-14.000

Smith, Neil; and Greenbarg, Gerson M., to Florida Orthopedics, Inc Lifting belt. 5,147,261, Cl. 482-106.000.

Smith and Nephew Associated Companies Limited: *See—*
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SmithKline Diagnostics, Inc.: *See—*
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Smothers, William K.; Weed, Gregory C.; Laganis, Evan D.; and Lalka, George, to Du Pont de Nemours, E. I., and Company. Red sensitive photopolymerizable compositions. 5,147,758, Cl. 430-281.000

Smyczek, Paul, J. Underwater vegetation cutter. 5,146,734, Cl. 56-8.000

Snider, Donna. Child's or infant's drinking cup assembly with dual locking mechanisms. 5,147,066, Cl. 220-717.000

Snow Brand Milk Products Co., Ltd.: *See—*
Dosako, Shunichi; Kusano, Hiroko; Doya, Eiki; and Idota, Tadashi, 5,147,853, Cl. 514-7.000

Snow, Lamar. Cholangiocatheter and delivery system. 5,146,925, Cl. 128-658.000

Snuttjer, Owen R.; and Rasinski, Michael ., to Westinghouse Electric Corp. Seal oil temperature control method and apparatus. 5,147,015, Cl. 184-6.220

Snyder, James R.: *See—*
Cancio, Leopoldo V.; Snyder, James R.; and Wu, Pai-Chuan, 5,147,346, Cl. 604-389.000

Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Ramwell, Peter W.; and Braquet, Pierre, 5,147,856, Cl. 514-16.000

Societe de Fabrication de Materiel Orthopedique: *See—*
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Societe Dite Sita: *See—*
De Monclin, Bruno, 5,147,003, Cl. 180-14.200

Societe Francaise Hoechst: *See—*
Mallo, Paul, 5,147,921, Cl. 524-493.000

Societe Nationale Elf Aquitaine: *See—*
Alquie, Bernard; Kohler, Norbert; and Wild, Marcel, 5,146,985, Cl. 166-270.000
Keskes, Naamen, 5,148,494, Cl. 382-1.000

Sodhi, Rana N. S.: *See—*
Foerch, Renate; Hunter, Duncan H.; McIntyre, N. Stewart; and Sodhi, Rana N. S., 5,147,678, Cl. 427-40.000

Soerens, Dave A.: *See—*
Huang, Yung-Hsiang; Soerens, Dave A.; Lachapell, Ruth A.; and Linker, Paul M., III, 5,147,347, Cl. 604-390.000

Sogabe, Kouichi: *See—*
Shimoda, Kouhei; Maeda, Takao; Sogabe, Kouichi; and Miyake, Masaya, 5,147,832, Cl. 501-96.000

Solar Systems SpA: *See—*
Danieli, Remo, 5,146,970, Cl. 160-173.000

Solar Turbines Incorporated: *See—*
Sood, Virendra M., 5,146,741, Cl. 60-39.550.

Solar Wide Industrial Ltd.: *See—*
Shalvi, Ram, 5,148,411, Cl. 367-108.000.

Solbourne Computer, Inc.: *See—*
Harlin, Roy E.; and Herrington, Richard A., 5,148,523, Cl. 395-164.000
Harlin, Roy E.; and Herrington, Richard A., 5,148,524, Cl. 395-166.000

Sollac (Societe Anonyme): *See—*
Seconde, Jean-Francois, and Heurtebust, Gerard, 5,147,058, Cl. 220-276.000

Solomon, Phillip A.: *See—*
Knepper, Jonathan D.; Masavage, Gerald J.; and Solomon, Phillip A., 5,146,661, Cl. 29-25.010

Solvay S.A.: *See—*
Volmer, Sophie; and Debecker, Dominique, 5,147,935, Cl. 524-152.000

Somex Mulhouse S.A.: *See—*
Buessinger, Pierre, 5,146,663, Cl. 29-41.000

Someya, Ikuo, to Sony Corporation. Television signal receiving apparatus. 5,148,270, Cl. 358-133.000

Sondergeld, Werner; and Hackelborger, Gerhard, to MAN Roland Druckmaschinen AG. Process for the production of a surface structure on printing mechanism cylinders for offset printing presses. 5,147,513, Cl. 204-129.650

Sony Corporation: *See—*
Frindle, Paul, 5,148,163, Cl. 341-131.000
Hatada, Hideo, 5,148,083, Cl. 315-8.000
Ishibashi, Akira; Mori, Yoshifumi; and Funato, Kenji, 5,147,823, Cl. 437-225.000
Kakuyama, Shinji, 5,148,328, Cl. 360-27.000
Kurashige, Masafumi; and Harada, Tetsuya, 5,148,277, Cl. 358-160.000
Kutaragi, Ken, 5,148,292, Cl. 358-433.000.
Masuda, Toshihiko; and Ueki, Masaaki, 5,148,168, Cl. 341-152.000
Nakamura, Takashi; and Nishimura, Yoshikazu, 5,148,281, Cl. 358-228.000
Nakane, Yasuaki; Miyaoka, Senri; Tamada, Sakuya; Nakayama, Hiroshi; Iwai, Junichi; and Igarashi, Shuichi, 5,148,285, Cl. 358-231.000
Ono, Katsuhisa; Eguchi, Yasuhito; Shindo, Mitsuyoshi; and Katsuno, Hiroshi, 5,148,187, Cl. 346-76.0PH.
Sako, Yoichiro; and Yamagami, Tamotsu, 5,148,422, Cl. 369-44.260
Shinpuku, Yoshihide, 5,148,333, Cl. 360-40.000
Someya, Ikuo, 5,148,270, Cl. 358-133.000
Tada, Keishi, 5,147,175, Cl. 414-749.000
Tsurushima, Katsuaki, 5,148,418, Cl. 369-32.000
Wachi, Shigeaki, 5,148,424, Cl. 369-44.370
Wong, Alan; Hori, Katsuya; and Yoshida, Tadao, 5,148,417, Cl. 369-32.000

Sony Corporation of America: *See—*
MacKay, Michael T.; Berger, Robert J.; Duffy, Robert; and Langford, Ted E., 5,148,154, Cl. 340-712.000

Sony Magnescale, Inc.: *See—*
Gardner, John P., 5,148,403, Cl. 360-15.000

Sood, Virendra M., to Solar Turbines Incorporated. Gaseous fuel injector. 5,146,741, Cl. 60-39.550.

Sopira, Terrence G.: *See—*
Shenoi, Kishan; Yang, Paul P.; and Sopira, Terrence G., 5,148,426, Cl. 370-32.100

Sorapec S.A.: *See—*
Bugnet, Bernard; Doniat, Denis; and Rouget, Robert, 5,146,958, Cl. 141-1.100

Sorex Medical, Inc.: *See—*
Reynolds, Valdon G.; and Davison, John A., 5,147,320, Cl. 604-174.000

Sowards, David K., to Exar Corporation. Dual EEPROM cell with current mirror differential read. 5,148,395, Cl. 365-185.000

Sowers, Edward E.: *See—*
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,147,954, Cl. 526-265.000

Sparman, Alden B., Sr.: *See—*
Smith, Donald P.; Dobie, Michael J.; Sparman, Alden B., Sr.; and Norris, John R., 5,147,994, Cl. 219-10.55R

Spector, Donald. System for creating custom-made miniatures. 5,148,196, Cl. 354-75.000

Spectra-Physics, Inc.: *See—*
Johnson, Robert W.; Bettman, Ralph B.; Hicks, Acle V.; and Yessik, Michael, 5,147,349, Cl. 606-4.000.

Spectrol Electronics Corp.: *See—*
Riley, Richard E., 5,146,785, Cl. 73-313.000.

Spectrum Sciences B.V.: *See—*
Lior, Ishaiau; and Ashkenazi, Itzhak, 5,148,222, Cl. 355-256.000

Spencer, Mark E., to Sentech Corporation. Capacitance sensor circuit and method for measuring capacitance and small changes in capacitance. 5,148,126, Cl. 331-135.000

Sperry Marine Inc.: *See—*
Woolfolk, Thomas M., 5,148,175, Cl. 342-95.000

Spilde, Rodney L. Ventilation system including vent controller apparatus. 5,147,244, Cl. 454-364.000

Spitalny, George: *See—*
Bursuker, Isia; Carlino, Joseph A.; Neddermann, Kim; Schacter, Bernice; Ellingsworth, Larry; and Spitalny, George, 5,147,799, Cl. 435-240.100.

Spitsyn, Boris; Efanov, Valery; Boulov, Leonid; Aleksenko, Alexander; Botev, Anantolij; and Skotheim, Terje, to Moltech Corporation. High efficiency X-ray anode sources. 5,148,462, Cl. 378-143.000

Spliethoff, Heinz; Moller, Burkhard; and Wolf, Bodo, to Saarberg-Interplan Gesellschaft fur Rohstoff-, Energie- und Ingenieurtechnik mbH. Process for the production of electrical energy and/or heating and process heat. 5,146,857, Cl. 110-234.000

Split-Cycle Technology Limited: *See—*
Mayne, Alfred R., 5,146,880, Cl. 123-55.00A.

Spohrer, Thomas S., to Motorola, Inc. CMOS bus driver circuit with improved speed. 5,148,047, Cl. 307-246.000

Sponge-Jet, Inc.: *See—*
Lynn, William R., 5,146,716, Cl. 51-320.000.

Sprague, David L., to Intel Corporation. One-dimensional interpolation circuit and method based on modification of a parallel multiplier 5,148,381, Cl. 364-723.000

Spriggs, Carl R., II; and Brack-Kaiser, Carol L. Triangular weaving frame. 5,146,659, Cl. 28-152.000

Spruhventile GmbH: *See—*
Cater, Miro S., 5,147,073, Cl. 222-321.000

Square D Company: *See—*
Dingle, Phillip J.; Thomas, Raymond W.; and Neill, Kenneth, 5,148,139, Cl. 337-6.000
Johnson, David K.; and Weber, Mark S., 5,148,433, Cl. 371-11.300.

SRI International: *See—*
Erell, Adoram, and Weintraub, Mitchel, 5,148,489, Cl. 381-47.000

Srikrishna, Kuppuswamy: *See—*
Bohannon, Kenneth W.; Srikrishna, Kuppuswamy; Sholing, Anthony F.; and Reder, Steven E., 5,146,869, Cl. 118-724.000.

SS Pharmaceutical Co., Ltd.: *See—*
Tokizawa, Minoru; Kanamaru, Yoshihiko; Matsumoto, Masaru, Asaoka, Takemitsu; Matsuda, Hideaki; Kuraishi, Tadayuki, Maebashi, Kazunori; Taido, Naokata; and Kawahara, Ryuichi, 5,147,886, Cl. 514-383.000

Stab, Rudolf, to Albert-Frankenthal AG. Longitudinal folding device. 5,147,276, Cl. 493-444.000.

Stacher, George W.: *See—*
Pulley, John K.; and Stacher, George W., 5,147,063, Cl. 220-454.000.

Stackman, Robert W.: *See—*
Calhoun, Glenn C.; Stackman, Robert W., and Klinkhammer, Michael E., 5,147,915, Cl. 524-204.000.

Stafford, Robert M. Fabric structure with double tensioning cables. 5,146,722, Cl. 52-222.000

Stafford, Timothy J.: *See—*
Smith, Ivor S.; and Stafford, Timothy J., 5,147,294, Cl. 604-49.000.

Stafilum AB: *See—*
Jonsson, Svante U. R., 5,147,290, Cl. 604-5.000

Stahl, Mark G.: *See—*
Myers, Robert M.; and Stahl, Mark G., 5,147,297, Cl. 604-20.000.

Stallmo, David C.: *See—*
Gordon, David W.; Stallmo, David C.; Warner, David M.; Brant, William A.; and Hubis, Walter A., 5,148,432, Cl. 371-10.100.

Stamm, Rebecca L.: *See—*
Witek, Richard T.; Williams, Douglas D.; Stanley, Timothy J.; Fenwick, David M.; Burns, Douglas J.; Stamm, Rebecca L.; and Heye, Richard, 5,148,536, Cl. 395-425.000

Standard Oil Company, The: *See—*
Kiovsky, Thomas E.; and Clark, Wendy L., 5,147,413, Cl. 44-328.000
Litt, Maria; Chung, Jack C.; Leininger, Gary G.; and Bond, David C., 5,148,370, Cl. 364-468.000

Stanfill, Willis H., Jr. Installation and removal tool for fiber optic connectors. 5,146,813, Cl. 81-120.000.

Staniszewski, Tadeusz, to Hunt Holdings, Inc. Automatic paper folder. 5,147,275, Cl. 493-416.000

Stanley Electric Co., Ltd.: *See—*
Terada, Toshiyuki, 5,148,299, Cl. 359-73.000

Stanley Electronics: *See—*
Clark, John; Martel, Brian J.; and Murray, James S., 5,148,159, Cl. 340-825.220.

Stanley, Timothy J.: *See—*
Witek, Richard T.; Williams, Douglas D.; Stanley, Timothy J.; Fenwick, David M.; Burns, Douglas J.; Stamm, Rebecca L.; and Heye, Richard, 5,148,536, Cl. 395-425.000

Stark, Casper F.: *See—*
Arroyo, Nestor A.; Stark, Casper F.; and Augustin, Raymond W., 5,147,366, Cl. 606-94.000.

Starke, Richard N.; and Bigler, Raymond G. Self contained urinary catheter assembly. 5,147,341, Cl. 604-349.000.

Starling Manufacturing Company, The: *See—*
Cull, Robert R.; and Cizek, Walter, 5,147,221, Cl. 439-585.000.

Starr, James W.: *See—*
Maresca, Joseph W., Jr.; Starr, James W.; and Wise, Richard F., 5,146,784, Cl. 73-313.000

State of Israel, Ministry of Defense, Rafael-Armament Development Authority: *See—*
Shiloh, Joseph; and Rosenberg, Avner, 5,148,111, Cl. 328-65.000

Statler, William O., to Unitech Development Corp. High turndown mass flow control system for regulating gas flow to a variable pressure system. 5,146,941, Cl. 137-8.000.

Stauble, Georg: *See—*
Hommen, Winfried; Stauble, Georg; Storzinger, Thomas; Wieser, Tiberius; and Wissler, Thomas, 5,147,114, Cl. 303-15.000

Staudenrausch, Georg, to Albert Handtmann Maschinenfabrik GmbH & Co. KG. Method and apparatus for making sausages. 5,147,239, Cl. 452-47.000

Stava, Elliott K., to Lincoln Electric Company, The. System and method of short circuiting arc welding. 5,148,001, Cl. 219-137.0PS.

Steele And Associates, Inc.: *See—*
Steele, Sandra L.; and Nettleton, Harry W., 5,146,625, Cl. 2-102.000.

Steele, Sandra L.; and Nettleton, Harry W., to Steele And Associates, Inc. Cooling vest. 5,146,625, Cl. 2-102.000.

Steenkamer, Arnoldus T.: *See—*
Verheesen, Wilhelmus J. F.; and Steenkamer, Arnoldus T., 5,147,762, Cl. 430-308.000

Stefan, Klaus-Peter: *See—*
Jochum, Peter; Gasser, Oswald; Holupirek, Manfred; Wanek, Erich; Guggenberger, Rainer; Stefan, Klaus-Peter; and Ellrich, Klaus, 5,147,904, Cl. 523-115.000.

Steffel, Horst. Apparatus for testing workpieces, in particular automotive vehicle tires, by means of X-rays. 5,148,456, Cl. 378-61.000.

Steffen, Francis, to SGS-Thomson Microelectronics S.A. Encapsulation of electronic modules. 5,147,982, Cl. 174-52.200.

Stein, Adolph J., to Raytheon Company. Electronic hardware package 5,148,135, Cl. 333-246.000

Stein, Jay A., to Hologic, Inc. Bone densitometer. 5,148,455, Cl. 378-55.000

Steinberg, David H.: *See—*
Luzzi, John J.; and Steinberg, David H., 5,147,568, Cl. 252-47.000

Steindorf, Hans-Joachim, to Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG. Device for filling molds with a casting resin and the like 5,147,660, Cl. 425-148.000

Steiner, Alois; Wuest, Theodor; and Christe, Marcel, to Sulzer Brothers Limited. Filling thread distributor mechanism for a series-shed weaving machine. 5,146,955, Cl. 139-450.000

Steiner Company, Inc.: *See—*
Holzner, Charles R., Sr.; and Voth, Allen J., 5,147,582, Cl. 261-30.000

Stemp, Geoffrey; and Burrell, Gordon, to Beecham Group p.l.c. 1,2-diamino-cyclobuten-3,4-dione derivatives. 5,147,866, Cl. 514-100.000

Stephan, Wolfgang: *See—*
Hies, Henry; Moller, Wolfgang; Dichtelmuller, Herbert; and Stephan, Wolfgang, 5,147,548, Cl. 210-639.000

Stephenson, Thomas P.: *See—*
Pentland, Alex P.; Simoncelli, Eero P.; and Stephenson, Thomas P., 5,148,497, Cl. 382-54.000

Sterling Drug Inc.: *See—*
Diehl, Karl-Heinz; and Oltmanns, Peter, 5,147,884, Cl. 514-365.000

Stern, Brian A.; Matzner, Markus; Layton, Richard; Huspeni, Paul J.; Frayer, Paul D.; and Cleary, James W., to Amoco Corporation. High strength polymer of hydroquinone poly(iso-terephthalate) containing residues of p-hydroxybenzoic acid. 5,147,967, Cl. 528-193.000

Stern, Howard R.: *See—*
Kelley, William J.; and Stern, Howard R., 5,147,238, Cl. 446-330.000

Sterner, Kevin B.: *See—*
Blakeslee, William W., deceased; Davidson, Ronald A.; Giles, Edwin Q.; Menihan, Robert M.; Naylor, David L.; Pitbladdo, Richard B.; Schad, Martin J.; Sterner, Kevin B.; Trentelman, Jackson P.; and Watts, Jason S., 5,147,436, Cl. 65-33.000

Stevens, Gary W.: *See—*
Herbst, William C.; Baker, Lauren D.; and Stevens, Gary W., 5,148,545, Cl. 395-725.000

Stewart, R. Glen, to Ideal Instruments, Inc. Retractable implanter 5,147,295, Cl. 604-61.000

Stewart, Roger G., to Thomson, S.A. Logic circuits as for amorphous silicon self-scanned matrix arrays. 5,148,058, Cl. 307-453.000

Stewart Systems, Inc.: *See—*
Kasik, John P., 5,147,033, Cl. 198-803.600

Stockel, Ivar H.: *See—*
Carlson, Willard E.; and Stockel, Ivar H., 5,147,502, Cl. 162-4.000

Stockhorst, Thomas: *See—*
Heindl, Anette; Schaulin, Rudolf; and Stockhorst, Thomas, 5,147,410, Cl. 8-555.000

Stolzer, Armin; and Blust, Rudolf, to KEURO Maschinebau GmbH & Co. KG. Method of handling goods, and more particularly rod, rail or plate goods in box pallets, and goods handling system. 5,147,176, Cl. 414-786.000

Stone, Todd D.: *See—*
Bradley, Guy M.; and Stone, Todd D., 5,147,134, Cl. 366-150.000

Stone & Webster Engineering Corp.: *See—*
Woebcke, Herman N., 5,147,511, Cl. 196-110.000

Stork, Karl: *See—*
Oppenlaender, Knut; Wegner, Brigette; Stork, Karl; Frosch, Franz and Wekel, Hans-Ulrich, 5,147,644, Cl. 424-401.000

Stork X-Cel B.V.: *See—*
Verheesen, Wilhelmus J. F.; and Steenkamer, Arnoldus T., 5,147,762, Cl. 430-308.000

Storzinger, Thomas: *See—*
Hommen, Winfried; Stauble, Georg; Storzinger, Thomas; Wieser, Tiberius; and Wissler, Thomas, 5,147,114, Cl. 303-15.000

Stout, Scott A.; Lin, Rui; Recht, Gunnar W.; Senftle, Joseph T.; and Larter, Stephen R., to Union Oil Company of California. Optical and pyrolyzate analyzer apparatus. 5,147,611, Cl. 422-78.000

Strabab Bau-AG: *See—*
Wolff, Reinhard; and Miesseler, Hans-Joachim, 5,148,017, Cl. 250-227.140

Straceski, Joseph F.: *See—*
Anjan, Yellapu; Habbel, Sam; and Straceski, Joseph F., 5,148,508, Cl. 385-51.000

Strehler, Richard; and Bartl, Max, to Hurth Getriebe und Zahnraeder G.m.b.H. Spur gear transmission, in particular for a drive unit of an industrial truck. 5,147,255, Cl. 475-311.000

Strickland, David W.: *See—*
Richardson, Larry E.; Strickland, David W.; and Zagar, Frank L., 5,147,987, Cl. 181-264.000

Stripping Technologies Inc.: *See—*
Abbot, Kenneth E.; and Lyons, Patrick J., 5,147,427, Cl. 55-302.000

Stromakov, Alexandr P.: *See—*
Fedorov, Svyatoslav N.; Linnik, Leonid F.; Antropov, Gennady M.; Shigina, Nina A.; Nikitenko, Vladimir I.; Arnautov, Leonid N.; Stromakov, Alexandr P.; Boldysheva, Irina A.; Oreshkin, Valery P.; and Chernyakov, Lev A., 5,147,284, Cl. 600-9.000

Stueckle, Duane H.; and Allen, Duane L. Foot pedal control mechanism for computers. 5,148,152, Cl. 340-706.000

Sturdivant, Linda D.: *See—*
Pan, Pauline H.; and Sturdivant, Linda D., 5,147,632, Cl. 424-54.000

Sturrock, Sheldon, Reusable, valved, transparent, pocket resuscitation mask. 5,146,914, Cl. 128-203.110

Suau, Jean-Marc: *See—*
Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,147,506, Cl. 162-135.000

Subbarao, Muralidhara, to Research Foundation of State University of New York, The. Passive ranging and rapid autofocusing. 5,148,209, Cl. 354-400.000

Suda, Shigeyuki; Houryu, Sakae; and Nose, Noriyuki, to Canon Kabushiki Kaisha. Position detecting method and apparatus. 5,148,037, Cl. 250-548.000

Suda, Shigeyuki: *See—*
Hattori, Jun; and Suda, Shigeyuki, 5,148,035, Cl. 250-548.000

Sueoka, Yasuhiro: *See—*
Kuragasaki, Mutsuo; Sueoka, Yasuhiro; Equchi, Akira; and Makino, Tetsuo, 5,147,509, Cl. 162-34[illegible].000

Sugano, Toshihiko: *See—*
Fujita, Takashi; and Sugano, Toshihiko, 5,147,839, Cl. 502-119.000

Sugawara, Akira: *See—*
Kanzaki, Toshihiro; Sugawara, Akira; Amatsu, Isamu; and Hatakeyama, Kouichi, 5,147,469, Cl. 148-684.000

Sugawara, Naoto; and Muratomi, Yoichi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head with contact gap. 5,148,343, Cl. 360-122.000

Sugawara, Yuji; and Kobe, Shinji, to Ashi Denka Kogyo Kabushiki Kaisha. Halogenated resin composition. 5,147,917, Cl. 524-357.000.

Suggs, Robert B., to American Oilfield Divers, Inc. Diver guidance method and system. 5,148,412, Cl. 367-[illegible]31.000

Sugimoto, Takao; Nishimura, Takehiro; Fujikake, Yohichi; and Yamaguchi, Akiomi, to Nippon Steel Corporation. Indentation hardness tester. 5,146,779, Cl. 73-81.000

Sugita, Naomasa, to Kabushiki Kaisha Toshiba. Method of manufacturing a Schottky diode device. 5,148,241, Cl. 357-15.000.

Sugitani, Hiroshi: *See—*
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R

Sugiya, Masashi: *See—*
Shimura, Seiji, Sugiya, Masashi; Hara, Yoshifusa; Kako, Kunio; and Saito, Akira, 5,147,409, Cl. 8-128.100

Sugiyama, Genroku; and Hirata, Toichi, to Hitachi Construction Machinery Co., Ltd. Valve apparatus and hydraulic circuit system. 5,146,747, Cl. 60-452.000

Sugiyama, Kazuhiko: *See—*
Nishimura, Eiichi; Toda, Akihito; Sugiyama, Kazuhiko; and Natou, Yukio, 5,147,493, Cl. 156-345.00

Sullivan, Ann; Dein, Lara; and Engelking, Scott T. Safety finger prick instrument. 5,147,375, Cl. 606-182.000

Sulzer Brothers Limited: *See—*
Bohler, Nikolaus; and Koch, Rudolf, 5,147,402, Cl. 623-16.000
Dekumbis, Roger; Marsden, Charles; and Wagniere, Jean-Daniel, 5,147,999, Cl. 219-121.630
Hueber, Joseph, 5,147,425, Cl. 55-23[illegible].000
Steiner, Alois; Wuest, Theodor; and Christe, Marcel, 5,146,955, Cl. 139-450.000

Sulzer-Escher Wyss GmbH: *See—*
Biondetti, Mario, 5,146,664, Cl. 29-1[illegible]6.200

Sumitomo Chemical Company, Limited: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takeshi, and Kakugo, Masahiro, 5,147,942, Cl. 525-397.000

Sumitomo Electric Industries, Ltd.: *See—*
Shimoda, Kouhei; Maeda, Takao; Sugabe, Kouichi; and Miyake, Masaya, 5,147,832, Cl. 501-96.000
Takenaka, Shinya, 5,148,008, Cl. 235.455.000
Tanaka, Saburo; Itozaki, Hideo; and Yazu, Shuji, 5,147,849, Cl. 505-1.000

Sumitomo Metal Mining Co., Ltd.: *See—*
Ohtsuka, Akihito; and Kijima, Yoshio, 5,147,601, Cl. 419-25.000

Sumitomo Rubber Industries Limited: *See—*
Kubota, Akinori; Ijiri, Masaaki; and Kobayashi, Michihito, 5,147,656, Cl. 425-42.000
Nock, Nigel G.; Clarke, David H.; and Martin, John, 5,147,478, Cl. 152-209.00R

Sumitomo Wiring System, Ltd.: *See—*
Koshi, Masaki; Yamada, Shouji; Watanabe, Akihiko; and Nemoto, Kouji, 5,147,479, Cl. 152-216.000

Sumitomo Wiring Systems, Ltd.: *See—*
Iura, Kazuo; Yamano, Yoshiaki, and Saka, Kazuhito, 5,147,510, Cl. 174-117.00F.

Sumiya, Keiji: *See—*
Yamana, Shozo; Kuwajima, Hideji; Ishihara, Minoru; Sumiya, Keiji; Ashizawa, Toranosuke, and Shimoda, Shuichiro, 5,147,851, Cl. 505-1.000

Sunbeam Plastics Corporation: *See—*
Minette, Jeffrey C., 5,147,052, Cl. 215-215.000

Sunderland, Richard A.: *See—*
Walker, Clarence L.; Sunderland, Richard A.; and Davis, Mark A., 5,147,312, Cl. 604-153.000

Sundstrand Corp.: *See—*
Treece, William D., 5,147,178, Cl. 4[illegible]5-58.400

Sundstrom, Staffan, to Coloplast A/S. Dressing material for the treatment of wounds, and corpuscles for use in the production thereof. 5,147,339, Cl. 604-307.000

Sunpower, Inc.: *See—*
Beale, William T.; and Redlich, Robert W., 5,148,066, Cl. 310-17.000

Supaflo Pty. Limited: *See—*
Taylor, David, 5,147,556, Cl. 210-712.000

Suppes, Galen J. Compact magnetic levitation transportation system. 5,146,853, Cl. 104-138.200

Surface Sciences, Inc.: *See—*
Cullen, Lawrence E., 5,147,050, Cl. 211-118.000.

Sutterlin, Philip H.; Bemiss, William R.; and Hey, G. Michael, to Echelon Systems Corporation. Data communication network providing power and message information. 5,148,144, Cl. 340-310.00A

Sutton, Richard C.; Danielson, Susan J.; Findlay, John B.; Oakes, Fred T.; Oenick, Marsha D. B.; Ponticello, Ignazio S.; and Warren, Harold C., III, to Eastman Kodak Company. Biologically active reagents prepared from carboxy-containing polymer, analytical element and methods of use. 5,147,777, Cl. 435-5.000

Suuronen, David E., to Gould Inc. Fuse with thin film fusible element supported on a substrate. 5,148,141, Cl. 337-297.000

Suwa, Hidenori; Ono, Shinichi; Hirano, Hiroyuki; and Naruse, Humio, to Nihon Shinku Gujutsu Kabushiki Kaisha. Loading and unloading airlock apparatus for a vacuum treatment chamber. 5,147,168, Cl. 414-217.000

Suyama, Junichi: *See—*
Cho, Shizuo; and Suyama, Junichi, 5,148,399, Cl. 365-205.000

Suzuki, Akira; Sakamoto, Yuji; and Masuda, Yuko, to Kirin Beer Kabushiki Kaisha. Culture medium device for bacteria. 5,147,801, Cl. 435-299.000

Suzuki, Akira: *See—*
Inagaki, Yoshitaka; Suzuki, Akira; and Mushika, Sadahiko, 5,147,392, Cl. 623-3.000

Suzuki, Akiyoshi: *See—*
Ohta, Masakatsu; Ina, Hideki; and Suzuki, Akiyoshi, 5,148,214, Cl. 355-43.000

Suzuki, Hideo: *See—*
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Hideo; Kinpara, Mamoru; and Watanabe, Kunihiko, 5,147,969, Cl. 84-600.000

Suzuki, Hiroyoshi: *See—*
Uchinami, Masanobu; Takahashi, Toshihisa; Nishiyama, Ryoji; Suzuki, Hiroyoshi; and Nishida, Shinichi, 5,148,369, Cl. 364-431.060

Suzuki, Hiroyuki: *See—*
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao, Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki; Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki; and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000.

Suzuki Kabushiki Kaisha: *See—*
Nakajima, Shinji; and Miyabe, Toshimasa, 5,147,077, Cl. 224-32.00R

Suzuki, Keiichiro. *See—*
Uda, Taizo; Itoh, Yukikatsu; Kawaguchi, Tetsuo; Hifumi, Emi; Taniguchi, Naoyuki; Suzuki, Keiichiro; Ishikawa, Mutsuo; and Noji, Shirou, 5,147,783, Cl. 435-7.230

Suzuki, Kenichi, to Oki Electric Industry Co., Ltd. Process for producing semiconductor device. 5,147,810, Cl. 437-31.000

Suzuki, Masahiro; and Nagata, Masato, to Oki Electric Industry Co., Ltd. Print data generator. 5,148,517, Cl. 395-115.000

Suzuki, Masashi: *See—*
Morita, Toshiki; Niikawa, Takeshi; Kato, Kiroyuki; and Suzuki, Masashi, 5,147,143, Cl. 400-279.000
Sakaida, Atsuo; Ikezaki, Yoshiyuki; Iriguchi, Akira; Niikawa, Takeshi; and Suzuki, Masashi, 5,147,141, Cl. 400-124.000

Suzuki, Motoyuki; and Deguchi, Yukichi, to Toray Industries, Inc. Aluminum deposited film and process for producing it. 5,147,726, Cl. 428-458.000

Suzuki, Shinichi; Ban, Takashi; Izumi, Yuji; Yoshida, Tetsuo; and Fukanuma, Tetsuhiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Scroll-type fluid compressor with rotation preventing coupling members. 5,147,192, Cl. 418-55.300.

Suzuki, Takayuki: *See—*
Hasegawa, Tetsuo; Suzuki, Takayuki; Kushida, Naoki; and Takizawa, Yoshihisa, 5,147,707, Cl. 428-212.000

Suzuki, Teruo: *See—*
Yamada, Chihiko; Suzuki, Teruo; Yoshida, Tsutomu; and Kubota, Shinji, 5,148,309, Cl. 359-443.000

Suzuki, Toshihide: *See—*
Kiyoura, Tadamitsu; Ajioka, Masanobu; Fujimoto, Naoshi, Suzuki, Toshihide; Kogure, Yasuo; Nagayama, Tokio; and Kanaya, Kazuo, 5,147,624, Cl. 423-502.000

Suzuki, Tsukasa: *See—*
Hanagata, Haruo; Suzuki, Tsukasa; Yanagida, Kazuo; and Igarashi, Hidesato, 5,147,515, Cl. 204-164.000

Suzuki, Yasurou: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takeshi; and Kakugo, Masahiro, 5,147,942, Cl. 525-397.000.

Swanson, Steven M.; Fanner, John C.; and Halstead, Nick V., to Onan Corporation. Governor assist mechanism. 5,146,889, Cl. 123-376.000

Swars, Helmut: *See—*
Maus, Wolfgang; Swars, Helmut; Breuer, Hans-Jurgen; and Cyron, Theodor, 5,146,743, Cl. 60-274.000

Sweatt, William C.: *See—*
O'Neil, Richard W.; and Sweatt, William C., 5,148,442, Cl. 372-71.000

Sweet, Douglas F., to Nash Engineering Company, The. Suction box covers for cleaning papermaking machine felts. 5,147,508, Cl. 162-279.000

Sweet, Randall P., to Dow Corning Corporation. Hot-melt silicone pressure sensitive adhesive composition and related methods and articles. 5,147,916, Cl. 524-266.000

Syers, Charles S. Removable headrest assembly for motor vehicle seats. 5,147,110, Cl. 297-397.000

Syntellect Inc.: *See—*
Saltwick, John M.; and Scarinci, Dean, 5,148,478, Cl. 380-6.000

Synthomer Chemie GmbH: *See—*
Rinck, Gunter; Moller, Knut; Fullert, Sigismund; Krause, Frank; and Koch, Helmut, 5,147,907, Cl. 524-48.000

Systel International S.p.A.: *See—*
Signoretto, Roberto, 5,147,048, Cl. 209-698.000

SyStemix, Inc.: *See—*
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Szilbereky, Jeno: *See—*
Nagy, Peter L.; Balaazs, Bela; Boross, Maria; Szilbereky, Jeno; Zsila, Gizella; Abraham, Lajos; Blasko, Gyorgy; Gachalyi, Bela; Almasi, Attila; and Nemet, Gabor, 5,147,879, Cl. 514-318.000

Szwejkowski, Chester; Latchford, Ian S.; Namose, Isamu; and Tsuchida, Kazumi, to Applied Materials, Inc. Process for removal of residues remaining after etching polysilicon layer in formation of integrated circuit structure. 5,147,499, Cl. 156-643.000.

t-PA Technology Trust: *See—*
Wilson, Elaine L., 5,147,790, Cl. 435-70.300

Tabankia, Farshid: *See—*
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Tabushi, Katsumi: *See—*
Niwa, Katsuhiro; Shimoyama, Tsuguhiro; Tabushi, Katsumi; and Anazawa, Toshio, 5,146,860, Cl. 112-121.270.

Tacchella, William L., to Cooper Industries, Inc. Method for draping curtains. 5,146,972, Cl. 160-330.000

Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, to Hitachi, Ltd. Dry etching method. 5,147,500, Cl. 156-643.000

Tada, Keishi, to Sony Corporation. Wafer transfer device for a semiconductor device fabricating system. 5,147,175, Cl. 414-749.000

Tadayon, Fereshteh, to Alusuisse-Lonza Services Ltd. Ceramic foam filter body having a gasket chemically and mechanically bonded thereto. 5,147,546, Cl. 210-506.000

Taddeo, Franklin A. Method and apparatus for dresser video images. 5,148,283, Cl. 358-254.000.

Tager, Karl H. Prosthetic cup member. 5,147,407, Cl. 623-22.000

Taguchi, Tomishige: *See—*
Kimura, Norio; Taguchi, Tomishige; Sakata, Tsuguhide; Tsuruno, Kunio; and Takei, Masahiro, 5,148,291, Cl. 358-336.000

Taguchi, Toshio: *See—*
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Tahara, Hisatsugu: *See—*
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Taido, Naokata: *See—*
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Taito Co., Ltd.: *See—*
Niki, Libor; and Albright, Lawrence, 5,147,862, Cl. 514-54.000

Taka, Hideo, to Canon Kabushiki Kaisha. Distance measuring apparatus using integration of reflected light and obtaining a plurality of distance signals. 5,148,011, Cl. 250-201.600.

Taka, Shin-ichi, to Kabushiki Kaisha Toshiba. Dipolar transistor. 5,148,252, Cl. 357-34.000

Takada, Seiji: *See—*
Kotani, Takaaki; Takada, Seiji; Goto, Shigenori; and Saito, Tatsuo, 5,148,211, Cl. 354-403.000

Takagi, Kazumasa: *See—*
Shiroishi, Yoshihiro; Yamashita, Takeo; Hishiyama, Sadao; Kumasaka, Noriyuki; Matsuda, Yoshibumi; Suzuki, Hiroyuki, Takagi, Kazumasa; Tsumita, Norikazu; Ohura, Masaki; and Ohno, Tomoyuki, 5,147,732, Cl. 428-668.000.

Takagi, Yasushi: *See—*
Morimoto, Kiyotake; Takagi, Yasushi; Kato, Isao; and Nakata, Masahiko, 5,147,897, Cl. 521-125.000

Takahashi, Fumihiko, to Hitachi Metals, Ltd. Swing-type actuator with thin reinforced movable coil. 5,148,071, Cl. 310-208.000

Takahashi, Hitoshi: *See—*
Ono, Tomohisa; Takahashi, Hitoshi; and Yamaguchi, Toshiaki, 5,147,105, Cl. 296-146.00F.

Takahashi, Kihei: *See—*
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Takahashi, Kouji: *See—*
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Takahashi, Masahiro: *See—*
Nonaka, Tomoharu; Makino, Hiroshi; Takahashi, Masahiro; Sata, Teiji; and Yoshino, Daisuke, 5,148,069, Cl. 310-68.00R.

Takahashi, Minoru; and Yokota, Mitsuo, to Fuji Photo Film Co., Ltd. Method and apparatus for driving the taking lens system of a camera. 5,148,200, Cl. 354-195.100.

Takahashi, Motoichi: *See—*
Kobori, Takuji; Ishii, Koji; Takahashi, Motoichi; Hirai, Junichi; Adachi, Yoshinori; Niwa, Naoki; Ariki, Shigeru; Kamei, Toshiaki; and Shizume, Takeharu, 5,147,018, Cl. 88-300.000

Takahashi, Shinichi: *See—*
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Takahashi, Toshihisa: *See—*
Uchinami, Masanobu; Takahashi, Toshihisa; Nishiyama, Ryoji; Suzuki, Hiroyoshi; and Nishida, Shinichi, 5,148,369, Cl. 364-431.060

Takamura, Ryoji: *See—*
Hayashi, Mutsumi; Takamura, Ryoji; Yamazaki, Chikayasu; Ueda, Minoru; and Kumo, Ichiro, 5,148,023, Cl. 250-372.000

Takamura, Tooru: *See—*
Shimamoto, Noboru; Takamura, Tooru; and Handa, Ryuichi, 5,147,691, Cl. 427-387.000

Takane, Atsushi; Miyamoto, Yoshiyuki; Takeda, Ryuzaburo; and Sano, Koichi, to Hitachi, Ltd. Magnetic resonance imaging method and system therefor. 5,148,109, Cl. 324-309.000

Takano, Masatoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Image recording apparatus. 5,148,228, Cl. 355-308.000

Takao, Kenji. *See—*
Ogishi, Hideo; Takao, Kenji; Umino, Shigeru; and Yamato, Koji, 5,147,729, Cl. 428-623.000
Ogishi, Hideo; Umino, Shigeru, Takao, Kenji; Kimura, Hajime; and Yamato, Koji, 5,147,730, Cl. 428-623.000

Takaoka, Toshio: *See—*
Fukuma, Takao; Tsukamoto, Keisuke; Takaoka, Toshio; and Yamasaki, Hirofumi, 5,146,885, Cl. 123-308.000

Takashima, Izumi, to Fuji Xerox Co., Ltd. Original document reading apparatus. 5,148,296, Cl. 358-482.000

Takatani, Kiyomitsu: *See—*
Kawasaki, Masayuki; and Takatani, Kiyomitsu, 5,148,048, Cl. 307-263.000

Takatori, Hiroshi: *See—*
Buttle, Kenneth G.; and Takatori, Hiroshi, 5,148,427, Cl. 370-32.100

Takeda Chemical Industries, Ltd.: *See—*
Kanamaru, Tsuneo; Nozaki, Yukimasa, and Muroi, Masayuki, 5,147,860, Cl. 514-34.000

Takeda, Hiroshi: *See—*
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Takeda, Ryuzaburo: *See—*
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Takeda, Takayuki; and Itoh, Shinichi, to Oki Electric Industry Co., Ltd. Electrophotographic process and apparatus. 5,148,225, Cl. 355-272.000

Takeda, Yuji, to Mitsubishi Gas Chemical Company, Inc. Polyamide resin, and polyamide resin compositions. 5,147,944, Cl. 525-432.000

Takehana, Toshihiro: *See—*
Hiromoto, Shuji; Kitamura, Roh; Yoshino, Fumitaka; Kamisaku, Takeshi; and Takehana, Toshihiro, 5,147,097, Cl. 280-691.000

Takei, Masahiro: *See—*
Kashida, Motokazu; Takei, Masahiro; Takahashi, Kouji, and Nagasawa, Kenichi, 5,148,331, Cl. 360-77.150
Kimura, Norio; Taguchi, Tomishige; Sakata, Tsuguhide; Tsuruno, Kunio; and Takei, Masahiro, 5,148,291, Cl. 358-336.000

Takemura, Yoshinari: *See—*
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Takenaka, Hiromitsu: *See—*
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Takenaka, Shinya, to Sumitomo Electric Industries, Ltd. Mark reading device with cyclicly varying power. 5,148,008, Cl. 235-455.000

Takenouchi, Shinich: *See—*
Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Sasaki, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinich, 5,146,891, Cl. 123-325.000

Takeshita, Takuo; and Watanabe, Muneaki, to Mitsubishi Materials Corporation. Sintered rare earth metal-boron-iron alloy magnets and a method for their production. 5,147,447, Cl. 75-246.000

Takesue, Mitsuyuki: *See—*
Mizuchi, Akira; Horikomi, Kazutoshi; Sasaki, Tadayuki; Awaya, Akira; Tomino, Ikuo; Takesue, Mitsuyuki; and Kihara, Noriaki, 5,147,876, Cl. 514-275.000

Takeuchi, Esther S.: *See—*
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Takeuchi, Hiroshi. *See—*
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Takeuchi, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Magneto-optical disc apparatus having head-disc distance control. 5,148,415, Cl. 369-13.000

Takeuchi, Masahiro, to Seiko Epson Corporation. Method of manufacturing an LDDFET having an inverted-T shaped gate electrode. 5,147,814, Cl. 437-44.000

Takeuchi, Masaki; Yasuda, Mitsuhiro; and Kanzaki, Mitsuru, to Chugai Seiyaku Kabushiki Kaisha. Herbicidal triazole compounds and herbicidal compositions containing the same. 5,147,445, Cl. 71-92.000

Takeuchi, Naoki: *See*—
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 5,147,661, Cl. 425-150.000

Takeuchi, Takikazu; Yokohara, Hiroyuki; Ogawa, Takuji; and Sakurai, Noboru, to Hitachi, Ltd.; and Hitachi Computer Peripherals Co., Ltd. Phase synchronization circuit. 5,148,334, Cl. 360-51.000

Takiguchi, Yasuyuki; Iida, Shigeki; and Toyooka, Takehiro, to Ricoh Company, Ltd.; and Nippon Oil Company, Limited. Method for orienting a liquid crystal polymer. 5,147,682, Cl. 427-58.000

Takikawa, Masahiko; and Awano, Yuji, to Fujitsu Limited. Semiconductor device having a selectively doped heterostructure. 5,148,245, Cl. 357-22.000

Takita, Yoshio: *See*—
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Takizawa, Mitsuharu: *See*—
Adachi, Hideki; Takizawa, Mitsuharu; Nakayama, Miho; Fukada, Taisei; Nakamura, Shinichi; Kuroyanagi, Satoshi; Tahara, Hisatsugu; Ozaki, Hiroshi; and Miyata, Masanori, 5,148,089, Cl. 318-66.000

Takizawa, Yoshihisa: *See*—
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Talbot, Geoffrey, to Unilever Patent Holdings B.V. Blends of non-lauric coating fats and liquid, trans-hardened high stability oils with high Rancimat Induction Period values and coatings and food products obtained therefrom. 5,147,676, Cl. 426-601.000

Talley, Robert E.: *See*—
Babbitt, Terry; Braunshteyn, Michael S.; Gillespie, Andrew J.; Jones, Donald H.; Keen, Billy J., Jr.; Raynor, Robert H.; Ritt, Renzer R.; and Talley, Robert E., 5,146,666, Cl. 29-429.000
Evers, Donald H.; Harris, William C., Jr.; and Talley, Robert E., 5,147,037, Cl. 206-256.000

Talonn, Daniel A.; and Ranford, Alan B., to Sherwood Medical Company. Combined syringe and needle shield and method of manufacture. 5,147,326, Cl. 604-198.000

Talwar, Ashok K., to American Nucleonics Corporation. Adaptive feed-forward method and apparatus for amplifier noise reduction 5,148,117, Cl. 330-151.000

Tam Ceramics, Inc.: *See*—
Dean, Terence C., 5,147,579, Cl. 252-315.000

Tamada, Masuo, and Tanaka, Tsutomu, to Kabushiki Kaisha Toshiba IC card with a stored data change inhibition function. 5,148,543, Cl. 395-700.000

Tamada, Sakuya: *See*—
Nakane, Yasuaki; Miyaoka, Senri; Tanada, Sakuya; Nakayama, Hiroshi; Iwai, Junichi; and Igarashi, Shuichi, 5,148,285, Cl. 358-231.000

Tamamori, Hideo, to Nippon Air Brake Co., Ltd. Fluid pressure control valve device for a railway car. 5,146,952, Cl. 137-627.500

Tamari, Vladimir F., to Tamari, Vladimir F. Method and means to cancel diffraction effects from radiation fields. 5,148,315, Cl. 359-558.000

Tambornini, Steven A.: *See*—
Wessells, Forrest A., Murphy, Edward F.; and Tambornini, Steven A., 5,147,761, Cl. 430-306.000

Tamehiro, Hiroshi; Chiziiwa, Rikio; Sakumoto, Yoshifumi; Funato, Kazuo; Yoshida, Yuzuru; and Keira, Koichiro, to Nippon Steel Corporation. Building construction steel having excellent fire resistance and low yield ratio. 5,147,474, Cl. 48-320.000

Tamglass Oy: *See*—
Leponen, Mauri E.; Yli-Vakkuri, Erkki; and Lind, Kalevi, 5,147,440, Cl. 65-287.000

Tamm, Rolf; Roedel, Guenther, and Rogasch, Klaus, to Bodenseewerk Perkin Elmer GmbH. Method and device for analyzing samples by means of atomic absorption spectroscopy 5,148,234, Cl. 356-312.000

Tamura, Hideharu; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Forming method of magnetic recording medium protective film. 5,147,684, Cl. 427-131.000

Tamura, Masayuki, to Mitsuba Electric Manufacturing Co. Ltd. Wiring device in direct current machine. 5,148,073, Cl. 310-239.000

Tan, Haw-Chan; Yu, Nobbert; and Lin, Yuan-Chieh, to Foxconn International, Inc. Electrical connector with conductive member electrically coupling contacts and filter components. 5,147,224, Cl. 439-620.000

Tanaka, Hajime: *See*—
Itou, Takeo; Matsuda, Hidemi; Tanaka, Hajime; and Shimizu, Kazuhiko, 5,148,082, Cl. 313-466.000

Tanaka, Koichi; Mikami, Akiyoshi; Taniguchi, Kouji; Okibayashi, Katsushi; Terada, Kousuke; Yamashita, Takuo; Ogura, Takashi; Nakaya, Hiroaki; Yoshida, Masaru; and Nakajima, Shigeo, to Sharp Kabushiki Kaisha. Process for preparing a thin film electroluminescent device. 5,147,683, Cl. 427-69.000

Tanaka, Kuniyoshi: *See*—
Watanabe, Miyoko; and Tanaka, Kuniyoshi, 5,148,026, Cl. 250-306.000

Tanaka, Saburo; Itozaki, Hideo; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Electrode for electrical connection to oxide superconductor and method for forming the same. 5,147,849, Cl. 505-1.000

Tanaka, Sadaaki: *See*—
Ogiri, Hiroshi; Murata, Kazue; and Tanaka, Sadaaki, 5,146,692, Cl. 34-12.000

Tanaka, Seiichi; Hirata, Teruo; and Yida, Masaharu. Ag-SnO_2 electrical contact materials. 5,147,728, Cl. 148-431.000.

Tanaka, Shigeaki: *See*—
Izumida, Masaaki; Sato, Koichi; Tanaka, Shigeaki; Fukuda, Tsuguhiro; Kuwabara, Nobuyuki; Goto, Akira; Watanabe, Takashi; Maeoka, Kunihiko; Sugitani, Hiroshi; Hattori, Yoshifumi; Ikeda, Masami; Saito, Asao; Masuda, Kazuaki; Saito, Akio; and Orikasa, Tsuyoshi, 5,148,192, Cl. 346-140.00R.

Tanaka, Tadao: *See*—
Nishimore, Masayoshi; Yoshida, Hiroshi; Tani, Masanori; Tanaka, Tadao; Fujii, Hiroshi; and Masuda, Hiroyuki, 5,147,008, Cl. 180-140.000

Tanaka, Takeshi; and Kajiwara, Kunio, to Yamaha Hatsudoki Kabushiki Kaisha. Fuel control system for injected engine. 5,146,899, Cl. 123-494.000

Tanaka, Toshimitsu: *See*—
Hattori, Toshihiko; Hitomi, Mitsuo; Tanaka, Toshimitsu; and Yamagata, Naoyuki, 5,146,897, Cl. 123-470.000

Tanaka, Tsutomu: *See*—
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Tanamachi, Steven W., to Minnesota Mining and Manufacturing Company. Capacitive film position sensing system for a film processor 5,148,207, Cl. 354-322.000

Tanba, Nobuo: *See*—
Nakazato, Shinji; Uchida, Hideaki; Saito, Yoshikazu; Yamamura, Masahiro; Kobayashi, Yutaka; Ikeda, Takahide; Hori, Ryoichi; Kitsukawa, Goro; Itoh, Kiyoo; Tanba, Nobuo; Watanabe, Takao; Shimohigashi, Katsuhiro; and Homma, Noriyuki, 5,148,255, Cl. 357-43.000

Tandon, Jagdish C.; Choi, Yungran; and Tewinkle, Scott L., to Xerox Corporation. Multiplexing arrangement for controlling data produced by a color images sensor array. 5,148,268, Cl. 358-41.000.

Tandy Corporation: *See*—
Ballard, Jerry L., 5,148,535, Cl. 395-425.000
Cockrum, Lloyd W.; and Kline, Christopher, 5,147,986, Cl. 181-145.000

Tang, Xun: *See*—
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Taniguchi, Naoyuki: *See*—
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Tanisake, Hiroka; Yamamoto, Koji; Koyama, Takeshi; Shinohara, Shunichi; Maruo, Kazunobu; and Toki, Tsukasa, to Mitsubishi Gas Chemical Company, Inc. Melt-processable copolyesterimide composed of bis-trimellitimide units. 5,147,962, Cl. 528-170.000

Tanisawa, Yasuhisa, to NEC Corporation. Optical waveguide device with two predetermined wavelength, polarization independent, directional coupler switches. 5,148,507, Cl. 385-41.000.

Tank, Volker; Dietl, Helmut; Haschberger, Peter; and Mayer, Oliver, to Deutsche Forschungsanstalt fur Luft- und Raumfahrt. Michelson interferometer for producing optical path differences by rotating corner cube retroreflectors. 5,148,235, Cl. 356-346.000

Tapper, Alexander; Buhl, Horst; and Holz, Josef, to Hoechst Aktiengesellschaft. Process for the preparation of phosphorous acid 5,147,625, Cl. 423-316.000

Tarumi, Niro: *See*—
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Taruya, Masaaki: *See*—
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Tasson, Brian B.: *See*—
Northrup, James R.; and Tasson, Brian B., 5,147,978, Cl. 102-434.000

Tatani, Kouji: *See*—
Koakutsu, Hiroshi; and Tatani, Kouji, 5,148,115, Cl. 330-2.000

Tate, William J.: *See*—
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Taylor, David, to Supaflo Pty. Limited. Thickener. 5,147,556, Cl. 210-712.000

Taylor, Gregory W.: *See*—
Young, Gerald A.; LaVon, Gary D.; and Taylor, Gregory W. 5,147,345, Cl. 604-378.000

Taylor, Julian S. Low pressure fluid emergency shutdown valve 5,146,942, Cl. 137-67.000

Tazi, Mohammed; Login, Robert B.; Plochocka, Krystyna; Haldar, Rama K.; Gangadharan, Balgopal; and Prosise, William E., to ISP Investments Inc. Denture adhesive. 5,147,941, Cl. 525-327.800

Tazi, Mohammed: *See*—
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Teac Corporation: *See*—
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Techmedica, Inc.: *See*—
Carignan, Roger G.; and Rose, Gregory C., 5,147,386, Cl. 623-21.000

Technology Applications Company Limited: *See*—
Lowe, John M.; and Devonport, Joseph, 5,148,355, Cl. 361-410.000

Tecogen, Inc.: *See*—
Mathur, Virendra K.; Breault, Ronald W.; McLarnon, Christopher R.; and Medror, Frank G., 5,147,516, Cl. 204-177.000.

Teichner, Robert W.: *See*—
Merrick, Stephen P.; and Teichner, Robert W., 5,148,243, Cl. 357-17.000

Tekkanat, Bora. *See*—
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Tektronix, Inc.: *See*—
Crosby, Philip S., 5,148,162, Cl. 341-122.000.
Lane, Richard I.; Bateman, Glenn; Mader, Josef L.; and Bremer, Ronald J., 5,148,230, Cl. 356-73.100.
Radich, David, 5,148,446, Cl. 372-109.000

Teleco Oilfield Services Inc.: *See*—
Matthews, H. Gerard, 5,148,408, Cl. 367-82.000

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Leland, John D., 5,147,451, Cl. 75-620.000.
Shah, Nikunj, 5,148,158, Cl. 340-825.170.

Teledyne Kinetics: *See*—
Mowry, Thomas E., 5,147,207, Cl. 439-66.000.

Telefonaktiebolaget L M Ericsson: *See*—
Dent, Paul W., 5,148,373, Cl. 364-484.000

Telesz, John P.: *See*—
Kadle, Prasad S.; Frombgen, Barry J.; and Telesz, John P., 5,146,767, Cl. 62-474.000.

Telser, Thomas: *See*—
Kurtz, Karl-Rudolf; Koch, Horst; and Telser, Thomas, 5,147,757, Cl. 430-270.000

Tempest, Michael C., to Federal Mogul Westwind Air Bearings Ltd. Centrifugal spindle. 5,147,165, Cl. 409-232.000.

Temple, Joseph L., III: *See*—
Celtruda, Joseph O.; Hua, Kein A.; Hunt, Anderson H.; Liu, Lishing; Peir, Jih-Kwon; Pruett, David R.; and Temple, Joseph L., III, 5,148,538, Cl. 395-425.000

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Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,147,359, Cl. 606-61.000

Tenryu Chemical Industry Co., Ltd.: *See*—
Yoshida, Yoshiaki, 5,147,591, Cl. 264-163.000

Terada, Kousuke: *See*—
Tanaka, Koichi; Mikami, Akiyoshi; Taniguchi, Kouji; Okibayashi, Katsushi; Terada, Kousuke; Yamashita, Takuo; Ogura, Takashi; Nakaya, Hiroaki; Yoshida, Masaru; and Nakajima, Shigeo, 5,147,683, Cl. 427-69.000

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Terada, Toshiyuki: *See*—
Inoue, Tomotoshi; Terada, Toshiyuki; and Tomita, Kenichi, 5,148,260, Cl. 357-67.000

Terao, Osamu: *See*—
Igarashi, Hiroshi; Terao, Osamu; Tsutsumi, Nobuhide; and Yamamoto, Yukio, 5,147,689, Cl. 427-264.000

Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Printing method for photographic printer. 5,148,213, Cl. 355-38.000

Terman, Lewis M.: *See*—
Chen, Chih-Liang; Cook, Peter W.; and Terman, Lewis M., 5,148,059, Cl. 307-475.000

Terrell, Noel E. Power plane support apparatus. 5,146,959, Cl. 144-1.00F

Terry, Jimmy C.: *See*—
Lee, Stanley M.; Terry, Jimmy C.; and Mrosko, John A., 5,146,846, Cl. 99-620.000

Terwilliger, Richard A.; Hebert, John D.; and Hall, Jack, to Vance Products Inc. Biopsy instrument stylet and cannula assembly 5,146,921, Cl. 128-754.000

TES Wankel Technische Forschungs-und Entwicklungsstelle Lindau GmbH: *See*—
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Tewinkle, Scott L.: *See*—
Tandon, Jagdish C.; Choi, Yungran; and Tewinkle, Scott L., 5,148,268, Cl. 358-41.000

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Texaco Inc.: *See*—
Chou, Kechia J.; and Hellmuth, Kathleen M., 5,147,549, Cl. 210-640.000
DeRosa, Thomas F.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,147,569, Cl. 252-47.500.
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Powers, William J., III; Matthews, Leonard A.; Leong, Marian F.; and Erickson, Robert W., Jr., 5,147,414, Cl. 44-347.000

Texas Instruments Incorporated. *See*—
Florence, James M., 5,148,157, Cl. 340-783.000
Frazier, Gary A.; and Bate, Robert T., 5,147,817, Cl. 437-52.000
Frazier, Gary A., 5,148,385, Cl. 364-728.070
Gill, Manzur; and Lindgren, Theodore D., 5,147,816, Cl. 437-52.000
Hilferink, Henk; Tip, Anne A.; and Velten, Henk, 5,148,404, Cl. 367-2.000
Krenik, William R.; and Izzi, Louis J., 5,148,065, Cl. 307-572.000
McDonald, T. Gus, 5,148,506, Cl. 385-16.000

Tezuka, Kouichi: *See*—
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Theeuwes, Felix; Gyory, J. Richard; and Haak, Ronald P., to Alza Corporation. Membrane for electrotransport transdermal drug delivery. 5,147,296, Cl. 604-20.000

Thek, Richard E.: *See*—
Duffy, Joseph J.; Potter, Jerry F.; Roth, Elwood A.; Samant, Kalika R.; Thek, Richard E.; and Todd, Maurice C., 5,146,651, Cl. 19-65.00T

Then, Rudolf L.: *See*—
Albrecht, Harry A.; Chan, Ka-Kong; Keith, Dennis D.; Then, Rudolf L.; and Weigele, Manfred, 5,147,871, Cl. 514-202.000.

Theobald, Hans: *See*—
Wolf, Bernd; Theobald, Hans; Zombik, Winfried, Goetz, Norbert; Wild, Jochen; Harreus, Albrecht; Hofmeister, Peter; Kuenast, Christoph; and DeKramer, Jacobus J., 5,147,645, Cl. 424-405.000.

Thera Patent GmbH & Co. KG: *See*—
Jochum, Peter; Gasser, Oswald; Holupirek, Manfred; Wanek, Erich; Guggenberger, Rainer; Stefan, Klaus-Peter; and Ellrich, Klaus, 5,147,904, Cl. 523-115.000

Therakos, Inc: *See*—
Edelson, Richard L., 5,147,289, Cl. 604-4.000

Therex Corporation: *See*—
Melsky, Gerald S.; and Prosl, Frank R., 5,147,483, Cl. 156-86.000

Thiesen, Todd J., to United States of America, Energy. Refractory thermowell for continuous high temperature measurement of molten metal. 5,147,137, Cl. 374-139.000

Thillays, Jacques C., to U.S. Philips Corporation. Photocoupler housing suitable for surface mounting to a circuit board. 5,148,039, Cl. 250-551.000

Thinking Machines Corporation: *See*—
Kahle, Brewster A.; Douglas, David C.; Vasilevsky, Alexander; Christman, David P.; Yang, Shaw W., and Crouch, Kenneth W., 5,148,547, Cl. 395-800.000

Thomas, Isabelle; and Lefort, Pierre O., to Sextant Avionique. Pressure microsensor. 5,146,787, Cl. 73-704.000

Thomas, John T.; and Monsees, Claude E., to Roberts Systems, Inc Form, fill and seal process and device. 5,147,491, Cl. 156-251.000.

Thomas, Raymond W.: *See*—
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Thomas, Roland C.: *See*—
Lewis, Michael L.; Kurre, Paul G.; Day, George B.; Fannin, Daniel G., and Thomas, Roland C., 5,147,246, Cl. 474-166.000
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Thompson, Aubrey E.: *See*—
Klosterboer, Donald H.; Owens, Jerry M.; and Thompson, Aubrey E., 5,148,208, Cl. 354-324.000

Thompson, Wayne T.: *See*—
Naab, Carlton W.; and Thompson, Wayne T., 5,148,346, Cl. 361-251.000

Thompson, William W.: *See*—
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Thomson Consumer Electronics, Inc.: *See*—
Blatter, Harold; and Beyers, Billy W., Jr., 5,148,275, Cl. 358-147.000
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Thomson-CSF: *See*—
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Thomson, S.A.: *See*—
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Thorngren, John T.: *See*—
Binkley, Michael J.; Thorngren, John T.; Lewis, Richard P.; and Grigson, Walter W., 5,147,584, Cl. 261-114.300

Thornton, Kenneth O.; and Phillips, Steven J., to Advanced Medical Systems, Inc. Biological fluid pumping means and method. 5,147,281, Cl. 600-16.000

Thurman, Robert B. Clothes dryer augmentation device. 5,147,715, Cl. 428-286.000

Tiller, Ralph. Golf ball dispensing and retrieving system. 5,147,101, Cl. 294-19.200

Tilles, Harvey G.; and Marc, Michel. Shoe insole proform II. 5,146,698, Cl. 36-44.000

Timmons, Robert D. Integrated vacuum pressure system for a bladder pump. 5,147,182, Cl. 417-234.000

Timpl, Rupert: *See*—
Brocks, Dietrich; Timpl, Rupert; and Paulsson, Mats, 5,147,782, Cl. 435-7.210.

Tioxide Group Services Limited. *See*—
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Tip, Anne A.: *See*—
Hilferink, Henk; Tip, Anne A.; and Velten, Henk, 5,148,404, Cl. 367-2.000
Tisdale, Roger B. Puzzle bolt. 5,147,093, Cl. 273-156.000
Titmas and Associates Incorporated: *See*—
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Titmas, James A., to Titmas and Associates Incorporated. Method for recovering energy from a wet oxidation products stream flow using rotational energy. 5,147,564, Cl. 210-767.000
Toa Corporation: *See*—
Sakamoto, Sinji; and Furukawa, Kenichi, 5,148,491, Cl. 381-119.000
Toa Steel Co., Ltd.: *See*—
Eguchi, Toyoaki; Ohwada, Noriyoshi; Sagae, Yutaka; and Ito, Katsumi, 5,146,759, Cl. 62-64.000
Toagosei Chemical Industry Co., Ltd.: *See*—
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Tochigifujusangyo Kabushiki Kaisha: *See*—
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Tochihara, Shinichi; Nishiwaki, Osamu; and Iwata, Kazuo, to Canon Kabushiki Kaisha. Ink jet recording method. 5,148,186, Cl. 346-1.100
Toda, Akihito: *See*—
Nishimura, Eiichi; Toda, Akihito; Sugiyama, Kazuhiko; and Naitou, Yukio, 5,147,493, Cl. 156-345.000.
Todd, Maurice C. *See*—
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Toide, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Projection lens. 5,148,320, Cl. 359-649.000
Toki, Akio. *See*—
Kobayashi, Kazuo; Toki, Akio; Ito, Keiichi; and Kuroki, Hisanori, 5,148,470, Cl. 379-58.000
Toki, Tsukasa: *See*—
Tanisake, Hiroka; Yamamoto, Koji; Koyama, Takeshi; Shinohara, Shunichi; Maruo, Kazunobu; and Toki, Tsukasa, 5,147,962, Cl. 528-170.000
Tokico Ltd.: *See*—
Kato, Takashi; Morita, Yutaka; Yamaguchi, Takeshi; Tsuge, Kazuo; Imamura, Kyoji; Kawai, Yoshio; Hasegawa, Hiroaki; and Amemori, Hiroyuki, 5,146,789, Cl. 73-861.910.
Tokitomo, Kazuo: *See*—
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Tokizawa, Minoru; Kanamaru, Yoshihiko; Matsumoto, Masaru; Asaoka, Takemitsu, Matsuda, Hideaki; Kuraishi, Tadayuki; Maebashi, Kazunori; Taido, Naokata; and Kawahara, Ryuichi, to SS Pharmaceutical Co., Ltd. Triazole derivatives and a composition for treating mycoses. 5,147,886, Cl. 514-383.000
Tokuda, Kimishiro; Oguri, Masaharu; and Naito, Shuzo, to Mitsubishi Jukogyo Kabushiki Kaisha. Boiler furnace combustion system. 5,146,858, Cl. 110-261.000
Tokyo Electron Limited: *See*—
Koike, Yukio, 5,148,034, Cl. 250-492.2.00
Nishimura, Eiichi; Toda, Akihito; Sugiyama, Kazuhiko; and Naitou, Yukio, 5,147,493, Cl. 156-345.00.
Nozawa, Toshihisa; Kamikanda, Osamu; Yoshida, Yukimasa; and Okano, Haruo, 5,147,497, Cl. 156-626.000
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Tokyo Ohka Kogyo Co., Ltd.: *See*—
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Tominaga, Akira: *See*—
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Tominaga, Koichi: *See*—
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Tomioka, Ichiro: *See*—
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Tomita, Kenichi: *See*—
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Tomita, Masami; Kishikawa, Seiji, and Kakuta, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Automatic cassette tape recording and reproducing apparatus with a pivotable magazine holder. 5,148,332, Cl. 360-92.000
Tomura, Shinya: *See*—
Nakane, Rintaro; Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Miura, Kunihiko; Tomura, Shinya; and Kohyama, Mitsuaki, 5,148,218, Cl. 355-208.000
Tondreault, Robert J.; Rollings, Robert W.; and DePriest, James F., to Robinson Nugent, Inc. Electrical interconnect device with module ejection means. 5,147,211, Cl. 439-160.000
Tone, Junsuke: *See*—
Dirlam, John P.; Cullen, Walter P.; Maeda, Hiroshi; and Tone Junsuke, 5,147,858, Cl. 514-23.000
Tonen Sekiyukageku, K.K.: *See*—
Sakuma, Masato; Fujita, Yuji; Kitano, Kissho; Yagi, Yukihiko; Sakaizawa, Masao; and Yamamoto, Noburo, 5,147,931, Cl. 525-66.000
Tonutti, Carletto, to Tonutti S.p.A. Reversible attachment for three point hitch rakes to tractor. 5,146,736, Cl. 56-14.900
Tonutti S.p.A.: *See*—
Tonutti, Carletto, 5,146,736, Cl. 56-14.900
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Topfl, Rosemarie, to Ciba-Geigy Corporation. Process for improving the yield and the wet fastness properties of dyeings or prints produced with anionic dyes on cellulose fibre material using alkyl di-allyl or halo-hydroxypropyl ammonium salts. 5,147,411, Cl. 8-606.000
Toppan Printing Co., Ltd.: *See*—
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Topping, Richard W.: *See*—
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Toray Industries, Inc.: *See*—
Hayashi, Mutsumi; Takamura, Ryoji, Yamazaki, Chikayasu; Ueda, Minoru; and Kumo, Ichiro, 5,148,023, Cl. 250-372.000.
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Touro, Freddie J.; and Wiewiorowski, Tadeusz K., to Freeport-McMoRan Inc. Process for recovery of gold from gold ores using a complexing pretreatment and sulfurous acid leaching. 5,147,617, Cl. 423-27.000
Touro, Freddie J.; and Wiewiorowski, Tadeusz K., to Freeport-McMoRan Inc. Process for recovery of gold from refractory gold ores using sulfurous acid as the leaching agent. 5,147,618, Cl. 423-27.000
Tower Manufacturing Corporation: *See*—
Rao, Chepur P.; Barrena, Juan J.; Aromin, Victor V.; and Astley John J., 5,148,344, Cl. 361-42.000
Townsend Engineering Company: *See*—
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Toymax Inc.: *See*—
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Toyoda Gosei Co., Ltd.: *See*—
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Toyoguchi, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Nonaqueous electrolyte secondary battery. 5,147,738, Cl. 429-194.000
Toyooka, Takehiro: *See*—
Takiguchi, Yasuyuki; Iida, Shigeki; and Toyooka, Takehiro, 5,147,682, Cl. 427-58.000
Toyota Jidosha Kabushiki Kaisha: *See*—
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Trach, Volker: *See*—
Psiorz, Manfred; and Trach, Volker, 5,147,882, Cl. 514-325.000
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Ku, Ming-ho, 5,147,129, Cl. 362-106.000
Trakas, Panos. Modular manifold assembly. 5,147,663, Cl. 425-549.000

Treece, William D., to Sundstrand Corp. Compressor shroud air bleed arrangement. 5,147,178, Cl. 415-58.400
Treibacher Chemische Werke Aktiengesellschaft: *See*—
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Tsantrizos, Peter; Lachance, Raynald; Hehshaw, Bruce; and Mavropoulos, Lakis T., to Noranda Inc. High enthalpy plasma torch 5,147,998, Cl. 219-121.500
Tsao, Grant. Automobile electronic alarm device. 5,148,145, Cl. 340-429.000
Tsao, Ying-Yen P.: *See*—
Dessau, Ralph M.; and Tsao, Ying-Yen P., 5,147,837, Cl. 502-66.000.
Tsaur, Allen K.; and Kam-Ng, Mamie, to Eastman Kodak Company Process of preparing a reduced dispersity tabular grain emulsion 5,147,771, Cl. 430-569.000
Tsaur, Allen K.; and Kam-Ng, Mamie, to Eastman Kodak Company Process of preparing a reduced dispersity tabular grain emulsion 5,147,772, Cl. 430-569.000
Tsaur, Allen K.; and Kam-Ng, Mamie, to Eastman Kodak Company Process of preparing a reduced dispersity tabular grain emulsion 5,147,773, Cl. 430-569.000
Tsuchida, Eishun; Nishide, Hiroyuki; and Kawakami, Hiroyoshi, to Union Carbide Industrial Gases Technology Corporation. Oxygen-permeable polymeric membranes. 5,147,424, Cl. 55-158.000
Tsuchida, Kazumi: *See*—
Szwejkowski, Chester; Latchford, Ian S.; Namose, Isamu; and Tsuchida, Kazumi, 5,147,499, Cl. 156-643.000
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Van Noy, Stephen J.; Patel, Anilbhai S.; and Carncross, Thomas, to Alcon Surgical, Inc. Bifocal intraocular lens with correction for spherical abberation. 5,147,393, Cl. 623-6.000.
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Yasuda, Mitsuhiro: *See—*
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Yasue, Takao, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor wafer. 5,147,824, Cl. 437-226.000.

Yasutomi, Tsuyoshi: *See—*
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Yatsugi, Tomishige: *See—*
Yamauchi, Hiroto; and Yatsugi, Tomishige, 5,148,329, Cl 360-19.100

Yazaki Corporation: *See—*
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Yazaki, Yoshito: *See—*
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Yazu, Shuji: *See—*
Tanaka, Saburo; Itozaki, Hideo; and Yazu, Shuji, 5,147,849, Cl. 505-1.000

Yeda Research and Development Co. Ltd.: *See—*
Gozes, Illana; and Fridkin, Matityahu, 5,147,855, Cl. 514-12.000

Yellamilli, Krishna M., to Intel Corporation. Recirculating transparent latch employing a multiplexing circuit. 5,148,052, Cl. 307-279.000.

Yessik, Michael: *See—*
Johnson, Robert W.; Bettman, Ralph B.; Hicks, Acle V.; and Yessik, Michael, 5,147,349, Cl 606-4.000

Yida, Masaharu: *See—*
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Yli-Vakkuri, Erkki: *See—*
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Yokogawa Medical Systems, Limited: *See—*
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Yokohara, Hiroyuki: *See—*
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Takahashi, Minoru; and Yokota, Mitsuo, 5,148,200, Cl. 354-195.100.

Yokoyama, Yukio; and Ono, Takao, to NEC Corporation. Mobile radio communication apparatus. 5,148,181, Cl. 343-702.000.

Yonezawa, Keitaro; and Shirakawa, Tsutomu, to Kabushiki Kaisha Kosmek. Clamping apparatus. 5,147,091, Cl. 269-137.000

York International Corporation: *See—*
Bauman, Bruce K.; and Boal, Charles F., 5,146,764, Cl. 62-228.500

York, Robert O., to Du Pont de Nemours, E. I., and Company. Foam blowing agent composition and process for producing foams. 5,147,896, Cl. 521-79.000

Yoshida, Akio: *See—*
Hoshinoughi, Susumu; Yoshida, Akio; and Kawazu, Akinobu, 5,147,760, Cl. 430-296.000

Yoshida, Hiroshi: *See—*
Nishimore, Masayoshi, Yoshida, Hiroshi; Tani, Masanori; Tanaka, Tadao; Fujii, Hiroshi; and Masuda, Hiroyuki, 5,147,008, Cl. 180-140.000

Yoshida, Kazuaki: *See—*
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Yoshida, Kobun, to Teac Corporation. Magnetic disk storage 5,148,339, Cl. 360-105.000

Yoshida Kogyo K.K.: *See—*
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Yoshida, Naruhito: *See—*
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Yoshida, Tadao: *See—*
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Yoshida, Takeomi: *See—*
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Yoshida, Tatsuya: *See—*
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Yoshida, Tetsuo: *See—*
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Yoshida, Yoshiaki, to Tenryu Chemical Industry Co., Ltd. Method of producing a lid device for wide-mouthed container. 5,147,591, Cl. 264-163.000

Yoshida, Yukata, to Fuji Photo Film Co., Ltd. Display device within finder for camera. 5,148,202, Cl. 354-222.000.

Yoshida, Yukimasa: *See—*
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Yoshino, Daisuke: *See—*
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Yoshino, Fumitaka: *See—*
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Yoshinuma, Mikio: *See—*
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Youmans, Robert J.: *See—*
Kim, Anderson H.; Weiner, Maurice; Jasper, Louis J., Jr.; and Youmans, Robert J., 5,148,251, Cl. 357-30.000

Young, Gerald A.; LaVon, Gary D.; and Taylor, Gregory W., to Procter & Gamble Company, The. High efficiency absorbent articles for incontinence management. 5,147,345, Cl. 604-378.000.

Yu, Chang; Doan, Trung T.; and Sandhu, Gurtej S., to Micron Technology, Inc. Semiconductor metallization method. 5,147,819, Cl. 437-173.000.

Yu, Nobbert: *See—*
Tan, Haw-Chan; Yu, Nobbert; and Lin, Yuan-Chieh, 5,147,224, Cl. 439-620.000

Yuge, Yoji: *See—*
Honda, Hisashi; and Yuge, Yoji, 5,147,127, Cl. 362-23.000.

Yun-Sheng, Chung. Card-operated lock. 5,146,770, Cl. 70-38.00C.

Yung-Chaun, Chen. Structure of multiplex connector. 5,148,044, Cl 307-140.000

Yung, Marcel M.: *See—*
Bird, Raymond F.; Gopal, Inder S.; Janson, Philippe A.; Kutten, Shay; Molva, Refik A.; and Yung, Marcel M., 5,148,479, Cl 380-23.000

Yung, Shui-Chow, to Calvert Environmental, Inc. Wet scrubber particle discharge system and method of using the same. 5,147,421, Cl 55-85.000

Yurecko, John M., Jr.: *See—*
Eilerman, Robert G.; Christenson, Philip A.; Yurecko, John M., Jr.; Mild, Frank; and Kucharski, Peter E., 5,147,463, Cl. 131-277.000.

Yurko, Garold M., to AMP Incorporated. Terminal retention device 5,147,227, Cl. 439-733.000

Yurtin, John A.: *See—*
Neale, Frank T., III; Von Schwerdtner, Detlev H.; and Yurtin John A., 5,147,217, Cl. 439-403.000

Yuuchi, Takahiro; Tsuchida, Yasuyuki; and Fujiwara, Masakatsu, to Sanyo Electric Co., Ltd. Wireless low-frequency medical treatment device with pulse interruption based upon electrode contact with the body. 5,146,920, Cl. 128-423.00R

Zabler, Erich: *See—*
Jansche, Walter; Zabler, Erich; and Dukart, Anton, 5,146,783, Cl 73-301.000

Zagar, Frank L.: *See—*
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Zagar, Paul S., to Micron Technology, Inc. Nonvolatile, zero-power memory cell constructed with capacitor-like antifuses operable at less than power supply voltage. 5,148,391, Cl. 365-96.000

Zahnradfabrik Friedrichshafen AG: *See—*
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Zakoji, Nobuyuki: *See—*
Morikawa, Sumio; and Zakoji, Nobuyuki, 5,146,683, Cl. 30-134.000

Zalewski, Wojciech, to Enhancements Unlimited, Inc. Automotive vehicle seat for disabled persons. 5,147,104, Cl. 296-65.100.

Zanotelli, Giovanni F., to Lever Brothers Company, Division of Conopco, Inc. Device for closing containers and pouring liquids from them. 5,147,076, Cl. 222-484.000

Zarowin, Charles: *See—*
Gratrix, Edward; and Zarowin, Charles, 5,148,319, Cl. 359-642.000

Zausner, Fredrick, to Wolder, Gross & Bondell. Telephone anti-theft device. 5,148,476, Cl. 379-437.000

Zdepski, Joel W.: *See—*
Acampora, Alfonse A.; Zdepski, Joel W.; and Siracusa, Robert J 5,148,272, Cl. 358-133.000.

Zebehazy, Thomas C.: *See—*
Harkrader, Ronald L.; and Zebehazy, Thomas C., 5,146,805, Cl 74-473.0SW

Zeiringer, Hans, to Treibacher Chemische Werke Aktiengesellschaft Method for producing a fine grained powder consisting of nitrides and carbonitrides of titanium. 5,147,831, Cl. 501-96.000.

Zennamo, Joseph A., Jr.; and Clark, Gary J., to Eagle Comtronics, Inc Quality factor improvement for filter applications. 5,148,133, Cl 333-175.000.

Zenner, Burch E.: *See—*
Hartley, Jeffrey W. and Zenner, Burch E., 5,147,136, Cl 374-57.000

Zermani, Thomas: *See—*
Rising, Donald B.; Desilets, Kenneth G.; and Zermani, Thomas, 5,146,794, Cl. 73-864.410.

Zexel Corporation: *See—*
Kushida, Takeo; and Higuchi, Toshiro, 5,148,068, Cl. 310-46.000

Ziegler, Gregory R., to Pennsylvania Research Corporation, The Process for producing microparticulated protein and the product thereof. 5,147,677, Cl. 426-614.000

Ziemba, Richard T., to United States of America, Army. Multi-option fuze system. 5,147,973, Cl. 102-214.000.

Zimmer, Inc.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,147,359, Cl. 606-61.000.
Houston, Michelle L.; and Greig, Kevin M., 5,147,406, Cl 623-20.000

Zimmermann, Manfred: *See—*
Klinksiek, Bernd; Kalz, Dietmar; Gerdes, Carsten; Kummeler, Ferdinand; Heinrich, Gunter; Reizlein, Karl; and Zimmermann, Manfred, 5,147,412, Cl. 23-293.00R

Zinger, William H.: *See—*
Krill, Jerry A.; Jesurun, Melrose M.; and Zinger, William H., 5,148,134, Cl. 333-242.000.

Zirkle, Thomas: *See—*
Gilbert, James G.; Lee, Fourmun; and Zirkle, Thomas, 5,147,812 Cl. 437-41.000

Zittel, David R. Open-throat blancher. 5,146,841, Cl. 99-348.000.

Zohler, Steven R., to Carrier Corporation. Enhanced heat transfer surface and apparatus and method of manufacture. 5,146,979, Cl 165-133.000

Zolk, Ralf: *See—*
Kerth, Juergen; Schwager, Harald; and Zolk, Ralf, 5,147,928, Cl 525-53.000

Zombik, Winfried: *See—*
Wolf, Bernd; Theobald, Hans; Zombik, Winfried; Goetz, Norbert, Wild, Jochen; Harreus, Albrecht; Hofmeister, Peter; Kuenast, Christoph; and DeKramer, Jacobus J., 5,147,645, Cl 424-405.000.

Zsila, Gizella: *See—*
Nagy, Peter L.; Balaazs, Bela; Boross, Maria; Szilbereky, Jeno Zsila, Gizella; Abraham, Lajos; Blasko, Gyorgy; Gachalyi, Bela Almasi, Attila; and Nemet, Gabor, 5,147,879, Cl. 514-318.000.

Zuckerwar, Allan J.; and Ngo, Kim Chi T., to United States of America, National Aeronautics and Space Administration. Vacuum-isolation vessel and method for measurement of thermal noise in microphones. 5,146,780, Cl. 374-175.000

Zuraski, Jeffery A.: *See—*
Weisgerber, Thomas W.; Zuraski, Jeffery A.; Babineau, James W and McDonald, Brian P., 5,147,004, Cl. 180-53.600.

Zwickey, Wayne C. Trauma victim head immobilization device and method. 5,146,641, Cl. 5-628.000

3D International A/S. *See—*
Larsen, Thor, 5,147,193, Cl. 418-68.000

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Automotive Products (USA) Inc.: *See*—
Tury, Edward L.; Salzmann, David F.; Leigh-Monstevens, Keith V.; Vander Poorte, John G.; and Peterson, David C., Re. 34,064, Cl. 74-335.000

Biosyntech GmbH: *See*—
Koster, Hubert; and Sinha, Nanda D., Re. 34,069, Cl. 536-27.000

Ektelon: *See*—
Mortvedt, Raymond L.; and Thompson, Steven M., Re. 34,067, Cl 273-73.00C
Mortvedt, Raymond L.; and Thompson, Steven M., Re. 34,068, Cl 273-73.00C

Kakinuma, Kazuo: *See*—
Yamamoto, Shosaku, and Kakinuma, Kazuo, Re. 34,066, Cl. 252-511.000

Kam Scientific Inc.: *See*—
Wainberg, Mark A.; and Wong, Chiu-Ming, Re. 34,065, Cl 252-104.000

Koster, Hubert; and Sinha, Nanda D., to Biosyntech GmbH. Process for the preparation of oligonucleotides. Re. 34,069, Cl. 536-27.000

Leigh-Monstevens, Keith V.: *See*—
Tury, Edward L.; Salzmann, David F.; Leigh-Monstevens, Keith V.; Vander Poorte, John G.; and Peterson, David C., Re. 34,064, Cl. 74-335.000

Lever Brothers Company: *See*—
Wells, Martin A., Re. 34,062, Cl 8-137.000.

Mortvedt, Raymond L.; and Thompson, Steven M., to Ektelon. Racquetball racquet with increased hitting area improved racquetball racquet construction. Re. 34,067, Cl. 273-73.00C.

Mortvedt, Raymond L.; and Thompson, Steven M., to Ektelon. Racquetball raquet with increased hitting area. Re. 34,068, Cl. 273-73.00C

Nippon Oil & Fats Co., Ltd.: *See*—
Yamamoto, Shosaku; and Kakinuma, Kazuo, Re. 34,066, Cl 252-511.000

Peterson, David C.: *See*—
Tury, Edward L.; Salzmann, David F.; Leigh-Monstevens, Keith V.; Vander Poorte, John G.; and Peterson, David C., Re. 34,064, Cl. 74-335.000

Salzmann, David F.: *See*—
Tury, Edward L.; Salzmann, David F.; Leigh-Monstevens, Keith V.; Vander Poorte, John G.; and Peterson, David C., Re. 34,064, Cl. 74-335.000

Shaunfield, John E.: *See*—
Vincent, Darrell L.; Vincent, Larry W.; and Shaunfield, John E., Re. 34,063, Cl. 73-862.230.

Sinha, Nanda D.: *See*—
Koster, Hubert; and Sinha, Nanda D., Re. 34,069, Cl. 536-27.000

Thompson, Steven M.: *See*—
Mortvedt, Raymond L.; and Thompson, Steven M., Re. 34,067, Cl. 273-73.00C
Mortvedt, Raymond L.; and Thompson, Steven M., Re. 34,068, Cl. 273-73.00C

Tury, Edward L.; Salzmann, David F.; Leigh-Monstevens, Keith V.; Vander Poorte, John G.; and Peterson, David C., to Automotive Products (USA) Inc. Electric shift apparatus. Re. 34,064, Cl 74-335.000

Vander Poorte, John G.: *See*—
Tury, Edward L.; Salzmann, David F.; Leigh-Monstevens, Keith V.; Vander Poorte, John G.; and Peterson, David C., Re. 34,064, Cl. 74-335.000

Vincent, Darrell L.; Vincent, Larry W.; and Shaunfield, John E. Monitoring torque in tubular goods. Re. 34,063, Cl. 73-862.230

Vincent, Larry W.: *See*—
Vincent, Darrell L.; Vincent, Larry W.; and Shaunfield, John E., Re. 34,063, Cl. 73-862.230.

Wainberg, Mark A.; and Wong, Chiu-Ming, to Kam Scientific Inc. Hypochlorite: tertiary alcohol disinfectants with reduced offensive odor. Re. 34,065, Cl. 252-104.000

Wells, Martin A., to Lever Brothers Company. Fabric softening composition contains water-insoluble surfactant and aliphatic mono-carboxylic acid. Re. 34,062, Cl. 8-137.000

Wong, Chiu-Ming: *See*—
Wainberg, Mark A.; and Wong, Chiu-Ming, Re. 34,065, Cl. 252-104.000

Yamamoto, Shosaku; and Kakinuma, Kazuo, to Nippon Oil & Fats Co., Ltd. Primer compositions. Re. 34,066, Cl. 252-511.000

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Allen, Timothy P.: *See*—
Mead, Carver A.; Allen, Timothy P.; and Faggin, Federico, B1 4,962,342, Cl. 307-201.000

Armstrong Manufacturing Company: *See*—
Pfaltzgraff, James R., B1 5,040,436, Cl. 76-112.000

Beach, Wayne H.: *See*—
Stiffler, Stephen P.; Beach, Wayne H.; Rowlett, Don C.; and Shirk, Steven D., B1 4,917,196, Cl. 75-385.000.

Boettner, George B., to Corning Glass Works. Furnace for fining molten glass. B1 4,906,272, 9-15-92, Cl. 65-346.000

Brooktree Corporation: *See*—
Colles, Joseph H., B1 4,831,282 Cl. 307-443.000

Colles, Joseph H., to Brooktree Corporation. CMOS input circuit. B1 4,831,282, 9-15-92, Cl. 307-443.000

Corning Glass Works: *See*—
Boettner, George B., B1 4,906,272, Cl. 65-346.000

Faggin, Federico: *See*—
Mead, Carver A.; Allen, Timothy P.; and Faggin, Federico, B1 4,962,342, Cl. 307-201.000

Kennametal Inc.: *See*—
Stiffler, Stephen P., Beach, Wayne H.; Rowlett, Don C.; and Shirk, Steven D., B1 4,917,196, Cl 75-385.000

Mead, Carver A.; Allen, Timothy P.; and Faggin, Federico, to Synaptics Inc. Dynamic synase for neural network. B1 4,962,342, 9-15-92, Cl. 307-201.000.

Minnesota Mining and Manufacturing Comp.: *See*—
Mott, Charles L., B1 4,756,414 Cl. 206-328.000

Miura, Osamu, to Tok Bearing Company Ltd. One way clutch. B1 4,660,698, 9-15-92, Cl. 192-45.000

Mott, Charles L., to Minnesota Mining and Manufacturing Comp. Antistatic sheet material and package. B1 4,756,414, 9-15-92, Cl. 206-328.000.

National Semiconductor Corporation: *See*—
Wright, Michael E., B1 5,051,621, Cl. 307-455.000.

New York Institute of Technology: *See*—
Stern, Garland, B1 4,600,919, Cl. 340-725.000

Noorily, Peter; and Slachetka, Joseph P., to Thomas & Betts Corporation. Shielded electrical connector. B1 4,619,494, 9-15-92, Cl. 439-449.000

Nordstrom, Duane M. Paperboard container for liquids including means to prevent fitment rotation. B1 1,033,128, 9-15-92, Cl. 220-465.000

Pfaltzgraff, James R., to Armstrong Manufacturing Company. Method and apparatus for tipping saw blades. B1 5,040,436, 9-15-92, Cl. 76-112.000.

Rice, Ivan G. Compression intercooled gas turbine combined cycle. B1 4,896,499, 9-15-92, Cl. 60-39.161.

Rowlett, Don C.: *See*—
Stiffler, Stephen P.; Beach, Wayne H.; Rowlett, Don C.; and Shirk, Steven D., B1 4,917,196, Cl. 175-385.000.

Shirk, Steven D.: *See*—
Stiffler, Stephen P.; Beach, Wayne H.; Rowlett, Don C.; and Shirk, Steven D., B1 4,917,196, Cl. 175-385.000

Slachetka, Joseph P.: *See*—
Noorily, Peter; and Slachetka, Joseph P., B1 4,619,494, Cl. 439-449.000

Stern, Garland, to New York Institute of Technology. Three dimensional animation. B1 4,600,919, 9-15-92, Cl. 340-725.000

Stiffler, Stephen P.; Beach, Wayne H., Rowlett, Don C.; and Shirk Steven D., to Kennametal Inc. Excavating tooth for an earth auger B1 4,917,196, 9-15-92, Cl. 175-385.000.

Synaptics Inc.: *See*—
Mead, Carver A.; Allen, Timothy P.; and Faggin, Federico, B1 4,962,342, Cl. 307-201.000.

Teare, John W. Cementitious construction panel. B1 5,030,502, 9-15-92, Cl. 428.193.000

Thomas & Betts Corporation: *See*—
Noorily, Peter; and Slachetka, Joseph P., B1 4,619,494, Cl 439-449.000.

Tok Bearing Company Ltd.: *See*—
Miura, Osamu, B1 4,660,698, Cl. 192-45.000.

Wright, Michael E., to National Semiconductor Corporation. Area-efficient low-power bipolar current-mode logic. B1 5,051,621, 9-15-92, Cl. 307-455.000

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Hazlett, Raymond W.; Araujo, Antonino; and Pezzoli, Paul A 329,380, Cl. D9-455.000

Abrams, Robert C.: *See*—
Weder, Donald E.; Weder, Erwin H., deceased; Weder, Wanda M legal co-representative; Craig, Franklin J.; Donnelly, Wilma M Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C 329,407, Cl. D11-164.000
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand John W.; and Abrams, Robert C., 329,408, Cl D11-164.000.

Ackeret, Peter, to Licinvest AG. Combined frame and container for pictures. 329,333, 9-15-92, Cl. D6-300.000

Alcraft, Inc.: *See*—
Chen, Michael; and Chen, Chiou-Shing, 329,451, Cl. D18-7.000

Alfonso, Pedro M.; Fernandez, Pedro E.; Irwin, John C.; Martin, Randall W.; Montedonico, Robert W.; Musgrave, Kenneth C.; and Small, Mark S., to International Business Machines Corporation Automotive test terminal. 329,390, 9-15-92, Cl. D10-75.000

Allied International: *See*—
Landy, Richard J., 329,367, Cl. D8-83.000

Allsop, Inc.: *See*—
Allsop, James D.; Barkley, Paul; and Calapp, David E., 329,409, Cl D12-111.000.

Allsop, James D.; Barkley, Paul; and Calapp, David E., to Allsop, Inc Bicycle frame. 329,409, 9-15-92, Cl D12-111.000

Altrack Limited: *See*—
Chandler, Graeme A., 329,413, Cl. D12-151.000

Alves Machado Guedes, Luis M., to Aveleda - Sociedade Agricola e Commercial Da Quinta Da Aveleda, S.A. Bottle. 329,385, 9-15-92 Cl D9-550.000.

Antonious, Anthony J. Putter type golf club head. 329,480, 9-15-92. Cl D21-217.000.

Antonious, Anthony J. Iron golf club head. 329,482, 9-15-92. Cl. D21-220.000

Araujo, Antonino: *See*—
Hazlett, Raymond W., Araujo, Antonino; and Pezzoli, Paul A 329,380, Cl. D9-455.000

Arioka, Tetsuya; Yokoyama, Hiroshi; and Kizaki, Hidesato, to Terumo Kabushiki Kaisha. Heat sterilizer for medical tube joint. 329,500, 9-15-92, Cl. D24-217.000.

Arney, Michel D.: *See*—
Bromberg, Edward E. A.; Larson, Dale N.; Sutton, David A.; and Arney, Michel D., 329,391, Cl. D10-81.000

Asano, Osamu; Shouji, Michihiro; Kowada, Masunari; and Mikiya Toshio, to Nitto Kohki Co., Ltd. Portable drill. 329,438, 9-15-92. Cl D15-132.000

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Isaac, Mimi. Refuse container cover. 329,515, 9-15-92, Cl. D34-4.000

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Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 329,405, 9-15-92, Cl. D11-149.000
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Weder, Donald E.; Weder, Erwin H., deceased; Weder, Wanda M., legal co-representative; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 329,407, Cl. D11-164.000.
Weder, Erwin H.: *See*—
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Weder, Erwin H., deceased: *See*—
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Weder, Wanda M.: *See*—
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Yamada, Hiromichi, to Sharp Kabushiki Kaisha. Microwave oven. 329,353, 9-15-92, Cl. D7-351.000
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Yoshida, Toshiya; Hara, Masaki; Goto, Masato; and Takagi, Katsunori, to Mitsubishi Denki Kabushiki Kaisha. Facsimile. 329,428, 9-15-92, Cl. D14-118.000
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Bradford, Norman G.: *See*—
Bradford, Lowell G.; and Bradford, Norman G., 7,975, Cl. 38.100.
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Eubanks, Mary W. Corn plant named Tripsacorn. 7,977, 9-15-92, Cl. 100.000
Gardner, Leith M.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 7,976, Cl. 41.100.
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Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 7,976, Cl. 41.100.
Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M., and Zaiger, Grant G., 7,976, Cl. 41.100.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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167 1	5,146,645
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259	5,146,650

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25 03	5,146,662
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116 2	5,146,664
123	5,146,675
229	5,146,676
243 5	5,146,677
243 51	5,146,665
429	5,146,666
433	5,146,667
525	5,146,668
557	5,146 669
561	5,146,670
603	5,146,671
798	5,146,672
828	5,146,673
830	5,146,674
857	5,146,678
889 7	5,146,679

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80	5,146 719
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454	5,146 730
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472	5,146 732

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264	5,146,739
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403	5,146,745
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452	5,146,747
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	5,146,754
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30 1	5,147,435
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862 336	5,146,790
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864 41	5,146,794
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866 5	5,146,796

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89 14	5,146,799
100 1	5,146,800
335	Re 34,064
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424 8 R	5,146,802
437	5,146,803
440	5,146,804
473 SW	5,146,805
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531	5,146,808
551 9	5,146,809
558	5,146,810
574	5,146,811
858	5,146,812

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230	5,147,446
246	5,147,447
331	5,147,448
354	5,147,449
601	5,147,450
620	5,147,451
767	5,147,452

CLASS 76

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CLASS 81

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125	5,146,814
437	5,146,815
487	5,146,816

CLASS 82

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58	5,146,818
127	5,146,819

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37	5,146,820
40	5,146,821
56	5,146,823
90	5,146,824
397	5,146,825
468 2	5,146,826
482	5,146,827
570	5,146,828
620	5,146,829
649	5,146,830
698	5,146,831
	5,146,832

CLASS 84

462	5,146,833
600	5,147,969
603	5,147,970
607	5,146,834

CLASS 87

1	5,146,835
22	5,146,836

CLASS 88

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CLASS 89

26	5,147,971
33 16	5,147,972

CLASS 91

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CLASS 92

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328	5,146,840
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421 V	5,146,842
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483	5,146,843
620	5,146,846

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264	5,147,975
275 3	5,147,976
427	5,147,977
434	5,147,978

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679	5,147,462
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724	5,146,869

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54	5,146,872
73	5,146,873
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109	5,146,876
172	5,146,877

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179 5	5,146,882
193 6	5,146,883
197 4	5,146,884
308	5,146,885
321	5,146,890
325	5,146,886
	5,146,891
337	5,146,887
339	5,146,888
376	5,146,889
399	5,146,892
425	5,146,893
447	5,146,894
449	5,146,895
470	5,146,896
	5,146,897
492	5,146,898
494	5,146,899
501	5,146,900
516	5,146,901
518	5,146,902
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634	5,146,906
644	5,146,907

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745	5,146,927
754	5,146,921
756	5,146,928
774	5,146,922
781	5,146,929
830	5,146,930
833	5,146,931
873	5,146,932
899	5,146,933

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359	5,146,934

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208	5,146,936
	5,146,937

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	5,147,465
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18	5,147,467
32	5,146,938
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34.2	5,146,940

CLASS 136

244	5,147,468

CLASS 137

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67	5,146,942
87	5,146,943
99	5,146,944
315	5,146,945
340	5,146,946
433	5,146,947
493 8	5,146,948
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594	5,146,951
627 5	5,146,952

CLASS 138

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CLASS 139

1 R	5,146,954
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1 1	5,146,958

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320	5,147,474
327	5,147,475
431	5,147,728
677	5,147,470
684	5,147,469

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CLASS 150

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159	5,146,967
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216	5,147,479

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89	5,147,484
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154	5,147,486
164	5,147,487
235	5,147,489
238	5,147,490
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281	5,147,492
345	5,147,493
417	5,147,494
540	5,147,495
583 8	5,147,496
626	5,147,497
627	5,147,498
643	5,147,499
	5,147,500
656	5,147,501

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1 1	5,146,969

CLASS 160

173	5,146,970
184	5,146,971
330	5,146,972

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7	5,147,503
55	5,147,504
129	5,147,505
135	5,147,506
158	5,147,507
279	5,147,508
343	5,147,509

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63	5,146,973
309	5,146,974
436	5,146,975
470	5,146,976

CLASS 165

15	5,146,977
111	5,146,978
133	5,146,979
167	5,146,980
185	5,146,981

CLASS 166

65 1	5,146,982
	5,146,983
	5,146,984
270	5,146,985
294	5,146,986
302	5,146,987
312	5,146,988
339	5,146,989
340	5,146,990
369	5,146,991
383	5,146,992
387	5,146,993
	5,146,994

CLASS 169

48	5,146,995
49	5,146,996

CLASS 172

42	5,146,997

CLASS 174

37	5,147,980
48	5,147,979
52 1	5,147,981
52 2	5,147,982
104	5,147,983
117 F	5,147,510
182	5,147,984
260	5,147,985

CLASS 175

21	5,146,998
254	5,146,999
334	5,147,000
385	B1 4,917,196
428	5,147,001

CLASS 180

6.5	5,147,002
14.2	5,147,003
53.6	5,147,004
69 5	5,147,005
79 4	5,147,006
132	5,147,007
140	5,147,008
143	5,147,009
197	5,147,010
234	5,147,011

CLASS 181

145	5,147,986
211	5,147,012
264	5,147,987
231	5,147,013

CLASS 184

6.22	5,147,015
6.3	5,147,014
7.4	5,147,016

CLASS 188

287	5,147,017

CLASS 190

18 A	5,147,019

CLASS 192

45	B1 4,660,698

CLASS 193

35 A	5,147,020

CLASS 194

217	5,147,021

CLASS 196

110	5,147,511

CLASS 198

347 2	5,147,022
409	5,147,026
419 3	5,147,027
454	5,147,023
495	5,147,028
619	5,147,029
642	5,147,030
750	5,147,031
781	5,147,024
782	5,147,025
789	5,147,032
803 6	5,147,033

CLASS 200

11 R	5,147,989
16 R	5,147,990
43 14	5,147,991
51 09	5,147,988
51 1	5,147,992

CLASS 203

51	5,147,512

CLASS 204

129 65	5,147,513
157 68	5,147,514
164	5,147,515
177	5,147,516
180.1	5,147,517
192.14	5,147,518
192.29	5,147,519
192 33	5,147,520
298.12	5,147,521
299 R	5,147,522
424	5,147,523
433	5,147,524

CLASS 206

1.5	5,147,034
45 23	5,147,035
232	5,147,036
256	5,147,037
328	B1 4,756,414
373	5,147,038
386	5,147,039
410	5,147,040
449	5,147,041
456	5,147,042
457	5,147,043
501	5,147,044

CLASS 208

46	5,147,525
111	5,147,526
120	5,147,527

CLASS 209

9	5,147,045
166	5,147,528
172 5	5,147,046
538	5,147,047
698	5,147,048

CLASS 210

90	5,147,530
91	5,147,531
97	5,147,532
98	5,147,533
104	5,147,534
138	5,147,535
198.2	5,147,536
	5,147,537
	5,147,538
198.3	5,147,539
232	5,147,540
321 74	5,147,541
321 75	5,147,542
413	5,147,543
438	5,147,544
445	5,147,545
506	5,147,546
605	5,147,547
639	5,147,548
640	5,147,549
	5,147,550
650	5,147,551
654	5,147,552
695	5,147,553
	5,147,529
	5,147,554
	5,147,555
	5,147,556
	5,147,557
698	5,147,558
712	5,147,559
	5,147,560
744	5,147,561
745	5,147,562
747	5,147,563
748	5,147,564
758	
767	

CLASS 211

70 5	5,147,049
118	5,147,050

CLASS 212

214	5,147,051

CLASS 215

215	5,147,052
216	5,147,053
253	5,147,054

CLASS 219

10 55 B	5,147,993
10 55 R	5,147,994
69 13	5,147,995
76 14	5,147,996
121 5	5,147,997
	5,147,998
121 63	5,147,999
125 11	5,148,000
137 PS	5,148,001
211	5,148,002
388	5,148,003
390	5,148,004
505	5,148,005

CLASS 220

254	5,147,055
263	5,147,056
268	5,147,057
276	5,147,058
281	5,147,059
288	5,147,060
334	5,147,061
410	5,147,062
454	5,147,063
465	B1 Re 33,128
651	5,147,064
709	5,147,065
717	5,147,066
739	5,147,067

CLASS 221

9	5,147,068
79	5,147,069

CLASS 222

83	5,147,070
92	5,147,071
212	5,147,072
321	5,147,073
383	5,147,074
402 15	5,147,075
484	5,147,076

CLASS 224

32 R	5,147,077
42 46 A	5,147,078
148	5,147,079

CLASS 227

82	5,147,080

CLASS 228

1.1	5,147,082
42	5,147,083
51	5,147,081
56 3	5,147,084
115	5,147,085
243	5,147,086

CLASS 235

70 R	5,148,006
382	5,148,007
455	5,148,008
462	5,148,009

CLASS 239

333	5,147,087

CLASS 244

3 11	5,147,088

CLASS 248

96	5,147,089
118 1	5,147,090

CLASS 250

201 5	5,148,010
201 6	5,148,011
203 H	5,148,012
208 1	5,148,013
214 AL	5,148,014
221	5,148,015
	5,148,016
227 14	5,148,017
231.1	5,148,018
231 14	5,148,019
231 16	5,148,020
288	5,148,021
305	5,148,025
306	5,148,026
309	5,148,027
327.2	5,148,028
341	5,148,022
361 R	5,148,029
370 09	5,148,030
372	5,148,023
458 1	5,148,031
492 1	5,148,032
492 2	5,148,024
	5,148,033
	5,148,034
515 1	5,148,040
548	5,148,035
	5,148,036
	5,148,037
	5,148,038
551	5,148,039
571	5,148,041

CLASS 252

8 551	5,147,565
	5,147,566
42.7	5,147,567
47	5,147,568
47.5	5,147,569
51 5 A	5,147,570
51 5 R	5,147,571
61	5,147,572
62 52	5,147,573
104	Re 34,065
108	5,147,574
171	5,147,575
174	5,147,576
299 62	5,147,577
358	5,147,578
385	5,147,579
506	5,147,580
511	Re 34,066

CLASS 261

24	5,147,581
30	5,147,582
112.2	5,147,583
114.3	5,147,584

CLASS 264

1.4	5,147,585
13	5,147,586
22	5,147,587
29 7	5,147,588
45.1	5,147,589
81	5,147,590
163	5,147,591
167	5,147,592
500	5,147,593
514	5,147,594
555	5,147,595

CLASS 269

137	5,147,091

CLASS 271

184	5,147,092

CLASS 273

73 C	Re 34,067
	Re 34,068
156	5,147,093

CLASS 277

144	5,147,094

CLASS 280

491 4	5,147,095
507	5,147,096
691	5,147,097
813	5,147,098

CLASS 292

175	5,147,099
246	5,147,331
284	5,147,351

CLASS 294

19 2	5,147,100
	5,147,101
152	5,147,102

CLASS 296

37.6	5,147,103
65 1	5,147,104
146 F	5,147,105
202	5,147,106
214	5,147,107

CLASS 297

85	5,147,108
217	5,147,109
397	5,147,110

CLASS 299

16	5,147,111

CLASS 301

17 SC	5,147,112

CLASS 303

9 73	5,147,113
15	5,147,114
105	5,147,115
115 EC	5,147,116
	5,147,117
	5,147,118

CLASS 307

65	5,148,042
66	5,148,043
140	5,148,044
201	5,148,045
	B1 4,962,342
245	5,148,046
246	5,148,047
263	5,148,048
270	5,148,049
271	5,148,050
272.3	5,148,051
279	5,148,052
328	5,148,053
352	5,148,054
353	5,148,055
443	5,148,056
	5,148,057
	B1 4,831,282
453	5,148,058
455	B1 5,051,621
475	5,148,059
	5,148,060
	5,148,061
511	5,148,062
530	5,148,063
571	5,148,064
572	5,148,065

CLASS 310

17	5,148,066
24	5,148,067
46	5,148,068
68 R	5,148,069
168	5,148,070
208	5,148,071
239	5,148,072
	5,148,073
311	5,148,074
323	5,148,075
	5,148,076
328	5,148,077

CLASS 312

49	5,147,119
111	5,147,120
296	5,147,121
321 5	5,147,122
348 1	5,147,123
348 4	5,147,124

CLASS 313

307	5,148,078
309	5,148,079
345	5,148,080
414	5,148,081
466	5,148,082

CLASS 315

3	5,148,083
76	5,148,084
248	5,148,085
276	5,148,086
291	5,148,087
411	5,148,088

CLASS 318

66	5,148,089
107	5,148,090
568 11	5,148,091
696	5,148,092
723	5,148,093

CLASS 320

2	5,148,094
22	5,148,095
32	5,148,096

CLASS 323

237	5,148,097
	5,148,098
314	5,148,099

CLASS 324

137	5,148,101
158 F	5,148,100
	5,148,102
158 P	5,148,103
173	5,148,104
207 14	5,148,105
207 21	5,148,106
207 26	5,148,107
226	5,148,108
309	5,148,109
323	5,148,110

CLASS 328

65	5,148,111
110	5,148,112
155	5,148,113

CLASS 329

341	5,148,114

CLASS 330

2	5,148,115
3	5,148,116
151	5,148,117
252	5,148,118
259	5,148,119
264	5,148,120
295	5,148,121

CLASS 331

3	5,148,122
4	5,148,123
78	5,148,124
135	5,148,125
	5,148,126

CLASS 332

103	5,148,128
104	5,148,127

CLASS 333

20	5,148,129
25	5,148,130
26	5,148,131
115	5,148,132
175	5,148,133
242	5,148,134
246	5,148,135

CLASS 335

78	5,148,136
301	5,148,137
302	5,148,138

CLASS 337

6	5,148,139
158	5,148,140
297	5,148,141
329	5,148,142

CLASS 338

195	5,148,143

CLASS 340

310 A	5,148,144
429	5,148,145
461	5,148,146
464	5,148,147
539	5,148,148
562	5,148,149
571	5,148,150
572	5,148,151
706	5,148,152
711	5,148,153

712 5,148,154
5,148,155
725 B1 4,600,919
783 5,148,156
5,148,157
825.17 5,148,158
825.22 5,148,159
825.44 5,148,160

CLASS 341

93 5,148,161
122 5,148,162
131 5,148,163
136 5,148,164
5,148,165
143 5,148,166
5,148,167
152 5,148,168
156 5,148,169
157 5,148,170
168 5,148,171

CLASS 342

5,148,172
3 5,148,173
21 5,148,174
95 5,148,175
104 5,148,176
124 5,148,177
127 5,148,178
357 5,148,179
437 5,148,180

CLASS 343

702 5,148,181
754 5,148,182
853 5,148,183

CLASS 346

1.1 5,148,184
5,148,185
5,148,186
5,148,193
76 PH 5,148,187
5,148,188
5,148,189
108 5,148,190
140 R 5,148,191
5,148,192
5,148,194
5,148,203
153.1 5,148,204

CLASS 351

159 5,148,205

CLASS 354

64 5,148,195
75 5,148,196
106 5,148,197
195.1 5,148,199
5,148,200
5,148,201
222 5,148,202
298 5,148,206
319 5,148,198
322 5,148,207
324 5,148,208
400 5,148,209
403 5,148,210
5,148,211
416 5,148,212

CLASS 355

38 5,148,213
43 5,148,214
72 5,148,215
5,148,216
203 5,148,217
208 5,148,218
219 5,148,219
245 5,148,220
246 5,148,221
256 5,148,222
260 5,148,223
271 5,148,224
272 5,148,225
290 5,148,226
296 5,148,227
308 5,148,228

CLASS 356

28 5,148,229
73 5,148,230
126 5,148,231
152 5,148,232
241 5,148,233
312 5,148,234
346 5,148,235
350 5,148,236
5,148,237
375 5,148,238
435 5,148,239

CLASS 357

15 5,148,240
5,148,241
16 5,148,242
17 5,148,243
22 5,148,244
5,148,245
23.13 5,148,249
5,148,250
23.5 5,148,246
23.6 5,148,247
23.7 5,148,248
36 5,148,251
38 5,148,252
5,148,253
5,148,254
43 5,148,255
45 5,148,256
49 5,148,257
5,148,258
67 5,148,259
5,148,260
5,148,261
68 5,148,262
71 5,148,263
74 5,148,264
80 5,148,265
5,148,266

CLASS 358

41 5,148,268
105 5,148,269
133 5,148,270
5,148,271
5,148,272
138 5,148,273
141 5,148,274
147 5,148,275
153 5,148,276
160 5,148,277
167 5,148,278
186 5,148,279
191.1 5,148,280
228 5,148,281
231 5,148,285
249 5,148,282
254 5,148,283
296 5,148,284
5,148,286
298 5,148,287
5,148,288
300 5,148,289
314 5,148,290
336 5,148,291
433 5,148,292
444 5,148,293
448 5,148,294
451 5,148,295
482 5,148,296

CLASS 359

53 5,148,297
72 5,148,298
73 5,148,299
76 5,148,300
80 5,148,301
95 5,148,302
170 5,148,303
207 5,148,304
265 5,148,305
271 5,148,306
359 5,148,125
385 5,148,307
432 5,148,308
443 5,148,309
479 5,148,310
507 5,148,311
5,148,312
555 5,148,313
558 5,148,315
561 5,148,316
566 5,148,317
629 5,148,318
642 5,148,314
5,148,319
649 5,148,320
689 5,148,321
708 5,148,322
738 5,148,323
839 5,148,324
841 5,148,325
853 5,148,326
855 5,148,327
862 5,147,126

CLASS 360

15 5,148,403
19.1 5,148,329
27 5,148,328
40 5,148,330
5,148,333
51 5,148,334
77.15 5,148,331
92 5,148,332
95 5,148,336
97.04 5,148,337
98.07 5,148,338
105 5,148,339
106 5,148,340
5,148,341
121 5,148,342
122 5,148,343

CLASS 361

42 5,148,344
104 5,148,345
251 5,148,346
272 5,148,347
356 5,148,348
383 5,148,349
386 5,148,350
388 5,148,351
391 5,148,352
5,148,353
400 5,148,354
410 5,148,355

CLASS 362

23 5,147,127
32 5,147,128
106 5,147,129
130 5,148,356
218 5,147,130
351 5,147,131
426 5,147,132

CLASS 363

5 5,148,357
24 5,148,358
48 5,148,359
5,148,360
95 5,148,361
5,148,362

CLASS 364

143 5,148,363
187 5,148,364
402 5,148,365
419 5,148,366
5,148,367
426.02 5,148,368
431.06 5,148,369
468 5,148,370
474.01 5,148,371
474.24 5,148,372
484 5,148,373
505 5,148,374
552 5,148,375
558 5,148,376
560 5,148,377
571.07 5,148,378
574 5,148,402
578 5,148,379
707 5,148,380
723 5,148,381
724.03 5,148,382
724.16 5,148,383
728.01 5,148,384
728.07 5,148,385
768 5,148,386
784 5,148,387
786 5,148,388

CLASS 365

95 5,148,390
96 5,148,391
149 5,148,392
5,148,393
185 5,148,394
5,148,395
189.03 5,148,396
189.07 5,148,397
201 5,148,398
205 5,148,399
222 5,148,400
230.03 5,148,401

CLASS 366

138 5,147,133
150 5,147,134
303 5,147,135

CLASS 367

2 5,148,404
13 5,148,405
22 5,148,406
32 5,148,407
82 5,148,408
91 5,148,409
96 5,148,410
108 5,148,411
131 5,148,412
135 5,148,413
140 5,148,414

CLASS 369

13 5,148,415
32 5,148,416
5,148,417
5,148,418
5,148,419
44.11 5,148,420
44.23 5,148,421
44.25 5,148,425
44.26 5,148,422
44.29 5,148,423
44.37 5,148,424
59 5,148,335

CLASS 370

9.42 5,148,429
32.1 5,148,426
5,148,427
60 5,148,428
100.1 5,148,430

CLASS 371

5.1 5,148,431
10.1 5,148,432
11.3 5,148,433
20.1 5,148,434
20.5 5,148,435
21.1 5,148,436

CLASS 372

32 5,148,437
37 5,148,438
46 5,148,439
56 5,148,440
70 5,148,441
71 5,148,442
93 5,148,443
94 5,148,444
97 5,148,445
109 5,148,446

CLASS 374

57 5,147,136
139 5,147,137
175 5,146,780

CLASS 375

7 5,148,447
60 5,148,448
76 5,148,449
81 5,148,450
96 5,148,452
97 5,148,451
116 5,148,453

CLASS 376

134 5,147,596
305 5,147,597
419 5,147,598
446 5,147,599
462 5,147,600

CLASS 378

40 5,148,454
55 5,148,455
61 5,148,456
70 5,148,457
72 5,148,458
105 5,148,459
108 5,148,460
119 5,148,461
143 5,148,462
144 5,148,463
156 5,148,465
165 5,148,464
167 5,148,466
197 5,148,467

CLASS 379

56 5,148,468
57 5,148,469
58 5,148,470
5,148,471
59 5,148,472
5,148,473
111 5,148,474
399 5,148,475
437 5,148,476

CLASS 380

6 5,148,478
23 5,148,479
28 5,148,480
46 5,148,481
5,148,485
48 5,148,482

CLASS 381

36 5,148,486
41 5,148,483
46 5,148,484
5,148,487
47 5,148,488
5,148,489
86 5,148,490
119 5,148,491
177 5,148,492
203 5,148,493

CLASS 382

1 5,148,494
6 5,148,477
9 5,148,495
42 5,148,496
54 5,148,497
5,148,498
5,148,499
5,148,502
55 5,148,500
56 5,148,501

CLASS 384

21 5,147,138
486 5,147,139
492 5,147,140

CLASS 385

3 5,148,503
14 5,148,504
16 5,148,505
5,148,506
41 5,148,507
51 5,148,508
109 5,148,509
142 5,148,510
145 5,148,511

CLASS 392

383 5,148,512

CLASS 395

13 5,148,513
24 5,148,514
27 5,148,515
100 5,148,516
115 5,148,517
131 5,148,518
141 5,148,519
148 5,148,520
155 5,148,521
161 5,148,522
164 5,148,523
166 5,148,524
250 5,148,525
275 5,148,526
325 5,148,527
375 5,148,528
5,148,529
5,148,530
5,148,531
5,148,532
425 5,148,533
5,148,534
5,148,535
5,148,536
5,148,537
5,148,538
5,148,539
5,148,540
575 5,148,541
600 5,148,542
700 5,148,543
5,148,544
725 5,148,545
5,148,546
750 5,148,389
800 5,148,547

CLASS 400

5,147,144
5,147,145

CLASS 403

5,147,146

CLASS 404

97 5,147,147
5,147,148
199 5,147,149
223.1 5,147,150
258 5,147,151
259.1

CLASS 406

5,147,152
86 5,147,153
112 5,147,154
191 5,147,155
197 5,147,156

CLASS 407

36 5,147,157
113 5,147,158
114 5,147,159

CLASS 408

3 5,147,160
61 5,147,161
110 5,147,162
202 5,147,164

CLASS 409

5,147,163
199 5,147,165
232

CLASS 411

29 5,147,166
44 5,147,167

CLASS 414

5,147,168
217 5,147,169
403 5,147,170
492 5,147,171
671 5,147,172
719 5,147,173
723 5,147,174
730 5,147,175
749 5,147,176
786 5,147,177
788.3

CLASS 415

58.4 5,147,178
168.2 5,147,179

CLASS 416

219 R 5,147,180
223 R 5,147,181

CLASS 417

234 5,147,182
300 5,147,183
394 5,147,184
5,147,185
420 5,147,186
423.1 5,147,187
511 5,147,188
567 5,147,189
571 5,147,190

CLASS 418

36 5,147,191
55.3 5,147,192
68 5,147,193
125 5,147,194

CLASS 419

25 5,147,601

CLASS 420

35 5,147,602
409 5,147,603
556 5,147,471

CLASS 422

13 5,147,604
37 5,147,605
56 5,147,606
57 5,147,607
58 5,147,609
63 5,147,608
64 5,147,610
78 5,147,611
99 5,147,612
116 5,147,613
186.18 5,147,614
261 5,147,615

CLASS 423

5 5,147,616
27 5,147,617
5,147,618
148 5,147,619
224 5,147,620
265 5,147,621
5,147,622
290 5,147,623
316 5,147,625
328 5,147,626
5,147,627
502 5,147,624
588 5,147,628
612 5,147,629
625 5,147,630

CLASS 424

9 5,147,631
54 5,147,632
56 5,147,633
70 5,147,634
72 5,147,635
85.4 5,147,636
85.8 5,147,637
5,147,638
89 5,147,639
93.A 5,147,640
94.5 5,147,641
94.61 5,147,642
94.64 5,147,643
401 5,147,644
405 5,147,645
424 5,147,646
427 5,147,647
435 5,147,648
439 5,147,650
443 5,147,651
450 5,147,652
473 5,147,654
489 5,147,655

CLASS 425

42 5,147,656
117 5,147,657
127 5,147,658
133.500 5,147,195
145 5,147,196
5,147,659
148 5,147,660
150 5,147,661
192.S 5,147,197
205 5,147,198

470 5,147,653
500 5,147,662
549 5,147,663

CLASS 426

2 5,147,664
19 5,147,665
45 5,147,666
56 5,147,667
61 5,147,668
94 5,147,669
98 5,147,670
140 5,147,671
241 5,147,672
250 5,147,673
427 5,147,674
549 5,147,675
601 5,147,676
614 5,147,677

CLASS 427

40 5,147,678
48 5,147,679
53.1 5,147,680
56.1 5,147,681
58 5,147,682
69 5,147,683
131 5,147,684
217 5,147,686
249 5,147,687
255.3 5,147,688
264 5,147,689
372.2 5,147,690
387 5,147,691
438 5,147,692

CLASS 428

22 5,147,693
34 5,147,694
34.1 5,147,695
36.4 5,147,696
36.6 5,147,697
40 5,147,698
5,147,699
64 5,147,700
5,147,701
65 5,147,702
82 5,147,703
97 5,147,704
167 5,147,705
189 5,147,685
193 B1 5,030,502
195 5,147,706
212 5,147,707
213 5,147,708
5,147,709
5,147,710
216 5,147,711
224 5,147,712
229 5,147,713
254 5,147,714
286 5,147,715
323 5,147,716
327 5,147,717
328 5,147,718
332 5,147,719
336 5,147,720
365 5,147,721
402 5,147,722
402.2 5,147,723
409 5,147,724
425.5 5,147,725
458 5,147,726
500 5,147,727
623 5,147,729
5,147,730
633 5,147,731
668 5,147,732
683 5,147,733
694 5,147,734

CLASS 429

17 5,147,735
27 5,147,736
94 5,147,737
194 5,147,738
5,147,739

CLASS 430

5 5,147,740
5,147,741
5,147,742
7 5,147,743
39 5,147,744
49 5,147,745
106 5,147,746
109 5,147,747
110 5,147,748
5,147,749
5,147,750
125 5,147,751
134 5,147,752
137 5,147,753
264 5,147,754
5,147,755
5,147,756
270 5,147,757
281 5,147,758
285 5,147,759
296 5,147,760
306 5,147,761
308 5,147,762
320 5,147,763
372 5,147,764
376 5,147,765
399 5,147,766
435 5,147,767
496 5,147,769
501 5,147,768
522 5,147,770
569 5,147,771
5,147,772
5,147,773

CLASS 431

10 5,147,199
11 5,147,200
326 5,147,201

CLASS 433

8 5,147,202
29 5,147,203
229 5,147,204

CLASS 434

169 5,147,205
219 5,147,206

CLASS 435

2 5,147,776
5 5,147,777
6 5,147,778
5,147,779
7.1 5,147,780
7.21 5,147,782
7.23 5,147,783
7.24 5,147,784
5,147,785
7.4 5,147,781
7.94 5,147,786
41 5,147,787
69.1 5,147,788
69.4 5,147,789
70.3 5,147,790
123 5,147,791
134 5,147,792
156 5,147,793
199 5,147,794
210 5,147,795
5,147,796
240.1 5,147,797
5,147,798
5,147,799
252.3 5,147,800
299 5,147,801

CLASS 436

6 5,147,802
16 5,147,803
66 5,147,804
86 5,147,805
149 5,147,806

CLASS 437

21 5,147,808
31 5,147,775
5,147,809
5,147,810
35 5,147,811
41 5,147,812
43 5,147,813
44 5,147,814
51 5,147,815
52 5,147,816
5,147,817
57 5,147,818
173 5,147,819
193 5,147,820
212 5,147,821
215 5,147,822
225 5,147,823
226 5,147,824
228 5,147,825
233 5,147,826
237 5,147,827
250 5,147,828

CLASS 439

66 5,147,207
67 5,147,208
70 5,147,209
91 5,147,210
160 5,147,211
266 5,147,212
5,147,213
326 5,147,214
344 5,147,215
367 5,147,216
403 5,147,217
404 5,147,218
449 B1 4,619,494
521 5,147,219
567 5,147,220
585 5,147,221
589 5,147,222
620 5,147,223
5,147,224
680 5,147,225
5,147,226
733 5,147,227
741 5,147,228
843 5,147,229
5,147,230

CLASS 440

75 5,147,231
89 5,147,232

CLASS 441

56 5,147,233
70 5,147,234
79 5,147,235

CLASS 446

253 5,147,236
297 5,147,237
330 5,147,238

CLASS 452

47 5,147,239
165 5,147,240
169 5,147,241

CLASS 454

63 5,147,242
323 5,147,243
364 5,147,244

CLASS 455

34.1 5,148,548

CLASS 464

25 5,147,245
59 5,147,246

CLASS 472

118 5,147,247

CLASS 474

166 5,147,248
168 5,147,249
206 5,147,250
5,147,251
242 5,147,253

CLASS 475

121 5,147,254
226 5,147,252
311 5,147,255

CLASS 482

47 5,147,256
71 5,147,257
87 5,147,258
101 5,147,259
104 5,147,260
106 5,147,261
110 5,147,262
112 5,147,263
118 5,147,264
119 5,147,265
131 5,147,266
142 5,147,267

CLASS 493

38 5,147,268
57 5,147,269
141 5,147,270
176 5,147,271
195 5,147,272
349 5,147,273
409 5,147,274
416 5,147,275
439 5,147,278
444 5,147,276
448 5,147,279

CLASS 494

53 5,147,277
56 5,147,280

CLASS 501

12 5,147,629
89 5,147,830
96 5,147,831
5,147,832
105 5,147,833
129 5,147,834
134 5,147,835

CLASS 502

64 5,147,836
66 5,147,837
71 5,147,838
119 5,147,839
167 5,147,840
173 5,147,841
304 5,147,842

CLASS 503

227 5,147,843
5,147,844
5,147,845
5,147,846

CLASS 505

1 5,147,847
5,147,848
5,147,849
5,147,850
5,147,851

CLASS 507

104 5,147,852

CLASS 514

7 5,147,853
12 5,147,854
5,147,855
16 5,147,856
19 5,147,857
23 5,147,858
26 5,147,859
34 5,147,860
54 5,147,861
5,147,862
63 5,147,863
82 5,147,864
91 5,147,865
100 5,147,866
114 5,147,867
119 5,147,868
170 5,147,869
202 5,147,871
219 5,147,872
230.2 5,147,873
238.2 5,147,874
259 5,147,875
275 5,147,876
291 5,147,877
299 5,147,878
318 5,147,879
319 5,147,880
321 5,147,881
325 5,147,882
338 5,147,883
365 5,147,884
381 5,147,885
383 5,147,886
5,147,887
419 5,147,888
443 5,147,889
479 5,147,890
5,147,891
522 5,147,892
530 5,147,893
783 5,147,870

CLASS 521

40.5 5,147,894
64 5,147,895
79 5,147,896
125 5,147,897
131 5,147,898
141 5,147,899

CLASS 522

25 5,147,900
42 5,147,901

CLASS 523

106 5,147,902
115 5,147,903
5,147,904
404 5,147,905
410 5,147,906

CLASS 524

48 5,147,907
49 5,147,908
94 5,147,909
95 5,147,910
5,147,911
122 5,147,912
141 5,147,913
152 5,147,935
185 5,147,914
204 5,147,915
266 5,147,916
357 5,147,917
442 5,147,918
444 5,147,919
451 5,147,920
493 5,147,921
496 5,147,922
555 5,147,923
559 5,147,924
589 5,147,925
591 5,147,926
710 5,147,927

CLASS 525

53 5,147,928
54.11 5,147,929
57 5,147,930
66 5,147,931
71 5,147,932
89 5,147,933
124 5,147,934
240 5,147,936
243 5,147,937
276 5,147,938
314 5,147,939
317 5,147,940
327.8 5,147,941
397 5,147,942
423 5,147,943
432 5,147,944
475 5,147,945
479 5,147,946
5,147,947

CLASS 526

62 5,147,948
129 5,147,949
134 5,147,950
173 5,147,951
220 5,147,952
262 5,147,953
265 5,147,954
271 5,147,955
318.42 5,147,956
332 5,147,963

CLASS 527

400 5,147,964

CLASS 528

12 5,147,965
15 5,147,957
48 5,147,959
75 5,147,960
170 5,147,962
182 5,147,961
188 5,147,966
193 5,147,967
210 5,147,968

CLASS 536

27 Re 34,069

CLASS 600

1 5,147,282
3 5,147,284
16 5,147,281

CLASS 602

7 5,147,283
22 5,147,285
24 5,147,286
32 5,147,287

CLASS 604

1 5,147,288
4 5,147,289
5 5,147,290
20 5,147,291
5,147,296
5,147,297
34 5,147,292
38 5,147,293
49 5,147,294
61 5,147,295
79 5,147,298
96 5,147,299
97 5,147,300
98 5,147,301
103 5,147,302
110 5,147,303
5,147,304
5,147,305
115 5,147,306
116 5,147,307
117 5,147,308
122 5,147,309
141 5,147,310
153 5,147,311
5,147,312
5,147,313
158 5,147,314
164 5,147,315
5,147,316
5,147,317
174 5,147,318
5,147,319
5,147,320
175 5,147,321
180 5,147,322
191 5,147,323
192 5,147,324
5,147,325
198 5,147,326
5,147,327
218 5,147,328
231 5,147,329
245 5,147,330
247 5,147,332
249 5,147,333
264 5,147,334
280 5,147,335
283 5,147,336
304 5,147,338
306 5,147,337
307 5,147,339
344 5,147,340
349 5,147,341
356 5,147,342
368 5,147,343
5,147,344
378 5,147,345
389 5,147,346
390 5,147,347

CLASS 606

4 5,147,349
5 5,147,352
15 5,147,353
5,147,354
16 5,147,348
23 5,147,355
37 5,147,356
49 5,147,357
57 5,147,358
61 5,147,359
5,147,360
5,147,361
72 5,147,362
73 5,147,363
85 5,147,364
88 5,147,365
94 5,147,366
96 5,147,367
107 5,147,368
108 5,147,370
127 5,147,371
130 5,147,372
144 5,147,373
151 5,147,374
170 5,147,376
182 5,147,375
194 5,147,377
206 5,147,378
5,147,379
207 5,147,380
219 5,147,381
228 5,147,382
231 5,147,383
234 5,147,384

CLASS 623

1 5,147,385
5,147,387
2 5,147,388
5,147,389
5,147,390
5,147,391
3 5,147,392
6 5,147,393
5,147,394
5,147,395
5,147,396
5,147,397
5,147,398
12 5,147,399
13 5,147,400
15 5,147,401
16 5,147,402
5,147,403
17 5,147,404
20 5,147,405
5,147,406
21 5,147,386
22 5,147,407
23 5,147,408

CLASSIFICATION OF DESIGNS

D1—	107	329,319		511	329,355			329,388	D13—	137	329,422			329,456			329,490
	108	329,320		575	329,356		57	329,395		143	329,423	D19—	2	329,457		284	329,491
D2—	250	329,321		620	329,357			329,396		174	329,424		36	329,459		295	329,492
	279	329,322			329,358		60	329,389		184	329,425		46	329,458		366	329,493
	314	329,323		637	329,359		75	329,390			329,426			329,460		377	329,494
	334	329,324		679	329,360		81	329,391	D14—	100	329,427		51	329,461	D24—	129	329,495
D3—	28	329,325	D8—	61	329,361		91	329,392		118	329,428		69	329,462		140	329,496
	331	329,326		62	329,362		106	329,393		129	329,429			329,463		206	329,497
	38	329,327		66	329,363		111	329,394		150	329,430		75	329,464			329,498
	39	329,328		71	329,364		126	329,397		155	329,431	D20—	8	329,465		213	329,499
	71	329,329			329,365		130	329,398		225	329,432		10	329,466		217	329,500
	76	329,330		76	329,366	D11—	6	329,399		234	329,433		41	329,467	D25—	62	329,501
	78	329,331		83	329,367			329,400	D15—	5	329,434		42	329,468		67	329,502
D5—	37	329,332		102	329,368		93	329,401		23	329,435	D21—	6	329,469		123	329,503
D6—	300	329,333		302	329,369		96	329,402		127	329,436		13	329,470	D26—	42	329,504
	334	329,334		331	329,370		131	329,403			329,437		59	329,471		63	329,505
	661	329,335		367	329,371			329,404		132	329,438		73	329,472	D27—	154	329,506
	670	329,336		380	329,372		149	329,405		139	329,439		108	329,473	D28—	18	329,507
		329,337		394	329,373		153	329,406			329,440		109	329,474	D29—	11	329,508
		329,338			329,374		164	329,407		143	329,441		128	329,475	D30—	124	329,509
		329,339			329,375			329,408	D16—	102	329,442		130	329,476		156	329,510
	373	329,340	D9—	346	329,376			329,409			329,443		195	329,477	D32—	31	329,511
	457	329,341		418	329,377	D12—	111	329,410		110	329,444			329,478		32	329,512
	515	329,343			329,378		133	329,411		116	329,445		204	329,479			329,513
		329,344		430	329,379		147	329,412		126	329,446		217	329,480	D34—	4	329,514
	547	329,345		434	329,380		151	329,413		209	329,447		220	329,481			329,515
	549	329,346		455	329,382		157	329,414		229	329,448			329,482		5	329,516
		329,347		521	329,381		187	329,415		243	329,449		221	329,483		28	329,517
	553	329,348		525	329,383		202	329,417	D18—	7	329,450		230	329,484		31	329,518
	567	329,349		529	329,384		204	329,418		40	329,452		234	329,485		32	329,519
	580	329,350		544	329,385		302	329,419		43	329,453		237	329,486	D99—	28	329,520
	597	329,351		550	329,386	D06—	466	329,420		48	329,454	D22—	144	329,487			329,521
	601	329,352	D10—	30	329,387		309	329,421		49	329,455	D23—	213	329,488			329,522
D7—	351	329,353					317						216	329,489		32	329,523
	399	329,354															

CLASSIFICATION OF PLANTS

P—		7,970		12	7,972													
		7,971		21	7,973		33:1	7,974		38:1	7,975		41:1	7,976		100	7,977	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
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Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
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Guam	14	New Jersey	34	West Virginia	54
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	5,146,925	5,146,921	5,147,429	5,148,267	5,147,484	5,147,650
	5,146,960	5,146,943	5,147,467	5,148,288	5,147,635	5,147,725
	5,147,163	5,146,946	5,147,524	5,148,313	5,147,667	5,147,761
	5,147,282	5,146,962	5,147,532	5,148,314	5,147,692	5,147,785
	5,147,508	5,146,968	5,147,550	5,148,323	5,147,722	5,147,829
	5,147,563	5,146,995	5,147,595	5,148,340	5,147,787	5,147,872
	5,148,435	5,146,998	5,147,608	5,148,383	5,147,799	5,147,980
04	5,146,769	5,147,039	5,147,611	5,148,389	5,147,858	5,147,983
	5,146,978	5,147,042	5,147,614	5,148,390	5,147,873	5,147,988
	5,147,208	5,147,063	5,147,636	5,148,395	5,147,881	5,147,990
	5,147,216	5,147,068	5,147,643	5,148,426	5,148,015	5,148,041
	5,147,291	5,147,071	5,147,680	5,148,427	5,148,319	5,148,147
	5,147,387	5,147,078	5,147,681	5,148,440	5,148,402	5,148,183
	5,147,427	5,147,081	5,147,721	5,148,442	5,148,408	5,148,279
	5,147,519	5,147,100	5,147,740	5,148,444	5,148,483	5,148,345
	5,147,561	5,147,101	5,147,779	5,148,450	10 : 5,146,631	5,148,346
	5,147,792	5,147,103	5,147,780	5,148,472	5,146,651	5,148,357
	5,147,812	5,147,110	5,147,784	5,148,490	5,146,956	5,148,410
	5,147,974	5,147,112	5,147,804	5,148,496	5,147,417	5,148,475
	5,148,061	5,147,125	5,147,813	5,148,503	5,147,518	13 5,146,637
	5,148,099	5,147,126	5,147,828	5,148,513	5,147,529	5,146,735
	5,148,126	5,147,167	5,147,936	5,148,516	5,147,586	5,146,757
	5,148,236	5,147,178	5,147,940	5,148,520	5,147,704	5,146,967
	5,148,358	5,147,191	5,147,972	4,831,282	5,147,758	5,147,121
	5,148,452	5,147,205	5,147,984	4,962,342	5,147,896	5,147,241
	5,148,478	5,147,207	5,147,997	5,051,621	5,147,945	5,147,341
	5,148,508	5,147,209	5,148,005	08 : 5,146,820	5,148,171	5,147,432
	5,148,540	5,147,210	5,148,025	5,146,959	12 5,146,630	5,147,433
05	5,146,910	5,147,224	5,148,032	5,147,055	5,146,644	5,147,458
	5,147,025	5,147,238	5,148,040	5,147,540	5,146,705	5,147,480
	5,147,093	5,147,257	5,148,052	5,147,685	5,146,710	5,147,575
06	Re.34,067	5,147,262	5,148,056	5,148,282	5,146,762	5,147,967
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PATENT AND TRADEMARK OFFICE NOTICES

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For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

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Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 19, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following 1ranges:

Utility Patents 4,866,789 through 4,868,924
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 17, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,541,125 through 4,542,536
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 19,1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,125	06/854,765	12/05/89
(4,460,585)	(06/458,451)	(7/17/84)
4,459,703	06/460,373	7/17/84
4,459,705	06/432,538	7/17/84
4,459,709	06/321,447	7/17/84
4,459,712	06/382,573	7/17/84
4,459,713	06/413,408	7/17/84
4,459,714	06/298,254	7/17/84
4,459,720	06/338,567	7/17/84
4,459,728	06/405,599	7/17/84
4,459,732	06/304,242	7/17/84
4,459,733	06/269,788	7/17/84
4,459,741	06/408,788	7/17/84
4,459,744	06/345,575	7/17/84
4,459,747	06/437,580	7/17/84
4,459,748	06/446,237	7/17/84
4,459,749	06/410,618	7/17/84
4,459,751	06/556,624	7/17/84
4,459,757	06/504,176	7/17/84
4,459,759	06/405,030	7/17/84
4,459,761	06/457,052	7/17/84
4,459,764	06/484,664	7/17/84
4,459,769	06/406,273	7/17/84
4,459,770	06/397,360	7/17/84
4,459,774	06/359,904	7/17/84
4,459,779	06/418,948	7/17/84
4,459,780	06/337,858	7/17/84
4,459,781	06/248,856	7/17/84
4,459,782	06/418,988	7/17/84
4,459,783	06/404,701	7/17/84
4,459,789	06/380,023	7/17/84
4,459,790	06/520,428	7/17/84
4,459,794	06/269,376	7/17/84
4,459,798	06/397,304	7/17/84
4,459,802	06/309,239	7/17/84
4,459,807	06/346,327	7/17/84
4,459,814	06/317,192	7/17/84
4,459,818	06/498,376	7/17/84
4,459,822	06/342,141	7/17/84
4,459,825	06/402,840	7/17/84
4,459,836	06/341,382	7/17/84
4,459,838	06/359,357	7/17/84
4,459,848	06/347,990	7/17/84
4,459,860	06/447,509	7/17/84
4,459,861	06/364,531	7/17/84
4,459,875	06/269,802	7/17/84
4,459,880	06/414,864	7/17/84
4,459,883	06/345,744	7/17/84
4,459,887	06/432,648	7/17/84
4,459,890	06/439,528	7/17/84
4,459,891	06/421,923	7/17/84
4,459,904	06/460,362	7/17/84
4,459,908	06/533,804	7/17/84
4,459,910	06/429,664	7/17/84
4,459,911	06/460,920	7/17/84
4,459,918	06/233,717	7/17/84
4,459,920	06/289,218	7/17/84
4,459,921	06/316,847	7/17/84
4,459,935	06/344,236	7/17/84
4,459,936	06/373,650	7/17/84
4,459,946	06/378,843	7/17/84
4,459,947	06/405,387	7/17/84
4,459,948	06/313,319	7/17/84
4,459,955	06/482,895	7/17/84
4,459,956	06/409,407	7/17/84
4,459,958	06/406,790	7/17/84
4,459,962	06/494,359	7/17/84
4,459,965	06/492,192	7/17/84
4,459,968	06/499,015	7/17/84
4,459,974	06/463,509	7/17/84
4,459,975	06/317,831	7/17/84
4,459,976	06/438,767	7/17/84
4,459,980	06/389,690	7/17/84
4,459,981	06/380,217	7/17/84
4,459,991	06/235,564	7/17/84
4,460,002	06/332,001	7/17/84
4,460,005	06/250,030	7/17/84
4,460,006	06/340,605	7/17/84
4,460,007	06/460,927	7/17/84
4,460,019	06/467,520	7/17/84
4,460,021	06/482,244	7/17/84
4,460,022	06/383,029	7/17/84
4,460,026	06/348,847	7/17/84
4,460,033	06/280,550	7/17/84
4,460,040	06/444,408	7/17/84
4,460,041	06/417,012	7/17/84
4,460,048	06/258,208	7/17/84
4,460,051	06/479,670	7/17/84
4,460,056	06/316,819	7/17/84

Patent Number	Serial Number	Issue Date
4,460,058	06/371,044	7/17/84
4,460,063	06/367,571	7/17/84
4,460,064	06/384,549	7/17/84
4,460,068	06/435,811	7/17/84
4,460,070	06/461,839	7/17/84
4,460,075	06/381,535	7/17/84
4,460,077	06/300,596	7/17/84
4,460,085	06/411,643	7/17/84
4,460,090	06/397,252	7/17/84
4,460,091	06/413,972	7/17/84
4,460,093	06/426,479	7/17/84
4,460,097	06/224,942	7/17/84
4,460,111	06/406,412	7/17/84
4,460,112	06/315,093	7/17/84
4,460,115	06/563,465	7/17/84
4,460,121	06/417,735	7/17/84
4,460,128	06/392,079	7/17/84
4,460,133	06/396,727	7/17/84
4,460,140	06/430,583	7/17/84
4,460,141	06/309,057	7/17/84
4,460,146	06/413,031	7/17/84
4,460,147	06/222,017	7/17/84
4,460,157	06/334,871	7/17/84
4,460,159	06/309,976	7/17/84
4,460,164	06/467,901	7/17/84
4,460,165	06/506,111	7/17/84
4,460,174	06/525,159	7/17/84
4,460,176	06/353,378	7/17/84
4,460,177	06/491,354	7/17/84
4,460,179	06/430,252	7/17/84
4,460,188	06/368,516	7/17/84
4,460,191	06/378,291	7/17/84
4,460,192	06/441,133	7/17/84
4,460,193	06/383,485	7/17/84
4,460,203	06/303,896	7/17/84
4,460,208	06/371,478	7/17/84
4,460,210	06/415,528	7/17/84
4,460,211	06/424,880	7/17/84
4,460,212	06/340,872	7/17/84
4,460,218	06/385,206	7/17/84
4,460,221	06/295,593	7/17/84
4,460,235	06/394,008	7/17/84
4,460,238	06/370,753	7/17/84
4,460,240	06/410,548	7/17/84
4,460,249	06/308,104	7/17/84
4,460,258	06/465,541	7/17/84
4,460,262	06/442,910	7/17/84
4,460,286	06/380,619	7/17/84
4,460,290	06/54 ,214	7/17/84
4,460,291	06/31 ,657	7/17/84
4,460,294	06/32 ,819	7/17/84
4,460,295	06/350,908	7/17/84
4,460,296	06/270,246	7/17/84
4,460,301	06/34 ,020	7/17/84
4,460,302	06/26 ,920	7/17/84
4,460,304	06/44 ,495	7/17/84
4,460,305	06/39 ,715	7/17/84
4,460,306	06/22 ,675	7/17/84
4,460,307	06/40 ,310	7/17/84
4,460,313	06/34 ,355	7/17/84
4,460,314	06/32 ,685	7/17/84
4,460,318	06/4 ,092	7/17/84
4,460,323	06/4 ,267	7/17/84
4,460,329	06/3 ,664	7/17/84
4,460,339	06/4 ,399	7/17/84
4,460,341	06/4 ,441	7/17/84
4,460,357	06/3 ,020	7/17/84
4,460,360	06/5 ,989	7/17/84
4,460,373	06/4 ,886	7/17/84
4,460,377	06/3 1,337	7/17/84
4,460,382	06/3 1,377	7/17/84
4,460,383	06/4 1,340	7/17/84
4,460,387	06/3 1,069	7/17/84
4,460,391	06/3 5,015	7/17/84
4,460,399	06/3 2,866	7/17/84
4,460,400	06/3 1,599	7/17/84
4,460,401	06/4 7,367	7/17/84
4,460,402	06/282,201	7/17/84
4,460,404	06/421,416	7/17/84
4,460,406	06/369,697	7/17/84
4,460,409	06/474,543	7/17/84
4,460,412	06/367,675	7/17/84
4,460,422	06/405,792	7/17/84
4,460,431	06/442,713	7/17/84
4,460,432	06/412,161	7/17/84
4,460,434	06/487,113	7/17/84
4,460,442	06/408,540	7/17/84
4,460,444	06/482,735	7/17/84
4,460,447	06/515,127	7/17/84
4,460,452	06/395,512	7/17/84
4,460,458	06/398,461	7/17/84
4,460,465	06/544,834	7/17/84
4,460,467	06/401,985	7/17/84
4,460,469	06/314,233	7/17/84
4,460,473	06/222,818	7/17/84
4,460,474	06/412,800	7/17/84
4,460,475	06/479,136	7/17/84
4,460,482	06/298,445	7/17/84
4,460,496	06/448,488	7/17/84
4,460,498	06/428,679	7/17/84
4,460,500	06/358,692	7/17/84
4,460,501	06/527,750	7/17/84
4,460,503	06/475,639	7/17/84
4,460,505	06/240,638	7/17/84
4,460,507	06/373,089	7/17/84
4,460,509	06/294,338	7/17/84
4,460,510	06/376,749	7/17/84
4,460,518	06/414,314	7/17/84
4,460,519	06/458,438	7/17/84
4,460,521	06/369,485	7/17/84
4,460,528	06/263,390	7/17/84
4,460,530	06/443,943	7/17/84
4,460,531	06/376,310	7/17/84
4,460,532	06/378,596	7/17/84
4,460,533	06/376,089	7/17/84
4,460,536	06/273,802	7/17/84
4,460,541	06/478,283	7/17/84
4,460,543	06/482,605	7/17/84
4,460,547	06/437,511	7/17/84
4,460,553	06/466,690	7/17/84
4,460,558	06/308,062	7/17/84
4,460,573	06/506,579	7/17/84
4,460,576	06/463,604	7/17/84
4,460,586	06/338,592	7/17/84
4,460,589	06/386,846	7/17/84
4,460,596	06/372,990	7/17/84
4,460,603	06/280,653	7/17/84
4,460,606	06/379,177	7/17/84
4,460,607	06/424,828	7/17/84
4,460,614	06/414,721	7/17/84
4,460,616	06/405,287	7/17/84
4,460,618	06/314,944	7/17/84
4,460,620	06/339,994	7/17/84
4,460,623	06/317,695	7/17/84
4,460,624	06/413,552	7/17/84
4,460,635	06/516,426	7/17/84
4,460,654	06/532,944	7/17/84
4,460,659	06/501,542	7/17/84
4,460,660	06/452,116	7/17/84
4,460,661	06/419,549	7/17/84
4,460,667	06/433,665	7/17/84
4,460,668	06/454,975	7/17/84
4,460,673	06/382,475	7/17/84
4,460,674	06/336,861	7/17/84
4,460,686	06/373,291	7/17/84
4,460,690	06/467,900	7/17/84
4,460,697	06/380,780	7/17/84
4,460,706	06/484,310	7/17/84
4,460,710	06/485,349	7/17/84
4,460,719	06/459,103	7/17/84
4,460,723	06/445,308	7/17/84
4,460,732	06/505,325	7/17/84
4,460,737	06/246,225	7/17/84
4,460,741	06/439,089	7/17/84
4,460,756	06/479,238	7/17/84
4,460,767	06/418,266	7/17/84

Patent Number	Serial Number	Issue Date
4,460,770	06/387,108	7/17/84
4,460,784	06/415,273	7/17/84
4,460,791	06/380,372	7/17/84
4,460,811	06/445,208	7/17/84
4,460,814	06/425,118	7/17/84
4,460,819	06/457,194	7/17/84
4,460,822	06/344,818	7/17/84
4,460,828	06/373,756	7/17/84
4,460,829	06/379,140	7/17/84
4,460,834	06/527,264	7/17/84
4,460,838	06/405,748	7/17/84
4,460,840	06/372,571	7/17/84
4,460,847	06/287,261	7/17/84
4,460,848	06/326,498	7/17/84
4,460,851	06/306,560	7/17/84
4,460,852	06/344,058	7/17/84
4,460,854	06/427,348	7/17/84
4,460,858	06/377,103	7/17/84
4,460,864	06/476,172	7/17/84
4,460,866	06/284,827	7/17/84
4,460,867	06/309,490	7/17/84
4,460,869	06/351,494	7/17/84
4,460,876	06/352,067	7/17/84
4,460,881	06/429,141	7/17/84
4,460,882	06/453,772	7/17/84
4,460,884	06/392,046	7/17/84
4,460,889	06/401,663	7/17/84
4,460,892	06/314,332	7/17/84
4,460,893	06/346,934	7/17/84
4,460,914	06/258,112	7/17/84
4,460,924	06/224,679	7/17/84
4,460,933	06/294,635	7/17/84
4,460,947	06/482,799	7/17/84
4,460,950	06/433,251	7/17/84
4,460,951	06/394,060	7/17/84
4,460,955	06/452,139	7/17/84
4,460,965	06/232,223	7/17/84
4,460,966	06/325,345	7/17/84
4,460,968	06/312,056	7/17/84
4,460,983	06/470,527	7/17/84
4,460,987	06/370,883	7/17/84
4,460,991	06/379,957	7/17/84
4,460,995	06/370,313	7/17/84
4,461,004	06/515,081	7/17/84
4,461,009	06/302,346	7/17/84
4,461,012	06/240,285	7/17/84
4,461,013	06/447,019	7/17/84
4,461,016	06/452,574	7/17/84
4,461,019	06/304,425	7/17/84
4,461,022	06/460,892	7/17/84
4,461,026	06/285,234	7/17/84
4,461,029	06/319,206	7/17/84
4,461,030	06/429,832	7/17/84
4,461,040	06/456,158	7/17/84
4,461,041	06/455,688	7/17/84
4,757,555	07/077,837	7/19/88
4,757,558	07/047,624	7/19/88
4,757,559	06/922,042	7/19/88
4,757,561	07/092,654	7/19/88
4,757,562	06/556,708	7/19/88
4,757,563	07/090,541	7/19/88
4,757,564	06/899,843	7/19/88
4,757,568	07/013,594	7/19/88
4,757,571	06/853,651	7/19/88
4,757,572	06/922,531	7/19/88
4,757,574	07/147,472	7/19/88
4,757,576	06/924,775	7/19/88
4,757,578	06/943,326	7/19/88
4,757,582	07/012,848	7/19/88
4,757,594	06/884,972	7/19/88
4,757,603	07/045,988	7/19/88
4,757,605	06/863,926	7/19/88
4,757,610	07/110,323	7/19/88
4,757,611	07/009,838	7/19/88
4,757,616	07/112,403	7/19/88
4,757,617	06/838,948	7/19/88
4,757,618	06/932,634	7/19/88
4,757,623	07/044,415	7/19/88
4,757,624	07/030,335	7/19/88
4,757,628	07/031,021	7/19/88
4,757,629	06/805,891	7/19/88
4,757,634	07/100,407	7/19/88
4,757,635	07/042,029	7/19/88
4,757,641	07/072,374	7/19/88
4,757,642	07/018,714	7/19/88
4,757,650	06/913,337	7/19/88
4,757,653	07/006,116	7/19/88
4,757,662	07/012,388	7/19/88
4,757,663	07/048,219	7/19/88
4,757,669	07/119,033	7/19/88
4,757,672	06/461,330	7/19/88
4,757,673	06/890,365	7/19/88
4,757,676	07/065,343	7/19/88
4,757,682	07/010,471	7/19/88
4,757,685	07/088,448	7/19/88
4,757,692	07/132,461	7/19/88
4,757,693	07/041,285	7/19/88
4,757,694	06/871,938	7/19/88
4,757,699	07/028,684	7/19/88
4,757,717	06/934,767	7/19/88
4,757,718	07/029,503	7/19/88
4,757,719	07/050,021	7/19/88
4,757,720	07/040,555	7/19/88
4,757,722	06/923,618	7/19/88
4,757,723	07/011,686	7/19/88
4,757,725	06/884,801	7/19/88
4,757,729	06/875,458	7/19/88
4,757,735	07/013,032	7/19/88
4,757,737	06/844,930	7/19/88
4,757,738	07/076,848	7/19/88
4,757,741	06/937,912	7/19/88
4,757,744	06/807,872	7/19/88
4,757,751	07/053,773	7/19/88
4,757,753	07/011,745	7/19/88
4,757,754	07/004,590	7/19/88
4,757,756	06/868,782	7/19/88
4,757,759	06/836,409	7/19/88
4,757,761	07/028,606	7/19/88
4,757,770	07/085,617	7/19/88
4,757,772	07/085,629	7/19/88
4,757,775	06/932,302	7/19/88
4,757,777	07/015,911	7/19/88
4,757,778	06/884,065	7/19/88
4,757,779	06/855,747	7/19/88
4,757,786	06/791,119	7/19/88
4,757,799	06/871,793	7/19/88
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4,757,858	06/401,780	7/19/88
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4,757,868	07/013,363	7/19/88
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4,757,899	07/095,410	7/19/88
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4,757,980	07/106,567	7/19/88
4,757,987	07/001,521	7/19/88
4,757,990	06/901,404	7/19/88
4,757,998	07/052,499	7/19/88
4,757,999	06/907,838	7/19/88
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4,758,083	07/042,258	7/19/88
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4,758,149	06/927,529	7/19/88
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4,758,162	06/928,814	7/19/88
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4,758,197	06/92[illegible],914	7/19/88
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4,758,219	06/73[illegible],472	7/19/88
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4,758,226	07/04[illegible],004	7/19/88
4,758,232	07/09[illegible],337	7/19/88
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4,758,237	07/00[illegible],148	7/19/88
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4,758,248	06/92[illegible],992	7/19/88
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4,758,252	07/00[illegible],446	7/19/88
4,758,262	06/86[illegible],869	7/19/88
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4,758,271	06/9[illegible],429	7/19/88
4,758,288	07/0[illegible],534	7/19/88
4,758,290	07/0[illegible],544	7/19/88
4,758,297	06/8[illegible],209	7/19/88
4,758,300	07/0[illegible],582	7/19/88
4,758,309	06/7[illegible],539	7/19/88
4,758,313	06/6[illegible],660	7/19/88
4,758,318	07/0[illegible],287	7/19/88
4,758,319	07/0[illegible],981	7/19/88
4,758,320	07/0[illegible],230	7/19/88
4,758,330	07/1[illegible],706	7/19/88
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4,758,427	4,758,445	7/19/88
4,758,454	4,758,460	7/19/88
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4,758,505	4,758,509	7/19/88
4,758,520	4,758,529	7/19/88
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4,758,545	4,758,558	7/19/88
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4,758,722	4,758,725	7/19/88
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4,758,752	4,758,763	7/19/88
4,758,766	4,758,775	7/19/88
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NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,383,289	06/216,364	5/10/83	12/15/80	7/30/92
4,401,207	06/228,360	8/30/83	1/26/81	7/30/92
4,401,637	06/234,925	8/30/83	2/17/81	3/30/92
4,402,336	06/261,614	9/06/83	5/07/81	7/30/92
4,423,503	06/322,948	12/27/83	11/19/81	6/30/92
4,693,377	06/902,092	9/15/87	8/27/86	7/30/92
4,706,805	06/866,742	11/17/87	5/27/86	7/30/92
4,711,837	06/769,903	12/08/87	8/27/85	7/30/92

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,845,118, Re. S.N. 07/927,052, Filed Aug. 10, 1992, Cl. 514/338, SUBSTITUTED THIENOIMIDAZOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, AND THEIR USE INHIBITOR OF GASTRIC ACID SECRETION, Hans-Jochen Lang, et. al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt am Main, Germany*, Attorney or Agent: Frank E. Caffoe, Ex. Gp.: 1205

4,848,268, Re. S.N. 07/925,901, Filed Aug. 6, 1992, Cl. 118. APPARATUS AND METHOD FOR APPLYING A LIQUID TO A MOVING WEB, Hans-Peter Sollinger, et. al., Owner of Record: *J. M. Voith GmbH, St. Poeltener Strasse, Fed. Rep. of Germany*, Attorney or Agent: James A. Finder. Ex. Gp.: 1112

4,879,641, Re. S.N. 07/789,055, Filed Nov. 7, 1991, Cl. 363/98, ANALOG MULTIPLEX FOR SENSING THE MAGNITUDE AND SENSE OF THE CURRENT THROUGH A H-BRIDGE STAGE UTILIZING A SINGLE SENSING RESISTANCE, Domenico Russi, et. al., Owner of Record: *SGS-Thompson Microelectronics, Cilavegna, Italy*, Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2102

4,932,258, Re. S.N. 07/898,963, Filed June 12, 1992, Cl. 73/497, STRESS COMPENSATED TRANSDUCER, Brian L. Norling, Owner of Record: *Sundstrand Corp., Rockford, Ill.*, Attorney or Agent: Stanley J. Tomsa, Ex. Gp.: 2605

4,948,402, Re. S.N. 07/928,407, Filed Aug. 12, 1992, Cl. 55/233, MODULAR AIR SCRUBBER SYSTEM, H. Forbes Davis, Owner of Record: *Davis Water & Waste Industries, Inc., Tallevast, Fla.*, Attorney or Agent: Michael J. Keenan, Ex. Gp.: 1307

4,972,837, Re. S.N. 07/928,787, Filed Aug. 13, 1992, Cl. 128/653.4, CONTRAST AGENTS FOR NUCLEAR-MAGNETIC IMAGING, Barry L. Engelstad, et. al., Owner of Record: *The Regents of the University of California, Oakland, Calif.*, Attorney or Agent: Hana Dolezalova, Ex. Gp.: 3305

5,059,288, Re. S.N. 07/929,169, Filed Aug. 11, 1992, Cl. 203/43, RECOVERY OF ISOPROPYL ACETATE AND ETHANOL FROM AN ISOPROPYL ACETATE, ETHANOL AND WATER-CONTAINING STREAM, William J. Curry, Owner of Record: *Harborchem, Livingston, N.J.*, Attorney or Agent: Arnold H. Krumble, Ex. Gp.: 1308

5,079,137, Re. S.N. 07/928,310, Filed Aug. 12, 1992, Cl. 430/559, SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL, Shunji Takada, Owner of Record: *Fuji Photo Film Co., Ltd., Kanagawa, Japan*, Attorney or Agent: Leonard R Svensson, Ex. Gp.: 1506

5,083,399, Re. S.N. 07/929,586, Filed Aug. 17, 1992, Cl. 49/462, DOOR EDGE GUARD, Gerald R. Schotthoefer, Owner of Record: *Adell Corp., Sunnyvale, Tex.*, Attorney or Agent: H. Dennis Kelly, Ex. Gp.: 3508

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a))

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,504,310, Reexam. No. 90/002,810, Requested Aug. 7, 1992, Cl. 075/027, PROCESS FOR THE PRODUCTION OF HIGH

PURITY METALS OR ALLOYS, Laurent L. Boulier, Owner of Record: *C. Delachaux, Gennevillier, France*, Attorney or Agent: John P. Spitals, Ladas & Parry, New York, N.Y., Ex. Gp.: 1101, Requester: Carl G. Love, Cushman Darby & Cushman, Washington, D.C.

4,692,834, Reexam. No. 90/002,809, Requested Aug. 11, 1992, Cl. 361/091, ELECTRONIC DISCHARGE PROTECTION CIRCUIT WITH VARIABLE LIMITING THRESHOLD FOR MOS DEVICE, Hiroshi Iwahashi, et. al., Owner of Record: *Kabushi Kaisha Toshiba, Tokyo, Japan*, Attorney or Agent: Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C., Ex. Gp.: 2104, Requester: Owner

4,952,142, Reexam. No. 90/002,812, Requested Aug. 17, 1992, Cl. 433/009, METHOD OF BONDING ORTHODONTIC BRACKETS, James Nicholson, Owner of Record: *Inventor, Hattiesburg, Miss.*, Attorney or Agent: Ralph A. Dowell, Dowell & Dowell, Arlington, Va., Ex. Gp.: 3303, Requester: Owner

5,029,954, Reexam. No. 90/002,813, Requested Aug. 10, 1992, Cl. 350/4.200, KALEIDOSCOPE, Mark W. Eilrich, et. al., Owner of Record: *Wildewoods Creative Products, Sonora, Calif.*, Attorney or Agent: Louis J. Bevasso, Poms, Smith, Lande & Rose, Los Angeles, Calif., Ex. Gp.: 2101, Requester: Owner

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Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Nov. 5, 1992.

Cruz, Lawrence, 811 N. Douglas Ave., Arlington Hgts., Ill. 60004
Schroeder, Werner H., 3026 Beechwood Ln., Falls Church, Va. 22042

Aug. 26, 1992 CAMERON WEIFFENBACH
Director
Office of Enrolment and Discipline

Registration To Practice

The following list contains the names of persons who successfully passed the registration examination that was held Apr. 8, 1991. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Nov. 5, 1992.

Arnold, Gianna J., 464 Tache, #304, Hull Quebec, Canada J9A 1M7
Bigley, Francis P., 418 Homestead Ct., Warminster, Pa. 18974
Brookes, Allan A., 1557 Lombard St., San Francisco, Calif. 94123
Finley, Stephen L., 4833 S. First St., Arlington, Va. 22204
Fountain, George L., 603 Cheswold Ct., Wayne, Pa. 19087
Frank, Scott M., 6530 E. Windsor Ln., Norcross, Ga. 30093
Harrington, Richard C., 600-4-5B Pine Hollow Rd., E. Norwich, N.Y. 11732
Heimbecher, Reed R., P.O. Box 71371, Los Angeles, Calif. 90071
Hogle, Doreen M., 32 Leonard Ave., Newton, Mass. 02160
Hough, Duane D., 780 Pleasantville Rd., Briarcliff Manor, N.Y. 10510
Lehnigk, Goerge F., 3019 Oakton Meadows Ct., Oakton, Va. 22124
Leslie, Mark R., 151 N. Craig St., #10-B, Pittsburgh, Pa. 15213
Messenger, Ernamarie, 2209 Stratford Rd., Delaware, Ohio 43015
Neth, Joann M., 10922 Pebble Run Dr., Silver Spring, Md. 20902
Reif, Kevin A., 1802 Sycamore Valley Dr., #103, Reston, Va. 22090
Smith, Kay-Ellen, 25 Fern Dr., Roslyn, N.Y. 11576
Stignani, Mark D., 4900 28th Ave. S., Minneapolis, Minn. 55417
Treanor, Richard L., 1725 New Hamp., Ave., N.W., #506, Washington, D.C. 20009
Trovato, Karen I., 269 Barger St., Putham Valley, N.Y. 10579
Twardzik, Barbara S., 14230 Forsythe Rd., Sykesville, Md. 21784

Aug. 26, 1992 CAMERON WEIFFENBACH
Director
Office of Enrollment and Discipline

Registration To Practice

The following list contains the names of persons who successfully passed the registration examination that was held Aug. 21, 1991. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Nov. 5, 1992.

Aberle, Timothy J., 6300 Stevenson Ave., #923, Alexandria, Va. 22304
Carroll, Kevin James, 14 Essex St., #1, Concord, N.H. 03301

Aug. 26, 1992 CAMERON WEIFFENBACH
Director
Office of Enrollment and Discipline

Classification of Patents Issued Aug. 18, 1992

The General and Mechanical portion of the Classification Section was inadvertently omitted from the *Official Gazette*. The information appears on the following pages.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 18, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
9 5,138,714
96 5,138,715
108 5,138,716
123 5,138,717
159 5,138,718
168 5,138,719
207 5,138,720
209 5,138,722
267 5,138,721
430 5,138,723

CLASS 4
241 5,138,724
393 5,138,725
420.4 5,138,726

CLASS 5
13 5,138,727
453 5,138,729
481 5,138,730
625 5,138,731
636 5,138,732
645 5,138,728

CLASS 15
22.1 5,138,733
28 5,138,734
97.1 5,138,735
119.2 5,138,736
143.1 5,138,737
247 5,138,738
250.42 5,138,739
256.51 5,138,740
340.1 5,138,741
5,138,742

CLASS 16
303 5,138,743
325 5,138,744
380 5,138,745

CLASS 24
20 R 5,138,746
5,138,747
30.55 5,138,748
196 5,138,749
587 5,138,750
637 5,138,751

CLASS 29
235 5,138,752
238 5,138,753
252 5,138,754
263 5,138,755
401.1 5,138,756
407 5,138,757
432.2 5,138,758
467 5,138,759
525 5,138,760
602.1 5,138,761
749 5,138,762
768 5,138,763
890.039 5,138,764
890.042 5,138,765
895.212 5,138,766

CLASS 30
43.92 5,138,767
151 5,138,768
392 5,138,769

CLASS 33
28 5,138,770
395 5,138,771
613 5,138,772

CLASS 34
13.8 5,138,773

CLASS 36
3 B 5,138,775
38 5,138,776
88 5,138,777
164 5,138,774

CLASS 38
77.8 5,138,778

CLASS 40
1.6 5,138,779
152 5,138,780
524 5,138,781
541 5,138,782
546 5,138,783
665 5,138,784

CLASS 42
66 5,138,785
70.11 5,138,786
98 5,138,787

CLASS 43
25 5,138,788
42.13 5,138,789
44.83 5,138,790
53.5 5,138,791

CLASS 47
9 5,138,792
57.6 5,138,793
58 5,138,794

CLASS 49
138 5,138,795
238 5,138,796

CLASS 51
102 5,138,797
124 L 5,138,798
165 R 5,138,799
165.71 5,138,800
204 5,138,801

CLASS 52
36 5,138,802
5,138,803
51 5,138,804
170 5,138,806
177 5,138,807
204 5,138,808
235 5,138,809
254 5,138,810
400 5,138,811
584 5,138,812
600 5,138,813
656 5,138,814
742 5,138,820
5,138,805

CLASS 53
55 5,138,815
381.7 5,138,816
399 5,138,817
429 5,138,821
443 5,138,822
520 5,138,823
556 5,138,818

CLASS 56
10.2 5,138,819
5,138,824
11.1 5,138,825
14.6 5,138,826

CLASS 57
270 5,138,827
281 5,138,828
288 5,138,829
315 5,138,830

CLASS 60
39.34 5,138,831
203.1 5,138,832
274 5,138,833
276 5,138,834
278 5,138,835
311 5,138,836
426 5,138,837
433 5,138,838
602 5,138,839
624 5,138,840
752 5,138,841

CLASS 62
80 5,138,842
82 5,138,843
89 5,138,844
99 5,138,845
148 5,138,846
244 5,138,851
292 5,138,847

CLASS 66
57 5,138,848
104 5,138,849
221 5,138,850

CLASS 70
16 5,138,852
209 5,138,853
264 5,138,854
457 5,138,855
493 5,138,856

CLASS 72
19 5,138,857
68 5,138,858
110 5,138,859
164 5,138,860
185 5,138,861
347 5,138,862
353.4 5,138,863
410 5,138,864
422 5,138,865
455 5,138,866

CLASS 73
1 H 5,138,867
1 R 5,138,868
31.03 5,138,869
38 5,138,870
5,138,871
64.41 5,138,872
118.1 5,138,873
5,138,874
151 5,138,875
155 5,138,876
5,138,877
159 5,138,878
160 5,138,879
304 C 5,138,880
304 R 5,138,881
483 5,138,882
504 5,138,883
662 5,138,884
723 5,138,885
749 5,138,886
856 5,138,887
861.83 5,138,888
863.12 5,138,889
864.66 5,138,890
864.67 5,138,891
865.6 5,138,892

CLASS 74
200 5,138,894
477 5,138,895
499 5,138,896
501.5 R 5,138,897
502.6 5,138,898
512 5,138,899
551.1 5,138,893
551.7 5,138,900
551.8 5,138,901
574 5,138,902
606 R 5,138,903
661 5,138,904
844 5,138,905
866 5,138,906
5,138,907

CLASS 76
104.1 5,138,908

CLASS 81
9.41 5,138,909
9.51 5,138,910
177.2 5,138,911
363 5,138,912
434 5,138,913
451 5,138,914
463 5,138,915
474 5,138,916
487 5,138,917

CLASS 82
1.11 5,138,918

CLASS 83
139 5,138,919
471.2 5,138,920
501 5,138,921
615 5,138,922
665 5,138,923

CLASS 84
604 5,138,924
609 5,138,925
615 5,138,926
624 5,138,927
635 5,138,928

CLASS 89
8 5,138,929
11 5,138,930
161 5,138,931

CLASS 91
378 5,138,932
462 5,138,933

CLASS 92
5 R 5,138,934
88 5,138,935
98 D 5,138,936

CLASS 99
323.4 5,138,937
331 5,138,938
482 5,138,939
538 5,138,940

CLASS 100
53 5,138,941
88 5,138,942

CLASS 101
115 5,138,943
365 5,138,944
425 5,138,945

CLASS 102
201 5,138,946
213 5,138,947
335 5,138,948
431 5,138,949
462 5,138,950
521 5,138,951

CLASS 105
72.2 5,138,952
149.2 5,138,953
199.3 5,138,954

CLASS 108
1 5,138,955
107 5,138,956

CLASS 110
234 5,138,957
346 5,138,958
5,138,959

CLASS 112
103 5,138,960
291 5,138,961
311 5,138,962

CLASS 114
222 5,138,963
229 5,138,964
230 5,138,965
274 5,138,966
301 5,138,967

CLASS 116
294 5,138,968

CLASS 118
72 5,138,969
126 5,138,970
624 5,138,971
699 5,138,972
723 5,138,973
731 5,138,974

CLASS 119
3 5,138,975
4 5,138,976
14.17 5,138,977
51.04 5,138,978
5,138,979
73 5,138,980
99 5,138,981

CLASS 122
4 D 5,138,982

CLASS 123
52 MV 5,138,983
73 A 5,138,984
90.17 5,138,985
179.21 5,138,987
179.3 5,138,986
188.14 5,138,988
193.5 5,138,989
5,138,990
196 R 5,138,991
198 F 5,138,992
228 5,138,993
248 5,138,994
335 5,138,995
5,138,996
449 5,138,997
5,138,998
502 5,138,999
514 5,139,000
520 5,139,001
575 5,139,002
635 5,139,003
644 5,139,004

CLASS 125
11.01 5,139,005
12 5,139,006

CLASS 126
39 J 5,139,007
77 5,139,008
299 R 5,139,009
451 5,139,010
512 5,139,011
522 5,139,012

CLASS 128
24 AA 5,139,013
57 5,139,014
200.16 5,139,016
201.28 5,139,017
207.14 5,139,018
207.15 5,139,019
419 PG 5,139,020
630 5,139,021
633 5,139,022
637 5,139,023
653.5 5,139,024
665 5,139,025
687 5,139,026
696 5,139,027
697 5,139,028
743 5,139,029
745 5,139,030
771 5,139,031
772 5,139,032
785 5,139,033

CLASS 131
277 5,139,034
299 5,139,035

CLASS 132
73.5 5,139,036
203 5,139,037
325 5,139,038

CLASS 134
95.1 5,139,039

CLASS 135
69 5,139,040

CLASS 137
15 5,139,041
5,139,042
43 5,139,043
80 5,139,044
114 5,139,045
505.42 5,139,046
543.21 5,139,047
553 5,139,048
614.05 5,139,049
625.29 5,139,050
630 5,139,051

CLASS 139
65 5,139,052
82 5,139,053

CLASS 140
3 CA 5,139,054

CLASS 141
1 5,139,055
5,139,056
18 5,139,057
40 5,139,058
237 5,139,059

CLASS 142
39 5,139,060

CLASS 144
134 A 5,139,061
144.5 R 5,139,062
176 5,139,063
337 5,139,064
371 5,139,065

CLASS 152
7 5,139,066
381.3 5,139,067

CLASS 160
66 5,139,068
84.1 5,139,069
5,139,070
115 5,139,071
176.1 5,139,072
177 5,139,073
271 5,139,074
310 5,139,075
371 5,139,076

CLASS 164
66.1 5,139,077

CLASS 165
10 5,139,078
61 5,139,079
67 5,139,080
104.12 5,139,081
104.32 5,139,082
113 5,139,083
162 5,139,084

CLASS 166
165 5,139,085
178 5,139,086
249 5,139,087
267 5,139,088
311 5,139,089
369 5,139,090

CLASS 172
15 5,139,091

CLASS 173
1 5,139,092
97 5,139,093

CLASS 175
61 5,139,094
68 5,139,095
92 5,139,096
122 5,139,097
269 5,139,098
292 5,139,099

CLASS 177
25.15 5,139,100
139 5,139,101

CLASS 180
19.2 5,139,102
24.01 5,139,103
89.13 5,139,104
140 5,139,105
148 5,139,106

CLASS 181
240 5,139,107

CLASS 187
18 5,139,110
51 5,139,111
57 5,139,112
133 5,139,113

CLASS 188
1.11 5,139,114
5,139,115
1.12 5,139,116
218 XL 5,139,117
264 CC 5,139,118
299 5,139,119
378 5,139,120

CLASS 192
1.43 5,139,121
3.29 5,139,122
45.1 5,139,123

48.3 5,139,124
58 B 5,139,125
111 A 5,139,126

CLASS 194

239 5,139,127
338 5,139,129
343 5,139,128
346 5,139,130

CLASS 198

346.1 5,139,131
376 5,139,132
750 5,139,133
780 5,139,134
852 5,139,135

CLASS 206

38 5,139,136
150 5,139,137
228 5,139,138
229 5,139,139
268 5,139,140
329 5,139,141
362.3 5,139,142
373 5,139,143
378 5,139,144
386 5,139,145
387 5,139,146
431 5,139,147
455 5,139,148
523 5,139,151
524.7 5,139,152
594 5,139,153

CLASS 209

273 5,139,154
534 5,139,149
576 5,139,150

CLASS 211

13 5,139,160
169 5,139,155

CLASS 212

149 5,139,156
175 5,139,157

CLASS 213

1.6 5,139,158
75 R 5,139,159
124 5,139,161

CLASS 215

1 C 5,139,162

CLASS 220

258 5,139,163
306 5,139,164
339 5,139,165
574 5,139,166

CLASS 221

312 A 5,139,167

CLASS 222

92 5,139,168
103 5,139,169
137 5,139,170
5,139,171
181 5,139,172
185 5,139,173
189 5,139,174
195 5,139,175
238 5,139,176
322 5,139,177
326 5,139,178
399 5,139,179
402.13 5,139,180
480 5,139,181
519 5,139,182
547 5,139,183

CLASS 223

98 5,139,184
111 5,139,185

CLASS 224

42.39 5,139,186
151 5,139,187
217 5,139,188
252 5,139,189

CLASS 226

74 5,139,190

CLASS 228

122 5,139,191
179 5,139,192
180.2 5,139,193

CLASS 229

23 R 5,139,194
143 5,139,195
157 5,139,196

CLASS 236

49.3 5,139,197

CLASS 238

10 B 5,139,198

CLASS 239

222.19 5,139,199
288.3 5,139,200
343 5,139,201
587.4 5,139,202

CLASS 241

20 5,139,203
21 5,139,204
33 5,139,205

CLASS 242

45 5,139,206
55 5,139,207
85.1 5,139,208
118.7 5,139,209
129 5,139,210
157 R 5,139,211
261 5,139,212
279 5,139,213
298 5,139,214

CLASS 244

3.21 5,139,215
5,139,216
164 5,139,217
165 5,139,218

CLASS 248

97 5,139,219
122 5,139,220
231.8 5,139,221
311.2 5,139,222
324 5,139,223

CLASS 251

50 5,139,224
61.2 5,139,225
129.08 5,139,227
129.2 5,139,226
149.6 5,139,228
174 5,139,229
285 5,139,230

CLASS 25

15 5,139,231
122 5,139,232
134 5,139,233

CLASS 25

II 5,139,234
36 5,139,235

CLASS 26

78 5,139,236
236 5,139,237
238 5,139,238
275 5,139,239

CLASS 2

140.12 5,139,241
140.13 5,139,240
160 5,139,242
167 5,139,243
293 5,139,244

CLASS 2

21 5,139,245
242 5,139,246

CLASS 2

39 5,139,247
5,139,248
53 5,139,249

CLASS

II 5,139,250
34 5,139,251
117 5,139,252
197 5,139,253
215 5,139,254

CLASS

29 BG 5,139,256
32 E 5,139,257
76 5,139,258
118 A 5,139,259
148 B 5,139,261
179 C 5,139,262
186.1 5,139,263
191 R 5,139,264
240 5,139,266
246 5,139,267
249 5,139,268
256 5,139,269
269 5,139,270
272 5,139,271
345 5,139,272
346 5,139,273

CLASS 277

58 5,139,274
134 5,139,275
163 5,139,276

CLASS 279

124 5,139,277

CLASS 280

47.26 5,139,278
91 5,139,279
741 5,139,280
775 5,139,281
808 5,139,282
819 5,139,283
823 5,139,284
849 5,139,285

CLASS 285

26 5,139,287
50 5,139,288
80 5,139,289
105 5,139,286
112 5,139,290

CLASS 292

42 5,139,291
92 5,139,292
246 5,139,294
251.5 5,139,293

CLASS 293

117 5,139,295
5,139,296
5,139,304
132 5,139,297

CLASS 294

145 5,139,298
159 5,139,299

CLASS 296

39.1 5,139,300
63 5,139,301
93 5,139,302
97.9 5,139,303
146 F 5,139,305
198 5,139,306
201 5,139,307

CLASS 297

191 5,139,308
194 5,139,309
391 5,139,310
481 5,139,311

CLASS 299

13 5,139,312
34 5,139,313

CLASS 301

36 R 5,139,314

CLASS 303

95 5,139,315
119 SV 5,139,316

CLASS 305

12 5,139,317

CLASS 312

1 5,139,318
7.1 5,139,319
9.53 5,139,320
209 5,139,321
351 5,139,322

CLASS 351

45 5,139,323
158 5,139,324
161 5,139,325
205 5,139,326

CLASS 356

I 5,139,327
39 5,139,328
70 5,139,329
5,139,330
218 5,139,331
243 5,139,332
246 5,139,333
301 5,139,334
328 5,139,335
349 5,139,336
358 5,139,337
376 5,139,338
446 5,139,339

CLASS 359

63 5,139,340
251 5,139,341
708 5,139,342

CLASS 362

226 5,139,343

CLASS 374

28 5,139,344
179 5,139,345

CLASS 383

107 5,139,346

CLASS 384

15 5,139,347
275 5,139,348
322 5,139,349
420 5,139,350

CLASS 400

120 5,139,351
208 5,139,352
584 5,139,353
605 5,139,354
616.1 5,139,355

CLASS 401

65 5,139,356
146 5,139,357

CLASS 403

7 5,139,358
24 5,139,359
396 5,139,360
408.1 5,139,361

CLASS 404

95 5,139,362

CLASS 405

63 5,139,363
81 5,139,364
129 5,139,365
198 5,139,366
201 5,139,367
230 5,139,368
262 5,139,369

CLASS 406

171 5,139,370

CLASS 407

101 5,139,371
118 5,139,372

CLASS 408

1 R 5,139,376

CLASS 409

80 5,139,373

CLASS 410

64 5,139,374
105 5,139,375

CLASS 411

340 5,139,377
353 5,139,378
368 5,139,379
433 5,139,381
437 5,139,380

CLASS 413

43 5,139,382

CLASS 414

3 5,139,383
281 5,139,384
667 5,139,385
794.4 5,139,386
795.8 5,139,387
799 5,139,388

CLASS 415

74 5,139,391

CLASS 416

248 5,139,389

CLASS 417

53 5,139,390
269 5,139,392
292 5,139,393
356 5,139,394
366 5,139,395
423.4 5,139,396
423.5 5,139,397
511 5,139,398

CLASS 418

9 5,139,399
48 5,139,400
67 5,139,401

CLASS 425

71 5,139,402
111 5,139,403
5,139,404
116 5,139,405
140 5,139,406
174.8 E 5,139,407
186 5,139,408
417 5,139,409
530 5,139,410
556 5,139,411

CLASS 431

12 5,139,412
77 5,139,413
176 5,139,414
242 5,139,415
354 5,139,416
5,139,417

CLASS 432

122 5,139,418

CLASS 433

24 5,139,419
31 5,139,420
5,139,421
126 5,139,422
201.1 5,139,424

CLASS 434

201 5,139,423

CLASS 439

17 5,139,425
65 5,139,426
66 5,139,427
133 5,139,429
157 5,139,430
159 5,139,435
188 5,139,436
266 5,139,437
269 5,139,438
359 5,139,439
364 5,139,431
372 5,139,432
395 5,139,433
399 5,139,434
413 5,139,440
472 5,139,441
620 5,139,442
5,139,443
668 5,139,444
676 5,139,445
751 5,139,446
752 5,139,447
876 5,139,448

CLASS 440

76 5,139,449

CLASS 441

5,139,450

CLASS 445

30 5,139,451
63 5,139,452

CLASS 446

75 5,139,453
150 5,139,454
219 5,139,455
231 5,139,456

CLASS 452

160 5,139,457

CLASS 454

147 5,139,458
187 5,139,459

CLASS 464

88 5,139,460
102 5,139,461

CLASS 472

119 5,139,462

CLASS 474

69 5,139,463
155 5,139,464

CLASS 475

24 5,139,465
191 5,139,466
235 5,139,467
324 5,139,468

CLASS 482

52 5,139,469
53 5,139,470
58 5,139,255
79 5,139,471
93 5,139,472

CLASS 600

3 5,139,473
15 5,139,474

CLASS 602

4 5,139,475
26 5,139,476
5,139,477
27 5,139,479
62 5,139,015

CLASS 604

8 5,139,480
26 5,139,478
49 5,139,481
66 5,139,482
[illegible] 5,139,483
154 5,139,484
158 5,139,485
164 5,139,486
165 5,139,487
184 5,139,488
192 5,139,489
201 5,139,490
294 5,139,491
339 5,139,492
349 5,139,493

CLASS 606

3 5,139,494
17 5,139,495
23 5,139,496
69 5,139,497
5,139,498
73 5,139,499
96 5,139,500
107 5,139,501
5,139,509
108 5,139,502
122 5,139,503
127 5,139,504
154 5,139,505
159 5,139,506
167 5,139,507
184 5,139,508
196 5,139,510
198 5,139,511
201 5,139,512
219 5,139,513
224 5,139,514

CLASS 623

1 5,139,515
3 5,139,516
5,139,517
5 5,139,518
6 5,139,519
13 5,139,520
20 5,139,521
23 5,139,522
37 5,139,523
38 5,139,524
55 5,139,525
59 5,139,526
66 5,139,527
5,139,528
5,139,529

PATENT NOTICES

Certificates of Correction For Week of September 22, 1992

D. 310,381 4,949,036 4,988,757 5,004,942
D. 314,114 4,949,889 4,988,993 5,005,134
D. 316,807 4,950,226 4,989,623 5,005,209
D. 321,673 4,950,847 4,990,048 5,005,234
Re. 33,414 4,952,110 4,990,083 5,005,421
4,701,460 4,952,494 4,990,284 5,005,731
4,783,250 4,952,538 4,990,497 5,005,741
4,792,702 4,955,381 4,990,625 5,006,120
4,796,828 4,956,633 4,990,743 5,006,141
4,809,855 4,957,097 4,991,359 5,006,170
4,810,080 4,957,600 4,991,389 5,006,235
4,817,509 4,957,766 4,991,541 5,006,259
4,819,740 4,959,364 4,992,394 5,006,297
4,820,521 4,959,399 4,992,397 5,006,610
4,828,700 4,959,662 4,992,593 5,006,806
4,837,171 4,960,070 4,992,646 5,007,094
4,843,377 4,960,652 4,992,841 5,007,198
4,845,647 4,960,662 4,992,860 5,007,304
4,849,531 4,961,105 4,993,696 5,007,316
4,860,666 4,961,538 4,993,756 5,007,573
4,866,101 4,961,751 4,993,949 5,007,641
4,867,797 4,962,083 4,994,140 5,008,074
4,871,709 4,962,976 4,994,210 5,008,101
4,872,038 4,963,074 4,994,284 5,008,186
4,873,125 4,963,236 4,994,344 5,008,259
4,879,058 4,963,834 4,994,387 5,008,381
4,800,752 4,964,065 4,994,607 5,008,941
4,884,580 4,964,656 4,995,098 5,009,220
4,884,820 4,964,799 4,995,416 5,009,456
4,886,367 4,965,159 4,995,592 5,009,806
4,891,702 4,965,175 4,996,005 5,010,347
4,895,421 4,966,839 4,996,130 5,010,972
4,896,190 4,967,234 4,996,470 5,010,985
4,897,031 4,968,196 4,997,165 5,011,567
4,897,046 4,968,331 4,997,662 5,012,097
4,897,319 4,968,391 4,997,769 5,012,155
4,898,144 4,970,203 4,998,134 5,012,298
4,899,053 4,970,592 4,998,307 5,012,316
4,900,157 4,970,882 4,998,454 5,012,856
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VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

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*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during August 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,897,596 to 3,902,195 inclusive
Plant Patents ..... 3,755 to 3,775

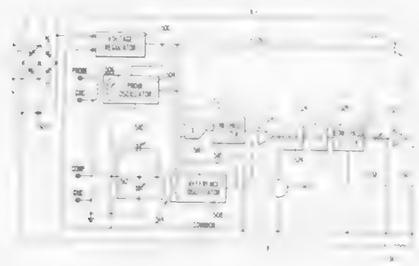
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,146,834 (1798th)

ADMITTANCE MEASURING SYSTEM FOR MONITORING THE CONDITION OF MATERIALS

Frederick L. Maltby, Jenkintown; Jonathan Kramer, and Kenneth M. Loewenstern, both of Warminster, all of Pa., assignors to Drexelbrook Controls, Inc.

Reexamination Request No. 90/002,405, Aug. 21, 1991.
Reexamination Certificate for Patent No. 4,146,834, issued Mar. 27, 1979, Ser. No. 743,618, Nov. 22, 1976.
Continuation-in-part of Ser. No. 507,540, Sep. 19, 1974, Pat. No. 3,993,947
Int. Cl.[5] G01R *11/52, 27/26*
U.S. Cl. 324—610



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–35** is confirmed.

1. In a two-wire transmitter system comprising a power supply and a load at one location and a two-wire transmitter at another location interconnected by a pair of transmission lines carrying a variable signaling current, the improvement comprising:

an admittance sensing probe including a probe electrode adapted to sense the condition and corresponding admittance of materials;

an admittance responsive network coupled to said probe representing the condition of materials; and

output means coupled to said admittance responsive network for varying the signaling current in response to the condition of materials.

B1 4,203,158 (1799th)

ELECTRICALLY PROGRAMMABLE AND ERASABLE MOS FLOATING GATE MEMORY DEVICE EMPLOYING TUNNELING AND METHOD OF FABRICATING SAME

Dov Frohman-Bentchkowsky, Haifa, Israel; Jerry Mar, Sunnyvale, Calif.; George Perlegos, Cupertino, Calif., and William S. Johnson, Palo Alto, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Reexamination Request No. 90/002,503, Nov. 7, 1991.
Reexamination Certificate for Patent No. 4,203,158, issued May 13, 1980, Ser. No. 969,819, Dec. 15, 1978.
Continuation-in-part of Ser. No. 881,029, Feb. 24, 1978, abandoned
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **8** and **10** are cancelled.

Claims **1, 9, 11, 12** and **14** are determined to be patentable as amended.

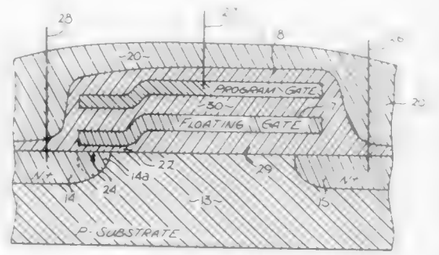
Claims **2–7, 13** and **15, 16**, dependent on an amended claim, are determined to be patentable.

9. An MOS memory device fabricated on a p-type silicon substrate comprising:

a first and second spaced-apart, n-type region in said substrate, said regions defining a channel there between, *said second region defining a laterally extending finger;*

a first oxide layer disposed over said channel;

an electrically floating, polycrystalline silicon gate disposed over said channel and insulated from said channel by said first oxide layer, *said floating gate extending across said finger;*



a third n-type region in said substrate contiguous with said second region;

a second oxide layer 70 Å to 200 Å thick disposed over at least a portion of said third region;

said floating gate extending over said portion of said third region and insulated from said third region by said second oxide layer;

a second conductive gate disposed above and insulated from said floating gate *and extending beyond the edges of said floating gate at said third region, said second gate extending across said finger;*

whereby, by the application of a positive potential to said second gate, charge is tunneled from said third region into said floating gate through said second oxide layer, and whereby, by the application of a positive potential to said second region, charge is tunneled from said floating gate through said second oxide layer to said third region.

B1 4,260,005 (1800th)

SELF-LOCKING FASTENER, FASTENER SYSTEM AND PROCESS

Edgar L. Stencel, Huntington Beach, Calif., assignor to VSI Corporation

Reexamination Request Nos. 90/002,222, Dec. 6, 1990 and 90/002,247, Jan. 4, 1991.
Reexamination Certificate for Patent No. 4,260,005, issued Apr. 7, 1981, Ser. No. 849,756, Nov. 9, 1977.
Int. Cl.[5] F16B *39/02, 39/28*
U.S. Cl. 411—3

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–17, 19–34** are cancelled.

Claim 18 is determined to be patentable as amended.

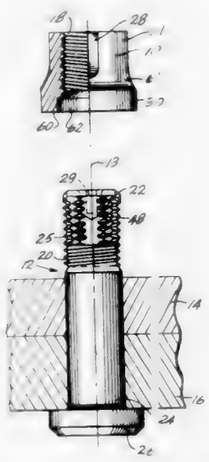
New claims 35 and 36 are added and determined to be patentable.

18. A fastener system comprising:

(a) a collar having an axial bore and internal threads in the axial bore, the internal threads as viewed along the axis of the bore being circular;

(b) at least [one lobe] *three equally spaced lobes* on the outside of the collar for engagement by a driver[,] *having at least three faces for applying a radial force on each lobe.* [the] *each* lobe having a surface that substantially parallels the axis of the bore;

(c) the lobe and collar material radially inward of [the] *each* lobe being plastically deformable in response to radial compressive forces of predetermined magnitude applied by the driver in concert with a workpiece corresponding to the yield strength of the *respective* lobe and the material radially inward of the lobe such that with such deformation both the lobe and the material radially inward thereof flow radially inward with the lobe tending to merge into the balance of the collar and the radially inward material protrudes into the axial bore;



(d) a pin having external threads for receipt of the internal threads of the collar; [and]

(e) means [of] *on* the pin for cooperating with the collar and applying a clamp-up load on a workpiece; *and*

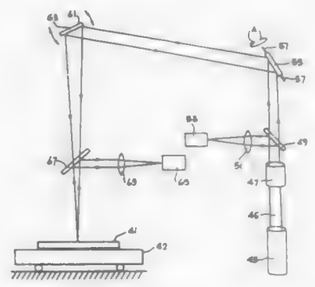
(f) a plurality of void volumes on the pin for receiving material of the collar that deforms radially inwardly and protrudes into the bore upon deformation of the lobes, the void volumes forming a surface on the pin that has varying radii from the axis of the pin, the number of void volumes on the pin being sufficiently greater than the number of lobes on the collar to assure that material radially inward from each lobe can flow into a void volume;

whereby, upon reaching the yield strength of the [lobe] *lobes* and material radially inward thereof, during the development of a clamp-up load on a workpiece the [lobe] *lobes deform* [and] radially [inward] *inwardly and* material [flow] radially inward [against] *from the lobes flow radially inward, so that a portion of the material of the collar protruding into the bore flows into such a void volume on the pin* to rotationally lock the pin and collar together.

B1 4,680,456 (1801st)
DATA SYSTEM EMPLOYING WALLET-SIZE OPTICAL CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation (Deleware)

Reexamination Request No. 90/001,978, Mar. 28, 1990.
Reexamination Certificate for Patent No. 4,680,456, issued Jul. 14, 1987, Ser. No. 763,028, Aug. 6, 1985.
Continuation-in-part of Ser. No. 673,572, Nov. 21, 1984, Pat. No. 4,544,835, and Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, each is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—454



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

1. A system for sequentially recording transaction data by means of a laser comprising,

a wallet size card with a transparent plastic laminating material protectively bonded to a strip of erasable high resolution direct-read-after-write optically [reflective] *reflectively* read laser recording material adhered to one side of the card, *said strip having prerecorded information, said strip also* being laser recordable in place on said card and having a minimal laser recording capacity of 250,000 binary bits, having laser created data spots in a surrounding optically contrasting field of said strip, representing accumulated transaction data, with a dimension of said spots being less than 25 microns, the optical reflective contrast ratio of said spots with respect to the surrounding field being at least two to one, *and*

laser means having a beam disposed in laser writing relation with respect to said strip for writing said spots, representing transaction data, [the spots having a size of less than 25 microns] *said transaction data being data added to previously recorded data on said card,*

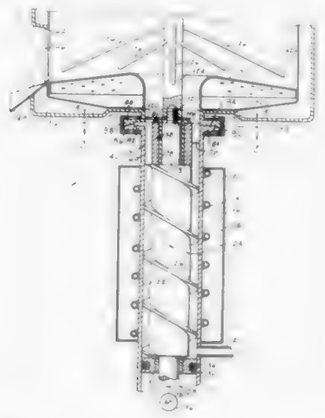
a light detector means disposed in reading relation with respect to said strip for reading said spots, *said light detector means including means reading said prerecorded information for generating reference position signals,* and

means for providing relative motion between the laser [beams] *beam* and the card for reading [transaction data on the card and] *previously recorded data and positioning the laser beam and card for* sequentially writing transaction data onto said card, *said relative motion providing means including means responsive to said reference position signals for ensuring reading and writing of transaction data at particular locations on said card.*

B1 4,741,173 (1802nd)
AUGER TYPE ICEMAKER

Charles G. Neumann, Palatine, Ill., assignor to Society National Bank

Reexamination Request No. 90/002,510, Nov. 14, 1991.
Reexamination Certificate for Patent No. 4,741,173, issued May 3, 1988, Ser. No. 823,826, Jan. 28, 1986.
Int. Cl.[5] F25C *1/14*
U.S. Cl. 62—298



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 and 6–12 is confirmed

Claims 4 and 5 are cancelled.

New claim 13 is added and determined to be patentable.

13. In an ice maker, apparatus including an elongated evaporator housing having an inner generally cylindrical freezing surface on which ice crystals are adapted to form, said housing having an opening at least at one end, an auger having a blade with a scraping edge and first and second ends, said first end of the blade being adjacent to said one end of the housing, bearing means mounting said auger for rotary movement about the axis of said cylindrical freezing surface in said housing to cause the scraping edge of said blade to scrape ice crystals off said surface and advance said crystals toward said one end of said housing, an extruding head having a central body portion extending along said axis, and formed with a plurality of ice extruding passages each passage having an inlet and an outlet and an outer boundary, the outer boundaries of the passages being situated substantially in an imaginary cylinder, means stationarily mounting said extruding head at said open one end of said housing with said passage inlets axially spaced from the axial locus of the said first end of said auger blade adjacent to said one end of said housing to form an ice crystal collecting plenum chamber, around the portion of said head between said passage inlets and said locus of said first end of said auger blade, from which ice crystals are fed to said inlets to emerge from said outlets as relatively hard bodies of ice, and divider means on said extruding head, said divider means being located in said ice collecting plenum chamber, extending radially from said central body portion to said imaginary cylinder and extending axially from said passage inlets toward said locus of said first end of said blade edge, and terminating substantially at said locus, said divider means dividing said plenum chamber into a number of subchambers less than the number of passages while effectively preventing rotation with said auger of any body of ice in said chamber.

B1 4,782,138 (1803rd)
PROCESS FOR SELECTIVELY SEPARATING THE ALPHA-LACTALBUMIN FROM THE PROTEINS OF WHEY

Jean-Paul Rialland, Retiers, and Jean-Pierre Barbier, St-Erblon, both of France, assignors to Laiteries E. Bridel, Societe Anonyme, Retiers, France

Reexamination Request No. 90/002,202, Nov. 13, 1990.
Reexamination Certificate for Patent No. 4,782,138, issued Nov. 1, 1988, Ser. No. 876,491, Jun. 17, 1986.
Claims priority, application France, Jun. 17, 1985, 85 09153
Int. Cl.[5] A23J *1/20*
U.S. Cl. 530—366

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 5–7 having been finally determined to be unpatentable, are cancelled.

Claims 1–3 and 9 are determined to be patentable as amended.

Claims 4 and 8 dependent on an amended claim, are determined to be patentable.

New claims 10–19 are added and determined to be patentable.

1. A [proess] *process* for selectively separating the alpha-lactalbumin from the proteins of whey, said process comprising heat treating whey concentrated to a dry matter content of 10 to 40% by weight, and acidified to a pH of less than 4, said whey being concentrated and acidified in any order, said heat treating being carried out at a temperature [not exceeding 75° C.,] *of from 60° C. to 75° C.* for a duration of 15 seconds to 1 [hour] *minute* sufficient to selectively precipitate substantially alpha-lactalbumin, and recovering said alpha-lactalbumin in the form of a precipitate from the whey.

B1-D300,184 1797
HANDBAG

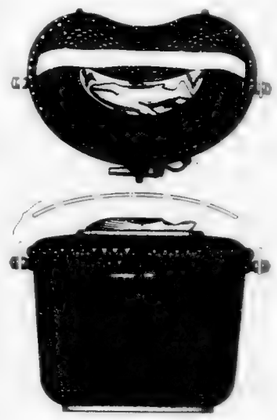
Glenaan M. Elliott, Nantucket, Mass., assignor to Glenaan, Inc., Nantucket, Mass.

Reexamination Request No. 90/002,526, Nov. 27, 1991.
Reexamination Certificate for Patent No. Des. 300,184, issued Mar. 14, 1989, Ser. No. 813,705, Dec. 27, 1985.
U.S. Cl. D3—51

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim one is cancelled.

[The ornamental design for a handbag, as shown and described.]



Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,070

METHOD AND SYSTEM FOR TRANSFERRING CALIBRATION DATA BETWEEN CALIBRATED MEASUREMENT INSTRUMENTS

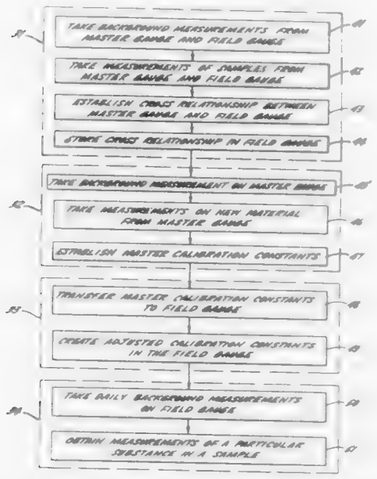
Ali Regimand, Research Triangle Park, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Original No. 4,864,842, dated Sep. 12, 1989, Ser. No. 226,137, Jul. 29, 1988. Application for reissue Jun. 7, 1990, Ser. No. 534,732

Int. Cl.[5] G01D *18/00*

U.S. Cl. 73—1 R

27 Claims



1. A test method for use with measurement instruments of the type which obtain measurement data from a sample and which utilize experimentally determined calibration curves to convert the measurement data into measurement readings, said test method being characterized by facilitating the calibration and use of a number of field instruments, and comprising the steps of

providing a master measurement instrument;

providing at least one field measurement instrument;

establishing a cross relationship between the measurement data detected by the master instrument and the measurement data detected by the field instrument;

obtaining a background measurement by the master instrument;

establishing master calibration data for a particular material by testing samples using the master instrument;

creating adjusted calibration data, specific for a particular field instrument, by adjusting the master calibration data based upon the previously established cross relationship between the master instrument and that particular field instrument *and the previously obtained master instrument background measurement;*

obtaining a background measurement by the field instrument; and

using the adjusted calibration data in the field instrument *and the background measurement obtained by the field instrument* to convert measurement data obtained by the field instrument into measurement readings.

Re. 34,071

SURFACE WELLHEAD

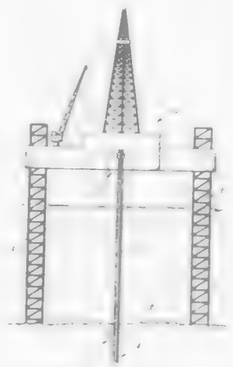
Bernard H. Van Bilderbeek, Houston, Tex., assignor to Ingram Cactus Company, Houston, Tex.

Original No. 4,938,289, dated Jul. 3, 1990, Ser. No. 274,192, Nov. 21, 1988. Continuation-in-part of Ser. No. 65,299, Jun. 22, 1987, Pat. No. 4,794,988. Application for reissue May 28, 1991, Ser. No. 706,024

Int. Cl.[5] E21B *7/12*

U.S. Cl. 166—342

45 Claims



24. A method of installing tubular casing through a blow-out preventer, the casing having a main axis and having a lower portion which has a locating member for engagement with a first fixture, and an upper portion which has an engagement member for engaging a support member on a second fixture in fixed spatial relationship to the first fixture, the engagement member and the support member being relatively movable in a direction axially of the casing, the method comprising setting the distance between the locating member and the engagement member greater than the distance between the first fixture and the support member, inserting the tubular casing through a blow-out preventer located on the second fixture, engaging the locating member with the first fixture, and bringing the engagement member and the support member into engagement, while the blow-out preventer is located above them on the second fixture, thereby to lock the casing between the first fixture and the support member.

Re. 34,072

MOTORCYCLE

Toshimitsu Asakura, Waki, and Tomoyuki Tagami, Soka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 46,949,244, dated Sep. 22, 1987, Ser. No. 813,254, Dec. 24, 1985. Continuation of Ser. No. 158,246, Feb. 19, 1988, abandoned. Application for reissue Sep. 22, 1989, Ser. No. 411,305

Claims priority, application Japan, Dec. 28, 1984, 59-278917; Dec. 29, 1984, 59-276553

Int. Cl.[5] B62K *5/04*

U.S. Cl. 180—68.3

14 Claims

1. A [motorcycle] *multiple-wheeled motorized vehicle* comprising:

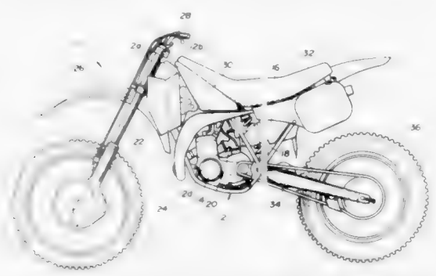
(a) an elongated frame having front and rear ends;

(b) an engine mounted on said frame;

(c) a fuel tank mounted on said frame above said engine and

having an upper surface extending along a length of the frame;

(d) an elongated seat mounted on said frame [above said fuel tank] *to extend* along the length of said frame, said seat having a bottom having a portion extending along the length thereof and disposed in spaced opposed relation to said upper surface of said fuel tank to define an air intake passageway therebetween, said passageway having an open front end opening toward the front end of said frame



and having a rear open end, said seat having a front end disposed [near to a front end o] *in overlying relationship to* said fuel tank so that said seat covers *at least a rear end portion of* said upper surface [of] *positioned above* said fuel tank [generally entirely]; and

(e) an air cleaner operatively connected to said engine and disposed rearwardly of said fuel tank, the rear open end of said passageway being in communication with said air cleaner whereby the ambient air can be fed to said air cleaner through said air intake passageway.

Re. 34,073

METHOD OF ANNOUNCING LOW LEVEL OF REMAINING LIQUID IN DROPPER

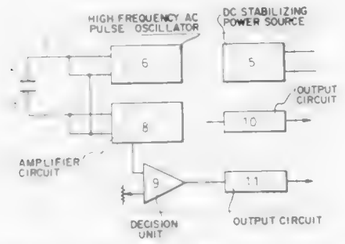
Takeo Suzuki, Kawasaki, Japan, assignor to Toho Plastic Co., Ltd., Kawasaki, Japan

Original No. 4,896,099, dated Jan. 23, 1990, Ser. No. 284,040, Dec. 14, 1988. Application for reissue Jan. 3, 1991, Ser. No. 637,572

Claims priority, application Japan, Feb. 10, 1988, 63-30591

Int. Cl.[5] **G08B** *21/00*, **G01F** *23/00*

U.S. Cl. 324—687 **2 Claims**



1. A method of announcing a low level of the remaining liquid in a dropper, comprising the steps of:

applying a pulse of a stable level to at least one of detecting electrodes attached to an outer surface of a lower portion of a liquid-containing dropper;

comparing a level of said pulse passed through an interior of said dropper with a reference pulse level, said reference pulse level being between a level of said pulse passed through said interior of said dropper when said liquid exists therein for defining a electrostatic capacity between said detecting electrodes and that of said pulse passed through said interior of said dropper when a remaining quantity of said liquid in said dropper decreases to such an extent that a significantly reduced electrostatic capacity is defined between said detecting electrodes; and

automatically actuating an annunciator when a judgement signal representative of unfavorable results derived from said step of comparing with said reference pulse level.

RE 34,074

Patent Not Issued For This Number

Re. 34,075

DERMAL USES OF TRANS-RETINOIDS FOR THE TREATMENT OF CANCER

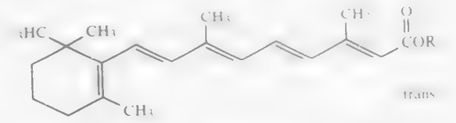
William P. Purcell, and Harlie A. Parish, both of Memphis, Tenn., assignors to Molecular Design International, Inc., Memphis, Tenn.

Original No. 4,994,491, dated Feb. 19, 1991, Ser. No. 284,185, Dec. 14, 1988. Continuation-in-part of Ser. No. 67,536, Jun. 29, 1987, Pat. No. 4,885,311. Application for reissue Jul. 18, 1991, Ser. No. 732,091

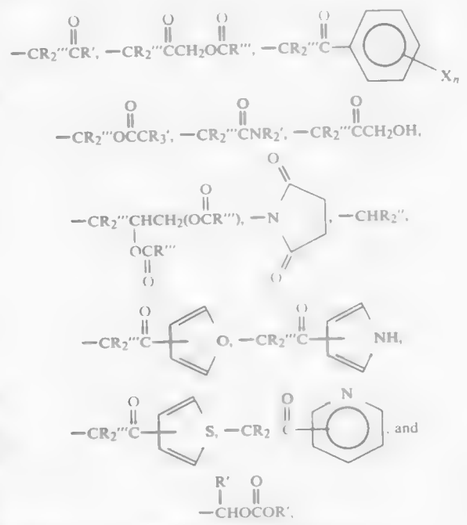
Int. Cl.[5] **A61K** *31/38, 31/40, 31/44, 31/215*

U.S. Cl. 514—529 **5 Claims**

1. A method for retarding and reversing the effects of skin cancer in a human subject requiring said treatment without the inducement of dermatitis which comprises topical application on a cancerous dermal site of said human subject a pharmaceutical composition which comprises an effective skin cancer treatment amount of a non-irritating retinoid having the formula

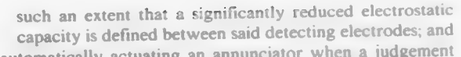


wherein R is a member of the group consisting of



wherein X is a member of the group consisting of

-continued



wherein *n* is a number from 1 to 5;

wherein R' is a member of the group consisting of H and any of the lower alkyls ranging from C_1 to C_6; wherein R'' is a member of the group consisting of

wherein each R''' is a member of the group consisting of R' and the hydrocarbon backbone of fatty acids; and further, where there are two or more R', R'', or R''' groups attached to the same carbon or nitrogen, each R', R'', R''' may be the same as or different from the other R', R'', R''' groups attached to that carbon or nitrogen; admixed with a pharmaceutically-acceptable topical vehicle.

Re. 34,076

METHOD FOR PRODUCING HYDROXY-CONTAINING ALKYLATED AROMATIC COMPOUNDS

Akira Takeshita; Shinzaburo Masaki; Takeo Fujii, all of Osaka; Tooru Tokumaru, and Akira Murakami, both of Ooita, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Original No. 4,912,264, dated Mar. 27, 1990, Ser. No. 59,119, Jun. 3, 1987. Application for reissue Jul. 15, 1991, Ser. No. 730,116

Claims priority, application Japan, Jun. 10, 1986, 61-133998; Jun. 10, 1986, 61-133999; Oct. 24, 1986, 61-254340; Oct. 24, 1986, 61-254341; Oct. 31, 1986, 61-260989; Oct. 31, 1986, 61-260990

Int. Cl.[5] **C07C** *37/14*

U.S. Cl. 568—790 **12 Claims**

1. A process for producing a hydroxy-containing alkylated aromatic compound, which comprises reacting, in liquid phase and at a temperature of 30°–150° C., an aromatic compound having at least one hydroxyl group selected from the group consisting of monohydric phenols, polyhydric phenols and naphthols, with an alkylating agent selected from the group consisting of *isobutene*, compounds represented by the formula:

$$R_1—CH=CH_2$$

wherein R_1 represents a straight or branched hydrocarbon residue having 1–10 carbon atoms, compounds represented by the formula:

$$R_2CH=CH—CH_3$$

wherein R_2 represents a straight or branched hydrocarbon residue having 1–9 carbon atoms, and cyclic unsaturated hydrocarbon shaving up to 10 carbon atoms, wherein the alkylating agent is used in an amount of 0.1–30 moles per mole of the aromatic compound, and the reaction is conducted in the presence of a heteropoly acid in an amount of [0.000–0.3] *0.00001–0.3* times by weight, and in the presence of water in an amount of 0.001–0.10 times by weight, based on the weight of the aromatic compound.

Re. 34,077

BLOOD SUBSTITUTE

Paul E. Segall; Harold D. Waitz, and Hal Sternberg, all of Berkeley, Calif., assignors to Cryomedical Sciences, Inc., Rockville, Md.

Original No. 4,923,442, dated May 8, 1990, Ser. No. 343,850, Apr. 26, 1989. Continuation-in-part of Ser. No. 189,011, May 2, 1988, abandoned. Application for reissue Oct. 23, 1990, Ser. No. 602,096

Int. Cl.[5] **A61K** *31/70, 53/06, 33/14, 31/715*

U.S. Cl. 604—52 **26 Claims**

21. The method of performing a bloodless hypothermic procedure upon a euthermic subject in need thereof comprising the steps of:

(a) lowering the subject's core body temperature to a temperature above ice point and insufficient to cause cardiac fibrillation;

(b) placing the subject's circulation on by-pass;

(c) perfusing the subject with an amount of a first perfusate sufficient to remove essentially all of the subject's circulating blood said first perfusate comprising, water, electrolytes in physiological concentration, a macromolecular oncotic agent, a biological buffer effective at physiological pH, simple sugar, and potassium ion in a concentration range of 4–5 mEq;

(d) when the subject's temperature is substantially hypothermic but before cardiac fibrallation occurs, perfusing the subject with an amount of a second perfusate sufficient to replace essentially all of the circulating first perfusate, said second perfusate comprising, water, electrolytes in physiological concentration, a macromolecular oncotic agent, a biological buffer effective at physiological pH, simple sugar [,] *and potassium ion in a concentration range of 25–45 mEq;*

(e) after cardiac contractile activity stops replacing essentially all of said circualting second perfusate with a third perfusate comprising water, electrolytes in physiological concentration, a macromolecular oncotic agent, a biological buffer effective at physiological pH, simple sugar, and potassium ion in a concentration range of 15–45 mEq;

(f) prior to reintroducing blood into the subject, replacing essentially all of the circulating third perfusate with a fourth perfusate comprising water, electrolytes in physiological concentration, a macromolecular oncotic agent, a biological buffer effective at physiological pH, simple sugar, and potassium ion in a concentration range of 6–10 mEq.

PLANT PATENTS

GRANTED SEPTEMBER 22, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,978

SHRUB ROSE PLANT NAMED TWOADVANCE

Jerry Twomey, Leucadia, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Jan. 11, 1991, Ser. No. 640,861
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub rose class, substantially as shown and described.

7,979

GRANDIFLORA ROSE PLANT NAMED TWOLOY

Jerry Twomey, Leucadia, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Jan. 11, 1991, Ser. No. 641,003
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the grandiflora rose class, substantially as shown and described.

7,980

HYBRID TEA ROSE PLANT NAMED TWOADORE

Jerry Twomey, Leucadia, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Jan. 11, 1991, Ser. No. 640,862
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

7,981

GRANDIFLORA ROSE PLANT NAMED TWOHAVE

Jerry Twomey, Leucadia, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Jan. 11, 1991, Ser. No. 640,863
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of rose plant of the gransflora rose class, substantially as shown and described.

7,982

GERANIUM NAMED AMERICANA SCARLET

Mitchell Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Mar. 29, 1991, Ser. No. 677,466
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of Geranium plant substantially as herein shown and described characterized by green foliage, scarlet flower color, and semi-double flowers on large umbels, the plant is fast-rooting and has a very vigorous growth habit.

7,983

GERBERA PLANT NAMED TERKAPOL

Lambertus J. M. Stravers, Kudelstaart, Netherlands, assignor to Terra Nigra BV, PA De Kwakel, Netherlands

Filed Jan. 25, 1991, Ser. No. 645,601
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Gerbera plant named Terkapol, as illustrated and described.

7,984

GERBERA PLANT NAMED TERIKATIR

Lambertus J. M. Stravers, Kudelstaart, Netherlands, assignor to Terra Nigra BV, PA De Kwakel, Netherlands

Filed Jan. 25, 1991, Ser. No. 645,602
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Gerbera plant named Terikatir, as illustrated and described.

7,985

CHRYSANTHEMUM PLANT NAMED BLUSH

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 5, 1991, Ser. No. 651,005
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—82.4 **1 Claim**

1. A new and distinct Chrysanthemum plant named Blush, as described and illustrated.

PATENTS

GRANTED September 22, 1992

ERRATA

454-131	5,148,736
220-339	5,148,912
5-601	5,148,943
482-003	5,149,074
267-159	5,149,084
424-602	5,149,150
514-254	5,149,368
503-221	5,149,688
524-099	5,149,689
524-110	5,149,723
523-466	5,149,724
430-288	5,149,730
530-399	5,149,776
546-315	5,149,792
556-413	5,149,822
556-089	5,149,839
556-110	5,149,844
556-436	5,149,845
558-192	5,149,846
558-192	5,149,847
320-062	5,150,045
323-356	5,150,046
395-108	5,150,311
395-118	5,150,312
380-029	5,150,401

PATENTS

GRANTED SEPTEMBER 22, 1992

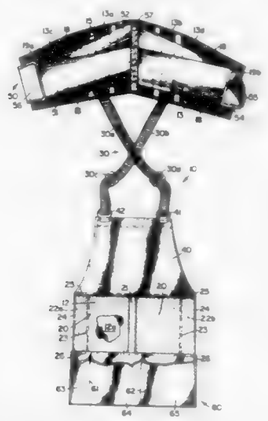
GENERAL AND MECHANICAL

5,148,549

BACK SUPPORT WITH SIDE OPENINGS AND ATTACHED APRON

Robin M. Sydor, Robbinsdale, Minn., assignor to Ergodyne Corporation, St. Paul, Minn.

Filed Apr. 23, 1991, Ser. No. 689,980
Int. Cl.[5] A41D *13/04*; A61F *5/02*
U.S. Cl. 2—44
10 Claims



1. A back support for providing abdominal and lumbosacral support as needed by the wearer, comprising:

(a) a waistband of a construction having a limited amount of stretch, said waistband comprising:

(i) a front panel having first and second ends and inner and outer surfaces;

(ii) a second panel having first and second ends and inner and outer surfaces;

(iii) means for suspending, from a wearer's shoulders, said front panel proximate the wearer's front said second panel proximate said wearer's back; and

(iv) means for operatively connecting, after suspending from the wearer's shoulders, said first end of said front panel to said first end of said second panel and for operatively connecting said second end of said front panel to said second end of said second panel; and

(b) an elastic band operatively connected to said outer surfaces of said front and second panels, said elastic band having first and second ends releaseably connected to said outer surface of said front panel, so as to be easily moved between an unstretched and a stretched position.

5,148,550

PROTECTIVE FACE AND HEAD GEAR

Robert F. Hodgkinson, Lake Forest; Peter J. Hylak, Northbrook, and Gary L. Berge, Crystal Lake, all of Ill., assignors to Hodgkinson Associates, Inc., Lake Bluff, Ill.

Filed Apr. 19, 1991, Ser. No. 687,504
Int. Cl.[5] A63B *71/10*
U.S. Cl. 2—424
8 Claims

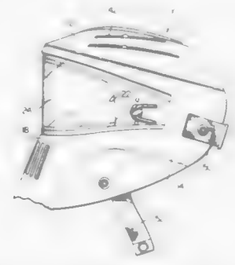
1. A field mask to be worn on the head by an individual to protect both his face and head, including his forehead, eyes, nose, mouth, ears, throat and top of his head, particularly from objects thrown or shot at the wearer, comprising, in combination:

a shell molded of a plastic material and having a top portion, side portions and a face portion all integrally formed and shaped to receive therein the head of an individual,

said top portion covering the top of the wearer's head and having formed therein a plurality of first vents for providing air flow through said head gear;

said side portions covering the sides of the wearer's head and extending below the wearer's ears;

said face portion covering the wearer's face and extending to cover a portion of the wearer's throat, said face portion further being flared outwardly at its lower end so that the head can be easily pivoted down in front without the lower end of the face portion contacting the throat;



a plurality of second vents formed in said face portion for providing air flow through said head gear,

a shield affixed behind said second vents for preventing dust and the like from being inhaled through said second vents,

said side portions and said face portion being formed to permit the wear to wear eye glasses while wearing said field mask and having formed therein an opening that extends across said face portion and each of said side portions so as to provide a wide field of vision through said face and side portions when looking out of said field mask through said opening; and

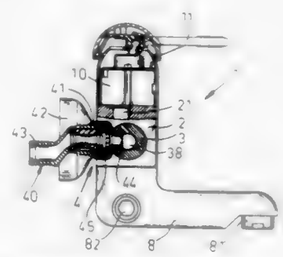
a transparent lens removably secured over said opening.

5,148,551

SURFACE-MOUNTING MIXING VALVE

Jürgen Humpert, Hemer, and Manfred Pawelzik, Soest, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH + Co., Hemer, Fed. Rep. of Germany

Filed Mar. 9, 1990, Ser. No. 491,666
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907893
Int. Cl.[5] E03C *1/04*
U.S. Cl. 4—192
8 Claims



1. A valve assembly adapted for connection to separate and spaced-apart hot- and cold-water supply pipes, the assembly comprising:

a generally cylindrical core centered on an upright core axis and formed with

a pair of diametrally oppositely open threaded seats,

a downwardly axially directed output nipple,

an upwardly open flat valve seat,

a pair of L-shaped input passages having adjacent output ends opening axially upward at the valve seat and input ends opening diametrally oppositely at the respective threaded seats, and

an output passage having an output end opening axially downward in the output nipple and an input end opening axially upward at the valve seat;

respective substantially identical input tubes centered on a transverse axis generally perpendicular to the core axis and each formed with

a threaded inner end screwed into the respective threaded seat of the core and an outer end, and

respective L-shaped fitting passages each having an output end opening at the respective inner end into the input end of the respective input passages and an input end opening transversely of the transverse axis offset from the respective outer end;

respective means for locking the input tubes against rotation in the respective input ends;

respective supply connections threaded into the input ends of the fitting passages and adapted to be connected to the respective hot- and cold-water supply pipes;

means including a mixing valve fixed in the valve sweat and bearing downward on the valve seat over the output ends of the input passages and the input end of the output passage for feeding hot and cold water from the respective input passages to the output passage; and

a faucet threaded on the output nipple over the output end of the output passage.

5,148,552

ASSEMBLY SPACE COVER FOR AN INSTALLATION MODULE

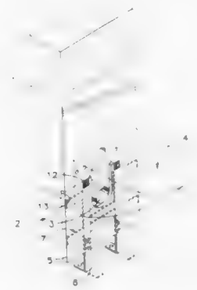
Jürgen Kress, Huglfing, and Konrad Breitenberger, Weilheim, both of Fed. Rep. of Germany, assignors to Gerberit AG, Rapperswil, Switzerland

Filed Oct. 16, 1990, Ser. No. 598,208

Claims priority, application European Pat. Off., Oct. 24, 1989, 89 119 777.4

Int. Cl.[5] A47J *47/20*; E03D *11/14*

U.S. Cl. 4—252.2 **19 Claims**



1. An assembly space cover for use with an installation module for sanitary equipment, the installation module being adapted to be secured to a vertical wall above a floor surface so that an assembly space is defined between the floor surface and a bottom surface of the assembly module, said assembly space over comprising a foamed apron adapted to be secured to the installation module in the vicinity of the bottom surface thereof and with its exterior surface substantially flush with a front surface of the installation module, said foamed apron having a metal reinforcement (7) structure which is substantially resistant to bending embedded therein.

5,148,553

CHILD'S URINAL FOR HANGING ON SIDE OF TOILET

Frederic Jermann, 102 Bryan Ct., Apt. 201, Laurel, Md. 20707-4546

Filed Aug. 6, 1991, Ser. No. 741,076

Int. Cl.[5] A47K *11/12*

U.S. Cl. 4—341 **16 Claims**

1. In combination with a toilet bowl having an upper rim with an inner wall and an outer wall, a child's urinal depending from the upper rim on the outside of the toilet bowl adapted for urination training of a child comprising, a basin portion having a front wall, a bottom wall and back wall means for forming a splash wall and extending upwardly in a substantially vertical plane from said bottom wall, said back wall means having an upper end in contact with the outer wall of the upper rim, hook means on the upper end of said back wall means for freely suspending said urinal from said upper rim, said hook means extending opposite to said basin portion, said hook means having a first portion extending from said back wall means over the upper rim toward the inside of said toilet bowl and a second portion connected to said first portion and extending downwardly along the inner wall of said upper rim, and the height of the back wall means being dimensioned so said basin portion is suspended on the outside of the toilet in proximity to the floor supporting the toilet, to thereby render the urinal accessible to a child too small to urinate over the upper rim of the toilet bowl.

5,148,554

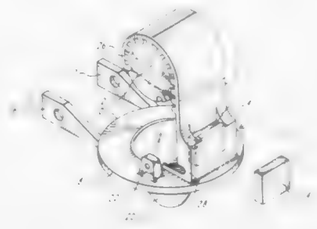
VARIABLE FLUSH VALVE FOR A TOILET

Paul F. Martin, Leesburg, Fla., assignor to Aqualogic Systems, Inc., Roswell, Ga.

Filed Dec. 7, 1990, Ser. No. 623,599

Int. Cl.[5] E03D *1/35*

U.S. Cl. 4—394 **8 Claims**



1. A modified valve for use with an outlet opening in a toilet tank comprising

a conventional bulb having a flange disposed about an outside surface of the bulb or sealing engagement with a valve seat disposed about the outlet opening;

a flexible extension structure attached at a first end to the valve seat and extending substantially perpendicularly from the valve seat, the extension structure including a second end having at least one primary attachment point and a plurality of secondary attachment points,

a float element removably attachable to the extension structure, the float element including a plurality of grooves for receiving the primary attachment point of the extension structure and at least one of the secondary attachment points of the extension structure;

wherein the number of secondary attachment points of the extension structure engaging the grooves of the float element determines the distance of the float element from the valve seat.

5,148,555

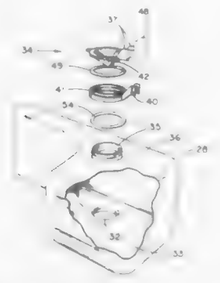
CONTROLLABLE WATER-DISPLACEMENT DEVICE

Charles E. Doyle, Grand Rapids, Mich., assignor to Water Logic, Inc., Grand Rapids, Mich.

Filed Feb. 25, 1991, Ser. No. 661,026

Int. Cl.[5] E03D *1/00*

U.S. Cl. 4—415 **5 Claims**



1. A variable displacement device for a flush tank, said device comprising:

a container having an exhaust opening in a lower portion and also an air inlet opening in an upper portion thereof;

closure means for sealing said inlet opening against the passage of said closure means being movable between positions opening and closing said inlet opening, said closure means being a rockable member having a closure portion at one extremity thereof, and a downwardly-open buoyancy chamber at the opposite end thereof, said container having fulcrum means between said closure portion and said buoyancy chamber for pivotally supporting said member thereon; and

actuating means adapted to open said closure means.

5,148,556

WALL-CANTILEVERED SHOWERING APPARATUS

John E. Bottoms, Jr., and Veronica M. Bottoms, both of 7770 (#231) Regents Rd., La Jolla, Calif. 92122

Filed Aug. 29, 1990, Ser. No. 583,072

Int. Cl.[5] A47K *3/24*

U.S. Cl. 4—567 **5 Claims**

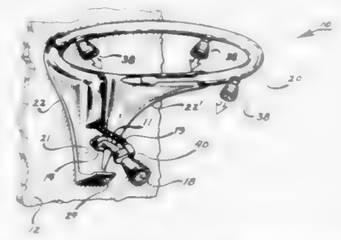
1. A water showering apparatus provided with convenient mounting around an existing water supply pipe against an existing vertical wall of a stall-shower or tub-shower installation comprising:

a generally vertical rigid header plate having a water manifold portion cantilevered from an upper portion thereof;

said water manifold portion extending away from said header plate and including a plurality of spaced shower heads;

a fluid conduit arranged in communication between said existing water supply pipe and said water manifold, to provide for flow of water through said manifold and said shower heads,

said header plate includes a flat rigid substantially vertical surface area formed on one side thereof and having an aperture formed therethrough to accommodate said existing water supply pipe, the surface opposite said one side including a gripper sleeve formed around said aperture including an outwardly projecting threaded sleeve portion having a plurality of gripper sleeve fingers;



a nut having threads which cooperate with the threads of said sleeve portion such that when said nut is threaded onto said sleeve portion said fingers will be biased into peripheral contact with said water supply pipe with said vertical surface area forced against said existing vertical wall to thereby provide support for said cantilevered water manifold.

5,148,557

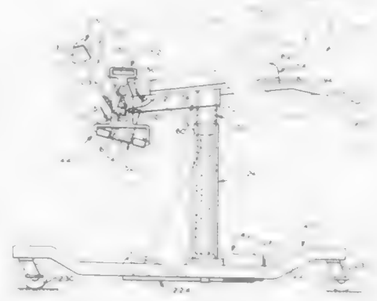
INVALID LIFT AND TRANSPORT APPARATUS

Vladimir Fridman, 404 Little Tor Rd., New City, N.Y. 10956, and Stanley R. Rosen, 8 Gerardine Pl., Spring Valley, N.Y. 10977

Filed Aug. 27, 1990, Ser. No. 572,260

Int. Cl.[5] A61G *7/08*

U.S. Cl. 5—81.1 **34 Claims**



1. An invalid lift and transport apparatus; comprising:

(a) carriage means of a size and construction to carry a person;

(b) person lifting means carried by said carriage means for lifting and lowering a person with respect to said carriage means;

(c) person body support means carried by said lifting means;

(d) said person body support means including:

(1) a back support portion disposed to coact with a person's back when a person is to be carried by said carriage means; and

(2) a leg support portion disposed to coact with a person's

legs when a person is to be carried by said carriage means;

(e) said back support portion being readily positionable with respect to said lifting means to be carried thereby and readily removable from said lifting means; and (f) said leg support portion being readily positionable with respect to, carried by, and coacting with said lifting means only when said back support portion is carried by said lifting means.

5,148,558
PATIENT TRANSFER SHEET
James L. Dunn, Topeka, Kans., assignor to O. R. Concepts, Inc., Olathe, Kans.
Filed Dec. 10, 1991, Ser. No. 805,309
Int. Cl.[5] A61G 7/08
U.S. Cl. 5—81.1 14 Claims

1. A device for transferring a patient from a generally horizontal, first surface of a first supporting structure to a generally horizontal, second surface of a second supporting structure spaced adjacently in generally side-by-side relationship, comprising:

(a) a first sheet having an inner surface with a first coefficient of friction between contacting surfaces of said inner surface and an outer surface with a second coefficient of friction for surfaces of the first and second supporting structures operably contacting said outer surface wherein said second coefficient of friction is substantially greater than said first coefficient of friction; said first sheet dimensioned to generally extend onto a portion of the width of the first surface and partially onto the second surface; and

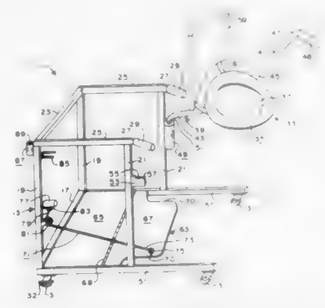
(b) dividing means for dividing said device lengthwise such that said device is separable and removable from beneath the patient without lifting or rolling the patient.

5,148,559
PATIENT CONVEYANCE DEVICE
Charles W. Morris, Rte. 1, Box 66, Paris, Tenn. 38242
Filed Apr. 9, 1991, Ser. No. 682,308
Int. Cl.[5] A61G 5/00
U.S. Cl. 5—86.1 15 Claims

1. A patient conveyance device for transporting a patient between first and second locations, said patient conveyance device comprising:

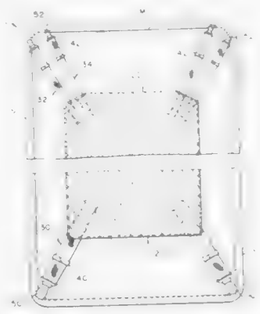
a) a frame having a first side, a second side, and a front joining the front ends of said first and second sides to one another; and

b) patient seat means for being supported by said frame and for supporting the patient in a seated position; said patient seat means being movably attached to said frame for allowing said patient seat means to be moved between an opened position for allowing the patient to sit down onto said patient seat means from a first location and to transfer from said patient seat means to a second location, and a closed position for allowing the patient to be easily transported by said patient conveyance device; said patient seat means including a seat member, said seat member having a central opening therethrough for allowing said patient conveyance device to be used as a toilet chair; said patient seat means including attaching means for pivotally attaching said seat member to said frame; said attaching means



including an arm member having a first end for being pivotally attached to said frame, having a midportion for supporting said seat member, and having a second end.

5,148,560
SHEET GARTER
Nelia R. Torres, 235 SW. Le Jeune Rd., Miami Springs, Fla. 33134
Filed Aug. 8, 1991, Ser. No. 741,926
Int. Cl.[5] A47G 9/04
U.S. Cl. 5—496 1 Claim

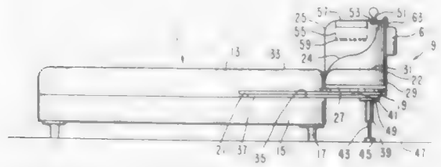


1. A device for keeping in place a fitted sheet covering a mattress and said fitted sheet having an edge, comprising:

A A generally rectangular central sheet member having substantially the same projected shape as said mattress and having smaller dimensions and said central sheet member being positioned generally centrally under said mattress; and

B A plurality of elastic members each having two ends and one of said ends being securely attached to corners areas of said central sheet and the other end being removably attached to said edge and said elastic members further including means for adjusting their lengths so that sufficient inwardly force is applied to said fitted sheet edge to keep them in place, the central sheet having a total of eight elastic members, with two elastic members attached to each of the four corner areas of said generally rectangular central sheet.

5,148,561
BABY CRIB ADJACENT TO PARENTAL BED
Douglas E. Tharalson, and Diana M. Tharalson, both of 29995 Mulholland Hwy., Agoura, Calif.
Filed Mar. 16, 1992, Ser. No. 852,298
Int. Cl.[5] A47D 7/00, 7/04
U.S. Cl. 5—95 14 Claims



1. A baby crib or the like in association with a mattress or a bed, comprising:

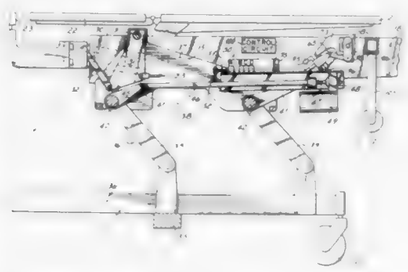
(a) a first horizontal panel means for supporting a crib mattress or the like;

(b) a vertical wall means for partially encircling said first horizontal panel means, and attachable to said first horizontal panel means; and

(c) a second horizontal panel means for supporting said first horizontal panel means, wherein said second horizontal panel means is adapted to attach to said first horizontal panel means, said horizontal panels being attached in an extended condition, and said second horizontal panel means positionable under the mattress, whereby said second horizontal panel means supports said first horizontal panel means and said vertical wall means in said extended condition adjacent the bed, and

wherein said first and second horizontal panel means having at least one attachment means for attaching to each of said first and second panel means, and further comprising at least one horizontal support attachable to said attachment means, thereby providing secure attachment between said first and second horizontal panel means providing greater support to said first horizontal panel means in said extended condition.

5,148,562
BIRTHING BED ADJUSTABLE TO TRENDELENBURG POSITION
Richard L. Borders, Cincinnati, Ohio; Daniel G. Stafford, Batesville, Ind.; Sandy M. Richards, Centerville, Ind., and Allen L. Walke, Batesville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.
Filed Oct. 21, 1991, Ser. No. 779,907
Int. Cl.[5] A61G 7/00
U.S. Cl. 5—610 9 Claims



1. A hospital bed comprising:

a base,

an intermediate frame,

a linkage mounting said intermediate frame on said base,

power means for raising and lowering said intermediate frame with respect to said base,

a main frame having a foot end and a head end, said main frame being pivotally mounted to said intermediate frame on a transverse axis,

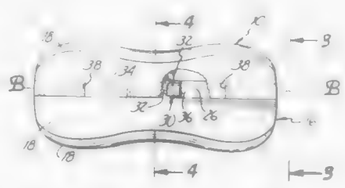
means for pivoting the head end of said main frame below said foot end to achieve a Trendelenburg position,

and control means for operating said power means during pivoting of said main frame to the Trendelenburg position when said intermediate frame is in its lowermost position to raise said intermediate frame to permit full pivoting of said main frame.

5,148,563
CUSTOM ORTHOTIC BRACING SYSTEM
Jeffrey D. Klearman, Chesterfield; Jeffrey J. Bierman, St. Louis; Lambert J. Pott, and Glen E. Watson, Jr., both of Chesterfield, all of Mo., assignors to Lake Medical Products, Inc., St. Louis, Mo., by said Jeff Bierman
Filed Oct. 29, 1991, Ser. No. 783,834
Int. Cl.[5] A61F 5/37
U.S. Cl. 5—652 22 Claims

10. A restraint for supporting a patient in a sitting position, said restraint having a removable panel member, said panel member being readily deformable to permit said panel member to be custom fit to any individual patient, said panel member being of sufficient width to fit snugly about the patient's torso, and means for securing said restraint to a chair or the like to thereby secure said patient into an upright sitting position.

5,148,564
MINIATURE PORTABLE SUPPORT CONSTRUCTION
Larry M. Reder, 3152 Casino Dr., Thousand Oaks, Calif. 91362
Filed Dec. 19, 1991, Ser. No. 810,476
Int. Cl.[5] A47C 20/02
U.S. Cl. 5—636 6 Claims



1. A miniature portable travel pillow construction generally in the shape of a generally contoured barbell that is elongated with a central axis, a pair of opposed enlarged ends and a narrowed center,

said pillow construction comprising:

(1) a body of a soft resilient material in the shape of the pillow construction;

(2) a removable outer cover of flexible material surrounding and generally conforming to the shape of the body;

said cover comprised of a plurality of elongated strips each having a central longitudinal axis and longitudinal edges stitched to the adjacent longitudinal edges of the adjacent strips, a first of said strips having first closure band portion along one longitudinal edge, a second of said strips having a second closure band portion along one longitudinal edge, said band portions generally overlying one another when the outer cover is assembled to form a longitudinal opening that defines an entrance/exit for the cover, the longitudinal edges of the remainder of said strips and the other longitudinal edges of the first and second closure strips each having a shape that is defined by a generally like curve, each of said curves meeting the central axis of the strip at the opposite ends of the strips, then curving first transversely outwardly from each end, and then curving back transversely inwardly;

the pillow construction being no longer than about ten inches and no wider than about five inches at its maximum diameter.

5,148,565

METHOD FOR MAKING A RUBBER BOOT CONTAINING HEAT REFLECTING MEANS

Prakash Devasthali, Davenport, Iowa, assignor to Norcross Footwear, Inc., Rock Island, Ill.

Division of Ser. No. 522,311, May 11, 1990, Pat. No. 5,068,982. This application Nov. 25, 1991, Ser. No. 796,852

Int. Cl.[5] A43B *1/10*

U.S. Cl. 12—142 EV 12 Claims

1. A method of making a fireboot comprising the steps of:

(a) heating rubber in the presence of a chemical peptizer for a period sufficient to breakdown the rubber;

(b) masticating the peptized rubber;

(c) mixing an ethylene-propylene-diene monomer with the masticated peptized rubber to form a smooth blend of rubber ethylene-propylene-diene and monomer;

(d) mixing styrene-butadiene rubber to the rubber ethylene-propylene-diene monomer mix to form a homegeneous blend;

(e) adding an aluminum pigment to the homegeneous blend to form a uniform pigmented aluminized mass of rubber;

(f) adding liquid ethylene-propylene terpolymer to the pigmented aluminized mass;

(g) adding at least one extender activator reinforcer antioxidant, or tack producing compound to said terpolymer pigmented aluminized mass;

(h) cooling the resulting mass to below 200° F.;

(i) adding accelerators and cross slinking agents to said mass;

(j) calendering said mass;

(k) adding said mass to upper portions of a boot; and,

(l) vulcanizing said boot.

5,148,566

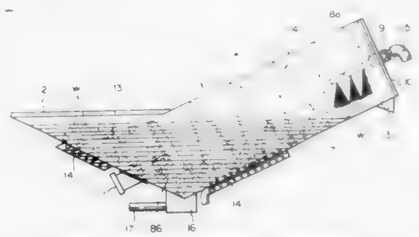
CONTINUOUS WASHING APPARATUS

Seitaro Nishibayashi, 2-36-1-910, Minamiohtsuka, Toshima-ku, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,520

Int. Cl.[5] A46B *13/04*

U.S. Cl. 15—3.21 4 Claims



1. A continuous washing apparatus comprising:

an elongate washing vessel having an inlet for receiving objects to be washed at one end thereof, and an outlet for discharging the objects at the other end thereof, said elongate washing vessel being arranged in an inclined manner so that the inlet is located downwardly and the outlet is located upwardly;

a conveying means disposed within said washing vessel for conveying said objects from the area adjacent to said inlet toward the area adjacent to said outlet;

a washing means for washing said objects;

said conveying means including a screw body rotatably mounted in said washing vessel, and a drive mechanism for driving said screw body;

said screw body including a continuous length of fin which extends helically around the longitudinal axis of said washing vessel, brush members attached to said fin for brushing said objects and an open central bore extending through the central portion of said screw body along the longitudinal axis thereof.

5,148,567

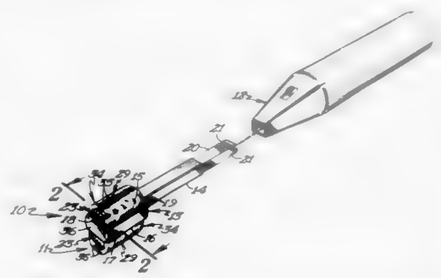
TOOTHBRUSH

Craig C. Daub, 5222 E. Bald Eagle Blvd., White Bear Lake, Minn. 55110

Filed Aug. 26, 1991, Ser. No. 750,101

Int. Cl.[5] A61C *17/34*; A46B *9/04, 13/02*

U.S. Cl. 15—22.1 5 Claims



1. A toothbrush comprising,

an elongate head including a rectangular shaped bristle support member, an elongate connecting member secured to said bristle support member and projecting therefrom, a combination electric motor and handle module having a socket therein, said connecting member projecting into said socket and being operatively connected to the electric motor and handle module whereby when said electric motor is energized, said head will be reciprocated,

said bristle support member having opposed substantially planar surfaces, a front transverse edge, a rear transverse edge, and opposed longitudinal edges, each planar surface having a pair of elongate longitudinally extending slots therein, each slot in said planar surface extending from a point adjacent one transverse edge through the other transverse edge thereof,

a plurality of elongate bristles arranged in tufted bristle bundles secured to said opposed planar surfaces and extending outwardly therefrom, said tufted bristle bundles being arranged in parallel, spaced apart longitudinally extending interior rows on each planar surface located inwardly of the parallel slots in the associated planar surface,

a plurality of outer brush elements each including an elongate rigid channel having, a plurality of elongate bristles therein defining an outer row of bristles, the outer ends of the outer row of bristles being arcuately bent, said channel of each brush element being positioned in one of said slots so that the bristles thereof project outwardly of the associated planar surface, means secured to said other transverse edge of the bristle support member for retaining said brush elements in said slots, outer ends of the bristles of each brush element extending over the interior rows of bristles whereby a user can simultaneously brush the occlusal, lingual and buccal surfaces of both the upper and lower arch of the user's teeth.

5,148,568

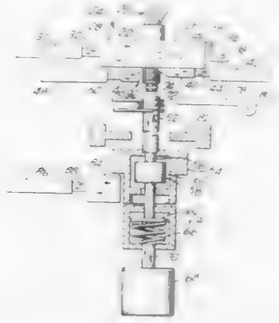
APPARATUS AND METHOD FOR MAKING AN END BRUSH WITH A MALE PROJECTION

James A. Bojar, Wauwatosa, and Richard J. Shaw, Hartland, both of Wis., assignors to Professional Dental Technologies, Corp., Batesville, Ark.

Division of Ser. No. 402,341, Aug. 31, 1989, Pat. No. 5,072,482. This application Jul. 12, 1991, Ser. No. 729,037

Int. Cl.[5] A46B *13/00*; A46D *3/04*

U.S. Cl. 15—28 13 Claims



1. A method of forming an end brush, comprising the steps of:

providing a bundle of generally parallel fibers formed of thermoplastic material said bundle having a first end portion and an opposite second end portion;

liquefying the fibers at said first end portion of said bundle so as to unite said fibers;

forming the liquefied fiber material to a shape providing a first segment lying in a first plane substantially perpendicular to said fibers and a second segment forming a hub chamber through which said fibers extend, said second segment projecting centrally of and outwardly from said first end portion of said bundle portion so as to form a projection; and

solidifying the liquefied fiber material so as to form a rigid base.

5,148,569

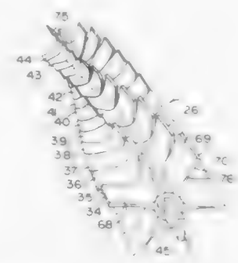
DEBRIS IMPELLER

John J. Jailor, Rockford, and Henry J. Rosendall, Grand Rapids, both of Mich., assignors to Bissell Inc., Grand Rapids, Mich.

Filed Oct. 17, 1990, Ser. No. 599,309

Int. Cl.[5] A47L *11/33, 11/40*

U.S. Cl. 15—041.1 26 Claims



1. An impeller for floor cleaning devices, including

an axle having a non-cylindrical cross section;

a plurality of individual integrally molded impeller segments each having a plurality of paddles and a central body with a non-cylindrical central opening adapted to be slipped over said axle, whereby said impeller may be assembled by said plurality of segments being slipped over said axle.

5,148,570

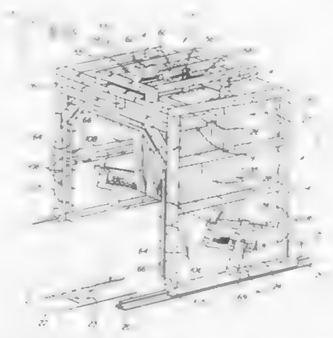
CAR WASH SYSTEM

Lonnie M. Crotts, Browns Summit, N.C., and William W. Rambo, Keeling, Va., assignors to Bivens Winchester Corporation, Danville, Va.

Filed Feb. 28, 1991, Ser. No. 662,269

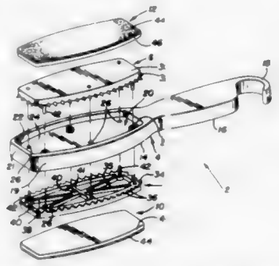
Int. Cl.[5] B60S *3/04*

U.S. Cl. 15—97.3 72 Claims



1. In a car wash apparatus of the type including at least one mitter curtain adapted to engage a vehicle during relative movement between the apparatus and the vehicle in the wash cycle, the improvement wherein said apparatus includes control means operative during the wash cycle to selectively adjust the length of said mitter curtain between a plurality of operative lengths respectfully engaging a plurality of vehicle portions.

5,148,571
LINT BRUSH ASSEMBLY
William E. Brazis, Medina, and Re: R. Mast, Orrville, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 10, 1992, Ser. No. 819,056
Int. Cl.[5] A47L *25/08*
U.S. Cl. 15—104.2 7 Claims



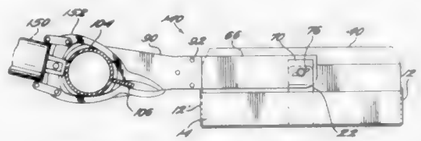
1. A brush for removal of lint, comprising: a unitarily formed, one-piece brush body having a handle portion at one end and a brush block portion at an opposite end, said brush block portion having oppositely directed top and bottom surfaces, each said surface having an outwardly open recess formed to extend therein, each recess defined by a bottom floor surface and sidewalls, and said brush block portion having at least two throughbores extending therethrough, substantially perpendicular to said top and bottom surfaces;
a pair of insert plate members dimensioned and shaped for close receipt within a respective one brush block recess, each said insert member having a top, a bottom, and side surfaces, a plurality of teeth spaced-apart and positioned to project outwardly from the side surfaces, at least one aperture extending into said bottom surface,
and at least one stake projection directed outward from said bottom surface, and positioned to extend through one said brush body throughbore and into the aperture of the other insert plate member, in force fit fashion, to secure said insert plate members to said brush body and within said brush body recesses; and a pair of lint removing pad members dimensioned to overlap a respective one of said insert plate members top surface and having a lower edge portion positioned to overlap and engage said insert plate member teeth, whereby securing said pad member to said insert plate member.

5,148,572
VIDEO GAME CONSOLE AND CARTRIDGE CLEANING KIT
James M. Wells, 1164 N. Oakwood Ave., Rialto, Calif. 92376, and Gary L. Sigritz, 2960 Florence Ct., Riverside, Calif. 92509
Filed Dec. 20, 1989, Ser. No. 453,983
Int. Cl.[5] B08B *11/00*
U.S. Cl. 15—118 11 Claims

1. A device for cleaning the contacts of a video game cartridge for use in a video game system, comprising:
a cleaning component having a first planar end to clean said contacts, and a second planar end to dry said contacts;
a first section of material attached on said first end for receiving a cleaning solution and cleaning said contacts; and
a second section of material, separate from said first section of material, attached on said second end for drying said contacts, wherein said first and said second sections of

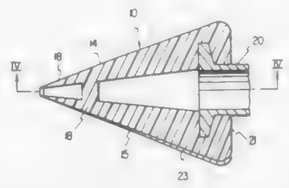
material are separated by a portion of the cleaning component.

5,148,573
APPARATUS FOR ATTACHING A CLEANING TOOL TO A ROBOTIC MANIPULATOR
Mark A. Killian, 102 Foxhunt Dr., North Augusta, S.C. 29841, and W. Thor Zollinger, 3927 Almon Dr., Martinez, Ga. 30907
Filed Sep. 4, 1991, Ser. No. 754,839
Int. Cl.[5] A47L *9/00*
U.S. Cl. 15—339 20 Claims



1. An apparatus for attaching a cleaning tool to a robotic manipulator, said apparatus comprising:
a frame;
means for attaching said tool to said frame; and
means for connecting said frame to said manipulator so that said tool can be used on a vertical, horizontal or sloped surface.

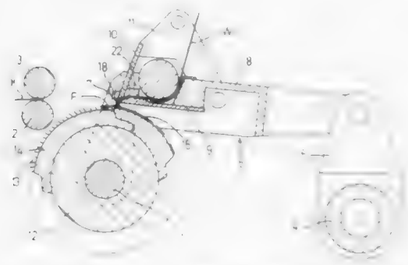
5,148,574
PROCESS AND DEVICE FOR COATING A GLASS SHEET WITH A FLEXIBLE FILM
Klemens Leclere, Neu Moresnet, Belgium; Hans-Willi Kessels, Herzogenrath, Fed. Rep. of Germany, and Friedhelm Hammes, Herzogenrath, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France
Division of Ser. No. 630,732, Dec. 20, 1990, Pat. No. 5,100,493, which is a continuation of Ser. No. 279,063, Dec. 2, 1988, abandoned. This application Sep. 20, 1991, Ser. No. 763,211
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740875
Int. Cl.[5] A47L *9/02*
U.S. Cl. 15—415.1 6 Claims



1. A device for applying suction in the coating of a glass

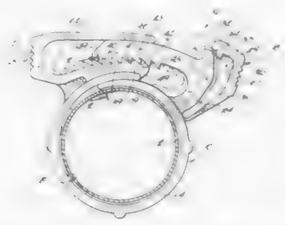
sheet with a flexible film, comprising: a slot nozzle adapted to the shape of the glass sheet and to be positioned adjacent a hollow space between said glass sheet and said flexible film and means connected to said slot nozzle for sucking air from such hollow space through said slot nozzle, wherein said slot nozzle comprises an elastically deformable slot nozzle, which, under the effect of the pressure difference produced by the suction action, adapts to the given shape of the glass sheet.

5,148,575
COMBING HEAD WITH LOWER NIPPER PLATE GUIDE ELEMENTS
Heinz Clement, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Mar. 21, 1991, Ser. No. 673,013
Claims priority, application Switzerland, Mar. 23, 1990, 00983/90
Int. Cl.[5] D01G *19/16*
U.S. Cl. 19—235 9 Claims



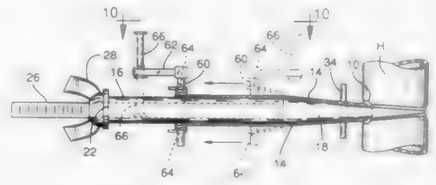
1. A combing head for a combing machine comprising
a lower nipper part having a frame and a lower nipper plate supported on said frame;
a top nipper plate movably mounted relative to said bottom nipper plate to press one edge of said top nipper plate against a front edge of said lower nipper plate; and
a first pair of lateral guide elements mounted on said lower nipper part, each said guide element having a fiber guide surface disposed in front of said front edge of said lower nipper plate and in facing relation to the other of said guide elements.

5,148,576
CONDUIT CLAMP
Edward P. Dyer, Germantown, Wis., assignor to Tyton Corporation, Milwaukee, Wis.
Filed Oct. 7, 1991, Ser. No. 772,704
Int. Cl.[5] B65D *63/02*
U.S. Cl. 24—20 R 4 Claims



1. A clamp including band means formed into a loop, first and second clamp means disposed respectively on the opposite ends of said band mans, each of said clamp means including engageable teeth means which cooperate to permit movement of said clamp means toward each other for increasing the force of said band means on the conduit disposed therein and which resist movement of said clamp means in an opposite direction, force indicator means mounted on said band means and responsive to the circumferential forces in said band means and movable from a first position to a second position when the force applied on said clamp means equals a predetermined value so that movement of said force indicator means from said first position to said second position indicates that said predetermined value of said force has been applied.

5,148,577
FORMING TOOL FOR WIRE CLAMP
Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524
Continuation-in-part of Ser. No. 642,822, Jan. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 476,628, Feb. 8, 1990, abandoned. This application Aug. 5, 1991, Ser. No. 740,451
Int. Cl.[5] B25B *27/10*
U.S. Cl. 24—27 13 Claims



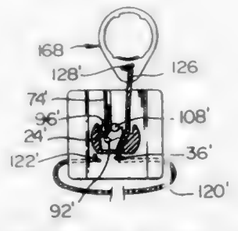
1. A tool for cinching at least one strand of bendable wire around an article to form a clamp, said strand of wire having a connecting loop in one end thereof and a free end arranged to be wrapped around the article in clamping relation, said tool comprising:
a tubular body member having an open rearward end and a nose portion with a forward end arranged to be engaged by the loop end of the wire for holding the loop end in position on the tool,
a longitudinal externally threaded tension member movable freely within said tubular body member and projecting out of said open rearward end of said body member,
anchor pin means integral with said tension member providing an anchor for the wire that leads from the loop and that extends around the article to be clamped, that extends around the article to be clamped,
oppositely extending lateral guide pins on said nose portion disposed rearwardly of the forward end of said nose portion for guiding the wire into a clamping relationship on an article to be clamped,
and a nut member threadedly mounted on the projecting portion of said tension member in abutting relation with the rearward end of said tubular body member,
said nut member in being threadedly moved in a direction toward the nose portion of said body member drawing said tension member rearwardly to tighten the wire anchored to said anchor pin means and to tighten the wire around the article.

5,148,578
CORD LOCK DEVICE
Martin D. H. Clarke, Aurora, and Ronald M. Davis, Unionville, both of Canada, assignors to ITW Plastiglide, Concord, Canada
Filed Feb. 28, 1991, Ser. No. 661,971
Claims priority, application Canada, Feb. 28, 1990, 2011200
Int. Cl.[5] A41B *7/00*
U.S. Cl. 24—41 20 Claims

1. A cord lock device of plastic material for use in association with wearing apparel, comprising:
backing means adapted to be secured to said wearing apparel;
housing means integrally formed with said backing means,

said housing means having opposed interior side surfaces, one of said side surfaces including a portion of said backing means, and said side surfaces having axially opposed pivot apertures, said housing having a cam surface and a confronting toothed surface;

a cam lock having a pivot pin adapted for pivotal movement within said housing in association with said pivot apertures, said cam lock having a toothed portion confronting said toothed surface of said housing means and a biasing



arm in contact with said cam surface of said housing means for pivotably biasing said cam lock about said pivot pin so as to bias said toothed portion of said cam lock toward said toothed surface of said housing means;

said housing side surfaces being sufficiently flexible so as to permit said cam lock pivot pin to be forced through an opening defined within said housing means so as to achieve a snap fitted operative position with said pivot apertures of said housing means

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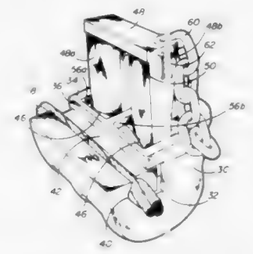
5,148,579

TRANSVERSALLY WEDGED CABLE HOOK

William Dyck, Delta; Harry Jones, Vancouver, and William Jordan, Surrey, all of Canada, assignors to Wire Rope Industries Ltd., Pointe-Claire-Quebec, Canada

Filed Jul. 3, 1991, Ser. No. 725,686
Claims priority, application Canada, Jul. 3, 1990, 2020355
Int. Cl.[5] F16G *1/04*
U.S. Cl. 24—136 R 6 Claims



1. A cable hook comprising:

a) a body member having a longitudinal channel of generally rectangular cross-section formed therein and an extension for partly closing the top of the channel leaving a longitudinal slot for inserting a portion of a cable into the channel, said channel having a cable engaging surface on one wall thereof;

b) a cable clamping member laterally movable in said channel and having an inner surface engaging the cable and a longitudinally double-tapered inverted V-shaped outer surface;

c) a transverse aperture extending through said body; and

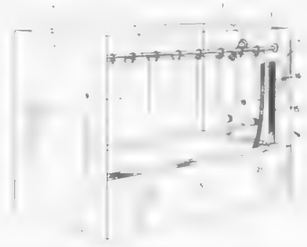
d) a wedge member insertable in said transverse aperture and having a vertically tapered surface for driving the cable clamping member against the cable in the channel and a transversally double-tapered surface mating the longitudinally double-tapered surface of said cable clamping member to provide oppositely acting wedging surfaces generating increased clamping action during pulling of the cable in either direction.

5,148,580

SHOWER CURTAIN SEALING AND FASTENING ARRANGEMENT

Dean W. Dyckow, 4876 St. Urbain, Montreal, Quebec, Canada H2T 2W2

Filed Jul. 1, 1991, Ser. No. 723,592
Claims priority, application Canada, Jul. 3, 1990, 2020320
Int. Cl.[5] A44B *21/00;* A47K *3/22*
U.S. Cl. 24—303 15 Claims



1. A kit for use in a shower enclosure having a first wall facing a second wall, said shower closure being closable by a shower curtain having an inner surface facing said enclosure, an outer surface and first and second vertical edges; said kit being designed to sealingly and removably fasten at least the first edge of the shower curtain to the first wall of the enclosure, and comprising:

first fastening means mounted on an elongated self-fastening member mountable on said first wall, said first fastening means extending flat and vertically along said first wall when said self-fastening member is mounted;

second fastening means mountable on the outer surface of said shower curtain along the first edge thereof for fastening engagement with said first fastening means, said second fastening means extending flat on said outer surface and thus causing said shower curtain adjacent said first edge to be folded toward said enclosure and extend flat onto said first wall when said first and second fastening means are engaged; and

self-fastening sealing means mountable on said first wall adjacent said first fastening means, said sealing means, when mounted, extending vertically near said first fastening means over the length of said self-fastening member, and comprising a protrusion projecting from said first wall toward said second wall inwardly of said first fastening means with respect to the enclosure;

whereby, in use, when said second means is in fastening engagement with said first means, said first edge of said curtain abuts said protrusion and thus is sealed by the same.

5,148,581

CLIP DEVICE

Jerome Hartmann, Carlisle, Iowa, assignor to Cobbs Manufacturing Company, Des Moines, Iowa

Filed Jan. 31, 1992, Ser. No. 830,122
Int. Cl.[5] A44B *9/00;* A47G *27/04*
U.S. Cl. 24—351 17 Claims

1. A clip device comprising:

clamping means having a first and second portion operatively aligned with each other for clamping an article therebetween,

each of said first and second portions having an article engagement side, an opposed side opposite said article engagement side, a front end and a back end opposite said front end;

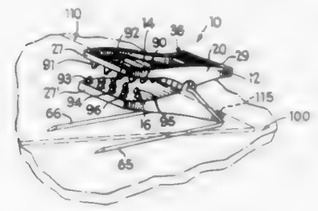
biasing means attached to said first and second portions of said clamping means for releasably maintaining said article engagement side of each of said first and second portions of said clamping means disposed to a substantially closed orientation;

one or more gripping means integrally formed with said article engagement side of each of said first and second portions for enhancing clamping of said article between said first and second portions of said clamping means; and

securing means operatively attached to at least a part of said clamping means for securement to an object adjacent said article,

said securing means includes two prong members integrally formed with said pivot attachment region,

said members are in substantially parallel alignment to each other, as well as being positionable in substantially parallel



alignment with said opposed side of one of said first and second portions of said clamping means prior to, and after, securement to said object,

each of said prong members have insertion tips for facilitating initial insertion, and, in turn, securement of said securing means in and to said object,

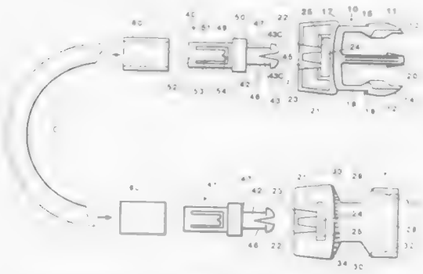
said securing means comprise retention means for substantially reducing the inadvertent release from said object said retention means including an acute angle between each of said prong members and said respective extension section proximate said back end of said first and second portions of said clamping means to form a stop on insertion of the prong members and so as to enable at least a part of said object to engage with said acute angle, to in turn, help preclude the inadvertent release of said securing means from said object.

5,148,582

QUICK RELEASE CORD STRAP SYSTEM

David B. Dennis, Jr., 959 Chalcedony St., #5, San Diego, Calif. 92109

Filed Aug. 8, 1991, Ser. No. 741,913
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—625 3 Claims



1. A quick release strap system comprising:

a first molded plastic quick release male buckle component having a center line, a base and a conical aperture in said base coaxial with said center line, and an annular bearing shoulder formed interiorly of said base and coaxial with said conical aperture,

a second molded plastic quick release female buckle component having a center line, a base and a conical aperture in said base coaxial with said center line, and an annular shoulder formed interiorly of said base and coaxial with said conical aperture,

a pair of molded plastic swivel connectors, each molded plastic swivel connector having at least a pair of spring cam surface fingers adapted to be cammed toward one another by said conical aperture and a bearing ledge formed on said spring cam fingers contiguous to said cam surfaces and engagable with said annular shoulder bearing surface after said spring cam surfaces have passed one of said conical apertures, respectively, and

a strap having a pair of ends and means securing respective ones of said pair of ends to one of said swivel connectors opposite said spring cam fingers, respectively

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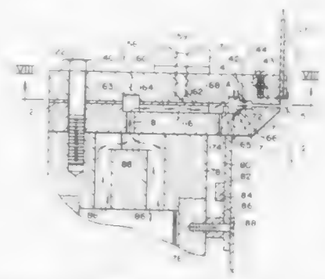
5,148,583

METHOD AND APPARATUS FOR PATTERNING OF SUBSTRATES

John M. Greenway, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 560,474, Jul. 27, 1990, abandoned, which is a continuation of Ser. No. 073,894, Jul. 14, 1987, abandoned, which is a continuation of Ser. No. 910,340, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 821,135, Jan. 22, 1986, which is a continuation of Ser. No. 731,340, May 6, 1985, abandoned, which is a continuation of Ser. No. 456,491, Jan. 7, 1938, abandoned. This application Nov. 26, 1991, Ser. No. 799,920
Int. Cl.[5] D06C *29/00, 23/00;* D06B *1/08*
U.S. Cl. 26—2 R 11 Claims



1. A method for treating a moving substrate travelling in a well-defined path by application of pressurized heated gas to the surface of said substrate to modify thermally the surface appearance of said substrate and impart a visual pattern thereto, comprising the steps of:

(a) generating an elongate reservoir of uniformly heated pressurized gas extending across the path of said substrate,

(b) fixing the relative position of said substrate path in spaced but closely adjacent relation to said reservoir;

(c) forming, within said reservoir, a thin, elongate uninterrupted sheet of a gas stream said stream, extending substantially continuously along the length of said reservoir and across the path of said substrate;

(d) projecting said stream directly and uniformly from said reservoir in a continuous and uninterrupted curtain of heated gas extending along the length of said reservoir in the direction of said substrate surface;

(e) diverting and diluting in a direction away from said substrate surface, a precisely defined lateral segment of said uninterrupted continuous curtain projecting from said reservoir at at least one location along the length of said reservoir after said curtain leaves said reservoir by means of a relatively cool gas stream, thereby preventing areas of

said substrate surface opposite said diverted lateral segment of said curtain from being squarely impinged in accordance with pattern information and thermally modified by said segment of said heated gas curtain while other lateral segments of said curtain are projected onto areas of said substrate surface and squarely impinge on said surface;

(f) maintaining the temperature of said heated gas stream at a uniform level along the length of said reservoir, said level being sufficient to enable said lateral segments of said curtain squarely impinging on said surface to modify thermally said surface appearance of said substrate; and

(g) moving said substrate on said path and into said stream projecting from said reservoir.

5,148,584

APPARATUS FOR NEEDLING A NONWOVEN WEB

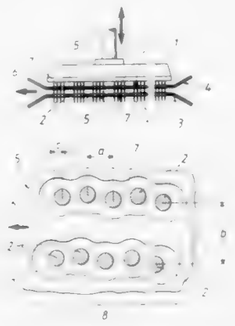
Ernst Fehrer, Auf der Gugl 28, A-4040 Linz, Austria

Filed May 10, 1991, Ser. No. 698,460

Claims priority, application Austria, May 16, 1990, 1087/90; Jul. 31, 1990, 1606/90; Dec. 11, 1990, 2507/90

Int. Cl.[5] D04H *8/00*

U.S. Cl. 28—115 7 Claims



1. An apparatus for needling a nonwoven web as it is moved in a direction of travel, which comprises

(a) a needle board carrying at least one row of a plurality of needle groups arranged successively in the direction of travel, each needle group consisting of

(1) a plurality of needles having shanks projecting from the needle board on one side thereof in the direction of the longitudinal shank axes, the needles being arrayed in the direction of travel and being offset from each other transversely to the direction of travel,

(b) a backing member facing the one needle board side and spaced therefrom, the backing member being engageable by the nonwoven web as it is moved in the direction of travel between the needle board and the backing member, and

(c) a perforated stripper plate extending between the needle board and the backing member, the stripper plate defining a plurality of holes arranged successively in the direction of travel, a respective one of said holes registering with a respective one of said needle groups,

(d) the needle board being reciprocable toward and away from the backing member for moving the needle groups through the registering holes in the perforated stripper plate.

5,148,585

DEVICE FOR MANIPULATING DROP WIRES FOR WARP-THREAD DRAWING-IN MACHINES

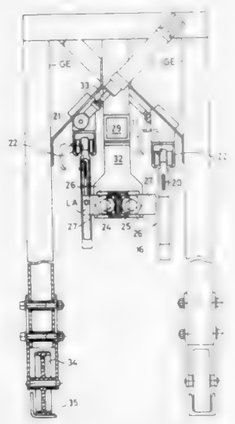
Silvio Jaeger, Mauren, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed May 17, 1991, Ser. No. 702,020

Claims priority, application Switzerland, May 18, 1990, 01694/90

Int. Cl.[5] D03J *1/14*

U.S. Cl. 28—205 19 Claims



17. Drop wire storing and transport apparatus for a warp-thread drawing-in machine, comprising magazines for accommodating stacks of drop wires; and transport means for transporting the magazines filled with drop wires to an unloading position where the drop wires may be removed from the magazines and for transporting emptied magazines from said unloading position; said transport means including means establishing a first path over which full magazines are fed toward said unloading position, means establishing a second path over which empty magazines are returned from said unloading position, and means for transferring magazines from said first path to said second path.

5,148,586

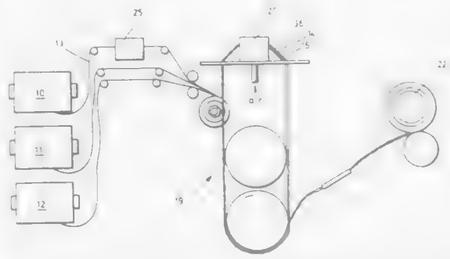
CRIMPED CONTINUOUS FILAMENT YARN WITH COLOR-POINT HEATHER APPEARANCE

Andrew M. Coons, III, Anderson, S.C., assignor to BASF Corporation, Parsippany, N.J.

Filed Feb. 5, 1991, Ser. No. 650,743

Int. Cl.[5] D02G *1/18*

U.S. Cl. 28—271 12 Claims



7. An apparatus for making a heather-dyeable or precolored heather yarn product comprising:

means for supplying a first crimped continuous filament yarn in the form of a relatively loose matrix substantially free of filament entanglement;

means for supplying in a direction of supply a second crimped continuous filament yarn which is precolored or differentially dyeable with respect to the first yarn;

a first entangling device including a fluid jet adapted to interlace filaments of a yarn passing therethrough by impinging a fluid perpendicular to the direction of supply;

means for feeding said second yarn through said first entangling device;

means for programming random exposure of said second yarn to said fluid jet to produce a color-point yarn product as said second yarn exits said first entangling device, said color-point product having relatively compact nodal regions of high entanglement of the filaments of said second yarn separated by bulkier regions of the same filaments relatively free of entanglement; and

a second entangling device having a fluid jet adapted to randomly entangle filaments of yarns passing therethrough; and

means for feeding said first yarn and said color-point yarn product through said second entangling device, whereby filament commingling between said first yarn and said color-point yarn product is substantially prevented within said nodal regions of said color-point yarn.

5,148,587

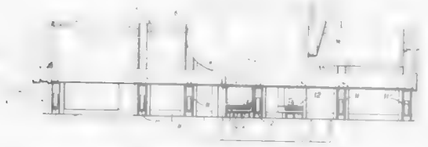
MULTI-PURPOSE PIPELINE CONSTRUCTION AND TESTING MACHINE

Carl R. Phelps; June T. Phelps, both of 234 Vernon La., and Douglas E. Phelps, 1024 Spell St., all of West Monroe, La. 71291

Filed Oct. 18, 1990, Ser. No. 599,416

Int. Cl.[5] B23P *23/02;* B23B *3/06*

U.S. Cl. 29—33 T 5 Claims



1. A multi-purpose pipeline construction and testing machine comprising a trailer adapted to be towed to a job site, said trailer including a chassis frame, an internal combustion engine mounted on said chassis frame, drive rollers rotatably mounted on said frame and adapted to rotatably support a pipe to be cut, said internal combustion engine being operatively connected to said drive rollers, a circular saw mounted on said chassis for cutting a pipe supported on said drive rollers, said internal combustion engine being operatively connected to said circular saw, a bevelling cutter mounted on said chassis for cutting a pipe supported on said drive rollers, said internal combustion engine being operatively connected to said bevelling cutter, and an abrasive wheel rotatably mounted on said chassis for bevelling the end of the pipe, said internal combustion engine being operatively connected to said abrasive wheel, said abrasive wheel comprising a housing secured to said chassis frame, said abrasive wheel being rotatably mounted in said housing, an inclined tubular entrant portion provided in said housing communicating with the face of the abrasive wheel, said entrant portion supporting the end portion of a pipe to be bevelled, whereby a pipe to be bevelled is manually moved into the entrant portion until the end thereof abuts the face of the rotating abrasive wheel, to thereby form a bevelled surface on the end of the pipe.

5,148,588

PROCESS FOR THE MANUFACTURE OF A FABRIC-COVERED VISOR

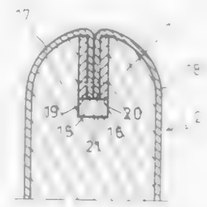
Charles B. Prillard, Rupt, France, assignor to Rockwell Automotive Body Systems-France, Paris, France

Filed May 10, 1991, Ser. No. 698,633

Claims priority, application France, May 11, 1990, 90 05933

Int. Cl.[5] B68G *7/00*

U.S. Cl. 29—91.1 8 Claims



1. In a process for the manufacture of a vehicle visor (2) of the type comprising a rigid core (1) enclosed in a fabric cover, said cover being formed into a fabric pocket (12) having on one of its sides (13) an opening (14) defined by lips (15, 16), the core (1) being inserted into said pocket (12) through said opening (14), and said opening (14) being closed to form said cover enclosing said core (1), the improvement comprising the steps of stiffening the lips (15, 16) of said opening (14) before said core (1) is inserted into said pocket (12), providing on said core (1) on the side thereof disposed adjacent said lips when said cover is inserted into said pocket, a groove (21), and inserting said stiffened lips (15, 16) into said groove (21) to close said opening (14).

5,148,589

SICKLE SECTION BLADE REPLACEMENT TOOL

Frederick R. Bot, R.R. 1, Box 114, Ivanhoe, Minn. 56142

Filed Jul. 19, 1991, Ser. No. 732,624

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—243.54 7 Claims

1. A tool for use in removing rivets and installing rivets in replacement of a sickle section blade, comprising:

a tubular column having an upper open end;

a shaft having an upper end with a head and a lower threaded end;

a threaded collar located on the threaded end of the shaft and movable longitudinally on the shaft by rotation with respect to the shaft;

the lower end of the shaft being installed in the tubular

column through the open end thereof up to the collar, said collar of a sufficient dimension to be in intercepting relationship to the open end of the column to support the shaft with respect to the column;

the heighth of said tool being adjustable by rotation of the collar on the shaft;

said head on the end of the shaft being configured to bear against a sickle section blade to permit work to be performed upon a rivet holding the blade;

said head on the end of the shaft having an upwardly open cup;

an anvil insertable in the cup of the head of the shaft for use in installing a rivet in a sickle bar to hold a replacement sickle section blade, said anvil having a first end that is concave for working on round headed rivets, and a second end that is flat for working on flat headed rivets;

a base connected to the lower end of the column; and

means pivotally connecting the base to the lower end of the column.

5,148,590

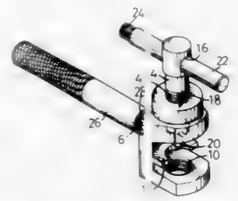
PORTABLE CHAIN DISASSEMBLING DEVICE

Rong C. Wu, No. 103, Sec. 1, Chung Yi Rd., Tainan, Taiwan

Filed Jan. 2, 1992, Ser. No. 816,757

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—257 **1 Claim**



1. A chain disassembling device comprising:

a body comprising:

a first wall formed with threaded hole;

a second wall extending perpendicular to said first wall and defining a threaded hole;

a third wall extending perpendicular to said second wall and defining a first threaded hole and a second threaded hole;

a positioning element mounted on said second wall, said positioning element extending parallel to and between said first wall and said third wall and defining two teeth;

a stem comprising:

a first end defining a hole transversely extending therethrough;

a middle portion defining a thread engaged with said threaded hole of said first wall; and

a second end defining a pushing rod extending co-axially therefrom said pushing rod being aligned with and extendable toward said second threaded hole of said third wall;

a first lever penetrating said hole of said stem for rotating said stem during operation of the device, said first lever defining a threaded end wherein said first level is removable from said stem securable to said first threaded hole of said third wall for storage; and

a second lever defining a threaded end securable to said threaded hole of said second wall to act as a handle in operation, said second lever removable from said second wall has been inserted and securable to said second threaded hole of said third wall for storage.

5,148,591

VISION TARGET BASED ASSEMBLY

Timothy R. Pryor, Tecumseh, Canada, assignor to Sensor Adaptive Machines, Inc., Windsor, Canada

Continuation of Ser. No. 110,541, Oct. 20, 1987, abandoned, which is a continuation of Ser. No. 865,637, May 14, 1986, abandoned, which is a continuation of Ser. No. 660,280, Oct. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 348,803, Feb. 16, 1982, abandoned, and a continuation-in-part of Ser. No. 453,910, Dec. 28, 1982, abandoned, and a continuation-in-part of Ser. No. 323,395, Nov. 20, 1981, Pat. No. 4,482,960, and a continuation-in-part of Ser. No. 651,325, Sep. 17, 1984, Pat. No. 4,769,700, and a continuation-in-part of Ser. No. 592,443, Mar. 22, 1984, Pat. No. 4,602,163, which is a continuation-in-part of Ser. No. 262,492, May 17, 1981, Pat. No. 4,453,085. This application Feb. 9, 1990, Ser. No. 478,078

Int. Cl.[5] H05K *13/00*

U.S. Cl. 29—407 **16 Claims**

1. A method for controlling an assembly process where a movable robot assembles a first part relative to a second part comprising the steps of:

affixing targets to one of the robot, first part, and second part;

locating a TV camera at a known position relative to one of the other of the robot, first part and second part;

grasping the first part with the robot;

determining with the TV camera the position of the targeted one of the robot, first part and second part; and

automatically controlling the movement of the robot to assemble the first part relative to the second part based on the determined position of the targeted one of the robot, first part and second part relative to the TV camera and other one of the others of the robot, first par and second part.

5,148,592

METHOD AND APPARATUS FOR HANDLING FLOOR COVERINGS

Peter Camitz, Stockholm, and Ichi S. Gadelius, Lidingö, both of Sweden, assignors to Proclino Golv AB, Älvsjö , Sweden

PCT No. PCT/SE89/00289, § 371 Date Jan. 17, 1991, § 102(e) Date Jan. 17, 1991, PCT Pub. No. WO89/12150, PCT Pub. Date Dec. 14, 1989

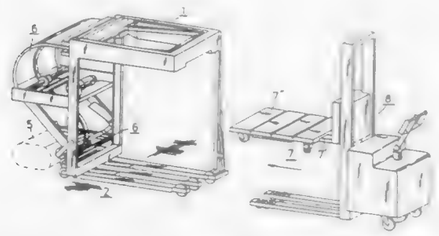
PCT Filed May 23, 1989, Ser. No. 623,431

Claims priority, application Sweden, May 31, 1988, 8802030

Int. Cl.[5] B23P *19/04;* **E01C** *23/08*

U.S. Cl. 29—426.4 **10 Claims**

1. A method for handling a floor covering, which covering comprises substantial planar floor-cover sections provided with a textile outer surface, said method comprising: taking-up floor-cover sections from a substantially flat support surface by the steps of moving a gripping device on a mobile pick-up means onto a floor-cover section, causing the gripping device to automatically grip said section by automatic insertion of a plurality of needle-shaped gripping elements, carried by said gripping device, into at least the textile outer surface of said



section to be lifted, continuously moving the gripping device by the mobile pick-up means, thereby sequentially lifting the gripped section, moving said lifted section to a new location, and subsequently withdrawing said needle-shaped elements from said outer surface of said lifted section, thereby releasing the gripping of said lifted section from the gripping device.

5,148,593

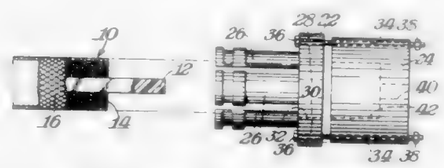
METHOD FOR JOINTING A DIELECTRIC WAVEGUIDE

Jeffrey A. Walter, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Aug. 1, 1991, Ser. No. 739,256

Int. Cl.[5] H01P *11/00*

U.S. Cl. 29—600 **7 Claims**



1. A method for making a joint between two sections of a dielectric waveguide, wherein said dielectric waveguide comprises a dielectric core having a non-circular cross-section, one or more layers of dielectric cladding wrapped around said core, and one or more shielding layers wrapped around said cladding, said method comprising:

(a) cutting one end of one of said dielectric waveguide sections to be jointed in a precise transverse cut perpendicular to the long axis of said waveguide,

(b) joining together a flanged coupling and an aluminum alignment tool, wherein said flanged coupling has, at its proximal end thereof, means for clamping and gripping said one end of said waveguide, said coupling having, at its distal end, a flange having a plurality of precision alignment openings therethrough, the coupling having a longitudinal opening through the center thereof to permit passage therethrough of said one end of said waveguide, said aluminum alignment tool having a plurality of precision openings therein in registry with said openings in said flange, said coupling and alignment tool being joined in precise alignment by fastening means extending through said precision openings, said alignment tool having a longitudinal opening therethrough whose cross-section corresponds to the cross-section of said dielectric core,

(c) stripping away from said dielectric waveguide at said one end thereof a portion of said cladding and shielding layers to expose a length of said core, said length being greater than the longitudinal dimension of said alignment tool,

(d) inserting said one end of said waveguide with exposed core into and through said flanged coupling and attached alignment tool such that said exposed core extends into and through the longitudinal opening in said alignment tool, the corresponding cross-sections of said core and said opening in said alignment tool thereby being in precise radial alignment with respect to each other,

(e) clamping said coupling at its proximal end to said dielectric waveguide by said clamping means while retaining precision alignment of said core and corresponding opening in said alignment tool,

(f) removing said aluminum alignment tool from said flanged coupling,

(g) affixing a shim-lapping tool to said flanged coupling, said shim-lapping tool having a central longitudinal opening therethrough whose cross-section corresponds to the cross-section of said waveguide, said one end of said waveguide extending therethrough, the longitudinal dimension of said shim-lapping tool being less than 0.025 inch,

(h) precisely cutting said one end of said waveguide transversely, adjacent to and with the aid of said shim-lapping tool, to form a precision transverse cut across said one end of said waveguide, the length of said waveguide extending outwardly from said flange thereby being less than 0.025 inch,

(i) removing said shim-lapping tool,

(j) repeating steps (a) through (i) for the other of said two sections of said waveguide to be jointed, and

(k) affixing the two so-prepared ends of said waveguide together, with their respective flanged couplings, such that said waveguide sections are in precise axial, radial and rotational alignment with respect to each other

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5,148,594

METHOD OF MANUFACTURING AN INJECTION MOLDING PROBE

Jobst U. Gellert, 7A Prince St., Georgetown, Ontario, Canada L7G 2X1

Filed Feb. 18, 1992, Ser. No. 836,352

Claims priority, application Canada, Dec. 11, 1991, 2057439-9

Int. Cl.[5] H05B *3/00*

U.S. Cl. 29—611 **8 Claims**

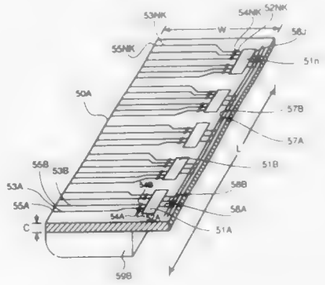
1. A method of manufacturing a metallurgically monolithic integral injection molding heated probe having an elongated outer body with a rear end and a forward end, an electrically insulated heating element extending longitudinally in the body from an external electrical terminal adjacent the rear end of the body, and a thermocouple bore extending longitudinally in the body adjacent the heating element, comprising the steps of:

(a) forming a hollow steel forward portion of the body having a bore extending from an open rear end to a closed forward end,

(b) forming a steel central elongated sleeve portion of the body having a rear end and a forward end with a heating element bore extending longitudinally therethrough from the rear end to the forward end,
(c) forming a rear hollow steel cap portion of the body having a rear end and a forward end, the cap portion having a threaded cylindrical seat extending forwardly from the rear end, the cap portion having a bore extending longitudinally therethrough from the seat to the forward end,
(d) forming an electrical terminal to be mounted adjacent the rear end of the body, the electrical terminal having an opening to receive therein a bared end of the electrical heating element in electrical connection with the electrical terminal, the electrical terminal having insulation to electrically insulate the electrical terminal from the body,
(e) inserting the electrical heating element into the heating element bore of the sleeve portion of the body and assembling the forward portion of the body, the central sleeve portion of the body, and the rear cap portion of the body in position wherein the bores are longitudinally aligned to form the body and mounting the electrical terminal adjacent the rear end of the body wherein said bared end of the electrical heating element extends into the opening in the electrical terminal,
(f) applying brazing material along the joins between the electrical terminal and the forward portion, central sleeve portion, and rear cap portion of the body,
(g) screwing a threaded filler tube into the threaded cylindrical seat in the rear cap portion of the body, the filler tube having a hollow bore leading to the bore through the rear cap portion of the body, and loading a predetermined quantity of silver into the hollow bore of the filler tube,
(h) inserting the assembled body, electrical terminal, and filler tube in an upright position into a vacuum furnace and heating to predetermined temperatures in a reduced oxygen atmosphere according to a predetermined cycle to melt the brazing material to braze the electrical terminal and the portions of the body together and to melt the silver which flows downwardly around the heating element to braze fill the bore in the forward portion of the body, the heating element bore in the central sleeve portion of the body, and the bore in the rear cap portion of the body to form a probe having a metallurgically monolithic integral structure, and
(i) removing the filler tube from the threaded seat in the rear cap portion of the body and machining a thermocouple bore to extend from the seat through the rear cap portion of the body and the central sleeve portion of the body into the silver which fills the bore in the forward portion of the body.

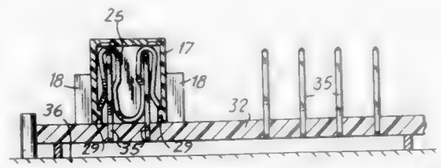
5,148,595
METHOD OF MAKING LAMINATED ELECTROSTATIC PRINTHEAD
David E. Doggett, Boulder Creek, and Brian J. Dahlquist, Palo Alto, both of Calif., assignors to Synergy Computer Graphics Corporation, Santa Clara, Calif.
Continuation-in-part of Ser. No. 516,007, Apr. 27, 1990, abandoned. This application Apr. 4, 1991, Ser. No. 678,416
Int. Cl.[5] H05K 3/34
U.S. Cl. 29—840 23 Claims

1. A method for making a high resolution electrostatic printhead without multiplexing comprising the steps of:
providing a substrate material narrow in width;
grinding the material to a particular thickness;
laminating a copper foil layer to at least one surface of the material;
etching the copper foil layer to form conductive traces; and



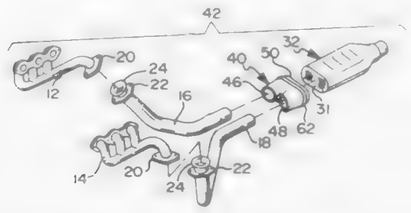
attaching integrated circuit die to the material so as to electrically contact the traces.

5,148,596
CONTINUOUS MOLDED ELECTRONIC COMPONENT ASSEMBLY
Irwin Zahn, New York, N.Y., assignor to Autosplice, Inc., Woodside, N.Y.
Continuation of Ser. No. 409,524, Sep. 19, 1989, abandoned. This application Feb. 26, 1992, Ser. No. 841,872
Int. Cl.[5] H05K 3/30
U.S. Cl. 29—842 4 Claims



1. A method for mechanizing the manufacture and assembly of a shunt connector onto pins on a printed circuit board comprising the steps:
(a) forming by a continuous molding process a first elongated continuous strip of individual plastic housing parts each containing a cavity and interconnected by severable plastic regions,
(b) winding onto a first reel the continuous strip formed by step (a),
(c) providing a first assembly machine having means for holding a supply of spring metal wire pieces and an insertion head,
(d) mounting the first reel of step (b) on the first machine and feeding the first continuous strip past the machine head and inserting into each cavity of the housing part a spring wire to form a second continuous strip of shunt connectors with inserted wire interconnected by said severable plastic regions,
(e) winding onto second reel the second continuous strip of step (d),
(f) providing a second inserting machine having a support for supporting a printed circuit board having pins for receiving a shunt connector and a head for inserting shunt connectors,
(g) mounting the second reel of step (e) on the second machine and feeding the second continuous strip from the second reel to the second machine head,
(h) controlling the second machine to provide the leading shunt connector on the second strip to the head while positioning the table so that a printed circuit board on the table is located under the head in a position to receive at selected pin locations the shunt connector,
(i) operating the second machine to cut-off along the severable region the leading shunt connector from the second strip and then to insert the cut-off shunt connector onto the printed circuit board pins at the selected location,
(j) repeating steps (h) and (i) to sever and insert the next leading shunt connector on the second strip onto pins at a second selected location on the printed circuit board or onto pins at a selected location on another printed circuit board.

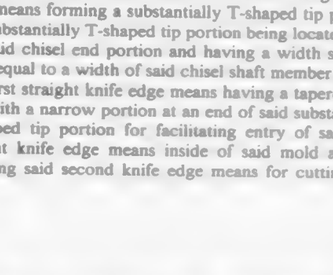
5,148,597
METHOD OF MAKING A COLLECTOR DEVICE
Andrew M. Weeks, Jackson, Mich., assignor to Tennessee Gas Pipeline Company, Lincolnshire, Ill.
Filed Aug. 27, 1990, Ser. No. 573,386
Int. Cl.[5] B21D 22/00
U.S. Cl. 29—890.08 9 Claims



1. A method of interconnecting two exhaust pipes extending from opposite manifolds of an internal combustion engine to an open end of a gas receiving member, said method including the steps of:
providing a collector device having an inlet end, an outlet end, and a chamber intermediate said inlet and outlet ends by reforming a cylindrical sheet of metal into a one-piece tubular shell having a longitudinal axis, and a first end wall and a second end wall spaced along said longitudinal axis, forming an outwardly extending annular rib into said shell adjacent said second end wall, and deforming said first end wall in a direction transverse to said longitudinal axis by forcing material of said first end wall into a predetermined shape to define first and second inlet passages and a closure portion therebetween for connection to said exhaust pipes;
positioning an end portion of each of said two exhaust pipes into said first and second inlet passages associated with said inlet end of said collector device;
positioning said open end of said gas receiving member into an outlet passage associated with said outlet end of said collector device; and
securing said collector device to said two exhaust pipes and said gas receiving member, said chamber allowing generally homogeneous mixing of exhaust gases entering said first and second inlet passages prior to delivery to said open end of said gas receiving member.

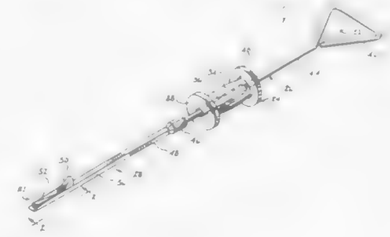
5,148,598
METHOD OF FABRICATING EXCHANGER U-BEND TUBE SUPPORT
Cecil C. Gentry, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 927,345, Nov. 5, 1986, Pat. No. 5,005,637. This application Jan. 14, 1991, Ser. No. 641,059
Int. Cl.[5] B23P 15/26
U.S. Cl. 29—890.043 3 Claims

1. A method of fabricating a supported tube bundle having a plurality of tubes, each tube including a first pass tube portion, a second pass tube portion, and a U-bend tube portion interconnecting the first and second pass tube portions, said method comprising the steps of:
positioning a strip support bar transversely adjacent an end of a tube support;
attaching first ends of a plurality of spaced first tube separation elements to said strip support bar;
alternately positioning said U-bend tube portions and second tube separation elements between said first tube separation elements such that:



a plurality of alternating tube rows and second tube separation elements are formed in a plane of said first tube separation elements; and
said first and second passes of said tubes extend substantially parallel into said tube support; and
attaching a U-tube ring around said U-bend tube portions in said plane of said first tube separation elements.

5,148,599
MOLD EXTRACTOR AND METHOD
Thomas L. Purcell, 8737 E. Hubbell St., Scottsdale, Ariz. 85257
Continuation of Ser. No. 345,288, May 1, 1989, Pat. No. 5,005,286. This application Feb. 1, 1991, Ser. No. 650,437
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] B26B 3/08
U.S. Cl. 30—1 1 Claim



1. A mold extractor comprising:
a chisel end portion;
chisel shaft member means connected to said chisel end portion for applying an impact force to said chisel end portion; said chisel end portion comprising a first straight knife edge means for separating a mold and a second straight knife edge means for cutting a mold, said first straight knife edge means and said second straight knife edge means forming a substantially T-shaped tip portion, said substantially T-shaped tip portion being located at an end said chisel end portion and having a width substantially equal to a width of said chisel shaft member means, said first straight knife edge means having a tapered portion with a narrow portion at an end of said substantially T-shaped tip portion for facilitating entry of said first straight knife edge means inside of said mold and for exposing said second knife edge means for cutting said

mold, said tapered portion having a wider portion substantially equal to the width of said chisel shaft member means;

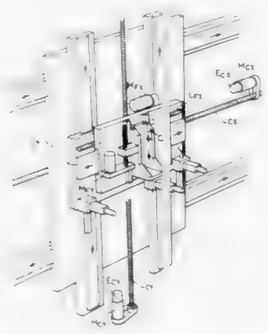
claw means for removing a container lid, said claw means being mounted on said chisel shaft member means in a direction to apply a force opposite in direction to a force exerted by said first and second knife edge means, said claw means having a first portion extending outwardly from a surface of said chisel shaft member means spaced from said second straight knife edge means, said claw means being located on the same side of said chisel shaft member means as said second straight knife edge means, said claw means having an inwardly sloped portion extending from said first portion to said second straight knife edge means and being a continuation of said tapered portion of said first straight knife edge means to facilitate cutting of said mold.

5,148,600

PRECISION MEASURING APPARATUS

Yehuda Y. Chen, Irvine, Calif., and Aharon Siev, Haifa, Israel, assignors to Advanced Robotics (A.R.L.) Ltd., Haifa Bay, Israel

Filed Sep. 17, 1991, Ser. No. 761,148
Int. Cl.[5] G01B 5/00
U.S. Cl. 33—1 M 20 Claims



1. Apparatus for precisely measuring the location of points on working media, comprising:

a base panel having a surface area at least equal to that of the largest working medium to be measured, said base panel including a reference mark and a grid of fiducial marks each located at a precisely-known location with respect to said reference mark;

a coarse positioning device movable in a plane over said base panel;

a fine positioning device having an area smaller than that of the base panel and carried by said coarse positioning device;

a holder for holding a working medium in contact with said base panel;

first measuring means for measuring the location of a preselected point on said coarse positioning device with respect to a preselected fiducial mark of the base panel;

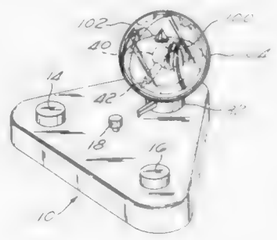
and second measuring means carried by said fine positioning device for measuring the location of a point to be measured on the working medium with respect to said preselected point on the coarse positioning device.

5,148,601

SPHERICAL DRAWING TEMPLATE

Richard H. Anderson; Robert R. Anderson, and Richard R. Anderson, all of P.O. Box 1059, Trabuco Canyon, Calif. 92678

Continuation-in-part of Ser. No. 420,136, Oct. 11, 1989, Pat. No. 5,038,482. This application Jul. 12, 1991, Ser. No. 728,736
Int. Cl.[5] B43L 13/00
U.S. Cl. 33—21.2 15 Claims



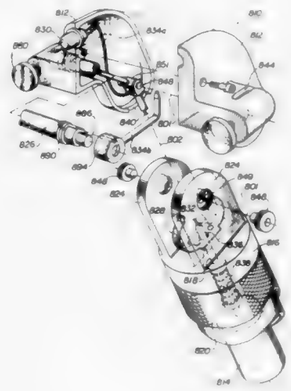
1. In a device for forming images upon a spherical surface, the device having a substantially transparent hollow sphere, a powder material disposed within the sphere, a scribe disposed within the sphere, and a control mechanism for manipulating the scribe, an improvement comprising a transparent member disposable in laminar juxtaposition to the surface of the sphere and indicia formed upon the transparent member such that the indicia may serve as a guide for manipulation of the scribe.

5,148,602

DETERMINING AND MARKING APPARATUS AND METHOD FOR USE IN OPTOMETRY AND OPHTHALMOLOGY

Forrest A. Marshall, 615 Acadamy Ave., Dublin, Ga. 31021

Continuation-in-part of Ser. No. 642,299, Jan. 17, 1991, Pat. No. 5,046,257, which is a continuation-in-part of Ser. No. 467,269, Jan. 19, 1990, Pat. No. 5,036,592. This application Aug. 2, 1991, Ser. No. 739,616
Int. Cl.[5] B43L 13/00
U.S. Cl. 33—28 8 Claims



1. A device for marking a lens worn by a patient having a visual axis, comprising:

a. a frame for positioning the device adjacent the lens;

b. a light source connected to the frame and positionable in a selected relationship with the visual axis;

c. a first marker connected to the frame for marking the lens, and

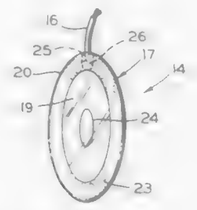
d. means for rotating the frame relative to the visual axis.

5,148,603

ILLUMINATED REAR PEEP SIGHT FOR A PROJECTILE DEVICE

Robert C. Beutler, Sand Creek, Mich., assignor to Kenneth Robertson, Toledo, Ohio, a part interest

Filed Sep. 30, 1991, Ser. No. 767,990
Int. Cl.[5] F41B 5/00
U.S. Cl. 33—265 22 Claims



1. A rear peep sight apparatus for use with a projectile device comprising:

a body having spaced apart front and rear surfaces, at least a portion of said rear surface being opaque;

means for mounting said body on a projectile device at a rear peep sight position;

a sighting means on said body separate from said opaque portion of said rear surface for aligning with a target positioned in front of said front surface and viewed from said rear surface through said body; and

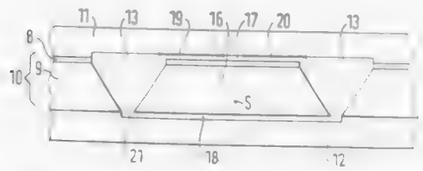
means for transmitting light from a light source through said body to illuminate an area of said body on said rear surface about said sighting means.

5,148,604

MICROMECHANICAL TILT SENSOR

Frank Bantien, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 17, 1991, Ser. No. 701,781
Claims priority, application Fed. Rep. of Germany, May 22, 1990, 4016471
Int. Cl.[5] G01C 9/06
U.S. Cl. 33—366 17 Claims



1. Sensor for tilt measurement, having a sensor element made from a monocrystalline silicon wafer (10), a movable silicon mass (16) etched out of said wafer (10), and means for evaluation of the displacement of said silicon mass,

characterized in that

said silicon mass (16) is defined by a surrounding etch groove (13) which completely penetrates silicon wafer (10), said mass (16) being connected to said silicon wafer (10) by two torsion bars aligned along a single axis,

said silicon mass (16) is movable by a rotation about the bar axis by twisting of said torsion bars (14, 15),

said sensor element is connected to at least one of an upper cover (11) and a lower cover (12),

on at least one of said covers (11, 12) at least two electrodes (19,20) are provided in the area of the silicon mass (16), and

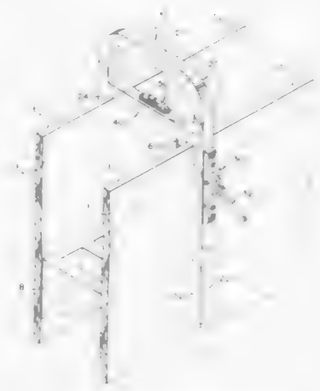
said silicon mass (16) and two electrodes (19,20) form capacitances whose difference in values is used for evaluation of the movement of the silicon mass.

5,148,605

FORMING LEVELING TOOL

Juan L. Julia, 235 SW. LeJeune Rd., Hialeah, Fla. 33134

Filed Aug. 27, 1991, Ser. No. 750,663
Int. Cl.[5] G01C 9/28
U.S. Cl. 33—370 1 Claim



1. A tool for mounting and leveling forming boards to a vertical wall, comprising:

A. first and second leg members having each two ends wherein said first leg member is longer than said second leg member;

B. a transverse member rigidly and perpendicularly mounted to one of the ends of each of said leg members;

C. a puncturing assembly mounted to said first leg member and further including a puncturing element that is selectively forced inwardly to puncture one of said boards holding same securely in place;

D. a third leg member rigidly and perpendicularly mounted to said transverse member and said third leg member being mounted at a parallel and spaced apart relationship with respect to said first member so that separation of said third and first leg members is sufficient to permit said one of said forming boards through and wherein said third leg member is shorter than said first and second leg members;

E. handle means mounted to said transverse member; and

F. level means longitudinally mounted along said transverse member.

5,148,606

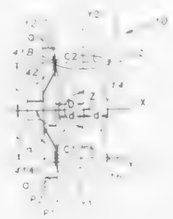
LEG MEASURING DEVICE

Jeffrey T. Mason, Escondido; Charles A. Bastyr, San Diego, and Bradley R. Mason, Olivenhain, all of Calif., assignors to Don Joy, Inc., Carlsbad, Calif.

Division of Ser. No. 308,259, Feb. 8, 1989, Pat. No. 4,989,337. This application Oct. 26, 1990, Ser. No. 604,119
Int. Cl.[5] A61B 5/103
U.S. Cl. 33—512 34 Claims

1. A method for measuring a leg for the fitting of a knee brace to the leg, the leg having an X-axis extending from the lateral side of the knee to the medial side of the knee about the knee condyles, a Y1-axis extending vertically downward

through the lower leg through the midline of the knee, a Y2-axis extending vertically upward through the upper leg through the midline of the knee, and a reference line drawn from a first position on the lateral side of the upper leg a first predetermined distance above the X-axis to a second position



on the lateral side of the lower leg a second predetermined distance below the X-axis, the method comprising:

a. measuring the width of the knee between the lateral and medial condyles; and

b. measuring the angle between the X-axis and the reference line.

5,148,607

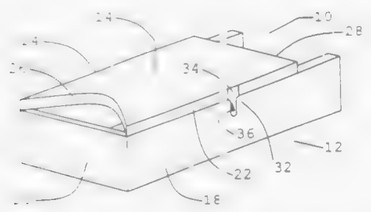
FISH HOLDING AND MEASURING DEVICE AND METHOD OF USE

Rupert W. Lasiter, Rte. 1, Box 1368, Elkhart, Tex. 75839

Filed Nov. 1, 1991, Ser. No. 786,287

Int. Cl.[5] **G01B** *5/02; A01K 97/00; B43L 7/00;* **B65D** *85/00*

U.S. Cl. 33—549 **19 Claims**



1. A fish holding and measuring device, comprising

a tray having a bottom with first and second edges, first and second ends, an upper face, and a lower face, having a pair of side walls, each with a lower edge and an upper edge, each of said side walls interconnected at its lower edge to and extending upwardly from said upper face of said bottom with one of said side walls disposed at said first edge and the other of said side walls disposed at said second edge, and having an end wall interconnected to and extending upwardly from said upper face of said bottom, with said end wall disposed at said first end of said bottom, and with said end wall extending between and interconnected to said side walls; and

a lid, with first and second edges and first and second ends, the width of said lid between said first and second edges thereof being approximately equal to the distance between said upper edges of said side walls and the length of said lid being less than the distance between said first and second ends of said tray, said lid being disposed over said tray upon said upper edges of said side walls and pivotally interconnected to said tray, said lid being positioned relative to said tray such that said first end of said lid is disposed toward said second end of said bottom from said end wall, so as to provide an access space to the interior of said tray between said first end of said lid and said end wall.

5,148,608

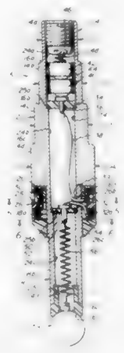
EDGE SENSOR WITH MULTI-SIZE OUTER ENGAGEMENT SURFACES

Moshe Meller, 175 Oberlin Ave., Lakewood, N.J. 08701

Filed May 1, 1991, Ser. No. 694,950

Int. Cl.[5] **G01B** *7/00*

U.S. Cl. 33—561 **13 Claims**



1. An edge sensor comprising:

a rigid metallic housing member having an outer grasping surface adapted to be grasped by a collet, said outer grasping surface having plurality of different outer dimensions for engagement with respective different sized collets, said outer grasping surface including a plurality of contiguous, co-axial outer cylindrical surfaces having respective different diameters;

a rigid metallic probe member extending from said housing member for contacting a workpiece, said probe member and said housing member comprising a single unitary rigid metallic member made from a single piece of rigid metallic material, said probe member having a tip end portion remote from said housing member;

a metal contact member mounted to said tip end portion of said probe member and arranged for contacting a workpiece, said metal contact member being electrically insulated from said tip end portion of said probe member;

indicator means for indicating contact of the workpiece with said metal contact member of said probe member; and

electrical means mounted within at least one of said housing member and said probe member for energizing said indicator means in response to contacting of the workpiece with said metal contact member of said probe means.

5,148,609

ADJUSTING LOCATOR FOR CUTTING TOOLS

Richard S. Green, LaPeer, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Apr. 5, 1991, Ser. No. 680,863

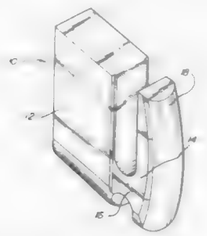
Int. Cl.[5] **B23B** *25/06*

U.S. Cl. 33—628 **5 Claims**

1. An adjusting locator for adjusting the axial position of the cutting insert in a cutting tool, said adjustor comprising:

(a) a body having sides and a length and width said body comprised of a resilient material; and

(b) a flex flange having an insert contact surface, said flange oriented substantially parallel with said body and connected to said body by a bridge, and spaced from said body by an adjusting groove, said bridge defined by said



adjusting groove and a flex groove, said flex flange being relieved along its sides relative to said body sides.

5,148,610

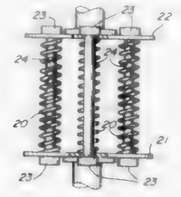
PRECISION PARALLEL MECHANICAL FLOAT

Robert F. Cusack, Grosse Pointe Park, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 624,502, Dec. 7, 1990, which is a continuation of Ser. No. 269,047, Nov. 9, 1988, abandoned, which is a division of Ser. No. 941,679, Dec. 15, 1986, Pat. No. 4,803,786. This application May 9, 1991, Ser. No. 697,378

Int. Cl.[5] **G01B** *5/25*

U.S. Cl. 33—644 **4 Claims**



1. A precision parallel float mechanism, comprising:

(a) a base including three registration surfaces in a fixed plane of reference, each of said registration surfaces being spaced an equal distance from each of the remaining of the three registration surfaces;

(b) a relatively displaceable member having three directly opposed corresponding registration surfaces lying in a plane of reference, said plane of reference being spaced from and substantially parallel to said fixed plane of reference;

(c) three columns, each column having a pair of peripheral contact surfaces having opposing side edges, each pair of contact surfaces being positioned at a respective opposite end of a respective column for engaging respectively a pair of said opposed registration surfaces;

(d) a plurality of head extremities, each head extremity being positioned at opposite ends of the columns, said head extremities engaging said registration surfaces; and

(e) yieldable preload resilient means carried on the columns, said yieldable preload resilient means establishing normal compressive engagement with respective registration surfaces subject to each column tilting in substantially parallel relationship wherein peripheral contact surfaces tilt to opposite peripheral side edge contact with respective registration surfaces in response to a predetermined force couple imposed on the parallel planes of reference of said base and displaceable member, said resilient means comprise compression springs disposed relative to the base and the displacement member to urge parallel lateral movement relative to each other.

5,148,611

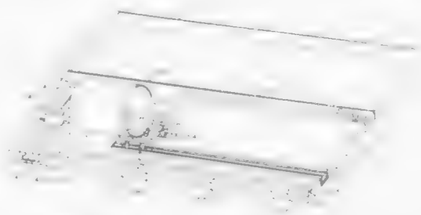
MULTIMEASUREMENT GAUGE ASSEMBLY

David W. Raetzel, Norco, Calif., assignor to Beatrice/Hunt-Wesson, Inc., Fullerton, Calif.

Filed Mar. 12, 1991, Ser. No. 668,192

Int. Cl.[5] **G01B** *5/02*

U.S. Cl. 33—783 **24 Claims**



1. A multimeasurement gauge assembly comprising:

a measuring block having a top reference surface, a measuring well defined in the top reference surface, and a plurality of longitudinally extending grooves defined in the top reference surface on one side of the measuring well,

a measuring device disposed in the measuring well, the measuring device having a measuring arm disposed to measure distances at the top reference surface, the measuring device being laterally movable to a plurality of different measurement positions, a measurement position being provided for each longitudinally extending groove; and

at least one slide bar disposable within one of the longitudinally extending grooves and having a reference post extending above the top reference surface, the measuring device being laterally movable to a position opposite the reference post to measure an object disposed between the measuring device and the reference post.

5,148,612

APPARATUS FOR MEASURING DISTANCES ON A WORKPIECE, AND SLIDING GAGE DESIGNED FOR THE DIGITAL MEASUREMENT OF SUCH DISTANCES

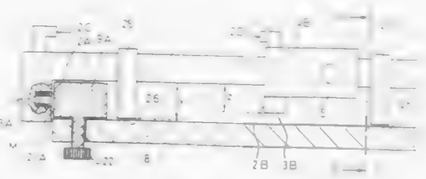
Carl S. Walser, Gamprin, Liechtenstein, and Johann M. Jost, Richterswil, Switzerland, assignors to Industrie-und-Handels-AG, Liechtenstein

Continuation of Ser. No. 116,394, Nov. 3, 1987, abandoned. This application May 29, 1990, Ser. No. 530,466

Claims priority, application Switzerland, Nov. 3, 1986, 04350/86

Int. Cl.[5] **G01B** *3/20, 7/14, 5/14*

U.S. Cl. 33—784 **25 Claims**



1. Apparatus for measuring distances in a plane, between a plurality of edges, at least one of which is on a workpiece, said apparatus comprising:

a) a straightedge;

b) means for supporting said straightedge in a position parallel to said plane; including two measuring limbs attached to said straightedge, at least one of said limbs being capable of sliding on said straightedge;

c) electronic digital means on said at least one slidable mea-

suring limb and on said straightedge for providing a read-out of a measurement, said electronic digital means comprising

1) sensor means in said slidable measuring limb for sensing and outputting data representative of the position of said sensor along said straightedge;

2) input means for selecting and inputting at least one reference value of said data representative of a reference position along said straightedge;

3) a display; and

4) computer means connected to said sensor means, said input means, and said display, being operable to calculate and control the display for displaying at least one measured distance between said reference position and a first one of said edges and further to display the mean value and the difference of two respective distances between said reference position and first and second ones of said edges;

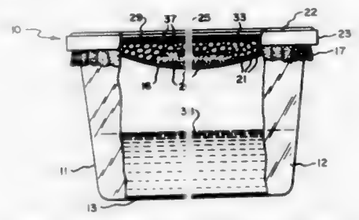
d) one of said measuring limbs having two limb parts projecting in two different directions from said straightedge;

e) said two limb parts presenting a smooth first measuring face perpendicular to said plane and having means to magnetically and detachably adhere said two limb parts to a third one of said edges, thereby bringing said straightedge into a perpendicular position with respect to said third one of said edges; and

f) measuring means projecting from the other of said measuring limbs along an axis perpendicular to said plane;

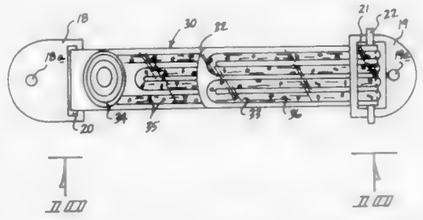
g) a second measuring face being formed on said measuring means and being movable into contact with said first and second ones of said edges and facing said first measuring face.

5,148,613
CLOSET DRIER
John S. Cullen, Buffalo, N.Y., assignor to Multiform Desiccants, Inc., Buffalo, N.Y.
Filed Sep. 30, 1991, Ser. No. 767,485
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—81 **16 Claims**



1. A closet drier comprising a container having a lower portion and an upper portion, an open top on said container, a first outer edge on said container defining said open top, a normally stretched elastic diaphragm having a second outer edge, means for fastening said second outer edge to said first outer edge, openings in said stretched elastic diaphragm, a vapor-permeable cover, and deliquescent material confined between said normally stretched elastic diaphragm and said vapor-permeable cover in said upper portion of said container for attracting vapor through said vapor-permeable cover while said openings in said stretched elastic diaphragm permit liquid formed by the dissolving of the deliquescent material due to its absorption of said vapor to flow into said lower portion of said container, said normally stretched elastic diaphragm contracting in response to said dissolving of said deliquescent material to thereby cause said openings therein to contract.

5,148,614
SHOE CLOSURE STRAP APPARATUS
Michael N. Kelly, 693A Pleasant St., Norwood, Mass. 02062
Filed Aug. 15, 1991, Ser. No. 745,146
Int. Cl.[5] A43B *11/00*
U.S. Cl. 36—50.1 **1 Claim**



1. A shoe closure strap apparatus in combination with a shoe, including a show upper, the shoe upper defining a shoe opening between a right flap and a left flap, the right flap and the left flap including a plurality of respective right and left flap lace openings, wherein the apparatus comprises,

an anchor plate pivotally mounted within one of said left flap lace openings, and

a buckle plate pivotally mounted within one of said left flap lace openings, and

the anchor plate including an anchor slot positioned adjacent the shoe opening, and the buckle plate including a buckle slot positioned adjacent the shoe opening, wherein the buckle slot includes a lock bar slidably mounted within said buckle slot in a parallel coextensive relationship within said buckle slot, and

a flexible belt web, the flexible belt web including a first end, with a securement loop mounted at the first end, the securement loop secured within the anchor slot, and

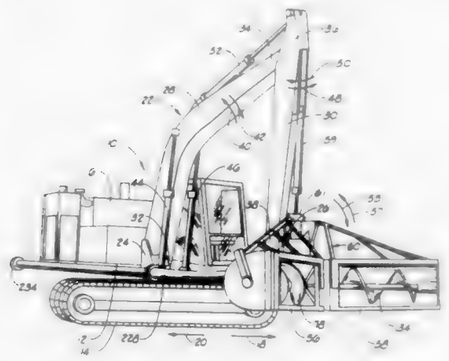
the second end including a free end, wherein the free end is directed through the buckle slot in surrounding relationship relative to the lock bar, and

respective right and left lock means mounted to the respective anchor and buckle plate for securement of the respective anchor and buckle plate to one of said right flap lace openings and one of said left flap lace openings respectively, and

each lock means includes a lock pin, the lock pin including a shank, the shank including a support plate, the support plate fixedly and orthogonally mounting the shank medially of the support plate and with the shank including a plurality of spring biased legs mounted at a distal end of the shank, wherein the spring biased legs of the respective right and left securement means are directed through the respective right and left flap and through the respective buckle and anchor plate to pivotally secure the buckle and anchor plate to the respective right and left flap, and

the belt web is transparent, and wherein the belt web includes a continuous serpentine conduit contained within the belt web extending from the first end to the second end, and a flexible shape retentive squeeze bulb reservoir mounted to the belt web adjacent the first end, and fluid contained within the reservoir and within the conduit, and the fluid including a predetermined quantity of reflective glitter particles suspended within the fluid, whereupon compression of the squeeze bulb reservoir effects projection of the fluid and glitter particles throughout the conduit.

5,148,615
DREDGING APPARATUS
C. Gene Maitlen, and Randall E. Maitlen, both of Cushing, Okla., assignors to VMI Inc., Cushing, Okla.
Filed Jun. 4, 1991, Ser. No. 710,262
Int. Cl.[5] E02F *3/24, 3/92*
U.S. Cl. 37—64 **9 Claims**



1. An improvement in a dredging apparatus for cooperating in removing a mixture of liquids and solids from a selected site comprising a frame with means for moving the frame in a forward direction and a rearward direction, and an arm assembly having a first end and a second end with the first end of the arm assembly being movably connected to the frame, the improvement comprising:

auger housing means connected to the arm assembly and having an auger opening formed through a portion thereof, the auger housing means comprising:

a first auger housing having a first end, a second end, a front and a back, an auger opening being formed through the front of the first auger housing and the auger opening intersecting the second end of the first auger housing, the first auger housing being connected to the auger frame; and

a second auger housing having a first end, a second end, a front and a back, an auger opening being formed through the front of the second auger housing and the auger opening extending through the second auger housing intersecting the second end thereof, the second auger housing being connected to the auger frame, and the second end of the second auger housing being disposed near and spaced a distance from the second end of the first auger housing forming a flow passageway therebetween, the first auger housing is disposed at an angle with respect to the second auger housing with the first and the second auger housings each being angled inwardly toward the flow passageway at an angle less than about 180 degrees; and

auger means rotatingly supported on the auger housing means and at least a portion of the auger means being disposed in the auger opening in the auger housing means;

means for rotatingly driving the auger means; and

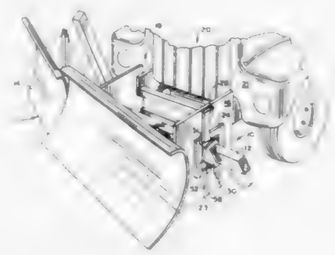
pump means having an inlet opening and an outlet opening, the inlet opening being in fluidic communication with the auger opening in the auger housing means, the mixture entering the auger opening and the auger means moving the mixture toward the pump means when the pump is drivingly rotated and the pump means receiving the mixture passed from the auger housing means via the inlet opening of the pump means and the pump means pumping the mixture through the discharge opening of the pump means.

5,148,616
ADAPTOR FOR EARTH WORKING CUTTING TEETH AND HOLDING CLAMP
Alfredo Maguina-Larco, Lima, Peru, assignor to A.M. Logistics Corporation, Woodbridge, Va.
Filed Dec. 21, 1990, Ser. No. 629,814
Int. Cl.[5] E02F *9/28*
U.S. Cl. 37—141 T **8 Claims**

1. An adaptor for connecting a boltless holding clamp, a cutting tooth formed from a hard material having constant transverse cross section, and a digging member of an earth working machine wherein said clamp comprises a substantially U-shaped body of material having appending wedge-locking flanges, said U-shaped body partially defining an elongated receiving channel means for receiving said cutting tooth, said adaptor comprising:

shank engagement means located at one end thereof for connecting with said digging member, and clamp receiving end means located at the other end thereof for receiving said clamp and tooth in clamping engagement, said receiving end means further including bearing surface means for cooperating with said U-shaped body to define a completed receiving channel means of constant transverse cross section which bears against said tooth when in clamping engagement, said receiving end means further including locking grooves coextensive with said receiving channel means for wedgedly interlocking with said appending flanges of said holding clamp, whereby said appending flanges, locking grooves and completed receiving channel means provides means for self-tightening said tooth of constant transverse cross section within said completed receiving channel means also of constant cross section in response to axial forces applied to said tooth and whereby said cutting tooth may be clamped at adjustable positions along said bearing surface.

5,148,617
WING PLOW MOUNTING SUPPORT FRAMEWORK
Richard Feller, Monroe, Wis., and Vincent Alongi, McConnell, Ill., assignors to Monroe Truck Equipment, Inc., Monroe, Wis.
Filed Jun. 25, 1991, Ser. No. 720,640
Int. Cl.[5] E01H *5/06*
U.S. Cl. 37—281 **19 Claims**

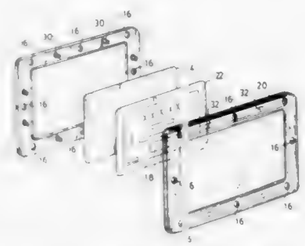


14. A wing plow comprising:

a wing plow mounting support framework including two spaced side walls adapted for attachment of a front plow

to the front thereof, mirror image sections attached to the side walls of the framework, a wing plow mounting arm extending through said sections, each section comprising means for engaging the mounting arm of the wing plow to prevent rotational movement about a horizontal pivot axis, and means for releasably securing said engaging means in an upright position when the engaging means is not engaging the mounting arm.

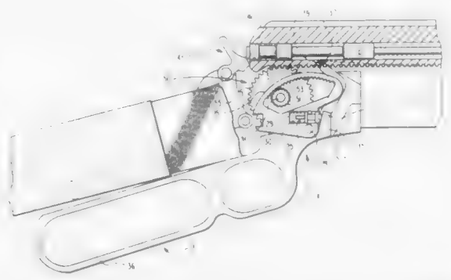
5,148,618
SEALED TAG
Blair M. Brewster, 297 Henry St., Brooklyn, N.Y. 11201
Continuation of Ser. No. 531,933, Jun. 1, 1990, abandoned. This application Oct. 18, 1991 Ser. No. 782,882
Int. Cl.[5] G09F *3/02*
U.S. Cl. 40—626 7 Claims



1. A sealed tamper resistant tag comprising:
at least substantially chlorine free base means;
a transparent window comprising at least a portion of the base means;
a peripheral frame portion on the base means surrounding the window, the tag being thicker at the frame than at the window;
a first upstanding rib on the base means for receiving and positioning an indicia bearing insert with at least a portion thereof visible within the window;
first alignment means on the frame;
a peripheral rim on the base surrounding the frame portion;
a least substantially chlorine free cover means disposed within the peripheral rim;
transparent window means on the cover means;
a frame portion on said cover means at least substantially surrounding the window portion of said cover means;
second alignment means on the cover means cooperating with said first alignment means for aligning the cover and base relative to each other with the transparent window portions of the cover and the base at least substantially in registration;
a recess in the cover means for receiving the first upstanding rib;
at least one seal formed between the cover and the base at least substantially surrounding the window portion of the cover and the base between the upstanding rib and the peripheral rim for forming a sealed chamber for receiving the indicia bearing insert; and
a plurality of aligned through mounting holes in the frame portions of the base means and the cover means for allowing the tag to be hung in at least two different orientations.

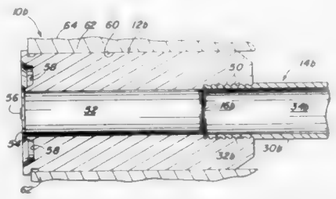
5,148,619
LEVER ACTION FOR FIREARMS
Joseph A. Badali, Ogden, Utah, assignor to Browning
Filed Nov. 26, 1991 Ser. No. 798,693
Int. Cl.[5] F41C *7/06*
U.S. Cl. 42—16 8 Claims

1. In a lever action firearm of the type in which a pivoted lever member transmits force to a bolt body through a rack and pinion system, whereby to move the bolt body rearward to cock the firearm, the improvement wherein said lever member comprises:
an external lever arm accessible for operation to pivot said lever arm forward; and
an internal lever arm assembly connected to and movable with said external arm, including:
an extension structured and arranged to push said bolt body rearward only during an initial increment of forward pivoting movement of said external lever arm; and



wherein said rack and pinion system comprises a floating rack element mounted to pivot with respect to said lever member and having means thereon structured and arranged to interact with means for moving said bolt body during a subsequent increment of forward pivoting movement of said external lever arm and to maintain rearward motion of said bolt body during any additional forward pivoting movement of said external lever arm.

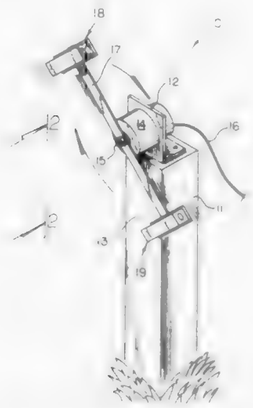
5,148,620
SHOTSHELL SIZE ADAPTER
Brian Nelson, 6900 Balcom Ave., Reseda, Calif. 91325
Filed Nov. 6, 1990, Ser. No. 609,559
Int. Cl.[5] F41A *21/10*
U.S. Cl. 42—77 2 Claims



1. An improved shotshell size adapter, said adapter comprising, in combination:
a) a cylindrical main body having a front portion with a front end and a rear portion with a rear end, said main body being solid throughout but having a central cylindrical bore extending therethrough along the longitudinal axis thereof, the main body being adapted to be seated within the bore of a shotgun breech, and said rear end of said adapter bore being adapted to receive a shotgun shell of a preselected size;
b) a cylindrical barrel having a front portion with a front end and a rear portion with a rear end with a preselected central bore extending longitudinally therethrough; and,
c) connector means releasably connecting said barrel at said rear end thereof to said front end of said adapter main body,
d) wherein the exterior surface of said rear end of said main body has an annular groove spaced outwardly from said bore to provide a finger space to enable a shotshell when

seated in said bore to be easily lifted by the fingers from said main body bore.

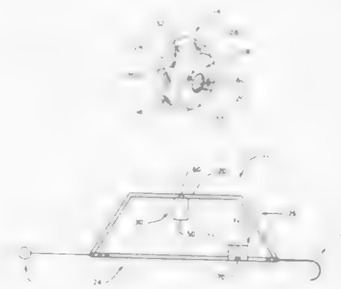
5,148,621
DEER REPELLING APPARATUS
Howard L. Rosen, Rte. 3, Box 115, Dillwyn, Va. 23936
Filed Feb. 14, 1992, Ser. No. 835,522
Int. Cl.[5] A01M *31/00*
U.S. Cl. 43—1 5 Claims



1. A deer repelling apparatus, comprising,
a rigid support post, the rigid support post including an upper distal end and a front wall, and
a mounting plate mounted to the upper distal end, and
a drive motor fixedly secured to the mounting plate, with the drive motor including an output shaft, and
electrical power supply directed through the drive motor, and
a mounting arm medially and orthogonally intersecting and fixedly secured to the output shaft, and
the mounting arm including an arm first end and an arm second end, the arm first end and the arm second end spaced an equal predetermined spacing relative to the output shaft, the arm first end including a first whistle member, and the arm second end including a second whistle member.

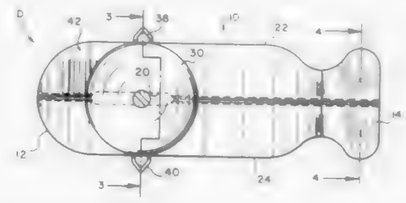
5,148,622
PERCH EYE FISHING LURE
Wayne R. Blair, 1399 Alleghany Rd., Attica, N.Y. 14011
Filed Jan. 8, 1991, Ser. No. 638,761
Int. Cl.[5] A01K *85/01*
U.S. Cl. 43—42 9 Claims

1. A fishing lure comprising:
A) a hollow perch-eye shaped housing, said housing being formed of plastic and including a sclera portion, a cornea portion, and a pupil portion in said cornea portion, said cornea portion being a first color, said pupil portion being a second color, said second color being sharply contrasted to said first color;



B) a sound generator in said housing; and
C) a chemical dispersing means in said housing.

5,148,623
DOWNRIGGER WEIGHT AND METHOD
Robert K. Haskell, 825 Wikiup Dr., Santa Rose, Calif. 95403
Filed Oct. 23, 1990, Ser. No. 602,168
Int. Cl.[5] A01K *95/00*
U.S. Cl. 43—43.13 18 Claims

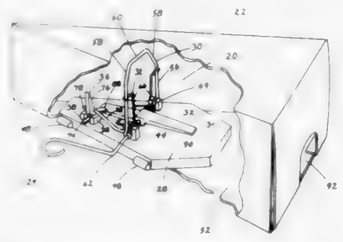


1. A downrigger weight, comprising:
a) a body having a front and a tail and oppositely disposed first and second surfaces;
b) first and second weights, each of said weights substantially overlying one of said surfaces and said weights being of substantially equal dimension and weight, said first and second weights being positioned forward of said tail and positioned to regulate the distance said downrigger weight is displaced laterally from a boat;
c) means operably securing said weights to said body;
d) at least a first eyelet secured to and extending from one of said weights, said at least a first eyelet for a line to tow said downrigger weight through a body of water;
e) means operably associated with said one weight for preventing rotation of said eyelet relative to said body;
f) said preventing means including a groove in one of said surfaces, and a tongue integral with said one weight and received within said groove; and
g) said groove extending substantially the length of said one surface for preventing bending of said body.

5,148,624
MOUSETRAP
George A. Schmidt, 1852 Kirby Rd., Glendale, Calif. 91208
Filed Apr. 10, 1991, Ser. No. 684,049
Int. Cl.[5] A01M *23/30*
U.S. Cl. 43—81 11 Claims

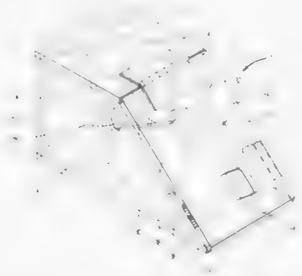
1. An animal trap comprising:
a base having an upper surface, a front end, a rear end, a first side edge and a second side edge;
a jaw frame pivotally mounted on said base for pivotal

movement between a cocked position and a sprung position;
spring means for biasing said jaw frame towards said sprung positions;
a catch member pivotally mounted on said base for pivotal movement between a catch position and a release position, said catch member having means for releasibly engaging said jaw frame when said jaw frame and said catch member are in said cocked position and said catch position, respectively, said catch member being pivotable to said release position to move said engaging means out of engagement with said jaw frame, thereby freeing said jaw frame for movement to said sprung position;
a trigger member pivotally mounted to said base for pivotal movement between a set position and at least one trip position, said trigger member including a trigger portion



adapted for operative association with said catch member, said trigger portion being positioned for manipulating said catch member when said catch member and said trigger member are in said catch position and said set position, respectively, said trigger portion forcing said catch member to said release position whenever said trigger member moves to said trip position, thereby freeing said jaw frame from releasible engagement with said catch member to permit said jaw frame to move to said sprung position;
cover means about said base, said cover means for prohibiting a human from contacting the trigger member and the catch member; and means for releasibly interlocking said base with said cover means, wherein said interlocking means includes at least one tab protruding from a side edge of said base and at least one slot located on said cover means so as to align with said tab for releasible engagement therewith.

5,148,62
ROACH TRAP
Walter M. Saleman, 840 The Rialto, Venice, Fla. 34285
Filed Apr. 6, 1992, Ser. No. 863,845
Int. Cl.[5] A01M *2:/20, 1/10*
U.S. Cl. 43—121 **13 Claims**

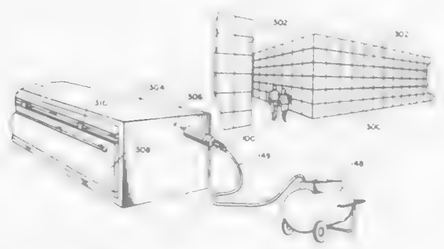


1. A roach trap for confining one or more roaches for disposal comprising:
a housing having flat panels connected along edge margins to form sides, an end, a bottom and a top which define an interior volume;
said top smaller in length than said bottom;
said sides, top and bottom each having an unsupported edge, said edges collectively defining an opening;
said opening oblique to said bottom;
a lid hinge connected at one end to said top unsupported edge and sized to conform to said opening when closed by gravity thereagainst in a manner preventing a roach from escaping from the interior of said roach trap;
a partition connected in the interior of said roach trap having a generally upright bait support aperture formed therethrough, said aperture having tapered side walls whereby a rigid piece of bait such as a peanut may be inserted partially into, but not through, said aperture;
a slender elongated means for supporting said lid in an open position above said opening a distance sufficient for a roach to enter into the interior of said roach trap, one end of said lid support means connected to said lid, the opposite end of said lid support means held from movement by contact with the bait positioned within said aperture, the weight of said lid acting through said lid support means against the bait to maintain said lid in its open position;
said lid being dropped to its closed position sealing said opening when the roach consumes a sufficient portion of the bait to allow the bait portion remaining in contact with the opposite end of said lid support means to pass through said aperture.

5,148,626
INSECT BARRIER AND DETERRENT DEVICE
Kenneth H. Haake, Sr., Buffalo, Tex., assignor to Ants-Away, Inc., Bryan, Tex.
Filed Jul. 17, 1990, Ser. No. 554,291
Int. Cl.[5] A01M *1/10;* **A01K** *5/00*
U.S. Cl. 43—121 **13 Claims**

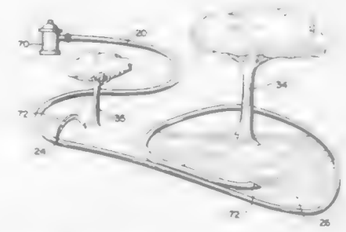
1. A barrier for placement on a shaft for preventing crawling insects from passing from a first location on the shaft below the barrier to a second location on the shaft above the barrier, comprising:
an integral member comprising a body of spongy material mounted on and substantially entirely surrounding said shaft, said member of spongy material being charged with an insect repelling substance; and
a protective cover slidably disposed on said shaft on top of and supported by said member of spongy material and substantially entirely covering said charged member of spongy material from the top and sides of said member, said protective cover being slidable along said shaft away from said member of spongy material a distance such that said member is exposed form above, thereby permitting said member to be recharged from above with said insect repelling substance when said insect repelling substance becomes dissipated or ineffective, without removing said protective cover or said member from said shaft;
at least one of said member of spongy material and said protective cover contacting said shaft around substantially the entire outer periphery of said shaft for preventing passage of such crawling insects along said shaft from such first location to such second location between said shaft and said member of spongy material or said protective cover.

5,148,627
METHOD FOR TREATING MAUSOLEUMS AGAINST PHORID FLY INFESTATION
Matthew J. Thomas, 603 Beaupre, Green Bay, Wis. 54301
Filed Jun. 18, 1990, Ser. No. 539,142
Int. Cl.[5] A01M *13/00*
U.S. Cl. 43—125 **3 Claims**



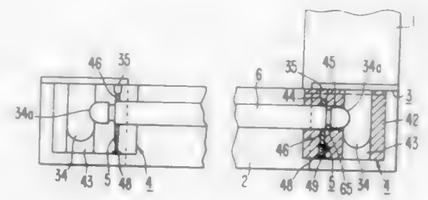
1. Method for treating mausoleums against Phorid Fly infestation, comprising the steps of:
(a) placing a casket in a vented mausoleum cell;
(b) opening the casket within the mausoleum cell to provide air access to the interior of the casket;
(c) sealing off the cell; by
(d) installing a sealer plate;
(e) caulking the sealer plate in place;
(f) waiting a period of time to allow the caulk to set;
(g) providing an insecticide installation access hole into the sealed mausoleum cell, to allow insecticide to be put into the cell from a point outside the cell;
(h) Selecting an insecticide from those insecticides that are:
relatively non-toxic to human beings;
effective to kill Phorid Flies for at least five years; and
carried in a powder base, said powder base being selected from those powders having a property of adherence to the surfaces within a mausoleum cell;
(i) covering all surfaces within the sealed mausoleum cell, including the interior of the casket with the insecticide, by:
(j) discharging, from outside the cell, under air pressure, a cloud of the insecticide in a quantity large enough to cover all surfaces in the mausoleum cell, into the mausoleum cell;
(k) waiting to allow the air pressure in the cell to be released through the vent;
(l) resealing the access hole to the mausoleum cell;
(m) cleaning up any insecticide that escaped from the cell when the insecticide was blown into the cell;
(n) mounting a decorative face plate.

5,148,628
IRRIGATION AND PERCOLATION METHOD AND APPARATUS
Robert M. Wulkowicz, 2801 W. Eastwood, Chicago, Ill. 60625
Filed Jul. 14, 1989, Ser. No. 380,192
Int. Cl.[5] A01G *29/00*
U.S. Cl. 47—48.5 **17 Claims**



1. A method of forming a soaking pool for trees or other plants which comprises:
(a) positioning an elongated, flexible, thin-walled, liquid-inflatable tube on the ground, spaced from the tree or plant that is to be soaked;
(b) said tube substantially encircling said trees or plants being irrigated;
(c) at least partially filling said tube with liquid to form a walled pool site;
(d) filling said walled pool site with water;
(d) after substantially all said water in the soaking pool thus formed has soaked into said ground, draining said liquid from said tube; and
(e) removing said tube for re-use around a second tree or plant.

5,148,629
RIGHT-HANDED AND LEFT-HANDED OPENABLE DOOR DEVICE
Kangi Minami, Osaka, Japan, assignor to Osaka Kanagu Co., Ltd., Osaka, Japan
Filed May 14, 1991, Ser. No. 699,949
Claims priority, application Japan, May 14, 1990, 2-123733
Int. Cl.[5] E05D *7/02*
U.S. Cl. 49—193 **3 Claims**



1. A door structure openable from the right side or the left side, comprising:
door frame means for supporting a door;
a door main body fittable with said door frame means for closing said door frame means;
hinge means at an upper and lower position on both sides of said door main body and door frame means for permitting said door main body to be opened from either the right or the left sides, said hinge means each having a shaft carrying member mounted on the door main frame and an L-shape hinge member having one leg pivotally mounted on said shaft carrying member for pivoting movement about an axis of opening movement of said door main

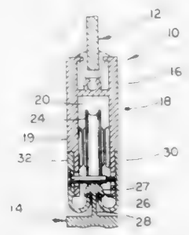
body along a side thereof, and the other leg having a locking bolt projecting therefrom in a direction in which said door main body moves away from said door frame means during opening movement of said door main body, said locking bolt having a recess opening laterally of the length thereof, said hinge means further having a locking body on said door main body having a locking bolt receiving recess therein in which said locking bolt is received when said door main body is closed against said door frame means, a locking pin in said locking body movable laterally of said locking body and into said locking bolt receiving recess and having an outer end engagable in said laterally open recess in said locking bolt for normally retaining said locking bolt in said locking bolt receiving recess and spring means engaged with said locking pin for urging said locking pin toward said locking bolt receiving recess, said outer end and laterally open recess having a shape for permitting said locking bolt and said locking body to be separated by a force urging said locking body lengthwise along said locking bolt, whereby when an opening force is exerted on one side of said door main body, said locking bodies of the hinge means at said one side of said door main body are separated from said locking bolts by the outer ends of said locking pins being forced out of said laterally open recesses to force said locking pins back into said locking bodies against the action of the spring means and thereby permit said one side of said door main body to move away from said door frame means, and the outer ends of the locking pins on the hinge means at the other side of said door main body remain engaged in said laterally open recesses for causing said L-shape hinge member to remain engaged with said door main body and to pivot on said shaft carrying members of said hinge means to permit said door main body to pivot about said other side.

5,148,630

SECURITY ASSEMBLY FOR A SLIDING GLASS DOOR

Mario Llorens, 310 W. 36th Ter., Hialeah, Fla. 33012

Filed Oct. 24, 1991, Ser. No. 782,087
Int. Cl.[5] E05D *13/00*
U.S. Cl. 49—425 5 Claims



1. For use on a sliding door of the type removably fitted within a surrounding frame structure, a securing assembly comprising:

a bottom substantially horizontal sash including two opposite, downwardly extending walls disposed in spaced relation so as to define an open channel along a length of a lower side of said bottom sash, said open channel having a plurality of rollers mounted therein,

a generally horizontal rail extending along a bottom seal of the frame structure, said rail being structured and configured to support said plurality of rollers in rolling engagement therewith, said rail further including a pair of oppositely disposed grooves extending along a length of said rail on opposite sides of a vertically extending web,

retaining means movably attached to said wall of said bottom sash being structured and disposed for preventing lifting and removal of the door from within the frame structure,

said retaining means including a pair of fittings formed of a rigid material including a first J-shaped fitting and a second J-shaped fitting each adapted to be oppositely mounted on one of said opposite walls such that a lower hook-shaped portion thereof extend upwardly and substantially within a corresponding one of said grooves,

attachment means for removably attaching said first J-shaped fitting and said second J-shaped fitting to said opposite walls of said bottom sash,

a lower edge of each of said opposite walls including a substantially reduced thickness being structured and disposed for flush mounting of a corresponding one of said pair of fitting such that an outer surface of each of said walls is flush with an outer surface of said corresponding one of said pair of fittings,

an exposed surface of said lower edge of each of said opposite walls including a serrated portion adapted for locking engagement with a congruent serrated surface on an inner side of said corresponding one of said pair of fittings, and

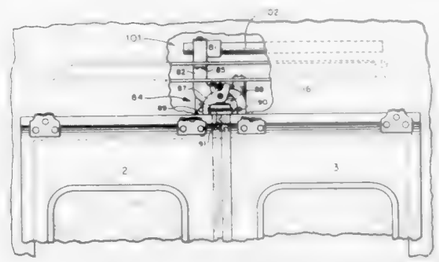
said first and said second J-shaped members being vertically adjustable on said lower edge of each of said opposite walls.

5,148,631

PNEUMATIC DOOR OPERATOR HAVING PNEUMATIC ACTUATOR AND LOCK

Robert G. Bayard, St. Eustache; Anthony J. Walsh, Lachine, both of Canada, and Roger J. Weseloh, Mount Prospect, Ill., assignors to Mark IV Transportation Products Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 167,221, Mar. 11, 1988, Pat. No. 4,901,474. This application Dec. 8, 1989, Ser. No. 447,793
Int. Cl.[5] E05D *13/04*
U.S. Cl. 49—449 3 Claims



1. In a power door operator utilizing a rodless cylinder having an internal fluid sealed piston and a magnetically coupled external piston, internal piston motion in said cylinder provided by admission of a pressurized fluid to said cylinder on either side of said piston in order to open and close bi-parting passenger doors over an opening in a vehicle side wall, the improvement comprising:

first and second coplanar doors mounted on said car for opposing motion in covering and uncovering an opening in said side wall; an endless belt and piston attachment operatively attaching said belt attached to said external piston, said belt on a mounting on said vehicle, said belt mounting arranging said belt with first and second oppositely moving belt surfaces positioned and moving essentially parallel to movement of said doors, said belt moved in conjunction with said external piston;

a first drive arm attached to said first belt surface, said first arm connected to said first door and having a first inner edge intermediate said door and second belt surface;

a second drive arm extending from and attached to said second belt surface and connected to said second door, said second drive arm also having an inner edge, one of said edges oppositely disposed relative to the other said edge when said doors are in said closed position;

stop pins projecting from said drive arms,

a door movement space defined between said drive arm inner edges when said doors are in a door closed position; and,

a panel lock assembly for restricting door panel movement when said doors are in said closed position comprising:

a mounting bracket on and extending from said vehicle side wall, said bracket aligned with said door movement space in the door closed position;

a pivot pin on and extending from said bracket;

first and second panel lock arms mounted on said pin for pivotal scissor-like motion around said pin;

first and second inner and outer jaws on opposite ends of said lock arms, said inner and outer arms intermediate said belt and said passenger doors;

means intermediate said outer jaws for biasing said lock arm outer jaws outwardly and inner jaws inwardly;

first and second lock arm positions corresponding to said door closed position and a door open position, said drive arm pins moving said outer lock arms inwardly from said second position to said first position on door motion from said open position to said closed position and from said first position to said second position on door opening;

a lock aperture, defined by said lock arm inner jaws when said lock arms are in said first position, said aperture closed by said lock arms in said second position;

means on said mounting bracket operable by said cylinder for projecting a force biased lock pin into said lock aperture and said door movement space; wherein when said doors are in said closed position said lock pin occupies said door movement space and said lock aperture thereby limiting door movement from a fully closed position.

5,148,632

CAVITY FORMING IN PLASTIC BODY

Meryle D. W. Adler, Corning; John W. Nelson, Painted Post, and Harold G. Shafer, Jr., Rock Stream, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 14, 1991, Ser. No. 715,571
Int. Cl.[5] B24B *13/00*
U.S. Cl. 51—55 7 Claims

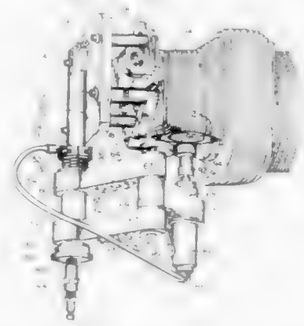
1. A milling machine for forming a cavity in a rigid organic plastic body comprising an abrading tool mounted on a holder, a first means for applying a rotary motion to the tool, and a second means for swinging the tool along a limited arc through the plastic body, the second means comprising an air spindle, a cable subject to a constant force for applying rotary motion to the air spindle, and a motion translating means that is mounted on the air spindle and is operatively associated with the tool holder, whereby the rotary motion of the air spindle is translated into an arcuate motion of the tool holder.

5,148,633

TOOL FOR RESURFACING EXHAUST PORT FLANGES

Michael Pigott, 10611 Lakeview Dr., and Woodruff Kozlow, 10720 Skyhawk Dr., both of New Port Richey, Fla. 34654

Filed Jun. 12, 1991, Ser. No. 713,871
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—126 11 Claims



9. A tool for resurfacing the exhaust port flanges of an air-cooled engine having a cylinder head, comprising:

a flat base plate;

a plurality of cylindrical spacer members sandwiched between said base plate and said cylinder head for spacing said base plate in substantially parallel relation to said cylinder head;

an elongate bolt disposed within the bore of each of said spacer members for securing each spacer member to said cylinder head, each bolt having a leading end disposed in screw threaded engagement with said cylinder head and a bolt head disposed in overlaying relation to said base plate so that tightening each bolt tightens its associated spacer member between the cylinder head and the base plate;

a shaft having a first part of semicircular cross station and a second part of circular cross section;

attachment means for securing said shaft first part in abutting, overlaying relation to said base plate;

an arm means pivotally mounted to said shaft second part;

a motor means mounted to a distal end of said arm means;

actuating means for operating said motor means;

a flange resurfacing means secured to an output shaft of said motor means and being rotatable when said motor means is actuated;

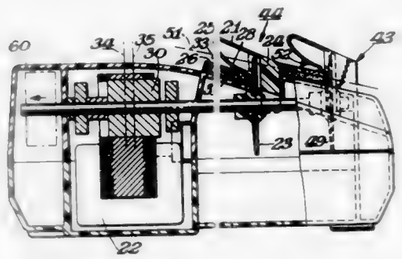
whereby an exhaust port flange is resurfaced in the substantial absence of engine disassembly.

5,148,634

SCISSOR SHARPENING APPARATUS WITH MAGNETIC GUIDE

Robert P. Bigliano, Wilmington, and Daniel D. Friel, Greenville, both of Del., assignors to Edgecraft Corp., Avondale, Pa.

Continuation-in-part of Ser. No. 396,974, Aug. 22, 1989, Pat. No. 5,005,319, which is a continuation-in-part of Ser. No. 304,323, Jan. 31, 1989, Pat. No. 4,897,965, which is a continuation-in-part of Ser. No. 917,601, Oct. 6, 1986, Pat. No. 4,807,399, which is a continuation-in-part of Ser. No. 588,794, Mar. 12, 1984, Pat. No. 4,627,194 and a continuation-in-part of Ser. No. 855,147, Apr. 23, 1986, Pat. No. 4,716,689, which is a continuation-in-part of Ser. No. 588,795, Mar. 12, 1984, abandoned. This application Dec. 31, 1990, Ser. No. 636,399
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[5] B24B *3/52*
U.S. Cl. 51—128 7 Claims



1. A scissor sharpening apparatus for sharpening a scissor blade comprising a ferromagnetic disk having an abrasive surface, motor means for rotating said disk, a magnetic guide means for positioning the scissor blade at a fixed angle relative to said abrasive surface, said magnetic guide means including a magnet having magnetic poles oriented with their axes nominally perpendicular to the flat face of the blade and nominally parallel to said abrasive surface, and said magnetic guide means being juxtaposed and slightly spaced from said abrasive surface for supporting the blade in contact with said abrasive surface whereby a magnetic current may flow from said magnet and through the blade and through said metallic disk and back to said magnet to maintain the blade in contact with said abrasive surface.

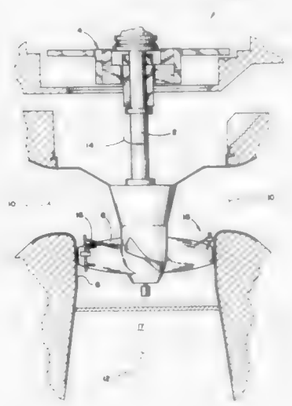
5,148,635

METHOD AND APPARATUS HYDRAULIC TURBINE REPAIR

Benny R. Porter, Chattanooga, Tenn., assignor to Arc Plan, Inc., Chattanooga, Tenn.

Continuation of Ser. No. 397,051, Aug. 22, 1989, abandoned.
This application Mar. 11, 1991, Ser. No. 667,439
Int. Cl.[5] B24B *21/02*
U.S. Cl. 51—135 R 20 Claims

1. An apparatus adapted for use in a hydroelectric turbine structure comprising a turbine shaft, a generator rotor assembly coupled to an upper portion of said turbine shaft, a turbine blade assembly coupled to a lower portion of said turbine shaft and comprising a plurality of turbine blades extending radially from said turbine shaft, and a turbine chamber having a cylindrical configuration and formed by a vertically disposed turbine liner wall adjacent distal ends of said turbine blades, said apparatus comprising:
- means for rotating said turbine blades and said turbine shaft to facilitate repair of pitting and general deterioration of surfaces of said liner wall
- a vertical support structure mounted to one or more of said turbine blades substantially adjacent said liner wall;
- a grinder contact wheel;
- a grinding belt coupled around said grinder wheel;
- energizing means for selectively rotating said grinder contact wheel and, correspondingly, said grinding belt;
- support means for mounting said grinder contact wheel, said grinding belt and said energizing means;
- adjustable connection means coupled to said support means and to said vertical support structure for mounting said grinder contact wheel to said vertical support structure, and for adjusting the horizontal position of said grinder



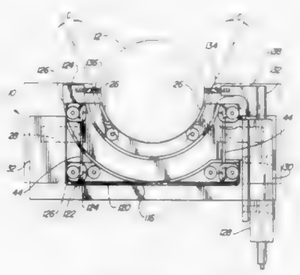
contact wheel relative to said vertical support structure, with the adjustment being in a radial direction relative to the turbine shaft; and
- said vertical support structure comprises additional adjustable connection means coupled to said adjustable connection means for adjusting the vertical position of said grinder contact wheel relative to said vertical support structure.

5,148,636

SIZE CONTROL SHOE FOR MICROFINISHING MACHINE

Edward E. Judge; Lowell W. Bennickson, and Arthur G. Reiser, all of Lansing, Mich., assignors to Industrial Metal Products Corporation, Lansing, Mich.

Division of Ser. No. 307,622, Feb. 7, 1989, Pat. No. 5,095,663.
This application May 3, 1991, Ser. No. 695,689
Int. Cl.[5] B24B *21/00*
U.S. Cl. 51—142 6 Claims



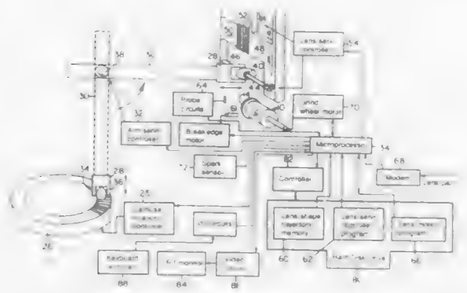
1. A method of microfinishing a cylindrical workpiece surface comprising the steps of:
- providing a microfinishing shoe for pressing an abrasive coated film against said workpiece surface,
- providing a gauge for continuously measuring the diameter of said workpiece surface,
- rotating said workpiece relative to said abrasive coated film in a first direction thereby causing material to be removed initially at a relatively high rate and thereafter at a relatively low rate,
- rotating said workpiece relative to said abrasive coated film in a second direction opposite said first direction thereby causing material to be removed initially at a relatively high rate and thereafter at a relatively low rate, and periodically reversing the direction of said rotation,
- preventing reversal of rotation from occurring when the measured diameter of said workpiece surface is less than a predetermined amount greater than a desired diameter such that the desired diameter is reached while material is being removed at said relatively low rate, and
- relieving the pressure applied by said film against said workpiece surface once the desired diameter is measured by said gauge.

5,148,637

LENS EDGING SYSTEM WITH PROGRAMMABLE FEED AND SPEED CONTROL

David L. Byron, Honeoye Fall, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 485,426, Feb. 27, 1990, abandoned.
This application Dec. 4, 1991, Ser. No. 803,711
Int. Cl.[5] B24B *49/00*
U.S. Cl. 51—165.71 21 Claims



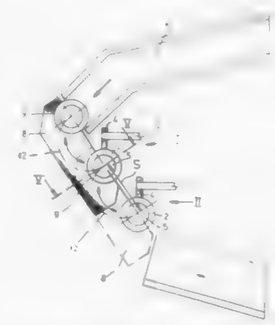
1. A lens edging system for shaping an optical lens workpiece having a major surface, said major surface having a boundary of an initial contour bounded by a relatively thin edge of said workpiece, by grinding said edge so as to change said boundary of said major surface to a new boundary corresponding to a predetermined contour, said system comprising
- an edging tool;
- holding means for holding said lens workpiece relative to an axis at least approximately normal to at least a portion of said major surface;
- memory means for storing data representing a lens edge grinding trajectory with respect to said edging tool, said data comprising a succession of lens rotation angles about said axis and a succession of lens radii corresponding to said succession of lens rotation angles, said lens radii defining said new boundary with respect to said axis; servo means for effecting rotation of said lens workpiece relative to said edging tool through servoed lens rotation angles about said axis and motion of the edge of said lens workpiece relative to and toward said edging tool to servoed lens radii;
- processor means connected to said memory means for controlling said servo means and for governing said servoed lens radii and said servoed lens rotation angles in accordance with said data, whereby said servoed lens rotation angles correspond to said succession of lens rotation angles stored in said memory and said servoed lens radii correspond to said succession of lens radii stored in said memory, whereby to change the contour of said major surface from said initial contour to said predetermined contour.

5,148,638

APPARATUS FOR GRINDING AN ANNULAR WORKPIECE

Rudolf Schwär, Wuppertal, Fed. Rep. of Germany, assignor to Ernst Thielenhaus KG, Wuppertal, Fed. Rep. of Germany

Filed Sep. 24, 1991, Ser. No. 764,487
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1991, 4104819
Int. Cl.[5] B24B *47/02*
U.S. Cl. 51—215 CP 6 Claims



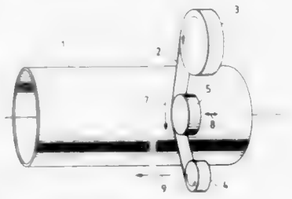
1. An apparatus for grinding annular workpieces, the apparatus comprising:
- a predetermined number of grinding stations including an upstream station and a downstream station, the stations being spaced a predetermined distance from one another along a straight path;
- means including a holder at each of the stations for gripping and rotating the workpieces;
- means including a tool at each of the stations for grinding the respective workpiece held by the respective holder;
- input means adjacent the upstream station for feeding workpieces sequentially to the apparatus;
- output means adjacent the downstream station for receiving workpieces from the downstream station;
- an elongated transport bar having the predetermined number of laterally and generally upwardly open seats including an upstream seat and a downstream seat, the seats being spaced longitudinally apart on the bar by the predetermined distance; and
- means for stepping the bar through an arc between an upstream position with its upstream seat aligned with the input means to receive a workpiece therefrom and the others of its seats aligned with the grinding stations to position a workpiece held in the other seat in the respective station and
- a downstream position with its upstream seat aligned with the upstream station to supply to it the workpiece received from the input means and with its other seat aligned with a station downstream of the upstream station to supply to it the workpiece from the upstream station.

5,148,639

SURFACE ROUGHENING METHOD FOR ORGANIC ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Kiyoshi Sakai, Chofu; Teigo Sakashibara; Harumi Sakou, both of, Tokyo, and Shoji Amamiya, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 386,221, Jul. 28, 1989, abandoned. This application Jan. 15, 1991, Ser. No. 820,810
Claims priority, application Japan, Jul. 29, 1988, 63-189820
Int. Cl.[5] B24B *21/00*; G03G *21/00*
U.S. Cl. 51—328 14 Claims



1. A method of roughening the rotating surface of an organic electrophotographic photosensitive member capable of visualizing toner images on said surface to reduce friction between said surface and a cleaning blade employed to remove excess toner from said surface which comprises:

(a) contacting an abrasive material with said rotating surface, wherein said abrasive material is in the form of a film, while rotating said film in the same direction of said rotating surface;

(b) vibrating said film at the point of said contact with said rotating surface in a vibrating direction parallel to the axis of rotation of said photosensitive member; and

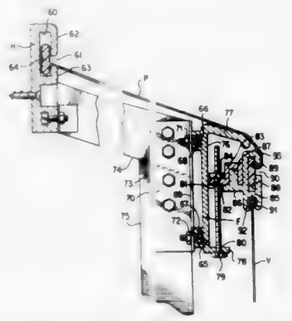
(c) urging said rotating and vibrating film against said rotating surface in a direction substantially perpendicular to the axis of rotation of said photosensitive member.

5,148,640

MANAGEABLE AWNING SYSTEM

Robert M. Reilly, Sr., 810 Barry St., Miami Beach, Fla. 33140

Filed Jun. 20, 1991 Ser. No. 718,369
Int. Cl.[5] E04B *1/12*
U.S. Cl. 52—74 3 Claims



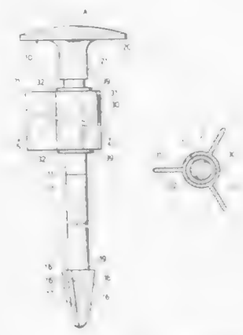
1. A pliable awning system comprising a headbar with a means of securing it to a building, a plurality of rafters structurally connecting the headbar to a frontbar supported by posts, a pliable fabric awning banner with the full length of its rearward edge attached to the headbar and the full length of its forward edge oppositely attached to a drawbar mounted on the frontbar by means of which drawbar the pliable fabric awning banner is drawn tight and maintained wrinkle free wherein the improvement comprises a frontbar formed with an upper flange with a rounded lip over which the pliable fabric awning banner is drawn tight and smooth by a drawbar incorporating a rectangular channel extruded along its length to receive through a forward opening thereto a semi-rigid plastic strip attached to the full length of the forward edge of the awning banner; a circular channel extruded along its length to receive through a downward opening thereto a semi-rigid plastic rope attached to a pliable fabric valence; an inverted T-shaped flange extending rearward to engage inverted U-shaped channels in a plurality of tensioning clips positioned along its length which clips have rearward extending flanges with openings through which square headed nuts receive threaded tensioning bolts extending to them through openings in a lower flange of the frontbar the flat vertical surface of which restrains the horizontally rearward motion of the tensioning clips mounted on the flange of the drawbar as the threaded tensioning bolts are turned in the square headed threaded nuts to pull down the drawbar thereby tightening and smoothing the awning banner.

5,148,641

FINNED SLEEVE FOR DRIVEN TYPE SURVEY MONUMENTS

William C. Rushing, and John D. Hohol, both of Madison, Wis., assignors to Berntsen International, Inc., Madison, Wis.

Filed Jun. 21, 1991, Ser. No. 718,630
Int. Cl.[5] E01F *9/02*
U.S. Cl. 52—103 21 Claims



1. A sleeve for a driven-type survey monument, comprising:

an elongated body having a hollow bore; and

a plurality of fins formed integrally with and extending outwardly from the elongated body;

wherein the hollow bore of the elongated body is adapted to receive a first portion of the survey monument,

wherein a gap is formed within the hollow bore of the sleeve between the elongated body and the first portion of the survey monument.

5,148,642

ANTISEISMIC STEEL STRUCTURAL WORK

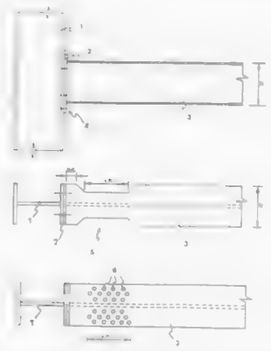
Andre Plumier, Tilff; Raymond Baus, Liege, both of Belgium; Rene Pepin, and Jean-Baptiste Schleich, both of Esch, Luxembourg, assignors to Arbed S.A., Luxembourg

Filed Aug. 16, 1989, Ser. No. 394,792
Claims priority, application Luxembourg, Aug. 24, 1988, 87320
Int. Cl.[5] E04H *9/02*
U.S. Cl. 52—167 R 10 Claims

1. A metal structure, comprising:

a vertical metal column; and

a metal girder extending horizontally from the column and having an end secured to the column, said girder having a substantially uniform cross-sectional area and having a dissipative zone of reduced cross sectional area near the end of the girder, said dissipative zone being capable of undergoing bending and functioning as a plastic hinge effective to provide resistance to seismic vibrations, said



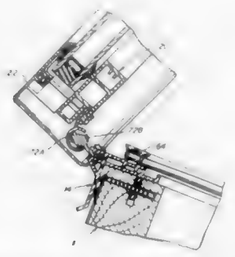
girder further comprising a pair of flat opposed flanges, said flanges extending longitudinally between two opposed edges and a base extending perpendicularly between the flanges, and wherein said dissipative zone comprises opposed indentations in the opposed edges of the flanges.

5,148,643

SKYLIGHT CONSTRUCTION

Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Filed Jun. 28, 1990, Ser. No. 545,516
Int. Cl.[5] E04B *7/18*
U.S. Cl. 52—200 18 Claims



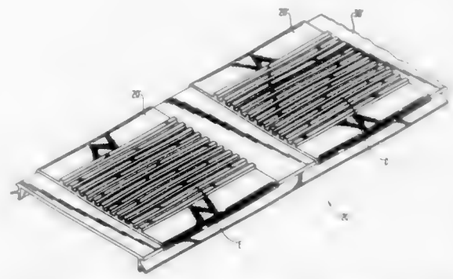
1. A skylight construction for an opening in a building or the like comprising: a rigid plastic curb frame means comprising, a plastic base frame and a sash frame means for firmly securing said rigid plastic curb frame means about said opening, transparent or translucent covering means, means for retaining the covering means on the rigid plastic curb frame means, hinge means comprising separate plastic base frame hinge member and sash frame hinge member, means connecting the hinge members to respective base and sash frames, said hinge members interlocking along an axis in a closed position of the frames to provide a water tight seal at said hinge members, said sash frame hinge member releasable from said base frame hinge member in a non-axial direction and lateral to the axis of the hinge members but only in at least a partially open position of the frames.

5,148,644

PROTECTIVE COVERING STRIP

Randy S. Weir, P.O. Box 247, Kapaa, Kauai, Hi. 96746

Filed Oct. 2, 1990, Ser. No. 591,776
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—300 18 Claims



1. A protective strip for covering a top surface of a first wooden member to be joined to a second wooden member overlying the first wooden member, said strip comprising:

an elongated body of water-impervious material sized to substantially cover the entire upper surface of the first wooden member, said body having a bottom surface contacting the first wooden member and a top surface opposite the bottom surface; and

spacing means positioned on said body and projecting from said body to support said second wooden member above the top surface of the strip and for spacing the first and second wooden members apart, thereby permitting air circulation at the joint between the first and the second wooden members;

wherein said strip includes two side portions coupled to said body on opposite sides thereof for overlying the side edges of said first wooden member; and

wherein each of said side portions includes a fixed end coupled to said body and a free end disposed opposite to said fixed end, said free end including a tapered portion to facilitate placement of said strip on the first wooden member.

5,148,645

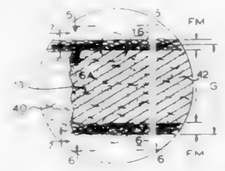
USE OF FIBROUS MAT-FACED GYPSUM BOARD IN SHAFT WALL ASSEMBLIES AND IMPROVED FIRE RESISTANT BOARD

Charles W. Leinert, Brian G. Randall, both of Stone Mountain, Ga., George F. Fowler, Jr., Norcross, and Ray W. Hinkel, Stone Mountain, all of Ga., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Continuation of Ser. No. 627,091, Dec. 11, 1990, abandoned, which is a continuation of Ser. No. 257,180, Oct. 13, 1988, abandoned, which is a continuation of Ser. No. 769,583, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 583,874, Feb. 27, 1984, Pat. No. 4,647,496. This application Aug. 6, 1991, Ser. No. 742,219
Int. Cl.[5] E04F *13/04, 13/18*
U.S. Cl. 52—443 3 Claims

1. A glass mat-faced gypsum board comprising a set core containing gypsum dihydrate and at least about 0.03 wt. %

chopped glass fibers, at least about 0.05 wt. % water-resistant additive, and paper fibers, whereby the board in ½ inch thick-



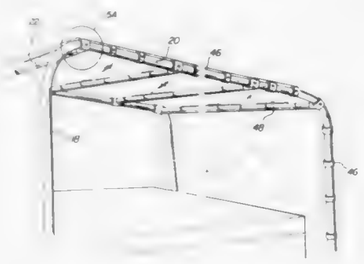
ness achieves at least a one hour fire rating in accordance with ASTM E-119.

5,148,645

CONVERTIBLE ENCLOSURE FOR HOT TUBS AND THE LIKE

Leonard A. Lutostanski, 13709 Towering Oaks, Shelby Township, Oceana County, Mich. 48315

Filed Aug. 8, 1991, Ser. No. 742,326
Int. Cl.[5] E04H *1/343*
U.S. Cl. 52—66 18 Claims



1. A convertible enclosure for covering a hot tub spa or the like comprising:

I. a frame including:

A) a pair of opposed, parallel end members arranged to define a rectangular parallelepipoid space therebetween and each including first and second tubular uprights and an interconnecting tubular top member, the interconnection between said top member and each of said first uprights defining a curve; and

B) a plurality of sliding cross-pieces connecting said opposed end members and configured to slide along both of said first uprights and along said top members from a first position, wherein said plurality of cross-pieces are disposed adjacent each other on said first uprights, to a second position wherein said plurality of cross-pieces are disposed along said top members at spaced intervals therealong, each of said sliding cross-pieces carrying a first attachment means proximate each end thereof;

II. a flexible, rectangular cover having two opposed sides and two opposed ends and configured to cover said defined space along the top and at least one side thereof, said cover including a plurality of second attachment means disposed along both sides of said cover at said spaced intervals and engagable with said first attachment means such that, when said cover is attached to said cross-pieces by engaging said first attachment means with said second attachment means, said space is uncovered when said cross-pieces are in said first position and covered by said cover at said top and said at least one side thereof when said cross-pieces are in said second position; and

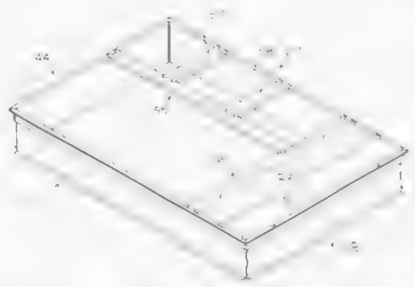
III. means for retaining said cross-pieces in said second position.

5,148,647

ROOF MOUNTING CURB

Phillip R. Rutledge, Farmers Branch, Tex., assignor to Rooftop Systems Inc., Carrollton, Tex.

Filed Aug. 16, 1991, Ser. No. 746,469
Int. Cl.[5] E04B *1/24*
U.S. Cl. 52—488 6 Claims



1. Roof mounting curb comprising:

at least 4 curb sides formed of channel shaped sheet metal having a web and opposing upper and lower flanges, said curb sides further having hinge ears formed on each end thereof extending from said curb sides further said web of the channel shaped metal,

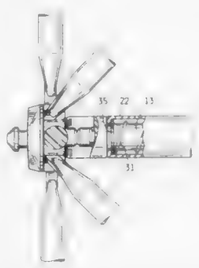
each curb side having a wood nailer strip contacting said web and said opposing upper flange of each curb side, and hinge pins insertable in the hinge ears of adjacent curb sides squaring the curb sides together.

5,148,648

QUICK-RELEASE FRAME CONNECTOR

Gary R. Sorenson, Apple Valley, and Philip C. Gerberding, Hopkins, both of Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.

Filed Jun. 21, 1991, Ser. No. 718,592
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—646 21 Claims



1. A quick-release frame connector for use with a collapsible display frame structure having hub assemblies comprising:

a) a cylindrical tubular housing portion having:

(i) a split first end portion having a collar portion;

(ii) an elongate central portion; and

(iii) a second end portion;

b) a compression spring member encircling said elongate central portion; and

c) a cylindrical tubular sleeve portion having a first end for engagement with the first end of the spring member, and enclosing the spring member and a portion of the elongate central portion, said first end also adapted for abutment with said collar portion; and

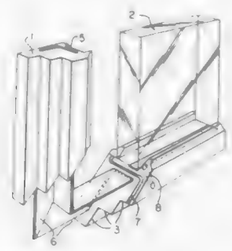
d) means for affixing a second end of said spring member to a predetermined position along said elongate central portion.

5,148,649

FRAMING AND IN PARTICULAR, IN FRAMES OR CASINGS OF WOOD

Rocco Cipriano, Via Acqua Del Paradiso No 8, Avellino C.F. CPRRCC46E04d798D, Italy

Filed Sep. 14, 1990, Ser. No. 583,064
Int. Cl.[5] E04C *2/38*
U.S. Cl. 52—656 5 Claims



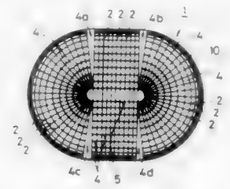
1. Improvements to wood frames including at least one stile and at least one rail which when assembled and contacting each other at an end thereof in a mating joint as defined by a mating end surface of said stile and a mating end surface of said rail, characterized in that a first narrow slot having two legs and at least two inclined sections is provided in each of said mating surfaces, said first slot extending within said rail and within said stile for a substantial distance, said rail and stile being capable of being assembled to form a portion of a window, each of said first slots permitting the accommodation of a metallic, relatively planar stiffener of substantial length having at least two legs, with each stiffener leg being located in said first slot and being of the same general shape as said first slot and wherein said stiffener is not visible when said stile and rail are assembled, said stiffener being positioned essentially wholly within said first slot and wherein the substantial length of said stiffener enables the attachment of hardware remote from said mating joint, said stiffeners being of a material that is not attacked by atmospheric agents, and screw means contacting a stiffener leg to hold said mating joint rigid.

5,148,650

RADIATING TRUSS ROOF SUPPORT ARRAY AND CONSTRUCTION METHOD THEREFOR

Toshiyuki Yamada; Yoshihiro Takahama; Hajime Nakajima, and Takayuki Nishiya, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Division of Ser. No. 354,452, May 19, 1989, Pat. No. 5,058,334.
This application Aug. 29, 1991, Ser. No. 752,062
Claims priority, application Japan, May 20, 1988, 63-123353
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—747 7 Claims



1. A method for assembling a radiating truss roof support array, comprising the steps:

providing a peripheral ring defining an outer periphery for an array;

locating a central girder within the periphery of said peripheral ring;

suspending a plurality of trusses, said trusses extending generally radially from said central girder to said peripheral ring for connecting said central girder to said peripheral ring;

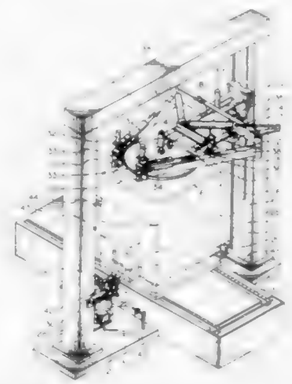
connecting adjacent radial trusses with a plurality of inner truss members extending generally perpendicularly from the associated radial trusses to form multiple concentric rings of said inner truss members, said rings radiating from said central girder outward to said peripheral ring, said concentric rings being separated by first fixed intervals, being interrupted at second fixed intervals leaving predetermined adjacent radial trusses unconnected by said inner-truss members.

5,148,651

UNWRAPPING APPARATUS WITH SWING ARMS AND GRIPPERS

Tadao Masuda; Masahiro Tsukuda; Shigeru Doiura; Kaoru Kawanishi, all of Takatsuki, and Hiroshi Iwasaki, Tokyo, all of Japan, assignors to Oji Seitai Kaisha, Ltd., Tokyo, Japan

Filed Oct. 3, 1991, Ser. No. 771,629
Claims priority, application Japan, Jan. 30, 1991, 3-27726
Int. Cl.[5] B65B *43/26*
U.S. Cl. 53—381.2 9 Claims



1. An unwrapping apparatus for unwrapping a load comprised of a pallet, a plurality of articles palletized on the pallet and a stretchable film wrapping the articles and the pallet together, said unwrapping apparatus comprising:

first and second upright frames arranged in a spaced relationship;

means for conveying a load to be unwrapped to a position between the first and second upright frames;

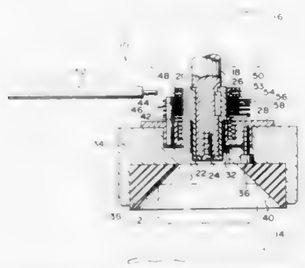
two lower gripper means arranged on the first upright frame for gripping a lower edge of the stretchable film of the load to be unwrapped, each of the lower gripper means being movable toward and away from the load to be unwrapped;

a cutter unit arranged on the first upright frame between the two lower gripper means for upward and downward movement along the first upright frame, the cutter unit having two pairs of pinch rollers with one of each pair of pinch rollers positionable on the exterior side of the stretchable film and the other on the interior side of the stretchable film to grip the stretchable film therebetween, and cutting means adapted to cut the stretchable film; and

a carriage arranged on the second upright frame for upward and downward movement along the second upright

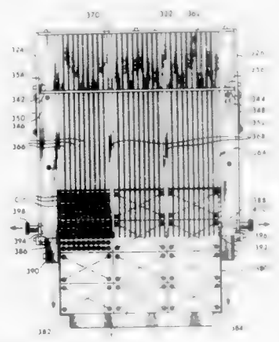
frame, the carriage having pressing means to press a top central region of the load to be unwrapped to stabilize the latter while being unwrapped, and a pair of swing arms symmetrically arranged on either side of the pressing means and extending toward the first upright frame, each of the swing arms having one end pivotally attached to the carriage and the other end provided with an upper gripper means for gripping an upper edge of the stretchable film of the load to be unwrapped, each of the upper gripper means being movable upward and downward, and toward and away from the load to be unwrapped, whereby the stretchable film that is cut by the cutting means is spread and separated from the load in accordance with a swing motion of the swing arms.

5,148,652
HAND CAPPER
Kenneth J. Herzog, 135 Industrial Blvd., Riverhead, N.Y. 11901
Filed Feb. 14, 1991, Ser. No. 655,537
Int. Cl.[5] B65B *7/28*
U.S. Cl. 53—331.5 **3 Claims**



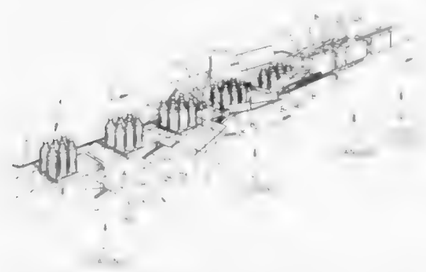
1. A hand held capper that will engage a cap for tightening the cap onto a container, said hand held capper comprising:
a) a drive unit having a spindle shaft whereby said drive unit is held and operated by the hand of a person so as to rotate said spindle shaft;
b) a clutch hub retained and keyed onto said spindle shaft which prevents movement circumferentially between said hub and said shaft;
c) a flange member carried on a bottom end of said clutch hub and rotatable thereabout;
d) a cap driver chuck attached to the bottom of said flange member;
e) an elastic chuck insert disposed within said cap driver chuck, said chuck insert having a tapered aperture therein for engagement with the cap being of any of various sizes;
f) a plurality of springs disposed about and into the top of said flange member;
g) a plurality of torque pins disposed about and into the top of said flange member;
h) a friction plate assembly disposed over said clutch hub to sit upon said springs and in engagement with said torque pins;
i) an adjusting nut threadable onto a top portion of said clutch hub and bearable onto the top of said friction plate assembly so that said friction plate assembly can provide torque to said torque pins, and into said flange member, said adjusting nut having a plurality of side apertures therein; and
j) a clutch adjusting tool for engagement with one of said side apertures in said adjusting nut for turning said adjusting nut to change tension therebetween thus varying pressure from said clutch hub through said friction plate assembly, through said flange member, through said cap driver chuck and into said chuck insert which will sense the torque between the cap and the neck of the container and will allow said cap driver chuck to stop rotating once the desired torque is reached while allowing said spindle shaft from said drive unit to continue to rotate; wherein said friction plate assembly includes:
k) a dimple plate with a dimpled bearing surface;
l) a plurality of large plates;
m) a plurality of small plates; and
n) a plurality of friction pads, whereby said dimple plate, said large plates, said small plates and said friction pads are disposed over said clutch hub in a stacked relationship in which generally said dimple plate sits on top, one of said small plates sits between two of said friction pads, which sits between two of said large plates which are in engagement with said torque pins so as to provide better torque transmission and dissipation of heat due to friction between said friction pads and better distribution of pressure to said torque pins.

5,148,653
BOXING MACHINE FOR RIMMED AMMUNITION
Daniel J. Scharch, 10325 County Rd. 120, Salida, Colo. 81202
Continuation-in-part of Ser. No. 610,397, Nov. 7, 1990, Pat. No. 5,052,167. This application Aug. 14, 1991, Ser. No. 745,226
Int. Cl.[5] B65B *35/34, 19/34, 5/06, 43/54*
U.S. Cl. 53—444 **20 Claims**



1. An apparatus for loading rimmed ammunition into boxes, said apparatus comprising:
a base assembly;
a bullet manifold mounted on said base assembly and having guide means;
a tray pan indexed beneath said bullet manifold aligned with said manifold guide means and sized to position a plurality of empty cartridge boxes into alignment with said guide means;
said guide means on said manifold being configured to guide ammunition into alignment with said empty cartridge boxes and to prevent rimmed ammunition from passing through said guide means;
means mounted on said base assembly for vibrating said bullet manifold to move ammunition into alignment with said guide means;
side walls mounted adjacent three sides of said bullet manifold to contain the loose ammunition on said manifold; and
a removable spacer bar mounted in a position near the front of said manifold and a removable rear gate positioned in a second position near the rear of said manifold.

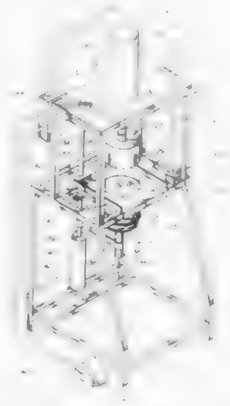
5,148,654
PACKAGING SYSTEM
Karl Kisters, Kleve, Fed. Rep. of Germany, assignor to Kisters Maschinenbau GmbH, Kleve, Fed. Rep. of Germany
Filed Jun. 6, 1991, Ser. No. 712,159
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1990, 4018140
Int. Cl.[5] B65B *11/08*
U.S. Cl. 53—462 **16 Claims**



1. A method of packaging a group of objects in a package formed of a blank having
a base panel,
base flaps joined at respective transversely extending flap-fold lines to the base panel,
a pair of side panels joined at respective longitudinally extending panel-fold lines to the base panel and transversely flanking the base panel, and
respective pairs of side flaps joined at respective transversely extending side flap-fold lines to the side panels, each pair of side flaps longitudinally flanking the respective side panel,
the method comprising the steps of sequentially
a) advancing the blank longitudinally parallel to the panel-fold lines to a loading station with the blank at least generally horizontal and advancing the group of objects horizontally and longitudinally to the station and depositing the group of objects on the base panel at the loading station;
b) folding up the side flaps through about 90°;
c) folding up the base flaps through between 45° and 80°
d) folding up the side panels through about 90°; and
e) pressing the base flaps longitudinally against the side flaps and against the group of objects and adhering the flaps together to form a finished package.

5,148,655
SLICER AND BAGGER FOR SUBSTANTIALLY FLAT FOOD PRODUCTS
Bart Salinas, 1207 S. Airhart Dr., Baytown, Tex. 77520
Filed Feb. 8, 1991, Ser. No. 652,550
Int. Cl.[5] B65B *63/00*
U.S. Cl. 53—514 **10 Claims**

1. An apparatus for slicing and bagging substantially flat food products comprising;
a. A frame;
b. a holder means substantially conforming to the shape of said food products to be sliced for holding said food products in vertical stacked alignment, including means to removably attach said holder means to said frame;
c. a slicer means having at least one slicer surface faced toward said food products to be sliced and means positioning said at least one slicer surface across and proximate said holder means for slicing said food products;
d. a ram means having formed therein recessed sections which correspond with said slicer means for completely driving said food products through said slicer means and completely slicing said food products without said ram means contacting said slicer means;
e. a follower means positioned below said slicer means a small but effective distance from said slicer means for receiving said food products as said food products are sliced and for preventing said food products from being flayed out of their vertical stacked alignment as said food products are sliced; and



f. a bagging means for receiving said food products as said food products are sliced and for progressively bagging said food products as said food products are sliced and received from said slicer means.

5,148,656
TRAINING REINS
Robert C. Meaghan, Belford, N.J., assignor to Miller Harness Company, Inc., East Rutherford, N.J.
Filed Nov. 29, 1990, Ser. No. 619,867
Int. Cl.[5] B68B *1/04*
U.S. Cl. 54—36 **30 Claims**

1. A set of reins attachable to a bit on a horse to thereby form a loop having a first side and a second side, each of which sides having at least two gripping sections to be held by a rider, each gripping section having identifying indicia to enable a rider to locate a desired gripping section while riding the horse, said identifying indicia being readily recognizable by a rider so that the rider can discern gripping sections from one another or other sections of said reins.

5,148,657

DOG BOOT

Vondie A. Stafford, 620 Iberia Rd., Clarkson, Ky. 42726, and Linda Dennis, 4411 S. OO E/W Rd. Lot No. 48, Kokoma, Ind. 46902

Filed Feb. 19, 1991, Ser. No. 656,742
Int. Cl.[5] B68C 5/00
U.S. Cl. 54—82 8 Claims

1. A dog boot, comprising, in combination:
a generally horizontal foot portion;
the foot portion having a sole along its bottom portion;
a generally vertical and cylindrical tubular calf portion;
and an ankle portion interconnecting the foot portion and the said calf portion;
the said calf portion and ankle portion being of a relatively large cross-sectional size which is large enough to accommodate the passing therethrough of a dog's paw, and of a size and shape such that the lower end of the calf portion generally fits and connects with the upper end of the ankle portion, and the lower end of the ankle portion is of the same general size and shape as the top of the foot portion, and connects therewith;
and the front of the boot is provided with a vertical panel, extending upwardly from at least as low as the lowest portion of the calf portion, and extending upwardly at least a substantial way toward the top of the calf portion, thus providing a tongue for the boot;
and in which a horizontal strap is provided, the strap being secured by a connection the end of to the boot, and in which the connection includes cooperable connection components of the strap and of the boot's calf portion, and the connection component of the boot's calf portion extends vertically along the rear of the boot's calf portion, thus providing that the strap may be positioned optionally at various vertically different locations along the calf portion of the boot.

5,148,658

CROP FEEDING APPARATUS

Jack F. Gerger, 1852 Coteau Ave., Weyburn, Saskatchewan, Canada S4H 2X5, and Lorne E. Fellner, Box 207, Ceylon, Saskatchewan, Canada S0C 0T0

Filed Jun. 4, 1991, Ser. No. 739,683
Claims priority, application Canada, May 22, 1991, 2043063
Int. Cl.[5] A01D 34/04, 34/13, 57/00, 65/02
U.S. Cl. 56—14.5 16 Claims

6. A crop feeder kit for use with a combine harvester to convey cut crop material from a crop cutting assembly to an auger means comprising: crop feeding teeth, mounting bolts to pass through a knife bar, cutting blade and crop feeding tooth, two self locking nuts for each tooth, a first one to assist in securing the cutting blade and a second one to fasten the feeder tooth against the first self locking nut, said crop feeding teeth comprising, a central elongated body portion, a mounting portion on a first end of said body portion and a curved portion on a second end of said body portion, a mounting eye formed as a part of said mounting portions, said curved portion and said mounting portion being in single plane to assist in a more positive even feeding of the cut crop.

10. In a harvesting assembly of a combine harvester having a header table with a leading edge and a crop auger rotatably mounted on said header table a knife having a plurality of cutting blades fastened to a reciprocating bar slidably mounted on the leading edge of said header table, a crop feeder tooth mounted on at least one of said cutting blades and extending

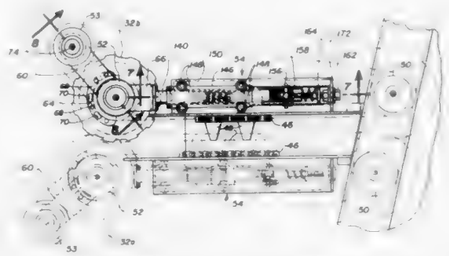
rearwardly toward said crop auger to reciprocate with the cutting blades, whereby crop material cut by said knife is conveyed to said auger in a uniform flow free of bunching.

5,148,659

FORAGE HARVESTER ROW CROP ATTACHMENT WITH CANTILEVERED FRONT IDLERS

Gary L. Bich, New Holland, and Anthony F. Diederich, Jr., Terre Hill, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 6, 1991, Ser. No. 665,070
Int. Cl.[5] A01D 45/02
U.S. Cl. 56—102 7 Claims



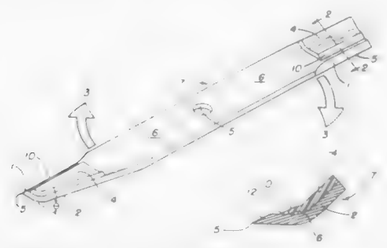
1. A forage harvester row crop attachment comprising:
a base frame;
a plurality of row crop divider units arranged side-by-side on said base frame to define a plurality of crop conveying paths;
a pair of gathering chains arranged to pass through each of said crop conveying paths from an entrance to an exit thereof for conveying crop material rearwardly through said crop conveying paths;
a pair of rotary knives disposed adjacent the entrance of each crop conveying path for cutting off crop material before it is conveyed rearwardly through said crop conveying paths by said gathering chains;
each of said gathering chains being wrapped around a drive sprocket and a pair of idler sprockets, said drive sprockets being located near the exits of said crop conveying paths, and said idler sprockets being located near the entrances to said crop conveying paths; and
one idler sprocket of each said pair of idler sprockets being supported in a cantilevered manner forwardly of said rotary knives, and forwardly of said base frame on which said divider units are mounted.

5,148,660

LAWN MOWER BLADE LIFT WING PROTECTOR

Edward A. Will, 2160 Oakridge La., Palm Bay, Fla. 32905

Filed Aug. 26, 1991, Ser. No. 750,093
Int. Cl.[5] A01B 34/03
U.S. Cl. 56—295 14 Claims



1. A rotatable metallic cutting blade for mounting on a lawn mower, said blade including outwardly extending arms, each arm having a forward side and a rearward side, each arm having a cutting edge formed on the forward side thereof, each arm having the rearward side opposed to said cutting edge formed as an upwardly directed flange behind the cutting edge, the improvement which comprises a layer of resilient elastomeric material on each flange facing the forward side of the arm.

5,148,661

TOBACCO HARVESTER AND USE THEREOF

Jerry L. Kennedy, Rte. 1 Box 23, Puryear, Tenn. 38251

Continuation-in-part of Ser. No. 600,664, Oct. 22, 1990, Pat. No. 5,081,827. This application Aug. 15, 1991, Ser. No. 745,174
Int. Cl.[5] A01D 45/16, 57/20
U.S. Cl. 56—27.5 13 Claims

1. A process for harvesting tobacco which comprises placing cut tobacco plants lengthwise along parallel rows of a tobacco field with leaf ends of stalks trailing butt ends and butt ends pointed toward a starting end of each row, turning an endless belt of an upwardly angled conveyor having a lower end running on a wheel and being sufficiently low on the ground for said butt ends to be lifted from ground level onto said turning endless belt at substantially the same speed as the surface speed of a wheel of a trailer being pulled by a tractor and having said conveyor associated with said trailer toward one side thereof, thereby pickin up said tobacco plants at their butt ends onto said endless belt as it turns upward at said lower end of said conveyor while said tractor and trailer move along said rows, conducting said plants along said endless belt to an opposite end of said conveyor and removing them from said endless belt conveyor for further handling.

7. Apparatus for harvesting tobacco comprising in operating position an endless belt conveyor angled upwardly having an upper end and a lower end and a wheel of adjustable height toward its lower end, said lower end being sufficiently adjustable to a ground operational level to permit said lower end when turning to dip under and pick up butt ends of tobacco plants aligned end to end in rows with leaf ends trailing butt ends as said conveyor approaches them, a trailer for spearing operations next to said endless belt conveyor and conveyor belt speed control means for coordinating turning speed of said conveyor belt with surface speed of a wheel of said trailer when said trailer along with said endless belt conveyor is being pulled by a tractor.

5,148,662

ROTARY RING FOR SPINNING

Hiroshi Yamaguchi, 1601-17, Higashigata, Kuwana-shi, Mie, Japan, assignor to Hiroshi Yamaguchi and Hiroshi Kimura, both of, Japan

Filed Jun. 1, 1990, Ser. No. 531,898
Claims priority, application Japan, Jun. 2, 1989, 1-141664
Int. Cl.[5] D01H 1/02, 7/56
U.S. Cl. 57—78 23 Claims

1. A rotary ring for spinning comprising
a holder having a lower end face,
a ring-shaped rotary member supported rotatably by a bearing inside the holder,
a braking show carried by a lower end of said rotary member and having an upper portion fixed to other lower end of the rotary member, said braking show having a lower portion for extending radially outwardly from said upper portion in a conical shape, said lower portion having an inner face and an outer face,
said braking shoe being of a flexibility and shape such that when said rotary member is rotated, the lower portion of the braking shoe will extend radially outwardly to a greater degree due to centrifugal force so that said lower portion will be moved in a space beneath said lower end face of the holder and generally toward said lower end face,
a substantially annularly shaped non-magnetic braking runner positioned to be in contact with the outer face of the lower portion of the braking shoe, said braking runner being mounted so as to be carried by the outer face of the braking shoe to frictionally contact said lower end face of the holder and to exert a braking force thereon.

5,148,663

ARRANGEMENT FOR GENERATION OF FANCY TWISTS ARRANGED AND/OR FORMED AT RANDOM ON A YARN

Friedrich Aalderink, Greenville, S.C., assignor to Eno Electronic GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 207,755 Jun. 16, 1988, abandoned.
This application Jan. 9, 1990, Ser. No. 463,834
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 37201069
Int. Cl.[5] D01H *13/02*
U.S. Cl. 57—91 5 Claims

1. An arrangement for the generation of fancy twists arranged and/or formed at random on a yarn, comprising

a) a fancy twist device through which at least one yarn thread is led, and

b) a feed device adapted to feed a yarn thread at different speeds through the fancy twist device, said feed device comprising:

a first roller, which rotates at a first constant speed

a second roller, which rotates at a second constant speed which differs from that of the first roller, and

a plurality of idler rollers which are electromagnetically controlled and which are arranged to press the yarn thread alternatingly against the first and the second rollers at a predetermined overall feed speed, and

a plurality of solenoids, each said solenoid being connected to a respective idler roller, and,

c) a control device for generating control commands for controlling said plurality of idler rollers of the feed device at a predetermined response time in an irregular sequence in order to thereby change the feed speed of said feed device,

characterized in that

d) the idler rollers of said plurality of idler rollers are each movable by respective separate solenoids to selectively press the yarn thread against an associated one of the first and second rollers and,

e) the solenoids being responsive to said control commands generated by said control device to operate said plurality of idler rollers in push-pull mode, whereby as the overall response time of the feed device reduces the overall feed speed of the feed device increases.

5,148,664

METHOD FOR STARTING OPERATION OF TWO-FOR-ONE TWISTER AFTER DOFFING

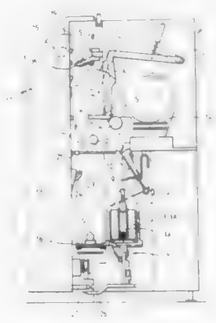
Tadashi Suzuki, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 3, 1991, Ser. No. 709,628
Claims priority, application Japan, Jun. 6, 1990, 2-147614
Int. Cl.[5] D01H *1/10, 7/86*
U.S. Cl. 57—269 4 Claims

1. A method for starting the operation of a two-for-one twister after doffing a take-up package in a spinning unit, comprising:

withdrawing and holding a yarn end from a feed package in the two-for-one twister,

rotating a spindle of the two-for-one twister to thereby impart a twist to the held yarn end,



winding the twisted yarn end onto a take-up tube to thereby form a bunch winding on the take-up tube, and

resuming operation of the spinning unit,

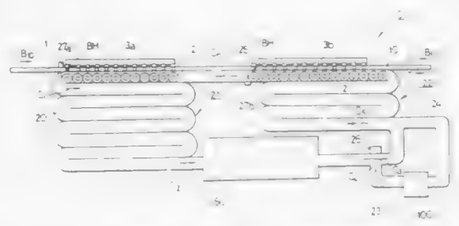
whereby the bunch winding comprises a yarn having a twist.

5,148,665

ROVING BOBBIN CARRIER SYSTEM

Shuji Kidani, Ishikawa, Japan, assignor to Kabushiki Kaisha Murao and Company, Kanazawa, Japan

Filed Mar. 8, 1991, Ser. No. 666,631
Claims priority, application Japan, Apr. 28, 1990, 2-114168
Int. Cl.[5] D01H *13/26, 11/00;* B65H *73/00*
U.S. Cl. 57—281 7 Claims



1. A roving bobbin carrier system comprising:

a carrier line for conveying a plurality of full wound roving bobbins and a plurality of unwound roving bobbins between a fine spinning frame and roving frame;

a stock conveyor provided aside carrier line independently thereof;

a first transfer mechanism provided at a first part of said stock conveyor for transferring said unwound roving bobbins on said carrier line to said stock conveyor;

a second transfer mechanism provided at a second part of said stock conveyor for transferring a plurality of blank roving bobbins on said stock conveyor to said carrier line; and

a residual roving removing device provided in said stock conveyor for removing a residual roving from said unwound roving bobbins to provide said blank roving bobbins; wherein

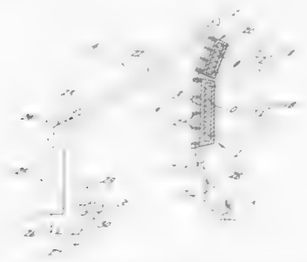
at least one of said first and second transfer mechanisms comprises a vertical rail, a vertically movable base adapted to be raised and lowered along said vertical rail and roving bobbin supporting device adapted to be horizontally moved relative to said vertically movable base, said roving bobbin supporting device being formed with a pair of grip handles for gripping upper and lower end portions of each said roving bobbin; and wherein wherein said stock conveyor forms a closed loop such that said roving bobbins on said conveyor are circulated.

5,148,666

YARN HEATING APPARATUS

Karl Bauer, Remscheid; Klaus Bartkowiak, Herne; Peter Dammann; Herbert Streppel, both of Remscheid, and Siegfried Morhenne, Breckerfeld, all of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Aug. 8, 1990, Ser. No. 564,196
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1989, 3926316; Jun. 29, 1990, 4020706
Int. Cl.[5] D01H *13/26;* D02G *3/02*
U.S. Cl. 57—290 17 Claims



1. An apparatus for heating an advancing yarn, comprising an elongate heating surface,

means for heating the heating surface, and

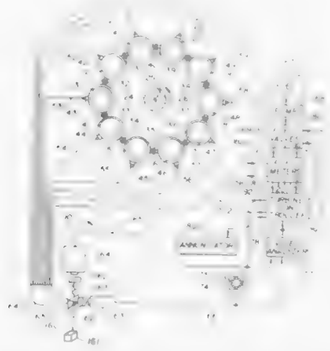
yarn guide means comprising a plurality of guide members mounted in a longitudinally spaced apart and interdigitally disposed arrangement along the length of said heating surface for engaging opposite sides of an advancing yarn and guiding the same along the heating surface in a laterally zigzagged path of travel which is adjacent but spaced form said heating surface along the entire length thereof.

5,148,667

GAS TURBINE FLAME DIAGNOSTIC MONITOR

William W. Morey, West Hartford, Conn., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Feb. 1, 1990, Ser. No. 473,573
Int. Cl.[5] F02C *7/00*
U.S. Cl. 60—39.02 3 Claims



1. A method for detecting the malfunction of a gas turbine during ignition, start up and under torque load comprising the steps of: optically viewing the entire flame in each combustor of said gas turbine,

determining a flame pattern based on electromagnetic radiation from the flame as a function of position in the field of view in each combustor, and

comparing the flame pattern of each combustor with a plurality of predetermined flame patterns, and determining a diagnosis of malfunction associated with one or more combustors of said turbine by the individual and total combustor correlated with the predetermined flame patterns.

5,148,668

COMBINED GAS/STEAM TURBINE POWER STATION PLANT

Hansulrich Frutschi, Rinikon, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jan. 17, 1991, Ser. No. 642,407
Claims priority, application Switzerland, Jan. 31, 1990, 312/90-4
Int. Cl.[5] F02C *7/268*
U.S. Cl. 60—39.05 4 Claims

1. A method for operating a gas/steam power plant wherein at least one steam turbine and at least one gas turbine drive an electrical generator comprising the steps of:

supplying throttled steam from a steam reservoir to said at least one steam turbine for start-up of the gas/steam power plant;

throttling said stem from said steam reservoir such that a start-up power of said at least one steam turbine is generated that is a fraction of a nominal output power of said at least one steam turbine

blocking during start-up a supply of steam to said steam reservoir from a waste heat boiler that is positioned to receive exhaust gas of said at least one gas turbine;

blocking at least during start-up a steam supply to a combustion chamber of said at least one gas turbine;

gradually delivering and igniting air and fuel in said combustion chamber of said at least one gas turbine; and,

switching the supply of steam to said at least one steam turbine from said steam reservoir to an evaporator bank of said waste heat boiler according to the attainment of a nominal rotary speed of said gas/steam power plant.

5,148,669

DETECTION OF PARTICULATES IN A HOT GAS FLOW

Karukkampalayam M. Sellakumar, San Diego, Calif., assignor to A. Ahlstrom Corporation, Karhula, Finland

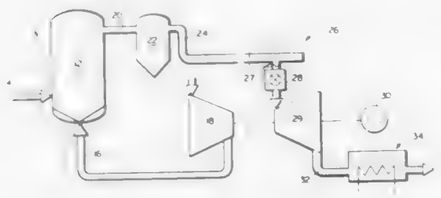
Filed Nov. 5, 1990, Ser. No. 609,518
Int. Cl.[5] F02G *3/00;* B01D *53/30, 45/08*
U.S. Cl. 60—39.092 10 Claims

1. An assembly for creating and using hot combustion gases, comprising:

means for combusting fuel to produce hot combustion gases having particles therein;

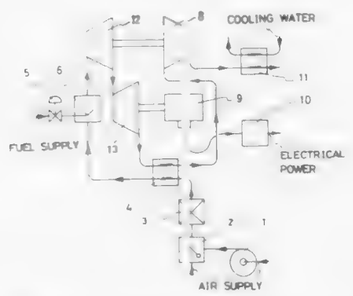
means for removing particles greater than a predetermined size from the hot combustion gases;

a conduit extending from said particle removing means, and having a generally linear first section;
a conduit second section comprising a restricted flow continuation of said first section;
a conduit third section disposed at approximately a 90° angle with respect to said first section and said second section;



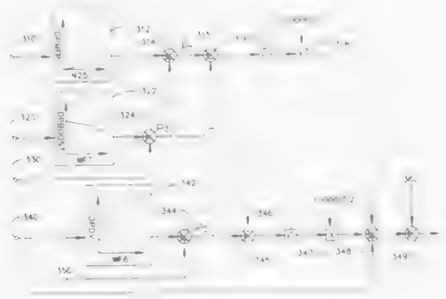
a turbine operatively connected to said conduit third section; and
particle detecting means operatively associated with said conduit second section.

5,148,670
GAS TURBINE COGENERATION APPARATUS FOR THE PRODUCTION OF DOMESTIC HEAT AND POWER
Peter H. Birch, Woodingdean; Toshiyuki Kondo, Brighton, both of United Kingdom, and Katsuhiro Mori, Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Continuation of Ser. No. 330,275, Mar. 29, 1989, abandoned. This application Jul. 5, 1991, Ser. No. 727,381
Claims priority, application United Kingdom, Mar. 31, 1988, 8807664
Int. Cl.[5] F02C *3/00, 7/27*
U.S. Cl. 60—39.142 **13 Claims**



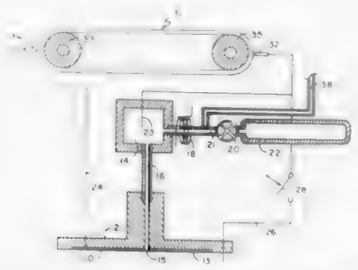
1. An apparatus for the domestic production of electricity, comprising:
a normal air intake for supplying atmospheric air as combustion air,
a heat exchanger in which combustion air is preheated;
means for supplying non-pressurized fuel,
a combustion chamber in which the non-pressurized fuel is burned in the preheated combustion air at a pressure no greater than atmospheric pressure to form gaseous combustion gases;
a centrifugal compressor;
an electrical generator;
at least one radial turbine in which the gaseous combustion gases are expanded and do work, the at least one turbine being connected to drive the compressor and said electrical generator;
means for starting the apparatus including an electric air blower and a valve which automatically closes the normal air intake during start up, for drawing air from the atmosphere and delivering it through the heat exchanger and combustion chamber to the turbine inlet; and
means for passing the gaseous combustion gases from said at least one turbine through said heat exchanger to preheat the combustion air and then to said compressor for recompression.

5,148,671
FUEL CIRCULATION CONTROL SYSTEM
Kevin H. Kast, Cincinnati, and William J. Myers, Jr., West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Oct. 17, 1990, Ser. No. 599,211
Int. Cl.[5] F02C *9/28*
U.S. Cl. 60—39.281 **8 Claims**



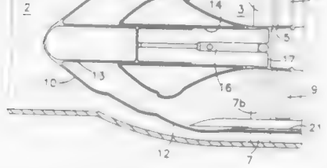
1. Control circuitry comprising:
first summing means for summing two input signals including first and second inputs and output, wherein said first input receives a first pressure signal and said second input receives a second pressure signal;
first transfer function means for converting an input signal to an output signal including an input connected to said output of said first summing means and an output;
first multiplier means for calculating a product, including a first and second inputs and an output, wherein said first input is connected to said output of said first transfer function means and said second input receives a first substantially constant input signal;
second summer means for summing two input signals including first and second inputs and an output, wherein said first input receives said second pressure signal and said second input receives a third pressure signal;
second transfer function means for converting an input signal to an output signal including an input and an output, wherein said input is connected to said output of said second summer means;
second multiplier means for calculating a product, including first and second inputs and an output, wherein said first input is connected to said output of said second transfer function logic means and said second input receives a second, substantially constant input signal;
third summer means for summing input signals including first, second and third inputs and an output, wherein said first input is connected to said output of said first multiplier means, said second input is connected to said output of said second multiplier means, said third input is connected to an external demand signal.

5,148,672
PULSE THRUSTER
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081
Filed Feb. 20, 1990, Ser. No. 481,333
Int. Cl.[5] F02K *7/02, 11/00*
U.S. Cl. 60—200.1 **8 Claims**



1. An impulse reaction propulsion engine comprising:
an electrically charged surface;
a fuel, the molecules of which bear an electrical charge of opposite charge to said charged surface;
means to disperse said charged fuel molecules against said oppositely charged surface in the presence of a fuel oxidizer; and
means to ignite said molecules to create a reaction against such surface to cause movement of said engine.

5,148,673
INTEGRATED TURBORAMJET ENGINE
Heinrich Enderle, Groebenzell, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany
Filed Oct. 24, 1990, Ser. No. 602,761
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935313
Int. Cl.[5] F02K *7/16*
U.S. Cl. 60—225 **25 Claims**



1. An integrated turboramjet engine comprising:
a common air inlet for a turbo and a ramjet circuit,
an annular turbo inlet duct disposed downstream of the common air inlet,
a ram-air inlet duct disposed downstream of the common air inlet duct and surrounding the turbo inlet duct,
a guide ring arranged in the common air inlet,
an inlet cone disposed radially inside the guide ring,
a lock ring disposed radially outside the guide ring,
an inlet cone adjusting device for selectively moving the inlet cone between a first ramjet operating position and a second turbojet operating position, and
a lock ring adjusting device for selectively moving the lock ring between a first ramjet operating position and a second turbojet operating position,
wherein when said inlet cone and lock ring are in their respective first ramjet operating positions, the inlet cone is situated in its front end position and the lock ring is situated in its rear end position so that the inlet cone, guide ring and lock ring form a duct wall which guides the gas flow into the ram-air inlet duct, and wherein when said inlet cone and lock ring are in their respective second turbojet operating positions, the ram-air inlet duct is closed off by the lock ring and the gas flow is guided on both sides of the guide ring into the turbo-inlet duct

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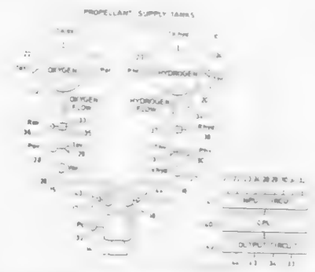
5,148,674
METHOD AND APPARATUS FOR PROVIDING REAL-TIME CONTROL OF A GASEOUS PROPELLANT ROCKET PROPULSION SYSTEM
Brian G. Morris, 10806 Sagewillow, Houston, Tex. 77089
Division of Ser. No. 470,480, Jan. 26, 1990, Pat. No. 5,063,734. This application Aug. 9, 1991, Ser. No. 741,894
Int. Cl.[5] F02K *9/42*
U.S. Cl. 60—240 **7 Claims**

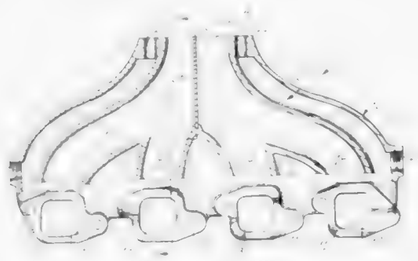


1. A rocket propulsion system for supplying gaseous fuels and oxidizers from pressurized sources of the propellants to the combustion chamber of a rocket engine and comprising:
first and second conduits for respectively carrying a gaseous fuel and oxidizer from pressurized sources of the propellants to the combustion chamber of a rocket engine,
first and second selectively-operable pressure regulators arranged in said first and second conduits for respectively regulating the feed pressures of a gaseous fuel and a gaseous oxidizer being supplied to the combustion chamber of a rocket engine;
means for providing real-time measurements of the combustion chamber pressure of a rocket engine supplied by a gaseous fuel and a gaseous oxidizer respectively flowing in said first and second conduits; and
control means responsive to real-time measurements of the pressure in the combustion chamber of a rocket engine for selectively controlling said first and second pressure regulators to regulate the feed pressures of a gaseous fuel and a gaseous oxidizer being supplied to the combustion chamber of a rocket engine for maintaining the pressure in the combustion chamber within a predetermined range of pressures wherein, said control means are selectively responsive to the pressure in the combustion chamber of a rocket engine for maintaining the mass flow rates of a gaseous fuel and gaseous oxidizer in a predetermined ratio only when the combustion chamber pressure is in its said predetermined range of pressures.

5,148,675
MARINE EXHAUST MANIFOLD AND HEADER PIPE SYSTEM
Frederick R. Inman, 250 Silver Tree, Glendora, Calif. 91740
Filed Apr. 26, 1991, Ser. No. 692,219
Int. Cl.[5] F01N *7/10*
U.S. Cl. 60—321 **8 Claims**

1. An exhaust manifold for a multi-cylinder internal combustion engine comprising a manifold body configured internally

thereof to define a plurality of inlet ports communicating within the body to an outlet port, the inlet ports opening through at least one engine face of the body via which the body can be mounted to an internal combustion engine of selected design for mating of the body inlet ports with respective exhaust opening defined by the engine in association with respective combustion chambers within the engine which fire in a selected sequence, the outlet port opening from the manifold body through a second face of the body via which the body can be connected to an exhaust pipe assembly for con-



ducting engine exhaust gases from within the manifold to a desire discharge location spaced from the body, and septum means in the body having an end in the outlet port essentially at the second face for dividing the inlet ports into groups of at least two ports each and for isolating the body internal spaces associated with each group from the spaces associated with each other group, the septum means comprising a plate having an edge in the outlet port, the plate being loosely engaged substantially along all other portions of its perimeter within a recess defined within internal surfaces of the manifold.

5,148,676

CONFLUENCE VALVE CIRCUIT OF A HYDRAULIC EXCAVATOR

Yukio Moriya, Kanagawa; Toshio Yokoyama, Uji; Fujitoshi Takamura, Hirakata, and Takumi Onoda, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP89/01201, § 371 Date Oct. 10, 1990, § 102(e) Date Oct. 10, 1990, PCT Pub. No. WO90/07031, PCT Pub. Date Jun. 28, 1990

PCT Filed Nov. 29, 1989, Ser. No. 555,494

Claims priority, application Japan, Dec. 19, 1988, 63-321784

Int. Cl.[5] E02F *3/43*; F15D *31/02*; F15B *13/04*

U.S. Cl. 60—429 12 Claims

1. Apparatus comprising a first variable capacity type hydraulic pump having an output, a second variable capacity type hydraulic pump having an output, a first group of control valves with each of the control valves in said first group being connected to a respective one of a first plurality of hydraulic actuators, a second group of control valves with each of the control valves in said second group being connected to a respective one of a second plurality of hydraulic actuators, a first hydraulic supply line connected between the outlet of said first variable capacity type hydraulic pump and said first group of control valves to supply hydraulic fluid to the first plurality of hydraulic actuators connected to the first group of control valves, a second hydraulic supply line connected between the outlet of said second variable capacity type hydraulic pump and said second group of control valves to supply hydraulic fluid to the second plurality of hydraulic actuators connected to the second group of control valves, and a confluence circuit connected to said first hydraulic supply line and to said second hydraulic supply line, said confluence circuit having an electromagnetically actuated confluence valve positioned therein for performing proportional flow rate control in the confluence circuit when confluence is desired;

wherein said confluence valve comprises an electromagnetically actuated piloting valve and a proportional flow rate control valve; said proportional flow rate control valve having first and second control inputs and first and second flow ports, said first flow port of said proportional flow control valve being connected to said first hydraulic supply line, said second flow port of said proportional flow control valve being connected to said second hydraulic supply line; said piloting valve having a first position, in

which it provides fluid communication between said first hydraulic supply line and said first control input of said proportional flow control valve, and a second position in which the fluid communication between said first hydraulic supply line and said first control input of said proportional flow control valve is interrupted; said second control input of said proportional flow control valve being connected to said second flow port of said proportional flow control valve.

5,148,677

METHOD OF AND MEANS FOR EXTRACTING HEAT FROM A HOT FLUID CONTAINING FOREIGN MATERIAL THAT INTERFERES WITH HEAT TRANSFER

Benjamin Doron, Jerusalem; Gad Assaf, Rehovot; Uriyel Fisher, Haifa, and Evgeny Aronov, Rehovot, all of Israel, assignors to Ormat Turbines (1965) Ltd., Yavne, Israel

Continuation-in-part of Ser. No. 443,683, Nov. 29, 1989, abandoned, which is a continuation of Ser. No. 128,824, Dec. 4, 1987, Pat. No. 4,894,993. This application Jul. 29, 1991, Ser. No. 737,133

Int. Cl.[5] F03G *4/06*

U.S. Cl. 60—641.5 27 Claims

1. A method for extracting heat from a hot fluid comprising a hot liquid containing scaling material whose solubility is proportional to the temperature of the liquid, said method comprising the steps of:

a liquid;

a) providing a pond containing

b) locating in said pond a vertical tube having an upper end that is substantially closed, and an open lower end that is immersed in the liquid in the pond and spaced from the bottom thereof for establishing a trapped region above a column of liquid in the said tube;

c) supplying said hot fluid to said trapped region; and

d) said pond and said tube being constructed and arranged so that the liquid in the pond and the liquid in said column are in substantial hydrostatic equilibrium, and said trapped region is maintained at a pressure such that some of the liquid supplied to said trapped region flashes into a vapor thereby concentrating the liquid below the trapped region;

e) the open lower end of the first tube effecting the passage to the bottom of the pond of scaling material that precipitates as a consequence of the concentration of liquid below the trapped region; and

f) extracting heat from said vapor.

5,148,678

EXHAUST GAS FLOW CONTROL VALVE FOR INTERNAL COMBUSTION ENGINE

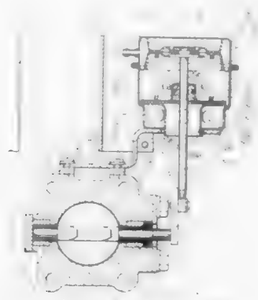
Hironori Ueda; Kazumichi Hanai; Hitoshi Takeuchi; Kazutaka Nakamichi, and Takashi Kubota, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Dec. 20, 1990, Ser. No. 631,304

Claims priority, application Japan, Dec. 26, 1989, 1-150390[U]; Sep. 7, 1990, 2-238435; Oct. 24, 1990, 2-286709

Int. Cl.[5] F02B *37/12*; F16K *49/00*

U.S. Cl. 60—602 8 Claims



1. An exhaust gas flow control valve for an internal combustion engine which is to be disposed in an exhaust pipe of the engine, comprising:

(a) a valve body disposed in an engine exhaust pipe and including an exhaust passage and a valve disposed in said exhaust passage;

(b) a diaphragm actuator for actuating said valve member and including a casing having an upper chamber and a lower chamber separated by a diaphragm;

(c) an actuator rod connected at an upper end thereof to the diaphragm and having a lower end thereof extending outside said casing and connected to a valve moving means;

(d) said casing also including an insulating chamber disposed below and connected to said lower compartment and having a centrally disposed cylindrical portion surrounding a portion of said actuator rod for reducing the heat transferred by said rod from the valve body to the diaphragm actuator; and

(e) a bracket connected to said valve body by means of a first valve body mounting seat and connected by means of a second actuator mounting seat to said insulating chamber whereby heat conducted from the valve body to the diaphragm actuator is reduced.

5,148,679

PORTABLE DEVICE FOR PRODUCING SOLID CARBON DIOXIDE

Christopher F. Eve, Washington, D.C., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 10, 1991, Ser. No. 757,366

Int. Cl.[5] F25J *1/00*

U.S. Cl. 62—10 18 Claims

3. A portable apparatus for converting a portion of received liquid carbon dioxide to solid carbon dioxide, the apparatus comprising:

an elongate stiff tube having first and second ends, said first end being formed to quickly connect with an outlet of a liquid carbon dioxide source to be supported solely thereby;

a process control valve having an inlet and an outlet, said valve inlet being connected to said second end of said tube whereby said process control valve is supported solely by said tube;

a head plate having a first opening therethrough and connected to said process control valve to be supported substantially horizontally solely thereby;

a heat exchange coil having an inlet and an outlet, mounted to and underneath said head plate to be supported solely thereby, said coil inlet communicating with said process valve outlet through said first opening in said head plate, said coil having a second end provided with a quick connect element;

an expansion nozzle having an inlet of a predetermined small cross-sectional area and an outlet having a larger cross-sectional area and a smooth internal surface defining an expansion path therebetween, said expansion nozzle being supported solely by connection with said quick connect element;

a foraminous bag connected at an upper end to said expansion nozzle outlet to depend downwardly therefrom and having a closable lower end;

means for releasably closing said lower end of said foraminous bag; and

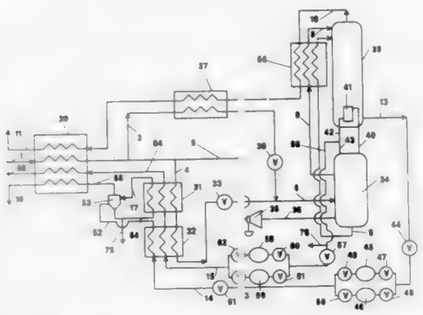
thermally insulating cover means for surrounding said foraminous bag, said nozzle and said heat exchange coil when releasably mounted underneath said head plate to be supported solely thereby, said cover means having at least one opening to allow leakage therethrough of gaseous carbon dioxide passing through said foraminous bag during use of the apparatus.

5,148,680

CRYOGENIC AIR SEPARATION SYSTEM WITH DUAL PRODUCT SIDE CONDENSER

James R. Dray, Kenmore, N.Y., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Jun. 27, 1990, Ser. No. 544,641
Int. Cl.[5] F25J 1/02
U.S. Cl. 62—24 24 Claims



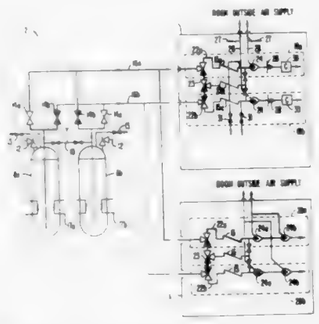
1. A method for the cryogenic separation of air to produce oxygen and nitrogen comprising:
(A) providing feed air into a higher pressure column and separating the feed air in the higher pressure column into nitrogen-enriched vapor and oxygen-enriched liquid;
(B) passing oxygen-enriched liquid from the higher pressure column into a lower pressure column;
(C) condensing nitrogen-enriched vapor to produce nitrogen-enriched liquid and passing nitrogen-enriched liquid into the lower pressure column;
(D) separating the fluids passed into the lower pressure column into nitrogen-rich vapor and oxygen-rich liquid;
(E) passing oxygen-rich liquid in indirect heat exchange with feed air to produce product oxygen gas; and
(F) passing nitrogen-enriched liquid produced by the condensation of nitrogen-enriched vapor in step (C) against oxygen-rich liquid in indirect heat exchange with feed air to produce product nitrogen gas.

5,148,681

PASSIVE EMERGENCY VENTILATION SYSTEM

Michel P. Lagache, Orinda, Calif., assignor to Bechtel Group, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 490,183, Mar. 8, 1990, abandoned. This application Jul. 11, 1990, Ser. No. 551,698
Int. Cl.[5] F25J 3/04
U.S. Cl. 62—48.1 23 Claims



1. Apparatus for providing emergency air to a selected room in an industrial facility comprising:
a) an air storage tank, said air storage tank selected from the group of pressurized liquid air storage tanks and compressed air storage tanks;
b) a flow line from said storage tank to a supply valve for permitting flow of air from said storage tank during an emergency event;
c) a heat exchanger downstream of said supply valve, said heat exchanger adapted to heat air from said tank by way of heat transfer with air in said room; and
d) an eductor in said flow line downstream of said heat exchanger, said eductor further connected to an ambient air supply line, said ambient air supply line terminating at an ambient air source outside of said room, said eductor discharging into said selected room.

5,148,682

ICE MOLDING DEVICE AND METHOD

J. Davis Wolf, 2340 Walnut, Boulder, Colo. 80302

Filed May 6, 1991, Ser. No. 695,959
Int. Cl.[5] F25D 3/00
U.S. Cl. 62—59 1 Claim

1. A method for forming ice around a beverage container comprising the steps of:
providing a lower piece;
providing a hollow upper piece mold means for coupling to said lower piece;
inserting a beverage container and water into the interior of said hollow upper piece mold means after inverting said hollow upper piece mold means;
attaching said lower piece to said hollow upper piece mold means to seal an open end of said hollow upper piece mold means;
reversing the combined hollow upper piece mold means with the attached lower piece to an upright position with said lower piece on the bottom;
freezing the combined hollow upper piece mold means with the attached lower piece in a freezer to form ice around substantially an exterior portion of said beverage container; and
removing said hollow upper piece mold means to provide an ice clad beverage container.

5,148,683

DEVICE FOR INTRODUCING COLD AIR INTO A ROOM

Gottfried Muller, and Paul Hipp, both of Kolbingen, Fed. Rep. of Germany, assignors to SCHAKO Metallwarenfabrik Ferdinand Schad KG, Kolbingen, Fed. Rep. of Germany

Filed May 21, 1991, Ser. No. 703,389
Claims priority, application Fed. Rep. of Germany, May 23, 1990, 4016563
Int. Cl.[5] F25D 17/00
U.S. Cl. 62—180 6 Claims

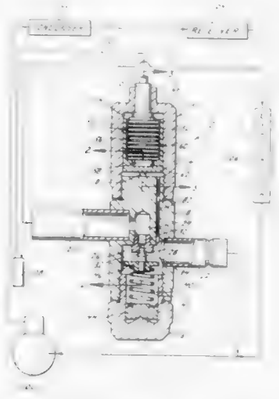
1. A device for introducing air into a room comprises: an external housing having longitudinally extending side wall means defining an interior space, said side wall means having slots provided with adjustable louvers for drawing air into said interior space; a cover plate mounted on said side wall means along a first plane substantially perpendicular to said longitudinally extending side wall means, said cover plate having outlet means for passing air from said interior space to said room; an internal hollow housing mounted within said external housing on said cover plate and defining with said external housing an annular space, said internal hollow housing defining first and second internal spaces arranged serially wherein said first space is larger than said second space and adjacent said cover plate; blower means located within said second space for drawing air through said slots, said annular space and said second space and forcing said air into said first space and out said outlet means; and refrigeration means located in said first space, said refrigeration means comprises first and second set of pipe means connected together wherein said first set of pipe means extend horizontally and lie in a second plane substantially parallel to said first plane and said second set of pipe means extend vertically and lie in a third plane substantially parallel to said first and second planes, a plurality of rectangular louvers secured to said pipes, said louvers lying in a fourth plane perpendicular to said first, second and third planes.

5,148,684

INJECTION VALVE FOR A REFRIGERATION SYSTEM

J. George Leimbach, Crestwood, and Joseph H. Heffner, Chesterfield, both of Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Apr. 12, 1991, Ser. No. 684,304
Int. Cl.[5] F25B 5/00
U.S. Cl. 62—197 7 Claims



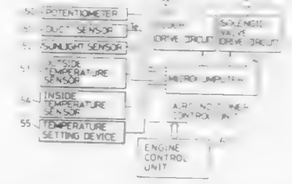
1. A control valve for controlling temperature of compressor discharge in a refrigeration system including an evaporator, a compressor and a condenser, the valve comprising:
(a) a body including an inlet port receiving refrigerant from one part of the system, an outlet port injecting refrigerant into the system at a point upstream of compressor discharge, a valve seat disposed between said inlet and outlet ports and a valve member movable relative to said valve seat to vary flow through said valve seat between said inlet and outlet ports,
(b) means mounted in the body and applying a force to said valve member tending to urge said valve member into a closed position, and
(c) means applying a modulating force to said valve member including a connector attached to the body, an actuator movable within the body, a bellows connected between said actuator and said connector, a temperature responsive means and means communicating with the bellows and means operatively interconnecting the actuator and the valve member said temperature responsive means, said communicating means and said bellows being filled with a liquid having an expansion coefficient sufficient to modulate the valve member in response to cubical expansion of the liquid due to temperature change of the temperature responsive means,
(d) the connector including an upper portion attached to the body upper portion and a lower portion received within the bellows to substantially reduce the effective volume of the bellows.

5,148,685

CONTROL SYSTEM FOR VARIABLE-CAPACITY COMPRESSOR IN AIR CONDITIONER

Akihiko Takano; Yoshihiko Sakurai, and Katsumi Iida, all of Saitama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,707
Claims priority, application Japan, Jun. 4, 1990, 2-144296
Int. Cl.[5] G05B 13/02
U.S. Cl. 62—229 4 Claims



1. A system for controlling a variable-capacity compressor in an air conditioner including an evaporator, said compressor compressing a cooling medium discharged from said evaporator, said system comprising:
(a) capacity control means for controlling the capacity of said compressor;
(b) detection means for detecting the actual temperature of the air downstream of said evaporator;
(c) target temperature setting means for setting a target temperature of the air downstream of said evaporator;
(d) temperature deviation calculation means for calculating a temperature deviation between said actual temperature and said target temperature;
(e) proportional calculation means for calculating a proportional control component in accordance with said temperature deviation;
(f) integral calculation means for calculating an integral control component in accordance with said temperature deviation;

(g) control amount calculation means for calculating, in accordance with the sum of said proportional control component and said integral control component, the amount of control to be applied to said capacity control means;

(h) judgment means for judging whether or not the sum of said proportional control component and said integral control component exceeds a limit value of said control amount corresponding to the maximum capacity of said compressor; and

(i) integral correction means for subtracting said proportional control component from said limit value of said control amount so as to determine said integral control component when said judgment means judges that said sum exceeds said limit value

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5,148,686

DEFROST CONTROL APPARATUS FOR A REFRIGERATION SYSTEM

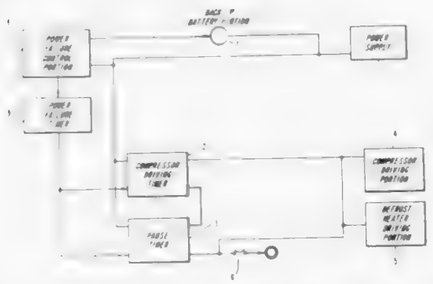
Han J. You, Kwangmyung, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Aug. 20, 1991, Ser. No. 747,346

Claims priority, application Rep. of Korea, Aug. 16, 1990, 90-12618

Int. Cl.[5] F25D *21/00*

U.S. Cl. 62—234 6 Claims



1. A defrost control apparatus for a refrigeration system including a power source, compressor driving timer, pause timer, compressor driving portion, defrost heater driving portion and bimetal portion, comprising:

power failure control means for controlling each portion of the refrigeration systems and detecting a power failure while connected to the power source;

a back-up battery means for supplying and cutting off a power supply according to the existence and nonexistence of a power failure detection signal from the power failure control means;

a power failure timer means for outputting a signal initializing the compressor driving timer and the pause timer when a predetermined time elapses from when a power failure detection signal is received from the power failure control means.

5,148,687

COOLING APPARATUS FOR BULK MATERIAL

Akira Tamei; Katsuhiro Oshio, both of Nara; Tadaaki Sumoto, Gose; Yoshihisa Tozawa, Nara; Takashi Nakahara, Itami; Masaru Nishimoto, Daito, and Yasuhiko Yasui, Ibaraki, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed May 21, 1991, Ser. No. 703,396

Claims priority, application Japan, Sep. 28, 1990, 2-102480[U]; Sep. 28, 1990, 2-268807; Sep. 29, 1990, 2-102596[U]

Int. Cl.[5] F25D *23/02*

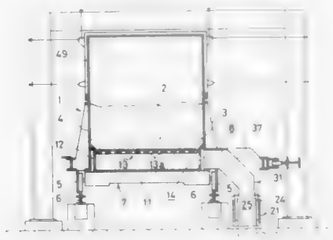
U.S. Cl. 62—266 5 Claims

1. A cooling apparatus for bulk material wherein masses of hot bulk material loaded on a plurality of troughs movable along a circular travel path are cooled by cooling air supplied from air boxes positioned below respective surfaces on which the masses of hot bulk material are placed, said cooling apparatus comprising:

a stationary annular air duct arranged in a circular fashion along said travel path and having an inner side wall portion located on the inner peripheral side and an outer side wall portion located on the outer peripheral side, said inner and outer side wall portions defining an air passage therebetween, said stationary annular air duct being open at the top;

annular water seal chambers provided on respective outer sides of said inner and outer side wall portions;

a movable annular air duct movable integrally with said troughs and capable of covering the opening of said stationary annular air duct from above, said movable annular air duct having an inner peripheral side wall portion and an outer peripheral side wall portion, said side wall portions having their respective lower ends positioned in corresponding relation to respective upper ends of the



inner and outer side wall portions of said stationary annular air duct;

a plurality of connecting ducts for communicating the movable annular air duct with respective air boxes of said troughs;

seal plate members depending respectively from the two side wall portions of said movable annular air duct for entry into the water in said annular water seal chambers;

gaps defined between respective lower ends of the side wall portions of said movable annular air duct and respective upper ends of the side wall portions of said stationary annular air duct which communicate the air passage within the stationary annular air duct with said annular water seal chambers;

first seal plates provided at respective upper ends of the side wall portions of said stationary annular air duct in relation to respective lower ends of the side wall portions of said movable annular air duct so as to minimize said gaps; and

second seal plates provided at respective lower ends of the side wall portions of said movable annular air duct to form labyrinth seals in cooperation with said first seal plates.

5,148,688

DRINKING VESSEL

Annette R. Pimm, and Jacob H. Fonda, both of 4085 Rte. 247, Gorham, N.Y. 14424

Filed Jul. 22, 1991, Ser. No. 733,462

Int. Cl.[5] F25D *3/08*

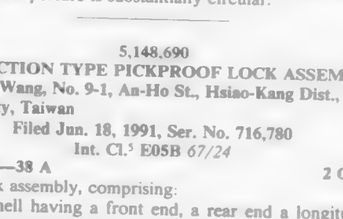
U.S. Cl. 62—457.3 13 Claims

1. The combination of:

a drinking vessel including a bottom and sidewalls defining a vessel interior to contain liquid;

a separate ice container including a bottom, sidewalls, and a removable liquid-tight cover openable into said vessel interior; and

mounting means to releasably mount said ice container within said vessel in a standing position on the bottom thereof, for immersion in said liquid;



whereby ice in said container provides positive cooling of liquid in said vessel without diluting said liquid.

5,148,689

HINGE FOR A NECKLACE

Ofer Azrielant, New York; Alex Gal, Hollis wood, and Kenneth Lautman, Long Beach, all of N.Y., assignors to Andin International, Inc., New York, N.Y.

Filed Sep. 29, 1989, Ser. No. 414,362

Int. Cl.[5] A44C *13/00*

U.S. Cl. 63—4 21 Claims

1. A necklace comprising in combination:

(a) a chain;

(b) two attaching members each defining an aperture, said attaching members rigidly attached at respective ends of said chain;

(c) a jewelry element having a substantially flat rear surface and two pins permanently attached at different points on said rear surface, each of said pins having one end thereof extending substantially at right angles from said rear surface and engaging respectively said apertures in said attaching members, and said pins having another end bent in close proximity to said rear surface, whereby said chain may move freely in relation to said jewelry element about said pins,

wherein each of said attaching members is substantially flat, and comprises a straight first edge attached to an end of said chain, and a curved second edge opposite to said first edge, and wherein said aperture is substantially circular.

5,148,690

TWO-SECTION TYPE PICKPROOF LOCK ASSEMBLY

Ruei-Fang Wang, No. 9-1, An-Ho St., Hsiao-Kang Dist., Kaohsiung City, Taiwan

Filed Jun. 18, 1991, Ser. No. 716,780

Int. Cl.[5] E05B *67/24*

U.S. Cl. 70—38 A 2 Claims

1. A lock assembly, comprising:

a lock shell having a front end, a rear end a longitudinal opening accessible from said front end, and an inner surface provided with a set of first tumbler holes disposed adjacent to said front end and a set of second tumbler holes disposed adjacent to said rear end;

a driving shaft axially disposed in said longitudinal opening and having a transverse head portion, a tail portion journaled on said rear end of the lock shell, and a shaft portion which is rectangular in cross-section,

first and second plug halves received in said longitudinal opening and cooperatively forming a cylindrical member in sliding contact with said inner surface of said lock shell, each of said first and second plug halves having a clamping face provided with an axial first notch, said first notch of said first and second plug halves cooperatively confining a rectangular receiving space, said shaft portion of said driving shaft extending into said rectangular receiving space and being clamped by said first and second plug halves, each of said first and second plug halves having a curved surface formed with at least one axially extending second notch which opens from a first end of said first and second plug halves and having a terminating end spaced from a second opposite end of said first and second plug halves to provide a groove-free space between said second end of said first and second plug halves and said terminating end of said second notch;

a biasing means to bias each of said first and second plug halves toward said transverse head portion of said driving shaft;

a key plug rotatably mounted to said lock shell inside said longitudinal opening adjacent to said front end, said key plug being formed as an annular wall confining an axial key way and having a set of third tumbler holes aligned with said first tumbler holes when said lock assembly is in a locked position, and a

rear end provided with first and second axially extending arc projections to engage said transverse head portion of said driving shaft;

a first set of holding means resiliently extending through said first and third tumbler holes into said key way to engage said lock shell and said key plug when said lock assembly is in said locked position;

a second set of holding means resiliently extending through said second tumbler holes into said longitudinal opening and

a key having a cylindrical key body provided with radial pits, and a front end formed with first and second axially extending curve protrusions which define a receiving groove therebetween, said first and second curve protrusions having different lengths;

said key being inserted in said key way such that said first set of tumbler means engage said radial pits so as to engage said key body with said key plug and disengage said lock shell from said key plug thus permitting rotation of said key plug relative to said lock shell, said curve protrusions moving said first and second plug halves away from said transverse head portion against said biasing means to align said groove-free space of said first and second plug halves and form a continuous annular path, said second set of tumbler means contacting said first and second plug halves at said annular path to permit rotation of said key relative to said lock shell;

whereby, when non-alignment of said groove-free space of said first and second plug halves occurs due to insertion of

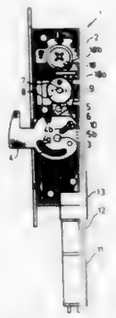
a wrong key into said key way, rotation of said key plug by the wrong key causing said second set of tumbler means to engage said second notch of said first and second plug halves and prevent further rotation of the wrong key and said key plug relative to said lock shell.

5,148,691

ELECTRICALLY AND MECHANICALLY ACTIVATABLE LOCK MECHANISM

Lars Walldén, Eskilstuna, Sweden, assignor to ASSA AB, Sweden

PCT No. PCT/SE90/00402, § 371 Date Dec. 27, 1991, § 102(e) Date Dec. 27, 1991, PCT Pub. No. WO91/00405, PCT Pub. Date Jan. 10, 1991
PCT Filed May 19, 1990 Ser. No. 778,976
Claims priority, application Sweden, Jun. 29, 1989, 8902363-4
Int. Cl.[5] E05B 47/00
U.S. Cl. 70—279 5 Claims



1. An electrically and mechanically activatable lock mechanism in the form of a narrow profile lock, comprising:

a) a lock housing (**2**),

b) a lock plunger in the form of a latch hook (**4**) pivotally mounted on a shaft (**3**),

c) a toothed, spring-activated drive element (**6**) pivotally mounted on a shaft (**5**) and operative to pivot the lock plunger between a lock-release position and a locking position,

d) a toothed, pivotal transmission/dogging element in engagement with a drive means (**9**) mounted on an output shaft (**10**) of an electric motor (**11**),

e) a toothed follower element (**17**) operative to coact with the transmission/dogging element (**8**) and being in meshing engagement with the drive element (**6**) and with a rectilinearly movable rack element (**18**),

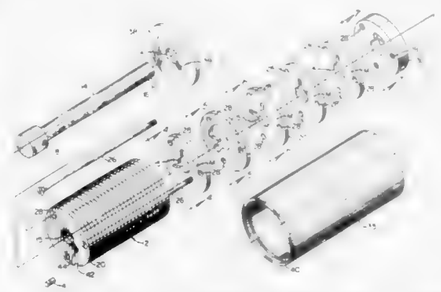
f) a pivotal cylinder lock follower (**19**) having a projection (**19***a*) for engagement with a notch (**18***a*) in the rack element (**18**), wherein the follower element (**17**) is pivotally mounted on a shaft (**7**) which also supports the transmission/dogging element (**8**) and is located adjacent said transmission/dogging element and presents a known central slot (**17***b*) having two sector-shaped parts defining a figure-eight configuration, said transmission/dogging element (**8**) having dogs (**8***b*) which engage in said two sector-shaped parts of said slot; and wherein the electric motor (**11**), subsequent to receiving a start impulse, functions to rotate the transmission/dogging element (**8**) through part of one revolution, via said output shaft (**10**) and said drive means (**9**), said rotary movement being transmitted via the dogs (**8***b*) to the follower element (**17**) so as to pivot said lock plunger, and thereafter to return immediately said transmission/dogging element (**8**) to its starting position, said follower element (**17**) remaining in its adopted position.

5,148,692

MAZE-TYPE LOCKING DEVICE

Gerald A. Gieseker, 6277 Estes St., Apt. 2, Arvada, Colo. 80004

Division of Ser. No. 326,089, Mar. 20, 1989, Pat. No. 4,974,848.
This application Nov. 5, 1990, Ser. No. 609,238
Int. Cl.[5] E05B 37/20
U.S. Cl. 70—290 7 Claims



1. In a locking device wherein locking means is movable between a locked and unlocked position with respect to a stationary member, the combination comprising:

an elongated member provided with a longitudinally extending bore extending therethrough, and an immovable but winding passageway defining an internal maze in communication with said bore along the length thereof, said passageway varying in rotational orientation at predetermined intervals along the length of said bore;

an unlocking member having a shaft disposed in said bore including a transversely extending arm on said shaft, said shaft having means projecting from said elongated member to be manually grasped for combined rotatable and axially slidable movement of said shaft and arm with respect to said bore and said passageway, respectively, in accordance with a known combination of axial and rotational movements of said arm necessary to advance said arm into engagement with said locking means, said locking means extending into the path of movement of said arm through said passageway whereby said locking means is activated only by engagement of said arm to move to an unlocked position with respect to said stationary member; and

said elongated member being generally cylindrical and comprised of a plurality of annular disks, each said disk provided with a central bore and a circumferential slot therein, said slots of adjacent said disks being in communication with one another along the length of said member to define said passageway, an outer cylindrical housing, and fastener means interconnecting said disks in predetermined fixed relation to one another and to said housing in accordance with said known combination of rotational and axial movements required for advancement of said arm through said passageway into engagement with said locking means.

5,148,693

METHOD AND A DEVICE FOR DETECTING FOLDING ANGLES OF A METAL SHEET DURING THE FOLDING AND A METHOD FOR FOLDING OF A METAL SHEET

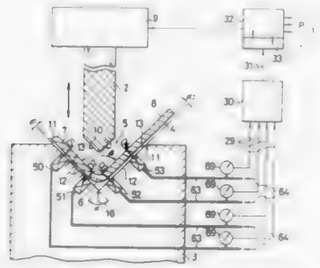
Franco Sartorio, and Bruno Nicoletta, both of Turin, Italy, assignors to Amada Company, Limited, Japan

Division of Ser. No. 612,574, Nov. 14, 1990, Pat. No. 5,099,666.
This application Oct. 29, 1991, Ser. No. 783,918
Claims priority, application Italy, Nov. 14, 1989, 67996 A/89; Nov. 14, 1989, 67997 A/89
Int. Cl.[5] B21D 5/02
U.S. Cl. 72—12 2 Claims

1. A method for detecting a folding angle formed between a pair of adjacent portions of a metal sheet during a folding

operation by a folding machine provided with a punch and a die, said die having a pair of adjacent wall surfaces cooperating with a said punch when said metal sheet is inserted therebetween, the method comprising the following steps of:

measuring, after folding said metal sheet and after accommodating a residual elastic return resulting thereform, a distance of each sheet portion from each adjacent wall surface, said wall surfaces angularly spaced apart by a vertex angle therebetween, wherein each wall surface incorporates a pneumatic gauge to emit a gas jet against each respective sheet portion in the direction substantially perpendicular to the said sheet portion, and wherein each said pneumatic gauge characterizes each said distance;



calculating by using said characterizations, each angle formed between each said wall surface and the said sheet portion facing the said wall, each said angle taken about the vertex; and

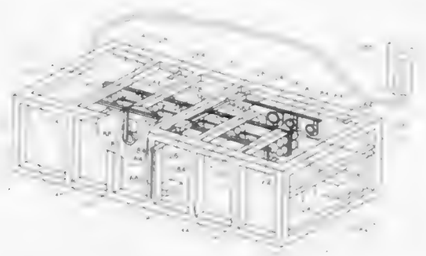
summing algebraically the value of the vertex angle and of the said calculated two angles.

5,148,694

SHEET METAL FORMING APPARATUS

Bruce M. Pearson, Westminster, and W. Wayne Worrell, Lafayette, both of Colo., assignors to Zimmerman Metals, Inc., Denver, Colo.

Filed Apr. 26, 1991, Ser. No. 692,287
Int. Cl.[5] B21D 5/08
U.S. Cl. 72—131 34 Claims



1. An apparatus for shaping a length of sheet metal having first and second longitudinal edges, comprising:

a frame structure having a central, longitudinal axis;

first and second longitudinal support means interconnected with and laterally movable relative to said frame structure, wherein said first and second longitudinal support means are positioned on opposite sides of said central, longitudinal axis and are substantially equidistant from and parallel to said central, longitudinal axis;

a plurality of first working means for progressively working a first portion of the sheet metal substantially adjacent to the first longitudinal edge, said plurality of first working means being longitudinally spaced along and connected to said first longitudinal support means;

a plurality of second working means for progressively working a second portion of the sheet metal substantially adjacent to the second longitudinal edge, said plurality of second working means being longitudinally spaced along and connected to said second longitudinal support means;

advancing means, positioned between said first and second longitudinal support means about said central, longitudinal axis and interconnected with and supported by said frame structure, for advancing the sheet metal by said plurality of first and second working means to progressively work the first and second portions, respectively, of the sheet metal, said advancing means comprising a plurality of longitudinally spaced drive roller assemblies, wherein each said drive roller assembly comprises at leastone upper drive roller and at least one lower drive roller for engaging the sheet metal therebetween;

at least two means for adjusting a lateral distance between said first and second longitudinal support means to thereby adjust a lateral distance between said first working means and said second working means, wherein said first and second longitudinal support means remain substantially equidistant from and parallel to said central, longitudinal axis during and after lateral movement of said first and second longitudinal support means by said means for adjusting, and wherein each said means for adjusting is interconnected with said first and second longitudinal support means, said at least two means for adjusting being longitudinally spaced; and

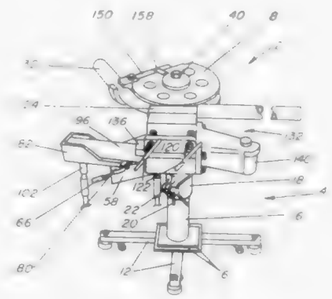
means for supporting said first and second longitudinal support means from said frame structure at least at two longitudinally spaced locations, said means for supporting accommodating lateral movement of said first and second longitudinal support means relative to said frame strcuture by said means for adjusting and being separate from said means for adjusting.

5,148,695

ADJUSTABLE PIPE AND TUBING BENDER

Harry S. Ellis, 62359 Verde Dr., Montrose, Colo. 81401

Filed Nov. 21, 1991, Ser. No. 796,543
Int. Cl.[5] B21D 7/04
U.S. Cl. 72—158 3 Claims



1. A pipe and tubing bender which comprises:

an upright, free standing, spindle assembly having a vertical axis, said spindle assembly comprising a lower part and an upper part, said upper part, at its lower end, having sleeve means which releasably fits over said lower part and is concentric therewith, said sleeve means being rotatable around said lower part;

a lower section which is removably mounted on said spindle assembly and which is rotatably movable and selectively adjustable around the vertical axis of the spindle assembly, said lower section including means for releasably engaging said spindle assembly;

an upper section which is removably mounted on said spindle assembly, said upper section being rotatably movable

around the vertical axis of the spindle assembly, said upper section being removably and pivotally connected to said lower section, said upper section having shoe bender means thereon which is adjustable for engaging a pipe or tube for bending, said upper section having means to apply pressure to and cause said shoe bender means to move and bend the pipe or tube;

said upper part of the spindle assembly having means near its lower end for permitting said lower section to be selectively engaged and locked to said upper part; and

a radius die releasably mounted on the upper end of said spindle assembly with said shoe bender, said die having means affixed thereto for releasably receiving and holding a pipe or tube.

5,148,696

METAL FORMING AND DRAWING PROCESS AND APPARATUS

Paul R. Visscher, Saugatuck, Mich., assignor to Spectta Products Corporation, Grand Haven Mich.

Continuation of Ser. No. 557,594, Jul. 25, 1990, abandoned. This application Jul. 29, 1991, Ser. No. 737,212

Int. Cl.[5] B21D *22/26*

U.S. Cl. 72—348 **4 Claims**

1. A method for preparing a metal furniture top having a surface and side portions joined together by drawn corners having a radius of approximately 3/32 inch comprising the following steps:

providing a metal blank;

trimming metal from each corner of said metal blank where the corner is to be drawn joining said surface and said side portions to limit the amount of metal to be drawn in drawing said corner, each corner being trimmed backward, prior to drawing, from a line at an angle to each side plus an additional amount from a portion near the center of said line on a line substantially bisecting said corner, said additional amount being determined by the depth of the draw;

placing said metal blank on a punch in a press;

providing a segmented metal die having corner pieces and side pieces in said press;

closing said press to bring said die and said punch to bear on said metal blank to form and draw said side portions and to draw said connecting corner portions in a single operation; and

removing any excess metal from said drawn corners and finishing said metal furniture top.

5,148,697

METHOD FOR WITHDRAWING WORKPIECE FROM DRAWING MOLD

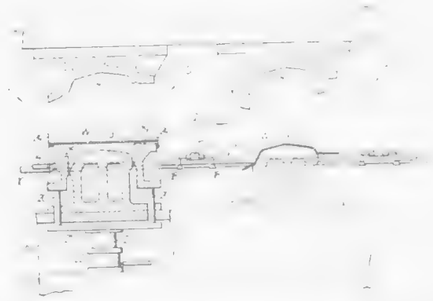
Motoatsu Shiraishi; Tatsuo Nagamitsu, and Mitsuki Nakamura, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1991, Ser. No. 687,348

Claims priority, application Japan, Apr. 19, 1990, 2-104140; Oct. 18, 1990, 2-280233

Int. Cl.[5] B21D *43/05*

U.S. Cl. 72—405 **3 Claims**



1. A method for withdrawing a workpiece from a drawing mold disposed at a working station and formed of an upper die, a lower die and a blank holder, comprising the steps of:

placing the workpiece on the blank holder at a raised position where the blank holder has been moved away from the lower die to substantially its uppermost position;

lowering the holder along with the workpiece toward the lower die of the drawing mold;

applying a drawing operation to said workpiece by cooperation of the upper and lower dies by lowering the upper die against the lower die to shape the workpiece between the dies;

raising the upper die after the drawing operation;

moving the cross bar means from a standby position between the drawing mold and a mold of a next station to a position between the upper and lower dies and for picking up the workpeice from between the upper and lower dies;

picking up the workpiece from between the upper and lower dies by the crossbar means;

moving the cross bar means from between the upper and lower dies while holding the workpiece to the next station and releasing the workpiece at the next station; and

holding said blank holder in the lowered position until the workpiece which has been subject to the drawing operation is discharged from the drawing mold by said cross bar means.

5,148,698

COMPRESSION TOOL

Helmut Dischler, Droste-Hülshoff-Str. 9, D-4040 Neuss 1, Fed. Rep. of Germany

Filed Apr. 3, 1991, Ser. No. 679,943

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011822

Int. Cl.[5] B21D *41/04;* **B23P** *11/00*

U.S. Cl. 72—410 **20 Claims**

1. A compression tool, comprising:

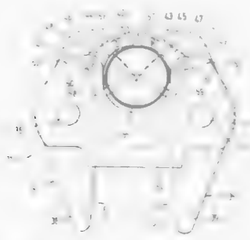
a) a housing having adjacently disposed first and second oppositely disposed portions defining therebetween a clearance;

b) first and second pivot levers, each of said levers pivotally secured to one of said portions and extending therefrom beyond said housing;

c) at least three compression jaws operably associated with said housing and disposed about said clearance, one of said jaws is secured to said housing and the other two of said jaws are each connected to one of said levers and are pivotal therewith, said one jaw being separate from said first and second pivot levers;

d) each of said jaws has an arcuate compression surface;

e) means are operably associated with each of said levers and the associated jaw for causing cooperating movement thereof; and



f) drive means are operably engaged with each of said levers exteriorly of said housing for causing pivoting thereof between a first open position and a second closed position, wherein pivoting of said levers from said first open position to said second closed position causes said other two jaws to pivot on each respective lever and relative to said one jaw so that said compression surfaces define a circle for compressing a work piece

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5,148,699

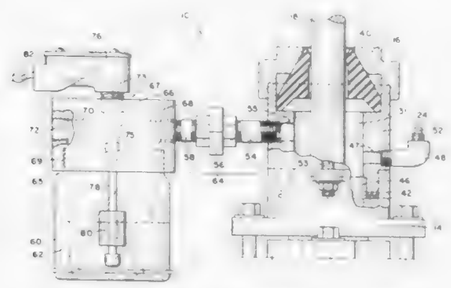
STUFFING BOX LEAK DETECTOR

Robert L. Morse, Tulsa, Okla., assignor to Pollution Control Specialty, Inc., Oklahoma City, Okla.

Filed Dec. 30, 1991, Ser. No. 814,761

Int. Cl.[5] G01M *3/04;* **E21B** *33/03;* **F16J** *15/00;* **F16K** *41/02*

U.S. Cl. 73—40 **9 Claims**



1. A stuffing box leak detector designed to be installed on a wellhead around a polish rod and between a stuffing box and a stuffing box cover comprising a split ring adapter, means for sealing the adapter around the polish rod, means for sealing the adapter between the stuffing box and the stuffing box cover, said adapter having a sealed interior, a reservoir holder provided with first and second access holes and an entrance hole, an overflow connection tube having two ends, one end being attached to the adapter and communicating with its interior, the other end being attached to the reservoir holder via the first access hole, said reservoir holder having a top side and a bottom side, said bottom side being removably connected to a fluid reservoir, said fluid reservoir having an interior, said overflow connection tube communicating with the interior of the reservoir, an entrance ell connected to the reservoir holder via a pipe nipple inserted in the entrance hole on the top side of the reservoir, a float assembly inserted in the entrance hole on the bottom side of the reservoir holder, said float assembly provided with a float switch, said float switch having electrical connections which extend through the reservoir holder via the entrance ell.

5,148,700

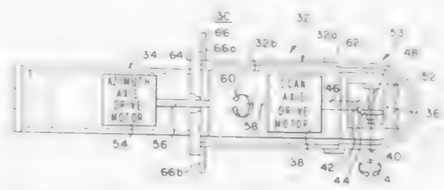
APPARATUS AND METHOD FOR LOCATING SEDIMENT IN A CONTAINER

Arthur V. King, Denton, Tex., assignor to Entech Design, Inc., Denton, Tex.

Filed Nov. 12, 1991, Ser. No. 791,781

Int. Cl.[5] G01N *15/00*

U.S. Cl. 73—61.41 **18 Claims**



1. Apparatus for locating sediment in a container, which is at least partially filled with liquid, said apparatus, comprising, in combination:

transducer means mountable with said container for emitting acoustic energy into the liquid and for receiving reflected acoustic energy, said transducer means being rotatable about first and second mutually perpendicular axes;

rotational means for rotating said transducer means about mutually perpendicular first and second axes;

control means for controlling said rotational means to rotate said transducer means about the respective first and second axes and for controlling said transducer means to emit an acoustic signal into the liquid and receive a corresponding reflected acoustic signal at each rotational position of said transducer means in a predetermined sequence of rotational positions, each rotational position being definable by a first rotational coordinate with respect to said first axis and a second rotational coordinate with respect to said second axis;

processing means responsive to the reflected acoustic signals for determining respective distances between said transducer means and respective points of reflection along respective scanning axes corresponding to the respective rotational positions of said transducer means and for comparing the computed distance at each scanning axis with a predetermined reference distance representing the distance between the transducer means and an inner surface of the container along the corresponding scanning axis, said processing means including means for identifying each point of reflection whose distance to the transducer means is less than the corresponding reference distance, the identified points of reflection representing respective locations of sediment in the container; and

image processing means for processing the identified points of reflection to provide a three-dimensional representation of the sediment in the container.

5,148,701

DOMESTIC WATER TESTER

John J. Brown, Pullman, Wash., assignor to Washington State University Research Foundation, Pullman, Wash.

Filed May 10, 1991, Ser. No. 698,730

Int. Cl.[5] G01N *33/18*

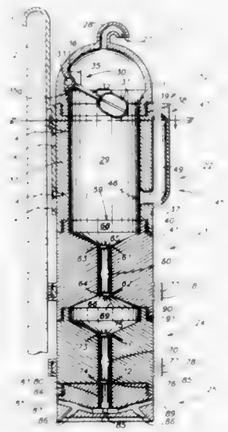
U.S. Cl. 73—61.41 **23 Claims**

1. A water testing system for mounting within a reservoir which experiences a fluctuating water level, such as the water closet of a sanitary toilet, comprising:

an enclosure defining an interior chamber having a chamber volume for receiving intermittent charges of water therein to;

at least one intake through which water held within the reservoir about external portions of the enclosure flows toward the interior chamber;

at least one indicator holder; said at least one indicator holder having means for holding at least one contamination indicator within a flow of water passing through the interior chamber;



at least one discharge connected in fluid communication with the interior chamber which allows controlled discharge of water when the water level drops within the reservoir about external portions of the enclosure;

a flow counter for indicating the flow of water through said at least one indicator holder;

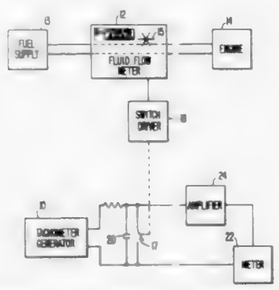
flow direction control means for controlling flow of water through said at least one indicator holder to substantially one direction.

5,148,702

FUEL CONSUMPTION RATE DETECTING APPARATUS FOR A VEHICLE

Joseph F. Gulick, Jr., 235 River Rd., Elkton, Md. 21921

Filed Oct. 17, 1990, Ser. No. 599,099
Int. Cl.[5] G01F *9/02*
U.S. Cl. 73—114 **12 Claims**



1. An apparatus for measuring the distance traveled by a vehicle per unit quantity of fuel, comprising:

a magnetic type generator for generating a voltage signal proportional to speed of said vehicle;

means for generating a pulse signal proportional to volume of fuel consumed by said vehicle;

switching means for cycling between open and closed positions in response to said pulse signal; and

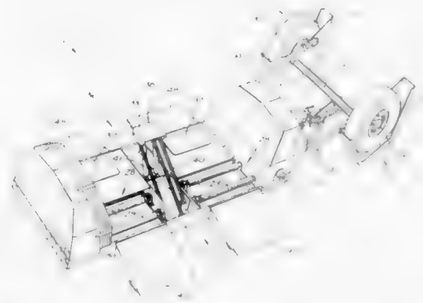
energy storage means, electrically connected to said magnetic type generator and said switching means, for storing a charge from said voltage signal when said switching means is in said open position and discharging said stored charge when said switching means is in said closed position, thereby generating a fuel consumption signal representing distance traveled per unit quantity of fuel.

5,148,703

VEHICLE INSPECTION TRAILER

Rodney G. Vaughan, Greenwich; Russell K. Findlay, Bradbury; Ivan Jakabek, Ermington; Ralph Richardson, Mainbar; Myles J. McLachlan, Balmain, and Geoffrey C. Venn-Brown, Lane Cove, all of Australia, assignors to Roads & Traffic Authority of New South Wales, New South Wales, Australia

Continuation of Ser. No. 442,344, Dec. 11, 1989, abandoned.
This application Apr. 26, 1991, Ser. No. 692,779
Claims priority, application Australia, Mar. 31, 1988, PI7538
Int. Cl.[5] G01L *5/28*
U.S. Cl. 73—123 **10 Claims**



1. A mobile vehicle inspection facility, said facility comprising:

a generally horizontally extending base frame having a horizontal axis dividing said frame into first and second sides;

a brake testing assembly mounted on said first side of said base frame and comprising two sub-assemblies arranged such that the wheels on an axle of a vehicle being tested are supported by the two sub-assemblies, each sub-assembly comprising at least two rollers adapted to engage a test vehicle wheel, said rollers being rotatably supported on said base frame so as to be rotatable about two generally parallel coextensive axles, first motor means for driving at least one of said rollers of each sub-assembly, and sensor means which provide an indication of the resistance applied to the driven roller by a braking system associated with the wheel being tested by the brake testing assembly;

a steering and suspension play detection assembly mounted on said second side of said base frame and including a jack to raise a test vehicle, a pair of movable members upon which front wheels of the test vehicle rest, and second motor means to move the movable members in unison in a first horizontal direction or a second direction transverse of the first direction; and

at least two wheels rotably mounted on a support movable between an inspection position where the wheels are raised above a ground surface so that the base frame is resting on said ground surface, and a transport position where the base frame is supported on said wheels for enabling the facility to be transported;

wherein said movable members of said play assembly are

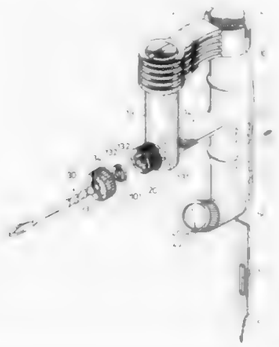
aligned with said two sub-assemblies of said brake testing assembly in a direction transverse to said axis so that a vehicle being tested may move transversely of said axis between said brake testing assembly and said steering and suspension play detection assembly.

5,148,704

TIRE MONITORING AND REPAIRING DEVICE

Yu-Hui Tsai, No. 8, Hou-Kou, Pei-Kung Chen, Yun-Lin Hsien, Taiwan

Filed Aug. 16, 1991, Ser. No. 746,358
Int. Cl.[5] B60C *23/02*; **G01L** *7/16*
U.S. Cl. 73—146.8 **6 Claims**



1. A tire monitoring and repairing device comprising:

a body having a front arm having an upper end and a lower end, a rear grip arm having an upper end and a lower end, an upper connecting arm interconnecting said upper ends of said front arm and said rear grip arm to be substantially in a U-shape, and a lower connecting arm below said upper arm and interconnecting said front arm and said rear grip arm, said front arm being tubular, said rear grip arm being hollow and slender and having a lower portion longer than that of said front arm;

a pressure gauge provided in said front arm and having a front side with a mouth piece forming a pressure inlet,

a tire repairing tool to be detachably mounted on said mouth piece,

a flash light device mounted in said rear grip arm and having a light emitting head provided at said lower end of said rear grip arm.

5,148,705

METHOD AND APPARATUS FOR DETERMINING THE WETTABILITY OF AN EARTH FORMATION

Robert Desbrandes, Baton Rouge, La., assignor to Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed Jun. 25, 1990, Ser. No. 542,576
Int. Cl.[5] E21B *49/00*
U.S. Cl. 73—152 **6 Claims**

1. A method for performing multiple extraction and injection pressure measurements in an earth formation penetrated by a well borehole, which borehold contains drilling mud, where: (i) the mud is a water base mud and the formation is a hydrocarbon zone or (ii) the mud is a hydrocarbon base mud and the formation is water saturated, which method comprises:

(a) establishing, through the wall of the well borehole and isolated from fluids within the borehole, a direct fluid flow path for communication with an adjacent formation to be measured;

(b) drawing a mud filtrate sample from the wall of the borehole;

(c) injecting the mud filtrate sample back into the wall of the borehole; and

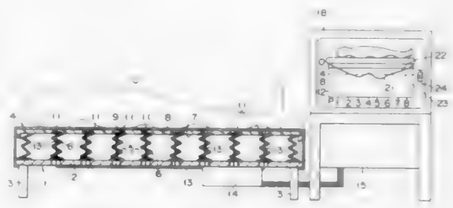
(d) continuously measuring and recording the pressure versus time during steps (b) and (c).

5,148,706

APPARATUS FOR SELECTING MATTRESS

Teruo Masuda, Itsukaichi; Masayasu Morita, Fuchu, and Masahiro Matsuzaki, Sayama, all of Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,876
Int. Cl.[5] A61B *5/11*
U.S. Cl. 73—172 **9 Claims**



1. An apparatus for selecting a mattress which will be suitable for the anatomy of a user, comprising:

a measuring mattress having a predetermined hardness, on which the user lies;

detecting means for detecting a load on each of a plurality of points of the measuring mattress when the user lies on the measuring mattress;

said detecting means including means for generating a detection signal indicating the load at each of the plurality of points, the load at each of the plurality of points deforming the measuring mattress by an amount determined by the actual load at each respective point;

control means for receiving the detection signal generated by said detecting means and for calculating a first average value that represents a plurality of deformations in the measuring mattress at a head portion and a leg portion of the user, said control means further calculating a second average value that represents a plurality of deformations in the measuring mattress at a plurality of other portions of the user excluding the head portion and the leg portion of the user; and

display means for displaying the first average value and the second average value calculated by said control means as a first straight line and a second straight line, respectively, said display means further displaying a mark which designates a hardness of a mattress suitable for the user, said hardness being determined on the basis of a comparison in

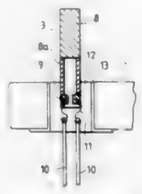
the amounts of deformation represented by the first and second straight lines.

5,148,707

HEAT-SENSITIVE FLOW SENSOR

Masanori Inada, and Hichiro Ohtani, Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 560,958
Claims priority, application Japan, Aug. 29, 1989, 1-222213
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—204.26 6 Claims



1. A heat-sensitive flow sensor including a bridge, circuit composed of a heat-sensitive resistor formed on a substrate provided within a fluid flow passage and a plurality of resistor said a control circuit for controlling current supplied to said heat-sensitive resistor to maintain said bridge circuit in a thermally balanced condition, a flow rate being detected from said thermally balanced condition of said bridge circuit, said flow sensor comprising:

a base;

a heat insulating support member supported by said base, said substrate having a base portion on which lead terminals of said heat-sensitive resistor are formed and connected to current supply leads, wherein said heat insulating support member comprises a material having a thermal expansion coefficient compatible with that of said substrate;

a metal plate positioned between said base and said heat insulating support member such that said heat-sensitive resistor protrudes from one side surface of said base; and

means for preventing stress produced in said support member due to thermal distortion caused by temperature variations from being applied to said substrate in a thickness direction of said support member, said stress preventing means comprising said base portion of said substrate being an only portion of said substrate buried in said heat insulating support member.

5,148,708

LIQUID LEVEL SENSOR WHICH PREVENTS LIQUID ABSORPTION

Michihiro Murata, Kyoto; Akira Fumada; Shigeo Yamazaki, both of Yokohama, and Kenji Matsuo, Sagamihara, all of Japan, assignors to Murata Mfg. Co., Ltd., Kyoto, Japan

Filed Apr. 29, 1991, Ser. No. 692,660
Claims priority, application Japan, May 8, 1990, 2-118020
Int. Cl.[5] G01F *23/24*
U.S. Cl. 73—304 R 21 Claims

1. A liquid level sensor for detecting the level of a liquid including an electrolyte matter, comprising:

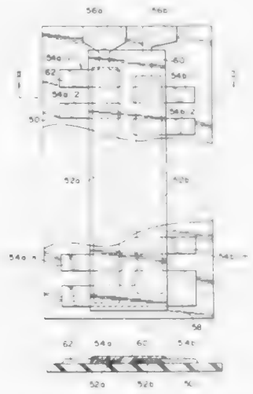
(a) an insulating substrate made of plastic thin film;

(b) a pair of resistance films disposed in parallel to each other with a predetermined space therebetween on said insulating substrate, said resistance films each having a lengthwise dimension which is larger than a widthwise dimension of said resistance films;

(c) a plurality of detecting electrodes mounted intermittently in a longitudinal direction on said resistance films, each electrode including an arm portion extending from said resistance films;

(d) lead electrodes mounted at one end of said resistance films, respectively; and

(e) a water-proof film for covering an exposed surface of said resistance films;



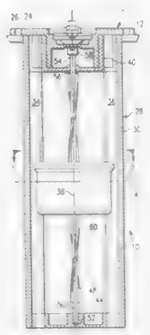
wherein the resistance between said lead electrodes, upon application of a voltage, depends on the liquid level of the electrolyte.

5,148,709

SPIRAL GAUGE WITH INTEGRAL SUPPORT TUBE

Herbert G. Ross, Jr., Argyle, Tex., assignor to Rochester Gauges, Inc., Dallas, Tex.

Filed Dec. 11, 1991, Ser. No. 804,930
Int. Cl.[5] G01F *23/38*
U.S. Cl. 73—320 4 Claims



1. A float gauge for mounting in a reservoir to measure the level of the fluid within the reservoir, comprising:

a head mounted to said reservoir, said head having an integral vent slot formed therein;

a support tube secured to said head for extending into the fluid, the support tube having a side portion with at least one linear guide rib;

a float within said support tube guided for motion along a first axis by said linear guide rib as the fluid level varies, the guide rib preventing rotation of the float about the axis;

a center shaft for rotation about the first axis, said shaft having a center portion of helical shape and said float rotating the center shaft about the first axis by engaging the helical section of the center shaft as the float moves along the first axis; and

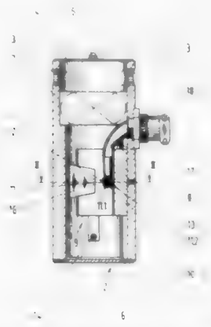
means mounted in the head for sensing rotation of said center shaft and calibrated to indicate the fluid level in the reservoir.

5,148,710

METHOD AND APPARATUS FOR DETERMINING THE RELATIVE HUMIDITY OF GASEOUS MATERIALS

Hans C. Gudehus, Power Weg 21, D-4513 Belm; Josef Ellmann, Moltkestrasse 8, D-4500 Osnabrueck, and Edgar Bauth, Siedlung am Schwegermoor 1 A, D-4508 Bohmte-Hunteburg, all of Fed. Rep. of Germany

Filed Feb. 25, 1991, Ser. No. 660,602
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005744
Int. Cl.[5] G01N *25/68*
U.S. Cl. 73—335.06 19 Claims



1. A method of determining the relative humidity of a gaseous medium comprising the steps of passing a stream of gaseous medium of which the relative humidity is to be determined to a measuring passage, providing a moistenable wet temperature sensor in said measuring passage, cooling said moistenable wet temperature sensor below the dew point temperature of said gaseous medium, condensing moisture in said gaseous medium on said moistenable wet temperture sensor, determining the thickness of the film of condensate on said moistenable wet temperature sensor, measuring the wet bulb temperature at said moistenable wet temperature sensor, providing a dry temperature sensor, measuring the dry temperature of said dry temperature sensor, and utilizing said measured temperatures for determining the relative humidity of said gaseous medium.

5,148,711

APPARATUS AND METHOD FOR REMOVING COMMON MODE VIBRATION DATA FROM DIGITAL TURBINE BLADE VIBRATION DATA

Michael Twerdochlib, Oviedo; Paul F. Rozelle, Fern Park, and Santitavee Sarasas, Winter Park, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1990, Ser. No. 607,934
Int. Cl.[5] G01H *11/00*; G01B *7/14*
U.S. Cl. 73—660 8 Claims

1. An apparatus for removing common mode vibration data from digital turbine blade vibration data, comprising:

sensor means for producing a signal indicative of the actual arrival time of each turbine blade at said sensor means;

first means responsive to said sensor means for producing digital data representing the actual arrival time of each turbine blade at said sensor means;

second means for establishing an expected arrival time for each turbine blade at said sensor means;

third means responsive to said digital data for generating a plurality of data entries each representing the difference between said actual arrival time and said expected arrival time;

fourth means for storing said data entries in a first string having a plurality of dummy entries at the beginning thereof and at the end thereof and for inserting into said first string space saver characters in the event that a data entry for a blade is not produced;

fifth means for establishing an average value, over a plurality of data entries, for each data entry, said average value

being representative of the vibration common to all of the turbine blades; and

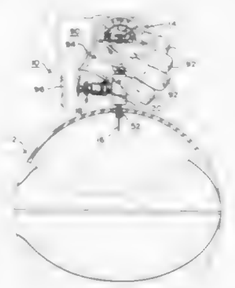
sixth means for subtracting each of said average values from its corresponding data entry to produce a second string wherein the entries in said second string are free of common mode vibration data.

5,148,712

BALL DEFLATOR

Michael J. Cross, Gurnee, and Joe Jasionowski, Park Ridge, both of Ill., assignors to Federal Equipment Company, North Chicago, Ill.

Filed Feb. 1, 1991, Ser. No. 649,608
Int. Cl.[5] G01L *7/00*
U.S. Cl. 73—756 2 Claims



1. A deflator for monitoring the inflation pressure of, and selectively deflating an inflated item, comprising:

a rectangularly shaped body having a central passageway, a first end, a second end and four sides, said first and second ends and a first side of said four sides each having a bore, each of said bores being threaded and in fluid communication with said central passageway;

measuring means for measuring the pressure of an inflated item having at least two ends, said measuring means being an air pressure gauge and said measuring means having a

threaded stem, said stem being engaged with said bore of said first end of said body, said measuring means being operationally connected and in fluid communication with said central passageway;

insertion means for insertion into an inflated item having a first end configured as a hollow needle with an opening for the ingress of air from the inflated item, said insertion means having a threaded second end having a knurled ring adapted to securely hold said hollow needle end and being engaged with said bore of said second end of said body, said insertion means being operationally connected and in fluid communication with said central passageway;

valve means for selectively deflating an inflated item having at least one air outlet, said valve means having a first end with an actuator including a push-button mechanism being connected to a valve stem which is biased by a spring so that when said stem is actuated it relieves air pressure from the inflated item said push-button mechanism having a knurled end for easy removal and replacement, said valve means having a threaded second end threadedly engaged with a valve engagement stem, said valve engagement stem threadedly engaged with said bore of said first side of said body, said valve means being operationally connected and in fluid communication with said central passageway;

means for sealingly engaging said measuring means, said insertion means and said valve means into said bores of said first and second ends and said side of said body;

said measuring means, said insertion means, said valve means and said body configured and positioned on the device so as to fit into the palm of a human hand while remaining accessible with a digit from the same hand; and

said measuring means, said insertion means and said valve means configured so as to be removable and interchangeably replaceable into said bores of said first and second ends and said side of said body

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5,148,713

STARTER SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

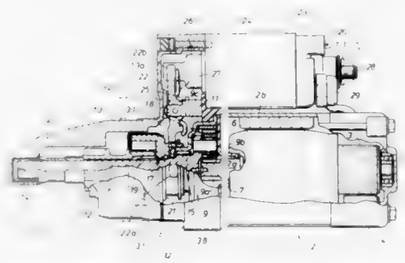
Eiichi Kimura, Kiryu; Shinichi Nagashima; Hitoshi Ono, both of Ashikaga, and Koji Nara, Maebashi, all of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gumma, Japan

Filed May 21, 1991, Ser. No. 703,546

Claims priority, application Japan, May 22, 1990, 2-053171[U]; May 22, 1990, 2-053172 U]

Int. Cl.[5] F02N *15/06*

U.S. Cl. 74—6 5 Claims



1. A starter system for an internal combustion engine, comprising:

an electric motor having an output shaft;

a power transmission unit including an output shaft carrying a pinion for meshing with a ring gear of an internal combustion engine, an input end of said power transmission unit being coupled to said output shaft of said electric motor; and

a casing accommodating said power transmission unit therein, and provided with an opening exposing said pinion gear;

said casing being provided with a mounting circumferential surface adapted to be substantially closely fitted into an associated bore provided in said engine or a transmission housing associated therewith, and a mounting flange extending radially from said casing and provided with means for securing said mounting flange onto said engine or said transmission housing and a mounting end surface extending perpendicularly to a longitudinal line of said output shaft of said power transmission unit, said mounting end surface being spaced from a proximal end of said mounting circumferential surface along said longitudinal line.

5,148,714

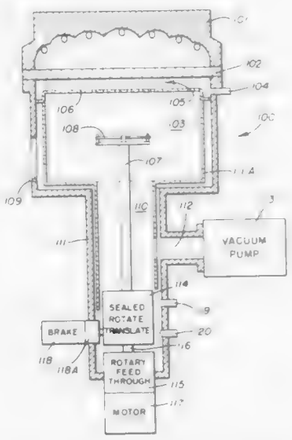
ROTARY/LINEAR ACTUATOR FOR CLOSED CHAMBER, AND REACTION CHAMBER UTILIZING SAME

James McDiarmid, San Jose, Calif., assignor to AG Processing Technology, Inc., Sunnyvale, Calif.

Filed Oct. 24, 1990, Ser. No. 602,750

Int. Cl.[5] F16H *29/02;* **C23C** *16/00*

U.S. Cl. 74—89.15 32 Claims



1. An apparatus for generating rotational and translational motion of an object through a barrier; comprising:

a shaft;

a feedthrough, coupled to the shaft, for feeding motion through the barrier to induce a rotational velocity to the shaft;

a sleeve, mounted over the shaft and coupled to the object;

engaging means, coupled to the shaft and to the sleeve, for providing an engaging force between the sleeve and the shaft so that normally the sleeve achieves a rotational velocity in response to the rotational velocity of the shaft;

controllable means, coupled to the sleeve, for overcoming the engaging force between the sleeve and the shaft to inhibit rotation of the sleeve so that sleeve achieves a reduced rotational velocity; and

translating means, coupled to the shaft and the sleeve, for translating a difference in the rotational velocities of the sleeve and the shaft into translational motion of the sleeve.

5,148,715

ACTUATOR OR ADJUSTING DRIVE

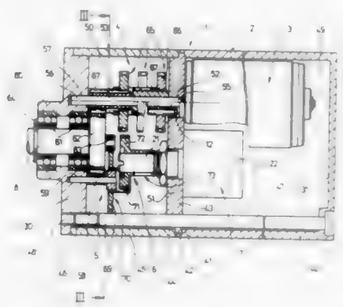
Peter-Theobald Blaser, Dielheim, and Walter Hofheinz, Heidelberg, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Nov. 19, 1990, Ser. No. 615,473

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1989, 8913588[U]

Int. Cl.[5] F16H *1/02*

U.S. Cl. 74—325 19 Claims



1. Actuator or adjusting drive having an electric drive motor with an output shaft connected to an actuating shaft and a position transmitter, comprising respective drive gears mounted on the output shaft and on the actuating shaft, and a reduction gear unit intermediately connected to the output shaft of the drive motor and to the actuating shaft via the respective drive gears, said reduction gear unit having two bearing shafts extending parallel to one another and spaced from the output shaft and the actuating shaft, said reduction gear unit comprising sets of reduction gearwheels formed of a pinion and a spur gear connected so as to be fixed against relative rotation therewith, said sets of reduction gearwheels being exchangeably mounted in staggered relationship on said two bearing shafts for selectively varying at least one of quantity and diameter of said sets of reduction gearwheels so that said pinions and said spur gears of said sets of reduction gearwheels are disposed in meshing engagement with one another, respectively, on different ones of said bearing shafts and form a series of reduction gear subunits, a first one of said reduction gear subunits being operatively connected with said drive gear of the output shaft of the drive motor and a last one of said reduction gear subunits being operatively connected with said drive gear of the actuating shaft

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5,148,716

PLANE MOTION MECHANISM

Hiroharu Suda, Tokyo, Japan, assignor to Nippon Connecticut Saw Co. and Una Data Ltd., both of Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,064

Claims priority, application Japan, Jul. 20, 1990, 2-190671; Jul. 1, 1991, 3-256037

Int. Cl.[5] G05G *11/00;* **F16H** *19/06;* **A47B** *13/00*

U.S. Cl. 74—479 33 Claims

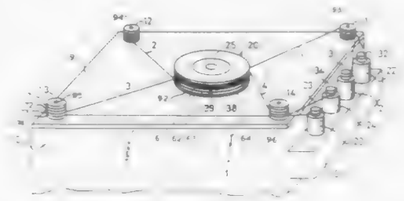
1. A plane motion mechanism comprising:

a base having a top planar surface;

a table mounted on said top planar surface of said base for movement thereon in plane motion, said table having an outer peripheral side surface;

at least first, second and third elongated power transmitting means each having first and second ends and a first end portion adjacent said first end of each said elongated power transmitting means, each said first end portion being wound about said outer peripheral side surface of said table;

at least first and second drive means to which said second ends of the respective first and second power transmitting means are connected, for applying tension forces respectively to said first and second power transmitting means; and



tension-applying means to which the second end of said third power transmitting means is connected, for applying a tension force to said third power transmitting means

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5,148,717

TELESCOPIC STEERING COLUMN APPARATUS

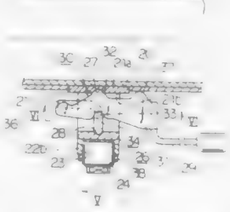
Mikio Yamaguchi, Takasaki, Japan, assignor to NKS Ltd., Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 749,300

Claims priority, application Japan, Aug. 23, 1990, 2-87449; Mar. 20, 1991, 3-24312

Int. Cl.[5] B62D *1/18*

U.S. Cl. 74—493 4 Claims



1. A telescopic steering column apparatus comprising

a cylindrical tubular outer column and a cylindrical tubular inner column combined in a telescopic relationship, the outer column having an outer peripheral surface and a through-hole, the inner column having an outer cylindrical peripheral surface;

a press member having outer and inner surfaces and inserted into the through-hole in the outer column so that the inner surface of the press member is adapted to be projected from the through-hole of the outer column to abut the outer cylindrical peripheral surface of the inner column;

a nest-shaped support member having an inner surface opposed to the outer surface of the press member and projecting from the outer peripheral surface of the outer column so as to contain the press member therein;

a toggle mechanism provided between the outer surface of the press member and the inner surface of the support member, the press member being directly associated with the toggle mechanism so that the toggle mechanism acts directly on the outer surface of the press member; and

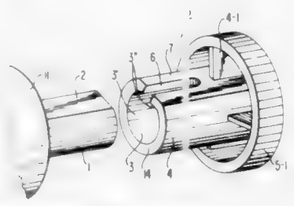
an adjustment lever for extending the toggle mechanism to press on the press member against the inner column and for retracting the toggle mechanism to release the press member from the inner column.

5,148,718

KNOB FOR ROTATING A SHAFT

Kazuhiro Kakuguchi; Hirozi Uchimura, both of Kawasaki, and Sekizi Nishino, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 568,724, Aug. 17, 1990, abandoned. This application Aug. 15, 1991, Ser. No. 746,817
Claims priority, application Japan, Aug. 18, 1989, 1-213460
Int. Cl.[5] G05G *1/10*; H25G *3/00*
U.S. Cl. 74—553 10 Claims



1. A rotation apparatus comprising:

a rotatable shaft, said shaft having on one end a flat side partially cut parallel to an axial direction thereof and a round side; and

a knob mounted on said one end of said shaft; said knob comprising an enlarged gripping portion at one end and having an integral cylinder portion at its other end, said cylinder portion comprising a hollow interior having a solid flat wall portion and a round wall portion whereby the cross-section of said hollow interior is approximately the same as the cross-section of said one end of said shaft to enable said cylinder portion to detachably fit over said one end of said shaft, said hollow interior of said cylinder portion having a diameter slightly smaller than the diameter of said one end of said shaft whereby said cylinder portion snugly fits over said one end of said shaft, said cylinder portion having an inner end and an outer end, said cylinder portion further having a slit cut through said flat wall portion and extending from said inner end along an axial direction of said cylinder portion to thereby reduce the stress concentration generated at an inner corner between said flat wall portion and said round wall portion, said slit having a length which is shorter than the length of said cylinder portion.

5,148,719

TORSIONAL-VIBRATION DAMPER

Herbert Ampferer, Sachsenheim, and Rudolf Grandhuber, Neu-Ulm, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 28, 1989, Ser. No. 329,550
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810764
Int. Cl.[5] F16C *3/04*; F16F *15/10*
U.S. Cl. 74—604 12 Claims

1. A torsional-vibration damper arrangement for an internal combustion engine, comprising

a hub,

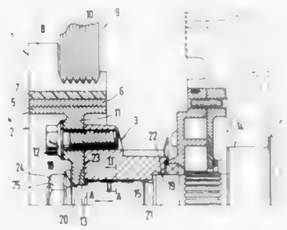
drive means drivingly connecting the hub with an internal combustion engine crankshaft;

and a mass body which is connected to the hub and is axially offset with respect thereto;

wherein the drive means includes interengageable driving members at the hub and crankshaft which operate to transmit driving torque between the crankshaft and hub;

wherein radial supporting element means are provided for absorbing bending moment forces between the mass body and the crankshaft, said radial supporting element means being separate from the drive means;

wherein the drive means is formed by an internal toothing of the hub and an external toothing of the crankshaft, which toothing extends over at least an axial partial area of the hub; an



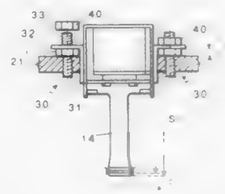
wherein one of said radial supporting element means includes a bearing support means located at one axial end of the toothing of the drive means.

5,148,720

LOCK-UP SOLENOID ASSEMBLY

Roger M. Swenson, Sr., Rte. #2 Box 49, Williamsville, Mo. 63967, and Roger M. Swenson, Jr., 731 Pershing Apt. #2, Poplar Bluff, Mo. 63901

Filed Sep. 12, 1991, Ser. No. 758,828
Int. Cl.[5] F16H *57/02*
U.S. Cl. 74—606 R 2 Claims



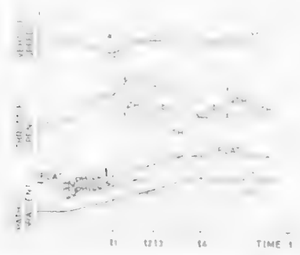
1. A replacement lock-up solenoid system for a pair of automatic transmissions wherein the lock-up solenoid for one transmission has a delivery sleeve which is longer by a distance D than the corresponding delivery sleeve of the other solenoid and wherein each solenoid is mounted on its respective transmission casing by at least a pair of bolts, each solenoid includes a bracket having outwardly extending legs, and said bolts pass through the respective legs and into threaded engagement with said threaded holes in said transmission casing, said replacement lock-up solenoid for both said transmissions having long delivery sleeve, and means for adjusting the mounting of said other lock-up solenoid on its respective transmission casing comprising a pair of threaded studs, spacing members on said threaded studs, respectively, said spacing member spacing said lock-up solenoid with a long delivery sleeve the length D and a threaded stud projection extending above said spacing member, respectively, and a nut engaged with each said threaded stud extensions, respectively.

5,148,721

AUTOMATIC FUZZY SPEED CONTROL SYSTEM FOR VEHICLE

Yoshiaki Anan, Hiroshima; Satoru Ando, Higashi-Hiroshima, and Takeshi Murai, Hatsukaichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 11, 1991, Ser. No. 668,143
Claims priority, application Japan, Mar. 12, 1990, 2-60890; Sep. 28, 1990, 2-262077
Int. Cl.[5] B60K *31/04*
U.S. Cl. 74—866 15 Claims



1. An automatic speed control system for a vehicle comprising:

throttle control means for controlling a throttle valve opening based on a deviation between a target speed and an actual speed of the vehicle so as to accomplish the target speed,

down-shift means for making a down-shift operation in an automatic transmission,

steady condition judging means for judging a steady condition after the down-shift operation;

up-shift means for making an up-shift operation in the automatic transmission when a reduction of the throttle valve opening more than a first predetermined value is detected, after determining the steady condition of the actual speed, by the steady condition judging means, and when a reduction of the throttle valve opening more than a second predetermined value is detected, before determining the steady condition of the actual speed, by the steady condition judging means.

5,148,722

METHOD FOR INVOKING A SHUTDOWN ON DEFAULT

Hemang S. Mehta, Sterling Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 17, 1990, Ser. No. 568,816
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 6 Claims

1. In a transmission system including a transmission having a plurality of gears, a plurality of solenoid-operated valves for allowing shifting between the gears, and an electronic controller for controlling electrical power to the solenoid-actuated valves, a method of invoking a shutdown on default to disconnect power from the solenoid-actuated valves, said method comprising the steps of:

defining temporary default gears to be allowed for operation of the transmission;

monitoring predetermined variables of the transmission by the electronic controller;

determining whether a fault has been detected based on the monitored predetermined variables;

disconnecting electrical power to the solenoid-actuated valves by the electronic controller if a fault has been detected;

determining whether faultless operation of the transmission has occurred for a predetermined time period by the electronic controller if a fault has not been detected; and

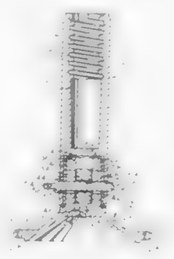
allowing shifting between additional gears if faultless operation of the transmission has occurred for the predetermined time period.

5,148,723

LIGHT BULB CHANGER

Robert D. Newman, Sr., and Robert D. Newman, Jr., both of P.O. Box 247, Greenwood, Mo. 64034

Filed Feb. 11, 1991, Ser. No. 653,044
Int. Cl.[5] H01K *3/32*
U.S. Cl. 81—53.11 3 Claims



1. Apparatus useful for changing a light bulb, comprising:

a generally cup-shaped member presenting a central base and an outwardly extending, light bulb-engaging sidewall formed of pliant, resilient material,

said base having structure defining an aperture therethrough, including an aperture inlet, an opposed aperture outlet, and a sidewall interconnecting said inlet and outlet;

an elongated sealing pin configured for selective insertion into and sealing of said base aperture in order to prevent passage of air through the base aperture,

said sealing pin including a sidewall for sealingly engaging said aperture sidewall;

means mounting said pin on said member for selective axial shifting movement of the pin between a sealing position wherein the pin is inserted within said base aperture with the pin sidewall sealingly engaging the aperture sidewall to prevent passage of air through the aperture, and an open position wherein the pin is at least partially withdrawn from the base aperture and a passageway is defined between said pin and aperture sidewalls to permit passage of air through the aperture; and

handle means operably coupled with said pin and supporting said member for, when the pin is in the open position thereof, compression of said member sidewall against a light bulb and axial shifting of the pin to the sealing position thereof in order to exhaust air from the member through said aperture and passageway and then seal the aperture, thereby creating a partial vacuum beween the light bulb and said member sidewall and attaching the light bulb to the member, and for subsequent withdrawal of the pin from said aperture in order to permit passage of air through the aperture and passageway to thereby relieve said partial vacuum and detach said member from said light bulb.

5,148,724
RATCHET WRENCH AND SOCKET APPARATUS
Gary R. Rexford, 76 Mechanic St., Lancaster, N.H. 03584
Filed Jun. 13, 1991, Ser. No. 714,504
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—60 3 Claims

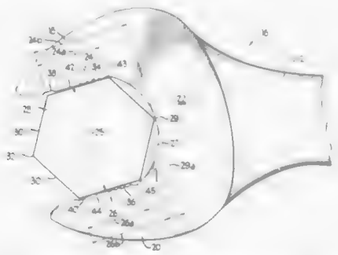
1. A ratchet wrench and socket apparatus, comprising in combination,
- a ratchet wrench including an elongate handle, the handle mounting a ratchet wrench head at a forward terminal end of the handle, and
- the head including an output drive shaft orthogonally oriented and directed exteriorly of the head, and
- at lest one socket member, the socket member defined by an elongate coaxially aligned configuration defined by a predetermined axial length, the socket member including a socket member first end and a socket member second end, the socket member first end including a first polygonal cavity directed longitudinally of the socket member interiorly thereof, and
- the socket member further including a second polygonal cavity coaxially aligned with the first polygonal cavity extending from the socket member second end interiorly thereof, and
- a socket member web orthogonally oriented relative to the axis of the socket member and positioned medially thereof, including a through-extending web cavity defined by a predetermined first cross-sectional configuration, and
- an extension adapter, the extension adapter including an adapter first cavity defined by a predetermined first cross-sectional configuration, and an adapter second cavity, the adapter second cavity defined by a predetermined second cross-sectional configuration, the extension adapter including a central leg, with the central leg including a leg forward polygonal end defined by the predetermined first cross-sectional configuration and a leg rear polygonal end defined by the predetermined second cross-sectional configuration, wherein the leg rear polygonal end is arranged for reception within the adapter second cavity, and the leg forward polygonal end is arranged for reception within the web cavity, and
- the handle includes an elongate handle cavity defined by a cavity entrance, and the extension adapter is arranged for reception within the cavity entrance, and the extension adapter includes a plurality of diametrically opposed and aligned legs, and the handle including a plurality of diametrically opposed L-shaped grooves originating at the cavity entrance for reception of the legs.

5,148,725
RATCHET ACTION OPEN ENDED SPANNER
Jeremia J. Botha, 1363 Daniel Street, Mountain View, Pretoria, Transvaal, South Africa
Filed May 17, 1991, Ser. No. 701,774
Int. Cl.[5] B25B *13/08, 13/10, 13/18, 13/28*
U.S. Cl. 81—91.2 5 Claims

1. A spanner which comprises a handle and jaws, the jaws comprising an upper jaw and a lower jaw, the upper jaw being articulated by means of an upper hinge pin to a distal part of the handle and the lower jaw being articulated by means of a lower hinge pin to the upper jaw and in an opposed relation to the upper jaw for defining a gap therebetween for gripping a member, the lower jaw being extended by a pawl projecting on the opposite side of the lower hinge pin to the lower jaw, the handle comprising a ratchet tooth which engages with the pawl, the upper hinge pin being located near the distal end of the handle and the ratchet tooth being located at an intermediate position between the upper hinge pin and the proximal part of the handle, said ratchet tooth comprising a ramp and a stop, said ratchet tooth being constructed and arranged so that pivoting of the handle in a first direction with respect to the upper jaw causes the pawl to ride up the ramp thereby pivoting said lower jaw toward said upper jaw to close said gap until the pawl engages the stop which positively stops further closing of the jaws at a predetermined gap, pivoting said handle in an opposite direction causing said pawl to move down said ramp, thereby pivoting said lower jaw away from the upper jaw.

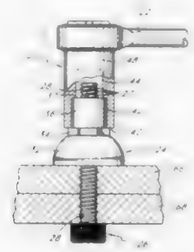
5,148,726
ONE-PIECE, OPEN-END WRENCHING HEAD WITH ROUGHENED JAWS
David A. Huebschen; William T. Pagac; Frank Mikic, all of Kenosha, Wis.; Thomas S. Severson, Auburn Hills, Mich., and Douglas M. Sorbie, Salem, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Continuation-in-part of Ser. No. 487,921, Mar. 5, 1990, Pat. No. 5,117,714, which is a continuation-in-part of Ser. No. 421,669, Oct. 16, 1989, abandoned. This application Nov. 27, 1991, Ser. No. 799,392
The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.
Int. Cl.[5] B25B *13/02*
U.S. Cl. 81—119 27 Claims

1. A one-piece, open-end wrenching head for a fastener having a plurality of generally flat sides intersecting at a plurality of corners, the fastener having an across-sides dimension, said wrenching head comprising two jaws of substantially equal length and a throat integrally interconnecting said jaws, said jaws including jaw driving surface portions spaced apart a predetermined distance slightly greater than the across-sides dimension of said fastener, the outermost end of each of said jaw driving surface portions being at a distance from the deepest point of said throat of at least 0.866 times the predetermined



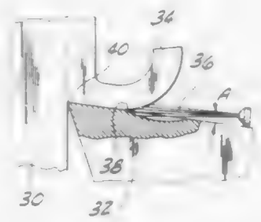
distance, at least one of said jaw driving surface portions having a roughened region thereon disposed adjacent to said throat and constructed and arranged to engage a portion of a side of the fastener, at least the other of said jaw driving surface portions having an unroughened region thereon disposed adjacent to said outermost end and constructed and arranged to engage a portion of a side of a fastener, said roughened region having a coefficient of friction substantially greater than that of said unroughened region.

5,148,727
INSTALLATION TOOL FOR LOCKING FASTENERS AND METHOD OF USE
Herman L. Williamson, Seal Beach, Calif., assignor to Air Industries Corporation, Garden Grove, Calif.
Filed Feb. 12, 1990, Ser. No. 479,089
Int. Cl.[5] B25B *13/06*
U.S. Cl. 81—121.1 3 Claims



1. An installation tool for fastening a locking collar and a bolt, the installation tool defining a cavity sized to engage a deformable portion of the collar, said installation tool further comprising:
- first and second wrenching portions spaced equally apart along an interior wall of said cavity, said first and second wrenching portions directly contacting and driving the deformable portion of the collar;
- a first pocket on said first wrenching portion, said first pocket tapered in depth to the interior wall of said cavity, said first pocket decreasing in axial height from a leading edge to a trailing edge of said first wrenching portion, said first pocket sized to accommodate collar material to reduce the cam off tendency of the tool;
- a first shoulder defined between said first wrenching portion and said first pocket, said first shoulder abutting against collar mass deformed into said first pocket during the threading of the collar onto the bolt to reduce the cam off of the tool from the collar;
- a second pocket on said second wrenching portion, said second pocket tapered in depth to the interior wall of said cavity, said second pocket decreasing in axial height from a leading edge to a trailing edge of said second wrenching portion, said second pocket sized to accommodate collar material to reduce the cam off tendency of the tool;
- a second shoulder defined between said second wrenching portion and said second pocket, said second shoulder abutting against collar mass deformed into said second pocket during the threading of the collar onto the bolt to reduce the cam off of the tool from the collar.

5,148,728
HIGH PRESSURE LUBRICOOLING MACHINING OF METALS
Marian Mazurkiewicz, Rolla, Mo., assignor to The Curator of the University of Missouri, Columbia, Mo.
Continuation of Ser. No. 518,988, May 4, 1990, abandoned, which is a continuation of Ser. No. 242,554, Sep. 12, 1988, abandoned. This application Sep. 3, 1991, Ser. No. 754,402
Int. Cl.[5] B23B *1/00, 27/10, 27/22*
U.S. Cl. 82—1.11 6 Claims

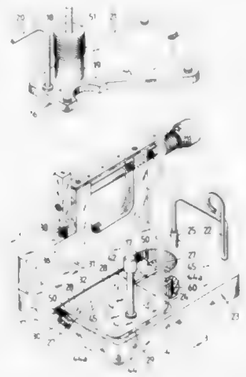


1. An improved method of machining metals, by effecting relative movement between a work piece and a tool having a cutting edge and a rake face extending generally rearwardly from the cutting edge, the cutting edge being in contact with the work piece thereby to cut the work piece resulting in the production of a chip engaging the tool along an interface having a leading edge generally rearward of the cutting edge, the improvement comprising the step of injecting a high pressure jet of lubricooling liquid into the interface generally between the leading edge of the chip and the tool during machining, the pressure of the jet being sufficient to cause the liquid to penetrate between the chip and the rake face of the tool and to flow along the interface from the leading edge of the chip into a cutting zone of the interface closely adjacent the cutting edge of the tool for lubricooling the workpiece and the tool, the jet originating from an orifice located outside the interface and being directed generally forwardly at the leading edge of the interface, the jet being at a pressure of at least about 5,000 p.s.i.

5,148,729
BIOLOGICAL TISSUE SLICER
Carlos Krumdieck, 3408 Wellford Cir., Birmingham, Ala. 35236
Filed Oct. 15, 1990, Ser. No. 597,066
Int. Cl.[5] G01N *1/06;* B26D *1/10*
U.S. Cl. 83—411.1 1 Claim

1. An improvement to a biological tissue slicer for producing uniform tissue slices of a defined thickness from a tissue sample, usable in tissue culture experiments, having a base including a slicer plate, variable in height relative to an upper surface of said base with a reference edge of said plate extending horizontally parallel to an upwardly opening cavity in said base, there being received within said cavity a substantially planar blade mounted on a driven rectangular blade holder which moves reciprocally within a rectangular groove found in said base within said cavity, the improvement comprising at least one

magnet cooperatively affixed within said rectangular groove and extending within a longitudinal slot, formed in said blade holder, in spaced relation to and beneath said blade to exert an attractive force on said blade urging said blade into planar abutment with said blade holder to prevent excessive move-



ment of said blade transversely of the plane of said blade, said blade holder supporting said blade between retaining members affixed thereto, engaging said blade to prevent relative longitudinal motion between said blade holder and said blade as said blade holder and blade concomitantly reciprocate along said rectangular groove relative to said magnet.

5,148,73(

SAWMARK GUIDE

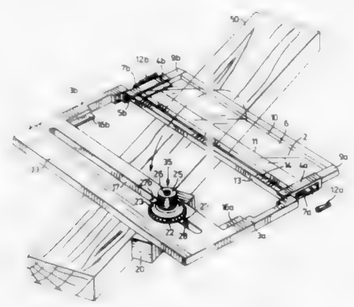
Ronald A. McCaw, 350 Kingsway Ave., North Bay, Ontario, Canada P1B 7V6

Continuation of Ser. No. 327,084, Mar. 22, 1989, abandoned. This application Dec. 24, 1990, Ser. No. 632,993

Claims priority, application Canada, Mar. 24, 1988, 562303

Int. Cl.[5] B27F *9/04*

U.S. Cl. 83—745 19 Claims



1. A saw guide for use in conjunction with a portable powered hand saw to position and guide the latter to perform a cut at a predetermined location in a flat elongate workpiece, said saw guide comprising:

a base having a saw guiding edge;

a flap pivotally attached to said base, said flap including at least one linear reference means thereon, said flap being movable about its pivot axis between a first position wherein it is extended laterally of said base so that said reference means is positioned outwardly of said saw guiding edge at a predetermined spacing therefrom and a second position wherein said flap is retracted so that said saw guiding edge is exposed for guiding abutment with the portable hand saw; and

anchor means carried by said base and selectively operable to anchor the base to the workpiece;

said base defining a recess into which said flap is received such that in said second position said flap does not project substantially above said base; and

said reference means being positioned so that with the flap in said first position alignment of said reference means with said predetermined cut location locates said base in a position wherein said guiding edge can guide the and saw to perform the desired cut at said predetermined location.

5,148,731

DEVICE FOR CUTTING FRUIT, VEGETABLES OR THE LIKE INTO SLICES

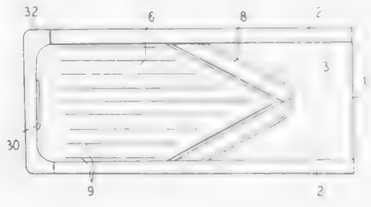
Juergen Boerner, Neustrasse, 5565 Niederkail, Fed. Rep. of Germany

Continuation of Ser. No. 562,250, Aug. 3, 1990, abandoned. This application Dec. 26, 1991, Ser. No. 815,537

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1989, 3926013

Int. Cl.[5] B26D *1/02*

U.S. Cl. 83—85.7 19 Claims



1. A device for cutting fruit, vegetables or the like into slices, comprising a blade-holding plate at whose leading edge a V-shaped cutter blade is arranged, comprising two framing ledges arranged essentially parallel that are connected to one another by the blade-holding plate and by at least one further web, and comprising a slide plate guided at the framing ledges and introducible parallel to the blade-holding plate, whereby a narrow gap remains between the adjacent portions of the slide plate and the cutter blade, characterized in that a support plate (**11**) is further provided that is fashioned as a closed surface and is to be positioned under said slide plate (**6**) and said slide plate includes a substantially V-shaped trailing edge adapted to be positioned adjacent and in substantially congruent relation to the V-shaped cutter blade, and said support plate being secured to said framing ledges, of a shape similar to the slide plate and arranged to engage and support the slide plate so that the slide plate is positioned between the support plate and the V-shaped cutter blade,

wherein structure associated with each of the framing ledges and the support plate supports the slide plate, and

slide plate locking means are provided in association with each of said framing ledges and said slide plate for securing said slide plate in position relative to cutter blade;

whereby said slide plate is introduced between the ledges in a plane substantially parallel to a plane of the cutter blade, is supported, and is secured in position relative to the cutter blade by urging the plate toward the cutter blade, said urging causing the locking means associated with the framing ledges and slide plate to interlock and position the slide plate relative to the cutter blade.

5,148,732

SAW UNIT FOR A VERTICAL BOARD SAW

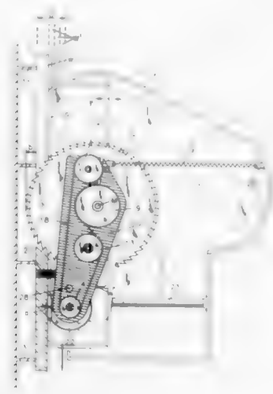
Ludwig Striebig, Luzern, Switzerland, assignor to Striebig AG, Littau, Switzerland

Filed Apr. 30, 1991, Ser. No. 693,624

Claims priority, application Switzerland, May 2, 1990, 1491/90

Int. Cl.[5] B27B *5/06, 5/29*

U.S. Cl. 83—863 16 Claims



1. A saw unit for a vertical board saw, comprising a housing movable vertically relative to a workpiece to be cut; a contact plate for contacting the workpiece, said contact plate being interposed between the workpiece and said housing and being movably attached to said housing such that said contact plate is movable in a first horizontal direction toward the workpiece and in a second horizontal direction away from the workpiece, whereby the position of said contact plate relative to said housing varies in response to the thickness of the workpiece; a main sawblade which is rotatable about an axis of rotation which is fixedly positioned relative to said housing such that said main sawblade extends outwardly from said contact plate; a support member which is pivotally mounted about said axis of rotation of said main sawblade such that the pivotal movement of said support member in a first arcuate direction causes a lower end of said support member to move generally in said first horizontal direction and an upper end of said support member to move generally in said second horizontal direction and such that the pivotal movement of said support member in a second arcuate direction, which is opposite to said first arcuate direction, causes said lower end of said support member to move generally in said second horizontal direction and said upper end of said support member to move generally in said first horizontal direction; a preslitting sawblade rotatably mounted on said lower end of said support member; rotating means for rotating said main sawblade about its said axis of rotation in a first rotational direction; transmitting means, mounted on said support member, for transmitting the rotation of said main sawblade to said preslitting sawblade in such a manner that said preslitting sawblade rotates in a second rotational direction, which is opposite to said first rotational direction; an adjustable stop mounted on said contact plate so as to limit the movement of said lower end of said support member in said first horizontal direction as said support member is pivoted in said first arcuate direction, whereby said stop determines the distance that said preslitting blade may extend from said contact plate; and urging means for continuously urging said lower end of said support member toward said stop, whereby the distance that said preslitting sawblade extends form said contact plate and into the workpiece remains constant regardless of the thickness of the workpiece.

5,148,733

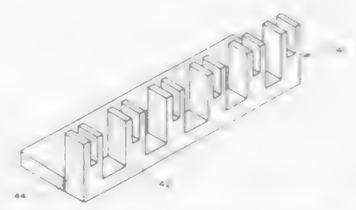
POLE PIECE FOR AN ELECTRIC STRING INSTRUMENT TO DECREASE MAGNETIC FLUX INTENSITY AROUND STRINGS

Kevin Beller, Santa Barbara, Calif., assignor to Seymour Duncan Corporation, Santa Barbara, Calif.

Filed Mar. 5, 1990, Ser. No. 488,925

Int. Cl.[5] G10H *3/18, 3/08*

U.S. Cl. 84—726 13 Claims



1. A pole piece for a magnetic pick-up of an electric string instrument having a string which vibrates in an area adjacent said pole piece, comprising first and second ferrous solids, each having a cross sectional shape, and in spaced-apart relationship so as to define a slot therebetween, said cross sectional shape, spaced-apart relationship and slot causing a magnetic flux pattern which minimizes the magnetic flux intensity in the area in which said string vibrates.

5,148,734

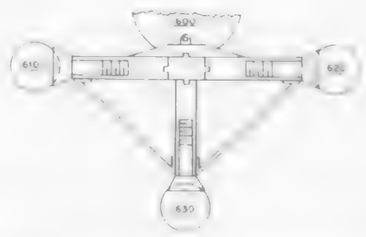
UNIVERSAL AIRCRAFT ROCKET/MISSILE LAUNCHER (UARML) AND TRIPLE LAUNCHER ADAPTER (TLA)

Eugene V. Lilly, Edwards AFB, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1991, Ser. No. 687,357

Int. Cl.[5] F41F *3/04*

U.S. Cl. 89—1.815 1 Claim



1. A universal aircraft missile launcher system for holding a missile next to the body of an aircraft, said universal aircraft missile launcher system comprising:

a means for mechanically retaining missiles, said retaining means mechanically retaining the missile next to the body of the aircraft;

a main support arm which serves as a frame; and which is fixed to said retaining means;

a main support beam which is fixed to said support arm;

a suspension lug which fixes said main support beam to said aircraft; and

a shaft which is fixed to said retaining means and which can protrude into said main support arm at adjustable depths so that said retaining means may be fixed at variable distances from said main support arm, wherein said shaft is threaded so that it screws into said main support arm so that the retaining means may be fixed at said variable distance from said main support arm.

5,148,735

ELECTROHYDRAULIC ACTUATOR

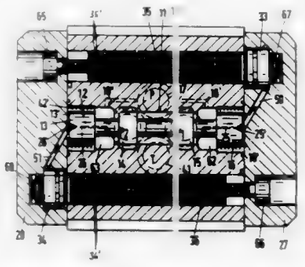
Sead Veletovac, Winterthur, Switzerland, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 422,698, Oct. 17, 1989, abandoned. This application Jul. 17, 1991, Ser. No. 732,336

Claims priority, application Switzerland, Oct. 25, 1988, 3972/88

Int. Cl.[5] F15B *13/043*

U.S. Cl. 91—459 18 Claims



1. In an electrohydraulic actuator, the combination comprising

a valve body;

an actuating cylinder operatively connected to said valve body to selectively receive pressure medium on one side from said valve body while delivering pressure medium on an opposite side to said valve body;

a spool mounted in said valve body for movement from a neutral position thereof to control a flow of pressure medium to and from said cylinder;

duct means for conducting pressure medium to opposite ends of said spool;

a pair of on/off valves, each said valve being in communication with a respective end of said spool to control a flow of pressure medium therefrom; and

a pair of piezoelectric servomotors, each said servomotor including piezoelectric discs, each capable of changing in thickness in response to a voltage imposed thereon, each servomotor being in contact with a respective on/off valve for selectively opening and closing said valve in response to an electrical digital pulse control signal to permit a flow of pressure medium from a respective end of said spool and to effect movement in small steps of said spool from said neutral position in a direction of said respective spool end.

5,148,736

AUTOMATIC SOLAR-POWERED CAR VENTILATOR

William Juang, 13, Hsi-Li Lane, Wai-Chu Village Erh-Lin Town, Chang-Hua Hsien, Taiwan

Continuation-in-part of Ser. No. 533,168, Jun. 4, 1990, abandoned. This application Jan 14, 1991, Ser. No. 640,643

Int. Cl.[5] B60H *1/26*

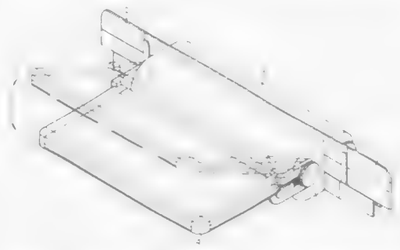
U.S. Cl. 454—131 3 Claims

1. An automatic solar-powered car ventilator comprising:

a main body being positioned between the upper horizontal bar of a window sash and the upper horizontal edge of the movable glass in a window in a car door, having (1) an air outlet at its front lower section, (2) a glass groove at its rear bottom edge for the upper horizontal edge of a movable glass in a window in a car door to fit in, (3) a rectangular plate at its rear upper section, (4) a wing plate extending from both side ends of the rectangular plate and having several holes, (5) a cylindrical holder fixed respectively at both vertical sides of the main body, (6) a conducting ring being fitted around the cylindrical holder and having a projecting sidewise conductor resting on a fastening projection on the inside surface of the cylindrical holder, (7) an L-shaped conductor being fixed on the inside surface of the side wall where the cylindrical holder is fixed on by means of a projection group and holes, having its bended section protruding out the rear surface of the main body and serving as an electrical conducting line together with the conducting ring, and (8) a fastening cap having a groove in its body to be fitted in by the fastening projection of the cylindrical holder such that when the fastening cap is fitted through the conducting ring and in the interior hollow in the cylindrical holder, the fastening cap and the conducting ring may not loosen to fall off;

one or two auxiliary bodies being connected with one or both sides of the main body, and having (1) a rectangular plate, (2) a glass groove at the bottom edge of the plate, (3) a supplementary plate extending down from the glass groove, (4) one or two projection groups at one or both sides of the supplementary plate for connecting the auxiliary body bodies with the wing plate(s) of the main body;

ventilating means to be mounted on the L-shaped conductor in the main body having (1) a fan, (2) a motor, (3) a base for mounting the fan and the motor and (4) a housing to shield the fan, the motor and the base, said base having projection at both lengthwise sides to fit in grooves at both lengthwise side bottoms of the housing for assembling or disassembling the base and the housing with screws, said base having a notch at each of both lengthwise bottom sides and two conductors on the wall near the notches, said housing having a cylindrical holder respectively at both sides, a conducting ring fitting around the holder, said ring having a projecting conductor to rest on a fastening projection in the holder which is fitted in its interior hollow by a fastening cap fixing the conducting ring, said fastening cap having a groove to fit with the fastening projection in the holder so as to hold tightly the conducting ring and the cap on the holder, and a socket being provided on the base near the motor and connected in parallel with the motor and the conductors or the conducting rings for electricity to be led to the motor;



a solar-energy board having (1) a C-shaped clamp respectively extending forward from the both ends of the front edge to catch hold of the holders of the main body or of the ventilating means, (2) a conductor abutting the clamp having a contact point at one end and connected with one pole of the solar-energy board so as to transmit the electricity generated by the solar-energy board to the motor through the conductors, the contact points, and the conducting rings in the main body or in the ventilating means, and a socket at proper place connected with the conductors;

characteristics that more than two main bodies can be installed in windows with movable glass in the right and left car doors, and one or two ventilating means can be mounted on the main bodies to suck in the open air by one of them and to exhaust out the air in the car by the other so that the hot stale air in the car can be quickly and effectively exhausted out without causing air convection in the car.

5,148,737

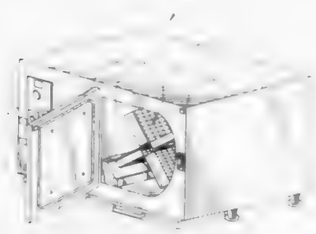
HOT AIR CIRCULATING OVEN AND FOOD HEATING APPARATUS

Larry Poulson, San Ramon, Calif., assignor to Cyclofur Company, L.P., San Francisco, Calif.

Filed Jun. 9, 1989, Ser. No. 364,627

Int. Cl.[5] A47J *37/00*

U.S. Cl. 99—327 67 Claims



1. A food heating apparatus to heat for selected time cycles a plurality of food portions, said apparatus comprising:

a. a housing defining a heating chamber;

b. a carrying assembly comprising:

i. a plurality of basket means, each of which is arranged to contain a related food portion to be heated,

ii. a mounting structure having mounting means by which each of said basket means can be mounted at selected mounting locations;

iii. said carrying assembly comprising first identifying means which in turn comprises first indicia by which each of said basket means can be identified in said heating chamber;

c. a control system comprising:

i. timing means having a plurality of selectively operable timing devices, each of which can be set for a predetermined timing cycle;

ii. second identifying means corresponding to said first identifying means and having second indicia associated with each of said timing devices by which each of said timing devices can be selectively associated with individual basket means at said mounting structure,

d. said apparatus comprising hot air circulating means arranged to heat and circulate air through said oven chamber,

e. said apparatus comprising a door for said heating chamber, said door having a closed position to enclose the heating chamber and an open position, said control system comprising interlock switch means which is responsive to opening and closing of said door in a manner that said hot air circulating means becomes operative upon closing of said door and stops operating when said door is open, said timing means being operatively connected to said interlock switch means in a manner that each of said timing devices which is operating through a timing cycle has said timing cycle interrupted during periods of time that said door is open, and each timing cycle is continued when said door is closed, said hot air circulating means being connected to said interlock switch means in a manner that closure of said door causes said interlock switch means to cause said hot air circulating means to be operative, whether or not selected timing devices are operating through a timing cycle,

whereby each basket means can be inserted in said heating chamber and a related timing device identifiably related with that basket means can be set to a predetermined timing cycle so that a period of time during which the food product in that basket means is heated in the oven chamber can be ascertained.

5,148,738

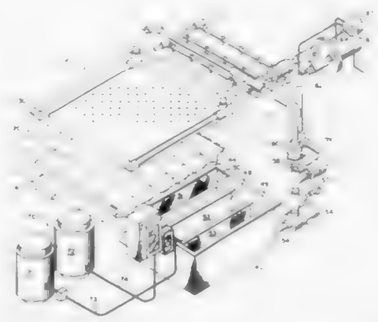
APPARATUS FOR CHEMICAL TREATING OF FRESH FRUIT AND THE LIKE

Charles R. Orman, San Bernardino; Paul E. Johnson, Riverside, and Bruce C. Adams, Pomona, all of Calif., assignors to Sunkist Growers, Inc., Ontario, Calif.

Continuation of Ser. No. 669,583, Mar. 14, 1991, abandoned, which is a continuation of Ser. No. 398,791, Aug. 24, 1989, Pat. No. 5,007,335, which is a division of Ser. No. 204,722, Jun. 10, 1988, Pat. No. 4,990,351. This application Oct. 11, 1991, Ser. No. 774,746

Int. Cl.[5] A23B *7/00, 7/16*

U.S. Cl. 99—487 5 Claims



1. The apparatus for chemically treating substantially solid, debris laden food articles, such as fresh fruit, comprising:

(a) a scrubbing station including scrubbing means to remove debris from said articles;

(b) liquid distribution means located above said scrubbing station whereby, simultaneously with the operation of said scrubbing means, a drenching liquid, comprising water containing one or more added chemicals, can be distributed over said articles while said articles are at said scrubbing station;

(c) liquid collection means below said scrubbing station for collecting, simultaneously with the operation of said liquid distribution means, drenching liquid that passes said fruit and said scrubbing means, said liquid collection means including clarifying means to remove debris from the drenching liquid collected therein; and

(d) recycle conduit means in fluid communication, and operating simultaneously with, said liquid collection means and said liquid distribution means whereby said collected, clarified liquid can be recycled to said liquid distribution means.

5,148,739

TRASH HANDLING AND STORAGE SYSTEM

Anthony Fox, Bloomington, Minn., assignor to Marcella M. Fox, Bloomington, Minn.

Continuation-in-part of Ser. No. 477,331, Feb. 8, 1990, abandoned. This application Feb. 27, 1991, Ser. No. 662,202

Int. Cl.[5] B30B *15/32*

U.S. Cl. 100—45 48 Claims

1. An integrated through-the-wall waste handling and storage system for processing and holding waste pending disposal which utilizes an opening in an inner or outer building wall and is accessible from both sides of the associated building wall comprising:

an elongated enclosed holding container for receiving, storing and discharging waste, including:

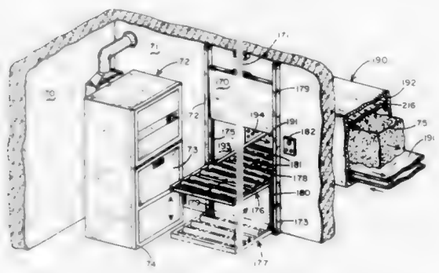
a receiving end portion having a receiving opening therein for receiving waste, wherein the receiving end portion is adapted to address a wall and to communicate through a juxtaposed wall opening,

a storage volume section for storing trash prior to collection, and

a discharge end portion having a discharge opening therein for expelling waste, wherein the discharge opening is accessible from the other side of the wall from a loading means;

a limited access motorized door associated with and accessing the receiving opening;

storage volume power driven mechanical conveying means for supporting and moving the waste within the storage volume of the container;



trash discharging means for discharging the trash through the discharge opening capable of discharging trash directly into a hauling mechanism; and

limited access motorized door associated with the discharge opening;

trash loading means including mechanical conveying means for receiving and supporting trash and conveying trash into the receiving end portion of the holding container, wherein the loading means is capable of accessing the holding container receiving opening through the wall opening; and

control means for controlling the operation of the system.

5,148,740

ROTARY PELLETIZING MACHINE WITH MATRIX DISC HAVING COPPER AND LOWER PLUNGERS

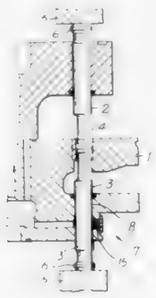
Ulrich Arndt, Lauenburg; Peter Lüneburg, Berkenthien; Kurt Marquardt, Hamburg; Hans-Joachim Pierags, Lübeck; Ulrich Zeuschner, and Günter Harten both of Schwarzenbek, all of Fed. Rep. of Germany, assignors to Firma Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Mar. 8, 1991, Ser. No. 667,016

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1990, 4018401

Int. Cl.[5] B30B *5/00, 11/08*

U.S. Cl. 100—264 **10 Claims**



1. A rotary pelletizing machine, comprising a rotatable matrix disc; a plurality of upper plungers and lower plungers guided in said matrix disc; and means for holding said lower plungers form falling out during a dismounting of said matrix disc, said holding means including a braking ring arranged in said matrix disc and pressing radially against said lower plungers so as to hold said lower plungers from falling out, said matrix disc being provided with a peripheral groove in which said braking ring is arranged, said matrix disc having a plurality of openings for receiving said lower plungers, and a plurality of connecting openings, said peripheral groove being connected with said openings for receiving said lower plungers through said connecting openings.

5,148,741

METHOD AND APPARATUS FOR REFLECTIVE ENHANCEMENT OF ROTAGRAVURE PRINTED MATERIAL

Lawrence G. Hickman, Glen Allen; William D. Lewis, Chesterfield, both of Va.; Jwohaw Thai, Shepherdsville, Ky., and Joseph C. Wirt, Midlothian, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 11, 1992, Ser. No. 849,566

Int. Cl.[5] B41F *9/02, 19/02;* **B41M** *1/24*

U.S. Cl. 101—32 **12 Claims**

1. A method of enhancing reflectivity of an image having a plurality of shapes and colors rotogravure printed on the surface of a web of material, said surface being capable of retaining a shape imparted thereon, comprising the steps of:

a) forming a plurality of varying density images from said image;

b) forming a plurality of enhanced reflectivity density images from said varying density images by combining each said varying density image with at least one reflectivity enhancing element;

c) forming an enhanced reflectivity composite image from said plurality of enhanced reflectivity density images;

d) forming an embossing roll from said enhanced reflectivity composite image;

e) printing said image on said surface of said web; and

f) embossing said surface of said web with said enhanced reflectivity composite image, each said element having a predetermined configuration and being in registration with at least one of said shapes, said colors or a combination thereof such that at least a portion of said elements provided enhanced reflectivity for at least a portion of said image.

5,148,742

CAN COATER WITH IMPROVED DEACTIVATOR RESPONSIVE TO ABSENCE OF A WORKPIECE

James S. Stirbis, Littleton, Colo., and Franklin P. Lee, Orange Park, Fla., assignors to Belgium Tool and Die Company, Lynchburg, Va.

Filed Jan. 10, 1991, Ser. No. 638,986

Int. Cl.[5] B41F *17/22*

U.S. Cl. 101—40 **59 Claims**

1. An offset blanket support assembly comprising:

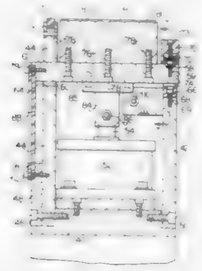
A. a rotary support member mounted for rotation about an axis of rotation;

B. mounting means on said rotary support member for supporting a blanket segment assembly for movement between an outer print enabling position and an inner print prevent position;

C. a blanket segment assembly mounted on said mounting means; and

D. said mounting means including:

(1) spring plate means for providing force urging said blanket segment assembly toward one of said positions; and



(2) selectively operable force exerting means for overcoming the force provided by said spring plate means to move said blanket segment assembly to the other of said positions,

wherein said spring plate means has an inner end and an outer end, said inner end of said spring plate means being attached in cantilever manner to said rotary support member and said outer end of said spring plate means being attached to said blanket segment assembly.

5,148,743

COATING MACHINE WITH MAGNETICALLY OPERATED DOCTOR BLADE (SQUEEGEE)

Johannes Zimmer, Ebentaler Str. 133, A-9020 Klagenfurt, Austria

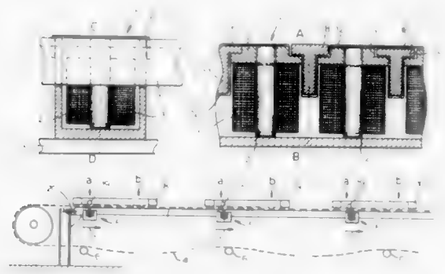
PCT No. PCT/AT90/00056, § 371 Date Feb. 15, 1991, § 102(e) Date Feb. 15, 1991, PCT Pub. No. WO90/15717, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 6, 1990, Ser. No. 635,116

Claims priority, application Austria, Jun. 16, 1989, 1482/89

Int. Cl.[5] B41L *13/06*

U.S. Cl. 101—123 **8 Claims**



1. A printing machine for coating a substrate web, said machine comprising:

a closed loop conveyor belt for displacing a substrate web to be coated along a printing path, said belt being formed with an inner side and with an outer side confronting the web;

at least one longitudinal profiled bar along said path and juxtaposed with said inner side of said conveyor belt;

means for holding said bar at opposite ends thereof;

application means for coating the web, said application means including:

at least one magnetic table movable along said path relative to said conveyor belt and formed with an upper face, said upper face being provided with receiving means accommodating said bar, and

a magnetizable doctor blade facing the web to be coated and adapted to cooperate with said magnetic table upon displacing the latter in opposite directions along said path, said bar being in sliding contact with said inner side of said belt, so that the web to be coated is flat all along said path regardless of a direction of displacement of said web along said path wherein

said receiving means includes a cutout formed in said magnet table and extending downwardly from said upper face, said bar being formed with a top side, said top side and said upper face being coplanar and being in continuous contact with said inner side of said conveyor belt along said path.

5,148,744

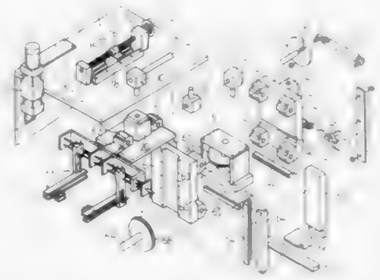
MICRO-CURVATURE ADJUSTABLE DEVICE FOR CURVE SCREEN PRINTING PRESSES AND IRONING PRESSES

Trong C. Chiang, P.O. Box 82-144, Taipei, Taiwan

Filed Sep. 27, 1991, Ser. No. 766,217

Int. Cl.[5] B41F *15/14;* **B41M** *1/12*

U.S. Cl. 101—124 **1 Claim**



1. A micro-curvature adjustable device for curve screen printing presses and ironing presses comprising:

an upper cover provided with a tool post mounted on a front side and an adjusting mechanism on an upper surface, said tool post being designed for receiving a scraper, said adjusting mechanism having two supports between which is pivotally mounted a screw with a hand wheel at one end, a threaded sleeve, a plurality of racks. said screw being engaged with said threaded sleeve, an upward oscillating block movable with respect to corresponding ones of said racks located on said threaded sleeve, a plurality of shafts mounted below said upper cover;

an oscillating plate mounted below said upper cover and having a front seat, a horizontal sliding block for passage of a shaft, and a pair of clamping arms located on the front side;

a front linking block, a downward oscillating block, and a rear linking block an oscillating arm arranged on said upper cover and connected with said front linking block, said downward oscillating block and said rear linking block, said front linking block being pivotally connected to said front seat, said downward oscillating block being connected with said upward oscillating block;

a rear connecting plate mounted under said upper cover and having a rear horizontal groove and a plurality of rear vertical sliding blocks located on an inner side, a rear toothed rack, said rear horizontal groove engaging said

rear toothed rack while said rear vertical sliding blocks are connected with one of said shafts, a linking plate and an axle, said rear connecting plate being provided with a seat and a guiding rod on a front side such that said seat is pivotally connected with said rear linking block while said guiding rod is pivotally connected with said rear connecting plate seat which is in turn pivotally connected with said linking plate via said axle;

a front connecting plate, an axle seat located between said front connecting plate and said rear connecting plate and having a pivoted gear engaged with a front toothed rack and said rear toothed rack;

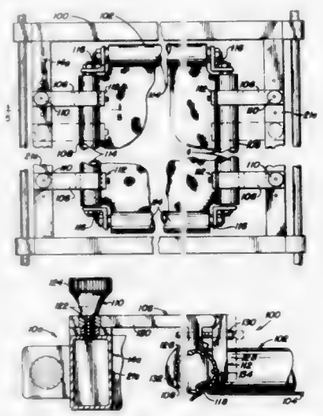
said front connecting plate being provided with a front horizontal groove and a plurality of vertical sliding blocks on an inner side, said front horizontal groove being engaged with said front toothed rack while the front vertical sliding block receives said shaft, two positioning clamping members, an outer side of said front connecting plate having a vertical recess threadedly engaged with said two positioning clamping members for receiving a vertical panel, said vertical panel being provided at a bottom with a pivoted block connected with a lower toothed rack engaged to a gear which is in turn connected with a shaft at the center; a guiding arm, and an eccentric disc with an adjusting slot being pivotally connected with said guiding arm which is in turn connected with said linking plate at the other end.

5,148,745

SCREEN PRINTING APPARATUS ASSEMBLY

Kaino J. Hamu, 16061 Dominica Cir., Huntington Beach, Calif. 92649

Filed Mar. 8, 1991, Ser. No. 666,374
Int. Cl.[5] B41F *15/14*
U.S. Cl. 101—127.1 **15 Claims**



1. In a screen printing apparatus, the combination comprising:

a screen frame carrier including two spaced screen frame support portions,

an open rectangular screen frame positioned between said support portions including frame members extending along two opposite sides of the frame adjacent said support portions, respectively,

means mounting said screen frame on said carrier including a pair of totally separate mounting brackets extending between each support portion and the adjacent frame member at positions spaced along the adjacent frame member, carrier attachment means securing each bracket to its adjacent support portion, and frame attachment means securing each bracket to its adjacent frame member, and wherein

said attachment means are adjustable along said support portions and frame members lengthwise of the frame members to permit individual adjustment of said bracket members along their adjacent support portions and frame members lengthwise of the frame members, and

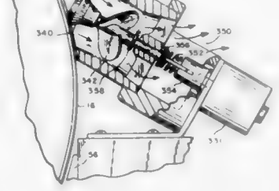
on attachment means of each mounting bracket is releasable to permit removal of said screen frame from said carrier.

5,148,746

PRINT-HEAD AND PLATE-CLEANING ASSEMBLY

Douglas D Fuller, Contoocook; Richard A. Williams, Hampstead; John P. Gardiner, Londonderry, and Harry Roberts, Merrimack, all of N.H., assignors to Presstek, Inc., Hudson, N.H.

Continuation-in-part of Ser. No. 553,817, Jul. 17, 1990, Pat. No. 5,121,688, which is a continuation-in-part of Ser. No. 413,172, Sep. 27, 1989, Pat. No. 5,005,479, which is a division of Ser. No. 234,475, Aug. 19, 1988, Pat. No. 4,911,075. This application Aug. 12, 1991, Ser. No. 743,877
The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.
Int. Cl.[5] B41F *35/00*; B41C *1/10*
U.S. Cl. 101—142 **23 Claims**



1. Apparatus for imaging a lithographic printing plate comprising:

a. means for supporting a lithographic printing plate having a polymeric surface;

b. a writing head for imaging the plate;

c. means for positioning the writing head in a predetermined orientation with respect to the surface of a lithographic printing plate supported by the plate-supporting means;

d. means for moving the positioning means and plate relative to one another so that the writing head scans over the surface of the plate;

e. means for causing the writing head to image the plate during the scan by selectively ablating material from the plate, thereby producing a series of imaging swaths each containing a plurality of image spots; and

f. means for dislodging, from the plate surface, any polymeric material overlying the image spots, the dislodging means comprising:

1) a rotating brush having a contact portion that makes contact with each swath no more than a predetermined number of times during the scan;

2) means for urging the brush against the surface of the plate with a force adequate to dislodge the overlying polymeric material;

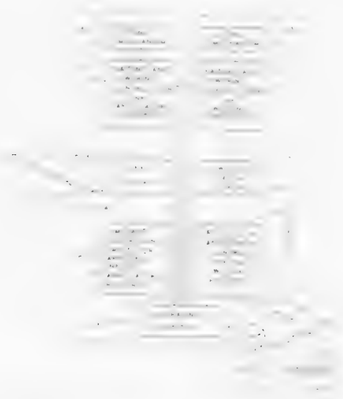
3) means for retracting the brush from the plate when the writing head is not imaging the plate.

5,148,747

PROCESS FOR SETTING A PRODUCTION RUN INK ZONE PROFILE

Anton Rodi, Leimen; Bernd Müller, Nussloch, and Robert Müller, Mörlenbach, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 540,612, Jun. 19, 1990, Pat. No. 5,081,926. This application Dec. 4, 1991, Ser. No. 803,337
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919922; Apr. 28, 1990, 4013740; Aug. 28, 1991, 4128537
Int. Cl.[5] B41F *7/04, 7/26*
U.S. Cl. 101—450.1 **20 Claims**



1. A method for establishing a production ink zone profile in an offset printing press, the printing press being for the production of successive prints of an image provided on a printing plate, the successive prints of the image being formed by the deposition of an ink on a printing medium during a printing operation of the offset printing press, the production ink zone profile being established in the printing press prior to the execution of the printing operation of the offset printing press, the printing press including a plate cylinder for receiving the mounting thereon of the printing plate, an ink reservoir for supplying the ink, an ink roller train comprising at least one ink applicator roller for transferring at least a portion of the ink supplied by the reservoir to the printing plate mounted on the plate cylinder, an ink metering apparatus for metering ink from the ink reservoir to the ink roller train, a wetting agent reservoir for supplying a wetting agent, and a wetting roller train comprising at least one wetting agent applicator roller for transferring at least a portion of the wetting agent supplied by the wetting agent reservoir to the printing plate mounted upon the printing cylinder, the ink metering apparatus comprising a plurality of individually adjustable ink metering devices for supplying ink to the ink roller train, said plurality of individually adjustable ink metering devices being disposed sequentially across the printing press in a direction substantially transverse to the direction of travel of the printing medium through the printing press, each of the plurality of individually adjustable ink metering devices defining a corresponding ink zone of the printing press, the amount of ink metered into the corresponding sequentially disposed ink zones defining the ink zone profile of the printing press, said method comprising the steps of:

determining, based upon the image provided on the printing plate, a production ink zone profile appropriate for the printing of the image provided on the printing plate during a production printing run;

determining, for each of the plurality of individually adjustable ink metering devices, a production ink zone flow to produce said production ink zone profile in the printing press during said production printing:

determining an ink flow level within the range of said determined production ink zone flows;

inverting said production ink zone flows about said determined ink flow level to thereby produce an inverted ink zone flow such that:

at least one peak of said production ink zone flow becomes a trough of said inverted ink zone flow: and at least one trough of said production ink zone flow becomes a peak of said inverted ink zone flow;

thereafter, operating the printing press with the plurality of ink metering devices set to produce said inverted ink zone flow;

thereafter, operating the printing press with the plurality of ink metering devices set to produce said production zone ink flow; and

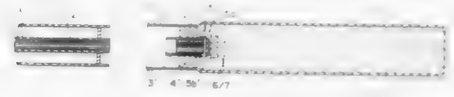
thereafter, printing the image provided on the printing plate onto the printing medium.

5,148,748

OPTICAL DETONATOR

Arthur G. Yarrington, M.S. 1073, Crows Nest, Queensland 4355, Australia

Filed Mar. 11, 1991, Ser. No. 667,923
Int. Cl.[5] F42C *19/00*
U.S. Cl. 102—201 **5 Claims**



1. An optical detonator comprising:

an elongated hollow body portion having a closed end containing a quantity of explosive material adjacent to said closed end, said elongated hollow body having an opening in an opposite end;

a fiberoptic cable having a terminal end receivably located in said opening of said elongated hollow body portion;

a frequency converter element means located within said elongated hollow body intermediate to said explosive material; and

a quantity of initiating pyrotechnic material located on one surface of said frequency converter element means which is adjacent said explosive material,

wherein said frequency converter element means is composed of a material capable of readily absorbing electromagnetic radiation.

5,148,749

PRIMING CHAMBER FOR A FIREARM CARTRIDGE

Félix-Victor Maes, and Jean-Paul Lechanteur, both of Levée Gérard 17, 4650 Chaineux, Belgium

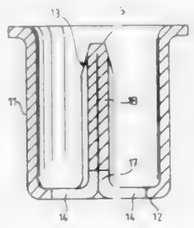
Filed Nov. 28, 1990, Ser. No. 619,755
Claims priority, application Belgium, Nov. 29, 1989, 08901275
Int. Cl.[5] F42C *19/10*
U.S. Cl. 102—204 **4 Claims**

1. A pressed one piece priming chamber comprising

a cylindrical envelope having a base;

a pair of flat extensions integral with and projecting from said base within said envelope to define a flat central member having a flat end, each of said extensions extending substantially across an internal diameter of said envelope at the base thereof, and opposed flat surfaces of said extensions being in contact with each other along a central axis of said envelope; and

a pair of flash holes in said base for expelling heat from within said envelope, said flash holes being located close



to said central axis and disposed on opposite sides of said extensions in contact with each other.

5,148,750

UNITARY PROJECTILE

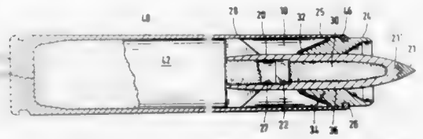
Wilfried Becker, Dusseldorf; Karl W. Bethmann, Moers; Bernhard Bisping, Ratingen, and Ulrich Theis, Muelheim, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 796,949, Sep. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 458,155, Dec. 16, 1982, abandoned, and a continuation-in-part of Ser. No. 448,508, Dec. 9, 1982, abandoned. This application Jul. 10, 1989, Ser. No. 380,481

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151525

Int. Cl.[5] F42B *5/00, 12/22, 14/06*

U.S. Cl. 102—439 8 Claims



1. A fin-stabilized sabot subcaliber explosive projectile ammunition comprising:

a pull-drive sabot means;

a splinter-forming projectile body having a fin-stabilization means adjacent a rear end thereof carried by said sabot means;

said projectile body having a blind bore axial channel means which extends from an open rear end of said projectile body forwardly to a solid nose portion thereof and being made of a tungsten sinter alloy having a density of at least 17 grams/cm^3; the tungsten content of said sinter alloy being at least 90% by weight and said sinter alloy forming a matrix which includes, in addition to tungsten, iron and nickel;

said ammunition further including a cylindrical propellant charge casing which has an open front end;

said sabot means being mounted on said front end of said casing with a portion of said sabot means and a portion of said projectile body extending forwardly of said front end of said casing;

a bottom igniter operatively mounted in said channel means; and

an explosive charge, for fragmenting said body and ignited by said bottom igniter, disposed in said channel means between said bottom igniter and said solid nose portion.

2. In an ammunition unit including an explosive subcaliber projectile provided with a discardable sabot which is mounted in a front end of a cylindrical shaped propellant charge casing, the improvement wherein:

said explosive projectile has a body made of a heavy metal sintered alloy having a content of at least 90% by wt. of tungsten, with

said projectile body having a central blind bore which is rearwardly open and a solid nose portion;

an explosive charge for fragmenting said body is disposed forwardly in said central bore and a bottom igniter for said explosive charge is mounted rearwardly relative to said explosive charge in said bore and has an adjustable actuation delay;

said discardable sabot is operatively mounted on said projectile and said sabot is also operatively mounted on said propellant charge casing;

said sabot is a pull-drive sabot and includes a gas pressure receiving surface means which extends substantially forwardly; and

the front end of said cylindrical propellant charge casing is closed by said projectile and sabot mounted thereon thereby providing a favorable volume accommodating a propellant charge in said casing, which volume extends from a rear bottom of said casing up to said forwardly extending gas pressure receiving surface means of said sabot.

5,148,751

BRIDGING MECHANISM FOR CROSSING RAILROAD TRACKS WITH VERTICALLY MOVING PIVOT CARRIAGE FOR BRIDGE PLATE

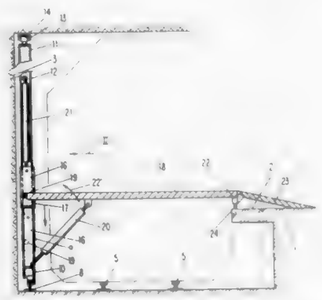
Kurt Alten, Ringstr. 14, D-3015 Wennigsen, and Albert Böttcher, Wennigsen, both of Fed. Rep. of Germany, assignors to Kurt Alten, Wennigsen, Fed. Rep. of Germany

Filed Oct. 17, 1991, Ser. No. 778,003

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1990, 4032892

Int. Cl.[5] E01F *1/00*

U.S. Cl. 104—31 10 Claims



1. A bridging mechanism for crossing railroad tracks, comprising:

a travel mechanism that is disposed on one side of said tracks, is guided parallel thereto, and includes a vertically upwardly directed support structure on which is displaceably guided a pivot connection means having a horizontal pivot axis;

a bridge plate having a rear end that is connected to said pivot connection means so as to be pivotable between an approximately vertical rest position and an approximately horizontal operating position in which a front end of said bridge plate rests upon a dock or platform that is disposed on an opposite side of said tracks; and

means for raising and lowering said pivot connection means on said support structure to simultaneously effect pivoting of said bridge plate such that during raising of said bridge plate from said operating position into said rest position thereof said pivot connection means is lowered, and during lowering of said bridge plate from said rest position into said operating position thereof said pivot connection means is raised.

5,148,752

PARKING GARAGE VEHICLE TURN-TABLE

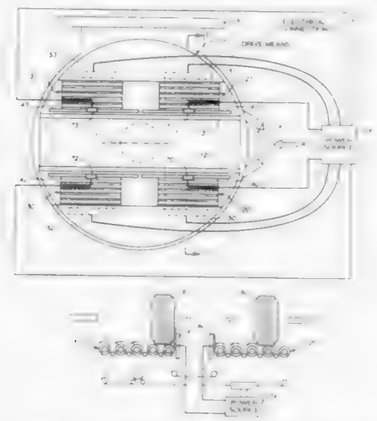
Kyoichi Yamashita, Kanagawa, Japan, assignor to Koyo Jidoki Company Limited, Yokohama, Japan

Filed Feb. 8, 1991, Ser. No. 653,094

Claims priority, application Japan, Feb. 27, 1990, 2-46891

Int. Cl.[5] B60S *13/00*

U.S. Cl. 104—44 12 Claims



1. A vehicle turn-table device for use in connection with a multi-story parking garage, comprising:

a substantially circular framed platform;

four sets of wheel fixing rollers positioned on the circular framed platform as a first pair and a second pair of rollers, the sets of rollers being positioned spatially so as to match spatial positioning of four wheels of a vehicle;

a first guard plate positioned alongside of and extending substantially parallel to the first pair of wheel fixing rollers;

a second guard plate positioned alongside of and extending substantially parallel to the second pair of wheel fixing rollers;

contact sensors positioned on each of the guard plates;

four movable side plates substantially parallel to the four sets of wheel fixing rollers and movably positioned alongside the fixing rollers on a side of the fixing rollers opposite from the guard plates;

an electrical system connecting the contact sensors with a mechanical power source; and

a power transfer means connecting the power source with the four sets of wheel fixing rollers and four movable side plates.

5,148,753

TRANSIT SYSTEM

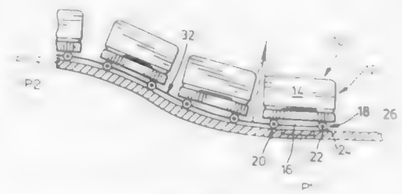
Stephen P. Lapp, P.O. Box 261, Odessa, Ontario, Canada K0H 2H0; Ronald F. van Huuksloot, 895 Old Colony Road, Kingston, Ontario, Canada K7P 1S1; Peter E. Timan, R.R. #1, Sydenham, Ontario, Canada K0H 2T0, and Harry Skoblenick, 238 Fairway Hill Crescent, Kingston, Ontario, Canada K7M 2B4

Continuation of Ser. No. 333,748, Apr. 5, 1989, abandoned, which is a continuation of Ser. No. 165,313, Mar. 8, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 433,448

Claims priority, application Canada, Mar. 13, 1987, 532042

Int. Cl.[5] B61B *13/12*

U.S. Cl. 104—290 29 Claims



1. A transit system comprising:

a guideway;

a train of cars to travel along said guideway; and

linear induction motor drive means to propel said train along said guideway, including primary means disposed along said guideway and a secondary means mounted on said train, said secondary means being articulated and extending the entire length of said train in a substantially continuous manner whereby said secondary means is moveable with respect to said train during movement of said train over a curve in said guideway to maintain substantially disposition of said secondary means over said primary means thereby to improve distribution of thrust throughout said train.

5,148,754

CARRIAGE LOCK FOR A MOBILE STORAGE SYSTEM WITH ROTATABLE ACTUATOR KNOB

Richard Lahti, Fond du Lac, and Kent Thomas, Mayville, both of Wis., assignors to Tab Products Company, Palo Alto, Calif.

Filed Mar. 11, 1991, Ser. No. 667,653

Int. Cl.[5] B61C *9/00;* E05B *13/10*

U.S. Cl. 105—96 27 Claims

1. A mobile storage system comprising:

a. a plurality of parallel rails embedded in a building floor;

b. a carriage that spans the rails;

c. wheel means for rollingly supporting the carriage on the rails;

d. drive means for manually moving the carriage along the rails, the drive means comprising:

i. a shaft immovably fixed to the carriage and having a longitudinal axis;

ii. hub means mounted on the shaft for rotation about the shaft longitudinal axis; and

iii. chain and sprocket means connecting the hub means to the wheel means for moving the carriage along the rails in response to manual rotation of the hub means; and

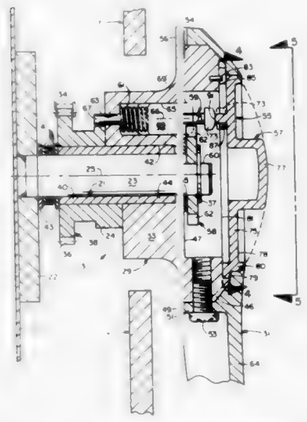
e. lock means for selectively enabling and preventing rotation of the hub means, the lock means comprising:

i. a lock plate held against rotation on the shaft;

ii. pin means translatable within the hub means between a first position whereat the pin means is engaged with the lock plate to prevent rotation of the hub means and a second position whereat the pin means is disengaged from the lock plate to enable rotation of the hub means; and

iii. knob means captured within the hub means for being

selectively rotated relative thereto to translate the pin means between the first and second positions thereof,



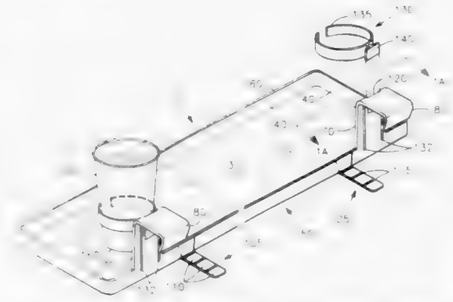
so that rotation of the knob means relative to the hub means selectively locks the carriage against movement along the rails and enables carriage movement along the rails.

5,148,755

UTILITY TRAY FOR ATTACHMENT TO A WALL, OR THE LIKE

Benny B. Morales, 2550 S. Cucamonga Ave., Ontario, Calif. 91761

Filed Nov. 19, 1990, Ser. No. 615,581
Int. Cl.[5] A47B 5/00
U.S. Cl. 108—47 3 Claims



1. A utility tray for attachment to an element defining a vertical surface, said tray comprising:

means defining a horizontal support surface having a peripheral edge, the peripheral edge having at least one straight portion;

an upwardly protruding lip originating from and extending above the peripheral edge;

at least two support arms extending upwardly from the straight portion, each of the support arms having a slot opening therein and a plurality of substantially parallel, protruding ribs, vertically disposed and protruding away from the support surface, said ribs spaced to provide clearance around the slot opening, each arm ending in a downwardly facing hook, each said hook extending away from the support surface for engagement over the element, the straight portion contacting the vertical surface;

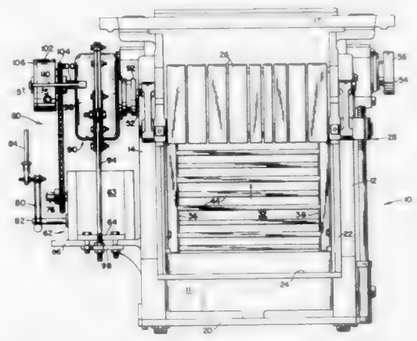
at least one clamp, each one of the at least one clamp comprising a circular band of flexible material having an attachment prong projecting therefrom, the prong adapted to fit into the slot opening, thereby enabling the support arm to hold the clamp in a position suitable for placement of a drinking cup into the band for lateral support of the cup, the cup resting on the horizontal support surface.

5,148,756

FUEL FEEDER FOR FURNACE

Richard C. Matysik, Hunlock Creek, Pa., assignor to Geneco Services, Inc., Hunlock Creek, Pa.

Filed Mar. 20, 1991, Ser. No. 672,457
Int. Cl.[5] F23K 3/18
U.S. Cl. 110—115 15 Claims



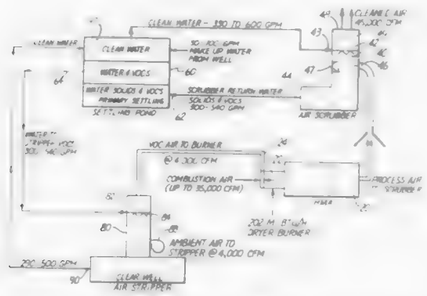
1. A feeder for feeding particulate fuel into a furnace comprising a housing having side walls, top and bottom walls, and a front wall having a discharge opening adapted to align with a charge opening in a wall of the furnace, said top wall having a fuel inlet opening for receiving fuel into said housing, rotor means adjacent said discharge opening including a rotor shaft with ends rotatably mounted on and extending beyond said side walls of said housing, fuel conveying means mounted in said housing to receive fuel from said inlet opening and to convey said fuel to said rotor means which then throws said fuel through said discharge opening into the furnace, power means connected to one end of said rotor shaft for rotating said rotor means, a variable speed drive assembly connecting the other end of said rotor shaft to said conveying means, said drive assembly including a self-contained adjustable speed drive unit having an input shaft, an output shaft, and adjusting means for regulating the speed of said output shaft, means mounting said adjustable speed unit from one wall of said housing, first drive means connecting the other end of said rotor shaft to said input shaft of said adjustable speed drive unit, a conveyor shaft rotatably mounted on said one wall of said housing and drive connected to said fuel conveying means, a self-contained speed reducer having an input shaft and a output shaft connected to said conveyor shaft, adjustable torque limiting means mounted on the input shaft of said speed reducer, and second drive means connecting said torque limiting means to said output shaft of said adjustable speed drive unit.

5,148,757

SOIL REMEDIATION METHOD AND APPARATUS

Charles McCrossan, Box 1240, 7865 Jefferson Hwy., Maple Grove, Minn. 55369

Division of Ser. No. 644,335, Jan. 23, 1991, Pat. No. 5,086,717.
This application Oct. 9, 1991, Ser. No. 773,246
Int. Cl.[5] F23J 3/00
U.S. Cl. 110—216 11 Claims



1. Apparatus for removing volatile organic compounds (VOC's) from soil comprising:

a soil heating drum having a burner for heating soil in the drum to substantially vaporize VOC's in the soil;

an air scrubber and means for ducting VOC's vaporized in the drum to the air scrubber, the air scrubber including means for absorbing into the air scrubber water a substantial portion of the vaporized VOC's;

a settling basin and means for conducting air scrubber water, into which VOC's have been absorbed, to the settling basin;

an air stripper, and conduit means for transporting water from the settling basin to the air stripper, the air stripper including means for vaporizing VOC's to remove them from the water;

means for conducting the VOC's vaporized in the air stripper to the burner whereby the VOC's will be burned to help heat the drum; and

means for returning the air stripper water from which the VOC's have been stripped to the air scrubber for use in absorbing VOC's coming from the drum.

5,148,758

FLOATING RECYCLING AND TRANSFER STATION

Udi E. Saly, Newton Center, and Brent Dibner, Chestnut Hill, both of Mass., assignors to Flexible Environmental Systems, Inc., Boston, Mass.

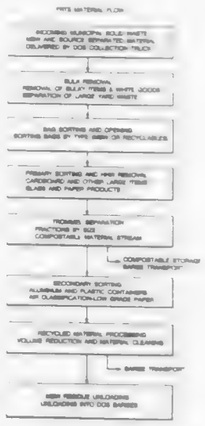
Continuation-in-part of Ser. No. 532,194, Jun. 1, 1990, Pat. No. 5,063,862. This application Sep. 13, 1991, Ser. No. 759,173
Int. Cl.[5] F23G 5/02
U.S. Cl. 110—220 15 Claims

1. A method of treating and transferring nonhazardous municipal residential and commercial solid waste on board a floating recycling and transfer station comprising of the steps of:

loading said incoming waste originating on shore directly onto said floating structure;

separating said incoming solid waste into recyclable material and a non-recyclable waste fraction on board said floating structure;

processing said recyclable materials for storage and transportation; and



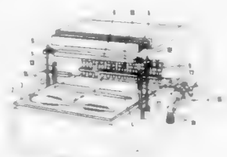
transferring said non-recyclable waste fraction onto marine based barge transportation.

5,148,759

THREADING A HOOKED WIRE NEEDLE IN A TIE SEWING MACHINE

Rudi Wirth, Schwarzenbach/Wald, Fed. Rep. of Germany, assignor to LIBA Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 573,237
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929127
Int. Cl.[5] D05B 87/02, 85/08
U.S. Cl. 112—121.22 2 Claims



1. An apparatus for threading a sewing thread onto a wire needle of a necktie sewing machine used in sewing a longitudinal seam along a necktie, comprising;

a supply reel for supplying sewing thread,

said needle having a pointed end and an open hook adjacent said pointed end.

a thread guide positioned in alignment with a trajectory of said end of the needle and positioned at a location before that location where the longitudinal seam beings,

a gripper for gripping the sewing thread at a location along the length of the thread between said eye and said supply

reel said gripper and thread being movable in such a manner that when the sewing thread is gripped and moves, the thread wraps tightly around the needle in a substantially U or V shape,

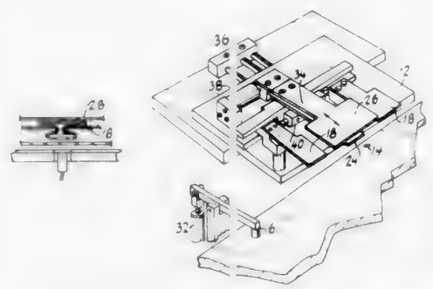
said open hook grasping the thread during movement of said needle and pulling the thread through said guide and effecting threading of said needle.

5,148,760

METHOD AND APPARATUS USING CLAMPS AND MOVABLE PLATES FOR PRODUCING PLEATS

Takashi Miyauchi, Duluth, Ga., assignor to Juki America, Inc., Duluth, Ga.

Filed May 18, 1990, Ser. No. 525,489
Int. Cl.[5] D05B *35/08*
U.S. Cl. 112—144 6 Claims



1. A method for forming a pleat in material and sewing said pleat, comprising the steps of:

a) positioning said material above a folding plate;

b) clamping down said material, and with a lower plate forcing a portion of said material below said folding plate in a proximity of said folding plate and with an upper plate clamping said material against said folding plate;

c) moving said folding plate a predetermined distance horizontally above said lower plate while said upper plate provides a frictional resistance to a movement of a portion of said material whereby a pleat is formed in said material;

d) clamping said material in the pleated configuration;

e) removing said folding plate, said upper plate and said lower plate; and

f) sewing said material, thus forming a sewn pleat.

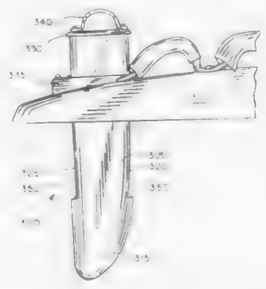
5,148,761

DAGGERFIN ADJUSTABLE SAILBOARD SKEG

William K. Winner, White Salmon, Wash., assignor to Bic Corporation, Milford, Conn.

Continuation-in-part of Ser. No. 414,801, Sep. 29, 1989, Pat. No. 5,038,698. This application Aug. 5, 1991, Ser. No. 740,756
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] B63B *35/79*
U.S. Cl. 114—39.2 21 Claims

13. A wind propelled sailing apparatus comprising a sailboard hull adapted to support a user; means for propulsion of said sailboard hull and adapted to receive wind for motive power; a skeg having front and rear edges, an upper portion, and a lower portion and being positioned and oriented in a rear central portion of said sailboard hull as the sole means for providing lateral resistance and directional control for the apparatus, said skeg being adjustable between a first position, whereby said skeg has a surface area sufficient to provide lateral resistance to side forces generated by said propulsion means and to provide directional stability to said sailboard hull when sailing upwind, and a second position, whereby the area of the skeg is reduced for sailing downwind; means for housing said skeg and facilitating vertical upward and downward movement thereof, said housing means having an opening configured and positioned about said skeg to minimize air entrainment between said housing opening and skeg to the underside of the hull due to forward movement thereof and to prevent water from being forced upward through the housing opening from beneath the sailboard hull; said skeg further including means for prevention of downward vertical movement of said skeg beyond a predetermined distance corresponding to said first position, and means for prevention of upward vertical movement of said skeg beyond a predetermined distance corresponding to said second position, said upward movement prevention means comprising a shoulder on each of the front and rear edges of the skeg positioned between the upper and lower portions thereof wherein the shoulders and lower portion of said skeg are configured and dimensioned to be greater in width from the front to rear edges than the longitudinal dimension of the housing opening.

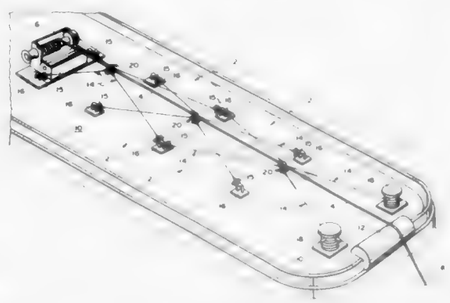


5,148,762

SAFETY LINE HARNESS

Francis C. Liu, Camarillo, Calif., and Beth E. Harris, East Flat Rock, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 13, 1990, Ser. No. 612,299
Int. Cl.[5] B63B *21/04*
U.S. Cl. 114—253 17 Claims



1. A safety line harness for restraining and arresting the snap-back of a parted line comprising:

a) at least one restraining line, each restraining line capable of elongating to absorb the energy of the parted line, each said restraining line having a first end and a second end, the first end attached to an attachment point remote from said restraining line and the second end communicating with a harnessed line;

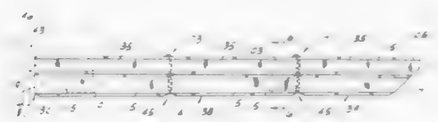
b) means for attaching said second end of said restraining line to the harnessed line, the attachment means communicating with said harnessed line and with said restraining line without said attachment means and said restraining line impairing the movement of said harnessed line when said harnessed line is moved laterally or moved axially.

5,148,763

KNOCKDOWN BOAT

Denny A. White, Huntsville, Mo., assignor to White and Cater Partnership, Moberly, Mo.

Filed Mar. 13, 1991, Ser. No. 668,936
Int. Cl.[5] B63B *7/04*
U.S. Cl. 114—352 17 Claims



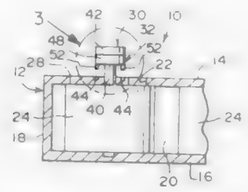
1. A knockdown boat comprising a bow section, an intermediate section and a stern section, each section having a bottom, opposite sides and fore and aft ends, a first motor mount for mounting a motor on the aft end of the intermediate section and a second motor mount for mounting a motor on the aft end of the stern section, means for selectively releasably interconnecting the bow, intermediate and stern sections end to end to form a three-section boat and for releasably interconnecting the bow and intermediate sections end to end to form a two-section boat, the motor being adapted to be mounted on the first motor mount when the boat is used as a two-section boat and on the second motor mount when the boat is used as a three-section boat, said bow, intermediate and stern sections being so dimensioned relative to one another that the bow section is nestable within the intermediate section and the intermediate section is nestable within the stern section when the sections of the boat are disconnected.

5,148,764

VCR VIDEO KEEPER

Bobby Berkenheger, 3621 N. Delay Ave., Covina, Calif. 91723, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Jul. 21, 1991, Ser. No. 733,434
Int. Cl.[5] G09S *11/02*
U.S. Cl. 116—318 2 Claims



1. A video cassette recorder index device comprising:

a) a box shaped housing having a top, bottom, side and end walls with the top wall having a plurality of spaced apart small window openings so as to form rows therealong;

b) a plurality of drums with top sides each being spaced apart and rotatable vertically within said housing;

c) indicia printed on said top sides so that said indicia can be viewed through said window openings.

d) each drum having means for manually rotating said drum within said housing and to a disired position;

e) each rotating means having means for adjustably locking said rotating means to said housing at said desired position so that said indicia can be viewed through said window openings; wherein said manually rotating means includes:

f) a shaft extending upwardly from the center of the top of said drum through the top wall of said housing; and

g) a knob affixed onto the distal end of said shaft so as to be able to manually rotate said drum; wherein said adjustably locking means includes:

h) the top wall of said housing having a plurality of radial spaced recesses about said shaft;

i) said shaft having an longitudinal slot therein;

j) a head having a tongue which slideably rides on said shaft with said tongue engagable within said slot to prevent said head from rotating about said shaft; and

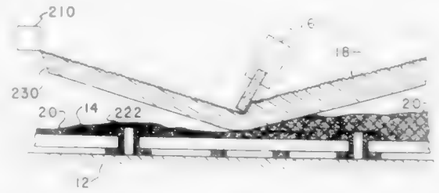
k) at least two pins spaced apart and extending downwardly from said head so that when said head is pulled all the way down on said shaft said at least two pins will enter respective recesses in the top wall of said housing to adjustably lock said drum in a stationary position within said housing to maintain a portion of said indicia of each drum at the respective small window openings in the top wall of said housing.

5,148,765

PRINTED-WIREBOARD PHOTOIMAGING

Paul L. K. Hung, Edison; John Cioffi, Middletown, both of N.J., and Mark L. Lavach, Tatamy, Pa., assignors to Elf Atochem North America, Inc., Pa.

Filed Feb. 22, 1990, Ser. No. 483,157
Int. Cl.[5] B05C *11/02*
U.S. Cl. 118—100 2 Claims



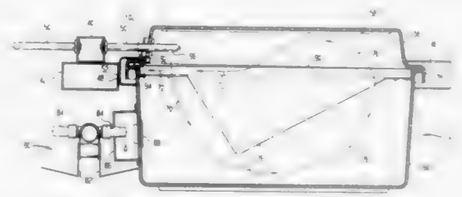
1. In apparatus for treating a printed wireboard with a solder mask, the board having circuit portions with a design topography disposed thereon, and the apparatus comprising an applicator and a support layer, the improvement which comprises a deformable layer with a plurality of surfaces with a substantial vertical deformability in at least one surface, wherein the deformable layer is substantially transparent to ultraviolet radiation.

5,148,766

VENTILATED RACK AND ANIMAL CAGE SYSTEM

Michael A. Coiro, Sr., Jacobstown; Dale R. Murray, Burlington Township, Burlington County, and Philip A. Lastowski, Hamilton Square, all of N.J., assignors to Allentown Caging Equipment Co., Inc., Allentown, N.J.

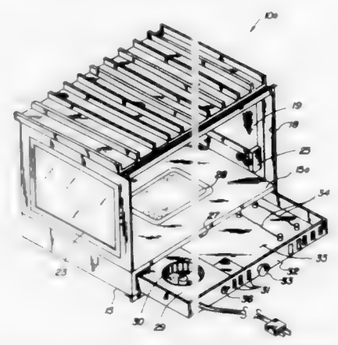
Filed Dec. 12, 1991, Ser. No. 806,146
Int. Cl.[5] A01K *1/00*
U.S. Cl. 119—17 18 Claims



1. An animal cage system comprising:

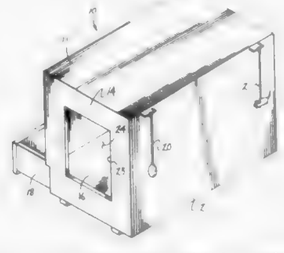
at least one cage having a top section and a bottom section that supports said top section at a periphery;
a rack for supporting said cage; and,
an air supply means including an air input means for supplying air to said cage and an air removal means for removing air from the periphery of said cage; and
a spacer bracket located between said top and bottom sections of said cage for separating said top and bottom sections to allow air to be removed from said periphery to an exhaust port after said air has circulated through said cage.

5,148,767
WINDOW MOUNTED PET ENCLOSURE
John A. Torchio, 31 Newell St., Pittsfield, Mass. 01201
Filed Jan. 23, 1992, Ser. No. 824,347
Int. Cl.[5] A01K *1/00*
U.S. Cl. 119—19 **1 Claim**



1. A window mounted pet enclosure, comprising,
the enclosure received within a window frame, wherein the window frame includes spaced frame bars receiving the enclosure, wherein the enclosure further includes spaced side walls, each side wall including a side wall opening, and an end wall, the end wall including an end wall opening, and a top wall fixedly mounted to the side walls and the end wall extending beyond the side walls and the end wall, and
a floor mounted to the side walls and the end wall spaced from the top wall, and
the top wall including a plurality of parallel ribs mounted coextensively along the top wall for directing rain water between the ribs and for strengthening the top wall, and
the enclosure further including a front wall, with the top wall canted downwardly from the front wall to the end wall for directing rain water therealong, wherein the side wall openings each include a side wall screen mesh coextensively therewithin, and the end wall opening includes an end wall screen mesh coextensively therewithin, the top wall including a top wall flange extending upwardly of the top wall adjacent the front wall, and the floor including a floor flange extending downwardly from the floor adjacent the front wall, wherein the top wall flange and the floor are arranged for reception through the window frame bars, and
the side wall openings each include a side wall transparent window plate pivotally mounted above each side wall opening, and the end wall opening includes an end wall transparent window plate, wherein each window plate includes a toggle hitch and each toggle hitch is mounted to a crank mechanism to effect displacement of the window plates from a first position in contiguous communication with the enclosure and permitting displacement of each window plate to a second position spaced from the enclosure, and
the enclosure includes an upper floor spaced above the floor, and a floor cavity is defined between the floor and the upper floor, with a slide drawer slidably mounted within the floor cavity, the slide drawer including a heating chamber within the slide drawer, and a blower motor mounted within the slide drawer adjacent the heating chamber, and the slide drawer including a slide drawer front wall, with a plurality of vents directed through the front wall for directing air through the slide drawer front wall to the blower motor, and a plurality of resistance heating elements mounted within the heating chamber, and a perforated plate mounted within the upper floor, wherein the perforated plate is positioned above the heating chamber to receive heated air from the heating chamber into the enclosure.

5,148,768
PET HOUSE APPARATUS
Michele D. Hinton, Rt. 5 Intervale, Covington, Va. 24426
Filed Oct. 18, 1991, Ser. No. 779,320
Int. Cl.[5] A01K *31/00*
U.S. Cl. 119—19 **1 Claim**



1. A pet house apparatus, comprising in combination,
an enclosure, the enclosure including a top wall, a first side wall spaced from a second side wall, a front wall spaced from a rear wall, and a top floor plate spaced from a bottom floor plate, the first side wall including at least one tether line, the at least one tether line mounted at an upper distal end of the at least one tether line to the first side wall and a lower distal end of the at least one tether line including at least one resilient toy member arranged for amusement of a pet, and
the front wall including a pet receiving entrance opening directed into a pet receiving cavity within the enclosure, and
the second side wall including a plurality of slide containers directed through the second side wall disposed between the top floor plate and the bottom floor plate, and
each slide container including a slide container front wall, each slide container front wall coplanar with the second side wall when each slide container is positioned within the enclosure, and
the rear wall includes a plurality of vent openings directed therethrough, and the top wall includes blower means fixedly mounted to the top wall to direct ventilation through the enclosure from the pet receiving entrance opening and the vent openings, and
the top floor plate is slidably mounted relative to the enclosure and is arranged for removal relative to the enclosure for access of a pet to the plurality of slide container, and
the second side wall includes a water reservoir housing and a feed housing fixedly mounted to the second side wall positioned above the top floor plate, and
the water reservoir housing includes a reservoir housing bottom wall, and a conduit directed through the bottom wall in fluid communication interiorly of the reservoir housing, and a conduit plug mounted to an upper terminal end of the conduit within the reservoir housing, wherein the plug is fixedly secured to an upper distal end of a lever plate, and the lever plate is directed through the bottom wall, wherein a lower distal end of the lever plate is positioned below the bottom wall, and the bottom wall including a seal, the seal resiliently mounting the lever plate therethrough to bias the plug onto the upper terminal end of the conduit permitting manual deflection of the plug relative to the conduit upon rotation of the lever plate within the seal, and
the feed housing includes a feed housing bottom wall, the feed housing bottom wall including a flange plate mounted to the feed housing directed below the feed housing bottom wall, and the flange plate including a flange plate boss projecting forwardly of the flange plate and positioned below the feed housing bottom wall, the flange plate boss including a rod member fixedly mounted to the flange plate boss, the rod member including an enlarged rod head mounted to an upper terminal end of the rod, and an actuator plate mounted pivotally to the rod below the rod head, and a spring captured between the actuator plate and the flange plate boss, wherein the spring is arranged in surrounding relationship relative to the rod, and the actuator plate is fixedly mounted to the feed housing bottom wall, and the feed housing bottom wall is removably mounted relative to the reservoir housing, and a pivot axle mounted to the reservoir housing orthogonally oriented relative to the actuator plate, whereupon rotation of the rod about the pivot axle effects displacement of the feed housing bottom wall relative to the feed housing.

5,148,769
AMUSEMENT DEVICE HAVING SUCTION CUP BASE AND INTERCHANGEABLE PET TOY
Alan Zelinger, Monsey, N.J., assignor to Ethical Products, Inc., Newark, N.J.
Filed Nov. 12, 1991, Ser. No. 790,504
Int. Cl.[5] A01K *15/00*
U.S. Cl. 119—29 **11 Claims**

1. A toy device for the amusement of pet animals, comprising
a suction cup base having a mounting section and a neck section, the mounting section removably affixed by suction to a supporting surface;
an elongated, generally arcuately shaped spring-like wire;
means arranged with one end of the wire and with the base neck section for removably mounting the wire to the base, whereby the wire extends substantially upwardly and sidewardly from the base;
a pet animal amusement object;
means arranged with the other end of the wire and with the amusement object for removably suspending said amusement object from said other wire end including the other wire end being formed as a loop, a split ring, the loop at the other wire end being disposed on the split ring, a generally U-shaped hook inserted in the amusement object so that a base of the hook extends from said object and said hook having a first leg and a second leg longer than the first leg so as to extend through the amusement object, with the end of the second leg terminating in a loop, and the base of the hook extending from the object being disposed on the split ring; and
the wire, the wire mounting means, the amusement object and the amusement object suspending means cooperating to provide random movement of the amusement object when said object is batted by a pet animal

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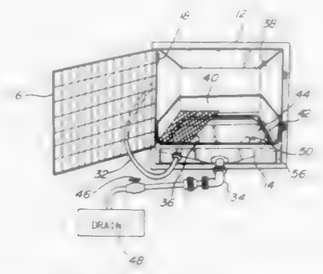
5,148,770
CHEW TOY FOR DOGS
Anthony O'Rourke, Malibu, Calif., assignor to Booda Products, Inc., Gardena, Calif.
Filed Oct. 3, 1991, Ser. No. 770,522
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—29 **6 Claims**

1. A chew toy for pets comprising a pair of hooves, each of said hooves defining a cavity therein, a length of rope defining oppositely extending end portions, each of said end portions extending into one of the cavities in one said hooves, and mean for securing each of said end portions of said length of rope within one of the cavities of said hooves such that said length of rope is secured to and extends between said hooves.

5,148,771
VETERINARIAN INFECTIOUS WASTE CONTAINMENT SYSTEM
Daniel L. Schuett, 3278 Baldwin Rd., Metamora, Mich. 48455, and John McIlmurray, 929 East Sutton Rd., Lapeer, Mich. 48446
Filed Sep. 3, 1991, Ser. No. 754,067
Int. Cl.[5] A01K *1/01*; **A61D** *11/00*
U.S. Cl. 119—17 **20 Claims**



1. A veterinarian infectious waste containment system for a sick animal comprising:
an animal cage having a closable cage door, an interior, and said interior of said animal cage having side walls;
a fluidic ingress line connected to a water supply;
a fluidic egress line connected to a drain;
a removable waste collection pan receivable in said animal cage, said waste collection pan connectable to said ingress line, having an inlet, an outlet connectable to said egress line, and means connected to said inlet for flushing said waste collection pan with water from said water supply received through said ingress line;

a shroud receivable in said anima cage, said shroud positionable on top of said waste collection pan and partially covering said interior side walls of said cage; and

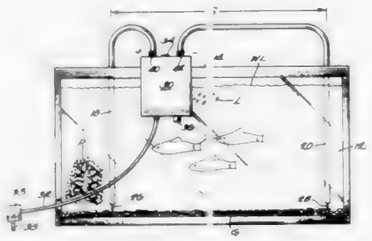
an animal resting platform supported in said animal cage by said shroud.

5,148,772

METHOD AND APPARATUS FOR ELECTRICALLY INHIBITING BACTERIA GROWTH IN AQUARIUMS

Robert N. Kirschbaum, 7036 S. Spruce Dr. West, Englewood, Colo. 80112

Filed Jan. 7, 1991, Ser. No. 638,095
Int. Cl.[5] A01K *63/04*
U.S. Cl. 119—5 9 Claims



1. An apparatus in combination with an aquarium having a sand or gravel floor for inhibiting reproduction of anaerobic bacteria in said aquarium, said apparatus comprising:

a first electrode having an exposed surface;

means for supporting said exposed surface of said first electrode adjacent the floor of the aquarium;

a second electrode having an exposed surface;

means for supporting said exposed surface of said second electrode adjacent the floor of the aquarium at a position spaced laterally from said first electrode; and

a voltage source connected to said first and second electrode for establishing a steady electrical potential between said first and second electrodes, said steady electrical potential being in the range of 0.1 to 1.0 volts;

said exposed surfaces of said first and second electrodes being dimensioned so as to provide a direct current between said first and second electrodes in the range of 0.1 to 10 milliamperes;

said direct current passing adjacent the floor of the aquarium to inhibit the reproduction of anaerobic bacteria growing adjacent thereto while avoiding inhibition of the reproduction of aerobic bacteria growing adjacent thereto.

5,148,773

FORCED AIR INCUBATOR

Fabio J. T. Ontiveros, Juarez No. 125, Tlaquepaque, Jalisco, Mexico

Filed Apr. 17, 1991, Ser. No. 699,304
Int. Cl.[5] A01K *41/00*
U.S. Cl. 119—37 7 Claims

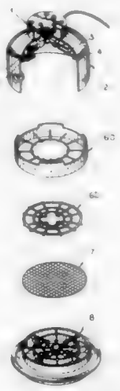
1. An incubator comprising:

a housing having a transparent dome upper portion for maintaining predetermined internal temperature and humidity conditions in the incubator and a base containing a plurality of interconnected water compartments, the number of compartments containing water being increased by raising a water level in the base;

a separator for separating said dome into a heating chamber portion and an incubation chamber portion, said heating chamber having a heat source and air circulation means, said incubation chamber receiving and enclosing eggs to be incubated;

a thermostat located in said incubation chamber and connected to said heat source for controlling the temperature in said incubation chamber;

egg turner means located in the base, said egg turner means including a ring supporting a plurality of radial wires rotatable about a vertical axis, an egg track formed by a plurality of circular tracks each formed of a ring concentric with said axis, means for rotating said supporting ring from an activation means outside said incubator and a plurality of radial stops attached across said egg track in a path of movement of eggs, whereby movement of eggs by said ring supported radial wires causes said eggs to rotate about said stops.

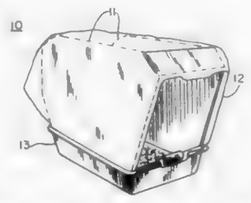


5,148,774

LITTER BAG FRAME

Walter G. Fields, 19 Village La., Middletown, N.J. 07748

Filed Mar. 30, 1992, Ser. No. 862,616
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—165 8 Claims



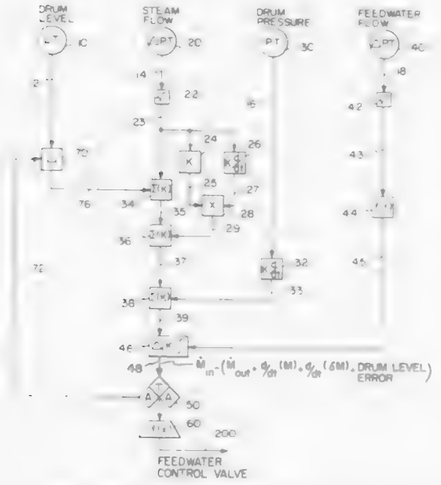
1. An enclosed litter box for domestic pets comprising; a disposable plastic bag having one open end; a supporting frame fitting within said plastic bag; said supporting frame forming a top section, a back section, and two side sections within said plastic bag; said supporting frame being open along a bottom section, with a corresponding portion of said plastic bag forming said bottom section; a layer of litter material spread over said portion of said plastic bag forming said bottom section; a front section of said frame being open at said open end of said bag, whereby a domestic animal has access through said open end of said bag to said litter material on said bottom section of said disposable plastic bag.

5,148,775

FEEDWATER CONTROL FOR DRUM TYPE STEAM GENERATORS

William J. Peet, Cambridge, Canada, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 22, 1992, Ser. No. 823,503
Int. Cl.[5] F22D *5/26*
U.S. Cl. 122—451 R 4 Claims



1. An apparatus for improving feedwater control to a drum type steam generator which undergoes load changes, comprising:

analog control means for setting a drum level set point;

drum level measuring means for measuring an actual drum level for the steam generator;

differential means connected to the analog control means and to the drum level measuring means for determining a drum level error value as a difference between the drum level set point and the actual drum level;

steam mass flow rate means for determining a steam mass flow rate for steam from the steam generator;

mass increment means for determining a rate of mass increment for the steam based on changes in steam flow;

mass increment means for determining a rate of mass increment for the steam generator based on changes in drum pressure;

feedwater flow measuring means for measuring actual feedwater flow to the steam generator;

summation means connected to the steam mass flow rate means and to the differential means for determining a proportional action sum of the drum level error value, the mass flow rate of steam and the rate of mass increment due to changes in steam flow and changes in drum pressure; and

calculation means connected to the summation means and to the feedwater measuring means for calculating adjustments to the feedwater supply based on a proportional action sum of the drum level error, the mass flow rate of steam and the rate of mass increment due to changes in steam flow and drum pressure and feedwater flow, in order to maintain a constant drum level;

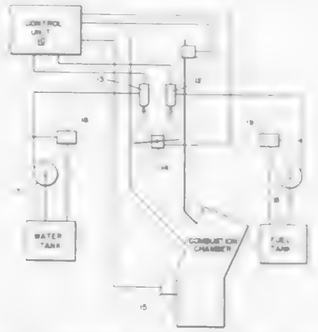
said calculation means being connected to the analog control means for supplying the adjustments to the analog control means for maintaining constant drum level while adjusting feedwater flow control to accommodate changes in load for the steam generator.

5,148,776

COORDINATED WATER AND FUEL INJECTION SYSTEM

Michael J. Connor, 8926 Simeon Ct., Upper Marlboro, Md. 20772

Filed Sep. 23, 1991, Ser. No. 764,341
Int. Cl.[5] F02B *47/02*
U.S. Cl. 123—25 J 9 Claims



1. A system for improving the efficiency of an internal combustion engine having at least one combustion chamber, an air intake manifold and an operator controlled throttle comprising:

a) at least one electronically actuated fuel injector;

b) a fuel supply reservoir communicatively connected with said fuel injector and including fuel pumping means for maintaining constant fuel pressure at the inlet of said fuel injector;

c) at least one electronically actuated water injector;

d) a water supply reservoir communicatively connected with said water injector and including water pumping means for maintaining constant water pressure at the inlet of said water injector;

e) an air flow measuring means for determining the rate of air flow through said air intake manifold;

f) means for measuring power demand operatively associated with said throttle; and

g) regulating means for controlling the rate at which atomized fuel and water are independently injected into the combustion fuel mixture of said engine, said means being operatively connected to said injectors and being responsive to both the rate of air flow in said air intake manifold and the position of said throttle, wherein the amount of water injected into said combustion fuel mixture is controlled as a function of both the amount of fuel injected and the ratio of fuel to air in said combustion fuel mixture to prevent premature detonation thereof in said combustion chamber over the operating range of said engine.

5,148,777

METHOD OF, AND APPARATUS FOR, KILLING MARINE LIFE IN AND ABOUT THE COOLING SYSTEM OF A MARINE VEHICLE

John V. Brockhurst, Angola, N.Y., assignor to JVB Development, Inc., Angola, N.Y.

Filed Jan. 27, 1992, Ser. No. 826,010
Int. Cl.[5] F01P *5/14*
U.S. Cl. 123—41.15 13 Claims

1. A method of killing marine life in the cooling system of a marine vehicle having a water-cooled internal combustion engine, said cooling system having an inlet passageway extending between an inlet port and said engine and through which cooling water is drawn and supplied to said engine in heat-exchange relation thereto, and having an outlet passageway extending between said engine and an outlet port and through

which heated cooling water from said engine is discharged, which method comprises the steps of:

providing an enclosure about said inlet and outlet ports such that water circulated through said cooling system will be drawn from, and discharged back into, said enclosure; and

operating said engine so as to cause the temperature of the water within said enclosure and said cooling system to increase to a predetermined minimum temperature;

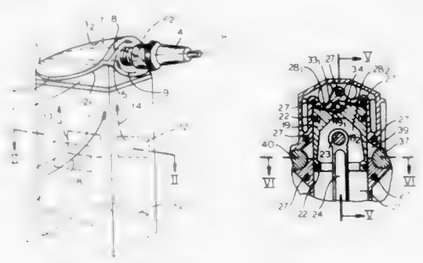
thereby to cause marine life in said enclosure and cooling system to be killed by the increased temperature of water within said cooling system and enclosure.

5,148,778

COMBUSTION CHAMBER FOR A SELF-IGNITING OR SPARK-IGNITED VALVELESS TWO-STROKE INTERNAL COMBUSTION ENGINE

Hermann Klaue, Montreux, Switzerland, assignor to Datwyler AG, Altdorf, Fed. Rep. of Germany

Filed Oct. 4, 1991, Ser. No. 771,486
Int. Cl.[5] F02B *75/02*
U.S. Cl. 123—65 R 7 Claims



1. A piston chamber assembly for a valveless two-stroke internal combustion engine comprising:

a cylinder of rectangular transverse cross section having a cylinder head at an upper end of said cylinder, said head having an underside, said cylinder having intake, exhaust and flushing slits in a wall thereof spaced from said cylinder head;

a piston of rectangular transverse cross section reciprocatable in said cylinder and having a piston crown spacedly juxtaposed with said underside in an upper dead point position of said piston and delimiting between them a combustion chamber, said piston and said cylinder having a common axis,

said piston crown and said underside defining in said position a combustion space forming part of said combustion chamber and having a configuration of a body of revolution of circular cross section centered on an axis of said space transverse to said common axis, said space being disposed along said common axis,

said piston crown and said underside being formed with respective first surfaces inclined to said common axis and tangentially extending in opposite directions from said space and offset by 180° from one another about said axis of said space,

said underside and said piston crown being each further formed with a respective second surface inclined to said common axis and juxtaposed with an opposite one of said first surfaces so as to define therewith a narrow gap squeezing respective flows in said combustion chamber into said space from opposite directions but inducing flow rotation in said space in the same sense; and

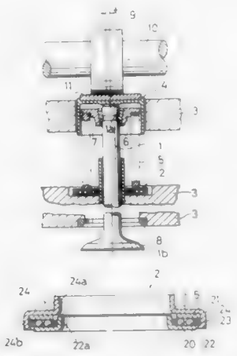
means for initiating combustion of a fuel-air mixture along said axis of said space in said combustion chamber.

5,148,779

VALVE ROTATING APPARATUS OF INTERNAL-COMBUSTION ENGINE

Hirotsugu Okuse, Chofu; Hiroshi Sato, Mitaka; Kenji Takahashi, Kashiwara, and Kazuo Uchida, Yamatotakada, all of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Apr. 30, 1991, Ser. No. 693,703
Claims priority, application Japan, May 9, 1990, 2-48512[U]
Int. Cl.[5] F01L *1/32*
U.S. Cl. 123—90.28 11 Claims



1. A valve rotating apparatus for an internal combustion engine having an engine head and a cam shaft, said apparatus comprising:

a valve;

a valve lifter attached to said valve and vertically movably disposed on the engine head;

cam means formed on the cam shaft for directly driving said valve through said valve lifter;

a thrust rolling bearing comprising:

an annular upper washer having a lower surface having a flat raceway;

an annular lower washer having an upper surface having a flat raceway, said lower washer being coaxial with said upper washer;

an annular cage held between said upper and lower washers; and

a plurality of balls held in said cage; and

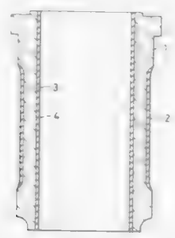
spring means for biasing said valve in the closing direction, said spring means being disposed between said valve lifter and said thrust rolling bearing.

5,148,780

CYLINDER LINER AND METHOD FOR MANUFACTURING THE SAME

Keiichi Urano, Nagano; Kazunori Mizutani, Okaya, and Nobuyuki Yamashita, Shiojiri, all of Japan, assignors to Teikoku Piston Ring Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1991, Ser. No. 813,375
Int. Cl.[5] F02F *1/00*
U.S. Cl. 123—193.2 3 Claims



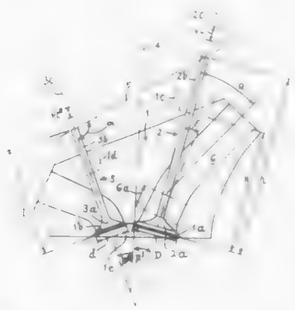
1. A cylinder liner comprising a nickel alloy plating film formed on at least a part of the liner having contact with cooling liquid on an outer peripheral surface, a nitrided layer formed on an inner peripheral surface, and said nickel alloy being an alloy selected from the group consisting of Ni-B alloy, Ni-P alloy, and Ni-Co-P alloy.

5,148,781

VALVE ARRANGEMENTS AND CYLINDER HEADS FOR INTERNAL COMBUSTION ENGINES

Sanzio P. V. Piatti, 17 Ovington Square, London SW3, United Kingdom

PCT No. PCT/GB90/00910, § 371 Date Feb. 8, 1991, § 102(e) Date Feb. 8, 1991, PCT Pub. No. WO90/15916, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 13, 1990, Ser. No. 651,214
Claims priority, application United Kingdom, Jun. 14, 1989, 8913682
Int. Cl.[5] F01L *1/04*
U.S. Cl. 123—193.5 20 Claims



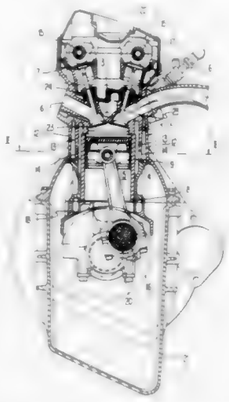
1. A cylinder head for an internal combustion engine provided with an overhead valve arrangement including poppet-type inlet and exhaust valves which are adapted to be reciprocated by at least one camshaft, the axes of the stems of the valves mutually diverging from their valve heads in directions generally transversely of the cylinder head, and defining the sides of an inverted triangle, the inverted base of which is formed by an imaginary line spanning the upper ends of the inlet and exhaust valve stems, and generally intersecting locations at which, in operation, valve-actuating forces are applied to the valve stems or their associated actuating elements, wherein the included angle (α) between the axes of the or each exhaust valve stem and said imaginary base line is approximately 90° or more, wherein the inlet valve head diameter (D) is increased, relative to the exhaust valve head diameter (d), to the extent that the inlet/exhaust valve head diameter ratio (D:d) is approximately 1.30:1 or more, and wherein the ratio of the length of the side of the triangle corresponding to the inlet valve axis, to the length of the side of the triangle corresponding to the exhaust valve axis, is approximately 1.40:1 or more.

5,148,782

CASING OF A TRUNK PISTON INTERNAL COMBUSTION ENGINE

Michael Krämer, Notzingen; Karl Zellinger, Winnenden, and Theodor Bacu, Waiblingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 21, 1991, Ser. No. 780,114
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1990, 4033623
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 R 14 Claims



1. A casing of a trunk piston internal combustion engine having a cylinder head, cylinder head cover, cylinder block and oil sump regions with bearings for the crankshaft and camshaft, wherein the cylinder block region, together with a part of the cylinder head closing each of the individual cylinder spaces at the combustion space end, is a common engine block casting which has open hollow spaces manufactured without the use of lost cores and is open in the direction of a cylinder axis at at least one end without undercut, and closing parts welded onto axial ends of the casting to close the hollow spaces and provide a closed continuous water jacket.

5,148,783

VALVE ACTUATING MECHANISM IN FOUR-STROKE CYCLE ENGINE

Tatsuya Shinkai, Hamamatsu; Kazuhiko Suzuki, and Younosuke Yokogi, both of Shizuoka, all of Japan, assignors to Suzuki Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 4, 1991, Ser. No. 664,273
Claims priority, application Japan, Mar. 8, 1990, 2-22617[U]; Mar. 23, 1990, 2-71981; Mar. 27, 1990, 2-75477
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.16 20 Claims

1. A valve actuating mechanism disposed within a four-stroke cycle engine within which exhaust and intake valves are disposed, comprising:

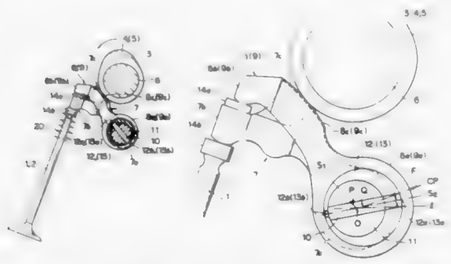
a rocker shaft rotatably supported within a cylinder head of

an engine and having eccentric large-diameter portions formed upon said rocker shaft;

rocker arm means including a first rocker arm rotatably mounted directly upon said rocker shaft, and second and third rocker arms rotatably mounted upon said eccentric large-diameter portions of said rocker shaft with said first rocker arm being interposed between said second and third rocker arms;

cam means including first, second, and third cam members which drive said first, second, and third rocker arms, respectively;

said first rocker arm being provided with a branched distal end, and said second and third rocker arms each being provided with a distal end which is respectively disposed



upon one of said distal ends of said branched distal end of said first rocker arm;

said second and third cams having the same cam profile while said first cam has a cam profile which is different from said profile of said second and third cams; and

means for rotating said rocker shaft such that axes of said eccentric large-diameter portions of said rocker shaft are always moved within one-half side of said rocker shaft between a diagonally inward limit position at which said first cam drives said first rocker arm, and a diagonally outward limit position at which said second and third cams drive said second and third rocker arms, said diagonally outward limit position being disposed at a position which is angularly disposed beyond dead points of said eccentric large-diameter portions of said rocker shaft.

5,148,784

STRUCTURE OF INTERNAL COMBUSTION ENGINE

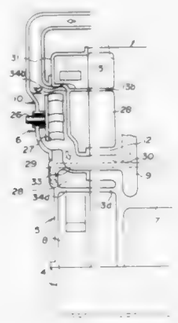
Toyoki Hiraoka, Tokyo; Syuji Kurosaka, Kawasaki, and Nobuhisa Jingu, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 18, 1991 Ser. No. 686,343

Claims priority, application Japan, May 1, 1990, 2-115407

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 C **5 Claims**



1. An internal combustion engine having a lubricating oil and a blow-by gas passing through a chain chamber, comprising:

a cylinder block having a front wall;

a chain cover, attached to said front wall of said cylinder block, for defining the chain chamber;

means for defining a coolant passage, said defining means being integrated with said front wall of said cylinder block and said chain cover, said defining means extending through the chain chamber; and

means for thermally isolating said defining means from the lubricating oil and the blow-by gas.

5,148,785

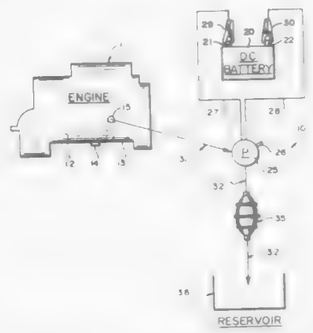
SYSTEM FOR REMOVING LUBRICATING OIL FROM AN INTERNAL COMBUSTION ENGINE OIL PAN

Ronald M. Sendak, Alexandria, Va., assignor to Sendak International Corp., Alexandria, Va.

Filed May 28, 1991, Ser. No. 705,984

Int. Cl.[5] F01M *11/04*

U.S. Cl. 123—196 R **1 Claim**



1. A portable system for removing lubricating oil from an internal combustion engine oil pan through an associated dip stick tube comprising an electric pump adapted to be driven by a source of 12 volt direct current, first and second conductor means connected to said electric pump and including means for connection to a source of 12 volt direct electrical current, first and second conduit means connected to said pump for respectively pumping oil from an associated oil pan through the dip stick tube and delivering oil to an associated reservoir, a flexible hand siphon vacuum pump in said second conduit means downstream of said pump whereby oil from the oil pan can be manually drawn into said electric pump to effect priming thereof prior to the energization of said electric pump from an associated direct electrical current, a 12 volt electric driven motor for driving said electric pump, switch means for said electric motor for energizing the same after the pump has been manually primed, said first and second conduit means being first and second tubes of synthetic polymeric/copolymeric material, said first tube being of a sufficient length to reach the bottom of an associated engine oil pan when inserted therein through an associated dip stick tube, said first tube being constructed of stiffer material than said second tube, and said first tube having a smaller internal diameter than an internal diameter of said second tube.

5,148,786

AIR INTAKE SYSTEM ARRANGEMENT OF MOTORCAR ENGINE

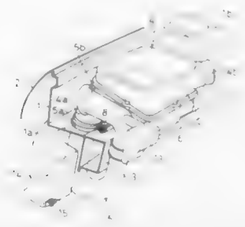
Yasuo Matsumura, and Atsushi Niimi, both of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1992, Ser. No. 817,032

Claims priority, application Japan, Jan. 21, 1991, 3-001243[U]; Jan. 21, 1991, 3-005078

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 E **20 Claims**



1. An air intake system arrangement for a motorcar engine, said air intake system having an air cleaner and an air duct to be connected to said air cleaner, characterized in that: said air cleaner is fixed at least at a part thereof to a motorcar body reinforcing member which has a closed cross-sectional shape and which is provided in an engine room; and that said air duct is disposed around said motorcar body reinforcing member.

5,148,787

RETENTION DEVICE

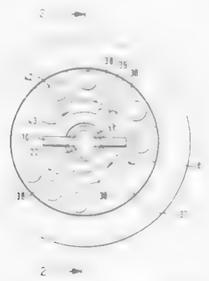
Otmar Ganser, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,417

Claims priority, application Fed. Rep. of Germany, Oct. 24. 1990, 4033803

Int. Cl.[5] F02D *9/08*

U.S. Cl. 123—337 **12 Claims**



1. A retention device for a coupling suitable for an engine load-adjustment apparatus, wherein the engine load-adjustment apparatus includes a throttle valve, a throttle-valve shaft, a throttle-valve housing, a clutch having a clutch disk, and a drive motor, wherein the throttle valve which determines the power output of an internal combustion engine and is connected, fixed for rotation, with the throttle-valve shaft mounted in the throttle valve housing, and wherein the shaft is connected via the clutch to the drive motor, one coupling part of the clutch being connected fixed for rotation with the throttle-valve shaft via the clutch disk; wherein

the retention device comprises a coupling pin, and a clamping device secured to the clutch disk; and

the clutch disk is fixed on the throttlevalve shaft by the coupling pin, and the coupling pin is retained by the clamping device for securing the clutch in radial direction on the shaft with locking forces being maintained by the coupling pin.

5,148,788

AIR-ASSIST FUEL INJECTION SYSTEM

George Saikalis, West Bloomfield; Teruo Yamauchi, Farmington Hills, and Robert W. Byers, Redford, all of Mich., assignors to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Jun. 19, 1991, Ser. No. 717,517

Int. Cl.[5] F02D *41/16;* **F02M** *23/04*

U.S. Cl. 123—339 **34 Claims**

1. A fuel injection system for an internal combustion engine, comprising:

at least one fuel injector for supplying fuel to said internal combustion engine;

a plurality of sensors for detecting various engine operating conditions, including engine speed;

fuel supply control means responsive to detected engine operating conditions for controlling said fuel injector to supply fuel to said internal combustion engine as a series of fuel pulses in time with engine operation;

a source of compressed air to be used in assisting fuel injection; and

air-assist control means responsive to detected engine operating conditions for selectively supplying compressed air from said source to compressed air to said fuel injector, so as to air-assist the fuel injection continuously for at least one engine operating condition and intermittently for another engine operating condition, and for providing no air-assist in the case of a further engine operating condition.

5,148,789

GOVERNOR DEVICE OF DIESEL ENGINE

Yasunori Shiraishi; Masahiro Nagahama; Mutsumi Murata; Yuzo Umeda; Setsuo Yamada, and Kazuyoshi Morioka, all of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Nov. 6, 1990, Ser. No. 609,570

Claims priority, application Japan, Nov. 7, 1989, 1-290753; Dec. 19, 1989, 1-329211

Int. Cl.[5] F02D *31/00*

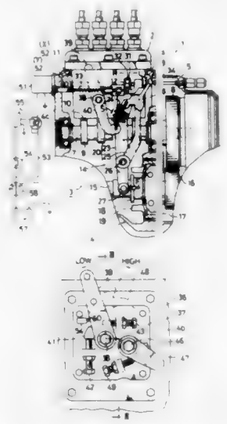
U.S. Cl. 123—367 **6 Claims**

1. An improved governor device of a diesel engine having a fuel injection pump and a control rack of said fuel injection pump adapted to be resiliently urged to a fuel increasing side by a governor spring and to be pushed to a fuel decreasing side in response to an input from an engine speed detecting means, wherein a tension force of said governor spring is adjusted by a speed control member, the improvement comprising:

a fuel limiting actuation member, responsive to quick engine acceleration, which operates to prevent an excessive fuel injection;

first means for detecting a selected time lapse; and

second means for detecting a position of an engine acceleration control element, coacting with said first means and said fuel limiting actuation member at a fuel limiting position during lapse of a predetermined time at least from the time that a predetermined quick engine acceleration is detected to actuate said fuel limiting actuation member to a fuel limitation cancelling position after lapse of said predetermined time, wherein



when a target value for a speed related parameter of the diesel engine exceeds a predetermined low speed range, said second means responds to generate an output to cause movement of the fuel limiting actuation member from said fuel limitation cancelling position to said fuel limiting position during said predetermined time depending on the detection of an excess over said target value, and

said second means is mounted in a speed control transmission system so as to make direct contact with said acceleration control element and comprises a limit switch.

5,148,790

LOAD ADJUSTMENT DEVICE

Gerd Hickmann, Schwalbach/Ts, and Manfred Pfalzgraf, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 781,753

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1990, 4034575

Int. Cl.[5] F02D *7/00*

U.S. Cl. 123—399 10 Claims

1. A load adjustment device comprising

a throttle valve which determines the output power of an internal combustion engine;

a throttle-valve housing and a throttle-valve shaft mounted in said housing, said throttle valve being connected, fixed for rotation, with said throttle valve shaft;

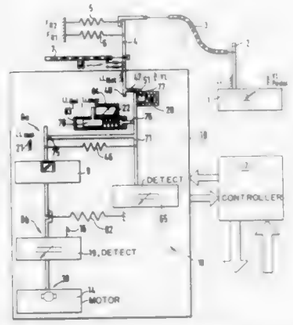
a control element, the throttle-valve shaft being acted on by said control element;

an accelerator pedal and a driver coupled to said accelerator pedal, said control element cooperating with said driver;

an electronic control device and an electric motor cooperating with said control device, said control element being controllable by means of said electric motor;

a first idle stop at maximum idle speed and a second idle stop which is displaceable between an emergency idle speed and maximum idle speed;

wherein a displacement path of said driver is limited by said first idle stop and, upon application of said driver against



said first idle stop, said control element is moveable within an idle control range relative to said driver by means of said electric motor; and

said driver is moveable toward minimum idle direction to contact said second stop.

5,148,791

METHOD OF ELECTRONIC ENGINE CONTROL FOR INTERNAL COMBUSTION ENGINE HAVING A PLURALITY OF CYLINDERS

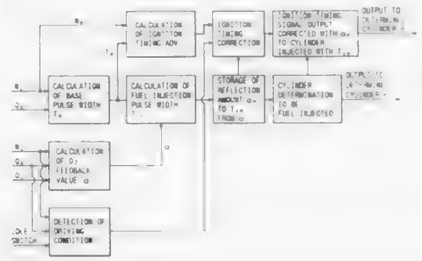
Masami Nagano, and Masahide Sakamoto, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1991, Ser. No. 762,331

Claims priority, application Japan, Sep. 19, 1990, 2-247573

Int. Cl.[5] F02P *5/15*; F02D *41/14*

U.S. Cl. 123—417 6 Claims



1. A method of an electronic engine control for an internal combustion engine having a plurality of cylinders comprising the steps of:

sequentially taking in engine parameters for the respective cylinders representing the engine operating conditions at corresponding separate timings;

determining base fuel amounts to be injected to the respective cylinders based upon the corresponding engine parameters taken in for the respective cylinders;

correcting the determined based fuel amounts for the respective cylinders with respective O_2 feed back coefficients obtained at predetermined sequential moments;

determining base ignition timings for the respective cylinders immediately after the fuel injection of the corrected fuel amounts based upon the same engine parameters as used for determining the corresponding base fuel amounts for the respective cylinders; and

correcting the determined base ignition timings for the respective cylinders by making use of the same O_2 feed back coefficients as used for correcting the corresponding base fuel amounts for the respective cylinders.

5,148,792

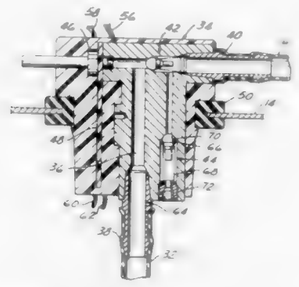
PRESSURE-RESPONSIVE FUEL DELIVERY SYSTEM

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Jan. 3, 1992, Ser. No. 816,730

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—497 4 Claims



1. A fuel delivery system for an internal combustion engine that includes:

a fuel supply with a fuel pump responsive to application of electrical power for supplying fuel under pressure,

fuel delivery means on the engine,

a fuel line having one end connected to an outlet of said pump and a second end connected to said fuel delivery means,

a check valve in said fuel line for preventing reverse flow of fuel from said delivery means to said pump,

means for applying electrical power to said pump, including a sensor coupled to said line between said check valve and said pump for providing an electrical signal as a function of fuel pressure at said pump outlet and means for applying electrical power to said pump as a function of said signal, and

fuel bypass means coupled to said fuel line between said pump outlet and said check valve for providing a restricted fuel flow path from said pump outlet parallel to said line, such that fuel continues to flow through said bypass means and said pump continues operation in the absence of fuel demand at said fuel delivery means.

5,148,793

COMPARTMENTAL EVAPORATIVE CANISTER AND PRESSURE CONTROL VALVE ASSEMBLY

S. Raghuma Reddy, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 20, 1991, Ser. No. 702,859

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—520 9 Claims

1. A fuel vapor storage canister assembly for an engine fuel system, comprising:

a main vapor storage compartment,

an auxiliary vapor storage compartment,

a vapor inlet/outlet aperture to the main compartment, and adapted for connection to a fuel tank and a source of engine vacuum,

an atmospheric vent opening to the auxiliary compartment,

a connective means between the main compartment and the auxiliary compartment, and

a control valve, comprising a diaphragm and spring, in the connective means between said main compartment and the auxiliary compartment, and

wherein said control valve is biased to prevent vapors from flowing from the main compartment into said auxiliary compartment, and is responsive to pressure in the main compartment to permit the diaphragm to unseat from against the connective means and allow the connective

means to be open when the pressure in the main compartment reaches a selected level, whereby substantially all vapor is collected in the main compartment.

5,148,794

FUEL AGITATING DEVICE FOR INTERNAL COMBUSTION ENGINE

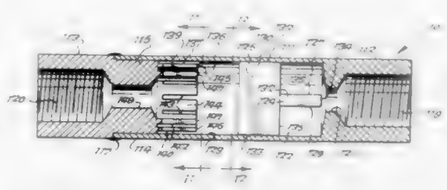
Douglas G. Scouten, 2665 Spring St., Niagara Falls, N.Y. 14305

Continuation-in-part of Ser. No. 547,806, Jul. 2, 1990, Pat. No. 5,069,191. This application Nov. 21, 1991, Ser. No. 795,520

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] F02M *33/00*

U.S. Cl. 123—538 16 Claims



1. An agitator for fuel being conducted to an internal combustion engine comprising a casing, a fuel inlet conduit in said casing, a fuel outlet conduit in said casing, a chamber within said casing between said fuel inlet conduit and said fuel outlet conduit, flow divider means in said chamber for dividing said chamber into a plurality of fuel flow paths on opposite sides thereof, an inner wall in said casing defining said exit portion, flange means in said casing within said chamber and spaced radially inwardly from said inner wall, and conduit means within said flange means for conducting fuel to said outlet conduit.

5,148,795

APPARATUS FOR CONTROLLING HEATER FOR OXYGEN SENSOR

Toshinari Nagai; Hiroshi Tanaka, both of Susono, and Makoto Suzuki, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 9, 1991, Ser. No. 773,718

Claims priority, application Japan, Oct. 12, 1990, 2-274095

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—697 11 Claims

1. An apparatus for controlling a heater for an oxygen sensor which is fastened to an exhaust passage of an internal combustion engine, said oxygen sensor having a sensor output signal indicating an air-fuel ratio of a mixture including fuel and air, said oxygen sensor including an oxide semiconductor element

having a resistance varying based on a change in a concentration of oxygen in the exhaust passage and including a heater for heating the oxide semiconductor element, said apparatus comprising:

heater control means for detecting a heater resistance value of said heater and for controlling said heater so that a detected resistance value of said heater is equal to a target resistance value;

specific operating condition detecting means for detecting a specific operating condition of the internal combustion engine where the air-fuel ratio is other than a stoichiometric air-fuel ratio; and

target resistance value changing means, coupled to said heater control means and said specific operating condition detecting means, for changing said target resistance value when the air-fuel ratio in the specific operating condition indicated by said sensor output signal is outside a normal range of air-fuel ratio which should be detected in the specific operating condition.

5,148,796

ARROW REST BEING LATERALLY ADJUSTABLE AND INSTANTLY REPLACEABLE IN A PREDETERMINED FIXED POSITION

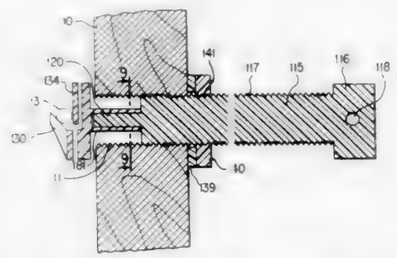
Miroslav A. Simo, 370 N. Delaplaine Rd., Riverside, Ill. 60546

Continuation of Ser. No. 418,190, Oct. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 170,161, Mar. 18, 1988, Pat. No. 4,881,515, which is a continuation-in-part of Ser. No. 57,383, Jun. 2, 1987, Pat. No. 4,809,670, which is a continuation-in-part of Ser. No. 788,486, Oct. 17, 1985, Pat. No. 4,732,135, which is a continuation-in-part of Ser. No. 482,186, Apr. 5, 1983, Pat. No. 4,548,188. This application Apr. 26, 1991, Ser. No. 693 776

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—44.5 **29 Claims**



1. In an arrow rest fixedly mounted with respect to an archery bow, the arrow rest having quick disconnect means comprising:

an elongated female adapter having one end secured to the arrow rest and an opposite end extending away from the arrow rest;

an elongated male adapter having one end fixable in a non-rotatable position with respect to a bow handle of the archery bow and an opposite end extending outward from said bow handle; and

said female adapter having an internal bore with a non-circular internal cross section, said male adapter having a non-circular external cross section compatible for mating with said female adapter, in a mated position said female adapter being non-rotatable with respect to said male adapter, and said male adapter forming an interference fit with said female adapter for repeatedly and instantly replacing the arrow rest in a precisely consistent and fixed position with respect to the archery bow.

5,148,797

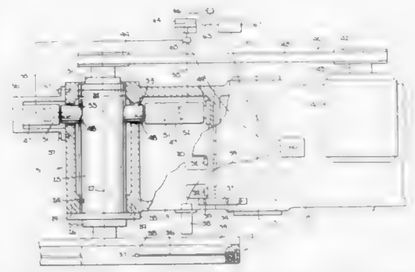
MOUNTING FOR AN INTERNAL DIAMETER SAW BLADE

Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Mar. 14, 1991, Ser. No. 669,034

Int. Cl.[5] B24B *7/20;* **B28D** *5/00*

U.S. Cl. 125—13.02 **23 Claims**



1. A mounting for an internal diameter saw blade comprising

a first housing part having a bore for mounting on a stationary shaft about a first fixed axis;

a second housing part having a bore for receiving a spindle on a second axis parallel to said first axis;

a spindle rotatably mounted in said second housing part on said second axis and having a free end projecting from said second housing part to mount an internal diameter saw blade on said second axis;

first means for pivotally mounting said second housing part relative to said first housing part on a pivot axis perpendicular to said first axis and said second axis; and

second means for imposing a force on said spindle within said second housing part perpendicular to said second axis to deflect said free end thereof laterally of said second axis.

5,148,798

STOVE FOR BURNING SOLID FUEL

Gerardus J. A. de Kock, Heesch, Netherlands, assignor to Oliehandel de Kock B.V., Heesch, Netherlands

Filed Jun. 24, 1987, Ser. No. 65,763

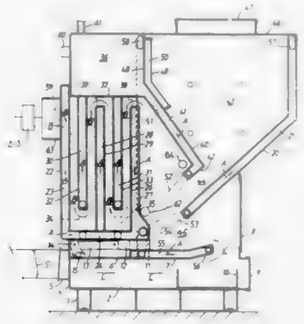
Claims priority, application Netherlands, Jun. 26, 1986, 8601677

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[5] F24B *1/08*

U.S. Cl. 126—10 **23 Claims**

1. A stove for burning solid fuel, such as coke or coal, comprising a feed hopper for storing a stock of fuel and a supporting member for supporting fuel present in a fire place, the feed hopper being in communication near its lower side with the space incorporating the fire place via a downwardly sloping fuel supply channel, which is bounded by boundary walls which are arranged one above the other and are interspaced by a distance of between 7–11 cms, whilst the arrangement further includes a passage for the supply of primary combustion air near the lower side of the combustion chamber and an inlet passage for the supply of secondary combustion air above the combustion chamber, characterized, in that the lowermost point of the lower boundary wall of the fuel supply channel is located at a distance of between 15–25 cms from the supporting member disposed therebelow, whilst the primary combustion air is sucked-in with the aid of a fan disposed upstream of the combustion chamber from the passage for supplying the primary combustion air, which passage is automatically closed by a valve when the fan is made inoperative.



5,148,799

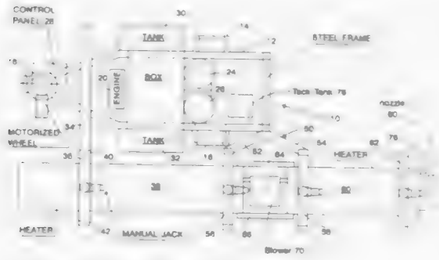
INFRARED ASPHALT HEATER

Eric R. St-Louis, Dollard-Des-Ormeaux; Jonathan P. St-Louis, and Kai G. St-Louis, both of Terrebonne, Quebec, all of Canada, assignors to Equipments St. Louis & Fils, Inc., Laval, Canada

Filed Apr. 23, 1991, Ser. No. 690,141

Int. Cl.[5] F23C *5/00*

U.S. Cl. 126—271.2 A **15 Claims**



1. An asphalt heating unit, comprising:

a self-propelled vehicle frame with vehicle wheels, a front, two sides and a rear end;

asphalt heating chamber means for generating heat to heat and soften asphalt pavement;

heater support means removably attached to said vehicle frame for holding the heating chamber means off to the side of the vehicle frame, whereby the heating chamber means are located entirely and only at a vehicle flank out of the path of the vehicle wheels;

adjustable support mechanism attached to said heating chamber said support mechanism having wheels on opposite sides of said heating chamber for engagement with a roadway and means for adjusting the height of the heating chamber from the roadway;

wherein said heating chamber means generates sufficient heat to heat the asphalt to a temperature sufficient to provide a bonding of newly laid and previously laid asphalt at a junction line at the vehicle flank while the vehicle is in motion.

5,148,800

APPARATUS FOR THE CONTINUOUS PASSIVE ARTICULATORY MOBILIZATION OF THE FOOT OF NEW-BORN BABY OR CHILD TECHNICAL DOMAIN

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PCT No. PCT/FR90/00219, § 371 Date Nov. 30, 1990, § 102(e) Date Nov. 30, 1990, PCT Pub. No. WO90/11750, PCT Pub. Date Oct. 18, 1990

PCT Filed Mar. 29, 1990, Ser. No. 613,650

Claims priority, application France, Mar. 30, 1989, 8904443

Int. Cl.[5] A61H *1/02*

U.S. Cl. 128—25 B **10 Claims**

1. Apparatus for continuous passive articulatory mobilization of the foot of a new-born baby or child, said food defining three mutually perpendicular axes of articulation, including an axis of articulation in flexion, an axis of articulation in abduction-adduction, and an axis of articulation in supination-pronation, wherein said apparatus comprises:

a mobilization assembly, including:

means including a sole for receiving said foot;

means for mounting said sole on a first support to pivot around the axis of articulation in flexion and the axis of articulation in abduction-adduction;

means for mounting said first support on a second support to pivot around the axis of articulation in supination-pronation;

a support console;

a cradle; and

means for mounting the cradle on the support console,

wherein said first support comprises a plate mounted on the second support by an abduction-adduction pivot said plate including an extension, the second support includes a beam mounted on an arm to pivot around the supination-pronation axis of articulation, said arm extending laterally with respect to said cradle and being mounted to pivot with said cradle; and

an operating system including:

a driving member mounted on the cradle and capable of being rotatably driven;

means for rotatably driving the driving member;

means including connecting rod members of adjustable length for connecting the cradle to at least said second support and said extension of the plate to convert rotary movement of said driving member into rectilinear movement of said connecting rod members, thereby causing pivotal movement of said second support and said extension around at least the respective abduction-adduction and supination-pronation axes; and

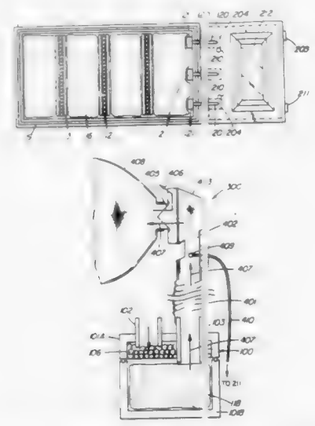
means for adjusting the length of the connecting rod members in order to adjust amounts by which the second support and extension are pivoted in response to said rectilinear movement of said connecting rod members.

5,148,801

ELECTRONIC HEATER-HUMIDIFIER FOR HYPOTHERMIA TREATMENT

Robert J. Douwens, Quathiaski Cove, and John S. Hayward, Victoria, both of Canada, assignors to University of Victoria, Victoria, Canada

Filed Mar. 23, 1990, Ser. No. 499,941
Int. Cl.[5] A61M 16/10, 15/00; A62B 7/00, 18/02
U.S. Cl. 128—203.16 14 Claims



1. An electronic heater/humidifier for hypothermia treatment comprising a casing provided with

(a) a heat exchanger system comprising an upper compartment loaded with a tangled mass of high heat conductivity material, and serially-interconnected thereto, at least two serially-interconnected lower compartments, each such lower compartment being open at the bottom to a water reservoir and containing at least one heater element for heating water in the water reservoir, and a porous hydrophilic batt;

(b) an air flow path between an air inlet and an air outlet providing a one-way-flow airway system comprising an upper air flow path through said tangled mass of high heat conductivity material in said upper compartment, to transfer heat obtained conductively from the heater elements for pre-heating the incoming air, and a lower air flow path through said at least two porous hydrophilic batts, for transferring heated water to the site of vaporization in the air flow path by wicking action;

(c) an inhalate thermal sensor located within the air stream of the air outlet, to monitor continuously the temperature of said air stream; and

(d) heater control mean including a high-limit thermal sensor to control electric power to said electric heaters, dependent on the temperature sensed by said inhalate thermal sensor.

5,148,802

METHOD AND APPARATUS FOR MAINTAINING AIRWAY PATENCY TO TREAT SLEEP APNEA AND OTHER DISORDERS

Mark H. Sanders, and Ronald J. Zdrojkowski, both of Pittsburgh, Pa., assignors to Respironics Inc., Murrysville, Pa.

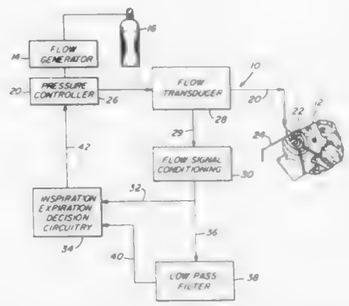
Filed Sep. 22, 1989, Ser. No. 411,012
Int. Cl.[5] A61M 16/00
U.S. Cl. 128—204.18 26 Claims

1. A method of providing breathing gas from a source for breathing by a patient who is breathing in repeated breathing cycles each including an inspiratory phase and an expiratory phase comprising the steps of:

supplying such breathing gas to the airway of such a patient at a positive pressure at least equal to ambient atmospheric pressure to maintain the patient's airway at a positive pressure substantially continuously throughout said repeated breathing cycles;

continually monitoring the flow of such breathing gas between such a source and the airway of such a patient;

from said monitoring, continually determining the instantaneous flow rate and the average flow rate of such breathing gas flowing between such a source and the airway of such a patient;



utilizing said instantaneous flow rate and said average flow rate to identify the occurrence of said inspiratory and expiratory phases; and

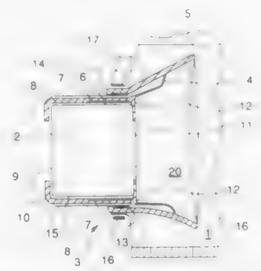
coordinating the patient's airway pressure with said occurrence of each said inspiratory and expiratory phase to maintain said positive pressure in the patient's airway substantially continuously during a sequence of said inspiratory and said expiratory phases with the magnitude of said positive pressure maintained during each said expiratory phase of said sequence being less than the magnitude of said positive pressure maintained during each immediately preceding inspiratory phase, respectively.

5,148,803

RESPIRATOR MASK WITH EASY-TO-CHANGE RESPIRATOR FILTER

Joachim Schlobohm, Salinenstrasse 7, D-2060 Bad Oldesloe, Fed. Rep. of Germany

Filed Jun. 18, 1991, Ser. No. 717,024
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1990, 4020127
Int. Cl.[5] A62B 7/10
U.S. Cl. 128—205.27 9 Claims



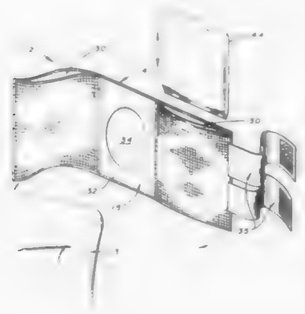
8. A respirator mask construction with a respirator filter, comprising: a respirator connection including a bellows sealing off an interior space of the mask against the surrounding atmosphere, said bellows being connected to a rigid cuff and surrounding the respirator filter at an end of said bellows facing the interior space of the mask, said cuff being connected to an elastic sleeve providing a continuation of said cuff surrounding the respirator filter, wherein the respirator filter can be inserted into or removed from the cuff when said elastic sleeve is folded back and fixed in a folded back position, said respirator filter together with said sleeve can be pushed into a mask body of the mask along a guide ring provided in the respirator connection, the length of insertion of said filter with the sleeve into the mask body being determined by the length of said bellows.

5,148,804

DEVICE, SYSTEM, AND METHODS FOR APPLYING CRYOTHERAPY

Dennis M. Hill, 23931 SW. 25th Ct., Issaquah, Wash. 98027, and Jerry L. Spence, 11308 - 101st Pl. Northeast, Kirkland, Wash. 98033

Filed Jun. 28, 1990, Ser. No. 546,110
Int. Cl.[5] A61F 7/00
U.S. Cl. 128—402 8 Claims



1. A device used to apply cryotherapy, comprising:

a) a rectangular-shaped wrap structure capable of being at least partially wrapped around a joint, said wrap structure having a central region, a first and second vertical edge, and an upper and lower horizontal edge, said wrap structure being made of a single sheet of flexible material and having an inside and an outside surface;

b) two pockets formed on said inside surface of said wrap structure, each said pocket being located on opposite sides of said central region, each said pocket being formed by attaching a cover made of thin, flexible mesh material, said mesh material having openings with a sufficient diameter to enable a portion of a gel pack inserted into each said pocket to touch the skin surface around said joint, and to make said mesh material sufficiently flexible to enable the insertion or removal of said gel pack from said pocket during use, each said pocket having an unattached extending edge thereby creating an opening into each said pocket;

c) two gel packs, one said gel pack being placed into each said pocket;

d) a passage located on said central region and approximately equal distance between said pockets, said passage having a sufficient size and shape to enable a portion of said joint to be partially extended through so that said device is aligned on said joint with said cooling vehicles disposed on substantially opposite sides of said joint when said device is attached to said joint;

e) two elastic straps having an attached end and a detachable end, said attached end being permanently attached to said second vertical edge of said wrap structure, each said strap capable of being placed around said joint and adjustably connected to said outside surface of said wrap structure on the opposite side of said device, said elastic straps having a sufficient length so that said pockets are disposed on substantially opposite sides of said joint when said device is attached to said joint and;

f. a pad-shaped hook connector attached to said inner surface of each said strap near said detachable end, and;

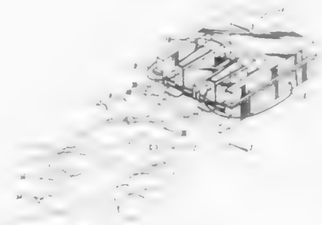
g. a pad-shaped loop connector located on said outside surface of said wrap structure on said side of wrap structure near said first vertical edge, said pad-shaped loop connector being capable of releasably engaging said pad-shaped hook connector on each said strap to adjustable connect each said detachable end of each said strap thereto.

5,148,805

DEFIBRILLATOR PAD SYSTEM AND METHOD FOR USING SAME

Lorne C. Scharnberg, West Des Moines, Iowa, assignor to Kas Products, Inc., Des Moines, Iowa

Filed Feb. 11, 1991, Ser. No. 653,360
Int. Cl.[5] A61N 1/04
U.S. Cl. 128—419 D 10 Claims



1. A method for using a defibrillator pad system with a pair of defibrillator paddles, each of said paddles having an electrode surface, said defibrillator pad system comprising a pair of first pad members, each comprising a first sheet member having upper and lower surfaces and a first electrically conductive member operatively secured to said upper surface of said first sheet member, said first electrically conductive member having a surface area less than the surface area of said electrode surfaces of each of said defibrillator paddles, said upper surface of said first sheet member being tacky so as to adhere to said electrode surfaces and having a surface area greater than said electrode surfaces of each of said defibrillator paddles; a pair of elongated flexible electrical connectors each having first and second opposite ends; a pair of second pad members, each comprising a second sheet member having an upper and a lower surface, an electrically second conductive member attached to said lower surface of said second sheet member, at least one of said second conductive member and said lower surface of said second sheet member being tacky so as to readily adhere to a patient's skin and hold said second conductive member in electrical contact therewith; first securing means electrically connecting said first ends of connectors to said first electrically conductive members of said first pad members; second securing means electrically connecting said second ends of said connectors to said second conductive members of said second pad members, said method comprising:

placing said upper surfaces of said pair of first pad members and said first electrically conductive members in facing engagement with said electrode surfaces of said defibrillator paddles whereby said tackiness of said upper surfaces of said first sheet members will secure said upper surfaces of said first sheet members in covering relation over said electrode surfaces and will hold said first conductive members in electrical contact with said electrode surfaces;

placing said lower surfaces of said second sheet members and said second conductive members in facing contact with a patient's skin at desired locations for defibrillating said patient's heart, whereby said tackiness of said one of

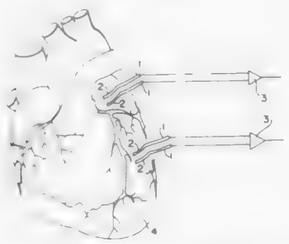
said second conductive members and said lower surfaces of said second sheet members causes said second pad members to be secured to said patient's skin at said desired locations with said second conductive members being in electrical contact with said patient's skin at said locations.

5,148,806

ELECTRODE FOR USE WITH A LIVING BODY

Yasuhiro Fukui; Kazuyuki Mitsui, both of 2-2, Nisiki-Cho, Kanda, Chiyoda-Ku, Tokyo 101; Hiroshi Kato, and Yoshihiro Chikamori, both of 123, Minamigutta, Yoshinaga-Cho, Wake-Gun, Okayama-Ken 709-02, all of Japan

Filed Dec. 22, 1989, Ser. No. 456,113
Claims priority, application Japan, Dec. 23, 1988, 63-325510
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—639 15 Claims



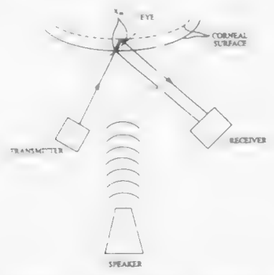
1. A conductive electrode for use on a living body, comprised of a porous, water vapor permeable material containing 5 to 90 percent by weight polytetrafluoroethylene and 10 to 95 percent by weight conductive powder.

5,148,807

NON-CONTACT TONOMETER

Hsiung Hsu, Columbus, Ohio, assignor to Ohio State University, Columbus, Ohio

Filed Aug. 28, 1990, Ser. No. 574,213
Int. Cl.[5] A61B *3/16*
U.S. Cl. 128—645 15 Claims



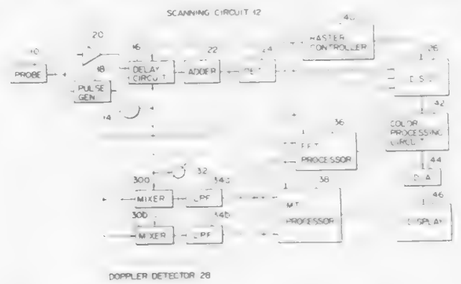
1. A tonometer for use in the non-contact measurement of intraocular pressure of an eye comprising, in combination:
means for producing a low frequency perturbating acoustic wave adapted to be positioned proximate a fixed eye wherein such perturbating acoustic wave is directed toward the eye for causing a vibration on the surface of the eye, the intensity of the vibration being dependent upon the intraocular pressure;
means for transmitting a high frequency wave adapted to be positioned proximate said perturbating wave producing means and the eye, such high frequency wave being transmitted toward the eye for reflection off the perturbated surface of the eye;
means for receiving such reflected high frequency wave and for detecting any modulation in the phase angle of such high frequency wave created by the acoustic vibration of the surface of the eye;
means for creating an output signal based upon such phase angle modulation; and
means for displaying such output signal for viewing.

5,148,808

ULTRASONIC DIAGNOSTIC APPARATUS DETECTING DOPPLER SHIFT

Nozomi Satake, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 25, 1990, Ser. No. 529,438
Claims priority, application Japan, May 29, 1989, 1-135509
Int. Cl.[5] A61B *8/06*
U.S. Cl. 128—660.05 11 Claims



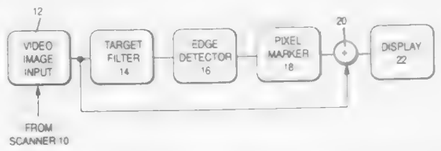
1. An ultrasonic diagnostic apparatus comprising:
means for scanning ultra-sonic waves in a section of an object under examination;
means for detecting the intensity of reflected ultrasonic waves from the object to obtain a tomography image;
means for detecting Doppler shifts of the reflected ultrasonic waves;
means for displaying blood flow in colors in the tomography image obtained by said intensity detecting means according to the Doppler shifts detected by the detecting means;
means for analyzing a frequency spectrum of the Doppler shifts of the reflected ultrasonic waves from a given point in the tomography image; and
transmission direction control means for setting a transmission direction of the ultrasonic waves to one of the direction required for displaying the blood flow in colors and the direction required for analyzing the frequency spectrum in a predetermined order.

5,148,809

METHOD AND APPARATUS FOR DETECTING BLOOD VESSELS AND DISPLAYING AN ENHANCED VIDEO IMAGE FROM AN ULTRASOUND SCAN

Robert M. Biegeleisen-Knight, Boca Raton, and Keith A. Duke, West Palm Beach, both of Fla., assignors to Asgard Medical Systems, Inc., Boca Raton, Fla.

Filed Feb. 28, 1990, Ser. No. 486,603
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.07 16 Claims



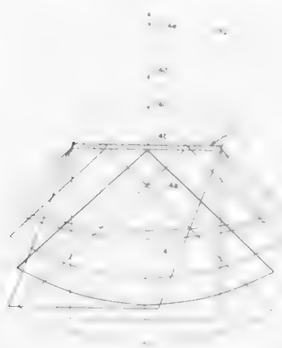
1. An apparatus for detecting blood vessels and displaying enhanced video images thereof based upon video images of an ultrasound scanner of subcutaneous blood vessels comprising:
means for receiving an input video image from said video images of said ultrasound scanner of subcutaneous blood vessels;
an edge detector, coupled to said means for receiving, sensing gradients in pixel values in a predetermined portion of said input video image and marking transitional pixels at predetermined gradients representing at least a portion of a vascular wall about a lumen of a blood vessel; and
means for concurrently displaying said video images of said ultrasound scan and the marked transitional pixels, said marked pixels being displayed in a contrasting color compared to the concurrently displayed images from said ultrasound scanner,
wherein said video images from an ultrasound scanner are a sequential plurality of scan video images, said means for receiving, edge detector and means for displaying utilizing a sequential plurality of input video images, corresponding to said plurality of scan video images, and said edge detector marking respective, sequential transitional pixels for at least predetermined, periodic ones of said sequential plurality of input video images; said means for displaying overwriting intermediate ones of said sequential plurality of input video images with the marked sequential transitional pixels.

5,148,810

VARIABLE ORIGIN-VARIABLE ANGLE ACOUSTIC SCANNING METHOD AND APPARATUS

Samuel H. Maslak, Redwood City; Hugh G. Larsen, Palo Alto; Joel S. Chaffin, Saratoga; Paul E. Chandler, Santa Cruz; Ian A. Galton, Pasadena, and Mehebub S. Karmali, Fremont, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 478,573, Feb. 12, 1990. This application Jul. 13, 1990, Ser. No. 552,019
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—661.01 21 Claims



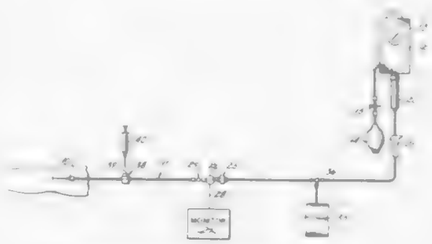
1. A method for scanning an array of individual transducer elements for obtaining image, velocity or various data from a section of a body comprising the steps of
propagating acoustic pressure waves into the body from at least one active transmit aperture of individual transducer elements,
receiving acoustic echoes on a set of acoustic lines the centers of which are spatially non-overlapping, including the step of steering the angle of each acoustic line relative to the array, using for each line a variable active aperture of individual transducer elements which selectively includes only some or all elements of the array,
so that an extension of the acoustic line in space beyond its origin at the array passes through a substantially common vertex which is not located on the transducer array.

5,148,811

METHOD AND APPARATUS FOR SAMPLING BLOOD AND FOR MONITORING BLOOD PRESSURE

Phillip D. Messinger, Powell, Ohio, assignor to Medex, Inc., Hilliard, Ohio

Continuation-in-part of Ser. No. 524,224, May 15, 1990, Pat. No. 5,048,537. This application Sep. 4, 1990, Ser. No. 577,153
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—673 5 Claims



1. A blood sampling system comprising:
a catheter for insertion into a patient's blood vessel,
a source of saline solution,
tubing connecting said source to said catheter,
a stopcock in series with said tubing,
a saline solution collection bag connected to said stopcock,
said stopcock selectively connecting said catheter to said source or said catheter to said collection bag, and
a sampling site in said tubing between said catheter and said stopcock.

5,148,812

NON-INVASIVE DYNAMIC TRACKING OF CARDIAC VULNERABILITY BY ANALYSIS OF T-WAVE ALTERNANS

Richard L. Verrier, Bethesda, and Bruce D. Nearing, Rockville, both of Md., assignors to Georgetown University, Washington, D.C.

Continuation-in-part of Ser. No. 659,711, Feb. 20, 1991, abandoned. This application Sep. 30, 1991, Ser. No. 768,054
Int. Cl.[5] A61B *5/0452*
U.S. Cl. 128—704 28 Claims

1. A method of analyzing an ECG having a plurality of R-R intervals for dynamic tracking of cardiac vulnerability, comprising the steps of:
sampling said ECG signal;

predicting the location in said ECG signal of the T-wave in each R-R interval;

partitioning each T-wave in said ECG signal into a plurality of time divisions;

summing the samples in each of said time divisions of said ECG signal;

forming a time series for each of said time divisions, each time series including corresponding sums from corresponding time divisions from successive ones of said T-waves; and

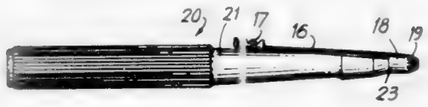
performing dynamic estimation on each said time series to estimate the amplitude of beat-to-beat alternation for each said time division.

5,148,813

BIOPSY INSTRUMENT WITH TISSUE SPECIMEN RETAINING AND RETRIEVAL DEVICE

Brian D. Bucalo, 1010 South Ocean Blvd., Pompano, Fla. 33062

Filed Nov. 20, 1990, Ser. No. 616,220
Int. Cl.[5] A61B 10/00
U.S. Cl. 128—754 3 Claims



1. A biopsy instrument, comprising:

a tissue penetrating device including an elongated holder and a tubular cutting member connected to one end of said holder and having a cutting edge for penetrating tissue, said cutting edge being shaped so as to substantially enclose a portion of penetrated tissue within said cutting member; and

a specimen retaining and retrieval device detachably connected to said tissue penetrating device for separating a specimen of tissue including tissue enclosed within said cutting member for surrounding tissue and for withdrawing, upon detachment from said tissue penetrating device, said specimen from said tissue penetrating device for subsequent handling, said specimen retaining and retrieval device comprising a handle, a sleeve integral with said handle and having cutting means thereon, said sleeve being mounted on an outside surface of said tubular cutting member when said tubular cutting member is boring into tissue, and said sleeve and said cutting means being movable axially relative to said cutting member such that said cutting means extends forwardly of said cutting member to sever a tissue specimen from said tissue which said cutting member has bored into, and said specimen retaining and retrieval device being detachable from said tissue penetrating device such that said retaining and retrieval device retains said tissue specimen therein.

5,148,814

HEATING APPARATUS FOR HYPERTHERMIA

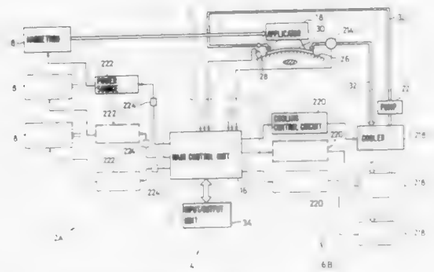
Makoto Kikuchi, Mitaka; Shinsaku Mori, Tokyo; Yoshio Nikawa, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 335,841, Apr. 10, 1989, Pat. No. 5,033,478, which is a division of Ser. No. 121,145, Nov. 16, 1987, Pat. No. 4,860,770, which is a division of Ser. No. 756,071, Jul. 17, 1985, Pat. No. 4,747,416. This application Jan. 4, 1991, Ser. No. 637,627

Claims priority, application Japan, Jul. 24, 1984, 59-153678; Jul. 24, 1984, 59-153679; Jul. 24, 1984, 59-153680; Jul. 24, 1984, 59-153681; Jul. 24, 1984, 59-153682

Int. Cl.[5] A61N 5/02

U.S. Cl. 128—804 10 Claims



1. A heating apparatus for hyperthermia comprising:

a plurality of electromagnetic wave generating means for generating electromagnetic waves, and respectively provided for a plurality of patients;

ON/OFF switching means associated with said electromagnetic wave generating means to ON/OFF control said electromagnetic wave generating means;

a plurality of applicators respectively associated with the bodies of the patients; means for applying electromagnetic waves generated by said electromagnetic wave generating means to respective ones of said applicators for respectively irradiating the bodies of the patients with electromagnetic waves;

a plurality of cooling members respectively associated with said applicators for cooling the bodies of patients with which the applicators are associated, each of said cooling members having a coolant outlet side;

means for recirculating coolant associated with said cooling members;

a plurality of flow rate adjusting means associated with said cooling members wherein each said flow rate adjusting means adjusts the flow rate of coolant which is recirculated through the corresponding one of said cooling members;

a plurality of internal temperature detecting means respectively associated with the bodies of the patients for detecting the temperature of a hyperthermia treatment region within a patient body irradiated with electromagnetic waves by the applicator associated with the body of the patient;

a plurality of coolant temperature detecting means respectively associated with said cooling members, each of said coolant temperature detecting means being provided on said coolant outlet side of the corresponding one of said cooling members; and

means for controlling, associated with said internal temperature detecting means and said coolant temperature detecting means, said means for controlling receiving information respectively detected by said internal temperature detecting means and said coolant temperature detecting means while integrally and simultaneously controlling, successively, each of said ON/OFF switching means and the output of the one of said flow rate adjusting means which corresponds to each of said ON/OFF switching means

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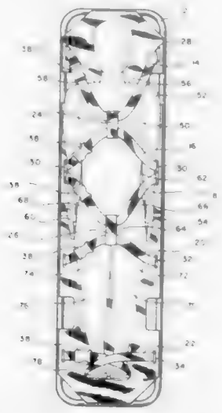
5,148,815

SPINAL RESTRAINT DEVICE

Douglas Britton, #203, 10835-115 Street, Edmonton, Alberta, Canada T5H 3L2

Filed Mar. 21, 1991, Ser. No. 672,827
Claims priority, application Canada, Jun. 6, 1990, 2018744
Int. Cl.[5] A61F 5/37
U.S. Cl. 128—869 7 Claims



1. A spinal restraint device, comprising:

a. a spine board, having a plurality of strap mounting means;

b. a plurality of straps mounted to the spineboard by said strap mounting means; and

c. at least one yoke

d. said plurality of straps including a first strap which extends through the yoke from strap mounting means positioned on the spineboard above the yoke to strap mounting means on an opposite side of said spineboard, and said plurality of straps including a second strap which extends through the yoke from strap mounting means on the spineboard positioned below the yoke to strap mounting means on an opposite side of said spineboard, such that the first strap and second strap describe the shape of an hourglass.

5,148,816

METHOD OF AND APPARATUS FOR MAKING A TOBACCO STREAM WITH A CORE CONTAINING TOBACCO RIBS

Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Nov. 8, 1990, Ser. No. 613,201
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939036

Int. Cl.[5] A24C 5/00

U.S. Cl. 131—84.1 23 Claims

1. A method of making rod-shaped smokers' products from tobacco shreds having a first range of sizes and tobacco ribs at least some of which have a second range of sizes larger than the sizes of said first range, comprising the steps of accumulating the shreds into an elongated flow of loose shreds; converting successive increments of the flow into an elongated stream having an outer portion and an inner portion surrounded by said outer portion; comminuting said at least some tobacco ribs to a range of sizes approximating said first range of sizes; and effecting the introduction of at least the majority of ribs, including the comminuted ribs, into the inner portion of said stream.

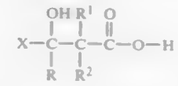
5,148,817

SMOKING COMPOSITIONS

Yoram Houminer, Richmond, and Harvey J. Grubbs, Mechanicsville, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,974
Int. Cl.[5] A24B 3/12; C07D 24/70
U.S. Cl. 131—278 20 Claims

1. A heterocyclic-hydroxy-substituted carboxylic acid composition corresponding to the formula:



where X is a heterocyclic substituent containing between about 2–12 carbon atoms, and any heteroatom in X is selected from oxygen, nitrogen and sulfur; R is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms; R^1 and R^2 are hydrogen or substituents selected from alilphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms, and R^1 and R^2 when taken together with connecting elements form an alicyclic structure; and the corresponding salts thereof; and wherein one of R^1 and R^2 is a 2-(2-butyl) substituent when X is pyridyl.

5,148,818

CIGARETTE MANUFACTURE

Hugh M. Arthur, Aylesbury, England, assignor to Molins plc, London, England

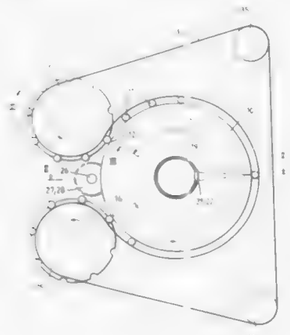
Filed Jun. 9, 1989, Ser. No. 363,878
Claims priority, application United Kingdom, Jun. 9, 1988, 8813683

Int. Cl.[5] A24C 5/60; B23K 26/00

U.S. Cl. 131—281 11 Claims

1. Apparatus for perforating cigarettes, comprising a drum, means for delivering cigarettes in pairs onto the drum at a delivery point, means for removing cigarettes from the drum at a withdrawal point; means for rotating each cigarette pair about its axis through at least substantially one revolution as it

moves from the delivery point to the withdrawal point; laser means arranged to direct a laser beam along the axis of the drum; a laser beam deflector; a rotatable member in the form of a tube containing the laser beam deflector and being coaxial with and rotatably supporting said drum, so that said laser beam deflector is rotatable with said rotatable member about the axis of the drum; and drive means for rotating the rotatable member at a speed greater than that of the drum, the laser



being pulsed so that successive pulses are directed by the rotating deflector simultaneously towards successive cigarette pairs and that each cigarette of a cigarette pair thus has a number of perforations formed in its wrapper as it moves between the delivery and withdrawal points; wherein said drum comprises axially spaced parts for supporting respective cigarettes of each cigarette pair, said laser beam deflector being arranged to direct a laser beam towards the cigarette pairs between said axially spaced drum parts.

5,148,81[illegible]

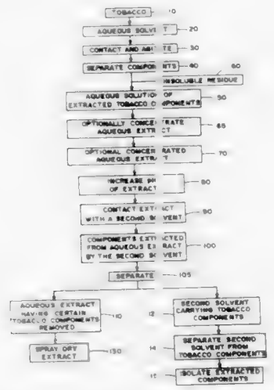
PROCESS FOR EXTRACTING TOBACCO

Barry S. Fagg, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 15, 1991, Ser. No. 746,252

Int. Cl.[5] A24B *15/24, 15/26*

U.S. Cl. 131—297 **19 Claims**



1. A process for providing a tobacco extract, the process comprising the steps of:

(i) extracting components from tobacco material with a first solvent having an aqueous character,

(ii) providing a liquid extract of tobacco within the first solvent,

(iii) contacting the first solvent and tobacco extract therewithin with a second liquid solvent which is immiscible with the first solvent and is an alcohol,

(iv) subjecting contacted first and second solvents to conditions sufficient to transfer some tobacco extract components from within the first solvent to within the second solvent, and

(v) separating the first and second solvents from one another.

5,148,820

PROCESSING OF TOBACCO LEAVES

Barbara C. Klammer, Southampton, and Roy L. Prowse, Eastleigh, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Sep. 11, 1990, Ser. No. 580,880

Claims priority, application United Kingdom, Sep. 18, 1989, 8921113; Jun. 1, 1990, 9012234

Int. Cl.[5] A24B *5/10*

U.S. Cl. 131—311 **45 Claims**

1. A method of processing whole leaf tobacco, which comprises feeding tobacco as whole leaf through a mill wherein the moisture content of at least a major proportion of the tobacco leaf is below the transition moisture content, the arrangement of said mill and the processing conditions being such that there exits said mill a tobacco product which is a mixture comprising flakes of tobacco leaf lamina and substantially intact tobacco leaf stem pieces, the lamina fraction of said product requiring substantially no further size reduction in order to render the lamina fraction suitable for being incorporated in smoking articles.

5,148,821

PROCESSES FOR PRODUCING A SMOKABLE AND/OR COMBUSTIBLE TOBACCO MATERIAL

Freddie W. Best, Winston-Salem, and Jackie L. White, Pfafftown, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 17, 1990, Ser. No. 569,325

Int. Cl.[5] A24B *15/12*

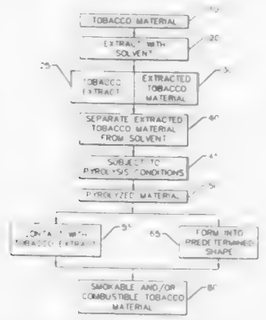
U.S. Cl. 131—370 **34 Claims**

1. A process for altering the character of tobacco material comprising the steps of:

(a) extracting a tobacco material using a solvent to provide (i) a tobacco extract within the solvent, and (ii) an extracted tobacco material;

(b) separating the extracted tobacco material from at least a portion of the extract and solvent; and

(c) subjecting the extracted tobacco material to pyrolysis conditions of a temperature of about 300° C. to about



1250° C. to effect a weight loss of about 35 to about 95 percent to provide a pyrolyzed material.

5,148,822

HAIR STRAIGHTENING METHOD AND TEXTURING STRENGTHENER COMPOSITIONS THEREFOR

Muhammad M. Akhtar, Bolingbrook, Ill., assignor to Johnson Products Co., Inc., Chicago, Ill.

Continuation of Ser. No. 95,397, Sep. 10, 1987, Pat. No. 5,060,680. This application Oct. 22, 1991, Ser. No. 781,717

Int. Cl.[5] A45D *7/04*

U.S. Cl. 132—204 **18 Claims**

1. An aqueous hair texturing and strengthening composition for application to hair about to undergo a highly alkaline hair straightening procedure comprising an aqueous nonacidic cosmetic vehicle having dispersed therein

about 0.1 to about 8 weight percent on a total composition weight basis of at least one water-dispersible quaternary nitrogen-containing compound having at least one alkyl group directly or indirectly bonded to a quaternary nitrogen group, each said alkyl group containing about 3 to about 22 carbon atoms, each said compound being selected from the group consisting of (a) non-proteinaceous, non-polymeric quaternary nitrogen containing compounds which are in the salt form and which contain said alkyl group and (b) hydrolyzed proteins which are in the salt form wherein at least one amino group therein is quaternized to include said alkyl group, each said compound being characterized by having a positive charge and being stable when in an aqueous medium at a pH of at least about 6.1 .

5,148,823

SINGLE CHAMBER MEGASONIC ENERGY CLEANER

Mario E. Bran, Garden Grove, Calif., assignor to Verteg, Inc., Anaheim, Calif.

Filed Oct. 16, 1990, Ser. No. 598,909

Int. Cl.[5] B08B *3/10*

U.S. Cl. 134—184 **6 Claims**

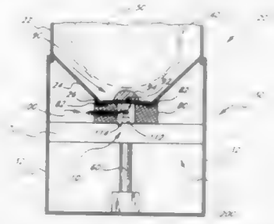
6. An apparatus for cleaning semi-conductor wafers and the like, comprising:

a tank for wafer-cleaning liquid and a wafer to be cleaned;

a dump valve in the lower portion of the tank for quickly dumping liquid from the tank; and

a device for generating megasonic energy positioned to agitate liquid in the tank to clean said wafer;

said device including a tube extending from one side of said tank to an opposite side of said tank with the tube being joined to said tank sides such that the tube defines a tubular space that is in open communication with the exterior of the tank, while the exterior of the tube is exposed to the liquid in the tank, said device including a transducer bonded to the interior of said tube to transmit energy through a wall portion of said tube into the liquid within the tube, said tube being located in the lower portion of said tank and the above said dump valve so that one or



more wafers may be positioned above said tube to be cleaned by liquid agitated by said megasonic energy, and the liquid may be quickly dumped from the tank by way of said valve.

5,148,824

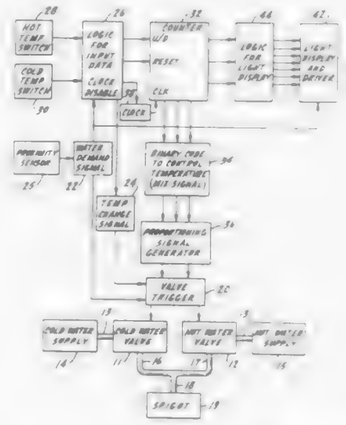
MIXING FAUCET HAVING REMOTE TEMPERATURE CONTROL

John R. Wilson, Naperville, and Nhon T. Vuong, Lombard, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Jan. 31, 1991, Ser. No. 648,972

Int. Cl.[5] G05D *11/13*

U.S. Cl. 137—3 **14 Claims**



14. In a mixing faucet of the type having first and second valve means for controlling the flow of first and second fluids, respectively, a method of operating the mixing faucet for proportionately mixing volumes of the first and second fluids to blend the two fluids in accordance with a user-selected mix ratio, comprising the steps of:

producing a mix signal representative of a desiree mix ratio;

producing a proportioning signal in accordance with the mix ratio, the proportioning signal being capable of opening the first and second valve means in accordance with the mix signal to produce the desired mix ratio;

applying the proportioning signal to the valve means immediately upon production of a mix signal for a predetermined finite time period; and

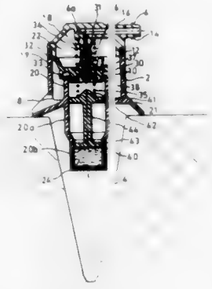
thereafter selectably sending the proportioning signal to the valve means at least at the end of said predetermined finite time period in accordance with the setting of a user-actuatable enabling means.

5,148,825

MOISTURE-RESPONSIVE VALVE

Jacob Gil, 7 Hachavatselet Street, Kiron, and Zvi Rubenstein, Timrat, both of Israel, assignors to Plastro-Gvat, Kibbutz Gvat; Agroteam Consultants Ltd., Migdal Haemek and Jacob Gil, Givat Shmuel, all of, Israel

Filed Nov. 20, 1991, Ser. No. 795,137
Int. Cl.[5] A01G *27/00*
U.S. Cl. 137—78.3 20 Claims



1. A moisture-responsive valve comprising:

a housing formed with an internal chamber, an inlet fitting connectible to a source of water for inletting water into the chamber via a valve seat within the chamber, and an outlet opening for outletting water from the chamber;

a valve assembly in said chamber including a valve member movable towards and away from said valve seat for controlling the flow of water through the valve seat into said chamber and out through said outlet opening;

and a water-swellable body within said housing adjacent a moisture-permeable wall thereof for controlling the movements of said valve member in response to the moisture passing through said moisture-permeable wall;

characterized in that said valve member is floatingly mounted between a first spring interposed between the valve member and the housing and urging the valve member away from said valve seat, and a second spring interposed between the valve member and the water-swellable body and urging the valve member towards said valve seat.

5,148,826

MOISTURE MONITORING AND CONTROL SYSTEM

Behrooz Bakhshaei, 26831 Anadale Dr., Laguna Hills, Calif. 92653

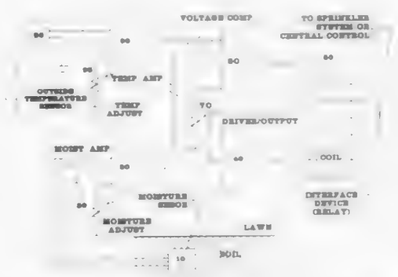
Filed Sep. 3, 1991, Ser. No. 753,782
Int. Cl.[5] A01G *25/16*
U.S. Cl. 137—80 4 Claims

1. A system for monitoring moisture level in soil and controlling application of water to the soil, the system comprising:

a plurality of a means for sensing moisture level in the soil at a plurality of discrete points, each said moisture level sensing means being electrically interconnected with one of;

a plurality of power amplifiers, where each said power amplifier is electrically interconnected with one of;

a plurality of a means for switching an electrical circuit; each of the moisture level sensing means is positioned in the soil such that a first voltage proportional to the level of moisture in the soil adjacent to each of the moisture level sensing means is produced by each of the moisture level sensing means, each of the first voltages being amplified by each one of the power amplifiers to a level adequate to energize each of the switching means whereby each of the moisture levels in the soil is used to energize and to deenergize each of the switching means in accordance with each of the moisture levels in the soil.

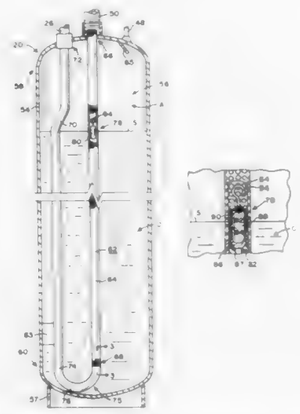


5,148,827

AIR-OIL FULL HYDRAULIC RESERVOIR TANK

Howard A. Masters, Bartlett, Tenn., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Nov. 26, 1991, Ser. No. 798,186
Int. Cl.[5] F16K *31/22*
U.S. Cl. 137—209 13 Claims



1. An air-oil full hydraulic reservoir tank of the type used with a remotely-spaced lift cylinder of a vehicle lift system, said tank comprising:

(a) a tank wall forming said tank;

(b) an upper portion and a lower portion of said tank;

(c) a discharge pipe within said tank, said discharge pipe comprising:

i. an inlet tube portion having a first end extending through said tank wall in said upper portion of said tank and having a second end disposed in said lower portion of said tank;

ii. an outlet tube portion having a first end extending through said tank wall in said upper portion of said tank and having a second end disposed in said lower portion of said tank; and

iii. connecting means in said lower portion of said tank for joining said second end of said inlet tube portion to said second end of said outlet tube portion and for allowing hydraulic oil to flow between said inlet and said outlet tube portions;

(d) an air line in communication with the interior of said tank, extending through said tank wall in said upper portion of said tank remote from where said first end of said inlet tube extends through said tank wall, for admitting pressurized air into said tank and for releasing pressurized air from said tank; and

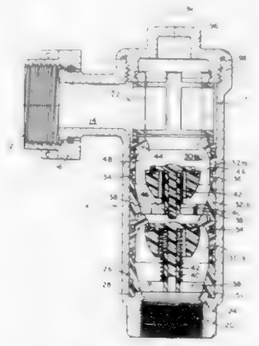
(e) low oil control means within said tank for blocking the flow of said oil from said inlet tube portion to said outlet tube portion when the level of said oil is below a predetermined level and for preventing the flow of air above said oil through said outlet tube portion.

5,148,828

CHECK VALVE ASSEMBLY

Scott C. Farnham, Peru, Ind., assignor to The Ford Meter Box Co., Inc., Wabash, Ind.

Filed Mar. 29, 1991, Ser. No. 677,098
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—454.6 29 Claims



1. An angled check valve assembly, comprising:

a pipe housing means having an inlet passageway therein for connection to a fluid supply inlet and an outlet passageway connected to and angled to the inlet passageway to provide an exit outlet which directs fluid from the supply inlet at an angle with respect to its inlet direction;

check valve means, comprising plural checks valve assemblies, each having an outer casing dimensioned to be received in one of the passageways, for preventing reverse flow from the outlet to the inlet;

an installation entry in the pipe housing means to allow for passage of the check valve means into the one passageway of the pipe housing means;

a closure means for fluidly closing and sealing the installation entry;

a spider spacer cage means located between the closure means and the check valve means at a point where the two angled passageways intersect for providing an open passageway for liquid flow from the inlet passageway to be angled to the outlet passageway;

the spider spacer cage means having at least one opening in a side wall thereof aligned with one passageway and a second opening in an end thereof aligned with the outer passageway;

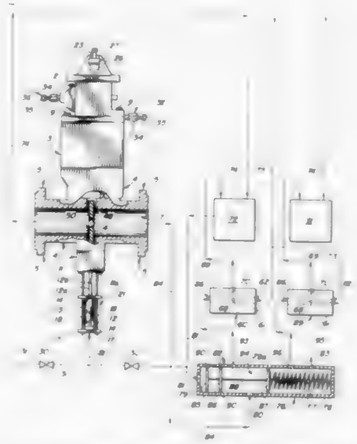
said spacer means being formed as a separate element from the closure means and being rotatable with respect thereto so as to allow the at least one opening to be aligned with said one passageway.

5,148,829

MULTI-ORIFICE PLATE AND FITTING WITH POSITIONER AND DIFFERENTIAL SELECTOR

Wayne E. Deville, 220 Estate Dr., Pineville, La. 71360

Filed Oct. 25, 1991, Ser. No. 782,654
Int. Cl.[5] F16K *31/126, 3/32*
U.S. Cl. 137—486 16 Claims



1. A multi-orifice plate fitting and plate positioning apparatus for mounting in a fluid transmission system and measuring the pressure of fluid flowing in the system, said apparatus comprising; a multi-orifice plate having at least two spaced orifices; an upper housing for selectively receiving said multi-orifice plate; upper plate-engaging means provided in the interior of said upper housing for selectively engaging and lifting said multi-orifice plate; a lower housing carried by said upper housing for selectively receiving said multi-orifice plate and a line bore provided in the interior of said lower housing for carrying the fluid; lower plate-engaging means provided in the interior of said lower housing for selectively engaging and lifting said multi-orifice plate; and a slide valve slidably mounted in the interior of said lower housing for selectively isolating the interior of said upper housing from the interior of said lower housing and facilitating removal of said multi-orifice plate from said upper housing, said multi-orifice plate normally adjustably located in said lower housing, with one of said orifices disposed in the path of the fluid; differential pressure selector means provided in pressure-sensing communication with the fluid on each side of said one of said orifices, for sensing a pressure drop across said one of said orifices; and plate piston means carried by said lower housing in engagement with said multi-orifice plate and provided in pressure-operating communication with said differential pressure selector means, whereby said multi-orifice plate is shifted in said lower housing to locate the other of said orifices in the path of the fluid, responsive to said pressure change and operation of said differential pressure selector means and said plate piston means.

5,148,830

FLOW CONTROL DEVICE

Hung Liu, 58, Ma Yuan West St., Taichung, Taiwan

Filed Aug. 30, 1991, Ser. No. 753,613
Int. Cl.[5] F16K *5/10*
U.S. Cl. 137—513.7 3 Claims

1. A flow control device comprising:

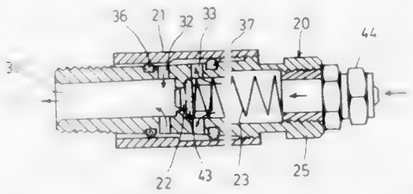
a body which is substantially cylindrical including a bore having an annular flange formed in a middle portion thereof, a pair of sealing rings engaged on a middle portion of an outer peripheral surface thereof, a first aperture

and a second aperture formed in said body and located between said sealing rings, said annular flange being located between said apertures;

a plug and a spring received in one end of said body;

a coupler engaged to said one end of said body, said spring being biased between said plug and said coupler so that said plug can be biased toward said annular flange of said body in order to close said bore of said body; and

a sleeve threadedly engaged on said body and engaged on



said sealing rings so that said sleeve is movable longitudinally relative to said body, and arranged such that a gap is formed between said sleeve and said body;

fluid flowing from said coupler into said body may flow through said first aperture and said gap and said second aperture and may flow into the other end of said body; said plug will be pushed against said spring when said fluid flows into said body from the other end of said body such that said fluid may flow through said bore of said body and may flow out of said coupler.

5,148,831

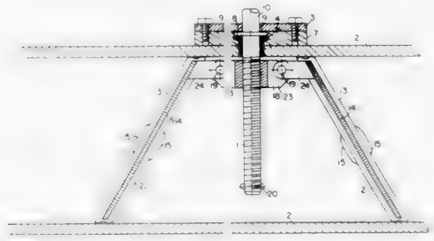
BI-DIRECTIONAL SHAFTLESS BUTTERFLY VALVE

Paul G. Kennedy, Horseheads, N.Y., assignor to Kennedy Manufacturing, Inc., Horseheads, N.Y.

Filed Apr. 30, 1991, Ser. No. 693,552

Int. Cl.[5] F16K *1/22*

U.S. Cl. 137—614.11 **2 Claims**



1. A bi-directional butterfly valve in a round pipe-like conduit comprising:

round pipe-like conduit means;

a pair of plate means for closing and opening said round pipe-like conduit means;

each of said plate means being elliptical having a major and a minor axis;

a rotatable stem means penetrating one side of said pipe-like conduit means along an axis perpendicular to said round pipe-like conduit means at its center;

said rotatable stem means containing threads as it passes within said pipe;

a threaded stem hinge nut means fitted with a first pair of hinge joint protrusions in a direction closest to said plate means, and placed around said rotatable stem means movable in either direction along said stem means;

a second pair of hinge joint protrusions, each fixedly connected to one of said plate means at a location coinciding with its major axis and closest to said stem means;

a pair of hinge pin means, each one joining one of said first and one of said second hinge joint protrusions together such that the rotation of said stem hinge nut means will move both of said plate means to close and open said round pipe-like conduit means as determined by the direction of said stem rotation;

each of said plate means being reversibly rotatable about an axis perpendicular to the axis of said pipe conduit means and also perpendicular to the rotatable stem means and at the same time each of said plate means reversibly translates a related distance along said axis of said pipe conduit means;

said minor axis of each of said plate means being slightly larger than the diameter of said pipe conduit means and the incremental length of the major axis of the elliptical plate means being directly related in magnitude to the translation distance of said elliptical plate during the rotation thereof from full open to full close and vice versa with the direction of translation being in one direction for opening and the other direction for closing.

5,148,832

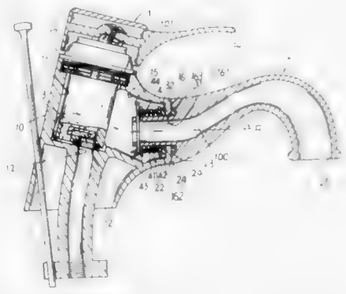
FAUCET HAVING RESILIENTLY-PACKED ROTATABLE SPOUT

Fu-Tung Lin, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Oct. 28, 1991, Ser. No. 783,231

Int. Cl.[5] E03C *1/02*

U.S. Cl. 137—615 **4 Claims**



1. A faucet comprising:

a valve body having a boss formed on a side portion of the valve body defining an interior chamber in said boss, a bore portion communicating the interior chamber having a valve plug normally sealing on a valve seat defining a valve opening of a water inlet for a sealing said valve opening and operatively opening said valve opening by a handle formed on the valve body, and a cap capping a top opening of the bore portion;

a spout having a shaft portion protruding inwardly from said spout rotatably mounted in said boss having a packing means packed in between said boss and said spout; and

a tensioning spring means secured on said shaft portion within said boss resiliently retaining said packing means on said boss and on said spout;

said boss including a central shaft hole formed in a central portion of a boss seat formed on an outer protruded end portion of the boss, an inner seat portion formed on an inside surface of the boss seat, and an outer seat portion formed on an outside surface of the boss seat opposite to the inner surface of the boss seat, said boss rotatably engageable with said spout; and said spout including: a central passage formed through the spout communicating the interior chamber and the bore portion of the valve body, a shaft portion protruding inwardly from the spout about a longitudinal axis longitudinally formed in a center portion of the shaft hole of the boss to be rotatably engaged with the central shaft hole of the boss as packed by said packing means having a pin hole transversely formed in an inner end portion of the shaft portion, and an annular recess annularly recessed in a shoulder portion generally annular shaped formed on a base portion of the shaft portion; said shoulder portion of the spout engaged with the outer seat portion of the boss of the faucet about an interface generally perpendicular to the longitudinal axis of said boss.

5,148,833

HIGH-SPEED FLOW CONTROL VALVE

Kazuo Ota, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

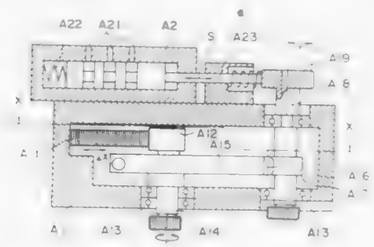
PCT No. PCT/JP89/01272, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/07667, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 18, 1989, Ser. No. 691,025

Claims priority, application Japan, Dec. 23, 1988, 63-325540

Int. Cl.[5] F15B *13/044*

U.S. Cl. 137—625.65 **20 Claims**



1. A high-speed flow control valve, comprising:

a laminated piezoelectric actuator which is a driving source,

first conversion means for converting a linear displacement of said laminated piezoelectric actuator to a rotary displacement;

second conversion means for returning said rotary displacement to a linear displacement; and

a valve spool which operates in linkage with said second conversion means;

wherein said first conversion means includes a first rotatable shaft on which a gear lever is mounted, a second rotatable shaft on which a first pinion that engages with said gear lever is mounted, and a cam for receiving the linear displacement of said laminated piezoelectric actuator as a rotary tangential line force at a position deviated from the center of said first rotatable shaft, said cam being disposed on the first rotatable shaft.

5,148,834

PISTON-TYPE PRESSURE ACCUMULATOR FOR TRACTION SLIP CONTROLLED BRAKE SYSTEMS AND SWITCHING ARRANGEMENT FOR SAME

Hans-Dieter Reinartz, Frankfurt am Main, and Hajo Pickel, Kelkheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

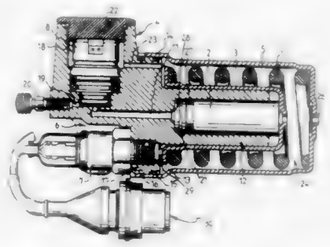
Filed Nov. 16, 1990, Ser. No. 614,803

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 3941241

Int. Cl.[5] F16L *55/04*

U.S. Cl. 138—31 **7 Claims**

1. In combination, accumulator means for a traction slip controlled brake system including a hydraulic wheel cylinder, pump means having an outlet supplying hydraulic fluid under pressure to said wheel cylinder, passage means connecting and accumulator means with said pump means outlet to accumulate fluid under pressure for actuation of said wheel cylinder, said accumulator means comprising a housing, said housing including a main portion and an elongated extension portion projecting from said main housing formed with a bore opening at one end of said extension, an accumulator piston slidably received in said bore, a cup shaped inner cap slidably received over said extension portion and having an end engaged from within by one end of said piston, said inner cap also formed with a collar movable on said housing extension to a position adjacent said housing main portion with said piston moved to a retracted position in said bore, a cup shaped outer cap received over said inner cap with an annular space therebetween and extending to and fixed on said housing main portion, a compression spring received over said inner cap interposed between said collar and the inside of said outer cap, a space intervening between said inner and outer cap ends with said piston in a retracted position



in said housing extension bore accomodating advancing movement of said piston until the outside of said inner cap end abuts against the inside of said outer cap end, a fluid passage formed in said housing extending into said housing extension bore, electromechanical charging valve means controlling communication between said pump outlet and said fluid passage to enable flow of fluid under pressure behind said piston to cause movement of said piston against the force of said compression spring to accumulate fluid under pressure in said bore; and

control switch means having a contact positioned to be engaged by said inner cap collar, said control switch controlling activation of said charging valve in correspondence with the position of said collar whereby the position of said piston controls activation of said charging valve.

5,148,835

WELL CASING PIPE THREAD PROTECTOR

Jim W. Clark, P.O. Box 935, Houma, La. 70361

Continuation of Ser. No. 572,266, Aug. 27, 1990. This application Jan. 29, 1992, Ser. No. 827,402

Int. Cl.[5] B65D *59/00*

U.S. Cl. 138—96 T **3 Claims**

1. A device for protecting the threads of a well casing pipe which comprises:

(a) a body constructed from material which is flexible and has resilient characteristics, said body being molded to have a central opening sized to fit about said threads and a gap between opposing ends of said body to provide the desired opening force and further having:

(i) a passageway extending through said body concentric to said central opening, and

(ii) a locking section having a cavity connecting to said passageway,

(b) a strap constructed of a high tensile strength fiber web capable of being folded over upon itself positioned in said passageway with its opposite ends extending into said cavity, said strap being of sufficient size and flexibility so as to enable removal from and replacement to said passageway, and

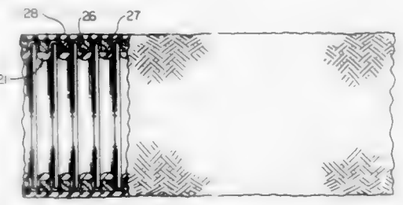
(c) a locking assembly operatively attached to the opposite ends of said strap to tighten said strap about said body to the degree necessary for said body to contact said threads.

5,148,836

FLEXIBLE HOSE CONSTRUCTION

James L. Lawrence, Ocala, Fla., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Jul. 12, 1990, Ser. No. 551,962
Int. Cl.[5] F16L *11/04*
U.S. Cl. 138—121 6 Claims



1. In a flexible hose construction comprising an inner corrugated hose made of polymeric material and having a plurality of outwardly convex projections with recesses therebetween and extending from one end thereof to the other end thereof, an outer sleeve of reinforcing material disposed in telescoping relation on said inner corrugated hose, and an outer sleeve of polymeric material disposed in telescoping relation on said outer sleeve of reinforcing material, the improvement comprising a sleeve of stiff polymeric material disposed between said sleeve of reinforcing material and said inner corrugated hose and having an outer peripheral surface that is substantially straight-line smooth and continuous and substantially coplanar with the apexes of said projections and having an inner peripheral surface that substantially mates with and is disposed in engagement with said projections and said recesses from said one end to said other end of said inner corrugated hose, said outer sleeve of polymeric material being extruded on said sleeve of reinforcing material so as to bond to said apexes of said projections of said inner corrugated hose by exuding through said sleeve of reinforcing material and to also bond to said outer peripheral surface of said sleeve of stiff polymeric material by exuding through said sleeve of reinforcing material.

5,148,837

PIPE FOR RELINING UNDERGROUND PIPELINES

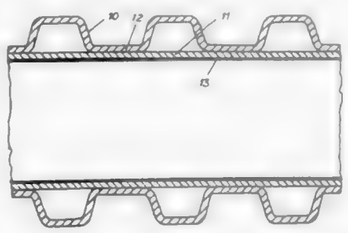
Lennart Ågren, Borås, and Eino Hölsö, Viskafors, both of Sweden, assignors to Uponor N.V., Netherlands Antilles

PCT No. PCT/SE89/00294, § 371 Date Jan. 8, 1991, § 102(e) Date Jan. 8, 1991, PCT Pub No. WO89/12198, PCT Pub. Date Dec. 14, 1989
PCT Filed May 25, 1989, Ser. No. 634,871
Claims priority, application Sweden, May 31, 1990, 8802005
Int. Cl.[5] F16L *11/12*
U.S. Cl. 138—121 4 Claims

1. A composite pipe for relining underground pipelines, comprising:

an annular rigid corrugated outside wall (**10**) of polymer material having an inner and outer surface;

an inside wall (**11**) composed of a thermoplastic elastomer which can be stretched and compressed, the inside wall having a substantially smooth inner surface and outer surface (**12**), the smoother outer (**12**) being connected to the inner surface of the outside wall (**10**); and



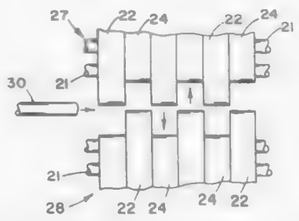
a thin wear protective, anti-friction layer (**13**) of polyethylene formed integrally on the inner surface of the inside wall (**11**) which increases durability and facilitates the manufacture of the composite pipe.

5,148,838

PAPERMAKERS FABRIC WITH ORTHOGONAL MACHINE DIRECTION YARN SEAMING LOOPS

Henry J. Lee, Summeville, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Continuation of Ser. No. 567,974, Aug. 15, 1990, Pat. No. 5,092,373, which is a continuation-in-part of Ser. No. 534,164, Jun. 6, 1990, Pat. No. 5,103,874. This application Jun. 14, 1991, Ser. No. 715,543
Int. Cl.[5] D03D *13/00*
U.S. Cl. 139—383 AA 2 Claims



1. A papermakers fabric having opposing ends comprising:

a system of flat monofilament MD yarns interwoven with a system of CMD yarns; and

a series of orthogonal end loops formed on each end of said fabric from selected MD yarns which are looped back and interwoven with said CMD yarns directly beneath themselves wherein the aspect ratio of said flat MD yarns is at least 3:1.

5,148,839

VALVE ASSEMBLIES FOR FILLING CONTAINERS WITH PRESSURIZED GAS

Lee D. Kirwan, 1223 Thistledown Avenue, and Roger C. Hurst, 1253 Thistledown Avenue, both of Sarnia, Ontario, Canada N7S 5A8

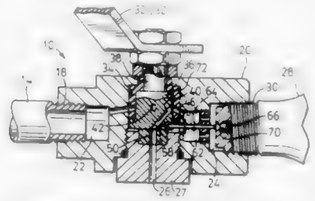
Filed May 6, 1992, Ser. No. 879,260
Int. Cl.[5] B65B *31/00*
U.S. Cl. 141—1 4 Claims

4. A method of filling a cylinder with pressurized gas from a source thereof, said cylinder having a valve with a valve member spring biased to a closed position, said method including:

providing a valve assembly comprising a valve housing having a main chamber, a supply port, a fill port and a vent port, said supply port, fill port and vent port communicating with the main chamber, said vent port also communicating with the atmosphere,

a valve body mounted in the main chamber for movement therein and having first passage means operable in a first position of the valve body to connect the fill port to the vent port, second passage means operable in a second position of the valve body to connect the supply port to the fill port and third passage means operable in a third position of the valve body to connect the fill port to the vent port,

a valve opening member movably mounted in the valve housing and actuated by the valve body when the valve body is moved to said second and third positions to engage and move the valve member of a cylinder secured to the fill port to an open position and



means for positioning the valve body in the first, second and third positions,

said method also including:

positioning the valve body in the first position to vent the fill port to the atmosphere,

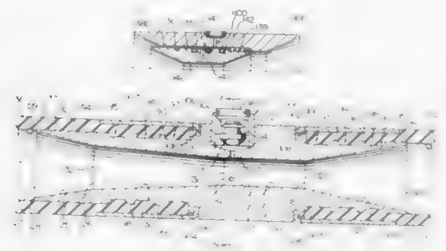
connecting a source of pressurized gas to the supply port, connecting a cylinder to the fill port, positioning the valve body in the second position to fill the cylinder with gas from the source thereof, positioning the valve body in the third position to vent the cylinder to the atmosphere, positioning the valve body in the second position to fill the cylinder with gas, positioning the valve body in the first position to vent the fill port to the atmosphere, and disconnecting the cylinder from the fill port.

5,148,840

HOSE ASSEMBLY HAVING A VENTURI SECTION WTIH A SLIDE MEMBER THEREIN AND METHOD OF MAKING THE HOSE ASSEMBLY

Rodger P. Grantham, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 709,031, May 31, 1991, Pat. No. 5,088,528, which is a continuation of Ser. No. 98,641, Sep. 18, 1987, abandoned. This application Nov. 25, 1991, Ser. No. 797,637
Int. Cl.[5] B67D *5/06*
U.S. Cl. 141—44 12 Claims



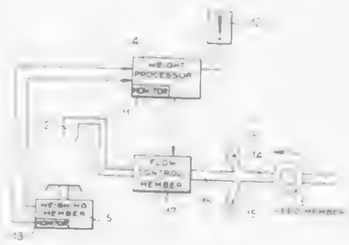
1. In a hose assembly having a first fluid passage therein for conveying a volatile liquid in one direction to a container and a second fluid passage therein for returning the vapors of the volatile liquid from the container, the assembly comprising a flexible inner hose having an outer peripheral surface and defining said first fluid passage therein, and a flexible outer hose having an inner peripheral surface and being disposed around said inner hose, said inner peripheral surface of said outer hose and said outer peripheral surface of said inner hose defining said second fluid passage therebetween, said inner hose having a substantially straight Venturi section therein that tends to remove liquid from a certain area of said second fluid passage, said inner hose having adjacent intermediate ends, said Venturi section having opposed ends respectively interconnected to said ends of said inner hose to provide said first fluid passage therewith, the improvement wherein said ends of said inner hose are respectively telescopically disposed on said opposed ends of said Venturi section, said Venturi section having a flow passage therethrough, said flow passage having an intermediate portion, said Venturi section having a radial passage leading from said second fluid passage to said intermediate portion of said flow passage, said Venturi section having a movable slide means in said flow passage thereof which is adapted to open said radial passage to said flow passage when the rate of the fluid flow through said flow passage is above a certain rate and to close said radial passage to said flow passage when the rate of the fluid flow through said flow passage is below said certain rate.

5,148,841

FILLING APPARATUS FOR FILLING RECEPTACLE WITH METERED WEIGHTS

André Graffin, La Ferte Bernard, France, assignor to Serac Group, La Ferte Bernard, France

Filed Jun. 25, 1990, Ser. No. 542,696
Claims priority, application France, Jun. 27, 1989, 89 08529; Jan. 25, 1990, 90 00852
Int. Cl.[5] B65B *3/28*
U.S. Cl. 141—83 5 Claims



1. A filling apparatus for filling receptacles, the apparatus comprising a feed member connected to at least one filling spout via a flow control member connected to an output of a weight processing unit having an input connected to a weighing member in order to deliver opening or closing signals to the flow control member as a function of a weight measured by the weighing member, a time measuring member for measuring an actual filling time during which the flow control member is open at a selected aperture, means for comparing the actual filling time with a reference time, and means for modifying the aperture of the flow control member as a function of the difference between the actual filling time and the reference time

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5,148,842

FUNNEL-ADAPTER FOR USE IN DISPENSING WATER AND ICE FROM A REFRIGERATOR WATER AND ICE DISPENSER

Dale Boust, P.O. Box 3486, Pinedale, Calif. 93650

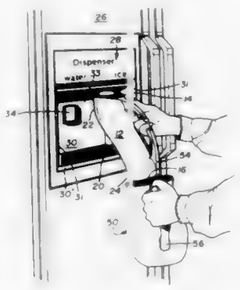
Filed Aug. 2, 1991, Ser. No. 739,477
Int. Cl.[5] B65B *39/00*
U.S. Cl. 141—98 4 Claims

1. In a refrigerator having a dispensing system comprising an front-opening chamber having a lower support surface and a rear surface, and at least one of a water-dispensing unit comprising a dispensing actuator and an ice-dispensing unit com-

prising a dispensing actuator, said open chamber having an upper partition defining the height of said chamber, the improvement comprising:

a funnel-adapter comprising a main housing having a hollow interior having an open, upper end and open, lower end; said main housing being hollow therethrough, said lower end being offset from said upper end, whereby a large container having a height and/width greater than the height or width of the chamber may be filled by said dispensing system;

said main housing comprising a first, upper portion, and a second, lower portion; said first, upper portion upwardly-terminating in said open, upper end, and said second, lower portion terminating in said open, lower end; said first, upper portion having a height less than said height of said chamber, and a width less than the width of said chamber for reception in said chamber, said first upper



portion being periodically, when in use, in surface-to-surface depressing contact against said dispensing actuator;

said first, upper portion comprising a bottom end, and said second, lower portion comprises a top end; said main housing further comprising an intermediate, transition-portion connecting said bottom end to said top end;

said intermediate transition-portion offsetting said second lower portion from said first upper portion, such that said second, lower portion projects outwardly of said chamber, with said lower end of said second, lower portion located laterally outwardly of said chamber, in order to access the interior of a large container;

and further comprising a container having a height greater than the height of said chamber; said lower end communicating with the interior of the container for directing the contents of said dispensing unit to the interior of said container.

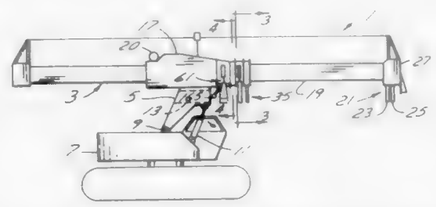
5,148,843

TREE DELIMBER WITH TREE FEEDING MEANS

Jean-Marie Côté, 14828 Labelle, Pierrefonds, Quebec, Canada H9H 1J3

Filed Jun. 6, 1991, Ser. No. 711,071
Claims priority, application Canada, Jun. 28, 1990, 2020113
Int. Cl.[5] B27L *1/00*
U.S. Cl. 144—2 Z **26 Claims**

1. A tree delimber machine having: a boom support; a boom assembly mounted on the boom support; the boom assembly having a sleeve, and a boom slidably mounted through the sleeve; means for moving the boom relative to the sleeve; tree gripping means on the front end of the boom; tree delimbing



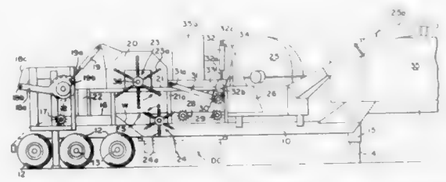
means on the front end of the sleeve; and tree feed means on the sleeve behind the delimbing means.

5,148,844

FLAIL DRUM SYSTEM

Milan W. Robison, Weidman, Mich., assignor to Chiparvestors, Inc., Winn, Mich.

Filed Feb. 12, 1992, Ser. No. 834,597
Int. Cl.[5] B27L *1/00*
U.S. Cl. 144—208 J **18 Claims**



1. In a flail drum system for delimbing and/or debarking wood products comprising trees and logs and wherein there is a wood product advancing mechanism for moving the wood products forwardly in a generally horizontal path; an upper rotary chain flail drum disposed above the path; and mounted to rotate about a generally horizontal axis transverse to the path; a lower rotary chain flail drum disposed below the path adjacent to the upper drum and mounted to rotate about a generally horizontal axis transverse to the path; and drive mechanism for driving the advancing mechanism and for rotating said flail drums; the improvement wherein at least one of said flail drums comprises:

a. a central shaft connected to be driven by said drive mechanism;

b. a pair of axially spaced apart end rod support members fixedly mounted on said shaft and having circumferentially aligned and spaced removable rods extending between them;

c. a series of radially extending rod support rings, having side walls with circumferentially spaced openings through which said rods extend, and which support said rods, fixedly connected to rotate with said shaft;

d. circumferentially scalloped annular spacers, disposed between said rings and circumferentially inset with respect to said rings to form circumferentially inset pockets between said rings with pocket side walls defined by said ring side walls, and providing radially inwardly extending openings through which said rods extend without engaging said spacers;

e. radially extending, circumferentially spaced chains, comprising a series of connected loop links with radially inner and outer terminal ends, the inner terminal ends of the chains comprising chain links, through which said rods extend, received in the openings in said spacers, and chain links extending outwardly therefrom which are guided on said pocket side walls radially outwardly of said spacers during rotation of the shaft, the outer terminal ends of said

chains extending sufficiently beyond said rings to freely contact wood product moving in said path during rotation of said shaft;

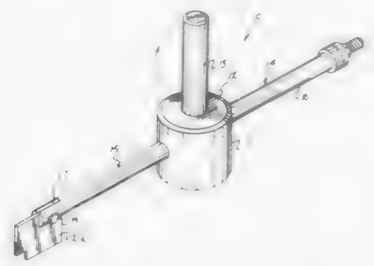
f. and means for fixedly connecting said spacers so that said openings therein, through which said rods extend, remain aligned with the openings in said rings through which said rods extend.

5,148,845

WOODWORKING ROTARY CUTTER APPARATUS

Karl F. Keup, and Ellen B. Davidson-Keup, both of 2330 Kevenauer Dr., Brookfield, Wis. 53005

Filed Aug. 6, 1991, Ser. No. 740,712
Int. Cl.[5] B26D *1/12;* **B27G** *13/00*
U.S. Cl. 144—218 **4 Claims**



1. A woodworking rotary cutter apparatus for securement to a collet member, wherein the apparatus comprises,

a cylindrical base member, the cylindrical base member including a cylindrical axis defined by the base member, wherein the cylindrical base member includes a cylindrical base member top wall orthogonally oriented to the cylindrical axis, and

a cylindrical collet shank integrally and coaxially mounted to the top wall, and

a cylindrical support shank diametrically directed through the cylindrical base member orthogonally oriented relative to the cylindrical axis, wherein the cylindrical support shank includes a first shank member and a second shank member, each longitudinally aligned relative to one another and projecting from opposed sides of the cylindrical base member, wherein the first shank member includes a first shank member forward end mounting a cutter blade spaced from the cylindrical base member, and

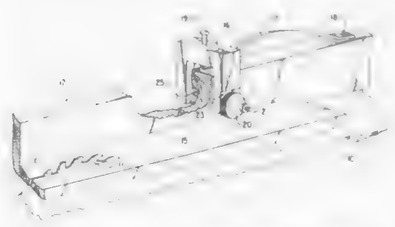
the second shank member rear end spaced from the cylindrical base member includes counter-weight means for counter-balancing the cutter blade during rotation of the cylindrical base member.

5,148,846

WORKPIECE GUIDE

Harry Van Gelder, 15200 Stagg St., #3, Van Nuys, Calif. 91405

Filed Feb. 3, 1992, Ser. No. 829,226
Int. Cl.[5] B27B *5/06, 27/02;* **B27C** *1/12*
U.S. Cl. 144—249 R **5 Claims**



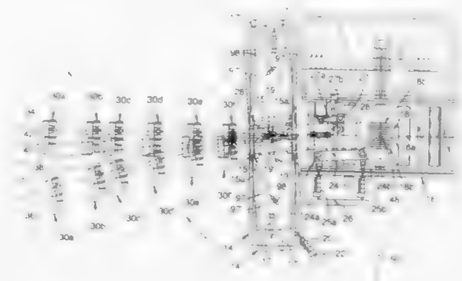
1. For use with a power woodworking tool having a table, a guide fence adjustably fixed to said table and cutter means extending above said table adjacent said guide fence, feed assisting guide means comprising a yoke mounted astraddle of said fence, and movable vertically relative thereto, wheel means pivotally fixed on one leg of said yoke and on the same side of said fence as said cutter means, said wheel having an axis of rotation tilted from a perpendicular to said fence, and means to bias said wheel towards said table whereby a workpiece on said table will be held against said fence.

5,148,847

METHOD AND APPARATUS FOR AROUND THE CURVE SAWING

Michael P. Knerr, Ridgefield, Wash., assignor to U.S. Natural Resources, Inc., Vancouver, Wash.

Filed Oct. 28, 1991, Ser. No. 783,009
Int. Cl.[5] B27B *1/00, 31/00*
U.S. Cl. 144—357 **6 Claims**



5. A method of around the curve sawing of a curved log comprising:

converting said curved log into a two-sided cant having first and second planar sides in substantially parallel relation;

identifying a curved centerline for said cant corresponding to a desired curved cutting pattern;

positioning a plurality of roller assemblies along a selected curved feed path, each roller assembly including opposing rollers adapted to engage said first and second planar sides of said cant and upon actuation urge said cant along a transport path normal to the roller axes of rotation, each transport path being located relative to a reference point of the corresponding rollers, each reference point being positioned along a path concentric to said selected curved feed path, said curved feed path being coincident with a fixed point of a cutting device;

positioning said cant whereby said curved centerline is substantially concentric to said selected curved feed path; and

actuating said roller assemblies to move said cant along said curved feed path and toward said fixed point for cutting of said cant along at least one line of cut concentric to said curved centerline.

5,148,848

LIFT ASSIST MECHANISM FOR RETRACTABLE AWNING

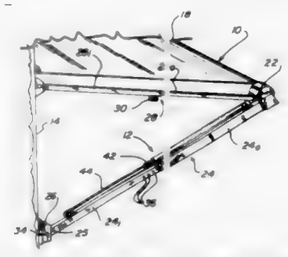
Brent W. Murray, Longmont, and Thomas G. Faludy, Westminster, both of Colo., assignors to Carefree/Scott Fetzer Company, Broomfield, Colo.

Filed Jan. 28, 1992, Ser. No. 826,899
Int. Cl.[5] E04F *10/06*
U.S. Cl. 160—67 **6 Claims**

1. In a retractable awning for attachment to the side of a recreational vehicle or the like wherein said awning includes an awning sheet secured along one edge to said side, an opposite edge of the awning sheet secured to a roll bar about which

the awning sheet can be wrapped, a pair of support arms including first and second slidably related members pivotally connected to said side at one end and to the roll bar at the opposite end, and a pair of rafter arms operably securable at an outer end to said roll bar and secured at an inner end to said side at a location above the connection of said support arms to the side, wherein the improvement comprises a mechanism to assist relative sliding movement of said first and second members of at least one of said support arms, said mechanism comprising:

a pair of gas springs, each including a cylinder, a piston and a piston rod connected to said piston, said piston rod retractably protruding from a first end of said cylinder, said cylinders including pressurized fluid operatively



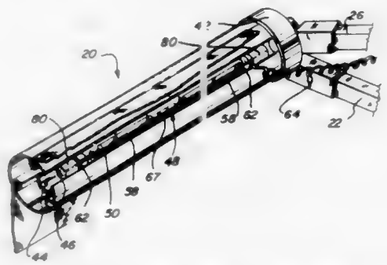
associated with said pistons to bias the piston rods outwardly relative to said cylinders, connector means for operatively interconnecting the opposite ends of said cylinders to each other in axial alignment so that the piston rods project in opposite directions, each piston rod having a free end, fixed abutment means on each of said first and second members, the free end of one piston rod being operatively engaged with the abutment means on the first of said members and the free end of the other of said piston rods being operatively engageable with the abutment means on the second of said members such that when said free ends of the piston rods are not fully extended and are engaged with the associated abutment means, the members are slidably biased.

5,148,149

LIGHTED RETRACTABLE AWNING

Thomas G. Faludy, Westminster, Colo., assignor to Carefree/-Scott Fetzer Company, Broomfield, Colo.

Filed Nov. 26, 1990 Ser. No. 618,158
Int. Cl.[5] E04F *10/06*
U.S. Cl. 160—67 6 Claims



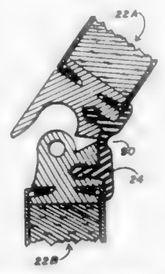
1. In a retractable awning of the type that is movable between an extended and a retracted condition, said awning having a flexible canopy, a rotatable roll bar secured to an edge of the canopy about which the canopy is rolled when the awning is in its retracted condition, wherein the improvement comprises a light source mounted on said roll bar and adapted to illuminate the area beneath the canopy when the awning is in its extended condition said light source being concealed by said canopy when the awning is in its retracted condition.

5,148,850

WEATHERPROOF CONTINUOUS HINGE CONNECTOR FOR ARTICULATED VEHICULAR OVERHEAD DOORS

Burton A. Urbanick, Gainesville, Ga., assignor to Paneltech Ltd., Gainesville, Ga.

Continuation-in-part of Ser. No. 373,142, Jun. 28, 1989, abandoned. This application Jan. 4, 1991, Ser. No. 638,199
Int. Cl.[5] E06B *3/48*
U.S. Cl. 160—231.1 16 Claims



1. An assembly hingeably and resiliently connecting mutually adjoining first and second panels of an overhead door while effectively damping vibration and sealing the gap between such panels irrespective of whether the door is closed or is fully or partially open, said assembly comprising:

(a) an elongated first member associated with a lateral edge of the first panel, said first member having a first opening and a laterally extending channel formed along at least a portion of its length;

(b) an elongated second member associated with a lateral edge of the second panel which adjoins the first panel, said second member having a second opening and a rail formed along at least a portion of its length, said rail being of a cross-sectional size and shape substantially complimentary to that of said channel so as to be at least partially received within said channel when the door is closed; and

(c) an elongated resilient elastomeric member extending across at least a portion of the widths of said first and second panels, said elastomeric member including

(i) a body generally in the form of an elongated strip having first and second sealing lips overlying exterior surfaces of said first and second panels, respectively, and

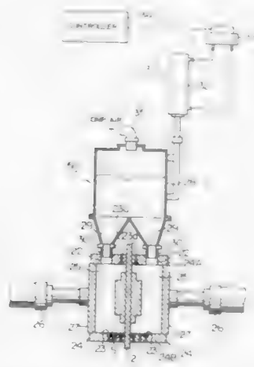
(ii) integral first and second projections located between said lips and extending from said body, said first and second projections being removably securable within said first opening of said first member and said second opening of said first member, respectively so as to bias said lips against said exterior surfaces of said panels to form a seal between said lips and said panels along substantially the entire length of said body when said first and second projections are received within said first and second openings, said elastomeric member serving to dampen mechanical vibration while maintaining said seal during operation of the door.

5,148,851

METHOD OF CHARGING SAND AND MOLDING MACHINE UTILIZING THEREOF

Yutaka Murata, Toyokawa, Japan, assignor to Sintokogio Ltd., Nagoya, Japan

Filed Jun. 27, 1991, Ser. No. 722,426
Claims priority, application Japan, Jun. 29, 1990, 2-172862
Int. Cl.[5] B22C *15/28*
U.S. Cl. 164—20 6 Claims



1. A method for charging sand into a space in a vertically arranged mold flask, the mold flask being formed with a sand charge port having a given depth and a plurality of vent holes in its top wall and having a plurality of vent holes in its bottom wall, and defining openings on both sides which are closed air-tight, respectively, by a match plate and a squeeze plate, the method comprising the steps of:

inserting a sand feed nozzle into said sand charge port at an intermediate depth of said sand charge port;

charging said into said space from a blow head together with compressed air through said sand feed nozzle and said sand charge port while venting air from the space through said vent holes so as to fill the space with the sand; and

forcing said sand feed nozzle inserted in said sand charge port to advance into said sand charge port by a certain depth so as to compress the sand charged in the space.

4. A molding machine comprising:

a match plate having a side surface which carries thereon a mold pattern;

a mold flask arranged vertically and having a top wall formed therein with a sand charge port and a plurality of vent holes, and a bottom wall formed therein with a plurality of vent holes, and defining therein first and second side openings, said first side opening being pressed against one surface of said match plate while said second side opening receiving therethrough a squeeze plate carried by a squeeze drive means so as to define a closed space within said mold flask;

a blow head located above said mold flask and having a sand feed nozzle adapted to be inserted in said sand charge port in said top wall of the mold flask, for charging sand and compressed air into said space,

means for lowering the blow head so as to insert said sand feed nozzle into said sand charge port of said mold flask; and

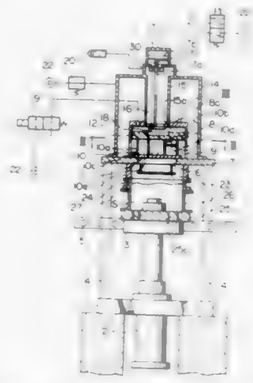
a control means for controlling said lowering means so as to lower said blow head in order to insert said sand feed nozzle into the sand charge port by an intermediate depth during the charging of sand into said space, and then to further lower said blow head so as to insert said sand feed nozzle through said sand charge port to a full depth after completion of sand charging.

5,148,852

COMPRESSED AIR BLOWING APPARATUS FOR USE IN GREEN SAND MOLD MOLDING FACILITY

Ukichi Oishi, Toyokawa, Japan, assignor to Sintokogio, Ltd., Nagoya, Japan

Filed Dec. 10, 1991, Ser. No. 804,643
Claims priority, application Japan, Dec. 14, 1990, 2-403415[U]; Dec. 14, 1990, 2-403417[U]
Int. Cl.[5] B22C *15/00*
U.S. Cl. 164—169 6 Claims



1. A compressed air blowing apparatus including:

a frame having an air outlet port for supplying compressed air into a flask;

a cylindrical sectioning device disposed on said frame, having, in an end portion thereof, an air feed hole communicated with said air outlet port and having, in another end portion thereof, an opening communicated with said air feed hole;

a cylinder disposed on said frame to surround said sectioning device;

a piston capable of sliding in said cylinder;

a first compressed air supply device having a compressed air reservoir tank for supplying compressed air to a first chamber which is formed on one side of said piston in said cylinder and in which said sectioning device is disposed;

a second compressed air supply device for urging said piston to hermetically close said opening by supplying compressed air to a second chamber formed on the other side of said piston in said cylinder;

an exhaust hole for communicating said second chamber with the outside; and

a valve for opening/closing said exhaust hole whereby, when said valve opens said exhaust hole, said piston pushed by compressed air supplied from said first compressed air supply device slides to open said opening and thereby compressed air supplied from said first compressed air supply device is introduced into said sectioning device through said opening before it is blown into said flask through said outlet port, characterized by:

a large and a small cylindrical members concentrically disposed and included in said sectioning device, wherein said opening is defined as an annular opening by end portions of said cylindrical members, and including a plurality of connecting ducts which establish a communication between the outside of said large cylindrical member and the inside of said small cylindrical member and which extend in the radial direction, whereby compressed air supplied from said first compressed air supply device is introduced into said opening from both outside of said large cylindrical member and inside of said small cylindrical member when said piston slides away from said opening.

5,148,853

METHOD AND APPARATUS FOR CONTROLLING THE HEAT TRANSFER OF LIQUID COOLANT IN CONTINUOUS CASTING

Ho Yu, Murrysville; Douglas L. Bruce, Vandergrift; Richard C. Stiffler, Pittsburgh; David D. Leon, Murrysville, and Francis J. Glogowski, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,759, Jun. 14, 1989, Pat. No. 4,987,950. This application Jan. 28, 1991, Ser. No. 647,332

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] B22D *11/124*

U.S. Cl. 164—455 18 Claims

1. A system for monitoring the relative density of a first fluid suspended as bubbles in a second fluid wherein one of said fluids is liquid and the other being gas, said system comprising:
(a) a conduit for passing said fluid mixture;
(b) one or more light passing surfaces in contact with said fluid mixture in said conduit;
(c) a means to transmit light into aid fluid mixture;
(d) a light sensor arranged to receive light emitted from said fluid mixture;
(e) a generating means for generating a signal related to the amount of light impinging on said sensor;
(f) a varying means for varying the amount of gas in said liquid in response to said signal; and
(g) means for passing wave energy to said light passing surfaces to clean the surfaces thereof in contact with said fluid mixture.

6. In a method for continuously casting metal ingots using a liquid coolant which includes casting molten metal into an open-ended mold used to form an ingot emerging therefrom, providing a liquid coolant, mixing a gas with said coolant liquid so that said liquid contains gas bubbles, using a light source and light sensor to detect the relative density of said bubbles from the scattering of light, comparing said density to a reference range, varying the amount of gas that is being mixed with said liquid when said density is outside said reference range to bring said density within said reference range, and applying said liquid coolant to said ingot emerging from said mold to effect at least partial solidification of said molten metal the improvement comprising:
generating waves of sufficient energy to effect cleaning of a light transmitting surface in contact with said liquid.

5,148,854

COUNTING DIE CAST MANUFACTURED GOODS

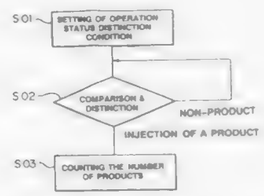
Toshinori Nakamoto, Kanagawa, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,821

Int. Cl.[5] B22D *17/00*

U.S. Cl. 164—457 17 Claims

1. An apparatus for counting die casting products manufactured by a die casting machine, comprising:
setting means for inputting shot data indicative of accepting shot operation of the die casting machine;
detecting means for detecting an operation status of the die casting machine and generating operation status data indicative thereof;
distinction means for comparing the detection data with the input shot data and generating a coincidence signal upon a favorable comparison; and
counting means, responsive to the coincidence signal, for counting the number of products produced by the die casting machine.



10. A method of counting die casting products manufactured by a die casting machine, comprising the steps of:
inputting shot data indicative of acceptable shot operation of the die casting machine;
detecting an operation status of the die casting machine;
distinguishing a coincidence of the detected operating status and the input shot data; and
counting the number of times there is coincidence, the count indicating the number of die cast products produced.

5,148,855

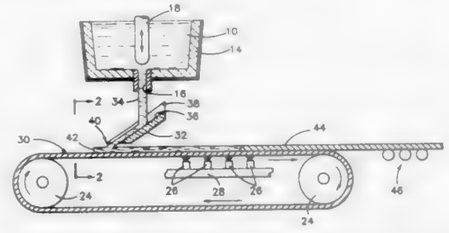
FEEDING SYSTEM FOR BELT CASTING OF MOLTEN METAL

Sankaranarayanan Ashok, Bethany, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Sep. 4, 1990, Ser. No. 576,863

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—479 7 Claims



1. An apparatus for feeding molten metal onto a moving surface in a casting apparatus comprising:
a source of molten metal;
a moving surface having a horizontal planar area thereon for receiving said molten metal;
feeding means located to receive said molten metal from said source and deposit it onto said moving surface, said feeding means directing said metal onto said moving surface in a direction toward the upstream end of the moving surface and opposed to the direction to movement of the moving surface; and
cooling means located downstream of the point at which said metal is deposited on said moving surface for cooling said metal on said moving surface so said metal beginning to solidify at a point downstream of said point.

5. A process for casting molten metal into a solidified strip of material in which molten metal is fed onto a continuously moving surface having a generally planar area, said process comprising:
providing a source of molten metal;
providing a horizontal moving surface for receiving said molten metal and causing it to solidify thereon downstream of the point at which the molten metal is received on said moving surface; providing cooling means at a location downstream of said point; and
feeding said molten metal from said source onto said moving surface in a direction toward the upstream end of the moving surface and opposed to the movement of the moving surface.

5,148,856

DIRECT CHILL CASTING MOULD WITH CONTROLLABLE IMPINGEMENT POINT

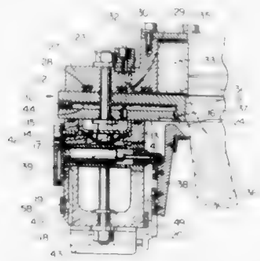
Friedrich P. Mueller, Schifferstadt, Fed. Rep. of Germany, and Guy LeBlanc, Longueuil, Quebec, Canada, assignors to Alcan International Limited, Montreal, Quebec, Canada

Continuation of Ser. No. 446,100, Dec. 5, 1989, abandoned. This application Jun. 11, 1991, Ser. No. 717,851

Claims priority, application Canada, Dec. 8, 1988, 585386

Int. Cl.[5] B22D *11/124*

U.S. Cl. 164—487 9 Claims



1. An apparatus for continuously casting molten metal comprising:
(a) an open-ended direct chill casting mould comprising a mould plate having inner axially extending walls defining a rectangular mould cavity with opposed long side walls and short side walls,
(b) coolant delivery apertures adjacent at least the mould cavity long side walls adapted to discharge streams of coolant inwardly at an angle in the direction of metal movement to impinge on an ingot being formed, and
(c) deflector means having a varying contoured face for deflecting the coolant streams in a variable direction dependent on the local shrinkage conditions of the rectangular ingot being formed such that the coolant impinges upon the ingot at a constant distance below said mould plate around the periphery of the ingot, said deflector means being a baffle having a contoured deflector face adapted to deflect the coolant streams in compensation for the outside solidification profile of the forming ingot.

8. In a process for the production of rectangular metal ingots by the direct chill continuous casting process comprising the steps of
(a) pouring molten metal into an open-ended thermally insulated hot top section,
(b) allowing the molten metal to descend from said hot top section into a lower chilled rectangular mould section axially aligned with said hot top section and bring said molten metal into contact with said chilled mould section to produce a solidified peripheral layer, and
(c) withdrawing the metal continuously from the chilled rectangular mould section at a predetermined casting rate and applying liquid coolant directly to the surface of the solidified peripheral layer of metal emerging from the chilled mould section,
the improvement which comprises deflecting the direction of the liquid coolant streams in a pattern determined by the shrink pattern of at least the long sides of the emerging rectangular ingot such that the coolant streams impinge on the emerging ingot at a uniform impingement point on all sides thereof, said coolant streams being deflected by engaging a varying contoured deflector face of a baffle which is laterally movable.

5,148,857

METHOD FOR REMOVING SOOT BY SCATTERING STEEL BALLS IN A HEAT-EXCHANGER AND HEAT-EXCHANGER PROVIDED WITH A STEEL BALL SCATTERER

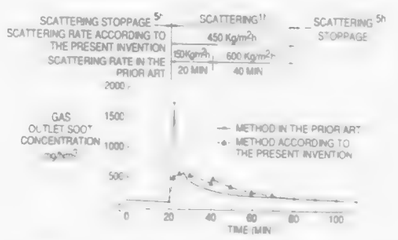
Masami Kato; Tadashi Tanaka; Satoshi Nakamura, all of Nagoya; Tsuneo Higashi; Hiroshi Fujike, both of Mihara; Katsuaki Makino, and Hiroshi Miyamoto, both of Hiroshima, all of Japan, assignors to Chubu Electric Power Company, Inc., Aichi and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed May 21, 1991, Ser. No. 703,774

Claims priority, application Japan, May 21, 1990, 2-52147[U]; May 21, 1990, 2-129292

Int. Cl.[5] F28G *13/00*

U.S. Cl. 165—1 2 Claims



1. A method for removing soot or the like adhered to heat transfer tubes of a heat-exchanger, said method comprising intermittently scattering steel balls towards said heat transfer tubes during a scattering operation; and controlling the rate at which the steel balls are scattered during said operation in such a manner as to set the rate at the commencement of the scattering operation to a small initial rate and to thereafter cause the rate to increase to one that is substantially greater than said initial rate.

5,148,858

HEAT EXCHANGER CONNECTED TO A WASTE WATER DISCHARGE CONDUIT

Hans A. Ovretveit, Telavag, Norway, assignor to Telavag Energiteknikk A/S, Telavag, Norway

PCT No. PCT/NO89/00037, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990, PCT Pub. No. WO89/10521, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 27, 1989, Ser. No. 601,739

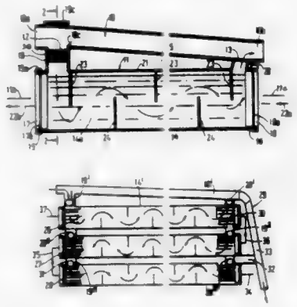
Claims priority, application Norway, 881869

Int. Cl.[5] F24J *3/00*; F28D *7/00*

U.S. Cl. 165—38 13 Claims

1. In combination,
a water discharge conduit disposed in a downwardly inclined direction for receiving a flow of waste water at an upper end, said conduit having a radially directed outlet opening at said upper end for discharging hot waste water therethrough and a radially directed inlet opening at a lower end;
a horizontally disposed water trap disposed below said conduit in parallel relation, said trap having an intake union at one end communicating with said outlet opening of said conduit to receive a flow of hot waste water therefrom and a discharge union at an opposite end communicating

with said inlet opening of said conduit to discharge the flow of waste water into said conduit; and



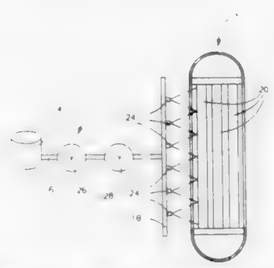
a plurality of pipes extending through said trap for conducting flows of fresh water therethrough in heat exchange relation with the flow of waste water in said trap.

5,148,859

AIR/LIQUID HEAT EXCHANGER

Henry E. Beamer, Middleport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1991 Ser. No. 653,588
Int. Cl.[5] F25B *19/00*; B64D *33/10*
U.S. Cl. 165—41 3 Claims



1. A radiator for the water cooling system of a high performance aircraft piston engine where the water temperature ranges 180°–220° F., said radiator having a core with an upstream face, spray means directed toward said upstream core face, and refrigerant supply means for selectively supplying a refrigerant to said spray means for spraying onto the heat transfer surface of said core to effect supplemental evaporative cooling that significantly increases the heat capacity of the cooling system and significantly reduces aircraft drag, said refrigerant being of a kind having an atmospheric boiling point substantially lower than water

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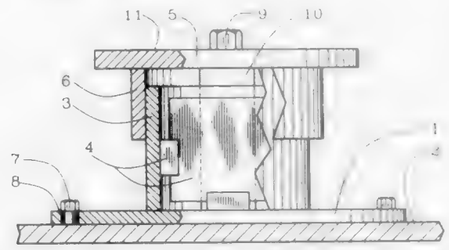
5,148,860

THERMAL CONTROL APPARATUS FOR SATELLITES AND OTHER SPACECRAFT

Ronald G. Bettini, 2578 Spruce Creek Blvd., Daytona Beach, Fla. 32014

Filed Oct. 9, 1990, Ser. No. 594,410
Int. Cl.[5] F28F *7/00*
U.S. Cl. 165—41 31 Claims

1. A spacecraft thermal-control apparatus comprising:
a base attachable to an exterior portion of a spacecraft;
a heat radiator positionable at a select distance from the base and attachable to the base with support means;
a heat-conductive sleeve in heat-conductive attachment to the heat radiator;
a heat-conductive cylinder in heat-communication relationship between the base and an inside periphery of the heat-conductive sleeve; and



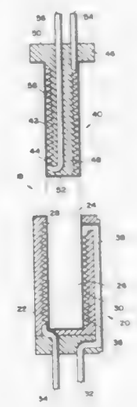
a heat-conductor in heat-communication relationship between the heat-conductive sleeve and components of the spacecraft requiring cooling.

5,148,861

QUICK DISCONNECT THERMAL COUPLER

David P. Colvin, Apex; James C. Mulligan, and Benjamin T. Gravely, both of Raleigh, all of N.C., assignors to Triangle Research and Development Corporation, Research Triangle Park, N.C.

Filed Jul. 31, 1991, Ser. No. 738,849
Int. Cl.[5] F28F *5/00*
U.S. Cl. 165—78 9 Claims



1. A quick disconnect heat exchanger for thermally coupling first and second discrete thermal loops, each loop adapted to carry a circulating heat exchange fluid and comprising:
a female member having an outer wall and an opening defining a cavity and whereby said cavity defines further an inner wall,
a first chamber defined by the inner and outer walls of said female member,
spaced apart inlet means and outlet means in fluid communication with said first chamber,
a male member defining a second chamber and having a second outer wall,
spaced apart second inlet means and second outlet means in fluid communication with said second chamber, said male member being adapted to be removably received within the cavity of said female member and wherein the outer wall of said male member is in substantial contacting

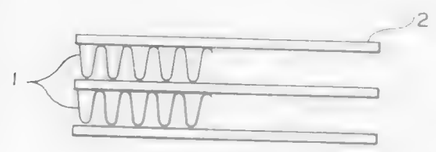
thermal energy transfer relation with the inner wall of said female member,
said chamber and said second chamber each having guide means for directing the fluid along the longitudinal axis of the respective male and female member so that the fluids make plural passes around the periphery of the respective male and female members;
whereby thermal energy is transferred between the first and second thermal loops as the heat exchange fluids flow through the respective first and second chambers of the heat exchanger when the female member and the male member are connected and wherein the first and second thermal loops may be decoupled by separating the male member and the female member without fluid loss, contamination or mixing of the heat exchange fluids.

5,148,862

HEAT EXCHANGER FIN MATERIALS AND HEAT EXCHANGERS PREPARED THEREFROM

Mitsuo Hashiura, Kenji Negura, Sadayuki Kamiya, Shigenori Yamauchi, Aichi; Yuji Suzuki, Kenji Kato, Naoki Tokizane, and Yoshifusa Shoji, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo and Nippondenso Co., Ltd., all of Aichi, Japan

Filed Nov. 27, 1991, Ser. No. 800,556
Claims priority, application Japan, Nov. 29, 1990, 2-326043; Nov. 29, 1990, 2-326044
Int. Cl.[5] F28F *19/00*
U.S. Cl. 165—134.1 7 Claims



1. An aluminum alloy fin material for use in an aluminum heat exchanger, which consists of, in weight percentage, 0.8 to 1.8% Fe, 0.3 to 3.0% Zn, up to 0.3% Cu and at least one element selected from the group consisting of 0.05 to 0.25% Zr and 0.05 to 0.25% Cr, with the balance being Al and unavoidable impurities, wherein Mn in the unavoidable impurities is 0.3% or less.

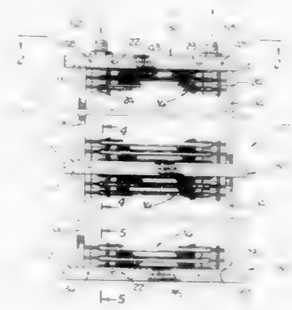
5. A heat exchanger which comprises:
(i) a fin member made of a brazing sheet consisting of an aluminum alloy core and a cladding made of an Al-Si brazing alloy and bonded onto both sides of the core, the aluminum alloy core consisting of, in weight percentage, 0.8 to 1.8% Fe, 0.3 to 3.0% Zn and up to 0.3% Cu and at least one element selected from the group consisting of 0.05 to 0.25% Zr and 0.05 to 0.25% Cr, with the balance being essentially Al and unavoidable impurities, wherein Mn in the unavoidable impurities is 0.3% or less; and
(ii) a fluid passage member made of an extruded tube consisting of an aluminum alloy consisting of at least one element selected from the group consisting of not more than 0.5% Cu and not more than 0.5% Mn, with the balance being essentially Al and unavoidable impurities, wherein the fin member is brazed to the fluid passage member.

5,148,863

MODULAR COOLER

Robert F. Fouts, Rancho Palos Verdes; Craig Fouts, Encinitas, and Earl J. Fouts, Rolling Hills, all of Calif., assignors to Earl's Supply Co., Long Beach, Calif.

Filed Jan. 15, 1992, Ser. No. 821,959
Int. Cl.[5] F28D *1/03*
U.S. Cl. 165—149 13 Claims



1. A modular cooler comprised of a plurality of interconnected units, each of said units comprising:
an upper plate and a lower plate;
a pair of spaced end walls secured to said upper and lower plates;
a plurality of spaced cooling plates mounted below said upper plate, above said lower plate and between said end walls and secured thereto, each of said cooling plates having a hollow midbody portion with integral flanges at each end of said midbody portion, with apertures therethrough, said apertures in said flanges being in fluid communication with the interior of said midbody portion;
a pair of spaced openings in each of said upper and lower plates, one of said openings being on one side of said upper and lower plates and the other of said openings being on the other side of one of said upper and lower plates, the openings on said one side of said upper plate being aligned with the opening on said one side of said lower plate and with said apertures extending through one side of said flanges, and the opening on the other side of said upper plate being aligned with the opening on the other side of said lower plate and with said apertures extending through the other side of said flanges whereby fluid communication is provided from said one of said openings through said aligned apertures, through said midbody portions and out said other of said openings, one of said units being secured in a fluid-tight manner to another of said units with the lower plate of one of said units abutting against the upper plate of another of said units, and a closure plate closing off the lower plate of said another of said units in a fluid tight manner.

5,148,864

HIGH PRESSURE ELECTRICAL CABLE PACKOFF AND METHOD OF MAKING

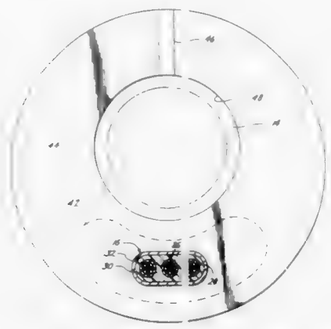
Jürgen A. Willis, and Mark A. Metzger, both of Lawrence, Kans., assignors to Cameo International Inc., Houston, Tex.

Filed Jun. 17, 1991, Ser. No. 716,191
Int. Cl.[5] E21B *33/00*
U.S. Cl. 166—65.1 8 Claims

2. A method of making a high pressure electrical cable packoff for an oilwell wellhead in a casing and surrounding a production tubing in which the cable includes at least one electrical conductor, an insulator around each conductor, a jacket around the insulators, and a protective metal exterior comprising,

at a longitudinal section of the cable removing the metal exterior and removing the jacket,

bonding a resin block to the insulation where the metal exterior and jacket were removed and extending the block outwardly beyond the outside of the cable, and



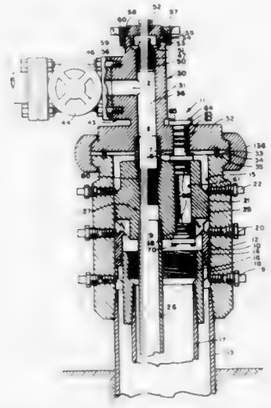
molding a resilient sealing ring around and enclosing the block and the longitudinal section of the cable where the metal exterior and jacket have been removed.

5,148,865

MULTI-CONVERSION WELLHEAD ASSEMBLY

Lehman T. Reed, 3219 Candlewood Dr., Bakersfield, Calif. 93306-1617

Filed Apr. 8, 1991, Ser. No. 681,978
Int. Cl.[5] E21B *33/03*
U.S. Cl. 166—76 13 Claims



1. A wellhead assembly for oil and gas wells comprising

an annular wellhead with a bore therethrough;

a tubing hanger mountable in said bore, said tubing hanger having first and second holes therethrough;

means for supporting a tubing string in the first hole;

means forming a bonnet with a first flow passage therein and a third hole therethrough

means for mounting said bonnet over said wellhead with said first flow passage in alignment with said first hole and said third hole in alignment with said second hole; and

sealing plug means removably mountable in the second and third holes;

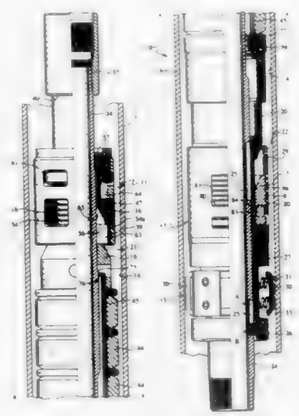
whereby said wellhead assembly is usable with some production modes of operation when said sealing plug means are positioned for sealing off said second and third holes and with other production modes when said sealing plug means are not so positioned.

5,148,866

WELL TOOL ANCHORING MECHANISM WITH IMPROVED SLIP RELEASE

Donald R. Greenlee, Cedar Hill, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 27, 1991, Ser. No. 767,174
Int. Cl.[5] E21B *33/129, 23/06*
U.S. Cl. 166—134 3 Claims



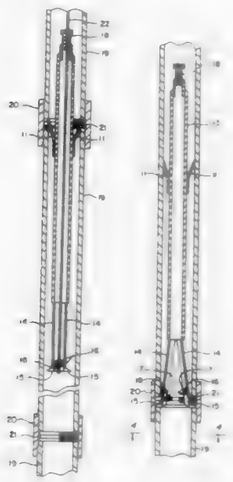
1. In a well tool with a set of slips carried within a cage slidably mounted on a mandrel for said slips to move within said cage radially from retracted positions into radially extended positions by the wedging action of a frustoconical setting head sliding between the mandrel and the slips so as to force the latter to gripping engagement with the inside of a well casing to anchor the tool against upwardly acting forces in the well, and a shoulder on said mandrel engageable with said cage to lift said cage off said setting head for releasing said slips to free the tool for upward movement within the well, the improvement comprising a plurality of windows formed within said cage and spaced circumferentially from each other around said mandrel, said slips protruding through said windows for movement between said retracted and extended positions with each of said slips having a toothed outer surface for gripping engagement with the casing wall and a primary release shoulder formed thereon beneath said toothed outer surface, said windows each including a lower edge engageable with said primary release shoulder when said cage is lifted by said shoulder on said mandrel and in turn lifting said slips free from said casing wall for movement into said retracted positions, and a plurality of circumferentially spaced slots formed through said cage with one each of said slots being associated with and located above each of said windows, each one of said slips including a secondary release shoulder formed thereon above said toothed outer surface and projecting in a radial direction outwardly from said cage into the one of said slots associated with said one slip, said slots further each having a lower ledge spaced from the edge of the one of said associated windows a selected distance whereby said ledge engages said secondary release shoulder in the event of deformation occurring between said primary release shoulder and said lower edge when pulling said mandrel upwardly to release said slips.

5,148,867

STOP FOR AN OIL WELL SWABBING DEVICE

Gary W. Coyle, Caldwell, Ohio, assignor to Concoyle Oil Fields Tools, Inc., Salt Lake City, Utah

Filed Jun. 17, 1991, Ser. No. 716,147
Int. Cl.[5] E21B *23/02*
U.S. Cl. 166—213 3 Claims



1. A stop for an oil well swabbing device, said stop comprising,

a cylindrical member of a diameter smaller than the interior diameter of the oil well casing in which said stop is to be used,

a plurality of outwardly biased finger members attached to said cylindrical member adjacent to the upper end thereof and upwardly extending when said cylindrical member is placed in an oil well casing and adapted to engage the lower end of a section of oil well casing pipe at a joint with another section of oil well casing pipe and adapted to resist upward movement of said cylindrical member in an oil well casing,

said finger members being of a size and shape such that they will bend downward along said cylindrical member when sufficient upward force is exerted on said cylindrical member, thus permitting said cylindrical member to be removed from said oil well casing,

a plurality of outwardly extending supports connected to and extending downwardly from the lower end of said cylindrical member when said cylindrical member is placed in an oil well casing and normally biased outwardly from said cylindrical member,

said supports being provided with means to engage the upper end of a section of oil well casing pipe at a joint with another section of oil well casing pipe and support said cylindrical member in said oil well casing,

said cylindrical member being provided with a hollow coaxial portion extending completely therethrough and adapted to receive a rod therein of a length such that said rod will extend beyond the upper and lower ends of said cylindrical member,

means on said supports adapted to permit said supports to be held by the lower end of said rod while said rod is positioned inside said cylindrical member,

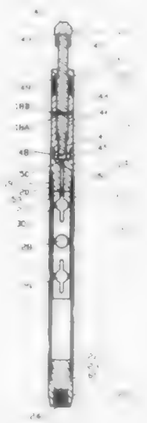
and means on the upper end of said rod adapted to engage means for lowering said rod and said cylindrical member into said oil well casing.

5,148,868

METHOD AND APPARATUS FOR PERFORATING TUBING

J. B. Christian, Rte. 9, Box 630, Laurel, Miss. 39440

Filed Aug. 12, 1991, Ser. No. 743,861
Int. Cl.[5] E21B *43/116*
U.S. Cl. 166—297 5 Claims



1. A method for perforating tubing inside a casing string, comprising the steps of:

a. positioning at the top of the tubing string a perforating apparatus;

b. subsequently dropping said perforating apparatus through said tubing string allowing it to hit an obstruction or plugged area in the tubing near the bottom of a well;

c. dropping an impact bar through said tubing string causing a collision with said perforating apparatus which will detonate said apparatus and create a drain hole in said tubing;

d. not removing said perforating apparatus and impact bar from said tubing prior to removal of said tubing string from a well;

e. recovering said perforating apparatus and impact bar from said tubing after said tubing string has been removed from a well.

2. A manually-dropped perforating apparatus for perforating tubing in a well with an explosive charge, comprising:

a. a percussion firing assembly machined from cylindrical lengths of solid metal, including:

i. a fishing neck drilled and threaded in the center of its bottom end to be disposed at the upper end of said percussion firing assembly by screwing said fishing neck onto a firing pin, said fishing neck machined to receive on its top the force from a dropped impact bar, and adapted for suspension from a wireline, if needed;

ii. a firing pin holder machined to receive a firing pin and dispose it on top of a shell holder, said firing pin holder threaded on top to receive a firing pin holder cap and threaded at its other end so that it can be screwed into said shell holder; said firing pin holder drilled vertically to approximately the same diameter as said firing pin and at its other end drilled vertically to a smaller diameter so that said firing pin can come into contact with a detonator in a shell holder;

iii. a firing pin holder cap to be disposed at one end of a firing pin holder and adapted at said end to approximately the same diameter as one end of a firing pin, so that said firing pin holder pin cap will slide onto said firing pin after the firing pin has been inserted into said firing pin holder, and said firing pin holder cap threaded so that it will screw onto the top of said firing pin

holder, so that when the firing pin holder cap is screwed into place the firing pin is prevented from being removed from said firing pin holder;

iv. a firing pin machined at one end with a small pinpoint-shaped extension so that said extension will hit a Hornet detonator in a shell holder; said firing pin with an unthreaded bottom end disposed into the top of a firing pin holder by inserting said end, which is the smallest end, into the top of said firing pin holder; and the other, upper, end of said firing pin with a diameter of a size slightly larger than the unthreaded end, so that said firing pin will accept a firing pin holder cap; and said firing pin with its middle portion having its largest diameter, said portion machined to accept a frangible pin; and said firing pin drilled through horizontally in said middle portion to produce a hole of a size which will accept a frangible pin, and so that said hole can be lined up with a hole horizontally drilled through said firing pin holder so that said firing pin holder will also accept the frangible pin, resulting in the alignment of said firing pin and said firing pin holder, so that said frangible pin can be inserted through said firing pin and said firing pin holder.

v. a shell holder disposed below a firing pin holder and above an expendable hollow charge carrier and which has been adapted to receive a 0.22 Hornet detonator, said detonator and a detonator cord being first crimped together, then said cord inserted into vertical center hole of said shell holder and said cord pulled through until said detonator seats in place; said shell holder milled at its bottom end to produce a horizontal slot bisecting said end and holes for screws drilled near said slotted end, so that said end and screws in said shell holder will hold in place a charge holder; said shell holder with an outside diameter at its slotted end such that said shell holder can be placed into said charge holder and held in place with screws; said shell holder grooved to accept two O-rings thereon; and said shell holder threaded at its top end to receive a firing pin holder;

b. the percussion firing assembly of claim 2.a. further including:

i. adapting an expendable hollow charge carrier to receive said percussion firing assembly and to secure said firing assembly by means of screws, and adapted at its lower end to receive a bull plug to be secured by screws;

ii. a charge holder which fits onto the bottom end of a shell holder and which is secured by screws;

iii. a bull plug disposed at the bottom of the perforating assembly, said plug adapted for insertion into the lower end of the charge holder and carrier assembly and fitted with two O-rings to secure a tight seal; said bull plug threaded at its bottom end so that weights can be attached if needed.

5,148,869

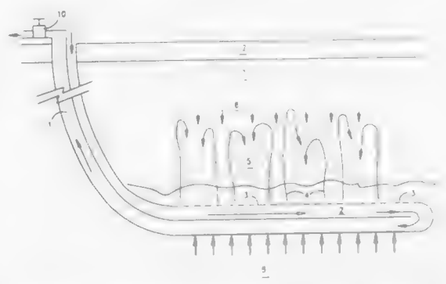
SINGLE HORIZONTAL WELLBORE PROCESS/APPARATUS FOR THE IN-SITU EXTRACTION OF VISCOUS OIL BY GRAVITY ACTION USING STEAM PLUS SOLVENT VAPOR

J. Michael Sanchez, Carrollton, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 31, 1991, Ser. No. 648,063
Int. Cl.[5] E21B *43/24*
U.S. Cl. 166—303 **12 Claims**

1. A method for removing immobile viscous hydrocarbonaceous fluids from a formation or reservoir penetrated by a horizontal wellbore, comprising:

a) circulating continuously in and out of said horizontal wellbore steam and a gas soluble in hydrocarbonaceous fluids through an upper perforated conduit of said horizontal wellbore and exiting through a lower conduit via a pressure at or below the reservoir pressure and below the reservoirs's fracture pressure so as to substantially avoid steam entry into the reservoir except by gravitational forces, thereby conduction heating the reservoir while obtaining by steam percolation and gas diffusion into the formation an enhanced reduction in the viscosity of hydrocarbonaceous fluids; and



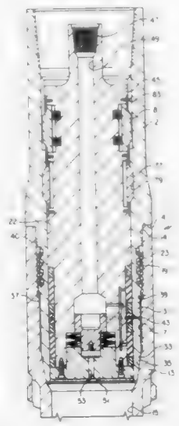
b) allowing steam to circulate in and out of said wellbore for a time sufficient to heat the reservoir by transient conduction to a temperature sufficient to remove continuously hydrocarbonaceous fluids of reduced viscosity from said lower conduit in said wellbore which fluids result from conduction heating, steam percolation and gas diffusion into the reservoir.

5,148,870

WELL TIEBACK CONNECTOR SEALING AND TESTING APPARATUS

Randolfo Fernandez, Aberdeen, and Andrew S. Mosley, Aberdeenshire, both of Scotland, assignors to ABB Vetco Gray Inc., Houston, Tex.

Filed Sep. 3, 1991, Ser. No. 753,532
Int. Cl.[5] E21B *33/043*
U.S. Cl. 166—344 **20 Claims**



14. In a subsea well assembly of a type having a lower tieback member adapted to face upward from a sea floor for receiving a downward facing upper tieback member lowered from a platform, the upper tieback member having an axial passage therethrough, the lower tieback member having a set of running grooves axially spaced from a set of tieback grooves, the upper tieback member having connection means for engaging the tieback grooves to connect the upper tieback member to the lower tieback member, an improved apparatus

for sealing and testing the connection of the tieback members, comprising in combination:

a lower sealing area located in the lower tieback member below at least one of the sets of running grooves and tieback grooves;

an upper sealing area located in the lower tieback member above the lower sealing area and above at least one of the sets of running grooves and tieback grooves;

a lower tieback seal located on a lower portion of the upper tieback member and positioned to sealingly engage the lower sealing area;

an upper tieback seal located on the upper tieback member above the lower tieback seal and positioned to sealingly engage the upper sealing area;

a test passage located between the lower and upper tieback seals and extending from the axial passage of the upper tieback member to the exterior of the upper tieback member;

a tubular body having an axial passage, the tubular body being adapted to be secured to a string of conduit and lowered from the platform into the upper tieback member;

upper and lower isolating seals on the exterior of the tubular body;

an energizing passage leading from the axial passage of the tubular body to the upper and lower isolating seals, respectively, for delivering fluid to the upper and lower isolating seals to cause the upper and lower isolating seals to seal against the axial passage of the upper tieback member at points above and below the test passage, respectively; and

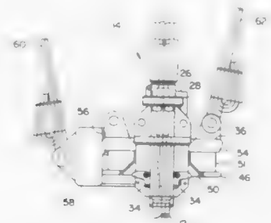
a communication passage leading from the axial passage of the tubular body to the exterior of the tubular body between the upper and lower isolating seals for supplying fluid pumped down the axial passage of the tieback member to the test passage between the upper and lower tieback seals while engaging the upper and lower sealing areas, respectively, to determine if any leakage past the upper tieback seal exists.

5,148,871

TENSION ADAPTER ASSEMBLY FOR COMPLETION RISER

Steven D. Gullion, Knaresborough, England, assignor to Cooper Industries, Inc., Houston, Tex.

Filed May 9, 1991, Ser. No. 697,717
Int. Cl.[5] E21B *7/128*
U.S. Cl. 166—345 **3 Claims**



1. Apparatus for tensioning a completion riser having an upper end comprising

a tension ring having means for exerting an upward load thereon and an internal landing seat,

a tension sleeve having a landing shoulder for engaging the internal landing seat in said tension ring,

means for clamping said tension sleeve to the upper end of the completion riser,

means for transmitting the upward load applied to the tension ring and said tension sleeve to the upper end of the completion riser,

said tension sleeve being sized to clamp around said upper end of said completion riser and to pass through a rotary table,

said tension ring being sized to engage within a drilling tension ring, and

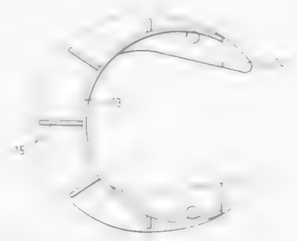
means on said tension sleeve for transmitting a tension load exerted by the completion riser to said tension ring.

5,148,872

HORSEHOOF BOOT WITH HORSESHOE

Helmuth Dallmer, Alte Landstrasse 3, 2125 Salzhausen-Putensen, Fed. Rep. of Germany

Filed Feb. 13, 1991, Ser. No. 654,777
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005388
Int. Cl.[5] A01L *3/00, 5/00*
U.S. Cl. 168—11 **5 Claims**



1. A horsehoof boot, comprising:

a one-piece plastic part including a base having an upper surface and a continuous flat lower surface which is adapted for attachment of a horseshoe, and a collar connected to said base and provided with predetermined breaking points so as to be adaptable upon attachment to a horsehoof; and

separate fastening elements detachably connecting said horseshoe to said base without requiring removal of said plastic part,

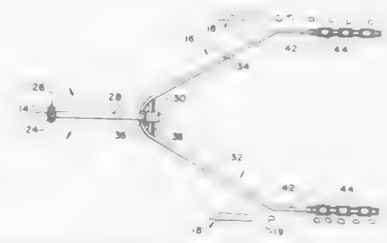
said base and said horseshoe having enclosed and aligned holes for allowing passage of said fastening elements and secure attachment of the horseshoe to said base of said plastic part.

5,148,873

ROW FOLLOWER

Ronny L. Barnes, O'Donnell, and Jimmy C. Ray, Denison, both of Tex., assignors to Gar-Bar Corporation, O'Donnell, Tex.

Filed Mar. 4, 1991, Ser. No. 664,632
Int. Cl.[5] A01B *69/00*
U.S. Cl. 172—5 **6 Claims**



3. Structure for sensing a path in a cultivated field for a tractor to follow;

a. said path having at least one structural guide which may be mechanically sensed,

b. said tractor having,

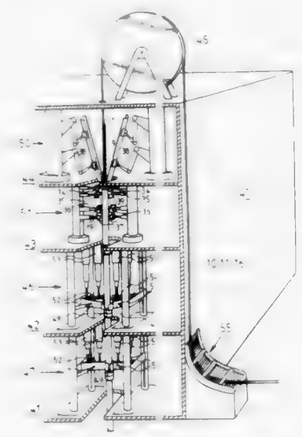
i. steering means to guide the tractor responsive to deviations from the path,
ii. a bracket on the tractor,
iii. a sensor for contacting said path guide attached to the bracket by
iv. mounting means for permitting and measuring horizontal movement of the sensor to the bracket;
c. the improved structure comprising in combination with the above:
d. stabilizer means connected to said sensor for stabilizing and prohibiting bounce of the sensor,
e. said stabilizer means is in the form of a drag strip on the path, and
f. said strip is flexible vertically but rigid horizontally.

5,148,874

HIGH-PRESSURE PIPE STRING FOR CONTINUOUS FUSION DRILLING OF DEEP WELLS, PROCESS AND DEVICE FOR ASSEMBLING, PROPELLING AND DISMANTLING IT

Werner Foppe, Geilenkirchen, Fed. Rep. of Germany, assignor to Technologie Transfer Establishment, Liechtenstein

PCT No. PCT/CH90/00123, § 371 Date Mar. 1, 1991, § 102(e) Date Mar. 1, 1991, PCT Pub No. WO90/13729, PCT Pub. Date Nov. 15, 1990
PCT Filed May 3, 1990, Ser. No. 656,134
Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914617
Int. Cl.[5] E21B 7/14
U.S. Cl. 175—11 22 Claims



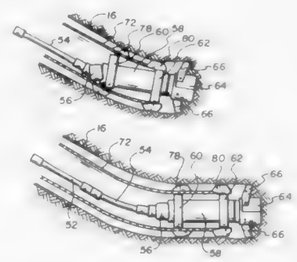
1. A process for assembling and propelling a high-pressure pipe string for continuous fusion drilling of deep wells which comprises: feeding supply lines (**10, 11, 16**), measurement instrumentation wiring (**17**) and control wiring (**18**) to a boring head in a continuous manner; encasing the supply lines (**10, 11, 16**), the measurement instrumentation wiring (**17**) and the control wiring (**18**) in a tight compression and tension resistant high-pressure pipe string comprising a plurality of pipe segments each comprising an inner profile (**1**) having a central pipe (2) with a plurality of profiles (**3**), and a plurality of shell elements (**4**) secured about the inner profile (**1**); and propelling the assembled pipe string continuously downward into a boring.

5,148,875

METHOD AND APPARATUS FOR HORIZONTAL DRILLING

Haraldur Karlsson, Kingwood; Gary E. Jacques, Houston, both of Tex.; James L. Hatten, Sumrall, Miss., and John K. Aslakson, Sandy, Utah, assignors to Baker Hughes Incorporated

Division of Ser. No. 541,836, Jun. 21, 1990, Pat. No. 5,074,366.
This application Sep. 24, 1991, Ser. No. 764,778
Int. Cl.[5] E21B 10/66
U.S. Cl. 175—62 24 Claims



12. A method of simultaneously drilling and casing a wellbore, comprising:
placing an end of a tubular casing string proximate a location where drilling is to be commenced;
inserting a first drill string including a drill bit within said casing string and extending said drill bit beyond said casing string end;
radially expanding said extended first drill string drill bit;
rotating said expanded first drill string drill bit and advancing said first drill string to drill said wellbore to a diameter greater than that of said casing string;
advancing said casing string in said wellbore behind said drill bit;
withdrawing said first drill string from said casing string and said wellbore after a first portion thereof has been drilled;
inserting a liner string of lesser diameter than said casing string therewithin to said end thereof;
inserting a second drill string including a drill bit within said liner string and extending said drill bit beyond said liner string;
radially expanding said second drill string drill bit;
drilling a second portion of said wellbore to a diameter greater than that of said liner string ahead of said casing string by rotating said expanded second drill string drill bit and advancing said second drill string and liner string ahead of said casing string.

5,148,876

LIGHTWEIGHT DRILL PIPE

Gerald E. Wilson, Montgomery, Tex., assignor to Prideco, Inc., Houston, Tex.

Filed Jun. 10, 1991, Ser. No. 712,529
Int. Cl.[5] E21B 17/10
U.S. Cl. 175—76 6 Claims

1. An aluminum pipe joint for use in a drill string for drilling wells having a well bore with a substantially non-vertical section where the portion of the drill string located in the non-vertical section is in compression and is urged into engagement with the low side of the hole by gravity, comprising an elongated tubular member of aluminum the outer surface of which is a machined surface, said tubular member having an outside diameter equal to the outside diameter of a standard joint of drill pipe over a substantial portion of its length, a section of increased diameter about midway between the ends of the joint, portions of enlarged diameter adjacent each end of the pipe joint having a diameter equal to the diameter of the external upset required for tool joints and to increase the buckling strength of the joint, steel tool joints attached to each end

of the tube, the length of said enlarged end portions being such that the joint will not be bent during tonging if the joint is

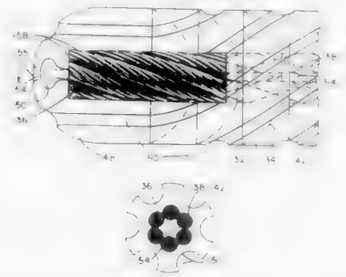
supported adjacent the end of the enlarged portion on which the tool joint being tonged is located.

5,148,877

APPARATUS FOR LATERAL DRAIN HOLE DRILLING IN OIL AND GAS WELLS

Donald C. MacGregor, 13 Hunters Trail, Warren, N.J. 07060

Filed May 9, 1990, Ser. No. 520,718
Int. Cl.[5] E21B 7/08, 17/20, 17/22
U.S. Cl. 175—79 18 Claims



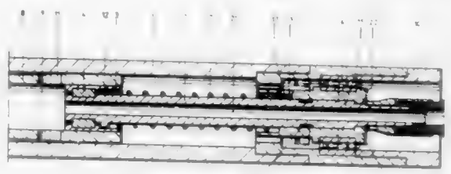
1. Apparatus for drilling a drain hole horizontally from an existing wellbore comprising:
a flexible rotary drillstring, with
a central flexible tensile member, and
a plurality of external disks, with mating spherical surfaces, each with a central hole closely fitted to the central member, arranged sequentially along the length of the central member, and
wherein the disks are slideably tight, one to the next.
9. Deflection block apparatus comprising:
a deflection block sized to an existing wellbore, and
an entrance at its upper surface, and
an exit, from its side, directed to the wellbore wall, and
a curved passageway, from its entrance to its exit, allowing passage of a rotating flexible drillstring, and
wherein the entrance and exit passageways are each essentially of the same diameter as the drillstring, and wherein the curved passageway is essentially of the same diameter as the deflected rotating flexible drillstring,
said curved passageway with a radius, for a deflection of 90°, of less than the wellbore diameter, and
a second passageway, through the block, from an upper surface, to a lower surface below the drillstring passageway exit, and
wherein the second passageway enters from within a rigid nonrotating pipe attached to the upper surface.

5,148,878

RAM BORING MACHINE

Paul Schmidt; Alfons Hesse, both of Lennestadt; Gerhard Balve, Lennestadt-Oberelspe, and Franz-Josef Püttmann, Lennestadt-Saalhausen, all of Fed. Rep. of Germany, assignors to Dipl.-Ing. Paul Schmidt, Lennestadt, Fed. Rep. of Germany

Filed Feb. 1, 1990, Ser. No. 473,611
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909567
Int. Cl.[5] E21B 4/14
U.S. Cl. 175—296 10 Claims



1. A ram boring machine having a striking piston that is axially displaceable in a housing, backward and forward movement of the machine is controlled by a guide tube that is nonrotatably connected to a supply hose and which engages within a cylinder chamber in the striking piston and by at least one corresponding control opening, wherein the guide tube is loaded both axially and torsionally, has axial and rotational stops and is rotatable and axially displaceable in a guide sleeve arranged at the rear end of said housing.

5,148,879

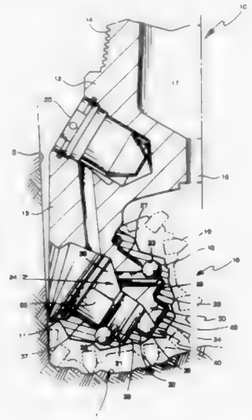
SPINDLE CAP BEARING FOR ROTARY CONE ROCK BITS

Michael E. Hooper, Spring, Tex., assignor to Smith International, Inc., Houston, Tex.

Filed Jun. 17, 1992, Ser. No. 716,586
Int. Cl.[5] E21B 10/22
U.S. Cl. 175—371 6 Claims

1. A rotary cone rock bit comprising:
a rock bit body forming a first pin end and a second cutting end, said second cutting end consisting of at least one leg forming a main axial journal bearing forming a first base end and a second end, a smaller axial spindle bearing formed at said second end of said main bearing, said axial spindle bearing forming a radial thrust surface at the end of the spindle bearing, and
a cylindrically shaped spindle cap forming a first open end and a second closed end, said spindle cap being adapted to be rotatively secured between said end of said spindle bearing and a cone base formed by said cone, said spindle cap forming axial bearing surfaces inside and outside of said cylindrically shaped cap, said cap further forming

inside and outside radial thrust bearing surfaces thereby, said rotatable spindle cap providing intermediate axial and



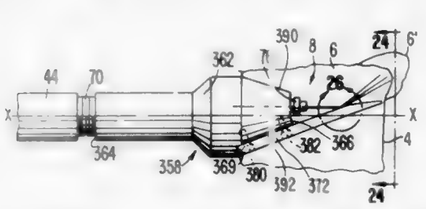
thrust bearing surfaces between said spindle bearing and said cone.

5,148,880

APPARATUS FOR DRILLING A HORIZONTAL CONTROLLED BOREHOLE IN THE EARTH

Douglas W. Lee, Enid; Arthur D. Dekan; James E. Franklin, both of Perry, all of Okla., and Richard P. Dunn, Wichita Falls, Tex., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Aug. 31, 1990, Ser. No. 575,568
Int. Cl.[5] E21B *7/08, 10/60, 10/62*
U.S. Cl. 175—393 **16 Claims**



1. A downhole tool for use at the end of a drill pipe having means for drilling a borehole in the earth in the axial direction of the drill pipe when the drill pipe is simultaneously rotated and axially advanced and for changing the direction of the borehole when the tool is advanced without rotation, comprising:

a tool body including:

a rearward end attachable to a drill pipe having a longitudinal axis; and

a forward end;

a blade assembly including an inner surface having a portion affixed to said tool body so that said blade assembly is at an acute angle to a longitudinal axis of said drill pipe and said blade assembly is extending beyond said forward end of said tool body;

a fluid passageway through said tool body;

a fluid nozzle fixed to said fluid passageway, associated with said tool body, and positioned behind a forward end of said blade assembly;

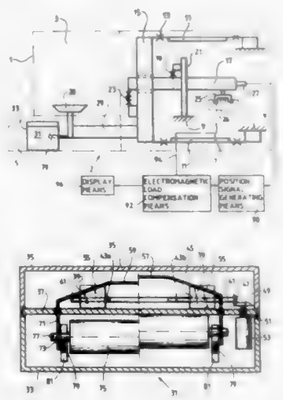
wherein said blade assembly further comprises means for deflecting fluid from said nozzle to an acute angle relative to the longitudinal axis of the drill pipe.

5,148,881

ELECTRONIC WEIGHTING APPARATUS WITH CALIBRATION WEIGHT ARRANGEMENT

Roger Leisinger, Zürich, Switzerland, assignor to Mettler - Toledo AG, Greifensee, Switzerland

Filed Jul. 8, 1991, Ser. No. 726,798
Claims priority, application Switzerland, Jul. 27, 1990, 2495/90
Int. Cl.[5] G01G *19/52, 3/08;* **G01L** *25/00*
U.S. Cl. 177—50 **13 Claims**



1. Electronic weighing apparatus, comprising:

(a) a frame (**9**);

(b) load receiver means (**28,15**) connected for movement relative to said frame;

(c) a calibration weight (**75**; **175**); and

(d) calibration weight operating means connected with said frame for displacing said calibration weight between weight-applying and weight-removed positions relative to said load receiving means, respectively, said calibration weight operating means including:

(1) a weight carrier member (**57,157**) arranged for connection with said calibration weight; and

(2) wedge means for displacing said calibration weight between said weight-applying and weight-removed positions, said wedge means including:

(a) a pair of axially spaced symmetrical wedge members (**39,139**) having opposite mirror-image inclined lifting surfaces (**55,155**) arranged for engagement with corresponding inclined surfaces on said carrier member, respectively; and

(b) rotatable spindle means (**41,141**) for alternatively displacing said wedge members toward and away from each other, respectively, said spindle means including a pair of longitudinally spaced threaded portions of opposite pitch (**43***a*, **43***b*; **143***a*, **143***b*) threadably connected in corresponding threaded bores contained in said wedge members respectively.

5,148,882

ROBOTIC VEHICLE HAVING TILTABLE PROPULSION UNITS

Olivier Carra, Peyrins, and Alain Delevallee, Ecully, both of France, assignors to Framatome, Courbevoie, France

Filed Oct. 30, 1990, Ser. No. 605,446
Claims priority, application France, Oct. 31, 1989, 89 14278
Int. Cl.[5] B62D *55/12*
U.S. Cl. 180—9.64 **5 Claims**

1. An intervention vehicle comprising:

(a) a vehicle body (**2**) having a length and a width extending

respectively along a longitudinal direction (X) and a transverse direction (Y);

(b) propulsion units (**4**, **6**) resting on the ground in operation to suport said vehicle body and to have an advance motion along said longitudinal direction;

(c) said vehicle comprising for each of said propulsion units (**4**):

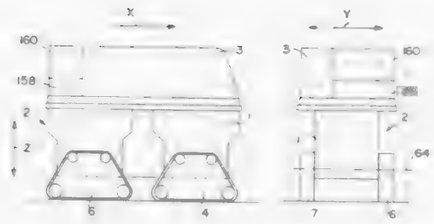
(i) a propulsion unit carrying shaft (**66**) carried by said vehicle body (**2**) and carrying a propulsion unit housing (**68**, **70**) while enabling it to perform a tilting motion (**62**) on command about a transverse tilting axis (**64**) of said propulsion unit;

(ii) an advance motor (**10**) and a tilting motor (**12**) carried by said vehicle body (**2**); and

(iii) an advance driven shaft (**8**) and a tilting driven shaft (**9**) driven by said advance motor and by said tilting motor, respectively, and extending coaxially into said propulsion unit along said tilting axis inside said propulsion unit carrying shaft;

(d) each said propulsion unit further comprising:

(i) an advance wheel (**72**) guided to rotate relative to said propulsion unit housing (**68**, **70**) about a transverse axis at a distance from said tilting axis in such a manner as to impart said advance motion to said propulsion unit;



(ii) internal advance transmission means (**82**, **84**, **86**) for driving said advance wheel from said advance driven shaft (**8**); and

(iii) internal tilting transmission means;

(e) said internal tilting transmission means comprising

(i) a first drive wheel (**88**) mounted on said tilting driven shaft beyond said carrying shaft (**66**) for rotating at a first tilting transmission angular speed;

(ii) a first linear transmission element (**90**) driven by said first wheel;

(iii) an intermediate shaft (**92**) extending transversely and guided to rotate relative to said propulsion unit housing;

(iv) a first driven wheel (**94**) mounted on said intermediate shaft and driven by said first linear transmission element to rotate said shaft;

(v) a second drive wheel (**96**) mounted on said intermediate shaft;

(vi) a second linear transmission element (**98**) driven by said second drive wheel; and

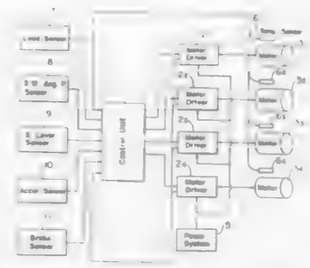
(viii) a tilting support driven wheel (**100**) cooperating with said second transmission element and fixed, at least angularly, on said carrying shaft to cause said intermediate shaft and said propulsion unit housing to rotate about said carrying shaft in such a manner as to drive said tilting motion at a tilting angular speed which is less than said first tilting transmission angular speed.

5,148,883

REGENERATIVE BRAKING ELECTRIC VEHICLE WITH FOUR MOTORS

Satoru Tanaka, Anjo; Mutsumi Kawamoto, Tokyo, and Hidemitsu Inagaki, Arakawa, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Dec. 27, 1990, Ser. No. 633,343
Claims priority, application Japan, Dec. 27, 1989, 1-342133
Int. Cl.[5] B60L *7/22*
U.S. Cl. 180—165 **7 Claims**



1. An electric vehicle having four wheels and comprising:

electric drive means for independently driving and braking each of the four wheels, said electric drive means including four electric motors, one electric motor being associated with each of the four wheels;

means for detecting the loading on each wheel and generating signals representing the loadings on the four respective wheels; and

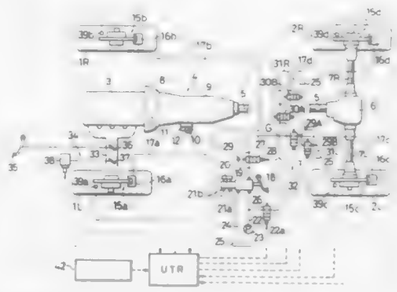
signal processing means for receiving said load signals, for calculating a distribution of braking forces to the four wheels and for generating output signals to said electric drive means to apply a braking force to its associated wheel in accordance with the calculated distribution of braking force.

5,148,884

SLIP CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

Toshiaki Tsuyama; Kazutoshi Nobumoto; Kaoru Sotoyama, and Toru Onaka, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Aki, Japan

Filed Apr. 1, 1991, Ser. No. 678,490
Claims priority, application Japan, Mar. 30, 1990, 2-86208
Int. Cl.[5] B60K *31/00*
U.S. Cl. 180—197 **27 Claims**



1. A slip control system for an automotive vehicle, comprising:

first slip control means for controlling a slip of a driven wheel so as not to become excessive by control of torque generated by an engine;

second slip control means for controlling a slip of each

driven wheel so as not to become excessive by controlling braking force for a right-hand driven wheel and a left-hand driven wheel individually and separately from each other;

incident detecting means for detecting occurrence of such an incident as causing the first slip control means to work in an abnormal way; and

control state changing means for changing a state of control by the second slip control means so as to make the braking force to be applied to the right-hand driven wheel and the left-hand driven wheel equal to each other when the incident has been detected by the incident detecting means.

5,148,885

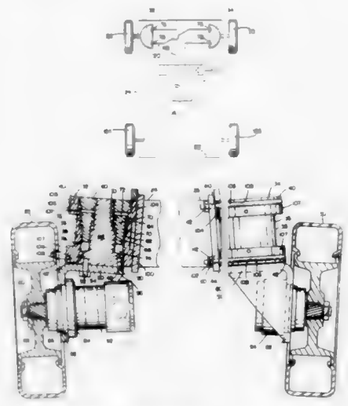
STEERABLE UTILITY VEHICLE

Paul P. Weyer, P.O. Box 398, Enumclaw, Wash. 98022

Filed Mar. 29, 1991, Ser. No. 677,303

Int. Cl.[5] B60K *17/14, 17/30;* **B62D** *5/06*

U.S. Cl. 180—253 **10 Claims**



1. A utility vehicle, comprising:

an elongated support frame extending between first and second frame ends and having left and right sides;

a pair of left and right first end wheels, said left first wheel being positioned toward said left side of said frame first end, and said right first wheel being positioned toward said right side of said frame first end;

a pair of left and right fluid-powered rotary actuators, said left actuator being positioned toward said left side of said frame first end, and said right actuator being positioned toward said right side of said frame first end, each of said actuators including:

a body rigidly attached to said frame, said body having a longitudinal axis, and body upper and lower ends;

first and second fluid ports for introducing pressurized fluid within said body at longitudinally spaced-apart locations;

a drive member extending generally longitudinally and coaxially within said body, said drive member being supported for rotational movement relative to said body, said drive member having an attachment portion at said body lower end;

a piston mounted within said body with said first port in fluid communication with one side thereof and said second port in fluid communication with an opposite side thereof to produce reciprocal longitudinal movement of said piston within said body in response to selective application of pressurized fluid to said first and second ports; and

a torque-transmitting member mounted for reciprocal longitudinal movement within said body, said torque-transmitting member engaging said body and said drive member to translate longitudinal movement of said piston toward said body upper end into rotational movement of said drive member relative to said body in a first rotational direction, and longitudinal movement of said piston toward said body lower end into rotational movement of said drive member relative to said body in a second rotational direction opposite said first rotational direction;

a pair of left and right wheel brackets, said left wheel bracket being mounted to said attachment portion of said left actuator for rotation therewith, and said right wheel bracket being mounted to said attachment portion of said right actuator for rotation therewith, said left first wheel being rotatably mounted to said left first wheel bracket in a position to rollingly support said frame, and said right first wheel being rotatably mounted to said right wheel bracket in a position to rollingly support said frame, said left and right wheel brackets being rotatable by said left and right actuators to turn said left and right first wheels to steer said frame to the left or right;

a motor supported by one of said left or right wheel brackets and drivably coupled to a corresponding one of said left or right first wheels to provide rotational drive power thereto;

a fluid-control valve;

a source of pressurized fluid connected to said fluid-control valve;

fluid conduit interconnecting said first and second ports of said left and right actuators for series operation, said fluid conduit including a first conduit connecting said fluid-control valve to said first port of said left actuator, a second conduit connecting said second port of said left actuator to said first port of said right actuator, and a third conduit connecting said second port of said right actuator to said fluid-control valve, said fluid-control valve being operable to selectively apply pressurized fluid to said first conduit or said third conduit and hence to said pistons of said left and right actuators to simultaneously rotate said drive members and thereby turn said left and right first wheels in unison and in substantially equal angular amounts to steer said frame to the left or right; and

at least one second end wheel mounted to said frame toward said frame second end in position to rollingly support said frame.

5,148,886

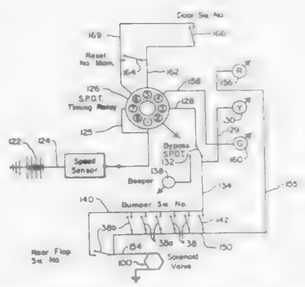
SAFETY CONTROL FOR VEHICLES

Gary W. Parsons, 735 E. 400 South, Orem, Utah 84057

Continuation of Ser. No. 143,670, Jan. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 941,696, Dec. 15, 1986, abandoned. This application Oct. 11, 1989, Ser. No. 420,011

Int. Cl.[5] B60K *28/14*

U.S. Cl. 180—275 **3 Claims**



1. An apparatus for use with a motor vehicle having a braking mechanism capable of stopping the vehicle, the apparatus comprising:

means for detecting the presence of a foreign object in the path of the vehicle which object contacts the detecting means during operation of the vehicle;

means for actuating the braking mechanism of the vehicle upon detection of the foreign object in the path of a vehicle; and

means for deactivating the brake actuating means when a duration of time of operation of the vehicle from a stopped position exceeds a predetermined duration of time, the deactivation means comprising:

means for monitoring the duration of time of operation of the vehicle from a stopped position; and

means for deactivating the brake actuating means when the duration of time of the operation of the vehicle from a stopped position exceeds a predetermined duration of time.

5,148,887

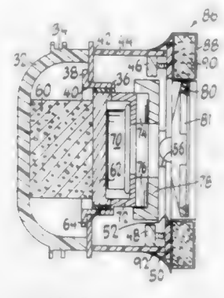
EARCUP ASSEMBLY INCORPORATING MECHANICAL ACTIVE NOISE REDUCTION

John A. Murphy, Philadelphia, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed Apr. 1, 1991, Ser. No. 678,748

Int. Cl.[5] H04R *25/00;* **A42B** *1/06*

U.S. Cl. 181—129 **15 Claims**



1. An earcup assembly for protecting an ear of a wearer's head from ambient noise including in combination a relatively rigid shell adapted to surround the ear of a wearer and to enclose a space adapted to communicate with the wearer's ear, said space occupying a volume, a resilient seal carried by said shell and having an opening to permit said seal to engage the wearer's head around the ear, a compensating element communicating with said space, means mounting said compensating element on said shell for movement relative to said shell in directions into said space and out of said space, and means responsive to flexing of said seal in response to ambient noise for moving said compensating element to maintain the volume of said space relatively constant.

5,148,888

RIBBON TRANSDUCERS

Graham Bank, 15 Mayfield Lane, Martlesham, Ipswich, Suffolk; Harold C. Pinfold, deceased, late of Elstree, both of England, and by Laurence P. Ross, executor, 35, Barham Avenue, Elstree, Herts., United Kingdom executor of said Carl Pinfold, deceased

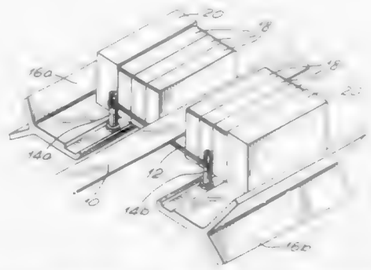
Filed Jun. 20, 1990, Ser. No. 540,963

Claims priority, application United Kingdom, Jun. 21, 1989, 8914283

Int. Cl.[5] G10K *13/00*

U.S. Cl. 181—171 **6 Claims**

1. A ribbon-type transducer comprising an elongate, electrically conductive, vibratable ribbon having two oppositely disposed ends, first and second suspension means at the respective ends of the ribbon and defining a longitudinal axis of the ribbon therebetween, a plurality of cross-suspension elements transversely of the longitudinal axis of the ribbon and to which the ribbon is secured, each said cross-suspension element being



capable of displacement at right angles to the longitudinal axis of the ribbon, and means to effect said displacement of each said cross-suspension element thereby to produce lateral movement of the ribbon.

5,148,889

HIGH LEVEL PACKAGE RETRIEVAL SYSTEM

Jay G. Fenwick, Albert Lea, and Jay R. Stemler, Jr., Owattona, both of Minn., assignors to Joyce/Streater Inc., Albert Lea, Minn.

Filed Sep. 30, 1991, Ser. No. 768,165

Int. Cl.[5] E06C *1/397*

U.S. Cl. 182—17 **11 Claims**

1. A mobile overhead package retrieval device to enable a user to move a retrieval platform from place to place along tracks mounted on a set of storage shelves to allow the user to safely retrieve packages from an overhead storage area on the storage shelves comprising:

a first and a second track located in a spaced relationship from each other, said first and said second track mountable on adjacently spaced storage shelves;

an elevated platform for supporting a user as the user removes a package from the storage shelf, said elevated platform including a set of rollers for rollingly supporting said elevated platform on said first and said second track to enable a user to move said elevated platform from place to place, said elevated platform including a retractable support for supporting said set of rollers to enable said elevated platform to be moved freely along said first and said second track even when the spacing between said first and said second track varies;

a fold-up ladder, said fold-up ladder having a first position extending from said elevated platform to a floor level to permit a user to climb up said ladder and onto said elevated platform, said fold-up ladder having a second position to allow a user to move said ladder and said elevated platform to a second location; and

a braking mechanism connected to said elevated platform, said braking mechanism including means to brake said elevated platform and prevent said elevated platform from moving when said braking mechanism is engaged so that a user can climb said ladder and remove a package from a storage shelf without having said elevated platform move along said pair of tracks.

5,148,890

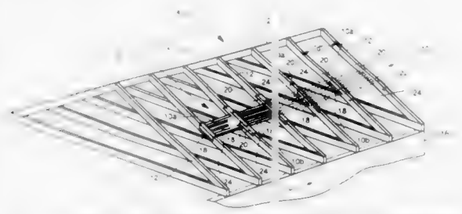
PORTABLE UTILITY PLATFORM UNIT

Linus A. Sipe, 366 N. Walnut, Dallastown, Pa. 17313

Filed Aug. 12, 1991, Ser. No. 743,987

Int. Cl.[5] E04G *1/36*

U.S. Cl. 182—45 **10 Claims**



1. A portable utility platform unit adapted to be detachably installed upon roof trusses between the spans thereof for supporting workmen during truss erection and installation procedures, said unit comprising in combination a short depending spaced flange truss clamp member, an elongated depending spaced flange truss clamp member provided with a recessed cut-out centrally intermediate the longitudinal ends thereof to form a slot adapted to conformably receive cooperatively therewithin the short depending spaced flange truss clamp member of another portable utility platform unit, and a plurality of laterally spaced treadle members parallelly assembling said short depending spaced flange truss clamp member to said elongated depending spaced flange truss clamp member thereby connectably joining the same at a clamp-to-clamp and center-to-center spacing equal to the specified truss-to-truss center-to-center spacing.

5,148,891

LADDER EXTENSION STEP APPARATUS

Karen R. McConnell, 616 Liberty, Beloit, Wis. 53511

Filed May 2, 1991, Ser. No. 694,769

Int. Cl.[5] E06C *7/11, 7/16*

U.S. Cl. 182—120 **3 Claims**

1. A ladder extension step apparatus, comprising in combination,

a ladder member, the ladder member including a right ladder leg spaced from and parallel a left ladder leg, the right ladder leg and left ladder leg including a plurality of ladder steps orthogonally mounted between the right and left ladder legs at an equal predetermined spacing between each ladder step, and

an extension assembly removably mounted to at least one of said ladder steps, the extension assembly including a respective right "J" shaped top support members spaced from and parallel a respective left "J" shaped top support member, and

each support member including a first plate web orthogonally mounted to a second plate web, wherein the second plate web is orthogonally mounted to the third plate web, wherein the third plate web is positioned below and parallel the first plate web, and wherein the first plate web is defined by a first length, and the third plate web is defined by a third length less than the first length, and

the at least one ladder step is defined by a predetermined thickness, wherein the second length defined by the second plate web is substantially equal to the predetermined thickness, and

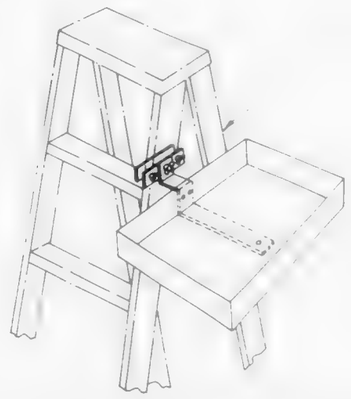
including a planar support web, the planar support web including a planar support web top surface and a planar support bottom surface, and

the right "J" shaped top support member and the left "J" shaped top support member are mounted to the planar support web top surface, wherein the second plate web and the third plate webs are spaced from the planar support web, and

further including a right bottom plate reciprocatably mounted to the planar support web below the right "J" shaped top support member, and

a left bottom plate mounted to the planar support web bottom surface below the left "J" shaped top support member, and

each right and left bottom plate reciprocatable from a first position extending forwardly of the planar support web adjacent the third plate web defined by a first spacing to



the retracted second position, wherein the right and left bottom plates are retracted relative to the third plate web of the respective right and left "J" shaped top support member a second spacing, wherein the second spacing is greater than the first spacing to permit removal and reinsertion of the ladders step between the right and left bottom plates and the right and left "J" shaped top support member, and

the first plate web of each "J" shaped support member includes a plurality of circular apertures spaced apart the predetermined spacing, and the planar support web includes a first pair of openings positioned below the first plate web of the right "J" shaped top support plate the predetermined spacing, and the planar support web includes a further pair of openings spaced below the left "J" shaped top support plate the predetermined spacing, and the right bottom plate includes a plurality of right elongate slots and the left bottom plate includes a plurality of left elongate slots, wherein the "J" shaped top support member, the planar support webs openings, and the right elongate slots receive the first fasteners therethrough, and the left "J" shaped top support member, the further openings and the left elongate slots of the left bottom plate include further fasteners directed therethrough.

5,148,892

QUICK STAND ADJUSTING DEVICE

Ching-Shui La, No. 7, Newputz, Shin-Zen, Tan-Shui, Taipei, Taiwan

Filed Sep. 19, 1991, Ser. No. 762,342

Int. Cl.[5] E06C *7/44*

U.S. Cl. 182—201 **6 Claims**

1. A quick stand adjusting device comprising: a hollow stand for supporting an object;

a support extendibly inserted in said hollow stand;

a base socket, said base socket having a through-hole through which said support is inserted and a connecting portion;

a lock cap, said lock cap having a through-hole through which said support is inserted and a connecting portion coupled to the connecting port on said base socket and secured to said hollow stand at the bottom;

a retainer set between said base socket and said lock cap, said retainer having a tapered peripheral surface and being consisted of two sections, said two sections each having a toothed portion at an inner side;

a control device comprised of a movable stop block and a transmission rod, said movable stop block being disposed between said retainer and said base socket and controlled to move up and down by said transmission rod; and

wherein rotating said transmission rod causes said movable stop block to be alternatively moved toward or apart from said retainer causing said retainer to lock said support in position or to disengage from said support for adjusting the position of said support relative to said hollow stand.

5,148,893

GEARLESS DRIVE MACHINE FOR ELEVATORS

Josef Vertesy, Luzern, and Andrzej Cholinski, Ebikon, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

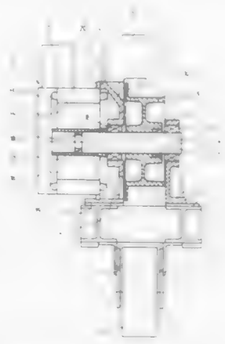
Filed Jul. 26, 1991, Ser. No. 736,100

Claims priority, application Switzerland, Jul. 26, 1990, 02 466/90-8

Int. Cl.[5] B66B *11/04*

U.S. Cl. 187—20 **15 Claims**

1. In a gearless drive machine for elevators having a machine frame, a hoist motor having a stator and a rotor and mounted on the machine frame driving a main shaft, a drive pulley attached to an output end of the main shaft with cable grooves for guiding the carrying cables connecting an elevator car with a counterweight, the improvement comprising: a moveable bearing and a fixed bearing supporting a main drive shaft at an output end thereof, said bearings being spaced apart for mounting a drive pulley on said main shaft between said bearings, said bearings being attached to a machine frame, said main shaft having a free end, and a hoist motor mounted on said



machine frame and having an overhung rotor, said rotor being detachably coupled to said free end of said main shaft.

5,148,894

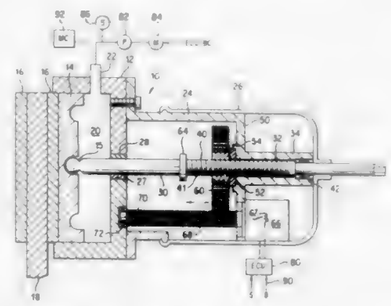
DISK BRAKE/PARKING BRAKE WITH THREADED PISTON ROD AND MOTOR

William C. Eddy, Jr., West Bloomfield, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 11, 1990, Ser. No. 598,464

Int. Cl.[5] F16D *55/26*

U.S. Cl. 188—72.6 **9 Claims**



1. A parking brake (10) having engaged and disengaged modes of operation comprising:

a caliper (12), a piston (14) movably mounted in the caliper (12), and a brake pad (16) movable with the piston, the caliper (12) and piston (14) defining a fluid chamber (20) adapted to receive pressurized fluid;

a piston rod (30) movable with the piston (12) having a threaded portion (40),

a nut (60) rotatably movable on the threaded portion (40) relative to a first stop (52);

first means (80, 82, 84, 92); for pressurizing the fluid chamber (20) to move the piston (14) and piston rod (30) attached thereto in a first direction to a brake engaged position; and

second means (66, 68) for rotating the nut (60) in one of a) synchronism with pressurizing the fluid chamber and b) subsequent to pressurizing the fluid chamber so that the nut moved along the threaded portion (40), of the piston rod, into contact with the first stop (52) thereby preventing the piston rod (30) from moving in a direction opposite the first direction away from its engaged position, wherein the second means (66, 68) comprises:

a first motor (66);

a first gear (68) rotated by the first motor (66); and wherein

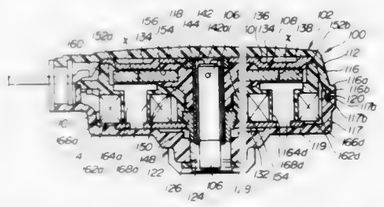
the nut (60) includes gear teeth (62) about its periphery drivingly connected to and slidably interacting along the teeth of the first gear (68).

5,148,895

ROTARY ACTUATOR FOR VARIABLE DAMPING FORCE SHOCK ABSORBER

Shinobu Kakizaki, Kanagawa, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 311,941, Feb. 16, 1989, abandoned.
This application May 14, 1991, Ser. No. 699,499
Claims priority, application Japan, Feb. 17, 1988, 63-34399
Int. Cl.[5] F16F 9/50; H02K 21/14
U.S. Cl. 188—299 42 Claims



1. A rotary actuator for a variable damping force shock absorber for rotatingly driving a rotatable member, comprising:

a rotary shaft connected to the rotatable member for rotation therewith;

a rotor assembly cooperating with said rotary shaft for rotation therewith and carrying at least one permanent magnet;

a stator assembly provided essentially in axial alignment with said rotor assembly and including a plurality of electromagnets selectively energized to have polarity according to polarity of power supply for selectively generating magnetic fields extending through said permanent magnet for rotatingly driving said rotor assembly;

switch means for controlling polarity of power supply for respective electromagnets for energizing the latter according to a predetermined schedule; and

an enclosed housing for receiving said rotary shaft, said rotor assembly and said stator assembly therein;

said stator assembly further including:

a first magnetically conductive plate opposing said rotor assembly with a given gap relative to the permanent magnet;

a second magnetically conductive plate opposing the electromagnets and in magnetic communication therewith; and

a non-magnetic supporting member within said housing retaining said first and second magnetically conductive plates with a preselected interval therebetween so as to oppose each other through said rotor and stator assemblies to provide magnetic paths for conducting magnetic waves, from said first and second magnetically conductive plates, through the electromagnets.

5,148,896

HIGH PRESSURE HYDROPNEUMATIC SHOCK ABSORBER

Harry C. Ralph, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 1, 1991, Ser. No. 724,121
Int. Cl.[5] F16F 9/43, 9/44
U.S. Cl. 188—314 1 Claim

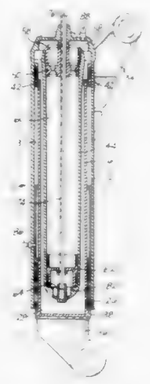
1. A hydropneumatic shock absorber, comprising:

a cylinder;

a piston slidably positioned in said cylinder, said piston and cylinder being configured as a telescopic suspension unit, said piston defining first and second variable volume chambers within said cylinder and filled with a working liquid, and said piston including a passage allowing said working liquid to flow between said first and second cylinder chambers;

a fixed volume reservoir having an elongated casing and located within said first cylinder chamber, said reservoir including an interior movable barrier wall defining first and second separated variable volume reservoir chambers, said first reservoir chamber filled with working liquid and said second reservoir chamber filled with a working gas;

said cylinder including a head portion partially defining said first cylinder chamber and supporting said elongated reservoir casing within said first cylinder chamber at one end of said casing;



said casing being spaced inwardly from said cylinder and said piston a distance sufficient to isolate said casing from contact with said cylinder and said piston and any lateral loads placed on said shock absorber; and

a plurality of flow-controlling damper valves communicating said first cylinder chamber with said first reservoir chamber, said damper valves being adjustably controlled externally of said cylinder,

relative telescopic movement of said piston and said cylinder causing damped flow of said working liquid from said first cylinder chamber to said first reservoir chamber and causing responsive movement of said barrier wall to allow expansion of said first reservoir chamber and corresponding reduction of said second reservoir chamber, thereby compressing said working gas,

and wherein lateral loads placed on said shock absorber are carried by said piston and cylinder and not by said reservoir casing.

5,148,897

PISTON VALVING FOR SHOCK ABSORBERS

Bert E. Vanroye, Borgloon, Belgium, assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Jul. 18, 1991, Ser. No. 732,498
Int. Cl.[5] F16F 9/34
U.S. Cl. 188—322.22 8 Claims

1. A piston assembly disposed for reciprocal movement in a working chamber of a shock absorber and dividing said working chamber into an upper portion and a lower portion, said piston assembly comprising:

a piston body connected to one end of a piston rod and having a recessed upper portion defining an enlarged counterbore;

an annular valve body disposed within said counterbore and having a central bore through which said piston rod extends;

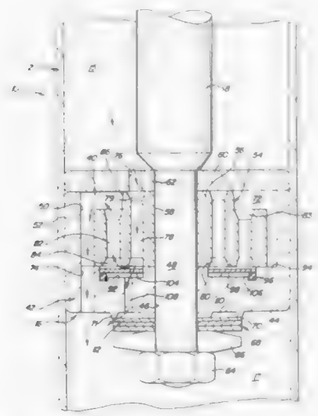
cover means for sealingly enclosing said annular valve body within said counterbore for defining a fluid cavity therebetween;

first flow bore means extending through said piston body for providing fluid communication between said lower portion of said working chamber and said fluid cavity;

second flow bore means extending through said cover means for providing fluid communication between said upper portion of said working chamber and a first annular flow passage formed in said valve body;

a first pressure chamber formed in said valve body in fluid communication with said first flow passage;

a second annular flow passage formed in said valve body in fluid communication with said fluid cavity;



a second pressure chamber formed in said valve body in fluid communication with said second flow passage;

a third annular pressure chamber formed in said piston body;

pressure-operated valve means disposed in said third pressure chamber and operable for regulating flow of damping fluid from said first flow passage to said second flow passage during a rebound stroke in response to a first pressure differential between said first and third pressure chambers, and said pressure-operated valve means operable for regulating flow of damping fluid from said second flow passage to said first flow passage during a compression stroke in response to a second pressure differential between said second and third pressure chambers; and

bypass means for selectively by-passing damping fluid between said upper and lower portions of said working chamber for generating said first and second pressure differentials.

5,148,898

ELECTRICAL VEHICLE TRANSPORTATION SYSTEM

Nicholas R. Musachio, 862 W. Iowa, St. Paul, Minn. 55117

Continuation-in-part of Ser. No. 383,036, Jul. 20, 1989, Pat. No. 5,045,646. This application Jun. 13, 1991, Ser. No. 714,457
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] B60L 9/00
U.S. Cl. 191—6 25 Claims

1. An electric vehicle transportation system, comprising:

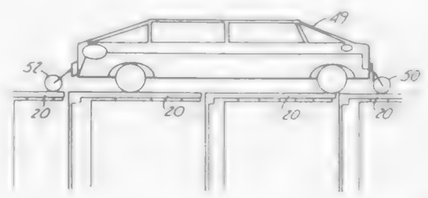
a defined route for vehicles;

a plurality of electrically isolated rail segments positioned longitudinally along the defined route;

an electric vehicle having an actuation signal generator and first and second trollies extending from the vehicle and spaced from one another in the direction of the defined route to connect with different rail segments;

a power bus;

a source of reference voltage level; and



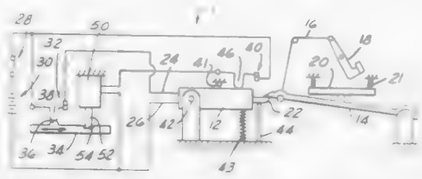
power switching means responsive to the actuation signal and associated with each rail segment for connecting each rail segment either to the power bus or to the reference voltage level.

5,148,899

METHOD AND APPARATUS FOR LOCKING OUT THE CLUTCH OF A MANUAL TRANSMISSION

Alvin H. Berger, Brownstown, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 22, 1991, Ser. No. 796,281
Int. Cl.[5] B60K 41/22
U.S. Cl. 192—3.63 9 Claims



1. In combination with a manual transmission having a shifter rail, a gearbox, and a clutch, the shifter rail being movable between a plurality of positions wherein the gearbox is conditioned for torque delivery and a position wherein the gearbox is not conditioned for torque delivery, the clutch being movable between an engaged position wherein rotation of an engine crankshaft is transmitted to the gearbox and a disengaged position wherein rotation of the engine crankshaft is not transmitted to the gearbox, an apparatus for locking out the clutch, the apparatus comprising:

means for determining whether the gearbox is conditioned for torque delivery; and

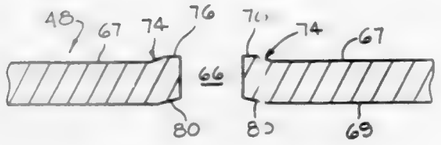
a clutch lockout solenoid having a projection which is movable from a normally retracted state when the gearbox is conditioned for torque delivery to an extended state when the gearbox is not conditioned for torque delivery, the projection moving to its extended state upon the clutch lockout solenoid being energized, the projection in its extended state projecting between the disengaged position of the clutch and the engaged position of the clutch to prevent movement of the clutch from the disengaged position to the engaged position.

5,148,900

VISCOUS COUPLING APPARATUS WITH COINED PLATES AND METHOD OF MAKING THE SAME

Sankar K. Mohan, Syracuse, N.Y., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Jun. 25, 1991, Ser. No. 720,401
Int. Cl.[5] F16D *35/00*; B21D *22/00*
U.S. Cl. 192—58 C 13 Claims



1. A viscous coupling apparatus comprising:

a rotatable hub, said hub being rotatable about an axis and having means for attaching to a rotatable first shaft;

a housing substantially enclosing said hub, a portion of said housing being radially outwardly spaced from said hub to define an internal chamber substantially encircling said hub, said housing being rotatable relative to said hub about said axis and including means for attaching to a rotatable second shaft;

a plurality of generally annular plates, said plates having opposing faces and having portions defining a plurality of openings therein, said plates being disposed within said chamber so as to encircle said hub and further including interleaved first and second sets said first set of said plates being mounted to said hub for rotation therewith, said second set of said plates being mounted to said housing for rotation therewith and being capable of relative rotation with respect to said first set of plates, one of said sets being axially movable relative said corresponding one of said hub and said housing and being capable of frictionally contacting said other set;

a viscous fluid disposed within said chamber and substantially immersing said plates, said fluid being subjected to viscous shearing during relative rotation between said first and second sets of said plates, said viscous fluid permitting relative rotation between said plates when the viscous shearing rate is relatively small and for transmitting torque from one of said sets to the other of said sets as the viscous shearing rate increases; and

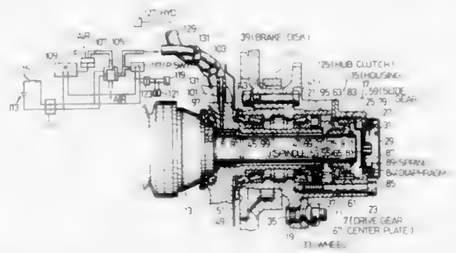
means for increasing torque transfer between said first and said second sets of said plates during relative rotation and frictional contact therebetween, said means including a raised portion formed on said plates of one of said first and second sets, said raised portion including an inclined ramp surface which terminates in an elongated planar wiping surface formed immediately adjacent to an edge portion of said opening and a declined ramp surface formed opposite said inclined ramp surface on an opposing face of said plate, said elongated planar wiping surface being oriented in a plane which is substantially parallel to said faces of said plate for providing a generally parallel contacting relationship with a complimentary face of said interleaved adjacent plate, said planar wiping surface operable for removing viscous fluid from said complimentary face of said interleaved adjacent plate during relative rotation and for enhancing frictional contact therebetween to thereby increase torque transfer.

5,148,901

HUB CLUTCH FOR AUTOMOTIVE VEHICLE

Sakuo Kurihara, and Kazuhiro Sakamoto, both of Tochigi, Japan, assignors to Tochigifujisangyo Kabushiki Kaisha, Ohmiya, Japan

Filed Mar. 27, 1991, Ser. No. 676,259
Int. Cl.[5] F16D *11/00*, *25/061*
U.S. Cl. 192—67 R 2 Claims



1. A hub clutch for locking and unlocking a wheel drive shaft to and from a hub clutch housing, which comprises:

(a) a drive gear fixed to the wheel drive shaft;

(b) a slide gear slidably engaged with said drive gear to lock the wheel drive shaft to the hub clutch housing and slidably disengaged from said drive gear to unlock the wheel drive shaft from the hub clutch housing;

(c) an elastic member for urging said slide gear into engagement with or disengagement from said slide gear;

(d) a pressure source composed of an electric motor and a pump driven by said motor, for supplying pressure into a pressure chamber formed between the wheel drive shaft and the hub clutch housing to move said slide gear against an elastic force of said elastic member; and

(e) pressure supplying means comprising;

(1) a valve mechanically connected to the pump for releasing the pressure to the atmosphere or supplying the pressure into the pressure chamber; and

(2) a pressure switch mechanically connected to said valve and electrically connected in series with said motor, for activating said motor to supply pressure into the pressure chamber via said valve when pressure to be supplied into the pressure chamber drops below a predetermined value and deactivating said motor when the pressure rises beyond another predetermined value, to maintain the pressure at a constant level.

5,148,902

ELECTROMAGNETIC COUPLING DEVICE

Hiroaki Nakamura, Ise, Japan, assignor to Shinko Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 614,599
Claims priority, application Japan, Nov. 15, 1989, 1-132083[U]
Int. Cl.[5] F16D *27/00*
U.S. Cl. 192—84 B 6 Claims

1. An electromagnetic coupling device comprising:

a rotary shaft comprising a hollow body having a plurality of circumferentially spaced, axially extending flexible legs depending therefrom;

a rotor retainer fitted around an outer periphery of said rotary shaft;

a hub rotatably mounted on said rotary shaft;

a rotor fixed to said rotary shaft between said rotor retainer and said hub;

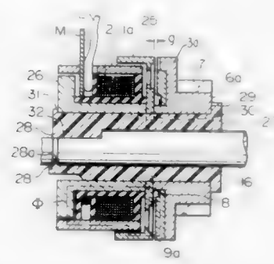
an armature mounted to said hub and engageable with said rotor; and

a stator mounted to said rotor retainer and including a coil, wherein said rotary shaft comprises:

a) an inwardly directed claw at a distal end of at least one of said legs for axially retaining the rotary shaft on a driven shaft to which the electromagnetic coupling device is mounted,

b) a fitting portion for positioning said hub on said rotary shaft,

c) a fixing portion for positioning said rotor retainer on said rotary shaft, and



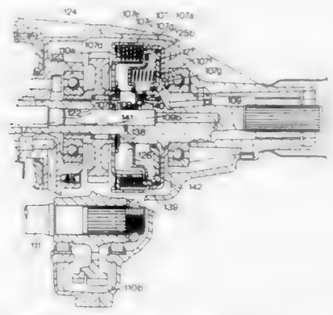
d) a fitting face on said rotary shaft for rotatably positioning said rotary shaft on a driven shaft to which the electromagnetic coupling device is mounted such that there arises no relative rotation of said rotary shaft with respect to said driven shaft.

5,148,903

POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Toshio Kobayashi, Tokyo; Keiichi Maruyama, Yokohama, and Yukio Ohnuki, Hachioji, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 381,124, Jul. 14, 1989, abandoned. This application Feb. 8, 1991, Ser. No. 652,474
Claims priority, application Japan, Jul. 28, 1988, 63-189792; Jul. 28, 1988, 63-189793; Jul. 28, 1988, 63-189794; Jul. 28, 1988, 63-189795; Jul. 28, 1988, 63-189796; Jul. 28, 1988, 63-189797; Jul. 30, 1988, 63-191146; Jul. 30, 1988, 63-191147; Sep. 28, 1988, 63-242974; Sep. 28, 1988, 63-242975
Int. Cl.[5] F16D *25/063*
U.S. Cl. 192—85 AA 1 Claim



1. In a power transmission system of a four-wheel drive motor vehicle having a differential lubricated by lubricating oil for differentiating speed of each wheel, a transmission interposed between an engine and said differential for transmitting power to said wheels, and a fluid-operated multiple-disc friction clutch mounted on said power transmission system for distributing said power to front wheels or rear wheels, the improvement of the system which comprises:

a casing adjacent the differential secured to a case of the transmission and having an oil chamber therein for storing actuating oil to actuate said clutch;

a seal member for sealing said oil chamber in order to separate said actuating oil from said lubricating oil;

a piston slidably mounted in a piston chamber in said oil chamber and operated by said actuating oil supplied to said piston chamber for engaging said clutch so as to distribute said power to said front and rear wheels in dependency on driving conditions;

a hydraulic circuit having an oil pump for supplying said actuating oil to said piston chamber and valves for controlling said actuating oil corresponding to said driving conditions;

said hydraulic circuit is compactly formed in said casing and a shaft of said corresponding power train so as to apply hydraulic pressure of said actuating oil from said casing to an outer end of said piston at said piston chamber for actuating said clutch, and to compensate said hydraulic pressure at the outer end of the piston by applying counteracting hydraulic pressure from a center portion of said shaft to an inner side of said piston, such that centrifugal force of the actuating oil at the outer end of the piston is balanced by said counteracting hydraulic pressure at the inner side of the piston; and

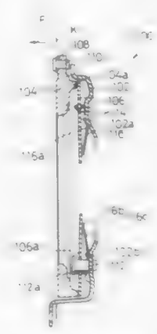
said pump is mounted on a side wall of said casing without interfering with said differential so as to be easily applicable for various types of said motor vehicle.

5,148,904

CLUTCH COVER ASSEMBLY

Yukihisa Takashi, Toyoake, and Nobuki Fukaya, Takahama, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 27, 1991, Ser. No. 766,382
Claims priority, application Japan, Sep. 28, 1990, 2-258908
Int. Cl.[5] F16D *13/71*
U.S. Cl. 192—89 B 9 Claims



1. A clutch cover assembly comprising:

an annular clutch cover;

a pressure plate connected to said clutch cover;

a diaphragm spring elastically disposed between said pressure plate and said clutch cover, said diaphragm spring being supported circumferentially and radially on said clutch cover by a supporting member inserted into a hole formed in said clutch cover, said diaphragm spring being supported axially on said clutch cover through an annular member located intermediate an inner wall of said clutch cover and one end of said supporting member, said diaphragm spring biasing an external portion of said pressure plate in the opposite direction of said clutch cover; and

spring means for establishing a biasing force in a direction opposite to said clutch cover, said spring means including an outer periphery which is located radially inwardly of said annular member and which contacts said clutch cover, and an inner periphery which is located radially inwardly of the outer periphery of the spring means and

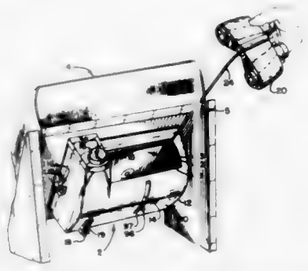
which contacts said diaphragm spring, said spring means including an annular portion defined between said outer periphery and said inner periphery, said spring means having a plurality of projections that extend outwardly from the outer periphery of the spring means, one of the projections extending from the outer periphery of the spring means forming an angle with respect to the annular portion that is different than the angle that another of said projections extending from the outer periphery of the spring means forms with said annular portion.

5,148,905

BINOCULAR VENDING APPARATUS AND METHOD

David J. Tacke, Polson, Mont., and Leslie Perhacs, Fallbrook, Calif., assignors to Binoptic International Systems, Inc., Wilmington, Del.

Filed Apr. 18, 1989, Ser. No. 340,129
Int. Cl.[5] G07F 7/00, 17/02
U.S. Cl. 194—210 16 Claims



1. A binocular vending apparatus for attachment to a structure, said apparatus comprising:

(a) a binoculars

(b) housing means for removably retaining said binoculars, said housing means including an elongated tether and tether retraction means for retracting a portion of the elongated tether, said elongated tether interconnecting said binoculars with said tether retraction means, said retraction means including biasing means for placing a bias upon the tether, said biasing means including bias actuation means for actuating said biasing means upon the occurrence of a predetermined event, wherein said biasing means can place a bias upon the tether toward retraction of the tether when the tether is withdrawn from said housing means and the predetermined event occurs; and

(c) a mounting plate, said mounting plate being attachable to the structure; wherein said housing means are removably mountable to said mounting plate when said mounting plate is attached to the structure.

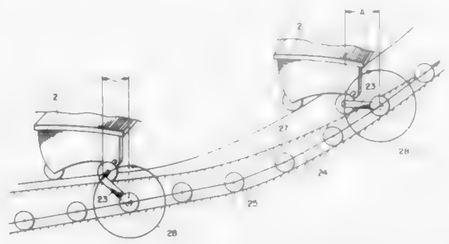
5,148,90[illegible]

CURVED ESCALATOR

Erik Brunn, Annenweg 130, 2870 Delmenhorst, Fed. Rep. of Germany

Filed Oct. 18, 1991, Ser. No. 780,278
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1990, 4036667
Int. Cl.[5] B66B 21/00
U.S. Cl. 198—328 5 Claims

1. An escalator comprising a plurality of movable steps supported on a parallel pair of inner and outer arced step tracks for movement along a curved path of travel, comprising a midsection of constant inclination, upper and lower landing zones having substantially no inclination and upper and lower transition zones which connect the midsection and the upper and lower landing zones, a spaced pair of inner and outer driving chains supported for movement along a spaced pair of main driving tracks spaced vertically below said step tracks, said chains being connected to the inner and outer edges of each of said steps to move said steps along said curved path of travel over said step rails, characterized by said main driving tracks defining a different curved arc than the step tracks in the transition zone and in the landing zones whereby the vertical distance between the main tracks and the step tracks is proportional to maintain the axis of each step radial to the path of



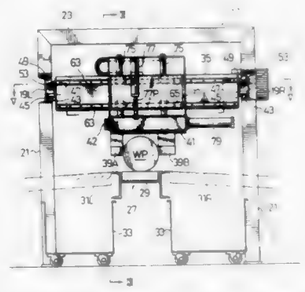
travel and the cosine of the angle of inclination of the path of travel, and the difference in vertical distance of the displacement along the main tracks is compensated by rotatable connecting rods which connect the driving chains to the inner and outer edges of each of the steps and rotate the steps to maintain the axis of each step radial to the path of travel and prevent the formation of gaps therebetween during operation.

5,148,907

CUT SECTIONS CONVEYING DEVICE FOR A CUTTING MACHINE

Toru Tokiwa, Hadano, Japan, assignor to Amada Company, Limited, Japan

PCT No. PCT/JP90/00638, § 371 Date Dec. 17, 1990, § 102(e) Date Dec. 17, 1990, PCT Pub. No. WO90/14191, PCT Pub. Date Nov. 29, 1990
PCT Filed May 18, 1990, Ser. No. 623,424
Claims priority, application Japan, May 19, 1989, 1-124535; Jun. 28, 1989, 1-074880[U]; Jul. 14, 1989, 1-182065
Int. Cl.[5] B65G 47/34
U.S. Cl. 198—468.2 8 Claims



1. A cut section conveying device for a cutting machine for conveying a section cut by a cutting machine, comprising:

a conveyor frame provided at the front side of the cutting machine;

a carriage supported on the conveyor frame in a freely reciprocating manner in a longitudinal direction, approaching and withdrawing relative to the cutting position of the cutting machine;

a movable vise body, suported in a manner allowing free movement in a lateral direction perpendicular to said longitudinal direction on the carriage, the movable vise body being provided with a first clamp jaw and a second clamp jaw for clamping a section cut from a workpiece by the cutting machine and able to move in the lateral direction with the clamp jaws clamping the cut section;

a reciprocating action device for moving the movable vise body in a reciprocating manner in the lateral direction relative to the carriage; and

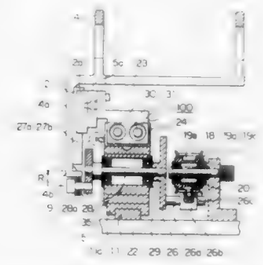
means for lifting up the clamp jaws so that the lower parts of the clamp jaws are raised to a position higher than the height of the cut section.

5,148,908

APPARATUS FOR CONVEYING LEAD FRAME

Masahiro Ishizuka, and Kazuyuki Hayashi, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 16, 1991, Ser. No. 760,390
Claims priority, application Japan, Sep. 19, 1990, 2-247232
Int. Cl.[5] B65G 25/00
U.S. Cl. 198—774.3 6 Claims



1. A lead frame conveying apparatus for transferring a lead frame sent to one of two guide rails between said two guide rails by scooping up said lead frame in a space formed by partially cutting off each of said guide rails, said apparatus comprising:

frame receiving means for carrying said lead frame placed thereon;

moving block means holding said frame receiving means so that said frame receiving means vertically slides so as to be elastically balanced at a predetermined neutral position thereof in the horizontal direction along the direction of transfer;

horizontal linear guide means extended between said guide rails so as to horizontally guide said moving block means along said direction of transfer of said lead frame;

stopper means for horizontally positioning said frame receiving means according to the positions of said two guide rails;

driving force transmitting means which performs an elliptic motion describing an ellipse and comprising horizontal reciprocating rectilinear motion between said two guide rails and semi-circular motions at both ends of said reciprocating rectilinear motion;

driving means for giving a driving force to said driving force transmitting means; and

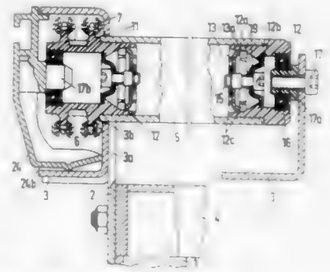
driving force converting means provided on said moving block means and connected to said driving force transmitting means and said frame receiving means so as to transmit said horizontal reciprocating rectilinear motion of said elliptic motion of said driving force transmitting means to said frame receiving means and convert said semi-circular motions at both ends of said reciprocating rectilinear motion into vertical reciprocating rectilinear motions by employing rolling contact for absorbing the horizontal component thereof and transmit said vertical reciprocating rectilinear motions to said frame receiving means so as to put said frame receiving means into rectangular motion.

5,148,909

ROLLER CONVEYOR TRAIN

Klaus Becker, and Rüdiger Ostholt, both of Wetter, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 28, 1989, Ser. No. 399,165
Int. Cl.[5] B65G 13/02
U.S. Cl. 198—780 50 Claims



1. A roller conveyor train comprising

support rollers wherein each support roller has a first axial end and a second axial end,

a first bearing inserted and placed at the first axial end,

a second bearing inserted and placed at the second axial end,

a first axle aligned with an axis for supporting said first bearing, and

a second axle aligned with the axis for supporting said second bearing;

a plurality of first cover plates, each cover plate being integral with a respective first axle;

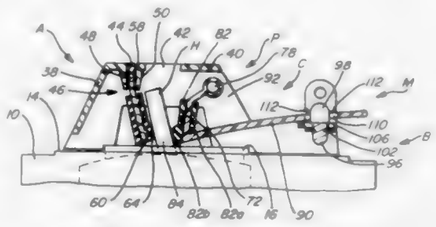
a first side cheek having the first cover plates disposed inside therein, but attached from the outside to the first side cheek, the first side cheek supporting the first cover plates attached from the outside and a respective said first axle for a respective said roller to run on, wherein each support roller protrudes with its first axial end through a respective first receiver opening in a web of the first side cheek and where each first axle is disengageably supported on the first side cheek, and a second side cheek supporting the second axle for each roller to run on, such that the respective second axial end of the support rollers is supported via the second axle attached to the second side cheek.

5,148,910

CIRCUIT BREAKER TAGGING/LOCKOUT APPARATUS

Danny R. Williams, Houston, Tex., assignor to Houston Industries Incorporated, Houston, Tex.

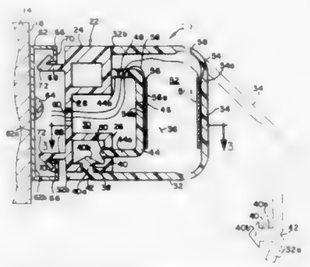
Filed Mar. 19, 1991, Ser. No. 671,494
Int. Cl.[5] H01H 9/28
U.S. Cl. 200—43.19 18 Claims



1. An apparatus for use with an electrical circuit breaker for retaining a handle of the circuit breaker in an off position while work is done on an electrical line or equipment connected to the circuit breaker to indicate work is being done, comprising:

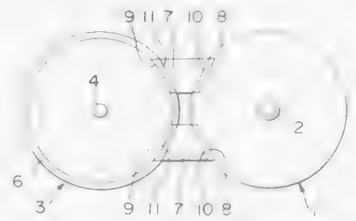
a protective closure having side walls and a top plate for mounting on the circuit breaker about the circuit breaker handle;
said closure having a handle slot formed in said top plate for access to the circuit breaker handle;
a contact finger mounted on said top plate and extending into said closure adjacent said handle slot for engaging the breaker handle when the breaker handle is in the off position;
camming means movable with respect to said closure to a handle contact position for camming the breaker handle against said contact finger when the breaker handle is in the off position, said camming means comprising:
a camming plate mounted beneath said top plate of said closure and having a camming face for camming the breaker handle in the handle contact position;
means mounting said camming plate for pivotal movement to the handle contact position; and
lock means mounted externally of said closure for locking said camming means in the handle contact position.

5,148,911
SENSING EDGE SWITCH
Bearge D. Miller, Concordville, and Anatoly Galperin, Philadelphia, both of Pa., assignors to Miller Edge, Inc., Concordville, Pa.
Filed Oct. 31, 1991, Ser. No. 785,621
Int. Cl.[5] H01H *3/16*
U.S. Cl. 200—61.43 **8 Claims**



1. A sensing edge for controlling movement of an object moving in a first direction by actuation of a device upon forcing being applied to the sensing edge, the sensing edge comprising:
an elongate base member for being secured to the object, said base member being constructed of a generally rigid material;
a first elongate wall having a first end and a second end, said first wall including an intermediate portion disposed between said first and second ends, said first and second ends being secured to said base member to form with the base member a cavity such that said intermediate portion is spaced from said base member, said first wall being constructed of a flexible material such that said first wall is compressible into said cavity upon application of external pressure thereto;
a second elongate wall having a first end and a second end, said first and second ends of said second wall being secured to said base member such that said second wall is positioned within said cavity between said first wall and said base member, said second wall being spaced from said first wall, said second wall including an intermediate portion disposed between the first and second ends thereof, said intermediate portion of said second wall being spaced from said base member and being generally aligned with the intermediate portion of the first wall; and
switch means positioned within said cavity between said first wall and said base member for actuation of the device upon application of external pressure to the first wall.

5,148,912
CAP CLOSING MEMBER FOR CONTAINER OPENING
Takamitsu Nozawa, Koto, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1991, Ser. No. 661,237
Int. Cl.[5] B65D *43/14*
U.S. Cl. 220—339 **13 Claims**

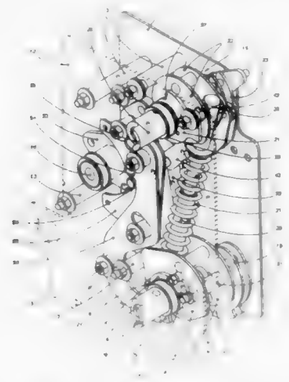


1. A lid member for a container opening comprising:
a main body of circular cross-section having an opening at its upper surface and having a rear surface;
a lid having a rear surface and the same cross-sectional shape as that of said main body for closing said opening and mounted on the upper surface of said main body, the lid assuming an open position and a closed position; and
at least two resilient belt plates connecting the rear surfaces of said main body and the lid to each other, wherein
each of the resilient belt plates forming a trapezoid having a bottom side and a top side parallel to each other and a pair of slant sides each connecting an end of the bottom side and an end of the top side, the top sides of the resilient belt plates being oppositely faced to each other, one slant side of each of the resilient belt plates being a lower side and connected to the rear surface of said main body through a thin-walled hinge and the other slant side of each of the resilient belt plates being an upper side and connected to the rear surface of the lid through another thin-walled hinge,
each of the resilient plates being connected to the rear surface of the main body and the rear surface of the lid to cause a cross-section crossing at a right angle with the resilient belt plates to draw an inverted truncated V-shape in the closed position of the lid, and
each of the resilient belt plates primarily rotating as a pivoting of the lid around the upper thin-walled hinge when the lid is opened or closed and secondarily reversed when each of the resilient belt plates is pivoted around a lower thin-walled hinge to cause a cross-sectional shape crossing at a right angle with the resilient belt plates at the another thin-walled hinge becoming a truncated V-shape in the open position of the lid.

5,148,913
OPERATING MECHANISM OF A THREE-POSITION SWITCH
Patrick Bonnardel; Jacques Vernay, both of Grenoble; Hugues Filiputti, Monestier De Clermont; Thierry Humbert, St. Martin D'Heres, and Marcel Rigaud, Izeaux, all of France, assignors to Merlin Gerin, France
Filed Mar. 12, 1991, Ser. No. 668,163
Claims priority, application France, Mar. 22, 1990, 90 03794
Int. Cl.[5] H01H *5/06*
U.S. Cl. 200—400 **7 Claims**

1. An operating mechanism of an electrical switch having movable contacts, comprising:
a main shaft (**10**) cooperable with movable contacts of said switch, said main shaft (**10**) rotatable between an open central position (**C1**) a closed position (**C2**) and a ground position (**C3**), wherein said open central position (**C1**) is located rotatably between said closed position (C2) and said ground position (C3);

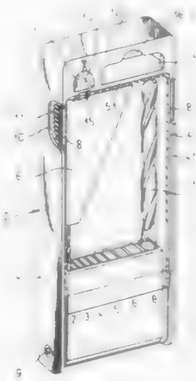
a first closing and opening device (**14**) for rotating said main shaft (**10**) between said central position (C1) and said closed position (C2) said first closing and opening device (**14**) including a first rotatable shaft (**16**) on which is disposed a first flange plate (**18**) having a first eccentric crank pin (**24**);
a second closing and opening device (**15**) for rotating said main shaft (**10**) between said central position (C1) and said ground position (C3), said second closing and opening device (**15**) including a second rotatable shaft (**20**) on



which is disposed a second flange plate (22) having a second eccentric crank pin (**25**);
toggle lever means (**19,33,23,42**) connecting said main shaft (**10**) with said first and second closing and opening devices (**14,15**);
a spring (**27**) fitted between said first and second eccentric crank pins (**24,25**) so as to provide torque for rotation of said main shaft (**10**) via said toggle lever means (**19,33,23,42**) between said open position (C1) and closed position (C2), and between said open position (C1) and ground position (C3).

5,148,914
BOX FOR DISPLAY AND STORAGE OF ELONGATED OBJECTS
Günter H. Budert, Bachhagel; Willi Platte, Attendorn; Gerhard Riess, Bachhagel-Burghagel; Georg Rau, Giengen-Hohenmemmingen, and Werner Hitzler, Herbrechtingen, all of Fed. Rep. of Germany, assignors to Firma Georg Knoblauch, Giengen/Brenz, Fed. Rep. of Germany
Filed Sep. 26, 1991, Ser. No. 766,728
Claims priority, application European Pat. Off., Sep. 26, 1990, 90118434
Int. Cl.[5] A45G *13/10*; B65D *85/24, 43/16*
U.S. Cl. 206—1.5 **10 Claims**

1. A box for the storage and display of elongated objects, the box comprising:
a base part having
a floor having a pair of parallel side edges and an end edge bridging the side edges,
respective side walls projecting upward from the side edges and in turn having upper edges, and
an outer end wall bridging the side walls and projecting upward from the end edge;
a cover part having a face plate, hinged on the base part, and pivotal thereon between an open position projecting upward from the base part and a closed position with the face plate lying wholly within the base part below the upper edges of the side walls, the cover part being formed with a laterally projecting grip tab coplanar with the face plate; and
a frangible latch element connected between the cover and base parts in the closed position of the cover part and retaining same therein, whereby the cover part can only



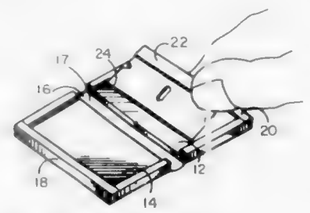
be moved into the open position after breaking of the latch element.

5,148,915
GOLF BAG COMPARTMENTALIZER
Daniel P. Ryan, 32 Hamilton Rd., No. 402, Arlington, Mass. 02174
Filed Aug. 30, 1991, Ser. No. 753,117
Int. Cl.[5] A63B *55/00*
U.S. Cl. 206—315.6 **8 Claims**

1. An insert for use in partitioning a golf club bag of given length into separate lengthwise compartments for storing and transporting golf clubs where the golf club bag is of the type that has a bottom end, an open top end, sides extending between the bottom end and open top end, and divider bars extending across its open top end, said insert comprising:
an elongated bag of predetermined cross-sectional shape and length where said predetermined length of said elongated bag is shorter than said given length of said golf club bag, said elongated bag being made of fabric and having a closed bottom end and an open top end, said open top end of said elongated bag having a plurality of flaps extending upwardly therefrom and each of said flaps having strips of hook and loop material extending outwardly therefrom;
means for holding and positioning said closed bottom end of said elongated bag in predetermined alignment with said bottom end of said golf club bag so that said closed bottom end of said elongated bag resists twisting with respect to said bottom end of said golf club bag, said means for holding and positioning said closed bottom end of said elongated bag comprising a polygonal shaped base attached to said closed bottom end of said elongated bag for aligning it in a predetermined position with respect to said open top end of said golf club bag; and

a plurality of strips of hook and loop material positioned around the outside surface of said elongated bag, adjacent to said top open end thereof, and in alignment with said strips of hook and loop material on said flaps so that said flaps can be wrapped around said divider bars of said golf club bag to retain said open top end of said elongated bag in alignment with said open top end of said golf club bag such that said fabric of said elongated bag can be placed in tension to maintain said predetermined shape thereof throughout the length of said golf club bag thereby separating said golf club bag into lengthwise compartments for the storage and transport of clubs.

5,148,916
RAZOR BLADE CARRIER
John N. Tillyer, Sr., 64 Middle St., Saco, Me. 04072
Filed Sep. 25, 1991, Ser. No. 765,443
Int. Cl.[5] A45C *1./26*
U.S. Cl. 206—352 **4 Claims**

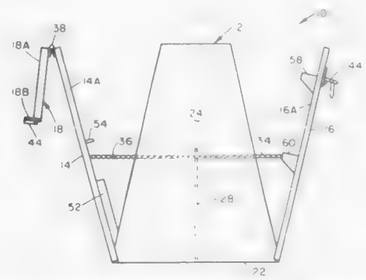


1. A single-edge razor blade carrier for carrying a single-edge razor blade, comprising:
a first piece of magnetically attractive strip material having inner and outer sides and edges defining a size somewhat larger than said razor blade to be carried;
a second piece of magnetically attractive strip material having inner and outer sides and edges defining a size somewhat larger than said razor blade to be carried;
a flexible hinge member joining said first and second pieces of magnetically attractive strip with said razor blade being positionable with its blade toward said flexible hinge member and with said second piece of magnetically attractive strip material being closable over said razor blade positioned therein to completely sandwich said razor blade between said inner sides of said first and second pieces of magnetically attractive strip material to form a protective housing for retaining said razor blade securely therein;
wherein said hinge member is formed of a tape positioned on the outer sides of said magnetically attractive strip material; and
wherein said flexible tape extends around and folds over the edges onto the inner sides of said first and second pieces of magnetically attractive strip material to form a recessed area defined by said tape on the inner sides of said strip material of a size large enough to receive said razor blade.

5,148,917
MULTIPLE TOOL ORGANIZING AND STORING CARRIER
Martin R. LeBrun, 1609 McKenny St., Gillette, Wyo. 82716
Filed Jan. 24, 1992, Ser. No. 825,065
Int. Cl.[5] B65D *85/20*
U.S. Cl. 206—372 **17 Claims**

1. A multiple tool organizing and storing carrier, comprising:
(a) a central housing having a bottom wall and upright opposite end walls, said central housing also having open opposite sides;
(b) a pair of opposite side doors pivotally mounted to said central housing for pivoting between opened positions away from said opposite sides of said central housing and closed positions engaged with opposite sides of said central housing;
(c) a plurality of tool holders separately supported on said central housing and on interiors of said side doors; and
(d) means for opening and closing an open top formed by said end walls of said central housing and said opposite side doors when in said closed positions, said opening and closing means being a lid hinged to an upper edge of one of said side doors, said lid being capable of pivotally moving relative to said one side door for opening away from and closing upon said open top of said carrier.

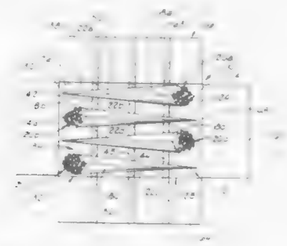
9. A multiple tool organizing and storing carrier, comprising:
(a) a central housing having a bottom wall and upright opposite end walls and an upright partition extending between said opposite end walls;
(b) a pair of opposite side doors pivotally mounted along lower edges thereof to opposite edges of said bottom wall of said central housing for pivoting between opened positions away from said central housing and closed positions engaged with opposite side edges of said end walls of said central housing;
(c) means for opening and closing an open top formed by said end walls of said central housing and said opposite side doors when in said closed positions, said opening and closing means being a lid hinged to an upper edge of one



of said side doors, said lid being capable of pivotally moving relative to said one side door for opening away from and closing upon said open top of said carrier; and
(d) a plurality of tool holders separately supported on opposite sides of said partition and on interiors of said side doors.

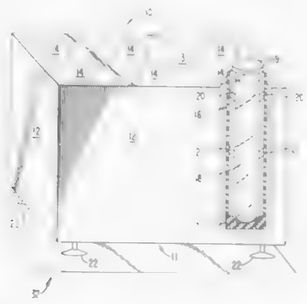
14. A multiple tool organizing and storing carrier, comprising:
(a) a central housing having a rectangular-shaped bottom wall and upright trapezoidal-shaped opposite end walls and an upright rectangular-shaped partition extending between said opposite end walls;
(b) a pair of opposite rectangular-shaped side doors pivotally mounted along lower edges thereof to opposite edges of said bottom wall of said central housing, said side doors being capable of pivoting between opened positions away from said central housing and closed positions engaged with opposite side edges of said end walls of said central housing;
(c) a rectangular-shaped lid hinged to an upper edge of one of said side doors and being capable of pivotally moving relative to said side door for opening away from and closing upon a rectangular-shaped open top of said carrier formed by said end walls of said central housing and said side doors when in said closed positions; and
(d) a plurality of tool holders being separately supported on opposite sides of said partition of said central housing and on interiors of said side doors.

5,148,918
SHIPPING CARTON FOR FLORAL GROUPING ASSEMBLIES
Donald E. Weder, Highland; William F. Straeter, Breese, and Joseph G. Straeter, Highland, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 692,329, Apr. 26, 1991, Pat. No. 5,092,465. This application Feb. 5, 1992, Ser. No. 831,767
Int. Cl.[5] B65D *85/50, 85/52*
U.S. Cl. 206—423 **29 Claims**



1. A shipping carton comprising:
a box assembly having an inner surface and an outer surface and at least partially enclosing a retaining space; and
a plurality of floral grouping assemblies, each floral grouping assembly being disposed in the retaining space in the box assembly and each floral grouping assembly having an adhesive disposed on a portion thereof with the adhesive on the floral grouping assemblies removably and adhesively engaging a portion of the box assembly and connecting each of the floral grouping assemblies to the box assembly when the floral grouping assemblies are placed in the retaining space in the box assembly for substantially preventing movement of the floral grouping assemblies in the box assembly during movements of the box assembly.

5,148,919
BLOOD TUBE SAFETY BOX
David H. Rubin, New Rochelle, N.Y., assignor to Kevin J. Kitson, White Plains, N.Y., a part interest
Filed May 17, 1991, Ser. No. 701,813
Int. Cl.[5] B65D *85/20*
U.S. Cl. 206—443 **4 Claims**



3. A container for holding test tubes adapted to enable a user to insert and withdraw a needle into and from said test tubes without manual manipulation of the test tube or container during the needle insertion or withdrawal process to thereby reduce the risk of needlesticks to said user, said container comprising:
top, bottom and side walls forming a substantially rectangular enclosure;
a plurality of openings formed in said top wall, said openings being sized at least as large as a diameter of said test tubes;
a plurality of holders for receiving and holding a plurality of test tubes, each of which is associated with a respective one of said openings and which extends downwards from said respective opening, wherein said holders are substantially cylindrical and have attached thereto resiliently deformable projection means for securely holding test tubes having different diameters, said projection means extending radially inwards and downwards to resist upwards force placed on a test tube, said holders further comprising cushion means located at a bottom portion thereof to cushion said test tubes and vertically located said test tubes; and
fixation means for removably securably fixing said container on a supporting surface.

5,148,920
PACKAGE AND PACKAGE INSERT
Michael R. Walker, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed Mar. 18, 1991, Ser. No. 670,807
Int. Cl.[5] B65D *81/10*
U.S. Cl. 206—588 **5 Claims**

1. A package for a product including;
a bottom with upwardly extending opposed walls forming a cavity with an opening at its top, wherein two opposed walls each contain a groove;
an insert comprising a front surface, a back surface, an inner edge, and an outer edge, wherein a portion of the outer edge fits within the grooves and the inner edge extends from the front surface to the back surface to define an aperture within which a said product may be disposed, the aperture having a pre-formed shape corresponding substantially to a said product's cross-sectional shape such that when a said product is fitted into the insert and the insert is fitted into the grooves a portion of the insert is between a said product and the opening, thereby providing positive restraint to motion of a said product relative to the insert toward the opening.

5,148,92

PNEUMATIC SEPARATION OF PARTICULATE MATERIAL

Victor A. M. White, Buckingham, England, assignor to GBE International PLC, Andover, England

PCT No. PCT/GB89/00774, § 371 Date Feb. 27, 1991, § 102(e) Date Feb. 27, 1991, PCT Pub. No. WO90/00445, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 7, 1989, Ser. No. 623,814

Claims priority, application United Kingdom, Jul. 8, 1988, 8816342; Aug. 17, 1988, 8819583

Int. Cl.[5] B07B 9/00

U.S. Cl. 209—20 18 Claims

1. In an apparatus for the pneumatic separation of light and heavy particles from particulate material including a substantially horizontal tray of sheet material having a plurality of grooves and ridges extending longitudinally thereof, the grooves and ridges having material inlet and exit ends, said tray having discrete apertures through which air passes from beneath the tray to at least partially fluidize the material under separation treatment to form a carpet on the tray, means for simultaneously vibrating the tray to release the light and heavy particles, and means for removing said light and said heavy particles, the improvement comprising, each groove being in the configuration of a trough and having bottom and side walls, said side walls having an upper portion, inclined walls extending from said upper portion of said side walls of the grooves to the uppermost portion of the ridges, said apertures being provided at least in the grooves and being sized and distributed so that when gas is introduced therethrough the velocity profile over the surface of the tray will be such that the gas velocity in the region of the grooves is greater than in the region of the ridges to cause the light particles to rise and the heavy particles to sink from the carpet of material, and the tray having a collection channel extending obliquely and transversely of the grooves and ridges adjacent the exit ends of the grooves.

5,148,922

GRAVITY PARTICLE SEPARATOR

Paul A. Marriott, Mullion Cottage, Bar Road, Helford Passage, Nr. Falmouth, Cornwall TR11 5LE, United Kingdom

PCT No. PCT/GB89/00439, § 371 Date Oct. 11, 1990, § 102(e) Date Oct. 11, 1990, PCT Pub. No. WO89/10197, PCT Pub. Date Nov. 2, 1989

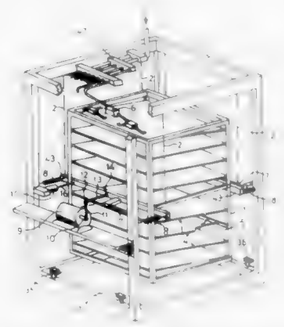
PCT Filed Apr. 25, 1989, Ser. No. 582,932

Claims priority, application United Kingdom, Apr. 26, 1988, 8809814

Int. Cl.[5] B03B 5/04, 13/00

U.S. Cl. 209—489 20 Claims

1. Apparatus for the separation of particles, the apparatus including a surface mounted for resonant oscillatory motion, characterised in that the apparatus comprises actuation means arranged to maintain the oscillation of the surface at substantially its resonant frequency, detection means arranged to detect a parameter of the separation operation and to produce an output signal representative thereof, and control means responsive to the said output signal and arranged to control operation of the separator as separation proceeds, the detection



means including means to detect the said resonant oscillation frequency.

5,148,923

APPARATUS FOR SORTING OR OTHERWISE TREATING OBJECTS

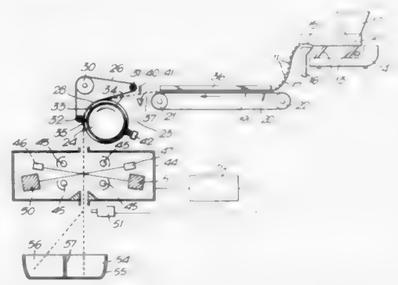
Herbert Fraenkel, London, and Stewart J. Mills, Essex, both of England, assignors to Sortex Limited, London, England

Filed Feb. 15, 1991, Ser. No. 656,486

Claims priority, application United Kingdom, Feb. 19, 1990, 9003698

Int. Cl.[5] B07C 5/02, 5/342

U.S. Cl. 209—539 16 Claims



1. Apparatus for sorting objects comprising an endless belt; guide means which are in contact with the belt and which cause the latter to have a curved portion; means for forming at least one path between the guide means and the curved portion of the belt for the passage of the objects therethrough, the path having an inlet portion arranged to receive objects which have travelled thereto along a trajectory which has a substantial horizontal component at the inlet portion, and the path having a substantially vertically disposed outlet portion through which the objects are discharged substantially vertically so as to fall under gravity; feeding means for feeding the objects to the inlet portion of the path; means for driving the belt so that objects passing into the path through the inlet portion thereof are centrifugally forced against the belt and carried thereby to the outlet portion thereof; viewing means, disposed below the outlet portion, for viewing the objects as they fall under gravity from the outlet portion; and separator means, controlled by the viewing means, for effecting separation between desired and undesired objects.

5,148,924

SHEET MATERIAL HANDLING FRAME

Stuart V. Mason, Biggleswade, and Robert M. Agnew, Datchworth, both of United Kingdom, assignors to Mark Abrahams & Sons, Ltd., Waltham Aldrey, United Kingdom

PCT No. PCT/GB88/00765, § 371 Date May 15, 1990, § 102(e) Date May 15, 1990, PCT Pub. No. WO89/02407, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 16, 1988, Ser. No. 469,544

Claims priority, application United Kingdom, Sep. 16, 1987, 8721824

Int. Cl.[5] A47G 19/08

U.S. Cl. 211—41 14 Claims

1. A sheet material handling frame comprising a base for supporting the sheets, at least one stanchion extending up from the base, first securing means for holding the bottom edge of the sheets against at least one stanchion, second securing means for holding the top edge of the sheets against said stanchion ,and lifting means attached toward the top of the stanchion by which the apparatus may be transported, wherein the second securing means are longitudinally movably retained by the stanchion to accommodate different heights of sheet, and wherein the first and second securing means are comprised of a strap which, in use, passes beneath the base, around the material, through a longitudinal slot in the stanchion, and over a strap guide which is slidably retained within the slot and which extends therefrom to rest on the top edge of the sheets when loaded on the frame.

5,148,925

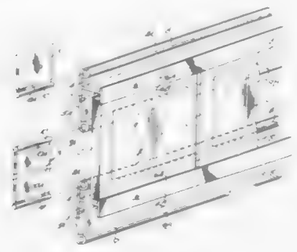
WALL MOUNTED RACK

Donald J. Althoff, 1946 Minda Dr., and Glen P. Hunt, 1686 Gilham Rd., both of, Eugene, Oreg. 97401

Filed Sep. 30, 1991, Ser. No. 767,669

Int. Cl.[5] A47F 5/00

U.S. Cl. 211—41 7 Claims



1. A rack for the storage of articles in rows along a room wall, said rack comprising,

rack members for vertically spaced placement on the room wall and each including a wall and a shelf having article barrier means,

spacers located between said rack members and adapted for room wall attachment, and

coupling means on said spacers and said rack members for coupling of the rack members in a vertical spaced apart relationship to one another, said coupling means including a support surface for supporting of the articles in an upright position and enabling tilting of the article by fingertip pressure during article removal from the rack.

5,148,926

BOTTLE HOLDER

Daniel Cocuzzo, 451 Moody St., Waltham, Mass. 02154, and Charles Deegan, 45 Merrimack St., Lowell, Mass. 01852

Filed Dec. 12, 1991, Ser. No. 806,698

Int. Cl.[5] A47F 5/00

U.S. Cl. 211—118 16 Claims

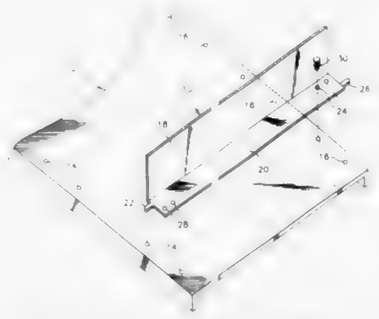
1. A holder for suspending a bottle having a shoulder, a neck, and a bottle cap, said holder comprising:

(a) a bottle engaging means having a ring-shaped body that terminates in a pair of legs, said body sized to fit over the neck of a bottle and held thereon between a shoulder of the bottle and a bottle cap secured to the neck;

(b) a connector means in the form of a cap having a closed end, a depending skirt, and an open end, a means in the form of a oppositely disposed holes formed in said skirt, each said hole sized and shaped to receive one of said legs, a central aperture formed in said closed end, a slot formed in said skirt and said closed end, said slot terminating at said aperture; and

(c) an attachment means having a head, a neck, and a foot, said neck joining said head and said foot, said neck sized to be received in said slot, said foot having a flange and a projection, said flange at the junction of said neck and said foot, said projection extending axially from said flange and away from said neck, said flange being larger than said slot, said projection sized to hold said legs in said holes, said head being freely rotatable relative to said connector means about a longitudinal axis of said holder, said bottle engaging means constrained for limited pivotal movement relative to said connector means about a transverse axis of said holder.

5,148,92[illegible]
PIN MOUNT SHEL F DIVIDER
John Gebka, Chicago Heights, Ill., assignor to Fast Industries Inc., Ft. Lauderdale, Fla.
Filed Aug. 7, 1991, Se . No. 741,656
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—184 3 Claims

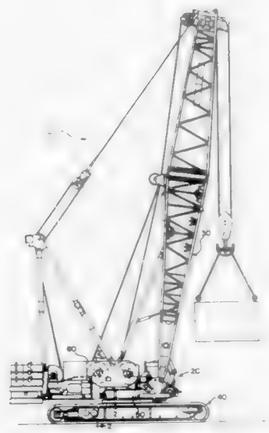


1. A shelf divider of sheet mate ial comprising an elongate divider panel, an elongate attach nent flange extending substantially perpendicularly from th divider panel, a single first tongue at a first end of the attachm nt flange, a first perforation in the attachment flange adjacent a second end of the attachment flange opposite said first en l and aligned with the first tongue, a single second tongue at t ne second end of the attachment flange laterally offset from s id first tongue, and a second perforation in the attachment flan e adjacent the first end and aligned with the second tongue.

5,148,9[illegible]8
SHELF SY TEM
William D. Arnold, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Dec. 1, 1989, S r. No. 444,531
Int. Cl.[5] A47 3 *43/00*
U.S. Cl. 211—187 9 Claims

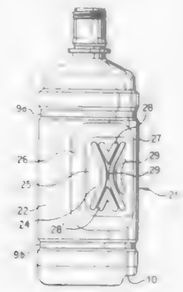
1. A shelving system capable o being completely assembled without the use of tools, the syst m comprising:
a shelf member having first an second ends and including a horizontal shelf position an at least one extending vertical portion;
at least one end bracket adapt d to be secured to one of the first and second ends of th shelf member and provide support for the shelf memb r;
means for connecting the end bracket and the shelf member, the means being adapted to connect the end bracket on the one end of the shelf membe by pressing the end bracket on the one end of the shelf member, and the means being adapted to restrain withdra val of the shelf member from connection with the end bracket and restrain pivoting movement of the shelf member relative to the end bracket;
the means for connecting the end bracket and the shelf member includes a first flexible latch member secured to the end bracket and a second rigid latch member secured to the end bracket, the first and second latch member being vertically spaced from each other and arranged to engage on opposite sides of the horizontal shelf portion of the shelf member to connect the end bracket with the shelf member;
and the means for connecting the end bracket and the shelf member includes a third flexible latch member secured to the end bracket and a fourth rigid latch member secured to the end bracket, the third and fourth latch members being horizontally spaced from each other and arranged to engage on opposite sides of the extending, vertical portion of the shelf member to connect the end bracket with the shelf member.

5,148,929
MULTI-COUPLING DEVICE FOR CRANE HYDRAULIC LINES
Charles R. Wernecke, Manitowoc, and Marlin P. Strouf, Two Rivers, both of Wis., assignors to The Manitowoc Company Inc., Manitowoc, Wis.
Filed Sep. 20, 1991, Ser. No. 762,771
Int. Cl.[5] B66C *23/62*
U.S. Cl. 212—180 20 Claims



1. A multi-coupling device for connecting multiple hydraulic lines between first and second portions of a crane that are not aligned with a tolerance as small as that necessary for connecting hydraulic line couplings, wherein the couplings each have two mating parts respectively secured to each of the two crane portions, the multi-coupling device comprising:
a) a first plate rigidly holding the first part of each of said couplings in a spaced relationship, said first plate being rigidly fixed to said first crane portion;
b) a second plate rigidly holding the second part of each of said couplings in a spaced relation corresponding to the spaced relation of the first coupling parts;
c) a mounting device which mounts said second . plate on said second crane portion with a freedom of movement at least as great as the tolerance in alignment between the first and second crane portions; and
d) alignment means for aligning said first and second plates.

5,148,930
BIAXIAL-ORIENTATION BLOW-MOLDED BOTTLE-SHAPED CONTAINER HAVING OPPOSED RECESSES AND GROOVES FOR STABLE GRIPPING AND ANTI-BUCKLING STIFFNESS
Akiho Ota, and Hiroichi Ishii, both of Koto, Japan, assignors to Yoshino Kobyosho Co., Ltd., Tokyo, Japan
Division of Ser. No. 112,070, Oct. 26, 1987, Pat. No. 4,993,565, which is a continuation-in-part of Ser. No. 851,450, Apr. 14, 1986, abandoned. This application Nov. 14, 1990, Ser. No. 612,483
Int. Cl.[5] B65D *23/10*
U.S. Cl. 215—1 C 8 Claims



1. A blow-molded bottle-shaped container of biaxially oriented thermoplastic synthetic resin comprising:
a container body defining a longitudinal center line and having a shoulder and neck portion at an upper end thereof and a bottom portion at a lower end thereof;
a pair of recesses depressed inwardly on opposite sides of a rear half portion of the container body substantially at a central height position of the container body to form a grip to be grasped by one hand, said recesses including tapered parts disposed oppositely with respect to the longitudinal center line and having inclined surfaces substantially inclined in a direction from the rear half portion of said container body towards a center thereof, said recesses having a nadir area aligned with an area including a point defining the center of gravity of said container; and
a substantially X-shaped projection formed from a pair of reinforcing ribs projecting from the surface of said tapered part of each of said recesses, said X-shaped projection extending substantially over an entire height and width of said tapered part.

8. A blow-molded bottle-shaped container of biaxially oriented thermoplastic synthetic resin, comprising:
a container body defining a longitudinal center line and having a shoulder and neck portion at an upper end thereof and a bottom portion at a lower end thereof;
a pair of recesses depressed inwardly on opposite sides of a rear half portion of the container body substantially at a central height position of the container body to form a grip to be grasped by one hand, said recesses including tapered parts disposed oppositely with respect to the longitudinal center line and having inclined surfaces substantially inclined in a direction from the rear half portion of said container body towards a center thereof, said recesses having a nadir area aligned with an area including a point defining the center of gravity of said container;
a substantially X-shaped projection formed from a pair of reinforcing ribs projecting from the surfaces of said recesses; and
a pair of parallel upper and lower reinforcing rib grooves located entirely in the grip between upper and lower limits of the recesses and extending between the tapered part of one recess and the tapered part of the opposite recess without extending into the recesses.

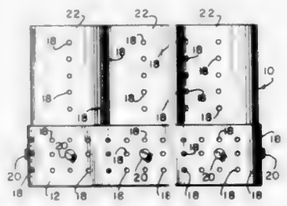
5,148,931
SAFETY CLOSURES FOR THREADED CONTAINERS
Do Le Minh, 17231 Regulus Dr., Yorba Linda, Calif. 92686
Filed Nov. 21, 1990, Ser. No. 616,661
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—220 10 Claims

1. A safety closure for a container comprising:
(i) a cap having an inner side wall and being provided with means for permitting engagement with a container by rotation in a closing direction and removal by rotation in a reverse direction which is opposite to said closing direction,
(ii) an outer side wall captive on said gap and surrounding said inner side wall,
(iii) means permitting rotation of said cap by said outer side wall in said closing direction and permitting rotation of said outer side wall relative to said cap in said reverse direction, and
(iv) means on said inner side wall and said outer side wall including
a type A groove,
a type B groove,
a type A protrusion, said type A protrusion being movable within said type A groove and said type B groove,
a type B protrusion, said type B protrusion being movable within said type A groove and said type B groove, when said type B protrusion is in said type B groove said type A protrusion is in said type A groove,
a non-interlocking means permitting rotation of said outer side wall relative to said gap in aid reverse direction when said type B protrusion is in said type A groove, and
interlocking means permitting rotation of said cap by said outer side wall in said reverse direction when said type B protrusion is in said type B groove.

5,148,932
MATERIALS-RECYCLING COLLECTION BIN ASSEMBLY
Richard Orefice, 64 Cherry Rd., Lake Hopatcong, N.J. 07849
Filed Oct. 23, 1991, Ser. No. 780,953
Int. Cl.[5] B65D *90/00*
U.S. Cl. 220—23.2 4 Claims

1. A materials-recycling collection bin assembly, comprising:
a base; and
a plurality of collection bins set in said base, in juxtaposition and in parallel; wherein
said bins comprises cylindrical sleeves, formed of plastic sheets having ends of said sheets coupled together;
said sleeves are open at opposite ends thereof;
said base, too, is formed of a plastic sheet which has ends thereof coupled together to define a simple band;
said base has an open top and an open bottom; and
said sleeves have a plurality of fastener-receiving holes

formed therein for alignment of given ones of said holes, in each sleeve, with such holes in an adjacent sleeve for



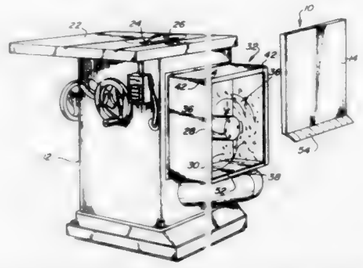
receiving fasteners therethrough (a) to secure such adjacent sleeves together, and (b) to provide some vertical stability, thereby, to such adjacent sleeves.

5,148,933

ACCESS MOTOR COVER FOR A SAWING TABLE

Timothy Hewitt, P.O. Box 839, Royal Oak, Mich. 48068

Filed Mar. 25, 1991, Ser. No. 674,126
Int. Cl.[5] B65D *43/02*
U.S. Cl. 220—4.31 **5 Claims**



1. A cover for permitting quick access to a motor housing of a sawing table, said cover comprising:
an outer face and an inner face, a top edge and a bottom edge;
said top edge extending inwardly at an angle with respect to said inner face, said top edge of said cover engaging a top surface of said motor housing to limit the downward displacement of said cover;
at least one pin extending downwardly from said top edge of said cover toward said bottom edge so that said at least one pin overlies and is substantially parallel to the plane of said inner face, said at least one pin receivable into a pin aperture provided through said top surface of said motor housing to align and secure said top edge of said cover to said housing when said top surface of said housing is engaged by said top edge; and
means for simultaneously securing said bottom edge of said cover to a bottom surface of said motor housing as said at least one pin is positioned through said pin aperture.

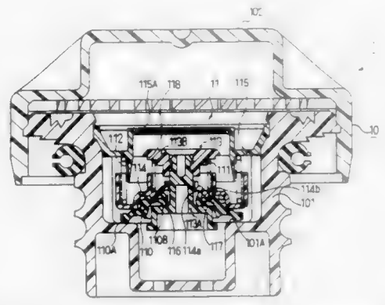
5,148,934

CAP HAVING A VALVE THEREIN

Joji Kasugai, Ichinomiya; Hirofuki Hagano, Inazawa, and Norikazu Hosokawa, Nishikasugai, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 20, 1991, Ser. No. 671,421
Claims priority, application Japan, Mar. 20, 1990, 2-70767
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—203 **3 Claims**

1. A cap having a valve built therein, comprising:
a cap body that can be installed on an aperture of a container; and
a valve body joined to said cap body, said valve body including an annular seal member, an inner coil spring, an outer coil spring, a core member, a guide plate and an outer spring shoe plate;
wherein said annular seal member includes an inner lip element and an outer lip element 110A, both extending in a first direction;
wherein said guide plate includes a taper surface and a projection;
said inner lip element has a first and second end;



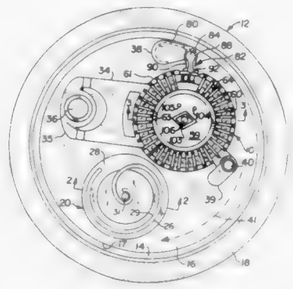
said first end of said inner lip element contacts the guide plate along said taper surface;
said second end of said inner lip element contacts said core member at an inner lip shoe portion;
said projection extends from said taper surface in about the same direction as said second end of said inner lip element; and
said projection fits into a space provided in said annular seal member.

5,148,935

VENTING RESEALABLE CONTAINER CLOSURE AND ASSOCIATED CLOSURE CONTAINER-COMBINATION

Jay W. Lyon, Greensburg, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 22, 1990, Ser. No. 601,453
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—208 **46 Claims**



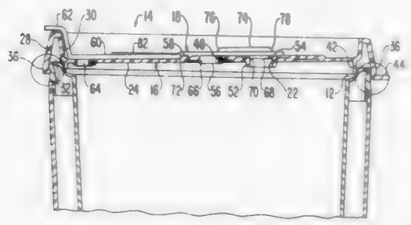
1. A cap for substantially gas-tight sealing engagement with a container wall having an opening therein circumscribed by a sealing surface, said cap comprising,
a top wall and a depending skirt cooperating therewith to define a sealing portion which is sealingly engageable in gas-tight relationship with said sealing surface,
means for securing said cap to said container wall,
tab means for manually engaging said cap to rotate the same between a sealed position and an unsealed position,
said cap having vent means provided by at least one weakened zone, which is disposed on or adjacent to said tab means, whereby said vent means will, when container pressure exceeds a predetermined level, move a portion of said cap away from said sealing surface to vent said container and, subsequently, automatically reestablish sealed contact with said sealing surface, and said cap having only one said weakened zone.

5,148,936

CONTAINER CLOSURE ARRANGEMENT

Gary C. DeGrow, Antioch, Tenn., assignor to Aladdin Synergetics, Incorporated, Nashville, Tenn.

Filed Apr. 5, 1991, Ser. No. 680,904
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—254 **16 Claims**



1. A closure cover for a container having an annular opening defining a mouth, the closure cover comprising:
a body portion of an extent sufficient for covering said container mouth and having means thereon for attaching said body portion to said container mouth;
a pair of substantially radially aligned openings including a dispensing opening and a vent opening in said body portion, said vent opening including a centering boss thereabout projecting upwardly from said body portion;
a stopper member formed of a substantially flat, elongated body mounted on said body portion for movement between a position overlying said openings and a position angularly displaced therefrom for alternately closing and exposing said openings, said stopper member containing means forming downwardly depending flanges conforming in shape to the respective openings in said body portion and forming a seal for said dispensing opening and a centering boss for said vent opening;
said centering boss on said stopper member and said centering boss around said vent opening being formed with cooperating inclined surfaces to facilitate relative movement between said centering bosses; and
means for connecting said stopper member to said body portion for rotational movement.

5,148,937

CAP WITH PERFORATING SPIKE FOR CONTAINER WITH A PROTECTIVE MEMBRANE

Albert Huard, Greenfield Park, Canada, assignor to Dero Enterprises Inc., Montreal, Canada

Filed Dec. 23, 1991, Ser. No. 812,019
Int. Cl.[5] B65D *17/44*
U.S. Cl. 220—278 **6 Claims**

4. The combination of a cap with a container having a neck with a wall defining an opening sealed by a protective membrane that has to be removed when the container is to be opened for the very first time,
said cap comprising a top portion sized to close said opening and a peripheral skirt portion that projects from said top portion and has a bottom edge, the wall of said neck and the skirt portion of said cap being both generally cylindrical and including opposite thread elements to allow detachable connection of the cap to the neck by screwing; in such a manner that said top portion of said cap closed said opening,
wherein said cap further comprises at least one open slot made in said skirt portion, said at least one open slot extending at an angle from the bottom edge of said skirt portion and being wide enough to engage the wall of said neck,

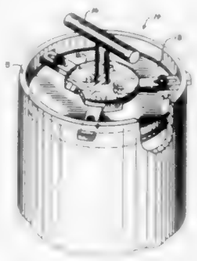
whereby said at least one slot makes said skirt to define a spike that can be used to perforate and remove the protective membrane when the container is opened for the very first time.

5,148,938

PRESSURE VESSEL

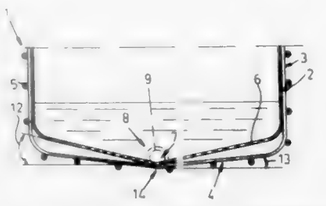
Howard W. Morgan, Jr., 100 Anchor Rd., P.O. Box 735, Michigan City, Ind. 46360

Continuation-in-part of Ser. No. 21,718, Mar. 4, 1987, abandoned. This application Feb. 19, 1988, Ser. No. 158,226
Int. Cl.[5] B65D *45/00*
U.S. Cl. 220—316 **8 Claims**



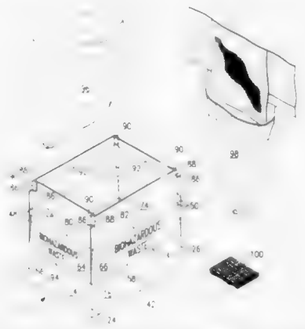
1. A pressure vessel having a housing with an opening and a lid, said lid spanning the opening of said housing, locking means associated with said lid shiftable between a closed position for securing said lid to said housing, and an open position for releasing said lid from said housing, the improvement comprising safety means for preventing pressurization of said housing associated with said locking means wherein said safety means is inactivated to allow pressurization of the housing as said lid is locked to said housing, said safety means including a vent opening in one of said lid and housing and sealing means shiftable between a housing sealed and unsealed relationship with respect to said vent opening as said lock means is shifted respectively between said closing and open positions, said locking means including an actuator part attached to said lid, a plurality of extendable and retractable fingers carried by said actuator part, and a plurality of openings in said housing, means connecting said fingers to said actuator part for extended and retracted movement of the fingers upon shiftable movement of the locking means, said fingers extending through said housing openings when said locking means is shifted into its closed position.

5,148,939
CONTAINER FOR STORING AND TRANSPORTING A LIQUID
Georges Roser, Wingen/Moder, France, assignor to Soltralentz S.A., Drulingen, France
Division of Ser. No. 479,709, Feb. 14, 1990, Pat. No. 5,024,346.
This application Jan. 10, 1991, Ser. No. 639,562
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905976
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] B65D *33/56, 88/62*
U.S. Cl. 220—401 3 Claims



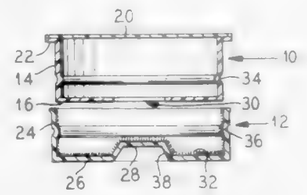
1. A storage and transport container for a fluent material, the container comprising:
a stiff outer vessel having an upright side wall formed of a grid of steel bars and a generally planar floor; and
an elastically flexible liner in the vessel having a side and a base respectively generally corresponding to the side wall and floor of the vessel and provided at a low point with a drain fitting, the base being inclined when the liner is only partially filled with the fluent material to the horizontal to the low point at an angle substantially greater than that between the vessel floor and the horizontal but forming the same angle and lying flatly on the floor when fully filled with the fluent material, the base engaging the floor generally only at the low point when the liner is only partially filled with the fluent material.

5,148,940
APPARATUS AND METHOD FOR DISPOSING OF INFECTIOUS MEDICAL WASTE
Nicholas E. Mendise, Columbus, Miss., assignor to Microtek Medical, Inc., Columbus, Miss
Filed Apr. 3, 1991, Ser. No. 679,619
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—404 7 Claims



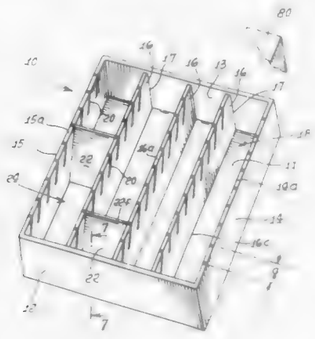
1. A vertically contractible and expandable disposable receptacle for collection, containment, storage, and transportation of waste material, said receptacle comprising:
an outer container formed from semi-rigid material, said material being cut and creased to provide;
a pair of side wall panels and a pair of end wall panels hingedly connected together and foldable along fold lines to form a rectangular container body;
at least one bottom wall panel foldably connected to a bottom edge, of at least one of said side wall or end wall panels to form a bottom for said receptacle;
a plurality of closure flaps hingedly connected at fold lines to the upper edges of at least two of said side wall or end wall panels and overlappingly disposed to form a multiply closure for said receptacle, each of said closure flaps being divided by an auxiliary fold line parallel to said fold line connecting said closure flaps to said side or end wall panels, whereby said receptacle can be closed into a vertically contracted size by folding said closure flaps at the fold lines joining said flaps to said side or end wall panels, or into a vertically expanded size by folding said closure flaps at said auxiliary fold lines in said flaps, and whereby said closure flaps may be erected to form upstanding extensions of said side or end wall panels;
a bag of flexible material disposed in the outer container, said bag having an opened shape complimentary to the interior of said outer container when said closure flaps are so erected and upstanding, and whereby the marginal edges of the opening of said bag may be bloused over the upper edges of said closure flaps when said flaps are so erected and upstanding; and
means for removably securing said closure flaps together when said closure flaps are erected to form upstanding extensions of said side and end wall panels.

5,148,941
POWDER DRUM
Norman A. Chezek, 100 Hepburn Rd. 4G, Clifton, N.J. 07012
Filed Jul. 5, 1991, Ser. No. 726,357
Int. Cl.[5] B65D *43/16*
U.S. Cl. 220—408 20 Claims



1. An improved powder drum, comprising:
means for containing a dry powder, said means for containing having at least one side wall and top and bottom ends, said top end being substantially open and said bottom end having a predetermined aperture;
means for closing said top end;
means for covering said bottom end and at least a portion of said at least one side wall of said means for containing, said means for covering having at least one side wall that mates with said at least one side wall of said means for containing and having a closed bottom end, said closed bottom end having a concave portion that substantially mates with said aperture in said bottom end of said means for containing; and
means for sealing said dry powder in said means for containing at least during assembly of said means for containing and said means for covering, said means for sealing substantially covering an inner surface of said means for covering.

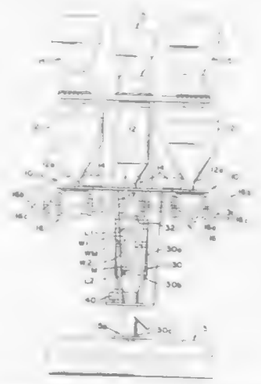
5,148,942
FILING BOX WITH ADJUSTABLE AND SELECTIBLE POSITION DIVIDERS, HAVING CORRUGATED BOX AND DIVIDER WALLS
Steven E. Snook, 921 High Country Dr., Glendora, Calif. 91740
Filed Nov. 22, 1991, Ser. No. 796,349
Int. Cl.[5] B65D *25/06*
U.S. Cl. 220—533 15 Claims



1. A reinforced box, with adjustable dividers, comprising in combination:
a) the box having a bottom wall, and laterally extending upright, opposite end walls, the box also having longitudinally extending, upright side walls and partition walls extending between and connected to said opposite end walls,
b) there being angled slots cut into said side walls and partition walls to intersect the tops thereof, the slot extending at acute angles relative to a top plane defined by the tops of said side walls and partition walls,
c) and panel-shaped dividers carried by and extending between certain of said longitudinally extending walls, said each divider having wings respectively received in two of the angled slots, and said dividers having lower portions extending below the levels of said wings and slots, and between said longitudinal walls,
d) whereby the dividers and longitudinal walls between which they extend form cells to receive cards in ordered face-to-face relation.

5,148,943
METHOD AND APPARATUS FOR METERING AND BLENDING DIFFERENT MATERIAL INGREDIENTS
Richard W. Moller, Fenton, Mich., assignor to Hydreclaim Corporation, Fenton, Mich.
Filed Jun. 17, 1991, Ser. No. 716,084
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—1 14 Claims

1. A method of metering different material ingredients for discharge to a material processing machine, comprising:
delivering to a common hopper a plurality of individual material ingredients at controllable individual material discharge rates,
discharging material from said common hopper to said processing machine at a discharge rate,
determining loss of weight of material in said hopper due to discharge of material therefrom,
determining the material processing rate of the processing machine from the sum of the material discharge rates of the ingredients to the common hopper and the discharge rate of the material from the common hopper to the processing machine, and
controlling the material discharge rates of the ingredients to the common hopper in response to said determined material processing rate as needed to maintain a preset recipe



of said blended ingredients at said determined material processing rate.

5,148,944
INTERACTIVE MEDICATION DELIVERY SYSTEM FOR INDIVIDUAL PILLS AND CAPLETS
Stephen B. Kaufman, Highland Park; Aleandro DiGianfilippo, Crystal Lake; Tamara L. Sager, Libertyville, all of Ill., and Ralph J. DeVito, Stanhope, N.J., assignors to Health Tech Services Corporation, Northbrook, Ill.
Filed Sep. 29, 1989, Ser. No. 414,921
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—131 8 Claims

1. A medication delivery device for individual pills/caplets comprising
a housing including a storage chamber which includes at least two separate storage compartments, each of the compartments capable of holding at least one pill/caplet and a dispensing chamber, each compartment of the storage chamber having a first opening communicating with the dispensing chamber for conveying a pill/caplet from the storage chamber into the dispensing chamber, the dispensing chamber having a second opening for dispensing the pill/caplet from the housing, and
a shuttle member movable within the dispensing chamber between a first and second position, the shuttle member having delivery means for receiving a pill/caplet through each of the first openings as the shuttle member is moved from its first position toward its second position and for carrying the received pill/caplet to the second opening

for dispensing as the shuttle member is returned to its first position,

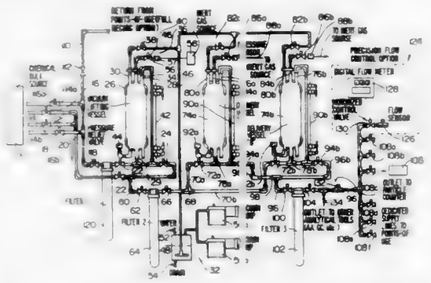
wherein, as the shuttle member is moved from its first position toward its second position, the delivery means encounters one of the first openings before the other one of the first openings, and wherein the delivery means receives the pill/caplet from the first encountered opening of a compartment that contains a pill/caplet.

5,148,945

APPARATUS AND METHOD FOR THE TRANSFER AND DELIVERY OF HIGH PURITY CHEMICALS

Tobin Geatz, Durham, N.C., assignor to Applied Chemical Solutions, Hollister, Calif.

Filed Sep. 17, 1990, Ser. No. 583,826
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—1 **37 Claims**



10. An apparatus for providing chemical transfer and delivery of chemical from a bulk source to an end-use station which comprises

a lifting vessel;

a source conduit between the bulk source and the lifting vessel, including a valve to control fluid flow through the source conduit;

a vacuum system in communication with the lifting vessel and including means to evacuate gas selectively from the lifting vessel;

a pressure system, operated independently of said vacuum system, in communication with the lifting vessel pressurize selectively the lifting vessel;

a delivery vessel in communication with the lifting vessel, including a transfer conduit permitting the transfer of chemical from the lifting vessel to the delivery vessel;

a delivery conduit from the delivery vessel to the end-use station, including a valve to control fluid flow through the delivery conduit;

a connecting conduits between the lifting vessel, the delivery vessel, and the end use station including valving to regulate flow through such conduits so to allow any vessel to be bypassed in the system without affecting the operation of the wherein said connecting means may include said transfer conduit and said delivery conduit system.

5,148,946

METHOD AND APPARATUS FOR DELIVERING PREDETERMINED AMOUNTS OF FLUIDS

Akira Mizuta, and Takeaki Shibuya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1990, Ser. No. 581,354
Claims priority, application Japan, Sep. 13, 1989, 1-237883
Int. Cl.[5] B67B *7/00*
U.S. Cl. 222—1 **10 Claims**

1. A method for delivering a predetermined amount of a fluid wherein the fluid is pressurized and passed through a pressure feed passageway, the pressure feed passageway is opened and closed, and a predetermined amount of the fluid is thereby delivered out of the pressure feed passageway,

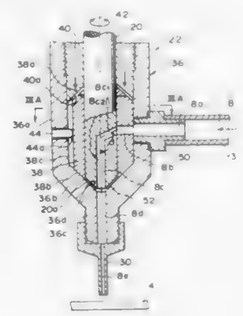
the method for delivering a predetermined amount of a fluid comprising the steps of:

i) locating a dispenser in said pressure feed passageway, said dispenser comprising a housing with a cylindrical part, a rotatable shaft rotatably disposed within said cylindrical part, and a seal member located between said cylindrical part of said housing and said rotatable shaft, said rotatable shaft being provided with a passageway part formed therethrough, which constitutes part of said pressure feed passageway, and said seal member being provided with a portion of said pressure feed passageway located outside of said passageway part,

ii) delivering said fluid by rotating said rotatable shaft to a predetermined orientation, in which said passageway part communicates with said portion of said pressure feed passageway in said seal member and located outside of said passageway part, and

iii) after a predetermined amount of said fluid has been delivered, rotating said rotatable shaft by a predetermined angle to an orientation, in which said passageway part does not communicate with said portion of said pressure feed passageway in said seal member and located outside of said passageway part, and thereby stopping the delivery of said fluid.

3. An apparatus for delivering a predetermined amount of a fluid, the apparatus comprising:



i) a means for pressurizing said fluid,

ii) a pressure feed passageway through which said pressurized fluid passes, and

iii) a dispenser located in said pressure feed passageway, said dispenser being provided with:

a) a rotatable shaft provided with a passageway part formed therethrough, which constitutes part of said pressure feed passageway,

b) a cylindrical part of a housing, which cylindrical part is fitted outside of said rotatable shaft such that said rotatable shaft can rotate therein,

c) a seal member which is constituted of a resilient material, said seal member being located between said cylindrical part of the housing and said rotatable shaft, said seal member including a portion of said pressure feed passageway passing therethrough and located outside of said passageway part,

d) an operation means for rotating said rotatable shaft, and

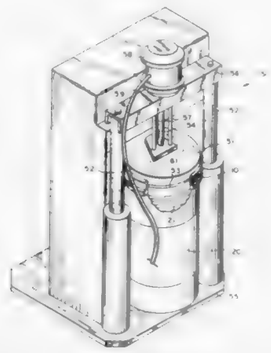
e) a control means for controlling said operation means in order for said rotatable shaft to be rotated to an orientation, in which said passageway part communicates with said portion of said pressure feed passageway passing through said seal member and located outside of said passageway part, and to an orientation, in which said passageway part does not communicate with said portion of said pressure feed passageway passing through said seal member and located outside of said passageway part.

5,148,947

DRUM EXTENDER APPARATUS FOR MELTING AND DISPENSING HOT MELTS

Edwin H. Epp, Roslindale, and Joseph W. Dupray, Jr., Ipswich, both of Mass., assignors to Bostik, Inc., Middleton, Mass.

Continuation of Ser. No. 159,851, Feb. 24, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,202
Int. Cl.[5] B67D *5/62*
U.S. Cl. 222—146.5 **15 Claims**



1. An apparatus for melting and dispensing a hot melt type adhesive which comprises:

a cylindrical container for holding hot melt type adhesive to be melted and dispensed in a molten liquid state, said container having one closed end and one open end,

means for supporting said container in an upright position with said open end facing upward,

a cylindrical platen having an 'O' ring seal on its side and having an orifice through which molten adhesive is pumped, said platen being positioned to fit into the open end of said container and sized so that the 'O' ring seal slideably engages the inside wall of said container,

means for heating said platen to melt said adhesive,

pumping means for pumping molten adhesive through said orifice,

means for pressing said heated platen in a downward motion into said adhesive and withdrawing said platen when the container has been emptied;

an annular drum extender flange positioned upon the open end of said container, said flange having an inside diameter about the same as that of said container and having a height sufficient to engage said 'O' ring seal of said heated platen, and lip means to cooperate with the open end of said container, and

clamping means for securing said annular flange to said container;

whereby the apparatus is capable of accommodating containers completely filled, without headspace.

5,148,948

LIQUID SOAP DISPENSER WITH MOUNTING BASE

Richard C. Granville, Royal Oak; James C. Mourlas, St. Michaels, and Michael K. Patrick, Greensboro, all of Md., assignors to Celeste Industries Corporation, Easton, Md.

Filed Jul. 5, 1991, Ser. No. 726,290
Int. Cl.[5] B67D *5/64*
U.S. Cl. 222—173 **18 Claims**

1. A liquid dispenser and a mounting base comprising, a bottle having a bottom wall, a discharge assistant connected to said bottle, a protrusion connected to the bottom wall of said bottle, a spherical end wall formed on said protrusion, whereby the bottle is prevented from standing upwardly on a horizontal supporting surface; a mounting base, means for securing said mounting base to a horizontal supporting surface, and means for fastening said protrusion to said mounting base,

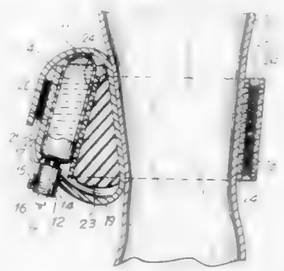
whereby the bottle is supported on said horizontal surface in an upwardly standing position.

5,148,949

DETACHABLE DISPENSER FOR DISTRIBUTING SCENT OR LURE

Frank Luca, 54 Green St., New York, N.Y. 10013

Filed May 2, 1991, Ser. No. 694,836
Int. Cl.[5] B67D *5/64*
U.S. Cl. 222—175 **3 Claims**



1. A liquid scent dispenser for attachment to a article of footwear at or about the ankle region, comprising:

a flexible container having a nozzle attached at one end for housing the desired liquid scent to be dispensed;

a flexible pouch in which said container is mounted, said flexible pouch having a hole in the lower end in which the nozzle of said container is positioned;

an elastic strap attached to said pouch;

cooperating fastening members attached to each end of the elastic strap to allow attachment of said pouch around the article of footwear at a desired tension; and

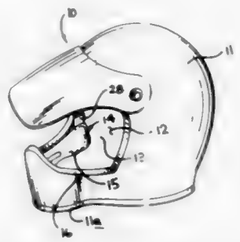
said flexible container, elastic strap and fastening members arranged and being so constructed so that when said dispenser is mounted on an article of footwear, movement of said footwear causes a variable tension to be applied to the flexible pouch and thereby to the container mounted whereby pressure created by the movement of said footwear itself coupled with said change of tension on the flexible container by said movement forces the liquid out of the container one drop at a time and absent such movement, liquid is not forced out of the container.

5,148,951

HELMET AND FLUID RESERVOIR APPARATUS

Dave K. Hosaka, 6652 S. Alta, Reedley, Calif. 93654

Filed Sep. 16, 1991, Ser. No. 760,113
Int. Cl.[5] B67D *5/62*
U.S. Cl. 222—175 5 Claims



1. A helmet and fluid reservoir apparatus, comprising,

a helmet shell, the helmet shell including a lower continuous edge, and the helmet shell further including a forward shell opening directed through the helmet shell, and a fibrous liner mounted within the helmet shell at least between the shell opening and the lower edge, and

a flexible fluid reservoir pouch mounted to the fibrous liner between the lower edge and the forward shell opening, the flexible reservoir pouch including a right flexible fluid container and a left fluid flexible container longitudinally aligned relative to one another and hingedly mounted relative to one another about a central conduit, and

the right fluid container and the left fluid container each including a respective right and left first hook and loop fastener patch for securement to the fibrous liner, and

the right and left flexible fluid container each including a respective right and left forward face, the respective right and left forward face each including a respective second right and left hook and loop fastener patch for securement to the fibrous liner, and

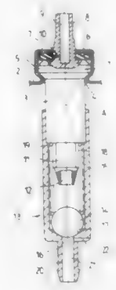
the central conduit including an "L" shaped drinking conduit projecting above the central conduit in fluid communication with the central conduit, the central conduit in fluid communication with the right and left fluid cavity.

5,148,952

VALVE FOR AN AEROSOL CAN HAVING A SEATED VALVE THAT REMAINS CLOSED DURING AN UNDERPRESSURE CONDITION OF THE CAN

Pierre Candat, Moussy-le-Vieux, France, assignor to L'Oreal, Paris, France

Filed Jun. 10, 1991, Ser. No. 712,520
Claims priority, application France, Jun. 27, 1990, 90 08082
Int. Cl.[5] B65D *83/06*
U.S. Cl. 222—402.22 9 Claims



1. A valve for spraying a product contained under pressure in an aerosol can, the valve comprising:

a first valve means for spraying the product in response to actuation of an actuating rod by a user, the first valve means having a body coupled to the aerosol can which extends towards the interior of the aerosol can, the body having at one end an extended portion for being connected to a dip tube; and

a seated valve means, in the interior of the aerosol can, coupled to the body for preventing the spraying of the product by the first valve means, even if the actuation rod is actuated, when a pressure in the interior of the aerosol can is less than a predetermined limit, the seated valve means including,

a casing for covering the extended portion and being coupled to the body,

a moveable closure element preventing or permitting supply of the product for spraying by the first valve means, and

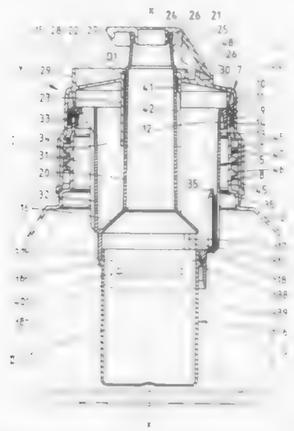
a calibrated spring disposed coaxial with the extended portion, a first end of the calibrated spring resting against the one end of the body and a second end of the calibrated spring exerting a force against the moveable closure element, the force exerted on the moveable closure element being such that the moveable closure element prevents supply of the product, even if the actuating rod is actuated, when the pressure in the interior of the aerosol can is less than the predetermined limit and permits supply of the product when the pressure in the interior of the aerosol can is greater than or equal to the predetermined limit.

5,148,953

DEVICE FOR THE APPORTIONED DELIVERY OF LIQUIDS

Manfred Fudalla, Leer, Fed. Rep. of Germany, assignor to Weener-Plastik GmbH & Co. KG, Weener/Ems, Fed. Rep. of Germany

Filed Feb. 14, 1991, Ser. No. 655,729
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008645
Int. Cl.[5] G01F *11/28*
U.S. Cl. 222—442 12 Claims



1. In a device, comprising an outlet tube, for apportioned delivery of liquid from a storage container through the outlet tube, the delivery taking place only upon a second turning over of the device, the device further comprising a cup-shaped housing divided by a partition wall into an upper chamber of said housing and a lower discharge chamber, the partition wall forming a bottom of the upper chamber, the discharge chamber and upper chamber of said housing communicating with each other by a passage hole, and a feed opening in the upper chamber, the outlet tube debouching above the partition wall in an upright position of the device, the improvement wherein

said outlet tube is attached to the upper chamber in the region of the bottom of the upper chamber and is spaced above said lower discharge chamber, and

detent means for connecting said lower discharge chamber to said upper chamber in a plane below the attachment of the outlet tube to the upper chamber in the upright position of the device.

5,148,954

ADJUSTABLE CAP SHAPER

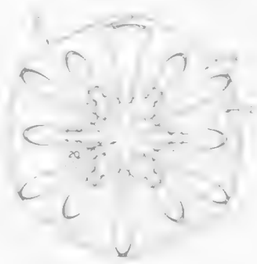
Clifford J. Myers, 1103 E. 25th St., Apt. 3, Cheyenne, Wyo. 82001

Filed Jul. 2, 1991, Ser. No. 724,753
Int. Cl.[5] A42C *1/00*
U.S. Cl. 223—25 15 Claims

1. An adjustable cap shaper for supporting a cap during drying, wherein said cap shaper comprises:

(a) a crown portion comprising a ring-shaped band member having a plurality of upwardly extending arch members secured thereto; wherein said arch members are flexible and each includes a free upper end; wherein said band member includes adjustment means for enabling the diameter of said band member to be adjusted; and

(b) a connector portion which is attached to said free ends of said arch members; wherein the point of attachment of each said arch member to said connector portion is adjustable in a manner such that said arch members form a desired shape for said cap.

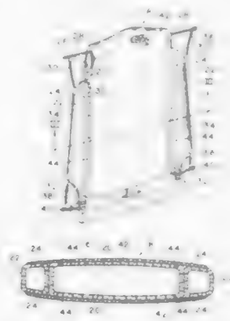


5,148,955

SHIELDED INFLATABLE SIDE BAGS FOR SHIRT PRESSER BAG ASSEMBLY

George Cares, Grand Rapids, Mich., assignor to Sheldon Company, Kentwood, Mich.

Filed Jun. 17, 1991, Ser. No. 716,008
Int. Cl.[5] D06C *15/00*; D06F *71/14*
U.S. Cl. 223—70 20 Claims



1. A presser bag assembly for use with a presser machine having a buck with at least one pressing surface and a heated plate for selective juxtapositions with said at least one pressing surface of said buck, said presser bag assembly being positioned over said buck and comprising:

(a) a body bag;

(b) at least one inflatable side bag made of a first material and extending laterally from said body bag; and

(c) a shield fabricated from a second material that is stiffer than said first material and extends laterally over a portion of said inflatable side bag in an effective amount to substantially prevent folding and pinching of the inflatable side bag against the body bag during pressing.

5,148,956

ARTICLE CARRIER

Gerald D. Funk, Box 475, Dinsmore, Saskatchewan, Canada S0L 0T0

Filed Mar. 12, 1991, Ser. No. 668,265
Int. Cl.[5] A45F *3/04*
U.S. Cl. 224—209 9 Claims

1. A carrier for new born calves comprising in combination a rectangular flexible carrier body, a reinforcing panel stitched to said carrier body thereby providing rigidity and strength

5,148,951

CONTAINER WITH FLEXIBLE RESILIENT DISPENSING SHEET FOR VISCOUS AND SEMI-SOLID CLEANING COMPOSITIONS

Juan C. V. Moure, Miranda, and Juan C. R. R. Ramos, Caracas, both of Venezuela, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 21, 1990 Ser. No. 616,537
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—386 5 Claims

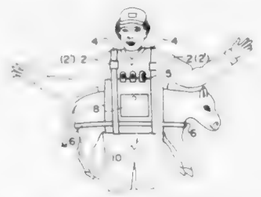
1. A dispensing package for viscous and semi-solid compositions, comprising:

(a) a container for said composition comprising a bottom and sidewalls and provided with an opening, wherein said sidewalls of said container are tapered so that the dimensions of said opening of said container are larger than the corresponding dimensions of said bottom of said container; and

(b) a dispensing sheet made of a flexible, resilient material, said dispensing sheet having an edge and being provided with a plurality of apertures;

wherein said dispensing sheet rests upon and adheres to the surface of a viscous or semi-solid composition contained in said container, wherein the composition is selected from the group consisting of gels, pastes, creams, lotions, and mixtures thereof, and wherein the shape of said dispensing sheet is substantially the same as the shape of said container.

and forming therewith by sewing, article holding pockets, two wide longitudinally mounted carrier straps stitched to said carrier body in parallel spaced relationship and having on one pair of extending ends a male buckle portion and on the other pair of extending ends a female buckle portion, a further wide carrier strap stitched to said carrier body transverse to the longitudinally mounted carrier straps and having on each extending end thereof a female buckle portion to cooperate with the male buckle portions of said longitudinally mounted carrier straps, a narrow female buckle portion attached at each edge of said carrier body where the further wide transverse carrier strap extends from said carrier body, a narrow carrier strap stitched to said carrier body in spaced parallel relationship to said further wide carrier strap and having on each end thereof a narrow male buckle portion, lifting loops on each end of said carrier body for engagement by a weigh scale hook, a measuring scale formed on one of said wide longitudinally mounted carrier straps, all of the straps being applied to one side of said carrier body, an outside pocket attached to the carrier body on the strap applied side so that in use it is furthest from the users body, and wherein the wide longitudinally mounted carrier straps with the extending ends carrying said male buckle portions attached thereto being adjustable and of considerable length have additional wide male buckle portions attached thereto near said carrier body to engage said female buckle portion on the extending ends of the wide longitudinally mounted carrier straps.



5,148,957

FRICTION WELDING

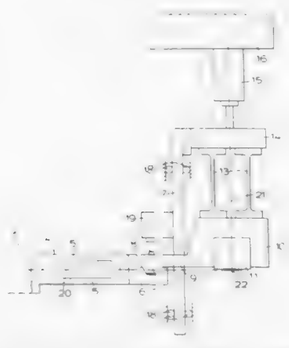
John G. Searle, Hednesford, England, assignor to Allwood, Searle & Timney (Holdings) Limited, West Midlands, England

Filed Oct. 22, 1991, Ser. No. 780,461

Claims priority, application United Kingdom, May 6, 1989, 8910452

Int. Cl.[5] B23K *20/12*

U.S. Cl. 228—2 6 Claims



1. Apparatus for use in welding a first component and a second component together by friction welding, comprising drive means operative to generate reciprocatory movement, a component holder operative to hold said first component, linking means operative to transmit reciprocatory movement from said drive means to said component holder so that in operation said first component performs reciprocatory heat-generating movement, pressure means operative to exert pressue on said component holder so that in operation said first component also performs welding movement, said pressure means being such as to accommodate the heat-generating movement during friction welding, and wherein said linking means comprises at least one flexible element which is alternately in compression and in tension as it transmits said reciprocatory movement from said drive means to said component holder and which bends or flexes to accommodate the welding movement of said component holder during friction welding.

5,148,958

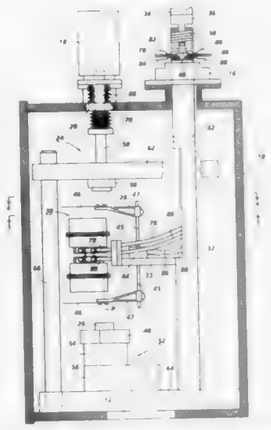
THIN FILM VACUUM COLD WELDING SYSTEM

Joseph Eskandari, Granada Hills, and Russell B. Rauch, Pasadena, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1991, Ser. No. 812,270

Int. Cl.[5] B23K *20/02, 20/24*

U.S. Cl. 228—3.1 8 Claims



1. A system for coating and bonding items together comprising:

a) a housing,

b) pressing means secured to said housing and including a pair of movable members, each said movable member having means for holding an item,

c) means for holding said members in an coating position where said members are spaced apart,

d) means for moving said members from said coating position toward each other into a pressing position to press together the items held by each movable member and for moving said movable members back to said coating position,

e) an arm rotatably mounted on said housing, coating means mounted on said arm for rotation therewith, means for rotating said arm and thereby said coating means from a home position into a coating position wherein said coating means is located between and aligned with items held by said movable members while said movable members are in their coating position, said coating means having means for coating at least one of the items held by one of said movable members when said coating means is in said coating position, said means for rotating said arm including means for rotating said arm and thereby said coating means out of said coating position back into their home position.

5,148,959

WEDGE BONDING TOOL

Earl S. Cain, Napa, and Jerome A. Carlson, San Mateo, both of Calif., assignors to Tribotech, Napa, Calif.

Filed Feb. 7, 1991, Ser. No. 652,117

Int. Cl.[5] B23K *37/02*

U.S. Cl. 228—4.5 6 Claims

1. A bonding tool including

a tapered work end including a narrow bonding tip for holding a wire against a surface to which it is to be bonded,

a shank secured to said tapered work end for guiding a wire along a vertical axis to the rear of said tapered work end, and

guide means secured to the rear of said tapered work end and defining therewith a guide channel extending along the rear of said tapered work end, said guide means for guiding a wire tangentially along said tapered work end from said shank to said narrow bonding tip, and

said guide channel having a portion adjacent said shank in alignment with said vertical axis.

5,148,960

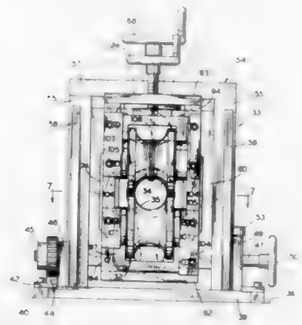
ROTARY SEAM GUIDE

Nelson D. Abbey, III, Monclova, and Timothy J. Lewandowski, Swanton, both of Ohio, assignors to Abbey Etna Machine Company, Perrysburg, Ohio

Filed Feb. 3, 1992, Ser. No. 830,066

Int. Cl.[5] B23K *13/02*

U.S. Cl. 228—17.5 11 Claims



1. Apparatus for aligning and guiding the seam of a tube as it enters the welder in the production of continuous seam-welded metal tubing comprising, a base plate, an upstanding framework mounted upon said base plate, a carrier plate member carried within the upstanding framework and adapted for movement therein toward and away from the base plate, box frame means mounted upon the carrier plate and adapted for rotation thereon to selected angular positions, opposed first and second rolls mounted for rotation within the box frame means, the peripheral circumferential surfaces of the first and second rolls defining therebetween a pass generally conforming to the outline of the tube, the first roll including an annular fin adapted for rolling reception in the seam as the tube is directed through said pass, and means for selectively moving said first roll toward and away from said second roll to selected positions within said box frame

5,148,961

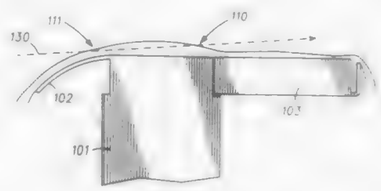
SELECTIVE WAVE SOLDER APPARATUS

Gary A. Humbert, Arlington Heights, and Robert W. Lela, Woodridge, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1991, Ser. No. 812,338

Int. Cl.[5] B23K *1/08*

U.S. Cl. 228—37 3 Claims



1. A selective wave solder apparatus for creating a narrow wave of molten solder to apply the solder to selective components of a printed circuit assembly, the apparatus comprising:

a plenum, having a bottom opening and a top opening, for conducting the molten solder from the bottom opening to the top opening, the top opening having three extended sides and one lower side;

means for pumping the molten solder from the bottom opening through the top opening;

an extended lip, coupled to a first extended side of the top opening opposite the lower side and angled down from the top opening, for creating a first ridge in the molten solder; and

a trough having a bottom coupled to the lower side of the top opening, a first side coupled to a second extended side of the top opening, and a second side coupled to a third extended side of the top opening, the trough additionally having a third side coupled to the trough bottom and at right angles to the trough's first and second sides, a gap separating the third side from the first and second sides, the trough creating a second ridge in the molten solder, the first and second ridges together forming the narrow wave of molten solder.

5,148,962

HOLDER FOR SOLDERING A FLEXIBLE CIRCUIT BOARD TO A SUBSTRATE

Marshall G. Jones, Scotia; Jerry T. Harrison, Schenectady; Joseph E. Piel, Jr., Scotia, and Lowell S. Smith, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 20, 1991, Ser. No. 702,551

Int. Cl.[5] H05K *13/04, 3/34*

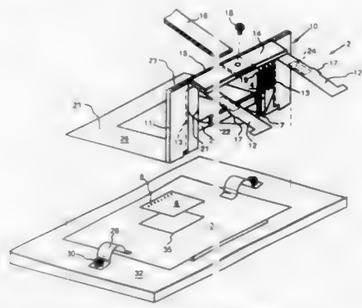
U.S. Cl. 228—49.1 6 Claims

1. A holder for retaining a flexible circuit board while said circuit board is being locally soldered to a substrate, said holder is comprised of:

a U-shaped holder means having legs;

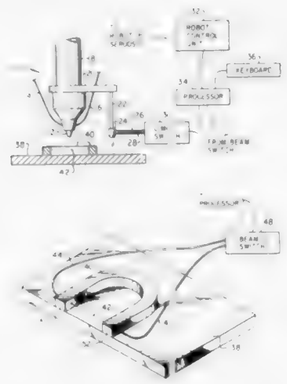
a door means attached to said U-shaped holder means;

a bracket means rigidly attached to said U-shaped holder means;
a base means;



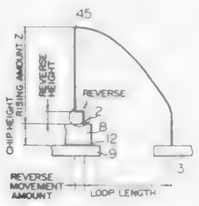
a guide means attached to said base means; and
a first retaining means rotatably attached to said base means.

5,148,961
METHOD FOR SOLDER NOZZLE HEIGHT SENSING
Christopher A. Hicks, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 586,653, Sep. 24, 1990, Pat. No. 5,119,759. This application May 6, 1992, Ser. No. 879,433
Int. Cl.[5] B23K *3/08*
U.S. Cl. 228—102 **9 Claims**



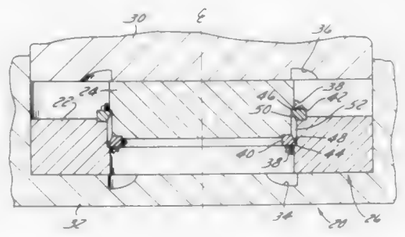
1. A method for controlling the height of a solder nozzle above a planar member in a solder deposition system having a solder nozzle mounted to a manipulatable robotic arm and adapted to dispense heated solder onto the surface of said planar member, said method comprising the steps of:
mounting a non-contact limit switch in a fixed relationship with respect to said solder nozzle, said non-contact limit switch generating a first signal in response to the presence of a planar member within a preselected proximity thereof;
providing a reference surface having a proximity sensor a predetermined distance above said reference surface adapted to generate a second signal in response to the presence of said solder nozzle at said predetermined distance above said reference surface;
manipulating said solder nozzle toward said reference surface; and
utilizing said first signal, said second signal and said predetermined distance to calculate a calibration offset value to be utilized to correct the apparent height of said solder nozzle above said planar member wherein variations in said fixed relationship between said non-contact limit switch and said solder nozzle may be accommodated.

5,148,964
WIRE BONDING METHOD
Yasuhiko Shimizu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 25, 1991, Ser. No. 645,650
Claims priority, application Japan, Feb. 13, 1990, 2-29534
Int. Cl.[5] B23K *1/06, 37/00, 31/12*
U.S. Cl. 228—102 **9 Claims**



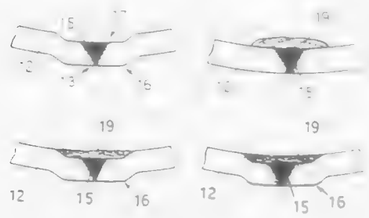
1. A wire bonding method for connecting an electrode pad on a semiconductor chip and an inner lead of a lead frame through metal wire, by moving a bonding tool holding the metal wire and providing a loop in the metal wire, comprising the steps of:
calculating a height difference between the electrode pad and the inner lead,
determining a reverse movement amount of the bonding tool according to said height difference,
bonding the metal wire held by the bonding tool to the electrode pad,
raising vertically the bonding tool to a predetermined level at which the bonding tool is reversed,
reversing horizontally the bonding tool in a direction opposite to the inner lead, to provide a horizontal section of wire, at the predetermined level by the reverse movement amount determined by the determining step, wherein the horizontal section is below a top of the loop to be provided,
raising vertically the bonding tool further to a top level,
moving the bonding tool from the top level to the inner lead, and
bonding the metal wire to the inner lead.

5,148,965
METHOD OF SHEAR FORGE BONDING AND PRODUCTS PRODUCED THEREBY
Arthur F. Hayes, Greendale, and Joseph A. Lemsky, St. Francis, both of Wis., assignors to Ladish Co., Inc., Cudahy, Wis.
Filed Aug. 9, 1990, Ser. No. 565,259
Int. Cl.[5] B23K *20/02, 28/02*
U.S. Cl. 228—115 **17 Claims**



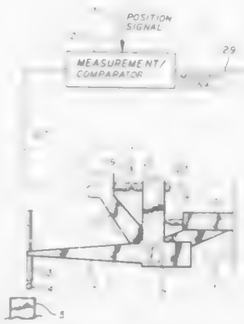
1. A method for shear forge bonding first and second metal parts having forging compatible compositions, comprising the steps of:
a. sizing first and second metal parts for joining across a shear forged bond line;
b. disposing said metal parts in forging dies configured to present said parts in a bonding-effective orientation;
c. shearing first and second surfaces, one on each of said metal parts, located proximately and opposite one another across an open gap, said gap having a width sufficient to prevent premature partial bonding of said surfaces, under controlled conditions of temperature and atmosphere selected to prevent the formation of any bonding disruptive surface contamination on the sheared surfaces; and
d. forging said parts to close said gap and bring said sheared surfaces into contact, under controlled conditions of temperature, pressure, atmosphere and peripheral constraint, to yield autogenous bond therebetween.

5,148,966
METHOD FOR PRODUCING OUTER SKIN FOR ELECTRIC DEPOSITION FOIL PRODUCING DRUM
Akira Minase, and Kinzo Murayama, both of Joetsu, Japan, assignors to Nippon Stainless Steel Kozai Co., Ltd., Niigata, Japan
Filed May 15, 1991, Ser. No. 700,239
Claims priority, application Japan, Feb. 14, 1991, 3-42671
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—149 **4 Claims**



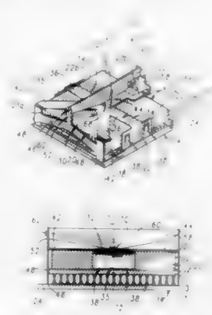
1. In a method for producing an outer skin for an electric deposition foil producing drum, including the steps of winding, into a cylinder, an outer skin of a planar material made of at least one material selected from the group essentially consisting of a titanium, niobium and tantalum, and forming an outer skin, spliced and welded with end faces of the planar material being abutted with each other at a joint portion, around an outer surface of an inner drum, said method comprising the following steps of:
forming a V-shaped opening tip portion, opened toward an inside, in an inner surface portion of the joint portion of said planar material of the outer skin;
welding the end faces of said joint portion at the opening tip portion from the inside to form a welded portion;
subsequently projecting the welded portion and a portion in the vicinity of the welded portion from the inside to the outside by a bulging or extruding work to form a bulged portion and a recessed portion inside of said bulged portion;
subsequently welding said recessed portion while cooling an outer surface of said bulged portion;
peening the outer surface of said bulged portion under a hot or cold working so that a thickness of the bulged portion is corrected to conform with a thickness of the planar material of the outer skin; and
subsequently annealing the peened portion.

5,148,967
APPARATUS AND METHOD FOR DETECTING MISSING INTERCONNECT MATERIAL
John B. Gabaldon, San Diego; Daniel D. Evans, Jr., Oceanside, and Dale W. Cawelti, Carlsbad, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jul. 15, 1991, Ser. No. 729,963
Int. Cl.[5] H01L *21/603*
U.S. Cl. 228—179 **5 Claims**



1. A method for detecting missing interconnect material during repetitive bonding, including the steps of:
(a) measuring the distance traveled by a bonding tool while the apparatus is attempting to bond interconnect material to a site;
(b) comparing the distance measured by said measurement means with a predetermined amount; and
(c) generating a missing signal to indicate the absence of interconnect material when said measurement falls below the predetermined amount.

5,148,968
SOLDER BUMP STRETCH DEVICE
Detlef W. Schmidt, Schaumburg; Carl Mussele, Elgin, and Kevin D. Moore, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 11, 1991, Ser. No. 653,553
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—180.2 **18 Claims**



1. A solder bump stretch device for use in combination with an electronic component and a substrate in attaching the component to the substrate by reflowed solder interconnections, said component comprising an outer face opposite the substrate, said device being assembled with the component and the substrate and being actuated during solder reflow to life the component relative to the substrate to form elongated interconnections, said device comprising

a web comprising a section and a flexible strip extending from the section,

means for fastening the web to the component to fix the web section to the component outer face so that said strip overlies the component outer face and is flexible between a relaxed position wherein the strip extends adjacent the component outer face and a biased position wherein the strip is bowed apart from the component outer face,

a leg connected to the strip remote from the section to depend about the component for engaging the substrate when the strip is in the relaxed position, and

expendable spacer means for supporting the strip in the biased position, said means being expendable during solder reflow to release the strip to the relaxed position to engage the leg to the substrate to lift the component.

5,148,969

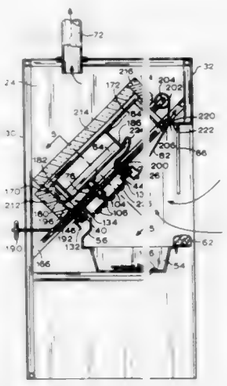
COMPONENT RECLAMATION APPARATUS AND METHOD

Bernard J. Boucher, Fitchburg, Mass.; Kerry S. Dinsmore, Nashua, N.H.; John A. Malesky, Auburn, Mass., and Douglas A. Brochu, Manchester, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 27, 1991, Ser. No. 799,535

Int. Cl.[5] B23K *1/00, 3/00*

U.S. Cl. 228—264 **33 Claims**



1. An apparatus for removing a component from a circuit board, the component being affixed to the board by means of a heat softenable bond, said apparatus comprising:

means for radiantly heating the heat softenable bond sufficiently to allow the removal of the component from the board; and

means for impacting the board in order to remove the component from the board while the bond is softened.

5,148,971

TAMPER EVIDENT FOLDING CARTON

Alan Johnston, New Haven, Conn., assignor to Rexham Corporation, N.C.

Filed Jan. 10, 1992, Ser. No. 819,464

Int. Cl.[5] B65D *5/06, /542*

U.S. Cl. 229—102 **2 Claims**

1. A tamper-evident folding carton having

(a) first, second, third, and fourth walls three of which are articulated to one another along parallel score lines, the fourth of which is adhered to the first by a glue lap articulated to the fourth wall;

(b) top and bottom end closing flaps articulated to the top and bottom of each said first, second, third, and fourth walls;

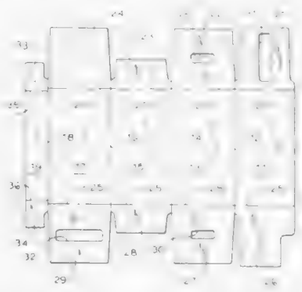
(c) a glue lap extension flap articulated to at least one of the top and bottom edges of said glue lap;

(d) said glue lap extension flap is adhered to an adjacent closing flap of said first wall;

(e) elongated viewing windows formed in the top and bottom flaps of said second panel;

(f) elongated adhesive closure slots formed in the top flap of said first panel and in the bottom flap of said fourth panel; said adhesive closure slots are adapted to underlie said viewing windows in registry therewith;

(g) the top end of said carton being closed by the sequential infolding of said third top flap; said fourth top flap; said first top flap having said adhesive slot; and said second top flap having said window;



(h) the bottom end of said carton being closed by the sequential infolding of said third bottom flap, said first bottom flap, said fourth bottom flap having said adhesive slot, and said second bottom flap having said window;

(i) adhesive closure means deposited in the form of a slug in said closure slots and adhering said windowed flaps to both said immediately underlying slotted flaps and to the end flaps underlying said slotted flaps; and

(j) tamper indicating seals adhered to said windowed flaps and closing off said windows; said seals including a carrier having tamper indicating means of low adhesion material adapted to create an irreversible "flagging" indicia viewable through said carrier at said window when said adhesive closure means sealing said windowed flaps to said underlying flaps has been disrupted by carton-opening or tampering motion.

5,148,971

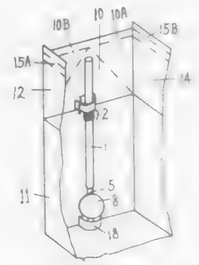
BEVERAGE CARTON WITH TELESCOPIC FLOATING STRAW

Si Yoll Ahn, 221-06 58th Ave. (1st Floor), Bayside, N.Y. 11364, assignor to Si Yoll Ahn, Bayside, N.Y.

Filed Sep. 19, 1991, Ser. No. 762,432

Int. Cl.[5] B65D *5/72*

U.S. Cl. 229—103.1 **1 Claim**



1. In combination, a gable top beverage carton arrangement containing:

(a) an extendable straw having a flexible portion, a float made of a material of a lesser gravity than water, and a ring on said straw to retain said float on said straw,

(b) a D-shaped clamp situated internally on a gable panel of said carton and straw retainer situated at a bottom wall of said carton, so that said straw is held vertically by both the D-shaped clamp and the straw retainer,

said extendable straw consisting of outer and inner telescopically engaged tubes; a second ring internally around the outer tube and third ring externally around the inner tube so that, when the tubes are telescopically engaged, the second and third rings will hold the tubes from separating when the straw is extended; the flexible portion of said straw positioned approximately between the gable panel and a side wall of said carton, so that when the gable panel is folded, the straw is bent, and the folded gable panel holds the straw from floating up.

5,148,972

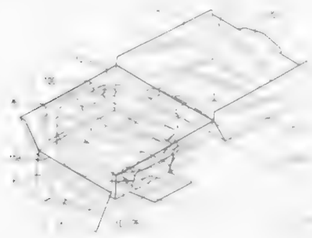
FAST FOOD CONTAINER

Robert E. Clayton, 1429 Laurel Hill Rd., Vienna, Va. 22182

Filed Jul. 22, 1991, Ser. No. 734,151

Int. Cl.[5] B65D *5/30*

U.S. Cl. 229—113 **6 Claims**



1. A food container for supporting and managing the consumption of food items comprising;

a top and a bottom portion;

said top portion comprising a top front panel, parallel top side panels having narrow ends, a rear panel, and a top panel;

said parallel top side panels having top tabs extending from said narrow ends for attaching said parallel top side panels to said top front panels and to said rear panel when assembled to form the top portion of the food container;

said rear panel being shared with said top and bottom portions of the container, and being opposed to the top front panel;

said top panel having first and second sets of parallel fold lines, said first set of parallel fold lines allowing said parallel top side panels to be folded and said second set of parallel fold lines allowing said top front and said rear panel to be folded so as to come into contact with and be affixed to said parallel top side panels;

said rear panel having an additional fold line which divides the top and bottom portions of the container and which further provides a hinge between said top and bottom portions of the food container;

said bottom portion comprising parallel bottom side panels having narrow ends, a bottom front panel and a bottom panel;

said parallel bottom side panels having bottom tabs extending from said last mentioned narrow ends for attaching said parallel bottom side panels to said bottom front panel and to said rear panel when assembled to form the bottom portion of the food container;

said bottom panel comprising third and fourth sets of parallel fold lines, said third set of parallel fold lines allowing the parallel bottom side panels to be folded and said fourth set of parallel fold lines allowing the bottom front and rear panels to be folded to come into contact with and be affixed to the parallel bottom side panels.

said parallel bottom side panels further comprising punch out tabs created by scoring a portion of said parallel bottom side panels to allow said punch out tabs to be folded out from said parallel bottom side panels, said punch out tabs further comprising fold lines fold lines parallel to and relatively above said third set of parallel fold lines;

said bottom front panel further comprising perforated lines perpendicular to the fourth set of fold lines to allow the bottom front panel to be separated from and folded down from the food container, and further comprising an additional fold line, parallel to but relatively above one of said fourth set of parallel fold lines.

5,148,973

INTERLOCKING CARTON AND LID

John Zimmermann, Scarborough, Canada, assignor to Paperboard Industries Corporation, Toronto, Canada

Filed Jan. 9, 1992, Ser. No. 818,383

Int. Cl.[5] B65D *43/08*

U.S. Cl. 229—125.28 **5 Claims**

1. An interlocking carton and lid, comprising:

a) a generally rectangular storage carton having side members and a bottom member, the carton provided with a top opening for providing access into the interior of said carton, at least two opposed side members provided each with a peripheral flap integrally formed therewith at the upper edges thereof adjacent said top opening, the flaps adhesively coupled to the interior surface of the corresponding side members, the connection between the flaps and the side members forming a crease, said at least two opposed side members each provided with at least one slit located therein at a predetermined position between said crease and the outer edge of said flap, the adhesive coupling between said flap and the interior surface of the side member being positioned between said slit and the outer edge of said flap, wherein that unglued portion of the side member located between the crease and the slit is bowed outwardly due to spring tension created in said unglued portion by the close proximity of said slit to said crease; and

b) a lid member having a generally rectangular, central portion, the peripheral edge portion of each side member provided with a flange member integrally formed therewith and extending substantially perpendicularly therefrom, the flange members including an outer member and an inner flap member, the connection between the inner flap portions and the outer members forming a crease, the flaps adhesively coupled to the interior surface of the corresponding outer members, said at least two opposed

flange members each provided with at least one slit located on the flap member at a predetermined position between said crease and the outer peripheral edge of said flap, the adhesive coupling between said flap and the interior surface of the flange outer member being positioned between said slit and the outer edge of said flap, wherein that unglued portion of the flap member located between the crease and the slit is bowed outwardly due to spring tension created in said unglued portion by the close proximity of said slit to said crease, the slits in the lid and carton being so located such that when the lid is placed on the carton the bowed out portions in the flap members pass over the bowed out portions in the carton side members so that the slits in the carton and lid come into registration, and whereby the bowed out portion of the flap in the side members interferes with the bowed out portion of the flap on the lid flange members thereby locking the lid and carton together.

5,148,974

SECURITY MAIL BOX WITH IMPROVED ANTI-TAMPER MEANS

Millard Clapper, Terrace Dr., R.D. , Binghamton, N.Y. 13901

Filed Dec. 13, 1991, Ser. No. 806,379
Int. Cl.[5] A65D *91/00*
U.S. Cl. 232—17 **16 Claims**

1. A security mailbox for deposit of mail in selectively alternative conventional and security modes, said mailbox comprising:

a) housing means having walls enclosing upper and lower compartments, said walls including first and second doors movable to permit and prevent access to the interiors of said upper and lower compartments, respectively;

b) a partition within said housing, at least a portion of said partition being movable between a first, substantially horizontal position, wherein said partition separates said upper and lower compartments, and a second position, providing an opening through which said upper and lower compartments communicate;

c) support means selectively movable between a supporting position, wherein said support means holds said portion of said partition in said first position thereof, and a non-supporting position, permitting movement of said portion of said partition to said second position thereof, said support means including an external threaded elongated member extending through one of said walls and having a manually engageable portion outside said housing and a supporting portion inside said housing, said manually engageable portion being reciprocally movable by engagement with an internally threaded element affixed to said one wall to effect movement of said supporting portion between said supporting and non-supporting positions;

d) first lock means permitting movement of said second door to permit access to said lower compartment only by authorized persons; and

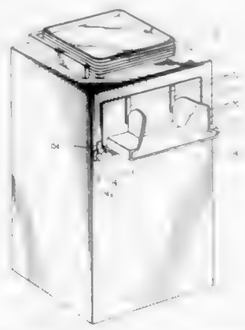
e) second lock means permitting movement of said support means from said non-supporting to said supporting position only by authorized persons, said second lock means including a structural member selectively positionable adjacent the exterior of said one wall to prevent movement of said manually engageable portion to effect movement of said support portion to said supporting position.

5,148,975

TRASH RECEPTACLE TRAY SUPPORT AND METHOD FOR EMPTYING TRAY

Jon E. Dickerson, Murray, and James E. Millburn, West Jordan, both of Utah, assignors to Zeit Company, Salt Lake City, Utah

Filed Sep. 3, 1991, Ser. No. 753,871
Int. Cl.[5] B65G *11/04;* **B65D** *43/26*
U.S. Cl. 232—44 **10 Claims**



1. A trash receptacle tray support comprising

(a) a tray platform adapted to support a tray,

(b) a means for attaching said tray platform to a trash receptacle,

(c) a means for emptying contents of a tray into a trash receptacle;

wherein said tray platform further comprise a means for directing trash into a trash receptacle, and

wherein said tray platform further comprises a means for limiting the movement of a tray wherein said limiting means comprises a lip

wherein said directing means are configured to open a trash receptacle door.

5,148,976

THERMOSTATIC MIXING VALVE

William Reid, Elderslie, Scotland, assignor to The Horne Engineering Co., Ltd., Johnstone, England

Filed Mar. 15, 1991, Ser. No. 670,415
Claims priority application United Kingdom, Mar. 17, 1990, [redacted]
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.2 **8 Claims**

1. A thermostatic mixing valve comprising:

a valve body including an abutment;

first and second inlets for relatively cold and hot fluids, respectively, in said body;

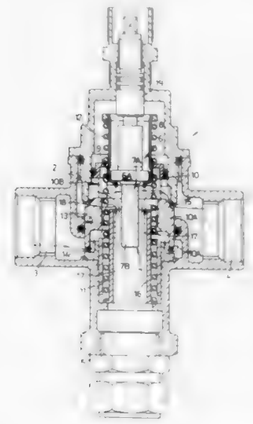
valve means for controlling fluid flows through said fluid inlets;

thermostatic control means for thermostatically controlling said valve means, said thermostatic control means including an outer part containing engagement means for engaging said abutment in said valve body, an inner part, and an intermediate part joining said inner part to said outer part, said inner part of said thermostatic control means defining

a thermal responsive element including a first, passive, portion and a second, active, portion;

first duct means in said valve body for directing a flow of cold fluid from said first inlet onto said first portion of said thermal responsive element, whereby said first portion is responsive essentially only to the temperature of the cold fluid;

second duct means in said valve body for directing a flow of hot fluid from said second fluid inlet to engage and mix



with cold fluid to form a mixed fluid and for directing a flow of mixed fluid onto said second portion of said thermal responsive element, whereby said second portion is responsive to the temperature of the mixed fluid; and

spring means in said valve body for urging said thermostatic control means into engagement with said abutment;

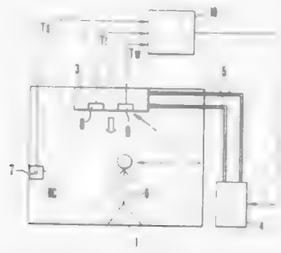
said second, active, portion having a length which varies automatically with changes in pressure of the hot and cold fluids passing to said thermal responsive element to compensate for these pressure changes.

5,148,977

CONTROL SYSTEM FOR AIR-CONDUCTIONER

Yozo Hibino, Chiyoda; Susumu Nakayama; Hiromu Yasuda, both of Shizuoka; Kensaku Oguni, Shimizu, and Kenji Tokusa, Shizuoka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,669
Claims priority, application Japan, Jun. 21, 1990, 2-163174
Int. Cl.[5] G05B *11/01;* **G01J** *5/00*
U.S. Cl. 236—49.3 **3 Claims**



1. A control system for an air-conditioner including means for setting a set value of a room temperature, means for detecting an actual value of the room temperature and control means for controlling the air-conditioner to adjust the room temperature depending upon the difference between the set value and the actual value of the room temperature, said control system comprising:

radiation temperature detecting means for detecting a radiation temperature; and

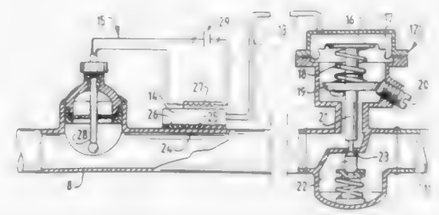
means for modifying the set value of the room temperature on the basis of a first control index represented as the difference between the set value and the actual value of the room temperature and a second control index represented as the difference between a temperature condition in the room and a comfort line, said temperature condition being represented by the room temperature and the radiation temperature, and said comfort line defining an inverse proportional relation between the room temperature and the radiation temperature, depending upon the set value of the room temperature.

5,148,978

COOLING MACHINE AND AN OPTIMALIZED THERMOSTATIC EXPANSION VALVE THEREFOR

Weinand A. M. Stapelbroek, Beltrum, Netherlands, assignor to Cooltronic B.V., Abbinksweg, Netherlands

Filed Mar. 28, 1991, Ser. No. 676,834
Claims priority, application Netherlands, Mar. 29, 1990, [redacted]
Int. Cl.[5] G05D *23/22;* **62** *225;* **236** *92 B, 68 R*
U.S. Cl. 236—68 R **10 Claims**



1. Cooling machine having a cooling cycle in which coolant circulates, the cooling cycle comprising:

1) an evaporator;

2) a compressor;

3) a condenser;

4) a thermostatic expansion valve including a bulb thermally connected to a coolant outlet of the evaporator;

5) an integrating control circuit for the thermostatic expansion valve, the integrating control circuit comprising:

a liquid sensitive sensor placed in the cooling cycle in direct contact with coolant, the sensor being connected via a voltage source to a heating element for heating the bulb; and

6) a thermal insulator located between the bulb and the coolant outlet for partially thermally insulating the bulb.

5,148,979

SETUP-SETBACK THERMOSTAT HAVING A SIMPLE SETUP-SETBACK VISUAL INDICATOR

Stephen J. Brueton, Stouffville, Canada, assignor to Honeywell Limited-Honeywell Limitee, North York, Canada

Filed Aug. 12, 1991, Ser. No. 743,549
Int. Cl.[5] G05D *23/00*
U.S. Cl. 236—94 **6 Claims**

1. A thermostat for controlling room temperature, comprising:

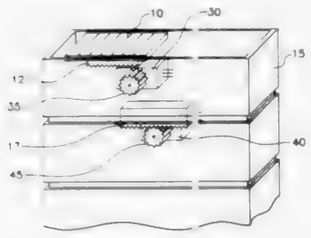
first temperature setting means movable in a first plane for selecting a first desired temperature;

second temperature setting means movable in a second plane between first and second extreme positions and a third intermediate position for modifying said desired temperature by a predetermined amount to create a second desired

temperature when said second temperature setting means is in said second position;

temperature adjustment means connected to said first and second temperature setting means; and

temperature sensing means connected to said temperature adjustment means, said temperature sensing means producing a first signal if the room temperature is greater than said second desired temperature and a second signal otherwise; and



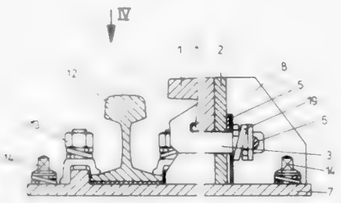
a flange adjacent to said second temperature setting means, said flange being substantially out of sight when said second temperature setting means is in said third intermediate position and becomes more visible as said second temperature setting means is moved away from said third intermediate position, whereby a visual indication of the thermostat being in a setback mode is provided.

5,148,980

DEVICE FOR SECURING IN POSITION GUIDE RAILS

Dieter Fritz, Fohnsdorf; Heinz Ossberger, and Johannes R. Oswald, both of Zeltweg, all of Austria, assignors to Voest-Alpine Zeltweg Gesellschaft m.g.b., Linz, Austria

Filed Jun. 4, 1990, Ser. No. 532,575
Claims priority, application Austria, Jun. 6, 1989, 1386/89
Int. Cl.[5] E01B *5/18*
U.S. Cl. 238—17 9 Claims



1. A device for securing a guide rail in position adjacent and parallel to a main rail, said device comprising:

a guide rail which is free from perforations;

a mounting part including a mounting plate, said mounting plate having a first side and a second side with at least one perforation formed through said mounting plate, said mounting plate being positioned such that it extends in a direction substantially parallel to the longitudinal direction of said rails and such that said rails are positioned on said first side of said plate;

at least one claw for securing said guide rail against said first side of said mounting plate, and wherein said claw extends through said perforation to contact said guide rail on said first side of said mounting plate while a free end of said claw, remains on said second side of said mounting plate;

a bracing member disposed against said second side of said mounting plate for bracing said claw against said second side of said mounting plate; and

retaining member disposed against said second side of said mounting plate for bracing said claw against said second side of said mounting plate; and

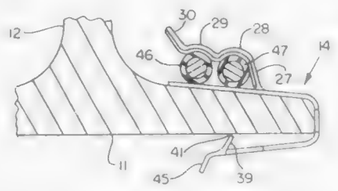
retaining means for contacting said claw at the free end and for cooperating with said bracing means to prevent movement of said claw.

5,148,981

TRACK CIRCUIT RETAINER CLIP

Edward J. Lynch, Jr., Akron, and Raymond S. Laughlin, Cuyahoga Falls, both of Ohio, assignors to Erico International Corporation, Cleveland, Ohio

Filed May 19, 1989, Ser. No. 354,390
Int. Cl.[5] E01B *89/62*
U.S. Cl. 238—351 9 Claims



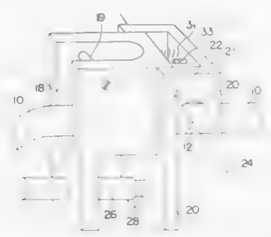
1. A track circuit retainer clip for securing a conductor to a rail comprising a U-shape spring metal clip having a bight portion and upper and lower legs, said lower leg including tangs having truncated biting edges providing biting line contact extending longitudinally of the rail, said upper leg including an upwardly projecting spring finger adapted to receive at least one electrical conductor between said spring finger and the upper leg to secure the conductor parallel to and within the edge of the base of the rail, said bight portion being unobstructed whereby the clip may be driven on the edge of the rail base by the swing of a hammer.

5,148,982

ADJUSTABLE SLIT NOZZLE

Donald L. Ekhoff, 2600 Day Rd., Gilroy, Calif. 95020

Continuation-in-part of Ser. No. 648,921, Feb. 1, 1991, abandoned. This application Apr. 26, 1991, Ser. No. 698,494
Int. Cl.[5] B05B *1/04*; B01D *43/00*
U.S. Cl. 239—1 17 Claims



8. An apparatus for spraying fluid which comprises:

a tube having a wall with at least one transverse slit;

a clamping member clamped onto a first section of said tube on a first side of said at least one slit;

a sliding member slidably mounted onto a second section of said tube on a second side of said at least one slit;

a hinging means for joining said clamping member to said sliding member providing that said first section is positioned at an orientation with respect to said second section and said at least one slit is opened to a size depending on said orientation; and

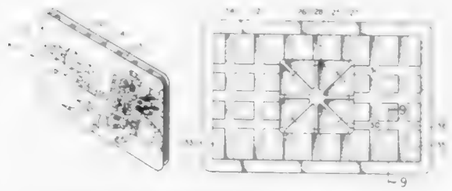
means for adjustably changing said orientation from one selected value to any other selected value within a range of values.

5,148,983

SCENTED SOUVENIR CARD

Ralph Muniz, 112 2nd St., #3, Seal Beach, Calif. 90740

Filed Aug. 16, 1991, Ser. No. 745,736
Int. Cl.[5] A61L *9/04*
U.S. Cl. 239—56 5 Claims



1. A souvenir device comprising:

a pair of members joined together to define an internal storage cavity between their opposing surfaces;

graphic indicia carried on at least one exterior face of said joined pair of members;

a pad carried in said internal storage cavity holding a quantity of a scented substance;

means internally communicating said scented substance exteriorly of said joined pair of members;

said communicating means comprises a plurality of open-ended passageways extending between said internal storage cavity and edge marginal regions of said joined pair of members; and

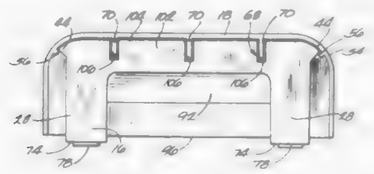
said plurality of passageways are defined between opposing surfaces of said members and opposing surfaces of a plurality of raised portions carried on a selected one of said members.

5,148,984

DEVICE FOR DISPENSING A VAPORIZABLE MATERIAL

John D. Bryson, Jr., Pewaukee, Wis., and Robert G. Kopp, Algonquin, Ill., assignors to Vaportek, Inc., Sussex, Wis.

Filed Mar. 14, 1991, Ser. No. 669,075
Int. Cl.[5] A61L *9/04*
U.S. Cl. 239—58 13 Claims



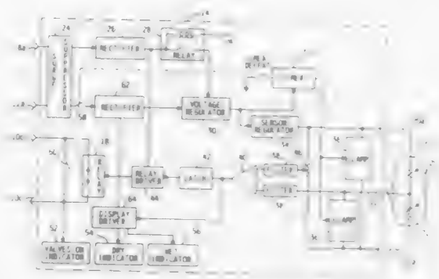
1. A device for dispensing a vaporizable material comprising a base adapted to be mounted on a moveable frame, a cover cooperating with said base to define therebetween an air passage having a first end and a second end spaced from said first end, an element containing vaporizable material disposed in said air passage, means for supporting said cover on said base for rectilinear movement relative to said base and in the direction of the spacing of said ends of said air passage, and means for dispensing the vaporizable material in response to movement of the frame, said dispensing means including means at one of said ends of said air passageway and on one of said base and said cover for selectively and adjustably opening and closing said air passage to afford air passage through said ends of said air passage in response to rectilinear movement of said cover relative to said base.

5,148,985

IRRIGATION CONTROL APPARATUS RESPONSIVE TO SOIL MOISTURE

Richard H. Bancroft, Riverside, Calif., assignor to The Toro Company, Minneapolis, Minn.

Division of Ser. No. 463,602, Jan. 11, 1990, Pat. No. 5,060,859.
This application Oct. 29, 1991, Ser. No. 784,478
Int. Cl.[5] A01G *25/16*
U.S. Cl. 239—64 4 Claims



1. An improved irrigation control apparatus for controlling operation of an electrically operated valve in an irrigation system, which comprises:

(a) a soil moisture sensor buried at least partially in the ground, wherein the sensor has at least one electrically conductive moisture sensing element which uses electrical power to generate an output signal indicative of the level of moisture in the ground; and

(b) a control unit operatively connected to the sensor and to an electrical power source for controlling the operation of the valve in accordance with the level of moisture in the ground, wherein the control unit has control circuit means for applying a relatively short duration pulse of power to the moisture sensing element of the sensor to obtain a sensor output signal only during the pulse, whereby corrosion of the sensor is minimized, wherein the control circuit means includes means for electrically isolating the sensor from the electrical power source whenever the sensor is unpowered, whereby the electrical isolation means protects the sensor from low level leakage of electrical power from the power source, wherein the electrical isolation means includes normally open relay means between the sensor and the electrical power source, which relay means is closed by the application of power to the sensor and is otherwise open, further helping minimize sensor corrosion.

5,148,986

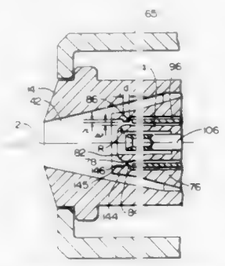
HIGH PRESSURE THERMAL SPRAY GUN

William P. Rusch, Lake Ronkonkoma, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 19, 1991, Ser. No. 732,978
Int. Cl.[5] B05B *1/24*
U.S. Cl. 239—85 9 Claims

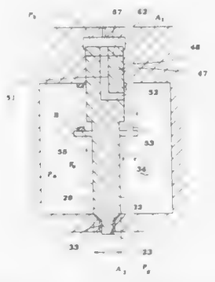
1. A thermal spray gun for spraying at high velocity, comprising a nozzle member with a nozzle face and an axis, a gas cap with an inwardly facing cylindrical wall defining a combustion chamber extending from the nozzle face to an open end, combustion means for injecting an annular flow of a combustible mixture of a combustion gas and oxygen from the nozzle member coaxially into the combustion chamber at a pressure therein of at least three bar above atmospheric pressure, outer gas means for injecting an annular outer flow of pressurized non-combustible gas adjacent to the cylindrical wall radially outward of the annular flow of the combustible mixture, feeding means for feeding heat fusible powder in a

carrier gas coaxially from the nozzle member into the combustion chamber proximate the axis, and inner gas means for injecting an annular inner flow of pressurized gas from the nozzle member into the combustion chamber coaxially between the combustible mixture and the powder-carrier gas, such that, with combusting of the combustible mixture, a high velocity spray stream containing the heat fusible powder is propelled through the open end;



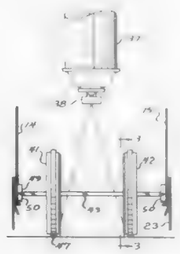
wherein the combustion means comprises the nozzle face having a shallow annular slot therein between the outer gas means and the inner gas means, and gas mixing means disposed in the nozzle member, the mixing means adjoining the annular slot and communicating therewith, and the mixing means being receptive of separate flows of the combustion gas and the oxygen for mixing the flows and effecting the combustible mixture into the annular slot, whereby the combusting of the combustible mixture is rooted in the annular slot.

5,148,987
HIGH PRESSURE FUEL INJECTION DEVICE FOR ENGINE
Jun Taue, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Jul. 3, 1991, Ser. No. 725,550
Claims priority, application Japan, Jul. 5, 1990, 2-178897
Int. Cl.[5] F02M *47/02*
U.S. Cl. 239—96 11 Claims



1. An accumulator type injection nozzle comprising an accumulator chamber for containing fuel under pressure, a discharge port for communicating said accumulator chamber with an engine for injecting fuel thereto, an injector valve for controlling the communication of said accumulator chamber with said discharge port for controlling the discharge of fuel to said engine, a control chamber communicating with said accumulator chamber for receiving fuel under pressure therefrom, said injector valve having a portion received in said control chamber for urging said injector valve to its closed position under the influence of fuel pressure in said control chamber, control valve means for sequentially relieving the pressure in said control chamber to achieve opening of said injector valve and the injection of fuel to said engine from said discharge port, and means for providing a substantially constant rate of discharge of fuel injected at low speed and low load conditions during the mid range of the time of injection and for causing the peak injection rate of discharge under higher load conditions to occur at the latter portion of the injection period.

5,148,988
SPRAYING APPARATUS
Thomas J. Smrt, Cary, Ill., assignor to Fox Valley Systems, Inc., Cary, Ill.
Continuation of Ser. No. 325,017, Mar. 16, 1989, Pat. No. 4,895,304, which is a continuation of Ser. No. 3,501, Jan. 15, 1987, abandoned, which is a continuation of Ser. No. 278,164, Jun. 29, 1981, Pat. No. 4,641,780. This application Jan. 19, 1990, Ser. No. 467,661
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] B05B *1/28*
U.S. Cl. 239—150 3 Claims

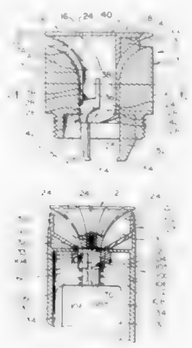


1. A masking disc comprising a circular end wall, a cylindrical flange having a distal end which extends coaxially outwardly from the circular wall, and a rim which projects radially outwardly beyond the perimeter of the wall, the rim being disposed by a predetermined distance axially away from the distal end of the flange, the circular wall having an aperture located at its center, the flange adjoining the perimeter of the circular end wall, and said circular wall comprising a surface having a plurality of generally radially extending ribs located on the surface of said wall.

5,148,989
INSECT DISPENSING APPARATUS AND METHOD
Burr W. Skinner, 10950 SW. 32nd St., Miami, Fla. 33165
Filed Dec. 10, 1990, Ser. No. 625,147
Int. Cl.[5] B64D *1/18*
U.S. Cl. 239—171 24 Claims

1. A dispenser for discharging insects from a moving vehicle comprising insect retaining means for retaining insects aboard said vehicle, delivery means having a delivery means discharge opening, extending from the retaining means into chute means, for delivering the insects into the chute means within an air stream, shield means for shielding the delivery means discharge opening from the direct impact of air passing the vehicle to prevent damage to the insects, wherein the chute means extends from the delivery means discharge opening generally toward the rear of the vehicle and essentially parallel to the longitudinal axis of the vehicle, for containing the air stream flowing out of the delivery means and for gathering a limited quantity of air at at least one axial location for controlled acceleration of the air stream and the insects contained within the air stream to the speed of air passing the vehicle, said acceleration being of a magnitude which does not damage the insects.

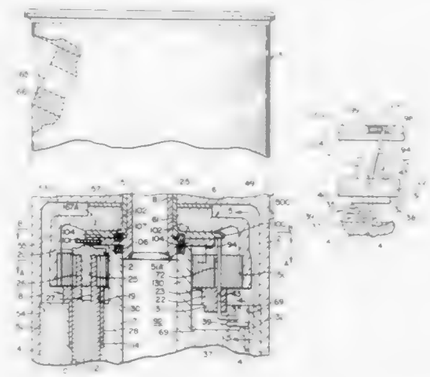
5,148,990
ADJUSTABLE ARC SPRAY AND ROTARY STREAM SPRINKLER
Carl L. C. Kah, Jr., 778 Lakeside Dr., N. Palm Beach, Fla. 33408
Filed Jun. 29, 1990, Ser. No. 546,120
Int. Cl.[5] B05B *1/32*
U.S. Cl. 239—222.17 41 Claims



3. A sprinkler having a nozzle with an adjustable arc of coverage, said nozzle having a tubular body means with a center opening therethrough, said tubular body means having an inlet end and outlet end with an inlet means at said inlet end for receiving pressurized water, a spray deflector member positioned at the other outlet end of said tubular body means, said center opening having a cylindrical section with an inner cylindrical surface, an arc set member having an adjustable arcuate inlet valving means located at the inlet end of said tubular body means, a cylindrical member positioned in the center of said cylindrical section of said center opening with an outer cylindrical surface, said inner and outer cylindrical surfaces forming an arcuate circumferential discharge slot for directing pressurized water onto said spray deflector.

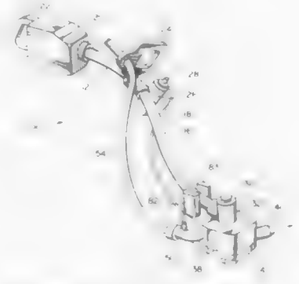
5,148,991
GEAR DRIVEN TRANSMISSION FOR OSCILLATING SPRINKLERS
Carl L. C. Kah, Jr., 778 Lakeside Dr., N. Palm Beach, Fla. 33408
Filed Dec. 13, 1990, Ser. No. 626,993
Int. Cl.[5] B05B *3/16*
U.S. Cl. 239—242 33 Claims

16. A rotary drive sprinkler comprising a sprinkler housing for receiving a supply of water, a nozzle assembly means for directing water therefrom, said sprinkler housing having an output shaft means, said output shaft means being connected to said nozzle assembly means, a rotary drive assembly means for driving said output shaft means, said rotary drive assembly means having a shiftable drive assembly in said housing, actuation means on said shiftable drive assembly for changing the direction of rotation of said output shaft means, said shiftable drive assembly having alternately engageable driving devices for rotating said nozzle assembly means in opposite directions, an over-center spring means for holding one of said alternately engaging driving devices directly in driving engagement with said output shaft means on each side of a center position until an over center spring carry means is prepared to pull said shiftable drive assembly disengaging said one driving device



and pull said shiftable drive assembly over the center position to permit the over-center spring means to drive said other driving device into engagement, two angular limit contact means rotatable with said output shaft means for contacting said actuation means for changing the direction of rotation of said output shaft means.

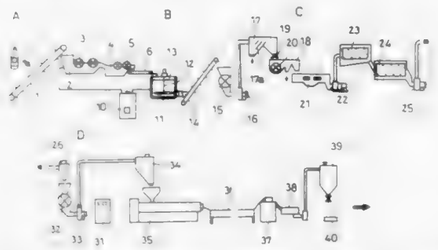
5,148,992
WASHING ACCESSORY FOR A STRING TRIMMER
John A. Morrow, Fort Mill, S.C., assignor to Textron Inc., Providence, R.I.
Filed Mar. 19, 1991, Ser. No. 671,956
Int. Cl.[5] B05B *15/00*
U.S. Cl. 239—289 16 Claims



1. A liquid washing apparatus comprising:
a frame having a general elongate shape;
a motor connected to a first end of said frame;
a drive shaft extending through said frame from said frame first end to a frame second end, said drive shaft being operably connected to said motor; and
a working end having a housing removably connected to said frame second end, said housing having an internal chamber, a liquid inlet into said chamber, and a liquid outlet out of said chamber, and said working end further comprising means for accelerating liquid entering said housing at said inlet to discharge the liquid from said outlet at in increased velocity, said means for accelerating including a pump located in said chamber and being operably connected to said drive shaft such that said motor can

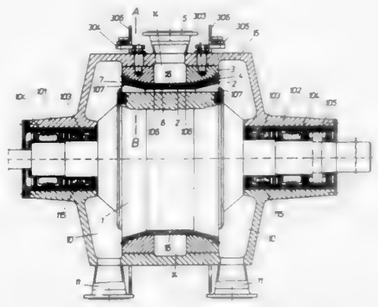
drive said pump to discharge liquid from said outlet at an increased velocity.

5,148,993
METHOD FOR RECYCLING TREATMENT OF REFUSE OF PLASTIC MOLDED ARTICLES AND APPARATUS THEREFOR
Hidehiro Kashiwagi, 3-2, Icchoji Oharacho, Tokushima-shi, Japan
Filed May 21, 1991, Ser. No. 703,382
Claims priority, application Japan, Dec. 27, 1990, 2-416561
Int. Cl.[5] B28B 17/00; B03B 9/06
U.S. Cl. 241—24 7 Claims



1. A method for recycling treatment of refuse of plastic molded articles which have paper labels attached thereto with adhesive and may have reinforcing protective coverings of dissimilar plastics at the bottom portions thereof, which method comprises the sequential steps of:
(a) immersing and agitating the refuse of plastic molded articles in a hot water bath to soften and release the protective coverings and simultaneously to remove stain and foreign matter clinging to the plastic molded articles,
(b) separating out and removing the protective coverings,
(c) injecting steam against the paper labels on the plastic articles freed of the coverings to release the paper labels from the plastic molded articles,
(d) breaking the paper labels and the plastic molded articles into fragments,
(e) separating the paper labels and the plastic molded articles by wind-force sorting into a label portion in which the paper labels predominate and a plastics portion in which the plastic molded articles predominate and removing the label portion,
(f) further separating the fragments of plastic molded articles only from the plastics portion by flying sorting thereby to remove completely the residual paper label fragments,
(g) cleaning the resulting fragments of plastic molded articles now free of the labels in cleaning water by irradiation of ultrasonic energy to completely remove any residual stain, foreign matter and adhesive,
(h) comminuting the fragments of plastic molded articles now substantially free from impurities further into small pieces, and
(i) preparing the small pieces of the purified plastic articles as chips or pellets for a recycling material.

5,148,994
SEGMENT FOR DRUM REFINERS AND STRUCTURE PROVIDED THEREWITH
Franz Haider; Martin Zehentner; Johann Lileg, all of Graz, Austria, and Lars Obitz, Waxholm, Sweden, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria
Filed Dec. 10, 1990, Ser. No. 624,812
Claims priority, application Austria, Jan. 23, 1990, 146/90
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] B02C 19/00
U.S. Cl. 241—261.1 84 Claims

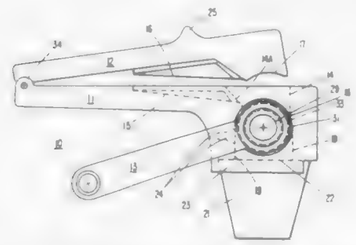


1. A segment for drum refiners for grinding of fibrous material having grinding surfaces, said drum refiners having a rotor, said rotor having a convex outer surface, said rotor being engine-driven, said rotor having an axis, said drum refiner having a material feed, said segment being provided with a projection of hammerhead-shaped cross-section for anchoring on said convex outer surface of said rotor, said hammerhead having an axis of symmetry, said rotor being provided with at least one surface provided with grinding elements composed of said grinding segments, said surfaces being inclined to said rotor axis and said at least one inclined surface having a diameter increasing away from said material feed, said segment being of T-shaped cross section with a stem and a flange, said stem and said flange being of slim configuration, said projection of hammerhead-shaped cross section having a head situated at the end of the segment nearest to said rotor axis, transition surfaces being provided between said stem and said head, and said transition surfaces from stem to said head viewed in cross section forming an angle of between 15 and 75 degrees open towards said head with the axis of symmetry of the hammerhead being symmetrical in cross section.

5,148,995
APPARATUS FOR DECOMPOSTING COMPRESSED TABLETS
Richard F. Hurst, 1101 River Reach Rd., Fort Lauderdale, Fla. 33315
Filed Aug. 1, 1991, Ser. No. 739,349
Int. Cl.[5] B02C 13/06
U.S. Cl. 241—30 20 Claims

11. A method of decomposing hard tablets into powder form of a predetermined maximum size, comprising the steps of:
loading tablets to be completely reduced to powder in a hopper of a housing,
providing an imperforate rotor in said housing having protruding helical shaped cutting ribs extending therefrom,
pressing said tablets to be reduced to powder against said rotor and said helical shaped cutting ribs,
rotating said rotor to simultaneously crush and shave powder particles from said tablet, and
applying force on the crushed and powdered particles in said

hopper of said housing until they are all reduced to a size less than the height of said helical shaped cutting ribs, and

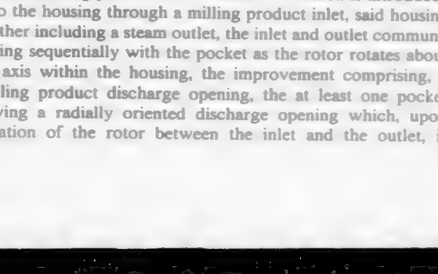


forcing all of said particles out of said hopper and into a discharge recovery chute.

5,148,996
ICE CRUSHER
Charles J. Fletcher, Sparta, and Mark J. Fletcher, Vernon, both of N.J., assignors to Clawson Machine Company, Franklin, N.J.
Continuation-in-part of Ser. No. 533,358, Jun. 5, 1990, abandoned. This application Oct. 5, 1990, Ser. No. 593,897
Int. Cl.[5] B02C 19/02
U.S. Cl. 241—36 16 Claims

1. An ice crusher for placement between an ice maker having ice outlet means and an ice storage bin having ice inlet means, said ice crusher comprising:
housing means defining an upper ice inlet means for communicating with the ice outlet means of said ice maker, and a lower ice outlet means for communicating with the ice inlet means of said storage bin;
a crusher assembly comprising a horizontally-extending crusher rotor mounted within said housing means, a plurality of ice-crushing elements extending radically from said rotor, and a grate member mounted within said housing and having a row of spaced-apart, open-ended slots for cooperating with said ice-crushing elements in a zone for crushing ice;
means within said housing for directing ice from said upper ice inlet means to said ice crushing zone;
driving means for rotatably driving said crusher rotor;
sensing means for detecting when ice formed in said ice maker is to be freed for deposit into the ice outlet means thereof, and for outputting a corresponding detect signal as long as ice is to be freed; and,
control means responsive to said detect signal for activating said driving means when said detect signal is present and deactivating said driving means when said detect signal is absent, said control means comprising time delay means responsive to a loss of said detect signal to initiate a predetermined time duration during which said driving means is kept activated and at the end of which said driving means is deactivated, said time duration being sufficient for freed ice remaining in said ice maker when said detect signal is lost to pass through said ice crushing zone.

5,148,997
SLAG CRUSHING DEVICE
Kazushi Gotoh, Kameyama, and Toshio Nakanishi, Koyama, both of Japan, assignors to Kabushiki Kaisha Daiki Aluminum Kogyosho, Osaka, Japan
Filed Mar. 21, 1991, Ser. No. 672,982
Claims priority, application Japan, Sep. 28, 1990, 2-261436
Int. Cl.[5] B02C 17/04
U.S. Cl. 241—65 14 Claims

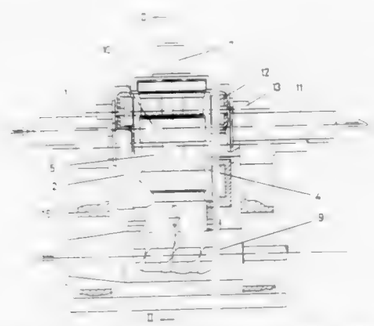


1. A slag crushing device, comprising a substantially cylindrical body having a slag insertion port in its one end and a discharge port in the other end, said cylindrical body is rotatably provided around a shaft center so inclined that the position of said discharge port is below the position of said slag insertion port, and a slag crushing portion is provided inside of said cylindrical body, the slag crushing portion comprising at least one guide frame (4C) including spaced disc-shaped bodies secured within said cylindrical body, at least one annular crushing body within said at least one guide frame, said at least one annular crushing body having a smaller radius than that of the cylindrical body and provided with an axis parallel with the shaft center of the cylindrical body such that said at least one annular crushing body can be idled, and said at least one guide frame for guiding said at least one annular crushing body having at least one inlet aperture (4B) for introducing slag into the at least one guide frame to be crushed by said at least one annular crushing body, at least one outlet aperture (4E) through which the crushed slag leaves said at least one guide frame for being transported to said discharge port, and the inlet apertures (4B) are larger than said outlet apertures (4E).

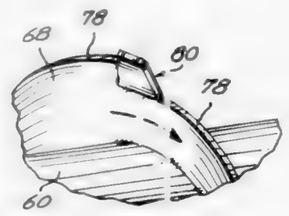
5,148,998
APPARATUS FOR THE TREATMENT OF MILLING PRODUCTS
Lars Obitz, Isterberget 3, Vaxholm, Sweden S-18500
Filed May 1, 1991, Ser. No. 694,232
Claims priority, application Sweden, May 4, 1990, 9001612-2
Int. Cl.[5] B02C 1/08
U.S. Cl. 241—241 23 Claims

1. In an apparatus for the treatment of milling products having a steam content which includes a housing, a rotor rotatably mounted in the housing, at least one pocket oriented in the peripheral surface of the rotor, the pocket functioning to receive milling product to be treated and which is introduced into the housing through a milling product inlet, said housing further including a steam outlet, the inlet and outlet communicating sequentially with the pocket as the rotor rotates about an axis within the housing, the improvement comprising, a milling product discharge opening, the at least one pocket having a radially oriented discharge opening which, upon rotation of the rotor between the inlet and the outlet, is

brought into open communication with said milling product discharge opening, said milling product discharge opening being located between the inlet and the outlet, a steam tight discharge means, said milling product discharge opening communicating with said steam tight discharge means whereby the milling product is thrown centrifugally through said discharge opening as the rotor rotates and thereafter the steam content of the at least one pocket subsequently discharged through the steam outlet.

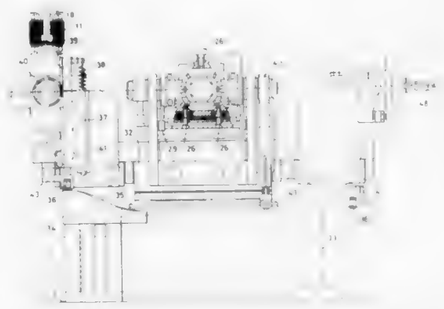


5,148,999
ANIMAL FEED MIXING SYSTEM
Robert M. Curfman, and J. Phil Roach, both of Sunnyside, Wash., assignors to Farm Shop, Inc., Sunnyside, Wash.
Filed Jan. 11, 1991, Ser. No. 640,213
Int. Cl.[5] B02C *19/22*
U.S. Cl. 241—260.1 10 Claims



1. An auger comprising:
a central shaft;
a flight joined at its inner peripheral edge to said central shaft, said flight having at least one notch in its outer peripheral edge, said notch having an inwardly oriented rear side and an adjacent bottom side, said bottom side extending in the direction of rotation of said flight to join with said outer peripheral edge of said flight; and
an insert positioned in said notch, said insert having a first mounting side positioned adjacent said rear side of said notch and a second mounting side positioned adjacent said bottom side of said notch, said insert further having a first cutting edge extending inwardly and in the direction of rotation of said flight from a location above said outer peripheral edge of said flight toward said bottom side of said notch.

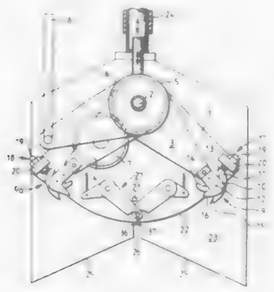
5,149,000
MACHINE FOR WINDING TWO-POLE STATORS
Luciano Santandrea, and Massimo Lombardi, both of Firenze, Italy, assignors to Axis S.p.A., Firenze, Italy
Division of Ser. No. 306,618, Feb. 6, 1989, Pat. No. 4,969,606.
This application Sep. 10, 1990, Ser. No. 579,606
Claims priority, application Italy, Mar. 10, 1988, 67196 A/88
Int. Cl.[5] H02K *15/02*
U.S. Cl. 242—1.1 R 9 Claims



1. The method of winding two-pole stators, said stators having a longitudinal axis and being supplied by a conveyor on which the longitudinal axes of said stators are substantially vertical, said method comprising the steps of:
removing a stator having a substantially vertically oriented longitudinal axis from the conveyor and placing it in a stator housing with its longitudinal axis still substantially vertical;
rotating said stator housing so that the longitudinal axis of said stator in said stator housing is substantially horizontal;
applying windings to said stator while the longitudinal axis of said stator is substantially horizontal;
anchoring the ends of the windings to the stator; and
discharging the stator from said stator housing.

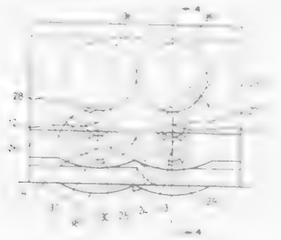
5,149,001
METHOD AND APPARATUS FOR SEPARATION OF DOUBLED YARN
Susumu Banba, Kyoto; Junichi Teranishi, Ohtsu; Shoji Sakai, Nagaokakyo; Makoto Uramoto, Uji, and Hiroshi Uchida, Oumihachiman, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Nov. 14, 1990, Ser. No. 614,192
Claims priority, application Japan, Nov. 15, 1989, 1-294965; Nov. 22, 1989, 1-304338; Dec. 25, 1989, 1-336101; Jan. 18, 1990, 2-9350; Jan. 18, 1990, 2-9351; Jan. 18, 1990, 2-9352; Feb. 22, 1990, 2-41987
Int. Cl.[5] B65H *54/00*
U.S. Cl. 242—42 11 Claims

1. An apparatus for separating a doubled yarn, the doubled yarn comprising a first yarn and a second yarn, the apparatus comprising:
positioning means for positioning the doubled yarn at a predetermined position,
separating means for separating the doubled yarn at the predetermined position, the separating means comprising first clamping means for clamping the first yarn with a first firmness and for clamping the second yarn with a second firmness, the first firmness being relatively greater than the second firmness, and



first moving means for moving the first clamping means away from the predetermined position to thereby separate the first yarn and the second yarn.

5,149,002
YARN TRAVERSING APPARATUS
Takami Sugioka, Matsuyama, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan
Continuation of Ser. No. 470,951, Jan. 26, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 774,163
Claims priority, application Japan, Feb. 4, 1989, 1-26384
Int. Cl.[5] B65H *54/28*
U.S. Cl. 242—43 A 7 Claims



1. A yarn traversing apparatus for traversing a yarn back and forth across a predetermined traverse stroke, comprising:
first traversing means for traversing said yarn from ends of said traverse stroke toward the center of said traverse stroke;
second traversing means for traversing said yarn from the center of said traverse stroke toward said ends of said traverse stroke;
first rotational spindle means for rotationally supporting said first traversing means at one end thereof about first axes of rotation;
second rotational spindle means, mounted adjacent said first rotational spindle means and being rotationally engaged therewith, for rotationally supporting said second traversing means at one end thereof opposite said one end of said first rotational spindle means, about second axes of rotation parallel to said first axes of rotation;
said yarn being alternately transferred between said first and second traversing means so as to traverse said predetermined traverse stroke from one end thereof to the other end thereof.

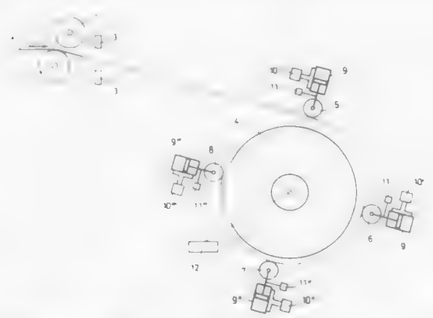
5,149,003
TOILET PAPER HOLDER AND PAPER TOWEL HOLDER
Glen D. Tharp, 5433 S. Clovis Ave., Fresno, Calif. 93725
Continuation of Ser. No. 568,751, Aug. 17, 1990, abandoned.
This application Sep. 13, 1991, Ser. No. 760,802
Int. Cl.[5] B65H *16/06*
U.S. Cl. 242—55.2 3 Claims

1. A paper holder for holding a paper roll including a hollow core comprising:
(a) a generally planar wall plate having a front surface and a back surface for mounting on a support surface;
(b) a pair of solid side arms extending generally perpendicularly from the front surface of the wall plate, each side arm including an inwardly facing surface, an outwardly facing surface, and a back edge joining the inwardly and outwardly facing surfaces, said back edge being abutted against the front surface of the wall plate;
(c) a pair of core engaging members mounted on respective side arms for engaging opposite ends of the paper roll;
(d) means for pivotally mounting at least one of said side arms so as to pivot about an axis parallel to the wall plate between a normal engaged position with respect to said paper roll and a disengaged position, said mounting means including a coil spring for biasing said pivotable side arm to an engaged position while allowing pivotal movement of said side arm to a disengaged position, said coil spring being perpendicular to said axis;
(e) a bore formed in the back edge of said pivotable side arm for receiving a first end of said coil spring;
(f) means for securing said first end of said coil spring in said bore;
(g) a spring hole formed in said wall plate and extending from the front surface into the plate; and
(h) means for anchoring said second end of said coil spring in said second spring hole.

5,149,004
METHOD FOR COILING STRIP IN REELING INSTALLATIONS
Peter Sudau, Hilchenbach, and Dieter Rosenthal, Niederfischbach, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 502,292, Mar. 30, 1990, abandoned.
This application Jan. 16, 1992, Ser. No. 823,049
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3910991
Int. Cl.[5] B65H *18/26*; B21C *47/02*
U.S. Cl. 242—57 12 Claims

1. In a method for controlling displaceable pressure rollers during the start-up of coiling a strip in a reeling installation, the pressure rollers being displaceable by means of pressure medium-operated cylinders, the reeling installation including a mandrel with spreadable segments, the method including detecting the beginning of the strip entering the reeling installation, following the strip beginning during the travel of the strip around the mandrel, utilizing the position of the strip beginning

for positioning the pressure rollers, raising the pressure rollers before the strip beginning enters between the pressure rollers and the mandrel and before the next winding is placed to such an extent that a gap formed between the respective pressure roller ad the mandrel exceeds the thickness of the strip which has already entered by a dimension which exceeds the strip thickness, and lowering each pressure roller after the strip beginning has passed from the raised position toward the mandrel into a position of operation, the improvement comprising adjusting the gap between each pressure roller in the operating position and the mandrel to at least n times the strip thickness,



wherein n is the number of windings of the strip coiled onto the mandrel at each pressure roller and the respective gaps between each pressure roller and the mandrel are decreasing in the coiling direction from pressure roller to pressure roller with the pressure rollers being in their position of operation, effecting a slip-free contact of the strip with the mandrel at the beginning of the second winding of the strip by spreading the segments of the mandrel, and moving the pressure rollers during the spreading movement of the segments away from the mandrel by a distance which corresponds to the radial movement of the segments.

5,149,005

MAGNETIC TAPE WIND-UP METHOD

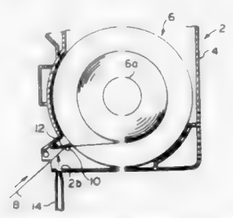
Akira Takagi; Masao Tsuruta; Akihisa Kita, and Shingo Sawahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 568,609, Aug. 15, 1990, abandoned, which is a continuation of Ser. No. 360,684, Jun. 2, 1989, abandoned. This application Oct. 29, 1991, Ser. No. 785,866

Claims priority, application Japan, Jun. 3, 1988, 65-136892

Int. Cl.[5] **B65H** *18/10, 27/00*

U.S. Cl. 242—67.1 R **15 Claims**



1. A magnetic tape wind-up method for winding up a magnetic tape around a hub, which is incorporated in a cassette case, while said magnetic tape is being moved and is guided by contact member means provided in said cassette case for guiding said magnetic tape,

wherein the improvement comprises:

winding up said magnetic tape while a gas is being blown against at least one of said contact member means and a portion of said magnetic tape, which portion is present in the vicinity of said contact member means, in such a way that said gas flows between said contact member means and said magnetic tape and minimizes contact between said contact member means and said magnetic tape being guided thereby, wherein aid contact member means includes a cylindrically shaped guide pole;

said gas being blown in a direction normal to a side face of said cassette case parallel to a width of said tape through a nozzle inserted into an opening in said side face of said cassette case, wherein said magnetic tape is guided by said contact member means only at one area of said contact member means, said one area being a portion of an outer circumference of said cylindrically shaped guide pole, and wherein said contact member means changes the direction of movement of said tape.

5,149,006

BAIL ARM SUPPORTING MECHANISM OF FISHING REEL

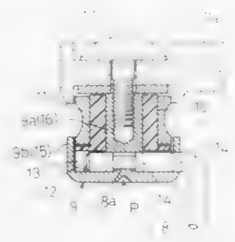
Yasuhiro Hitomi, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Sakai, Japan

Filed Nov. 30, 1990, Ser. No. 619,910

Claims priority, application Japan, Dec. 2, 1989, 1-140084[U]

Int. Cl.[5] **A01K** *89/01*

U.S. Cl. 242—231 **5 Claims**



1. A bail arm supporting mechanism of a fishing reel, the mechanism comprising:

an arm lever;

a bail formed of a bar-like member;

a link member including a support shaft portion, said link member including means for fixedly connecting one end of said support shaft portion to said arm lever, said link member including at the other end of said support shaft portion a cylindrical large-diameter connecting portion, to which a connecting end of said bail is fixedly connected;

a recess formed in a face of said large-diameter connecting portion facing said arm lever;

a bush fitted on said support shaft portion,

said bush including an insert portion at one end thereof facing said large-diameter connecting portion and fitted into said recess; and

a line guide roller rotatably mounted on said bush;

wherein said connecting end of the bail is fitted into said large-diameter connecting portion from a lateral wall to a center of said large-diameter connecting portion with a portion of said connecting end being exposed to said recess, said insert portion including an engaging portion to engage said exposed portion of said connecting end.

5,149,007

DRAG MECHANISM FOR SPINNING REEL FOR FISHING

Masaji Saito, Tokyo, Japan, assignor to Daiwa Seiko, Tokyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,595

Claims priority, application Japan, Aug. 10, 1989, 1-93448[U]

Int. Cl.[5] **A01K** *89/027*

U.S. Cl. 242—246 **6 Claims**

1. A drag mechanism for a spinning reel for fishing, comprising:

a reel body;

a spool shaft connected to and extending from said reel body along a longitudinal axis of said spool shaft;

a spool for receiving fishing line there around rotatably mounted on said spool shaft;

braking means comprising brake plates mounted on said spool shaft for braking the rotation of said spool with respect to said spool shaft;

depressing means non-rotatably mounted on said spool shaft for urging said brake plates along said spool shaft and against said spool, said depressing means comprising a pressure member for contacting said brake plates;

braking force adjusting means for controlling the braking of said brake plates against said spool, said adjusting means comprising a control knob which is threadingly engaged with an end of said spool shaft and rotatable relative to said pressure member, said control knob and said pressure member having mutually facing surfaces which contact each other, said mutually facing surfaces defining a substantially enclosed chamber along said spool shaft between said pressure member and said control knob; and,

engagement means located within said substantially enclosed chamber for preventing free rotation between said control knob and said pressure member.

5,149,008

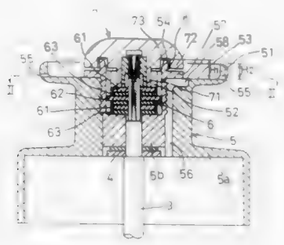
SPINNING REEL WITH ADJUSTABLE DRAG MEMBER

Takeshi Oi, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 631,500

Int. Cl.[5] **A01K** *89/02*

U.S. Cl. 242—246 **8 Claims**



1. A spinning reel comprising:

a reel body;

a spool (5) rotatably supported by a spool shaft (3),

an adjustable drag member (6) for imparting a braking force to rotation of the spool (5), and

an adjusting member (7) for axially pressing the drag member (6) to thereby adjust the braking force,

wherein the spool (5) includes a front face (53), a rear face, and a trunk which is located between the front face and the rear face, said front face (53) having an outer periphery,

wherein the spool (5) further includes an annular projection (54) projecting forwardly of the front face (53) for preventing water from entering the front face to reach the drag member (6),

wherein the spool (5) further includes a front jaw (51), said front jaw (51) being located at the outer periphery of the front face (53), and wherein the annular projection (54), the front face (53) and the front jaw (51) form a concavity,

wherein the spool (5) further includes at least one drain port (56) axially extending through the trunk from the concavity to the rear face, and

wherein the adjusting member (7) is provided with an annular groove (73), and wherein the annular projection (54) is received within the annular groove (73) to form a labyrinthine seal for preventing water from reaching the adjustable drag member (6).

5,149,009

FISHING REEL

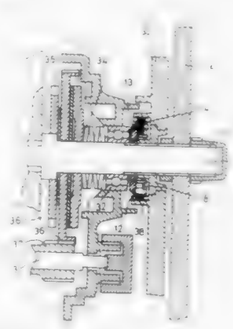
Jun Sato, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 426,775, Oct. 26, 1989, abandoned. This application Jan. 16, 1992, Ser. No. 821,140

Claims priority, application Japan, Oct. 31, 1988, 63-143116[U]

Int. Cl.[5] **A01K** *89/015*

U.S. Cl. 242—268 **5 Claims**



1. A fishing reel comprising:

a reel body;

a handle;

a handle shaft rotatably supported to said reel body, said handle shaft being rotated by said handle;

a spool shaft and a spool, said spool shaft being rotatably supported to said reel body, said spool being located on said spool shaft;

a first transmission gear rotatably fitted on said handle shaft and a second transmission gear fitted on said spool shaft, wherein said first transmission gear transmits a rotational force to said second transmission gear;

a multi-plate type frictional braking mechanism for applying a frictional force for frictionally engaging said first transmission gear with said handle shaft;

a star drag axially movably threaded on said handle shaft, said star drag comprising frictional force adjusting means for adjusting the frictional force applied by said multi-plate type frictional braking mechanism, said frictional

force adjusting means being operated by rotating and axially moving said star drag with respect to said handle shaft;

a click barrel peripherally defining a plurality of teeth and attached to said star drag;

a click spring member having an approximately inverse 'V' shaped configuration, said click spring member including a top engaging portion which is movable in a generally radial direction and which is engageable with said teeth so as to generate a click sound, and a pair of leg portions extending away from said top engaging portion in opposite, outward directions, said click spring member comprising a plate spring;

a spring receiver barrel for receiving said click spring member, said spring receiver barrel being nonrotatable relative to said handle shaft and axially slidable relative to said handle shaft;

wherein said spring receiver barrel defines at an axial end thereof a spring retainer opening for retaining said click spring member;

said spring retainer opening having a peripheral wall which forms at said axial end a first cutout portion for allowing said top engaging portion of said click spring member to move back and forth in said generally radial direction, and second cutout portions, said second cutout portions of said spring retainer opening comprising a pair of contact faces extending substantially normal to said generally radial direction, said leg portions of said click spring member being in contact with said faces of said second cutout portions; and

anti-slipoff means for preventing said click spring member from slipping off said spring retainer opening.

5,149,010

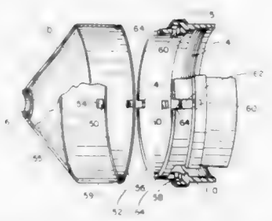
TWO-PART FRONT COVER FOR SPINCAST REELS

Bruce E. Bacher, Broken Arrow, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Continuation of Ser. No. 462,451, Jan. 9, 1990, abandoned. This application May 6, 1991, Ser. No. 698,331

Int. Cl.[5] A01K *89/01*

U.S. Cl. 242—311 **4 Claims**



1. In a spincast-type fishing reel having a reel axis and an internal mechanism carried within an improved housing, comprising:

a rear cover;

means on the housing for mounting the reel to a fishing rod;

a front cover having an axis and a first part with a cylindrical portion with a front and rear edge, said front edge including two cylindrical concentric axially directed flanges forming an annular groove therebetween, one of said flanges having first and second circumferentially spaced apart cutouts therein;

means for securing said rear edge of said first part to the rear cover; and

said front cover having a second part, said second part including a conical forward portion a cylindrical rearward portion, said rearward portion having a rear edge, said rearward portion being receivable within said annular groove of said first part and having spaced-apart deflectable tabs struck directly from the cylindrical rearward portion at a location spaced forwardly of the rear edge of the second part of the front cover, said tabs each projecting in cantilever fashion radially inwardly from the cylindrical rearward portion of the second part of the front cover, said tabs being receivable one each within said first and second cutouts when said rearward cylindrical portion is fully seated in said annular groove, there being first cooperating means on the spaced apart tabs and second front cover part for preventing said first and second parts from being pulled apart with the first and second front cover parts in locked operative relationship, wherein the cooperating means are integrally formed on the first and second parts for keying the first and second parts against relative rotation about the axis with the first and second parts in a first predetermined relative rotational position with the tabs spaced axially from the annular groove and for guiding the tabs into the first and second cutouts to place the first and second front cover parts in locked operative relationship upon the first and second parts being aligned in said first predetermined relative rotational position and moved in a straight line axially towards each other,

said cooperating means including at least a notch on the forwardmost edge of the first cover part extending radially completely through the first cover part for reception of at least one of the tabs to receive the one tab and thereby align the first and second front cover parts in said first relative rotational position about the axis to thereby allow guided axial movement of the one tab into one of the first and second cutouts, wherein the notch is aligned with one of said first and second cutouts,

said notch being U-shaped opening in a forward axial direction and bounded by a forwardly facing edge so that there is an unimpeded path defined from forwardly of the first cover part to said forwardly facing edge,

said cooperating means including a radially undercut ramp surface in the first front cover part extending axially substantially the entire distance from the forwardly facing edge bounding the notch to one of the first and second cutouts,

whereby by placing the first and second front cover parts in an axially overlapping relationship, one within the other in said first relative rotational position, wherein one of the tabs is in said notch, the first and second front cover parts can be placed in their locked operative relationship simply by moving the first and second front cover parts axially, one against the other, which causes the one tab to bear against the ramp surface so as to be deflected thereby radially outwardly until the one tab aligns with one of the first and second cutouts whereupon the one tab springs back into the one of the first and second cutouts so that the first cooperating means maintains the first and second front cover parts in said locked operative relationship.

5,149,011

RADAR BORESIGHT ERROR COMPENSATOR

Harvey J. Gratt, Plano, Tex., and Chris E. Geswender, Clinton, Okla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 20, 1991, Ser. No. 727,264

Int. Cl.[5] F41G *7/28*

U.S. Cl. 224—3.19 **4 Claims**

1. In a vehicle guidance system having a radar controlled steering means for guiding a vehicle to a target, said steering control means having azimuth and elevation control output signals for controlling the steering of said vehicle, the antenna for said radar being enclosed in a radome, a boresight error rate correction system for said radome, said boresight error rate correction system comprising:

means for nutating said vehicle;

said antenna receiving return signals from said target through said radome;

means for processing return azimuth and elevation signals received from said target to determine the true line of sight between said target and said antenna.

5,149,012

TURBOCRAFT

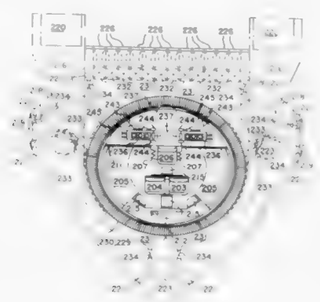
Rene L. Valverde, 4405 Toledo St., Coral Gables, Fla. 33146

Filed Sep. 10, 1991, Ser. No. 757,326

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] B64C *39/06*

U.S. Cl. 244—12.2 **24 Claims**



1. An aircraft comprising a substantially circular body having a profile in the direction of flight as a profile of an airplane wing, at least two concentric counter-rotating turbo-blade assemblies disposed within said body for effecting a vertical lifting air stream through said assemblies, power generating means having an intake portion, means for coupling said power generating means to said turbo-blade assemblies for maintaining them in rotary motion, thrusting means coupled to said power generating means for applying horizontal thrust to said aircraft, retro-boosting means including a plurality of combustion chambers disposed proximal to said turbo-blade assemblies for boosting said vertical lifting airstream, a compressed air plenum in fluid communication with said combustion chambers and with the intake portion of said power generating means for supplying oxygen for sustaining combustion in said combustion chambers and for sustaining power in said power generating means, upper vanes disposed above said turbo-blade assemblies for ingesting air, and lower vanes disposed below said compressed air plenum for exhausting air, and respective upper and lower vane control means.

5,149,013

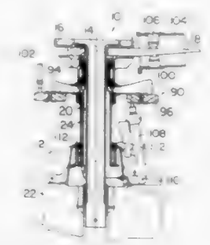
RETRACTABLE HELICOPTER ROTOR

Ralph D. Costanzo, Monroe; Robert J. Durwin, Trumbull; Lee N. Hager, Southbury, and William L. Noehren, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 16, 1991, Ser. No. 701,257

Int. Cl.[5] B64C *27/32*

U.S. Cl. 244—17.11 **7 Claims**



1. A helicopter having a fuselage and a rotor which is movable between an extended, flight operational position and a retracted position including:

(a) means to support the rotor from the fuselage for rotation about an axis of rotation including:

(1) a support platform fixedly supported from the fuselage and including a ring shaped flange positioned concentrically and in spaced relationship about the rotor axis of rotation and extending substantially perpendicular thereto;

(2) a normally fixed mast member of circular cross-section positioned concentrically about the rotor axis of rotation and having a ring flange at its axially inner end which abuts the axially inner side of the support platform ring flange and is fixedly connected thereto by a series of bolts extending through a circumferential array of aligned bolt holes in the flanges; and

(3) means connecting the upper end of the mast member to the rotor so as to support the rotor from the mast member for rotation about the axis of rotation;

(b) a transmission positioned within a housing located inwardly of the mast member; and having

(1) an output quill connected to and mounted for rotation with the transmission and including a cylindrical portion positioned concentrically about the rotor axis of rotation and having a ring of splines positioned circumferentially about the axis of rotation and extending in a direction axially therealong, and further having at least one axially extending alignment spline which extends substantially the full length of the output quill cylindrical portion;

(c) a rotor drive shaft of substantially circular cross-section and positioned concentrically about the rotor axis of rotation and having:

(2) an inner end which is cylindrical in cross-section and positioned concentrically about the axis of rotation and including:

(a) a circumferential array of splines which operatively engage the splines of the transmission output quill so as to operatively connect the rotor drive shaft and, hence, the rotor to the transmission to be driven thereby during rotor extended flight operation; and

(d) means to lower the mast with the rotor attached thereto inwardly along the axis of rotation when the connecting bolts between the abutting flanges of the support platform and the mast are removed so that the rotor is thereby moved form its extended flight operational position to a

retracted position and so tha the rotor is prevented from rotating during the retractin motion due to the continuous engagement between the rotor drive shaft splines and the output quill alignment sp ine, said transmission output quill alignment spline serv ng to maintain continuous spline alignment between the output quill and rotor drive shaft while the hub is bein lowered to the retracted position or being raised to the extended flight position and operatively engages the roto drive shaft splines when in the extended flight position.

5,149,014

ROTARY WING AIRCRAFT

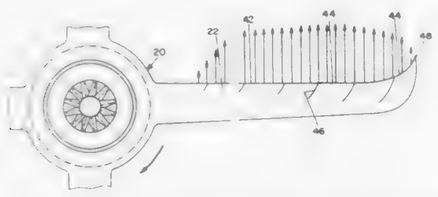
Alexander Faller, Ergoldsbach, Fed. Rep. of Germany, assignor to Alexander Faller Maschinenbau, Ergoldsbach, Fed. Rep. of Germany

Filed Feb. 27, 1990, Ser. No. 485,945

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1989, 3906109

Int. Cl.[5] B64C *27/18*

U.S. Cl. 244—17.19 **15 Claims**



1. A rotary wing aircraft havin a drive apparatus, said drive apparatus comprising:

a rotor head having an air suc ion region;

a rotor blade rotatably mounte d on said rotor head having a trailing edge and a hollow interior and provided on said trailing edge at least one ou let for compressed air; and

a suction device mounted in said air suction region, said suction device having a pressure side connected to said hollow interior of said roto blade, an impeller rotatably driven around a vertical a is of said rotor head and a plurality of stationary guide vanes mounted downstream of said impeller.

5,149,015

RADIO CONTROLLED HOT AIR BALLOON

R. Scott Davis, 305 Meridian Dr , Cocoa Beach, Fla. 32931

Filed Aug. 19, 1991, Ser. No. 747,000

Int. Cl.[5] B64B *1/40*

U.S. Cl. 244—31 **1 Claim**

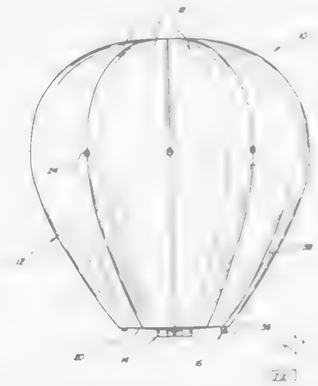
1. A new and improved hot air balloon assembly comprising:

balloon means;

hot air generating means for providing a supply of hot air to said balloon means, thereby to effect a desired floatation of said balloon means above a ground surface, said hot air generating means including a burner and a fuel supply associated with said burner. said fuel supply comprising a combustible gas retained within at least one expandable balloon, said balloon means serving to pressurize said gas and to effect a displacement thereof from said balloon means to said burner;

remote control means for controlling said hot air generating means, said remote control means including a radio control system, said radio control system including a receiver attached to said hot air generating means and a remotely positionable transmitter for sending operating signals to said receiver;

a flame shield movably positionable relative to a fuel tray associated with said burner, said receiver operating to move said flame shield over said fuel tray to effect an extinguishment of a flame associated with said burner, and further operating to move said flame shield away from said fuel tray to increase a burning capacity of said fuel tray to thereby increase a supply of said hot air to said balloon means, said burner further including a fuel supply line whereby said combustible gas may be supplied to said burner for effecting a generation of said hot air, said fuel supply line further including a vaporizing coil positionable around a heat shield associated with said burner, said heat shield shielding said balloon means from said flames; and



at least one launching lug attached to a peripheral portion of said balloon means, said at least one launching lug including a round label having a peel-off backing adhesive for attaching said label to said balloon means, and further including a first section of string glued along said label and a second section of string similarly glued along said label and overlying said first section of string, thereby to provide an attachment loop, and further including a grab tab attached to said loop and facilitating a capturing of said loop by an individual when it is desired to attach said balloon means to a launch stand.

5,149,016

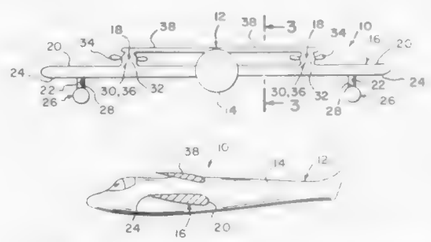
PROP JET AIRPLANE PROPELLING SYSTEM

John Huhn, 503½ Capital SW., Battle Creek, Mich. 49015, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Jan. 25, 1991, Ser. No. 645,784

Int. Cl.[5] B64D *27/02*

U.S. Cl. 244—55 **2 Claims**



1. A propelling system for an aircraft having a fuselage and a pair of swept wings, comprising:

a) a pair of propeller driving engines, each carried on top of a rearward edge of each swept wing so as to push the aircraft forward;

b) a pair of pylons, each carried on bottom of a forward edge of each swept wing; and

c) a pair of jet engines, each affixed to a bottom end of each said pylon so as to pull the aircraft forward; further including a pair of airfoil support structures parallel to and spaced from said wings each extending outwardly from one side of the fuselage connected to and providing additional support for said propeller driving engines.

5,149,017

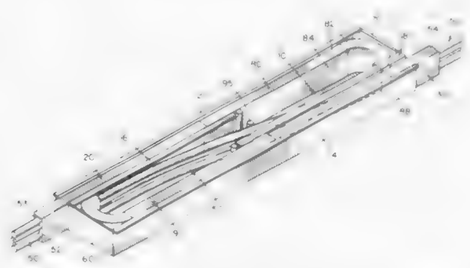
SERVICE TRANSPORT UNIT

Jay McEntire, Anaheim Hills; Richard Haglund, Manhattan Beach; Ed Johnson, Corona Del Mar, and J. Garrett MacFarlane, Torrance, all of Calif., assignors to Teledyne Inet, Torrance, Calif.

Filed Nov. 15, 1991, Ser. No. 792,959

Int. Cl.[5] B64F *1/00*

U.S. Cl. 244—114 R **28 Claims**



14. A service transport unit for providing utilities to a parked aircraft comprising:

a) a box attached to a passenger loading bridge;

b) a first slider slidably mounted within the box and attached to the passenger loading bridge;

c) a utility bundle including at least one utility line attached to the first slider;

d) a first utility bundle tracker, including a curved member, that receives the utility bundle from the first slider and which effects a turn in the direction of the utility bundle;

e) a second utility bundle tracker, including a curved member, slidably mounted within the box, that effects a turn in the direction of the utility bundle;

f) a second slider with the utility bundle affixed thereto, slidably mounted within the box and receiving the utility bundle from the second utility bundle tracker, wherein the second slider and second utility bundle tracker are oriented so as to be disposed across a mirror plane, transecting the midline of the box and parallel to the side walls thereof, from the first slider and first utility bundle tracker, whereby extension or retraction of the passenger loading bridge causes the utility bundle to be removed from, or pushed into the box.

5,149,018

COOLING SYSTEM FOR A HYPERSONIC AIRCRAFT

Larry T. Clark, Enumclaw, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 17, 1990, Ser. No. 525,888

Int. Cl.[5] B64C *1/00*

U.S. Cl. 244—117 A **10 Claims**

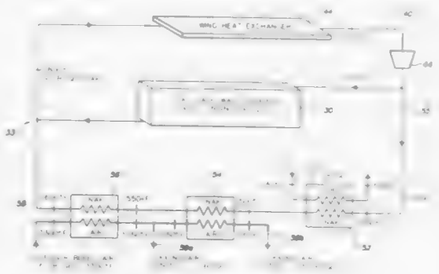
1. A cooling system for a hypersonic aircraft using non-cryogenic fuel and operable at speeds above Mach 3, comprising:

an aircraft body having a relatively low temperature exterior portion whose surface temperature does not exceed approximately 1000° Fahrenheit during flight at speeds of up to Mach 7;

a ram-type, non-cryogenic engine for propelling the aircraft;

an engine heat exchanger having a first heat exchange surface in contact with the engine and a second heat exchange surface exposed to a flow of a liquid metal;

an aircraft heat exchanger manufactured of a material capable of operating at temperatures of up to only approximately 1800° Fahrenheit, the aircraft heat exchanger



being positioned in thermal contact with the relatively low temperature exterior portion of the aircraft body; and

circulation means for circulating the liquid metal through the engine heat exchanger to the aircraft heat exchanger so that heat from the engine is dissipated by the aircraft exchanger to the surrounding atmosphere.

5,149,019

BALLOON PARACHUTE

Sigvard J. Stenlund, Boulder, Colo., assignor to University Corporation for Atmospheric Research, Boulder, Colo.

Filed Sep. 30, 1991, Ser. No. 768,031

Int. Cl.[5] B64D *17/02*

U.S. Cl. 244—145 **6 Claims**

1. A balloon parachute comprising:

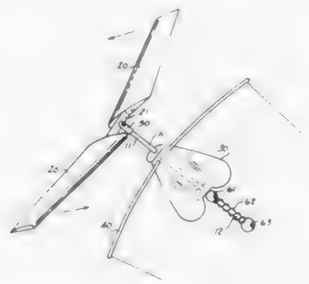
an enclosure fabricated from a relatively non-air porous fabric, said enclosure having a vertex, a rectangular top, and an upper surface disposed therebetween, said top having four edges, with a strip of air-porous fabric attached lengthwise in parallel disposition to each of said edges, said strip of said air-porous fabric having a length substantially the same as a length of said edge, said upper surface having at least one relatively air-porous porous intake vent located near vertex, said intake vent allowing air to pass therethrough into an interior of said enclosure, thereby inflating said enclosure when said balloon parachute descends through the air.

5,149,020

TETHERED ROTARY KITE

Craig V. Rundle, 21815 SE. 26th St., Maple Valley, Wash. 98038, and Gary L. Hooten, P.O. Box 410, Port Townsend, Wash. 98368

Filed Sep. 26, 1991, Ser. No. 765,872
Int. Cl.[5] B64C *31/06*
U.S. Cl. 244—153 A 15 Claims



1. A tethered flying device, generally referred to as a rotokite, comprising

a body shaft with an upper end and a lower end,

a rotating air foil means having aerodynamically lifting surfaces,

means to attach the air foil to the upper end of the body shaft,

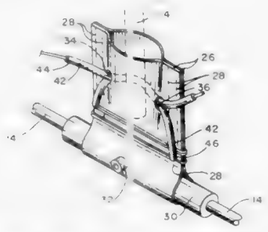
a stabilizing keel having a top and a bottom, slidably and rotatably mounted on the body shaft intermediate the shaft length, further comprising means to adjustably secure the keel at a selective position on the body shaft.

5,149,021

KITE WITH IMPROVED TAILPIECE CONNECTOR

Jonathan J. Prouty, P.O. Box 3065, Boulder, Colo. 80307

Division of Ser. No. 319,681, Mar. 7, 1989, and a continuation-in-part of Ser. No. 463,021, Jan. 10, 1990, and a continuation-in-part of Ser. No. 508,358, Apr. 9, 1990, abandoned. This application Jul. 6, 1990, Ser. No. 549,163
Int. Cl.[5] B64C *31/06*
U.S. Cl. 244—155 A 18 Claims



1. A kite having a sail, a keel strut having a rear end, tailpiece connector means attached directly to the sail for receiving the rear end of the keel strut, said tailpiece connector means including a piece of sheet material forming a pocket which receives the rear end of the keel strut, said piece of sheet material also forming a transverse sleeve, and a cross strut extending through said transverse sleeve.

5,149,022

SATELLITE ROLL AND YAW ATTITUDE CONTROL METHOD

Patrick Flament, Le Cannet, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Nov. 29, 1990, Ser. No. 619,548
Claims priority, application France, Nov. 29, 1989, 89-15732
Int. Cl.[5] B64G *1/36*
U.S. Cl. 244—168 24 Claims

1. A method for controlling the roll and yaw attitude of an artificial satellite following an orbit in the solar system and provided with roll, yaw and pitch axes, where the satellite has a satellite body with North and South sides, North and South solar generator panels extending from said North and South sides and connected to said satellite body by respective independent drive motors adapted to be controlled separately so as to orient said North and South solar generator panels about said pitch axis with respective depointing angles γ_n and γ_s relative to respective nominal instantaneous orientations in which said panels face towards the sun, an attitude measuring system adapted to provide instantaneous roll and yaw attitude signals; and calculation means at least partly carried on board the satellite being provided for calculating from said attitude signals theoretical command torques to be generated in the plane of the roll and yaw axes for cancelling any instantaneous attitude error of the satellite in said plane of the roll and yaw axes; this method comprising the steps of:

A. as a preliminary stage:

selecting respective acceptable ranges for said respective depointing angles of said North and South solar generator panels;

determining for any pair of respective depointing angles within said respective acceptable ranges a respective pair of resulting command torques C_s–C_p parallel to two predetermined torque axes in said plane of said roll and yaw axes induced by the solar radiation pressure acting on said solar generator panels;

reporting in a C_s–C_p diagram points having as coordinates said respective pairs of resulting command torques and determining in said diagram a locus consisting of the whole of said points, any pair of coordinates in this diagram thus determining either a possible command torque if said coordinates define a point inside said locus, or a non-possible command torque if said coordinates define a point outside said locus;

and, drafting a law of correlation between each point of said locus and a corresponding pair of depointing angles able to induce due to solar radiation pressure the possible command torque determined by said each point;

B. then cyclically at a specific frequency that is constant or not as the satellite follows its orbit:

selecting the geometrical axes x and z, fixed or not, in said plane of the roll and yaw axes and selecting for said geometrical axes respective maximum values of tolerable command torque error such that the maximum value for the z axis is substantially lower than the maximum value for the x axis;

tracing these geometrical axes in said C_s–C_p diagram;

calculating from instantaneous roll and yaw attitude signals supplied by said attitude measuring system, a respective instantaneous theoretical command torque in said plane of the roll and yaw axes adapted to cancel any instantaneous attitude error;

identifying in said locus a point, having relative to said z geometrical axis a torque component substantially identical to the torque component of the point corresponding to said respective instantaneous theoretical command torque and having relative to the x axis a torque component as near as possible to the torque component of said point corresponding to said respective instantaneous theoretical command torque;

identifying with said law of correlation from said point in said locus a respective pair of depointing angles;

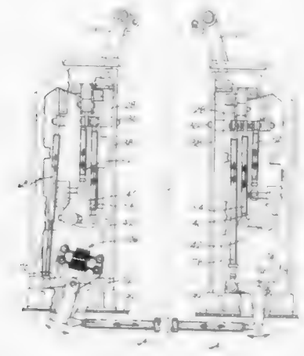
and, controlling said drive motors so as to orient said solar generator panels to said pair of depointing values.

5,149,023

MECHANICALLY-LINKED SIDE STICK CONTROLLERS WITH ISOLATED PITCH AND ROLL CONTROL MOVEMENT

Seiya Sakurai, Seattle; Dieter W. Hoener, Bellevue, and Erwin V. Schweizer, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 12, 1991, Ser. No. 730,271
Int. Cl.[5] B64C *13/12*
U.S. Cl. 244—229 2 Claims



1. Mechanically-linked control stick mechanisms for isolating movement in two axes, comprising:

first and second control stick mechanisms, each comprising:

a hand-operated control member movable to swing about two axes of rotation;

a first lever member on said control member which moves in response to swinging movement of said control member about the first axis of rotation; and

a reciprocating member having a first portion pivotally attached to said control member at a location spaced from the second axis of rotation and having an elongated second portion longitudinally movable along a line of reciprocation substantially co-axial with said first axis of rotation in response to swinging movement of said control member about the second axis of rotation;

wherein movement of each said first lever member effecting operation of a separate first control sensor and movement of each said reciprocating member effecting operation of a separate second control sensor, each said control sensor including means for translating mechanical motion into an electrical signal; and

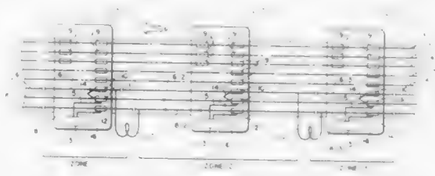
mechanical linkage between said first and second control stick mechanisms for transferring movement of the control member of one mechanism to the control member of the other, said mechanical linkage including override means for allowing movement of either one of said first and second control stick mechanisms and its separate control sensors in the even that the other control stick mechanism is mechanically stuck or inoperable.

5,149,024

CONVEYOR CARRIAGE CONTROL SYSTEM

Hiroshi Kawashima, and Keiji Yamamoto, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 5, 1990, Ser. No. 548,266
Claims priority, application Japan, Aug. 9, 1989, 1-204820
Int. Cl.[5] B61L *3/18*
U.S. Cl. 246—66 24 Claims



1. A system for controlling the movement of at least one carriage in a conveyor system having a conveyor rail and means on the at least one carriage to move the carriage along the conveyor rail comprising:

a) electrical wire means extending along the conveyor rail so as to define at least first and second zones, the electrical wire means normally forming an open electrical circuit;

b) means operatively associated with the electrical wire means in the first zone to selectively close the electrical circuit;

c) a drive motor located on the at least one carriage for moving the at least one carriage along the conveyor rail; and,

d) controller means operatively associated with the at least one carriage and operatively associated with the drive motor and with the electrical wire means to control the drive motor and to stop the movement of the carriage in the second zone when the electrical circuit is closed, the controller means including:

i) analog to digital conversion means to convert an analog signal from the electrical wire means into a first digital signal;

ii) central processing unit means operatively associated with the analog to digital conversion means to receive the first digital signal from the analog to digital conversion means and to generate a second digital signal; and,

iii) digital to analog signal conversion means operatively associated between the central processing unit and the drive motor to convert the second digital signal to an analog signal to control the operation of the drive motor.

5,149,025

DETECTION OF OVERHEATED RAILROAD WHEEL AND AXLE COMPONENTS

Jeffery J. Utterback, Harrisonville, and Randall S. Mecca, Warrensburg, both of Mo., assignors to Harmon Industries, Inc., Blue Springs, Mo.

Division of Ser. No. 415,103, Sep. 29, 1989, Pat. No. 5,060,890, which is a continuation-in-part of Ser. No. 255,787, Oct. 11, 1988, Pat. No. 4,928,910. This application Sep. 13, 1991, Ser. No. 759,237
Int. Cl.[5] B61K *9/06*
U.S. Cl. 246—169 A 8 Claims

1. In a process for detecting an overheated component of a railroad train, the steps of:

at a trackside location, sensing heat from said component with an infrared detector;

comparing the response of said detector when infrared radiation is received form said component to the response of said detector when infrared radiation from the component is not received by the detector; and

when said radiation is not being received,

(a) pulsing a radiation-emitting element at two input energy levels to irradiate said detector,

(b) comparing the output signals from said detector produced in response to said pulsing to obtain a difference signal,

(c) measuring the ambient temperature proximate to said detector, and

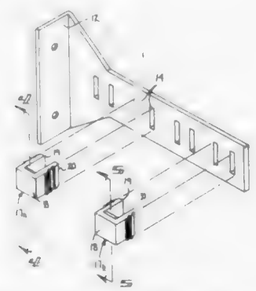
(d) deriving a detector error value from said difference signal in accordance with the temperature coefficient of the detector applicable to said ambient temperature.

5,149,026

WIRE SUPPORT APPARATUS

Roger D. Allen, R.R. 1, Box 749 E. Lebanon, Me. 04027

Filed Aug. 28, 1991, Ser. No. 751,137
Int. Cl.[5] F16L *3/22*
U.S. Cl. 248—68.1 3 Claims



1. A wire support apparatus comprising,

an "L" shaped support plate the "L" shaped support plate including a first plate orthogonally mounted to a second plate defining an "L" shaped configuration, and

the second plate including mounting means for mounting the second plate relative to a support member, and

the first plate including a plurality of slot pairs directed therethrough, the slot pairs are parallel relative to one another, and each slot pair includes individual slots, wherein each of said individual slots is arranged parallel relative to one another, and each individual slot within a slot pair is spaced apart a predetermined spacing, and

at leat one "U" shaped locking member, the "U" shaped locking mebmer receivable in at least one of said slot pairs for securement of a wire member received within the "U" shaped lock member in confrontation with the first plate when the "U" shaped locking member is directed into the first plate, and

said "U" shaped locking member includes a base web, the base web including a first leg spaced from a second leg, the first leg spaced from the second leg the predetermined spacing, and

the first leg and the second leg each include spaced parallel exterior ribs mounted to each exterior surface of each leg, wherein each of the ribs are arranged parallel relative to the base web, and

the base web includes an interior surface within the "U" shaped locking member, and the interior surface of the base web includes a rupturable adhesive packet mounted thereon, and

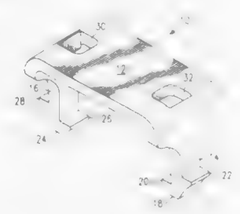
the base web includes a series of piercing teeth mounted to the interior surface, and the piercing teeth are in contiguous communication with the rupturable adhesive packet to rupture the adhesive packet upon projection of the "U" shaped locking member within one of said slot pairs.

5,149,027

MULTIPLE LEG HEIGHT SNAP FIT CABLE HOLDER APPARATUS

William F. Weber, Allen, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Jan. 31, 1992, Ser. No. 831,221
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—68.1 7 Claims



1. Cable holder apparatus comprising, in combination:

U-shaped flexible material having a main bit portion with first and second side portions extending from said main bit portion to form a plurality of legs and said main and each of said side portions including said legs having interior and exterior surfaces, said interior surfaces facing one another, the legs of said side portions each having;

interior and exterior surface projections for coaction with an opening in a base and said side portions having extremities extending a distance X from said interior surface of said main portion as viewed from an end of said U-shaped flexible material;

said side portions each having an opening therein thereby defining two legs extending to the extremity of said portion which legs are shorter than the distance X as viewed from a side of said U-shaped flexible material; and

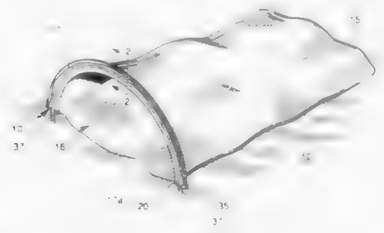
said interior and exterior surface projections each having holding surfaces which holding surfaces are different distances from the extremities of said legs whereby different size cables may be secured in accordance with the holding surface utilized.

5,149,028

LAWN BAG SUPPORT FRAME

Colin T. Blackaby, and Yvonne M. Blackaby, both of 3021 Perrysburg Rd., Logansport, Ind. 46947

Filed Sep. 5, 1991, Ser. No. 755,615
Int. Cl.[5] B65B *67/04*
U.S. Cl. 248—101 9 Claims



1. A support assembly for use in combination wit a flexible container for supporting the container with the mouth of the container open, comprising:

an elongated clip having a longitudinal length substantially less than the length of the perimeter of the mouth of the flexible container, the clip having a slot formed therein along the entire longitudinal length of the clip, said clip being sufficiently flexible to assume an arcuate shape when disposed entirely within the container adjacent the mouth of the container, said clip being formed of a resilient material to exert a radially outward force against the container when the clip is disposed entirely therein to hold the mouth of the container open; and

an elongated flexible and resilient rod having an outer surface configured for press-fit engagement within said slot of said clip with a portion of the container trapped therebetween, and means integral with said rod for engaging the ground, wherein said rod has a longitudinal length greater than the longitudinal length of said clip to define overhang portions at the ends of said rod extending beyond the ends of said clip during said press-fit engagement, said overhang portions having a length sufficient for engagement into the ground to maintain the support assembly in position on the ground.

5,149,029

ELECTRONIC TEST HEAD POSITIONER FOR TEST SYSTEMS

Nathan R. Smith, Vincentown, N.J., assignor to inTest Corporation, N.J.

Continuation of Ser. No. 501,962, Mar. 29, 1990, abandoned, which is a continuation of Ser. No. 265,591, Nov. 1, 1988, abandoned, which is a division of Ser. No. 22,287, Mar. 5, 1987, abandoned, which is a division of Ser. No. 753,684, Jul. 10, 1985, Pat. No. 4,705,447, which is a division of Ser. No. 522,635, Aug. 11, 1983, Pat. No. 4,589,815, which is a continuation-in-part of Ser. No. 411,311, Aug. 25, 1982, Pat. No. 4,527,942. This application Aug. 8, 1991, Ser. No. 744,644
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—124 8 Claims

1. In combination with a testing system for testing electronic devices having an electronic device handler and a substantially heavy electronic test head, a system for positioning said electronic test head through six degrees of freedom for docking and undocking with said electronic device handler comprising:

a support column defining a first vertical axis;

a positioner assembly including

(a) a first arm unit:

(i) having means for mounting said positioner assembly on said support column for vertical movement along said first vertical axis,

(ii) defining a second vertical axis spaced from said first vertical axis such that said first vertical axis is always oriented vertically, and said first arm unit precludes a non-vertical orientation of said second vertical axis, and

(iii) having horizontal linear motion guide means for providing horizontal linear movement of said heavy electronic test head with respect to said support column, said horizontal linear motion guide means including at least a first sliding member linearly slideably engaged within a receiving member,

(b) a second arm unit:

(i) having means for mounting said second arm unit to said first arm unit for pivotal movement about said second vertical axis

(ii) mounted so as to preclude linear vertical movement relative to said first arm unit and

(iii) defining a horizontal axis, which is precluded from not intersecting at least one of said first and second

vertical axes, said second arm unit precluding a non-horizontal orientation of said horizontal axis,

(c) a test head receiving unit:

(i) having means for mounting said heavy electronic test head receiving unit to said second arm unit for pivotal movement of said heavy electronic test head about said horizontal axis,

the test head receiving unit precluded from pivotal movement about a vertical axis other than at least one of said first vertical axis and said second vertical axis,

and counterbalancing means coupled to said positioner assembly for providing a substantially weightless condition to said positioner assembly with the heavy electronic test head mounted on said test head receiving unit, the heavy electronic test head being manually rotated without the effect of gravity to permit docking and undocking of the heavy electronic test head with the electronic device handler.

5,149,030

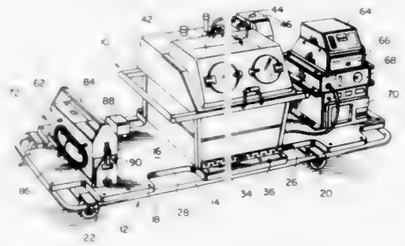
ADVANCED NEONATAL TRANSPORT SYSTEM

Todd G. Cockrill, Little Rock, Ark., assignor to Summa A.N.T.S., Little Rock, Ark.

Filed Dec. 23, 1988, Ser. No. 288,966
Int. Cl.[5] A61G *12/00*
U.S. Cl. 248—129 7 Claims

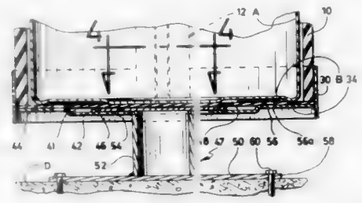
1. A neonatal transport system comprising a stretcher having a rigid panel having a large, substantially planar upper surface and peripheral handle forming means to enable the stretcher to be carried, a plurality of bracket structures mounted on the rigid panel, equipment supported by said bracket structures in optimum relationship and in secure relationship from the upper surface of the panel with the supported medical equipment including an incubator for a neonate located centrally of the stretcher, a humidifier supported from the incubator, an infusion pump, oxygen monitor, pulse oximeter, neonatal ECG

monitor mounted adjacent one end of the stretcher and alternative AC cord and DC battery system with power switch for



supplying AC or DC power on demand mounted adjacent the other end of the stretcher.

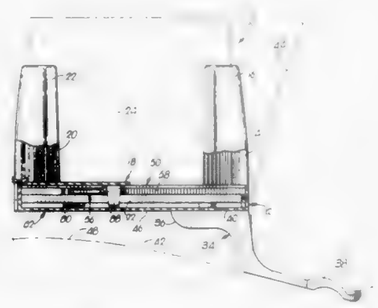
5,149,031
TRASH CAN HOLDER
Jacques Henri, 950 Saint-Luc Blvd., Saint-Luc, Canada J0J 2A0
Filed Apr. 8, 1991, Ser. No. 681,956
Int. Cl.[5] B65F *1/00*
U.S. Cl. 248—131 14 Claims



1. A trash can holder comprising an upright side wall of circular cross-section and a circular, bottom closure plate, a stand adapted to be fixed onto a supporting surface and including an upright stem and a circular top plate fixed to the upper end of said stem, said bottom closure plate resting flat and slidable on said top plate, a first annular flange surrounding said stem, underlying and in slidable contact with the underside of said top plate and defining a circular opening co-axial with said bottom closure plate and of a diameter smaller than the diameter of said top plate and greater than the cross-sectional size of said stem, spacer means fixing said first annular flange to the underside of said bottom closure plate and arranged in a circle co-axial with said circular opening and having a diameter greater than that of said top plate, said bottom closure plate transversely shiftable and rotatable relative to said top plate, while being prevented from tilting relative to said top plate and said upright stem.

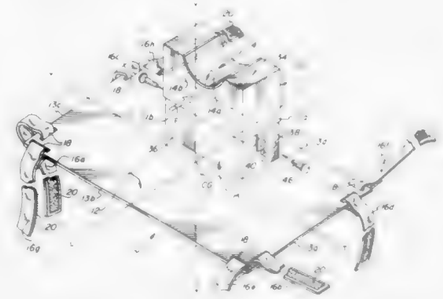
5,149,032
UNIVERSAL CUP HOLDER FOR USE IN VEHICLES
Stephen W. Jones, 710 Commercial St., Emporia, Kans. 66801; Mitchell H. Babkes, 8444 W. Birch La., Wichita, Kans. 67212, and David D. McCormick, 8830 Maple Dr., Overland Park, Kans. 66207
Filed Nov. 29, 1990, Ser. No. 620,347
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—154 8 Claims

1. A universal cup holder for use in vehicles comprising:
a base including a pair of fixed, upright arms;
an adjustable unit shiftably carried by said base;
a pair of upright arms carried by said adjustable unit, said unit and said arms being shiftable toward and away from said fixed arms whereby to vary the distance between the fixed arms and the shiftable arms to thereby permit the creation of cup receiving areas of differing sizes within the confines of said arms; and
means for locking said adjustable unit in a predetermined position with respect to said base, said locking means including a ratchet and pawl assembly for permitting incremental sliding shifting movement of the adjustable



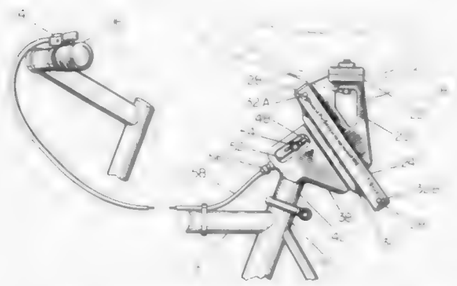
unit with respect to the base and a lock for said ratchet and pawl assembly, said lock being longitudinally slidable with respect to said assembly to engage the pawl during travel of the lock to cause the pawl to remain engaged with the ratchet to thereby lock the adjustable unit in the aforementioned predetermined position.

5,149,033
EXTREMITY SUPPORT APPARATUS
Donald R. Burzler, Rolling Hills Farm, Rt. #1, Box 245, Buena Vista, Tenn. 38318
Continuation-in-part of Ser. No. 478,582, Feb. 12, 1990, abandoned. This application Mar. 25, 1991, Ser. No. 674,697
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—176 20 Claims



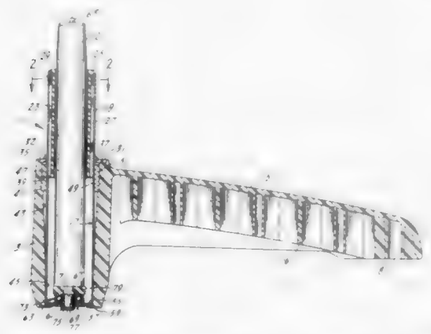
1. A support apparatus for supporting at least one of a user's extremities in an elevated position, the apparatus comprising:
a vertically extending elevation member terminating at its lower end in a base portion and at its upper end in an elevated support surface dimensioned and configured to receive at least one extremity of the user at an elevation above a footing member, defined below;
a footing member extending transversely of and outwardly from the base portion of the elevation member to stabilize the footing of the elevation member; and
securement means attached to the support apparatus, the securement means being dimensioned and configured to fasten the support apparatus to a supporting structure.

5,149,034
SADDLE POSITIONING DEVICE FOR BICYCLES
Scott Ganaja, 2011 Morgan La., Redondo Beach, Calif. 90278
Filed Aug. 8, 1991, Ser. No. 742,614
Int. Cl.[5] F16M *11/04*
U.S. Cl. 248—178 6 Claims



1. A saddle positioning device for bicycles which moves forwardly and upwardly, and rearwardly and downwardly comprising:
a stationary slide rack angled obliquely upward and forward, with an angle greater than 40 degrees from horizontal, the lower portion thereof with a seatpost for mounting into a bicycle frame;
a movable slide member partially enveloping and slidable relative to said slide rack, having a polygonal cross section to resist rotation, and having an upper portion with means for mounting a saddle; and
a locking means to fix the position of said slide member relative to said slide rack.

5,149,035
CHAIR BASE AND POST ASSEMBLY FOR AN OFFICE CHAIR
Mark J. Bonnema, East Grand Rapids, and David J. Morrison, Allendale, both of Mich., assignors to The Shaw-Walker Company, Muskegon, Mich.
Continuation of Ser. No. 239,462, Sep. 11, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 512,903
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—188.7 5 Claims



1. A chair base and post assembly for an office chair including:
a base formed of plastic and having a central tubular hub and base arms extending radially from the hub,
said hub having a socket extending vertically therethrough,
said socket having an irregular cross-section which is larger at the top than at the bottom of the socket and having a counterbore formed in the socket near said top,
a cylindrical post tube positioned in said socket and extending out of said socket above said hub,
means attached to the outside of said post tube and resting on said hub to support said post tube,
annular internal surface located in the socket near the top and bottom thereof to engage said post tube to stabilize it against lateral movement,
said annular internal surface located in the socket near the bottom thereof being formed as a non-tapered internal wall of the hub and said annular internal surface located in the socket near the top thereof being formed as the internal wall of a sleeve seated in said counterbore in the socket near the top thereof, and
means located at the bottom of said post tube to support a lifting mechanism positioned in said post tube.

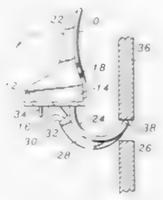
5,149,036
DEVICE FOR ATTACHING AN IV POLE TO A HOSPITAL BED OR THE LIKE
Gerald F. Sheehan, 20440 Anza, #125, Torrance, Calif. 90503
Filed Aug. 29, 1991, Ser. No. 751,549
Int. Cl.[5] F16L *3/08*
U.S. Cl. 248—215 8 Claims

1. A method for connecting an IV pole to a patient transport device in a manner such that the IV pole moves together with the patient transport device and wherein the bottom of the IV pole is positioned above the hospital floor surface comprising the steps of:
providing a vertically extending IV pole having a base member;
providing a device for attaching said IV pole to said patient transport device in a manner such that said base member is above said floor surface, said device comprising a bracket member, said bracket member having an elongated first side portion, a base portion substantially orthogonal to said first side portion and a spaced apart second side portion substantially parallel to said first elongated portion, the space between said first and second side portions being selected such that the bracket portion can be attached to said patient transport device, said device further comprising a U-shaped clamp member comprising first and second leg members and a base member, said base member being rigidly attached to the elongated side portion of said bracket member, a threaded bore being formed in said first leg member and a thumb screw for engaging said threaded bore;
attaching said bracket portion to said patient transport device;
disengaging said thumb screw so that said IV pole is posi-

tionable within the opening formed between said first and second leg members of said clamp member; and

positioning said IV pole within said opening and engaging said thumb screw such that said IV pole is secured to said clamp member at a position whereby said base member is supported above the hospital floor surface.

5,149,037
WALL HANGER
Alan Smith, 31501 West St., Laguna Beach, Calif. 92677
Filed Mar. 22, 1991, Ser. No. 673,415
Int. Cl.[5] A47K *1/00*
U.S. Cl. 248—216.1 **5 Claims**



1. A device for supporting objects on a wall, said device comprising:

a. a base defining a front and a rear face, said rear face defining a supporting surface for contact with the exterior surface of said wall;

b. a hanger portion extending from said front face of said base, said hanger element including a support area for receiving and carrying a portion of said object being supported; and

c. an elongate arcuate arm extending from said rear face of said base and adapted to extend through an aperture in the wall, said arcuate arm terminating in a blunt tip for non-penetrating contact with the interior surface of the wall, said arm having a rectangular cross section, a downwardly extending flange running the length of said elongate arm, the downward extension of the flange being greatest at the base of the arm where it joins said rear face of said base and gradually decreasing toward said free end of said arm.

5,149,038
MOUNTING DEVICE FOR SMOKE ALARM
Richard A. VanCleve, 9N646 Flora Dr., Elgin, Ill. 60123
Filed Apr. 16, 1991, Ser. No. 685,729
Int. Cl.[5] A47F *1/10*
U.S. Cl. 248—297.2 **20 Claims**

1. An alarm mounting assembly including a wall mount and an alarm mount wherein:

a. said wall mount is secured to a wall;

b. said alarm mount is slidably mounted with respect to said wall mount;

c. said alarm mount includes a fastening means for securing said alarm mount at a certain position within said wall mount;

d. said alarm mount has an alarm secured to an upper portion thereof;

e. said alarm mount provides for raising or lowering of the alarm;

f. said fastening means cooperates with said movable and fixable mounting device;

g. said ceiling is perpendicular to said wall;

h. said alarm mount includes a wall member and a ceiling member;

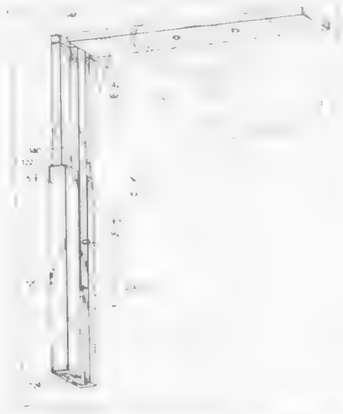
i. said ceiling member is substantially perpendicular to said wall member;

j. said wall member is slidably mounted within said wall mount;

k. said wall mount has an open end and a closable end;

l. said open end is closer to said ceiling than said closeable end;

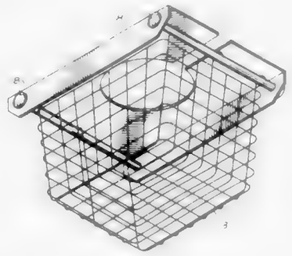
m. said closable end is oppositely disposed from said open end;



n. said ceiling member has an alarm means secured thereto; and

o. said closable end includes a blocking member.

5,149,039
PROTECTIVE CAGE
Bradley J. Peterson, and Lonnie R. O'Keeffe, both of El Paso, Tex., assignors to Bradley J. Peterson, El Paso, Tex.
Continuation-in-part of Ser. No. 478,924, Feb. 12, 1990, abandoned. This application Nov. 15, 1990, Ser. No. 614,589
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—300 **15 Claims**



1. An apparatus for protecting a device having a mounting base portion thereof which attaches through at least two screws to an electrical box located in a ceiling or wall, said device additionally attaching to wires extending from said electrical box, said apparatus comprising:

a mounting plate having a hole located therein, said hole having a diameter which is larger than the distance between said screws and sufficiently small so that said plate is held in place by clamping action imposed between said base portion of said device and said electrical box, and said plate having a slot extending from said hole to an exterior edge of said plate, said slot being dimensioned to accommodate said wires; and

a cage attached to said plate and configured in cooperation with said plate for enclosing said device.

5,149,040
SIDE BEAM PIPE HANGER AND METHOD OF MAKING
Richard W. Heath, Lake Mathews, Calif., assignor to Tolco, Incorporated, Corona, Calif.
Filed Aug. 7, 1991, Ser. No. 741,722
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—300 **22 Claims**

1. A bracket to support a rod connected to a pipe hanger, said bracket comprising:

a pair of thin flat hanging segments overlying each other along a central plane, said segments being adapted to be connected to an elevated, vertical support surface;

a cylindrical rod receiving section having an axis that extends generally parallel to and spaced from said plane; and

a neck connecting said section to said segments, said neck including a pair of connectors generally perpendicular to and extending away from said segments, with one connector formed integral with one circumferential end of said rod receiving section and one of said segments, and the other neck connector being formed integral with a second circumferential end of said rod receiving section and the other of said segments.

5,149,041
PORTABLE HOLDER TO SUPPORT A RECAPPED CONTAINER OF EFFERVESCENT LIQUID IN AN INVERTED POSITION TO RETAIN THE LIQUIDS FRESHNESS
Dennis V. Hartke, 4825 Mill Pond Loop, Auburn, Wash. 98002
Continuation-in-part of Ser. No. 461,683, Jan. 8, 1990, Pat. No. 5,065,966, which is a continuation-in-part of Ser. No. 277,360, Nov. 29, 1988, Pat. No. 4,960,254. This application Aug. 21, 1991, Ser. No. 748,184
Int. Cl.[5] A47G *23/02*
U.S. Cl. 248—146 **6 Claims**

1. A portable holder in combination with a previously opened, recapped container of effervescent liquid, upper portions of said container having arcuate surfaces, wherein, the container is supported in an inverted position, whereby, remaining effervescent liquid therein is forced into contact about the interior of the replaced cap causing the liquid to form a seal between the cap and container to prevent the escapement of gas from the container, comprising:

a surrounding upright body having a top portion, with a formed pocket therein which conforms to and engages said arcuate surfaces, and open bottom ended congruently spaced vertical support means, wherein, said formed pocket, in said top portion, receives, and limits the lateral movement of said inverted container, wherein, said vertical support means are congruously positioned about said formed pocket, and extend downward from said top portion a distance at least equal to the farthest distance the

inverted container must protrude through said top portion to stabilize said container in an inverted position.

5,149,042
CEILING FAN MOUNTING APPARATUS
Christopher E. Dumais, 8729 Graves Ave., #14C, Santee, Calif. 91971
Filed Jul. 11, 1991, Ser. No. 728,703
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—317 **5 Claims**

1. An apparatus for cantileverly mounting a ceiling fan, a ceiling light fixture and power cord to a side wall of a building comprising:

a. a first tubular section having a plurality of mounting holes to receive mounting fasteners to mount the first section to the side wall;

b. a power cord guide cap in one end of the first tubular section;

c. a second tubular section angularly attached at a first end to another end of the first tubular section;

d. a third tubular section angularly attached at a first end to a second end of the second tubular section;

e. a fourth tubular section having one end releasingly and angularly connected to a second end of the third tubular section;

f. the third tubular section having a suspension bar attached within the second end;

g. a suspension member;

h. an attachment port in one end of the suspension member;

i. a bolt removably placed through the attachment port and through a fixture port in the ceiling fan and ceiling light fixture to releasingly attach the fixture to the suspension member; and

j. a hook on another end of the suspension member to releasingly suspend the suspension member from the suspension bar.

5,149,043

TURNTABLE DEVICE

Ernst H. Grundmann, Am Sportplatz 36, 4005 Meerbusch, Fed. Rep. of Germany

Filed Nov. 26, 1990, Ser. No. 617,814

Claims priority, application Fed. Rep. of Germany, May 26, 1990, 9006002[U]

Int. Cl.[5] A47B *91/00*

U.S. Cl. 248—349 17 Claims

1. A turntable device for supporting items including any one audio units, video units, floodlights, flower pots, and showpieces, the device comprising:

a base plate, for supporting the turntable on a base, the base plate having a circular bearing race extending at a top side near an outer periphery of the base plate;

a first concentric bearing ring mounted on the bearing race of the base plate; and

a turntable mounted coaxially upon the base plate for rotation about a common center axis, the turntable having a circular bearing race extending at an under side near an outer periphery of the turntable;

wherein a second bearing race is provided on the base plate and the turntable, a second bearing ring being provided between the respective second bearing races of the base plate and turntable; wherein the base plate includes two circular concentric retaining rings radially spaced from one another, each having a respective one of the first-mentioned and second bearing races; and wherein the retaining rings are assembled into a unit by substantially radially extending webs.

5,149,044

CAP SHOE

Werner Mennekes, Lünen, and Rudi Podjadtke, Herne, both of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Jun. 28, 1991, Ser. No. 723,490

Claims priority, application Fed. Rep. of Germany, May 17, 1991, 4116142

Int. Cl.[5] E21D *15/00*

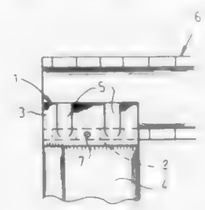
U.S. Cl. 248—357 6 Claims

1. A mine support assembly, comprising:

a mine prop having an end;

a cap tree supported by the mine prop; and

a cap shoe connecting said cap tree with said end of said mine prop, said cap shoe being formed as a die-shaped U-shaped elongated member having a base plate adapted to be affixed to said mine prop and a pair of generally parallel spaced-apart shanks extending orthogonally to said base plate all along the base plate and unitary therewith, said shanks being formed with inwardly projecting, longitudinally spaced corrugations elongated in directions



perpendicular to said base plate and formfittingly engageable in complementary formations of said head tree.

5,149,045

VACUUM TRACK AND PALLETS

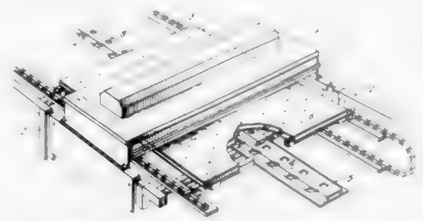
Sandor Szarka, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Division of Ser. No. 442,920, Nov. 29, 1989, Pat. No. 4,984,960.

This application Oct. 4, 1990, Ser. No. 592,647

Int. Cl.[5] A45D *42/14*

U.S. Cl. 248—363 2 Claims



1. A vacuum pallet comprising:

an upper plate member and a lower plate member interconnected by end members to define a vacuum chamber therein, said upper plate member having a plurality of small openings disposed in open communication with said chamber, and said lower plate member having one relatively larger opening therethrough;

an open lattice or honeycomb-like support structure between said plate members; and,

a shoe mounted over said lower plate opening adapted to fit snugly over a vacuum port and to facilitate evacuation of said chamber.

5,149,046

PAGE TURNING SYSTEM

James J. Kerley, Greenbelt, and Wayne D. Eklund, Edgewood, both of Md., assignors to The United States of America as represented by the Administrator, National Aeronautics & Space Administration, Washington, D.C.

Filed Dec. 24, 1991, Ser. No. 812,932

Int. Cl.[5] A47B *97/04*

U.S. Cl. 248—453 4 Claims

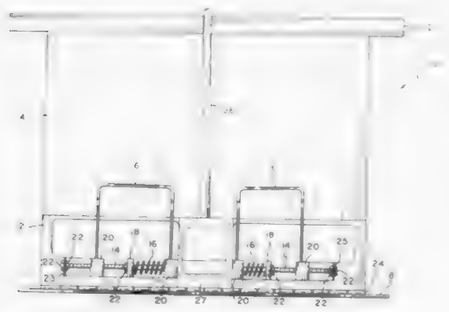
1. A device for holding reading materials for use by readers without arm mobility adapted to hold the reading materials in position for reading with the pages displayed to enable turning by means of a rubber tipped stick held in the mouth comprising:

a pair of rectangular frames for holding and positioning said reading material opened in reading posture with said pages displayed at a substantially unobstructed sighting position for reading;

said pair of rectangular frames connected to one another by a hinge such that the angle between said frames may be varied thereby varying the inclination of said reading materials;

an adjustable brace and a spring means affixed between said pair of rectangular frames;

means for holding opposing pages of said reading material open for reading without substantial visual interference of said pages, said means adjustable to the page thickness of said reading material and said means having a variable friction adjustment so as to enable to force of said means against said pages to be varied, said means also permitting manipulation of said pages by said rubber tipped stick employed by said reader;



said means for holding opposing pages of said reading material open for reading without substantial visual interference of said pages comprises a pair of bent wires, each said bent wire mounted to a pair of wire mounts slideably mounted to a threaded rod affixed to one said frame having a spring thereon to provide a spring bias on said wire mounts, said spring bias adjustable by turning a nut threadably attached to said rod; and

said rubber tipped stick employed by said reader comprising at least one hollow tube having a shaped tip and a mouthpiece shaped so as to be gripped by the teeth of said reader.

5,149,047

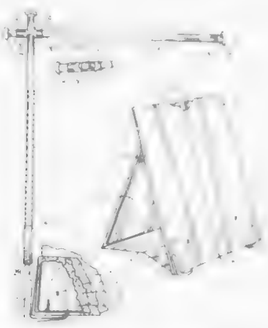
FOLDABLE ADD-ON EASEL WITH SPRING PAGE HOLDERS FOR BOOKCOVERS/FOLDERS, WITH LINE GUIDE ATTACHMENT

Annabelle D. Tucker, 4480 Sherman Oaks Cir., Sherman Oaks, Calif. 91403

Filed Sep. 3, 1991, Ser. No. 754,045

Int. Cl.[5] A47B *97/04*

U.S. Cl. 248—459 6 Claims



1. A collapsible, portable, easel structure to be attached to the back of a book comprising, an elongated blank having therein a plurality of fold lines to define top, central and bottom panels; said top panels being adhesively coated and folding inwardly toward the central panel to extend toward the inward fold edge of said bottom panels, forming an attachment means for a book back; reinforcement means secured to the central panel so that a gap is formed between said support means permitting the central panel to fold around the spine of a book; said bottom panels comprising a plurality of foldable flaps forming a support base for the easel and said inward folded edge of the bottom panels being adhesively coated, forming attachment means for a book back and also for securing spring page holders.

5,149,048

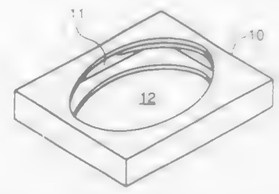
SHOCK ABSORBENT MOUNTING ARRANGEMENT FOR DISK DRIVE OR OTHER COMPONENT

James H. Morehouse, Jamestown; James A. Dunckley; David M. Furay, both of Boulder; John A. Mount; Bernard J. Rondestvedt, both of Longmont, and Steven B. Volk, Boulder, all of Colo., assignors to Integral Peripherals, Boulder, Colo.

Continuation-in-part of Ser. No. 630,136, Dec. 19, 1990. This application Sep. 25, 1991, Ser. No. 765,349

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—632 21 Claims



1. A combination for protecting an electronic, mechanical or electro-mechanical component to be mounted in an instrument against damage from shock forces imposed on the instrument, the combination comprising:

an electronic, mechanical or electro-mechanical component to be mounted in an instrument;

a shock absorbent jacket which at least partially encloses the component; and

means for retaining the jacket and the component at a selected location in the instrument;

wherein the jacket and the retaining means function cooperatively so as to protect the component against a shock force applied to the instrument, regardless of the direction of the force.

5,149,049

SUPPORT DEVICE FOR MOTOR

Masaharu Nemura; Tomohiro Aoki, both of Kanagawa; Tohru Kobayashi, Tokyo; Masatoshi Ikkatai, Kanagawa; Yasushi Murayama, Tokyo; Takashi Uchida, and Tatsuo Mitomi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,672

Claims priority, application Japan, Jul. 19, 1989, 1-188231

Int. Cl.[5] F16M *9/00*

U.S. Cl. 248—674 7 Claims

1. A drive motor and motor supporting device, comprising:

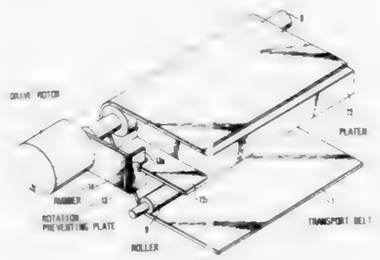
a driven device having a driven shaft, said driven device having a first fixed member;

a motor provided with a motor output shaft connected directly to said driven shaft of said driven device, said motor having a motor case and being cantileverly supported only by connection to said driven shaft;

a rotation preventing member fixedly secured to said motor case;

stabilizing means for fitting said rotation preventing member to said first fixed member, said stabilizing means including

a cut-out portion in either said rotation preventing member or said first fixed member and a complementary portion on the other of said rotation preventing member or said first fixed member for extending into the cut-out portion in said rotary preventing member or said fixed



member, said stabilizing means preventing the rotation of said motor and preventing eccentric deviation of said motor output shaft; and

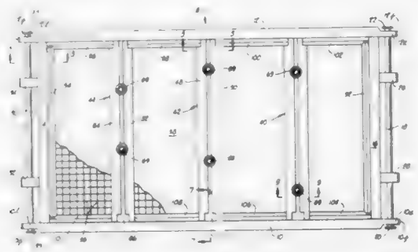
an elastic member for elastically engaging said rotation preventing member with said fixed member.

5,149,050

MACHINERY BASE PAD

Derrell Smith, P.O. Box 6772, Moore, Okla. 73160, and Aladino Cassar, 2449 Glenn Ave., Del City, Okla. 73115

Filed Jan. 14, 1991, Ser. No. 640,850
Int. Cl.[5] F16M *5/00*
U.S. Cl. 248—679 **5 Claims**



5. A base pad for anchoring heavy vibrating machinery comprising:

a rigid rectangular frame including a plurality of interconnected beams defining and enclosing a rectangular interior space, said beams each having a pair of spaced flanges interconnected by a web portion extending between the flanges, said beams each further having spaced openings through the web portions hereof, said openings placing said interior space in communication with the exterior side of said rigid frame;

cementitious material within said interior space defined and enclosed by said rigid rectangular frame and having an upwardly facing, machinery-supporting surface;

a plurality of tie down fastener subassemblies movably mounted in the cementitious material and accessible in said upwardly facing surface for securing machinery to said base pad; and

liquid drainage means for channeling the flow of liquids falling on the surface of said base pad to selected locations thereon adjacent said openings, with said selected locations aligned with, and communicating with, said openings to facilitate the drainage of liquids from said selected locations through said openings to the outer side of said rigid frame, said liquid drainage means comprising upwardly opening gutters set in the upper surface of said cementitious material and positioned to move the liquid toward said selected locations aligned with said spaced openings in the web portions of said beams to facilitate drainage of the liquid therethrough.

5,149,051

KEYBOARD FLIP STAND

Michael J. Schriner, Rocky River, Ohio, assignor to Microvision, Inc., Westlake, Ohio

Continuation of Ser. No. 607,594, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 443,441, Nov. 30, 1989, abandoned. This application Nov. 20, 1991, Ser. No. 798,344
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—918 **6 Claims**

1. In combination, a keyboard and a keyboard stand comprising:

a) the stand of consisting of:

i) a rigid base of generally planar configuration;

ii) a rigid wall extending generally orthogonally from said base and making a rigid joint therewith along one end of said base, the upper surface of the base and the inner side of the wall being substantially flat; and,

iii) a pressure-sensitive adhesive deposit on the inner side of said wall;

b) said deposit affixing the bottom of the keyboard to the inner side of the wall, the wall and the keyboard being selectively positionable in a substantially vertically oriented storage position;

c) the base having a lower surface configured to support the combination on a support surface and maintain the combination in its vertical storage position;

d) the keyboard being equipped with an electric cord;

e) the keyboard being displaced from said joint sufficiently to allow passage of the electric cord behind said keyboard when in a use position, the deposit being disposed sufficiently beyond said joint to avoid contact with said electric cord; and,

f) wherein the deposit, the base, and the wall being unobstructive to said passage of the electric cord across said joint, and the sizes of the base and the wall of the stand and the angle of the intersection therebetween being adequate for rendering the keyboard independently stable in the storage position.

5,149,052

PRECISION MOLDING OF POLYMERS

Vladimir A. Stoy, and George P. Stoy, both of Princeton, N.J., assignors to Kingston Technologies, Inc., Dayton, N.J.

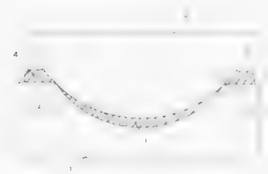
Filed Nov. 16, 1987, Ser. No. 120,947
Int. Cl.[5] B22C *9/08*
U.S. Cl. 249—105 **11 Claims**

1. An apparatus for precision molding of polymers to form a precisely shaped product, comprising:

molding cavity for receiving a solution of the polymer; and,

means for introducing coagulating fluid into said molding cavity while preventing the escape of said polymer solution from said molding cavity,

whereby said polymer solution may be coagulated by the influx of a coagulating fluid into said polymer solution, which coagulating fluid would cause both the coagulation and swelling of the polymer solution so as to mold said polymer solution under pressure in said molding cavity into a precisely shaped product,



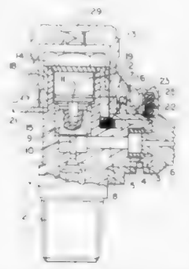
and wherein said means for introducing a coagulating fluid into said molding cavity is a semipermeable gate capable of allowing the diffusion of a coagulating fluid into the molding cavity at a faster rate than the rate of diffusion of the solvent out of the molding cavity.

5,149,053

DISCONNECTION-PREVENTING SAFETY DEVICE FOR LIQUEFIED GAS BOTTLE VALVE FOR USE WITH QUICK-COUPLING CONNECTOR

Rosaria Galli, Recco, Italy, assignor to Rosaria Galli & C. S.A.S., Italy

Filed Mar. 22, 1991, Ser. No. 673,806
Claims priority, application Italy, Jul. 4, 1990, 12483 A/90
Int. Cl.[5] F16L *37/28*
U.S. Cl. 251—149.9 **13 Claims**



1. A safety arrangement for a bottle containing liquefied gas to be dispensed, comprising:

(a) a valve body having an inlet for mounting the body on the bottle, a discharge outlet for dispensing the liquefied gas, and a flow passage extending from the inlet to the outlet;

(b) a valve member mounted in the passage for movement from a normally-closed position in which the liquefied gas is blocked from the discharge outlet, to an open position in which the liquefied gas flows along the passage to the discharge outlet;

(c) a manually-operated knob mounted on the body for turning movement about an axis between angularly-offset, end-limiting positions;

(d) means operatively connecting the knob in a force-transmitting relationship to the valve member to move the valve member from the normally-closed position to the open position;

(e) a coupler for connection to, and disconnection from, the discharge outlet to selectively conduct the liquefied gas therefrom;

(f) alignment means for permitting said connection and disconnection of the coupler only when the valve member is in the normally-closed position; and

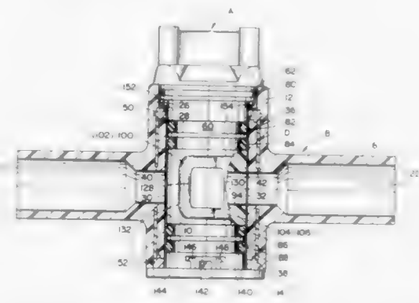
(g) means for locking the knob to prevent movement of the valve member to the open position upon said disconnection of the coupler, and for unlocking the knob upon said connection of the coupler.

5,149,054

REINFORCED POLYMER VALVE

David P. Passerell, Geneva, and Stan Skrbis, Richmond Heights, both of Ohio, assignors to Perfection Corporation, Madison, Ohio

Continuation-in-part of Ser. No. 360,292, Jun. 2, 1989, abandoned. This application Dec. 5, 1990, Ser. No. 622,713
Int. Cl.[5] F16K *5/04*
U.S. Cl. 251—309 **30 Claims**



1. A valve comprising:

a body of polymeric material having a chamber defined therein;

inlet and outlet passages operatively communicating with the chamber;

a valve member received in the chamber for selective rotation about an axis between open and closed positions;

a reinforcing member received in the body around the chamber for maintaining close dimensional tolerances between the valve member and the body; and

first and second centering rings operatively engaging the reinforcing member at axially spaced regions, the centering rings stabilizing the reinforcing member during formation of the body so that the reinforcing member is totally encapsulated.

5,149,055

SHUT-OFF VALVE

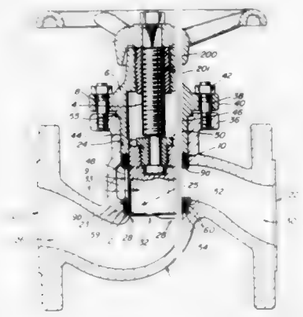
Richard Huber, Modling, Austria, and Peter Wirz, Unterkulm, Switzerland, assignors to Klinger AG, Zug, Switzerland

Continuation-in-part of Ser. No. 363,353, Jun. 6, 1989, abandoned, which is a continuation of Ser. No. 165,407, Feb. 26, 1988, abandoned, which is a continuation of Ser. No. 935,272, Nov. 26, 1986, abandoned. This application Jul. 6, 1990, Ser. No. 549,359
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 3542636; Jul. 8, 1986, 3622889; Sep. 16, 1986, 3631447
Int. Cl.[5] F16K *3/24*
U.S. Cl. 251—324 **14 Claims**

8. A sealing ring for a sliding piston type of shut-off valve having a flow channel with a tubular portion adapted to receive therein a piston movable along its axis for blocking flow of a medium through said flow channel when engaging a sealing ring having an axis and fixed to said tubular portion, said sealing ring comprising:

a plurality of ring-shaped lamellae connected to each other and adapted to be in a plane perpendicular to said piston axis, with each of said lamellae having an inner peripheral side edge surface adapted to be substantially parallel to said sealing ring axis and sized to be sealingly engaged with said piston, each of said lamellae being formed of

expanded graphite adapted to have an installed density of 1.5 to 2..2 g/cm^3; and



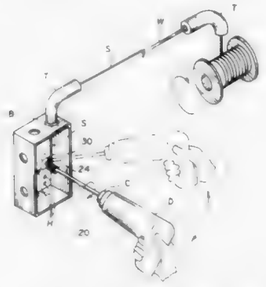
a guard ring on at least one exposed, outwardly directed face of said plurality of lamellae connected to each other.

5,149,056

WIRE PULLER FOR ELECTRICAL CONDUITS

Brian E. Jones, 8910 Roanoke Pl., NE., Bremerton, Wash. 98310

Filed Jun. 27, 1991, Ser. No. 721,883
Int. Cl.^{5} E21C *29/16*
U.S. Cl. 254—134.3 FT **16 Claims**



1. A string puller for use with a drill having a chuck for pulling a string into a junction box from a hollow conduit connected thereto, said box having walls including wall holes therethrough, the wall holes having a wall hole diameter;

said puller comprising a rigid body having cylindrical symmetry about an axis and including:

a chuck end,

a pin end,

an elongated chuck portion adjacent said chuck end,

a pin adjacent said pin end, said pin having a pin diameter smaller than the wall hole diameter;

a round flange disposed on said body between said chuck portion and said pin;

a spooling portion having a constant spooling diameter, said spooling portion disposed between said chuck portion and said flange;

a cross hole through said spooling portion for inserting the string therethrough, said cross hole generally at right angles to said axis; and

said flange diameter being greater than said chuck diameter; whereby

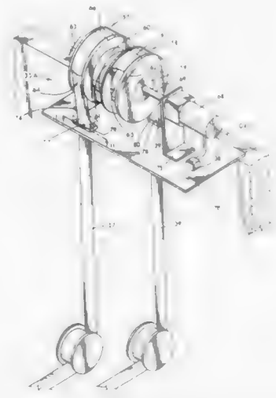
said chuck portion may be clamped in the chuck, said pin may be inserted into one of the wall holes in the box, an end of the string may be wrapped about said body adjacent said flange, and said body may be rotated by the drill for drawing the string into the box from the conduit, with the string prevented from wrapping about said pin by said flange.

5,149,057

TAPE DRIVE WITH SELF-EXPANDING COILS FOR SLUDGE COLLECTOR

Charles L. Meurer, Golden, Colo., assignor to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 321,440, Mar. 9, 1989, Pat. No. 4,927,537.
This application Mar. 9, 1990, Ser. No. 491,199
Int. Cl.^{5} B66D *1/00*; F16H *21/40*
U.S. Cl. 254—276 **2 Claims**



1. Apparatus for reciprocating a carriage having first and second opposite sides, said carriage being movable in first and second opposite directions; comprising:

a drum mounted for rotation on an axis;

first and second reels mounted for rotation on said axis relative to said drum, each of said reels including a pair of spaced flanges, a hub between said flanges and a connecting ring that are connected as an integral unit;

means for selectively coupling each of said first and second reels to said drum such that said first and second reels are connectible independently of one another to rotate with or free from said drum;

a first metal tape having a first end connected to said hub and wound thereon in a first rotary direction to form a first coil, said first tape having a second end connected to said first side of said carriage, said first tape being resilient and tending to uncoil itself on said hub of said first reel;

a second tape having a third end connected to said second hub and wound thereon in a second rotary direction to form a second coil, said second tape having a fourth end connected to said second side of said carriage, said second tape being resilient and tending to uncoil itself on said hub of said second reel;

pulley means for guiding said first and second tapes from said first and second reels in separate paths so that said first tape extends to said first side of said carriage and said second tape extends to said second side of said carriage;

reversible means for rotating said first and second reels in first and second opposite rotary directions, said rotation in said first rotary direction being effective to tighten said first coil of said first tape on said first hub and to permit said second coil of said second tape to uncoil itself on said second hub, said rotation in said second rotary direction being effective to permit said first coil to uncoil itself on said first hub and to tighten said second coil on said second hub;

means responsive to the number of revolutions of said drum for generating a reversing signal;

means responsive to said reversing signal for reversing said direction of rotation of said reversible means and said reels, said tightly wound second coil becoming uncoiled upon rotation in said first direction and said loosely wound first coil becoming tightly wound upon said rotation in said first direction to take up said first tape on said first reel and move said carriage in said first direction, said carriage moving in said first direction pulling said second tape around said pulley means from said second reel; and

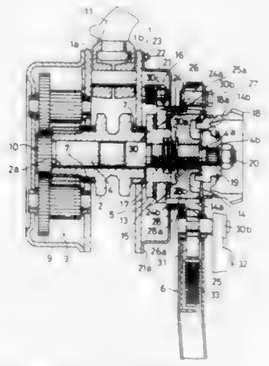
means extending partially around each of said first and second reels for limiting the maximum diameter of said first and second coils to retain said first and second coils on said first and second respective reels.

5,149,058

LEVER-OPERATED HOIST

Yosaku Nishimura, Osaka Prefecture, Japan, assignor to Vital Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1990, Ser. No. 615,847
Claims priority, application Japan, Dec. 20, 1989, 1-147434[U]
Int. Cl.^{5} B66D *1/04*
U.S. Cl. 254—369 **6 Claims**



1. A lever-operated hoist comprising:

a side plate, and a drive shaft transversely thereof,

a brake cover attached to the side plate and comprising a tubular part,

an operating lever, an operating lever cover thereon comprising an inside tubular part disposed radially inwardly of and journalled in the brake cover tubular part, and

a tubular assembly member having a body member mounted radially inwardly of and engaging the inside tubular part,

said tubular assembly member having a transverse flange at each end,

one of the flanges engaging and holding against movement in the axial direction the inside tubular part, the other flange engaging and holding against movement in the axial direction the brake cover tubular part, thereby limiting the movement of the operation lever in the axial direction of said drive shaft.

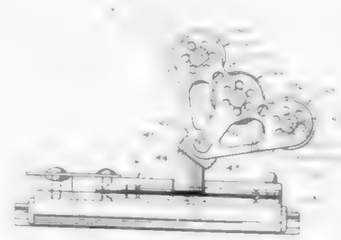
5,149,059

LOW PROFILE MULTIPLE BEARING BLOCK FAIRLEAD

J. Kevin Monahan, Delafield, Wis., assignor to Harken, Inc., Pewaukee, Wis.

Filed Apr. 25, 1991, Ser. No. 691,463
Int. Cl.^{5} B66D *3/08, 3/04*
U.S. Cl. 254—394 **3 Claims**

1. A fairlead multiple bearing block assembly for supporting a flexible line, said assembly comprising at least three adjacent sheaves, each sheave comprising an inner race and an outer line receiving race rotatable about the inner race, said sheaves being arranged in a common plane to receive the line and having parallel axes of rotation intersecting a common arc having a diameter larger than the diameter of the sheaves, side plate means for connecting the inner races of said sheaves in a fixed relation to form said assembly, and an upright fitting outside of said arc for securing said sheave assembly to a base support, said fitting comprising an arm, first pivot means between said side plate means and said arm to enable pivoting of the sheave assembly about a first axis parallel to the axes of rotation of the sheaves, second pivot means between said arm and the side plate means to enable pivoting of the sheave assembly around a second axis perpendicular to and intersecting said first axis, and third pivot means between said base and said arm in the plane of the sheave assembly to enable said assembly to swing laterally.



5,149,060

METHOD OF FABRICATING AN ORNAMENTAL FENCE POST OR FENCE COLUMN STRUCTURE

Roger T. Boes, 3713 Bixler, Metairie, La. 70001

Continuation-in-part of Ser. No. 367,245, Jun. 16, 1989, which is a continuation of Ser. No. 251,914, Sep. 9, 1988, Pat. No. 4,858,891. This application Dec. 5, 1989, Ser. No. 446,303
Int. Cl.^{5} B21F *27/00*
U.S. Cl. 256—21 **4 Claims**

1. A method of fabricating a fence post or fence column having the appearance of a one-piece, traditional ornamental cast or wrought iron fence post or fence column, comprising the following steps:

a. Providing an elongated support member of a specific length having an axial cavity therethrough and an upper

area and having a specific configuration relative its elongated surface;

b. Providing a kit comprising a plurality of ornamental members of varying exterior sizes, design and appearances, having interior and exterior walls and vertical cavities therethrough sized and configured to slidingly engage said elongated support member and associated means to affix said ornamental members to said elongated support member, said ornamental members further including

a base member having a length of about one-quarter to one-half the total height of the elongated support member, and having an exterior diameter substantially greater than said elongated support member,

at least one medial ornamental member of lesser length than said base member,

at least one upper ornamental member of lesser length than said base member juxtaposed to the upper area of said elongated support member, and

an ornamental capping member juxtaposed said upper ornamental area, said ornamental capping member covering said cavity of said elongated support member; and

c. sequentially slidingly engaging each of said ornamental members individually over said elongated support member, and attaching said ornamental members to said support member to form a fence post or column having the appearance of a one-piece, traditional wrought iron fence post or fence column, in the following arrangement, from bottom to top

at the bottom, said base member, positioned above the terminal end of the support member to provide means for anchoring the support member in concrete, above said base member, at least one of said medial ornamental members,

above said medial ornamental member, at least one of said upper ornamental members, and

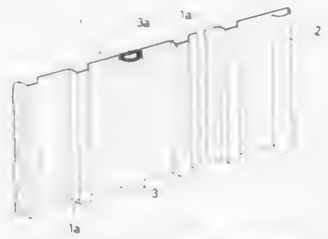
above said upper ornamental member, said ornamental capping member, thereby forming a complete fence post or fence column.

5,149,061

PANEL FOR ROAD CONSTRUCTION

Arsenio Borgnini, Via Alcide De Gasperi, 38, Valfabbrica (PG)

Filed Aug. 27, 1991, Ser. No. 750,286
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—24 8 Claims



1. A rigid panel that can be stably assembled in succession with identical panels that are positioned adjoining thereto, so as to form a continuous screen installed lengthwise above road barriers, the panel, in combination, comprised of:

a metal panel having an external face, a top, a bottom, and a pair of opposite traverse edges;

a plurality of ridges formed on the external face of the panel, so as to project outwardly from the external face, the ridges being spaced from one another at regular intervals along the panel, and each of said ridges being substantially U-shaped in cross-section;

molded flashing being substantially inverted U-shaped in cross-section, the molded flashing being disposed on the top of the panel;

a substantially T-shaped support including a base stabilizing plate and a guide positioned at substantially the center thereof so as to project upwardly therefrom, the guide having a guide space formed therein, such that the bottom of the panel may be received in the guide space, so as to be securely held in the guide space by the guide;

one of the traverse edges of the panel formed extending forwardly away from the external face of the panel and then being bent backwardly towards the external face of the panel, so as to be substantially semi-circular in shape with a cavity defined therein that is partially closed by the external face of the panel, the one of the traverse edges further terminating short of the exterior face of the panel, such that a slot is defined therebetween for permitting access into the said cavity;

the other of the traverse edges of the panel formed extending forwardly away from the external face and then being bent backwardly away from the external face, so as to be substantially semi-circular in shape with an open cavity defined thereby;

an end tab formed on the other of the traverse edges of the panel and extending towards the panel, such that the said end tab substantially closes the open cavity formed on the other of the traverse edges of the panel;

the one of the traverse edges of the panel being of a size, such that an other of the traverse edges of a first adjoining panel fits therearound with the end tab of the other of the traverse edges of the first adjoining panel extending through the slot formed between the said one of the traverse edges and the exterior face of the panel, so as to be locked in place between the other of the traverse edge and the external face of the panel; and

the other of the traverse edges of the panel being of a size, such that the said other of the traverse edges fits around a one of the traverse edges of a second adjoining panel with the end tab of the panel extending through the slot defined between the one of the traverse edges and the exterior face of the second adjoining panel, so as to be locked in place between the other of the traverse edge and the external face of the said second adjoining panel

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5,149,062

PREREDUCTION FURNACE OF A SMELTING REDUCTION FACILITY OF IRON ORE

Masahiro Matsuo, and Genji Kanatani, both of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 657,668
Claims priority, application Japan, Feb. 27, 1990, 2-044373
Int. Cl.[5] C22B *5/14*
U.S. Cl. 266—172 4 Claims

1. A prereduction furnace of a smelting reduction facility of iron ore, the prereduction furnace having an upper part where iron ores are fed thereto to be prereduced, and a lower part wherein a reducing gas is fed, the prereducing furnace comprising:

a fluidizing prereduction chamber at the upper part of the prereduction furnace for receiving iron ores therein for prereduction;

a gas blowing chamber at the lower part of the prereduction furnace for receiving a reducing gas therein;

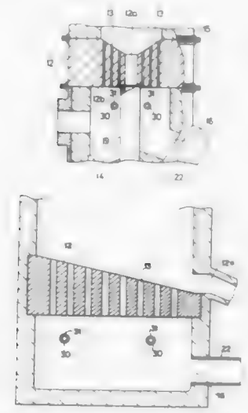
a distributor arranged in the prereduction furnace between said fluidizing prereduction chamber and said gas blowing chamber so as to separate said chambers from each other;

a first plurality of nozzles passing through said distributor for injecting said reducing gas in said gas blowing chamber into said fluidizing prereduction chamber;

a discharge pipe mounted at a bottom portion of said fluidizing prereduction chamber and extending through said distributor for discharging prereduced iron ores from the prereduction furnace;

at least two horizontally movable gas purging pipes mounted in the prereduction furnace below said distributor; and

a second plurality of nozzles coupled to said horizontally movable gas purging pipes and arranged inside said gas blowing chamber for injecting a purging gas to a bottom



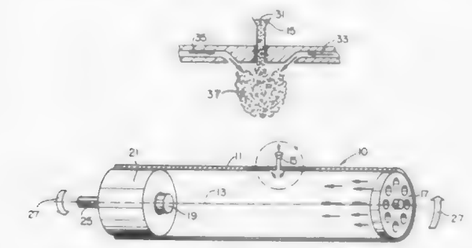
surface of said distributor to remove particles from the bottom surface of said distributor to prevent clogging of lower ends of said first plurality of nozzles.

5,149,063

COLLISION CENTRIFUGAL ATOMIZATION UNIT

Monde A. Otooni, Glassboro, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 17, 1991, Ser. No. 691,601
Int. Cl.[5] B22F *9/00*
U.S. Cl. 266—204 6 Claims



1. Apparatus for producing submicron and smaller metal alloy particles, comprising:

main chamber means having a longitudinal axis;

feeder means for introducing a quantity of molten alloy under pulsed gas pressure in a direction generally radial to said axis, said feeder means having gas stream means for forming metal droplets from said alloy;

gas accelerator means for directing axially flowing gas against said droplets from said feeder means in said chamber, said accelerator means directing said droplets in an axial direction; and

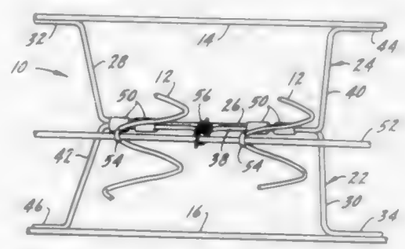
substrate means located along said axis and in the direction of flow from said accelerator means, for receiving said droplets at a predetermined distance from said feeder means, whereby said particles are produced.

5,149,064

FOUNDATION UNIT EDGE SUPPORT SYSTEM

Martin Schulz, Jr., Bremham, Tex., assignor to Steadley Company, Carthage, Mo.

Filed Mar. 19, 1991, Ser. No. 671,541
Int. Cl.[5] F16F *3/02*
U.S. Cl. 267—97 6 Claims



1. An edge support system for a foundation of the type having spaced top and bottom bearing surfaces separated by rows of support members extending between opposite side edges of the foundation, the foundation also having top and bottom border members at said side edges, the edge support system being situated at a side edge and comprising

a. a first torsion element comprising

i. an elongated, horizontal torsion segment located between and generally parallel to said top and bottom border members and offset inwardly in said foundation,

ii. a first connection leg extending between one end of said torsion segment and said top border member,

iii. means securing said first connection leg to said top border member,

iv. a second connection leg extending between the other end of said torsion segment and said bottom border member,

v. means securing said second connection leg to said bottom border member,

b. a second torsion element comprising

i. an elongated, horizontal torsion segment located between and generally parallel to said top and bottom border members and offset inwardly in said foundation,

ii. a first connection leg of said second torsion element extending between one end of said second torsion segment and said top border member,

iii. means securing said first connection leg of said second torsion element to said top border member,

iv. a second connection leg of said second torsion element extending between the other end of said second torsion segment and said bottom border member,

v. means securing said second connection leg of said second torsion element to said bottom border member,

c. said torsion segments being located contiguous to one another, with the first connection leg of said first torsion element being located above the second connection leg of said second torsion element and with the first connection leg of said second torsion element being located above the second connection leg of said first torsion element,

d. means attaching said torsion segments to one another, and

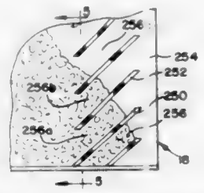
e. an expansion spring having opposite ends and being connected at one end to said attached torsion segments and being connected at the opposite end to an intermediate rod located midway between said upper and lower border members, said rod being secured to said support members and being offset inwardly in said foundation while remaining generally parallel to said lower and upper border members, and said one end of said expansion spring being connected to a bend in at least one of said torsion segments.

5,149,065

FOAM CUSHION WITH LABYRINTHINE SIDE SEAMS

Charles M. Willden, Grafton, and Dennis E. Willden, Port Washington, both of Wis., assignors to Insta-Foam Products, Inc., Joliet, Ill.

Division of Ser. No. 345,346, Apr. 28, 1989, Pat. No. 4,999,945.
This application Oct. 26, 1990 Ser. No. 604,672
Int. Cl.[5] B65D *81/00*
U.S. Cl. 267—136 5 Claims



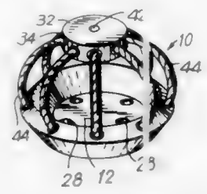
1. A foam cushion for packaging purposes comprising: a cushion envelope including a foam-receiving cavity defined by a unitary web, said web being folded over itself to provide a folded side and having a pair of spaced apart opposed end seams extending generally perpendicularly from the folded side and an intermittent labyrinth side seam extending between said end seams and opposite the folded side and cushioning foam in said foam-receiving cavity.

5,149,066

ISOLATOR WITH IMPROVED SYMMETRICAL RESPONSE TO SHOCK AND VIBRATION FORCES

Raymond E. Snaith, Jericho; Max Barrasso, Merrick, and Eric Jansson, Huntington, all of N.Y., assignors to Aeroflex International Incorporated, Caguas, P.R.

Filed Feb. 11, 1991, Ser. No. 653,257
Int. Cl.[5] F16F *1/00*; F16M *1/00*
U.S. Cl. 267—136 11 Claims



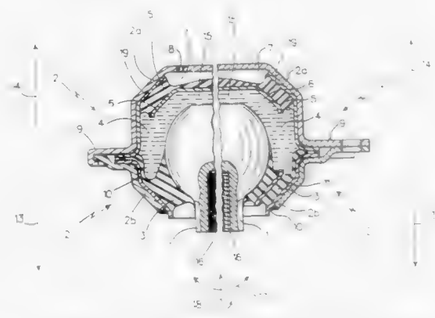
1. An isolator for resisting transmission of shock and vibration forces between structures, comprising:
(a) a dish-shaped base connectable to one of the structures, and having an outer peripheral portion;
(b) an elevated support connectable to another of the structures, and having an outer peripheral section, said elevated support being spaced at a distance from the base as considered along a predetermined axis; and
(c) a plurality of arched, individual, flexural support, wire elements arranged circumferentially about the predetermined axis and spanning the distance between the base and the elevated support, each arched wire element having one end connected interiorly within the elevated support and extending past the outer peripheral section of the elevated support and an opposite end connected interiorly within the base and extending past the outer peripheral portion of the base, said arched wire elements being tensioned and flexing from a rest position in response to the transmission of shock and vibration forces between the structures, and returning to the rest position when said forces have abated.

5,149,067

BEARING

Frank Frühauf, Eitorf; Wilhelm Mayerböck, Kirchdaun, and Jörn-Rainer Quast, Bad Bodendorf, all of Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany

Continuation of Ser. No. 442,139, Nov. 28, 1989, abandoned.
This application Apr. 19, 1991, Ser. No. 688,381
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841194
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.13 21 Claims



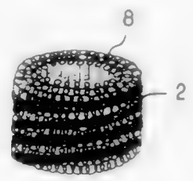
1. A bearing for being mechanically connected between a first object and a second object for transferring a force between the first object and the second object, said bearing comprising:
a housing element for being connected to the first object;
a substantially solid ball element for being connected to the second object;
said ball element having a ball shaped portion;
said ball-shaped portion of said ball element being positioned in spaced-apart relation with and at least partially surrounded by said housing element;
said ball element defining a linear axis along a substantial line of symmetry of said bearing;
fluid in communication with said ball element and said housing element;
a sole, sealed fluid cavity formed at least by said ball element and said housing element, wherein said fluid is disposed within said fluid cavity;
said fluid at least partially surrounding a substantial portion of said ball-shaped portion of said ball element;
said fluid for at least transmitting a force between said ball element and said housing element when said ball element moves relative to said housing element;
a lower resilient element being vulcanized to said ball element and said housing element for at least transferring a force between said ball element and said housing element when said ball element moves in a first direction and when said ball element moves in a second direction;
an upper resilient element for being interposed between said fluid and said housing element for transmitting a force between said fluid and said housing element;
said upper resilient element being braced by said fluid to receive a force between said ball element and said housing element;
said bearing having at least one cross-section generally through said linear axis;
said fluid cavity comprising a substantial portion of said at least one cross-section;
said upper resilient element and said ball element being separated by a substantial distance; and
said fluid cavity forming a substantial indentation in a portion of said lower resilient element.

5,149,068

RESILIENT ANTI-VIBRATION SLEEVE, IN PARTICULAR FOR AN EXHAUST COUPLING

Louis Brandener, Poissy, France, assignor to Societe Jacques Dubois, Barentin, France

Filed Mar. 4, 1991, Ser. No. 663,610
Claims priority, application France, Mar. 15, 1990, 90 03333
Int. Cl.[5] F16F *7/00*
U.S. Cl. 267—147 3 Claims



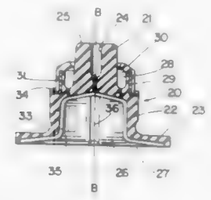
1. A resilient anti-vibration sleeve comprising a cylindrical mass of compressed steel wire and a maintaining strip made of one of knitted, woven and braided metal wire, said resilient sleeve with said maintaining strip having a spring constant substantially similar to that of the mass of compressed steel wire, the strip being helically wound around the outer surface of the mass of compressed steel wire, with the ends thereof being rigidly fixed to the mass of compressed steel wire.

5,149,069

SPRING SEAT/JOUNCE BUMPER ASSEMBLY

Richard D. Hein, Wabash, Ind., assignor to GenCorp Inc., Fairlawn, Ohio

Filed Nov. 8, 1991, Ser. No. 790,741
Int. Cl.[5] F16F *1/36*
U.S. Cl. 267—153 8 Claims



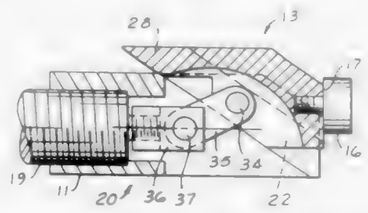
1. A jounce bumper, comprising:
(a) a generally cylindrical, resilient, elastomeric head with a centrally disposed void, protruding from an integral, hollow, cylindrical elastomeric body which terminates in axially spaced relation from the head at an outstanding integral elastomeric annular flange;
(b) an integral, annular elastomeric extension of the body extending from the body and flange in surrounding, spaced relation around the head and forming an annular void around the head, the extension having a free outer end which curves inwardly towards the head and terminates in proximity to the head in spaced axial relation from a free outer end of the head opposite the annular flange, the volume of the annular void being in correlated relation to the displacement of the head under a predetermined load; and
(c) a rigid, hollow, cylindrical sleeve encased in the extension of the body and designed to restrict radial expansion of the head beyond filling of the annular void.

5,149,070

EDGE CLAMP

Henry Dykstra, Milford, Mich., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed May 10, 1991, Ser. No. 698,275
Int. Cl.[5] B23Q *3/02*
U.S. Cl. 269—32 1 Claim



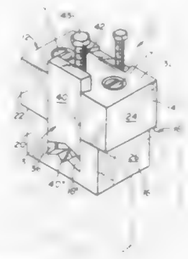
1. An edge clamp comprising a clamp body mountable on a support surface and having a top surface,
said clamp body including inclined linear guide means inclined relative to said support surface,
clamp jaw means having a top surface and reciprocally guided on said body along said inclined linear guide means,
linear fluid pressure actuating means having a longitudinal axis and mounted on said body and actuatable to move in parallel relation to said support surface,
linkage means comprising a single connecting link extending between said actuating means and said jaw means and having two spaced pivots having axes parallel to each other and transverse to the longitudinal axis of said actuating means, and
said linkage means advancing and retracting said jaw means to and from a clamping position in which the top surface of said jaw means is flush with the top surface of said clamp body,
wherein said longitudinal axis of said actuating means intersects the axes of both said pivots upon reaching said clamping position.

5,149,071

DOUBLE-JAW VICE FOR HOLDING WORKPIECES

Paul L. Oliveira, 517 Anuhea Place, Volcano, Hi. 96785

Filed Nov. 4, 1991, Ser. No. 787,263
Int. Cl.[5] B23Q *3/06*
U.S. Cl. 269—43 16 Claims



1. A vice comprising:
a main frame having a front portion and a rear portion;
a first clamping jaw-member independently mounted in said front portion;
a second clamping jaw-member mounted in said rear portion, said second clamping jaw-member being mounted independently of said first clamping jaw-member, and separately mounted to said rear portion;

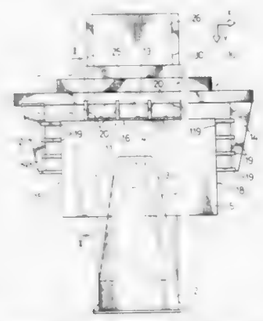
said main frame further comprising a hollow space, said first clamping jaw-member and said second clamping jaw-member being connected by said hollow space for cooperative relationship therebetween, whereby a long workpiece clamped at a first section thereof by said first jaw-member may also be simultaneously clamped at a second section thereof by said second jaw-member.

5,149,072

SHEET WORKPIECE POSITIONING DEVICE

Franco Sartorio, and Mario Scavino, both of Turin, Italy, assignors to Amada Company, Limited, Japan

Filed Dec. 15, 1989, Ser. No. 451,081
Claims priority, application Italy, Dec. 16, 1988, 68116 A/88
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—111 13 Claims



1. A sheet workpiece gripping device mounted on a supporting member of a workpiece positioning device for positioning a sheet workpiece with respect to a processing position of a sheet workpiece processing machine, comprising:

a first jaw mounted on the supporting member, projecting therefrom;

a second jaw mounted on the supporting member, projecting therefrom and free to move in its projection direction;

means for biasing the second jaw toward the first jaw when the second jaw is moved toward the supporting member, said biasing means comprising a flared surface section formed on a rear surface of the second jaw, and a regulating block mounted on the first jaw, contacting the flared surface section of the second jaw;

means, provided in the supporting member, for moving the second jaw toward the supporting member;

a coupling member coupled to the second jaw moving means and detachably coupled to the second jaw; and

a U-shaped elastic member formed with a pair of prongs having different lengths, wherein the second jaw is provided on the free end of the longer prong.

5,149,073

APPARATUS FOR USE IN THE REPAIR OF MACHINES

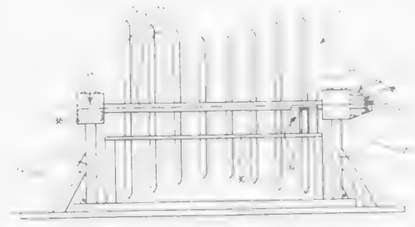
Michael J. Fraser, Broughton Hackett, United Kingdom, assignor to Refurbished Turbine Components Limited, Droitwich, United Kingdom

Filed Jun. 18, 1990, Ser. No. 539,996
Claims priority, application United Kingdom, Jun. 20, 1989, 8914156
Int. Cl.[5] B25B *9/00*
U.S. Cl. 269—297 16 Claims

1. An apparatus for the repair of a turbine rotor, said rotor having at least one array of turbine blades, said apparatus comprising:

a stand provided with a base connected to rotor supports, said rotor supports supporting the rotor at spaced positions along its length, and adapted to permit desired rotation of said rotor about a longitudinal axis thereof;

at least one work station, said work station having location means adapted to locate said work station relative to said stand, and providing a work surface adapted to extend alongside a turbine blade when the rotor is positioned on said stand; and



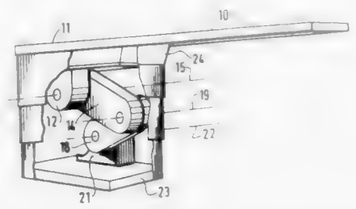
said means adapted to prevent rotation of said rotor on said stand and to prevent relative movement between a blade positioned alongside said work station relative to said work station so as to permit work operations to be carried out on said blade.

5,149,074

PATIENT SUPPORT HAVING A LONG RANGE OF VERTICAL DISPLACEMENT

Jean-Pierre Jarin, Lamoriaye, France, assignor to General Electric CGR SA, Issy les Moulineaux, France

Continuation of Ser. No. 486,413, Feb. 28, 1990, abandoned.
This application Apr. 10, 1991, Ser. No. 683,492
Claims priority, application France, Mar. 23, 1989, 89 03846
Int. Cl.[5] A61G *13/00*
U.S. Cl. 5—601 5 Claims



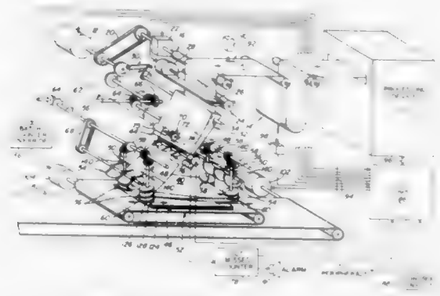
1. A patient support, wherein said support comprises a table, having a surface, one end of which is in an overhung position whilst the other end is attached to an articulation having a horizontal axis of rotation, at least one arm to which said articulation is attached whilst the other end of the at least one arm is attached to another articulation having a horizontal axis of rotation, and a pedestal which is rigidly fixed to the ground and on which said another articulation is fixed, wherein said articulations are provided with means for actuating them in angular movements such that the pivotal displacement of the at least one arm and of the table are synchronized so that an acute angle formed between the at least one arm at an associated articulation and a horizontal plane passing through the associated articulation is equal for each articulation and wherein each of said articulations are situated in different and parallel vertical planes in order to be able to be folded-back against each other thereby providing that said horizontal axis of rotation of said articulation and said horizontal axis of rotation of said other articulation is in one and the same horizontal plane and that said at least one arm is also in said horizontal plane.

5,149,075

APPARATUS FOR SEPARATING FOLDED WEB

H. W. Crowley, Newton, and Joseph R. Bilinski, Tewksbury, both of Mass., assignors to Roll Systems, Inc., Burlington, Mass.

Filed Jan. 15, 1991, Ser. No. 641,472
Int. Cl.[5] B41L *1/32*
U.S. Cl. 270—39 81 Claims



1. A web separator comprising:

means for cutting a web at programmed predetermined separation locations, the separation locations disposed variably upon the web at any position therealong and said means for cutting including blade means for dividing the web at an unbroken and unperforated separation location;

means, positioned downstream of the means for cutting, for folding the web at predetermined fold locations, the fold locations being positionable upon the web at locations different than the separation locations whereby separated web sections may be sized larger and smaller than other folded web sections;

means, positioned downstream of the means for folding, for supporting the folded web in a zig-zag stack;

said means for folding including swinging director means to guide advancing sections of the web to opposing fold edges of the zig-zag stack;

means for driving the web through the means for cutting into the director means; and

clutch means to deactivate the means for driving, while at least the means for folding, swinging director means and means for supporting continue operating.

5,149,076

ENVELOPE FEEDER WITH ADJUSTABLE CONSTANT OVERLAP

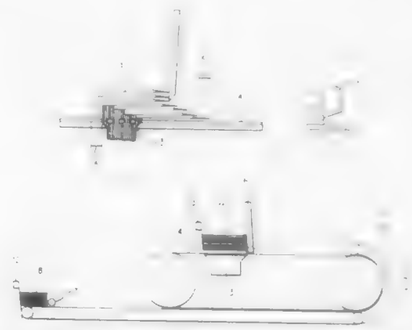
Reinhard Stenz, Brunnenwiesenstrasse 4, CH-8108 Dällikon, Switzerland

PCT No. PCT/CH88/00196, § 371 Date Jul. 10, 1989, § 102(e) Date Jul. 10, 1989, PCT Pub. No. WO89/04805, PCT Pub. Date Jun. 1, 1989
PCT Filed Jun. 13, 1989, Ser. No. 381,737
Claims priority, application Switzerland, Nov. 27, 1987, 04619/87
Int. Cl.[5] B65H *5/22, 3/34, 29/66*
U.S. Cl. 271—2 5 Claims

1. An envelope feeder for a printing machine adapted to feed envelopes from a refill pile in which the envelopes are stacked such that each flaps is folded over an upper face of the envelope to a storage pile in a stream of overlapped envelopes, said feeder comprising:

lateral feed means for laterally feeding envelopes from the refill pile with the lateral flap edge leading and with an essentially constant predetermined degree of envelope flap overlap, said lateral feed means including a first conveyor belt led around a guide roller, a stripper movably disposed above the first conveyor belt to contain the refill pile, and suction means disposed below the top portion of the first conveyor belt and the stripper for applying constant suction to a bottom envelope in the refill pile so as to draw the bottom envelope from the refill pile and hold it to the first conveyor belt, wherein the distance between the stripper and a top portion of the first conveyor belt is adjustable, wherein the longitudinal position of the stripper is adjustable to change the predetermined degree of envelope flap overlap in the stream of envelopes, and wherein the first conveyor belt is provided with perforations so as to be air-permeable; and

means for turning over the envelopes before the envelopes reach the storage pile, said means including a second conveyor belt.

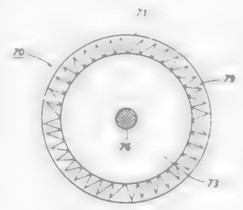


5,149,077

HYBRID NUDGER ROLL

Michael J. Martin; Steven R. Moore; Russell J. Sokac, all of Rochester; Robert P. Siegel, Penfield, and Gerald M. Garavuso, Farmington, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1991, Ser. No. 719,854
Int. Cl.[5] B65H *3/22*
U.S. Cl. 271—18.3 6 Claims



1. A nudger roll for use in a friction retard feeder for feeding substrates from a stack to a retard mechanism, comprising:

a core member;

a plurality elastomeric members supported by said core member; and

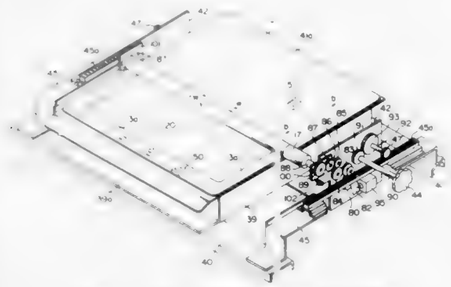
a plurality of studded members supported by said core member, and wherein said plurality of studded members are positioned on said core member alternately with respect to positioning of said plurality of elastomeric members, and wherein tips of said plurality of studded members are just below a plane along the surface of said plurality of elastomeric members.

5,149,078

RECORDING SHEET STORING APPARATUS FOR AN IMAGE FORMING SYSTEM

Naoyuki Matsuda, Machida; Sadanobu Murasaki, Isahara; Hajime Takei, Machida, and Yukiyoshi Yamakoshi, Isahara, all of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Dec. 27, 1990, Ser. No. 634,702
Claims priority, application Japan, Dec. 28, 1989, 1-341293
Int. Cl.[5] B65H *1/00*
U.S. Cl. 271—145 10 Claims



8. A recording sheet storing apparatus comprising:
storing means for storing recording sheets therein, the storing means having an opening through which the recording sheets are taken out;
a cover member which is removably adhered to the storing means to cover the opening;
winding means for winding the cover member;
supporting means for supporting the winding means in a manner that the winding means is rotatable, the supporting means being movable along the storing means to enable the winding means to operatively contact the cover member; and
driving means for providing a driving force which is operable in a first mode where the driving force is transmitted to the winding means and in a second mode wherein the driving force is transmitted to the supporting means.

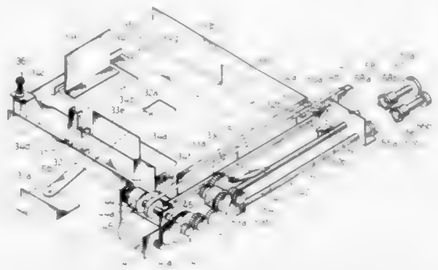
5,149,079

FEEDING DEVICE HAVING A PIVOTAL COPY MATERIAL HOLDING PLATE

Kenichi Iwamoto; Yuji Sugimoto; Toyoaki Namba; Masakatsu Itoigawa, all of Nara; Yoshihumi Shibano, Yamatokoriyama, and Kenzi Okada, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 521,839, May 10, 1990, Pat. No. 5,071,111. This application Sep. 24, 1991, Ser. No. 765,942
Claims priority, application Japan, May 15, 1989, 1-121809; May 15, 1989, 1-121810; May 15, 1989, 1-121811; May 15, 1989, 1-121813
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] B65H *1/00*
U.S. Cl. 271—162 16 Claims

1. A feeding device comprising:
an arm member freely movable in a horizontal plane with one edge thereof rotatably supported;
copy material orientation changing means whose axis is rotatably supported by the other edge of the arm member and which rotates in the horizontal plane to at least two copy material feeding directions for lateral feeding and longitudinal feeding; and
a moving member rotatably mounted in a vicinity of a corner of the copy material orientation changing means, which shifts the copy material orientation changing means by moving back and forth in a direction orthogonal to a copy material feed direction,
wherein the device further includes a guide shaft member installed in the direction orthogonal to the copy material feed direction and a moving block member rotatably supporting said moving member and having a through



hole formed substantially in the center thereof, the moving block member being guided so as to move linearly along the guide shaft through the through hole.

5,149,080

VIBRATORY SHEET FEEDER

Shinji Yamamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1991, Ser. No. 740,893
Claims priority, application Japan, Aug. 7, 1990, 2-208993; Sep. 6, 1990, 2-236627; Oct. 30, 1990, 2-292509
Int. Cl.[5] B65H *7/02*
U.S. Cl. 271—265 13 Claims

1. A vibratory feeder for a sheet comprising:
a vibration member brought into frictional contact with the sheet to be fed, said vibration member generating a travelling wave for feeding the sheet in response to an electrical signal applied thereto; and
a control member operationally connected to said vibration member for controlling the travelling wave, said control member-generating a first travelling wave controlling state in which the sheet is fed at a first- speed and a second travelling wave- controlling state in which the sheet is fed at a second speed slower than the first speed, said second travelling wave controlling state being achieved when the sheet has been fed through a predetermined distance.

5,149,081

FEED TABLE UNIT OF A SHEET-FED PRINTING MACHINE

Martin Greive, Heidelberg-Ziegelhausen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Feb. 13, 1991, Ser. No. 655,160
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—272 8 Claims

1. Feed table unit of a sheet-fed printing machine with machine side frames for feeding sheets of paper from a stacker to a printing unit, comprising a feed table including a table top, two side parts holding said table top, endless flexible conveyor means having a drive for revolving said conveyor means around said table top, and deflection rollers supported in said

side parts for guiding said conveyor means, said feed table being supported so as to be laterally displaceable with respect to the machine side frames from an operating position to a rest

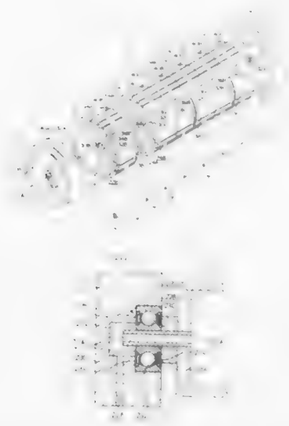
position, said fed table being laterally lockable fixedly into said operating position thereof, the printing unit having a drive connected with said deflection rollers in said operating position of said feed table.

5,149,082

DRUM FOR IMAGE RECORDING APPARATUS

Naoyuki Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 396,207, Aug. 21, 1989, Pat. No. 5,060,931.
This application Feb. 13, 1991, Ser. No. 654,467
Claims priority, application Japan, Aug. 22, 1988, 63-207848; Aug. 23, 1988, 63-209095; Aug. 23, 1988, 63-209096
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—276 7 Claims



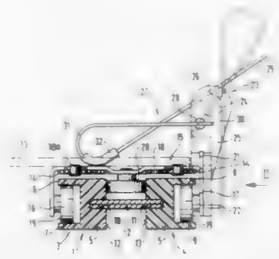
1. A drum for an image recording apparatus comprising:
a main body member comprising a plurality of separate cylindrical members, each comprising an outer surface and two end surfaces separated in an axial direction, said cylindrical members being arranged serially in said axial direction, neighboring ones of said cylindrical members having a plurality of openings in end surfaces thereof for attracting a recording material against a surface wall constituted by said outer surfaces of said cylindrical members;
a pair of cylindrical side members for closing two opposite sides of said main body member and forming a chamber internal of said surface wall;
a shaft member arranged to penetrate said main body and said pair of side members, so as to be disposed internally of said surface wall and to be secured to at least said pair of side members, in which a through hole establishing a connection between said chamber and outside is formed therein; and
a radial ball bearing supporting said shaft member and having a sealing member secured to either an outer race or an inner race.

5,149,083

CONVEYOR ASSEMBLY WITH GRIPERS FOR SHEET-LIKE PRODUCTS

Peter Merkli, Oftringen, and Jean-Claude Oppliger, Niederhasli Schweiz, both of Switzerland, assignors to GRAPHA-Holding AG, Hergiswil, Switzerland

Filed Apr. 3, 1991, Ser. No. 679,800
Claims priority, application Switzerland, Apr. 11, 1990, 1250/90
Int. Cl.[5] B65H *29/04*
U.S. Cl. 271—277 24 Claims



1. A gripper conveyor assembly, particularly for sheet-like products, comprising an elongated guide defining a plurality of elongated tracks; a plurality of grippers each having a plurality of roller followers, at least one for each of said tracks and each movable along the respective track; a substantially rigid elongated carrier defining a predetermined path for said grippers and said guide comprising at least one elongated plastic rail connected with said carrier; and means for moving said grippers relative to said guide, including at least one flexible traction element connected with said grippers.

5,149,084

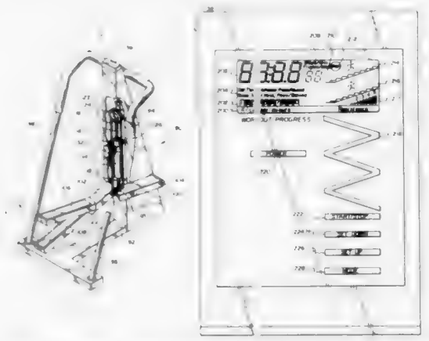
EXERCISE MACHINE WITH MOTIVATIONAL DISPLAY

William T. Dalebout; Michael Burk, and Kelly Boren, all of Logan, Utah, assignors to Proform Fitness Products, Inc., Logan, Utah

Filed Feb. 20, 1990, Ser. No. 482,188
Int. Cl.[5] A63B *23/035*
U.S. Cl. 482—3 16 Claims

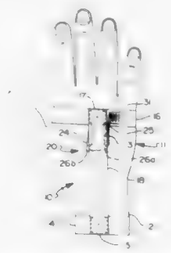
1. An exercise apparatus, comprising:
a frame;
a movable member associated with said frame, said moveable member being positioned and configured to be repetitiously moved by a user at a user rate of movement selected by said user;
speed sensing means associated with said moveable member for sensing said user rate;
input means associatively liked with a computation means and operable by said user to input target values of exercise parameters, said target values including a target user rate, target distance and target time;
said computation means associatively linked with said speed sensing means for computing exercise parameters, said computation means being operable to receive said target

values from said input means and said user rate from said speed sensing means, and to calculate one of said target values from any two of said target values; and



display means associatively linked with said computation means for displaying said target values.

5,149,085
TRAINING AID FOR SHOOTING A BASKETBALL
William Sanchez, 620 Beech, Clio, Mich. 48420
Filed Jan. 22, 1992, Ser. No. 825,401
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—1.5 A **8 Claims**



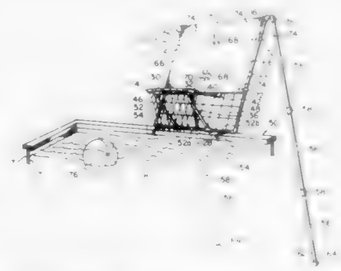
5. A device for training a basketball player in proper shooting technique, the device being adapted to be placed on the player's wrist and hand and comprising:
(a) a first band adapted to be placed substantially surrounding the wrist of the player;
(b) a second band adapted to be placed substantially surrounding a portion of the hand of the player;
(c) a strap interconnecting the first band to the second band;
(d) an electrical switch which is normally open and which is disposed substantially below the strap, the switch comprising a pair of electrical contacts; and
(e) a sound generating device which is adapted to generate a sound when the switch is closed to complete an electrical circuit.

5,149,087
TURF REPAIR TOOL INCLUDING CLUB SUPPORT
James W. Thompson, Jr., 1680 Midland Rd., Southern Pines, N.C. 28387
Filed Feb. 10, 1992, Ser. No. 832,960
Int. Cl.[5] A63B *37/00;* **B65B** *67/12*
U.S. Cl. 273—32 B **3 Claims**

1. A utility golf accessory comprising: an elongated rod having a handle end a ground penetrating end; a handle formed on the handle end of the elongated rod; a ground penetrating fork secured to the ground penetrating end of the elongated rod for repairing ball marks and divots; and means disposed on the handle end of the elongated rod for receiving and supporting the handle end of golf clubs, the support means including a pivot pin secured to the handle and extending therefrom and a hook pivotally mounted about the pivot pin and rotatable thereabout and wherein the hook is adapted to receive the handle end of one or more golf clubs while the utility golf accessory is anchored in the ground.

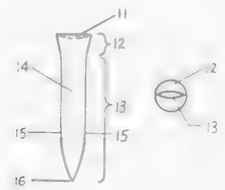
5,149,088
POOLSIDE BASKETBALL GAME
Irving Ziff, 333-B W. Alondra Blvd., Gardena, Calif. 90248
Filed Aug. 2, 1991, Ser. No. 739,463
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—15 R **5 Claims**

1. The combination of an assembly of component means for assembling a poolside basketball game having the capability for attachment to various sizes of pools and widths of top rails of above-ground swimming pools, and the means comprising:
a) a basketball hoop means for providing a target for a basketball, with integral supporting brace means for providing support for the hoop means;
b) a backboard framework means for supporting a backboard, and a cord net attached around the hoop,
c) a second backstop means for providing a backstop comprising a hard reboundive panel;



d) an attachment means for rigidly securing said hoop means and backboard means to the top rail of an above-ground swimming pool; and
e) an adjustable rearwardly deposed bracing means for bracing, supporting, and stabilizing the backboard means on the backside thereof.

5,149,088
WEDGE SHAPED GOLF TEE
Patrick J. O'Hara, 1916½ Whitley Ave., No. 3, Los Angeles, Calif. 90068
Filed Mar. 21, 1991, Ser. No. 673,666
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—33 **3 Claims**

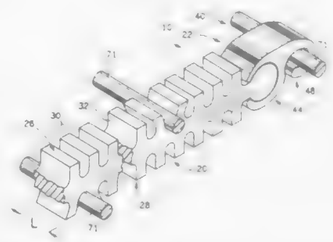


1. A one piece golf tee for supporting a golf ball comprising an elongated flexible ground engaging shaft, said shaft having a circular concaved ball support head at one end thereof and its other end terminating in a tapered point; said shaft further having a substantially elliptical shaped transverse cross-section intermediate said ball support head and said tapered point, said elliptical shaped cross-section having major and minor axes, each end of said minor axis terminating at a convex face of said shaft and each end of said major axis terminating in a sharp edge of said shaft, said sharp edges extending approximately 80% of the length of said tee when in use, said tee, upon being contacted by a golf club head traveling in a direction substantially parallel to said minor axis and substantially transverse to said major axis will have a bending moment about an axis defined by the intersection of the ground surface and said shaft.

5,149,089
METHOD OF LOCATING GRIPPING HOLES IN BOWLING BALL
George Zelinski, 17311 McCarron Rd., Lockport, Ill. 60441
Division of Ser. No. 612,819, Nov. 14, 1990, Pat. No. 5,046,731.
This application Mar. 21, 1991, Ser. No. 673,229
Int. Cl.[5] A63B *37/06*
U.S. Cl. 273—63 E **10 Claims**

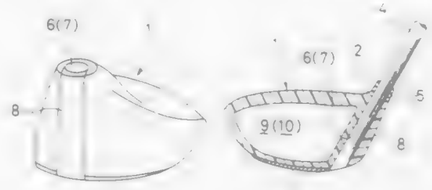
1. A method of locating a thumb and finger holes in bowling ball having a mass of preselected density and a center (**16**) and a top weight block of a greater density that the preselected density and having a center axis of symmetry (**28**) aligned with said center (**16**) and a plane of symmetry (**36**) which passes through said center axis (**16**) of said elongated weight block, said weight block having a length greater than its width in a direction perpendicular to said center axis, and said plane of symmetry passing along said length of said block:
determining the location of said plane of symmetry of the weight block; and
drilling the thumb and finger holes into the ball around said center axis so that said thumb and finger balls have a preselected angular relationship only to said plane of symmetry (**36**) of said weight block to achieve a desired breaking point for the ball.

5,149,090
VIBRATION DAMPING DEVICE FOR SPORTS RACQUET
Sam H S Chen, 13947 Carriage Rd., Poway, Calif. 92064, and C. F. Chang, 403, Sec. 2, Sha-Tzen Road, Ta-Tu, Taichung Hsien, Taiwan
Filed Dec. 30, 1991, Ser. No. 814,494
Int. Cl.[5] A63B *51/10*
U.S. Cl. 273—73 D **19 Claims**



1. A device for damping vibrations for a sports racquet having sets of interwoven strings defining a striking surface; said device comprising:
an elongated band having a longitudinal axis and composed of elastic flexible material; said band including:
a first end; and
a second end opposite said first end; and
securing means attached to said first end and to said second end for securing said band in a stretched condition between said opposite ends to a tennis racquet in an interwoven relationship with a plurality of strings on the racquet striking surface; said band further including:
a plurality of channels therein; each said channel including side walls; each said channel for receiving a string interwoven with said band such that said channel side walls bear against opposite sides of the string.

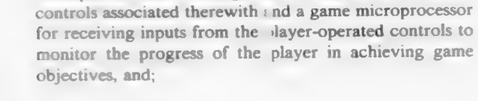
5,149,091
GOLF CLUB HEAD
Takaharu Okumoto, Chigasaki; Tetsuya Hayashi, Hiratsuka, and Masahiro Kato, Zama, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed May 3, 1991, Ser. No. 695,701
Claims priority, application Japan, May 7, 1990, 2-117046; May 9, 1990, 2-117540; Jun. 6, 1990, 2-59193[U]; Jun. 6, 1990, 2-59194[U]
Int. Cl.[5] A63B *53/02*
U.S. Cl. 273—80.2 **10 Claims**



1. A gold club head comprising a club head main body molded from a synthetic resin, said body having a heel portion having a backside, a sole portion having a bottom surface, an upper portion having a top surface and a hosel portion having an upper end located adjacent said heel portion and said upper portion, a channel in said heel portion having an opening on the backside thereof, said channel and its opening extending from the upper end of the hosel portion to the bottom surface

of the sole portion and a separate cover member mountable over said opening to form, with said channel, a shaft fit hole for receiving a golf club shaft.

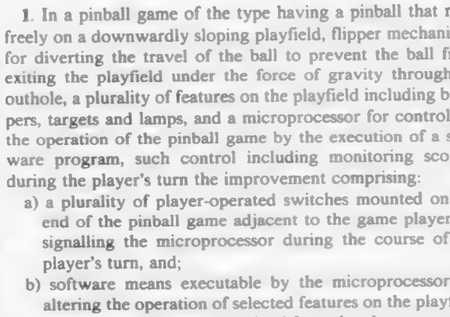
5,149,092
LOCKING MEANS FOR EXTENDABLE BATON
Kevin Parsons, 16 Wagon Wheel Dr., Appleton, Wis. 54915
Filed Aug. 16, 1991, Ser. No. 746,468
Int. Cl.[5] F41B *15/02*
U.S. Cl. 273—84 R 19 Claims



1. An extendable baton of the type having an outer tubular handle defining a baton axis, the handle with a capped end, an open end and an inner peripheral wall, and at least one nesting, telescoping member having an outer peripheral wall, said telescoping member carried in said handle within said inner peripheral wall and axially movable relative thereto between a fully retracted, nested position, and a fully extended, expanded position, the baton further including means for selectively maintaining the telescoping member in either the retracted or expanded position, said means comprising:
   a. a positive stop for limiting the axial movement of the telescoping member relative to the handle when in the extending position, said positive stop adapted for engaging a portion of the inner peripheral wall of the handle with a portion of the outer peripheral wall of the telescoping member in a noninterfering relationship for maintaining the axial alignment of the handle and the telescoping member;
   b. a locking device movable between a first, locked position and a second, unlocked position for selectively locking the telescoping element in one of the extended and retracted positions; and
   c. an annular channel in the inner peripheral wall of the handle, and adapted for receiving the locking device for locking the telescoping element in a retracted position.

5,149,093
AMUSEMENT DEVICE WITH TRADING CARD DISPENSER
Winston H. Schilling, Park Ridge; Mark D. Ritchie, Carol Stream; John Krutsch, and Joseph Joos, both of Chicago, all of Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.
Continuation of Ser. No. 669,385, Mar. 14, 1991, Pat. No. 5,137,278. This application Jan. 9, 1992, Ser. No. 819,104
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Int. Cl.[5] A63F *7/02, 7/36*
U.S. Cl. 273—118 A 5 Claims

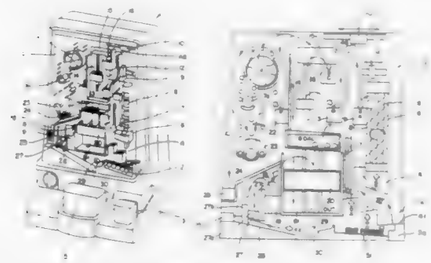
1. In combination:
   a coin operated amusement game including player operated controls associated therewith and a game microprocessor for receiving inputs from the player-operated controls to monitor the progress of the player in achieving game objectives, and;
   a trading card dispenser for dispensing trading cards to a game player responsive to signals from the game microprocessor when predetermined game objectives are achieved.



5,149,094
PLAYER-OPERATED CONTROL SYSTEM FOR PINBALL GAMES
Gregory J. Tastad, Stone Park, Ill., assignor to William Electronics Games, Inc., Chicago, Ill.
Continuation of Ser. No. 551,277, Jul. 19, 1990, abandoned. This application Aug. 5, 1991, Ser. No. 741,228
Int. Cl.[5] A63F *7/30*
U.S. Cl. 273—121 A 1 Claim

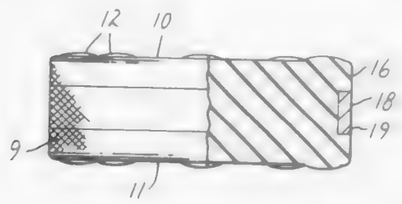
1. In a pinball game of the type having a pinball that rolls freely on a downwardly sloping playfield, flipper mechanisms for diverting the travel of the ball to prevent the ball from exiting the playfield under the force of gravity through an outhole, a plurality of features on the playfield including bumpers, targets and lamps, and a microprocessor for controlling the operation of the pinball game by the execution of a software program, such control including monitoring scoring during the player's turn the improvement comprising:
   a) a plurality of player-operated switches mounted on the end of the pinball game adjacent to the game player for signalling the microprocessor during the course of the player's turn, and;
   b) software means executable by the microprocessor for altering the operation of selected features on the playfield according to the signal received from the player-operated switches during the course of the player's turn, each time the player achieves predetermined game objectives.

5,149,095
BALL CONVEYING GAME APPARATUS
Kiyoshi Kashimoto, and Masanori Mizunuma, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Nov. 8, 1991, Ser. No. 789,684
Claims priority, application Japan, Nov. 30, 1990, 2-128070[U]
Int. Cl.[5] A63F *7/00*
U.S. Cl. 273;121 B 20 Claims



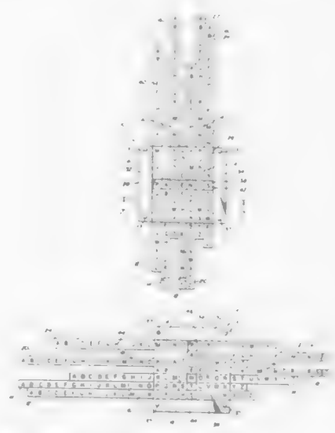
1. A ball conveying game apparatus comprising:
   a plurality of balls;
   a vertical game board surface;
   a plurality of ball support portions provided on said vertical game board surface;
   at least one protrusible and retractable plunger provided at at least one of said plurality of ball support portions;
   a manual operating member, operatively connected to said plurality of ball support portions, for transferring a ball from one of said ball support portions to another one of said ball support portions along a ball moving course, and conveying the ball from a starting point to a goal point; and
   a plurality of choosable ball moving courses arranged in said ball moving course, selection from among said choosable ball moving courses made by operating said manual operating member.

5,149,096
HOCKEY PUCK
Michael D. Keating, 6231 Sixth St. N., Oakdale, Minn. 55119; Robert W. Norris, 6704 Wooddale Ave., Minneapolis, Minn. 55435, and Ronald K. Jakubas, 7761 Clinton Rd., Jackson, Mich. 49201
Continuation-in-part of Ser. No. 277,957, Nov. 30, 1988, which is a continuation of Ser. No. 33,011, Mar. 31, 1987, abandoned. This application Nov. 5, 1991, Ser. No. 788,133
Int. Cl.[5] A63B *71/00*
U.S. Cl. 273—128 R 6 Claims



1. A hockey puck having a body of a circular shape and thickness of a conventional hockey puck, said body having oppositely projecting spaced ends, characterized in that each end has at least three symmetrically circumferentially spaced circular dome shaped projections formed integrally with said body on said ends and extending therefrom between 0.01 to 0.04 inch and terminating with a dome-shaped end surface substantially parallel to each other and to the surface of the puck.

5,149,097
CROSSWORD PUZZLE AID
John H. Tonello, 11 Five Corners Rd., Centerville, Mass. 02632, and Michael J. Tonello, 13 Dartmouth St., Boston, Mass. 02116
Filed May 1, 1991, Ser. No. 694,145
Int. Cl.[5] A63F *9/00*; G09B *1/28*
U.S. Cl. 273—148 R 10 Claims



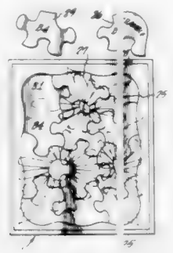
1. A word puzzle device comprising:
   a plurality of elongated strips each having two sets of equally spaced letters, wherein one of said sets is oriented vertically and another of said sets is oriented horizontally,
   a housing for retaining said plurality of strips in parallel,
   said plurality of strips being arranged in a side by side orientation and movable with respect to one another in the housing,
   said housing having a first opening for viewing said vertically oriented letters and a second opening for viewing said horizontally oriented letters on each of said plurality of strips, wherein said strips are moveable so that different letter combinations can be viewed through said openings.

5,149,098
JIGSAW PUZZLE GAME BOARD HAVING CORRESPONDING INDICIA
William J. Bianchi, 10935 S. Fulton Wells, Santa Fe Springs, Calif. 90670
Continuation of Ser. No. 467,902, Jan. 22, 1990, Pat. No. 5,062,637. This application Jul. 3, 1991, Ser. No. 725,658
Int. Cl.[5] A63F *9/10*
U.S. Cl. 273—157 R 6 Claims

1. A board game comprising a game board having a base and frame around the base, and a plurality of game pieces in the form of jigsaw puzzle pieces which substantially fill the base, the frame being disposed around the base to hold the game pieces on the base, the improvement comprising
   the base having a top surface for normally supporting a plurality of jigsaw game pieces, and the base having formed thereon game piece sections over substantially the entire top surface of the base in the form of outlines of respective game pieces, and further having first game indicia in each such section,
   the game pieces having bottom surfaces and being shaped for mating with the outlines of respective game piece

sections, and the bottom surfaces of the game pieces having like first game indicia thereon,

said first game indicia comprising first indicia on a board and on each game piece for ease of associating a particular game piece with the game board and comprising a second indicia in each game piece section of the top surface of the base and on the bottom surface of each respective game



piece identifying a particular game piece and location thereof on the base, and

at least one of said game pieces having on the bottom surface a third unique indicia, such unique indicia when on a selected game piece and this game piece being placed in a game board causes, according to rules of play, the board to be advanced from one player to the next player.

5,149,099

GOLF CLUB SWING TRAINING DEVICE AND METHOD

Daniel L. Radakovich, 14479 Regency Dr., Strongsville, Ohio 44135

Filed Jan. 17, 1992, Ser. No. 822,344
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—189 R 16 Claims

1. A device for facilitating swinging of a playing club, the device comprising:

a loop of elastic material sized to be placed in a relaxed condition over a player's head and rest on a player's shoulder so that a rear distal portion of the elastic loop is disposed approximately at a position of or adjacently below the shoulder blades and a front distal portion of the loop is disposed at a first position approximately between the player's chest and abdomen;

a connecting strap secured to the elastic loop at the rear distal portion of the elastic loop; and

means for securing the strap to the body of a player so that the loop may be stretched from said first position;

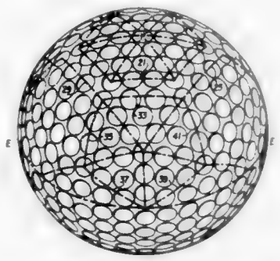
said elastic loop having a coefficient of elasticity which enables the loop to be stretched by the hand of the player pushing against the front distal portion of the loop while gripping the handle of the club so as to stretch the elastic loop from said first position to a second position in which the arms of a player are fully outstretched while holding onto the loop and a handle end of the club.

5,149,100

GOLF BALL

Terence Melvin, Somers, Conn., and Joseph F. Stiefel, Shrewsbury, Mass., assignors to Lisco, Inc., Tampa, Fla.

Filed Jun. 17, 1991, Ser. No. 716,465
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 5 Claims



1. A golf ball having a plurality of dimples formed on the spherical surface of the golf ball, said surface defining opposite poles and an equator midway between said poles dividing the surface into two hemispheres, each of said hemispheres having substantially the same dimple pattern, said dimple pattern comprising

a dimple located at each pole;

a hexagon formation of dimples comprising six substantially equally spaced lines of dimples radiating outwardly from said pole and dimples between the outer ends of said liens to thereby define six triangular areas of dimples in said hexagon formation;

six substantially equally sized adjacent pentagon formations of dimples, each comprising five lines of dimples interposed between said hexagon formation of dimples and the equator, one side of each of said pentagon formations being substantially parallel top one side of said hexagon formation, each of said pentagon formations of dimples sharing a common line of dimples with adjacent pentagon formations of dimples; and

additional dimples located within the liens of dimples defining said hexagon formations and said pentagon formation, and between said pentagon formations and said equator.

5,149,101

HORSE RACE GAME APPARATUS

Peter A. Mazza, Rte. 6, Box 526, Dahlonega, Ga. 30533, and Jasper Kirk, 235 Valley Dr., Roswell, Ga. 30075

Filed Nov. 25, 1991, Ser. No. 797,369
Int. Cl.[5] A63F *3/00, 9/14*
U.S. Cl. 273—246 1 Claim

1. A horse race game apparatus, comprising,

a game board, the game board including a first end wall, a second end wall, a first side wall, and a second side wall defining a generally rectilinear configuration, with a starting row space arranged contiguously along the first end wall on a top surface of the game board, with an ending row space arranged contiguously with the second end wall on the top surface of the game board, and

spaced parallel game path spaces directed between the starting row space and the ending row space, and

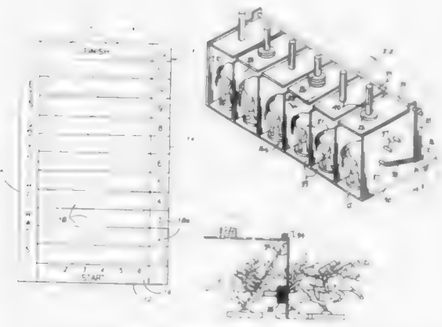
a predetermined number of dice members, and

a dice cup arranged for reception of the dice members, and a plurality of tokens equal to the predetermined number, and

a plurality of wagering discs, and

each of the tokens afforded a number from one to the predetermined number, and each dice member including a digital representation on the dice member from one to the predetermined number, whereupon directing of the dice members from the dice cup, the tokens are moved forwardly when a dice member indicates a digital representation in association with a token, and the starting row space is demarcated into a plurality of starting spaces equal to the predetermined number, and wherein the starting row space includes a starting space first starting side wall contiguously joined to the first side wall coextensive with the starting row space oriented orthogonally relative to the game board top surface, and a second starting side wall parallel to the first starting side wall arranged contiguously with the second side wall coextensive with the starting row space, wherein the first starting side wall and the second starting side wall are of a predetermined height, and the starting row space includes a plurality of intermediate side walls orthogonally oriented to the game board top surface between the first starting side wall and the second starting side wall and parallel to the first starting side wall and the second starting side wall coextensive therewith to define the plurality of starting spaces in the starting row space, and

a support axle pivotally mounted parallel to the game board



top surface mounted orthogonally to the first starting side wall and the second starting side wall and positioned above an intersection defined by the starting row space and an adjacent game path space of said plurality of game path spaces, and a starting axle lever fixedly mounted to a first distal end of the support axle, the starting lever positioned adjacent to and exteriorly of the first starting side wall, wherein the starting axle lever includes a lever lower peg mounted adjacent a lower distal end of the support axle lever, and the first starting side wall includes a plurality of first starting side wall pegs, and each of the first starting side wall pegs is positioned at varying positions relative to the support axle, and a spring mounted between the lever lower peg and one of the plurality of first starting side wall pegs, and

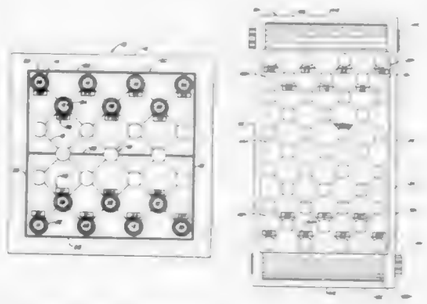
a plurality of axle plates, each axle plate mounted orthogonally relative to the starting axle and extending over a starting space of said plurality of starting spaces, and each axle plate defined by a predetermined height equal to the predetermined height of the first starting side wall and the second starting side wall, and each axle plate including a plate rod orthogonally mounted to said axle plate and wherein each wagering disc includes a wagering disc bore directed therethrough permitting each wagering disc to be positioned onto one of said axle plate rods.

5,149,102

APPARATUS AND METHOD OF PLAYING A MATH GAME

Bernard W. McGowan, 8205 Brownsville, Bethany, Okla. 73008, and Stephen P. Scully, Fort Lauderdale, Fla., assignors to Bernard W. McGowan, Oklahoma City, Okla.

Filed Sep. 23, 1991, Ser. No. 765,216
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—258 18 Claims



1. A math game comprising:

a game board having a plurality of defined spaces comprising goals with some of the goals being designated first home goals, some of the goals being designated second home goals and the remaining goals being designated field goals, the field goals being disposed between the first home goals and the second home goals;

a plurality of first goal math indicia, each first goal math indicia being disposed on the game board near and associated with one of the first home goals;

a plurality of second goal math indicia, each second goal math indicia being disposed on the game board near and associated with one of the second home goals;

a plurality of first playing pieces, each first playing piece being disposable on one of the first home goals at a start of game position;

a plurality of second playing pieces, each second playing piece being disposed on one of the second home goals at the start of game position, the first playing pieces being movable on at least some of the field goals to one of the second home goals and the second playing pieces being movable on at least some of the field goals to one of the first home goals, each first playing piece and each second playing piece having playing math indicia disposed thereon, each first playing piece being movable from the first home goal where said first playing piece initially is disposed sequentially onto one or more of the field goals and onto one of the second home goals and each second playing piece being movable from the second home goal where said second playing piece initially is disposed sequentially onto one or more of the field goals and onto one or more of the first home goals until all of the first playing pieces are disposed on the second home goals or all of the second playing pieces are disposed on one of the first home goals or until the first playing pieces and the second playing pieces no longer are movable on the game board in an end of game position, a score being totalled when the first and second playing pieces are at the end of game position and a score being the playing math indicia on the first playing piece or the second playing piece combined with the second goal math indicia or the first goal math indicia respectively where the first or second playing piece is disposed at the end of game position;

a game box, the game board being supported on the game box and the game box including a component space;

a math function board supported on the game box and disposed under the game board; and

wherein the game board further comprises slots in the game board with each slot being associated with one of the first home goals or the second home goals, the math function board having a plurality of math indicia disposed thereon, and at least one of the game board and the math function board being movable to align one of the math indicia on the math function board with each slot in the game board, each math indicia aligned with one of the slots comprising one of the first or second goal math indicia; and

roller means rollingly supported on the game box, the math function board being connected to the roller means and the roller means being rollingly movable to rollingly to move the math function board in a first direction or a second direction to align different math indicia on the math function board with the slots in the game board.

5,149,10[illegible]

WORD EXTRACTING WORD GAME AND METHOD

Alice A. Ross, 2131 St. Lukes La., Baltimore, Md. 21207

Filed Feb. 15, 1990, Ser. No. 480,652
Int. Cl.[5] A63F *9/18*
U.S. Cl. 273—432 6 Claims

1. A method of playing a word game comprising the steps of:

selecting a group of players;

selecting an initiating player from the group of selected players;

randomly selecting a known word from a word supply for viewing by the initiating player;

initiating a timer for a preselected time period;

identifying and recording known words which already exist within the left to right letter order of the randomly selected known word by the initiating player, and ceasing such identifying and recording when the preselected time period has expired;

awarding and recording points based on the number of such known words correctly identified within the randomly selected known word;

repeating the foregoing steps by the remaining players from said group of players until a preselected point total of the recorded points is reached by at least one of the group of players.

5,149,1[illegible]4

VIDEO GAME HAVING AUDIO PLAYER INTERATION WITH REAL TIME VIDEO SYNCHRONIZATION

Elissa Edelstein, 343 Cardinal Medeiros Ave., Cambridge, Mass. 02141

Filed Feb. 6, 1991, Ser. No. 651,314
Int. Cl.[5] A63F *9/22*
U.S. Cl. 273—434 17 Claims

1. A video game system, comprising:

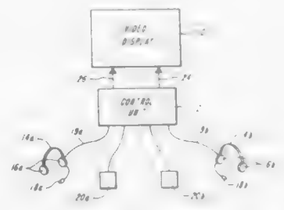
a) an audio input means for receiving audio input from a player of a video game; and

b) a video display for displaying video images of the video game;

c) data processing means programmed to generate and coordinate activity of a video game, said data processing means including

1) means for providing a video object on said video display which represents said player in the video game;

2) means for synchronizing the audio input received from the player through the audio input means with the video object of the player so that the video object mimics



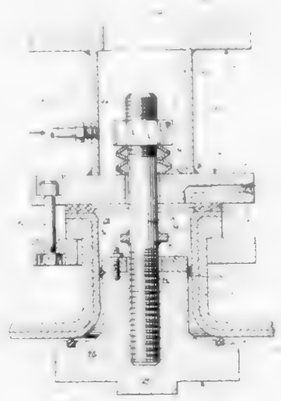
speaking in a fashion synchronized with said audio input.

5,149,105

METHOD AND APPARATUS FOR REPAIRING VESSELS

Phillip R. Beaver; Thomas E. Henke; Charles R. Bergen, and Cecil P. Loechelt, II, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 11, 1991, Ser. No. 652,982
Int. Cl.[5] F16J *15/06*; G01M *3/04*
U.S. Cl. 277—1 19 Claims



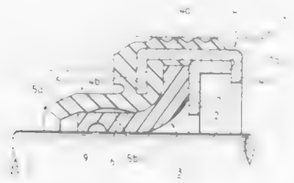
1. A method for sealing a port of a lined vessel, which method comprises: (1) sealing said port with an apparatus comprising (a) a sealing means for forming a gas-tight seal with said port to close off said port, said sealing means containing an adjustment rod, an urging means, and an adjustment means, (b) a chamber forming means for forming, along with said sealing means, a chamber, (c) an inlet, and (d) an outlet which inlet and outlet are both in gaseous communication with said chamber; (2) feeding an inert gas via said inlet; (3) continually exhausting the fed gas via said outlet; and (4) monitoring said outlet to determined the presence in the exhausted gas of a vessel fluid, atmospheric gases, or both a vessel fluid and atmospheric gases which may have leaked into said chamber.

5,149,106

LIP SEAL DEVICE

Akira Takenaka; Keiichi Shimasaki, and Hiroshi Kanayama, all of Aichi, Japan, assignors to Taibo Kogyo Co., Ltd., Aichi, Japan

Continuation of Ser. No. 547,255, Jul. 3, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 834,980
Claims priority, application Japan, Jul. 4, 1989, 1-172563
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—37 2 Claims



1. A lip seal device for sealing the gap between a housing and a rotatably supported rotary shaft, comprising:

a case surrounding said rotary shaft;

a lip seal having an outer peripheral base end portion which is secured to said case, and an inner peripheral front end portion which is curved toward a sealed fluid and includes a sealing surface in sliding contact with the outer surface of said rotary shaft, a first annular groove being formed in the sealing surface of said lip seal and being continuous around the circumference of said rotary shaft;

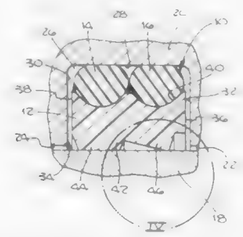
an elastic retaining member having an outer peripheral base end portion secured to said case and an inner peripheral front end portion circumscribing the outer surface of the front end portion of said lip seal so as to urge the front end portion of said lip seal towards said rotary shaft, the front end portion of said retaining member being spaced from said rotary shaft wherein said retaining member has a base portion between the outer peripheral base end portion and the inner peripheral front end portion thereof and a second annular groove is formed in the base portion and spaced from said lip seal to concentrate sealed fluid pressure on the front end portion of said retaining member wherein said retaining member contacts said lip seal on immediate opposite sides of said second annular groove.

5,149,107

ELASTOMER ENERGIZED SEALING AND EXCLUSION DEVICE

Martin M. Maringer, Fort Wayne, Ind.; Henry A. Traub, Palisades; John W. Kosty, Fountain Valley, both of Calif., and O. Theodor Mack, Fort Wayne, Ind., assignors to W. S. Shamban & Company, Santa Monica, Calif.

Continuation of Ser. No. 330,105, Mar. 29, 1989, abandoned. This application Aug. 12, 1991, Ser. No. 746,795
Int. Cl.[5] F16J *15/24, 15/32*
U.S. Cl. 277—165 9 Claims



1. A seal assembly for sealing the annular space between first and second reciprocating members, said second member including an annular groove defining a seal housing for said seal assembly, said seal housing having a bottom, sides and an open top adjacent to said first member, said groove being closed except for said top, said seal assembly being adapted to prevent the escape through said annular groove of hydraulic fluid or gas from a hydraulic fluid or gas reservoir located on an interior side of said seal assembly, said seal assembly also being adapted to exclude the entry into said hydraulic fluid or gas reservoir of contaminants located on an exterior side of said seal assembly, said seal assembly comprising:

a seal ring having an interior edge, an exterior edge, a bottom edge and a top edge for sealing contact with said first reciprocating member, said seal ring being generally rectangular in cross-section, said bottom edge including two grooves therein facing said seal housing bottom, two energizer rings disposed in said respective grooves, said grooves and energizer rings having conforming shapes whereby said energizer rings are located radially between said housing bottom and said seal ring bottom edge for providing directing bias to said seal ring to urge said seal ring top edge against said first reciprocating member, said top edge including an exclusion portion adjacent to said exterior edge and a sealing portion located adjacent to said interior edge, said sealing portion of said top edge comprising:

a) an annular seal apex for sealing contact with said first member;

b) a first surface extending radially from said seal apex towards said seal ring bottom edge and sloped towards said interior edge at an angle of between about 10 to 40 degrees relative to a plane of said seal assembly which is perpendicular to the axis of said annular space;

c) a second surface extending axially from said first surface to the interior edge of said seal ring, said first and second surfaces defining an annular a vortex producing means which directs hydraulic fluid or gas back into said reservoir during reciprocal movement of said first and second members;

d) a third surface extending radially from said seal apex towards said seal ring bottom edge and sloped towards said exterior edge at an angle of between about 70 to 85 degrees relative to a plane of said seal assembly which is perpendicular to the axis of said annular space; and

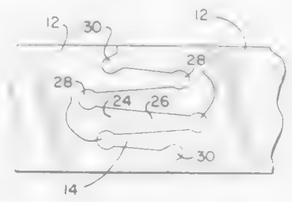
a fourth surface extending radially from said third surface back to said seal ring top edge wherein said fourth surface is sloped towards said exterior edge at an angle of between about 10 to 40 degrees relative to a plane of said seal assembly which is perpendicular to the axis of said annular space, wherein said third and fourth surfaces define a hydraulic fluid or gas chamber for trapping hydraulic fluid or gas which leaks past said seal apex.

5,149,108

MULTI-PIECE GASKET JOINT

Karoly Leiszter, West Allis, Wis., assignor to Great Gasket Concepts, Inc., West Allis, Wis.

Filed Feb. 15, 1991, Ser. No. 657,162
Int. Cl.[5] F16J *15/00*
U.S. Cl. 277—199 1 Claim



1. A multiple-piece gasket comprising:

a first piece of elongated gasket material having at least one end terminating in a plurality of longitudinally extending fingers with a plurality of grooves disposed therebetween, said fingers having at least two different lengths and two different shapes with a rounded tip disposed on the end of said fingers,

a second piece of elongated gasket material having at least one end terminating in a plurality of longitudinally extending fingers with a plurality of grooves disposed therebetween, said fingers having at least two different lengths and two different shapes with a rounded tip disposed on the end of said fingers,

said fingers on said second piece configured to be accepted by and frictionally held within said grooves on said first piece and

said grooves on said second piece configured to accept and frictionally hold said fingers on said first piece,

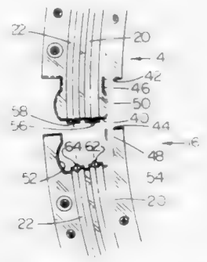
the mating of said fingers and grooves defining a seam line extending across the width of the joined gasket pieces, the length of said seam line being greater than twice the width of the joined gasket pieces.

5,149,109

INTERLOCKING SEGMENTED SEAL

Jerry G. Jelinek, LaHabra, and Orville J. Bain, Vay Nuys, both of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Sep. 18, 1991 Ser. No. 761,591
Int. Cl.[5] F 6J *9/16*
U.S. Cl. 277—199 **7 Claims**



1. A continuous seal for isolating a first area bounded by said seal from an exterior area, said first area in communication with internal portions of first and second separable bodies, said seal being held by attachment means to at least one of said bodies; said seal including:

a retainer, said retainer comprised of generally rigid material, said retainer having a first face and a second face generally opposed of said first face;

said retainer comprised of separable segments, each of said segments having a first edge and a second edge, said first and second edges abutting second and first edges respectively of adjacent segments when said segments are assembled in said seal, at least one first segment being attached to a first body before at least one second segment is attached to said first body;

each of said segments further including a resilient element mounted thereon, said element including a first portion extending normal or said first surface on each segment, and a second portion extending normal of said second surface on each segment;

said first and second element portions each having first ends and second ends adjacent said first and second edges respectively of each segment, said first and second ends of said resilient element portions each extending beyond said first and second edges when said segments are in the unassembled condition, whereby said resilient element portions are in abutting compressed relation when said segments are assembled in said seal to provide continuity of said sealing elements about said seal;

wherein an improvement comprises:

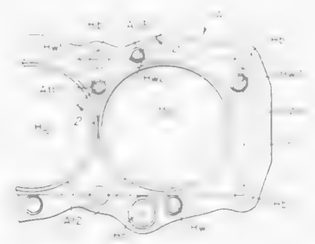
said first and second ends of said resilient element portions comprising first and second tapered element surfaces respectively, said first and second surfaces extending at an acute angle relative to a direction normal of said first and second faces of said segments, and wherein said first tapered element surface of said first segment is directed outward and away from said first body, whereby upon attachment of said second segment to said first body said first and second tapered faces are in abutting compressed relation and dislocation of adjacent resilient element portions is minimized.

5,149,110

METAL GASKET WITH FLUID HOLE SEALING SEVICES

Susumu Inamura, Tokyo, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 712,894
Claims priority, application Japan, Jul. 11, 1990, 2-73596[U]; Aug. 7, 1990, 2-83093[U]
Int. Cl.[5] F16J *15/08*
U.S. Cl. 277—235 B **9 Claims**



1. A metal gasket for an internal combustion engine having a plurality of cylinder bores and bolt holes, and at least first and second fluid holes, said first fluid hole being located within an area surrounded by an imaginary line linking centers of the bolt holes along an outer periphery of the gasket, and said second fluid hole being located outside the area surrounded by the imaginary line, said gasket comprising:

a first metal plate extending substantially throughout an entire area of the engine and including a plurality of holes corresponding to the cylinder bores, bolt holes and first and second fluid holes,

a first bead formed on the first metal plate around the first fluid hole for sealing around the same, and

a second bead formed on the first metal plate around the second fluid hole, said first bead having spring constant higher than that of the second bead so that when the gasket is tightened, the first bead is sufficiently compressed to seal around the first bead.

5,149,111

DISTORTION-FREE EXPANSION/CONTRACTION ARBOR OR CHUCK ASSEMBLY

Sil Han, 321 Sunset Dr., Wilmette, Ill. 60091

Continuation-in-part of Ser. No. 341,126, Apr. 20, 1989, Pat. No. 5,003,702. This application Mar. 8, 1991, Ser. No. 666,358
Int. Cl.[5] B23B *31/40, 31/20*
U.S. Cl. 279—2.03 **18 Claims**

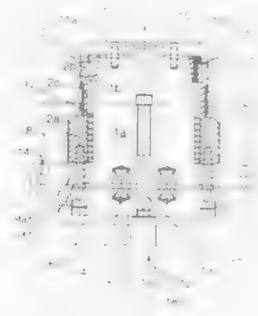
1. A distortion-free expanding arbor assembly, for holding a workpiece or tool having a bore or center hole of a given inside diameter in alignment with a machine axis, comprising:

an arbor body positioned in alignment with the machine axis, said arbor body having a linear body portion with outer surfaces facing radially outwardly relative to the machine axis and an expansion portion with inclined faces facing outwardly at an inclined angle to the machine axis;

an expansion member positioned radially outwardly of said arbor body and being movable relative to said arbor body in reciprocal directions in parallel with the machine axis, said expansion member having a linear body portion with inner surfaces facing radially inwardly toward the outer surfaces of said linear body portion of said arbor body and an expansion portion with inclined faces at an inclined angle to the machine axis facing inwardly in sliding contact with the inclined faces of said arbor body, said expansion portion being expanded radially outwardly into pressure contact with the inside diameter of the bore or center hole of the workpiece or tool for holding the same securely when said expansion member is moved relative to said arbor body in an expansion direction, and being released from pressure contact therewith when moved relatively in a release direction; and

a ball bushing disposed between the inner surfaces of said linear body portion of said expansion member and the outer surfaces of said linear body portion of said arbor body and being configured and dimensioned for a slight interference fit to provide substantially zero clearance of said inner surfaces of said expansion member and said outer surfaces of said arbor body and for substantially frictionless movement therebetween.

9. A distortion-free contraction chuck assembly, for holding



a workpiece or tool having a body portion or shaft of a given outside diameter in alignment with a machine axis, comprising:

a chuck body positioned in alignment with the machine axis, said chuck body having a linear body portion with inner surfaces facing radially inwardly relative to the machine axis and a contraction portion with inclined faces facing inwardly at an inclined angle to the machine axis;

a contraction member positioned radially inwardly of said chuck body and being movable relative to said chuck body in reciprocal directions in parallel with the machine axis, said contraction member having a linear body portion with outer surfaces facing radially outwardly toward the inner surfaces of said linear body portion of said chuck body and a contraction portion with inclined faces at an inclined angle to the machine axis facing outwardly in sliding contact with the inclined faces of said chuck body, said contraction portion being contracted radially inwardly into pressure contact with the outside diameter of the body portion or shaft of the workpiece or tool for holding the same securely when said contraction member is moved relative to said chuck body in a contraction direction, and being released from pressure contact therewith when moved relatively in a release direction; and

a ball bushing disposed between, the outer surfaces of said linear body portion of said contraction member and the inner surfaces of said linear body portion of said chuck body and being configured and dimensioned for a slight interference fit to provide substantially zero clearance of said outer surfaces of said contraction member and said inner surfaces of said chuck body and for substantially frictionless movement therebetween.

5,149,112

BICYCLE CONVERSION BAR

Leonard G. Nauman, Golden Valley, and Dale E. Stenberg, Bloomington, both of Minn., assignors to Kidz First, Inc., Golden Valley, Minn.

Continuation-in-part of Ser. No. 457,371, Dec. 27, 1989, Pat. No. 5,052,704. This application Oct. 12, 1990, Ser. No. 597,507
Int. Cl.[5] A63C *17/18;* **B62K** *13/00*
U.S. Cl. 280—7.11 **4 Claims**

1. A conversion bar for converting a female-style bicycle of the type having first and second spaced apart upright posts and a tube extending diagonally therebetween to a male-style bicycle, said conversion bar comprising:

first and second telescoping sleeves, each said sleeve having a free end;

a first mounting means attached to said free end of said first sleeve, said first means for mounting said conversion bar to the first post; and

a second mounting means attached to said free end of said second sleeve, said second means for mounting said conversion bar to the diagonal tube or said second post such that said conversion bar is disposed substantially horizontally to the riding surface;

wherein said first and second mounting means each comprise:

first and second spaced apart mounting member pivotally attached to its respective sleeve free end for embracing engagement with said bicycle post and diagonal tube, whereby said mounting means may be angularly adjusted with respect to said sleeves as required for attachment to said bicycle posts and diagonal tube; and

shock absorbing means attached to each said mounting means for absorbing road generated shock forces and protecting its respective post or tube from damage thereby, at least one of said shock absorbing means comprising first and second cushions attached to mutually facing sides of said first and second mounting members respectively.

5,149,113

CONVERTIBLE STROLLER AND CAR SEAT

Rodney H. Alldredge, 2013 Reed Rd., Birmingham, Ala. 35215

Filed Apr. 5, 1991, Ser. No. 680,752
Int. Cl.[5] B62B *7/12*
U.S. Cl. 280—30 **20 Claims**

1. Combined stroller and child seat apparatus that is selectively convertible between a stroller mode in which the apparatus is adapted to be moved over the ground on stroller wheels extending from the apparatus, and a child seat mode in which the stroller wheels are retraced, said apparatus comprising:

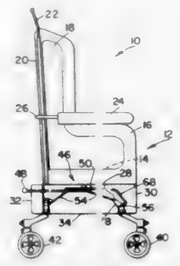
a. a child seat including a seat portion and a back portion to accommodate a small child, and a wheel housing positioned below and secured to the seat portion for receiving

a plurality of wheels to permit conversion of the device to and from a stroller;

b. a plurality of wheel carriers pivotally carried by the wheel housing for pivotal movement into and out of the housing, each wheel carrier rotatably supporting at least one wheel to permit the apparatus to be pushed along the ground when the wheels are extended from the wheel housing to place the apparatus in the stroller mode;

c. a pivotable wheel carrier actuator carried within the wheel housing for pivotal movement about a substantially vertical pivot axis to selectively move the wheel carriers between a retracted position within the wheel housing and an extended position at which each wheel carrier extends outwardly from the wheel housing;

d. connection means extending between the wheel carriers and the wheel carrier actuator for transferring pivotal movement of the wheel carrier actuator about a substantially vertical pivot axis to the wheel carriers to pivot the wheel carriers about substantially horizontal pivot axes between extended and retracted positions;



e. actuating means extending outwardly from the wheel housing, the actuating means connected with the wheel carrier actuator for pivoting the wheel carrier actuator; and

f. a plurality of support brackets carried within the wheel housing for pivotally supporting the wheel carriers for movement about substantially horizontally disposed pivot axes, wherein the support brackets include guide slots for guiding movement of outer ends of the connecting rods in a downward and outward direction during wheel extension, and tension springs extending between the outer ends of the connecting rods and the wheel carriers for pivoting the wheel carriers about their pivot axes as the connecting rod ends move along the guide slots.

5,149,114

NESTABLE CARGO CART

Mark S. Lewandowski, White Bear Lake; David M. Gessner, Lino Lakes, and Robert C. Anthony, North Oaks, all of Minn., assignors to Smarte Carte Inc., White Bear Lake, Minn.

Filed Jun. 25, 1991 Ser. No. 720,891

Int. Cl.[5] B62B *5/02*

U.S. Cl. 280—33.992 **14 Claims**

1. A nestable cargo cart suitable for carrying a plurality of cargo items, the cart comprising:

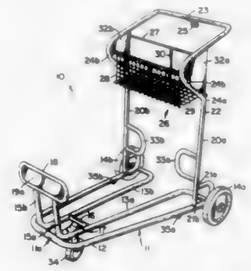
(a) a lower frame disposed about a longitudinal axis having longitudinally spaced forward and aft ends;

(b) wheel means operatively connected to the lower frame;

(c) first and second upright members operatively connected to the lower frame adjacent the aft end and rising generally vertically upward in a first vertical orientation;

(d) third and fourth upright members operatively connected to the lower frame adjacent the forward end and rising generally vertically upward in a second vertical orientation wherein, at a first elevation from the floor surface, a first horizontal dimension between a lower portion of the first and second upright members and a lower portion of the third and fourth upright members is less than a second horizontal dimension between an upper portion of the first and second upright members and an upper portion of the third and fourth upright members at a second elevation from the floor surface; and

(e) first and second cargo retaining means operatively connected to the first and second upright members, respectively, and disposed generally inward, each cargo retaining means having top and bottom portions and a width dimension measured from the upright member;



wherein the width of the first and second cargo retaining means increases from the top portion to a maximum located intermediate the top and bottom portions and decreases toward the bottom portion.

5,149,115

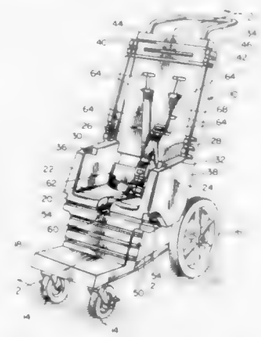
COMPACT STORAGE STROLLER

Tony Sampedro, P.O. Box 247, Damascus, Ohio 44619

Filed Oct. 28, 1991, Ser. No. 783,251

Int. Cl.[5] B62B *7/00*

U.S. Cl. 280—33.998 **9 Claims**



1. A cart for transporting objects, said cart including a wheeled base having front and rear end portions and defining a rearwardly opening cavity whose width and height increases rearwardly, said front end portion tapering forwardly in width and diminishing forwardly in height for reception within said cavity defined by another of said carts, whereby said carts may be ganged transported and stored in front-to-rear relatively displaced positions, said first mentioned cart including upstanding opposite side portions centrally intermediate said front and rear end portions and an upstanding rear wall including an upper end rearwardly directed handle and defining a front-to-rear extending opening through said rear wall, opposite side upper portions of said rear wall and said upper portions of said opposite side portions defining coacting projection and recess means for mating with each other to support yet another of said carts in inverted position relative to and from the first mentioned cart with the handle of the rear wall of said yet another cart extending forwardly through said front-to-rear extending opening of said another of said carts and the rearwardly projecting handle of said another of said carts projecting rearwardly through said opening of said yet another of said carts.

5,149,116

BALANCED MULTI-WHEEL WHEELBARROW

Pierre Donze, "Clos Varegues" St. Andrieux 76930, Octeville/Mer, and Jean P. Frank, 3 rue des Songes 68850, Staffelfelden, both of France

Division of Ser. No. 532,236, Jun. 4, 1990, Pat. No. 5,026,079, which is a continuation of Ser. No. 369,836, Jun. 22, 1989, abandoned, which is a continuation of Ser. No. 313,754, Feb. 22, 1989, abandoned, which is a continuation of Ser. No. 208,242, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 117,983, Nov. 9, 1987, abandoned, which is a continuation of Ser. No. 912,071, Sep. 25, 1986, abandoned. This application Apr. 12, 1991, Ser. No. 684,190

Claims priority, application France, Sep. 25, 1985, 85 14194

Int. Cl.[5] B62B *1/20*

U.S. Cl. 280—47.26 **11 Claims**

1. A wheelbarrow comprising:

a frame;

a container mounted on said frame;

bearings secured to said frame for receiving an axle;

an axle removably secured in said bearings, said axle extending between said bearings and laterally beyond said bearings a distance sufficient to mount wheels on said axle laterally beyond said bearings, said axle defining a plurality of positions between said bearings, including a position midway between said bearings, in which wheels can be mounted and a plurality of positions laterally beyond said bearings in which wheels can be mounted;

at least one wheel mounted on said axle in a position selected from said number of positions, said bearings being spaced from one another by a distance sufficient to allow two of said wheels to be secured to said axle between said bearings;

means for securing said wheel in said selected position on said axle;

arms extending from said frame for grasping by a user; and

supporting means depending from said frame to support said wheelbarrow, in cooperation with said wheels, in a static position.

5,149,117

UNIVERSAL TOY SAUCER

Doublas A. Wilkens, Sr., 1721 W. Pine St., and Ronald F. Ullrich, 1031 Mason St., both of Lodi, Calif. 95242

Filed Sep. 9, 1991, Ser. No. 756,999

Int. Cl.[5] B62B *13/00*

U.S. Cl. 280—18.1 **4 Claims**

1. A new and improved universal saucer toy which can be used alternatively as a flexibly supported swing, a snow sled and a water slide, said toy comprising:

a user supporting, concavely-shaped saucer body;

an upright support pole fixely secured to a central portion of said saucer body;

a through-extending aperture in a topmost portion of said support pole, said aperture being designed to receive a cord to facilitate a use of said toy as a swing when said cord is attached to an overhead support;

a through-extending slot in a peripheral edge of said saucer body, said slot functioning as a carrying handle and also a cord attachment means when said toy is being towed across a body of water whereby said toy is functioning as a waterslide;

and

a spring means interconnected between said support pole and said saucer body, said spring means facilitating relative movement between said support pole and said saucer body.

5,149,118

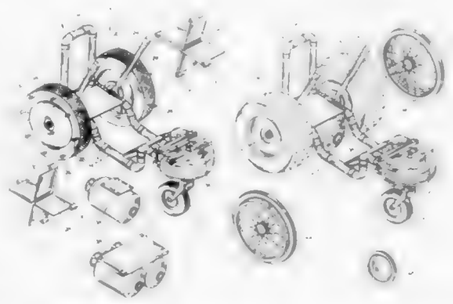
ALL-TERRAIN WHEELCHAIR

Stuart G. Oxford, 13616 N. 78th St., Omaha, Nebr. 68122

Continuation-in-part of Ser. No. 439,612, Nov. 20, 1989, which is a continuation-in-part of Ser. No. 263,417, Oct. 27, 1988. This application Oct. 9, 1990, Ser. No. 594,343

Int. Cl.[5] B63B *35/02*; B63H *16/00*

U.S. Cl. 280—250.1 **3 Claims**



1. In combination:

a wheelchair of the type having an open frame with a forward end, rearward end, and opposite sides;

said open frame comprising tubular, air-filled frame members to provide flotation for the wheelchair on water;

a seat means mounted on the rearward end of said frame for supporting a person thereon;

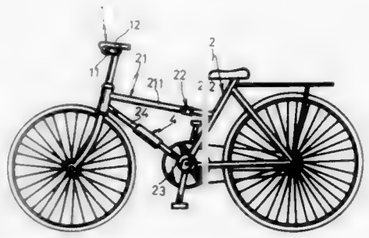
a pair of drive wheels rotatably mounted on the frame at the rearward end thereof and disposed opposite said seat means;

a front wheel rotatably mounted on the forward end of the frame means;

said front wheel rotatably mounted on a bracket which is pivotally mounted to said frame to freely pivot the wheel to rotate in the direction of travel of the wheelchair; and

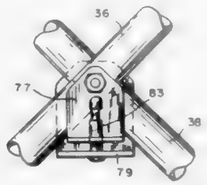
a floatation device removably mounted to said frame directly below said seat means, to provide buoyancy for the rearward end of the wheelchair in water.

5,149,119
SHOCK-ABSORBING FOLDING BICYCLE
Tsong-Ching Hwang, No. 54-5, Sec. 1, Hsin Sheng S. Road, Taipei, Taiwan
Filed Oct. 28, 1991, Ser. No. 783,493
Int. Cl.[5] B62K *1'/00, 15/00*
U.S. Cl. 280—275 5 Claims



1. A folding bicycle comprisin ;:
a) a head tube assembly for st ering control, the head tube assembly including a transve se rod having a pair of recesses at two opposite ends th reof, a pair of ratchets disposed in the pair of recesses, a pair of handle bars secured to the transverse rod, each h andle bar having a ratchet at one end thereof engaged wi h a corresponding ratchet in a recess and secured in posi ion by a screw;
b) a top tube, a seat tube, th e top tube being connected between the head tube assem bly and the seat tube, the top tube including a front tube and a rear tube, a toggle joint connecting the front and re r tubes, the toggle joint including a stub tube transvers ely fastened on the front tube at one end thereof, the stub tube including two bearings fastened therein at two opp site ends thereof, a U-shaped frame fastened on the rear tube at one end thereof, the U-shaped frame including tw o pivot holes at two opposite ends, and a bolt and a loc nut securing the U-shaped frame to the two bearings;
c) a down tube, a shock-abs rbing device secured in the down tube, a protective leeve enclosing the shock-absorbing device, a bottom bracket at a bottom end of the seat tube, the down tube being connected between the head tube assembly and th bottom bracket, the down tube including a forked por ion at one end pivotally secured to the head tube ass mbly by a screw, an outer threaded portion and a join at an opposite end;
d) the shock-absorbing device ncluding a front connector, a tension spring, a rear conne tor, a connecting sleeve and an adjusting nut;
e) the front connector includ ng a joint holder at one end, the joint holder being co prised of two symmetrical connecting plates for holdi g the joint on the down tube, means for securing the join holder to the joint, an outer threaded portion, a worm, nd an elongate rod;
f) the rear connector includin an elongate sleeve, the elongate rod being disposable within the elongate sleeve, a worm, an outer threaded po tion and a forked connecting end connected to the botto n bracket by a screw;
g) the tension spring having o e end secured to the worm on the front connector and a opposite end secured to the worm on the rear connecto ;
h) the connecting sleeve incl ding two internally threaded opposite ends releasably an threadedly engaged with the outer threaded portions of t e front and rear connectors to enclose the tension spring t erein;
i) the adjusting nut being m unted on the outer threaded portion of the rear connect r for controlling the position of the connecting sleeve on the front and rear connectors; and
j) wherein the handle bars ay be rotated upwardly and secured in a horizontal po ition for steering control or rotated downwardly into collapsed position to reduce space occupation, the connecting sleeve may have one end released from the outer threaded portion of the front connector to permit the front and rear connectors to be connected by the tension spring for absorbing shock, the toggle joint for permitting the top tube to be folded up into a collapsed position, and the connection of the joint on the down tube and the joint holder on the front connector permits the down tube to be folded up into a collapsed position.

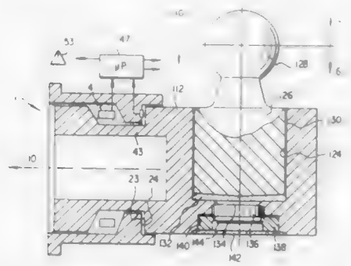
5,149,120
WHEELCHAIR LOCK
Thomas S. Halliday, 111 Edgewater Dr., Needham, Mass. 02192
Filed Sep. 5, 1991, Ser. No. 755,080
Int. Cl.[5] B62K *19/18;* B62B *9/12*
U.S. Cl. 280—304.1 6 Claims



1. Locking apparatus for selectively preventing the folding of a wheelchair of the type having a seat, sides and a pair of centrally pivoted cross braces for interconnecting the sides and located under the wheelchair seat which move from an x-shaped configuration to a more parallel configuration when the wheelchair is folded, said locking apparatus comprises:
a pin having opposite sides and comprising the pivot for said cross braces:
a bracket member mounted at each end of said pin;
an elongated bar which is pivotally joined at one end to one of said brackets, and is adapted to be swung into a position between said cross braces to thereby obstruct the folding; and
locking means removably mounted at the other end of said bar and the other of said brackets for selectively retaining said bar in obstructing position.

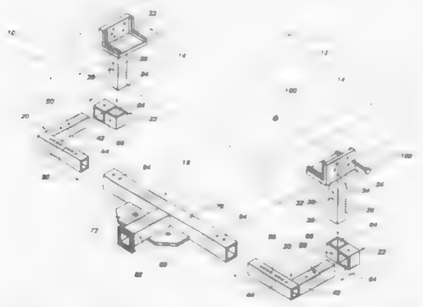
5,149,121
FORCE MEASURING DEVICE
Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister GbmH, Augsburg, Fed. Rep. of Germany
Continuation of Ser. No. 380,414, Jul. 17, 1989, abandoned, which is a division of Ser. No. 226,592, Aug. 1, 1988, Pat. No. 4,864,874. This application Nov. 27, 1990, Ser. No. 619,801
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725917; May 27, 1988, 3818126
Int. Cl.[5] B60D *1/14*
U.S. Cl. 280—432 16 Claims

1. A trailer coupling having a force measuring device incorporated therein, comprising:
a first body adapted to be operatively coupled with a tracting vehicle and having an essentially vertical cylindrical recess formed therein;
a first piston member disposed in said vertical cylindrical recess and forming a small space between an end surface of said first piston member and an interior bottom wall of said vertical cylindrical recess and having projecting therefrom in an upward direction arresting means for engagement with a complementary coupling means of a trailer;
a pressure sensor means protectedly arranged within said body for sensing pressure; and
wherein a narrow cylindrical gap is formed between a peripheral surface of said piston member and a cylindrical interior surface of said vertical cylindrical recess, said gap and said small space being essentially completely filled



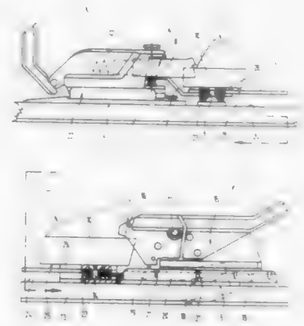
with an essentially incompressible elastomeric material which is in contact with said pressure sensor and strongly adheres to said surfaces of said piston member and said recess.

5,149,122
ADJUSTABLE HITCH ASSEMBLY
Robert A. Helber, 1115 N. Ash, Layton, Utah 84041
Filed Apr. 26, 1991, Ser. No. 692,183
Int. Cl.[5] B60D *1/00*
U.S. Cl. 280—491.2 15 Claims



9. An adjustable hitch assembly for vehicles comprising:
a receiver member for receiving a trailer tongue;
a linking arm means slidably engageable with said receiver member to enable selective positioning of said receiver member along a first horizontal axis;
an attachment member means for mounting on a frame of said vehicle; and
a coupler means having a first means for slidably engaging said linking arm means and a second means for slidably engaging said attachment member means to enable selective positioning of said receiver member along a second horizontal axis and a vertical axis, said first engaging means being positioned adjacent said second engaging means such that the second horizontal axis and the vertical axis are in different planes.

5,149,123
SKI BINDING WITH FRONT AND HEEL JAWS CONNECTED BY A CARRIER PLATE FOR THE SOLE
Alois Rohrmoser, Wagrain, Austria, assignor to Varpat Patentverwertungs AG, Littau, Switzerland
Continuation of Ser. No. 483,100, Feb. 22, 1990, abandoned. This application Feb. 10, 1992, Ser. No. 833,595
Claims priority, application Austria, Feb. 22, 1989, 396/89
Int. Cl.[5] A63C *9/081*
U.S. Cl. 280—618 8 Claims

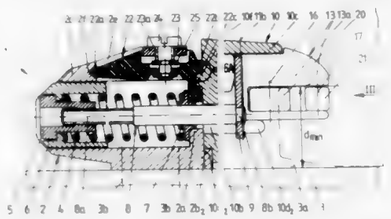


1. A ski binding comprising a toe piece and a heel piece, the pieces respectively comprising a device for retaining a toe of a ski boot and a device for retaining a heel of the ski boot on a longitudinally extending ski, the retaining devices being pivotal about respective pivots on the toe and heel pieces, one of the pieces being secured to a mounting surface of the ski in a longitudinally fixed position, a longitudinal guiding device for the other piece, the guiding device being affixed to the mounting surface of the ski and other piece being mounted in the longitudinal guiding device for free longitudinal displacement, respective releasing mechanisms arranged to pivot the retaining devices and thereby to release the toe and heel of the ski boot from the retaining devices in response to an adjustable releasing force, a connecting device interconnecting the toe and heel pieces for longitudinal movement of the other piece relative to the one piece while the connecting device has a fixed length, the connecting device including a longitudinally extending connecting element having opposite ends linked to vertical pivots supported on the mounting surface of the ski, the one piece being linked to one vertical pivot at a first end of the connecting element, and a lever having opposite ends linked to the pivot of the retaining device of the one piece and to the one vertical pivot at the first end of the connecting element.

5,149,124
FRONT JAW
Heinz Wittmann; Karl Stritzl, both of Vienna, and Andreas Janisch, Oeyenhausen, all of Austria, assignors to TMC Corporation, Baar, Switzerland
Filed Nov. 2, 1990, Ser. No. 608,544
Claims priority, application Austria, Nov. 3, 1989, 2542/89
Int. Cl.[5] A63C *9/08*
U.S. Cl. 280—633 8 Claims

1. In a front jaw comprising a housing adapted to be mounted on a ski, in which housing is housed a release spring and through which housing extends a pull rod loaded by the release spring, which pull rod acts through a crosspart onto a shorter lever arm of each of two toggle levers pivotal about vertically extending axles, a longer lever arm of each of the two toggle levers engaging a front edge surface of a sole of a ski boot, the housing having at its rear end two bearing surfaces extending symmetrically with respect to the vertical

longitudinal center plane and with the two toggle levers simultaneously functioning as a sole down-holding means, the improvement wherein the axles of the two toggle levers are arranged in a bearing part having a through opening therethrough and through which opening the pull rod extends, the bearing part, when the toggle levers are in a position holding the ski boot onto the ski, being supported on the two bearing surfaces on the housing with means being provided for pre-



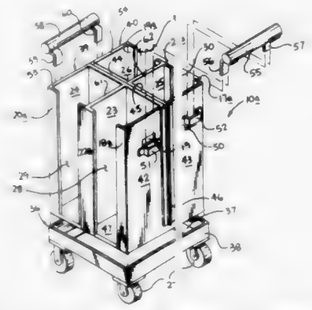
venting a pivoting of the bearing part in a transversely extending plane toward the pull rod, and wherein the pull rod carries the crosspart at its rear end, which crosspart, when the toggle levers are in a position holding the ski boot onto the ski, rests on the shorter lever arms of the two toggle levers, and wherein adjustment means is provided for adjusting the elevation of the bearing part relative to the housing and, consequently, the elevation of the toggle levers to facilitate an accommodating of ski boots with varying sole thicknesses.

5,149,125

GOLF DRIVING RANGE CART APPARATUS

James Gray, 3835 E. 134th Ct., Thornton, Colo. 80241

Filed Oct. 23, 1991, Ser. No. 780,962
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—651 8 Claims



1. A golf driving range cart apparatus, comprising:

a wheeled support cart including a support cart floor and a support cart continuous side wall projecting orthogonally upwardly relative to the floor defining a parallelpiped cavity,

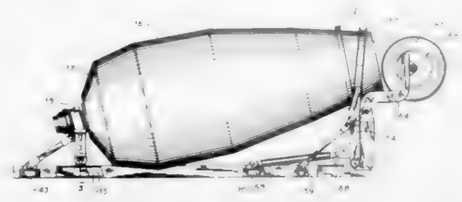
first and second containers, each of said containers including a first side wall, a rear wall and a front wall, said front wall of each container having at least one opening for entrance into at least one well formed therein, the rear wall and the first side wall of the first container defining a first intersection and the rear wall and the first wall of the second container defining a second intersection, a hinge connecting said first container to said second container at said first and second intersections for pivotal movement between a first position in which the rear walls of said first and second containers are in a contiguous coextensive, back-to-back relationship and the first walls of said first and second containers are in a coplanar relationship and a second position in which the rear walls of said first and second containers are in a coplanar relationship and the first walls of said first and second containers are in a contiguous coextensive relationship, a lower portion of said first and second containers adapted to be received within the cavity of the support cart while in their first position, and a first handle member including means for removably securing the first handle member to the first side walls of said first and second containers while in their first position.

5,149,126

TRUCK MIXER MOUNTING FRAME

George A. Brennan, La Habra Heights, Calif., assignor to Rexworks, Inc., Milwaukee, Wis.

Continuation of Ser. No. 487,908, Mar. 5, 1990, abandoned. This application Nov. 15, 1991, Ser. No. 795,242
Int. Cl.[5] B28C *5/20*
U.S. Cl. 280—704 4 Claims



1. In a transit concrete mixer truck having a concrete mixer drum rotatably mounted on front and rear pedestals each pedestal including two leg portions supported on a truck frame having a pair of spaced apart side sills, the improvement comprising a mounting assembly for at least one of the pedestals wherein

each support for the two leg portions of the pedestal includes universally moveable connections disposed between the leg portions and the side sills whereby the leg portions of the pedestal are relieved of strains imposed by distortion of the truck frame;

a "C" shaped cross member extending crosswise between and secured at its ends to the side sills at a location spaced from said pedestal, the open side of the "C" shaped cross member facing downwardly; and

an inclined force transmitting strut disposed between the side sills and connected by a universally moveable connection at its lower end to a central portion of said cross member and by a universally moveable connection at its upper end to a central portion of said pedestal, the point of securement between the lower end of the strut and the cross member being offset so that forces applied by the strut to the cross member pass through the shear center of the cross member whereby the connection between the ends of the cross member and the sills are relieved of twisting movement.

5,149,127

AIR BAG STRUCTURE FOR AN AUTOMOTIVE VEHICLE

Toshiyuki Manabe; Yasunori Iwamoto; Masafumi Sakakida, all of Hiroshima; Hisao Muramoto, Yamaguchi; Haruhiro Inada, and Masahiro Matsunaga, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Shinchi, Japan

Continuation-in-part of Ser. No. 470,613, Jan. 29, 1990, abandoned. This application Jan. 15, 1991, Ser. No. 641,333
Claims priority, application Japan, Jan. 31, 1989, 1-010002[U]; Jul. 23, 1990, 2-078557
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—731 22 Claims

1. Air bag system for preventing injuries to passengers in a passenger compartment of an automotive vehicle, said air bag system comprising:

an air bag module mounted on a steering wheel which faces a passenger in the passenger compartment;

control means mounted to the body of the automotive vehicle for controlling the air bag module;

at least one first electrical harness section extending from the control means and having a connecting means disposed at a distal end thereof, wherein said at least one first electrical harness section has a middle portion which extends through the steering wheel; and

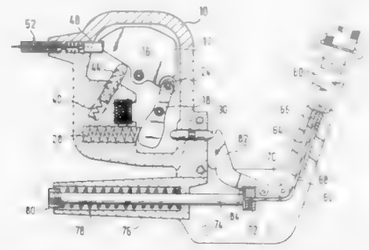
temporary holding means for connecting the air bag module detachably to a fastening element provided in the steering wheel.

5,149,128

CONTROL MECHANISM FOR PRETENSIONERS IN VEHICLES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Apr. 16, 1991, Ser. No. 686,156
Claims priority, application European Pat. Off., Apr. 17, 1990, 90107273.6
Int. Cl.[5] B60R *21/32*
U.S. Cl. 280—734 3 Claims



1. A control mechanism for a pretensioner of a safety belt restraining system or for a gas-bag restraining system in a vehicle, comprising a vehicle-sensitive inertia mass movably mounted in a housing and a release member pivotally mounted in said housing and bearing via a roller on a concave cam force of said inertia mass, said housing being hermetically sealed, and said release member being spring biased to hold said roller in said concave cam face and to maintain said inertia mass in a stable position,

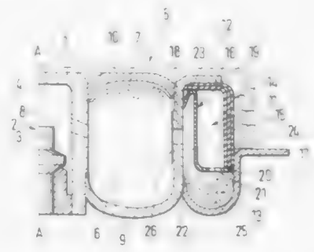
said inertia mass being arrestable in its stable readiness position by a securing element movably mounted in or on said housing and being actuatable from the outside of said housing through a housing opening, said housing opening being sealed towards the outside.

5,149,129

GAS GENERATOR

Karl Unterforsthuber, Oberhaching, and Christian Geisreiter, Munich, both of Fed. Rep. of Germany, assignors to Bayern-Chemie Gesselschaft für Flugchemische Antriebe mbH, Fed. Rep. of Germany

Filed Feb. 22, 1991, Ser. No. 660,704
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1990, 4005871
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—740 16 Claims



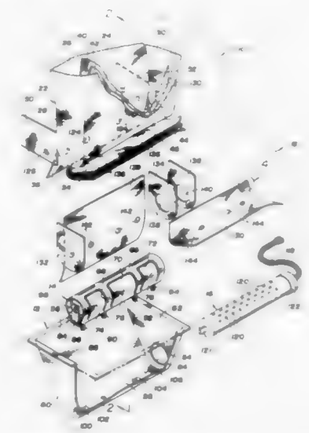
1. A gas generator for an inflatable protective cushion of a collision protection system for occupants of a vehicle, comprising: means defining a combustion chamber filled with a solid propellant that can be ignited by an igniting unit, the combustion chamber including passage openings for passage of expanding gas; and, a filter ring cooperating with said means defining a combustion chamber to provide a filter chamber positioned adjacent the combustion chamber, said filter chamber communicating with the combustion chamber through said passage openings, said filter ring having an exposed annular surface extending continuously on its outside over its circumference for discharging propellant gases into an air bag.

5,149,130

LINER FOR INFLATABLE OCCUPANT RESTRAINT CUSHION

Robert G. Wooley, Westland, and Tai L. Chan, Troy, both of Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 28, 1991, Ser. No. 704,770
Int. Cl.[5] B60R *21/20*
U.S. Cl. 280—743 3 Claims



1. In combination, a cylindrical shaped gas generator includ-

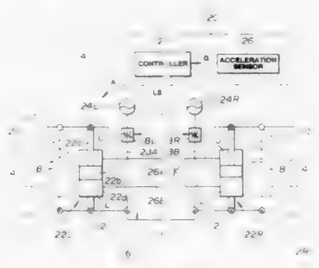
ing a cylindrical manifold containing chemicals for generating hot gas and having ports therein through which the hot gases exit the gas generator, a heat shield of cylindrical shape enclosing the gas generator and having an open end through which the cylinder may be inserted into the heat shield and having portions of the heat shield spaced away from the gas generator to reduce the direct conduction of high temperature from the gas generator to the heat shield and having other portions of the heat shield contacting with the gas generator in order to provide a mounting relationship therebetween, an inflatable cushion of pyrolizible fabric tightly packaged about the heat shield in a deflated condition and being inflated by the hot gasses emanating from the gas generator, and a fabric of high temperature resistive properties carried by the inflatable cushion at least in those areas of the inflatable cushion contacting the heat shield and gas generator so that the high temperature of the gas generator and the high temperature conducted to the heat shield is experienced by the fabric of high temperature resistive property whereby the high temperatures generated by the gas generator are prevented from pyrolizing the inflatable cushion.

5,149,131

HYDRAULIC DAMPING DEVICE FOR VEHICLES

Fukashi Sugasawa; Masatsugu Yokote, and Tomohiro Yamamura, all of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 13, 1991 Ser. No. 698,903
Claims priority, application Japan, May 14, 1990, 2-123723
Int. Cl.[5] B62D *9/02*
U.S. Cl. 280—772 **22 Claims**



1. A damping device for a vehicle having a plurality of wheels and a vehicle body, comprising:

an actuator having a pair of fluid cylinders installed between the vehicle body and two of the wheels, said cylinders having cylinder chambers and conduit means for interconnecting said cylinder chambers; and

damping force producing means fluidly connected to said cylinder chambers and said conduit means for producing a damping force in proportion to a flow rate of fluid therethrough;

in which said actuator causes a larger flow rate of fluid to pass through said damping force producing means when the two wheels make strokes involving a relative movement therebetween than when the two wheels make strokes without involving any substantial relative movement therebetween.

5,149,132

SPLIT REAR TRUCK FRAME

Phillip C. Ruehl, Elm Grove, and Benjamin E. Coursin, Milwaukee, both of Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 4, 1991, Ser. No. 650,057
Int. Cl.[5] B62D *21/00*
U.S. Cl. 280—800 **24 Claims**

1. A truck rear frame for supporting the non-continuous, structural components of a truck, the components including a front cab and a rear load box, said rear frame being rearward of and attached to a front frame supporting the front cab, said rear frame having a rear spring front hanger and a rear spring rear hanger for supporting a rear spring therebetween, said rear frame comprising:

a front portion for supporting the front cab and the rear load box;

a rear portion for supporting the rear load box;

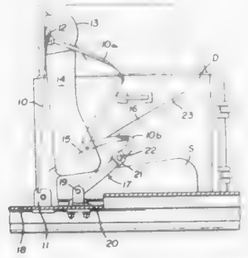
said front portion being a structural component formed separately from said rear portion but attached thereto at about said rear spring front hanger, wherein said front and rear portions have sections attached at an overlap joint having a front end at the front of said rear portion, and a rear end at the rear of said front portion, and wherein said front end of said joint is forward of said rear spring front hanger, and said rear end of said joint is rearward of said rear spring front hanger.

5,149,133

SEAT BELT SYSTEM FOR MOTOR VEHICLE

Alfredo Alvarado, 4310 Bayview Drive, Fort Lauderdale, Fla. 33308

Filed Apr. 9, 1991, Ser. No. 682,357
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 **15 Claims**



1. In a motor vehicle having a door enabling a person to enter and leave the vehicle, and a seat having an outboard side adjacent said door and an inboard side away from said door, said seat having an upwardly extending back rest,

a seat belt system comprising:

an elongated guideway on said door;

a slide slidable along said guideway and having means for slidably receiving a seat belt;

a belt retractor adjacent the rear of said seat mounted on the vehicle body;

a belt guide above said retractor near the top of said back rest at said inboard side of said seat rigidly attached to said back rest, said belt guide having means for slidably receiving a belt;

a belt anchor at said inboard side of the seat;

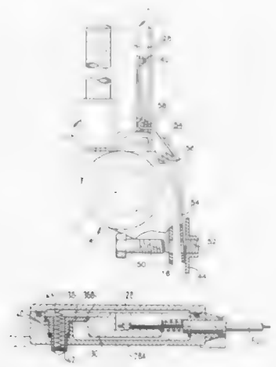
and a belt coupled to said retractor and extending up from said retractor to said belt guide, passing slidably through said belt guide across the front of said back rest to said slide to provide a shoulder belt segment for engaging the upper torso of a person sitting on said seat, and extending from said slide across the front of said back rest to said anchor to provide a lap belt segment for engaging the lap of a person on said seat.

5,149,134

SAFETY MECHANISM FOR A SAFETY BELT PRETENSIONER

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 698,294
Claims priority, application European Pat. Off., May 15, 1990, 90109106.6
Int. Cl.[5] B60R *22/46, 21/32*
U.S. Cl. 280—806 **8 Claims**



1. A safety mechanism for a pretensioner in a vehicle safety belt restraining system, the safety belt restraining system including a belt retractor and a pretensioner drive integrated with the belt retractor to form a single assembly unit having a mounting flange, the safety belt restraining system further including a vehicle sensitive inertial mass member movably accommodated in a housing, said safety mechanism comprising:

a blocking member for blocking actuation of said pretensioner, said blocking member being movable into a position engaging said mass member to block movement of said mass member until the assembly unit is mounted on a body portion of the vehicle;

a control element engaging said blocking member for controlling the position of said blocking member and displaceably mounted in a wall of said housing and extending outwardly through said wall from the interior of the housing, said control element being movable between a first position in which said blocking member engages said mass member and a second position in which said blocking member is disengaged from said mass member; and

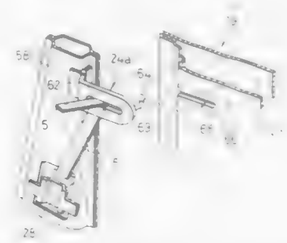
a two-armed sensing lever pivotally mounted on said housing for moving said control element, said lever having a first arm with a sensing lug on its free end adjacent the mounting flange of said assembly unit and a second arm engaging said control element.

5,149,135

FRONT SEAT SHOULDER BELT AND SEAT BACK SUPPORTING STRUCTURE

Takeshi Konishi; Fumiyuki Otani, both of Hiroshima; Hisao Muramoto, Yamaguchi; Isao Hirashima, Hiroshima; Yoshinobu Nomura, Kure, and Shigefumi Kohno, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 365,850, Jun. 15, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,649
Claims priority, application Japan, Jun. 15, 1988, 63-79737[U]; Jun. 15, 1988, 63-79739; Jun. 15, 1988, 63-148644[U]
Int. Cl.[5] B60R *22/24, 22/00*
U.S. Cl. 280—806 **12 Claims**



1. A seat belt device for fastening a passenger seated on a seat device of a vehicle, comprising:

shoulder belt means, carried by a guide member fixed to a seat belt back member of the seat device, for embracing an upper body portion of the passenger;

support means fixed at one end to the seat back member and extending downwardly from the fixed end and rearwardly of the vehicle, for preventing said seat back member from moving forward during a collision;

first anchor means mounted on a body member of the vehicle rearward of the seat back member for carrying the support means;

retractor means mounted on a body member for winding to retract the support means;

lock means provided in the retractor means for preventing the support means from being drawn out from the retractor means when a horizontal acceleration acting on the retractor means is greater than a predetermined value; and

second anchor means mounted on a center pillar for carrying the shoulder belt means, the shoulder belt means extending through said guide member at a position lower than a window section;

wherein said vehicle further comprises a rear door, the first anchor means is rotatably mounted on the center pillar, a joint member is provided at a tip end portion of the first anchor means, and the first anchor means is joined with said rear door through said joint member.

5,149,136

SHOULDER ADJUSTER

Tetsuya Maekawa; Yuichi Nanbu, and Noriyuki Kosugi, all of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

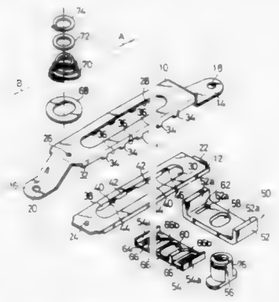
Filed Aug. 13, 1991, Ser. No. 744,693
Claims priority, application Japan, Sep. 5, 1990, 2-235060
Int. Cl.[5] B60R *22/20*
U.S. Cl. 280—808 **9 Claims**

1. A shoulder adjuster comprising:

a guide rail fitted so that the longitudinal direction is set as a vertical direction to a vehicle and provided with a plurality of notches formed at intervals in the longitudinal direction; and

a slide member slidable in the longitudinal direction of said guide rail and having engaging parts engaging with said notches and a shoulder anchor fitting part, characterized by said guide rail being consisted of a synthetic resin guide

rail and a metal guide rail so that said slide member engages with said synthetic resin guide rail during a non-



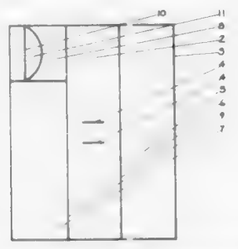
emergency, and during an emergency said synthetic resin guide rail is deformed to make said slide member engage with said metal guide rail.

5,149,137

LOTTO ORGANIZER

Lloyd E. Holt, 15861 Oriote La., Huntington Beach, Calif. 92649

Filed May 28, 1991, Ser. No. 706,022
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—31 5 Claims



1. A device for retaining lottery game materials comprising:
a. an outside cover and an inside cover of the same dimensions attached around their perimeter;
b. a ticket entry pocket attached to the perimeter of the inside cover on three edges with the fourth edge of the ticket entry pocket open thus forming a compartment of approximately one third to one half the size of the inside cover;
c. a ticket receipt pocket and a coin receipt pocket combination attached to the perimeter of the inside cover on three edges opposite the ticket entry pocket thus forming a compartment of approximately one third to one half the size of the inside cover;
d. wherein the ticket receipt pocket and the coin pocket are attached on a common line between them to the inside cover with the coin pocket approximately one fourth the width of the ticket receipt pocket and each the same depth;
e. wherein the coin pocket is attached on its fourth edge to form a closed pocket which has a semicircular flap which opens to allow access to the coin pocket; and
f. the outside cover and the inside cover made of suitable material such that they may be folded in book fashion along a fold line generally equidistant from and parallel to the ticket entry pocket and the opposite ticket receipt pocket and coin receipt pocket wherein the inside cover has two slits across the fold line at its approximate center with the two slits long enough to allow a pen to pass through and be retained.

5,149,138

METHOD OF APPLYING A FLUORESCENT MARKING COMPOSITION

Michael D. Zemsky, P.O. Box 677, Gainesville, Va. 22065-0677

Continuation-in-part of Ser. No. 454,623, Dec. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 280,481, Nov. 18, 1988, abandoned. This application Aug. 27, 1990, Ser. No. 572,564
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—70 10 Claims

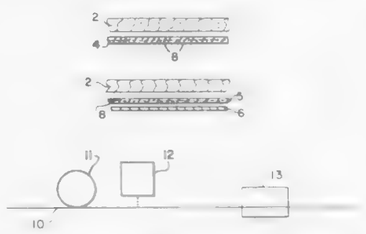
1. A method of marking a porous web with a fluorescent material and detecting the transference of the fluorescent material onto a second surface following contact with the marked porous web, said method comprising the steps of:
(1) applying to a porous web a solution consisting essentially of from about 0.05 to about 2.5 of solvent-soluble, organic fluorescent compound dissolved in 100 ml of an organic solvent having a boiling point of distillation range at 760 mmHg of between about 15° C. and 35° C., thereby providing a fluorescent residue on the porous web that is non-color contributing under white light, essentially invisible to the unaided eye without ultraviolet illumination, is visualized under ultraviolet light, and is readily transferred on contact in a quantity sufficient for detection under ultraviolet light from the porous web to a second surface; and
(2) irradiating a surface believed to have come into contact with the porous web with ultraviolet light to visualize and detect any fluorescent residue on the irradiated surface.

5,149,139

STAMP SUCH AS A POSTAGE STAMP AND A METHOD FOR PRODUCING IT

Wittich Kaule, Emmering, Fed. Rep. of Germany, assignor to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 855,371, Apr. 24, 1986, abandoned. This application Sep. 5, 1989, Ser. No. 403,022
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514852
Int. Cl.[5] B42D *15/00*; G09C *3/00*
U.S. Cl. 283—70 10 Claims



1. A method of automatically detecting with a machine the presence of a previously-used postage-type stamp while said stamp is attached to a carrier substrate, comprising the steps of:
passing through a machine a carrier substrate having adhesively adhered thereto a stamp comprised of a base sheet of non-transparent paper or synthetic material and a layer of adhesive on the base sheet of paper or synthetic material adhering said stamp to said carrier substrate, said layer of adhesive containing a machine-testable marking substance suitable for automatic processing and detectable by a machine through the paper or synthetic material comprising the stamp base sheet, wherein said marking substrance is contained within said adhesive layer in such a way that said marking substance is not substantially lost through normal moistening of the adhesive to adhere the stamp, but wherein said marking substance is incorporated into the adhesive layer in such a way that at least a substantial portion of the marking material is removed upon detachment of the stamp from a previous carrier substrate to which the stamp has been adhered by said adhesive layer;
performing a machine reading through said stamp base sheet, while said stamp is adhered to said carrier substrate, to determine the presence of said machine-testable marking substance in said adhesive layer; and
making a determination of the validity of said stamp, including whether said stamp has been previously adhesively adhered to a carrier substrate and subsequently removed therefrom, based upon the amount of marking substance detected to be present in said adhesive layer.

5,149,140

SECURITY, INFORMATION DOCUMENT

William H. Mowry, Jr., Dayton, and Robert L. Neitman, Kettering, both of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Mar. 11, 1991, Ser. No. 667,283
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—93 10 Claims

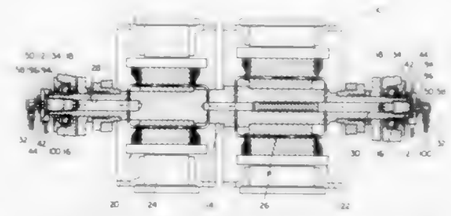
1. A security, information document for providing information to a reader from an information source organization, comprising:
a document substrate;
a first area on said substrate in which a half-tone warning image is printed, delineating said information source organization, said half-tone warning image being printed with a half-tone screen of such a line spacing and element size that it is readily reproducible by a copier;
a second area on said substrate in which a half-tone background image is printed, one of said first and second areas surrounding the other, and in which said information printed over said substrate is printed in an ink of substantially the same blackness as said half-tone warning image and said half-tone background image, whereby an attempt to copy said document without copying said half-tone warning image or said half-tone background image by adjustment of copier settings results in loss of said information.

5,149,141

INTERNALLY-LOCATED ROTATING UNION FOR A MOTOR-GENERATOR SET

Brian L. Newhouse, Apollo, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1987, Ser. No. 42,184
Int. Cl.[5] H02K *9/193*
U.S. Cl. 285—13 13 Claims



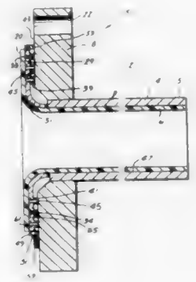
1. A rotating union for use in transmitting a pressurized fluid from a stationary source to a passageway defined in a rotating shaft having an annular-shaped end section defining an open axial bore communicating with the passageway, said rotating union comprising:
(a) a tubular housing disposable within the bore in the shaft end section and having a hollow interior and axially-displaced inner and outer ends;
(b) means for mounting said housing within the bore in the shaft end section for rotation with the rotating shaft and so as to define an open annular gap between the shaft end section and said housing;
(c) a tubular pipe disposed in said hollow interior of said housing and having axially-displaced inner and outer ends, said pipe having a central channel defined therethrough;
(d) means mounted to said outer end of said pipe for coupling a fluid transmission means, being connected to the stationary fluid source, to said pipe outer end for supplying fluid through said channel of said pipe to the passageway of the shaft;
(e) means disposed between, and displaced from said inner ends of, said housing and pipe and rotatably mounting said pipe within said housing so as to define a space between said pipe and housing extending at least from said pipe-mounting means to said inner ends of said housing and pipe and to permit rotation of said housing relative to said pipe when said housing is mounted within the bore in the shaft end section and is rotating with the rotating shaft;
(f) means spaced axially inwardly from said pipe mounting means and being disposed between and adjacent to said inner ends of said housing and pipe for effecting a seal therebetween which, except for leakage of only a residual amount of fluid past said seal and into a portion of said space extending axially between said pipe mounting means and said seal-effecting means, prevents any substantial backflow of fluid past said seal from the passageway of the shaft;
(g) means defined through said housing for providing fluid communication between said space and said gap in order to allow the flow of said fluid leakage from said space to said gap; and
(h) means mounted on said coupling means and defining a fluid leakage collection chamber in fluid communication with said gap for receiving flow of fluid leakage therefrom.

5,149,142

VENT COLLAR FOR PLASTIC LINED PIPE

Lee E. Walko, Midland, and Rodney G. Grusecki, Omer, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1988, Ser. No. 251,264
Int. Cl.[5] A16L *55/00*
U.S. Cl. 285—14 22 Claims



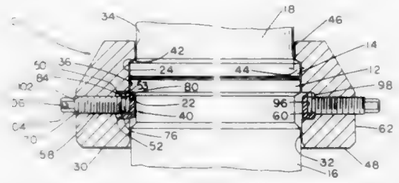
1. A pipe segment comprising:
a casing having a pair of ends;
a pipe flange fixedly attached to said casing proximate at least one of said ends of said casing;
a liner, received within said casing, having a liner flange extending radially outward and positioned in overlapping relation with said pipe flange; and
a vent collar positioned between said pipe flange and said liner flange, said vent collar having at least one predetermined, defined channel having an inlet opening and an outlet opening spaced radially outward of said inlet opening, whereby permeated gases trapped between said casing and said liner can be vented through said at least one defined channel, said vent collar further including at least one ridge which projects outwardly and offsets said vent collar from said pipe flange to thereby define said at least one channel.

5,149,143

CONNECTOR ASSEMBLY WITH DETACHABLE SLEEVE

Robert M. Howell, Houston, Tex. assignor to National-Oilwell, Houston, Tex.

Continuation of Ser. No. 383,101, Jul. 20, 1989, abandoned. This application May 8, 1991, Ser. No. 698,359
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—18 14 Claims



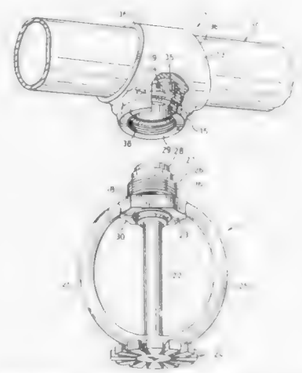
1. A connector for connecting a first annular member having a generally cylindrical body with an enlarged diameter portion forming an external end hub having a first shoulder with a second annular member having a second shoulder, comprising:
an integral ring forming an annular wall with an enlarged bore and a reduced diameter portion extending radially inward from said annular wall and forming a reduced bore, said enlarged bore sized to slidingly receive that generally cylindrical body and external end hub of the first annular member and the second shoulder of the second annular member, said reduced diameter portion sized to only slidingly receive the generally cylindrical body whereby said reduced diameter portion engages the first shoulder;
an annular recess disposed in said annular wall adjacent said enlarged bore and at an axial distance from said reduced diameter portion greater than the axial distance between the first and second shoulders; and
a circumferentially extending arcuate shoulder having means for radial reciprocation on said annular wall within said recess between a retracted position disposed within said recess and an extended position extending from said recess for engaging the second shoulder for clamping the shoulders of the annular members between said reduced diameter portion and said arcuate shoulder.

5,149,144

PIPE BRANCH FITTING AND BRANCH APPLIANCE THEREFOR

James Blakeley, Thornhill, Canada, assignor to Sprink, Inc., Fullerton, Calif.

Continuation of Ser. No. 157,221, Feb. 18, 1988, abandoned. This application Mar. 16, 1989, Ser. No. 324,953
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—23 10 Claims



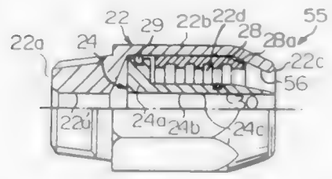
1. In combination, a pipe branch fitting and a sprinkler for use with a pipe having a pre-cut hole, the branch fitting comprising:
(a) a continuous cylindrical tube having a cylindrical inner surface adapted for embracement around the pipe at the position of the hole and having opposing axial end walls that slant axially inwardly towards one another;
(b) an upstanding hollow, internally threaded boss on one side of the cylindrical tube;
(c) a resilient sealing gasket at the inner side of the boss; and
a one-piece sprinkler head comprising:
(i)(a) a threaded portion adapted for retention in the threaded boss and having a generally planar annular surface bearing rotatably on the sealing gasket and being formed adjacent its inner end with a reduced diameter spigot end portion adapted for repositioning in the pre-cut hole of the pipe, adjacent its opposite outer end with at least one wrench receiving surface so that the sprinkler head can be turned by a wrench means to displace the sprinkler head inwardly into the threaded boss to compress the sealing gasket against the pipe, (b) an inward-facing shoulder on the spigot end portion for abutment on the outer surface of the pipe within the sealing gasket, whereby the compression applied to the gasket by the sprinkler head is restricted to a predetermined limit, the spigot end portion extending axially beyond the threaded portion and being adapted, in use, the extend a short distance beyond said inward-facing shoulder and (c) a distribution means for sprinkling fluid exiting the pipe; and
(ii) wherein the sealing gasket has at least one annular surface portion lying substantially in a generally transverse plane, and a saddle-shaped annular surface portion adapted to conform to the surface of the pipe around the pre-cut hole of the pipe and being adapted to be confined between and in substantially complete conformity with the adjacent surfaces of the sprinkler head the branch fitting, and the pipe.

5,149,145

HOSE FITTING

Takahiro Yokomatsu; Kenji Mine, and Shinichiro Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

Continuation of Ser. No. 370,791, Jun. 23, 1989, abandoned, which is a division of Ser. No. 230,869, Aug. 11, 1988, abandoned. This application Feb. 4, 1991, Ser. No. 649,198
Claims priority, application Japan, Sep. 29, 1987, 62-246770; Mar. 8, 1988, 63-55389
Int. Cl.[5] F16L *17/00*
U.S. Cl. 285—101 1 Claim



1. A hose fitting for sealed connection to a multilayer hose, comprising:
a first, one-piece cylindrical member having a small diameter bore portion and a large diameter bore portion connected to said small diameter bore portion, the small diameter bore portion being formed with an axial small bore extending therethrough, and the large diameter bore portion being stationary with respect to said small diameter bore portion and being formed with an axial large bore extending therethrough and having a cylindrical portion and a portion tapering radially inward from said cylindrical portion in a direction axially outward with respect to said large diameter bore portion;
a second cylindrical member axially slidable within said large diameter bore portion of said first cylindrical member and having a radial flange portion and an axial tubular portion extending from said radial flange portion, the radial flange portion being provided with a first sealing member sealingly engaging with the inner surface of said large diameter bore portion and the axial tubular portion being formed with a through bore communicating with said axial small bore of said small diameter bore portion of said first cylindrical member and provided with a second sealing member sealingly engageable with the multilayer hose, and said first sealing member serving so that said second cylindrical member is axially slid along and on said large diameter bore portion of said first cylindrical member, as a piston, when internal pressure is applied to said hose fitting; and
a collet provided within said large diameter bore portion and having an outer surface engageable with said tapering portion of said first cylindrical member and radially constrictible when moving axially within said tapering portion, the multilayer hose being merely inserted and firmly fixed between said collet and said axial tubular portion of said second cylindrical member by axial outward movement of said collet caused by axial outward movement of said second cylindrical member.

5,149,146

DOUBLE KNUCKLE JOINT FOR A WIDE RANGE ORIENTATION OF A LIQUID DISTRIBUTOR WITH RESPECT TO A FEEDER PIPE

Giancarlo Simoni, Genova, Italy, assignor to Siroflex S.r.l, Italy

Filed Mar. 21, 1990, Ser. No. 496,775
Claims priority, application Italy, Dec. 4, 1989, 12606 A/89
Int. Cl.[5] F16L *27/04*
U.S. Cl. 285—166 12 Claims

1. A pipe joint assembly, comprising: an adjustable pipe joint including
(A) a one-piece, hollow sleeve extending along a longitudinal axis between opposite end faces and having a pair of generally ball-shaped end portions spaced longitudinally apart of each other, and a cylindrical central portion intermediate, and integral with, the ball-shaped end portions, each ball-shaped end portion having an outer diameter as considered along a transverse axis normal to the longitudinal axis, said outer diameters of the ball-shaped end portions being different in magnitude, said ball-shaped end portions and said central portion together bounding an internal fluid flow passage that extends along the longitudinal axis between the end faces of the sleeve;
(B) inlet connector means for connecting one of the ball-shaped end portions to a fluid feed means, said inlet connector means including
(i) an annular, hollow, inlet outer member of rigid material and extending along a first axis and circumferentially surrounding said one ball-shaped end portion, said inlet member having an annular lip extending radially inwardly of the first axis to bound a first circular opening having a diameter smaller than the outer diameter of said one ball-shaped end portion and greater than the outer diameter of said other ball-shaped end portion, said lip having a first, concave, inner circumferential surface,
(ii) an annular, hollow, inlet locking ring mounted entirely within the inlet member and having a first, concave, inner, circumferential wall which, together with the first, inner, circumferential surface of said lip, form a generally spherical first socket for rotatably receiving said one ball-shaped end portion to orient said first axis in a range of inclination angles relative to said longitudinal axis, said first, concave, inner, circumferential wall extending substantially to the end face of said one ball-shaped end portion to increase the range of the inclination angles, and
(iii) an inlet seal mounted in sealing engagement among the inlet member, the inlet locking ring and said one ball-shaped end portion; and
(C) outlet connector means for connecting the other of the ball-shaped end portions to a fluid discharge means, said outlet connector means including
(i) an annular, hollow, outlet outer member of resilient

material and extending along a second axis and circumferentially surrounding said other ball-shaped end portion, said outlet member having an annular flange extending radially inwardly of the second axis to bound a second circular opening having a diameter smaller than the outer diameter of said other ball-shaped end portion, said outlet member resiliently engaging said other ball-shaped end portion, said flange having a second, concave, inner, circumferential surface,

(ii) an annular, hollow, outlet locking ring mounted within the outlet member and having a second, concave, inner, circumferential wall which, together with the second, inner, circumferential surface of said flange, form a generally spherical second socket for rotatably receiving said other ball-shaped end portion to orient said second axis in a range of inclination angles relative to said longitudinal axis, said second, concave, inner, circumferential wall extending substantially to the end face on said other ball-shaped end portion to increase the range of the inclination angles, and

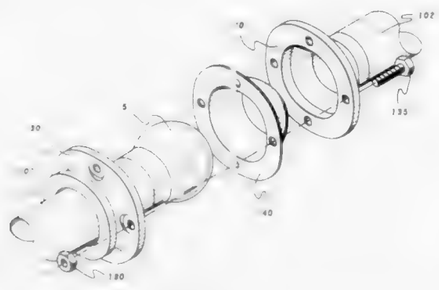
(iii) an outlet seal mounted in sealing engagement among the outlet member, the outlet locking ring and said other ball-shaped end portion.

5,149,147

CONDUIT COUPLING FOR HIGH TEMPERATURE, HIGH PRESSURE APPLICATIONS

Marie A. Kastrup, West Chester; Ivan H. Peterson, Hamilton, and Bruce A. Hamblin, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 18, 1991, Ser. No. 687,279
Int. Cl.[5] F16L *27/04*
U.S. Cl. 285—261 **18 Claims**



1. A coupled conduit for high pressure, high temperature use, said coupled conduit comprising:

a) a first conduit including

i) an outer diameter, and

ii) a hollow spherical ball extending from the coupled end, said spherical ball having a central outer diameter greater than the outer diameter of said first conduit,

b) a second conduit including

i) a longitudinal axis, and

ii) an open end cap extending from the coupled end, said end cap having support means for multiple fasteners and a flared frustoconically shaped inner surface having sides at an angle of inclination, relative to said longitudinal axis, in the range of 30°–50°,

c) a retaining ring adapted to pivot about the hollow spherical ball during assembly, having support means for multiple fasteners which is complementary to the support means for multiple fasteners of the end cap and wherein all or a portion of the retaining ring has an inner diameter that is smaller than the central outer diameter of said spherical ball,

d) a metal sealing ring having hemispherically shaped inner and outer surfaces which conform to an outer surface of the hollow spherical ball, and

e) multiple fasteners; wherein:

i) the spherical ball is seated within the flared frustoconically shaped inner surface of the end cap with a portion of the spherical ball extending outside of said end cap,

ii) the retaining ring is positioned concentrically about a portion of the spherical ball which extends outside of said end cap,

iii) the support means for multiple fasteners on the retaining ring and the end cap are aligned and support the multiple fasteners,

iv) the sealing ring is positioned concentrically about the spherical ball and is compressed between the hollow spherical ball and the open end cap, and

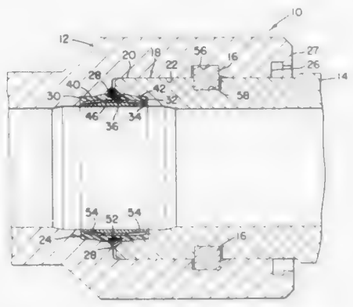
v) the multiple fasteners compress elements (a)–(d) with sufficient force so as to provide a hard point contact between said metal sealing ring hemispherically shaped outer surface and said open end cap flared frustoconically shaped inner surface, thereby providing a seal between the spherical ball and the end cap.

5,149,148

PIPE SWIVEL JOINT WITH IMPROVED BORE SEAL

Ralph Taeuber, Jr., Houston; Sergio A. Castillo, Jr., Spring, and Tep Ungchusri, The Woodlands, all of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 13, 1991, Ser. No. 744,611
Int. Cl.[5] F16L *27/00*
U.S. Cl. 285—276 **18 Claims**



1. A pipe swivel joint capable of quick and easy servicing in the field, said joint comprising an assembly of

a) a male pipe swivel joint hub;

b) a female pipe swivel joint hub;

c) means interlocking said hubs in a rotatable manner while providing a thrust bearing therebetween;

d) radial bearing means between said hubs; and

e) a bore seal assembly for providing a dynamic fluid pressure seal between said hubs, said bore seal assembly comprising a sleeve-like seal element with an outer annular groove and an anti-extrusion ring residing in said groove to prevent extrusion of said seal element and radially energize said joint hubs toward their operational positions.

5,149,149

PIPE CONNECTING DEVICE WITH BAYONET AND INTERLOCKING BUSHING STRUCTURE

Wen C. Wu, 132-2, Hsi Hsin Street, Chang Ya Village, Hsiu Shui Hsiang, Changhua, Taiwan

Filed Jan. 16, 1992, Ser. No. 821,039
Int. Cl.[5] F16L *37/00*
U.S. Cl. 285—402 **2 Claims**

1. A pipe connecting device for connecting two tubes into a line, the connecting device includes a first bush fixedly fastened in one tube in flush with an end edge thereof, a second bush fixedly fastened in the other tube in flush with an end edge thereof, and a pipe connector to connect said first bush to said second bush, said first and second bushes each comprising a guide groove through the periphery thereof in a longitudinal direction and a curved locating groove extending from said guide groove and through the periphery thereof in a latitudinal direction, the locating groove of said first bush curving leftwards and upwards, the locating groove of said second bush curving rightwards and downwards, said pipe connector being made in a hollow structure having a circular outward flange at

the middle and two unitary pins projecting from an outer wall surface thereof at right angles, said two unitary pins being arranged in a row and disposed at two opposite locations relative to said flange, wherein said two tubes can be detached from each other when the guide groove on said first bush is longitudinally aligned with the guide groove on said second bush; said two tubes are firmly connected together when said two unitary pins are respectively engaged into the locating grooves on said first and second bushes.

5,149,150

MOTION TRANSMITTING AND AMPLIFYING DEVICE

Allen V. C. Davis, Chatsworth, Calif., assignor to Kathryn L. Acuff Trust and Heather Ruth Davis Trust, both of Chatsworth, Calif.

Continuation-in-part of Ser. No. 444,450, Dec. 21, 1989, abandoned, which is a division of Ser. No. 284,947, Dec. 14, 1988, Pat. No. 4,891,479. This application Mar. 26, 1991, Ser. No. 679,156
Int. Cl.[5] H01H *35/34*
U.S. Cl. 267—159 **13 Claims**

1. A motion transmitting and amplifying device for effecting electrical contact responsive to a deforming force applied to one surface thereof comprising;

a spring metal disc having a substantially continuous circular rim portion and a central motion translating and amplifying portion;

said central motion translating and amplifying portion configured to resemble the letter W including a pair of driver loops having generally parallel legs and an output loop having generally parallel legs;

one leg of each of said driver loops being connected to a different leg of said output loop;

electrical contact means on said output loop;

and means connecting the ends of said driver loops opposite their connections with said output loop confining the outer ends of said driver loops against outward movement with respect to each other;

said connecting means comprising the substantially continuous circular rim portion;

the legs of said output loop being locally stressed by deformation so that the legs of said output loop are closer together at their connection with said driver loops than at the closed end of said output loop;

whereby deforming force applied to one face of said disc produces amplified movement of said contact on said output loop in the same direction as the applied force

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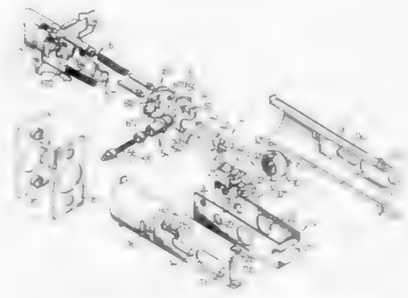
5,149,151

ADJUSTABLE LATCH ASSEMBLY OF LEVER LOCK

Chao C. Shen, No. 62, Hoshan St., Tainan, Taiwan TWX

Filed Aug. 27, 1991, Ser. No. 750,328
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—1.5 **5 Claims**



1. An adjustable latch assembly used in a lever lock, comprising:

a shell having two sections each having a first slot through which a spindle penetrates, a second slot through which a pin penetrates for securing said latch assembly to a door, a third slot communicating with two holes at two ends, and a fourth slot extending perpendicular to said first, second, and third slots;

a shelf having a first position and a second position within said shell;

a rotator mountable on said shelf,

actuating means actuatable by said rotator;

a bolt; and

a positioning and pulling assembly for retaining said shelf in said first position or said second position and for pulling said bolt into said shell when actuated by said actuating means.

5,149,152

LOCKABLE LATCH ASSEMBLY WITH FLEXIBLE BAND LOCKING MEMBER SURROUNDING A CAM SURFACE

Charles A. Lanius, Prairie du Sac, Wis., assignor to Flambeau Products Corporation, Middlefield, Ohio

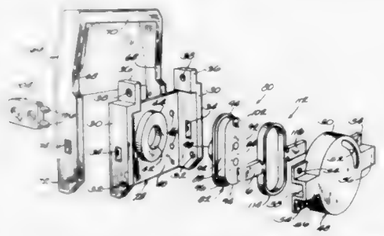
Filed Feb. 6, 1992, Ser. No. 831,874
Int. Cl.[5] E05C *9/04*
U.S. Cl. 292—37 **20 Claims**

17. A latch mechanism for use in securing first and second members against movement relative to one another, said latch mechanism comprising:

a driver member adapted to be supported on the first member for selective pivotal movement relative thereto between a lock position and an unlock position, said driver

member including an elongated annular outer cam surface; and

a locking member including a flexible band surrounding said cam surface and slidingly engaging said cam surface, said band being deformable to conform to the contour of said cam surface, and a locking bar moveable with a portion of said band and extending radially outwardly from said portion of said band, said locking bar being reciprocally



moveable relative to said first member in response to deformation of said band, said locking bar being moveable between a retracted position when said driver member is moved to said unlock position and an extended position when said driver member is moved to said lock position, said locking bar being adapted to engage the second member to restrict movement thereof relative to the first member when said locking bar is in said extended position.

5,149,153

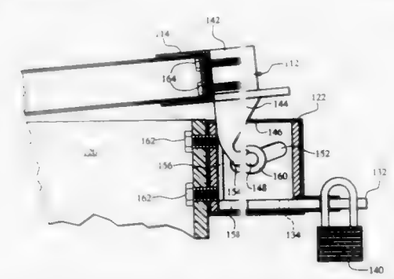
SELF-DISENGAGING LOCKING DEVICE

Thomas L. Drewry, Rte. 4, Box 1105, Union City, Tenn. 38261, and Max L. Hardin, Rte. 1, Kenton, Tenn. 38233

Continuation-in-part of Ser. No. 691,520, Apr. 25, 1991, Pat. No. 5,094,487. This application Feb. 27, 1992, Ser. No. 842,266

Int. Cl.[5] B65F *1/12*; E05C *1/08*

U.S. Cl. 292—104 **14 Claims**



1. A locking device for use on a container having at least one hinged lid pivotable between open and closed positions and generally vertical front and side walls, said locking device comprising:

a housing, having an opening formed therein, mounted to a wall of said container;

latch means, having a first portion securable to the lid of said container and a second portion extendable through said opening when said lid is in its closed position;

keeper means, disposed within said housing, for engaging said second portion of said latch means upon moving said lid to its closed position, thereby securing said lid in its closed position,

said keeper means comprising a keeper pin having first and second ends slidably disposed within said housing, said keeper pin being moveable between engaged and disengaged positions relative to said second portion of said latch means; and

manual release means, operative for selectively moving said keeper pin between said engaged and disengaged positions, thereby allowing selective opening of said lid.

5,149,154

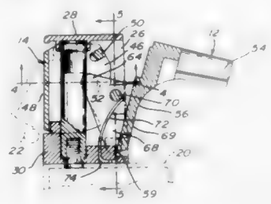
DOOR LATCH

Gad Shaanan, Montreal, Canada, assignor to Ideal Security Inc., LaSalle, Canada

Filed Jan. 27, 1992, Ser. No. 826,471

Int. Cl.[5] E05C *3/08*

U.S. Cl. 292—226 **5 Claims**



1. A door latch comprising a housing, including side walls, a top bight portion, and a separate base member, the housing defining a front opening and a rear opening, at least a pivot socket provided at the top portion of the housing adjacent the bight, the pivot socket being opened towards the bottom; a latch bolt including at least a pivot member is arranged in the housing with the pivot member in the pivot socket, wherein the latch bolt is adapted to pivot between an extended position projecting from the housing through the front opening and a retracted position within the housing, the latch bolt having at least a web member extending away from the pivot member towards the bottom and parallel to the housing side walls, and a first camming recess defined in the web; the base member including at least a pivot socket means open towards the bight of the housing, a lever having a dog leg member and a handle, the dog leg member including at least a first pivot member adapted to be seated in the pivot socket on the base member and at least a camming projection on the dog leg spaced upwardly from the first pivot member and adapted to engage the camming recess defined in the web of the latch bolt; the lever including a handle extending through the rear opening of the housing such that when the handle is pivoted in a clockwise manner, the camming projection on the dog leg, engaged in the recess of the web, will cause the latch bolt to pivot counterclockwise to retract within the housing, and spring means are located in the housing to return the latch bolt to an extended position.

5,149,155

LEVER HANDLE LOCK ASSEMBLY

Ben J. Caeti, Brooklyn, N.Y.; Paul Raybary, Roanoke, Va., and Boris Grinshpon, Brooklyn, N.Y., assignors to Arrow Lock Manufacturing Company, Brooklyn, N.Y.

Filed Jun. 14, 1991, Ser. No. 713,111

Int. Cl.[5] E05C *1/16*

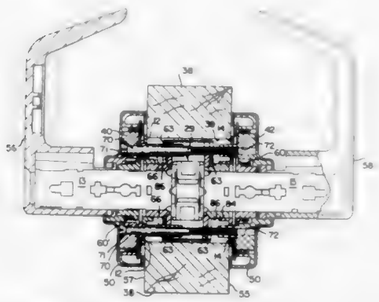
U.S. Cl. 292—336.3 **20 Claims**

1. A lock assembly for mounting in a door panel having first and second sides and a transverse bore therethrough comprising:

a lock chassis, adapted to fit within said bore, having rotatable spindles extending therefrom for actuating a latch bolt upon rotation of said spindles, said chassis having a support opening on at least said first side of said door panel;

a support member, having a diameter greater than said bore, on at least said first side of said door panel and adapted to be non-rotatably secured thereto, said support member having thereon an opening corresponding to said chassis support opening;

a support member fastener having a hollow, elongated body with an internal opening extending along its length, said support member fastener being adapted to extend through said support member opening and into said chassis support opening to non-rotatably secure said chassis to said support member;



a rose through which a spindle extends for mounting on said door panel over said support member, said rose being securable to the lock assembly by an elongated rose fastener extending through said hollow support member fastener.

5,149,156

POWER DOOR-LOCK ACTUATOR WITH PIVOTING ROCKER AND CONNECTING GEARS

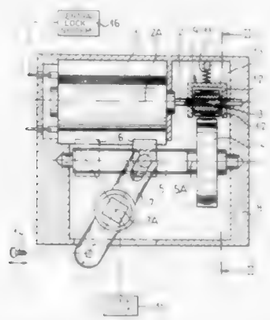
Frank Kleefeldt, Heiligenhaus, Fed. Rep. of Germany, assignor to Kiekert GmbH & Co., Heiligenhaus, Fed. Rep. of Germany

Filed Dec. 24, 1991, Ser. No. 813,263

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1991, 4108641

Int. Cl.[5] E05C *3/06*; F16H *57/00*

U.S. Cl. 292—336.3 **5 Claims**



1. In combination with a door lock movable between a locked position and an unlocked position, an actuator comprising:

a housing adjacent the lock;

a reversible electric motor in the housing having an output shaft extending along a motor axis;

an input gear fixed on the output shaft and rotatable thereby about the motor axis;

a threaded spindle extending in the housing along a spindle axis adjacent the motor axis;

an output gear fixed on the spindle;

a nut threaded on the spindle and movable along the spindle axis on rotation of the spindle between a pair of axially offset positions;

means including a link connected between the nut and the lock for moving the lock between its locked and unlocked positions on displacement of the nut between its end positions;

manual actuation means coupled to the nut for manually displacing the nut between its end positions;

a rocker pivotal about the shaft axis at the input gear;

a pair of connecting gears journaled in the rocker and flanking and meshing with the input gear, the rocker being pivotal between one angled position with one of the connecting gears meshing with the output gear and another angled position with the other of the connecting gears meshing with the output gear and through a central position with neither of the connecting gears meshing with the output gear; and

spring means urging the rocker into the central position, whereby torque transmitted to the rocker on rotation of the input gear pivots the rocker depending on input-gear rotation direction into one of its angled positions to couple the input gear to the output gear.

5,149,157

DEVICE FOR LOCKING AN EMERGENCY EXIT

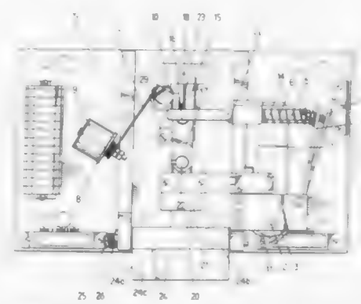
Charles M. Laugery, La Trinite, and Paul A. Mombelli, Nice, both of France, assignors to Mecanismes Electroniques Realises Innovation Conception Brevets, Sartrouville, France

Filed May 31, 1991, Ser. No. 708,926

Claims priority, application France, Jun. 5, 1990, 90 06951

Int. Cl.[5] E05B *15/02*

U.S. Cl. 292—341.16 **18 Claims**



1. A locking device for an emergency exit including at least one door mounted relative to a fixed wall, the locking device being capable for locking purposes of selectively taking up a first mode of operation when the public is present and that provides positive safety, with unlocking being under remote control by an electrical current being interrupted, and a second mode of operation when the public is not present and that provides enhanced security, said locking device comprising a support plate for fixing to one of said fixed wall and said door constituting said emergency exit, a bolt for co-operating with at least one catch element defining a keeper and fixed to the other one of said door and said fixed wall constituting said emergency exit, locking means for locking said bolt, unlocking control means for unlocking said locking means, and enhanced security means for selectively inhibiting the operation of said unlocking control means, wherein the bolt has a first portion including abutment means for coming into abutment against said catch element to prevent relative movement between said door and said fixed wall, and a second portion essentially perpendicular to said first portion and mounted to pivot about a bolt axis parallel to said first and second portions, wherein the bolt co-operates both with a retraction spring which has energy stored therein in the bolt-closed position, and with a locking piston guided by a guide part along a direction perpendicular to said pivot axis to bear in a locking position against the rear face of said second portion, and wherein the locking means further includes a toggle mechanism comprising a first

link pivoting about a first axis perpendicular to the displacement direction of said piston and to the bolt axis and having a position which is fixed relative to the support plate, and a second link hinged firstly to the first link and secondly to the locking piston about respective second and third moving axes parallel to said first axis, the first, second and third axes, when in the locking position, being substantially in alignment on the axis of the piston, and a toggle-collapsing spring having energy stored therein when in said locking position.

5,149,158

WAFER CARRIER HOLDER FOR WAFER CARRIERS

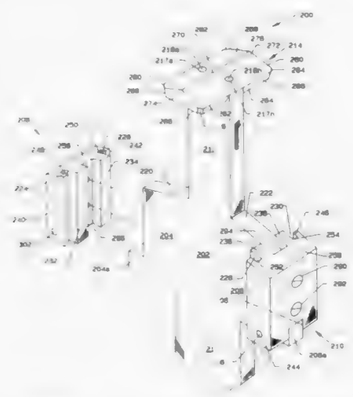
James Molinaro, Coplay, and Eric Stapp, Bernville, both of Pa., assignors to SubMicron Systems, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 438,024, Nov. 20, 1989, Pat. No. 5,100,190. This application Jun. 4, 1990, Ser. No. 532,572

The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.

Int. Cl.[5] B65D *71/00*

U.S. Cl. 294—1.1 9 Claims



1. In combination, a wafer carrier holder, end effectors and wafer carriers comprising:

a. at least one wafer carrier including tabs for engaging a gripping means of said wafer carrier holder;

b. said wafer carrier holder comprising a central member including horizontal members with opposing gripping means affixed thereto, said gripping means spacing said wafer carrier from said central member, said gripping means including first and second opposing vertical channels for slidably receiving the tabs of the wafer carrier, a downwardly extending vertical member from said central member, an upward extending handle support member from said central member, opposing beveled surface means extending outwardly from said handle support member, and at least one quartz rod extending through said central member; and,

c. said end effectors including means for engaging said opposing beveled surface means of said wafer carrier holder.

5,149,159

DISPOSABLE COLLECTOR AND CONTAINER

Dale L. Bardes, 1113 W. Albion Ave., Chicago, Ill. 60626-4613

Continuation of Ser. No. 377,019, Jul. 7, 1989, abandoned. This application Feb. 21, 1991, Ser. No. 658,972

Int. Cl.[5] A01N *29/00*

U.S. Cl. 294—1.3 19 Claims

1. A disposable collector and container for the manual collection and containment of small amounts of material and small objects without direct manual contact, said collector and container comprising an elongated bag-like structure of thin, flexible, moisture-proof material having an open end, a closed end, and closed side edges, said bag being sized to comfortably receive the user's hand, said closed end being gusseted to form a "W"-shape in cross section, a second exterior ply of thin, flexible, moisture-proof material at and overlying said closed end of said collector and container, said second ply being gusseted to have a corresponding "W"-shape in cross section, said second ply comprising the exterior ply when said collector and container is right side-out, said second ply being attached to said collector and container in such a way that a thin layer of air exists therebetween, reducing friction between said collector and container and said exterior ply and enhancing movement therebetween, said attachment of said outer ply and said thin layer of air comprising means for enabling controlled movement between said exterior ply and said container and collector to enhance puncture resistance thereof, said gussets in said closed end and second exterior ply forming two interior pockets for receipt of the user's fingers and thumb, respectively, and an intermediate exterior pocket therebetween for receipt of the material being collected and for engagement thereof by and between said fingers and thumb, said collector and container when turned inside-out to remove it from the user's hand comprising a container for said collected material.

5,149,160

PIPE STRUCTURE

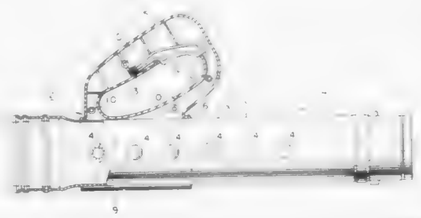
Giichi Iida, Tokyo, and Kazunori Takahashi, Kawagoe, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed May 2, 1991, Ser. No. 694,739

Claims priority, application Japan, May 7, 1990, 2-047511[U]

Int. Cl.[5] B65G *9/00*

U.S. Cl. 294—16 1 Claim



1. A pipe structure comprising a pipe member and a handle member provided on said pipe member for supporting it in such a manner that the position of said handle member relative to said pipe member in the lengthwise direction can be adjusted to a desired position, and said handle member is formed as an integral molded part which is divided into two half bodies along the axial direction of said pipe member, a hinge portion is connected between opposite side edges of said half bodies, and said two half bodies are combined to each other by bending at said hinge portion so that said handle member is mounted around said pipe member

wherein said handle member has a plurality of semispherical recesses formed at certain intervals on a line in an inner surface of each of said two half bodies in the lengthwise direction thereof, said recesses being arranged to engage corresponding protruding portions formed at intervals on a line on the outer periphery of said pipe member.

5,149,161

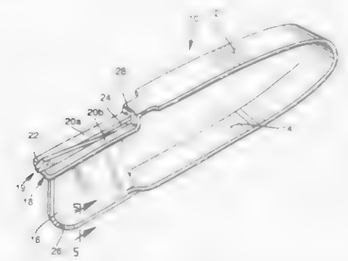
COOKIE DROPPER

Franklin G. Smith, 2944 S.E. Tibbetts, Portland, Oreg. 97202

Filed Nov. 29, 1990, Ser. No. 620,364

Int. Cl.[5] A47J *43/28*

U.S. Cl. 294—26.5 2 Claims



1. A cookie dropper comprising:

a unitary member made of one piece of resilient material and having first and second opposing arms;

the first and second arms being movable relative to one another;

the first arm terminating in a flat spatula that has a flat surface;

the second arm terminating in a ram including two parallel fingers arranged to define an enclosed slot through which the spatula fits, a finger of the ram being movable across the flat surface of the spatula, the fingers being connected at one end of the slot, and wherein the spatula includes a protruding tab having a flat surface that is coplanar with the flat surface of the spatula and that fits through the enclosed slot without bending of the tab, the resiliency of the arms normally holding the tab against the connected end of the fingers thereby to retain the spatula within the slot, and wherein the fingers are offset so that a major portion of one finger is nearer to the first arm than is the other finger.

5,149,162

DEVICE FOR CONVEYING LAYERS COMPRISING A MULTITUDE OF INDIVIDUAL OBJECTS

Heinz Focke, Verden, and Johannes Holloch, Langwedel, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jul. 31, 1990, Ser. No. 560,637

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 3926121

Int. Cl.[5] B66C *1/02*

U.S. Cl. 294—64.1 8 Claims

1. A device for conveying layers each of which contains a plurality of individual objects, said device comprising:

a) suction head means (27) for picking up a layer of individual objects (14) by directly contacting top sides of the objects in the layer,

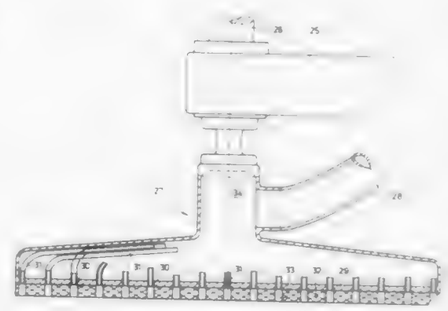
said suction head means (27) comprising a hollow suction chamber (34) having a connection means (28) for connection to a vacuum source which produces a negative pressure in said suction chamber, and

said suction chamber (34) being bounded at a bottom side thereof by a flat suction plate (29) which directly contacts the top sides of the objects;

b) a plurality of vertically extending suction bores (33) disposed in said suction plate (29) for direct juxtaposition with said top sides of the objects,

said bores (33) being spaced apart by such horizontal distances that each object (14) is directly acted upon on its top side by at least one of said bores (33), said horizontal distances between said bores (33) being smaller than a horizontal dimension of the objects (14), and

said bores (33) opening out into said suction chamber (34), and



c) a plurality of flow ducts (31) in the form of flexible tubes for conducting air between said suction bores (33) and the vacuum source, each flow duct (31) having a first end, connected to a respective one of said bores (33), and an opposite free open end,

said flow ducts (31) being of approximately equal length and being located completely—including each free open end as well—within said suction chamber (34).

5,149,163

ON AND OFF FISHING TOOL

Jackie D. Pruitt, Levelland, Tex., assignor to Well-o Oil Service, Inc., Brownfield and Felipe Hernandez, Levelland, both of, Tex., a part interest to each

Filed Dec. 26, 1989, Ser. No. 456,314

Int. Cl.[5] E21B *31/18*

U.S. Cl. 294—86.31 2 Claims

2. Structure for removing broken sucker rod in a deep well having

a. a composite sucker rod having

b. a splintered partial joint above

c. a metal coupling having

d. a four faced wrench flat thereon with a ledge at the top of each wrench flat, and

e. said coupling connected to a stuck sucker rod extending down in the well;

the improved tool in combination with the above comprising:

f. a tubular overshot about 40 feet in length having a top and bottom end telescoped over the splintered partial joint,

g. a tubular bowl having a top and bottom attached at its top to the bottom end of the overshot,

h. a four fingered collet having a top and a bottom telescoped within said bowl,

hh. a hook on each collet finger engaged with said ledge at the top of each wrench flat,

i. a tubular stack connected to the top of said collet,

j. a shoulder between said collet and said stack,

k. said shoulder angled upward from the inside so that the splintered partial joint is guided from the collet into the stack,

l. a helical compression spring telescoped around said stack and extending from the top of the bowl to the shoulder between the collet and said stack,

m. an internal flange at the bottom of the bowl to limit the downward travel of the collet, and

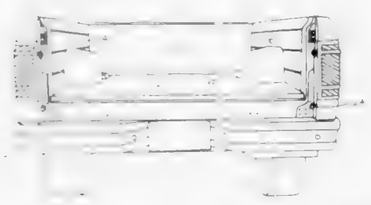
n. an internal taper within the bowl a short distance above said internal flange.

5,149,164

BED FINISHER FOR PICKUP TRUCK

Jesse E. Wilson, 13207 Dairy Maid Dr. #204, Germantown, Md. 20874

Filed Sep. 10, 1991, Ser. No. 757,216
Int. Cl.[5] B62D *25/00*
U.S. Cl. 296—50 **20 Claims**



1. A bed finisher for being received in lieu of a tailgate of a vehicle having a cargo bed, wherein the lateral ends of the tailgate are pivoted on and releasably latchable to vertical side walls of the cargo bed of the vehicle said bed finisher comprising left and right upright members each including means for mating with pivot means formed in the side walls of the cargo bed for mating with pivot members on the lateral ends of the tailgate, each including means for mating with latch members on the side walls of the cargo bed for releasably latching the ends of the tailgate to the side walls of the cargo bed of the vehicle, and each including a cover member for concealing said pivot means and said latch members on the side walls of the cargo bed.

5,149,165

STRUCTURES FOR LIFTING OUTBOARD SIDE OF SEAT OF MOTOR VEHICLE DURING SIDE IMPACT COLLISION

Ronald L. Woolley, 2510 N. University Ave., Provo, Utah 84604

Filed May 6, 1991, Ser. No. 696,103
Int. Cl.[5] B60N *2/42*
U.S. Cl. 296—68.1 **2 Claims**

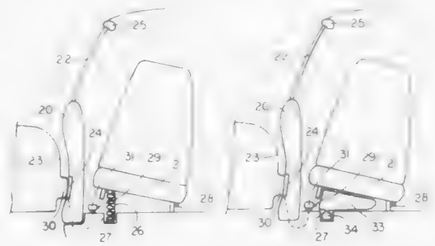
1. A system used in motor vehicles for raising the outboard side of a passenger seat upon side impact of the vehicle by another object, said system comprising

sensing means for detecting impact of the side of the vehicle by another object;

means for activating a trigger mechanism when the sensing means detects impact of the side of the vehicle;

means for raising the outboard side of a seat adjacent to the side of the vehicle that has been impacted, wherein the means for raising the outboard side of the seat comprises at least one spring mounted between the seat and the floor of the vehicle so as to exert force against the outboard side of the seat; and

the trigger mechanism includes a latch which, when the trigger mechanism is not activated, holds the outboard side of the seat firmly mounted to the floor of the vehicle, and when the trigger mechanism is activated, the latch



releases allowing the outboard side of the seat to move upwardly under the force of said spring.

2. A system used in motor vehicles for raising the outboard side of a passenger seat upon side impact of the vehicle by another object, said system comprising

sensing means for detecting impact of the side of the vehicle by another object;

means for raising the outboard side of a seat adjacent the side of the vehicle that has been impacted, wherein the means for raising the outboard side of the seat comprises an air bag inflation device mounted between the seat and the floor of the vehicle so as to exert an upward force against the outboard side of the seat when the air bag inflation device is inflated; and

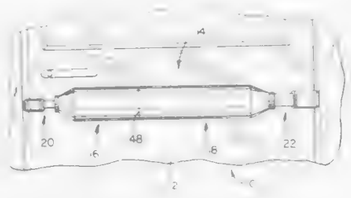
means for inflating the air bag inflation device in response to detection of impact of the side of the vehicle by said sensing means.

5,149,166

VEHICLE DOOR PROTECTOR

Dale A. Wille, 2648 Saratoga Dr., Waterloo, Iowa 50702, and Douglas Sevey, Waterloo, Iowa, assignors to Dale A. Wille, Waterloo, Iowa

Filed Nov. 25, 1991, Ser. No. 797,536
Int. Cl.[5] B60R *13/04*
U.S. Cl. 293—128 **21 Claims**



1. A vehicle door protector, comprising:

a first elongated member having a hook at one of its ends;

a second elongated member having a hook at one of its ends;

wherein the first and second members are engagable with each other to form an elongated door mounting subassembly defining a longitudinal spanning portion extending between first and second ends, wherein the hooks are located one at each end of the door mounting subassembly and are engagable with spaced edges of a door to mount the door mounting subassembly thereto, and wherein the first and second members are capable of movement relative to each other in a longitudinal direction such that the spanning portion of the door mounting subassembly can be lengthened to allow the hooks to be removed from the edges of the door and shortened to allow the hooks to be moved toward each other to engage the edges of the door; and

a pair of cushion members each defining a longitudinal passage through which the spanning portion of the door mounting subassembly extends, wherein the pair of cushion members include facing engaging surfaces and encompass a majority of the length of the spanning portion, and wherein the cushion members in combination with the door mounting subassembly are capable of absorbing shocks to protect the door from being subjected to shocks which otherwise would cause damage to the door.

5,149,167

BODY PANEL FOR A VEHICLE

Frank G. Rieck, Oegstgeest, and Marcellinus A. M. van Schaik, Maarssen, both of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed Nov. 6, 1991, Ser. No. 788,457
Claims priority, application Netherlands, Nov. 13, 1990, 9002475
Int. Cl.[5] B62D *25/10*
U.S. Cl. 296—191 **12 Claims**

1. A body panel for a vehicle intended for use as an exterior part of the vehicle, comprising a sheet formed of at least one layer and having opposite faces, and an elongate structural member connected to said sheet so as to support said sheet and intended for use in mounting the body panel to a vehicle, wherein said structural member is of uniform cross-sectional shape along its length and lies against one said face of said sheet so as to follow the shape of said sheet, said structural member having, as seen looking at said one face of said sheet, at least one bend and portions extending away from said bend.

5,149,168

WINDOW MOLDING FOR AUTOMOBILE

Yukihiko Yada, and Yasuhiro Wato, both of Ohbu, Japan, assignors to Tokai Kogyo Co. Ltd., Ohbu, Japan

Filed Jun. 24, 1991, Ser. No. 719,834
Claims priority, application Japan, Jun. 25, 1990, 2-166138; Jun. 25, 1990, 2-166139
Int. Cl.[5] B60J *10/02*
U.S. Cl. 296—201 **16 Claims**

1. In a window molding for an automobile, comprising a molded body adapted to be mounted in a substantially endless manner in a apace of the automobile and an inner periphery of a rear window opening of an automobile body, said molded body having wall means sealingly engageable with said inner periphery and said outer periphery so as to seal and trim said space, the improvement which comprises: said molded body includes a substantially planar, elastic, flange portion projecting from only a section of said molded body that is to extend along a lower edge of said rear window glass, said flange portion being adapted to elastically abut against a panel forming a lower edge of said rear window opening, an upper trim portion including an upper, inwardly extending flange adapted to overlie and seal against an outer surface of an outer peripheral edge portion of the rear window glass, a column portion projecting downwardly from said upper trim portion and a

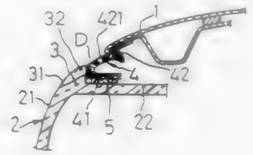
lower, inwardly extending flange adapted to underlie and seal against an inner surface of said outer peripheral edge portion of the rear window glass, said upper flange, said column portion and said lower flange defining a substantially continuous channel for encircling the rear window glass and providing a substantially continuous border thereon, said flange portion projecting outwardly from a lower edge of said column portion only in said section of said molded body, the remainder of said molded body being free of said flange portion, said flange portion extending a substantial distance beyond an outer edge of said upper trim portion in said section of said molded body.

5,149,169

SEAL STRUCTURE FOR THE ENGINE HOOD OF A MOTOR VEHICLE

Masahiro Nozaki, Inazawa, Japan, assignor to Toyoda Gsoei Co., Ltd., Nishikasugai, Japan

Filed Jun. 17, 1991, Ser. No. 716,112
Claims priority, application Japan, Jun. 18, 1990, 2-159575
Int. Cl.[5] B60J *10/00*
U.S. Cl. 296—206 **9 Claims**



1. A seal structure for sealing a gap between a front edge of an engine hood of a motor vehicle, and an upper edge of a head lamp thereof, said head lamp having an upper surface with a front edge, comprising:

a projection formed at said front edge of said upper surface of the head lamp, a front surface of said projection being inclined upwardly and rearwardly, a top edge of said projection being spaced from said front edge of the engine hood so that a small gap is defined therebetween; and

a seal member attached to said upper surface of the head lamp on a rear side of said projection, said seal member having a sealing portion having a surface which closes said small gap, wherein

said projection has a triangular cross-section which is com-

posed of an inclined surface extending from an upper end of an inclined front surface of the head lamp toward the front edge of the engine hood, and a rear surface in a plane which is substantially perpendicular to the upper surface of the head lamp, and

said seal member includes a base portion having an L-shaped cross-section so as to have a vertical part and a horizontal part, and said sealing portion extends from an upper end of said vertical part of said base portion obliquely rearwardly, the height of said vertical part being substantially equal to that of said rear surface of said projection, said base portion being attached to the upper surface of the head lamp so that said vertical part closely contacts said rear surface of said projection, and said seal surface of said sealing portion, closely contacts a lower surface of the engine hood.

5,149,170

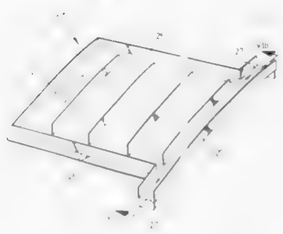
VEHICLE ROOF WITH WATER CATCHING HEADLINER

Hirco Matsubara, Kamo, Japan; Kurt Meier, Oberdolling, Fed. Rep. of Germany; Georg Kohlpaintner, Martinsried, Fed. Rep. of Germany, and Horst Bienert, Gauting, Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 682,087

Int. Cl.[5] B60J *7/053*

U.S. Cl. 296—213 **22 Claims**



1. Vehicle roof with a roof opening in a stationary roof skin and a cover for alternatively closing and at least partially opening the roof opening, as well as with a rigid sliding inside roof headliner for alternatively closing and at least partially opening a framed opening lying under the roof opening, said headliner comprising a headliner panel having an upper side extending from rearwardly of the roof opening to a front edge area of the roof opening in a forwardmost position thereof, and with a lateral drip molding running, in a longitudinal vehicle direction, under each lateral side of the roof opening, longitudinal cover guide mechanisms extending along the drip moldings and guiding the cover during displacement thereof by a drive mechanism in the longitudinal vehicle direction; wherein the sliding inside roof headliner, itself, forms a water catching device that is located under an edge gap defined between a rear edge of the cover and an adjoining rear edge of an upper roof surface in the plane of the stationary roof skin at the roof opening, at least when the cover is in said forwardmost position, said headliner being configured as a means for directly catching any water coming through the edge gap of the roof opening at its rear edge and for diverting the water over said upper side of the headliner panel in to the lateral drip moldings at side edge areas of the headliner without spilling off a rear edge of the headliner panel.

9. Vehicle roof with a roof opening in a stationary roof skin and a cover for alternatively closing and at least partially opening the roof opening, as well as with a sliding inside roof headliner for alternatively closing and at least partially opening a framed opening lying under the roof opening, and with a lateral drip molding running, in a longitudinal vehicle direction, under each lateral side of the roof opening, longitudinal cover guide mechanisms extending along the drip moldings and guiding the cover during displacement thereof by a drive mechanism in the longitudinal vehicle direction; wherein the sliding inside roof headliner, itself, forms a water catching device that is located under a rear edge of the roof opening, at least when the cover is in a forwardmost position, said headliner being configured as a means for directly catching any water coming through the roof opening at its rear edge and for diverting the water over an upper side of the headliner into the lateral drip moldings at side edge areas of the headliner; wherein each of the longitudinal cover guide mechanisms form an inner side wall of a respective drip molding and an outer wall of a longitudinally extending water duct; wherein the water duct is connected to a respective drip molding by at least one laterally extending passageway through the respective longitudinal cover guide mechanism and wherein the sliding inside roof headliner is constructed so as to divert water caught on its upper surface into the water duct, from which it is able to flow into the drip molding via the laterally extending passageway.

5,149,171

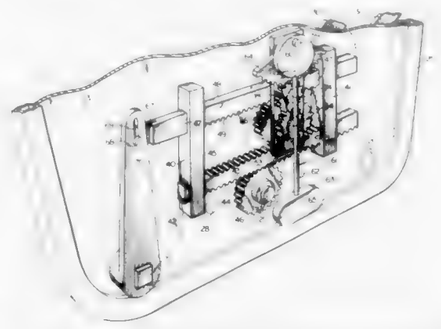
WALKOVER SEAT WITH INERTIAL LATCH

Leonid Gilevich, Skokie, and James C. Masters, Glen Ellyn, both of Ill., assignors to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed Jul. 16, 1990, Ser. No. 552,825

Int. Cl.[5] B60N *2/02*

U.S. Cl. 297—94 **35 Claims**



1. In combination with a vehicle seat for use with a vehicle which undergoes deceleration, said vehicle seat including a pair of opposite ends, a frame, a seat back, and means mounting said seat back on said frame for walkover movement of the seat back between opposite seat ends, a latching system mounted on said frame and associated with said seat back, said latching system comprising:

inertia-activated latching means (a) for automatically resisting walkover movement by said seat back during vehicle deceleration above a preselected magnitude, when the seat back is at either of said opposite seat ends and at any position therebetween, and (b) for permitting walkover movement of the seat back during vehicle deceleration below said preselected magnitude and when said vehicle is at rest, without the employment of a manual latch release.

5,149,172

CHILD SAFETY SEAT

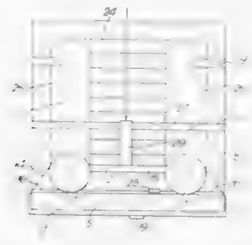
Parry Davis, 1, The Paddock, Eaglesfield, Hartford, Northwich Cheshire CW8 1NQ, England

Filed Jul. 25, 1990, Ser. No. 557,045

Claims priority, application United Kingdom, Jul. 27, 1989, 8917133

Int. Cl.[5] A47D *1/10*

U.S. Cl. 297—250 **20 Claims**



1. A child safety seat for mounting on a chair having a seat and a backrest, comprising a seat portion which in the mounted position of said safety seat engages with seat of said chair, said seat portion including a child engaging seat part and respective elongated lateral restraints extending along and secured to opposite sides of said seat part disposed in a direction from front to rear thereof, there being provided adjustable length strap means connected at respective opposite ends to said restraints whereby adjustment of the length of said strap means effects mutual counter rotation of said restraints to vary the height of said child engaging seat part.

5,149,173

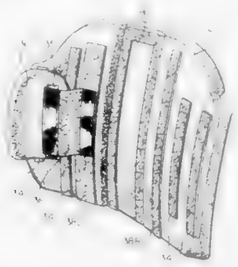
BOLSTER WITH IMPROVED ATTACHMENT MEANS

Eric C. Jay, Boulder, and Richard R. Runkles, Englewood, both of Colo., assignors to Jay Medical, Ltd., Boulder, Colo.

Continuation-in-part of Ser. No. 607,527, Nov. 1, 1990, which is a continuation-in-part of Ser. No. 272,137, Nov. 16, 1988, abandoned. This application Sep. 27, 1991, Ser. No. 766,679

Int. Cl.[5] A47C *7/46*

U.S. Cl. 297—284.9 **12 Claims**



1. A wheelchair back system comprising a back, a bolster, and an attachment means,

said back having a front surface having lateral portions and a central portion;

said bolster having a rear surface adapted to be positioned upon one of said lateral portions of said back, said bolster having a front surface which includes a sloped portion adapted to provide lateral support to a wheelchair user, the rear surface of said bolster being removably affixed to one of said lateral portions of said back; and

said attachment means comprising a strap attached to the front surface of said bolster, said strap member including means to removably engage the front surface of said back toward the center of said back, whereby said strap provides improved lateral attachment of said bolster to said back.

5,149,174

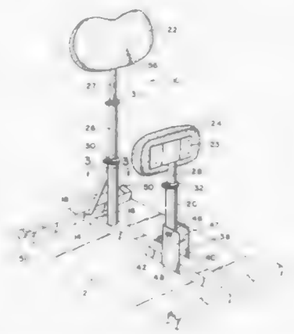
ERGONOMIC STAND

Ruth A. Charash, 2012 Como Ave., SE., Minneapolis, Minn. 55414, assignor to Ruth A. Charash, St. Paul, Minn.

Continuation of Ser. No. 411,103, Sep. 22, 1989, abandoned. This application Jul. 1, 1991, Ser. No. 723,581

Int. Cl.[5] A47C *7/00*

U.S. Cl. 297—423 **9 Claims**



1. A support stand adapted for providing support at shins and posterior of a partially standing, working person, comprising:

(a) seat supporting means for supporting the posterior, said seat supporting means having a seat and first means for holding said seat at an angle not exceeding about 35 degrees from vertical;

(b) shin supporting means for supporting the shins, said shin supporting means including a shin support and second means for holding said shin support including means for limiting movement of said shin support to an angle wherein said person's knees are in a slightly bent position at an angle of about 165°–170° when the posterior is supported by said seat supporting means;

(c) a unitary, flat planar portion extending between said seat supporting means and of said shin supporting means and having width to allow said working person to stand thereon and thereby to stabilize said seat supporting means and said shin supporting means relative to one another, said seat supporting means and said shin supporting means having a space between one another, said seat supporting means including a lower first portion, said shin supporting means including a lower second portion;

means for attaching said first and second portions to said flat planar portion to provide rigidity and further stabilize said stand for said working person; and,

(d) means for adjusting horizontal distance between said seat supporting means and said shin supporting means without spanning the space between said seat supporting means and said shin supporting means to accommodate lateral movements by said working person.

5,149,175

THIN SEAM MINING AND RELATED SORTING METHOD

Robert C. Hills, Kingsport, Tenn., assignor to Amvest Corporation, Charlottesville, Va.

Filed Apr. 15, 1991, Ser. No. 684,868

Int. Cl.[5] F21C *35/20;* **B07C** *5/346*

U.S. Cl. 299—1.9 **10 Claims**

1. A method of split load mining a coal seam having a thickness less than that conventionally considered economical to

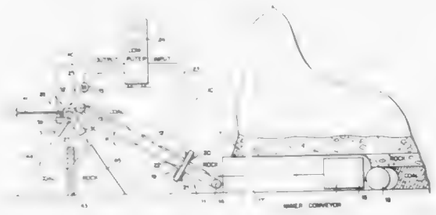
mine utilizing a cutting element having an operative cutting dimension approximately equal to the coal seam thickness, comprising the steps of:

(a) cutting into essentially only the coal seam with the cutting element to form a mine bore having a mouth;

(b) conveying cut coal from the bore to the mouth;

(c) periodically interrupting steps (a) and (b) to cut into overburden or the bore floor to enlarge the bore to provide adequate clearance distance for the mining operation, thereby generating non-coal cut material;

(d) conveying the non-coal cut material from the bore to the mouth;



(e) substantially continuously automatically conveying the cut coal and non-coal cut material in a common path away from the bore mouth;

(f) while practicing step (e), substantially continuously automatically analyzing at least one property of the conveyed material that distinguishes coal from non-coal, to determine whether conveyed material at a first location along the common path is primarily coal or primarily non-coal; and

(g) in response to step (f), automatically diverting primarily coal to a second location, and diverting primarily non-coal to a third location.

5,149,176

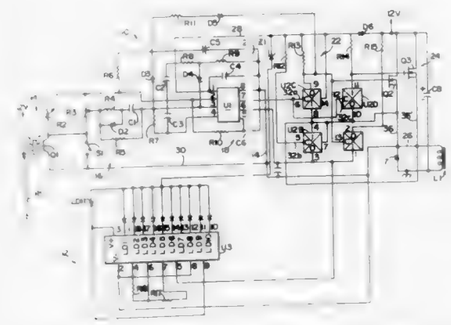
CONTROLLER FOR ELECTRIC BRAKING SYSTEMS

Larry Eccleston, Marshall, Mich. assignor to Tekonsha Engineering Company, Tekonsha, Mich.

Continuation-in-part of Ser. No. 390,617, Aug. 7, 1989, Pat. No. 5,050,937. This application Aug. 7, 1990, Ser. No. 563,505

Int. Cl.[5] B60T *13/72*

U.S. Cl. 303—20 **11 Claims**



1. In an electronic controller for electrically actuated vehicle brakes, of the type having means for producing control signals which are proportionally representative of the desired extent of vehicle braking and further having means for producing pulses of current which are proportionally representative of the magnitude of said control signals, for correspondingly energizing vehicle brake-actuation means, the improvement wherein said means for producing pulses of current includes a MOSFET element for energizing said brake-actuation means, a switch for selectively feeding a signal from a terminal of the MOSFET element, and an input to said means for producing pulses, said switch being coupled to said input and said terminal of said MOSFET element such that said switch isolates said input of said means for producing pulses from said terminal of said MOSFET element when the vehicle brake-actuation means are not being energized, said switch automatically coupling said MOSFET to said input of said means for producing pulses when said brake-actuation means are energized.

5,149,177

AUTOMOTIVE WHEEL SPEED CONTROL

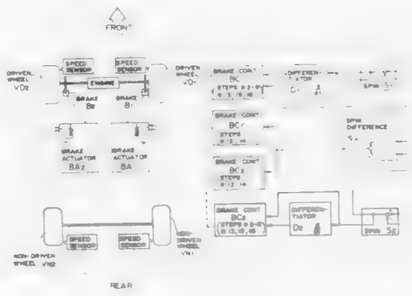
Hideaki Fujioka, and Koji Takata, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 30, 1987, Ser. No. 139,850

Claims priority, application Japan, Jan. 9, 1987, 62-3802

Int. Cl.[5] F02D *29/02;* **B60K** *28/16*

U.S. Cl. 303—110 **18 Claims**



1. A wheel speed control apparatus for use in a vehicle having a driven wheel driven by an engine, said wheel speed control apparatus comprising:

a spin detecting means for detecting a spin amount of said driven wheel;

a control variable producing means for producing a control variable FUNC which is a function of said spin amount and a differential of said spin amount;

first comparator means for comparing said control variable FUNC with first and second threshold levels in which the first threshold level is greater than the second threshold level;

quick increase signal producing means for producing a quick increase signal under a first condition obtained when said control variable FUNC exceeds said first threshold level and until said control variable FUNC attains a positive peak point to quickly increase a braking effect of said driven wheel;

quick decrease signal producing means for producing a quick decrease signal under a second condition obtained when said control variable FUNC falls below said second threshold level and until said control variable FUNC attains a negative peak point to quickly decrease said braking effect of said driven wheel; and

a moderate control signal producing means for producing a moderate control signal when said control variable FUNC is other than said first and second conditions to moderately change said braking effect of said driven wheel.

5,149,178

HYDRAULIC BRAKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

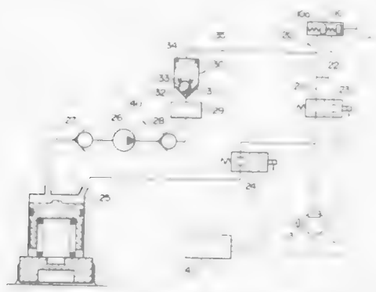
Tadao Saito, Nagoya; Masakazu Sugisawa, Takahama, and Yoshio Watanabe, Kariya, all of Japan, assignors to Aisin Seiki K.K., Kariya, Japan

Filed Mar. 28, 1991, Ser. No. 676,483

Claims priority, application Japan, Mar. 31, 1990, 2-34308[U]

Int. Cl.[5] B60T *8/34*

U.S. Cl. 303—116 R **6 Claims**



1. A hydraulic braking system for an automotive vehicle having a master cylinder communicated with a wheel brake cylinder for supplying a brake fluid thereto through a primary passage, and an anti-skid apparatus including a fluid pump disposed in a recirculation passage connected to said primary passage, comprising:

an orifice disposed in said recirculation passage on the discharge side of said fluid pump and directly communicated with said master cylinder; and

a relief valve disposed in said recirculation passage in parallel with said orifice, said relief valve blocking a flow of the brake fluid from said primary passage to said fluid pump and permitting a flow of the brake fluid from said fluid pump to said primary passage when a differential pressure between the pressure on the upstream side of said orifice and the pressure on the downstream side thereof exceeds a predetermined value.

5,149,179

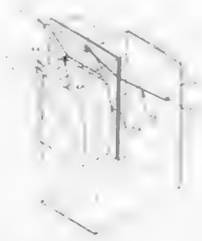
AUTOMATIC CONTAINER COVER

Terrance E. Nash, RR 1, Salo Road, Sorrento, British Columbia, Canada V0E 2W0

Filed Apr. 24, 1991, Ser. No. 690,768

Int. Cl.[5] A47B *81/00*

U.S. Cl. 312—275 **9 Claims**



1. A container with an automatic cover in combination with a door and a structural member on which the door is hingedly mounted to pivot on a hinge about a vertical hinge axis between an open position and a closed position, the container comprising a container body mounted on said door, said container body having sidewalls, a bottom, and an open top; a cover hingedly attached to said open top of said container body to rotate about a horizontal hinge axis to move between an opened position, wherein said open top of said container body is uncovered, and a closed position, wherein said open top of said container body is covered; an elastic, flexible filament having a first end and a second end; and means for attaching said first end to said structural member other than said door and said hinge, and means for attaching said second end to said cover so that said elastic, flexible filament is suspended between said cover and said structural member, such that as said door is moved to the open position, said elastic, flexible filament stretches over the horizontal hinge axis to provide a means for pulling said cover into said opened position, and as said door is moved into said closed position, said elastic, flexible filament providing a means for urging said cover into said closed position.

5,149,180

ARTICLE OF FURNITURE WITH A DOOR SLIDABLE INTO DOOR COMPARTMENT

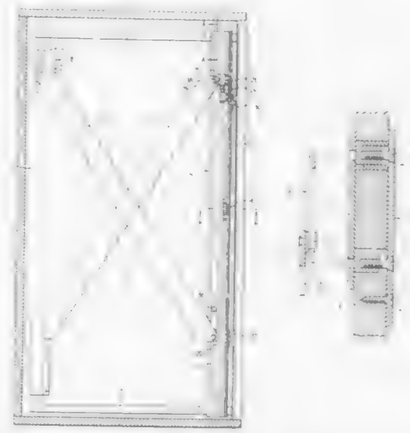
Karl Haab, Obere Weidstrasse 7, CH-6343 Rotkreuz, Switzerland, and Otto Haab, Im Erspach, CH-8932 Mettmemstetten, Switzerland

Filed Mar. 14, 1990, Ser. No. 493,159

Claims priority, application Switzerland, Mar. 14, 1989, 943/89; Dec. 20, 1989, 4591/89

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—322 **33 Claims**



1. A furniture article in combination with a door slidable from a use position into a door compartment of the furniture article, said door compartment having at least one side wall, the combination comprising:

a door;

a substantially vertical door-carrying bar coupled to said door;

opposite guide rails provided in said compartment each having means for slidably engaging said door-carrying bar for guiding said bar with said door into or out of said compartment;

a scissors-assembly positioned in said compartment and having two beams connected to said one side wall by two first anchor means and to said bar by two said second anchor means, one of said two first anchor means and one of said two second anchor means being fixed, and the other one of said two first anchor means and the other one of said two second anchor means being vertically displaceable;

said rails including an upper rail for guiding an upper end of said bar and a lower rail for guiding a lower end of said

bar, said upper rail and said lower rail both being fixed to said one side wall; and

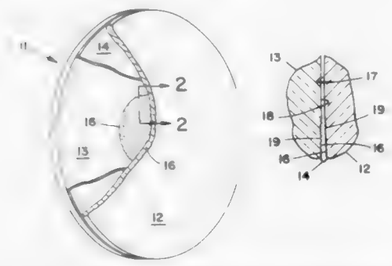
fixing means by which said rails are fixed to said side wall, said fixing means including means for permitting adjustment of spacing of a respective rail from said one side wall from a side thereof opposite said door compartment.

5,149,181

LENS WAFER, LAMINATE LENS AND METHOD OF FABRICATION THEREOF

Mark J. Bedford, Sonoma, Calif., assignor to Pilkington Visioncare, Inc., Menlo Park, Calif.

Filed Nov. 2, 1990, Ser. No. 609,161
Int. Cl.[5] G02C 7/02, 7/06
U.S. Cl. 351—166 **17 Claims**



1. In a light transmissive wafer for use in fabricating a laminated lens, said wafer having a bonding surface which is bonded to the surface of a second lens component by a transparent adhesive during fabrication of said lens, the improvement comprising:

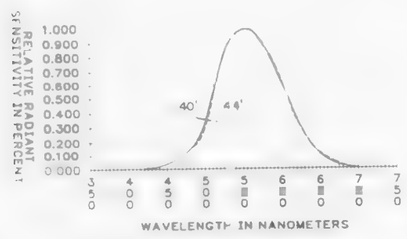
said wafer having at least one visually observable region at said bonding surface which is formed to impair use of the wafer in the absence of the adhesive and second lens component by disrupting light transmission through said region and which is visually distinguishable from other areas of said bonding surface prior to bonding of said wafer to said second lens component, which region becomes invisible and ceases to impair use of the wafer when the wafer is bonded to said second lens component with said adhesive.

5,149,182

OPTICAL FILTER FOR AN OPTICAL MEASUREMENT INSTRUMENT

Peter A. Keller, Aloha, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed May 2, 1991, Ser. No. 694,603
Int. Cl.[5] G01N 21/25; G01J 3/51
U.S. Cl. 356—405 **4 Claims**



1. An optical filter for selectively absorbing electromagnetic radiation for matching the spectral response of the average human eye comprising:

a plurality of optical glass filter elements with each element selectively absorbing a portion of the electromagnetic radiation with one of the optical glass filter elements exhibiting a positive deviation in the blue portion of the electromagnetic spectrum in the range of 470 nm; and

a corrective optical glass filter element exhibiting a negative deviation in the blue portion of the electromagnetic spectrum in the range of 470 nm to offset the positive deviation in the optical glass filter.

5,149,183

COLOR ENHANCING LENS

Colin M. Perrott, Portola Valley, Calif., and Kenneth J. Pidgeon, O'Halloran Hill, Australia, assignors to Pilkington Visioncare Holdings, Inc., Menlo Park, Calif.

Filed Sep. 26, 1990, Ser. No. 588,181
Claims priority, application United Kingdom, Sep. 29, 1989, 8921993
Int. Cl.[5] G02B 5/20
U.S. Cl. 359—885 **7 Claims**

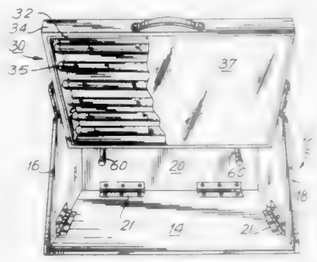
1. A color enhancing sun lens comprising a lens having an integrated visible light transmission, with respect to CIE illuminant C, of less than 40% T, wherein the transmission over a 10 nm wide band centered on 480 nm and a second 10 nm wide band centered on 630 nm is at least 1.5 times the integrated visible light transmission of the lens.

5,149,184

WORK STATION WITH PHOTOTHERAPY LIGHT BOX

Philip Hughes, 34 Yacht Club Dr., Lake Hopatcong, N.J. 07849, and Michael Terman, 14 E. 4th St., New York, N.Y. 10012

Continuation of Ser. No. 175,953, Mar. 31, 1988, abandoned. This application Jan. 19, 1990, Ser. No. 472,424
Int. Cl.[5] F21V 21/06; A61N 1/00
U.S. Cl. 362—1 **18 Claims**



1. A combined work station and phototherapy unit for use by a person comprising:

a portable base unit having vertically extending support means to rest on a surface and define an interior work space which is to be illuminated,

a light fixture associated with said base unit having at least one electric lamp therein for producing a visible light output, and

means for mounting said light fixture to said base unit to be located above said work space and to place said electric lamp at an angle in the range of between about 30° to about 60° relative to the horizontal and at a height to supply the visible light output produced by the lamp to a person working at the place where the work station is located both in line and at least in part from a superior position relative to the line of sight of the person.

5,149,185

EMERGENCY HALL LIGHTING

Robert R. Mandy, 32750 Bingham La., Bingham Farms, Mich. 48025

Filed Aug. 12, 1991, Ser. No. 743,806
Int. Cl.[5] F21V 19/04
U.S. Cl. 362—20 **4 Claims**

1. In an emergency lighting system for a hallway the combination of a series of at least four spaced lighting fixtures each having an energizable incandescent lamp, a stepdown transformer having a secondary winding connected to a normal power source of at least 100 volts, said incandescent lamps all normally connected directly across the secondary winding of said stepdown transformer; switch means having power terminals for normal lighting and emergency lighting;

a battery charger directly energized by the primary power source for providing a charging current and an emergency battery power source having a lesser voltage than the voltage across the secondary winding of said stepdown transformer;

said switch means connecting said emergency battery power source to said battery charger when said primary power source is operative and connecting every other one of said at least four lamps to only said emergency battery source when said primary power source is inoperative;

said switch means in its normal lighting position connecting all of said at least four lamps for illuminating all of said lamps during normal operation of the primary power source; and

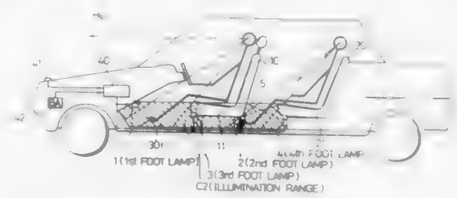
said switch means during emergency lighting disconnecting said secondary winding from said plurality of lamps such that the only electrical load across said emergency battery power source is said every other one of said at least four lamps whereby the level of illumination from said lamps is maintained at least one foot candle for a period in excess of 90 minutes.

5,149,186

VEHICLE ROOM FLOOR ILLUMINATING APPARATUS

Yoshio Matsuno; Shinichiro Choji, both of Machida; Kazuhiko Ito, Hirakata, and Teruaki Shigeta, Neyagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Jun. 15, 1990, Ser. No. 538,332
Claims priority, application Japan, Jun. 26, 1989, 1-164451
Int. Cl.[5] B60Q 3/00
U.S. Cl. 362—75 **7 Claims**



1. A vehicle floor illuminating apparatus provided with at least one front seat arranged in a vehicle room, comprising:

(a) power supplying means;

(b) at least one first foot lamp means connected to said power supplying means, for illuminating only a selected lower room space roughly below a seat cushion of the front seat in the vehicle room, said first foot lamp means being mounted in a first foot lamp range A, range A being defined by imaginary lines between uppermost and lowermost forward ends of the front seat cushion in height and between a lower surface of an instrument panel and a frontmost end of the front seat cushion in length, when seen from the side of the vehicle; and

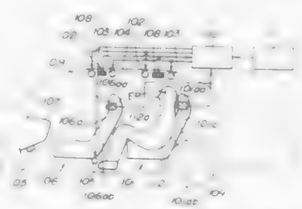
(c) a second foot lamp mounted in the first foot lamp range A, for illuminating a front floor before the front seat and a middle floor under the front seat.

5,149,187

LIGHTING SYSTEM FOR USE IN VEHICLE CABIN

Yoshio Matsuno, Tokyo; Hitoshi Matsui, Kawasaki; Izumi Okamura, Hikone; Teruaki Shigeta, and Yoshinori Tanabe, both of Osaka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Sep. 18, 1991, Ser. No. 761,057
Claims priority, application Japan, Sep. 21, 1990, 2-253443; Sep. 21, 1990, 2-253445
Int. Cl.[5] B60Q 11/00
U.S. Cl. 362—80 **16 Claims**



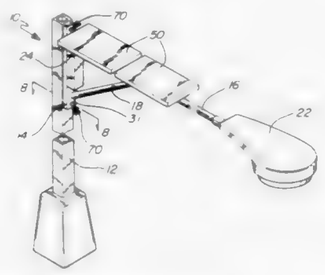
1. A lighting system for use in a cabin of a vehicle, the vehicle having a roof, a floor, a door and a seat occupant, the lighting system comprising:

a plurality of first lamps arranged between the roof and a plane including an eye point of the seat occupant, said plurality of first lamps illuminating predetermined surfaces;

at least one second lamp so constructed and arranged as to illuminate the floor; and

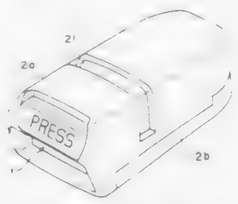
first means for allowing said predetermined surfaces to obtain predetermined luminance levels.

5,149,188
SOLAR POWERED EXTERIOR LIGHTING SYSTEM
Steven Robbins, Miami, Fla., assignor to Solar Outdoor Lighting, Inc., Boca Raton, Fla.
Filed Apr. 1, 1991, Ser. No. 678,759
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—183 11 Claims



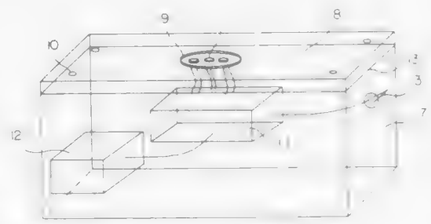
1. A lighting system characterized by:
a substantially vertical support member configured to fit upon a pole and to be mounted against a wall;
an upper cantilevered support arm extending from said vertical support member at a first vertical point;
a lower cantilevered support arm extending from said vertical support at a second vertical point and connected to the upper arm at a position spaced away from said vertical support to form a frame assembly;
a lighting element connected at a distal end of one of said support arms;
a photovoltaic panel mounted to the upper cantilevered support arm;
an electrical storage battery mounted to said frame assembly within a perimeter of said frame assembly defined by said vertical support and said upper and lower cantilevered support arms;
means for operably interconnecting said electrical storage battery, said photovoltaic panel, and said lighting element such that said photovoltaic panel delivers electrical power to said battery, and said battery selectively delivers electrical power to said lighting element; and
control means for actuating and deactuating said lighting element in response to the ambient light condition about said lighting system.

5,149,189
LATERAL ILLUMINATED BUCKLE FOR VEHICLE SEAT BELT SYSTEM
Yoshihisa Kawamura, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan
Filed Apr. 15, 1991, Ser. No. 685,815
Claims priority, application Japan, Apr. 18, 1990, 2-102534
Int. Cl.[5] A44B *11/00*; B60R *22/02*; B60Q *1/00*
U.S. Cl. 362—108 5 Claims



1. An illuminated buckle for a seat belt system comprising a releasable latch mechanism for receipt of a buckle tongue having opposite side edges and top and bottom faces, the latch mechanism including a lateral side located opposite each side edge of the buckle tongue and a top side located opposite the top face of the buckle tongue, cover means for covering at least the top and lateral sides of the latch mechanism, an illuminating source located within said cover means, and light-transmitting means on at least the lateral sides of said cover means for transmitting light from the illuminating source.

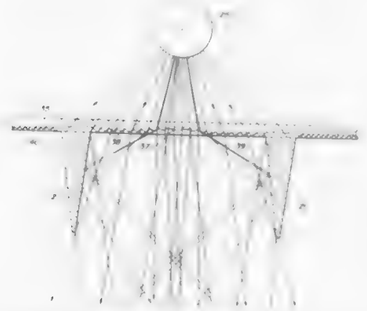
5,149,190
PORTABLE SAFETY DEVICE
Robert MacKenzie, Marion Bridge, Canada, assignor to Bay Industrial and Mine Tech Inc., Canada
Continuation-in-part of Ser. No. 468,364, Jan. 22, 1990, Pat. No. 4,999,753. This application Jan. 4, 1991, Ser. No. 637,373
Claims priority, application Canada, May 24, 1989, 600539
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—234 9 Claims



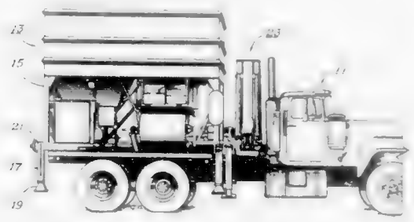
1. A portable power pack comprising:
a bundle of high energy batteries with positive and negative terminals respectively interconnected in a parallel arrangement;
a pair of terminal plates for supplying DC power;
current limiting means connected in series with said terminal plates and said parallel arrangement of batteries for limiting the current supplied by said terminals to a predetermined safe value; and
a mass of solidified flowable material completely encapsulating said bundle of batteries, said positive and negative terminals, and said current limiting means and leaving only said terminal plates exposed to permit current to be drawn from said power pack, whereby on direct shorting of said exposed terminals of said power pack, the current flowing between said exposed terminals does not exceed said predetermined safe value.

5,149,191
COMBINATION LOUVER/LENS LIGHT FIXTURE SHIELD
Ian Lewin, 11408 St. Andrew's Way, Scottsdale, Ariz. 85254, and Joe Greer, 4827 N. 35th St., Phoenix, Ariz. 85018
Filed Dec. 23, 1991, Ser. No. 812,028
Int. Cl.[5] F21V *11/02*
U.S. Cl. 362—290 19 Claims

1. A light-shielding and light-directing apparatus for placement in the light-emitting opening of a luminaire having a source of light therein, said apparatus including in combination
a louver assembly for mounting in the light-emitting opening of the luminaire, and comprising at least a plurality or longitudinal louvers dividing the light-emitting opening into a plurality of rectangular apertures, each of said longitudinal louvers having a predetermined depth in a plane perpendicular to the plane of the light-emitting opening in the luminaire; and
lens means located in the luminaire between said louver assembly light rays from the source of light in the luminaire, and directing such intercepted light downwardly through said apertures at angles select to substantially minimize amount of light which strikes said louvers.

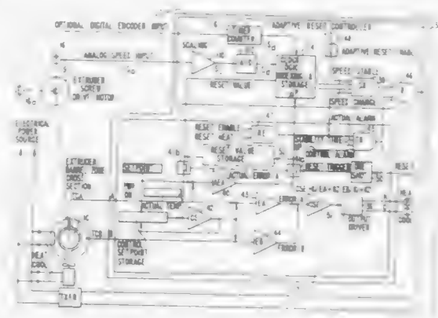


5,149,192
SYSTEM FOR MIXING CEMENTITIOUS CONSTRUCTION MATERIALS
Alton B. Hamm, Fort Worth, and Grover C. Ratliff, Hurst, both of Tex., assignors to Mixer Products, Inc., Forth Worth, Tex.
Continuation of Ser. No. 252,379, Sep. 30, 1988, abandoned. This application Apr. 1, 1991, Ser. No. 678,066
Int. Cl.[5] B01F *7/18*
U.S. Cl. 366—8 31 Claims



18. An apparatus for mixing predetermined constituents of construction materials, including sand and cement, in a batch mixer having desired volume of mix selected from a range of volumes comprising:
a batch mixer for mixing a batch of cementitious material having predetermined volumetric size;
an operator control means including a volume selector input means for an operator select a desired total volume of cementitious material to be mixed by the batch mixer from a range of available batch sizes, the operator control means being responsive to the volume selector means for automatically controlling delivery of necessary quantities of constituents for the batch of cementitious material to a batch mixer and mixing of a batch of cementitious material in the selected desired total volume with predetermined proportions of constituents;
downwardly converging sand storage means and a first conveyor having an entrance connected with a lower end of the sand storage means for creating a relatively consistent volumetric flow of sand, the first conveyor being responsive to the control means for operating at a predetermined speed to produce a predetermined volumetric flow of sand for a predetermined time interval, the operator control means determining the predetermined time interval for operation of the conveyor to deliver at the predetermined volumetric flow rate a volume of sand in predetermined proportion to the selected desired total volume of the batch of cementitious material,
downwardly converging cement storage means and a second conveyor having an entrance connected with a lower end of the cement storage means for creating a relatively consistent volumetric flow of cement, the second conveyor being responsive to the operator control means for operating at a predetermined speed to produce a predetermined volumetric flow of cement for a predetermined time interval, the control means determining the time interval for operation of the second conveyor to deliver at the predetermined volumetric flow rate a volume of cement in predetermined proportion to the selected desired total volume of the batch of cementitious material; and
means for automatically delivering a predetermined volume of water to the batch mixer in predetermined proportion to be desired total volume of the batch of cementitious material.

5,149,193
EXTRUDER TEMPERATURE CONTROLLER AND METHOD FOR CONTROLLING EXTRUDER TEMPERATURE
Louie M. Faillace, Pawcatuck, Conn., assignor to Crompton & Knowles Corporation, Stamford, Conn.
Filed Jan. 15, 1991, Ser. No. 641,310
Int. Cl.[5] B29C *7/72, 47/82*
U.S. Cl. 366—145 17 Claims



1. An extruder temperature controller comprising:
means for sensing an actual screw speed of an extruder screw in an extruder barrel, said extruder barrel having at least one heat exchange means in at least one heat exchange zone;
means for sensing an actual temperature in said at least one heat exchange zone of said extruder barrel;
means for indexing and storing a plurality of screw speeds, and a plurality of corresponding temperature reset values;
means for comparing and selecting, said means for comparing and selecting (i) compares said actual screw speed with each of said stored screw speeds and (ii) selects one of said stored screw speeds, said selected screw speed being a member of said plurality of stored screw speeds having a value most arithmetically equivalent to said actual screw speed, said means for comparing and selecting retrieves said temperature reset value corresponding to said selected, stored screw speed; and
means for generating a control output driver signal to said heat exchange means when said temperature reset value deviates from said actual temperature by an amount greater than a preset threshold amount, said control output driver signal being responsive to said retrieved temperature reset value from said means for comparing and selecting.
11. A method for controlling extruder temperature comprising:

sensing an actual screw speed for an extruder screw in an extruder barrel, said extruder barrel having at least one heat exchange means;

indexing and storing a plurality of screw speeds, and a plurality of corresponding temperature reset values;

comparing said actual screw speed with each of said stored screw speeds;

selecting one of said stored screw speeds, said selected screw speed being a member of said plurality of stored screw speeds having a value most arithmetically equivalent to said actual screw speed, said step of selecting retrieves said temperature reset value corresponding to said selected, stored screw speed; and

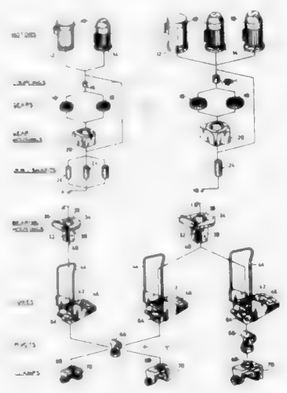
generating a control output driver signal to said heat exchange means, said control output driver signal being responsive to said retrieved temperature reset value.

5,149,194

MODULAR MIXER SYSTEM

David J. Engels, Springwater; William F. Hutchings, and David O. Mechler, both of Fairport, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 19, 1990, Ser. No. 615,531
Int. Cl.[5] **B01F** *7/00*
U.S. Cl. 366—282 21 Claims



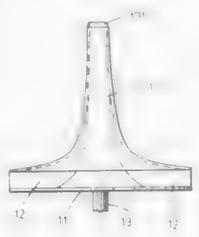
1. A mixer system for driving at least one impeller on an impeller shaft with a motor, said system being assembled from a plurality of modular components which are selected in accordance with the motor drive power, power transmission and mounting characteristics which characterize the mixer system, said mixer system comprising a first housing having means for rotatably supporting said impeller shaft extending from a lower end of said first housing, said first housing having an upper end, said upper end having first means for interchangeably assembling those of said modular components providing drive power to said impeller shaft, said drive power components being selectable from different motors which are mounted directly upon said upper end for direct drive of said mixer shaft and from different transmissions having lower and upper ends, which are mounted on said upper end of said first housing and have second means for interchangeably assembling said selected one of said different motors at the upper end of said transmissions, and means for assembling a selected one of said modular components which provides a mounting for said mixing system to said first housing.

5,149,195

AGITATOR

Stefan Löfgren, Klöse 118, S-914 00 Nordmaling, Sweden

PCT No. PCT/SE88/00684, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO89/06160, PCT Pub. Date Jul. 13, 1989
PCT Filed Dec. 15, 1988, Ser. No. 476,389
Claims priority, application Sweden, Dec. 30, 1987, 8705205
Int. Cl.[5] **B01F** *7/22*
U.S. Cl. 366—343 7 Claims



1. An agitator of the type which operates while fully submerged in a fluid, said agitator including a vessel (**10**), said vessel (**10**) having a wall with an inner surface of hyperbolic and rotational-symmetrical shape, said wall converging toward the top of said vessel, a fluid inlet (**101**) at the top of said vessel opening directly into said fluid in which said vessel is submerged and guide vanes (**12**) at the bottom thereof, an unobstructed flow passage which progressively increases in cross sectional area extending from said inlet to said guide vanes, said guide vanes extending outwardly from said fluid passage to said inner surface of said hyperbolic-shaped wall and downwardly beyond said hyperbolic-shaped wall, said vanes being attached to said inner surface of said wall, a circular plate (**11**) positioned below said hyperbolic-shaped wall and attached to said guide vanes, a shaft (**13**) attached to said circular plate, and motor means attached to said shaft for rotating said shaft, said circular plate, said guide vanes and said guide vessel in unison.

5,149,196

COMPOST HANDLING MACHINE

Thomas J. Piacentino; Thomas J. Piacentino, Jr., both of Kennett Square, Pa., and Howard Rosenbloom, Westville, N.J., assignors to International Process Systems, Glastonbury, Conn.

Division of Ser. No. 104,799, Oct. 2, 1987, Pat. No. 4,828,399. This application Feb. 15, 1989, Ser. No. 284,260
Int. Cl.[5] **B01F** *13/00*
U.S. Cl. 366—345 4 Claims

1. A compost handling machine, comprising:

a carriage to support the machine for movement along a composting bay; and

a compost agitating assembly connected to the carriage, and to agitate compost in the composting bay, the agitating assembly including

i) spaced apart, left and right support arms,

ii) an agitating drum rotatably connected to and laterally extending between the support arms,

iii) a hydraulic motor located inside the drum and connected thereto to rotate the drum,

iv) a hydraulic circuit including a plurality of hydraulic fluid lines connected to the motor to conduct fluid to and from the hydraulic motor,

wherein each of the support arms is substantially solid, one of the support arms forms an elongated through opening longitudinally extending forward to a position laterally projecting inside the drum, and extending rearward to a position laterally projecting rearward of the drum; and said hydraulic fluid lines extend along an outside surface of said one of the support arms, through the elongated opening thereof to a position inside the drum, and to the hydraulic motor;

the agitating assembly further including

v) an outside cover plate covering the elongated through

opening, and releasably connected to the one of the support arms, and

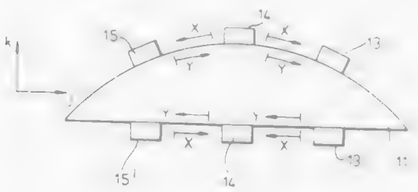
vi) an inside cover plate covering at least a part of the elongated opening, said inside cover plate being located inside the elongated opening and permanently connected to the one of the support arms.

5,149,197

PIEZO ELECTRIC RESONATOR TEMPERATURE SENSOR

George H. S. Rokos, Bishop's Stortford, and Peter E. Morley, Rayne, both of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 28, 1991, Ser. No. 706,216
Claims priority, application United Kingdom, Jun. 12, 1990, 9013056
Int. Cl.[5] **G01K** *11/22*
U.S. Cl. 374—117 6 Claims



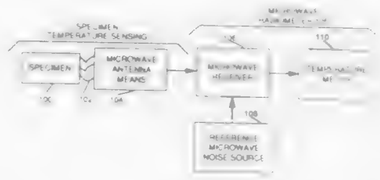
1. A method of determining the temperature of a crystal resonator comprising a lenticular quartz body, the method comprising providing a plurality of electrodes on said body, generating via said electrodes first and second harmonics of respective first and second C-mode fundamental vibrations, said first and second harmonics being mutually inharmonically related, of similar frequency and of the same overtone order, and comparing said first and second harmonics whereby to derive a signal indicative of the oscillator temperature, wherein each said harmonic fundamental vibration is a shear mode harmonic vibration characterised as an (n, a, b) vibration where n is the overtone number and is equal to the number of nodes along a first direction, a is the number of anti-nodes along a second direction perpendicular to the first direction, and b is the number of anti-nodes along a third direction perpendicular to said first and second direction.

5,149,198

TEMPERATURE-MEASURING MICROWAVE RADIOMETER APPARATUS

Fred Sterzer, Princeton, N.J., assignor to MMTC, Inc., Princeton, N.J.

Filed May 2, 1991, Ser. No. 699,309
Int. Cl.[5] **G01K** *1/17;* **G01J** *5/00*
U.S. Cl. 374—139 14 Claims



1. In apparatus employing a microwave radiometer to measure the temperature of a specimen; said apparatus including microwave antenna means which when situated in cooperative relationship with said speciment is responsive to a portion of the microwave interval of the frequency-spectrum distribution of the electromagnetic radiation emitted by said specimen; the improvement wherein said specimen is a given material at high temperature and wherein said microwave antenna means comprises:

an antenna sheath; and

a microwave antenna adapted to be disposed within the interior of said antenna sheath, whereby at least a portion of said antenna sheath may be immersed in said given material at high temperature;

said antenna sheath being composed of a high-loss, high-temperature material that is substantially inert to said given material at high temperature so that it can withstand being immersed in said given material at high temperature continuously without substantial damage thereto, and said high loss, high temperature material of which said antenna sheath is composed exhibiting characteristics approaching that of a "black body" for absorbing heat radiation from the surrounding material at high temperature and then reradiating a portion of the absorbed heat radiation as microwave energy into said interior thereof; and

said microwave antenna being composed of a low-loss, high-temperature dielectric material that is substantially inert to the high temperature reradiated into the interior of said antenna sheath and received by said microwave antenna.

5,149,199

TEMPERATURE DETECTION CIRCUIT USED IN THERMAL SHIELDING CIRCUIT

Hitoshi Kinoshita, Kawasaki, and Masaru Hashimoto, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 21, 1991, Ser. No. 703,833
Claims priority, application Japan, May 24, 1990, 2-134940
Int. Cl.[5] **G05F** *3/20;* **H01L** *29/78*
U.S. Cl. 374—178 8 Claims

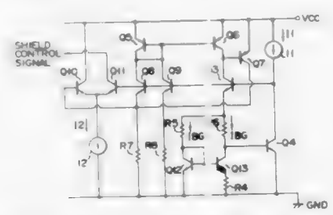
1. A heat-shielding circuit comprising:

first current source means including a band gap type voltage source having a positive temperature coefficient;

second current source means for generating a second current having one of zero and negative temperature coefficients;

comparing means for comparing a first current flowing through the band gap type voltage source and having a positive temperature coefficient with the second current generated by the second current source and having one of the zero and negative temperature coefficients, so as to detect a relationship between the first and second currents, said comparing means determining the necessity for

protection when the relationship between the first and second currents has reversed and supplying a shield control signal to a protection-requiring circuit to stop operation of the protection-requiring circuit; and



switch means for detecting the second current and reducing the amount of the second current when the second current has reached a value corresponding to a temperature indicative of the necessity for protection, thereby reducing a protecting-releasing temperature to be a value lower than a protection-start temperature

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5,149,201

ANGLE SEALED BOTTOM GROCERY SACK

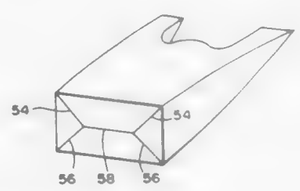
Gordon L. Benoit, 952 Oakridge Rd., Victor, N.Y. 14564

Continuation of Ser. No. 264,662, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 53,442, May 22, 1987, abandoned, which is a continuation of Ser. No. 815,978, Jun. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 606,320, May 2, 1984, abandoned. This application Nov. 13, 1989, Ser. No. 434,597

Int. Cl.[5] B65D *30/10, 33/10*

U.S. Cl. 383—8

19 Claims



1. A grocery bag structure of a thermoplastic film material comprising front and rear bag walls connected by gusset panels and having an open mouth top portion, said open mouth portion being characterized by having handles located at opposite regions thereof, said handles being of double films as a result of being integral extensions of said front and rear walls and gusset panels,

said bag having a bottom closure including a central two-film heat seal formed by sealing said front and rear bag walls and four diagonal heat seals outside of said central heat seal and formed by sealing said gusset panels to said front and rear bag walls with no substantial trapped gusset in said bag bottom closure.

5,149,20[illegible]

TEMPERATURE MEASURING PROBE AND ELECTRONIC CLINICAL THERMOMETER EQUIPPED WITH SAME

Masahiro Shiokawa; Makoto Ikeda; Kiyoshi Sohma, all of Kanagawa; Masami Iriki, Koufu; Kinji Uchino, Yokohama; Yoshikatsu Kawashima, Yokosuka, and Masahiro Kusakabe, Yokohama, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

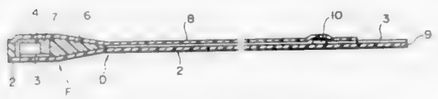
Division of Ser. No. 396,540, Aug. 21, 1989. This application Sep. 3, 1991, Ser. No. 753,883

Claims priority, application Japan, Aug. 25, 1988, 63-209457

Int. Cl.[5] G01K *7/22, 7/16*; H01C *1/01, 1/02*

U.S. Cl. 374—185

6 Claims



1. A temperature measuring probe comprising:

a flat, flexible strip-shaped base member;

a core member secured on said base member and including at least one cavity therein;

a temperature measuring circuit including a temperature sensing body positioned within said at least one cavity of the core member, the thickness of said core member at a portion of said at least one cavity being approximately the same as that of said temperature sensing body, said core member having a smoothly diminishing thickness from said at least one cavity toward the rearward end of the probe;

a conductor coupled to said temperature sensing body;

a connector formed on one end of said base member; and

a coating member on said core member for sealing the interior of said probe from the outside.

5,149,202

CONTAINER STRUCTURE HAVING TRANSPARENT OUTER POUCH

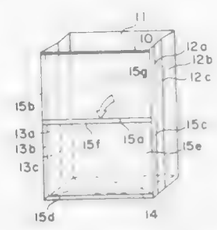
James Dickert, 1657 Old Oak Pl., Darien, Ill. 60559

Filed Jul. 26, 1990, Ser. No. 558,221

Int. Cl.[5] B65D *30/22*

U.S. Cl. 383—106

8 Claims



1. An improved container structure comprising:

a blank of sheet material formed with a face panel and a back panel each having the same surface area and being respectively defined by opposed pairs of longitudinal edges and upper and lower lateral edges, gusset panels at opposed lateral sides thereof defined by opposed pairs of longitudinal edges and upper and lower depthwise edges, an open top end, and a closed bottom end, said face, back, and gusset panels having inner and outer surfaces; and

a layer of transparent, plastic material having a surface area defined by opposed pairs of longitudinal edges and upper and lower lateral edges which is substantially equal to the surface area of said face or back panel, wherein said transparent plastic layer has three of its four longitudinal and lateral edges secured respectively to corresponding longitudinal edges on the outer surface of the side gusset panels and the lower lateral edge of the front or back panel, thereby forming a transparent pouch over substantially the entire surface area of the front or back panel on said outer surface of said container for insertion of a desired visual material therein,

wherein said transparent plastic layer has a lateral cut formed therein to provide an open edge, and an upper part of the surface area thereof above said cut is sealed to the outer surface of the container, while a lower part of the surface area thereof below said cut is not secured to the outer surface of the container, thereby forming a lower pouch on the outer surface of the container; and

wherein said open edge not secured to the outer surface of the container has a band secured in registration along said open edge to mark and reinforce said edge.

5,149,203

BULLET-PROOF BAG

Michael Sacks, Manchester, United Kingdom, assignor to Dowty Armourshield Limited, Manchester, England

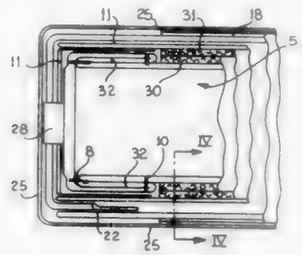
Filed Apr. 2, 1991, Ser. No. 679,245

Claims priority, application United Kingdom, Apr. 2, 1990, 9007347

Int. Cl.[5] B65D *85/00*

U.S. Cl. 383—111

14 Claims



1. A bag having a base wall and a plurality of side walls surrounding an internal space, said walls incorporating at least one layer of high tensile strength and high stretch resistance material such as to be capable of resisting penetration by a bullet, said layer comprising a single-piece layer which extends over said base wall and at least two adjacent said side walls and is folded between the base wall and side walls forming tucks in the side walls, there being a tuck between the side walls comprising each adjacent pair of side walls.

5,149,204

DUST SEAL DEVICE OF A LINEAR GUIDE APPARATUS

Kazuhito Tennichi, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

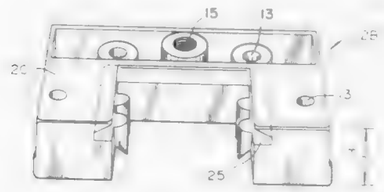
Filed Jun. 19, 1991, Ser. No. 717,632

Claims priority, application Japan, Jun. 20, 1990, 2-65031

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—15

1 Claim



1. A dust seal device of a linear guide apparatus wherein the linear guide apparatus is formed of an axially extending guide rail having ball rolling grooves respectively formed in both side surfaces and a slider movably straddling the guide rail, the slider including a slider main body having ball rolling grooves respectively opposing the ball rolling grooves of the guide rail and formed in inner surfaces of side walls thereof, the slider main body further having through bores as ball return passages formed respectively in the side walls in parallel to the ball rolling grooves of the slider main body, a pair of end caps respectively joined to opposite ends of the slider main body, each of the end caps having a pair of curved paths respectively for bringing a corresponding one of the ball return passages into communication with a corresponding one of the ball rolling grooves, and a plurality of balls rollably inserted into the opposing ball rolling grooves, the dust seal device comprising:

a pair of side seals for respectively sealing front and rear openings of gaps between the slider and the guide rail, each of the side seals having an inverted U-shape and mounted to one of the end caps by inserting each side seal into a recessed groove formed in an end portion of an opening of each end cap.

5,149,205

DUST SEAL DEVICE OF LINEAR GUIDE APPARATUS

Toru Tsukada, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

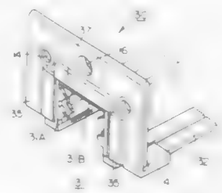
Filed Jun. 25, 1991, Ser. No. 720,600

Claims priority, application Japan, Jun. 26, 1990, 2-67635

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—15

2 Claims



1. A dust seal device of a linear guide apparatus, wherein the linear guide apparatus includes a guide rail extending axially and having ball rolling grooves respectively formed in both side surfaces thereof and a slider movably straddling the guide rail, the slider including a slider main body having ball rolling grooves respectively opposing the ball rolling grooves of the guide rail and formed in inner surfaces of side walls thereof, the slider main body further having through bores as ball return passages formed respectively in the side walls thereof in parallel to the ball rolling grooves of the slider main body, a pair of end caps respectively joined to opposite ends of the slider main body, each of the end caps having a pair of curved paths respectively bringing corresponding ones of the ball return passages into communication with corresponding ones of the ball rolling grooves, and a plurality of balls rollably inserted into the opposing ball rolling grooves, the dust seal device comprising:

a pair of side seals for sealing front and rear openings of gaps between the slider and the guide rail;

a pair of under seals for sealing lower openings of the gaps between the slider and the guide rail; and

a pair of seal fixing plates respectively attached to front and rear end surfaces of the end caps, each of the seal fixing plates having a seal sandwiching gap facing a surface of the guide rail to be sealed, at least one pair of the pair of side seals and the pair of under seals being attached respectively to the pair of seal fixing plates,

the at least one pair of the side seals and the under seals attached to the seal fixing plates including a seal holding plate, a seal member secured to one edge of the seal holding plate, and a spring portion formed on the other edge of

the seal holding plate for applying a constant pressure preload to the seal member,

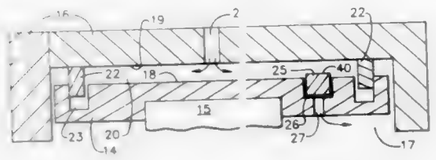
wherein the seal holding plate of the at least one of the pair of the side seals and the under seals is inserted into the seal sandwiching gap of the seal fixing plate so that the at least one pair of side seals and the pair of under seals are attached to the end caps through the seal fixing plates.

5,149,206

HYDRAULIC SHAFT DAMPER PRESSURE CONTROL

Melvin Bobo, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 17, 1991, Ser. No. 686,444
Int. Cl.[5] F16C *39/04*
U.S. Cl. 384—99 16 Claims



1. A squeeze film damper for use in a gas turbine engine, the damper comprising:

(a) an annular bearing support member positioned in an annular chamber where opposing circumferential surfaces of said chamber and said support member define an annular squeeze film space therebetween, and where motion of said bearing support member generates a circumferentially moving fluid pressure wave in the squeeze film space; and

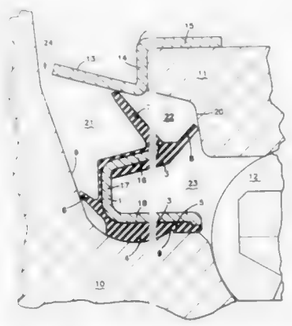
(b) damper fluid control means in said damper and operative by the damper fluid pressure wave in said squeeze film space to prevent discharge of damper fluid from a relatively high pressure region of the squeeze film space, and permit discharge of damper fluid from an opposite, relatively low pressure region of said squeeze film space.

5,149,207

SEAL FOR BEARINGS OF MOTOR VEHICLE WHEEL HUBS

Angelo Vignoito, Turin, Italy, assignor to SKF Industrie S.p.A., Turin, Italy

Filed May 13, 1991, Ser. No. 698,938
Claims priority, application Italy, May 24, 1990, 67380 A/90
Int. Cl.[5] F16C *33/76, 33/78;* F16J *15/32*
U.S. Cl. 384—478 4 Claims



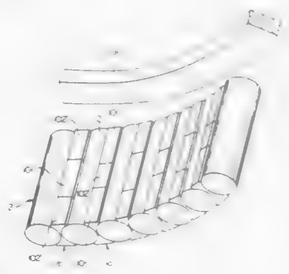
1. A sealing device for motor vehicle hubs having a bearing with an inner rotating race and an outer fixed race comprising a centrifugation device (1) equipped with a seal (3) mounted on the inner rotating race (10) of the bearing and a shield (2) mounted on the outer fixed race (11); said shield being composed by the union of three circular surfaces, said circular surfaces including an axially disposed cylindrical surface, a radially disposed plane surface, and a tapered surface diverging towards the outside of the bearing, said tapered surface acting as a dust cover and stretching towards the surface of the inner race in such a way as to tighten an opening for polluting agents and as to subsequently facilitate expulsion of polluting agents by centrifugal effect; the seal (3) being bound to the centrifugation device (1) and being fixed to the inner race (10) by a lower main body portion (4) and a cylindrical portion (5); said seal (3) having three sealing lips (6, 7, 8), a first (6) of said sealing lips sliding respectively against a surface (9) of the inner race (10) so as to prevent polluting agents from getting near the lower main body portion, a second (7) of said sealing lips sliding against and contacting the shield (2) mounted onto the outer race (11), and a third (8) of said sealing lips contacting and sliding against a surface (20) of the outer race (11), said second of said sealing lips being located intermediate said first of said sealing lips and said third of said sealing lips and being distant from said lower main body portion and said cylindrical portion of said seal, and said third of said sealing lips being distant from said lower main body portion (4) and said cylindrical portion (5); said sealing lips increasing the sealing action caused by centrifugal action by increasing the contact force against the portion of the shield; and the centrifugation device (1) and the shield (2) being shaped and positioned so as to form a first chamber (21) open towards an exterior portion of the bearing, said first chamber being located between said first of said sealing lips and said second of said sealing lips, a second closed intermediate chamber (22) between said second of said sealing lips and said third of said sealing lips and a third chamber (23) open towards inner parts of the bearing and being located between said third of said sealing lips and said lower main body and said cylindrical portions of said seal.

5,149,208

BEARING WITH LUBRICATING AND NON-LUBRICATING SPACERS

David A. Zornes, Redmond, Wash., assignor to Balanced Engines, Inc., Tacoma, Wash.

Continuation-in-part of Ser. No. 503,526, Apr. 2, 1990, Pat. No. 5,040,906. This application Aug. 14, 1991, Ser. No. 745,267
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] F16C *19/40, 33/66*
U.S. Cl. 384—551 13 Claims



1. A bearing comprising:

means providing a raceway;

a plurality of rolling elements in said raceway:

non-rolling spacer elements in said raceway between and closely adjacent to said rolling elements for maintaining a predetermined minimum spacing therebetween, said non-rolling spacer elements being arranged to be engaged by said rolling elements when maintaining said minimum spacing;

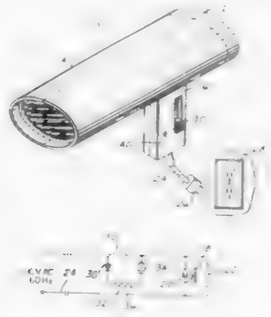
and lubricating spacer elements in said raceway between said rolling elements, said lubricating elements being free to float independently of said rolling elements and non-rolling spacer elements and being arranged so that each lubricating element can be engaged by the two adjoining of said rolling elements.

5,149,209

HAIR DRYER WITH AUDIBLE UNPLUG ALARM

Richard M. Condrey, and Jerry O. Lorant, both of Birmingham, Ala., assignors to Jerry O. Lorant, Birmingham, Ala.

Filed Mar. 4, 1991, Ser. No. 663,613
Int. Cl.[5] F24H *3/02;* H05B *1/02*
U.S. Cl. 392—379 5 Claims



1. In an electrical appliance adapted to be powered by utility power and including a power plug adapted to be removably inserted into a utility power outlet, and switch means coupled to said plug and responsive to an operator for selectively applying and removing utility power to and from said appliance, alarm apparatus for warning an operator to remove said plug from the utility outlet when power is removed from the appliance by said switch means, said apparatus comprising:

alarm means carried by said appliance and responsive to application of electrical power for providing an audible alarm signal, and

circuit means coupled to said plug and to said switch means for applying electrical power from said plug to said alarm means when power is removed from said appliance by said switch means and said plug is inserted in a utility outlet, and for removing power from said alarm means when power is applied to said appliance by said switch means,

said switch means comprising switch contact means having a closed condition for applying electrical power from said plug to said appliance and an open condition for removing power from said appliance, and

said alarm means and said circuit means being connected in series across said switch contact means such that closure of said switch contact means short circuits said alarm means and said circuit means for removing power from said alarm means.

5,149,210

APPARATUS FOR RECORDING AND/OR READING INFORMATION

Björn S. H. Eriksson, Sollentuna, Sweden, assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 30, 1991, Ser. No. 647,863
Claims priority, application Sweden, Feb. 2, 1990, 9000373
Int. Cl.[5] B41J *11/20*
U.S. Cl. 400—56 12 Claims

1. Apparatus for recording and/or reading information on a record carrier comprising:

a head having a recording and/or reading nose;

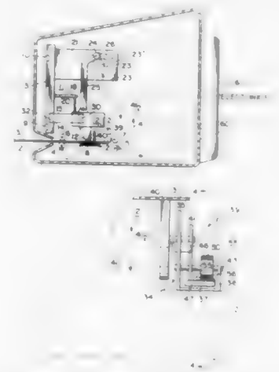
means for receiving a recording medium;

means for movably supporting the head; and

means in contact with said received medium during operation of said apparatus for maintaining a spaced apart distance between the received medium and said nose;

first preload means for applying a first preload bias force to said means for maintaining a spaced apart distance between the received medium and said nose to establish a first preload condition against the received medium; and

second preload means for applying a second preload bias force to said means for maintaining a spaced apart distance between the received medium and said nose to establish a second preload condition against the received medium, the second preload bias force being greater than the first preload bias force.



5,149,211

PRINTERS AND ANCILLARY SYSTEMS

Robert M. Pettigrew, Pound Cottage, High Street, Foxton, Cambridgeshire; Alan J. Harry, 2 The Lawns, Melbourn, Royston, Hertfordshire SG8 6BA; Paul R. Nailor, 82b Queen's Drive, Finsbury Park, London N4, all of United Kingdom; Fred Adelmann, Pestalozzistrasse 7, 6930 Eberbach am Neckar, Fed. Rep. of Germany; Peter Franzen, Ersheimer Strasse 9, 6932 Hirschhorn am Neckar, Fed. Rep. of Germany, and Juergen Schoon, Tannenhalde 6, 6930 Eberbach am Neckar, Fed. Rep. of Germany

Continuation of Ser. No. 286,658, Dec. 19, 1988, abandoned.
This application Oct. 9, 1990, Ser. No. 594,372
Claims priority, application United Kingdom, Aug. 12, 1988, 8819174
Int. Cl.[5] B41J *3/39*
U.S. Cl. 400—88 9 Claims

1. A label printer comprising a housing; a printing unit adapted to print labels; means for supplying to said printing unit a substrate onto which indicia are to be printed in order to form said printed labels; and means for inputting data to control the nature of the indicia printed at said printing unit, said means for inputting data being arranged to function without

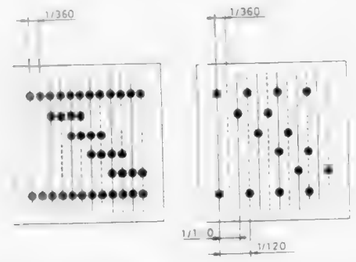
the use of a pre-configured alpha-numeric keyboard and comprising a cursor moving device and a graphics display system, said printing unit, said means for supplying substrate, and said means for inputting data mounted on said housing.

5,149,211

DOT PRINTER WITH CHANGEABLE QUALITY DOT PATTERN

Atsushi Murakami, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 18, 1991, Ser. No. 670,918
Claims priority, application Japan, May 12, 1990, 2-121565
Int. Cl.[5] B41J 2/485
U.S. Cl. 400—121 7 Claims



1. A dot printer comprising:
a print head for printing input data on a recording medium;
a print head moving means for laterally reciprocating the print head relative to the recording medium at a normal speed and a fast speed;
a print head driving means for driving the print head;
a storage means for storing predetermined basic dot patterns; and
a printing operation control means for reading the basic dot pattern corresponding to input data, producing a printing dot pattern on the basis of the basic dot pattern stored in the storage means, and controlling the print head moving means and the print head driving means according to the printing dot pattern to print the input data on the recording medium at a normal speed using the basic dot pattern as the printing dot pattern;
wherein the printing operation control means comprises:
a reference dot pattern producing means for producing a reference dot pattern by replicating each column continuously n times wherein an arrangement of the replicated columns is the same as that of the basic dot pattern; and
a printing dot pattern producing means for producing a printing dot pattern, for printing during fast speed movement of the print head, on the basis of the reference dot pattern by omitting m dots after a head dot and after remaining successive dots of a continuous dot row of the reference dot pattern to create a printing dot pattern comprising continuous dot rows of alternating printed dots having gaps therebetween as a result of the m omitted dots, m and n being positive integers.

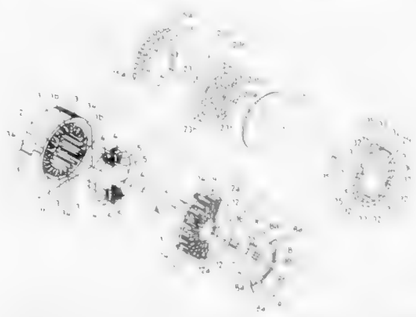
5,149,213

NOISE REDUCING BACK STOPPER FOR AN IMPACT PRINT HEAD

Hitoshi Yoshida, Kounan, and Katsuhiko Yokoi, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 29, 1991, Ser. No. 692,659
Claims priority, application Japan, Jul. 11, 1990, 2-186258
Int. Cl.[5] B41J 2/235, 29/10
U.S. Cl. 400—124 13 Claims

1. A print head for a dot printer comprising:
a yoke for mounting excitation coils;
an armature support frame mounted to said yoke;
a plurality of armatures pivotally mounted in said armature support frame, each said armature supporting a print wire; and
a back stopper arranged on a side opposite said print wires of said armatures to stop a retreat of an armature after completing a print strike, said back stopper having integral thereto a contacting portion for contacting the retreating armature, an outer frame for positioning on said armature support frame and a connecting surface between said contacting portion and said outer frame, said connecting surface having a plurality of openings therein.

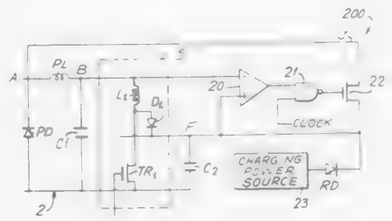


5,149,214

PRINT WIRE DRIVING APPARATUS

Yoshikiya Futagawa, and Katsuhiko Nishizawa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 450,137
Claims priority, application Japan, Dec. 13, 1988, 63-314262; May 18, 1989, 1-124746
Int. Cl.[5] B41J 9/38
U.S. Cl. 400—157.2 14 Claims



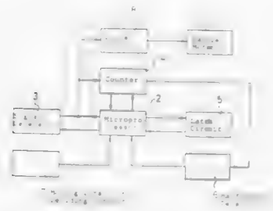
1. A print wire driving apparatus for use in a printer, the printer including at least one print wire and, an associated urging coil for driving a corresponding print wire when a current is supplied to said coil, comprising:
accumulating means for storing electro-magnetic energy accumulated in said urging coil when said current is not supplied to said urging coil;
power source means for producing said current, said power source means including a smoothing capacitor and a smoothing inductor, said electro-magnetic energy stored in said accumulating means being transmitted to said smoothing capacitor through said smoothing inductor;
feedback means for providing at least a portion of said electro-magnetic energy stored in said accumulating means to said smoothing capacitor of said power source means when the voltage across said accumulating means reaches a predetermined level, said feedback means including first detection means for detecting when the voltage across said accumulating means is greater than or equal to the predetermined level and first switch means responsive to detection by said first detection means for permitting at least a portion of the electro-magnetic energy in accordance with said accumulating means to be provided to said smoothing capacitor of said power source means, said smoothing inductor providing a current to said smoothing capacitor when the voltage across said accumulating means is below said predetermined level; and
regulating means for maintaining a minimum level of voltage across said accumulating means, said minimum level being equal to or less than said predetermined level.

5,149,215

CARRIAGE POSITION ERROR DETECTION IN A SERIAL PRINTER

Koichi Sugino, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,010
Claims priority, application Japan, Dec. 29, 1988, 63-331203
Int. Cl.[5] B41J 19/30
U.S. Cl. 400—279 11 Claims



1. A serial printer comprising:
carrier motor means for driving a printing head;
means for generating a countable output signal;
means responsive to said output signal for driving said carrier motor means;
counter means for counting the output signal of said output signal generating means;
microprocessor means for controlling said signal generator means and counter means; and
malfunction detector means for detecting a malfunction responsive to the count in said counter means reaching a predetermined value, and for resetting said microprocessor means in response thereto.

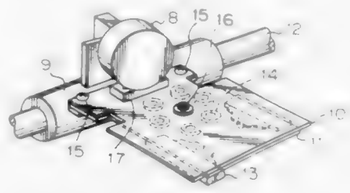
5,149,216

PRINTER CARRIAGE ASSEMBLY HAVING THERMAL DISSIPATING MEANS

Jiro Tanuma, and Shinichi Katakura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 478,563, Feb. 12, 1990, Pat. No. 5,059,046, which is a continuation of Ser. No. 862,799, May 13, 1986, abandoned. This application May 1, 1991, Ser. No. 694,358
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] B41J 25/304
U.S. Cl. 400—320 8 Claims

1. A carriage assembly for a printer, said carriage assembly comprising:
a printed circuit board having opposite first and second planar surfaces;
a thermally conducting plate having opposite first and second planar surfaces, said first planar surface of said thermally conducting plate being disposed along said first planar surface of said printed circuit board;
drive elements disposed on said second planar surface of said thermally conducting plate and electrically connected to said printed circuit board.



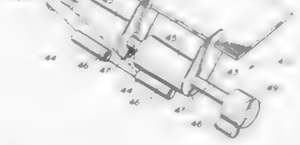
a plurality of space motor coils disposed on said second planar surface of said thermally conducting plate and electrically connected to said printed circuit board.

5,149,217

SELECTIVELY ACTUATABLE MULTIPLE MEDIUM FEED MECHANISM FOR A MICRO PRINTER

Hiroshi Narita, Suwa, Japan, assignor to Seiko Epson Corporation, Japan

Filed Apr. 10, 1990, Ser. No. 507,319
Claims priority, application Japan, Apr. 10, 1989, 1-90312; Dec. 20, 1989, 1-330604
Int. Cl.[5] B41J 11/50
U.S. Cl. 400—608.4 6 Claims



1. A micro medium feed mechanism for a printer comprising
a step motor for supplying power to feed one or more printing mediums through said printer,
a transmission means coupled to said motor and providing a power reduction output of said step motor power,
a drive shaft connected to and driven by said transmission means,
a plurality of medium feed rollers rotatably supported on said drive shaft and arranged to feed one or more of said mediums upon rotation of said shaft and a plurality of clutch mechanisms to selectively transmit rotational power from said drive shaft to selectively rotate one or more of said medium feed rollers,
each of said clutch mechanisms comprising
a clutch spring on said drive shaft and adjacent to at least one of said medium feed rollers, one end of said clutch spring fixed relative to said medium feed rollers,
a clutch plate rotatably supported relative to said drive shaft adjacent to said clutch spring, the other end of said clutch spring engaged by said clutch plate,
an electromagnetic clutch rotatably supported relative to said drive shaft adjacent to said clutch plate and in axial alignment with said clutch spring and said medium feed roller,
said electromagnetic clutch when unactivated permitting said clutch spring to immediately grip said drive shaft and rotate said roller therewith.

said electromagnetic clutch when activated for drawing said clutch plate further to said electromagnetic clutch to cause disengagement of said clutch spring from said drive shaft to release said clutch spring and said medium feed roller from rotating with said drive shaft and

urging means between said clutch spring and said clutch plate to continually maintain said clutch plate biased against said electromagnetic clutch so that, when said electromagnetic clutch is unactivated, the positional relationship between said clutch plate relative to said electromagnetic clutch will be substantially the same so that the amount of time required for each activation of said electromagnetic clutch and disengagement of said clutch spring from said drive shaft will be substantially the same.

5,149,218

PRINTING APPARATUS WITH DISENGAGEABLE PAPER SUPPLY AND TWO-STAGE DISCHARGE PLATE

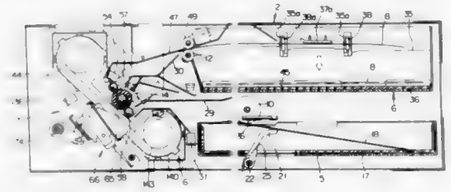
Mitsuo Iwatani; Hitoshi Kamoda; Masatoshi Mikuriya, all of Kanagawa; Tadao Kashiyama Chiba, and Yoshio Kajino, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 318,221, Mar. 3, 1989, Pat. No. 5,061,099. This application May 8, 1991, Ser. No. 697,897

Claims priority, application Japan, Mar. 31, 1988, 63-078691

Int. Cl.[5] B41J *13/10*

U.S. Cl. 400—625 **3 Claims**



1. A printing apparatus comprising:

a printing mechanism including a printing head and a platen for carrying out a printing operation;

a discharge tray;

a discharge means for transmitting a printed paper sheet from said printing mechanism to said discharge tray, and including shifting means for shifting said printed sheet from an intermediate discharge position to said discharge tray;

a supply mechanism including:

a supply tray for containing a stack of paper sheets,

a stack of paper sheets contained in said supply tray, each sheet having leading and trailing edges,

a vertically movable bottom plate in said supply tray for raising said stack of paper sheets, and

a roller rotatably mounted above said supply tray and being engageable with an uppermost sheet in said stack when the latter is raised by said movable bottom plate for propelling the engaged paper sheet from said supply tray to said platen in a path having a length therealong from said rollers to said platen which is substantially smaller than the dimension of each of said paper sheets between said leading and trailing edges and

control means for controlling movement of said roller and said bottom plate including drive means operative for selective rotation of said roller, and actuating means operative in synchronism with said drive means for raising said bottom plate at the initiation of said selective rotation so that said roller engages said uppermost paper sheet and propels the latter along said path to said platen and for lowering said bottom plate and thereby disengaging said roller from said uppermost paper sheet before said trailing edge of said uppermost paper sheet is propelled past said roller, thereby preventing the imparting of shock to said uppermost paper sheet while a portion thereof is at said platen for the performance of a printing operation;

said actuating means including an actuation member connected to said shifting means and movable between a first position and a second position, movement of said actuation member from said first position to said second position causing the raising of said bottom plate and movement of said actuation member from said second position to said first position causing said shifting means to shift said printed sheet from said intermediate discharge position to said discharge tray.

5,149,219

SWING-TYPE MECHANICAL PENCIL

Shuhei Kageyama; Takahiko Suzuki, and Yuichi Yamagishi, all of Kawagoeshi, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

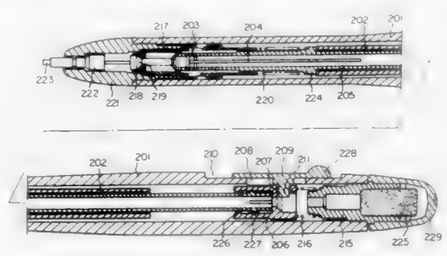
Division of Ser. No. 203,784, Jun. 7, 1988, Pat. No. 4,929,107. This application May 8, 1990, Ser. No. 520,636

Claims priority, application Japan, Jun. 12, 1987, 62-90663; Jul. 31, 1987, 62-117960; Oct. 14, 1987, 62-157740; Mar. 18, 1988, 63-36964

The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.

Int. Cl.[5] B43K *21/02, 21/06, 24/04*

U.S. Cl. 401—65 **5 Claims**



1. In a swing type mechanical pencil in which lead is extended out the head end of an outer sleeve from a lead feeding mechanism by the action of a knocking hammer by swinging said mechanical pencil by said outer sleeve, the improvement comprising; a lead case; a lead case bearing engaging a rearward portion of said lead case; a clinching part formed on the rearward portion of said lead case; said lead case bearing having an interference fit with said clinching part on said lead case such that said lead case bearing is retained on the end of said lead case; slider means slidably mounted on said outer sleeve for sliding said lead case into a locked position preventing movement; an elongate slit means on opposite sides of the rearward end of said lead case; hammer abutment means on the rearward end of said lead case circumjacent said elongate slit means; spring bearing projecting abutment means on a forward portion of said lead case for retaining a biasing spring between said lead case and said outer sleeve; said hammer sliding over the end of said lead case and said hammer abutment; said hammer being retained on said lead case between said hammer abutment and spring bearing projecting abutment; whereby said hammer is prevented from coming off said lead container.

5,149,220

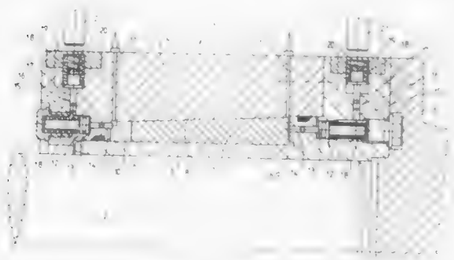
FRICTIONAL RESISTANCE COUPLING

Ernst Elsner, and Karl Junginger, both of Herbrechtingen, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jun. 17, 1991, Ser. No. 716,432

Int. Cl.[5] F16D *2/04*

U.S. Cl. 403—5 **15 Claims**



1. A frictional resistance coupling for the non-rotary and releasable connection of two coaxial components, said coupling comprising:

(a) an outer part facing one of said two coaxial components and an inner part facing the other of said two coaxial components, said outer and inner parts including surfaces forming an annular chamber which extends axially, and which, in said axial direction, is conical in shape;

(b) a conical, annular piston located within said annular chamber, said piston including surfaces in sealing engagement with axially extending surfaces of the annular chamber, said annular piston being axially movable in the annular chamber and having end faces at opposite axial ends, said end faces cooperating with surfaces of said annular chamber adjacent thereto form two pressure chambers within said annular chamber;

(c) a passage means communicating with each of said pressure chambers for receiving a supply of a pressurizing medium which can be supplied from a high pressure source into respectively one of the two pressure chambers;

characterised by the combination of the following further features:

(d) the outer part (4) comprises at least one movably guided indicator (20) therein;

(e) the annular piston (7) communicating with the indicator (20) for moving the indicator to a predetermined position upon movement of the annular piston (7) to an end position within one of the pressure chambers (9, 10); and

(f) a sensor means (21) disposed adjacent the outer part for sensing when the indicator is in said predetermined position.

5,149,221

ANGLED CONNECTION OF SUSPENDED CEILING TEES

Michael Slapsys, Toronto, Canada, assignor to CGC Inc., Oakville, Canada

Filed Dec. 4, 1991, Ser. No. 802,278

Int. Cl.[5] F16B *9/00*

U.S. Cl. 403—201 **5 Claims**

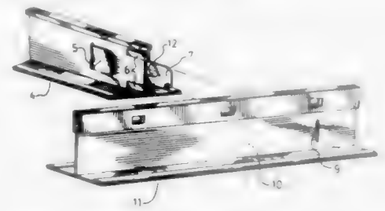
2. A bendable clip for connecting the end of a first suspended ceiling tee to a second suspended ceiling tee at an angle, where each said tee has a generally vertical web portion and a generally horizontal flange portion beneath and extending laterally on each side of said web portion, said clip comprising:

a body portion;

an integral first tab portion projecting from one end of said body portion for insertion in a vertical slot in said web portion of said first tee;

an integral second tab portion projecting from the other end of said body portion for insertion in a vertical slot in said web portion of said second tee; the width of said tabs being less than the width of said body portion; and

means for securing said clip against said web portion of said first tee with said first tab in said vertical slot in said web



portion of said first tee and with said second tab projecting beyond the end of said first tee, said means comprising two integral tongue portions projecting from said body portion alongside said second tab portion, each said tongue portion being bendable around the end of said first tee, one on either side of said second tab

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5,149,222

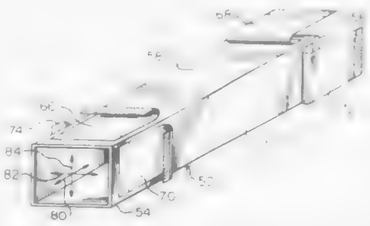
ROLLING FLEXURE BEARING SYSTEM FOR CONSTRAINING MOVEMENT OF A CARRIAGE AND METHOD THEREFORE

Lester M. Yeakley, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Oct. 4, 1991, Ser. No. 771,652

Int. Cl.[5] F16D *1/00*

U.S. Cl. 403—291 **7 Claims**



4. A system of constraining a multi-surface carriage for one degree of freedom of movement, said system comprising:

five flexure bearings; each of said five flexure bearings including:

a thin sheet of elastic material;

means for securing a first end portion of one surface of said thin sheet to a surface of the carriage;

means for securing a second end portion of said one surface of said thin sheet to a surface of another object; and

a bend axis formed in said thin sheet of material perpendicular to the direction of movement of said flexure bearing so said thin sheet is formed in a curvilinear shape so that said flexure bearing is moveable in a direction normal to said bend axis but is constrained from movement in a direction parallel to said bend axis; and

a first of said fire flexure bearings attached to the proximate end of a first surface of the carriage;

a second of said five flexure bearings attached to the distal end of the first surface of the carriage and aligned with said first flexure bearing;

a third of said five flexure bearings attached to the proximate end of a second surface of the carriage;

a fourth of said five flexure bearings attached to the distal end of the second surface of the carriage and aligned with said third flexure bearing;

a fifth of said five flexure bearings attached to a third surface of the carriage; and

each of said five flexure bearings attached to surfaces opposing the carriage surfaces so that the carriage is constrained to linear movement with one degree of movement in a direction normal to the bend axes of each of said five flexure bearings.

5,149,223

DRIVE COUPLING

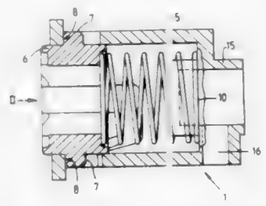
Geoffrey Watts, Herts, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1990, Ser. No. 627,467

Claims priority, application United Kingdom, Dec. 22, 1989, [illegible]

Int. Cl.[5] F16B 7/00; F16D 3/00

U.S. Cl. 403—359 7 Claims



1. A rotary drive coupling for receiving a splined shaft, the coupling comprising:

two interengaged parts, each having an axis, the parts being coaxially aligned;

one of the interengaged parts having coaxial opposing ends, the one part being connectable at one end thereof to a drive means, the other end having a cylindrical recess for housing the other interengaged part, said one part having diametrically opposed openings therethrough at said other end and perpendicular to the axis of said one part, each of said openings defining a predetermined guide surface having a start point and inclined guide surfaces oppositely disposed and extending from said start point;

said other interengaged part having a cylindrical outer surface with diametrically opposing arms thereon which are perpendicular to the axis thereof and having a coaxial aperture therethrough, the aperture having internal splines parallel with the axis thereof for receiving a splined shaft to be drivingly rotated thereby, said other part being rotatably positioned in the cylindrical recess of the one part with the arms thereof being disposed in the openings of the one part and on the guide surfaces thereof; and

spring means to urge the arms of the other part to the start point of each of the guide surfaces of the openings in said one part, so that insertion of the splined shaft to be rotated, if misaligned with the internal splines of the other part, causes the arms of the other part to be guidingly moved in opposite directions along the inclined guide surfaces from the start point, thereby rotating said other part to allow the misaligned splined shaft to be inserted therein.

5,149,224

INTERLOCKING HIGHWAY STRUCTURE

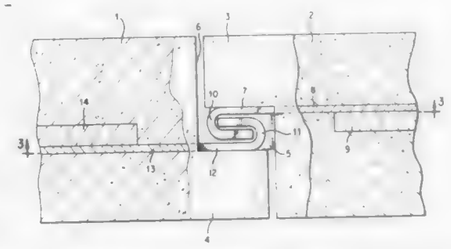
Rodney I. Smith, Rte. 2, Box 7, Hidland, Va. 22728

Filed Jul. 25, 1989, Ser. No. 384,788

Int. Cl.[5] E01F 13/00

U.S. Cl. 404—6 6 Claims

1. A highway barrier system comprising a plurality of rigid upright sections disposed end to end in interlocking relationship, the end of each said sections having a projecting portion and a recessed cavity disposed at ts ends such that the recessed cavity of one section accommodates the adjacent projecting portion of the interlocking section next to it, each of said recessed cavities being further provided with interlock means partially attached thereto for connecting together adjoining sections, each of said interlock means projecting into its own



recessed cavity and being adapted to engage the projecting part of the interlock means of the section next to it to hold said sections together and in alignment.

5,149,225

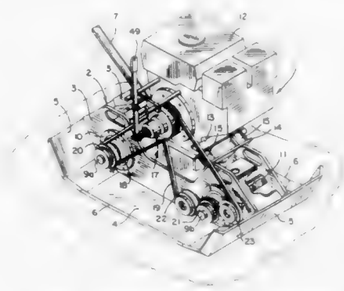
REVERSIBLE DRIVE FOR A VIBRATORY COMPACTOR

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Singer, Wis.

Filed Mar. 13, 1991, Ser. No. 668,771

Int. Cl.[5] E01C 19/36; F16H 33/00

U.S. Cl. 404—133.1 10 Claims



1. A reversible walk-behind vibratory compactor, comprising a frame, compaction means mounted on the frame and adapted to engage a material to be compacted, drive means mounted on the frame and including a drive shaft, a pair of eccentric shafts mounted for rotation on the frame, first connecting means for connecting the drive shaft with a first of said eccentric shafts for rotating said first eccentric shaft in a first direction, second connecting means for connecting said drive shaft with a second of said eccentric shafts for rotating said second eccentric shaft in the opposite direction, and clutch means operably connected to the drive shaft for selectively connecting each connecting means with said drive shaft for selectively rotating each eccentric shaft to provide forward and reverse movement for said compactor.

5,149,226

FLEXIBLE OIL SPILL CONTAINMENT BOOM

James E. Antinoro, 1600 SW. 20th Ave.; James A. Antinoro, 613 SW. 22nd Ter., both of Ft. Lauderdale, Fla. 33312, and Randy D. Antinoro, 1711 SW. 23rd St., Ft. Lauderdale, Fla. 33316

Filed Dec. 12, 1990, Ser. No. 626,951

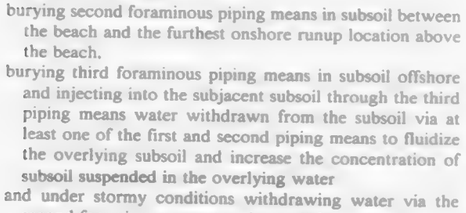
Int. Cl.[5] E02B 15/04

U.S. Cl. 405—65 13 Claims

1. An oil spill containment boom for deployment between a ship and a pier comprising:

a water floatable barrier to contain a floating substance on the surface of the water, said barrier having an inner and outer surface; and

an elongated flexible bar attached to said outer surface of



said floating barrier, said flexible bar disposed longitudinally along said outer surface of said floatable barrier to provide a spring-like tension to retain said barrier between said ship and said pier.

5,149,227

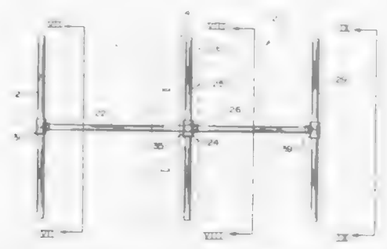
BEACH STABILIZATION WITH MULTIPLE FLOW CONTROL

James M. Parks, 3509 Merrick Ct., #210, Lexington, Ky. 40502

Continuation-in-part of Ser. No. 488,683, Mar. 5, 1990. This application May 6, 1991, Ser. No. 696,044

Int. Cl.[5] E02B 3/06, 8/02

U.S. Cl. 405—73 17 Claims



1. Beach stabilization method comprising the steps of

burying first foraminous piping means in beach subsoil in the vicinity of the mean low water contour,

withdrawing water via the first foraminous piping means under the beach to dewater the beach subsoil and favor beach accretion,

burying second foraminous piping means in subsoil between the beach and the furthest onshore runup location above the beach,

burying third foraminous piping means in subsoil offshore and injecting into the subjacent subsoil through the third piping means water withdrawn from the subsoil via at least one of the first and second piping means to fluidize the overlying subsoil and increase the concentration of subsoil suspended in the overlying water

and under stormy conditions withdrawing water via the second foraminous means to dewater the onshore subsoil and favor the deposition of subsoil suspended in water onrushing onshore and thereby oppose erosion therefrom.

5,149,228

PROP PRELOADING APPARATUS

Frans R. P. Pienaar, Noordheuwel; Brian P. Lewis, Meredale, and Graham Clark, Boksburg, all of South Africa, assignors to HL&H Timber Products (Proprietary) Limited, Johannesburg, South Africa

Filed Jun. 26, 1991, Ser. No. 721,268

Int. Cl.[5] E21D 15/32

U.S. Cl. 405—289 11 Claims

1. A prop preloading apparatus comprising a frame, means for supporting the frame on an end of an elongate prop in a manner permitting at least limited swivelling movement of the frame relative to the prop about at least one axis transverse to the axis of the prop, and a flexible preload bag which is inflatable with a settable substance and which is dimensioned to be supported by the frame, wherein the frame includes a support member in the form of a tray for receiving and supporting the bag and wherein the apparatus includes a cover member which makes a telescopic fit with the tray and which, in combination with the support member, forms an enclosure for the bag.

5,149,229

METHOD OF AND APPARATUS FOR PNEUMATICALLY CONVEYING GRANULAR SOLIDS

Willi Gericke, Watt, Switzerland; Karl-Ernst Wirth, Happurg, and Wolfgang Siebenhaar, Nürnberg, both of Fed. Rep. of Germany, assignors to Gericke AG, Maschinenfabrik, Regensdorf, Switzerland

Filed Oct. 3, 1989, Ser. No. 416,264

Claims priority, application European Pat. Off., Oct. 4, 1988, 88116404.0; Sep. 28, 1989, 89117944.2

Int. Cl.[5] B05B 17/00

U.S. Cl. 406—75 33 Claims

1. A method of pneumatically conveying material in form of granular solids; comprising the steps of:

feeding the material under pressure with addition of a carrier

gas in a transport pipe in such a manner that its cross sectional area is only partly filled with material; and

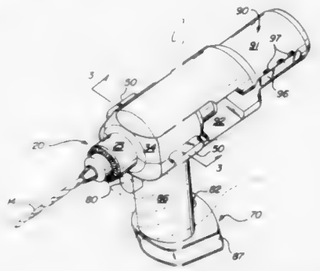
subjecting individual pipe sections of the transport pipe independently from each other to vibrations for reducing frictional resistance between the material and the transport pipe and for forming a flow pattern in form of a strand/crown flow up to a plug flow including a flow in form of a fluidized bed, with a material layer forming at the pipe bottom being also advanced.

5,149,230

ROTATING DUAL ATTACHMENT RECEPTACLE APPARATUS TOOL

Daniel R. Nett, 2401 Commor, Hamtramck, Mich. 48212

Filed Mar. 4, 1991, Ser. No. 662,719
Int. Cl.[5] B23B *45/02*
U.S. Cl. 408—42 38 Claims



1. A Rotating Dual Attachment Receptacle Apparatus Tool comprising:

a stem grip housing having a top and bottom end, said stem grip housing having an electric motor disposed therein;

a safety guard housing, said safety guard housing being disposed generally normal to the longitudinal axis of said stem grip housing and suitably affixed thereto; said safety guard housing having disposed therein a cavity;

a rotating drill head assembly having a top and bottom end, said rotating drill head assembly being generally disposed within said safety guard housing cavity having a main drive shaft and a plurality of chuck shafts therein, the main drive shaft having an upper and lower end, wherein the lower end extends into said stem grip housing and the upper end extends into said safety guard housing; said rotating drill head assembly being able to rotate about the main drive shaft axis;

a locking means disposed within said rotating drill head assembly which extends into locking depressions located within the top inside surface of said safety guard housing; the locking means has a sliding post portion which extends into the locking depression and securely locks said rotating drill head assembly at 180 degree interval locking positions;

a means for opening and closing the motor's electric circuit, the opening and closing means comprises a plurality of electric contacts suitably located at the lower front portion of said safety guard housing and the bottom end of said rotating drill head assembly, wherein the electric contacts close the electrical circuit when said rotating drill head assembly is positioned in either of the 180 degree locking interval positions;

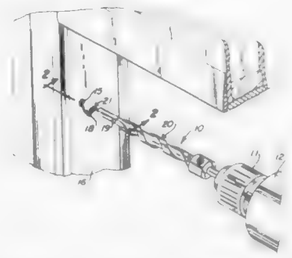
whereby said rotating drill head assembly can be rotated in a plane perpendicular to the main drive shaft to utilize either accessory without the need of rechucking it.

5,149,231

COUNTERBORE

Roy E. Bowling, 1355 Harlan St., Lakewood, Colo. 80214

Filed Dec. 23, 1991, Ser. No. 811,733
Int. Cl.[5] B23B *41/00, 51/00*
U.S. Cl. 408—82 2 Claims



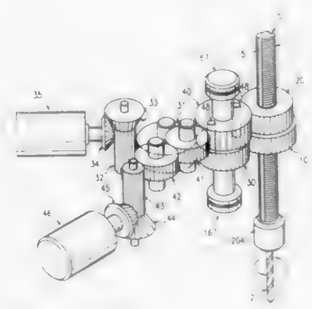
1. A counterbore for enlarging an existing hole in the presence of a wire having an end extending through said hole, said counterbore comprising a twist drill bit of a size of the enlarged hole to be drilled, said bit having a shank at the rear end thereof for engagement with a drill chuck, a pilot shank extending from the cutting end of said bit, said pilot shank being approximately the size of said existing hole and adapted to extend therethrough during drilling for guiding said twist drill bit, and a swivel at the leading end of said pilot adapted for engagement with said wire during counterbore drilling, whereby said wire is guided into said hole without twisting during drilling of the counterbore and extracted from said hole when said twist drill bit and pilot shank is withdrawn from said counterbore.

5,149,232

MECHANICAL PECK DRILL

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 374,306, Jun. 30, 1989, Pat. No. 5,062,745.
This application Sep. 10, 1991, Ser. No. 757,445
Int. Cl.[5] B23B *47/18*
U.S. Cl. 408—137 25 Claims



1. Apparatus comprising:

a spindle;

a first gear, slidably mounted on said spindle, for rotating said spindle about the longitudinal axis of the spindle;

a second gear, engaging said spindle, for reciprocating said spindle along its longitudinal axis;

a third gear, engaging said first gear;

a fourth gear, engaging said second gear, said fourth gear being shiftable between a first position wherein it is engaged with said third gear and a second position wherein it is disengaged from said third gear, said fourth gear being capable of turning about its axis of rotation when disengaged from said third gear thereby turning said second gear to reciprocate the spindle when said fourth gear is disengaged from said third gear; and

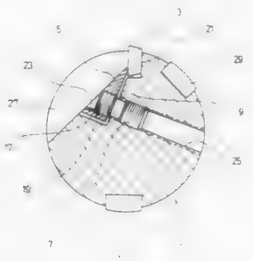
a first drive train engaging said third gear to drive said third gear.

5,149,233

REAMER

Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to Mapal, Fed. Rep. of Germany

Filed Dec. 22, 1989, Ser. No. 454,967
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3903655
Int. Cl.[5] B23B *27/16*
U.S. Cl. 408—199 16 Claims



1. A reamer comprising:

a head having a rotation axis and an opening for a clamping screw and a recess, the recess including a cutter plate mounting portion having a shoulder and a clamping jaw mounting portion having a first apex and two lateral boundary surfaces diverging from the first apex at an angle β;

a clamping jaw mounted in the clamping jaw mounting portion of the recess of the head and having a mounting hole aligned with the head opening;

a clamping screw threadedly engaging the mounting hole of the clamping jaw and the opening of the head;

at least one cutter plate having a cutting edge and being held against the shoulder of the cutter plate mounting portion of the recess by the clamping jaw, wherein the clamping jaw (5) is formed in a triangular plan shape with a second apex, the clamping jaw having lateral side surfaces diverging from the second apex at an angle α which is substantially equal to the angle of β, and a longitudinal holding edge joining the two lateral side surfaces, the longitudinal holding edge of the clamping jaw being substantially parallel to and impinging against the at least one cutter plate, the mounting hole (23) being located near the second apex of the clamping jaw, and the two lateral side surfaces of the clamping jaw (5) forming guide surfaces (13, 15), the guide surfaces of the clamping jaw contacting the lateral boundary surfaces of the recess to achieve in a correct alignment of the clamping jaw mounting portion of the clamping jaw with respect to the cutter plate; and

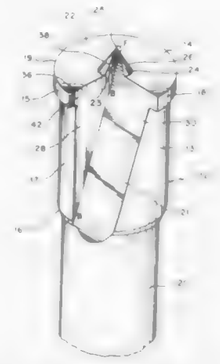
first and second guide strips mounted on said head, wherein said first guide strip is mounted at a first location adjacent to and circumferentially behind said at least one cutter plate and said second guide strip is mounted at a second location diametrically opposite said at least one cutter plate.

5,149,234

SPOT-WELD REMOVING TOOL

LaVerne R. Durfee, Jr., DeWitt, Nebr., assignor to Unibit Corporation, DeWitt, Nebr.

Filed Aug. 16, 1991, Ser. No. 746,790
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—211 9 Claims



1. A cutting tool for disconnecting first and second metallic members joined together by at least one spot-weld, comprising

a cutting body extending from a front end to a rear end and having an exterior surface;

a shank connected to said cutting body at said rear end,

said cutting body having a concave base surface positioned at said front end,

pilot means extending directly outwardly from said base surface defined by a solid outside surface thereof having conical configuration, so that a concave recess being formed by intersecting each other said concave base surface and said conical outside surface of said pilot means,

said cutting body having first and second surfaces extending inwardly from the exterior surface, said first and second surfaces intersecting each other to form only a single flute means, said exterior surface of the cutting body being substantially cylindrical except for said single flute means,

said first surface, said second surface and said flute means extending into said pilot means,

a cutting edge of said cutting tool formed at intersection of said first surface with said base surface of the cutting body, and

a cutting tip as formed at a junction of said exterior surface, said base surface and said first surface,

whereby when said cutting tip penetrates through the entire thickness of said first metallic member in an area of said spot-weld, said cutting edge and said concave recess form a slug of an uncut material from the metal of the first member while said slug being bonded to the second metallic member by said spot-weld.

5,149,235

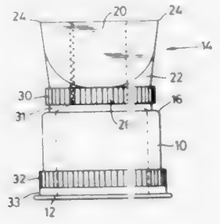
NUT

Martin G. Ollis, Butlers Leap, Clifton Road Industrial Estate, Rugby, Warwickshire, Great Britain

Filed Mar. 5, 1991, Ser. No. 664,879
Claims priority, application United Kingdom, Mar. 7, 1990, 9005075
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—41 3 Claims

1. A nut fastener device for a blind hole anchor comprising a tubular sleeve and screw threaded nut disposed at the end of the sleeve, the nut having frusto-conical surface portions with a maximum diameter at the end of the nut remote from the sleeve and a minimum diameter at the end nearest the sleeve,

the frusto cone being co-axial with he sleeve, and the arrangement being such that when the de vice is entered into a blind hole and a screw threaded mandrel is passed through the sleeve and engaged with the nut and then displaced axially in the appropriate direction, the nut is drawn into the sleeve thereby expanding the sleeve and wedging the nut in the sleeve, the nut having at least one back tapered face which is



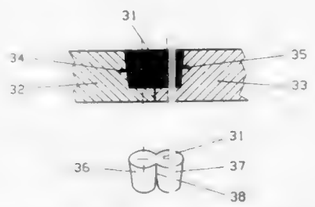
arcuate about an axis eccentric to that of the sleeve, and there being two bands of exterior teeth applied, a first of which is around the nut adjacent the sleeve and the second of which is around the sleeve at the opposite end from the nut, the teeth of the band on the sleeve being fewer in number than the teeth of the band on the nut and the difference in the number of teeth of the two bands corresponding to the number of said tapered faces.

5,149,236

DEVICE FOR ASSEMBLING FRAMES AND FRAME MOULDINGS AND A MITER CUTTING MACHINE FOR IMPLEMENTING THE DEVICE

Christian Rapayelian, Marseille, France, assignor to Cassese Society, France

Filed Oct. 9, 1990, Ser. No. 596,837
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—439 2 Claims



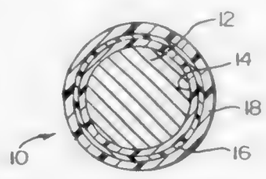
1. Device for assembling frames and frame mouldings comprising a monolithic assembly piece forming a double tenon and intended to be introduced into blind bores of corresponding shape provided at the edge of the junction surfaces of a workpiece to be assembled, characterized by the fact the double tenon has the form of two identical circular truncated cones (**36, 37**) of a height substantially equal to three quarters of the thickness of workpieces (**32, 33**) to be assembled and by the fact that the two circular truncated cones are juxtaposed so that the distance between their parallel axes is slightly less than the length of the largest diameter, and so that the large and small bases, perpendicular to the axes, are respectively in the same plane, the two largest forming an eight and the two smallest being tangent or very nearly so, so that the intersection (**38**) of the two truncated cones (**36, 37**) forms a triangle, and by the fact that the two blind bores (**34, 35**) each have the form of one of said truncated cones and are formed at the end of each of the two workpieces (**32, 33**) to be assembled, so as to define on each junction surface an indentation of a form identical to that of the intersection (**38**) of the assembly piece (**31**) so that, once said workpieces (**32, 33**) have been joined, the assembly piece (**31**) may be force fitted into these two bores (**34, 35**) and firmly apply the surfaces to be joined one against the other so as to form a strong assembly which may be dismantled.

5,149,237

COATED METAL FASTENER AND COATING COMPOSITION THEREFOR

William L. Gabriel, Barrington; Geronimo E. Lat, Prospect Heights, and Lawrence S. Shelton, Morton Grove, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 22, 1991, Ser. No. 659,236
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—446 22 Claims



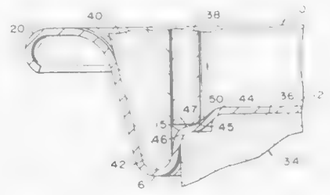
1. A coating composition for metal fasteners comprising:
a copolymer of an aromatic monomer and a monomer with α,β unsaturation with carboxyl groups, said α,β unsaturated monomer selected from the group consisting of maleic acid, fumaric acid and maleic anhydride;
a thermoplastic synthetic resin adhesive;
and an inert organic solvent selected from the group consisting of aromatic solvents, ketones, chlorohydrocarbons, and mixtures thereof.

5,149,238

PRESSURE RESISTANT SHEET METAL END CLOSURE

Carl McEldowney, Russia, and Philip Spangler, Sidney, both of Ohio, assignors to The Stolle Corporation, Sidney, Ohio

Filed Jan. 30, 1991, Ser. No. 648,045
Int. Cl.[5] B21D *22/30*
U.S. Cl. 413—8 15 Claims



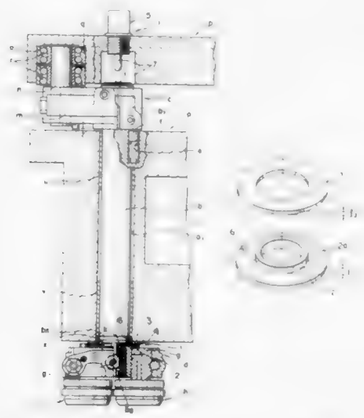
1. A method of forming a sheet metal closure to provide increased buckle resistance comprising in sequence the steps of
providing a sheet metal closure having a central panel, a panel radius around the central panel having an outer peripheral portion, a countersink around the panel radius, a chuckwall around the countersink, and a curved flange around the chuckwall, said countersink having a bottom and said central panel disposed above said bottom,
coining said panel radius around at least a portion of the circumference of said central panel, and
reforming said central panel by supporting a major portion of the undersurface thereof and reforming the outer peripheral portion of said central panel into a stepped portion while moving said countersink radius, chuckwall and curved flange downward with respect to the major portion of the central panel to increase substantially the height of said central panel above the bottom of said countersink.

5,149,239

MECHANISM FOR ESTABLISHING CLEARANCE BETWEEN SEAMING CAM LEVER AND HOUSING OF CAN END DOUBLE-SEAMING MACHINE

Toru Honma, Ohmiya; Izumi Matsushita, Koshigaya; Yoshiteru Kojika, Saitama, and Noboru Sasaki, Kitamoto, all of Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,678
Claims priority, application Japan, Jul. 25, 1990, 2-195030
Int. Cl.[5] B65B *7/28*; B21D *51/26*
U.S. Cl. 413—31 7 Claims



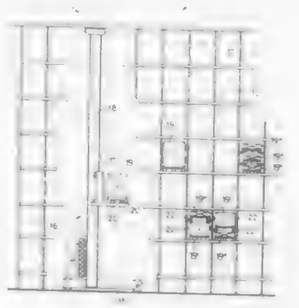
1. A can end double-seaming machine comprising:
a housing having a vertical hole defined therein and extending between upper and lower surfaces thereof;
a shaft rotatably extending through said vertical hole and having upper and lower end portions projecting from the upper and lower surfaces, respectively, of said housing, and a neck on said lower end portion thereof;
a seaming cam lever mounted on said upper end portion of said shaft for rotation therewith about an axis of the shaft;
a seaming roll lever mounted on said lower end portion of said shaft for rotation therewith about the axis of the shaft;
a pair of seaming rolls rotatably mounted on a lower end of said seaming roll lever;
biasing means in said housing, for normally urging said shaft, said seaming roll lever, and said seaming cam lever upwardly;
a mechanism for establishing a predetermined clearance between a lower surface of said seaming cam lever and said upper surface of said housing;
said mechanism comprising:
an annular spacer disposed around said shaft between said seaming roll lever and said lower surface of said housing, said annular spacer comprising a marginal portion held against the lower surface of said housing with said seaming roll lever, said shaft, and said seaming cam lever being urged upwardly by said biasing means, and a tubular support disposed around said shaft and projecting integrally from said marginal portion toward said hole in the housing, said shaft being supported on said tubular support through said neck with said seaming cam lever spaced from the upper surface of said housing by a predetermined clearance while said marginal portion is being held against the lower surface of said housing; and
pressing means for pressing said shaft downwardly until the lower surface of said seaming cam lever is held against the upper surface of said housing when said annular spacer is disposed around said shaft and said seaming roll lever is mounted on the lower end portion of said housing.

5,149,240

ADJUSTABLE STORAGE RACK

Gaetano Di Rosa, Turin, Italy, assignor to Fata Automation S.p.A., Turin, Italy

Filed Jan. 14, 1991, Ser. No. 640,813
Claims priority, application Italy, Jan. 15, 1990, 19063 A/90
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—277 3 Claims



1. In a storage rack comprising a plurality of vertical risers and horizontal stringers spaced apart to form a plurality of rows and columns of compartments open at the front and arranged to receive load units from a vertically and horizontally moveable handling device having extractable forks for inserting into and removing therefrom load units from said compartments, the improvement comprising at least one pair of brackets pivotally mounted opposite each other on side walls of each of the compartments and moveable between a vertical, out-of-the-way position where they lie parallel with said side walls and permit a load unit to pass between them and a lowered, working position where they extend into the interior of said compartments to support a load unit therein, each of said brackets having an operating element extending outwardly therefrom and operating means on said handling device for simultaneously engaging the operating elements of a pair of brackets to move said pair of brackets between said positions depending on the size of the load unit to be stored in a compartment.

5,149,241

DUAL MAST APPARATUS FOR STORAGE AND RETRIEVAL VEHICLES

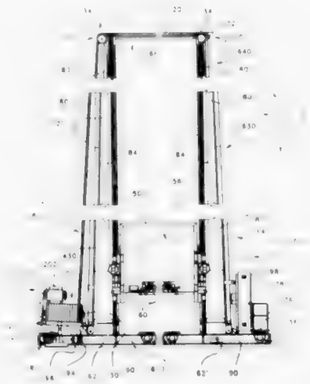
Ralph B. Haymore, Salt Lake City, and Mark I. Johnson, American Fork, both of Utah, assignors to Eaton-Kenway, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 653,837, Feb. 11, 1991. This application Apr. 12, 1991, Ser. No. 684,423
Int. Cl.[5] B65G *1/00*
U.S. Cl. 414—279 3 Claims

1. A dual mast storage and retrieval vehicle comprising
carriage means on the vehicle upon which goods are placed for vertical transport;
two masts which jointly support the carriage means, which carriage means travels vertically between the two masts,
first base means which fully support one of the masts disposed thereon, said first base means comprising horizontally disposed means for bearing weight imposed by the one mast and mast connecting means upon said weight bearing means such that resultant bending of the weight bearing means due to load received from the one mast is symmetrically distributed about the mast connecting means relative to the first base means thereby providing relatively load independent, essentially only vertical displacement of the one mast due to the imposition of weight;

second base means which fully support the other mast disposed thereon, said second base means comprising horizontally disposed means for bearing weight imposed by the other mast and mast connecting means centrally disposed upon said weight bearing means such that resultant bending of the weight bearing means due to load received from the other mast is symmetrically distributed about the mast connecting means relative to the second base supporting means thereby providing relatively load independent, essentially only vertical displacement of the other mast due to the imposition of weight;

each of said base means comprising ground support means essentially independent from the other base means and each of said base means comprising down-aisle drive



means said down-aisle drive means being interconnected in master/slave relationship such that the vehicle is powered to move in only one direction at any given moment;

coupling means which joins said base means to form a single vehicle, said coupling means comprise first means for rotatingly varying the disposition of said first base means relative to the base mean in down-aisle and cross-aisle directions and second means for rotatingly varying the disposition said second base means relative to the first base means in down-aisle and cross-aisle directions thereby permitting variation in vertical displacement and cross-aisle displacement between the first base means and second base means while maintaining an essentially constant down-aisle coupling distance and thereby constraining the distance between the mass to be essentially constant.

5,140,242

VERTICAL DRIVE APPARATUS FOR STORAGE AND RETRIEVAL VEHICLES

Ralph B. Haymore, Salt Lake City, Utah, assignor to Eaton-Kenway, Inc., Salt Lake City, Utah

Filed Feb. 11, 1991, Ser. No. 653,837
Int. Cl.[5] B65G *1/00*
U.S. Cl. 414—279 **12 Claims**

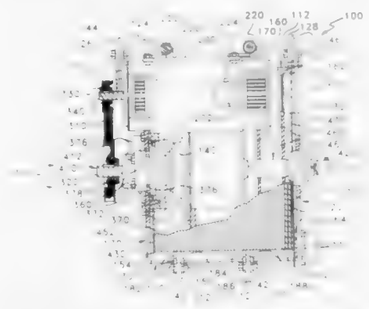
1. A storage and retrieval vehicle comprising:

means for driving the vehicle longitudinally along an aisle beside which inventory is addressably stored;

a base and a mast supported upon said base;

a vertically driven carriage eccentrically supported by said mast for selective vertical movement to acquire and deposit the inventory;

a unitary vertical drive assembly comprising means by which the carriage is selectively displaced up and down, frame means and connectors by which the unitary vertical drive assembly is releasably and operably mounted on the vehicle above the base directly adjacent the mast whereby the unitary vertical drive is selectively mounted to and



dismounted from said releasible and operable position on the storage and retrieval vehicle as a single unit;

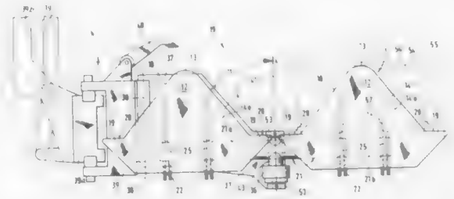
said connectors comprising releasible fasteners.

5,149,243

LIFTING/TILTING OR TILTING APPARATUS FOR EMPTYING BINS, IN PARTICULAR GARBAGE BINS, INTO A COLLECTING BIN

Jakob Naab, Mainz, and Arno Gajewski, Munster-Sarmsheim, both of Fed. Rep. of Germany, assignors to Zoller-Kipper GmbH, Mainz-Laubenheim, Fed. Rep. of Germany

Filed Jan. 8, 1990, Ser. No. 461,981
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639861
The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.
Int. Cl.[5] B65F *3/04*
U.S. Cl. 414—408 **7 Claims**



1. In a lifting and tilting apparatus for emptying garbage bins (**55**) having uptake pockets (**54**) into the opening of a collecting bin, said apparatus having gripper means (**12**) adapted to be received in said uptake pockets (**54**) of said garbage bins (**55**), and said apparatus further having a cross beam (**21**) and a lifting arm (**37**), and means (**39***a*, **39***b*, **39***c*) for causing up and down arcuate movement of the lifting arm (**37**) about a horizontal axis, characterized in that:

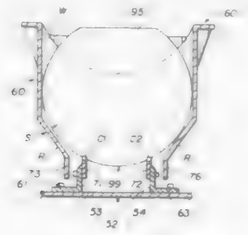
the said cross beam (**21**) has a pivot joint (**36**) connected thereto, said cross beam further having a pair of arms (**21***a*, **21***b*) extending in opposite directions from said pivot joint (**36**), said pivot joint being connected to said lifting arm (**37**) for swivelling movement of the cross beam (**21**) with respect to the lifting arm (**37**) about an upright axis, and further characterized by said gripper means comprising two substantially triangular gripping and carrying plates (**12**, **12**) one on each arm (**21***a*, **21***b*) of the cross beam (**21**), said apparatus being further characterized by a mechanism (**75**, **76**) connected with the pivot joint (**36**) for swinging the cross beam (**21**) with respect to the lifting arm (**37**).

5,149,244

APPARATUS FOR ALIGNING WAFERS WITHIN A SEMICONDUCTOR WAFER CASSETTE

Herbert Webber, Crawley Down, and Peter Edwards, Horsham, both of United Kingdom, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 395,679, Aug. 18, 1989, abandoned.
This application Jun. 17, 1991, Ser. No. 715,882
Int. Cl.[5] B65G *65/30*
U.S. Cl. 414—417 **8 Claims**



1. In semiconductor process equipment in which wafers are removed individually from a cassette by automated equipment, an improvement comprising:

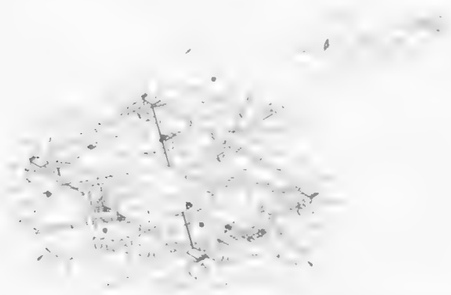
jig means extendable into a bottom portion of said cassette and engageable with a bottom edge portion of said wafers to lift said wafers from contact with said bottom portion of said cassette, where said jig means provides precise positioning of said bottom edge portion of said wafers within said cassette to facilitate removal of said wafers individually from said cassette by means of said automated equipment, said jig means including a first elongated body having an upper surface provided with a plurality of teeth separated by substantially V-shaped grooves, where the bottom portion of each groove is configured to accept an edge of a semiconductor wafer, and where a top of each of the plurality of teeth form a trapezoid with two parallel sides of unequal length.

5,149,245

BALL RETRIEVER

Howard Landmann, 16637 Valley Dr., Tampa, Fla. 33618

Filed Oct. 1, 1990, Ser. No. 590,674
Int. Cl.[5] B60P *1/00*
U.S. Cl. 414—440 **11 Claims**



1. An improved apparatus for retrieving balls from the ground and depositing the balls in a container, comprising:

a frame capable of being moved over the ground;

motive means for moving said frame over the ground;

ball catching means mounted on said frame for picking up the balls from the ground and for transporting the balls to the container;

a rake assembly mounted on said frame for directing the balls toward said ball catching means;

said rake assembly comprising a plurality of rake heads;

a plurality of spring means mounted on said frame for individually mounting said plurality of rake heads relative to said frame with said ball catching means being disposed between said plurality of rake heads;

said plurality of spring means individually biasing each of said plurality of rake heads in contact with the ground for sliding over a surface of the ground and directing the balls toward said ball catching means irrespective of variations in the contour of the ground; and

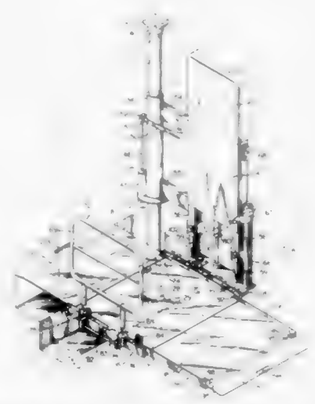
each of said plurality of rake heads being positioned at an angle with a direction of forward motion of said frame such that a ball which contacts one of said plurality of rake heads is transferred to an adjacent one of said plurality of rake heads toward said ball catching means.

5,149,246

WHEELCHAIR LIFT APPARATUS FOR COMMERCIAL VEHICLES

Russell J. Dorn, Aurora, Colo., assignor to Stewart & Stevenson Power, Inc., Commerce City, Colo.

Division of Ser. No. 524,747, May 17, 1990, Pat. No. 5,026,244.
This application Jun. 18, 1991, Ser. No. 716,860
Int. Cl.[5] B60P *1/44*
U.S. Cl. 414—541 **8 Claims**



1. In lift apparatus for a vehicle having a doorway, a raised floor level above the doorway and stairs between the doorway and the floor level, the improvement comprising:

a vertical support at one side of the entrance to the doorway;

platform support means connected in swiveled relation to said vertical support, said support means including drive means, telescoping guide members and a base member movable between said floor level and street level in response to actuation of said drive means;

a foldable platform assembly including hinge means connecting said assembly in hinged relation to said base member, said platform assembly including a center platform section, and front and rear platform sections hinged in relation to said center platform section, and adjustable control means associated with said hinge means to selectively resist movement of said platform assembly from an upward position to a downward position;

each of said platform sections being of flat, generally rectangular configuration, and means pivotally interconnecting

adjacent of said sections whereby said sections are disposed in flush relation to one another in an extended position and are foldable upon one another in an stored position by pivoting said front and rear platform sections over said central platform section; and

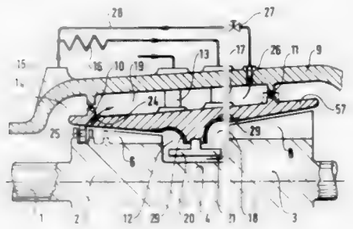
a barrier plate at one end of said front platform section, said barrier plate including pivot means pivotally interconnecting said plate to said front platform section for movement between a vertical position and a horizontal position.

5,149,247

SINGLE HP-MP INTERNAL STATOR FOR A STEAM TURBINE WITH CONTROLLED STEAM CONDITIONING

Jean-Pierre Gros, Villemomble, and Patrick Laffont, Privas, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Apr. 26, 1990, Ser. No. 515,017
Claims priority, application France, Apr. 26, 1989, 89 05543
Int. Cl.[5] F01D *5/14*
U.S. Cl. 415—108 6 Claims



1. An HP-MP steam turbine body comprising a rotor having an HP portion and an MP portion interconnected by an intermediate portion;

an HP internal stator co-operating with the HP portion of the rotor to define an HP stream;

an MP internal stator co-operating with the MP portion of the rotor to define an MP stream;

the HP internal stator and the MP internal stator being positioned axially inside an external stator by sealed axial positioning means situated around the MP stream in a plane which is at a distance from the inlet of said MP stream;

thermal protection means being situated around the HP stream in a plane at a distance from the inlet of said HP stream, said positioning means and said thermal protection means co-operating with the external stator and with the HP and MP internal stators to define an inter-stator space swept by steam;

HP admission means opening out to the inlet of the HP stream;

MP admission means opening out to the inlet of the MP stream and fed with a flow of steam taken off from the outlet of the HP stream and passed through a resuperheater device;

the inlets of the HP and MP streams being adjacent to each other and separated by sealing means supported by the internal stators and disposed in the intermediate portion of the rotor between the HP and MP portions;

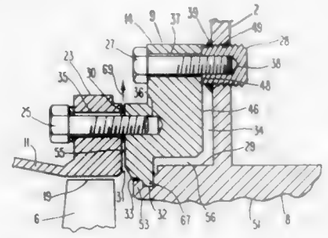
wherein the HP internal stator and the MP internal stator constitute a single internal stator and wherein the interstator space includes firstly steam admission means fed with steam taken from one of the last stages of the HP stream and opening out in the vicinity of the thermal protection means which isolate the inter-stator space from the outlet of the HP stream, and secondly steam exhaust means whose orifices are disposed in the vicinity of the axial positioning means, the said exhaust means being provided with flow adjustment means.

5,149,248

APPARATUS AND METHOD FOR ADAPTING AN ENLARGED FLOW GUIDE TO AN EXISTING STEAM TURBINE

Edward P. Cramer, Charlotte, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 10, 1991, Ser. No. 639,612
Int. Cl.[5] F01D *25/32*
U.S. Cl. 415—169.2 15 Claims



12. In a steam turbine having an annular flow path bounded at its outer periphery by an inner cylinder and a flow guide, said flow guide having a diameter larger than the flow guide for which said steam turbine was originally designed, a plurality of rotating blades arranged in rows disposed within said flow path, said inner cylinder having a circumferentially extending wall, said flow guide having a circumferentially extending vertical flange, an apparatus for mounting said flow guide vertical flange to said inner cylinder wall and for removing moisture from said flow path, comprising:

a) a plurality of first arcuate members arranged between said inner cylinder wall and said flow guide vertical flange along a first portion of the circumferential extent of said flow guide vertical flange, said first arcuate members and said flow guide forming a first circumferentially extending gap therebetween, said first arcuate members having an inner diameter;

b) a plurality of second arcuate members arranged between said inner cylinder and said flow guide vertical flange along a second portion of the circumferential extent of said flow guide vertical flange, said second arcuate members and said flow guide forming a second circumferentially extending gap therebetween;

c) a plurality of bosses formed in said inner cylinder wall, said bosses having faces and means for adjusting the axial position of said faces, said first arcuate members supported against said faces; and

d) a lip machined in said inner cylinder outer diameter and a mating groove machined in said inner diameter of said first arcuate members.

15. In a steam turbine inner cylinder having a circumferentially extending radially oriented wall and an outer diameter, a method of installing an enlarged exhaust flow guide, comprising the steps of:

a) machining a lip in said outer diameter of said inner cylinder;

b) drilling and tapping a plurality of holes in said wall;

c) installing a threaded plug having a face in each of said holes;

d) mounting a plurality of arcuate segments onto said inner cylinder, each of said arcuate segments having a groove mating with said lip, and having upstream and downstream circumferentially extending radially oriented faces;

e) adjusting the axial position of each of said threaded plugs by rotating said threaded plugs within said threaded holes until said face of each of said threaded plugs bears against said upstream face of one of said arcuate segments; and

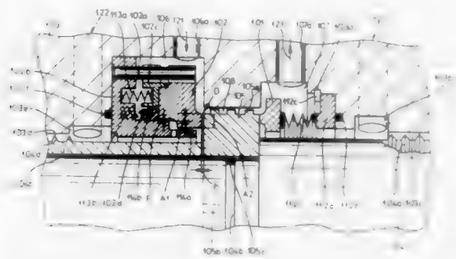
f) mounting said exhaust flow guide onto said downstream face of said arcuate segments.

5,149,249

SHAFT SEAL ASSEMBLY, ESPECIALLY FOR HIGH-PRESSURE TURBOCOMPRESSORS

Helmut Schellong, Duisburg; Karl-Heinz Victor, Castrop-Rauxel; Hans-Wilhelm Laarman, Hamm; Gustav Maser, Dortmund, and Ralf Dedeken, Witten-Heven, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Dusseldorf and Pacific Wietz GmbH & Co. KG, Dortmund, both of Fed. Rep. of Germany

Filed Feb. 21, 1991, Ser. No. 659,105
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005428
Int. Cl.[5] F04D *29/08*
U.S. Cl. 415—170.1 13 Claims



1. A shaft seal assembly for a turbocompressor, comprising:

a shaft

a housing surrounding said shaft and formed with a pressurized gas space to be sealed from the atmosphere;

a gas-side axially sealing slide ring surrounding said shaft, received in said housing and angularly fixed therein;

an atmosphere-side axially sealing slide ring surrounding said shaft, received in said housing and angularly fixed therein;

means for mounting said atmosphere-side slide ring for axial and radial movement relative to said housing at an axially extending functional gap defined between said atmosphere-side slide ring and said housing, and including:

an O-ring sealing said functional gap relative to said housing without exerting centering forces upon said atmosphere-side slide ring, and

a further O-ring and springs acting upon said atmosphere-side slide ring for centering same relative to said housing along an inner diameter of said atmosphere-side slide ring;

a rotor ring on said shaft between said slide rings and having opposite sealing surfaces respectively juxtaposed with sealing surfaces of said slide rings;

a respective blocking-liquid compartment formed in said housing and open toward each of said slide rings outwardly thereof;

an annular passage formed in said housing around a periphery of said rotor ring and interconnecting said compartments, said atmosphere-side slide ring sealing the respective compartment against the atmosphere and said gas-side slide ring sealing the respective compartment against said gas space; and

means for connecting both of said compartments in a blocking-liquid circulation path including a pump and a cooler,

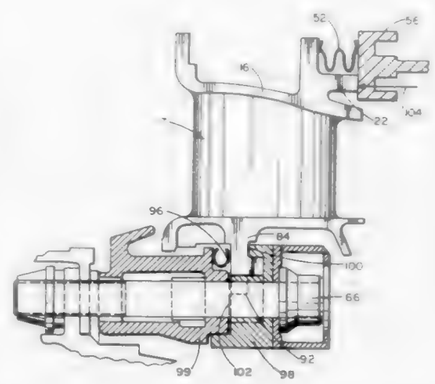
said atmosphere-side slide ring having a surface-area ratio K between substantially 0.45 to 0.60 between an area A1 constituting the numerator of said ratio and formed by a net effective area of said atmosphere-side slide ring biased by said blocking liquid and an are A2 constituting the denominator of said ratio and constituting a sealing area of said atmosphere-side slide ring against said rotor ring, said rings are composed of a material having a modulus of elasticity of at least 250,000 N/mm^2.

5,149,250

GAS TURBINE VANE ASSEMBLY SEAL AND SUPPORT SYSTEM

Larry W. Plemmons, Fairfield; Melvin Bobo, Cincinnati, both of Ohio; Alan P. Wilds, Danvers, and Gary C. Liotta, Beverly, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 28, 1991, Ser. No. 662,073
Int. Cl.[5] F01D *9/00*
U.S. Cl. 415—209.3 14 Claims



1. Apparatus for statically determinant mounting of a vane assembly in a gas turbine engine, the vane assembly including at least one vane extending between a radially outer nozzle band and a radially inner nozzle band, the radially outer nozzle band having axially directed load bearing elements on distal ends thereof and the radially inner nozzle band having a radially inward oriented flange depending therefrom, the engine including a radially outer support member positioned to engage the load bearing elements in the radially outer nozzle band when the vane assembly is in an operative position and further including a radially inner support member for engaging the flange to axially restrain the vane assembly, the inner support member including means for releasably connecting the flange thereto for supporting the vane assembly in radial and circumferential directions and further including seal means operatively coupled between said radially outer nozzle band and said radially outer support member for inhibiting gas flow therebetween, the seal means including a radially outwardly extending flange connected to said radially outer nozzle band and a corresponding flange extending from the engine substantially parallel to said radially outwardly extending flange, a resilient seal being positioned between said radially outwardly extending flange and said corresponding flange.

5,149,251

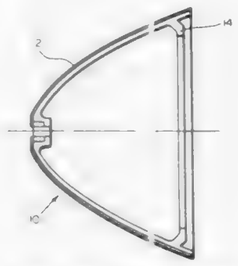
METAL/COMPOSITE SI INNER CONE

John F. Scanlon, Okemos, and Gary Wigell, Lansing, both of Mich., assignors to Auto Air Composites, Inc., Lansing, Mich.

Division of Ser. No. 614,289, Nov. 5, 1990. This application Feb. 4, 1992, Ser. No. 830,593

Int. Cl.[5] B64C 1/14

U.S. Cl. 416—245 R 4 Claims



1. A parabolic spinner cone for airplane engines comprising:
a metal shell defining the lateral sides of the parabolic cone, the shell having an interior and exterior surface, and
a thermoplastic composite structural member bonded to the interior surface of the metal shell.

5,149,252

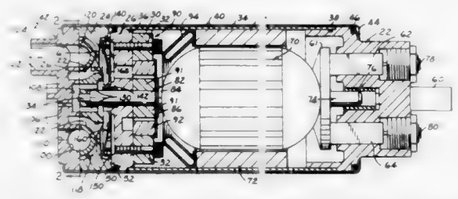
TWO-STAGE PUMP FOR HANDLING HOT FUEL

Charles H. Tuckey, and J. D. Tucker, both of Cass City, Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Feb. 4, 1991, Ser. No. 650,164

Int. Cl.[5] F04B 23/08

U.S. Cl. 417—205 11 Claims



1. An electrically powered fuel pump assembly for directing fuel under pressure to an internal combustion engine which comprises:
(a) an inlet housing (20) to receive a supply of fuel and having a pumping face with a first annular pumping channel (100) open to a fuel inlet (102) at a first end and open to a fuel outlet (112,126) at a second end, said fuel outlet comprising a second annular channel (126) radially within said first channel, and a central chamber (108) within said second annular channel having a vapor exit port (106),
(b) a first spacer housing (24) adjacent said pumping face with outlet passages (122) connecting said central chamber (108) with said second annular channel (126), and having an annular rotor channel (118) facing said first annular pumping channel (100),
(c) a first pumping rotor (120) in said rotor channel (118), and
(d) means (82) for driving said pumping rotor (120).

5,149,253

MAGNET PUMPS

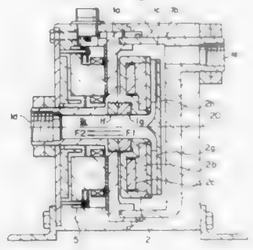
Eiji Miyamoto, Tokyo; Yoshinori Ojima, Kanagawa; Tadashi Yakabe, Kanagawa, and Toshiya Kanamori, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jun. 5, 1990, Ser. No. 533,405

Claims priority, application Japan, Jun. 5, 1989, 1-141175; Jun. 8, 1989, 1-144033; May 15, 1990, 2-123133

Int. Cl.[5] F04D 13/06

U.S. Cl. 417—353 16 Claims



1. A magnet pump, comprising:
a closed type impeller having a first portion with a permanent magnet embedded therein, a plurality of vanes attached to said first portion, and a main plate attached to said vanes, said impeller being rotatably driven by a magnetic force from the outside of said impeller, said permanent magnet being disk shaped and oriented perpendicular to a rotational axis of said impeller;
a pump casing including a suction port, a discharge port and a pumping chamber in which the impeller is contained, the impeller being rotatably contained in said pumping chamber of said casing and having the permanent magnet embedded therein;
a bearing provided on the suction side of the impeller and having a stationary part fixed to said casing and a moving part fixed to said impeller, an outer diameter of said bearing being smaller than an inner diameter of said permanent magnet embedded in said impeller, said bearing being shaped to support radial force and thrust force acting on said impeller;
a magnetic force driving mechanism constituting a means for affording the magnetic force on said permanent magnet within said impeller to rotatably drive the latter, said magnetic force driving mechanism being mounted on a non-liquid-contacting portion of said casing on a suction side of said impeller and facing said impeller in respect to the direction of the rotary shaft axis of said impeller; and
a fluid inlet passage for communicating between said suction port and said pumping chamber, said fluid inlet passage being formed to pass through the center portion of said magnetic force driving mechanism and the center of the bearing as defined by the rotational axis of the impeller.

5,149,254

REFRIGERATION COMPRESSOR HAVING A CONTOURED PISTON

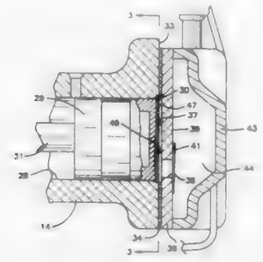
Delmer R. Riffe, Cullman, Ala., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 6, 1991, Ser. No. 711,337

Int. Cl.[5] F04B 39/10

U.S. Cl. 417—569 12 Claims

1. A hermetic refrigeration compressor comprising a cylinder block having an end surface, a cylinder bore extending through said cylinder block from said end surface and defining an axis perpendicular to said end surface, a valve plate secured to said end surface and having a flat surface extending across said cylinder bore, a piston mounted for reciprocation in said cylinder bore to and from said valve plate, a discharge port extending through said valve plate and opening into said cylinder bore, said piston having an end face extending adjacent said valve plate, said end face including a recessed portion with at least



part of said recessed portion being in alignment with at least part of said discharge port, the remainder of said piston end face around said recessed portion being flat and parallel to said valve plate surface.

5,149,255

GEARING SYSTEM HAVING INTERDIGITAL CONCAVE-CONVEX TEETH FORMED AS INVALUTES OR MULTI-FACETED POLYGONS

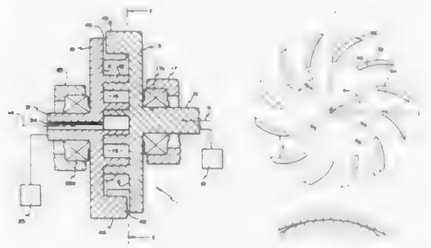
Neils O. Young, Boise, Id., assignor to Arthur D. Little, Inc., Cambridge, Mass.

PCT No. PCT/US91/00990, § 371 Date Oct. 25, 1991, § 102(e) Date Oct. 25, 1991

Continuation-in-part of Ser. No. 481,243, Feb. 20, 1992, Pat. No. 5,051,075. This PCT application Feb. 19, 1991, Ser. No. 768,196

Int. Cl.[5] F01C 1/04; F16D 3/04

U.S. Cl. 418—55.3 8 Claims



1. A gearing system for use in relative orbiting gear drive systems comprising:
a first gear plate which is rotatable about a first axis, said first gear plate including a plurality of axially extending teeth located on and circumferentially equally spaced about a first pitch circle;
a second gear plate which is rotatable about a second axis, parallel to and laterally spaced by a distance substantially equal to an orbit radius R_{or} from said first axis, said second gear plate including a plurality of axially extending teeth located on and circumferentially equally spaced about a second pitch circle;
said plurality of teeth on said first plate being arranged to be interdigitated with the plurality of teeth on said second plate such that relative angular displacement of one gear plate relative to the other gear plate is prevented while an orbital movement of one gear plate relative to the other gear plate is accommodated;
each tooth on said first and second gear plates including an axially extending convex surface portion and an opposed axially extending concave surface portion such that any one pair of interdigitated teeth have a surface mesh with the convex surface portion of one tooth conforming to and engaging with the concave surface portion of the other tooth; and
wherein all the teeth take the form of truncated involutes.

3. A gearing system for use in relative orbiting gear drive systems comprising:
a first gear plate which is rotatable about a first axis, said first gear plate including a plurality of axially extending teeth located on and circumferentially equally spaced about a first pitch circle;
a second gear plate which is rotatable about a second axis, parallel to and laterally spaced by a distance substantially equal to an orbit radius R_{or} from said first axis, said second gear plate including a plurality of axially extending teeth located on and circumferentially equally spaced about a second pitch circle;
said plurality of teeth on said first plate being arranged to be interdigitated with the plurality of teeth on said second plate such that relative angular displacement of one gear plate relative to the other gear plate is prevented while an orbital movement of one gear plate relative to the other gear plate is accommodated;
each tooth on said first and second gear plates including an axially extending convex surface portion and an opposed axially extending concave surface portion such that any one pair of interdigitated teeth have an approximate surface mesh with the convex surface portion of one tooth approximately conforming to and engaging with the concave surface portion of the other tooth; and
wherein all of the teeth take the form of multi-faceted polygons.

5,149,256

ROTARY, POSITIVE DISPLACEMENT MACHINE WITH SPECIFIC LOBED ROTOR PROFILE

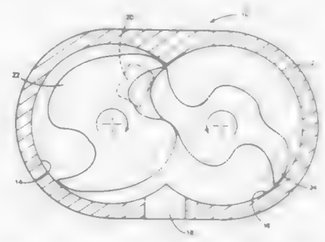
Lothar P. Schmitz, Leeds, England, assignor to The Drum Engineering Company Limited, England

Filed Apr. 25, 1991, Ser. No. 691,495

Claims priority, application United Kingdom, May 5, 1990, 9010211

Int. Cl.[5] F04C 18/20

U.S. Cl. 418—150 4 Claims



1. A rotary positive-displacement machine of the type having intermeshing lobed rotors, comprising:
a housing having two parallel cylindrical intersecting bores defined therewithin;
an inlet port communicating with said two bores for the introduction of low pressure fluid to the housing;
an outlet port formed in at least one end wall of the housing for the discharging of high pressure fluid from the housing;
first and second two-lobed rotors mounted respectively in the two bores for synchronous rotation;
said first rotor having a hub portion which periodically occludes said outlet port to control the generation and discharge of high pressure fluid from the housing;
each lobe of said first rotor having a leading tip portion which is radiussed so that it does not define a sharp edge;

each lobe of said first rotor having an outer flank, a portion of which is a first convex curve, which is generated to correspond to the form of the tip of the second rotor and which merges with a first convex arcuate portion whose centre is offset from the first rotor axis; and

each lobe having a trailing flank formed by a second convex curve, generated to correspond to the form of the tip of the second rotor, which merges with a second convex arcuate portion, whose centre is offset from the first rotor axis, followed directly by a concave arcuate portion whose centre is also offset from the first rotor axis.

5,149,258

EXTRUSION NOZZLE

Meinrad Rossé, La Tour-de-Peilz, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Jan. 31, 1990, Ser. No. 473,219

Claims priority, application Switzerland, Feb. 21, 1989, 603/89

Int. Cl.[5] B29C *47/16*

U.S. Cl. 425—190 10 Claims

1. A nozzle for depositing a layer of a fluid mass on a surface comprising a coupling defining a nozzle entry passage and a body integral with the coupling having four sides which extend from an apex of the body at the coupling and form a parallelepipedic cross-section shape and wherein two opposing sides thereof widen and two opposing sides narrow as the body extends linearly away from the coupling to a curved body portion which in turn extends to a body end which defines an exit slot wherein the sides that widen each terminate tangentially to a horizontal plane at the body end exit slot in a form of an arc of a circle of which the center is at the apex of the body.

5,149,25?

COMPRESSOR WITH A CYLINDER HAVING IMPROVED SEIZURE RESISTANCE AND IMPROVED WEAR RESISTANCE, AND METHOD OF MANUFACTURING THE CYLINDER

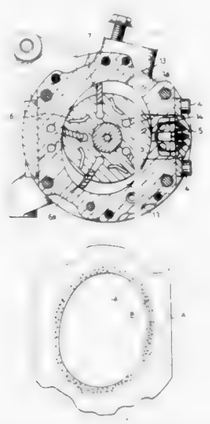
Masahiro Iio, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 482,207, Feb. 20, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 806,856

Claims priority, application Japan, Mar. 29, 1989, 1-35961[U]

Int. Cl.[5] F04C *18/344, 25/00;* F01B *31/00*

U.S. Cl. 418—178 6 Claims



1. In a compressor having a cylinder formed of an aluminum alloy and having an inner peripheral surface portion, and a moving member slidably received within said cylinder,

the improvement wherein:

hard particles are evenly dispersed only in said inner peripheral surface portion of said cylinder and not throughout the entire extent of said cylinder;

said hard particles are formed of a chemical compound selected from the group consisting of Si_3N_4, TiC, and SiC; and

said cylinder is formed by subjecting a green compact of a powdery material for said aluminum alloy to hot extrusion; and

wherein said hard particles are dispersed only in an inner peripheral surface portion of said green compact which is thereafter subjected to said hot extrusion.

5,149,259

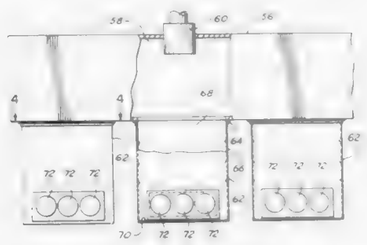
GRATELESS REGENERATIVE INCINERATOR

Richard J. Greco, Matawan, N.J., assignor to JWP Air Technologies, Mountainside, N.J.

Filed Oct. 28, 1991, Ser. No. 783,554

Int. Cl.[5] F23D *14/00;* F23G *7/08*

U.S. Cl. 431—5 17 Claims



1. A regenerative incinerator comprising:

an enclosure defining a common combustion region;

a burner in association with said enclosure positioned to create a flame which extends into said common combustion region;

a plurality of heat exchange chamber, one end of each of said heat exchange chamber being in flow communication with said common combustion region;

a plurality of gas distribution assemblies, at least one of said gas distribution assemblies being positioned in each of said heat exchange chambers at the other end of said heat exchanger chambers, said gas distribution assembly including a valve, and said gas distribution assembly being connected to a source of air to be cleaned, and an exhaust for cleansed air, said valve alternatively connecting said gas distribution assembly to said source of air to be cleaned and said exhaust;

each of said gas distribution assemblies having at least two tubes for the flow of gas therethrough; and

a heat exchange material disposed in each of said heat exchange chambers between said one end and said other end of each of said heat exchange, chambers and in contact with said tubes.

5,149,260

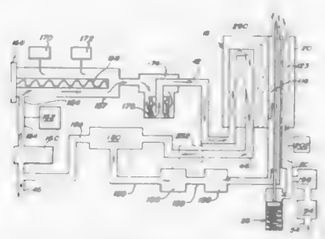
DEVICE AND METHOD FOR COMBUSTION OF WASTE OIL

Harry D. Foust, Rte. 1, Box 92U, Bridgewater, Va. 22812

Continuation of Ser. No. 345,953, May 1, 1989, abandoned. This application May 3, 1991, Ser. No. 695,438

Int. Cl.[5] F23D *11/44*

U.S. Cl. 431—11 37 Claims



1. A device for burning waste oil, and the like, through atomization and ignition thereof in a suitable combustion chamber, comprising: a closed loop oil circulating system, the circulating system including an oil circulating conduit the conduit having a pump for pumping the oil there through and a heater for heating the oil as it is circulated by the pump, an atomizing gun, the gun including a heat exchange oil channel, the heat exchange channel in fluid communication on each end thereof with the circulatory conduit and forming a portion of the closed loop circulatory system so that the oil can flow to and subsequently away from the gun as it circulates through the circulatory system, and the atomizing gun having a combustion oil channel regulatably connected to the circulating system by a combustion oil system, the combustion system including a combustion oil conduit in fluid communication with the circulatory conduit and valve means for regulatably diverting oil from the circulatory conduit to the combustion oil channel, and the atomizing gun including a nozzle assembly, the nozzle assembly in fluid communication with the combustion oil channel and with a pressurized air conduit providing pressurized air from a source thereof for providing atomizing of the combustion oil and injection thereof from an oil injection orifice of the nozzle assembly into the combustion chamber, and the diverting valve means permitting circulating of the oil through the circulating system separately from the diversion of oil therefrom to the combustion oil channel.

5,149,261

OXYGEN HEATER AND OXYGEN LANCE USING OXYGEN HEATER

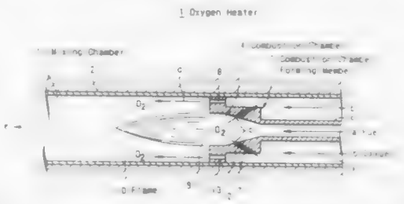
Toshio Suwa, Kawasaki; Nobuaki Kobayashi, and Takashi Hirano, both of Tokyo, all of Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 86,734, Jul. 9, 1987, Pat. No. 4,928,605. This application Dec. 4, 1989, Ser. No. 445,194

Claims priority, application Japan, Nov. 15, 1985, 60-256351; Nov. 15, 1985, 60-256352; Nov. 15, 1985, 60-256353

Int. Cl.[5] F23D *1/00;* F23C *1/10*

U.S. Cl. 431—207 19 Claims



1. An oxygen heater for heating oxygen, the oxygen heater comprising:

an internal wall of a mixing chamber;

oxygen supply means for supplying oxygen to the inside of the internal wall;

a combustion chamber-defining member disposed inside the internal wall and defining a combustion chamber, communicating with the oxygen supply means, for both mixing and burning fuel with oxygen supplied thereto, the combustion chamber having an opening for blowing a flame;

fuel supply means for supplying fuel to said combustion chamber; and

an oxygen-jetting opening, disposed around the opening of the combustion chamber and communicating with the oxygen supply means, for allowing oxygen supplied thereto to flow out therefrom and to form an oxygen curtain, the oxygen curtain being positioned between the internal wall of the mixing chamber and a flame due to the combustion in the combustion chamber to protect the internal wall from heat emitted by the flame; wherein the fuel supply means supplies the fuel to said combustion chamber at a predetermined flow rate, the oxygen heater further comprising control means for controlling chamber within the range of 1 to 5 times more than an oxygen flow rate which is theoretically adequate to completely burn the fuel supplied to the combustion chamber at said predetermined flow orate, so that fuel supplied to the combustion chamber is burned with an adequate or excess amount of oxygen.

5,149,262

BURNER CONSTRUCTION, IGNITER ASSEMBLY THEREFOR

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

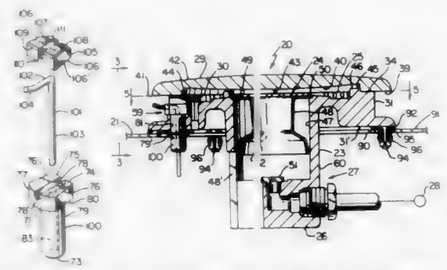
Filed Jul. 19, 1991, Ser. No. 732,643

Int. Cl.[5] F23Q *7/06*

U.S. Cl. 431—258 16 Claims

1. In a burner construction comprising a burner body means having a chamber means therein and having opposed end means one of which is open to said chamber means and the other of which has means for interconnecting a source of fuel to said chamber means, and a removable cap means closing said one end means of said body means, said burner construction having port means interconnecting said chamber means to the exterior of said burner construction and through which said fuel can issue to burn externally to said burner construction, and body means having an annular surface means interrupted by a plurality of radially disposed groove means that

are spaced apart by land means of said annular surface means, said cap means having an annular surface means cooperating with said annular surface means of said body means to close said groove means on one end thereof whereby said groove means define said port means, said annular surface means of said body means having an igniter receiving slot means therein, and an igniter assembly having a part thereof disposed in said slot means, said igniter assembly comprising an electrically insulating body member having an intermediate portion and having opposed end surface means one of which is disposed adjacent said cap means, and an electrically conductive L-shaped electrode means carried by said body member and having two legs one of which has a first part thereof that



extends out of said intermediate portion thereof for sparking to said cap means, said one leg of said electrode means having a second part, the improvement wherein said body member comprises an electrically insulating cover member secured to said intermediate portion so as to cover said second part of said one leg of said electrode means to prevent said second part from sparking to said cap means and to define part of said one end surface means of said body member, said one end surface means having a groove means therein for feeding fuel from said chamber means to said first part of said one leg of said electrode means that is not covered by said cover member, said groove means in said one surface means of said body member being generally U-shaped so as to have an open end that is generally closed by said cap means.

5,149,263

TORCH BURNER METHOD AND APPARATUS

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Columbia, Md.

Filed Jun. 6, 1991, Ser. No. 710,024

Int. Cl.[5] F23D *11/00*

U.S. Cl. 431—2 **11 Claims**

1. In a system for heating objects having a supply of fluid fuel under pressure which is to be stoichiometrically mixed to achieve a combustible mixture, fluid fuel flow line connected to said fluid fuel under pressure, a manual control valve in said fluid fuel flow line, a torch means for mixing air with said fluid fuel to achieve said combustible mixture, the improvement wherein said torch means includes a fluidic oscillator for forming a jet of said fluid fuel and oscillating said jet in ambient air downstream of said fluid oscillator to mix air with said fuel and achieve said combustible mixture a distance spaced from any physical structure of said torch whereby a flame front of burning combustible mixture has a broad shape and is spaced a distance from said fluidic oscillator which is determined by the sweep angle, wave pattern and frequency of said fluidic oscillator.

5,149,264

METHOD OF PRODUCING CERAMIC PRODUCTS

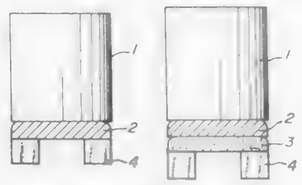
Osamu Horikawa, Toyoake, and Yukihisa Wada, Aichi, both of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Mar. 18, 1991, Ser. No. 676,941

Claims priority, application Japan, Mar. 28, 1990, 2-76709

Int. Cl.[5] F24D *23/02*; F27B *21/00*

U.S. Cl. 432—2 **7 Claims**



1. A method of producing a fired ceramic product, comprising the steps of:

mounting a green supporting plate on a fired supporting plate;

mounting a green ceramic body directly on said green supporting plate; and

firing said green ceramic body, said green supporting plate and said fired supporting plate in a firing furnace to produce said fired ceramic product from said green ceramic body.

5,149,265

METHOD FOR FIRING DIRECT-FIRED BURNER

Harry P. Finke, Pittsburgh, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed May 31, 1991, Ser. No. 708,185

Int. Cl.[5] F27D *7/00*

U.S. Cl. 432—24 **13 Claims**

1. A method for firing a direct-fired burner to heat a front wall in a heating chamber, said burner having a firing capacity, C, greater than a maximum firing rate required for said heating chamber, said burners mounted on a burner wall opposite said front wall, said method comprising the steps of:

(a) measuring a front wall temperature;

(b) entering the measurement of step (a) into a computer;

(c) deriving a firing rate demand value, F, by means of said computer as a function of said front wall temperature and a set point greater than said front wall temperature; and

(d) initiating an impulse firing mode by means of said computer wherein said burner is fired at its full capacity, C, for a time, t_f, defined by the equation $t_f=(F/C)t_c$, where t_c represents the time for a normal firing cycle which includes ignition and firing.

5,149,266

METHOD AND APPARATUS FOR COOLING HOT MATERIAL

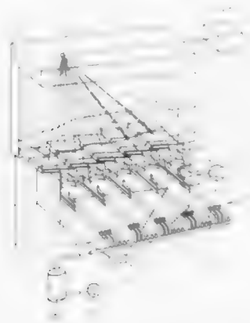
Otto Heinemann, Ennigerloh, and Heinz-Herbert Schmits, Rheda-Wiedenbruck, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Feb. 5, 1991, Ser. No. 650,735

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004393

Int. Cl.[5] F25B *45/00*

U.S. Cl. 432—77 **17 Claims**



1. A method of cooling a moving layer of hot granular material supported on an air permeable grate, said material having zones at different temperatures, said method comprising constantly passing a stream of cooling air upwardly through said grate and said material, and periodically passing pulses of additional cooling air upwardly through said grate and said material at higher temperature zones thereof.

5,149,267

DENTAL SHADE GUIDE ASSEMBLY

Ross A. Longhini, Woodbury; Daryl L. Neisse, Lake Elmo; Gerald E. Drake, Oakdale, and James R. Kvitrud, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 29, 1991, Ser. No. 647,551

Int. Cl.[5] A61C *19/10*

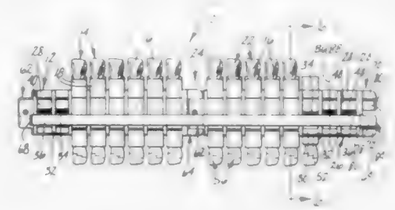
U.S. Cl. 433—26 **18 Claims**

1. A dental shade guide assembly comprising:

a first holder having a number of dental shade guides arranged in a row;

a second holder having a number of dental shade guides arranged in a row; and

a coupler for releasably coupling said first holder to said second holder, said coupler including a first part connected to said first holder and a second part connected to said second holder, said first part having means for releasably coupling said first part to said second part in snap-fit relation as said first part moves toward said second part, said coupler sustaining said first holder in a certain orientation relative to said second holder when said first holder is coupled to said second holder such that said row of



shade guides of said first holder is generally parallel with said row of shade guides of said second holder.

5,149,268

METHOD OF FILLING AN ENDODONTICALLY PREPARED ROOT CANAL

William B. Johnson, 5010 E. 68th St., Suite 104, Tulsa, Okla. 74136

Filed Apr. 16, 1991, Ser. No. 696,753

Int. Cl.[5] A61C *5/02*

U.S. Cl. 433—224 **3 Claims**

1. A method of filling an endodontically prepared root canal in a tooth employing an obturator in the form of an elongated slender body having a proximal end and a distal end, the obturator body having a handle portion at said proximal end, the body having a shaft portion from the handle portion to said distal end, such shaft portion being dimensioned so that the portion thereof adjacent said distal end may be received in the endodontically prepared root canal, the obturator body having a plurality of integral spaced apart length indicators formed on the exterior surface of the shaft portion between the handle portion and the portion adjacent the distal end to be received in the endodontically prepared root canal, the indicators serving to indicate the length of the shaft portion to the distal end, comprising the steps of:

(a) inserting the shaft portion of an obturator body into the root canal so that the shaft portion distal end at least substantially reaches the root canal apical end;

(b) noting the depth of the obturator body shaft portion in the root canal using the depth indicators;

(c) withdrawing the obturator body from the root canal;

(d) inserting filler material into the root canal to at least substantially fill the root canal;

(e) inserting the obturator body shaft portion into the root canal to displace the filler material to more completely fill the root canal;

(f) observing the depth of insertion of the shaft portion of the obturator body and continuing to insert the obturator body shaft portion while observing the depth until the full depth is achieved as noted in step (b); and

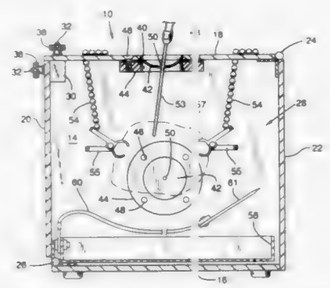
(g) severing the obturator body handle portion from the obturator body shaft portion;

(h) retaining the shaft portion thereof with the root canal; and
(i) removing the severed handle portion from the tooth.

5,149,269
MANUAL TEACHING CALCULATOR
Howard Ylitalo, R.R. 2, Box 106, Cokato, Minn. 55321
Filed May 20, 1991, Ser. No. 702,404
Int. Cl.[5] G06C *1/00*
U.S. Cl. 434—203 1 Claim

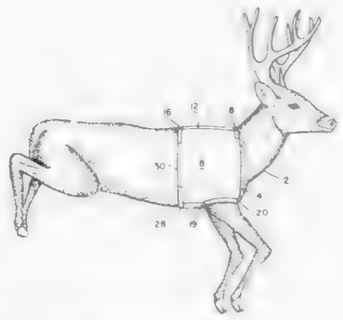
1. A manually operable arithmetic calculating device, having in combination,
a single rod,
a stop member at each end of said rod,
said rod having thirty one rings thereon slidable therealong,
said rings being colored with each fifth ring being of a different color to indicate groups of five rings,
numerals on said rod corresponding in number to the number of said rings and respectively appearing to the right of each ring,
an unnumbered length of said rod extending from the last number thereon to provide a space for unused rings, and
said stop member being of a height to elevate said rod on a flat surface sufficiently to move said rings in making calculations.

5,149,270
APPARATUS FOR PRACTICING SURGICAL PROCEDURES
M. J. McKeown, 4405 Coast Hwy., North Bend, Oreg. 97459
Filed Oct. 29, 1990, Ser. No. 604,496
Int. Cl.[5] G09B *23/28*
U.S. Cl. 434—262 13 Claims



1. A simulator for an individual to practice endoscopic procedures used in surgical and diagnostic techniques, comprising:
a container having a cavity and said container having at least one aperture providing entry to said cavity for inserting a viewing scope and an instrument to be used to practice a surgical procedure;
access means selectively opening said container for setting up a practice procedure and closing said container to prevent viewing of said cavity other than through said viewing scope;
means for mounting an object simulating a human organ in the cavity; and,
an electrical connector connectable to the object for completing an electrical circuit of an operating procedure using an electrical surgical instrument whereby the individual can practice the operating procedure under conditions closely resembling actual conditions.

5,149,271
BIG GAME CAPE GUIDE
Brian D. Marvich, 115 Park Rd., R.D. #3, Aliquippa, Pa. 15001
Filed Dec. 19, 1991, Ser. No. 810,156
Int. Cl.[5] G09B *23/00*
U.S. Cl. 434—295 8 Claims

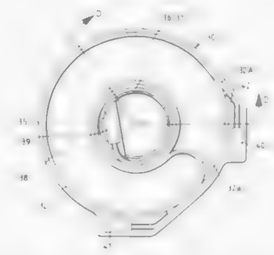


1. A garment adapted to be fitted substantially snugly about the forequarters of a cervine animal, said garment having when applied to said animal a rearward edge defining a line of cut for trophy-production purposes.

5,149,272
ASSAY FOR TOTAL AND DIRECT BILLIRUBIN
Yih-Shiong Wu, Carmel; Jeanne Bohannon; Yolanda White, both of Indianapolis, and Mark J. Simmons, Carmel, all of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.
Filed May 30, 1991, Ser. No. 707,720
Int. Cl.[5] G01N *33/00*
U.S. Cl. 436—97 21 Claims

1. A reagent composition for the measurement of bilirubin in a sample comprising a diazonium salt, iodide ions, an acid and at least one betaine selected from the group consisting of alkyl betaine, betaine and betaine hydrate.

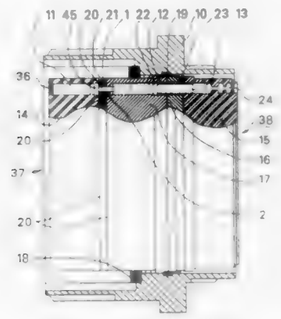
5,149,273
CLOCK SPRING
Hiroyuki Bannai, Furukawa, and Hironori Kato, Sendai, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Jun. 13, 1991, Ser. No. 715,079
Claims priority, application Japan, Jun. 14, 1990, 2-62196[U]
Int. Cl.[5] H01R *39/02*
U.S. Cl. 439—15 2 Claims



1. In a clock spring including a fixed member, a movable member rotatably mounted on said fixed member with a cable

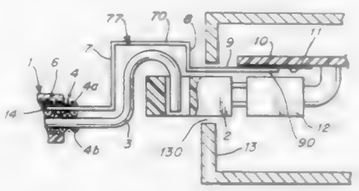
accommodating portion defined therebetween, and a cable accommodated in said cable accommodating portion, said cable having one end fixed to said fixed member and led out of said fixed member and having the other end fixed to said movable member and led out of said movable member; the improvement wherein said cable accommodating portion comprises a plurality of first concentric grooves and second concentric grooves arranged in opposed relationship to each other, and said cable comprises a plurality of wire-like cables separated from one another, one portion of said wire-like cables being wrapped in one direction within either of said first concentric grooves or said second concentric grooves, while the other portion being wrapped in the opposite direction reverse to said one direction within the other of said first concentric grooves and said second concentric grooves, whereby an inverted portion of each said wire-like cable is formed between said one portion and said other portion, the number of wrapping of one or several of said wire-like cables being smaller than that of the remaining wire-like cables.

5,149,274
ELECTRICAL CONNECTOR WITH COMBINED CIRCUITS
David O. Gallusser, Oneonta, and James B. LeBaron, New York, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.
Filed Apr. 1, 1991, Ser. No. 678,159
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—76 18 Claims



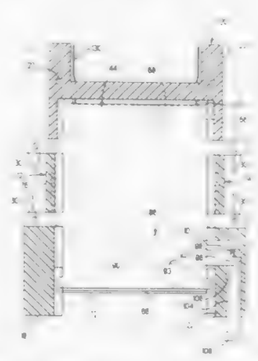
1. A connector for electrically connecting a first electrical component to a second electrical component, comprising:
contact means including a plurality of socket/pin contacts for carrying electrical signals between said first electrical component and said second electrical component;
means for grouping circuits at a first end of said connector into fewer circuits at an opposite end, including a circuit board having a plurality of holes equal in number to the number of said socket/pin contacts, said circuit board having on at least one surface a plurality of continuous conductive traces connecting together at least two, but less than the total number, of said holes in said circuit board, said socket/pin contacts extending through said holes;
means for electrically connecting said socket/pin contacts to said traces;
connector shell means for housing said circuit board and said socket/pin contacts; and
means including at least one dielectric insert bonded to said circuit board to form an integral assembly for retaining said circuit board and said socket/pin contacts in said shell means.

5,149,275
CABLE CONNECTOR
Philippe Pitta, Fontaine, France, assignor to Bull, S.A., France
PCT No. PCT/FR89/00397, § 371 Date Jun. 18, 1991, § 102(e) Date Jun. 18, 1991, PCT Pub. No. WO90/01816, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 28, 1989, Ser. No. 487,996
Claims priority, application France, Jul. 29, 1988, 88 10279
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—98 16 Claims



1. A multi-wire cable connector comprising in combination:
a cable having a plurality of conducting wires and a grounding element;
a first socket connected to said cable;
a second socket mounted into a piece of electrical equipment and into which said first socket is to be connected; and
a transfer part provided with a plurality of flexible contact fingers having elastic properties and bent into a U-shape, said transfer part being adapted to be engaged within said equipment to provide an electrical ground connection, and adapted to be connected to the grounding element of said cable and mechanically assembled to said first socket whereby electrical continuity of the grounding element is assured upstream of the first socket while simultaneously assuring mechanical reinforcement of the cable connection to said first socket, whereby repeated insertions and extractions of the first socket into the second socket will be withstood without causing electrical disconnect of any of said conducting wires.

5,149,276
MODULAR HOLDER HAVING AN EJECTOR MECHANISM FOR A DUAL IC PACKAGE
Dirk R. Dixon, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 18, 1991, Ser. No. 809,352
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—159 2 Claims



1. A modular holder for two memory cards, each card adapted to be electrically engaged with electrical means of an

electrical connector, said holder enabling separate insertion and ejection of said cards from said holder, said holder comprising:

a central plate affixed between opposed side rails intermediate upper and lower surfaces thereof, said central plate having a connector proximate end and a card receiving end and opposed major surfaces, said rails being adapted to slidingly receive said memory cards therebetween such that one of said cards is insertable above said center plate and the other of said cards is insertable below said center plate said center plate defining first and second card receiving regions when said holder is mounted to a circuit board;

first and second ejector plates movably held between said side rails and spaced above and below said center plate and substantially parallel therewith and proximate to respective upper and lower major surfaces of said center plate, each said ejector plate having a connector proximate end and a card receiving end and opposed lateral edges extending therebetween, each connector proximate end further including at least two tab portions extending essentially perpendicularly thereto and in a direction away from said center plate and into respective card receiving regions; said tab portions being adapted to engage connector proximate surfaces along a side of a said memory card upon said cards being received into said card receiving regions;

first and second rocker arms adapted to move respective ones of said first and second ejector plates from a first position wherein the associated one of said memory cards is electrically connected to said connector to a second position wherein said memory card is disconnected from said connector, said first and second rocker arms being disposed.

said first rocker arm having first and second ends and an intermediate portion therebetween,

said first end being rotatably secured to said first ejector plate substantially centrally of the opposed side rails and proximate the card receiving edge thereof, said second end extending beyond said lateral edge of said first ejector plate proximate of the side rails and said intermediate portion being pivotally secured to one of said major surfaces of said central plate proximate the card receiving edge thereof and said one of said side rails

said second rocker arm having first and second ends and an intermediate portion, therebetween,

said first end being rotatably secured to said second ejector plate substantially centrally of the opposed side rails and proximate the card receiving edge thereof, said second end extending beyond said lateral edge of said second ejector plate proximate the other of the side rails and said intermediate portion being pivotally secured to the other of said major surfaces of said central plate proximate the card receiving edge thereof and said other of said side rails; and

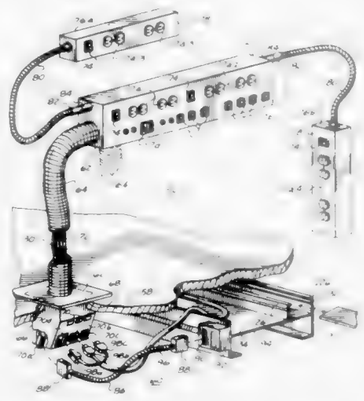
first and second means to actuate said first and second rocker arms, said first and second means being movable along a respective side rail to engage a second end of a respective rocker arm and upon movement thereof, said second end causes said rocker arm to pivot about its intermediate position moving said first end away from said connector, thereby moving said ejector plate away from the connector, whereby a card carried by said ejector plate is moved away from the connector by the ejector plate and ejected from the respective card receiving cavity.

5,149,277

CONNECTIVITY MANAGEMENT SYSTEM

Dolan M. LeMaster, 2536 E. Inglewood, Mesa, Ariz. 85283

Continuation-in-part of Ser. No. 220,313, Jul. 18, 1988, abandoned. This application Jan. 17, 1990, Ser. No. 466,249
Int. Cl.[5] H01R 4/60
U.S. Cl. 439—207 18 Claims



1. An integrated connectivity distribution raceway for use in a wiring management system to house both communication and power wires, said raceway comprising:

a plurality of raceway walls configured so that:

a first portion of said walls substantially encloses a power channel, and

a second portion of said walls defines a communication channel, said communication channel being substantially open on a top side thereof, said first and second portions of said walls having a common wall;

communication wiring residing within said communication channel, said communication wiring being configured for transmission of electrical communication signals;

a power cable residing within said power channel, said power cable being configured for transmission of electrical power; and

a connector mounted to said first portion of said walls proximate said power channel and having contacts coupled to said power cable.

5,149,278

TERMINAL BLOCK

Charles W. Waas, Huntington Beach, and Mark R. Jespersen, Burbank, both of Calif., assignors to PSI Telecommunications, Inc., Burbank, Calif.

Filed Feb. 22, 1991, Ser. No. 660,284
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—412 19 Claims

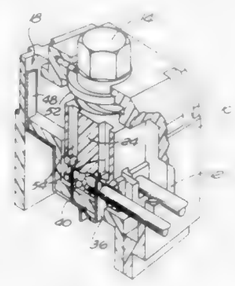
1. A multi-wire terminal block comprising:

an elongated housing having a plurality of separate chambers and a plurality of holes for allowing wire pairs to be inserted into said chambers;

a plurality of electrical contact elements, respectively configured in each of said plurality of separate chambers;

a plurality of wire carrier members, each configured in a respective one of the plurality of separate chambers, each of said wire carrier members having one or more openings for receiving wire pairs inserted through the holes in said chambers, and each said wire carrier member being movable within the chamber so as to move a wire engaged thereby into contact with said electrical contact element; and

a plurality of actuator mechanisms, each coupled to a respective one of said plurality of wire carrier members and adapted to move said wire carrier member within said chamber and relative to said actuator mechanism in a manner such that the actuator mechanism does not change its degree of entry into the chamber.

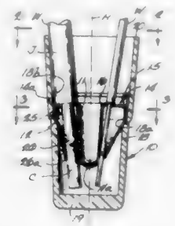


5,149,279

PUSH-IN ELECTRICAL CONNECTOR ASSEMBLY

Robert W. Kruse, 219 Warren Ave., Rockford, Ill. 61107

Filed May 23, 1990, Ser. No. 528,046
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—441 24 Claims



1. A push-in electrical connector assembly for electrically connecting the stripped ends of a plurality of electrical wires, said connector assembly comprising:

a housing having an interior cavity;

an elongate electrically conductive member disposed within said interior cavity;

a wall at one end of said interior cavity defining a plurality of wire receiving passages communicating with said interior cavity and arranged in a generally circular locus around said electrically conductive member; and

retaining means within said interior cavity and separate from said electrically conductive member for biasing the stripped ends of the electrical wires into contact with said electrically conductive member and for resisting withdrawal of the stripped ends of the electrical wires from said interior cavity when the stripped ends of the electrical wires are inserted into said interior cavity through said wire receiving passages.

5,149,280

WIRE HOLDING DEVICE FOR DISCRETE ELECTRICAL WIRES

Richard R. Edgley, Elmhurst; Peter Ingwersen, Gilberts, and Dennis W. Berek, Naperville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 9, 1991, Ser. No. 773,466
Int. Cl.[5] H01R 13/58
U.S. Cl. 439—457 8 Claims

1. In a wire holding device for holding a plurality of discrete electrical wires in a generally parallel side-by-side relationship and to facilitate providing longitudinal strain relief therefor, the improvement comprising:

a housing,

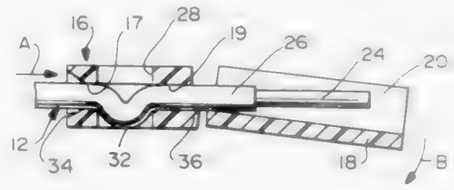
a plurality of generally parallel retaining passages through the housing for longitudinally receiving and substantially surrounding the wires to retain the wires in substantially all radial lateral directions,

a plurality of access windows extending through the housing transversely of the retaining passages to provide access to the wires in the passages by an appropriate bending tool,

each retaining passage having cavity means opposite each respective window and into which a portion of a respective wire can be bent laterally of its axis so that the bent portion of the wire provides rotational and longitudinal strain relief for the wire,

said windows and said cavity means being provided by second passages extending through the housing transverse to and intersecting the retaining passages, and

said housing having a body portion through which the retaining passages extend, the passages having wire-insertion ends and wire-exiting ends, and the housing including a wire guard portion projecting from the body portion at the wire-exiting ends of the passages to protect distal ends of the wires projecting from the wire-exiting ends of the passages, the wire guard portion of the housing surrounding less than all sides of the distal ends of the wires.

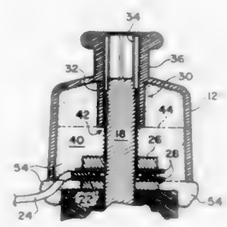


5,149,281

TEST ENABLING TERMINAL ENCLOSURE APPARATUS AND METHOD

Gerritt G. Hills, and Vicki L. Hills, both of Austin, Tex., assignors to Teltronics, Inc., Austin, Tex.

Filed Sep. 24, 1991, Ser. No. 764,542
Int. Cl.[5] H01R 13/52
U.S. Cl. 439—521 14 Claims



1. An enclosure for protecting an electrical contact member, the enclosure comprising:

(a) an elongated enclosure body defining an enclosure cavity and having a contact member receiving end with a contact member receiving opening therein;

(b) contact member receiving means connected to the enclosure body and positioned within the enclosure cavity for receiving the contact member in a contact member receiving area and retaining the enclosure body in a contact

member protecting position substantially covering the contact member;

(c) a self-healing encapsulant substantially filling the enclosure cavity; and

(d) enclosure opening means for providing an opening in the enclosure body through which an elongated probe may be inserted into the enclose cavity to make contact with the contact member when the contact member is received therein, the enclosure opening means being formed in the enclosure body in an area removed from the contact member receiving end and spaced from the contact member receiving area so that an interval of the encapsulant separates the enclosure opening means from the contact member receiving area.

5,149,282

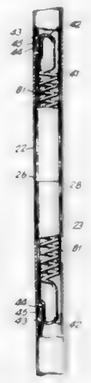
MODULAR STEM SYSTEM FOR LIGHTING APPLICATIONS

Anthony C. Donato, Westfield; Albert L. Newman, West Orange, both of N.J., and Alejandro Mier-Langner, Brooklyn, N.Y., assignors to Lightolier Division of The Genlyte Group, Inc., Secaucus, N.J.

Continuation of Ser. No. 744,674, Aug. 9, 1991, abandoned, which is a continuation of Ser. No. 575,231, Aug. 30, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 844,997

Int. Cl.[5] H01R 13/73

U.S. Cl. 439—530 9 Claims



1. A modular stem system for lighting apparatus comprising:

hollow stems, each having first and second ends;

a connector plug mounted at each first end;

a connector receptacle adjacent to each second end, the receptacle being configured for receiving the plug of another stem so as to permit connection of the stems end to end;

at least one stem having a flexible joint so as to permit flexure of the stem upon the application of lateral forces to the stem system;

means for dually securing each receptacle to the respective stem and each plug to the respective receptacle so as to facilitate connection of the stems end to end; and

a light source adjacent to the second end of the lowermost stem;

each joint having two members, each member having a hollowed portion and an end configured for cooperation with the corresponding end of another member so as to allow pivotal movement about the ends;

a resilient member extending between and into the hollowed members for urging together their corresponding ends; and

a sleeve extending between and into the hollowed members so as to protect the resilient member.

5,149,283

PLUG AND SOCKET

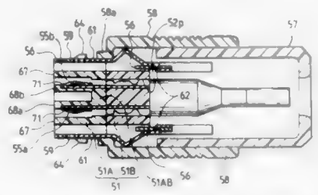
Yasuo Nakazawa, Maebashi, Japan, assignor to Hosiden Corporation, Osaka, Japan

Filed Sep. 23, 1991, Ser. No. 763,546

Claims priority, application Japan, Sep. 27, 1990, 1-101472

Int. Cl.[5] H01R 13/648

U.S. Cl. 439—607 8 Claims



1. A plug, adapted to be connected to a socket, comprising:

a cylindrical metallic shield cover;

an insulating body mounted in said shield cover;

a first insulating partition wall integral with said body and disposed inside of said shield cover, said first partition wall extending forwardly of said body to a plane in which a front end of said shield cover lies, said first insulating partition wall havin a plurality of first housing grooves cut in a first side surface thereof to extend side by side axially forwardly;

insulating support arm means integral with said body and disposed adjacent to and spaced from a second side surface of said first partition wall opposite to said first side surface, said insulating support arm means extending forwardly from said body axially thereof to said plane, said insulating support arm means having second housing grooves cut in opposite side surfaces thereof;

power supply contacts extending axially through said body and in said second housing grooves with one side of each of said power supply contacts in said second housing grooves being exposed; and

a plurality of signal contacts extending side by side through said body and in said first housing grooves with one side of each of said signal contacts in said first housing grooves being exposed;

a front end face of said first partition wall protruding further than tips of said signal contacts, and a front end face of said support arm means protruding further than tips of said power supply contacts.

5,149,284

EXHAUST SYSTEM FOR AN OUTBOARD MOTOR

Takaji Kawai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 11, 1991, Ser. No. 684,681

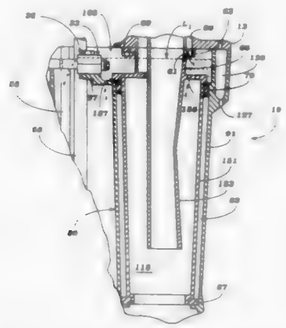
Claims priority, application Japan, Apr. 12, 1990, 2-97078

Int. Cl.[5] B63H 5/12

U.S. Cl. 440—52 12 Claims

1. In an outboard motor comprising a power head including a water cooled internal combustion engine, a drive shaft housing depending from said power head and containing a drive shaft driven by said engine, and a lower unit depending from said drive shaft housing and supporting a propeller adapted to be driven by said drive shaft, a swivel bracket journaling a steering shaft, vibration damping means between said steering shaft and said drive shaft housing for affixing said steering shaft to said drive shaft housing, the improvement comprising the connection of said vibration damping means to said drive shaft housing forming the forward wall of a first cooling water reservoir, means for delivering cooling water from said engine to said water reservoir, said forward wall being provided with

means for permitting water to pass said forward wall for discharge from said water reservoir into a lower area of said drive



shaft housing for cooling said vibration damping means by a flow of water when said engine is operating.

5,149,285

TILT/TRIM DEVICE FOR OUTBOARD ENGINE

Yutaka Kinoshita, Saitama, Japan, assignor to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Jul. 3, 1990, Ser. No. 547,797

Claims priority, application Japan, Jul. 3, 1989, 1-78548

Int. Cl.[5] B63H 5/12

U.S. Cl. 440—61 5 Claims

5. A tilt/trim device for an outboard engine mounted on a transom of a marine vessel, comprising:

a stern bracket adapted to be fixedly mounted on the transom;

a swivel bracket pivotally supported on said stern bracket, the outboard engine being adapted to be mounted on said swivel bracket;

a hydraulic cylinder/piston unit for vertically swinging said swivel bracket with respect to said stern bracket, said hydraulic cylinder/piston unit having one end pivotally coupled to said stern bracket and an opposite end pivotally coupled to said swivel bracket, said hydraulic cylinder/piston unit having a cylinder; and

a hydraulic circuit hydraulically connected to said hydraulic cylinder/piston unit, for extending and contracting the hydraulic cylinder/piston unit;

said hydraulic circuit comprising:

a main oil tank for storing working oil therein;

an auxiliary oil tank for storing working oil therein, said auxiliary oil tank and said main tank being integrally cast with said cylinder, said auxiliary oil tank being disposed in a position higher than said main oil tank; and

a communication oil passage through which an upper portion of said main oil tank and a lower portion of said auxiliary oil tank communicate with each other, said communication oil passage being inclined upwardly from said main oil tank toward said auxiliary oil tank.

5,149,286

TILTING DEVICE FOR MARINE PROPULSION UNIT

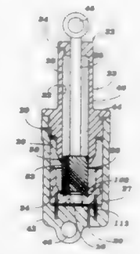
Eiichiro Tsujii, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 5, 1991, Ser. No. 710,590

Claims priority, application Japan, Jun. 5, 1990, 2-145482; Sep. 13, 1990, 2-241331

Int. Cl.[5] B63H 5/12

U.S. Cl. 440—61 31 Claims



1. In an outboard drive assembly comprising a first element adapted to be affixed to an associated watercraft, a second element carrying a propulsion device and means connecting said first and said second elements, the improvement comprising means for tilting said first element relative to said second element comprising a housing means defining a fluid motor having a single bore extending through the length of said housing, said bore having first and second chambers, said first chamber having a greater effective area than said second chamber; and further, a first moveable member and a second moveable member, said first moveable member disposed within one of said two chambers and said second moveable member disposed within said other of said two chambers, said first moveable member being engageable with said second moveable member; and an elongated connector fixed for movement with one of said two moveable members and extending to a position outside one end of said housing; means for connecting said elongated connector to one of said first and second elements and means for connecting an end of said housing, opposite said end out of which said elongated connector extends, to the other of said first and second elements.

5,149,287

SEPARATE OILING SYSTEM FOR OUTBOARD MOTOR

Takashi Koike, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 24, 1991, Ser. No. 705,291

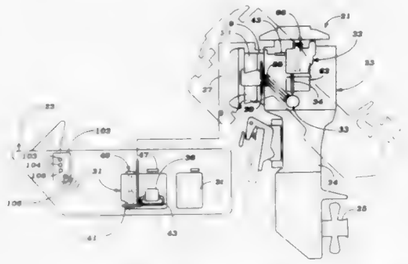
Claims priority, application Japan, May 24, 1990, 2-132480

Int. Cl.[5] B63H 21/10

U.S. Cl. 440—88 9 Claims

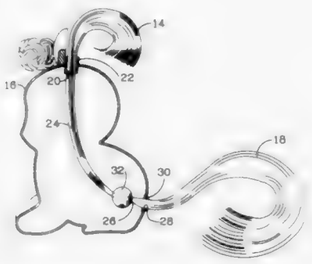
1. An outboard motor adapted to be mounted on a transom of a watercraft for tilt and trim movement, said outboard motor including a power head having an internal combustion engine, a lubricant tank for containing lubricant for the operation of said engine carried by said outboard motor, a trim condition sensor carried by said lubricant tank for sensing a

change in the trim of said lubricant tank, and protective circuit means for initiating protective act on when said trim condition



sensor senses a predetermined trim change of said lubricant tank.

5,149,238
TOY FIGURE WITH INTERCONNECTED RETRACTABLE HAIR AND TAIL
William J. Kelley, Torrance, Calif., assignor to Mattel, Inc., El Segundo, Calif.
Continuation of Ser. No. 574,076, Aug. 29, 1990, abandoned.
This application Oct. 3, 1991, Ser. No. 772,621
Int. Cl.[5] A63H *3/44, 3/36*
U.S. Cl. 446—319 7 Claims



1. A toy representing an animal comprising a body portion, at least a pair of openings in the body portion, loose strands of groomable material representing a first hirsute appendage of the animal represented projecting externally through one of the openings, loose strands of groomable material representing a second hirsute appendage of the animal represented projecting externally through the second of the openings, and means connecting the loose strands of groomable material representing a first hirsute appendage to the loose strands of groomable material representing a second hirsute appendage within the body of the toy whereby withdrawing a portion of one of the loose strands of groomable material causes the other of the loose strands of groomable material to draw into the body of the toy.

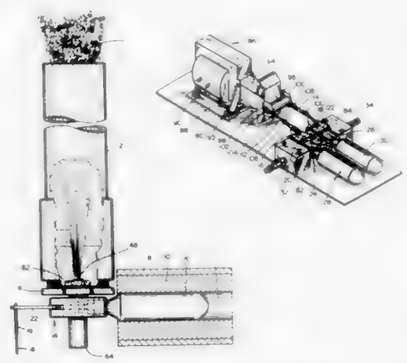
5,149,289
TRANSFORMABLE DOLL
Patricia Edwards, 1608 Shafter, San Angelo, Tex. 76901, and Jody Armstrong, San Angelo, Tex., assignors to Patricia Edwards, San Angelo, Tex.
Filed Feb. 12, 1991, Ser. No. 654,014
Int. Cl.[5] A63H *3/12*
U.S. Cl. 446—321 12 Claims

1. A doll transformable between at least a first and a second character, comprising:

a first body portion representing the upper body of the first character;
a second body portion representing the upper body of the second character;
the first and second body portions secured together and extending in substantially opposite directions from their point of interconnection;
first detachable support means for supporting the first and second body portions with the first body portion extending away from the detachable support means and for concealing the second body portion from view;

a skirt attached at the point of interconnection of the first and second body portions for concealing nonselected body parts, having an upper surface conforming in appearance to the first body portion of the first character and a lower surface conforming in appearance to the second body portion of the second character; and
fastening means on both the upper and lower surface of the skirt for securing and releasing the selected detachable support means from the selected body portion.

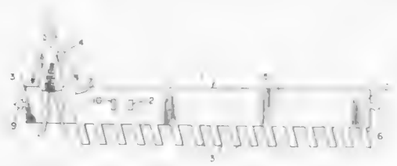
5,149,290
CONFETTI CANNON
Tyrone J. Reveen, 12-B Sunset Way, #208, Henderson, Nev. 89014
Continuation-in-part of Ser. No. 188,537, Apr. 29, 1988, Pat. No. 5,015,211, which is a continuation-in-part of Ser. No. 940,866, Dec. 12, 1986, abandoned. This application May 10, 1991, Ser. No. 698,598
The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.
Int. Cl.[5] A63H *33/30, 37/00*
U.S. Cl. 446—475 16 Claims



1. A confetti propulsion device for exploding a plug of confetti packed into the device comprises
a barrel having a length of at least 8" and a length/inside diameter ratio of from at least 14 to about 60,

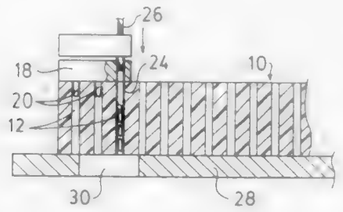
propulsion means comprising a sealed CO_2 cartridge mounted at a lower end of the barrel,
valve means operatively connected to the propulsion means for releasing the contents of the CO_2 cartridge substantially instantaneously, and
trigger means for actuating the valve means.

5,149,291
MOVING TOYS FORMED FROM FLEXIBLE SHEET
Jack E. Di Franco, 1201 S. Ocean Dr., Apt. 1903 S., Hollywood, Fla. 33019, and Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301
Filed Nov. 5, 1990, Ser. No. 609,197
Int. Cl.[5] A63H *3/08*
U.S. Cl. 446—488 20 Claims



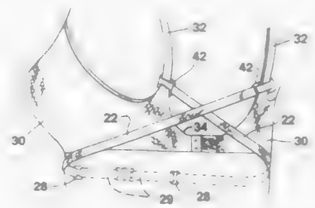
1. A moving toy constructed from a sheet of material comprising:
an elongate strip of sheet material having a long axis, two short sides, and having a top portion, an intermediate portion and a bottom portion extending along said long axis;
said top portion defining at least one object extending upward from said intermediate portion;
said bottom portion provided with a plurality of downwardly directed appendages, said appendages each having a first end connected to said intermediate portion and a second, free end upon which said toy stands; and
said toy being assembled by bending said strip along said long axis into a generally cylindrical shape wherein a first said short side overlaps a second said short side and said cylindrical shape being maintained by fastening means, said fastening means being located at at least one of said short sides of said intermediate portion, said intermediate portion thereby forming a substantially smooth, continuously curved, outer wall, wherein said toy will move about on a vibratory surface.

5,149,292
BEE NEST STRIPPER
Percy A. Eggerman, Watson, Canada, assignor to Eggerman Farms Ltd., Watson, Canada
Filed Feb. 4, 1991, Ser. No. 650,199
Claims priority, application Canada, Nov. 15, 1990, 2030095
Int. Cl.[5] A01K *51/00*
U.S. Cl. 449—1 19 Claims



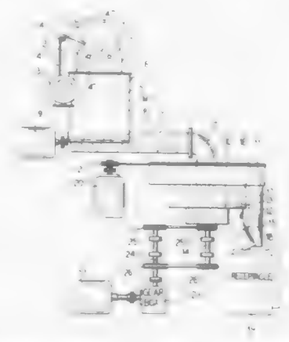
1. A method of stripping larvae from a hole through a leaf cutter bee nest, said method comprising:
extending into the hole a tube having a close fit in the hole and thereby separating larvae from the nest around the hole; and
ejecting the larvae from the hole.

5,149,293
BRASSIERE ACCESSORY
Lisa Gable, 719 St. James Pl. #419, East Windsor, N.J. 08561
Filed Nov. 29, 1991, Ser. No. 800,485
Int. Cl.[5] A41C *3/12;* A41F *1/00, 1/04, 17/00*
U.S. Cl. 450—86 6 Claims



1. A brassiere accessory comprising two elongated bands having fastening means at each end thereof to connect the same together and grip tabs at each of the other ends thereof, each grip tab having a pair of slot openings to allow passage therethrough of a brassiere shoulder strap and a serrated edge opposite said slot openings for gripping said shoulder strap, and an arcuate opening through which each of the ends of the elongated bands is threaded.

5,149,294
PROCESSING MACHINE FOR BOILED/COOKED CRAB
Jan R. Storesund, Osthus, N-4276 Vedavågen, Norway
Continuation of Ser. No. 689,781, May 15, 1991, abandoned.
This application Jan. 21, 1992, Ser. No. 826,216
Claims priority, application Norway, Nov. 17, 1988, 885125
Int. Cl.[5] A22C *29/00*
U.S. Cl. 452—10 2 Claims



1. A processing machine for crustacea and the like, comprising
a shell crushing means for crushing shells of the crustacea; and
a subsequent separation means disposed to receive meat and shell fragments from said shell crushing means for separating the meat from the shell fragments, at least partially, through a centrifugal force effect, said separation means comprising:
a first tray with a rotary floor disposed to receive in an inner area a mixture of meat and shells from said shell crushing means;

means for rotating said rotary floor of said first tray;
a shell collection tray overlying said first tray;
a number of upright separation-wall-defining adjacent members are arranged along a path of a closed ring to separate said first tray into the inner area and an outer periphery, spacing between said adjacent members being such that meat may penetrate, but where almost all the hard shell fragments are unable to pass between said adjacent members, separated meat being collected within the outer periphery externally of said adjacent members, said upright separation-wall-defining adjacent members being rotary screw-threaded spindles having a screw-thread pitch; and
means for rotating said adjacent members in a direction of rotation of said spindles being deliberately selected so as to promote an upward twisting motion of separated shell fragments into said overlying shell collection tray, the separated meat making its way to the outer periphery of the said first tray externally of said spindles.

5,149,295

METHOD FOR DE-HAIRING ANIMALS

Rod A. Bowling, Fort Collins, and Robert P. Clayton, Kersey, both of Colo., assignors to Monfort Inc., Greeley, Colo.

Filed Oct. 26, 1990, Ser. No. 604,064
Int. Cl.[5] A22B *5/08*
U.S. Cl. 452—71 **40 Claims**

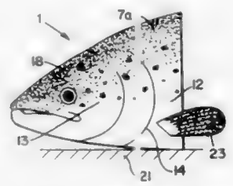
1. In a method for slaughtering an animal, wherein said animal is immobilized, dispatched, and fabricated, the improvement comprising the steps of:
a. contacting a depilatory substance to said animal's hair prior to dispatching said animal; and
b. removing said hair contacted by said depilatory substance.

5,149,296

MACHINE FOR PROCESSING BELLY FLAPS FROM A FRONT PART OF A FISH

Sigurdur Kristinsson, Reykjavik, Iceland, assignor to Jonatan HF, Reykjavik, Iceland

Filed Jul. 25, 1991, Ser. No. 735,895
Claims priority, application Iceland, Oct. 11, 1990, 3638
Int. Cl.[5] A22C *25/14*
U.S. Cl. 452—108 **8 Claims**



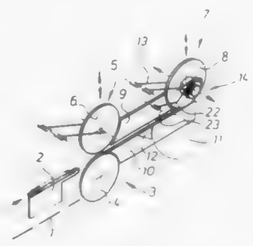
1. A method for cutting belly flaps from a front part of a fish which part includes the belly with its contained organs, the belly flaps, gill lids, cheeks, the gill arches, tongue and its radix, and the pectoral nose and bones and related items, said method comprising: moving, by means of horizontal drive means which engage the front part with the belly of the front part facing forward in the direction of movement along a straight transport track onto a cantilevered beam comprising a belly scraper, which is an elongated U formed beam directed opposite to the moving direction of the front part with the foremost end of the belly scraper, which will be opposite the lower joint of the gill arches, being a knife; continuing the movement of the front part so its belly and contained organs move over the U-formed beam; elevating, by engaging with an elevation structure in the floor of the U-formed belly scraper, the lower joint of the gill arches and thereby the body and the radix of the tongue, so that the pectoral nose faces the knife end; and continuing moving of the front part so the pectoral nose moves into and past the knife, whereby the knife end of the belly scraper is caused to penetrate into the front part and through the pectoral nose, so that the jaw of the front part is moved along and above the upper edge of the U-formed belly scraper, and the belly scraper thereby separating the main part of the head from the foremost end of the belly flaps.

5,149,297

APPARATUS FOR SEVERING THE MUSCLE FLESH OF FISH

Horst H. Braeger, and Hans Finke, both of Lübeck, Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH + Co KG, Lubeck, Fed. Rep. of Germany

Filed Jan. 7, 1992, Ser. No. 817,652
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1991, 9101085[U]
Int. Cl.[5] A22C *25/16*
U.S. Cl. 452—162 **12 Claims**



1. An apparatus for cutting off the muscle flesh from fish prepared at their bellies such as to provide an opened belly cavity, the apparatus essentially comprising
(a) conveyor means equipped with at least one conveying element for receiving a fish individually by engaging it within said belly cavity, and for conveying said fish with its tail end leading along a conveying path defined by the movement of said at least one conveying element; and
(b) processing tools arranged along said conveying path and including at least
(ba) belly filleting tool means,
(bb) back filleting tool means, and
(bc) severing tool means,
said tool means each comprising at least one pair of circular knives, respectively, which are driven, arranged symmetrically with regard to said path of said conveying elements, and designed to cut into said fish at both sides of belly and back spokes included in said fish up to the backbone of said fish, and for cutting in the region of the flanks defined by said backbone, respectively,
wherein said circular knives of said severing tool means are arranged to be controlled in their position of height with regard to said conveying path and, at the same time, to be adjustable depending on said height controlling with respect to their mutual distance.

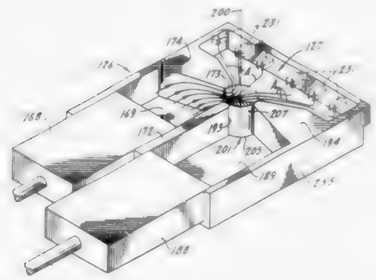
5,149,298

VERTICAL VALVE FOOD PATTY MOLDING MACHINE

Scott A. Lindee, New Lenox, Ill., assignor to Formax, Inc., Mokena, Ill.

Filed Dec. 13, 1991, Ser. No. 806,312
Int. Cl.[5] A22C *7/00*
U.S. Cl. 452—174 **12 Claims**

1. In a high speed food patty molding machine comprising:
a food product molding mechanism;
two food pumps, each pump comprising a cavity of predetermined width having an inlet at one end, an outlet at the other end, and a plunger movable between a retracted position and a pressure position in which the plunger is advanced into the cavity toward the outlet, the pump cavities being located adjacent to one another and separated by a common wall;
supply means for supplying moldable food products into the inlet of each pump cavity,
a manifold connecting the outlets of the two pump cavities to the molding mechanism with the manifold extending across the outlet ends of the pump cavities,
pump drive means for driving the pump plungers in overlapping alternation so that at least one pump cavity always contains moldable food product under pressure,
and valve means for sealing off the outlet of each pump cavity from the manifold whenever the plunger for that pump is moving toward its retracted position, affording a



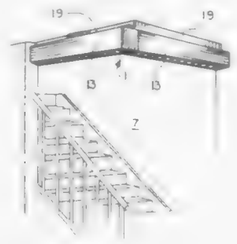
continuous pressurized supply of moldable food product to the molding mechanism,
the improved manifold and valve means comprising:
each pump cavity outlet located at the juncture of said cavity common separation wall and the discharge end of its cavity with the outlets merging to form a common manifold inlet to the manifold; and
a rotary valve member positioned in the manifold inlet and reciprocally rotatable between one operating position in which one pump cavity outlet is closed and the other pump cavity outlet is open to the manifold inlet and another operating position in which the one pump cavity outlet is open and the other pump cavity outlet is closed to the manifold inlet.

5,149,299

ROOM-AIR INTERCEPTOR DEVICE

James F. Sauer, 1806 Susquehannock Dr., McLean, Va. 22101

Filed Feb. 27, 1992, Ser. No. 842,643
Int. Cl.[5] F24F *7/007*
U.S. Cl. 454—195 **4 Claims**



1. A room-air interceptor device means in combination with a first room, at least a second room and a stairwell, with said stairwell providing access to and providing air communication with said first room and said second room, with said first room having a floor and ceiling and said second room having a floor and ceiling, with said floor and ceiling of said first room being spatially below said floor and ceiling of said second room, respectively, and with said first room and said stairwell having a common entrance, said room-air interceptor device means being mounted in proximal relationship to said ceiling of said first room and before said first room's entrance to said stairwell, said interceptor device means operating to dissipate the effects of convection or gravity circulation in said first room, resulting in and ranging from the lowest air temperature being at the floor of said room to the higher temperature air being in proximal relationship to the ceiling of the first room and the highest temperature air being at the ceiling of the first room, by intercepting and recirculating such higher and highest temperature room air, in the first room, within the first room to render the room air temperature in the first room more uniform and, hence, more comfortable for human habitation and enjoyment, and by said interceptor device means further functioning to eliminate the stairwell's chimney effect in continuously drawing such higher and highest temperature room air from the first room

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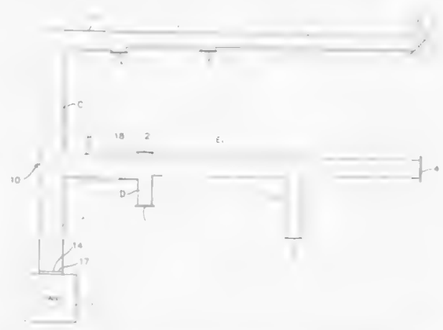
5,149,300

METHOD OF CONSTRUCTION OF PRE-BALANCED AIR HANDLING SYSTEM

Michael R. Barrett, 14 N. Ridge Rd., Greenbelt, Md. 20770

Filed May 9, 1991, Ser. No. 697,617
Int. Cl.[5] F24F *7/06*
U.S. Cl. 454—338 **5 Claims**



4. The method of sizing the downstream leg of an angular turn of air handling duct system relative to the upstream leg at the angular turn, wherein said angular turn includes an predetermined included angle of at least 90 and less than 180 degrees, said method including providing an upstream duct leg of a first predetermined inside cross sectional area, providing a downstream duct leg of a second predetermined inside cross sectional area greater than said first predetermined cross sectional area and equal to the inside cross sectional are of the upstream leg multiplied by the square root of 180 divided by the included angle of the angular turn, and connecting said upstream and downstream legs in a manner defining said included angle between said upstream and downstream legs.

5,149,301

BAFFLE MEANS FOR ROOF RIDGE VENTILATOR

Thomas A. Gates, Sidney, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

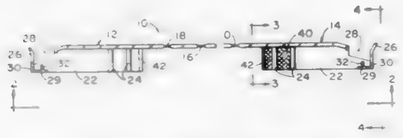
Filed Aug. 23, 1991, Ser. No. 749,182
Int. Cl.[5] F24F *7/02*
U.S. Cl. 454—365 **2 Claims**

1. A ventilator for straddling an aperture in the ridge of a roof comprising:
at least two rectangular cover panels joined together along one longitudinal edge thereof, with each panel having an interior surface and an exterior surface, said exterior surfaces being disposed to receive overlaying shingles when said panel is located on a roof ridge, and having narrow

areas of reduced thickness extending lengthwise of the panels to permit conformance of the panels to the surface of the roof,

a plurality of longitudinally spaced support walls extending downwardly from the interior surfaces of said panels to support the panels above the roof surface and permit air circulation through said aperture, with each of said support walls having a portion extending beyond the longitudinal edges of the cover panels located opposite the edges at which the panels are joined together,

a substantially vertical baffle wall connecting the projecting ends of said support walls, and extending lengthwise of the panels and spaced from the longitudinal edges of the panels,



a plurality of posts extending downwardly from the interior surfaces of the panels,

at least one ribbon of open screen material extending generally lengthwise of each panel and supported within each panel by said posts and the inwardly facing ends of said longitudinally spaced walls

said baffle walls defining a plurality of openings for draining water from the ventilator, and

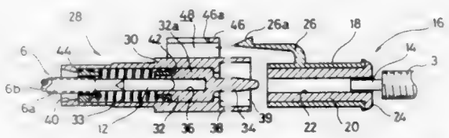
a plurality of upwardly extending baffles associated with said openings and spaced inwardly therefrom toward the center of the panels and in line with the openings to deflect any wind driven rain or snow that may enter through said openings, and thereby substantially preclude any such rain or snow from entering the aperture in the roof.

5,149,302

APPARATUS AND METHOD FOR CONNECTING A SCREW SHAFT AND A DRIVE CABLE IN A SHOULDER BELT POSITIONAL ADJUSTMENT DEVICE

Hideaki Yano, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 653,518
Claims priority, application Japan, Mar. 8, 1990, 2-57391
Int. Cl.[5] F16C *1/06*
U.S. Cl. 464—52 **4 Claims**



1. An apparatus for connecting a screw shaft and a drive cable in a shoulder belt position adjusting device of a seat belt, said screw shaft having a connecting end with a noncircular section and said drive cable having a connecting end with a noncircular section, said apparatus comprising:

a first joint device including a cylindrical rotatable member having a noncircular inner hole, said connecting end of the screw shaft being inserted into one end of the inner hole of the rotatable member; and a first holder for rotationally holding the rotatable member,

a second joint device including a coupling member having a cylindrical body, a cable receiving bore extending axially inwardly from one end of the cylindrical body, said connecting end of the drive cable being inserted into the cable receiving bore, and a projection extending axially outwardly from another end of the body and having a noncircular section, said projection being engageable with one end of said inner hole of the rotatable member; a second holder having a coupling member holding bore for rotationally receiving the coupling member at one side thereof, a recess formed at another side of the second holder for receiving the first holder therein, and a stopper for partly separating the coupling member holding bore and the recess; and a spring situated in the coupling member holding bore to urge the cylindrical body of the coupling member toward the stopper, said spring, in case the projection does not enter into the inner hole of the rotatable member when the first and second joint devices are connected together, being compressed to allow the coupling member to move away from the stopper, and when the projection aligns the inner hole of the rotatable member, said spring pushing the coupling member to engage with the rotatable member,

an engaging element formed on one of the first and second holders and extending toward the other of the first and second holders, and

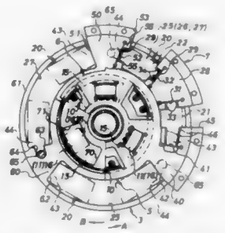
a receiving element formed on said other of the first and second holders, said engaging element being inserted into the receiving element to immovably connect the first and second joint devices together, said engaging element and receiving element being joined together when the first and second joint devices are joined together regardless connection of the projection of the coupling member and the inner hole of the rotatable member.

5,149,303

CLUTCH DAMPER DISC ASSEMBLY

Masahiko Koshimo, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP89/00523, § 371 Date Feb. 21, 1990, § 102(e) Date Feb. 21, 1990, PCT Pub. No. WO8$/12768, PCT Pub. Date Dec. 28, 1989
PCT Filed May 25, 1989, Ser. No. 465,191
Claims priority, application Japan, Jun. 24, 1988, 63-156205
Int. Cl.[5] F16D *3/12, 3/14*
U.S. Cl. 464—68 **4 Claims**



1. A clutch damper disc assembly comprising an annular output member having a flange portion to be connected to an output shaft, a pair of cover members extending radially outward from opposite sides of said flange portion and joined to each other at their radial outer end portions, a pair of input members having a torque input portion disposed at opposite sides of said flange portion of said output member and inward of said cover said input members being joined at their radial outer end portions to said cover members, a pair of intermediate members disposed between each of said input members and said output member, and plural spring mechanisms for coupling said output member and said input members in the circumferential direction of said clutch damper disc assembly, said output member, said input members and said intermediate members each having a plurality of first windows for accommodating a pair of first springs of first spring mechanisms of said plural spring mechanisms at outer circumferential areas

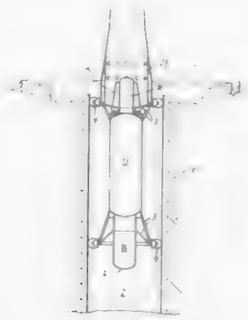
thereof, said input members and said output member each having a plurality of second windows for accommodating second springs of said spring mechanisms at inner circumferential areas thereof, each input member having a first edge portion for engagement with a first end portion of said each first spring mechanism when said clutch damper disc assembly is rotated in a first rotation direction, a first spring holding portion enclosing an outer peripheral end portion of said said first springs of said each first spring mechanism near said first edge portion, and a second edge portion for engagement with a second end portion of said first springs of said each first spring mechanism when said clutch damper disc assembly is rotated in a second rotating direction, said intermediate member having a second edge portion for engagement with said second end portion of said first springs of said each first spring mechanism in said first rotating direction of said clutch damper disc assembly, a second spring holding portion surrounding an outer peripheral end portion of said first springs of said each first spring mechanism near said second edge portion and serving as a second engaging portion for engagement with said input member in said second rotation direction, said each first spring holding portion entering said first window of said input member for engagement with said second edge portion of the input member, and a first engaging portion for engagement with said output member in said first rotation direction, and said output member having a first edge portion for engagement with said first end portion of said first spring mechanism in said second rotation direction.

5,149,304

ARRANGEMENT INCLUDING A MOVEABLE TOWER

Michael H. Purser, Innovation, South Efford Barns, Aveton Gifford, Kingsbridge, Devon TQ7, 4NX, United Kingdom

Filed Apr. 7, 1989, Ser. No. 334,516
Claims priority, application United Kingdom, Apr. 9, 1988, 8808360
Int. Cl.[5] A63G *31/00*
U.S. Cl. 472—131 **19 Claims**



1. An arrangement comprising a tube, a liquid at least partly filling said tube, a tower slidably disposed within said tube having sides spaced away from the sides of said tube and arranged to displace said liquid, and means for moving the tower relative to said tube.

5,149,305

CONTINUOUSLY ADJUSTABLE ROTARY BIAS DEVICE

James R. Gordon, Benton, Ill., assignor to Gordon Belt Scrapers, Inc., Benton, Ill.

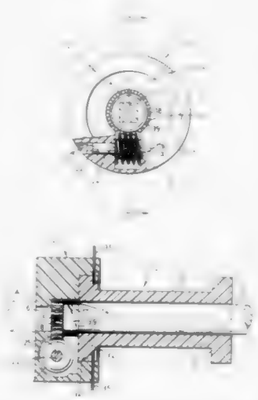
Filed Aug. 16, 1991, Ser. No. 745,733
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—101 **20 Claims**

1. A continuously adjustable, resilient, rotational bias device for applying a resilient rotary torsion force to a shaft or like rotatable member, at any selected bias force level within a predetermined bias force range, comprising:

a housing;

a rotary retention member, rotatably mounted in the housing;

drive means, mounted in the housing, for rotating the retention member to any one of a multiplicity of different angular orientations in the housing, within a given range, and



for retaining the retention member in any such rotational orientation;

a resilient rotary bias member;

first anchor means for anchoring one end of the bias member to the housing;

second anchor means for anchoring the other end of the bias member to preclude rotation thereof; and

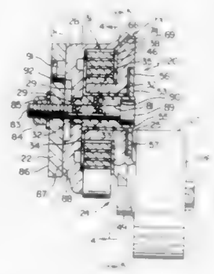
connecting means for connecting a shaft to the retention member for rotation therewith.

5,149,306

BELT TENSIONER AND METHOD OF MAKING THE SAME

John N. Sidwell, and Linn E. Corbin, both of Springfield, Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 576,299, Aug. 31, 1990, Pat. No. 5,057,059, which is a division of Ser. No. 450,656, Dec. 13, 1989, Pat. No. 4,971,589. This application Aug. 27, 1991, Ser. No. 751,357
The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—135 **10 Claims**



1. In a bushing means for a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative

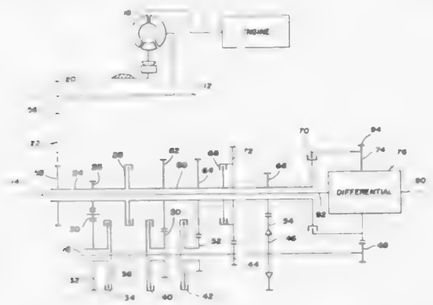
to said belt, a belt engaging means carried by said support means and being movable relative thereto, and spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, said support means comprising a shaft means having a longitudinal axis, said belt engaging means comprising an arm rotatably mounted on said shaft means, said arm having a bearing surface, said support means having a bearing surface facing said bearing surface of said arm, said bushing means being adapted to be disposed between said bearing surfaces and have bearing surface means in engagement therewith to facilitate movement therebetween, the improvement wherein said bearing surface means of said bushing means are respectively disposed to define an angle with said axle so as to tend to prevent cocking of said arm on said shaft means when said belt engaging means is tensioning said belt.

5,149,307

MULTISPEED POWER TRANSMISSION

John D. Malloy, and Michael B. Solt, both of Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1991, Ser. No. 776,021
Int. Cl.[5] F16H *37/08*
U.S. Cl. 475—200 2 Claims



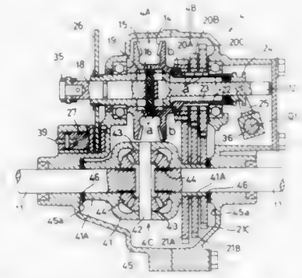
1. A power transmission comprising: input drive means; output drive means including a differential gear arrangement; an input shaft drivingly connected with said input drive means; a first transfer shaft coaxial with said input shaft; first clutch means for selectively connecting said input shaft to said first transfer shaft; a second transfer shaft disposed parallel to and noncoaxial with said input shaft and said first transfer shaft; reverse gear means operatively connected with said input shaft and said second transfer shaft including selectively engageable reverse clutch means for providing a reverse drive connection between said input shaft and said second transfer shaft; output gear means drivingly connecting said second transfer shaft with said differential gear arrangement; a plurality of gear pairs operatively connected between said first and second transfer shafts each including a selectively engageable clutch means for providing a plurality of drive ratios between said transfer shafts, said first clutch means being operable in combination with said plurality of gear pairs to selectively provide a plurality of drive ratios between said input means and said output means; and second clutch means for selectively connecting said first transfer shaft directly with said output means and cooperating with said first clutch means for providing a forward drive ratio between said input means and said output means.

5,149,308

TRANSMISSION

Norimi Nakamura; Tadao Adachi; Akio Matsui; Kouji Fujiwara; Mitsugu Kobayashi; Tetsuo Yamaguchi, and Minoru Fukuda, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 359,908, Jun. 1, 1989, abandoned. This application Feb. 28, 1992, Ser. No. 841,306
Claims priority, application Japan, Aug. 22, 1988, 63-208546; Aug. 22, 1988, 63-208547
Int. Cl.[5] F16H *37/08*
U.S. Cl. 475—203 9 Claims



8. A differential mechanism for use with a small transmission including driven ground wheels, comprising;

an input section for receiving drive and including a differential case,

differential gear means for receiving the drive from said input section, and

an output section for outputting the drive to said driven ground wheels, said output section including axles journaled in axially extending first bearing bosses defined by a transmission case with said axles supported by and rotatable within said first bearing bosses, a bearing outwardly of said first bearing bosses in said transmission case,

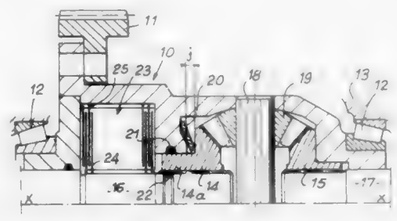
wherein said differential case has elongated second bearing bosses extending axially juxtaposed to inside walls of said first bearing bosses defined by said transmission case, and is supported exclusively by said axles through said elongated second bearing bosses.

5,149,309

DIFFERENTIAL TRANSMISSION DEVICE AND CONTROLLED-SLIP COUPLING

Pierre Guimbretiere, Neauphle-Le-Chateau, France, assignor to Glaenzer Spicer, Poissy, France

Filed May 8, 1991, Ser. No. 697,186
Claims priority, application France, May 11, 1990, 90 05907
Int. Cl.[5] F16H *1/44*
U.S. Cl. 475—234 16 Claims



1. Transmission device, especially for a motor vehicle, which comprises a differential comprising an input member and two output members, said output members including a sun gear rotatable with a respective output shaft and at least one

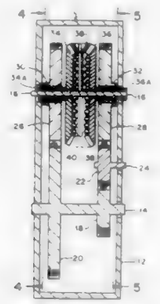
pair of planet gears meshed with said sun gears as well as a controlled-slip coupling device arranged between two of the said input and output members, and said sun gears and planet gears being positioned in a first containment and said coupling being positioned in a second containment, said first and second containments being separated by a sealing means, at least one of the said input or output members being axially movable under the effect of a torque exerted on it, the displacement of this member being utilized to modify the operating characteristic of the controlled-slip coupling.

5,149,310

DIFFERENTIAL SPEED REDUCER

Cesar U. Damino, 8181 Wayne Rd., Apt. L1114, Westland, Mich. 48185

Filed May 21, 1991, Ser. No. 703,813
Int. Cl.[5] F16H *1/28, 37/10*
U.S. Cl. 475—329 9 Claims



1. A differential speed reducer comprising

a housing with two side walls;

an input shaft supported by both side walls;

an output shaft supported by both side walls;

a first gear and a second hear each fixedly connected to said input shaft;

a third gear mounted in a freely rotatable manner on one side wall in meshed engagement with said second gear;

a fourth gear mounted in a freely rotatable manner on said output shaft in meshed engagement with said third gear and including a fifth gear connected to said fourth gear;

a sixth gear mounted in a freely rotatable manner on said output shaft in meshed engagement with said first gear rotating in the opposite direction of said fourth gear and including a seventh gear connected to said sixth gear; and

an orbiting pinion gear freely rotatable about an axle which is fixably connected at a right angle to said output shaft and in meshed engagement with said fifth and seventh gears for rotating said output shaft at a rate dependent on the difference in speed of the oppositely rotating fifth and seventh gears.

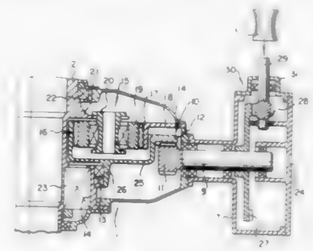
5,149,311

GEAR UNIT, PARTICULARLY FOR USE IN A HELICOPTER

Waltherus J. T. H. Luijten, Breugel, Netherlands, assignor to Daf Special Products, Netherlands

Continuation of Ser. No. 294,403, Jan. 9, 1989, Pat. No. 4,983,153, which is a continuation of Ser. No. 941,146, Dec. 12, 1986, abandoned. This application Jan. 4, 1991, Ser. No. 637,622
Claims priority, application Netherlands, Dec. 18, 1985, [redacted]
Int. Cl.[5] F16H *1/32, 57/02;* B64C *27/12*
U.S. Cl. 475—343 7 Claims

1. A gear unit in combination with a helicopter having a plurality of transmission reduction stages, for use in said helicopter, and intended for a relatively high output torque at an output shaft which carries and drives the main rotor of the helicopter with a relatively low speed of rotation and a total transmission ratio between 70 and 150, comprising a transmission reduction stage with non-parallel shafts, said transmission reduction stage with non-parallel shafts including a cylindrical gear and a face gear positioned on one of said non-parallel



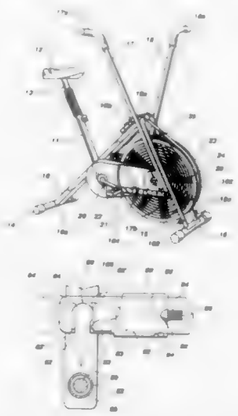
shafts with a center of said face gear being positioned at a distance to the side of the axis of the output shaft and coinciding with the axis of said one of said non-parallel shafts, said cylindrical gear transmitting power to the output shaft, said cylindrical gear being encased in a gear box and being removable from said gear box through detachable cover means mounted to said gear box and/or by detaching said gear box.

5,149,312

QUICK DISCONNECT LINKAGE FOR EXERCISE APPARATUS

Harold B. Croft, Logan, and Ken C. Jones, Hyde Park, both of Utah, assignors to Proform Fitness Products, Inc., Logan, Utah

Filed Feb. 20, 1991, Ser. No. 658,307
Int. Cl.[5] A63B *22/12, 69/16*
U.S. Cl. 482—62 17 Claims



13. An exercise cycle having link members operatively correcting respective handlebars to pedal shafts, comprising:

a latching surface disposed on each of said pedal shafts,

a latching aperture in said link member for receiving said latching surface, said latching aperture comprising a bay sized to accommodate said latching surface, said bay including a mouth extending upwardly from the bottom edge of said link member; and

means for retaining said latching surface within said latching aperture when each said link member is connected to said pedal shaft.

5,149,313

METHOD FOR EXERCISING AND/OR TESTING MUSCLES OF THE LOWER TRUNK

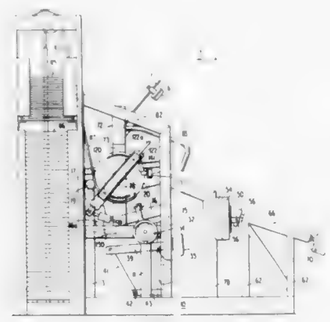
Arthur A. Jones, 1155 NE. 77th St., Ocala, Fla. 32670

Continuation of Ser. No. 637,618, Jan. 4, 1991, Pat. No. 5,092,590, which is a division of Ser. No. 422,905, Oct. 18, 1989, Pat. No. 5,005,830, which is a division of Ser. No. 236,367, Aug. 25, 1988, Pat. No. 4,902,009, which is a continuation-in-part of Ser. No. 60,679, Jun. 11, 1987, Pat. No. 4,836,536, and Ser. No. 181,372, Apr. 14, 1988, Pat. No. 4,834,365. This application Dec. 26, 1991, Ser. No. 813,531

The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.

Int. Cl.[5] A63B *21/062*

U.S. Cl. 482—100 6 Claims



1. A method of testing muscles such as lumbar or abdominal muscles of the lower trunk of the human body comprising the steps of seating a subject body on a seat with the pelvis restrained against movement to isolate movement of said muscles from the pelvis, connecting to a movement arm a resistance weight of known force less than the maximum static strength of said muscles to be lifted and lowered by the subject, having the subject move the upper trunk in one direction by exerting said muscles to apply a force to the movement arm to pivot the movement arm in one direction to lift said resistance weight and then move the upper trunk in an opposite direction to relieve the force on said movement arm to cause the resistance weight to lower and pivot the movement arm in said opposite direction, repeating said steps until said muscles fatigue and are no longer capable of pivoting the movement arm in said one direction and wherein the stroke of said resistance weight is limited to substantially reduce kinetic energy of the resistance weight.

5,149,314

ENHANCED EXERCISE FLOAT

Peter N. Ciolino, Elmwood Park, N.J., and Peter A. Ciolino, 561 Cherry Tree La., Kinnelon, N.J. 07405, assignors to Peter A. Ciolino, Kinnelon, N.J.

Continuation-in-part of Ser. No. 359,215, May 31, 1989, abandoned. This application May 30, 1990, Ser. No. 530,620

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.[5] A63B *21/008*

U.S. Cl. 482—111 13 Claims

1. An apparatus to provide support and buoyancy to a user during an exercise routine performed in an aquatic environment comprising:

a first flotation section configured to correspond to the shape of the user's back as extending from the upper shoulders to the waist of said user, having a width that is sufficiently narrow thereby permitting the free movement of the arms and shoulders, and having sufficient buoyancy to support the user's back at a submerged surface position in the aquatic environment to perform the exercise routine,

a second flotation section having a greater width than said first flotation section and configured to correspond to the shape of the user's seat as made up of the buttocks to the upper thigh region of said user and having sufficient buoyancy to support said seat at said submerged surface position in said aquatic environment,

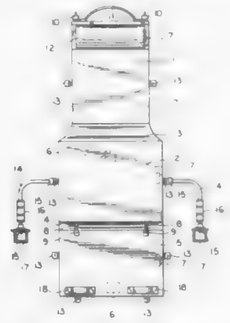
a first hinge means located between and operatively connecting said first flotation section with said second flotation section in a manner permitting pivoting of said sections through an angle of at least 90° between said first and second flotation sections,

a third flotation section configured to correspond to the user's legs and feet, having sufficient buoyancy to support said user's lower legs and feet at said submerged surface position in said aquatic environment,

a second hinge means located between and operatively connecting said third flotation section to said second flotation section in a position so that said first, second and third flotation sections form a substantially elongated float conforming to the total length of the user,

a plurality of mating attachment points located on the perimeter of at least one of said first, second and third flotation sections, and

a pair of elastic strap means, each one of said elastic strap means having attachment means located at one end of said



elastic strap means for attaching to one of said plurality of mating attachment points and handgrip means located on said elastic strap means distal from said attachment means, wherein said elastic strap means for providing increased resistance to water borne movement by said person during said exercise routine.

9. A method of aquatic exercise performed by a user concentrated on developing and conditioning the muscle groups associated with a user's stomach, back and hip area comprising the steps of:

placing into an aquatic environment a flotation platform of the type characterized by a first float section and a second float section joined together by a first hinge means, and said second float section and an attachable attachment means for attaching a third float section including a second hinge means, and a pair of elastic strap means, each of said elastic strap means having attachment means for connecting to one of a plurality mating attachment points located on the sides of said flotation platform, a stirrup means located on said elastic strap means opposite of said attachment means, wherein said first float section is shaped to correspond to the shape of said user's back without interfering with the free movement of said user's arms and shoulders, said second float section is shaped to correspond to a user's seat, and said hinge permits pivoting of at least 90°; and

mounting onto said flotation platform whereby said user is supported at a submerged surface position in the aquatic environment facing upward and said user's back is located proximate to said first hinge means permitting movement from both an inclined and upright user position in said aquatic environment during the performance of an aquatic exercise by using said stirrup means for performing an knee to chest exercise.

5,149,315

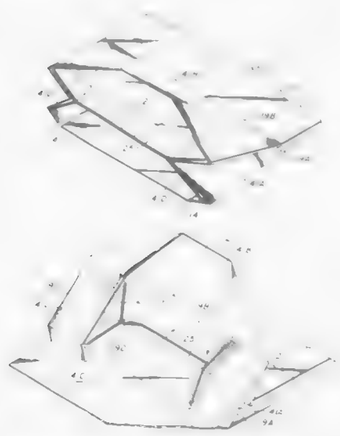
METHOD OF MAKING LINED SQUARE BOTTOM BAG

Jeffrey D. Muhs, Ames, Iowa, assignor to American Packaging Corporation, Philadelphia, Pa.

Filed Apr. 12, 1991, Ser. No. 685,476

Int. Cl.[5] B31B *35/26, 39/60*

U.S. Cl. 493—189 10 Claims



10. A method of making a bag construction of the rectangular bottom type comprising an outer bag and an inner bag contained within and secured to said outer bag as a separate bag structure, comprising the steps of:

forming a tube length including an outer tube length and an inner tube length, said inner tube length being made of a sealable material and being sealed along a longitudinal seam thereof to provide an inner tube length structure sealed throughout its longitudinal extent but unsealed at its top and bottom ends, said inner and outer tube lengths being adhered to each other at limited contiquous areas thereof and being non-adhered throughout a substantial bottom portion thereof, said bottom portion being of a size sufficient to be formed into a rectangular bottom structure for the bag construction,

providing a cross seal to said inner tube length extending transversely across the bottom end thereof to completely seal the bottom end of the inner tube length, and

forming a rectangular shaped bottom of the bag construction, said bottom forming step including an initial step of opening the bottom end of the outer tube length to a fully opened condition to form a rectangular configuration having four bottom flaps of the outer tube length extending from four rectangularly arranged fold lines, the sealed bottom end of the inner tube length extending across the bag bottom between said fold lines, and said bottom forming step including a subsequent step of folding inwardly said four bottom flaps on said four fold lines to complete the bottom of the bag construction.

5,149,316

DIE CUTTING AND WELDING DEVICE FOR AN ON-DEMAND BAG FORMING MACHINE INCORPORATED IN A CHECKOUT COUNTER

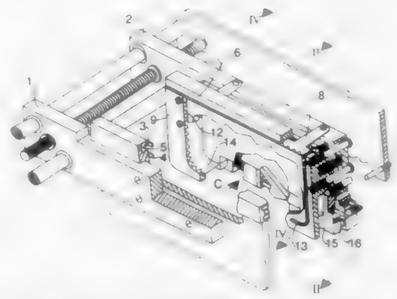
Angelo Cappi, Vignola, and Renato Rimondi, Bazzano, both of Italy, assignors to A.W.A.X. Progettazione E Ricerca S.R.L., Vignola, Italy

Filed Mar. 15, 1991, Ser. No. 669,908

Claims priority, application Italy, Mar. 15, 1990, 19692 A/90

Int. Cl.[5] B31B *1/16, 1/64*

U.S. Cl. 493—194 13 Claims



1. A welding and die cutting device for an apparatus for automatically forming bags from an elongated web of film, comprising:

a first (1) and a second (2) mobile holder disposed for relative movement toward and away from each other;

a welding counter-plate (9) carried by said second mobile holder (2);

a horizontal blade (8) on the counter-plate for transversely cutting the film web to separate a formed bag from the web;

a second blade (14, 15) for longitudinally cutting handles in a bag being formed;

a bladeholder (16) interposed between said counter-plate (9) and said second mobile holder (2) and from which said second blade (14, 15) depends;

means (17, 18, 19, 20, 25, 26) slidably and elastically linking said bladeholder (16) and said second mobile holder (2); and

a pivotally rotatable spacer element (34) selectively movable between a first position for maintaining a predeterminately spaced relation between said bladeholder (16) and said second mobile holder (2) and a second position in which said bladeholder and second mobile holder are relatively movable into substantial abutment.

5,149,317

LIGHT-PULSING, VISUAL STIMULUS ENTERTAINMENT DEVICE AND METHOD

Wilbur A Robinson, Little Rock, Ark., assignor to I Q International, Inc., Little Rock, Ark.

Filed Oct. 11, 1989, Ser. No. 419,950

Int. Cl.[5] A61M *21/00*

U.S. Cl. 600—27 12 Claims

1. A visual stimulus device comprising

a first circuit means for generating a first electrical signal comprising a sequence of pulses,

a second circuit means for generating or otherwise providing, at least part of the time, a second electrical signal comprising a sequence of pulses,

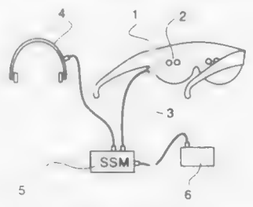
a combining circuit means for receiving at a first input said first electrical signal and at a second input said second electrical signal, and for outputting at an output an output electrical signal comprising a sequence of pulses corre-

sponding to a respective combination of said first and second electrical signals, and

illumination means for receiving said output electrical signal and providing a visual signal to a subject, said visual signal comprising a sequence of light pulses that is the same as said sequence of pulses of said output electrical signal,

wherein said pulse sequence of said output electrical signal is in a frequency range which allows the subject to perceive the flashing of said visual signal,

wherein said first circuit means comprises an astable multivibrator for generating said pulse sequence output therefrom at a respective frequency, and wherein further:



said second circuit means comprises conversion means for receiving an audio signal as an input, and for converting said audio signal to said sequence of pulses of said output therefrom; and

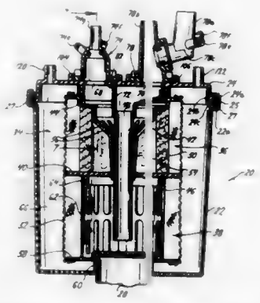
said combining circuit means comprises an exclusive OR gate, said exclusive OR gate having as first and second inputs two signals respectively corresponding to said sequences of pulses of said first and second electrical signals and an output corresponding to said sequence of pulses output from said combining means.

5,149,318

QUICK-CHANGEOVER BLOOD HANDLING APPARATUS

Erin J. Lindsay, Dexter, Mich., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 14, 1990, Ser. No. 493,286
Int. Cl.[5] B01D *19/02*
U.S. Cl. 604—4 **42 Claims**



1. An apparatus for handling a patient's blood during a medical procedure which is convertible for use after the procedure for at least one further use; the apparatus comprising:

a reservoir;

port means in the reservoir comprising at least one opening;

a primary device alignable with the port means, to which connections can be made for adapting the reservoir for use during the medical procedure;

at least one secondary device, separate from the primary device, alignable with the port means, to which connections can be made for adapting the reservoir for one or more further uses after the medical procedure; and

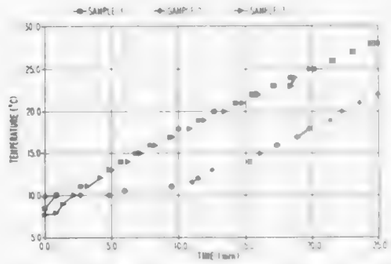
means for mounting the primary device and the secondary device on the reservoir with the primary device initially aligned with the port means to allow the reservoir to be used during the medical procedure, the mounting means allowing the primary device to be moved out of alignment with the port means and removed from the reservoir and allowing a secondary device to be moved into alignment with the port means to allow the reservoir to be used after the medical procedure.

5,149,319

METHODS FOR PROVIDING LOCALIZED THERAPEUTIC HEAT TO BIOLOGICAL TISSUES AND FLUIDS

Evan C. Unger, 13365 E. Camino La Cebadilla, Tucson, Ariz. 85749

Filed Sep. 11, 1990, Ser. No. 581,027
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 **14 Claims**



1. A method for heat treating biological tissues and fluids which comprises:

(i) administering to the tissue or fluid to be treated a therapeutically effective amount of a hyperthermia potentiator selected from the group consisting of gas, gaseous precursors and perfluorocarbons; and

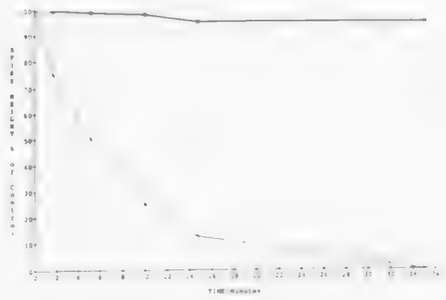
(ii) applying ultrasound to heat said tissue or fluid to a temperature of at least about 43° C.

5,149,320

COMPOSITE ANESTHETIC ARTICLE AND METHOD OF USE

Avtar S. Dhaliwal, and Shabir Z. Masih, both of Suite 43, 408 State of Franklin Rd., Johnson City, Tenn. 37604

Division of Ser. No. 319,343, Mar. 6, 1989, which is a continuation-in-part of Ser. No. 179,877, Apr. 11, 1988, abandoned. This application Jan. 11, 1991, Ser. No. 640,096
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—49 **6 Claims**



1. A method for reducing stinging or burning pain sensations

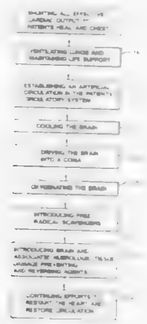
at the site of injection of local parenteral anesthetic material, said pain sensations being caused by the said material in its acidic form, and for improving the onset and duration of the said material, said method comprising providing a chemical composition having anesthetic properties and suitable for immediate injection at the time of medical procedure into the human body, said composition consisting of water, a local parenteral anesthetic dissolved therein and which, in non-buffered form, gives an acid pH of from about 2.5 to about 6.9, wherein said anesthetic comprises from about 0.5 to about 2.0% by weight of the composition, said composition being buffered with sufficient aqueous $NaHCO_3$ to maintain the pH thereof between about 7.0 and about 7.6, and further containing from about 0.0004 moles of dissolved CO_2 per ml of composition up to the saturation level of dissolved CO_2 at a CO_2 head pressure of up to about 2.5 atmospheres.

5,149,321

BRAIN RESUSCITATION DEVICE AND METHOD FOR PERFORMING THE SAME

Ronald M. Klatz, 1510 Montana St., and Robert M. Goldman, 2434 N. Greenview, both of Chicago, Ill. 60614

Filed Oct. 10, 1990, Ser. No. 595,387
Int. Cl.[5] A61M *21/00*
U.S. Cl. 604—52 **33 Claims**



1. A method of treating anoxic or ischemic brain and associated nervous tissue injury comprising:

a. establishing an artificial circulation in a patient's circulatory system by cathertizing said patient at an injection point;

b. driving the brain into a comatose state by introducing barbiturates through said catheter;

c. oxygenating the brain by introducing oxygen carrying agents through said catheter;

d. lowering the brain temperature by introducing cooled fluid through said catheter, said cooled fluid being at a temperature below body temperature;

e. inhibiting free radical damage by introducing free radical scavengers through said catheter;

whereby metabolic rates of said tissues are slowed during treatment and said patient remains substantially neurologically intact.

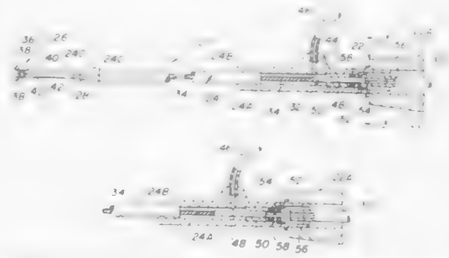
5,149,322

MOTOR DRIVEN APPARATUS HAVING MEANS TO PREVENT REUSE AND METHOD OF USE OF SAID APPARATUS

John Nash, Dowington, Pa., assignor to Kensey Nash Corporation, Exton, Pa.

Filed Jan. 14, 1991, Ser. No. 640,664
Int. Cl.[5] A61M *5/50*
U.S. Cl. 604—110 **23 Claims**

1. Apparatus for use within the body of a living being, said apparatus comprising a tubular member, a working head, drive means, and drive disabling means, said tubular member being of small cross-sectional area to enable it to be inserted in the body of said being, said working head located adjacent said tubular member and being coupled to said drive means to be operated thereby to effect some procedure within said body.



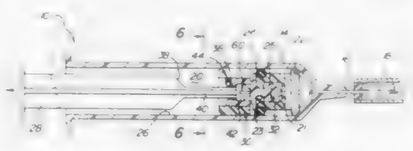
said drive means being arranged to be driven by motor means coupled thereto, said tubular member carrying a liquid through at least a portion thereof, said drive disabling means disabling said drive means some time after said liquid is carried through said portion of said member to thereby prevent operation of said working head.

5,149,323

SELF DESTRUCT DOUBLE SYRINGE

John P. Colonna, 1183 Coquille St., Sarasota, Fla. 34242

Filed Apr. 8, 1991, Ser. No. 681,991
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **18 Claims**



1. A self destructing syringe comprising:

an outer housing having an interior cavity;

a hollow needle affixed to the end of said outer housing, said needle having a passage in communication with the interior cavity of said housing such that fluid can be drawn into said cavity through said passage in said needle;

a plunger operatively received within said housing and adapted to reciprocate within said interior cavity;

a plunger rod received within said housing and adapted to reciprocate within said interior cavity, said plunger rod being selectively coupled to said plunger to control the movement of said plunger within said housing when coupled to said plunger;

a coupling means for selectively coupling said plunger and said plunger rod such that said plunger and plunger rod are initially coupled to permit said plunger to be drawn away from said needle by said plunger rod to draw fluid into said cavity and to be pushed toward said needle to issue fluid from said cavity and said needle; said coupling means automatically disconnecting said plunger and said plunger rod after said plunger has been drawn away from said needle;

said coupling means including;

a connector means for selectively interconnecting said plunger rod and said plunger, said connector means extending outwardly from said rod in the direction of said plunger;

a receiver means for selectively joining the plunger rod and the plunger, said receiver means having a head member at one end for insertion into said plunger to secure said

receiver to said plunger and expandable fingers at the opposite end adapted to receive and capture said connector means, said receiver means being generally tubular with the walls of said tube being split longitudinally such that said receiver means is free to expand for receipt of said connector means;

a locking means operatively mounted upon said plunger rod for engaging said receiver means and locking said connector means within said receiver means during the initial drawing of said plunger away from said needle and for automatically releasing said receiver means after said initial drawing of said plunger;

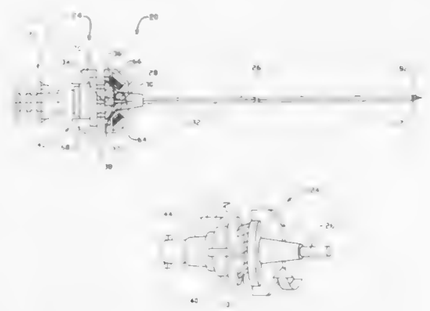
whereby said plunger cannot be drawn away from said needle more than once.

5,149,324

SURGICAL NEEDLE WITH REMOVABLE HUB

Benjamin S. Clawson, Oakland, Calif., assignor to Surgical Dynamics, Inc., Alameda, Calif.

Filed Apr. 27, 1990, Ser. No. 516,108
Int. Cl.[5] A61M *5/50*
U.S. Cl. 604—110 **4 Claims**



1. A surgical needle comprising:
a needle body;
a hub;
said hub including means for securing said hub onto said needle body;
said hub including non-reusable means for selectively releasing said securing means in order to allow said hub to be removed from said needle body, said non-reusable means for allowing the hub to be moved relative to and non-reconnectably released from, said needle body, said non-reusable means for not allowing said securing means to resecure said hub onto the needle body.

5,149,325

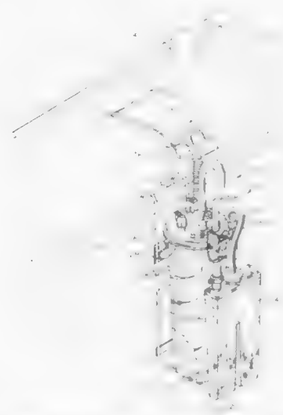
VACUUM SYSTEM FOR AUTO TRANSFUSION DEVICE

Anil M. Telang, Saugus, and Douglas J. McDowell, Santa Clarita, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Feb. 25, 1991, Ser. No. 660,491
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—119 **8 Claims**

1. A system for collection and reinfusion of fluids from a patient, comprising:
a rigid canister having walls forming a cavity, said canister also having a top opening;
a hollow liner for insertion into said cavity of said canister, said liner to receive fluids from a patient, said liner having
a cover for attaching said liner to said top of said canister,
a flexible body having upper and lower portions, said upper portion being attached to said cover,
a bottom attached to said lower portion of said body,
said flexible body and said bottom being shaped so as to generally conform to said walls of said canister, said flexible body and said bottom being located within said cavity of said canister when said cover is attached to said top of said canister;

vacuum means for continuously providing a relatively high vacuum to said cavity of said canister and a relatively low vacuum inside said liner when said liner is located in said cavity to cause said liner to expand against said walls of said canister, said vacuum means including:
a low vacuum source, said low vacuum source further including;
a control module for transforming a variable high vacuum into a constant low vacuum and for providing a one-way check valve to prohibit return of air when draining fluids and air from a patient, said control module having
a first suction control chamber for transforming said variable high vacuum into a constant low vacuum, said first chamber containing a first column of fluid at a first predetermined level;
a second water seal chamber for containing a second column of fluid at a second predetermined level, said second level being less than said first level;
a lid covering an upper surface of both of said first and second chambers, said lid providing a first path



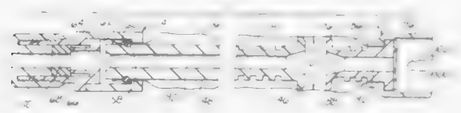
between said high vacuum source and said second chamber, said lid also providing a pathway connecting said first and second chambers above said fluid levels in said first and second chambers thereby equalizing the pressure in said first and second chambers,
a first tube within said first chamber, said first tube having first and second ends, said first end being immersed in said fluid and said second end extending above said first chamber through said lid and being open to atmospheric pressure, whereby when said high vacuum source is applied to said first chamber through said pathway, said first tube supplies atmospheric air to said high vacuum source through said first column of fluid via bubbles thereby creating a residual pressure in said first chamber which remains constant and dependent on the height of said column of fluid in said first chamber; and
a second tube within said second chamber, said second tube having first and second ends, said first end being immersed in said fluid in said second chamber and said second end in communication with the pleural cavity of the patient, said vacuum in said second chamber being normally lower than the vacuum in the patient's pleural cavity thereby causing air in the cavity to be pulled through said second end of said second tube through said second column of fluid toward said high vacuum source, when said vacuum in said cavity is greater than vacuum in the second chamber, fluid in said second chamber is pulled into said second tube to prevent air in said second chamber from returning to said pleural cavity, said second tube having a valve located at said second end which closes when fluid rises to said second end of said tube; and
a vacuum sensing valve in series between said low vacuum source and said inside of said liner, said valve opening to atmosphere when said vacuum inside said liner exceeds a predetermined value; and
drainage means for providing fluid communication between said inside of said liner and said patient.

5,149,326

ADJUSTABLE CATHETER CONTAMINATION SHIELD

Randal W. Woodgrift, Laguna Niguel, and Gregory P. Welsh, Newport Beach, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 586,626, Sep. 21, 1990, abandoned. This application Jan. 17, 1992, Ser. No. 826,280
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—163 **59 Claims**



1. An adjustable catheter contamination shield comprising:
a distal fitting including bushing means for coupling to an introducer and means, defining a bore through the distal fitting, for enabling passage of a catheter therethrough;
a proximal fitting including means, defining a bore therethrough, for enabling passage of a catheter through the proximal fitting;
collapsible shield means, disposed between said distal and proximal fitting, for enclosing an adjustable space therebetween and for shielding a portion of a catheter disposed between the distal and proximal fittings; and
means for supporting the shield means in a collapsed configuration and for causing the collapsed shield means to expand along a longitudinal axis thereof from only one portion of the collapsed configuration at a time when the distal and proximal fittings are moved apart from one another.

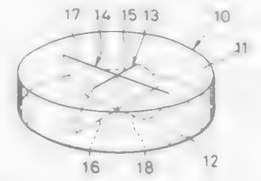
5,149,327

MEDICAL VALVE, CATHETER WITH VALVE, AND CATHETER ASSEMBLY

Hiroaki Oshiyama, Kanagawa, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1990, Ser. No. 568,198
Claims priority, application Japan, Sep. 5, 1989, 1-103482[U]; Sep. 29, 1989, 1-252289
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—167 **16 Claims**

1. A medical valve comprising:
a valve member made of a flexible elastic material and having at least two faces;
a first slit disposed between a first face of said at least two faces and a second face of said at least two faces; and
a second slit disposed between said first face and said second face;
wherein said first slit and said second slit intersect each other;
wherein a first opening width of said first slit on said first face is different from a second opening width of said first slit on said second face; and



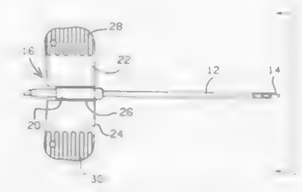
wherein a first opening width of said second slit on said first face is different from a second opening width of said second slit on said second face.

5,149,328

INTRAVENOUS NEEDLE ASSEMBLY HAVING INTERLOCKING WINGS

Juergen H. Zaha, Winthrop Harbor, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 31, 1990, Ser. No. 636,653
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—177 **2 Claims**



1. A winged needle assembly comprising:
a steel needle:
a plastic hub molded to secure a portion of the needle:
flexible wings radially attached to the hub for manual manipulation of the needle: and
opposed mirror image patterns of grooves on said flexible wings for interlocking opposed wings to each other when said wings are flexed together to prevent relative movement of said needle.

5,149,329

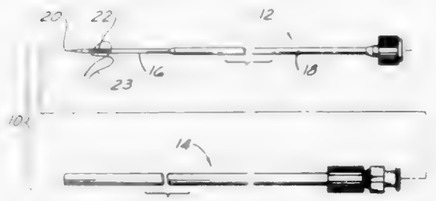
SURGICAL SUTURE CARRIER AND METHOD FOR URINARY BLADDER NECK SUSPENSION

David A. Richardson, Farmington Hills, Mich., assignor to Wayne State University, Detroit, Mich.

Filed Dec. 12, 1990, Ser. No. 626,184
Int. Cl.[5] A61B *19/00*
U.S. Cl. 604—272 **14 Claims**

1. A suturing needle assembly for access to an internal body tissue which is accessible by a curved or elongated pathway, the needle assembly comprising:
an elongated needle having a flexible portion and rigid portion connected thereto, said rigid portion having a tip for piercing the body tissue and defining a means disposed therewithin for removably attaching surgical thread and for securely retaining the surgical thread as the rigid portion is propelled into and is withdrawn from the body tissue; and
a flexible sheath which is selectively positionable over said

cup, said sheath being adapted to bend in cooperation with said needle in response to pressure exerted by a surgeon or



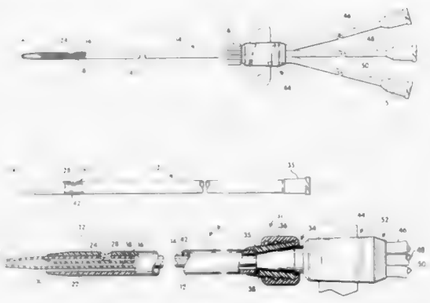
by constraints imposed by the cured or elongated pathway.

5,149,330

CATHETER CONVERTIBLE FROM SINGLE TO MULTILUMEN

Jerry R. Brightbill, Framingham, Mass., assignor to The Kendall Company

Filed Jan. 10, 1991, Ser. No. 639,623
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—280 **21 Claims**



1. A venous catheter capable of being converted from a single lumen large bore venous catheter into a multilumen catheter comprising:

a first flexible elongated large bore catheter tube adapted for insertion in the vein of a patient and having a proximal end, a distal end, an inner wall and a single bore extending there through;

a second flexible elongated catheter tube having a proximal end, a distal end, an outer wall and defining at least one lumen extending there through and terminating in at least one opening; said second catheter tube having an outer diameter which is smaller than the inner diameter of said first catheter tube, and capable of being removably disposed within said first catheter tube abutting a portion of the inner wall of said first catheter tube and defining a single lumen in the portion of the bore between the inner wall of said first catheter tube and the outer wall of said second catheter tube;

said single lumen terminating in at least one opening in said first catheter tube;

a connector having a first connector portion affixed to the proximal end of the first catheter tube, and a second connector portion affixed to the proximal end of the second catheter tube, said connector portions being mateable to provide a fluid tight coupling, said connector being a standard luer connector with locking threads;

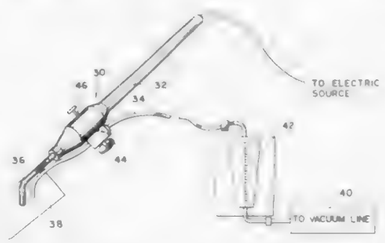
said second catheter tube being removably coupled in a fluid tight relationship to said first catheter tube via said mateable connector portions.

5,149,331

METHOD AND DEVICE FOR WOUND CLOSURE

Ariel Ferdman, 12 Hillside Ave., Melrose, Mass. 02176; Jingwen Kuo, Boxboro, Mass.; David Miller, Brookline, Mass.; Vladimir Pinsky, Brighton, Mass.; William D. Richards, Medway, Mass., and David Swann, Cambridge, Mass., assignors to Ariel Ferdman, Woburn, Mass.

Filed May 3, 1991, Ser. No. 695,704
Int. Cl.[5] A61H 35/00
U.S. Cl. 604—290 **12 Claims**



1. A method of treating a would comprising the steps of:

applying a porous, adhesive backed dressing to a wound site; and

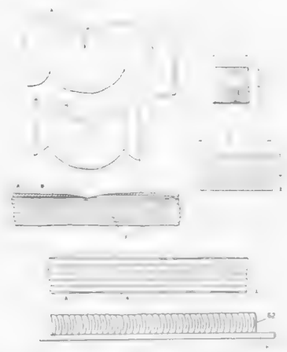
applying a vacuum to said wound site through said porous dressing to draw the tissue adjacent the wound into bonding contact with said adhesive without depressing said dressing into the wound.

5,149,332

ABSORBENT AND CUSHIONING PRODUCTS AND THEIR MANUFACTURE

Richard R. Walton, Ten West Hill Pl., Boston, Mass. 02114; Richard C. Walton, Wellesley; George E. Munchbach, Roslindale, both of Mass., and Robert W. Young, Locust Valley, N.Y., assignors to Richard R. Walton, Boston, Mass., a part interest

PCT No. PCT/US86/02647, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/04164, PCT Pub. Date Jun. 16, 1988
Continuation-in-part of Ser. No. 754,669, Jul. 11, 1985, Pat. No. 4,627,849, which is a continuation of Ser. No. 393,543, Jun. 30, 1982, abandoned. This PCT application Dec. 8, 1986, Ser. No. 311,600
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[5] A61F 13/15
U.S. Cl. 604—358 **53 Claims**



1. A product comprising at least a first, longitudinally microundulated, shortened layer of fibers,

said layer being further characterized by having at least 10 microundulations per inch in said longitudinal direction, said microundulations being in a longitudinally compressed-together relationship with adjacent microundulations having their sides abutting one another, said microundulated layer having a length at least 20% shorter than the lay-flat length of the layer when the layer is extended to cause said microundulations to lie substantially flat,

said microundulated layer being shape-retentive when undisturbed and having stored mechanical energy capable, under activating conditions, to cause said product to expand.

5,149,333

POLYMERIC WEB COMPOSITIONS FOR USE IN ABSORBENT ARTICLES

Philip A. Sasse, Alpharetta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 715,944, Jun. 14, 1991, which is a division of Ser. No. 598,276, Oct. 16, 1990, Pat. No. 5,063,272. This application Mar. 27, 1992, Ser. No. 859,193
Int. Cl.[5] A61F 13/15; C08L 33/06; C08K 5/05
U.S. Cl. 604—367 **9 Claims**

1. An absorbent article having an outer cover, an absorbent core and an inner liner, wherein said absorbent core comprises a composite structure comprising a polymeric web comprising a blend of from about 60 to about 95 weight percent of a copolymer of a (meth)acrylate ester and (meth)acrylic acid and from about 5 to about 30 weight percent of polyethylene glycol.

5,149,334

ABSORBENT ARTICLES CONTAINING INTERPARTICLE CROSSLINKED AGGREGATES

Frank H. Lahrman; Charles J. Berg, and Donald C. Roe, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 2, 1990, Ser. No. 503,501
Int. Cl.[5] A61F 13/15
U.S. Cl. 604—367 **25 Claims**

1. A disposable absorbent article comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined with said topsheet; and

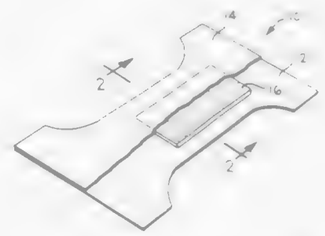
an absorbent core positioned between said topsheet and said backsheet, said absorbent core comprising a particulate, absorbent, polymeric composition comprising interparticle covalently crosslinked aggregates, said interparticle crosslinked aggregates comprising (i) substantially dry precursor particles of substantially water-insoluble, absorbent, hydrogel-forming, polymer material; said polymer material of said precursor particles being selected from the group consisting of hydrolyzed starch-acrylonitrile graft copolymer, partially neutralized starch-acrylonitrile acid graft copolymer, starch-acrylic acid graft copolymer, partially neutralized starch-acrylic acid graft copolymer, saponified vinyl acetate-acrylic ester copolymers, hydrolyzed acrylonitrile or acrylamide copolymers, slightly network crosslinked products of any of the foregoing copolymers, partially neutralized polyacrylic acid, and slightly network crosslinked products of partially neutralized polyacrylic acid; and (ii) an interparticle crosslinking agent reacted with said polymer material of said precursor particles to form crosslink bonds between said precursor particles; said interparticle crosslinking agent being selected from the group consisting of polyhydric alcohol compounds, polyglycidyl ether compounds, polyfunctional aziridine compounds, polyfunctional amine compounds, and polyfunctional isocyanate compounds; said interparticle crosslinked aggregates being present in said polymeric composition in an amount such that said polymeric composition has a mass average particle size at least about 30% greater than the mass average particle size of said precursor particles.

5,149,335

ABSORBENT STRUCTURE

Stanley R. Kellenberger, Appleton; Wen-Huey Shih-Schroeder, Little Chute, and Anthony J. Wisneski, Kimberly, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 23, 1990, Ser. No. 484,598
Int. Cl.[5] A61F 13/15
U.S. Cl. 604—372 **58 Claims**



1. An absorbent structure, said absorbent structure comprising:

means for containing a superabsorbent material; and

superabsorbent material contained by said containment means, said superabsorbent material having a free-swell rate of less than about 60 seconds and a five-minute AUL of at least about 15 g/g, said superabsorbent being present in said containment means in an amount of from about 60 to about 100 weight percent, based on a total weight of said containment means and said superabsorbent material.

5,149,336

DISPOSAL BREAST PADS FOR NURSING MOTHERS

Haley C. Clarke, 4798 Deer Run, NE., Kennesaw, Ga. 30114, and Lisa C. Panoz, Rte. 1, Box 12828, Hwy. 211, Hoschton, Ga. 30548

Filed Apr. 3, 1991, Ser. No. 679,772
Int. Cl.[5] A61F 13/15, 13/20
U.S. Cl. 604—388 **15 Claims**

1. A contoured breast pad for use by a human female wearer who has at least one breast, said pad being placed between a brassiere cup worn by the wearer and said breast, the brassiere cup having at least an inner surface configured to accommo-

date a human female breast, said pad having an interior concave surface and an exterior concave surface and comprising an inner fluid wicking layer, an outer fluid resistant layer, a central fluid absorbent layer located between said inner layer and said outer layer and a peripheral edge;

said inner layer having a soft and comfortable texture configured to be against said breast and embodying a wicking quality which wicks fluid contacting said inner layer through said inner layer into said central fluid absorbent layer such that said inner layer remains relatively dry;

said outer layer comprising a moisture resistant material;

said central layer comprising a fluid absorbent material which will absorb and retain fluid upon contact; and

said peripheral edge comprising an upper point, an inner side edge, an outer side edge, and a rounded bottom edge;

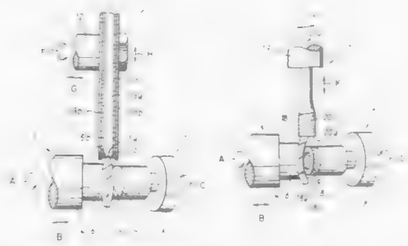
wherein a portion of said outer layer wraps around said rounded bottom edge and extends upwardly along the interior concave surface of said pad, said inner layer and said outer layer are bonded together creating a hollow interior space in which said central fluid absorbent layer is enveloped, and said breast pad has a tear drop shape and hemispherical cross-section and is of such a size and shape that it will conform to and encompass said breast and will conform to and contact the inner surface of the brassiere cup.

5,149,337

LENS GRINDER AND METHOD OF GRINDING LENS

Masaki Watanabe, Tokyo, Japan, assignor to Olympus Optical Company Limited, Japan

Continuation of Ser. No. 396,688, Aug. 18, 1989, abandoned.
This application Feb. 28, 1991, Ser. No. 664,414
Claims priority, application Japan, Oct. 20, 1988, 63-265081
Int. Cl.[5] B24B *1/00, 13/00*
U.S. Cl. 51—284 R 13 Claims



1. A lens grinder comprising:

a work spindle unit having a rotatable work spindle to releasably mount an optical lens to be worked at a free end of the work spindle;

a curve generator tool spindle unit having a rotatable curve generator tool spindle to releasably mount a cup-shaped surface grinding stone at a free end of the curve generator tool spindle to grind an optical surface of the lens to impart a desired curvature thereto, said tool spindle and said work spindle being movable toward and away from each other and said tool spindle being swingable about a center of the lens in a plane that includes the axis of the work spindle;

a fillet spindle unit having a rotatable, axially and radially movable fillet tool spindle to releasably mount a lens periphery grinding stone at a free end of the fillet tool spindle to grind a peripheral surface and peripheral edge of the lens, the axis of rotation of said fillet tool spindle being parallel to the optical axis of the lens; and

means for simultaneously rotating the work spindle, the curve generator tool spindle and the fillet tool spindle to effect simultaneous grinding of the lens at the optical surface and the peripheral surface and peripheral edge thereof.

9. A method of grinding a lens comprising the steps of: controlling the rotation of a lens to be ground about an optical axis of the lens, grinding an optical surface of the lens with a cup-shaped grinding stone to impart a desired spherical curvature thereto, and grinding an outer periphery and a fillet of the lens with an outer periphery grinding stone simultaneously with the grinding of the optical surface by controllably moving the outer periphery grinding stone parallel to the optical axis and normal to the lens synchronously with the control of the optical surface grinding.

5,149,338

SUPERPOLISHING AGENT, PROCESS FOR POLISHING HARD CERAMIC MATERIALS, AND POLISHED HARD CERAMICS

Kenneth W. Fulton, 6 Adams Rd., Hubbardston, Mass. 01452

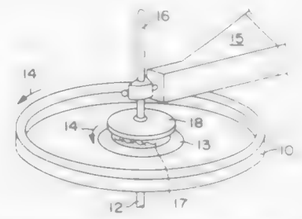
Filed Jul. 22, 1991, Ser. No. 733,306
Int. Cl.[5] B24D *17/00*
U.S. Cl. 51—293 12 Claims

1. A process for polishing hard ceramic materials to a surface roughness below about 20 angstroms RMS, comprising:

a. forming a layer of petroleum pitch on a polishing tool;

b. forming channels in said pitch;

c. wetting said pitch with a polishing compound comprising colloidal alumina and a powder of a substance that is harder than the substrate to be polished; and



d. contacting said substrate to be polished with said wetted pitch and imparting relative motion to said substrate.

5,149,339

ROTARY DEVICE FOR REMOVING PARTICULATES FROM A GAS STREAM

Earl R. Collins, Jr., La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 11, 1991, Ser. No. 667,712
Int. Cl.[5] B03C *1/00*
U.S. Cl. 55—6 28 Claims

1. A method of separating particulates contained in a gas stream emanating from a source, comprising:

defining a flow path through which the gas stream flows, said flow path having an inlet portion and an outlet portion with a central portion disposed between said inlet and outlet portions;

charging particulates in the gas stream entering said inlet portion of said flow path;

generating a vortex flow with a vortex generator disposed outside said flow path adjacent said central portion of said flow path, said vortex flow leaving said vortex generator through a vortex outlet;

inducing particulates from the gas stream in said flow path to pass from said central portion of said flow path through a passageway located in said central portion of said flow path into said vortex generator; and

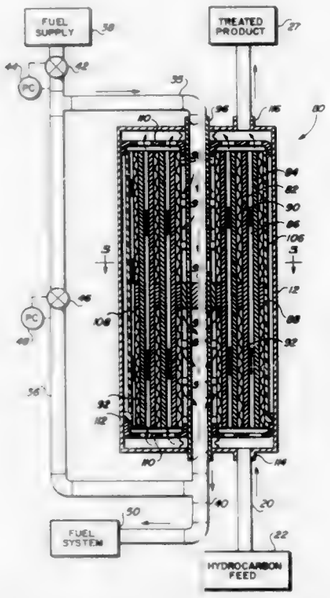
diverting particulates entering said vortex generator into said vortex flow, and inwardly into said vortex outlet, whereby the particulates are exhausted from said vortex generator through said vortex outlet.

5,149,340

PROCESS AND APPARATUS FOR SEPARATING IMPURITIES FROM HYDROCARBONS

John J. Waycuilis, Lafayette, La., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 12, 1991, Ser. No. 672,059
Int. Cl.[5] B01D *53/22, 63/10*
U.S. Cl. 55—16 4 Claims



1. A process for separating gaseous impurities from a hydrocarbon mixture, comprising the steps of:

contacting one side of a semi-permeable membrane with a flowing stream of the hydrocarbon mixture, the membrane being selectively permeable to the impurities desired to be separated so as to allow such impurities to diffuse through the membrane and

purging impurities which have diffused through the membrane by contacting the other side of the membrane with a stream of sweep gas flowing in a direction which is countercurrent or crosscurrent to the direction of flow of the hydrocarbon mixture;

the stream of sweep gas diluting and reducing the partial pressure of the impurities on the permeate side of the membrane to thereby increase the driving force of the impurities across the membrane while at the same time increasing the total back pressure on the membrane;

the ratio of the molar flow rate of the sweep gas to the molar permeation rate of impurities removed from the hydrocarbon mixture being at least 2 to 1, thereby reducing the partial pressure of the impurities on the permeate side of the membrane and correspondingly increasing the driving force and permeation flux of the impurities across the membrane, while allowing the back pressure to be significantly greater than atmospheric pressure;

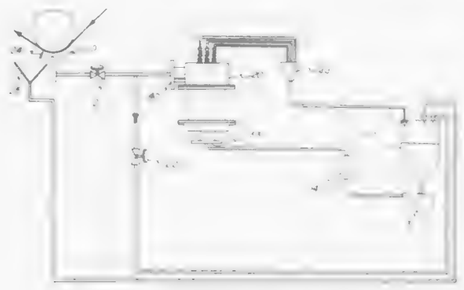
the partial pressure of the impurities being decreased to such an extent that there is no need for a compressor in the fluid system containing the membrane unit, and the total back pressure on the membrane being increased to a point where permeate may be delivered by said back pressure directly to another station in the fluid system.

5,149,341

PAPER COATER SKIP PREVENTION AND DEAERATION APPARATUS AND METHOD

John A. Taylor, and Paul J. Caryk, both of c/o The Black Clawson Company, 46 N. First St., Fulton, N.Y. 13069

Filed Aug. 23, 1991, Ser. No. 748,864
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—36 6 Claims



1. The method of deaerating paper coating liquid prior to the application of said liquid to a coater, comprising the steps of:

applying under pressure a coating liquid to be treated to an axial flow cylindrical separator tube having a vortex generator at the inlet end in the form of a helical flighting surrounding a solid center shaft and causing the gas bubbles to coalesce in said tube into a conical gas region, the base of which is adjacent the end of said flighting and the tip of which extends toward an opposite outlet end of said tube,

providing in said tube a gas pickup conduit at said tube outlet end spaced from said conical gas region and positioned with an open end facing said flighting and on the axial center of said tube,

causing said coating liquid to pass through said generator from said inlet end through said flighting to said outlet end at a rate sufficient to cause discrete bubbles to be separated from said gas region and carried by the flow from said inlet toward said outlet end into said conduit,

withdrawing a gas-rich fraction through said conduit, and

withdrawing deaerated coating liquid from said outlet end for delivery to said coater.

5,149,342

SYSTEM FOR RECOVERING SOLVENTS AND DISPOSING OF CONTAMINANTS RELEASED BY REGENERATION OF SOLVENT LADEN AIR ADSORBER VESSELS

Jerald L. Mestemaker, and Clyde G. Anderson, both of Vero Beach, Fla., assignors to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Apr. 17, 1991, Ser. No. 686,669
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—59 6 Claims

1. A process for recovering solvents and disposing of contaminants released by regeneration of solvent-laden air (SLA) adsorbents, said process comprising the steps of:

(a) passing steam through the adsorbents to desorb solvents and contaminants from the adsorbents;

(b) condensing the steam, solvents and contaminants exiting the adsorbent to produce a condensate;

(c) separating the condensate into at least one solvent-rich fraction having contaminants and a water fraction having contaminants;

(d) stripping the water fraction to produce a substantially pure liquid water phase and a contaminant-bearing vapor phase;

(e) rectifying the contaminant-bearing vapor phase to concentrate the contaminants in the contaminant-bearing vapor phase; and

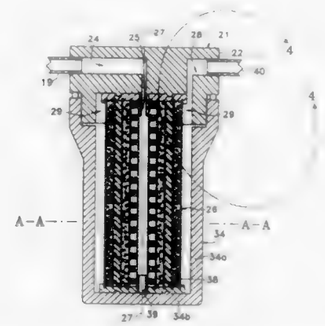
(f) incinerating a quantity of the concentrated contaminant-bearing vapor phase.

5,149,343

METHOD FOR FILTERING RADON FROM A GAS STREAM

Richard F. Sowinski, 996 Arnold Dr., Martinez, Calif. 94553

Filed Feb. 22, 1991, Ser. No. 660,350
Int. Cl.[5] B01D *53/04, 27/04, 39/08*
U.S. Cl. 55—66 15 Claims



1. A method of filtering, adjacent to an end user-customer's residence or business in which at least a single gas appliance is located, a natural gas stream in which radon has been concentrated at sufficient levels to be a health threat in a natural gas gathering and distributing network, comprising the steps of:

(a) introducing the natural gas stream to a filter selected from a group that includes impingement, absorbing and adsorbing media whereby radon concentrated in the gas stream at sufficient levels to be a health threat by aperiodic loading of the natural gas within the gathering and distributing network, are filtered from the gas stream and captured irrespective of mode of transport,

(b) passing the filtered natural gas stream to the customer's gas appliance wherein safe use of the energy associated with the stream occurs,

(c) periodically and safely removing the filter of step (a) for disposing of captured radon,

(d) inserting a new filter in place of the removed filter of step (c).

5,149,344

MULTI-PHASE FLOW AND SEPARATOR

Daniel H. Macy, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 2, 1991, Ser. No. 694,592
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—167 8 Claims

1. A separator for resolving a multi-phase fluid which includes at least two immiscible liquids having different densities and a gaseous component, said separator being normally subject to an unstable environment which, causes movement of the contained fluids, which apparatus includes:

a receiving tank **12** communicated with a source **16** of the multi-phase fluid to be separated,

said receiving tank **12** having means **18** for venting the gaseous component which separates from the liquid phase,

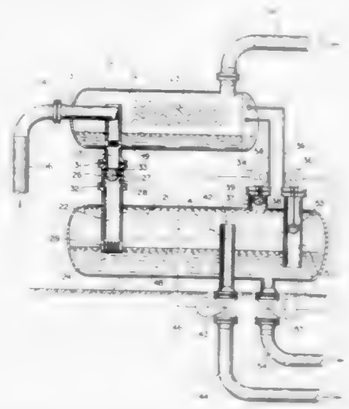
a separating vessel **21** positioned at a lower elevation than said receiving tank,

valved conduit means **26** communicating said tank **12** with the separating vessel **21** to conduct a gravity flow of substantially gas-free liquid into the separating vessel,

said valved conduit means **26** forming a flow passage having an annular seat **33**,

a float member **27** movably retained in said flow passage, being displaceable by fluid in said tank to engage said annular seat whereby to discontinue liquid flow through the conduit means, and

means for discharging discrete flows of said at least two immiscible liquids from said vessel.

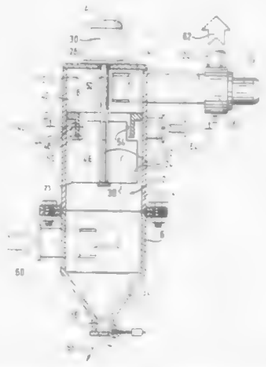


5,149,345

CENTRIFUGE PURIFIER FOR A GAS FLOW

Christian Bouchard, Le Pre Saint Gervais, and François Brulez, Paris, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Oct. 12, 1990, Ser. No. 596,261
Claims priority, application France, Oct. 12, 1989, 89 13343
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—406 10 Claims



1. In a centrifugal purifier for a gas flow contaminated with particles, said purifier comprising:

a centrifugal separation chamber (**2**) delimited by a cylindrical confinement wall (**4**) which is circularly symmetrical about a longitudinal axis (**A**), said chamber having a length extending along said axis in a forward flow direction from an upstream end (**6**) to a downstream end (**8**);

an inlet opening (**10**) formed at said upstream end of said chamber to receive an inlet gas flow constituted by a carrier gas contaminated with said particles that are to be removed therefrom;

an outlet opening (**8**) formed at said downstream end of said chamber for delivering a purified gas flow;

flow means (**16**) for causing said carrier gas to flow from said inlet opening to said outlet opening through said cylindrical confinement wall, thereby forming an internal gas flow within said cylindrical confinement wall having a longitudinal velocity component in said forward direction, axially of said cylindrical confinement wall;

spin means (**24**) for imparting rotation to said internal gas flow around said axis, thereby causing centrifugal force to concentrate said particles in the vicinity of said cylindrical confinement wall along a centrifugal deposition section (**38**) extending over a fraction of the length of said centrifugal separation chamber; and

a removal opening within said cylindrical confinement wall for the particles which have been concentrated in this manner close to said cylindrical confinement wall;

the improvement wherein said cylindrical confinement wall includes a peripheral obstacle (**42, 44**) disposed downstream from said desposition section, projecting radially out from said cylindrical confinement wall into said centrifugal separation chamber downstream of said spin means (**24**) so as to at least slow down the longitudinal displacement of a peripheral gas stream constituting a nonseparate fraction of said internal gas flow containing said particles concentrated by the centrifugal force, and said peripheral obstacle being axially open thereby enabling a radially inner gas stream constituting the remainder of said internal gas flow to flow longitudinally in said forward flow direction downstream of said peripheral obstacle within said centrifugal separation chamber;

said removal opening (**33**) being disposed within said cylindrical confinement wall at the level of said spin means just upstream of said peripheral obstacle to receive said particles from said peripheral stream as slowed down by said peripheral obstacle.

5,149,346

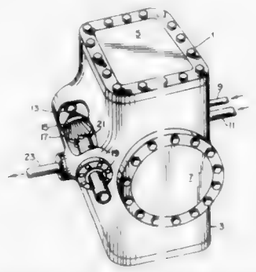
APPARATUS FOR REDUCTION OF VIBRATION IN LIQUID-INJECTED GAS COMPRESSOR SYSTEM

Harry J. Skruch, Baltimore, and John R. Ward, Owings, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1991, Ser. No. 718,322

Int. Cl.[5] **B01D** *45/12*

U.S. Cl. 55—438 **1 Claim**



1. A compressed gas system for reducing vibration and pulsation levels in gas piping systems comprising:

a housing,

a liquid-injected rotary positive displacement screw gas compressor within said housing, having an inlet port and a discharge port, a plenum chamber connected to said compressor at the discharge port thereof, separation means to impart to a gas-liquid mixture a circular flow of such velocity to separate gas and liquid into separate streams and means for diverting the liquid away from the compressed gas said compressor and said separation means being enclosed within said housing, said separation means including a tuyere, and said means for diverting the liquid away from the compressed gas includes a first conduit which surrounds and is concentric with a second conduit for carrying the gas, said first and second conduits forming a concentric arrangement of conduits and said concentric arrangement of conduits passes from the interior of said housing at said plenum through a wall of said housing to the exterior of said housing and means for removing liquid from said second conduit whereby the vibration and pulsation levels are reduced.

5,149,347

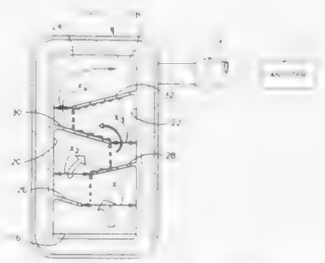
WATER SEPARATOR FOR FUEL CANISTER PURGE

Kenneth W. Turner, Webster; Patti S. Du Bois, Hamlin; Peter J. Alfred, Victor, and Thomas W. Greer, Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1991, Ser. No. 661,942

Int. Cl.[5] **B01D** *45/00*

U.S. Cl. 55—446 **1 Claim**



1. In a vehicle having a fuel vapor canister through which a purge flow of air and entrained water droplets is forcibly drawn from ambient at a predetermined range of flow rates, a separator for removing said entrained water droplets from said purge flow, comprising,

an inflow chamber formed by an opposed pair of side walls with a bottom inlet into which said purge flow is initially drawn upwardly between said side walls from ambient, and,

a series of interleaved, downwardly sloped separator fins attached in alternating fashion to said side walls, each of said fins having a free edge spaced from its opposite side wall past which said flow slips before reaching the underside of the next fin in the series, said free edges thereby creating a series of restricting gaps with said opposite side walls, each of which is successively decreased in size in the upstream direction so as to accelerate said purge flow, when it is within a defined subrange of said predetermined range of flow, to the optimum velocity for the separation of said water droplets therefrom as it impinges on the underside of the next fin in the series, said separated water droplets facing decreasing flow velocity in the downward direction so as to be able to drain off said downwardly sloped fins and ultimately out of said bottom inlet.

5,149,348

FILTER SYSTEM FOR LARGE CONTAINERS

Heinz Bissinger, Zaberfeld, Fed. Rep. of Germany, assignor to Bissinger GmbH, Fed. Rep. of Germany

PCT No. PCT/DE90/00162, § 371 Date Jun. 28, 1991, § 102(e) Date Jun. 28, 1991, PCT Pub. No. WO90/11816, PCT Pub. Date Oct. 18, 1990

PCT Filed Mar. 7, 1990, Ser. No. 720,427

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910203; Sep. 16, 1989, 3931033

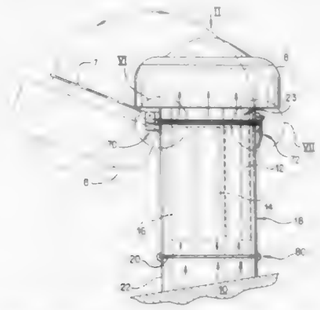
Int. Cl.[5] **B01D** *46/00*

U.S. Cl. 55—478 **36 Claims**

1. In a filter apparatus for a large container with a hollow housing containing at least one filter, having an air inlet opening connectable with the large container and an air outlet opening in communication with the filter,

the improvement comprising:

the filter (**12, 14, 16**) insertable into the air outlet opening (**30** to **33**) and supported by a filter flange (**40, 41, 42**) on an edge of the air outlet opening (**30** to **33**), and



an air outlet side (**23**) of the hollow housing (**18**) having the air outlet opening (**30** to **33**) coverable with a dome (**8**), said dome (**8**) operationally connected to the hollow housing (**18**) and in communication with the air outlet opening (**30** to **33**), connected under pressure with a filter flange (**40, 41, 42**) in a closed position and, in an open position, uncovers the air outlet side (**23**).

5,149,349

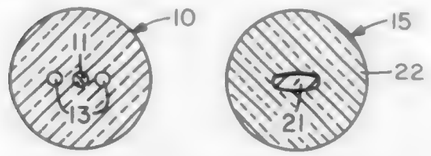
METHOD OF MAKING POLARIZATION RETAINING FIBER WITH AN ELLIPTICAL CORE, WITH COLLAPSED APERTURES

George E. Berkey, Pine City; Robert M. Hawk, Bath, and Steven H. Tarcza, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 11, 1991, Ser. No. 728,276

Int. Cl.[5] **C03B** *37/023*

U.S. Cl. 65—3.11 **17 Claims**



1. A method of making a polarization retaining single-mode optical fiber comprising drawing an optical fiber from a cylindrically-shaped draw blank having a cylindrically-shaped glass core surrounded by cladding glass and having apertures consisting of a single pair of cylindrical apertures that are parallel to and diametrically opposed with respect to said core, said fiber being drawn at such a rate that said apertures close, thus causing the core of said fiber to have an elliptical cross-section.

5,149,350

APPARATUS FOR FUSION-SPLICING A PAIR OF POLARIZATION MAINTAINING OPTICAL FIBERS

Kenichiro Itoh; Takeshi Yamada; Tsutomu Onodera, all of Sakura; Mikio Yoshinuma, Yachiyo, and Yasuyuki Kato, Mito, all of Japan, assignors to Fujikura Ltd. and Nippon Telegraph & Telephone Corporation, both of Tokyo, Japan

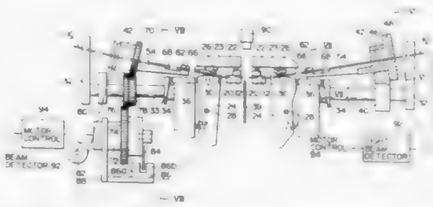
Continuation of Ser. No. 379,690, Jul. 11, 1989, Pat. No. 4,986,843, which is a continuation of Ser. No. 51,741, May 18, 1987, abandoned. This application Dec. 26, 1990, Ser. No. 633,764

Claims priority, application Japan, May 20, 1986, 61-115901; May 20, 1986, 61-115902; May 20, 1986, 61-115903; May 20, 1986, 61-115904

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] **C03B** *25/00*

U.S. Cl. 65—12 **3 Claims**



1. An apparatus for fusion-splicing a pair of polarization maintaining optical fibers comprising:

a body;

a pair of supporting members provided on said body and arranged in a line for supporting thereon a pair of polarization maintaining optical fibers in a line;

a first clamp means for clamping an end portion of one of said pair of polarization maintaining optical fibers, said first clamp means being provided on said body;

a second clamp means for clamping an end portion of the other of said pair of polarization maintaining optical fibers, said second clamp means being provided on said body;

manual rotation means coupled to said first clamp means for rotating the first clamp means to rotate the end portion of one clamped optical fiber about an axis thereof to enable a fast coarse rotational alignment with the end portion of the other clamped optical fiber;

motor means coupled to said second clamp means for rotating the second clamp means to rotate the end portion of said other clamped optical fiber about an axis thereof to achieve a fine rotational alignment of the end portion of said other clamped optical fiber with the end portion of said one clamped optical fiber;

motor control means connected to said motor means for controlling the rotation of said motor means to minimize an extinction ratio of said pair of optical fibers;

means for moving said pair of optical fibers toward each other provided on said body;

stopper means having mirror means mounted thereon provided on said body, said stopper means being set to one position selected from among a first position, a second position, and a third position, the stopper means functioning in said first position as a stopper against said optical fibers when the optical fibers are moved toward each other by said moving means, and functioning in said second position as a mirror for reflecting an image of respective end faces of said pair of optical fibers facing each other, the stopper means when set to said third position being displaced away from the line along which said optical fibers are supported so that said optical fibers are permitted to further move toward each other by said moving means to abut against each other;

said manual rotation means and said motor means being

rotated when said stopper means is set to said second position;

a microscope for observing, via said mirror means, when said stopper means is set to said second position, the image of the end faces of said pair of optical fibers to determine the rotational alignment of the optical fibers; and

fusion splicing means provided on said body, located between said first and second clamp means, for fusion-splicing the end portions of said pair of optical fibers by an arc discharge after said fine rotational alignment is completed.

5,149,351

METHOD FOR MAKING A CURVED SOLAR PANEL FOR AN AUTOMOBILE

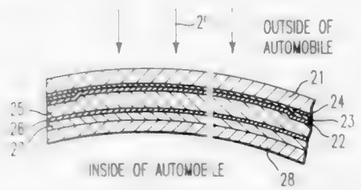
Susumu Yaba; Tomoya Takigawa; Sinya Kikugawa; Koichi Osada; Katsuhito Sato, all of Yokohama, and Masaru Omae, Kanagawa, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 356,234, May 24, 1989, Pat. No. 5,059,254. This application Jul. 22, 1991, Ser. No. 733,874

Claims priority, application Japan May 24, 1988, 63-124890; Apr. 24, 1989, 1-48042

Int. Cl.[5] C08B 23/023

U.S. Cl. 565—60.2 8 Claims



1. A method of making a curved solar panel for an automobile, comprising the steps of:

heating a glass sheet;

coating a transparent electroconductive film on one side of said glass sheet;

heating and bending the coated glass sheet so as to make the coated surface concave while limiting the rise of the resistance value of said transparent electroconductive film;

forming a photoelectric conversion layer on said transparent electroconductive film on the concave surface of the glass sheet;

forming a back electrode on said photoelectric conversion layer so that electricity can be taken out between said transparent electroconductive film and the back electrode;

forming a protective layer on the photoelectric conversion layer which faces the inside of said automobile.

5,149,35

METHOD OF AND SYSTEM FOR BENDING SHEET GLASS

Hideo Yoshizawa; Yasuhiko Saikawa; Noriaki Kanda, and Norihiko Higashide, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 16, 1990, Ser. No. 614,832

Claims priority, application Japan, Nov. 17, 1989, 1-299388

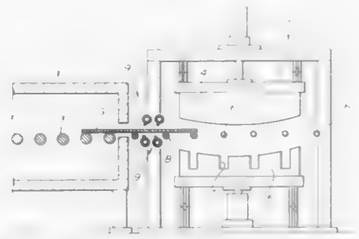
Int. Cl.[5] C03B 23/023

U.S. Cl. 65—106 10 Claims

1. A method of bending a sheet of glass with a system including a feed mechanism for feeding the sheet of glass along a predetermined path, a heating furnace disposed along the path for heating the sheet of glass, and a shaping device disposed along the path for bending the sheet of glass heated by the heating furnace, said method comprising the steps of:

bending the sheet of glass with said shaping device; and

before bending the sheet of glass, which is inclined to have an increasing temperature gradient from a leading end portion to a trailing end portion of the sheet of glass by thermal radiation during transfer from said heating furnace to said shaping device, thermally processing the sheet of glass to different degrees from the leading and trailing end portions of the sheet of glass, thereby uniformizing temperatures of the sheet of glass over its entire surface from the leading end portion of the trailing end portion of the sheet of glass, said step of thermally processing the sheet of glass comprises the step of cooling the sheet of glass by cooling means for obliquely ejecting air upstream toward the sheet of glass with respect to the direction in which the sheet of glass is fed from the heating furnace to the shaping device such that the portion of the sheet of glass which has moved past said cooling means is prevented from further cooling by the ejecting air.



5,149,353

METHOD FOR INTERMITTENTLY STORING PAIRS OF GLASS SHEETS IN A WINDSHIELD PRODUCTION LINE

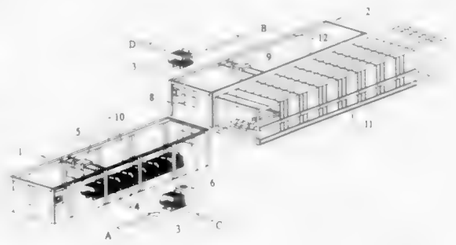
Eero Sipila, and Erkki Yli-Vakkuri, both of Tampere, Finland, assignors to Tamglass Oy, Tampere, Finland

Continuation-in-part of Ser. No. 343,333, Apr. 26, 1989, abandoned. This application Jul. 24, 1990, Ser. No. 556,435

Claims priority, application Finland, May 11, 1988, 882194

Int. Cl.[5] B65G 49/00

U.S. Cl. 65—107 10 Claims



1. A method of intermediately storing pairs of flat glass sheets, comprising:

carrying said pair of flat glass sheets, along with other pairs of flat glass sheets, on a first storage rack to a first intermediate storage;

carrying said pair of flat glass sheets from said first storage rack to a first stand at an end of said first intermediate storage using a first carrier trolley;

carrying said pair of flat glass sheets from said stand to a bending furnace;

bending said pair of flat glass sheets in said furnace;

carrying said pair of bent glass sheets from said furnace to a second stand at an end of a second intermediate storage;

carrying said pair of bent glass sheets from said second stand to a second storage rack in said second intermediate storage using a second carrier trolley; and

carrying said pair of bent glass sheets, along with other pairs of bent glass sheets, on said second storage rack away from said second storage.

5,149,354

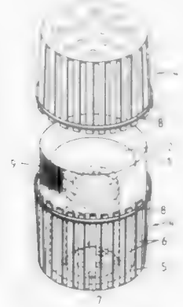
COMPOSITION FOR TREATING SWIMMING POOLS

Brendan J. Delaney, 68 Honiball Street, Rynfield, Benoni, South Africa

Filed Jan. 10, 1991, Ser. No. 639,800

Int. Cl.[5] A01N 25/08, 59/20, 59/16

U.S. Cl. 71—67 27 Claims



1. A bactericidal, algicidal and fungicidal composition for use in the treatment of the water of a swimming pool comprising

I. a mixture of active ingredients comprising by weight

a) a water-soluble copper compound, serving as a source of copper ion, representing, calculated as $CuSO_4 \cdot 5H_2O$, more than 50% of all active ingredients,

b) a water-soluble silver compound capable of supplying a bactericidal concentration of silver ion,

c) a water-soluble gluconate capable of forming soluble complexes with silver,

d) a complexone, being an organic amine capable of forming water-soluble copper complexes in an amount of about between 1/50 and 1/5 of the amount of said copper compound, calculated as $CuSO_4 \cdot 5H_2O$,

e) between about 5 and 30% water, and

II. a copper reactivator means, comprising solid copper metal,

III. the composition being a solid form suitable for placing in a dispenser having water pervious walls.

5,149,355

ADDUCT COMPOSITIONS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

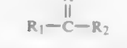
Division of Ser. No. 150,230, Jan. 29, 1988, Pat. No. 5,116,916, which is a division of Ser. No. 771,259, Aug. 30, 1985, Pat. No. 4,772,986, which is a continuation-in-part of Ser. No. 679,235, Dec. 7, 1984, Pat. No. 4,589,925, Ser. No. 675,774, Nov. 28, 1984, Pat. No. 4,673,522, Ser. No. 673,358, Nov. 20, 1984, Pat. No. 4,664,717, Ser. No. 673,508, Nov. 20, 1984, Pat. No. 4,944,787, and Ser. No. 453,496, Dec. 27, 1982, Pat. No. 4,910,179, which is a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, abandoned, Ser. No. 444,667, Nov. 26, 1982, abandoned, Ser. No. 331,001, Dec. 15, 1981, Pat. No. 4,402,852, Ser. No. 330,904, Dec. 15, 1981, Pat. No. 4,404,116, Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925, Ser. No. 318,368, Nov. 5, 1981, Pat. No. 4,447,253, and Ser. No. 318,343, Nov. 5, 1981, Pat. No. 4,397,675. This application Jun. 28, 1990, Ser. No. 546,571

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[5] A01N 59/00

U.S. Cl. 71—83 32 Claims

1. A composition comprising a member selected from the group consisting of surfactants, polar solvents other than water, and combinations thereof, and the mono-adduct of sulfuric acid and a compound having the empirical formula



wherein X is a chalcogen, each of R_1 and R_2 is selected from hydrogen, NR_3R_4 and NR_5, at least one of R_1 and R_2 is independently other than hydrogen, each or R_3 and R_4 is independently selected from hydrogen and monovalent organic radicals, and R_5 is selected from divalent organic radicals.

5,149,356

HERBICIDAL SULPHONYLAMINOCARBONYLTRIAZOLINONES HAVING SUBSTITUENTS WHICH ARE BONDED VIA SULPHUR

Klaus-Helmut Müller, Duesseldorf; Peter Babczinski, Wuppertal; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

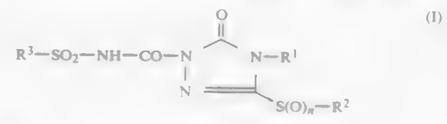
Division of Ser. No. 596,845, Oct. 12, 1990, Pat. No. 5,085,684, Continuation-in-part of Ser. No. 580,900, Sep. 11, 1990, which is a continuation-in-part of Ser. No. 556,052, Jul. 20, 1990, Pat. No. 5,057,144, which is a continuation-in-part of Ser. No. 337,775, Apr. 13, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 777,824

Claims priority, application Fed. Rep. of Germany, May 9, 1988, 3815765; Oct. 12, 1989, 3934081; Nov. 3, 1989, 3936622; Nov. 3, 1989, 3936623

Int. Cl.[5] C07D 409/12, 417/12; A01N 43/64, 43/78

U.S. Cl. 71—90 7 Claims

1. A sulphonylaminocarbonyltriazolinone of the formula



(I)

in which

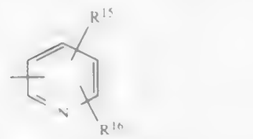
n represents the numbers 0, 1 or 2,

R^1 represents hydrogen, hydroxyl or amino, or represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkylcar-

bonyl or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkynyl, each of which is optionally substituted by fluorine, chlorine or bromine, or represents C_3–C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine or C_1–C_4-alkyl, or represents phenyl-C_1–C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, fluorine- or chlorine-substituted C_1–C_3-alkoxy, C_1–C_4-alkylthio, fluorine- or chlorine-substituted C_1–C_3-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl or C_1–C_4-alkoxycarbonyl, or represents C_1–C_6-alkoxy which is optionally substituted by fluorine, chlorine, cyano, phenyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_4-alkenyloxy, or represents C_1–C_4-alkylamino which is optionally substituted by fluorine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl, or represents C_3–C_6-cycloalkylamino or di-(C_1–C_4-alkyl)-amino,

R^2 represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_3–C_6-cycloalkyl, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl or represents C_3–C_6-alkenyl or C_3–C_6-alkynyl, each of which is optionally substituted by fluorine, chlorine or bromine, or represents C_3–C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine or C_1–C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1–C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, fluorine- or chlorine-substituted C_1–C_3-alkoxy, C_1–C_4-alkylthio, fluorine- or chlorine-substituted C_1–C_3-alkylthio, C_1–C_4-alkyl-sulphinyl, C_1–C_4-alkylsulphonyl or C_1–C_4-alkoxy-carbonyl, and

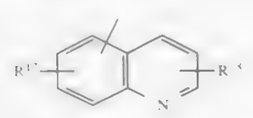
R^3 represents the radical



where

R^{15} and R^{16} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine or chlorine)m, C_1–C_4-alkoxy (which is optionally substituted by fluorine or chlorine), or represents C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (each of which is optionally substituted by fluorine or chlorine), or represent aminosulphonyl, mono-(C_1–C_4-alkyl)-aminosulphonyl, or represents di-(C_1–C_4-alkyl)-aminosulphonyl or C_1–C_4-alkoxycarbonyl or dimethylaminocarbonyl; or

R^3 represents the radical



where

R^{17} and R^{18} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine or bromine), C_1–C_4-alkoxy (which is optionally substituted by fluorine or chlorine), or represent C_1–c_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which is optionally substituted by fluorine or chlorine), or represent di-(C_1–C_4-alkyl)-aminosulphonyl; or

R^3 represents the radical

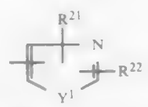
where

R^{19} and R^{20} are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl (which is optionally substituted by fluorine or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine or chlorine), C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which is optionally substituted by fluorine or chlorine), di-(C_1–C_4-alkyl)-amino-sulphonyl, C_1–C_4-alkoxy-carbonyl or dimethylaminocarbonyl, and

A represents oxygen, sulphur or the group N—Z^1 where

Z^1 represents hydrogen, C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C_3–C_6-cycloalkyl, benzyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine or nitro), C_1–C_4-alkylcarbonyl, C_1–C_4-alkoxy-carbonyl or di-(C_1–C_4-alkyl)-aminocarbonyl; or

R^3 represents the radical



where

R^{21} and R^{22} are identical or different and represent hydrogen, C_1–C_4-alkyl, halogen, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy or C_1–C_4-halogenoalkoxy,

Y^1 represents sulphur or the group N—R^{23} where

R^{23} represents hydrogen or C_1–C_4-alkyl; or

R^3 represents the radical

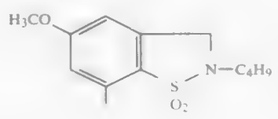
where

R^{24} represents hydrogen, C_1–C_4-alkyl, benzyl, pyridyl, quinolinyl or phenyl,

R^{25} represents hydrogen, halogen, cyano, nitro, C_1–C_4-alkyl (which is optionally substituted by fluorine or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine or chlorine), dioxolanyl or C_1–c_4-alkoxy-carbonyl and

R^{26} represents hydrogen, halogen or C_1–C_4-alkyl; or

R^3 represents



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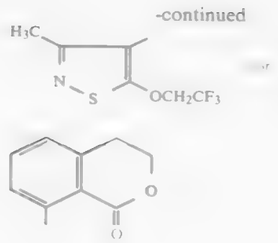


5,149,357

HERBICIDAL SUBSTITUTED BENZOYLSULFONAMIDES

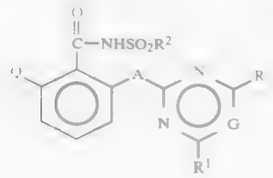
John A. Dixson, Newtown, Pa.; Natesan Murugesan, Lawrenceville, N.J., and Keith D. Barnes, Newtown, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 19, 1990, Ser. No. 540,653

Int. Cl.[5] A01N *43/54*; **C07D** *239/60, 417/10, 413/10*

U.S. Cl. 71—92 **17 Claims**

1. Compound of the formula



in which

A is oxygen, sulfur or NR^3;

G is CH;

R and R^1 are independently alkyl, alkoxy, haloalkoxy or alkylamino;

R^2 is phenyl, substituted phenyl, alkyl, cycloalkyl, haloalkyl or $—CH_2[(R^4)C(R^5)]_n—Z$;

R^4 and R^5 are independently hydrogen, alkyl, or halogen;

Z is cyano, amino, alkylamino, dialkylamino, $—NHCO_2$alkyl, alkoxy, alkylthio, alkylsulfonyl, alkenyl, alkynyl, phenyl or substituted phenyl;

n is 0 to 5;

Q is hydrogen, halogen, alkyl, alkoxy, haloalkoxy, nitro, amino, haloalkyl, alkylthio, alkylsulfonyl, phenyl, substituted phenyl, phenoxy or substituted phenoxy, or a 5- or 6-membered aromatic heterocycle selected from thiophene, furan, pyrrole, pyrazole, isoxazole, isothiazole, imidazole, oxazole, thiazole, oxadiazole, thiadiazole, triazole, tetrazole, pyridine, pyrimidine, pyrazine, pyridazine and triazine; and

R^3 is hydrogen, alkyl, $—C(O)NH_2$ or —C(O)alkyl;

wherein any alkyl, alkynyl, or alkenyl moiety including the hydrocarbon moiety of any alkoxy group has less than 6 carbon atoms; any cycloalkyl group has from 3 to 7 carbon atoms; and substituted phenoxy and substituted phenyl substituents are halogen, lower alkyl, lower alkoxy, nitro, amino, lower haloalkyl, lower haloalkoxy, lower alkylthio, lower alkylsulfonyl, lower alkenyl, lower alkynyl, lower alkenyloxy or lower alkynyloxy, or two substituents taken together to form a C_1–C_3 alkylenedioxy heterocyclic ring.

5,149,358

HERBICIDAL COMBINATION BASED ON BROMOXYNIL ALKANOATES AND 2-[[(4,6-DIMETHOXYPYRIMIDIN-2-YL)AMINOCARBONYL]AMINO-SULFONYL]-N,N-DIMETHYL-3-PYRIDINE CARBOXAMIDE

Thierry Bernard, Dardilly, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

PCT No. PCT/FR90/00401, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO90/15535, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 7, 1990, Ser. No. 646,646

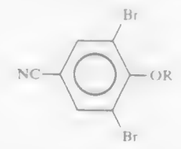
Claims priority, application France, Jun. 13, 1989, 89 08154

Int. Cl.[5] A01N *43/40, 43/54, 47/30, 37/34*

U.S. Cl. 71—92 **29 Claims**

1. A herbicidal composition comprising a synergistic herbicidally effective amount of:

(a) at least one compound of the formula



wherein R' is a C_2–C_{10} alkylcarbonyl group; and

(b) 2-[[(4,6-dimethoxypyrimidin-2-yl)aminocarbonyl-]aminosulphonyl]-N,N-dimethyl-3-pyridinecarboxamide).

5,149,359

DERIVATIVES FROM 3,4-DEHYDRO-PIPERIDIN-5-ONE EXHIBITING A HERBICIDAL ACTIVITY

Giovanni Camaggi, Novara; Giovanni Meazza, Saronno, and Ciro Preziuso, Opera, all of Italy, assignors to Agrimont S.p.A., Milan, Italy

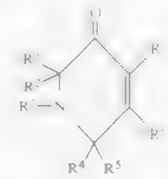
Filed Feb. 21, 1990, Ser. No. 482,720

Claims priority, application Italy, Feb. 21, 1989, 19498 A/89

Int. Cl.[5] A01N *43/40*; **C07D** *211/86*

U.S. Cl. 71—94 **23 Claims**

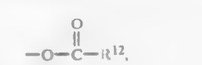
1. A compound represented by the formula:



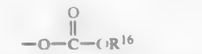
wherein R is —CO—R^7,

or —NH—COR^{10}; wherein R^7 and R^9, which are the same or different, are C_1–C_6 alkyl, cycloalkyl, naphthyl, or phenyl which is unsubstituted or substituted by halogen, —CN, $—NO_2$, $—CH_3$, $—SOCH_3$, $—OCH_3$, or $—CF_3$; R^8 is C_1–C_6 alkyl which is unsubstituted or substituted by 1–4 C_2–C_6 alkynyl which is unsubstituted or substituted by 1–4 halogen, C_2–C_6 alkenyl which is unsubstituted or substituted by 1–4 halogens, C_3–C_6 alkynyl, C_3–C_7 cycloalkyl, C_7–C_{20} aralkyl or phenyl which is unsubstituted or substituted by halogen, —CN, $—NO_2$, $—CH_3$, or $—CF_3$; R^{10} is phenyl which is unsubstituted or substituted by halogen, —CN, $—NO_2$, $—CH_3$, $—OCH_3$ or $—CF_3$; R^2, R^3, R^4 and R^5, which are the same or

different, are hydrogen, or C_1–C_3 alkyl which is unsubstituted or substituted by 1–4 halogen; R^6 is —OR^{11},



—$S(O)_m$—R^{13}, —$NR^{14}R^{15}$, halogen,



or —O—$S(O)_q$—R^{17}; wherein R^{11} is hydrogen, alkali metal or alkaline earth metal; R^{12} and R^{13}, which are the same or different, are C_1–C_6 alkyl which is unsubstituted or substituted by 1–4 halogen; C_3–C_6 cycloalkyl; C_7–C_{20} aralkyl, or phenyl which is unsubstituted or substituted by halogen, —CN, —NO_2, —CH_3,—OCH_3, —CF_3 or dialkylamino; m and q, which are the same or different, are 0, 1 or 2; R^{14} and R^{15}, which are the same or different, are hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy;

R^{16} is C_1–C_6 alkyl, C_2–C_6 alkenyl, C_7–C_{20} aralkyl or phenyl which is unsubstituted or substituted by halogen, —NO_2, —CN, —CF_3, —CH_3 or —OCH_3; R^{17} is C_1–C_6 alkyl or phenyl which is unsubstituted or substituted by halogen, —NO_2, —CN, —CF_3, or —OCH_3;

R^1 is phenyl which is unsubstituted or substituted by halogen, —NO_2, —CN, —CF_3, C_7–C_{20} alkyl; C_7–C_{20} aralkyl; C_3–C_7 cycloalkyl or —OR^{18}; wherein R^{18} is C_1–C_{10} alkyl, phenyl which is unsubstituted or substituted by halogen, —NO_2 or —CN, C_7–C_{20} aralkyl which is unsubstituted or substituted by halogen;

wherein X is selected from the group consisting of O and S, and Y is phenyl which is unsubstituted or substituted by halogen, —NO_2, —CN, —CF_3, aryloxy or arylamino; C_3–C_6 cycloalkyl; C_1–C_8 alkyl unsubstituted or substituted by 1–11 halogen; —R^{19}—X^1—R^{20}; —X—R^{21}; —R^{22}—X^1—R^{23}—X^2—R^{24}; —$NR^{25}R^{26}$; wherein R^{19} is C_1–C_{16} alkyl or aralkyl; R^{20} is C_1–C_{16} alkyl which is unsubstituted or substituted by 1–6 halogen, C_3–C_6 alkenyl, C_3–C_6 alkynyl, C_3–C_7 cycloalkyl, phenyl, or C_7–C_{13} phenylalkyl; R^{21} is C_1–C_{16} alkyl unsubstituted or substituted by 1–6 halogen, C_3–C_8 alkenyl, C_3–C_6 alkynyl, C_3–C_7 cycloalkyl, aralkyl, phenyl, —R^{19}—X^1—R^{20}; R^{22}, R^{23} and R^{24}, same or different are C_1–C_{16} alkyl; R^{25} and R^{26}, same or different, are hydrogen, C_1–C_{16} alkyl, C_1–C_6 alkoxy, phenyl which is unsubstituted or substituted by halogen, —NO_2, —CN, CF_3, —OCF_3, —SO_2—phenyl, or —CO—phenyl; and X^1 and X^2, are the same or different, and are selected from the group consisting of O, S, So and SO_2 aryl is defined as phenyl or naphthyl.

5,149,360

LIQUID LAYDOWN PROCESS AND METAL FILTER

Paul C. Koehler; Stephen A. Geibel, and Michael B. Whitlock, all of Cortland, N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 598,954, Oct. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,409, Mar. 8, 1990, abandoned, which is a continuation of Ser. No. 386,123, Jul. 28, 1989, abandoned. This application Feb. 18, 1992, Ser. No. 836,311

Int. Cl.[5] **G21F** *1/00*

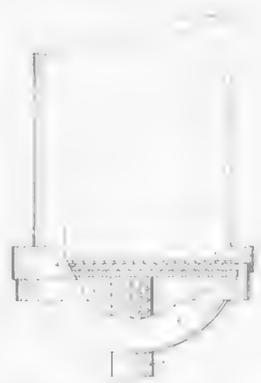
U.S. Cl. 75—228 **33 Claims**

1. A method of making a porous metal filter sheet which comprises:

(a) forming a stabilized suspension of a metal particulate in a liquid medium;

(b) pressure filtering the stabilized suspension through a screen that is fine enough to retain substantially all of the particles so as to form a wet cake;

(c) removing liquid from said wet cake to provide a dried cake with green strength; and



(d) sintering the dried cake to fuse the metal particles and remove all volatile material.

5,149,361

CERMET ALLOY

Yusuke Iyori, Fukaya, and Nobuhiko Shima, Narita, both of Japan, assignors to Hitachi, Ltd., Chiyoda and Hitachi Taga Engineering Co., Ltd., Koto, both of, Japan

Filed Dec. 26, 1989, Ser. No. 457,172

Claims priority, application Japan, Dec. 27, 1988, 63-330570

Int. Cl.[5] **C22C** *29/12, 29/02, 29/06, 29/14*

U.S. Cl. 75—233 **3 Claims**

1. A cermet alloy having a structure including a hard phase and a bonding phase which is comprised of at least one of iron group metals of the periodic table, said bonding phase containing fine hard grains of a mean grain size not greater than 2000 Å dispersed therein; wherein said fine hard grains are made up of at least one grain selected from the group consisting of ZrN, ZrCN, HfC, Al_2O_3, Y_2O_3, Dy_2O_3, ZrO_2 and Nd_2O_3.

5,149,362

CONTACT FORMING MATERIAL FOR A VACUUM INTERRUPTER

Tsutomu Okutomi, Yokohama; Atsushi Yamamoto, Fuchu; Seishi Chiba, Yokohama; Tsuneyo Seki, Fuchu; Mikio Okawa, Tama; Mitsutaka Honma, Tokorozawa; Kiyofumi Otobe, Hachioji; Yoshinari Satoh, Tokyo, and Tadaaki Sekiguchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 28, 1989, Ser. No. 386,264

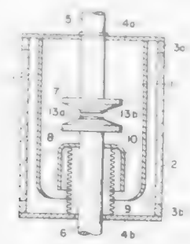
Claims priority, application Japan, Aug. 19, 1988, 63-205965

Int. Cl.[5] **C22C** *29/08*

U.S. Cl. 75—240 **9 Claims**

1. An Ag-Cu-WC contact forming material for a vacuum

interrupter comprising a highly conductive component comprising Ag and Cu and an arc-proof component consisting essentially of WC wherein the content of said highly conductive component is such that the total amount of Ag and Cu-(Ag+Cu) is from 25% to 65% by weight and the percentage of Ag based on the total amount of Ag and Cu[Ag/(Ag+Cu)] is from 40% to 80% by weight; wherein the content of said arc-proof component is from 35% to 75% by weight; wherein



the total amount of Cu is at least about 5% by weight; wherein the structure of said highly conductive component comprises a matrix and a discontinuous phase, said discontinuous phase having a thickness or width of no more than 5 micrometers and being finely and uniformly dispersed in said matrix at an interval of no more than 5 micrometers; and wherein said arc-proof component comprises a discontinuous grain of having a grain size of no more than 1 micrometer.

5,149,363

PROCESS FOR SMELTING OR MELTING FERROUS OR NON-FERROUS METAL FROM SELF-REDUCING AGGLOMERATES OR METAL

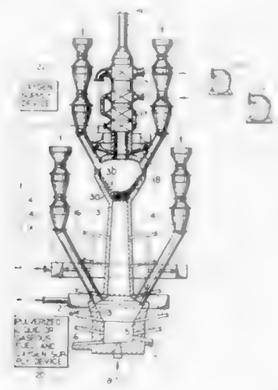
Marcos A. Contrucci, Caminho Do Sertao s/n°, Alto Da Boa Vista, Rio de Janeiro; Henrique P. Rizzo, Rua Thomaz Carvalhal, 855 Apto. 12, Paraiso, Sao Paulo; Herbert Schwarz, Rua Jaragua, 295 Joinville; Pedro H. C. Costa, Rua Joao Theiss, 72 Joinville; Enrique L. Gonzales, Rua Raul Pompeia, 131 Apto. 107, Copacabana, Rio de Janeiro; Pedro V. Duran, Rua Austergildo De Menezes, 104 Joinville; Norberto Jacomini, Rua Assis Brazil, 160 Joinville, and Adalberto B. de Souza Santos, Rua Parana, 290 7° Andar Apto., 701 Joinville, all of Brazil

Continuation-in-part of Ser. No. 167,143, filed as PCT/BR86/00020, Oct. 28, 1986, abandoned. This application Jan. 5, 1989, Ser. No. 293,697

Claims priority, application Brazil, Oct. 13, 1986, PI8605001

Int. Cl.[5] **C22B** *5/00, 9/16*

U.S. Cl. 75—414 **16 Claims**



1. A process for melting metal, comprising:

providing longitudinally hollow shaft having a top at one longitudinal end and a bottom at an opposite longitudinal end;

receiving a burden of only metal in burden-receiving means in the shaft between the top and bottom of the shaft;

feeding solid fuel into a hearth at the bottom of the shaft;

burning at least the solid fuel in the hearth for producing hot combustion gases including CO that rise in the shaft from the bottom of the shaft toward the top of the shaft, whereby to heat the burden;

providing at least air to the hearth for the burning in the hearth with first tuyere means;

providing sufficient air with second tuyere means to the hot combustion gases rising in the shaft to the burden-receiving means that an atmosphere in the burden-receiving means is at least substantially non-reducing means, whereby at least most of the CO combustion gas from the hearth burns for additionally heating and melting the burden into molten metal and slag;

receiving hot gases from the shaft in chimney means at the top of the shaft; and

removing from the hearth the molten metal and slag that run down the shaft and into the hearth from the burden.

5,149,364

DESULFURIZATION AGENT

Donald B. Craig, Grand Island; Thomas K. McCluhan, No. Tonawanda, and Robert H. Kaiser, Youngstown, all of N.Y., assignors to Elkem Metals Company, Pittsburgh, Pa.

Division of Ser. No. 493,301, Mar. 14, 1990, Pat. No. 5,078,784. This application Jul. 26, 1991, Ser. No. 737,554

Int. Cl.[5] **C21C** *7/064;* **C22B** *1/24*

U.S. Cl. 75—566 **17 Claims**

1. A method for making a desulfurization agent for an iron melt comprising the steps of: forming a mixture of about 60% to about 90% by weight particulate commercial calcium carbide and about 5% to about 25% by weight particulate silicon dioxide; compacting said mixture; and granulating the compacted mixture to form a particulate uniform mixture of commercial calcium carbide and silicon dioxide.

5,149,365

DIORGANOTIN COMPOUNDS, AND AGENTS WHICH HAVE A BACTERICIDAL AND FUNGICIDAL ACTION AND CONTAIN THESE COMPOUNDS

Horst Landsiedel, Unna, and Hans Plum, Hamm-Heessen, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Bergkamen, Fed. Rep. of Germany

PCT No. PCT/EP89/00704, § 371 Date Jan. 22, 1991, § 102(e) Date Jan. 22, 1991, PCT Pub. No. WO90/01033, PCT Pub. Date Feb. 8, 1990

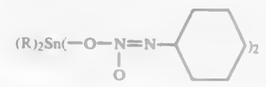
PCT Filed Jun. 22, 1989, Ser. No. 640,406

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824807

Int. Cl.[5] **C09D** *5/14;* **C01G** *19/00*

U.S. Cl. 106—18.32 **8 Claims**

1. The reaction product of a dialkyltin compound with N-cyclohexyl-N'-hydroxydiazenium oxide, said reaction product having the general formula



wherein each R, which may be the same or different, is an alkyl radical having 1 to 12 carbon atoms.

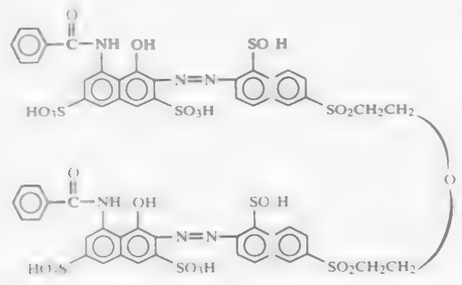
5,149,365

DISAZO COMPOUND AND INK COMPOSITION CONTAINING THE SAME

Hideo Kawashita; Mituhiro Ohta, and Kazuya Ogino, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited and Taoka Chemical Company, both of Osaka, Japan

Filed Oct. 9, 1991, Ser. No. 773,501
Claims priority, application Japan, Oct. 18, 1990, 2-281297
Int. Cl.[5] C09D *11/02* C07C *245/08*
U.S. Cl. 106—22 7 Claims

1. A disazo compound represented by the following formula (I) or salt thereof,



(I)

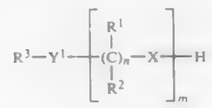
5,149,367

PRINTING INKS

Knud Reuter, Krefeld, and Thomas Scholl, Meerbusch, both of Fed. Rep. of Germany, assignors to Bayer Aktiengelselschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1991, Ser. No. 707,494
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1990, 4018182
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 7 Claims

1. Offset printing inks comprising (1) a vehicle, (2) a colorant, and (3) an additive compound, said additive compound being in the offset printing ink in an amount effective to substantially prevent undesirable build-up of the offset printing ink during offset printing, and said additive compound having the formula (A)

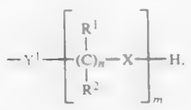


(A)

in which

R^1 and R^2 independently of one another and independently of each recurring unit, denote H, C_{1-24}-alkyl, aryl or C_{1-24}-alkaryl,

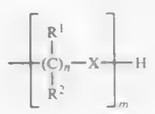
R^3 denotes H, C_{1-24}-alkyl, aryl, C_{1-24}-alkaryl—where R^3 can, if desired carry 1–3 further substituents from the series comprising—O—R^1, —NR^1R^2 or radicals



Y^1 denotes O, S, NR^1,

X, independently of each recurring unit, denotes O, S,

where R^4 is H, C_{1-24}-alkyl, aryl, C_{1-24}-alkyl-aryl or



n denotes an integer from 2–4 and
m denotes an integer from 3–450.

5,149,368

RESORBABLE BIOACTIVE CALCIUM PHOSPHATE CEMENT

Sung-Tsuen Liu, 29 Landing, Laguna Niguel, Calif. 92677, and Harvey H. Chung, 43 Via Costa Verde, Rancho Palos Verdes, Calif. 90274

Filed Jan. 10, 1991, Ser. No. 639,536
Int. Cl.[5] C09K *3/00*
U.S. Cl. 424—602 14 Claims

1. A cementitious paste for orthopaedic, dental and maxillofacial applications comprising:

a cementing powder of tetracalcium phosphate;

a setting reagent consisting essentially of an acidic citrate, wherein the weight ratio of cementing powder to setting reagent lies between 2:1 and 15:1; and

sufficient water to form said paste, and which paste, after setting has a pH greater than 5.

5,149,369

BISMUTH OXYCHLORIDE NACREOUS PIGMENT HAVING IMPROVED WEATHER FASTNESS AND THE PRODUCTION THEREOF

Robert E. Eberts, Mahopac; Robert M. Juby, II, Cold Spring, and Michael T. Venturini, II, Peekskill, all of N.Y., assignors to Mearl Corporation, Ossining, N.Y.

Continuation of Ser. No. 654,292, Feb. 8, 1991, abandoned. This application Jan. 6, 1992, Ser. No. 818,415
Int. Cl.[5] C09C *1/00;* C04B *20/10*
U.S. Cl. 106—479 20 Claims

1. A pearlescent pigment composition, consisting essentially of bismuth oxychloride crystals coated with a cerium compound, the cerium compound being present in an amount effective to improve weather fastness of said pigment.

5,149,370

WELL CEMENT COMPOSITIONS HAVING IMPROVED PROPERTIES AND METHODS

Stein Olaussen, Hafrsfjord; Audun Bjordal, Esbjerg, and Geir Solland, Sandnes, all of Norway, assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 21, 1991, Ser. No. 779,673
Int. Cl.[5] C04B *9/12, 7/00, 40/00*
U.S. Cl. 106—737 19 Claims

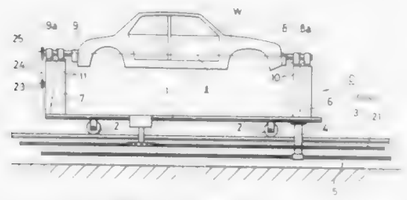
1. An improved well cement composition comprising water in an amount sufficient to form a pumpable slurry, hydraulic cement and an aqueous colloidal silicic acid suspension wherein the colloidal silicic acid particles in the suspension have a specific surface area in the range of from about 50 m^2/g to about 1000 m^2/g, said colloidal silicic acid suspension being present in said composition in an amount in the range of from about 1% to about 30% by weight of dry cement therein.

5,149,371

CONVEYING SYSTEM

Makoto Tateuchi, and Kentaro Ozue, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 25, 1991, Ser. No. 673,999
Claims priority, application Japan, Mar. 30, 1990, 2-34358[U]
Int. Cl.[5] B05C *13/02*
U.S. Cl. 118—56 40 Claims



1. A conveying system comprising:

a conveying carriage so disposed as to run on and along a predetermined conveying passageway, which has a support unit including a means for rotatably supporting a substrate and a locking mechanism for suspending rotation of the substrate;

and a rotation-suspending station so disposed in a predetermined position of the predetermined conveying passageway as to suspend the rotation of the substrate in its predetermined rotary position;

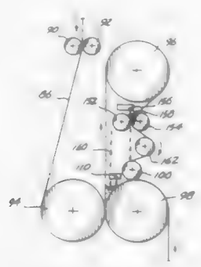
wherein the rotation-suspending station has means acting upon the means for rotatably supporting the substrate which are structured and arranged on the conveying carriage for suspending rotation of the substrate; rotary-position detecting means for detecting the predetermined rotary position of the substrate; and locking means for operating the locking mechanism when the predetermined rotary position of the substrate is detected by the rotary-position detecting means.

5,149,372

MULTIPLE ROLL IMPREGNATOR

Frank E. Ives, Kent, Wash., assignor to PMC, Inc, Sun Valley, Calif.

Filed Feb. 27, 1990, Ser. No. 485,441
Int. Cl.[5] B05C *3/02*
U.S. Cl. 118—412 5 Claims



1. An apparatus for impregnating a strip of woven or non-woven fabric with viscous liquid comprising:

means for holding a roll of said fabric;

first roll means for receiving said fabric from said roll;

a second roll for receiving said fabric from said first roll means;

a third roll positioned above said second roll to receive fabric from said second roll after the fabric has wrapped part way around said second roll;

a fourth roll positioned beside said second roll and below said third roll for receiving fabric from said third roll after the fabric has wrapped part way around said third roll, said fourth roll and said second roll intimately engaging said fabric as it extends between said fourth and second rolls;

a fifth roll, positioned above said second roll and said fourth roll, for holding said fabric between said fourth roll and said fifth roll, the fabric thereafter leaving said fourth roll on the side opposite from said second roll;

means for rotating at least said first roll means and said fourth roll;

means for introducing said viscous liquid into the space between the fabric and the fourth roll so that the fabric picks up liquid as it travels upwardly from said second roll towards said third roll, wherein said viscous fluid is forced into said fabric as said fabric passes over said third roll, and said fifth roll is positioned relative to said fourth roll to squeeze excess viscous liquid from said fabric, said excess viscous liquid flowing over said fourth roll to return to the space between said fabric and said fourth roll;

sixth and seventh rolls positioned below said third roll and above said fourth and fifth rolls for receiving fabric from said third roll, said sixth and seventh rolls engaging the fabric therebetween, said sixth roll being positioned between the fabric extending toward said third roll and the fabric extending away from said third roll; and

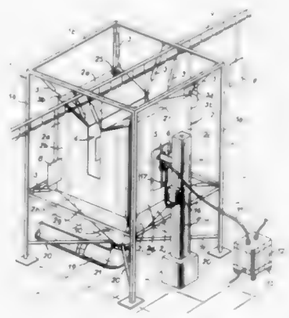
means for introducing a viscous liquid between said fabric and said sixth roll, the sixth and seventh rolls being positioned such that excess viscous liquid from between said fabric and said sixth roll flows into the space between said fabric and said fourth roll.

5,149,373

INSTALLATION FOR APPLYING A COATING PRODUCT

Michel Gondrand, Vizille, France, assignor to Sames S.A., Meylan, France

Filed Dec. 19, 1989, Ser. No. 453,817
Claims priority, application France, Dec. 21, 1988, 88 16912
Int. Cl.[5] B05B *15/12*
U.S. Cl. 118—634 21 Claims



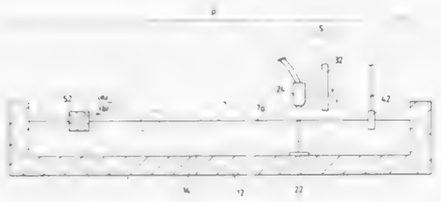
18. Installation for applying a coating product comprising a fixed framework and a plurality of enclosures each adapted to be individually placed in said framework each said enclosure being composed of top, bottom and side walls enclosing a product coating region; attachment means detachably securing a selected one of said enclosures to, and within, said framework; and coating product delivery apparatus including spraying means for spraying the coating product onto objects in said enclosure, wherein said flexible material is electrically insulative.

5,149,37[illegible]

DEVICE FOR FORM NG LB FILM

Toshiyuki Miyadera; Makoto Okan›, and Fumio Matsui, all of Saitama, Japan, assignors to Pi neer Electric Corporation, Tokyo, Japan

Filed Nov. 6, 1990, Se . No. 609,554
Claims priority, application Japa , Apr. 24, 1990, 2-108321
Int. Cl.[5] B05C *3/09*, B05D *1/20*
U.S. Cl. 118—691 5 Claims



1. A device for forming an LB film, comprising:

a packing unit for moving a ba rier to compress a sample spreading over a surface of a s ubphase liquid reserved in a water tank; and

a taking unit operatively connec ed to said water tank so as to transfer a monomolecular ilm formed on said sample which has been orientation-packed with the packing unit to a substrate plate;

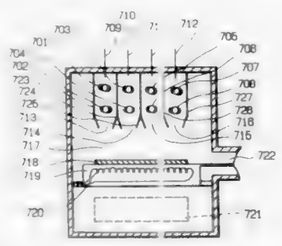
said packing unit comprising a p cking control device operatively connected to said ba rier, said packing control device moving said barrier u der the control thereof to compress said sample until sai sample spreading over said surface of said subphase liqu l has a predetermined film pressure, said packing contr l device further having a detector for measuring an op ical absorbance of the thus compressed sample when the predetermined film pressure is reached, wherein the barrie is moved under the control of the packing control device in response to said detector until a predetermined value o optical absorbance of said film is reached.

5,149,375

APPARATUS FOR FORMING A DEPOSITED FILM OF LARGE AREA WITH THE USE OF A PLURALITY OF ACTIVATED GASES SEPARATELY FORMED

Jinsho Matsuyama, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 550,19 , Jul. 10, 1990, which is a division of Ser. No. 376,869, Jul. 7 1989. This application May 28, 1991, Ser. N . 707,943
Claims priority, application Jap n, Jul. 14, 1988, 63-173758; Jul. 14, 1988, 63-173759; Jul. 14, 988, 63-173760
Int. Cl.[5] C23C *16/48*, *16/50*
U.S. Cl. 118—719 2 Claims



1. An apparatus for forming a functional deposited film on the surface of a substrate by way of plasma reaction among activated gases formed separately from at least two film-forming raw material gases, said apparatus comprising:

(a) a film-forming chamber having a substrate holder provided with means for heating said substrate disposed on the surface of said substrate holder; and

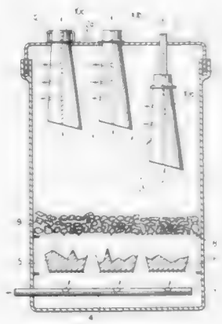
(b) at least two activation chambers, each said activation chamber being provided with (i) means for supplying a film-forming raw material gas thereinto; (ii) means for decomposing said film-forming raw material gas; (iii) a filament made of a metallic material capable of exhibiting a catalytic effect to activate said film-forming raw material gas into a plasma state upon application of an electric power thereto, the activated gases being transported in a direction perpendicular to the direction of the longer axis of said filament; and (iv) a gas introduction port for introducing the activated gaseous material into said film-forming chamber, each said gas introduction port having (iv-a) an opening near t he surface of said substrate; (iv-b) a rectangular or elliptic shape with the length of the longer axis being at least twice the length of the shorter axis and (iv-c) a position parallel to each other at a distance less than the length of the shorter axis.

5,149,376

PROCESS AND APPARATUS FOR THE SIMULTANEOUS DEPOSITION OF A PROTECTIVE COATING ON INTERNAL AND EXTERNAL SURFACES OF HEAT-RESISTANT ALLOY PARTS

Jean-Paul Fournes, Milly la Foret, and René J. Morbioli, Corbeil, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Division of Ser. No. 372,889, Jun. 29, 1989, Pat. No. 5,068,127. This application Sep. 20, 1991, Ser. No. 763,220
Claims priority, application France, Jun. 30, 1988, 88 08801
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—719 2 Claims



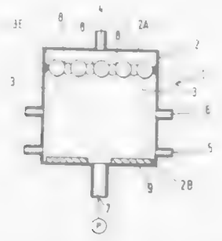
1. Apparatus for use in a process for the simultaneous deposition of a protective coating on both external and internal surfaces of at least one heat-resistant alloy part, said apparatus comprising a box for placement in an enclosure containing a protective gas, a distributor pipe at the bottom of said box and adapted to be connected to means for supplying a controlled flow of a carrier gas into said box, a first supporting grid disposed in said box above said distributor pipe, said first grid carrying chromium fluoride F_3Cr powder, and a second supporting grid disposed in said box above said first grid, said second grid carrying a donor of the metal to be deposited on said at least one part, said at least one part to be coated being disposed at the top of said box such that outlet openings from said internal surfaces are oriented towards receiving gases which, in use, circulate in said box.

5,149,377

COATING APPARATUS

Hilmar Esrom, Heidelberg, Fed. Rep. of Germany, and Ulrich Kogelschatz, Hausen, Switzerland, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Jun. 15, 1990, Ser. No. 538,829
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 3919538
Int. Cl.[5] C23C *16/48*
U.S. Cl. 118—722 7 Claims



1. Apparatus for coating a substrate having a surface, comprising a reactor vessel having an upper surface, side walls and a lower surface, a UV radiation source disposed in said reactor vessel, said UV radiation source including electrodes in the form of elongated hollow bodies having mutually parallel longitudinal axes disposed in a plane parallel to and substantially between 2 and 4 cm spaced apart from said upper surface of said reactor vessel, each two adjacent electrodes defining a gap therebetween having a width substantially between 0.1 and 10 mm, and a feed line disposed in said upper surface of said reactor vessel for emitting a gas selected from the group consisting of Ar_2, Kr_2, and Xe_2 to be introduced into said gaps, each two adjacent electrodes being connected to a high alternating voltage for feeding a power of substantially 50 watts to said UV radiation source and generating a quiet discharge in said gaps emitting UV radiation having a wavelength of substantially between 90nm and 170nm, feed lines for feeding a process gas disposed in said side walls of said vessel extending tangentially to the surface of the substrate and spaced apart therefrom by at least 2cm, and at least one feed line for a blanketing gas centrally disposed in one of said side walls, and at least one drain centrally disposed in said lower surface of said vessel for draining gases introduced into said reactor vessel, and a pump connected to said drain for exhausting gas.

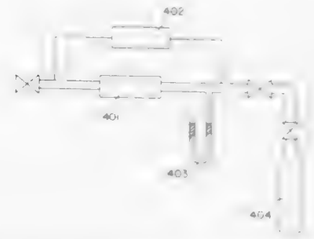
5,149,378

TUNGSTEN FILM FORMING APPARATUS

Tadahiro Ohmi, Sendai; Nobuhiro Miki, Osaka; Matagoroh Maeno, Izumi, and Hirohisa Kikuyama, Nara, all of Japan, assignors to Hashimoto Kasei Kabushiki-Kaisya, Osaka, Japan

PCT No. PCT/JP90/00456, § 371 Date Nov. 21, 1990, § 102(e) Date Nov. 21, 1990, PCT Pub. No. WO90/12418, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 4, 1990, Ser. No. 613,730
Claims priority, application Japan, Apr. 10, 1989, 1-090226
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—725 20 Claims

1. A tungsten film forming apparatus comprising a reaction chamber, means for introducing WF_6 gas to said reaction chamber and including a container of WF_6 gas, and means for introducing H_2 gas to said reaction chamber and including a container of H_2 gas, wherein at least the portion of said reaction chamber which is to be in contact with WF_6 is made of a metal material having a fluorinated passivation film comprising a substantially stoichiometric metal fluoride on the surface.

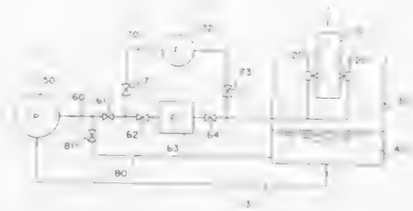


5,149,379

METHOD OF CLEANING DRUMS

Masaru Gotoh, Nara, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 25, 1990, Ser. No. 603,117
Claims priority, application Japan, Oct. 31, 1989, 1-285866
Int. Cl.[5] B08B *1/04*, *3/02*, *3/06*
U.S. Cl. 134—10 3 Claims



1. A method of cleaning a drum by spraying a cleaning fluid on the outer circumferential surface of said drum to clean thereon, wherein the cleaning fluid is pumped out from a pump under a prescribed pressure and flows selectively through a primary fluid passage provided with a primary filter having a relatively coarse porous structure or through a secondary fluid passage provided with a finishing filter having a relatively fine porous structure so as to remove from the cleaning fluid foreign matter which is bigger than or equal to a prescribed size finally to be supplied to a plurality of nozzles for spraying therefrom, comprising the steps of:

sending a cleaning fluid at the prescribed pressure pumped out from the pump to the primary fluid passage;

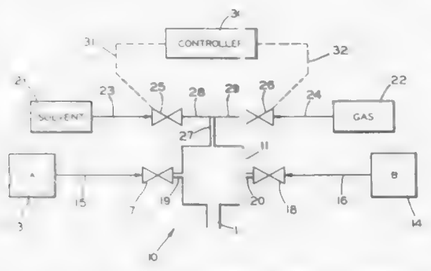
passing the cleaning fluid at the prescribed pressure through the primary filter so as to clean the outer circumferential surface of said drum by spraying the cleaning fluid thereon through the plurality of nozzles;

sending a cleaning fluid pumped out from the pump to the secondary fluid passage and at the same time preventing part of the cleaning fluid from flowing therethrough; and

passing part of the cleaning fluid at the prescribed pressure through the finishing filter so as to clean the outer circumferential surface of said drum by spraying the cleaning fluid thereon through the plurality of nozzles; and

said primary filter having a porous filter structure such that particles having a size greater than about 10 μm are filtered out of the cleaning fluid, such that the cleaning fluid passing through said primary filter at a relatively high pressure of about 50 kg/cm^2 does not lose most of the pressure thereof in passing through said primary filter.

5,149,380
PURGING PROCESS FOR MULTICOMPONENT REACTIVE LIQUID DISPENSING DEVICE
Fredric H. Decker, 3423 S.E. Jefferson St., Stuart, Fla. 34997
Continuation of Ser. No. 304,729, Jan. 31, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,984
Int. Cl.[5] B08B *3/02, 5/02*
U.S. Cl. 134—22.13 14 Claims



7. A process for removing residual reaction products from the mixing chamber, liquid reactant injection ports, and dispensing pathway of a multicomponent reactive liquid dispensing device, comprising the steps of:

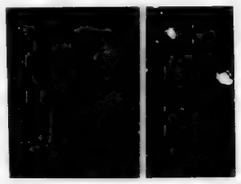
A) purging the residual reaction products, by performing at least two consecutive cycles of the sequential steps of:

i) injecting a liquid solvent into the mixing chamber and inertially impacting the reaction product residue with the liquid solvent mass for about 0.1 seconds to about 5 seconds; and

ii) injecting a pressurized gas into the mixing chamber, beginning substantially simultaneously with the completion of the injection of liquid solvent in step i and expelling from the chamber impacted reaction product residue, solvent and gas for about 0.1 seconds to 10 seconds; and

B) drying the mixing chamber, liquid reactant injection ports, and dispensing pathway, by injecting pressurized gas for about 1 second to 30 seconds into the mixing chamber.

5,149,381
METHOD OF MAKING A COMPOSITE POWDER COMPRISING NANOCRYSTALLITES EMBEDDED IN AN AMORPHOUS PHASE
Hans Grewe, Grefrath-Vinkrath, and Wolfgang Schlump, Essen, both of Fed. Rep. of Germany, assignors to Fried.Krupp GmbH, Essen, Fed. Rep. of Germany
Filed Dec. 5, 1988, Ser. No. 279,646
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741119
Int. Cl.[5] C22C *1/00*
U.S. Cl. 148—513 19 Claims



1. A process for producing a powder, comprising the steps of:

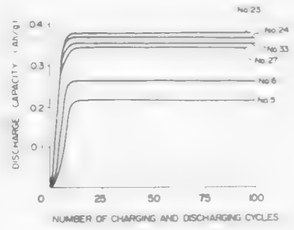
mixing powders of at least two different ceramics, in a ratio adapted to form at least one amorphous phase; and

subjecting the mixed powders to mechanical stresses of at least 12 G in a neutral or reducing atmosphere at about 20° C. until there are no crystallites larger than about 10 nm as determined by transmission electron microscopy, to produce powder particles having unreactive exterior surfaces and comprising at least one amorphous phase in which said crystallites not larger than about 10 nm are embedded.

5,149,382
METHOD OF PRETREATING METAL BY MEANS OF COMPOSITION CONTAINING S-TRIAZINE COMPOUND
Ralph C. Gray, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Division of Ser. No. 426,355, Oct. 25, 1939, abandoned. This application Aug. 23, 1991, Ser. No. 749,237
Int. Cl.[5] C23C *22/82*
U.S. Cl. 148—257 5 Claims

1. A process of pretreating a metal surface which comprises applying to said surface an aqueous composition having a pH of about 3.4 to 6.0 at a temperature of about 30° C. to 80° C., said composition comprising at least 0.01 percent by weight based on the total weight of the composition of a cyanuric acid.

5,149,383
HYDROGEN STORAGE ALLOY ELECTRODE
Hajime Seri, Izumiotsu; Yoshio Moriwaki, Hirakata; Akemi Shintani, Osaka, and Tsutomu Iwaki, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 29, 1991, Ser. No. 677,572
Claims priority, application Japan, Apr. 3, 1990, 2-088540; Jul. 2, 1990, 2-174741
Int. Cl.[5] C22C *22/00*
U.S. Cl. 148—400 8 Claims



1. A hydrogen storage alloy electrode made of a five-membered or six-membered hydrogen storage alloy or a hydride thereof, the major phase of which is Laves phase of a $C_{15}(MqCu_2)$ type, the formula of said alloy being represented by $Zr_\alpha Mn_\beta M_\gamma Cr_\delta Ni_\epsilon$, wherein M is one or more elements selected from V and Mo; $0.9 \leqq \alpha \leqq 1.1$; $0 \leqq \beta \leqq 0.5$; $0 < \gamma \leqq 0.2$; $0 < \delta \leqq 0.4$; and $1.2 \leqq \epsilon \leqq 1.3$.

5,149,384
PROPELLANT MATERIAL
Frank A. Marion, Glendale, Ariz., assignor to Universal Propulsion Company, Inc., Phoenix, Ariz.
Continuation of Ser. No. 78,569, Jul. 28, 1987, abandoned, which is a continuation of Ser. No. 750,228, Jun. 28, 1985, abandoned, which is a continuation of Ser. No. 547,854, Nov. 2, 1983, abandoned. This application Mar. 5, 1990, Ser. No. 489,288
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.1 49 Claims

1. A propellant, consisting of:

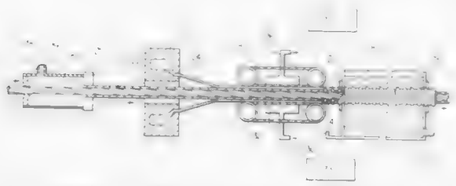
a binder/reducing agent having hydrocarbyl linkages including —CH_2—,

a first oxidizing material formed from an inorganic lead oxidizer salt, and

a second oxidizing material containing oxygen and at least one element other than lead,

the first and second oxidizing materials and the binder/reducing agent being provided in relative percentages by weight, and being combustible at temperatures below the temperature of vaporized lead, to obtain a reduction of the first oxidizing material substantially only to lead oxide, (Pbo), and not lead, during the combustion of the propellant at temperatures below the temperature of vaporized lead.

5,149,385
TENDONS FOR PRESTRESSED CONCRETE STRUCTURES AND METHOD OF USING SUCH TENDONS
Makoto Kurauchi, Houston, Tex.; Kiyoshi Hayasaki, Amagasaki, Japan; Toshikazu Minami, Amagasaki, Japan, and Mutsuhiko Ohnishi, Amagasaki, Japan, assignors to Shinko Kosen Kogyo Kabushiki Kaisha, Amagasaki, Japan
Division of Ser. No. 478,704, Feb. 8, 1990, which is a continuation-in-part of Ser. No. 111,197, Oct. 22, 1987, abandoned. This application May 23, 1991, Ser. No. 705,060
Claims priority, application Japan, Dec. 28, 1986, 61-309965
Int. Cl.[5] B32B *31/16;* B29C *47/02*
U.S. Cl. 156—85 1 Claim



1. A process for making a tendon for prestressed concrete structures and for being buried in concrete, which comprises:

coating a wire strand core member with an unset bonding adhesive with a thickness of at least 20 μ wherein said unset bonding adhesive comprises a latent normal temperature settable adhesive;

melt extruding and shrinking a seamless plastic sheath around said coated core member;

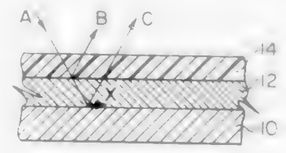
corrugating the plastic sheath with the depth of an indented portion thereof being deeper than the thickness of the plastic forming the sheath; and

rapidly cooling the tendon.

5,149,386
TAMPER-EVIDENT STRUCTURES
Paul Smits; Aron M. Rosenfeld, both of Kingston, Canada, and Howard F. DeFerrari, Louisville, Ky., assignors to Alcan International Limited, Montreal, Canada
Continuation of Ser. No. 295,899, Jan. 11, 1989, which is a division of Ser. No. 83,720, Aug. 10, 1987. This application Dec. 17, 1990, Ser. No. 629,167
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—150 5 Claims

1. A method of making a tamper-evident structure incorporating latent patterns or messages which become visible only upon activation of said structure, which method comprises:

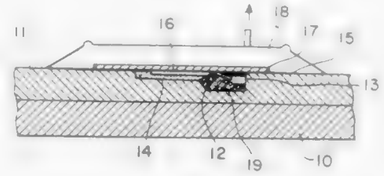
forming a laminate capable of generating a substantially non-dichroic colour by a light interference and absorption phenomenon, consisting of a layer of an anodizable metal of medium light reflectivity and a layer of a metal oxide, by coating limited areas of said metal layer with an adherent mask, thus creating masked areas and unmasked areas on said metal layer, subjecting said masked metal layer to anodization to produce an initial layer of metal oxide on said unmasked areas, said anodization being carried out in the presence of sufficient fluorine ions to make said layer of metal oxide adherent to but detachable from said metal in said unmasked areas, removing said mask, and carrying out further anodization of said metal layer in the absence of fluorine ions in order to form said layer of metal oxide



of said laminate over an entire surface of said metal layer; and

adhering a flexible strip of transparent or translucent material over said laminate in such a manner that the strength of attachment of the flexible strip to the laminate exceeds the adhesive strength between said layers of metal and metal oxide in said unmasked areas.

5,149,387
FLUSH MOUNTING OF THIN FILM SENSORS
Thomas C. Moore, Sr., Poquoson, Va., assignor to Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed May 6, 1991, Ser. No. 699,288
Int. Cl.[5] B29C *65/48*
U.S. Cl. 156—241 10 Claims



1. A process for the flush mounting of a sensor in a recessed area of a surface, which process comprises:

introducing an adhesive bonding mixture into the recessed area, the adhesive bonding mixture providing thermal expansion matching with the surface surrounding the recessed area;

providing a strip of high performance polymeric tape with the sensor to be mounted attached to the underside thereof, the strip of high performance polymeric tape being positioned over and covering the recessed area so that the tape acts as a carrier for the sensor;

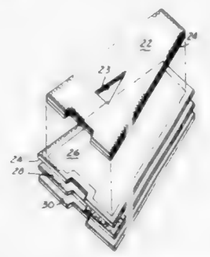
providing a shim having a flexibility so that it will conform to the surface surrounding the recessed area, the shim being positioned over and covering the strip of high performance polymeric tape;

covering the shim with a vacuum pad, curing the adhesive bonding mixture and evacuating the area above the surface while holding the sensor flush with the surface during curing of the adhesive bonding mixture;

after curing of the adhesive bonding mixture, removing the vacuum pad and shim, and peeling the high performance polymeric tape away from the sensor;

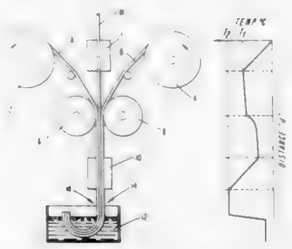
providing electrical connections for the sensor followed by filling remaining space in the recess area with a polymeric foam, then applying the adhesive bonding mixture over the polymeric foam and curing the polymeric foam.

5,149,38
PRE-SEWN LETTER AND METHOD
Ted Stahl, 41612 Clairpointe, Mt. Clemens, Mich. 48043
Continuation of Ser. No. 459,727, filed as PCT/US88/03700, Oct. 2, 1988. This application Feb. 4, 1991, Ser. No. 651,018
Feb. 4, 1991, Ser. No. 651,018
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—250 8 Claims



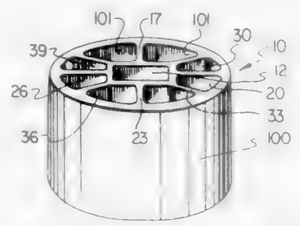
1. A method of producing an embroidered emblem for application by heat to a fabric comprising the steps of:
providing a woven fabric layer
cutting from the woven fabric layer the shape of the emblem to be formed;
sewing a thread about the periphery of the cut-out emblem to form an embroidered emblem; and
applying a thermoplastic adhesive over one surface of the emblem and the sewn thread exposed on such surface.

5,149,389
LAMINATED METAL SHEET
Peter J. Heyes, Oxfordshire; Nicholas J. Middleton, Wiltshire, and Alison M. Brown, Oxfordshire, all of England, assignors to CMB Foodcan plc, Woodside, England
Continuation-in-part of Ser. No. 377,837, Jun. 9, 1989, abandoned. This application Apr. 18, 1990, Ser. No. 512,544
Claims priority, application United Kingdom, Oct. 15, 1987, 8724239
Int. Cl.[5] B32B 31/26
U.S. Cl. 156—272.4 35 Claims



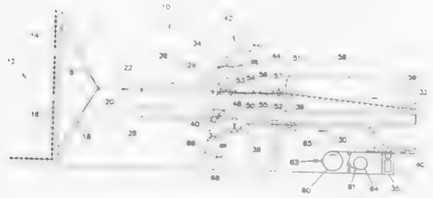
27. A process for preparing a laminated metal sheet having on one or both major surfaces thereof a composite film of a non-crystalline copolyester adhered directly thereto, said copolyester consisting essentially of a copolymer having at least about 60 mole percent of ethylene terephthalate and the remainder being less than about 40 mole percent of copolymerized ester units other than ethylene terephthalate, which process comprises adhering to one or both major surfaces of the metal sheet a composite film or films of said copolyester having a polyester inner layer (A1) and a polyester outer layer (A2), said composite film or films of said copolyester being adhered to the metal sheet by a process which comprises:
(i) heating the metal sheet to a temperature (T1) above the softening point of the polyester inner layer (A1) but below the melting point of the polyester outer layer (A2);
(ii) laminating the film or films to the metal sheet;
(iii) reheating by indirect means the laminate so that the metal sheet reaches a temperature above the melting point of the or each polyester film; and
(iv) after holding at these elevated temperatures, quenching rapidly the polyester coated metal to a temperature below the glass transition points of the polyester coating resins; wherein
(v) the laminating, reheating and quenching conditions are such that the polyester film or films in the metal/polymer laminate is or are converted into non-crystalline or amorphous form.

5,149,390
NON-COLLAPSIBLE TIRE BUILDING DRUM
George W. Beard, and Frank Hamer, both of Gravenhurst, Canada, assignors to Gravenhurst Plastics Ltd., Ontario, Canada
Continuation-in-part of Ser. No. 409,320, Sep. 19, 1989, abandoned. This application Jan. 22, 1991, Ser. No. 644,194
Int. Cl.[5] B29D 30/24
U.S. Cl. 156—414 4 Claims



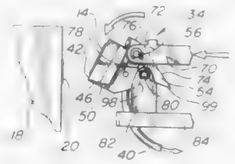
1. A cylindrical tire building drum having two axial ends, said tire building drum consisting of: a non-inflatable, non-collapsible, rigid, non-reactive, vulcanization-resistant, unreinforced, synthetic thermoplastic material shell, said shell being of the same diameter between its two said axial ends and also providing a smooth surface between its two said axial ends, said shell having a) an axially-longitudinally-extending smooth outer circumferential face; b) an axially-longitudinally-extending inner circumferential face; c) a central, axially-longitudinally-extending core of a non-circular cross-section, said core having an inner, axially-longitudinally-extending face, and an outer, axially-longitudinally-extending face, said core being specially adapted for mounting said cylindrical tire building drum on a rotatable, axially-longitudinally-extending shaft of a conventional tire building machine, said core having d) a plurality of integral, fixed-length, rigid, non-movable, radially-outwardly-projecting, axially-longitudinally-extending ribs, said ribs projecting radially between said outer axially-longitudinally-extending face of said central core and said axially-longitudinally-extending inner circumferential face of said shell, each said radially-projecting, axially-longitudinally-extending rib being connected to its associated face of said axially-longitudinally-extending central core and to its associated axially-longitudinally-extending inner circumferential face of said cylindrical tire building drum at thickened area of greater cross-sectional area than the cross-sectional area of the other portions of each said rib at both side faces of each said rib, thereby to provide rugged reinforcement areas; said cylindrical tire building drum having an axially-longitudinally-extending length which varies from about 1 foot to about 20 feet.

5,149,391
PREPREG MACHINE WITH A SINGLE ENDLESS CONVEYOR BELT
Hsin L. Li, Parsippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied-Signal Inc., Morristownship, N.J.
Continuation of Ser. No. 281,585, Dec. 9, 1988, abandoned. This application Jul. 22, 1991, Ser. No. 734,074
Int. Cl.[5] B32B 5/12
U.S. Cl. 156—441 18 Claims



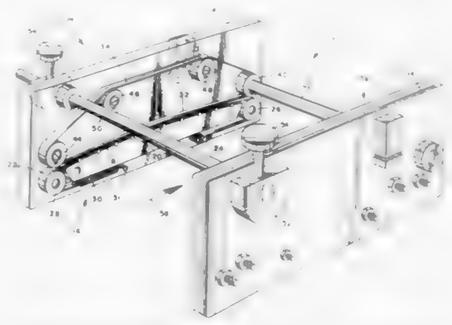
1. An improved prepreg machine of a type in which a fibrous web of unidirectional fiber, the fibrous web having a bottom surface, is supported and advances through a coating station where a matrix composition is deposited on the web and then through an oven, downstream from the coating station, the improvement comprising: only one endless conveyor belt to vertically support the advancing fibrous web directly on a bottom surface of the fibrous web, a pull means comprising at least one set of driven pull rolls, wherein one of said pull rolls is in direct contact with an underside of the endless belt and a second of said pull rolls is in direct contact with the fibrous web to simultaneously exert force directly and longitudinally onto the conveyor belt and the fibrous web to advance the conveyor belt and the fibrous web, and a means to feed a bottom sheet between the fibrous web and the conveyor belt.

5,149,392
APPARATUS FOR APPLYING LABELS TO CONTAINERS
Frederick A. Plaessmann, Edison, N.J., assignor to Seal Spout Corporation, Liberty Corner, N.J.
Continuation of Ser. No. 416,857, Oct. 4, 1989, Pat. No. 5,022,954. This application Oct. 25, 1990, Ser. No. 603,788
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] B65C 9/18, 9/14
U.S. Cl. 156—542 32 Claims



1. An apparatus for sequentially applying a label to a surface of each of a plurality of containers comprising:
an indexing table having means for removably holding a plurality of containers having a surface to which a label is to be applied, the surface aligned in a first planar orientation and sequentially conveying each container to a label applying station;
means for feeding a continuous web to the label applying station, the applying station comprising a label receiving station and an associated cam surface and pivoting means, the web having a plurality of labels removably disposed thereon, each label having a surface with an adhesive thereon;
means for removing a label from the web at the label applying station and depositing the label, adhesive side exposed, on a label receiving station in a second planar orientation;
positioning means acting on the label applying station causing the cam surface to pivot about the pivoting means to thereby position the label receiving station to a position whereby the label is parallel to the surface of the container to which the label is to be applied;
the positioning means extending the applying station by causing the cam surface to ride along the pivoting means to thereby position the label in contact with the surface of the container enabling the adhesive surface to adhere to the container surface; and
means for repositioning and retracting the label receiving station to the second planar orientation to permit the depositing of another label from the web to the label receiving station

5,149,393
EDGE SEALER FOR MULTI-PLY BUSINESS FORMS
Wilbur P. Hutchinson, Mt. Prospect, Ill., and Gerald L. Smith, Dover, N.H., assignors to Moore Business Forms, Inc., Grand Island, N.Y.
Filed Oct. 26, 1989, Ser. No. 426,650
Int. Cl.[5] B30B 5/06, 15/34
U.S. Cl. 156—555 12 Claims



1. Apparatus for heat-sealing the edge of a multi-ply business form having heat-sensitive adhesive applied along an edge thereof comprising:
a frame;
an endless belt carried by said frame;
means for driving said belt;
a guide surface carried by said frame in opposition to a portion of said belt for receiving the edge of the multi-ply business form therebetween;
means carried by said frame for applying heat to the edge passing between said belt portion and said guide surface to activate the heat-sensitive adhesive and secure the plies one to the other; and
a second frame spaced opposite the first mentioned frame, a second endless belt carried by said second frame, means for driving said second belt, a second guide surface carried by said second frame in opposition to a portion of said second belt for receiving therebetween a second edge of the multi-ply business form opposite the first-mentioned edge and which second edge has heat-sensitive adhesive applied thereto, and means for applying heat to the second edge passing between said second belt portion and second guide surface to activate the heat-sensitive adhesive thereto secure the plies of the second edge one to the other.

5,149,394

METHOD AND APPARATUS FOR CONTINUOUSLY FABRICATING LAMINATES

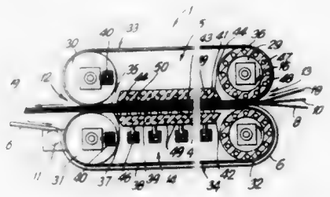
Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Continuation of Ser. No. 584,468, Sep. 18, 1990, which is a division of Ser. No. 420,028, Oct. 11, 1989. This application Feb. 24, 1992, Ser. No. 840,568

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 3834993

Int. Cl.[5] B30B *5/02, 15/34*

U.S. Cl. 156—555 12 Claims



1. Apparatus for continuously fabricating laminate formed of several layer of resin-impregnated material webs by pressure molding the layers together comprising means for supplying material webs with at least one web being free of resin, means for impregnating the at least one web with a resin hardenable by at least one of heating cooling and chemical reaction, means for combining the material webs to form a laminate including a double band press for pressure molding the material into the laminate, said double band press comprises two endless press bands one located opposite the other with said press bands having an inlet at one end for receiving the webs to be pressed between the bands and an outlet at the other end, each of said press bands passing over an inlet end reversing drum and a outlet end reversing drum, said press bands arranged to apply pressure to the webs and at least one of heating and cooling the webs, means for receiving the laminate from said double band press and for processing the laminate for storage or use, said impregnating means comprises at least one device for supplying resin to said at least one material web free of resin, said endless press bands each having an endless run formed of a plurality of stretches and having one stretch of each endless press band disposed in closely spaced coextensive relation extending between said inlet and said outlet and forming a pressing reaction zone therebetween, said device for applying resin located between said outlet and said inlet outside of said pressing reaction zone and adjacent to one of said endless press bands, said material supply means including means for guiding the at least one material web free of resin from said device onto one of the stretches of the endless press band located adjacent to said device and the one of said stretches located between said inlet and outlet outside of said pressing reaction zone, means for heating the one of said stretches whereby impregnation and drying of the at least one material web with the applied resin is effected at least partially on the one of the stretches running in the direction from the outlet to the inlet, wherein the improvement comprises that said device contains a low-solvent resin for impregnating the at least one material web, said means for heating comprising at least one of a first device located in said outlet end reversing drum of the one of said press bands containing one of the stretches on which the at least one material web with applied resin extends from the outlet to the inlet, and a second device for heating the one of the stretches on which the at least one material web with applied resin extends in the direction from the outlet to the inlet, said second device comprises a heating plate located within the one of the press bands containing the one of the stretches on which the at least one material web with applied resin extends, said heating plate located adjacent to and spaced from the one of the stretches, and heat conducting elements in contact with and extending between said heating plate and an inside surface of the one of the stretches, with said heat conducting elements disposed in sliding engagement with said inside surface, whereby the at least one material web is heated by heat conduction in addition to residual heat.

5,149,395

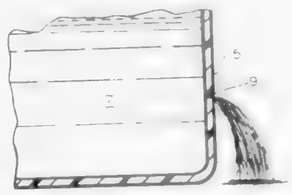
HANDHELD FLUID LEAK SEALING APPARATUS

Richard E. Bell, Jr., Tampa, Fla., assignor to Hikes Point Industries, Inc., Temple Terrace, Fla.

Continuation-in-part of Ser. No. 889,969, Jul. 28, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 170,991

Int. Cl.[5] B32B *35/00*

U.S. Cl. 156—581 1 Claim



1. Handheld waterbed-leak-sealing means for sealing leaks in waterbed membranes in situ without emptying water therefrom, comprising

elongated base means and elongated first clamp means manually juxtaposable at a free end portion of each to grip a folded part of a normally dry face of a waterbed membrane, whose opposite face is wetted and under fluid pressure, the gripped part including a non-leaking annular membrane portion ringing a leak locus therein,

said first clamp means having a bore through such free end portion thereof positionable over the leak locus, and thereby adapted to seal it off temporarily pending application of a patch thereto; and

second clamp means having a head end insertable through such bore in the first clamp means, and thereby adapted to compress a patch therein over the leak locus and into adherence to such annular portion of the membrane to seal off the leak permanently;

wherein such gripping end portions so juxtaposed are ramped apart from one another at increasing distance along the part of a waterbed membrane being gripped thereby from the rest of the waterbed.

5,149,396

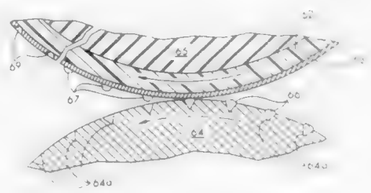
SUSCEPTOR FOR MICROWAVE HEATING AND METHOD

David Wilson, Mississauga, Canada, assignor to Golden Valley Microwave Foods Inc., Edina, Minn.

Continuation of Ser. No. 529,229, May 25, 1990, Pat. No. 5,059,279, which is a continuation of Ser. No. 369,193, Jun. 21, 1989, Pat. No. 4,959,120. This application Oct. 18, 1991, Ser. No. 779,057

Int. Cl.[5] B44C *1/22;* C23F *1/00*

U.S. Cl. 156—656 11 Claims



1. A process for producing a microwave susceptor for heating food in a microwave oven, said method comprising the steps of:

providing a microwave transparent substrate in sheet form having a microwave active metallic film thereon,

maintaining the entire surface of the metallic film exposed for further treatment;

applying to at least one part of the exposed metallic film spaced apart droplets of an agent for removing metal from said film while leaving a greater amount of metal in a second part of the film;

maintaining areas between the droplets of the agent for removing the metal uncoated so that the exposed metal surface is free of material between the applied droplets of the agent;

said agent selectively removing a portion of the metallic film over at least a part of the surface thereof to provide a reduced amount of the metallic film remaining in said part of the film where the agent is applied;

said step of removing a portion of the microwave active metallic film being conducted so as to leave a coating of the microwave active metallic film having at least one of the following:

(a) a first resistivity in said one part and a lower resistivity in the second part,

(b) a first optical density in said one part and a higher optical density in said second part.

5,149,397

FABRICATION METHODS FOR MICROMECHANICAL ELEMENTS

Igor I. Boi, Sherman Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1991, Ser. No. 725,174

Int. Cl.[5] B44C *1/22;* C03C *15/00, 25/06;* H01L *21/306*

U.S. Cl. 156—657 37 Claims

1. A process for making an concave surface comprising,

providing a member having a generally planar surface with wall means extending from said surface,

growing bumper means into said wall means and forming a convexo-concave relationship with said wall means,

removing said bumper means from said wall means such that said wall means retains the concave shape.

5,149,398

APPARATUS FOR PRODUCING A FAST DISSOLVING GRANULAR PRODUCT

John H. Shaffer, Cleveland; William L. Kurtz, Chattanooga, and John H. Hubbard, Cleveland, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 353,571, May 18, 1989, Pat. No. 5,085,847. This application Dec. 24, 1990, Ser. No. 632,724

Int. Cl.[5] B01D *1/18*

U.S. Cl. 159—4.01 14 Claims

1. A generally vertically extending spray dryer with a generally vertical central axis therethrough for use in spray drying a thermally sensitive granular product consisting of the combination of:

(a) a dryer housing having sidewalls, a top and a bottom;

(b) a liquid infeed line connected to the dryer housing adjacent the top;

(c) a gas infeed line connected to the dryer housing adjacent the top;

(d) a first nozzle within the dryer housing adjacent the top and connected in flow communication with the liquid and gas infeed lines to provide an atomized liquid spray within the dryer housing;

(e) a drying gas infeed line connected to the housing adjacent the top to feed a drying gas downwardly into contact with the atomized liquid spray to form granular particles,

(f) a bed adjacent the bottom of the dryer housing for retaining the granular particles, the bed further having an outlet to permit the granular particles to exit the dryer housing;

(g) a second drying gas infeed line connected to the dryer housing for providing a drying gas adjacent and upwardly in to the bed to dry and fluidize the bed of granular particles and to blow dust particles upwardly; and

(h) a second nozzle mounted below the first nozzle along the generally vertical central axis of the dryer and just above the fluidized bed of granular particles within the dryer housing for spraying a liquid generally downwardly onto the fluidized bed and the upwardly blown dust particles to cause the dust particles to increase in size and to minimize dust in the bed of granular particles.

5,149,399

LIQUID EVAPORATOR

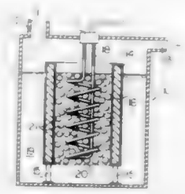
Mitsuhiro Kishi, and Toyohiko Sunaoka, both of Tochigi, Japan, assignors to Kabushiki Kaisha Japanic/Japanic Corporation, Tochigi, Japan

Filed Jan. 24, 1989, Ser. No. 301,543

Claims priority, application Japan, May 10, 1988, 63-113269; May 21, 1988, 63-124149; Jul. 12, 1988, 63-172851; Nov. 19, 1988, 63-292788

Int. Cl.[5] B01D *1/00;* C02F *1/04*

U.S. Cl. 159—22 23 Claims



1. A liquid evaporator comprising:

an air-tight outer container defining therein an interior space for containing liquid therein;

an inner container mounted on said outer container for partitioning the interior space of said outer container into an inner space and an outer space respectively inside and outside of said inner container, said inner container having a thermal insulating wall;

a heater fixed to the outer container and positioned inside the inner container; and

a plurality of heat holding balls contained in the inner container.

5. A liquid evaporator, comprising:

an outer container defining therein a closed compartment for receiving waste liquid for evaporation, said outer container including a generally tubular sidewall which extends vertically and joins to vertically spaced top and bottom walls;

an inner container positioned substantially vertically concentrically within said outer container, said inner container comprising a generally vertically elongate hollow tube which is opened at the upper end thereof, said inner container having a cross section which is substantially smaller than the cross section of the tubular sidewall of said outer container so that said inner container partitions said compartment into an inner space as defined within said inner container and an outer space which is of an annular configuration and is defined between said inner and outer containers;

means providing for liquid communication between said inner and outer spaces in the vicinity of said bottom wall so that the liquid will be at the same level within both of said inner and outer spaces, the liquid level within said compartment being below the upper end of said inner container;

said upper end of said inner container being spaced downwardly from said top wall to define a vapor-collecting region in an upper portion of said outer container;

an inlet communicating with the upper portion of said compartment for permitting waste to be supplied thereto;

an outlet communicating with the upper portion of said compartment for permitting discharge of the vapor therefrom;

heater means positioned substantially entirely within the inner space for heating the liquid therein to effect vaporization of the liquid within the inner space so that the vapors pass outwardly through the open upper end of said inner container into the upper portion of the outer container for discharge through the outlet; and

said inner container having thermal insulating properties for confining the heat substantially within the inner space and for preventing the heat from being transferred outwardly into the liquid in the outer space.

5,149,400

POLYMERIC BASIC ALUMINUM SILICATE-SULPHATE

Dieter Haase, Ste-Catherine; Nelu Spiratos, La Prairie, and Carmel Jolicoeur, Deauville all of Canada, assignors to Handy Chemicals Ltd., La Prairie, Canada

Continuation-in-part of Ser. No. 444,792, Dec. 1, 1989, Pat. No. 5,069,893, which is a continuation-in-part of Ser. No. 266,854, Nov. 3, 1988, Pat. No. 4,981,675. This application Oct. 23, 1990, Ser. No. 601,374

The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.

Int. Cl.[5] **D21H** *21/10, 21/16, 17/63*

U.S. Cl. 162—181.6 **21 Claims**

1. In a process of papermaking in which a furnish comprising an aqueous suspension of fibers and a neutral or alkaline sizing system is drained on a foraminous support, the improvement comprising:

adding to the furnish before draining water treating agent comprising an aqueous solution of a basic polynucleate aluminum hydroxy silicate-sulphate compound having a composition of the formula:

$$Al_A(OH)_B(SO_4)_C(SiO_X)_D(H_2O)_E$$

wherein

A is 1.0;

B ranges from 0.75 to 2.0

C ranges from 0.30 to 1.12;

D ranges from 0.005 to 0.1;

X is greater than 2.0 but less than or equal to 4.0 such that $3=B+2C+2D\ (X-2)$; and

E is larger than 4.

5,149,401

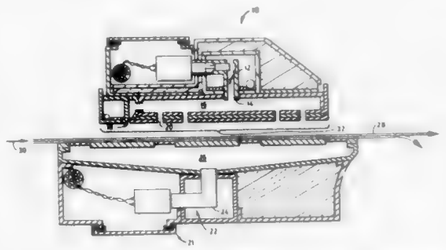
SIMULTANEOUSLY CONTROLLED STEAM SHOWER AND VACUUM APPARATUS AND METHOD OF USING SAME

Eric T. Langevin, Northboro, and James A. Bourque, Sudbury, both of Mass., assignors to Thermo Electron Web Systems, Inc., Auburn, Mass.

Continuation of Ser. No. 682,435, Apr. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 487,772, Mar. 2, 1990, abandoned. This application Oct. 29, 1991, Ser. No. 785,143

Int. Cl.[5] **F26B** *13/02, 21/06;* **D21F** *5/14*

U.S. Cl. 162—207 **7 Claims**



4. A method for controlling the temperature of a web to be formed into paper comprising steps of

causing the web to travel on a forming fabric endless belt substantially in a plane in a paper making machine, between a steam apparatus, said steam apparatus disposed over said belt directing a supply of steam directly onto an upper surface of the web; said steam apparatus comprising steam supply manifold and a steam chamber interconnected by a feed pipe, a lower wall of said steam apparatus forming a bottom wall of said steam chamber, said lower wall defining a plurality of impingement nozzles spaced in a direction of travel of said belt, and disposed proximate said upper surface of said web, said impingement nozzles being uniformly spaced from said web, said lower wall further defining at least in part a Coanda nozzle, said Coanda nozzle being disposed proximate a forward edge of said steam apparatus and being configured so as to direct steam forwardly therefrom parallel to said belt and in a direction opposite to the direction of travel of said belt; and a vacuum apparatus for withdrawing the supply of steam, said vacuum apparatus being located opposite and directly beneath said apparatus for applying the steam and beneath said belt; said vacuum apparatus having a vacuum chamber underlying all of said steam chamber and extending beyond said steam chamber forwardly and rearwardly of forward and rearward walls of said steam apparatus, said vacuum chamber being defined in part by a planar upper surface parallel to, and separated from, said steam apparatus lower wall and thereby uniformly proximate said nozzles, and

simultaneously controlling the steam supply apparatus and said vacuum withdrawal apparatus, by increasing the withdrawal of the vacuum chamber opposite the steam supply as the opposite steam supply application is increased.

5,149,402

HEADBOX HAVING A PRIMARY STOCK FLOW AND A LATERALLY INJECTED SECONDARY FLOW

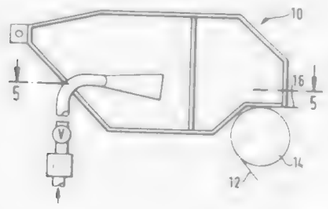
Ian W. Riddick, Bury, England, assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 204,046, Jun. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 84,610, Aug. 10, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,571

Claims priority, application United Kingdom, May 14, 1987, 87 11330

Int. Cl.[5] **D21F** *1/02*

U.S. Cl. 162—336 **2 Claims**



1. A headbox for ejecting stock onto a forming wire of a papermaking machine, said headbox comprising:

an upper and a lower wall;

first and second side walls, each side wall extending between said upper and lower walls such that said upper, lower and side walls define therebetween a slice chamber for the passage therethrough of a primary flow of the stock;

means for ejecting a secondary flow of the stock laterally into said primary flow in said slice chamber such that said secondary flow extends through said side walls for controlling fiber orientation along lateral side edges of the stock ejected from the headbox onto the forming wire;

a plurality of trailing elements disposed within said slice chamber for generating uniformity of flow within said primary flow and for inhibiting generation of eddies within said slice chamber;

said means for injecting said secondary flow further including:

first conduit means connected to said first side wall for conducting said secondary flow through said first side wall into said slice chamber;

second conduit means connected to said second side wall for conducting said secondary flow through said second side wall into said slice chamber;

said means for injecting said secondary flow further including:

a first valve for controlling said secondary flow through said first side wall;

a second valve for controlling said secondary flow through said second side wall;

said first conduit means further including:

a first portion disposed upstream relative to said slice chamber, said first portion having a first and a second end, said first end being connected to said first side wall, said first end extending from said upper to said lower wall such that said secondary flow is injected laterally into said primary flow along the entire distance between said upper and lower wall;

said second conduit means further including:

a first part disposed upstream relative to said slice chamber, said first part having a first and a second extremity, said first extremity being connected to said second side wall, said first extremity extending from said upper to said lower wall such that said secondary flow is injected laterally into said primary flow along the entire distance between said upper and lower walls; and

said first portion and said first part being of flared nozzle-shaped configuration, said first end and said first extremity each being of elongate configuration such that as said secondary flow flows along respectively said first portion and first part, said secondary flow is injected in a fan-shaped configuration into said primary flow.

5,149,403

FLUORINE-CONTAINING CATION EXCHANGE MEMBRANE FOR ELECTROLYSIS AND PROCESS FOR PRODUCING ALKALI METAL HYDROXIDE BY USING THE SAME

Tetsuji Shimohira; Yoshiaki Higuchi; Yoshihiko Saito, and Kohji Suzuki, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 7, 1990, Ser. No. 629,643

Claims priority, application Japan, Sep. 27, 1990, 2-255302

Int. Cl.[5] **C25B** *1/16, 13/08*

U.S. Cl. 204—98 **9 Claims**

1. A fluorine-containing cation exchange membrane for electrolysis, which comprises a multi-layered structure prepared by integrally laminating (i) the first ion exchange layer having —COOM groups, wherein —M is hydrogen or an alkali metal, in an ion exchange capacity of from 0.6 to 2.0 meq/g dry resin and having a thickness of from 5 to 300 μm, (ii) the second ion exchange layer present on an anode side of the first ion exchange layer, the second ion exchange layer having a smaller specific resistance and a larger thickness than the first ion exchange layer, and (iii) a hydrophilic asymmetric porous layer present on a cathode side of the first ion exchange layer, the porous layer having a water-permeability which becomes smaller in proportion as being closer to the cathode.

7. A process for producing an alkali metal hydroxide, which comprises supplying an alkali metal chloride aqueous solution to an anode compartment of an electrolytic cell partitioned by the membrane as defined in claim 1 into the anode compartment and a cathode compartment, and electrolyzing it to produce the alkali metal hydroxide in the cathode compartment.

5,149,404

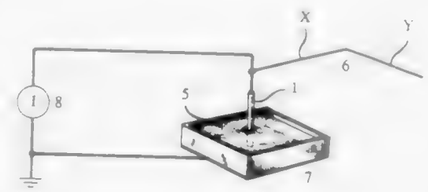
FINE LINE SCRIBING OF CONDUCTIVE MATERIAL

Greg E Blonder, Summit, and Theodore A. Fulton, Warren Township, Somerset County, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 14, 1990, Ser. No. 628,253

Int. Cl.[5] **C25F** *3/12, 3/14;* **B44C** *1/22*

U.S. Cl. 204—129.1 **17 Claims**



1. A process for fabricating a body including a pattern delineated in a material of said body comprising the steps of delineating said material and completing said body characterized in that said delineation step comprises removing a portion of said material of said body through the use of an electric field emanating from an electrode tip to said material wherein said electric field controls said delineation, whereby the spatial resolution of said delineation is determined by the shape of said electric field, rather than by the shape of said electrode, and wherein this spatial resolution is such that the linewidth of said pattern is at least 1.25 times the diameter of said electrode tip and the geometry of said pattern is determined by translation of said electrode relative to the surface of said material.

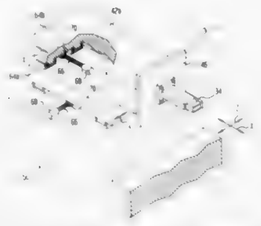
2. The process of claim 1 wherein said lines of electric force act on said body by a process comprising electrolytic etching.

5,149,405

FOUR-AXIS ECM MACHINE AND METHOD OF OPERATION

Norbert A. Bruns, Cincinnati, Ohio; Richard F. Fussner, Brookville, Ind., and John S. Reynolds, Maineville, Ohio, assignors to Lehr Precision Inc., Cincinnati, Ohio

Filed May 28, 1991, Ser. No. 706,059
Int. Cl.[5] B23H *3/04, 7/10, 7/26, 9/12*
U.S. Cl. 204—129.1 25 Claims



1. A method of electrochemically machining (ECM) a stationary workpiece having a stacking axis and first and second opposite sides using first and second cathode tools having first and second longitudinal and transverse axes, respectively, comprising the steps of:

supplying a positive voltage to said workpiece and a negative voltage to said first and second tools;

channeling an electrolyte between said workpiece and said first and second tools; and

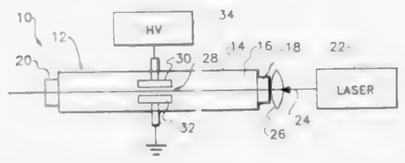
moving said first and second tools along said first and second longitudinal axes, respectively, toward said workpiece and substantially perpendicularly to said workpiece stacking axis, and along said first and second transverse axes, respectively, substantially parallel to said workpiece stacking axis for electrochemically machining said workpiece, said first tool being translated along said first longitudinal axis independently of translation along said first transverse axis for obtaining a selectively variable resultant feedrate direction for said first tool, and said second tool being translated along said second longitudinal axis independently of translation along said second transverse axis for obtaining a selectively variable resultant feedrate direction for said second tool.

5,149,406

ELECTRICAL FIELD QUENCHING OF OPTICAL BREAKDOWN

Ruth A. Mullen, Malibu, and Robert W. Hellwarth, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 3, 1989, Ser. No. 389,208
Int. Cl.[5] C01B *33/00*
U.S. Cl. 204—157.22 15 Claims



1. A method of quenching optical breakdown, comprising the steps of:

(a) providing a medium;

(b) causing a laser beam to propagate through the medium; and

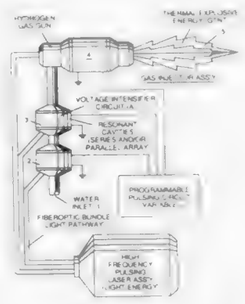
(c) applying an electrical field across an optical interaction volume of the medium of sufficient magnitude to increase an optical breakdown threshold of the medium and thereby quench optical breakdown of the medium induced by interaction of the laser beam with the medium, the magnitude of said electrical potential being selected to produce an electric field voltage across said optical interaction volume that is substantially less than the medium's electrical breakdown voltage.

5,149,407

PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS

Stanley A. Meyer, 3792 Broadway, Grove City, Ohio 43123

PCT No. PCT/US89/02622, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO89/12704, PCT Pub. Date Dec. 28, 1989
Continuation-in-part of Ser. No. 207,730, Jun. 16, 1988, Pat. No. 4,936,961, which is a continuation-in-part of Ser. No. 81,859, Aug. 5, 1987, Pat. No. 4,826,581. This PCT application Jun. 15, 1989, Ser. No. 460,859
The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.
Int. Cl.[5] C07G *13/00*
U.S. Cl. 204—157.41 12 Claims



4. A method of obtaining thermal energy from water, consisting of:

(A) providing a capacitor, within which water is included as a dielectric, in a resonant charging choke circuit that includes an inductance in series with the capacitor;

(B) subjecting the capacitor to a pulsating, unipolar electric field in which the polarity does not pass beyond an arbitrary ground, whereby the water molecules within the capacitor are subjected to a charge of the same polarity;

(C) further subjecting the water in said capacitor to said pulsating electric field to achieve a pulse frequency such that the pulsating electric field induces a resonance within the water molecule;

(D) continuing the application of the pulsing frequency to the capacitor after resonance occurs so that the energy level within the molecule is increased in cascading incremental steps in proportion to the number of pulses;

(E) maintaining the charge of said capacitor during the application of the pulsing field, whereby the co-valent electrical bonding of the hydrogen and oxygen atoms within said molecules is destabilized, such that the force of the electrical field applied within the molecule exceeds the bonding force of the molecule, and hydrogen and oxygen atoms are liberated from the molecule as elemental gases;

(F) collecting said hydrogen and oxygen gases, and any other gases that were formerly dissolved within the water

(G) subjecting the collected gas mixture to a pulsating, polar electric field whereby electrons of the gas atoms are distended in their orbital fields by reason of their subjection to electrical polar forces, at a frequency such that the pulsating electric field includes a resonance with respect to an electron of the gas atom;

(H) cascading said gas atoms with respect to the pulsating electric field such that the energy level of the resonant electron is increased in cascading incremental steps.

(I) ionizing said gas atoms;

(J) subjecting the ionized gas atoms to electromagnetic wave energy having a predetermined frequency to induce a further election resonance in the ion, whereby the energy level of the electron is successively increased;

(K) extracting further electrons from the resonating ions while such ions are in an increased energy state to destabilize the nuclear and electron configuration of said ions, and

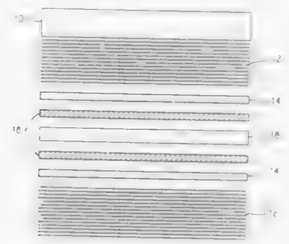
(L) subjecting the destabilized ions to thermal ignition.

5,149,408

CAPILLARY BLOTTING PAD FOR MOLECULAR TRANSFER TO MEMBRANES

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Apr. 29, 1991, Ser. No. 692,579
Int. Cl.[5] C25B *1/00*; B01D *57/02*
U.S. Cl. 204—182.3 18 Claims



1. A method for transferring macromolecules in a liquid solution medium from a flat liquid-permeable matrix layer to a semi-permeable receiving membrane layer comprising the steps of:

providing a two sided semi-permeable membrane layer adapted to transmit liquid solutions by capillary transport and resist passage of macromolecules,

providing an interlocked hydrophilic absorbent-containing material in the form of a non-woven absorbent felt layer comprising from 25% to 100% by weight hydrophilic absorbent textile fiber material,

placing said liquid-permeable matrix layer is contact with one side of said membrane layer

placing said absorbent felt layer in contact with the other side of said membrane layer,

initiating capillary transport of liquid solution from said liquid-permeable matrix layer toward said absorbent layer, and

allowing the resulting sandwiched layers of said matrix, membrane and absorbent to remain in contact for sufficient time so that said macromolecules are transferred from said matrix toward said membrane.

5,149,409

PROCESS FOR FABRICATING THIN FILM METAL ALLOY MAGNETIC RECORDING DISKS TO SELECTIVELY VARIABLE COERCIVITIES

Richard H. Ahlert, San Jose; James K. Howard, Morgan Hill, and Steven E. Lambert, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1991, Ser. No. 640,182
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.2 6 Claims

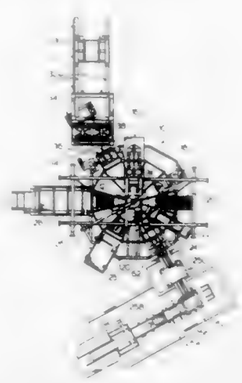
1. In a process for the fabrication of a thin film magnetic recording disk wherein the process includes the step of sputter-depositing a magnetic alloy layer comprising cobalt, platinum and chromium in a sputtering chamber having a host gas atmosphere, an improvement comprising the steps of introducing a hydrocarbon gas into the sputtering chamber and sputter depositing the magnetic alloy layer in the presence of the hydrocarbon gas.

5,149,410

CATHODE STRIPPING APPARATUS

Victor E. Robinson; Stein Kristoffersen, both of Porcupine, and Joseph Laezza, Timmins, all of Canada, assignors to Falconbridge Limited, Toronto, Canada

Filed Oct. 16, 1990, Ser. No. 598,369
Int. Cl.[5] C25D *17/00*
U.S. Cl. 204—199 8 Claims



1. Apparatus for stripping electrodeposited metal sheets from cathodes comprising a carousel mounted for rotation through 360°, means for charging said cathodes one by one onto the carousel and support them vertically at the periphery of said carousel, a plurality of stations located at the periphery of the carousel for subjecting said cathodes to various operations required to strip the electrodeposited metal from the cathodes and means for sequentially advancing the cathodes through said stations and subjecting them to the operations required to strip the same and discharge the stripped sheets and then the cathodes from the carousel.

5,149,411

TOXIC FUMES REMOVAL APPARATUS FOR PLATING TANK

Robert L. Castle, 305 Carlton Ave., Los Gatos, Calif. 95032, assignor to Robert L. Castle; Richard Castle and Charles D. Castle, all of Los Gatos, Calif.

Continuation-in-part of Ser. No. 688,962, Apr. 22, 1991, abandoned. This application Dec. 24, 1991, Ser. No. 814,090
Int. Cl.[5] C25B *15/08*; C25D *21/02, 21/04, 21/06*
U.S. Cl. 204—237 13 Claims

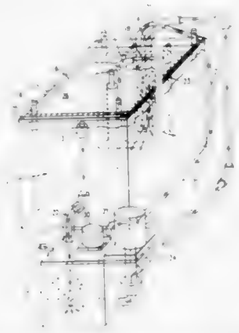
1. A toxic fume scrubbing apparatus comprising:

a plating tank for containing a plating solution, said tank having anode and cathode electrodes which generate toxic bubbles and toxic fumes during the plating process;

an airtight separation tank coupled to said plating tank in a closed loop configuration;

means for circulating said plating solution between said plating tank and said airtight separation tank within said closed loop;

means connected to said tanks for scrubbing said toxic bubbles to remove said toxic fumes;



a lid having air inlet holes formed therein positioned on the top of said plating tank.

5,149,412

ELECTROLYSIS CELL AND REFRACTORY MATERIAL THEREFOR

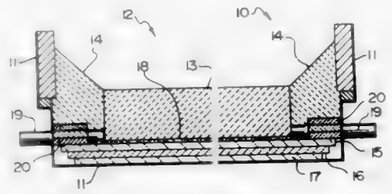
Claude Allaire, Chicoutimi-Nord, Canada, assignor to Alcan International Limited, Montreal Canada

Division of Ser. No. 636,749, Jan. 2, 1991, Pat. No. 5,106,797, which is a continuation-in-part of Ser. No. 276,104, Nov. 23, 1988, abandoned. This application Aug. 14, 1991, Ser. No. 744,955;

Claims priority, application Canada, Nov. 26, 1987, 552914

Int. Cl.[5] C25C *3/06*; C04B *35/00*

U.S. Cl. 204—243 R 5 Claims



1. An aluminum electrolysis cell, comprising:

a metal container including side walls and a bottom wall defining an enclosure for cell contents; and

a refractory lining within said enclosure adjacent said side walls and bottom walls, said lining comprising at least one layer of refractory material

said at least one layer of refractory material being resistant to corrosion by alkaline materials and fluorides at high temperatures, and having been produced by:

calcining red mud containing Bayer sodalite at a temperature in the range of about 900 to 1400° C. for a time sufficient to remove combined water and to produce nepheline from said Bayer sodalite in said red mud;

grinding the product following calcination to the -4 Tyler mesh range;

mixing the ground product with a binder selected from the group consisting of silica-containing particulate materials or precursors thereof, alumina-containing particulate materials or precursors thereof, and mixtures thereof, in an amount sufficient to bind the ground product upon firing, and sufficient water to produce a formable mixture;

forming the mixture into a shaped product; and

firing the shaped product at a temperature in the range of about 900 to 1400° C. to produce said refractory material.

5,149,413

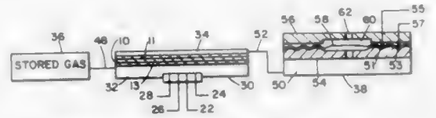
EFFICIENT ELECTROCHEMICAL MOTOR

Henri J. R. Maget, 6455 La Jolla Blvd., La Jolla, Calif. 92037

Filed Aug. 6, 1990, Ser. No. 563,050

Int. Cl.[5] C25B *9/00*; B01D *13/02*

U.S. Cl. 204—258 8 Claims



1. An electrochemical motor comprising:

storage means for holding a supply of electrochemically active gas;

a gas-tight pump housing;

a rigidly supported electrolytic membrane having two sides disposed in said gas-tight pump housing and defining therein first and second gas-tight pump chambers;

first connection means for the free flow of said gas from said storage means to said first gas-tight pump chamber;

a gas-tight motor housing comprising first and second motor partitions;

a diaphragm disposed in said gas-tight motor housing and defining therein a first gas-tight motor chamber with said first motor partition and a second gas-tight motor chamber with said second motor partition;

said two motor partitions disposed to act as immobile diaphragm stops;

at least one of said diaphragm stops being shaped to conform topographically with said diaphragm such that the displacement volume of at least one said motor chamber is substantially zero in at least one of said end of stroke positions of said diaphragm, so that said diaphragm may move from one said diaphragm stop to the other in substantially immediate response to a change in gas pressure in said first gas-tight motor chamber;

second connection means for providing a free flow of said gas between said second gas-tight pump chamber and said first gas-tight motor chamber;

at least one pervious electrode disposed on each said side of and in contact with said electrolytic membrane;

said at least one electrode on the first said side of said electrolytic membrane being separated from one another by spaces and said at least one electrode on the second side of said electrolytic membrane being disposed to form, wtih said at least one electrode on said first side, at least one electrode pair separated by said electrolytic membrane;

said gas being electrochemically reversibly active so as to enter into an anodic reaction at one side of said at least one electrode pair where the gas molecules are converted to ions transportable through said electrolytic membrane and a cathodic reaction at the opposite side of said at least one electrode pair where said ions are reconverted to gas molecules;

means for providing a reversible electric current to said at least one electrode pair, said current acting to transport said ions through said electrolytic membrane whereby said gas is pumped reversibly from one said side of said electrolytic membrane to the other;

pressure sensing means for sensing the pressure of said gas in at least one of said gas-tight pump chambers;

control means, responsive to said pressure sensing means for varying the magnitude and direction of said electric current to cause said gas to flow through said electrolytic membrane into one or the other of said gas-tight pump chambers; and

means for converting the gas pressure change in said second gas-tight motor chamber to mechanical motion.

5,149,414

OXYGEN GAS DIFFUSION ELECTRODE

John S. C. Chiang, Mercerville, N.J., and Charles J. Nicholson, New Hope, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 20, 1986, Ser. No. 932,835

Int. Cl.[5] G25B *11/12*

U.S. Cl. 204—294 10 Claims

6. A gas diffusion electrode made by the process of claim 5.

5,149,415

FILM FORMING APPARATUS

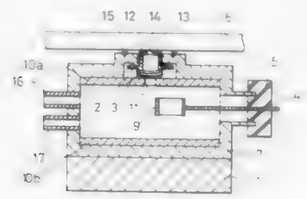
Toshio Sugita, and Osamu Koseki, both of Tokyo, Japan, assignors to Department of Electrical Engineering, Science University of Tokyo and Seiko Instruments Inc., both of, Japan

Filed Sep. 10, 1990, Ser. No. 580,641

Claims priority, application Japan, Sep. 27, 1989, 1-113763[U]

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.14 4 Claims



1. An apparatus for forming a film on an object by depositing particles produced by cathode sputtering, comprising: a vacuum chamber; a cylindrical anode disposed in said vacuum chamber; a pair of opposed cathodes disposed on two faces of the inner walls of said vacuum chamber facing said anode such as to be positioned at a right angle with respect to a cylindrical center line of said anode; a passage hole formed in one of said opposed cathodes; a holed plate having a through-hole for passing the particles and being positioned so that the through-hole faces the object, said holed plate having a tapered thickness around the periphery of said through-hole; a conduit supported by said vacuum chamber and having one end aligned with a center line of said passage hole and another end supporting the holed plate; urging means for urging the holed plate toward the object, said urging means including at least one of a spring, a piezoelectric element and an actuator in pressing contact with the conduit and not the object; and magnetic means including a magnet disposed on the other cathode not having said passage hole for exerting lines of magnetic force generally at a right angle upon said opposed electrodes, and wherein said magnetic means is positioned so as not to extend between the object and said vacuum chamber.

5,149,416

POLYMERIC ELECTROPHORESIS MEDIA

Hans W. Osterhoudt, Spencerport; Ignazio S. Ponticello, Pittsford; Kenneth G. Christy, Jr., and David B. LaTart, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 431,048, Nov. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 339,468, Apr. 18, 1989, abandoned. This application Dec. 20, 1991, Ser. No. 812,885

Int. Cl.[5] G01N *27/26*; R01D *57/02*

U.S. Cl. 204—299 R 31 Claims

1. A preformed, acrylamide based, water-soluble copolymer useful for making an electrophoresis medium by crosslinking by a reaction with a selected crosslinking agent that does not involve a free-radical vinyl addition mechanism, said copolymer comprising a minor proportion of a comonomer that contains a site for said crosslinking reaction with said selected crosslinking agent, said preformed copolymer further having the following properties:

1) $\overline{M}_w$ small enough that the addition of 1.25 to 1.5 times the stoichiometric amount of the selected crosslinking agent will not raise the viscosity of the mixture so much that the medium cannot be poured into a 0.15×14×14 cm mold within about 4 to 10 minutes after addition of the crosslinking agent, and

2) $\overline{M}_n$ large enough to provide a crosslink density sufficient to form a gel after about 10 minutes after addition of 1.25 to 1.5 times the stoichiometric amount of the selected crosslinking agent, said gel ultimately having sufficient integrity within about 2 hours after pouring to be removed from the mold and handled gently without tearing or falling apart.

5,149,417

GEL ELECTROPHORESIS CASSETTE

Brian D. Foley, Westford, and John Iovaine, Melrose, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Sep. 13, 1991, Ser. No. 759,263

Int. Cl.[5] B01D *61/42*; C25D *13/00*

U.S. Cl. 204—299 R 9 Claims

1. A cassette for conducting electrophoresis which comprises:

a first flat plate having two side edges substantially parallel to each other,

a second flat plate having two side edges substantially parallel to each other,

a first spacer positioned inward slightly away from a side edge of said first flat plate and away from a side edge of said second flat plate to form a first small space between said plates,

a second spacer positioned inward slightly away from a side edge of said first flat plate and away from a side edge of said second flat plate to form a second small space between said plates,

a space adapted to retain a gel defined by said first flat plate, said second flat plate, said first spacer and said second spacer,

and a soft adhesive positioned within said first small space and said second small space and having a Durometer (Shore A) of between about 45 and 70, thereby to effect adhesion between (a) said first plate, said second plate and said first spacer and (b) said first plate, said second plate and said second spacer.

5,149,418

VERTICAL GEL ELECTROPHORESIS APPARATUS HAVING UNIVERSAL GEL ASSEMBLY SUPPORT STRUCTURE

Robert W. Flesher, Baltimore, Md., assignor to Apogee Designs, Ltd., Baltimore, Md.

Filed Sep. 4, 1991, Ser. No. 754,530

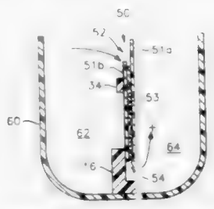
Int. Cl.[5] B01D *61/42*; C25D *13/00*

U.S. Cl. 204—299 R 8 Claims

1. In an electrophoresis apparatus including a container for containing conductive buffer solution and means for applying

electrical current to said buffer solution, the improvement comprising:

a support plate mounted in said container for receiving a gel assembly, said gel assembly having top and bottom openings therein, said support plate comprising support portions integrally formed therewith for sealing the gel assembly in said container so as to divide said container into laterally juxtaposed first and second chambers when supporting a gel assembly, the top opening being in contact with solution in said first chamber and said bottom opening being in contact with solution in said second chamber, said support portions of said support plate comprising vertical support members having faces cut therein for receiving vertical edges of the gel assembly and an integral bottom support member having a face cut therein for receiving a bottom edge of the gel assembly, the face in said integral bottom support member terminating short of the full width of said vertical support member faces so as to define flanges on which the bottom vertical edges of the gel assembly rest, surface portions of the faces of said vertical support members and said integral bottom support member serving to seal against surface portions of the gel assembly so that the bottom opening of the gel assembly contacts buffer solution in the second chamber through the face of the integral bottom support member; and



means for holding said gel assembly upright in said support plate.

5,149,419

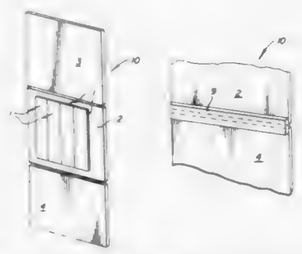
METHOD FOR FABRICATING LONG ARRAY ORIFICE PLATES

Richard W. Sexton, and James E. Harrison, Jr., both of Dayton, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1991, Ser. No. 732,281

Int. Cl.[5] C25D *1/08*

U.S. Cl. 205—75 5 Claims



1. A method for electroforming linear orifice plates comprising the steps of:

(a) forming a nonconductive linear peg pattern, corresponding to the desired orifice pattern, on the plating surface of an electrically conductive plating substrate having end edges which are substantially perpendicular to the linear peg pattern;

(b) placing electrically conductive robber panels adjacent said end edges of the plating substrate;

(c) coupling the plating surface of the plating substrate to the top surfaces of adjacent robber panels with a thin strip a electrically conductive material; and

(d) placing the so-coupled plating substrate/robber panel unit in an electroplating system and operating that system for a predetermined period to form an orifice plate having a linear array of precisely uniform orifices.

5,149,420

METHOD FOR PLATING PALLADIUM

Robert E. Buxbaum, East Lansing, Mich., and Peter C. Hsu, Overland Park, Kans., assignors to Board of Trustees, operating Michigan State University, East Lansing, Mich.

Filed Jul. 16, 1990, Ser. No. 553,550

Int. Cl.[5] C25D *5/34*

U.S. Cl. 205—219 15 Claims

1. A method for plating palladium on a metal selected from the group consisting of niobium, vanadium and tantalum as pure metals and in alloys which comprises:

(a) providing the metal with a roughened and cleaned exposed surface to be plated;

(b) electrolytically hydriding the surface of the metal to be plated to form a metal hydride; and

(c) plating the surface of the metal with the metal hydride with the palladium to form a coating.

5,149,421

CATALYTIC DEWAXING PROCESS FOR LUBE OILS USING A COMBINATION OF A SILICOALUMINOPHOSPHATE MOLECULAR SIEVE CATALYST AND AN ALUMINOSILICATE ZEOLITE CATALYST

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1989, Ser. No. 401,170

Int. Cl.[5] C10G *11/02*

U.S. Cl. 208—114 21 Claims

1. A process for catalytically dewaxing a hydrocarbon oil feedstock boiling above about 350° F. and containing straight chain and slightly branched chain hydrocarbons comprising contacting said hydrocarbon oil feedstock in the presence of added hydrogen gas sequentially with a layered catalyst comprising a SAPO-11, SAPO-31 or SAPO-41 intermediate pore size silicoaluminophosphate molecular sieve and a hydrogenation component, and an intermediate pore size aluminosilicate zeolite catalyst.

5,149,422

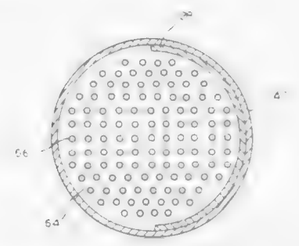
FINITE PARTICLE REMOVAL SYSTEM

Barry L. Barrington, North-Great Falls, Mont., assignor to Analytic Laboratories, Inc., Merrillvill, Ind.

Filed Dec. 20, 1990, Ser. No. 632,129

Int. Cl.[5] B01D *35/06*

U.S. Cl. 210—85 12 Claims



1. A finite particle removal system for use in the filtration of a fluid having a filter comprising: a wall surrounding the filter; an upstream portion and a downstream end portion disposed closing opposite ends of the wall; the front upstream portion having a fluid inlet, and the downstream end portion having a fluid outlet; the fluid inlet being capable of translating fluid from outside the filter into an expansion area within the filter; the expansion area being disposed immediately downstream of the fluid inlet inside the wall and immediately upstream of a series of perforated plates and filter media; the fluid outlet being capable of translating fluid from a collection area, inside the filter, out of the filter; the collection area being disposed immediately downstream of the series of perforated plates and filter media which are each disposed across an interior cross-section of the wall surrounding the filter, said perforated plates including magnetic plates, second plates, and third plates; a positive terminal and a negative terminal adapted to transmit positive and negative voltages to a positive conductor and a negative conductor, respectively; the positive conductor and the negative conductor being disposed substantially parallel and in proximity to the wall, and extending continuously alongside the series of plates; the positive conductor and the negative conductor being disposed within the wall in such manner that there is no physical contact between the positive conductor and the negative conductor; expansion joints having apertures parallel to the wall, the positive conductor, and the negative conductor, with the positive conductor and the negative conductor being disposed between the expansion joints and the wall, and the expansion joints abutting either the positive conductor or the negative conductor; the perforated plates having portions disposed within the apertures enabling support of the perforated plates, and enabling each of the second and third plates to make contact with the positive conductor and the negative conductor, respectively, such that electrostatic voltages on the positive conductor and the negative conductor can be applied to the respective plates; said perforations in said plates enabling fluid to flow through the plates; and filter media disposed between each of the plates in the series.

2. A finite particle removal system for use in the filtration of a fluid having a filter comprising the elements of claim 1 wherein a voltmeter is connected between the positive terminal and the negative terminal for measuring the potential difference between the positive terminal and the negative terminal.

5,149,423

APPARATUS FOR THE PURIFICATION OF WASTE WATER WITH SWIVELLING MIXING CONTAINER

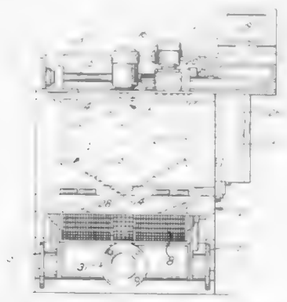
Ralf F. Piepho, August-Warnecke-Weg 22, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Jun. 12, 1991, Ser. No. 715,111

Claims priority, application European Pat. Off., Jun. 23, 1990, 90111970

Int. Cl.[5] B01D *33/048*; B01F *11/00*

U.S. Cl. 210—148 7 Claims



1. Apparatus arranged for purifying waste water by precipitating out foreign material therein and separating at purified water from the precipitate comprising:

a pair of side frames;

a shaft extending between said side frames;

a semi-cylindrical container mounted for swivelling rotation on said shaft;

said container having spaced semi-circular side walls at opposed ends of said shaft, and a bottom wall extending between said side walls, said bottom wall terminating in spill-over edge to one side of said shaft;

a band filter means disposed beneath the container for receiving contents of the container which spill over said edge as the container is rotated in a direction lowering said edge said content containing water and precipitate,

means for advancing the band filter to carry away said precipitate; and

means beneath said band filter for receiving purified water which flows through the band filter.

5,149,424

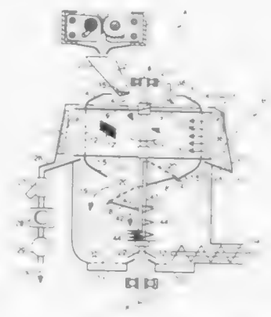
CENTRIFUGE APPARATUS FOR RESIDUAL LIQUID WASTE REMOVAL FROM RECYCLABLE CONTAINER MATERIAL

Lynn C. Lundquist, 10833 NE. Russell, Portland, Oreg. 97220

Filed Mar. 29, 1991, Ser. No. 677,307

Int. Cl.[5] B01D *33/06*

U.S. Cl. 210—174 13 Claims



2. A centrifuge for separating chipped material from residual liquid waste contained in the vessel, comprising:

a rotating sieve assembly including a central driven shaft and a cylindrical sieve screen carried thereon;

means for rotating said central driven shaft, whereby the chipped material is rotated at high speed within said sieve screen for removing the residual liquid waste from the chipped material and wherein the residual liquid waste exits said sieve assembly through said sieve screen,

said sieve assembly having a first impervious sieve bell attached at a first end of said sieve screen for loading chipped material, a second impervious sieve bell attached at a second end of said sieve screen defining a discharge opening, said first and second impervious sieve bells extending convexly relative to the interior of said sieve screen;

a discharge door for covering said discharge opening, said discharge door including a fluid impervious outer covering having an outer peripheral edge contiguous to the second sieve bell when said discharge door is in a closed sealing position, said impervious outer covering meeting said shaft at an acute angle relative to the interior of said sieve screen thereby forming a catch basin for retaining the residual liquid waste in said sieve assembly when said assembly is in a non-rotating condition, and for providing a plane of unrestricted travel for the residual liquid waste from said catch basin to said sieve screen during rotation of said assembly,

said discharge door further including a fluid pervious sieve baffle which forms an obtuse angle with the shaft relative

to the interior of said sieve screen providing a sloping surface for directing the chipped material past the discharge door when said door is opened and for providing a sieve through which residual liquid waste may pass into said catch basin, said sieve baffle extending from the shaft to the outer peripheral edge of said impervious outer covering; and,

actuating means for said discharge door which provides shifting of said door between said closed, sealing position against the second sieve bell of said sieve assembly, and an open discharge position, wherein the chipped material may be discharge from said sieve assembly.

5,149,425

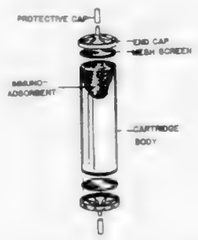
AFFINITY SUPPORTS FOR HEMOPERFUSION

M. Abdul Mazid, Edmonton, Canada, assignor to Chembiomed, Ltd., Edmonton, Canada

Division of Ser. No. 270,950, Nov. 15, 1988. This application Apr. 3, 1991, Ser. No. 679,801

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 14 Claims



1. An affinity matrix suitable for extracorporeal perfusion of a body fluid for the selective removal of specific components or for chromatography which comprises:

(a) a solid, particulate support derivatized to a specific affinity ligand, wherein said derivatized support is

(b) coated with a biocompatible polymer,

wherein the polymer coating is an integral membrane-type coating, and

wherein the membrane coating has a pore size of at least 20 angstroms, and

wherein said coating prevents the leaching of fine particles from the matrix.

5,149,426

STATIONARY PHASE FOR ENANTIOMERIC RESOLUTION IN LIQUID CHROMATOGRAPHY

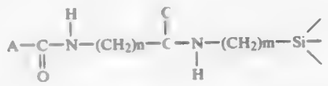
Katsunori Watabe, and Osamu Motokawa, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Jul. 23, 1991, Ser. No. 734,776

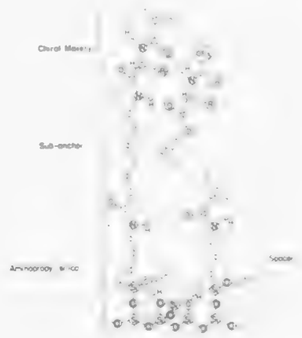
Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 12 Claims

1. A stationary phase for enantiomeric resolution liquid chromatography, comprising: a support sized and dimensioned for chromatographic separation having a chiral group of the formula:



wherein A—CO— represents a chiral moiety; m represents an integer of not less than 3; and n represents an integer of not less than 5.



5,149,427

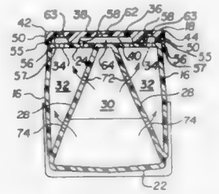
CAP FOR UNDERDRAINS IN GRAVITY FILTERS

Marvin A. Brown, Sewickley; Gerald D. Wolfe, Zelienople, and Richard P. Beverly, Butler, all of Pa., assignors to The F.B. Leopold Company, Inc., Zelienople, Pa.

Filed Apr. 3, 1991, Ser. No. 679,947

Int. Cl.[5] B01D *24/22*

U.S. Cl. 210—274 20 Claims



9. In a filter system having a filter bottom with a plurality of underdrain laterals extending in parallel rows across said filter bottom and having a fine grain filter media supported on said underdrain laterals, the improvement comprising a capped filter underdrain block for supporting said fine grain filter media and receiving effluent therefrom in a downflow mode while discharging a backwash fluid thereto in an upflow mode, said capped filter underdrain block comprising:

a block having a top wall, a bottom wall and two side walls extending between said top wall and said bottom wall, said block having at least one conduit therethrough, said top wall having a plurality of orifices in communication with said conduit for receiving said effluent and discharging said backwash fluid;

a cap having a porous, planar body, said body having a top surface, a bottom surface, a first lateral edge, a second lateral edge, a front edge and a rear edge, said body further having pores which are sized so that said body supports said fine grain filter media without said media penetrating therethrough;

a flange extending downward from each edge with a lower portion of each flange in a plane below said bottom surface;

at least one groove formed in said bottom surface; and

means for securing said cap to the top wall of said block so that said bottom surface extends above said orifices, said flanges engage said top wall and said top surface supports said fine grain filter media;

said bottom surface and said flanges defining a distribution chamber above said orifices;

wherein said at least one groove defines a means for distributing said backwash fluid across an entire surface area of said cap.

5,149,428

WATER FILTER WITH EXTENDED OPERATIONAL PERIOD

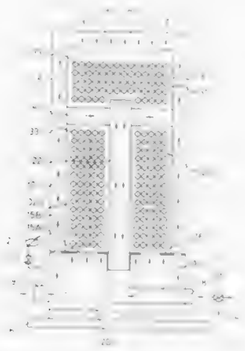
Yukichi Morimoto, Anjoh, Japan, assignor to Atlas Corporation, Tokyo, Japan

Filed Jan. 18, 1991, Ser. No. 643,236

Claims priority, application Japan, Jan. 19, 1990, 2-8485

Int. Cl.[5] B01D *24/02*

U.S. Cl. 210—283 4 Claims



1. A water filter, comprising:

a housing member connected to a water inlet pipe;

a cassette member filled with filtration and activation agents, which is located inside the housing member, and which has open upper and lower ends, where a water path connecting the water inlet pipe and the upper end is formed between the housing member and the cassette member, while the lower end is directly connected with the water inlet pipe;

a center pipe located inside the cassette member for connecting an inside of the cassette member with a water outlet pipe; and

a damper member placed inside the cassette member in contact with the filtration and activation agents, which vertically slides along the center pipe during a filtration operation by the cassette member while keeping contact with the filtration and activation agents, and which divides the inside of the cassette member into an upper filtration chamber connected with the upper end and a lower filtration chamber connected with the lower end, where the water flows through the upper filtration chamber from the upper end and the lower filtration chamber from the lower end alteratively.

5,149,429

FILTER FOR REMOVING CONTAMINANTS FROM REFRIGERANT

Norman L. Baker, 104, 438 Victoria Avenue East, Regina, Saskatchewan, Canada S4N 0N7

Filed May 29, 1991, Ser. No. 707,046

Claims priority, application Canada, Aug. 27, 1990, 2024022

Int. Cl.[5] B01D *24/12*

U.S. Cl. 210—291 7 Claims

7. In combination:

a. a trap for removing liquid contaminants from refrigerant, comprising:

i. a container having a top and a bottom;

ii. an inlet adjacent to the bottom of the container;

iii. an outlet for refrigerant in a gaseous state at the top of the container;

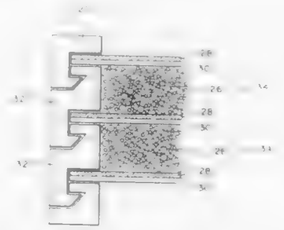
iv. an outlet for liquid contaminants at the bottom of the container; and

b. a filter for removing contaminants from refrigerant, comprising:

i. a transparent elongate closed container having a first end, a second end and an interior;

ii. an inlet positioned adjacent to the first end,

iii. an outlet positioned adjacent to the second end;



iv. desiccant substantially filling the interior of the container;

v. a plurality of liquid impervious and vapour flow retarding chamois membranes positioned transversely within the interior of the container; and

vi. a plurality of oil absorbing blown polypropylene membranes positioned transversely within the interior of the container, such that the desiccant is divided into a plurality of layers separated by membranes and refrigerant enters the inlet and passes through the plurality of layers prior to exiting the container via the outlet.

5,149,430

FLUID DISTRIBUTING HEAD FOR A MEMBRANE FILTER MODULE FOR FILTRATION OF FLUIDS

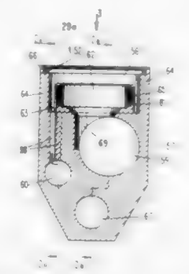
Gerhard Strohm, Oestrich-Winkel; Wilfried Kaul, Weinsheim, and Georg Schnieder, Traisen, all of Fed. Rep. of Germany, assignors to Seitz-Filter-Werke GmbH und Co., Bad Kreuznach, Fed. Rep. of Germany

Filed Nov. 20, 1991, Ser. No. 795,883

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1990, 4036978; Nov. 6, 1991, 4136551

Int. Cl.[5] B01D *63/02*

U.S. Cl. 210—321.8 33 Claims



1. A fluid distributing head for a membrane filter module for micro and ultra filtration of fluids, the membrane filter module comprising a filter housing and membranes in the form of a bundle disposed inside the filter housing, the membranes being selected from the group consisting of tubular membranes, capillary membranes, and hollow fiber membranes, the filter housing, at a face thereof, having two separate inlets that are sealed relative to one another, with a first one of the separate inlets being a central inlet connected to a face of the bundle of

membranes and with the second one of the separate inlets being an outer inlet connected with an outside of the bundle of membranes, said fluid distributing head comprising means for providing an alternative for changing flow paths, including:

a housing with two parallel side walls and a face extending perpendicular to said parallel side walls, said face having a receiving opening for receiving the face of the filter housing, and said housing having a first and a second fluid channel extending at a right angle relative to said receiving opening from a first one of said parallel side walls to a second one of said parallel side walls, said first and second fluid channels being separated from one another, whereby, when the filter housing is received by said receiving opening, said first and said second fluid channels, respectively, are connected by intermediate channels to a respective one of the two separate inlets of the filter housing; and

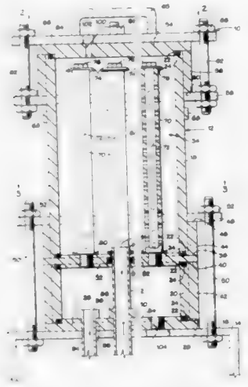
an arrangement of said intermediate channels that is varied depending on an inner and an outer flow path within the membrane filter module, with an arrangement and respective diameters of said first and second fluid channels remaining unchanged.

5,149,431

FILTER CANISTER WITH A PLASTIC PIPE AND A METAL BUSHING

David S. Coen, 8227 S. Gary, Tulsa, Okla. 74137

Filed Nov. 23, 1990, Ser. No. 617,131
Int. Cl.[5] B01D *29/15*
U.S. Cl. 210—323.2 10 Claims



1. A filter canister for accommodating pressurized fluids, said canister comprising:

an elongated, cylindrical plastic pipe having a pair of open ends;

a cover for each end of the pipe respectively, each cover being disposed across its corresponding pipe end engaging the pipe and closing the pipe whereby the pipe and covers conjointly define a chamber within the pipe;

a reinforcing band for each end of said pipe respectively, each band being disposed in encircling relationship around the pipe adjacent its corresponding pipe end in disposition to reinforce the pipe side wall in the region adjacent said end; said pipe comprising a pair of cylindrical sections of like diameter, said sections being disposed in longitudinal alignment;

a partition extending transversely across the pipe between the sections dividing said chamber into a pair of compartments, there being at least one reinforcing band for each section respectively, each end of each pipe section having a corresponding end edge of a reinforcing band extending in co-planar relationship therewith to provide enhanced strength and width for the canister at said section ends;

a steel plate extending across the cover over the end of one of said pipe sections;

a steel ring encircling the other pipe section, said ring having a smaller internal diameter than the external diameter of said band encircling the end of said other section proximal said one section; and

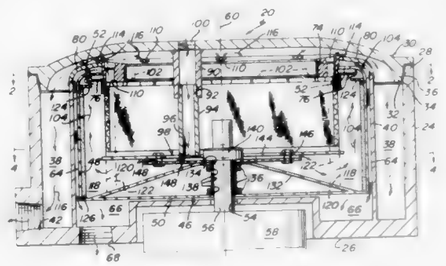
clamp means interconnecting said ring and said plate for applying tensile force to the pipe sections for holding the sections sealed against said partition.

5,149,432

CENTRIFUGE FOR SEPARATING LIQUIDS OF DIFFERENT SPECIFIC GRAVITIES

Aaron Lavin, 3500 Davisville Rd., Hatboro, Pa. 19040

Filed Apr. 30, 1991, Ser. No. 693,491
Int. Cl.[5] B04B *9/00*
U.S. Cl. 210—381 14 Claims



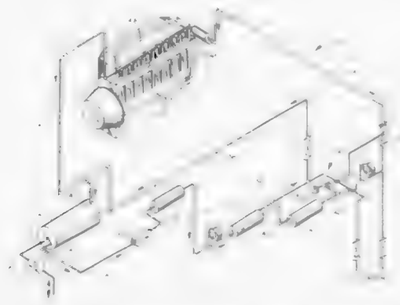
1. A centrifuge for separating a first insoluble flowable material having a first specific gravity from a second flowable material having a second and higher specific gravity, said centrifuge comprising a bowl, a flowable material conveying wall, first means in communication with said conveying wall for receipt of said first material, and second means for receipt of said second material, said bowl being arranged to be rotated about a rotation axis and comprising a circular sidewall extending around said axis and an annular top wall projecting radially inward from said sidewall, said bowl when rotated causing said first material to be located closer to said axis than said second material and with an interface located at a first predetermined radial distance from said axis, said bowl additionally comprising an annular separator plate and a central hub, said separator plate being spaced below said top wall and away from said sidewall, said top wall of said bowl being disposed below said conveying wall to form a space therebetween in communication with said second means, said second material being able to flow into the space between said separator plate and said top wall, said hub having at least one radial passageway extending radially through it in communication with the space between said separator plate and said top wall and with the space between said top wall and said conveying wall, said hub also having at least one axial passageway extending through it, said axial passageway having an outlet opening in communication with said conveying wall and an entrance opening in communication with the interior of said bowl and located at a second predetermined radial distance from said axis, said second distance being smaller than said first distance, whereupon when said bowl is rotated said first material flows through said radial passageway to said first means and said second material flows through said axial passageway to said second means.

5,149,433

METHOD AND APPARATUS FOR SUPPLY OF DECONTAMINATED FUEL TO DIESEL ENGINE

Larry A. Lien, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed Aug. 5, 1991, Ser. No. 741,117
Int. Cl.[5] B01D *35/14*
U.S. Cl. 210—641 16 Claims



14. A method of decontaminating diesel fuel which is contaminated with suspended and colloidal solids, water and bacteria to prepare such fuel for use in a diesel engine comprising the steps of:

pumping contaminated diesel fuel from a tank into a first filtering stage in which the contaminated diesel fuel is circulated across a spiral-wound ultrafiltration element having a membrane with a pore size sufficiently small to block passage of all contaminants which include water, suspended solids and bacteria;

passing a portion of the diesel fuel through said membrane to provide fuel free of said contaminants;

circulating said portion of said diesel fuel into a second filtering stage in which all of said portion is passed through a spiral-wound ultrafiltration element having a membrane with a pore size sufficiently small to block passage of all such contaminants;

circulating from said first stage filter the other portion of said contaminated diesel fuel that bypasses said membrane and returning said other portion to said tank;

pumping said portion of said diesel fuel from said second filtering stage into a fuel injector feed line for a diesel engine;

recirculating said diesel fuel from said fuel injector feed line to said tank, and measuring the pressure differential of the circulating diesel fuel across said second filtering stage

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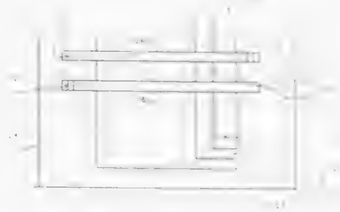
5,149,434

GRAVITY SEPARATOR

Saleam Essop, 97 Sir Kurma Reddi Road, Clairwood Natal, South Africa

Filed Feb. 25, 1991, Ser. No. 661,069
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—521 3 Claims

1. An apparatus for separating, by gravity, a mixture of oil and water comprising a separating tank, a discharge tank, a communication passage connecting a lower portion of said separating tank with a lower portion of said discharge tank, an inlet in the separating tank for introducing a mixture of oil and water into the apparatus, at least one first discharge aperture in an upper portion of the separating tank for discharge of oil separated from the mixture in the apparatus and at least one second discharge aperture in an upper portion of the discharge tank for the water separated from the mixture in the apparatus, the level of the said first discharge aperture being higher than the level of the said second discharge aperture relative to an operative horizontal base plane of the apparatus wherein the said first discharge aperture is provided with a first conduit generally parallel to the said base plane and extending to an extremity approximately directly above the location of the said second discharge aperture and the said second discharge aperture is provided with a second conduit generally parallel to the said base plane and extending a location approximately directly



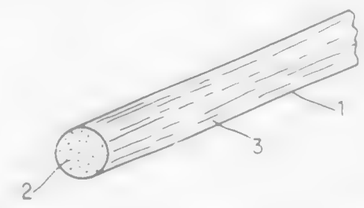
below the location of the said first discharge aperture, the said first and second conduits having, at their extremities, first and second openings respectively, the said first opening being at a relatively higher level in respect to the said second opening in relation to the said base plane.

5,149,435

MOLECULAR SIEVE ARRANGEMENT AND FILTERING METHOD FOR REMOVAL OF A SELECTED CONSTITUENT

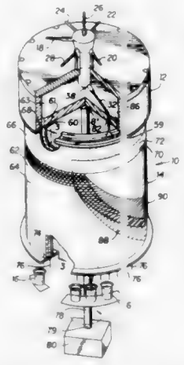
Hans-Jürgen Laube, Siegershausen, Switzerland, assignor to H J L Projects & Developments Ltd., Düdingen, Switzerland

PCT No. PCT/CH89/00002, § 371 Date Sep. 6, 1989, § 102(e) Date Sep. 6, 1989, PCT Pub. No. WO89/06156, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 6, 1989, Ser. No. 415,252
Claims priority, application Switzerland, Jan. 7, 1988, 26/88
Int. Cl.[5] B01D *61/00, 39/00*
U.S. Cl. 210—651 23 Claims



10. A filtering method, comprising the steps of contacting a fluid with a filter substance containing a porous carrier material and a porous molecular sieve material having internal surfaces which generate an attractive force; drawing a selected constituent of said fluid into said carrier material using said attractive force; and substantially preventing accumulation of any constituent of said fluid on said internal surfaces.

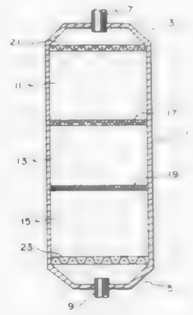
5,149,436
CONTINUOUS DISPLACEMENT CHROMATOGRAPHIC METHOD
Vernon T. Taniguchi, Anaheim, and Allen W. Doty, Pomona, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
Continuation of Ser. No. 434,913, Nov. 8, 1989, abandoned, which is a division of Ser. No. 276,677, Nov. 28, 1988, Pat. No. 4,915,843. This application Oct. 25, 1991, Ser. No. 782,816
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—657 20 Claims



19. A method for separating at least two chromatographic species from each other, the method comprising the steps of:
(a) loading a particulate bed with a chromatographic specie A, the particulate bed comprising a resin;
(b) simultaneously introducing a feed mixture stream, a displacer reagent stream, a barrier reagent stream, and a purge stream into a chromatographically inert retaining layer and then through the resin, the feed mixture stream comprising chromatographic species B and C wherein C has a greater affinity than B for the resin, the displacer reagent stream comprising a specie D wherein forms chelate complexes with B and C which complexes have little affinity for the resin, and the barrier reagent stream comprises a chromatographic specie A wherein A has a lesser affinity than B for the resin;
(c) moving the streams with respect to the particulate bed so that substantially all the resin is at least twice sequentially contacted with (i) the feed mixture stream, (ii) the displacer reagent stream, (iii) the barrier reagent stream, and (iv) the purge stream;
(d) collecting substantially pure B; and
(e) collecting substantially pure C.

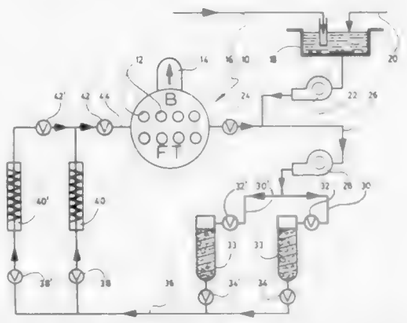
5,149,437
WATER FILTER
Theodore L. Wilkinson, 126 Warwickshire La., Glen Burnie, Md. 21061, and Frank J. Sork, 512 Dunberry Dr., Arnold, Md. 21012
Filed Mar. 29, 1991, Ser. No. 676,698
Int. Cl.[5] C02F *1/76, 1/72, 1/42*
U.S. Cl. 210—665 19 Claims

13. A method for the purification of water which comprises sequentially contacting water with first, second and third layers of water purification materials,
said first layer of purification material comprising a bed of particles of dissimilar metals having first and second redox potentials such that conditions are established in said bed for spontaneous oxidation and reduction reactions between contaminants present in the water and said metal particles upon contact of said water with said first material,
said second layer of purification material comprising activated carbon, and



said third layer of purification material comprising a weak acid cation exchange resin, and
recovering purified water subsequent to contacting said first, second and third layers.

5,149,438
METHOD FOR MAGNETICALLY TREATING WATER IN A CLOSED LOOP HEAT TRANSFER SYSTEM
Claude L. Hebert, 340 Boulevard Mortagne, Boucherville, Quebec, Canada J4B 1B5
Filed Jun. 11, 1991, Ser. No. 713,168
Claims priority, application Canada, Jun. 18, 1990, 2019185
Int. Cl.[5] C02F *1/48*
U.S. Cl. 210—695 11 Claims

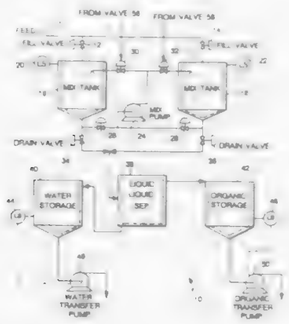


8. In a method for the treatment of water having impurities therein with a closed loop transfer system wherein said water is heated, subsequently used in a heat transfer operation, and then returned for reheating, the improvement comprising the steps of creating a magnetic field having magnetic lines of flux extending in a certain direction, passing said water from said heating step through said magnetic field in a direction such that the direction of flow of the water cuts the direction of said lines of flux at an angle with respect thereto, and maintaining said water in the magnetic field for a period of time sufficient for particles formed from said impurities to have an orientation imparted thereto, subsequently directing the water passed through said magnetic field to said heating step and then to said heat transfer operation, and then mechanical filtering said water prior to again subjecting said water to said magnetic field to remove at least a portion of the particles formed by application of said magnetic field, and continuously circulating said water through said heating step.

5,149,439
WATER TREATMENT AGENT
James D. Birchall, Mouldsworth, England, assignor to Imperial Chemical Industries PLC, London, England
Filed Jan. 30, 1992, Ser. No. 828,111
Claims priority, application United Kingdom, Feb. 11, 1991, 9102796
Int. Cl.[5] C02F *1/62*
U.S. Cl. 210—702 9 Claims

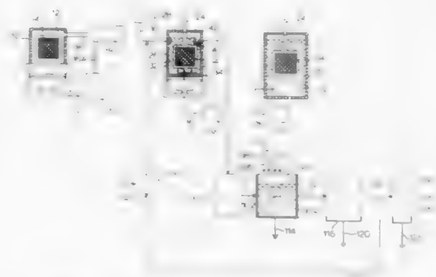
1. A process of treating water containing dissolved aluminum which comprises dissolving in the water an agent comprising a water soluble particulate alkali metal or quaternary ammonium silicate, the particles having a coating of a water-insoluble silicate over at least a part of their surface.

5,149,440
EMULSION RESOLUTION
James W. Moller, Houston, Tex., assignor to Bird Environmental Systems & Services, Inc., Norwood, Mass.
Filed Jul. 26, 1990, Ser. No. 558,146
Int. Cl.[5] B01D *17/05*
U.S. Cl. 210—708 15 Claims



1. A method for resolving an emulsion comprising the steps of
introducing an emulsion comprising an aqueous phase and an organic phase comprising components capable of polymerizing or coagulating into a tank;
heating said emulsion at a temperature sufficient to prevent said emulsion from setting up inside said tank while gently agitating said emulsion to avoid formation of hot spots;
adding a non-corrosive inorganic separation aid incapable of initiating polymerization of said emulsion or its constituents to said tank with mixing to cause said emulsion to separate into its constituent aqueous and organic phases, said separation aid comprising a saturated brine solution;
allowing the contents of said tank to settle once addition of said separation aid is complete; and
removing the separated aqueous and organic phases from said tank.

5,149,441
METHOD OF TREATING WASTEWATER CONTAINING HEAT-CURABLE (METH) ACRYLIC MONOMER COMPOSITIONS
Edward K. Welch, II, Bristol, and Frederick F. Newberth, III, Hartford, both of Conn., assignors to Loctite Corporation, Hartford, Conn.
Filed Oct. 18, 1991, Ser. No. 778,559
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.[5] C02F *1/70, 1/58, 1/56*
U.S. Cl. 210—719 18 Claims



1. A method of treating wastewater comprising an aqueous medium having a heat-curable (meth)acrylic monomer-containing composition therein, at temperature below that necessary to effect heat-curing of the composition, said method comprising:
(a) adjusting the pH of the aqueous medium to a value in the range of from about 8 to about 10, by addition of base thereto;
(b) contacting the aqueous medium with an effective amount of a reducing agent which is polymerizingly effective for the monomer to yield corresponding polymer from the monomer;
(c) mixing a cationic flocculating agent with the aqueous medium, in sufficient quantity to flocculate the polymer in the aqueous medium; and
(d) physically separating the polymer-containing aqueous medium and recovering a monomer- and polymer-reduced aqueous medium effluent.

5,149,442
REDUCTION OF HALOGENATED ORGANIC COMPOUNDS IN SPENT BLEACH LIQUOR
Mats G. Nyström, Ytterby; Kenneth O. Larsson; Anna K. Skogby, both of Göteborg, and Solvie M. Herstad, Torslanda, all of Sweden, assignors to Eka Nobel AB, Bohus, Sweden
Filed Apr. 23, 1991, Ser. No. 689,503
Claims priority, application Sweden, Apr. 23, 1990, 9001481
Int. Cl.[5] D21C *9/16*
U.S. Cl. 210—724 21 Claims

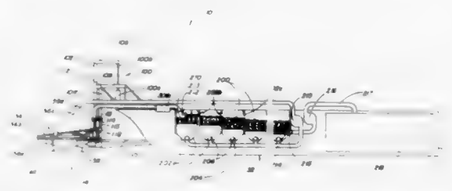
1. A method of reducing the amount of discharged halogenated organic substance in spent bleach liquor obtained from delignification and bleaching of lignocellulose-containing pulp with halogen-containing compounds, comprising maintaining the spent bleach liquor at a pH of from about 2.5 to about 10, in a processing stage wherein substantially no delignification or bleaching of the pulp occurs, and at a temperature and for a residence time sufficient to reduce the amount of halogenated organic substance by at least about 30% by weight.

5,149,443

SYSTEM FOR RECOVERING OIL FROM THE OCEAN CONTROLLED BY WAVE PROFILE GENERATING COMPUTER

O'Neal Varnam, Supply, N.C., assignor to Jay R. Houston, Shallotte; Nancy Champion, Long Beach; Mason H. Anderson; Shelia K. McLamb, both of Shallotte and Samuel N. Varnam, Supply, all of, N.C.

Filed Jul. 18, 1991, Ser. No. 732,486
Int. Cl.[5] C02F 1/40; G06F 15/54
U.S. Cl. 210—739 23 Claims



16. A method for collecting and removing oil from the surface of a body of water using an oil removal system adapted for use with a vessel and having a suction nozzle, comprising the steps of:

(a) sensing a plurality of water surface variables;

(b) inputting the water surface variables to a computer means;

(c) generating a water surface profile using the computer means;

(d) generating a vacuum at the nozzle for inducing oil laying at the surface of the body of water into the nozzle; and

(e) continuously controlling the movement of the nozzle in accordance with the water surface profile created by the computer means such that the nozzle may effectively skim the surface of the water irrespective of changes in oil layer depth, wave amplitude, wave velocity, wave direction, and water temperature.

5,149,444

PROCESS FOR THE DECONTAMINATION OF SOILS, SEDIMENTS, AND SLUDGES

Robert Hoch, Hensonville, N.Y., assignor to SDTX Technologies, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 516,262, Apr. 30, 1990, Pat. No. 5,096,600. This application Jul. 3, 1990, Ser. No. 547,839
Int. Cl.[5] B09B 1/00
U.S. Cl. 210—751 20 Claims

1. A method for the decontamination of a soil, sediment, or sludge containing toxic halogenated organic compound and containing water comprising the steps of:

(a) mixing said soil, sediment, or sludge with a reagent capable of reacting with said halogenated compound and heating said mixture of soil, sediment, or sludge and reagent in a reaction zone to an elevated temperature thereby forming a reaction zone vapor stream containing at least a portion of the water contained in said soil, sediment, or sludge and unreacted halogenated organic compound;

(b) condensing a portion of said reaction zone vapor stream under conditions suitable for the formation of

(i) a condensate stream containing substantially all of the halogenated organic compound in said reaction zone vapor stream, and

(ii) a vapor stream containing water and trace amounts of said halogenated organic compound;

(c) recycling said condensate to said reaction zone;

(d) treating said vapor stream to remove trace halogenated organic compound and venting the so-treated stream to the atmosphere; and

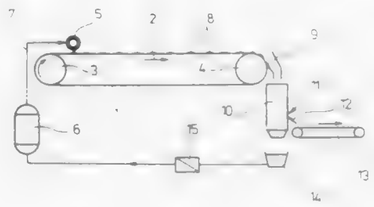
(e) removing soil, sediment, or sludge containing less contaminant from said reaction zone.

5,149,445

PROCESS AND APPARATUS FOR THE PURIFICATION OF SUBSTANCES

Konrad Schermutzki, Remseck, and Herbert Würmseher, Meitingen, both of Fed. Rep. of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Dec. 10, 1991, Ser. No. 804,597
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041669
Int. Cl.[5] B01D 43/00
U.S. Cl. 210—773 16 Claims



1. A process for the purification of a substance, comprising the steps of:

providing the substance in molten form,

forming the molten substance into drops which are solidified into crystalline pellets,

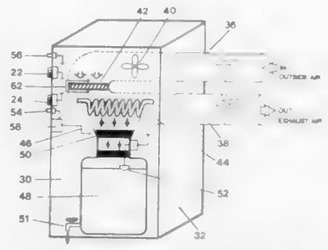
conveying the pellets while subjecting the pellets to a flow of hot gas causing outer surfaces of the pellets to melt and drip off, and recovering the dripped-off melt and said pellets separately.

5,149,446

POTABLE WATER GENERATOR

James J. Reidy, 1260 Main St., Holden, Mass. 01520

Filed Jan. 30, 1991, Ser. No. 648,541
Int. Cl.[5] C02F 1/00; B01D 5/00; F25D 17/06
U.S. Cl. 210—744 13 Claims



13. A water generating method for obtaining potable water from inside or outside ambient air, comprising:

bringing a supply of inside or outside ambient air to a first station and for releasing the air back after it has been processed;

filtering the air through a filtering element prior to processing of the air, said air filter element becoming useless when removed;

extracting water vapor in the air brought to the first station;

moving air from outside the device through the first station and for returning the air back outside the first station;

filtering the water from the extracting step through a filtering element, which becomes useless when removed;

collecting the water at a collecting station after it is filtered;

sensing the water level at the collecting station below the top of the collecting station for shutting down the process

or activating a pump when the collecting station is full of water;

deactivating the device when the air filter element is to be replaced and until this nonreusable air filter element is replaced after a preselected pressure drop;

deactivating the device when the water filter element is to be replaced and until this nonreusable water filter element is replaced after a predetermined time;

detecting the temperature and the relative humidity of the air brought to the first station and using this information in accordance with predetermined conditions to initiate and cease the process to minimize energy consumption and maximize water yield according to parameters chosen by the user; and

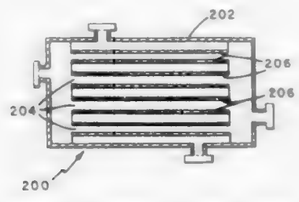
providing a signal and deactivating the unit when the air filter element or the water filter element are in need of being replaced.

5,149,447

CREOSOTE FILTRATION SYSTEM WITH A SHELL AND TUBE TYPE FILTRATION DEVICE

Mansour Mashayekhi, Huntington, W. Va.; Roger L. Haley, Russell, Ky.; Joe E. Payne, Maumelle, Ark., and C. Conrad Kempton, Morristown, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 23, 1991, Ser. No. 704,754
Int. Cl.[5] B01D 37/00
U.S. Cl. 210—767 19 Claims



10. A process for the filtration of xylene insolubles within a creosote process stream which comprises the steps of:

providing a creosote filtration apparatus which comprises:

a filtration device having a shell and at least one tube wherein said tube is constructed of ceramic or metallic filter material wherein the filtration device is adapted to separate a creosote stream containing xylene insolubles entering the filtration device through an inlet in communication with the tube into a first stream containing a first concentration of xylene insolubles and removing said first stream through an outlet, and into a second stream containing a second concentration of xylene insolubles and removing said second stream through an outlet wherein the first concentration is greater than the second concentration,

a feed tank containing creosote and in communication with the at least one tube via an inlet to the filtration device,

providing a heated process stream of creosote containing xylene insolubles to the tube of the filtration apparatus, and

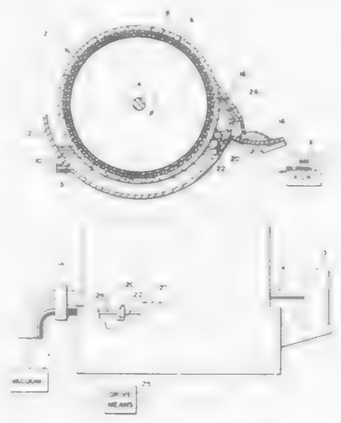
separating the heated process stream of creosote containing xylene insolubles within the filtration device into a first stream containing a first concentration of xylene insolubles and removing said first stream through an outlet, and into a second stream containing a second concentration of xylene insolubles and removing said second stream through an outlet wherein the first concentration is greater than the second concentration.

5,149,448

METHOD AND APPARATUS FOR THICKENING LIME SLUDGE

Esko Mattelmaki, Varkaus, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed Apr. 22, 1991, Ser. No. 688,086
Claims priority, application Finland, Apr. 25, 1990, 902064
Int. Cl.[5] B01D 33/06, 33/46
U.S. Cl. 210—784 19 Claims



1. A method of thickening lime sludge utilizing a drum filter surface which rotates about a substantially horizontal axis into operative association with lime sludge in a vat, comprising the steps of continuously:

(a) rotating the drum about its axis so that the drum filter surface comes in contact with lime sludge in the vat so that a precoat filter layer is formed on the drum filter, and a dried layer of lime sludge collects on the precoat layer;

(b) scraping the dried layer of lime sludge from the drum filter; and then

(c) directing a first liquid jet against a strip of the precoat above the lime sludge in the vat so as to remove that strip of the precoat layer from the drum, by continuously reciprocating the first jet in a dimension parallel to the axis of rotation of the drum, so as to remove a strip of precoat at a time.

5,149,449

METHOD AND DEVICE FOR FILTURING OF SUSPENSIONS

Kent Strid, Svadenvägen 11, S-810 28 Järbo, and Rolf Oswaldsson, Skyttestigen 10B, S-803 36 Gävle, both of Sweden

PCT No. PCT/SE90/00639, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO91/04778, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 4, 1990, Ser. No. 689,766
Claims priority, application Sweden, Oct. 4, 1989, 8903267
Int. Cl.[5] B01D 29/62
U.S. Cl. 210—798 31 Claims

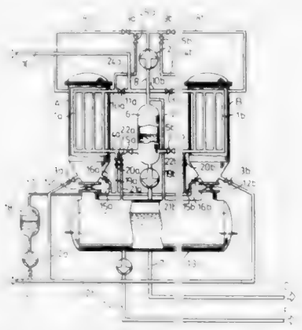
1. A method for filtering a suspension in a filtering apparatus having a pressure vessel, said pressure vessel having a stationary filter therein, and for re-conditioning said filter after performing filtration therethrough, said filter comprising at least one substantially vertical filter element covered with filter medium, on the outside of which material is deposited during filtration while filtrate flowing through said filter medium is discharged through at least one filtrate channel on the inside of said filter medium, said pressure vessel being provided with suspension inlet means for suspension to be filtered, unfiltered suspension outlet means for unfiltered suspension, filtrate out-

let means for said filtrate, deposi outlet means for material deposited on said filter medium an back-wash inlet means for at least one washing medium for b ck-wash said filter element from said filtrate channel through said filter medium to said pressure vessel, and gas inlet me ns for a gas medium; said method including the steps of:

(a) feeding said suspension th ough said suspension inlet means and discharging said f ltrate through said filtrate outlet means only during filtra ion, while keeping remaining inlets and outlets closed;

(b) supplying said filtrate to a sep rator for separating filtrate and gas medium brought alon g therewith;

(c) interrupting feeding of said su spension after filtration and



discharging unfiltered suspens on from said pressure vessel through said unfiltered s spension outlet means to return said unfiltered suspens on to said suspension inlet means;

(d) in connection with said disc harge of unfiltered suspension, introducing said gas med um into said pressure vessel for drying of said material dep osited on said filter medium during filtration and for displa cement of said filtrate out of said filter element and said ilter outlet means to said separator; and

(e) performing back-wash with a washing medium other than filtrate and opening said deposit outlet means for said material deposited on said filter medium for removal thereof together with said wa hing medium.

5,149,451

WATER SOLUBLE SALT PRECOATS FOR WIRE DRAWING

Thomas W. Tull, Southfield, Mich., assignor to Henkel Corporation, Amber, Pa.

Division of Ser. No. 492,697, Mar. 13, 1990, Pat. No. 5,012,262, which is a continuation of Ser. No. 307,643, Feb. 7, 1989, abandoned. This application Feb. 21, 1991, Ser. No. 658,927

Int. Cl.[5] **C10M** *125/22, 173/02*

U.S. Cl. 252—18 **20 Claims**

1. A composition for coating steel wire to facilitate the cold drawing thereof, said composition comprising:

(A) from about 50 to about 99.9% by weight of a component selected from the group consisting of Na_2SO_4, K_2SO_4, and mixtures thereof;

(B) from about 0 to about 49.9% by weight of a component selected from the group consisting of $Na_2B_4O_7$, $NaBO_2$, $K_2B_4O_7$, KBO_2 and mixtures of any two or more thereof; and

(C) from about 0.01 to about 5% by weight of a component selected from the group consisting of potassium soaps, sodium soaps, and ammonium soaps;

wherein the percentages by weight are based on the total weight of components A, B, and C in the composition, and wherein not more than 50% by weight of the total of sodium plus potassium plus ammonium ions in components A, B, and C of the composition consists of sodium ions.

5,149,452

WAX ISOMERATE HAVING A REDUCED POUR POINT

Gerald A. MacAlpine; Partick M. E. Halls, and Andre E. Asselin, all of Ontario, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 19, 1990, Ser. No. 630,466

Int. Cl.[5] **C10M** *173/00*

U.S. Cl. 252—56 R **12 Claims**

1. A wax isomerate having a reduced pour point which comprises

(a) a major amount of a wax isomerate, and

(b) an additive combination of

(i) from about 0.01 to about 5 wt. % of a low molecular weight polyalkylmethacrylate having a weight average molecular weight ranging from about 10,000 to about 50,000, and

(ii) from about 0.1 to about 1 wt. % of a high molecular weight polyalkylmethacrylate having a weight average molecular weight ranging from about 70,000 to about 150,000.

wherein the amount of (i) and (ii) are synergistically effective in reducing the pour point of the isomerate thus formed to a lower pour point than would have been obtained using the low molecular weight polyalkylmethacrylate or high molecular weight polyalkylmethacrylate alone.

5,149,453

METHOD FOR DETECTING LEAKAGE IN A REFRIGERATION SYSTEM

Manher Parekh, Warren, Mich., assignor to H. B. Fuller Automotive Products, Inc., Shoreview, Minn.

Continuation of Ser. No. 430,958, Nov. 1, 1989, abandoned, which is a continuation of Ser. No. 181,188, Apr. 11, 1988, abandoned, which is a division of Ser. No. 704,666, Feb. 25, 1985, Pat. No. 4,758,366. This application Mar. 12, 1991, Ser. No. 668,716

Int. Cl.[5] **G01N** *21/64;* **G01M** *3/04;* **C09K** *5/04*

U.S. Cl. 252—68 **11 Claims**

1. A method of detecting a leak in a refrigeration system, the method comprising:

(a) circulating in a refrigeration system a composition that fluoresces under ultraviolet light comprising:

(i) a refrigeration liquid comprising a polyhalogenated hydrocarbon refrigerant and a refrigeration oil; and

(ii) an effective amount of a fluorescent, alkyl substituted perylene dye compound; wherein the fluorescent dye is soluble in the refrigeration liquid and does not adversely affect the operation of a refrigeration system; and

(b) exposing the refrigeration system to ultraviolet light to fluoresce any of the fluorescent composition on the exterior of the refrigeration system;

wherein a leak in the refrigeration system may be detected.

5,149,454

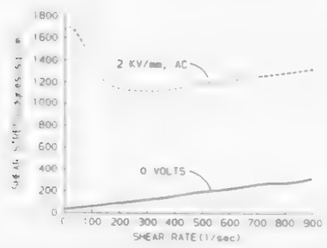
ELECTRORHEOLOGICAL COMPOSITIONS INCLUDING $AM_{5-11}O_{8-17}$

Raymond L. Bloink, Swartz Creek; Bradley W. Kibbel, Ferndale, and Bob R. Powell, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1991, Ser. No. 702,975

Int. Cl.[5] **C10M** *171/00, 169/04;* **C09K** *3/00*

U.S. Cl. 252—74 **1 Claim**



1. An electrorheological composition comprising a solid phase comprising a material having the formula $AM_{5-11}O_{8-17}$ where A is at least one selected from the group consisting of Li, Na K, Rb, Ag, and Te; and M is at least one selected from the group consisting of Fe and Ga, said solid phase being present in an amount ranging from about 5 to about 50 percent by volume of said composition; and a liquid phase comprising a dielectric fluid, said composition being substantially free of water and effective to produce an electrorheological response in the presence of an electric field.

5,149,455

PROCESS FOR INCREASING THE DENSITY OF SPRAY DRIED, PHOSPHATE-REDUCED DETERGENTS

Jochen Jacobs, Wuppertal; Ulrich Jahnke, Monheim; Dieter Jung, Hilden; Rudolf Oleffelmann, Langenfeld, and Wilfried Adler, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 335,904, Apr. 10, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 644,469

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1988, 3812530

Int. Cl.[5] **C11D** *1/02, 1/66*

U.S. Cl. 252—174.13 **10 Claims**

1. A process for producing a phosphate-reduced detergent product containing

A) 4–20% by weight of at least one anionic surfactant;

B) 2 to 20% by weight of at least one nonionic surfactant;

C) 20 to 50% by weight of at least one builder;

D) 3 to 25% by weight washing alkalis;

E) 0 to 30% by weight of other detergent constituents, which process comprises:

(1) continuously introducing a spray-dried detergent tower powder, the tower powder containing an anionic surfactant and not more than 50% by weight of the amount of component B) in the phosphate-reduced detergent product and not more than an amount of component B) comprising 5% by weight of the phosphate reduced detergent product, the tower powder having an apparent density of at least 350 grams/liter, into a cylindrical, substantially horizontal mixing drum having a smooth inner wall and having a shaft, mounted for axial rotation about a central axis of the mixing drum, equipped with radially arranged impact tools having a length (from the central axis) between about 80% and about 98% of the internal radius of said drum and regulating the rotational speed of the shaft at a Froude index of from about 100 to about 800 and a mean residence time of the tower powder in the mixing drum of 10 to 60 seconds at a constant tower powder throughput, wherein the Froude index is a dimensionless number equal to

$$\frac{W^2 r}{g}$$

wherein W is the rotational speed of the shaft in radius per unit time, r is the length of the tools from the central axis, g is the gravitational constant and w, r and g are in consistent units;

(2) continuously introducing at least one nonionic surfactant, in a liquid state, into the mixing drum to form the detergent product without pulverizing or agglomerating the tower powder.

5,149,456

DETERGENT COMPOSITIONS COMPRISING A HYDROTALCITE-LIKE MATERIAL FOR REDUCING COLORANT MIGRATION

Martin Concannon, West Kirby; Maurice Webb, Vicars Cross, and Keith R. F. Cockett, Nr Wigan, all of Great Britain, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,483

Claims priority, application United Kingdom, Dec. 4, 1989, 8927363

Int. Cl.[5] **C11D** *3/12*

U.S. Cl. 252—174.25 **6 Claims**

1. A detergent composition comprising:

(a) from 5 to 50% by weight of a detergent active system comprising at least 25% by weight of nonionic detergent active based on the weight of the system; and

(b) from 1% to 30% by weight of material as defined in formula I below:

$$M_{k+m}N_{n+p}(OH)_2A_2^{y-}x.H_2O \qquad (I)$$

wherein:

M is any 1+ or 2+ cation or combination thereof;

N is any 3+ or 4+ cation or combination thereof;

k is the sum of the individual mole fractions of the 1+ cations;

m is the sum of the individual mole fractions of the 2+ cations;

n is the sum of the individual mole fractions of the 3+ cations;

p is the sum of the individual mole fractions of the 4+ cations;

wherein either but not both of k and m or n and p can be zero, $K+m+n+p=1$ and A_2^{y-} is any anion of charge y^- and mole fraction z, or combination of anions of similar or different y^-;

wherein $k+2m+3n+4p-2-2y=O$; and

wherein x ranges from 1 to 100.

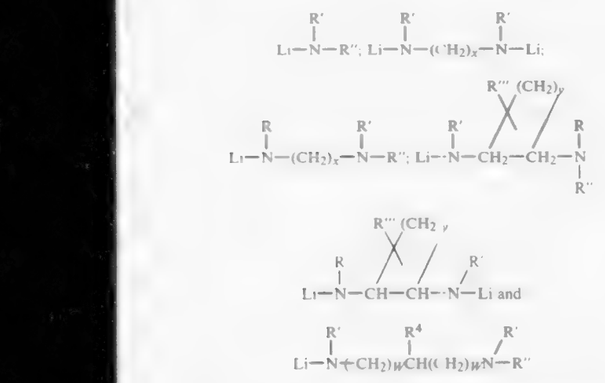
5,149,45

STABLE MIXED LITHIUM AMIDE REAGENT COMPOSITIONS

W. Novis Smith, Philadelphia, Pa. assignor to Cyprus Foote Mineral Company, Malvern, Pa.

Filed Jun. 30, 1989, Ser. No. 374,740
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—182.12 10 Claims

1. A reagent composition having improved thermal stability and which is free of ether consisting essentially of at least a 0.5 Molar concentration solution of a mixture of lithium amides selected from the group consisting of:



wherein

R, R′ and R″ are the same or different and each represent hydrogen, an alkyl of 1 to 8 carbon atoms or an alkyl monocyclic aliphatic group, R‴ is hydrogen, alkyl or alkoxy, R^4 is alkyl or phenyl,

W is from 0 to 4,

x is an integer of 2 to 8, and

y is an integer of 2 to 6,

and a monocyclic aromatic solvent,

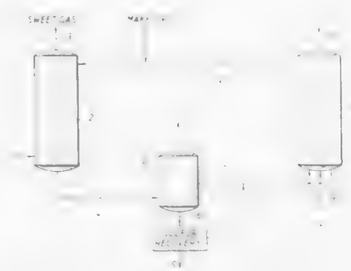
said reagent composition being derived from the reaction of n-alkyl lithium and at least two amines.

5,149,459

H_2S REMOVAL COMPOSITION

Donald C. Olson, Houston, Tex.; John J. Miller, deceased, late of Houston, Tex., and executor Wayne R. Miller, Omaha, Nebr., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 381,346, Jul. 18, 1989, abandoned, which is a division of Ser. No. 75,195, Jul. 16, 1987, Pat. No. 4,859,436, which is a continuation of Ser. No. 769,196, Aug. 23, 1985, abandoned. This application Sep. 18, 1991, Ser. No. 760,853
Int. Cl.[5] C01B *17/04*
U.S. Cl. 252—191 1 Claim



1. A composition of matter comprising an aqueous solution comprising ammonium ferric nitrilotriacetate chelate and ammonium ferrous nitrilotriacetate chelate, the molar ratio of ammonium ferric nitrilotriacetate chelate to ammonium ferrous nitrilotriacetate chelate being from about 0.2 to about 6, and at least about 0.1 percent, molar basis, with respect to said ammonium ferric and ammonium ferrous nitrilotriacetate chelates, of aqueous ammonia, the solution having a pH of from about 5 to about 8.5, the total iron content of the solution being from about 0.5 to about 7 percent by weight, based on the weight of the iron and the solution, and the total concentration of sodium or potassium ions present being less than that sufficient to precipitate sodium or potassium ferrous nitrilotriacetic acid.

5,149,460

COMPOSITION FOR H_2S REMOVAL

Donald C. Olson, Houston; John J. Miller, deceased, late of Houston, both of Tex.; Wayne R. Miller, executor, Omaha, Nebr.; George C. Blytas, and Zaida Diaz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 381,332, Jul. 18, 1989, abandoned, which is a division of Ser. No. 75,196, Jul. 16, 1987, Pat. No. 4,871,520, which is a continuation of Ser. No. 769,195, Aug. 23, 1985, abandoned. This application Sep. 18, 1991, Ser. No. 760,856
The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.
Int. Cl.[5] C01B *17/04*
U.S. Cl. 252—191 1 Claim

1. A composition of matter comprising an aqueous solution comprising ammonium ferric nitrilotriacetate chelate and ammonium ferrous nitrilotriacetate chelate, the molar ratio of ammonium ferric nitrilotriacetate chelate to ammonium ferrous nitrilotriacetate chelate being from about 0.2 to about 6, at least about 0.1 percent, molar basis, with respect to said ammonium ferric and ammonium ferrous nitrilotriacetate chelates, of aqueous ammonia, and ammonium thiosulfate in a ratio of 0.01 mol of about 4 mols of ammonium thiosulfate per gram equivalent of iron present, based on the total concentration of ammonium ferric nitrilotriacetate chelate and ammonium ferrous nitrilotriacetate chelate, the solution being a pH of from about 5 to about 8.5, the total iron content of the solution being from

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5,149,453

POLYUREA RIM SYSTEMS HAVING IMPROVED FLOW PROPERTIES AND CONTAINING AN ORGANIC CYCLIC CARBONATE

Neil H. Nodelman, Pittsburgh, Pa., assignor to Miles Inc., Pittsburgh, Pa.

Division of Ser. No. 546,078, Jun. 29, 1990, Pat. No. 5,028,635, which is a continuation-in-part of Ser. No. 463,762, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 346,186, May 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 212,751, Jun. 28, 1988, abandoned. This application Apr. 17, 1991, Ser. No. 686,555
Int. Cl.[5] C09K *3/00*; C08G *18/28, 18/70*
U.S. Cl. 252—182.26 3 Claims

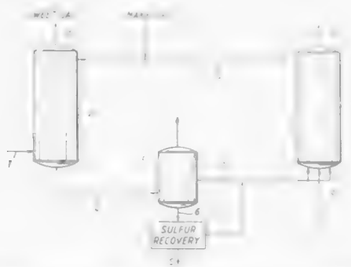
1. An isocyanate reactive mixture comprising

a polyether having at least two isocyanate-reactive groups and a molecular weight of from 1800 to 12,000 in which at least 50% of the isocyanate-reactive groups are primary and/or secondary amine groups,

ii) an amine-terminated chain extender, and

iii) from 2 to 20 parts by weight per 100 parts by weight of components i) and ii) of propylene carbonate.

about 0.5 to about 7 percent by weight, based on the weight of the iron and the solution, and the total concentration of sodium



or potassium ions present being less than that sufficient to precipitate sodium or potassium ferrous nitrilotriacetic acid.

5,149,461

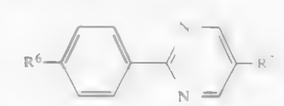
FERROELECTRIC LIQUID CRYSTAL COMPOSITION

Kanetsugu Terashima; Mitsuyoshi Ichihashi, both of Ichihara; Makoto Kikuchi, Kisarazu; Fusayuki Takeshita, Ichihara, and Kenji Furukawa, Yokosuka, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 276,389, Nov. 25, 1988, Pat. No. 5,064,568. This application Jul. 19, 1991, Ser. No. 733,183
Claims priority, application Japan, Nov. 26, 1987, 62-296055
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] C09K *19/34, 19/12, 19/30, 19/52*
U.S. Cl. 252—299.61 2 Claims

1. A ferroelectric liquid crystal composition which comprises a mixture of the following three liquid crystal components A, B and C, and the ratio of these components being 20 to 75% by weight of A, 5 to 30% by weight of B and 5 to 35% by weight of C with respect to the total weight of the three components:

said liquid crystal component A being composed of one or more selected from the group consisting of a compound represented by the general formula (IV)



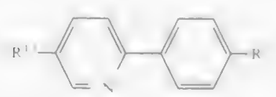
(IV)

wherein R^6 and R^7 are identical or different and each of them is respectively an alkyl group or an alkoxy group having 1 to 18 carbon atoms,

a compound represented by the general formula (V)

wherein R^8 and R^9 are identical or different and each of them is respectively an alkyl group or an alkoxy group having 1 to 18 carbon atoms,

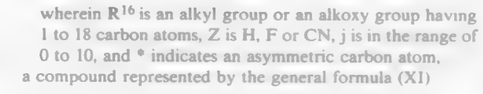
a compound represented by the general formula (VI)



(VI)

wherein R^{10} and R^{11} are identical or different and each of them is respectively an alkyl group or an alkoxy group having 1 to 18 carbon atoms,

and a compound represented by the general formula



(VII)

wherein R^{12} is an alkyl group or an alkoxy group having 1 to 18 carbon atoms, X is no group or an oxygen atom, k is in the range of 0 to 10, and (±) represents a racemic compound;

said liquid crystal component B being composed of one or more of compounds represented by the general formula (VIII)

(VIII)

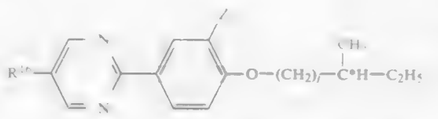
wherein R^{13} and R^{14} are identical or different and each of them is respectively an alkyl group or an alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom;

and said liquid crystal component C being composed of one or more of compounds represented by the general formula (IX)

(IX)

wherein R^{15} is an alkyl group or an alkoxy group having 1 to 18 carbon atoms, Y is H, F or CN, and * indicates an asymmetric carbon atom and in addition to said three components A, B and C the following liquid crystal component D, the ratio of the component D being 5 to 25% by weight based on the total weight of said three components A, B and C:

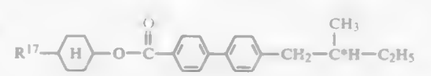
said liquid crystal component D being composed of one or more selected from the group consisting of a compound represented by the general formula (X)



(X)

wherein R^{16} is an alkyl group or an alkoxy group having 1 to 18 carbon atoms, Z is H, F or CN, j is in the range of 0 to 10, and * indicates an asymmetric carbon atom,

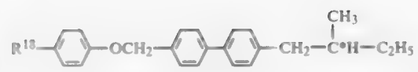
a compound represented by the general formula (XI)



(XI)

wherein R^{17} is an alkyl group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom,

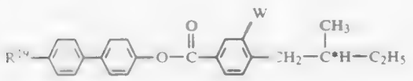
a compound represented by the general formula (XII)



(XII)

wherein R^{18} is an alkyl group or an alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom,

and a compound represented by the general formula (XIII)



(XIII)

wherein R^{19} is an alkyl group or an alkoxy group having 1 to 18 carbon atoms, W is H, F or CN, and * indicates an asymmetric carbon atom.

5,149,462

OPTICALLY ACTIVE COMPOUND

Keiichi Sakashita; Seiji Hayashi; Tetsuya Ikemoto, all of Kawasaki, and Osamu Yamamoto, Tokyo, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,898

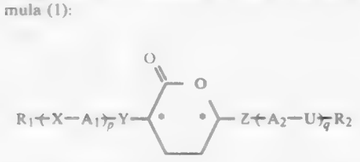
Claims priority, application Japan, Jul. 12, 1989, 1-179867

Int. Cl.[5] C09K *19/34*; **C07D** *309/00*

U.S. Cl. 252—299.61 **1 Claim**

1. A ferroelectric liquid crystal composition comprising:

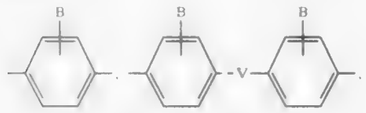
(A) an optically active compound having δ-valerolactone ring, which is represented by the following general formula (1):



(1)

wherein R_1 and R_2 independently represent a linear or branched alkyl group having 1 to 18 carbon atoms, a linear or branched alkenyl group having 2 to 18 carbon atoms, a liner or branched alkoxyalkyl group having 1 to 3 carbon atoms in the alkoxy portion and 1 to 18 carbon atoms in the alkyl portion, or an alkyl, alkenyl or alkoxyalkyl group as mentioned above in which at least one hydrogen atom is substituted by a halogen atom, with the proviso that when R_1 or R_2 has a structure that can possess an optically active group, it may be an optically active group or a racemic modification, X is a direct bond, Y is a direct bond, U represents a direct bond, —O—,

is a direct bond, Z is $—CH_2O—$, A_1 and A_2 independently represent



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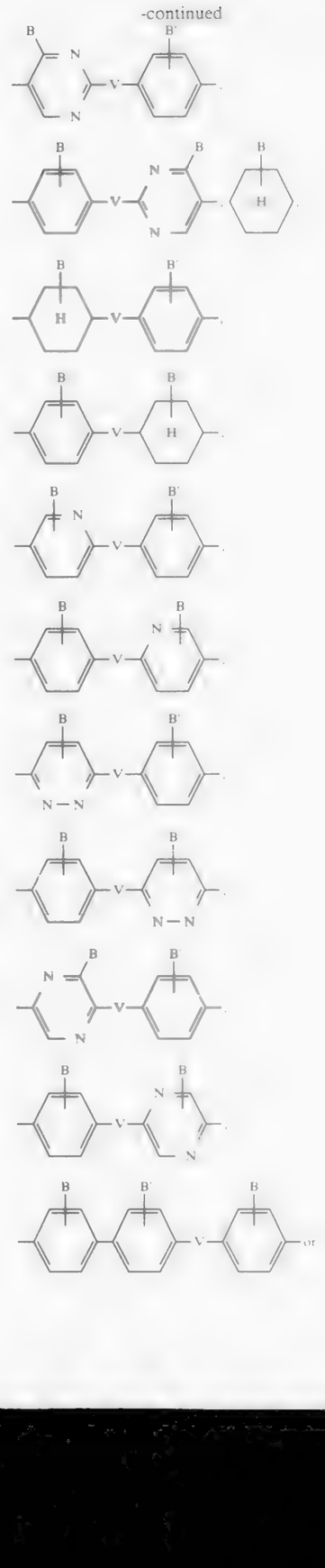
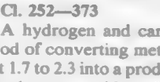


in which B, B' and B'' independently represent a hydrogen atom, a halogen atom, a cyano group, a methyl group, a methoxy group or a trihalomethyl group and V represents a direct bond, $—CH_2O—$, $—OCH_2—$,



p is zero, q is one, and *C represents an asymmetric carbon atom; and

(B) a material selected from the group consisting of ferroelectric liquid crystal compound, ferroelectric liquid crystal compositions, non-chiral liquid crystal compounds, a liquid crystal composition showing the phase series of isotropic phase-neumatic phase-smectic A phase, and a liquid crystal composition showing the phase series of isotropic phase-nematic phase-smectic C phase.

5,149,463

THICKENED ACIDIC LIQUID COMPOSITION WITH SULFONATE FWA USEFUL AS A BELACHING AGENT VEHICLE

David Peterson, Pleasanton, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Apr. 21, 1989, Ser. No. 342,800

Int. Cl.[5] C09K *11/06*; **C11D** *3/39, 9/42, 3/42*

U.S. Cl. 252—301.21 **14 Claims**

1. A thickened substantially clear aqueous acid solution having a pH below about 6 useful as a laundering aid comprising:

a thickener for the aqueous solution dissolved therein and in an amount effective to thicken the aqueous solution without substantially reducing the clarity thereof, the thickener consisting essentially of (a) a copolymer of α,β-ethylenically unsaturated carboxylic acid and one or more ethylenically unsaturated monomers copolymerizable therewith, (b) an acid soluble fluorescent whitener having sulfonate groups, and (c) from about 0.1 wt. % to about 5 wt. % with respect to the total composition of an amphoteric surfactant or an amine oxide.

5,149,464

CATALYTIC GAS CONVERSION METHOD

Malcolm L. H. Green; Anthony K. Cheetham, both of Oxford, and Patrick D. F. Vernon, Littlemore, all of Great Britain, assignors to Gas Research Institute, Chicago, Ill.

Filed Jun. 29, 1990, Ser. No. 546,291

Claims priority, application United Kingdom, Jun. 30, 1989, 8915111; Aug. 25, 1989, 8919303; Jan. 24, 1990, 9001665; Mar. 7, 1990, 9005126

Int. Cl.[5] C07C *1/02*

U.S. Cl. 252—373 **8 Claims**

1. A hydrogen and carbon monoxide selective single step method of converting methane and oxygen in a molar ratio of about 1.7 to 2.3 into a product gas comprsiing mainly hydrogen and carbon monoxide and lesser amounts of water and carbon dioxide in which the H_2:H_2O ratio is at least about 8 and the CO:CO_2 ratio is at least about 8, said method comprises contacting said methane and oxygen without the addition of H_2O at a temperature of about 650° to 900° C. and pressure of about 10 to about 600 kPa and a solid catalyst of the formula $M_xM'_yO_z$ where M is selected from the group consisting of Mg, B, Al, Ga, Si, Ti, Zr, Hf and Ln wherein Ln is a member of the lanthanum and lanthanide series of elements; M' is a d-block transiton metal selected from the group consisting of Fe, Os, Co, Rh, Ir, Pd, PT, Ni and Ru; and each of the ratios x/z, y/z and (x+y)/z is about 0.1 to 8; and a catalyst formed by heating said $M_xM'_yO_z$ under non-oxidizing conditions.

5,149,465

CONDUCTIVE RESIN COMPOSITION

Toru Ueki; Kenji Sakata; Masaji Yoshimura; Kazuharu Kanezaki, and Ineo Iwata, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 25, 1991, Ser. No. 674,381

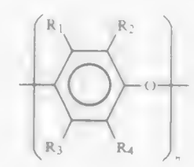
Claims priority, application Japan, Mar. 29, 1990, 2-078688

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—511 **9 Claims**

1. An electrically conductive resin composition comprising:

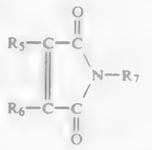
(A) from 50 to 95% by weight of polyphenylene ether resing which is homopolymer or a copolymer comprising one or more of structural units represented by the formula (I)



(I)

wherein each of R_1,R_2, R_3 and R_4 is individually selected from the group consisting of a hydrogen atom, halogen atom, hydrocarbon, halogenated hydrocarbon, hydrocarbonoxy group and haolgenated hydrocarbonoxy group and n is an integer of 20 or more, and which has an inherent viscosity of from 0.25 to 0.70 dl/g measured at 25° C. in a chloroform solution;

(B) from 50 to 5% by weight of a copolymer of a styrenic compound which is one or more of compounds selected from the group consisting of styrene, 50-methylstyrene, o-methylstyrene and p-methylstyrene, and α,β-unsaturated dicarboxylic acid imide compound which is represented by the formula (II):



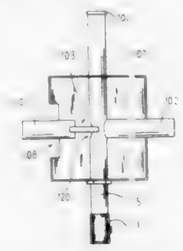
(II)

wherein each of R_5, R_6 and R_7 is individually selected from a hydrogen atom, alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl, substituted cycloalkyl, phenyl or substituted phenyl;

(C) from 5 to 30 parts by weight of an electrically conductive carbon per 100 parts by weight of the sum of the resin (A) and the copolymer (B); and

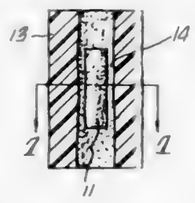
(D) from 1 to 20 parts by weight of a low molecular weight polystyrene per 100 parts by weight of sum of the resin (A) and the copolymer (B), the number of average molecular weight of the low molecular weight polystyrene (D) is 30,000 or less determined by gel permeation chromatography based on a polystyrene standard.

5,149,466
WATER VAPORIZER
Karl H. Megenbier, 8 Holly Tree Close, Market Rasen, Lincolnshire, United Kingdom LN8 3BP
PCT No. PCT/GB90/00307, § 371 Date Sep. 3, 1991, § 102(e) Date Sep. 3, 1991, PCT Pub. No. WO90/10150, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 27, 1990, Ser. No. 752,512
Claims priority, application United Kingdom, Mar. 2, 1989, 8904707
Int. Cl.[5] F02M *25/02*
U.S. Cl. 261—18.2 3 Claims



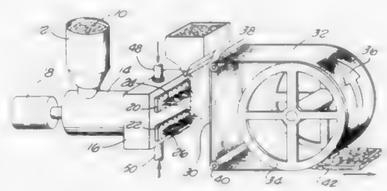
1. A water vapouriser device for supplying steam to the air intake of a diesel or petrol engine having an exhaust system, the water vapouriser device comprising:
a water boiler (7) for mounting in heat exchange relation with the exhaust system of the engine, and
a steam reservoir (2) comprising a housing (107) having a steam inlet (101) for receiving steam from the boiler in use, an air inlet (105), and an outlet (102) for supplying steam to the air intake of the engine,
characterised in that the steam inlet and outlet of the steam reservoir comprise inlet and outlet pipes (101, 102) which project into the housing (107), the pipes having respective openings within the housing which are separated by a gap (103).

5,149,467
IMPROVED METHOD OF MANUFACTURE FOR CLAD OPTICAL CONDUIT
Jamshid J. Zarian, Woodland Hills, Calif., assignor to Lumenyte International Corporation, Costa Mesa, Calif.
Continuation-in-part of Ser. No. 565,726, Aug. 13, 1990, Pat. No. 5,052,778, which is a continuation of Ser. No. 304,417, Jan. 30, 1989, Pat. No. 4,957,347. This application Sep. 30, 1991, Ser. No. 769,688
Int. Cl.[5] G02B *6/20*
U.S. Cl. 264—1.5 1 Claim



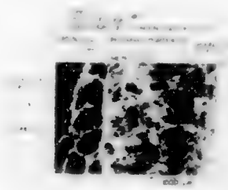
1. The process of making a flexible, clad monofilament conduit comprising the steps of:
selecting a length of a relatively durable polymeric tubular jacket;
cutting a slit along the length of the jacket;
selecting a length of tubular cladding form the group, preshrunken heat shrinkable fluorinated ethylene-propylene copolymer, perfluoralkoxy resin, and polytetrafluoroethylene tubing;
closing one end of said tubular cladding with a stopper;
pressurizing said tubular cladding with an inert gas and maintaining pressure;
inserting said tubular cladding inside said jacket;
removing said stopper and releasing the inert gas from the tubular cladding;
placing a polymerizable mixture inside of the tubular cladding;
polymerizing the mixture to form a flexible tubular core;
removing the jacket; and
applying heat to the cladding effective to radially shrink the cladding to form a relatively narrow, uniform gap between the outer periphery of the core and the inner periphery of the cladding.

5,149,468
METHOD FOR PRODUCING FILTER MATERIAL FORMED OF MELT-BLOWN NON-WOVEN MAT SANDWICHING ADDITIONAL MATERIAL
James W. Hershelman, Alhambra, Calif., assignor to Moldex/-Metric Products, Inc., Culver City, Calif.
Filed Nov. 17, 1989, Ser. No. 438,701
Int. Cl.[5] D04H *5/00*
U.S. Cl. 264—12 6 Claims



1. In a method for producing a melt-blown non-woven mat wherein a fiber-forming thermoplastic polymer resin is extruded in molten form through a row of individual nozzles each surrounded by an individual stream of hot gas which attenuates the molten resin into fibers that together form a fiber stream, and the fibers are collected on a receiver in the path of the fiber stream to form the non-woven mat, including the following steps
providing at least two spaced rows of nozzles to produce first and second fiber streams spaced from each other,
collecting the spaced fiber streams on the receiver to form a first non-woven mat portion and a second non-woven mat portion and with the first non-woven mat portion overlaying the second non-woven mat portion,
injecting at a position intermediate the first and second fiber streams material different than the fiber-forming resin to have a substantial portion of the different material captured between the first and second fiber streams and thereby form a collected structure of the first and second mat portions sandwiching the substantial portion of the different material,
providing the receiver as a substantially vertical surface and providing the spaced fiber streams as upper and lower substantially horizontal streams to be collected on the substantially vertical surface of the receiver, and
wherein the injection of the substantial portion of the different material between the substantially horizontal fiber streams is provided by having the different material fall to the position intermediate the spaced fiber streams and wherein the fall of the different material is provided at a portion above both fiber streams to have the substantial portion of the different material pass through the upper fiber stream to the intermediate position.

5,149,469
METHOD OF MANUFACTURING A WOUND DRESSING
Shigeru Komatsuzaki; Toshinobu Hirayama, and Tetsuo Toyokawa, all of Yokohama, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Division of Ser. No. 545,734, Jun. 29, 1990. This application Mar. 26, 1991, Ser. No. 665,203
Claims priority, application Japan, Jul. 11, 1989, 1-178833
Int. Cl.[5] A61L *15/00*
U.S. Cl. 264—28 9 Claims



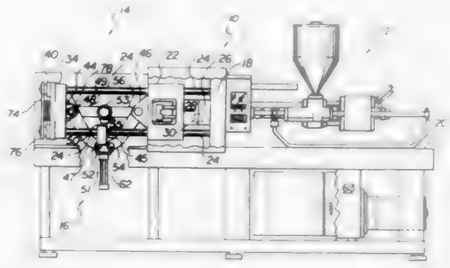
5. A method of manufacturing a wound dressing having microscopic filmy interconnections and a porous structure of continuous pores throughout the wound dressing, comprising the steps of:
a) heating while simultaneously stirring a poly-α-amino acid and a solvent to form a homogeneous solution;
b) adding a liquid which inhibits the freezing of the homogeneous solution;
c) cooling while simultaneously stirring the homogeneous solution to form a gel comprising a dispersion of gel particles of the poly-α-amino acid; and
d) freeze-drying the gel.

5,149,470
METHOD OF MAKING A DIAPHRAGM OF CARBONACEOUS MATERIAL
Yoshihisa Suda, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed Jun. 20, 1989, Ser. No. 368,762
Int. Cl.[5] C01B *31/02, 31/04*
U.S. Cl. 264—29.6 6 Claims

1. A method for manufacturing a carbonaceous diaphragm for acoustic equipment, which comprises: mixing graphite powder with a bridging agent and a chlorine-containing resin to obtain a mixture; kneading the mixture sufficiently; adding a resin solvent and graphite powder to the mixture and mixing with a mixer having high shearing force; making the mixture into a sheet form; preforming said sheet into a film having a desired thickness by passing it through calendar rolls; molding the preformed film into a diaphragm shape; removing the contained solvent therefrom by treatment in heated air to obtain a completely hardened molding; and sintering the hardened molding in an inert atmosphere.

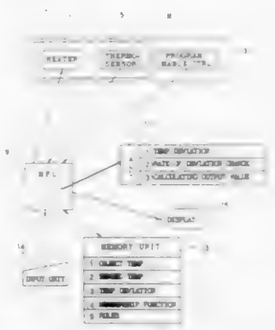
5,149,471
CLAMP FORCE CONTROL
John C. Catanzaro, Lebanon, and Ronald M. Sparer, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jun. 17, 1991, Ser. No. 716,423
Int. Cl.[5] B29C *45/76*
U.S. Cl. 264—40.5 14 Claims

1. A method for providing a desired clamping force to hold first and second mold elements on a molding machine in contact, said molding machine having a clamp for generating a clamping force by operating a toggle mechanism to a fully extended configuration in response to control signals generated by a machine control, the method comprising the steps of:
a. producing a first value representing the desired clamping force;
b producing a second value representing a desired initial clamping force;
c. determining in response to the first and second values a desired mold touch position representing a first configuration of the toggle mechanism upon the mold elements achieving initial contact, said configuration being effective to produce the desired clamping force upon the toggle mechanism being operated to the fully extended configuration;
d. producing a first control signal representing the desired mold touch position;



e. operating the clamp in response to the first control signal to move the toggle mechanism to the first configuration simultaneously with mold elements achieving initial contact;
f. producing a second control signal representing the fully extended configuration of the toggle mechanism; and
g. operating the toggle mechanism to the fully extended configuration in response to the second control signal thereby applying the desired clamping force to the mold elements.

5,149,472
FUZZY INFERENCE THERMOCONTROL METHOD FOR AN INJECTION MOLDING MACHINE
Masashi Suganuma, Sakaki, Japan, assignor to Nissei Jushi Kogyo Kabushiki Kaisha, Nagano, Japan
Filed Aug. 15, 1991, Ser. No. 745,331
Claims priority, application Japan, Aug. 27, 1990, 2-226359
Int. Cl.[5] B29C *45/78*
U.S. Cl. 264—40.6 10 Claims



1. A thermocontrol method for an injection molding machine so as to control thermocontrolled components to maintain an object temperature corresponding to an operating status of the injection molding machine,
comprising the steps of:
detecting the operating status of the injection molding machine and the temperature of the thermocontrolled components thereof;

calculating the deviation between the object temperature of the thermocontrolled components corresponding to the present status of the injection molding machine and the present temperature detected, and the rate of deviation change between the present deviation and the previous deviation;

performing fuzzy inference to define a control value of means for heating the thermocontrolled portions or means for cooling the thermocontrolled components by inferring the status of the injection molding machine, the deviation calculated and the rate of deviation change, wherein the status of the injection molding machine, the temperature deviation, the rate of deviation change and the control value of the means for heating or the means for cooling are defined as fuzzy variables, and wherein the inference is based on rules governing a mutual relationship among membership functions and groups into which the member grades assigned to previously and optionally divided areas which correspond to respective optional values of the fuzzy variables;

calculating an actual control value of the means for heating or the means for cooling based on the fuzzy inference; and

controlling the temperature of the means for heating or the means for cooling with the actual control valve.

5,149,473

METHOD FOR PRODUCTION OF STYRENIC FOAM

Edward C. LeDuc, Marietta, Ga., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 6, 1992, Ser. No. 832,023
Int. Cl.[5] C08J *9/08, 9/14*
U.S. Cl. 264—51 **9 Claims**

1. A method for the production of a styrenic foam comprising:

(a) heating a alkenyl aromatic resin and an added plasticizing material in an extruder to produce a molten resin mixture;

(b) injecting into the molten resin mixture a blowing agent comprising at least one C_4–C_5 alkane, CO_2 and a halogenated ethane selected from the group consisting of 1,1,1,2-tetrafluoroethane, 1-chloro-1,1-difluoroethane, 1,1,1-trifluoroethane and mixtures thereof, wherein the halogenated ethane comprises less than about 70.0 wt. % of total blowing agent weight, to produce an extrusion mass at a temperature and under a pressure sufficient to prevent foaming of the extrusion mass;

(c) extruding the extrusion mass through a die into a zone having a temperature and pressure sufficient to permit expansion of the extrusion mass to produce the alkenyl aromatic foam.

5,149,474

METHOD OF MAKING GLASS FORMING MOLDS OF AN AMORPHOUS FUSED SILICA COMPOSITION

Pierre Rohatyn, Le Roc, 30130 St. Alexandre, France

Continuation of Ser. No. 174,609, Mar. 29, 1988, abandoned. This application Aug. 14, 1990, Ser. No. 567,825
Int. Cl.[5] B29C *33/38*
U.S. Cl. 264—63 **7 Claims**

1. A method for making molds which comprises the steps of:

(a) thoroughly mixing a hydraulic compound containing ingredients in the following approximate proportions:

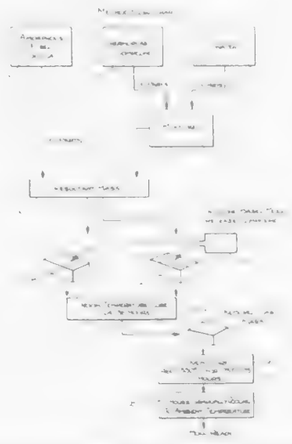
Al_2O_3	30%
CaO	7%
SiO_2	56%

with water in the ratio by weight of six parts hydraulic compound to two and four-tenths parts water thereby forming a hydraulic compound composite;

(b) thoroughly mixing the said hydraulic compound composite with amorphous fused silica in the weight ratio to the prior parts of ten parts amorphous fused silica, thereby forming a composite mass;

(c) forming the composite mass into a mold shape;

(d) curing the said composite mass at room temperature for a period in the range of 8 to 36 hours; and



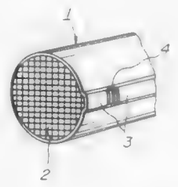
(e) curing the said composite mass at a temperature in the range of from 460° C. to 550° C. for a period ranging from 1.75 to 2.75 hours.

5,149,475

METHOD OF PRODUCING A HONEYCOMB STRUCTURE

Osamu Horikawa, Toyoake, and Koichi Ikeshima, Okazaki, both of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 384,633, Jul. 25, 1989, Pat. No. 5,098,763. This application Jul. 19, 1991, Ser. No. 733,173
Claims priority, application Japan, Jul. 28, 1988, 63-186981
Int. Cl.[5] B32B *3/12*
U.S. Cl. 264—67 **5 Claims**



1. A method of producing a honeycomb structure comprising the steps of:

extruding a ceramic batch to form a honeycomb structure having at least one ridge arranged on at least one part of an outer surface of said honeycomb structure and extending in a direction of through-apertures of said honeycomb structure; and

removing at least one part of said ridge to form a notch substantially perpendicular to said direction of through-apertures.

5,149,476

APPLICATOR TRAP GUIDE

Benny M. Sedman, Laurens, S.C., assignor to AlSiMag Technical Ceramics, Inc., Laurens, S.C.

Division of Ser. No. 571,086, Aug. 22, 1990. This application Dec. 26, 1991, Ser. No. 813,988
Int. Cl.[5] C04B *35/64, 41/53*
U.S. Cl. 264—67 **1 Claim**

1. The method of producing a ceramic applicator trap guide which comprises the steps of:

pressing a ceramic around a mandrel to form a block defining a filament chamber;

removing the mandrel;

boring a hole through said block tapering to a reduced diameter orifice in communication with said chamber;

maching said block to form the trap guide which has the following features; in a cylindrical peg housing said bored hole, an entrance face in communication with said filament chamber having an upper facet on a plane parallel to a subtending lower facet, said upper and said lower entrance facets separated by a horizontal through in communication with said chamber and a diagonal fluted sleeve, said sleeve having a pair of side walls which diverge upward forming opposing tapered surfaces coverging with a trap guide top surface, and an opposing exit face in communication with said chamber having an upper facet on a plane parallel to a subtending lower facet, said upper and said lower exit facets separated by a horizontal trough in communication with said chamber; and

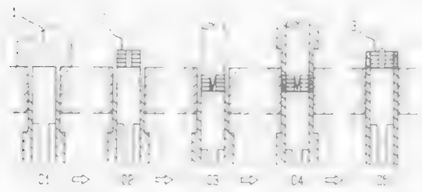
firing said block to harden and strengthen the ceramic.

5,149,477

PROCESS FOR PRODUCING A RESIN BONDED MAGNET STRUCTURE

Fumitoshi Yamashita, Ikoma; Akihiko Watanabe, Kadoma, and Masami Wada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 665,014, Mar. 5, 1991, abandoned. This application Feb. 21, 1992, Ser. No. 840,634
Claims priority, application Japan, Mar. 7, 1990, 2-55333
Int. Cl.[5] B29C *43/18*
U.S. Cl. 264—112 **7 Claims**



1. A process for producing a resin bonded magnet structure, comprising the steps of:

(a) adding a solid epoxy resin of at least one epoxy oligomer and microcapsules, prepared from a formaldehyde condensation resin, which contain at least one liquid epoxy resin to a melt spun powder of a rare earth element-iron alloy to form a granulated intermediate material, wherein said epoxy oligomer has alcoholic hydroxyl groups in the molecular chain thereof and said solid epoxy resin has a softening temperature (Durran's melting point) of 65° C. to 85° C.;

(b) mixing said granulated intermediate material with a powdered curing agent and a lubricant to form a compound wherein said compound contains 93% to 96% by weight of said melt spun powder;

(c) forming a green body of a resin bonded magnet by compressing said compound, and simultaneously integrating said green body with a supporting member; and

(d) curing said solid and liquid epoxy resins in said green body by application of heat to form a rigid structure of said resin bonded magnet integrated with said supporting member.

5,149,478

FORMING DECORATIVE TRIM STRIPS FROM CONTINUOUS EXTRUSIONS

Douglas N. Malm, Brecksville, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Nov. 18, 1991, Ser. No. 793,585
Int. Cl.[5] B29C *47/06*
U.S. Cl. 264—162 **8 Claims**

1. A method of forming an elongated trim strip having contoured ends and a predetermined cross-sectional configuration comprising:

providing an extruded length of thermoplastic material to have a uniform cross-section in planes perpendicular to its longitudinal axis and a length at least as great as the desired trim strip, said extruded length having a face side and a back side;

removing material from the back side of the length adjacent the ends thereof to cause each end portion of the length to gradually reduce in thickness from the original extruded thickness to a minimum thickness closely adjacent the associated end;

providing a rigid and relatively flat backing strip and deflecting the extruded length to bring the back side of the reduced thickness end portions into engagement with the backing strip and bonding the back side of the extruded length including the end portions to the backing strip to produce a finished trim strip having contoured ends.

5,149,479

METHOD OF MANUFACTURING MODULAR COVER OF AIR BAG

Hideo Nakajima, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,818
Claims priority, application Japan, Mar. 6, 1990, 2-54294
Int. Cl.[5] B28B *7/14, 7/02*
U.S. Cl. 264—163 **7 Claims**

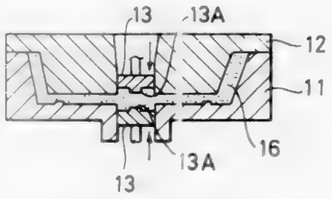
1. A method of manufacturing a modular cover for an air bag comprising,

preparing a mold formed of a stationary die, a movable die movable toward the stationary die to define a cavity between the two dies and two tear-line impressing movable members attached to the respective dies and movable forward and rearward with respect to the cavity formed between the two dies, each movable member having an elongated projection for forming a tear-line and flat side faces on both sides of the elongated projection;

withdrawing the movable members away from the cavity of the mold to form extra spaces adjacent the cavity;

supplying a resin material into the cavity of the mold to fill the resin material in the cavity and the extra spaces;

moving the respective movable members toward the cavity to positions where the flat side faces on both sides of the respective elongated projections are flush with respective outer surfaces of the cavity and the elongated projections project into the cavity so that tear-lines are formed in the resin material supplied into the mold and the resin material



in the extra spaces is supplied to an area around the tear-lines with compression to provide enough density at the area around the tear-lines;

hardening the resin material within the cavity of the mold; and

separating the hardened resin material from the mold thereby obtaining the modular cover provided with the tear-lines on both sides of the modular cover with sufficient strength.

5,149,480

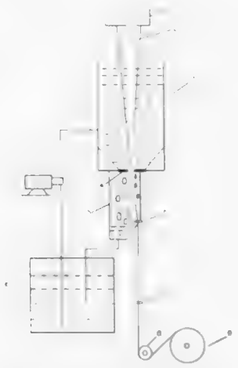
MELT SPINNING OF ULTRA-ORIENTED CRYSTALLINE POLYESTER FILAMENTS

John A. Cuculo; Paul A. Tucker both of Raleigh, N.C.; Gao-Yuan Chen, Chester, Va., and Ferdinand Lundberg, Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed May 18, 1990, Ser. No. 525,874

Int. Cl.[5] D01D 6/62

U.S. Cl. 264—178 F **10 Claims**



1. A one-step process for producing melt spun thermoplastic polymer filaments of high orientation and tenacity, comprising extruding molten fiber-forming thermoplastic polyester polymer in the form of filaments, while directing the thus extruded filaments into a liquid bath, while maintaining the liquid bath at a temperature at least 30° C. above the glass transition temperature of the thermoplastic polymer to provide isothermal crystallization conditions for the filaments in the bath, and while withdrawing the filaments from the bath at a speed of 3000 meters per minute or greater to stress the filaments as they pass through the bath.

5,149,481

METHOD OF MANUFACTURING THERMOPLASTIC SHEET OR FILM

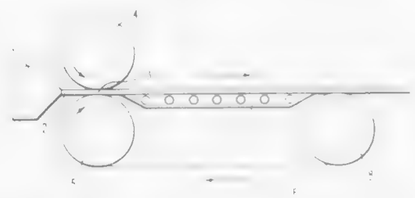
Heinz Gross, Rossdorf; Andreas Fetzer, Bickenbach, and Günther Dickhaut, Riedstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 10, 1991, Ser. No. 712,424

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1990, 4018530

Int. Cl.[5] B29C 47/90

U.S. Cl. 264—210.2 **4 Claims**



1. A method of manufacturing an extruded, smooth finished solid sheet or film of thickness <1 mm, from a thermoplastic plastic having a glass transition temperature >50° C., by extruding the plastic in a thermoplastic state through a slot nozzle to form a flat extruded strip, which is introduced into the roll gap of a roll stack having a smoothed upper roll and a lower roll, with the upper roll being maintained at a temperature below the glass transition temperature of the thermoplastic plastic and with the lower roll being maintained at a temperature in the plastic state domain of the thermoplastic plastic, and, after exiting the roll gap, the extruded strip is moved resting on a smooth-finished endless belt which passes around the lower roll, thereby smoothing the surfaces of the strip; and cooling said extruded strip below the glass transition temperature.

5,149,482

INJECTION-MOLDING DIMENSION-CONTROL AND CLAMP-REDUCTION

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Primtec, Rancho Santa Fe, Calif.

PCT No. PCT/US90/02982, § 371 Date Feb. 1, 1991, § 102(e) Date Feb. 1, 1991, PCT Pub. No. WO90/14936, PCT Pub. Date Dec. 13, 1990

Continuation-in-part of Ser. No. 361,275, Jun. 5, 1989, Pat. No. 5,008,064. This PCT application May 30, 1990, Ser. No. 646,641

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] B29C 45/14

U.S. Cl. 264—255 **12 Claims**

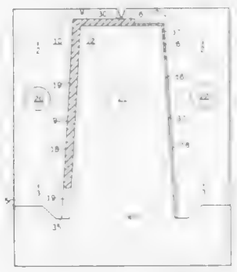


FIG. 1

1. A method of controlling dimensions of a hollow plastic product having perimetric side walls that is injection molded

by using a core mold section and a cavity mold section that are combined to define a mold cavity for the product therebetween, and which mold sections, when so combined, are separated by a parting line, wherein the mold cavity includes a gate in a base region and flow channels extending from the base region through a region of the cavity that defines the side walls of the product, the method comprising the step of

injecting plastic material continuously into the mold cavity from the gate until the mold cavity is filled with said injected plastic material, with said injection being under such conditions of injection pressure, injected plastic material temperature, mold cavity wall temperature, flow channel length, distance between flow channels, flow channel thickness and wall thickness in a thin-cavity region between flow channels that initially injected plastic material solidifies in the thin-cavity regions to stabilize the core mold section in relation to the cavity mold section prior to the mold cavity being filled with the injected plastic material.

5,149,483

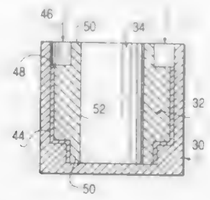
METHOD OF RESIN IMPREGNATING ELECTRIC MACHINERY

David W. Okey; Owen M. Briles, and Francis T. Carriglitto, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 26, 1991, Ser. No. 660,871

Int. Cl.[5] B29C 45/18, 45/46

U.S. Cl. 264—272.19 **20 Claims**



1. A method of impregnating electric machinery containing windings with a resin comprising:

providing a vessel for containing the electric machinery and an impregnating resin with the vessel having an interior volume which provides resin in contact with an exterior surface of the electric machinery to be contacted with resin to impregnate the windings;

heating the vessel containing the electric machinery to a first temperature sufficient to reduce viscosity of the resin upon contact with the machine and vessel to promote flow of the resin into contact with the windings; and

contacting the heated vessel and electric machinery with the resin under atmospheric or less than atmospheric pressure said vessel and machinery heating the resin from a storage temperature, maintained below said first temperature to a second temperature sufficient to reduce the viscosity of the resin and promote capillary action with a reduced viscosity resin flowing into contact with the windings to be impregnated and the capillary action drawing the heated resin into interstices within the electric machine.

5,149,484

PROCESS FOR INJECTION MOLDING

George E. Ealer, Whitehouse Station, N.J., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 11, 1990, Ser. No. 625,467

Int. Cl.[5] B29C 45/00

U.S. Cl. 264—328.17 **6 Claims**

1. A process for preparing a low haze molded article comprising:

(i) adding a nucleating agent to a polypropylene homopolymer or copolymer to provide a prenucleated polypropylene homopolymer or copolymer having a molecular weight of at least about 20,000 and an isotactic index of at least about 60 percent;

(ii) forming a composition by mixing the prenucleated polypropylene with linear low density polyethylene having a melt index of at least about 120 grams per 10 minutes, in an amount of about 1 to about 5 percent by weight based on the total weight of the polyethylene and the polypropylene;

(iii) introducing into an injection molding zone, under molding conditions, said composition; and

(iv) molding said composition at a temperature below the melting point of the polypropylene.

5,149,485

METHOD AND APPARATUS FOR EXTRUSION BLOW MOLDING POLYETHYLENE TEREPHTHALATE ARTICLES

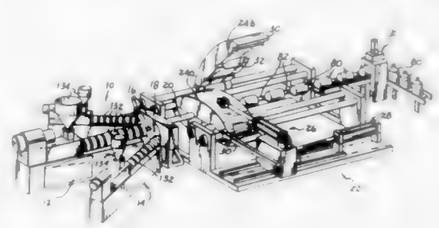
Samuel L. Belcher, Cincinnati, Ohio, assignor to Sabel Plastechs, Inc., Cincinnati, Ohio

Continuation of Ser. No. 644,241, Jan. 22, 1991, Pat. No. 5,080,855, which is a continuation of Ser. No. 235,237, Aug. 23, 1988, Pat. No. 4,988,279. This application Aug. 2, 1991, Ser. No. 739,989

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] B29C 49/04, 49/64

U.S. Cl. 264—532 **6 Claims**



1. A method for extrusion blow molding polyethylene terephthalate articles, comprising:

(a) feeding polyethylene terephthalate pellets into the input end of an extruder having a barrel with an output opening, an extrusion screw disposed in the barrel, means for rotating the screw, a die head attached to the barrel at an end adjacent the output opening, and a plurality of extruder heating means for independently heating a plurality of zones of the barrel and die head;

(b) controlling the extruder heating means to establish a reverse temperature gradient along the combined length of the extruder barrel and die head beginning at a temperature at the input end of the extruder not to exceed about 560° F. and ending at a minimum temperature at the output of the die head in the approximate range of 490° F.-520° F., thereby increasing the viscosity of the polyethylene terephthalate along the length of the extruder and establishing a viscosity gradient-induced back pressure in the extruder barrel;

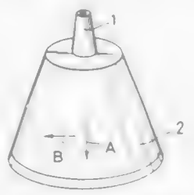
(c) imparting sufficient shear energy to the molten polyeth-

ylene terephthalate in the extruder to render it substantially clear, homogenous and free of non-melted pellets at the input to the die head;
(d) extruding the polyethylene terephthalate in the form of a hollow tube from the die head;
(e) oscillating in a path a plurality of blow molds mounted on a support structure adjacent the extruder;
(f) closing each blow mold around the hollow tube as it is extruded from the die head to enclose a segment thereof;
(g) moving each closed blow mold along said path relative to the die head;
(h) injecting blow gas into the hollow tube while each closed mold is in said path to form the desired article; and
(i) opening each mold to release the hollow blow molded article therefrom.

3. An apparatus for extension blow molding polyethylene terephthalate articles, comprising:
(a) an extruder for extruding monolayer polyethylene terephthalate as a hollow tube, said extruder having a barrel with an input opening and an output opening, an extrusion screw disposed within said barrel, means for rotating said screw, a die head attached to said barrel at an end adjacent said output opening, and a plurality of extruder heating means for independently heating a plurality of zones of said barrel and die head to predetermined temperatures which in turn heat the polyethylene terephthalate to predetermined temperatures as it passes from said input opening to said output opening and through said die head, said screw having a tapered tip at an end adjacent said die head;
(b) means for controlling said extruder and die head heating means to establish a reverse temperature gradient along the combined length of said extruder barrel and said die head beginning at a temperature at the input end of said extruder not to exceed about 650° F. and ending at a minimum temperature at the output of said die head in the approximate range of 490° F.-520° F., to thereby increase the viscosity of the polyethylene terephthalate along the length of said extruder and establish a viscosity gradient-induced back pressure in said extruder barrel;
(c) means for imparting sufficient shear energy to the molten polyethylene terephthalate to render it substantially clear, homogenous and free of non-melted pellets at the input to said die head;
(d) a structure adjacent said extruder for supporting a plurality of traveling blow molds and means for oscillating said blow molds on said support structure along a path; and
(e) a plurality of traveling blow molds supported by said support structure, each said mold having means for opening and closing and each said mold positioned and configured to close around the hollow tube as it is extruded from said die head to enclose a segment thereof, to travel along said path away from said die head in a closed position, to inject blow gas into the hollow tube while said closed mold is in said path to form the desired article, to open and release the blown article, and to travel toward said die head in an open position.

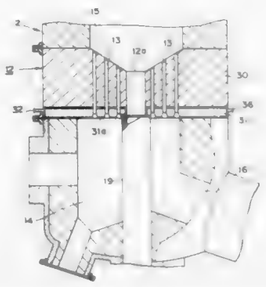
5,149,486
METHOD FOR MANUFACTURING SPEAKER VIBRATION MEMBER
Fumiaki Baba, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 397,397, Aug. 23, 1989, abandoned. This application Sep. 13, 1990, Ser. No. 582,374
Int. Cl.[5] B29C *71/10, 55/10*
U.S. Cl. 264—553 **5 Claims**

1. A method for manufacturing a speaker vibration member in a molding process, said method comprising the steps of:
preparing a mixture of materials for forming said speaker member, said mixture of materials containing no less than 10% by weight of liquid crystal polymer and 3 to 40% by weight of fiber or flake filler,
forming the mixture of materials into a sheet; and



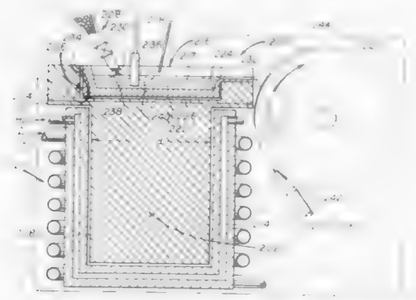
vacuum-forming the sheet into the shape of the speaker vibration member.

5,149,487
PREREDUCTION FURNACE OF A SMELTING REDUCTION FACILITY OF IRON ORE
Masahiro Matsuo; Genji Kanatani; Hitoshi Kawata; Tatsurou Ariyama; Jirou Mase; Yoshiyuki Kitano; Haruhito Tsuboi, and Shinichi Isozaki, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan
Filed Feb. 20, 1991, Ser. No. 658,781
Claims priority, application Japan, Feb. 27, 1990, 2-44372; Jun. 16, 1990, 2-158154; Jun. 16, 1990, 2-158155
Int. Cl.[5] C22B *5/14*
U.S. Cl. 266—172 **28 Claims**



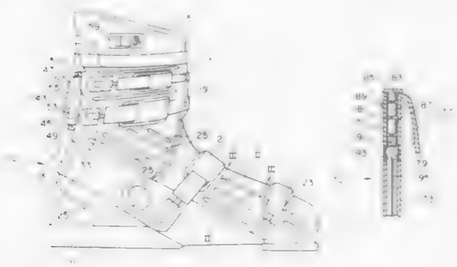
1. A prereduction furnace of a smelting reduction facility of iron ore, the prereduction furnace having an upper part where iron ores are fed thereto to be prereduced, and a lower part wherein a reducing gas is fed, the prereducing furnace comprising:
a fluidizing prereduction chamber at the upper part of the prereduction furnace for receiving iron ores therein for prereduction;
a gas blowing chamber at the lower part of the prereduction furnace for receiving a reducing gas therein;
a distributor arranged in the prereduction furnace between said fluidizing prereduction chamber and said gas blowing chamber so as to separate said chambers from each other;
said distributor including a ceramic main body mounted between said fluidizing prereduction chamber and said gas blowing chamber;
a metal box attached at a bottom side of said ceramic main body of said distributor, said metal box including a passage therein in which a cooling fluid flows;
a plurality of nozzles passing through said ceramic main body and through said metal box for injecting said reducing gas in said gas blowing chamber into said fluidizing prereduction chamber; and
a discharge pipe mounted at a bottom portion of said fluidizing prereduction chamber and extending through said ceramic main body, through said metal box, and through a bottom of said gas blowing chamber, for discharging prereduced iron ores from the prereduction furnace.

5,149,488
APPARATUS AND METHOD FOR SPILL CHILLING RAPIDLY SOLIDIFIED MATERIALS
James Dickson, deceased, late of Stirling, N.J. by Jacqueline T. Dickson, executor , assignor to Dickson Enterprises, Inc., Stirling, N.J.
Filed Mar. 28, 1990, Ser. No. 500,365
Int. Cl.[5] B22D *11/06*
U.S. Cl. 266—242 **15 Claims**



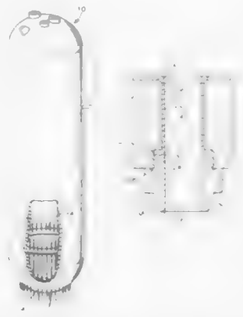
1. An apparatus for melting and forming a rapidly solidified material from solid feed material comprising:
a) an inductor having a first section and a second section, said first section having a cavity forming a crucible;
b) an induction coil positioned around said second section of said inductor;
c) means for providing feed stock into said crucible;
d) a focused energy source for directing energy into said cavity for locally melting said feed stock and forming a skulled melt having a molten pool contained therein;
e) means for monitoring and controlling the temperature at a skull crucible interface being defined by the interface between said skull and said crucible; and
f) a moving casting surface positioned at a separation such that the chill surface accepts a stream resulting from the overflow which results from the addition of feed stock.

5,149,489
ILLUMINATED SKI BOOTS AND POLES
Robin Crews, R.D. 3, Box 154, Little Falls, N.Y. 13365
Filed Feb. 5, 1992, Ser. No. 831,675
Int. Cl.[5] F21V *5/00*
U.S. Cl. 362—32 **16 Claims**



1. A ski equipment ensemble, comprising:
a) a pair of ski boots, each boot comprising:
i) a body portion and a sole;
ii) said body portion having a plurality of lenses mounted thereon, each lens defining an internal chamber;
iii) an optical fiber within each chamber and optically coupled to a light source mounted on said boot;
b) a pair of ski poles, each pole comprising:
i) an elongated transparent body;
ii) a spike connected at one end of said body;
iii) a handle connected at another end of said body, said handle containing a further light source optically connected to a further optical fiber extending within said body.

5,149,490
METHOD AND APPARATUS FOR REPLACING A NOZZLE
Steve K. Brown, Lynchburg; Larry D. Dixon, Forest, and Samuel J. Moses, Lynchburg, all of Va., assignors to B&W Nuclear Service Company, Lynchburg, Va.
Filed Dec. 17, 1991, Ser. No. 809,360
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—260 **4 Claims**

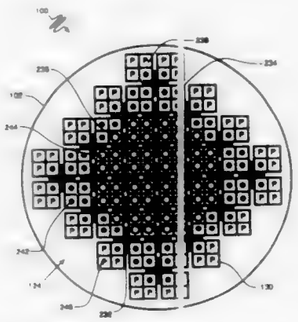


1. A method of replacing a damaged nozzle in a nuclear reactor coolant system pressurizer wherein the nozzle extends into the pressurizer through a nozzle bore in the wall of the pressurizer, comprising:
a. removing the damaged nozzle;
b. partially tapping the nozzle bore to provide threads therein;
c. threading a replacement nozzle having first and second ends and a flange extending radially therefrom and adjacent the second end of said replacement nozzle into the nozzle bore such that the first end of said replacement nozzle is substantially flush with the interior of the pressurizer and the flange is against the exterior of the pressurizer; and
d. providing a seal weld between the first end of said replacement nozzle and the interior of the pressurizer.

5,149,491
SEED AND BLANKET FUEL ARRANGEMENT FOR DUAL-PHASE NUCLEAR REACTORS
Steven P. Congdon, Los Gatos, and Russell M. Fawcett, San Jose, both of Calif., assignors to General Electric Company, N.Y.
Continuation-in-part of Ser. No. 553,073, Jul. 10, 1990. This application May 31, 1990, Ser. No. 708,269
Int. Cl.[5] G21C *1/00*
U.S. Cl. 376—267 **8 Claims**

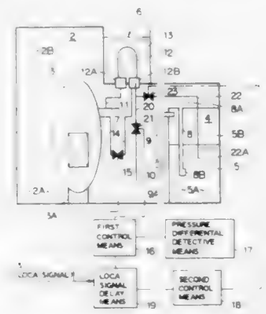
1. A fuel management method for a dual-phase nuclear reactor, said method comprising:
installing a fuel bundle at a first core location accessed by coolant through a relatively small aperture, each of said bundles having a predetermined group of fuel elements;

operating said reactor a first time;
shutting down said reactor;



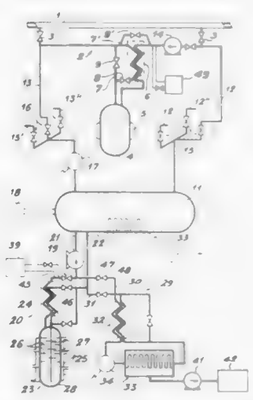
reinstalling said fuel bundle at a second core location accessed by coolant through a relatively large aperture; and
operating said reactor a second time.

5,149,493
REACTOR CONTAINMENT VESSEL
Kenji Arai; Hirohide Oikawa, and Hideo Nagasaka, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 18, 1991, Ser. No. 732,237
Claims priority, application Japan, Jan. 30, 1991, 3-10246
Int. Cl.[5] G21C *15/18*
U.S. Cl. 376—283 10 Claims



1. A reactor containment vessel composed of a wetwell and a drywell in which a cooling system is provided comprising:
a reactor pressure vessel included in the drywell with a main steam line extending outward therefrom, the drywell having an inner space divided by vertical upper and lower areas and charged with a non-condensable gas;
an emergency condenser connected to the main steam line and provided at a level substantially corresponding to the upper area of the drywell, said emergency condenser including a heat exchanger means for condensing steam introduced therein;
a suppression chamber provided in the wetwell and defined by an air chamber and a pool in which pool water is charged;
a suppression vent line provided in the suppression chamber, having one open end opened to the drywell and another open end soaked into the pool, said one open end being positioned at a level substantially corresponding to the upper area in the drywell where the main steam line is disposed so as to communicate between the drywell and suppression chamber; and
a communication line vertically extending in the drywell for guiding the non-condensable gas to the lower area of the drywell.

5,149,493
INSTALLATION TO REGENERATE COLD TRAPS LOADED WITH THE HYDRIDE AND OXIDE OF A LIQUID METAL
Christian Latge, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Apr. 19, 1990, Ser. No. 510,972
Claims priority, application France, Apr. 20, 1989, 89 05261
Int. Cl.[5] G21C *19/42*
U.S. Cl. 376—312 3 Claims



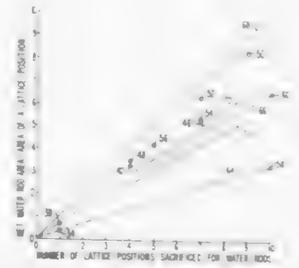
1. An installation for regeneration of cold traps loaded with hydride and oxide of a liquid metal, wherein said installation includes a regeneration circuit filled with liquid metal on which is disposed at least one trap to be regenerated, said regeneration circuit being provided with means to establish a circulation of the liquid metal in the regeneration circuit and through the trap, means to adjust the temperature of the liquid metal to values sufficient to dissolve the oxide and the hydride which decompose to give off hydrogen, tritium and oxygen, and a device to draw off the dissolved hydrogen and tritium and a first dump equipped with an oxygen retention device, said device to draw off the dissolved hydrogen and tritium comprising a membrane through which hydrogen and tritium permeate, said membrane having one face communicating with the liquid metal regeneration circuit and another face communicating with a partial vacuum pumping circuit with respect to the liquid metal regeneration circuit, and a tank disposed on the partial vacuum pumping circuit which is lined with a solid for fixing the hydrogen and the tritium.

5,149,494
PROTECTING PERSONNEL AND THE ENVIRONMENT FROM RADIOACTIVE EMISSIONS BY CONTROLLING SUCH EMISSIONS AND SAFELY DISPOSING OF THEIR ENERGY
Virginia Russell, 435 Crescent Ave., Buffalo, N.Y. 14214
Continuation of Ser. No. 30,041, Mar. 24, 1987, abandoned, which is a continuation of Ser. No. 426,824, Sep. 29, 1982, Pat. No. 4,663,115, which is a continuation-in-part of Ser. No. 933,529, Aug. 14, 1978, abandoned, which is a continuation of Ser. No. 781,503, Apr. 13, 1977, abandoned. This application Mar. 22, 1989, Ser. No. 327,415
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[5] G21D *7/00*
U.S. Cl. 376—320 5 Claims

1. An apparatus for protecting organisms and the environment from harmful emissions from a radiation source by shielding said organisms and environment from at least a portion of such emissions, comprising;
a plurality of metallic shielding parts located to absorb emissions from the source, with one of said plurality of parts being located farther away from the source than an other of said plurality of parts and with the one and other of the shielding parts being respectively of metals having atomic numbers differing from one another by at least ten atomic numbers so that an electrical potential difference between said one and other shielding parts is established; and
means, electrically interposed between the one and other shielding parts and physically remote from said source, for dissipating said electrical potential difference by consuming electric power, said means including a variable resistance element and means for automatically varying the resistance of said variable resistance element to keep the potential difference low by maintaining a current flow between the shield parts.

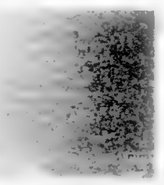
5,149,495
WATER ROD FOR NUCLEAR REACTOR AND METHOD FOR PROVIDING AND USING SAME
Robert B. Elkins, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.
Filed May 24, 1990, Ser. No. 527,901
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—444 18 Claims

1. A water rod, usable for containing water in a substantially interior position in a nuclear fuel rod bundle, the bundle having a plurality of lattice positions spaced at a predetermined lattice pitch, comprising:
a hollow longitudinally extending tube having a sidewall which defines a cross-sectional interior region of said tube, configured to substantially occupy a predetermined number of the lattice positions of the bundle;
said cross-sectional interior region being configured to define two round-cornered, triangular regions continuously connected by a constricted region, said constricted region being defined by two inwardly extending longitudinal projections;
wherein said predetermined number is greater than four lattice positions and less than nine lattice positions; and
wherein said area of said cross-sectional region, said predetermined number, and said pitch define a water rod efficiency greater than about 0.7; and,
at least one projection on an exterior portion of said sidewall; and



wherein said sidewall has sufficient resiliency to permit inward flexing of said sidewall, at least in a portion substantially adjacent to said projection, to permit passage of said projection over an obstruction when said water rod is axially moved proximate to said obstruction.

5,149,496
METHOD OF MAKING HIGH STRENGTH, HIGH STIFFNESS, MAGNESIUM BASE METAL ALLOY COMPOSITES
Santosh K. Das, Randolph; Chin-Fong Chang, Morris Plains, and Derek Raybould, Denville, all of N.J., assignors to Allied-Signal Inc., Morristownship, Morristown County, N.J.
Division of Ser. No. 650,134, Feb. 4, 1991. This application Jan. 27, 1992, Ser. No. 826,542
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—17 7 Claims



1. A method for making a magnesium based metal matrix alloy composite article, said method comprising the steps of:
(a) mixing and blending a magnesium based matrix alloy powder and a SiC particulate to achieve substantially uniform distribution of said particulate in said matrix alloy;
(b) forming said mixture into a consolidated body by the application of heat and pressure in vacuum;
(c) preheating and fabricating said consolidated body into an article by the application of heat and pressure.

5,149,497

OXIDATION RESISTANT COATINGS OF GAMMA TITANIUM ALUMINUM ALLOYS MODIFIED BY CHROMIUM AND TANTALUM

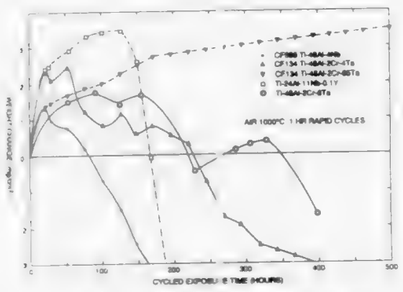
Douglas W. McKee, Burat Hills, and Shyh-Chin Huang, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 12, 1991, Ser. No. 713,494

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] C22C *14/00*; C21D *1/00*

U.S. Cl. 420—418 4 Claims



1. A composite structural metal article comprising,

a metal substrate and a metal protective coating on said substrate,

the metal of said article being a titanium aluminide,

the coating on said substrate being bonded to and protecting said substrate from oxidative attack at temperatures to 850° C. and higher, and

said coating having a composition substantially according to the following expression:

$$Ti\text{-}Al_{46\text{-}52}Cr_{1\text{-}4}Ta_{4\text{-}8}$$

5,149,498

METHOD OF PRODUCING TARNISH-RESISTANT AND OXIDATION-RESISTANT ALLOYS USING ZR AND B

Fehmi Nilmen, Kriftel, and Heinrich Winter, Eschborn, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP89/00404, § 371 Date Dec. 18, 1989, § 102(e) Date Dec. 18, 1989, PCT Pub. No. WO89/09838, PCT Pub. Date Oct. 19, 1989

PCT Filed Apr. 14, 1989, Ser. No. 449,906

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812738

Int. Cl.[5] C22C *1/02, 9/00, 5/06*

U.S. Cl. 420—492 5 Claims

1. Method for producing a tarnish-resistant and oxidation-resistant sheets, billets, rods, tubes, profiles or wires for tarnish-resistant and oxidation-resistant structural components which tolerate thermal and mechanical stresses, of copper or silver as a matrix material exhibiting a high conductivity and a high softening temperature, comprising:

preparing a copper or silver melt by adding, to said copper or silver, stoichiometric amounts of boron and zirconium whereby said stoichiometric amounts comprise additions of 0.3 to 0.6 weight percent of zirconium and 0.1 to 0.2 weight percent of boron, resulting in a fine dispersion melt of less than 1 volume percent of ZrB_2 in said copper or silver; and subsequently processing the fine dispersion melt into a semifinished product using continuous casting units or continuous rolling units, wherein said semifinished product and said structural component made therefrom exhibit a combination of a high electrical conductivity from over 95 up to 99 percent IACS, a high softening temperature of at least 600° C., high tensile strength of 800° C. (in the range of 120 N/mm^2), an excellent formability and a resistance to corrosive environments.

5,149,499

COOPER-FE-P-NB ALLOYS FOR ELECTRICAL AND ELECTRONIC PARTS AND ITS MANUFACTURING PROCESS

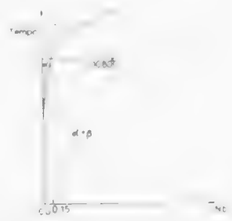
Young G. Kim; Han I. Yoo, both of Seoul; Sang K. Han, Ulsan, and Deung Y. Lee, Seoul, all of Rep. of Korea, assignors to Poongsam Corporation, Seoul, Rep. of Korea

Filed Sep. 6, 1991, Ser. No. 756,171

Claims priority, application Rep. of Korea, Sep. 18, 1990, 14754/1990

Int. Cl.[5] C22C *9/00*

U.S. Cl. 420—495 3 Claims



1. A copper alloy for electric and electronic parts having high conductivity characteristics, consisting of 0.005 to 0.15 by weight percent Niobium, 0.005 to 0.15 by weight percent Iron, 0.01 to 0.05 by weight percent Phophorus, and the balance copper.

5,149,500

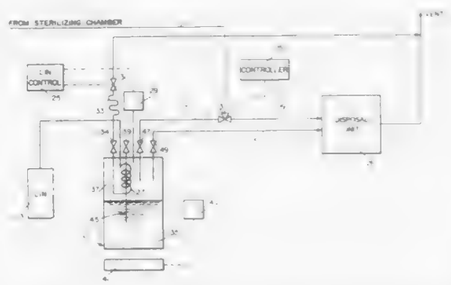
COMPACT SYSTEM FOR RECOVERY OF STERILIZING GAS MIXTURES

Sudhir R. Brahmbhatt, Macungie, and George A. Timberlake, Jr., Gilbertsville, both of Pa., assignors to MG Industries, Valley Forge, Pa.

Filed Apr. 4, 1991, Ser. No. 680,517

Int. Cl.[5] A61L *2/00*

U.S. Cl. 422—31 18 Claims



1. A method of recovering a sterilizing gas mixture, the mixture including a sterilizing gas and a relatively inert diluent, the method being performed after completion of a sterilization operation, the method comprising the steps of:

(a) purging a sterilizing chamber, in a first purging cycle, the purging step being the first such step performed after completion of a sterilization operation, to remove spent sterilizing gas mixture the mixture containing a sterilizing gas and a relatively inert diluent from the sterilizing chamber,

(b) directing the spent sterilizing gas mixture from the sterilizing chamber to a means for liquefying the spent sterilizing gas mixture,

(c) purging the sterilizing chamber, in a second purging cycle, performed after step (b), to remove residual sterilizing gas mixture from the sterilizing chamber, and

(d) directing the residual sterilizing gas mixture obtained from step (c) into a disposal means, the disposal means comprising means for converting the sterilizing gas in the residual sterilizing gas mixture into a harmless substance.

5,149,501

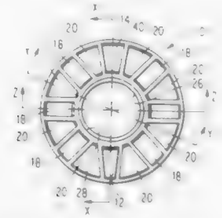
MULTICHAMBERED CONTAINER AND INSTRUMENT FOR PERFORMING DIAGNOSTIC TESTS

Arthur L. Babson, Chester; Thomas Palmieri, Paramus, both of N.J., and Douglas R. Olson, Doylestown, Pa., assignors to Cirrus Diagnostics, Inc., Chester, N.J.

Filed Jan. 29, 1990, Ser. No. 471,416

Int. Cl.[5] G01N *31/02*

U.S. Cl. 422—58 47 Claims



42. A multichambered container adapted to be rotated about a longitudinal axis through said container for determining the concentration of plasma constituents, comprising:

a plurality of chambers integrally formed in said container, each of said chambers defined by a plurality of walls, each of said chambers being non-communicable with each other and said chambers being accessible by a pipetter;

a separation chamber including a means for separating a first constituent from a biological fluid by centrifugation;

a reagent positioned in a reagent chamber for reacting with a second constituent in said biological fluid; and

windows positioned in a chamber in said multichambered container for allowing optical monitoring of a reaction occurring in said chamber, whereby rotation about said longitudinal axis through said container causes separation of said first constituent from said biological fluid.

5,149,502

COLORIMETRIC APPARATUS FOR CONTINUOUS CONTROL OF IMPURITIES ON HYDRATE OF ALUMINA

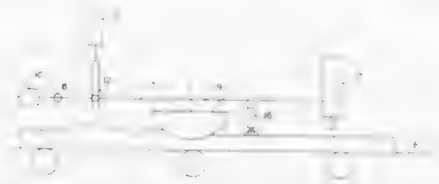
Raymond Dablainville, Gardanne, and Jean Dufour, La Barque, both of France, assignors to Aluminium Pechiney, Courbevoie, France

Filed Feb. 5, 1991, Ser. No. 650,790

Claims priority, application France, Feb. 26, 1990, 90 02600

Int. Cl.[5] G01N *21/00*

U.S. Cl. 422—62 4 Claims



1. Apparatus for automatic, quantitative determination of an impurity contained in a product with an uneven upper surface travelling in bulk on a conveyor belt, the impurity forming a color upon reaction with a known reagent, said apparatus comprising:

(a) a conveyor belt;

(b) a leveling system comprising:

a leveling device (9) comprising a half-cylinder having a downwardly-directed arcuate surface formed of a plastic sheet (13) located above the conveyor belt, the half-cylinder having a longitudinal axis substantially perpendicular to the direction of travel of the belt and a length which is less than the transverse width of the belt, the plastic sheet being fixed at its boundary generatrices onto a frame (15);

a lever arm (7) above the belt to which said frame is rigidly fixed, said lever arm being supported in equilibrium about a horizontal shaft (8);

a jack (11) for adjusting the lever arm and enabling the arcuate surface of the half-cylinder to be brought into contact with product travelling on the belt, the jack having a head connected to the lever arm, so as to enable the lever arm to oscillate independently of the head as the leveling device follows variations of the thickness of product travelling on the belt;

(c) means (16) for spraying liquid reagent onto leveled product travelling on the belt downstream of the leveling system;

(d) means (17) for measuring the color intensity of leveled product travelling on the belt downstream of said means (16) for spraying;

(e) program means for controlling, at predetermined intervals, the jack for adjusting each of the lever arm to selectively bring said half-cylinder into contact with the product on said conveyor belt, the means for spraying of the reagent onto the product, and the means for measuring the color intensity of the product; and

(f) means for determining the quantity of said impurity in the product based upon the measured color intensity.

5,149,503

APPARATUS FOR MEASURING HEMOGLOBIN CONCENTRATION AND OXYGEN SATURATION THEREOF

Hiromasa Kohno, Kanagawa; Hiroaki Honda, Naha, and Masahiro Nadeshima, Kanagawa, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

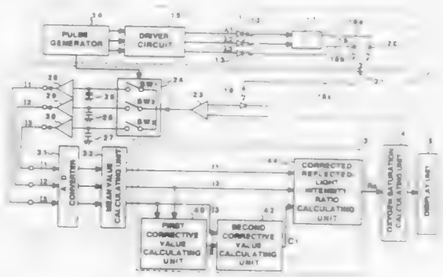
PCT No. PCT/JP88/00742, § 371 Date Mar. 2, 1990, § 102(e) Date Mar. 2, 1990, PCT Pub. No. WO89/01144, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 22, 1988, Ser. No. 460,057

Claims priority, application Japan, Jul. 24, 1987, 62-186135; Jul. 24, 1987, 62-186136

Int. Cl.[5] G01N *21/00, 33/48*

U.S. Cl. 422—82.05 12 Claims



1. An apparatus for measuring a degree of oxygen saturation in blood, comprising:

source means for emitting light at a first and second wave-

length (λ_1, λ_2), with a difference of a degree of extinction between oxygenated hemoglobin and carbomonoxy hemoglobin being comparatively large at said first wavelength and small at said second wavelength;

first light-irradiating means having a first light-irradiating portion, and being coupled to said source means for alternately irradiating blood with light of said first or second wavelength (λ_1, λ_2);

second light irradiating means having a second light-irradiating portion, and being coupled to said source means for constantly irradiating the blood with light of said second wavelength λ_2;

detecting means, arranged such that the distance from the detecting means to said first light-irradiating means and the distance from the detecting means to said second light-irradiating means differ, for detecting intensities (I_1, I_2, I_3) of light reflected from the blood irradiated with the light from each of the first and second light-irradiating portions of said first and second light-irradiating means corresponding to their wavelength;

memory means for storing an Hb calibration curve;

arithmetic means for calculating a reflected-light intensity ratio function g(Hb') of blood having a reference value (Hb') of hemoglobin concentration by reference to said Hb calibration curve stored in said memory means;

first corrective value calculating means for calculating a first corrective value (X) based on both a reflected-light intensity ratio $(I_2/I_3)_s$ from a blood with known hemoglobin concentration and said reflected-light intensity ratio function, according to an equation $X=g(Hb')\times(I_2/I_3)/(I_2/I_3)_s$, to correct a ratio ($I_2/I$) of detected reflected-light intensity (I_2) due to irradiation with light of said second wavelength produced by said first light-irradiating means versus detected reflected-light intensity (I_3) due to irradiation with light of said second wavelength produced by said second light-irradiating means;

second corrective values calculating means for calculating a second corrective value (C_1) based on said first corrective value (X), the reflected-light intensity (I_3) of light from the second light-irradiating means detected continuously by said detecting means, and a constant value (C_0), according to an equation $C_1=C_0\times(I_3)\times(X)$;

reflected-light intensity ratio correcting means for correcting to remove an influence of hematocrit value and for calculating a corrected reflected-light intensity ratio (R_s) based on said second corrective value (C_1), a reflected-light intensity ratio (I_1/I_2) of the detected reflected-light intensity (I_1) of light of said first wavelength produced by the first light-irradiating means versus detected reflected-light intensity (I_2) of light of said second wavelength produced by the first light-irradiating means, according to an equation $R_s=(I_1-C_1)/(I_2-C_1)$; and

oxygen saturation degree calculating means for calculating the degree of oxygen saturation in blood based on a correlation function (f(x)) using the corrected reflected light intensity ratio (R_s) outputted by said reflected light intensity ratio correcting means.

5,149,504

APPARATUS FOR ASSESSING GAS ODOR INTENSITY

Toshiaki Tanaka, 478, Banba-cho, Shimokanuki, Numazu-shi, Shizuoka-ken, Japan

Continuation of Ser. No. 419,589, Oct. 10, 1989. This application Oct. 9, 1991, Ser. No. 773,439

Claims priority, application Japan, Oct. 20, 1988, 63-265107

Int. Cl.[5] **G01N** *13/22, 27/00*

U.S. Cl. 422—88 **6 Claims**

1. An apparatus for assessing odor intensity of combustion gas from an internal combustion engine, comprising:

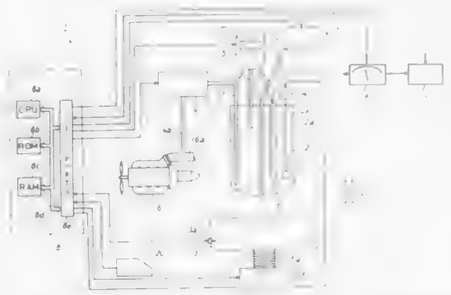
a reaction vessel;

combustion gas delivery means for delivering combustion gas to the reaction vessel;

water delivery means for delivering water to the reaction vessel;

means for preparing an aqueous solution from the combustion gas and the water delivered to the pH sensing means for sensing the pH value of the aqueous solution;

measuring means for initiating and regulating assessment according to a predetermined method, and for assessing an



odor intensity based on the pH sensed by the pH sensor according to a predetermined relationship between pH and odor intensity of the combustion gas;

output means for outputting the odor intensity assessed by the measuring means; and

waste removal means for removing the aqueous solution from the reaction vessel.

5,149,505

DIAGNOSTIC TESTING DEVICE

Kenneth P. English, Bolingbrook; Stanley E. Micek, III, Grayslake; Michael B. O'Connell, Waukegan, and Edward S. Tripp, Park City, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 18, 1989, Ser. No. 381,360

Int. Cl.[5] **B01L** *3/00;* **G01N** *21/01*

U.S. Cl. 422—99 **27 Claims**

1. A diagnostic testing device comprising, in combination,

a base member defining a cavity, a plurality of antibiotic units within said cavity;

a cover member on said base member, said cover member defining a central cover opening for the reception of a liquid specimen;

a central member positioned between said base member and said cover member, said central member having said plurality of antibiotic units spaced inwardly from its periphery;

distribution means comprising a porous wicking material positioned between said cover opening and said antibiotic units for delivering portions of the liquid specimen to said antibiotic units, said distribution means including a fibrous distribution wheel having a central portion and a plurality of legs extending outwardly from said central portion, said fibrous distribution wheel being positioned on said central member, the outer ends of each of said legs received by a respective one of said antibiotic units;

indicator means in communication with said cover member for indicating the effectiveness of antibiotics;

delivery means comprising a porous wicking material extending upwardly from each of said antibiotic units, whereby relative vertical movement between said delivery means and said indicator means places said delivery means and said indicator means into an engaging relationship, said delivery means including a fibrous cylinder positioned in each of said antibiotic units and extending upwardly toward said cover member; and

means for stably biasing said cover member and said central member in first and second positions relative to each other whereby in said first position said fluid delivery means and indicator means are not in fluid communication with each other and in said second position said fluid delivery means and indicator means are in fluid communication with each other.

5,149,506

STOOL COLLECTION AND TRANSPORT DEVICE

Barbara T. Skiba, Chicago; Donald R. Harreld, Woodstock, and Lawrence G. Ponsi, Wheeling, all of Ill., assignors to Sage Products, Inc., Crystal Lake, Ill.

Filed Aug. 9, 1991, Ser. No. 743,023

Int. Cl.[5] **G01N** *1/00*

U.S. Cl. 422—102 **6 Claims**

1. A stool collection and transport device comprising

a. an upright container having means defining an open mouth at the top thereof,

b. a removable lid for said container, said lid being shaped to sealingly engage said mouth,

c. means defining an access aperture in said lid, said aperture being smaller in dimension than said mouth and being situated to one side of said lid,

d. a cap shaped to engage said access aperture and seal said aperture, and

e. a collection spoon secured to the underside of said lid and extending into said container, said spoon being located adjacent said aperture and being situated to a side of said lid generally opposite said one side, said spoon having a scoop disposed at an angle relative to vertical and being oriented toward said aperture.

5,149,507

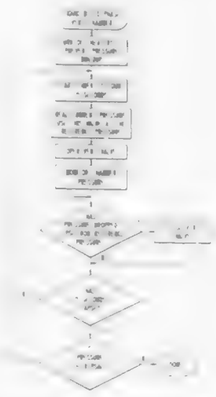
METHOD OF VENTING A STERILIZER

Charles E. Ellis, Jr., Phelps, N.Y., assignor to MDT Corporation, Torrance, Calif.

Filed Jan. 31, 1991, Ser. No. 648,239

Int. Cl.[5] **A61L** *2/00;* **G05D** *16/00*

U.S. Cl. 422—112 **16 Claims**



1. A method of venting a sterilizer chamber comprising the steps of:

providing a sterilizer chamber containing a liquid load at elevated pressure;

providing sensing means disposed for sensing the pressure within said sterilizer chamber;

providing valve means for selectively opening and closing a vent associated with said sterilizer chamber;

providing timing means for timing a series of venting intervals of selected duration, each of the venting intervals having a start and an end;

opening said valve means to vent the sterilizer chamber;

starting the timing means to time a venting interval;

monitoring the pressure sensed by the sensing means;

closing the valve means if a drop in said pressure which exceeds a preselected maximum drop occurs between the start and end of the venting interval, and, if the valve means has been closed, reopening the valve means at the end of the venting interval; and

repeating in sequence said steps of starting the timing means, monitoring the pressure, and closing and reopening the valve means until the pressure within the sterilizer chamber is below a desired level.

5,149,508

PARALLEL PATH CATALYTIC CONVERTER

Wesley P. Bullock, Windham, Ohio, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

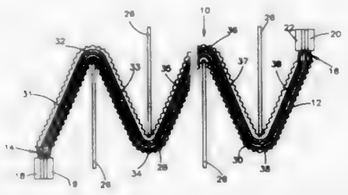
Continuation of Ser. No. 319,575, Mar. 6, 1989, abandoned. This application Sep. 16, 1991, Ser. No. 759,967

Int. Cl.[5] **F01N** *3/10*

U.S. Cl. 422—174 **27 Claims**

1. An electrically heatable catalytic converter comprising in combination (a) a stainless steel housing; (b) at least one bundle of contiguous nonnesting layers of corrugated thin stainless steel strips, each of said strips having a metal oxide coating and a catalyst on at least one surface, and said at least one bundle being folded and disposed in said housing; (c) ceramic cloth insulation disposed between contiguous reaches of said at least one folded bundle; (d) electrical contact means secured to each end of said at least one bundle for connection to positive and negative poles of a voltage source; and (e) high temperature resistant insulation means for isolating said at least one bundle from said housing.

16. An electrically heatable monolith comprising in combination (a) an accordion folded bundle of contiguous layers of corrugated thin stainless steel strips in nonnesting relation, and



having a catalyst on at least one surface of each strip in said bundle; and (b) electrical contact means at each end of said bundle for connection to positive and negative poles of a voltage source.

5,149,509

APPARATUS FOR A CATALYTIC REACTION OF A GAS MIXTURE, WHICH CONTAINS H2S AND SO2, BY THE CLAUS PROCESS

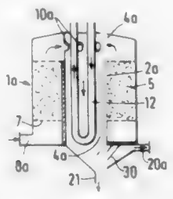
Herbert Fischer, Lollar, and Wolfgang Nehb, Frankfurt, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 3, 1990, Ser. No. 562,548

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 3926105

Int. Cl.[5] B01D *53/36*

U.S. Cl. 422—177 11 Claims



1. A reactor for the catalytic reaction of a gas mixture, which contains H_2S and SO_2, by the Claus process to produce elementary sulfur vapor and for cooling the gas mixture to condense the elementary sulfur, which is withdrawn as a liquid, comprising a container having a centrally disposed cooling chamber and an annular chamber, the annular chamber surrounding the cooling chamber and being provided with an inlet for the gas mixture, granular catalyst to produce elementary sulfur from H_2S and SO_2 within the annular chamber, the cooling chamber containing at least one coolant line and being provided with a passage for the flow of the gas mixture from the annular chamber, so that the gas mixture passes over the coolant line with a gas outlet and at its lower end with an outlet for liquid elementary sulfur.

5,149,510

REACTIVE ZIRCONIUM OXIDE AND ITS PREPARATION

Joseph Recasens, Sorgues; Daniel Urffer, Morieres, and Pierre Ferlanda, Le Poutet, all of France, assignors to Societe Europeen des Produits Refractaires, Paris, France

Filed May 25, 1990, Ser. No. 528,484

Claims priority, application France, Mar. 22, 1988, 88 03680

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] C01G *25/00*

U.S. Cl. 423—84 5 Claims

1. A process which comprises

a) providing a zirconium oxide produced by thermal decomposition of zircon followed by chemical digestion of a resultant silicate phase,

b) reacting said zirconium oxide at 600°–950° C. with an alkali metal hydroxide or carbonate so as to form an alkali metal zirconate,

c) hydrolyzing the resultant alkali metal zirconate so as to produce a suspension of zirconium oxide hydrate in a concentrated solution of alkali metal hydroxide,

d) separating the zirconiium oxide hydrate from said concentrated solution and washing the zirconium oxide hydrate isolated, and

e) drying the zirconium oxide hydrate at a temperature in the range of 110° to 570° C. whereby a zirconium oxide compound is recovered.

5,149,511

METHOD OF SELECTIVELY REDUCING NO_x

Clifford N. Montreuil, Dearborn, and Mordecai Shelef, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 7, 1991, Ser. No. 772,297

Int. Cl.[5] B01D *47/00, 53/54;* B01J *8/00;* C01B *21/00*

U.S. Cl. 423—212 9 Claims

1. A method of treating automotive exhaust gas emissions from a lean-burn engine carrying excess oxygen, comprising the steps of:

(a) distributing a liquified, oxygenated organic compound into said emissions as a reductant and at a location adjacent the source of emission generation, said compound being a partially oxygenated, low molecular weight compound selected from within the group consisting of alcohols, aldehydes, ketones, and ethers;

(b) substantially immediately exposing said reductant/emission mixture to a transition metal-exchanged high silica ZSM5 zeolite {(SiO_2/Al_2O_3 of between 10–50)} catalyst at a compatible space velocity; and

(c) sequentially exposing the effluent from said zeolite catalyst to an oxidation catalyst.

5,149,512

CATALYTIC REDUCTION OF NOX USING METHANE IN THE PRESENCE OF OXYGEN

Yuejin Li, Allentown, and John N. Armor, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 1, 1991, Ser. No. 739,273

Int. Cl.[5] B01J *8/00;* C01B *21/00*

U.S. Cl. 423—239 35 Claims

1. A process for destroying nitrogen oxides comprising: reacting the nitrogen oxides, methane and oxygen in the presence of a crystalline zeolite having a silicon to aluminum ratio of greater than or equal to about 2.5 wherein the zeolite is exchanged with an effective amount of a cation selected from the group consisting of cobalt, nickel, iron, chromium, rhodium and manganese under conditions sufficient to convert the nitrogen oxides to gaseous nitrogen, water and carbon oxides.

5,149,513

METHOD OF PREPARING INORGANIC POROUS MEMBER

Kouichi Takahama; Shozo Hirao; Masaru Yokoyama; Takashi Kishimoto; Hiroshi Yokogawa, and Atsushi Makino, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 8, 1988, Ser. No. 268,469

Claims priority, application Japan, Nov. 11, 1987, 62-284631

Int. Cl.[5] C01B *33/21*

U.S. Cl. 423—328 12 Claims

7. A method for preparing a multilayered structure of Na-montmorillonite, Ca-montmorillonite, 3-octahedron synthetic saponite, Na-hectorite, Li-hectorite, Na-taeniolite, Li-taeniolite, acid clay, synthetic mica or a mixture thereof, comprising the steps of:

forming a solution containing a first solvent and an inorganic layer-forming material, the material becoming swelled in the solvent;

mixing said solution with a quantity of pillar-forming material sufficient to form a multilayered structure of alternating layers formed from the layer-forming material and pillars formed from the pillar-forming material;

substituting a second solvent for the first solvent, the second solvent being methanol, ethanol, isopropanol or a mixture thereof and having a critical temperature or pressure lower than that of the first solvent;

substituting a third solvent for the second solvent, the third solvent being carbon dioxide, dichlorodifluoromethane or a mixture thereof and having a critical temperature or critical pressure lower than that of the second solvent;

separating the third solvent from the layer-forming and pillar-forming materials by subjecting the solution to drying at temperature and pressure conditions at or above the critical point of the third solvent, the solid residue from the drying step forming an inorganic porous composition having said multilayered structure.

5,149,514

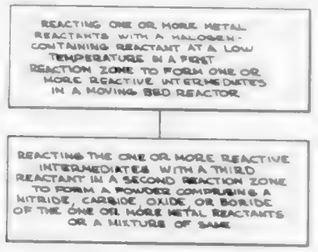
LOW TEMPERATURE METHOD OF FORMING MATERIALS USING ONE OR MORE METAL REACTANTS AND A HALOGEN-CONTAINING REACTANT TO FORM ONE OR MORE REACTIVE INTERMEDIATES

Angel Sanjurjo, San Jose, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 333,180, Apr. 4, 1989, abandoned. This application Feb. 8, 1991, Ser. No. 654,395

Int. Cl.[5] C01B *21/068, 21/06, 31/30, 13/22*

U.S. Cl. 423—344 7 Claims



4. A low temperature process for forming a powder comprising one or more metal compounds which comprises:

(a) reacting fluidized particles of one or more metal reactants, comprising a fluidized bed first reaction zone in a reactor, with a halide-containing reactant to form one or more reactive intermediates;

(b) passing said one or more reactive intermediates from said first reaction zone to a second reaction zone in said reactor spaced from said fluidized bed comprising said first reaction zone; and

(c) contacting said one or more reactive intermediates in said second reaction zone with a third reactant introduced into said reactor at said second reaction zone and selected from the class consisting of a carbon-containing reactant, an oxygen-containing reactant, a nitrogen-containing reactant, and mixtures thereof to form said metal compound powder comprising respectively, one or more metal carbides, metal oxides, metal nitrides, or a mixture thereof.

5,149,515

PROCESS FOR THE PRODUCTION OR RECOVERY OF ACIDS FROM METALLIFEROUS SOLUTIONS OF SUCH ACIDS

Wilhelm Karner, Eichgraben; Dieter Wurmbauer, Österreich; Karl H. Krivanec, Österreich, and Juanito Horn, Österreich, all of Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz-Andritz, Austria

Continuation of Ser. No. 207,206, Jun. 16, 1988, abandoned. This application Nov. 29, 1990, Ser. No. 622,352

Claims priority, application Austria, Jun. 16, 1987, 1534/87

Int. Cl.[5] C01B *13/14, 21/40*

U.S. Cl. 423—393 7 Claims

1. A process for producing an acid selected from the group consisting of nitric acid and a mixture of nitric and hydrofluoric acid from a solution containing anions of the acid by spray roasting of said solution and subsequent condensation and absorption of the gases formed thereby, the solids arising therefrom being withdrawn, comprising the steps of:

a) spraying into a reactor and atomizing of said solution;

b) heating the atomized solution of step a) at a temperature range of 300° to 400° C. by contacting the atomized solution with hot gases generated by a burner projecting into the reactor, resulting in a complete decomposition of the solution, thereby converting the metal content thereof into a metal oxide and forming gases and acid in gaseous state; and

c) condensing and absorbing the gases formed in step b) in an aqueous absorption solution which is cooled to a temperature in the range of 0° to 70° C. in heat exchangers.

5,149,516

PARTIAL OXIDATION OF METHANE OVER PEROVSKITE CATALYST

Scott Han, Lawrenceville, N.J.; Lorenzo C. DeCaul, Chester, Pa.; Robert E. Palermo, Bloomfield, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Oct. 15, 1990, Ser. No. 597,219

Int. Cl.[5] C01B *31/18, 3/26*

U.S. Cl. 423—415 A 14 Claims

1. A process for the partial oxidation of methane, said process comprising contacting methane and oxygen with a perovskite of the formula ABO_3, where A is at least one metal atom capable of occupying the 12-coordinate sites of the perovskite and B is at least one metal atom capable of occupying the 6-coordinate sites of the perovskite, wherein methane and oxygen are contacted with said perovskite under conditions sufficient to convert said methane and oxygen to a mixture of carbon monoxide and hydrogen, and wherein methane and oxygen are contacted with said perovskite at a temperature of from about 600° C. to about 900° C.

5,149,51
HIGH STRENGTH, MELT SPU CARBON FIBERS AND METHOD FOR PROD UCING SAME
Charles C. Fain, and Danny D. E ie, both of Clemson, S.C., assignors to Clemson University, Clemson, S.C.
Filed Jan. 21, 1986, Se r. No. 820,734
Int. Cl.[5] D01I 9/12
U.S. Cl. 423—447.2 4 Claims

1. A carbon fiber, said fiber fila ent having:
a tensile strength greater than 2 0 ksi;
a generally annular-shaped trans verse cross-sectional area;
a line-origin microstructure, th origin line of said microstructure being located and sl aped substantially as a line which constitutes the line for ed by uniformly collapsing the perimeter of said transvers cross-sectional area of said fiber filament upon itself.

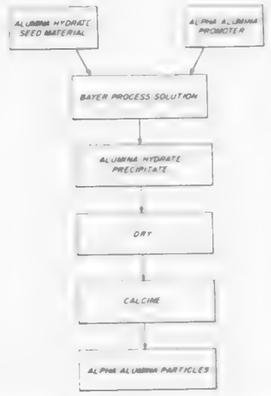
5,149,513
ULTRA-THIN PURE FLE KIBLE GRAPHITE CALENDERED SHEET AND METHOD OF MANUFAC URE
Robert A. Mercuri, Seven Hills; G orge Getz, Parma Heights; Ronald A. Greinke, Medina, an Ronald A. Howard, Brook Park, all of Ohio, assignors to U ar Carbon Technology Corporation, Danbury, Conn.
Continuation-in-part of Ser. No. 373,924, Jun. 30, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 574,807
Int. Cl.[5] C01I 31/04
U.S. Cl. 423—449 5 Claims

1. A process for producing a cor tinuous pinhole free sheet of flexible, low density, graphite ha ing a thickness of between 2–5 mils comprising the steps of:
(a) providing natural graphite p rticles having a purity of at least 97% pure natural graph te;
(b) treating the natural graphite particles with an oxidizing agent to intercalate the grapl ite;
(c) washing the intercalated gr phite particles to minimize agglomeration;
(d) drying the washed particles
(e) introducing the dried particl s into a preheated furnace at a preselected temperature o at least about 2000° F. to cause the graphite particles o undergo extremely rapid expansion until the particles expand to a specific volume of at least about 800 cc/gm;
(f) passing said expanded graph ite through pressure rolls to form a compressed sheet of s id graphite with a thickness of between about 2–5 mils a id a density of less than 1.3 g/cc; and
(g) rolling said compressed she et into a continuous pinhole free sheet of less than about 2 ounces/sq. yard.

5,149,519
PREPARATION OF SULFUR-F REE TITANIUM DIOXIDE
Thierry Chopin, Saint Denis, and Patrick Fourré, Paris, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Continuation of Ser. No. 330,48 , Mar. 30, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 649,180
Claims priority, application Fr nce, Mar. 30, 1988, 88 04169
Int. Cl.[5] C01G 23/04
U.S. Cl. 423—610 20 Claims

19. A process for the preparatio n of anatase titanium dioxide, comprising a step of hydrolyzing a sulfur-free compound of titanium in the presence of
(i) at least one organic carboxylic acid containing a combination of groups of either:
(A) one carboxyl group in combination with
(a) at least one hydroxyl group and at least one amine group, or
(b) at least two amine groups, or
(c) at least two hydroxyl groups,
or (B) at least two carboxyl groups in combination with
a) at least one hydroxyl group and at least one amine group, or
b) at least one hydroxyl group, or
c) at least one amine group,
or (ii) at least one salt of said at least one acid (i), said hydrolysis being carried out in a reaction medium with a molar concentration of titanium ranging from 0.1 to 1.5 mole/-liter in the reaction medium and a concentration of said at least one acid (i) or salt (ii) ranging from 0.002 to 0.5 mole/liter in the reaction medium and a step of recovering a product consisting essentially of anatase, sulfur-free titanium dioxide directly from said hydrolyzing step, the product having a mean particle size of 80 nanometers or less and being capable of forming a stable sol.

5,149,520
SMALL SIZED ALPHA ALUMINA PARTICLES AND PLATELETS
Steven W. Sucech, Lake Villa, Ill.; John E. Marhanka, Benton, Ark., and Alan Pearson, Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
PCT No. PCT/US89/02659, § 371 Date Jan. 31, 1990, § 102(e) Date Jan. 31, 1990
Continuation-in-part of Ser. No. 137,159, Dec. 23, 1987, Pat. No. 4,847,064. This PCT application Jun. 19, 1989, Ser. No. 460,844
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] C01F 7/02
U.S. Cl. 423—625 20 Claims



1. An economical process for producing particles of alpha alumina comprising the steps of:
(a) providing an aqueous aluminate solution containing about 50–400 g/l caustic soda and about 0.50–0.80 grams Al_2O_3 per gram of caustic soda;
(b) treating the aqueous aluminate solution with alumina hydrate seed material and particles of an alpha alumina promoter, thereby to participate from the aqueous aluminate solution alumina hydrate particles containing the alpha alumina promoter;
(c) separating the precipitated alumina hydrate particles from the aqueous aluminate solution;

(d) drying said alumina hydrate particles; and
(e) calcining said alumina hydrate particles in the presence of a chlorine- or fluoride-, chloride- or boron-containing mineralizer to produce particles comprising predominantly alpha alumina.
15. Alpha alumina particles having a plate-like shape and an average size of less than about 1 micron.

5,149,521
COMPOSITION FOR USE IN ORAL CAVITY
Kazuko Hirose, Tokyo; Kouji Maeda, Utsunomiya; Kenichi Arai, Takasaki, and Takeshi Inoue, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Aug. 28, 1991, Ser. No. 751,084
Claims priority, application Japan, Aug. 31, 1990, 2-229876; Dec. 10, 1990, 2-407182
Int. Cl.[5] A61K 7/16, 7/26, 9/68
U.S. Cl. 424—58 8 Claims

1. A pharmaceutical composition for treatment in the oral cavity comprising:
(A) an abrasive water-insoluble granule having a weight-average particle size of 10 μm to 2 mm, which is easily breakable or deformable when used in the oral cavity.
(B) menthol or a naturally occurring substance comprising menthol and at least one additional component, as a flavoring component,
(C) one or more additional flavoring components selected from the group consisting of oils and extracts of basil, camphor, caraway, cardamon, coriander, geranium, ginger, laurel, lavender, mace, nutmeg, peper, rose, rosemary, thyme, ylang ylang, jasmin, vanilla, hyssop, lavandin, orris, carrot seed, davana, elemi and osmanthus, borneol and its derivatives; heliotropin, α-ionone, β-ionone, γ-ionone, δ-ionone and derivatives thereof; lactones; and thymol, vanillin, ethyl vanillin, maltol and ethyl maltol, and
(D) a pharmaceutically acceptable carrier,
wherein said easily breakable or deformable granule (A) is present in an amount of from 1 to 50 wt. % of the total weight of said composition, said flavoring components (B) and (C) are present in a combined amount of from 0.1 to 10 wt. % of the total weight of said composition, and said flavoring component (C) is present in an amount of from 1 ppm to 10 wt. % of the total weight of said flavoring components (B) and (C).

5,149,522
CLEAR HAIR AND BODY CLEANSING COMPOSITION
Horst Schwarz, Seeheim, and Hans Hölzel, Fränkisch-Crumbach, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
PCT No. PCT/EP90/00742, § 371 Date Dec. 18, 1990, § 102(e) Date Dec. 18, 1990, PCT Pub. No. WO90/15589, PCT Pub. Date Dec. 27, 1990
PCT Filed May 8, 1990, Ser. No. 634,171
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1989, 3919669
Int. Cl.[5] A61K 7/06, 7/48; C11D 9/32
U.S. Cl. 424—70 14 Claims

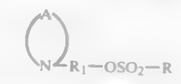
1. Clear aqueous hair and body cleansing composition consisting essentially of 0.1 to 50 percent by weight lauryl alcohol diglycol ether sulfate, a poly[N-[3-(dimethylammonium)-propyl]-N'-[3-(ethyleneoxyethylenedimethylammonium)-propyl[urea dichloride], a sulfosuccinate and water.

5,149,523
POLYSTYRENESULFONATE-DRUG COMPLEX AND SOLID DOSAGE FORMS THEREOF
Per J. Lundberg, Mölndal; Karin Wingstrand, Västra Frölunda; Kjell H. Andersson, Fjäras, and Leif Simonsson, Göteborg, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden
Continuation-in-part of Ser. No. 539,863, Jun. 18, 1990, Pat. No. 5,068,272. This application Dec. 19, 1990, Ser. No. 629,877
Claims priority, application Sweden, Jun. 29, 1989, 8902236; Dec. 7, 1990, 9003902
Int. Cl.[5] A61K 31/74, 9/14, 31/745
U.S. Cl. 424—78.1 10 Claims

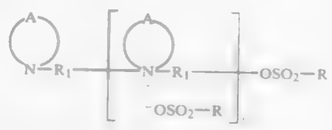
1. A pharmaceutical composition comprising the salt of almokalant, 4-[3-[ethyl[3-(propyl-sulfinyl)propyl]amino]-2-hydroxypropoxy]benzonitrile, with polystyrenesulfonic acid and hydroxypropylmethylcellulose.

5,149,524
ANTIMICROBIAL POLYMERIC QUATERNARY AMMONIUM SALTS
Samuel E. Sherba, Willingboro, N.J.; Raj J. Mehta, Gujarat, India; Margaret M. Bowers-Daines, and Adam Chi-Tung Hsu, both of Lansdale, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Filed Jan. 3, 1991, Ser. No. 637,085
Int. Cl.[5] A61K 31/74; L08G 75/00
U.S. Cl. 424—78.36 15 Claims

1. Process comprising polymerizing a monomer


(IV)

wherein R_1 = $-(CH_2)_m-$, $-(CH_2CH_2-O)_n-CH_2CH_2-$ or $-(CH_2CH_2CH_2-O)_n-CH_2CH_2CH_2-$ in which m=7 to 24, n=1 to 10;
wherein R is alkyl, cycloalkyl, aryl, substituted aryl, alkaryl optionally substituted on the aryl portion or aralkyl optionally substituted on the aryl portion, R having up to 20 carbon atoms and is optionally branched;
wherein A is $(CH_2)_p$, $(CH_2)_q-O-(CH_2)_r$ or $(CH_2)_q-S-(CH_2)_r$ or (C_{1-3})alkyl substituted analogous thereof, wherein p=2 to 8, q=1 to 8, and r=1 to 8
to produce a polymer


(V)

having antimicrobial properties.
2. Composition comprising polymer produced by the process of claim 3 having utility as an antimicrobial agent.

5,149,525

ORGANOPHOSPHORUS INSECTICIDES AS SYNERGIZICIDES FOR CARPOPHILUS SPP. PHEROMONES

Patrick F. Dowd, Peoria, and Robert J. Bartelt, East Peoria, both of Ill., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

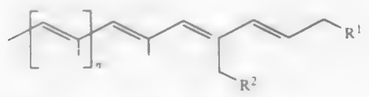
Continuation-in-part of Ser. No. 387,555, Jul. 31, 1989, Pat. No. 5,008,478, which is a continuation-in-part of Ser. No. 275,863, Nov. 25, 1988, Pat. No. 5,011,683. This application Nov. 9, 1990, Ser. No. 610,903

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] A01N *25/00*

U.S. Cl. 424—84 22 Claims

1. A composition for attracting and killing nitidulid beetles comprising substantially pure pheromone attractant for said nitidulid beetles and an organophosphorus insecticide, wherein said pheromone comprises a hydrocarbon or mixtures of hydrocarbons having the structure:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen and lower alkyl, and n is zero or one.

5,149,526

USE OF CHOLESTERYL ESTERS AS MOUNTING SEX PHEROMONES IN COMBINATION WITH 2,6-DICHLOROPHENOL AND PESTICIDES TO CONTROL POPULATIONS OF HARD TICKS

Daniel E. Sonenshine, Virginia Beach, Va.; J. Gordon Hamilton, Liverpool, England, and William R. Lusby, Adelphi, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 9, 1990, Ser. No. 610,904

Int. Cl.[5] A01N *45/00*

U.S. Cl. 424—84 6 Claims

1. A tick attractant composition consisting essentially of:

a) a cholesteryl ester, wherein the ester is an ester of 2 to 22 carbons in length, and

b a 2,6-dihalogenated phenol, selected from the group consisting of 2,6-dichlorophenol and 2,6-dibromophenol,

in an amount and proportion effective for attracting ticks.

5,149,527

IMMUNOPOTENTIATING PROTOCOL FOR CHEMOTHERAPY-RESPONSIVE TUMORS

Larry M. Weisenthal, Huntington Beach, Calif., assignor to Oncotech, Inc., Irvine, Calif.

Filed Sep. 18, 1990, Ser. No. 584,272

Int. Cl.[5] A61K *37/02*

U.S. Cl. 424—85.2 9 Claims

1. A method to effect necrosis and/or regression in tumors which are responsive to tumor destructive therapy, which method comprises:

administering to a subject harboring said tumor cells therapeutic protocol effective to destroy at least a portion of said tumor cells and to induce production or activation of macrophages specific therefor, followed by

administering to said subject, after a time period sufficient to permit the formation of said macrophages which are capable of specific toxicity to said tumor cells, an amount of an immunopotentiator for macrophage effective to cause said necrosis and/or regression.

5,149,528

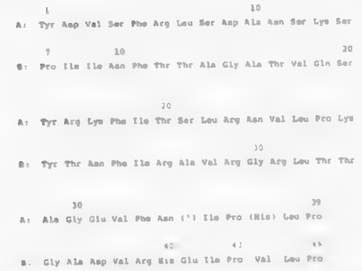
CYTOTOXIC PROTEIN FROM *TRICHOSANTHES KIRILOWII*

John M. Maraganore, Waltham, Mass., and Wayne R. Kindsvogel, Seattle, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Division of Ser. No. 36,840, Apr. 10, 1987, Pat. No. 4,985,541. This application Nov. 13, 1989, Ser. No. 434,173

Int. Cl.[5] A61K *39/44;* C07K *15/10, 17/02*

U.S. Cl. 424—85.91 19 Claims



1. A cytotoxic composition comprising a protein having the following properties:

inhibits protein synthesis in vitro;

exhibits abortifacient activity in mice;

does not contain N-linked glycosidic linkages;

has an amino acid composition consisting essentially of, in moles of amino acid per mole of protein,

Asx	20	Pro	10
Glx	19	Tyr	12
Ser	18	Val	18
Gly	9	Met	5
His	1	Ile	16
Arg	15	Leu	26
Thr	15	Phe	13
Ala	26	Lys	11;

has a molecular weight as determined by polyacrylamide gel electrophoresis of approximately 25,000 Daltons; and contains the amino-terminal amino acid sequence;

X-Asp-Val-Ser-Phe-Arg-Leu-Ser-Asp-Ala-Asn-Ser-Lys-Ser-Tyr-Arg-Lys-Phe-Ile-Thr-Ser-Leu-Arg-Asn-Val-Leu-Pro-Lys-Ala-Gly-Glu-Val-Phe-Asn-Ile-Pro,

wherein X is tyrosine or H; covalently attached to a polypeptide capable of binding to the surface of mammalian cells.

5,149,529

COMPOSITIONS AND TREATMENT FOR HERPES SIMPLEX

Rodney Ho, Danville; Thomas Merigan, Portola Valley; Rae L. Burke, and Dino Dina, both of San Francisco, all of Calif., assignors to Board of Trustees of Leland Chiron Corporation, Emeryville and Stanford Junior University, Stanford, both of, Calif.

Continuation of Ser. No. 179,095, Apr. 8, 1988, abandoned. This application Oct. 11, 1991, Ser. No. 773,073

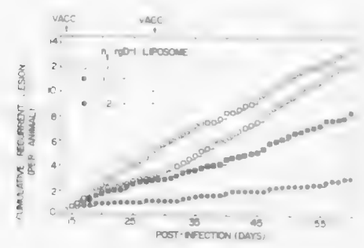
Int. Cl.[5] A61K *39/245*

U.S. Cl. 424—88 11 Claims

1. A composition for treating a subject for herpes simplex virus infection, which composition comprises:

an effective amount of a herpes surface glycoprotein selected from the group consisting of gB and gD; and

an effective amount of an adjuvant selected from the group consisting of N-acetylmuramyl-L-alanyl-D-isoglutamine and chemical equivalents of N-acetylmuramyl-L-alanyl-D-isoglutamine; wherein said glycoprotein and adjuvant are encapsulated in liposomes in aqueous solution.



5,149,530

LIVE NEWCASTLE DISEASE VIRUS VACCINES

Nico van Wiltenburg, Weesp, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

Filed Jul. 13, 1989, Ser. No. 379,232

Claims priority, application Netherlands, Jul. 18, 1988, 8801819

Int. Cl.[5] A61K *39/12;* C12N *7/00*

U.S. Cl. 424—89 5 Claims

1. A live vaccine against Newcastle Disease, comprising a virus of the strain NDW (Newcastle Disease virus "Wiltenberg"), registered at the CNCM (Collection Nationale de Cultures de Microorganismes) of the Institut Pasteur in Paris, under accession number I-781, with a pharmaceutically acceptable carrier.

5,149,531

METHOD OF USING COLD-ADAPTED LIVE INFLUENZA VIRUS VACCINE AS AN ANTIVIRAL AGENT AGAINST INFLUENZA

Julius S. Youngner, and Patricia W. Dowling, both of Pittsburgh, Pa., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Jun. 27, 1990, Ser. No. 544,823

Int. Cl.[5] A61K *39/149, 39/12*

U.S. Cl. 424—89 15 Claims

1. A method of treating a patient for influenza virus comprising

introducing as an antiviral agent a cold-adapted reassortant live influenza virus vaccine into said patient intranasally, and

effecting by said introduction immediate interference with the growth of said influenza virus, whereby said interference with the growth of said influenza virus will be achieved without awaiting the body's production of antibodies to said influenza virus.

5,149,532

METHOD OF VACCINE OR TOXOID PREPARATION AND IMMUNIZATION BY COLONIZATION WITH RECOMBINANT MICROORGANISMS

Phillip A. Brunell, Los Angeles, Calif., assignor to Cedars Sinai Medical Center, Los Angeles, Calif.

Filed Nov. 1, 1989, Ser. No. 430,491

Int. Cl.[5] A61K *39/245;* C12N *21/00, 15/38*

U.S. Cl. 424—89 3 Claims

1. A method of preparing a vaccine against herpes simplex virus comprising:

a) transforming lactobacillus by recombinant DNA technology to express herpes simplex virus glycoprotein D;

b) growing said lactobacillus in a suitable culture medium: and

c) harvesting said lactobacillus by separating it from said culture medium.

5,149,533

MODIFIED T-PA WITH KRINGLE-/REPLACED BY ANOTHER KRINGLE

Eileen R. Mulvihill, Seattle, Wash.; Shinji Yoshitake, Yatabe, Japan; Yasunori Ikeda, Ushiku, Japan; Suguru Suzuki, Ushiku, Japan; Akira Hashimoto, Ryugasaki, Japan; Teruaki Yuzuriha, Sakura, Japan, and Bjorn A. Nexo, Soborg, Denmark, assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation of Ser. No. 58,217, Jun. 4, 1987, abandoned. This application Aug. 12, 1991, Ser. No. 747,452

Int. Cl.[5] A61K *37/547;* C12N *9/64, 15/58;* C07H *21/04*

U.S. Cl. 424—94.64 12 Claims

1. A modified human t-PA wherein the K1 domain of native t-PA is replaced with another kringle domain selected from the group consisting of the human t-PA K2 domain, human plasminogen K1 domain, human plasminogen K4 domain, human plasminogen K5 domain, human factor XII kringle domain, human prothrombin K1 domain, and the human prothrombin K2 domain, said kringle domain mediating the binding of the modified human t-PA to fibrin, said kringle containing six cysteine residues, and said modified human t-PA exhibiting increased half-life or increased clot lysis activity as compared to native t-PA.

5,149,534

SPIROGYRA CONTROLLING AND DEODORANT COMPOSITION

Hisashi Obayashi, Shiga; Yasuhiro Matsumura, Osaka, and Akitoshi Mochida, Chiba, all of Japan, assignors to Takeda Garden Product Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 556,182

Claims priority, application Japan, Jul. 24, 1989, 1-192088

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.100 4 Claims

1. A method of controlling spirogyra and bad odor which compises adding to water or damp ground the cortex of Japanese cedar, Japanese cypress, or a mixture thereof in a feathery form, in a milled form, or as an extract.

5,149,535

PROCESS FOR THE MODIFICATION OF WHEY

Horst Meinhardt, Rheinstrasse 16, 5419 Herschbach, and Ulrich Leithe, Tuebinger Strasse 31, 4000 Duesseldorf, both of Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 395,317

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827833

Int. Cl.[5] A61K *35/78, 9/00*

U.S. Cl. 424—195.1 11 Claims

1. A process for the manufacture of modified whey utilizing lactic acid bacteria, for use in the manufacture of washing-active substances, cosmetics, and pharmaceutical products, comprising the step of at least partially freeing the whey of lactose by utilizing a suitable lactic acid bacteria on the basis of fermentation, and further including the step of adding to the whey at least one component chosen from the group consisting of medicinal herbs, vegetable ingredients, and extracts thereof before the fermentation step.

5,149,536

DENTAL ROOT CANAL BACTERIALCIDAL LUBRICANT

Victor L. Ratkus, 227 Colchester Ave., Burlington, Vt. 05401

Filed Dec. 6, 1991, Ser. No. 804,118

Int. Cl.[5] B61K *6/00*

U.S. Cl. 424—401 3 Claims

1. A dental root canal bacterialcidal lubricant comprising by weight:

A. cetyl alcohol in the range of about 1% to 10%;

B. sodium lauryl sulfate in the range of about 0.5% to 10%;
C. propylene glycol in the range of up to about 10%;
D. methyl paraben in the range of about 0.5% to 2%;
E. propyl paraben in the range of about 0.025 to 2%;
F. butyl paraben in the range of about 0.01 to 2%; and
G. purified water in the range of about 64% to 98.4%.

5,149,53[illegible]

USE OF TAUROCHOLIC ACID AND ITS SALTS AS ENHANCERS FOR CALCITONIN CONTAINING PHARMACEUTICAL COMPOSITIONS

Moise Azria, Basel, and Michel Steiger, Berne, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 497,036, Mar. 21, 1990, abandoned, which is a continuation of Ser. No. 243,576, Sep. 13, 1988, abandoned. This application Nov. 14, 1991, Ser. No. 791,841
Claims priority, application United Kingdom, Sep. 15, 1987, 8721700; Jan. 29, 1988, 8801991; Mar. 3, 1988, 8805068
Int. Cl.[5] A61K 37/00, 37/24
U.S. Cl. 424—436 20 Claims

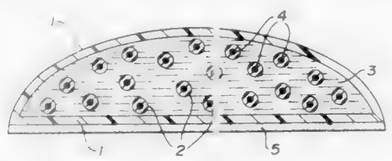
1. A pharmaceutical composition in suppository form useful in reducing calcium levels in the blood and exhibiting enchanced bioavailability of the active ingredient comprising: 1) a suppository base; 2) as the active ingredient, a therapeutically effective amount of calcitonin in free base, pharmaceutically acceptable acid addition salt or complex form; and 3) as an enhancer for the calcitonin, from 1% to 4% of taurocholic acid, or a pharmaceutically acceptable salt thereof, based on the total weight of the composition.

5,149,538

MISUSE-RESISTIVE TRANSDERMAL OPIOID DOSAGE FORM

Colin D. Granger, Chester, and Thomas H. Simon, Morris Plains, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.Y.

Filed Jun. 14, 1991, Ser. No. 716,037
Int. Cl.[5] A61K 9/70, 31/485
U.S. Cl. 424—449 9 Claims



1. A dosage form for the transdermal delivery of one or more opioid to the systemic circulatory system of a mammal comprising, in combination:
a) delivery means through which said opioid is delivered to said systemic circulatory system by applying to the skin, wherein said delivery means comprises a polymeric film which is permeable to said opioid and forms a cavity containing a reservoir of said opioid;
b) one or more of said opioid being selected from the group consisting of morphine, buprenorphine and pharmaceutically acceptable salts thereof said opioid being permeable through said delivery means and to the skin to which it is applied;
c) an effective amount of one or more antagonist substance being selected from the group consisting of naltrexone, naloxone, nalorphine, nalorphine dinicotinate, nalmefene, nadide, levallorphan, cyclazocine, amiphenazole, and pharmaceutically acceptable salts thereof, said antagonist substance sufficient to substantially attenuate the euphorigenic effect of said opioid, wherein said antagonist substance is releasable from said dosage form upon being ingested or substantially immersed in a solvent; and
d) barrier means which separate said antagonist substance from said opioid, and form a plurality of microencapsulated bodies containing said antagonist substance, wherein said bodies are distributed throughout said reservoir of said opioid, said barrier means being impermeable to said opioid and to said antagonist substance

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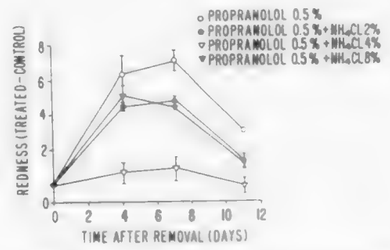
5,149,539

REDUCTION OR PREVENTION OF SENSITIZATION TO DRUGS

Philip W. Ledger; Michel J. N. Cormier, both of Mountain View, and Alfred Amkraut, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 562,788, Aug. 3, 1990, Pat. No. 5,120,545. This application Nov. 15, 1991, Ser. No. 793,936
The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.
Int. Cl.[5] A61F 13/00
U.S. Cl. 424—449 16 Claims



1. A method of reducing or preventing human skin sensitization during transdermal administration to a human of a sensitizing drug, which drug is susceptible to inducing skin sensitization in a human when the drug is transdermally administered, the method comprising coadministering to a selected site on the skin or mucosa of the human:
(a) a therapeutically effective amount of the sensitizing drug, at a therapeutically effective rate over a predetermined period of time; and
(b) an antigen processing-inhibiting agent in an amount effective to inhibit the processing of the drug as an antigen, wherein the agent is either an ionophere, in an amount of from about 0.01 wt % to about 5 wt %, or a weak base compound, in an about of from about 0.2 wt % to about 20 wt %.

5,149,540

THROMBIN COMPOSITION FOR ORAL ADMINISTRATION

Yasuyuki Kunihiro; Ryo Tanaka; Seishichi Hata, and Koji Yamada, all of Shinjuku, Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1991, Ser. No. 661,226
Claims priority, application Japan, Mar. 1, 1990, 2-50494
Int. Cl.[5] A61K 37/547
U.S. Cl. 424—489 16 Claims

1. A hemostatically solid composition comprising:
a hemostatically effective amount of thrombin as an active ingredient;
0.9 to 9.0 wt % of at least one stabilizer selected from the group consisting of gelatin, albumin and glycine; and
more than 89.0 to 99.0 wt % of at least one carrier selected from the group consisting of sucrose and mannitol.

5,149,541

PSYLLIUM-CONTAINING PRODUCES WITH A DISTRIBUTION OF PARTICLE SIZE

Paul D. Leis, Jr., Hamilton; Larry E. Burns, Goshen, and Karen R. Hafer, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 252,848, Oct. 3, 1988, abandoned. This application Feb. 20, 1991, Ser. No. 657,619
Int. Cl.[5] A61K 35/78, 9/14, 9/16, 31/725
U.S. Cl. 424—489 30 Claims

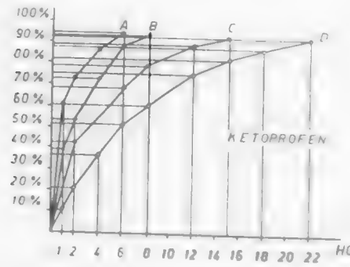
1. Psyllium husk comprising particle sizes distributed as follows: less than about 5% larger than about 60 mesh, less than about 15% larger than about 80 mesh, at least about 45% within the range of from about 80 mesh to about 200 mesh, and less than about 40% smaller than about 200 mesh.

5,149,542

COATING MEMBRANE AND COMPOSITIONS PREPARED THEREFROM

Roberto Valducci, Via del Sole, 4, Savignano sul Rubicone, Italy 47039

PCT No. PCT/IT87/00085, § 371 Date May 2, 1988, § 102(e) Date May 2, 1988, PCT Pub. No. WO88/02253, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 29, 1987, Ser. No. 194,992
Claims priority, application Italy, Sep. 30, 1986, 3530 A/86
Int. Cl.[5] A61K 9/58, 9/62, 9/22, 9/48
U.S. Cl. 424—493 13 Claims



1. A pharmaceutical oral controlled release composition comprising a multiplicity of small pellets consisting of microgranules of inert material, a medicament layer applied thereon and a coating membrane applied upon the medicament layer, said coating membrane being a mixture of stearic acid and ethylcellulose or of paraffin and methacrylic acid copolymers, characterized in that the medicament is selected from the group consisting of ketoprofen, paracetamol, propranolol, diltiazem, isosorbide-5-mononitrate, phenylpropanolamine and diacerheyn, stearic acid and paraffin being present in an amount ranging from 0.7% to 16% and ethylcellulose and methacrylic acid copolymer being present in an amount ranging from 0.3% to 26.3%, based on the medicament weight respectively, and in that the medicament sustained release in vitro achieved is of from 4 to 22 hours or longer.

5,149,543

IONICALLY CROSS-LINKED POLYMERIC MICROCAPSULES

Smadar Cohen, Petach-Tickva, Israel; Carmen Bano, Valencia, Spain; Karyn B. Visscher, State College, Pa.; Marie Chow, Brookline, Mass.; Harry R. Allcock, State College, Pa., and Robert S. Langer, Newton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass. and Pennsylvania Research Corporation, University Park, Pa.

Filed Oct. 5, 1990, Ser. No. 593,684
Int. Cl.[5] A61K 9/50
U.S. Cl. 424—499 7 Claims

1. A composition comprising a biological material selected from the group consisting of liposomes, viruses, procaryotic cells, and eucaryotic cells encapsulated in a microcapsule.
the microcapsule a gel prepared from an ionically crosslinkable synthetic polymer, wherein the polymer is a polyelectrolyte selected from the group consisting of poly(phosphazenes), poly(acrylic acids), poly(methacrylic acids), copolymers of acrylic acid or methacrylic acid and polyvinyl ethers or poly(vinyl acetate), sulfonated polystyrene, poly(vinyl amines), poly(vinyl pyridine), poly(vinyl imidazole), imino substituted polyphosphazenes, ammonium or quaternary salts and copolymers thereof, is soluble in an aqueous solution selected from the group consisting of water, aqueous alcohol, and buffered aqueous salt solutions and has charged side groups which are crosslinked by reaction of the side groups with multivalent ions of the opposite charge,

wherein multivalent cations are selected from the group consisting of calcium, copper, aluminum, magnesium, strontium, barium, tin, organic cations, poly(amino acids), poly(ethyleneimine), poly(vinylamine), poly(allyl amine) and polysaccharides, and multivalent anions are selected from the group consisting of dicarboxylic acids, sulfate ions, carbonate ions, poly(acrylic acids), poly(methacrylic acids), copolymers of acrylic acid or methacrylic acid, sulfonated poly(styrene) and poly(styrene) with carboxylic acid groups,
wherein the gel is insoluble in an aqueous solution after crosslinking, and
has an outer membrane formed by crosslinking of the gel with a polyvalent ion of the same charge as the multivalent ions.

5,149,544

METHOD OF INHIBITING PROGENITOR CELL PROLIFERATION

Patrick S. Gentile, Louisville, Ky.; Charlie R. Mantel, Plainfield, and Hal E. Broxmeyer, Indianapolis, both of Ind., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Nov. 13, 1989, Ser. No. 436,164
Int. Cl.[5] A61K 35/28, 35/00, 37/00; A01N 37/18
U.S. Cl. 424—577 2 Claims

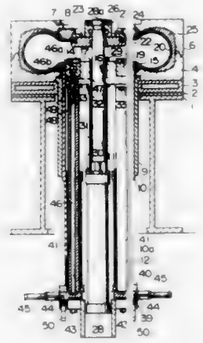
1. A method of inhibiting hematopoietic progenitor cell proliferation comprising contacting the hematopoietic progenitor cells with a conditioned medium, the conditioned medium being prepared by a method comprising:
injecting a mouse with lactoferrin or acidic isoferritin; and
preparing a conditioned medium using bone marrow or spleen cells removed from the mouse

5,149,545

CENTRAL MECHANISM OF TIRE VULCANIZER

Katsuyoshi Sakaguchi, and Akira Hasegawa, both of Akunoura, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,524
Claims priority, application Japan, Mar. 26, 1990, 2-73224
Int. Cl.[5] B29C *35/00, 37/00*
U.S. Cl. 425—35 2 Claims



1. In a central mechanism of a tire vulcanizing apparatus including a bladder, a lower ring having a conduit for passage of a vulcanizing medium to the interior of said bladder, and a lower clamp ring detachably secured to said lower ring for removably securing a lower end portion of said bladder within said apparatus, wherein the improvement comprises:

said lower clamp ring having key-shaped holes formed therein, each of said holes having a large diameter passing portion and a small diameter locking portion;

said lower clamp ring being moveable relative to said lower ring between a first state and a second state;

clamp rods each having one end passing through a respective one of said holes in said lower clamp ring and engageable with a nut member, said nut member being sized to engage with the locking portion of said key hole when said lowerclamp ring is in its first state and to pass through the passing portion of said key hole when said clamp ring is in its second state;

spring means associated with said clamp rods and being operable to displace said rods in one direction to locate said nut members in engagement with the locking portions of said key holes when said lower clamp ring is in its first state thereby to prevent movement of said lower clamp ring to its second state; and

fluid pressure cylinder means associated with said clamp rods and being operable to displace said rods in an opposite direction, against the force of said spring means, to disengage said nut members from the locking portions of said key holes and permit said lower clamp ring to be moved to its second state and be removed form said lower ring by passage of said nut members through the passing portions of said key holes for replacing said bladder.

5,149,546

CHECK VALVE FOR A FLUID-ASSISTED PLASTIC INJECTION MOLDING APPARATUS

William A. Nelson, New Baltimore Mich., assignor to Automotive Plastic Technologies, Inc., Sterling Heights, Mich.

Filed Jul. 1, 1991, Ser. No. 724,044
Int. Cl.[5] B29C *45/23*
U.S. Cl. 425—130 24 Claims

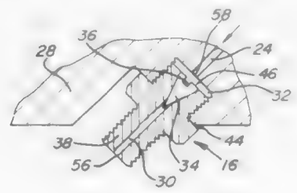
1. A nozzle for use in a fluid-assisted plastic injection molding apparatus, said nozzle including

(a) a nozzle body having an upstream end for fluid communication with an end of an associated plastic injection molding machine and a downstream end for fluid communication with a sprue of an associated mold body, said nozzle body including

(1) an axially extending first bore for establishing a plastic flow path,

(2) a second bore extending through, and non-axially to, the nozzle body where a first end of the second bore is in fluid communication with a fluid supply and a second end of the second bore is in fluid communication with, and intersects, the axially extending first bore, and

(3) a valve chamber provided in the second bore and in fluid communication with the second bore wherein the valve chamber is tapered and has a small diameter and a large diameter such that the small diameter of the valve chamber is adjacent to the first end of the second bore, the large diameter of the valve chamber is adjacent to the second end of the second bore, and the large diameter of the valve chamber is larger than the second bore diameter; and



(b) a tapered valve member adapted to fit within the valve chamber and movable therein between a closed position and an open position, wherein

(1) when the tapered valve member is in the closed position, the tapered surfaces of the valve member are sufficiently engaged with the tapered surfaces of the valve chamber to prevent fluid from passing from the second end of the second bore to the first end of the second bore, and

(2) when the tapered valve member is in the opened position, the tapered surfaces of the valve member are displaced from the tapered surfaces of the valve chamber whereby fluid can pass from the first end of the second bore to the second end of the second bore.

5,149,547

APPARATUS FOR MULTI-CAVITY INJECTION MOLDING

Antony Gill, Rochester, Mich., assignor to Automotive Plastic Technologies, Inc., Sterling Heights, Mich.

Filed Jun. 12, 1991, Ser. No. 713,938
Int. Cl.[5] B29C *45/77*
U.S. Cl. 425—145 9 Claims

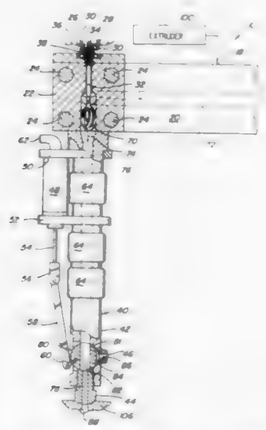
1. An injection molding apparatus for use with a multiple cavity injection mold to produce a plurality of plastic articles, said apparatus comprising:

(a) a plurality of nozzles wherein each nozzle contains a resin passageway within a nozzle body, wherein the resin passageway is in fluid communication at a downstream location with an associated article cavity within the multiple cavity injection mold;

(b) a resin manifold having (1) an entry for connection with a resin extrusion machine and (2) a number of manifold passageways equal to the number of nozzles, where one end of each manifold passageway is in fluid communication with the entry and the other end of each manifold passageway is in fluid communication with the upstream end of the resin passageway of an associated nozzle;

(c) a separate spindle for each nozzle, where the spindle is located within a combined passageway formed by the resin passageway of the associated nozzle and the associated manifold passageway and where the spindle is adapted to rotate in a reproducible manner in response to resin flowing around and past the spindle from an upstream to downstream direction;

(d) a separate shut-off valve for each nozzle, where each shut-off valve is located within the resin passageway between the upstream end of the nozzle and the associated article cavity whereby the flow of resin can be controlled; and



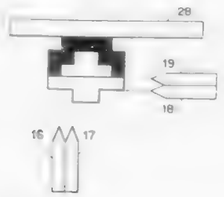
(e) a separate means for each nozzle for measuring the number of rotations the spindle associated with that nozzle makes due to resin flowing around and past the spindle; whereby for each nozzle, when the number of spindle rotations reaches a predetermined number for that nozzle, the shut-off valve for that nozzle can be activated to stop the flow of resin to that nozzle's associated article cavity independently of the flow of resin to the other article cavities.

5,149,548

APPARATUS FOR FORMING THREE-DIMENSION ARTICLE

Mitsuo Yamane, Yotsukaichi, and Takashi Kawaguchi, Aichi both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 18, 1990, Ser. No. 539,192
Claims priority, application Japan, Jul. 3, 1989, 1-169951
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] B29C *35/08;* B05B *7/06;* H05B *1/00*
U.S. Cl. 425—174.4 13 Claims



1. An apparatus for forming a three-dimensional article on the basis of three-dimensional information about the article with a two-part curable material and a setting material therefor, the setting material being encapsulated in microcapsules which are rupturable upon light radiation or heat radiation, the apparatus comprising:

a stage for mounting thereon the three-dimensional article to be formed;

a dispersing unit for dispersing the microcapsules uniformly in the two-part curable material;

an ink jet head unit positioned below the stage for jetting the two-part curable material and the microcapsules dispersed therein toward said stage to laminate the two-part curable material and the microcapsules on the stage;

a microcapsule rupturing unit for rupturing the microcapsules and to cure the two-part curable material laminated on said stage, the microcapsule rupturing unit comprising one of light applying means and heat applying means, the light applying means applying the light radiation toward the two-part curable material and the microcapsule dispersed in the two-part curable material jetted and laminated on the stage, and the heat applying means applying the heat radiation toward the two part-curable material and the microcapsules dispersed in the two-part curable material jetted and laminated on the stage;

a control means for controlling said ink jet head unit in order to change at least one of a jetting direction of the two-part curable material and a jetting amount of the material jetted from the ink jet head unit on the basis of the information in order to control a jetting and laminating operation of the two-part curable material on said stage, and for controlling said microcapsule rupturing unit in order to rupture the microcapsules disposed in the two-part curable material laminated on the stage after the two-part curable material is laminated on said stage, said controlling means also controlling the repetition of the jetting operation of said ink jet head and the microcapsule rupturing operation of said microcapsule rupturing unit.

8. An apparatus for forming a multi-kind or multi-color three-dimensional article with plural two-part curable materials of different kinds or different colors and setting materials therefor on the basis of a three-dimensional information on the article, the setting materials for the two-part curable materials being encapsulated in the microcapsules rupturable upon light radiation, the apparatus comprising:

a stage for mounting thereon the three-dimensional article to be formed;

plural tanks for accommodating the different kind or color two-part curable materials;

plural ink jet heads positioned below said stage for jetting along respective flight passages of the materials toward said stage to individually laminate the two-part curable materials on said stage, the flight passages being defined between said stage and the ink jet heads;

a light supplying unit for irradiating light to the laminated two-part curable materials on said stage to rupture microcapsules in the two-part curable materials and to cure the two-part curable materials; and

a control means for controlling said ink jet head unit in order to change at least one of a jetting direction of the two-part curable materials along the flight passages and a jetting amount of the materials jetted from said ink jet head unit on the basis of the information in order to control a jetting and laminating operation of the two-part curable materials on said stage, and for controlling said microcapsule rupturing unit in order to rupture the microcapsules dispersed in the two-part curable materials laminated on the stage after the two-part curable materials are laminated on said stage, said controlling means also controlling the repetition of the jetting operation of said ink jet head and the microcapsule rupturing operation of said microcapsule rapturing unit.

5,149,549

METHOD AND COMPOSITION FOR ACHIEVING ANIMAL WEIGHT GAIN WITH MYCOTOXIN-CONTAMINATED ANIMAL FOOD

Lawrie Beggs, Roselle, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Filed Nov. 21, 1990, Ser. No. 616,611
Int. Cl.[5] A23K 1/00
U.S. Cl. 426—2 10 Claims

1. A method of increasing the nutritional value of mycotoxin-contaminated animal feed ingested by an animal comprising feeding montmorillonite clay to said animal simultaneously with said mycotoxic-contaminated animal feed such that said montmorillonite clay and mycotoxin-contaminated animal feed are present simultaneously in the digestive tract of said animal, wherein said montmorillonite clay fed to said animal is fed in an amount sufficient to aid the metabolic absorption of nutrients from said contaminated animal feed.

5,149,550

METHODS FOR MAKING PET CHEWS

David M. Mohilef, Chatsworth, Calif., assignor to Pet Center, Inc., Los Angeles, Calif.

Filed Sep. 10, 1991, Ser. No. 757,181
Int. Cl.[5] A23K 1/10, 1/18
U.S. Cl. 426—3 18 Claims

1. A method for making pet chews consisting essentially of:
(a) removing adherent fat from hoofstock ligaments by washing said ligaments in an aqueous degreasing solution comprised of water, strong alkali and cleaning agents for an amount of time sufficient to substantially remove adherent fat from said ligaments,
(b) roasting the de-fatted ligaments from step (a) until said ligaments assume a desired color,
(c) drying said ligaments from step (b) until said ligaments are hardened or substantially hardened.

14. A method for of making pet chews consisting essentially of:
(a) removing adherent fat from hoofstock ligaments by roasting said ligaments in an oven until most of the adherent fat liquefies and falls off and away from said ligaments,
(b) drying the de-fatted ligaments from step (a) until the ligaments are hardened or substantially hardened,
(c) substantially removing any fat remaining on said ligaments by suitable manual or mechanical means.

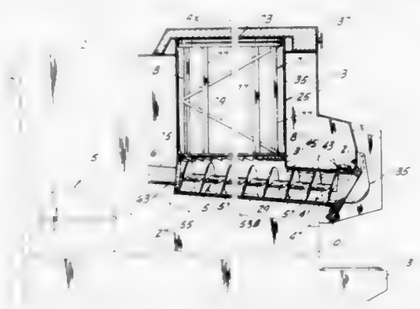
16. A method according to any of Claims 3–14 further comprising shaping said ligaments into desired shapes.

5,149,55

APPARATUS FOR AND METHOD OF DISPENSING FOOD PRODUCT SUCH AS HARD ICE CREAM

David B. Anderson, St. George, Utah, assignor to Quixpenser, Inc., Salt Lake City, Utah

Filed Oct. 30, 1990, Ser. No. 605,975
Int. Cl.[5] B29C 47/92
U.S. Cl. 426—231 49 Claims



1. Apparatus for automatically dispensing food product such as hard ice cream, comprising:
means for holding a supply of food product under refrigeration,
chamber means adjacent said holding means for receiving food product an for delivery therefrom of a serving portion of food product,
cutting means for cutting food product from the supply for delivery to said chamber means thereby to pack said chamber means with food product, and
means for sensing the extent to which food product is packed in said chamber means and for effecting stoppage of delivery of food product to said chamber means when said chamber means becomes packed to a predetermined extent.

44. A method of automatically dispensing food product such as hard ice cream, comprising
placing a supply of hard food product in a container under refrigeration,
cutting food product from the supply and delivering food product so removed to chamber means communicating with the interior of the container,
continuing to deliver food product to said chamber means until the chamber means becomes packed to a predetermined extent and then stopping deliver,
sensing the pressure at which food product is packed in said chamber means and stopping delivery of food product to said chamber means when the packing pressure reaches or exceeds a predetermined pressure, and
dispensing a serving portion of food product packed in said chamber means.

5,149,552

CALCIUM CITRATE ANTICAKING AGENT

Susan Vidal, Patterson, and Fouad Z. Saleeb, Pleasantville, both of N.Y., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed May 23, 1991, Ser. No. 704,500
Int. Cl.[5] A23L 2/38; C07C 59/265
U.S. Cl. 426—321 15 Claims

1. A reaction product of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide and calcium carbonate with citric acid wherein said reaction product has a mole ratio of calcium to citric acid from 2.5:2 to 2.95:2 and a pH value in a 1% water slurry of said reaction product from about 4 to below 7 at 25° C.

7. A dry, flavored, powdered fructose-containing soft drink composition comprising as an anti-caking agent therefor a reaction product of a calcium compound selected from the group consisting of calcium hydroxide, calcium oxide and calcium carbonate with citric acid wherein said reaction product has a mole ratio of calcium to citric acid from 2.5:2 to 2.95:2, a pH value in a 1% water slurry of said reaction product from about 4.0 to below 7 at 25° C. and said reaction product having a moisture content no greater than 6 weight percent.

5,149,553

BEER PROCESSING AND COMPOSITION

Kenneth A. Berg, North Wales; Reinhard H. Witt, Wyncote, and M. Robert Deroif, Pottstown, all of Pa., assignors to PQ Corporation, Valley Forge, Pa.

PCT No. PCT/US90/05858, § 371 Date Jun. 6, 1991, § 102(e) Date Jun. 6, 1991
Continuation-in-part of Ser. No. 420,502, Oct. 12, 1989, abandoned. This PCT application Oct. 11, 1990, Ser. No. 700,205
Int. Cl.[5] C12H 1/04
U.S. Cl. 426—330.4 25 Claims

1. A composition for treating beer to prevent chill haze, said composition comprising a silica gel reacted with a multivalent metal ion and being characterized by a uniform distribution of the metal in the pores and on the surface of the silica, and wherein said multivalent metal is not precipitated in the pores of the silica or around the particles of silica, said composition being prepared by the steps of:
a. combining a solution of sodium silicate or potassium silicate with a solution of an acid to form a silica hydrosol, the composition and proportions of said silicate and acid solution being such that 60 to 85% by weight of the sodium or potassium in the silicate solution is neutralized and the hydrosol contains 8 to 12% by weight SiO_2;
b. allowing said hydrosol to set to a hydrogel;
c. granulating said hydrogel into discrete particles;
d. contacting said hydrogel particles with a solution of 3 to 10% by weight of a salt of a multivalent metal and maintaining the pH of the mixture of hydrogel and solution at a value of about 7 to 10.5, whereby the metal reacts or exchanges with the silica but large precipitates of hydrous metal oxide do not form within the pores of the silica or around the silica particles;
e. maintaining contact between the hydrogel particles and metal salt solution until the desired level of metal is reacted or exchanged with the silica;
f. washing the reacted silica
g. drying and milling the reacted silica; and
h. recovering the product silica.

5,149,554

METHOD AND APPARATUS FOR TRANSFERRING FOOD MATERIAL SLICES

Norman C. Abler, Madison, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 24, 1991, Ser. No. 690,481
Int. Cl.[5] A23L 1/00; B65B 35/00
U.S. Cl. 426—420 35 Claims

32. A method of transferring slices of food material, comprising the steps of:
providing a rotating member having a non-rotating, inner member;
rotating the rotating member so that the outer surface thereof engages an individual food material slice;
applying negative air pressure to a portion of said rotating member outer surface to adhere the individual food material slice to a material slice receiving portion of said rotating member;
rotating said rotating member while said individual food material slice is adhered to said rotating member material slice receiving portion, so that the rotating member material slice receiving portion is disposed proximate to a material slice support member;
moving the non-rotating member within said rotating member and applying positive air pressure to said rotating member individual material slice receiving portion to thereby urge said individual food material slice off of said rotating member outer surface material slice receiving portion and onto said support member.

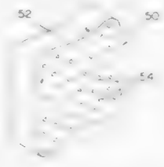
5,149,555

METHOD FOR FORMING AN OPEN TEXTURED PRODUCT

Richard C. Flindall, Brighton, Canada, assignor to Kraft General Foods Canada Inc., Don Mills, Canada

Continuation of Ser. No. 353,986, May 18, 1989, abandoned. This application Feb. 16, 1990, Ser. No. 481,420
Int. Cl.[5] A23L 1/18; A23P 1/12, 1/14
U.S. Cl. 426—448 5 Claims

1. A method of forming an open textured food product having a predetermined, uniform width comprising:
conducting an extrudable food material under pressure into an expansion chamber defined by an extruder die;
immediately expanding the food material to the same shape as the desired shape of the finished product and expanding said food material to said final predetermined uniform width upon entry of the food material into the expansion chamber to form an open texture throughout the interior of the expanded material while expanding the food material to a self-maintaining shape;



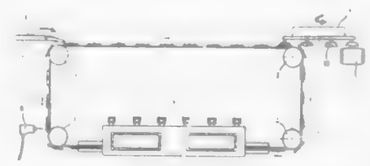
guiding the expanded food material forward through the expansion chamber, along a smooth inside surface of the extruder die, to form a smooth outside surface on the expanded food material;
discharging the expanded food material from the extruder die; and
cutting the discharged food material into individual pieces.

5,149,556

PROCESS FOR PASTEURIZING AND PRECOOKING UNCOOKED PIZZA BASES

Toai Le Viet, Vevey, and Eberhard Raetz, Corseaux, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed May 3, 1990, Ser. No. 518,162
Claims priority, application Switzerland, May 22, 1989, 1920/89
Int. Cl.[5] A23L 3/01
U.S. Cl. 426—521 11 Claims



1. A process for obtaining a pasteurized and precooked pizza base comprising heating a vitroceramic plate by microwaves to heat the vitroceramic plate to a temperature of from 250° C. to 300° C., removing the heated vitroceramic plate from the microwaves, placing a raw pizza base on the heated vitroceramic plate removed from the microwaves for from about 2 minutes to about 3 minutes to pasteurize and precook the pizza base in contact with the vitroceramic plate and then removing the pasteurized and precooked pizza base from the vitroceramic plate.

5,149,557

WHIPPABLE NON-DAIRY CREAMS

Anthony Morrison, Bedford; Ian M. Kimsey, Radwell, and Heather Marks, Bedford, all of Great Britain, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed May 1, 1991, Ser. No. 694,182
Claims priority, application European Pat. Off., May 2, 1990, 90304805.6
Int. Cl.[5] A23L 1/09, 13/00
U.S. Cl. 426—570 17 Claims

1. A whippable non-dairy cream comprising:
a water-continuous emulsion of an aqueous phase having up to 10% of a buttermilk component and optionally having a thickener;
a fat phase having a fat selected from the group consisting of

palm kernel, hardened palm kernel, palm midfraction, palm stearin, palm kernel stearin, coconut, hardened coconut, cocoa butter substitutes, butter fat or mixtures thereof; and

an emulsifier system having at least a stabilizing emulsifier and at least a destabilizing emulsifier,

wherein the non-dairy cream has 15-25 wt.% of the fat and not more than 0.7 wt.% of the emulsifier system and the non-dairy cream is whippable within 6 minutes using a domestic electrical whipper.

5,149,558

FREEZE DRIED SWEETENED CONDENSED SKIM MILK CRYSTALS AND ITS PROCESS OF MAKING

Cindy E. Little, and Eric Cully, both of Orlando, Fla., assignors to Crystals International, Plant City, Fla.

Continuation-in-part of Ser. No. 491,085, Mar. 9, 1990, Pat. No. 5,024,848. This application Jun. 17, 1991, Ser. No. 714,889
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] A23C *9/00*
U.S. Cl. 426—588 5 Claims

1. A method of producing a food ingredient, said method comprising:

forming a solution consisting of 100% sweetened condensed skimmed milk made of skimmed milk and sucrose,

diluting said solution with water to form a solution have 50°-65° brix, and

drying said solution under a pressure of 2.5 to 4.0 mm Hg by freeze-drying, effected by a continuous vacuum dryer to produce a dry food ingredient of 100% sweetened condensed skimmed milk crystals,

said drying being effected at a temperature in the range of from 165°-220° F. to avoid carmelization of the 100% sweetened condensed skimmed milk.

5,149,559

PROCESS FOR THE PREPARATION OF A LOW CALORIE BUTTER SPREAD AND PRODUCTS OBTAINED BY SAID PROCESS

Belinda Alaers, Keerbergen, Belgium; Peter B. Ernsting, Delft, Netherlands; Pieter M. Holemans, Kapellén, Belgium, and Cornelis Van Der Struis, Vlaardingen, Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 485,415, Feb. 27, 1990, abandoned.
This application Jun. 10, 1991, Ser. No. 713,633
Claims priority, application United Kingdom, Mar. 3, 1989, 8904941; Nov. 13, 1989, 8925623
Int. Cl.[5] A23D *7/00*
U.S. Cl. 426—602 9 Claims

1. A process for the preparation of a low fat, water-in-oil emulsion spread containing 30-80% wt. of a continuous fat phase and a dispersed aqueous phase, the process comprising the steps of:

(a) enriching the fat content of a fat-containing lacteal fluid containing less than 45% wt butterfat and more than 45% of a first, lactose-containing aqueous phase, to obtain an enriched lacteal fluid having 55-75% wt. fat;

(b) diluting said enriched lacteal fluid with a second aqueous phase having a lower lactose content than said first aqueous phase, to obtain a mixture having 30-60% wt. fat; and

(c) cooling and working said mixture, whereby phase inversion occurs and said low fat spread is obtained.

5,149,560

HEAT-RESISTANT CHOCOLATE AND METHOD OF MAKING SAME

Kirk S. Kealey, Long Valley, and Nancy W. Quan, Budd Lake, both of N.J., assignors to Mars, Inc., McLean, Va.

Filed Mar. 25, 1991, Ser. No. 674,652
Int. Cl.[5] A23G *3/00*
U.S. Cl. 426—602 12 Claims

1. A method of preparing a heat-resistant chocolate which comprises combining tempered chocolate and a stable water-in-oil emulsion, in the form of a lipid microstructure, able, and in an amount effective, to form the heat-resistant chocolate.

5,149,561

METHODS OF MAKING SIMULATED RAW EGGS

Eustathios Vassiliou, 12 S. Townview La., Newark, Del. 19711

Continuation-in-part of Ser. No. 750,116, Aug. 26, 1991, which is a continuation-in-part of Ser. No. 551,160, Jul. 11, 1990, Pat. No. 5,073,399. This application Sep. 11, 1991, Ser. No. 757,641
Int. Cl.[5] A23L *1/32*
U.S. Cl. 426—614 12 Claims

1. A method of making a simulated egg comprising the steps of:

(a) mixing a colored edible liquid with a negative non-thermoreversible gel former;

(b) shaping the product of step (a) into individual monolithic portions;

(c) heating the portions of step (b) until a solid shell is formed around each of said portions, while the inside of each portion remains liquid; and

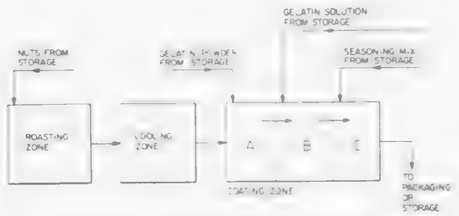
(d) adding each portion of step (c) into liquid egg-white.

5,149,562

PRODUCT AND PROCESS OF COATING NUTS WITH EDIBLE PROTEIN

Gerald D. Hebert, Hopatcong, and Oris E. Holloway, Sparta, both of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Filed Jun. 28, 1990, Ser. No. 546,539
Int. Cl.[5] A23L *1/36*; A23B *9/14*
U.S. Cl. 426—632 21 Claims



1. A process for preparing roasted nuts which comprises:

(a) heating the nuts in an edible oil under conditions effective to impart a roasted nut color, flavor and aroma;

(b) applying edible protein in dry form to the surface of the roasted nuts to obtain a uniform coating of edible protein on the roasted nuts;

(c) applying about 2% to about 7% by weight of water to said edible protein-coated nuts to produce a surface to which a subsequently applied seasoning mix will adhere; and

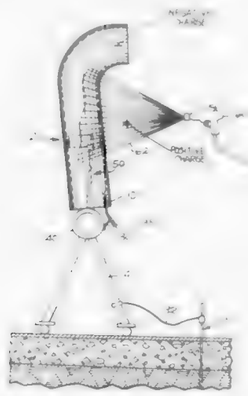
(d) applying a seasoning mix to the protein-coated nuts under conditions effective to obtain a coating of seasoning mix on the nuts.

5,149,563

METHOD FOR ELECTROSTATICALLY COATING PLASTER MANDRELS

Scott M. Collier, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 6, 1991, Ser. No. 711,674
Int. Cl.[5] B05D *1/04*
U.S. Cl. 427—27 1 Claim



1. A method for electrostatically spraying a plaster mandrel supported on a painting rack utilizing a spray gun, said method comprising:

positioning an electrically conductive ground terminal in an uncured portion of said plaster mandrel;

closing an electrical circuit path between said electrically conductive ground terminal and said painting rack; and,

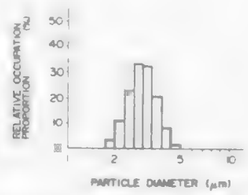
closing an electrical circuit path between said painting rack and said spray gun.

5,149,564

METHOD OF FORMING LURICATING FILM AND A METHOD OF PREPARING MAGNETIC RECORDING MEDIUM

Atsushi Kato, Hiratsuka; Waichi Nagashiro, Kanagawa, and Motoo Akagi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,689
Claims priority, application Japan, Mar. 16, 1990, 2-064047
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—127 6 Claims



1. A method of forming a lubricating film which comprises applying an emulsion comprising 1 to 10 parts by weight of a fluorinated polymer, 1 to 10 parts by weight of a surfactant and 10 to 1,000 parts by weight of water as a dispersing medium to a substrate and then drying the film; said fluorinated polymer being a perfluoropolyether represented by the following formula:

$$F-(CF(CF_3)CF_2O)_n-C_2H_5$$

wherein n is a number from 11 to 49 and the means particle diameter of the emulsion is in the range of 0.1 to 10 μm.

5,149,565

ADDITIVES FOR LEAD-FREE FRITS

Ronald E. Johnson, Tioga, Pa.; Kenneth A. Kirk, and Kathleen A. Wexell, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 31, 1991, Ser. No. 785,484
Int. Cl.[5] B05D *7/00*
U.S. Cl. 427—215 12 Claims

1. In a method for eliminating the grayish discoloration which develops when lead-free and cadmium-free glass frit particles are applied to a substrate by means of an organic vehicle and fused to form a glaze, which discoloration is the result of a carbonaceous residue, said method comprising the steps of:

(a) preparing lead-free and cadmium-free glass frit particles of a desired composition;

(b) forming a suspension of said frit particles in an organic vehicle;

(c) applying said suspension onto a substrate; and

(d) firing said suspension to burn off said vehicle and to fuse said frit particles into a glaze;

the improvement comprising adsorbing a coating of an organic compound containing at least one sulfur oxide group as an oxidizing agent onto the surface of said frit particles such that, upon firing said suspension, said organic compound is burned out and the carbonaceous residue is oxidized to thereby eliminate said grayish discoloration.

5,149,566

METAL PLATING PROCESS

David Morton, Rowlands Gill, and Timothy M. Handyside, Newcastle, both of United Kingdom, assignors to Courtaulds Coatings Limited, United Kingdom

Filed Sep. 26, 1989, Ser. No. 412,789
Claims priority, application United Kingdom, Sep. 27, 1988, 8822641
Int. Cl.[5] B05D *7/22*
U.S. Cl. 427—235 14 Claims

1. A coating process for internal surfaces of a tank for liquid cargo or ballast, in which process a metal plating composition is applied to said internal surfaces by means of an applicator to form a metal layer at least one micron thick, wherein said metal plating composition contains a gelling or thickening agent in an amount such that said composition is thixotropic or has a viscosity such that it does not substantially drip from a downwardly facing surface to which it has been applied.

5,149,567

CUSHION AND METHOD OF MANUFACTURING THE SAME

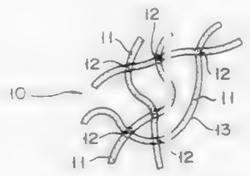
Takeshi Minegishi, Sagamihara; Yasuo Yoneshige, Kawasaki; Toshihiro Takehana, Yokohama, and Toru Sakai, Tokyo, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Division of Ser. No. 77,041, Jul. 16, 1987, Pat. No. 4,902,542, which is a continuation-in-part of Ser. No. 811,521, Dec. 20, 1985, abandoned. This application Feb. 15, 1990, Ser. No. 480,559
Claims priority, application Japan, Dec. 28, 1984, 59-281080
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—240 20 Claims

1. A method of manufacturing a cushion, comprising the steps of:

impregnating a main body, comprising organic synthetic

fibers having a denier of 1–20 and which are stereoscopically intertwined, with a polyurethane prepolymer solution so as to allow the polyurethane prepolymer to attach to the fibers;



centrifuging the cushion body to remove excess solution from the cushion body; and

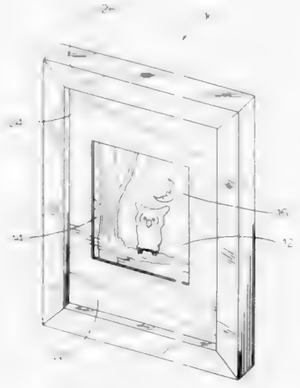
curing the polyurethane prepolymer by bringing the polyurethane prepolymer attached to the fibers into contact with a curing agent comprising water.

5,149,568

GLOW IN THE DARK ARTWORK

Michael P. Beck, 4048 Kristy Cir., Omaha, Nebr. 68112

Filed Nov. 19, 1990, Ser. No. 615,368
Int. Cl.[5] F21K *2/00*
U.S. Cl. 428—14 **10 Claims**



1. A glow in the dark artwork, comprising:

a luminescent layer having front and back surfaces;

support means for supporting said luminescent layer; and

an image layer including a plurality of image defining opaque and translucent areas, said image layer overlying the front surface of said luminescent layer and in adjacent relation thereto whereby upon exposure of said front surface of said luminescent layer to a light source said image means and luminescent layer produce an image visible in low ambient light.

5,149,569

BASE MEMBER FOR PROTECTIVE STRIP ASSEMBLY

David S. McCue, Marblehead, Mass., assignor to McCue Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 477,540, Feb. 12, 1990, Pat. No. 5,096,753. This application Feb. 1, 1991, Ser. No. 649,440
Int. Cl.[5] E04F *19/04*; **B60J** *11/00*
U.S. Cl. 428—31 **12 Claims**

1. A protective strip assembly comprising

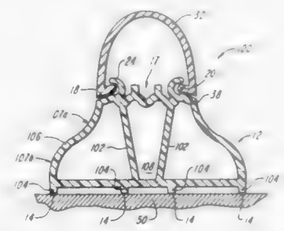
a) an elongate base member having a longitudinal axis and comprising:

i) a mounting element defining at least one mounting surface and a plurality of spurs forming said mounting surface;

ii) means for attaching said mounting element to a wall;

iii) a trim connector portion extending parallel to the longitudinal axis of the base member and spaced apart from said mounting surfaces and including an opposing pair of latch elements extending along said longitudinal axis and having an inwardly angled first latch wall substantially transverse to and extending along said longitudinal axis, said first latch wall extending from each of said latch elements;

iv) a web-like structure formed by at least one support member extending transverse to said longitudinal axis from said trim connector portion to said mounting element; and



v) a side wall downwardly extending from each of said first latch walls; and

b) a protective trim member in interlocking engagement with said base member at said trim connector portion, said member comprising:

i) an elongate top portion extending along said longitudinal axis, connected to a pair of opposed leg members, each of which is resiliently spreadable transverse to said axis; and

ii) each of said leg members terminating in a latch ridge interfitting with each said latch element;

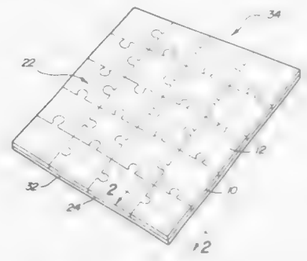
whereby application of force to said top portion of said trim member in a direction transverse to said longitudinal axis causes said time member to slide laterally and downwardly along said side wall thereby absorb said force.

5,149,570

PEEL-OFF PUZZLE

Merrie Cain, 14654 Dolphin, Detroit, Mich. 48223-1833

Filed Sep. 21, 1990, Ser. No. 585,933
Int. Cl.[5] A63F *9/10*; **B32B** *3/14*
U.S. Cl. 428—33 **2 Claims**



1. A jigsaw puzzle having a plurality of interlocking pieces which can be adhered to a receiving surface during assembly, each of said plurality of interlocking pieces comprising:

a rigid first sheet, said first sheet having a front surface and a back surface, said front surface having an image disposed thereon for viewing, said image in combination with other of said plurality of interlocking pieces comprising a composite image on said jigsaw puzzle;

an adhesive sheet bonded to said back surface, said adhesive sheet substantially covering said back surface and having a pressure sensitive adhesive surface substantially covering said adhesive sheet opposite said back surface;

a release sheet substantially covering said pressure sensitive adhesive surface of said adhesive sheet, said release sheet including means for ready removal for exposing said pressure sensitive adhesive surface; and

whereby each of said plurality of interlocking pieces can be simultaneously assembled and adhered to said receiving surface to form a mounted jigsaw puzzle ready for hanging upon a wall.

5,149,571

LICENSE PLATE

Richard C. Croell, 134 Willow Pl., Broomfield, Colo. 80020

Filed Oct. 11, 1990, Ser. No. 596,053
Int. Cl.[5] A61F *13/02*
U.S. Cl. 428—40 **10 Claims**

7. A multi-ply laminae tamper resistant license plate consisting essentially of:

a plate means;

said plate means having a front side capable of receiving printed and written indicia thereon;

said plate means having an upper edge portion having an attachment means thereon and a lower portion;

a transparent polymeric sheet means having a front side and a back side the same dimensions as said plate means having an upper edge portion having an attachment means therein corresponding to said plate means and a lower portion;

said upper edge portion is affixed correspondingly to said front side of said plate means;

said lower portion of said back side of said transparent polymeric sheet means having an adhesive means thereon;

a protective liner means releasably affixed to said adhesive means;

whereby in operation, an expiration data is placed on said front side of said plate means and said protective liner is removed from said adhesive means and said transparent polymeric sheet means is permanently affixed to said plate means forming said license plate attachable to a vehicle.

5,149,572

DISPOSABLE, ROLLUP TEMPORARY FLOOR MAT

Joseph W. Gaggero, Lawrence, and Michael W. Sullivan, Topeka, both of Kans., assignors to The Lawrence Paper Company, Lawrence, Kans.

Filed Feb. 8, 1991, Ser. No. 653,654
Int. Cl.[5] B65D *65/28*
U.S. Cl. 428—43 **7 Claims**

1. A disposable, temporary floor mat for collecting dirt and covering the floor of a motor vehicle, said floor mat consisting essentially of:

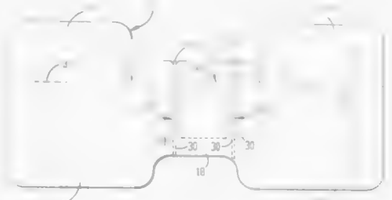
a first, lowermost layer formed of corrugated paper having opposed upper and lower surfaces and presenting a plurality of elongated, juxtaposed, alternating, downwardly and upwardly peaked corrugations,

the lower surface of said first layer being nonplanar and presenting a plurality of spaced, floor-engaging corrugation peaks and being adapted for directly and conformably contacting said motor vehicle floor with said corrugations inhibiting shifting of the floor mat; and

a second, uppermost, panel layer formed of paper having opposed upper and lower surfaces and with the lower surface thereof permanently adhered to the upwardly peaked corrugations of said first layer,

the upper surface of said second layer presenting a planar wear and dirt-collecting surface for said floor mat,

at least one of said first and second layers being essentially



imperforate for preventing significant passage of dirt and the like through the floor mat,

said first and second layers cooperatively presenting a pair of spaced apart main sections respectively adapted to underlie the feet of the driver and a passenger riding in said vehicle, and an intermediate section extending between and interconnecting said main sections,

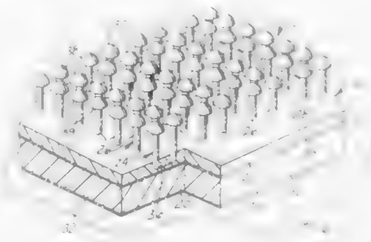
said floor mat being operable for resting upon and conforming with the driver's side and passenger's side floor sections of said vehicle, and the intermediate section therebetween, and for roll-up of the floor mat in a direction for enclosing said second panel layer within said first corrugated layer whereby dirt collected on said dirt-collecting surface remains within the rolled-up floor mat for easy disposal.

5,149,573

HIGHLY TRANSPARENT STRIP MATERIAL USED FOR FORMING FASTENERS

James J. Kobe, and Susan K. Nestegard, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 1, 1990, Ser. No. 531,869
Int. Cl.[5] A44B *17/00*, *18/00*; **B32B** *3/06*
U.S. Cl. 428—93 **6 Claims**



1. A strip material from which a portion may be severed and used as a portion of a fastener, said strip material comprising a polymeric bonding layer; a multiplicity of flexible, resilient, generally U-shaped monofilaments, each monofilament including a central elongate bight portion embedded in the bonding layer, two stem portions extending from the opposite ends of

said bight portion and projecting generally normal to an exposed major surface of the bonding layer, and enlarged heads at the ends of said stem portions opposite said bight portion, a layer of viscoelastic material having a thickness in the range of about 0.052 to 0.152 centimeter adhered to the surface of the bonding layer opposite said exposed major surface and having an attachment surface opposite said bonding layer, and pressure sensitive adhesive means along said attachment surface for adhering the strip material to a substrate, and the combination of said bonding layer, said monofilaments, said layer of viscoelastic material and said pressure sensitive adhesive means being highly transparent when viewed from an angle at which the exposed major surface of the bonding layer can be seen after the strip material is adhered to a substrate by said pressure sensitive adhesive means so that the color of the substrate will be fairly clearly seen through the strip material after it is adhered to a substrate.

5,149,574

LAMINATES OF IMPROVED EDGE STABILITY

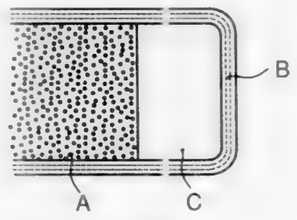
Bernd Gross, Grossniedesheim; Heinz Weber, Gruenstadt, and Georg Schuon, Laupheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 9, 1991, Ser. No. 639,096

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002067

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—116 **6 Claims**



1. A laminate of improved edge stability formed from

A. a foam or honeycomb core layer from 30 to 150 $kg.m^{-3}$ in density composed of a heat resistant thermoplastic or thermoset material,

B. at least one cover layer composed of a fiber reinforced unfoamed heat resistant thermoplastic or thermoset material,

wherein at least one edge of the core layer is joined to foam strip C from 200 to 1000 $kg.m^{-3}$ in density composed of a heat resistant thermoplastic material.

5,149,575

CORNER EDGE BUMPERS

Martin T. Soifer, 7208 Montrico Dr., Boca Raton, Fla. 33433

Filed Oct. 17, 1990, Ser. No. 599,314

Int. Cl.[5] A47B *95/00*

U.S. Cl. 428—188 **13 Claims**

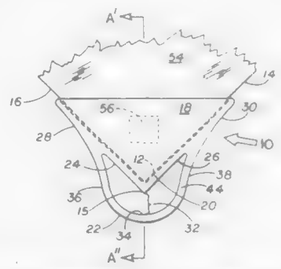
1. A bumper for covering an edge formed at the junction of structure sidewalls comprising:

a corner edge cover for engaging said structure sidewalls and edge, said cover having cover wall segments connected at adjacent ends to define a cover junction;

a resilient central arcuate shield wall segment spaced outwardly from said corner edge cover;

a plurality of resilient shield wall legs, each shield wall leg connecting tangentially to an opposite side of said arcuate shield wall segment and extending to connect to one of said cover wall segments, said arcuate shield wall segment and said shield wall legs integrally connected to form a shield wall extending away from the cover wall segments in a first direction; and

a top plate integrally connected to top edges of said cover wall segments and extending away from and between said



cover wall segments in a second direction, opposite said first direction, whereby said top plate restricts the separation of said cover wall segments from said structure sidewalls during impact of an object with said shield wall.

5,149,576

MULTILAYER NONWOVEN LAMINIFEROUS STRUCTURE

David C. Potts, Dunwoody; George A. Young, Atlanta; Dennis S. Everhart, Alpharetta; J. Gavin MacDonald, Decatur, and Ronald S. Nohr, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 26, 1990, Ser. No. 618,354

Int. Cl.[5] B32B *5/24, 31/20, 33/00;* **D04H** *3/14, 3/16*

U.S. Cl. 428—198 **21 Claims**

1. A nonwoven laminiferous structure having at least two melt-extended nonwoven layers which comprises:

(A) a first layer which comprises at least a portion of a first nonwoven web; and

(B) a second layer adjacent to said first layer which comprises at least a portion of a second nonwoven web; in which,

(1) the boundary between any two adjacent melt-extruded nonwoven layers is distinct in that fibers at or near the surfaces of such adjacent layers are not significantly intermingled;

(2) the fibers of at least one of said first and second layers are prepared by melt extrusion through a die at a shear rate of from about 50 to about 30,000 sec^{-1} and a throughput of no more than about 5.4 kg/cm/hour of a mixture of an additive and a thermoplastic polymer, which additive (a) is present at a level of from about 0.05 to about 15 percent by weight, based on the amount of thermoplastic polymer, and (b) imparts to the surfaces of said fibers, as a consequence of the preferential migration of said additive to the surfaces of said fibers as they are formed, at least one characteristic which is different from the surface characteristics of fibers prepared from said thermoplastic polymer alone, said preferential migration taking place spontaneously upon the formation of said fibers without the need for a post-formation treatment of any kind;

(3) the additive present in any melt-extruded nonwoven layer does not migrate to an adjacent layer to a significant degree in use, so that the surface characteristics of each layer remain substantially as originally prepared;

(4) said thermoplastic polymer is selected from the group consisting of polyolefins, polyesters, polyetheresters, and polyamides; and

(5) said laminiferous structure has been pattern bonded by the application of heat and pressure.

5,149,577

DUAL PURPOSE STENCIL-FORMING SHEET CONTAINING A RED PIGMENT

Wei-Min Chang, Carmel, Ind., and Bror Anderson, Yonkers, N.Y., assignors to Mallace Industries Corporation, Evanston, Ill.

Filed Jan. 7, 1991, Ser. No. 638,099

Int. Cl.[5] B32B *3/00, 21/06, 27/00;* **B05C** *17/06*

U.S. Cl. 428—207 **13 Claims**

1. A dual purpose stencil-forming sheet consisting essentially of a porous, ink-pervious, fibrous tissue, base sheet and an ink-impervious, red impregnant therethrough, said impregnant comprising a red pigment, a film-forming material, and an organic solvent-soluble resin having a softening point in excess of 160° C., the red pigment imparting a red color to said stencil-forming sheet and constituting means for enabling said stencil-forming sheet to receive readily visible black-on-red markings from a black-inked ribbon and to apply readily visible red-on-white or red-on-pastel markings by applying some of the red pigment to a backing sheet which is white or pastel in color, and which is in direct contact with said impregnant, as the ribbon is struck by keys or pins.

5,149,578

MULTILAYER FILM FOR TAMPER INDICATION BY USE OF OPTICAL INTERFERENCE REFLECTION

John A. Wheatley, and Walter J. Schrenk, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 456,922, Dec. 26, 1989, abandoned. This application Dec. 23, 1991, Ser. No. 814,237

The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.

Int. Cl.[5] B65D *101/00;* **G02B** *1/10;* **B32B** *7/00*

U.S. Cl. 428—213 **17 Claims**

1. A multilayer optical interference film comprised of contiguous layers of two or more diverse thermoplastic materials of differing refractive indices whereby the film retains a permanent visual color change as evidence of tampering or an attempt at tampering when the yield point of at least one of the diverse materials has been at least equalled by the strain associated with such tampering or with such an attempt at tampering, and where before such yield point is at least equalled the wavelength of an unsuppressed reflectance of normally incident light is not within the visible spectrum while after such yield point is at least equalled the reflectance is retained in the visible spectrum to provide a permanent visual color change.

5,149,579

POLYPROPYLENE FOAM SHEETS

John J. Park, Neenah, Wis.; Leon Katz, Stamford, Conn., and Norman G. Gaylord, New Providence, N.J., assignors to James River Corporation of Virginia, Richmond, Va.

Division of Ser. No. 493,541, Mar. 14, 1990. This application Dec. 11, 1991, Ser. No. 804,701

Int. Cl.[5] C08J *9/08, 9/14*

U.S. Cl. 428—213 **8 Claims**

1. A multilayered foam sheet useful for forming rigid or semi-rigid articles for packaging applications, comprising at least one layer of a polypropylene foam sheet formed of a polypropylene characterized by at least

(a) either z-average molecular weight M_z of at least 1.0×10^6 or a ratio of the z-average molecular weight M_z to weight average molecular weight M_w M_z/M_w of at least 3.0, and

(b) either equilibrium compliance J_{eo} of at least 12×10^{-5} cm^2/dyne or recoverable shear strain per unit stress Sr/S of at least 5×10^{-5} cm^2/dyne at 1 sec^{-1} and at least one functional polymeric layer.

5,149,580

VINYLIDENE CYANIDE-VINYL BENZOATE DERIVATIVE NONLINEAR OPTICAL POLYMERS

Manabu Kishimoto; Iwao Seo; Atsushi Oda; Yukiko Ohashi, and Dechun Zou, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

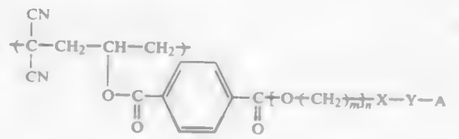
Filed Aug. 19, 1991, Ser. No. 747,029

Claims priority, application Japan, Sep. 28, 1990, 2-257416

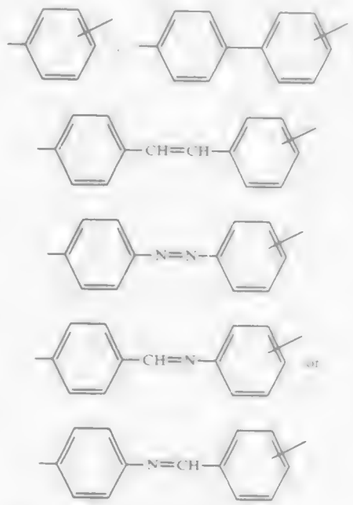
Int. Cl.[5] C08F *222/34*

U.S. Cl. 428—220 **9 Claims**

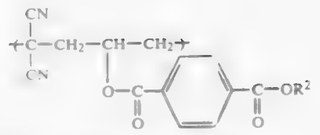
1. An organic nonlinear optical material which comprises a polymer having the following constitutional units, in amounts of 5 to 100 mole % of (I), 0 to 50 mole % of (II) and 0 to 50 mole % of (III), and a weight average molecular weight (Mw) of the polymer being 10,000 to 2,000,000:



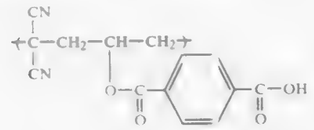
wherein m represents an integer of 1 to 10, n represents 0 or 1, X represents $—NR^1—$ or —O—, R^1 represents hydrogen, methyl or ethyl, Y represents



A represents $—NO_2$, —CN, $—CF_3$ or $—SO_2—C_lH_{2l+1}$ and *l* represents an integer of 1 to 100.



wherein R^2 represents an alkyl group, and



5,149,581

POLYETHER COPOLYMERS, RESIN COMPOSITIONS CONTAINING THEM, AND MOLDED ARTICLES FORMED FROM THEM

Shigeru Matsuo; Shigeru Murakami; Shinji Chino; Hiroyuki Higuchi, and Mikiya Hayashi, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

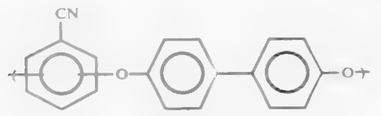
Filed Nov. 13, 1990, Ser. No. 612,609

Claims priority, application Japan, Nov. 21, 1989, 1-302753; Dec. 11, 1989, 1-321008; Dec. 21, 1989, 1-329467; Dec. 28, 1989, 1-338095; Jan. 8, 1990, 2-000447

Int. Cl.[5] B32B *27/00*; C08G *65/40*

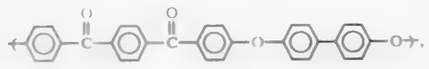
U.S. Cl. 428—224 47 Claims

1. A polyether copolymer, comprising: the repeating units represented by the following general formula (I)



(I)

and the repeating units represented by the following formula (II)



(II)

the molar ratio of the repeating units represented by the formula (I) based on the total of the repeating units represented by the formula (I) and the repeating units represented by the formula (II) being from 0.1 to 0.8, and the polyether copolymer having a melt viscosity (the viscosity under no shearing stress) of at least 500 poise as measured at 400° C.

5,149,582

TAILORABLE, FLAME BARRIER, PUNCTURE-RESISTANT FABRIC SHEET MATERIAL AND METHOD OF MANUFACTURING SAME

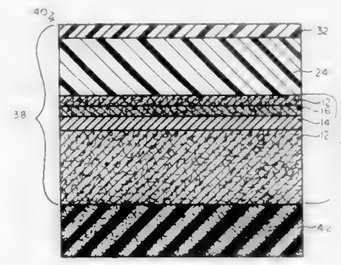
Louis J. LaMarca, II, Westminster, Mass., and James F. Hayes, Sr., Mason, N.H., assignors to The Haartz Corporation, Acton, Mass.

Continuation-in-part of Ser. No. 628,404, Dec. 17, 1990, Pat. No. 5,100,724, which is a continuation of Ser. No. 411,052, Sep. 22, 1989, Pat. No. 4,980,228. This application Jan. 23, 1992, Ser. No. 824,547

The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.[5] B32B *5/02*

U.S. Cl. 428—234 42 Claims



1. A tailorable, flame barrier, puncture-resistant composite fabric sheet material for use as a surface covering and which fabric sheet material comprises:

a) a non-woven, flame-resistant, fibrous sheet material;

b) a metal foil sheet material to impart heat sink and flame barrier properties to the composite fabric sheet material;

c) a stretchable, fibrous, tailorable, wrinkle recovery and puncture-resistant sheet material to impart properties to the composite fabric sheet material;

d) the non-woven fibers of the fibrous sheet material needle punched and mechanically extending through both the stretchable fibrous sheet material and the metal foil sheet material to form a back layer of non-woven fibers on one surface and to form a top layer of said non-woven fibers on the opposite surface, the metal foil sheet material after being needle punched in fragmented pieces within the non-woven sheet material;

e) a top layer of a thermoplastic polymer bonded to the top non-woven, fibrous sheet material on the one surface; and

f) optionally an abrasion-resistant top coating layer on the thermoplastic polymer layer, the composite fabric sheet material meeting the requirements of Federal Test Method 5903 and the SBSU Fire Block Test.

5,149,583

ORIENTED THREAD STRUCTURE AND A METHOD FOR MANUFACTURING SAME

Jukka Saarikettu, Kustaa Adolfinkatu 78, SF-67200 Kokkola, Finland

PCT No. PCT/FI89/00020, § 371 Date Jul. 31, 1990, § 102(e) Date Jul. 31, 1990, PCT Pub. No. WO89/07673, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 9, 1989, Ser. No. 548,982

Claims priority, application Finland, Feb. 9, 1988, 880571

Int. Cl.[5] B32B *7/00*

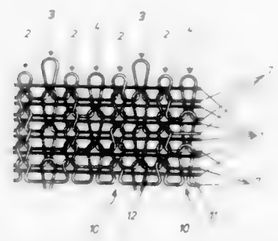
U.S. Cl. 428—253 12 Claims

1. A method for the manufacture of an oriented thread structure to be laminated, in which reinforcing threads (1) are bound to form an oriented fiber mat or corresponding knitted element, by which the threads (1) are laminated inside resin or other binder and thus a strong shell structure is formed, characterized in that the knitting is carried out on a so-called double circular knitting machine to form a weft-knitted mat in

such a way that the knitting includes the following sequential and continually repeating stages in manufacture.

(a) making a first loop (2) by a first set of needles,

(b) orienting at least one reinforcing thread (1) to be included in the knitted fabric on top of the above-mentioned first loop, and



(c) putting a second loop (3,4) by a second set of needles on top of the oriented reinforcing thread and attached to the above-mentioned first loop,

in which case the oriented reinforcing thread (1) runs with the support of the loops (2,3,4) and straight between the courses in the channel formed by them.

5,149,584

CARBON FIBER STRUCTURES HAVING IMPROVED INTERLAMINAR PROPERTIES

R. Terry K. Baker, and Nelly M. Rodriguez, both of 86 Lee Rd. - 827, Opelika, Ala. 36801

Filed Oct. 23, 1990, Ser. No. 602,182

Int. Cl.[5] B32B *5/06*

U.S. Cl. 428—297 6 Claims

1. A high performance composite material comprised of: (a) a carbon fiber structure comprised of a primary structure of carbon fibers having grown therefrom, carbon filaments, which structure is characterized as: (i) having a crystallinity greater than about 75%; and (ii) having substantially all of the filaments in a form selected from branched, spiral, helical, or a combination thereof; and (b) a matrix material selected from plastics and carbon.

5,149,585

MAGNETIC RECORDING MEDIUM

Narito Goto; Katsuyuki Takeda; Kunitsuna Sasaki, and Nobuyuki Sekiguchi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 726,571

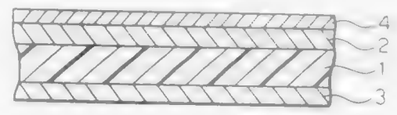
Claims priority, application Japan, Jul. 13, 1990, 2-186461

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—323 16 Claims

1. A magnetic recording medium comprising a support having an uppermost magnetic layer and at least one lower layer, said lower layer being between said support and said uppermost layer, said uppermost magnetic layer comprising a binder and a hexagonal magnetic powder and having a layer thickness of 0.1 to 1.0 μm,

at least one said lower magnetic layer comprising a polyvinyl chloride resin having an anionic functional group, a polyurethane resin having either a sulfonic group or a carboxyl group, and a cobalt-containing ferromagnetic iron oxide powder, said at least one lower magnetic layer



having a coercive force of 500 to 1200 Oe, said uppermost layer and said lower layer being formed on said support by wet-on-wet, substantially simultaneous multilayer coating.

5,149,586

RADIATION-CURABLE ADHESIVE TAPE

Shinichi Ishiwata, Hiratsuka; Michio Ueyama, Kanagawa; Hiroyuki Nakae, Kawasaki; Yoshiyuki Funayama, Yokohama; Kazushige Iwamoto, Hiratsuka, and Isamu Noguchi, Tokyo, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 216,269, Jul. 7, 1988, Pat. No. 4,999,242. This application Dec. 21, 1990, Ser. No. 631,902

Claims priority, application Japan, Jul. 8, 1987, 62-168515; Mar. 31, 1988, 63-76185; Mar. 31, 1988, 63-76186; Apr. 1, 1988, 63-78201; Apr. 1, 1988, 63-78202

Int. Cl.[5] C09J *7/02*

U.S. Cl. 428—345 10 Claims

1. A radiation-curable adhesive tap which comprises a multilayer radiation-transmitting substrate comprising at least three radiation-transmitting resin layers with a soft poly(vinyl chloride) used as an intermediate layer; the substrate having a radiation-curable adhesive layer formed thereon which comprises:

100 parts by weight of an acrylic adhesive;

5 to 500 parts by weight of at least one isocyanurate compound selected from the group consisting of:

tris (acryloxyethyl) isocyanurate,

tris (methacryloxyethyl) isocyanurate,

tris-4-(acryloxy-n-butylisocyanurate,

tris (1,3-diacryloxy-2-propyloxycarbonylamino-n-hexyl) isocyanurate,

tris (1-acryloxy-3-methacryloxy-2-propyloxycarbonylamino-n-hexyl) isocyanurate, and

bis (2-acryloxyethyl-2-(5-acryloxy)hexyloxyethyl isocyanurate; and

0.5 to 100 parts by weight of a urethane acrylate compound having carbon-carbon double bonds, per 100 parts by weight of the acrylic adhesive.

5,149,587

RESEALABLE OUTSERT LABEL

Marilyn Hill, Marietta, and Byron L. Baker, York, both of Pa., assignors to Uarco Incorporated, Barrington, Ill.

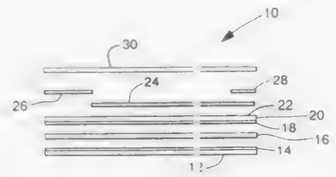
Filed Oct. 21, 1991, Ser. No. 779,962

Int. Cl.[5] B32B *7/12*; G09F *3/00*

U.S. Cl. 428—354 5 Claims

1. An improved resealable outsert label structure comprising in combination, a carrier liner backing having applied to the upper side surface thereof an adhesive release medium, a base layer having applied to the immediate underside surface thereof a pressure sensitive adhesive bonding medium in turn bonding thereto a pressure sensitive adhesive layer to detachably assemble said base layer to said adhesive release medium upon said carrier liner backing, a base layer upper surface having applied thereto a release-reseal coating strip inward from a cover hinge end thereof uniformily thereacross to a reseal tab end thereof, a cover panel hinge adhesive applied from the cover hinge end of said base layer upper surface

inward therefrom in planar abuttable coincidence with aid release-reseal coating strip, a reseal tab adhesive strip applied upon aid release-reseal coating strip beginning more than halfway inward thereacross from the cover hinge interior begin-



ning end thereof to the reseal tab end thereof, and a cover panel bondably adhered top the base layer upper surface at one end thereof by the cover panel hinge adhesive and releasably adhered to the base layer upper surface at the other end thereof by said reseal tab adhesive strip.

5,149,588

FITTING PAD FOR SKI BOOTS

Toshiharu Fukushima, and Takashi Okada, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Sep. 5, 1989, Ser. No. 402,781

Claims priority, application Japan, Sep. 7, 1988, 63-224274; Sep. 7, 1988, 63-224275

Int. Cl.[5] **B32B** *9/04*

U.S. Cl. 428—411.1 **14 Claims**

1. A ski boots fitting pad comprising a copolymer including a first polymer unit selected from the group consisting of acrylic monomer units and vinyl acetate monomer units, and a second polymer unit comprising ethylene, wherein said first polymer unit comprises at least about 20 percent by weight of said copolymer, said copolymer having a number average molecular weight of less than about 30,000, a melt flow rate of at least 300 gram/10 min., and a melt thermal energy not greater than about 50 cal/gram in a temperature range from about 25° C. to the melt termination temperature of said copolymer.

5,149,589

THERMOPLASTIC ELASTOMER COMPOSITION OF EXCELLENT FUSION BOND PROPERTY

Masanori Naritomi, Urayasu, and Noritaka Ogawa, Tokyo, both of Japan, assignors to Taisei Purasu Co., Ltd., Japan

Filed Sep. 6, 1990, Ser. No. 578,337

Claims priority, application Japan, Sep. 13, 1989, 1-235620

Int. Cl.[5] **B32B** *7/28, 27/36*

U.S. Cl. 428—412 **6 Claims**

1. A thermoplastic elastomer composition which is fusion bonded to a molded piece that is formed from a rigid synthetic resin material to form a composite molded product, wherein said thermoplastic elastomer composition comprises;

(1) 100 parts by weight of a thermoplastic elastomer selected from the group consisting of a hydrogenated SBS block copolymer, olefin elastomer, diene elastomer, and urethane elastomer, and

(2) 25 to 185 parts by weight of a thermoplastic polyester elastomer, said thermoplastic polyester elastomer being a polyether-ester copolymer which has a polyester segment that is prepared from an aromatic dicarboxylic acid and a short-chain glycol and a polyether segment that is prepared from an aromatic dicarboxylic acid and a polyalkylene glycol.

5,149,590

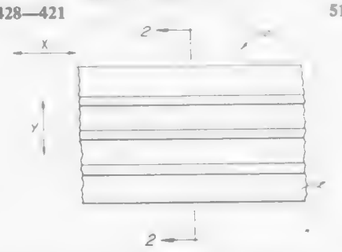
ELECTRICAL SUBSTRATE MATERIAL

David Arthur, Norwood, and Gwo S. Swei, Northboro, both of Mass., assignors to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 15,191, Feb. 17, 1987, Pat. No. 4,849,294. This application Dec. 2, 1988, Ser. No. 279,474

Int. Cl.[5] **B32B** *15/08*

U.S. Cl. 428—421 **51 Claims**



1. An electrical substrate material comprising:

fluoropolymeric material;

ceramic filler material, said filler material being in an amount of at least about 55 weight percent of the total substrate material;

said ceramic filler being coated with a fluorinated silane coating or a coating containing a mixture of a fluorinated silane and a non-fluorinated silane; and

at least one layer of metal conductive material being disposed on at least a portion of said electrical substrate material.

5,149,591

BLENDS OF POLYVINYL ALCOHOL AND POLYURETHANE WATER DISPERSIONS FOR INCREASED HUMIDITY RESISTANCE OF WATER SOLUBLE WHITE SIDEWALL PAINTS

George P. Patitsas, Kent, and Bharat K. Kansupada, Mogadore, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1991, Ser. No. 676,495

Int. Cl.[5] **B32B** *27/00, 27/40, 25/04;* **C08J** *3/02*

U.S. Cl. 428—423.1 **11 Claims**

1. A humidity resistant rubber laminate, comprising:

a rubber substrate; and

a coating composition blend comprising;

polyvinyl alcohol, a plasticizer that effectively plasticizes polyvinyl alcohol, and an effective amount of a water dispersible polyurethane to provide increased humidity resistance to said coating composition, wherein said effective amount of polyurethane is from about 2 to less than 20 parts by weight per 100 parts by weight of said polyvinyl alcohol.

5,149,592

ULTRAVIOLET RADIATION CURABLE CLEARCOAT

Mitchell F. Wojnarowicz, Chicago, Ill., assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 521,245, May 9, 1990, abandoned. This application Feb. 4, 1991, Ser. No. 650,579

Int. Cl.[5] **B32B** *27/30, 27/16*

U.S. Cl. 428—447 **13 Claims**

1. A flexible glossy, cured, coating adherent to a flexible substrate said adherent cured coating comprising a polymer

component containing, based on the weight of the polymer component from about 40 to about 80 percent by weight total of at least one aliphatic urethane diacrylate having an average molecular weight of about 1000 to about 3000 and a viscosity of about 1000 to about 15,000 centipoise at about 150° to 160° F. and from about 60 to about 20 percent by weight of a monofunctional urethane acrylate and containing, based on the weight of the cured coating, from 0.5 to about 6 percent by weight of an organosilicone component which comprises a reactive silicon polyacrylate.

5,149,593

Patent Not Issued For This Number

5,149,594

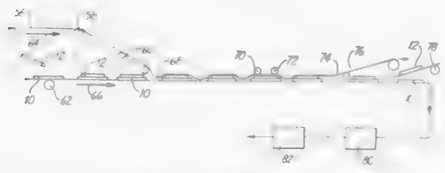
METHOD FOR CUTTING AND POSITIONING DOUGH IN A PAN

Daniel J. Lewandowski; James R. Evans, both of Burnsville, and Randall D. Jessup, Vadnais Heights, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 521,134, May 9, 1990, abandoned. This application Jan. 31, 1992, Ser. No. 830,544

Int. Cl.[5] **A21D** *10/02*

U.S. Cl. 426—503 **15 Claims**



1. A method of cutting a moving sheet of dough and positioning the cut dough in a moving pan without the aid of a diaphragm, the pan having at least one dough receiving surface, the method comprising:

providing at least one moving pan;

positioning a continuous cutting ring having at least one cutting edge above the dough receiving surface, the cutting ring being stationary in relation to the pan;

placing the moving sheet of dough over at least one dough receiving surface; and

cutting the dough with the cutting edge of the continuous cutting ring, such that the dough positioned within each cutting edge forms a cut dough portion which is delivered to and conforms to a shape of the dough receiving surface by means of gravity and without the aid of a diaphragm.

5,149,595

CERMET ALLOY AND PROCESS FOR ITS PRODUCTION

Katsuhiko Kojo; Akibumi Negishi, both of Saitama, and Hisaaki Ida, Chiba, all of Japan, assignors to Hitachi Metals Ltd. and Hitachi Tool Engineering Ltd., both of Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 757,752

Claims priority, application Japan, Sep. 12, 1990, 2-241519; Jun. 3, 1991, 3-159967

Int. Cl.[5] **B22F** *3/00*

U.S. Cl. 428—552 **26 Claims**

1. A cermet alloy having a structure comprising a hard phase and a bonding phase, said hard phase comprising (1) at least one of MC MCN, wherein M is at least one element selected

Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, and W and (2) at least one W-Co-B compound; said bonding phase comprising Co.

5,149,596

VAPOR DEPOSITION OF THIN FILMS

David C. Smith; Stevan G. Pattillo; Joseph R. Laia, Jr., and Alfred P. Sattelberger, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 5, 1990, Ser. No. 593,839

Int. Cl.[5] **C23C** *16/18, 16/44;* **B32B** *15/00*

U.S. Cl. 428—656 **24 Claims**

1. A nanocrystalline film comprised of a substantially carbon-free metal selected from the group consisting of rhodium, iridium, molybdenum, tungsten, rhenium, platinum, or palladium, said film having a metal content of at least 97% by weight, said film having a thickness of from about 10 nanometers to about 250 nanometers, and said film having a crystalline structure therein with a metallic grain size of from about 2 to about 40 nanometers, said film further characterized as having a substantially narrow distribution of crystal grain sizes within said film.

5,149,597

WEAR RESISTANT COATING FOR METALLIC SURFACES

Kenneth H. Holko, 7384 Trade St., San Diego, Calif. 92121-2422

Continuation-in-part of Ser. No. 308,608, Feb. 10, 1989, abandoned. This application Jan. 5, 1990, Ser. No. 704,741

Int. Cl.[5] **B32B** *15/00;* **C22C** *19/05*

U.S. Cl. 428—680 **5 Claims**

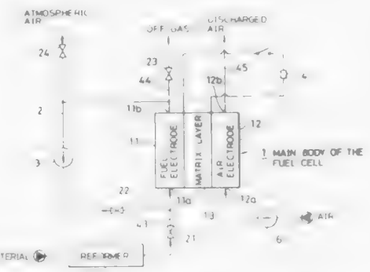
1. In a substrate having at least one surface thereon slidably engageable with guide means therefor, the improvement comprising a hard and lubricious coating, said coating comprising a nickel based alloy including, by weight at least 1% Phosphorus, 1% Chromium and 0.1% Boron, said nickel based alloy comprising first and second alloys mixed together and coated on said substrate, said first alloy including, by weight, approxi-

mately 14% Chromium, 0.1% Silicon, 0.2% Iron, 10% Phosphorus and the balance Nickel, and said second alloy including, by weight, approximately 3.5% Silicon, 1.5% Iron, 1.9% Boron and the balance Nickel.

5,149,598
BATTERY ARRANGEMENT
Morton Sunshine, Ft. Lauderdale, Fla., assignor to ACR Electronics, Inc., Ft. Lauderdale, Fla.
Filed Jul. 11, 1991, Ser. No. 728,225
Int. Cl.[5] H01M 2/00
U.S. Cl. 429—1 20 Claims

1. A system for supplying electrical power to a battery powered device which is submersible in an ambient fluid, the system being of the type wherein there is provided at least one battery element having first and second electrical terminals, the system comprising:
- a battery supply for containing the battery element, the battery supply being provided with;
  - a substantially tubular support member for supporting the battery element therewithin;
  - first and second battery supply terminals arranged substantially on respective ones of first and second ends of said substantially tubular support member;
  - first seal means formed of a resilient material arranged to overlie and render inaccessible to said ambient fluid said first battery supply terminal; and
  - second seal means arranged in the vicinity of said second end of said substantially tubular support member for preventing entry of the ambient fluid into said substantially tubular support member, said second battery supply terminal being electrically exposed;
- a housing for the battery-operated device, said housing having an aperture therethrough for accommodating said battery supply;
- contact means for piercing said first seal means and communicating electrically with said first battery supply terminal;
- closure means for sealingly closing said aperture through said housing; and
- resilient biasing means for urging said battery supply into communication with said contact means.

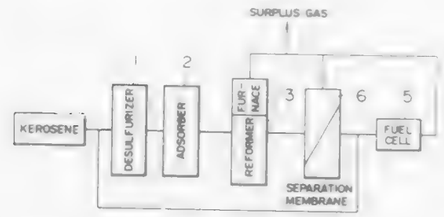
5,149,599
METHOD OF STOPPING THE OPERATION OF PHOSPHORIC ACID TYPE FUEL CELL
Tomoyoshi Kamoshita, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Sep. 19, 1990, Ser. No. 584,770
Claims priority, application Japan, Sep. 20, 1989, 1-243685
Int. Cl.[5] H01M 8/04
U.S. Cl. 429—13 6 Claims



1. A method of stopping the operation of a phosphoric acid fuel cell having a matrix type main body including a fuel electrode and an air electrode and containing phosphoric acid as an electrolyte, a fuel gas containing a combustible component, a fuel gas circulation line for circulating the fuel gas and including the fuel electrode, a closable air inlet connected to the fuel gas circulation line for taking up air, a closable fuel gas supply and discharge line for supplying the fuel gas to the fuel electrode and discharging the fuel gas from the fuel electrode, and a reaction air supply and discharge line for supplying reaction air to the air electrode, said method comprising the steps of:
- interrupting a load of said fuel cell;
- supplying air from said air inlet while circulating gas in said fuel electrode to said fuel gas circulation line;
- decreasing a concentration of the electrolyte with water resulting from an electrode catalyst reaction occurring in said main body of said fuel cell;
- closing said fuel gas circulation line on its discharge side to consume said combustible component in said gas circulating in said fuel circulation line due to said electrode catalyst reaction; and
- decreasing the concentration of said combustible component in said fuel electrode and decreasing further the concentration of said electrolyte to predetermined respective levels.

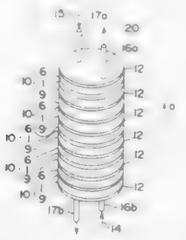
5,149,600
FUEL CELL ELECTRICITY GENERATION PROCESS
Osamu Yamase; Sumio Yoshizawa, and Tadayuki Miura, all of Tokyo, Japan, assignors to Petroleum Energy Center and Showa Shell Sekiyu Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1990, Ser. No. 634,590
Claims priority, application Japan, Dec. 27, 1989, 1-336486
Int. Cl.[5] H01M 8/06
U.S. Cl. 429—17 8 Claims

1. An improved fuel cell electricity generation process comprising:
- providing an apparatus which includes a desulfurizer, an adsorber, a reformer, a non-porous gas separation membrane comprising a polymer, and a fuel cell;
- using said separation membrane to treat reformed gas from the reformer at a temperature of 50°–150° C. and under a pressure of 2–10 kg/cm^2 to separate carbon monoxide contained in the reformed gas; and



feeding gas which permeats through the separation membrane to said fuel cell.

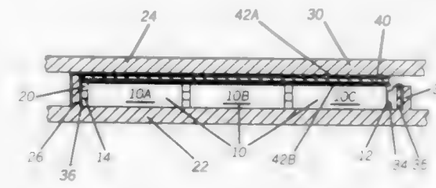
5,149,601
SOLID OXIDE FUEL CELL
Akira Shiratori, Nagaokakyo; Shozo Kobayashi, Takatsuki; Hiroshi Takagi, Otsu, and Yukio Sakabe, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Jun. 5, 1991, Ser. No. 710,444
Claims priority, application Japan, Jun. 6, 1990, 2-149644
Int. Cl.[5] H01M 8/10
U.S. Cl. 429—30 20 Claims



1. A solid oxide fuel cell including a plurality of cells, each of the cells comprising:
- a solid electrolyte having a fuel side electrode and an air side electrode on upper and lower side thereof, respectively; and
- a fuel side conductive distributor connected with the fuel side electrode and an air side conductive distributor connected with the air side electrode of the solid electrolyte, the conductive distributors comprising porous material capable of distributing air and fuel gas evenly to the air side electrode and the fuel side electrode, respectively;
- wherein the solid electrolyte and the distributors are arranged one upon another and the cells are connected via interconnectors to form a laminate structure.

5,149,602
SELF-CORRECTING CELL LOCATING COMPRESSIVE PAD
Niko M. Savovic, Sunrise, and Adnan Aksoy, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 20, 1991, Ser. No. 718,124
Int. Cl.[5] H01M 2/10
U.S. Cl. 429—96 9 Claims

1. A battery housing assembly for receiving an energy source, comprising:
- a chamber for receiving said energy source; and
- retaining means having opposed sides adhesively attached in between said chamber and said energy source for applying



a force in a direction substantially opposite to an energy source displacement parallel to said retaining means.

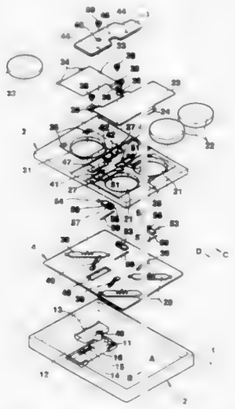
5,149,603
BATTERY PACK FOR MEDICAL INSTRUMENTS
Thomas W. Fleming, Van Nuys; Lanny A. Gorton, Sunland, and Paul S. Cheney, II, Canyon Country, all of Calif., assignors to Pacesetter Infusion, Lts., Sylmar, Calif.
Filed Dec. 27, 1990, Ser. No. 636,042
Int. Cl.[5] H01M 2/10
U.S. Cl. 429—98 27 Claims

1. A battery pack for battery powered operation of an electronic medical instrument, said battery pack comprising:
- a base plate;
- at least one battery mounted on said base plate;
- a foil shield mounted onto said base plate in a position covering said at least one battery;
- a housing cap;
- means for mounting said housing cap onto said base plate, said housing cap cooperating with said base plate to enclose said at least one battery and said foil shield and to prevent access to said at least one battery without at least partial destruction of one of said housing cap and base plate; and
- conductor means for connecting said at least one battery to the medical instrument.

5,149,604
BATTERY ACCOMMODATING STRUCTURE
Hiroaki Nakanishi, Tokyo, Japan, assignor to Casio Computer Co. Ltd., Japan
Filed Feb. 14, 1991, Ser. No. 655,680
Claims priority, application Japan, Feb. 20, 1990, 2-37232
Int. Cl.[5] H01M 2/10
U.S. Cl. 429—97 7 Claims

1. A battery accommodating structure comprising:
- a casing;
- first and second recess means formed of recesses in the casing, for accommodating respective batteries therein;
- first and second plate members detachably attached to the casing to prevent the batteries from being removed from the first and second battery accommodating recess means; and
- release means movable between a first position where the first plate member can be detached from the casing, a

second position where the second plate member can be detached from the casing, and a third position where



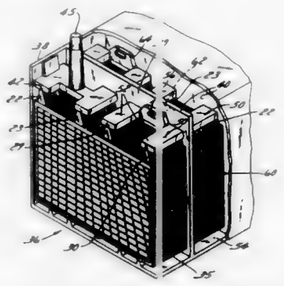
neither of said first and second plate members can be detached from the casing.

5,149,605

DUAL LUG BATTERY PLATE CONSTRUCTION

Thomas J. Dougherty, Waukesha, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Sep. 17, 1991, Ser. No. 760,930
Int. Cl.[5] H01M *2/24*
U.S. Cl. 429—160 9 Claims



1. A battery apparatus including at least two battery plate stacks separated by a wall comprising:

a plurality of plates in each stack, at least some of the plates including spaced apart, generally coplanar collector lugs, the collector lugs forming parallel rows of lugs;

elongate collector straps electrically coupling the lugs in each row and a weld element electrically coupling the straps; and

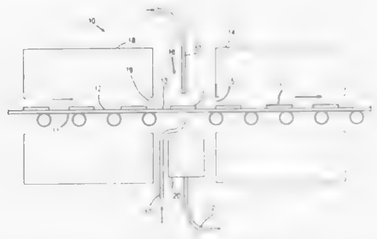
a weld element of each stack being electrically coupled to a weld element of an adjacent stack through said wall.

5,149,606

METHOD OF TREATING A BATTERY ELECTRODE WITH PERSULFATE

Norma K. Bullock, Pewaukee, and Ralph A. Petersen, West Allis, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 12, 1991, Ser. No. 667,878
Int. Cl.[5] H01M *10/04*
U.S. Cl. 429—228 21 Claims



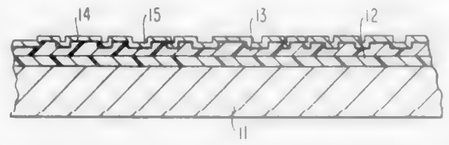
1. In a method for converting lead monoxide to lead dioxide an uncured positive electrode for use in a lead-acid battery, which electrode includes a conductive support and a positive lead-acid battery paste, including the step of reacting lead monoxide in the past of the electrode with an alkaline solution of a persulfate salt under conditions effective to form lead dioxide in said paste, the improvement wherein the persulfate solution further contains a stabilizing agent in an amount effective to stabilize lead sulfates of the paste in the alkaline persulfate solution.

5,149,607

MATRIX

Matinus J. M. De Graaf, and Herman C. Meinders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 474,319, Jan. 29, 1990, abandoned, which is a continuation of Ser. No. 827,576, Feb. 10, 1986, abandoned. This application Oct. 12, 1990, Ser. No. 597,961
Claims priority, application Netherlands, Nov. 25, 1985, 8503234
Int. Cl.[5] B29D *17/00*
U.S. Cl. 430—17 5 Claims



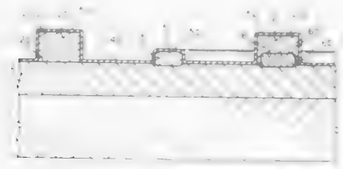
1. A matrix suitable for use in an injection molding process or a compression molding process for the manufacture of optically readable information carriers which carriers comprise an optically readable information track, said matrix comprising a stainless steel supporting plate of a thickness of at least 200 μm, and which plate is provided with an epoxy resin bonding layer and which bonding layer is provided with a layer of a radiation-cured synthetic resin composition, which layer of synthetic resin comprises, in a surface away from the supporting plate, an information track which is the negative of said optically readable information track.

5,149,608

EMULSION PRINTING PLATE RELIEF COATINGS

Dean T. Deibler, and Joseph A. Marcanio, both of Cortland, N.Y., assignors to BMC Industries, St. Paul, Minn.

Filed Jun. 9, 1989, Ser. No. 363,911
Int. Cl.[5] G03F *5/00*
U.S. Cl. 430—23 13 Claims



1. An emulsion coated printing plate for laying out a shadow mask pattern in etchant resist on a metal web comprising:

a transparent plate having a top surface;

a layer of compressible emulsion located on said top surface, said layer of compressible emulsion having a first surface;

a first opaque master pattern located on said first surface, said first opaque master pattern projects upward from said first surface of said emulsion to define a channel for evacuation of air between said first surface of said emulsion and a layer of etchant resist;

a strip line having a second opaque master pattern enclosing said first opaque master pattern, said strip line located on said layer of compressible emulsion, said strip line defining a compressible emulsion interior region being encompassed by said strip line and a compressible emulsion exterior region located outside said strip line;

a plurality of first spacers located on said first opaque master pattern to space said first opaque master pattern from a layer of etchant resist; and

a plurality of second spacers located on and supported by said layer of compressible emulsion in said exterior region, said layer of compressible emulsion in said exterior region spacing said compressible emulsion layer in said exterior region from a layer of etchant resist so that the air can be evacuated from said interior region through said exterior region whereby an air evacuation channel is provided over said strip line by said first plurality of spacers and said second plurality of spacers.

5,149,609

POLYMERS FOR PHOTORECEPTOR OVERCOATING FOR USE AS PROTECTIVE LAYER AGAINST LIQUID XEROGRAPHIC INK INTERACTION

Robert C. U. Yu; John W. Spiewak, both of Webster, and Deborah Nichol-Landry, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1990, Ser. No. 627,338
Int. Cl.[5] G03G *5/04*
U.S. Cl. 430—58 19 Claims

19. An electrographic imaging member comprising a charge transport layer and an overcoat layer, said overcoat layer comprising a polymer selected from the group consisting of a copolymer of a hole transport compound linked to a urethane, a fluorine-based pendant active moiety functional polymer of a polyester, a fluorine-based pendant active moiety functional polymer of a polycarbonate, a fluorine-based pendant active moiety functional polymer of a polyurethane, and an organopolyphosphazene having hole transport pendant groups, and wherein said overcoat layer is of a thickness which prevents crystallization and leaching of hole transport compound in said charge transport layer upon exposure to liquid zerographic ink and ink solvent carriers.

5,149,610

COLOR TONER AND TWO-COMPONENT DEVELOPER CONTAINING SAME

Hiroyuki Kobayashi, Yokohama; Mitsuru Uchida, Tokyo, and Kenji Okado, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 504,696, Apr. 5, 1990, Pat. No. 5,116,711, which is a continuation of Ser. No. 117,753, Nov. 6, 1987, abandoned. This application Mar. 4, 1992, Ser. No. 847,763
Claims priority, application Japan, Jan. 19, 1987, 52-009467
Int. Cl.[5] G03G *9/09*; B65D *85/58*
U.S. Cl. 430—106 44 Claims

1. A yellow toner composition comprising:

a yellow toner which in turn comprises at least a binder resin and a yellow colorant, and a hydrophobic silica fine powder;

the yellow toner having a volume-average particle size of 11.0 to 14.0 microns, containing 30% by number or less or particles having sizes below 6.35 microns and containing 9% by weight or less of particles having sizes above 20.2 microns;

the yellow toner composition having a agglomeration degree of 25% or below and an apparent density of 0.2 to 1.5 g/cm^3;

the yellow toner having an apparent viscosity at 100° C. of 10^4 to 5×10^5 poise, an apparent viscosity at 90° C. of 5×10^4 to 5×10^6 poise, a DSC heat-absorption peak at 58° to 72° C., and a gloss of 5.0% or higher;

the yellow toner containing 0.5 to 7.0 wt. parts of the yellow colorant per 100 wt. parts of binder resin;

the yellow toner having chromaticity values of $a^*=-6.5$ to -26.5, $b^*=73.0$ to 93.0, and $L^*=77.0$ to 97.0;

the yellow toner showing a triboelectric charge of -5 to -20 micro-C/g with respect to a ferrite carrier coated with a mixture of a fluorine-containing resin and a styrene type resin containing 70 wt. % or more of carrier particles having sizes of 250 mesh-pass and 350 meshs-on; and

the yellow toner having a spectral reflectance of 60% or more in an infrared region of 900 to 1000 nm.

5,149,611

COLOR TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Toshitaro Kohri; Junji Machida, and Masahiro Anno, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 265,672, filed as PCT/JP88/00152, Feb. 16, 1988, abandoned.
This application Aug. 13, 1990, Ser. No. 566,890
Claims priority, application Japan, Feb. 17, 1987, 62-35189; Jan. 12, 1988, 63-5341
Int. Cl.[5] G03G *9/09, 9/097*
U.S. Cl. 430—110 19 Claims

1. A color toner other than black for developing an electrostatic latent image, which comprises a non-magnetic core particle and fine particles of a charge-enhancing agent fixed on the surface of the core particle by fusing the surface of the core particle at the content of 0.03 to 0.65% by weight on the basis of the toner weight, said non-magnetic core particle containing a thermoplastic resin and a colorant other than black.

5,149,612

FABRICATION OF ELECTROPHOTOGRAPHIC IMAGING MEMBERS

Edouard E. Langlois, Rochester, N.Y.; Kathryn T. Kehoe; Warren R. Smith, both of Oklahoma City, Okla.; Mark Muscato, Yukon, Okla.; Barbara D. Ceplinski, Oklahoma City, Okla.; Alan C. Kirchoff, Webster, N.Y.; Robert F. Dunham, and Michael D. Stair, both of Yukon, Okla., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 548,310
Int. Cl.[5] G03G *5/047*
U.S. Cl. 430—132 15 Claims

1. A continuous coating process for fabricating an electrophotographic imaging member comprising a providing a substrate coated with a charge generation layer and applying a coating of a charge transport layer comprising a dopant, the improvement comprising detecting during said continuous coating process the change in dopant concentration required when the electrical properties of said imaging member deviate from a predetermined value, determining the amount of a highly doped charge transport coating solution and undoped or lowly doped charge transport composition required to achieve said change in dopant concentration, feeding said amounts of a highly doped charge transport composition and undoped or lowly doped charge transport composition into a mixing zone, rapidly mixing said amounts of a highly doped charge transport composition and undoped or lowly doped charge transport composition in said mixing zone to form a uniformly doped charge transport composition, and applying said uniformly doped charge transport composition to said charge generation layer during said continuous coating process.

5,149,613

PROCESS FOR PRODUCING IMAGES ON A PHOTOSENSITIVE MATERIAL

Paul Stahlhofen, Wiesbaden, and Dieter Mohr, Budenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 192,941, May 12, 1988, abandoned.
This application Nov. 22, 1989, Ser. No. 440,439
Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716848
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—296 20 Claims

1. A process for producing images on a photosensitive material comprising a support and a normally positive-working photosensitive layer, the process comprising the steps of:

activating the photosensitive layer by exposure to ultraviolet light;

imagewise heating of selected regions within the UV activated region by means of a laser beam, electron beam or thermal printer to produce thermally hardened regions in the UV activated region and

developing with an aqueous-alkaline developer,

wherein a mixture comprising a compound containing at least one —C—O—C— or —C—O—Si— bond which can be split by acid and a compound forming a strong acid upon exposure is employed in the photosensitive layer.

5,149,614

DEVELOPER COMPOSITIONS FOR PS PLATES AND METHOD FOR DEVELOPING THE SAME WHEREIN THE DEVELOPER COMPOSITION CONTAINS A SURFACTANT HAVING AN ARYL GROUP, AN OXYALKYLENE GROUP AND A SULFATE ESTER OR SULFONIC ACID GROUP

Keiji Akiyama, and Hiroshi Misu, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 9, 1989, Ser. No. 349,095
Claims priority, application Japan, May 10, 1988, 63-112885
Int. Cl.[5] G03F *7/023, 7/32*
U.S. Cl. 430—302 8 Claims

2. A method of developing a presensitized plate which comprises the steps of:

(i) developing an imagewise light-exposed positive working presensitized lithographic plate comprising a support having an imagewise light-exposed positive working light-sensitive layer containing an o-quinone diazide compound with a developer composition to remove light-exposed areas of the positive working light-sensitive layer, to provide a lithographic printing plate, and

(ii) developing an imagewise light-exposed negative working presensitized lithographic plate comprising a support having an imagewise light-exposed negative working light-sensitive layer containing a diazo resin with a developer composition to remove light-unexposed areas of the negative light-sensitive layer, to provide a lithographic printing plate

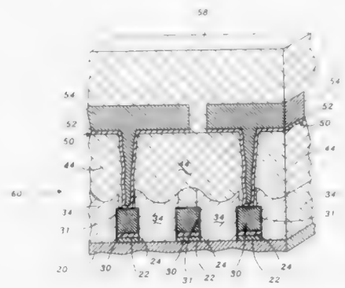
said developer composition for the positive working presensitized lithographic plate and said developer composition for the negative working presensitized lithographic plate each comprising water, an alkali silicate, at least one compound having at least one aryl group, at least one oxyalkylene group and at least one sulfate ester group or sulfonic acid group and organic solvents and/or anionic surfactants, the organic solvent being selected from those having solubility in water of not more of 10% by weight and the anionic surfactant being selected from the group consisting of C_8 to C_{22} higher alcohol sulfate ester salts, aliphatic alcohol sulfate ester salts, alkyl aryl sulfonic acid salts, sulfonic acid salts of alkylamides, sulfonic acid salts of dibasic aliphatic acid esters and combinations thereof.

5,149,615

METHOD FOR PRODUCING A PLANAR SURFACE ON WHICH A CONDUCTIVE LAYER CAN BE APPLIED

Kishore K. Chakravorty, Issaquah, and Minas H. Tanielian, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 8, 1991, Ser. No. 638,802
Int. Cl.[5] G03C *1/74*
U.S. Cl. 430—313 20 Claims



1. A method of producing a planar surface on which successive conductor layers can be formed in a multi-layer circuit, comprising the steps of:

a. forming a conductive trace on a substrate;

b. applying a first coat of a dielectric material over the conductive trace and the substrate;

c. removing a portion of the dielectric material that overlies the conductive trace;

d. applying a second coat of the dielectric material over the conductive trace and over the first coat of the dielectric material, the second coat at least partially dissolving and combining with the first coat, thereby leveling out any non-planar irregularities in the first coat and leaving a substantially planar surface; and

e. removing a portion of the second coat of the dielectric material overlying the conductive trace where an electrically conductive via is to be formed between the conductive trace already formed on the substrate and a subsequent conductive trace, the substantially planar surface of the combined first coat and second coat providing a base for forming the subsequent conductive trace.

5,149,616

PROCESSLESS IMAGING TO MAXIMIZE BLUE LIGHT ABSORPTION OF AN IMAGE

Kou-Chang Liu, Wayne, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Filed Oct. 23, 1990, Ser. No. 601,535
Int. Cl.[5] G03C *1/00, 1/72*
U.S. Cl. 430—346 3 Claims

1. A permanently yellow, thermally imageable composition consisting essentially of the homopolymer of the diacetylene isopropyl carbamate monomer having the formula

$$[(CH_3)_2NHCOO(CH_2)_4C{\equiv}C{\equiv}C]_{\overline{n}}$$

and between about 0.001 and about 1 wt. % of an energy absorbing heat transferring dye having absorption in the wavelength range of from about 575 to about 1,500 nm and selected from the group of a polycarbocyanine dye, a pyrylium dye and a squarillium dye and mixtures thereof.

5,149,617

IMAGEABLE DIACETYLENE ETHERS

Kou-Chang Liu, Wayne, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Division of Ser. No. 601,499, Oct. 23, 1990, Pat. No. 5,094,134.
This application Oct. 25, 1991, Ser. No. 783,019
Int. Cl.[5] G03C *1/00, 1/72*
U.S. Cl. 430—346 9 Claims

1. An imageable film comprising a substrate on which is supported an imageable layer of the diacetylene ether having the formula

$$\mathrm{XCOCH_2CH_2OCH_2{-}C{\equiv}C{-}C{\equiv}C{-}Y}$$

wherein X is a radical having from 1 to 22 carbon atoms and is selected from the group of alkyl, carbamate, alkenyl, aryl, phenylamino, alkaryl, aralkyl, aralkenyl, monoalkylamino and dialkylamino and Y is alkyl or alkenyl having from 1 to 22 carbon atoms or $—CH_2OCH_2CH_2OOCX'$ where X' is independently selected from the group of X.

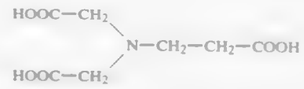
5,149,618

BLEACH FIXING PROCESS

Gustav Tappe, Leverkusen; Ralf Wichmann, Cologne; Heinz Meckl, Bergisch Gladbach, and Edgar Draber, Cologne, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen Bermany, Fed. Rep. of Germany

Filed Sep. 20, 1991, Ser. No. 763,115
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1990, 4031757
Int. Cl.[5] G03C *7/00*
U.S. Cl. 430—393 3 Claims

1. A process for bleach fixing an exposed and developed colour photographic material whose silver halide emulsion layers contain silver chlorobromide emulsions having a silver bromide content of from 0.3 to 2.0 mol-%, characterised in that the bleach fixing bath (1) contains, as bleaching agent, an iron (III) complex, at least 50 mol-% of whose complex former corresponds to the following formula



(I)

(2) is adjusted to a pH of x, where $7.0 > x > 4.5$ and

(3) contains a thiosulphate.

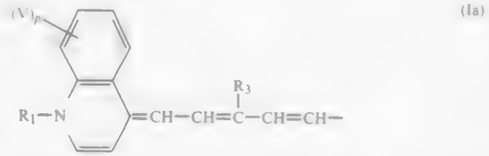
5,149,619

SILVER HALIDE PHOTOGRAPHIC EMULSION

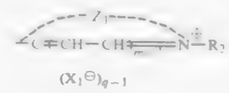
Yuji Mihara, and Toshinao Ukai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 435,881, Nov. 14, 1989, abandoned.
This application Sep. 5, 1991, Ser. No. 755,595
Claims priority, application Japan, Nov. 15, 1988, 63-288058
Int. Cl.[5] G03C *1/02*
U.S. Cl. 430—572 13 Claims

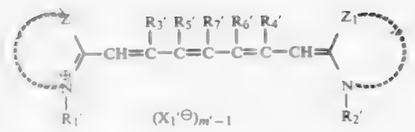
1. A silver halide photographic emulsion comprising a combination of at least one infrared sensitizing dye represented by formula (Ia) or (Ib) and at least one compound represented by formula (IIa) or (IIb):



(Ia)

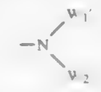


wherein R_1 and R_2 may be the same or different, and each represents an alkyl group; R_3 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a phenyl group, a benzyl group or a phenethyl group; V represents a hydrogen atom, a lower alkyl group, an alkoxy group or a halogen atom; Z_1 represents a group of non-metal atoms which is required to complete a five or six membered nitrogen-containing heterocyclic ring; X_1 represents an acid anion; and m, p and q each independently represents 1 or 2, provided that when an intramolecular salt is formed, then q is 1,

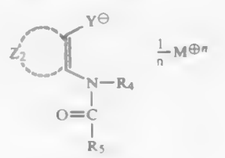


(Ib)

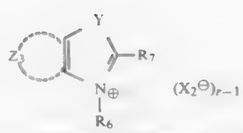
wherein R_1' and R_2' may be the same or different and each represents an alkyl group; R_3' and R_4' each individually represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a phenyl group, a benzyl group or a phenethyl group; R_5' and R_6' each represents a hydrogen atom, or R_5' and R_6' may be joined together to form a divalent alkylene group; R_7' represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a phenyl group, a benzyl group or an



group, wherein W_1' and W_2' each independently represents an alkyl group or an aryl group, or W_1' and W_2' may be joined together to form a five or six membered nitrogen-containing heterocyclic ring; R_3' and R_7', or R_4' and R_7', may be joined together to form a divalent alkylene group, Z' and Z_1' each independently represents a group of non-metal atoms which is required to complete a five or six membered nitrogen-containing heterocyclic ring; X_1' represents an acid anion; and m' represents 1 or 2, provided that when the dye forms an intramolecular salt, then m' is 1, and



(IIa)



(IIb)

wherein R_4 represents an alkyl group or an alkenyl group; R_6 represents a substituted alkyl group or a substituted alkenyl group; R_5 and R_7 each represents a hydrogen atom, an alkyl group or an aryl group; Y represents an oxygen atom, a sulfur atom, a selenium atom or a tellurium atom; Z_2 and Z_3 each represents atoms which are required to complete an aromatic ring; $M^{\oplus n}$ represents an onium ion, an ion of a group IA or group IIA element, or a cation of atomic valency n selected from among the metal ions of groups IIB, VIIB, IVA or VA; X_2 has the same significance as X_1 in formula (I); and r represents 1 or 2, provided that when the compound forms an intramolecular salt, then r is 1.

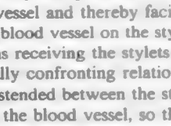
5,149,620

POST PROCESSING STABILIZED PHOTOTHERMOGRAPHIC EMULSIONS

Sahron M. Simpson; John R. Boon; Marco Bucci; Massimo Bertoldi; Cristina Soncini, and Kumars Sakizadeh, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 30, 1990, Ser. No. 559,619
Int. Cl.[5] G03C *1/02*
U.S. Cl. 430—617 **15 Claims**

1. A photothermographic imaging element comprising a substrate having on at least one side thereof a layer comprising a photographic silver halide in reactive association with a silver source material, a reducing agent for silver ion, and a binder, said layer having therein or in an adjacent layer a post processing stabilizing amount of an electron-withdrawing group at least as electron-withdrawing as $CF_3(CH_2)_6$- on the 3-position of 5-mercapto-1,2,4-triazole wherein said triazole is represented by the formula:



wherein

R represents hydrogen, alkyl group, aryl group or aralkyl group, and

Q represents an electron-withdrawing group at least as electron-withdrawing as $CF_3(CH_2)_6$-, and wherein Q is represented by the formula:

$$(H)_e(CX_3)_a(CF_2)(CH_2)_d-$$

wherein

X comprises halogen atoms,

a is 0 or 1,

c is 0 or between 1 and 20,

d is 0 or between 1 and 6,

e is 0 when a is 1 and e is 1 when a is 0, and

a plus c is at least 1.

5,149,621

KIT FOR CRYOPRESERVING BLOOD VESSELS

Robert T. McNally; Cameron McCaa; Kelvin G. M. Brockbank; Albert E. Heacox, all of Marietta, Ga., and Harvey L. Bank, Charleston, S.C., assignors to CryoLife, Inc. & Medical Univ. of South Carolina, Marietta, Ga.

Division of Ser. No. 88,092, Aug. 21, 1987. This application Jan. 23, 1990, Ser. No. 436,364
Int. Cl.[5] A01N *1/02*
U.S. Cl. 435—1 **4 Claims**

1. A kit comprising:

(i) a blood vessel stent comprising

first and second elongated stylets each having an end capable of insertion within a portion of a blood vessel from a donor;

means on said stylets operative to engage the interior of the blood vessel and thereby facilitate fluid tight ligation of the blood vessel on the stylets; and

support means receiving the stylets in selectively adjustable mutually confronting relation whereby the blood vessel is distended between the stylets to prevent contraction of the blood vessel, so that the stent supports the blood vessel through the stages of procurement and cryopreservation; and

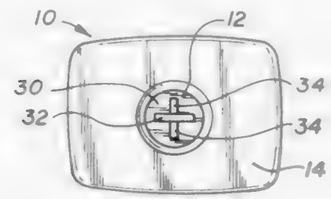
(ii) a composition comprising a cryoprotectively effective concentration of a cell penetrating cryoprotectant and a cryoprotectively effective concentration of a glycosaminoglycan.

5,149,622

SOLID PHASE ANALYTICAL DEVICE AND METHOD FOR USING SAME

William E. Brown, Grayslake; John M. Clemens; Sharon M. Devereaux, both of Gurnee; John G. Hofler, Ingleside; Kevin M. Knigge, Wheeling, and Sarah E. Safford, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 831,013, Feb. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,416, Oct. 4, 1985, abandoned. This application May 21, 1990, Ser. No. 528,277
Int. Cl.[5] C12Q *1/70, 1/14;* G01N *21/00*
U.S. Cl. 435—5 **18 Claims**



1. A method for determining the presence or amount of an analyte in a fluid, comprising the steps of:

a) incubating a sample of the fluid with a plurality of substantially spherical, solid particles having an average diameter of from about 0.1 to about 5 microns, the particles having immobilized upon their surfaces a binding substance which specifically binds the analyte, whereby the analyte becomes bound to the substance to form an analyte/binding substance complex on the particles;

b) contacting a porous, fibrous matrix with the incubated particles, wherein the average diameter of said particles is less than the particle retention rating of said matrix and whereby at least a portion of the incubated particles become retained and immobilized within the matrix upon at least a portion of the fibers thereof;

c) contacting said fibrous matrix containing the complex of the particles with a with a labeled substance capable of specifically binding the analyte, said labeled substance capable of producing a detectable response in the presence of the analyte and an indicator substance, whereby the labeled substance becomes bound to the complex on the particles;

d) washing unbound labeled substance from said fibrous matrix;

e) contacting said fibrous matrix with the indicator substance; and

f) detecting the response produced as a function of the presence or amount of analyte in the sample.

11. A solid-phase assay device useful in a binding assay to determine the presence or an amount of an analyte in a fluid sample comprising

a) a rigid carrier means for holding a porous matrix of fibers,

b) a porous matrix of fibers arranged in a substantially planar layer having a first sample-contacting surface and a second surface opposed to said first surface, said matrix being disposed in said carrier means such that, when the device is used in the performance of an assay, at least a portion of the sample contacting the first surface passes through said substantially planar layer to the second surface, and

c) substantially spherical, solid particles retained and immobilized on the fibers of said porous matrix, said particles having a substance adsorbed or bound to their surfaces which specifically binds analyte, said coated particles having an average diameter between about 0.1 and about 5 microns and wherein the average diameter of said particles is less than the particle retention rating of said porous matrix.

5,149,623

RAPID, EASY, AND ECONOMICAL SCREENING TEST FOR ANTIBODIES TO HUMAN IMMUNODEFICIENCY VIRUS

James R. Carlson; Steve C. Mertens, both of Davis, and Joann L. Yee, Sacramento, all of Calif., assignors to Virotest, Inc., Lodi, Calif.

Filed Feb. 1, 1989, Ser. No. 303,819
Int. Cl.[5] C12Q *1/70, 1/00;* G01N *33/53*
U.S. Cl. 435—5 **8 Claims**

1. A method for conducting a thermal insensitive immunoassay for the detection of antibodies against the human immodeficiency virus in saliva said method comprising:

comprising:

(a) immobilizing antigen peptide of 121 of Seq. ID NO. 1 to a solid support;

(b) reacting immobilized antigen from step (a) with saliva samples suspected of containing antibodies directed against human immunodeficiency virus to form antigen-/antibody complexes;

(c) washing the antigen/antibody complexes of step (b) with washing solutions comprising detergents to remove unbound antibody;

(d) reacting the antigen/antibody complexes with an enzyme-labelled antihuman antibodies to form a sandwich complex;

(e) separating the sandwich complex to remove unbound labelled antihuman antibodies; and

(f) reacting the sandwich complex with a compound able to act as a substrate for the enzyme label such that the enzymatic reaction can be colorimetrically monitored; wherein all reagents used in steps (a) –(f) are stable at temperatures between 4° and 39° C.

5,149,624

METHOD FOR DETECTING BACTERIAL OR FUNGAL DISEASES IN PLANTS

Dean W. Gabriel, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Oct. 7, 1986, Ser. No. 916,102
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **10 Claims**

1. A method for detecting a bacterial or fungal disease in a plant, said disease characterized by the presence of leaf lesions containing bacterial or fungal pathogen cells in said plant, comprising:

a) providing a sample of said pathogen cells free from DNA and RNA degrading enzymes from said leaf lesions,

b) binding said pathogen cells to a solid support,

c) disrupting said pathogen cells bound to said support whereby the DNA of said cells is released therefrom and is bound to said support,

d) probing said DNA bound to said support with an assayable DNA that is complementary to the bacterial or fungal RNA to be detected whereby any bacterial- or fungal-RNA or bacterial- or fungal-DNA is hybridized to form an assayable DNA-bacterial or -fungal RNA hybrid or an assayable DNA-bacterial or -fungal DNA hybrid; and

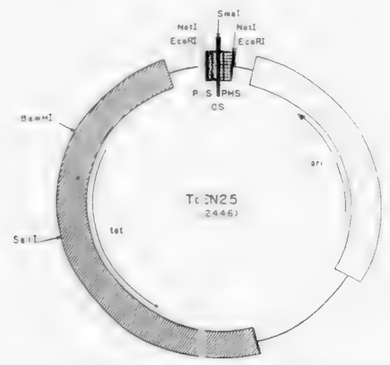
e) subjecting the probed material to an assay to detect the presence of any of said hybrids.

5,149,625

MULTIPLEX ANALYSIS OF DNA

George M. Church, Boston, and Stephen Kieffer-Higgins, Dorchester, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 223,596, Aug. 4, 1988, and a continuation-in-part of Ser. No. 84,623, Aug. 11, 1987. This application Mar. 28, 1990, Ser. No. 500,419
The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.
Int. Cl.[5] C 2Q *1/68*
U.S. Cl. 435—6 22 Claims



1. A kit comprising at least two vectors, each vector of said set having at least one cloning site and having at least one tag sequence comprising at least 15 base pairs, each of said tag sequences of any one of the vectors being incapable of hybridizing with any of said tag sequences of any other of the vectors under stringent hybridization conditions,

each said vector of said set differing from each other said vector of said set only at said tag sequence.

11. A method for analyzing a DNA specimen comprising

(a) providing a set of at least two vectors, each vector of said set comprising a cloning site and including at least one tag sequence, each tag sequence in each vector differing from each tag sequence of every other vector of said set, and each being incapable of hybridizing to said DNA specimen under stringent conditions,

(b) providing a first and a second DNA sequence from said DNA specimen, said first DNA sequence being different from said second DNA sequence,

(c) ligating said first DNA sequence into the cloning site of one of said vectors, and said second DNA sequence into the cloning site of a second of said vectors, thereby producing a plurality of hybrid vectors,

(d) providing a pool of said hybrid vectors,

(e) treating separate aliquots of said pool in a plurality of vessels to produce fragments comprising said tag sequence, wherein said fragments in each vessel differ in length from each other and all terminate at a fixed known base or bases, wherein said fixed known base or bases in one of said vessels differ from said fixed known base or bases in another of said vessels,

(f) separating said fragments comprising tag sequences from each said vessel according to their size,

(g) hybridizing the separated fragments of step (e) under stringent conditions with a first oligonucleotide probe able to hybridize specifically with one of said tag sequences, and

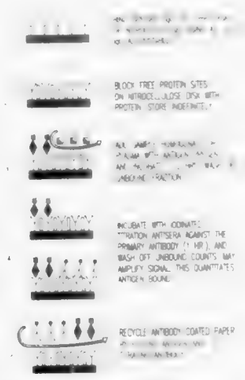
(h) detecting the pattern of hybridization wherein said pattern reflects the nucleotide sequence or restriction map of said DNA specimen.

5,149,626

MULTIPLE ANTIGEN IMMUNOASSAY

Nigel Fleming, Arlington, Mass., assignor to McLean Hospital Corporation, Belmont, Mass.

Continuation of Ser. No. 49,375, May 14, 1987, abandoned. This application Dec. 18, 1989, Ser. No. 449,158
Int. Cl.[5] G01N *33/53, 33/537, 33/543*
U.S. Cl. 435—7.9 10 Claims



1. A method for determining the presence of an analyte in a sample, comprising:

a) contacting a sample suspected of containing the analyte with a solid phase support onto which an analyte-specific first antibody has been immobilized;

b) incubating said sample with said support for a sufficient amount of time to allow the analyte present in the sample to bind to said first antibody;

c) separating said solid phase support from the incubation mixture obtained in step b);

d) contacting said solid phase support with a second detectably labeled titrating antibody which is specific for said first antibody;

e) incubating the mixture formed in step d) for a time sufficient to allow said titrating antibody to bind to said first antibody;

f) separating said solid phase support from the incubation mixture obtained in step e); and

g) detecting and measuring the amount of bound labeled antibody and correlating the amount of bound labeled antibody to the amount of analyte in the sample by comparing the amount of bound labeled antibody to a standard curve constructed from analyte standards, wherein the quantity of analyte is inversely proportional to the amount of bound labeled antibody.

5,149,627

IMMUNOASSAY FOR CELL PROTEINS

James E. Brown, Lafayette, Calif., assignor to Miles, Inc., Elkhart, Ind.

Continuation of Ser. No. 299,385, Jan. 23, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 823,581
Int. Cl.[5] G01N *33/53*
U.S. Cl. 435—7.1 3 Claims

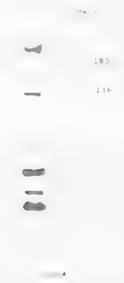
1. A method of determining the amount of cellular proteins in a therapeutic protein preparation expressed from mammalian cells that have been grown in the presence of media proteins, the method consisting of the sequential steps of

(a) obtaining a partially purified sample that includes both cellular proteins from the mammalian cells and media proteins in which the cells were grown;

(b) using the sample to prepare antiserum which includes polyclonal antibodies to both the cellular proteins and the media proteins;

(c) immunopurifying the antiserum of step (b) by contacting the antiserum of step (b) with immobilized immunizing antigens;

(d) contacting the antiserum of step (c) with immobilized media proteins under conditions sufficient to remove the



antibodies to media proteins from the antiserum, thereby producing an antiserum depleted of antibodies to the media protein; and

(e) using the depleted antiserum of step (d) in an immunoassay to determine the amount of cellular proteins in the therapeutic protein preparation.

5,149,628

METHODS FOR DETECTING BCL-3 GENE IN HUMAN LEUKEMIAS

Carlo M. Croce, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Filed Nov. 15, 1989, Ser. No. 436,888
Int. Cl.[5] C12Q *1/68, 15/00;* G01N *33/566;* C07H *15/12*
U.S. Cl. 435—6 13 Claims

1. A nucleic acid probe of at least 12 nucleotides consisting essentially of a segment of the bcl-3 locus.

5,149,629

COULOMETRIC ASSAY SYSTEM

Judith Rishpon, Wolfson, and Ilara Rosen, Ramat-Gan, both of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Filed Apr. 4, 1988, Ser. No. 177,463
Claims priority, application Israel, Apr. 7, 1987, 82131
Int. Cl.[5] G01N *33/53, 33/552;* C12M *1/40*
U.S. Cl. 435—7.9 11 Claims

1. Apparatus for the sequential rapid qualitative or quantitative assay of a plurality of samples of members of biospecific binding pairs by coulometric measurement, comprising:

a plurality of working electrodes corresponding to the number of samples to be assayed, said electrodes immersed in a common solution in a vessel,

a multiplexer for effecting sequential coulometric measurements,

a potentiostat;

there being provided in said vessel a reference electrode and a counter electrode, means for applying a predetermined voltage during each such measurement;

which measurements are that of the electric charge passing between each working electrode and the evaluation thereof indicating the quantity of one of the members of the biospecific binding pairs, or its presence, said working electrodes comprising an electrically inert support which supports a member selected from the group consisting of carbon felt, carbon paper or carbon cloth to which there is firmly bonded one of the biospecific pair members which specifically binds the second complementary member, which second member is tagged by an enzyme or which second member is coupled to at least one further biospecific member, the last of which further biospecific members is tagged with an enzyme;

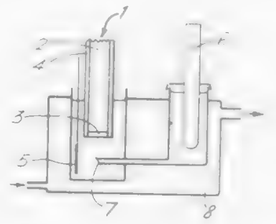
whereby when the electrodes are introduced into a substrate of the enzyme, a coulometric signal is formed, thereby sequentially measuring said samples.

5,149,630

METHODS OF ASSAY

Gordon C. Forrest, Braemore, High Park Avenue, East Horsley, Surrey KT24 5DP; Hugh A. O. Hill, 9 Clover Close, Oxford; Simon J. Rattle, 29, Lower Street, Quainton, Buckinghamshire, HP22 4BL, and Grenville A. Robinson, 23 Burnham Way, Ealing, London W13 9YF, all of England

Continuation of Ser. No. 694,923, Jan. 25, 1985, abandoned. This application Feb. 9, 1988, Ser. No. 157,100
Claims priority, application United Kingdom, Jan. 26, 1984, 8402058
Int. Cl.[5] G01N *33/536*
U.S. Cl. 435—7.9 22 Claims



1. In a homogeneous method of electrochemical assay of a ligand in a sample using an electrochemical apparatus having at least a working electrode and and auxiliary electrode and containing components comprising:

(a) the sample,

(b) a specific binding partner to the ligand and at least one further reagent selected from ligand analogues and specific binding partners to the ligand, one of the components (b) being labelled with an oxidoreductase enzyme, and

(c) a substrate for the enzyme, the improvement which comprises said apparatus additionally containing an electron transfer chemical capable of aiding the transfer of electrons between the substrate and the working electrode via the enzyme as a result of oxidation or reduction of the substrate but which is not essential for the activity of said

enzyme, and the method including the step of determining whether the said transfer of electrons is perturbed by formation of a complex of said ligand with at least one specific binding partner.

5,149,631

COMPOUND MARKED WITH TRITIUM, ITS PREPARATION AND ITS USE IN THE LOCATION OF NUCLEAR RECEPTORS OF RETINOIDS

Braham Shroot, and Michel Darmon, both of Antibes, France, assignors to Centre International de Recherches Dermatologiques Galderma (CIRD Galderma), Valbonne, France

Division of Ser. No. 553,812, Jul. 19, 1990, Pat. No. 5,073,361. This application Mar. 27, 1991, Ser. No. 675,804
Claims priority, application France, Jul. 20, 1989, 89 09778
Int. Cl.[5] G01N *33/53*
U.S. Cl. 435—7.21 3 Claims

1. A method of detecting nuclear receptors of retinoic acid in a biological sample, which nuclear receptors are endogenous or are obtained by conventional transfection methods, comprising the steps of:

(i) contacting said sample with radioactive tritiated 6-[3-(1-adamantyl)-4-methoxyphenyl -2-naphthoic acid, under such conditions that binding of said radioactive tritiated 6-[3-(1-adamantyl)-4-methoxy phenyl]-2-naphthoic acid to said nuclear receptors occurs, and

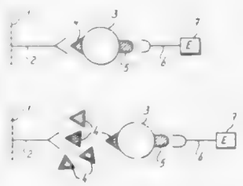
(ii) detecting the presence of said radioactive tritiated 6-[3-(1-adamantyl)-4-methoxyphenyl]-2-naphthoic acid bound to said nuclear receptors in said sample.

5,149,632

METHOD FOR THE DETECTION OF MOLDS IN FOODSTUFFS AND HUMAN AND ANIMAL BODY FLUIDS

Servatius H. W. Notermans, Bilthoven; Jacobus H. Van Boom, Voorschoten, and Gerrit H. Veeneman, Oegstgeest, all of Netherlands, assignors to De Staat Der Nederlanden Vertengwoordigd Door De Minister Van Welzijn, Rijswijk, Netherlands

Filed Jan. 12, 1989, Ser. No. 296,718
Claims priority, application Netherlands, Jan. 13, 1988, 8800073
Int. Cl.[5] G01N *33/569*
U.S. Cl. 435—7.31 4 Claims



1. A method for the detection of a mold in a sample comprising the steps of:

(a) combining a portion of the sample with an antibody that specifically binds to an extracellular polysaccharide produced by the mold and determining the binding of a component in the sample with the antibody;

(b) if binding is detected in step (a), combining another portion of the sample, the antibody and an amount of a synthetically prepared epitope of said extracellular polysaccharide sufficient to effectively block all binding of said antibody to the extracellular polysaccharide present in the sample and determining the presence or absence of the binding of a component in the sample with the antibody wherein the presence of binding indicates a false positive result and the absence of binding indicates the presence of mold in the sample.

5,149,633

PROCESS AND REAGENT FOR THE SPECIFIC DETERMINATION OF FRUCTOSAMINE CONTENT IN BLOOD AND SAMPLES OBTAINED FROM BLOOD

Bernd Vogt; Liselotte Schellong, both of Tutzing; Joachim Siedel, Bernried, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,381
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732688
Int. Cl.[5] C12Q *1/26, 1/54, 1/28*
U.S. Cl. 435—25 27 Claims

1. In a process for the specific determination of the serum fructosamine content on a blood sample or in sample obtained from blood by reaction with a tetrazolium salt at an alkaline pH and measurement of the resultant color change, the improvement comprising:

(i) removing components which cause non-specific reduction of the tetrazolium salt or which cause turbidity by treating the sample with a reagent composition comprising at least one oxidoreductase and at least one SH group blocking agent in an amount sufficient to prevent non-specific reduction of the tetrazolium salt from 1 to 15 minutes, the pH of said composition being from 6 to 9,

(ii) bringing the sample to a pH of from 10 to 12 with a rebuffering reagent prior to or simultaneously with the reaction with the tetrazolium salt, and

(iii) determining color formation or color change from 1 to 15 minutes after adding said rebuffering reagent.

5,149,634

BIOASSAY FOR ENVIRONMENTAL QUALITY

Brian P. Bradley, Ellicott City, Md., assignor to The University of Maryland, College Park, Md.

Filed Apr. 14, 1989, Ser. No. 339,594
Int. Cl.[5] C12Q *1/02, 1/00*
U.S. Cl. 435—29 6 Claims

1. A biological, sublethal assay to determine the presence of specific chemical pollutants in an aquatic environment comprising:

1) cultivating a population of an organism common to said aquatic environment which produces shock proteins in response to stress induced by chemical pollutants,

2) exposing a portion of said population to the environment to be assayed, for the period of time sufficient to induce production of stress proteins by said exposed population, if a chemical pollutant stressor is present in the environment,

3) determining the type of stress proteins produced by said organisms exposed to said environment and

4) determining the identity of the chemical pollutant by correlating it with the type of stress proteins produced by said population exposed to said environment.

5,149,635

MESSENGER RNA STABILIZATION IN ANIMAL CELLS

Stephen D. Gillies, Scituate, Mass., assignor to Abbott Biotech, Inc., Needham Heights, Mass.

Continuation of Ser. No. 907,067, Sep. 12, 1986, abandoned. This application May 16, 1990, Ser. No. 523,255
Int. Cl.[5] C12P *21/02;* C12N *15/85, 5/10, 15/00*
U.S. Cl. 435—69.1 28 Claims

1. A process for producing a protein in a myeloma cell line, said process comprising the steps of:

a) providing a recombinant DNA obtained from a cell which naturally produces said protein, said DNA comprising in sequence a coding region encoding said protein, a stop signal codon, and a native 3′ untranslated region as it naturally occurs 3′ to said coding region including a polyadenylation signal;

b) reducing the number of base pairs of said native 3′ untranslated region of said DNA between said stop signal and said polyadenylation signal to produce an intact, transcriptionally competent, shorter DNA having a shorter untranslated region comprising less than about 300 nucleotide bases between said stop signal codon and a polyadenylation signal;

c) transfecting said myeloma cell line with said shorter DNA; and

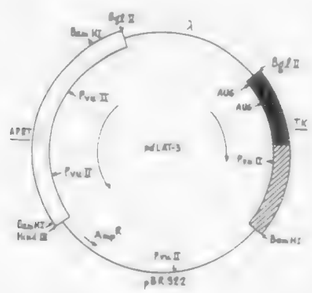
d) culturing said transferred cell line to produce said protein, the amount of protein produced by said transfected cell line being greater than the amount of protein produced by an otherwise identical cell line containing the DNA described in step a.

5,149,636

METHOD FOR INTRODUCING CLONED, AMPLIFIABLE GENES INTO EUCARYOTIC CELLS AND FOR PRODUCING PROTEINACEOUS PRODUCTS

Richard Axel, and James M. Roberts, both of New York, N.Y., assignors to Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 103,807, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 683,251, Dec. 17, 1984, abandoned, which is a continuation of Ser. No. 358,206, Mar. 15, 1982, abandoned. This application Sep. 26, 1988, Ser. No. 249,454
Int. Cl.[5] C12P *21/02;* C12Q *1/68;* C12N *15/10*
U.S. Cl. 435—69.1 50 Claims



1. A process for generating in eucaryotic cells multiple copies of foreign DNA I which comprises:

a) cotransforming suitable eucaryotic cells with said foreign DNA I and with foreign DNA II, said foreign DNA II including a functionally deficient thymidine kinase or adenine phosphoribosyltransferase gene whose primary promoter has been removed, said foreign DNA I including a functional gene coding for production of a desired proteinaceous product, said functional and functionally deficient genes being different;

b) said cotransformation being carried out under conditions permitting production of the desired product encoded by the gene on DNA I but not expression of the selectable or identifiable trait encoded by the gene on DNA II;

c) recovering the resulting cotransformed eucaryotic cells producing the desired proteinaceous product;

d) cloning the cotransformed cells so recovered under conditions permitting selection or identification of calls which express the selectable or identifiable trait encoded by the gene on DNA II;

e) recovering the then resulting cloned cells and thereby obtaining eucaryotic cells which contain multiple copies of DNA I.

28. A process for generating in eucaryotic cells multiple copies of foreign DNA I which comprises:

a) cotransforming suitable eucaryotic cells with said foreign DNA I and with a DNA molecule which includes a foreign DNA II and a foreign DNA III, said foreign DNA II including a functionally deficient thymidine kinase or adenine phosphoribosyltransferase gene whose primary promoter has been removed, said foreign DNA III including an amplifiable gene coding for a dominant, second selectable or identifiable phenotypic trait, said foreign DNA I including a functional gene coding for production of a desired proteinaceous product, said functional and functionally deficient genes being different;

b) said cotransformation being carried out under conditions permitting selection or identification of cotransformed cells expressing said dominant, second phenotypic trait but not the first selectable or identifiable trait encoded by the gene on DNA II;

c) recovering the resulting cotransformed cells expressing said dominant, second phenotypic trait;

d) cloning the cotransformed cells so recovered under conditions permitting selection or identification of cells which express the first selectable or identifiable trait encoded by the gene on DNA II;

e) recovering the then resulting cloned cells and thereby obtaining eucaryotic cells which contain multiple copies of DNA I.

5,149,637

RECOMBINANT FACTOR VIIIC FRAGMENTS

Dorothea H. Scandella, Gaithersburg, Md.; William N. Drohan, Springfield, Va.; Theodore S. Zimmerman, and Carol A. Fulcher, both of LaJolla, Calif., assignors to Scripps Clinic & Research Foundation, LaJolla, Calif. and Rorer Biotechnology Inc., Springfield, Va.

Division of Ser. No. 34,828, Apr. 6, 1987, Pat. No. 4,980,456. This application Sep. 20, 1990, Ser. No. 585,766
Int. Cl.[5] C12N *15/10, 21/00;* C07H *15/12;* C07K *13/00*
U.S. Cl. 435—69.6 13 Claims

2. A self-replicating expression vector capable of expressing in an in vitro culture system a recombinant Factor VIIIC fragment selected from the group consisting of a polypeptide in glycosylated or unglycosylated form extending from about amino acid 1563 to about amino acid 2332 of human Factor VIIIC and having an unglycosylated M_r value of about 88,000 d as determined by SDS-PAGE, a polypeptide in glycosylated or unglycosylated form extending from about amino acid 326 to about amino acid 742 of human Factor VIIIC and having an unglycosylated M_r value of about 49,000 d as determined by SDS-PAGE, a polypeptide in glycosylated or unglycosylated form extending from about amino acid 1974 to about amino acid residue 2332 of human Factor VIIIC and having an unglycosylated M_r of about 37,500 d as determined by SDS-PAGE and a polypeptide in glycosylated or unglycosylated form extending from about amino acid residue 2052 to about amino acid residue 2332 of human Factor VIIIC.

5,149,638

TYLOSIN BIOSYNTHETIC GENES TYLA, TYLB AND TYLI

Robert J. Beckmann, Indianapolis; Karen L. Cox, Martinsville, and Eugene T. Seno, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 251,718, Sep. 29, 1988, abandoned. This application Jul. 30, 1991, Ser. No. 741,204
Int. Cl.[5] C12P *19/62, 19/34;* C12N *1/21, 15/52*
U.S. Cl. 435—76 28 Claims

1. An isolated DNA sequence which comprises a gene sequence which encodes an activity selected from the group consisting of the tylA, tylB and tylI biosynthetic gene products of *Streptomyces fradiae.*

25. A method for increasing the tylosin-producing ability of a tylosin-producing microorganism, said method comprising

1) transforming with a recombinant DNA vector or portion thereof a microorganism that produces tylosin or a tylosin precursor by means of a biosynthetic pathway, said vector or portion thereof comprising a DNA sequence as claimed

in claim 1 that codes for the expression of an activity that is rate limiting in said antibiotic biosynthetic pathway, and

2) culturing said microorganism transformed with said vector under conditions suitable for cell growth, expression of said antibiotic biosynthetic gene, and production of said antibiotic or antibiotic precursor.

5,149,639

BIOLOGICALLY PURE CULTURES OF STREPTOMYCES AND USE THEREOF IN MACROLIDE ANTIBIOTIC PRODUCTION

Leonard Katz, Wheeling; James Tuan, Waukegan, and James B. McAlpine, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 209,166, Jun. 17, 1988, abandoned, which is a division of Ser. No. 843,116, Mar. 24, 1986, Pat. No. 4,874,748. This application May 25, 1989, Ser. No. 356,953

Int. Cl.[5] **C12P** *19/62;* **C12N** *1/21, 15/03*

U.S. Cl. 435—76 **6 Claims**

6. A method for producing an antibiotic *Streptomyces erythreus* said method comprising the steps of:

(a) preparing a genomic library of an oleandomycin-producing *Streptomyces antibioticus* ATCC 11891 in the vector pNJ1;

(b) transforming a plurality of cells of *Streptomyces erythreus* 9EI41 with said genomic library of *Streptomyces antibioticus* in vector pNJ1;

(c) culturing the transformed cells of step (b) under conditions suitable for production of antibiotics; and

(d) recovering the antibiotic.

5,149,640

METHOD FOR PRODUCING GALACTOSE TRANSFER PRODUCTS

Norimasa Oonishi, and Kenzo Yokozeki, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 22, 1989 Ser. No. 454,944

Claims priority, application Japan, Dec. 22, 1988, 63-324855; Jun. 29, 1989, 1-168103

Int. Cl.[5] **C12P** *19/02, 19/12, 19/44;* **C12R** *1/01*

U.S. Cl. 435—100 **11 Claims**

1. A method for producing a galactose transfer product, which comprises:

allowing a microorganism strain of the genus Sterigmatomyces, Sirobasidium or Rhodotorula, which is capable of producing a galactose transfer product of the formula $(Gal)_n$—R, wherein Gal represents a galactose residue, n represents an integer of 1 to 4 and R represents sugar as a galactose receptor to act on a combination of lactose and galactose receptor at 20° to 70° C. at a pH of 2 to 10; and

collecting the galactose transfer product produced.

5,149,641

PROCESS FOR PRODUCING MEVALONIC ACID

Akira Endo, and Seiji Koike, both of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 158,714, Feb. 22, 1988, abandoned. This application Dec. 17, 1990, Ser. No. 629,184

Claims priority, application Japan, Mar. 4, 1987, 62-49620; Mar. 4, 1987, 62-49621; Mar. 4, 1987, 62-49622; Mar. 4, 1987, 62-49623

Int. Cl.[5] **C12P** *17/06, 7/46, 7/40;* **C12N** *1/16*

U.S. Cl. 435—125 **2 Claims**

1. A process for producing mevalonic acid, which comprises culturing a strain having all of the identifying characteristics of *Saccharomycopsis fibuligera* IFO 0107 in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances, wherein an effective amount of a non-ionic surfactant is added to the medium during the culturing period and thereafter recovering mevalonic acid from the culture medium.

5,149,642

PROCESS FOR PREPARING 2-ACYLGLYCERIDES OR 1,2 OR 2,3-DIACYLGLYCERIDES

Adam W. Mazur, Cincinnati; George D. Hiler, II, and Magda El-Nokaly, both of Harrison, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 20, 1990, Ser. No. 511,674

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.[5] **C12P** *7/64, 7/62;* **C12N** *9/20*

U.S. Cl. 435—135 **17 Claims**

1. A process for preparing mixtures of 2-acyl glycerides and 1,2 or 2,3-diacyl glycerides comprising:

(A) mixing for at least one hour at a temperature of from 20° C. to 50° C.

(1) from 15% to 25% aqueous buffer containing a catalytic amount of 1,3-specific lipase enzyme, said aqueous buffer, having a pH from about 4 to about 8;

(2) from 20% to 60% water immiscible hydrocarbon;

(3) from 3% to 65% triglyceride; and

(4) from 10% to 25% of an alkyl alcohol selected from the group consisting of secondary butanols; tertiary butanols; primary, secondary and tertiary alkyl alcohols having from 5 to 8 carbon atoms; and mixtures thereof; and

(B) separating the water immiscible hydrocarbon layer containing the 2-acyl glyceride and 1,2 or 2,3-diacyl glycerides.

5,149,643

METHOD FOR THE PRODUCTION OF GRANULAR CITRIC ACID AND SALTS THEREOF

Helmut A. Mothes, Granger; Bhalchandra H. Patwardhan, Elkhart, both of Ind.; Theo G. Schroeder, Wuppertal, Fed. Rep. of Germany, and David J. Solow, Elkhart, Ind., assignors to Haarmann & Beimer, Elkhart, Ind.

Continuation of Ser. No. 692,616, Apr. 29, 1991, Pat. No. 5,104,799, which is a continuation-in-part of Ser. No. 594,548, Oct. 5, 1990, Pat. No. 5,045,459. This application Nov. 15, 1991, Ser. No. 792,667

Int. Cl.[5] **C12P** *7/48;* **C12R** *1/73, 1/685*

U.S. Cl. 435—144 **5 Claims**

1. A method for the production of granular citric acid which comprises:

a) producing an impure, aqueous citric acid solution by the fermentation of an appropriate carbon and hydrogen source in the presence of an appropriate microorganism to produce a fermentation broth containing citric acid together with biomass from the microorganism and other impurities;

b) removing the biomass by conventional liquid/solid separatory techniques to provide a partially purified citric acid solution;

c) subjecting the partially purified citric acid solution to one or more recovery procedures other than crystallization to provide a further purified solution; and

d) introducing the further purified solution into the chamber of a fluidized bed reactor where it is suspended in a flow of upwardly rising air together with seed particles to thereby form granules of citric acid.

5,149,644

PROCESS FOR THE RELEASE OF POLY(3-HYDROXY CARBOXYLIC ACIDS)

Werner Lubitz, Munich, Fed. Rep. of Germany, assignor to PCD Polymere Gesellschaft m.b.H., Linz, Austria

Filed Dec. 26, 1990, Ser. No. 633,785

Claims priority, application Austria, Dec. 27, 1989, 2942/89

Int. Cl.[5] **C12P** *7/42*

U.S. Cl. 435—146 **6 Claims**

1. Process for releasing poly(3-hydroxy carboxylic acid) granules from cells of Gram-negative bacteria containing the latter and divalent cations, by expression of a cloned natural or chimeric lysis gene, wherein, before induction of lysis gene expression, the ionic concentration of divalent cations is increased to between 0.05 and 0.05 mol/l, the expression of the lysis gene is induced by raising the temperature, the cells are harvested by gentle centrifugation, and the still wet cells are resuspended in water or buffer solutions, which results in the release of the polymer granules by spontaneous lysis.

5,149,645

PROCESS FOR INTRODUCING FOREIGN DNA INTO THE GENOME OF PLANTS

André Hoekema, Brisane; Paul J. J. Hooykaas, Leiden, and Robert A. Schilperoort, Anthonie Duyckiaan 10c 2334 CD, Leiden, all of Netherlands, assignors to Rijksuniversiteit Leiden and Robbert Adriaan Scilperoort, both of Leiden, Netherlands

Continuation of Ser. No. 737,154, May 23, 1985, abandoned. This application Dec. 5, 1989, Ser. No. 449,282

Claims priority, application Netherlands, Jun. 4, 1984, 8491780

Int. Cl.[5] **C12N** *15/84, 1/21, 15/90*

U.S. Cl. 435—172.3 **6 Claims**

3. A process for the transfer of recombinant DNA into the cells or protoplasts of plants selected from the group consisting of dicotyledonous plants and monocotyledonous plants of the families Liliaceae and Amaryllidaceae, said process comprising infecting the plants or plant cells, or incubating protoplasts from the plants, with Agrobacterium bacteria which contain in their genetic material a Vir-region from the Ti plasmid of Agrobacterium and at least one T-region, wherein said T-region comprises said recombinant DNA flanked on both sides by border sequences as present in wild-type of Agrobacterium, and wherein said Vir-region is integrated into the chromosome of said Agrobacterium bacteria prior to said infecting or incubating step.

5,149,646

PROCESS FOR ISOLATING GALACTOSE OXIDASE

Laura J. Crane, Buttzville, N.J.; Adam W. Mazur, Cincinnati, Ohio; David R. Nau, Lebanon, N.J., and Bernard W. Kluesener, Harrison, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 453,729, Dec. 20, 1989, abandoned. This application Dec. 13, 1991, Ser. No. 807,010

Int. Cl.[5] **C12N** *9/04*

U.S. Cl. 435—190 **12 Claims**

1. A process for preparing galactose oxidase enzyme solutions comprising the steps of:

(1) aerobically fermenting a *Dactylium dendroides* source of galactose oxidase in a medium comprising a nitrogen source, a carbon source, trace metals, thiamine and from 10 to about 60 micromolar in copper at a temperature of between 20° C. to about 25° C.;

(2) filtering the supernatant liquid from the fermentation broth using a 0.15 to 0.25 μm filter;

(3) concentrating the enzyme by ultrafiltration with a 10,000 molecular weight membrane;

(4) equilibrating the retentate from (3) with a buffer containing copper ions, histidine and hydroxide ion; and

(5) purifying the enzyme using high performance liquid chromatography methods on a carboxy-sulfon column wherein said column comprises sulfonic derivatives of N-acylated covalently bound, non-crosslined polyethyleneimine bonded phase silicas wherein the enzyme is eluted with a buffer having a pH of 5.8 comprising histidine, sodium acetate and cupric ions.

5,149,647

PROCESS FOR EXTRACTING PURE FRACTIONS OF LACTOPEROXIDASE AND LACTOFERRIN FROM MILK SERUM

Hans Burling, Lund, Sweden, assignor to Svenska Mejeriernas Riksforening: Ekonomi-Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE88/00643, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO89/04608, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 25, 1988, Ser. No. 488,040

Claims priority, application Sweden, Nov. 27, 1987, 8704719-7

Int. Cl.[5] **C12N** *9/08;* **C07K** *3/22, 13/00;* **A23J** *1/20*

U.S. Cl. 435—192 **14 Claims**

1. A process for extracting pure fractions of lactoperoxidase and lactoferrin from milk serum, comprising initially microfiltering the milk serum, then passing it through a bed of a fast flow type strong cation exchanger at a high rate of flow of about 1–1.5 bed volumes/minute for selective adsorption of lactoperoxidase and lactoferrin, and then successively and selectively eluting the lactoperoxidase with a saline solution having a concentration of 0.10–0.4 M at a pH of about 6.5 and the lactoferrin with a saline solution having a concentration of 0.5–2 M.

5,149,648

ENZYMES EMPLOYED FOR PRODUCING PULPS

Tomoaki Nishida, Ibaraki; Yoshinori Kashino, Tsukuba; Akio Mimura, Tsukuba; Yoshimasa Takahara, Tsukuba, and Kokki Sakai, Fukuoka, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Division of Ser. No. 493,778, Mar. 15, 1990, Pat. No. 5,081,027. This application Feb. 6, 1991, Ser. No. 651,632

Claims priority, application Japan, Mar. 16, 1989, 1-62162; Mar. 29, 1989, 1-74930

Int. Cl.[5] **C12P** *1/02, 7/00;* **C12R** *1/645*

U.S. Cl. 435—192 **2 Claims**

1. A purified lignin degrading enzyme F-1, F-2 or F-3, having the following characteristics:

a) a substrate specificity such that each of F-1, F-2 and F-3 reacts upon syringylglycerol-β-syringylether to produce α-syringyloxy-β-hydroxypropiosyringon, 2-(2,6-dimethoxyphenoxy)-3-hydropropanol and 2,6-dimethoxyphenol;

b) a substrate specificity such that each of F-1, F-2 and F-3 does not react on 4-O-ethyl-syringylglycerol-β-syringylether;

c) each of F-1, F-2 and F-3 exhibits a molecular weight of about 88,000±5,000 (SDS-polyacrylamide electrophoresis); and

d) each of F-1, F-2 and F-3 exhibits an isoelectric point of about 2.5, 2.2 and 2.0, respectively.

5,149,649

MULTI-LAYERED POROUS HOLLOW FIBER MEMBRANE FOR USE IN CELL CULTURE

Takao Miyamori; Makoto Uchida, both of Otake; Kanehiko Enomoto, Tokyo; Akihiro Sakimae, Otake, and Ryozo Numazawa, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,323

Claims priority, application Japan, Aug. 4, 1989, 1-201165; Oct. 9, 1989, 1-263510

Int. Cl.[5] **C12N** *5/00;* **B01D** *39/00;* **C12M** *1/04*

U.S. Cl. 435—240.242 **7 Claims**

1. A method for culturing cells by supplying oxygen to a culture medium and/or culture broth through a hollow fiber membranous structure, wherein said membranous structure is a multi-layer composite membrane which consists of two porous layers, having slit-like pores, on both the surfaces and a non-porous layer having a thickness of 10 micrometers or less in a median layer, and wherein said layers are laminated one after the other.

5,149,650

VACCINES FOR HUMAN RESPIRATORY VIRUS

Gail W. Wertz, Birmingham, Ala. and Peter L. Collins, Rockville, Md., assignors to University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation-in-part of PCT/US86/02756, Dec. 23, 1986, which is a continuation-in-part of Ser. No. 818,740, Jan. 14, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 218,737

Int. Cl.[5] C12N *1/00*

U.S. Cl. 435—243 26 Claims

1. A recombinant DNA molecule comprising a DNA sequence encoding human respiratory syncytial virus structural proteins selected from the group consisting of:

a) F protein;

b) G protein;

c) 22K protein;

d) 9.5K protein;

e) major capsid protein N; and

immunogenic fragments thereof.

5,149,651

PROCESS FOR CULTURING MICROORGANISMS OF THE GENUS PSEUDOMONAS AND PROCESS FOR PRODUCING L-ALANINE USING SAID MICROORGANISMS

Makoto Goto, Inashiki; Terukazu Nara, Niihari; Yasukazu Uchida, Inashiki; Masato Terasawa, Inashiki; Hideaki Yukawa, Inashiki, and Hisashi Yamagata, Ushiku, all of Japan, assignors to Mitsubishi Petrochemical. Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 691,880

Claims priority, application Japan, Apr. 27, 1990, 2-110272; Mar. 18, 1991, 3-52528

Int. Cl.[5] C12N *1/38, 1/36;* C12R *1/38;* C12P *13/06*

U.S. Cl. 435—244 11 Claims

1. A process for culturing microorganisms of the genus Pseudomonas containing aspartate beta-decarboxylase comprising cultivating said microorganisms in a medium comprising a chelating agent selected from the group consisting of ethylenediamine tetraacetic acid (EDTA), ethyleneglycol-bis (2-aminoethyl) tetraacetic acid (EGTA), hydroxyethylenediamine triacetic acid (HEDTA), diethylenetriaminepentaacetic acid (DTPA), nitrilotriacetate (NTA), triethylenetetraamine hexaacetic acid (TTHA), the salts thereof and o-phenanthroline, wherein the chelating agent concentration in the medium is 0.001 to 5 g/l.

5,149,652

FERMENTATION BROTH DEGASSIFICATION

Michael T. Seals, and Eugene H. Wegner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 181,358, Apr. 14, 1988, Pat. No. 4,952,509. This application May 29, 1990, Ser. No. 529,809

Int. Cl.[5] C12N *1/14;* C12M *1/21*

U.S. Cl. 435—246 10 Claims

1. A process for degassing a starting fermentation broth containing a dispersed gas phase in the form of bubbles and suspended cultured microorganisms comprising the steps of:

(a) providing a degassing apparatus comprising: a generally fluid-tight vessel defining a degassing zone, said degassing zone having a gravitationally upper portion and a gravitationally bottom portion; first spray nozzle means in flow communication with said upper portion and constructed so as to pass particulate bodies having an average particle size of at least about 0.0005 millimeters and to produce spray droplets having average sizes not greater than about 2.5 millimeters; vent means in flow communication with said upper portion; and recycle means providing flow communication between said bottom portion and said upper portion and including second spray nozzle means in flow communication with said upper portion and constructed so as to pass particulate bodies having an average particle size of at least about 0.0005 millimeters and to produce spray droplets having average sizes not greater than about 2.5 millimeters;

(b) charging a starting fermentation broth containing a dispersed gas phase in the form of bubbles and suspended microorganisms under a pressure of at least about 3 psig through said first spray nozzle means so as to form a first spray suspension, said first spray suspension having a bottom surface;

(c) coalescing said first spray suspension to form a bulk liquid phase in said bottom portion of said degassing zone, said bulk liquid phase having a gravitationally upper portion, a gravitationally bottom portion and an upper surface whereby said upper surface of said bulk liquid phase forms the bottom surface of said first spray suspension;

(d) directing said first spray suspension downewardly towards said upper surface;

(e) removing a first portion of said bulk liquid phase from said bottom portion of said degassing zone;

(f) pressurizing said first portion of said bulk liquid phase to from about 1 to 50 psig;

(g) discharging said first portion of said bulk liquid phase through said second spray nozzle means so as to form a second spray suspension; and

(h) coalescing said second spray suspension into said bulk liquid phase, said second spray suspension being directed towards said upper surface.

5,149,653

PRESERVATION OF VIRUSES

Bruce J. Roser, Balsham, Great Britain, assignor to Quadrant Bioresources Limited, Cambridge, Great Britain

PCT No. PCT/GB89/00047, § 371 Date Nov. 20, 1989, § 102(e) Date Nov. 20, 1989, PCT Pub. No. WO89/06542, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 18, 1989, Ser. No. 411,473

Claims priority, application United Kingdom, Jan. 21, 1989, 8801338

Int. Cl.[5] C12N *7/00, 1/04, 1/00*

U.S. Cl. 435—260 3 Claims

1. A method of preserving an infectious virion for subsequent reconstitution, the method comprising subjecting an aqueous system containing the infectious virion and trehalose to drying either in the frozen state or at ambient temperature so as to produce a preserved infectious virion, whereby upon rehydration said preserved infectious virion is a reconstituted infectious virion.

5,149,654

INCUBATION DEVICE FOR MICROTITER PLATES

Jürgen Gross, Hofheim am Taunus; Holger Pufahl, Frankfurt am Main; Dieter Sänger, Niedernhausen; Karl-Heinz Schaller, Schöneck, and Hugo Wilmes, Eschborn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 603,953

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1989, 3938565

Int. Cl.[5] C12M *1/38;* B65G *1/00*

U.S. Cl. 435—287 12 Claims

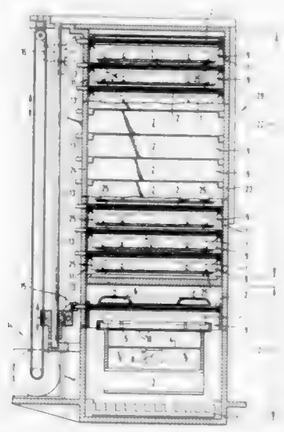
1. An incubation apparatus for microtiter plates, comprising:

a heating chamber for holding a microtiter plate and including a controllable hot air generator, a gate for closing the heating chamber off from the outside environment, air guide means for equalizing and distributing a stream of hot air to a microtiter plate disposed in the heating chamber, and return means for collecting and returning hot air form the microtiter plate to the hot air generator;

an incubation chamber located adjacent the heating chamber and, divided into a plurality of compartments by shelves for receiving microtiter plates, each compartment including a gate for closing the compartment off from the outside environment;

a plurality of heaters, each heater being associated with one of said compartments; and

gripping and transporting means having at least a portion extending between the heating chamber and incubation



chamber, having a vertically displaceable working platform and a horizontally displaceable gripping arm, the gripping and transporting means for moving a microtiter plate between the heating chamber and selected compartment of the incubation chamber.

5,149,655

APPARATUS FOR GENETIC TRANSFORMATION

Dennis E. McCabe, Middleton, and Brian J. Martinell, Madison, both of Wis., assignors to Agracetus, Inc., Middleton, Wis.

Filed Jun. 21, 1990, Ser. No. 541,563

Int. Cl.[5] C12M *1/00*

U.S. Cl. 435—287 10 Claims

6. An apparatus for performing a genetic transformation of a living organism by the acceleration of carrier particles comprising:

a support unit constructed and arranged so as to supply a motive force for accelerating carrier particles into the organism; and

hand-held means comprising a body member, a carrier sheet, and a retaining screen for retaining the carrier sheet attached to the body member, the body member having formed in it a discharge chamber constructed so as to generate a shock wave from said motive force and to direct shock wave therein toward the carrier sheet and constructed so as to hold the carrier sheet thereon in such a way that the shock wave will be applied to accelerate the carrier sheet, the retaining screen arranged so as to retain the carrier sheet after it is accelerated so that the carrier particles are separated therefrom; and

umbilical means for transmitting the motive force from the support unit to the hand-held unit.

5,149,656

MICROBIOLOGICAL ASSAY PAD AND KIT FOR SELECTIVE DETECTION OF TOXICANTS

Gabriel Bitton, and Ben Koopman, both of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Filed May 3, 1990, Ser. No. 518,686

Int. Cl.[5] C12M *1/40*

U.S. Cl. 435—288 13 Claims

1. An assay pad useful for detecting the presence of heavy metal toxicants in an environmental sample, said pad comprising one or more enzyme substrates selected from the group consisting of MUGA and CPRG which, when acted upon by an enzyme, are converted to compounds which can be detected on said pad.

5,149,657

***ESCHERICHIA COLI* EXPRESSION VECTOR ENCODING BIOADHESIVE PRECURSOR PROTEIN ANALOGS COMPRISING THREE TO TWENTY REPEATS OF THE DECAPEPTIDE (ALA-LYS-PRO-SER-TYR-PRO-PRO-THR-TYR-LYS)**

Kathy J. Maugh, Walnut, Calif., and David M. Anderson, Rockville, Md., assignors to Enzon Labs Inc., Gaithersburg, Md.

Continuation of Ser. No. 25,140, Mar. 12, 1987, which is a continuation-in-part of Ser. No. 671,967, Nov. 16, 1984, Pat. No. 4,798,791, and a continuation-in-part of Ser. No. 933,945, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 650,128, Sep. 13, 1984, abandoned. This application Feb. 8, 1991, Ser. No. 655,234

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] C12N *15/00, 1/21, 15/70, 15/62*

U.S. Cl. 435—320.1 2 Claims

1. An *E. coli* recombinant expression vector comprising plasmid pGX2287 and a DNA sequence of a bioadhesive precursor protein analog wherein said DNA sequence is selected from the group consisting of:

a. X_N where X=GCG AAA CCA AGT TAC CCA CCG ACC TAC AAA N=3 or 5 and G, A, T, and C represent the deoxyribonucleotides containing the bases guanine, adenine, thymine and cytosine, respectively;

b. X_5YX_5 where X, G, A, T, and C are as defined above and Y=ACG CCG GCC;

c. $X_5YX_5YX_5Y$ where X, Y, G, A, T, and C are as defined above; and

d. $X_5YX_5YX_5YX_5Y$ where X, Y, G, A, T, and C are as defined above;

and wherein expression of said DNA sequence in said *E. coli* is under the control of said plasmid's O_L/P_R promoter, and trpB ribosome binding site and translation initiation signal.

5,149,658

METHOD FOR THE SEPARATION AND/OR FORMATION OF IMMISCIBLE LIQUID STREAMS

Michael M. Cassaday, Valhalla; Vito F. Christiano, Somers, both of N.Y., and Bachalli Vasudeva, Princeton Junction, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

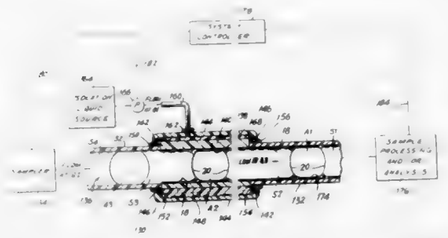
Division of Ser. No. 73,049, Jul. 14, 1987. This application Dec. 14, 1990, Ser. No. 628,804

Int. Cl.[5] G01N *35/08*

U.S. Cl. 436—53 18 Claims

14. In a method for the introduction of a liquid into a stream

of another liquid which is immiscible therewith and flowing in conduit means, said conduit means having a wall and an inlet end, said conduit means including an inner surface which is selectively wettable by one of said liquids to the substantial exclusion of the other of said liquids, the improvements comprising, the steps of, introducing said liquid through said conduit means wall into the stream of said another of said liquids



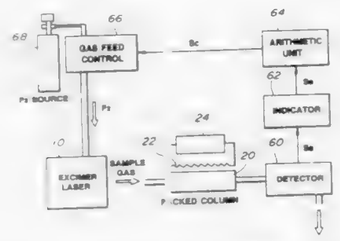
at a location within said conduit means downstream of said inlet end to from a common stream of said liquids therewithin, with said liquid which selectively wets said inner conduit means surface being preferentially attracted thereto to the substantial exclusion of the other of said liquids to form a liquid stream at said inner conduit means surface which substantially encapsulates the stream of the other of said liquids within said conduit means.

5,149,659

METHOD AND APPARATUS FOR ANALYZING FLUORINE CONTAINING GASES

Kohzo Hakuta, Fuchu; Minoru Yamamaki, Tokyo; Takashi Suenaga, Yamaguchi; Mitsuo Kodama, Ube; Hisaji Nakano, Ube, and Shinsuke Nakagawa, Ube all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Division of Ser. No. 330,898, Mar. 31, 1989, Pat. No. 5,017,499.
This application Mar. 5 1991, Ser. No. 666,691
Claims priority, application Japan, Mar. 31, 1988, 63-79088; Dec. 16, 1988, 63-317658; Dec. 27, 1988, 63-330115
Int. Cl.[5] G01N *31/00*; H01S *3/22*
U.S. Cl. 436—55 21 Claims



1. A method of controlling the concentration of fluorine in an excimer laser gas during operation of an excimer laser to thereby stabilize the output power of the laser, the method comprising the steps of:

(a) passing a sample of the laser gas extracted from the excimer laser through a packed column comprising a compound which has no halogen atom and reacts with fluorine gas to form a solid fluoride and at least one of molecular oxygen and carbon dioxide, said solid fluoride being retained in said packed column;

(b) measuring the concentration of said at least one of molecular oxygen and carbon dioxide in a gas flowing out of said packed column and producing an electrical signal representing the measured concentration of said at least one of molecular oxygen and carbon dioxide as an indication of the concentration of fluorine in the laser gas;

(c) making a computing operation using said electrical signal to find a deviation of the concentration of fluorine in the laser gas from a predetermined concentration and producing a control signal representing an appropriate amount of supply of fluorine to the laser gas in the laser for cancellation of said deviation; and

(d) regulating the supply of fluorine to the laser gas in the laser based on said control signal.

5,149,660

DIAGNOSTIC REAGENTS RELATING TO HERPES SIMPLEX VIRUS

Gary H. Cohen, Havertown, Pa., and Roselyn J. Eisenberg, Haddonfield, N.J., assignors to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 148,285, Jan. 29, 1988, abandoned, which is a continuation of Ser. No. 463,141, Feb. 4, 1983, Pat. No. 4,762,708, which is a continuation-in-part of Ser. No. 350,021, Feb. 18, 1982, abandoned. This application Jun. 10, 1991, Ser. No. 712,683
Int. Cl.[5] G01N *33/569*; C07K *15/04, 15/14*
U.S. Cl. 436—87 3 Claims

1. A diagnostic reagent for use in detection of Herpes simplex virus type 1 antibodies or Herpes simplex virus type 2 antibodies in a fluid sample comprising:

purified and isolated Herpes simplex virus envelope glycoprotein gD-1, purified by selective reversible binding to a monoclonal anti-gD antibody immunoadsorbent, or

an immunologically active fragment thereof, or

an immunologically active synthetic replica thereof; and,

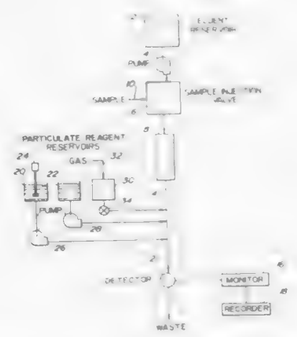
an immunologically acceptable carrier.

5,149,661

FLUID ANALYSIS WITH PARTICULATE REAGENT SUSPENSION

Douglas T. Gjerde, Saratoga, Calif., and James V. Benson, Reno, Nev., assignors to Sarasep, Inc., Saratoga, Calif.

Continuation-in-part of Ser. No. 204,073, Jun. 8, 1988, abandoned. This application May 26, 1989, Ser. No. 557,514
Int. Cl.[5] G01N *1/18, 35/08*
U.S. Cl. 436—178 11 Claims



1. In an analytical method for determining presence or concentration of original analyte in a solution comprising detecting a detectable dissolved substance in solution with a detecting means for determining the presence or concentration of the dissolved substance, the improvement comprising

a) mixing the solution with particulate reagent to form a flowable suspension, the particulate reagent modifying the solution to yield a concentration of total detectable substance which correlates with the concentration of original analyte while remaining insoluble, wherein the particulate reagent does not have bound thereto, an antibody, antibody binding fragment, or antigen selected for specific antibody binding reactions; and

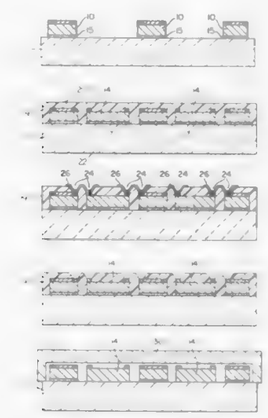
b) detecting the presence or concentration of the detectable dissolved substance in the solution with the detecting means.

5,149,662

METHODS FOR TESTING AND BURN-IN OF INTEGRATED CIRCUIT CHIPS

Charles W. Eichelberger, Schenectady, N.Y., assignor to Integrated System Assemblies Corporation, Schenectady, N.Y.

Division of Ser. No. 676,206, Mar. 27, 1991, Pat. No. 5,091,769.
This application Feb. 21, 1992, Ser. No. 839,920
Int. Cl.[5] H01L *21/66*
U.S. Cl. 437—8 34 Claims



1. A method for packing integrated circuit chips for testing, each of said integrated circuit chips to be packaged including at least one interconnection pad, said method comprising the steps of:

(a) disposing in predetermined pattern a plurality of spacer blocks on a substrate having a substantially flat upper surface, said spacer blocks being patterned to frame a multiplicity of distinct areas on said substrate's upper surface, at least one of said plurality of spacer blocks including a connection array for applying one of a biasing signal, power signal, ground signal and clock signal to selected chip interconnection pads, said at least one connection array having at least one interconnection pad;

(b) disposing a plurality of integrated circuit chips on said substrate, each of said chips being disposed in one of said areas framed by said spacer blocks such that each chip is bounded on at least one side by a spacer block;

(c) employing an encapsulant to completely surround said chips and said spacer blocks and said upper surface of said substrate so that any space between said chips and said spacer blocks is filled by said encapsulant material;

(d) providing a plurality of via openings in said encapsulant, said openings being disposed over at least some of said chip interconnection pads and said connection array interconnection pads; and

(e) providing a pattern of electrical conductors above said encapsulant such that said conductors extend to said via openings so as to electrically connect selected chip interconnection pads and connection array interconnection pads through said openings.

5,149,663

METHOD FOR MANUFACTURING A BI-CMOS SEMICONDUCTOR DEVICE

Sang H. Chai; Yong S. Koo; Kwang S. Kim, and Kee S. Nam, all of Daejeon, Rep. of Korea, assignors to Korean Electronics and Telecommunications, Rep. of Korea

Filed Oct. 21, 1991, Ser. No. 780,253
Claims priority, application Rep. of Korea, Oct. 22, 1990, 90-16866
Int. Cl.[5] H01L *21/70, 21/265*
U.S. Cl. 437—31 1 Claim

1. A method for manufacturing a Bi-CMOS device comprising the steps of:

(a) forming an N+ type huried layer upon a P type silicon substrate;

(b) growing an N type epitaxial layer upon it;

(c) depositing an oxide film and carrying out a masking process for defining a P well;

(d) implanting and diffusing an impurity down to the N type epitaxial layer in order to form a P well;

(e) removing the oxide film only on the P well and N type epitaxial layer;

(f) growing an oxide, and depositing a nitride film on the oxide film upon the P well and N type epitaxial layer;

(g) defining device active regions by means of an active region mask;

(h) ion-implanting an impurity by means of a field mask in order to form P+ junction isolation regions;

(i) growing an oxide film to form device isolation regions by means of an oxide isolation process;

(j) growing a gate oxide film of CMOS transistor after removal of the oxide film and nitride film;

(k) ion-implanting an impurity in order to form base and collector of bipolar transistor after removing the gate oxide film of the regions corresponding to the base and collector of the bipolar transistor;

(l) forming N+ type polysilicon on the N type epitaxial layer corresponding to region in which the emitter of the bipolar transistor is formed and on the gate oxide film corresponding to regions in which gates of the CMOS transistor are formed, and sequentially depositing an oxide film and a first nitride film for defining the emitter and collector of the bipolar transistor and the gates of the CMOS transistor;

(m) sequentially depositing an oxide film and a second nitride film at side walls of the N+ type polysilicon;

(n) etching exposed portions of the N+ epitaxial layer up to determined depth and depositing a third nitride film at side portions of the second nitride film;

(o) depositing an oxide film on the etched portions of the epitaxial layer; and

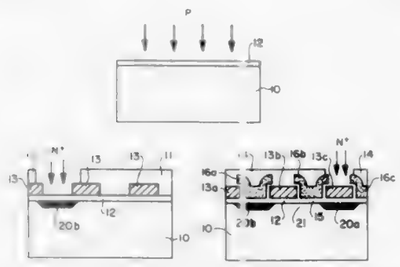
(p) implanting impurities to portions of the epitaxial layer exposed by removal of the second and third nitride film in order to make base region of the bipolar transistor and source/drain regions of a PMOS transistor P+type, and to make source/drain regions of an NMOS transistor N+type.

5,149,664

SELF-ALIGNING ION-IMPLANTATION METHOD FOR SEMICONDUCTOR DEVICE HAVING MULTI-GATE TYPE MOS TRANSISTOR STRUCTURE

Yun-seung Shin, and Soo-Cheol Lee, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Sep. 18, 1989, Ser. No. 408,649
Int. Cl.[5] H01L *21/255, 21/28*
U.S. Cl. 437—41 **17 Claims**



1. A self-aligning ion-implantation method for semiconductor devices comprising a plurality of first gate electrode layers and a plurality of second gate electrode layers arranged alternately and mutually insulatedly on channel regions located between drain regions and source regions of a semiconductor substrate so that said layers constitute a multigate type MOS transistor structure, comprising the steps of:

forming said first gate electrode layers at uniform intervals on said channel regions in such a manner as to be electrically insulated from said substrate;

ion-implanting an impurity having a conduction type different from that of said substrate into selected ones of said channel regions located between said first gate electrode layers;

forming said second gate electrode layers on said channel regions located between said first gate electrode layers in such a manner as to be electrically insulated from said substrate and said first gate electrode layers, and in such a manner as for the peripheral portions of said second gate electrode layers to be overlapped with the peripheral portions of said first gate electrode layers, at least one of said second gate electrode layers being disposed above said selected channel regions doped with the impurity; and

ion-implanting an impurity having a conduction type different from that of said substrate through said first gate electrode layers into selected others of said channel regions located below said first gate electrode layers, whereby the impurity is ion-implanted in a self-aligned manner due to adjacent ones of said second gate electrode layers.

5,149,665

CONDUCTIVE SOURCE LINE FOR HIGH DENSITY PROGRAMMABLE READ-ONLY MEMORY APPLICATIONS

Ruojia Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jul. 10, 1991, Ser. No. 727,702
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—43 **10 Claims**

1. A method of forming a semiconductor memory device, comprising the steps of:

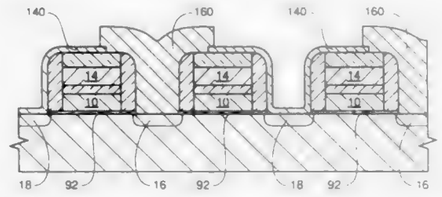
a) forming a first insulation layer over a substrate, said first insulation layer comprising alternating rows of field and gate insulation;

b) forming a first conductive layer over said first insulation layer, said first conductive layer comprising conductive rows overlying and parallel with said gate insulation;

c) forming a second insulation layer over said first conductive layer;

d) forming a second conductive layer over said second insulation layer;

e) removing portions of said second conductive layer to form word lines which are perpendicular with said field insulation;



f) removing portions of said conductive rows to form floating gates at the junctions of said word lines and said gate insulation;

g) removing portions of said gate insulation which are not protected by said word lines thereby forming areas of exposed substrate segmented in the row direction by said gate insulation and in the column direction by said field insulation; and

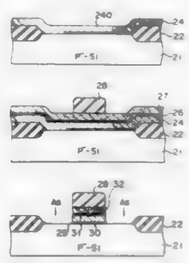
h) changing the electrical properties of said exposed substrate areas to form source and drain regions.

5,149,666

METHOD OF MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE HAVING A FLOATING GATE ELECTRODE COMPOSED OF 2–10 SILICON GRAINS

Yuuichi Mikata, and Toshiro Usami, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 622,148, Dec. 3, 1990, Pat. No. 5,031,010, which is a continuation of Ser. No. 453,109, Dec. 22, 1989, abandoned, which is a continuation of Ser. No. 138,608, Dec. 29, 1987, abandoned. This application Apr. 15, 1991, Ser. No. 684,870
Claims priority, application Japan, Jan. 7, 1987, 62-593
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—43 **4 Claims**



1. A method of manufacturing a semiconductor memory device comprising the steps of:

forming an insulation film on a silicon substrate;

removing a predetermined portion of said insulation film, said predetermined portion of said insulation film being on at least one of the drain and source forming regions of a semiconductor memory device having a floating gate structure;

forming a silicon layer on said silicon substrate by an epitaxial growth process, said silicon layer having a portion which extends on said insulation film and comprising 2 to 10 silicon grains; and

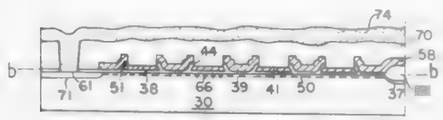
removing a predetermined portion of said silicon layer to form a portion thereof which is separated from said substrate, said separated portion of said silicon layer constituting a floating gate electrode of said semiconductor memory device.

5,149,667

MASK ROM DEVICE HAVING DOUBLE POLYCRYSTALLINE SILICONE AND PROCESS FOR PRODUCING THE SAME

Jeongdal Choi, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Division of Ser. No. 490,746, Mar. 8, 1990, abandoned. This application Aug. 31, 1990, Ser. No. 576,594
Claims priority, application Rep. of Korea, May 31, 1989, 89-7341
Int. Cl.[5] H01L *21/70, 27/00*
U.S. Cl. 437—52 **6 Claims**



1. In a process for producing a mask ROM device having a NAND type memory cell and having a high integration double polycrystalline silicon the steps comprising:

sequentially forming a pad oxide film and a nitride film on a first conductive type semiconductor substrate and then etching a predetermined region of the nitride film and ion-implanting first conductive type impurities into said substrate thereby forming an ion-implantation region;

forming a field oxide film on said ion-implantation region, removing said nitride film and ion-implanting second conductive type impurities thereby forming a depletion type channel;

removing the pad oxide film and forming sequentially a first gate oxide film, a first gate electrode substance, an oxide film, a nitride film and an LTO film on the substrate and the field oxide film;

etching a predetermined region of said LTO film, nitride film and oxide film, thereby forming a first gate electrode and exposing the substrate;

forming a second gate oxide film on said exposed substrate and LTO film and forming a spacer at the side surface of said first gate electrode;

depositing a second gate electrode substance on the second gate oxide film, the spacer and the LTO film;

sequentially etching said second gate electrode substance, LTO film, nitride film and oxide film on said LTO film thereby forming a second gate electrode;

etching a part of a predetermined second gate electrode of said second gate electrode, depositing a photoresist and forming an opening for an ion-implantation into a selected memory cell;

ion-implanting said first conductive type impurities into the selected memory cell thereby programming into a compensated enhancement type channel; and

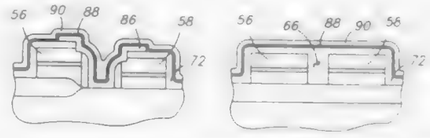
forming source and drain regions by ion-implanting said second conductive type impurities into the substrate to be formed source and drain regions, and then forming an insulating film on the whole surface of the second gate oxide film, the first gate electrode and the second gate electrode, and forming a connection opening on said second conductive type diffusion region, and forming a metal film for a bit line.

5,149,668

METHOD OF PREVENTING STORAGE NODE TO STORAGE NODE SHORTS IN FABRICATION OF MEMORY INTEGRATED CIRCUITRY HAVING STACKED CAPACITORS AND STACKED CAPACITOR MEMORY INTEGRATED CIRCUITS

Howard E. Rhodes, and Tyler A. Lowrey, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Nov. 19, 1991, Ser. No. 795,338
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **8 Claims**



1. A semiconductor processing method of fabricating memory integrated circuitry having stacked capacitors, the method comprising the following steps:

fabricating a semiconductor wafer to provide a pair of adjacent, substantially parallel and spaced word lines and to define regions for formation of stacked storage node capacitors and buried contacts therefor, the individual stacked capacitors overlapping the pair of adjacent word lines;

the pair of adjacent word lines including first separation regions therebetween within which storage node capacitors and respective buried contacts are provided, the pair of adjacent word lines including second separation regions therebetween, the first and second separation regions alternating relative to one another between and along the substantially parallel and separated word lines, the first separation regions having a first separation distance which defines the spacing between the pair of word lines in the first separation regions, the second separation regions having a second separation distance which defines the spacing between the pair of word lines in the second separation regions, the second separation distance being less than the first separation distance;

providing an insulating layer to a first selected thickness atop the wafer and between the pair of word lines, the first selected thickness being greater than one-half the second separation distance to fill the second separation regions between the pair of word lines with insulating material, the first selected thickness being less than one-half the first separation distance to provide a space within the first separation regions between the pair of word lines, the space having a width;

selectively removing portions of the insulating layer within the first separation regions to define buried contacts to underlying substrate;

depositing a layer of conductive material to a second selected thickness atop the wafer and within the space;

patterning the layer of conductive material to define lower storage node capacitor plates; and

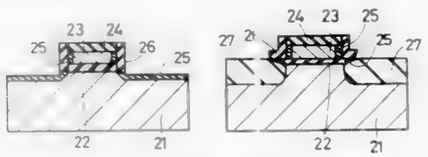
providing a capacitor dielectric and upper storage node capacitor plates above the lower storage node capacitor plates.

5,149,669

METHOD OF FORMING AN ISOLATION REGION IN A SEMICONDUCTOR DEVICE

Takashi Hosaka, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Mar. 4, 1988, Ser. No. 164,431
Claims priority, application Japan Mar. 6, 1987, 62-51269; Mar. 6, 1987, 62-51270
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—72 2 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

forming an insulating film on a surface of a semiconductor substrate;

providing a masking layer for preventing oxidation of the underlying semiconductor substrate surface, said masking layer comprising a polycrystalline silicon film directly disposed on the insulating film and a silicon nitride film covering upper and side walls of the polycrystalline silicon film, the masking layer being formed by

forming the polycrystalline silicon film on the insulating film,

forming a first silicon nitride film on the polycrystalline silicon film,

successively subjecting the first silicon nitride film, the polycrystalline silicon film and the semiconductor substrate to selective etching,

oxidizing the semiconductor substrate to form an oxide film on the sides of the polycrystalline silicon film and the surface of the semiconductor substrate,

depositing a second silicon nitride film on the surface of the exposed portion of the semiconductor substrate, and

subjecting the second silicon nitride film to anisotropic etching to form side wall spacers of the second silicon nitride film on the sides of the polycrystalline silicon film;

subjecting the semiconductor substrate to an oxidation treatment to form an oxide film by selective oxidation of the semiconductor surface parts not masked by the masking layer; and

forming an element isolation region defined by the oxide film by removing the masking layer and the insulating film;

wherein the extent to which the semiconductor substrate is etched during formation of the masking layer is from 0.4 to 0.6 of the thickness of the oxide film which defines the element isolation region.

5,149,670

METHOD FOR PRODUCING SEMICONDUCTOR LIGHT EMITTING DEVICE

Kunihiko Isshiki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 7, 1991, Ser. No. 712,909
Claims priority, application Japan, Oct. 26, 1990, 2-288882
Int. Cl.[5] H01L *21/20, 21/203, 21/265, 21/30*
U.S. Cl. 437—129 15 Claims

1. A method for producing a semiconductor light emitting device comprising the steps of:

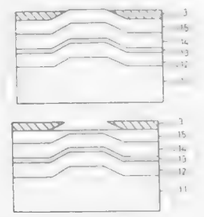
forming a stripe-shaped mesa on a surface of a semiconductor substrate;

epitaxially growing a multiple layer structure including at least a first cladding layer, an active layer, a second cladding layer, and a cap layer on said semiconductor substrate so that said active layer and cap layer have stripe-shaped mesas corresponding to the mesa of said substrate;

depositing photoresist on said cap layer to provide a flattened surface;

removing said photoresist to expose said mesa of said cap layer;

removing a portion of said cap layer using the photoresist remaining on said cap layer as a mask to make said cap layer approximately flat;



depositing a thin film to be used as a mask for ion bombardment on said cap layer and on the remaining photoresist;

removing the remaining photoresist together with the thin film disposed on the remaining photoresist; and

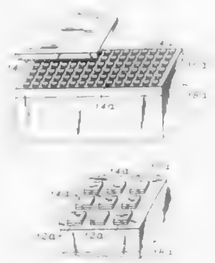
bombarding the cap layer with ions using the remaining thin film on said cap layer as a mask to produce higher resistivity regions adjacent the remaining thin film than directly below the remaining thin film.

5,149,671

METHOD FOR FORMING MULTILAYER INDIUM BUMP CONTACT

Wei Koh, Irvine, and Wayne D. Kuipers, Mission Viejo, both of Calif., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 3, 1990, Ser. No. 620,734
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—183 2 Claims



1. A method for connecting an infrared detector array to signal conditioning electronics, the method comprising the steps of:

a) forming an array of square multilayer bump contacts upon an insulating substrate, the step of forming the array comprising the steps of:

i) forming a layer of resist material upon the insulating substrate, the layer of resist material defining an array of uncovered square area;

ii) forming a conductive layer upon the resist layer and uncovered square areas;

iii) forming a layer of indium upon the conductive layer;

iv) removing the layer of resist and any of the conductive layer and indium layer formed upon the resist from the substrate, the remaining portions of the conductive layer and the indium layer defining an array of square bump contacts, the indium layer covering the conductive layer such that the surface area of the indium layer is equal to the surface area of the conductive layer;

v) forming conductive conduits through the insulating substrate form providing electrical communication between the multilayer bump contacts and the signal conditioning electronics; and

b) bump bonding hemispherical indium bump contacts formed upon the infrared detector array to corresponding square bump contacts formed upon the insulating substrate;

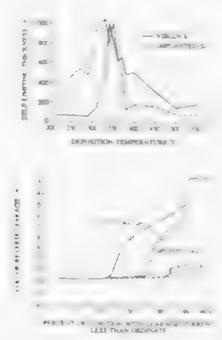
c) wherein the bump bonding of the hemispherical indium bump contacts formed upon the infrared detector array to the corresponding square bump contacts formed upon the substrate mitigates the problem of misalignment by reducing the precision with which the infrared detector array and the array of multilayer bump contacts must be aligned during the bump bonding process.

5,149,672

PROCESS FOR FABRICATING INTEGRATED CIRCUITS HAVING SHALLOW JUNCTIONS

Nadia Lifshitz, 1591 Longhill Rd., Millington, N.J. 07946, and Ronald J. Schutz, 14 Upper Warren Way, Warren, N.J. 07060

Continuation of Ser. No. 617,464, Nov. 19, 1990, which is a continuation of Ser. No. 226,917, Aug. 1, 1988, abandoned. This application Aug. 29, 1991, Ser. No. 754,361
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—189 6 Claims



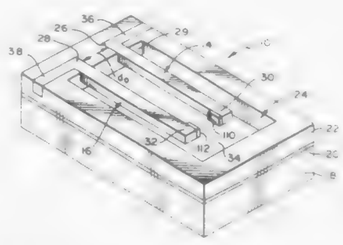
1. A process for fabricating a semiconductor device comprising the steps of treating a substrate by forming a passage through a region overlying a device junction, depositing a material over at least a portion of said region to form an electrical contact to said junction together with an electrical conducting region on the surface of said overlying region and progressing towards completing said device, characterized in that said passage has an aspect ratio of at least 1.1, said junction has a depth shallower than 2500 Å, and said electrical contact and said conductive region on said surface comprises a deposition of 1) a material that presents a barrier to the solid-state diffusion of tungsten and 2) a deposition of tungsten by interaction of said substrate with a deposition comprising WF_6 entities and a reducing agent wherein said substrate is heated to a deposition temperature in the range 250° C. to 600° C. during said tungsten deposition wherein said deposition temperature and environment is controlled such that said interaction is self-limiting with a self-limiting thickness less than said junction depth and wherein said deposition temperature is chosen such that the yield of said junctions decrease not more than 10% compared to the yield obtained for the same function having a via aspect ratio of 0.75 and having a contact of only aluminum.

5,149,673

SELECTIVE CHEMICAL VAPOR DEPOSITION OF TUNGSTEN FOR MICRODYNAMIC STRUCTURES

Noel C. MacDonald; Liang-Yuh Chen, and Zuoying L. Zhang, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 313,206, Feb. 21, 1989, Pat. No. 5,072,288. This application Sep. 19, 1991, Ser. No. 762,492
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—192 14 Claims



1. A method of forming a microdynamic structure, comprising:

forming on a top surface of a substrate wafer a first dielectric layer; forming a second layer of silicon dioxide on a top surface of said first layer to produce a composite dielectric wafer;

patterning and etching said composite dielectric wafer to produce at least one channel in said wafer, said channel extending partially through said second layer and having a bottom wall in said silicon dioxide layer, the bottom wall being spaced above said top surface of said first layer;

implanting silicon in said silicon dioxide bottom wall of said channel;

selectively depositing a refractory metal in said channel to fill said channel;

depositing an isolation mask on said first layer to and on said refractory metal to mask said refractory metal in said channel;

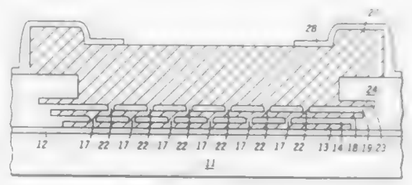
etching said silicon dioxide layer in the region surrounding at least a part of said metal-filled channel to produce a cavity and to free said metal to provide a cantilever beam extending into said cavity.

5,149,674

METHOD FOR MAKING A PLANAR MULTI-LAYER METAL BONDING PAD

John L. Freeman, Jr., Mesa, and Clarence J. Tracy, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1991, Ser. No. 716,454
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—195 9 Claims



6. A method for planarizing a multiple layer metal pad comprising:

providing a first metal layer;

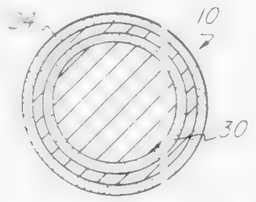
providing a first dielectric with a multitude of vias that cover the first metal layer;
providing a second metal layer that covers the multitude of vias, thereby filling the multitude of vias, making electrical contact between the first metal layer and the second metal layer, as well as planarizing the second metal layer;
providing a second dielectric with a multitude of vias that cover the second metal layer, thereby exposing the second metal layer through the multitude of vias;
providing a third metal layer that covers the multitude of vias of the second dielectric, thereby filling the multitude of vias, making electrical contact between the second and third metal layer, as well as planarizing the third metal layer;
providing a final dielectric layer with a single opening that exposes the third metal layer; and
providing a final metal layer that covers the single opening, thereby filling the single opening and making electrical contact to the third metal layer.

5,149,675

RING CRYSTALLIZATION OF WAFERS TO PREVENT THERMAL SHOCK

Kendall S. Wills, Houston; Paul A. Rodriguez, Lewisville, and Melvin L. Brewer, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1990, Ser. No. 636,314
Int. Cl.[5] C30B 13/00
U.S. Cl. 437—248 **6 Claims**



1. A method of preventing breakage of a single crystal wafer due to thermal shock, comprising the steps of:
controlling and maintaining said wafer at a level temperature;
heating the edge of the wafer with a localized heating source until a molten pool of material develops, followed immediately by rapid cooling of the molten pool; and
rotation of said wafer and/or said localized heating source, concurrent with said heating and said rapid cooling, until a ring of polycrystalline material is formed around said edge of said wafer.

5,149,676

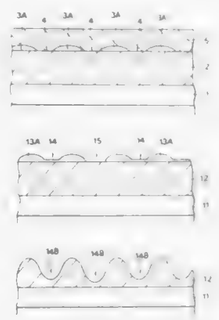
SILICON LAYER HAVING INCREASED SURFACE AREA AND METHOD FOR MANUFACTURING

Jae K. Kim, and In S. Chung, both of Kyungki, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki, Rep. of Korea

Filed Jun. 18, 1991, Ser. No. 716,901
Claims priority, application Rep. of Korea, Jun. 22, 1990, 90-9260
Int. Cl.[5] H01C 21/465
U.S. Cl. 437—228 **21 Claims**

1. A process for manufacturing a granulated silicon layer on a substrate, the method comprising:
sequentially depositing a first insulating layer, a first silicon layer and a second insulating layer on the substrate;
performing an ion-implanting process on the second insulating layer;
depositing a second silicon layer on the second insulating layer which simultaneously unevenly etches away the second insulating layer forming a plurality of pin holes in the second insulating layer to expose the first silicon layer thereunder at each pin hole;
etching the second silicon layer to expose the second insulating layer and the first silicon layer exposed at each pin hole of the plurality of pin holes formed in the second insulating layer;
etching the first silicon layer exposed by the plurality of pin holes in the second insulating layer to form a plurality of cavities in the first silicon layer; and
removing the second insulating layer while simultaneously deepening each cavity of the plurality of cavities to form a granulated silicon layer.

12. A process for manufacturing a granulated silicon layer on a substrate, the method comprising:
sequentially depositing a first insulating layer and a first silicon layer on the surface of the substrate;



depositing a second insulating layer on the first silicon layer;
performing an ion-implanting process on the second insulating layer deposited on the first silicon layer;
etching the second insulating layer to unevenly erode the second insulating layer such that the thickness of the second insulating layer varies and a plurality of pin holes is formed in the second insulating layer with each hole exposing a portion of the first silicon layer;
etching the first silicon layer exposed by the plurality of pin holes in the second insulating layer to form a plurality of cavities in the first silicon layer, and further etching the unevenly eroded second insulating layer; and
selectively etching the plurality of cavities formed in first silicon layer to deepen each cavity and to remove the second insulating layer to form a granulated silicon layer.

5,149,677

EXOTHERMIC PROCESS FOR THE PRODUCTION OF MOLYBDENUM SILICIDE COMPOSITES

Alexandr G. Merzhanov, ulitsa Tretya, 3, kv.2; Alexandr M. Stolin, Institutsky prospekt, 6, kv. 86; Leonid M. Buchatsky, ulitsa Lesnaya, 5, kv. 99, and Sergei V. Vedeneev, proezd Stroitelei, 4, kv. 48, all of, Moskovskaya oblast, poselok Chernogolovka, U.S.S.R.

Continuation of PCT/SU89/00181, Jun. 30, 1989. This application Apr. 30, 1991, Ser. No. 696,553
Int. Cl.[5] L04B 35/58
U.S. Cl. 501—96 **4 Claims**

1. A method of producing a ceramic composite material comprising molybdenum silicide, aluminum oxide, and $Al_xSi_yO_z$, where: x=2.6, y=3.6, z=5.13 characterized in that an exothermic mixture of the following composition (wt %) is formed:

silicon	29–38
molybdenum (VI) oxide	7–42
aluminium	3–16
molybdenum	13–52

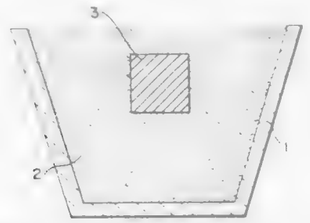
heat treatment of the said mixture is conducted in a combustion mode, followed by compaction of the obtained combustion products by way of at least two-stage compression with a degree of deformation within 0.75 to 0.90 at each stage, at a temperature within 1500° to 1900° C.

5,149,678

METHOD OF MODIFYING CERAMIC COMPOSITE BODIES BY A POST-TREATMENT PROCESS AND ARTICLES PRODUCED THEREBY

Terry D. Claar; William B. Johnson, both of Newark, Del., and Robert A. Rapp, Columbus, Ohio, assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 296,966, Jan. 13, 1989, Pat. No. 5,004,714.
This application Jul. 12, 1990, Ser. No. 551,487
The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.
Int. Cl.[5] C04B 35/10
U.S. Cl. 501—134 **20 Claims**



1. A method of producing a self-supporting body comprising producing a first composite body by:
selecting a parent metal;
heating said parent metal in a substantially inert atmosphere to a temperature sufficient to permit infiltration of molten parent metal into a mass comprising at least one boron donor material and at least one carbon donor material and reacting molten parent metal with said mass to form at least one parent metal boron-containing compound;
continuing said infiltration reaction for a time sufficient to produce said first composite body comprising at least one parent metal boron-containing compound; and
contacting at least a portion of said first composite body with a source of a second metal for a predetermined time at a predetermined temperature, thereby reacting a least a portion of said first composite body with said source of a second metal to form said self-supporting body.

5,149,679

GALLIUM-CONTAINING ZEOLITE CATALYSTS

Geoffrey L. Price, Baton Rouge, La.; Vladislav I. Kanazirev, Sofia, Bulgaria, and Kerry M. Dooley, Baton Rouge, La., assignors to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed May 1, 1990, Ser. No. 517,334
Int. Cl.[5] B01J 29/06, 23/08
U.S. Cl. 502—61 **19 Claims**

1. A catalyst prepared by the step of making an intimate mechanical mixture of:
(a) a zeolite with a pore mouth comprising 10 oxygen atoms; and
(b) a compound comprising gallium;
wherein gallium has been transported into the zeolite structure at a cation site.

4. A catalyst as recited in claim 1, wherein said compound is selected from the group consisting a gallium salts, alkali metal gallates, gallium oxide, and gallium suboxide.

11. A catalyst prepared by making an intimate mechanical mixture of:
(a) a zeolite with a pore mouth comprising 10 oxygen atom; and
(b) a compound comprising gallium;
wherein said zeolite has at least one cation site comprising gallium (I).

5,149,680

PLATINUM GROUP METAL ALLOY CATALYSTS FOR HYDROGENATION OF CARBOXYLIC ACIDS AND THEIR ANHYDRIDES TO ALCOHOLS AND/OR ESTERS

Melanie Kitson, and Peter S. Williams, both of Hull, England, assignors to The British Petroleum Company p.l.c., London, England

Division of Ser. No. 282,312, Nov. 21, 1989, Pat. No. 4,985,572.
This application Nov. 19, 1990, Ser. No. 615,395
Claims priority, application United Kingdom, Mar. 31, 1987, 8707595
Int. Cl.[5] B01J 23/64, 23/54, 21/18
U.S. Cl. 502—185 **16 Claims**

1. A catalyst composition comprising an admixture of component (A) comprising an alloy of (i) at least one noble metal of Group VIII of the Periodic Table of the elements and (ii) at least one metal capable of alloying with the aforesaid Group VIII noble metal admixed with component (B) comprising at least one of the metals rhenium, tungsten and molybdenum.

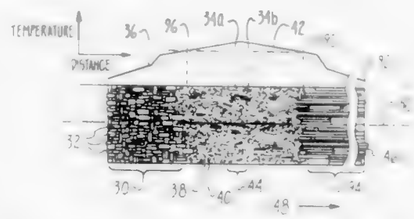
7. A catalyst composition comprising component (A) comprising an alloy of (i) at least one noble metal of Group VIII of the Periodic Table of the elements and (ii) at least one metal capable of alloying with the aforesaid Group VIII noble metal and a support component (C) comprising a high surface area graphitised carbon having a BET surface area of at least 300 m^2/g; a ratio of BET to basal plane surface area of not greater than 4:1; and a ratio of basal plane surface area to edge surface area of at least 10:1, said graphitised carbon having been prepared by the successive steps of (1) heating a carbon material in an inert atmosphere at a temperature of from 900° to 3300° C., (2) oxidising the carbon at a temperature between 300° C. and 1200° C. and (3) heating in an inert atmosphere at a temperature of between 900° C. and 3000° C.

5,149,681

MELT TEXTURING OF LONG SUPERCONDUCTOR FIBERS

Tihiro Ohkawa, La Jolla; Richard B. Stephens, and Albert J. Lieber, both of Del Mar, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed May 14, 1990, Ser. No. 523,221
Int. Cl.[5] B32B 9/00
U.S. Cl. 505—1 **24 Claims**



1. A superconductive wire including a ceramic superconductor coating and a continuous elongated wire substrate supporting said coating and having an elongated dimension and a dimension perpendicular to said elongated dimension, said superconductive wire prepared by a process which comprises the steps of:

(A) Providing a continuous elongated polycrystalline wire substrate having a radially curved surface and a plurality of randomly aligned crystal facets on said surface, wherein said substrate is formed from a metal or a metal alloy selected from the group consisting of nickel, iron, chromium, aluminum, manganese, magnesium, titanium, and mixtures thereof, said metal alloy optionally including up to 4.4% by weight of silicon;

(B) Depositing a superconductor coating on said substrate, wherein said superconductor coating is selected from a group consisting of bismuth-based superconductors, thallium-based superconductors, and rare earth-based superconductors having the generalized formula RE $Ba_2Cu_3O_{7-x}$ where RE is a rare earth element and x is between about 0 and 0.5, rare earth-based superconductors having the generalized formula RE $Ba_2Cu_4O_8$, and mixtures thereof;

(C) Continuously drawing said coated wire substrate along said elongated dimension through a heating zone at a drawing rate of up to about one meter per hour to heat contiguous portions of said ceramic superconductor coating;

(D) Heating said portion of said superconductor coating in said heating zone to an elevated temperature about equal to or greater than the peritectic temperature of said ceramic superconductor coating, said heating being substantially uniform across said dimension perpendicular to said elongated dimension of said substrate;

(E) Withdrawing said portion of said heated superconductor coating from said heating zone at said drawing rate to establish a temperature gradient along said elongated dimension of said substrate and said superconductor coating coated thereon; and

(F) Cooling said superconductor coating to below said elevated temperature to thereby facilitate growth of superconducting ceramic crystalline grains in said superconductor coating and to grow said grains in a direction substantially parallel to said elongated dimension of said substrate resulting in said superconductive wire.

5,149,683

METHOD FOR PRODUCING OXIDE SUPERCONDUCTOR

Takahiro Wada; Nobuo Suzuki; Ataru Ichinose; Yuji Yaegashi; Hisao Yamauchi, and Shoji Tanaka, all of Tokyo, assignors to Matsushita Electric Industrial Co., Ltd., Osaka; The Tokyo Electric Power Co., Inc.; Central Research Institute of Electric Power Industry, both of Tokyo; Tohoku Electric Power Co., Inc., Miyagi and International Superconductivity Technology Center, Tokyo, all of, Japan

Filed Feb. 11, 1991, Ser. No. 659,637

Claims priority, application Japan, Feb. 19, 1990, 2-038085

Int. Cl.[5] H01B *12/06;* **C01G** *3/00;* **C04B** *41/89;* **H01L** *39/12*

U.S. Cl. 505—1 **3 Claims**

1. A method for producing an oxide superconductor expressed by a chemical composition formula of $(R_{1-x}Ca_x)(BA_{1-y}Sr_y)_2Cu_4O_8$, comprising reacting, by heating, a first material expressed by $(R_{1-x}Ca_x)(BA_{1-y}Sr_y)_2Cu_3O_{7-z}$ and a Cu material, wherein R stands for one or more rare earth elements selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, and Yb, and wherein $0.001 \leqq x \leqq 0.25$, $0 \leqq y \leqq 0.5$, and $0 \leqq z \leqq 1$.

5,149,684

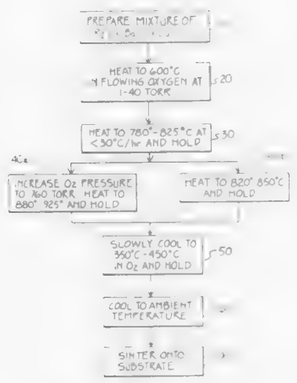
PRODUCTION OF A SUPERCONDUCTOR POWDER HAVING A NARROW MELTING TRANSITION WIDTH USING A CONTROLLED OXYGEN ATMOSPHERE

Lawrence D. Woolf, Carlsbad; Frederick H. Elsner, Cardiff, and Clyde H. Shearer, Santee, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Apr. 9, 1991, Ser. No. 682 552

Int. Cl.[5] C01D *11/02, 11/00;* **C01G** *3/02*

U.S. Cl. 505—1 **11 Claims**



1. A process for producing a superconductor powder comprising:

(a) providing a mixture of finely divided R_2O_3, $BaCO_3$ and CuO in stoichiometric proportions wherein the ratio of R-Ba-Cu in said mixture is about 1-2-3 and R is selected from the group consisting of yttrium, elements having an atomic number between 57 and 71 inclusive, and mixtures thereof;

(b) heating said mixture to a preheat temperature in oxygen at an initial oxygen partial pressure between about 1 and 40 torr;

(c) heating said mixture from said preheat temperature to a plateau temperature greater than said preheat temperature at a heating rate less than about 30° C. per hour and at said initial oxygen partial pressure, said plateau temperature between about 780° C. and 825° C.;

(d) maintaining said mixture at said plateau temperature and said initial oxygen partial pressure for a time sufficient to calcine said mixture to a superconductor powder having a formula $R_1Ba_2Cu_3O_{7-x}$ wherein x is between about −1 and 1;

(e) increasing oxygen partial pressure to between about 200 and about 800 torr above said initial oxygen partial pressure;

(f) heating said superconductor powder to an increased temperature between about 880° C. and 925° C. at said increased oxygen partial pressure; and

(g) maintaining said superconductor powder at said increased temperature and said increased oxygen partial pressure for a time sufficient to reduce the melting transition width of said superconductor powder.

5,149,68[illegible]

MANUFACTURING METHOD FOR SUPERCONDUCTING CERAMICS AND PRODUCTS THEREOF

Nicholas D. Spencer, Washington, D.C.; Wie H. Pan, Columbia, and John Rudesill, Baltimore, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 095,083, Sep. 11, 1987, abandoned. This application Feb. 12, 1988, Ser. No. 155,340

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] H01L *39/1[illegible]* **C01F** *17/00*

U.S. Cl. 505—1 **16 Claims**

1. Process comprising introducing simultaneously into a stirred reaction medium comprising a pool of water a first solution comprising carbonate ions from quaternary ammonium carbonate, and a second solution comprising L.M.A. metal ions to form a slurry comprising precipitates of the respective metal carbonates, and recovering and drying the precipitates; L being at least one trivalent metal, M being at least one bivalent metal, and A being at least one metal of multiple valency; and L, M, and A being present in a predetermined atomic ratio for a superconductor.

X is then preset at the electron-conducting contact on the ion conductor side and

(4) finally the content of the electronegative component X in the ion lattice of the superconductor is adjusted by applying a constant voltage at a temperature of less than 400° C until the current flow reaches zero.

5,149,686

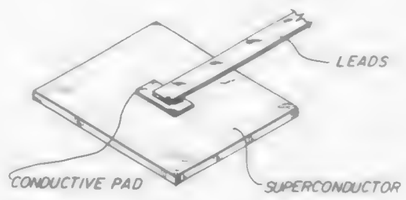
HIGH-T_c SUPERCONDUCTING UNIT HAVING LOW CONTACT SURFACE RESISTIVITY

John W. Ekin, Boulder, Colo.; Armand J. Panson, and Betty A. Blankenship, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 117,259, Nov. 6, 1987, Pat. No. 4,963,523. This application Oct. 16, 1990, Ser. No. 598,483

Int. Cl.[5] C04B *35/00;* **H01R** *4/00;* **H01B** *12/00*

U.S. Cl. 505—1 **13 Claims**



1. A superconducting unit, comprising:

a superconductor formed from high-T_c superconducting material and having at least one surface in a substantially non-degraded state;

an electrically conductive pad formed from an metal inert from oxidation with said pad having first and second surface portions, said first surface portion being in contact with said substantially non-degraded superconductor surface so that a low contact resistivity exists between the contact pad and the superconductor; and

electrically conductive means connected with said second surface portion of said pad to enable transmission of electric current at high current densities between said superconducting unit and a second unit through said electrically conductive means and said electrically conductive pad.

5,149,685

ADJUSTING THE TRANSITION TEMPERATURE, THE SATURATION CURRENT DENSITY WITH AND WITHOUT A MAGNETIC FIELD AND THE PROPORTIONS OF NORMALLY CONDUCTING PHASES OF CERAMIC SUPERCONDUCTORS

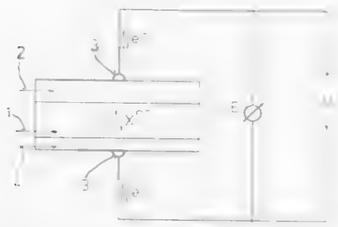
Wolfgang Goepel, Tuebingen, and Hans-Dieter Wiemhoefer, Eningen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 26, 1988, Ser. No. 262,979

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736301

Int. Cl.[5] H01L *39/00, 39/12*

U.S. Cl. 505—1 **4 Claims**



1. A method for adjusting the transition temperature, the saturation current density with and without a magnetic field and the proportions of normally conducting phases in ceramic superconductors having a structure derived from perovskite, by changing the content of one or more of the electronegative components throughout the entire ion lattice of the superconductor, by a non-stoichiometric amount, wherein

(1) a superconductor having a structure derived from perovskite is applied to one side of an ion-conducting substrate whose mobile ion type X^{n-} corresponds to an electronegative component X of the superconductor, said electronegative component X having a chemical potential, and

(2) an electron-conducting contact is mounted on the side of the superconductor which is non-contiguous to the ion-conducting substrate, and a second electron-conducting contact is mounted on the side of the ion conductor which is non-contiguous to the superconductor, and

(3) the chemical potential of the electronegative component

5,149,687

METHOD FOR MAKING ORIENTED BISMUTH AND THALLIUM SUPERCONDUCTORS COMPRISING COLD PRESSING AT 700 MPA

Francis S. Galasso, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 1, 1991, Ser. No. 678,507

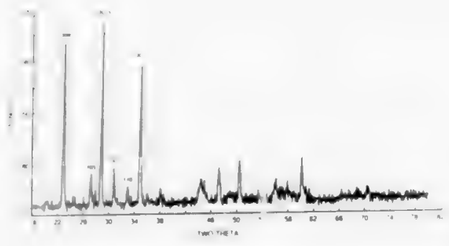
Int. Cl.[5] C01B *13/14;* **C01F** *11/02;* **C01G** *3/02;* **B28B** *1/00*

U.S. Cl. 505—1 **4 Claims**

1. A method for making an oriented superconducting material, comprising:

cold pressing a nonoriented superconducting material selected from the group consisting of Bi_1, Bi_2, Tl_1, Tl_2, Pb substituted Bi_1, Pb substituted bi_2, Pb substituted Tl_1, and Pb substituted Tl_2 superconductor materials at a pressure

of at least about 700 MPa to form an oriented superconducting material that has a ratio of x-ray refection intensity from the (0010) plane to the reflection intensity from the (105) plane of 1.6 or greater.



5,149,688

METHODS, COMPOUNDS, AND COMPOSITIONS FOR IMMUNOSUPPRESSION

Dale G. Ando, Walnut Creek; Corey H. Levenson, Oakland, and Irwin Braude, Vallejo, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Apr. 24, 1990, Ser. No. 513,983
Int. Cl.[5] A61K *31/50, 31/19*
U.S. Cl. 514—254 **2 Claims**

1. A method for preventing or treating rheumatoid arthritis in an animal, comprising administering to the animal therapeutically effective amounts of SA and MTX, wherein said SA and MTX are administered separately or in combination.

5,149,689

FLUORAN COLOR FORMER MIXTURE AND USE THEREOF IN RECORDING MATERIALS

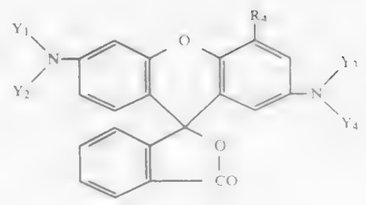
Rudolf Zink, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 712,032, Jun. 7, 1991, abandoned, which is a division of Ser. No. 489,728, Feb. 28, 1990, Pat. No. 5,071,480, which is a continuation of Ser. No. 113,839, Oct. 26, 1987, abandoned. This application Dec. 20, 1991, Ser. No. 812,840
Claims priority, application Switzerland, Oct. 31, 1986, 4313/86; Jan. 16, 1987, 158/87
Int. Cl.[5] B41M *5/145, 5/30*
U.S. Cl. 503—221 **5 Claims**

1. A pressure-sensitive recording material containing a substrate and a colour former mixture containing at least
(a) a flouran component of the formula

(1)

in which
R_1 is hydrogen or methyl,
R_2 is halogen, methyl or ethyl,
X_1 is C_1-C_5-alkyl, cyclohexyl, phenyl or tolyl,
X_2 is C_1-C_5-alkyl, or $—NX_1X_2$ is pyrolidino, and
X_3 and X_4 are each C_7-C_9-phenylalkyl or chlorine- or methyl-ringsubstituted benzyl, and
(b) a fluoran component of the formula



(2)

in which
R_4 is hydrogen, halogen or methyl,
Y_1 is C_1-C_5-alkyl, cyclohexyl, phenyl or tolyl,
Y_2 is C_1-C_5-alkyl, or $—NY_1Y_2$ is pyrrolidino, and
Y_3 and Y_4 are each C_7-C_9-phenylalkyl or chlorine- or methyl-ringsubstitute benzyl,
wherein the weight ratio of (a):(b) is 1:3 to 1:2.

5,149,690

DRILLING FLUID ADDITIVE AND METHOD FOR INHIBITING HYDRATION

Arvind D. Patel, Houston, and Henry C. McLaurine, Katy, both of Tex., assignors to M-I Drilling Fluids Company, Houston, Tex.

Filed Oct. 28, 1991, Ser. No. 783,368
Int. Cl.[5] C09K *7/02*
U.S. Cl. 507—131 **12 Claims**

5. A method for controlling hydration in the drilling of subterranean wells comprising adding a functionally effective amount of a polyamide to a drilling fluid, said polyamide comprising the reaction product of diethylenetriamine and hydroxyacetic acid, and injecting said drilling fluid into a subterranean well.

9. A method for controlling hydration in the drilling of subterranean wells comprising adding a functionally effective amount of a polyamino acid to a drilling fluid, said polyamino acid comprising the reaction product of a polyamine and chloroacetic acid, and injecting said drilling fluid into a subterranean well.

5,149,691

ISSUE REPAIR AND REGENERATION THROUGH THE USE OF PLATELET DERIVED GROWTH FACTOR (PDGF) IN COMBINATION WITH DEXAMETHASONE

Robert B. Rutherford, Farmington, Conn., assignor to Creative BioMolecules, Inc., Hopkinton, Mass.

Filed Mar. 12, 1991, Ser. No. 669,070
Int. Cl.[5] A61K *37/36*
U.S. Cl. 514—12 **11 Claims**

1. A method for promoting regeneration and repair of dental tissue in a mammal comprising:
applying to said tissue a therapeutically effective amount of a composition comprising platelet-derived growth factor (PDGF) and dexamethasone.

5,149,692

BISALKOXYPHOSPHINYL COMPOUNDS AS RENIN INHIBITORS

Annette M. Doherty, Ann Arbor; Harriet W. Hamilton, and Bruce A. Steinbaugh, both of Chelsa, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 21, 1989, Ser. No. 454,795
Int. Cl.[5] C07K *5/06, 5/08*
U.S. Cl. 514—18 **17 Claims**

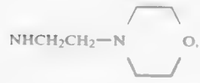
1. A peptide of the formula

A—X—Y—W—U I

or a pharmaceutically acceptable salt thereof wherein

A is $(MeO)_2P(=O)—$, $(iPrO)_2P(=O)—$, or $(CH_2=CH—O)_2P(=O)—$;

X is PHE or TYR(OMe);
Y is HIS, TZA, MET, PGY, PPG, ALG, ATM, or GLY;
W is STA, CYSTA, CAD, DFCYS, DFKCYS, DFSTA, or DFKSTA;
U is hydrogen,



$NHCH_2CH_2N(CH_2CH_2OH)_2$, or $NHCH_2CH(CH_3)CH_2CH_3$.

5,149,693

COMBINATION OF TOBRAMYCIN AND FLUOROMETHOLONE FOR TOPICAL OPHTHALMIC USE

Gerald D. Cagle; Thomas O. McDonald, and Allan L. Rosenthal, all of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 165,952, Mar. 9, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 440,912
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—40 **5 Claims**

1. A method of treating ophthalmic inflammation and infection which comprises administering topically to the affected eye of a human host a therapeutically effective amount of an ophthalmic pharmaceutical composition comprising an anti-inflammatory effective amount of a steroid selected from the group consisting of fluorometholone and fluorometholone acetate; an anti-infective effective amount of tobramycin; and a pharmaceutically acceptable carrier therefor.

5,149,694

COMBINATION OF TOBRAMYCIN AND DEXAMETHASONE FOR TOPICAL OPHTHALMIC USE

Gerald D. Cagle; Thomas O. McDonald, and Allan L. Rosenthal, all of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 165,950, Mar. 9, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 440,546
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—40 **3 Claims**

1. A method of treating ophthalmic inflammation and infection which comprises administering topically to the affected eye of a human host a therapeutically effective amount of an ophthalmic pharmaceutical composition comprising an anti-inflammatory effective amount of dexamethasone; and anti-infective effective amount of tobramycin; and a pharmaceutically acceptable carrier therefor.

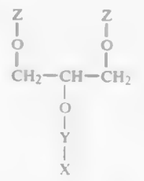
5,149,695

FUMARIC ACID DERIVATIVES, PROCESS FOR THE PRODUCTION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

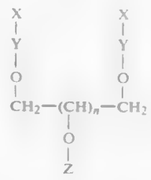
Peter P. Speiser, Freudenbergstr. 101/D2, 8044 Zürich, and Rajendra K. Joshi, Badenerstr. 795, 8048 Zürich, both of Switzerland

Division of Ser. No. 814,668, Dec. 30, 1985, Pat. No. 4,851,439. This application Mar. 13, 1989, Ser. No. 322,654
Claims priority, application Switzerland, Jan. 15, 1985, 161/85
Int. Cl.[5] A61K *31/19, 31/225;* **C07C** *55/02*
U.S. Cl. 514—75 **4 Claims**

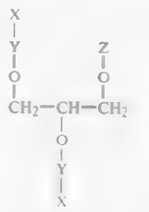
1. A fumaric acid derivative having a formula (II), (III), (IV) or (V)



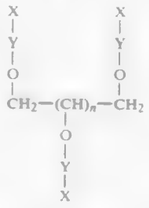
(II)



(III)

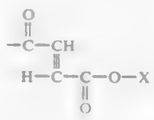


(IV)



(V)

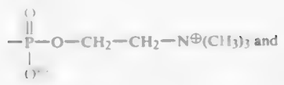
wherein n is an integer from 1 to 3, Y is a fumaroyl group of formula (VI),



(VI)

X may be the same or different and is independently selected from the group consisting of a hydrogen atom, a CH_3 group, a C_2H_5 group and a metallic cation, Z may be the same or different and is independently selected from the group consisting of a saturated or unsaturated C_6–C_{24} acyl group,

a group of formula (VIII),



(VIII)

a hydrogen atom, or at most one of the group O—Z together is a hydrogen atom or a C_1–C_8 alkyl group, with the proviso that in formula (V), n is not 1 or 2 and X is not a hydrogen atom.

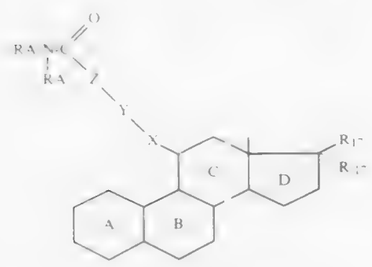
5,149,695

19-NOR-STEROIDS

André Claussner, Villemomble; Lucien Nedelec, Le Raincy; Daniel Philibert, La Varenne Saint Hilaire, and Patrick Van De Velde, Paris, all of France, assignors to Roussel Uclaf, Paris, France

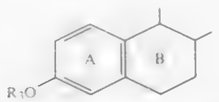
Filed Feb. 23, 1990, Ser. No. 484,424
Claims priority, application France, Feb. 24, 1989, 89 02384
Int. Cl.[5] C07J *1/00, 5/00;* A61K *31/565, 31/57*
U.S. Cl. 514—179 11 Claims

1. Novel 19-nor-steroids of the formula



I

wherein the A and B rings have a structure



R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and acyl of an organic carboxylic acid of 1 to 7 carbon atoms, R_{17} and R'_1 together form =O or R_{17} is —OH or acyloxy and R'_{17} is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and alkenyl and alkynyl of 2 to 8 carbon atoms, all optionally substituted with at least one member of the group consisting of halogen, alkoxy, alkylthio, —NH_2, mono- or dialkylamino, optionally oxidized amino-alkyl, dialkylaminoalkyl, dialkylaminoalkoxy, —OH, acyloxy, free or esterified carboxy, —CN, —CF_3, phenyl, furyl, thienyl, benzyl, X is selected from the group consisting of —CH_2—, —CH_2O—, phenylene and phenylenoxy linked to the C ring through a carbon atom Y is selected from the group consisting of a simple bond and saturated and unsaturated aliphatic of 1 to 18 carbon atoms optionally interrupted with at least one member of the group consisting of phenylene, —O— —and optionally oxidized —S— and optionally terminated with phenylene, Z is a simple bond or —CH_2—O— linked to Y by a carbon atom, R_4 and R_4 being individually selected from the group consisting of hydrogen and alkyl of 1 to 8 carbon atoms optionally substituted with at least one member of the group consisting of aryl, alkylamino, dialkylamino, —OH, halogen and esterified carboxyl with the proviso 1) that both of R_4 and R'_4 are not hydrogen and 2) when Z and Y are both simple bonds, X is not —CH_2— or —CH_2—O—.

10. A method of inducing hormonal activity in warm-blooded animals comprising administering to warm-blooded animals an antiestrogenically effective amount of at least one compound of claim 1.

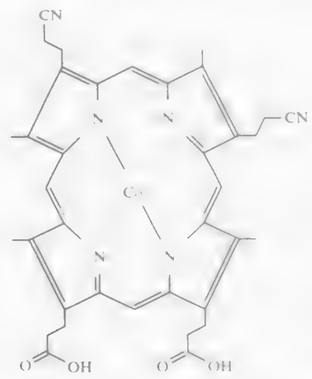
5,149,697

COBALT PORPHYRIN PHARMACEUTICAL COMPOSITIONS

Michael R. Johnson, Chapel Hill, and Stephen V. Frye, Durham, both of N.C., assignors to Glaxo Inc., Research Triangle Park, N.C.

Filed Apr. 18, 1991, Ser. No. 687,268
Int. Cl.[5] A61K *31/555;* C07D *487/22*
U.S. Cl. 514—185 9 Claims

1. A cobalt porphyrin of the following formula (Ia):



(Ia)

or a pharmaceutically acceptable salt or complex thereof with an aromatic base ligand selected from the group consisting of pyridine, imidazole, and 2-methylimidazole.

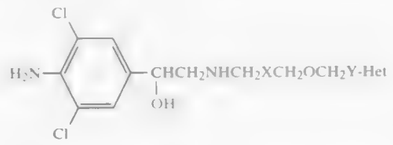
5,149,698

CHLOROANILINE DERIVATIVES

Lawrence H. C. Lunts, Broxbourne, England, assignor to Glaxo Group Limited, London, England

Division of Ser. No. 230,358, Aug. 10, 1988, Pat. No. 4,996,218.
This application Dec. 7, 1990, Ser. No. 624,337
Claims priority, application United Kingdom, Aug. 11, 1987, 8718939
Int. Cl.[5] A61K *31/505, 31/495;* C07D *239/26, 239/34*
U.S. Cl. 514—211 11 Claims

1. A compound of the formula



or a physiologically acceptable salt or solvate thereof wherein

X represents a C_{1-6}alkylene group,

Y represents a C_{1-6}alkylene group, with the proviso that the sum total of carbon atoms in the chains X and Y is not more than 10,

and Het represents a pyrimidinyl group, optionally substituted by one or two groups selected from C_{1-4}alkyl, C_{1-4}alkoxy,-hydroxy,halogen, —NR^3R^4 and —COR^8, wherein R^3 and R^4 each represent a hydrogen atom or a C_{1-4}alkyl group or —NR^3R^4 forms a pyrrolidino, piperidino, hexamethyleneimino, piperazino, N-methylpiperazino, morpholino, homomorpholino or thiomorpholino group; and R^8 represents hydrogen, C_{1-4}alkoxy or NR^3R^4

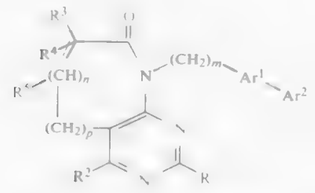
5,149,699

SUBSTITUTED PYRRIDOPYRIMIDINES USEFUL AS ANTGIOTENSIN II ANTAGONISTS

John W. Ellingboe, Princeton; Madelene Nikaido, Monmouth Junction, and Jehan Bagli, Princeton, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

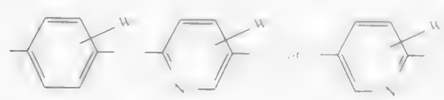
Filed Oct. 24, 1991, Ser. No. 782,025
Int. Cl.[5] C01D *411/04;* A61K *31/505*
U.S. Cl. 514—258 14 Claims

1. A compound of formula I

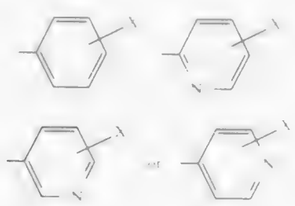


I

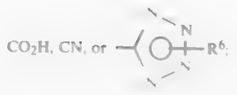
wherein R^1, R^2, R^3, and R^4 are independently H, lower alkyl containing 1 to 6 carbon atoms, or perfluoroalkyl containing 1 to 6 carbon atoms; R^5 is H or R^5 taken together with R^3 comprises a double bond, n is 1, p is 0, m is 0 to 3; Ar^1 is



wherein W is H, lower alkyl containing 1 to 6 carbon atoms, halogen, hydroxy, or lower alkoxy containing 1 to 6 carbon atoms; Ar^2 is



wherein X is



wherein R^6 is H, tert-butyl, tri-n-butylstannyl, or triphenylmethyl; or a pharmaceutically acceptable salt thereof.

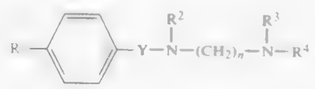
5,149,700

SUBSTITUTED ARYLSULFONAMIDES AND BENZAMIDES

John W. Ellingboe; Jehan F. Bagli, both of Princeton, N.J., and Michael W. Winkley, St. Albans, Vt., assignors to American Home Products Corporation, New York, N.Y.

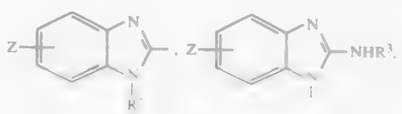
Continuation of Ser. No. 530,684, May 30, 1990, abandoned.
This application Oct. 30, 1991, Ser. No. 785,136
Int. Cl.[5] A61K *31/505, 31/47;* C07D *329/02, 401/00*
U.S. Cl. 514—275 21 Claims

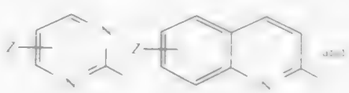
1. The compounds of formula (I):

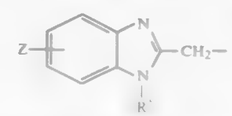


(I)

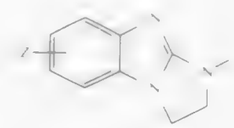
wherein R^1 is H, $NHSO_2CH_3$ or 1-imidazolyl; Y is SO_2 or C(O); n is 2 or 3; R^2 and R^3 are lower alkyl, containing 1 to 6 carbon atoms and R^4 is selected from the group consisting of:







wherein R^3 and R^5 are lower alkyl containing 1 to 6 carbon atoms and Z is H or $NHSO_2CH_3$; or R^3 and R^4 are joined to form



wherein Z is H or $NHSO_2CH_3$ or the pharmaceutically acceptable salt thereof.

5,149,701

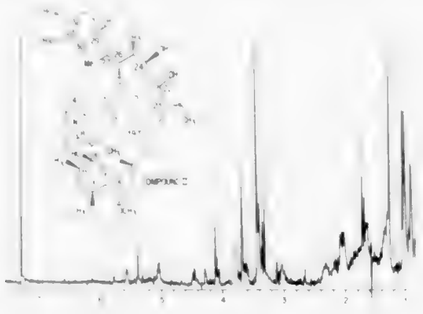
C-31 METHYLATED FR-900520 CYCLIC HEMIKETAL IMMUNOSUPPRESSANT AGENTS

Ali Shafiee, Westfield, N.J.; Louis Kaplan, New City, N.Y.; Shieh-Shung T. Chen, Morganville, N.J.; Byron H. Arison, Watchung, N.J.; Lawrence F. Colwell, Jr., Eatontown, N.J., and Francis Dumont, Rahway, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 1, 1991, Ser. No. 738,995
Int. Cl.[5] A61K *31/395;* C07D *491/16*
U.S. Cl. 514—291 4 Claims

1. An immunosuppressant, Compound II, which exhibits positive inhibition of T-cell activation by the T-cell proliferation assay and a proton nuclear magnetic spectrogram as depicted in FIG. 2.

4. A method of use for treating a human host to prevent transplantation rejection, or for treating autoimmune disease



comprising administering to said host a therapeutically effective amount of Compound II.

5,149,702

CYCLOHEPTENOPYRIDINE DERIVATIVES, PROCESS FOR PREPARATION THEREOF AND ANTIULCER AGENTS CONTAINING THE SAME

Shin-ichi Yamada, Fukushima; Takao Goto, Koori; Rie Yorita, Fukushima; Eizi Shimanuki, Fukushima; Takaji Yamaguchi, Fukushima; Kentaro Kogi, Shiroishi, and Senichi Narita, Tokyo, all of Japan, assignors to Toa Eiyo Ltd., Tokyo, Japan

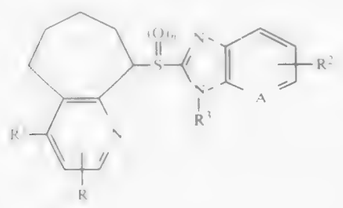
Filed Nov. 27, 1990, Ser. No. 618,943

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—303 **2 Claims**

1. A cycloheptenopyridine derivative of the formula

[1]



wherein R represents a hydrogen atom or lower alkyl group; R^1 represents a hydrogen atom, halogen atom, lower cycloalkoxy group, amido group, substituted phenoxy group, substituted benzyloxy group, lower alkoxy group optionally containing halogen atom(s), nitro group, hydroxyl group, lower alkenyloxy group, lower alkylthio group, or a group $—NR^4R^5$ wherein R^4 and R^5 may be the same or different and each represents a hydrogen atom or lower alkyl group, or R^4 and R^5 mutually combine together with the nitrogen atom adjacent thereto to form a 5- or 6- membered heterocyclic group; R^2 represents a hydrogen atom, halogen atom, lower alkyl group optionally containing a halogen atom, lower alkoxy group optionally containing a halogen atom, hydroxyl group, acyl group, lower alkoxycarbonyl group, nitro group or amino group; R^3 represents a hydrogen atom, a lower alkyl group, lower alkoxymethyl group, lower alkylcarbonyl group, lower alkoxycarbonyl group, carbamoyl group, lower alkylcarbamoyl group, lower alkylcarbonylmethyl group, lower alkoxycarbonylmethyl group, lower acyloxymethyl group, lower alkylsulfonyl group, or physiologically acceptable protective group eliminatable in an acid medium or under physiological conditions; n represents 0 or 1; and A represents a methine carbon or nitrogen atom or a pharmaceutically acceptable salt thereof.

5,149,703

QUINOLINE-SUBSTITUTED CHROMANS AND RELATED COMPOUNDS AS LEUKOTRIENE ANTAGONISTS

Cheuk K. Lau, Ile Bizard, and Claude Dufresne, Dollard des Ormeaux, both of Canada, assignors to Merck Frosst Canada, Inc., Kirland, Canada

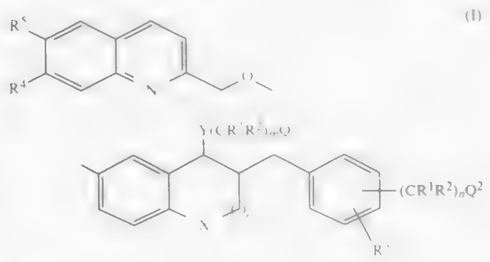
Filed Sep. 6, 1991, Ser. No. 755,906

Int. Cl.[5] A61K *31/47;* **C07D** *405/12, 409/12, 215/14*

U.S. Cl. 514—311 **4 Claims**

1. A compound of the formula:

(I)



wherein:
each of R^1 and R^2 is independently H or lower alkyl;
R^3 is H or Cl
R^4 is Cl or Br;
R^5 is H, Cl or Br;
each of R^6 and R^7 is independently H or Lower alkyl;
R^8 is alkyl, substituted or unsubstituted phenyl, or CF_3;
R^9 is H, lower alkyl, or CF_3;
each of Q^1 and Q^2 is independently CO_2H, $CONR^1R^2$, 1H-(or 2H-)tetrazol-5-yl, COR^9, $C(R^6R^7)OH$, or $CONHSO_2R^8$;
X is CH_2, O, or S;
Y is O or S;
m is 1 to 4;
n is 0 or 1; and
p is 0 or 1;
or a pharmaceutically acceptable salt thereof.

5,149,704

PLATELET ACTIVATING ANTAGONISTS

James B. Summers, Libertyville; Steven K. Davidsen, Mundelein; Douglas H. Steinman, Morton Grove; James G. Phillips, Antioch; Michael B. Martin, Waukegan, and Denise E. Guinn, Grayslake, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

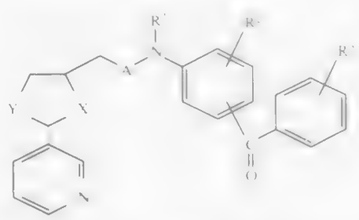
Filed May 3, 1991, Ser. No. 695,351

Int. Cl.[5] C07D *417/04;* **A61K** *31/44*

U.S. Cl. 514—342 **9 Claims**

1. A compound having the structural formula:

I



or a pharmaceutically acceptable salt thereof, wherein
R^1 hydrogen or alkyl of from one to six carbon atoms;
R^2 is one or more groups selected from
hydrogen,
halogen, and
alkyl of from one to six carbon atoms;
R^3 is one or more groups selected from
hydrogen,
halogen, and
alkoxy of from one to six carbon atoms;
A is absent or is $—N(R^4)C(O)—$ where R^4 is hydrogen or alkyl of from one to six carbon atoms;
X is $>NR^5$ where R^5 is
hydrogen,
alkyl of from one to six carbon atoms,
alkoyl of from one to six carbon atoms,
$—C(O)NR^6R^7$ where R^6 and R^7 are independently hydrogen or alkyl of from one to six carbon atoms,
$—C(O)OR^8$ where R^8 is an alkyl radical of from one to six carbon atoms; and
Y is sulfur.

5,149,705

ACETYLENES DISUBSTITUTED WITH A HETEROAROMATIC GROUP AND A TETRALIN GROUP AND HAVING RETINOID LIKE ACTIVITY

Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

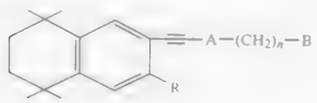
Filed Mar. 13, 1987, Ser. No. 25,434

The portion of the term of this patent subsequent to May 22, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/455;* **C07D** *213/30*

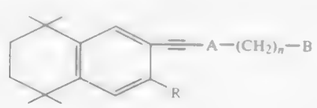
U.S. Cl. 514—356 **8 Claims**

1. A compound of the formula



where R is hydrogen or lower alkyl; A is pyridyl; n is 0–5; and B is H, —COOH or a pharmaceutically acceptable salt, ester of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic alcohols of 5 to 10 carbon atoms, or phenol, or amide or mono- or disubstituted amide of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic radicals of 5 to 10 carbon atoms thereof, $—CH_2OH$ or a lower alkyl ether or ester of saturated aliphatic acids of ten or fewer carbon atoms or the cyclic or saturated aliphatic cyclic acids of 5 to 10 carbon atoms, or benzoic acid thereof, or —CHO or a lower alkyl acetal derivative thereof, or $—COR_1$ or a lower alkyl ketal derivative thereof where R_1 is $—(CH_2)_mCH_3$ where m is 0–4; or a pharmaceutically acceptable salt thereof.

6. A pharmaceutical composition comprising a pharmaceutically acceptable excipient and a compound of the formula



where R is hydrogen or lower alkyl; A is pyridyl; n is 0–5; and B is H, —COOH or a pharmaceutically acceptable salt, ester of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic alcohols of 5 to 10 carbon atoms, or phenol, or amid or mono- or disubstituted amide of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic radicals of 5 to 10 carbon atoms thereof, $—CH_2OH$ or a lower alkyl ether or ester of saturated aliphatic acids of ten or fewer carbon atoms or the cyclic or saturated aliphatic cyclic acids of 5 to 10 carbon atoms, or benzoic acid thereof, or —CHO or a lower alkyl acetal derivative thereof, or $—COR_1$ or a lower alkyl ketal derivative thereof where R_1 is $—(CH_2)_mCH_3$ where m is 0–4; or a pharmaceutically acceptable salt thereof.

5,149,706

STABILIZED ISOTHIAZOLONE

Ryoji Funatsu, Tokyo; Susumu Mitsui, Koshigaya; Shigeru Kurose, Misato, and Atsuko Gato, Koshigaya, all of Japan, assignors to Somar Corporation, Japan

Filed Jul. 2, 1990, Ser. No. 546,851

Claims priority, application Japan, Jul. 17, 1989, 1-183924

Int. Cl.[5] A61K *31/425, 31/08*

U.S. Cl. 514—372 **5 Claims**

1. A stabilized isothiazolone germicidal composition comprising consisting essentially of:
a solvent containing at least 50% by weight of 3-methyl-3-methoxybutyl alcohol; and
an isothiazolone compound dissolved in said solvent.

5,149,707

1-((2-FLUOROPHENYL)(4-FLUOROPHENYL)PHENYLMETHYL)-1H-IMIDAZOLE USEFUL AS ANTIFUNGAL AGENT

Javier Bartroli, and Manuel Anquita, both of Barcelona, Spain, assignors to J. Uriach & Cia, S.A., Barcelona, Spain

Continuation of Ser. No. 257,095, Oct. 13, 1988, abandoned. This application Dec. 14, 1990, Ser. No. 628,937

Claims priority, application European Pat. Off., Jul. 28, 1988, 88112239

Int. Cl.[5] A61K *31/415;* **C07D** *233/62;* **A01N** *43/50*

U.S. Cl. 514—396 **3 Claims**

1. -1-[(2-Fluorophenyl)(4-fluorophenyl)phenylmethyl]-1H-imidazole or a pharmaceutically acceptable salt thereof.

5,149,708

PHOTOSENSITIZING DIELS-ALDER PORPHYRIN DERIVATIVES

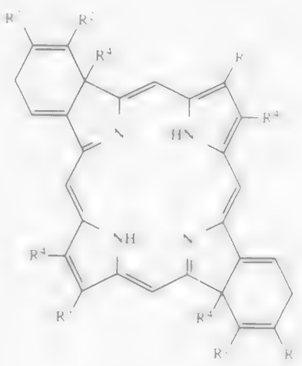
David Dolphin; Paul Y. Hin, and Tilak Wijesekera, all of Vancouver, Canada, assignors to University of British Columbia, British Columbia, Canada

Continuation-in-part of Ser. No. 363,185, filed as PCT/CA90/00191, Jun. 7, 1990, abandoned, which is a continuation of Ser. No. 221,161, Jul. 19, 1988, Pat. No. 4,920,143, which is a continuation-in-part of Ser. No. 041,680, Apr. 23, 1987, Pat. No. 4,883,790, which is a continuation-in-part of Ser. No. 005,204, Jan. 20, 1987, abandoned. This application Feb. 28, 1991, Ser. No. 663,137

Int. Cl.[5] A61K *31/40;* **C07D** *437/22*

U.S. Cl. 514—410 **6 Claims**

1. A compound of the formulas 1-1 through 1-6



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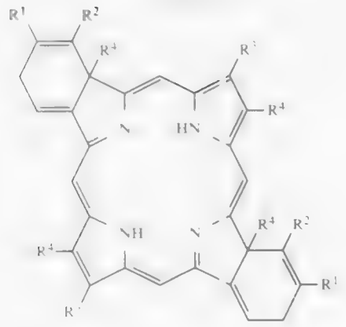

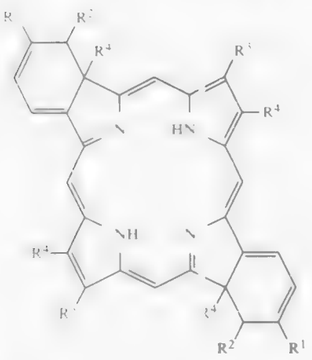

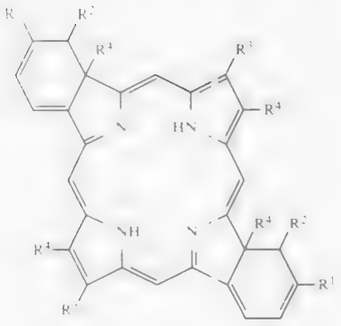

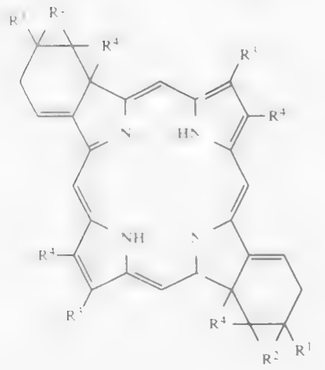

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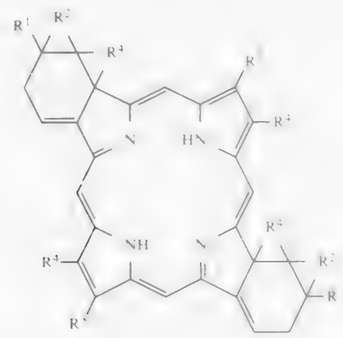


which compound is fluorescent and photosensitizing,

wherein at least one of R^1 and R^2 is selected from the group consisting of carbalkoxy (2-6C); aryl (6-10C); alkyl (1-6C) or aryl (6-10C) sulfonyl; cyano; and —CONR^{5}CO—, wherein R^5 is aryl (6-10C) or alkyl (1-6C); and the other R^1 and R^2 is selected from the group consisting of the aforesaid substituents and H; and

wherein each R^3 and R^4 is independently selected from the group consisting of substituted or unsubstituted alkyl (1-6C); and substituted and unsubstituted omega-carboxyalkyl (2-6C) and the esters, amides, and salts thereof.

6. A pharmaceutical composition which is useful in targeting specific biological material which composition comprises an effective amount of the compound of claim **1** in admixture with at least one pharmaceutically acceptable excipient.

5,149,709

INHIBITORS OF ACYL-COENZYME A: CHOLESTEROL ACYL TRANSFERASE

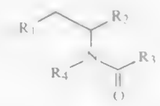
John Clader, Cranford; Sundeep Dugar, Parlin, both of N.J.; Timothy Kogan, Half Moon Bay, Calif.; Bradley Tait, Canton, Mich., and Wayne Vaccaro, Princeton, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jul. 3, 1990, Ser. No. 547,644

Int. Cl.[5] **A01N** *47/10*; **C07C** *733/02*

U.S. Cl. 514—486 **16 Claims**

1. A compound represented by the formula



wherein R_1 and R_2 are independently X-substituted phenyl, wherein X is 1 to 3 substituents independently selected from the group consisting of halogeno, lower alkyl, hydroxy, lower alkoxy, amino, lower alkylamino, lower dialkylamino, acetamido, methanesulfonylamino, carboxy and lower alkoxycarbonyl;

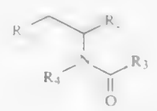
and in addition, one of R_1 and R_2 can be as defined above and the other can be phenyl;

R_3 is a diphenyl substituted alkyl chain of 1 to 25 carbon atoms, branched or straight, saturated or containing one or more double bonds; or $—(CH_2)_7CH=CH(CH_2)_7CH_3$;

R_4 is hydrogen, lower alkyl, phenyl, or X-substituted phenyl;

or a pharmaceutically acceptable salt thereof.

15. A method of treating atherosclerosis comprising administering to a mammal in need of such treatment a pharmaceutical composition comprising an ACAT-inhibitory affective amount of a compound represented by the formula



wherein R_1 and R_2 are independently X-substituted phenyl, wherein X is 1 to 3 substituents independently selected from the group consisting of halogeno, lower alkyl, hydroxy, lower alkoxy, amino, lower alkylamino, lower dialkylamino, acetamido, methanesulfonylamino, carboxy and lower alkoxycarbonyl;

and in addition, one of R_1 and R_2 can be as defined above and the other can be phenyl;

R_3 is an alkyl chain of 1 to 25 carbon atoms, branched or straight, saturated or containing one or more double bonds; an alkyl chain as defined substituted by one or more substituents selected from the group consisting of phenyl and X-substituted phenyl; an alkyl chain as defined interrupted by one or more groups independently selected from the group consisting of —O—, —S—, —SO—, —SO_2—, —NH—, —N(lower alkyl)—, —C(O)—, phenylene and X-substituted phenylene; or an interrupted alkyl chain as defined substituted by one or more substituents selected form the group consisting of phenyl and X-substituted phenyl;

R_4 is hydrogen, lower alkyl, phenyl or X-substituted phenyl; or a pharmaceutically acceptable salt thereof, in a pharmaceutically acceptable carrier.

5,149,710

PHARMACEUTICAL COMPOSITIONS FOR TREATING PSORIASIS

Andrew M. Creighton, London, and William A. Jeffery, Essex, both of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 422,673, Oct. 17, 1989, abandoned, which is a division of Ser. No. 183,067, Apr. 19, 1988, Pat. No. 4,902,714, which is a division of Ser. No. 842,857, Mar. 24, 1986, Pat. No. 4,755,619. This application Oct. 17, 1990, Ser. No. 597,180

Claims priority, application United Kingdom, Apr. 1, 1985, 8508508

Int. Cl.[5] **A61K** *31/225, 31/35, 31/36, 31/275*

U.S. Cl. 514—547 **21 Claims**

1. A method for aiding regression and palliation of psoriasis in human patients, which method comprises the step of administering to a patient in need thereof a therapeutically effective amount of a compound of formula (II)

(II)

wherein R_1 and R_2 are each separately selected from hydrogen, alkyl, alkenyl and alkynyl groups having up to a maximum of four carbon atoms and being unsubstituted, and alkyl, alkenyl and alkynyl groups having up to a maximum of three carbon atoms and being substituted by one phenyl, carboxy, alkoxycarbonyl, halogeno (other than fluoro), hydroxy or alkoxy group, or by one or more fluoro groups, but with the proviso that when R_1 is hydrogen then R_2 is hydrogen or methyl, or R_1 and R_2 together constitute an ethylene bridging group, and R_3 excludes any group in which the bonding carbon atom does not carry at least one hydrogen atom, R_3 being selected from (a) alkyl, alkenyl and alkynyl groups having up to a maximum of ten carbon atoms and being either unsubstituted or substituted by one or more alkoxy, carboxy, halogeno, hydroxy, alkoxycarbonyl, benzyloxycarbonyl, cyano, amino, alkylamino, dialkylamino or oxo groups and (b) aralkyl, aralkenyl and aralkynyl groups in which the aromatic part of the group may optionally be substituted by one or two substituents selected from halogeno, lower alkyl, lower alkoxy, amino and nitro groups or by one methylenedioxy group, and in which the aliphatic part of the group has up to a maximum of ten carbon atoms and may optionally be substituted by one substituent selected from alkoxycarbonyl and cyano groups, with the further proviso that the compound is in the meso or erythro configuration when each of R_1 and R_2 is the same or different unsubstituted or substituted alkyl, alkenyl or alkynyl group, and salts thereof with a physiologically acceptable inorganic or organic acid.

5,149,711

2-CYCLOPENTENONE DERIVATIVES

Atsuo Hazato, Hino, and Seizi Kurozumi, Kokubunji, both of Japan, assignors to Teijin Limited, Osaka, Japan

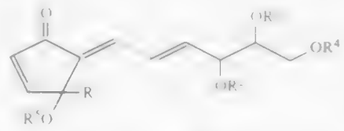
Filed Mar. 7, 1989, Ser. No. 319,688

Claims priority, application Japan, Mar. 9, 1988, 63-53681

Int. Cl.[5] **A61K** *31/12, 31/22*; **C07C** *49/747, 69/21*

U.S. Cl. 514—548 **7 Claims**

1. A 2-cyclopentenone derivative represented by the following formula



wherein R^1 represents an alkyl group having 1 to 10 carbon atoms which may be substituted by a substituted or unsubstituted phenyl or phenoxy group, R^2, R^3, R^4 and R^5 are identical or different and each represents a hydrogen atom or an alkanoyl group of up to 5 carbon atoms, and the wavy line shows that the bonded state of the double bond is E or Z.

5,149,712

TREATMENT OF CORNEAL EDEMA WITH DIATRIZOATE SOLUTIONS

Ronald A. Schachar, P.O. Box 1039, Denison, Tex. 75020

Filed Dec. 18, 1991, Ser. No. 809,129

Int. Cl.[5] **A61K** *31/195*

U.S. Cl. 514—563 **8 Claims**

1. A method for treating corneal edema comprising contacting a cornea that has a reduced light transmissive ability due to edema with an amount of a pharmaceutically acceptable nontoxic salt of diatrizoic acid in an aqueous solution sufficient to improve the light transmissive ability of said cornea.

5,149,713

USE OF BACLOFEN FOR THE TREATMENT OF ANGINA PECTORIS

Pascal-Pierre Bousquet, Strasbourg, France, assignor to Adir et Compagnie

Filed May 22, 1991, Ser. No. 704,302

Claims priority, application France, May 23, 1990, 90 06437

Int. Cl.[5] **A61K** *31/195*

U.S. Cl. 514—567 **1 Claim**

1. A method for the treatment of angina pectoris in a living animal in need of the same, comprising the step of administering to said animal a dose of a compound selected from baclofen, an isomer thereof and a pharmaceutically-acceptable salt thereof, the dose being one-half to one mg/kg.

5,149,714

ANTIDEPRESSANTS

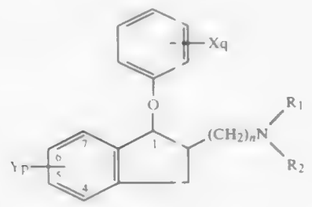
Jules Freedman, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 434,665, Nov. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 401,518, Aug. 29, 1989, abandoned, which is a continuation of Ser. No. 296,474, Jan. 12, 1989, abandoned, which is a division of Ser. No. 287,517, Dec. 19, 1988, abandoned, which is a continuation of Ser. No. 85,665, Aug. 14, 1987, abandoned. This application Aug. 15, 1990, Ser. No. 569,259

Int. Cl.[5] A61K *31/13*; C07C *211/03*

U.S. Cl. 514—655 18 Claims

1. A compound of the formula



wherein

p and q are each independently 0, 1 or 2,

n is 1,

Y and X are each independently lower alkyl, lower alkoxy, hydroxy, CF_3, or halogeno,

R_1 and R_2 are each independently hydrogen, lower alkyl, or aralkyl,

or an acid addition salt thereof.

5,149,716

INSULIN DERIVATIVES, PROCESS FOR THEIR PREPARATION, THEIR USE AND A PHARMACEUTICAL PREPARATION CONTAINING THEM

László Vértesy, Eppstein/Taunus; Karl Geisen, Frankfurt am Main, and Richard Bicker, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

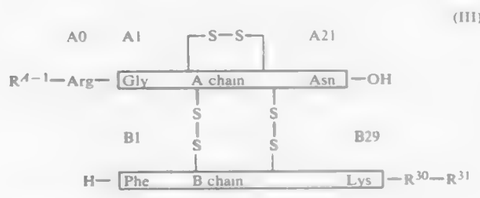
Filed Oct. 26, 1990, Ser. No. 603,835

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1989, 3936876

Int. Cl.[5] A61K *37/26, 37/02*

U.S. Cl. 514—3 9 Claims

1. An insulin derivative of the formula III



(III)

in which

a) $R^{30}+R^{31}$ together=OH, or

b) R^{30}=a radical or a neutral, genetically encodable L-amino acid and

R^{31}=OH, or

a physiologically acceptable organic group of basic character having up to 50 carbon atoms, whose synthesis involves 0 to 3 α-amino acids and whose optional terminal carboxyl function can be present free, as an ester function, as an amide function, as a lactone, or reduced to CH_2OH, and

c) R^{A-1}=a radical of Thr, Ser, or Ala,

and physiologically acceptable salts thereof, with the exception of the cases in which, at the same time, R^{30}=Ala, R^{31}=OH, R^{A-1}=Lys or Arg, and the A and B chains are the sequences of bovine insulin.

5,149,715

CONTROL OF FUNGAL DISEASES IN THE PRODUCTION OF MUSHROOMS

Gale L. Armstrong, San Mateo; Nigel S. Dunn-Coleman, Los Gatos, and Mark Wach, Aptos, all of Calif., assignors to Monterey Mushroom, Inc., Capitola, Calif.

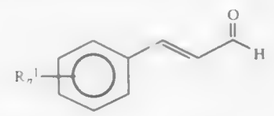
Filed Feb. 9, 1989, Ser. No. 308,690

Int. Cl.[5] A01N *35/00*

U.S. Cl. 514—701 17 Claims

1. A method of controlling toxic fungal diseases in mushrooms infected with a fungal disease, comprising:

adding an effective fungal-disease-inhibiting amount of a compound of the formula



to a substrate in which mushrooms are growing or are later grown, wherein n is an integer from 0 to 3 and each R^1 independently represents halogen.

5,149,717

ALKANOPHENONES USEFUL FOR TREATING ALLERGIES

Andreas von Sprecher, Oberwil, Switzerland; Andreas Beck, Freiburg, Fed. Rep. of Germany; Bruno Schaub, Courroux, Switzerland, and Robert W. Lang, Pratteln, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

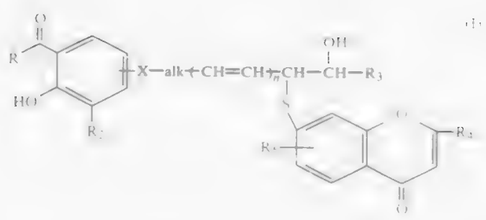
Continuation of Ser. No. 566,645, Aug. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 546,683, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 324,924, Mar. 17, 1989, abandoned. This application Nov. 15, 1991, Ser. No. 795,227

Claims priority, application Switzerland, Mar. 29, 1988, 1186/88-7; Oct. 14, 1988, 3857/88-5; Sep. 19, 1989, 3402/89-4

Int. Cl.[5] A61K *31/35, 31/41*; C07D *311/24, 257/04*

U.S. Cl. 514—456 14 Claims

1. Substituted alkanophenone of the formula



(I)

in which R_1 is unsubstituted or fluorinated lower alkyl, R_2 is hydrogen, or unsubstituted or fluorinated lower alkyl or lower alkenyl, X is lower alkylene, oxy, thio or a direct bond, alk is lower alkylene, n is 1 or 2, R_3 is phenyl that is unsubstituted or is substituted by unsubstituted or fluorinated lower alkyl, lower alkoxy, halogen, unsubstituted or lower alkylated amino carboxy, lower alkoxycarbonyl, carbamoyl, N-(benzenesulfonyl)-carbamoyl that is unsubstituted or substituted in the phenyl moiety by lower alkyl, lower alkoxy, halogen or a combination thereof, N-mono- or N,N-di-lower alkylcarbamoyl, or a combination thereof, or is lower alkyl that is unsubstituted or is substituted by fluoro or fluoro and chloro, carboxy, lower alkoxycarbonyl, carbamoyl, N-mono- or N,N-di-lower alkylcarbamoyl or N-(benzenesulfonyl)-carbamoyl that is unsubstituted or substituted in the phenyl moiety by lower alkyl, lower alkoxy, halogen or a combination thereof, R_4 is carboxy, lower alkoxycarbonyl, carbamoyl or N-mono- or N,-di-lower alkylcarbamoyl or N-(benzenesulfonyl)-carbamoyl that is unsubstituted or substituted in the phenyl moiety by lower alkyl, lower alkoxy, halogen or a combination thereof, R_4 is 5-tetrazolyl, and R_5 is hydrogen or lower alkyl or a salt thereof.

12. A method for the treatment of allergic diseases in a patient in need of such treatment, which method comprises the administration of a therapeutically effective amount of a compound according to claim 1.

5,149,718

BIOLOGICAL FLUID PURIFICATION SYSTEM

Daniel Meruelo, Scarborough, and Gad Lavie, New York, both of N.Y., assignors to New York University, New York, N.Y.

Filed Jan. 19, 1989, Ser. No. 299,971

Int. Cl.[5] A61K *31/05, 31/045*; A61F *5/44*; A61B *19/00*

U.S. Cl. 514—732 12 Claims

1. A method for significantly reducing or completely eliminating the infectivity of a virus present in a retaining means for retaining a biological fluid, said method comprising:

contacting said retaining means with an effective amount of at least one antiviral compound selected from the group consisting of antiviral effective polycyclic aromatic diones; analogs, isomers, homologs and derivatives of said diones; physiologically acceptable salts of said diones, analogs, isomers, homologs and derivatives; and mixtures of said diones, analogs, isomers, homologs, derivatives and salts.

5,149,719

COMPOSITION FOR TRANSDERMAL PENETRATION OF MEDICAMENTS

Richard H. Ferber, and Scott A. Burton, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 27, 1990, Ser. No. 515,198

Int. Cl.[5] A61K *47/00*

U.S. Cl. 514—772 6 Claims

1. A composition useful for the enhancement of the transdermal delivery of a medicament, comprising an effective amount of the medicament suspended in

(a) a formulation comprising an aqueous solution of lower alcohol, where the concentration of the lower alcohol is between about 10% and about 35% by volume of the solution, and

(b) higher alcohol selected from the group consisting of 1-hexanol, 1-octanol, 1-nonanol, 1-decanol, 1-undecanol, 1-dodecanol, 1-tridecanol, 1-tetradecanol, 4-methyl-1-pentanol, 5-methyl-1-heptanol, 3,3-dimethyl-1-octanol, 3-cyclopentyl-1-propanol, cis-3-hexen-1-ol, trans-3-hexen-1-ol, 9-decen-1ol and 2-octanol, said higher alcohol being present in an amount that is sufficient to substantially saturate the composition.

5,149,720

PROCESS FOR PREPARING EMULSIONS THAT ARE POLYMERIZABLE TO ABSORBENT FOAM MATERIALS

Thomas A. DesMarais, Norwood; Stephen T. Dick, Blue Ash, and Thomas M. Shiveley, Moscow, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 743,947, Aug. 12, 1991. This application Feb. 3, 1992, Ser. No. 830,159

Int. Cl.[5] C08J *9/26, 9/28*

U.S. Cl. 521—63 15 Claims

1. A continuous process for the preparation of a high internal phase emulsion which is suitable for subsequent polymerization and dewatering to thereby form an absorbent foam material, which process comprises:

A) providing a liquid feed stream of an oil phase comprising

i) from about 3% to 41% by weight of a substantially water-insoluble, monofunctional glassy monomer component;

ii) from about 27% to 73% by weight of a substantially water-insoluble, monofunctional rubbery comonomer component;

iii) from about 8% to 30% by weight of a substantially water-insoluble, polyfunctional cross-linking agent component, and

iv) from about 2% to 33% by weight of an emulsifier component which is soluble in the oil phase and which is suitable for forming a stable water-in-oil emulsion;

B) providing a liquid feed stream of a water phase comprising an aqueous solution containing from about 0.2% to 40% by weight of water-soluble electrolyte;

C) simultaneously introducing said liquid feed streams into a dynamic mixing zone at flow rates such the the initial weight ratio of water phase to oil phase being introduced ranges from about 2:1 to 10:1;

D) subjecting the combined feed streams in said dynamic mixing zone to sufficient shear agitation to at least partially form an emulsified mixture in said zone while maintaining steady, non-pulsating flow rates for the oil and water phase stream;

E) steadily increasing the ratio of water to oil feed streams being introduced into said dynamic mixing zone to within the range of from about 12:1 to 100:1 at a rate of increase which does not destroy the emulsified nature of the contents of said dynamic mixing zone, while maintaining the emulsified contents of said dynamic mixing zone at a temperature of from about 25° C. to 70° C., and while subjecting the emulsified contents of said zone to continued shear agitation which is sufficient to eventually form a high internal phase emulsion that, upon subsequent polymerization, provides a foam having an average cell size of from about 5 to 100 microns;

F) continuously withdrawing the emulsified contents of said dynamic mixing zone and continuously introducing said emulsified contents into a static mixing zone wherein said emulsified contents are further subjected to sufficient shear mixing to thereby completely form a stable high internal phase emulsion having a water to oil phase weight ratio of from about 12:1 to 100:1; and

G) continuously withdrawing said stable high internal phase emulsion from said static mixing zone such that said stable

high internal phase emulsion can be thereafter polymerized and dewatered to form a solid absorbent foam.

5,149,721

PROCESS FOR PRODUCING POLYSTYRENE RESIN FOAM

Mikio Ishikawa, Tochigi, and Toshiro Kobayashi, Ibaraki, both of Japan, assignors to Sekisui Kaseihin Kogyo K.K., Nara, Japan

Filed Dec. 27, 1991, Ser. No. 813,663
Claims priority, application Japan, Dec. 27, 1990, 2-408426
Int. Cl.[5] C08J 9/14
U.S. Cl. 521—79 **5 Claims**

1. A process for producing a polystyrene resin foam, which comprises supplying an extruding machine with a mixture of polystyrene resin, a fine inorganic powder and a highly volatile foaming agent, heating the mixture to an extrudable state, and extruding the mixture from the nozzle into a zone of lower pressure, wherein 0.01 to 2 parts by weight of an alcoholic ester of a higher fatty acid is added to 100 parts by weight of the polystyrene resin.

5,149,722

DISPERSANT FOR CARBON BLACK-FILLED FOAM

Thomas G. Soukup, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla. and Apache Building Products Company, Meridian, Miss.

Filed Aug. 28, 1991, Ser. No. 751,393
Int. Cl.[5] C08J 9/00
U.S. Cl. 521—99 **12 Claims**

1. A process for producing a closed cell, rigid, isocyanate-based polymer foam which comprises

(a) providing in an isocyanate-based polymer foam-forming composition a dispersion of carbon black, the carbon black being present in an amount of at least about 2 percent by weight, based on the weight of the polymer in the foam, an end-capped polyoxyalkylene compound which is nonreactive with isocyanate groups being incorporated in the foam-forming composition, and

(b) thereafter foaming and curing the resultant filled foam-forming composition,

wherein the polyoxyalkylene compound is present in an amount sufficient to help bring about a uniform dispersion of the carbon black throughout the foam so that there is present in the cell walls of the foam an amount of predominantly non-agglomerated carbon black which reduces the aged k-factor of the foam to below the aged k-factor of the corresponding unfilled foam having the same density and prepared from the same foam-forming composition as the filled foam except that the carbon black is omitted and the amount of foaming agent is adjusted to equalize the densities of the filled and unfilled foams.

5,149,723

STABILIZED POLYACETAL COMPOSITIONS CONTAINING A MIXTURE OF HALS HAVING TERTIARY FUNCTIONALITY

Richard A. Hayes, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

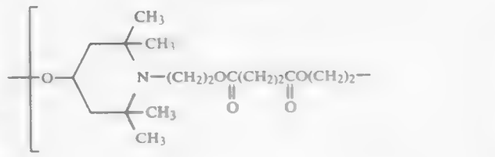
Filed Mar. 22, 1991, Ser. No. 673,352
Int. Cl.[5] C08K 5/34
U.S. Cl. 524—99 **14 Claims**

1. A composition consisting essentially of

(a) 95.00–99.90 weight percent of a polyacetal polymer,

(b) 0.05–2.50 weight percent of at least one hindered amine light stabilizer ("HALS") selected from the group consisting of HALS (b)(1) and HALS (b)(2) as follows:

HALS (b) (1)



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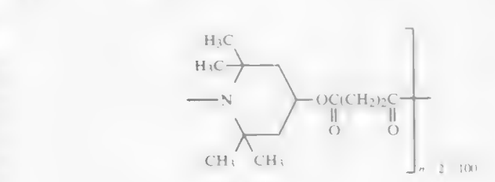
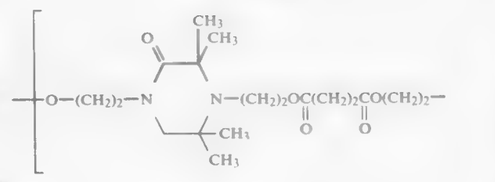
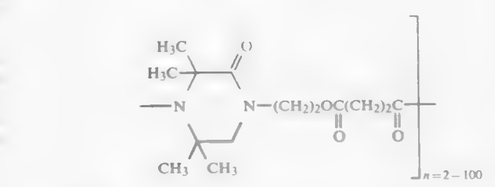


HALS (b)-(2)

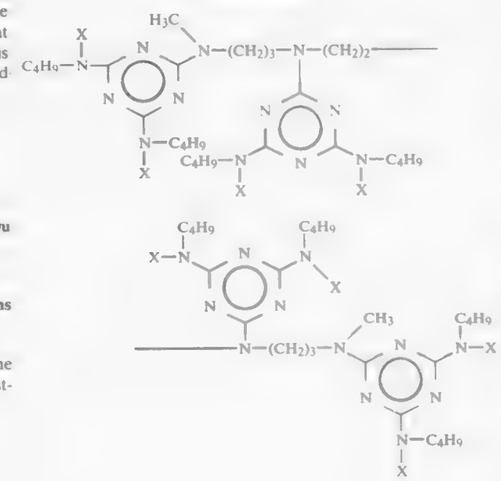




and

(c) 0.05 to 2.50 weight percent of at least one HALS selected from the group consisting of HALS (c)(1), HALS (c)(2), and HALS (c)(3) as follows:

HALS (c) (1)



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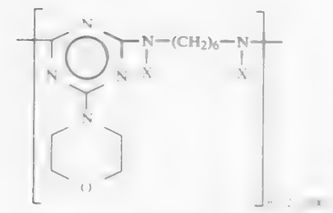
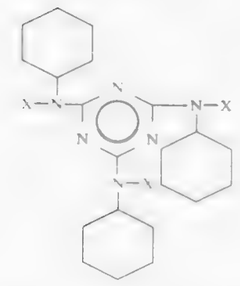
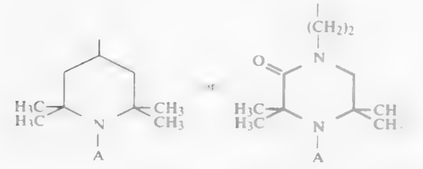
HALS (c) (2)



HALS (c) (3)



and where in each of HALS (c)(1), HALS (c)(2), and HALS (c)(3), X is selected from



wherein A is C_1–C_6 alkyl,

and provided that the above stated weight percents are based upon the total of components (a), (b), and (c) only.

5,149,724

ANTI-STATIC AND ANTI-FOGGING COMPOSITIONS FOR USE IN POLYVINYL CHLORIDE AND POLYOLEFIN FILMS

Timothy E. Fahey, and Julia A. Falter, both of Williamsport, Pa., assignors to Lonza Inc., Fair Lawn, N.J.

Filed Oct. 23, 1989, Ser. No. 425,728
Int. Cl.[5] C08K 5/15
U.S. Cl. 524—110 **12 Claims**

1. A resin composition which comprises an admixture of a polyvinyl chloride containing from 0.5 to 2.0 parts per hundred parts of resin of a polyglycerol ester and from 0.5 to 2.0 parts per hundred parts of resin of an ethoxylated sorbitan ester.

5,149,725

FLEXIBLE POLYURETHANE FOAMS WITH REDUCED DRIPPING DURING BURNING

Manfred Genz, Damme, Fed. Rep. of Germany, and Andreas Rothacker, Sterling Heights, Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Nov. 25, 1991, Ser. No. 796,966
Int. Cl.[5] C08J 9/00
U.S. Cl. 521—110 **7 Claims**

1. A process for the preparation of a drip retardant flexible polyurethane foam obtained by reacting a polyol composition comprising:

a) a polyol;

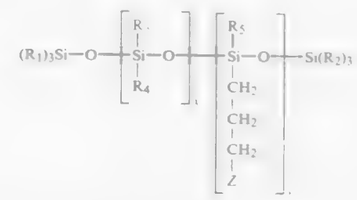
b) a drip retardant;

c) a blowing agent;

d) a urethane promoting catalyst; and optionally

e) a surfactant, a chain extender, and/or a flame retardant

with an organic polyisocyanate, said drip retardant having the formula:



wherein R_1, R_2, R_3, R_4, and R_5 are each selected from the group consisting of alkyl radicals having 1–4 carbon atoms and aryl radicals; Z is selected from the group consisting of OH and NH_2; x is from 10 to 200; and y is from 2 to 50.

5,149,726

INSECT RESISTANT FOAM BODY USEFUL IN FARM BUILDINGS

Jean-Philippe Deblander, Mundolsheim, France, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 746,849, Aug. 19, 1991. This application Dec. 16, 1991, Ser. No. 807,920
Claims priority, application United Kingdom, Aug. 24, 1990, 9018640
Int. Cl.[5] C08J 9/14; E04B 2/00
U.S. Cl. 521—143 **7 Claims**

1. A plastic foam body comprising a foamed plastic polymer having a plurality of closed non-interconnecting cells, a minimum cross-sectional dimension of at least about 30 mm, and a water vapor permeability not greater than about 1.8 perm inches as measured by ASTM Method C-355-64, Procedures for Desiccant Method, said foam body being without discontinuities and substantial variation in average cell diameter across the minimum cross-sectional dimension of the body by D-2842-69, wherein the foam body has a density, d, of about 40 kg/m^3 or greater, and average cell dimensions V, E, and H in three mutually perpendicular directions of at least about 1.0 mm, at least about 1.0 mm, and at least about 0.9 mm respectively and wherein the value R as calculated by Formula 1

FORMULA 1

$$R \geq \frac{V \times E \times H}{(V \times E) + (V \times H) + (E \times H)} \cdot d^2$$

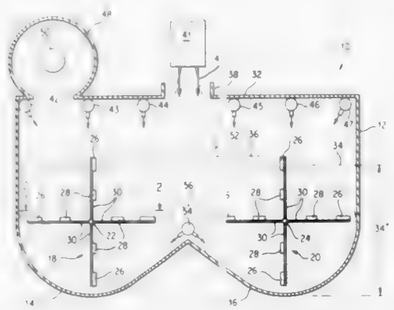
is at least about 600 and a light transmission through a thickness of about 36 mm of about 20 percent.

5,149,727

IRRADIATION DEVICE FOR FLUOROPOLYMERS

Robert S. Luniewski, Smithtown, N.Y., assignor to Medical Sterilization, Inc., Syosset, N.Y.

Filed Feb. 26, 1990, Ser. No. 485,284
Int. Cl.[5] C08J 3/28
U.S. Cl. 522—156 19 Claims



1. Apparatus for radiation processing of polytetrafluoroethylene comprising:
an irradiation vessel;
an irradiation source providing an electron beam within said irradiation vessel;
means within said irradiation vessel to agitate the polytetrafluoroethylene, said agitating means urging the polytetrafluoroethylene particles to move randomly and haphazardly; and
means for extracting particles of polytetrafluoroethylene of a preselected diameter/molecular weight range from said irradiation vessel during operation of said irradiation source.

5,149,728

BLENDS OF POLYARYLENE SULFIDES, PHENOLIC RESIN NITROARYLATES GLASS FIBERS AND OPTIONALLY OTHER FILLERS

Burkhard Köhler; Hans-Detlef Heinz, both of Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Aug. 5, 1991, Ser. No. 740,114
Claims priority, application Fed. Rep. of Germany, Aug. 15, 1990, 4025782
Int. Cl.[5] C08K 5/32
U.S. Cl. 524—259 2 Claims

1. Blends of
A) 89.9 to 20% by weight polyarylene sulfides,
B) 0.1 to 35% by weight phenolic resin, of which the OH groups are completely or partly esterified with 2-, 3- or 4-nitrobenzoic acid or 3,5-dinitrobenzoic acid or other acids corresponding to formula (I)

$$(O_2N)_n—Ar—COOH \quad (I),$$

in which
n = 1, 2 or 3 and
Ar is an (n+1)-functional aromatic radical containing 6 to 14 carbon atoms,
C) 10 to 79.9% by weight glass fibers which are optionally sized with polyurethane film formers and aminosilane or epoxysilane coupling agents
and optionally up to 300% by weight, based on the polyarylene sulfides, of other mineral or organic fillers and reinforcing materials and/or inorganic or organic auxiliaries.

5,149,729

WATERBORNE ACRYLIC STAIN COMPOSITION CONTAINING CORE-SHELL GRAFTED POLYMERS

Diane J. Englund, Woodinville, Wash., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 1, 1990, Ser. No. 517,020
Int. Cl.[5] C08K 5/06; C08L 67/07; C08F 220/10, 222/04
U.S. Cl. 524—366 21 Claims

1. A waterborne stain composition for protecting wood surfaces comprising:
(a) a resin component comprising a core-shell polymer having an alkali-insoluble polymer core and an alkali -soluble polymer shell; and
(b) a solvent component comprising water and an organic solvent selected from a glycol and a glycol ether, said organic solvent present in an amount of from about 6 percent to about 9 percent by weight of the entire composition.

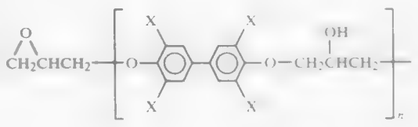
5,149,730

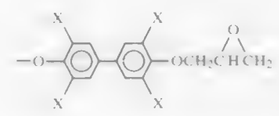
EPOXY RESIN COMPOSITION

Yasuyuki Murata; Isako Konishi; Ryohei Tanaka, all of Yokkaichi, and Yoshinori Nakanishi, Suzuka, all of Japan, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1990, Ser. No. 537,316
Claims priority, application Japan, Jun. 13, 1989, 1-148283
Int. Cl.[5] C08L 63/02, 63/00; C08F 283/10
U.S. Cl. 523—466 12 Claims

1. An electrical encapsulation composition comprising:
(a) a diglycidyl ether which can be represented by the formula





in which each X is independently selected from H, halide and C_{1-5} alkyl, and n has an average valve within the range of 0 to about 3;
(b) a curing amount of a trisphenolic curing agent which is the product of reacting, in the presence of an acid condensation reaction catalyst, a substituted or unsubstituted phenolic hydroxyl group-containing aromatic aldehyde or ketone and a substituted or unsubstituted phenol;
(c) an accelerating amount of a cure accelerator; and
(d) at least about 50 weight percent, based on the weight of the composition, of an inorganic filler.

5,149,731

POLYARYLENE SULFIDE RESIN COMPOSITION

Katsumi Uota; Hiroyuki Sano; Hajime Serizawa, and Masaru Kubota, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Apr. 9, 1991, Ser. No. 682,250
Claims priority, application Japan, Apr. 25, 1990, 2-110893
Int. Cl.[5] C08J 5/10; C08K 5/24; C08L 81/04
U.S. Cl. 524—265 15 Claims

1. A polyarylene sulfide resin composition prepared by mixing 100 parts by weight of a resin component comprising
(A) 99 to 20 parts by weight of a polyarylene sulfide resin and
(B) 1 to 80 parts by weight of a polyamide resin with

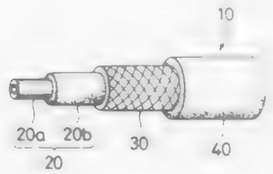
(C) 0.5 to 50 parts by weight of an olefin copolymer comprising an α-olefin and a glycidyl ester of an α,β-unsaturated acid,
(D) 0.01 to 5 parts by weight of an alkoxysilane compound and
(E) 0 to 400 parts by weight of one or more fillers selected from among fibrous, powdery and flaky ones.

5,149,732

RUBBER COMPOSITION FOR POLYMER-METAL BONDING AND METHOD OF HOSE-METAL FITTING ATTACHMENT

Shigeru Igarashi; Osamu Ozawa, both of Hiratsuka, and Tetsu Kitami, Hadano, all of Japan, assignors to The Yokohama Rubber Co., Ltd.

Filed Mar. 6, 1990, Ser. No. 489,029
Claims priority, application Japan, Mar. 7, 1989, 1-54732; May 8, 1989, 1-114551
Int. Cl.[5] C08K 5/10
U.S. Cl. 524—315 8 Claims



1. A rubber composition for use in a composite hose for the attachment of said hose to a metal fitting, said hose comprising an inner tube, a reinforcing layer and a cover superimposed in the order mentioned, said inner tube including an inner peripheral wall formed of a polymeric, which composition comprises:
(a) 100 parts by weight of a base rubber selected from the group consisting of chlorosulfonated polyethylene rubber, butyl rubber, chlorobutyl rubber and bromobutyl rubber;
(b) 30 to 300 parts by weight of at least one member selected from the group consisting of an inorganic filler and an organic filler, said inorganic filler having a hydrochloric acid-soluble content of less than 3 percent;
(c) 2 or greater parts by weight of a silane coupling agent; and
(d) a vulcanizing agent, whereby the composition has a minimum viscosity of from 45 to 120 determined at 125° C. on a Mooney viscometer.

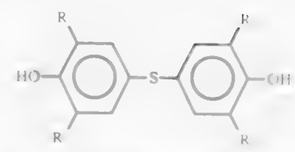
5,149,733

STABILIZED POLYMERS

George B. Klingensmith, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 20, 1989, Ser. No. 382,380
Int. Cl.[5] C08K 5/36
U.S. Cl. 524—331 22 Claims

1. A composition stabilized against degradation caused by exposure to ultraviolet light which comprises a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, and a stabilizing quantity of a mixture of a weakly acidic channel-type carbon black, which shows a pH from about 3.5 to about 6.5, and a thiobisphenol, wherein the thiobisphenol is of the formula



wherein R independently is secondary or tertiary alkyl of from 3 to 8 carbon atoms inclusive, and R' independently is alkyl of up to 8 carbon atoms inclusive.

5,149,734

HIGHLY FILLED THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS

Robert A. Fisher, Wadesville; Keith N. Gray, Newburgh, and Lawrence R. Wallace, Evansville, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 20, 1989, Ser. No. 424,749
Int. Cl.[5] C08K 3/30
U.S. Cl. 524—423 9 Claims

1. A molding composition consisting essentially of:
(a) 15–30% by total weight of said composition of polybutylene terephthalate resin;
(b) polyethylene terephthalate resin; and
(c) from 50–75% by total weight of said molding composition of barium sulfate.

5,149,735

SELF-EXTINGUISHING POLYMERIC COMPOSITIONS

Giancarlo Bressan; Claudio Troglia; Corrado Brichta, all of Milan, and Giancarlo Barbero, Arona, all of Italy, assignors to Enimont Augusta Industriale S.R.L., Milan, Italy

Filed Oct. 31, 1990, Ser. No. 607,321
Claims priority, application Italy, Nov. 6, 1989, 22274 A/89
Int. Cl.[5] C08J 5/10; C08K 3/34; C08L 23/00
U.S. Cl. 524—450 21 Claims

1. Self-extinguishing polymeric composition comprising, expressed in per cent by weight referred to the total composition:
a) from 1 to 25% of an organic aliphatic, cycloaliphatic, aromatic halogen-derivative;
b) from 10 to 40% of an adduct between an inorganic halide and a zeolite;
c) from 0.5 to 5% of an organic reactive agent suited to modify the polymeric matrix at the combustion temperature, comprising an organic compound capable of generating radicals said temperature, and at a cross-linking agent;
d) the remaining portion being composed of at least a thermoplastic polymer and/or copolymer.

5,149,736

HEAT RESISTANT GEL COMPOSITIONS

Jose P. Gamarra, Union City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 217,798, Jul. 12, 1988, Pat. No. 4,942,370, which is a continuation-in-part of Ser. No. 72,309, Jul. 13, 1987, abandoned. This application May 7, 1990, Ser. No. 519,617
Int. Cl.[5] C08L 53/00
U.S. Cl. 524—490 5 Claims

1. A method of environmentally protecting a substrate which comprises:
surrounding the substrate with a housing such that a composition is positioned between the substrate and the housing, the composition comprising:
about 5 to about 30 parts by weight of a poly(styrene-ethylene-butylene-styrene) triblock copolymer having a styrene to ethylene-butylene block ratio of about 27 to 35 styrene blocks to about 65 to 73 ethylene-butylene blocks, and having a molecular weight of at least 100,000; and

about 70 to about 95 parts by weight of a plasticizer the plasticizer comprises a hydrocarbon oil having a molecular weight of about 400 to about 2,500 and a solubility parameter of about 6.0 to 8.5;

wherein the triblock copolymer and the plasticizer have been (a) melt blended and (b) at sufficiently high temperature or under sufficiently high shear have been treated to cause the composition to have a cone penetration of at least about 50 (10^{-1} mm), an ultimate elongation of at least about 200% and a viscosity of 200° C. of at least 100 poise; and

bringing the composition and the substrate into contact with each other.

5,149,737

CARBOXY CONTAINING MONOMERS AND POLYMERS AND LATICES PREPARED FROM SAME

Ignazio S. Ponticello, Pittsford, and Richard C. Sutton, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 539,768, Jun. 18, 1990, abandoned. This application Feb. 12, 1991, Ser. No. 654,112

Int. Cl.[5] **C08L** *31/06, 25/14;* **C08F** *230/04, 228/02, 222/26*

U.S. Cl. 524—564 **12 Claims**

1. A polymer comprising recurring units derived from:

(a) from 80 to about 99.8 mole percent of one or more ethylenically unsaturated polymerizable, non-crosslinkable, vinyl aromatic monomers which provide hydrophobicity to said polymer,

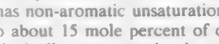
(b) from about 0.2 to 20 mole percent of one or more ethylenically unsaturated polymerizable monomers represented by the structure:

wherein:

R is hydrogen, halo or alkyl of 1 to 3 carbon atoms,

M is hydrogen, an alkali metal ion or an ammonium ion, and

L is a linking group having from 8 to 50 atoms in its linking chain, and comprises two or more divalent hydrocarbon groups connected or terminated with one or more nitrogen, oxygen or sulfur atoms, or with one or more groups containing said atoms in the linking chain, provided L has at least one arylene which is not directly connected to the terminal



group.

and further provided that none of said hydrocarbon groups has non-aromatic unsaturation, and

(c) from 0 to about 15 mole percent of one or more additional ethylenically unsaturated polymerizable monomers other than those identified in categories (a) and (b) above.

5,149,738

PROCESS FOR THE IN SITU BLENDING OF POLYMERS

Kiu H. Lee, South Charleston, W. Va.; Frederick J. Karol, Belle Mead, N.J., and Sari B. Samuels, North Woodmere, N.Y., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 271,639, Nov. 16, 1988, Pat. No. 5,047,468. This application Jul. 2, 1991, Ser. No. 724,805

Int. Cl.[5] **C08F** *297/08* · **C08L** *23/20, 23/08*

U.S. Cl. 525—53 **8 Claims**

1. A process for the in situ blending of polymers wherein a higher density and higher melt index ethylene copolymer matrix is prepared in a high melt index reactor and a lower density and lower melt index ethylene copolymer is then incorporated into the ethylene copolymer matrix in a low melt index reactor comprising continuously contacting, under polymerization conditions, a mixture of ethylene and at least one alpha-olefin having at least 3 carbon atoms in at least two fluidized bed reactors connected in series, with a catalyst comprising:

(i) a silica supported complex consisting essentially of magnesium, titanium, a halogen, and an electron donor;

(ii) at least one activator compound for said complex having the formula $AlR''_eX'_fH_g$ wherein X' is Cl or OR''; R' and R'' are saturated aliphatic hydrocarbon radicals having 1 to 14 carbon atoms and are the same or different; f is 0 to 1.5; g is 0 or 1; and e+f+g=3; and

(iii) a hydrocarbyl aluminum cocatalyst,

the polymerization conditions being such that an ethylene copolymer having a high melt index in the range of about 0.2 to about 0.5 gram per 10 minutes is formed in at least one reactor and an ethylene copolymer having a low melt index in the range of about 0.001 to about 0.2 gram per 10 minutes is formed in at least one other reactor, each copolymer having a density of from about 0.860 to about 0.965 gram per cubic centimeter and a melt flow ratio in the range of from about 20 to about 70, and being admixed with active catalyst, with the provisos that:

(a) the mixture of high melt index copolymer of ethylene and active catalyst formed in one reactor in the series is transferred to an immediately succeeding reactor in the series in which low melt index polymer is made;

(b) in a reactor in which the low melt index copolymer is made:

(1) said alpha-olefin is present in a ratio of about 0.1 to about 3.5 moles of alpha-olefin per mole of ethylene; and

(2) hydrogen is present in a ratio of about 0.001 to about 0.3 mole of hydrogen per mole of combined ethylene and alpha-olefin;

(3) additional hydrocarbyl aluminum cocatalyst is added in an amount sufficient to restore the level of the activity of the catalyst transferred from the preceding reactor in the series to about the critical level of activity in the first reactor in the series;

(4) other than the active catalyst referred to in proviso (a), no additional catalyst is added;

(c) in a reactor in which high melt index copolymer is made:

(1) said alpha-olefin is present in a ratio of about 0.02 to about 3.5 moles of alpha-olefin per mole of ethylene; and

(2) hydrogen is present in a ratio of about 0.05 to about 2 moles of hydrogen per total moles of ethylene and alpha-olefin.

5,149,739

FIBER-REINFORCED THERMOPLASTIC ELASTOMER POLYURETHANE COMPOSITIONS WITH EITHER MODIFIED AND/OR UNMODIFIED POLYOLEFINS

Biing-lin Lee, Broadview Heights, Ohio, assignor to The BFGoodrich Company, Brecksville, Ohio

Continuation of Ser. No. 508,880, Apr. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 226,589, Aug. 1, 1988, Pat. No. 4,975,207. This application Aug. 26, 1991, Ser. No. 778,553

Int. Cl.[5] **C08L** *51/06, 75/04;* **C08K** *3/36, 7/14*

U.S. Cl. 525—66 **15 Claims**

1. A thermoplastic elastomer polyurethane composition, comprising:

the reaction product consisting essentially of approximately 100 parts by weight of an unaged polyurethane containing free isocyanate with a modified polyolefin, in the presence of high shear of at least 600 reciprocal seconds, the amount of said modified polyolefin, being up to about 40 parts by weight, said unaged polyurethane made from a hydroxyl-terminated intermediate, a chain extender glycol, and an excess of polyisocyanate, the equivalent weight amount of said polyisocyanate to said hydroxyl-terminated intermediate and said chain extender being from about 1.01 to about 1.20.

5,149,740

RESIN COMPOSITION

Takashi Maruyama, Kobe, and Yukio Mizuno, Niihama, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 16, 1990, Ser. No. 494,401

Claims priority, application Japan, Mar. 22, 1989, 1-067480

Int. Cl.[5] **C08L** *27/24, 53/02, 71/12*

U.S. Cl. 525—92 **15 Claims**

1. A resin composition which comprises:

(a) a polyolefin resin in an amount of 95–50% by weight,

(b) a polyphenylene ether resin in an amount of 5–50% by weight,

(c) a partially hydrogenated alkenyl aromatic compound-isoprene block copolymer in an amount of 1–4 parts by weight based on totally 100 parts by weight of the components (a) and (b), and

(d) an ethylene-α-olefin copolymer elastomer in an amount of 5–30 parts by weight based on totally 100 parts by weight of the components (a) and (b).

5,149,741

HOT MELT CONSTRUCTION ADHESIVES FOR DISPOSABLE SOFT GOODS

Mark D. Alper, New Berlin, and Marion M. Myers, Milwaukee, both of Wis., assignors to Findley Adhesives, Inc., Wauwatosa, Wis.

Continuation-in-part of Ser. No. 383,834, Jul. 21, 1989, abandoned. This application Sep. 20, 1991, Ser. No. 763,436

Int. Cl.[5] **C09J** *109/06, 125/10, 191/00, 193/00*

U.S. Cl. 525—95 **6 Claims**

1. A hot melt construction adhesive suitable for disposable soft goods and wherein the hot melt construction adhesive is operable to bind a polyolefin or nonwoven substrates to at least one elastic, polyolefin, foam, or nonwoven substrate, the hot melt construction adhesive comprising:

(a) about 15 parts to about 40 parts of a styrene-isoprene-styrene block copolymer, and wherein the styrene content of the styrene-isoprene-styrene block copolymer is 25% to 50%, by weight, of the total weight of the styrene-isoprene-styrene block copolymer;

(b) about 40 to about 70 parts of a compatible tackifying resin selected from the group consisting of tackifying resins which include pentaerythritol esters;

(c) about 5 parts to about 30 parts of a napthenic/paraffinic oil; and

(d) 0.1 to 2 parts, by weight, of a phosphite antioxidant, hindered phenolic antioxidant and a stabilizer, and wherein the construction adhesive further is operable to have a melt viscosity of not greater than 6000 cP at a temperature of 325° F.

5,149,742

HEAT CURABLE ADHESIVES BASED ON POLYMERS HAVING A POLYBUTADIENE CHAIN BACKBONE AND CONTAINING HYDROXYL GROUPS

Richard Hemel, Monheim-Baumberg, Fed. Rep. of Germany; Julius Herold, Gettysburg, Mich.; Hans-Juergen Buecken, Monheim, and Peter Hofmann, Duesseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,701

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741165

Int. Cl.[5] **C08F** *8/34, 8/30*

U.S. Cl. 525—124 **20 Claims**

1. A heat curable adhesive, comprising:

a) polybutadiene chain backbone polymer having a number average molecular weight of from about 1000 to about 3500 and an OH value in the range from about 20 to about 100;

b) blocked multi-siocyanate molecules;

c) sulfur;- and

d) a vulcanization accelerator.

5,149,743

HALOGEN TERMINATED POLY (HALOSTYRENES) AND A PROCESS FOR THE PREPARATION THEREOF

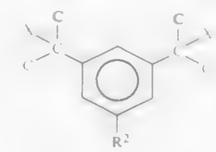
Joseph P. Kennedy, Akron, Ohio, and Miklos I. Zsuga, Debrecen, Hungary, assignors to The University of Akron, Akron, Ohio

Filed Feb. 15, 1990, Ser. No. 480,676

Int. Cl.[5] **C08G** *65/20;* **C08F** *12/16*

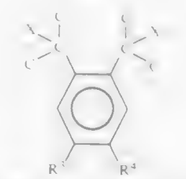
U.S. Cl. 525—331.4 **49 Claims**

1. A process for the synthesis of halogen-terminated poly(-halostyrenes) polymer comprising the steps of contacting a halostyrene monomer with a sterically hindered inifer selected from the group consisting of the formulas (a) and (b)



(a)

and



(b)

where R^2 in formula (a) is an alkyl group having from 1 to 5 carbon atoms, or a cycloalkyl group having from 4 to 8 carbon atoms, and where R^3 and R^4 in formula (b) can be the same or different, wherein R^3 and R^4 are an alkyl group having from 1 to 5 carbon atoms, or a cycloalkyl group having from 4 to 8 carbon atoms, and where X is chlorine or bromine, in the presence of a solution of a fully chlorinated metal chloride Friedel-Crafts acid coinitiator in a solvent for a time sufficient to effect formation of said polymer and at a temperature sufficient to suppress indane ring formation.

5,149,744

PROCESS FOR THE DIRECT FLUORINATION OF POLYMERIC RESINS

Gregorio Tarancon, Sarnia, Canada, assignor to Liquid Carbonic Inc., Ontario, Canada

Filed Jun. 28, 1990, Ser. No. 545,277

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] **C08F** *8/22*

U.S. Cl. 525—356 **7 Claims**

1. A process for fluorinating polymeric material capable of being fluorinated comprising the steps of contacting said polymeric material with elemental fluorine and a dense carrier fluid having a critical temperature higher than ambient temperature, a boiling point lower than ambient temperature minus 60 celsius degrees, and a molecular weight in the range of about 40 to about 200, said elemental fluorine being present in the dense carrier fluid in a concentration in the range of about 2 to about 15% by volume.

5,149,745

TRANSITION METAL CROSSLINKING OF ACID-CONTAINING POLYMERS

Joseph M. Owens, Hatboro, and Richard T. Gray, Levittown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 285,481, Dec. 16, 1988, abandoned.
This application Apr. 23, 1991, Ser. No. 690,375
Int. Cl.[5] C08F 8/42
U.S. Cl. 525—366 11 Claims

1. A process of producing an aqueous film-forming coating composition having a Tg above room temperature comprising:

a) charging a reaction zone with:

1) an aqueous film-forming polymer dispersion prepared from more than one ethylenically unsaturated monomer, including from about 4 to about 90 weight percent of acid-functional monomer(s), said polymer having pendant acid functionality and a calculated Tg of from greater than about room temperature to less than the decomposition temperature of said polymer, and

2) less than about a stoichiometric equivalent amount, based on acid functionality of said polymer, of an insoluble transition metal compound, solubility in water less than 0.4% at 60° C. and

b) maintaining the reaction zone at a temperature above about the calculated Tg and below the decomposition temperature of said polymer for a time sufficient to react said acid and metal to produce a composition having a Minimum Filming Temperature above that of the film-forming polymer starting material.

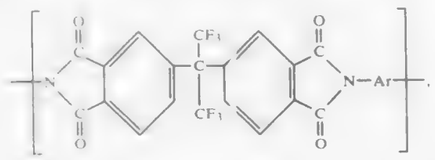
5,149,746

SEMI-INTERPENETRATING POLYMER NETWORK FOR TOUGHER AND MORE MICROCRACKING RESISTANT HIGH TEMPERATURE POLYMERS

Ruth H. Pater, Tabb, Va., assignor to The United States of America as represented by The National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 301,925, Jan. 26, 1989, Pat. No. 5,098,961.
This application Mar. 6, 1991, Ser. No. 665,371
Int. Cl.[5] C08L 79/08
U.S. Cl. 525—422 4 Claims

1. A process for preparing a semi-interpenetrating polymer network which process comprises mixing an uncrosslinked, nadic endcapped polyimide prepolymer with a mixture of monomer precursors of a linear thermoplastic polyimide and allowing said prepolymer and monomer precursors to react randomly to form a simultaneous interpenetrating polymer network comprising a constituent high performance thermosetting polyimide having a nadic end group acting as a crosslinking site, and a constituent high performance linear thermoplastic polyimide having the following repeating unit:



the constituent high performance thermosetting polyimide and the constituent high performance linear thermoplastic polyimides having comparable mechanical performance, thermooxidative stability, and glass transition temperatures (±50° C.), and being present in a weight ratio of 95:5 respectively to 5:95 respectively.

5,149,747

CARBOXYLIC ESTERS OF HYDROXYL-CONTAINING GRAFT POLYMERS AND PROCESS FOR THEIR PREPARATION

Joachim Gersdorf, Wiesbaden, and Matthias Kroggel, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1989, Ser. No. 451,331
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843505
Int. Cl.[5] C08G 18/63
U.S. Cl. 525—454 14 Claims

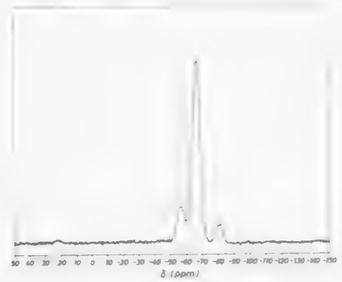
1. A graft polymer which comprises the esterification product of a hydroxyl-containing graft polymer with an acylating reagent, esterified in the melt in homogeneous phase without addition of a catalyst which can lead to coloration of the product, wherein said hydroxyl-containing graft polymer has a graft base which comprises a polymer comprising diol components and diisocyanate components, said polymer having at least two urethane groups in the molecule, onto which graft base have been grafted a plurality of polymer chains comprising units of vinyl esters of carboxylic acids, said vinyl esters having 3 to 20 carbon atoms, or hydrolysis products thereof.

5,149,748

PROCESS OF PREPARING SURFACE-MODIFIED POLYMETHYLSILSESQUIOXANE SPHERICAL FINE PARTICLES

Takaaki Shimizu; Toshihiro Okon, both of Joetsu; Toshio Ohba, and Yoshinori Inokuchi, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,822
Claims priority, application Japan, Dec. 15, 1988, 63-317539
Int. Cl.[5] C08F 283/00
U.S. Cl. 525—477 12 Claims



1. A process for preparing surface-modified polymethylsilsesquioxane spherical fine particles, comprising the steps of:

hydrolyzing methyltrialkoxysilane represented by the general formula:

$$CH_3Si(OR)_3$$

wherein R represents an alkyl group having 1 to 4 carbon atoms or further hydrolyzing a partially-hydrolyzed product of the methyltrialkoxysilane in the presence of an alkali catalyst in aqueous solvent,

subsequently carrying out condensation polymerization to obtain an aqueous suspension of a polymethylsilsesquioxane, and

surface-modifying said polymethylsilsesquioxane fine particles at a temperature between about 0° and 80° C. by dropwise adding to said aqueous suspension of said particles an organotrialkoxysilane represented by the general formula:

$$R^1Si(OR^2)_3$$

wherein R^1 represents at least one member selected from the group consisting of an alkyl group having two or more carbon atoms, an alkenyl group, a phenyl group, an epoxy group, an acryloxy group and an amino group; and R^2 represents an alkyl group having 1 to 4 carbon atoms.

5,149,749

POLY(PHENYLENE SULFIDE) COMPOSITION AND ARTICLES HAVING IMPROVED THERMAL STABILITY AT HIGH TEMPERATURES

Jennings P. Blackwell, deceased, late of Broken Arrow, Okla. by Bruce A. Blackwell, executor, and Bruce L. Ramsey, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 31, 1990, Ser. No. 531,321
Int. Cl.[5] C08F 283/00; C08G 75/00; C08L 81/00, 77/06
U.S. Cl. 525—537 22 Claims

1. A polymer composition for forming films and fibers having improved thermal stability at high temperatures, said composition consisting essentially of:

a poly(phenylene sulfide) base resin having at least about 90% by weight of poly(p-phenylene sulfide) repeat units and a melt flow in the range of from about 10 to about 300 g/10 minutes as determined by ASTM D-1238, Procedure B-Automatically Time Flow Rate Measurement, Condition 315/5.0, with a 5 minute preheat; and

a thermal stabilizer selected from the group consisting of polyethersulfone and polyamide-imide for increasing the thermal stability of the films and fibers at a temperature of at least 150° C. without deteriorating the strength thereof, said thermal stabilizer being present in the composition in an amount in the range of from about 0.5% to about 5% by weight of the composition.

5,149,750

PREPARATION OF FINELY DIVIDED, GEL-LIKE, WATER-SWELLABLE COPOLYMERS

Manfred Niessner; Stefan Wickel, both of Ludwigshafen; Wilfried Heide, Freinsheim, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 20, 1989, Ser. No. 438,876
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843780
Int. Cl.[5] C08F 2/20, 220/04, 222/02
U.S. Cl. 526—81 5 Claims

1. A process for the preparation of a finely divided, gel-like, water-swellable copolymer, which comprises copolymerizing

(a) water-soluble, monoethylenically unsaturated monomers,

(b) from 0.001 to 1 mol %, based on the monomers (a), of monomers containing two or more ethylenically unsaturated double bonds and

(c) from 0 to 20 mol %, based on the monomers (a), of water-insoluble, monoethylenically unsaturated monomers,

in 20–80% strength by weight aqueous solution in the presence of a polymerization initiator and from 0.1 to 10% by weight, based on the monomers used in the copolymerization, of a surfactant having an HLB value of not less than 3, the monomers being copolymerized in the presence of initially from 0 to 50% by weight of the amount of surfactant to a conversion of not less than 60% with thorough mixing, the remaining amount of surfactant then being added to the reaction mixture, the copolymerization being completed and the gel-like copolymer obtained in finely divided form then being dried.

5,149,751

PROCESS FOR THE PREPARATION OF 1-MONOALKYL-DIMETHYLSILYLPROPYNE POLYMERS

Yukihiro Saito; Katsunori Waragai, both of Kawasaki, and Shiro Asakawa, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1989, Ser. No. 402,419
Claims priority, application Japan, Sep. 5, 1988, 63-221712
Int. Cl.[5] C08H 4/58
U.S. Cl. 526—178 15 Claims

1. A process for the preparation of 1-monoalkyl(C_1–C_4)dimethylsilyl-1-propyne polymers which comprises polymerizing a 1-monoalkyl(C_1–C_4)dimethylsilyl-1-propyne monomer in the presence of a compound of a transition metal of Group V of the Periodic Table and a member selected from the group consisting of α,ω-dihydropolydialkylsiloxanes and polyalkyldihydrosiloxanes in a solvent inert for the polymerization.

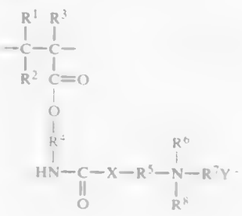
5,149,752

CATIONIC POLYMERS

Janusz Jachowicz, Bethel, Conn., and Chittamuru Ramireddy, Austin, Tex., assignors to Clairol Incorporated, New York, N.Y.

Filed Feb. 16, 1990, Ser. No. 481,417
Int. Cl.[5] C08F 230/04, 226/02
U.S. Cl. 526—240 6 Claims

1. A cationic polymer comprising about 50% or more of the units of formula I:



(I)

wherein:

(a) R^1, R^2 and R^3 are each independently selected from the group consisting of H, halogen, alkyl, C_{1-6} alkoxy, C_{1-6} aminoalkyl, C_{1-6} haloalkyl, phenyl, C_{1-6} alkylphenyl, C_{1-6} alkoxyphenyl, halophenyl containing 1 to 5 halogen atoms, and aminophenyl containing 1 to 5 amino groups;

(b) R^4 and R^5 are independently C_{1-20} alkylene linkages bearing from 0 to 10 halogen, or C_{1-6} alkoxy substituents;

(c) X is —O— or —NH—;

(d) R^6, R^7, and R^8 are each independently C_{1-20} alkyl, with the proviso that at least one of R^6, R^7, and R^8 contains a C_{10-20} group; and

(e) Y is a halide ion or C_{1-6} alkyl sulfate ion.

5,149,753

FLUORINE-CONTAINING COPOLYMER AND PROCESS FOR PREPARING THE SAME

Hiroshi Inukai, Settsu, and Takahiro Kitahara, Suita, both of Japan, assignors to Daikin Industries, Ltd., Japan

Continuation of Ser. No. 316,956, Feb. 28, 1989, abandoned.
This application Oct. 4, 1990, Ser. No. 579,089
Claims priority, application Japan, Mar. 1, 1988, 63-48459
Int. Cl.[5] C08F 18/20
U.S. Cl. 526—245 5 Claims

1. A fluorine-containing copolymer having a light transmittance of 90% or more and consisting essentially of

(a) about 50 to about 95% by weight of fluoroalkyl methacrylate represented by the formula

wherein n is an integer of 6 to 10, and
(b) about 5 to about 50% by weight of methyl methacrylate.

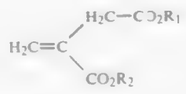
5,149,754

STAIN-RESISTANT POLYMERS DERIVED FROM ITACONIC ACID USEFUL AS COATINGS FOR FIBERS

George D. Green, Park Ridge, Ill.; Stephen A. Munk, West Lafayette, Ind., and Darryl K. Barnes, Bellwood, Ill., assignors to Allied-Signal Inc, Morris Township, Morris County, N.J.

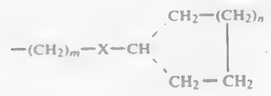
Division of Ser. No. 512,227, Apr. 9, 1990, Pat. No. 5,006,408, which is a division of Ser. No. 292,862, Jan. 3, 1989, Pat. No. 4,925,906. This application Mar. 18, 1991, Ser. No. 670,659
Int. Cl.[5] C08F 32/00
U.S. Cl. 526—309 9 Claims

1. A polymeric composition useful as a stain resistant coating on substrates, the polymeric composition comprising
an addition polymer formed from at least one monomer, selected only from the group having the formula



(A)

where R_1 is H, C_5–C_{22} alkyl,



cyclobutyl, cyclopentyl, cyclohexyl, or cycloheptyl;
m = 0–12;
n = 0, 1, 2, or 3;
X = CH_2, 0 when m > 1, and
R_2 is chosen from the list above and may or may not be the same as R_1, except R_1 and R_2 cannot both be H.

5,149,755

PREPARATION OF POLY(BENZOX, IMID, THIAZOLE) POLYMERS

Robert J. Perry, Pittsford, N.Y. assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1991, Ser. No. 726,437
Int. Cl.[5] C08G 73/18, 73/22, 75/32
U.S. Cl. 528—210 20 Claims

1. A method for preparing a polymer comprising the step of reacting, carbon monoxide, an aromatic halide reactant having the general formula

$$X^1—Ar^1—Z^1$$

and an aromatic amine reactant having the general formula

$$Z^2—Ar^2—M^1,$$

wherein
X^1 and Z^1 are non-ortho,
Z^2 and M^1 are non-ortho,
one of Z^1 and Z^2 is X^2 and the other one is M^2, —Ar^1— and —Ar^2— are each independently selected from the group consisting of aromatic and heteroaromatic moieties having a total of ring carbons and heteroatoms of from 6 to about 20,
—X^1 and —X^2 are each independently selected from the group consisting of —I and —Br,
—M^1 and —M^2 are each independently selected from moieties having an —NH_2 radical and, ortho to said —NH_2 radical, a radical selected from the group consisting of —NH_2, —OH, and —SH,
in the presence of solvent and catalyst, said catalyst being selected from the group consisting of platinum compounds, nickel compounds, and palladium compounds.

5,149,756

HYBRID AMINO RESIN COMPOSITIONS

David W. Demarey, Westhampton, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 24, 1989, Ser. No. 301,191
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] C08F 283/00; C08G 8/28; C08L 61/00, 61/20
U.S. Cl. 528—230 20 Claims

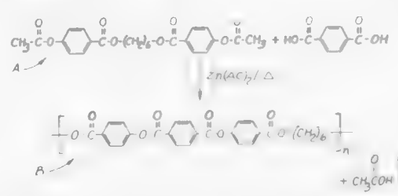
1. A curable composition comprising an alkoxymethyl amino resin component, a hydroxy-functional component co-reactive with the alkoxymethyl amino resin, a (meth)-acryloyl component and a metal sulfonate of a metal selected from Groups IB, IIIB, IVB, VB, VIB, VIIB, and VIII of the CAS version of the Periodic Table.

5,149,757

PROCESS TO SYNTHESIZE LIQUID CRYSTALLINE POLYESTERS

Simon W. Kantor, Agawam; Robert W. Lenz, Amherst, and William J. Ward, Sunderland, all of Mass., assignors to University of Massachusetts at Amherst, Amherst, Mass.

Filed May 1, 1990, Ser. No. 517,122
Int. Cl.[5] C08G 63/00, 67/00, 63/02
U.S. Cl. 528—271 6 Claims



1. A process for forming a liquid crystalline polyester resin of the aromatic triad type which comprises reacting an alkylene bis(acetoxybenzoate) monomer and an aromatic dicarboxylic acid monomer with removal of acetic acid by-product.

5,149,758

CONTINUOUS PRODUCTION OF POLYCAPROLACTAM HAVING A REGULATED AMINO END GROUP CONTENT

Paul Matthies, Heidelberg, Fed. Rep. of Germany, assignor to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 11, 1991, Ser. No. 713,303
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1990, 4019780
Int. Cl.[5] C08G 69/16
U.S. Cl. 528—318 4 Claims

1. A process for the continuous production of polycaprolactam having a regulated amino end group content, in which caprolactam is polymerized at 240°–290° C. in the presence of water as initiator and in the presence of a dicarboxylic acid as chain regulator, which comprises polymerizing caprolactam in a single stage in the presence of from 0.3 to 5% by weight of water and from 0.1 to 0.6% by weight of terephthalic acid or isophthalic acid or of a mixture thereof, each percentage being based on caprolactam, at a uniform pressure through the entire polymerization time of from 1.0 to 1.9 bar, measured in the vapor phase above the polymerization zone, while maintaining a water content of from 0.1 to 0.5% by weight, until the sum total of the amino and carboxyl end group contents is from 115 to 150 meq/kg, with the proviso that the amino end group content does not drop below 25 meq/kg, measured on extracted polycaprolactam.

5,149,759

PROCESS FOR PREPARING AROMATIC POLYAMIDES OF HIGH HYDROLYSIS RESISTANCE WITH CONTROLLED WATER CONTENT OF DIAMINE

Georg-Emrich Miess, Königstein; Peter Klein, Wiesbaden, and Wilfried Pressler, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 3, 1991, Ser. No. 679,922
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1990, 4010941
Int. Cl.[5] C08G 69/28
U.S. Cl. 528—348 11 Claims

1. A process for preparing an aromatic polyamide of high hydrolysis resistance by reacting an aromatic dicarbonyl dichloride or dicarbonyl dichloride mixture with an aromatic diamine or diamine mixture in an organic solvent in the presence or absence of an inorganic salt which increases the solubility of the aromatic polyamide formed in the organic solvent, which comprises dissolving the diamine or diamine mixture, having a water content of up to 25% by weight, in the organic solvent, which solvent optionally contains water, and subjecting the solution to a vacuum distillation in an inert gas atmosphere at a pressure of from 100 pascals (Pa) to 5×10^3 Pa at a bottom of column temperature of about 20° C. to 160° C., until the water content of a bottom product is < 100 ppm and then optionally adding inorganic salts, and thereafter the dicarbonyl dichloride or dicarbonyl dichloride mixture to bottom product and reacting to prepare polyamide.

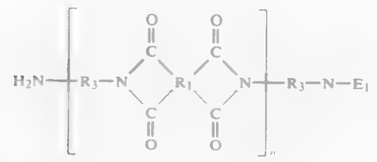
5,149,760

HALOGENATED POLYIMIDE RESINS PREPARED BY ADDITION REACTIONS

Tito T. Serafini, Redondo Beach; Paul G. Cheng, Rancho Palos Verdes; Kenneth K. Ueda, Lomita, and Ward F. Wright, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 472,198, Jan. 30, 1990. This application Jan. 22, 1992, Ser. No. 824,089
Int. Cl.[5] C08G 69/26, 63/08, 75/00, 67/00
U.S. Cl. 528—353 28 Claims

1. A composition of matter consisting essentially of low molecular weight prepolymers substituted with a halogen selected from the group consisting of chlorine and fluorine, the prepolymers having only one end cap radical and suitable for chain extension and crosslinking to form high molecular weight, thermally stable polyimides, the prepolymers having the formula:



where
R_1 is a tetravalent aryl radical,
each R_2 is independently selected from the group consisting of alkyl and hydrogen, at least one R_2 being alkyl,
R_3 is a divalent aryl radical,
E_1 is an end cap radical having at least one unsaturated moiety and being capable of undergoing addition polymerization, and
n is at least 2 and is sufficiently small that the average molecular weight of the prepolymers is less than about 10,000

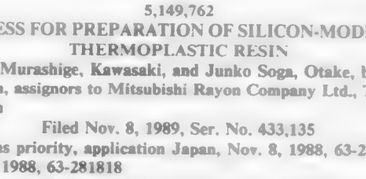
5,149,761

AROMATIC ETHER IMIDES

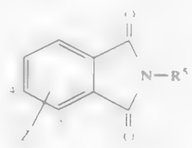
Knud Reuter; Dieter Freitag, both of Krefeld; Günther Weymans, Leverkusen, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 417,216, Oct. 4, 1989, Pat. No. 4,994,579. This application Nov. 1, 1990, Ser. No. 608,078
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834660
Int. Cl.[5] C08G 69/26, 8/02, 14/00, 73/10
U.S. Cl. 528—353 2 Claims

1. The method of producing plastics comprising polycondensing an aromatic ether imide wherein said imide is prepared by reacting a compound corresponding to



wherein
R^1 and R^2 denote independently of one another hydrogen, halogen, C_{1-8} alkyl,
C_{5-6} cycloalkyl, C_{6-10} aryl or C_{7-12} aralkyl,
R^3 and R^4 independently denote hydrogen or C_{1-6} alkyl,
X denotes a carbon atom with the provision that at least one ring carbon atom is substituted by two C_{1-6} alkyl groups,
R^5 denotes C_{1-4} alkyl, C_{5-6} cycloalkyl or C_{6-10} aryl and
M stands for an alkali metal, with a compound corresponding to



wherein
Z denotes fluorine, chlorine or a nitro group and
R^5 has the meaning indicated above, at temperatures from 20° to 180° C. in the presence of a dipolar, aprotic solvent.

5,149,762

PROCESS FOR PREPARATION OF SILICON-MODIFIED THERMOPLASTIC RESIN

Yoshio Murashige, Kawasaki, and Junko Soga, Otake, both of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433,135
Claims priority, application Japan, Nov. 8, 1988, 63-281817; Nov. 8, 1988, 63-281818
Int. Cl.[5] C08G 77/26, 69/26, 69/28; C08K 5/54
U.S. Cl. 528—353 9 Claims

1. A process for the preparation of a silicon-modified thermoplastic resin, which comprises heating a mixture comprising 10 to 90% by weight of an imide group-containing thermoplastic resin and 90 to 10% by weight of a modified silicon compound having an amino group —NH_2 at one end of the mole-

cule and an alkyl group $-C_nH_{2n+1}$ (n is an integer of at least 1) at the other end of the molecule, to chemically bond the imide group-containing thermoplastic resin to the modified silicon compound.

5,149,763

PROCESS FOR TRANSFORMING AMINO- OR HYDROXY-CONTAINING MATERIALS OF PLANT SEED ORIGIN INTO PLASTICS FEEDSTOCKS

Artur Simon, and Éva Z. n. Simon, both of Budapest, Hungary, assignors to Muanygipari Kutató Intézet, Budapest, Hungary

Filed Jul. 31, 1990, Ser. No. 560,585
Claims priority, application Hungary, Jul. 31, 1989, 3907/89
Int. Cl.[5] C08G *83/00*
U.S. Cl. 528—1 6 Claims

1. A process for transforming amino-containing materials of plant seed origin into plastics feedstocks, which comprises reacting amino-containing starting materials of plant seed origin with an oxo compound in an aqueous medium of 34% to 62% by mass water, optionally, also with an amino compound, simultaneously or subsequently; then transforming the obtained macromolecular material into plastics feedstock by adding a lubricant, stabilizing additive and, optionally, a colorant additive and homogenizing the mixture.

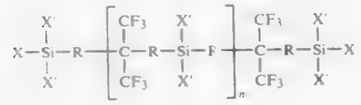
5,149,764

SUBSTITUTED SILYL-TERMINATED COMPOUNDS AND POLYMERS THEREOF

Kreisler S. Y. Lau, Alhambra; Abraham L. Landis, Northridge, and Thomas K. Dougherty, Playa del Rey, all of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 73,025, Jul. 14, 1987, Pat. No. 4,935,479.
This application Apr. 10, 1990, Ser. No. 507,070
Int. Cl.[5] C08G *77/08*
U.S. Cl. 528—14 8 Claims

1. A method of forming a compound of the formula IV



where

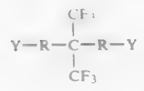
R is a benzoxazole group substituted with a phenylene group on the oxazole moiety, the fused benzene ring of the benzoxazole group being attached to the C_3F_6 group and the phenylene group on the oxazole moiety being attached to the $-SiXX'_2$ group,

X is H, Cl, or Br,

X' is Cl, or Br, and

n is an integer from 1 to about 10, comprising the steps of:

a) providing a compound of the formula II



where

Y is a halogen, and

R is as defined above;

b) reacting said compound of formula II with an alkyl lithium compound in a molar ratio of about 1:2 in an appropriate solvent to form a reaction mixture;

c) gradually adding to said reaction mixture a silicon halide having formula III

where

Hal is Cl or Br, and

X and X' are as defined above; to form said compound of formula IV.

5,149,765

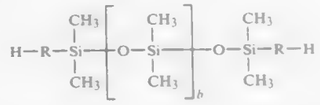
TERMINAL PHOSPHATED SILICONE POLYMERS

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 546,358, Jun. 27, 1990, Pat. No. 5,070,171. This application Oct. 17, 1991, Ser. No. 778,506
Int. Cl.[5] C08G *77/04*
U.S. Cl. 528—25 6 Claims

1. A silicone phosphate compound which is prepared by the phosphation reaction of;

(a) a terminal hydroxyl group of a silicone polymer which conforms to the following structure;



R is $-(CH_2)_3-O-(CH_2CH_2-O)_x-(CH_2(CH_3)-CH-O)_y-(CH_2CH_2-O)_z-$ x, y and z are integers independently ranging from 0 to 20;

b is an integer from 1 to 200; with

(b) a phosphating agent selected from the group consisting of polyphosphoric acid and phosphorus pentoxide.

5,149,766

PROCESS FOR THE PREPARATION OF URETDIONE GROUP CONTAINING POLYISOCYANATES

Bernd Bruchmann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 16, 1990, Ser. No. 568,122
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930670
Int. Cl.[5] C08G *18/74*
U.S. Cl. 528—49 2 Claims

1. A process for the preparations of uretdione group containing polyisocyanates, comprising reacting monomeric aromatic diisocyanates in the presence of 1,2-dimethylimidazole as a catalyst in an inert organic solvent wherein the weight ratio of solvent to diisocyanate lies in a range of from 0.1:1 to 2:1.

5,149,767

THERMOSETTING MIXTURES UTILIZING ARALIPHATIC SULFONIUM SALTS

Kurt Munk, Grenzach, Fed. Rep. of Germany, and Martin Roth, Giffers, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

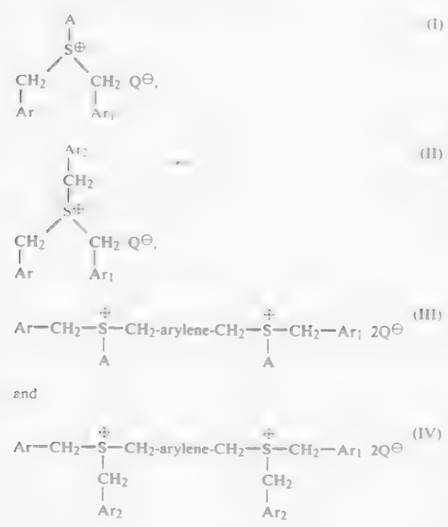
Filed Oct. 11, 1990, Ser. No. 595,918
Claims priority, application Switzerland, Oct. 18, 1989, 3788/89
Int. Cl.[5] C08F *4/20*; C08G *59/68*
U.S. Cl. 528—71 11 Claims

1. A thermosetting mixture which comprises

(a) an epoxy resin having on average more than one 1,2-epoxide group in the molecule,

(b) a di- or polyisocyanate compound, and

(c) a sulfonium salt selected from the group consisting of the compounds of formulae I to IV



(I)

(II)

(III)

and

(IV)

wherein

A is C_1–C_{12}alkyl, C_3–C_8cycloalkyl, C_4–C_{10}cycloalkylalkyl or phenyl which is unsubstituted or substituted by one or more substituents selected from the group consisting of C_1–C_8alkyl, C_1–C_4alkoxy, halogen, nitro, phenyl, phenoxy, alkoxycarbonyl having 1–4 C atoms in the alkoxy radical and acyl having 1–12 C atoms;

Ar, Ar_1 and Ar_2 independently of one another are each phenyl which is unsubstituted or substituted by one or more substituents selected from the group consisting of C_1–C_8alkyl, C_1–C_4alkoxy, halogen, nitro, phenyl, phenoxy, alkoxycarbonyl having 1–4 C atoms in the alkoxy radical and acyl having 1–12 C atoms; or are naphthyl which is unsubstituted or substituted by one or more substituents selected from the group consisting of C_1–C_8alkyl, C_1–C_4alkoxy, halogen, nitro, phenyl, phenoxy, alkoxycarbonyl having 1–4 C atoms in the alkoxy radical and acyl having 1–12 C atoms;

arylene in each case is phenylene which is unsubstituted or substituted by one or more substituents selected from the group consisting of C_1–C_8alkyl, C_1–C_4alkoxy, halogen, nitro, phenyl, phenoxy, alkoxycarbonyl having 1–4 C atoms in the alkoxy radical and acyl having 1–12 C atoms; or is naphthylene which is unsubstituted or substituted by one or more substituents selected from the group consisting of C_1–C_8alkyl, C_1–C_4alkoxy, halogen, nitro, phenyl, phenoxy, alkoxycarbonyl having 1–4 C atoms in the alkoxy radical and acyl having 1–12 C atoms; and

$Q^{\ominus}$ is $SbF_6^{\ominus}$, $AsF_6^{\ominus}$ or $SbF_5OH^{\ominus}$.

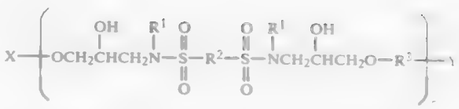
5,149,768

HYDROXY-FUNCTIONAL POLY(ETHER SULFONAMIDES) AS THERMOPLASTIC BARRIER RESINS

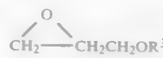
Jerry E. White; Anthony P. Haag, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 21, 1991, Ser. No. 718,684
Int. Cl.[5] C08G *59/44*
U.S. Cl. 528—89 10 Claims

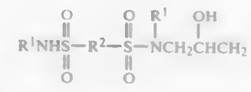
1. A thermoplastic polymer comprising a hydroxy-functional poly(ether sulfonamide) represented by the formula:



wherein each R^1 is independently an alkyl, aryl, substituted alkyl, or substituted aryl moiety, each R^2 is independently and predominantly hydrocarbylene moiety or divalent aromatic moiety, each R^3 is independently a divalent aromatic moiety, and n is a whole number from 10 to about 1000, X is



and Y is



wherein R^1, R^2 and R^3 are as defined previously.

5,149,769

PROCESS FOR THE PRODUCTION OF AROMATIC POLYESTERS

Peter Fialla, Maria Enzersdorf, Austria, assignor to Isovolta Osterreichische Isolierstoffwerke, Wiener Neudorf, Austria

Continuation of Ser. No. 574,605, Aug. 28, 1990, abandoned, which is a continuation of Ser. No. 224,917, Jun. 16, 1988, Pat. No. 4,962,180. This application Dec. 12, 1991, Ser. No. 806,694
Claims priority, application Australia, Oct. 2, 1986, 2796/86
Int. Cl.[5] C08G *63/02, 63/18*
U.S. Cl. 528—193 9 Claims

1. A continuous process for producing an aromatic polyester by polycondensing at least one mono- or multinuclear substituted or unsubstituted diphenol as first reactant with at least one aromatic dicarboxylic acid halide as second reactant comprising:

preparing an aqueous phase by mixing the said at least one diphenol, an alkali metal hydroxide for the formation of diphenolates with a phase transfer catalyst, water or a mixture of water and an organic solubilizer;

preparing an organic liquid phase by mixing the said at least one aromatic dicarboxylic acid halide and an organic solvent to form a solution thereof;

continuously mixing the aqueous phase with an organic solvent to form a fine pre-emulsion;

preparing a reaction emulsion by continuously supplying organic liquid phase and pre-emulsion to an input of a dispersing unit whereby reactants in said phase and pre-emulsion are mixed in constant proportions;

passing the reaction emulsion through at least one dispersing unit.

5,149,770

PREPARATION OF A POLYCARBONATE WITH ELECTRON DONATIVE AMINE COMPOUND AND ALKALI OR ALKALINE EARTH METAL COMPOUND

Tatsuya Kanno, and Tsutomu Yamato, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 638,975, Jan. 8, 1991, which is a continuation-in-part of Ser. No. 475,206, Feb. 2, 1990, Pat. No. 5,025,083, which is a continuation-in-part of Ser. No. 423,336, Oct. 18, 1989, abandoned. This application Sep. 24, 1991, Ser. No. 764,300

Claims priority, application Japan, Feb. 10, 1989, 1-31904; Jun. 23, 1989, 1-161039; Oct. 26, 1989, 1-279048

Int. Cl.[5] C08G 64/28, 64/30

U.S. Cl. 528—199 7 Claims

1. A process for producing a polycarbonate by melt-polycondensing, at least one dihydric hydroxy compound and a bisarylcarbonate in the presence of a catalyst system comprising an electron donative amine compound and a compound selected from the group consisting of alkali metal compounds and alkaline earth metal compounds.

5,149,771

LIQUID CRYSTAL-ALIGNING FILM AND A LIQUID CRYSTAL DISPLAY ELEMENT

Shizuo Murata, and Minoru Nakayama, both of Ichiharashi, Japan, assignors to Chisso Corporation, Japan

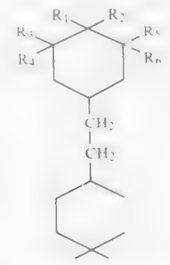
Filed Dec. 21, 1990, Ser. No. 631,449

Claims priority, application Japan, Jan. 25, 1990, 2-15747

Int. Cl.[5] C08G 69/26

U.S. Cl. 528—353 13 Claims

1. A liquid crystal-aligning film comprising as its main component, a high molecular weight polymer containing in its long chain, a substituted-cyclohexylethylcyclohexylidene group or cyclohexylethylcyclohexylidene group expressed by the formula



(1)

wherein R_1 to R_6 each represent a hydrogen atom or an alkyl group of 1 to 22 carbon atoms and may be the same as or different from one other.

5,149,772

HALOGENATED POLYIMIDE RESINS PREPARED BY ADDITION REACTIONS

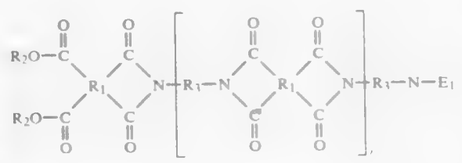
Tito T. Serafini, Redondo Beach; Paul G. Cheng, Rancho Palos Verdes; Kenneth K. Ueda, Lomita, and Ward F. Wright, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 472,036, Jan. 30, 1990, Pat. No. 5,091,505. This application Jan. 22, 1992, Ser. No. 824,090

Int. Cl.[5] C08G 69/26, 63/08, 75/00; C08L 67/00

U.S. Cl. 528—353 28 Claims

1. A composition of matter consisting essentially of low molecular weight prepolymers substituted with a halogen selected from the group consisting of chlorine and fluorine, the prepolymers having only one end cap radical and suitable for chain extensions and crosslinking to form high molecular weight, thermally stable polyimides, the prepolymers having the formula:



where

R_1 is a tetravalent aryl radical,

each R_2 is independently selected from the group consisting of alkyl and hydrogen, at least one R_2 being alkyl,

R_3 is a divalent aryl radical,

E_1 is an end cap radical having at least one unsaturated moiety and being capable of undergoing addition polymerization, and

n is at least 2 and is sufficiently small that the average molecular weight of the prepolymers is less than about 10,000.

5,149,773

POLYQUINOXALINE AND THE METHOD OF PREPARATION

Long Y. Chiang, Somerset, N.J., and John W. Swirczewski, Kintnersville, Pa., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 482,459, Feb. 21, 1990, abandoned. This application Jun. 24, 1991, Ser. No. 726,149

Int. Cl.[5] C08G 73/00

U.S. Cl. 528—423 11 Claims

1. A homopolymer consisting essentially of recurring moieties of 1,2,3,4-tetrahydroquinoxaline, monoorgano-substituted 1,2,3,4-tetrahydroquinoxaline or diorgano-substituted 1,2,3,4-tetrahydroquinoxaline.

5,149,774

METHOD FOR RECYCLING DISCOLORED POLYOLEFINS

Ambelal R. Patel, Ardsley, N.Y., and Stephen D. Pastor, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 31, 1990, Ser. No. 560,689

Int. Cl.[5] C08F 8/32

U.S. Cl. 528—492 13 Claims

1. A method for reclaiming and recycling an already discolored polyolefin resin, which is discolored as a result of improper processing at a too elevated temperature or of prolonged aging, which method comprises

incorporating into said discolored polyolefin resin an effective color reducing amount of a hydroxylamine of formula I

$$T_1T_2NOH$$

wherein

T_1 and T_2 are independently hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbons atoms, aralkyl of 7 to 15 carbon atoms or said aralkyl substituted by alkyl of 1 to 18 carbon atoms or by α-cumyl, with the proviso that T_1 and T_2 are not both hydrogen, and

reprocessing the discolored polyolefin resin, now containing said hydroxylamine of formula I, to yield a reclaimed and recycled polyolefin resin with sufficiently reduced color to make said reprocessed polyolefin acceptable for reuse.

5,149,775

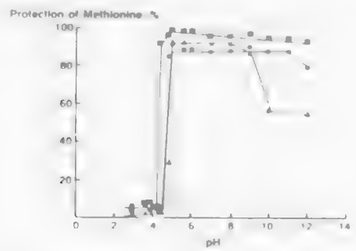
METHOD FOR PURIFYING HIGH MOLECULAR WEIGHT VINYLPYRIDINE/STYRENE POLYMERS FROM SOLUTION

Stephen H. W. Wu, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 25, 1991, Ser. No. 647,122

Int. Cl.[5] C08F 6/06, 6/12

U.S. Cl. 528—493 8 Claims



1. A process for purifying high molecular weight polymers comprising

(A) dispersing with agitation a 2-vinylpyridine/styrene or 4-vinylpyridine/styrene polymer fraction containing residual monomers, low molecular weight polymers of a number average molecular weight less than 10,000 and high molecular weight polymers of a number average molecular weight greater than 100,000 in a solvent system comprising

(i) acetone, methyl ethyl ketone, or a mixture thereof, and

(ii) about 0.1% to about 12%, based on the total weight of the solvent system, of water, methanol, ethanol, or a mixture thereof.

under conditions such that a major portion of the high molecular weight polymers are swollen but a major portion of the residual monomers and low molecular weight polymers are soluble in the solvent system, and

(B) allowing the dispersion of step (A) to settle to form a gel-like layer with a supernatant followed by separating the supernatant from the gel-like layer.

5,149,776

CROSS-LINKING HARDENABLE RESIN COMPOSITION, METAL LAMINATES THEREOF AND METAL SURFACE PROCESSING METHOD THEREWITH

Kenji Kushi; Ken-ichi Inukai; Takayuki Iseki; Seiya Koyanagi, and Yasuyuki Fujimoto, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1990, Ser. No. 614,123

Claims priority, application Japan, Nov. 17, 1989, 1-299130

The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.[5] G03C 1/725

U.S. Cl. 430—288 8 Claims

2. A cross-linking hardenable resin composition in accordance with claim 1 above, said cross-linking hardenable resin composition including a mixture of:

a) 50 to 70 parts by weight of binder resin comprising thermoplastic resin A and thermoplastic resin B, where thermoplastic resin A and thermoplastic resin B each have a weight averaged molecular weight ranging from 75,000 to 200,000, and the ratio by weight of thermoplastic resin A to thermoplastic resin B is in the range of 2:8 to 8:2;

b) 30 to 50 parts by weight of cross-linking monomer, where each molecule of cross-linking monomer includes at least 2 carbon-carbon double bonds; and

c) 0.1 to 10 parts by weight of photopolymerization initiator, such that when the amount of each of said binder resin, cross-linking monomer and photopolymerization initiator making up said mixture is expressed in terms of parts by weight of said mixture, the total thereof equals 100; and

such that said thermoplastic resin A in said binder resin has a glass transition temperature (T_g) measured by differential scanning calorimetry (DSC) in the range of 70 to 88° C., and each 100 parts by weight thereof is comprised of:

i) 18 to 30 % by weight thereof of first polymerizable substance, said first polymerizable substance in turn made up of at least one type of chemical compound selected from acrylic acid and methacrylic acid;

ii) 12 to 45 % by weight thereof of second polymerizable substance, said second polymerizable substance being at least one type of chemical compound selected from the group of chemical compounds comprising 1 to 8 carbon atom alkyl group possessing alkyl acrylate compounds;

iii) 15 to 70 % by weight thereof of third polymerizable substance, said third polymerizable substance being at least one alkyl methacrylate having a 1 to 8 carbon atom alkyl group; and

iv) 0 to 40 % by weight thereof of fourth polymerizable substance, said fourth polymerizable substance being at least one type of chemical compound selected from styrene and ring substituted styrene; and

such that thermoplastic resin B in said binder resin has a T_g as measured by DSC ranging from 92 to 110° C., and is co-polymerized with a mixture of monomers comprising:

v) 18 to 30 % by weight thereof of first polymerizable substance, said first polymerizable substance in turn made up of at least one type of chemical compound selected from acrylic acid and methacrylic acid;

vi) 7 to 25 % by weight thereof of second polymerizable substance, said second polymerizable substance being at least one type of chemical compound selected from the group of chemical compounds comprising 1 to 8 carbon atom alkyl group possessing alkyl acrylate compounds;

vii) 15 to 75 % by weight thereof of third polymerizable substance, said third polymerizable substance being at least one type of chemical compound selected from the group of chemical compounds comprising 1 to 8 carbon atom alkyl group possessing alkyl methacrylate compounds; and

viii) 0 to 40 % by weight thereof of fourth polymerizable substance, said fourth polymerizable substance being at least one type of chemical compound selected from the group of chemical compounds comprising styrene and ring substituted styrene.

5,149,777

HUMAN INSULIN ANALOGS AND PREPARATIONS CONTAINING THEM

Finn B. Hansen, Roskilde, and Per Balschmidt, Espergaerde, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK88/00124, § 371 Date Mar. 19, 1991, § 102(e) Date Mar. 19, 1991, PCT Pub. No. WO90/01038, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 20, 1988, Ser. No. 640,308

Int. Cl.[5] A61K 37/26, 37/02

U.S. Cl. 530—303 20 Claims

1. Human insulin analogs exhibiting high biological activity, characterized in that the amino acid residue in position B25 is His or Tyr, that the amino acid residue in one or more of the positions A4, A8, A17, A21, B9, B10, B12, B13, B21, B26, B27, B28, and B30 is optionally replaced by another amino acid residue, and that the amino acid residue in the B30-position is optionally missing or blocked at the C-terminal in the form of ester or amide, provided that when B25 is Tyr then B30 is different from Ala.

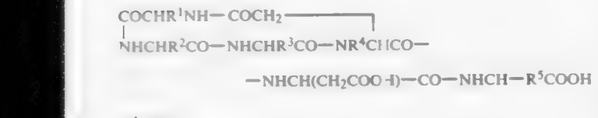
5,149,77?

CYCLIC PEPTIDES FOR TREATING HERPES INFECTIONS

Julian Adams, Ridgefield, Conn.; John DiMaio, Montreal, and Raymond Plante, Laval, both of Canada, assignors to Bio-Mega, Inc., Laval, Canada

Filed Jul. 3, 1990, Ser. No. 547,721
Claims priority, application Canada, Jul. 7, 1989, 605070
Int. Cl.[5] C07K *7/54*
U.S. Cl. 530—317 1 Claim

1. An anti-HSV-1 peptide of the formula



wherein
R^1 is (4-hydroxyphenyl)methyl;
R^2 is 1-methylethyl;
R^3 is 1-methylpropyl;
R^4 is hydrogen; and
R^5 is 2-methylpropyl, or a therapeutically acceptable salt thereof.

5,149,779

HUMORAL HYPERCALCEMIC FACTOR ANTAGONISTS

Michael Chorev, Jerusalem, Israel and Eli Roubini, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 26, 1990, Ser. No. 557,828
Int. Cl.[5] C07K *7/54, 7/36;* A61K *37/02*
U.S. Cl. 530—317 3 Claims

1. A peptide having the following structure:

$[Lys^{13}, Asp^{17}]hHC\ F(X-34)NH_2$

wherein X is 7, 8, 9, 10, or 11 and wherein (a) Ala^{34} is replaced by Tyr^{34}, and/or (b) Phe^{23} is replaced by a hydrophobic amino acid selected from the group consisting of the D- or L-stereoisomers of Leu, Nle, Val, Tyr, Trp, beta-naphthylAla and alpha-naphthylAla, and/or (c) Gly^{12} is replaced by an amino acid selected from the group consisting of the D- or L-stereoisomers of Trp, Pro, Ala, Aib, naphthylAla, alpha-MeTrp and N-MeGly and/or (d) any or each of Asp^{10}, Lys^{11} or Ser^{14} is replaced by an amino acid selected from the group consisting of the D- or L-stereoisomers of Asn, Leu and His, and/or (e) the N-terminal amine is acetylated.

5,149,780

PEPTIDES AND ANTIBODIES THAT INHIBIT INTEGRIN-LIGAND BINDING

Edward F. Plow; Stanley E. D'Souza, and Mark H. Ginsberg, all of San Diego, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Oct. 3, 1988, Ser. No. 252,674
Int. Cl.[5] C07K *7/00, 15/28;* C12N *15/11, 15/00*
U.S. Cl. 530—324 12 Claims

1. A polypeptide of 60 to 90 amino acid residues in length having a sequence homologous to the GPIIIa amino acid residue sequence represented by the formula: DYPV-DIYYLMDLSYSMKDDLWSIQNLGT-KLATQMRKLTSNLRIGFGAFVDKPVSPYMYISPPE.

5,149,781

STEROID/THYROID HORMONE RECEPTOR-RELATED GENE INAPPROPRIATELY EXPRESSED IN HUMAN HEPATOCELLULAR CARCINOMA

Hugues Blaudin de THE; Agnes Marchio; Pierre Tiollais, and Anne Dejean, all of Paris, France, assignors to Institut Pasteur

Continuation-in-part of Ser. No. 134,130, Dec. 17, 1987, which is a continuation-in-part of Ser. No. 133,687, Dec. 16, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 209,009
Int. Cl.[5] C07K *07/06, 07/08, 07/10, 17/00, 13/00*
U.S. Cl. 530—326 12 Claims

1. A polypeptide of hap protein, wherein the polypeptide consists essentially of an amino acid sequence selected from the group consisting of:

a) GlnHisArgHisThrAlaGlnSerIleGluThrGlnSerThrSerSerGlu GluLeuValProSerProProSerProLeuProProProArgValTyrLysPro CysPheValGlnAspLysSerSerGlyTyrHisTyrGlyValSerAlaCysGlu GlyCysLysGlyPheArgArgSerIleGlnLysAsnMetIleTyrThrCysHis ArgAspLysAsnCysValIleLysValThrArgAsnArgCysGlnTyrCys ArgLeuGlnLysCysPheGluValGlyMetLysGluSerValArgAsnAsp ArgAsnLysLysLysGluThrSerLysGlnGluCysGluSerTyrGlu MetThrAlaGluLeuAspAspLeuThrGluLysIleArgLysAlaHisGluThr PheProSerLeuCys;
b) ValArgAsnAspArgAsnLysLysLysGluThrSerLysGlnGlnCys
c) AsnAspArgAsnLysLysLysGluThrCys
d) CysGlyValSerGlnSerProLeuValGln and
e) AlaGluLeuAspAspLeuThrGluLysIleArg;

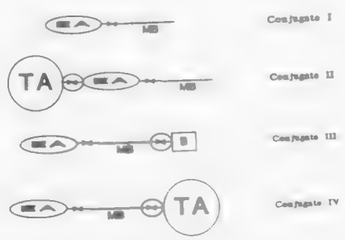
linked to a carrier molecule.

5,149,782

MOLECULAR CONJUGATES CONTAINING CELL MEMBRANE-BLENDING AGENTS

Tse-wen Chang; Jean deVilliers, and Wayne Gordon, all of Houston, Tex., assignors to Tanox Biosystems, Inc., Houston, Tex.

Filed Aug. 19, 1988, Ser. No. 234,399
Int. Cl.[5] C07K *7/10, 17/02*
U.S. Cl. 530—326 11 Claims



1. A molecular conjugate, comprising a macromolecular drug linked to a substantially hydrophobic membrane blending agent which can blend with an insert into a cellular membrane, the agent being cleavably linked to a blocking agent which blocks the ability of the membrane blending agent to insert into a cellular membrane.

5,149,783

EXPRESSION OF THE VIRALLY CODED PROTEASE P2A OF HRV2

Wolfgang Sommergruber, Vienna; Friederike Fessl, Perchtolsdorf; Ernst Kuechler, Vienna; Dieter Blaas, Vienna; Timothy Skern, Vienna; Manfred Zorn, Vienna; Markus Duechler, Vienna; Heinrich Kowalski, Vienna; Peter Volkmann, Vienna; Ingrid Maurer-Fogy, Vienna, all of Austria, and Peter Pallai, Brookfield, Conn., assignors to Boehringer Ingelheim International GmbH, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 288,894
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743848; Jul. 23, 1988, 3825118
Int. Cl.[5] A61K *37/02;* C12Q *1/70*
U.S. Cl. 530—326 1 Claim

1. A peptide consisting of TRPIITTAGPSDMYVH, wherein the peptide is capable of being cleaved by P2A of HRV II

5,149,784

PROCESS FOR MAKING VANCOMYCIN

Alexander H. T. Chu, Buffalo Grove, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Jul. 10, 1990, Ser. No. 550,424
Int. Cl.[5] C07K *1/14, 9/00*
U.S. Cl. 530—344 11 Claims

1. A process for the manufacture of vancomycin comprising:
a) exposing a vancomycin-containing culture to a first adsorbent and eluting the vancomycin from said first adsorbent with a solvent selected from the group consisting of solutions of ammonium hydroxide and ammonium salts;
b) passing the vancomycin eluate produced by step a) through a second adsorbent;
c) adding a solution of base to the product of step b) to produce a solution with a pH of about 9.5 to about 10.5;
d) adding methanol to the solution of step c) thereby crystallizing the vancomycin from the solution;
e) substantially separating the crystals from the solution;
f) slurrying the crystallized vancomycin from step e);
g) adding to the product of step f) a base solution in an amount sufficient to increase the pH of the resulting solution to about 9.5 to about 10.5;
h) adding methanol to the solution of step g) thereby recrystallizing vancomycin from the solution; and
i) substantially separating the crystals from the solution.

5,149,785

PROTEINS WHICH REGULATE GENE EXPRESSION OF THE INTERLEUKIN-2 RECEPTOR AND OF HUMAN LYMPHOTROPIC RETROVIRUSES

Harvey I. Cantor, Wellesley; Roberto Patarca, and Gordon J. Freeman, both of Brookline, all of Mass., assignors to Dana-Farber Cancer Institute, Boston, Mass.

Division of Ser. No. 154,758, Feb. 11, 1988, Pat. No. 4,952,499.
This application Feb. 21, 1990, Ser. No. 483,151
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—350 15 Claims

1. A substantially pure rpt-1 protein comprising the amino acid sequence as depicted in FIG. 2, or an amino acid sequence functionally equivalent to that depicted in FIG. 2 wherein at least one amino acid residue within the sequence is substituted by another amino acid, resulting in a silent change.

5,149,786

DOPAMINE RELEASING PROTEIN AND ANTIBODY

Victor D. Ramirez, Champaign, Ill., and Frank Marcus, Danville, Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Oct. 12, 1989, Ser. No. 420,830
Int. Cl.[5] C07K *15/00;* A61K *37/43, 39/00*
U.S. Cl. 530—350 6 Claims

1. Dopamine releasing protein, substantially free of other adrenal proteins and brain-derived proteins, which is capable of selectively stimulating the dose-dependent release of dopamine from striatal tissue.

5,149,787

METHOD FOR MAINTAINING INTACT, NON-DEGRADED FACTOR VIII/VON-WILLEBRAND FACTOR DURING BLOOD PROCESSING

Thomas J. Kunicki, Brookfield, and Robert R. Montgomery, Mequon, both of Wis., assignors to The Blood Center Research Foundation, Milwaukee, Wis.

Division of Ser. No. 612,873, May 22, 1984, Pat. No. 4,710,381.
This application Nov. 24, 1987, Ser. No. 124,677
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[5] C07K *3/02, 3/12*
U.S. Cl. 530—383 5 Claims

1. A method of obtaining intact, non-degraded FVIII/vWf from blood or plasma containing FVIII/vWf and cellular sources of a calcium activated protease capable of cleaving the FVIII/vWf, said method including the steps of: adding an inhibitor for the protease to the blood or plasma to inhibit the action of the calcium activated protease and prevent the protease from acting on the FVIII/vWf, the inhibitor being selected from a class consisting of leupeptin and antipain; and purifying FVIII/vWf from the blood or plasma so treated.

5,149,788

PURIFICATION OF CHIMERIC PROTEINS CONTAINING AN IL-2 MOIETY BY RECEPTOR-AFFINITY CHROMATOGRAPHY

Pascal Bailon, Florham Park, N.J.; John E. Smart, Weston, Mass., and David V. Weber, Nutley, N.J., assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 51,967, May 19, 1987. This application Oct. 24, 1988, Ser. No. 261,198
Int. Cl.[5] C07K *15/00, 3/20, 17/00;* G01N *33/50*
U.S. Cl. 530—350 15 Claims

1. An IL-2 receptor-affinity adsorbent comprising a solubilized TAC antigenic IL-2 cell surface receptor protein immobilized on a solid support, which immobilized receptor molecules are capable of specifically binding to a chimeric protein containing an IL-2 moiety in essentially unaggregated monomeric form.

5,149,789

REACTIVE DYES WITH TWO OR THREE NITROGEN-CONTAINING HALOHETEROCYCLES AS REACTIVE SYSTEM

Joerg L. Jessen, Speyer; Klaus Pardl, Ludwigshafen; Hermann Loeffler, Speyer; Bernd Siegel, Ludwigshafen, and Manfred Patsch, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

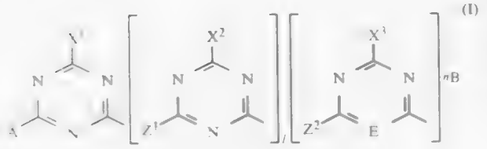
Filed Mar. 8, 1990, Ser. No. 490,710

Claims priority, application Fed Rep. of Germany, Apr. 1, 1989, 3910649

Int. Cl.[5] C09B *62/09, 62/04;* D06P *1/382*

U.S. Cl. 534—618 2 Claims

1. A reactive dye of the formula I



(I)

wherein

l is 0 or 1,

n is 0 or 1,

E is nitrogen,

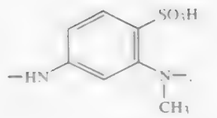
A is the radical of a nonmetallized azo dye attached to the triazine ring via an imino or C_1–C_4-alkylimino group,

B is the same as A,

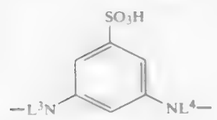
X^1 and X^2 are both chlorine,

X^3 is chlorine, and

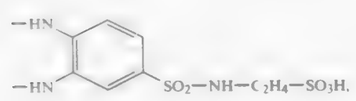
Z^1 and Z^2 are identical or different and each is independently of the other a radical of the formula



or



or



where L^3 and L^4 are identical or different and each is independently of the other hydrogen or unsubstituted or cyano- or hydroxy-substituted C_1–C_4-alkyl,

with the provisos that l is 0 when n is 1, and n is 0 when l is 1.

5,149,790

BIS CHLOROTRIAZINE REACTIVE DYES CONTAINING A BENZYLAMINE LINKING GROUP

John A. Taylor, Prestwich, England, assignor to Imperial Chemical Industries plc, London, England

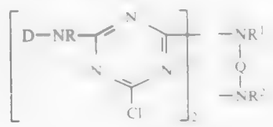
Filed Dec. 1, 1989, Ser. No. 444,433

Claims priority, application United Kingdom, Dec. 2, 1988, 8828222.3

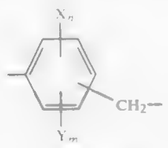
Int. Cl.[5] C09B *62/08, 62/06;* D06P *1/382*

U.S. Cl. 534—634 15 Claims

1. A water-soluble reactive dye of the formula:



wherein D represents a chromophore selected from the group consisting of azo, anthraquinone and triphenodioxazine, each of which has one or represents hydrogen or an C_{1-8}-alkyl which is unsubstituted or substituted by a substituent selected from the group consisting halogen, hydroxy, cyano, carboxy, carbamoyl, or phenyl and Q represents a group of the formula:



wherein each of X and Y, independently, represents halogen, ntiro, carboxy or sulpho and each of n and m, independently, represents an integer from 0 to 2.

5,149,791

CHLOROTRIAZINE REACTIVE DYES HAVING A 4-METHOXY-2-SULFOANILINE DIAZO COMPONENT AND 2-AMINO-5-NAPHTHOL-7-SULFONIC ACID COUPLING COMPONENT

Athanassios Tzikas, Pratteln, and Urs Lauk, Zürich, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

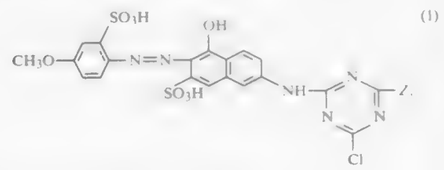
Filed Oct. 26, 1990, Ser. No. 604,552

Claims priority, application Switzerland, Nov. 1, 1989, 3941/89

Int. Cl.[5] C09B *62/085, 67/26;* D06P *1/382*

U.S. Cl. 534—638 7 Claims

1. A reactive dye of the formula



(1)

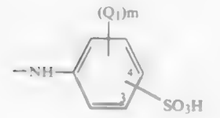
in which Z is a radical of the formula

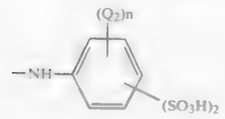
or

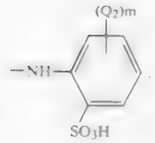
or

where L^3 and L^4 are identical or different and each is independently of the other hydrogen or unsubstituted or cyano- or hydroxy-substituted C_1–C_4-alkyl,

with the provisos that l is 0 when n is 1, and n is 0 when l is 1.







in which n is the number 0, 1 or 2 and m is the number 1 or 2, $(Q_1)_m$ is 1 or 2 substituents Q_1 independent of one another from the group comprising C_1–C_4alkyl, C_1–C_4alkoxy, acetylamino and carboxyl, $(Q_2)_n$ is 0 to 2 substituents Q_2 and $(Q_2)_m$ is 1 or 2 substituents Q_2 independent of one another from the group comprising C_1–C_4alkyl, C_1–C_4alkoxy, acetylamino, halogen and carboxyl, and the sulfo group in the radical of the formula (1b) is bonded to the benzene ring in the 3- or 4-position.

5,149,792

PLATELET-DERIVED GROWTH FACTOR B CHAIN ANALOGS

Arlen R. Thomason, Thousand Oaks, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.

Filed Dec. 19, 1989, Ser. No. 454,794

Int. Cl.[5] C07K *13/00;* A61K *37/36*

U.S. Cl. 530—399 4 Claims

1. A recombinant protein having a homogeneous amino acid sequence comprising amino acids 1-119 of PDGF B_{109} precursor protein.

5,149,793

EXO-3',4'-O-BENZYLIDENE-3''-DEMETHYLCHARTREUSIN AND ITS SALTS

Nobutoshi Yamada; Hideo Sugi; Sadanori Mizukoshi; Kenji Kon, and Taiji Katayama, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jan. 29, 1990, Ser. No. 471,428

Claims priority, application Japan, Jan. 30, 1989, 1-19957; Apr. 5, 1989, 1-86588

Int. Cl.[5] C07H *17/04, 15/24;* A61K *31/71*

U.S. Cl. 536—16.8 3 Claims

1. Exo-3',4'-O-benzylidene-3''-dimethylchartreusin.

5,149,794

COVALENT LIPID-DRUG CONJUGATES FOR DRUG TARGETING

Milton B. Yatvin, Portland, Oreg.; David W. Parks, Seattle, Wash.; Ronald W. McClard, Portland, Oreg.; Michael H. B. Stowell, Salt Lake City, Utah, and John F. Witte, Portland, Oreg., assignors to State of Oregon, Portland, Oreg.

Filed Nov. 1, 1990, Ser. No. 607,982

Int. Cl.[5] C07H *17/00;* A61K *37/22, 31/70*

U.S. Cl. 536—29 10 Claims

1. A composition of matter comprising an antiviral or antineoplastic drug, a polar lipid carrier, two linker functional groups and a spacer, wherein the spacer has a first end and a second end and wherein the polar lipid is attached to the first end of the spacer through a first linker functional group and the antiviral or antineoplastic drug is attached to the second end of the spacer through a second linker functional group.

5,149,795

NIKKOMYCIN DERIVATIVES

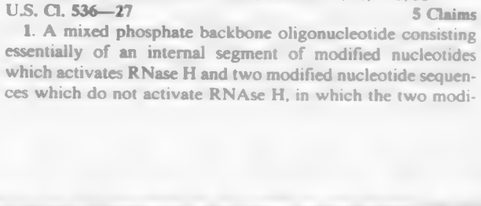
Richard F. Hector, Dublin, Calif.; Klaus Schaller, Wuppertal, Fed. Rep. of Germany; Heinrich F. Moeschler, and Manfred Plempel, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 252,613, Oct. 3, 1988, Pat. No. 5,019,560. This application Mar. 25, 1991, Ser. No. 674,255

Int. Cl.[5] C07H *19/00, 19/052;* A61K *31/71, 31/70*

U.S. Cl. 536—23 1 Claim

1. The compound having the following structure:



5,149,796

CHIMERIC DNA-RNA CATALYTIC SEQUENCES

John J. Rossi, Glendora; Pairoj Chang, Colton, and Bruce E. Kaplan, Claremont, all of Calif., assignors to City of Hope, Duarte, Calif.

Continuation-in-part of Ser. No. 401,613, Aug. 31, 1989. This application Apr. 30, 1991, Ser. No. 675,921

Claims priority, application World Int. Prop. O., Jun. 5, 1990, PCT/US90/03102

Int. Cl.[5] C07H *17/80*

U.S. Cl. 536—27 3 Claims

1. A catalytic molecule capable of cleaving an RNA sequence at a known ribozyme cleavage site said molecule having the formula

3' X - AAAG - Y - AGUAAGUC - Z 5'

or

3' X - CAAAG - Y - AGUAAGUC - Z 5'

in which X and Z are DNA sequences that base pair with an RNA substrate at positions juxtaposed to said known cleavage site,

AAAG, CAAAG and AGUAGUC are RNA sequences,

Y is a DNA sequence that base pairs inter se in a manner required to permit said RNA sequences to cleave said substrate at said cleavage site.

5,149,797

METHOD OF SITE-SPECIFIC ALTERATION OF RNA AND PRODUCTION OF ENCODED POLYPEPTIDES

Thoru Pederson, Worcester; Sudhir Agrawal, Shrewsbury; Sandra Mayrand, Shrewsbury, and Paul C. Zamecnik, Shrewsbury, all of Mass., assignors to The Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

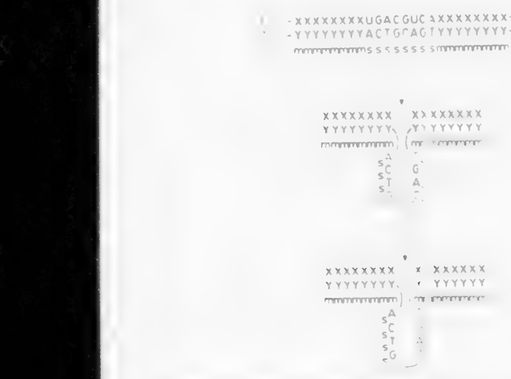
Filed Feb. 15, 1990, Ser. No. 480,269

Int. Cl.[5] C12N *15/11, 9/00;* C07D *475/00, 475/32*

U.S. Cl. 536—27 5 Claims

1. A mixed phosphate backbone oligonucleotide consisting essentially of an internal segment of modified nucleotides which activates RNase H and two modified nucleotide sequences which do not activate RNAse H, in which the two modi-

fied nucleotide sequences flank the internal segments, one on each side of the internal segment, wherein the internucleoside bridging phosphate residues of the internal segment are modified phosphates which are phosphorothioates and the internu-



cleoside bridging phosphate residues of the two flanking modified nucleotide sequences are modified phosphate selected from the group consisting of: methyl phosphonates, phosphoromorpholidates, phosphoropiperazidates, and phosphoramidates.

5,149,799

PROCESS FOR SYNTHESIZING OLIGONUCLEOTIDES AND THEIR ANALOGS ADAPTABLE TO LARGE SCALE SYNTHESES

Sudhir Agrawal, and Paul C. Zamecnik, both of Shrewsbury, Mass., assignors to Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

Filed Apr. 6, 1989, Ser. No. 334,679
Int. Cl.[5] C07H *21/00*
U.S. Cl. 536—27 **2 Claims**

1. An improved process for synthesizing oligonucleotides by condensing a solid support-bound nucleotide with free activated nucleoside H-phosphonate monomer, wherein the improvement comprises producing the activated nucleoside H-phosphonate monomer by combining nucleoside H-phosphonate monomer and an activator in a ratio of less than one part monomer to five parts activator, and allowing the activated nucleoside H-phosphonate to react with the solid support-bound nucleotide for about 15 seconds or less.

5,149,799

METHOD AND APPARATUS FOR COOKING AND SPRAY-DRYING STARCH

Roger W. Rubens, East Brunswick, N.J., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Jan. 26, 1990, Ser. No. 471,141
Int. Cl.[5] C08B *30/00, 30/14*
U.S. Cl. 536—102 **8 Claims**

1. A method for cooking and spray-drying a starch, comprising:

a) slurrying the starch in an aqueous medium;

b) feeding a stream of the starch slurry at a pressure from about 50 to 250 psig without atomizing the starch slurry as it enters into an atomizing chamber within a spray-drying nozzle;

c) injecting a heating medium into the atomizing chamber at a pressure from about 50 to 250 psig;

d) simultaneously cooking and atomizing the starch slurry as the heating medium forces the starch through a vent in the chamber; and

e) drying the atomized starch.

5,149,800

POLY(OXYALKYLENE) MODIFIED PHTHALOCYANINE COLORANTS

Edward W. Kluger, Pauline, S.C., and Max A. Weaver, Kingsport, Tenn., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 26, 1989, Ser. No. 371,477
Int. Cl.[5] C07D *209/56;* **C08K** *5/3456*
U.S. Cl. 540—123 **13 Claims**

1. A colorant having the formula A—[D—Z—SO_2—N(R-2)—Y]$_n$,

wherein A is non-ionic phthalocyanine chromophore of Cu, Ni or Al;

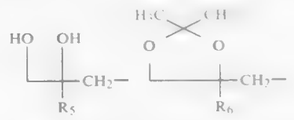
n is 1-16;

wherein R_2 is hydrogen, C1-C20 alkyl or cycloalkyl, phenyl, benzyl or Y;

Z is an arylene moiety selected from benzene, naphthalene, anthracene, biphenyl, thiophene, benzothiazole, benzoxazole, furan, thiazole, thiadiazole and quinoline;

D is a linking group selected from O, SO_2, S, N(R_3) and N(SO_2R_4), where R_4 is C1-C20 alkyl or cycloalkyl, and R_3 is hydrogen or R_4;

Y is a poly(oxyalkylene) moiety comprising at least three monomeric units selected from the formula (—RO—), wherein each R is an alkylene of 2-4 carbons, and Y is terminated with a group selected from hydrogen, C1-C20 alkyl, C1-C20 cycloalkyl, phenyl, and groups having the formula



where R_5 and R_6 are selected from hydrogen, methyl and ethyl.

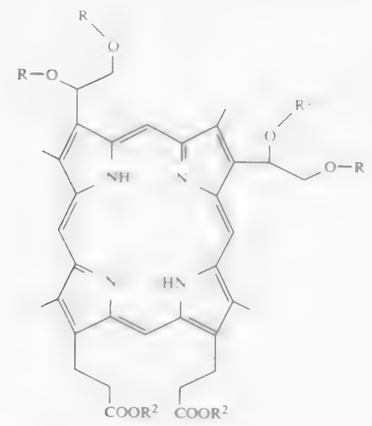
5,149,801

BORONATED PORPHYRIN COMPOUNDS

Stephen B. Kahl, Portola Valley, and Myoung-Seo Koo, San Francisco, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Nov. 21, 1990, Ser. No. 616,679
Int. Cl.[5] C07D *487/22*
U.S. Cl. 540—145 **7 Claims**

1. A compound having the structure



where R is

R^1 is —H or

R^3 is carborane, and R^2 is —H, an alkyl having 1 to 7 carbon atoms or an aryl having 6 to about 7 carbon atoms, or a physiologically acceptable salt.

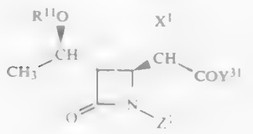
5,149,802

PROCESS FOR PRODUCING AZETIDINONE DERIVATIVES

Takeo Yoshioka, Ayase; Ryoichi Miyata, Fujisawa; Toshio Tsuchida; Hiroshi Tone, both of Yokohama, and Rokuro Okamoto, Fujisawa, all of Japan, assignors to Mercian Corporation, Tokyo, Japan

Division of Ser. No. 599,354, Oct. 5, 1990, abandoned. This application Jul. 10, 1991, Ser. No. 729,771
Claims priority, application Japan, Oct. 6, 1989, 1-260278
Int. Cl.[5] C07D *205/08, 405/04*
U.S. Cl. 540—200 **1 Claim**

1. A compound of the formula:



(VIII-1)

wherein

R^{11} denotes a lower alkanoyl group, a halo-lower alkanoyl group, an allyl group, a benzyloxycarbonyl group, a p-nirobenzyloxycarbonyl group or a p-chlorobenzyloxycarbonyl group; X^1 denotes a chlorine or bromine atom; Y^{31} denotes a chlorine or bromine atom, an -S-lower alkyl group or an -S-phenyl group; and Z^1 denotes a hydrogen atom, a phenyl group, a 4-methoxyphenyl group, a 2,4-dimethoxyphenyl group, a benzyl group, a p-nitrobenzyl group, a dianisylmethyl group of a 2,4-dimethoxybenzyl group.

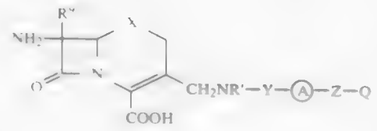
5,149,803

INTERMEDIATES FOR CEPHALOSPORIN COMPOUNDS

Gareth M. Davies, Macclesfield; Colin J. Strawson, Congleton, both of England, and Jean J. Lohmann, Hermonville, France, assignors to Imperial Chemical Industries PLC, London, England and ICI Pharma, Cergey Cedex, France

Division of Ser. No. 349,662, May 10, 1989, Pat. No. 5,055,462.
This application Jul. 18, 1991, Ser. No. 732,478
Claims priority, application United Kingdom, May 10, 1988, 8811055
Int. Cl.[5] C07D *501/18*
U.S. Cl. 540—225 **4 Claims**

1. A compound of the formula



(IX)

wherein

Q is phenyl or naphthyl substituted by groups R^2 and R^3 which are ortho with respect to one another and wherein R^2 is hydroxy or an in vivo hydrolysable ester group thereof and R^3 is hydroxy or an in vivo hydrolysable ester group thereof, Q being optionally substituted by C_{1-6} alkyl, halo, hydroxy, hydroxy C_{1-6} alkyl, cyano, trifluoromethyl, nitro, amino, C_{1-6} alkylamino, di-C_{1-6} alkylamino, amino C_{1-6} alkyl, C_{1-6} alkylamino C_{1-6} alkyl, di-C_{1-6} alkylamino C_{1-6} alkyl, C_{1-6} alkanoyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkanoyloxy, carbamoyl, C_{1-6} alkylcarbamoyl, di-C_{1-6} alkyl carbamoyl, carboxy, carboxy C_{1-6} alkyl, sulpho, sulpho C_{1-6} alkyl, C_{1-6} alkanesulphonamido, C_{1-6} alkoxycarbonyl, C_{1-6} alkanoylamino, nitroso, thioureido, amidino, ammonium, mono-, di- or tri-C_{1-6} alkylammonium or pyridinium, or a 5-membered heterocyclic ring consisting of 1 to 4 hetero ring atoms selected from oxygen, nitrogen and sulphur, the remaining ring atoms being carbon and said ring being optionally substituted by 1, 2 or 3 C_{1-6} alkyl or C_{1-6} alkoxy groups;

R^1 is hydrogen, C_{1-6} alkyl optionally substituted by any of halo, hydroxy, C_{1-6} alkoxy, carboxy, amino, cyano, C_{1-6} alkanoylamino, phenyl or heteroaryl, or R^1 is C_{2-6} alkenyl;

Y is —CO— or —SO_2—;

X is sulphur or sulphinyl;

Z is a direct bond, C_{1-4} alkylene, C_{2-4} alkenylene, C_{2-4} alkynylene, —CO—, —$(CH_2)_nNR^4CO$— or —$CONR^4(CH_2)_n$— wherein n is 0 to 4;

R^4 is hydrogen or C_{1-6} alkyl;

R^9 is hydrogen, methoxy or formamido;

A is a phenylene ring or a 5- or 6-membered heterocyclic ring consisting of 1, 2, or 3 ring atoms selected from nitrogen, oxygen and sulphur with the remaining ring atoms being carbon atoms, either ring being unsubstituted or substituted by C_{1-6} alkyl, halo, hydroxy, hydroxy C_{1-6}alkyl, cyano, trifluoromethyl, nitro, amino, C_{1-6}alkylamino, di-C_{1-6}-alkylamino, C_{1-6}alkanoyl, C_{1-6}alkoxy, C_{1-6}alkylthio, C_{1-6}alkanoyloxy, carbamoyl, C_{1-6}alkylcarbamoyl, di-C_{1-6}alkyl carbamoyl, carboxy, carboxy C_{1-6}alkyl, C_{1-6}alkoxycarbonyl-C_{1-6}alkyl, sulpho, sulphoC_{1-6}alkyl, sulphonamidoC_{1-6}alkyl, C_{1-6}alkoxycarbonyl, C_{1-6}alkanoylamino, thioureido or amidino, and the ring A being unfused or fused to a benzene ring.

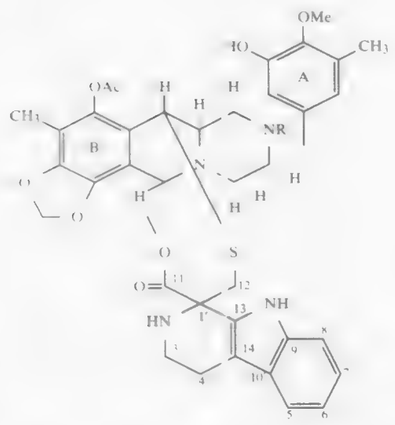
5,149,801

ECTEINASCIDINS 736 AND 722

Kenneth Rinehart, and Ryuichi Sakai, both of Urbana, Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

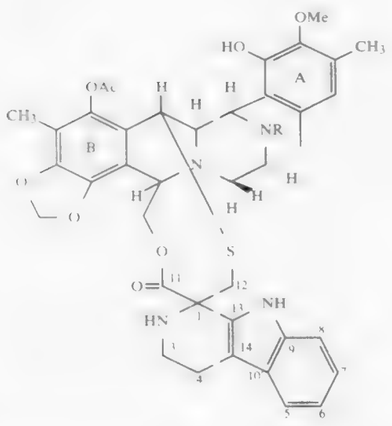
Filed Nov. 30, 1990, Ser. No. 620,427
Int. Cl.[5] C07D *515/22*
U.S. Cl. 540—466 3 Claims

1. Ecteinascidin 736, essentially free of cellular material of *E. turbinata*, and having the structural formula:



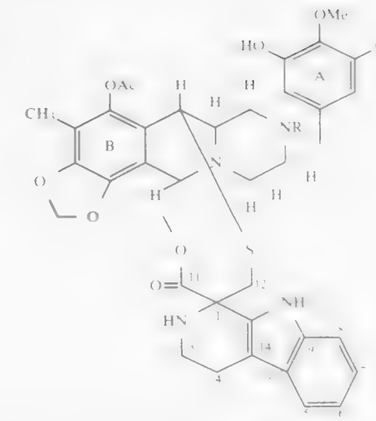
wherein X =OH and R =CH_3.

2. Ecteinascidin 722, essentially free of celluar material of *E. turbinata*, and having the structural formula:



wherein X =OH and R =H.

3. O-Methyl-ecteinascidin 736 essentially free of cellular material of *E. turbinata*, and having the structural formula



wherein X =OCH_3 and R =CH_3.

5,149,805

PROCESS FOR THE PRODUCTION OF MONOBLOCKED DIISOCYANATES

Rainer Gras, Bochum; Elmar Wolf, Recklinghausen; Josef Disteldorf, Marl; Werner Huebel, Recklinghausen, and Horst Schnurbusch, Herne, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,605
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739477
Int. Cl.[5] C07D *223/10, 223/12;* C07C *249/00, 251/00*
U.S. Cl. 540—485 10 Claims

1. A monoblocked diisocyanate composition produced by a process comprising the steps of:

(i) reacting a blocking agent with a diisocyanate in a ratio of 1 mole of said blocking agent to 5 to 20 moles of said diisocyanate to obtain a reaction mixture which contains monoblocked diisocyanate and excess diisocyanate; and

(ii) removing said excess diisocyanate from said reaction mixture to obtain a composition containing said monoblocked diisocyanate and not more than 6.5 wt.% of free diisocyanate,

wherein said diisocyanate is one member selected from the group consisting of hexamethylene diisocyanate, 2-methyl-1,5-diisocyanatopentane, 2-ethyl-1,4-diisocyanatobutane, 1,5-diisocyanatohexane, 1-10-diisocyanatodecane. 1,9-diisocyanato-5-methylnonane, dodecamethylene diisocyanate, isophorone diisocyanate, hexahydroxylylene-1,4-diisocyanate and hexahydroxylylene-1,3-diisocyanate; and said removing step comprises thin film evaporation of said excess diisocyanate.

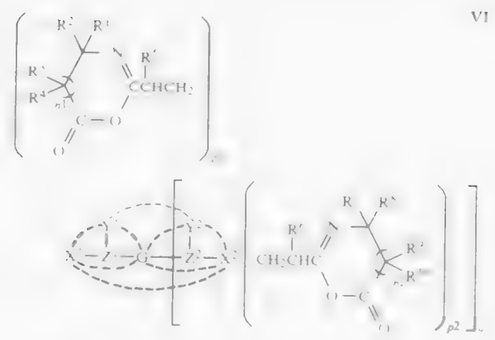
5,149,806

AZLACTONE MICHAEL ADDUCTS

Dean M. Moren, North St. Paul; Steven M. Heilmann, Afton; Larry R. Krepski, White Bear Lake, and Jerald K. Rasmussen, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1990, Ser. No. 500,768
Int. Cl.[5] C07D *265/06*
U.S. Cl. 544—72 13 Claims

1. An azlactone-functional adduct having the formula



VI

wherein

p^1 and p^2 independently have integral values of 1 to (the valence of X^1 or X^2) −1, where p^1 relates to X^1 and p^2 to X^2;

R^1, R^2, R^7, and R^8 independently represent,an alkyl group, a cycloalkyl group, an aryl group, or at least one of (R^1 and R^2) and (R^7 and R^8) taken together with the carbon atom to which they are joined form a ring of 4 to 12 atoms;

R^3, R^4, R^9, and R^{10} are independently hydrogen or lower alkyl;

R^5 and R^6 independently are hydrogen or methyl;

n^1 and n^2 independently are 0 or 1;

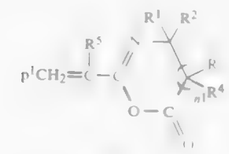
X^1 and X^2 independently are selected from the group consisting of —CH_2 (when at least one of p^1 and p^2 = 1); —CH (when at least one of p^1 and p^2 = 2); —C (when at least one of p^1 and p^2 = 3); —$CR^{11}R^{12}$ in which R^{11} and R^{12} are selected from the group consisting of alkyl, alkenyl, cycloalkyl, and aryl monovalent groups, a single bond, and polyvalent alkylene, alkenylene, cycloalkylene, or arylene linking groups; —CHR^{11}; —CR^{11}; —CW^1W^2 in which W^1 and W^2 are independently selected from $R^{11}O_2C$—, R^{11}(CO)—, N≡C—, R_F(CO)— in which R_F is a substantially perfluorinated alkyl, cycloalkyl, or aryl group. $R^{11}NH$(CO)—, $R^{11}R^{12}N$(CO)—, $R^{11}SO_2$—, $R^{11}R^{12}C$=N—, $R^{11}N$=(R^{12})C—, R^{11}(CS)—, $R^{11}S_2C$—, $R^{11}NH$(CS)—, $R^{11}R^{12}N$(CS)—, $R^{11}R^{12}C$=CR^{13}— in which R^{13} is defined the same as R^{11} and R^{12}, and O_2N— groups; —$CR^{11}W^1$; —CHW^1; —CW^1; —NR^{14} in which R^{14} (linking at least one of X^1 to Y^1, X^1 to G, X^1 to X^2, X^2 to Y^2, and X^2 to G) is a single bond, alkylene, alkenylene, or arylene group such that the ring formed contains 4 to 6 ring atoms; and —NW^1;

Z^1 and Z^2 independently are C, N, or S=O;

Y^1 and Y^2 independently are doubly bonded oxygen (=O); doubly bonded sulfur (=S); =$CR^{15}R^{16}$, or —CR^{15}=$CR^{16}R^{17}$ in which R^{15} and R^{16} independently are defined the same as R^{11}, R^{12}, and R^{13}, except that R^{15} can be an electron pair, and in which R^{17} is a monovalent group selected from alkyl, alkenyl, cycloalkyl, and aryl groups; =NR^{15} (to include triply bonded nitrogen (≡N:) when R^{15} is an electron pair and G is a single bond from at least one of Y^1 to Z^1 and Y^2 to Z^2); or —$NR^{18}R^{19}$ in which R^{18} and R^{19} independently can be hydrogen, alkyl, cycloalkyl, aryl, a single bond, alkylene, cycloalkylene, or arylene, or together with the nitrogen atom to which they are joined form a ring of 4 to 12 ring atoms; and

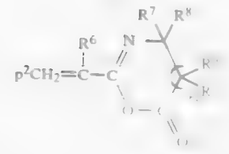
G is —H; —$NR^{20}R^{21}$ in which R^{20} and R^{21} independently are defined the same as R^{11}, R^{12}, and R^{13}; —NHR^{20}; —R^{20}; or —OR^{20}; =O; polymeric monovalent and polyvalent groups; an electron pair; or a single bond; and

q is an integer of zero or greater and is equal to (the valence of G)−1; wherein said azlactone-functional adduct is prepared by a process comprising the step of reacting at least one 2-alkenyl azlactone Michael acceptor of Formulae VIIa and VIIb:



VIIa

and



VIIb

wherein:

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, n^1, n^2, p^1, and p^2 are as previously defined,

with a Michael donor of Formula VIII

VIII

wherein

X^1, X^2, Y^1, Y^2, Z^1, Z^2, G, q, p^1 and p^2 are as previously defined, to provide said azlactone-functional adduct

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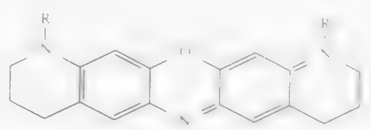
5,149,807

OXAZINE LASER DYES

Peter R. Hammond, Livermore, and George F. Field, Danville, both of Calif., assignors to The United States of America, as represented by the United States Department of Energy, Washington, D.C.

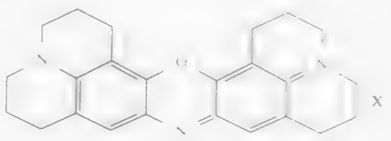
Filed Sep. 18, 1991, Ser. No. 761,559
Int. Cl.[5] C07D *498/14, 498/22*
U.S. Cl. 544—99 5 Claims

1. A compound of the formula



wherein R_1 and R_2 are independently selected from the substituent groups consisting of linear and branched alkyl and fluoroalkyl groups of 1 to 10 carbon atoms, and wherein X^- is an anion.

4. A compound of the formula



wherein X^- is an anion.

5,149,808
N-HETEROCYCLIC S UBSTITUTED -PYRROLIDIN- -ONES

Karl-Heinz Weber, Gau-Algesheim; Gerhard Walther, Bingen/-Rhein; Claus Schneider, Ingelheim am Rhein; Dieter Hinzen, Bingen/Rhein; Franz J. Kuhn, Gau-Algesheim, and Erich Lehr, Waldalgesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

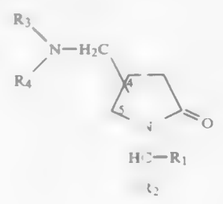
Division of Ser. No. 632,351, Dec. 2 , 1990, Pat. No. 5,073,671, which is a division of Ser. No. 350,507, May 11, 1989, Pat. No. 4,996,224, which is a continuation of Ser. No. 199,291, May 26, 1988, Pat. No. 4,833,140, which is a division of Ser. No. 878,828, Jun. 26, 1986, Pat. No. 4,767,759, which is a continuation-in-part of Ser. No. 657,219, Oct. 3, 1984, abandoned. This application Sep. 4, 1991, Ser. No. 755,039

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336024

Int. Cl.[5] C07D *401/06, 403/06, 417/06*

U.S. Cl. 544—141 1 Claim

1. A compound of the formula



wherein

R_1 is hydrogen or alkyl of 1 to carbon atoms;

R_2 is 2-, 3- or 4-pyridyl, phenyl or mono- or di-substituted phenyl, where the substituents are each individually alkoxy of 1 to 2 carbon atoms, fluorine, chlorine, bromine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, hydroxyl or nitro; and

R_3 and R_4, together with each other and the nitrogen atom to which they are attached form an unsubstituted or methyl-substituted, 6-membered heterocycle selected from the group consisting of piperidino, piperazino and morpholino;

where the aminomethyl substituent is attached to the 4- or 5-position of the pyrrolidine ring, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5,149,809
SYNTHESIS OF 2-ALKYLHEXAHYDROPYRIMIDINES FROM NITRILES

Frank E. Herkes, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 26, 1991, Ser. No. 798,605

Int. Cl.[5] C07D *239/04*; C07B *43/04*

U.S. Cl. 544—242 7 Claims

1. A process for the preparation of hexahydropyrimidines which comprises reacting an alkyl nitrile having 1 to 18 carbon atoms with a 1,3-diaminoalkane having 3 to 18 carbon atoms or an N-alkyl-1,3-diaminoalkane in which the alkane has 3 to 18 carbon atoms, and in which the N-alkyl group has 1 to 18 carbon atoms, in the presence of a hydrogenation catalyst at a temperature in the range of 70 to 250 degrees C. and hydrogen at a pressure of 100 to 1000 psig, said alkyl nitrile being present in a 1 to 3 molar ratio to the amount of the 1,3-diaminoalkane or the N-alkyl-1,3-diaminoalkane

5,149,810
PYRIMIDINE COMPOUNDS

Trevor R. Perrior, Wokingham; David J. Tapolczay, Reading, and Alan J. Whittle, Twyford, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

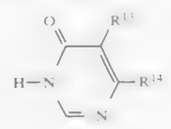
Continuation of Ser. No. 341,920, Apr. 24, 1989, Pat. No. 5,077,297. This application Sep. 23, 1991, Ser. No. 764,219

Claims priority, application United Kingdom, Apr. 22, 1988, 8809552; Mar. 22, 1989, 8906329

Int. Cl.[5] C07D *239/36, 239/56*

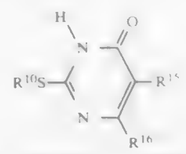
U.S. Cl. 544—309 3 Claims

1. A pyrimidinone compound of formula (IIIA) or (VA):



(IIIA)

wherein R^{13} is hydrogen or halogen and R^{14} is trifluoromethyl or pentafluoroethyl, with the proviso that when R^{14} is trifluoromethyl, R^{13} is halogen;



(VA)

wherein R^{10} is hydrogen or C_{1-4}alkyl; R^{15} is cyano and R^{16} is trifluoromethyl, difluoromethyl or pentafluoroethyl or R^{15} is hydrogen or halogen other than fluorine and R^{16} is pentafluoroethyl or difluoromethyl.

5,149,811
FLAVIN MODIFYING AGENT FOR CONDUCTIVE SUBSTRATE

Satoshi Ueyama, and Satoru Isoda, both of Hyogo, Japan, assignors to Kozo Iizuka, Director Genral, Agency of Industrial Science and Technology, Tokyo, Japan

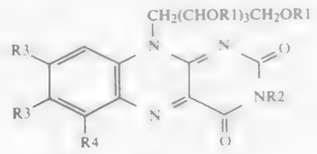
Continuation of Ser. No. 243,600, Sep. 13, 1988, abandoned. This application Sep. 21, 1990, Ser. No. 587,470

Claims priority, application Japan, Dec. 24, 1987, 62-325525

Int. Cl.[5] C07D *487/04*

U.S. Cl. 544—345 1 Claim

1. A flavin derivative represented by the formula:



wherein R_1 represents an acetyl, R_2 and R_3 each represent a hydrogen atom or a lower alkyl group having one to four carbon atoms and R_4 represents a thiocyanato group or a mercapto group.

5,149,812
INDUSTRIAL PROCESS FOR THE PREPARATION OF (1S)-1-[N-(4-O-DEACETYL-23-VINBLASTINOYL)AMINO]-2-METHYLPROPYL DIETHYL PHOSPHONATE AND ITS SALTS

Roger Thevignot, Bolbec, France, assignor to Adir et Compagnie, Courbevoie, France

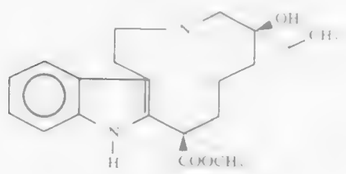
Filed Mar. 25, 1991, Ser. No. 674,653

Claims priority, application France, Jan. 31, 1991, 91 01073

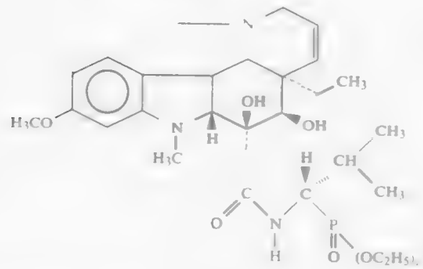
Int. Cl.[5] C07F *9/65, 9/576, 9/59*

U.S. Cl. 546—23 4 Claims

1. Process for the preparation of (1S)-1-[N-(4-O-deacetyl-23-vinblastinoyl)amino-2-methylpropyl diethyl phosphonate of the formula I:

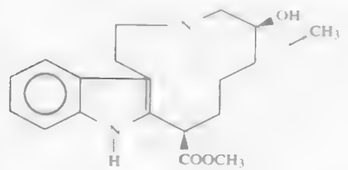


(I)

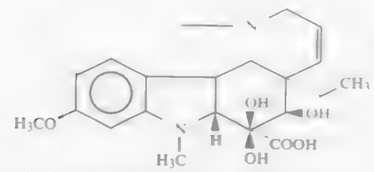


or a salt thereof, wherein:

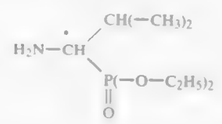
4-O-deacetylvinblastinoic acid of the formula II:



(II)



is condensed with the dextrorotatory isomer of phosamine or 1-amino-2-methylpropyl diethyl phosphonate of the formula III



(III)

by means of the functional precursor peptide coupling reagent BOP or 1-benzotriazolyloxy-tris(dimethylamino)-phosphonium hexafluorophosphate in a solvent comprising tetrahydrofuran;

and, if desired, the product obtained is purified by preparative chromatography on silica and then converted into an addition salt with an acid.

5,149,813
PROCESS FOR (1,2,3,4-TETRAHYDRO-9-ACRIDINIMINO)CYCLOHEXANE CARBOXYLIC ACID AND RELATED COMPOUNDS

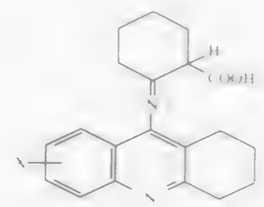
Lawrence L. Martin, Lebanon; Joseph F. Payack, Somerset, and Helen H. Ong, Whippany, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 788,079, Nov. 5, 1991, Pat. No. 5,126,449, which is a division of Ser. No. 640,348, Jan. 11, 1991, Pat. No. 5,089,615, which is a division of Ser. No. 371,228, Jun. 26, 1989, Pat. No. 4,999,358. This application Mar. 27, 1992, Ser. No. 858,721

Int. Cl.[5] C07D *219/10*

U.S. Cl. 546—105 1 Claim

1. A method of preparing a compound of the formula,



(IV)

where X is hydrogen, loweralkyl, loweralkoxy or halogen, which comprises reacting 9-amino-1,2,3,4-tetrahydroacridine with ethyl cyclohexanone 2-carboxylate to obtain said compound.

5,149,814
ALKYL 2-BENZYLIDENE-4-(2-ALKYLIMIDAZOPYRID-1-Y1) BENZOYLACETATE ESTERS AS INTERMEDIATE COMPOUNDS

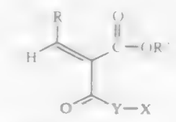
Kelvin Cooper, Deal; Michael J. Fray, Canterbury; Kenneth Richardson, Birchington, and John Steele, Sandwich, all of England, assignors to Pfizer Inc, New York, N.Y.

Division of Ser. No. 517,286, May 1, 1991, Pat. No. 5,070,205, which is a division of Ser. No. 251,413, Sep. 29, 1988, Pat. No. 4,935,430. This application Sep. 11, 1991, Ser. No. 757,780

Int. Cl.[5] C07D *221/02*

U.S. Cl. 546—118 1 Claim

1. A compound of the formula (IV):



wherein Y is 1,4-phenylene, R is phenyl, chlorophenyl, trifluoromethoxyphenyl, difluorophenyl, cyanophenyl, fluorophenyl or methylenedioxyphenyl, R^3 is alkyl having one to six carbon atoms and X is 2-alkylimidazo[4,5-c]pyridyl said alkyl having one to four carbon atoms, 2-alkylimidazo[4,5-b]pyridyl said alkyl having one to four carbon atoms, 2-alkylimidazo[1,2-a]pyridyl said alkyl having one to four carbon atoms, 2-trifluoromethylimidazo[4,5-c]pyridyl or 2-alkyl-4,6-dime-

thylimidazo[4,5-c]pyridyl said alkyl having from one to four carbon atoms.

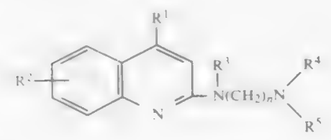
5,149,815

N-SUBSTITUTED-2-AMINOQUINOLINES

Annmarie L. Sabb, Pennington, N.J., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 692,743, Apr. 29, 1991, Pat. No. 5,093,333.
This application Nov. 19, 1991, Ser. No. 794,277
Int. Cl.[5] C07D *401/12*
U.S. Cl. 546—163 3 Claims

1. A compound of the formula



wherein

R^1 is H, alkyl or cycloalkyl of 1 to 6 carbon atoms;

R^2 is H, alkyl of 1 to 6 carbon atoms, cyano, halo, nitro, amino or mono or dialkylamino in which the alkyl groups have 1 to 6 carbon atoms;

R^3 is H or alkyl of 1 to 6 carbon atoms;

n is 1 to 5

and R^4 and R^5 taken with the nitrogen atom to which they are attached are pyrrolidin-2-on-1-yl or a pharmaceutically acceptable salt, hydrate or solvate thereof.

5,149,816

HIGH TEMPERATURE PROCESS FOR SELECTIVE PRODUCTION OF 3-METHYLPYRIDINE

Gerald L. Goe, Greenwood, and Robert D. Davis, Indianapolis, both of Ind., assignors to Reilly Industries, Indianapolis, Ind.

Continuation-in-part of Ser. No. 217,686, Jul. 11, 1988, abandoned. PCT filed Jul. 7, 1989, PCT No. PCT/US89/02969, § 371 Date Apr. 1, 1991, § 102(e) Date Apr. 1, 1991, Pub. No. WO90/00546, PCT Pub. Date Jan. 25, 1990, Ser. No. 635,532
Int. Cl.[5] C07D *213/09*
U.S. Cl. 546—251 29 Claims

1. A high temperature process for the selective production of 3-methylpyridine in high yield, comprising the step of:

contacting a vaporized feed stream containing 2-methyl-1,5-pentanediamine with a metal-oxide catalyst, said contacting being at a temperature of about 500°–600° C. for a time of less than about 30 seconds wherein said catalyst comprises an oxide of:

molybdenum;
cadmium;
copper;
chromium;
copper-chromium;
iron;
tungsten;
bismuth;
cobalt;
lanthanum;
niobium;
zinc;
silicon;
aluminum;
lead;
antimony;
thorium;
titanium;
vanadium;
palladium; manganese; or cesium.

5,149,817

TEIRAHYDROPYRIDINE DERIVATIVES

Hiromu Matsumura; Toshisada Yano, both of Hyogo; Hiroshi Hashizume, Osaka; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Feb. 15, 1991, Ser. No. 655,585
Claims priority, application Japan, Mar. 5, 1990, 2-54220
Int. Cl.[5] C07D *401/12*
U.S. Cl. 546—281 4 Claims

1. A compound of the formula:

wherein Ar is phenyl which has identically or differently one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, trifluoromethyl, hydroxy and phenyl, which latter phenyl may be substituted by hydroxy, lower alkyl, lower alkoxy or halogen, or Ar is phenyl which is substituted by two halogen atoms;

n is an integer of from 2 to 6;

R^1 is hydrogen or lower alkyl;

the group

may have identically or differently 1 to 3 substituents selected from the group consisting of lower alkyl, halogen, oxo and phenyl, which phenyl may be substituted by hydroxy, lower alkyl, lower alkoxy or halogen; and

p and q each is an integer of 0 to 1, excluding the case where p is 0 when q is 1;

or a pharmaceutically acceptable acid addition salt thereof.

5,149,818

SYNTHESIS OF AMINONITROBENZODIFUROXAN

Stephen L. Christian; Andrew P. Chafin, both of Ridgecrest; Arnold T. Nielsen, Santa Barbara; Ronald L. Atkins, Ridgecrest; William P. Norris, Ridgecrest, and Richard A. Hollins, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1990, Ser. No. 593,413
Int. Cl.[5] C07D *271/12*
U.S. Cl. 548—126 10 Claims

1. A method of synthesizing aminonitrobenzodifuroxan, comprising the steps of:

(a) dissolving pentanitroaniline in a solvent;

(b) adding an alkali metal azide to the pentanitroaniline solution;

(c) stirring the solution; and,

(d) recovering the aminonitrobenzodifuroxan.

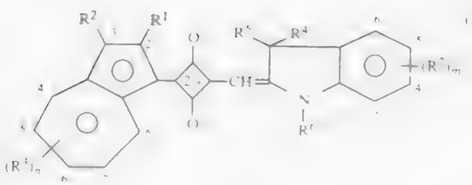
5,149,819

SQUARYLIUM COMPOUNDS AND OPTICAL INFORMATION RECORDING MEDIUM USING THE SAME

Tsutomu Satoh, Yokohama; Ikuo Shimizu, and Yukiyoshi Ito, both of Yokkaichi, all of Japan, assignors to Ricoh Company, Ltd. and Kyowa Hakko Kogyo Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 495,715, Mar. 16, 1990, Pat. No. 5,085,909, which is a continuation-in-part of Ser. No. 341,325, Apr. 20, 1989, abandoned. This application May 1, 1991, Ser. No. 694,379
Claims priority, application Japan, Apr. 28, 1988, 63-106944
Int. Cl.[5] C07D *277/60, 513/02, 491/02, 209/04*
U.S. Cl. 548—149 9 Claims

1. A squarylium compound having formula (I):



wherein

R^1 and R^2 independently represent hydrogen, an alkyl group having 1 to 4 carbon atoms, an aralkyl group, or an aryl group, or R^1 and R^2 form a benzene ring, heterocyclic ring formed by —CH=CH—O—, =CH—O—CH=, —N=CH—S—, —CH=CH—S—, =CH—S—CH=, —S—CH=CH— or —O—CH=CH— or alkylene ring formed by alkylene moiety having 3 to 4 carbon atoms which may have a substituent, in combination with two adjacent carbon atoms in the ring to which R^1 and R^2 are bonded;

R^3 represents an alkyl group having 1 to 4 carbon atoms, an aralkyl group, an aryl group or an alkoxyl group having 1 to 8 carbon atoms; n is an integer of 0 to 3, and when n is 2 or 3, R^3s may be the same or different, or form a benzene ring, heterocyclic ring formed by —CH=CH—O—, =CH—O—CH=, —N=CH—S—, —CH=CH—S—, =CH—S—CH=, —S—CH=CH— or —O—CH=CH— or alkylene ring formed by alkylene moiety having 3 to 4 carbon atoms which may have a substituent, in combination with two adjacent carbon atoms in the ring to which R^3s are bonded;

R^4 and R^5 independently represent an alkyl group having 1 to 4 carbon atoms;

R^6 represents an alkyl group having 1 to 4 carbon atoms, an aralkyl group or an aryl group;

R^7 represents a halogen, an alkyl group having 1 to 4 carbon atoms, an aralkyl group, an aryl group or an alkoxyl group having 1 to 4 carbon atoms; m is an integer of 0 to 4, and when m is 2, 3 or 4, R^7s may be the same or different, or form a benzene ring, heterocyclic ring formed by —CH=CH—O—, =CH—O—CH=, —N=CH—S—, —CH=CH—S—, =CH—S—CH=, —S—CH=CH— or —O—CH=CH— or alkylene ring formed by alkylene moiety having 3 to 4 carbon atoms which may have a substituent, in combination with two adjacent carbon atoms in the ring to which R^7s are bonded.

5,149,820

DEUTERATED COMPOUNDS

Berat Borretzen; Rolf O. Larsen, both of Porsgrunn; Erik O. Pettersen; John M. Dornish, both of Oslo, and Reider Oftebro, Hvalstad, all of Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Division of Ser. No. 24,783, Mar. 11, 1987, Pat. No. 4,874,780.
This application Aug. 21, 1989, Ser. No. 396,218
Int. Cl.[5] C07D *263/04, 339/08*
U.S. Cl. 548—215 1 Claim

1. A compound selected from the group consisting of a compound of the formula:

wherein Ar is phenyl substituted by alkyl of 1–5 carbon atoms, cycloalkyl of 3–6 carbon atoms, halogen, nitro, amino, monoalkylamino of 1–5 carbon atoms or dialkylamino of 1–5 carbon atoms in each alkyl group, or is unsubstituted phenyl, which substituted or unsubstituted phenyl is non-deuterated or partly or completely deuterated, and X_1 and X_2 together with the carbon atom to which they are attached form a cyclic thioacetal, dithiane or oxazolidine, and a pharmaceutically acceptable salt thereof, with the proviso that when Ar is unsubstituted phenyl, then X_1 and X_2 cannot be dithiane

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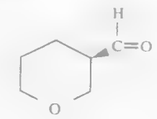
5,149,821

PROCESS AND INTERMEDIATES FOR OPTICALLY ACTIVE 3-FORMYLTETRAHYDROPYRANS

Bernard S. Moore, and Frank J. Urban, both of Waterford, Conn., assignors to Pfizer Inc, New York, N.Y.

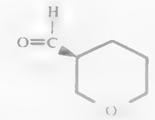
Filed Oct. 11, 1990, Ser. No. 596,165
Int. Cl.[5] C07D *263/02*
U.S. Cl. 548—215 8 Claims

1. A process for the preparation of an optically active 3-formyltetrahydropyran of the absolute stereochemical formula



(Ia)

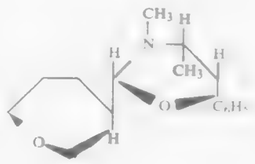
or



(Ib)

which comprises the steps of:

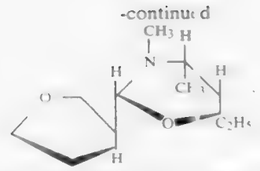
(a) reacting racemic 3-formyltetrahydropyran in a reaction inert solvent either with (+)-ephedrine to form a mixture of diastereomeric oxazolidines of the formulas:



(IIa)

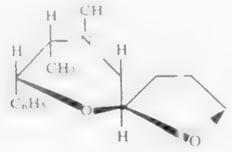
and

-continued



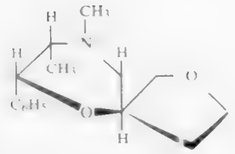
(IIIa)

or with (−)-ephedrine to form a mixture of diastereomeric oxazolidines of the formulas:



(IIb)

and



(IIIb)

(b) separating the diastereomeric oxazolidine of the formula (IIa) or (IIb) from its respective mixture in the form of a crystalline, acid addition salt; and

(c) hydrolyzing in water the resulting diastereomeric salt of the oxazolidine of formula (IIa) or (IIb) to form, respectively, said optically active 3-formyltetrahydropyran of the formula (Ia) or of the formula (Ib).

5,149,822

PREPARATION OF 2,3-DICHLORO-5-ACETYLPYRIDINE

Hans Lindel, Leverkusen; Werner Hallenbach, Langenfeld, and Bernd Gallenkamp, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

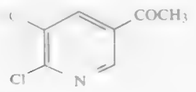
Filed Apr. 12, 1989, Ser. No. 336,969

Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815727; Nov. 11, 1988, 3838243

Int. Cl.[5] C07D *211/70, 211/82*

U.S. Cl. 546—315 4 Claims

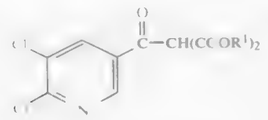
1. A process for the prepartion of 2,3-dichloro-5-acetylpyridine of the formula



(I)

comprising

decarboxylating a compound of the formula



(IV)

in which

R^1 stands for methyl or ethyl,

in a solvent selected from the group consisting of (a) dimethylsulfoxide and water, and (b) dioxane, acid and water.

5,149,823

SULFONAMIDE SUBSTITUTED SPIRODILACTAMS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 9, 1990, Ser. No. 564,528

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] C07D *491/00, 279/00, 225/04, 267/02*

U.S. Cl. 548—410 12 Claims

1. A sulfonamide-substituted spirodilactam compound comprising a spirodilactam compound having nitrogen atoms in the 1- and 6-positions of the spiro ring system and having sulfonamoyl moieties on hydrocarbyl substitutents attached on each spiro ring nitrogen atom, there being up to about 60 carbon atoms in said compound.

5,149,824

PROCESS FOR PREPARING ARYLAMIDE BISNADIMIDES

S. Richard Turner; Robert J. Perry, both of Pittsford, and Richard W. Blevins, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1991, Ser. No. 724,269

Int. Cl.[5] C07D *209/56*

U.S. Cl. 548—435 10 Claims

1. A method for the production of an arylamide bisnadimide, said method comprising the step of:

condensing a nadimide compound having the nitrogen of said nadimide substituted with a halogen substituted aromatic group, with a primary diamine dinucleophile in the presence of carbon monoxide, a base and a palladium catalyst.

5,149,825

2-AZABICYCLO(2.2.1)HEPT-5-ENE-2-ACETIC ACID, DERIVATIVES THEREOF AND RELATED COMPOUNDS, PROCESS FOR THE PREPARATION OF SAID COMPOUNDS AND THE USE OF SAID COMPOUNDS FOR THE MANUFACTURE OF N-PHOSPHONOMETHYLGLYCINE

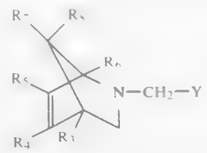
David A. Cortes, Fairless Hills, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 276,186, Nov. 23, 1988, Pat. No. 4,946,993. This application Aug. 31, 1989, Ser. No. 399,571

Int. Cl.[5] C07D *209/00*

U.S. Cl. 548—515 5 Claims

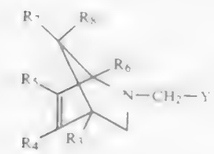
1. A compound having the structure



V

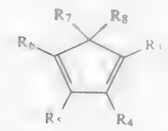
wherein R_3, R_4, R_5, R_6, R_7 and R_8 are each independently hydrogen, C_1–C_4 alkyl, C_6H_5 or NO_2; and Y is $CON(R_1)_2$ or CN wherein R_1 is hydrogen or C_1–C_4 alkyl.

4. A method for the preparation of an azabicycloalkene compound having the structure



V

wherein R_3, R_4, R_5, R_6, R_7 and R_8 are each independently hydrogen, C_1–C_4 alkyl, C_6H_5 or NO_2; and Y is COOH; which consists essentially of reacting H_2N—CH_2—COOH with formaldehyde and a cyclopentadiene compound of Formula VI



VI

wherein R_3, R_4, R_5, R_6, R_7 and R_8 are as described in Formula V, in the presence of a non-aqueous C_1–C_4 alkyl carboxylic acid.

5,149,826

POLY[(3-PYRROLYL)ACETIC ACID]

Didier Delabouglise, and Francis Garnier, both of Thiais, France, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

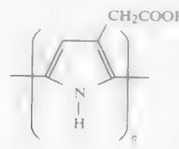
Filed Jan. 4, 1991, Ser. No. 637,631

Claims priority, application Japan, Jan. 8, 1990, 2-409

Int. Cl.[5] C07D *207/30;* C08F *26/06*

U.S. Cl. 548—518 2 Claims

1. A poly[(3-pyrrolyl)acetic acid] represented by the formula (I)



(I)

wherein n is an integer of 2 or more.

5,149,827

METHOD FOR HANDLING MALEIMIDES

Yuichi Kita, Akashi; Kazuo Kishino, and Hiroko Ueda, both of Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jan. 8, 1991, Ser. No. 638,620

Claims priority, application Japan, Jan. 10, 1990, 2-1525; Mar. 12, 1990, 2-57959; May 18, 1990, 2-126969

Int. Cl.[5] C07D *207/448*

U.S. Cl. 548—548 19 Claims

1. A method for handling a maleimide, which method comprises handling said maleimide in the presence of a stabilizer at a temperature exceeding the melting point thereof in a state kept in contact with a gas phase having a molecular oxygen content of not more than 10% by volume.

5,149,828

STABILIZERS FOR COLOR PHOTOGRAPHY RECORDING MATERIALS

Jean Rody, Riehen, and David G. Leppard, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

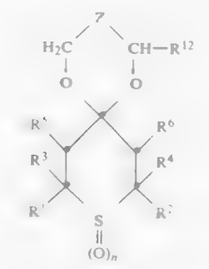
Division of Ser. No. 251,081, Sep. 29, 1988, Pat. No. 4,933,271. This application Mar. 21, 1990, Ser. No. 487,218

Claims priority, application Switzerland, Sep. 30, 1987, 3799/87

Int. Cl.[5] C07D *409/02*

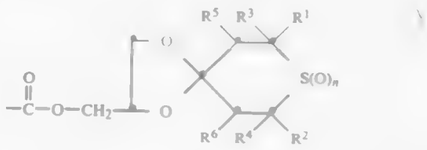
U.S. Cl. 549—13 3 Claims

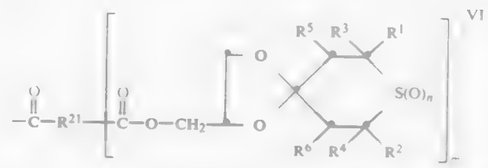
1. A compound of the formula Ia



Ia

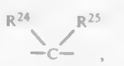
in which n is 0, 1 or 2, R^1 and R^2 independently of one another are hydrogen or methyl, R^3 and R^4 independently of one another are hydrogen, C_1–C_{14}alkyl, phenyl, thienyl or phenyl which is substituted by 1 or 2 C_1–C_8alkyl, cyclophenxyl, phenyl, C_7–C_9phenylalkyl, C_1–C_{18}-alkoxy or halogen, R^5 and R^6 independently of one another are hydrogen, C_1–C_4alkyl, phenyl, —COO(C_1–C_{18}alkyl), —CO—CH_3, —CO—phenyl, —$CH(CR^7)$—CH_3 or —$CH(OR^7)$-phenyl and R^7 is hydrogen, C_1–C_{12}alkyl, C_2–C_{18}alkanoyl or benzoyl, R^{12} is hydrogen, C_1–C_4alkyl or —CH_2—OR^{20}, R^{20} is hydrogen, C_1–C_4alkyl, C_2–C_4alkyl, C_2–C_{13}alkanoyl, benzoyl or a group of the formula V or VI





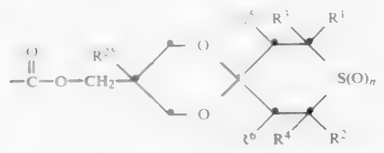
VI

in which m is 1, 2 or 3, R^{21}, if m is 1, is a direct bond, C_1–C_{12}alkylene, C_2–C_6alkylene which is substituted by phenyl or benzyl or interrupted by —O— or —S—, vinylene, phenylene or a group —NH—R^{28}—NH—, and if m is 2, is C_3–C_{12}alkanetriyl or C_6–C_{12}arenetriyl, and if m is 3, is C_4–C_{12}alkanetetrayl or C_6–C_{12}arenetetrayl, and R^{28} is C_2–C_{12}-alkylene, C_6–C_{12}cycloalkylene, phenylene, naphthylene or phenylene which is substituted by C_1–C_4alkyl, C_1–C_4alkoxy or halogen, Z is a direct bond or a group

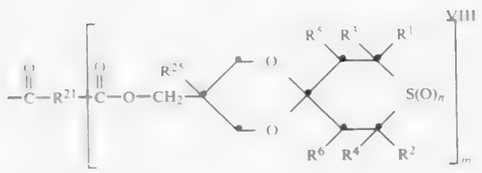


in which R^{24} is hydrogen, C_1–C_4alkyl, —OH or —CH_2OR^{26},

R^{25} is hydrogen or C_1-C_4alkyl and R^{26} is hydrogen, C_1-C_4alkyl, C_2-C_{18}alkanoyl, benzoyl or a group of the formula VII or VIII



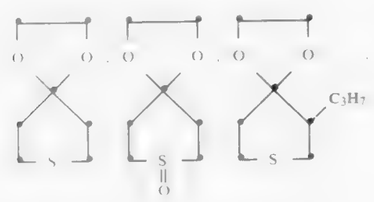
VII



VIII

in which is 1, 2 or 3,

With the proviso that the compounds of the formulas



and

are excluded.

5,149,829

METHOD OF PREPARING DRY, CONCENTRATED SALTS OF ASCORBATE 2-POLYPHOSPHATE

Paul A. Seib, and Xiao Y. Wang, both of Manhattan, Kans., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 14, 1991, Ser. No. 641,042

Int. Cl.[5] **C07F** *9/06*

U.S. Cl. 549—222 **16 Claims**

1. A method of preparing dried, concentrated ascorbate 2-polyphosphate salts, comprising the steps of:

providing a quantity of ascorbate 2-polyphosphate species and inorganic phosphate contaminants in aqueous solution;

adding a member selected from the group consisting of calcium chloride and magnesium chloride to said solution, with the concentration of said contaminants in said solution being sufficiently small to prevent formation of a gel, with the pH of the solution being at a level of below 10;

precipitating at least a portion of said contaminants as the calcium or magnesium salts thereof, with the ascorbate 2-polyphosphate species from said reaction mixture remaining in the supernatant and

recovering said ascorbate 2-polyphosphate species from said supernatant as a dried product.

5,149,830

SUBSTITUTED XANTHENE COMPOUNDS

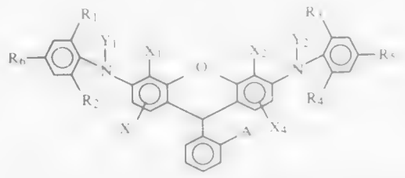
Louis Locatell, Chico, Calif.; Kenneth Norland, Lexington, Mass.; F. Donald Roberts, Dover, Mass., and Charles Zepp, Berlin, Mass., assignors to Steadfast, Inc., Cambridge, Mass.

Filed Feb. 23, 1990, Ser. No. 484,429

Int. Cl.[5] **G03C** *1/40, 1/84, 5/54, 1/10*

U.S. Cl. 549—223 **14 Claims**

1. A substituted xanthene compound of the formula:



wherein R_1-R_6 are each independently alkyl, alkenyl, alkynyl, halogen, haloalkyl, $SO_2N(alkyl)_2$, aryl, substituted aryl, or hydrogen;

Y_1 and Y_2 are each independently alkyl, alkenyl, alkynyl, or hydrogen;

X_1, X_2, X_3, and X_4 are each independently selected from the group consisting of hydrogen, halogen, haloalkyl, alkyl, alkenyl, alkynyl, NO_2, SO, $SO_2N(alkyl)_2$, and SO_2 groups; and

A is selected from the group consisting of SO_3, $SO_2N(alkyl)_2$, CO_2, and CO_2CH_3,

whereby at least two of the R_1R_6 moieties are not hydrogen and R_3 or R_4 can optionally form a phenyl ring with R_5 or R_1 or R_2 can optionally form a phenyl ring with R_6.

5,149,831

PROCESS FOR PRODUCING METHYLNORBORNENE DICARBOXYLIC ACID ANHYDRIDE

Hiroshi Furukawa, Kawagoe; Hiroyuki Inagaki, Saitama; Masaharu Ishii, Saitama, and Hiroshi Ueno, Saitama, all of Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Mar. 19, 1991, Ser. No. 671,574

Claims priority, application Japan, Apr. 27, 1990, 2-110586

Int. Cl.[5] **C07D** *307/77*

U.S. Cl. 549—237 **5 Claims**

1. A process for producing methylnorborene dicarboxylic anhydride by reacting a C_6-C_7 fraction which results from steam cracking of a hydrocarbon mixture, said C_6-C_7 fraction containing 5-methylcyclopentadiene with maleic anhydride at a temperature of 0°–50° C. in the presence of protonic acid whereby the 5-methylcyclopentadiene is isomerized to 1-methylcyclopentadiene and 2-methylcyclopentadiene or mixtures thereof.

5,149,832

MONO AND DIACYL DERIVATIVES OF LL-F28249 COMPOUNDS

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

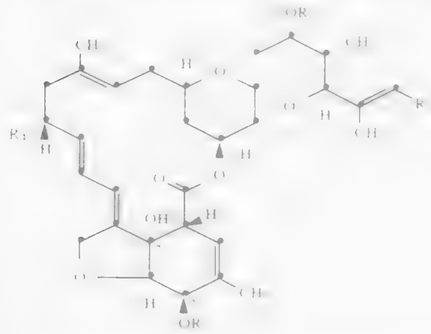
Filed Sep. 12, 1986, Ser. No. 907,281

The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.

Int. Cl.[5] **C07D** *315/00*

U.S. Cl. 549—264 **1 Claim**

1. A compound represented by structural formula (I):



(I)

wherein R_1 is acetyl; R_2 is hydrogen; R_3 is isopropyl; and R_4 is methyl.

5,149,833

PROCESS FOR PREPARING D,L-LACTIDE

Joachim Hess, Bingen; Klaus R. Muller, Ingelheim, and Manfred Muller, Bickenbach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 529,022, May 25, 1990, Pat. No. 5,011,946. This application Feb. 5, 1991, Ser. No. 650,507

Claims priority, application Fed. Rep. of Germany, May 26, 1989, 3917178

Int. Cl.[5] **C07D** *319/12*

U.S. Cl. 549—274 **7 Claims**

1. A process for preparing D,L-lactide which comprises

a) dissolving D-lactide in a first volume of a solvent or a mixture of solvents capable of forming an azeotrope with water, to produce a first solution;

b) filtering the first solution;

c) dissolving L-lactide in a second volume of the solvent or mixture of solvents, to produce a second solution; d) filtering the second solution; e) combining the filtered first solution and the filtered second solution, to produce a starting solution; f) concentrating the starting solution, to produce a residual solution; g) cooling the residual solution until a crystalline precipitate of D,L-lactide forms; h) separating the crystalline precipitate from the remainder of the residual solution; and i) drying the crystalline precipitate.

5,149,834

4-HYDROXYTETRAHYDROPYRAN-2-ONE DERIVATIVES

Masakatsu Matumoto, Sagamihara; Nobuko Watanabe, Kamakura; Eiko Mori, Kodaira, and Jun Kusunoki, Tokyo, all of Japan, assignors to Fujirebio Inc., Tokyo, Japan

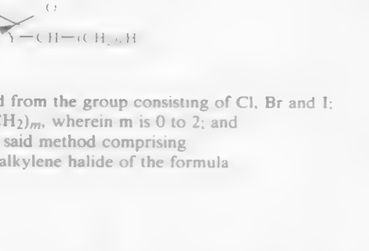
Filed Mar. 7, 1991, Ser. No. 665,666

Claims priority, application Japan, Mar. 7, 1990, 2-53489; Jun. 1, 1990, 2-141492; Jun. 1, 1990, 2-141493; Jul. 4, 1990, 2-175392

Int. Cl.[5] **C07D** *309/30, 409/14, 405/14*

U.S. Cl. 549—292 **28 Claims**

1. A 4-hydroxytetrahydropyran-2-one derivative with general formula (I):



(I)

wherein R_1 represents hydrogen or a 2-tetrahydropyranyl group; R_2 and R_3 each represent hydrogen or an alkyl group having 1 to 6 carbon atoms, R_4 represents hydrogen, an alkyl group having 1 to 6 carbon atoms, an alkenyl group having 2 to 6 carbon atoms, an aryl group selected from the group consisting of phenyl, pyridyl, naphthyl, thienyl, furyl and imidazolyl, an aralkyl group selected from the group consisting of benzyl, pyridylmethyl, naphthylmethyl, thiophenylmethyl, furylmethyl and imidazolylmethyl, an acyl group selected from the group consisting of acetyl, propionyl, butyryl, valeryl and hexanoyl, an aroyl group selected from the group consisting of benzoyl, toluoyl, naphthoyl, pyridinecarbonyl and furoyl, or a substituted sulfonyl group selected from the group consisting of methanesulfonyl, benzenesulfonyl and toluenesulfonyl; A represents $—CH_2CH_2—$ or $—CH=CH—$; and n is an integer of 1 or 2.

5,149,835

SUBSTITUTED MEVALONOLACTONES, AND METHODS FOR STEREOSELECTIVE PREPARATION THEREOF AND DESMETHYL HOMOLOGUES THEREOF

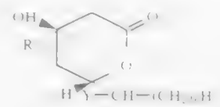
Cary J. Morrow, and Joseph M. Eridon, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Apr. 27, 1989, Ser. No. 343,772

Int. Cl.[5] **C07D** *309/30*

U.S. Cl. 549—292 **7 Claims**

1. A stereospecific method of preparing a 3-OH, 5-trans mevalonolactone of the formula



(I)

wherein

Y is selected from the group consisting of Cl, Br and I;

R' is $CH_3(CH_2)_m$, wherein m is 0 to 2; and

n is 0 to 12, said method comprising

reacting an alkylene halide of the formula

$H(CH_2)_n—CH=CH—CH_2X$

wherein X is Cl, Br or I, with an acylacetic acid ester of the formula

$R'COCH_2COOR$

wherein R'' is selected from the group consisting of alkyl, cycloalkyl, aryl, alkylaryl and aralkyl, which may be unsubstituted or substituted by alkyl or alkyloxy, and R' is H or $CH_3(CH_2)_m$, wherein m is 0–8, in the presence of an organic ether and a metal M selected from the group consisting of Zn and alkali and alkaline earth metals, in proportions and under conditions effective to form

$MX^+(H(CH_2)_nCH=CHCH_2-CO^-(R')—CH\cdot{}_2COOR'')$,

wherein M, X and R'' are as defined above; and

adding Y_2 to said ester wherein Y is selected from the group consisting of Cl, Br and I, in a proportion and under conditions effective to form the mevalonolactone of formula (I).

5,149,836

PROCESS FOR THE PROI UCTION OF GAMMA BUTYROLACTONE THF I N PREDETERMINED AMOU TS

Waldo De Thomas, Saylorsburg, Pa.; Paul D. Taylor, West Milford, and Heinn F. Tomfohrde, III, Kinnelon, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Jul. 25, 1991, Ser. No. 735,498

Int. Cl.[5] **C07D** *307/26*

U.S. Cl. 549—325 **4 Claims**

1. A multistage vapor phase process for the production of gamma-butyrolactone and tetrahydrofuran in a predetermined selectivity ratio of about 15–92% to 7–83%, respectively, at an overall conversion of 90–100%, which comprises: in a first stage, hydrogenating a feed mixture of maleic anhydride and excess hydrogen over a first bed of a catalyst of about 30–65wt. % CuO, 18–50 wt. % ZnO and 3–22% Al_2O_3, to produce a crude reactor effluent containing predominately gamma-butyrolactone, and, in a second stage, directly contacting said crude reactor effluent with hydrogen over a second bed of a catalyst of about 10–50 wt. % CuO, 30–65 wt. % ZnO and 3–20 wt. % Cr_2O_3, which can convert said gamma-butyrolactone into tetrahydrofuran, during a predetermined contact time of about 1–4 seconds, and at a predetermined temperature of about 200°–350° C., the relative amount of gamma-butyrolactone and tetrahydrofuran obtained in said second stage being predetermined by the defined contact time over the second bed, and the selected volume ratio of about 1:1 to 1:4 of the respective first and second catalysts in said beds, at said second bed temperature.

5,149,837

PROCESS FOR TRANS-6-[2-(SUBSTITUTED-PYRROL-1-YL)ALKYL]PYRAN-2-ONE INHIBITORS OF CHOLESTEROL SYNTHESIS

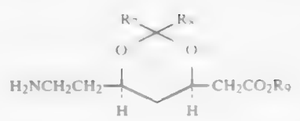
Donald E. Butler; Carl F. Deering; Alan Millar; Thomas N. Nanninga, all of Holland, and Bruce D. Roth, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 792,311, Nov. 14, 1991, which is a division of Ser. No. 595,461, Oct. 9, 1990, Pat. No. 5,097,045, which is a division of Ser. No. 303,733, Feb. 1, 1989, Pat. No. 5,003,080, which is a continuation-in-part of Ser. No. 158,439, Feb. 22, 1988, abandoned. This application Feb. 12, 1992, Ser. No. 834,443

Int. Cl.[5] **C07D** *319/06*

U.S. Cl. 549—333 **7 Claims**

1. A compound of Formula IV



IV

wherein R_7 and R_8 are independently hydrogen, alkyl of from one to three carbon atoms, phenyl or R_7 and R_8 are taken together as $—(CH_2)_n—$, wherein n is 4 or 5, and R_8 is alkyl of from one to eight carbon atoms, a three- to six-membered cycloalkyl group, or α,α-dimethylbenzyl.

5,149,838

INTERMEDIATES FOR SUBSTITUTED AZETIDINONES USEFUL AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

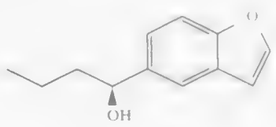
Guy R. Humphrey, Belle Mead; Ann M. Madar, Rahway, and Andrew S. Thompson, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 20, 1991, Ser. No. 764,609

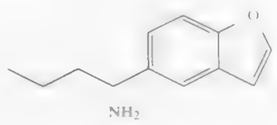
Int. Cl.[5] **C07D** *307/78*

U.S. Cl. 549—471 **1 Claim**

1. A process intermediate selected from the group consisting of B, C and D, which are

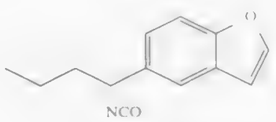


B



C

and,



D

5,149,839

SILANE COUPLING AGENT AND GLASS FIBER PRODUCT FOR LAMINATES

Hideharu Waketa; Yoshiharu Suzuki; Motoharu Murakoshi, all of Fukushima; Hideaki Kakiuchi, Saitama; Masuhito Ohgushi, Kumamoto; Kenichi Watanabe, and Toshiya Sawai, both of Kanagawa, all of Japan, assignors to Nitto Boseki Co., Ltd. and Chisso Corp., Japan

Division of Ser. No. 432,856, Nov. 7, 1989, Pat. No. 5,069,971. This application Aug. 30, 1991, Ser. No. 753,656

Claims priority, application Japan, Nov. 8, 1988, 63-280417; Aug. 24, 1989, 1-216025

Int. Cl.[5] **C07F** *7/08*

U.S. Cl. 556—413 **16 Claims**

1. A silane coupling agent prepared by reacting 2.3 to 4.0 mols of a haloalkylalkoxysilane with 1 mol of a diamine having N atoms to which 4 active hydrogen atoms are bound.

5,149,840

HYDROXY FURANONE PREPARATION

Coenraad Decnop, Bussum; Johannes M. van Dort, Lage Vuursche, and Johannes T. de Hey, Hilversum, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed May 18, 1990, Ser. No. 527,282

Claims priority, application European Pat. Off., May 18, 1989, 89201269.1

Int. Cl.[5] **C07D** *307/58*

U.S. Cl. 549—477 **9 Claims**

1. Process for preparation of 5-methyl- or 2,5-dimethyl-4-hydroxy-2,3-dihydrofuran-3-one comprising the steps of:

a reacting a pentose or 6-deoxyhexose in the presence of an amino acid:

i at a temperature between 50° and 180° C.,

ii for a time between 30 min. and 5 days,

iii in a molar ration of sugar:amino acid of between 1:10 and 20:1,

b distilling the hydroxyfuranone from the reaction mixture at a pressure below 5 kPa and in the presence of an organic solvent having a boiling point within 50° C. of that of the hydroxyfuranone at distillation pressure.

5,149,841

N,N,N',N'-TETRACLYCIDYL-4,4'-DIAMINODIPHENYLMETHANES

Werner Schaffner, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

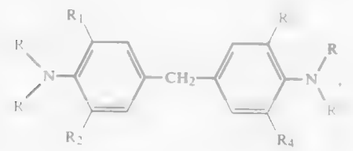
Filed May 1, 1991, Ser. No. 694,525

Claims priority, application Switzerland, May 7, 1990, 1537/90

Int. Cl.[5] **C07D** *301/27, 301/26, 303/36*

U.S. Cl. 549—520 **12 Claims**

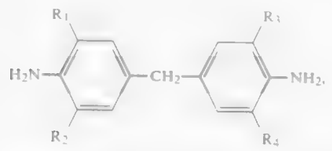
1. A process for the preparation of a compound of the formula I



(I)

in which R is glycidyl, R_1 and R_3 independently of one another are C_1–C_6alkyl and R_2 and R_4 independently of one another are hydrogen or methyl, wherein

(i) a diamine of the formula II



(II)

in which R_1, R_2, R_3 and R_4 are as defined above, is reacted with epichlorohydrin in the absence of catalyst in a molar ratio of 1:12 to 1:40 at a temperature of 80° to 115° C. and

(ii) a phase transfer catalyst and a weak inorganic base are mixed with the reaction mixture at 30°–70° C., the epichlorohydrin is subjected to distillation while being circulated and at the same time the dehydrochlorination is carried out with the addition of a concentrated, aqueous alkali metal or alkaline earth metal hydroxide solution and simultaneous removal of the water distilled off azeotropically, and wherein said weak inorganic base is an alkali metal bicarbonate.

5,149,842

PROCESS FOR PREPARING PEROXIDE PERFLUOROPOLYETHERS

Dario Sianesi, Milan; Antonio Marraccini, Dormelletto, and Giuseppe Marchionni, Milan, all of Italy, assignors to AUSTIMONT S.r.l., Milan, Italy

PCT No. PCT/EP90/00638, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO90/12832, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 20, 1990, Ser. No. 613,483

Claims priority, application Italy, Apr. 20, 1989, 20207 A/89

Int. Cl.[5] **C07D** *301/06, 303/08;* **C08F** *2/46;* **C07C** *179/00*

U.S. Cl. 549—550 **32 Claims**

1. A process for the preparation of peroxidic perfluoropolyethers comprising perfluoroalkylenoxy units having at least two carbon atoms, the process comprising reacting one or more perfluoroolefins, except tetrafluoroethylene used alone, are reacted with oxygen in the liquid phase at a temperature not exceeding 50° C. and in the presence of one or more compounds having one or more F—X bonds, in which X is selected from the group consisting of F, O and Cl, wherein the compounds having one or more F—O bonds are selected from organic compounds containing one or more fluoroxy groups.

32. Peroxidic perfluoropolyethers comprising perfluoroalkylenoxy units having at least two carbon atoms, obtainable by the process of claim 1.

5,149,843

CONJUGATED DIENE COMPOUNDS

Hisao Takayanagi; Yasunori Kitano, both of Yokohama, and Yasuhiro Morinaka, Tsuchiura, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

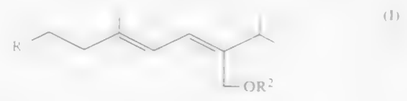
Filed Jun. 7, 1991, Ser. No. 712,043

Claims priority, application Japan, Jun. 20, 1990, 2-162438

Int. Cl.[5] **C07C** *33/02, 33/14, 33/42, 43/15, 43/17, 49/203, 49/24;* **C07D** *303/08*

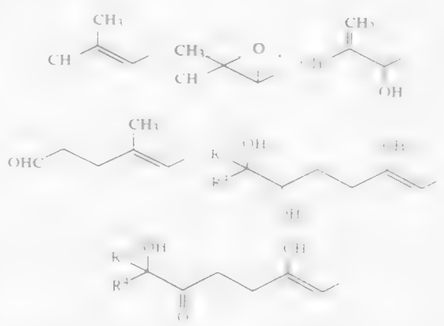
U.S. Cl. 549—561 **1 Claim**

1. A conjugated diene compound of the formula (I):



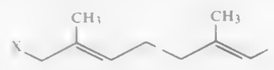
(I)

wherein R^1 is



(in which R^3 and R^4 are independently alkyl group of 1 to 4 carbon atoms or taken together form a cyclic alkyl group).

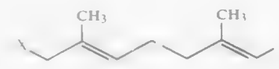
(in which R^5 is alkyl group of 1 to 4 carbon atoms) or



(in which X is hydroxy group, halogen atom or $—OSO_2R^6$ (R^6 is alkyl group of 1 to 4 carbon atoms optionally substituted by halogen atom or phenyl group optionally substituted by alkyl group of 1 to 4 carbon atoms)), and R^2 is hydrogen atom,

(in which R^7 is hydrogen atom or alkyl group of 1 to 4 carbon atoms, R^8 is alkyl group of 1 to 4 carbon atoms, or R^7 and R^8 taken together may form a ring).

(in which R^9-R^{11} are independently alkyl group of 1 to 4 carbon atoms or phenyl group) or acyl group, with the proviso that when R^1 is



(X is as defined above), R^2 is not hydrogen atom.

5,149,844

HETEROCYCLIC DIORGANOTIN CATALYSTS FOR USE IN POLYURETHANE SYSTEMS

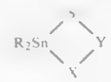
James D. Nichols, and John B. Dickenson, both of Fogelsville, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 424,778, Oct. 20, 1989. This application Sep. 9, 1991, Ser. No. 756,936

Int. Cl.[5] C07F *7/22*

U.S. Cl. 556—89 **12 Claims**

1. A compound of the formula



where

R is a C_1-C_8 alkyl or an aryl group.

Y is

X is —S— or —O—

5,149,845

EXTRACTANTS FOR THE SEPARATION OF TRANSITION AND RELATED METAL IONS

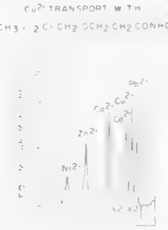
Abraham Shanzer; Jacqueline Libman, and Shneior Lifson, all of Rehovot, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 441,102, Nov. 24, 1989, Pat. No. 5,101,066. This application Nov. 13, 1991, Ser. No. 790,985

Claims priority, application Israel, Nov. 25, 1988, 088498

Int. Cl.[5] C07F *1/08*

U.S. Cl. 556—110 **11 Claims**



1. A process for the selective extraction of a metallic species from a mixture with one or more other metallic species, which comprises

contacting the mixture with a compound of the formula:

wherein n is 1 or 2; m is zero, 1 or 2; q is zero, 1 or 2; R, R^1, R^2 and R^3 are independently selected from the group consisting of H, alkyl, aryl, aralkyl, alkyl—COOR′, alkyl-CONHR′ and alkyl—$CONR'_2$ wherein R′ is alkyl to effect chelation; and

separating the chelated compound from remaining cations.

5,149,846

DEUTERATED ANALOGS OF 1,25-DIHYDROXYCHOLECALCIFEROL

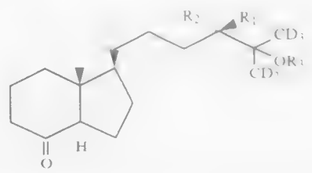
Enrico G. Baggiolini, North Caldwell; Bernard M. Hennessy, Nutley, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 96,981, Sep. 14, 1987, Pat. No. 4,898,855. This application Nov. 16, 1989, Ser. No. 438,546

Int. Cl.[5] C07F *7/18*; C07C *49/633*

U.S. Cl. 556—436 **8 Claims**

1. A compound of the formula



wherein R_1 and R_2 are either both hydrogen or both deuterium, R_3 is hydrogen or $Si(Alk)_3$, wherein Alk is lower alkyl.

5,149,847

NAPHTHALOCYANINE COMPOUND AND PRODUCTION THEREOF

Yasuhiro Yamasaki, Atlanta, Ga., assignor to Orient Chemical Industries, Ltd., Osaka, Japan

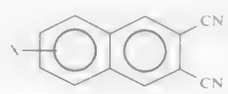
Division of Ser. No. 504,309, Apr. 4, 1990, Pat. No. 5,064,951. This application May 15, 1991, Ser. No. 700,453

Claims priority, application Japan, Apr. 6, 1989, 1-87230

Int. Cl.[5] C07C *255/52*

U.S. Cl. 558—192 **2 Claims**

1. An intermediate compound represented by the formula:



[2]

wherein X represents

and wherein R^1 and R^2 respectively represent hydroxyl, a C_{1-10} alkyl, phenyl, or ethoxy.

5,149,848

PROCESS FOR PRODUCING 1-AMINOANTHRAQUINONES

Noboru Sugishima; Noriaki Ikeda; Yasushi Fujii, all of Himeji, and Akira Inoue, Hirakata, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

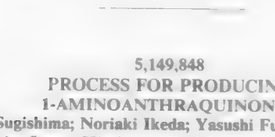
Continuation of Ser. No. 315,591, Feb. 27, 1989, abandoned. This application Apr. 8, 1991, Ser. No. 682,413

Claims priority, application Japan, Feb. 29, 1988, 63-44335; Dec. 20, 1988, 63-319420; Dec. 20, 1988, 63-319421

Int. Cl.[5] C07C *211/04*

U.S. Cl. 552—238 **16 Claims**

1. A process for producing 1-aminoanthraquinones represented by formula (C)

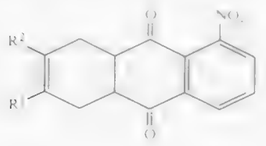


(C)

wherein R^1 and R^2, independently from each other, denote one type selected from a hydrogen atom, an alkyl group having 1 to 4 carbon atoms and a halogen atom,

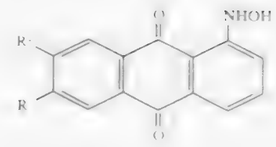
which consists essentially of the steps of:

converting 5-nitro-1,4,4a, 9a-tetrahydroanthraquinones represented by formula (A)



(A)

wherein R^1 and R^2 are as defined above, into 1-hydroxylaminoanthraquinones represented by formula (B)



(B)

wherein R^1 and R^2 are as defined above, in the presence of a basic compound; and

electrolytically reducing the resulting hydroxylaminoanthraquinones in the presence of a basic compound to produce 1-aminoanthraquinones represented by formula (C).

5,149,849

PROCESS FOR THE PREPARATION OF QUINHYDRONES

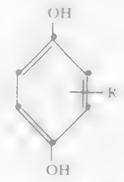
Michael Bellas, Yeong-Jen Kuo, both of Kingsport, Tenn., and Fred H. Rash, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1991, Ser. No. 670,661

Int. Cl.[5] C07C *46/06, 50/04*

U.S. Cl. 552—293 **5 Claims**

1. Process for the preparation of a quinhydrone compound which comprises contacting an aromatic diol having the formula



with a peroxide selected from hydrogen peroxide, alkyl peroxides and percarboxylic acids in the presence of a catalyst system comprising a cerous carboxylate and a cupric carboxylate and an inert solvent at a temperature of about 0° to 80° C., wherein the peroxide:aromatic diol mole ratio is in the range of about 0.4 to 0.6 and R is hydrogen, alkyl of up to about 8 carbon atoms, halogen, cyclohexyl or phenyl.

5,149,850

PROCESS FOR THE PRODUCTION OF HIGH-PURITY TETRACHLORO-1,4-BENZOQUINONE

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 151,883, Feb. 3, 1988, abandoned. This application Jun. 28, 1991, Ser. No. 726,625

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703566; Mar. 6, 1987, 3707148

Int. Cl.[5] C07C *50/24, 46/06*

U.S. Cl. 552—308 **4 Claims**

1. A process for the production of high-purity tetrachloro-1,4-benzoquinone by the action of chlorine and hydrochloric acid on hydroquinone, which comprises causing 1.9 to 2.1 times the molar quantity of gaseous chlorine to act at temperatures from 5° to 15° C. on 1 mol of hydroquinone in 6 to 7 times the molar quantity of 30 to 37% hydrochloric acid, then in a first dilution step diluting the resulting suspension, essentially containing 2,5-dichlorohydroquinone, with 2 to 3 parts of water, relative to hydroquinone employed, and initially warming to a temperature from 20° to 30° C., subsequently introducing 1.9 to 2.1 times the molar quantity of chlorine gas in an air

atmosphere while raising the temperature to 90°–100° C. with simultaneous dilution with 3.5 to 4.5 parts of water, relative to hydroquinone employed in a second dilution step, and finally introducing 1 to 2 times the molar quantity of gaseous chlorine, relative to hydroquinone employed, at temperatures from 100° to 115° C.

5,149,851

PROCESS FOR PREPARING TRIGLYCERIDES CONTAINING POLYUNSATURATED FATTY ACID MOIETIES

Virginia F. Stout; Erich J. Gauglitz, Jr., and William B. Nilsson, all of Seattle, Wash., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 25, 1990, Ser. No. 603,075
Int. Cl.[5] C11C 3/06
U.S. Cl. 554—165 8 Claims

1. A method for the preparation of a triglyceride containing at least one polyunsaturated fatty acid residue which comprises reacting less than three moles of polyunsaturated fatty acid C_{1-4} alkyl esters with one mole of glycerol in the presence of a C_1–C_4 alkoxide of lithium, potassium, sodium, magnesium or aluminum, at a temperature of about 25°–175° C. and at a pressure below atmospheric pressure; and separating C_{1-4} alkanol as it is formed.

5,149,852

PROCESS FOR CONCENTRATION AND SEPARATION OF HIGHLY UNSATURATED FATTY ACID ESTER

Makoto Arai, and Hideki Fukuda, both of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 196,525, May 20, 1988, abandoned. This application Mar. 27, 1991, Ser. No. 676,470
Claims priority, application Japan, May 22, 1987, 62-125076
Int. Cl.[5] C07B 63/00; C07C 67/56, 69/24, 69/30
U.S. Cl. 554—193 7 Claims

1. A process for the separation of an eicosapentaenoic acid ester having a purity of at least 90% from a mixture of fatty acid esters containing the eicosapentaenoic acid ester, which comprises:

contacting the mixture dissolved in hexane with a zeolite containing alkylammonium cations having 1 to 4 carbon atoms to absorb the eicosapentaenoic acid ester;

washing the zeolite with hexane to desorb impurities; and

washing the zeolite with hexane mixed with 0.01 to 10% of ethanol, based on the volume of the nonpolar solvent, to desorb eicosapentaenoic acid ester having a purity of at least 90%.

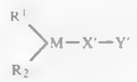
5,149,853

ORGANOMETALLIC COMPOUNDS

Dietrich Erdmann, Mühltal; Max E. Van Ghemen; Ludwig Pohl, both of Darmstadt; Herbert Schumann, Berlin; Uwe Hartmann, Berlin; Wilfried Wassermann, Berlin; Meino Heyen, and Holger Jurgensen, both of Aachen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 389,197, Aug. 3, 1989, Pat. No. 5,112,432, which is a continuation-in-part of Ser. No. 96,583, Sep. 15, 1987, Pat. No. 4,880,492. This application Nov. 8, 1991, Ser. No. 789,518
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631469
Int. Cl.[5] C07F 5/00, 5/06, 19/00
U.S. Cl. 556—1 10 Claims

1. An organometallic compound according to the formula



wherein

M is AL, In or Ga;

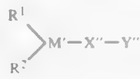
X′ is —2—C_6H_4—$(CH_2)_n$–, —$(CH_2)_m$—2—C_6H_4—, —2—C_6H_{10}—$(CH_2)_m$— or –$(CH_2)_m$—2-C_6H_{10}—, where m=1 or 2;

Y′ is —NR^3R^4, —PR^3R^4, —AsR^3R^4 or —SbR^3R^4; and

R^1, R^2, R^3 and R^4 are each independently H, straight-chain or branched alkyl containing 1–8 carbon atoms, partially or completely fluorinated straight-chain or branched alkyl containing 1–8 carbon atoms, cycloalkyl, alkenyl or cycloalkenyl containing in each case 3–8 carbon atoms, unsubstituted phenyl or a substituted phenyl;

with the proviso that R^1, R^2, R^3 and R^4 are not simultaneously methyl if M denotes indium, X′ denotes —2—C_6H_4—CH_2— and Y′ denotes —NR^3R^4.

6. An organometallic compound according to the formula



wherein

M′ is Ga or In;

X″ is —$(CHR^5)_n$— where n=2, 3, 4 or 5;

R^5 is H or alkyl containing 1–4 carbon atoms;

Y″ is —NR^3R^4, —PR^3R^4, AsR^3R^4, —SbR^3R^4, or a 5- or 6-membered heterocyclic ring where the heteroatoms are from group 5A; and

R^1, R^2, R^3 and R^4 are independently of each other, H, straight-chain or branched alkyl containing 1–8 carbon atoms, partially or completely fluorinated straight-chain or branched alkyl containing 1–8 carbon atoms, cycloalkyl, alkenyl or cycloalkenyl containing in each case 3–8 carbon atoms, unsubstituted phenyl or substituted phenyl.

5,149,854

PREPARATION OF PLATINUM GROUP METAL AND RHENIUM CARBOXYLATES

Thomas E. Nappier, Parma, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Dec. 10, 1990, Ser. No. 624,648
Int. Cl.[5] C07F 15/00
U.S. Cl. 556—49 67 Claims

1. A method for preparing a platinum, palladium, osmium, iridium, rhodium or rhenium salt of a carboxylic acid comprising

(A) preparing a mixture of

(1) at least one alkali or alkaline earth metal salt of the carboxylic acid,

(2) at least one platinum, palladium, osmium, iridium, rhodium or rhenium salt having an anion other than the carboxylate anion of (A)(1), and

(3) an organic liquid capable of at least partly dissolving the at least one alkali or alkaline earth metal salt of the carboxylic acid (1) and the at least one platinum, palladium, osmium, iridium, rhodium or rhenium salt (2), which is not a solvent for a salt formed between the alkali or alkaline earth metal of (1) and the anion of (2); and

(B) maintaining the mixture (A) at a temperature below the decomposition temperature of components (1), (2) and (3) and the platinum, palladium, osmium, iridium, rhodium or rhenium carboxylate product for a period of time sufficient to form the carboxylate product.

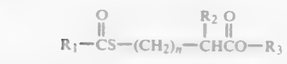
5,149,855

PROCESS FOR RACEMIZING OPTICALLY ACTIVE CARBOXYLIC ACID ESTERS

Akihiro Sakimae; Eiji Ozaki; Kanehiko Enomoto; Ryozo Numazawa, and Yoshimasa Kobayashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

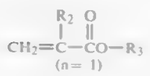
Filed Dec. 14, 1990, Ser. No. 627,779
Claims priority, application Japan, Dec. 26, 1989, 1-336893
Int. Cl.[5] C07C 327/00
U.S. Cl. 558—255 3 Claims

1. A process for racemizing an optically active carboxylic acid ester of the formula (1):

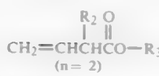


(1)

wherein R_1 is an alkyl group of 1–6 carbon atoms, an aralkyl group of 7–18 carbon atoms, or an aryl group of 6–14 carbon atoms, R_2 and R_3 independently are alkyl groups of 1–6 carbon atoms, and n is 1 or 2, which consists of contacting the compound of the formula (1) with an amine compound, wherein said amine compound is selected from the group consisting of monoethanolamine, diethanolamine, and tertiary amine, in the presence of an unsaturated carboxylic acid ester of the formula (2) when n in the formula (1) is 1, and in the presence of an unsaturated carboxylic acid ester of the formula (3) when n in the formula (1) is (2)



(2)



(3)

wherein R_2 and R_3 are as defined above.

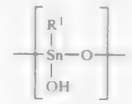
5,149,856

PROCESS FOR THE PREPARATION OF CARBONIC ACID DIESTERS CONTAINING AT LEAST ONE AROMATIC ESTER GROUP

Norbert Schön; Hans-Josef Buysch, and Wolfgang Ebert, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 20, 1991, Ser. No. 657,930
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1990, 4006520
Int. Cl.[5] C07C 68/06, 69/96
U.S. Cl. 558—270 17 Claims

1. A process for the preparation of carbonic acid diesters containing at least one aromatic ester group from the reaction of carbonic acid diesters containing at least one aliphatic ester group and phenols by catalysed transesterification, wherein one or more polymeric hydroxystannoxanes containing monomeric units of the formula



in which

R^1 denotes straight-chain or branched C_1–C_{18}-alkyl, C_3–C_8-cycloalkyl, C_6–C_{14}-aryl, C_7–C_{15}-aralkyl or a C_1–C_{18}-alkylene radical or C_6–C_{14}-arylene radical bridging two polyhydroxystannoxane chains, are employed as the catalyst in an amount of 0.001–20% by weight, based on the carbonic acid diester employed which contains at least one aliphatic ester group.

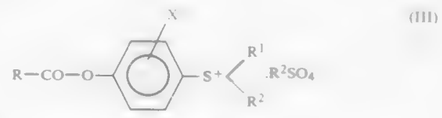
5,149,857

PROCESS FOR PRODUCTION OF SULFONIUM COMPOUNDS

Mutsuhiko Takeda; Isao Hagiwara; Fumiya Zaima, and Shuzabu Sakaguchi, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

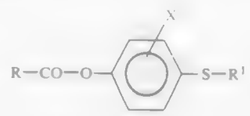
Filed May 29, 1990, Ser. No. 530,898
Claims priority, application Japan, Jun. 7, 1989, 1-143018; Jul. 20, 1989, 1-188118
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—271 12 Claims

1. A process for producing a sulfonium compound of the formula



(III)

which comprises reacting an alkylthiophenol compound of the formula



(I)

and a dialkyl sulfate of the formula

$(R^2)_2SO_4$ (II)

in an amount of 1 to 15 moles of the dialkyl sulfate per mole of the alkylthiophenol compound and at a temperature of 0° to 150° C., wherein R^1 and R^2 are identical or different and are each an alkyl group having 1 to 4 carbon atoms, X is a hydrogen atom, a halogen atom, or an alkyl group having 1 to 4 carbon atoms, and R is an allyloxy group, a 9-fluorenylmethoxy group, or a 2,2,2-trichlorethoxy group.

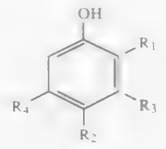
5,149,858

SELECTIVE ORTHO-CHLORINATION OF PHENOLS

Jean-Roger Desmurs, Saint-Symphorien D'Ozon; Bernard Besson, Pont De Claix, and Isabelle Jouve, Villeubanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 18, 1988, Ser. No. 219,780
Claims priority, application France, Jul. 17, 1987, 87 10418
Int. Cl.[5] C07C *253/30, 37/62*
U.S. Cl. 558—419 13 Claims

1. A process for the selective chlorination, in the ortho position relative to the hydroxyl group, of a phenolic compound having the formula (I):



(I)

in which:

R_2 is a halogen atom; an alkyl group having 1 to 4 carbon atoms; an alkoxy group having 1 to 4 carbon atoms; an acyloxy group having 2 to 4 carbon atoms; an alkanoyl acyl group having 2 to 4 carbon atoms; a carboxylic acid group; an ester group —$COOR_5$, wherein R_5 is a straight or branched alkyl radical having 1 to 4 carbon atoms; a nitrile group; an OH group; a —CHO group; an —NO_2 group; an acetamideo group

R_1 is a hydrogen atom or a substituent R_2;

R_3 and R_4, which may be identical or different, are each a hydrogen tom or a substituent R_2; comprising conducting said selective chlorination in a molten medium, using gaseous chlorine, in the presence of a selectivity-enhancing effective amount of at least one organic cation comprising an onium ion derived from nitrogen, phosphorus, arsenic, sulfur, selenium, oxygen, carbon or iodine and which is coordinated with a hydrocarbon moiety.

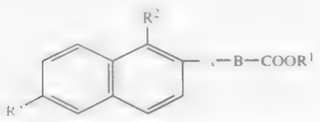
5,149,859

NAPHTHALENE DERIVATIVES

Atsuo Hazato; Takumi Takeyasu, both of Hino; Koji Tomimori, Hachioji, and Yoshinori Kato, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 14, 1990, Ser. No. 582,443
Claims priority, application Japan, Sep. 14, 1989, 1-239460; Sep. 29, 1989, 1-252325; Oct. 16, 1989, 1-266211
Int. Cl.[5] C07C *321/22, 219/14, 69/66, 251/18*
U.S. Cl. 560—10 7 Claims

1. A naphthalene derivative of formula (I):



(I)

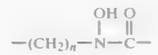
wherein R^1 represents a hydrogen atom, a C_1–C_5 alkyl group or a non-toxic salt moiety;

R^2 and R^3 independently represents a hydrogen atom or —OR^4 where R^4 represents a hydrogen atom or a C_1–C_3 alkyl group;

A represents a group:

where X^1 and X^2 represents an oxygen atom or N—OR^5, where R^5 represents a hydrogen atom or a C_1–C_3 alkyl group, a group:

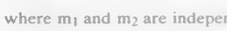
where Y^1 and Y^2 independently represent an oxygen atom or a group N—OR^6, where R^6 represents a hydrogen atom or a C_1–C_3 alkyl group, or a group:



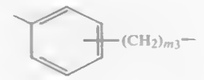
where n is 0 or 1; and

B represents —$(CH_2)_m$—

wherein m is an integer of 1 to 8,



where m_1 and m_2 are independently 1 or 2, or



wherein m_3 is 0 or 1.

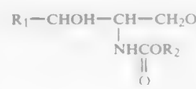
5,149,860

LIPID COMPOUNDS DERIVED FROM SPHINGOSINES, PROCESS FOR PREPARING THESE AND THEIR APPLICATIONS, IN PARTICULAR IN COSMETICS AND IN THE PHARMACY OF SKIN CONDITIONS

Alexandre Zysman, Paris; Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Sep. 20, 1990, Ser. No. 585,653
Claims priority, application France, Sep. 21, 1989, 89 12423
Int. Cl.[5] C07C *261/00*
U.S. Cl. 560—160 4 Claims

1. Lipid compound of the formula:



(I)

in which

R_1 denotes a C_{11} to C_{21} alkyl or alkenyl radical optionally bearing a hydroxy group, and

R_2 denotes a linear or branched C_8 to C_{30} hydrocarbon radical, saturated or bearing one or more ethylenically unsaturated bonds.

5,149,861

RECOVERY OF TRIALKYLAMINES AND METHYL FORMATE FROM MIXTURES OBTAINED IN THE PREPARATION OF TRIMETHYLOLALKANES

Franz Merger, Frankenthal; Peter Hettinger, Edingen-Nickarhausen; Leopold Hupfer, Friedelsheim; Juergen Paetsch, Wachenheim; Heribert Deck, Ludwigshafen; Heinz Auer, Neulussheim, and Erwin Brunner, Ludwighsafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 185,469, Apr. 25, 1988, abandoned.
This application Mar. 1, 1991, Ser. No. 664,463
Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715035
Int. Cl.[5] C07C *67/03, 67/36, 69/06*
U.S. Cl. 560—234 13 Claims

1. A process for recovering trialkylamine and methyl formate from a crude reaction mixture obtained in the preparation of a trimethylolalkane by reaction of an n-alkanal with from 2.2 to 4.5 moles of formaldehyde in aqueous solution in the presence of from 0.6 to 3 moles of a trialkylamine, both quantities based on 1 mole of alkanal, and subsequent hydrogenation, wherein the crude reaction mixture

(a) is heated to from 100° to 200° C., the water present in the reaction mixture is substantially separated off by distillation, together with any unconverted free trialkylamine, the trialkylamine present in the form of a trialkylammonium formate also being freed with formation of a trimethylolalkane formate as the trialkylamine and water are distilled off, and the trimethylolalkane formate is then transesterified with methanol to trimethylolalkane and methyl formate in the presence or absence of a catalytic amount of an alkali metal alkoxide or alkaline earth metal alkoxide, or

(b) is substantially dewatered by distillation to a water content of not more than about 15% by weight, any unconverted free trialkylamine being removed at the same time, the trialkylamine present in the form of a trialkylammonium formate is separated off by admixing the remaining mixture with methanol and heating the admixture to from 100° to 200° C. to form methyl formate and trialkylamine,

and the reaction products are then isolated.

5,149,862

PREPARATION OF POLYTETRAMETHYLENE ETHER GLYCOL USING AN ACIDIC ZIRCONIA CATALYST

Suriyanarayan Dorai, Lockport; Melvin C. Baker, Youngstone, and James A. Schultz, Grand Island, all of N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1991, Ser. No. 661,010
Int. Cl.[5] C07C *67/24, 69/16, 41/01, 43/13*
U.S. Cl. 560—240 7 Claims

1. A process comprising contacting tetrahydrofuran with a catalytically effective amount of acidic zirconium oxide at 10° to 80° C. in the presence of 0.5 to 30 percent of the reaction mass of a mixture of acetic acid and acetic anhydride and recovering polytetramethylene ether glycol or an acetate-capped polytetramethylene ether glycol.

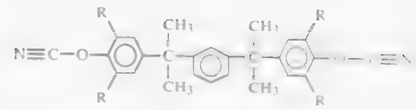
5,149,863

LOW TEMPERATURE CURABLE DICYANATE ESTERS OF DIHYDRIC PHENOLS

David A. Shimp, Prospect, and Jeffrey T. Vanderlip, Louisville, both of Ky., assignors to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Division of Ser. No. 501,231, Mar. 29, 1990, Pat. No. 5,068,309.
This application Aug. 12, 1991, Ser. No. 744,065
Int. Cl.[5] C07C *261/00*
U.S. Cl. 560—301 4 Claims

1. A compound of the formula



wherein R is independently H or C_1 to C_4 alkyl.

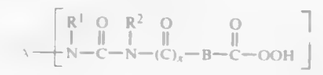
5,149,864

UREIDOPEROXYCARBOXYLIC ACIDS AND PREPARATION AND USE THEREOF

Hanspeter Gethöffer, Frankfurt am Main; Gerd Reinhardt, Kelkheim, and Peter Naumann, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 21, 1991, Ser. No. 703,461
Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016980
Int. Cl.[5] C07B *275/00*
U.S. Cl. 562—2 14 Claims

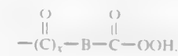
1 A compound of the formula



where

y is 1 or 2,

A is hydrogen, C_1–C_2-alkyl, aryl or a group of the formula

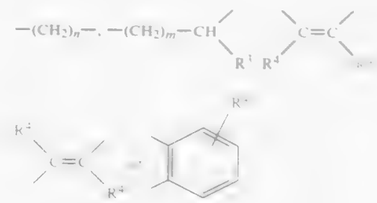


if y is 1, or C_2–C_{20}-alkylene or arylene if y is 2,

R^1 and R^2 can be identical or different and each is hydrogen, C_1–C_{20}-alkyl, aryl, haloaryl, alkoxyaryl or alkylaryl, or else R^1 and R^2 together are a C_2–C_4-alkylene radical,

x is 0 or 1,

B is a group of the formula



n is from 1 to 20,

m is 0, 1 or 2,

R^3 is C_1–C_{20}-alkyl and

R^4 is in each case hydrogen or C_1–C_{20}-alkyl.

5,149,865

NEW P-OXIBENZOIC ACID DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR USE AS DRUG

Friedemann Reiter, Putzbrunn; Helmut Grill, Vaterstetten; Hans-Helmut Henschel; Michael Schliack, both of Munich; Klaus Seibel, Gräfelfing; Roland Löser, Feldafing, and Gerhard Lang, Freising, all of Fed. Rep. of Germany, assignors to Klinge Pharma GmbH, Munich, Fed. Rep. of Germany

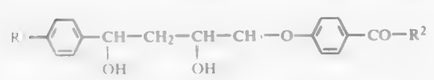
Filed Dec. 20, 1991, Ser. No. 811,257

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1991, 4127800

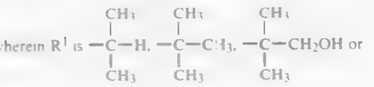
Int. Cl.[5] C07C 65/00

U.S. Cl. 562—473 13 Claims

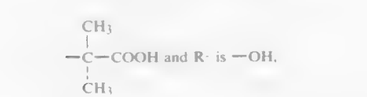
1. p-oxibenzoic acid derivatives of the general formula (1)

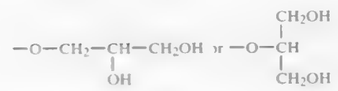


(1)



wherein R^1 is





or a physiologically compatible salt thereof.

5,149,866

PROCESS FOR THE PREPARATION OF OMEGA-ARYLALKANOIC ACIDS

Huh-Sun Chiou, Corpus Christi, Tex.; Mark R. Rubino, Monroeville, Pa.; Susan W. Jahoda; Daniel Lindley, and John R. Battler, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 14, 1991, Ser. No. 746,276

Int. Cl.[5] C07C 61/01, 327/00

U.S. Cl. 562—478 17 Claims

1. A process for the preparation of omega-arylalkanoic acids of the formula

wherein

R is hydrogen, hydroxy, C_1–C_4 alkyl, C_1–C_8 alkoxy, or aryl;

R^1 is C_1–C_4 alkyl; and

Ar is an aryl group which can be further substituted with at least one of hydrogen, C_1–C_8 alkyl, C_1–C_8 alkoxy, aryl, halide, amino with the amino nitrogen bonded to hydrogen or C_1–C_8 alkyl, or acetamido;

said process comprising the steps of:

a) reacting an aryl alkyl ketone of the formula

wherein R, R^1 and Ar are as defined above, with sulfur, a primary or secondary amine and a catalyst to produce a reaction mixture containing a thioamide, sulfur and sulfur-containing compounds;

b) subsequently basifying said Step a) reaction mixture to produce a compound of the formula R—Ar—R^1—CO_2M, wherein R, R^1 and Ar are as defined above and M is an alkali metal selected from the group consisting of Na, K, and Li; and

c) acidifying said Step b) reaction mixture to produce the omega-arylalkanoic acid of the formula R—Ar—R^1-CO_2H, wherein R, R^1, and Ar are as defined above.

5,149,867

CRYSTALLIZATION OF WATER-INSOLUBLE DICARBOXYLIC ACID

Clay T. Chen, and Mary S. Chen, both of Metuchen, N.J., assignors to Hatco Corporation, Fords, N.J.

Filed Jul. 28, 1987, Ser. No. 78,550

Int. Cl.[5] C07C 51/42

U.S. Cl. 562—486 10 Claims

1. A process for the crystallization of an aromatic dicarboxylic acid, having water solubility of less than 0.1% at 100 degrees Centigrade and being initially in the form of small particles, which comprises; reacting, in an aqueous medium, said acid and a base selected from an alkali and ammonia to prepare an aqueous slurry comprising said small particles of said acid, crystals of a mono salt of said acid and said base, a solution of a di salt of said acid and said base, and from 0 to 10% of a surfactant, maintaining said acid in said slurry until said small particles of said acid have dissolved and have been replaced by large well-formed crystals of said acid.

5,149,868

CARBONYLATION PROCESS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 19, 1991, Ser. No. 671,316

Claims priority, application United Kingdom, Dec. 3, 1990, 9026211

Int. Cl.[5] C07C 51/10

U.S. Cl. 562—497 17 Claims

1. A process for the carbonylation of olefinically or alkynically unsaturated compounds which comprises reacting said compounds with carbon monoxide in the presence of water and a catalyst comprising:

a) a palladium compound,

b) a phosphine of general formula $PR^1R^2R^3$, wherein R^1, R^2 and R^3 are the same or different and each represent an alkyl, cycloalkyl or aryl group, at least one of which carries a substituent selected from the group consisting of sulfonic acid, phosphonic acid and carboxylic acid groups, or a salt thereof, and

c) an anion of an acid having a $pK_a < 3$ (measured in water at 18° C.) except hydrohalogenic acids,

and wherein the reaction medium is at least initially a multiphase liquid reaction medium

5,149,869

PROCESS FOR THE PRODUCTION OF DIMETHYLCYCLOPROPANECARBOXYLIC ACID

Thomas Meul, Visp, and Ulrich Kämpfen, Brig, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed Dec. 6, 1991, Ser. No. 803,066

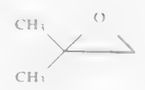
Claims priority, application Switzerland, Dec. 17, 1990, 3991/90

Int. Cl.[5] C07C 61/04

U.S. Cl. 562—506 8 Claims

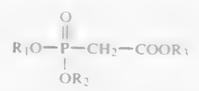
1. Process for the production of R,S-2,2-dimethylcyclopropanecarboxylic acid of the formula:

comprising converting isobutylene oxide of the formula:



(II)

with a phosphonoacetic acid trialkyl ester of the formula:



(III)

wherein R_1, R_2 and R_3 are the same or different and are a C_1–C_4 alkyl group, branched or unbranched, in the presence of a base in an R,S-2,2-dimethylcyclopropanecarboxylic acid-C_1–C_4 alkyl ester of the formula:

(IV)

wherein R_3 has the above meaning, and hydrolyzing the ester to the end product in the presence of a base.

5,149,870

PROCESS FOR THE PRODUCTION OF 1-(AMINOMETHYL)CYCLOHEXANE ACETIC ACID

Hans P. Mettler, Brig-Glis, and Felix Previdoli, Brig, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 612,985, Nov. 15, 1990, and Ser. No. 727,939, Jul. 10, 1991, Pat. No. 5,095,148. This application Nov. 1, 1991, Ser. No. 786,721

Claims priority, application Switzerland, Nov. 16, 1989, 4128/89

Int. Cl.[5] C07C 61/08

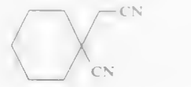
U.S. Cl. 562—507 14 Claims

1. Process for the production of 1-(aminomethyl)cyclohexane acetic acid of the formula:

(I)

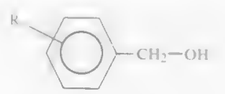
comprising:

(a) reacting (1-cyanocyclohexyl)acetonitrile of the formula:



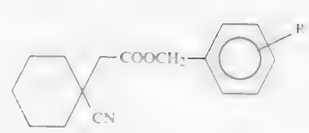
(VI)

with a benzyl alcohol of the general formula:



(IV)

wherein R_1 is H, an alkoxy group, a nitro group or halogen, in the presence of a mineral acid, and subsequently the reaction product with water to provide (1-cyanocyclohexyl)acetic acid benzyl ester of the formula:



(V)

wherein R_1 is defined as above; and

(b) hydrogenating the (1-cyanocyclohexyl)acetic acid benzyl ester in the presence of a hydrogenating catalyst with hydrogen to form the 1-(aminomethyl)cyclohexane acetic acid.

5,149,871

WATER-SOLUBLE THIOUREA DIOXIDE DERIVATIVES AND PROCESS FOR PREPARING SAME

Hirohisa Nitoh; Osami Ohura, both of Fuji, and Morio Suzuki, Hamamatsu, all of Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1991, Ser. No. 797,789

Claims priority, application Japan, Nov. 29, 1990, 2-325432

Int. Cl.[5] C07C 315/00

U.S. Cl. 562—556 5 Claims

1. A water-soluble thiourea dioxide derivative represented by the general formula

wherein M is K^+, Na^+, or $\frac{1}{2}$ Ca^{2+}, and n is an integer of 1 to

5,149,872

PROCESS FOR THE PREPARATION OF OXALYL- AND OXAMYL-HYDRAZIDES

Giuseppe Messina, Alghero; Loreno Lorenzoni, Porto Torres; Paolo Calaresu, Sassari, and Giovanni M. Sechi, Ozieri, all of Italy, assignors to Enichem Anic S.p.A., Palermo, Italy

Continuation of Ser. No. 341,749, Apr. 21, 1989, Pat. No. 5,017,721. This application Feb. 14, 1991, Ser. No. 655,041

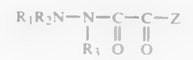
Claims priority, application Italy, Apr. 21, 1988, 20276 A/88

The portion of the term of this patent subsequent to May 21, 2008 has been disclaimed.

Int. Cl.[5] C07C 241/02; C07D 295/023, 279/12, 279/06

U.S. Cl. 564—151 4 Claims

1. A process for the preparation of an oxalyl-hydrazide of formula (I)



wherein

R_1 represents a hydrogen atom or an optionally substituted alkyl, cycloalkyl, phenyl, or phenyl-alkyl group,

R_2 designates a hydrogen atom or an optionally substituted alkyl group, or, R_1 and R_2 taken together with the adjacent nitrogen atom represent a saturated heterocyclic ring,

R_3 is a hydrogen atom or an optionally substituted alkyl group,

Z is $—NR_3—NR_1R_2$, wherein R_1, R_2, and R_3 are as defined above;

consisting essentially of contacting oxamide with excess hydrated hydrazine derivative of formula (III)

(III)

optionally in the presence of additional water; wherein

R_1, R_2, and R_3 are as defined above.

5,149,873

PROCESS FOR THE PURIFICATION OF MANDELIC ACID N,N-DIETHYLAMIDE

Christer L. HaKansson, Vikingsgatan, and Bengt L. Karlsson, Stenbocksgatan, both of Sweden, assignors to Rexolin Chemicals AB, Helsingborg, Sweden

Filed Feb. 1, 1991, Ser. No. 649,401
Int. Cl.[5] C07C *231/34, 231/24*
U.S. Cl. 564—170 9 Claims

1. A process for the purification of mandelic acid N,N-diethylamide, DEM, by forming a crystalline adduct of DEM with a calcium halide and water

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5,149,874

METHOD FOR MANUFACTURING 3-AMINO-2-CYCLOHEXENE-1-ONE, AND A NOVEL POLYMER INGREDIENT AND ITS PREPARATION

Stephen E. Jacobson, Princeton Junction, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1991, Ser. No. 685,359
Int. Cl.[5] C07C *209/68, 211/40*
U.S. Cl. 564—248 1 Claim

1. 3-amino-2-cyclohexene-1-imine and its salts.

5,149,875

HALOGENATION OF AROMATIC AMINE COMPOUNDS

Jerry R. Patton, and Narayanasamy Gurusamy, both of Ballwin, Mo., assignors to Mallinckrodt Specialty Chemicals Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 472,930, Jan. 31, 1990, Pat. No. 5,053,542. This application Jan. 15, 1991, Ser. No. 641,396
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] C07C *209/74*
U.S. Cl. 564—412 26 Claims

1. A process for halogenating an aromatic amine compound, comprising forming a mixture including an aromatic amine compound and quaternary ammonium halide, and halogenating the aromatic amine compound in the presence of the quaternary ammonium halide in said mixture.

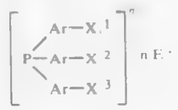
5,149,876

PROCESS FOR THE PREPARATION OF AMINES

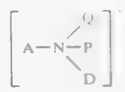
Detlef Kampmann, Bochum; Jürgen Weber, Oberhausen; Helmut Bahrmann, Hamminkeln-Brünen, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 7, 1991, Ser. No. 651,727
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1990, 4006112
Int. Cl.[5] C07C *209/26*
U.S. Cl. 564—467 26 Claims

1. A process for the preparation of aliphatic secondary and/or tertiary amines comprising a reaction of an olefin with carbon monoxide, hydrogen, and a primary and/or secondary amine in a liquid phase, at elevated temperature and pressure, in the presence of rhodium and an aqueous solution of salts of arylphosphines of the formula



wherein Ar is an aryl radical; X is a sulfo group; x^1, x^2, x^3 are 0 or 1, with the proviso that at least one of x^1, x^2, or x^3 is 1. E is an alkali metal atom, NH_4, or a quaternary ammonium ion of the formula



wherein A is a carbon rich alkyl radical having 6 to 20 carbon atoms, Q, R, D are individually straight or branched chain alkyl radicals having 1 to 4 carbon atoms, and n is an integer from 1 to 3.

5,149,877

PROCESS FOR PRODUCING ALKYLENAMINE

Yasushi Hara, Shin-nanyo; Yukio Ito, Kudamatsu, and Kazuhiko Sekizawa, Shin-nanyo, all of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Continuation of Ser. No. 283,975, Dec. 13, 1988, abandoned. This application Jun. 1, 1990, Ser. No. 530,431
Claims priority, application Japan, Dec. 18, 1987, 62-318913; Dec. 18, 1987, 62-318914; Dec. 18, 1987, 62-318915
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] C07C *209/14*
U.S. Cl. 564—479 4 Claims

1. A process for producing an alkylenamine, which process consists essentially of reacting ammonia and/or an alkylenamine with an alkanolamine in the presence of a catalyst comprising a mixture of niobium oxide and an inorganic acid, to obtain an alkylenamine having an increased number of alkylene chains over the ammonia and/or the alkylenamine as starting material.

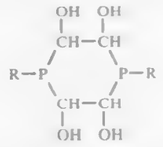
5,149,878

1,4-DISUBSTITUTED-2,3,5,6-TETRAHYDDROXY-1,4-DIPHOSPHORINANES AND THEIR OXIDES OR SULFIDES

Allan J. Robertson, 36 Forster Avenue, Thorold, Niagara Region, Ontario, Canada, and James B. Gallivan, 45 Cranbury Rd., Norwalk, Conn. 06851

Division of Ser. No. 495,065, Mar. 19, 1990, Pat. No. 4,968,416, which is a division of Ser. No. 409,919, May 22, 1989, Pat. No. 4,929,393, which is a division of Ser. No. 309,572, Feb. 13, 1989, Pat. No. 4,855,507. This application Jul. 2, 1990, Ser. No. 546,644
Claims priority, application Canada, Mar. 28, 1988, 562688
Int. Cl.[5] C07F *9/6568*
U.S. Cl. 568—12 4 Claims

1. A method for the production of a 1,4-disubstituted-2,3,5,6-tetrahydroxy-1,4-diphosphorinane having the formula



which comprises adding glyoxal, under an inert atmosphere, to a primary phosphine having the formula:

$$RPH_2$$

wherein R is a substituted or unsubstituted C_1–C_{12} alkyl radical, a C_5–C_7 cycloalkyl radical, a C_8–C_{12} aralkyl radical or a C_6–C_{12} aryl radical, at a molar ratio of about 1:2, respectively, and at about ambient temperature and recovering the resultant product.

5,149,879

POLYSULFIDES COMPOUNDS AND LIPID PEROXIDATION INHIBITOR CONTAINING THE POLYSULFIDE COMPOUNDS AS ACTIVE INGREDIENT

Shoji Awazu, Kawaguchi; Toshiharu Horie, Musashimurayama; Yukihiro Kodera, Hiroshima; Shinji Nagae, Hiroshima; Hiromichi Matsuura, Hiroshima, and Yoichi Itakura, Hiroshima, all of Japan, assignors to Wakunaga Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed Jun. 21, 1991, Ser. No. 718,763
Claims priority, application Japan, Jun. 22, 1990, 2-165445
Int. Cl.[5] C07C *321/18*
U.S. Cl. 568—21 4 Claims

1. A polysulfide compound represented by the following formula (II):

$$R^3—(S)_n—R^4 \quad (II)$$

wherein R^3 and R^4 are same or different lower alkenyl groups and n is an integer of 6 to 10.

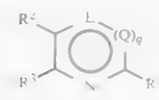
5,149,880

NITROGEN-CONTAINING AROMATIC HETEROCYCLIC LIGAND-METAL COMPLEXES AND THEIR USE FOR THE ACTIVATION OF HYDROGEN PEROXIDE AND DIOXYGEN IN THE REACTION OF ORGANIC COMPOUNDS

Donald T. Sawyer; Ceshing Sheu; Andrzej Sobkowiak, and Hui-Chan Tung, all of College Station, Tex., assignors to The Texas A & M University System, College Station, Tex.

Continuation-in-part of Ser. No. 466,485, Jan. 16, 1990, abandoned. This application Aug. 24, 1990, Ser. No. 573,346
Int. Cl.[5] C07C *45/28*
U.S. Cl. 568—342 6 Claims

1. A process for the oxygenation of an organic compound which comprises contacting said organic compound with a complex of formula $(L)_lM(OM)_m(L')_n(A)_p$ in which L and L' are the same or different and each is a ligand of formula



wherein:
R^1 is hydrogen, CO_2^- or CO_2H;
R^2 is hydrogen or alkyl;
R^3 is hydrogen, CO_2^-, CO_2H or pyridinyl; or
R^2 and R^3 joined together and taken with the other atoms in the ring form a quinoline ring which is unsubstituted or substituted in the 8-position of O^-;
E is CH, N, NH or CR^4 wherein R^4 is alkyl;
Q is CH;
q is 0 or 1 provided that when q is 0, there is no Q substituent, E and the carbon atom to which R^1 is attached are joined directly and E is NH;
M is a transition metal cation;
O is oxygen;
A is an anion of an organic or mineral acid or is a halogen anion;
l is 1, 2, 3 or 4;
m is 0 or 1;
n is 0, 1, 2, 3 or 4; and
p is 0, 1 or 2; in the presence of dioxygen under conditions suitable for said conversion to take place, provided that M is in its reduced state and L is at least monosubstituted by CO_2^- or CO_2H when M is Fe, and L is not quinolinolate or quinolinol when M is Fe and L is not picolinolate or picolinic acid when M is Mn or Co.

5,149,881

METHOD FOR PRODUCING METHYL ISOBUTYL KETONE

Takashi Ushikubo; Yumiko Kakuno, both of Yokohama, and Hisako Tsujiura, Chiba, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed May 20, 1991, Ser. No. 702,401
Claims priority, application Japan, May 21, 1990, 2-130553
Int. Cl.[5] C07C *45/73*
U.S. Cl. 568—396 11 Claims

1. A method for producing methyl isobutyl ketone, which comprises contacting acetone and hydrogen in the presence of palladium and an oxide and/or a hydroxide of at least one metal selected from the group consisting of Group IVB and Group VB elements treated with an organosilicon compound of the formula (I):

$$R^1_a(OR^2)_bX_cSi \quad (I)$$

wherein each of R^1 and R^2 is selected from the group consisting of hydrogen, alkyl, vinyl and aryl having a total carbon number of at most 30, wherein R^1 may be substituted with groups selected from the group consisting of hydroxyl, amino, alkyl substituted amino, mercapto, glycidoxy, carboxyl and carbonyl and R^1 and R^2 may be the same or different, X is an element selected from the group consisting of hydrogen, fluorine, chlorine, bromine, and iodine, and a, b and c are such that $0 \leqq a < 4$, $0 \leqq b \leqq 4$ and $0 \leqq c \leqq 4$, respectively, and $a+b+c=4$.

5,149,882

PURIFICATION OF 2-CHLORO-5-NITROBENZALDEHYDE OR ACETALS THEREOF

Bernd Schaefer, 22 Hauptstrasse, 6749 Dierbach; Wolfgang Freund, 71 Johann-Gottlieb-Fichte-Strasse, 6730 Neustadt, and Gernot Reissenweber, 15 Drosselstrasse, 6737 Boehl-Iggelheim, all of Fed. Rep. of Germany

Filed Jun. 4, 1991, Ser. No. 709,855
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1990, 4019049
Int. Cl.[5] C07C *45/78, 45/80*
U.S. Cl. 568—438 8 Claims

1. A method of isolating 2-chloro-5-nitrobenzaldehyde or an acetal thereof from a mixture containing 2-chloro-5-nitrobenzaldehyde and at least one isomer thereof wherein the mixture is introduced into a liquid in which the 2-chloro-5-nitrobenzaldehyde is insoluble and the isomers thereof are more readily soluble so as to form a suspension of the 2-chloro-5-nitrobenzaldehyde and a solution of the isomers in the liquid at a temperature of from $-10°$ to $+140°$ C., and separating the suspended 2-chloro-5-nitrobenzaldehyde as a solid from the dissolved isomers thereof.

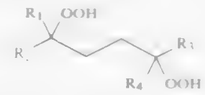
5,149,883

PREPARATION OF ALIPHATIC DIHYDROPEROXIDES

John A. Marsella, and Reinaldo M. Machado, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

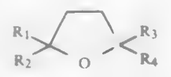
Filed May 13, 1991, Ser. No. 699,422
Int. Cl.[5] C07C *409/04*
U.S. Cl. 568—564 9 Claims

1. In a process for the preparation of aliphatic hydroperoxides represented by the formula:



wherein R_1, R_2, R_3, and R_4 independently of one another are

C_1–C_4 alkyl, the improvement which comprises reacting a tetrahydrofuran derivative represented by the formula:



wherein R_1, R_2, R_3, and R_4 independently of one another are C_1–C_4 alkyl, having a freezing point below −10° C. and a boiling point above about 100° C. with hydrogen peroxide and a dehydrating acid selected from the group consisting of sulfuric acid and phosphoric acid to form said dihydroperoxide.

5,149,885

TUBE BUNDLE REACTOR, USE THEREOF IN EXOTHERMIC ORGANIC REACTIONS, AND PREPARATION OF KETONES AND ALDEHYDES USING SAME

Karl Brenner, Ludwigshafen; Wilhelm Ruppel, Schwetzingen; Otto Woerz, Friedelsheim; Klaus Halbritter, Mannheim; Hans-Juergen Scheiper, Mutterstadt; Werner Aquila, Mannheim, and Hartwig Fuchs, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 529,756, May 29, 1990, abandoned, and Ser. No. 399,353, Aug. 28, 1989, abandoned, and Ser. No. 34,940, Apr. 6, 1987, abandoned. This application Apr. 1, 1991, Ser. No. 680,631

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612213

Int. Cl.[5] C07C *45/39*

U.S. Cl. 568—471 **10 Claims**

1. A process for the preparation of an aliphatic, aromatic or araliphatic ketone and aldehyde by oxidative dehydrogenation of the corresponding alcohol in a strong exothermic reaction with a catalyst of group 1*b* of the periodic table which comprises passing the alcohol to be oxidatively dehydrogenated through the tubes of a short tube bundle reactor, which contains multiple reaction tubes (A) arranged between an enclosure of tubesheets (B), and passing a fluid heat transport medium through said enclosure crosswise across said tubes (A), such that the tubes are surrounded by the heat transport medium, said transport medium providing for removal of heat from the strong exothermic reaction such that the reaction is conducted significantly isothermally wherein the reaction tubes (A) have an inside diameter of from 0.5 to 3.0 cm and the ratio of reaction tube length to inside diameter ranges from 2 to 10.

5,149,886

OXIDATION OF ISOBUTANE TO TERTIARY BUTYL HYDROPEROXIDE

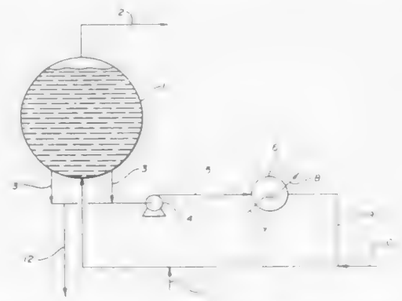
John C. Jubin, Jr., West Chester, Pa., assignor to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Feb. 20, 1992, Ser. No. 839,983

Int. Cl.[5] C07C *409/04*

U.S. Cl. 568—571 **4 Claims**

1. In a process for the molecular oxygen oxidation of isobutane to TBHP wherein isobutane and molecular oxygen are fed to a reaction zone and reacted therein in the liquid phase at conditions effective to form TBHP, the improvement which comprises continuously removing a liquid reaction mixture stream from the reaction zone, cooling said stream by indirect heat exchange with a heat transfer fluid thereby to remove the reaction exotherm, returning the cooled reaction mixture to the reaction zone, and injecting the molecular oxygen feed to



the reaction into the cooled reaction mixture prior to the return thereof to the reaction zone.

5,149,886

PREPARATION OF 9,9-BIS-(4-HYDROXYPHENYL)-FLUORENE

Winfried Orth, Hassloch/Pfalz; Emmerich Pastorek, Hemsbach; Wolfgang Weiss, Neckarhausen, and Hans W. Kleffner, Battenberg/Pfalz, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Feb. 11, 1992, Ser. No. 834,897

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1991, 4107242

Int. Cl.[5] C07C *37/20, 39/12*

U.S. Cl. 568—727 **9 Claims**

1. In a process for the preparation of 9,9-bis-(4-hydroxphenyl)-fluorene by condensing fluorenone and phenol in a molar ratio of 1:4 to 1:8 at 30° to 90° C. in the presence of gaseous hydrogen chloride and β-mercapto-propionic acid catalyst, the improvement comprising distilling water of reaction and dissolved hydrochloric acid from the completed reaction mixture, dissolving the distillation residue in a nitrile, separating the crystallized adduct of nitrile and 9,9-bis-(4-hydroxphenyl)-fluorene from the nitrile and dissociating the adduct to recover high purity 9,9-bis-(4-hydroxphenyl)-fluorene.

5,149,887

SEPARATION OF ALKYL-SUBSTITUTED PHENOLIC ISOMERS WITH BARIUM-POTASSIUM EXCHANGED ZEOLITIC ADSORBENT

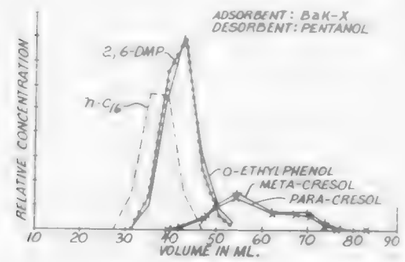
Hermann A. Zinnen, Summit, N.J., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 458,256, Dec. 28, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 624,810

Int. Cl.[5] C07C *37/82, 37/70*

U.S. Cl. 568—751 **6 Claims**

1. A process for coextracting para-cresol and meta-cresol from a feed mixture comprising para-cresol, ortho-cresol and meta-cresol and at least one other alkyl phenol comprising contacting said feed at adsorption conditions with an adsorbent comprising an X zeolite exchanged at ion exchangeable sites with barium ions or a mixture of barium and potassium ions, containing at least about 5 weight % water (LOI) to selectively adsorb said para-cresol and meta-cresol, contacting said adsorbent with a desorbent comprising an aliphatic alcohol, at desorption conditions, said adsorption and desorption conditions including a temperature within the range of from about 20° C.



to about 250° C. and a pressure within the range of from about atmospheric to about 500 psig so as to maintain liquid phase.

5,149,888

HYDROXYLATION OF PHENOLS/PHENOL ETHERS

Michel Costantini, Lyons; Eric Garcin, Montrouge; Michel Gubelmann, Lyons, and Jean-Michel Popa, Drancy, all of France, assignors to Rone-Poulenc Chimie, Courbevoie, France

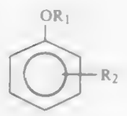
Filed Feb. 28, 1990, Ser. No. 486,429

Claims priority, application France, Feb. 28, 1989, 89 02868

Int. Cl.[5] C07C *37/60, 41/26*

U.S. Cl. 568—771 **20 Claims**

1. A process for the preparation of an hydroxylated phenol or phenol ether, or an admixture thereof comprising reacting a compound of the formula (I):



(I)

in which R_1 is a hydrogen atom, or a methyl, ethyl or phenyl radical, and R_2 is a hydrogen atom, an alkyl radical having from 1 to 4 carbon atoms, an alkoxy radical having from 1 to 4 carbon atoms, or a phenyl or cyclohexyl radical with hydrogen peroxide, in the presence of a catalytically effective amount of a catalyst consisting essentially of titanium dioxide.

5,149,889

COMPOSITION FOR USE IN ORGANOLITHIUM SYNTHESIS REACTIONS

Jürgen Deberitz, Frankfurt, and Wilfried Weiss, Oberursel, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 346,868, May 3, 1989, Pat. No. 4,982,017. This application Oct. 30, 1990, Ser. No. 605,742

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815166

Int. Cl.[5] C07C *27/00, 29/09, 29/14*

U.S. Cl. 568—878 **12 Claims**

1. A process for preparing a tertiary alcohol of the Formula (II)

wherein

R and R^1 are each independently C_1 to C_6 alkyl, phenyl, or phenyl-C_1 to C_4 alkyl, or R and R^1 together with the adjacent carbon atom form a C_4 to C_7 carbocyclic ring, and R^2 is methyl or ethyl, which comprises the steps of:

(a) forming a reaction system by suspending a mixture of:

15 to 25% by weight of methyllithium or ethyllithium;

35 to 45% by weight of an inorganic compound selected from the group which consists of at least one metal oxide selected from the group which consists of SiO_2, Al_2O_3, and CaO, and synthetic anhydrous aluminum silicate; and

35 to 45% by weight of a paraffin oil or wax; in an organic solvent selected from the group which consists of:

C_5 to C_{10} saturated aliphatic hydrocarbons, C_5 to C_{10} cycloaliphatic hydrocarbons, aromatic hydrocarbons selected from the group which consists of benzene, toluene, and xylene, and aliphatic or cycloaliphatic ethers selected from the group which consists of diisopropyl ether, di-n-butyl ether, tert-butylether, tetrahydrofuran and dioxane;

(b) adding a ketone of the Formula (I)

R—CO—R^1

to said reaction system at a temperature between 0° C. and the boiling point of the organic solvent in an amount that is stoichiometrically equivalent to the amount of methyllithium or ethyllithium in the reaction system and refluxing said reaction system to form a reaction product;

(c) hydrolyzing and cooling the reaction product formed in step (b) by adding water to the reaction system to form the tertiary alcohol of the Formula (II); and

(d) recovering the tertiary alcohol of the Formula (II) from the reaction system.

5,149,890

PROCESS FOR THE ISOLATION OF PURE DINITROTOLUENES

Günther Rauchschwalbe, Leverkusen; Heinz-Ulrich Blank, Odenthal; Ludwig Deibele, Cologne; Kaspar Hallenberger, and Gerhard Ruffert, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 1, 1991, Ser. No. 786,479

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1990, 4036758

Int. Cl.[5] C07C *205/11*

U.S. Cl. 568—934 **14 Claims**

1. A process for the isolation of pure 2,4- and 2,6- dinitrotoluene, wherein a mixture containing these isomers is distilled in a distillation column having a central region, under a pressure of 0.5 to 20 mbar and at a temperature of 80° to 200° C. with exclusion of reducing conditions.

5,149,891

METHOD FOR PREPARING PITCH FLUORIDE

Takeshi Morimoto, Yokohama; Mikio Sasabe, Tokyo; Toshiyuki Maeda, and Hiroyuki Fujimoto, both of Osaka, Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Apr. 10, 1991, Ser. No. 683,347

Claims priority, application Japan, Apr. 10, 1990, 2-93109; Jul. 20, 1990, 2-190800

Int. Cl.[5] C07C *17/02, 17/04, 17/02, 23/46*

U.S. Cl. 570—148 **14 Claims**

1. A method for preparing a pitch fluoride which consists essentially of reacting pitch with fluorine at a temperature of from 0° to 350° C. in a fluorine type inert medium, which fluorine inert medium is liquid during reaction, by dispersing pitch in the fluorine type inert medium and then introducing fluorine therein.

5. A method for preparing a liquid-like pitch fluoride, which consists essentially of reacting a solid-like pitch fluoride with fluorine at a temperature of from 130° to 550° C. in a fluorine type inert medium, which medium is liquid during reaction, by dispersing or dissolving the solid-like pitch fluoride in the

fluorine type inert medium and then introducing fluorine therein.

9. A method for preparing a liquid-like pitch fluoride, which consists essentially of preparing a solid-like pitch fluoride by reaction of pitch with fluorine at a temperature of from 0° to 350° C. in a fluorine type inert medium and then reacting the resultant solid-like pitch fluoride with fluorine in a fluorine type inert medium, wherein said fluorine type inert medium is liquid during reaction, by dispersing the pitch or solid-like pitch fluoride in the inert medium and then introducing fluorine therein.

5,149,892

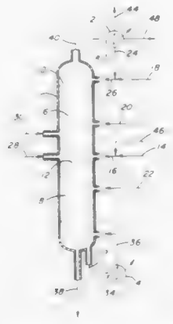
CHLORINATED BENZENES

Robert E. Feathers, Irwin, Pa., and J. Douglas Mansell, Sulphur, La., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 22, 1991, Ser. No. 782,006

Int. Cl.[5] **C07C** *17/12, 25/00*

U.S. Cl. 570—210 **17 Claims**



1. In the method wherein a benzenoid feedstock compound represented by the formula $C_6H_{6-x}Cl_x$ is chlorinated in the presence of a chlorination catalyst in a chlorination system to produce a benzenoid product compound represented by the formula $C_6H_{5-x}Cl_{x-1}$, where x is an integer in the range of from 0 to 5, the improvement wherein:

(a) said chlorination system comprises a rectifying zone and a stripping zone;

(b) said rectifying zone contains chlorination catalyst;

(c) said feedstock compound is introduced to said chlorination system;

(d) molecular chlorine is introduced to the top of said stripping zone;

(e) said feedstock compound is countercurrently contacted in said rectifying zone with molecular chlorine;

(f) overhead vapor from said rectifying zone is partially condensed to provide a liquid phase comprising liquid feedstock compound and a gaseous phase comprising hydrogen chloride;

(g) substantially all of said liquid phase is introduced as reflux to said rectifying zone;

(h) said gaseous phase is removed from said chlorination system;

(i) liquid from said rectifying zone is countercurrently contacted in said stripping zone with reboiled vapors of said product compound; and

(j) said product compound is removed from said stripping zone.

5,149,893

CATALYTIC HYDROGENATION PROCESS

Frank King, Middlesbrough, and Martin E. Fakley, Stockton-on-Tees, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 519,690, May 7, 1990, Pat. No. 5,041,408. This application Jun. 6, 1991, Ser. No. 711,055

Claims priority, application United Kingdom, May 9, 1989, 8910623

Int. Cl.[5] **C07C** *5/10*

U.S. Cl. 585—267 **4 Claims**

1. A catalytic hydrogenation process comprising contacting a catalyst effective to promote a hydrogenation reaction with a feed stream comprising gaseous hydrogen and an unsaturated hydrocarbon thereby hydrogenating at least some of said unsaturated hydrocarbon, said catalyst being prepared from a precursor comprising a calcium aluminate cement and at least one oxide of a metal selected from nickel and cobalt by reduction of said metal oxide, and wherein said precursor contains 10 to 70% by weight of said metal oxide (expressed as the divalent oxide, MO) and has a porosity in the range 25 to 50%, in which at least 30% of the pore volume is in the form of pores of size in the range 15 to 35 nm and less than 40% of the pore volume is in the form of pores of diameter greater than 35 nm.

5,149,894

ALKYLATION USING ZEOLITE SSZ-25

Dennis L. Holtermann, Crockett, and Robert A. Innes, San Rafael, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 697,519, Apr. 29, 1991, and Ser. No. 333,666, Apr. 5, 1989, abandoned, which is a division of Ser. No. 14,958, Feb. 17, 1987, Pat. No. 4,826,667, which is a continuation-in-part of Ser. No. 823,698, Jan. 29, 1986, abandoned, said Ser. No. 697,519, is a continuation of Ser. No. 595,084, Oct. 10, 1990, abandoned. This application Aug. 15, 1991, Ser. No. 745,582

Int. Cl.[5] **C07C** *2/66*

U.S. Cl. 585—467 **54 Claims**

1. A hydrocarbon conversion process comprising using calcined SSZ-25 zeolite under hydrocarbon conversion conditions in the reaction of alkylating wherein said zeolite has the X-ray diffraction lines of Table 2.

5,149,895

VULCANIZABLE LIQUID COMPOSITIONS

Thomas S. Coolbaugh, Morrisville; Frederick C. Loveless, Yardley, both of Pa.; Demetreos N. Matthews, Ewing, and Leslie R. Rudnick, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 16, 1990, Ser. No. 466,135

Int. Cl.[5] **C07C** *2/40;* **C08F** *297/02*

U.S. Cl. 585—507 **26 Claims**

1. A liquid block copolymer comprising at least three alternating blocks

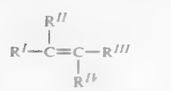
$$(I)_x\text{-}(B)_y\text{-}(I)_x$$

wherein:

I is a block of at least one polymerized conjugated diene having at least five (5) carbon atoms and the following formula

(1)

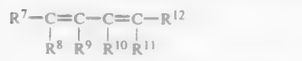
wherein R^1-R^6 are each hydrogen or a hydrocarbyl group, provided that at least one of R^1-R^6 is a hydrocarbyl group and provided that the structure of the residual double bond in the polymerized block I has the following formula



(2)

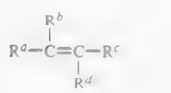
wherein R^I, R^{II}, R^{III} and R^{IV} are each hydrogen or a hydrocarbyl group, provided that either both R^I and R^{II} are hydrocarbyl groups or both R^{III} and R^{IV} are hydrocarbyl groups;

B is a block of a polymer of at least one conjugated diene, different from that used to polymerize the block I, having at least four (4) carbon atoms and the following formula



(3)

wherein R^7-R^{12} are each hydrogen or a hydrocarbyl group, provided that the structure of the residual double bond in the polymerized block B has the following formula



(4)

wherein R^a, R^b, R^c and R^d are each hydrogen (H) or a hydrocarbyl group, provided that one of R^a or R^b is hydrogen, one of R^c or R^d is hydrogen, and at least one of R^a, R^b, R^c or R^d is a hydrocarbyl group;

x is at least 1, and y is at least 25;

said polymerized block B containing at least about 25 wt. % of 1,2-units if it is a polymer of predominantly 1,3-butadiene;

said copolymer being selectively hydrogenated so that each of the blocks B is substantially completely hydrogenated and thereby contains substantially none of the original unsaturation, while each of the blocks I retains a sufficient amount of its original unsaturation to vulcanize said copolymer.

5,149,896

PROCESS FOR OLIGOMERIZING LIGHT OLEFINS

Giuseppe Bellussi, Piacenza; Fabrizio Cavani, Modena; Virginio Arrigoni, and Roberto Ghezzi, both of Milan, all of Italy, assignors to Enitricerche S.p.A., Milan, Italy

Filed Jun. 14, 1991, Ser. No. 715,786

Claims priority, application Italy, Jun. 22, 1990, 20744 A/90

Int. Cl.[5] **C10L** *1/16*

U.S. Cl. 585—532 **11 Claims**

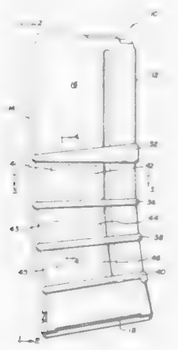
1. A process for oligomerizing propylene consisting of reacting olefin comprising propylene by means of an X-ray amorphous alumina-silica gel catalyst with a silica/alumina molar ratio of between 30/1 and 500/1, a surface area of between 500 and 1000 m^2/g, a total pore volume of between 0.3 and 0.6 ml/g, an average pore diameter of the order of 10 A or less, and free or substantially free of pores with a diameter greater than 30 A wherein the reaction is conducted at a temperature of between 100° C. and 250° C., at a pressure of between 10 and 70 atm, and for a time of between 5 and 90 minutes.

5,149,897

SEE-THROUGH MAGAZINE

William J. Howard, P.O. Box 573, Wilson, N.C. 27893

Filed Dec. 6, 1991, Ser. No. 802,831
Int. Cl.[5] F41A *9/62*
U.S. Cl. 42—50 7 Claims



1. A see-through magazine of a polyamide composition in which cartridges within the magazine are visible, said magazine being for holding, and reliably feeding cartridges to a bolt-equipped firearm; said magazine comprising:

a front wall; and

a back wall; and

two sidewalls of a given thickness joining the front wall to the back wall; and

a bottom plate closing the bottom of the magazine; and

a follower spring-biased, by a spring to move away from the bottom plate; and

a plurality of longitudinal ribs on the inside surface of the side walls, wherein said ribs guide the spring and the cartridges as they move up and down the magazine; and

a plurality of integral translucent windows between the longitudinal ribs; and

wherein the windows and the walls are of a composition of fiber-reinforced polyamide; and

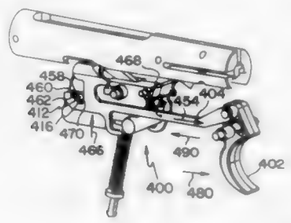
wherein the windows are thinner than the walls, are translucent, and wherein cartridges in the magazine can be seen through the windows.

5,149,898

FIRE CONTROL ASSEMBLY

M. Gaines Chesnut, Golden; William L. Wood, Arvada, both of Colo., and Ernest Brandenburg, Dallas, Tex., assignors to Ram-Line, Inc., Wheat Ridge, Colo.

Continuation-in-part of Ser. No. 436,369, Nov. 14, 1989. This application Feb. 26, 1991, Ser. No. 661,991
Int. Cl.[5] F41A *19/44*
U.S. Cl. 42—69.01 14 Claims



1. An improved fire control assembly of the type having a sear, a sear size, a hammer, a trigger and a disconnect for use with a firearm, wherein the improvement comprises:

a pin protruding from a frame which encloses the fire control assembly; and

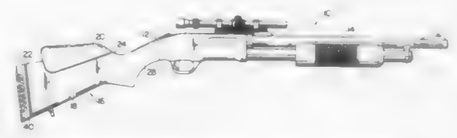
means for selectively engaging the disconnect with said pin to hold the disconnect out of a firing position.

5,149,899

GUNSTOCK HAVING INTERCHANGEABLE COMBS

Gary Dabrowski, Naugatuck, Conn., assignor to O.F. Mossberg & Sons, Inc., North Haven, Conn.

Filed Oct. 24, 1991, Ser. No. 781,969
Int. Cl.[5] F41C *23/14*
U.S. Cl. 42—72 19 Claims



1. A gunstock assembly comprising a buttstock having a butt including a heel, said buttstock having a forecomb forward of said butt and a top surface extending forwardly from said heel and in the direction of said forecomb, said buttstock defining an upwardly open notch having a peripheral edge, a comb selected from a plurality of combs of differing height, each of said combs being shaped and sized to be seated upon said buttstock within said notch and substantially fill said notch, each of said combs having a peripheral skirt partially defining a recess for receiving an associated portion of said buttstock therein when said comb is assembled with said buttstock within said notch, said peripheral skirt overlying an associated marginal portion of said buttstock and substantially concealing said peripheral edge when said comb is assembly with said buttstock and attaching means for releasably retaining said comb in assembly with said buttstock within said notch.

5,149,900

FIREARM SUPPORT WITH SEAT

Bruce Buck, Glencoe, Minn., assignor to Virgil J. Buck, Barrett, Minn.

Filed Nov. 29, 1991, Ser. No. 800,844
Int. Cl.[5] F41A *23/06*
U.S. Cl. 42—94 8 Claims

1. Firearm support and seat arrangement, comprising, in combination:

(a) support means including a tripod supported seat assembly;

(b) an articulating support arm assembly comprising a plurality of individual arm segments pivotally coupled together one to another to form said articulating support arm assembly, pivot assemblies arranged to pivotally interconnect individual arm segments to neighboring arm segments, and with each individual pivot assembly providing for relative motion, between adjacent arm segments about two axes of rotation, with said axes of rotation being disposed at right angles, one to the other;

(c) said pivot assemblies further including means for accommodating pivotal motion about axes arranged along vertically spaced apart horizontal planes, and at least one pivot assembly accommodating motion along a generally horizontal axis and with the other accommodating motion about a generally vertical axis; and

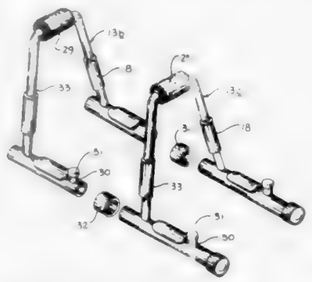
(d) cradle means coupled to the distal end of said articulating support arm assembly for actively positionably retaining a firearm in cradled relationship therewithin.

5,149,901

GUITAR SUPPORT APPARATUS

Mark C. Boor, and Celeste Boor, both of 682 N. Star Rte., Questa, N. Mex. 87556

Filed May 28, 1991, Ser. No. 705,950
Int. Cl.[5] G10G *5/00*; G16M *11/00*
U.S. Cl. 84—327 **2 Claims**



1. A guitar support apparatus comprising,

a guitar support unit, wherein the guitar support unit includes a right tubular rail spaced from and parallel a left tubular rail, and

a "U" shaped brace mounted to the right and left tubular rails, the "U" shaped brace including a right leg fixedly mounted to the right tubular rail orthogonally oriented relative to the right axis defined by the right tubular rail, and

the "U" shaped brace including a left leg fixedly mounted to the left tubular rail and orthogonally oriented relative to a left axis defined by the left tubular rail, and

the "U" shaped brace including a top leg equally joined to upper terminal ends of the right and left legs, wherein the top leg, the left leg, and the right leg each include a cylindrical cushion wound thereabout, and

a plurality of units securable together in an aligned relationship, wherein each "U" shaped brace of each unit is arranged parallel relative to one another, and

including a right junction sleeve joining each right tubular rail of each unit in a coaxially aligned relationship relative to one another and a left junction sleeve joining in a coaxially aligned relationship left tubular rails of adjacent units together, and

each right and left tubular rail includes a respective right and left cushion pad mounted to a top surface of each rail adjacent each respective right and left leg, and each right and left rail includes a respective right and left projection boss fixedly mounted relative to each respective right and left tubular rail, wherein each projection boss is positioned to receive a guitar member thereon, and

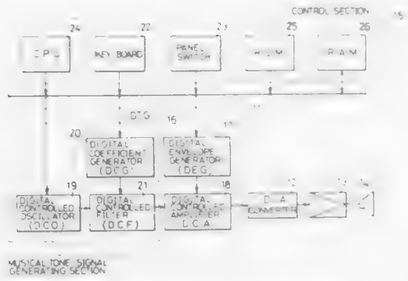
each top leg of each "U" shaped brace of each unit includes a bristle matrix mounted about each cylindrical cushion mounted to each top leg to permit cleaning of fret and guitar string portions of a guitar member.

5,149,902

ELECTRONIC MUSICAL INSTRUMENT USING FILTERS FOR TIMBRE CONTROL

Yutaka Washiyama, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Nov. 29, 1990, Ser. No. 619,864
Claims priority, application Japan, Dec. 7, 1989, 1-316514; Jan. 29, 1990, 2-161521
Int. Cl.[5] G10H *1/12*
U.S. Cl. 84—622 **10 Claims**



1. An electronic musical instrument comprising:

musical tone signal outputting means for outputting a musical tone signal having a frequency according to a pitch;

control information outputting means for outputting control information for controlling a timbre of said musical tone signal output from said musical tone signal outputting means;

filter combining means for combining a plurality of basic filters having flat and different frequency responses based on said control information from said control information outputting means; and

timbre control means for filtering said musical tone signal from said musical tone signal outputting means using said basic filters combined by said filter combining means to thereby control said timbre of said musical tone signal.

5,149,903

MUSICAL TONE GENERATING APPARATUS HAVING MEANS FOR CONTROLLING THE AMPLITUDE OF A MUSICAL TONE SIGNAL ENVELOPE

Akira Iizuka, and Keiji Kawakami, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 19, 1991, Ser. No. 671,354
Claims priority, application Japan, Mar. 19, 1990, 2-68622
Int. Cl.[5] G10H *1/057*
U.S. Cl. 84—627 **4 Claims**

1. A musical tone generating apparatus comprising:

triggering means for generating a triggering signal which triggers the generation of a desired musical tone;

musical tone generating means for generating a musical tone signal corresponding to said desired musical tone based on said triggering signal, said musical tone signal having an amplitude;

envelope generating means for generating an envelope which controls the amplitude of said musical tone signal, said envelope having current values measurable according to the amplitude of said musical tone signal; and

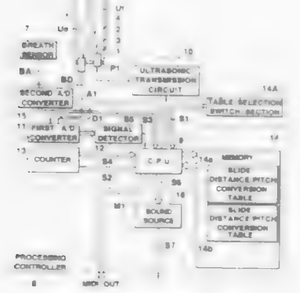
control means for controlling an initial value of a next envelope based on a comparison result obtained through a comparison operation in which the current value of said envelope generated in response to the previously generated triggering signal is compared with a predetermined value when said triggering signal is generated.

5,149,904

PITCH DATA OUTPUT APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT HAVING MOVABLE MEMBERS FOR VARYING INSTRUMENT PITCH

Yukio Kamiya, Kiyose; Touru Watanabe, Fussa, and Ryutaroh Hayashi, Tachikawa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1990, Ser. No. 473,349
Claims priority, application Japan, Feb. 7, 1989, 1-13170[U]; Mar. 10, 1989, 1-58300
Int. Cl.[5] G10H *3/00*
U.S. Cl. 84—723 **11 Claims**



7. An electronic musical instrument, comprising:

a first movable member and a second movable member arranged in contact with one another for relative movement over a determined path;

relative position detection means for detecting a position of said second movable member relative to said first movable member;

selection means for selecting one of a plurality of conversion characteristics each of which characteristics defines a function for converting the detected relative position into pitch data;

conversion means for converting the relative position detected by said relative position detection means into corresponding pitch data in accordance with the conversion characteristics selected by said selection means;

pitch data output means for outputting the pitch data converted by said conversion means;

bite pressure detection means for detecting a bite pressure; and

means, responsive to the bite pressure detected by said bite pressure detection means, for outputting a signal for instructing generation of a musical tone having a pitch corresponding to the pitch data output from said pitch data output means.

5,149,905

MOVEABLE MUSICAL INSTRUMENT SUPPORT APPARATUS

William S. Count, 427 Roberts Rd., Pacifica, Calif. 94044

Filed Sep. 11, 1989, Ser. No. 405,760
Int. Cl.[5] G10H *3/00, 1/32*
U.S. Cl. 84—744 **8 Claims**

1. A movable musical instrument support apparatus comprising:

a central support including a first end and a second end;

means for supporting a musical instrument, said means being positioned proximate to said first end of said central support;

a boom assembly for supporting a microphone, said boom assembly being positioned proximate to said first end of said central support;

a base support including a plurality of wheels positioned at said second end of said central support;

a push cable, said push cable enclosing a functional cable used in relation to said musical instrument, said push cable being coupled to said base support and extending from the perimeter of said base support; and

light means positioned along said central support for illuminating the area adjacent to said musical instrument.

5,149,906

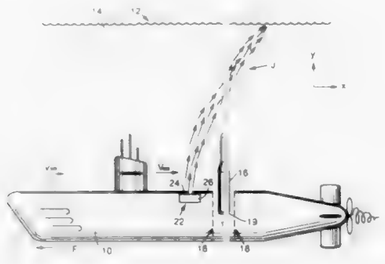
TECHNIQUE FOR LAUNCHING A PROJECTILE INTO A FLOWING MEDIUM

Henry August, Chatsworth, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 17, 1991, Ser. No. 716,166
Int. Cl.[5] F41F *3/07*
U.S. Cl. 89—1.810 **8 Claims**

1. A method for launching a projectile from a launch point into a medium in motion relative to said projectile, comprising the steps of:

a) injecting a pressurized jet into said medium upstream from the launch point to said projectile and

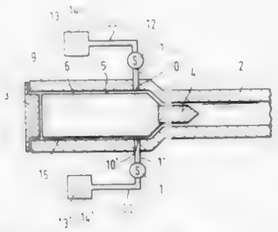


b) propelling said projectile from said launch point into said medium proximate to said injected jet.

5,149,907
WEAPON

Stefan Thiesen, Erkrath, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 5, 1991, Ser. No. 755,061
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1990, 4028224
Int. Cl.[5] F41A 1/04
U.S. Cl. 89—7 7 Claims

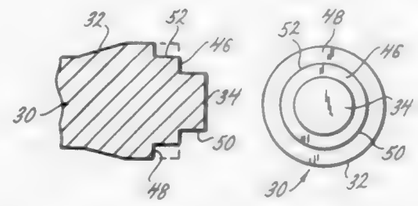


1. A weapon comprising: a barrel having a wall portion defining a propellant charge chamber at a breech end of said barrel; a breech block for sealing the breech end of said barrel and said chamber; and means for delaying the drop in the maximum of the gas pressure in said barrel following ignition of a propellant charge disposed in said charge chamber, said means for delaying being an arrangement for injecting an additional quantity of a liquid propellant into said propellant charge chamber including at least one opening in said wall portion, a reservoir for a liquid propellant, conduit means connecting said reservoir to said propellant charge chamber via said at least one opening, and means responsive to the gas pressure in said propellant charge chamber and including a valve disposed in said conduit means, for causing injection of liquid propellant into said propellant chamber such that the gas pressure curve in said gun barrel is broadened in its maximum region without increasing the maximum pressure value.

5,149,908
COMBUSTION INSTABILITY SUPPRESSION IN REGENERATIVE LIQUID PROPELLANT GUN

Klaus C. Schadow; Ephraim Gutmark; Kenneth J. Wilson, and Robert A. Smith, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 555,881, Jul. 10, 1990, abandoned. This application Aug. 19, 1991, Ser. No. 751,362
Int. Cl.[5] F41F 1/04
U.S. Cl. 89—7 8 Claims



5. A fixed bolt in a regenerative liquid propellant gun being centrally disposed within and spaced apart from the surrounding walls of a breech, the breech containing a combustion chamber and a reservoir adapted to contain a regenerative liquid propellant flow, the fixed bolt comprising:

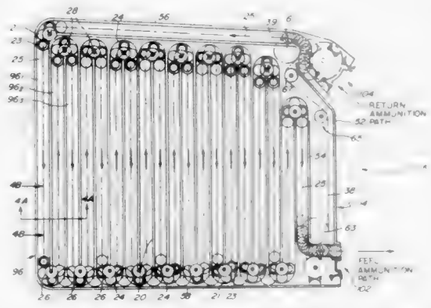
an elongated generally cylindrical body having a central longitudinal axis, a leading end portion fixedly supported by the breech, and a trailing free end proximate the reservoir and juxtapositioned the combustion chamber; and

a variable geometry longitudinally protruding means symmetrical about the central longitudinal axis of said bolt, disposed at said trailing free end so that an effective amount and orientation of turbulent regenerative propellant flow is established about the trailing free end to eliminate or inhibit the formation of coherent propellant vortices within the combustion chamber of the regenerative propellant gun.

5,149,909
OPPOSED ROUND PARALLEL PATH SINGLE BAY AMMUNITION FEED SYSTEM

Richard L. Hagen, Villa Park; William C. Baldwin, Costa Mesa, and William W. Thompson, Fountain Valley, all of Calif., assignors to North American Dynamics, Tustin, Calif.

Filed Jun. 13, 1991, Ser. No. 714,572
Int. Cl.[5] F41A 9/69
U.S. Cl. 89—33.16 16 Claims



1. An ammunition feed and storage apparatus comprising:

a magazine means for providing first and second series of sequential rounds along a single path, the rounds being provided in alternating opposing orientation;

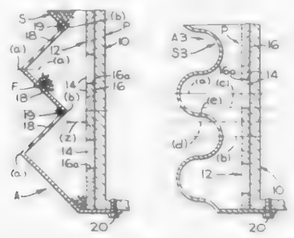
twister conveyor means for receiving the first and second series of rounds, for aligning the first and second series of rounds, and for conveying the first and second series of rounds onto first and second paths, respectively; and

path integrator means for receiving the first and second series of rounds from the twister conveyor means and for integrating the first and second series of rounds into a single third series of rounds wherein the third series of rounds is aligned in common orientation.

5,149,910
POLYPHASE ARMOR WITH SPOILER PLATE

Gregg L. McKee, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 8, 1966, Ser. No. 532,815
Int. Cl.[5] F41H 5/04, 7/04
U.S. Cl. 89—36.02 2 Claims

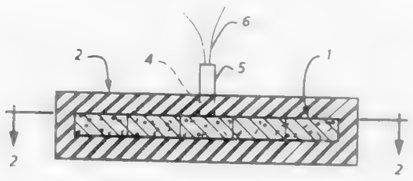


1. Composite armor comprising a polyphase component having an anvil and a shield backed up by the anvil, said shield comprising a mosaic of interfitting sintered high alumina ceramic tiles having a hardness number of approximately 9 on the Moh scale; and a spoiler component comprising corrugated metal plate means in front of and spaced from said shield, said spoiler plate means being generally parallel to said shield; said tiles being hexagonal, the peaks and valleys of the corrugations of said spoiler plate means coinciding with the centerlines of parallel rows of tiles.

5,149,911
FLEXIBLE SHEET EXPLOSIVE

Vernon D. Ringbloom, West Friendship, and Matthew O. Savage, Woodbine, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1991, Ser. No. 654,429
Int. Cl.[5] F42D 3/00, 5/00
U.S. Cl. 102—302 16 Claims



1. An explosive sheet device for exerting an effective force on an object positioned in operative relation thereto, comprising: explosive charge means for internally generating thermal and kinetic energy in response to detonation thereof and flexible protective means for rendering the explosive charge means insensitive to externally applied impact forces, including thermal insulating means supportingly spacing the explosive charge means from the object for restricting flow of the thermal energy released by said detonation, said thermal insulating means being formed by two energy absorbing layers between which the explosive charge means is sandwiched, one of said two layers being dimensioned to substantially absorb the thermal energy released while sufficiently transmitting the kinetic energy to the object to exert said effective force thereon.

5,149,912
METHOD AND APPARATUS FOR ASSEMBLING A FUSEE AND WIRE SUPPORT STAND

Robert A. Waidner, Baltimore, and John J. Brady, Easton, both of Md., assignors to Standard Fusee Corporation, Easton, Md.

Filed Jul. 20, 1987, Ser. No. 75,687
Int. Cl.[5] F42B 4/26
U.S. Cl. 102—343 15 Claims

1. A method of attaching a support stand to a fusee comprising the steps of:

(a) loading the support stand into a workpiece holding device;

(b) inserting the fusee into assembled relationship with the support stand within said workpiece holding device;

(c) applying fastening means to an end portion of said fusee;

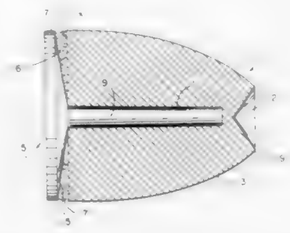
(d) securing said fastening means about said end portion of said fusee and said support stand to form a complete fusee and support stand assembly; and

(e) removing said assembly from said workpiece holding device.

5,149,913
FORCED EXPANDING BULLET

Steven Y. Arakaki, 927 Laki Rd., Honolulu, Hi. 96817

Filed Sep. 5, 1990, Ser. No. 577,671
Int. Cl.[5] F42B 12/34
U.S. Cl. 102—506 8 Claims



1. An expanding bullet assembly, comprising a bullet head, a plunger and an axially movable attachment therebetween;

the bullet head further comprising a deformable material for mushrooming and fragmenting, wherein an axial borehole extends within the head from a substantially flat rear face of the head substantially to a front tip of the head, said

borehole being complementary to a pin portion of the plunger;

the plunger further comprising a base portion having a frusto-conical front face for engaging the substantially flat rear face of the head and a perpendicularly protruding pin from the frusto-conical front face of the base portion thereby forming a gap between the substantially flat rear face of the bullet head and the frusto-conical front face of the base portion;

an axially movable attachment between the plunger and the bullet head, wherein the pin extends axially inward from the substantially flat rear face of the bullet head substantially to the tip of the bullet head within the borehole and completely fills the borehole; and

the bullet head further comprising a frontal cavity comprising a circumferential wall sloping from a generally central point of the bullet head to a circumferential edge of the front tip of the bullet head.

5,149,914

DEVELOPMENT APPARATUS USING A FLEXIBLE MAGNETIC FIELD FORMING LAYER

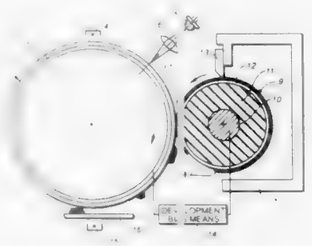
Yoshiro Koga; Shizue Nakazawa, and Takehiko Okamura, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 8, 1991, Ser. No. 667,616

Claims priority, application Japan, Mar. 9, 1990, 2-58321; Mar. 9, 1990, 2-58322; Mar. 9, 1990, 2-58323; Mar. 9, 1990, 2-58324; Mar. 9, 1990, 2-58325; Mar. 9, 1990, 2-58328; Mar. 9, 1990, 2-58329; Mar. 9, 1990, 2-58332; Mar. 9, 1990, 2-58333; Mar. 9, 1990, 2-58334; Mar. 9, 1990, 2-58335

Int. Cl.[5] G03G *15/09*

U.S. Cl. 118—657 **47 Claims**



1. A development apparatus for use in an image forming apparatus comprising:

a development member having a surface for the transport of a uniform layer of magnetic toner to a development region formed between said development member and a latent image carrier to develop a latent image formed on said latent image carrier, said development member comprising an elastic layer and a substantially continuous flexible magnetic field forming layer formed on said elastic layer.

5,149,915

HYBRID SHIELDED CABLE

David L. Brunker, Naperville; Burce J. Crane, Lombard, and John E. Lopata, Naperville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 6, 1991, Ser. No. 711,230

Int. Cl.[5] H01B *7/34*

U.S. Cl. 174—36 **27 Claims**

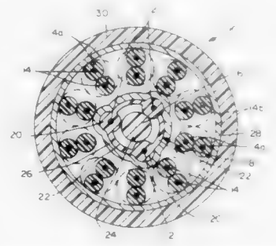
1. A multi-conductor hybrid cable construction, comprising:

a plurality of signal conductors;

a unitary dielectric member surrounding the signal conductors and integrally joining the conductors in a circular array about the axis of the cable;

inner conductive shielding means about the unitary dielectric member and the surrounded signal conductors;

a plurality of data conductors arranged circumferentially about the inner conductive shielding means; and



an outer conductive shielding means about the data conductors.

5,149,916

TERMINATION OF MINERAL INSULATED ELECTRIC CABLE

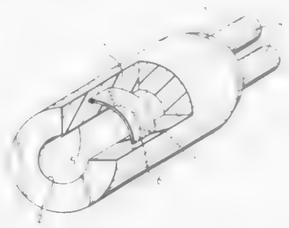
Harry Baker, Knutsford, and Alan Postill, Stockport, both of England, assignors to Bicc plc, England

Filed May 10, 1991, Ser. No. 698,653

Claims priority, application United Kingdom, May 11, 1990, 9010559

Int. Cl.[5] H02G *15/02*

U.S. Cl. 174—74 R **17 Claims**



1. A termination of a mineral insulated electric cable comprising at least one conductor, a metal sheath surrounding and radially spaced from the conductor, and compacted mineral insulating powder electrically insulating the conductor from and filling the space between the conductor and, the metal sheath, in which termination a cut-back end of the cable is sealed by a preformed cap of electrically insulating material comprising a tube which over a part of its length extending from one of its ends effects a circumferentially continuous, substantially fluid-tight fit around the cable sheath and which at the other of its ends has an end wall integral with the tube and spaced from the end face of the cable and, tightly embedded in an protruding from the circumferential wall of said part of the length of the tube a device of metal or metal alloy whose protruding part mechanically engages with and secures the cap to the cable sheath and restrains the cap against removal from the cable, the end wall of the cap having at least one throughbore through which the cable conductor passes and the space within the cap between the end face of the cable and said end wall being filled with waterproof electrically insulating material.

5,149,917

WIRE CONDUCTOR FOR HARNESS

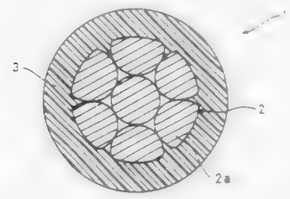
Kazuo Sawada; Atsuhiko Fujii; Yoshihiro Nakai; Naoyuki Ohkubo; Hajime Shiraishi; Fumio Ono; Katsushi Matsuda, all of Osaka, and Kazunori Tsuji, Mie, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Sumitomo Wiring Systems, Ltd., Yokkaichi, both of, Japan

Filed May 7, 1991, Ser. No. 696,503

Claims priority, application Japan, May 10, 1990, 2-121968; Dec. 28, 1990, 2-409162

Int. Cl.[5] H01B *1/02*

U.S. Cl. 174—129 R **8 Claims**



1. A conductor wire for an electrical conductor harness, comprising a conductor cross-sectional area within the range of 0.03 to 0.3 mm^2, said conductor comprising a plurality of strands made of a copper alloy containing 0.2 to 10% by weight of Sn, said conductor wire having been produced by the following steps performed in the following sequence:

(a) braiding a plurality of individual strands to form a braided conductor wire,

(b) circularly compressing said braided conductor wire, and

(c) heat treating said braided and circularly compressed conductor wire at a temperature within the range of 180° to 500° C. for at least ten minutes to form a braided, circularly compressed, and heat treated conductor wire, wherein ends of said individual strands hold together substantially without fraying.

5,149,918

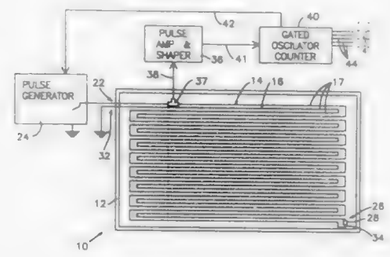
TOUCH SENSITIVE OVERLAY

Andrew F. Kozik, and Dennis M. Taylor, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1990, Ser. No. 620,186

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **18 Claims**



1. An apparatus adapted to determine coordinates comprising:

a signal conducting line having a first end and a second end, the signal conducting line being configured to allow changes of impedance at an unlimited number of spaced locations therealong when a finger is placed in direct contact with any of said unlimited number of spaced locations on the signal conducting line, said signal conducting line having a characteristic impedance;

a single ground line having first and second ends, at least one of said first and second ends being grounded, said ground line being disposed substantially parallel to said signal conducting line;

support means for supporting a portion of the signal conducting and ground lines;

a signal generator connected operably to the first end of the signal conducting line, the signal generator generating a measuring signal along the signal conducting line, the measuring signal having a predetermined voltage characteristic over a plurality of time intervals when the measuring signal is undisturbed, the voltage characteristic of the measuring signal varying from the predetermined characteristic by a deviation that is greater than a predetermined deviation when a disturbance develops in the measuring signal at one of the time intervals;

an electrical load operably connected to the second end of the signal conducting line, said electrical load having an impedance which is substantially equivalent to the characteristic impedance of said signal conducting line; and

processing means operably connected to the first end of the signal conducting line for determining the time interval during which the measuring signal is disturbed, the processing means including a memory device for storing a plurality of said unlimited number of spaced locations and correlating means for corresponding the time interval with one of the spaced locations stored in said memory device.

5,149,919

STYLUS SENSING SYSTEM

Evon C. Greanias, Chevy Chase, Md.; Frank L. Stein, Vienna, Va.; Robert Donaldson, and Michael Gray, both of Annapolis, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 608,062, Oct. 31, 1990, Pat. No. 5,117,071.

This application Nov. 26, 1991, Ser. No. 798,471

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—19 **16 Claims**

1. An improved stylus detection system having a transparent overlay with a transparent array of horizontal and vertical conductors, the horizontal conductors being spaced from the vertical conductors by an insulating material, a control processor, a radiative source for stylus detection, a switchable path to couple selected conductors to the radiative source in response to appropriate commands from the control processor and a stylus wherein:

the control processor is connected to a radiative source measurement means to receive measured radiative signal values of the conductors when the switchable path has connected a first pattern of conductors to the radiative source to detect the vertical and horizontal location of the stylus with respect to the overlay;

the control processor is connected to the radiative source measurement means when the switchable path has connected a second pattern of conductors to the radiative

source to detect the height of the stylus with respect to the overlay; and,

whereby stylus horizontal and vertical location and stylus height with respect to the overlay can be determined.

5,149,921

ACOUSTICAL PANEL AND METHOD OF MAKING SAME

Brian L. Meeker, Maumee, and Walter D. Harmon, Newark, both of Ohio, assignors to Fiber Lite Corporation, Maumee, Ohio

Continuation of Ser. No. 435,201, Nov. 9, 1989, abandoned. This application Sep. 3, 1991, Ser. No. 754,167

Int. Cl.[5] E04B *1/82*

U.S. Cl. 181—290 20 Claims

1. An acoustical panel, comprising:

A) a porous mass of a plurality of discrete bundles of glass fiber, wherein the individual glass fibers within each of said bundles are randomly oriented in planes generally parallel to one another, said bundles are randomly oriented relative to each other with at least some of said bundles being disposed in planes not parallel with the major surfaces of said panel, and said bundles are intertangled with adjacent bundles; and

B) a cured resinous binder distributed throughout said porous mass and adhered to said glass fibers;

wherein the sound absorbing coefficient of said panel is at least 0.80 when measured in the range from about 100 to about 500 cycles per second.

5,149,921

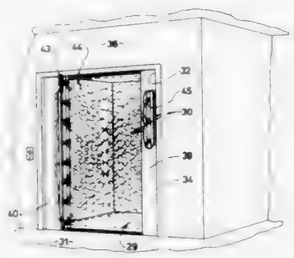
SELF CORRECTING INFRARED INTRUSION DETECTION SYSTEM

Sergio Picado, London, Ark., assignor to Innovation Industries, Inc., Russelville, Ark.

Filed Jul. 10, 1991, Ser. No. 728,241

Int. Cl.[5] B60R *3/00*

U.S. Cl. 187—130 65 Claims



1. A system for detecting intrusions within a monitored space, said system comprising:

a plurality of spaced apart transmitters adapted to be disposed along one side of said space for radiating signals across said space;

a plurality of spaced apart receivers adapted to be disposed along an opposite side of said space for detecting the presence or absence of signals radiated by said transmitters;

circuit means for operating said transmitters and said receivers, said circuit means comprising means for establishing a long beam pattern and a short beam pattern, and means for switching between said long and short beam patterns depending upon the width of said space.

5,149,922

ELEVATOR LOAD DETECTOR DEVICE USING MOVABLE DETECTOR PLATES

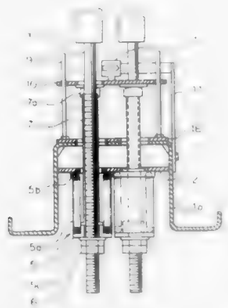
Tamaiti Kondou, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 6, 1990, Ser. No. 578,144

Claims priority, application Japan, Sep. 8, 1989, 1-233742; Sep. 13, 1989, 1-237681; Sep. 13, 1989, 1-237684; Dec. 4, 1989, 1-314996

Int. Cl.[5] B66B *3/02*

U.S. Cl. 187—131 17 Claims



1. A load detector device for an elevator for detecting a load of an elevator cage which is suspended within a hoist way by means of ropes, comprising:

rod-shaped anchoring members connected at one end thereof to the ropes and inserted at the other end thereof axially translatably through an anchoring plate;

elastic support means for elastically supporting said anchoring members to the anchoring plate, said elastic support means including, for each one of said anchoring members, a resilient member bearing at one end thereof on the anchoring plate and at the other end thereof on an annular seat translatably fitted on the inserted end portion of the anchoring member, the axial translation of the annular seat away from the anchoring plate being limited by an adjustable fixing means axially adjustably fixed onto the inserted end of the anchoring member;

activator members each surrounding an anchoring member and bearing at one end thereof on the annular seat fitted on the anchoring member, to extend axially translatably through said anchoring plate; and

detector means for detecting displacements, with respect to the anchoring plate, of the ends of the activator members opposite to the ends thereof bearing on said annular seats.

5,149,923

BACKLIT TACTILE KEYBOARD WITH IMPROVED TACTILE AND ELECTRICAL CHARACTERISTICS

Gregory B. Demeo, Lydeborough, N.H., assignor to Lucas Duralith Corporation, Millville, N.J.

Continuation-in-part of Ser. No. 669,958, Mar. 15, 1991. This application Aug. 29, 1991, Ser. No. 751,185

Int. Cl.[5] H01H *13/70*

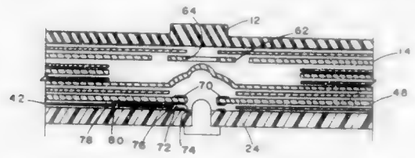
U.S. Cl. 200—5 A 55 Claims

1. A keypad for mounting over a substrate and providing at least one key, said at least one key being backlit by at least one light source, said keypad comprising in combination:

an at least partially translucent overlay layer means having a top surface with at least a portion of said top surface comprising at least one key;

tactile layer means, located under said overlay layer means and having at least one collapsible resilient dome substantially aligned with a corresponding said at least one key, for providing a tactile feedback and an actuation force when said at least one key is depressed a predetermined amount and said at least one resilient dome inverts, each of said at least one resilient dome including a smaller dome thereon, said smaller dome comprising a means for improving force distribution when said at least one resilient dome inverts and for permitting passage of light from said at least one light source to said at least one key;

circuitry layer means, located under said tactile layer means and on said substrate, having at least one conductor located thereon, said at least one conductor being substan-



tially aligned with a corresponding dome of said tactile layer;

shorting layer means, with at least one conductive area located between said at least one resilient dome of said tactile layer means and a corresponding said at least one conductor of said circuitry layer means and responsive to said tactile layer means, for electrically connecting a corresponding said at least one conductor with said at least one conductive area when said key is depressed and said at least one resilient dome inverts, said shorting layer means including means for passing light from said at least one light source to said at least one key;

means for electrically interconnecting said at least one conductive area of said shorting layer means with said circuitry layer means; and

means for maintaining the relative positions of said overlay layer means, said tactile layer means, said circuitry layer means, and said shorting layer means.

5,149,924

MULTIPLE CONTACT SWITCH ARRANGEMENT

Wolfgang Priesemuth, Postkamp 13, Breitenburg-Nordoe, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,385

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917637

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.[5] H01H *9/00, 1/58, 23/24*

U.S. Cl. 200—5 R 14 Claims

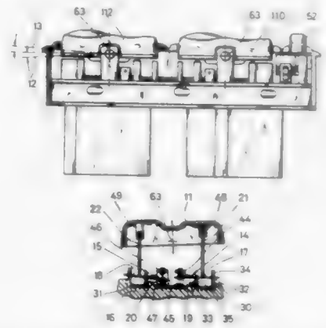
1. A multiple contact switch arrangement where from a nonoperative position two switch positions can be assumed via respective manually actuatable rocker-type switches, comprising:

a housing for accommodating at least two of said rocker-type switches, each of which further comprises:

switch element means mounted in said housing and having two essentially flat switch springs that are provided with switch contacts for interaction with contacts of operational circuit means;

a manually operated rocker-type push mechanism that is pivotably mounted in said housing; and

two actuating elements in the form of push members that are pivotably connected to said rocker-type push mechanism, are disposed essentially perpendicular to said switch



springs, and each rest upon a respective one of said switch springs.

5,149,925

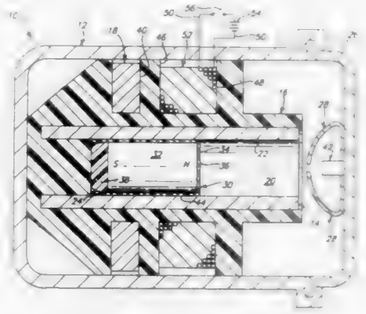
QUICK-RESPONSE ACCELEROMETER

Leonard W. Behr, Pontiac; Steven J. Anderson, Willis; Donald A. Duda, Novi, and Robert B. Colten, Bloomfield Hills, all of Mich., assignors to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Sep. 5, 1990, Ser. No. 577,485

Int. Cl.[5] G01D *15/135*

U.S. Cl. 200—61.45 M 5 Claims



1. An accelerometer comprising:

a housing having a cylindrical passage formed therein;

an annular magnetically-permeable element secured to said housing so as to encircle a first longitudinal portion of the passage;

a cylindrical magnetic sensing mass located within the passage, said sensing mass magnetically-interacting with said element so as to be magnetically biased towards a first position within the passage, said first position being characterized in that a longitudinal portion of said sensing mass is situated within said first portion of the passage, said sensing mass being displaced from said first portion towards a second position within the passage in response to an accelerating force exceeding said magnetic bias;

damping means for retarding the displacement of said sensing mass within the passage; and

switch means on the housing responsive to the sensing mass when the sensing mass is displaced to said second position within the passage,

wherein said damping means comprises an electrically-conductive, nonmagnetic ring encompassing the passage, the

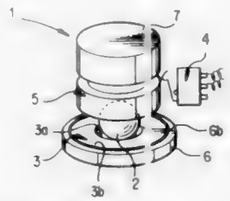
displacement of said sensing mass within the passage including an electric current in said ring, said electric current in said ring generating a magnetic field opposing further displacement of said sensing mass.

5,149,92[illegible]

ACCELERATION SENSOR

Katsuyasu Ono, Chigasaki, Japan assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 606,719
Claims priority, application Japan, Nov. 8, 1989, 1-130406[U]; Sep. 13, 1990, 2-96411[U]
Int. Cl.[5] H01H 35/14
U.S. Cl. 200—61.45 M 17 Claims



1. An acceleration sensor comprising:
a spherical inertial mass formed of a magnetic material;
a magnet having a holding part for normally holding said inertial mass seated thereat, a first surface with which said inertial mass is brought into contact when said inertial mass moves from said holding part, and a second surface opposite to said first surface;
a switch;
a switch changeover member being actuatable by said inertial mass when said inertial mass moves out of said holding part onto said first surface of said magnet upon exertion of acceleration having a predetermined or larger magnitude on said inertial mass, for changing the position of said switch; and
a magnetic member secured to said second surface of said magnet, said magnetic member having one end thereof located in said holding part and another end thereof shaped to cover an opposed end of said magnet, in a manner such that magnetic lines of force are generated in a manner being concentrated around said holding part of said magnet and on said opposed end of said magnet.

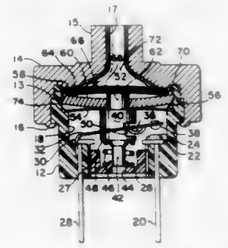
5,149,92[illegible]

BINARY ACTION PRESSURE SWITCH

Daniel Stahly, Elmhurst, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 5, 1991, Ser. No. 680,870
Int. Cl.[5] H01H 35/26
U.S. Cl. 200—83 P 9 Claims

1. A make-before break binary action pressure switch comprising:
(a) housing means defining a pressure sensing cavity and having a fluid pressure inlet port formed therein, and including a pressure responsive member forming a portion of the boundary of said cavity and movable in response to pressure changes in said cavity;
(b) switch means disposed in said housing means, said switch means including a contact carrying a blade member movable between a first position closing said contact on a stationary contact and a second position opening said contact;
(c) a switch actuator member movably disposed in said housing means;
(d) first spring means operative to bias said actuator member and said pressure responsive member in one direction;
(e) second spring means having one reaction end operatively contacting said actuator member and the opposite reaction and operatively contacting said blade member; and,
(f) with no pressure signal applied to said inlet port, said first spring means is operative to bias said pressure responsive member and actuator member to a position such that said second spring is operative to effect movement of said blade member to said second position, and upon said inlet port experiencing a first predetermined first level of pressurization, said pressure responsive member is operative to overcome said bias of said first spring means and effect movement of said actuator member in a direction opposite said one direction to a first position, whereupon said second spring means effects movement of said blade member to said first position, and upon said inlet port experiencing increasing pressurization to a second level a predetermined amount above said first level, said pressure movement of said actuator member to effect further movement of said actuator member in said direction opposite said one direction to second position whereupon said second spring means effects movement of said blade member against said first position, and upon decreasing pressurization of said inlet to a third level intermediate said second and first level said pressure responsive member is operative to effect movement of said actuator member in said one direction to a third position whereupon said second spring means is again operative to effect movement of said blade member to said first position, and upon further decreasing pressurization of said inlet port to a fourth level less than said first level said pressure responsive member causes said actuator member to move in said one direction to a fourth position whereupon said second spring means is operative to again effect movement of said blade member to said second position.



5,149,928

ARC SPINNER INTERRUPTER HAVING CONTACT BOUNCE SUPPRESSOR

Eugene L. Kamp, Fulton, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Sep. 20, 1991, Ser. No. 763,327
Int. Cl.[5] H01H 33/18, 3/60
U.S. Cl. 200—147 R 7 Claims

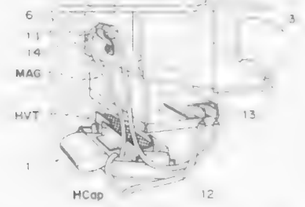
1. An arc spinner interrupter apparatus comprising:
a fixed electrical contact assembly;
a ring electrode having first and second axial ends and defining a central longitudinal axis;
a field coil surrounding the ring electrode;
means for electrically coupling he ring electrode to the fixed contact assembly through the field coil so that a magnetic field is created within the ring electrode during current flow through the field coil;
a second electrical contact assembly having an arm which is selectively movable along a path into and out of engagement with the fixed contact assembly, the fixed contact assembly including an arcing element extending in a first direction generally parallel to the path of movement of the arm and being biased toward a position at least partially within the path of movement such that the arm impacts and engages the arcing element during movement toward the fixed contact assembly; and
dampener means for dampening oscillation of the arcing element in a second direction transverse to a plane defined by the path of movement of the arm, the dampener means including a mass and biasing means for biasing the mass toward a position in contact with the arcing element so that when the arm of the second contact assembly impacts the arcing element the kinetic energy of the arcing element acting in the second direction is transferred from the arcing element to the mass and oscillation of the arcing element is reduced.

5,149,929

MICROWAVE OVEN WITH INVERTER CONTROLLED POWER SOURCE

Hiroshi Minakawa, Higashiosaka; Yoshikazu Kitaguchi, Kashiwara, and Eiji Fukuda, Amagasaki, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1991, Ser. No. 677,246
Claims priority, application Japan, Mar. 30, 1990, 2-85445
Int. Cl.[5] H05B 6/68
U.S. Cl. 219—10.55 B 7 Claims



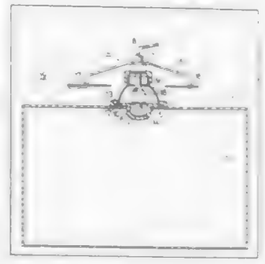
1. A microwave oven including an inverter controlled power source, said power source comprising:
power supply means for supplying high frequency power to microwave generating means,
microwave generating means coupled to said power supply means for generating microwave power in relation to said high frequency power, said microwave generating means operating stably at a temperature above a working equilibrium temperature;
electrical conductor means of a predetermined impedance coupling said power supply means to said microwave generating means;
temperature sensitive impedance changing means coupled to said electrical conductor means for changing said impedance between a first level impedance and a second level impedance in response to temperature, said first level impedance being established when said impedance changing means is heated below a predetermined threshold temperature, said second level impedance being established when said impedance changing means is heated above said threshold temperature, said threshold temperature being lower than said working equilibrium temperature.

5,149,930

MICROWAVE OVEN WITH LAMP AND MICROWAVE SEAL

Ilmari Levoska, Åby, and Ove R. Fredriksson, Söderköping, both of Sweden, assignors to Whirlpool International B.V., Eindhoven, Netherlands

Filed Jul. 11, 1990, Ser. No. 556,783
Claims priority, application Sweden, Jul. 18, 1989, 8902556
Int. Cl.[5] H05B 6/76
U.S. Cl. 219—10.55 R 10 Claims



1. A microwave oven comprising:
an oven cavity enclosed by a cavity wall,
a microwave source for feeding microwave energy of a substantially uniform wavelength into said cavity,
a lighting device for illumination of the cavity,
said lighting device comprising a single light source arranged at the cavity wall, and
a microwave seal substantially preventing leakage of microwaves to the external surroundings of the cavity through said lighting device,
said microwave seal comprising a single hole in the cavity wall,
said single hole being associated with said single light source in a one-to-one relationship therewith,
said single hole selected to be smaller in size in relation to the wavelength of the microwaves which is such that the dimensioning of the hole substantially prevents passage of microwaves through the hole,
wherein said single light source comprises a lightintensive lamp positioned outside the cavity, having a short filament and small dimensions relative to the single hole, and being arranged in close proximity to the single hole.

5,149,931

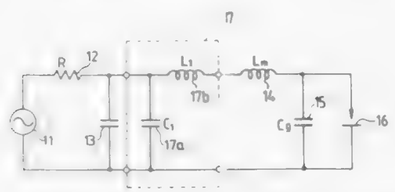
POWER SOURCE FOR ELECTRIC DISCHARGE MACHINING

Takuji Magara, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,895
Claims priority, application Japan, Apr. 11, 1989, 1-91433; Apr. 11, 1989, 1-91434; Apr. 11, 1989, 1-91435; Sep. 21, 1989, 1-245498
Int. Cl.[5] B23H 1/02
U.S. Cl. 219—69.13 17 Claims

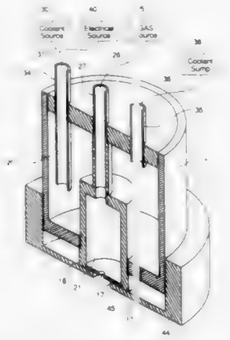
1. A power source for an electric discharge machining in which voltage is applied across an electrode and a workpiece to be machined to cause electric discharge in an interelectrode gap formed between said electrode and said workpiece to thereby machine said workpiece, comprising:

an AC source for applying an AC voltage to an interelectrode gap having a capacitance; and



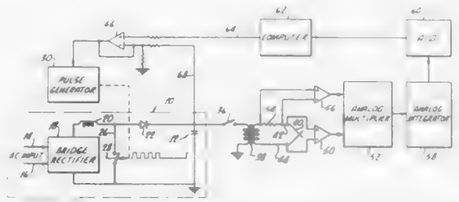
a resonance circuit, for causing resonance to occur with the capacitance, whereby an electric discharge machining is carried out under an occurrence of resonance.

5,149,932
ARC/GAS ELECTRODE
Richard M. Poorman, Arab, and Jack L. Weeks, Guntersville, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Mar. 29, 1991, Ser. No. 677,182
Int. Cl.[5] B23K *9/24*
U.S. Cl. 219—75 5 Claims



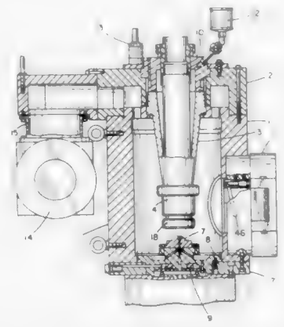
1. A gas/arc electrode comprising
a. a first housing,
b. a second housing positioned inside the first housing and having an end extending through an opening in said first housing to an exposed position, said second housing being electrically conductive and having an outlet orifice in said end, said first housing being larger than the second housing to form a first chamber surrounding the second housing, said second housing forming a second chamber,
c. means for circulating a coolant through said first chamber into contact with the second housing to cool said second housing and said electrode,
d. means for supplying a gas to the second chamber, and
e. means for supplying an electrical current to the second housing to ionize the gas flowing from the orifice to provide a current path from the electrode to a workpiece positioned adjacent to said orifice.

5,149,933
WELDING CONTROL
Joseph E. Donner, Vista, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 20, 1991, Ser. No. 811,201
Int. Cl.[5] B23K *11/26*
U.S. Cl. 219—113 17 Claims



1. A method for controlling energy delivered to a weld head from a capacitor bank that stores a weld voltage and is charged by a charging circuit, said method comprising the steps of:
charging the capacitor bank to a first voltage,
delivering energy from said capacitor bank to make a first weld,
measuring energy delivered during said first weld,
calculating a second voltage to be stored for a second weld in accordance with a function of energy delivered during said first weld,
charging said capacitor bank to said second voltage, and
delivering energy from said capacitor bank to make a second weld.

5,149,934
HIGH VOLTAGE ELECTRON BEAM GUN
Timothy J. Haynie, Hickory Hills, and Glen S. Lawrence, Naperville, both of Ill., assignors to Ferranti Sciaky, Inc., Chicago, Ill.
Filed Sep. 24, 1991, Ser. No. 764,844
Int. Cl.[5] B23K *15/00*
U.S. Cl. 219—121.27 10 Claims

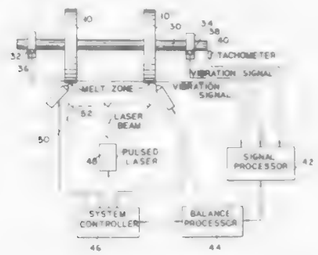


1. An electron beam gun for operation at voltages from 100 to 200 kilovolts comprising; a cylindrical gun housing, (**1**) a pumping manifold mounted above the said gun housing, a hollow elongated cylindrical insulator (**3**) supported at one end by said pumping manifold concentrically within said gun housing, a cartridge feed-through (**21**) mounted at the opposite end of said insulator, a cartridge head assembly mounted within the said cartridge feed-through, the said head assembly consisting of a filament holder assembly (**6**) which includes a cathode electrode (**18**) insulated from a filament holder (**40**) and means (**34**) for connecting said filament holder to terminals (**37**) on the said cartridge head assembly, an anode mount supporting an anode (**7**) in close proximity to the said cathode electrode; an alignment coil supported below the anode, means including a receptacle for supplying electric current to the filament, means for supplying to and retaining oil within the cathode insulator, pumping means, (**14**) for evacuating the gun, mounted on the pumping manifold, safety switch means for grounding the gun parts to the housing and an access door assembly mounted on said housing.

5,149,935
METHOD AND APPARATUS FOR FORMING AMALGAM PREFORM
Edward J. Ozimek, Penfield; Edward Carnall, Jr., and David N. Bull, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 9, 1990, Ser. No. 594,806
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.65 16 Claims

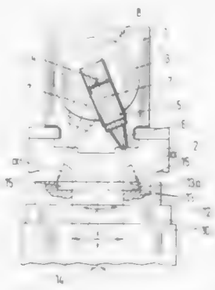
12. Apparatus for forming a body of a desired shape and size from a thin layer of an amalgam comprising a mixture of a liquid metal and a powdered metal comprising:
a base plate having a surface on which the amalgam can be spread as a thin layer;
means for cooling the base plate to a first temperature below the melting temperature of the liquid metal in the amalgam so as to apply the first temperature to and completely through said layer; and
means for applying a second temperature above the melting temperature of the liquid metal to and completely through said layer along the edge of a portion of the layer which is to form the body.

5,149,936
MULTI-PLANE BALANCING PROCESS AND APPARATUS USING POWDER METAL FOR CONTROLLED MATERIAL ADDITION
James F. Walton, II, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.
Filed Apr. 10, 1991, Ser. No. 683,333
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.65 11 Claims



1. A dynamic system for balancing a rotary object having a surface, comprising:
a. support means for rotatably supporting said object:
b. sensor means for sensing the position of said object;
c. laser supply means for supplying laser beam pulse impinging on said object;
d. control means for designating a melt zone on said object, said control means being coupled to said sensor means and said laser supply means for directing said laser beam pulse to said melt zone; and
e. supply means for supplying additive material to said melt zone, wherein said additive material is bonded on said melt zone by said laser pulse to form a metallurgical bond with said object for correcting the balance of said object while said object is rotating.

5,149,937
PROCESS AND DEVICE FOR THE MANUFACTURE OF CAVITIES IN WORKPIECES THROUGH LASER BEAMS
Werner Babel, Pfronten; Peter Grund, Rieden; Gunter Eberl, Waltenhofen/Lanzen, and Uli Sutor, Pfronten, all of Fed. Rep. of Germany, assignors to Mabo Aktiengesellschaft, Fed. Rep. of Germany
Filed Jul. 13, 1990, Ser. No. 553,077
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1989, 3923356; Oct. 2, 1989, 8911733[U]
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.68 10 Claims

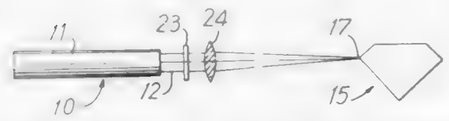


1. A laser beam milling apparatus, comprising:
a machine support;
a housing slideably mounted on said machine support;
a laser installation disposed in said housing that includes focusing and guide elements configured to produce a laser beam output along a first beam axis;
a motor driven rotatable head including a beam deflector mounted on said housing for rotation around said first beam axis, said beam deflector being positioned to receive said laser beam along said first beam axis and to deflect said beam along a second beam axis;
a motor driven slideable workpiece table positionable in a vertical and horizontal direction along a curvilinear path that crosses said second beam axis such that said laser beam may be directed to a workpiece mounted on said workpiece table in a back and forth feed motion; and
a program control system for controlling said laser installation, said rotatable head and said workpiece table.

5,149,938
METHODS FOR PRODUCING INDICIA ON DIAMONDS
Ronald H. Winston, Scarsdale, and Necip Alev, New York, both of N.Y., assignors to Harry Winston, S.A., Geneva, Switzerland
Filed Oct. 11, 1990, Ser. No. 595,861
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 21 Claims

1. A method of producing a marking on a diamond, the method comprising the steps:
positioning a mask between an output of an excimer laser

and a portion of a surface of the diamond to be marked; and



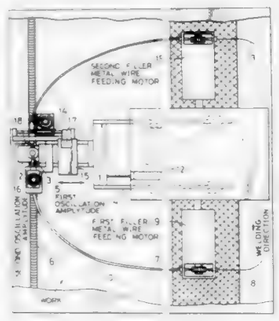
directly irradiating the portion of the surface of the diamond with the excimer laser through the mask so as to permit the radiation of the excimer laser itself to create the mark in a pattern defined by the mask.

5,149,939

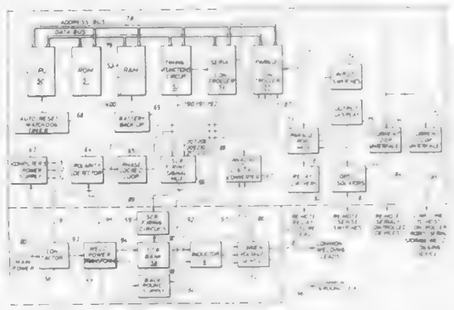
AUTOMATIC WELDING APPARATUS

Hiroshi Imaizumi, Tokyo; Toshio Kato, Kodaira; Hideaki Nakashima, Yokohama; Yasuo Murakami, Hikari; Hideki Kashimura, and Kiichi Katayama, both of Kawasaki, all of Japan, assignors to Aichi Sangyo Co., Ltd. and Nippon Steel Corp., both of Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 757,546
Claims priority, application Japan, Jul. 3, 1991, 3-258256
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—125.12 9 Claims



1. In an automatic welding apparatus for non-consumable-electrode-type arc welding in which welding is performed while oscillating a welding torch and a first wire in a direction perpendicular to a weld line and in a predetermined amplitude and time period, said welding torch and said first wire forming a molten pool of metal along said weld line, the improvement comprising a mechanism which is adapted to feed a second wire into said molten pool in the same direction with the weld line and from the side opposite to said first wire, and which is adapted to oscillate said second wire in synchronism with the oscillation of said welding torch and said first wire and at a position where both wires are opposed to each other along an axis perpendicular to said weld line.



5. An apparatus for synchronizing a welding power supply to an alternating current source of electrical energy, comprising:

a welding power supply coupled to a source of alternating current ("AC") electrical energy, the welding power supply being operable for supplying electrical power for welding operations;

a synchronization circuit coupled to said source of AC electrical energy, the synchronization circuit including:

(a) a phase locked loop, the phase locked loop being electrically coupled but not directly mechanically linked to the source of AC electrical energy, the phase locked loop being operable to electrically lock to the AC electrical energy from the source of AC electrical energy, the phase locked loop being operative to provide an indication of the frequency of the source of AC electrical energy;

(b) a zero crossing detector, the zero crossing detector being operative to detect the phase error of the phase locked loop compared with the source of AC electrical energy; and,

the synchronization circuit being operable to develop timing signals which are synchronized with the source of AC electrical energy, the timing signals being coupled to the welding power supply.

5,149,940

METHOD FOR CONTROLLING AND SYNCHRONIZING A WELDING POWER SUPPLY

Clint A. Davis, League City, and Melvin P. Trail, Houston, both of Tex., assignors to Beckworth Davis International Inc., Houston, Tex.

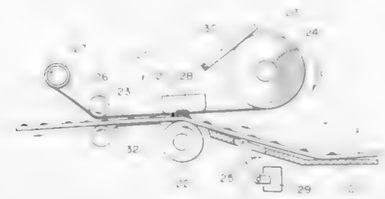
Continuation of Ser. No. 879,318, Jun. 27, 1986, Pat. No. 4,821,202, which is a continuation of Ser. No. 817,258, Jan. 8, 1986, abandoned, which is a continuation of Ser. No. 762,696, Aug. 5, 1985, abandoned, which is a continuation of Ser. No. 469,519, Feb. 24, 1983, Pat. No. 4,561,059. This application Oct. 18, 1988, Ser. No. 256,401
Int. Cl.[5] B23K *9/10*
U.S. Cl. 219—130.21 25 Claims

5,149,941

IMAGE FIXING APPARATUS WITH MOVABLE SHEET MEMBER AND DETECTORS

Hiromitsu Hirabayashi, Yokohama; Kensaku Kusaka, Kawasaki; Atsushi Arai, Kasukabe, and Yoshiaki Takayanagi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 206,767, Jun. 15, 1988, abandoned. This application Mar. 14, 1991, Ser. No. 668,333
Claims priority, application Japan, Jun. 16, 1987, 62-147884; Jan. 22, 1988, 63-012069; Apr. 15, 1988, 63-091267; Apr. 15, 1988, 63-091268; Apr. 15, 1988, 63-091269; Apr. 15, 1988, 63-091270; Apr. 15, 1988, 63-091271; Apr. 15, 1988, 63-091272; Apr. 15, 1988, 63-091274; May 6, 1988, 63-109192; May 6, 1988, 63-109193
Int. Cl.[5] G03G *15/20*
U.S. Cl. 219—216 66 Claims



1. An image fixing apparatus for fixing an unfixed image formed on an image carrying member, comprising:

a non-endless wound sheet member movable together with the image carrying member in contact with the unfixed image carried thereon;

means for rewinding said sheet member;

a heat generating element contacted to such a side of said sheet member as is opposite to a side thereof contactable to the unfixed image, said heat generating element being disposed in a fixed position; and

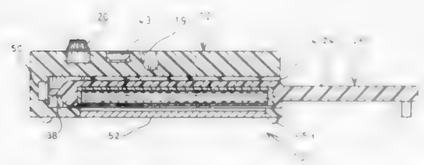
means for detecting a remaining amount of said sheet member.

5,149,942

HOT MIRROR TO PREVENT CONDENSATION IN HUMID ENVIRONMENTS

James A. Garrett, 505 Wimbledon Road, NE., Atlanta, Ga. 30324

Continuation-in-part of Ser. No. 564,647, Aug. 9, 1990, abandoned. This application Jun. 3, 1991, Ser. No. 710,374
Int. Cl.[5] H05B *3/20*
U.S. Cl. 219—219 18 Claims



1. A non-fogging mirror device for particular use in high humidity environments, which comprises:

a housing means, said housing means having a top exposed surface and being provided with an internal cavity opening from one side of said housing, said cavity having a bottom surface, a top surface and a rear wall, said housing means further being provided with a recess in said top exposed surface;

a pressure sensitive electrical switch means mounted in said rear wall of said cavity;

an electrical heater means mounted in said bottom surface of said cavity;

means for providing electrical power to said pressure sensitive switch and said heater means, said pressure sensitive switch and said heater means being electrically connected in series; and

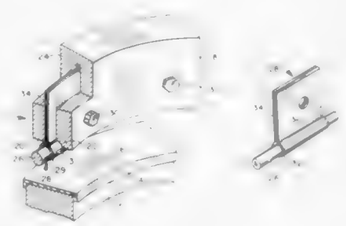
a portable mirror means adapted to be inserted in said cavity, said mirror means having a projection to engage said pressure sensitive switch and thereby connect said electrical power to said heater means when said mirror means is fully inserted into said cavity, said mirror means having a handle to be grasped by a user for insertion and removal of said mirror means from said cavity, said handle having a distal end for being releasably received in said recess of said housing means, said mirror means provided with an internal reservoir containing a liquid to be heated by said heater means and with a mirror surface oriented to face said heater means when said mirror means is inserted into said cavity.

5,149,943

HEAT SEALING MEMBER FOR MAKING CONTOURED HEAT SEALS

Vytautas Kupcikevicius, Oaklawn; Philip F. Cilia, Palos Hills, and Darrell L. Burkeen, Lansing, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Jan. 8, 1992, Ser. No. 818,307
Int. Cl.[5] B32B *31/18*; H05B *1/00*
U.S. Cl. 219—243 20 Claims



1. A heat sealer comprising:

a) a seal bar having a substantially flat longitudinlly extending face and a slot in said seal bar opening through said face for the full length of said seal bar;

b) a flexible electrically heated sealing wire on said face and extending along said slot opening for at least the full length of said slot;

c) a heat resistant fabric longitudinally folded onto itself and draped around said heat sealing wire to provide a single ply encircling said wire for at least the length of said bar and a double ply portion extending radially from said heat sealing wire;

d) said double ply portion being received into said slot and the combined width of said wire and encircling fabric being greater than the width of said slot such that said wire is not received into said slot; and

e) securing means for fixing said double ply portion within said slot whereby said fabric anchors said wire to said seal bar.

5,149,944

ELECTRIC COOKING APPLIANCE

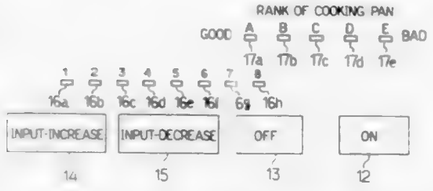
Nobuo Shimomura, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 17, 1991, Ser. No. 716,086
Claims priority, application Japan, Jun. 26, 1990, 2-167473
Int. Cl.[5] H05B *3/74*
U.S. Cl. 219—464 7 Claims

1. An electric cooking appliance comprising:

a) a heater lamp;

b) a top plate on which a cooking pan containing foodstuff to be cooked is placed, the top plate being disposed over the heater lamp;
c) temperature sensing means for sensing an ambient temperature of the heater lamp;
d) output power control means outputting a controlled output value command for controlling an output of the heater lamp, the output control means controlling the output of the heater lamp so that the output of the heater



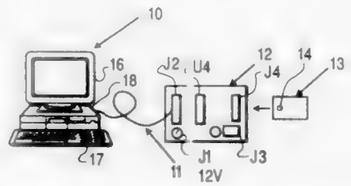
lamp is gradually decreased based on the controlled output value command every time the temperature sensed by the temperature sensing means exceeds a critical temperature value for protection of the heater lamp;
e) determination means for determining a degree of heat absorptivity of the cooking pan in accordance with the controlled output value command in the condition that the cooking pan is placed on the top plate; and
f) display means for displaying a result of the determination of the determination means.

5,149,945

METHOD AND COUPLER FOR INTERFACING A PORTABLE DATA CARRIER WITH A HOST PROCESSOR

Jerry W. Johnson, Likesade, and John M. Taskett, Plano, both of Tex., assignors to Micro Card Technologies, Inc., Dallas, Tex.

Filed Jul. 5, 1990, Ser. No. 548,414
Int. Cl.[5] G06K 5/00
U.S. Cl. 235—380 23 Claims



1. A method for interfacing a portable data carrier with an asynchronous receiver transmitter for asynchronous data transmission via a signal coupler adapted to receive the portable data carrier in an associated connector comprising

generating a carrier present signal CRD PRS and a clear to send signal CTS upon insertion of the portable data carrier in the connector adapted to receive said carrier; generating a request-to-send RTS signal from said asynchronous receiver transmitter after receipt by the asynchronous receiver transmitter of a clear to send CTS signal;

generating a card on CD ON signal in response to the request to send RTS signal from said receiver transmitter;

generating a card voltage signal CRD VCC to be applied to the portable data carrier in response to said CRD ON signal; and

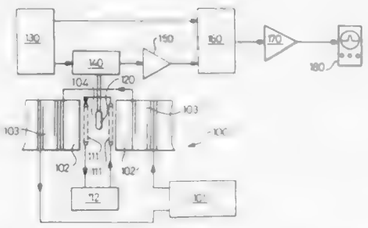
transmitting and receiving data between said receiver transmitter and portable data carrier in response to said generated signals and insertion of a data carrier into the connector, said step of transmitting and receiving data including the step of echoing data from the receiver transmitter to allow said receiver transmitter to receive its own transmission and detect errors in communication on a character by character basis and allow a character error to be acted upon prior to the transmission of the next character.

5,149,946

METHOD OF AUTHENTICATING AN OBJECT BY ELECTRON PARAMAGNETIC RESONANCE, APPARATUS FOR IMPLEMENTING THE METHOD, AND AN OBJECT USEABLE WITH THE METHOD

Denis Jerome, Jouy en Josas; Georges Tevanian, l'Hay les Roses; Patrick Batail, and Marc Fourmigue, both of Paris, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Filed Oct. 10, 1990, Ser. No. 595,388
Claims priority, application France, Oct. 13, 1989, 89 13418
Int. Cl.[5] G06K 7/08; G01V 3/00; C07C 13/48
U.S. Cl. 235—439 12 Claims



1. An apparatus for authenticating and/or identifying a document using electron paramagnetic resonance spectroscopy, a quantity of at least one authenticating substance being added to the document in powder form and having a paramagnetic resonance peak of a width (ΔH1/2) not greater than 1.5 Gauss, said apparatus comprising:

means for applying to the document in a region incorporating said substance a static magnetic field (Ho) having an amplitude in the range 50–370 Gauss, whereby said resonance peak of said at least one substance occurs at a frequency in the range of about 135 MHz to 1 GHz, said means having a pair of parallel opposed end faces defining an air gap therebetween;

means for superimposing on said static magnetic field a modulation field (Hm) collinear with said static magnetic field;

means for applying to said document in said region an electromagnetic field (H1) at the frequency of said resonance peak and perpendicular to said static and modulation fields, said electromagnetic field having an amplitude equal or greater than said width of said resonance peak, said means comprising a bifilar line located in said air gap, tuned on said frequency of the resonance peak and having two branches each parallel to said faces defining said air gap, short-circuited together at a free end thereof and bent at an intermediate portion thereof; and

phase detection means for detecting power variations of said electromagnetic field and for deriving therefrom information about the presence or absence of said substance having said peak width;

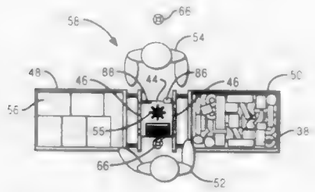
whereby a document to be authenticated and/or identified can be moved between the portions of said branches on either side of said bent regions in a direction essentially parallel to said opposed end faces.

5,149,947

PORTABLE CHECKOUT SYSTEM

Donald A. Collins, Jr., Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 27, 1989, Ser. No. 328,659
Int. Cl.[5] G06K 7/10; A63F 9/02
U.S. Cl. 235—462 3 Claims



1. In a merchandising establishment having a stationary checkout station in which each purchased merchandise item has located thereon a coded label identifying the item, a portable operator controlled checkout system which can be moved to any position within the establishment for processing purchased merchandise items comprising:

a portable optical scanning apparatus including a scanning window through which scanning light beams are projected and a plurality of bracket members extending outwardly in a horizontal plane in opposite directions from opposite sides of said scanning apparatus;

a first movable cart member containing purchased merchandise items and having a first handle member securely engaging one of said bracket members for horizontally positioning the scanning apparatus adjacent to said first handle member and in said horizontal plane with said first handle member of the cart member; and

a second movable cart member for supporting processed purchased merchandise items having a second handle member engaging another of said bracket members on the opposite side of said scanning apparatus from said one of said bracket members for supporting the optical scanning apparatus horizontally in alignment with and between the first and second handle members of said movable cart members, enabling a checkout operator located adjacent the scanning apparatus and between the first and second movable cart members to move a purchased merchandise item located in the cart member past the scanning window along the scanning apparatus to read the coded label after which the merchandise item is positioned in said second cart member.

5,149,948

IMPROVED BAR CODE READER SYSTEM FOR READING BAR CODES UNDER HIGH SPECULAR REFLECTION CONDITIONS WITH A VARIETY OF SURFACE EFFECTS

Thomas J. Chisholm, Milton, Mass., assignor to Computer Identics, Canton, Mass.

Filed Jul. 16, 1990, Ser. No. 553,859
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 13 Claims

1. An improved bar code reader system for reading bar codes having a wide range of intensity of reflected radiation, comprising:

means for repeatedly scanning a beam of radiation across a bar code containing bar and space code elements;

means for monitoring the number of scans of the beam across the bar code;

means for sensing the radiation reflected from the bar code and providing a bar code signal representative thereof;

means, responsive to the means for sensing, for amplifying said bar code signal at a selected one of a number of prespecified gains; and

means, responsive to said means for monitoring, for selecting one of said prespecified gains for each scan of the bar code, where the gain selected is associated with a given scan of the bar code.

4. The bar code reader system of claim 1 in which said means for sensing senses radiation reflected at an acute angle from the bar code surface and includes:

means for illuminating a bar code, having specular space elements and diffusive bar elements, with radiation polarized in a first direction, said radiation directed at an acute angle to the surface of the bar code and generally parallel

to the bars and spaces, for diverting radiation reflected from said specular spaces away from said means for sensing and for directing a portion of the radiation reflected from specular imperfections in the bars to the means for sensing, and

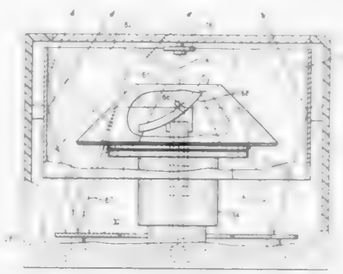
substantially cross-polarizing means for blocking a portion of the return from the specular imperfections in the bars and passing substantially half of the radiation diffusively reflected from the bars and a portion of the return from the specular imperfections of the bars.

5,149,949

OPTICAL SCANNER WITH COUNTERROTATING REFLECTOR ELEMENTS

Charles K. Wike, Jr., Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 10, 1990, Ser. No. 625,323
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—467 21 Claims



1. An optical scanning apparatus comprising:

a rotatably mounted drive member rotating in a first direction;

a source of scanning light beams projecting the light beams along a first light path;

a first deflecting means mounted on said drive member and in said first light path for deflecting the light beams along a plurality of second light paths;
first drive means for rotating the drive member in said first direction;
a ring of first mirror members conically arranged around said first deflecting means whereby the light beams deflected by said first deflecting means will strike the interior surfaces of said first mirror members for deflecting the beams along a plurality of third light paths which extend in a direction opposite to said first light path;
second drive means for rotating the first mirror members in a second direction opposite to said first direction;
a horizontally extending circular mirror member fixedly mounted below said ring of first mirror members and which extends beneath the entire ring of first mirror members and surrounds the drive member for deflecting the light beams along a plurality of fourth light paths; and
a ring of second mirror members mounted around said ring of first mirror members and in said fourth light paths for receiving the light beams deflected by said circular mirror member for deflecting the light beams in said scanning direction.

5,149,940

HAND-HELD LASER SCANNING HEAD HAVING DETACHABLE HANDLE PORTION

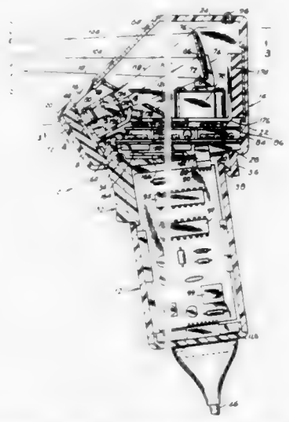
Jerome Swartz, Setauket; Howard M. Shepard, Great River, both of N.Y.; Eric F. Darkan, San Francisco, Calif.; Mark J. Krichever, Hauppauge, N.Y.; Boris Metlitsky, Hauppauge, N.Y., and Edward Barkan, South Setauket, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Division of Ser. No. 454,144, Dec. 21, 1989, Pat. No. 5,021,641, which is a division of Ser. No. 299,151, Jan. 9, 1989, Pat. No. 4,897,532, which is a continuation of Ser. No. 148,669, Jan. 26, 1988, Pat. No. 4,825,057, which is a division of Ser. No. 706,502, Feb. 28, 1985, abandoned. This application Apr. 24, 1991, Ser. No. 690,702

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—472 13 Claims



1. A hand-held laser scanning head for reading indicia, said head comprising:
a) a body portion;
scanning means mounted in said body portion for scanning said media; and
c) handle portion detachably fixed to said body portion and accommodating at least one printed circuit board such that said circuit board is adapted to be electrically connected to and disconnected from said scanning means upon the attachment and detachment, respectively, of said handle portion with said body portion, whereby a function of the scanning head may be charged by changing or adding to said printed circuit board.

5,149,951

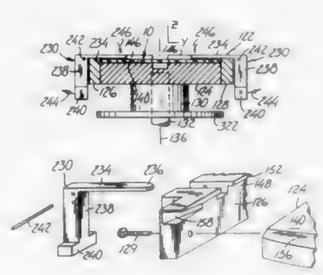
APPARATUS AND METHOD FOR PRESENTING A DATA CARD FOR DATA TRANSFER WITH CENTRIFUGAL FLYWEIGHT

Peter J. Vogelgesang, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, a Corporation of Delaware, St. Paul, Minn.

Filed Mar. 5, 1990, Ser. No. 488,091

Int. Cl.[5] G06K *7/10, 7/14, 7/00, 13/063*

U.S. Cl. 235—485 28 Claims



1. An apparatus for aligning a data card having a top surface bearing a generally planar annular data storage region thereon for data transfer and having an opposite bottom surface, the apparatus comprising:
a rotatable card holder having a support for the bottom surface of the card, the card holder aligning the annular data storage region of the card perpendicular to the axis of rotation of the card holder, and aligning the card so that the axis of rotation of the card holder is coaxially aligned with the annular data storage region of the card;
a drive assembly to rotate the card holder and card thereon about the axis of rotation; and
a plurality of flyweight members pivotally mounted along opposite sides of the card holder to engage the top surface of the card at locations radially disposed outside the annular data storage region to apply a force from each flyweight member, as a function of the rate of rotation of the card holder, to urge the bottom surface of the card against the support.

5,149,952

OPTICAL GAUGING APPARATUS USING DUAL BEAMS AND INTERMITTENT INTERRUPTION

Hirokazu Tanaka; Kiyomitsu Ishikawa, both of Tokyo, and Tomohiro Yamaguchi, Yokohama, all of Japan, assignors to Stanley Electric Corporation, Tokyo, Japan

Filed Jul. 19, 1991, Ser. No. 732,636

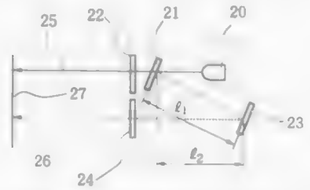
Claims priority, application Japan, Aug. 10, 1990, 2-210337; Aug. 24, 1990, 2-220967

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 10 Claims

1. Optical gauging apparatus comprising divider means to divide light emitted from a single light source into a pair of light components propagated along a pair of optical paths, respectively; projector means to project the respective light components divided from a single light by the divider means onto an object to be gauged along a pair of different optical path lengths; shield means for intermittently shielding at least one of the light components propagated along the associated

light path; and signal processor means for photoelectric conversion of the light components reflected on the object fol-



lowed by time-division processing of photoelectric conversion signals to provide a desired gauging information.

5,149,953

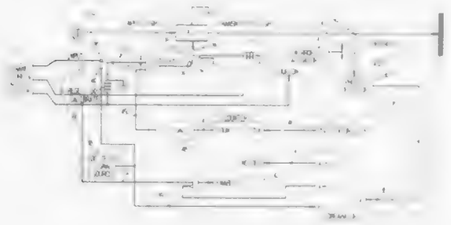
DRIFT TRACKING IN AN ELECTRO-OPTIC LIGHT MODULATOR

James C. Erwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,812

Int. Cl.[5] G01J *1/32*

U.S. Cl. 250—205 9 Claims



1. A method for compensating for space-charge-induced drift in transmission characteristics of an electro-optic device of a light modulator, said method comprising the steps of:
recurrently interrupting application of a modulating drive signal to said electro-optic device to apply a predetermined test drive signal thereto in lieu of the modulating drive signal;
intercepting light transmitted through said device in synchronism with application of the test drive signal;
generating, in response to light from said intercepting step, a calibration bias signal having a magnitude that is indicative of the level of space charge in said device; and
applying the calibration bias signal to supplement the modulating drive signal between times of said recurrent interruptions, thereby at least partially offsetting the effect of space charge in said device on the intensity of light transmitted through said device.

5,149,954

HOLD CAPACITOR TIME DELAY AND INTEGRATION WITH EQUILIBRATING MEANS

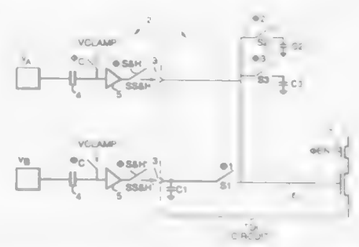
Kevin L. Pettijohn; Todd E. Sessler, and John A. Stineman, all of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Mar. 26, 1991, Ser. No. 675,231

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 14 Claims

1. A method of performing a time delay and integration function with a plurality of electrical signals, comprising the steps of:
storing, during individual ones of a first plurality of consecutive time intervals, a sample of a first electrical signal;
equilibrating, during individual ones of a second, subsequent plurality of time intervals, one of the stored samples with a stored sample of a second electrical signal; and



outputting, subsequent to each of the steps of equilibrating, an electrical signal having a magnitude that is expressive of the equilibrated stored samples.

5,149,955

FULL CONTACT IMAGE SENSOR DEVICE WITH LIGHT BLOCKING MEANS

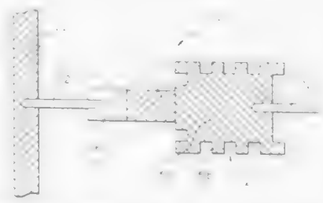
Koichi Kitamura; Hidenori Mimura; Kazuo Yamamoto; Yasumitsu Ohta, and Kazuyoshi Sai, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 555,594

Claims priority, application Japan, Jul. 26, 1989, 1-193359; Nov. 16, 1989, 1-299058

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—211 J 16 Claims



1. A full contact image sensor device comprising
a plurality of juxtaposed light receiving elements arranged to macroscopically touch an object in order to receive light reflected from the object and to generate electric signals in response thereto, the light receiving elements having first spaces therebetween, each light receiving element corresponding to a pixel and comprising a plurality of light receiving element blocks; and
means for blocking a penetration of light through said first spaces.

5,149,956

TWO-COLOR RADIATION DETECTOR ARRAY AND METHODS OF FABRICATING SAME

Paul R. Norton, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 12, 1991, Ser. No. 715,086

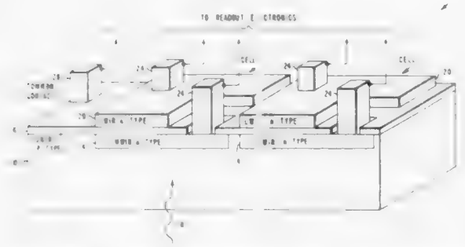
Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—211 J 21 Claims

1. A method of fabricating an array of semiconductor radiation detectors, comprising the steps of:
providing a substrate;
selectively forming a plurality of first regions adjacent to a surface of the substrate, the first regions being comprised of a first semiconductor material having a first type of electrical conductivity and a significant responsivity to

electromagnetic radiation having wavelengths within a first spectral band;

forming an electrically conductive layer comprised of a second semiconductor material over an exposed area of the surface of the substrate and over the plurality of first regions, the layer being comprised of semiconductor material having a second type of electrical conductivity for forming a plurality of first heterojunctions with the underlying first regions; and



selectively forming a plurality of second regions upon the layer, individual ones of the second regions being in registration with and disposed above a corresponding one of the first regions, the second regions being comprised of a third semiconductor material having the first type of electrical conductivity for forming a plurality of second heterojunctions with the underlying layer, the third semiconductor material further having a significant responsivity to electromagnetic radiation having wavelengths within a second spectral band that does not significantly overlap the first spectral band.

5,149,957

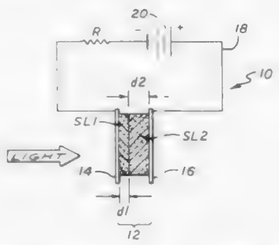
SEMICONDUCTOR-TO-METAL OPTICAL SWITCH FOR POWER LIMITATION IN THE INFRARED

Brian M. Pierce, Moreno Valley; George D. Lawrence, Los Angeles; David B. Chang, Tustin and Jonathan W. Arenberg, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 21, 1991, Ser. No. 748,170

Int. Cl.[5] H01L 40/14

U.S. Cl. 250—211 R **12 Claims**



1. A device for protecting a light sensitive object against high intensity light in the middle infrared spectral region comprising:

first and second transparent electrodes;

first and second semiconductor layers disposed between said first and second electrodes;

said first semiconductor layer comprising a first semiconductor material made from mercury cadium telluride and said second semiconductor layer comprising a second semiconductor material made from germanium;

means for applying an electric field to said first and second electrodes;

said first semiconductor layer being transparent to incident light and comprising means for generating conducting electrons by the absorption of photons, the resulting electrons being injected into said second semiconductor layer by said electric field;

said second semiconductor layer being transparent to incident light below a predetermined intensity and comprising means for increasing the number of conducting electrons injected from said first semiconductor layer due to the interaction of said electric field and said conducting electrons, whereby for incident light intensities above the predetermined intensity, sufficient conducting electrons are formed in said second semiconductor layer to cause a semiconductor-to-metal transition of material in said second semiconductor layer to block the incident light.

5,149,958

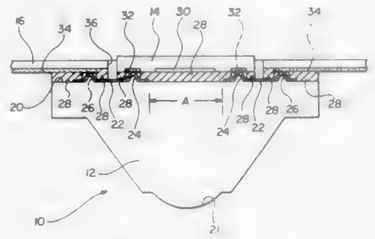
OPTOELECTRONIC DEVICE COMPONENT PACKAGE

Gary A. Hallenbeck, Fairport; Wilbert F. Janson, Jr., Shortsville, and William B. Jones, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1990, Ser. No. 626,663

Int. Cl.[5] H01J 3/14; H01L 27/14

U.S. Cl. 250—216 **17 Claims**



12. An optoelectronic device component comprising:

an optical element having a plano surface, the plano surface having raised bumps, corresponding to first bumps and second bumps, selectively formed therein, the plano surface further having a pattern of electrical conductors formed thereon, each conductor having a portion thereof overlaying a first bump and a second bump; and

a photoelectric die having an optically active portion and die bond pads on a front side thereof, the front side being attached to the plano surface of said optical element and the die bond pads being electrically connected to corresponding electrical conductors of said optical element at corresponding first bumps.

5,149,959

AIRBORNE MULTIBAND IMAGING SPECTROMETER

William E. Collins; Sheng-Huei Chang, both of Millbrook, and Mark J. Westfield, Hopewell Junction, all of N.Y., assignors to Geophysical & Environmental Research Corporation, N.Y.

Filed Apr. 15, 1991, Ser. No. 685,614

Int. Cl.[5] G01J 3/50

U.S. Cl. 250—226 **17 Claims**

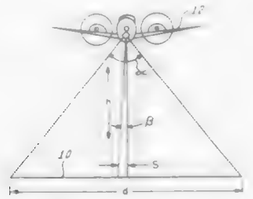
1. A geological, geophysical, and environmental survey instrument adapted for use with an airborne vehicle, comprising:

optical imaging means, comprising: wide-angle rotating mirror means having a plurality of reflective surfaces for providing a substantially continuous image with respect to time of radiant spectral emissions at a predetermined angular field of view, and first fixed mirror means for redirecting said image of spectral emissions from said rotating mirror means through an aperture to collimating means for providing a collimated output thereof;

spectrometer means, comprising second fixed mirror means angularly disposed for directing said collimated output to

first beam splitter means, said first beam splitter means integrally located in the optical path of said collimating means for receiving said output and for providing at least first and second bands of spectral emissions having different predetermined wavelengths to diffraction grating means, said diffraction grating means selectively responsive to a corresponding one of said at least first and second bands of spectral emissions for providing a predetermined angular dispersion of said spectral emissions at said different predetermined wavelengths, the number and bandwidth of said dispersed spectral emissions selected for maximizing a detection threshold for a given noise equivalent temperature difference;

detector means, comprised of a plurality of photoresponsive sensing elements configured in a line array, each of said sensing elements so constructed and adapted for responding to a given bandwidth of spectral emissions and spatially disposed for alignment with one of said angularly dispersed spectral emissions, said sensing elements being



incrementally spaced in proportion to a given wavelength to which each of said elements are responsive, for providing a signal representative of a given spectral emission amplitude as a function of wavelength, said diffraction grating means and said detector means cooperating in alignment to maintain registration of said angularly disposed spectral emissions with predetermined ones of said plurality of sensing elements; and

signal processing means simultaneously operative for each of said sensing elements, comprising means for averaging and holding a detected signal at a substantially constant value to provide a continuous signal output for a predetermined period of time, means for periodically sampling said continuous signal output in synchronism with rotation of said rotating mirror means and for producing an updated sample corresponding to the interval between successive pixels as said mirror means traverses said angular field of view, and an analog-to-digital converter, thereby to provide a continuous signal output in digital form at each of said sensed spectral wavelengths.

5,149,960

METHOD OF CONVERTING SCANNER SIGNALS INTO COLORIMETRIC SIGNALS

Bruce Dunne, Westmont, Ill., and Thomas G. Stockham, Jr., Salt Lake City, Utah, assignors to R. R. Donnelley & Sons Company, Lisle, Ill.

Filed Jul. 3, 1991, Ser. No. 725,657

Int. Cl.[5] G01J 3/46

U.S. Cl. 250—226 **29 Claims**

1. A method of developing a set of colorant signals representing substantially exact amounts of colorants required to reproduce a color in a medium, comprising the steps of:

using a photosensitive device to develop a first set of color definition signals defining the color in terms of amounts of color components according to a transformation function;

processing the set of color definition signals in an iterative conversion loop wherein the loop develops a succession of sets of colorant estimates that converge toward the required exact amounts of colorants; and

selecting a set of colorant estimates that meets a solution criterion as the set of colorant signals.

5,149,961

METHOD AND APPARATUS FOR OPTICAL FIBER LENGTH DETERMINATION

Timonthy G. Arnold, Windsor, and Arthur J. Barlow, Alton, both of England, assignors to EG&G, Ltd., Wokingham, England

Filed Apr. 24, 1991, Ser. No. 693,108

Claims priority, application United Kingdom, Aug. 24, 1990, [illegible]

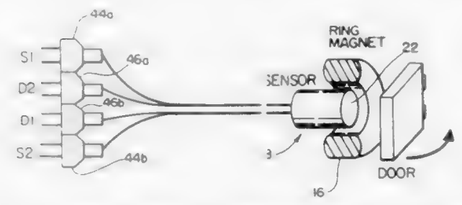
Int. Cl.[5] H01J 5/16

U.S. Cl. 250—227.11 **11 Claims**

1. Apparatus for measuring optical fiber length comprising:

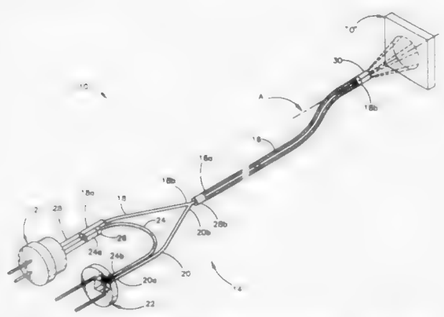
a light source for launching a light signal into an optical fiber under test, detector means at a remote end of said fiber for responding to said light source, time detector means for responding to the output of said detector, first modulation means defining a first modulation frequency, means responsive to said first modulation means for producing first and second light modulation signals each differing in frequency from the first modulation frequency by a fixed amount, light modulation means for modulating said light signal by said first and second light modulation signals, means for responding alternately to the phase of the output of said detector means indicative of the light signal modulated by of each of the first and second light modulation signals, whereby the output of said time detector has a phase responsive to the effective length of the fiber, a phase sensitive detector receiving as a signal input an output of said time detector means, a second modulation source comprising a low frequency modulation means providing a second modulation frequency for determining the alternation of response by said time detector and for providing a reference input to said phase sensitive detector for enabling said phase sensitive detector to provide an output indicative of a proportion of the time detector output in phase with said second modulation frequency.

5,149,961
PROXIMITY DETECTOR USING FARADAY EFFECT AND BIDIRECTIONAL TRANSMISSION
Lisa B. Maurice, Jericho, Vt., assignor to Simmonds Precision Products, Inc., Akron, Ohio
Filed Jun. 3, 1991, Ser. No. 709,627
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.17 17 Claims



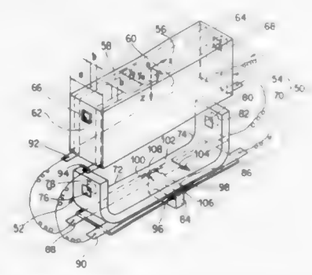
1. A proximity detector for detecting position of a ferrous target comprising a permanent magnet providing a magnetic field portion that changes in response to movement of the target, and a magneto-optic sensor that detects said magnetic field portion change, said magneto-optic sensor including a magneto-optic material positioned within said magnetic field portion, a pair of photoelectric devices with each of said devices emitting light of a predetermined wavelength when an electrical signal is applied thereto and producing an electrical output signal when light is incident thereon, a pair of optic fibers with each of said fibers having one end positioned to couple light to and from a respective one of said photoelectric devices and an opposite end adjacent to a respective polarizer, means that transmit polarized light bi-directionally along an optical path through said magneto optic material, said magneto-optic material rotating said light angle of polarization in relation to said magnetic field portion; and signal processing means to detect said polarization angle rotation based on said photoelectric devices output signals.

5,149,963
FIBER-OPTIC POSITION SENSOR INCLUDING PHOTOVOLTAIC BI-CELL
William L. Hassler, Jr., El Toro, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio
Filed Jul. 3, 1990, Ser. No. 547,903
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.21 20 Claims



1. A device for sensing position of an object comprising:
(a) a light source;
(b) a light detector that produces signals proportional to intensity of light incident on said detector, said detector being a photovoltaic bi-cell that produces electrical signals proportional to the intensity of incident light thereon, and having first and second discrete regions for sensing incident light, said first region sensing incident reference light from said light source, and said second region sensing incident light reflected from the object;
(c) a fiber-optic bundle for transmitting light from said source to the object along a first light path, for transmitting light reflected from the object to said detector along a second light path, and for transmitting reference light from said source to said detector; and
(d) means for processing said detector signals to determine positions of the object.

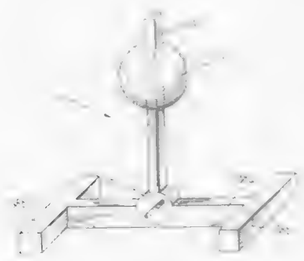
5,149,964
MICROWAVE INTERACTION MODULE, IN PARTICULAR FOR AN ATOMIC OR MOLECULAR BEAM RESONATOR
Pierre Thomann, Fontainemelon, Switzerland, assignor to Oscilloquartz S.A., Neuchatel, Switzerland
Filed Nov. 21, 1990, Ser. No. 616,534
Claims priority, application Swaziland, Nov. 24, 1989. 04213/89-6
Int. Cl.[5] H01S 1/00
U.S. Cl. 250—251 9 Claims



1. A microwave interaction module for reacting atomic or molecular particles with a radiofrequency magnetic field comprising:
a magnetic shielding enclosure formed of a cylindrical part having a rectangular base closed at its extremities by an entry plate and an exit plate, said plates each having an aperture for the passage of a beam of particles through the shielding enclosure along an axis parallel to the axis of the cylinder,
a constant magnetic field source comprising a plurality of parallel coils arranged inside the enclosure and designed to be connected to an electrical source outside the enclosure, and
an electromagnetic cavity to create a radiofrequency electromagnetic field along the path of the particles,
wherein each coil is formed of one or several electrical conductors, the two extremities of each electrical conductor passing through said enclosure and the extremities of the conductors being connected to each other and being designed to be connected to the electrical source to form parallel coils traversed by the same current, said electrical connectors being arranged in symmetrical manner in relation to a plane (PS) parallel to the plane of the coils and containing the bundle of particles.

5,149,965
PRECISION RADIOGRAPHY SCALING DEVICE
Lloyd A. Marks, Bryn Mawr, Pa., assignor to Temple University, Philadelphia, Pa.
Filed Apr. 23, 1990, Ser. No. 512,844
Int. Cl.[5] G01B 15/00
U.S. Cl. 250—252.1 10 Claims

1. A method for scaling a radiograph of a target structure within a three dimensional radiographic image field of a radiographic camera comprising placing at least one radiopaque sphere of known dimensions in said three dimensional radiographic image field at a location previously occupied by said target structure when said target structure radiograph was taken and then making a radiograph of said spherical object

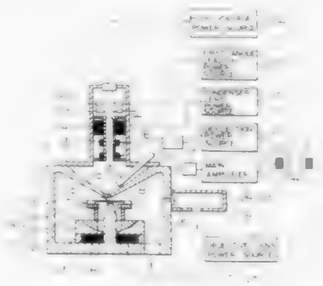


with said camera, thereafter calculating a first dimension to be determined in said target structure radiograph by comparing said first dimension to the known dimension of said spherical object in the radiograph thereof.

5,149,966
APPARATUS AND METHOD FOR THE ABSOLUTE DETERMINATION OF THE ENERGY OF A ION BEAM
Marco Silari, Milan, and Claudio Birattari, Bresso, both of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy
Filed Apr. 10, 1991, Ser. No. 682,963
Claims priority, application Italy, Apr. 11, 1990, 19986
Int. Cl.[5] H01J 37/00
U.S. Cl. 250—309 12 Claims

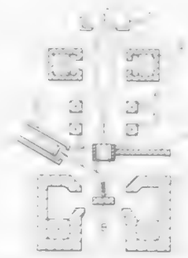
1. Apparatus for determining the kinetic energy E_i of a particle beam, such as ions, and particularly light weight ions, comprising a vacuum scattering chamber and computer means, said scattering chamber consisting of a fixed section and a mobile section pivotable with respect to the fixed one, the two sections being connected to each other and vacuum proof, wherein the fixed section is operatively connectable to a line of an incident particle beam and comprises a target, consisting of a sheet, with a thickness of a few μm, of a suitable material formed of molecules consisting of atoms with light weight nuclei, and atoms with heavy nuclei, suitable to elastically and inelastically scatter said particles, and wherein the mobile section comprises means for detecting charged particles and means for transducing the signals supplied by said detector means into electrical signal indicative of the energy possessed by particles elastically and inelastically scattered by said target for preselected angular positions of the mobile section with respect to the fixed one, or scattering angles θ, said fixed section being joined to a plate provided with a graduated scale, said mobile section being fastenable to said plate by micrometric registration means which regulate its angular position with respect to the fixed section, said computer means for determining the kinetic energy E_i of said incident particle beam being programmed for receiving data relating to selected physical values of said particle beam and data relating to said selected angular positions of said mobile section with respect to the fixed one and to the relative values of the energy possessed by the elastically scattered particles and the energy possessed by the inelastically scattered ones from said target, to derive from said data a crossover angle (θ_c) in which the energy possessed by the elastically scattered particles equals that possessed by the inelastically scattered particles, and with the aid of selected relativistic kinematics relationships, the value of the kinetic energy E_i possessed by the incident particle beam.

5,149,967
CHARGED-PARTICLE BEAM APPARATUS
Tadashi Otaka, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 10, 1990, Ser. No. 594,947
Claims priority, application Japan, Oct. 13, 1989, 1-265088
Int. Cl.[5] H01J 37/20
U.S. Cl. 250—310 60 Claims



1. A specimen stage mounted inside an objective lens having a magnetic pole projecting from a bottom wall of the lens, for use in a charged particle beam apparatus, said specimen stage comprising:
inclination means supported by said bottom wall of the lens and having a space in which the magnetic pole is inserted for adjusting and angle of inclination of a specimen; and
a specimen holder supported on said inclination means.

5,149,968
SCANNING ELECTRON MICROSCOPE
Mitsugu Sato, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 6, 1991, Ser. No. 755,844
Claims priority, application Japan, Sep. 6, 1990, 2-234357
Int. Cl.[5] H01J 37/28, 37/244
U.S. Cl. 250—310 7 Claims



1. A scanning electron microscope for detecting a secondary electron from a sample by a secondary electron detector disposed above an objective lens and obtaining an observation image, comprising:

shield means for shielding an electric field on an optical axis by said secondary electron detector; and

moving means for moving selectively said shield means to a first position at which said shielding means shields the electric field on said optical axis and to a second position at which collection of the secondary electron by said electric field is promoted.

5,149,969

INFRARED SURVEILLANCE DEVICE

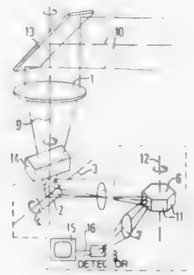
Jean-Pierre Fouilloy, Velizy, and Fernand R. Loy, Sceaux, both of France, assignors to Thomson-TRT Defense, Guyancourt, France

Filed Jun. 14, 1984, Ser. No. 640,146

Claims priority, application France, Jun. 14, 1983, 83 09821

Int. Cl.[5] G02B *26/10, 26/08, 23/02*

U.S. Cl. 250—334 9 Claims



1. A thermographic scanner of a field of view of a scene observed by an infrared thermographic system, said scanner comprising:

a first optomechanical means including (a) at least one infrared detector located in a plane, (b) an entrance objective means, having an optical axis, for focusing infrared radiation on said plane of at least one infrared detector, (c) rapid scan means for providing rapid line scanning, and (d) raster scanning element means in a first mode of operation for incrementally adjusting successive scan lines in a direction perpendicular to said scan lines;

a second optomechanical means including (a) means for changing direction of infrared radiation from said scene to said optical axis of said entrance objective, (b) derotator means, and (c) means for rotating said changing means about said optical axis at a first speed, for rotating said derotator means at a second speed equal to one-half said first speed, and for orienting said derotator means at a first initial predetermined angle with respect to said changing means in a first mode of operation, and for orienting said derotator means at a second initial predetermined angle with respect to said changing means in a second mode of operation such that scan lines in said second mode of operation are orthogonally arranged with respect to scan lines during said first mode of operation, independent of said changing means position.

5,149,970

DUAL-BAND OPTOELECTRONIC IMAGING APPARATUS INCLUDING A "VENETIAN BLIND" DICHROIC PLATE ARRANGEMENT

Colin G. Whitney, Agoura Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

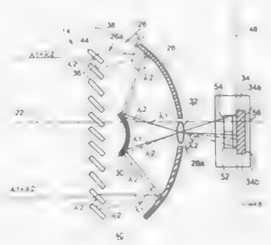
Filed Sep. 26, 1991 Ser. No. 765,798

Int. Cl.[5] G01J *3/36*

U.S. Cl. 250—339 25 Claims

1. A dual-band optical imaging apparatus for producing first and second optical images of a scene including first and second electromagnetic radiation in first and second optical wavelength bands respectively received from the scene, comprising:

an assembly of inclined dichroic plates which transmit the first radiation therethrough in a first direction and reflect the second radiation therefrom in a second direction which is deviated from the first direction by a predetermined angle; and



optical means for focussing the transmitted first radiation and reflected second radiation at a focal plane to produce the first and second optical images respectively;

said predetermined angle being selected such that the first and second optical images are laterally displaced from each other by a predetermined distance in the focal plane.

5,149,971

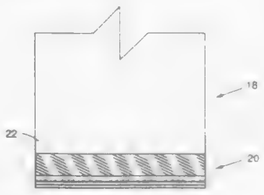
SCINTILLATOR ASSEMBLY FOR ALPHA RADIATION DETECTION AND METHOD OF MAKING THE ASSEMBLY

Stephanie A. McElhaney; Martin L. Bauer, both of Oak Ridge, and Marion M. Chiles, Koxville, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Jan. 16, 1991, Ser. No. 642,252

Int. Cl.[5] G01T *1/20;* **C09K** *11/54*

U.S. Cl. 250—361 R 19 Claims



1. A scintillator assembly for use in the detection of alpha radiation comprising:

an optically transparent body having a front surface against which alpha particles desired to be detected impinge, said body having a phosphor layer embedded within the front surface;

a thin layer of opaque material disposed directly upon the embedded phosphor in the front surface for preventing ambient visible light from entering the body through the front surface; and

a layer of protective material, which is transparent to alpha particles moving through the protective material layer, disposed directly upon the opaque material layer to provide the assembly with a damage-resistant window.

5,149,972

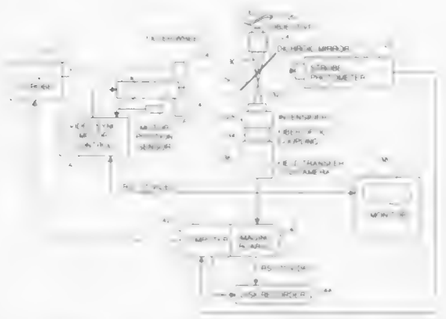
TWO EXCITATION WAVELENGTH VIDEO IMAGING MICROSCOPE

Frederic Fay, Worcester, Mass., and Fernando Dellaville, Philadelphia, Pa., assignors to University of Massachusetts Medical Center, Worcester, Mass.

Filed Jan. 18, 1990, Ser. No. 466,889

Int. Cl.[5] G01N *21/64*

U.S. Cl. 250—461.1 9 Claims



1. An apparatus for measuring the concentration of an ion in a sample comprising:

a fluorescent imaging microscope;

a uv radiation source capable of producing a plurality of uv excitation wavelengths;

a filter device to select a first and a second excitation wavelength from said plurality of uv excitation wavelengths, said first excitation wavelength capable of exciting fluorescence by said ion in one valence state and said second excitation wavelength capable of exciting fluorescence by said ion in a second valence state;

a sample chamber to hold a sample for illumination by said radiation of said first and second wavelengths;

a photometer to measure the intensity of the excitation wavelength being selected by said filter device and to generate an intensity signal representative of the measured intensity;

a beam splitter to direct a portion of the intensity of said selected wavelength onto said sample to be measured and to direct a second portion of the intensity of said selected wavelength onto said photometer;

optical elements to collect the fluorescent light emitted by said sample;

an image intensifier positioned to receive the fluorescent light collected by said optical elements and to produce a intensified image of said sample;

a video camera to view the intensified image and to produce an electronic signal representative of a frame of said image;

a frame digitizer to digitize said frame of said electronic signal;

a synchronizer in communication with said filter device and said video camera to synchronize the selection of one of said excitation wavelengths with the beginning of the production of said frame of said electronic signal by said video camera; and

a processor in communication with said uv radiation source and said photometer to control the intensity of said uv radiation source and to record the intensity signal produced by said photometer, said computer also in communication with said frame digitizer to process the frame digitized by said frame digitizer and store the processed results on a disk.

5,149,973

APPARATUS FOR WIRING SEMICONDUCTOR DEVICE USING ENERGY BEAM AND WIRING METHOD BY USING THE SAME

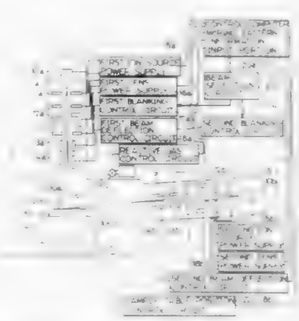
Hiroaki Morimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha

Filed Jun. 28, 1991, Ser. No. 723,094

Claims priority, application Japan, Jul. 2, 1990, 2-175799

Int. Cl.[5] H01J *37/317*

U.S. Cl. 250—492.2 9 Claims



1. A semiconductor device wiring apparatus for forming a wiring on a semiconductor device through irradiation with an energy beam by supplying such a reactive gas as forms a conductive material constituting a wiring by irradiation with an energy beam, said semiconductor device wiring apparatus comprising:

first beam generating means for generating said first energy beam,

first beam emitting means for emitting the first energy beam generated by said first beam generating means to form a first wiring,

second beam generating means for generating a second energy beam disposed at such a position that the emission direction of the same crosses the emission direction of the first energy beam generated from said first beam generating means,

second beam emitting means for emitting the second energy beam generated from said second beam generating means to form a second wiring on the side surface of said first wiring, and

emission controlling means for controlling said first and second beam emitting means to control irradiation operations with said first and second energy beams.

5,149,974

GAS DELIVERY FOR ION BEAM DEPOSITION AND ETCHING

Steven J. Kirch, Lagrangeville, N.Y.; James P. Levin, Jericho, Vt., and Alfred Wagner, Brewster, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1990, Ser. No. 605,601

Int. Cl.[5] G01J *37/317*

U.S. Cl. 250—492.2 11 Claims

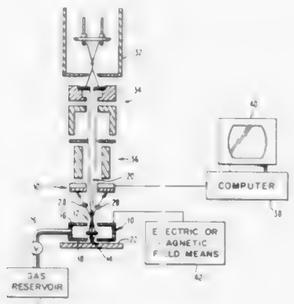
1. An ion beam structure for specimen imaging and modification comprising:

a gas container means disposed over a target specimen, said container means having an upper side with first aperture therein and a lower side with a second aperture therein co-linear with said first aperture,

an ion beam generator for generating a focussed ion beam, said beam generator disposed over said gas container means wherein said ion beam passes through said first and second apertures onto said specimen,

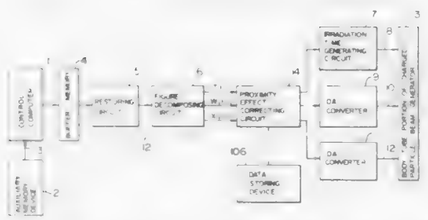
a gas supply means connected to said container for introduc-

ing into said gas container means a gas containing a species to be adsorbed onto said specimen surface, wherein said gas contains said species passes through said second aperture on said lower side of said container means and exits



said container in order to be adsorbed onto said specimen surface and wherein said ion beam decomposes said adsorbed gas on said target specimen for deposition at very small local position.

5,149,975
PATTERN FABRICATION METHOD USING A CHARGED PARTICLE BEAM AND APPARATUS FOR REALIZING SAME
Haruo Yoda, and Fumio Murai, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 29, 1991, Ser. No. 647,562
Claims priority, application Japan, Jan. 31, 1990, 2-19028
Int. Cl.[5] H01J 37/304
U.S. Cl. 250—492.2 22 Claims



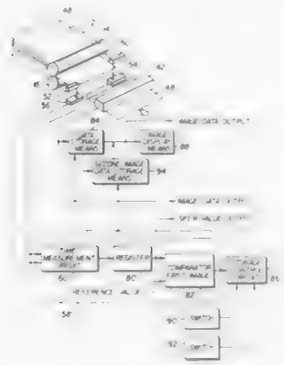
1. A method of exposing a pattern on a surface of a sample using a charged particle beam comprising:
a step of dividing the surface where the pattern should be formed into predetermined partial regions and storing the pattern area density in each of said partial regions in the form of pattern density map data; and
a step of correcting exposure dose with said charged particle beam previously set for every irradiation unit, referring to said pattern density map data at the irradiation with said charged particle beam, in order to suppress the proximity effect.

5,149,976
CHARGED PARTICLE BEAM PATTERN GENERATION APPARATUS AND METHOD
Dale M. Sipma, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 31, 1990, Ser. No. 576,577
Int. Cl.[5] H01J 37/302
U.S. Cl. 250—492.2 32 Claims

1. A charged particle beam system comprising:
means for generating a charged particle beam;
beam deflecting means for deflecting the beam across a target;
a control system for the beam which includes means for controlling the beam deflecting means to deflect the beam through a sequence of successive pixel locations, and to dwell at each of said pixel locations for controlled dwell times, and
means for adjusting the beam dwell time for different pixel locations,
wherein said means for controlling the beam dwell time includes means for establishing an initial dwell time for the first pixel in a sequence of pixels, and for adjusting the beam dwell time by a set of predetermined increments for successive pixels in said sequence to establish a predetermined dwell time gradient over said sequence.

5,149,977
DOCUMENT READER APPARATUS
Kikuo Mita, Yokohama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 21, 1991, Ser. No. 659,219
Claims priority, application Japan, Jun. 1, 1990, 2-143924
Int. Cl.[5] G60K 9/00
U.S. Cl. 250—556 11 Claims

1. A document reader apparatus comprising:
image data reading means for optically reading and converting an image of a document to image data represented by electrical signals;
first image data storage means for storing the image data;
image quality judgement means for (a) detecting the orientation of a predetermined edge of the document being fed to the image data reading means, (b) providing a primary judgement of the acceptability of the image data of the document acquired by the image data reading means, and (c) providing a first control signal to the first image data storage means when the image data is primarily judged as being of acceptable quality for causing said acceptable quality image data to be outputted, and a second control signal to the first image data storage means when the image data is primarily judged as being of unacceptable quality; and
image display means for providing on a monitor display screen a readout of the image data which is primarily

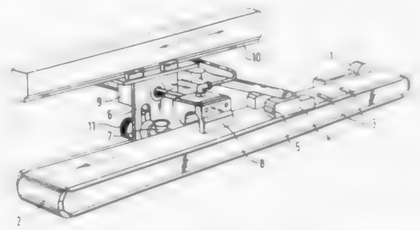


judged as being of unacceptable quality in response to the second control signal from the image quality judgement means for providing a secondary visual judgement as to whether such primarily judged unacceptable quality image data is visually deemed acceptable or unacceptable.

5,149,978
APPARATUS FOR MEASURING GRAIN SIZES IN METALIZED LAYERS
Jon Opsal, Livermore, and Allan Rosencwaig, Danville, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.
Filed Dec. 7, 1990, Ser. No. 624,036
Int. Cl.[5] G01N 21/86, 15/02
U.S. Cl. 250—560 16 Claims

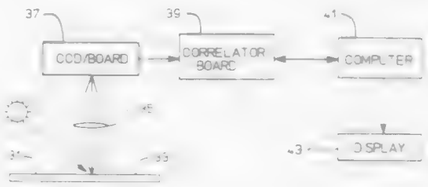
9. A method for evaluating grain sizes on the surface of the sample, wherein the grains have irregular shapes, said method comprising the steps of:
generating a probe beam;
scanning the probe beam with respect to the surface of the sample an amount sufficient to cross a plurality of grain boundaries;
measuring the power of the reflected probe beam as a function of the position of the probe beam on the surface of the sample; and
evaluating the sizes of the grains on the sample surface based on the probe beam power measurements by determining the average distance on the sample between locations where the power measurement drops below a predetermined threshold level to derive the average grain size.

5,149,979
SAGGER LOADING APPARATUS AND A METHOD OF LOADING A SAGGER
George A. Harrow, 4 Rhyd-yr-Helyg, Swansea, United Kingdom PCT No. PCT/GB89/00405, § 371 Date Aug. 30, 1990, § 102(e) Date Aug. 30, 1990, PCT Pub. No. WO89/10525, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 18, 1989, Ser. No. 566,420
Claims priority, application United Kingdom, Apr. 18, 1988, 8809124; Sep. 13, 1988, 8821421
Int. Cl.[5] G01N 21/86, 9/04
U.S. Cl. 250—561 34 Claims



1. Apparatus for loading a sagger with a plurality of unfired ceramic bodies, which apparatus comprises:
(a) at least one array of pins arranged such that each said pin can receive a respective one of said bodies;
(b) first transfer means for taking said unfired ceramic bodies individually and in succession each to one of said pins in said array to be located thereby; and
(c) second transfer means for simultaneously removing a plurality of said bodies located on said array of pins, and for subsequently depositing said bodies into said sagger.

5,149,980
SUBSTRATE ADVANCE MEASUREMENT SYSTEM USING CROSS-CORRELATION OF LIGHT SENSOR ARRAY SIGNALS
John Ertel, Portola Valley; William D. Holland, Palo Alto; Kent D. Vincent, Cupertino; Rueiming Jamp, Los Altos, and Richard R. Baldwin, Saratoga, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 1, 1991, Ser. No. 786,495
Int. Cl.[5] G01N 21/86
U.S. Cl. 250—561 28 Claims



1. A method for determining the distance of advance in a selected direction of a sheet of paper or other substrate, the method comprising the steps of:
illuminating a selected surface of the substrate with light of at least a predetermined light strength signal at a predetermined angle;
providing N light sensors, positioned in a linear array and uniformly spaced apart by a distance d along the linear array, that each receive and sense the signal strength of light issuing from the selected surface at a predetermined optical magnification factor MF and provide a first array

of light strength signals $s_1(k)$ ($k=1, 2, \ldots, N$), where N is a selected integer >2;

allowing the substrate to move in the selected direction;

allowing the array of sensors to each receive and sense a second array of light strength signals $s_2(k)$ ($k=1, 2, \ldots, N$), for light issuing from the selected surface, after the substrate has moved;

forming the cross-correlation function

$$C(K) = \sum_{k=1}^{L} s_1(k+i-1)s_2(k+K-1)$$

$$(K = 1, \ldots, N-L+1)$$

of the first and second arrays of light strength signals, where L is a predetermined integer satisfying $1 \leqq L < N$ and i is a selected integer satisfying $1 \leqq i \leqq N$, and determining the value of the integer $K=K_O$ that produces the largest value of the cross-correlation function value C(K); and

determining that the substrate has moved an approximate distance $D=(MF)(K_O-i)d$ in the selected direction.

5,149,981

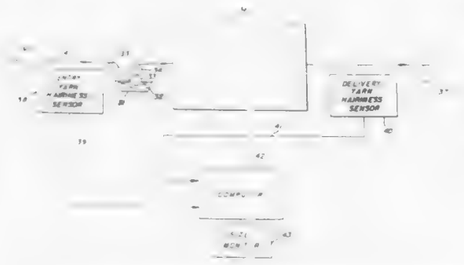
METHOD FOR MONITORING SIZE ENCAPSULATION OF YARN BY DETERMINING HAIRINESS OF THE YARN

Charles F. Strandberg, Jr., 202 Longview Rd., High Point, N.C. 27260, and Robert C. Strandberg, 1718 Aftonshire Dr., Greensboro, N.C. 27410

Continuation of Ser. No. 472,116, Jan. 30, 1990, Pat. No. 5,043,590, which is a continuation-in-part of Ser. No. 428,992, Oct. 30, 1989, Pat. No. 5,072,691. This application Jul. 1, 1991, Ser. No. 723,752

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—571 **22 Claims**



1. A method for quantifying size encapsulation of yarn on a slasher comprising the steps of:

a. measuring the hairiness of yarn at the entry of a slasher prior to the application of size to the yarn,

b. measuring the hairiness of yarn at delivery from the slasher, and

c. solving the equation:

$$\text{Size Encapsulation} = 360\left(1 - \frac{\text{Hairiness at Delivery}}{\text{Hairiness at Entry}}\right)\text{degrees.}$$

5,149,982

FOREIGN PARTICLE INSPECTION APPARATUS

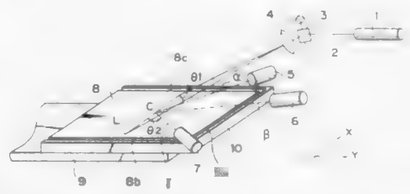
Tsuneyuki Hagiwara, Tokyo, and Fuminori Hayano, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 694,083, May 1, 1991, abandoned. This application Jan. 21, 1992, Ser. No. 825,811

Claims priority, application Japan, May 7, 1990, 2-117384

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—571 **11 Claims**



1. A foreign particle inspection apparatus for detecting any foreign particle present on a transparent object to be inspected, comprising:

applying means having a light source obliquely emitting a light beam onto one surface of said object;

moving means for moving said object and said light beam relative to each other for the scanning of an area of said surface by said light beam;

a photoelectric converter having a light receiving surface disposed to oppose said surface of said object and at least one end of said object, said photoelectric converter receiving scattered light from said foreign particle incident on said light receiving surface and outputting an electrical signal conforming to the intensity of the received light; and

a light intercepting member disposed for intercepting light propagated in said object from said scanning area toward said end of said object, that would otherwise be transmitted through said end and travel externally of said object to said light receiving surface.

5,149,983

METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF AT LEAST ONE MATERIAL IN A FLUID MEDIUM MIXED MATERIALS

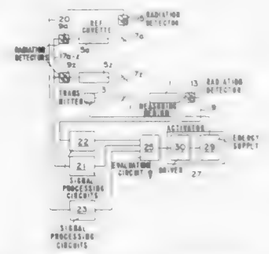
Heinz J. Kaiblinger, Munich, Fed. Rep. of Germany, assignor to Chlean Plants & Engineering Establishment, Vaduz, Liechtenstein

Filed Oct. 12, 1990, Ser. No. 596,376

Claims priority, application Switzerland, Sep. 7, 1990, 2913/90

Int. Cl.[5] G01N *15/06, 21/00*

U.S. Cl. 250—575 **8 Claims**



1. Method for determining the concentration of at least one material within a fluid in a measuring medium (1), wherein the at least one material has a radiation frequency absorption range from an absorption maximum region to a low absorption region, comprising

transmitting a first radiation having a frequency (f_1) in the range of the radiation absorption maximum of said material, and transmitting at least one second radiation with a frequency (f_2) lying in the low radiation absorption region of said material, along the same path through said measuring medium (1);

detecting the transmitted first and second radiations after passing through said measuring medium (1) by means of a detector (13) and converting the detected radiations into proportional electrical signals;

transmitting said first and second radiations (f_1, f_2) in the transmitting step as pulses with the same constant repetition frequency ($1/T_N$) in alternating fashion;

maintaining the pulse intervals between the pulses of said first and said second radiations (f_1, f_2) constant with respect to each other, and the time dependent intensity course of the pulses of said first and second radiations so as not to overlap each other;

dividing out a portion of the first and second radiations before entering said measuring medium;

placing a reference fluid containing a known concentration of said at least one material, the concentration of which is to be measured in said fluid in the measuring medium (1), in a reference volume (5*a*, . . . 5*z*);

passing the divided out portion of the first and second radiations through the reference volume (5*a*, . . . 5*z*) containing the reference fluid;

detecting the divided out portion of the first and second radiations after passing through said reference volume (5*a*, . . . 5*z*) and converting the detected radiations into proportional electrical signals;

demodulating said electrical signals from the detected first and second radiations passed through said measuring medium (1), and demodulating said electrical signals from the detected divided out portion of the first and second radiations passed through said reference volume (5*a*, . . . 5*z*);

integrating over a time span said electrical signals corresponding to the pulses of the first and second radiations (f_1, f_2) passed through said measuring medium (1) and said electrical signals corresponding to the divided out portion of the first and second radiations passed through said reference volume (5*a*, . . . 5*z*); and

comparing the integrated values of said electrical signals of said pulses of said first and said second radiations (f_1, f_2) with one another in an evaluating circuit and determining the concentration of the said at least one material in the fluid is the measuring medium (1).

5,149,984

ELECTRIC POWER SUPPLY FOR USE DOWNHOLE

Roger L. Schultz, Richardson; Kevin R. Manke, Flower Mound; Neal G. Skinner, Lewisville; William L. Bohan, Garland, and Allen R. Young, Arlington, all of Tex., assignors to Halliburton Company, Dallas, Tex.

Filed Feb. 20, 1991, Ser. No. 658,478

Int. Cl.[5] F03B *13/02, 13/10;* **F01B** *23/10*

U.S. Cl. 290—54 **30 Claims**

1. A downhole electrical power supply apparatus, comprising:

a high fluid pressure source zone defined at least partially in said apparatus;

a low fluid pressure discharge zone defined at least partially in said apparatus;

a fluid powered engine means, for providing a rotational mechanical output powered by fluid flowing from said source zone through said engine means to said discharge zone;

a fluid supply valve means between said source zone and said discharge zone for controlling flow of fluid from said source zone through said engine means; and

electrical power generating means for converting said rotational mechanical output of said engine means into electrical output.

5,149,985

TWO-BATTERY SUPPLY FOR OPERATING AND WAITING MODES OF A CARPHONE

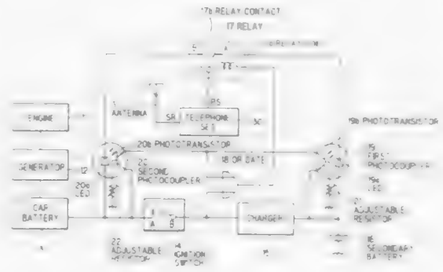
Ryuhei Fujiwara, Tokyo, Japan, assignor to NEC Corporation

Filed Oct. 31, 1990, Ser. No. 606,986

Claims priority, application Japan, Oct. 31, 1989, 1-283557

Int. Cl.[5] H02J *9/06*

U.S. Cl. 307—10.7 **12 Claims**



10. An apparatus for controlling a power supply to an electric machine in a vehicle, comprising:

primary power supply means for supplying power to electric equipment;

secondary power supply means for supplying power to said equipment;

means for detecting a waiting or operating condition of said equipment to provide a condition signal; and

means responsive to said condition signal for selectively supplying power from one of said primary and secondary power supply means to said equipment.

5,149,986

ELECTRONIC CONTROL BUTTON OPERATED BY SOUND ABSORPTION

Vincent P. Jalbert, Middlebury, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation-in-part of Ser. No. 368,696, Jun. 20, 1989, abandoned. This application Dec. 12, 1990, Ser. No. 626,390

Int. Cl.[5] H01H *35/00;* **H03K** *17/94;* **B66B** *3/00;* **G08B** *7/06*

U.S. Cl. 307—117 **24 Claims**

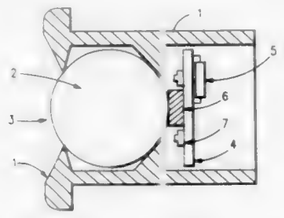
4. A touch button for controlling a function, said touch button comprising:

a source of sound waves;

a body having a target area for contact by a user, said body allowing sound waves generated by said sound source to

be transmitted therethrough, said body allowing at least a portion of the transmitted sound waves to be reflected back through said body;

a receiver to sense the reflected sound waves;



monitoring means operatively connected to said receiver for monitoring the received sound waves and generating a signal to affect the controlled function when a predetermined amount of sound waves are absorbed at said target area, indicating the presence of a user at said target area

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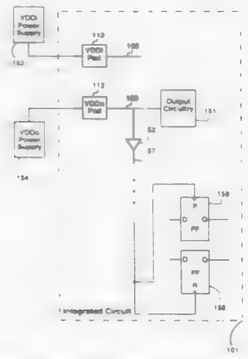
5,149,987

PROVISION OF CIRCUIT RESET WITHOUT A DEDICATED I/O PIN

William C. Martin, Carrollton, Tex., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 19, 1991, Ser. No. 747,892
Int. Cl.[5] H03K *19/003*
U.S. Cl. 307—272.3 **12 Claims**



1. An electronic device which is reset using a reset line internal to the electronic device, electronic device comprising:

internal logic circuitry;

an internal logic power signal input to the electronic device,

an internal logic power signal line, coupled to the internal logic power signal input and to the internal logic circuitry, the internal logic power signal line being used to deliver an internal logic power signal to the internal logic circuitry;

a plurality of outputs;

a plurality of output drivers, coupled to the plurality of outputs and to the internal logic circuitry, the plurality of output drivers buffering output signals generated by the internal logic circuitry and placed on the plurality of outputs;

an output power signal input to the electronic device;

an output power signal line, coupled to the output power signal input and to the plurality of output drivers, the output power signal line being used to deliver an output power signal to the output drivers; and, a reset line, coupled to the output power signal line and the internal logic circuitry, the reset line being used to reset the internal logic circuitry;

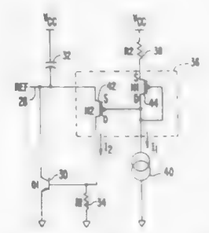
wherein a reset cycle is begun by placing the internal logic power signal on the internal logic power signal line while placing a ground signal on the output power signal line and the reset cycle is completed by placing the output power signal on the output power signal line.

5,149,988

BICMOS POSITIVE SUPPLY VOLTAGE REFERENCE

Douglas D. Smith, Puyallup, and Terrance L. Bowman, Sumner, both of Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 287,967, Dec. 21, 1988, abandoned.
This application Nov. 7, 1990, Ser. No. 610,724
Int. Cl.[5] G05F *3/20*
U.S. Cl. 307—296.6 **12 Claims**



1. A reference circuit for producing a reference voltage level from a positive voltage supply, comprising:

means, coupled to said positive voltage supply, for establishing a first voltage level at a node;

an output transistor having a first output electrode coupled to a reference circuit output providing an output of said reference voltage level and having a second output electrode coupled to a second voltage supply;

control circuit means, connected to each of said node, said first output electrode and a control electrode of said output transistor, for providing said first voltage level from said node to said reference circuit output, increasing a current provided to said control electrode in response to an increase in said reference voltage level and decreasing the current to said control electrode responsive to a decrease in said reference voltage level; and

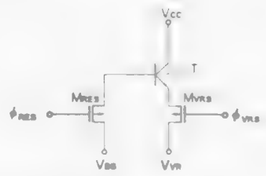
a capacitor coupling said first output electrode to said positive voltage supply.

5,149,989

METHOD FOR RESETTING A PHOTO-ELECTRIC CONVERTER

Takahiro Oguchi, Atsugi, and Hayao Ohzu, Fuchu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,372
Claims priority, application Japan, Dec. 14, 1989, 1-322737
Int. Cl.[5] H04N *9/00*
U.S. Cl. 307—311 **8 Claims**



1. An image pickup device comprising:

a) a transistor having a plurality of main electrodes and one control electrode;

b) first switch means connected to said control electrode and driven by a first pulse, for resetting said control electrode to a first potential;

c) second switch means connected to a first main electrode and driven by a second pulse, for resetting said first main electrode to a second potential; and

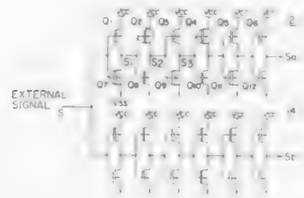
d) control means for causing said second switch means to reset said first main electrode to the second potential, then causing said first switch means to reset said control electrode to the first potential, and then causing said second switch means to again reset said first main electrode to the second potential in order to reset said transistor.

5,149,990

SEMICONDUCTOR DEVICE FOR PREVENTING MALFUNCTION CAUSED BY A NOISE

Hirokazu Yamazaki, Kawasaki, and Masanobu Yoshida, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 18, 1991, Ser. No. 642,837
Claims priority, application Japan, Jan. 19, 1990, 2-011577
Int. Cl.[5] H03K *17/16, 19/003*
U.S. Cl. 307—443 **19 Claims**



1. A semiconductor device comprising:

first buffer means for receiving an external signal of said semiconductor device, shaping a waveform of said external signal to produce a first output signal for performing an active/stand-by control of an internal circuit of said semiconductor device, said first buffer means having a response characteristic to a change from an active state to a stand-by state of said external signal which is slower than a response characteristic to a change from said stand-by state to said active state; and

second buffer means for receiving said external signal of said semiconductor device, shaping the waveform of said external signal to produce a second output signal for performing an active/stand-by control of an output circuit of said semiconductor device, said second buffer means having a response characteristic to a change from an active state to a stand-by state or from a stand-by state to an active state of said external signal which is faster than the response characteristic to the change from said active state to said stand-by state of said external signal in said first buffer.

5,149,991

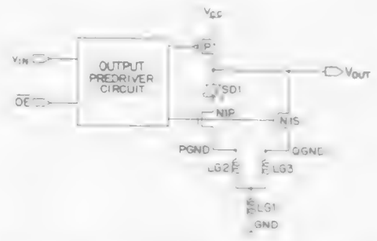
GROUND BOUNCE BLOCKING OUTPUT BUFFER CIRCUIT

Alan C. Rogers, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 6, 1991, Ser. No. 711,313
Int. Cl.[5] H03K *17/16, 19/20*
U.S. Cl. 307—443 **14 Claims**

1. An output buffer circuit having an input (V_{IN}) for receiving data signals of logic high and low potential levels, an output (V_{OUT}) for delivering data signals propagated through the buffer circuit, a relatively large current carrying capacity primary pulldown transistor element (N1,N1P) coupled to the output for discharging a relatively large sinking current from the output (V_{OUT}) through a sinking current path to a low potential power ground rail (GND,PGND) including parasitic ground rail lead inductance (LG,LG1,LG2), and pullup means (P1) coupled to the output for sourcing current to the output (V_{OUT}) from a high potential power supply rail (V_{CC}), said output buffer circuit being subject to ground bounce pulses in the ground rail (GND,PGND), comprising:

diode means (SD1,D1,ND1,NSC) coupled in the sinking current path in series with the primary pulldown transistor element (N1,N1P) between the buffer circuit output (V_{OUT}) and the low potential power ground rail (GND,PGND), said diode means being oriented for passing sinking current to the low potential ground rail (GND,PGND) and for blocking transfer to ground bounce pulses in the ground rail (GND, PGND) to the



output (V_{OUT}) thereby protecting quiet outputs of similar buffer circuits coupled to the same ground rail;

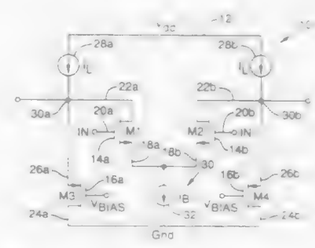
said power ground rail (GND) of the output buffer circuit comprising a relatively noisy output ground lead (PGND) and a relatively quiet ground lead (QGND) relatively inductively isolated from each other, said primary pulldown transistor element (N1P) being coupled to the relatively noisy output ground lead (PGND) and further comprising a secondary pulldown transistor element (N1S), said primary and secondary pulldown transistor element having control nodes coupled to each other, said secondary pulldown transistor element (N1S) being coupled between the output (V_{OUT}) and the relatively quiet ground lead (QGND) for discharging a secondary sinking current for pulling down the potential at the output V_{OUT} substantially to ground potential.

5,149,992

MOS FOLDED SOURCE-COUPLED LOGIC

David J. Allstot, Pittsburgh, Pa., and Sayfe Kiaei, Corvallis, Oreg., assignors to The State of Oregon Acting by and Through the State Board of Higher Education on Behalf of Oregon State University, Eugene, Oreg.

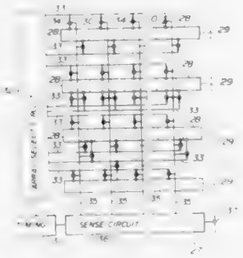
Filed Apr. 30, 1991, Ser. No. 693,532
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—448 **23 Claims**



1. An MOS logic circuit featuring reduced switching currents, the circuit comprising:

a power bus having a substantially fixed voltage, which may be zero;
first and second MOS input transistors connected in a source-coupled arrangement and each having an input and an output;
first and second MOS output transistors connected in a common-gate arrangement and each having an input coupled to an output of an MOS input transistor;
a first constant current source coupling the power bus to the first MOS input transistor and to the first MOS output transistor; and
a second constant current source coupling the power bus to the second MOS input transistor and to the second MOS output transistor;
wherein overlap currents and displacement currents are prevented from generating large noise spikes.

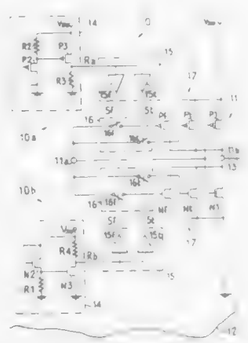
5,149,993
CIRCUIT ARRANGEMENT OF SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Hideo Kikuchi, and Tetsu Tanizawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 11, 1990, Ser. No. 599,595
Claims priority, application Japan, Oct. 13, 1989, 1-266661
Int. Cl.[5] H01L *25/00*
U.S. Cl. 307—465.1 **18 Claims**



1. A circuit arrangement of a semiconductor integrated circuit device comprising:
logic cell arrays arranged into columns, each of the logic cell arrays having a plurality of logic cells, each of said logic cells having at least one monitor point;
select lines carrying select signals, each specifying a corresponding one of said logic cell arrays;
read lines carrying monitor signals showing logic states of monitor points of said logic cells, said select lines and said read lines being provided so that the total number of said select lines and read lines is less than the sum total of the number of said logic cell arrays and a maximum number of monitor points contained in one of said logic cell arrays; and
switch elements connecting the monitor points of said logic cells to said read lines in response to said select signals.

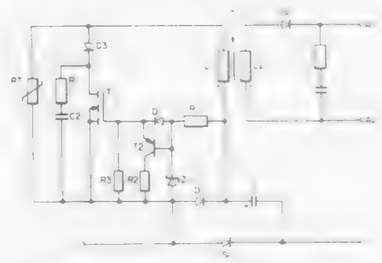
5,149,994
METHOD AND APPARATUS FOR COMPENSATING INHERENT NON-UNIFORMITY OF ELECTRICAL PROPERTIES AMONG MOS INTEGRATED CIRCUITS
Georges Neu, Mariel sur Mauldre, France, assignor to Bull S.A., Paris, France
Filed Dec. 11, 1990, Ser. No. 625,945
Claims priority, application France, Dec. 15, 1989, 89 16596
Int. Cl.[5] H03F *1/30*
U.S. Cl. 307—491 **11 Claims**

4. Apparatus for compensating inherent non-uniformity of the electrical properties of a field effect transistor (P1) in an integrated circuit (12) among a plurality of integrated circuits so as to provide a constant output current,
producing a reference signal (Ra) representing conduction of a reference transistor (P2) of the integrated circuit;
defining a conduction threshold (Tt, Tf);
comparing the reference signal with the conduction threshold; and
producing a compensating current if the reference signal does not reach the conduction threshold the apparatus comprising:



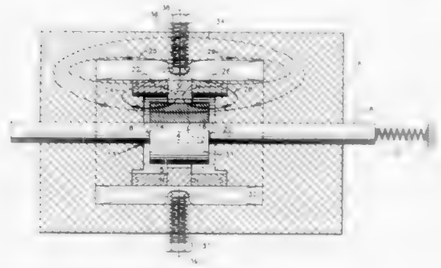
a reference circuit for producing a reference signal representing conduction of a reference transistor of the integrated circuit;
a threshold circuit, responsive to the reference signal, for providing at least one constant threshold;
a switch (16), responsive to the threshold circuit; and
a compensating circuit (17), controlled by the switch, the compensating circuit comprising at least one current path (Pt, Pf) parallel to that of field effect transistor (P1) and selected by the switch.

5,149,995
ELECTRICAL CIRCUIT FOR THE SWITCH-OFF RELIEF OF A CONTROLLABLE SEMICONDUCTOR SWITCH
Hans G. Hofgräff, Hopzkirchen, Fed. Rep. of Germany, assignor to Transtechnik GmbH, Fed. Rep. of Germany
Filed Sep. 19, 1990, Ser. No. 585,313
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1989, 3931729
Int. Cl.[5] H03K *17/72*
U.S. Cl. 307—633 **4 Claims**



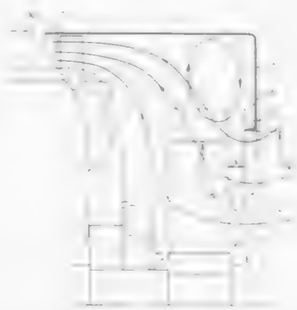
1. An energy feedback thyristor circuit comprising:
a gate turn-off thyristor switchable between on and off states;
a first diode connected in series combination with a storage capacitor and said series combination connected in parallel with said gate turn-off thyristor, wherein a free diode end is connected to one end of said gate turn-off thyristor and a free storage capacitor end is connected to the other end of said gate turn-off thyristor;
a transformer having a primary winding and a secondary winding;
a controllable discharge switch;
one end of said primary winding connected intermediate said first diode and storage capacitor in said series combination and the other end of said primary winding connected to one end of said controllable discharge switch;
the other end of said controllable discharge switch connected to said free diode end; and
a control circuit having an output operatively coupled to said controllable discharge switch, and having an input coupled to said first diode for responding to the voltage polarity across said first diode;
said control circuit closing said controllable discharge switch when a voltage polarity in reverse bias direction is applied to said first diode during switching on of said gate turn-off thyristor, and opening said controllable discharge switch when a voltage polarity forward bias direction is applied to said first diode during switching off of said gate turn-off thyristor for storing an inductive energy within said transformer during said switching on of said gate turn-off thyristor by enabling a current to flow through said primary winding for discharging said storage capacitor and for interrupting said current flow through said primary winding for discharging the energy stored in said transformer through said secondary winding.

5,149,996
MAGNETIC GAIN ADJUSTMENT FOR AXIALLY MAGNETIZED LINEAR FORCE MOTOR WITH OUTWARDLY SURFACED ARMATURE
Mark A. Preston, South Hadley, Mass., and Frederick W. Stingle, Simsbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Feb. 5, 1990, Ser. No. 474,960
Int. Cl.[5] H02K *41/02, 35/06*
U.S. Cl. 310—12 **9 Claims**



1. A linear force motor comprising:
a housing, having an elongated chamber therewithin;
an armature, arranged within said chamber for axial displacement therealong, having first and second exterior armature faces substantially perpendicular tot he direction of said axial displacement, wherein a first gap is formed between said first exterior armature face and a first end of said chamber and a second gap is formed between said second armature face and an other end of said chamber;
means for providing a counter force on said armature varying linearly with displacement of said armature;
a first axially magnetized permanent magnet, for establishing a first axial magnetic field passing through said first gap and said first face and for establishing a first leakage magnetic field;
a second axially magnetized permanent magnet, for establishing a second axial magnetic field passing through said second gap and said second face and for establishing a second leakage magnetic field, wherein said second axial field magnetically opposes said first axial field and wherein the ratio of the magnitude of the magnetomotive force of said second axial field of the magnitude of the magnetomotive force of said first axial field is substantially equal to the ratio of the square of magnetic reluctance experienced by said second fields to the square of magnetic reluctance experienced by said first fields;
means, responsive to an electrical signal, for providing a variable magnetic field which varies according to the magnitude of said electrical signal and which passes through said first and second gaps and said first and second armature faces; and
means for variably positioning one or more ferromagnetic slugs within said leakage fields, whereby the gain of said motor varies according to the position of said slugs.

5,149,997
FAN FOR AN ELECTRICALLY OPERATED MACHINE
Martti Suomela, Vantaa, Finland, assignor to ABB Stromberg Drives Oy, Helsinki, Finland
PCT No. PCT/FI90/00182, § 371 Date Jan. 3, 1992, § 102(e) Date Jan. 3, 1992, PCT Pub. No. WO91/01586, PCT Pub. Date Feb. 7, 1991
PCT Filed Jul. 12, 1990, Ser. No. 778,113
Claims priority, application Finland, Jul. 14, 1989, 893435
Int. Cl.[5] H02K *9/06, 9/00*
U.S. Cl. 310—63 **3 Claims**



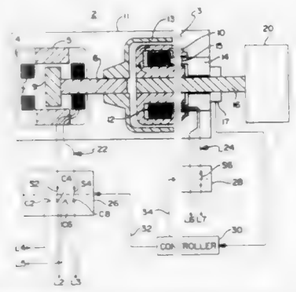
1. A fan for an electrically operated machine, comprising a propeller (1) arranged axially about the machine and including a hub (8) and several blades attached to it and projecting substantially radially from it; and a cover (2) surrounding the propeller (1) in the front and on the sides and comprising a suction opening (3) on the suction side of the propeller (1) and an opening (7) on the pressure side for passing ventilation air into the machine parts to be cooled, characterized by the combination of the following features:
the blades (9) have a radius of curvature (R) and they are attached to the hub (8) at a blade angle (α) between 25° and 70°;
a gap (S) defined between the suction opening (3) or a cylindrical extension (5) thereof and the blades (9) of the propeller (1) in the axial direction is no more than 20% of the outer diameter of the propeller (1);
the inner diameter (D_A) of the suction opening (3) before the propeller (1) is 0.8 to 1.6 times the outer diameter (D_S) of the propeller; and
the inner diameter of the cover (2) is at least 1.2 times the outer diameter (D_S) of the propeller or the inner diameter (D_A) of the suction opening, depending on which one of them is larger.

5,149,994

EDDY CURRENT DRIVE DYNAMIC BRAKING SYSTEM FOR HEAT REDUCTION

John H. Wolcott, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 23, 1991, Ser. No. 749,086
Int. Cl.[5] F16D 63/00; H02K 49/04, 7/104
U.S. Cl. 310—105 8 Claims



1. A dynamoelectric machine braking system for reduced drive motor heating comprising:
a dc power source for supplying dc electrical power;
an ac power source for supplying ac electrical power;
an ac electric drive motor having a motor output shaft and a motor coil electrically connected to said ac power source;
an eddy current coupling comprising, a rotor member rotatable about an axis of rotation, an inductor means drivingly attached to said motor output shaft and rotatable about said axis of rotation relative to said rotor member, a coupling coil means connected to said ac power source for producing an electromagnetic field thereby electromagnetically coupling said rotor member and said inductor means, an output shaft having a first end connected to said rotor member and a second end connectable to an inertial load whose motion is to be braked;
motor switch means for connecting said motor to said ac power source and for connecting said motor to said dc power source; and
control means for controlling the state of said motor switch means and for directing said ac power source to said coupling coil means when the amplitude of said ac power source directed to said coupling coil means is reduced to substantially zero thereby decoupling said rotor member from said inductor drum and when said control means directs said motor switch means to connect said motor coil to said dc power source until the rotational speed of said motor is substantially reduced in value, and wherein said control means increases the amplitude of said ac power source to said coil means to electromagnetically recouple said rotor member to said inductor drum thereby effectuating a braking action on said inertial load while dissipating an increased quantity of heat in said eddy current coupling.

5,149,999

POWER TOOL WITH IMPROVED INTERNAL WIRING STRUCTURE

Kimitaka Abo, Mito; Yoshio Osada, and Junichi Kikuchi, both of Katsuta, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 617,103
Int. Cl.[5] H01R 39/38; H02K 13/00
U.S. Cl. 310—239 5 Claims

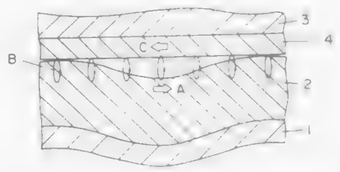
5. A power tool comprising a housing having a longitudinal axis and an end face, a commutator motor in said housing having an output shaft extending in the direction of the axis for driving a load implement of the tool, said commutator motor including a stator with a stator winding wound around it and first and second electrically conductive brush holders secured to said housing and respectively holding therein first and second brushes, the motor including first and second output leads, an internal wiring structure electrically connecting said stator winding and said brush holders, said internal winding structure including first and second electrically insulating terminals, a first electrically insulating terminal board in said housing having a planar face at right angles to the longitudinal axis, the planar face being located on one end of said motor, said first terminal board carrying first and second terminals respectively connected to said first and second output leads, said first and second terminals extending in the direction of the axis, a second electrically insulating terminal board in said housing having a planar face at right angles to the longitudinal axis located between the first terminal board and the housing end face, said second terminal board carrying third and fourth terminals extending in the direction of the axis and being in confronting relation with the first and second terminals, respectively, the first and third terminals being snap engaged to provide an electrical connection between them, the second and fourth terminals being snap engaged to provide an electrical connection between them, and power line leads held in situ by the second terminal board electrically and mechanically connected to the third and fourth terminals.

5,150,000

ULTRASONIC MOTOR

Yoshinobu Imasaka, Higashiosaka; Hiroshi Yoneno, Shiki, and Masanori Sumihara, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., LTD, Osaka, Japan

Continuation-in-part of Ser. No. 259,703, Oct. 19, 1988, abandoned. This application Feb. 6, 1990, Ser. No. 477,198
Claims priority, application Japan, Oct. 20, 1987, 62-262854; Oct. 21, 1987, 62-266793; Nov. 11, 1987, 62-284533; Feb. 9, 1988, 62-27974; Mar. 29, 1988, 63-75450; Jun. 8, 1988, 63-141097
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—323 6 Claims



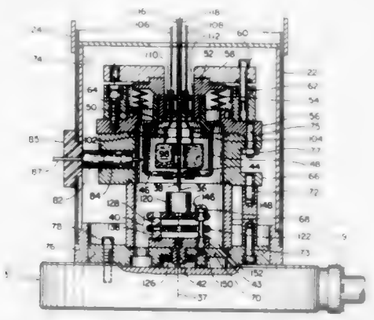
1. In an ultrasonic motor wherein a moving body is contacted under a pressure on a vibrating body on which a piezoelectric body is disposed, and ultrasonic traveling-wave is produced on said piezoelectric body and said vibrating body by inputting high-frequency electric power of ultrasonic frequency to said piezoelectric body, and by this, said moving body is driven by means of wave-front of said traveling-wave through a friction means, the improvement wherein said moving body or the contact surface of said moving body consists essentially of a composite plastic resin material containing at least carbon fiber in an amount of more than 5 weight percent, fluorocarbon resin powder in an amount of more than 5 weight percent, and a matrix resin.

5,150,001

FIELD EMISSION ELECTRON GUN AND METHOD HAVING COMPLEMENTARY PASSIVE AND ACTIVE VACUUM PUMPING

Albert V. Crewe, Palos Park, Ill., assignor to Orchid One Corporation, Palos Hills, Ill.

Filed Apr. 10, 1990, Ser. No. 508,292
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] H01J 7/18
U.S. Cl. 313—7 3 Claims



1. A differential pressure electron beam system, comprising:
system vacuum enclosure means defining a system vacuum enclosure;
means for evacuating said system vacuum enclosure to a predetermined vacuum level; and
a modular encapsulated high brightness source of electrons comprising:
source vacuum enclosure means defining a source vacuum enclosure, said source vacuum enclosure means defining a differential pressure aperture communicating with said system vacuum enclosure,
a high brightness cathode within said source vacuum enclosure requiring an ultra high vacuum environment for efficient operation,
non-evaporable getter means located within said source vacuum enclosure and immediately adjacent said high brightness cathode for pumping said source enclosure to an ultra high vacuum level, and
supplemental ion pump means coupled to said source vacuum enclosure and functioning simultaneously with said non-evaporable getter means for pumping from said source vacuum enclosure argon, hydrocarbons and other gases not removed, or not removed efficiently, therefrom by said non-evaporable getter means.

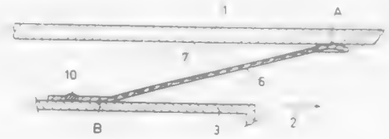
5,150,002

ELECTRON TUBE WITH ELECTRODE CENTERING ARRANGEMENT

Willem Van der Hoeck; Piet C. J. Van Rens, and Johannes A. Rebergen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 647,196, Sep. 4, 1984, abandoned. This application Jan. 30, 1989, Ser. No. 304,891
Claims priority, application Netherlands, Sep. 12, 1983, 8303145
Int. Cl.[5] H01J 19/48
U.S. Cl. 313—417 12 Claims

1. An electron tube including a tubular glass envelope portion having an electrode system slidably supported therein by a plurality of pretensioned metallic spring elements, each of said spring elements having a first end attached to the electrode system and extending angularly therefrom, generally in a direction of insertion of the electrode system into the tubular glass envelope portion, to a second end thereof which slidably presses against an inner wall surface of the envelope portion;
characterized in that the first end of each of the spring elements is affixed to the electrode system at a first point, the second end of each of said spring elements slidably contacts the inner wall surface at a second point, and each of said spring elements is shaped such that:
1) in a relaxed state, before insertion into the envelope portion, an effective length of said spring element extending from the first point to the second point has a predefined curve including at least one bend and arcuate portion on each side of said bend for establishing a



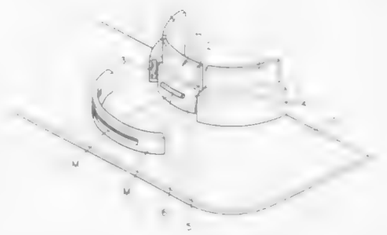
predetermined normal force F_r at the second point, perpendicular to the inner wall surface, when in the pretensioned state; and
2) in the pretensioned state, after insertion into the envelope portion, said spring element is centered substantially along a straight line over its effective length;
said shape ensuring that the normal force F_r, acting through the second point against pressure applied by the spring element, and a frictional force F_f, acting against a force applied to cause sliding of the second end along said inner wall surface, collectively produce a resultant force acting along the effective length of the spring element and having substantially no component acting perpendicularly to said effective length, thereby substantially preventing flexing of the spring element during insertion of the electrode system into the envelope portion

5,150,003

SEPARATOR FOR DEFLECTION YOKE

Hyunjeong Shin, Hwasung, Rep. of Korea, assignor to Samsung Electronics, Kyunggi, Rep. of Korea

Filed Feb. 6, 1991, Ser. No. 651,556
Claims priority, application Rep. of Korea, Apr. 19, 1990, 90-5004
Int. Cl.[5] H01J 29/70
U.S. Cl. 313—440 3 Claims



1. A separator for a deflection yoke which is used as a neck holder surrounding the neck of a cathode ray tube comprising:
a flange with a semicircular hole on one side which is as large as the neck of a cathode ray tube;
two curved members, where a lower portion is perpendicularly attached to said flange, with a circumferentially raised reinforcing portion containing an insertion slot

formed on an outer surface of aid lower portion of said curved members;

an intermediate curved member with a raised lower portion substantially flush with said insertion slot of said curved members and a guide projection on said raised lower portion formed in the circumferential direction and is in alignment with the center line of said insertion slot; and

a correcting means for correcting the convergence of electronic beams, wherein said correcting means has a centered elongated guide slot formed in the lengthwise direction to allow said correcting means to slide along said guide projection.

5,150,004

CATHODE RAY TUBE ANTI-GLARE COATING

Hua Sou Tong, Mundelein, and Gregory Prando, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 558,993, Jul. 27, 1990, abandoned. This application Oct. 27, 1990, Ser. No. 602,522
Int. Cl.[5] H01J *31/00, 29/88*
U.S. Cl. 313—479 49 Claims

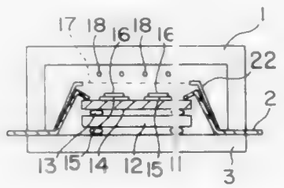
25. A CRT having a surface with reduced gloss comprising a CRT having a coating on the surface thereof, said coating being provided by applying fine droplets of a solution consisting essentially of a silane and a saturated hydrocarbon in a solvent system comprising an alcohol and water onto the surface of said CRT and curing the silane and saturated hydrocarbon for a period of time sufficient to convert said silane to a siloxane coating on the surface of said cathode ray tube.

5,150,005

VACUUM FLUORESCENT DISPLAY PANEL HAVING AN ALKALI-FREE GLASS PLATE

Shinji Yokono, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 11, 1990, Ser. No. 596,545
Claims priority, application Japan, Oct. 12, 1989, 1-266944
Int. Cl.[5] H01J *31/15, 63/02*
U.S. Cl. 313—495 3 Claims



1. A vacuum fluorescent display panel comprising:

a first glass member;

an intermediate glass plate bonded on said first glass member by using a first adhesive material;

an alkali-free glass plate bonded on said intermediate glass plate by using a second adhesive material, said alkali-free glass plate being provided with thin film transistors and anode-phosphor layers formed thereon;

grid electrodes arranged above said anode phosphor electrodes;

cathodes arranged above said grid electrodes;

a second glass member coupled with said first glass member to form a vacuum envelope; and

lead-out electrodes extending from a junction part and connected to electrodes within said vacuum

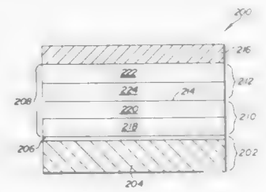
wherein the coefficient of linear expansion of said intermediate glass plate is lower than the coefficient of linear expansion of said first glass member, and is higher than the coefficient of linear expansion of said alkali-free glass plate.

5,150,006

BLUE EMITTING INTERNAL JUNCTION ORGANIC ELECTROLUMINESCENT DEVICE (II)

Steven A. Van Slyke, Rochester; Philip S. Bryan, and Frank V. Lovecchio, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1991, Ser. No. 738,777
Int. Cl.[5] H01J *1/63*
U.S. Cl. 313—504 34 Claims



1. An internal junction organic electroluminescent device comprised of, in sequence, an anode, an organic hole injecting and transporting zone, an organic electron injecting and transporting zone, and a cathode,

CHARACTERIZED IN THAT said organic electron injecting and transporting zone is comprised of

an electron injecting layer in contact with the cathode and,

interposed between the electron injecting layer and the organic hole injecting and transporting zone, a blue emitting luminescent layer comprised of an aluminum chelate of the formula:

$(R^5\text{-}Q)_2\text{-Al-O-L}$

where

Q in each occurrence represents a substituted 8-quinolinolato ligand,

R^2 represents an 8-quinolinolato ring substituent chosen to block sterically the attachment of more than two substituted 8-quinolinolato ligands to the aluminum atom,

L is a phenyl or aromatic fused-ring moiety which can be substituted with hydrocarbon groups such that L has from 6 to 24 carbon atoms.

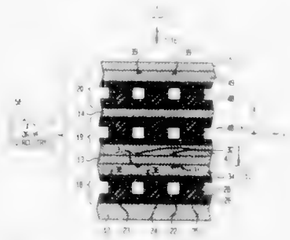
11. An internal junction organic electroluminescent device according to claim 10 further characterized in that the electron donating substituents are independently chosen from the group consisting of —R′, —OR′ and —N(R″)R′, where R′ is a hydrocarbon containing up to 6 carbon atoms and R″ is hydrogen or R′ and the electron accepting substitutents are each independently chosen from among electron accepting cyano, halogen, and α-haloalkyl, α-haloalkoxy, amido, sulfonyl, carbonyl, carbonyloxy and oxycarbonyl substituents containing up to 6 carbon atoms.

5,150,007

NON-PHOSPHOR FULL-COLOR PLASMA DISPLAY DEVICE

Nicholas C. Andreadakis, Whitehouse Station, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation of Ser. No. 522,227, May 11, 1990, abandoned. This application May 16, 1991, Ser. No. 702,443
Int. Cl.[5] H01J *1/00*; H05B *53/00*; G09G *1/00*
U.S. Cl. 313—586 1 Claim



1. A display device comprising:

means including four parallel spaced-apart substrates defining three separate spaces each for containing a gas that, when activated, respectively emits light of a specified color, each of said spaces being defined between facing surfaces of an adjacent pair of substrates,

a parallel electrode array formed on each facing surface of said substrates, the two electrode arrays associated with each gas space being orthogonally disposed with respect to each other,

a parallel rib array formed on each facing surface of said substrates, the two rib arrays associated with each gas space being orthogonally disposed with respect to each other, orthogonal pairs of said ribs defining at their intersections multiple individual cells of said display device, the cells in each space being respectively aligned with corresponding cells in the other spaces to form three-cell sets constituting full-color picture elements,

the orthogonal electrode arrays associated with each gas space defining a matrix having multiple intersections that respectively correspond with the locations of said cells,

and means for applying electrical signals to said electrode arrays to cause the gas in selected ones of said cells to be activated,

wherein the gases in said spaces respectively emit, when activated, red, green and blue light,

wherein said rib array is made of dielectric material,

wherein each cell contains dielectric material overlying portions of the electrode array associated with that cell, and

wherein each electrode of each of said parallel electrode arrays includes a relatively high-conductivity optically opaque portion and an adjacent relatively low-conductivity optically transparent portion, the optically transparent portion of each electrode being aligned with the cells that are associated with that electrode to permit viewing of light emitted from the associated cells.

5,150,008

PLUG-IN TYPE ELECTRICAL BULB APPARATUS

Shang-Lun Lee, No. 190, Nai-Ta Road, Hsin-Chu City, Taiwan

Filed May 22, 1991, Ser. No. 703,912
Int. Cl.[5] H01J *5/48*; H01R *33/00*
U.S. Cl. 315—71 1 Claim

1. An alternating current electrical bulb apparatus comprising:

a bulb having a filament sealed therein and a plug-in end having first and second elastic conductive wires extending from the filament through said plug-in end;

a head portion including a bulb seat and a metal head, said bulb seat including a recess adapted to receive said plug-in end of said bulb;

said metal head including a head portion and a center terminal, generally centered in said head portion;

said bulb seat and said metal head being rigidly affixed to each other;

first and second elastic plates disposed within said recess in said bulb seat for electrically contacting said first and second conductive wires on said plug-in end of said bulb;

a third conductive wire and a third conductive plate disposed in said head portion and engageable with said pair of elastic plates;

said third conductive plate providing an electrical connection between said bulb seat and said metal head;

said third conductive wire being connected from said second conductive plate to said center terminal;

a diode connected in series with said third conductive wire such that said alternating current supplied to said electrical bulb apparatus is converted to a direct current of a lower voltage between said first and second elastic plates

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5,150,009

GLOW DISCHARGE LAMP

Michael R. Kling, Stratham, N.H., and William J. Roche, Merrimac, Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Aug. 30, 1991, Ser. No. 753,246
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—107 8 Claims

1. A glow discharge lamp having an electronic circuit for regulating lamp output according to changing environmental conditions comprising:

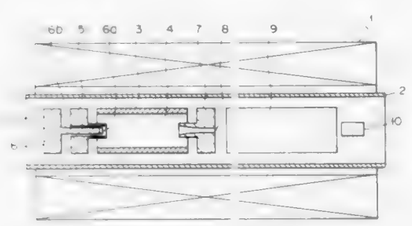
a light transmitting envelope containing mercury and a noble gas fill;
an anode disposed in said envelope having a single lead-in wire;
a cathode lamp filament located within said envelope having a pair of lead-in wires;
a power lamp circuit electrically connected between said anode lead-in wire and said cathode for creating a lamp voltage;
a filament power circuit electrically connected to said pair of cathode lamp filament lead-in wires for creating a filament voltage whereby said lamp voltage decreases with an increasing filament voltage;
a sensing and control circuit including a lamp start up circuit for limiting control circuit current and voltage during startup, said sensing and control circuit being adapted for adjusting the filament voltage in accordance with changing environmental conditions for maintaining lamp voltage at a predetermined constant value from about 11 to about 16 volts; and
said sensing and control circuit including means for detecting lamp voltage in excess of said predetermined value and means responsive to said detecting means for increasing said filament voltage for reducing said lamp voltage to said predetermined value.

5,150,010

DISCHARGE-IN-MAGNETIC-FIELD TYPE ION GENERATING APPARATUS

Katsuhiro Kageyama, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 13, 1991, Ser. No. 669,025
Claims priority, application Japan, Mar. 14, 1990, 2-62912
Int. Cl.[5] H01J *33/00*
U.S. Cl. 315—111.81 11 Claims



1. An ion generating apparatus comprising:
a vacuum container connected to a vacuum unit;
magnetic field generating means, for generating magnetic field to be applied into said vacuum container;
a positive pole, having a hollow part whose ends are opened and, which is disposed in said magnetic field such that a center line of said hollow part is in parallel with a direction of said magnetic field;
a first negative pole, disposed opposite to one opening of said hollow part, which has a rodlike part extending toward said positive pole and coaxial with the center line of said hollow part;
a second negative pole, disposed opposite to another opening of said hollow part, which has an ion injecting hole located at a positive where an axis of said second negative pole intersects with said center line of said hollow part;
a control electrode disposed either between said positive pole and said first negative pole or between said positive pole and said second negative pole; and
means for applying a highest electric potential of all the electrode and poles to said positive pole, and an electric potential higher than those of said first and second negative poles to said control electrode.

at least either said control electrode or said second negative pole further comprises:
a cylinder having a through hole coaxial with said hollow part, said cylinder having first and second ends; and
a platelike part provided on the first end of said cylinder, wherein
said cylinder has a part made of at least one kind of metal belonging to a group consisting essentially of vanadium, chromium, niobium, molybdenum, tantalum and tungsten; and
at least one of said control electrode, said first negative pole, and said second negative pole has a part made of titanium.

5,150,011

GAS DISCHARGE DISPLAY DEVICE

Yoshihiro Fujieda, Osaka, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 4, 1991, Ser. No. 664,199
Claims priority, application Japan, Mar. 30, 1990, 2-86570
Int. Cl.[5] G09G *3/10*
U.S. Cl. 315—169.4 9 Claims

1. A gas discharge display device having a plasma display panel provided with a transparent front plate, a rear plate facing said front plate, dielectric partitions arranged in a direction for partitioning a discharging space into discharge paths, a group of stripe-shaped first electrodes each positioned between a pair of said dielectric partitions and acting as an anode, a group of stripe-shaped second electrodes arranged in a direction intersecting another direction, along which each of said first electrodes extends, and acting as cathodes and a third electrode covered with a dielectric layer and provided at a rear side of said group of said second electrodes, a discharge cell being provided in crossing portions of said first and second electrodes, said gas discharge display device further comprising a reset electrode provided in a region contiguous to said group of said second electrodes and a driving circuit connected to said first, second, third and reset electrodes for applying a voltage to cause a displaying discharge to predetermined ones of said first electrodes to thereby cause displaying discharges in a period when said group of said second electrodes are serially scanned, for further applying a negative pulse to said third electrode and also for applying a positive pulse to said first electrode to make said dielectric layer store electric charge during a vertical blanking interval in which said group of said second electrodes are not scanned, and moreover cause scanning discharges between the stored charges and said second electrodes during said group of said second electrodes are serially scanned, and for changing an electric potential of said reset electrode in a period from a moment, at which an electric potential of said third electrode is changed, to another moment, at which the serial scan of said second electrodes is commenced, so that a reset discharge is caused between said reset electrode and each of said predetermined ones of said first electrodes and thus an electric potential of said predetermined ones of said first electrodes is made to have a predetermined value, wherein said third electrode is a single conductive film, and said third electrode and said dielectric layer are provided to an area corresponding to an entire area of a displaying region of said gas discharge display device.

5,150,012

LOW PRESSURE XENON LAMP AND DRIVER CIRCUITRY FOR USE IN THEATRICAL PRODUCTIONS AND THE LIKE

David A. Pringle, 16749 Bollinger Dr., Pacific Palisades, Calif. 90272; David McDonald, Canyon Country, Calif., and Zhong F. Yan, Shanghai, China, assignors to David A. Pringle, Pacific Palisades, Calif.

Filed Jun. 7, 1991, Ser. No. 712,868
Int. Cl.[5] H05B *41/36*
U.S. Cl. 315—200 A 10 Claims

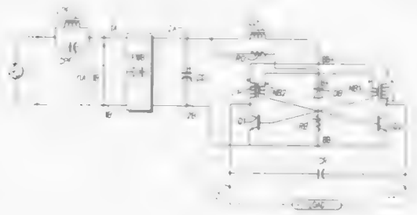
1. A high intensity lighting system for use in producing relatively short bursts of intense light, said system comprising:
(a) a lamp containing xenon gas at a pressure less than atmospheric when at room temperature;
(b) an igniter;
(c) switching means connected in series with said lamp and with said igniter, said switching means coupling said lamp and said igniter to a source of electrical power in response to a control signal; and
(d) control means for generating said control signal, said control means including manually operated switch means for controlling when said control signal is turned on and turned off and further including means for limiting the on time period of said control signal to a predetermined maximum time period.

5,150,013

POWER CONVERTER EMPLOYING A MULTIVIBRATOR-INVERTER

Andrzej Bobel, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1991, Ser. No. 696,422
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—209 R 19 Claims



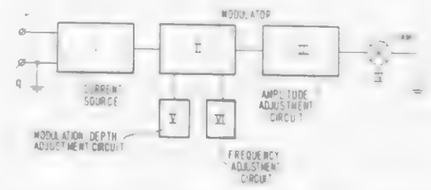
1. Ballasting means for gas discharge lamps comprising: a source of relatively low frequency AC voltage; a DC voltage supply means powered from said source of AC voltage and operable to provide a unidirectional voltage between positive and negative terminals; a multivibrator-inverter connected with said pair of DC terminals and operable to provide a relatively high frequency sinewave AC voltage between a first inverter output terminal and a second inverter output terminal, said multivibrator-inverter having a plurality of magnetically independent LC resonant circuits and said multivrator-inverter being operable to periodically and in predetermined phase relation connect each of the magnetically independent LC resonant circuits means with said DC terminals; and output circuit means connected with said inverter output terminals and operable to connect with and to power said lamps wherein said multivibrator-inverter means comprises: at least two power switching transistor means having respective bases, emitters and collectors; at least two magnetically independent LC resonant circuit means (i) in which the tank capacitor means is common for said LC resonant circuits, (ii) said LC resonant circuits being connected in predetermined phase relation with said voltage supply terminals by way of said switching transistor means, (iii) each tank inductor means of said LC resonant circuit means is connected in circuit with collector-emitter junction of said transistor means (iv) and said tank capacitor means is connected between collectors of the transistor means; feedback control means comprising secondary windings of said two magnetically independent resonant inductors, said secondary windings being connected to said transistor means and operable to provide intermittent current to effect periodic conduction of each of said switching transistor means in predetermined phase relation, and each said periodic conduction time period is dependent on the natural resonant frequency of said L-C resonant circuits respectively, and each of said conduction periods being initiated when the emitter-collector voltage of said switching transistor means is substantially zero in magnitude; and base current control means consisting of switching diode means connected in circuit with resistor means; and said current control means being connected between first terminals of said secondary windings and emitters of said transistor means, thereby operable to provide control of forward feedback base current and to terminate said forward feedback base current supplied to bases, and provide reverse feedback current to effectively turn-off said transistor means by force evacuation of charge carriers from base-emitter junction.

5,150,014

LAMP BALLAST CONTROL CIRCUIT AND METHOD

Lukas Kastelein, Roosendaal, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1991, Ser. No. 639,495
Claims priority, application Netherlands, Jan. 29, 1990, 9000200; Jan. 29, 1990, 9000202
Int. Cl.[5] H05B *41/36*
U.S. Cl. 315—224 12 Claims



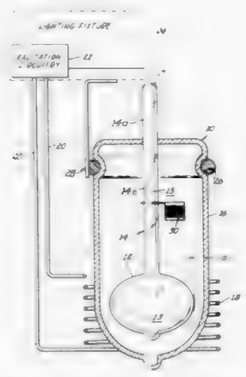
1. A circuit arrangement suitable for operating a low pressure mercury discharge lamp by means of a high-frequency current, comprising circuitry for generating the high-frequency current from a supply voltage, a modulator for modulating the high-frequency current into a substantially sinusoidally modulated current with a modulation frequency f and a modulation depth M, said current arrangement being provided with circuitry for adjusting an amplitude A averaged over a modulation period of the substantially sinusoidally modulated

current and circuitry for effecting a change in the modulation of said substantially sinusoidally modulated current.

5,150,015
ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP HAVING AN INTERGRAL QUARTZ OUTER JACKET

Raymond A. Heindl, Euclid; Mark E. Duffy; James T. Dakin, both of Shaker Heights, all of Ohio; Harald L. Witting, Burnt Hills, N.Y.; Richard C. Nagle, Euclid, Ohio, and Lawrence T. Mazza, Mayfield Heights, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1991, Ser. No. 685,371
Int. Cl.[5] H05B 41/24
U.S. Cl. 315—248 17 Claims



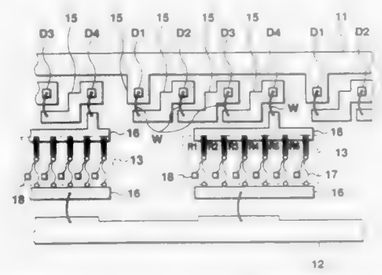
1. An electrodeless high intensity discharge lamp comprising:
an arc tube containing a fill of ionizable gas;
means for aiding in the starting of said gas discharge, said aiding means including a starting member disposed in close proximity to said arc tube and being of a dimension substantially narrower than said arc tube;
an outer jacket disposed in surrounding relation to a portion of said arc tube and only a portion of said starting member, said outer jacket being of a dimension such that a first, minimum spacing exists between said arc tube and said outer jacket and a second spacing exists between said at least a portion of said starting member and said outer jacket, said first, minimum spacing between said arc tube and said outer jacket allowing for the positioning of said exciting means in close proximity to said arc tube and said second spacing between said outer jacket and said at least a portion of said starting member allowing for thermal management of heat generated by said gas discharge, said starting member further being supported within said outer jacket without the use of metallic components; and
wherein said arc tube, said starting member and said outer jacket are composed of like non-metallic materials.

5,150,016
LED LIGHT SOURCE WITH EASILY ADJUSTABLE LUMINOUS ENERGY

Kensuke Sawase, and Hiromi Ogata, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Sep. 20, 1991, Ser. No. 763,289
Claims priority, application Japan, Sep. 21, 1990, 2-253405; Sep. 21, 1990, 2-253406; Dec. 26, 1990, 2-406620
Int. Cl.[5] H05B 37/00
U.S. Cl. 315—294 5 Claims

1. An LED light source including a plurality of LED chips, comprising:
positive and negative electrodes;
at least one LED chip row including a plurality of LED chips connected in series, one end of the LED chip row being connected to one of the electrodes; and
a resistor array connected to the LED chip row in series

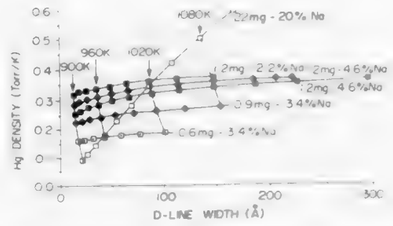


between the two electrodes, the resistor array including a plurality of resistors having different resistance values, arranged in parallel, a plurality of fuses connected in series with the respective resistors, and a plurality of trim pads connected in series with the respective resistors in parallel with the respective fuses.

5,150,017
HIGH PRESSURE SODIUM DISCHARGE LAMP

Rudy E. A. Geens, Leuven, Belgium, and Elliot F. Wyner, Peabody, Mass., assignors to GTE Products Corporation, Danvers, Mass. and GTE Sylvania N.V., Tienen, Belgium

Filed Jun. 27, 1991, Ser. No. 722,024
Int. Cl.[5] H05B 41/00
U.S. Cl. 315—326 9 Claims

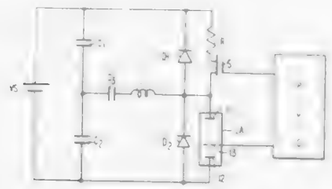


1. A high pressure sodium lamp for connection to an electrical power source, said lamp having a rate life at a normally operable rated input voltage and applied power, said lamp comprising an elongated arc tube having a pair of electrodes wherein said lamp has a lamp voltage across said electrodes during operation, said lamp being of the type wherein the concentration of sodium decreases during usage of said lamp over said rated life resulting in a corresponding increase in lamp voltage, each electrode being in sealing relationship with a respective end of said arc tube whereby said arc tube and said electrodes form a volume internal said arc tube, said electrodes forming a discharge path for a high emissive arc wherein said arc is extinguishable at an extinguishing lamp voltage across said electrodes, means adapted to connect said electrode to said power source for generating said arc at an applied wattage and said rated input voltage, a fill within said elongated arc tube, said fill including an inert starting gas, mercury and sodium, said mercury and sodium being present in an amount less than two milligrams per cubic centimeter of said volume of the interior of said arc tube wherein the weight rate of sodium to mercury is less than 1 to 20 whereby said lamp is saturated with said sodium and unsaturated with said mercury during lamp operation whereby said lamp voltage is maintained below said extinguishing lamp voltage at an input voltage exceeding about 90 percent of said rated input voltage.

5,150,018
GAS DISCHARGE LAMP WITH GRID AND CONTROL CIRCUITS THEREFOR

Gert W. Bruning, Tuckahoe, N.Y.; Leo F. Casey, Watertown, Mass.; Paul R. Veldman, Oss, and Klaus Vegter, Nuenen, both of Netherlands, assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 12, 1991, Ser. No. 744,190
Int. Cl.[5] H01J 11/04, 15/04
U.S. Cl. 315—349 21 Claims

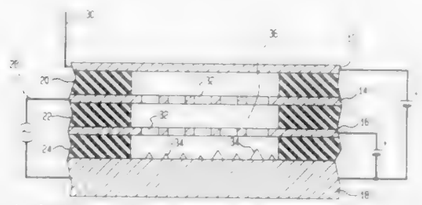


1. In combination, a source of voltage, a fluorescent lamp connected to said source of voltage for operation in response thereto from a non-conductive state to a conductive state, said fluorescent lamp having a control grid which operates to control said fluorescent lamp in both it conductive and non-conductive states in response to control signals received by said control grid and control means generating said control signals.

5,150,019
INTEGRATED CIRCUIT ELECTRONIC GRID DEVICE AND METHOD

Michael E. Thomas, Milpitas, and Kranti V. Anand, deceased, late of Sunnyvale, Calif. by Madhu Anand, heir, assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Oct. 1, 1990, Ser. No. 591,296
Int. Cl.[5] H01J 17/36, 1/16
U.S. Cl. 315—350 44 Claims

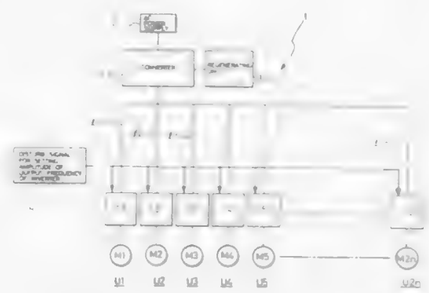


1. An integrated circuit electronic grid device, comprising:
a first conductive layer having a conductive surface with a plurality of emitters disposed upon said conductive surface,
a second conductive layer disposed above said first conductive layer and insulated from said first conductive layer by a first dielectrical medium,
electrical biasing means coupled to said first and second conductive layers for providing an electrical bias between said first and second conductive layers to provide a flow of electrons from said emitters of said first conductive layer toward said second conductive layer, and
said second conductive layer being formed with a plurality of holes therethrough adapted for permitting said flow of electrons to pass through said second conductive layer, the holes of said plurality of holes and the emitters of said plurality of emitters being disposed in a substantially non-aligned arrangement with respect to each other.

5,150,020
DRIVING CONTROLLING METHOD FOR DRUMS OF AUTOMATIC WINDER

Yutaka Ueda, Nara, and Tadashi Suzuki, Uji, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 212,187, Jun. 27, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 603,262
Claims priority, application Japan, Jul. 2, 1987, 62-166058
Int. Cl.[5] H02P 3/18
U.S. Cl. 318—87 17 Claims



1. A driving controlling method for traverse drums of an automatic winder wherein each of a plurality of winding units thereof has a traverse drum driving motor and an associated inverter for providing an output signal to control the driving of said motor in accordance with the frequency amplitude of the output signal, said method comprising the steps of:
repetitively and periodically varying the frequency amplitude of the output signal of the traverse drum driving inverters, wherein the frequency amplitude is varied at regularly occurring intervals;
controlling a first number of the inverters to provide an output signal having a frequency amplitude which controls the associated motors to be decelerated;
controlling a second number of the inverters to provide an output signal having a frequency amplitude which controls the associated motors to be accelerated;
generating regenerative energy upon deceleration of the motors; and
consuming motor driving energy upon acceleration of the motors;
wherein the generated regenerative energy and the consumed motor driving energy may cancel each other.

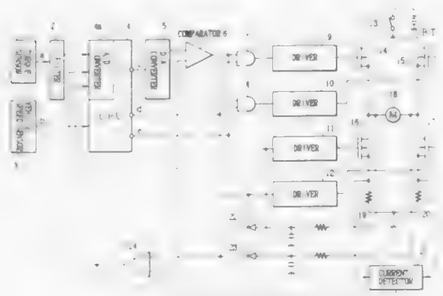
5,150,021
METHOD OF CONTROLLING ELECTRIC POWER STEERING APPARATUS

Shinobu Kamono; Masayuki Shimura, and Tomoyuki Ishii, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 583,600, Sep. 17, 1990, abandoned. This application Feb. 5, 1992, Ser. No. 831,612
Claims priority, application Japan, Sep. 18, 1989, 1-240194
Int. Cl.[5] B62D 5/04
U.S. Cl. 318—488 2 Claims

1. A method of controlling an electric power steering apparatus, comprising the steps of:
detecting a value of a motor terminal across voltage in steering operation;
comparing the detection value with a retrieval value of a motor terminal across voltage in a steering wheel held state to produce a steering state determination result having the steering wheel held state; and

limiting a motor current when said steering wheel held state is determined according to the steering state determina-



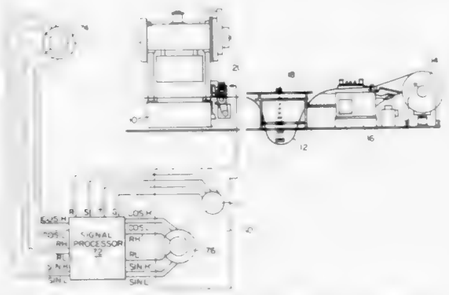
tion result, and a motor current value in the steering wheel held state is not less than a predetermined set value.

5,150,022

PRESS FEEDER AND PILOT RELEASE USING SERVO CONTROL

John E. Waddington, Richmond, R.I., assignor to Waddington Electronics, Inc., Cranston, R.I.

Filed Mar. 5, 1991, Ser. No. 664,655
Int. Cl.[5] G05B *9/02*
U.S. Cl. 318—563 18 Claims



1. An apparatus for feeding stock material into a press driven by a shaft, which press uses pilot pins to align the stock material in the press, the apparatus comprising:

a housing

a first rotatable pinch roller secured to the housing;

a second rotatable pinch roller positionable adjacent the first pinch roller such that stock material may be fed between the rollers under tension from the rollers;

a pivotable support to which the second pinch roller is secured, and wherein a pivoting of the support in a first direction causes the second pinch roller to move away from the first pinch roller;

a spring element providing a bias which urges the second pinch roller toward the first pinch roller;

a cam follower secured to the pivotable support;

a movable cam in contact with the cam follower such that a movement of the cam initiates a pivoting of the pivotable support against the bias of the spring element;

a sensor sensing the position of the press shaft and generating a press position signal indicative thereof;

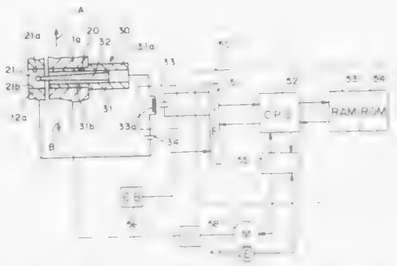
a signal processor receiving the press shaft position signal and generating a motor control signal in response thereto; and a servo motor for receiving the motor control signal from the signal processor and causing movement of the cam in response thereto.

5,150,023

METHOD AND APPARATUS FOR INDEXING MOVING PORTION OF ROBOT TO ORIGIN

Osamu Toyama, Kariya; Akira Shimokoshi, Toyoake, and Takashi Kawasaki, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 26, 1992, Ser. No. 841,801
Claims priority, application Japan, Feb. 28, 1991, 3-34414
Int. Cl.[5] G05B *13/00*
U.S. Cl. 318—567 9 Claims



1. In a robot including at least one moving portion adapted to be driven by a drive unit and a position detector for detecting the position of said moving portion,

a method for indexing the moving portion of said robot to a mechanical origin, comprising the steps of:

forming first and second reference holes respectively in said moving portion and a holding portion supporting said moving portion relatively movably;

positioning said moving portion by operating said drive unit such that said first reference hole may be generally aligned to said second reference hole;

fitting in said first reference hole a plug gauge which includes a foot adapted to be fitted in said reference hole and a probe attached to said foot and adapted to be inserted into said second reference hole;

moving said moving portion relative to said holding portion in a first direction by operating said drive unit;

stopping the relative movement of said moving portion when the probe of said plug gauge comes into contact with the inner wall of said second reference hole;

moving said moving portion relative to said holding portion in a second direction opposed to said first direction by operating said drive unit;

stopping the relative movement of said moving portion when the probe of said plug gauge comes again into contact with the inner wall of said second reference hole; and

determining the central position of the moving of said moving portion in said second direction as said mechanical origin on the basis of the output of said position detector.

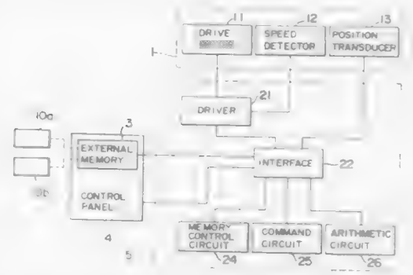
5,150,024

CONTROL SYSTEM OF AN INDUSTRIAL ROBOT

Yutaka Kimura; Hiroshi Okumura; Hirokata Mihara, and Mitsutoshi Yoshida, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 234,266, Aug. 19, 1988. This application Feb. 28, 1990, Ser. No. 487,027
Claims priority, application Japan, Oct. 23, 1987, 62-266526; Nov. 16, 1987, 62-1714802
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—568.1 4 Claims

1. A control system of an industrial robot in which an operation program of the robot is read out from a storage medium and is deciphered and calculated to obtain data so that a robot machine is controlled on the basis of the data, characterized by the provision of external memory means having function of storage and reading out of the operation program, and control means having function of deciphering and calculating the operation program supplied from said external memory means



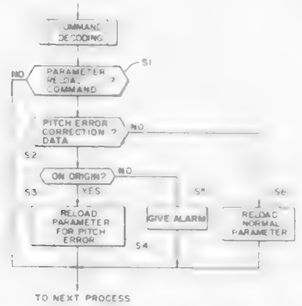
to control the robot machine, said external memory means being the exclusive memory means for storing and reading out the operation program to control the robot machine.

5,150,025

RELOADING SYSTEM FOR PITCH ERROR CORRECTION DATA

Takao Sasaki; Kentaro Fujibayashi, both of Tokyo, and Shintaro Kageyama, Yamanashi, all of Japan, assignors to Fanuc Limited, Yamanashi, Japan

PCT No. PCT/JP90/00532, § 371 Date Jan. 2, 1991, § 102(e) Date Jan. 2, 1991, PCT Pub. No. WO90/14622, PCT Pub. Date Nov. 29, 1990
PCT Filed Apr. 24, 1990, Ser. No. 635,624
Claims priority, application Japan, May 18, 1989, 1-125334
Int. Cl.[5] G05B *19/25*
U.S. Cl. 318—571 4 Claims



1. A method for reloading pitch error correction data at the time of replacing a movable part for a mechanical system of a numerically controlled machine tool, the pitch error correction data reloading method comprising:

(a) providing a command to the numerically controlled machine tool to reload the pitch error correction data, in accordance with a machining program, at the time of replacing the movable part,

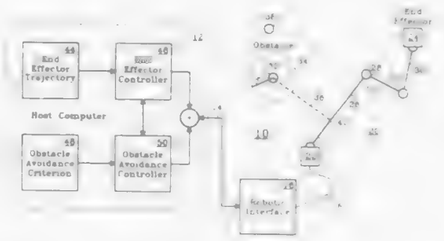
(b) reloading the pitch error correction data in the numerically controlled machine tool when replacing the movable part.

5,150,026

OBSTACLE AVOIDANCE FOR REDUNDANT ROBOTS USING CONFIGURATION CONTROL

Homayoun Seraji, La Crescenta, Calif.; Richard D. Colbaugh, and Kristin L. Glass, both of Las Cruces, N. Mex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 19, 1990, Ser. No. 615,668
Int. Cl.[5] G05B *19/42*
U.S. Cl. 318—568.11 1 Claim



1. A method of controlling a redundant robot, comprising the steps of:

defining end effector coordinates to position an end effector in a workspace by changing joint angles between links connected to the end effector;

determining spheres of influence having fixed radii surrounding obstacles at known positions in the workspace;

defining kinematic tasks for collision avoidance corresponding to additional task motion capability available as a result of the redundancy of the robot, said kinematic tasks including

(a) continuously determining a first critical point on a link closest to a closest one of said spheres of influence;

(b) defining a first critical distance related to the distance between the first critical point and the obstacle within said closest sphere of influence;

(c) forming inequality constraints in which the first critical distance is greater than the radius of said closest sphere of influence; and

combining said end effector coordinates with said kinematic tasks to form task related configuration variables for control of said redundant robot;

dynamically modifying said joint angles while operating the robot system to position the end effector in the work space while maintaining said inequality constraints by stopping motion of the first critical point toward said first obstacle when the first critical distance equals the radius of said closest sphere of influence;

modifying said kinematic tasks to then include

(d) continuously determining a second critical point related to a closest point on a link closest to a next closest sphere of influence;

(e) defining a second critical distance related to the distance between the second critical point and a second obstacle, said second obstacle being in said next closest sphere of influence;

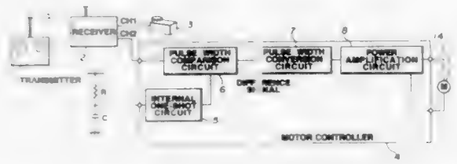
(f) forming additional inequality constraints in which the second critical distance is greater than the radius of said next closest sphere of influence; and

dynamically modifying said joint angles while operating the robot system to position the end effector in the work space while continuing to stop motion of said first critical point toward said first obstacle and maintaining said additional inequality constraints by stopping motion of the second critical point toward said second obstacle when the second critical distance equals the radius of said next closest sphere of influence.

5,150,02
MOTOR DRIVE CIRCUIT FOR RADIO-CONTROLLED MODEL

Nobuhiro Suzuki, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Dec. 27, 1990, Ser. No. 634,503
Claims priority, application Japan, Dec. 27, 1989, 1-149392[U]
Int. Cl.[5] G11B 17/22
U.S. Cl. 318—581 9 Claims

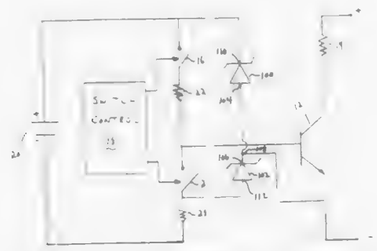


1. A motor drive circuit for a radio-controlled model comprising:
an internal one-shot circuit for generating a reference signal;
a pulse width comparison circuit for comparing an input signal for controlling a motor with said reference signal produced in synchronism with said input signal and generating a difference signal between said input signal and said reference signal;
a pulse width conversion circuit for converting said difference signal into a digital signal having a plurality of bits and subjecting said digital signal to weighing processing for every bit thereof to optimally vary an inclination of input and output characteristics of said motor drive circuit; and
a power amplification circuit for amplifying a signal generated from said pulse width conversion circuit and supplying a current for driving said motor in a radio-controlled model unit.

5,150,028
TWO ZENER DIODE ONE POWER SUPPLY FAST TURN OFF

Rasappa Palaniappan, Michigan City, Ind., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 31, 1990, Ser. No. 606,569
Int. Cl.[5] H0.P 5/16
U.S. Cl. 318—701 25 Claims

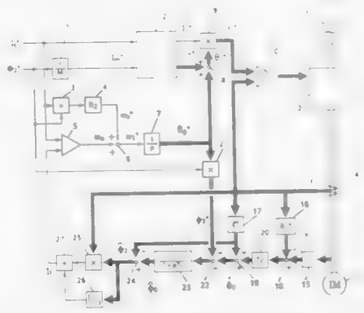


1. A drive circuit for controlling conductivity of a load switch for controlling current flow through an electrical load comprising:
a DC source having a positive terminal and a negative terminal;
a first switch and a second switch each having a control electrode and first and second power electrodes, the first and second switches having the first power electrodes respectively coupled to the positive and negative terminals and the second power electrodes coupled to a junction point coupled to a control electrode of the load switch, conduction of the first switch causing the load switch to turn on by applying a control signal to the control electrode of the load switch and conduction of the second switch causing the load switch to be turned off by applying a control signal to the control electrode of the load switch;
first and second voltage limiting devices coupled together at a point coupled to a power electrode of the load switch and an electrode of the first voltage limiting device being coupled to the positive terminal and an electrode of the second voltage limiting device being coupled to the negative terminal; and wherein
conduction of the second switch causes current flow through only one of the voltage limiting devices which reverse biases the control electrode of the load switch in response to an electrical potential between the control and the power electrode of the load switch causing the load switch to be turned off.

5,150,029
METHOD AND APPARATUS FOR CONTROLLING THE MAGNETIC FLUX OF AN INDUCTION MOTOR

Eiji Watanabe, and Tsugutoshi Ohtani, both of Yukuhashi, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu, Japan

PCT No. PCT/JP89/00296, § 371 Date Nov. 17, 1989, § 102(e) Date Nov. 17, 1989, PCT Pub. No. WO89/09512, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 20, 1989, Ser. No. 445,675
Claims priority, application Japan, Mar. 26, 1988, 63-72572
Int. Cl.[5] H02P 5/40
U.S. Cl. 318—800 2 Claims

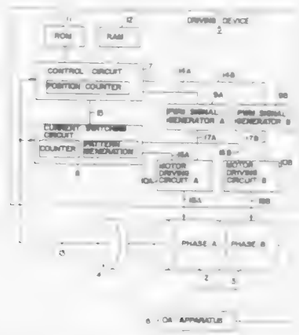


1. An induction motor magnetic flux control device for controlling an induction motor having a secondary circuit time constant, comprising:
a current detector and a voltage detector for detecting current flowing in and voltage applied to an induction motor, respectively
a first constant device connected to multiply the detected current value of said current detector by a primary resistance value;
a second constant device connected to multiply the detected current value of said current detector by a leakage reactance value;
a first subtracter connected to subtract the output value of said first constant device from the detected voltage value of said voltage detector;
a third constant device connected to multiply the output value of said first subtracter by the secondary circuit time constant of said induction motor;
a first adder connected to add the output value of said second constant device to the output value of said third constant device to obtain an induced voltage value;
a second adder connected to add a magnetic flux command value to the output value of said first adder;
a primary delay circuit connected to input the output value of said second adder and to output a magnetic flux value, said primary delay circuit having a primary delay time constant; and
a second subtracter connected to subtract the output value of said second constant device from the output value of said primary delay circuit to thereby obtain a secondary magnetic flux voltage.

5,150,030
MOTOR DRIVING DEVICE

Noriaki Ito, and Soichi Hiramatsu, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1990, Ser. No. 623,593
Claims priority, application Japan, Dec. 8, 1989, 1-319718
Int. Cl.[5] H02P 5/34
U.S. Cl. 318—811 11 Claims



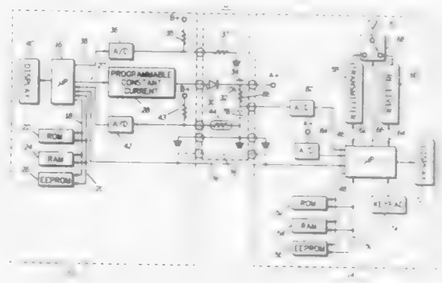
1. A motor driving device for driving a motor having a rotor and a plurality of excitation coils, said device comprising:
detection means for detecting a rotation position of the rotor of the motor and for producing detection signals representing the rotation position;
control means for performing closed-loop control of the switching timing for excitation currents applied to the excitation coils according to detection signals from said detection means; and
a plurality of drive control means for controlling the current supplied to the excitation coils in accordance with an output from said control means, said plurality of drive control means comprising a plurality of pulse-width modulation signal generators for controlling current passing through the excitation coils, wherein said control means outputs a pulse-width modulation command signal to one of said plurality of said pulse-width modulation signal generators of such a value that the torque generated by one of the excitation coils, whose exciting current is controlled by said one of said plurality of drive control means, is substantially equal to the value of a detent torque of the motor.

5,150,031
BATTERY CHARGING SYSTEM

Gordon W. James, Plantation; Joseph F. Sheridan, Davie, and Wayne Moy, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1988, Ser. No. 252,419
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—2 15 Claims

1. A method for charging a battery while contemporaneously supplying power to a device, comprising the steps of:
at a charging unit:
(a) obtaining data from the device via a serial data link coupled between the charging unit and the device;
(b) processing said data to determine an operational state of the device, said operational state comprising a charging current to said battery and a supply current to said device;
(c) adjusting a current source in response to said operational state of the device to provide a current signal; and

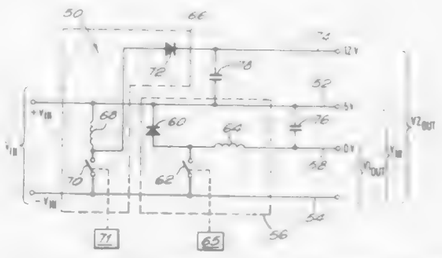


(d) providing said current signal approximately equal to the arithmetic sum of the charging and supply currents to the device and the battery so as to contemporaneously charge the battery and supply power to the device

5,150,032
COMBINED CHARGING AND SUPPLY CIRCUIT

Joseph K. P. Ho, Kowloon, Hong Kong, assignor to Astec International Limited, Hong Kong

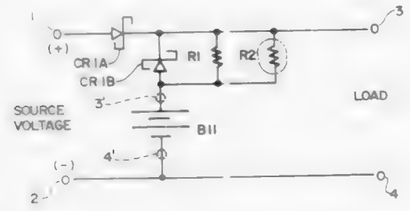
Filed May 4, 1990, Ser. No. 519,276
Claims priority, application United Kingdom, May 4, 1989, 8910193
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—14 5 Claims



1. A combined charging circuit for a rechargeable battery and supply circuit, comprising a rechargeable battery having a first terminal and a second terminal for supplying power to an output supply having a first terminal and a second terminal, said first terminal of said battery being coupled to said first terminal of said output supply, an adaptor arranged to be connected to a source of mains current for providing power from that source at a voltage greater than the fully charged voltage of the battery to supply power to said output supply in place of the battery and to charge the battery, and a buck converter interposed between said battery and said output supply, said buck converter acting as a switching charger for the battery when said adapter is providing power from the source and providing a low resistance path when said battery is supplying power to said output supply, said buck converter comprising a rectifier across the battery, an inductor and an electronic switch in series with one another interposed between said second terminal of the battery and said second terminal of the output supply, and a switching circuit coupled to said electronic switch for controlling the operation of said electronic switch, said electronic switch acting as the switch-

ing element of the switching charger when the adaptor is powered from said source of mains current and as a low ON resistance conductive element between said battery and said output supply when the battery is supplying power to the output supply.

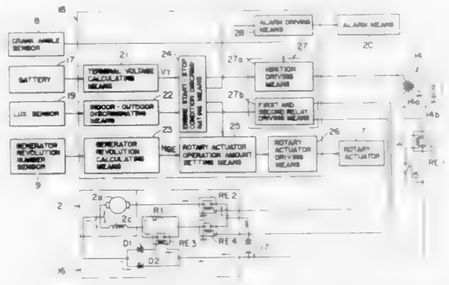
5,150,033
FLAT PLATE SEALED LEAD-ACID BATTERY CHARGING SYSTEM AND METHOD
David W. Conway, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa
Filed Dec. 9, 1988, Ser. No. 282,009
Int. Cl.[5] H02J 7/04; H02H 5/04
U.S. Cl. 320—51 2 Claims



1. In a battery charging system,
flat plate lead-acid battery means for association with a portable unit and for cyclic recharging after periods of portable use, said battery means having plural cells providing a given rated capacity, and
protective current limiting circuit means comprising resistance means interposed so as to control charging current to said battery means,
said resistance means automatically responding to current flow therein due to a maximum applied charging voltage and the battery means being in a substantially discharged state, to limit charging current to a schedule of values as a function of time which reliably avoids venting of the battery means while effecting substantial recharging of the battery means in not more than about one-half hour,
said flat plate lead-acid battery means together with said resistance means forming a battery pack which is removable from and replaceable in a portable unit as a single entity, said battery pack consisting essentially of said flat plate lead-acid battery means, said resistance means, and schottky diode means providing bypass diode means defining a bypass current path bypassing said resistance means for accommodating load current flowing from said battery means.

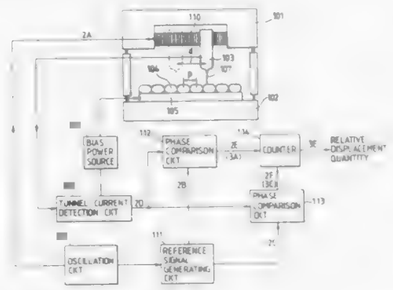
5,150,034
AUTOMATICALLY CHARGING SYSTEM FOR ELECTRIC AUTOMOBILE
Yasuaki Kyoukane, and Toshihiro Nagano, both of Omiya, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 24, 1990, Ser. No. 602,146
Claims priority, application Japan, Oct. 25, 1989, 1-279108
Int. Cl.[5] H01L 41/08
U.S. Cl. 320—62 5 Claims

1. An automatic charging system for an electric automobile provided with an engine, a generator, an electric motor and a battery, comprising:
first detecting means for detecting an environmental illumination and producing an output signal representing an amount of said illumination;
second detecting means for detecting a terminal voltage of the battery;
discriminating means with a preliminarily set predetermined value of reference illumination and for comparing said output signal from said first detecting means with said predetermined value to produce discrimination results;
engine start-stop condition determining means for determining an engine start-stop condition based on said terminal voltage and results of said discriminating means; and



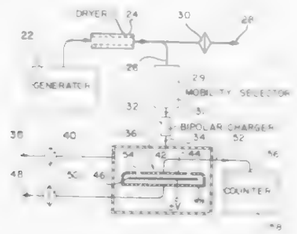
starting and stopping means for starting and stopping engine operation in accordance with a determination results of said determining means.

5,150,035
ENCODER HAVING ATOMIC OR MOLECULAR STRUCTURE REFERENCE SCALE
Hiroyasu Nose, Zama; Toshimitsu Kawase, Atsugi; Tohshiko Miyazaki, Isehara; Takahiro Oguchi, Atsugi, and Akihiko Yamano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 27, 1990, Ser. No. 515,872
Claims priority, application Japan, Apr. 27, 1989, 1-105889
Int. Cl.[5] G01N 27/00
U.S. Cl. 324—71.1 29 Claims



1. An encoder having:
a reference scale having periodic structure of atoms or molecules in a predetermined direction;
a probe having a tip facing said reference scale, said probe being used to detect the structural variation information of said periodic structure of said reference scale; and
relative displacement amount detecting means for detecting the amount of relative displacement between said reference scale and said probe along said predetermined direction from the structural variation information obtained by said probe;
said reference scale being provided with substantially continuous atomic or molecular structure in which a structural variation is substantially not detected with respect to a direction orthogonal to said predetermined direction.

5,150,036
PROCESS AND APPARATUS FOR CALIBRATING A PARTICLE COUNTER
Michel Pourprix, Montlhery, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Feb. 26, 1991, Ser. No. 661,824
Claims priority, application France, Feb. 27, 1990, 90 02414
Int. Cl.[5] G01N 15/02; G06M 11/00
U.S. Cl. 324—71.4 5 Claims



1. A method for calibrating a particle counter comprising the following steps;
forming a vector gas flow by an aerosol of particles of the same grain size;
developing ions in the vector gas with both sign by a bipolar charger, certain particles being electrically charged to a stationary charge state in which the distribution of the number of charges fixed to each particle follows a Gaussian law (Gunn or Boltzmman);
passing the charge aerosol into a mobility selector to attract the charged particles to electrodes therein and classify them as a function of the numbers p of their elementary electrical charges e and allowing said electrically neutral particles to escape;
collecting said neutral particles and passing said neutral particles into said particle counter to be calibrated, said particles counter displaying a value N'_o;
counting the values of N_p and N_{p+1} of said number of particles of charges pe and (P+1)e fixed by said selector and calculating by the formula

$$N \quad N_p \exp\left(\frac{\eta}{\quad}\left[\eta^{-} \quad \ln\left(\eta \cdot \frac{1}{\quad} \quad \frac{1}{\eta} \ln \frac{N_p}{N_{p+1}}\right)\right]\right)$$

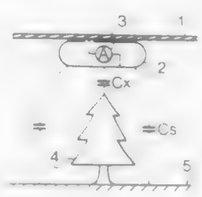
the number N_o representing the number of neutral particles supplied to said counter; and
comparing N'_o with N_p.

5,150,037
PARTICLE DETECTOR AND PARTICLE DETECTING APPARATUS HAVING THE DETECTOR
Chihiro Kouzuki, Kasaishi, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan
Filed Sep. 11, 1991, Ser. No. 757,705
Claims priority, application Japan, Nov. 30, 1990, 2-340798
Int. Cl.[5] G01N 15/00, 27/07
U.S. Cl. 324—71.4 8 Claims

1. A particle detector for passing a liquid specimen suspending particles into an orifice so as to surround the liquid specimen with a sheath liquid, and detecting particles individually depending on the changes based on the difference of the electric impedance of liquid and particles, which comprises
means for passing and recovering a multilayer flow consisting of a conductive liquid specimen as inner layer, a conductive first sheath liquid as middle layer, and a nonconductive second sheath liquid surrounding them as outer layer, through an orifice, and

a pair of electrodes disposed at both sides of the orifice so as to contact the conductive liquid.

5,150,038
SYSTEM FOR DETECTING THE EXTRAORDINARY APPROACH OF OBJECTS HAVING EARTH POTENTIAL TOWARD A POWER TRANSMISSION LINE
Kimiharu Kanemaru, and Junichi Kaitou, both of Hitachi, Japan, assignors to Hitachi Cable Limited, Tokyo, Japan
Continuation of Ser. No. 340,612, Apr. 19, 1989, abandoned.
This application Jul. 30, 1991, Ser. No. 737,633
Claims priority, application Japan, Sep. 27, 1988, 63-239761
Int. Cl.[5] G01R 31/02
U.S. Cl. 324—72.5 12 Claims



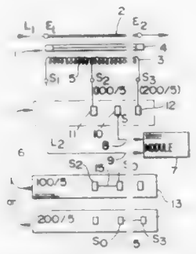
1. A system for detecting the extraordinary approach of objects having an earth potential into proximity with a power transmission line, comprising:
a detector suspended from the power transmission line for detecting said extraordinary approach, said detector including
a detector casing,
mounting means at the top of the casing and attachable with the power transmission line for mounting the detector casing on the line so as to be suspended from and wholly disposed beneath the line, the entire casing defining an electrode forming stray capacitance to the ground,
a charging current detecting circuit within the detector casing for measuing variations in a charging current flowing from the power transmission line into a stray capacitance formed between the detector casing and the earth, and
a transmitter within the detector casing for transmitting values measured by the charging current detecting circuit; and
a receiver remote from the detector casing for receiving and evaluating the values transmitted by said transmitter.

5,150,039

ELECTRICAL MEASURING TRANSFORMER

Jean-Paul P. Avocat, 4, rue Philippe Lebon, 59500 Lambres Lez Douai, France

Continuation of Ser. No. 365,252, Jun. 12, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 607,650
Claims priority, application France, Jun. 17, 1988, 88 08555
Int. Cl.[5] G01R *17/20, 15/08*
U.S. Cl. 324—127 **15 Claims**



1. An electrical measuring apparatus for measuring one or more electrical values present in a primary circuit, said apparatus comprising:

a secondary circuit comprising at least one winding, said secondary circuit comprising a plurality of secondary circuit connection terminals for defining a plurality of respective unique transformation ratios, a first output terminal connected to said secondary circuit, a second output terminal, and a common contact connected to said second output terminal;

plural selection means for enabling a selection of one said plurality of unique transformation ratios, each of said selection means comprising a transformer configuration device which is dimensioned and configured to be plugged into said secondary circuit to selectively allow a connection between said common contact and a respective one of said plurality of secondary circuit connection terminals corresponding to a selected one of said plurality of unique transformation ratios; and

means coupled to said secondary circuit for measuring an electrical value corresponding to the current present in at least one of said plurality of secondary circuit connection terminals.

5,150,040

DUAL-MODE Z-STAGE

Herbert P. Byrnes, Poughkeepsie, and Richard Wahl, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1990, Ser. No. 601,490
Int. Cl.[5] G01R *31/02*; **B23Q** *3/18*
U.S. Cl. 324—158 F **10 Claims**

1. Apparatus for positioning a work piece along the Z axis in an X, Y and Z axis system comprising,

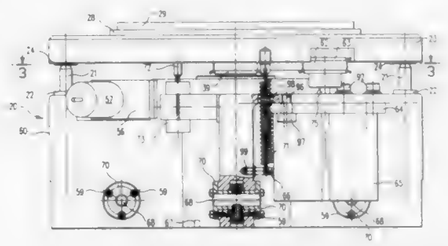
a positioning system with X, Y, and Z axis motion,

a work supporting element (**23**) extending horizontally in a plane defined by said X and Y axes, said element (**23**) being supported by a vertically extending lift means for moving said work supporting element (**23**) vertically along said Z-axis with respect to a main support member (**60**),

said lift means including a vertical elevator system comprising,

1) a reciprocable vertical linear drive (**41**, **32**),

2) a plurality of vertically extending support shafts (**21**) carried reciprocably by cooperating bearing members (**22**), said bearing member (**22**) being secured to said main support member (**60**), with said support shafts (**21**) being supported by said bearing members (**22**) for vertical, reciprocable sliding up and down within said bearing members (**22**), each of said support shafts (**21**) having an actuator end, the other end (**26**) of each of said support shafts (**21**) being coupled at a different point to said work supporting element (**23**) for supporting a portion of the weight thereof,



3) crank means for connecting forces to elevate said support shafts from said linear drive,

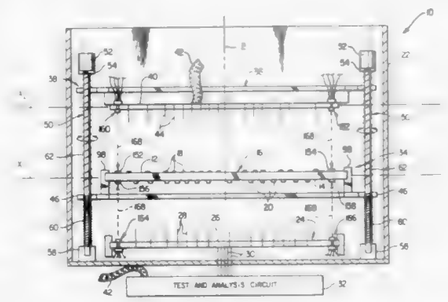
4) said support shafts driving said work supporting element **23** up in response to force from crank means in response to said vertical linear drive.

5,150,041

OPTICALLY ALIGNABLE PRINTED CIRCUIT BOARD TEST FIXTURE APPARATUS AND ASSOCIATED METHODS

Steven M. Eastin, Cypress, and Ivan W. Byford, Dayton, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 21, 1991, Ser. No. 719,313
Int. Cl.[5] G01R *13/02*
U.S. Cl. 324—158 F **19 Claims**



1. Electrical test fixture apparatus for simultaneously testing the bottom and top sides of a circuit board having first and second spaced series of electrically conductive test contact points disposed on said bottom and top sides, respectively, said electrical test fixture apparatus comprising:

a bottom probe structure having a top side portion through which a vertical axis extends, said top side portion having a spaced series of electrically conductive first probe members positioned thereon and being alignable and operatively engageable with said first series of test contact points;

a top probe structure having a bottom side portion facing said bottom probe structure top side portion and spaced upwardly apart therefrom along said vertical axis, said bottom side portion having a spaced series of electrically conductive second probe members positioned thereon and being alignable and operatively engageable with said second series of test contact points;

first support means for supporting said top probe structure for selective shifting thereof relative to said bottom probe structure in a first horizontal plane passing through said top probe structure;

second support means for supporting said circuit board between said top and bottom probe structures, with said first and second series of test contact points respectively facing said first and second probe members and being vertically spaced apart therefrom, for selective shifting of the supported circuit board relative to said bottom probe structure in a second horizontal plane passing through the supported circuit board;

first alignment adjustment means for optically sensing a misalignment between said first probe members and said first series of test contact points and automatically shifting the supported circuit board in said second horizontal plane to bring said first probe members and said first series of test contact points into precise horizontal alignment with one another;

second alignment adjustment means for optically sensing a misalignment between said second probe members and said second series of test contact points and automatically shifting said top probe structure in said first horizontal plane to bring said second probe members and said second series of test contact points into precise horizontal alignment with one another; and

drive means for creating relative vertical movement between said first support means, said second support means and said bottom probe structure in a manner creating an operative engagement between the aligned first probe members and first series of test contact points, and creating an operative engagement between the aligned second probe members and second series of test contact points, said drive means including:

vertical lead screw means threadingly engaging said first and second support means and being operatively rotatable to downwardly translate said first and second support means in a manner essentially simultaneously bringing said first series of test contact points into contact with said first probe members, and said second series of test contact points into contact with said second probe members, and

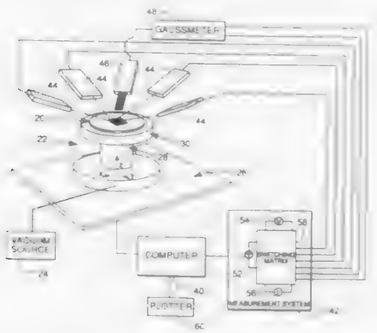
means for operatively rotating said vertical lead screw means.

5,150,042

ON-WAFER HALL-EFFECT MEASUREMENT SYSTEM

David C. Look, and Philip D. Mumford, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 23, 1991, Ser. No. 763,736
Int. Cl.[5] G01R *31/00, 19/00*
U.S. Cl. 324—158 R **8 Claims**



1. A nondestructive measurement system for making on-wafer Hall effect measurements of a patterned GaAs wafer, comprising:

a support fixture mounting said GaAs wafer, said GaAs wafer having on a surface thereof a plurality of test sites each comprising a set of ohmic contacts connected to a van der Pauw pattern;

magnet means mounted on said support fixture for generating a magnetic field, said magnet means positioned adjacent said GaAs wafer so as to produce a Hall effect in said GaAs wafer;

means for measuring said magnetic field at said test sites;

a plurality of test probes positioned adjacent said GaAs wafer;

means connected to said support fixture for moving said GaAs wafer relative to said test probes to bring said set of ohmic contacts into contact with said test probes;

measuring means comprising a source of current and a voltage measuring device, and switching means for selectively connecting said source of current and voltage measuring device to said test probes;

means for storing values of voltages measured by said voltage measuring device and for storing values of magnetic field measured at said test sites;

means for calculating sheet resistance of said GaAs wafer at said test sites from a first series of voltages measured by said voltage measuring device;

means for calculating sheet Hall concentration in said GaAs wafer at said test sites from a second series of voltages measured by said voltage measuring device and from the magnetic field measured at said test sites; and

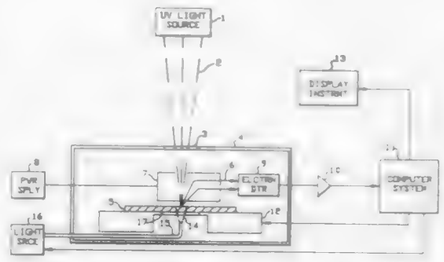
means for calculating Hall mobility in said GaAs wafer at said test sites from calculations of said sheet Hall concentration and said sheet resistance.

5,150,043

APPARATUS AND METHOD FOR NON-CONTACT SURFACE VOLTAGE PROBING BY SCANNING PHOTOELECTRON EMISSION

Larry D. Flesner, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 11, 1991, Ser. No. 653,829
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 R **6 Claims**



1. An apparatus for sensing the electrical potential on the surface of a material, comprising:

a vacuum chamber in which the material is positioned;

an ultraviolet light source for irradiating a first surface of the material with an ultraviolet beam so that the material emits electrons having kinetic energies which are variable according to the electrical potential of said first surface of the material;

first means positioned to irradiate a second surface of the material, different than said first surface, with a modulated light beam for producing photovoltaic effects in the material; and

second means positioned to receive said emitted electrons for displaying data corresponding to said emitted elec-

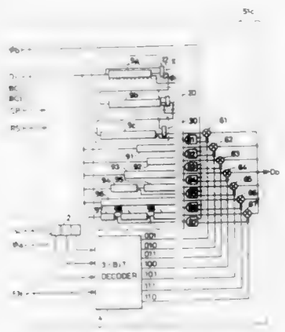
trons having kinetic energies within a predetermined range.

5,150,044

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE COMPRISING SCAN PATHS HAVING INDIVIDUAL CONTROLLABLE BYPASSES

Takeshi Hashizume, and Kazuhiro Sakashita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,822
Claims priority, application Japan Mar. 29, 1990, 2-86102; Feb. 20, 1991, 3-024953
Int. Cl.[5] G01R *1/28*
U.S. Cl. 324—158 R 12 Claims



1. An integrated circuit device comprising:
a data input node (TDI),
a data output node (TDO),
shift register means (**92***a*) coupled between said data input node and said data output node,
a plurality of circuits-to-be-tested (**103–105**),
a series connected plurality of scan path circuit means (**9***a*, **9***b*, **9***c*) for receiving input data from said input node, supplying said test input data to said circuits-to-be-tested, receiving test result data from said circuits-to-be-tested, and supplying said test result data to said data output node, wherein each of said plurality of scan path circuit means is connected to a corresponding circuit-to-be-tested of said plurality of circuits-to-be-tested,
wherein (i) said series connected plurality of scan path circuit means and (ii) said shift register means are connected in parallel,
selective enable means (**2, 4, 61, 62, 81, 82**) responsive to an externally applied selecting signal for selectively enabling each one of said serial connection of said plurality of scan path circuit means and said shift register means,
a plurality of bypass means (**14, 15, 16**) each connected across a corresponding scan path circuit means of said series connected plurality of scan path circuit means for bypassing said corresponding scan path circuit means, and
bypass control means (**17, 18**) responsive to an externally applied bypass control signal for selectively operating each of said plurality of bypass means.

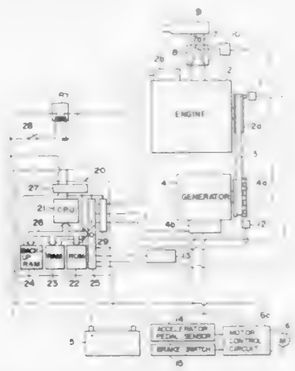
5,150,045

ELECTRIC AUTOMOBILE

Toshihiro Nagano, and Yasuaki Kyoukane, both of Omiya, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1990, Ser. No. 615,242
Claims priority, application Japan, Nov. 22, 1989, 1-305009
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—62 9 Claims

1. An electric automobile vehicle having, a battery as a drive power source, a generator for generating an electric power, an engine for driving said generator for charging said battery, a speed sensor for sensing a vehicle speed and a generator speed sensor for detecting a rotational speed of the generator, comprising:
recharge identification means for detecting a charging condition of the battery and for producing a first signal when



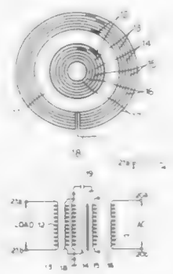
a terminal voltage of the battery reaches a predetermined lower limit voltage;
traveling time judgment means for detecting a traveling time of the automobile and for producing a second signal every predetermined set traveling time for which the automobile has traveled; and
recharge means responsive to at least one of said first signal and said second signal for recharging the battery.

5,150,046

NOISE-SHIELDED TRANSFORMER

Seok G. Lim, Inchon, Rep. of Korea, assignor to Goldstar Electric Machinery Co., Rep. of Korea

Filed May 17, 1991, Ser. No. 702,231
Claims priority, application Rep. of Korea, Dec. 17, 1990, 20058/1990
Int. Cl.[5] H01F *15/04, 27/33*
U.S. Cl. 323—356 6 Claims



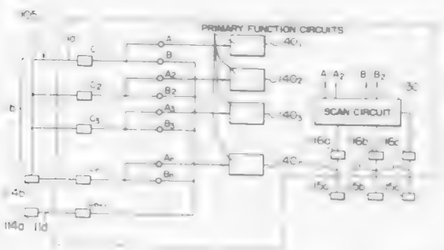
1. A noise-shielded transformer comprising:
a toroidal core;
a secondary winding uniformly wound around the whole magnetic path field of the toroidal core;
a bifilar shield winding wound around said secondary winding, one end of which being grounded and the other end being connected to a resonance condenser;
a conductive plate adapted to wrap the bifilar shield winding so as not to be one-turn shorted;
an insulating member for wrapping the conductive plate;
a high voltage winding wound around the insulating member, both ends of which being floated; and
a primary winding uniformly wound around the high voltage winding.

5,150,047

MEMBER FOR USE IN ASSEMBLY OF INTEGRATED CIRCUIT ELEMENTS AND A METHOD OF TESTING ASSEMBLED INTEGRATED CIRCUIT ELEMENTS

Tamio Saito; Toshio Yamamoto; Naoharu Ohikata, and Jiro Ono, all of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 17, 1990, Ser. No. 553,082
Claims priority, application Japan, Jul. 21, 1989, 1-190099; Jul. 31, 1989, 1-198685
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R 9 Claims



1. An apparatus for assembly and testing of an IC element having a first section designated for primary functions of the IC element and a second section designated for testing of the IC element, said apparatus comprising;
a substrate made of a film of insulating material and having an IC-mounting portion defining a position of an IC element to be assembled;
a plurality of first leads mounted on the substrate and connected to the first section of an IC element when mounted to the IC-mounting portion;
a plurality of second leads connected to the second section of the IC element;
a single first test pad for connection of the first leads thereto;
second test pads for connection of the respective second leads thereto; and
means for connecting said first leads to at least one of said second leads when testing the IC element through said first and second pads.

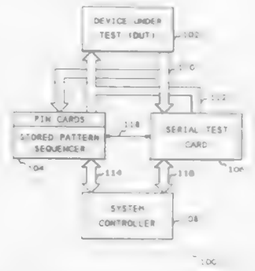
5,150,048

GENERAL PURPOSE, RECONFIGURABLE SYSTEM FOR PROCESSING SERIAL BIT STREAMS

Robert E. McAuliffe, Loveland; Christopher B. Cain, Longmont, and John E. Siefers, Ft. Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 12, 1990, Ser. No. 581,604
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 R 20 Claims

1. A system for testing a serial bit stream circuit comprising:
personality module means for connecting said system to said circuit and for converting a serial bit stream signal format of said circuit to a common bit stream signal format, wherein said serial bit stream signal format has more than two levels and said common bit stream signal format is a binary format;
reconfigurable bit processing means for converting between said common bit stream format and a converted bit stream signal format;
bus means connecting said personality means and said reconfigurable bit processing means for conducting said common bit stream signal comprising serial data transfer means, and clock transfer means; and



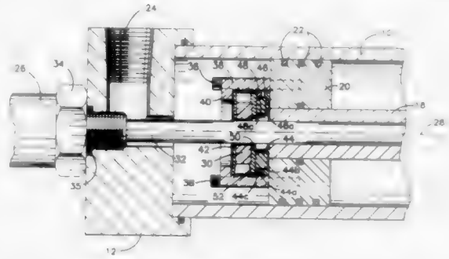
programmable serial test sequencing means connected to said reconfigurable bit processing means for testing said serial bit stream circuit and for identifying said circuit as correctly functioning or rejecting said circuit as defective.

5,150,049

MAGNETOSTRICTIVE LINEAR DISPLACEMENT TRANSDUCER WITH TEMPERATURE COMPENSATION

John L. Schuetz, Hiawatha, Kans., assignor to Schuetz Tool & Die, Inc., Hiawatha, Kans.

Filed Jun. 24, 1991, Ser. No. 719,484
Int. Cl.[5] G01B *7/14, 17/00;* F01B *31/12;* H04B *11/00*
U.S. Cl. 324—207.12 11 Claims



9. In a magnetostrictive linear displacement transducer having an elongated waveguide, a processing head for applying electrical signals to the waveguide, and a magnet which moves with a piston and which produces a magnetic field with which the electrical signals interact to produce ultrasonic signals propagated along the waveguide to the processing head to provide information indicative of the piston location, a method of compensating for the effects of temperature on the speed of the ultrasonic signals comprising moving the magnet toward the processing head with increasing temperature by a distance sufficient to substantially counteract the slower speed of the ultrasonic signals with increasing temperature.

5,150,050

ADAPTIVE VARIABLE THRESHOLD QUALIFICATION LEVEL CIRCUIT FOR SIGNAL PROCESSING IN DISK DRIVES

Stephen R. Genheimer, and Steven L. Welty, both of Mustang, Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

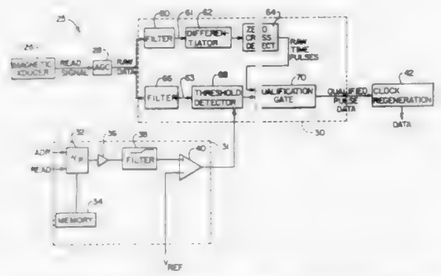
Filed Jul. 30, 1990, Ser. No. 559,857
Int. Cl.[5] G01R *33/12;* G11B *27/36*
U.S. Cl. 324—212 16 Claims

1. An apparatus for detecting and mapping disk defects of a

magnetic disk, the defects being detected from a raw data signal, having an amplitude, developed by relative movement of a magnetic transducer in a magnetic disk drive with respect to addressable portions of the magnetic disk, the apparatus comprising:

a qualification level generator circuit suitable for generating a variable qualification level signal for qualifying signal pulses in the raw data signal;

a controller, coupled to the qualification level generator circuit, for varying the qualification level signal to set a qualification threshold;



a threshold detector, coupled to the controller and having the raw data signal as an input for detecting disk defects resulting in the raw data signal failing to meet the qualification threshold, the controller causing the transducer to generate a second raw data signal corresponding to the addressable portions after the controller has varied the qualification level signal to detect additional disk defects; and

mapping means, responsive to the threshold detector, for mapping the disk defects detected.

5,150,05

HOME GAUSSMETER WITH FILTER-INTEGRATOR CIRCUIT FOR MEASURING ELF RADIATION

Michael Friedman, Raymond; Owen Harrington, and David Dunn, both of Windham, all of N.H., assignors to Memtec Corporation, Salem, N.H.

Filed Apr. 11, 1991, Ser. No. 683,994

Int. Cl.[5] G01R *33/02, 29/08, 15/10*

U.S. Cl. 324—258 **4 Claims**

1. A meter for measuring extremely-low-frequency electromagnetic fields comprising:

A) a coil that produces a coil voltage in response to varying magnetic fields;

B) a filter-integrator circuit connected to receive the coil voltage as its input and having as its transfer function the product of those of a high-pass filter and an integrator, the high-pass filter having a cut-off frequency below 60 Hz and an attenuation at 10 Hz at least 20 db greater than its attenuation at 60 Hz; and

C) a display circuit responsive to the output of the filter-integrator circuit for generating a visual indication thereof.

5,150,052

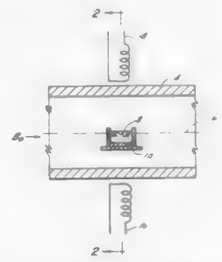
APPARATUS AND METHOD FOR MAGNETIC RESONANCE SPECTRAL IMAGING

Mary E. Meyerand, 64 Littel Acres Rd., Glastonbury, Conn. 06033

Filed Feb. 15, 1991, Ser. No. 656,993

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **18 Claims**



1. A method for magnetic resonance spectral imaging of sample volume, comprising:

generating a uniform magnetic field in a first direction;

placing the sample volume within the uniform magnetic field;

generating a uniform radio frequency excitation field across a sample volume in a second direction, said second direction being oriented at a nonzero angle relative to the first direction;

generating a first spatially nonuniform radio frequency detection field across the sample volume, said nonuniform field being oriented at a nonzero angle relative to the first direction and having a cusp shape surrounding a minimum point of minimal radio frequency detection sensitivity;

sequentially positioning the minimum point in each of a plurality of different positions within the sample volume;

detecting signals corresPonding to radio frequency absorption or emission by the sample volume at each position of the plurality of positions;

calculating spatially localized nuclear magnetic resonance chemical spectra within the samPle volume from the signals detected.

5,150,053

MAGNETIC RESONANCE IMAGING OF SHORT T_2 SPECIES WITH IMPROVED CONTRAST

John M. Pauly; Steven M. Conolly, both of Menlo Park, and Dwight G. Nishimura, Palo Alto, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 386,901, Jul. 28, 1989, Pat. No. 5,025,216. This application Jan. 25, 1991, Ser. No. 645,859

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **12 Claims**

1. A method of obtaining slice-selective magnetic resonance signals for imaging short T_2 species while suppressing longer T_2 species comprising the steps of

(a) applying a static magnetic field (B_o) to a body thereby aligning nuclear spins,

(b) applying an RF pulse to said body, said RF pulse having sufficient amplitude to excite the longer T_2 species but insufficient amplitude to excite the short T_2 species,

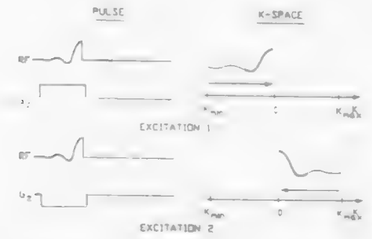
(c) applying a modulated magnetic gradient (G(t)) to said body,

(d) applying a first RF excitation pulse ($B_1(t)$) to said body to tip said nuclear spins,

(e) detecting first magnetic resonance signals from said body,

(f) applying a second RF excitation pulse ($B_1(t)$) to said body to tip said nuclear spins, said first RF excitation to pulse and said second RF excitation pulse each being half of a conventional slice-selective pulse,

(g) detecting second magnetic resonance signals from said body, and



(h) combining said first magnetic resonance signals and said second magnetic resonance signals.

5,150,054

NMR-SPECTROMETER WITH SAMPLE EXCHANGER

Raymond Dupree, Leamington Spa, United Kingdom, assignor to Bruker Analytische Meβtechnik GmbH, Fed. Rep. Of Germany

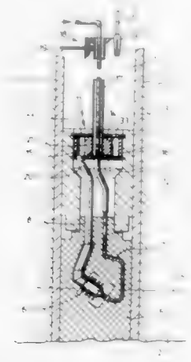
PCT No. PCT/DE89/00324, § 371 Date Nov. 21, 1990, § 102(e) Date Nov. 21, 1990, PCT Pub. No. WO89/11646, PCT Pub. Date Nov. 30, 1989

PCT Filed May 20, 1989, Ser. No. 602,314

Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818039

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **6 Claims**



1. NMR-spectrometer apparatus comprising:

magnet system means for producing a magnetic field which is nearly homogeneous within a specified region;

a sample holder located in said homogeneous region of the magnetic field; and

a sample changer comprising a sample magazine and means for transferring one sample at a time from said magazine to said sample holder and back, said sample magazine being disposed within the magnetic field at a position enabling each sample to become pre-polarized by the magnetic field, said pre-polarization being sufficient to enable each sample to take a spectrum in said magnetic field.

5,150,055

NUCLEAR MAGNETIC RESONANCE EXCITING DEVICE

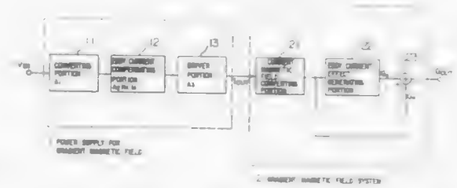
Mitsuyoshi Kimura, Katsuta, and Yoshikazu Amano, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1990, Ser. No. 618,931

Claims priority, application Japan, Dec. 1, 1989, 1-313200

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—322 **10 Claims**



1. A nuclear magnetic resonance exciting device comprising:

means for generating a static magnetic field—a sample being located therein—

means for generating a gradient magnetic field;

means for driving said gradient magnetic field generating means so as to superpose said gradient magnetic field on said static magnetic field;

means for generating a radio frequency pulse; and

means for exciting nuclear magnetic resonance of said sample by applying said radio frequency pulse under the presence of said gradient magnetic field;

wherein said nuclear magnetic resonance exciting device comprises a gradient magnetic field system; said gradient magnetic field system comprises said gradient magnetic field generating means and an eddy current effect generating portion, where the eddy current effect is generated due to said gradient magnetic field; said means for driving said gradient magnetic field generating means comprises means for compensating said generated eddy current effect; and said eddy current effect compensating means has an inverse of the transmission function of said gradient magnetic field system as a transmission function.

5,150,056

METHOD AND DEVICE FOR LOCATING THE LONGITUDINAL AXIS OF A BRANCH PIPE FROM A MAIN PIPE

Norman B. Wilcock, Woodbridge Electronics Ltd., Deben Way, Woodbridge, Suffolk, Great Britain

PCT No. PCT/GB90/00881, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO90/15347, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 7, 1990, Ser. No. 651,229

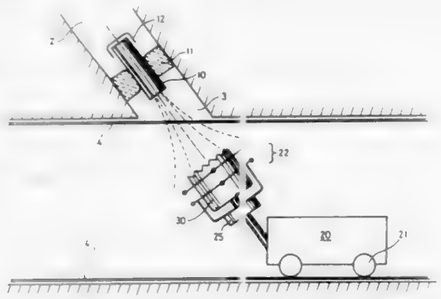
Claims priority, application United Kingdom, Jun. 8, 1989, 8913200

Int. Cl.[5] G01B *7/31*

U.S. Cl. 324—326 **13 Claims**

1. A method for locating the longitudinal axis of a branch pipe from a main pipe, which method comprises mounting a magnetic field emitter in the branch pipe so that it radiates magnetic lines of force generally axially along the branch pipe

and into the main pipe, and locating the axis of the branch pipe by detecting the primary line of the magnetic flux emitted from



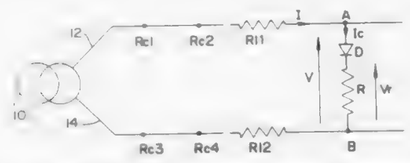
the emitter by means of a location device moveable within the main pipe.

5,150,057

CONTINUOUS MONITORING SYSTEM OF THE ELECTRICAL CONDUCTION OF A MAINS SYSTEM

Eric Suptitz, Grenoble, and Joseph Diaferia, St. Martin d'Heres, both of France, assignors to Merlin Gerin, Meylan, France

Filed Nov. 14, 1990, Ser. No. 612,860
Claims priority, application France, Nov. 24, 1989, 89 15689
Int. Cl.[5] G01R *31/02, 31/08*
U.S. Cl. 324—508 **10 Claims**



1. A measuring system of the line resistance of an electrical mains system comprising first and second conductors fed by an A.C. voltage source, said measuring system comprising:

at least one measuring module including means for producing a D.C. current component Ic between first and second points (A,B) situated, respectively, on the first and second conductors, measuring means for measuring a voltage (V) applied between said first and second points (A,B) an extraction filter for extracting a D.C. component of said measured voltage (V), and a processing circuit coupled to an output of the extraction filter, said processing circuit comprising computation means for computing a value representative of a line resistance (RL) of a portion of the mains system, detection means for detecting a variation of said line resistance value (RL), comparison means for comparing said variation with a preset threshold (s1), and indication means for indicating a conduction fault when said variation exceeds said threshold.

5,150,058

E-FIELD DETECTOR AND ANNUNCIATOR

Michael J. Johnson, 12809 N. 23rd St., Phoenix, Ariz. 85022

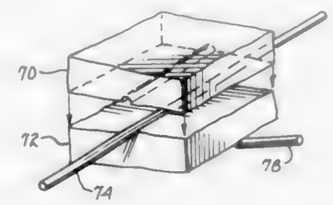
Filed May 15, 1989, Ser. No. 352,048
Int. Cl.[5] G01R *31/08*
U.S. Cl. 324—519 **24 Claims**

1. Apparatus for detecting and annunciating the presence of an E-Field above a threshold energy level, said apparatus comprising in combination:

a) conductive foam E-Field sensor means for capacitively coupling with the E-Field to generate an electrical signal;

b) passive electro-optic means for detecting an annunciating the presence of an electrical signal above a predetermined threshold; and

c) means for electrically interconnecting said conductive



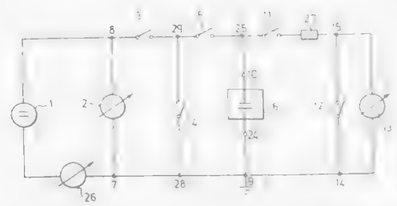
foam E-Field sensor means directly to said electro-optic means to energize and to actuate said electro-optic means in response to an above threshold electrical signal generated by said conductive foam E-Field sensor means.

5,150,059

METHOD AND APPARATUS FOR TESTING THE CONDITION OF INSULATING SYSTEM

Alajos Bognár; Gusztáv Csépes, and István Hámos, all of Budapest, Hungary, assignors to B & C Diagnostics Kft., Budapest, Hungary

Filed Nov. 7, 1990, Ser. No. 610,406
Claims priority, application Hungary, Nov. 9, 1989, 5843/89
Int. Cl.[5] G01R *31/12*
U.S. Cl. 324—551 **9 Claims**



1. A method for testing the condition of insulating systems comprising of the steps of:

a) charging the insulating system to a given direct current voltage level over a charging time period in the range of 10^{-3} to 10^{4} seconds;

b) discharging the insulation system over a discharging time period, wherein the ratio of charging time period to discharging time period is chosen to be in the range of 0.1–100;

c) determining the peak value of return voltage after discharge and computing the ratio of return voltage to charging voltage;

d) repeating steps a) through c) at a plurality of charging and discharging time periods in which the ratio thereof remains at said chosen value;

e) obtaining a spectrum of the return voltage peak charging voltage ratio as a function of charging time; and

f) comparing said spectrum to a reference spectrum for said system to determine the condition thereof.

5,150,060

MULTIPLEXED RADIO FREQUENCY LINEAR POSITION SENSOR SYSTEM

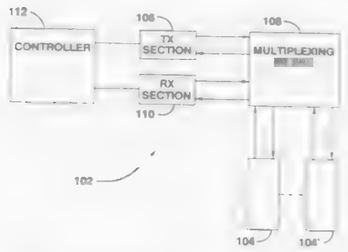
Ali A. Bitar, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 5, 1991, Ser. No. 726,068
Int. Cl.[5] G01R *33/32*
U.S. Cl. 324—635 **24 Claims**

1. An apparatus for detecting the linear extensions of a plurality of hydraulic cylinders, each said hydraulic cylinder having a piston, a piston rod, and a housing and defining a variable length coaxial resonant cavity, the linear extension of each cylinder being defined by the relative position of each piston and piston rod relative to the corresponding housing, comprising:

transmitting means for generating an RF signal having a predetermined frequency varying between preselected minimum and maximum values;

multiplexing means for receiving said RF signal and selectively delivering said RF signal into the coaxial resonant



cavity of one of said hydraulic cylinders and for receiving a first electromagnetic wave signal within said coaxial resonant cavity of said one of said hydraulic cylinders;

receiving means for comparing the magnitude of said first electromagnetic wave signal to a first predetermined threshold value and responsively producing a first resonant signal; and

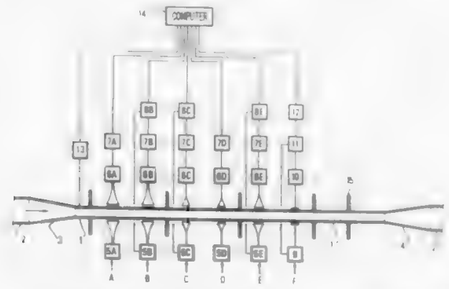
controlling means for receiving said resonant signal and responsively determining the linear extension of said one hydraulic cylinder as a function of the frequency of said RF signal.

5,150,061

METHOD AND DEVICE FOR MEASURING THE QUALITIES OF A MULTIPHASE FLUID

Yvon Castel, Croissy Sur Seine; John Lynch, Rueil Malmaison, and Jean-Pierre Burzynski, Lyons, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 527,340, May 23, 1990, Pat. No. 5,049,823. This application Jul. 24, 1991, Ser. No. 735,052
Claims priority, application France, May 23, 1989, 89 06835
Int. Cl.[5] G01R *27/04*
U.S. Cl. 324—640 **22 Claims**



1. A method of determining a quality of a volume of a fluid made up of a first liquid and a second liquid, each liquid having a known frequency-dependent intrinsic characteristic response to microwave energy, said method comprising the steps of:

(a) passing microwave energy of a first frequency through the volume of fluid, the first frequency being a frequency for which the value of the intrinsic characteristic of the first liquid is large in comparison to the value of the intrinsic characteristic of the second liquid;

(b) determining the value of the intrinsic characteristic of the microwave energy of the first frequency after passage thereof through the volume of fluid;

(c) passing microwave energy of a second frequency through the volume of fluid, the second frequency being a frequency for which the difference between the value of the intrinsic characteristic of the first liquid and the value of the intrinsic characteristic of the second liquid is small;

(d) determining the value of the intrinsic characteristic of the microwave energy of the second frequency after passage thereof through the volume of fluid;

(e) determining the cross-section of the first liquid within the volume of fluid from the result of step (b);

(f) determining the cross-section of the combined first and second liquids within the volume of fluid from the result of step (d); and

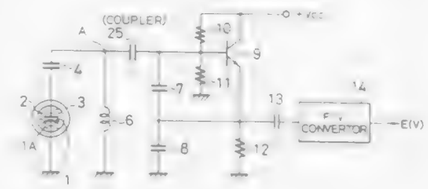
(g) determining the cross-section of the second liquid within the volume of fluid from the results of steps (e) and (f)

5,150,062

ELECTROSTATIC CAPACITANCE SENSING CIRCUIT

Kiyoshi Takeuchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 2, 1991, Ser. No. 634,240
Int. Cl.[5] G01N *27/22*
U.S. Cl. 324—675 **15 Claims**



1. An electrostatic capacitance sensing circuit, comprising;

(a) resonance means having an electrode capacitance formed by a substance to be measured, a corrosion preventing capacitor for preventing electrolytic corrosion connected in series with the electrode capacitance with respect to a junction point, and an inductance connected to the electrode capacitance and said corrosion preventing capacitor via said junction point;

(b) active element means oscillating at a resonance frequency predetermined by said resonance means; and

(c) capacitive coupling means connected between said junction point of the inductance and the corrosion preventing capacitor and said active element means to prevent a DC voltage from being applied to the electrode capacitance.

5,150,063

BRIDGE FOR MEASURING THE REFLECTION COEFFICIENT

Wolfgang Burkhard, Baierbrunn, and Klaus Danzeisen, Gräfelfing, both of Fed. Rep. of Germany, assignors to Rohde & Schwarz GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 3, 1991, Ser. No. 725,467
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021944
Int. Cl.[5] G01R *27/28*
U.S. Cl. 324—646 **10 Claims**

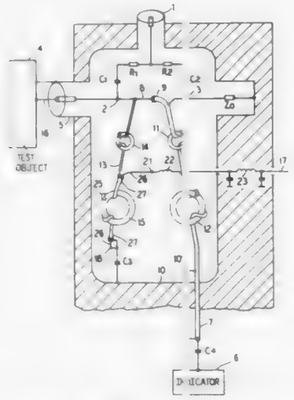
1. A bridge system for measuring a reflection coefficient, comprising:

a frame;

a bridge having a neutral arm provided in the frame;

a balun means for supplying to an indicator a voltage drop across the neutral arm of the bridge;

said balun means having a coaxial cable, a center conductor of which is coupled to one connecting point while an outer conductor thereof is coupled to another connecting point of the neutral arm of the bridge, said coaxial cable being wound onto at least one ferrite core, and a line portion connected in parallel to said coaxial cable, one end



of said line portion together with the center conductor of the coaxial cable being coupled to said one connecting point of the neutral arm of the bridge and said line portion being likewise wound onto at least one ferrite core; and

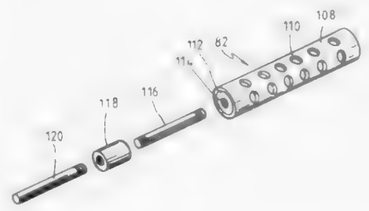
means for feeding a d.c. voltage to a test object connected to the bridge through a coaxial line, said means comprising a compensating winding which is wound onto at least one of said ferrite cores and leads to an end of the line portion of the balun, said end being not connected to the frame.

5,150,065

FLEXIBLE HOLDER FOR A CORROSION-DETECTING COUPON

Damian J. Luna, Broken Arrow, Okla., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 22, 1989, Ser. No. 397,044
Int. Cl.[5] G01R *27/00*
U.S. Cl. 324—700 **13 Claims**



1. An apparatus for testing a plurality of corrosion indicating parameters within a processing system, said apparatus comprising:

a hollow tubular shank having a first end and a second end;

a hollow flexible shaft having a first end and a second end, the first end of said flexible shaft being attached to the second end of said tubular shank;

a hollow tubular sleeve having a first end and a second end, the first end of said tubular sleeve being attached to the second end of said flexible shaft, thereby forming a passageway extending from the first end of said tubular shank to the second end of said tubular sleeve;

a wire being disposed in said passageway and forming a resistive loop which protrudes from the second end of said tubular sleeve;

an electrical outlet being connected to the first end of said tubular shaft, said wire beginning and ending at said electrical outlet;

a sheath having a first end and a second end, said first end of said sheath being attachable to the second end of said tubular sleeve, said sheath being adapted to encompass said resistive loop when attached; and

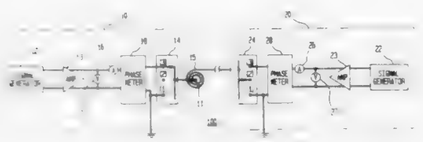
an electrically insulative member being attached to said second end of said sheath, said electrically insulative member being adapted to hold a first end of a corrosion-testing coupon such that a second end of said corrosion-testing coupon extends axially outwardly from said second end of said sheath.

5,150,06-

METHOD AND APPARATUS FOR DETERMINING PARAMETERS OF A TRANSMISSION LINE DEPLOYED IN A SEAWATER ENVIRONMENT

Irwin Nozick, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 1, 1991, Ser. No. 738,762
Int. Cl.[5] G01R *27/28*; **H04M** *3/26*
U.S. Cl. 324—691 **6 Claims**



1. A method for determining transmission line parameters of an underwater vehicle guidance wire comprises the steps of:

deploying the guidance wire in seawater, wherein the guidance wire is partially coiled and partially paid out to a known length;

generating, for a plurality of known lengths, a plurality of alternating voltages of known amplitude and frequency, and applying same to a first end of the guidance wire wherein the seawater serves as an electrically grounded return for the guidance wire

determining, for the plurality of alternating voltages at each of the known lengths, open and short circuit parameters at the first end when a second end of the guidance wire is alternately switched between an open circuit mode and a short circuit mode;

applying the plurality of alternating voltages of known amplitude and frequency for each of the known lengths to the second end wherein the seawater serves as an electrically grounded return for the guidance wire; and

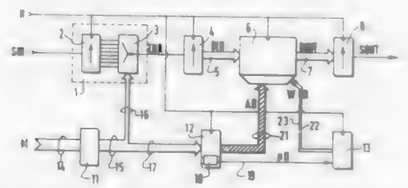
determining, for the plurality of alternating voltages at each of the known lengths open and short circuit parameters at the second end when the first end is alternately switched between an open circuit mode and a short circuit mode, wherein the open and short circuit parameters determined at both ends for the plurality of alternating voltages at each of the known lengths are used to generate equivalent circuit parameters indicative of the transmission line parameters.

5,150,066

PROGRAMMABLE DIGITAL SIGNAL DELAY DEVICE AND ITS USE FOR A ERROR CORRECTION CODE DEVICE

Pascal Butel, Brive La Gaillarde; Alain Dahiot, Ussac, and Joël Ferrier, Brive La Gaillarde, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1990, Ser. No. 530,712
Claims priority, application France, May 30, 1989, 89 07099
Int. Cl.[5] H03K *5/159, 7/00, 17/00*; **G06F** *11/00*
U.S. Cl. 328—55 **9 Claims**



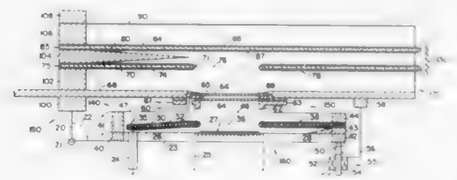
1. A delay device for delaying a digital serial input signal SIN by a programmable integer number M of periods H, so by a time $\tau = M.H$, and for transforming it into a delayed digital serial output signal SOUT having the same bit rate as SIN, comprising an at least one-bit input register, a random access memory (RAM) connected to the input register and having a plurality r of memory locations each location containing an integer number p of bits which is at least equal to 1, an at least one-bit output register connected to the random access memory, and means for controlling the RAM including a decoder which receives the number M in digital form on an input bus, and produces a programming number N on an output bus, a cyclic counter connected to the decoder and the RAM which receives, from the output bus of the decoder, the programming number N or its principal part n and cyclically addresses the RAM, and a sequencer connected to the cyclic counter for receiving a write/read control signal from the cyclic counter and supplying the RAM with write and read control signals.

5,150,067

ELECTROMAGNETIC PULSE GENERATOR USING AN ELECTRON BEAM PRODUCED WITH AN ELECTRON MULTIPLIER

Michael R. McMillan, 19151 Stedwick Dr., Gaithersburg, Md. 20879-2937

Filed Apr. 16, 1990, Ser. No. 516,143
Int. Cl.[5] H03K *3/04*; **H01J** *43/06*
U.S. Cl. 328—64 **12 Claims**



1. An electromagnetic pulse generator comprising:

a vacuum envelope;

a waveguiding structure in said envelope, with first and second ends and including a sequence of four substantially-parallel plate electrodes, said four electrodes aligned in parallel between said first and second ends, and said sequence of four electrodes separated by a sequence of three gaps, said sequences of electrodes and gaps oriented so that a first one of said gaps is located between first and second ones of said electrodes;

means for supporting said electrodes in said envelope;

respective apertures disposed in said first and second ones of said electrodes, said respective apertures in alignment at a position between said ends, said alignment defined by a line which is substantially perpendicular to said electrodes;

a screen electrode extending across said aperture in said second plate electrode;

a chevron electron multiplier located at said aperture in said first plate electrode, said chevron multiplier comprising first and second substantially-flat parallel microchannel plates, said second microchannel plate extending across said aperture in said first plate electrode, and said first microchannel plate located proximate said second microchannel plate and outside said waveguiding structure;

a high, positive, constant voltage is applied to said second plate electrode and a third one of said plate electrodes, while said first plate electrode and a fourth one of said plate electrodes are connected to ground;

an electron gun located outside said waveguiding structure, along said line, and located proximate said first plate electrode, said electron gun having a negative voltage with respect to said first electrode;

said microchannel plates of said electron multiplier having electron entrance surfaces oriented toward said electron gun, and electron exit surfaces oriented away from said gun;

a fast-rising pulse is applied to said electron gun, said pulse initiating a low-intensity pulsed electron beam from said gun, said electron beam accelerated toward said electron multiplier by said negative voltage and thereby attaining a resulting beam velocity, said electron beam having a substantially-flat front surface composed of electrons, which is inclined at an angle of inclination with respect to said entrance surface of said first microchannel plate of said electron multiplier;

said electrons in said front surface of said electron beam first making contact with said entrance surface of said first microchannel plate of said electron multiplier at a narrow intersection region where said front surface of said beam and said entrance surface of said first plate converge;

said electrons in said front surface of said electron beam at said intersection region being promptly amplified nonlinearly by said two microchannel plates, said amplification comprising an immediate, complete discharge of said second plate in a narrow region of said second plate proximate said first intersection region and parallel to it;

said first intersection region moving along said entrance surface of said first microchannel plate toward said second end of said waveguiding structure at a velocity determined by said beam velocity and said angle of inclination, and said amplified electrons being accelerated toward said second plate electrode by said voltage on said second plate electrodes, said electron multiplier and said second plate electrode thereby acting to create an intense sheet electron beam from said low-intensity, pulsed electron beam;

said sheet electron beam proceeding across said first gap and through said screen in said second plate electrodes, and being inclined with respect to said screen, crossing said screen in a second intersection region, said second intersection region also travelling with said velocity of said first intersection region toward said second end of said waveguiding structure;

said sheet electron beam crossing a second one of said gaps before being absorbed at said third plate electrode;

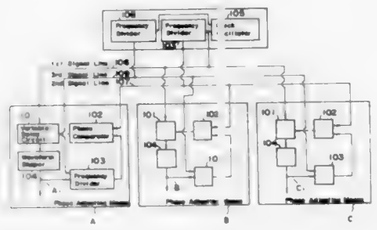
said sheet electron beam generating two transverse-electromagnetic pulses in said second gap, said generation initiated where said sheet beam begins to cross said screen, and terminated where the last of said sheet beam is absorbed at said third electrode, after which said pulses travel respectively toward said ends of said waveguiding structure at the speed of light in vacuum.

5,150,068

CLOCK SIGNAL SUPPLY METHOD AND SYSTEM

Seiichi Kawashima, Hadano; Noboru Masuda, Kokubunji; Shuichi Ishii, Sayama, and Bunichi Fujita, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 391,782
Claims priority, application Japan, Aug. 10, 1988, 63-199361
Int. Cl.[5] H03K 5/00, 5/13
U.S. Cl. 328—155 15 Claims



1. A clock signal supply method, said method comprising the steps of:

generating a clock signal at a clock signal generating source end;

generating a reference signal and a synchronizing signal, both said reference signal and said synchronizing signal based on said clock signal at said clock signal generating source end, both said reference signal and said synchronizing signal having a period longer than that of said clock signal;

delivering said clock signal, said reference signal and said synchronizing signal to each of a plurality of clock signal destination ends;

delaying said clock signal delivered to said clock signal destination ends;

frequency-dividing said delayed clock signal in synchronism with said synchronizing signal at each one of said clock destination ends;

comparing in phase a resultant frequency-divided signal with said reference signal at each one of said clock destination ends; and

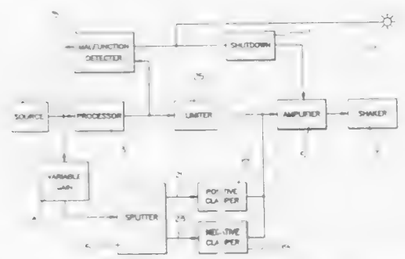
controlling said delay of said clock signal at each one of said clock destination ends in accordance with a result of said comparing step such that said resultant frequency-divided signal and said reference signal coincide in phase with each other.

5,150,069

WAVEFORM TRACKING CLIPPER CIRCUIT

James D. Sherman, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 6, 1990, Ser. No. 505,750
Int. Cl.[5] H03K 5/08
U.S. Cl. 328—171 18 Claims



1. A solid state waveform tracking clipper circuit for preventing the instantaneous amplitude of a processed vibration test signal at the input to a shaker amplifier form substantially exceeding the instantaneous amplitude of an unprocessed vibration test signal, the unprocessed vibration test signal having been processed to develop the vibration test signal, comprising:

a. limiting means connected between the processed signal and the input of the amplifier for limiting the processed signal at the input of the amplifier;

b. solid state splitter means having an input connected to the unprocessed signal and having a first and second output, the first output for tracking a first portion of the unprocessed signal, the second output for tracking a second portion of the unprocessed signal;

c. first clamping means connected to said first output and to the input of the amplifier for clamping the input of the amplifier to the value of said first output; and

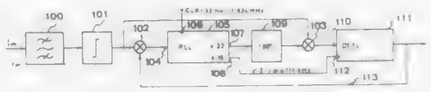
d. second clamping means connected to said second output and to the input of the amplifier for clamping the input to the amplifier to the value of said second output.

5,150,070

DEMODULATOR FOR BIPHASE, SUPPRESSED-CARRIER PSK SIGNALS

Paolo Rinaldi, and Federico Cecili, both of Rome, Italy, assignors to Telesia Microelecttronica S.r.l., Italy

Filed Aug. 7, 1990, Ser. No. 563,699
Claims priority, application Italy, Aug. 9, 1989, 48291A/89
Int. Cl.[5] H04L 27/22
U.S. Cl. 329—307 5 Claims



1. A demodulator suitable for the demodulation of digital information transmitted as a suppressed carrier biphase PSK auxiliary signal in a radio transmission channel comprising:

a filter for extracting a portion of signal spectrum carrying said PSK signal;

an amplitude limiter connected to said filter for limiting the amplitude of said PSK signal;

a double loop circuit comprising:

a first multiplier having a first input connected to said limiter, and a second input;

a digital phase locked loop having an input connected to said first multiplier output and a clock input connected to receive a stable clock signal, said digital phase locked loop producing, respectively, first and second signals at the frequency of said suppressed carrier and at a frequency of twice said suppressed carrier;

a ninety degree phase shift circuit connected to receive said first signal;

a second multiplier connected to receive a signal from said phase shift circuit and a signal from said limiter; and,

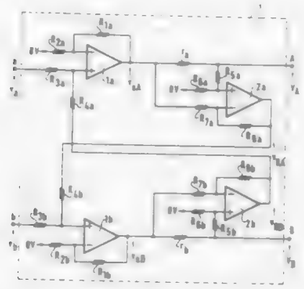
a data transition tracking loop decoder connected to receive a signal from said second multiplier and said second signal from said phase locked loop, said decoder providing a demodulated signal to said first multiplier second input.

5,150,071

DIFFERENTIAL OUTPUT STAGE FOR ELECTRONIC EQUIPMENT

Jean-Pierre Bouzidi, Lannion, France, assignor to Alcatel Cit, Paris, France

Filed Mar. 21, 1991, Ser. No. 672,799
Claims priority, application France, Mar. 29, 1990, 90 04032
Int. Cl.[5] H03F 3/68
U.S. Cl. 330—84 6 Claims



1. A differential output stage for electronic equipment, the output stage comprising:

a two-port network having two paths, each connecting an input terminal to an output terminal, wherein the stage comprises means for generating a negative feedback voltage from each path for applicating to the other, and means for providing an output voltage in each path equal to an identical linear combination in each path, of the input voltage to the path and of the negative feedback voltage from each path;

wherein each of said paths includes first means for adding together the input voltage of the path under consideration with the negative feedback voltage from the other path, and second means for subtracting the output voltage from the path under consideration from the output voltage of the first means;

wherein the output voltage of said second means constituting the negative feedback voltage from the path under consideration for applicating to the other path.

5,150,072

DISTORTION CORRECTION FOR AN AMPLIFIER SYSTEM

Jeffrey M. Malec, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 15, 1991, Ser. No. 776,829
Int. Cl.[5] H03F 1/26
U.S. Cl. 330—149 15 Claims

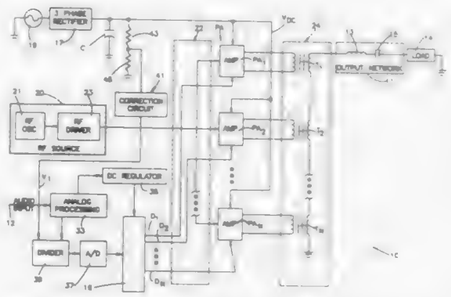
1. An amplifier system having distortion reduction and comprising:

a DC voltage source having AC and DC components;

means for providing an input signal to be amplified;

amplifier means coupled to said DC voltage source for amplifying said input signal to provide an output signal in accordance therewith;

correction signal means for providing a correction signal including means for separating said AC and DC components and means for controlling the magnitude and phase of said AC component independently of said DC component to provide an adjusted AC component and means for summing said DC component and said adjusted AC component to provide an adjusted correction signal; and



means for combining said adjusted correction signal with said input signal prior to application of said input signal to said amplifier means.

5,150,073

LOW-NOISE PREAMPLIFIER STAGE, IN PARTICULAR FOR MAGNETIC HEADS

Bruno Murari, Via Ardigò 1, 20052 Monza, Province of Milan; Domenico Rossi, Via Roma 161, 27024 Cilavegna, Province of Pavia, and Pierantonio Savino, Via D. Alighieri 3, 20080 Casarile, Province of Milano, all of Italy

Filed Dec. 17, 1990, Ser. No. 628,023
Claims priority, application Italy, Dec. 22, 1989, 22819 A/89
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—261 6 Claims

1. A low-noise preamplifier stage circuit, in particular for magnetic heads, comprising an input stage which includes a differential circuit formed by a first transistor and by a second transistor with coupled emitters and a single-transistor output stage, the emitter area of said second transistor being a multiple of the emitter area of said first transistor whereby said first transistor and said second transistor of the differential circuit have different bias currents with the bias current of said second transistor being higher than the bias current of said first transistor, generating an intrinsic offset voltage between the respective base terminals, the base terminal of said first transistor defining an input of the stage and the base terminal of said second transistor being connected to an intermediate point of a pair of resistors, said resistors being mutually coupled in series between said single transistor of the output stage and a line at reference voltage, so as to bias said output stage with said offset voltage, said input stage having a first current source which is connected to said coupled emitters of said first transistor and said second transistor of the input stage, said first current source generating a current which is a multiple of the bias current of said first transistor, said input stage furthermore comprising a branch for setting the bias current of said first transistor, said branch comprising a second current source suitable for generating a current having a preset value, and current source means which are connected to the collector terminal of said first transistor, said current source means being

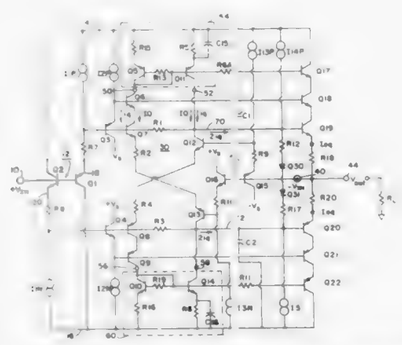
controlled by said setting branch so as to generate said bias current of said first transistor, said second transistor being biased at a current which is equal in value to the difference between the current generated by said first current source and the bias current of said first transistor, said controlled current source means comprising a bias resistor which is connected between the collector terminal of said first transistor and said line at reference voltage, said circuit further comprising an operational amplifier which has a first input connected to the intermediate point between said bias resistor and said first transistor and a second input connected to a terminal of a further resistor which is connected between said second current source and said line at reference voltage, the output of said operational amplifier being connected to the base terminal of a further transistor, said further transistor being connected, with its collector and emitter terminals, between said second current source and said further resistor.

5,150,074

WIDE-BAND TRANSCONDUCTANCE GENERATOR

Royal A. Gosser, Reidsville, N.C., assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 3, 1991, Ser. No. 695,270
Int. Cl.[5] H03F *1/26*
U.S. Cl. 330—263 **19 Claims**



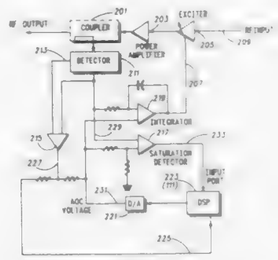
1. A wide-band transconductance generator comprising:
first and second pairs of complementary transistors each including base, emitter and collector;
said first and second pairs of transistors being cross-coupled to provide a cross-quad circuit wherein one of said first pair is in series with a complementary one of said second pair, and the other of said first pair is in series with the other of said second pair;
a first biasing circuit connected between d-c power leads and having an input circuit and two output circuits providing respective level-shifted outputs corresponding to a signal connected to the input circuit of said first biasing circuit;
a first input terminal connected to the input circuit of said first biasing circuit to supply thereto an a-c signal;
means connecting the two level-shifted outputs of said first biasing circuit to the bases of said first pair of transistors respectively;
a second biasing circuit connected between d-c power leads and having an input circuit and two output circuits providing respective level-shifted outputs corresponding to a signal connected to the input circuit of said second biasing circuit;
a second input terminal connected to the input circuit of said second biasing circuit to supply thereto an a-c signal;
means connecting the two level-shifted outputs of said second biasing circuit to the bases of said second pair of transistors respectively; and
output means coupled to two collectors of said first and second pairs of transistors to produce an output signal for the transconductance generator.

5,150,075

POWER AMPLIFIER RAMP UP METHOD AND APPARATUS

Alexander W. Hietala, Cary, and Gregory R. Black, Vernon Hills, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1991, Ser. No. 709,738
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—279 **12 Claims**



1. A transmitter including a means for amplifying a first signal and means for controlling the means for amplifying, the means for amplifying having at least two inputs, at least one output, an active state and an inactive state, the first signal having a power level, a first frequency and coupled to a first one of the at least two inputs of the means for amplifying, the means for amplifying responsive to a voltage of a second signal, the means for controlling comprising:
a first means for generating the second signal, said first means for generating having an input and an output, said output of said first means for generating the second signal coupled to a second one of the at least two inputs of the means for amplifying;
means for generating a third signal, responsive to the active state of the means for amplifying, having an input and an output, said input of said means for generating said third signal coupled to a first one of the at least one output of the means for amplifying; and
means for determining the voltage level of the second signal, having an input and an output, said input of said means for determining coupled to said output of said means for generating said third signal and said output of said means for determining coupled to said input of said first means for amplifying the first signal is ramped up into the active state without a substantial burst of frequency noise.

5,150,076

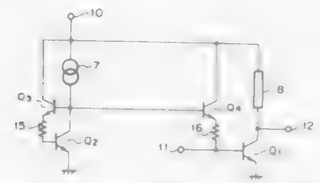
EMITTER-GROUNDED AMPLIFIER CIRCUIT WITH BIAS CIRCUIT

Hiroshi Asazawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 24, 1991, Ser. No. 719,812
Claims priority, application Japan, Jun. 25, 1990, 2-166117
Int. Cl.[5] H03F *1/30*
U.S. Cl. 330—296 **7 Claims**

1. An amplifier circuit having an input terminal, an output terminal and a power supply terminal, said circuit comprising:
an amplifying transistor having its base connected to said input terminal, having its collector connected to said output terminal and connected to said power supply terminal through a load, and its emitter grounded;
a first biasing transistor having its emitter connected to the base of said amplifying transistor, and its collector connected to said power supply terminal;

a bias voltage generating circuit including a constant current source; a constant current source transistor having its collector connected to said power supply terminal through said constant current source and having its emitter grounded; and a second biasing transistor having its



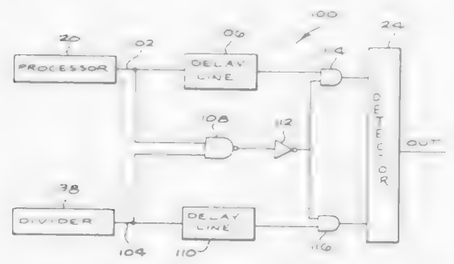
base connected to the collector of said constant current source transistor and also connected to the base of said first biasing transistor, its emitter connected to the base of said constant current source transistor, and its collector connected to said power supply terminal.

5,150,077

GENERATION OF HORTIZONTAL SYNC PULSE

Joseph H. Colles, Vista, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Sep. 26, 1991, Ser. No. 766,817
Int. Cl.[5] H03L *7/00*
U.S. Cl. 331—1 A **20 Claims**



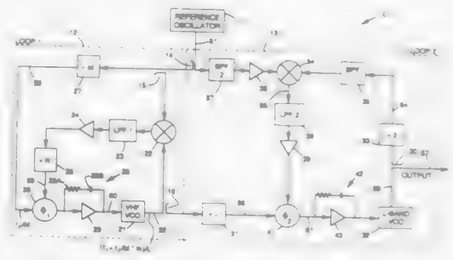
1. In combination,
first means for providing sync pulses controlling the generation of horizontal and vertical retrace periods in a television image,
second means for providing comparison signals having a time variable relative to the time of the sync pulses,
third means for providing a particular delay of the sync pulses and of the comparison signals,
fourth means responsive to the sync pulses, the comparison signals, the sync pulses with the particular delay and the comparison signals with the particular delay for producing resultant pulses representative, with particular limits dependent upon the particular delay, of the difference in time between the sync pulses and the comparison signals,
fifth means responsive to the resultant pulses for producing an oscillatory signal having a frequency variable in accordance with the occurrence of the resultant pulses, and
sixth means for deriving the comparison signals in accordance with the frequency of the oscillatory signal.

5,150,078

LOW NOISE FINE FREQUENCY STEP SYNTHESIZER

Steve S. Yang, Chatsworth, and Keith P. Arnold, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 29, 1991, Ser. No. 799,817
Int. Cl.[5] H03L *7/00*
U.S. Cl. 331—2 **15 Claims**



1. A frequency synthesizer comprising:
reference frequency oscillattor means (**11**) for providing a reference frequency signal (**51**);
a first phase locked loop (**12**) coupled to the reference frequency oscillator means (**11**) for generating a first synthesized signal (**52**) at a selectable one of a plurality of desired frequencies, each of the frequencies differing from an adjacent frequency by a substantially uniform frequency step size; and
a second phase locked loop (**13**) coupled to the reference frequency oscillator means (**11**) and to the first phase locked loop (**12**) for generating an output signal (**57**) having a predetermined frequency said second phase locked loop (**13**) comprising second oscillator means (**32**) for generating a second synthesized signal (**53**) at a selectable one of a second plurality of desired frequencies, first divider means (**33**) coupled to the second oscillator means (**32**) for dividing the second synthesized signal (**53**) by a first predetermined fixed number to produce a divided second synthesized signal (**54**), mixing means (**34**) coupled to the reference frequency oscillator (**11**) and to the first divider means (**33**) for mixing the divided second synthesized signal (**54**) with a predetermined harmonic of the reference frequency signal (**51**) to produce an offset frequency signal (**55**), second divider means (**31**) coupled to the first phase locked loop (**12**) for dividing the first synthesized (**52**) by a second predetermined fixed number to produced a divided second reference frequency signal (**56**) having a reduced frequency step size and reduced noise, and phase detector means (**41**) coupled to the mixing means (**34**) and to the second divider means (**31**) for locking the offset frequency signal (**55**) to the divided second reference frequency signal (**56**).

5,150,079

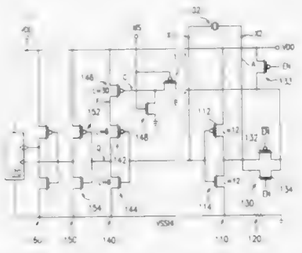
TWO-MODE OSCILLATOR

Clark R. Williams, Plano, and Ching-Lin Jiang, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 499,853, Mar. 27, 1990. This application Jun. 18, 1991, Ser. No. 717,238
Int. Cl.[5] H03B *5/00*
U.S. Cl. 331—75 **1 Claim**

1. An integrated circuit oscillator, comprising:
(a) first and second resonator leads connectable to a resonator;
(b) an amplifier stage operatively connected to provide AC amplification between said first and second resonator leads, said amplifier stage with a first input trip voltage; and

(c) a first-stage output buffer including a gain stage which has an input connected to the input of said amplifier stage;
(d) wherein said gain stage, in a first mode of operation of the oscillator, has an input trip voltage approximately



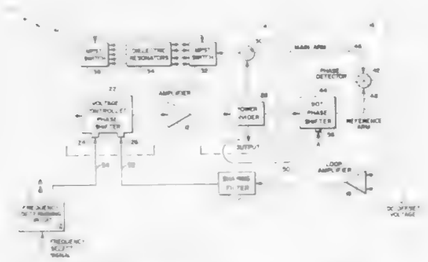
equal to said first input trip voltage and, in a second mode of operation of the oscillator, said gain stage has an input trip voltage not approximately equal to said first input trip voltage.

5,150,080

FREQUENCY AGILE SWITCHED RESONATOR OSCILLATOR WITH NOISE DEGENERATION

Michael J. Bianchini, North Middleboro; Christopher T. Lyons, Tyngsboro; Richard A. Michalik, Andover, and Raymond C. Waterman, Jr., Westford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 12, 1991, Ser. No. 806,956
Int. Cl.[5] H03B *1/04, 5/18*
U.S. Cl. 331—99 **11 Claims**



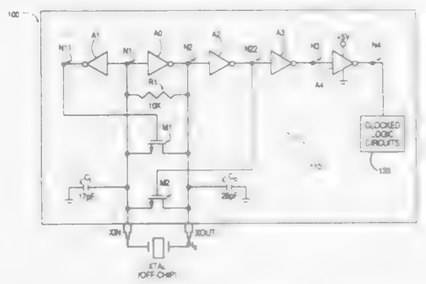
1. An oscillator comprising:
(a) an amplifier having an input and an output;
(b) a feedback circuit disposed between the input and the output of the amplifier, the feedback circuit comprising:
(i) plurality of resonators;
(ii) a pair of switches, each switch having a first input port and multiple connectable ports, said multiple connectable ports of each switch connected to a corresponding one of the plurality of resonators; and
(iii) a voltage-controlled phase shifter disposed in series with the switches; and
(c) means, responsive to signals from the feedback circuit, for providing a control signal to the voltage-controlled phase shifter for degenerating low frequency noise within the oscillator.

5,150,081

INTEGRATED CRYSTAL OSCILLATOR WITH CIRCUIT FOR LIMITING CRYSTAL POWER DISSIPATION

Jules Goldberg, Santa Clara, Calif., assignor to Adaptec, Inc., Milpitas, Calif.

Filed Feb. 28, 1991, Ser. No. 662,530
Int. Cl.[5] H03B *5/36;* **H03L** *5/02*
U.S. Cl. 331—109 **17 Claims**



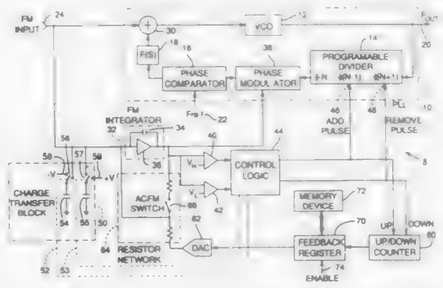
1. In an integrated circuit containing a crystal-controlled oscillator circuit, a circuit comprising:
amplifier means, operatively coupled to said oscillator circuit, for detecting power dissipated by an oscillator crystal wherein said amplifier means includes an input line and an output line with said input line being connected to said crystal-controlled oscillator circuit; and
means, responsive to the amplifier power detection means, for limiting power dissipation of said oscillator crystal to a predetermined safe limit wherein upon said power dissipation reaching a predetermined level, said amplifier power detection means enables said power limiting means to drain power from said crystal-controlled oscillator circuit.

5,150,082

CENTER FREQUENCY CALIBRATION FOR DC COUPLED FREQUENCY MODULATION IN A PHASE-LOCKED LOOP

Scott B. Grimmett, Veradale; David P. Whipple, Greenacres, and Marcus K. DaSilva, Spokane, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 21, 1992, Ser. No. 839,826
Int. Cl.[5] H03L *7/081, 7/16;* **H03C** *3/00*
U.S. Cl. 332—128 **16 Claims**



1. An electronic circuit for calibrating a frequency modulated phase-locked loop (PLL) to cancel an offset current causing center frequency drift of a DCFM synthesized signal comprising:
a PLL for generating said synthesized signal;
an integrator connected to the PLL for DC coupling an FM signal to the PLL to thereby phase modulate the synthesized signal;
means for generating a feedback current around the integrator and applying the feedback current to the input of the integrator;
control means for settling the feedback current to a current magnitude equal and opposite to the magnitude of the offset current when frequency modulation is removed from the FM signal; and
means for holding the feedback current at said current magnitude when frequency modulation is again added to the FM signal to thereby cancel the offset current during DC coupled frequency modulation of the synthesized signal.

5,150,083

DIGITALLY CONTROLLED MONOLITHIC SWITCH MATRIX USING SELECTABLE DUAL GATE FET POWER DIVIDERS AND COMBINERS

Tzu H. Chen, East Brunswick, and Mahesh Kumar, Lawrenceville, both of N.J., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 255,092, Oct. 7, 1988, abandoned. This application Aug. 9, 1990, Ser. No. 565,877
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 333—103 **11 Claims**

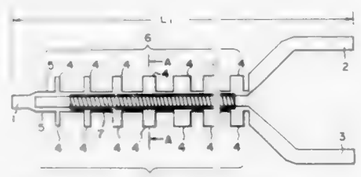
10. A digitally controlled switching apparatus for selectively directing power from at least one input port and at least one auxiliary input port to at least one output port and at least one auxiliary output port, comprising:
a first active power divider means having an input terminal connected to a first input port, a first output terminal, and a second output terminal coupled via a third circuit means to a first auxiliary output port, the first active power divider means comprising first and second dual gate FETs each having source, drain and first and second gate electrodes, the first gate electrodes of the first and second dual gate FETs being connected together and to the input terminal, the source electrodes of the first and second dual gate FETs being connected together and to a point of reference potential, the drain electrode of the first FET connected to the first output terminal, the drain electrode of the second FET connected to the second output terminal, and at least one of the second gate electrodes of each of the dual gate FETs connected to respective control terminals;
a first active power combiner means having a first input terminal directly connected to the first output terminal of the first active power divider means, a second input terminal coupled to a first auxiliary input port, and an output terminal, the first active power combiner means comprising first and second dual gate FETs each having source, drain and first and second dual gate electrodes, the first gate electrode of the first FET in the first active power combiner means connected to the first input terminal of the first active power combiner means, the first gate electrode of the second FET in the first active power combiner means connected to the second input terminal of the first active power combiner means, the source electrodes of the first and second dual gate FETs being connected together and to a point of reference potential, the drain electrodes in the first and second dual gate FETs being connected together and to the output terminal of the first active power combiner means, and at least one of the second gate electrodes of each of the dual gate FETs in the first active power combiner means connected to respective control terminals;
a second active power divider means having an input terminal coupled to a second input port, a first output terminal, and a second output terminal coupled via a fourth circuit means to a second auxiliary output port, the second active power divider means comprising first and second dual gate FETs each having source, drain, and first and second gate electrodes, the first gate electrodes of the first and second dual gate FETs being connected together and to the input terminal of the second active power divider means, the source electrodes of the first and second dual gate FETs being connected together and to a point of reference potential, the drain electrode of the first FET in the second active power divider means connected to the first output terminal of the second active power divider mean, the drain electrode of the second FET in the second active power divider means connected to the second output terminal of the second active power divider means, and at least one of the second gate electrodes in each of the dual gate FETs in the second active power divider means connected to respective control terminals;
a second active power combiner means having a first input terminal directly connected to the first output terminal of the second active power divider means, a second input terminal connected to the output terminal of the first active power combiner means, and an output terminal coupled to a first output port, the second active power combiner means comprising first and second dual gate FETs each having source, drain, and first and second gate electrodes, the first gate electrode of the first FET in the second active power combiner means connected to the first input terminal of the second active power combiner means, the first gate electrode of the second FET in the second active power combiner means connected to the second input terminal of the second active power combiner means, the source electrodes of the first and second dual gate FETs being connected together and to a point of reference potential, the drain electrodes of the first and second dual gate FETs being connected together and to the output terminal of the second active power combiner means, and at least one of the second gate electrodes in each of the dual gate FETs in the second active power combiner means connected to respective control terminals; and
a control means for applying digital control signals to the control terminals of the first and second active power divider means and the first and second active power combiner means to selectively switch power from the first input port to the first output port and the first auxiliary output port, and to selectively switch power from the second input port to the first output port and the second auxiliary output port, and to selectively switch power from the first auxiliary input port to the first output port.

5,150,084

POWER DIVIDER

Masahito Asa, and Masayuki Nakajima, both of Tokyo, Japan, assignors to Tokimec, Inc., Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 662,139
Claims priority, application Japan, Feb. 28, 1990, 2-48562
Int. Cl.[5] H01P 5/12
U.S. Cl. 333—128 21 Claims



1. A power divider, which includes one or more conductor bases, one or more dielectrics and one or more strip conductors, for dividing and composing microwave power, said divider comprising:

(a) a common port and n distributing ports adapted to be connected to respective external lines; and

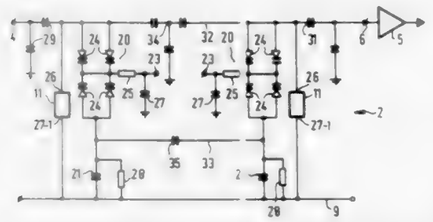
(b) n impendance transformers, each including a filter structure for performing a filter function and each disposed between said common port and a respective one of said n distributing ports.

5,150,085

ELECTRONICALLY TUNABLE FRONT END FILTER FOR RADIO APPARATUS

Jeffrey E. Hales, Keyesborough, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1990, Ser. No. 549,788
Claims priority, application Australia, Jul. 7, 1989, 5119
Int. Cl.[5] H03H 7/12; H01P 1/202
U.S. Cl. 333—174 8 Claims



5. A filter comprising a plurality of isolated ceramic resonators each having a respective input, and a corresponding plurality of variable capacitance means, each variable capacitance means being coupled to the input of a respective associated ceramic resonator for electronic tuning over a range of frequency,

wherein the inputs of two adjacent ceramic resonators are coupled through a first signal coupling path, and through a second signal coupling path in parallel with said first signal coupling path, for coupling signals from one of the adjacent resonators to the other of the adjacent resonators,

the first signal coupling path consists of fixed capacitance means, and

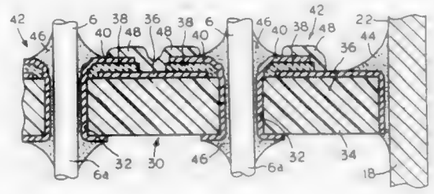
the second signal coupling path comprises at least a cascade arrangement of the entire variable capacitance means associated with one of the adjacent resonators and the entire variable capacitance means associated with the other of the adjacent resonators.

5,150,086

FILTER AND ELECTRICAL CONNECTOR WITH FILTER

Tsukasa Ito, Omiya, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 18, 1991, Ser. No. 732,380
Claims priority, application Japan, Jul. 20, 1990, 2-190606
Int. Cl.[5] H03H 7/04
U.S. Cl. 333—182 9 Claims



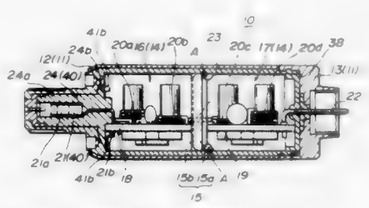
1. An electrical filter connector, comprising a metal shell providing a grounding path and a dielectric housing secured therein, an array of electrical contacts secured in said dielectric housing including post member of a given diameter extending outwardly from said dielectric housing providing signal paths, an inductive plate member of magnetic material having a multiplicity of through holes each of a diameter larger than the given diameter of the post members with said post members being disposed in said holes to provide an inductance to said signal path, a first metal layer on a surface of said plate member electrically connected to said shell member and ground path forming one plate of a capacitor, a capacitance material individual to each post member extending around said hole and surrounding said post member providing a capacitance C for said signal path, a second metal layer covering the surface of the said hole forming a second plate of the capacitor to define with the inductance of said plate an LC network separate for each contact to minimize parasitic capacitance between contacts and reduce cross-coupling while allowing a close center-to-center spacing of said contacts.

5,150,087

ELECTRICAL SIGNAL FILTER AND METHOD FOR MANUFACTURE OF ELECTRICAL SIGNAL FILTER INTERNAL CIRCUIT BOARD

Hiroto Yoshie, Sagamihara, and Hironobu Sato, Isehara, both of Japan, assignors to Mitsumi Electric Co., Ltd., Japan and Regal Technologies Ltd., Englewood, Colo.

Filed Nov. 29, 1990, Ser. No. 619,942
Claims priority, application Japan, Nov. 30, 1989, 1-138713[U]; May 31, 1990, 2-57817[U]; Oct. 27, 1990, 1-126324[U]; Oct. 31, 1990, 2-114604[U]; Oct. 31, 1990, 2-114605[U]; Oct. 31, 1990, 1-114606[U]; Oct. 31, 1990, 2-114607[U]; Oct. 31, 1990, 2-294877[U]
Int. Cl.[5] H03H 7/00
U.S. Cl. 333—185 14 Claims



1. An electric signal filter comprising:

circuit board means;

first and second filter circuits mounted on said circuit board means;

a unitary, cup-like substantially cylindrical inner case open at one end portion, said circuit board means being inserted entirely within said inner case via said open end portion, said inner case having a first connector at the other end portion thereof connected to one of said filter circuits;

a cup-like substantially cylindrical outer case open at one end portion, said inner case being inserted into said outer case via said open end portion to assemble said inner and outer cases, said inner case entering said outer case with the open end portion entering first, and said outer case having a second connector at the other end portion theeof connected to the other of said filter circuits, said outer case being engageable with said inner case such that said inner case can be positioned in said outer case so that said inner and outer cases substantially surround said filter circuits and said circuit board means and filter circuits can be shielded in said inner and outer cases, said filter circuits shielded in said inner and outer cases being connectable to an external circuit via said first and second connectors; and

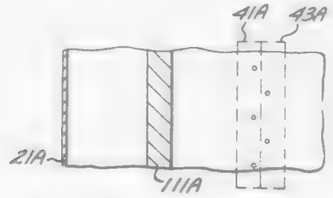
a shield member provided between said first and second filter circuits, said shield member being formed of a pair of axially opposed, disc-like shield member halves having means for retaining said pair of opposed shield member halves in an assembled state, said shield member halves forming an internal cavity in said shield member through which a conductor electrically connecting said first and second filter circuits passes.

5,150,088

STRIPLINE SHIELDING TECHNIQUES IN LOW TEMPERATURE CO-FIRED CERAMIC

Kathleen L. Virga, Redondo Beach; Craig Shoda, Torrance, and Joseph N. Owens, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 27, 1991, Ser. No. 675,763
Int. Cl.[5] H01P 3/08
U.S. Cl. 333—238 11 Claims



1. A stripline shielding structure in a unitized multilayer circuit structure having a plurality of insulating layers, a bottom surface, and a sidewall surface for shielding a stripline conductor, the shielding structure comprising:

a lower ground plane metallization layer formed on the bottom surface of the unitized multilayer circuit structure located below the stripline conductor;

an embedded ground plan metallization layer formed between predetermined insulating layers of the utilized multilayer circuit structure located above the stripline conductor;

first conductive means electrically connected between said lower ground plane and said embedded ground plane metallization layers, said first conductive means disposed on one side of the stripline and extending along the length thereof;

second conductive means electrically connected between said lower ground plane and said embedded ground plane metallization layers, said second conductive means disposed on the other side of the stripline and extending along the length thereof; and

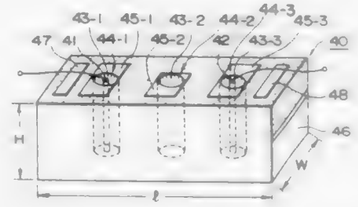
resistive layers formed between predetermined insulating layers and overlying said embedded ground plane metallization layer.

5,150,089

DIELECTRIC FILTER HAVING AN ATTENUATION POLE TUNABLE TO A PREDETERMINED FREQUENCY

Tomokazu Komazaki; Katsuhiko Gunji; Norio Onishi, and Akira Mashimo, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 423,034, Oct. 18, 1989, abandoned.
This application Dec. 26, 1990, Ser. No. 641,252
Claims priority, application Japan, Oct. 18, 1988, 63-260440
Int. Cl.[5] H01P 1/202, 1/205
U.S. Cl. 333—206 1 Claim



1. A dielectric filter comprising:

a homogeneous monolithic block of dielectric material having opposite top and bottom surfaces, opposite front and rear surfaces and opposite left and right side surfaces, wherein said front and rear surfaces, lower portions of said left and right side surfaces adjacent to said bottom surface and said bottom surface are metalized;

first, second and third cylindrical resonators spaced apart from each other in a row in a left to right direction between said front and rear surfaces, each of said first, second and third cylindrical resonators extending in a top to bottom direction through said monolithic block;

a pair of first rectangular electrodes respectively extending lengthwise along said top surface in a front to rear direction of said monolithic block and respectively encompassing openings of said first and third cylindrical resonators, one of said pair of first rectangular electrodes extending lengthwise from said first cylindrical resonator to intermediate top surface portions of said monolithic block respectively located between said first cylindrical resonator and said front and rear surfaces, the other of said pair of first rectangular electrodes extending lengthwise from said third cylindrical resonator to intermediate top surface portions of said monolithic block respectively located between said third cylindrical resonator and said front and rear surfaces;

a second rectangular electrode encompassing an opening of said second cylindrical resonator and extending lengthwise along said top surface in the front to rear direction of said monolithic block between and spaced from said pair of first rectangular electrodes, said second electrode extending lengthwise from said second cylindrical resonator to an intermediate top surface portion of said monolithic block located between said second cylindrical resonator and one of said front and rear surfaces, said second rectangular electrode having substantially a same width as that of each of said pair of first rectangular electrodes and having a shorter length than that of each of said pair of first rectangular electrodes such that portions of said pair of first rectangular electrodes do not have said second rectangular electrode interposed therebetween;

a pair of third rectangular electrodes extending lengthwise along said top surface in the front to rear direction of said monolithic block, each of said pair of third rectangular electrodes having a substantially same length and a smaller width than each of said pair of first rectangular

electrodes, wherein one of said pair of third rectangular electrodes is spaced from and located between said left side surface and said one of said pair of first rectangular electrodes, and the other of said pair of third rectangular electrodes is spaced from and located between said right side surface and said other of said pair of first rectangular electrodes; and

input and output pins made of a conductive material and coaxially inserted respectively into said first and third cylindrical resonators;

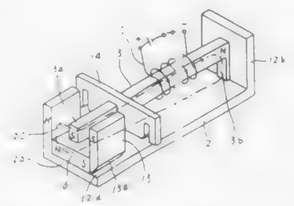
wherein said shorter length of said second rectangular electrode permits a partial direct coupling between said pair of first rectangular electrodes for obtaining an overcoupling capacitance, and wherein said metalized portions of said left and right side surfaces and said pair of third rectangular electrodes are adapted for adjusting capacitive coupling.

5,150,091

ELECTROMAGNETIC POLAR RELAY

Takashi Miura, Nagano, and Yoshiaki Kamiya, Suzaka, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 22, 1989, Ser. No. 410,822
Claims priority, application Japan, Sep. 22, 1988, 63-237806
Int. Cl.[5] H01H *51/22*
U.S. Cl. 335—84 **16 Claims**



1. An electromagnetic polar relay comprising:

a first yoke having a main portion and first and second ends positioned at respective angles with respect to the main portion, said first end positioned with respect to said main portion to have a first magnetic reluctance between said first end and said main portion;

a second yoke, positioned to face said first end, having a lower end positioned to face the main portion and to have a second magnetic reluctance between said second yoke and said main portion that is larger than the first magnetic reluctance;

an armature having a first portion movably connected to the second end of said first yoke and having a second portion movable between said first yoke and said second yoke;

a coil positioned about said armature; and

a permanent magnet, positioned over said main portion, having a first pole magnetically connected to the first end of said first yoke and a second pole magnetically connected to said second yoke.

5,150,091

BUS COVER AND LUG COVER FOR A MOLDED CASE CIRCUIT BREAKER

Marshall B. Hart, Middletown; David J. Lesslie, Plainville; Andrew M. Candelora, East Haven, and Michael C. Guerrette, Plymouth, all of Conn., assignors to General Electric Company, New York, N.Y.

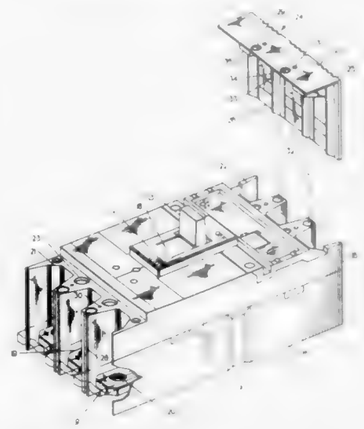
Filed Nov. 8, 1990, Ser. No. 611,204
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 **15 Claims**

1. A bus cover for molded case circuit breakers comprising:

a plastic top part;

a plastic back part extending perpendicular from said top part; and

a plurality of electrical isolation barriers integrally formed with said top and said back parts, said barriers extending co-extensive with said back part and including means formed therein for attachment to a circuit breaker cover said attachment means comprising a corresponding plurality of circular shanks integrally-formed on said barriers,



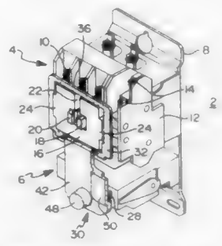
said circular shanks being sized to conform to openings formed within said circuit breaker cover said circular shanks further including ribs extending from a top part thereof lockingly engaging shaped slots formed on a circuit breaker cover to thereby increase said electrical isolation.

5,150,092

CONTROL BUTTON ADAPTOR FOR ELECTRIC CONTROL APPARATUS

Arthur F. Kolb, Bowling Green, Ky., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 6, 1991, Ser. No. 665,873
Int. Cl.[5] H01H *67/02*
U.S. Cl. 335—132 **12 Claims**



1. A control button adaptor for electric control apparatus wherein location of a finger-engagable button portion is predetermined relative to location of a corresponding lunger of said apparatus to be depressed in response to depression of said button, said adaptor comprising:

a platform portion attached to said apparatus, said apparatus having a pair of oppositely directed projections cooperably engagable with a pair of oppositely inwardly directed ledges on said platform portion by sliding said platform portion onto said apparatus, said platform portion having resiliently deflectable means engaging said apparatus for blocking sliding movement of said adaptor in a direction to disengage said ledges and said projections;

a cantilever portion extending from said platform portion and overlying a depressible plunger of said apparatus, said cantilever portion being deflectable in a direction to effect depression of said plunger; and

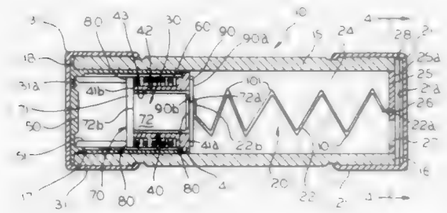
a finger-engagable button portion projecting from said cantilever portion at a predetermined location thereon offset in a significant plane of said cantilever relative to said depressible plunger.

5,150,093

TIME DELAY FUSE FOR MOTOR STARTER PROTECTION

Leon Gurevich, St. Louis, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 17, 1991, Ser. No. 711,769
Int. Cl.[5] H01H *85/04*
U.S. Cl. 337—163 **15 Claims**



1. A fuse comprising:

a hollow tube having an inner surface, said tube further having a proximal end and a distal end;

a distal endcap covering said distal end of sad tube, said distal endcap having an inner surface;

a proximal endcap covering the proximal end of said tube, said proximal endcap having an inner surface;

a fuse element, said fuse element being a non-cylindrical fuse link with a proximal end and a distal end, said fuse element constructed and arranged with a number of weak spots, said number of said weak spots being greater than the product of the rms voltage rating of said fuse and 0.01, said fuse link having a plurality of bends between said weak spots;

means for electrically connecting said proximal end of said fuse element to said inner surface of said proximal endcap;

means for triggering an interrupting of the electric current during an overload condition and electrically connecting said distal end of said fuse element with said inner surface of said distal endcap; and

a loose sand filler, said filler being positioned around said fuse element to ensure fast and reliable clearing of the fuse during a short circuit event.

5,150,094

FUSE BLOCK, PARTICULARLY FOR PRINTED CIRCUITS

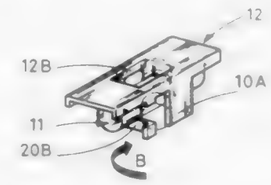
Ezio Babini, Zola Predosa, Italy, assignor to Fittings For Industry S.r.l., Bologna, Italy

Filed May 30, 1991, Ser. No. 707,795
Claims priority, application Italy, May 31, 1990, 4836/90[U]
Int. Cl.[5] H01R *13/68*; H02B *1/18*
U.S. Cl. 337—214 **9 Claims**

1. A holder for a cartridge type fuse having a body and a conductor at each end, comprising:

a frame member having a longitudinal axis and a transverse axis, said frame being longer along the longitudinal axis;

a pair of L-shaped wings, each wing having an arm with one end attached to one surface of the frame member and a transversely extending finger at the other end thereof, said wings spaced on opposite sides along the length of the frame member with the fingers thereof spaced from the frame oppositely transversely directed toward opposite longitudinal sides of the frame, a fuse inserted by being placed oblique to the longitudinal axis of said frame and



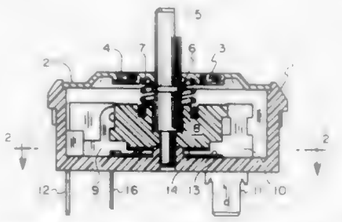
rotated into the opposite open sides of the wings and held on said fingers.

5,150,095

MULTI-POSITION ROTARY SWITCH WITH POSITION SENSOR

William H. Jones, Villa Park, Ill., assignor to Appliance Control Technology, Inc., Addison, Ill.

Filed Apr. 4, 1991, Ser. No. 680,523
Int. Cl.[5] H01C *10/10*
U.S. Cl. 338—196 **7 Claims**



1. A multi-position rotary switch including a plurality of switching elements and a manually rotatable mechanism causing operation of a different one of said plurality of switch elements in response to each position of rotation of said mechanism, the improvement comprising:

sensing means operable to provide an indication to an external control circuit of the position to which said mechanism has been rotated and of the switch contact operated in response to said rotation, said sensing means comprising;

a single resistive element including a first circuit termination;

a plurality of circuit pads connected in spaced apart relationship to said resistive element;

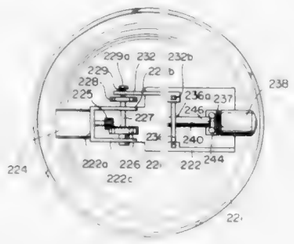
a second circuit termination;

and wiper means secured to said mechanism providing in response to said rotation electrical contact between said second terminal and a single one said circuit pads whereby a predetermined amount of resisitance is provided between said first and second terminals and in response to additional rotation of said mechanism a different value of resistance is provided for each position of rotation, said resistance value operated to provide an indication to a connected external control circuit of said position to which said mechanism has been rotated and of switching contact operated in response to said rotation.

5,150,096
EMERGENCY MAP APPARATUS AND METHOD OF USE THEREOF
Samuel H. Lake, Jr., 28503 Winterdale Dr., Canyon Country, Calif. 91351
Filed Nov. 6, 1990, Ser. No. 609,639
Int. Cl.[5] G08B *1/00*
U.S. Cl. 340—286.14 10 Claims

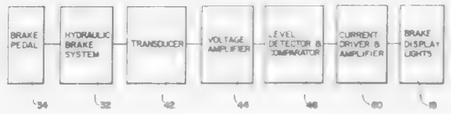
1. Map apparatus, comprising:
a street map denoting neighborhood streets, secondary streets and primary streets;
means for selecting, from said neighborhood streets, a destination street;
first means responsive to said selecting means for indicating said destination street on said map; and
second means, responsive to said selecting means, for indicating on said map, for each of said primary streets, intersections with preferred secondary streets;
wherein said preferred secondary streets initiate a more direct route from said each of said primary streets to said destination street than other of said secondary streets;
the map apparatus being capable of indicating more than one intersection to provide alternative routes to said destination street; and
emergency vehicles thereby if formed of said intersections initiating the most direct route from each of said primary streets to said destination street.

5,150,097
MOTOR DRIVEN BELL STRIKING MECHANISM
Mitsuo Sakaguchi, Tokyo, Japan assignor to Kobishi Electric Co., Ltd., Tokyo, Japan
Filed Aug. 28, 1989, Ser. No. 399,155
Int. Cl.[5] G10K *1/064*
U.S. Cl. 340—396 5 Claims



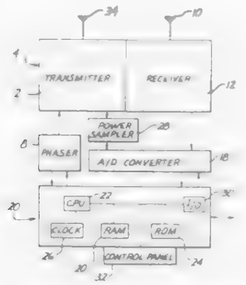
1. A motor actuated bell comprising:
(a) a sound generating member;
(b) a motor attached to the sound generating member, the motor having a rotatable drive shaft;
(c) a push rod supported from the sound generating member so as to be movable in one dimension;
(d) a cam means connecting the rotatable drive shaft to the push rod and converting a rotational movement of the drive shaft to a reciprocal movement of the push rod over a predetermined range;
(e) elastic means attached to said sound generating member; and
(f) a striking member supported from the sound generating member by said elastic means, the striking member being positioned to be out of contact with the sound generating member while the motor is not activated, the striking member at least momentarily being in contact with the push rod whereby receiving an urging force, separating from the push rod thereafter, and thereby afterwards momentarily striking the sound generating member for generating a sound therefrom while the motor is being activated.

5,150,098
BRAKE SIGNALING SYSTEM AND PROCESS
Robert Rakow, 5020 S. Lake Shore Dr., #4307-N, Chicago, Ill. 60615
Filed Nov. 13, 1990, Ser. No. 613,274
Int. Cl.[5] B60Q *1/44*
U.S. Cl. 340—479 4 Claims



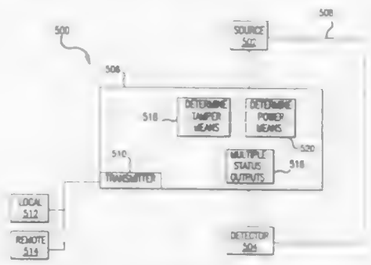
1. A brake signaling system for use in motor vehicles, comprising:
a brake display comprising a lighting set of at least four brake lights mounted on a motor vehicle and facing rearwardly, said lighting set of at least four brake lights including at least two red lights;
a hydraulic brake system for decelerating and stopping said vehicle;
a brake pedal connected to said hydraulic brake system and exerting hydraulic braking pressures on said hydraulic brake system, said brake pedal being moveable from an upward inactive position to a downward depressed braking position by braking forces applied by a foot of an operator of the vehicle, said brake pedal being responsive to different braking forces and rates;
illuminating and signaling means operatively connected to said hydraulic brake system for sequentially and progressively illuminating and signaling different pairs of said brake lights when different braking forces are applied to said brake pedal, said illuminating and signaling means including
pressure transducer means for sensing said hydraulic braking pressures in said hydraulic brake system and for producing a voltage;
voltage amplifier means comprising a low-noise amplifier connected to said pressure transducer means for amplifying said voltage produced from said pressure transducer means;
level detector and comparator means comprising a series of five reference voltage resistors and three level comparators connected to said low-noise amplifier for comparing said amplified voltage with reference voltage levels, and generating currents when said reference voltage levels are exceeded by said amplified voltage from said low-noise amplifier; and
current driver and amplifying means comprising three current amplifiers connected to said lighting set of at least four brake lights and three parallel sets of current driving resistors and diodes connected to and between said current amplifiers and said level comparators, each of said parallel sets of current driving resistors and diodes comprising two current driving resistors connected in series to one of said current amplifiers and one of said level comparators including a first leading current driving resistor positioned adjacent and connected to said one of said current amplifiers and a second trailing current driving resistor positioned adjacent and connected to said one of said level comparators and a current driving diode connected in parallel to said first leading resistor, said current driver and amplifying means amplifying said current and activating said brake lights when said brake pedal is depressed so that different pairs of said brake lights are activated and illuminated when different braking forces are applied to said brake pedal.

5,150,099
HOME SECURITY SYSTEM AND METHODOLOGY FOR IMPLEMENTING THE SAME
Richard M. Lienau, 1236 Wellesley Ave., #1, Los Angeles, Calif. 90025
Filed Jul. 19, 1990, Ser. No. 554,407
Int. Cl.[5] G08B *13/18*; G01S *13/00*
U.S. Cl. 340—552 20 Claims



1. A security system for automatically determining that an unauthorized intruder has entered a monitored area comprising:
template forming means for forming a reference template of normal ambient digital signals representing the position of all stationary objects predetermined to be normal within said area and further containing allowable body digital signals representing the electromagnetic signature of each of a plurality of moving bodies predetermined to be allowable within said area;
a transmitter having an output antenna adapted to transmit energy into said monitored area;
a receiver having an input adapted to receive said energy transmitted into said area by said transmitter as reflected from objects within said area and further having an output;
signal processing means having an output and an iput, said input coupled to said receiver output, said signal processing means for processing said received energy into current digital signals representing the current position of all stationary objects within said area and of any moving body within said monitored area;
signal comparison means having an input and an output, said input coupled to said template forming means and to said output of said signal processing means for comparing the normal ambient digital signals and the allowable body digital signals contained in said template with the current digital signals processed in said signal processing means; and
an output indicator means connected to the output of said signal comparison means for indicating to a user of said system that an unauthorized intruder is in said monitored area if said comparisons are not within predetermined parameters.

5,150,100
SECURITY SYSTEM
David G. Black, Scottdale, and Edwin P. Wilson, Allison Park, both of Pa., assignors to Minatronics Corporation, Pittsburgh, Pa.
Filed May 23, 1991, Ser. No. 705,385
Int. Cl.[5] G08B *13/18*; H01J *5/16*
U.S. Cl. 340—555 13 Claims

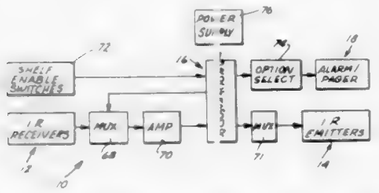


1. A security system comprising:
an optical source for producing optical signals;
a detector in optical communication with the optical source which receives the optical signals produced by the optical source;
an optical waveguide connected to the source and detector for transmitting the optical signal therebetween;
an electrical circuit in communication with the optical source and the detector, having an alarm which is either in a first state when the optical signals received by the detector have not been attenuated beyond a predetermined limit or a second state when the optical signals received by the detector have been attenuated beyond the predetermined limit, said circuit controlling the optical source and determining whether the optical signal received by the detector is such that the alarm is in the first state or the second state, said circuit also having means for indicating if the optical signals passing through the waveguide have been attenuated due to the optical waveguide having too long a length such that a transition from the first state to the second state is imminent to occur, the presence of this imminent transition being a pre-alarm condition.

5,150,101
SECURITY SYSTEM FOR CIGARETTE DISPLAY CASE
Donald L. Goris, Grand Rapids, and David A. Noorman, Jenison, both of Mich., assignors to MiQuest Corporation, Grand Rapids, Mich.
Continuation of Ser. No. 575,909, Aug. 31, 1990, abandoned.
This application Mar. 20, 1991, Ser. No. 673,183
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—568 18 Claims

1. A cigarette display case having a plurality of shelves each having an exit through which a single carton of a vertical stack may pass, comprising:
detector means for optically detecting the presence of a carton within any one of said exits;
control means responsive to said detector means for emitting an alarm signal when either (1) a predetermined number of cartons have passed through said exits within a first predetermined period of time, or (2) a carton remains within one of said exits for a second predetermined period of time,

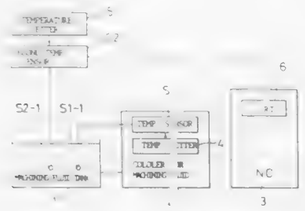
said control means including means for polling said detector means; and



alarm means responsive to said control means for emitting an alarm when said control means emits the alarm signal.

5,150,102
MACHINING FLUID TEMPERATURE DEVIATION ALARM

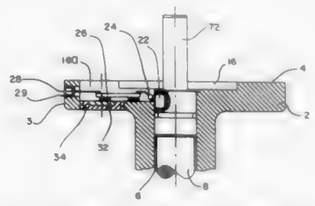
Hidenori Takashima, Kamakura, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan
PCT No. PCT/JP89/01074, § 371 Date Jun. 22, 1990, § 102(e) Date Jun. 22, 1990, PCT Pub. No. WO90/04479, PCT Pub. Date May 3, 1990
PCT Filed Oct. 19, 1989, Ser. No. 499,441
Claims priority, application Japan, Oct. 27, 1988, 63-269538
Int. Cl.[5] G08B *17/06*
U.S. Cl. 340—584 3 Claims



1. In an electrical discharge machining device in which a machining fluid temperature adjuster is controlled so that a monitored machining fluid temperature is within an allowable temperature range, in response to an output signal of a temperature sensor indicative of whether the machining fluid temperature is within said allowable temperature range, a machining fluid temperature deviation alarm device, comprising:
a setter for setting a predetermined temperature range encompassing said allowable temperature range;
a second temperature sensor provided independently of said temperature sensor and adapted to monitor said machining fluid temperature, determine whether said monitored machining fluid temperature is within said predetermined temperature range, and deliver a signal indicative of the result of said determination; and
alarm means for giving an alarm in response to the output signal of said second temperature sensor, indicative of a deviation of said monitored machining fluid temperature from said predetermined temperature range.

5,150,103
FIXTURE CONTAINING COMPACT ROTATIONAL POSITIONING SENSOR

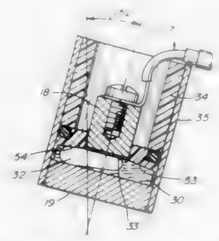
Peter Janssen-Weets, Goldenstedt, Fed. Rep. of Germany, assignor to Univam Armaturentechnologie GmbH, Wildeshausen, Fed. Rep. of Germany
Filed Jan. 17, 1991, Ser. No. 642,414
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 9000605[U]
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—686 17 Claims



1. A fixture containing a rotational position sensor for detecting movement of a member comprising:
an attachment flange having a through-opening, an outer surface and a front face for mounting of a driving contrivance, said front face having a recess proximate to said through-opening;
a control shaft with a control end and a free end, said control end attached to the member, said free end passing through said through-opening of said attachment flange for connection to the driving contrivance; and
at least one sensor for detecting the position of said control shaft disposed within said recess, whereby said attachment flange essentially conceals said sensor when the driving contrivance is mounted to said attachment flange.

5,150,104
ATTITUDE INDICATOR DEVICE UTILIZING CAPACITANCE MEASUREMENT

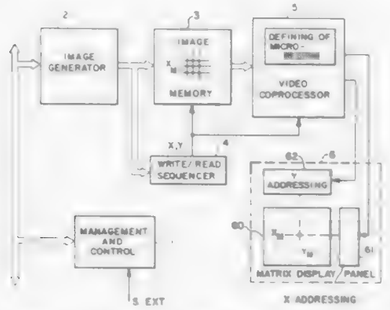
Alexander R. Thomas, 14 Ashcroft Ter., Groveland, Mass. 01834, and Anthony S. Pruszenski, Jr., Plum Island, Mass., assignors to Alexander Rhys Thomas, Groveland, Mass.
Filed Mar. 6, 1991, Ser. No. 665,409
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—686 44 Claims



1. An attitude sensor device for sensing deviations from a reference orientation, said sensor device comprising:
a capacitor having two electrodes spaced apart from one another;
a damped dielectric fluid disposed between said electrodes, said damped dielectric fluid having a bubble of a different dielectric constant and density than said fluid, disposed therein,
a nonconductive sealed enclosure for containing said damped dielectric fluid, means defining an upper surface of said enclosure and having tapered sides, such that said bubble is substantially centrally disposed between said electrodes when said sensor device is in said reference orientation;
means for detecting a capacitance change when said sensor device is altered from said reference orientation; and
means for outputting a warning signal when said capacitance change is detected.

5,150,105
SYSTEM FOR THE DISPLAY OF COLOR IMAGES ON MATRIX DISPLAY PANELS

Jean-Noël Perbet, Eysines; Pierre Bossoutrot, and Philippe Geneste, both of Merignac, all of France, assignors to Thomson CSF, Paris, France
Continuation of Ser. No. 235,554, Aug. 24, 1988, abandoned. This application Apr. 4, 1991, Ser. No. 681,451
Claims priority, application France, Aug. 28, 1987, 87 12039
Int. Cl.[5] G09G *1/28, 3/00*
U.S. Cl. 340—701 8 Claims



1. A system for displaying color images on a matrix display panel, comprising:
a generator for generating an image to be displayed,
an image memory, coupled to the generator to receive the image to be displayed, for storing the image,
scanning means for reading the image from the image memory according to a matrix scan defined in X and Y coordinates,
means for processing, in accordance with characteristics of a plurality of micro-regions of the matrix display panel, the image read from the image memory to produce a processed image, the processed image being defined by a plurality of image points to be displayed on the matrix display panel,
means for displaying the processed image on the matrix display panel, and
management and control means for determining dimensions of each of the micro-regions, each of the micro-regions comprising a first number n of pixels in the X direction and a second number m of pixels in the Y direction, n and m each being at least equal to three, and for controlling the display means to display each of the image points in a respective one of the micro-regions, the center of said each micro-region being substantially located at the center of the respective one of the image points, the image points being displayed such that a first one of the micro-regions and at least a second one of the micro-regions partially overlap.

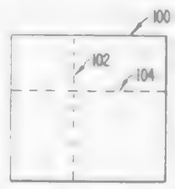
5,150,106
POINTING DEVICE FOR RAPID MOVING CONTROL OF A CURSOR ON A SINGLE AXIS

Fong Kwang-Chien, 5F, No. 3, Lane 359, Chung Shan Rd., Sec. 2, Chung Ho City, Taipei Hsien, Taiwan
Continuation of Ser. No. 315,743, Feb. 27, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 674,300
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—709 8 Claims

6. The corrdinate-data input device in accordance with claim 5, wherein said output means includes:
register means for storing said first and second displacement data in respective portions of said register; and
inhibit means responsive to said first and second direction inhibit signals for periodically setting respective ones of said register means portions to a predetermined value indicating no displacement in inhibited ones of said directions.

5,150,107
SYSTEM FOR CONTROLLING THE DISPLAY OF IMAGES IN A REGION OF A SCREEN

Motohiro Kurisu, Fremont, Calif., assignor to Zilog, Inc., Campbell, Calif.
Continuation of Ser. No. 396,963, Aug. 22, 1989, abandoned. This application Oct. 7, 1991, Ser. No. 771,819
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—724 9 Claims



1. A device for controlling a cathode ray tube in order to display desired images on a screen of the tube, locations on said screen being identified by horizontal and vertical addresses, said screen having row addresses, said device comprising:
means for storing information to be displayed on the screen of the cathode ray tube;
control means for selecting information for display from said storing means, said control means including
means for storing a row address of the screen,

a row address counter which counts in response to a horizontal synchronization signal,

comparator means for comparing the row address stored in the row address storage means to the count of the counter, said comparator means having an output indicating the result of the comparison, and

means for generating a display control signal as a function of the output of the comparator means, for controlling the cathode ray tube so that said cathode ray tube displays the selected information, said display control signal also indicating a predetermined horizontal address;

said control means being such that when said display control signal indicates a horizontal address, selected information is displayed only in the portion of the screen above or below said horizontal address and not in the remainder of the screen; and

where the position of said displayed information remains fixed relative to said screen

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5,150,108

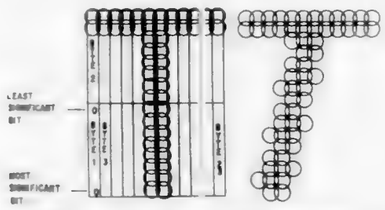
METHOD FOR SLANTING A GENERIC FONT FORMAT WHILE INSERTING CORRECTIVE PIXELS TO IMPROVE PRINT QUALITY

Roger Markham, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 457,448, Dec. 27, 1989, abandoned. This application Nov. 12, 1991, Ser. No. 789,635

Int. Cl.[5] G09G *1/06*

U.S. Cl. 340—735 5 Claims



1. A method for slanting an unslanted symbol of a font, wherein the font has a predetermined generic font format and comprises a plurality of unslanted symbols, each unslanted symbol defined according to the generic font format as an arrangement of designated pixel locations, comprising the steps of:

defining each of the plurality of unslanted symbols as a first grouping of possible pixel locations containing all of the designated pixel locations;

dividing the first grouping of possible pixel locations of the unslanted symbol into a plurality of second groupings of possible pixel locations;

storing the first grouping of pixel locations of the unslanted symbol in a first set of memory locations;

copying the first grouping of pixel locations of the unslanted symbol to be slanted stored in the first set of memory locations to a second set of memory locations;

simultaneously slanting the unslanted symbol stored in the second set of memory locations to create a staircase edge on the unslanted symbol to form a slanted symbol and designating additional pixels at predetermined pixel locations in the slanted symbol to conceal the staircase edge without storage of additional pixel information relating to the symbol, by masking each of the second groupings of the unslanted symbol with a predetermined pattern of designated pixel locations; and

storing the plurality of masked second groupings in the second set of memory locations.

5,150,109

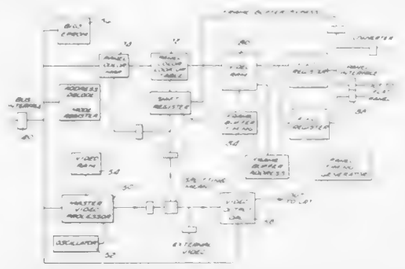
VGA CONTROLLER CARD

Wayne F. Berry, Palm Springs, Calif., assignor to Touchstone Computers, Inc., Tustin, Calif.

Filed Feb. 13, 1989, Ser. No. 310,398

Int. Cl.[5] G09G *3/00*

U.S. Cl. 340—811 5 Claims



1. A bus mountable VGA controller for use on personal computers comprising:

(a) a circuit board having means for interfacing said circuit board to the bus of a personal computer;

(b) a video graphics array processor for converting video signals presented on said bus to generate VGA standard signals; wherein said video graphics array processor is register compatible with VGA standard operational modes; wherein said video graphics array processor comprises an Intell 82706;

(c) means for converting said VGA standard signals to a time synchronized video signal suitable for driving a flat panel display comprising;

(i) register means for storing said VGA standard signal;

(ii) color table and map means for identifying said stored VGA standard signal in reference to the flat panel display to be utilized;

(iii) frame buffer means for storing said VGA standard signal processed by said color table and map means;

(iv) timer means to adjust the frequency and timing of said VGA standard signal stored in said frame buffer means; and

(v) first-in, first-out frame buffer means for outputting said VGA standard signal to a flat panel display; and

(vi) means for converting said standard VGA signal from a raster scan display format to a line scan display format; and

(d) a means for splitting a signal disposed between said video graphics array processor and said converting means, wherein said VGA standard signal is split into first and second VGA standard signal, said first VGA standard signal being applied to said converting means for driving a flat panel display and said second VGA standard signal being applied to an output DAC to drive a conventional CRT display.

5,150,110

SELECTIVE CALL COMMUNICATION SYSTEM WITH REMOTELY GENERATED REPEAT MESSAGES

Robert L. Breeden, Boynton Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 27, 1990, Ser. No. 564,501

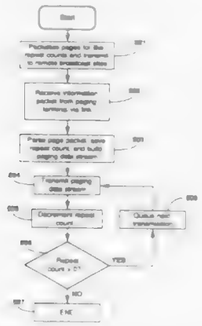
Int. Cl.[5] H04Q *7/00*

U.S. Cl. 340—825.44 15 Claims

1. A selective call communication method in a selective call communication system comprising a system terminal, a plurality of transmitting sites, and at least one selective call receiver, the method comprising the steps of:

(a) transmitting an information signal comprising information and a control word from the system terminal to the plurality of transmitting sites; and

(b) receiving the information signal from the system terminal and operating to transmit and re-transmit a number of



times the information from at least some of the plurality of transmitting sites, the number of times determined in response to the control word.

5,150,111

APPARATUS FOR AND METHOD OF DETECTING AN ABNORMALITY IN A SIGNAL

Keishi Fujieda, and Takeshi Kawamura, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 431,557, Nov. 3, 1989, abandoned. This application Nov. 7, 1991, Ser. No. 790,137

Claims priority, application Japan, Nov. 4, 1988, 63-279878

Int. Cl.[5] H04B *3/00*

U.S. Cl. 340—825.3 22 Claims

1. A method of detecting an abnormality in a single analog signal generated by a signal source, comprising the following steps:

(a) deriving a digital now-signal as a first digital signal level from said single analog signal presently provided by said signal source;

(b) deriving a digital past signal as a second digital signal level from said single analog signal provided by said signal source prior to said digital now-signal so that a predetermined time interval exists between said digital now-signal and said digital past signal;

(c) comparing said digital now-signal level and said digital past signal level itself with each other; and

(d) determining the presence or absence of an abnormality in said single analog signal from said signal source in accordance with a result of said comparing of said digital now-signal level with said digital past signal level.

5,150,112

INTERFACE FOR USE BETWEEN TWO COMMUNICATION UNITS

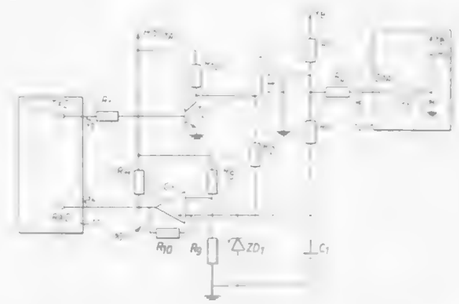
Thomas Riehemann, Bühlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP88/00904, § 371 Date Jun. 7, 1990, § 102(e) Date Jun. 7, 1990, PCT Pub. No. WO90/04296, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 10, 1988, Ser. No. 499,389

Int. Cl.[5] H04Q *1/00;* **H04B** *3/20;* **H04L** *5/16;* **H04M** *11/00*

U.S. Cl. 340—825.3 5 Claims



1. An interface for interfacing between a first communication unit having a two-wire connection and a second communication unit having a single-wire connection, the interface comprising:

a comparator having an output connected to a first of the two-wire connections and a non-inverting input connected to the single-wire connection for transmitting data signals from the second communication unit to the first communication unit;

a first transistor connected to the single-wire connection; and, switching network means for responding to a high/-low potential of the second of the two-wire connections and a high/low potential of the single-wire connection for controlling transmission through said transistor and for controlling the potential of said non-inverting input of said comparator, whereby, when a data signal is transmitted by the first communication unit on the second of the two-wire connections, the output of the comparator is at high potential and the first of the two-wire connections is at high potential so that the data transmitted by the first communication unit is not received by the first communication unit on the first of the two-wire connections and, when a data signal is transmitted by the second communication unit on the single-wire connection, the output of the comparator is at low potential and such transmitted data is received by the first communication unit on said first of the two-wire connections;

said switching network means including a second transistor (T2) responsive to the potential of the second connection (TXD) of the two-wire first and second connections (RXD, TXD); and,

voltage divider means connected between said second transistor (T2) and said non-inverting input of said comparator for coacting with said second transistor (T2) to control said potential on said non-inverting input so as to cause said output of said comparator to be at a high potential when said first communication unit is inactive (not transmitting and not receiving) and when said first communication unit is transmitting and so as to cause said potential to be low when said first communication unit is receiving.

5,150,1 3

METHOD AND APPARATUS FOR TRANSMITTING AN INFORMATION SIGNAL TOGETHER WITH DATA PACKETS OF RELATED AND UNRELATED TEXTUAL INFORMATION AND RECEIVING APPARATUS THEREFOR

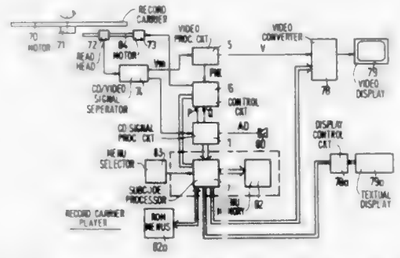
Björn Blüthgen, Celle, Fed. Rep. of Germany, assignor to Philips and Du Pont Optical Company, Nieuwegein, Netherlands

Filed Mar. 26, 1990, Ser. No. 499,914

Claims priority, application European Pat. Off., Mar. 28, 1989, 89200779.0

Int. Cl.[5] H04B 1/00

U.S. Cl. 340—825.3 14 Claims



11. A receiver for a transmission signal which includes a main information signal and a subinformation signal which consists of a series of interleaved first and second subinformation data packets, the main information signal and the first series of data packets having originated from a record carrier on which they were recorded together, the first subinformation data packets representing textual information in a plurality of first menus relating to the main information signal and the second subinformation data packets representing textual information in a plurality of second menus unrelated to the main information signal, the menu items being in the form of commands and corresponding command codes for executing such commands; said receiver comprising:

means for separating the main information signal and the subinformation signal;

means for reproducing the information represented by the main information signal;

a memory for storing menu items of said first and second menus in a selected part of said memory;

display means responsive to the commands in the menus stored in said selected part of said memory for displaying selected ones of such menus corresponding to parts of the information represented by the subinformation signal; and

selection means for selecting a menu item of a displayed menu and executing the command indicated by the command code stored in said memory corresponding to said selected menu item.

5,150,114

POLLING-TYPE INFORMATION TRANSMISSION SYSTEM

Stig R. Johansson, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1990, Ser. No. 609,968

Claims priority, application Sweden, Nov. 10, 1989, 8903775

Int. Cl.[5] H04Q 1/00

U.S. Cl. 340—825.54 4 Claims

1. A polling-type information transmission system comprising an interrogator and a plurality of transponders, each transponder having a unique address assigned thereto,

wherein each transponder comprises:

means for receiving and detecting a start code transmitted by said interrogator when said transponder is within range of the interrogator,

means responsive to detection of said start code for transmitting a reply code after a delay period, said delay period including a delay time which is dependent on the respective address of the transponder, and

means for receiving and transmitting information from and to said interrogator upon receipt of a transmission addressed to said transponder, and

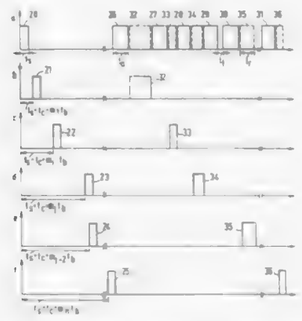
said interrogator comprises:

means for transmitting said start code,

means for receiving said reply codes transmitted by any of said transponders which are within range of the interrogator,

means for measuring a respective time delay between transmission of said start code and a start of each period of continuous reply code reception, and

means, responsive to measurement of said time delay, for



identifying the unique address of each respective transponder which is a first transponder which transmitted a reply code which starts a period of reply code reception,

characterized in that said interrogator further comprises

means for measuring a respective duration of each period of continuous reply code reception,

means, responsive to measurement of each said respective duration, for determining respective addresses corresponding to each additional transponder in addition to the respective first transponder whose respective delay period falls within one of said periods of reply code reception, and

means for transmitting a respective transmission addressed to each respective first transponder and each respective additional transponder.

5,150,115

INDUCTIVE TYPE INCREMENTAL ANGULAR POSITION TRANSDUCER AND ROTARY MOTION ENCODER HAVING ONCE-AROUND INDEX PULSE

Joannes N. M. deJong, Suffern; Meng H. Lean, Briarcliff Manor; Barry Wolf, Yorktown Heights; John J. Ricciardelli, Poughkepsie; Stuart A. Schweid, Henrietta, and Robert M. Lofthus, Honeoye Falls, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1990, Ser. No. 627,207

Int. Cl.[5] G08C 19/46

U.S. Cl. 340—870.31 35 Claims

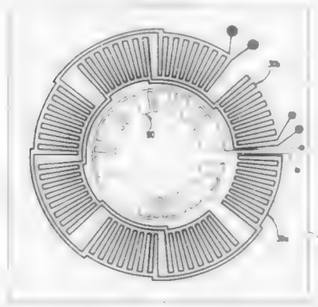
1. A rotary encoder comprising:

a stator having at least one conductive pattern on one side thereof;

a rotor having another conductive pattern on one side thereof which faces said at least one conductive pattern of said stator; and

means for inductively coupling said another conductive pattern on said rotor to said at least one conductive pattern on said stator so as to generate an output signal indicative of the angular position of said rotor to said stator;

wherein said means for inductively coupling includes processing means for receiving at least an induced signal from said another conductive pattern on said rotor and generating said output signal, at least said processing means being located on a side of said stator opposite from said at least one conductive pattern.



5,150,116

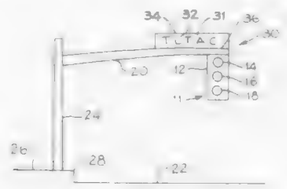
TRAFFIC-LIGHT TIMED ADVERTISING CENTER

Harold B. West, 617 Ridgeland, Cheyenne, Wyo. 82009

Filed Apr. 12, 1990, Ser. No. 509,286

Int. Cl.[5] G08G 1/00

U.S. Cl. 340—928 29 Claims



8. A variable message apparatus, electrically connected to and synchronized with a traffic control device, for displaying an alpha-numeric and symbolic display for disseminating information to oncoming traffic, comprising a display visibility means automatically controlled in such a way that the alpha-numeric and symbolic display may at times be visible and at other times may be effectively made invisible, and wherein said display visibility means is electronically programmed in such a way that the alpha-numeric and symbolic display may be automatically and selectively changed according to a predetermined display schedule chosen by a user.

5,150,117

POWER MANAGEMENT SYMBOLOGY DISPLAY SYSTEM

Bruce E. Hamilton, Sandy Hook; Lorren Stiles, Roxbury, and Howard P. Harper, Huntington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1991, Ser. No. 689,404

Int. Cl.[5] G01C 23/00

U.S. Cl. 340—973 14 Claims

1. A power management symbology display system for a helicopter having a powerplant that includes two engines designed to provide a predetermined rate torque based upon a nominal set of atmospheric conditions, comprising:

a video display subsystem;

sensing means disposed in interactive relation with said video display subsystem for generating signals corresponding to the spatial location and perspective of said video display subsystem;

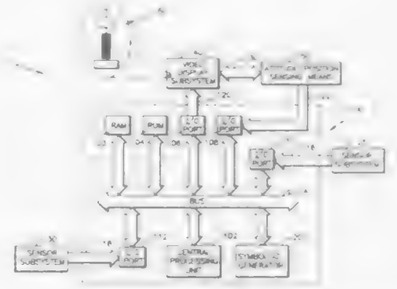
sensor means for generating raw data representing status information regarding the powerplant of the helicopter and the external world; and

computer processing means for defining the spatial location and perspective of said video display means based upon said signals generated by said sensing means, said computer processing means being operative to generate a multi-dimensional, combined analog/digital power management symbol that provides visual cues regarding the status of the powerplant, said power management symbol being optimized for discriminability and compatibility with a pilot's visual system, said power management symbol including

first dimension means for providing a static, analog symbolic representation of a nominal torque rating of the drivetrain of the powerplant based upon the predetermined rate torque, said first dimension means having a constant magnitude greater than the predetermined rated torque wherein said first dimension means functions as a referent for said power management symbol,

second dimension means for providing a single dynamic, analog symbolic representation of maximum continuous power available from the powerplant, said second dimension means being disposed in combination with said first dimension means and referenced with respect thereto to provide a readily perceptible visual cue of maximum continuous power available vis-a-vis said nominal torque rating,

third dimension means for providing a single dynamic,



analog symbolic representation of power required to hover out of ground effect, said third dimension means being disposed in combination with said first dimension means and referenced with respect to said second dimension means to provide a readily perceptible visual cue regarding power required to hover out of ground effect vis-a-vis said maximum continuous power available,

fourth dimension means for providing a single dynamic analog representation and a digital symbolic representation of instantaneous average power provided by the powerplant, said single analog symbolic representation provided by said fourth dimension means being superimposed upon said first dimension means and referenced in combination with said second dimension means to provide a readily perceptible visual cue regarding average power being utilized vis-a-vis said maximum power available, and

fifth dimension means for providing a dynamic, analog symbolic representation of a torque split operating condition in the powerplant, said fifth dimension means being disposed in combination with said first dimension means and referenced in combination with said second dimension means to provide readily perceptible visual cues regarding instantaneous power being provided by each of the two engines only when instantaneous power being provided by each of the two engine exceeds a predetermined threshold differential;

wherein said first, second, and third dimension means and one of said fourth and fifth dimension means are simultaneously displayed in combination to form said multi-dimensional, combined analog/digital power management symbol;

and wherein said computer processing means is further operative to generate said power management symbol in a synchronized video format for display via said video display subsystem.

5,150,118

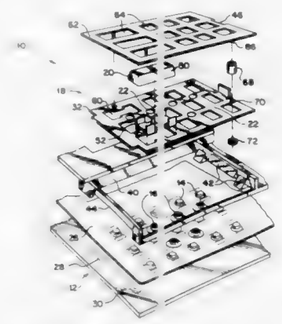
INTERCHANGEABLE CODED KEY PAD ASSEMBLIES ALTERNATELY ATTACHABLE TO A USER DEFINABLE KEYBOARD TO ENABLE PROGRAMMABLE KEYBOARD FUNCTIONS

Thomas W. Finkle, Santa Rosa, and Ralph M. Swanson, Sebastopol, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 348,826, May 8, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 629,059

Int. Cl.[5] H03M *11/02*

U.S. Cl. 341—23 **18 Claims**



1. An interchangeable keyboard selectively actuable by a user, comprising:

switch means comprising:

user actuable means forming a portion of the switch means; and

actuable key decoding means forming an additional portion of the switch means and

key means separate from and selectively coupled to the switch means, the key decoding means being actuated by coupling of the key means to the witch means independent of the user actuating the user actuable means, the key means comprising:

at least one key coupled to the user actuable means and selectively actuable by the user for actuating the user actuable means after the key means is coupled to the switch means; and

key enclosing means coupled to the key decoding means and independent of the at least one key for actuating the key decoding means when the key means is coupled to the switch means for identifying a function selectable by the user after the key means is coupled to the switch means and the at least one key is thereafter actuated by the user, the function being dependent upon identification of the key means responsive to actuation of the key decoding means by the key encoding means when the key means is coupled to the switch means, identification of the function being determined dependent upon actuation of the key decoding means by the key encoding means and independent of actuation by the user of the at least one key;

wherein the switch means further comprises:

a printed circuit board having conductive elements applied to the surface of a dielectric material;

a keyboard element molded from elastomeric material and mounted overlying the printed circuit board, the keyboard element comprising:

a sheet of elastomeric material having at least one integral upwardly projecting elastomeric protrusion, the at least one protrusion overlying the conductive elements of the printed circuit board;

a conductive member retained within the at least one protrusion between the protrusion and the printed circuit board to interconnect the conductive elements of the printed circuit board when the protrusion is moved toward the printed circuit board;

the at least one key for moving the at least one protrusion toward the printed circuit board when the key is selectively actuated by the user;

at least one additional integral upwardly projecting elastomeric protrusion incorporated into the sheet of elastomeric material, the additional protrusion overlying the conductive elements of the printed circuit board; and

a conductive member retained within the additional protrusion between the protrusion and the printed circuit board to interconnect the conductive elements of the printed circuit board when the protrusion is moved toward the printed circuit board;

the key encoding means for moving the additional protrusion toward the printed circuit board when the key means is coupled to the switch means, thereby activating the key decoding means.

5,150,119

DATA COMPRESSION METHOD AND APPARATUS

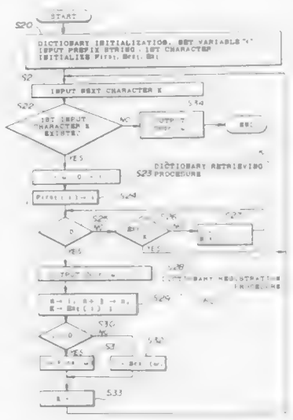
Shigeru Yoshida, Ebina; Yoshiyuki Okada, Isehara; Yasuhiko Nakano, and Hirotaka Chiba, both of Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 13, 1991, Ser. No. 744,443

Claims priority, application Japan, Aug. 13, 1990, 2-213990; Oct. 19, 1990, 2-281431; Oct. 19, 1990, 2-281432; Oct. 19, 1990, 2-281433

Int. Cl.[5] H03M *7/00*

U.S. Cl. 341—51 **19 Claims**



1. A data compression method comprising the steps of:

(a) determining whether or not an input partial string which corresponds to a part of an input data string coincides with any of registered partial strings which have been registered in a dictionary in accordance with a retrieval order indicated by data stored in a list, said registered partial strings being arranged in a tree structure in an order in which said registered partial strings appear and being assigned reference numbers, said list being provided for each node of said tree structure;

(b) coding said input partial string which makes a longest match with one of said registered partial strings by a reference number which has been registered in said dictionary and which has been assigned to said one of said registered partial strings;

(c) assigning a reference number to a partial string obtained by adding extension data to said input partial string and registering said reference number in said dictionary; and

(d) modifying said list so that a position of a first registered partial string among said registered partial strings in the tree structure is interchanged with a position of a second registered partial string among said registered partial strings, said first and second registered partial strings extending from an identical node of said tree structure.

5,150,120

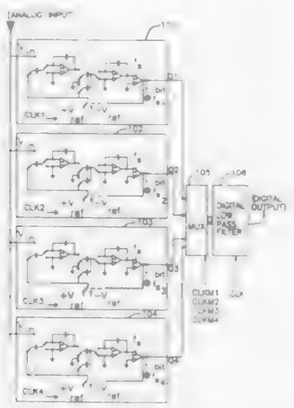
MULTIPLEXED SIGMA-DELTA A/D CONVERTER

Mohammad Yunus, Fremont, Calif., assignor to Harris Corp., Melbourne, Fla.

Filed Jan. 3, 1991, Ser. No. 637,047

Int. Cl.[5] H03M *3/02*

U.S. Cl. 341—143 **20 Claims**



1. A sigma-delta analog-to-digital converter comprising:

a plurality N of sigma-delta modulators arranged in parallel having an analog input signal applied thereto and being controlled by a respective modulator clock at a given modulator sampling frequency and providing a respective modulator digital output signal;

signal combining means coupled to said plurality N of sigma-delta modulators for combining the modulator digital output signals from said modulators in phased sequence to form an overall digital output signal, wherein said overall output digital signal has an effective sampling frequency that is a multiple of N times the sampling frequency of the individual modulators; and

filtering means for filtering quantization noise from said overall digital output signal.

5,150,121

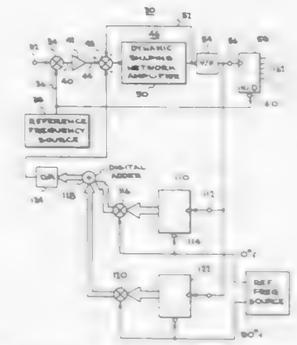
PARAMETER SENSING AND PROCESSING SYSTEM

Gerald R. Newell, Alamo, and Pradeep Bhardwaj, Danville, both of Calif., assignors to New SD, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 257,509, Oct. 13, 1988, Pat. No. 4,980,687. This application Sep. 14, 1990, Ser. No. 583,654

Int. Cl.[5] H03M *1/60*

U.S. Cl. 341—157 **12 Claims**



1. A system for sensing a parameter, comprising:

a source for providing a reference signal of predetermined frequency;

means responsive to the parameter and to the reference signal for providing a modulated signal having a frequency corresponding to the frequency of the reference signal and an amplitude corresponding to the value of the parameter;

a voltage-to-frequency converter responsive to the modulated signal for providing an output signal having a frequency corresponding to the level of the modulated signal;

a frequency-to-digital converter including an up-down frequency counter having a counting input to which the output signal from the voltage-to-frequency converter is applied and an up-down control input to which the reference signal is applied for switching the counting direction of said up-down counter in synchronism with said reference signal to thereby demodulate the output signal from the voltage-to-frequency converter.

5,150,122

MILITARY AIRCRAFT

Stephen W. Bell, Suffolk, England, assignor to GEC-Marconi Limited, England

Filed Jul. 21, 1987, Ser. No. 81,809

Claims priority, application United Kingdom, Jul. 22, 1986, 8617912; Jul. 22, 1986, 8617914; Jul. 22, 1986, 8617916; Jul. 22, 1986, 8617919

Int. Cl.[5] H01Q *15/20*

U.S. Cl. 342—8 **16 Claims**

1. In combination, an aircraft of a first radar cross-section providing a first radar return; a selectably deployable radar

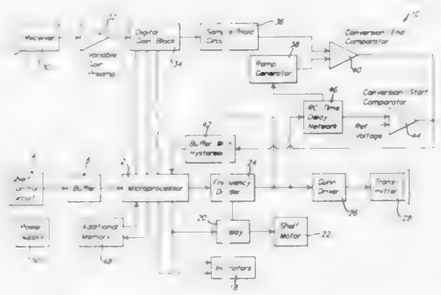
reflector means, including at least one radar deflector mounted on the aircraft, for, in combination with the aircraft, providing a radar cross-section which differs from said first radar cross-section and which corresponds to that of a different aircraft, and thus providing a radar return corresponding to that of said different aircraft when said radar reflector means is deployed; and means for providing that the radar reflector means is not deployed during normal operations of the aircraft so that the radar signature of the aircraft stored and used by any radar defense system which detects the aircraft during such normal operations will be that of the aircraft alone, and for providing deployment of the at least one radar reflector during a combat operation so that the radar signature of the aircraft in combination with the radar deflector means will be that of said different aircraft and will be different from that which would have been stored by any radar defense system that detected the aircraft during normal operations thereof.

5,150,123

FIELD DISTURBANCE MONITOR SYSTEM

David P. Orlowski, Clinton; Larry Eccleston, Marshall, and Earl R. Goodrich, II, East Lansing, all of Mich., assignors to Microwave Sensors, Ann Arbor, Mich.

Filed May 20, 1991 Ser. No. 703,178
Int. Cl.[5] G01S *9/42*
U.S. Cl. 342—28 **12 Claims**



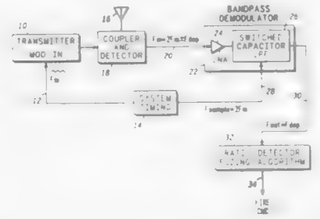
1. A system for sensing movement of an object comprising:
(a) a means for transmitting a pulsed microwave signal;
(b) a means for receiving a return signal which represents a reflection of the pulsed signal;
(c) conversion means for converting the magnitude of the analog return signal to a digital representation;
(d) a comparison means for comparing the digital representation of the return signal with the magnitude of a reference signal and for producing an output signal that indicates movement of an object;
(e) control means including a microprocessor and digital gain circuit for adjusting the gain applied to the detected signal such that the return signal is processed within a preferred measurement bounds;
said conversion means comprising:
sample and hold means for sensing the return signal and holding the magnitude of the sensed signal;
ramp means for producing a linear ramped voltage signal having an increasing magnitude;
a first comparator coupled to the output of the sample and hold means and the ramp means for comparing the magnitude of the received signal with the magnitude of the linear ramped voltage signal and for producing a first feed back signal coupled to the microprocessor for counting the time required for the linear ramped voltage to reach the magnitude of the sample signal thereby converting the return signal from an analog signal to a digital signal.

5,150,124

BANDPASS FILTER DEMODULATION FOR FM-CW SYSTEMS

Gerald J. Moore, Mesa, and Curtis L. Eickerman, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1991, Ser. No. 674,010
Int. Cl.[5] G01S *13/32*; F42C *13/04*
U.S. Cl. 342—68 **6 Claims**



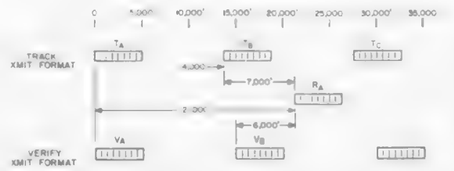
1. A radar system for processing a FM-CW harmonic signal comprising:
transmitter means comprising a frequency modulation signal input and a transmitter output;
antenna means comprising an antenna output;
coupler/detector means comprising a first coupler/detector input coupled to the transmitter output, a second coupler/detector input coupled to the antenna output, and a coupler/detector output;
bandpass demodulator means comprising a first bandpass demodulator input coupled to the coupler/detector output, a second bandpass demodulator input, and a bandpass demodulator output;
ratio detector fuzing algorithm means comprising a ratio detector fuzing algorithm input coupled to the bandpass demodulator output, and a ratio detector fuzing algorithm output; and
system timing means comprising a first system timing output coupled to the frequency modulation signal input and a second system timing output coupled to the second bandpass demodulator input.

5,150,125

HIGH DOPPLER RATE, HIGH ALTITUDE CAPABILITY COHERENT PULSE DOPPLER RADAR ALTIMETER

James R. Hager, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 24, 1990, Ser. No. 632,938
Int. Cl.[5] G01S *13/20, 13/70*
U.S. Cl. 342—120 **6 Claims**



1. An aircraft pulse Doppler radar altimeter for providing ambiguous range rejection, comprising:
(a) means for separately transmitting, when enabled, a first and a second sequence of pulses of a first and a second pulse repetition interval, respectively;
(b) timing and control means for periodically enabling said means for transmitting said first and second sequence of pulses on a time-shared basis;
(c) receiver means including range gate means for receiving ground return signals corresponding to said first and second sequence of pulses;

(d) means, including said timing and control means, coupled to said range gate means for continuously adjusting the time following the transmission of the pulses in said first sequence of pulses at which said range gate is enabled until said receiver means detects a ground return signal overlapped by said range gate;
(e) means responsive to the detection of an overlap of ground return resulting from said first sequence of pulses with said range gate for causing said timing and control means to initiate transmission of said second sequence of pulses and for determining whether a ground return corresponding to said second sequence of pulses is overlapped by the then position of said range gate; and
(f) means for reinitiating said means coupled to said range gate means when said detection responsive means determines the absence of overlap between said ground return corresponding to said second sequence of pulses and said then position of said range gate means.

5,150,126

TRANSMITTING AND RECEIVING PART OF A PULSE DOPPLER RADAR

Udo Knepper, Langenargen, and Ralph Speck, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Dornier GmbH, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 698,389
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1991, 4104907
Int. Cl.[5] G01S *7/288, 13/34*
U.S. Cl. 342—137 **12 Claims**

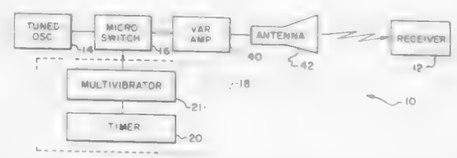
1. A transmitting and receiving part of a pulse Doppler radar comprising:
a transmitting oscillator which, with a pulse repetition frequency, generates radar pulses of a duration period;
an antenna coupled to the transmitting oscillator;
a reception mixer coupled to the antenna and which generates intermediate frequencies;
means for generating an intermediate-frequency reference frequency;
an inphase mixer which generates I-signals, and a quadrature phase mixer which generates Q-signals;
means for frequency shifting coupled to the transmitting oscillator to cause the transmitting oscillator to also operate as a local reception oscillator, wherein the intermediate-frequency reference frequency is generated coherently with respect to the pulse repetition frequency.

5,150,127

PORTABLE RADAR SIMULATOR

Kenneth Aw, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1992, Ser. No. 878,593
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—169 **11 Claims**



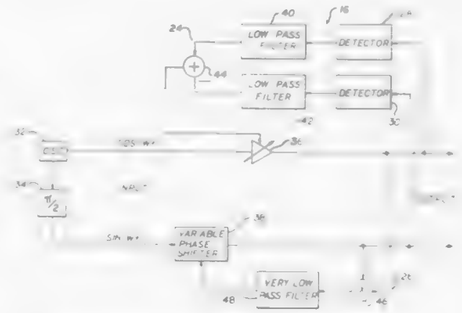
1. A portable radar simulator for measuring the sensitivity of a radar receiver, said radar simulator comprising:
signal generating means for providing a continuous wave signal, said signal generating means allowing for the adjustment of the frequency of said continuous wave signal within a first frequency range;
switching means for receiving said continuous wave signal from said signal generating means;
timing circuit means for providing a pulsed control signal with a fifty percent duty cycle, said timing circuit means allowing for the adjustment of the frequency of said pulsed control signal within a second frequency range;
multivibrator means for receiving said pulsed control signal and then adjusting the pulse width of each pulse of said control signal so as to set the pulse width of each pulse of said control signal for a predetermined time period;
said switching means in response to said pulsed control signal either inhibiting or passing therethrough said continuous wave signal; and
antenna means adapted to receive that portion of the continuous wave signal passed through said switching means, said antenna means providing in response to said continuous wave signal a beam of pulsed microwave energy to said radar receiver for measuring the sensitivity of said radar receiver.

5,150,128

IN-PHASE AND QUADRATURE CONVERSION ERROR COMPENSATOR

Knut S. Kongelbeck, Chatsworth, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 15, 1991, Ser. No. 655,616
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—174 **18 Claims**



1. A system for detecting phase and gain imbalance errors in a synchronous detector having first means (32) for providing a first signal representing a first sinusoidal term, second means

(32,34) for providing a second signal representing a second sinusoidal term complementary to said first sinusoidal term, means for mixing (**12**) an input signal with said first signal and means for mixing (**14**) said input signal with said second signal, said system for detecting phase and gain imbalance errors comprising:

means for detecting (**28**, **30**) amplitude errors in said first and second signals;

means for correcting (**44**, **36**) amplitude errors in said first and second signals and providing an output signal in response thereto;

means for detecting (**46**, **48**) phase errors in said first and second signal; and

means for correcting (**38**) said phase errors in said first and second signals and providing an output signal in response thereto.

5,150,129

LIQUID JET RECORDING METHOD AND APPARATUS HAVING ELECTRO-THERMAL TRANSDUCER CONNECTED TO A HIGHER POWER SOURCE POTENTIAL SIDE THROUGH A SWITCH

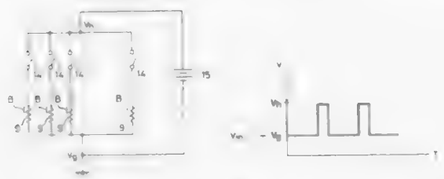
Toshitami Hara, Tokyo; Hisanori Tsuda, Atsugi, and Shinichi Hirasawa, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 320,917, Mar. 8, 1989, abandoned, which is a continuation of Ser. No. 946,097, Dec. 23, 1986, abandoned, which is a continuation of Ser. No. 652,889, Sep. 21, 1984, abandoned. This application May 21, 1990, Ser. No. 525,315

Claims priority, application Japan, Sep. 26, 1983, 58-177284

Int. Cl.[5] **B41J** *2/05*

U.S. Cl. 346—1.1 **3 Claims**



1. A method for recording with a recording apparatus comprising a recording head having a plurality of discharge openings, said recording head comprising a plurality of liquid pathways corresponding to said discharge openings, each pathway communicating with one of said discharge openings for storing the liquid to be discharged from said discharge openings, a plurality of heat generating resistor members, at least one formed within each of said liquid pathways to form a heat generating portion for providing the liquid with heat energy, a plurality of electrical switch elements, at least one connected to each of said plurality of resistor members, a plurality of pairs of electrodes, at least one pair connected to each of said resistor members, and a power source for applying a voltage to the heat generating resistor members to generate heat energy utilized when discharging the liquid, wherein said power source is connected to one electrode side of said heat generating resistor members at a higher potential side of said power source through each of said plurality of electrical switch elements, and wherein a lower potential side of said power source or ground is directly connected to the other electrode side of said heat generating resistor members, said method comprising:

a non-recording step in which said electrical switch elements are in a non-connecting position when no recording signal is inputted, wherein said heat generating resistor members are connected to the lower potential side of said power source or to ground, and therefore the liquid electrically in contact with said resistor members is connected to the low potential state or ground; and

a recording step in which said electrical switch elements are in a connecting position when a recording signal is inputted, wherein a state change occurs and a bubble is formed in the liquid from heat energy generated from application of a positive voltage of a high potential to said heat generating resistor members, said high potential being generated upon driving selectively said electrical switch elements to connecting positions in response to an input recording signal, whereby the liquid is displaced by the bubble and discharged from said discharge opening to attach to a recording medium, thereby performing recording.

5,150,130

LABEL PRINTER

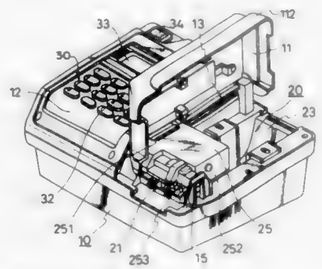
Junichi Sato, Hasudashi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan

Filed Nov. 19, 1990, Ser. No. 615,455

Claims priority, application Japan, Dec. 14, 1989, 1-324300

Int. Cl.[5] **G01D** *15/00*; **B41F** *1/08*

U.S. Cl. 346—76 PH **11 Claims**



1. A label printer comprising:

a drive section having a front panel thereover and an electric control and operating circuit therein, said front panel having input means operatively associated with said electric circuit for entering printing data into said electric control and operating circuit;

a printing section adjacent said drive section and having an upwardly open label tape extension passage there-within with an upwardly open label tape storage recess at one end thereof for storing a roll of label tape and an upwardly exposed platen roller at another end thereof and an upwardly exposed label position detector for detecting a position of a label on the label tape and positioned along said label tape extension passage between said label tape storage recess and said platen roller and electrically connected to said electric control and operating circuit,

platen roller drive apparatus connected to said platen roller and to which said electric control and operating circuit is electrically connected;

a head holder pivotally mounted along one side of said label tape extension passage adjacent said platen roller for pivoting movement from a position over said platen roller at least 90 degrees;

a thermal printing head on said head holder opposing said platen roller when said head holder is in position over said platen roller for bringing said printing head in contact with said platen roller under pressure, said thermal printing head being moved away from said platen roller by pivoting movement of said head holder to expose said label tape extension passage, said thermal printing head being electrically connected to said electric control and operating circuit, and

an openable cover pivotally mounted along a side of said label tape extension passage for pivotal movement independent of said head holder from a position over said label tape extension passage at least 90 degrees for exposing an entire length of said label tape extension passage;

whereby said electric control and operating circuit, in response to printing data entered thereinto, controls said thermal printing head for printing required information on labels on the label tape, and in response to a detection signal from said label position detector, drives said platen roller drive apparatus for positioning a label relative to said printing head, and further drives said platen roller drive apparatus for forwarding the label tape with a printed label thereon, and when said openable cover and said head holder are pivoted through at least 90 degrees, said label tape extension passage is fully exposed along a whole length thereof.

5,150,131

GRAPHICS PRINTER INCLUDING DEVICE FOR MAINTAINING PRINT MEDIUM CONTACT

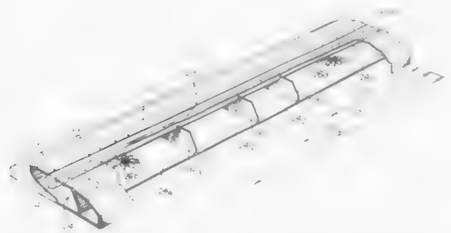
Thierry Le Jaoudour, Creteil, France, assignor to OCE Graphics France, S.A., Creteil Cedex, France

Filed Jan. 22, 1991, Ser. No. 643,944

Claims priority, application France, Jan. 22, 1990, 90 00704

Int. Cl.[5] **G01D** *15/28*; **B65H** *5/02*

U.S. Cl. 346—134 **16 Claims**



1. A device which maintains contact between a print medium and a guiding platform within a printing zone of a graphics printer which comprises:

a suction chamber formed beneath said guiding platform of said graphics printer, said guiding platform constituting an upper wall of said suction chamber,

a plurality of orifices formed across a width of said platform and communicating with said suction chamber,

at least one suction means provided within said suction chamber for creating a partial vacuum within said suction chamber in combination with said orifices, and

at least one partition provided within said suction chamber separating said suction chamber width-wise into at least two compartments while providing a limited passage section between adjacent compartments, such that said orifices communicate with each of said compartments, said print medium being guided over said platform covering a variable portion of said width of said platform as a function of a format of said print medium, the first of said at least two compartments extending beneath that portion of said platform which comprises at least a fraction of said width of said platform which would be occupied by said print medium which has the smallest format of those variable formats capable of being accommodated by said printer.

5,150,132

MATERIAL CONTAINING A CURED SUBSTANCE FOR USE WITH A LIQUID EJECTION RECORDING HEAD AND APPARATUS

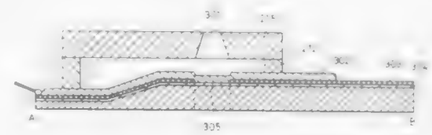
Masako Shimomura; Hiromichi Noguchi, both of Kanagawa, and Akihiko Shimomura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1990, Ser. No. 505,599

Claims priority, application Japan, Apr. 7, 1989, 1-086898

Int. Cl.[5] **B41V** *2/05*

U.S. Cl. 346—140 R **14 Claims**



5. A liquid ejection recording head according to claim 4, wherein said member for defining the liquid path is a wall of the liquid path.

5,150,133

ELECTROSTATIC LATENT IMAGE FORMING APPARATUS

Chiaki Ohigashi, Yokohama, Japan, assignor to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 540,942

Claims priority, application Japan, Jun. 28, 1989, 1-165934

Int. Cl.[5] **G01D** *15/06*

U.S. Cl. 346—155 **15 Claims**

1. An electrostatic latent image forming apparatus comprising:

a recording head having a set of styluses arranged in a line on a surface thereof facing an electrostatic recording medium, said styluses being electrically connected as stylus blocks each including a predetermined number of styluses, and a set of control electrodes arranged in two lines in a manner to interpose said styluses therebetween;

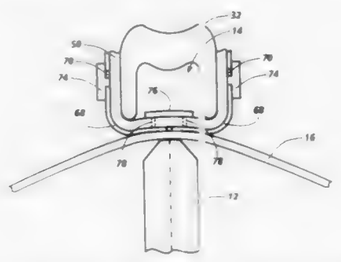
first drive means for applying a first voltage of one of polarities to said set of styluses;

second drive means for selectively applying a second voltage of opposite polarity to said control electrodes in correspondence to said first voltage to allow the potential of said electrostatic recording medium to change in correspondence to said first voltage; and

a roller disposed on the side of the back surface of said electrostatic recording medium and having a conductive member which is divided into segments of a width substantially equal to the width of said control electrodes and

is provided only at portions opposed to said control electrodes and styluses.

5,150,134
COUNTER ELECTRODE FOR AN ELECTROSTATIC RECORDER
Lorin K. Hansen, Fremont, and Stephen D. White, Santa Clara, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed May 29, 1991, Ser. No. 706,708
Int. Cl.[5] G01D 15/06
U.S. Cl. 346—155 19 Claims



1. An electrostatic recorder for applying electrical charges in image configuration upon a movable image recording member, said recorder including a stylus electrode array and a counter electrode array, said electrode arrays being aligned with one another on opposite surfaces of said image recording member and being positioned so as to extend across the direction of movement of said image recording member, and said counter electrode array comprises

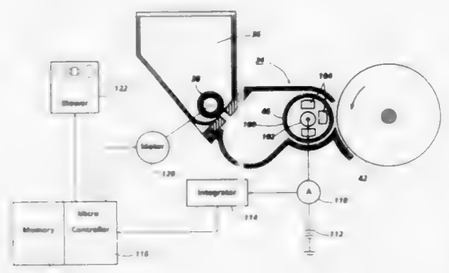
a base member comprising an electrically insulating film,

a plurality of electrically conductive traces extending substantially in said direction of movement supported on said base member,

resistive means interconnecting said conductive traces, and

means for applying electrical potentials to periodically spaced conductive traces.

5,150,135
CURRENT SENSING DEVELOPMENT CONTROL SYSTEM FOR AN IONOGRAPHIC PRINTING MACHINE
Brendan C. Casey, Webster, and William L. Gary, Lyons, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 20, 1990, Ser. No. 569,806
Int. Cl.[5] G01D 15/06
U.S. Cl. 346—159 14 Claims



1. An ionographic printing apparatus for generating and developing a latent electrostatic image on an insulative surface with marking particles having means for storing a supply of marking particles, means for dispensing marking particles into the storing means, and means for transporting the marking particles from the storing means to a location closely adjacent the latent image for development thereof, wherein the improvement comprises:

means, operative during latent image development, for sensing the cumulative charge of the marking particles developed thereon, the sensing means further generating a signal pulse indicating when a predetermined amount of cumulative charge has been transferred with the marking particles;

means, responsive to a signal pulses, for regulating the discharge of marking particles into the storing means at a specified dispense rate upon detecting a predetermined number of pulses, thereby replenishing the supply of marking particles available within the transport means;

ion generating means for depositing ions on the insulative surface to create a latent image test patch having predefined characteristics;

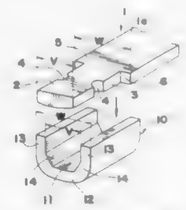
means for selectively developing, with the marking particles, said latent image test patch;

means for measuring a cumulative charge of the marking particles developed on said latent image test patch;

means for transmitting a signal indicative of said cumulative charge to a control means for comparison with a threshold, based upon a nominal marking particle concentration, whereby the control means will determine an actual marking particle concentration within the storing means; and

means for adjusting the specified dispensing rate in response to said actual marking particle concentration, so that the subsequent discharge of marking particles into the storing means, as regulated by the control means, is done in a manner suitable to cause an equilibrium concentration of marking particles to approach said nominal marking particle concentration.

5,150,136
STRUCTURE FOR CONNECTING EYEGLASS PARTS
Eiichi Nakanishi, Ashiya, Japan, assignor to Nakanishi Optical Co., Ltd., Osaka, Japan
Filed Sep. 10, 1990, Ser. No. 579,719
Claims priority, application Japan, Apr. 3, 1990, 2-35913[U]
Int. Cl.[5] G02C 5/14
U.S. Cl. 351—111 2 Claims



1. A structure for connecting eyeglass parts, the structure comprising: a small plate formed at a portion of a main body of one of the eyeglass parts, the portion being connected to another of the eyeglass parts; the small plate extending from and being integral with the main body which is made of Ni-Ti base alloy; constricted regions formed at both side surfaces of the small plate; a connecting member made of another metal and having side walls and a cross section of U-shape defining a channel into which the small plate is inserted; the side walls of the connecting member being folded onto the small plate inserted in the channel in such a state that inner surface portions of said member are pressed into the constricted regions of the small plate, wherein said connecting member is secured to said small plate, thus allowing the other eyeglass part to be soldered or welded to the connecting member which is inseparably wound around the small plate, and

wherein each side surface of the main body and each corresponding side surface of the connecting member are flush with each other.

5,150,137
POSITIONING SYSTEM FOR PUPIL IMAGING OPTICS
William W. Owens, II, Fremont, and Thomas P. Frangesh, Campbell, both of Calif., assignors to Pulse Medical Instruments, Rockville, Md.
Filed Oct. 10, 1990, Ser. No. 595,399
Int. Cl.[5] A61B 3/14
U.S. Cl. 351—210 5 Claims

1. In an ophthalmological instrument including pupil imaging optics, an electro-mechanical positioning system for said pupil imaging optics, said electro-mechanical positioning system tracking pupil movement and comprising:

first and second members of a first parallelogram linkage, said first member being pivotally connected to said second member and having mounted thereto said pupil imaging optics;

third and fourth members of a second parallelogram linkage, said third member having pivotally mounted thereto said second member;

a base member, said third member being pivotally mounted to said base member;

a subbase pivotally mounted to said fourth member for movement with said second parallelogram linkage;

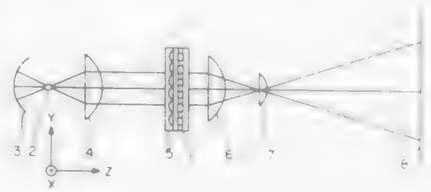
pupil image sensing means responsive to said pupil imaging optics for generating a first electrical signal proportional to a sensed horizontal error in pupil image and a second electrical signal proportional to a sensed vertical error in pupil image;

first electrical motor mounted to said subbase and having a shaft connected to said second member for moving said second member about its pivot with said third member and responsive to said first electrical signal to impart horizontal movement to said pupil imaging optics; and

second electrical motor mounted to said base member and having a shaft connected to said third member for moving said third member about its pivot with said base member and responsive to said second electrical signal to impart vertical movement to said pupil imaging optics.

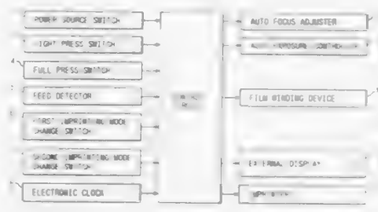
5,150,138
PROJECTION TYPE IMAGE DISPLAY APPARATUS
Hiroshi Nakanishi, Tenri, and Hiroshi Hamada, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 21, 1991, Ser. No. 657,752
Claims priority, application Japan, Feb. 26, 1990, 2-45076
Int. Cl.[5] G03B 21/14
U.S. Cl. 353—38 8 Claims

1. A projection type image display apparatus comprising an arc lamp for emitting light rays by arc discharge, a light reflecting means for reflecting the light from the arc lamp, a transmissive display panel comprising multiple rectangular picture elements arranged in a matrix wherein the picture elements are mutually arranged adjacent to their longer sides and shorter sides, an optical means for making the light rays parallel to each other, each light ray being perpendicular to the display panel and irradiating the display panel with the parallel rays, a microlens array comprising lens elements arranged in correspondence to the respective picture elements, wherein



the arc lamp is disposed perpendicularly to the optical axis of the optical means.

5,150,139
ELECTRIC CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE
Daiki Tsukahara, Hiratsuka, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Dec. 21, 1990, Ser. No. 631,450
Claims priority, application Japan, Dec. 29, 1989, 1-344594
Int. Cl.[5] G03S 17/24
U.S. Cl. 354—106 6 Claims



1. An electric camera, comprising:

imprinting means disposed opposite to a film and capable of imprinting plural digit data to an exposure frame of the film;

first imprint mode changing means operated for selecting a first imprint mode for imprinting first data to said exposure frame, and a first no imprint mode for not imprinting the first data;

second imprint mode changing means operated for selecting a second imprint mode for imprinting second data to said exposure frame together with said first data, and a second no imprint mode for not imprinting the second data; and

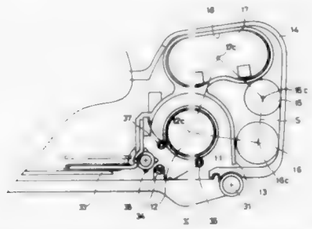
control means for automatically effecting said second no imprint mode without an operation of said second imprint mode changing means, when the first no imprint mode is selected by said first imprint mode changing means.

5,150,140
MOTOR DRIVEN CAMERA HAVING STROBE INCORPORATED THEREIN
Toshiyuki Kitazawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 16, 1990, Ser. No. 552,108
Claims priority, application Japan, Jul. 21, 1989, 1-190169; Jul. 21, 1989, 1-190170
Int. Cl.[5] G03B 17/02
U.S. Cl. 354—145.1 19 Claims

1. A strobe incorporated in a camera having at least first and second drive motors, a main strobe condenser and at least one battery, wherein:

said first drive motor is located in a rotatable film winding spool of the camera;

said second drive motor, said main strobe condenser and said battery are located to surround said film winding spool, so that the longitudinal axes of said second drive motor, said main strobe condenser and said battery extend in the



direction of the rotational axis of said film winding spool; and

the centers of said two drive motors, said main strobe condenser and said battery in a plan view substantially form an imaginary polygon

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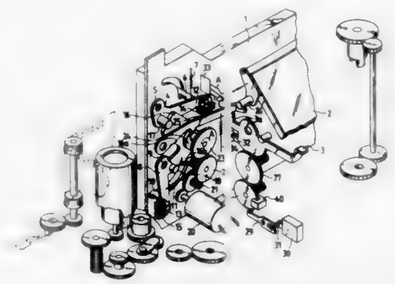
5,150,14

ELECTRIC DRIVE DEVICE FOR CAMERA

Kimio Uematsu, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 509,222, Apr. 16, 1990, abandoned.
This application Feb. 27, 1991, Ser. No. 663,060
Claims priority, application Japan, Apr. 19, 1989, 1-99740; May 12, 1989, 1-119862
Int. Cl.[5] G03B *19/12*
U.S. Cl. 354—152 33 Claims



1. In a camera having a focal plane shutter and a movable mirror displaceable into and out of a phototaking optical path, an electric drive device for charging and releasing said shutter and for displacing said mirror, comprising:

an electric motor having a drive shaft rotatable in two directions,

charging cam means rotatably drivingly coupled to said motor drive shaft and cooperable with an actuating member of said shutter, said charging cam means being rotatable in a first direction on a rotation axis in response to rotation of said motor drive shaft in one of said two directions for displacing said actuating member to charge said shutter and being rotatable in a second direction on said rotation axis in response to rotation of said motor drive shaft in the other of said two directions for releasing said actuating member to enable release of said shutter, and

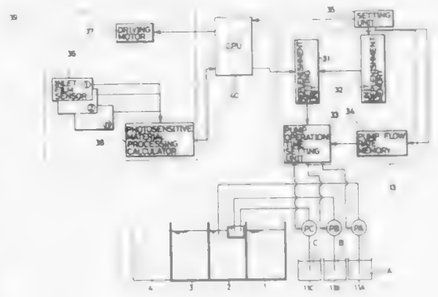
mirror driving means, including a drive member mounted to said charging cam means for displacement about said rotation axis with rotation of said charging cam means and cooperable with a mirror displacement member, for effecting displacement of said mirror out of said optical path through displacement of said drive member with rotation of said charging cam means in said second direction by said motor drive shaft and for effecting displacement of said mirror back into said optical path through displacement of said drive member with rotation of said charging cam means in said first direction by said motor drive shaft.

5,150,142

DEVICE FOR REPLENISHING FIXING SOLUTION EMPLOYED IN AUTOMATIC PROCESSOR

Yoshihiro Masuda; Akira Murata; Hitoshi Togawa, and Nobuaki Miura, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Sep. 21, 1990, Ser. No. 586,454
Claims priority, application Japan, Sep. 21, 1989, 1-111385[U]
Int. Cl.[5] G03D *3/02*
U.S. Cl. 354—324 9 Claims



1. A fixer replenishing device for mixing liquids to form a fixing solution, said device comprising:

a container for holding fixing solution, the fixing solution being a mixture of at least a first liquid and a second liquid, said first and second liquids being such that a crystal is precipitated when said first and second liquids are directly mixed together;

diluting solution supply means for diluting said first liquid to form diluted liquid, said diluting solution supply means being adjacent to said container and supplying diluted liquid to said container by overflow from said diluting solution supply means; and

second liquid supply means for supplying said second liquid into said container.

5,150,143

TRIMMING INFORMATION RECORDABLE CAMERA

Yoshimi Ohno, Kawasaki, and Junichi Shinohara, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 22, 1991, Ser. No. 688,261
Claims priority, application Japan, May 1, 1990, 2-111763; May 10, 1990, 2-118603; May 10, 1990, 2-118604; Jan. 29, 1991, 3-8989
Int. Cl.[5] G03B *5/00, 13/12, 13/36, 17/24*
U.S. Cl. 354—400 11 Claims

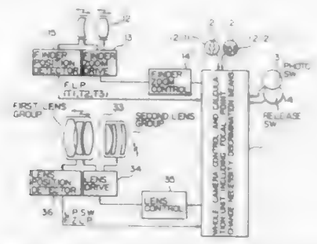
1. A trimming information recordable camera which is usable in cooperation with a labo-system in which a film is printed according to said trimming information written in said film when loaded in said camera, said camera comprising:

a photographing lens having a plurality of focal lengths and being capable of selecting one of said focal lengths;

a zoom finder through which a view field angle can be continuously changed; and

a writing means for writing said trimming information in said film,

said film being able to be printed in accordance with said trimming information which is obtained from a information of



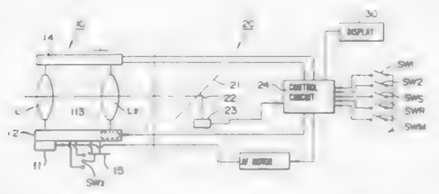
said view field angle of said zoom finder and a information of a view field angle of said photographing lens.

5,150,144

LENS DRIVING DEVICE

Isao Soshi, and Tatsuhide Takebayashi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 655,345
Claims priority, application Japan, Feb. 14, 1990, 2-13294[U]
Int. Cl.[5] G03B *13/00*
U.S. Cl. 354—400 10 Claims



1. A device for driving a power zoom lens including one or more lens groups displaceable in a direction along the optical axis by means of an electric drive unit comprising:

memory means for storing a focal length position of said lens group;

control means for displacing said one or more lens groups to said focal length position stored in said memory means by means of said electric drive unit, for controllable zooming thereof; and,

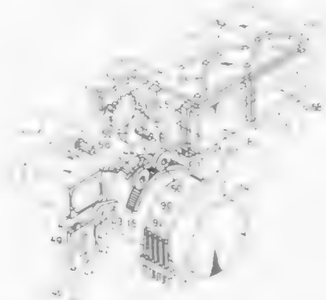
operation means for actuating said memory means to store a current focal length and for causing said control means to perform said controllable zooming to said focal length stored in said memory means, wherein said operation means comprises a pair of switches whereby, when both switches are concurrently actuated in the ON position, said memory means memorizes a focal length, and, when only one of said switches is actuated ON, said control means performs said controllable zooming so as to drive said electric drive unit to said focal length memorized in said memory means.

5,150,145

LENS SHUTTER CAMERA INCLUDING ZOOM LENS

Keisuke Haraguchi; Shinsuke Kohmoto; Takeo Kobayashi; Shigeru Kondoh; Hideki Ohkubo; Norio Numako; Saburo Sugawara; Susao Nakamura; Hirofumi Matsuo; Katsuhiko Nomura; Etsuro Nishio, and Haruo Ishii, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 144,030, Jan. 7, 1988, Pat. No. 4,944,030.
This application Feb. 14, 1990, Ser. No. 480,213
Claims priority, application Japan, May 12, 1986, 61-108278; May 12, 1986, 61-108279; May 28, 1986, 61-80861; Jun. 2, 1986, 61-83932; Jun. 2, 1986, 61-127496; Jun. 21, 1986, 61-145470; Jun. 26, 1986, 61-150995; Aug. 15, 1986, 61-125045; Aug. 22, 1986, 61-196911; Aug. 29, 1986, 61-132658; Aug. 29, 1986, 61-132659; Aug. 29, 1986, 61-132660; Aug. 29, 1986, 61-132661; May 28, 1987, 61-80862
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] G03B *5/00, 13/12, 13/36*
U.S. Cl. 354—403 92 Claims



1. A lens shutter type of camera having a zoom lens and a viewfinder optically separate form said zoom lens, said zoom lens driven by a motor, means, associated with said motor, for driving said zoom lens continuously between an extreme wide angle position and an extreme telephoto position, and means, associated with said motor, for driving said zoom lens beyond said telephoto position into a close-up photographic position.

5,150,146

FOCUS DETECTING DEVICE UTILIZING AUXILIARY ILLUMINATION

Hiroshi Ueda; Toru Matsui, and Noriyuki Okisu, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 351,854, May 15, 1989, abandoned.
This application Nov. 5, 1990, Ser. No. 610,333
Claims priority, application Japan, May 16, 1988, 63-118632; May 16, 1988, 63-118791; May 17, 1988, 63-119681; Oct. 25, 1988, 63-268783; Oct. 25, 1988, 63-268784
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—403 17 Claims

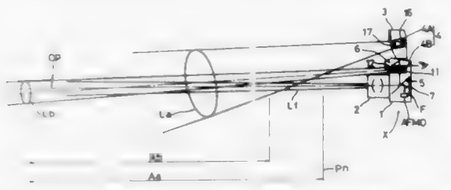
1. A focus detecting device utilizing auxiliary illumination light, comprising:

focus detecting means for detecting a focusing condition with respect to an object by utilizing an image of the object;

first auxiliary light projecting means for projecting a first auxiliary light toward said object;

second auxiliary light projecting means for projecting a second auxiliary light toward said object, said second auxiliary light being different in characteristics from said first auxiliary light; and

selecting means for selecting between said first auxiliary light projecting means and said second auxiliary light



projecting means in response to the brightness of said object.

5,150,147

ELECTRONICALLY CONTROLLED CAMERA

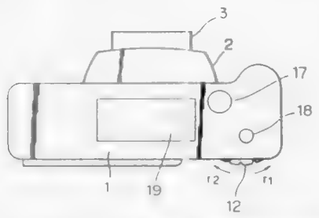
Takeo Kobayshi, Tokyo; Yasushi Tabata, Ichikawa; Norio Numako, Nogi, and Katsutoshi Nagai, Kawaguchi, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 655,089

Claims priority, application Japan, Feb. 14, 1990, 2-32986

Int. Cl.[5] G03B *7/26 5/00, 17/40*

U.S. Cl. 354—412 **13 Claims**



1. An electronically controlled camera comprising:
discriminating means for discriminating whether an operating status of said camera has been kept unchanged for a predetermined period of time
prohibiting means for automatically prohibiting power supply to said camera if it is discriminated that the operating status of said camera has been unchanged for said predetermined period of time;
storing means for storing the operating status of said camera immediately before the power supply is automatically prohibited by said prohibiting means; and
setting means for setting the operating status of said camera to the status stored in said storing means when power is re-supplied after power supply has been automatically prohibited by said prohibiting means.

5,150,148

CAMERA WITH IMPROVED ABILITY TO PHOTOGRAPH MOVING OBJECTS

Noboru Akami, Yokohama, and Daiki Tsukahara, Hiratsuka, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

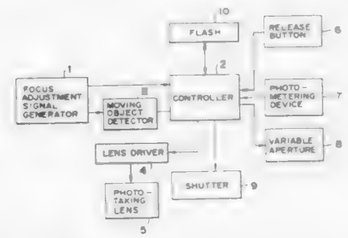
Filed Sep. 10, 1990, Ser. No. 580,181

Claims priority, application Japan, Sep. 14, 1989, 1-107222[U]

Int. Cl.[5] G03B *7/00, 7/08*

U.S. Cl. 354—413 **4 Claims**

4. A camera having a photo-taking lens, a shutter, and a variable aperture, and comprising:
(a) means for determining whether an object to be photographed is moving along an optic axis of the photo-taking lens at a speed above a predetermined value;
(b) means for performing photography in which a combination of shutter speed and aperture diameter provides an exposure in accordance with photometric data when the determined speed of the object does not exceed said predetermined value;
(c) means for performing photography with said aperture adjusted to a diameter which is smaller than said diameter in accordance with said photometric data and with said shutter adjusted to a shutter speed which is slower than said shutter speed in accordance with said photometric



data when the determined speed of the object exceeds said predetermined value;
(d) means for automatic focusing adjustment of said photo-taking lens; and
(e) means for modifying the adjustment of said photo-taking lens to compensate for movement of the object along the optical axis of the lens.

5,150,149

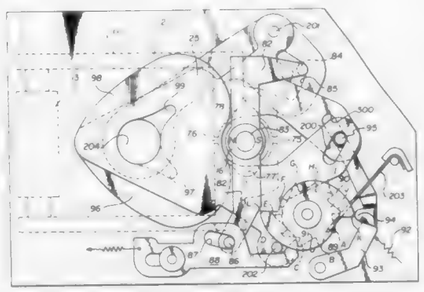
MULTI-APERTURE ELECTROMAGNETIC CAMERA SHUTTER

John H. Alligood, Penfield; John H. Minnick, Rochester, and David A. Castor, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1991, Ser. No. 735,982

Int. Cl.[5] G03B *7/08, 9/08*

U.S. Cl. 354—441 **27 Claims**



1. A multi-aperture electromagnetic camera shuttering system that utilizes one or more aperture blades for producing a plurality of aperture openings and one or more shutter blades for regulating the amount of light that is allowed to enter the aperture openings, said system comprises:
an armature comprising: a coil; and a coil, said coil is capable of receiving current and said armature will produce a first magnetic field;
a magnet that produces a second magnetic field, said magnet is coupled to said first magnetic field;
means coupled to one or more of said aperture blades for moving one or more of said aperture blades to different positions to form a plurality of aperture openings;
a moveable member that is coupled to said magnet and said moving means for moving said means and one or more of said shutter blades past said aperture opening; and
means coupled to said armature for controlling the presence or absence of said first magnetic field and the polarity of said first magnetic field so that if said armature has one polarity said magnet will move said member and one or more of said aperture blades to form an aperture opening and if said armature has a second polarity said magnet will move said member and said one or more shutter blades past said opening formed by said aperture blades and allow light to enter the optical path of said camera;
whereby, each time said controlling means causes said magnet to move said member and said member moves said aperture blades, said aperture blades will form a different aperture opening.

5,150,150

APPARATUS FOR PREVENTING IMAGE FROM BEING BLURRED IN CAMERA

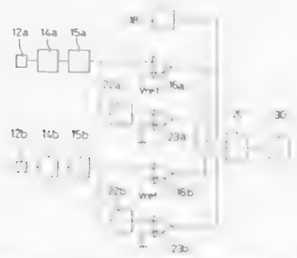
Shigeo Enomoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,554

Claims priority, application Japan, Sep. 6, 1989, 1-230992; May 18, 1990, 2-128922

Int. Cl.[5] G03B *17/38*

U.S. Cl. 354—456 **37 Claims**



1. An apparatus for preventing an image from being blurred in a camera, comprising:
at least one angular velocity detecting means for detecting the absolute value of the angular velocity applied to the camera;
detecting means for detecting that the absolute value of the angular velocity detected by said angular velocity detecting means is below a predetermined value; and
actuating means for actuating a shutter of the camera only when the absolute value of the angular velocity detected by said angular velocity detecting means is below a predetermined value and the absolute value of the angular velocity is decreasing.

5,150,151

REFLECTING DEVICE AND PATTERN TRANSFER APPARATUS USING THE SAME

Noritaka Mochizuki, Yokohama, and Ryuichi Ebinuma, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

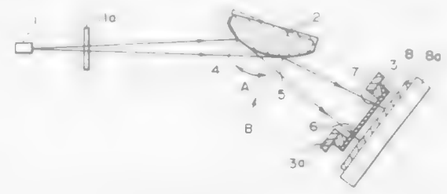
Filed Mar. 6, 1990, Ser. No. 489,194

Claims priority, application Japan, Mar. 9, 1989, 1-55182; Feb. 20, 1990, 2-37214; Mar. 2, 1990, 2-51174

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **10 Claims**

1. An exposure apparatus comprising:
holding means for holding a member to be exposed;
a movable mirror having a reflection surface for reflecting an X-ray beam from a radiation source to direct the X-ray beam along a path toward the member for exposure of the member with the X-ray beam; and
moving means for moving, during the exposure of the member, said reflection surface of said movable mirror without causing any substantial change in the path of the X-ray beam to thereby reduce non-uniformness of the exposure



of the member to the X-ray beam resulting from a defect in said reflection surface of said movable mirror.

5,150,152

EXPOSURE APPARATUS INCLUDING DEVICE FOR DETERMINING MOVEMENT OF AN OBJECT

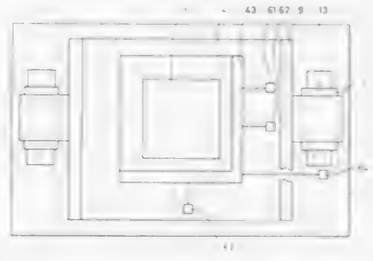
Junji Isohata, Tokyo, and Shinji Tsutsui, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,619

Claims priority, application Japan, Sep. 13, 1990, 2-241162

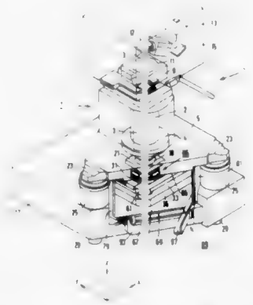
Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **23 Claims**



1. A projection exposure apparatus in which, after positions of an original body and an exposure body have been adjusted, the original and exposure bodies are scanned as a unit relative to a projection optical system to transfer a pattern on the original body onto the exposure body, said apparatus comprising:
holding means for holding the exposure body, said holding means being rotatable in a predetermined plane and being rectilinearly movable parallel to the predetermined plane;
first measuring means for measuring movement of said holding means, by use of optical interference;
scanning means for performing a scanning operation of the original and exposure bodies in a scanning direction relative to the projection system, said scanning means carrying said holding means and said first measuring means;
second measuring means disposed on a fixed system on which the projection system is mounted, independent of said scanning means, for measuring a movement distance of said holding means in a direction different from the scanning direction, by use of optical interference;
light reflecting means mounted on said holding means, said reflecting means cooperating with said first and second measuring means to measure the movement of said holding means; and
determining means for determining inclination of said light reflecting means, when said scanning means is scanned in the scanning direction by a predetermined distance, based on the predetermined distance in the scanning direction and an amount of displacement of said reflecting means in the direction different from the scanning direction measured by said second measuring means.

5,150,153
LITHOGRAPHIC DEVICE WITH A SUSPENDED OBJECT TABLE
Dominicus J. Franken, Veldhoven; Fransiscus M. Jacobs, Asten; Johannes M. M. Van Kimmenade, Ell; Cornelis D. Van Dijk, Boxtel, and Jan Van Eijk, Eindhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Dec. 10, 1991, Ser. No. 804,577
Claims priority, application Netherlands, Feb. 5, 1991, 9100202
Int. Cl.[5] G03B *27/42*
U.S. Cl. 355—53 9 Claims



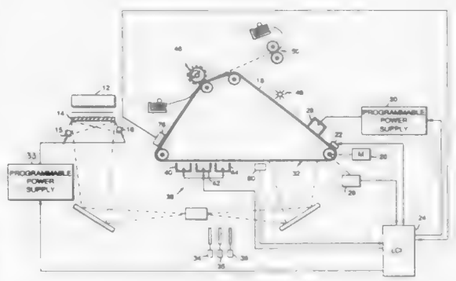
1. A lithographic device comprising a lithograpic irradiation system which has a vertical main axis parallel to a z-direction and is fastened near a lower side to a mounting member belonging to a frame of the device, and comprising a positioning device which is arranged below the irradiation system and by means of which an object table is displaceable relative to the irradiation system over a guide surface of a support member coupled to the positioning device which guide surface extends perpendicular to the z-direction, characterized in that the positioning device and the support member are positioned as a unit on a carrier which is suspended from the mounting member.

5,150,154
APPARATUS FOR FORMING IMAGES DISCHARGE LAMP AND CURRENT, TONE AND TEMPERATURE CONTROL MEANS
Satoru Kuwabara, Chiryu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Aug. 16, 1990, Ser. No. 568,225
Claims priority, application Japan, Aug. 22, 1989, 1-215306; Sep. 29, 1989, 1-256344; Oct. 23, 1989, 1-275677
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 12 Claims

1. An image forming apparatus, comprising:
lighting means for irradiating an original with light during an exposure period;
processing means for forming images from light reflected by or passed through the original;
lighting power control means for reducing power to the lighting means such that the lighting means is turned down but is not turned off during a standby period when the lighting means is not irradiating the original for processing by the processing means;
a high frequency high voltage invertor for applying high voltage to the lighting means;
current limiting means between the high voltage invertor and the lighting means for selectively limiting a current supplied to the lighting means; and
control means for controlling the current limiting means to limit the current supplied to the lighting means during the

standby period such that the lighting means is turned down but is not turned off.

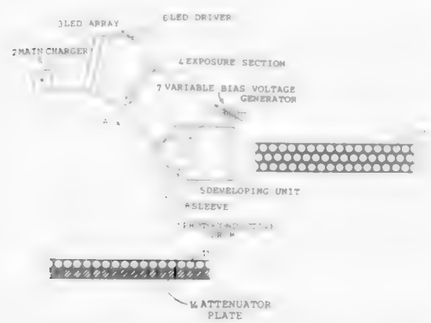
5,150,155
NORMALIZING AIM VALUES AND DENSITY PATCH READINGS FOR AUTOMATIC SET-UP IN ELECTROSTATOGRAPHIC MACHINES
Allen J. Rushing, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 1, 1991, Ser. No. 678,395
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 6 Claims



1. An automatic set-up process for adjusting process control parameters of an electrostatographic machine having an image receiver, said process comprising:
calibrating the machine by:
manually adjusting process control parameters to attain a visually desirable image,
detecting the optical density of the untoned image receiver at a predetermined position of the image receiver,
recording a toner test patch at said predetermined position according to the manually-adjusted process control parameters, and determining an aim value by normalizing the recorded toner test patch density by said detected optical density of the untoned image receiver at said predetermined position; and
setting-up the machine by:
producing a set-up control density reading for said predetermined position by sensing the untoned density of the image receiver at said predetermined position,

recording a set-up toner density patch corresponding to the aim value at said predetermined position;
detecting the density of the recorded set-up toner density patches, and
setting process control parameters in accordance with differences between the detected density of the recorded set-up toner density patch, normalized by the set-up control density reading, and the aim value.

5,150,156
ELECTROSTATIC IMAGE RECORDING MACHINE CAPABLE OF MULTIPLE GRADATIONS
Haruo Koyama, Yawata, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 611,783
Claims priority, application Japan, Nov. 30, 1989, 1-313647
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—214 8 Claims



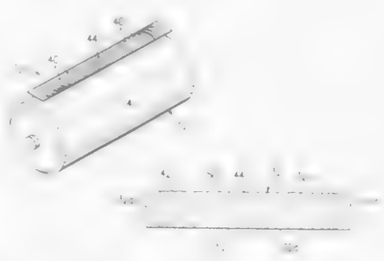
1. An image recording machine in which a latent image corresponding to an original to be recorded is produced on a photoconductive material previously charged to a full voltage and the latent image is made visible by a developer, the image recording machine comprising:
means for designating a specific area of an original; and
voltage decreasing means for decreasing the voltage of the photoconductive material within an area corresponding to a designated specific area;
wherein said voltage decreasing means includes an array of light emitting diode elements contained in a long case having partitions which are closely arranged, such that a shadow does not appear on the photoconductive material when less intense light is emitted by said array of light emitting diode elements and
wherein said array of light emitting diode elements comprises a plurality of linear light emitting diode arrays which are folded such that said partitions of neighboring light emitting diode arrays are displaced by half-pitch.

5,150,157
ELECTROPHOTOGRAPHIC APPARATUS
Yuichi Yamaki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 26, 1990, Ser. No. 543,446
Claims priority, application Japan, Jun. 28, 1989, 1-164030
Int. Cl.[5] G03G *5/02, 21/00*
U.S. Cl. 355—219 5 Claims

1. An electrophotographic apparatus comprising:
a rotary drum type photosensitive member including a cylindrical conductor and a photosensitive layer formed on the outer peripheral surface of said cylindrical conductor;
a conductive plate facing said photosensitive layer across an air gap and disposed to extend in the axial direction of said rotary drum type photosensitive member; and
an electric power source for supplying a DC constant voltage between said photosensitive member and said conductive plate, for causing a uniform electric charge to be formed on the surface of said photsensitive layer;
wherein said photsensitive member is positioned to prevent exposure of said photosensitive layer to extraneous light, while permitting the surface of said photosensitive layer to be selectively discharged by a laser beam within the electrophotographic apparatus to expose an image on said photosensitive layer, and

wherein the distance between said photosensitive layer and said conductive plate is constant, and the diameter of said rotary drum type photosensitive member is less than the width of said conductive plate as measured in the direction of rotation of said rotary drum type photosensitive member.

5,150,158
FLAT SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING DEVICE
Khosrow Lak, Lawrenceville, and E. Neal Tompkins, Atlanta, both of Ga., assignors to Colorocs Corporation, Norcross, Ga.
Filed Oct. 29, 1990, Ser. No. 605,086
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—239 24 Claims



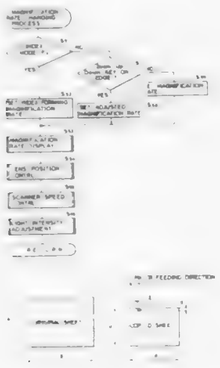
1. A reproduction apparatus having an arcuate photoconductive member, including:
a flat screen member for modulating an exposure source and spaced apart from the arcuate photoconductive member and fixed relative to the movement thereof, said flat screen member having ends and a longitudinal axis perpendicularly disposed to said ends;
a plurality of opaque lines disposed on said flat screen member, said plurality of arcuate opaque lines being centered along the longitudinal axis thereof; and
at least one of said opaque lines being arcuate in shape.

5,150,159

COPYING MACHINE CAPABLE OF PROVIDING INDEXES

Shoji Igawa, and Akio Kotani, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 424,674, Oct. 20, 1989, abandoned. This application May 20, 1991, Ser. No. 703,691
Claims priority, application Japan Oct. 24, 1988, 63-267781; Oct. 24, 1988, 63-267782
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—243 16 Claims



1. An image forming apparatus for forming an image on a paper, comprising:
a photoreceptor having a photosensitive layer thereon;
means for charging said photoreceptor;
means for exposing said image on said photoreceptor so as to form a first latent electrostatic image on said photoreceptor;
means for setting magnification rate of said exposing means;
means for selecting a first mode in which said image is exposed on said photoreceptor in said set magnification rate and a second mode in which said image is exposed on said photoreceptor in a magnification rate smaller than said set magnification rate so that an unexposed portion is formed at a peripheral portion of said photoreceptor;
means for partially removing, when said second mode is selected, charge at the unexposed portion formed on said photoreceptor to form a second latent electrostatic image;
means for developing said first and second latent electrostatic images to provide first and second visible images; and
means for transferring the first and second visible images onto said paper.

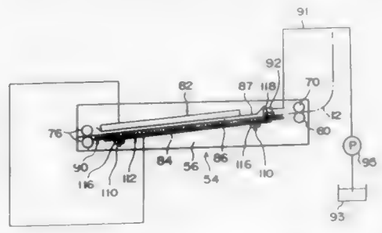
5,150,160

LIQUID ELECTROPHOTOGRAPHIC APPARATUS HAVING AN IMPROVED BACK ELECTRODE

Shin Masui, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1991, Ser. No. 676,589
Claims priority, application Japan, Apr. 2, 1990, 2-88068
Int. Cl.[5] G03G *15/10*
U.S. Cl. 355—256 8 Claims

1. A liquid electrophotographic apparatus, comprising:
a developing electrode in opposing and spaced-apart relationship with a first surface of a photoconductive material upon which is formed an electrostatic latent image; and
a back electrode which is brought into contact with a second surface opposite to said first surface of said photoconductive material disposed in opposing relation to said developing electrode, and made of an electrically conductive material having a three-dimensional net structure, whose portions in contact with said second surface of said photoconductive material define a macroscopically flat surface



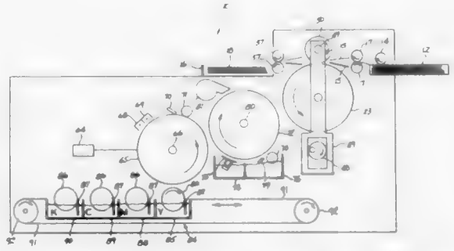
wherein the thickness of said back electrode is greater than ½ of the distance between said developing and back electrodes.

5,150,161

COLOR PRINTING APPARATUS AND PROCESS USING FIRST AND SECOND TRANSFER SURFACES

David P. Bujese, Southington, Conn., assignor to Olin Corporation, Cheshire, Conn.

Continuation of Ser. No. 682,496, Apr. 9, 1991, abandoned. This application Nov. 14, 1991, Ser. No. 808,251
Int. Cl.[5] G03G *15/01, 15/10, 15/16*
U.S. Cl. 355—256 44 Claims



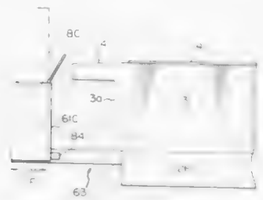
1. Apparatus for transferring a liquid toner color image comprising in combination:
(a) a photosensitive surface mounted adjacent imagewise exposing means for exposing an image thereon;
(b) charging means cooperative with the photosensitive surface to charge the surface on the photosensitive surface;
(c) developing means to develop the charged image with liquid toner;
(d) a first intermediate transfer surface mounted adjacent the photosensitive surface to receive the developed liquid image from the photosensitive surface;
(e) drying means to substantially dry the developed liquid image on the first intermediate transfer surface to form a dry image;
(f) a second intermediate transfer surface contactable with the first intermediate transfer surface, the second intermediate transfer surface having an adhesive or tacky quality effective to remove the dry image from the first intermediate transfer surface;
(g) feeding means effective to feed a final receiving surface to the second intermediate transfer surface; and
(h) fusing means effective to contact the dry image to the final receiving surface and fuse the image thereto.

5,150,162

TONER SUPPLY DEVICE FOR AN IMAGE FORMING APPARATUS

Takeshi Saito, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,446
Claims priority, application Japan, Mar. 28, 1990, 2-33383[U]; Mar. 30, 1990, 2-34580[U]; Apr. 3, 1990, 2-36397[U]; Apr. 6, 1990, 2-37112[U]; Apr. 6, 1990, 2-37113[U]; Apr. 9, 1990, 2-38237[U]; Apr. 17, 1990, 2-41214[U]; Aug. 31, 1990, 2-92345[U]
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—260 13 Claims



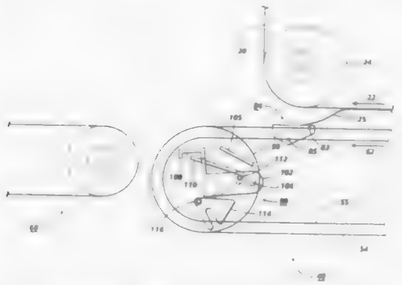
1. A toner supply device for supplying a toner to each of a plurality of developing units incorporated in an image forming apparatus, comprising:
a plurality of toner supply units each being detachably engaged with respective one of said plurality of developing units; and
toner supply path means for supplying a toner from each of said plurality of toner supply units to associated one of said plurality of developing units;
said toner supply path means being selectively connected to or disconnected from said developing units;
said device further comprising support means for supporting said plurality of toner supply units integrally beneath and in parallel to a operating section of said image forming apparatus, said operating section being positioned in a front portion of said image forming apparatus and extending in a lateral direction of said image forming apparatus.

5,150,163

SHEET TRANSPORT SYSTEM WITH IMPROVED RELEASE MECHANISM

Scott C. Durland, Rochester; James R. Cassano, Penfield; Richard M. Dastin, Fairport; Dan F. Lockwood, Ontario; Roger M. Swanson, Fairport, and Robert J. Tanniscoli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 22, 1991, Ser. No. 704,151
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—271 17 Claims



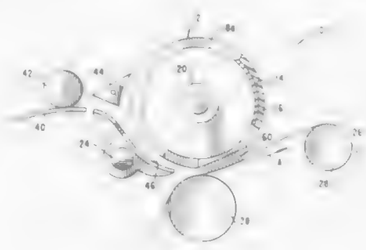
1. An apparatus for advancing a sheet in a predetermined path through a transfer zone and into registration with information on a moving member, comprising:
means for advancing the sheet through the transfer zone so that the information on the moving member is transferred to the sheet on one side thereof; and
means, positioned on the side of the sheet opposite the information, for effecting release of the sheet from said advancing means, wherein said release effecting means is positionable at a first fixed position spaced apart from the path of the sheet and at a second fixed position within the path of the sheet, the first fixed position and the second fixed position each being fixed in relation to the path of the sheet.

5,150,164

TRANSFER APPARATUS

Robert H. Shea, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 16, 1991, Ser. No. 807,337
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—271 16 Claims



1. In an electrostatographic reproduction device wherein marking particle images are transferred from a moving transferable image support by a transfer member as said transfer member moves in contact with said support, an improved transfer apparatus for assuring registration between marking particle images and said transfer member, said improved transfer apparatus comprising:
means for driving said transfer member at a predetermined speed substantially in timed relation with movement of said transferable image support;
means, located between said transfer member and said drive means, for accommodating for any mismatch in speeds of said transfer member and said transferable image support at the area of contact therebetween; and
means, located in that portion of said transfer member outside of the image transfer area, for facilitating relative movement between said transfer member and said transferable image support during the period of time when said facilitating means is in intimate contact with said support, whereby said transfer member is substantially decoupled from said transferable image support such that any force buildup due to speed mismatch and/or misalignment is relieved to enable registration between said transfer member and said support to be periodically reset.

5,150,165

IMAGE FORMING APPARATUS HAVING IMAGE TRANSFER MEMBER

Jun Asai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1991, Ser. No. 682,676
Claims priority, application Japan, Apr. 10, 1990, 2-93054
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—274 14 Claims

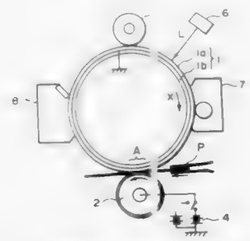
1. An image forming apparatus comprising:
an image bearing member;
image transfer charging means for transferring a toner image from said image bearing member onto a transfer material,

said transfer charging means having a transfer member contactable to a backside of the transfer material;

wherein said transfer member includes a conductive base, an elastic layer outside said conductive base, and a surface layer outside said elastic layer, satisfying:

$5\times10^7 \leqq R_2 \leqq 5\times10^{10}$ (ohm.cm). and

$R_1d_1/R_2d_2 \geqq 10$



where R_1 is a volume resistivity of said elastic layer (ohm.cm); d_1 is a thickness thereof (cm); R_2 is a volume resistivity of said surface layer (ohm.cm); and d_2 is a thickness thereof; and

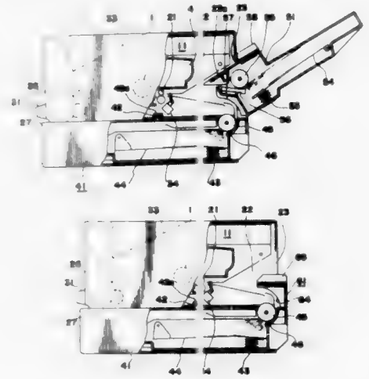
wherein a resistance of said surface layer and a resistance of said elastic layer vary in accordance with a change in ambient condition and a resistance variation of said surface layer is larger than a resistance variation of said elastic layer.

5,150,166

IMAGE FORMING SYSTEM INCLUDING ATTACHABLE SHEET SUPPLYING UNITS FOR TRANSPORTING SHEETS DIRECTLY TO AN IMAGE FORMING PART

Yasuhiro Matsuura; Hiroaki Kojima; Hirofumi Hasegawa; Naoto Ohmori, and Yukio Yamada, all of Osaka, Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Oct. 18, 1989, Ser. No. 423,770
Int. Cl.[5] B41J *11/00*
U.S. Cl. 355—308 **4 Claims**



4. An image forming system comprising:

a main body having an image forming means and a housing member which encloses the image forming means;

first and second units which are attachable to said main body at the same time and each of which is adapted to contain a stack of sheets to be supplied one by one into said main body;

wherein said second unit has a take-up roller for supplying sheets one by one from the stack of sheets in the second unit into said main body, and said first unit has a guide member for guiding sheets from said second unit toward said image forming means, and

wherein said housing member has an opening for receiving sheets of paper from said first and second units, and said guide member guides the sheets from said second unit so that the sheets from said second unit are fed into said housing member through the same opening that sheets from said first unit are fed; and

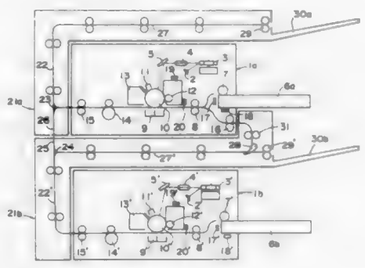
wherein said system further comprises a sheet guiding unit attachable to said main body together with said second unit for guiding sheets from said second unit toward said image forming means when said first unit is not attached to said main body.

5,150,167

IMAGE FORMING APPARATUS

Takashi Gonda, Aichi; Hirofumi Hasegawa, Hadano; Motohiro Yamada, Okazaki, and Takayuki Ariyama, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 6, 1991, Ser. No. 755,832
Claims priority, application Japan, Sep. 10, 1990, 2-240457
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—313 **11 Claims**



1. An image forming apparatus comprising:

a plurality of image forming means each of which is capable of forming images and includes a sheet feeding portion for feeding recording sheets therefrom, and a sheet discharge portion for discharging the recording sheet bearing a recorded image,

a sheet transporting unit for transporting sheets discharged from an arbitrary one of said image forming means to the discharge portion of its own or to that of other image forming means,

a control means for controlling, when one of said image forming means is incapable of continuous operation during an execution of its operation, to operate another image forming means in place thereof, and controlling to discharge the image bearing sheets onto the same discharge portion to which sheets are discharged previously.

5,150,168

DUPLEX PRINTER AND METHOD OF PRINTING

Venkatesh H. Kamath, Fairport; Michael A. Malachowski, and David R. Kamprath, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

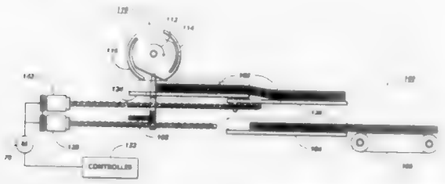
Filed Aug. 1, 1991, Ser. No. 739,005
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—319 **26 Claims**

12. A duplex feeder for feeding copy sheets having images on one side thereof to a copying station for imaging on the other side thereof, comprising:

a feeder for feeding the copy sheets to the copying station;

a feeder tray for supporting a stack of the copy sheets to be fed by said feeder;

at least one stationary buffer tray separate from said feeder tray for stacking the copy sheets when said feeder tray is full;



moving means for moving the copy sheets from said buffer tray to said feeder tray; and

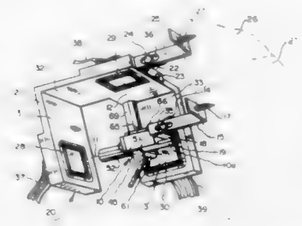
sensing means for sensing that said buffer tray is full and that said feeder tray is empty and for triggering said moving means.

5,150,169

METHOD AND APPARATUS FOR SENSING AND MEASURING RELATIVE POSITION AND MOTION BETWEEN TWO POINTS

Earl Van Wagoner, West Jordan, Utah, assignor to Hoggan Health Industries, Inc., Draper, Utah

Filed Sep. 23, 1991, Ser. No. 763,943
Int. Cl.[5] A61B *5/05*
U.S. Cl. 356—1 **23 Claims**



1. Apparatus for measuring relative movement between two points, comprising radiation source means for generating three orthogonal radiation beams whose directional vectors intersect at a common point, said common point constituting one of said two points; radiation sensing means capable of detecting in three two dimensional sensing planes the position of each of three orthogonal radiation beams, said radiation sensing means arranged to detect in different planes the position of each of the three radiation beams from the radiation source means, each of said three sensing planes intersecting at an origin point, said origin point constituting the other of the said two points; and calculation means for calculating the relative position of the two points at a particular time from the determined positions of the three radiation beams striking the sensing means at that particular time.

5,150,170

OPTICAL PHASE CONJUGATE VELOCIMETER AND TRACKER

David J. Morris, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 26, 1991, Ser. No. 749,874
Int. Cl.[5] G01P *3/36*
U.S. Cl. 356—28.5 **20 Claims**

1. Apparatus for tracking a light-reflective target to determine its velocity and/or position, comprising:

(a) a source of coherent light having a frequency, ν_0, a portion of the coherent light from the source being directed generally toward the light-reflective target, illuminating it so that it reflects at least some of the coherent light along a detection path as a first order light signal, a frequency of the coherent light comprising the first order light signal being changed by a Doppler shift, ν_{0b}, due to a component of the velocity of the target along the detection path;

(b) optical phase conjugate means, disposed along the detection path so as to receive the first order light signal, for producing a first optical phase conjugate wave in respect to the first order light signal, the first optical phase conjugate wave having a frequency that is shifted from ν_0 by $-\nu_{0b}$ and returning to the light-reflective target in the opposite direction along the detection path, at least a portion of the first optical phase conjugate wave being reflected by the light-reflective target back along the detection path toward the optical phase conjugate means

and experiencing a total Doppler shift in frequency of $-\nu_{0b}^2$ due to the component of the velocity of the target along the detection path, this portion of the first optical phase conjugate wave being thus a second order light signal;

(c) imaging means, disposed so as to receive at least a portion of the second order light signal and at least a portion of the first order light signal that is reflected from the light-reflective target, for detecting and monitoring a spatially dependent intensity of such portions, producing an electrical signal indicative of a combination of said light signals for use in determining the position of the light-reflective target; and

(d) signal processing means for monitoring the frequency of the electrical signal, which results from the detection of the combination of the first and the second order light signals, to determine the component of the velocity of the target along the detection path.

5,150,171

FLUXES SCINTILLOMETER

Reginald J. Hill, Boulder, and Gerard R. Ochs, Longmont, both of Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jul. 30, 1990, Ser. No. 559,039
Int. Cl.[5] G01N *21/41*; G01M *9/00*
U.S. Cl. 356—128 **19 Claims**

1. A flux scintillometer comprising: first means for measuring the refractive-index structure parameter of the atmosphere, wherein said first means comprise

(i) a laser light source,

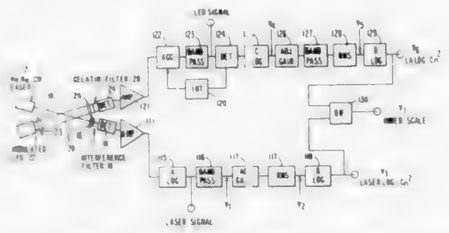
(ii) laser light receiving means for receiving light from the laser light source through the atmosphere,

(iii) means for measuring variance of intensity of the light received from the laser light source,

(iv) means for correcting the measured variance of intensity

of the light received from the laser light source for saturation of scintillation, and

(iv) means for obtaining the refractive-index structure parameter of the atmosphere from the corrected measured variance of intensity of the light received from the laser light source;



second means for obtaining a value of the inner scale of turbulence of the atmosphere

third means, responsive to the first and second means, for deriving at least one flux value from the refractive-index structure parameter and the inner scale of turbulence.

5,150,172

INTERFEROMETER SPECTROMETER HAVING TILTABLE REFLECTOR ASSEMBLY AND REFLECTOR ASSEMBLY THEREFOR

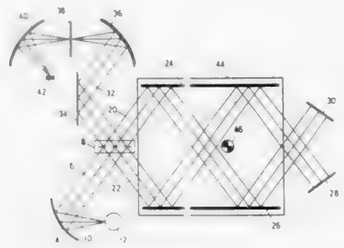
Philip R. Brierley, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Continuation of Ser. No. 435,184, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 142,142, Jan. 11, 1988, Pat. No. 4,915,502. This application May 17, 1991, Ser. No. 715,705

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—346 **4 Claims**



1. A modulator for modulating the path difference between two arm beams of a twin-arm interferometer, comprising a rotatably supported housing having first and second plane mirrors substantially rigidly attached thereto, wherein the first and second mirrors are mutually facing, have a region between them, and are each substantially parallel to the rotation axis of the rotatably supported housing such that an angular displacement of the rotatably supported housing causes a simultaneous change in the path length of both of the two arm beams.

5,150,173

METHOD AND APPARATUS FOR ALIGNMENT AND EXPOSURE

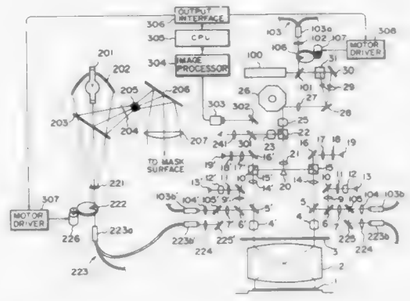
Kazuhito Isobe, Kawasaki, and Reiji Hirano, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1991, Ser. No. 646,401

Claims priority, application Japan, Jan. 31, 1990, 2-019232

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—401 **10 Claims**



1. An alignment and exposure method usable in manufacturing semiconductor devices, for aligning a mask and a wafer and for exposing the wafer to the mask to print a pattern of the mask on a photoresist of the wafer, said method comprising the steps of:

illuminating the wafer with first illumination light having a center wavelength at a first wavelength and second illumination light having a center wavelength at a second wavelength;

adjusting the proportion of the first illumination light and the second illumination light;

illuminating an alignment mark of the wafer with the proportion-adjusted first and second illumination light;

photoelectrically detecting the illuminated alignment mark of the wafer and adjusting the relative position of the wafer with respect to the mask on the basis of a detection signal formed as a result of the photoelectric detection; and

exposing the wafer to the mask with exposure light.

5,150,174

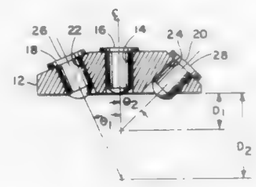
PHOTOELECTRIC COLOR SENSOR

Lawrence J. Ryczek, Oconomowoc; Michael G. Taranowski, Milwaukee, and Eugene F. Duncan, Wauwatosa, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 25, 1991, Ser. No. 674,247

Int. Cl.[5] G01J *3/50*

U.S. Cl. 356—402 **7 Claims**



1. A photoelectric color sensor comprising:

(a) at least one pair of angularly oppositely disposed electrically energizable light sources emitting beams of a common chromaticity, with one beam of said pair directed to intersect a first target area at a first predetermined angle, and the other beam of said pair directed to intersect a second target area disposed a selected distance substantially farther from said first target area at a second predetermined angle different from said first predetermined angle;

(b) photodetector means disposed intermediate said ones of said pair and positioned to detect diffused reflections from an object located between said first and second target area and operative to provide an electrical signal indicative of the sum of said reflections;

(c) means operative to intermittently energize said sources at common times, and said photodetector means receives the combined reflections of said pair of sources.

5,150,175

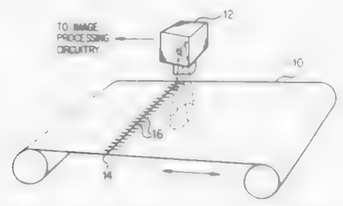
OPTICAL IMAGING SYSTEM FOR FABRIC SEAM DETECTION

Douglas L. Whitman, Pembroke, and Adel K. Sarrafzadeh, Blacksburg, both of Va., assignors to American Research Corporation of Virginia, Radford, Va.

Filed Mar. 13, 1991, Ser. No. 668,614

Int. Cl.[5] G01N *21/86*

U.S. Cl. 356—429 **17 Claims**



1. A method for detecting a seam or other closely spaced periodic object in a moving web having top and bottom surfaces, comprising the steps of:

illuminating the top surface of said moving web;

receiving light reflected by said moving web as a result of said step of illuminating using camera means aligned across the width of said moving web;

converting said reflected light into corresponding electrical signals;

reading out said electrical signals from said camera means for processing;

filtering the converted corresponding electrical signals to produce an alternating current signal having a magnitude proportional to the presence of a seam or other closely spaced periodic object;

processing said alternating current signal to produce a direct current signal corresponding to said reflected light; and

comparing said direct current signal to a predetermined reference value to determine whether a seam or other closely spaced periodic object has been detected.

5,150,176

PN JUNCTION SURGE SUPPRESSOR STRUCTURE WITH MOAT

Mark Schoenberg, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1992, Ser. No. 834,746

Int. Cl.[5] H01L *29/90*

U.S. Cl. 357—13 **11 Claims**

1. A semiconductor structure comprising:

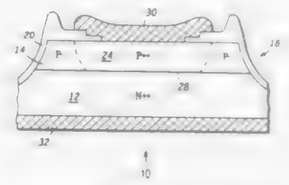
a semiconductor substrate of a first conductivity type having first and second surfaces;

an epitaxial semiconductor layer of a second conductivity type disposed on said first surface of said substrate;

a region in said epitaxial layer having a higher dopant concentration than the remainder of said epitaxial layer;

a junction at an interface of said substrate and said highly doped region of said epitaxial layer;

a moat disposed about said epitaxial layer and a portion of said substrate;



dielectric material disposed on said epitaxial layer and in said moat; and

contacts contacting said highly doped region of said epitaxial layer and said substrate.

5,150,177

SCHOTTKY DIODE STRUCTURE WITH LOCALIZED DIODE WELL

Murray J. Robinson, Falmouth; Christopher C. Joyce, Gorham, and Tim W. Luk, Scarborough, all of Me., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 6, 1991, Ser. No. 803,214

Int. Cl.[5] H01L *29/48*

U.S. Cl. 357—15 **12 Claims**

1. A Schottky diode structure comprising a diode junction and an ohmic contact formed in the surface of an epitaxial layer of semiconductor material deposited over a substrate, wherein the improvement comprises a diode NWell of N type atoms underlying said diode junction, electrically coupling said diode junction to said ohmic contact, wherein said N type atoms are distributed in a retrograde concentration upward from said substrate.

5,150,178

GATE STRUCTURE FOR A SEMICONDUCTOR MEMORY DEVICE

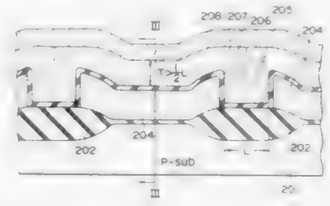
Seiichi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1991, Ser. No. 690,660

Claims priority, application Japan, Apr. 24, 1990, 2-106377

Int. Cl.[5] H01L *29/68, 23/48, 29/06, 29/04*

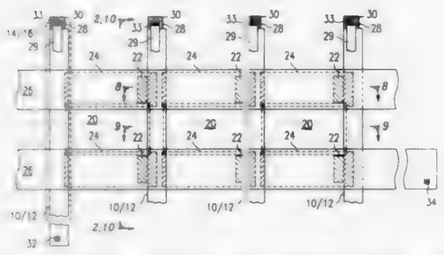
U.S. Cl. 357—23.5 **12 Claims**



1. A semiconductor memory device of multistage gate structure, comprising:

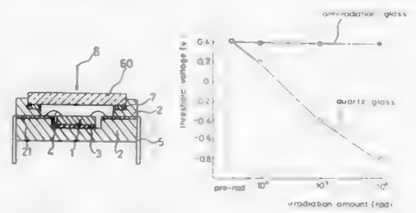
a semiconductor substrate;
a field oxidation film of a predetermined pattern formed on said semiconductor substrate for defining element forming regions in which semiconductor elements are formed;
first gate electrodes formed on said element forming regions, the first gate electrodes being separated from each other by a predetermined width;
an insulating film formed to define grooves having substantially the same width between said first gate electrodes; and
a second gate electrode of superimposed-layer structure formed on said insulating film made of a polysilicon layer formed on said insulating film and a high melting point metal layer or a silicide layer of a high melting point metal formed on the polysilicon layer, surfaces of those portions of said polysilicon layer which are above said grooves being substantially flat.

5,150,179
DIFFUSIONLESS SOURCE/DRAIN CONDUCTOR ELECTRICALLY-ERASABLE, ELECTRICALLY-PROGRAMMABLE READ-ONLY MEMORY AND METHOD FOR MAKING AND USING THE SAME
Manzur Gill, Rosharon, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jul. 5, 1990, Ser. No. 548,045
Int. Cl.[5] H01L *29/68*
U.S. Cl. 357—23.5 **41 Claims**



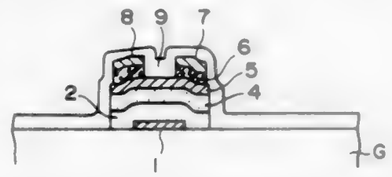
1. A contactless diffusionless source/drain conductor electrically-erasable and programmable read-only memory cell formed at a face of a semiconductor layer of a first conductivity type, comprising:
first and second conductors, formed overlying portions of said semiconductor layer, and separated to define a channel region therebetween, a thin insulator layer formed across at least said channel region of said semiconductor layer, said first conductor controlling and defining a drain inversion region in said semiconductor layer, said second conductor controlling and defining a source inversion region in said semiconductor layer;
a thin insulative tunneling window formed on said semiconductor layer adjacent said second conductor;
a floating gate conductor overlying said thin insulative tunneling window for establishing a Fowler-Nordheim tunnel current path from said source inversion region and disposed over at least a portion of said channel region for controlling channel conductance in the last said portion;
a control gate conductor insulatively overlying said floating gate; and
first and second diffused regions of a second conductivity type opposite said first conductivity type formed in said semiconductor layer remote from said memory cell, said first diffused region formed adjacent said drain inversion region, said second diffused region formed adjacent said source inversion region.

5,150,180
PACKAGED SEMICONDUCTOR DEVICE WITH HIGH ENERGY RADIATION ABSORBENT GLASS
Yomiyuki Yama, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Apr. 24, 1991, Ser. No. 690,279
Claims priority, application Japan, Jun. 15, 1990, 2-158421
Int. Cl.[5] H01L *31/00, 27/14*
U.S. Cl. 357—29 **8 Claims**



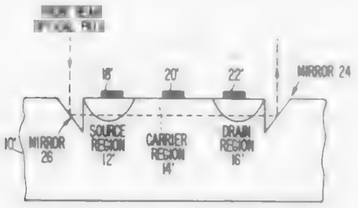
1. A packaged semiconductor device comprising:
a semiconductor element including a surface on which light is incident;
a semiconductor package containing said semiconductor element and including at least one external lead for transferring an electrical signal from said semiconductor element to the outside; and
optical glass sealing said semiconductor package and protecting said semiconductor element for transmitting light to said semiconductor element wherein said optical glass includes at least one of cerium oxide and titanium oxide for absorbing high energy radiation.

5,150,181
AMORPHOUS THIN FILM SEMICONDUCTOR DEVICE WITH ACTIVE AND INACTIVE LAYERS
Shinichi Takeda, Hiratsuka, and Masato Yamanobe, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 26, 1991, Ser. No. 675,280
Claims priority, application Japan, Mar. 27, 1990, 2-078401; Mar. 27, 1990, 2-078402
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **27 Claims**



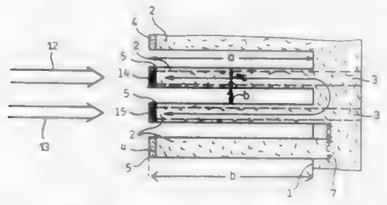
1. A thin film semiconductor device comprising:
a substrate;
an active semiconductor layer of amorphous silicon including and hydrogen provided on said substrate;
a first inactive semiconductor layer provided on said active semiconductor layer, and containing hydrogen at a higher concentration than that of said active semiconductor layer, but not less than 20 percent hydrogen concentration;,
an ohmic layer; and
a metal layer provided on said ohmic layer.

5,150,182
SEMICONDUCTOR DEVICE ENHANCED FOR OPTICAL INTERACTION
C. David Capps, Seattle, and R. Aaron Falk, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jun. 7, 1988, Ser. No. 203,726
Int. Cl.[5] H01L *27/14, 31/00, 27/01, 29/00*
U.S. Cl. 357—30 **7 Claims**



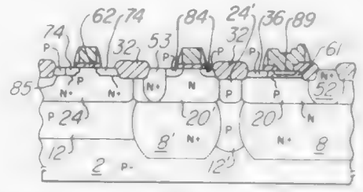
1. A semiconductor device comprising:
a charge carrier region;
means, comprising at least one pair of mirror surfaces formed in a substrate of said semiconductor device, for providing an optical path through said charge carrier region, said path being through a longest dimension of said charge carrier region;
means for applying a write beam to said optical path, said write beam having a wavelength within an absorption band of said semiconductor device;
means for applying a read beam to said optical path, said read beam having a wavelength outside said absorption band of said semiconductor device; and
means for detecting at least one of a phase or polarization change after said read beam passes through said charge carrier region.

5,150,183
SWITCH MATRIX INCLUDING OPTICALLY NON-LINEAR ELEMENTS
Falk Mikosch, Graben-Neudorf, Fed. Rep. of Germany, and Stanley D. Smith, Edinburgh, Great Britain, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany
Filed May 10, 1989, Ser. No. 349,615
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722881
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—32 **12 Claims**



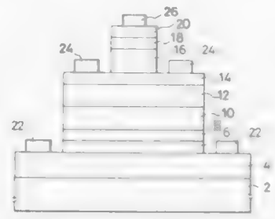
1. In a switch matrix composed of a plurality of optically non-linear elements disposed as optically active layers on a common substrate surface; the improvement wherein: the substrate surface is a microstructure composed of a plurality of pillars with lateral spacings in a micron range; and the optically active layers of the respective devices are applied to respective frontal faces of free pillar ends in a cross-sectional region of the pillars.

5,150,184
METHOD FOR FORMING EMITTERS IN A BICMOS PROCESS
Robert H. Eklund, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 306,439, Feb. 3, 1989, Pat. No. 5,047,357. This application May 24, 1991, Ser. No. 706,433
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—34 **22 Claims**



1. A bipolar transistor formed at a surface of a semiconductor body, comprising:
a collector region of a first conductivity type;
a base region of a second conductivity type disposed within said collector region at said surface;
an emitter electrode comprising a semiconductor material slightly doped with a remaining portion of a first dopant species and heavily doped with a second dopant species, both of said first conductivity type, said first dopant species having a relatively greater diffusivity than said second dopant species; and
an emitter region of said first conductivity type disposed within said base region and in contact with said emitter electrode, said emitter region heavily doped with said first dopant and slightly doped with said second dopant by said first and second dopants diffused from said emitter electrode.

5,150,185
SEMICONDUCTOR DEVICE
Hiroshi Yamada, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Apr. 12, 1991, Ser. No. 684,385
Claims priority, application Japan, Apr. 18, 1990, 2-102143; Sep. 19, 1990, 2-249088
Int. Cl.[5] H01L *29/72, 29/161, 27/12, 29/12*
U.S. Cl. 357—34 **32 Claims**



1. A semiconductor device capable of operating under a predetermined voltage, comprising:
an emitter layer;
a base layer of a first conductivity type formed in contact with the emitter layer having a first bandgap;
a first collector layer formed in contact with the base layer, and having a second bandgap substantially equal to the first bandgap; and
a second collector layer formed in contact with the first collector layer, and having a third bandgap wider than the second bandgap,

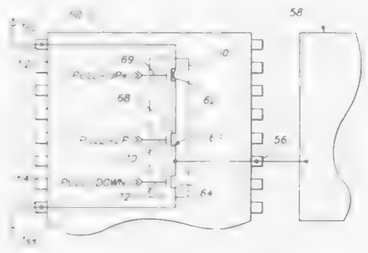
wherein the first collector layer has characteristics including a thickness sufficient to cause carriers injected from the first conduction type base layer and flowing in the first collector layer under the predetermined voltage, to have a kinetic energy substantially equal to or higher than a bandgap at an interface between the first collector layer and the second collector layer and sufficient to not cause an avalanche breakdown.

5,150,185

CMOS OUTPUT PULL-UP DRIVER

David Pinney, Boise, Id.; Gary Johnson, Austin, Tex.; Greg Roberts, and Steve Casper, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Mar. 6, 1991, Ser. No. 665,558
Int. Cl.[5] H01I 27/02
U.S. Cl. 357—42 26 Claims



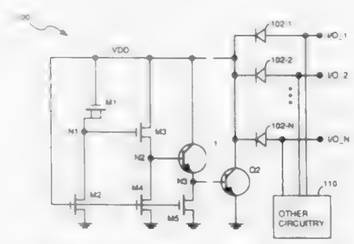
1. A CMOS integrated circuit output terminal driver comprising:
an output terminal;
a pull-up circuit connected to the output terminal, said pull-up circuit having
(a) a p-channel MOS pull-up transistor, and
(b) a native n-channel MOS transistor connected in series with the p-channel pull-up transistor, wherein the native n-channel transistor has a native turn-on threshold voltage.

5,150,187

INPUT PROTECTION CIRCUIT FOR CMOS DEVICES

Eddy C. Huang, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Mar. 5, 1991, Ser. No. 665,386
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—43 6 Claims



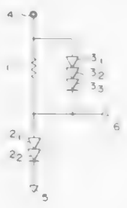
1. In an MOS semiconductor circuit, a shared protection circuit coupled to a plurality of input/output pads and to other circuitry in the MOS semiconductor circuit, said shared protection circuit comprising:
first and second voltage source nodes, one of said voltage sources node comprising a high voltage source node and the other comprising a low voltage source node;
a multiplicity of diodes, each coupling a distinct input/output node to said first voltage source node so that a transient voltage of a predefined polarity on any input/output node is transmitted to said first voltage source node; and
a Darlington pair of parasitic bipolar transistors, coupled to said first and second voltage source nodes so as to conduct charge from said first voltage source node to said second voltage source node when a transient voltage of said predefined polarity having at least a predefined magnitude occurs on said first voltage source node;
whereby said shared protection circuit will drain current from any of said input/output nodes, via said first voltage source node, when a transient voltage of said predefined polarity occurs thereon.

5,150,188

REFERENCE VOLTAGE GENERATING CIRCUIT DEVICE

Takahiko Hara, and Syuso Fujii, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1990, Ser. No. 620,030
Claims priority, application Japan, Nov. 30, 1989, 1-311368
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—41 17 Claims



1. A reference voltage generating circuit device, which is integrally formed on a semiconductor substrate and connected between first and second supply terminals where an external supply voltage is applied, comprising:
electrical resistor means having a first terminal connected to said first supply terminal, which has a first potential, and a second terminal;
at least one first diode connected between the second terminal of said electrical resistor means and said second supply terminal, which has a second potential lower than the first potential, so as to have a forward characteristic with respect to said supply voltage; and

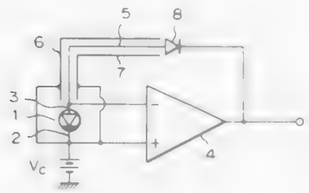
at least one second diode connected to said electrical resistor means in parallel, connected to said first diode in series, and having an anode to which is applied a potential the same as the first potential so as to have the forward characteristic with respect to said supply voltage, wherein a node between said first diode and said second diode is connected to output terminal means.

5,150,189

SEMICONDUCTOR APPARATUS

Takahiro Shirai, Hiratsuka; Tsuneori Yoshinari, Tokyo, and Kazuhiko Muto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 361,391, Jun. 5, 1989, abandoned, which is a continuation of Ser. No. 175,675, Mar. 25, 1988, abandoned, which is a continuation of Ser. No. 18,476, Feb. 25, 1987, abandoned. This application Sep. 24, 1990, Ser. No. 587,616
Claims priority, application Japan, Feb. 28, 1986, 61-44783; Feb. 28, 1986, 61-44784; Feb. 28, 1986, 61-44785; Feb. 28, 1986, 61-44786
Int. Cl.[5] H01L 29/40
U.S. Cl. 357—53 8 Claims



1. A semiconductor apparatus comprising:
a semiconductor substrate;
a generating means for generating a signal, said generating means being coupled to an operational amplifier;
a signal line arranged on said semiconductor substrate for transmitting the signal generated by said signal generating means; and
guard means comprising a conductive region in the vicinity of and surrounding said signal line, wherein a potential of said guard means is substantially equal to a potential of said signal line.

5,150,190

Patent Not Issued For This Number

5,150,191

P-TYPE II-VI COMPOUND SEMICONDUCTOR DOPED

Nawoto Motegi, Kanagawa; Tsutomu Uemoto, Yokohama; Atsushi Kamata, Chigasaki, and Hiroshi Mitsuhashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 21, 1990, Ser. No. 616,563
Claims priority, application Japan, Nov. 21, 1989, 1-300702; Feb. 13, 1990, 2-32145
Int. Cl.[5] H01L 29/227
U.S. Cl. 357—61 20 Claims

Zn	Se	Zn	Se
Se	Zn	Si	Zn
Zn	Cl	Zn	Se
Se	Zn	Se	Zn

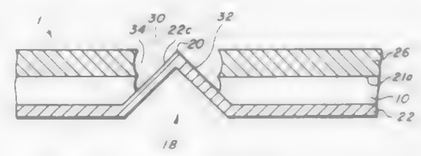
1. An optical semiconductor device provided with a p-type group II-VI compound semiconductor layer wherein dopants selected from group VII atoms, atoms of groups III and IV, and atoms of groups IV and VII are added and associations are formed so that shallow acceptor level can be defined, each of the associations is selected from the group IV atom and the group III atom, the group IV atom and group VII atom, and the group VII atom and a vacancy of a group II atom, and is formed between those lattice points which are adjacent to each other.

5,150,192

FIELD EMITTER ARRAY

Richard F. Greene, Charlotte, N.C., and Henry F. Gray, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 589,102, Sep. 27, 1990, Pat. No. 5,057,047.
This application Jun. 20, 1991, Ser. No. 718,034
Int. Cl.[5] H01L 23/48, 29/44
U.S. Cl. 357—68 7 Claims



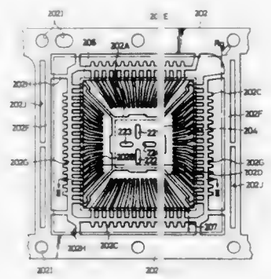
1. A field emitter array comprising:
a substrate made of a single crystal material having first and second surfaces and having at least one hole with a plurality of sides which intersect at a crystallographically sharp apex;
an electron emitter comprising a first conducting layer conforming to said first surface and said sides of said at least one hole and filling said apex;
a gate comprising a second conducting layer conforming to said second surface; and
an aperture comprising at least one bore in said substrate, said bore intersecting said gate and a predetermined portion of said electron emitter.

5,150,193

RESIN-ENCAPSULATED SEMICONDUCTOR DEVICE HAVING A PARTICULAR MOUNTING STRUCTURE

Toshihiro Yasuhara, Kokubunji; Masachika Masuda, Kodaira; Gen Murakami, Malhida; Kunihiko Nishi, Kokubunji; Masanori Sakimoto, Hinode; Ichio Shimizu, Tamamura; Akio Hoshi, Isesaki; Sumio Okada, and Tooru Nagamine, both of Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Tobu Semiconductor, Ltd., Saitama, both of, Japan

Continuation of Ser. No. 198,316, May 25, 1988, abandoned.
This application Feb. 11, 1991, Ser. No. 653,244
Claims priority, application Japan, May 27, 1987, 52-128333; Sep. 19, 1987, 52-235903; Sep. 19, 1987, 52-235904; Sep. 19, 1987, 52-235905
Int. Cl.[5] H01L 23/12, 23/28
U.S. Cl. 357—70 28 Claims



1. A lead frame for a semiconductor device comprising:

a quadrangular-shaped chip supporting member for mounting a semiconductor chip on a chip mounting surface thereof, wherein said chip supporting member has a pair of first sides facing each other and a pair of second sides facing each other;

at least two first elongated through-holes arranged on a line parallel to one of said second sides, and at least two second elongated through-holes arranged on line parallel to one of said first sides; and

a plurality of leads arranged adjacent to said chip supporting member,

wherein said chip supporting member includes adhering portions for adhering said semiconductor chip thereon, each surrounded by one of said first sides, one of said second sides, one of said first through-holes and one of said second through-holes, and wherein one of said adhering portions is joined with another of said adhering portions at a portion of said chip supporting member located between said first elongated through-holes.

5,150,194

ANTI-BOW ZIP LEAD FRAME DESIGN

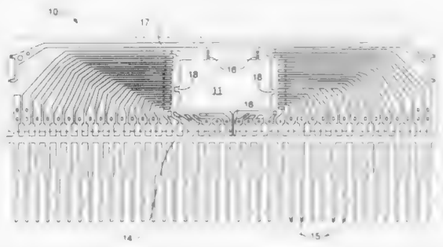
Jerry M. Brooks, and Chender Huang, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Apr. 24, 1991, Ser. No. 691,586
Int. Cl.[5] H01L 2/48, 23/12
U.S. Cl. 357—70 1 Claim

1. An integrated circuit package zig zag inline multiple lead frame configuration to be used to reduce bowing and bending during integrated circuit assembly, the lead frame comprising;

a) a plurality of conventional lead fingers, held in generally parallel spaced relationship by a conventional and integral support structure, each finger conventionally attached on one end to the lead frame and extending in a known way to the proximity of the edge of a conventional downset die attach paddle, for the purpose of conventional multiple electrical connection to a conventional die;

b) a tie bar support beam which is in the same plane as and attached, on its opposing ends, to opposing sides of the lead frame, extending generally parallel and adjacent to a long side of said downset die paddle and providing attachment and support for a plurality tie bars, which are attached on their opposing ends to the long side of said downset die paddle adjacent to said support beam, in order to help secure and support the downset die attach paddle in proper planar relationship during encapsulation of the integrated circuit assembly;



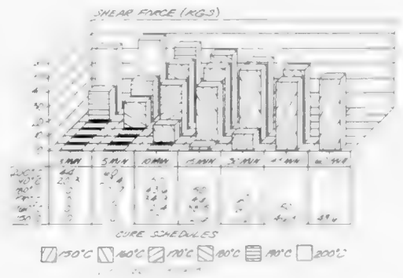
c) at least one downset tie bar attached on one end to the multiple lead finger support structure and on its opposing end to a side of the die attach paddle not adjacent to the tie bar support beam, in order to help secure and support the downset die attach paddle in proper planar relationship during encapsulation of the integrated circuit assembly.

5,150,195

RAPID-CURING ADHESIVE FORMULATION FOR SEMICONDUCTOR DEVICES

My N. Nguyen, San Diego, Calif., assignor to Johnson Matthey Inc., Valley Forge, Pa.

Filed Oct. 24, 1990, Ser. No. 602,504
Int. Cl.[5] H01L 23/14
U.S. Cl. 357—72 17 Claims



1. An adhesive formulation suitable for attaching a semiconductor device to a substrate comprising 10 to 40 wt.% cyanate ester vehicle and 60 to 90 wt.% of thermally and/or electrically conductive filler,

said cyanate ester vehicle comprising liquid cyanate ester having a viscosity of about 1 to 5 poise at 25° C., about 2 to 6 pph alkylphenol and about 50 to 500 ppm of metal catalyst,

said filler comprising particulate material of less than 70 microns; and

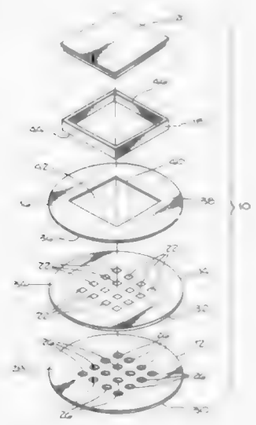
said adhesive having the capability of being cured in about 5 minutes at 200° C.

5,150,196

HERMETIC SEALING OF WAFER SCALE INTEGRATED WAFER

Klo Yamamoto, Los Angeles, and Stewart O. Fong, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 17, 1989, Ser. No. 380,948
Int. Cl.[5] H01L 23/32
U.S. Cl. 357—74 14 Claims



1. A hermetically sealed integrated wafer comprising:

a wafer having a top surface, a bottom surface and a centrally located integrated circuit zone adapted to receive multiple integrated circuits;

a support layer having a top surface and a bottom surface, said top surface being sealingly bonded to said wafer bottom surface and wherein said support layer includes openings to provide electrical access through said support layer to each said integrated circuit in said integrated circuit zone;

an expansion buffering layer having a top surface and a bottom surface, said bottom surface being sealingly bonded to said wafer top surface, said expansion buffering layer including a centrally located perimeter defining an integrated circuit opening through which integrated circuits located in said integrated circuit zone may be exposed;

a sealing ring housing surrounding said centrally located perimeter, said sealing ring housing having a bottom surface sealingly bonded to said top surface of said expansion buffering layer to thereby provide hermetic sealing of the integrated circuit zone, wherein said expansion buffering layer provides thermal buffering of expansion between said sealing ring housing and said wafer; and

a covering plate sealingly bonded to said top surface of said sealing ring.

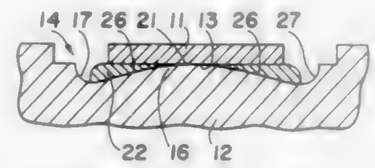
5,150,197

DIE ATTACH STRUCTURE AND METHOD

William R. Hamburgen, Menlo Park, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 417,730, Oct. 5, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 628,944
Int. Cl.[5] H01L 39/02, 23/02
U.S. Cl. 357—80 10 Claims

1. In a semiconductor device: a substrate having a die attach area with a mounting surface, a semiconductor die having a surface facing the mounting surface, one of said surfaces being contoured in such manner that a central portion of the die is closer to the substrate than an edge portion, a first die attach material filling the region between the central portion of the die and the substrate and providing good heat transfer between the central portion of the die and the substrate, and a second die attach material comprising a different material than the first



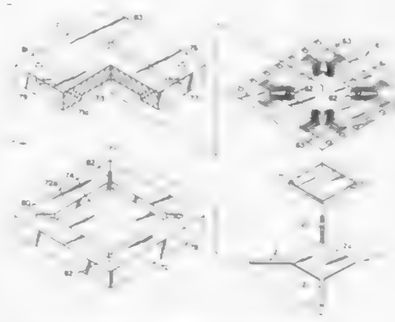
die attach material filling the region between the edge portion of the die and the substrate and bonding the edge portion to the substrate.

5,150,198

RADIATOR FOR SEMICONDUCTOR CHIP

Naoharu Ohikata; Toshio Yamamoto, and Masashi Konda, all of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,520
Claims priority, application Japan, Mar. 15, 1990, 2-65290
Int. Cl.[5] H01L 23/02
U.S. Cl. 357—81 25 Claims



4. A semiconductor package comprising:

a plastic encapsulation in which a semiconductor chip and a radiator attached to said semiconductor chip are sealed within plastic,

said radiator including a plate element formed from a heat conductive material,

said radiator further comprising at least one projecting portion extending outwardly from an outer periphery of said plate element so as to extend outwardly, laterally beyond an outer periphery of the semiconductor chip, and

said projecting portion being located at a position to avoid outer leads of said semiconductor chip and exposed beyond said plastic encapsulation.

5,150,199

METHOD FOR CORRELATING COLOR MEASURING SCALES

Martin L. Shoemaker, Hopkins; Dana N. Hughes, Wyoming, and Steven L. Kuchta, Comstock Park, all of Mich., assignors to Megatronics, Inc., Grand Rapids, Mich.

Filed Jan. 2, 1990, Ser. No. 459,542
Int. Cl.[5] H04N 9/64
U.S. Cl. 358—21 R 16 Claims

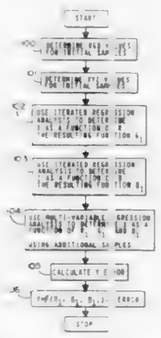
1. A method of generating tristimulus XYZ values from an image, comprising the steps of:

generating initial RGB values from initial color samples

using a video camera, said initial colors having known tristimulus XYZ values;

using regression analysis on said RGB values and said known XYZ values to generate an initial function R_1 which represents an initial estimate of X as a function of R, an initial function G_1 which represents an initial estimate of Y as a function of G, and an initial function B_1 which represents an initial estimate of Z as a functions of B;

generating additional RGB values from additional color



samples using said video camera, said additionally colors having known tristimulus values;

using regression analysis to generate an X_{est} function as a function of said R_1, G_1, and B_1 functions, and a Z_{est} function as a function of said B_1 function based on said additional RGB values and said additional XYZ values;

generating image RGB values from said image using said video camera, and outputting XYZ values for said image corresponding to said image RGB values by using said R_1, G_1, Z_1, X_{est}, and Z_{est} functions.

5,150,200

PICTURE STILL CIRCUIT FOR TV RECEIVER HAVING SYNCHRONOUS SIGNAL DETECTION

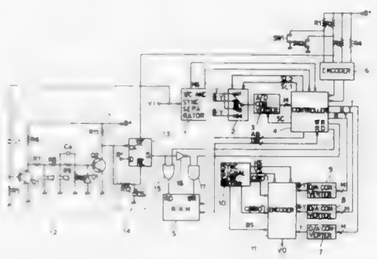
Sam P. Hong, Kyungsangbook, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 14, 1990, Ser. No. 627,259

Claims priority, application Rep. of Korea, Dec. 15, 1989, 18653/1989

Int. Cl.[5] H04N 9/74

U.S. Cl. 358—22 **6 Claims**



1. In a still picture circuit for a television receiver comprising:

a luminance/color difference and synchronous signal separator for separating video signals inputted from a video camera into a synchronizing signal, a luminance signal and color difference signals;

analog switching means for sequentially selecting said luminance signal and color difference signals;

an analog/digital converter for converting the output signal of said analog switching means to a digital signal;

a picture holding switch and a refresh switch, and an encoder for encoding the states of said holding switch and refresh switch;

a controller connected to receive the output signal of said encoder for receiving the output signal of said analog/-digital convertor and applying it to a RAM, said RAM having a read state ad a write state;

digital/analog converters for converting luminance signal and color difference signal output from said controller; and

an encoder connected to synthesize the output signals of said digital/analog converters with the output signal of a synchronizing signal digital generator; the improvement comprising:

synchronizing voltage detecting means connected to detect the synchronizing signal of the video signal input from said video camera into a voltage;

an integrator for integrating the output signal of said synchronizing voltage detecting means;

a flip flop connected to receive the output signal of said synchronizing voltage detecting means and the output signal of said integrator as a clock signal and reset signal, respectively, for thereby generating read control and write control signals, respectively in response to the presence of absence of input of said video signal; and

gates connected to set said RAM to its write and read state with said write control signal and read control signal of said flipflop, respectively, or regardless of the write control signal and read control signal, setting said RAM forcibly to its read state.

5,150,201

DIGITAL TELEVISION-SIGNAL-PROCESSING CIRCUIT WITH ORTHOGONAL OUTPUT CLOCK

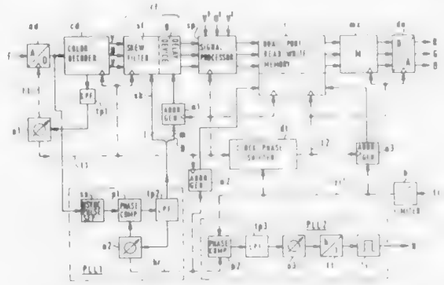
Soenke Mehrgardt, March, and Hans-Juergen Desor, Gundelfingen, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,063

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011241

Int. Cl.[5] H04N 5/04, 9/89, 5/95

U.S. Cl. 358—23 **12 Claims**



1. A digital television-signal-processing circuit that processes a composite color signal sampled by a first clock signal, said circuit comprising:

a first phase-locked loop that receives said sampled composite color signal, said first phase-locked loop generating a horizontal reference clock and generating a filtered phase-difference value, said filtered phase-difference value comprising a plurality of low-order bits forming a skew value and a plurality of high-order bits forming an integral multiple N of the sampling period;

a second phase-locked loop that receives said horizontal reference clock generated by the first phase-locked loop and that receives a flyback signal responsive to a flyback pulse, said second phase-locked loop comprising a frequency and phase control system having a locked oscillator, said second phase-locked loop generating a horizontal pulse having a phase responsive to the temporal position of the flyback signal;

a color decoder that receives said sampled composite color signal and that generates luminance-signal values and color-signal values;

an orthogonal filter comprising:

a skew filter that receives said luminance-signal values and said color-signal values and that generates phase-corrected output values in response to said skew value;

an adjustable delay device that selectively delays said phase-corrected output values; and

a control device that receives said integral multiple N and that adjusts the delay of said adjustable delay device;

a dual-port read/write memory having a write-address input and a read-address input, and having a write clock and a read clock, said write clock being said first clock signal, said dual-port read/write memory receiving and storing said phase-corrected output values;

a write-address generator that provides write addresses to said write address input of said dual-port read/write memory, said write-address generator providing a start address in response to said horizontal reference clock;

a read-address generator that provides read addresses to said read-address input of said dual-port read/write memory, said read-address generator providing a start address in response to said flyback signal; and

a clock-phase shifter that receives said first clock signal and that generates a second clock signal that is provided to said read clock input of said dual-port read/write memory, said clock-phase shifter further receiving said flyback signal and synchronizing said second clock signal with said flyback pulse so that data stored in said dual-port read/write memory is read out in synchronism with said flyback pulse.

5,150,202

SEPARABLE DIAMOND SHAPED MULTIDIMENSIONAL FILTERS FOR COMPOSITE VIDEO ENCODING/DECODING APPLICATIONS

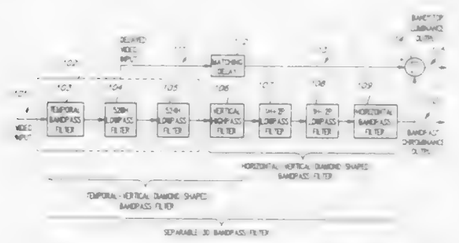
Chon T. Ledinh, Brossard, and Huu L. Huynh, Montreal, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Sainte-Foy, Canada

Continuation-in-part of Ser. No. 543,409, Jun. 26, 1990. This application Oct. 15, 1990, Ser. No. 597,346

Claims priority, application Canada, Apr. 27, 1990, 2015587

Int. Cl.[5] H04N 9/78

U.S. Cl. 358—31 **49 Claims**



1. A diamond shaped multidimensional filter circuit for decoding NTSC composite video signals, said diamond shaped filter circuit comprising a series configuration of separable filters connected at an input to said composite video signals, a matching delay circuit connected to said input and providing a delayed output signal matching the delay of the resulting signal of said series of configuration separable filters, said series configuration of separable filters producing a chrominance signal at an output thereof, and adder circuit having a positive and negative input, said negative input being connected to said chrominance output to receive said chrominance signal, said delayed output signal being connected to said positive output, said adder yielding a bandstop luminance signal at an output thereof, said series configuration of separable filters comprising a series combination of separable filters to produce a horizontal-vertical diamond shaped bandpass filter, said series configuration of separable filters producing a bandpass chrominance output signal

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5,150,203

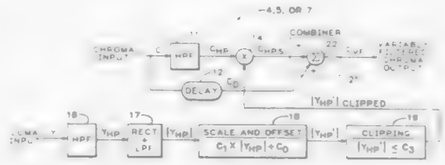
VARIABLE CHROMINANCE FILTERING FOR ENCODING TELEVISION SIGNALS

Jon A. Fairhurst, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Dec. 26, 1990, Ser. No. 633,821

Int. Cl.[5] H04N 9/78, 11/14

U.S. Cl. 358—40 **26 Claims**



1. A method for filtering a chrominance signal comprising the steps of:

generating a chrominance detail signal from the chrominance signal;

delaying a chrominance signal to produce a delayed chrominance signal;

limiting the chrominance detail signal according to a luminance detail signal to produce a limited chrominance detail signal; and

combining the limited chrominance detail signal with the delayed chrominance signal to produce a variably filtered chrominance signal.

5,150,204

SOLID STATE IMAGE PICKUP HAVING PLURAL PIXELS ARRANGED ON PLURAL LINES

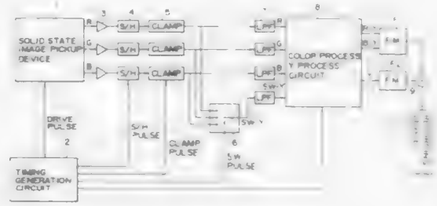
Yasuyuki Yamazaki, Ohmiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,547

Claims priority, application Japan, Apr. 27, 1988, 63-102411; Apr. 27, 1988, 63-102413

Int. Cl.[5] H04N 9/077

U.S. Cl. 358—44 **19 Claims**



1. An image pickup apparatus comprising:

a solid state image pickup device having a plurality of pixels disposed on plural lines;

means for reading two lines of said pickup device at a first frequency, having a first on-period, to simultaneously

output different color signals onto three output channels at the first frequency wherein; and

switching means for generating switching pulses for dot-sequentializing the different color signals simultaneously outputted to said three output channels to obtain a luminance signal, the switching pulses having a second frequency of 1.5 times the first frequency.

5,150,205

ACTUATED MIRROR OPTICAL INTENSITY MODULATION

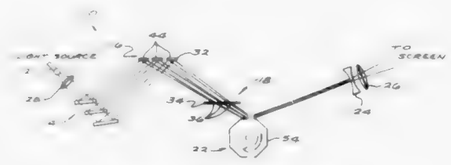
Gregory Um, Torrance, and Andre Szilagyi, Brentwood, both of Calif., assignors to Aura Systems, Inc., Los Angeles, Calif.

Filed Nov. 1, 1989, Ser. No. 429,987

The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.

Int. Cl.[5] H04N 9/31, 5/74

U.S. Cl. 358—60 46 Claims



1. A television display apparatus comprising:

a source for emitting a white light;

means for splitting said white light into a plurality of primary light beams, each of said primary light beams being one of the primary colors;

means for spreading each of said primary light beams into a bell-shaped beam;

means for clipping the profile of each of said bell-shaped beams into a clipped beam;

means for horizontally scanning each of said clipped beams simultaneously;

means for collimating said scanned light into a collimated beam; and

means for projecting said collimated beam onto a screen.

5,150,206

VIDEO DISPLAY SYSTEM USING AN IMPROVED COLOR SIGNAL TECHNIQUE

Alan Roberts, Coulsdon, United Kingdom, assignor to British Broadcasting Corporation, London, England

Filed Jan. 22, 1991, Ser. No. 643,753

Claims priority, application United Kingdom, Jan. 22, 1990, 9001429

Int. Cl.[5] H04N 9/67

U.S. Cl. 358—30 15 Claims

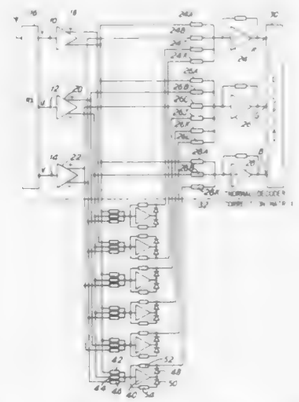
1. Video display apparatus comprising:

inputs for receiving input signals comprising a luminance input signal and two chrominance input signals;

a display device for displaying an image derived from the input signals and adapted to receive three colour component signals;

decoding matrix means coupled between the inputs and the display device to provide a linear transformation between the input signals and the three colour component signals; and

correction matrix means coupled to receive the input signals and providing outputs to the decoding matrix means to modify the output thereof, the correction matrix means comprising a plurality of matrix sections, there being at least one section for each colour component signal and at least two sections for at least one of the colour component signals, each matrix section being operative over only a



portion of a permissible colour range and being inoperative over the rest of the permissible colour range.

5,150,207

VIDEO SIGNAL TRANSMITTING SYSTEM

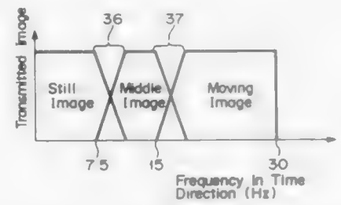
Ikuo Someya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 695,712

Claims priority, application Japan, Feb. 20, 1990, 2-039526

Int. Cl.[5] H04N 7/12, 7/04

U.S. Cl. 358—133 7 Claims



1. An image signal transmitting system comprising:

input means for providing said image signal;

first field offset sub-sampling means coupled to said input means for processing a first image signal as a still image, said first image signal being in a relatively lower region of temporal motion frequency in a frequency band;

frame/line offset sub-sampling means coupled to said first field offset sub-sampling means for processing the first image signal processed by said first field offset sub-sampling means;

line offset sub-sampling means coupled to said input means for processing a second image signal as a moving image, said second image signal being in a relatively higher region of temporal motion frequency in the frequency band; and

second field offset sub-sampling means coupled to said input means for processing a third image signal, said third image signal being in a middle region of temporal motion frequency between said lower temporal frequency region and said higher temporal frequency region in the frequency band;

wherein said third image signal is sub-sampled substantially only by said second field offset sub-sampling means, and each of said sub-sampling means has the same sampling points for said first, second and third image signals.

5,150,208

ENCODING APPARATUS

Hideki Otaka, Neyagawa; Masakazu Nishino, Kashiwara, and Tatsuro Juri, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 16, 1991, Ser. No. 777,015

Claims priority, application Japan, Oct. 19, 1990, 2-282121; Nov. 13, 1990, 2-307388

Int. Cl.[5] H04N 2/133

U.S. Cl. 358—133 10 Claims

1. An encoding apparatus comprising:

blocking means for collecting sampled values of an input signal to obtain blocks of sampled values;

orthogonal transformation means for orthogonally transforming sampled values of each block to obtain orthogonal components;

detection means for detecting amplitudes of components excepting a direct-current component out of the orthogonal components obtained by said orthogonal transformation means;

first quantization means for quantizing said orthogonal components only when an amplitude detected by said detection means exceeds a predetermined value;

second quantization means for quantizing data obtained by said first quantization means in accordance with the amplitudes detected by said detection means; and encoder means for encoding data obtained by said second quantization means.

5,150,209

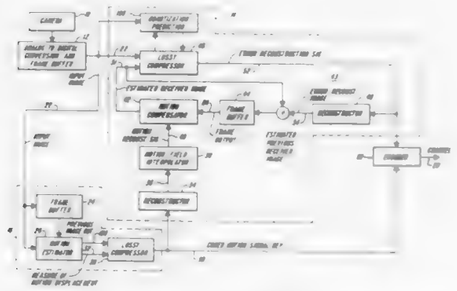
HIERARCHICAL ENTROPY CODED LATTICE THRESHOLD QUANTIZATION ENCODING METHOD AND APPARATUS FOR IMAGE AND VIDEO COMPRESSION

Richard L. Baker, Belmont; Jeffrey Bernstein, Marblehead; Bernd Girod, Boston; Xiancheng Yuan, Bedford, and Edmund Thompson, Burlington, all of Mass., assignors to PictureTel Corporation, Peabody, Mass.

Continuation of Ser. No. 522,602, May 11, 1990. This application May 10, 1991, Ser. No. 698,396

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—133 58 Claims



1. A method for encoding interframe error data, in an image transmission system, for transmitting a sequence of image frames, said method comprising the steps of

decimating an interframe predicted image data for a current image frame for generating a prediction pyramid data structure having a plurality of decimation levels,

decimating an uncoded current image data representing the uncoded current image frame for generating a current image pyramid data structure having said plurality of decimation levels, and

applying hierarchical entropy coded, lattice threshold quantization encoding to said prediction and current image pyramid data structures on a selected level by level basis for generating an encoded data representation of the difference between the predicted image data and the uncoded current image data.

5,150,210

IMAGE SIGNAL RESTORING APPARATUS

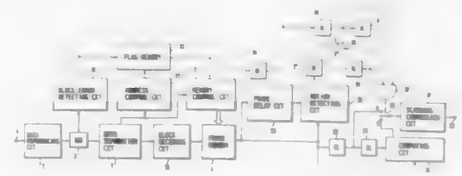
Hidenori Hoshi; Keiichi Fukuzawa, and Yoshiki Ishii, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 759,867, Sep. 16, 1991, abandoned, which is a continuation of Ser. No. 454,168, Dec. 21, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 801,625

Claims priority, application Japan, Dec. 26, 1988, 63-326288; Dec. 26, 1988, 63-326290

Int. Cl.[5] H04N 7/12, 7/18

U.S. Cl. 358—135 8 Claims



1. An image signal restoring apparatus for restoring an original image signal from a transmitted image information signal, comprising:

a) judgment means, to which an image information signal formed by dividing one picture amount of image signal composed of a plurality of picture element signals into a plurality of blocks each composed of a plurality of picture element signals and by block coding, for every block, the plurality of picture element signals constituting a respective one of the plurality of blocks is inputted for every block, for judging whether the picture element signals in each block are restorable or not on the basis of the inputted image information signal;

b) motion detecting means for detecting presence or absence of motion in an image represented by the picture element signals of a block in which the picture element signals have been judged to be restorable by said judgment means; and

c) interpolation means for selecting either the picture element signals of a block belonging to the same picture as that of the block in which the picture element signals have been judged to be not restorable by said judgment means or the picture element signals of a block belonging to a picture different from that of the block in which the picture element signals have been judged to be not restorable, according to a result of detection made by said motion detecting means, and for outputting the selected picture element signals as interpolation picture element signals.

5,150,211

METHOD AND SYSTEM FOR MULTIPLEXING AUDIO AND VIDEO SIGNALS TO DISTRIBUTE STILL PICTURES WITH ACCOMPANYING SOUND

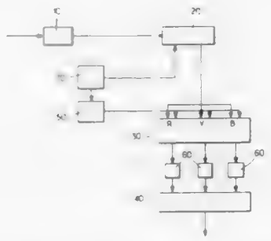
Pierre Charbonnel, Betton, and Bernard Thepaut, Pace, both of France, assignors to L'Etat Francais represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications-CNET), Issy-Les-Moulineaux and Telediffusion de France, Paris, both of, France

Filed Aug. 28, 1990, Ser. No. 573,409

Claims priority, application France, Sep. 5, 1989, 89 11591

Int. Cl.[5] H04N 7/08

U.S. Cl. 358—143 **7 Claims**



1. A method of multiplexing an analog audio signal in an analog video signal having an amplitude dynamic range, with the audio signal being multiplexed in an active portion of the video signal corresponding to a video picture, the method comprising the steps of:

digitizing and utilizing data rate compression techniques of said audio signal in order to obtain a sequence of digital code words;

storing temporarily said sequence of digital code words in a buffer;

extracting digital code subwords sequentially from said buffer at a frequency related to a line frequency of said video signal, each said subword comprising a number of bits which is predetermined as a function of said amplitude dynamic range of said video signal;

converting each of said subwords which are extracted into analog form so as to provide analog samples having amplitude levels proportional to quantizing of corresponding digital code subwords; and

subjecting said active portion of said video signal to amplitude modulation by said analog samples so as to provide a composite signal having a same format as said video signal.

5,150,212

CONTROL SYSTEM FOR RECORDING AND REPRODUCING A PLURALITY OF VIDEO SIGNALS

Hyeong-deok Han, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi Rep. of Korea

Filed Dec. 31, 1990, Ser. No. 634,356

Claims priority, application Rep. of Korea, Dec. 31, 1989, 19720/89

Int. Cl.[5] H04N 7/04, 7/18

U.S. Cl. 358—147 **6 Claims**

1. A control system for controlling recording of video signals and for controlling reproduction of the recorded video signals, the control system comprising:

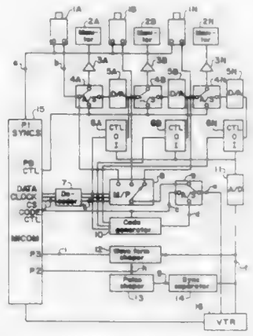
mixing means for processing at least first and second video signals outputted from at least first and second video cameras respectively and for transmitting the processed signals to a video recording/playing apparatus, which then records the processed signals;

separating means for receiving the recorded signals from the video recording/playing apparatus and extracting and isolating from the recorded signals said at least first and second video signals and transmitting the isolated signals to corresponding first and second video monitors;

a microcomputer responsive to signals from said mixing means and said separating means for generating timing signals to various elements within said mixing means and said separating means; and

a decoder for generating decoding signals in response to at least some of said timing signals from said microcomputer, wherein said mixing means comprises:

a multiplexer for multiplexing the video signals output from said video cameras in response to said decoding signals;



a code generator for receiving at least some of said timing signals from said microcomputer and said decoding signals and generating an output address signal; and

an analog switch responsive to said at least some of said timing signals output from said microcomputer for selectively switching control between the generated output address signal from said code generator and the multiplexed video signals from said multiplexer, and for transmitting the selectively switched signals to said video recording/playing apparatus.

5,150,213

VIDEO SIGNAL PROCESSING SYSTEMS

Paul R. N. Kellar, and Brian R. G. Nonweiler, both of Newbury, United Kingdom, assignors to Quantel Limited, United Kingdom

Continuation of Ser. No. 580,370, Sep. 6, 1990, abandoned, which is a continuation of Ser. No. 163,184, Feb. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 713,028, Mar. 18, 1985, abandoned. This application Jun. 28, 1991, Ser. No. 725,393

Claims priority, application United Kingdom, Apr. 19, 1984, 8410181

Int. Cl.[5] H04N 5/14

U.S. Cl. 358—160 **30 Claims**

1. A video signal processing system comprising:

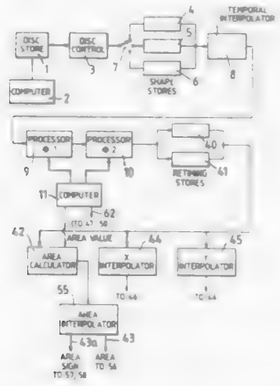
frame store means for storing picture point signals at respective addressable storage locations;

input means for providing sequences of picture point signals defining successive pictures;

shape store means for providing address signals representing predetermined addresses in said frame store means for respective picture point signals in a sequence of said picture point signals defining one of said pictures, said predetermined addresses defining a desired transformation in the shape of the picture;

circuit means for manipulating said address signals provided by the shape store means to produce manipulated address signals defining a change in the transformation of the shape defined by said address signals;

means for writing the respective picture point signals provided by said input means in locations of said frame store means determined by said manipulated address signals produced by said circuit means to thereby rearrange said picture point signals in a rearranged sequence as compared with the sequence as provided by said input means; and



reading means for reading said picture point signals from said frame store means in the rearranged sequence, said rearranged sequence producing a change in picture shape.

5,150,214

METHOD AND CIRCUIT FOR CORRECTION OF HORIZONTAL EDGES

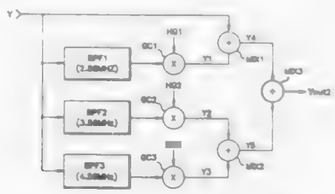
Yun-Bok Shin, and Joung-Sang Lee, both of Suwon, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Continuation of Ser. No. 559,262, Jul. 27, 1990, abandoned. This application Sep. 25, 1991, Ser. No. 764,968

Claims priority, application Rep. of Korea, Jul. 29, 1989, 1989-10792

Int. Cl.[5] H04N 5/208

U.S. Cl. 358—166 **21 Claims**



10. A circuit for correcting horizontal edges in a digital image signal processing system, comprising:

first means for filtering an input luminance signal to produce a low frequency component signal, a medium frequency component signal and a high frequency component signal;

second means for receiving said low frequency component signal, medium frequency component signal and high frequency component signal, and for controlling a gain of each of said low frequency component signal, medium frequency component signal and high frequency component signal in response to corresponding, respectively received, gain control signals; and

third means for mixing said input luminance signal and said gain controlled low frequency component signal, medium frequency component signal and high frequency component signal to produce a mixed output luminance signal.

5,150,215

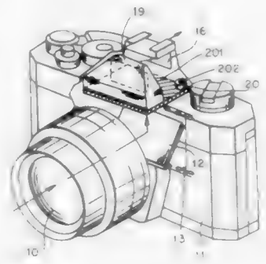
SINGLE LENS REFLEX CAMERA HAVING FILM AND STILL VIDEO FUNCTIONS

Zhimin Shi, 25-17 39th Ave., Long Island City, N.Y. 11101

Filed Mar. 14, 1991, Ser. No. 669,875

Int. Cl.[5] H04N 5/30, 5/225

U.S. Cl. 358—209 **11 Claims**



1. A single lens reflex camera having film and still video functions, said camera comprising a camera casing; an objective lens; a film back for loading film; a reflex mirror capable of taking a first position reflecting light through the lens to a focusing screen plane and a second position; an electronic view finder unit mounted on the top of the casing; and a still video image capturing unit mounted on the top of the casing; and a still video image capturing unit provided at the focusing screen plane of the view finder, said image capturing unit picking up the light passing through the objective lens and reflected by the reflex mirror and converting the light into electric signals for the electronic view finder and for outputting still video images captured thereon; means for controlling the camera operated in three modes including a still video mode with the reflex mirror remaining in the first position for capturing the still video images, a film mode with the reflex mirror taking the second position for exposing the film and then returning to the first position, and a dual mode with the reflex mirror being respectively in the first position and the second position for producing both the still video and film images; and a releasing button programmed to selectively operate the camera in accordance with one of the three modes.

5,150,216

SOLID-STATE IMAGE SENSING DEVICE HAVING AN OPTIMUM OVERFLOW DRAIN VOLTAGE GENERATION CIRCUIT

Yoshihiko Tokitou, Yokohama, and Atsushi Houjo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 12, 1991, Ser. No. 684,566

Claims priority, application Japan, Apr. 13, 1990, 2-97887

Int. Cl.[5] H04N 5/335

U.S. Cl. 358—213.11 **3 Claims**

1. A solid-state image sensing device, comprising:

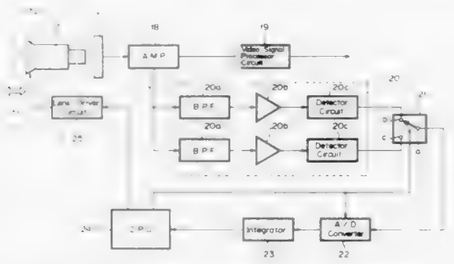
photoelectric transducing means for generating electric changes in response to incident light intensity;
charge transferring means for accumulating and transferring electric charges generated by said photoelectric transducing means;
an overflow drain to drain excessive charge; and
voltage generating means, responsive to a voltage selecting signal provided externally and connected to said overflow drain, for generating an adaptive overflow drain voltage to be applied to said overflow drain, said adaptive overflow drain voltage causing maximum blooming suppression, said voltage generating means including a voltage divider circuit having a plurality of resistors connected in series between voltage supply terminals.

5,150,217

METHOD AND APPARATUS FOR AUTOFOCUS CONTROL USING LARGE AND SMALL IMAGE CONTRAST DATA

Satoko Senuma, and Masaaki Tsuruta, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 662,458
Claims priority, application Japan, Mar. 6, 1990, 2-54420
Int. Cl.[5] H04N *5/232*
U.S. Cl. 358—227 **6 Claims**



1. A device for automatic focusing control, comprising:
a movable focusing lens;
imaging means for producing a video signal based on light from a subject transmitted through said movable focusing lens;
means for producing contrast data from the video signal of a small image frame located within a large image frame and of the large image frame in a field on said imaging means; and
control means for controlling said movable focusing lens in response to the produced contrast data including means for obtaining contrast data from the small image frame when the contrast data from the large image frame are maximum, and means for controlling the movable focusing lens to maximize the contrast data from the small image frame.

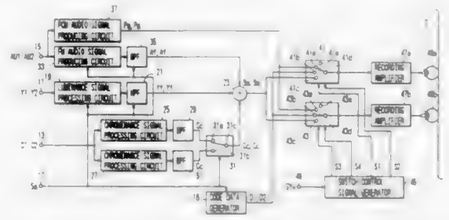
5,150,218

VIDEO TAPE RECORDER WITH RECORDING OF A CODE TO IDENTIFY PICTURE ASPECT RATIO

Tadashi Ezaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 753,423
Claims priority, application Japan, Sep. 20, 1990, 2-250696
Int. Cl.[5] H04N *5/78*
U.S. Cl. 358—310 **7 Claims**

1. An apparatus for recording video and audio signals, the apparatus comprising:
input means for receiving either a first input video signal that represents a picture having a first aspect ratio and a first input audio signal associated with said first input video signal or a second input video signal that represents a picture having a second aspect ratio and a second input audio signal associated with said second input video signal, and for receiving an aspect ratio indicating signal which indicates whether said first video and audio input signal or said second video and audio input signals are being received;
recording video signal producing means connected to said input means for processing the received input video signal and for generating selectively, under control of said received aspect ratio indicating signal, either a first recording video signal based on said first input video signal when the latter is received or a second recording video signal based on said second input video signal when said second input video signal is received,
digital audio signal producing means connected to said input means for processing the received input audio signal and for generating a digital audio signal based on said received first or second audio signal,



code data reproducing means connected to said input means for generating, in accordance with said received aspect ratio indicating signal, code data indicating whether said first recording video signal or said second recording video signal is being generated by the recording video signal producing means,
magnetic head means operative to scan a magnetic recording medium for forming a plurality of record tracks arranged successively on the magnetic recording medium, and
signal supply means connected to said recording video signal producing means, said digital signal producing means and said code data producing means for supplying the magnetic head means with said first or second recording video signal, said digital audio signal and said code data in such a manner that a unit period segment of said first or second recording video signal, a segment of said digital audio signal corresponding to said unit period segment and said code data are recorded in respective different portions of each of said record tracks.

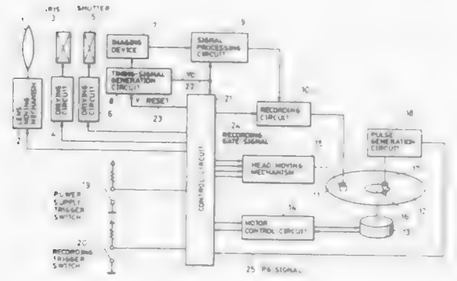
5,150,219

ELECTRONIC CAMERA WHEREIN THE NONRECORDING HEAD MOVING PERIOD IS A MULTIPLE OF THE VERTICAL SYNCHRONIZING PERIOD

Nobuo Fukushima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1989, Ser. No. 425,606
Claims priority, application Japan, Oct. 31, 1988, 63-276868
Int. Cl.[5] H04N *5/76, 5/225*
U.S. Cl. 358—335 **23 Claims**

1. An electronic camera for recording an image of an object on a recording medium by using a moving head and an imaging device, said camera comprising:
electronic pulse generation means for electronically outputting a signal to cause a signal stored in the imaging device to be read out to the moving head in a first time period;
head moving means for moving said head relative to the medium; and
control means, coupled to said electronic pulse generating means and to said head moving means, for controlling said head moving means so that a time required for moving the head to a subsequent track after recording is within a second time period equal to n times (where n is an integer) a vertical synchronizing period of a video synchronizing signal, said control means causing an exposure time for obtaining an image signal for a next frame to overlap with said second time period.

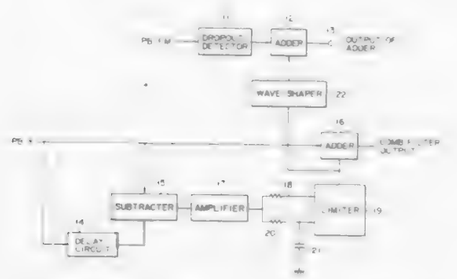


5,150,220

VIDEO SIGNAL-PROCESSING CIRCUIT FOR OUTPUTTING A DROP OUT SIGNAL SUPERIMPOSED ON A CORRELATION/NONCORRELATION SIGNAL

Hideyuki Hagino, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 14, 1990, Ser. No. 582,079
Claims priority, application Japan, Sep. 19, 1989, 1-240759
Int. Cl.[5] H04N *5/94, 9/88*
U.S. Cl. 358—336 **3 Claims**



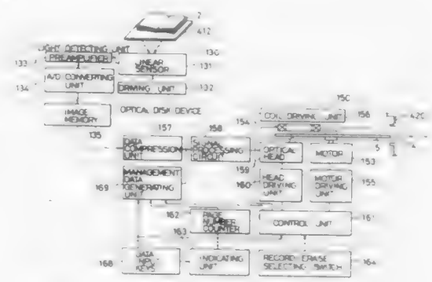
1. A video signal-processing semiconductor integrated circuit, comprising:
dropout signal-generating means, supplied with a frequency-modulated video reproduction signal, for generating a dropout signal when the video reproduction signal has an amplitude level lower than a predetermined value;
delay means for delaying a luminance signal, obtained by demodulating the video reproduction signal, by one horizontal period;
subtraction means for obtaining a difference component between the luminance signal delayed by the delay means and the luminance signal not delayed by the delay means;
noncorrelation/correlation signal-generating means for outputting a signal having a first level if the difference component obtained by the subtraction means is larger than a predetermined level and for outputting a signal having a second level different from said first level if the difference component is smaller than said predetermined level;
adder means for adding the dropout signal and the noncorrelation/correlation signal generated by the noncorrelation/correlation signal generating means together and generating a signal obtained by the addition; and
one output terminal for outputting the signal generated by the adder means to an external region.

5,150,221

SIMPLE ELECTRONIC FILE SYSTEM

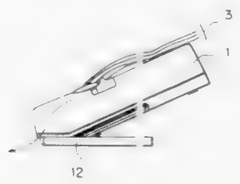
Yasuji Shima, Yokohama, Japan, assignor to Tosoh Corporation, Shinnanyo, Japan

PCT No. PCT/JP89/00673, § 371 Date Feb. 28, 1990, § 102(e) Date Feb. 28, 1990, PCT Pub. No. WO90/00779, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 5, 1989, Ser. No. 465,195
Claims priority, application Japan, Jul. 7, 1988, 63-169524; Jul. 7, 1988, 63-169525; Jul. 9, 1988, 63-170036; Jul. 13, 1988, 63-174076; Aug. 29, 1988, 63-214343
Int. Cl.[5] G06K *3/14*; H04N *1/21*
U.S. Cl. 358—403 **9 Claims**



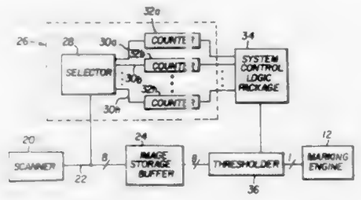
1. A simple electronic file system comprising:
a copying machine with an optical disk device having a light detecting unit for converting an optical image of a document into digital image information; an image storing unit for storing the digital image information converted from the light detecting unit; a printer unit for printing the digital image information on paper; an optical disk unit for recording the digital image information in an optical disk contained in a replaceable optical disk cartridge in units of pages, wherein the optical disk unit of the copying machine with an optical disk device erases the information recorded in the optical disk; and a selection unit for selecting whether the digital image information will be printed by the printer unit or not, and whether the digital image information will be recorded by the optical disk unit or not; and
a reproduction only optical disk device having a selection unit for selecting one of the pages recorded in the optical disk in the optical disk cartridge to be reproduced; an optical disk unit for reading the digital image information of the page selected by the selection unit; an image storing unit for storing the digital image information read by the optical disk unit; and a flat display unit for displaying the image information stored in the image storing unit,
the copying machine with the optical disk device recording in the optical disk the image information of the document in units of pages, and the reproduction only optical disk device reproducing the image information recorded in the optical disk in units of pages.

5,150,222
FACISIMILE APPARATUS W TH IMPROVED HANDLE CONFIGUI ATION
Norio Nakayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1990, Ser. No. 500,338
Claims priority, application Japan, Apr. 7, 1989, 1-40456[U]
Int. Cl.[5] H04N *1/00;* A47B *95/02*
U.S. Cl. 358—400 2 Claims



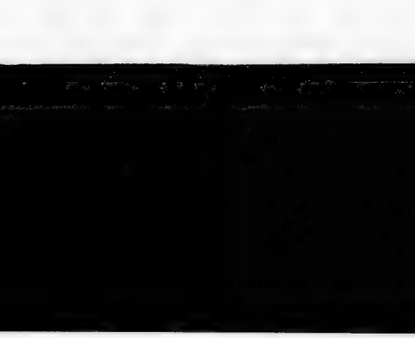
1. A facsimile apparatus comprising:
(a) a handle;
(b) a handle fitting recess in which said handle is retractable into said facsimile body such that said handle will not protrude out of said facsimile body, said handle being slidable along said handle fitting recess away from said facsimile body;
(c) said handle fitting recess formed in either side or both sides of a bottom of said facsimile body, said handle fitting recess having at least a first recess portion and a second recess portion wherein said first recess portion is at an angle with respect to said second recess portion;
(d) a guide groove formed in said handle fitting recess and provided with a handle retaining disc for slidably and rotatably locking said handle to said facsimile body; and
(e) means comprising at least said handle and said handle fitting recess for supporting said facsimile body in an inclined position.

5,150,223
COPIER WITH SINGLE PASS AUTO EXPOSURE
Lawrence B. Telle, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 30, 1989 Ser. No. 443,543
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 8 Claims



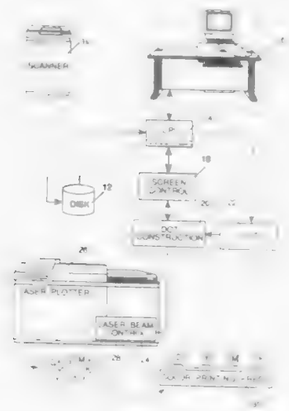
1. An electronic copier for reproducing original documents from electrical signals representative of an image content of the documents; said copier comprising:
image forming means for forming a copy based on a supplied series of electrical signals;
data monitoring means for determining a characteristic of the original document from a series of electrical signals representative of the image content of substantially the entire document;
image processing means for processing electrical signals representative of the image content of the documents on the basis of the characteristic of the original document determined by said data monitoring means to improve the quality of the reproduction, and for applying the processed electrical signals to said image forming means;
memory means for storing a series of electrical signals representative of the image content of a document, and for applying the stored electrical signals to said image processing means;
scanning means for generating, during a single scan of a document, a series of electrical signals representative of the image content of the documents and for applying the scanned signals to said data monitoring means and said memory means; and
means for retrieving the stored series of electrical signals from said memory means and for applying the stored series of electrical signals to said image processing means.

5,150,224
IMAGE FORMING APPARATUS WITH SELECTABLE AUTOMATIC DOCUMENT SIZE OR COPY PAPER SIZE PRIORITY MODES
Kazuhiro Mizude, Osaka; Hirofumi Matsuda, Ibaragi; Haruo Yamamoto, Osaka, and Eiichi Tone, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Sep. 5, 1991, Ser. No. 755,392
Claims priority, application Japan, Sep. 26, 1990, 2-258172
Int. Cl.[5] H04N *1/393;* G03G *15/04*
U.S. Cl. 358—449 4 Claims



1. An image forming apparatus comprising:
document holder means for holding a document;
document size detection means for detecting the size of the document;
copy paper feeder means carrying a plurality of copy paper sheets having different sizes for feeding a copy paper sheet;
copying means for copying an image of the document onto the fed copy paper sheet, the copying means including a copy magnification changer;
copy paper size selection means for selecting a desired copy paper size from the plurality of copy paper sizes;
all-clear means for clearing a previously set copy condition and setting an automatic document size priority mode; and
control means for controlling the copy paper feeder means and the copy magnification changer to clear a previously set copy condition and execute the automatic document size priority mode in response to actuation of the all-clear means, and to execute an automatic copy paper size priority mode when the copy paper size selection means is actuated, said control means comprising means, in said automatic document size priority mode, to control said copy paper feeder to select a copy paper size independently of document size detection means and to control the copy magnification changer to copy the document image onto the selected copy paper sheet corresponding to the document size at a life size magnification, said control means further comprising means, in the automatic copy paper size priority mode, to control said copy paper feeder to select a copy paper size in dependence upon the document size detection means and to control the copy magnification changer to copy the document image onto the selected copy paper sheet with a copy magnification that is dependent upon the document size detection means.

5,150,225
APPARATUS FOR GENERATING A SCREENED REPRODUCTION OF AN IMAGE
Haim Kreitman, Kefar-Sava, Israel, assignor to Scitex Corporation Ltd., Herzlia, Israel
Filed May 18, 1990, Ser. No. 524,922
Int. Cl.[5] H04N *1/21*
U.S. Cl. 358—456 19 Claims

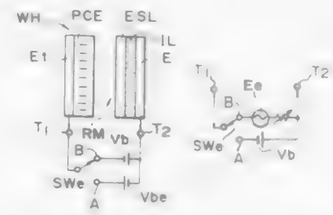


1. A technique for generating a screened reproduction of an image comprising the steps of:
providing a representation of an original having input density values of the original at various locations thereon;
storing information representing a plurality of contours of desired dot configurations, corresponding to various possible density values for a multiplicity of screen dots;
for each coordinate pair of a plotter, corresponding to a given location on the original, determining whether the coordinate pair lies inside or outside of a contour corresponding to the input density value of the original for that location, from among said input density values; and
operating the plotter to write only if the coordinate pair lies inside the contour, thereby to produce the multiplicity of screen dots of sizes representing the input density values of the original.

5,150,226
METHOD AND APPARATUS FOR REPEATEDLY RECORDING OPTICAL IMAGE INFORMATION AND IMAGE PICKUP DEVICE
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Tsutou Asakura, Yokohama; Masato Furuya, Yokosuka; Hirohiko Shinonaga, Yokohama, and Hiromichi Tai, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Jun. 21, 1989, Ser. No. 369,226
Claims priority, application Japan, Jun. 21, 1988, 63-152556; Sep. 26, 1988, 63-240295; Nov. 3, 1988, 63-278229
Int. Cl.[5] G02F *1/135;* H04N *3/10, 3/15, 1/028*
U.S. Cl. 358—471 6 Claims

1. An image pickup device comprising:
a recording member having a charge transfer suppressive layer member and a dielectric layer member as stacked members having a boundary surface therebetween whereby optical information in the form of an electrostatic charge is repeatedly erased and recorded at the boundary surface;
recording means having a writing head for recording the electrostatic charge image on the recording member by application of an electrical potential between the writing head and the recording member;
erasing means for erasing the electrostatic charge image recorded on the recording member prior to subsequently recording another electrostatic charge image on the recording member by generating and applying an alternating voltage between the writing head and the recording member, the alternating voltage having an amplitude which gradually decreases as time lapses; and
whereby the charge image formed at the boundary surface between the stacked members moves within the charge transfer suppressive layer member as a tunnel current according to a tunnel effect in response to the alternating voltage being applied between the writing head and the recording member of the erasing means, thus being erased.

4. An image pickup device comprising:
a recording member having a charge transfer suppressive layer member and a dielectric layer member as stacked members having a boundary surface therebetween whereby optical information in the form of an electrostatic charge image is repeatedly erased and recorded at the boundary surface;



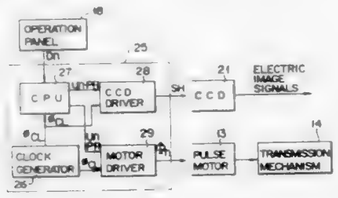
recording means having a writing head for recording the electrostatic charge image on the recording member by application of a first electrical potential between the writing head and the recording member;
erasing means for erasing the electrostatic charge image recorded on the recording member prior to subsequently recording another electrostatic charge image on the recording member by generating and applying a second electrical potential having a polarity opposite to that of the first electrical potential, between the writing head and the recording member;
whereby the charge image formed at the boundary surface between the stacked members moves within the charge transfer suppressive layer member as a tunnel current according to a tunnel effect in response to the second electrical potential being applied between the writing head and the recording member of the erasing means, thus being erased.

5,150,227
APPARATUS FOR READING CHARACTER OR GRAPHICS IMAGE ON DOCUMENT
Takashi Koshiyouji, Yokohama; Teruhiko Uno, Mitaka, and Shuuji Kizu, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 21, 1990, Ser. No. 541,329
Claims priority, application Japan, Jun. 23, 1989, 1-162225
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—497 16 Claims

1. An apparatus for reading an image illuminated by a lamp element which emits light at a predetermined constant level, comprising:
means for selecting one of first and second modes, said first mode using a first number representing a first linear reading density for reading said image, and said second mode using a second number representing a second linear reading density for reading said image;
means for sensing line images which are reflected from said image, wherein said sensing means comprises a CCD line sensor which outputs image signals, corresponding to said

line images, with a predetermined constant driving cycle; and

means for moving said sensing means such that a light accumulation time of said CCD line sensor is constant for each of said modes, and such that the speed at which said CCD line sensor is moved in an auxiliary scanning direction is changed in accordance with the mode selected by said selecting means,



said moving means including a pulse motor capable of changing a rotation thereof in accordance with the mode selected by said selecting means, and converting means for converting the rotation of said pulse motor to a linear movement of said sensing means in said auxiliary scanning direction, said converting means comprising a power transmission mechanism having a plurality of pulleys and belts and a conversion ratio determined on the basis of the least common multiple of said first and second numbers.

5,150,228

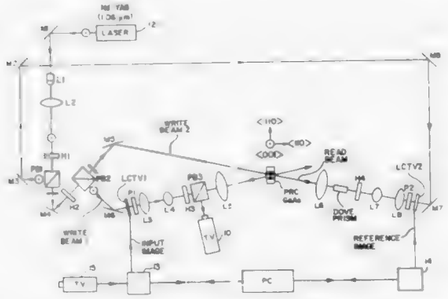
REAL-TIME EDGE-ENHANCED OPTICAL CORRELATOR

Tsuen-Hsi Liu, Northridge, and Ching-Jen Cheng, La Crescenta, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1991, Ser. No. 797,569

Int. Cl.[5] G03B *1/18*; **G02B** *27/42*

U.S. Cl. 359—7 **5 Claims**



1. A real-time edge-enhanced VanderLugt optical correlator utilizing degenerate four-wave mixing properties of a photorefractive crystal comprising

means for producing polarized coherent first and second write beams directed onto a first face of said crystal for producing a diffraction grating,

means for producing a polarized read beam directed onto a second face of said crystal opposite said first face for Bragg diffraction by said diffraction grating produced by mixing said first and second write beams, whereby a diffracted beam propagates along the path of said first write beam in an opposite direction,

separate spatial light modulators in the paths of said first write beam and said read beam in order to introduce in real time an input image and a reference image in said first write beam and said read beam, respectively,

separate lenses in the paths of said first write beam and said read beam between said spatial light modulators and said first and second opposing faces of said photorefractive crystal for separate Fourier transformation of said input and reference images,

said photorefractive crystal being oriented to cause said diffracted beam to be polarized perpendicular to that of said read beam,

a polarizing beam splitter in said path of said first write beam between said spatial light modulator in the path of said first write beam and said lens for Fourier transformation of said first write beam, whereby said diffracted beam is reflected out of said path of said first write beam,

means for adjusting the ratio of power of said read beam to said first write beam, with said read beam of sufficient power for optimum edge enhancement of said reference image by four-wave mixing in said photorefractive crystal, and

readout means positioned to receive said diffracted beam reflected by said polarizing beam splitter.

5,150,229

OPTICAL CORRELATOR

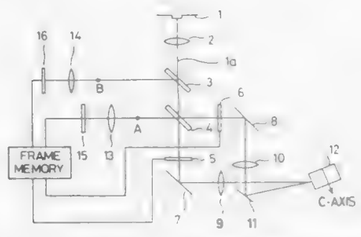
Toshiharu Takesue, and Yasuyuki Mitsuoka, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Sep. 7, 1989, Ser. No. 404,325

Claims priority, application Japan, Sep. 7, 1988, 63-227673

Int. Cl.[5] G03H *1/16*; **G06G** *9/00*

U.S. Cl. 359—7 **15 Claims**



12. An optical correlator, comprising: light means for generating coherent light; transforming means receptive of the coherent light for transforming two sets of pictorial information into coherent images by the coherent light; first generating means for receiving the coherent images and generating corresponding respective phase conjugate waveforms; second generating means respective of the phase conjugate waveforms for generating a sum corresponding to the sets of pictorial information and a difference corresponding to the sets of pictorial information; Fourier transform means for producing corresponding respective Fourier images corresponding to the sets of pictorial information; and receiving means for receiving the Fourier images.

5,150,230

ROD LENS FIXING METHOD AND FIBER COLLIMATOR MANUFACTURED THEREBY

Takayuki Masuko; Shunichi Satoh; Tetsuo Ishizaka, and Toshio Ohya, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 19, 1991, Ser. No. 762,193

Claims priority, application Japan, Sep. 20, 1990, 1-248671; Oct. 17, 1990, 1-276302; Oct. 17, 1990, 1-276305

Int. Cl.[5] G02B *7/26*

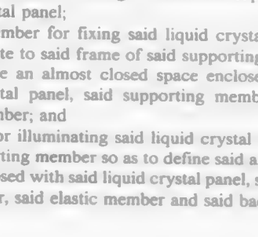
U.S. Cl. 359—34 **10 Claims**

1. A rod lens fixing method comprising the steps of:

providing a flanged split sleeve having an axial slit extending continuously from one end of said flanged split sleeve to the other end thereof, said axial slit being wide enough at at least a flange of said flanged split sleeve to permit laser welding;

press-fitting a rod lens into said flanged split sleeve;

applying a solder into said axial slit to solder said rod lens to said flanged split sleeve;



inserting said flanged split sleeve into a bore formed at one end portion of a sleeve, said bore having a diameter larger than outer diameter of said flanged split sleeve and smaller than an outer diameter of said flange; and

laser-welding said flange to one end surface of said sleeve at a plurality of points on an outer circumference of said flange and in said axial slit.

5,150,231

IMPACT RESISTANT FERROELECTRIC LIQUID CRYSTAL APPARATUS

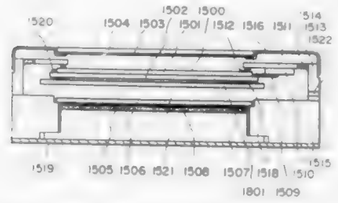
Hirofumi Iwamoto, Hiratsuka; Hisao Tajima, Yokohama; Makoto Uehara, Yokohama; Yoshihiro Onitsuka, Yokohama; Takao Miyamoto, Chigasaki; Hiroshi Takabayashi, and Satoshi Yoshihara, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1990, Ser. No. 634,740

Claims priority, application Japan, Dec. 29, 1989, 1-343132; Aug. 27, 1990, 2-226021; Dec. 12, 1990, 2-401564

Int. Cl.[5] G02F *1/13, 1/1335, 1/1333*

U.S. Cl. 359—44 **32 Claims**



1. A liquid crystal display apparatus, comprising:

a liquid crystal panel comprising a pair of substrates each provided with an electrode and a liquid crystal disposed between said pair of substrates;

a supporting member having a frame for supporting said liquid crystal panel;

an elastic member for fixing said liquid crystal panel in a floating state to said frame of said supporting member so as to define an almost closed space enclosed with said liquid crystal panel, said supporting member and said elastic member; and

a backlight for illuminating said liquid crystal panel below said supporting member so as to define said almost closed space enclosed with said liquid crystal panel, said supporting member, said elastic member and said backlight.

5,150,232

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY ELEMENT AND PROJECTION TYPE ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE

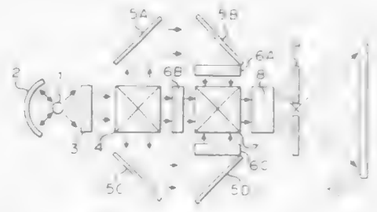
Tomoki Gunkima, Yokohama; Masanori Yuki, Hatano; Masaya Kunigita; Yoshinori Hirai, both of Yokohama; Yukio Yoshikawa, Kawasaki, and Eiji Shidoji, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,072

Claims priority, application Japan, Oct. 4, 1988, 63-249020; Jul. 27, 1989, 1-192760

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—51 **24 Claims**



1. A projection type active matrix liquid crystal display device of the type which includes an active matrix liquid crystal display element wherein a liquid crystal polymer composite comprised of nematic liquid crystal dispersively contained in a polymer matrix having a refractive index which is substantially equal to the ordinary refractive index (n_o) of the liquid crystal used is held between an active matrix substrate on which an active element is provided for each pixel electrode and a counter electrode substrate on which a counter electrode is provided, a light source for projection light, and an optical system of projection, characterized in that the anisotropy of refractive index Δn of the nematic liquid crystal used is greater than 0.18, and the average particle diameter R(μm) of the liquid crystal dispersively contained in the polymer matrix and the distance d(μm) between the active matrix substrate and the counter electrode substrate satisfy the relationships of

$$0.3 < R \cdot \Delta n \; 0.7 \quad (1)$$

$$4 \; R < d < 8 \; R. \quad (2)$$

5,150,233

LIQUID CRYSTAL DEVICE AND DISPLAY APPARATUS WITH A THREE-LAYERED ELECTRODE OF ITO, MOLYBDENUM, AND ALUMINUM

Takashi Enomoto, Zama; Toshifumi Yoshioka, Hiratsuka, and Naoya Nishida, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,501

Claims priority, application Japan, Feb. 26, 1990, 2-042611

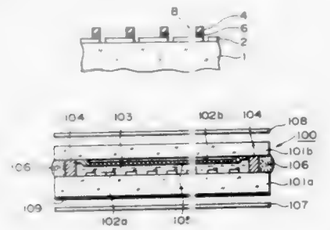
Int. Cl.[5] G02F *1/1343*

U.S. Cl. 359—54 **15 Claims**

12. A display apparatus, comprising:

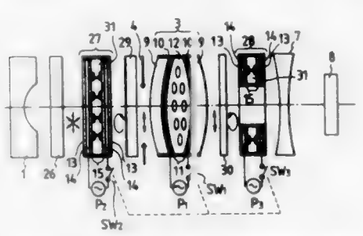
(a) a liquid crystal device comprising (i) a first substrate having thereon first electrodes having a laminated structure including a first layer of indium tin oxide, a second layer of molybdenum or a molybdenum alloy, and a third layer of aluminum or an aluminum alloy having a thickness of 50–2,000 Å, disposed in the named order, wherein said second and third layers cover only a part of said first layer; (ii) a second substrate having thereon second electrodes disposed opposite to the first electrodes; and (iii) a

liquid crystal disposed between the first and second substrates;



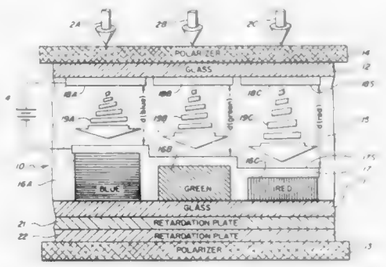
(b) a first means for supplying signal voltages to the first electrodes and the second electrodes, and
(c) a second means for controlling the first means.

5,150,234
IMAGING APPARATUS HAVING ELECTROOPTIC DEVICES COMPRISING A VARIABLE FOCAL LENGTH LENS
Susumu Takahashi, Kunitachi; Akira Takano; Hirofumi Miyanaga, both of Hachiouji; Hisanari Shimazu, Akishima; Kimihiko Nishioka, Hachiouji Akitoshi Toda, Kunitachi; Masaru Shiraiwa, Hachiouji, and Akira Taniguchi, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Division of Ser. No. 390,402, Aug. 7, 1989, Pat. No. 5,071,229.
This application Nov. 4, 1991, Ser. No. 787,139
Claims priority, application Japan, Aug. 8, 1988, 63-197733; Oct. 24, 1988, 63-267612; Jan. 12 1989, 1-5434
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—65 **14 Claims**



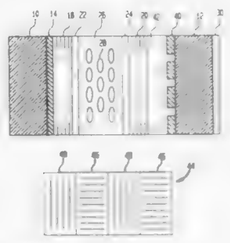
1. An imaging apparatus having electrooptic devices, comprising:
first and second circularly polarizing means having first and second states of operation and disposed on an optical axis, said first and second circularly polarizing means in spaced relation having a space therebetween, in said first state circularly polarized light of one direction is transmitted and in said second state all circularly polarized light is transmitted;
first and second ¼ wave plates disposed on said optical axis in said space between said first and second circularly polarizing means;
a variable focal length lens containing a material having an electrooptic effect, disposed on said optical axis between said first and second ¼ wave plates;
a light blocking member having an aperture on said optical axis; and
power source means for actuating in synchronization said first and second circularly polarizing means and said variable focal length lens,
one of said first and second circularly polarizing means being provided with a central transparent part smaller in diameter than said aperture of said light blocking member, said first circularly polarizing means, said first ¼ wave plate, said light blocking member, said second ¼ wave plate and said second circularly polarizing means functioning as light blocking means for changing an aperture thereof to different sizes.

5,150,235
APPARATUS FOR IMPROVING THE ANGLE OF VIEW IN A LIQUID CRYSTAL DISPLAY
Elias S. Haim; John A. Rupp, both of Glendale, and Cecil W. Penn, Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn. and Hosiden Corporation, Osaka, Japan
Filed Feb. 4, 1991, Ser. No. 650,444
Int. Cl.[5] G02F *1/1335*
U.S. Cl. 359—68 **1 Claim**



1. A liquid crystal display for displaying a polychromatic image, said display comprising:
a first linear polarizer;
a plurality of liquid crystal pixels, each liquid crystal pixels having an optical path including:
an optical filter for transmitting a preselected band of optical radiation;
a first and a second conducting layer; and
liquid crystal material between said first and said second conducting layers;
a first retardation film;
a second retardation film; and
a second linear polarizer;
wherein distances between said first and said second conducting layers are determined by said preselected band of optical radiation and wherein each of said distances are selected to be less than the distance for the first minimum for transmission of said preselected band of optical radiation.

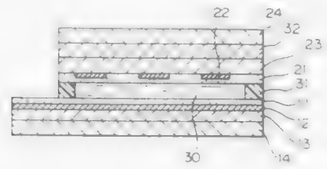
5,150,236
TUNABLE LIQUID CRYSTAL ETALON FILTER
Jayantilal S. Patel, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.
Continuation-in-part of Ser. No. 577,220, Aug. 31, 1990, Pat. No. 5,068,749. This application Oct. 16, 1990, Ser. No. 598,476
Int. Cl.[5] G02F *1/1335, 1/1337, 1/137*
U.S. Cl. 359—71 **18 Claims**



1. A tunable optical filter, comprising:

two interference mirrors, each having reflectivity of at least approximately 95%;
a liquid crystal disposed between said interference mirrors; and
two electrodes for changing a refractive index of said liquid crystal.

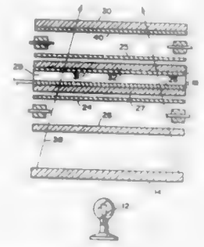
5,150,237
LIQUID CRYSTAL DISPLAY ELEMENT
Haruo Iimura, Yokohama; Yasuyuki Takiguchi, Kawasaki, and Akihiko Kanemoto, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed May 11, 1990, Ser. No. 522,378
Claims priority, application Japan, May 15, 1989, 1-121048; Jun. 6, 1989, 1-143594
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—73 **8 Claims**



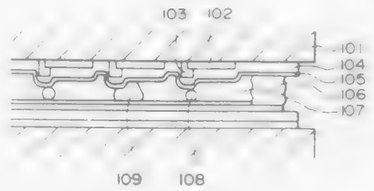
1. A liquid crystal display element, comprising:
a liquid crystal cell including a layer of a nematic liquid crystal material having a positive dielectric anisotropy, said layer being sandwiched between a pair of substrates each provided with an electrode, molecules of said liquid crystal material being homogeneously oriented substantially parallel to each of surfaces of said substrates when a voltage is not applied;
a pair of polarizers disposed such that said liquid crystal cell is sandwiched between said polarizers, and such that a direction of a transmission axis of each of said polarizers adjacent to said layer is shifted from an orientation direction of said molecules; and
a uniaxial medium disposed between said liquid crystal cell and one of said polarizers for compensating for dependence of a spectrum of a light on a visual angle, said light being transmitted through said liquid crystal cell, said uniaxial medium having a positive optical anisotropy, and being arranged such that an optical axis thereof makes a right angle with a surface of the substrate of said cell which is adjacent to said uniaxial medium.

5,150,238
ACTIVE MATRIX LCD PROJECTION SYSTEM WITH ANTI-REFLECTIVE CHARACTERISTICS
James H. Vogeley, Yorktown, and Patrick H. Newton, Hampton, both of Va., assignors to nView Corporation, Newport News, Va.
Filed Mar. 4, 1991, Ser. No. 663,124
Int. Cl.[5] G02F *1/1335, 1/1333*
U.S. Cl. 359—74 **8 Claims**

1. Apparatus for displaying images on a surface comprising:
a light source for projecting light along an optical path toward the surface;
liquid crystal means disposed in said optical path;
means for generating liquid crystal energizing signals and coupled to said liquid crystal means for selectively energizing portions thereof to define an image for projection on the surface;
a glass panel spaced above said liquid crystal means and in said optical path; and
anti-reflective means disposed in said optical path adjacent the underside of said glass panel to substantially preclude light from being reflected back toward said liquid crystal means, thereby substantially precluding secondary reflections from interfering with the images displayed on the surface.

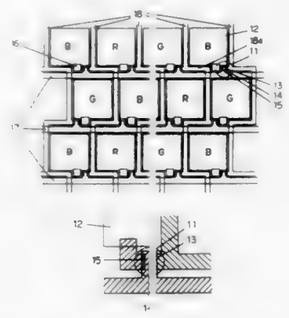


5,150,239
ONE-PACK TYPE EPOXY SEALANT WITH AMINE-TYPE CURING AGENT, FOR LIQUID CRYSTAL CELL, DISPLAY APPARATUS AND RECORDING APPARATUS
Yasuyuki Watanabe, Chigasaki; Masayuki Shimamune, Tokyo, and Masaaki Suzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 8, 1991, Ser. No. 652,661
Claims priority, application Japan, Feb. 9, 1990, 2-028496; Feb. 5, 1991, 3-035252
Int. Cl.[5] G02F *1/1339*
U.S. Cl. 359—80 **13 Claims**



13. A recording apparatus, comprising:
a liquid crystal shutter array including a liquid crystal cell, a clock signal generator, a scanning electrode selector, a scanning electrode driver, a data generator, a data modulator and a signal electrode driver;
a light source;
a photosensitive member; and
a developing device;
wherein said liquid crystal cell comprises a pair of oppositely disposed electrode plates having a sealant bonding the electrode plates to define a space, and a liquid crystal filling the space, wherein the sealant is a cured product of a one-pack type thermosetting epoxy adhesive containing a potential hardener activatable at an elevated temperature, said sealant further comprising an amine-type room temperature hardener added in a proportion of 1.0–3.0 wt. % of the total of the epoxy adhesive and the amine-type room temperature hardener.

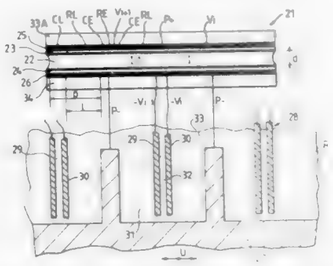
5,150,240
THIN FILM ACTIVE MATRIX CIRCUIT
Jeong J. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Nov. 30, 1989, Ser. No. 443,209
Claims priority, application Rep. of Korea, Nov. 30, 1988, 15942/1988
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—87 **4 Claims**



1. A thin film active matrix circuit for use in a thin film transistor-liquid crystal display color television set comprising:
a plurality of thin film transistors;
said plurality of thin film transistors each including,
a drain protrusion electrode,
a source protrusion electrode formed by extending a source bus line in a direction perpendicular to said source bus line and opposite to said drain protrusion electrode, and
a gate protrusion electrode formed by extending a gate bus line in a direction perpendicular to said gate bus line and perpendicular to said source protrusion electrode for connecting said drain protrusion electrode and said source protrusion electrode; and
a plurality of pixels, operatively connected to said plurality of thin film transistor;
said pixels each being connected to said drain protrusion electrode at a lower portion thereof;
said pixels being formed in a shape of a regular tetragon and a horizontal portion of said source bus line being extended in a direction opposite to said source protrusion electrode, thereby improving picture quality.

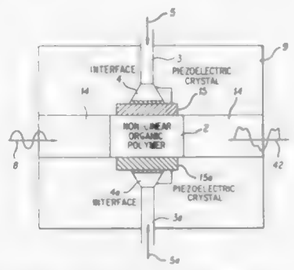
5,150,241
LIQUID CRYSTAL ELECTRO-OPTICAL DEFLECTOR HAVING ELECTRODE ARRAY AND COMB SHAPED ELECTRODE FORMED ON RESISTIVE LAYER
Pascal Joffre, Bourg La Reine; Gerard Illiaquer, Viry Chatillon, and Jean-Pierre Huignard, Paris, all of France, assignors to Thomson-CSF, Puteaux, France
Filed Jul. 19, 1990, Ser. No. 554,461
Claims priority, application France, Jul. 25, 1989, 89 09997
Int. Cl.[5] G02F *1/13, 1/29*
U.S. Cl. 359—89 **6 Claims**

1. A liquid crystal electro-optical deflector through which a beam to be deflected is passed comprising:
a thin film of liquid crystal;
two arrays of electrodes, each of said arrays positioned on each side of said thin film of liquid crystal, each electrode of each of said arrays of electrodes being connected to a different potential;
comb-type electrodes, each of said comb-type electrodes being connected to a predetermined biasing potential and interdigitated with electrodes of each of said arrays of electrodes; and
resistive layers, each of said arrays of electrodes and each of said comb-type electrodes being formed on each of said resistive layers;
wherein said liquid crystal, said arrays of electrodes, said



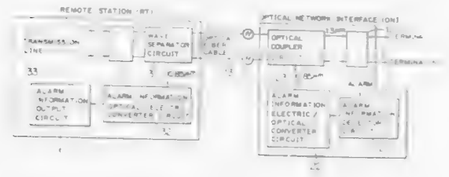
comb-type electrodes and said resistive layers form an assembly of phase-shifters positioned side-by-side for generating a spatial modulation of a phase of a beam passing through the deflector.

5,150,242
INTEGRATED OPTICAL COMPUTING ELEMENTS FOR PROCESSING AND ENCRYPTION FUNTIONS EMPLOYING NON-LINEAR ORGANIC POLYMERS HAVING PHOTOVOLTAIC AND PIEZOELECTRIC INTERFACES
William G. Fellows, 8610 Snowden Loop, Laurel, Md. 20708
Continuation of Ser. No. 569,893, Aug. 17, 1990, abandoned.
This application Oct. 24, 1991, Ser. No. 784,630
Int. Cl.[5] G02B *6/12*; G02F *3/00*
U.S. Cl. 359—108 **8 Claims**



1. An integrated optical device comprising:
a monolithic crystalline substrate;
an optical waveguide channel having an input end-face and an output end-face formed on said substrate and extending longitudinally along said substrate;
said optical waveguide channel having at least one optical cell thereon comprised of an optically non-linear organic polymer;
signal means to said optical cell;
an interface responsive to said signal input means for controlling the refractive index of said optical cell,
the interface being of an piezoelectric crystal formed on the substrate.

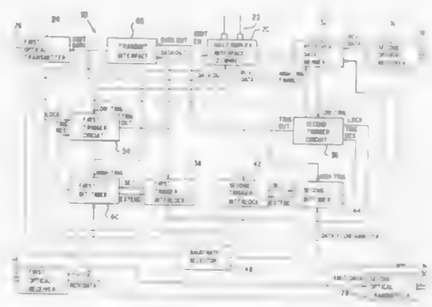
5,150,243
METHOD AND APPARATUS FOR MONITORING AN OPTICAL NETWORK INTERFACE
Hiroyuki Suzuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 536,810, Jun. 12, 1990, abandoned.
This application Oct. 24, 1991, Ser. No. 781,687
Claims priority, application Japan, Jun. 12, 1989, 1-148909
Int. Cl.[5] H04B *10/08*; H04J *14/02*
U.S. Cl. 359—110 **10 Claims**



1. A communications transmission system comprising:
an optical network interface including an optical coupler, for combining a terminal optical signal and an alarm optical signal before transmission, located at an interface thereof;
a remote station including a wave separator circuit, for separating the terminal optical signal and the alarm optical signal, located at an interface of said remote station;
an optical fiber interconnecting said optical network interface and said remote station for transmitting the terminal optical signal and the alarm optical signal,
said optical network interface permitting transmission of the terminal optical signal having a predetermined wave length in either direction along said optical fiber between said remote station and a subscriber's terminal;
an alarm information transmitting component of said optical network interface, operatively connected to said optical coupler, for converting alarm information generated as a result of a fault within said optical network interface into the alarm optical signal having a wave length which is different than said predetermined wave length, and delivering the alarm optical signal to said optical fiber,
said optical fiber transmitting the alarm optical signal received from said alarm information transmitting component to said remote station; and
an alarm information receiving component, operatively connected to said wave separator circuit, for processing the alarm optical signal transmitted by said optical fiber to derive alarm information therefrom.

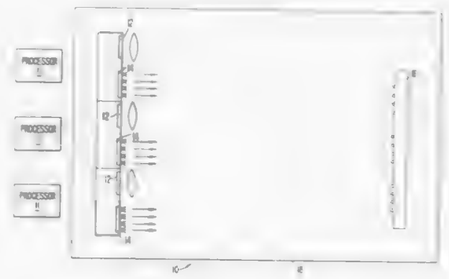
5,150,244
FIBER OPTIC INTERFACE
Warren Cecchini, Penn Hills, Pa., assignor to American Auto-Matrix, Inc., Export, Pa.
Filed Jun. 8, 1990, Ser. No. 535,389
Int. Cl.[5] H04B *10/24*
U.S. Cl. 359—113 **3 Claims**

1. An apparatus comprising:
a first optical receiver for receiving optical digital signals from a first optical fiber;
a second optical receiver for receiving optical digital signals from a second optical fiber;
a half duplex interface which communicates with the first and second optical receivers and to a half duplex line for receiving electrical digital signals from the half duplex line and sending electrical digital signals thereto corresponding to optical digital signals received from either the first or second optical receivers;
a first optical transmitter means for providing optical digital signals to a third optical fiber corresponding to digital signals received by the first or second optical receivers or the interface;
a second optical transmitter means for providing optical digital signals to a fourth optical fiber corresponding to signals received by the first or second optical receivers or the interface;
a receiver data merger connected to the first and second optical receivers for merging the signals therefrom and producing a corresponding signal;
a first trigger circuit in communication with the interface and the first and second optical transmitters for passing signals from the interface to the transmitters when the first trigger circuit is in a first state;



a second trigger circuit in communication with the optical receive data merger and the interface, and the first and second optical transmitter, for passing signals from the receiver data merger to the interface and to the first and second fiber transmitter when the second trigger circuit is in a first state; and
means for controlling when the first and second trigger circuits are in the first ate, said controlling means connected to the first and second trigger circuit and preventing the first and second trigger circuit from being in the first state at the same time and for preventing one of the trigger circuits from being in the first state for at least a predetermined period of time corresponding to a number of bits after the other trigger circuit is in the first state.

5,150,245
MULTIPROCESSOR COMPUTER WITH OPTICAL DATA SWITCH
William T. Smithgall, League City, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 18, 1989, Ser. No. 424,360
Int. Cl.[5] H04J *14/00*
U.S. Cl. 359—117 **10 Claims**



1. A data switch for sharing data among a plurality of data processing members comprising:
a plurality of data processing members;

projecting means connected to each of said data processing members for projecting data generated by said data processing member;

reading means connected to each of said data processing members for reading projected data; and

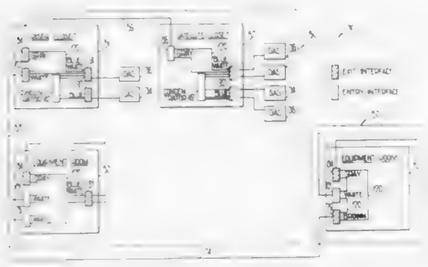
reflecting means for reflecting the projected data to the means for reading data, said reflecting means, said projecting means and said reading means optically aligned with respect to each other such that each of said reading means is capable of reading projected data from each of the data processing members simultaneously.

5,150,245

ADMINISTRATION ARRANGEMENT FOR LOCAL AREA NETWORK ARCHITECTURE

Robert M. Kimball, Brick, N.J., and Thomas F. McIntosh, Dunwoody, Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 31, 1989, Ser. No. 401,354
Int. Cl.[5] H04B *10/20*
U.S. Cl. 359—118 **50 Claims**



1. An optical ring network topology, which comprises:

at least two stations;

an administrative location;

an optical path which extends from said administrative location to a first one of said stations and which returns from said first one of said stations to said administrative location;

an optical path which extends from said administrative location to a second one of said stations and which returns from the second one of said stations to said administrative location;

a plurality of interface means disposed at said administrative location for terminating said optical path to said first one of said stations and for terminating said optical path to the second one of said stations, each said interface means having at least two ports each port adapted to have an optical signal pass therethrough and being capable of having the direction of a signal through each port thereof changed; and

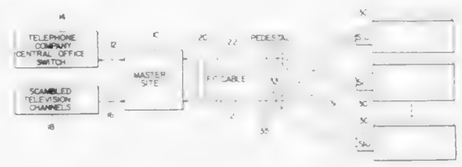
jumper means disposed at said administrative location and capable of interconnecting selected portions of said interface means for providing a ring by completing said optical path from said first one of said stations through ones of said interface means at said administrative location to the second one of said stations, said plurality of interface means being such that said stations may be connected by said jumper means in different optical paths through said plurality of interface means

5,150,247

FIBER OPTIC TELECOMMUNICATION SYSTEM EMPLOYING CONTINUOUS DOWNLINK, BURST UPLINK TRANSMISSION FORMAT WITH PRESET UPLINK GUARD BAND

Randall B. Sharpe, Chapel Hill; J. Richard Jones, Raleigh; Thomas E. O'Shea, Chapel Hill, all of N.C.; Paul W. Casper, West Melbourne; James W. Toy, Melbourne, both of Fla.; Gregory M. Evans, Cary, and Richard N. Sears, Raleigh, both of N.C., assignors to Broadband Technologies, Inc., Research Triangle Park, N.C.

Filed Oct. 30, 1989, Ser. No. 429,083
Int. Cl.[5] H04J *14/08*
U.S. Cl. 359—135 **20 Claims**



1. A fiber optic communication system for conveying telecommunication messages over a first optical fiber from a master site to a plurality of remote sits, geographically separated from one another, and over a second optical fiber from said plurality of remote sites to said master site, said remote sites being coupled to said first optical fiber by way of a first fiber coupling device at a first common location on said first optical fiber, and to said second optical fiber by way of a second fiber coupling device at a second common location on said second optical fiber, said system comprising:

at said master site,

first means, to which a plurality of telecommunication channels are coupled and being coupled to said first optical fiber, for transmitting first messages over said first optical fiber to said plurality of remote sites in a continuous time division format, said first messages containing first telecommunication signals and identifying remote sites for whom said first telecommunication signals are intended, and second means, coupled to said second optical fiber, for receiving successive bursts of second messages transmitted from remote sites, said second messages containing second telecommunication signals from remote sites and identifying the remote sites sourcing said second telecommunication signals; and

at a respective remote site,

third means, coupled to said second optical fiber, for transmitting said second messages over said second optical fiber to said master site in time division multiple access format, in which a respective second message is separated from another, successive second message, by a guard band having a duration defined in accordance with a differential optical fiber transmission distance between said second common location on said second optical fiber and first and second ones of said remote sites whose optical fiber transmission distances from said second common location are most different from each other, and the second messages have durations which are defined in accordance with echo path delay requirements through the system.

5,150,248

TERAHERTZ REPETITION RATE OPTICAL COMPUTING SYSTEMS, AND COMMUNICATION SYSTEMS AND LOGIC ELEMENTS USING CROSS-PHASE MODULATION BASED OPTICAL PROCESSORS

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463; Ping-Pei Ho, 240-42 69th Ave., Douglaston, N.Y. 11362, and Patrice Baldeck, 270 Convent Ave., New York, N.Y. 10031

Filed Jul. 21, 1989, Ser. No. 382,752
Int. Cl.[5] H04B *10/12*
U.S. Cl. 359—160 **17 Claims**

1. An optical communication system using the spectral effects of cross-phase modulation comprising:

a) means for generating first and second beams of laser light, said first beam comprising a series of pulses of a first frequency, said second beam comprising a series of pulses of a second frequency, said pulses of said first beam being stronger in intensity relative to said pulses of said second beam;

b) means disposed along the path of said first beam for modulating said pulses in said first beam according to predetermined information;

c) means for combining said first beam and second beam to form a third beam;

d) a non-linear material disposed along the path of said third beam for receiving said third beam and producing a fourth beam, said fourth beam including pulses of said first frequency, pulses of said second frequency, and pulses of a third frequency the pulses of said third frequency resulting from the spectral effects of cross-phase modulation;

e) means disposed along the path of said fourth beam for filtering out pulses of said first frequency;

f) means for splitting said fourth beam into a fifth beam and a sixth beam;

g) means for detecting pulses in said fifth beam of said second frequency; and

h) means for detecting pulses in said sixth beam of said third frequency.

5,150,249

TWO-MIRROR SCANNER WITH PINCUSHION ERROR CORRECTION

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Continuation-in-part of Ser. No. 549,228, Jul. 6, 1990, Pat. No. 5,048,904. This application Aug. 12, 1991, Ser. No. 743,670
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—202 **11 Claims**

1. For scanning an object plane, a scanner comprising:

A) a light source or detector;

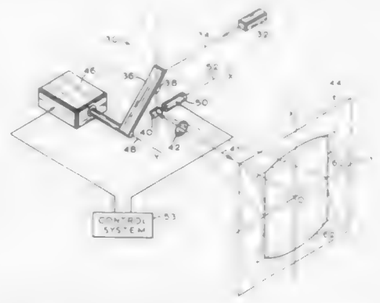
B) a first mirror for reflecting light between (i) a first path extending from the first mirror to the source or detector and (ii) a second path;

C) a first mirror driver for pivoting the first mirror cyclically about a first pivot axis;

D) a second mirror, resiliently mounted on a resilient member for pivoting about a second pivot axis so as to exhibit a natural pivoting frequency thereabout, for reflecting light between the second path and a third path that extends to the object plane;

E) a second mirror driver for cyclically pivoting the second mirror about the second pivot axis through a plurality of cycles for each cycle of pivoting of the first mirror substantially at the natural pivoting frequency, whereby the deflection that the first mirror's pivoting causes in the location at which the third path would reach the object plane in the absence of a lens in the third path depends on the pivot angle of the second mirror and thus would produce pincushion distortion; and

F) a lens disposed in the third path between the second mirror and the object plane and so characterized by barrel distortion as to reduce the pincushion distortion that would prevail in the absence of the lens.

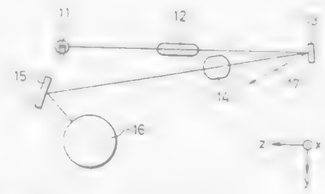


5,150,250

LIGHT SCANNING OPTICAL SYSTEM FOR AN IMAGE OUTPUT SCANNER USING AN ELECTRO-MECHANICAL LIGHT MODULATOR

Michitaka Setani, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 508,476, Apr. 11, 1990, abandoned, which is a continuation of Ser. No. 344,449, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 820,748, Jan. 22, 1986, abandoned. This application Sep. 27, 1991, Ser. No. 766,268
Claims priority, application Japan, Jan. 23, 1985, 61-009155; Jan. 23, 1985, 61-009156
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—221 **18 Claims**



1. A light scanning optical system of an image output scanner, comprising:

a light source;

a lens means, the shape of said lens means being flat in a main scan direction so as to condense a light from said light source to a slit-like beam, a section of which extends in the main scan direction;

an electro-mechanical light modulator, said modulator including an array of elements arranged in the main scan

direction and each capable of deflecting an incident light beam from said light source in at least two directions in accordance with an input signal, said slit-like light beam impinging on said array of elements and each of said elements making image information by a change-over of a direction of deflection of each of said elements in accordance with the input signal; and

a projection optical system for projecting only a signal light of the image information which is deflected in at least one direction of said at least two directions.

5,150,251

OPTICAL POLARIZATION STATE CONVERTING APPARATUS FOR USE AS ISOLATOR, MODULATOR AND THE LIKE

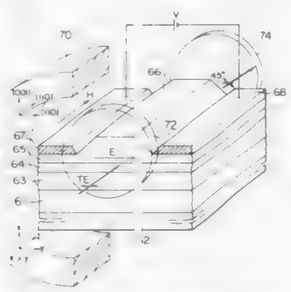
Yasuo Tomita, Yokohama; Hitoshi Oda, and Masahiro Okuda, both of Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1991, Ser. No. 739,260

Claims priority, application Japan, Aug. 4, 1990, 2-207096; Aug. 9, 1990, 2-211253

Int. Cl.[5] G02B *5/172*

U.S. Cl. 359—246 **21 Claims**



1. A polarization-state converting apparatus comprising:

a waveguide comprising a magnetic semiconductor:

means for applying a magnetic field to said waveguide in a first predetermined direction; and

means for applying an electric field to said waveguide in a second predetermined direction;

whereby a mode conversion is caused, via electrooptic and magnetooptic effects due to the electric and magnetic fields, to change the polarization state of light propagating through said waveguide.

5,150,252

HARMONICS GENERATION ELEMENT

Yasunori Furukawa, Kumagaya, and Masayoshi Sato, Fukaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

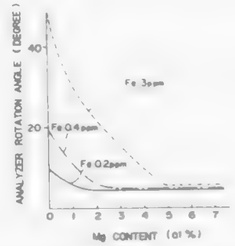
Continuation of Ser. No. 486,872 Mar. 1, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 841,789

Claims priority, application Japan, Apr. 4, 1989, 1-084963

Int. Cl.[5] G02F *1/03 1/07;* **H03F** *7/04*

U.S. Cl. 359—252 **7 Claims**

1. A harmonics generation element comprising an optical waveguide for operation in the range of about 10°–60° C. in which a primary laser beam is made incident into nonlinear optical crystals so that a higher-order harmonics beam with said wavelength of the primary laser beam as a fundamental wave is produced as a secondary output light, said harmonics generation element comprising single-crystals of lithium niobate as said nonlinear optical crystals, single crystals containing magnesium of between 1 and 5 atomic percent and an impurity Fe content of 0.4 ppm or less.



5,150,253

REFLECTIVE MIRROR HAVING COOLING UNIT ATTACHED THERETO

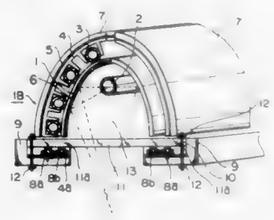
Minoru Watanuki, Tokyo, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed May 15, 1991, Ser. No. 699,617

Claims priority, application Japan, May 18, 1990, 2-128649

Int. Cl.[5] G02B *7/18*

U.S. Cl. 359—360 **12 Claims**



1. A reflective mirror comprising:

a reflective layer of material deposited on the surface of a first plate, said material having properties that ultraviolet rays are reflected from said reflective surface and infrared rays are passed through said reflective surface; and

a cooling unit comprising:

a first cooling pipe contacting a surface of said reflective mirror opposite to the reflective surface of said reflective mirror; and

a plurality of first fixing members in the form of plates contacting and holding said first cooling pipe to said opposite surface of said reflective surface of said reflective mirror.

5,150,254

ENDOSCOPE WITH SHAPE RECOGNITION MECHANISM

Satoshi Saitou, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1990, Ser. No. 513,958

Claims priority, application Japan, Apr. 28, 1989, 1-107527

Int. Cl.[5] G02B *23/00;* **H04N** *7/18;* **A61B** *1/06*

U.S. Cl. 359—367 **14 Claims**

1. A front-viewing type endoscope, comprising:

a scope section in a cable having a forceps channel opening to a scope end surface and an imaging device located on the scope end surface; and

beam projector means to be inserted into the forceps channel for projecting a patterned light beam for shape recognition of an object to be imaged by the imaging device, the beam projector means including:

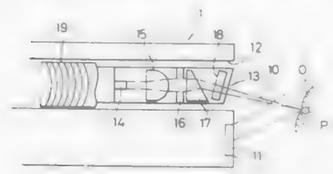
means for generating the patterned light beam from a source light beam such that the patterned light beam is projected at a predetermined angle with respect to the object to be imaged;

prism means for deflecting the source light beam such that the source light beam prependicularly enters the generating means;

diaphragm means for controlling an amount of the source light beam entering the prism means;

lens means for focusing the source light beam entering the diaphragm means; and

light guide means for transmitting the source light beam to the lens means.



5,150,255

BINOCULAR WITH SHADING DEVICE

Shen-Yuan Lin, No. 3, Alley 61, Chuan Chou Street, San Chung City, Taipei Hsien, Taiwan

Filed Sep. 5, 1991, Ser. No. 757,652

Int. Cl.[5] G02B *23/18*

U.S. Cl. 359—409 **8 Claims**

1. A binocular provided with a shading device comprising:

a) a hat for screening against light and heat, the hat including a front portion and a pair of yokes extending downwardly from the front portion and positioned forwardly of the eyes of a wearer of the hat;

b) a pair of collapsible telescopes, each telescope including a front end and a rear end, each rear end being provided with a U-shaped member;

c) a cross joint connecting each yoke with a U-shaped member for permitting the telescope to pivot between a downward viewing position when extended and an upward storage position when retracted; and

d) cooperating means carried by the telescopes and the hat for securing the telescopes in the upward storage position.

5,150,256

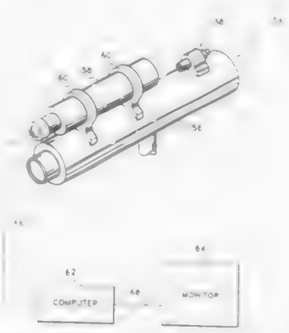
OPTICAL RETICLE PROJECTOR

Thomas W. Dey, Springwater, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1990, Ser. No. 607,191

Int. Cl.[5] G02B *23/00*

U.S. Cl. 359—428 **19 Claims**



1. A ground-based optical system for collecting data on an astronomical target of interest that moves across the sky during a period of observation, due to movement of the earth's rotation;

a first optical component having a first aperture with a field of view aimed for acquiring an image of the target of interest;

a second optical component having a second aperture with a field of view aimed for acquiring an image of an astronomical guide target that is different from the target of interest and that moves across the sky in correspondence with the movement of the target of interest;

means for connecting the second optical component to the first optical component;

means, fixedly mounted on the first optical component separate from the second optical component, for projecting an image of a reticle into a portion of the field of view of the second aperture; and

means, responsive to changes in position of the acquired image of the guide target relative to the projected image of the reticle, for moving the first optical component to track the movement of the target of interest.

5,150,257

HIGH RELIABILITY, LOW INTENSITY BACK LIT SR AND NVGC INDICATOR ASSEMBLY

Akbar Mohabbatizadeh, Huntington Beach, and Barry J. Weidenhammer, Newport Beach, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1991, Ser. No. 736,862

Int. Cl.[5] F21V *13/00*

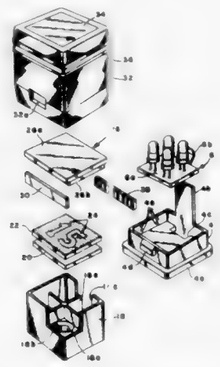
U.S. Cl. 359—601 **30 Claims**

16. A sunlight readable indicator assembly operable to indicating and non-indicating states comprising:

a legend plate having a viewing surface reflective of ambient light; and

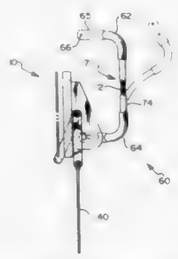
a light valve juxtaposed said viewing surface operable in response to an electric signal for changing transmissivity

thereof between substantially opaque and substantially transparent states, said light valve being substantially



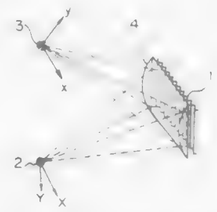
opaque in a non-indicating state of said indicator assembly, blocking ambient light from said legend plate.

5,150,258
COMBINATION MIRROR AND SUN VISOR
William P. Schmidt, 21000 Woodruff, Rockwood, Mich. 48173, and Franklin D. Hutchinson, 28000 Beel Rd., New Boston, Mich. 48164
Filed Apr. 1, 1991, Ser. No. 678,036
Int. Cl.[5] G02B 5/08
U.S. Cl. 359—608 3 Claims



1. An apparatus for mounting in a vehicle to provide reflection and shade, comprising:
(a) a mirror;
(b) means for mounting the mirror to the vehicle, the means for mounting comprising a flexibly deformable adjustment arm;
(c) a visor panel;
(d) means for mounting the visor panel to the mirror mounting means; and
wherein the visor panel mounting means is adjustable to allow placement of the visor to cover the mirror and to alternate positions on opposite sides of the mirror and substantially coplanar therewith.

5,150,259
OPTICAL IMAGING DEVICE
Noriji Oishi, Nagoya, Japan, assignor to Mitsubishi Rayon Company Ltd., Tokyo, Japan
Filed Jul. 22, 1991, Ser. No. 733,984
Claims priority, application Japan, Jul. 30, 1990, 2-201854; Jul. 30, 1990, 2-201855; Jul. 30, 1990, 2-201856; Jul. 30, 1990, 2-201857; Sep. 21, 1990, 2-253008
Int. Cl.[5] G02B 5/04
U.S. Cl. 359—619 38 Claims



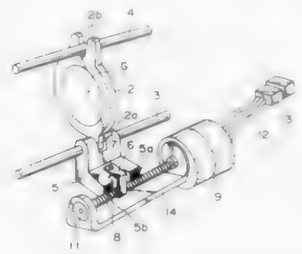
1. An optical imaging device for projecting an image of a strip area from an object plane via an optical path to an image plane, comprising:
reflecting means having a plurality of pairs of reflecting surfaces arranged on a flat surface and forming an array extending in a first direction parallel to a long axis of said strip area, each pair of said reflecting surfaces being composed of two flat surfaces crossing at a $\pi/2$ radian, and each crossing line of two adjacent said reflecting surfaces being perpendicular to said first direction; and
cylindrical focusing means having a focusing power directed only to a second direction perpendicular to said first direction, said cylindrical focusing means projecting said image component of said second direction from said object plane to said image plane;
when said optical path is divided into two parts from said object plane to said reflecting means and from said reflecting means to said image plane, each of said two parts of said optical path respectively have a substantially equal parameter γ, as given by a following formula (1);

$$\gamma=\Sigma_k (l_k/n_k) \quad (1)$$

where
l_k is a thickness of each medium in respective optical paths,
n_k is a refractive index of said medium in respective optical paths.

5,150,260
OPTICAL APPARATUS
Tatsuo Chigira, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 1, 1991, Ser. No. 769,453
Claims priority, application Japan, Oct. 2, 1990, 2-265351
Int. Cl.[5] G02B 15/00
U.S. Cl. 359—694 16 Claims

1. An optical apparatus comprising:
a lens holding member holding a lens;
a guide member for guiding the movement of said lens holding member in the direction of an optical axis;
a gear shaft rotatable by a drive source; and
a moving member having a gear portion meshing with said gear shaft and movable in the direction of the optical axis by the rotation of said gear shaft to thereby move said lens holding member in the direction of the optical axis, said moving member being rotatably supported in a direction

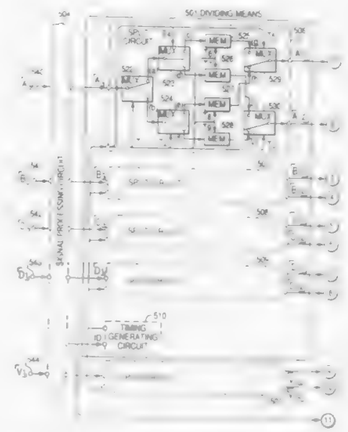


substantially orthogonal to the axial direction of said gear shaft.

5,150,261
COMBINED SCREWDRIVER AND MAGNIFYING GLASS
Allan Tsai, 2F, No. 1, Lane 222, Tun-Hua N. Rd., Taipei City, Taiwan
Filed Jul. 24, 1991, Ser. No. 735,087
Int. Cl.[5] G02B 7/02; B25F 1/00
U.S. Cl. 359—810 1 Claim

1. A combined screwdriver and magnifying glass comprising:
a screwdriver having a handle and a shank connected to said handle, said handle including a top end, a hollow casing detachably mounted on said top end, and a plurality of screws received in said hollow casing;
a block member made of elastic material detachably and frictionally sleeved around said shank, said block, member having an upper portion having an annular groove and a lower portion below said annular groove, said lower portion providing an added axial length and an added contact surface between said block member and said shank for increasing a retaining force between said block member and said shank, said lower portion having a cross-section smaller than that of said upper portion in order to compensate for the increased resistance resulting from said added axial length and said added contact surface; and
a magnifying glass sleeved around said block member and engaged in said annular groove.

5,150,262
RECORDING METHOD IN WHICH RECORDING SIGNALS ARE ALLOCATED INTO A PLURALITY OF DATA TRACKS
Nobuo Hosokawa, Ikeda, and Shigekazu Togashi, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 11, 1990, Ser. No. 476,496
Claims priority, application Japan, Oct. 13, 1988, 63-257578
Int. Cl.[5] G11B 5/09
U.S. Cl. 360—48 2 Claims



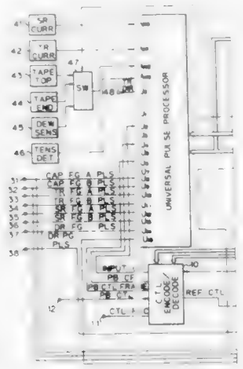
1. A method of recording comprising the steps of:
dividing data of each of a plurality of frames including video signals and a plurality of channels of audio signals of signals to be disposed among a plurality of the same source signals into a plurality of divided data independent from other data to be recorded on a recording medium;
dividing each of a plurality of tracks provided on the recording medium into a plurality of sectors along the longitudinal direction thereof, onto which the divided data are separately and optionally recorded so as to be subsequently changed by other divided data during the editing of data; and
recording each of the divided data onto each of the sectors in such a manner that each of the divided data relating to the same kind of source signals as arranged in succession within at least more than two of the sectors of tracks which are positioned adjacent to each other in the direction of moving the recording medium so as to form an editing data unit consisting of the same kind of source signals which is adapted to be scanned by at least more than two heads at the same time during the editing of data.

5,150,263
TAPE TENSION SERVO-SYSTEM FOR VIDEO TAPE RECORDING AND/OR REPRODUCING APPARATUS
Hitoshi Sakamoto, and Toshiaki Kojima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 23, 1990, Ser. No. 512,412
Claims priority, application Japan, Apr. 25, 1989, 1-104895
Int. Cl.[5] G11B 15/467, 15/43
U.S. Cl. 360—69 11 Claims

1. In a video tape recording and/or reproducing apparatus having a rotary mechanism rotated by a respective drive means in a manner to vary a characteristic of the apparatus which influences the recording and/or reproducing of video signals in slant tracks on a tape during longitudinal advancement of the tape; a servo-system for controlling said characteristic comprising:

measuring means for measuring a value of said characteristic and providing a correspondi g measured signal comprised of pulses;

signal processing means comprising pulse I/O means for receiving said pulses from sa d measuring means, an arithmetic logic unit (ALU), a plurality of data registers, function table means for storing a plurality of functions, and control means for sequentially reading out and decoding



the stored functions, said decoded functions controlling said pulse I/O means, said ALU and said data registers so as to process said pulses and provide a respective error signal; and

a central processing unit receiving said error signal and generating a corresponding control signal applied to said drive means for controlling the latter in the sense to restore said characteristic to desired value.

5,150,264

SAFETY DEVICE FOR CONTROLLABLY DRIVING THE CASSETTE HOLDER OF A VIDEO CASSETTE RECORDER SUBJECTABLE TO OVERLOAD

Toshiya Nakabayashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

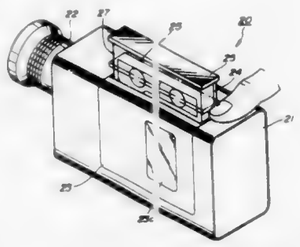
Filed Nov. 14, 1990 Ser. No. 613,135

Claims priority, application Japan, Aug. 30, 1988, 63-215501; Aug. 30, 1988, 63-215502

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] G11B *15/00, 15/18, 15/60*

U.S. Cl. 360—71 **6 Claims**



1. Video cassette loading apparatus, comprising: a cassette holder movable between a cassette receiving position and a retracted position; controllable loading means for driving said cassette holder between said positions; detecting means for detecting abnormal operation of said loading means caused by an overload; and protection means coupled to said loading means for controlling the operation of said loading means to alleviate said overload by reducing a driving force exerted on said cassette holder without removing said driving force and, if the reduction in the driving force on said cassette holder fails to alleviate said overload, to selectively stop driving of said cassette holder or reverse the direction of said driving of the cassette holder.

5,150,265

TAPE TENSIONING DEVICE FOR TAPE RECORDER

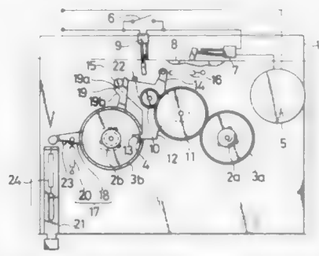
Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1990, Ser. No. 565,459

Claims priority, application Japan, Jan. 31, 1990, 2-21201

Int. Cl.[5] G11B *15/18, 5/008;* **B65H** *59/38*

U.S. Cl. 360—71 **6 Claims**



1. A tape recorder and tape tensioning device combination comprising

a tape recorder including:

a pair of first and second reel spindles,

a cassette detection switch closable responsive to loading of a tape cassette on the first and second reel spindles,

a motor switch closable by an operation for the selection of a desired operation mode, and

a tape driving motor connected in series to a power source via the cassette detection switch and the motor switch, whereby rotation of the tape driving motor is transmitted to one of the first and second spindles in association with the operation-mode selecting operation to set the desired operative mode; and

a tape tensioning device including

a normally-ON tape-slack-elimination detecting switch connected in parallel with the motor switch,

a drive gear provided for rotation by the tape driving motor,

a movable member provided for movement between a first position and a second position,

a brake means movable in association with a movement of the movable member so that when the movable member is at the second position, said brake means engages a drive system for the first reel spindle to inhibit rotation of the first reel spindle but, when the movable member is at the first position, said brake means is maintained out of engagement with the drive system for the first reel spindle to permit the first reel spindle to rotate,

a tape slack eliminating gear supported on the movable member, the tape slack elimination gear being selectively engageable in a rotation transmitting route extending between the drive gear and the second reel spindle to transmit the rotation of the drive gear to the second reel spindle, such that the tape slack eliminating gear engages with the rotation transmitting route when the movable member is at the second position and disengages from the rotation transmitting route when the movable member is at the first position,

a holding means for further moving the movable member toward the first position when, as a result of termination of rotation of the second reel spindle, the tape slack eliminating gear has been disengaged from the rotation transmitting route and the movable member has moved toward the first position, whereby the tape slack eliminating gear is moved out of the rotation transmitting route to cut off the

rotation transmitting route and also to hold the movable member at the first position,

a switch operating portion movable responsive to a movement of the movable member so that, when the movable member is held at the first position, the switch operating portion turns off the tape-slack-elimination detecting switch, and

a reset means for releasing said holding means in association with unloading of the tape cassette from the first and second reel spindles, thereby moving the movable member to the second position.

5,150,266

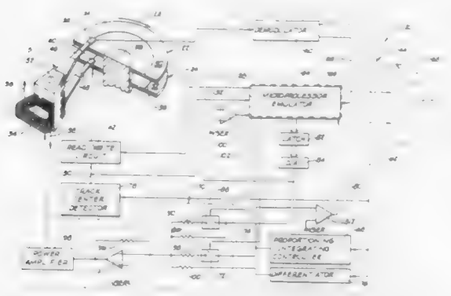
HARD DISK DRIVE ADAPTATION BASED ON APPROACH TIME MEASUREMENT

Glenn D. Albert, Yukon, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Apr. 30, 1990, Ser. No. 516,294

Int. Cl.[5] G11B *5/55, 19/04*

U.S. Cl. 360—78.04 **11 Claims**



10. A method for minimizing the time for commencement of reading from or writing to a data track on a rotating data storage disk of a hard disk drive by a magnetic head following movement of the head to a selected track, comprising the steps of:

measuring an approach time for the head to traverse a preselected distance proximate the selected data track as the head approaches the data track; and

commencing reading or writing of data at the end of a delay time, measured from completion of the traversal of said preselected distance, selected in relation to the measured approach time.

5,150,267

DISC DRIVE GASKET AND METHOD OF FORMING SAME

Ronald F. Reinisch, Soquel, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

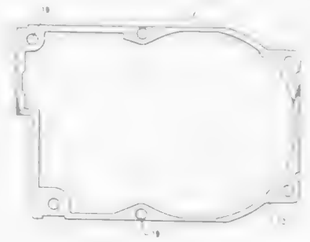
Continuation-in-part of Ser. No. 518,219, May 3, 1990. This application May 2, 1991, Ser. No. 694,668

Int. Cl.[5] G11B *33/14*

U.S. Cl. 360—97.020 **22 Claims**

1. In a disc drive system having a recording media within a sealed housing having top and bottom casing members, a read/write head for transferring information between said recording media and an external system and a head positioner assembly for locating said head relative to said recording media, the improvement comprising a gasket for sealing a connection between said top and bottom casing members, said gasket including:

a liner sheet for lateral stability during thermo cycling; and



opposing layers of a foam material formed on said liner sheet, said foam material consisting of a foamable radiation cured cross-linked polymer.

5,150,268

HEAD CLEANING DEVICE FOR DISK-TYPE DATA STORAGE UNIT

Nobuaki Abe, and Yuichi Kurosawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,222

Claims priority, application Japan, Feb. 2, 1990, 2-22032

Int. Cl.[5] G11B *5/41*

U.S. Cl. 360—128 **9 Claims**

1. A head cleaning device for use with a data storage unit having a drive member for rotating a data storage disk and read/write head for accessing the data storage disk, said head cleaning device comprising:

a) a cleaning disk for wiping said read/write head of said data storage unit;

b) a jacket storing said cleaning disk;

c) said jacket having an opening for allowing said cleaning disk to contact said read/write head through said opening;

d) connecting means for drivingly connecting the drive member of said data storage unit to said cleaning disk; and

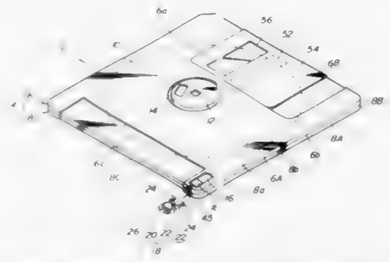
e) said connecting means comprising a first end operatively and detachably connectable to the drive member of said data storage unit and a second end operatively connected to said cleaning disk, and being responsive to rotative drive power from the drive member of said data storage unit, said connecting means comprising means for rotating said cleaning disk about its own axis and moving said axis of said cleaning disk with respect to said jacket.

5. A head cleaning device for cleaning a read/write head of a disk data storage unit, comprising:

a rotatable cleaner for slidably contacting the read/write head; and

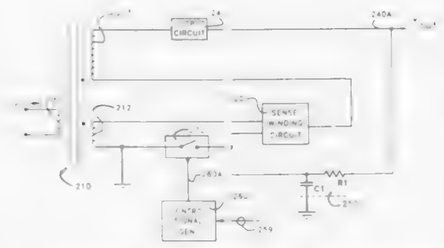
means for rotating said cleaner about an axis while translating said axis in a direction generally transverse to said axis.

5,150,269
DISK CARTRIDGE WITH WRITE PROTECT MECHANISM
Yuji Iwaki, and Masanori Funaya na, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 6, 1990, Ser. No. 609,592
Claims priority, application Japan, Nov. 14, 1989, 1-295589
Int. Cl.[5] G11B 23/03
U.S. Cl. 360—133 10 Claims



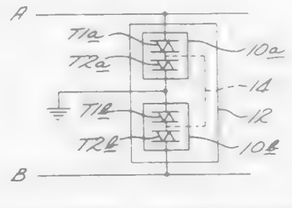
1. A disk cartridge with a write protect mechanism comprising:
a cassette casing for rotatably housing a recording medium disk therein, the cassette casing including a first half and a second half, each of which have upstanding peripheral side walls and wherein the sidewalls of the first half abut against the side walls of the second half;
a manually operable write protect tab;
a housing space provided in the cassette casing for movably receiving the manually operable write protect tab therein to allow the write protect tab to slide between different indicating positions wherein a first side wall of the first half and an abutting, second side wall of the second half each have a first recess and second recess, respectively, therein which together form an opening from the housing space to the outside of the cassette casing;
wherein the first and second sidewalls at least in the vicinity of the opening are elastically deformable and the opening is dimensioned to allow insertion of the write protect tab into the housing space subject to elastic expansion of the opening as the write protect tab is inserted into the opening so as to capture the inserted write protect tab within the housing space one the write protect tab is fully inserted into the housing space.

5,150,270
TRANSFORMER CIRCUIT AND METHOD WITH SATURATION PREVENTION
Leonard Ernst, Boonton, and David Quam, Stanhope, both of N.J., assignors to Dowty RFL Industries, Inc., Boonton, N.J.
Filed Mar. 1, 1991, Ser. No. 662,728
Int. Cl.[5] H02H 3/00
U.S. Cl. 361—64 23 Claims



1. A transformer circuit apparatus for receiving an input signal and generating an output signal representative of the input signal, comprising:
a transformer having a primary winding for receiving said input signal, a sense winding, and a feedback winding;
first circuit means, coupled to said sense winding and responsive to the magnetic flux sensed by the sense winding, for applying a signal to the feedback winding that tends to reduce the flux sensed by the sense winding;
means coupled to said sense winding for producing an output signal as a function of the magnetic flux sensed by the sense winding;
feedback circuit means, including a low-pass filter, for feeding back a signal that depends on said output signal to said first circuit means;
means for determining the presence of input signal offsets, and for generating offset indication signals in response thereto; and
control means responsive to the offset indication signals for controlling said low-pass filter.

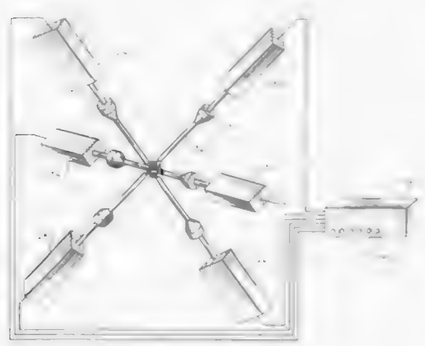
5,150,271
TELECOMMUNICATION EQUIPMENT PROTECTOR
Diethard Unterweger, Plainville; Pravin N. Popat, Norton, and Ronald J. Candelet, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 21, 1990, Ser. No. 570,579
Int. Cl.[5] H02H 9/00
U.S. Cl. 361—119 10 Claims



1. A high voltage transient protector for telecommunication equipment coupled to a ring line, tip-line and common line comprising first and second solid state chips, each chip having four laterally disposed protector sections, two for positive voltage protection and two for negative voltage protection, the chips having a bottom portion electrically connected to all four sections, a dual-in-line lead frame, a first portion of the lead frame forming a heat sink member, the bottom portion of the first and second chips mounted on and electrically bonded to the first portion of the lead frame, first and second current carrying positive temperature coefficient of resistivity elements electrically bonded to other electrically separated portions of the lead frame and to the first and second protection sections respectively, and plastic encapsulant encasing the chips, resistance elements and lead frame with a plurality of leads extending from the lead frame out of the encapsulant.

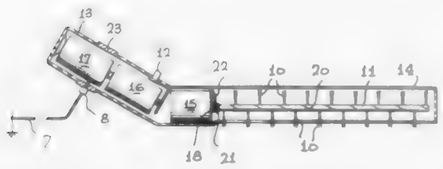
5,150,272
STABILIZED ELECTROMAGNETIC LEVITATOR AND METHOD
Thomas J. Danley, Highland Park, and Charles A. Rey, Naperville, both of Ill., assignors to Intersonics Incorporated, Northbrook, Ill.
Filed Mar. 6, 1990, Ser. No. 489,372
Int. Cl.[5] H02N 15/00
U.S. Cl. 361—144 13 Claims

1. A device for stabilized electromagnetic levitation of an object having at least some conductivity, said device comprising a plurality of separate conductive coils located around the object, and power amplifier means for supplying each of the coils with alternating current at more than one frequency



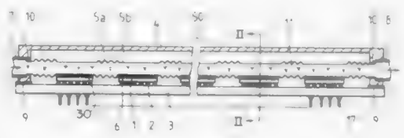
simultaneously and at sufficient power to enable levitation of the object between the coils.

5,150,273
DEVICE FOR REMOVING DUST, LINT AND STATIC CHARGE FROM FILM AND PLASTIC SURFACES
Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356
Filed Jan. 17, 1991, Ser. No. 642,864
Int. Cl.[5] H05F 3/00
U.S. Cl. 361—221 12 Claims



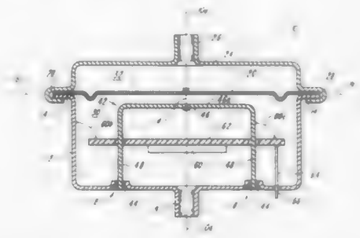
1. A dust, lint and static charge removing device comprising:
a housing means for supporting the components of the device and having a handle means for holding the device, wherein the handle means supports a first electrical conduction means on its external surface, said first electrical conduction means being positioned such that it makes contact with the hand of the person holding the device, said first electrical conduction means having electrical continuity with the fiber tufts of the rotor means,
a rotatable shaft means mounted on bearing means within the housing means, said shaft means supporting a plurality of spaced apart electrically conductive fiber tufts, said fiber tufts projecting radially from said shaft means,
second electrical conduction means which provides electrical continuity between the fiber tufts of said shaft means and to a terminal connection on the housing means,
a third electrical conduction means from the terminal connection the housing means to an earth ground,
a motor means for rotating the shaft means,
a power source means for providing power for the motor means,
a switch means for selecting the direction of rotation of the motor means,
a switch means for turning the motor means on and off.

5,150,274
MULTI-CHIP-MODULE
Kenichi Okada, Yokohama; Kyoko Amemiya, Kouhoku; Takao Terabayashi, Yokohama; Hideaki Sasaki, Hadano; Kuninori Imai, Tsukui, and Shinichi Kazui, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 9, 1991, Ser. No. 727,042
Claims priority, application Japan, Jul. 11, 1990, 2-181451
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—382 8 Claims



1. A multi-chip-module comprising:
a plurality of chips in which each is provided with terminals;
a cooling system provided with a coolant supply pipe including an arrangement of straight tube sections and flexible bellows sections alternately disposed in an axial direction thereof, said straight tube sections of said coolant supply pipe being joined metallically to upper faces of said plurality of chips;
a multilayer circuit board electrically connected with said terminals of said plurality of chips; and
I/O leads mounted on said multilayer circuit board and provided as external electrical terminal connections of said plurality of chips.

5,150,275
CAPACITIVE PRESSURE SENSOR
Shih-Ying Lee, Lincoln, and Sen Z. Li, Acton, both of Mass., assignors to Setra Systems, Inc., Acton, Mass.
Filed Jul. 1, 1991, Ser. No. 723,372
Int. Cl.[5] H01G 7/00
U.S. Cl. 361—283 15 Claims



1. A capacitive pressure sensor comprising:
A. a diaphragm having an electrically conductive central portion and having a first side and a second side,
B. a first rigid concave base member extending about a central axis, and having peripheral rim lying in a first plane, said first plane being perpendicular to said central axis,
C. means for securing the periphery of said diaphragm to said rim of said first base member whereby said diaphragm is nominally planar and said diaphragm periphery lies substantially in said plane, whereby said first base member and said diaphragm define a substantially closed first region housed in part by said first side of said diaphragm,
D. first electrode assembly fixedly coupled to said first base member and including a substantially planar electrically conductive surface in said first region and substantially parallel to and separated by a gap, d, from said first side of

said diaphragm, wherein said first electrode assembly includes:

(i) a set of n apertures extending through said first base member, where n is an integer greater than or equal to 2,

(ii) a first rigid, electrically conductive electrode including said substantially planar conductive surface and including n elongated leg portions extending away from said conductive surface and angularly offset therefrom, and extending through associated ones of said n apertures in said first base member,

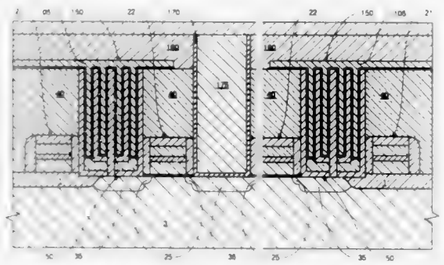
(iii) securing means for securing said leg portions in the respective ones of said associated apertures to the first base member whereby said first electrode is electrically insulated from said diaphragm, and said first region is pneumatically separate from a second region adjacent to the second side of said diaphragm.

5,150,276

METHOD OF FABRICATING A VERTICAL PARALLEL CELL CAPACITOR HAVING A STORAGE NODE CAPACITOR PLATE COMPRISING A CENTER FIN EFFECTING ELECTRICAL COMMUNICATION BETWEEN ITSELF AND PARALLEL ANNULAR RINGS

Fernando Gonzalez, and Larry D. Comar, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 24, 1992, Ser. No. 826,903
Int. Cl.[5] H01G 4/06; H01L 21/70; G11C 7/00
U.S. Cl. 361—313 47 Claims



1. A method for fabricating a capacitor in a semiconductor comprising:

a) forming a dielectric isolation interlayer to overlie previously fabricated semiconductor structures and a substrate of said semiconductor device;

b) forming an opening in said interlayer to expose a contact area of said substrate;

c) depositing in said opening an initial conductive layer to overlie said interlayer, said previously fabricated structures, and said contact area;

d) alternately depositing alternating layers, said alternating layers including at least one alternate insulative layer and at least one alternate conductive layer to overlie said initial conductive layer, said alternate depositing initiated with an alternate insulative layer and terminated with a final alternate conductive layer

e) forming a masking pattern by depositing a masking insulative layer to overlie said final conductive layer, such that a channel is retained in said opening, said channel defined by sidewalls including said masking insulative layer, said sidewalls forming said masking pattern;

f) extending said channel in a direction toward said substrate by anisotropically insitu etching according to said masking pattern, at least said masking insulative layer and said alternating layers to expose at least said initial conductive layer;

g) forming a conductive fin in said channel, to overlie said masking pattern, said fin capable of electrical communication with said initial and said alternate conductive layers, thereby said initial and alternate conductive layers and said fin capable of functioning as a first capacitor plate upon completion of the fabrication of the capacitor;

h) exposing said alternate and said masking insulative layers;

i) etching at least a portion of said alternate and masking insulative layers, said etching creating cavities and exposing vertical portions of said initial and alternate conductive layers and vertical portions of said fin;

j) blanket depositing a dielectric layer to overlie at least said initial and alternate conductive layers and said fin; and

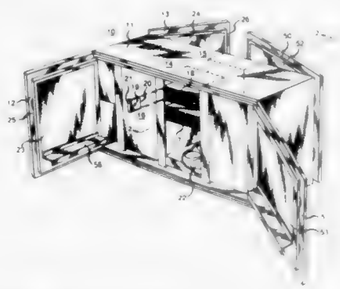
k) blanket depositing a cell conductive layer to overlie said dielectric layer, said cell conductive layer capable of functioning as a second capacitor plate, said dielectric layer capable of electrically insulating said first and second capacitor plates one from the other.

5,150,277

COOLING OF ELECTRONIC EQUIPMENT CABINETS

Gary D. Bainbridge, Sparta, and Stephen J. Palaszewski, Chester, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 519,050, May 4, 1990, abandoned. This application Jul. 6, 1991, Ser. No. 742,210
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—384 11 Claims



1. A cabinet (10), comprising:

a fan (22) mounted to said cabinet so as to be capable of drawing air in a vertical direction;

means for providing recirculation of the air in a vertical direction opposite to the direction of air drawn by the fan, said means including a plate member (23) mounted to the inside of a door of said cabinet to form a duct (25) for recirculation of the air adjacent to a surface of said door so as to provide cooling of the air by said surface of the door, the fan being mounted to be capable of blowing air into the duct;

a plurality of shelves (17, 18) mounted to said cabinet with a side positioned adjacent to said plate member and vertically spaced from said fan; and

a heat exchanging element (30) mounted to said cabinet and positioned adjacent to a side of said shelves opposite to said door.

5,150,278

FINNED HOUSING

Kenneth W. Lynes, and Zdenek Nepovim, both of Lindsay, Canada, assignors to J. E. Thomas Specialties Limited, Ontario, Canada

Filed Apr. 16, 1991, Ser. No. 700,844
Int. Cl.[5] H05H 7/20
U.S. Cl. 361—386 18 Claims

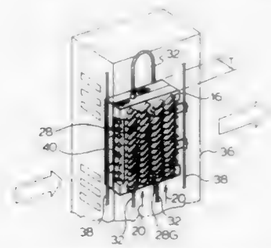
1. A housing for electrical components having a generally planar metal wall defining a longitudinal dimension greater than a width dimension comprising:

metal fins projecting outwardly from the outside surface of said wall,

said fins being arranged in rows with said rows spaced from each other along their lengths to define row channels,

said fins in respective rows being spaced by gaps,

the arrangement of said gaps in the respective row providing approximately aligned angle channels across a plurality of rows at an angle of 30°–60° to said row channels,



said fins and gaps being arranged to provide that said angle channels are generally parallel to said longitudinal dimension;

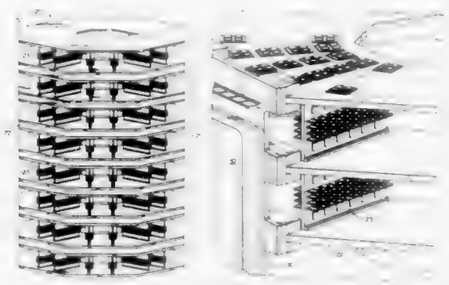
said row channels and angle channels being open at the end to allow easy ingress and egress of air having flow directions generally parallel to said outside surface.

5,150,279

HIGH PERFORMANCE COMPUTER SYSTEM WITH PLATTERS AND UNIDIRECTIONAL STORAGE MODULES THEREBETWEEN

Clive A. Collins, Poughkeepsie, and James A. McDonald, Newburgh, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1991, Ser. No. 671,057
Int. Cl.[5] H05K 7/12, 7/20; H02B 1/56; G11C 5/06
U.S. Cl. 361—393 20 Claims



1. A high performance computer system comprising:

a plurality of platters positioned parallel to each other, each of said platters including input or output lines and memory request or memory response switches coupled to said lines;

unidirectional storage modules positioned between adjacent platters and electrically connected between said memory request and memory response switches on said adjacent platters and defining unidirectional memory access and response flow between said adjacent platters; and

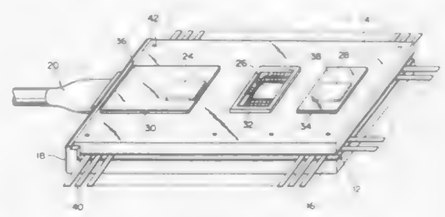
processors connected to peripheral edges of said platters and coupled to said input and output lines.

5,150,280

ELECTRONIC CIRCUIT PACKAGE

Yasunari Arai, Tokyo; Hiroshi Hamano, Kawasaki; Izumi Amemiya, Yokohama; Takuji Yamamoto, and Takeshi Ihara, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 8, 1990, Ser. No. 564,345
Claims priority, application Japan, Aug. 11, 1989, 1-206634; Nov. 28, 1989, 1-306720; Jan. 17, 1990, 2-6417
Int. Cl.[5] H05K 1/18; H01L 23/48
U.S. Cl. 361—401 30 Claims



15. An electronic circuit package, comprising:

first and second conductive metal members, and

a circuit board disposed between said first and second metal members and having a cutout in which an electronic circuit part is accommodated, and wherein said circuit board has a plurality of such cutouts,

wherein said first metal member has openings at locations corresponding to said cutouts of said circuit board, and said second metal member has spaces at locations corresponding to said cutouts, to which such electronic circuit parts are to be secured,

wherein each of said openings is covered with a lid member made of a metal,

wherein said circuit board includes a first insulator layer having conductor patterns formed on a surface thereof, and a second insulator layer adhered or stuck to said first insulator layer in such a manner as to cover over said conductor patterns except edge portions of an outer periphery of said circuit board and edge portions of said cutouts,

wherein said conductor patterns include signal strip lines having end portions exposed on a pair of opposing edge portions of each of said cutouts, DC or low speed lines having end portions exposed on edge portions of each of said cutouts opposing to said edge portions of said outer periphery of said circuit board, and ground patterns formed in areas other than areas in which said signal strip lines and DC or low speed lines are formed such that said ground patterns do not contact with any of said signal strip lines and DC or low speed lines,

wherein each of the electronic circuit parts is an IC chip, and portions of said signal strip lines on said edge portions of said cutouts are connected to high speed signal input/output ports of the IC chips while portions of said DC or low speed lines on said edge portions of said cutouts are connected to low speed signal input/output ports and power supply ports of said IC chips and portions of said signal strip lines and/or DC or low speed lines on said edge portions of said outer periphery of said circuit board are connected to package leads,

wherein a metal block is interposed between each of said IC chips and an edge portion of a corresponding one of said cutouts on which said edge portions of said DC or low speed lines are exposed and is secured to said second metal member, and a ground port of a corresponding one of said IC chips is connected to said metal block,

wherein a large number of via-contacts extending through said first and second insulator layers to establish connection with said first and second metal members are pro-

vided at least in areas of said ground patterns in the neighborhood of said signal strip lines, and

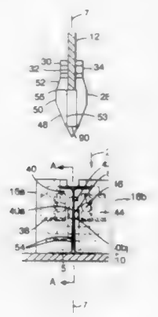
wherein an optical fiber is introduced into the inside of one of said cutouts.

5,150,281

FLEXIBLE CIRCUIT EDGE BOARD CONNECTOR

Mark J. Owens, Phoenix, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Sep. 7, 1990, Ser. No. 579,303
Int. Cl.[5] H01R 23/70
U.S. Cl. 361—413 20 Claims



1. A connector system for electrically connecting a first circuit board to electrical contacts on a second circuit board by means of a flexible printed circuit, comprising:

a receptacle structure mounted on said first circuit board, having an insertion axis and carrying a flex circuit, the flex circuit having a stationary connection to contacts on said first circuit board and a moveable portion comprising an area having electrical contacts moveable between first and second positions, said area of said flexible circuit being oriented generally parallel with said insertion axis,

said first position being one in which said moveable flex portion is positioned sufficiently close to said insertion axis to cause a non-electrical engagement of contacts on said flex circuit to an opposing portion of said receptacle structure,

said second position being one in which said moveable flex circuit portion is spaced from said insertion axis sufficiently to avoid any engagement of contacts on said flex circuit with said opposing portion of said receptacle structure,

biasing means associated with said moveable portion to press the flex circuit toward said first position,

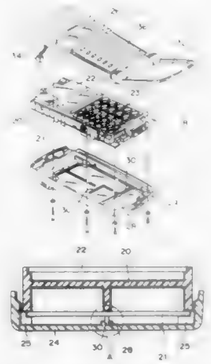
and cam means associated with said second circuit board, effective during insertion of the second circuit board along said insertion axis to position the moveable portion toward the second position during insertion to avoid engagement of respective second circuit board contacts with said moveable portion contacts, and toward the first position after insertion to enable engagement of said second circuit board contacts with said moveable portion contacts.

5,150,282

ELECTROMAGNETIC SHIELDING STRUCTURE OF HIGH-FREQUENCY CIRCUIT ARRANGEMENTS

Masashi Tomura, and Hisamitsu Takagi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 24, 1991, Ser. No. 764,724
Claims priority, application Japan, Dec. 14, 1990, 2-410590
Int. Cl.[5] H05K 9/00
U.S. Cl. 361—424 4 Claims



1. An electromagnetic shielding structure of high-frequency circuit arrangements, comprising:

a mounting member at least the surface of which has been treated to provide electrical conductivity:

a printed-circuit board having a ground pattern installed on said mounting member, said printed-circuit board being mounted with a plurality of high-frequency functional circuits;

a molded plastic casing the inside surface of which has been treated to provide electrical conductivity, for housing said mounting member and said printed-circuit board mounted thereon;

a plurality of ribs formed integral with said inside surface of said molded plastic casing, for separating said high-frequency functional circuits mounted on said printed-circuit board, said ribs having a long groove; and

a shielding member pressed in said long groove of said ribs, said shielding member being a flexible solid material at least the surface of which is electrically conductive, and the top end of said shielding member being pressed against said ground pattern of said printed-circuit board to electromagnetically shield each of said high-frequency functional circuits.

5,150,283

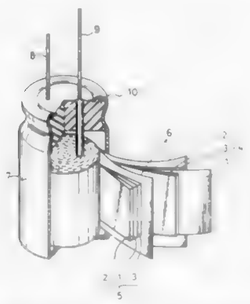
ELECTRIC DOUBLE LAYER CAPACITOR AND METHOD FOR PRODUCING THE SAME

Akihiko Yoshida, Hirakata, and Kiyoaki Imoto, Takaishi, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed Mar. 28, 1991, Ser. No. 676,175
Claims priority, application Japan, Mar. 29, 1990, 2-082401; May 7, 1990, 2-118281; Jul. 6, 1990, 2-180002; Jul. 31, 1990, 2-203288; Oct. 25, 1990, 2-289155
Int. Cl.[5] H01G 9/00
U.S. Cl. 361—502 18 Claims

1. An electric double layer capacitor comprising:

a pair of polarizable electrodes having electrically-conductive substrates coated with layers made of a mixture of activated carbon and at least one of polysaccharides and their derivatives which acts as a binding agent,



a separator interposed between said polarizable electrodes which are facing one other, and

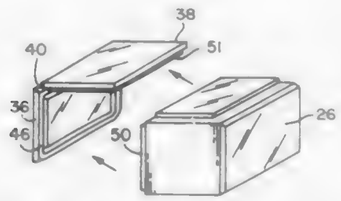
an electrolyte.

5,150,284

TEMPORARY REPLACEMENT SAFETY LIGHT SYSTEM

Frank C. Dobert, Earlton Gayhead Rd., Box 204, Earlton, N.Y. 12058

Filed Jan. 14, 1992, Ser. No. 820,353
Int. Cl.[5] F21L 7/00
U.S. Cl. 362—83.1 9 Claims



1. A temporary safety light replacement system for automotive vehicles comprising:

a safety light having a plurality of sides, said light having a lens on a front side through which the light shines, said lens having a predetermined shape and color;

a self contained energy source within the safety light;

a switch on the safety light for turning the light on and off;

a holder adapted to be secured to the vehicle, said holder having a first and second securing surface to receive the safety light; and

means for connecting said first and second securing surfaces for movement between an open and closed position;

wherein said securing surfaces receive and secure at least two sides of the safety light, and wherein said first and second securing surfaces are adapted to engage and attach to each other holding the holder in the closed position if said safety light is detached from such.

5,150,285

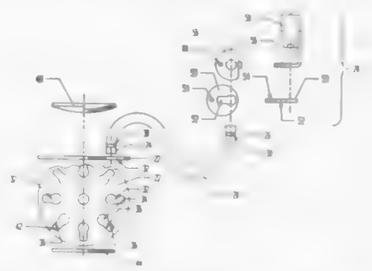
CHANDELIER ASSEMBLIES MADE OF INTERLOCKING COMPONENTS

Arnold Schonbek, Plattsburgh, N.Y., assignor to A. Schonbek & Co., Inc., Plattsburgh, N.Y.

Continuation of Ser. No. 539,606, Jun. 18, 1990, abandoned.
This application Dec. 24, 1991, Ser. No. 814,073
Int. Cl.[5] F21S 1/06
U.S. Cl. 362—405 30 Claims

1. A chandelier framework comprising:

a first plate having plate slots and opposing plate surfaces, arms having arm slots, each arm extending through a respective plate slot, with the arm slot engaging the opposing surfaces of the plate adjacent the respective plate slot, and



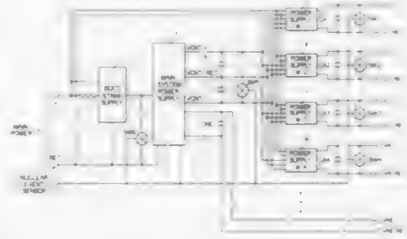
a second plate secured to the first plate and abutting a surface of at least two arms for preventing lateral movement of the at least two arms within the plate slots.

5,150,286

APPARATUS AND METHOD FOR PROTECTING ELECTRONIC CIRCUITRY FROM DAMAGE

Joseph G. Venditto, Jr., Perkasie, and James P. Detweiler, Lansdale, both of Pa., assignors to Performance Controls, Inc., Horsham, Pa.

Filed Mar. 12, 1991, Ser. No. 668,122
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—56 20 Claims



1. Apparatus for protecting electronic circuitry from damage from a particular condition, the circuitry having at least one power supply, the power supply including a transformer, the apparatus comprising:

a) means for sensing the presence of the condition, the sensing means being connected to means for closing a switch in response to presence of the condition,

b) transformer means, connected to the condition sensing means, for generating a pulse in response to a signal from the sensing means, the transformer means being distinct from the transformer of the power supply,

c) means for connecting said pulse to means for temporarily creating a short-circuit across the output of the power supply, and

d) means, responsive to the sensing means, for disconnecting the power supply upon detection of the signal from the sensing means, and for permitting the power supply to re-start when said signal is no longer detected, the means for disconnecting being separate from the means for creating a short-circuit.

5,150,287

QUARTER-BRIDGE CIRCUIT FOR HIGH CURRENTS

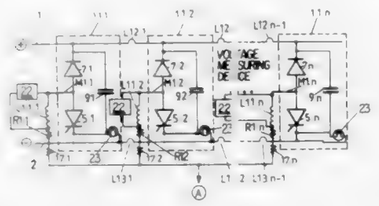
Horst Grüning, Wettingen, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jul. 22, 1991, Ser. No. 733,889

Claims priority, application European Pat. Off., Aug. 2, 1990, 90114824.7

Int. Cl.[5] H02M 7/515

U.S. Cl. 363—135 10 Claims



1. A quarter-bridge circuit for high currents, comprising a plurality of turn-off semiconductor components (**5.1**, . . . , **5.**n; **6.1**, . . . , **6.**n) that can be turned off via a gate in each case and one freewheeling diode (**7.1**, . . . , **7.**n; **8.1**, . . . , **8.**n) each, located opposite a midpoint (**M1.1**, . . . , **M1.**n; **M2.1**, . . . , **M2.**n), so that a total current in the quarter-bridge circuit is subdivided into a plurality of parallel current paths, wherein

a) for each current path essentially one assigned clamping capacitor (**9.1**, . . . , **9.**n; **10.1**, . . . , **10.**n) is arranged in parallel with the freewheeling diode (**7.1**, . . . , **7.**n; **8.1**, . . . , **8.**n) and the turnoff semiconductor component (**5.1**, . . . , **5.**n; **6.1**, . . . , **6.**n) in such a way that the respective freewheeling path has as minimal an inductance as possible overall, and

b) there is provided between a load terminal (**3**) of the quarter-bridge circuit and each midpoint (**M1.1**, . . . , **M1.**n; **M2.1**, . . . , **M2.**n) of the current paths one inductor (**L11.1**, . . . , **L11.**n, **L21.1**, . . . , **L21.**n) each which limits the rate of current rise, so that a current rush caused by an operating delay does not overload the turnoff semiconductor component (**5.1**, . . . , **5.**n; **6.1**, . . . , **6.**n).

5,150,288

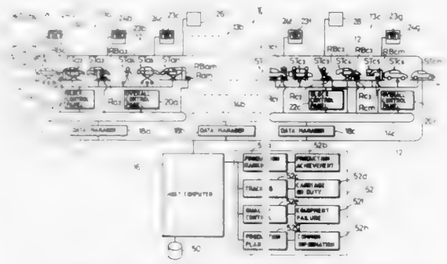
PRODUCTION MANAGEMENT SYSTEM AND METHOD OF TRANSMITTING DATA

Shinji Imai; Hiroshi Hamano; Michio Fujinuma; Chikafumi Shimanaka, and Shinzo Urushidani, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 451,304

Int. Cl.[5] G06F 15/46

U.S. Cl. 364—132 3 Claims



1. A production management system for controlling a production line having a plurality of working stations having respective automatic machines controllable by at least one of sequencers and robot controllers, comprising:

a plurality of pieces of production equipment, each of said pieces of production equipment including at least one of a sequencer and a robot controller, and an automatic machine controllable by said at least one of said sequencer and said robot controller;

read-out means for reading type data applied to workpieces delivered to the production line;

computer means having memories for storing type data and operation pattern data composed of bit trains, said computer means comprising a plurality of slave computers for controlling said at least one of sequencers and robot controllers, and a host computer for controlling said slave computers and supervising common information required by said slave computers, wherein said type data read by said read-out means are transmitted through said host computer to said slave computers, and said slave computers select operation pattern data corresponding to the transmitted type data;

a main network by which said host computer and said plurality of slave computers are interconnected;

a plurality of subnetworks by which said slave computers and said at least one of sequencers and robot controllers are interconnected; and

the system being such that when a workpiece is delivered to the production line, the type data of the delivered workpiece are read by said read-out means and transmitted to said computer means, and said computer means transmits operation pattern data corresponding to the transmitted type data to said at least one of sequencers and robot controllers for controlling the automatic machine, and when said common information is to be modified due to a change in said pieces of production equipment, the common information stored in said host computer is modified into corrected common information, and the corrected common information is transmitted from said host computer to said plurality of slave computers, so that the common information stored in said slave computers can be modified by said corrected information.

5,150,289

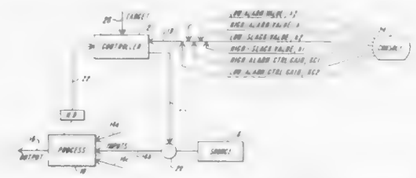
METHOD AND APPARATUS FOR PROCESS CONTROL

Paul C. Badavas, Southboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Jul. 30, 1990, Ser. No. 559,645

Int. Cl.[5] G06F 15/46; G05B 13/02

U.S. Cl. 364—154 39 Claims



1. An apparatus for closed-loop control of a process performed with equipment that responds to a controlled variable signal to vary a first characteristic of that process, said apparatus having the improvement comprising

A. batch monitoring means for monitoring values of a first process characteristic of the process being performed and for generating a signal representative of an arithmetic mean of those monitored values and for generating a signal representative of a standard deviation of those monitored values,

B. normalization means coupled to said batch monitoring means for responding to said mean value-representative signal and to said standard deviation-representative signal to generate an error signal representative of a normalized deviation of said monitored values,

C. drift detection means coupled to said normalization means for responding to said error signal to detect a selected change in said first process characteristic, said drift detection means comprising

i) first accumulation means for generating a high-value accumulation signal representative of a summation of time-successive values of a difference between said error signal and a first slack value, and

ii) second accumulation means for generating a low-value accumulation signal representative of a summation of time-successive values of a difference between an additive inverse of said error signal and a second slack value, which may be independent of said first slack value,

D. process control means coupled to said drift detection means for selectively generating a manipulated variable signal representative of a sum of a prior value of said manipulated variable signal and a scaled one of at least one of said high-value accumulation signal and said low-value accumulation signal, and

E. closed-loop control means for applying said manipulated variable signal to the process-performing equipment to drive the controlled variable signal to a target value.

5,150,290

PROCESSOR ARRAY SYSTEM INCORPORATING N-BIT SCALAR PROCESSOR AND M X M-BIT PROCESSOR ARRAY

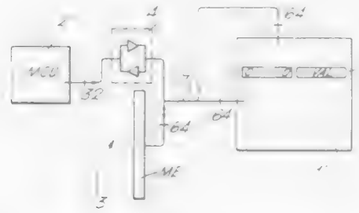
David J. Hunt, Wokingham, United Kingdom RG11 1AZ, assignor to AMT (Holdings) Ltd., Reading, United Kingdom

Filed Aug. 23, 1989, Ser. No. 397,709

Claims priority, application United Kingdom, Aug. 25, 1988, 8820237

Int. Cl.[5] G06F 15/80, 15/16

U.S. Cl. 364—736 4 Claims



1. In a processor array system having an n-bit scalar processor, n-bit scalar processor registers formed in said scalar processor, an m x m-bit processor array, and array support means operatively connected to said scalar processor and processor array, the improvement comprising in combination:

an n-bit wide data path linking said n-bit scalar processor registers to said array support means and an m-bit wide data path linking said array support means to said processor array, where m and n are positive integers and m is an integer multiple of n;

register interface means arranged to interface said n-bit scalar processor registers to said processor array;

an m-bit wide edge register operatively connected to said processor array via said m-bit wide data path; and

address generation means formed in said scalar processor and operatively connected to said register interface means, said address generation means being arranged when in a row-column addressing mode to address a specified row-column of said processor array thereby writing values from one of said n-bit scalar processor registers to n-least significant bit positions of said specified row/column and arranged when in word addressing mode to address a specified one of a plurality of n-bit words of said processor array thereby writing values from one of said scalar n-bit registers to said specified word position.

5,150,291

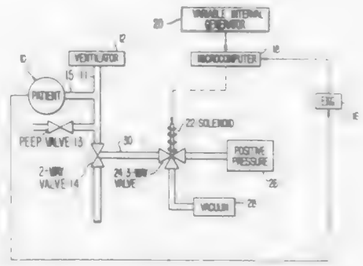
RESPIRATORY VENTILATION APPARATUS

Charles C. Cummings, Towson, Md., and Robert I. Prince, Gainesville, Fla., assignors to Puritan-Bennett Corporation, Carlsbad, Calif.

Continuation of Ser. No. 512,577, Apr. 20, 1990, abandoned, which is a continuation of Ser. No. 845,942, Mar. 31, 1986, abandoned. This application Oct. 1, 1990, Ser. No. 593,324

Int. Cl.[5] G06F 15/42

U.S. Cl. 364—413.03 26 Claims



16. In a respiratory ventilation apparatus having a ventilator and a primary means for producing a pressure or volume supported breath cycle alternatingly providing a patient breathing pathway with a relatively high positive ventilation pressure and a relatively low positive ventilation pressure, the improvement comprising:

means for detecting heart beats in a plurality of cardiac cycles of said patient, including means for generating an electrical heart beat signal in response to said heart beat, and amplifying means for squaring said electrical heart beat signal;

secondary means for producing said relatively low positive ventilation pressure in said patient breathing pathway commencing at a variable moment following a detected heart beat for a variable time interval during selected cardiac cycles; and

means for determining said variable moment.

5,150,292

METHOD AND SYSTEM FOR DETERMINATION OF INSTANTANEOUS AND AVERAGE BLOOD FLOW RATES FROM DIGITAL ANGIOGRAMS

Kenneth R. Hoffmann, Chicago, and Kunio Doi, Hinsdale, both of Ill., assignors to Arch Development Corporation, Chicago, Ill.

Filed Oct. 27, 1989, Ser. No. 428,059

Int. Cl.[5] G06F 15/00

U.S. Cl. 364—413.07 24 Claims

1. A method for automated measurement of instantaneous and average blood flow rates using a digital X-ray image, comprising the steps of:

generating a sequence of digital X-ray images of an object as a contrast material is injected into the object;

storing said images;

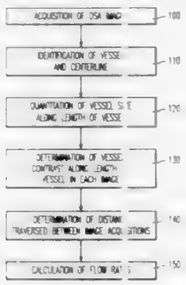
identifying opacified vessels in each of said images;

measuring selected vessel parameters, including vessel size, contrast, and position, of the opacified vessels identified in said identifying step;

identifying the same vessel in different of said images;

deriving vessel longitudinal density curves representing vessel contrast as a function of one of longitudinal distance or volume along the length of said vessel based on the measured vessel contrast;

correlating said density curves from different images to measure one of distances or volumes traversed by said contrast material as a function of time; and



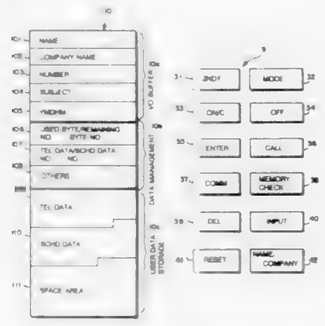
calculating at least one of instantaneous and average flow velocities and flow rates in said vessels from the measured one of distances or volumes and said measured vessel parameters.

5,150,293

SMALL ELECTRONIC MEMO DATA STORAGE, DISPLAY AND RECALL APPARATUS

Kaoru Murata, Nara, and Eichiki Matsuda, Yamatotakada, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 18, 1990, Ser. No. 539,818
Claims priority, application Japan, Jun. 20, 1989, 1-157958; Jun. 30, 1989, 1-170484; Jun. 30, 1989, 1-170485
Int. Cl.[5] G06F *15/38, 15/20, 00/00*
U.S. Cl. 364—419 **7 Claims**



1. In a small electronic memo data storage, display and recall apparatus capable of storing a plurality of numeric strings in a RAM, said apparatus including, for each of said stored numeric strings,

a first associated but separately addressable portion of said RAM for storing a first character string related to and associated with each stored numeric string, and

a second associated but separately addressable portion of said RAM for storing a second character string also related to and associated with each stored numeric string.

6. A method for selectively accessing one of a plurality of numeric strings stored in an electronic memory correspondingly related to a plurality of separately addressable related character strings stored in said electronic memory, said method comprising the steps of:

(i) searching at least one set of related character strings using a first search criteria, and

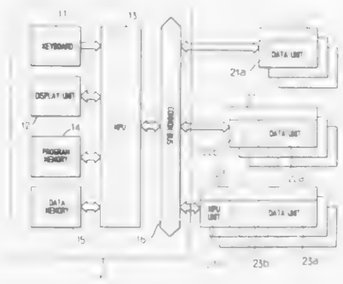
(ii) selectively continuing to search at least one set of said related character strings using a second search criteria, wherein said second search criteria includes data recalled as a result of step (i).

5,150,294

PLURAL DICTIONARY APPARATUS WITH AUTOMATIC RETRIEVAL FROM MORE THAN ONE PLUG-IN IC DICTIONARY CARD

Masakazu Tateno, Tokyo, Japan, assignor to Fuji Zerox Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,392
Claims priority, application Japan, Sep. 29, 1988, 63-245343
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 **5 Claims**



1. An electronic dictionary apparatus comprising:

plural dictionary cards at least comprising data memory means in which respective dictionary data groups have previously been registered for plural dictionaries having different applications;

input means for inputting a header entry desired to be retrieved;

retrieval means for performing a sequential inquiry according to the header entry for all dictionary cards which have a possibility of having dictionary data corresponding to said input header entry among said plural dictionary cards in accordance with the input of said header entry, and sequentially specifying dictionary data corresponding to said input header entry according to a response from each dictionary card, said retrieval means including memory-table means for storing the transferred identifying information as a table, and performing a retrieval about the existence of dictionary cards which have a possibility of having dictionary data corresponding to said input header entry according to the stored identifying information; and

display means for visually displaying said input header entry and the sequentially specified dictionary data, wherein

said plural dictionary cards are individually and removably connected to said retrieval means via a bus line, and said connected dictionary cards previously transfer identifying information relative to own cards to said retrieval means via said bus line.

5,150,295

COMPUTERIZED SYSTEM FOR JOINING INDIVIDUAL MAPS INTO A SINGLE MAP PRODUCT

William Mattingly, Huntsville, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 22, 1990, Ser. No. 526,144
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—420 **12 Claims**

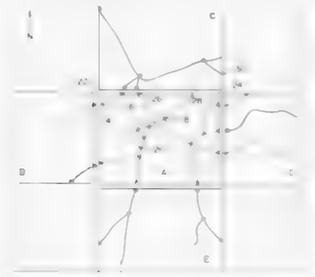
1. A computerized method of producing a map from a plurality of small map sections, said small map sections being in digital line graph format, the method comprising:

(a) receiving data corresponding to geographical features on the earth's surface as raw map data, said raw map data relating to small sections of the earth's surface in digital line graph format;

(b) locating the north, south, east and west border arcs in said raw map data, wherein said border arcs include nodes along the border arc;

(c) converting said raw map data into a format which identifies the latitude and longitudinal coordinates, and a type of map coverage;

(d) edgematching each node along the border arc of one map section to its adjacent map sections by matching the nodes along the border arc with the most closely corresponding node along an adjacent border arc, within a predetermined tolerance distance;



(e) snapping said node of said one map section to said most closely corresponding node along said adjacent border arc;

(f) repeating steps (b), (c), (d), and (e) for each border of said one map section, with its corresponding adjacent border on the adjacent map section;

(g) repeating steps (b) through (f) until all of the edges of the small map sections are matched;

(h) joining said small map sections at the matched edges; and

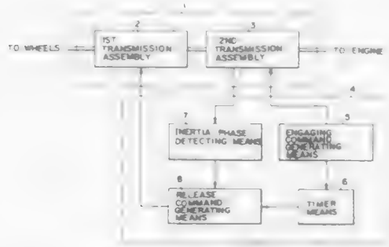
(i) producing a final map product from the joined small map sections.

5,150,296

SHIFT CONTROL SYSTEM AND METHOD FOR AUTOMATIC TRANSMISSION, INCLUDING BOTH A TIMER AND AN INERTIA PHASE START DETECTOR

Kunihiro Iwatsuki; Hiromichi Kimura, and Hideaki Otsubo, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 5, 1990, Ser. No. 577,576
Claims priority, application Japan, Sep. 5, 1989, 1-229638
Int. Cl.[5] B60K *41/06*
U.S. Cl. 364—424.1 **4 Claims**



1. A shift control system for an automatic transmission comprising:

a first transmission assembly comprising means for changing gear ratios therein in accordance with a release or engagement of a first frictional engagement means;

a second transmission assembly connected in series to said first transmission assembly and comprising means for changing gear ratios therein in accordance with an engagement or release of a second frictional engagement means, the second transmission assembly having intervals of gear ratios which are narrower than intervals of the gear ratios of said first transmission assembly, so that a change in the gear ratios of said first transmission assembly by the release of said first frictional engagement means and the change in the gear ratios of said second transmission assembly in an opposite direction to that of said first transmission assembly by the engagement of said second frictional engagement means may be simultaneously accomplished to execute a change in the gear ratio in the transmission as a whole in a direction identical to that of said first transmission assembly;

engagement start commanding means for commanding a start of the engagement of said second frictional engagement means;

timer means for outputting a timer signal after a lapse of a predetermined constant time from the engagement start command from said second frictional engagement means;

detection means for detecting a start of an inertia phase of said second transmission assembly accompanying the engagement start of said second frictional engagement means, from a rotary state of a rotary member in either of said first or second transmission assemblies, to thereby output a detection signal; and

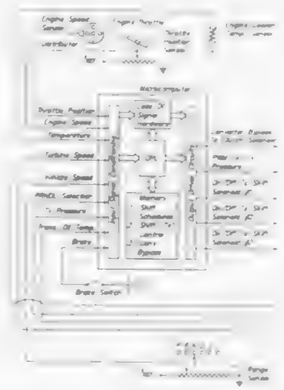
release start commanding means for commanding a start of the release of said first frictional engagement means simultaneously with the first of the timer signal from said timer means and the detection signal from said detection means.

5,150,297

ELECTRONIC SHIFT CONTROLS FOR A MULTIPLE RATIO TRANSAXLE

John A. Daubenmier, Canton; Paul A. Baltusis, Waterford; Ronald T. Cowan, Troy; Joseph E. El-Khoury, Novi, and Roy S. Williams, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 17, 1990, Ser. No. 583,921
Int. Cl.[5] B60K *41/06, 41/22*
U.S. Cl. 364—424.1 **31 Claims**



1. An electronic control system for a multiple-ratio transmission for an automotive vehicle having a throttle controlled engine comprising gearing, pressure operated clutch and brake servos adapted to establish and disestablish multiple ratios, such establishment and disestablishment of said multiple ratios defining ratio shift points, a pressurized valve system comprising a valve circuit having multiple, interactive shift control valve elements that communicate with said servos, each valve element having two pressure distribution positions;

solenoid valve means in said circuit for distributing selec-

tively to said shift control valve elements a fluid pressure signal for actuating said shift control valve elements, each shift control valve element having a separate fluid pressure distribution pattern for each of its two pressure distribution positions;

an electronic processor having a memory portion, said memory portion including information storage registers, shift control information being stored in said storage registers, said information including functional relationships between throttle position and vehicle speed that determine said shift points;

vehicle speed and throttle position sensor means communicating with said processor for developing ratio shift controlling signals for said solenoid valve means, said signals being established by said processor in response to the determination of the functional relationship between the values of sensed speed and throttle position as said shift control information in said memory is addressed;

desired gear determination means for establishing gear ratios in accordance with said functional relationship;

manual vale means for manually selecting a pressure distribution pattern in said valve circuit whereby said shift control valve elements are conditioned for automatic torque ratio selection in any of several ranges of ratios depending upon the magnitudes of the speed and throttle position;

shift command means for commanding a ratio change determined by said desired gear determination means; and

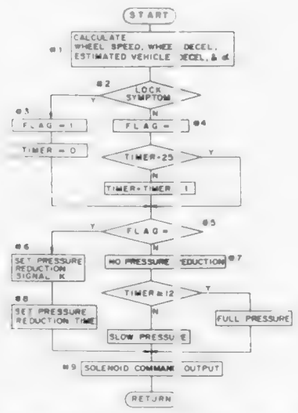
means for controlling the time required to perform a change in ratio in response to a variation in the relative magnitude of said signals to effect optimum shift smoothness, said time controlling means establishing shift time delay values of each ratio step in a range of ratio changes, said processor comprising a central processor control means for sequencing the operation of said time controlling means after a gear ratio is established by said desired gear determination means and before said ratio change is commanded by said shift command means.

5,150,293

BRAKE CONTROL DEVICE IN AN ANTILOCK BRAKE SYSTEM

Hideaki Fujioka, and Yoshio Katayama, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 492,103, Mar. 12, 1990, abandoned.
This application May 10, 1991, Ser. No. 700,885
Claims priority, application Japan, Mar. 13, 1989, 1-60326; Mar. 15, 1989, 1-63295; Apr. 28, 1989, 1-109940
Int. Cl.[5] B60T *8/32*
U.S. Cl. 364—426.02 **15 Claims**



1. A brake control device for use in an antilock brake system for automatically adjusting a valve responsive to an indication of brake locking to reduce a fluid pressure in a brake cylinder to stop brake locking, said brake control device comprising:

means for outputting a pressure reduction signal K, in accordance with wheel deceleration;

pressure detecting means for providing an indication of a current brake cylinder fluid pressure;

means for outputting a compensation value α in accordance with vehicle deceleration, said vehicle deceleration being proportional to said fluid pressure;

means for calculating a solenoid opening coefficient J in accordance with said compensation value α and said pressure reduction signal K; and

means for determining a duty ratio in accordance with said solenoid opening coefficient J, said duty ratio being a time signal indicative of predetermined time periods during which said valve is to be opened and closed to adjust the brake cylinder fluid pressure, the time period during which said valve is opened being larger when said detected current brake cylinder fluid pressure is decreasing, thereby maintaining said predetermined amount of pressure reduction.

5,150,299

ANTILOCK WHEEL SPEED CONTROL DEVICE HAVING FIRST AND SECOND BRAKE PRESSURE CONTROLLERS

Hideaki Fujioka, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

PCT No. PCT/JP89/00035, § 371 Date Sep. 5, 1990, § 102(e) Date Sep. 5, 1990, PCT Pub. No. WO90/08056, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 17, 1989, Ser. No. 576,436
Int. Cl.[5] B60T *8/58*
U.S. Cl. 364—426.02 **3 Claims**

1. A wheel speed control device comprising:

a wheel speed calculating means for calculating a wheel speed Vw of each wheel of a vehicle based on a output Vi of a wheel speed sensor for each wheel;

a vehicle speed calculating means for calculating a vehicle speed Vv;

a wheel speed differentiating means for producing a differentiated output Vd of the wheel speed Vw of said wheel speed calculating means;

a slip speed calculating means for calculating a slip speed Si of said each wheel from the wheel speed Vw of said wheel speed calculating means and the vehicle speed Vv of said vehicle speed calculating means;

a first brake pressure controller for calculating a control variable from the differentiated output Vd of said wheel speed differentiating means and the output Si of said slip speed calculating means and for outputting, based on the results of the thus calculated control variable, a pressure increase, pressure hold or pressure reduction command to a brake control actuator to control a brake pressure on each wheel; and

a second brake pressure controller;

said second brake pressure controller comprising:

(a) a means for judging whether or not said control variable calculated by said first brake pressure controller is between a first threshold value and a second threshold value which is larger than said first threshold value,

(b) a means for judging, if said control variable is judged to between said first and second threshold values, whether or not said slip speed Si is larger than a predetermined threshold value,

(c) a counter means for incrementing a value CTR thereof if said slip speed Si is judged to be equal to or larger than said predetermined threshold value and for decrementing the value CTR thereof if said slip speed Si is judged to be smaller than said predetermined threshold value, and

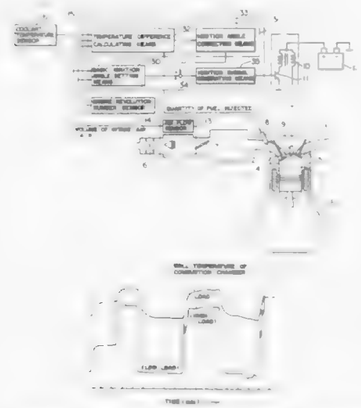
(d) a first pressure increase means for checking the value CTR of said counter means at predetermined time intervals and for issuing a command to hold the brake pressure if CTR≧0 and issuing a command to increase the brake pressure at a low rate if CTR<0, wherein a time duration of each low-rate pressure increase by said first pressure increase means is increased if a current value CTR is smaller than a previous value CTR and decreased if the current value CTR is larger than the previous value CTR, and wherein the time duration of said each low-rate pressure increase by said first pressure increase means is increased or decreased according to a number of times a low-rate pressure increase operation is executed in a previous skid cycle.

5,150,300

IGNITION TIMING CONTROLLER FOR SPARK-IGNITION INTERNAL COMBUSTION ENGINE USING ESTIMATED CYLINDER WALL TEMPERATURE

Yoshiaki Danno, Kyoto; Kazuhide Togai, Osaka; Hiromitsu Ando, Aichi; Jun Takemura, Aichi; Eiichi Koujina, Aichi, and Ichiyo Kojima, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo K.K., Japan

Continuation of Ser. No. 483,504, Feb. 23, 1990, abandoned.
This application Aug. 7, 1991, Ser. No. 742,525
Claims priority, application Japan, Feb. 23, 1989, 1-44162
Int. Cl.[5] F02P *5/14, 5/00*
U.S. Cl. 364—431.03 **20 Claims**



1. An ignition timing controller for a spark-ignition internal combustion engine, said controller comprising:

means for setting the ignition timing of the engine in accordance with the state of operation of the engine;

wherein the ignition timing setting means comprises:

estimating means for estimating and storing at predetermined intervals the wall temperature of a combustion chamber of the engine from a variable which indicates the quantity of combustion energy of the engine, wherein said estimating means corrects a present estimated temperature in accordance with a stored, previous temperature to compensate for a lag in the transfer of heat of combustion to a wall of the combustion chamber, and outputs the thus-corrected, present estimated temperature as a wall temperature of the combustion chamber; and

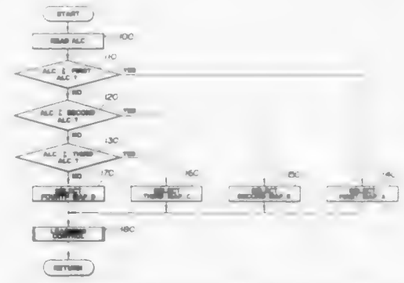
calculating means for calculating the ignition timing from the corrected, present estimated wall temperature of the combustion chamber; and means for actuating an ignition system on the basis of the ignition timing set by the ignition timing setting means.

5,150,301

AIR/FUEL MIXTURE RATIO LEARNING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE USING MIXED FUEL

Masuo Kashiwabara; Hideyuki Kojima; Hiromitsu Yamaura, and Seiichi Otani, all of Gunma, Japan, assignors to Japan Electronic Control Systems Company Limited, Isezaki, Japan

Filed Jun. 29, 1990, Ser. No. 545,528
Claims priority, application Japan, Jun. 29, 1989, 1-165305
Int. Cl.[5] F02M *51/00*
U.S. Cl. 364—431.05 **13 Claims**



1. An air/fuel mixture ratio learning control system for an internal combustion engine using a fuel which contains a first fuel component and a second fuel component, said system comprising:

air/fuel mixture induction means for receiving intake air and said fuel to form an air/fuel mixture to be fed into an engine combustion chamber;

fuel supply means for supplying a controlled amount of said fuel into said induction means;

first sensor means, associated with said fuel supply means, for producing a first signal indicative of concentration of said first fuel component contained in said fuel to be fed into said air fuel mixture induction means from said fuel supply means;

second sensor means for producing a second signal indicative of an air/fuel ratio of said air/fuel mixture;

third means for deriving a basic fuel amount based on a preselected basic engine operation parameter;

fourth means for deriving a first correction coefficient based on said first signal;

fifth means for deriving a FEEDBACK correction coefficient based on said second signal for adjusting said air/fuel ratio to be at a target value during a FEEDBACK mode control of said air/fuel ratio;

sixth means for deriving a second correction coefficient based on said FEEDBACK correction coefficient, said second correction coefficient being derived corresponding to one of a plurality of predetermined engine driving ranges and one of a plurality of predetermined concentra-

tion ranges of said first fuel component contained in said fuel, one of said predetermined engine driving ranges being identified by an instantaneous value of said preselected basic engine operation parameter and one of said predetermined concentration ranges being identified by an instantaneous value of said first signal, said second correction coefficient cyclically derived in a predetermined stable engine driving condition during said FEEDBACK mode control for updating said second correction coefficient previously derived and previously stored corresponding to said predetermined engine driving ranges and said predetermined concentration ranges of said first fuel component, said second correction coefficient being stored after updating corresponding to one of said predetermined engine driving ranges and one of said predetermined concentrations ranges which was used to update said second correction coefficient; and

seventh means for correcting said basic fuel amount to provide a corrected fuel amount based on said first correction coefficient and said second correction coefficient and said FEEDBACK correction coefficient to control said fuel supply means to supply said fuel to said induction means in an amount corresponding to said corrected fuel amount.

5,150,302

DECENTRALIZED CONTROL METHOD FOR CORRUGATOR LINE

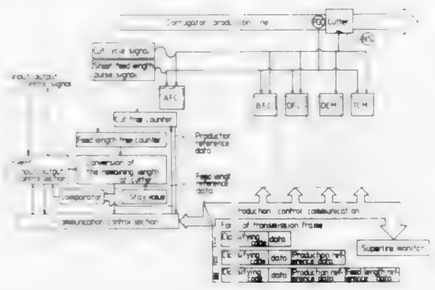
Nokihisa Adachi; Minoru Naito, and Shinji Watanabe, all of Kasugai, Japan, assignors to Isowa Industry Company Ltd., Aichi, Japan

Filed May 30, 1990, Ser. No. 530,514

Claims priority, application Japan, Jun. 3, 1989, 1-141880

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—471 **2 Claims**



2. A decentralized control method for controlling the operation of a corrugator line which is employed for continuously making corrugated boards, comprising the steps of:

bonding a liner to a corrugated medium so as to form a single-faced corrugated board;

bonding another liner to said single-faced corrugated board so as to form a double-faced corrugated board;

cutting said double-faced corrugated board into individual double-faced corrugated board sheets having a predetermined length;

providing a local control unit for each unit process embodied within each one of the preceding process steps for performing synchronized production control of said corrugator line by means of said unit-process local control units which are allotted different operational functions and which are linked together within a multiplex transmission network;

supplying cycle pulses, comprising synchronization signals which serve as a production reference for each one of said local control units and which are obtained when said double-faced corrugated boards are cut to said predetermined lengths, to each one of said local control units for achieving said synchronized production control of said corrugator line by means of said local control units; and

supplying feed length pulses, which serve as sheet feed length reference values and which are obtained from feed length measuring means disposed along a transportation route of said corrugated boards as said corrugated boards are transported along said transportation route, to each one of said local control units for achieving highly accurate synchronized production control of said corrugator line by means of said local control units.

5,150,303

NUMERICAL CONTROL INFORMATION GENERATING APPARATUS AND METHOD FOR DETERMINING MACHINING MODE THEREOF

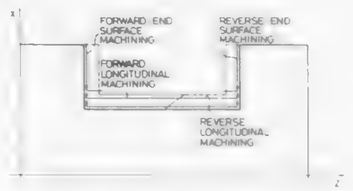
Yasushi Fukaya, and Yuto Mizukami, both of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Mar. 15, 1990, Ser. No. 493,682

Claims priority, application Japan, Mar. 15, 1989, 1-62957

Int. Cl.[5] G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474.14 **9 Claims**



1. A numerical control information generating apparatus for automatically determining machining modes of a numerical control machining device based on data denoting a shape of a starting material and a shape of a finished part, comprising:

means for determining a machining area by comparing the shape of the starting material and the shape of the finished part;

means for dividing the machining area into a forward end surface machining area which can be cut by a forward end surface machining tool, a reverse end surface machining area which can be cut by a reverse end surface machining tool, a forward longitudinal machining area which can be cut by a forward longitudinal machining tool, and a reverse longitudinal machining area which can be cut by a reverse longitudinal machining tool; and

means for determining the machining modes for each of the forward end surface, reverse end surface, forward longitudinal and reverse longitudinal machining areas.

5,150,304

METHOD OF MAKING AN IMPLANTABLE JOINT PROSTHESIS

Rütger Berchem, Essen, and Volkhard Schnitzler, Bochum, both of Fed. Rep. of Germany, assignors to Metalpraecis Berchem + Schaberg Gesellschaft fur Metallformgebung mbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Oct. 25, 1990, Ser. No. 603,632

Claims priority, application European Pat. Off., Oct. 28, 1989, 89120072

Int. Cl.[5] G06F *15/46*; A61F *2/30*

U.S. Cl. 364—474.24 **15 Claims**

1. A method of making an implantable joint prosthesis, comprising the steps of:

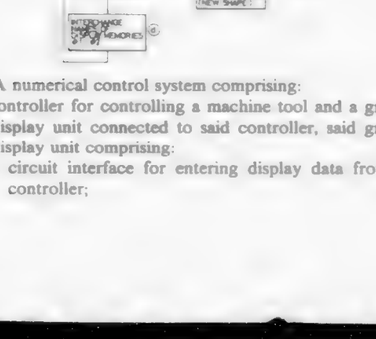
(a) ascertaining the geometry of a bone cavity in a bone adapted to receive an implantable joint prosthesis by scanning said bone by irradiation;

(b) determining a lie of a geometrical centroid axis from the geometry ascertained in step (a);

(c) developing a shaft core region extending along said axis by finite element analysis of said geometry with the boundary conditions

(c_1) that a shaft core formed by said region along said axis must have an undercut-free configuration, and

(c_2) that there must be a uniform stress distribution along said shaft of normal stresses arising in a shaft/bone transition region;



(d) establishing a configuration of a surface region on said core considering condition (c_1) and in accordance with the result of condition (c_2); and

(e) fabricating a shaft of an implantable joint prosthesis with said core and said surface region.

5,150,305

NUMERICAL CONTROL SYSTEM PROVIDING GRAPHIC MACHINING SIMULATION

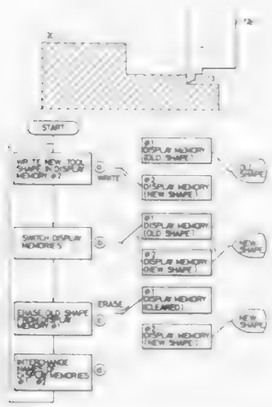
Katsuhide Sekikawa, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Continuation of Ser. No. 309,969, Feb. 13, 1989, abandoned, which is a continuation of Ser. No. 612,948, May 23, 1984, abandoned. This application Nov. 20, 1989, Ser. No. 438,988

Claims priority, application Japan, May 23, 1983, 58-90334

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—474.26 **2 Claims**



1. A numerical control system comprising:

a controller for controlling a machine tool and a graphics display unit connected to said controller, said graphics display unit comprising:

a circuit interface for entering display data from said controller;

a memory for storing said display data through said circuit interface;

a central processing unit for issuing commands to a graphics interface in accordance with said display data;

display memories for storing graphics patterns; and

a CRT for displaying said graphics patterns from said display memories in accordance with said commands;

said central processing unit processing said graphics patterns in said display memories through said graphics so as to display a workpiece shape as a shaded image on said CRT in accordance with a first user selection, a tool shape with said workpiece shape on said CRT in accordance with a second user selection, and movement of said tool shape on said CRT;

said numerical control system further comprising means for machining the workpiece in a simulated fashion in accordance with said movement of said tool shape with respect to said workpiece shape on said CRT so as to change a shape of said shaded image in said display memories based on calculations by said central processing unit;

said central processing unit further processing said graphics patterns so as to remove, from said CRT, an interference area in which a tool tip shape of said tool shape interferes with the workpiece shape displayed as the shaded image as simulated machining of said workpiece by said tool shape proceeds.

5,150,306

CUTTING TOOL STOP-CONTROL APPARATUS

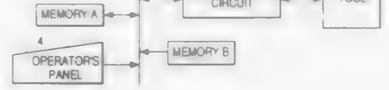
Hideaki Kawamura; Takao Sasaki, both of Hachioji, and Syuji Matsuura, Kodaira, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 391,561, Jul. 21, 1989, abandoned. This application Sep. 30, 1991, Ser. No. 767,560

Claims priority, application Japan, Dec. 3, 1987, 62-306523; PCT Int'l Appl., Nov. 18, 1988, PCT/JP88/01171

Int. Cl.[5] G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474.34 **4 Claims**



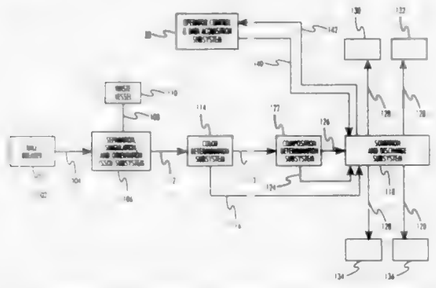
1. A cutting tool stop-control apparatus for bringing a cutting tool to an emergency stop during cycle operation based on a commanded cycle program having plural sequential steps of operation, and restoring said tool to a cycle starting position, comprising:

memory means for storing a plurality of continuance programs, each one being specific to one of the plural sequential steps, for returning said cutting tool to the cycle starting position in accordance with a stopping position at each stage of the cycle operation and each comprising a return optimum sequence of steps;

discriminating means coupled to the memory means for discriminating cycle program operation step upon the occurrence of a stop; and

program control means for calling one of the plurality of continuance programs, which is stored in said memory means, from said cycle program in accordance with a stopping position corresponding to the discriminated cycle operation step, thereby returning the cutting tool to the cycle starting point through the return optimum sequence of steps conforming to the stopping position.

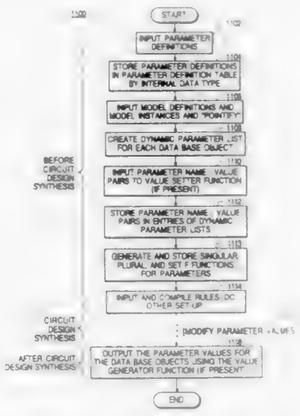
5,150,307
COMPUTER-CONTROLLED SYSTEM AND METHOD FOR SORTING PLASTIC ITEMS
Carroll T. McCourt; Charles J. Emering, both of Westminster; Douglas S. Laurence, Columbia; Roy A. Eckhart, Baltimore, and William Cass, Timonium, all of Md., assignors to Automation Industrial Control, Inc., Baltimore, Md.
Filed Oct. 15, 1990, Ser. No. 596,940
Int. Cl.[5] G06F 15/20 B07C 5/08
U.S. Cl. 364—478 29 Claims



13. A computer-controlled system for sorting a plurality of plastic items, comprising;
(a) first means for identifying the predominant color of each of the plastic items;
(b) second means for identifying the predominant composition of each of the plastic items, wherein said second means comprises an inspection conveyor having a first belt and a second belt spaced from said first belt; and
(c) third means for discharging each of the plastic items to one of a plurality of collection vessels based on the predominant color of the plastic item as identified by said first means and the predominant composition of the plastic item as identified by said second means.

5,150,308
PARAMETER AND RULE CREATION AND MODIFICATION MECHANISM FOR USE BY A PROCEDURE FOR SYNTHESIS OF LOGIC CIRCUIT DESIGN
Donald F. Hooper, Northborough; Edward G. Fortmiller, Hudson, and David F. Wall, Worcester, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation-in-part of Ser. No. 907,303, Sep. 12, 1986, abandoned. This application Jun. 28, 1989, Ser. No. 373,167
Int. Cl.[5] G06F 15/60, 15/40
U.S. Cl. 364—489 6 Claims

1. A method for synthesizing logic circuits by parameter creation and modification in a data processing system, the data processing system including a data base, the data base including data base objects each having an internal data type, a first set of Model Instances consisting of connected data base objects of the Model Instance internal data type representing portions of an electrical circuit, at least one data base object having at least one of a first plurality of parameters representing data describing the data base object, each of the first plurality of parameters including a parameter name and a parameter value stored in a dynamic parameter list of the data base object, the method comprising the steps, performed by the data processing system, of:
inputting a parameter definition defining a parameter not included in the first plurality of parameters, the parameter definition containing a selected internal data type;
storing the parameter definition in an entry of a parameter definition table in the data base;
generating at least one function, having a function name, to access parameter vales associated with data base objects of the selected internal data type; and

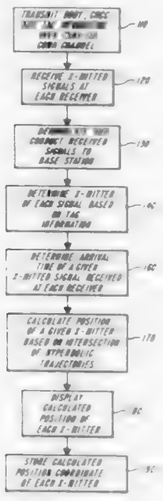


storing the name of the generated function as an entry of a macro table in the data base.

5,150,309
COMPREHENSIVE LOGIC CIRCUIT LAYOUT SYSTEM
Ching-Hao Shaw, Plano; Patrick Bosshart, Dallas; Douglas Matzke, Plano; Vibhu Kalyan, Dallas, and Theodore Houston, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 336,957, May 18, 1989, abandoned, which is a continuation of Ser. No. 081,419, Aug. 4, 1987, Pat. No. 4,870,598. This application Jun. 29, 1990, Ser. No. 546,080
Int. Cl.[5] G06F 15/20
U.S. Cl. 364—491 2 Claims

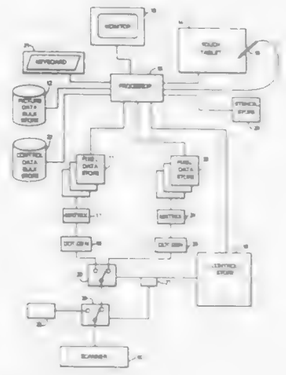
1. A random logic circuit for providing full custom design of a layout comprising:
a logic array which is multiply folded and which includes static gates and dynamic gates, said logic array further including more than two levels of logic;
a tile section for processing non-Boolean operations, and including routing connections for transfer of signals within and without the tile section; and
router connections between the logic array and the tile section.

5,150,310
METHOD AND APPARATUS FOR POSITION DETECTION
Philip G. Greenspun, Melrose, and Gregory B. Baecher, Wayland, both of Mass., assignors to Consolve, Inc., Lexington, Mass.
Filed Aug. 30, 1989, Ser. No. 400,354
Int. Cl.[5] G01S 3/02
U.S. Cl. 364—516 33 Claims



1. A system for determining, in real-time, the spatial position of at least one object, the system comprising
transmitting means including at least one transmitter coupled to said at least one object for transmitting a modulated electromagnetic radiation signal, said transmitted signal being modulated with a data bitstream including transmitter identification data and having a time-variant waveform including a selected feature,
receiving means, including a plurality of receivers disposed at selected known locations, for receiving said transmitted signal and for generating an electrical receive signal representative of said transmitted signal,
demodulation means, coupled to said receiving means, for demodulating said electrical receive signal to generate a demodulated electrical signal, and
processing means, coupled to said demodulation means, for identifying said at least one transmitter and calculating, in response to said demodulated electrical signal, the spatial position of said at least one object with respect to said selected known positions of said receivers, said processing means including
arrival-time means for processing said demodulated electrical signal to generate arrival-time signals, said arrival-time signals being representative of respective arrival times at which said electromagnetic radiation is received at respective receivers,
said arrival-time means including means for generating arrival time signals in response to the selected feature in said time-variant waveform, and
calculation means, for processing said arrival-time signals associated with said at least one object and corresponding to respective receivers, to calculate the spatial position of said at least one object with respect to said selected positions of said receivers.

5,150,311
ELECTRONIC PRINT-DOT GENERATION
Robert J. Long, Blewbury, and Barry D. R. Miles, Newbury, both of England, assignors to Quantel Limited, Newbury, England
Continuation of Ser. No. 350,605, May 11, 1989, abandoned. This application Jul. 22, 1991, Ser. No. 735,093
Claims priority, application United Kingdom, May 17, 1988, [illegible]
Int. Cl.[5] G06K 15/00
U.S. Cl. 395—108 26 Claims



1. A high resolution print dot generating apparatus comprising:
a pixel source of intensity related pixel data representing a first image;
converting means for converting said pixel data to first print data defining an array of print dot clusters representing at least one color separation of said image and having a first resolution limited by the spacing of the clusters;
a print data source of second print data representing a second image different to that of said first print data;
a dot source of third print data, independent of said first and second print data, defining a control image representing at least one character or other predefined shape and having a second resolution which is higher than said first resolution and is limited by the spacing of print dots forming said print dot clusters; and
selecting means responsive to said third print dot data for selecting either said first print data or said second print data to output print dot data for use in printing such that the output print dot data represents at least one color separation of said first image at said first resolution combined with a portion of said second image defining at least one character or other predefined shape at said second resolution.

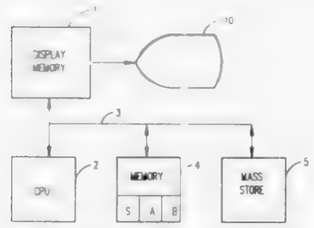
5,150,312
ANIMATION PROCESSOR METHOD AND APPARATUS
Bradley J. Beitel, Woodside, and Robert D. Gordon, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 16, 1989, Ser. No. 367,284
Int. Cl.[5] G06F 3/14
U.S. Cl. 395—118 12 Claims

10. In a data processing system comprising display memory means coupled to display means, apparatus for generating a relative motion between a first displayed image and a second displayed image, comprising:
first buffer memory means for storing a representation of the first image;
second buffer memory means for storing a first portion of

the display memory means corresponding to the second image;

third buffer memory means for storing the first portion of the display memory means corresponding to the second image having the first image combined therewith and also for storing a second portion of the display memory means corresponding to the second image at a location where the first image is required to be next combined; and

control means, coupled to the display memory means and to the aforesaid plurality of buffer memory means, for (a) copying the first portion of the display memory means to the second buffer memory means, for (b) combining the contents of the first buffer memory means with the first portion of the display memory means, for (c) copying the first and the second portions of the display memory means



to a first region and to a second region, respectively, of the third buffer memory means, the first portion including the combined contents of the first buffer memory means, for (d) copying the second buffer memory means to the first region of the third buffer memory means, thereby overwriting the representation of the first image stored therein, for (e) copying the second region of the third buffer memory means to the second buffer memory means, for (f) combining the first buffer memory means with the second portion of the third buffer memory means to cause the representation of the first image to transfer from the first region to the second region and, for (g) copying the third buffer memory means to the display memory means thereby causing an apparent relative movement of the first displayed image relative to the second displayed image.

5,150,313

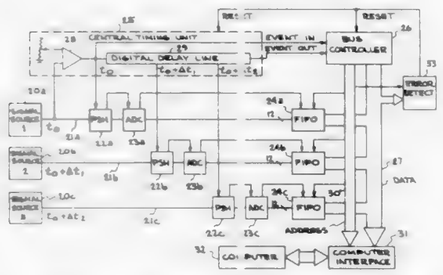
PARALLEL PULSE PROCESSING AND DATA ACQUISITION FOR HIGH SPEED, LOW ERROR FLOW CYTOMETRY

Gerrit J. van den Engh, and Willem Stokdijk, both of Livermore, Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Apr. 12, 1990, Ser. No. 508,226

Int. Cl.[5] **G01R** *29/02;* **H03K** *5/19*

U.S. Cl. 364—569 **25 Claims**



1. Apparatus for pulse processing and data acquisition from a plurality of detectors generating asynchronous event pulses from a single event, comprising:

a plurality of parallel input channels, each of which receives one of the event pulses from a respective detector;

pulse digitization means in each channel for digitizing the event pulse received in the channel;

a channel FIFO buffer in each channel connected to the respective pulse digitization means;

a common data bus connected to all the FIFO buffers;

central control means external to the channels connected to each channel for providing a synchronizing timing signal to the respective pulse digitization means in each channel in response to a start signal from at least one of the channels to synchronize pulse digitization in each channel with detection of the event by the respective detector and to digitize each pulse on each channel substantially immediately after the pulse is input on the channel;

a bus controller connected to the data bus and to the control means for transferring correlated data from the FIFO buffers to the data bus following an actuation signal from the control means, the transferred data being correlated to the event.

5,150,314

METROLOGICAL APPARATUS AND CALIBRATION METHOD THEREFOR

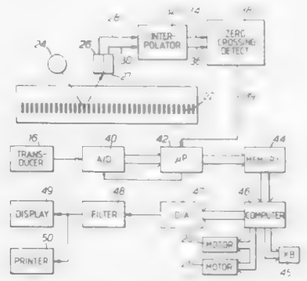
John D. Garratt; Paul J. Scott, and Ian K. Buehring, all of Leicester, United Kingdom, assignors to Rank Taylor Hobson Limited, United Kingdom

Filed Jun. 22, 1990, Ser. No. 542,718

Claims priority, application United Kingdom, Jun. 23, 1989, 8914418; Jun. 23, 1989, 8914419

Int. Cl.[5] **H03M** *1/06;* **G01D** *5/34*

U.S. Cl. 364—571.02 **21 Claims**



1. A metrological apparatus for measuring physical surface geometry, said apparatus comprising a transducer, said transducer producing an analogue electrical signal representative of a characteristic of a physical surface the geometry of which is to be measured, and an analogue to digital converter the gain of which varies with frequency over a particular frequency range, said analogus electrical signal being input to said analogue to digital converter to be analogue to digital converted thereby into a digital signal,

said apparatus further comprising processing means for processing said digital signal to compensate for said variation of gain with frequency over said particular range.

5,150,315

ELECTRICAL RESISTOR VALUE DECODING CALCULATOR

Lawrence F. Katzin, 324 Westridge Dr., Raleigh, N.C. 27609

Continuation-in-part of Ser. No. 239,514, Sep. 1, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 544,736

Int. Cl.[5] **G06F** *3/00*

U.S. Cl. 364—709.02 **3 Claims**

1. An electronic hand-held pocket-sized calculator for aiding in the determination of the value of electrical resistors of the type having resistor value color bands and comprising:

a keypad comprising a keypad housing and an array of ten manually operated keypad switches for receiving input signals, each of said keypad switches having a numeral from zero through nine associated therewith and being uniquely colored so as to correspond to the colors of the International Resistor Color Code;

said array of manually operated keypad switches being adapted to receive three input signals, each of said input signals being a single keystroke and each of said keystrokes representing a single color band on the resistor;

calculating means operatively connected to said keypad switches for performing mathematical calculations on the input signals for determining the value of a resistor; and

a display means operatively connected to said calculating means for displaying the computational result of the mathematical computations on the input signals, whereby the value of a resistor is calculated and displayed after the three input signals corresponding to the three resistor color bands have been entered.

5,150,316

ELECTRONIC APPARATUS

Akitaka Morita, Nara; Eichika Matsuda, Yamatotakada; Toshiro Oba, Nara, and Yoshimitsu Inamori, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 228,270, Jul. 21, 1988, abandoned. This application Mar. 7, 1990, Ser. No. 489,883

Claims priority, application Japan, Jul. 21, 1987, 62-111449[U]

Int. Cl.[5] **G06F** *3/00*

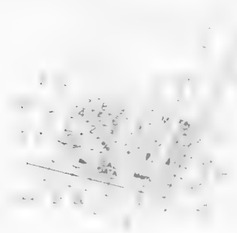
U.S. Cl. 364—709.12 **13 Claims**

1. An electronic data storage device and calculator apparatus comprising:

a set of keys for inputting a plurality of data including character and symbol information in addition to numerical information and further including a dedicated key of said set of keys for inputting a symbol for separating sets of three digits of a numerical value and a dedicated key of said set of keys for inputting a forward direction indicating symbol, wherein data being input following input of the forward direction indicating symbol is defined as numerical information, said numerical information thereafter continuing until a succeeding non-numerical character is input or until the end of a data line is input;

means for storing and calling said data; and

computer means for performing a calculation using said stored numerical information and said symbol for separating sets of three digits of a numerical value of at least one of said data.



5,150,317

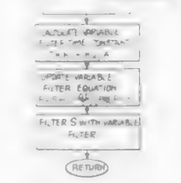
ADAPTIVE DIGITAL FILTER WHICH IS RESPONSIVE TO THE RATE OF CHANGE OF AN INPUT SIGNAL

Lauren P. Countryman, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 11, 1989, Ser. No. 295,858

Int. Cl.[5] **G06F** *15/31*

U.S. Cl. 364—724.01 **24 Claims**



1. A method of filtering a digital signal having a minimum incremental change between digit values represented in the digital signal, the method comprising the steps of:

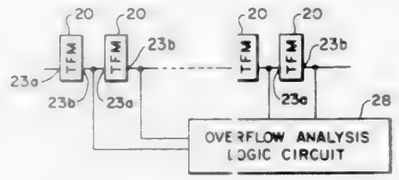
a. receiving the digital signal;

b. determining a change between digit values represented in the digital signal;

c. filtering the digital signal using an adjusted time constant so as to generate a filtered output of the digital signal; and

d. automatically adjusting the time constant of a filter so that as the change between the digit values represented in the digital signal (i) decreases, the filter time constant is increased in a manner to filter the digital signal for a greater period and in a manner to filter the digital signal for a period that is greater than a period between minimum incremental changes of the digit values represented in the digital signal, and (ii) increases, the filter time constant is decreased in a manner to filter the digital signal for a shorter period and in a manner to filter the digital signal for a period that is greater than the period between minimum incremental changes of the digit values represented in the digital signal.

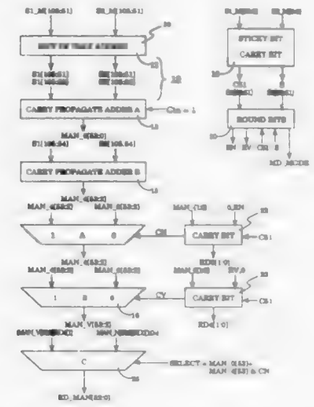
5,150,318
DIGITAL FILTER SYSTEM WITH ANOMALY DETECTION AND INDICATION
Tetsuro Kontani, Yokohama, and Yutaka Miki, Hirakata, both of Japan, assignors to LSI Logic Corp., Milpitas, Calif.
Division of Ser. No. 483,584, Feb. 22, 1990. This application Dec. 23, 1991, Ser. No. 814,392
Claims priority, application Japan, Feb. 23, 1989, 1-41894
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—724.03 2 Claims



1. A digital filter system comprising:
a series of transversal filter modules, each transversal filter module comprising:
a plurality of multipliers;
a plurality of adders, each adder having an overflow output;
a plurality of delay elements;
a plurality of filter coefficient inputs;
a signal input;
a signal output;
an overflow signal input;
means for indicating anomalies, having a plurality of inputs and an output;
wherein:
the multipliers, adders, delay elements, filter coefficient inputs, signal input and signal outputs are interconnected as a transversal digital filter circuit; and
said digital filter system further comprising:
means for generating a logical signal output indicating the existence of an anomaly when an anomalous condition occurs in one of said transversal filter modules, and for sending the logical signal output to the next transversal filter module;
wherein said digital filter system further includes:
means for carrying out logical calculation on the logic signal output generated at each transversal filter module to determine at which module the anomalous condition occurs.

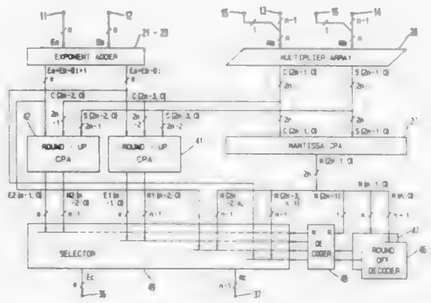
5,150,319
CIRCUITRY FOR ROUNDING IN A FLOATING POINT MULTIPLIER
Grzegorz B. Zyner, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.
Filed May 3, 1991, Ser. No. 695,423
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—745 5 Claims

1. A rounding circuit for rounding a final mantissa of bits 2n+1:0 in floating point multiplication by two binary operands bits n:0 for a binary tree floating point multiplier, said binary tree floating point multiplier generating said final mantissa by adding in parallel a plurality of pairs of partial products each of bits 2n+1:01 through a plurality of carry-propagate adder, said rounding circuit comprising:
first adder means for providing bits n+1:0 of a first mantissa by summing bits 2n+1:n of a first and second partial products presuming that no carry-in has occurred when summing bits n−1 of said first and second partial products without waiting for the generation of bits n−1:0 of said first and second partial products;
second adder means for providing bits n+1:2 of a second mantissa by summing bits 2N+a:n+2 of said first and second partial products presuming that a second carry-in has occurred when summing bits n+1 of said first and second partial products without waiting for the generation of said second carry-in from bits n+1:0 of said first and second partial products;
first multiplexor means for providing a first set of bits 1:0 for said final mantissa based on an actual carry-in from summing bits n−2:0 of said first and second partial products and a rounding condition, the first set of bits 1:0 for said final mantissa being chosen for no mantissa overflow;



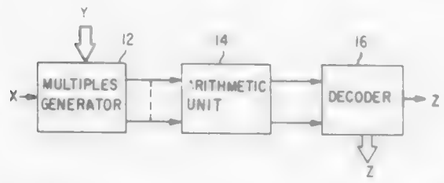
second multiplexor means for providing a second set of bits 1:0 for said final mantissa based on an actual carry-in from summing bits n−2:0 of said first and second partial products and a rounding condition, the second set of bits 1:0 for said final mantissa being chosen for mantissa overflow; and
third multiplexor means for selecting bits n+1:2 and bits 1:0 for said final mantissa based on whether a carry-in propagates past bits 1:0 of said final mantissa and whether a mantissa overflow has occurred.

5,150,320
FLOATING-POINT MULTIPLIER DEVICE COMPRISING THREE CARRY PROPAGATE ADDERS OPERABLE IN PARALLEL
Takashi Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 29, 1991, Ser. No. 783,684
Claims priority, application Japan, Oct. 30, 1990, 2-292879
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—748 9 Claims



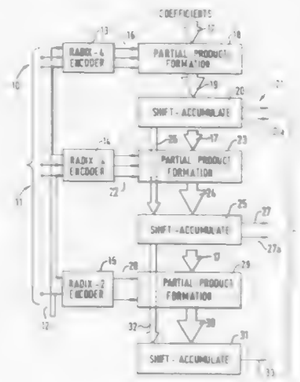
1. A floating-point multipler device supplied with binary data signals which represent a first number comprising a first exponent and a first mantissa and a second number comprising a second exponent and a second mantissa and comprises first and second exponent signals representative of said first and said second exponents and first and second mantissa signals representative of said first and said second mantissas, said floating-point multiplier device being for calculating an ultimate product of said first and said second numbers, said ultimate product comprising an ultimate exponent and a rounded-off mantissa, said floating-point multiplier device comprising:
an exponent adder supplied with said first and said second exponent signals to produce an exponent sum signal representative of an exponent sum of said first and said second exponents;
a multiplier array supplied with said first and said second mantissa signals to produce a carry save sum signal representative of a carry save sum as a provisional product of said first and said second mantissas;
a mantissa carry propagate adder connected to said multiplier array to use said carry save sum signal in producing a mantissa product signal representative of a mantissa product of said first and said second mantissa with said provisional product used in calculating said mantissa product;
a first round-up carry propagate adder connected to said exponent adder and said multipler array to use said exponent sum signal and said carry save sum signal in producing a first sum exponent signal representative of a first sum exponent and a first rounded signal representative of a first rounded mantissa;
a second round-up carry propagate adder connected to said exponent adder and said multipler array to use said exponent sum signal and said carry save sum signal in producing a second sum exponent signal representative of a second sum exponent and a second rounded signal representative of a second rounded mantissa; and
selecting means connected to said exponent adder, said mantissa carry propagate adder, and said first and said second rounded-up carry propagate adders for selecting said ultimate exponent from said exponent sum and said first and said second sum exponents and said rounded-off mantissa from said mantissa, product and said first and said second rounded mantissas.

5,150,321
APPARATUS FOR PERFORMING SERIAL BINARY MULTIPLICATION
Patrick N. Keating, Ellicott City, Md., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Dec. 24, 1990, Ser. No. 632,691
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—759 13 Claims



1. An apparatus for multiplying a first input binary number by a second input binary number, comprising:
(a) generating means for serially generating in response to the second input binary number, a plurality of multiples of the first input binary number, said multiples being in the form of serial binary numbers;
(b) arithmetic means for serially adding, from a most significant bit to a least significant bit, said plurality of multiples to produce a first unsigned redundant binary number represented by a first and a second output serial binary number; and
(c) decoding means for serially converting, from a most significant bit to a least significant bit, said first unsigned redundant binary number into a conventional binary number.

5,150,322
MIXED-RADIX SERIAL/PARALLEL MULTIPLIERS
Stewart G. Smith, Valbonne; Ralph W. Morgan, La Colle sur Loup, and Julian G. Payne, Antibes, all of France, assignors to VLSI Technology, Inc., San Jose, Calif.
Filed Jun. 5, 1990, Ser. No. 534,597
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—760 6 Claims



1. A serial/parallel multiplier for the formation of a multiplicative product of a multiplicand having a multiplicity of bits and a multiplier having a plurality of coefficient bits, comprising:
means for receiving the bits of the multiplicand in clusters of n bits wherein n is greater than two, said receiving means having a plurality of groups of inputs wherein each group consists of not more than two;
and for each of the said groups:
a respective radix-N encoder wherein N is equal to two when the respective group consists of one bit and is equal to four when the respective group consists of two bits;
a radix-N partial product generator coupled to the respective radix-N encoder and to receive a respective coefficient bit; and
a shift-accumulate sub-pipe coupled to receive partial products from the respective partial product generator and to provide a group of bits of the said product, the number of bits in this group being unity where N is two and two where N is four, the sub-pipes being interconnected and constituting together a processing pipe.

5,150,323
ADAPTIVE NETWORK FOR IN-BAND SIGNAL SEPARATION
Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 11, 1989, Ser. No. 392,681
Int. Cl.[5] G06G 7/00, 7/60; G10L 3/00; G06K 9/62
U.S. Cl. 364—807 13 Claims

1. A signal processor for separating a composite signal into at least one of its constituent signals, said processor comprising:
means for dividing said composite signal into discrete sampled portions;

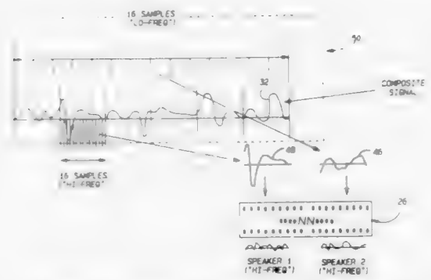
a plurality of neurons capable of receiving signals and producing an output signal said neurons including input neurons adapted to receive said sampled portions of said composite signal;

a plurality of synaptic connection means providing a weighted interconnection between selected ones of said neurons;

means for training said processor to produce an output that approximates at least one of said constituent signals, said training means including:

(a) means for presenting a composite input training signal to selected ones of said neurons;

(b) means for presenting a desired output, consisting of at least one of said constituent signals, to selected ones of said neurons; and



(c) means for changing the strength of said synaptic connection means to cause said signal processor to produce said desired output in response to said training signal; and

filter means for generating both low frequency and high frequency representations of said composite signal to present to said input neurons wherein said low frequency representation includes a larger portion of said composite signal than said high frequency representation; and

wherein said desired output consists of high frequency representation of at least one of said constituent signals, whereby said processor is capable of receiving both a high frequency and a low frequency portion of said composite signal during training and during processing.

5,150,324

ANALOG ARITHMETIC CIRCUIT THAT CAN PERFORM MULTIPLICATION DIVISION EXPANSION AND COMPRESSION BY USING DELTA SIGMA MODULATOR

Kaoru Takasuka, Yokohama, and Ken'ichi Takahashi, Sagamihara, both of Japan, assignors to Asahi Kasei Microsystems Co. Ltd., Japan

PCT No. PCT/JP89/00588, § 371 Date Feb. 6, 1990, § 102(e) Date Feb. 6, 1990, PCT Pub. No. WO89/12280, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 9, 1989, Ser. No. 460,077

Claims priority, application Japan, Jun. 9, 1988, 63-140492; Aug. 1, 1988, 63-190683; Aug. 4, 1988, 63-193384; Aug. 4, 1988, 63-193385

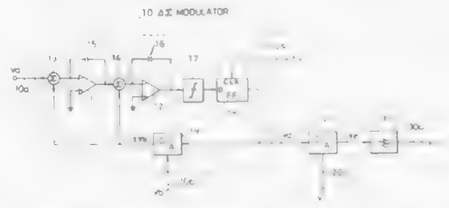
Int. Cl.[5] G06G 7/16

U.S. Cl. 364—807 11 Claims

1. An analog arithmetic circuit which receives an operated signal and a variable operating signal, and outputs the result of an arithmetic operation, said analog arithmetic circuit comprising:

ΔΣ modulation means having A/D conversion means and first D/A conversion means, said A/D conversion means sampling said operated signal at a predetermined sampling frequency, thereby outputting a digital signal, and said first D/A conversion means receiving said digital signal, and outputting a first analog signal that takes a positive or negative amplitude determined by a binary state of said digital signal and an amplitude of a first reference signal applied to said first D/A conversion means, said first D/A conversion means including means for feeding said first analog signal back to said A/D conversion means as a feedback signal to an input of said D/A conversion means to produce a difference signal between the operated signal and the feedback signal;

second D/A conversion means for receiving said digital signal and outputting a second analog signal that takes a



positive or negative amplitude determined by a binary state of said digital signal and an amplitude of a second reference signal applied to said second D/A conversion means; and

low-pass filtering means for receiving said second analog signal and outputting an analog signal representing the result of an arithmetic operation,

wherein the analog arithmetic circuit includes means for applying at least one of first reference signal and said second reference signal as said variable operating signal.

5,150,325

BI-CMOS SEMICONDUCTOR MEMORY DEVICE, INCLUDING IMPROVED LAYOUT STRUCTURE AND TESTING METHOD

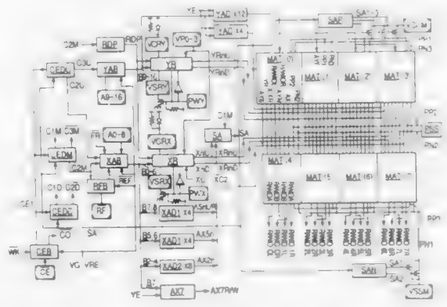
Kazumasa Yanagisawa, Kokubunji; Tatsuyuki Ohta, Ohme; Tetsu Udagawa, Iruma; Kyoko Ishii, Tokyo; Hitoshi Miwa, Ohme; Atsushi Nozoe, Ohme; Masayuki Nakamura, Ohme; Tetsurou Matsumoto, Higashiyamato; Yoshitaka Kinoshita, Kokubunji; Yoshiaki Ouchi, Fussa; Hiromi Tsukada, Kokubunji; Shoji Wada, Tokyo; Kazuo Mihashi, Sakaiminato; Yutaka Kobayashi, Katsuta, and Goro Kitsukawa, Hinode, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp, both of Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,227

Claims priority, application Japan, Mar. 20, 1989, 1-65841

Int. Cl.[5] G11C 13/00

U.S. Cl. 365—177 26 Claims



1. A semiconductor memory device comprising:

a first terminal to which a first supply voltage is to be applied;

a second terminal to which a second supply voltage is to be applied, the second supply voltage being lower than the first supply voltage;

a plurality of word lines;

a plurality of data lines;

a plurality of memory cells coupled to the plurality of word and data lines so that each memory cell is coupled to one word line and one data line, each of the plurality of memory cells including a capacitor and a selecting MOSFET, the selecting MOSFET having a gate coupled to the corresponding one word line and a source-drain path coupled between the corresponding one data line and the capacitor;

an oscillator circuit for providing pulse signals;

a voltage generator, coupled to receive the first and second supply voltages and responsive to the pulse signals provided by said oscillator circuit, for generating a third voltage higher than the second voltage; and

selecting means, responsive to selection signals applied to said semiconductor memory device, for selecting at least one of the plurality of memory cells by selecting one word line and one data line, the selecting means further including word driver circuits, coupled to the plurality of word lines and to the voltage generator and responsive to a word line selection signal generator and responsive to a word line selection signal generated according to the selection signals, for providing the third voltage to the selected word line.

5,150,326

REGISTER FILE CAPABLE OF HIGH SPEED READ OPERATION

Yasushi Aoki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 23, 1990, Ser. No. 601,650

Claims priority, application Japan, Oct. 23, 1989, 1-276880

Int. Cl.[5] G11C 7/00

U.S. Cl. 365—189.01 4 Claims

1. A register file comprising:

a plurality of address line pairs each comprising write and read address lines;

a plurality of write data line pairs each comprising first and second write data lines and a plurality of read data line pairs each comprising first and second read data lines; and

a matrix array of registers associated respectively with said address line pairs and said write and read data line pairs, each of said registers comprising:

a latch having first and second terminals;

a first write transfer gate responsive to a potential at the associated write address line for establishing a path between the associated first write data line and the first terminal of said latch and a second write transfer gate responsive to said potential for establishing a path between the second terminal of said latch and the associated second write data line;

a first pair of N-channel metal oxide semiconductor (MOS) transistors having drain-source paths connected in series between a voltage source and ground forming a first junction therebetween and having gates respectively coupled to said first and second terminals of said latch;

a second pair of N-channel MOS transistors having drain-source paths connected in series between the voltage source and ground forming a second junction therebetween and having gates respectively coupled to said first and second terminals of said latch so that opposite potentials may develop across said first and second junctions corresponding to potentials developed at said first and second terminals of the latch; and

a first read transfer gate formed by an N-channel MOS transistor responsive to a potential at the associated read address line for establishing a path between the associated first read data line and said first junction, and a second read transfer gate formed by an N-channel MOS transistor responsive to said potential at said associated read address line for establishing a path between the associated second read data line and said second junction.

5,150,327

SEMICONDUCTOR MEMORY AND VIDEO SIGNAL PROCESSING CIRCUIT HAVING THE SAME

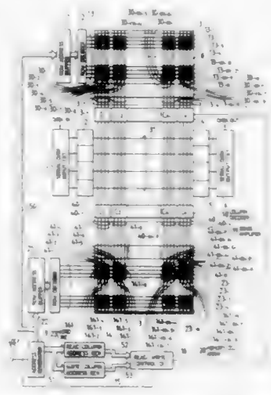
Junko Matsushima, Kashihara, and Hironori Akamatsu, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 429,527, Oct. 31, 1989, abandoned. This application Aug. 29, 1991, Ser. No. 752,919

Claims priority, application Japan, Oct. 31, 1988, 63-273326

Int. Cl.[5] G11C 7/00, 8/00

U.S. Cl. 365—189.01 10 Claims



1. A semiconductor memory comprising a writing circuit for dividing data continuously supplied to a serial data input circuit into groups of data each group having a plurality of bits, a reading circuit for reading out groups of bits at a time, a serial data output circuit for providing a sequence of data bits representing data read out in groups by said reading circuit, a memory cell array including a column decoder and a row decoder, a row address buffer for providing addresses for a plurality of bits at a time to said row decoder, an address generator, and

a circuit provided between said address generator and said column decoder,

said circuit including a read column address generator, a write column address generator and a column address control circuit for interchanging addresses applied to said memory cell array between read and write column ad-

dresses generated by said read column address generator and said write column address generator,

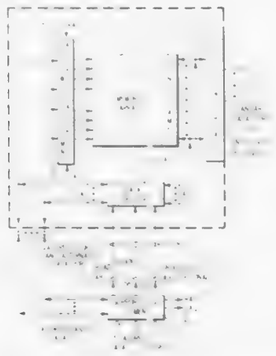
wherein said read column address generator and said write column address generator include means for time shifting addresses generated by said address generator thereby to enable data for a particular address in the memory cell array to be inputted to the memory substantially simultaneously with output of data from said particular address by internally changing column addresses for reading and writing.

5,150,328

MEMORY ORGANIZATION WITH ARRAYS HAVING AN ALTERNATE DATA PORT FACILITY

Frederick J. Aichelmann, Jr., Hopewell Junction, N.Y., assignor to Internation Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,560
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—189.03 11 Claims



1. A memory organization comprising:

a plurality of memory arrays, each array having a data port adapted to pass data signals to and from the array, a separate address/data port larger than the data port and adapted to pass data signals to and from the array and to pass row and column address signals to the array, and at least one separate control port for receiving control signals;

bidirectional data buffer means coupled to each array and the address/data port for separating the data signals from the address signals and sending data signals to the array during a memory write operation and for receiving the data signals from the array and sending data signals through the address/data port during a memory read operation, interspaced between each pair of row and column address signals so as to avoid interference with the address signals; and

logic means for applying control signals to the data buffer means so as to control the memory write and read operations and to control the selection of a particular array.

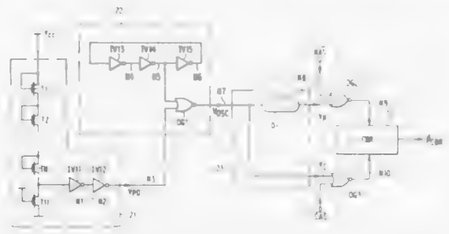
5,150,329

DYNAMIC MEMORY WITH A REFRESH CONTROL CIRCUIT

Katsuji Hoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 555,697
Claims priority, application Japan, Jul. 21, 1989, 1-189440
Int. Cl.[5] G11C 11/00, 13/00
U.S. Cl. 365—222 2 Claims

2. A dynamic memory comprising a memory array having a plurality of memory cells arranged in rows and columns, a first terminal to receive a row address strobe signal, a second terminal to receive a column address strobe signal, a set of address terminals, an address buffer to take in an external row address information upon activation of said row address strobe signal via said set of address terminals, a column address buffer to take in a column address information upon subsequent activation of said column address strobe signal under activation of said row address strobe signal via said set of address terminals, a refresh address counter to generate a refresh address, a refresh circuit to select one of said rows in said memory array in response to the input information and to refresh the information stored in the memory cells in the row thus selected, a switching circuit connected to said row address buffer and said refresh address counter to supply as an input information to said refresh circuit an external row address information when in a first state and to supply as an input information to said



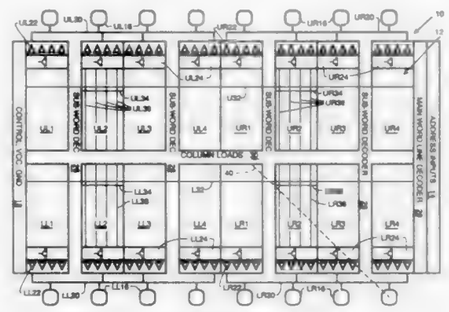
refresh circuit a refresh address when in a second state, a detection circuit having a first and a second input terminals to generate a detection signal when said second input terminal reaches an active level after said first input terminal has reached the active level, a first means to hold said switching circuit in said second state when a detection signal exists and in the first state when a detection signal is absent, a second means to activate said first input terminal upon activation of said column strobe signal, a third means to activate said second input terminal upon activation of said row address strobe signal, a detection circuit to detect a decrease in a voltage at a power source voltage terminal and to output a detection signal, and a control circuit to control the input terminal at an active level in response to the detection output and to subsequently control said second input terminal at an active level.

5,150,330

INTERBLOCK DISPERSED-WORD MEMORY ARCHITECTURE

Ejaz U. Haq, Sunnyvale, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 469,617, Jan. 24, 1990, abandoned. This application Jun. 27, 1991, Ser. No. 722,586
Int. Cl.[5] G11C 7/00, 5/02
U.S. Cl. 365—230.03 10 Claims



1. A memory device comprising:

an array of memory cells arranged in cell rows and cell columns and arranged in blocks of contiguous ones of said cells, said array including a plurality of subrows, each of said subrows being an intersection between one of said blocks and one of said cell rows, each of said subrows including a plurality of said cells;

data ports providing for communication between said cells and a host system;

addressing inputs for receiving address codes for selecting respective sets of said cells for coupling with said data ports, each of said sets containing all of said cells coupled to said data ports in response to a respective address code, the cells of each set that are within the same row being dispersed within said row and among a plurality of said blocks, each cell of a selected set being coupled to a respective one of said data ports, each of said subrows including cells from a plurality of mutually exclusive ones of said sets; and

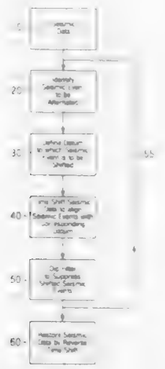
address decoding means for decoding each of said address codes in accordance with a divided word line architecture including main word line decoding means, subword line decoding means and column decoding means, said subword line decoding means including plural subword lines, each of said subword lines being arranged to activate all of said cells in a respective one of said subrows, said column decoding means causing at least some cells in each activated subrow to remain decoupled from said data ports, said address decoding means providing for the activation of a plurality of said subword lines in response to each received address code so that not all cells coupled to said data ports lie within the same of said blocks.

5,150,331

METHOD FOR ENHANCING SEISMIC DATA

Stephen L. Harris, Calgary, Canada, and Dennis A. Yanchak, Richmond, Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 25, 1991, Ser. No. 674,622
Int. Cl.[5] G01V 1/36, 1/24
U.S. Cl. 367—50 20 Claims



1. A method for enhancing seismic data comprising a set of seismic signals, including the steps of:

(a) identifying coherent noise events in the seismic signals to be attenuated;

(b) constructing a datum line in the time-space (t-x) domain of the seismic data;

(c) nonhyperbolically time-shifting the identified coherent noise events for aligning them with the datum line;

(d) transforming the time-shifted seismic data from the t-x domain to the frequency-wavenumber (fk) domain; and

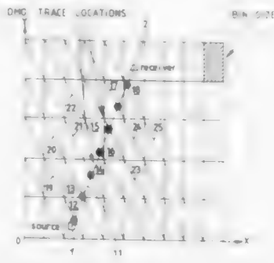
(e) two-dimensionally filtering the seismic data in the fk domain for attenuating the coherent noise events aligned with the datum line.

5,150,332

METHOD OF ASSIGNING A SEISMIC TRACE

Richard Bale, Beckenham, and Richard Hale, Orpington, all of England, assignors to GECO A.S., Stavanger, Norway

Filed Aug. 19, 1991, Ser. No. 746,640
Claims priority, application United Kingdom, Aug. 21, 1990, 9018317
Int. Cl.[5] G01V 1/00
U.S. Cl. 367—73 13 Claims



1. A method of assigning a seismic trace obtained by means of a seismic energy source at a first location and a receiver at a second location, comprising the steps of:

defining a two dimensional coordinate system representing a plane containing a plane containing the first and second locations;

defining a straight line segment extending between the first and second locations;

defining an array of congruent regions covering at least a portion of the straight line segment;

defining, in each of the regions intersected by the portion of the straight line segment, a crossing line intersecting the straight line segment at an intersection point, the crossing lines defined in all the regions being parallel to each other and the intersection points being evenly spaced apart; and

assigning offspring seismic traces to the intersection points.

5,150,333

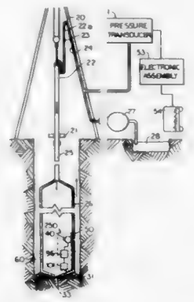
METHOD AND APPARATUS FOR PROVIDING IMPROVED PRESSURE PULSE CHARACTERISTICS FOR MEASURING WHILE DRILLING

Serge A. Scherbatskoy, 3921 Clayton Rd. E., Fort Worth, Tex. 76116

Continuation of Ser. No. 140,960, Jan. 5, 1988, abandoned, which is a continuation of Ser. No. 75,686, Jul. 20, 1987, abandoned, which is a continuation of Ser. No. 924,046, Oct. 28, 1986, abandoned, which is a continuation of Ser. No. 811,952, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 718,895, Apr. 2, 1985, abandoned, which is a continuation of Ser. No. 443,128, Nov. 19, 1982, Pat. No. 4,460,943, which is a division of Ser. No. 383,269, May 28, 1982, Pat. No. 4,520,468, which is a continuation of Ser. No. 68,526, Aug. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application Nov. 22, 1988, Ser. No. 275,706
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] G01V 1/40
U.S. Cl. 367—83 41 Claims

1. A system for performing measurements in a drill hole during drilling operations using a drill string, said drill string defining a part of a fluid passage through which drilling fluid is forced to flow under pressure downwardly through said drill string from the earth's surface towards the lower end of said drill string and then upwardly through the annulus surround-

ing said drill string from said lower end of said drill string to the earth's surface, means at a first location for sensing the magnitude of a downhole parameter and for generating a plurality of voltage changes representing said magnitude, a restriction within said passage, said restriction causing a pressure drop within said passage and as a consequence thereof creating a high pressure zone and a low pressure zone within said passage on different sides of said restriction with a consequent pressure difference therebetween, means comprising a bypass valve in a bypass between said zones for providing fluid communication between said high pressure zone and low pressure zone.



valve actuating apparatus wherein a means is provided for rapidly opening said valve in response to said voltage changes and wherein the rate of opening said valve (is within the regime of hydraulic shock waves thereby generating) generates a negative pressure hydraulic shock wave upon (the) each opening of said valve, resulting at a second location in a decrease following by an increase in drilling fluid pressure, and

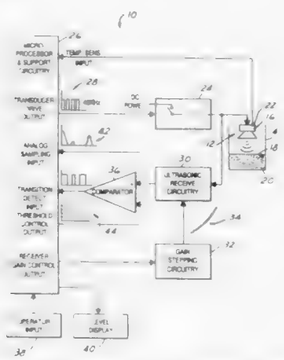
a transducer at said second location for detecting said hydraulic shock wave.

5,150,334

SYSTEM AND METHOD FOR ULTRASONIC MEASUREMENT OF MATERIAL LEVEL

David J. Crosby, San Jose, Calif., assignor to Bindicator Company, Port Huron, Mich.

Filed Sep. 16, 1991, Ser. No. 760,619
Int. Cl.[5] G01S *9/66*
U.S. Cl. 367—98 **23 Claims**



1. A system for monitoring level of material that comprises:

transducer means for transmitting ultrasonic signals toward and receiving an echo signals from a surface of the material,

switch means for selectively connecting and disconnecting said transducer means to and from a source of electrical power for energizing and de-energizing said transducer means, and

microprocessor-based control means having an output coupled to said switch means for controlling operation thereof, said output providing a pulsed periodic signal at variable frequency, duty cycle and total time duration to operate said switch means at an ultrasonic frequency that corresponds to said periodic signal frequency, at a duty cycle that corresponds to said periodic signal duty cycle and/or a time duration that corresponds to said periodic signal time duration,

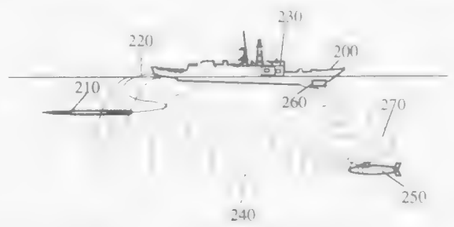
said control means including means for discriminating between false echo signals and true echo signals from the material surface comprising means operatively coupled to said transducer means for sampling and storing said echo signals, means for identifying an echo signal having greatest amplitude, means for examining duration of all echo signals having an amplitude at least equal to a predetermined percentage of said greatest amplitude, and means for identifying a said true echo signal as the echo signal among those so examined having greatest time duration.

5,150,335

FREQUENCY INTERRUPT CONTINUOUS TRANSMIT ACTIVE SONAR TRANSMISSION AND SIGNAL PROCESSING TECHNIQUE

Scott E. Hoffman, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Jun. 11, 1991, Ser. No. 714,104
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—101 **15 Claims**



1. In a time domain continuous transmit sonar system, a method for generating a time domain continuous transmitted waveform of energy for resolving range/Doppler ambiguity, comprising:

selecting a first frequency for the waveform at the beginning of a first time interval; and

selecting a second frequency for the waveform at the beginning of a second time interval, wherein the beginning of the second time interval corresponds in time to the end of the first time interval and further wherein the second frequency is different from the first frequency, so that the waveform is discontinuous in the frequency domain at the end of the first and beginning of the second time interval,

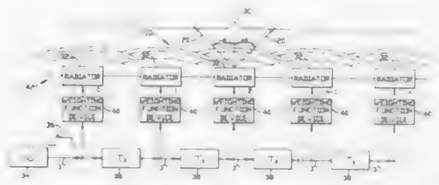
wherein examination of echo returns from an object in response to the transmitted waveform from both the first and second time interval will permit proper resolution of the range and Doppler shift frequency caused by the object without range/Doppler ambiguity.

5,150,336

FREQUENCY DISPERSIVE TRANSMITTING ARRAY

Shelby F. Sullivan, Solana Beach; Frank E. Gordon, San Diego, and Brett D. Castile, Del Mar, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1991, Ser. No. 758,994
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—103 **27 Claims**



1. An apparatus for propagating composite wave energy comprised of a plurality of components each having a frequency of wave motion which is a function of a direction in which each of said components is propagated, comprising:

radiating means for radiating said composite wave energy, said radiating means having a plurality of radiating elements comprising an array;

signal-generating means for generating broad-band signals in a selected band of frequencies;

time-delay means for providing a time delay between the emission of said broad-band signals from each successive one of said plurality of said radiating elements, said time-delay means being coupled between successive ones of said plurality of said radiating elements and having a delay time which is a multiple of the period of the dominant frequency radiated in a direction broadside to said array;

said array having a radiation pattern;

said signal-generating means being coupled to and driving said radiating means through said time delay means; and

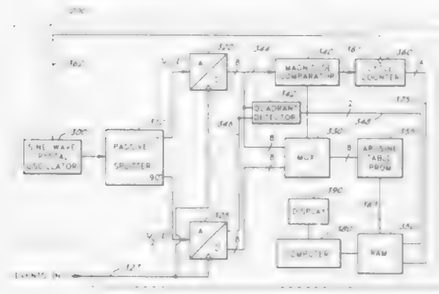
window weighting function means for controlling the behavior of said radiation pattern of said array, said window weighting function means being coupled between said signal generating means and each of said radiating elements.

5,150,337

METHOD AND APPARATUS FOR MEASURING TIME ELAPSED BETWEEN EVENTS

Michael Inbar, Santa Barbara, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Feb. 21, 1990, Ser. No. 482,639
Int. Cl.[5] G04F *8/00*
U.S. Cl. 368—118 **12 Claims**



1. An apparatus for measuring the time elapsed between events comprising:

a sinusoidal wave generator that produces first and second sinusoidal waves which are 90° out of phase with respect to one another;

sampling circuit that samples instantaneous amplitudes of said sinusoidal waves in response to each event and that outputs first and second digital values which correspond to said instantaneous amplitudes when each event occurs;

a magnitude comparator that measures the magnitude of at least one of said first and second digital values and that outputs a signal indicating which of said first and second sinusoidal waves is currently in an angular quadrant having the greatest average change in magnitude per change in angular position;

a multiplexer that receives said first and second digital values and that receives said indicating signal from said magnitude comparator, said multiplexer providing an output digital value corresponding to the digital value of the sinusoidal wave currently in an angular quadrant having the greatest average change in magnitude per change in angular position when each event occurs;

a quadrant detector that receives said first and second digital values and that outputs a quadrant identifier signal that identifies which of four angular quadrants said first and second sinusoidal signals are in when each event occurs:

a convertor that receives said output digital value from said multiplexer and that outputs a digital angular position value that identifies a unique angular position within one angular quadrant of said first and second sinusoidal signals for each event in response to said sampled values;

a data storage device that receives said digital angular position value from said converter and said quadrant identifier signal from said quadrant detector and that stores said angular position value and said quadrant identifier signal for each event;

a cycle counter that counts the number of full cycles between each event; and

processing circuitry that determines the total time elapsed between said events in response to said stored angular position values and said stored quadrant identifier signals for each of said events and in response to the output of said cycle counter.

5,150,338

OPTICAL DISK READING AND WRITING SYSTEM HAVING MAGNETIC WRITE HEAD MOUNTED ON AN AIR-BEARING SLIDER

Henryk Birecki, Palo Alto, and George M. Clifford, Jr., Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 392,161, Aug. 10, 1989, abandoned, and a continuation-in-part of Ser. No. 421,215, Oct. 13, 1989, abandoned. This application Jan. 30, 1990, Ser. No. 472,517
Int. Cl.[5] G11B *11/00, 7/00*; G11C *13/06*
U.S. Cl. 369—13 **5 Claims**

1. A system for reading and writing binary information onto a recording surface of a magneto-optical memory disk, comprising:

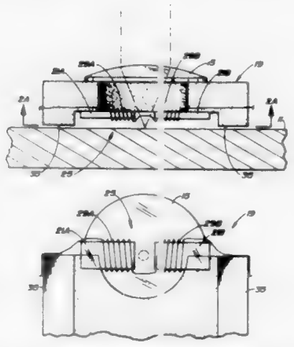
hydrodynamic bearing means including an air-bearing slider that travels above the surface of the magneto-optical memory disk at a generally constant distance;

objective lens means carried by the hydrodynamic bearing means for focusing laser light for heating selected areas of the optical recording surface sufficiently that the coercivity of the heated areas is lowered for allowing magnetic domains in the heated areas to be established;

magnetic writing head means, including a pair of first and second magnetic pole pieces that are mounted on the undersurface of the air-bearing slider between the objective lens means and the surface of the magneto-optical disk, that are carried by the hydrodynamic bearing means for recording magnetic domains, representing binary states, on the heated areas on the magneto-optical disk, the first and second magnetic pole pieces being mounted

end-to-end, parallel to the disk surface, with a space therebetween, above which the objective lens means is mounted, for focussing laser light through the gap between the opposing ends;

the magnetic writing head means further including a conductor means which is wound in a first coil about the first



pole piece in one direction and which is wound in a second coil about the second pole piece in the opposite direction; and

actuator means for positioning the point of focus of the objective lens means above selected data tracks on the data plane of the magneto-optical disk.

5,150,339

OPTICAL DISK MEDIUM AND ITS APPLICATION METHOD AND SYSTEM

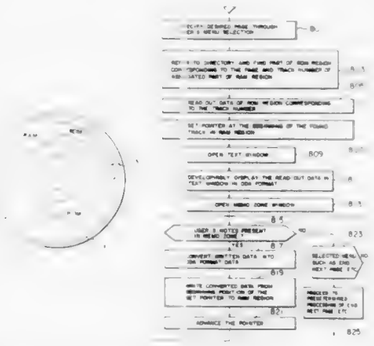
Hirotada Ueda, Kokubunji; Seiji Yonezawa, Hachioji, and Takashi Takeuchi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 462,565, Jan. 9, 1990. This application Apr. 20, 1990, Ser. No. 512,116

Claims priority, application Japan, Apr. 24, 1989, 1-101624; Jun. 16, 1989, 1-152341

Int. Cl.[5] G11B *17/22, 3/70, 5/84, 7/26*

U.S. Cl. 369—32 **19 Claims**



1. An optical disk medium adapted to be read by a movable optical head having means for deflection scanning of a light spot, comprising a first region (ROM region) having first data already recorded therein and capable of being optically only read out therefrom by a movable optical head having a deflection scannable light spot and a second region (RAM region) having second data capable of being optically recorded therein and read out therefrom by the movable optical head with the deflection scannable light spot interlacedly located on said optical disk medium, and at least a portion of the second data related to the first data stored in said first region is stored in a part of said second region which is located in such a positional relationship that allows substantially continuous access to a part of said first region where said first data related thereto is stored so that at least read out of the first and second related data is enabled by deflection scanning of the light spot without effecting movement of the movable optical head.

5,150,340

DISC APPARATUS FOR READING OUT INFORMATION FROM DISC RECORDING MEDIUM

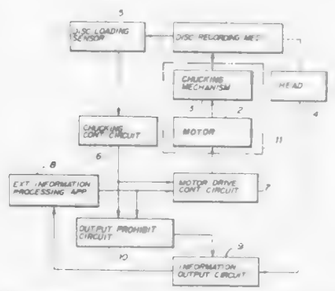
Tohru Miura, Mitaka; Miya Umeda, Tokorozawa, and Katsuya Enami, Houya, all of Japan, assignors to Teac Corporation, Japan

Filed Nov. 27, 1990, Ser. No. 618,656

Claims priority, application Japan, Nov. 28, 1989, 1-136892[U]

Int. Cl.[5] G11B *17/22, 33/02, 23/00, 15/18*

U.S. Cl. 369—33 **8 Claims**



1. A disc apparatus which is controlled by an external processing apparatus, said disc apparatus comprising:

a drive mechanism rotatively driving a disc recording medium recording information and having a hub at a center thereof, said drive mechanism including a motor and chucking mechanism provided on a shaft of said motor, said chucking mechanism supporting and fastening the hub of said disc recording medium at a regular position that is given by positioning the center of the disc recording medium which has been loaded into the disc apparatus on the shaft of said motor;

a head reading out information from said disc recording medium;

disc loading detection means for outputting a loading detection signal when said disc recording medium has been loaded into said disc apparatus;

chucking control means for outputting a first signal for driving said motor when said disc loading detection means outputs the loading detection signal and during an interval in which the support and fastening of the hub of said disc recording medium at the regular position is carried out by said chucking mechanism;

motor drive control means for driving said motor when at least one of the first signal from said chucking control means and a second signal from said external information processing apparatus is supplied;

information output means for supplying information obtained from said head to said external information processing apparatus when the motor is being driven by said motor drive control means; and

output prohibit means for prohibiting the supply of information from said information output means to said external information processing apparatus during the interval in which the first signal is outputted from said chucking control means.

5,150,341

DISK FILE APPARATUS

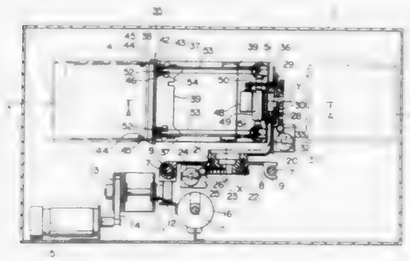
Hitoshi Shibayama, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 27, 1990, Ser. No. 499,899

Claims priority, application Japan, Mar. 31, 1989, 1-83343

Int. Cl.[5] G11B *17/22, 17/04, 15/68, 17/08*

U.S. Cl. 369—36 **11 Claims**



1. A disk file apparatus comprising:

a pair of stockers arranged to be opposite to each other within a housing and having a plurality of disk cartridges piled up and stored therein;

a disk driving means arranged adjacent to said stockers so as to perform a recording and a reproduction;

a carrier reciprocated between said pair of stockers and said disk driving means;

a changer arranged at said carrier so as to load and unload the disk cartridges into and away from the stockers and the disk driving means;

a first reversing means for rotating said changer around a first axis crossing at a right angle with a line connecting the relative directions of said pair of stockers with a linear line and for reversing the changer between one position opposing against one stocker and the other position opposing against the other stocker; and

a second reversing means for rotating said changer around a second axis extending toward a linear direction connecting relative directions of said pair stockers by a linear line and reversing a top surface and a bottom surface of the disk cartridge.

5,150,342

PHOTO-DETECTING DEVICE

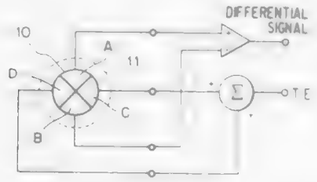
Shinichi Nagahara; Naoharu Yanagawa, and Takaaki Matsumoto, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 8, 1991, Ser. No. 652,726

Claims priority, application Japan, Jun. 27, 1990, 2-166624

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.14 **5 Claims**



1. A photo-detecting device comprising a light receiving element for receiving a laser beam reflected from an optical information recorded disc via an objective lens, wherein a diameter of a light receiving area of said light detecting element is made smaller than that of the laser beam, said light receiving area being divided into at least four segments by dividing lines radially extending from the center thereof, said dividing lines forming 45 degree angles with a tracking direction of the laser beam, said dividing lines forming first and second diametrically opposite segments along a diameter perpendicular to the tracking direction, and forming third and fourth diametrically opposite segments along a diameter parallel to the tracking direction each of said segments being connected to respective output terminals.

5,150,343

MINIATURIZED LOW-POWER-CONSUMPTION OPTICAL HEAD PROVIDED WITH A STATE TRANSFORMATION MECHANISM

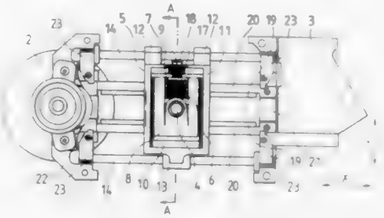
Yoshikazu Goto; Satoshi Kikuya, and Benichi Miyazaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 19, 1990, Ser. No. 554,337

Claims priority, application Japan, Jul. 19, 1989, 1-186403; Jul. 19, 1989, 1-186404

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.22 **12 Claims**



1. An optical head comprising:

a movable bobbin having an objective lens for focusing a light beam on an information track formed on a recording medium;

a carriage for holding said movable bobbin;

transfer guide means for guiding said carriage in such a manner that said carriage can move in a tracking direction;

bobbin supporting means for supporting said movable bobbin and guiding said movable bobbin to said carriage in such a fashion that the objective lens can move in the tracking direction and in a focusing direction, said carriage being able to be connected with and released from a fixed portion outside said carriage and said bobbin supporting means in a manner such as to restrain a movement of said movable bobbin in the tracking direction;

tracking drive means having tracking coils, each of which is connected to said movable bobbin for driving the objective lens in the tracking direction and further having a magnetic circuit placed in a position spaced a predetermined distance from said carriage for generating magnetic flux across said tracking coils;

focus drive means for driving the objective lens in the focusing direction; and

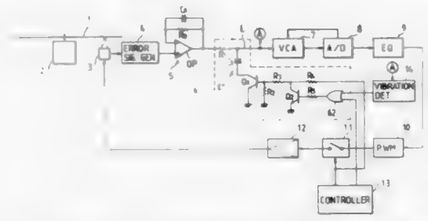
state transformation means for changing the relative positions of said movable bobbin and said carriage from a first state, in which the objective lens can move in the tracking direction but said carriage does not move in the tracking direction, to a second state, in which said movable bobbin and said carriage move in the tracking direction as one body by releasing said carriage from said fixed portion and connecting said carriage to said bobbin supporting means, the state transformation means further changing the relative positions of said movable bobbin and said carriage from the second state to the first state by releasing said carriage from said bobbin supporting means and connecting said carriage to said fixed portion.

5,150,344

TRACKING SERVO SYSTEM

Munehiko Iwase; Hidehiro Ishii; Noriyoshi Takeya, and Tatsuya Fukuda, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 23, 1990, Ser. No. 483,705
Claims priority, application Japan, Sep. 28, 1989, 1-255003
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.28 **5 Claims**



1. A tracking servo system for use in a recording/reproducing apparatus, said recording/reproducing apparatus recording to and reproducing from a recording medium having a plurality of recording tracks, said tracking servo system comprising:

tracking error signal generation means for generating a tracking error signal corresponding to a direction and a quantity of deviation of a relative position between a recording track of an information recording disk and an information reading point in a radial direction of said information recording disk;

a servo loop for controlling said relative position in accordance with a polarity and level of said tracking error signal;

control means for controlling opening/closing of said servo loop; and

noise removal means for removing a high-frequency noise component contained in said tracking error signal, said noise removal means being controlled by said control means so as to be in an inoperative state at least when said servo loop is in an opened state, wherein said noise removal means has an inoperative state also during a predetermined period immediately after said servo loop shifts from said opened state to a closed state.

5,150,345

OPTICAL INFORMATION RECORDING APPARATUS PROVIDED WITH MEANS FOR SAMPLING AND HOLDING A SERVO SIGNAL WHEN THE INTENSITY OF A LIGHT BEAM VARIES BETWEEN INTENSITY LEVELS

Satoshi Shikichi, Tokyo, and Shigeto Kanda, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 711,423, Jun. 5, 1991, abandoned, which is a continuation of Ser. No. 225,722, Jul. 28, 1988, abandoned. This application Nov. 18, 1991, Ser. No. 794,644
Claims priority, application Japan, Aug. 12, 1987, 62-200037
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.34 **9 Claims**

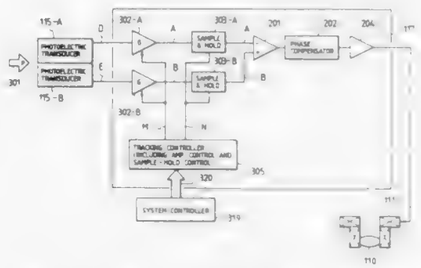
1. An optical information recording apparatus for optically recording information on a recording medium, said apparatus comprising:

means for condensing a light beam into a light beam spot, intensity modulating means for intensity modulating the light beam between at least two discrete non-zero intensity levels based on the information to be recorded, and means for scanning the light beam on a recording medium to record the information thereon;

detecting means for detecting a position error signal indicative of a position error between the light beam spot and the recording medium in at least one of a focusing direction perpendicular to the surface of the medium and a tracking direction in a plane parallel to the surface of the medium which is perpendicular to tracks formed on the medium;

servo means for correcting the position error on the basis of the position error signal detected by said detecting means;

gain varying means for varying gain of said servo means in accordance with the intensity level of the light beam;



sampling and holding means for sampling and holding the position error signal; and

control means for controlling said sampling and holding means to cause said sampling and holding means to sample and hold the position error signal as long as the intensity of the light beam is at least halfway between different levels during shift in intensity levels.

5,150,346

AUTOMATIC TRACKING SERVO GAIN CONTROL APPARATUS

Tadashi Minakuchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 450,928, Dec. 14, 1989, abandoned. This application Oct. 4, 1991, Ser. No. 769,765
Claims priority, application Japan, Dec. 14, 1988, 63-315955
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.36 **16 Claims**

1. An automatic gain control apparatus, comprising:

means for holding voltages in compliance with a peak level of a playback signal that includes recorded area components and track cross components, said playback signal being obtained by playing back a recording medium with tracks, on which data is recorded through a head, and for outputting said holding voltage;

means for detecting a first signal included in said playback signal and producing a detection signal;

means for producing a first base signal which includes only said track cross components thereof by discharging said voltages held by said holding means in response to said detection signal;

means for generating a first control signal that includes only said recorded area components based upon said first base signal; and

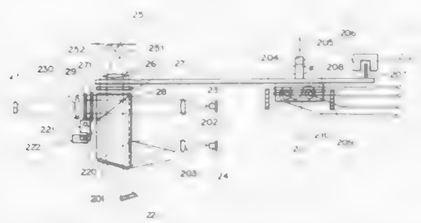
means for controlling a gain of an error signal that corresponds to a position of said head in accordance with said first control signal.

5,150,347

BEAM TRACK POSITION CONTROL APPARATUS FOR OPTICAL DISK APPARATUS

Shigenori Yanagi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 5, 1990, Ser. No. 488,147
Claims priority, application Japan, Mar. 14, 1989, 1-61530
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.37 **8 Claims**



1. A beam track position control apparatus for an optical disk apparatus including a rotatable optical disk on which a plurality of guide grooves for guiding a beam spot projected thereon are spirally formed along a direction of rotation of the rotatable optical disk, an optical head including a first light source for emitting a first beam of light, a second light source for emitting a second beam of light and an object lens for focusing the first and the second beams onto the optical disk, and track actuator means for moving the object lens in the radial direction, said beam track position control apparatus comprising:

first photodetector means for detecting light of the first beam reflected from said optical disk and producing a first output signal;

second photodetector means for detecting light of the second beam reflected from said optical disk and producing a second output signal;

means for inclining the optical axis of the second beam passing through said object lens and changing the position of the second beam incident on said optical disk;

actuator means for driving said optical axis inclining means;

third photodetector means for detecting a current position of said optical axis inclining means and producing a third output signal;

first control means for controlling said track actuator means based on a track error signal obtained from the first output signal from said first photodetector means; and

second control means for controlling said actuator means based on another track error signal obtained from the second output signal from said second photodetector means and a current position signal obtained from the third output signal from said third photodetector means to thereby change the position of the second beam incident on said optical disk.

5,150,348

TRACKING SERVO UTILIZING BEAM SPLITTER

Shuichi Fujita, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

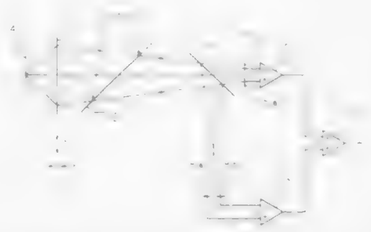
Filed Nov. 28, 1990, Ser. No. 619,758
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.41 **5 Claims**

1. An optical head which irradiates a beam on a recording medium and detects a tracking error on said recording medium by the reflected beam from said recording medium comprising:

a focusing unit for focusing the reflected beam from said recording medium,

a beam splitter for splitting the light path of the reflected beam transmitted by said focusing unit into first and second light paths,

a first photo detector arranged in said first light path and before the focal point of said reflected beam in the first light path, having a light receiving area split into at least two parts and outputting a signal responsive to the difference in the quantity of the entering beam between said two parts,



a second photo detector arranged in said second light path and beyond the focal point of said reflected beam in the second light path, having a light receiving area split into at least two parts and outputting a signal responsive to the difference in the quantity of the entering beam between said two parts, and

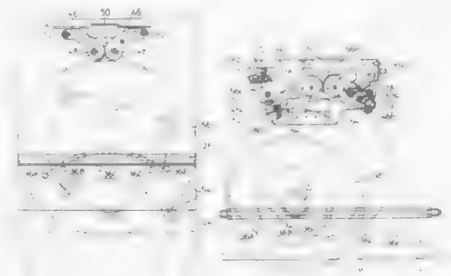
operating means for totaling the outputs of said first and second photo detectors wherein the output of said operating means is applied as a tracking control signal.

5,150,349

DISC LOADING STRUCTURE

Kazuki Takai, Ichikawa; Yuuji Teraguchi, and Mitsuo Nakatani, both of Toda, all of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1990, Ser. No. 599,035
Claims priority, application Japan, Oct. 19, 1989, 1-272646; Oct. 19, 1989, 1-272648; Oct. 20, 1989, 1-273446; Oct. 20, 1989, 1-273447
Int. Cl.[5] G11B *33/02, 17/04, 17/08, 15/48*
U.S. Cl. 369—75.2 **6 Claims**



2. A disk loading structure comprising:

a transfer means for transferring either a large disc or a small disc to a position above a turntable; and

a sensor group comprising a plurality of disc detecting sensors selectively exhibiting a detection mode and a non-detection mode;

said sensor group being divided into a first sensor group section and a second sensor group section;

said first sensor group section being arranged so as to define

therein an interval smaller than the diameter of a large disc;

said second sensor group arranged within said first sensor group section and arranged so as to define therein an internal smaller than the diameter of a small disc, each of the sensors providing respective signals, and

control means responsive to said signals for judging whether an article inserted is an adapter for dimensionally adapting said small disc to said large disc, when said first sensor group section exhibits the detection mode and said second sensor group section exhibits the non-detection mode.

5,150,350

MAGNETO-OPTICAL DATA RECORDING AND REPRODUCING DEVICE

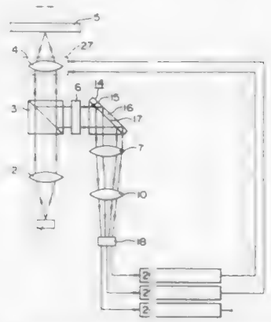
Hideki Aikoh, Higashiosaka; Tohru Nakamura, Katano; Masayuki Shinoda, Moriguchi, and Noboru Kikuchi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 6, 1989, Ser. No. 403,446

Claims priority, application Japan, Sep. 9, 1988, 63-227009

Int. Cl.[5] G11B *5/09*

U.S. Cl. 369—112 **5 Claims**



1. A magneto-optical data recording and reproducing device for storing data in a data memory medium which modulates a polarization plane of an incident light beam, erasing data therefrom and reproducing data stored therein, comprising:

a light source for emitting a light beam having a linear polarization,

a light spot forming means for condensing said light beam emitted from said light source and forming a light spot on said data memory medium,

a beam splitting means, located between said light source and said light spot forming means, for receiving and splitting a reflected light beam from said data memory medium,

a beam detecting prism, onto which the light beam split by said beam splitting means is applied, for providing a polarizing function such that a predetermined first pencil light beam with a first linear polarization is reflected while a second pencil light beam with a second linear polarization orthogonal to said first linear polarization is transmitted,

a beam splitting prism, located adjacent to said beam detecting prism and including two reflecting surfaces which are disposed respectively in different planes, for splitting, by reflection, said second pencil light beam transmitted through said beam detecting prism into two subpencil light beams having approximately a same quantity of light, said two split subpencil light beams being adapted to be used to produce a tracking error signal, and then for re-applying them to said beam detecting prism to form two optical axes extending along approximately a same direction as that of said first pencil light beam,

a focusing means for receiving said first pencil light beam and said two subpencil light beams which have passed through said beam detecting prism and said beam splitting prism and for focusing them;

at least one photo detector onto which said focusing means focuses said first pencil light beam and said two subpencil light beams, for producing an output signal including a data signal component, and a tracking error signal component based on said two subpencil light beams,

a data retrieval unit for detecting data stored in said data memory medium in accordance with said data signal component of said output signal of said photo detector,

a tracking servo unit to which said tracking error signal component is applied, and

a driving means for driving at least said light spot forming means in response to an output signal from said tracking servo unit.

5,150,351

OPTICAL INFORMATION RECORDING APPARATUS FOR RECORDING AN INPUT SIGNAL HAVING VARIABLE WIDTH PULSE DURATION AND PULSE SPACING PERIODS

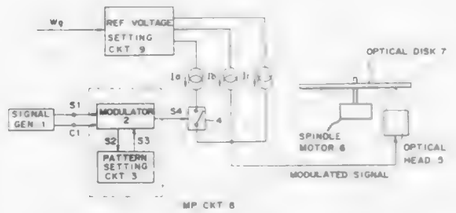
Eiji Ohno, Hirakata; Kenichi Nishiuchi, Moriguchi; Noboru Yamada, Hirakata; Kenzou Ishibashi, Moriguchi; Kunio Kimura, Tsuzuki, and Nobuo Akahira, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 546,906, Jul. 2, 1990, Pat. No. 5,109,373. This application Jun. 7, 1991, Ser. No. 712,031

Claims priority, application Japan, Jun. 30, 1989, 1-170207; Dec. 13, 1989, 1-323369

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **8 Claims**



1. A recording apparatus which records an input signal having variable width pulse duration periods and variable width pulse spacing periods on a recording medium by irradiation of an optical beam to form recording marks corresponding to each of said pulse duration periods, said apparatus comprising:

a means for detecting a leading edge of each of said pulse duration periods and for producing a start signal thereupon;

a means for detecting a trailing edge of each of said pulse duration period and for producing a stop signal thereupon;

a means for storing a predetermined basic pattern formed by a pulse string, said pulse string having a predetermined length equal to the longest pulse duration period of said variable width pulse duration periods;

a means for producing said basic pattern from its beginning in response to said start signal and for terminating the production of said basic pattern in response to said stop signal to produce a cutout basic pattern signal;

a reference voltage setting means for producing a first bias current corresponding to a difference between recording and erasing power levels, a second bias current corresponding to a difference between erasing and playback power levels and a third bias current corresponding to said playback power level;

a first switch means disposed in a line for outputting said first bias current, said first switch means being turned on and off in accordance with said cutout basic pattern signal to produce a modulated first bias current;

a means for adding said modulated first bias current, said second bias current and said third bias current to produce a modulated signal; and

a beam emitting means for emitting said optical beam in accordance with said modulated signal.

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INFORMATION RECORDING AND REPRODUCING APPARATUS HAVING AN EMERGENCY CONVEYING DEVICE FOR MOVING A CARRIAGE MEMBER TO AN EJECTING PORT

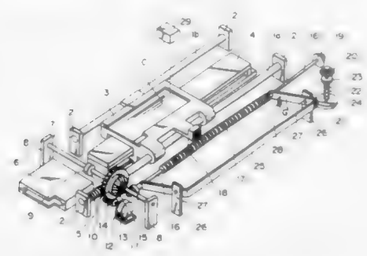
Hideo Kurihara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,333

Claims priority, application Japan, Sep. 27, 1988, 63-241881

Int. Cl.[5] G06K *13/00, 13/06*

U.S. Cl. 369—258 **4 Claims**



1. An optical information recording /reproducing apparatus for effecting at least one of recording of information on and reproducing of information from a card-like information recording medium by use of a light beam, said apparatus comprising:

an opening through which the information recording medium can be inserted into and ejected form said apparatus;

a driving roller for conveying the information recording medium inserted through said opening into said apparatus;

a rotary motor for rotationally driving said driving roller by a driving force;

a driving transmission mechanism for transmitting the driving force of said rotary motor to said driving roller;

holding means for receiving the information recording medium conveyed by said driving roller and for holding the information recording medium;

an engaging section provided on said holding means;

an optical head for effecting at least one of recording of information on and reproducing of information from the information recording medium;

a linear motor for moving said holding means relative to said optical head; and

manual driving means adapted to come into engagement with said engaging section of said holding means and said driving transmission mechanism to rotationally drive said driving roller and to move said holding means relative to said optical head by a manual operation from outside of said apparatus,

wherein said manual driving means is retractably provided against said driving transmission mechanism and said holding means so that when said driving transmission mechanism transmits the driving force of said rotary motor to said driving roller and said holding means is being moved by said linear motor, said manual driving means is retracted to a position away from said engaging section of said holding means and said driving transmission mechanism, and when said linear motor is rendered inoperative due to an abnormal condition, said manual driving means is caused to come into engagement with said driving transmission mechanism and said engaging section of said holding means to be driven by a manual operation from outside of said apparatus, thereby rotationally driving said driving roller in an ejecting direction and moving said holding means toward said opening to eject said information recording medium form said apparatus.

5,150,353

APPARATUS FOR SCANNING A DISC, AND SUCTION DEVICE FOR HOLDING A DISC FLAT DURING SCANNING

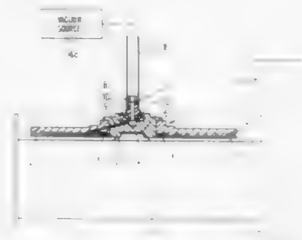
Thomas M. Schnorr, Wolfenbüttel, and Jurgen G. Hannemann, Seelze, both of Fed. Rep. of Germany, assignors to Philips and Du Pont Optical Company, Nieuwegein, Netherlands

Continuation of Ser. No. 229,375, Aug. 5, 1988, abandoned. This application Sep. 11, 1991, Ser. No. 759,724

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726226

Int. Cl.[5] G11B *23/00, 25/00*

U.S. Cl. 369—270 **11 Claims**



1. A suction holding device for holding a disc relative to a turntable of an apparatus while the apparatus scans the disc, said device comprising a holding element having a holding side having substantially the same diameter as the disc to be scanned, and means for applying a vacuum between the element and the disc, characterized in that

on its holding side the element has concentrically arranged annular depressions and at least one radially extending depression communicating with the annular depressions,

said means for applying includes a connection member which is rotatably journalled to the element on a side of the element opposite the holding side, said connection member having a first passage therethrough which communicates via an air-tight connection with a second passage through the element, said first passage being arranged for connection to a vacuum source, and said second passage communicating with said at least one radially extending depression, and

the holding side of said element faces the turntable, and on its holding side said element comprises means for temporarily connecting mechanically to centering and driving portions of the turntable while the apparatus scans said disc,

whereby said device receives driving power for rotating the element from the holding side, while connection to a vacuum source is made from the opposite side.

5,150,354

DISK CARTRIDGE

Hirokimi Iwata, Ibaragi, and Shuji Haruna, Tokyo, both of Japan, assignors to Sony Corporation, Japan

Filed Oct. 31, 1989, Ser. No. 429,805

Claims priority, application Japan, Nov. 11, 1988, 63-147216[U]

Int. Cl.[5] G11B *23/02, 23/03*

U.S. Cl. 369—291 **5 Claims**

1. A disk cartridge comprising:

a main body of the cartridge for rotatably housing therein a disk-shaped recording medium, said main body of the

cartridge having a major surface for extending over said recording medium and an opening in the major surface thereof for exposing a signal recording surface of the disk-shaped recording medium accommodated therein to the outside and an insertion/detachment aperture for the disk-shaped recording medium on a lateral side thereof normal to major surface, and

an opening/closing member having a pivot section on a first side thereof fulcrumed at one end of said aperture of said

main body of the cartridge for opening and closing said aperture, said opening/closing member having a resilient arm on a second side thereof, said resilient arm having a retaining end pawl engaging in a mating retaining section provided on the other lateral side of said main body of the cartridge,

wherein said pivot section is provided with releasing means for releasing the engagement between the pivot section and the main body of the cartridge when said opening/closing member is rotated beyond a predetermined extent.

5,150,355

RELATING EXCHANGES

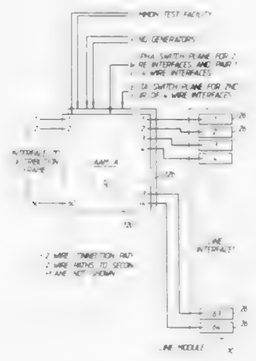
Nigel P. Dyer, Glebelands, 1 St. Michael's, Church Road, Liverpool, L17 7BD, England

Filed Mar. 28, 1990 Ser. No. 501,531

Claims priority, application United Kingdom, Mar. 31, 1989, 8907315

Int. Cl.[5] **H04G** *11/04*; **H04J** *1/16, 3/14*

U.S. Cl. 370—16 **13 Claims**



1. An electronic cross connect frame, for an exchange or a multiplexer thereof, comprising an analogue access matrix having an integral number n+x subscriber line interfaces and an integral number n interface connections to a distribution frame, the matrix being capable of switching, on a one-one basis, up to 2x of the subscriber line interfaces to any of the interface connections to the distribution frame, and control means associated with the matrix for switching a subscriber interface to an interface connection to the distribution frame and for mapping the paths from the subscriber line interfaces to the interface connections to the distribution frame.

5,150,356

DUAL-RING ATM COMMUNICATIONS SYSTEM

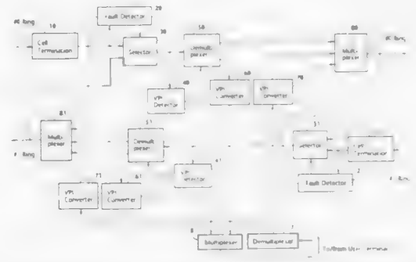
Takashi Tsutsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 26, 1991, Ser. No. 735,533

Claims priority, application Japan, Jul. 27, 1990, 2-197631

Int. Cl.[5] **H04J** *3/14*; **H04L** *12/42*

U.S. Cl. 370—16.1 **2 Claims**



1. An asynchronous transfer mode communications system, comprising:

first and second ring transmission lines; and

a plurality of network nodes connected in the first and second ring transmission lines so that cells are transmitted in one direction over the first ring transmission line and an opposite direction over the second ring transmission line, each of the nodes comprising:

first multiplexer means for forwarding a cell to a first segment of the first ring transmission line and second multiplexer means for forwarding a cell to a first segment of the second ring transmission line, each of the cells forwarded by the first and second multiplexer means containing a first identifier (R_k) identifying one of the ring transmission lines and a second identifier ($P_{i,j}$) identifying a path between source and destination nodes;

first cell detector means for examining the identifiers of a cell from a second segment of the first ring transmision line to determine the destination of the cell;

second cell detector means for examining the identifiers of a cell from a second segment of the second ring transmission line to determine the destination of the cell;

first demultiplexer means normally connected to the second segment of the first ring transmission line for terminating the cell therefrom or passing it on to the first multiplexer means depending on the destination determined by the first cell detector means;

second demultiplexer means normally connected to the second segment of the second ring transmission line for terminating the cell therefrom or passing it on to the second multiplexer means depending on the destination determined by the second cell detector means;

first fault detector means for detecting a fault on the second segment of the first ring transmission line;

second fault detector means for detecting a fault on the second segment of the second ring transmission line;

first switching means for establishing a first emergency connection from the second multiplexer means to the first demultiplexer means in response to the detection of a fault by the first fault detectors means and disconnecting the first demultiplexer means from the second segment of the first ring transmission line; and

second switching means for establishing a second emergency connection from the first multiplexer means to the second demultiplexer means in response to the detection of a fault by the second fault detector means and disconnecting the second demultiplexer means from the second segment of the second ring transmission line.

5,150,357

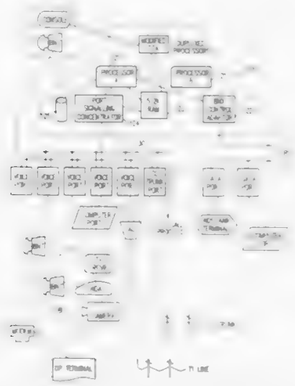
INTEGRATED COMMUNICATIONS SYSTEM

Emil Hopner, 211 Prospect Ave., Los Gatos, Calif. 95030; John R. Featherston, 64 Central Ave., Los Gatos, Calif. 95032, and Michael A. Patten, 7454 Tulare Hill Rd., San Jose, Calif. 95139

Filed Jun. 12, 1989, Ser. No. 365,175

Int. Cl.[5] **H04Q** *11/04*

U.S. Cl. 370—68.1 **10 Claims**



1. Apparatus for connecting an originating port to a receiving port in a communication system, said apparatus comprising:

a distributed control switching matrix having a plurality of originating group submatrices, a plurality of intermediate group submatrices and a plurality of terminating group submatrices;

said originating port transmitting a first control signal for selecting an originating group submatrix;

said originating group submatrix selecting a path to a terminating group submatrix via an intermediate group submatrix in response to the combination of a second control signal produced by said intermediate group submatrix with said first control signal;

said intermediate group submatrix selecting a path to the receiving port via a terminating group submatrix in response to the combination of a third control signal produced by said terminating group submatrix with said second control signal;

said terminating group submatrix producing and transmitting a fourth control signal to said originating port which represents verification that connection form said originating port to said receiving port has been made.

5,150,358

SERVING CONSTANT BIT RATE TRAFFIC IN A BROADBAND DATA SWITCH

Vikram Punj, Naperville, Ill., and Albert K. Wong, Edison, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 23, 1990, Ser. No. 571,800

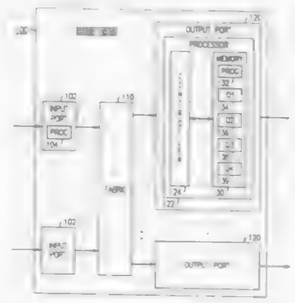
Int. Cl.[5] **H04J** *3/22*

U.S. Cl. 370—84 **9 Claims**

1. A method of transmitting packetized data traffic from a number of sources having different bit rates comprising the steps of:

entering data from sources having different bands of bit rates in different queues; and

transmitting data from queues serving higher bit rate sources with higher priority than data from queues serving lower bit rate sources;



wherein some of said sources generate constant bit rate data and others generate variable bit rate data, wherein separate queues are used for serving constant bit rate data sources and variable bit rate data sources and wherein said transmitting comprises transmitting data from queues serving constant bit rate sources with higher priority than data from queues serving bit rate sources.

5,150,359

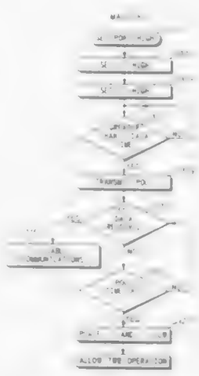
MULTIPLEXED SYNCHRONOUS/ASYNCHRONOUS DATA BUS

Gregory P. Wilson, Lake Zurich; Bryan A. Potratz, Palatine; Thomas J. Walczak, Woodstock, all of Ill.; Jeffery L. Mullins, Cupertino, Calif., and Mark E. Prill, Lake Zurich, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 6, 1990, Ser. No. 563,364

Int. Cl.[5] **H04J** *3/02*

U.S. Cl. 370—85.11 **10 Claims**



4. A slave data device couplable to a data transmission bus including three communications lines, at least two of the three communications lines conveying a first data message from a master data device at a first rate of data transfer and at least one of the three communications lines conveying a second data message at a second rate of data transfer from the master data device which applies a first binary signal to a first of the three communications lines for a period of time greater than one bit time of the first rate of data transfer and which applies a second

binary signal to a second of the three communications lines for a period of time greater than one bit time of the first rate of data transfer, and conveying a third data message to the master data device, each of the data messages having a plurality of binary bits and each bit having either a binary zero state or a binary one state for a period of time related to the data transfer rate, the slave data device comprising:

means for detecting the first binary signal applied to the first of the three communications lines by the master data device for a period of time greater than one bit time of the first rate of data transfer;

means for detecting the second binary signal applied to the second of the three communications lines by the master data device for a period of time greater than one bit time of the first rate of data transfer;

means for receiving the binary bits of the second data message from the at least one of the three communications lines; and

means, responsive to receipt of the second data message and said means for detecting the first binary signal and said means for detecting the second binary signal, for applying a third data message to the third of the three data lines when said first binary signal and said second binary signal are detected to have opposite binary states.

5,150,360

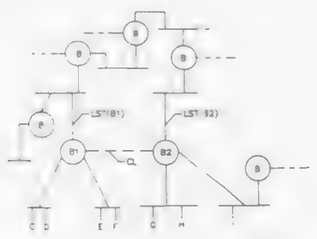
UTILIZATION OF REDUNDANT LINKS IN BRIDGED NETWORKS

Radia J. Perlman, Acton; William Hawe, Pepperell, and Anthony Lauck, Wellesley, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 7, 1990, Ser. No. 489,910

Int. Cl.[5] H04J *3/24*

U.S. Cl. 370—94.3 **28 Claims**



1. In a bridged communication network that has been pruned to form a loop-free spanning tree configuration having a root bridge, a method of exchanging messages between stations, through a point-to-point cross-link outside the spanning tree configuration, the method comprising the steps of:

identifying a cross-link between any two bridges in the network, wherein the cross-link exists outside the spanning tree configuration;

selecting in at least one of the two bridges a set of destination stations for receipt of messages to be transmitted over the cross-link, the destination stations being selected without regard to their locations with respect to the root bridge in the spanning tree configuration;

advising the other of the two bridges of the identities of the selected destination stations;

examining each message received over the spanning tree at the other of the two bridges to determine if the intended destination of the message qualifies as one of the selected stations; and

forwarding the message over the cross-link if the destination station in the message qualifies

5,150,361

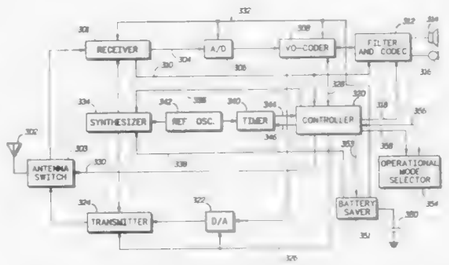
ENERGY SAVING PROTOCOL FOR A TDM RADIO

Alfred B. Wieczorek, Plantation, Fla.; Alvin D. Kluesing, San Diego, Calif., and Michael D. Sasuta, Mundelein, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 300,992, Jan. 23, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 644,368

Int. Cl.[5] H04B *1/16;* **G08B** *5/22*

U.S. Cl. 370—95.1 **24 Claims**



23. A battery powered communication device being capable of conserving energy by functioning in one of two operational modes while operating within a time division multiplexed communication system having a communication channel arranged into repetitive time frames which include a plurality of slots, wherein each frame includes at least two control slots allocated for the communication of signalling and control information, wherein said signalling and control information include a slot identification code for identifying location of each control slot within the frame, said device comprising:

receiving means for receiving information from one or more of the plurality of time slots;

means for monitoring only a portion of one of said at least two control slots and detecting the slot identification code of said control slot when operating in a low power or energy saving mode;

means for monitoring a portion of each of said at least two control slots and detecting the slot identification codes of the at least two control slots when operating in a higher power mode;

control means for controlling the battery powered communication device to operate in the energy saving mode or the higher power mode in response to a control signal.

5,150,362

BEACON CARRIER

Dag E. Åkerberg, Järfälla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 6, 1990, Ser. No. 578,249

Claims priority, application Sweden, Sep. 13, 1989, 8903030

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.100 **6 Claims**

1. A method of selecting a base station, radio channel and time slot at a mobile station for call set up or handover in a mobile communication system comprising a plurality of base stations, mobile stations, and time division multiple access radio channels, comprising the steps of:

transmitting from each base station, in each communication radio channel time slot used by the transmitting base station for calls, at least once during a multiframe on the communication channel, roaming signals comprising information on identity of the transmitting base station and communication radio channels available at the transmitting base station;

transmitting from each base station in one time slot of a predetermined control radio channel roaming signals comprising information on identity of the transmitting base station and communication radio channels available at the transmitting base station;

scanning the predetermined control radio channel for receiving satisfactory roaming signals at any mobile station;

scanning communication radio channels available according to received roaming signals for receiving noise and interfering radio signals in time slots unused by the base station at any mobile station desirous of call set up or handover;

storing and updating information on base station identity and available communication radio channels and time slots from radio signals received at any mobile station;

selecting at any mobile station desirous of call set up or handover a base station and a time slot on a communication radio channel for call set up or for handover according to information received in satisfactory roaming signals at the mobile station on the control radio channel and communication radio channel respectively; and

transmitting to the selected base station from the mobile base station desirous of call set up or handover radio signals comprising information on mobile station identity, the selected communication radio channel and the time slot selected.

5,150,363

SERIAL INPUT/OUTPUT MULTIPLEXING APPARATUS

Michael L. Mitchell, Terre Haute, Ind., assignor to Digital Audio Disc Corporation, Terre Haute, Ind.

Filed Aug. 11, 1989, Ser. No. 392,417

Int. Cl.[5] H04J *3/04;* **H04L** *5/16;* **H04B** *3/20*

U.S. Cl. 370—112 **17 Claims**

1. Serial input/output multiplexing apparatus for bi-directional communication between remote devices and a controller over a two-wire, asynchronous communication channel, comprising:

a remote module including remote input interface means for receiving input status signals from each of plural input devices coupled thereto, remote output interface means for transmitting output control signals to each of plural output devices coupled thereto, and control means for selectively coupling the remote input interface means or the remote output interface means to said two-wire, asynchronous communication channel for supplying serial input status information to said communication channel in response to said input status signals or for supplying to the remote output interface means output control information serially received from said communication channel; and

a local module including local output interface means for applying said input status information to said controller, local input interface means for receiving from said controller output control information to be coupled to said remote module, and control means for selectively coupling the local output interface means or the local input interface means to said two-wire, asynchronous communication channel for applying to said controller said input status information serially received by the local output interface means from said communication channel or for serially supplying said output control information from the local input interface means to said communication channel in response to output control information received by the local input interface means from said controller.

5,150,364

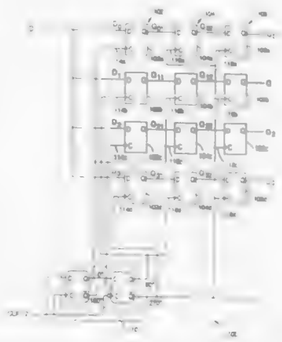
INTERLEAVED TIME-DIVISION DEMULTIPLEXOR

Kevin J. Negus, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 24, 1990, Ser. No. 573,550

Int. Cl.[5] H04J *3/04*

U.S. Cl. 370—112 **15 Claims**



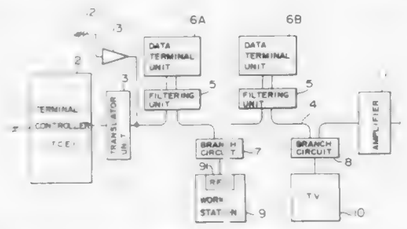
1. A synchronous, interleaved, time-division 1:M demultiplexor for demultiplexing a serial input bit stream having an input bit rate of B into M parallel output bits, comprising:

input latching means for parallelly receiving and latching M serial bits in respective synchronization with a first plurality of selected phases of a multiphase clock signal having a frequency of B/M, wherein each of the first plurality of multiphase clock signal phases is selected to cause the latching of a corresponding bit, wherein M is an integer power of two and equal to or greater than four, and wherein B is a bit rate in bits per second of the received M serial bits;

intermediate latching means for receiving the M latched bits from the input latching means and latching same in respective synchronization with a second plurality of selected phases of the multiphase clock signal, wherein each of the second plurality of multiphase clock signal phases is selected to cause the latching of a corresponding bit to occur substantially at a time at least 2/B after the bit is first received; and

output latching means for receiving the M latched bits from the intermediate latching means and latching same in respective synchronization with at least one selected phase of the multiphase clock signal, wherein each phase is selected to cause the latching of a corresponding bit to occur substantially at a time at least 2/B after the bit is first received.

5,150,365
COMMUNICATION SYSTEM FOR COEXISTENT BASE BAND AND BROAD BAND SIGNALS
Tetsuhiko Hirata, Kawasaki; Kazuo Yagyu, Atsugi; Matsuaki Terada, Machida; Hiroshi Nakase, Fujisawa; Shigeru Oshima, Hadano; Motoyoshi Morito, Saitama, and Takahiko Nishizawa, Satte, all of Japan, assignors to Hitachi, Ltd. and Yagi Antenna Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 122,303, Nov. 18, 1987, abandoned.
This application Jul. 5, 1990, Ser. No. 548,431
Claims priority, application Japan, Nov. 18, 1986, 61-274423
Int. Cl.[5] H04... *1/02*
U.S. Cl. 370—123 8 Claims

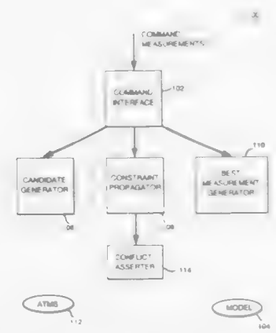


1. A communication system comprising:
a transmission path;
a plurality of first terminal units having means for outputting a corresponding base band signal having frequency components within a base band signal range
a plurality of branch filter means each being provided for an associated one of said first terminal units, each having a first port, a second port, third port, and a low pass filter means, having a predetermined cut-off frequency, connecting said first port to said second port and connecting said third port to said second port, said associated one of the said first terminal units being connected to said second port, for preventing communication to said transmission path of frequency components of said base band signal above said predetermined cut-off frequency outputted from said associated one of said first terminal units, and said branch filter means having a high pass filter means, within said transmission path, having a lower cut-off frequency above said low pass filter cut-off frequency, connecting said first port to said third port for passing a broad band signal, said broad band signal having a range extending upwards from said lower cut-off frequency, through said transmission path from said first port to said third port;
a plurality of second terminal units each having means for sending out a first modulated signal having a first frequency range and means for receiving a second modulated signal having a second frequency range, said first and second frequency ranges being higher than the cut-off frequency of said lowpass filter means, a part of a lower one of said first and second frequency ranges being overlapped with the higher frequency components of said base band signal cut off by said lowpass filter means; and
a plurality branch connecting means, each being provided for an associated one of said second terminal units, for connecting said associated one of said second terminal units to said transmission path.

5,150,366
REDUCED DELAY CIRCUITS FOR SHIFT REGISTER LATCH SCAN STRINGS
Paul H. Bardell, Jr., Carmel, and William H. McAnney, La-Grangeville, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Aug. 1, 1990, Ser. No. 561,399
Int. Cl.[5] H04B *17/00*
U.S. Cl. 371—22.3 4 Claims

1. An apparatus for the built-in self testing of sequential digital logic circuits, said apparatus comprising:
means for generating pseudo-random bit sequences on a plurality of output signal lines;
a first set of shift register latches comprising at least one scan string coupled to said output signal lines of said sequence generating means;
a second set of shift register latches comprising at least one scan string distinct from any string in said first set of shift register latches, with at least one scan string from said second set also being coupled to said output signal lines of said sequence generating means;
a first register coupled so as to receive output bit sequences from at least one scan string from said first set of shift register latches; and
a second register coupled so as to receive output bit sequences from at least one scan string from said second set of shift register latches.

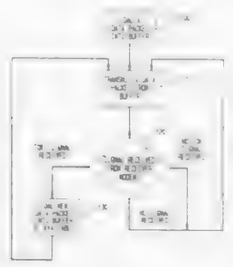
5,150,367
COMPOSITE RANGE CONSTRAINT PROPAGATION CONTROL
David W. Tong, Scotia; Kevin C. Zalondek, and Christopher H. Jolly, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Mar. 2, 1990, Ser. No. 487,515
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—23 5 Claims



1. A method for composite range constraint propagation control, a constraint propagation mechanism being utilized to implement propagation, said method comprising the steps of:

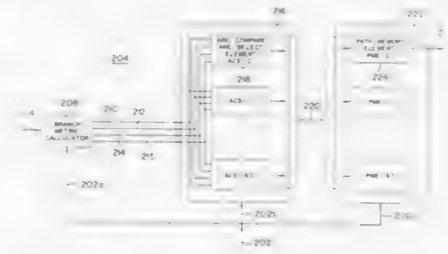
determining whether more than one range is to be propagated through a selected component;
propagating one range if only one range is to be propagated; and
propagating a composite range if more than one range is to be propagated, and if the ranges are sufficiently identical, said sufficiency of identity being determined by comparing a predetermined threshold to the sum of the absolute values of a first and second value, wherein said first value is the difference between the maximum values of said ranges and said second value is the difference between the minimum values of said ranges.

5,150,368
MINIMIZATION OF MODEM RETRANSMISSIONS
Tho Autruong, Mountain View, and Daniel Lai, Los Altos, both of Calif., assignors to Rolm Systems, Santa Clara, Calif.
Filed Apr. 10, 1990, Ser. No. 507,283
Int. Cl.[5] H04L *1/18*; G06F *11/00*
U.S. Cl. 371—31 7 Claims



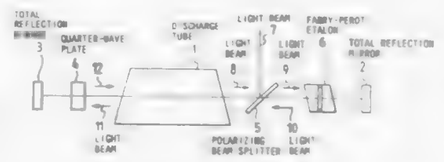
1. Method for minimizing retransmissions between modems comprises the steps of:
receiving a data packet and determining a checksum;
comparing the checksum with a checksum embedded in the data packet;
if the checksums are the same, transmitting a signal which indicates that a data packet was received correctly;
if the checksums are different, determining whether the number of incorrectly received data packets is less than a predetermined threshold, and, if so, saving the data packet with its embedded checksum and transmitting a signal which indicates that a data packet was not received correctly; otherwise, predicting a dat packet from the received data packet and predetermined ones of previously received and saved data packets, including the embedded checksums, and determining a checksum for the predicted data packet;
if the embedded checksum in the predicted data packet matches the determined checksum for the predicted data packet, transmitting a signal which indicates that a data packet was received correctly; and
if the embedded checksum in the predicted data packet does not match the determined checksum for the predicted data packet, saving the newly received data packet with its embedded checksum and transmitting a signal which indicates that a data packet was not received correctly;
wherein the step of predicting a data packet comprises bit averaging the received data packet and predetermined ones of previously received and saved data packets.

5,150,369
HIGH-SPEED CONVOLUTIONAL DECODER
Tony M. Costa, 81 Seeley Ave., Kearny, N.J. 07032, and Robert Resuta, 225 Charlotte Ave., S. Bound Brook, N.J. 08880
Filed Jun. 13, 1989, Ser. No. 365,845
Int. Cl.[5] G06F *11/10*; H03M *13/12*
U.S. Cl. 371—43 15 Claims



1. A convolutional decoder for decoding a received message of digital data convolutionally encoded at a constraint length of K, comprising:
(a) branch metric calculating means for receiving said digital data and providing output signals indicative of branch metrics therefore;
(b) a plurality of 2^{K-1} parallel circuit means for receiving said output signals form said branch metric calculating means and compounding state metrics, said 2^{K-1} parallel circuit means being interconnected to form a trellis and generating decision bits; and
(c) a plurality of 2^{K-1} parallel memory circuits for receiving said decision bits from said plurality of 2^{K-1} parallel circuit means, said 2^{K-1} parallel memory circuits being interconnected also to form a trellis and responsive to said received decision bits to output a decoded digit of said received message data without traceback into said decoder.

5,150,370
NARROW-BAND LASER APPARATUS
Nobuaki Furuya, Kawasaki; Takuhiro Ono, Zama; Naoya Horiuchi; Keiichiro Yamanaka, both of Kawasaki, and Takeo Miyata, Zama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 487,080, Mar. 1, 1990, Pat. No. 4,985,898. This application Dec. 12, 1990, Ser. No. 626,145
Claims priority, application Japan, Jun. 14, 1989, 1-151789; Nov. 1, 1989, 1-286840; Jan. 12, 1990, 2-4984; Jan. 12, 1990, 2-4985; Jan. 12, 1990, 2-4986
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—106 41 Claims



1. A narrow-band laser apparatus comprising:
(a) an optical resonator including first and second reflecting means;
(b) laser medium provided in a light path of said optical

resonator for emitting light, said laser medium including an exciting means;

(c) polarizing beam splitting means provided between said first reflecting means and said laser medium in said light path for splitting said light into a first polarizing component as an output light and a second polarized component, said polarizing beam splitting means being arranged so as to direct said second component toward said first reflecting means;

(d) selection means provided between said second reflecting means and said laser medium in said light path for selecting a given wavelength component from said light; and

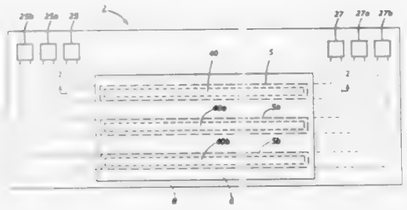
(e) polarizing conversion means provided between said polarizing beam splitting means and said second reflecting means in said light path for producing said first and second polarizing components in response to said light.

5,150,371

LASER DIODE CARRIER WITH A SEMICONDUCTOR COOLER

Igor Abramov; Steven A. Buhler, both of Redondo Beach, and Parviz P. Mazdiyasni, Brea, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 5, 1991, Ser. No. 710,599
Int. Cl.[5] H01S *3/04*
U.S. Cl. 372—34 6 Claims



1. A flip chip combination of a laser diode chip and a thermoelectric cooler chip, comprising

said laser diode chip comprising a plurality of laser stripes;

said cooler chip comprising a plurality of cooling strips; and

said laser chip and said cooler chip being attached to each other in a manner that each of said laser stripes is substantially aligned with and operably connected to a respective cooling strip so that each cooling strip cools its respective laser stripe.

5,150,372

FREQUENCY SWEEPING PHASE-LOCKED-LOOP SYNTHESIZER POWER SUPPLY FOR CO_2 WAVEGUIDE LASER

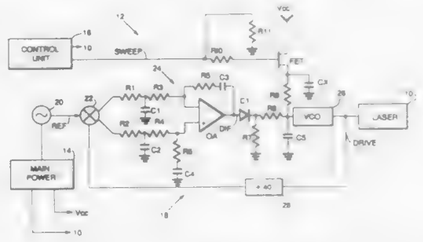
Charles E. Nourrcier, Lakewood, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 13, 1991, Ser. No. 759,348
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—38 22 Claims

1. A radio frequency (RF) power supply for a CO_2 waveguide laser, comprising:

phase-locked-loop frequency synthesizer means for normally generating an RF laser drive signal at a first predetermined frequency for continuous laser operation; and

frequency sweeping means for causing the synthesizer means to sweep the frequency of the drive signal downwardly from a second predetermined frequency which is higher than the first predetermined frequency, through an



intermediate third predetermined frequency for laser lighting, to the first predetermined frequency.

5,150,373

DEVICE FOR RINSING A HOLLOW GUIDE FOR CARBON DIOXIDE LASERS

Achim Kolb, Bretten; Manfred Baier, Knittlingen, and Klaus Müller, Knittlingen-Freudens, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Mar. 12, 1991, Ser. No. 668,026
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008217
Int. Cl.[5] H01S *3/03*
U.S. Cl. 372—61 12 Claims

1. A device for gas rinsing a hollow guide for CO_2 lasers, comprising a hollow guide being designed as a thin ceramic hollow tube which has proximal and distal ends and which is guided in an outer tube, made from stainless steel, whilst leaving a hollow space between the outer tube and the ceramic hollow tube, with the outer tube having an inner wall, proximal and distal ends and being provided at the proximal end with a connecting part having a gas connection and receiving a focusing optical system, wherein the ceramic hollow tube is guided in the outer tube through at least one mounting part arranged at the proximal end and at least one mounting part at the distal end, which in each case is supported locally with respect to the inner wall of the outer tube and is provided with free flow cross-sections to conduct the rinsing gas in the region of support.

5,150,374

METHOD OF FABRICATING A WAVEGUIDE OPTICAL RESONANT CAVITY

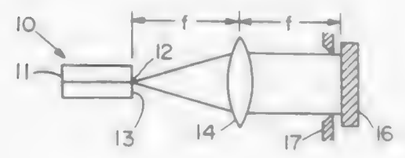
Aram Mooradian, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 341,028, Apr. 20, 1989, Pat. No. 5,050,179. This application Jun. 7, 1991, Ser. No. 712,185
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—92 19 Claims

1. A method for fabricating a waveguide optical resonant cavity for a diode laser comprising the steps of:

a) forming a waveguide in a body of single crystal silicon, said waveguide having an internal width D and a length l extending from a first end to a second end;

b) disposing a lens between the diode laser and the first end of the waveguide for coupling light from the laser to the waveguide; and



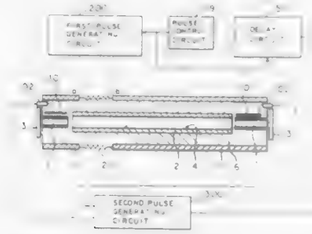
c) forming a resonant cavity output mirror on the second end.

5,150,375

SUBSTANCE VAPORIZING APPARATUS

Yoichiro Tabata; Yoshihiro Ueda; Shigeo Ueguri, and Kazuhiko Hara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 535,615
Claims priority, application Japan, Jun. 14, 1989, 1-151927; Jun. 14, 1989, 1-151933; Jun. 14, 1989, 1-152675
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—98 11 Claims



1. A substance vaporizing apparatus for generating a vapor of a substance for use as an excited medium or an ionized medium in a vapor ion laser and wherein the vapor is generated by heating the substance in a gas-filled tube, comprising a container for containing the substance, said container being disposed within the gas-filled tube and being provided with at least one hole extending through its wall to connect the interior of said container with the interior of said gas-filled tube, thereby forming a flow passage for vapor generated within said container to flow from the interior of said container into the interior of said gas-filled tube.

5,150,376

LASER SOURCE

Shigeru Ohmori, Osaka, and Yoichi Sasai, Hirakata, both of Japan, assignors to Matsushita Electric Indutrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1990, Ser. No. 629,442
Claims priority, application Japan, Dec. 20, 1989, 1-330515
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—107 18 Claims

1. A laser source comprising:

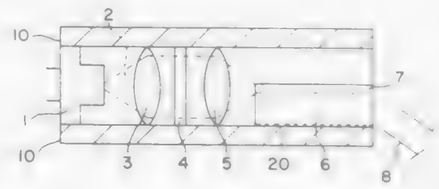
a lens barrel composed of a first material and having an optical axis disposed therein;

a frequency doubler positioned within said lens barrel and having:

(a) a nonlinear optical crystal adhered directly to said lens barrel, and

(b) an optical waveguide formed on said nonlinear optical crystal along said optical axis,

said frequency doubler composed of a second material which has a thermal expansion coefficient substantially similar to the thermal expansion coefficient of said first material of said lens barrel; and



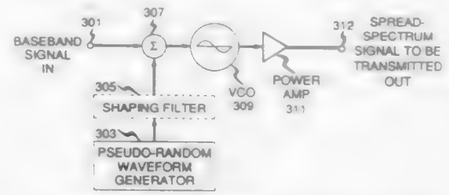
a laser generator positioned within said lens barrel along said optical axis for emitting a laser beam, said laser beam passing through said optical waveguide of said frequency doubler before exiting said lens barrel.

5,150,377

DIRECT SEQUENCE SPREAD SPECTRUM (DSSS) COMMUNICATIONS SYSTEM WITH FREQUENCY MODULATION UTILIZED TO ACHIEVE SPECTRAL SPREADING

Giovanni Vannucci, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 2, 1990, Ser. No. 608,418
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 18 Claims



1. A spread spectrum transmission apparatus comprising:

means for accepting a baseband signal containing information,

means for generating a spreading waveform,

means for combining the spreading waveform with the baseband signal to produce by the sum thereof a spread spectrum signal that is frequency modulated.

5,150,378

METHOD AND APPARATUS FOR COHERENT COMMUNICATIONS IN NON-COHERENT FREQUENCY-HOPPING SYSTEM

Shou Y. Mui, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Oct. 7, 1991, Ser. No. 772,468
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 20 Claims

11. Apparatus for coherent modulation and coding in non-coherent frequency-hopping systems for digital data communication between different first and second locations, comprising:

means for transmitting an original subsequence of data bits from the first location, and including:

means for convolutionally encoding the original data bit subsequence;

means for interleaving the encoded data into a sequential stream;

means for inserting a subsequence of at least one reference bit into the interleaved stream to obtain a total bit sequence; and

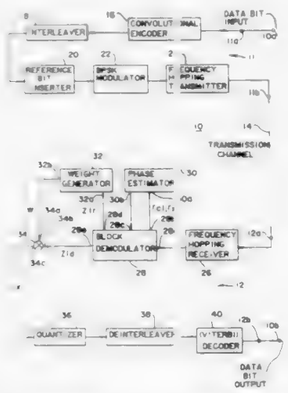
means for modulating the total bit sequence onto a non-

coherently frequency-hopped R.F carrier signal for transmission to at least the second location; and

means for providing the original subsequence of data bits at the second location, including:

means for recovering an in-phase (I) and quadrature-phase (Q) representation of the modulating bit stream from the transmitted signal received at the second location;

means for estimating from the bit stream representation a phase shift of a channel reference carrier signal;



means for demodulating the bit stream representation, responsive to the estimated-phase channel reference carrier signal, into separate reference bit factor and data bit factor streams;

means for modifying the data bit factor stream by a weighting factor W indicative of a level of confidence that the channel reference carrier phase has been estimated accurately; and

means for reversing the interleaving and encoding processes for the modified data bit factor stream to output the original data bit subsequence.

5,150,379

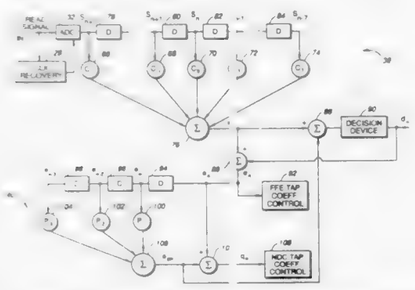
SIGNAL PROCESSING SYSTEM FOR ADAPTIVE EQUALIZATION

Richard A. Baugh, Palo Alto; Ran-Hun Chiu, Los Altos, both of Calif.; Darlene L. Hart, Atlanta, Ga.; Merban Jam, Fremont, and Sui-hing Leung, Cupertino, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 27, 1991, Ser. No. 766,692

Int. Cl.[5] H03H *7/30*

U.S. Cl. 375—14 **16 Claims**



1. A signal processing system for data signals subject to noise and intersymbol interference comprising:

equalizer means for processing a data signal to provide reduction of intersymbol interference, said equalizer means having a plurality of first adaptive circuits responsive to a first error signal,

decision means coupled to said equalizer means for converting said processed data signal into a stream of data samples,

first error means for generating said first error signal as a function of a difference in signal level between said stream of data samples and said processed data signal, said first error means connected to said first adaptive circuits of said equalizer means for adjustment thereof, and

noise predicting means for processing said first error signal to predict noise in said processed data signal, said noise predicting means having a plurality of signal delay taps and second adaptive circuits, said signal delay taps having an input to receive said first error signal, said noise predicting means having an output which is a second error signal generated as a cumulation of signal delay tap outputs weighted by said second adaptive circuits, said output coupled between said equalizer means and said decision means for providing compensation of a signal level to said processed data signal,

said decision means thereby being less susceptible to error due to a noise.

5,150,380

RECEIVER CAPABLE OF REMOVING BOTH INTERSYMBOL INTERFERENCE AND FREQUENCY OFFSET

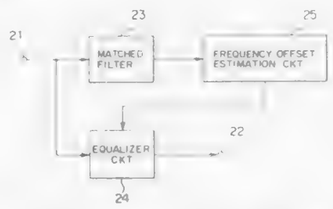
Kazuhiro Okanoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 17, 1990, Ser. No. 597,693

Claims priority, application Japan, Oct. 18, 1989, 1-272006

Int. Cl.[5] H03H *7/30*

U.S. Cl. 375—16 **5 Claims**



1. A receiver supplied with a reception signal which is transmitted through a transmission path and which is subjected to an intersymbol interference and a frequency offset related to said intersymbol interference said receiver producing an output signal substantially exempted from said intersymbol interference and said frequency offset and comprising:

a matched filter which has a filter characteristic matched with said transmission path and which is supplied with said reception signal for producing a filter output signal,

frequency offset estimating means supplied with said filter output signal for estimating said frequency offset from said filter output signal to produce an estimation signal representative of said frequency offset, and

equalizing means supplied with said reception signal and said estimation signal for equalizing said intersymbol interference and said frequency offset of said reception signal on the basis of said estimation signal to produce said output signal.

5,150,381

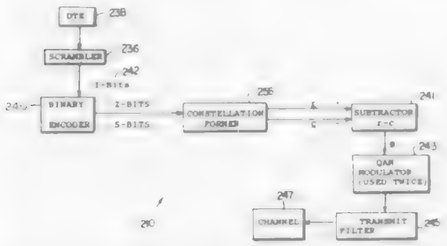
TRELLIS SHAPING FOR MODULATION SYSTEMS

G. David Forney, Jr., Cambridge, and Vedat M. Eyuboglu, Boston, both of Mass., assignors to Codex Corporation, Mansfield, Mass.

Continuation-in-part of Ser. No. 312,254, Feb. 16, 1989, abandoned. This application Oct. 13, 1989, Ser. No. 421,610

Int. Cl.[5] H04L *5/12, 25/49*

U.S. Cl. 375—39 **75 Claims**



73. A modem for transmitting and receiving digital data sequences via a channel comprising

means for mapping a said digital data sequence into a sequence of signal points to be sent, including a sequence selector for selecting said signal point sequence from a subset of all possible signal point sequences based on said digital data sequence, all said possible signal point sequences in said subset lying in a fundamental region of a trellis code, said fundamental region being other than a simple Cartesian product of finite-dimensional regions,

a modulator for sending said signal points of said sequence via said channel,

a demodulator for receiving a possibly channel-affected version of said signal point sequence from said channel, and

means for recovering a digital data sequence from said possibly channel-affected version of said signal point sequence.

5,150,382

FREQUENCY ERROR DETECTING APPARATUS

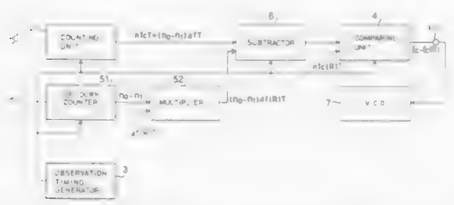
Atsuya Kume, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 675,200

Claims priority, application Japan, Jun. 20, 1990, 2-162395

Int. Cl.[5] H03D *3/04*

U.S. Cl. 375—88 **11 Claims**



1. A frequency error detecting apparatus for detecting an error between a center frequency of a received signal and a center frequency of a receiver in an FSK (Frequency Shift Keying) communication system wherein a plurality of distinct data symbols constituting said received signal are each represented by a particular frequency displaced from a center frequency by a shift frequency, comprising:

counting means for counting a number of cycles of said received signal over a predetermined period of time;

correction value generating means for generating a correction value corresponding to the amount of deviation from said center frequency of said received signal included in said number counted by said counting means caused by possible unequal distributions of said distinct data symbols received over said predetermined period of time;

means for correcting said counted number in accordance with said correction value to produce a corrected number; and

means for comparing a center frequency represented by said corrected number with said center frequency of said receiver and outputting an error signal equal to the difference therebetween.

5,150,383

ASYNCHRONOUS QUADRATURE DEMODULATOR

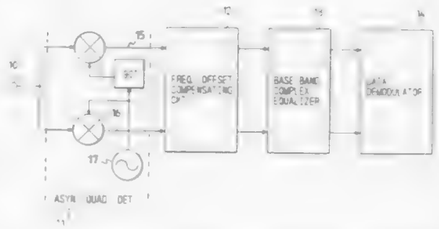
Kouei Misaizu, Kawasaki, and Hiroshi Ohnishi, Tokyo, both of Japan, assignors to Matushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 7, 1991, Ser. No. 665,857

Claims priority, application Japan, Mar. 8, 1990, 2-57184

Int. Cl.[5] H04L *27/06*

U.S. Cl. 375—94 **5 Claims**



1. An asynchronous quadrature demodulator comprising:

an asynchronous quadrature detector means having a local oscillator means for receiving and detecting a carrier and for outputting signals;

a frequency compensating circuit means for receiving the signals outputted from said asynchronous quadrature detector means, for estimating and compensating a frequency offset between an oscillating frequency of said local oscillator means and a frequency of a received carrier on the basis of frequency correcting signals included in the received carrier and for outputting a signal representing a result of the compensation of the frequency offset;

a base band complex equalizer means for receiving the signal outputted from said frequency compensating circuit means, for eliminating a transmission-channel distortion due to a multiplex transmission from the signal received from said frequency compensating circuit means and for outputting a signal indicating a result of the elimination of the transmission-channel distortion; and

a data demodulator means for receiving the signal outputted from said base band complex equalizer and for demodulating data from the signal received from said base band complex equalizer means.

5,150,384

CARRIER RECOVERY METHOD AND APPARATUS HAVING AN ADJUSTABLE RESPONSE TIME DETERMINED BY CARRIER SIGNAL PARAMETERS

Stephen V. Cahill, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1990, Ser. No. 590,401

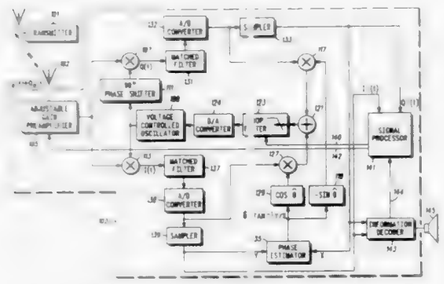
Int. Cl.[5] H04B *1/30*

U.S. Cl. 375—97 **16 Claims**

1. A demodulator circuit for demodulating an input signal having varying amplitude and phase, the demodulator circuit including phase tracking means having a predetermined re-

sponse time for tracking the phase of the input signal, the demodulator circuit comprising:

a) means for detecting a rate of change of the amplitude of the input signal; and



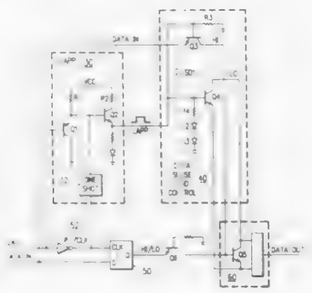
means for varying the predetermined response time of the phase tracking means responsive to the detected rate of change of the amplitude of the input signal.

5,150,385

SYNCHRONIZED PULSED LOOK-AHEAD CIRCUIT AND METHOD

Jay A. Maxey, Jr., and Kevin M. Ovens, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1990, Ser. No. 637,837
Int. Cl.[5] H03K *5/05*
U.S. Cl. 375—106 21 Claims



1. A synchronized pulsed look-ahead circuit for a synchronized device that, in synchronism with CONTROL signals, responds to multi-phase DATA inputs and provides corresponding DATA outputs after an associated propagation delay, comprising:

a LAPP section for generating a synchronized LAPP pulse that switches active in synchronism with the CONTROL signal and is then switched inactive after a look-ahead period of a predetermined hold time Th; and

a DATA sense and control section enabled by LAPP pulses and responsive to at least one DATA input phase for independently controlling, during the associated look-ahead periods, the DATA output of the synchronized device such that the corresponding DATA output phase is provided after a predetermined set-up time Tsu which is less than the associated propagation delay for the synchronized device;

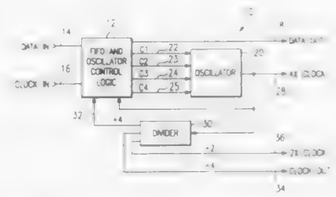
the duration of the hold time Th of the LAPP pulse being at least as long as the propagation delay.

5,150,386

CLOCK MULTIPLIER/JITTER ATTENUATOR

Kenneth J. Stern; Navdeep S. Sooch, both of Austin, Tex., and Jerrell P. Hein, West Lawn, Pa., assignors to Crystal Semiconductor Corporation, Austin, Tex.

Continuation of Ser. No. 51,985, May 19, 1987, Pat. No. 4,805,198. This application Feb. 9, 1989, Ser. No. 308,326
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—118 16 Claims



1. A jitter attenuator for attenuating jitter on an external clock signal applied to an input terminal of said jitter attenuator, said external clock signal having associated therewith external data wherein said external data has a data rate equal to the frequency of said external clock signal, said jitter attenuator comprising:

a) a clock generator for generating an internal clock having discrete frequencies, said internal clock frequency being responsive to a signal on at least one input node of said clock generator; and

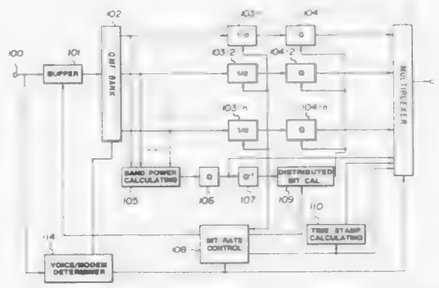
b) control circuitry coupled to said input terminal and to said at last one input node of said clock generator for controlling the frequency of said internal clock such that the average frequency of said internal clock is substantially equal to the lone term average frequency of said external clock signal, said control circuitry allowing an instantaneous phase difference between said internal clock and said external clock signal which is greater than the data period of said external data.

5,150,387

VARIABLE RATE ENCODING AND COMMUNICATING APPARATUS

Hidetaka Yoshikawa, Hino; Kimio Miseki, Kawasaki, and Masami Akamine, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1990, Ser. No. 630,911
Claims priority, application Japan, Dec. 21, 1989, 1-331875; Dec. 21, 1989, 1-331876
Int. Cl.[5] H04B *1/66*
U.S. Cl. 375—122 16 Claims



1. A variable rate encoding and communicating apparatus comprising:

a transmitter which samples an input signal, compresses and encodes the sampled input signal to form compressed data, integrates the compressed data into a cell, and transmits the cell through a network; and

a receiver which receives the cell transmitted from said transmitter through the network, decodes the compressed data in the cell to reproduce the input signal,

said transmitter being adapted to estimate a signal-to-noise ratio (SNR) of the input signal reproduced in said receiver and to adjust a sample size of the input signal so that the SNR becomes substantially a constant level, wherein

said transmitter includes:

sampling means for sampling the input signal by a designated sample size;

frequency band dividing means for dividing a frequency band of the sampled input signal into a predetermined number of subbands to form respective frequency band signals in the respective subbands;

power calculating means for calculating an electric power level of each frequency band signal;

bit-rate control means for computing the SNR of the sampled input signal reproduced in said receiver on the basis of a ratio of a sample size of the sampled input signal and the number of bits utilized for encoding each frequency band signal in the cell and the electric power of each frequency band signal as parameters, and for instructing said sampling means to increase the sample size of the input signal until the SNR substantially reaches a predetermined value;

first bit distribution calculating means, when the sample size of the input signal is increased until the SNR substantially reaches the predetermined value, for distributing the number of bits in the cell utilized for encoding each frequency band signal to each subband in accordance with the electric power of each frequency band signal calculated by said power calculating means at the time the SNR substantially reaches the predetermined value to determine the number of bits utilized for encoding each frequency band signal in each subband;

encoding means, when the sample size of the input signal is increased until the SNR substantially reaches the predetermined value, for encoding each frequency band signal formed by the frequency band dividing means at the time the sample size is increased by the number of bits distributed to each subband to form codes representing the respective frequency band signals; and

transmitting means for integrating into the cell the codes representing the frequency band signals formed by said encoding means, the sample size of the input signal, and data indicative of the electric power of each frequency band signal, and for transmitting the cell to said receiver through the network, and

wherein said receiver includes:

cell decomposing means, when receiving the cell through the network, for extracting from the cell the codes representing the respective frequency band signals, the sample size of the input signal, and the data indicative of the electric power of each frequency band signal;

second bit distribution calculating means for calculating the numbers of bits distributed to each subband in accordance with the electric power of each frequency band signal indicated by the data extracted by said cell decomposing means;

decoding means for decoding the codes representing the respective frequency band signals extracted by said cell decomposing means in accordance with the bit numbers distributed to each subband determined by said second bit distribution calculating means to reproduce the respective frequency band signals; and

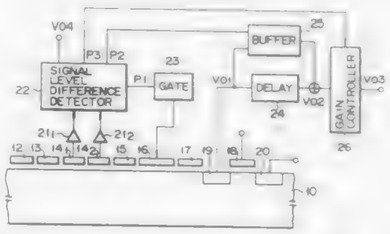
synthesizing means for synthesizing the respective frequency band signals reproduced by said decoding means to reproduce the input signal.

5,150,388

SOLID STATE IMAGE SENSING DEVICE OUTPUT

Nozomu Harada; Yukio Endo, and Yuji Ide, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 11, 1991, Ser. No. 757,614
Claims priority, application Japan, Sep. 12, 1990, 2-239885
Int. Cl.[5] G11C *19/28*; H01L *29/78*
U.S. Cl. 377—60 15 Claims



1. A solid state image sensing device comprising:

image sensing means for outputting optical images as signal charges;

signal charge transfer means connected to said image sensing means and having of a plurality of transfer stages for transferring said signal charges;

first reading means arranged on a plurality of positions of said transfer stages to non-destructively read said transferred signal charges as a first output signal including a plurality of first output signal components;

detecting means for detecting a difference between said first output signal components of said first output signal and outputting a detected signal corresponding to the specified difference of said signal components;

second reading means for adding said signal charges corresponding to said first output signal components which corresponds to said detected signal and reading a second output signal including a second signal component corresponding to the added signal charge;

signal inserting means for inserting said second output signal component into at least one of said first output signal components which is canceled due to transfer for addition of said first output signal components and outputting a third output signal including at least one third output signal component corresponding to said second output signal component; and

means for lowering the signal level of said second and third output signal components according to the number of addition stages.

5,150,389

SHIFT REGISTER

Soichi Kawasaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

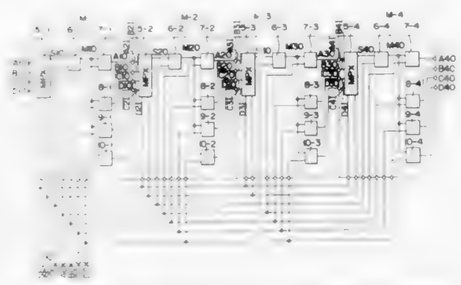
Filed Jan. 24, 1991, Ser. No. 645,403
Claims priority, application Japan, Jan. 26, 1990, 2-17303
Int. Cl.[5] G11C *19/00*
U.S. Cl. 377—67 14 Claims

1. A shift register comprising:

a plurality of storing means each of which stores data having a plurality of bits and which are cascade-connected so that an output of one of said storing means is applied as an input of a succeeding-stage storing means,

wherein said plurality of storing means each includes selection means for selecting one bit from an input data having a number of bits according to a selection signal; first latch

means for latching the bit selected by said selection means; and a plurality of second latch means which number cor-



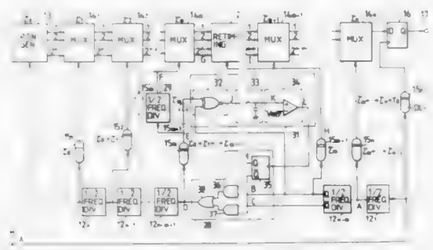
responds to the number of bits, for latching an output of said first latch means in a time-sharing fashion.

5,150,390

HIGH-RATE PULSE PATTERN GENERATOR

Mishio Hayashi, Menuma, and Tetsuo Sotome, Tatebayashi, both of Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 748,755
Claims priority, application Japan, Aug. 20, 1990, 2-218454
Int. Cl.[5] H03K *5/13*
U.S. Cl. 377—116 12 Claims



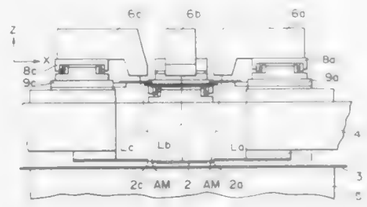
1. A high-rate pulse pattern generator comprising:
frequency division circuits connected in cascade in the first stage through the n-th stage for receiving and sequentially ½-frequency-dividing entered clock signals, where n is an integer of 2 or larger;
a pattern generator for generating N pieces of pattern data parallel to each other in synchronism with an output clock signal from said frequency division circuit in the n-th stage, where N is an integer of 2 or larger but not larger than 2^n;
multiplexing circuits connected in cascade in the first stage through the n-th stage, for receiving said pattern data in parallel to each other from said pattern generating circuit, each said multiplexing circuit multiplexing every two input pattern data into one under control of a multiplexing control clock signal and issuing the multiplexed pattern data;
(n−1) first control clock supply circuit for providing said multiplexing control clock signals to said multiplexing circuits in the n-th to first stages except the m-th stage according to frequency division output clock signals of the frequency division circuits in the first to n-th stages except the m-th stage, where m is one of integers from 0 to (n−1);
a second control clock supply circuit for providing said multiplexing control clock to the multiplexing circuit in said m-th stage according to either one of an input clock signal to and an output clock signal from said frequency division circuit in the (n−m+1)th stage;
a retiming circuit inserted in series to the input of said multiplexing circuit in the (m+1)th stage for receiving, as a retiming clock signal, said multiplexing control clock signal to be supplied to the multiplexing circuit in the (m+1)th stage from said frequency division circuit in the (n−m)th stage through corresponding one of said first control clock supply circuits, and thereby retiming the input pattern data and applying the result to said multiplexing circuit in the (m+1)th stage;
an approach detection means for detecting a relative phase difference between a node of the pattern data entered into said retiming circuit and an edge of said retiming clock and, when said phase difference falls within a predetermined range, issuing an approach detection signal; and
a phase switching means inserted in series to the output of said frequency division circuit in the (n−m)th stage for responding to said approach detection signal from said approach detection means, shifting an output clock signal from the frequency division circuit in said (n−m)th stage by a predetermined phase quantity and supplying the result to the frequency division circuit of the next stage.

5,150,391

EXPOSURE APPARATUS

Ryuichi Ebinuma, Kawasaki; Nobutoshi Mizusawa, Yamato; Takao Kariya, Hino; Shigeyuki Suda, Yokohama, and Shunichi Uzawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,346, Feb. 28, 1991, abandoned.
This application Feb. 5, 1992, Ser. No. 830,449
Claims priority, application Japan, Mar. 2, 1990, 2-049583
Int. Cl.[5] G21K *5/04*
U.S. Cl. 378—34 5 Claims



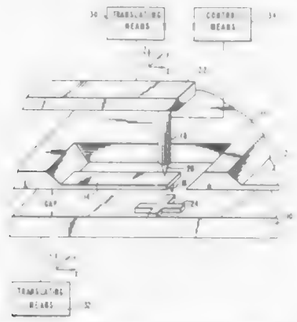
1. An exposure apparatus for transferring a pattern of an original onto a workpiece, said apparatus comprising:
a blocking member for defining a rectangular exposure region with respect to at least one of the original and the workpiece, wherein the exposure for the pattern transfer can be effected with the exposure region defined by said blocking member;
a plurality of detection systems for detecting a positional deviation between the original and the workpiece, each of said detection systems is disposed so as to be associated with at least one of four sides of the rectangular exposure region;
a plurality of first movable stages each being provided so as to be associated with at least one of the four sides, each of said first movable stages being adapted to carry thereon one of said detection systems disposed to be associated with a corresponding side, and each of said first movable stages comprises a single-axis stage movable in a direction parallel to a corresponding side; and
a plurality of second movable stages each for carrying thereon corresponding one of said first movable stages, each of said second movable stages comprising a single-axis stage movable in a direction perpendicular to a corresponding side and in a direction parallel to the rectangular exposure region, and each of said second movable stages being operable to displace said light blocking member to change the rectangular exposure region.

5,150,392

X-RAY MASK CONTAINING A CANTILEVERED TIP FOR GAP CONTROL AND ALIGNMENT

Fritz J. Hohn, Somers, and Mark A. McCord, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 9, 1991, Ser. No. 756,642
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—34 5 Claims



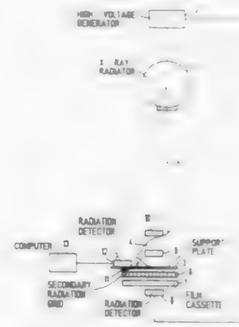
1. A structure for providing precise alignment in the x,y dimensions and precise gap control in the z dimension between a mask and a wafer in a lithography system comprising:
a wafer to be lithographically exposed to radiation having a raised alignment mark on the upper surface thereof,
a mask disposed over said wafer, said mask having radiation transparent areas for permitting radiation to strike said wafer in predetermined patterns,
said mask having at least one physical opening therein including a cantilever member portion of said mask material projecting from an edge of said mask opening into said opening, said cantilever member being constrained only at one end at said edge of said opening and being free to move in the Z dimension at the end opposite said edge of said opening,
a tip affixed to the said opposite end of said projecting cantilever position of said mask material,
gap control means, including a tip, disposed vertically in the Z dimension over said opposite end of said projecting cantilever, said gap control means further including means for moving said tip into contact with said projecting cantilever for bending said cantilever down toward said wafer in Z dimension to a predetermined gap spacing distance,
means for raising said wafer upward in the Z dimension until substantially proximate said tip on said projecting cantilever,
and means for translating said wafer in the X and Y dimensions until said sharp tip on said projecting cantilever is in contact with said alignment mark.

5,150,393

X-RAY DIAGNOSTICS INSTALLATION FOR MAMMOGRAPHY

Horst Aichinger, Feurth; Sigrid Jolte-Barfuss, Erlangen, and Karlheinz Koehler, Herzogenaurach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 9, 1991, Ser. No. 743,443
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1990, 4030906
Int. Cl.[5] A61B *6/04*
U.S. Cl. 378—37 1 Claim



1. An x-ray diagnostics installation for mammography exposures comprising:
means for generating an x-ray beam emanating from a focus;
a support plate to support an examination subject at a distance from said focus in a measurement field irradiated by said x-ray beam, said examination subject receiving an average parenchyma dose in said measurement field from said means for generating an x-ray beam;
a radiation detector disposed on said support plate next to said measurement field also at said distance from said focus and generating an electrical signal corresponding to radiation from said x-ray beam incident thereon; and
computer means connected to said radiation detector programmed with the dependency of said average parenchyma dose with respect to the radiation incident on said radiation detector for generating a value corresponding to said average parenchyma dose.

5,150,394

DUAL-ENERGY SYSTEM FOR QUANTATIVE RADIOGRAPHIC IMAGING

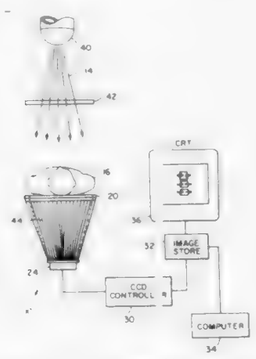
Andrew Karellas, Auburn, Mass., assignor to University of Massachusetts Medical School, Worcester, Mass.

Filed Dec. 5, 1989, Ser. No. 446,472
Int. Cl.[5] G01N *23/04*
U.S. Cl. 378—62 36 Claims

1. A stationary bone densitometry apparatus for examining a region of a subject's body, comprising:
a dual-photon x-ray source to deliver a beam of x-ray radiation toward the subject's body, the x-ray beam being applied simultaneously to the entire region of the body under examination;
a scintillation screen to receive the x-ray radiation passing through the subject's body from the x-ray source, the screen emitting radiation with a spatial intensity pattern proportional to the spatial intensity pattern of the received x-ray radiation;
a binnable charged coupled device (CCD) sensor which is stationary relative to the subject's body and which receives radiation emitted from the scintillation screen, the CCD sensor integrating the received radiation signal throughout the duration of the x-ray transmission and

generating a discrete electronic representation of the spatial intensity pattern of the radiation emitted from the scintillation screen;

a focusing element to focus radiation from the scintillation screen onto the CCD sensor; and



a CCD controller for controlling the CCD sensor and for processing the discrete electronic representation generated by the CCD sensor that is correlated with a density of the subject's bone within the region.

5,150,395

DEVICE FOR EXAMINING A TEST OBJECT BY MEANS OF GAMMA OR X-RAYS

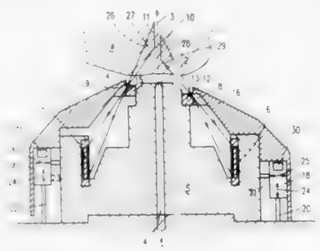
Josef Kosanetzky, Norderstedt, and Karl H. Fischer, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1991, Ser. No. 638,255

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000507

Int. Cl.[5] G01N *23/20*

U.S. Cl. 378—86 22 Claims



1. A device for detecting X-ray or gamma radiation scattered by an object in response to an incident radiation pencil beam, said device comprising:

a body;

at least one slit diaphragm secured to a body;

at least one detector secured to the body, said at least one slit diaphragm for directing said scattered radiation onto said at least one detector; and

adjusting means for changing the relative position of the at least one diaphragm to the at least one detector, each diaphragm position corresponding to a different region of the object producing said directed scattered radiation.

5,150,396

X-RAY EXAMINATION APPARATUS COMPRISING AN X-RAY IMAGE INTENSIFIER TUBE

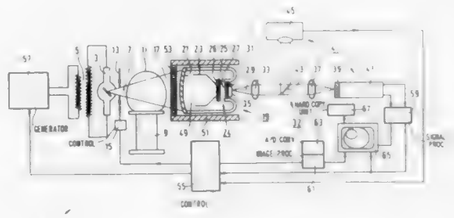
Rudolph M. Snoeren, Eindhoven, and Johannes W. J. M. Scheuermann, Heerlen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 24, 1991, Ser. No. 734,831

Claims priority, application Netherlands, Jul. 25, 1990, 9001687

Int. Cl.[5] H05G *1/64*

U.S. Cl. 378—99 16 Claims



1. An X-ray examination apparatus, comprising an X-ray image intensifier tube having an entrance screen, an exit section comprising an exit screen and an exit window, an optical imaging system and a photosensitive detection device, said exit section comprises a fibre optical plate and an element which selectively increases optical spatial frequency is between the fibre optical plate and the optical imaging system.

5,150,397

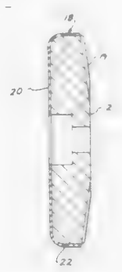
THERMAL EMISSIVE COATING FOR X-RAY TARGETS

Michael J. Randzaao, New Berlin, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Sep. 9, 1991, Ser. No. 756,417

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—129 14 Claims



1. An x-ray tube anode comprised of a body having a surface region for being impinged by electrons to produce x-radiation and a coating distinct from said region for enhancing the thermal emittance of said body, said coating composed of a metal oxide coating comprising:

ZrO_2 present in an amount of about 8% to 20% by weight and Al_2O_3 together with TiO_2 present in an amount of about 92% to 80% by weight with the Al_2O_3 being present with respect to the TiO_2 in a ratio in the range of about 4 to 1.

5,150,398

BEARING AND ROTARY ANODE X-RAY TUBE EMPLOYING THE BEARING

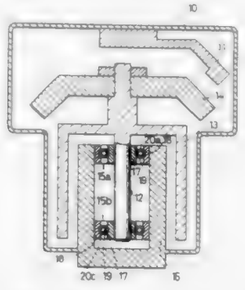
Takeshi Nishioka; Tsutomu Shikansi, both of Yokohama, and Hitoshi Marumo, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 6, 1989, Ser. No. 375,963

Claims priority, application Japan, Jul. 6, 1988, 63-166858; May 16, 1989, 1-120305

Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—132 42 Claims



1. A rotary anode X-ray tube, comprising a cathode for emitting electrons in a vacuum vessel, an anode target with which the electrons emitted from the cathode collide to generate X-rays, a rotor fixed integrally with the anode target, and a bearing for rotatably supporting the anode target, said bearing comprising a frictional surface subjected to friction due to the rotation of said shaft and a lubricant coating applied to said frictional surface to reduce the friction, wherein said lubricant coating takes its liquid state while said shaft is rotating at temperatures of about 200° C. and said frictional surface is composed of a material capable of resisting a chemical action of said lubricant, wherein said lubricant coating is made from tin and said frictional surface is made from a ceramic capable of resisting the chemical action of tin, wherein said ceramic is one of silicon nitride, silicon carbide, alumina and zirconia.

5,150,399

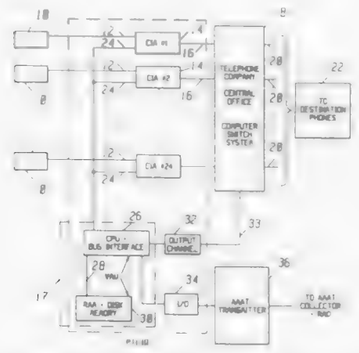
PUBLIC TELEPHONE INTERFACE AND METHOD OF OPERATING THE SAME

Jerry Yasuda, Villa Park, Calif., assignor to Telephonic Equipment Corporation, Irvine, Calif.

Filed Aug. 27, 1990, Ser. No. 572,764

Int. Cl.[5] H04M *3/50, 1/64*

U.S. Cl. 379—67 11 Claims



1. An apparatus for use in combination with a plurality of coin operated pay phones, a telephone central office switch system and with a plurality of destination telephones coupled to said central office switch system, said pay phones, destination telephones and central office switch system coupled together through telephone lines, said apparatus comprising:

a plurality of call intercept means, each one of said plurality of call intercept means for handling voice communication on corresponding ones of said telephone lines coupled to one of said plurality of coin operated pay phones and to said central office switch system;

computer means for storing and processing digital information outside said central office switch system; and

a digital bus coupling said computer means with each of said plurality of call intercept means, said computer means being coupled to said central office switch system and operative to voice interactively communicate through said plurality of call intercept means with each one of said plurality of coin operated pay phones to selectively store a voice message originating with at least one of said plurality of coin operated pay phones through said corresponding one of said plurality of call intercept means, voice communication between said call intercept means and said plurality of coin operated pay phones being performed without accessing said central office switch system, said voice message for later selective transmission by said computer means through said central office switch system to a user selected one of said plurality of destination telephones,

whereby voice messages are received from a said plurality of coin operated pay phones and stored without dependence upon communication through said central office switch system.

5,150,400

METHOD OF CONTROLLING A DATA TERMINAL EQUIPMENT FOR EQUALIZING A TRANSMISSION LINE CHARACTERISTIC AND DATA TERMINAL EQUIPMENT USING THE SAME

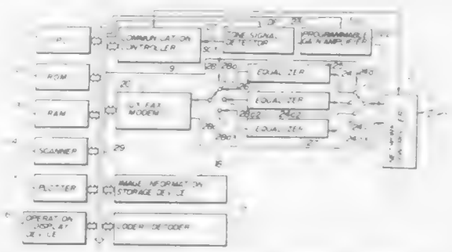
Takeshi Ukegawa, Hadano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1990, Ser. No. 614,520

Claims priority, application Japan, Nov. 20, 1989, 1-299819

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—93 16 Claims



1. A method for controlling a data terminal equipment coupled to a network via a line and coupled to a center apparatus via said line and said network, said method comprising the steps of:

determining whether an adjustment mode between said center apparatus and said data terminal equipment has been set;

executing said adjustment mode after it is determined that said adjustment mode has been set including:

receiving a plurality of tone signals sent from said center apparatus and having mutually different frequencies;

detecting levels of said tone signals;

judging a characteristic of said line on the basis of the levels of said tone signals detected by said detecting step; and

selecting a suitable equalizing characteristic most suitable for the characteristic of said line judged by said judging step

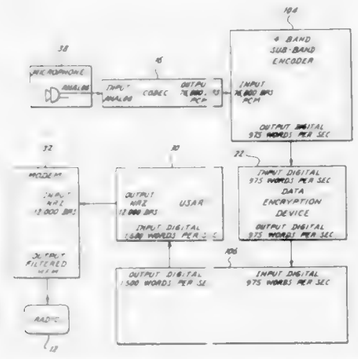
from among a plurality of predetermined equalizing characteristics compensating for possible characteristics of said line by one of selecting one of a plurality of equalizers having respective of said equalizing characteristics and adjusting a gain of a programmable gain amplifier.

5,150,401

RETROFITTABLE ENCRYPTION/DECRYPTION APPARATUS USING MODIFIED FREQUENCY MODULATION

James C. Ashby, III, Priddy; Clark Burkhart, Azle; Frankie B. Favors, Ft. Worth; Roy G. Tiemann, Priddy; Robert L. Vandaveer, Portsville, and Lothar A. Krause, Jr., Irving, all of Tex., assignors to Chips International, Inc., Priddy, Tex.

Filed Dec. 4, 1990, Ser. No. 621,476
Int. Cl.[5] H04B *1/00*
U.S. Cl. 380—29 21 Claims



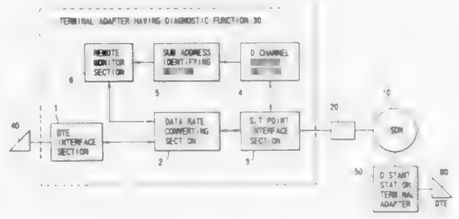
1. A communication system for providing secure communication over a communication channel, comprising:
- a conventional radio capable of transmitting and receiving non-secure analog signals;
- means for converting said radio into a DES-encryption device, including:
  - a codec coupled to receive said non-secure analog signals and convert said analog signals into pulse code modulated digital signals;
  - a signal processor coupled to receive said pulse code modulated digital signals and convert said digital signals into a plurality of sub-band codes in response to a series of prologues transmitted over said communication channel;
  - means for exclusive-oring DES codes with respective said sub-band codes to produce modified DES-encrypted signals;
  - a modem for transmitting said modified DES-encrypted signals over said communication channel in MFM format in response to said series of prologues transmitted over said communication channel;
- means for converting said radio into a DES-decryption device, including:
  - said modem for receiving said modified DES-encrypted signals and converting said modified DES-encrypted signals from MFM to NRZ format;
  - said signal processor coupled to receive NRZ signals with said NRZ format and perform DES-decryption and sub-band decoding of said NRZ signals; and,
  - said codec coupled to convert said decrypted and decoded signals into analog output.

5,150,402

ISDN TERMINAL HAVING DIAGNOSTIC FUNCTION

Masayuki Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 757,805
Claims priority, application Japan, Sep. 12, 1990, 2-239954
Int. Cl.[5] H04M *3/42, 11/00, 9/00*
U.S. Cl. 379—93 3 Claims



1. An ISDN terminal adapter having a diagnostic function, comprising:
- a terminal adapter section having a data rate converting function for communication with an office terminal of a distant station connected to an ISDN;
- an S/T point interface section for converting an output signal from said terminal adapter section into protocol of said ISDN;
- a D channel control section for receiving D channel information from the distant station through said S/T point interface section and extracting a sub-address from the D channel information;
- a sub-address identifying section for determining whether the sub-address of the D channel information input from said D channel control section coincides with a predetermined code; and
- a remote monitor section for setting a remote monitor state in response to a control signal generated in accordance with the determination result from said sub-address identifying section.

5,150,403

COIN FRAUD PREVENTION SYSTEM FOR COIN TELEPHONES

H. Weaver Jordan, 2189 NW. 53rd St., Fort Lauderdale, Fla. 33309

Filed May 28, 1991, Ser. No. 706,370
Int. Cl.[5] H04M *1/66, 17/02*
U.S. Cl. 379—145 14 Claims

1. A coin fraud prevention system for a coin telephone with a voice transmitter, comprising coin tone detecting means for simultaneously detecting presence of two coin tones coupled to said voice transmitter; and coin telephone disabling means in said coin telephone for disabling said coin telephone in response to detecting coin tones from the transmitter.

5,150,404

PUBLIC TELEPHONE VOLUME CONTROL

H. Weaver Jordan, 2189 N.W. 53rd St., Fort Lauderdale, Fla. 33309

Filed May 28, 1991, Ser. No. 706,160
Int. Cl.[5] H04M *1/60, 17/02*
U.S. Cl. 379—155 7 Claims

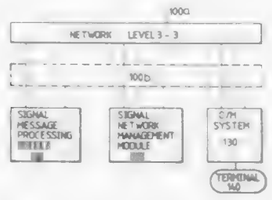
1. A volume control for a telephone having a receiver, comprising a manual key for generating a volume increment for each operation of the key; a volume increment counter connected to said manual key for counting volume increments; a controlled gain amplifier connected ahead of said receiver; a gain control network connected between said controlled gain amplifier and said counter for controlling the gain of said amplifier in response to the number of volume increments counted in said volume increment counter, a mounting base for mounting at least said controlled gain amplifier, said volume increment counter and said manual key, and a power supply commonly connected to at least said controlled gain amplifier, said volume increment counter and said DTMF encoder.

5,150,405

DUPLEX STRUCTURE SIGNAL TRANSFER POINT SYSTEM FOR COMMON CHANNEL SIGNALLING SYSTEM NO. 7

Young H. Lee; Young S. Baek; Seok G. Lee; Kun W. Lee; Jong E. Chae, and Hyun T. Lee, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon and Korea Telecommunication Authority, Seoul, both of, Rep. of Korea

Filed Sep. 21, 1990, Ser. No. 585,994
Claims priority, application Rep. of Korea, Sep. 23, 1989, 1989-13721
Int. Cl.[5] H04M *7/06;* H04Q *11/04*
U.S. Cl. 379—230 6 Claims



1. A duplex structure signal transfer point system for common channel signalling system No. 7, comprising:
- serial duplexed interconnection means;
- duplexed network interface means connected to said serial duplexed interconnection means, for performing an interconnection between a plurality of signal message processing submodules;
- parallel duplexed interconnection means connected to said duplexed network interface means, for performing a parallel duplexed interconnection between a plurality of unit level 2 performing means and a duplexed unit level 3 performing means;
- said duplexed unit level 3 performing means connected to said parallel duplexed interconnection means, for performing a protocol level 3 of a message transfer protocol in the common channel signalling system No. 7; and
- said plurality of unit level 2 performing means connected to said parallel duplexed interconnection means, for performing a protocol level 2 of the message transfer protocol in the common channel signalling system No. 7.

5,150,406

AUTOMOTIVE TELEPHONE SUPPORT

Richard Dunchock, 535 S. Coast Hwy., Unit 59, Laguna Beach, Calif. 92651

Continuation-in-part of Ser. No. 724,586, Jul. 1, 1991, Pat. No. 5,131,036. This application Nov. 7, 1991, Ser. No. 788,802
The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.
Int. Cl.[5] H04M *1/00;* B60R *7/00;* A47B *96/06*
U.S. Cl. 379—446 12 Claims

1. A telephone supporting device detachably mounted to an automobile center console, the console having an upper edge portion, an exterior side portion, and a lower edge portion, the device comprising:
- a housing for supporting a telephone, the housing being sized and configured for mounting upon the console and for supporting a telephone thereon, said housing having an engagement member formed on an inner surface thereof; and
- a coupling member releasably engageable to said console under the housing, said coupling member having an upper flange formed to receive the upper edge portion of the console, a first lower flange extending away from the exterior side portion of the console, and a second lower flange formed to receive the lower edge portion of the console, said first lower flange being releasably engageable to said housing engagement member to secure said housing to the console.

5,150,407

SECURED DATA STORAGE DEVICES

Steve S. C. Chan, P.O. Box 34620, Chicago, Ill. 60634

Filed Dec. 16, 1991, Ser. No. 807,976
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—4 11 Claims

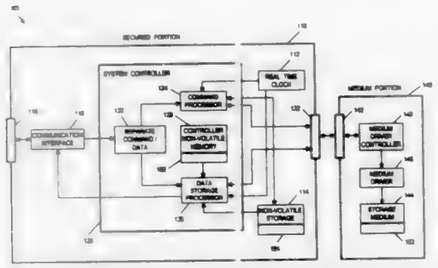
1. A device for storing user data and the time of storage of the user data comprising:
- storage means for storing data, said storage means having a first storage area for storing a first portion of a first key;
- clock means for keeping time continuously;

means for generating a value representative the time indicated by said clock means;

first key storage means for storing a second portion of said first key, said first key storage means being physically separated from said storage means;

means for generating a set of combined data by combining the user data and said value representative of the time;

means for generating a set of encoded data in response to



said set of combined data as a function of said first portion and said second portion of said first key;

encoded data storage means for storing said set of encoded data in said storage means in reponse to a first user command;

means for retrieving said set of encoded data from said storage means in response to a second user command; and

means for decoding said encoded data as function of said first portion and said second portion of said first key.

5,150,408

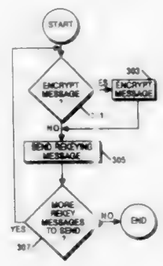
KEY DISTRIBUTION COMMUNICATION SYSTEM

Michael W. Bright, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1991, Ser. No. 661,748

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—21 **26 Claims**



1. A method of key distribution between a key management controller and at least one communication unit in a communication system, comprising the steps of:

locating the at least one communication unit;

sending, responsive to said locating, a rekeying message to the at least one communication unit; and

requesting from the at least one communication unit an acknowledgment of receipt of said rekeying message.

5,150,409

DEVICE FOR THE IDENTIFICATION OF MESSAGES

Peter Elsner, Fritz-Baer-Str. 27, 8000 Munich 71, Fed. Rep. of Germany

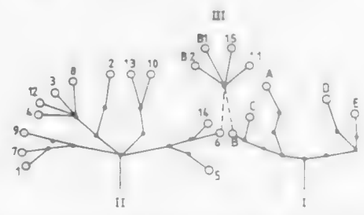
PCT No. PCT/EP88/00717, § 371 Date Jan. 19, 1990, § 102(e) Date Jan. 19, 1990, PCT Pub. No. WO89/01690, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 11, 1988, Ser. No. 458,707

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726901; Aug. 10, 1988, 3827172

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—23 **25 Claims**



1. A method of encrypting/decrypting messages, whereby an input message provided as characters is converted character-by-character, dependent on preceding characters, into an output message, the steps of the method comprising: defining a branching network as a carrier of encrypting/decrypting characteristics, said branching network comprising nodes linked together by selectable branches, wherein each node has a number of selectable branches leading to optional nodes, and wherein at least one encrypting/decrypting character is assigned to each of said selectable branches; defining a selection run, which is a step-by-step selection of said selectable branches on the basis of the character-by-character input message to select character-by-character an encrypting/decrypting characteristic; defining said output message, which is formed on the basis of said selected encrypting/decrypting characteristic; said selection run, starting from a first selected node, selecting on the basis of currently active characters of the input message said selectable branches, to convert any specific input message of optional length character-by-character into a specific selection path through said branching network, whereby the same nodes on said selection path can be selected repeatedly; and forming said output message in at least one selection run on the basis of said encrypting/decrypting characters assigned to said branches selected on said selection path.

5,150,410

SECURE DIGITAL CONFERENCING SYSTEM

John Bertrand, Upper Nyack, N.Y., assignor to ITT Corporation, New York, N.Y.

Filed Apr. 11, 1991, Ser. No. 684,688

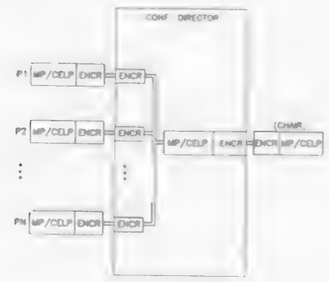
Int. Cl.[5] H04K *1/00*; H04Q *11/04*; H04B *3/36*; H04M *3/42*

U.S. Cl. 380—28 **6 Claims**

1. A secure digital conferencing system comprising:

a plurality of digital voice signal encoding terminals each employing a multipulse or a code-excited linear predictive (CELP) speech processing module for encoding speech signals of respective conference participants in multipulse or CELP form;

a director terminal having receiving means for receiving the multipulse or CELP encoded signal streams from said plurality of voice signal encoding terminals, synthesizing means employing a multipulse or a code-excited linear predictive (CELP) speech processing module for synthesizing a combined speech signal from the received encoded signal streams, and analyzing means employing multipulse or CELP for analysis of the composite signal



and for transmission back to said plurality of participants' voice signal encoding terminals.

5,150,411

CRYPTOGRAPHIC SYSTEM ALLOWING ENCRYPTED COMMUNICATION BETWEEN USERS WITH A SECURE MUTUAL CIPHER KEY DETERMINED WITHOUT USER INTERACTION

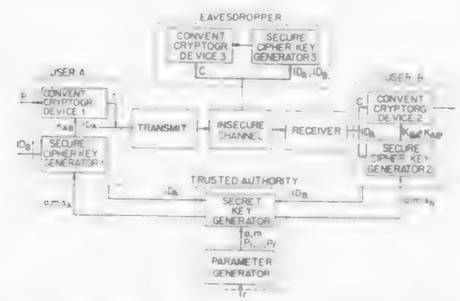
Ueli Maurer, Wil, Switzerland, assignor to Omnisec, Regensdorf, Switzerland

Filed Jan. 16, 1991, Ser. No. 641,742

Claims priority, application European Pat. Off., Oct. 24, 1990, 90120365.3

Int. Cl.[5] H04L *9/30*

U.S. Cl. 380—30 **32 Claims**



20. Trusted authority means in a cryptographic system comprising:

(a) system parameter generator means for generating secret system prime numbers $P_1, P_2, \ldots, P_r$, a publicly-known system modulus m, where $m=P_1 * P_2 * \ldots * P_r$, and a publicly-known system base a, which is a primitive element of given finite fields $GF(p_1), \ldots, GF(p_r)$;

(b) means for receiving publicly-known user identification information from a user A;

(c) means for suitably transforming the publicly-known user identification information from a user A into a user identity ID_A so that the user identity ID_A has a discrete logarithm modulo m for the base a; and

(d) secret key generator means for transforming the user identity ID_A into a secret key s_A for the user A with the inverse of the exponentiation function

$$a^{s_A}=(ID_A)^2 \pmod m,$$

that is solved for s_A, the inverse of the exponentiation function being infeasible to compute without knowing the secret system prime numbers $p_1, p_2, \ldots, p_r$ and the secret key s_A enabling user A to communicate securely with a user B who has a publicly-known user identity ID_B with a mutual secure cipher key K_{AB}, defined by the equation:

$$K_{AB}=(ID_B)^{2sA} \pmod m,$$

the mutual secure cipher key K_{AB} being determined without previous interaction with user B.

5,150,412

SECURITY MODULE FOR RADIO TELEPHONE

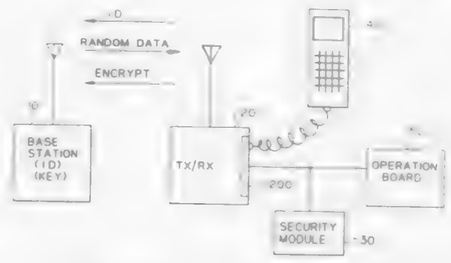
Tsuguo Mara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 692,419

Claims priority, application Japan, Apr. 28, 1990, 2-114424

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—43 **12 Claims**



1. A security module for use with a radio telephone and preventing a KEY code from being read out from outside the security module comprising:

an electrically rewritable non-volatile memory to which the KEY code is written;

encrypting means for encrypting data entered from outside the security module on the basis of the KEY code stored in said non-volatile memory, and outputting said encrypted data;

interface means for receiving data from outside the security module and outputting said encrypted data; and

control means for enabling said non-volatile memory to be accessed via an internal bus and an external bus and, when said non-volatile memory is accessed, deleting the KEY code.

5,150,413

EXTRACTION OF PHONEMIC INFORMATION

Tomofumi Nakatani, Yokohama, and Shogo Nakamura, Matsudo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 713,465, Mar. 19, 1985, abandoned. This application Oct. 2, 1989, Ser. No. 415,481

Claims priority, application Japan, Mar. 23, 1984, 59-57161; Mar. 27, 1984, 59-59084

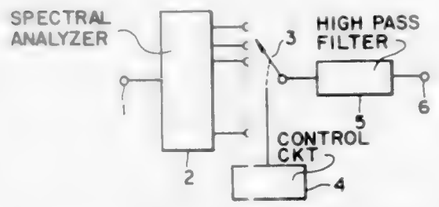
Int. Cl.[5] G10L *7/10*

U.S. Cl. 381—46 **9 Claims**

1. A method for processing a signal obtained by subjecting a voice signal to frequency analysis and represented as a variation of level relative to frequency, the voice signal extending over a predetermined frequency range and having a component which changes relatively slowly with respect to frequency and a component which changes relatively rapidly with respect to frequency in order to extract said relatively rapidly changing component, the improvements comprising the steps of:

sampling said voice signal repetitively at predetermined frequency intervals first from one end to the other end of said range and then in reverse to thereby form a periodic sampled signal as a function of time, wherein the period of

said periodic sampled signal corresponds to twice said range; and



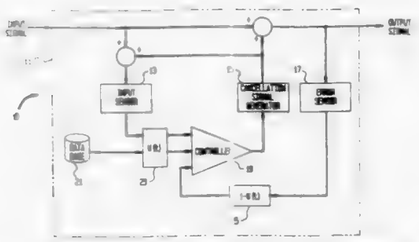
removing said relatively slowly changing component from said sampled signal by filtering to extract the information of said relatively rapidly changing component.

5,150,414

METHOD AND APPARATUS FOR SIGNAL PREDICTION IN A TIME-VARYING SIGNAL SYSTEM

Kam W. Ng, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1991, Ser. No. 678,580
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—47 **14 Claims**



1. A method of signal prediction in a time-varying signal system using the estimate-maximize (EM) algorithm, comprising the steps of:
providing the EM algorithm with complete and incomplete data sets;
selecting a time function based on the characteristics of time-varying signals over a time period of interest from t=0 to T, said time function indicative of a percentage of the complete data set and a percentage of the incomplete data set, both percentages being a function of time, wherein the incomplete data set percentage is the complement of the complete data set percentage;
performing the estimate and maximize steps of the EM algorithm during the time period of interest using the selected percentages of the complete and incomplete data sets.

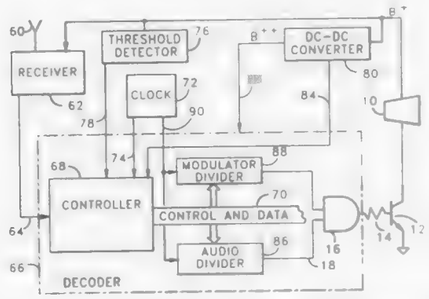
5,150,415

VOLUME CONTROL CIRCUIT USING PULSE MODULATION

James I. Jaffee, West Palm Beach, and Michael J. DeLuca, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 345,811, May 1, 1989, abandoned. This application Dec. 21, 1989, Ser. No. 453,119
Int. Cl.[5] H03G 3/00
U.S. Cl. 381—104 **25 Claims**

1. A volume control circuit for an audio transducer comprising:
driver circuit governed by a governing signal having a periodic rate to excite the audio transducer during pulsed periods generated from said governing signal to render an audio signal at a desired volume and audio frequency corresponding to said periodic pulse rate of said governing signal; and
control circuit coupled to said driver circuit and selectively



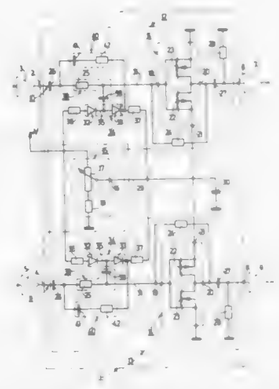
activated to at least pulse rate modulate the excitation of the audio transducer during said pulsed periods generated from said governing signal to alter the excitation of the audio transducer thereby altering the volume of the audio signal rendered by the audio transducer.

5,150,416

ELECTRONIC LEVEL CONTROL CIRCUIT FOR SOUND SIGNALS

Rudolf Hasler, Vienna, Austria, assignor to U.S. Philips Corp., New York, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,474
Claims priority, application Austria, Sep. 28, 1989, 2265/89
Int. Cl.[5] H03G 3/00, 5/00, 3/10; H03F 3/18
U.S. Cl. 381—104 **4 Claims**



1. A circuit arrangement for the electronic level control of a sound signal comprising an amplifier circuit which is inserted into a sound signal path and the gain of said amplifier circuit being controlled independence on a variable direct control voltage, and a voltage-adjusting stage for generating the variable direct control voltage, the variable direct control voltage generated being supplied to the amplifier circuit for controlling its gain, characterized in that the amplifier circuit is formed by a CMOS inverter having a signal input, a signal output and a supply voltage connection, the signal input of the amplifier circuit being coupled to a series resistor for supplying the sound signal, the level of which sound signal is to be controlled, at the signal output of the amplifier circuit a level-controlled sound signal being generated, and the supply voltage connection of the amplifier circuit being supplied with the variable direct control voltage, generated by means of the voltage-adjusting stage, as a supply voltage for the CMOS inverter, and means for operating the CMOS inverter in dependence on the direct control voltage supplied to the supply voltage connection, such that the gain of the CMOS inverter decreases and a dynamic output impedance of the CMOS inverter increases with decreasing direct control voltage

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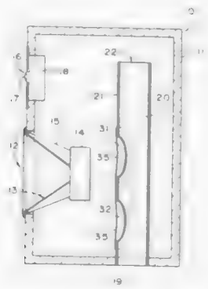
5,150,417

BASS REFLEX TYPE SPEAKER SYSTEM

Karl-Erik Stahl, Varmdo, Sweden, assignor to Socon AB, Västeraås, Sweden

Filed Feb. 25, 1991, Ser. No. 660,056
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—154 **17 Claims**



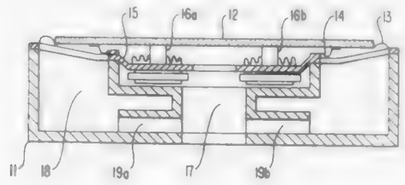
1. A bass reflex type speaker system, comprising:
(a) a cabinet;
(b) a driver mounted in said cabinet for transmitting sound waves inside said cabinet;
(c) a bass reflex port in a wall of said cabinet;
(d) a duct open at both ends and mounted inside said cabinet with one end connected to said port, said duct having an additional opening between its ends; and
(e) a deflectable membrane covering said additional opening.

5,150,418

SPEAKER SYSTEM

Kazuki Honda, Katano; Hiroyuki Takewa, Kaizuka; Shuji Saiki, Uda, and Kazue Satoh, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 22, 1991, Ser. No. 688,427
Claims priority, application Japan, Apr. 20, 1990, 2-106167; Apr. 20, 1990, 2-129609
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—159 **2 Claims**



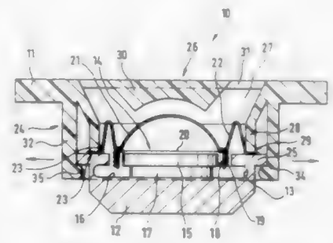
1. A speaker system comprising:
a frame member;
a diaphragm fixedly mounted by an edge member to said frame member;
an enclosure for securely holding said frame member;
a first acoustic region defined by a rear surface of said diaphragm, said frame member, and an inner edge member extending between said diaphragm and said frame member, said inner edge member for separating a rearward area of said diaphragm into two regions; and
a second acoustic region defined by said rear surface of said diaphragm, said edge member, said inner edge member, said frame member, and an inner wall of said enclosure,
wherein one of said first and second acoustic regions is a rear opening type and the other is bass-reflex type, further having an acoustic mass between said first and second acoustic regions for providing a phase inversion characteristic.

5,150,419

CALOTTE-TYPE TREBLE LOUDSPEAKER

Ulrich Kizak, Niederwinkling, and Kurt Leipold, Feldkirchen, both of Fed. Rep. of Germany, assignors to Nokia Unterhaltungselektronik GmbH, Pforzheim, Fed. Rep. of Germany

Filed Sep. 19, 1991, Ser. No. 762,893
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1990, 4031742
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—194 **2 Claims**



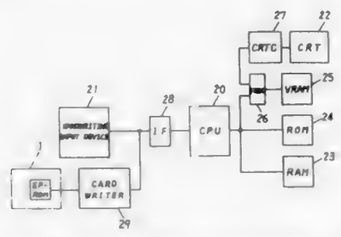
1. A loudspeaker (10) comprising a pot magnet (12); a pole core (14) comprising an upper pole plate (15) and a highly energized disk (17) arranged between the upper pole plate (15) and a bottom (16) of the pot magnet (12), said pole core being arranged concentrically inside the pot magnet (12) and at a certain distance (18) from an inner face thereof; a one-piece membrance (21) having a central semispherical portion, a peripheral part designed to act as a centering portion; a moving coil (19) that is attached to the membrance (21) in a transition area between the centering portion (22) and said semispherical portion, said moving coil having a free end that projects into the gap (18) between the inner face of the pot magnet (12) and the pole core (14); and a single-piece case component (11) that covers both the semispherical portion of the membrance (21) and the centering portion (22), said case component being provided with acoustic equalizers (30) opposite said semispherical portion, and said case component being connected to the pot magnet (12), the diameter of the moving coil (19) is less than 19 mm, the single-piece case component (11) is connected to the pot magnet (12) exclusively by means of elastic snap catches (32) arranged on the side wall (24) of the case component, where locking hooks (35) forming an integral part of said snap catches (32) engage with a collar (25) arranged on the outer surface of the pot magnet (12), and the single-piece membrance (21), once the case component (11) has been locked to the pot magnet (12), is maintained in its position between the case component (11) and the pot magnet (12) solely and exclusively by virtue of the fact that a part of the membrance (21) is pressed against said pot magnet (12) by a free end (29) of a piece of tubing (28) arranged on said case component (11).

5,150,420

SIGNATURE IDENTIFICATION SYSTEM

Kaoru Haraguchi, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 921,144, Oct. 21, 1986, abandoned.
This application Jun. 18, 1991, Ser. No. 715,742
Claims priority, application Japan, Oct. 21, 1985, 60-235976
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—3 3 Claims



1. A signature identification system for use with a user memory card adapted to electronically store invisible hand-written signature data representing a genuine signature of said user in a data storage area therein, said system comprising:

a handwriting input device comprising:

signature input means for inputting a hand-written signature;

signature reading means for reading said hand-written signature inputted by a genuine user of said memory card; and

writing means for writing said hand-written signature as hand-written signature data in said data storage area on said memory card, including:

a controller to control operations of said writing means, said controller receiving said read hand-written signature from said signature reading means and converting it to hand-written signature data;

a memory connected to said controller for storing said hand-written signature data;

a display memory connected to said memory and controller for receiving said hand-written signature data;

a display means for displaying said hand-written signature data; and,

a display controller for converting said hand-written signature data stored in said display memory into a format for display on said display means;

means for reading out said hand-written signature data in said data storage area of said memory card;

said controller receiving said read out hand-written signature data for displaying it on said display means as a genuine hand-written signature; and

said display means, responsive to said controller, for displaying said genuine hand-written signature so that said genuine hand-written signature displayed on said display means can be visually compared with another hand-written signature signed on another document to identify if said other hand-written signature is genuine.

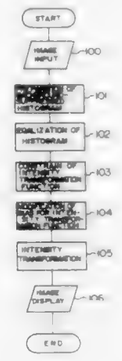
5,150,421

SYSTEM FOR AUTOMATED TRANSFORMATION OF GRAY LEVEL OF IMAGE

Koichi Morishita, Kawasaki; Tetsuo Yokoyama, Tokyo, and Kazuhiro Sato, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 639,221
Claims priority, application Japan, Jan. 9, 1990, 2-002100
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—6 12 Claims

1. An automated gray level transformation system for an image processing system including image input means for inputting images, image processing means for processing inputted images and image output means for outputting result of processing by said image processing means, said system comprising, as part of said image processing means, means for continuously constraining an intensity transformation function, which is calculated from a cumulative intensity histogram for each input image, on the basis of the distance between said



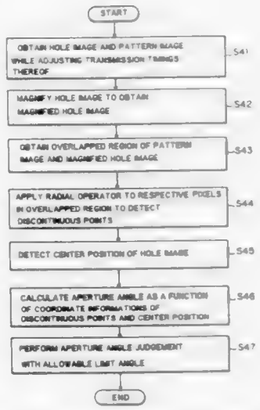
intensity tranformation function and a pre-selected reference intensity transformation function, further comprising means for suppressing an adverse effect of a background region other than an objective region of an input image during computation of said cumulative intensity histogram.

5,150,422

METHOD OF AND APPARATUS FOR INSPECTING CONDUCTIVE PATTERN ON PRINTED BOARD

Ryuji Kitakado; Hironobu Yano; Hiroaki Kakuma; Tetsuo Hoki, and Takao Kanai, all of Tenjinkitamachi, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Division of Ser. No. 500,294, Mar. 27, 1990, Pat. No. 5,027,417.
This application Mar. 22, 1991, Ser. No. 674,547
Claims priority, application Japan, Mar. 31, 1989, 1-82117; May 12, 1989, 1-119056; May 25, 1989, 1-131876; Jun. 27, 1989, 1-164330; Jun. 27, 1989, 1-164331
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—8 4 Claims



1. A method of inspecting a printed board for pattern defects, said printed board being provided with an electrically-conductive pattern and a through hole thereon, said method comprising the steps of:

(a) photoelectrically reading an image of said printed board;

(b) dividing said image of said printed board into a first pattern image represening said electrically conductive pattern and a hole image representing said through hole;

(c) obtaining a second pattern image by selectively performing one of the steps of:

(c-1) defining said second pattern image by said first pattern image itself and

(c-2) magnifying said hole image to obtain a magnified hole image and then obtaining said second pattern image by an overlapped region image representing an overlapped region on which said first pattern image and said magnified hole image overlap each other;

(d) detecting a center point of said hole image;

(e) defining a two-dimensional radial operator having unit operators which extend from a radial center point to different directions;

(f) applying said radial operator to said second pattern image under the condition where said radiant center point is positioned at said center point of said hole image;

(g) calculating an aperture angle of said second pattern image as a function of an application result of said radial operator obtained in the step (f); and

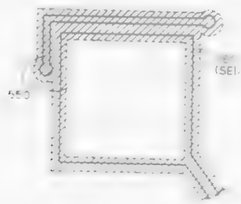
(h) comparing said aperture angle with a predetermined reference angle and thereby judging whether said electrically conductive pattern has a non-allowable defect or not.

5,150,423

METHOD OF AND DEVICE FOR INSPECTING PATTERN OF PRINTED CIRCUIT BOARD

Tetsuo Hoki, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co. Ltd., Japan

Filed Jul. 9, 1991, Ser. No. 727,826
Claims priority, application Japan, Jul. 10, 1990, 2-183257
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—8 26 Claims



1. A method of inspecting an objective printed board having a conductive pattern thereon, said method comprising the steps of:

(a) obtaining an image of said objective printed board, wherein said image includes an image of said conductive pattern;

(b) extracting an edge from said image of said conductive pattern of from an image substantially equivalent to said image of said conductive pattern, to generate an edge image;

(c) enlarging width of respective portions of siad edge image to generate an edge image;

(d) determining first and second areas in said image of said objective printed board, wherein said first area coincides with said enlarged edge image and said second area is an area other than said first area; and

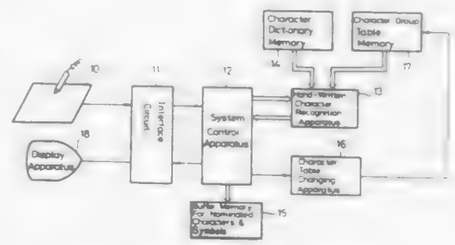
(e) inspecting said first area in a first inspection mode and inspecting said second area in a second inspection mode different from said first inspection mode.

5,150,424

ON-LINE CHARACTER RECOGNITION APPARATUS

Masayuki Aguro; Hidekazu Tanaka, both of Tokyo; Kimiyoshi Yoshida, Kanagawa, and Akio Sekano, Ibaraki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 621,017
Claims priority, application Japan, Dec. 4, 1989, 1-314956
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—13 4 Claims



1. A character recognition apparatus comprising:

a) input means for obtaining hand-written information;

b) character dictionary memory means for storing characteristics of characters and symbols;

c) character recognition means for determining a first character or symbol from said hand-written information in association with characteristics of characters and symbols stored in said character dictionary memory means;

d) group table memory means for storing group tables of characters and symbols, wherein each of the group tables is represented by a nominated character or symbol;

e) display means connected to the character recognition means and the group table memory means for displaying the first character or symbol and one of the group tables representing the first character or symbol, if said first character or symbol is one of the nominated characters or symbols; and

f) a group changing means connected to said group table memory means for changing group tables of said group table memory means.

5,150,425

CHARACTER RECOGNITION METHOD USING CORRELATION SEARCH

Gregory J. Martin, Canandaigua, N.Y.; Robert Y. Chen, Seattle, Wash.; John F. Cook, and James A. Mason, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1991, Ser. No. 752,801
Int. Cl.[5] G06K 9/62
U.S. Cl. 382—14 5 Claims

1. A method of character recognition, comprising the steps of:

1) font training or creating a font of trained characters by:

(a) acquiring an image composed of a two dimensional array of pixels;

(b) locating all of the characters in the image by selectively scanning columns or rows of a predetermined area of the image and comparing each pixels intensity with a reference level to determine the first pixel of each character and recording the location (column and row coordinates) of such pixel and identifying the other pixels adjacent to the first whose intensity also exceeds the reference level and recording the upper left and lower right coordinates of a box bounding each character;

(c) identifying (labeling) all located characters and entering such identified characters as trained characters in memory;

(d) repeating steps (a) thru (c) for every image in the training set;
(e) creating a correlation matrix by computing a correlation coefficient for every trained character with every other trained character and storing such matrix in memory;
(f) defining a list of trained character possibilities for every unknown character to be recognized;
(g) setting an upper limit on the number of trained characters that will be tested for each unknown character;
2) recognizing unknown characters by:
(h) acquiring a two dimensional array of pixels;
(i) locating all unknown characters in a manner described in (b);
(j) selecting one of the unknown characters found in step (i) and selecting an initial trained character from the list of trained character possibilities for the unknown character;
(k) computing a correlation coefficient between the selected unknown character and the trained character;
(l) performing step (v) and succeeding steps if the correlation coefficient exceeds a threshold;
(m) performing step (n) and succeeding steps if the correlation coefficient does not exceed a threshold;

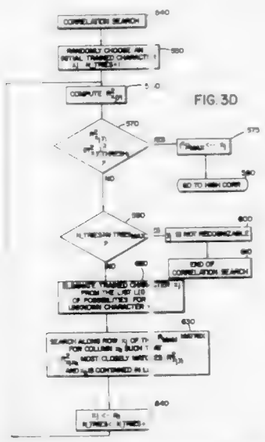


FIG. 3D

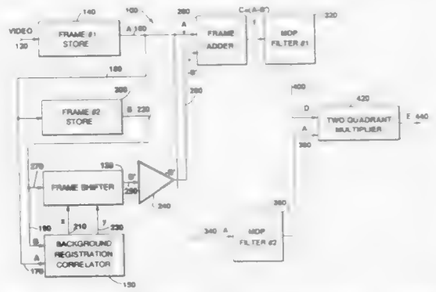
(n) performing step (p) and succeeding steps if the limit on the number of trained characters to be tested defined in step (g) has been exceeded;
(o) performing step (r) and succeeding steps if the limit on the number of trained characters to be tested defined in step (g) has not been exceeded;
(p) determining that the unknown character is not recognizable;
(q) repeating step (j) and succeeding steps until all unknown characters have been processed;
(r) eliminating the previously selected trained character from the list of trained character possibilities for the unknown character;
(s) searching along the row of the correlation matrix defined in step (e) corresponding to the most recently selected trained character for an entry that most closely matches the correlation coefficient found in step (k) and selecting as the next trained character to be tested the trained character corresponding to the column of this entry with the requirement that this trained character be contained in the list of trained character possibilities for the unknown character;
(t) incrementing the count of the number of trained characters tested for the unknown character;
(u) repeating steps (k) and all succeeding steps;
(v) saving the currently selected trained character as a candidate character for classifying the unknown character;
(w) eliminating the currently selected trained character from the list of trained character possibilities for the unknown character;
(x) performing step (bb) and succeeding steps if there are more entries in the list of trained character possibilities for the unknown character;
(y) performing step (z) and succeeding steps if there are no more entries in the list of trained character possibilities for the unknown character;
(z) classifying the unknown character as the most recently defined candidate character;
(aa) repeating step (j) and succeeding steps until all unknown characters have been processed;
(bb) searching along the row of the correlation matrix defined in step (e) corresponding to the most recently defined candidate character for an entry that exceeds a threshold and selecting as the next trained character to be tested the trained character corresponding to the column of this entry with the requirement that this trained character be contained in the list of trained character possibilities for the unknown character;
(cc) performing step (z) and all succeeding steps if a trained character can not be found in step (bb);
(dd) performing step (ee) and all succeeding steps if a trained character can be found in step (bb);
(ee) computing a correlation coefficient of the most recently selected trained character and the unknown character;
(ff) replacing the candidate character with the most recently selected trained character if the correlation coefficient computed in step (ee) exceeds the correlation coefficient of the candidate character and the unknown character;
(gg) removing the most recently selected trained character from the list of trained character possibilities for the unknown character;
(hh) repeating step (x) and all succeeding steps.

5,150,426

MOVING TARGET DETECTION METHOD USING TWO-FRAME SUBTRACTION AND A TWO QUADRANT MULTIPLIER

Nam D. Banh, Canoga Park; Thomas K. Lo, Temple City; Kelly D. Holthaus, Chatsworth, and Jack M. Sacks, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1990, Ser. No. 616,267
Int. Cl.[5] G06K *9/20, 9/00;* **H04N** *7/18;* **G01S** *13/00*
U.S. Cl. 382—48 **24 Claims**



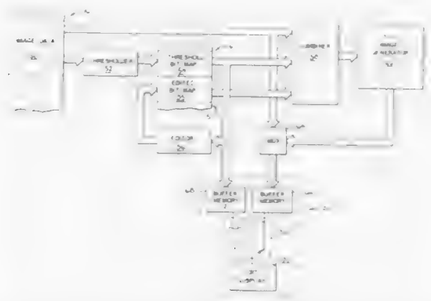
18. A method for detecting a moving object in a cluttered scene comprising the steps of:
storing a first frame of video data of the cluttered scene at a first time in a first frame storage device;
transferring the first frame of video data from the first storage device to a second frame storage device at a second time;
storing a second frame of video data of the cluttered scene in the first frame storage device substantially at the second time;
subtracting the second frame of video data from the first frame of video data to form subtracted video data;
filtering the subtracted video data in a first spatial filter;
filtering the first frame of video data through a second spatial filter; and
multiplying outputs from the first and second spatial filters in a two quadrant multiplier to detect the object and eliminate an ambiguous image of the object.

5,150,427

THREE DIMENSIONAL DISARTICULATION

David M. Frazee, Waukesha, and Carl R. Crawford, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Sep. 29, 1989, Ser. No. 414,377
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—48 **3 Claims**



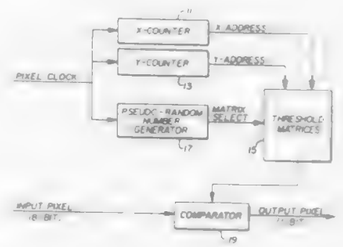
1. A method of editing three-dimensional images formed of a plurality of image data words formed of first bits, each image data word associated with a voxel of a three dimensional imaged object comprising the steps of:
establishing a three dimensional bit map comprised of a plurality of second bits with each second bit identified to an image data word;
editing the three dimensional bit map;
producing from the plurality of image data words and the edited bit map, edited image data words corresponding to image words of the image object by:
a) setting a word of the edited image data to the value of its corresponding image word if its associated second bit in the bit map is not set and the value of its associated image word is outside of a predetermined range;
b) setting a word of the edited image data to a predetermined pad value if its associated second bit in the bit map is not set and its associated image word is within the predetermined range; and
c) setting a word of the edited image data to the value of its corresponding image word if its associated second bit in the bit map is set and its associated image word is within the predetermined range
extracting a surface from the edited image data; and
displaying the extracted surface.

5,150,428

METHOD FOR GENERATING HALFTONE IMAGE DATA WITH RANDOMLY SELECTED THRESHOLD ARRAY

Anthony J. Leone, Pittsford, and Kevin E. Spaulding, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1991, Ser. No. 677,933
Int. Cl.[5] G06K *9/38*
U.S. Cl. 382—50 **10 Claims**



1. A method incorporating randomly selected threshold arrays for generating a halftone image from an input image comprising the steps of:
a. forming a plurality of threshold arrays, each with a predetermined number of threshold values accessed by row and column coordinates such that the values of each of the elements for a base threshold array is incremented for each succeeding one of said plurality of threshold arrays;
b. receiving into a electronic apparatus an input pixel value representing a pixel of the input image;
c. electronically selecting one threshold value from a randomly selected one of the plurality of said threshold arrays;
d. electronically comparing the input pixel value and the selected threshold value; and
e. generating an electronic output pixel value dependent upon which of the input pixel value and the selected threshold value is greater, thereby generating a pixel of the halftone image;
wherein the step of selecting one threshold value includes a step of determining an input pixel coordinate and a matrix element coordinate corresponding to the output pixel coordinate by:
1. determining the input pixel coordinate based on the position of the input pixel within the input image;
2. determining the row and column coordiantes within the selected threshold array by sequentially stepping through the rows and columns of the threshold array, with the column coordinate being incremented by a fixed increment for each output pixel along a scan line and the row coordinate being incremented for each scan line, the row and the column coordinates returning to the first row or column when a coordinate exceeds the matrix dimension; and
3. determining the threshold value at the row and column coordiantes of the randomly selected threshold array.

5,150,429

IMAGE PROCESSOR WITH ERROR DIFFUSION MODULATED THRESHOLD MATRIX

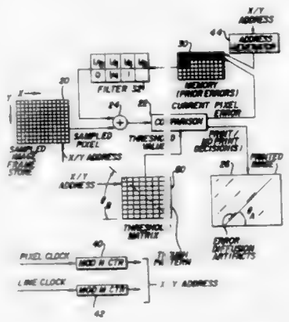
Rodney L. Miller, and Craig M. Smith, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 134,621, Dec. 17, 1987, abandoned. This application Jun. 18, 1991, Ser. No. 716,759
Int. Cl.[5] G06K *9/38*
U.S. Cl. 382—50 **25 Claims**

1. A method for reproducing a gray level image in a bi-tonal medium, comprising:
a comparison step comprising (a) comparing a summed

value with a threshold value to make a print or no print decision characterized by a corresponding one of two print values, and (b) subtracting said corresponding one print value from said summed value to generate a difference;

a diffusing step comprising (a) storing at least one of a succession of differences generated by said comparison step and (b) combining at least a corresponding one of said differences with an incoming gray level pixel to form a



sum and providing said sum as said summed value of said comparison step, wherein said produced diffused image is characterized by a set of elongate artifacts having a prevailing artifact direction;

determining said threshold value of said comparison step from a matrix of threshold values, the matrix having a trough pattern having a direction generally perpendicular to that of said prevailing direction, said matrix further contains no other trough patterns.

5,150,430

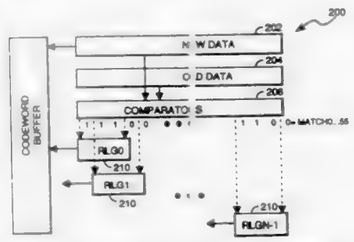
LOSSLESS DATA COMPRESSION CIRCUIT AND METHOD

Ke-Chiang Chu, Saratoga, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 15, 1991, Ser. No. 670,281

Int. Cl.[5] H03M 7/34

U.S. Cl. 382—56 **9 Claims**



1. A lossless data compression circuit, comprising:

new data register means for storing a new data string to be compressed, said new data string containing an ordered sequence of characters stored at corresponding positions in said new data register means;

shift register means for storing and shifting a set of comparison characters to be compared with said characters stored in said new data register means; said shift register shifting positions of said comparison characters until all of said comparison characters have been shifted through said shift register means;

comparison means, coupled to said new data register means and said shift register means, for simultaneously comparing all of said characters stored in said new data register means with corresponding ones of said comparison characters stored in said shift register means each time that said comparison characters are shifted in said shift register means;

composite reproduction length means, coupled to said comparison means, for determining simultaneously, for all positions in at least a contiguous subset of positions in said new data register means, maximum length strings within said set of comparison characters matching substrings of said characters stored in said new data register means beginning at corresponding positions in said new data register means, said composite reproduction length means producing in parallel a multiplicity of data pairs, each data pair corresponding to a different position in said new data register means, each data pair comprising a length value, corresponding to said maximum length string found for a substring beginning at a corresponding position in said new data register means, and a pointer value denoting where said maximum length string is located in said set of comparison characters; and

codeword generating means, coupled to said composite reproduction length means, for generating a sequence of codewords representing said new data string to be compressed, each said codeword including data corresponding to one of said data pairs and representing a substring of said new data string.

5,150,431

DEVICE FOR CONVERTING NORMAL OUTLINE DATA INTO COMPRESSED OUTLINE DATA, OR VICE VERSA

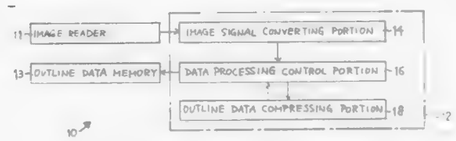
Hitoshi Yoshida, Kohnan; Naoyuki Kawamoto, Tajimi; Takahiro Kanegae, Nagoya, and Kazuma Aoki, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 23, 1991, Ser. No. 644,607

Claims priority, application Japan, Jan. 26, 1990, 2-16454

Int. Cl.[5] G06K 9/36

U.S. Cl. 382—56 **13 Claims**



1. A data compressing device for preparing compressed outline data from normal outline data, comprising:

determining means for processing said normal outline data, said normal outline data representing an outline of a character or other visible representation, said outline consisting of a plurality of segments connected end to end to each other so as to form a closed loop, said normal outline data including coordinate data representative of X and Y coordinate values of a plurality of segment specifying points which determine positions of said segments, and segment type data indicative of a type of each of said segments, said determining means determining whether or not all of a plurality of successive points of said plurality of segment specifying points which successive points are successively located along said closed loop have a same X coordinate value or a same Y coordinate value; and

data compressing means, responsive to said determining means, for omitting said X or Y coordinate value for at least one of said plurality of successive points, to thereby prepare said compressed outline data, if said all of the successive points have said same X or Y coordinate value which is equal to said X or Y coordinate value to be omitted.

5,150,432

APPARATUS FOR ENCODING/DECODING VIDEO SIGNALS TO IMPROVE QUALITY OF A SPECIFIC REGION

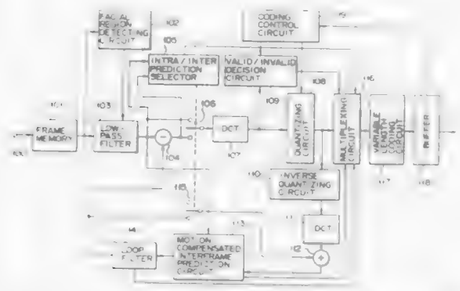
Hideyuki Ueno, Fujisawa, and Kenshi Dachiku, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 22, 1991, Ser. No. 673,416

Claims priority, application Japan, Mar. 26, 1990, 2-73275; Jun. 29, 1990, 2-173077

Int. Cl.[5] G06K 9/36

U.S. Cl. 382—56 **19 Claims**



1. An image encoding apparatus for encoding input image signals which correspond to a movable image having a specific region and are sequentially input for every frame, comprising:

region detecting means for detecting the specific region from said input image signals and outputting a region specifying signal for discriminating specific region from other regions;

low-pass filter means for selectively filtering in the space direction image signals of regions other than said specific region, which are included in said input image signals, according to said region specifying signal; and

coding means for orthogonal transformation coding of image signals output from said low-pass filter means.

5,150,433

HISTOGRAM/VARIANCE MECHANISM FOR DETECTING PRESENCE OF AN EDGE WITHIN BLOCK OF IMAGE DATA

Scott J. Daly, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1989, Ser. No. 444,470

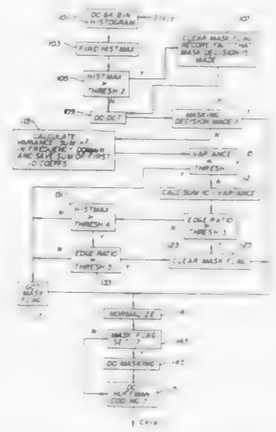
Int. Cl.[5] G06K 9/46; H04N 1/415

U.S. Cl. 382—56 **22 Claims**

1. For use with a signal processing mechanism for compressing signals representative of an image for transmission over a bandwidth-limited communication channel, in which blocks of transform coefficients, that have been obtained by subjecting said signals to a spatial frequency block transformation process, are quantized and the quantized transform coefficients encoded for transmission over said channel, a method of detecting the presence of an edge within an image block for which a corresponding block of image transform coefficients is obtained, comprising the steps of:

(a) generating a histogram of said image block;

(b) determining prescribed variance characteristics of said image block in accordance with transform coefficients associated with said image block; and



(c) identifying whether or not an edge is present within an image block in dependence upon said histogram and said prescribed image variance characteristics.

5,150,434

IMAGE DATA FILING SYSTEM WITH IMAGE DATA MODIFICATION FACILITY

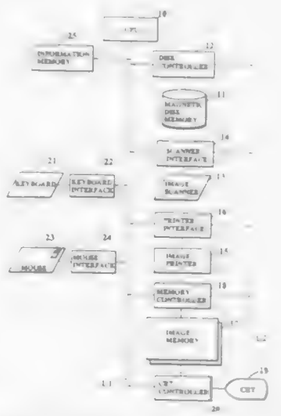
Osamu Hori; Akio Okazaki, both of Yokohama, and Shigeyoshi Shimotsuji, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 529,355, May 29, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 774,155

Claims priority, application Japan, May 31, 1989, 1-135801

Int. Cl.[5] G06K 9/03

U.S. Cl. 382—57 **4 Claims**



1. A method of modifying image data in an image data filing system, comprising the steps of:

specifying an image to be modified among images filed in the system;

displaying the specified image to be modified;

specifying a region to be modified on the displayed image to be modified, said region being a part of the image to be

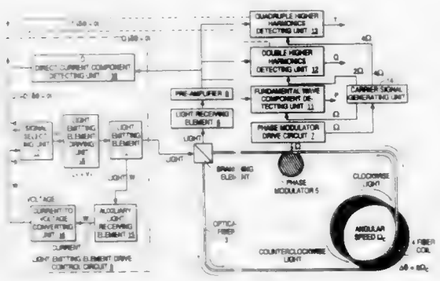
modified formed locally around a modification to be made on the image to be modified;
obtaining a hard copy of the specified region to be modified;
making a modification on the obtained hard copy of the specified region to be modified to obtain a modified image;
reading the modified image from the hard copy;
changing a size of the modified image read from the hard copy such that the modified image can be fitted into the region of the image to be modified;
aligning the modified image in changed size with the region of the image to be modified by adjusting an orientation of the modified image such that corners of the modified image are aligned with corners of the region of the image to be modified; and
replacing the region of the image to be modified with the aligned modified image, by subdividing the region of the image to be modified into a plurality of subregions, detecting modified portions within the modified image by calculating a similarity for each subregion of the region of the image to be modified, with and without the modification, and substituting only the detected modified portions of the modified image into the region of the image to be modified.

5,150,435

SIGNAL PROCESSING SYSTEM OF OPTICAL FIBER GYRO

Kouichi Washimi, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 13, 1991, Ser. No. 744,249
Claims priority, application Japan, Aug. 27, 1990, 2-225613
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—1 **2 Claims**



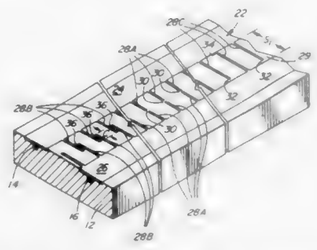
1. A signal processing system of an optical fiber gyro comprising:
a light emitting element for generating a monochromatic light;
a fiber coil formed by spirally winding a continuous optical fiber;
a phase modulator provided adjacent at one end of said fiber coil and comprising piezoelectric vibrator around which a part of said optical fiber is wound, a phase of the light passing through said optical fiber being modulated by expanding and contracting said piezoelectric vibrator;
a branching element for dividing said monochromatic light into clockwise and counterclockwise lights, for transmitting said clockwise and counterclockwise lights to opposite ends of said fiber coil, respectively, and for uniting again said clockwise and counterclockwise lights into a coherent light;
a light receiving element for detecting an intensity of said coherent light;
a phase modulator drive circuit for driving said phase modulator at a predetermined demodulation frequency;
a synchronous detection circuit for synchronism-detecting a sensor signal obtained from said light receiving element at said predetermined demodulation frequency and at frequencies integer times said demodulation frequency; and
an auxiliary light receiving element for monitoring an output of said light emitting element; and
when the light emitting element output is less than a predetermined value, a power for driving said light emitting element being controlled so that a direct current component or a harmonic component at an even number times the fundamental component of said sensor signal obtained from said light receiving element becomes constant; and
when said light emitting element output has reached said predetermined value, said light emitting element output being controlled by a monitoring signal of said auxiliary light receiving element so that it does not exceed said predetermined value.

5,150,436

SLOW-WAVE ELECTRODE STRUCTURE

Nicolas A. F. Jaeger, and Zachary K. F. Lee, both of Vancouver, Canada, assignors to The University of British Columbia, Canada

Filed Sep. 6, 1991, Ser. No. 756,300
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—2 **21 Claims**



1. A slow-wave electrode structure suitable for modulating a signal for a pair of spaced substantially parallel optical waveguides integrated in a substrate, said structure comprising a pair of substantially parallel conductor strips on a surface of said substrate and with each of said strips in interactive relationship with its respective adjacent of said waveguides, a plurality of narrow fin means substantially coplanar with and extending transversely across a gap separating said conductor strips without connecting said strips, said fin means being spaced apart longitudinally of said strips by a distance significantly less than the wavelength of said signal and forming a capacitance connection between said strips, said fin means being dimensioned so as to increase the capacitance per unit length between said strips without an equivalent decrease in inductance per unit length along said strips so that the phase velocity of a signal carried by said strips is reduced.

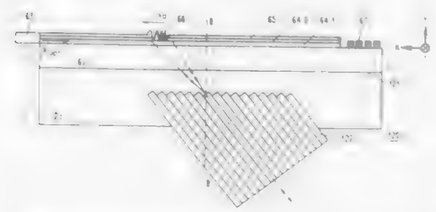
5,150,437

ELECTRO-OPTICAL SCANNER

Fritz Gfeller, Rüschlikon, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1991, Ser. No. 806,943
Claims priority, application Switzerland, Feb. 25, 1991, 90810990
Int. Cl.[5] G02B *6/00*
U.S. Cl. 385—7 **16 Claims**

1. Electro-optical scanner, comprising
a transparent substrate (62),
arranged on said substrate (62), an optical waveguide (64) and an acoustic waveguide (65), at least partly colinear and in an interactive relationship with respect to each other,
at least one opto-electronic device coupled to said optical waveguide (64) for feeding light waves into said optical waveguide (65), and/or for converting light waves received from said optical waveguide (64) into electric signals,
a transducer (67) for feeding, into said acoustic waveguide (65), acoustic waves which,
when interacting with light waves propagating in said optical waveguide (64), deflect the light at least partly out from the optical waveguide (64) into said transparent substrate (62), or,
when exposed to light waves applied from said transparent substrate (62), couple said light at least partly into said optical waveguide (64), and
control circuitry for



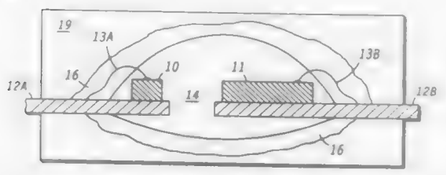
causing said transducer (67) to feed an acoustic wave pattern, consisting of a limited, predetermined number of individual waves, into said acoustic waveguide (65), forming a short traveling diffraction grating (68) thereon, for
selectively controlling frequency and amplitude of said individual waves, and for
synchronizing said acoustic wave pattern on said acoustic waveguide (65) and said light waves reaching said acoustic wave pattern via said optical waveguide (64) or via said transparent substrate (62), so as to provide for proper interaction therebetween.

5,150,438

OPTOCOUPLER APPARATUS WITH REFLECTIVE OVERCOAT

Clem H. Brown, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 29, 1991, Ser. No. 737,291
Int. Cl.[5] G02B *6/12*
U.S. Cl. 385—14 **12 Claims**



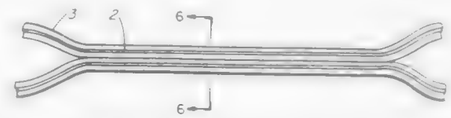
1. An optocoupler apparatus with reflective overcoat which comprises:
a light emitting diode mounted on a first conductor;
a detector device mounted on a second conductor wherein the first conductor is spaced from the second conductor;
a first conductive interconnect that electrically connects the light emitting diode with a third conductor, wherein the third conductor is spaced from the first and second conductors;
a second conductive interconnect that electrically connects the detector device with a fourth conductor, wherein the fourth conductor is spaced from the first, second, and third conductors;
a light coupling material surrounding the light emitting diode, the detector device, portions of the first and second conductive interconnects, and portions of the first and second conductors, including a bottom side of the first and second conductors;
a light reflective material coating a portion of the light coupling material that surrounds the bottom side of the first and second conductors; and
an encapsulating material enclosing the light coupling material, the light reflective material, the first and second conductive interconnects, and portions of the first, second, third, and fourth conductors.

5,150,439

SIMPLIFIED WDM FUSED FIBER COUPLER DESIGN

Kenneth O. Hill, Kanata; Francois Bilodeau, Nepean; Bernard Malo, Gatineau, and Derwyn C. Johnson, Nepean, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Communications, Canada

Filed May 22, 1991, Ser. No. 704,274
Claims priority, application Canada, Jul. 31, 1990, 2022367
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—39 **6 Claims**



1. A two-channel single mode optical fiber fused coupler comprising two optical fibers, each with a core and cladding, fused together at a narrow tapered waist, wherein a first channel is at a wavelength of λ_1 and a second channel is at a wavelength of λ_2, the coupler having a characteristic wavelength λ_0 where $\lambda_1 < \lambda_0 < \lambda_2$ and the normalized frequency

$$V = \frac{2\pi a}{\lambda_0}\sqrt{\eta_1^2 - \eta_2^2} > 1 \text{ but } \simeq 1$$

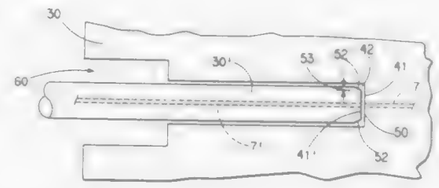
for all local fiber core radii throughout the coupling structure where a is the fiber-core radius, η_1 is the refractive index of the core and η_2 is the refractive index of the cladding.

5,150,440

COUPLING OF OPTICAL FIBER TO OPTICAL WAVEGUIDE DEVICE

Bruce L. Booth, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 595,838, Oct. 11, 1990, abandoned.
This application Sep. 9, 1991, Ser. No. 758,343
Int. Cl.[5] G02B *6/30*
U.S. Cl. 385—49 **29 Claims**



1. A method of coupling an optical fiber having a first waveguide, a first end-point and a first center axis to an optical device having a second waveguide, a second end-point and a second center-axis, comprising the steps

forming an opening of substantially square cross section, symmetrically in front of the second end-point in a direction substantially parallel to the direction of the second waveguide, the opening being adaptable to receive the optical fiber,

introducing a liquid adhesive photopolymer in the opening;

inserting the fiber in the opening of the device so that the first and second end points are separated by a predetermined distance, and the first center axis substantially coincides with the second center axis;

raising the temperature to a predetermined point; and

photocuring the liquid adhesive photopolymer at the raised temperature, with the requirement that the raised temperature is high enough as to reduce temperature versus optical-throughput oscillations of the device at temperatures lower than the predetermine point.

5,150,441

Patent Not Issued For This Number

5,150,442

COMBINED ELECTRIC/OPTIC CABLE AND APPLICATION THEREOF TO THE LINK BETWEEN A CAMERA HEAD AND A CONTROL UNIT

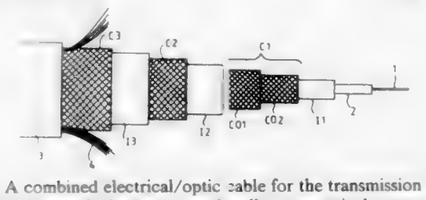
Gérard Desmons, Clichy, France, assignor to Thomson Video Equipement, Cergy Saint Christophe, France

Filed Mar. 12, 1991, Ser. No. 668,174

Claims priority, application France, Mar. 27, 1990, 90 03876

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—101 **9 Claims**



1. A combined electrical/optic cable for the transmission of television signals, having a rotationally symmetrical structure and comprising, along one and the same central axis and protected by an external sheath, at least three imbricated, concentric, tubular electrical conductors C1, C2, C3, separated by insulator tubes, the conductor C3 being designed to be grounded, and at least one central optic fiber, with the same axis, designed to transmit video signals.

5,150,443

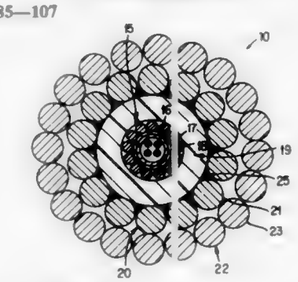
CABLE FOR DATA TRANSMISSION AND METHOD FOR MANUFACTURING THE SAME

Willem A. Wijnberg, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 14, 1990, Ser. No. 567,837

Int. Cl.[5] G01B *6/44*

U.S. Cl. 385—107 **20 Claims**



1. A cable comprising:

a core having at least one energy transmission line;

a jacket enclosing said core;

armor means helically surrounding said jacket, said armor means including at least one set of strands; and

an embedding elastic structure comprising a cured, thermosetting material surrounding said jacket and molded for receiving said armor strands.

5,150,444

OPTICAL FIBER CABLES AND COMPONENTS THEREOF CONTAINING AN HOMOGENEOUS BARRIER COMPOSITION CAPABLE OF PROTECTING OPTICAL FIBERS FROM HYDROGEN, AND RELATIVE HOMOGENEOUS BARRIER COMPOSITION

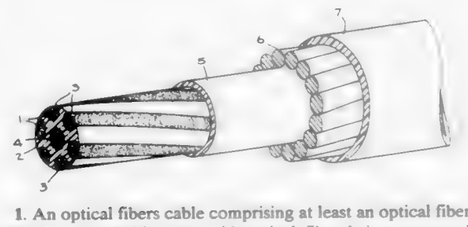
Claudio Bosisio, Brembate Sotto, and Antonio Campana, Milan, both of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy

Filed Jun. 27, 1991, Ser. No. 723,441

Claims priority, application Italy, Jul. 2, 1990, 20833 A/90

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—109 **19 Claims**



1. An optical fibers cable comprising at least an optical fiber housed in a suitable seat, said optical fiber being protected against the damaging action of hydrogen by a barrier composition which is capable of absorbing hydrogen chemically and comprises

(a) at least a silicon unsaturated organic compound having more than 0.2 mmoles of unsaturated groups per 100 g of said compound and having the following general formula:

(I)

wherein:

R and R', which may be the same or different, are alkyl, alkenyl or aryl

R'' and R''', which may be the same or different, are alkenyl, and

n is an integer;

(b) at least a catalyst selected from the group comprising inorganic and organic complexes of transition metals and organic salts of transition metals

characterized in that said barrier composition consists of an homogeneous phase which does not contain any metal or crystalline particle at the microscopic and X-ray diffractometric inspection.

5,150,445

LUMINOUS DISPLAY SYSTEM INCORPORATING OPTICAL FIBERS

Takashi Toyoda, and Masafumi Takesako, both of Sagamihara, Japan, assignors to Minto Kensetsu Co. Ltd., Kanagawa, Japan

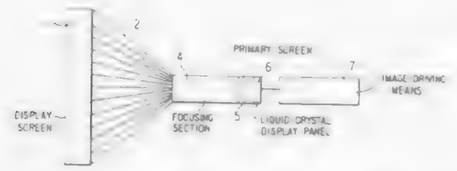
PCT No. PCT/JP88/00612, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO89/10606, PCT Pub. Date Nov. 2, 1989

PCT Filed Jun. 20, 1988, Ser. No. 598,706

Claims priority, application Japan, Apr. 22, 1988, 63-98198

Int. Cl.[5] G02B *6/04*

U.S. Cl. 385—116 **2 Claims**



1. A luminous display system incorporating optical fibers, comprising:

a display screen in which a plurality of output terminals of said optical fibers are embedded in and extend through a plurality of through-holes so as to face forward, said through-holes being formed in said display screen so as to be equally spaced apart from each other in both a vertical and a horizontal direction;

a focusing section having its rear surface serving as a primary screen, said focusing section being constructed of a bundle of a plurality of input terminals of said optical fibers, with the arrangement of said input terminals of said optical fibers corresponding to that of said output terminals of said optical fibers in both a vertical and a horizontal direction, and with an effective area of said primary screen being equal to or less than that of said display screen;

a liquid crystal display panel serving as a display terminal unit which is controlled/driven by an image driving means of a television receiver, a video player, or a computer display instrument to produce an image; and

means for projecting an image produced on said liquid crystal display panel onto said primary screen including a lens disposed to focus the image produced by said liquid crystal display panel and a reflective surface disposed between said lens and said primary screen to reflect the image produced by said liquid crystal display panel onto said primary screen whereby an image issued from said liquid crystal display panel to said primary screen passes through said optical fibers to reach said display screen on which the image is enlarged to provide a luminous display image thereon.

5,150,446

CONVERSION EFFICIENCY SECOND HARMONIC GENERATOR

Thomas L. Penner, Fairport; Douglas R. Robello, Webster; Nancy J. Armstrong, Ontario, and David J. Williams, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1991, Ser. No. 760,436

Int. Cl.[5] G02F *1/37*

U.S. Cl. 385—122 **15 Claims**

1. An optical article comprised of

a support,

an organic layer unit capable of converting a portion of electromagnetic radiation of a selected wavelength to its second harmonic wavelength,

means for optically coupling into said organic layer unit a source of polarized electromagnetic radiation having a wavelength representing a zero order transverse magnetic mode, and

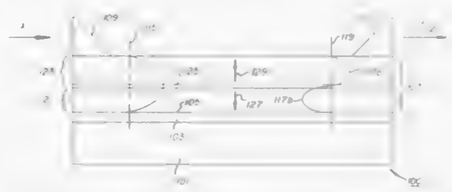
means for receiving from said organic layer unit a portion of the electromagnetic radiation in the form of a first order transverse magnetic mode,

said support including adjacent one major surface a portion which is transparent to the electromagnetic radiation sought to be propagated,

said organic layer unit having a thickness which is at least 70 percent of the wavelength of the zero order transverse magnetic mode and differs by less than 100Å from the thickness required for identical propagation constants of the zero and first order transverse magnetic modes,

said organic layer unit being comprised of a Y type Langmuir-Blodgett assembly of amphiphiles coated on the support over the transparent surface portion and forming a first Langmuir-Blodgett layer unit containing noncentrosymmetric organic molecular dipoles of a first orientation providing a second order polarization susceptibility to the first layer unit in excess of 10^{-9} electrostatic units, and

said organic layer unit is comprised of a Y type Langmuir-Blodgett assembly of amphiphiles forming a



second Langmuir-Blodgett layer unit containing noncentrosymmetric organic molecular dipoles of a second orientation providing a second order polarization susceptibility to the second layer unit in excess of 10^{-9} electrostatic units, but of opposite sign to that of the first layer unit,

the second Langmuir-Blodgett layer unit being coated on the first Langmuir-Blodgett layer unit.

the Langmuir-Blodgett layer units being comprised of amphiphiles satisfying the formula:

Hy-M-L where

Hy is a hydrophilic moiety;

L is a lipophilic moiety; and

M is an organic molecular dipole linking group comprised of:

-A-E-D-

where

A is an electron acceptor;

D is an electron donor; and

E is a conjugated π bonding system linking A and D.

5,150,447

OPTICAL WAVEGUIDE WHICH IS FORMED BY LIQUID PHASE EPITAXIAL GROWTH

Hitoshi Tamada; Atsuo Yamada; Yukie Taneyama, and Masaki Saitoh, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 747,621

Claims priority, application Japan, Aug. 24, 1990, 2-224008

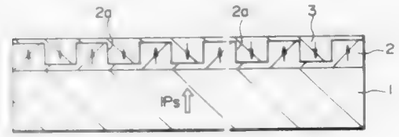
Int. Cl.[5] G02B *6/12*

U.S. Cl. 385—130 **7 Claims**

6. An optical waveguide comprising:

a dielectric crystal substrate wh ch is polarized in one direction;

a first dielectric crystal thin fil n formed by a liquid-phase epitaxial growth process ov r one major surface of the dielectric crystal substrate and provided in the major surface thereof with parallel grooves in a predetermined arrangement, and which is polarized in the direction of polarization of the dielectric crystal substrate and has a



Curie temperature which is higher than the temperature for the liquid-phase epitaxial growth process; and

a second dielectric crystal thin f lm formed by a liquid-phase epitaxial growth process ov r said major surface of the first dielectric crystal thin fil n and polarized in a direction which is opposite to the dir ction of polarization of said dielectric crystal substrate an l which has a Curie temperature which is higher than th : temperature for the liquid-phase epitaxial growth proc ss.

5,150,448

BEVERAGE FLOW HEATER UTILIZING HEATED TUBE WITH DISCRETE HEATING ZONE

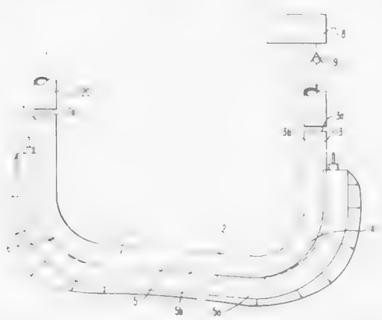
Thomas Salomon, Schloss Holte, Fed. Rep. of Germany, assignor to Melitta Haushalts-Produkte GmbH & Co., KG, Minden, Fed. Rep. of Germany

Filed Dec. 17, 1990, Ser. No. 628,355

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941476

Int. Cl.[5] F24H *1/12*; A47J *31/54*

U.S. Cl. 392—480 **18 Claims**



1. In a flow heater for water in a machine which produces hot water, the machine including a water tube having an inflow end for receiving water and an outflow end for dispensing hot water, and a heating tube connected to the water tube in a heat conductive manner, the improvement wherein said heating tube is divided over its extent into a plurality of regions of different heating outputs, respectively, for intensely heating the water to below the boiling point in a first zone of the water tube adjacent the inflow end, followed by a less intense heating of the water to attain the boiling point in a second zone of the water tube, followed by an intense heating of the water until a vigorous formation of vapor bubbles occurs in a third zone of the water tube, and finally followed by a less intense heating of the water for reheating the water in a fourth zone of the water tube adjacent the outflow end.

5,150,449

SPEECH RECOGNITION APPARATUS OF SPEAKER ADAPTATION TYPE

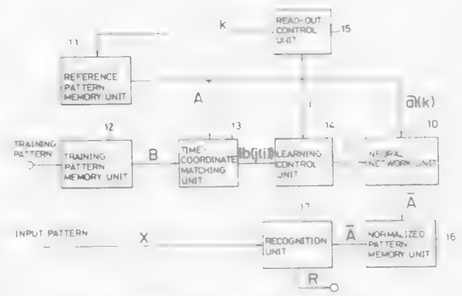
Kazunaga Yoshida, and Takao Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 353,838, May 18, 1989, abandoned. This application Apr. 23, 1991, Ser. No. 688,715

Claims priority, application Japan, May 18, 1988, 63-122559

Int. Cl.[5] G10L *5/00*

U.S. Cl. 395—2 **8 Claims**



1. A speech recognition apparatus comprising:

training pattern supplying means for supplying at least one sample speech pattern produced by a particular speaker as a training pattern, said training pattern being composed of a time series of first feature vectors;

reference pattern storing means for storing a plurality of standard reference patterns including at least one sample reference pattern corresponding to said sample speech pattern, said standard reference patterns being composed of a time series of second feature vectors and produced by a standard speaker different from said particular speaker;

a neural network including a plurality of input nodes in its input layer and a plurality of output nodes in its output layer, each of said input nodes being connected to said output nodes and being weighted by corresponding internal parameters;

learning control means supplied with said training pattern for modifying said internal parameters of said neural network in a learning phase, said neural network being supplied with a plurality of said time series of said second feature vectors, within a vicinity of a time point, of said sample reference pattern and converting said time series of said second feature vectors into time series of third feature vectors of a normalized sample reference pattern, said internal parameters being modified so as to minimize a difference between each of said first feature vectors, corresponding to said time point, of said traning pattern and each of said third feature vectors of said normalized sample reference pattern;

said neural network receiving, in a recognition phase after said learning phase, a plurality of said standard reference patterns and converting said standard reference patterns into normalized standard reference patterns; and

a recognition unit for receiving an input speech pattern produced by said particular speaker and said normalized standard reference patterns and for recognizing said input speech pattern based on said normalized standard reference patterns.

5,150,450

METHOD AND CIRCUITS FOR NEURON PERTURBATION IN ARTIFICIAL NEURAL NETWORK MEMORY MODIFICATION

Richard M. Swenson; David K. Andes; Donald H. Witcher; Robert A. Licklider, and James F. Barbieri, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1990, Ser. No. 591,318

Int. Cl.[5] G06F *15/18, 15/46*

U.S. Cl. 395—23 **11 Claims**

6. The method of using an artificial neural network which:

receives a plurality of data signals;

generates a plurality of output signals, each of said output signals depending on all of said data signals;

has a plurality of input terminals;

has a plurality of output circuits, each of said output circuits generating one of said output signals;

has a plurality of synapses, each of said synapses

connecting one of said input terminals to one of said output circuits and

including means for weighting an effect of a signal received at said one of the input terminals on the one of said output signals generated by said one of said output circuits,

has an input connection to each of said output circuits, the synapses corresponding to the output circuit being connected to said input connection; and

has a first one of said output circuits generating a different output signal than a second one of said output circuits when the same signal is provided at said input connection of said first output circuit and at said input connection of said second output circuit,

wherein the method comprises:

receiving said plurality of data signals at a set of said input terminals;

receiving a perturbation signal at one of said input terminals excluded from said set;

perturbing said output signals by said perturbation signal, each of said output signals being perturbed independently of others of said output signals and independently of said data signals;

receiving a balancing signal at one of said input terminals excluded from said set so that a synapse of said first output circuit and a synapse of said second output circuit receive said balancing signal; and

adjusting the effect of the balancing signal by the weighting means of said synapse of said first output circuit and by the weighting means of said synapse of said second output circuit so that said first output circuit and said second output circuit generate substantially the same output signal when substantially the same signals are received at said set of said input terminals

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5,150,451

EQUIPMENT AND METHOD FOR CONTROLLING THE OPERATION OF A LINE OF MACHINES, PARTICULARLY PRESSES

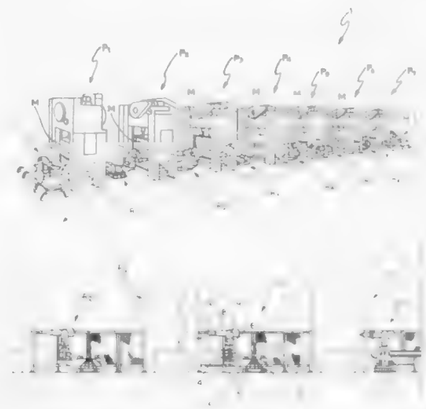
Stefano Deplano, Turin, Italy, assignor to Comau S.p.A., Turin, Italy

Filed Dec. 17, 1990, Ser. No. 628,779

Claims priority, application Italy, Dec. 20, 1989, 68135-A/89

Int. Cl.[5] G05B *19/42*; G06F *15/46*

U.S. Cl. 395—83 **6 Claims**



1. Equipment for controlling operation of a line including a plurality of machines, particularly presses, which are intended to perform a succession of operations on individual pieces which are advanced along the line from an upstream machine to a machine immediately downstream thereof, the line also including a plurality of programmable manipulator robots interposed between each upstream machine and the machine immediately downstream for transferring each of said pieces from said upstream machine to said machine immediately downstream, such that each said robot is immediately downstream of its upstream machine and immediately upstream of its machine immediately downstream, each of said machines having a movable device in combination therewith which is movable in an operating cycle of the machine combined therewith between an operative position for carrying out a certain operation on each of said pieces arranged in said machine and an inoperative position in which each of said pieces can be deposited in said machine or can be removed therefrom; each said robot including a gripping member which is movable between a first position in which it can grip a piece situated in a machine immediately upstream of the robot and a second position in which it can deposit the piece it has gripped in a machine immediately downstream of the robot,

wherein said equipment further comprises:

first machine-control means for controlling a first of said machines in said line, said first machine-control means being arranged to cause a cyclic movement of said movable device of said first machine between its inoperative position and its operative position at a predetermined, basic cycle frequency,

machine-operation sensor means associated with each of said machines in said line for emitting a first signal each time a machine is at a predetermined point in its operating cycle,

robot control means associated with each said robot in said line for starting an associated robot and for causing the gripping member of said robot to move cyclically from a

rest position to said first position, from said first position to said second position and from said second position back to said rest position in a working cycle which is in phase with the operating cycle of the machine immediately upstream of said robot, said robot control means being enabled to start the associated robot in response to said first signal by the said machine-operation sensor means associated with a machine immediately upstream of said robot.

robot-operation sensor means associated with each said robot in said line for emitting a second signal each time the gripping member of an associated robot is at a predetermined point in its working cycle, and

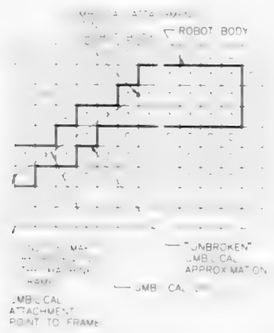
further machine control means associated with each machine downstream of said first machine in said line for starting a cyclic movement of the movable device of an associated machine between its operative position and its inoperative position, said further machine control means being enabled to start the associated machine in response to said second signal by the robot-operation sensor means associated with a robot immediately upstream of that associated machine, so that the operating cycle of each machine downstream of said first machine is in phase with the working cycle of the robot immediately upstream thereof and the operating cycles of each machine downstream of said first machine and the working cycles of each said robot are governed in cascade by the basic cycle frequency of said first machine.

5,150,452

METHOD AND APPARATUS FOR ANTI-COLLISION AND COLLISION PROTECTION FOR MULTIPLE ROBOT SYSTEM

Steven H. Pollack, Washington Crossing, Pa., and Brian D. Hoffman, Somerville, N.J., assignors to Megamation Incorporated, Lawrenceville, N.J.

Filed Jul. 28, 1989, Ser. No. 387,222
Int. Cl.[5] G06F *9/00*
U.S. Cl. 395—90 **41 Claims**



1. A collision detection met robot system having at least two robots movable about a common surface of a predetermined size

(a) providing a world map and a plurality of robot maps each divided into an xy grid of uniform sized squares, each map being the same size as said common surface for receiving two-dimensional representations, of robots projected onto said common surface;

(b) associating each of said squares of each maps with a predetermined memory cell in an associated memory;

(c) installing the initial location of each robot in its associated map by setting each memory cell associated with a square in the associated robot map having at least a portion thereof occupied by said robot to a first binary state;

(d) installing the initial location of each robot in the world map by combining the binary bit of each robot map memory cell with the binary bit of the associated memory cell of the world map;

(e) removing the initial location of a predetermined robot from the world map by a logical combination of the memory cells of the robot map of said predetermined robot with the associated memory cells of the world map responsive to a move request for said predetermined robot;

(f) installing the swept area representing movement from the initial position to a desired final position of said predetermined robot upon a swept area robot map by setting all of the memory cells occupied by the swept area to said predetermined state;

combining the binary states of associated memory cells of said swept area robot map and said world map using a first type of logical OR operation;

(h) combining the binary states of associated memory cells of said swept area map and said world map using a second type of logical OR operation different from said first type of logical OR operation;

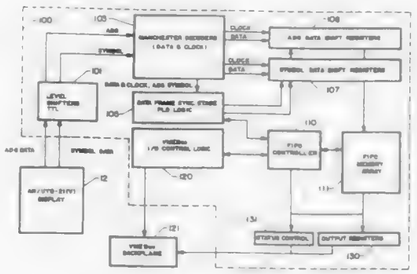
(i) indicating a collision if the binary states of any one of the associated memory cells of the logical combinations resulting from said first and second types of logical OR operations are unequal.

5,150,453

CAPTURE OF VECTOR CRT DISPLAY FOR HARDCOPY

Joseph A. Hala, Windsor Locks, and Donald W. Johnson, Lebanon, both of Conn., assignors to United States of America, Washington, D.C.

Filed Mar. 11, 1991, Ser. No. 667,717
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—106 **6 Claims**



1. A data capture circuitry unit for real-time capture of vector CRT display data for use in a real-time hardcopy processing system in which data is captured in response to a read request signal initiated by an external microprocessor, said data capture circuitry unit comprising:

means for converting the data to transistor-transistor level (TTL) signals;

a Manchester decoder having an internal clock for decoding said TTL signals into separate clock and data signals;

means for converting said data signals into parallel data signals using said clock signal;

local memory for storing said parallel data signals;

means for accessing said local memory, said accessing means writing to said local memory in synchronization with said internal clock;

means for receiving read requests from the aforesaid external processor, said receiving means being in communication with said accessing means and operable in synchronization with the aforesaid external processor to write said parallel data signals to said local memory asynchronously with respect to the external microprocessor; and

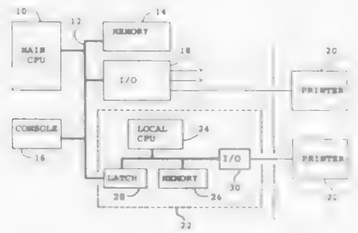
a status/control register connected to said local memory and said accessing means for maintaining the status of said local memory as being in one of an empty, full or overflowed state, whereby said accessing means is prevented from writing to said local memory in one of said full or overflowed states.

5,150,454

PRINTING SYSTEM AND METHOD

Patrick Wood, 49 Manito Ave., Lake Hiawatha, N.J. 07034, and Stephen Kochan, 35 Pheasant Run, Kinnelon, N.J. 07405

Filed Oct. 16, 1991, Ser. No. 777,065
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—114 **41 Claims**



1. A printing system for printing from a source of drawing instructions a two dimensional image reducible to pixels arranged in a plurality of ranked image lines, comprising:

a storage means having a compressed region and an uncompressed region, each having a designated capacity and each being arranged to store pixels of one or more of said plurality of image lines;

drawing means coupled to said storage means and adapted to be coupled to said source of drawing instructions for responding thereto, said drawing means being operable to store new pixels in said storage means for successively selected ones of said image lines, said drawing means including:

(a) conditional means for compressively encoding and moving from said uncompressed region to said compressed region a remote one of said image lines, if (i) the selected one of said image lines is in said compressed region and (ii) said uncompressed region has reached its designated capacity;

(b) decompression means for expansively decoding said selected one of said image lines, if located in said compressed region; and

(c) insertion means for inserting one or more new pixels according to said drawing instructions into said selected one of said image lines by storing said selected one in said uncompressed region; and

printing means coupled to said storage means for printing said plurality of image lines in rank order, decompressing compressed ones of said image lines from said compressed region before printing.

5,150,455

IMAGE DATA PROCESSOR

Takashi Morikawa, and Ikunori Yamaguchi, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1990, Ser. No. 550,370
Claims priority, application Japan, Jul. 12, 1989, 1-181241
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—114 **8 Claims**

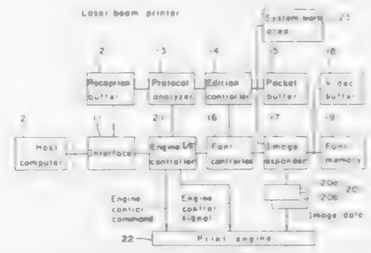
1. An image data processor for use in an image forming apparatus in which image data of one page are received from outside and bit data based on the image data are supplied to a printing portion in a predetermined quantity each time such that a whole of an image of the one page is printed, said image data processor comprising:

an analysis means for sequentially analyzing the image data received from the outside;

a data formulating means for sequentially formulating the bit data in accordance with analytic results of the image data by said analysis means, first and second memories for storing the bit data formulated by said data formulating means, said first memory having a memory capacity enabling storage of the predetermined quantity of the bit data;

an output means for outputting to the first memory, the bit data stored in said second memory; and

a supply means for supplying to said printing portion, the predetermined quantity of the bit data stored in said first memory.

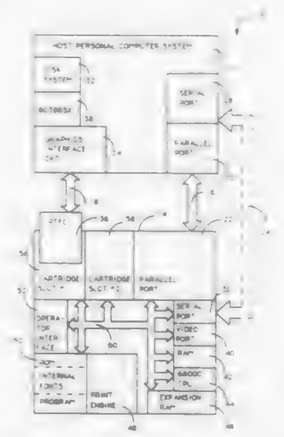


5,150,456

GRAPHIC IMAGE PRINTING SYSTEM AND METHOD

Kuo H. Wu, Torrance; Roger Schneider, Redondo Beach, and Kelvin K. Ishigo, Gardena, all of Calif., assignors to Elite High Technology, Inc., Torrance, Calif.

Filed Aug. 6, 1990, Ser. No. 563,417
Int. Cl.[5] G06D *15/00*
U.S. Cl. 395—114 **10 Claims**



1. A printing system comprising:

a writable font store that is connectable to receive from a host data processing system and store character definition data defining an image of at least one character to be printed, the character definition data being communicated over a first communication path; and

a printer subsystem connectable to receive from a host data processing system over a second communication path different from the first communication path a command to

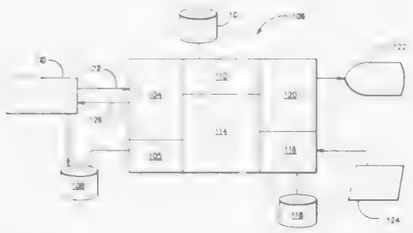
print the at least one character, the printer subsystem being operable in response to a received print command to print the at least one character by accessing the character definition data stored in the font store and printing the at least one character with an image defined by the stored character definition data.

5,150,457

ENHANCED VISUALIZATION USING TRANSLUCENT CONTOUR SURFACES

Jason L. Behm, Kingston, and Wei-Hwan Chiang, Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1990, Ser. No. 517,785
Int. Cl.[5] G06F *15/72*
U.S. Cl. 395—120 **8 Claims**



1. A method for generating a visual representation of discretely sampled data values on a display device, said data values each representing a value of a variable describing a property of a real or imaginary system, said method operating on a computer system having a storage means and an operator interaction means, the method comprising the steps of:

storing a data transform and a set of image organization rules;

transforming said discretely sampled data values into a standardized data structure according to said data transform;

storing said standardized data structure in a hierarchical data structure store according to said image organization rules;

accessing said heirarchical data structure to extract a plurality of standardized data structures for visual representation;

rendering said plurality of standardized data structures as a two dimensional representation of a three dimensional figure to create said visual representation;

storing said visual representation in said storage means for display on said display device.

5,150,458

ELECTRONIC IMAGE INFORMATION FILING APPARATUS DISPLAYING EDITING CORRECTIONS

Hidefumi Masuzaki, and Satoshi Ito, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,289
Claims priority, application Japan, Nov. 16, 1987, 62-287302
Int. Cl.[5] G06F *15/62;* **G09G** *1/16*
U.S. Cl. 395—135 **7 Claims**

1. An electronic image information filing apparatus for displaying first and second image information, comprising:

storage means for storing said image information;

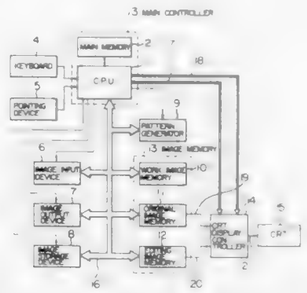
processing means connected to said storage means;

first memory means connected to said processing means for storing said first image information in binary pixel data from read out from said storage means by said processing means;

means for inputting and using said second image information for editing the first image information;

second memory means for storing said second image information in binary pixel data form;

image display control means for reading out said first and second image information from said first and second memories under control of said processing means, respectively, and for combining said first and second image information pixel by pixel to form resultant display image data wherein each of said first and second image information has a different display status, said image display control means combining said first and second image information while simultaneously reading out said first and second image information from said first and second memories, respectively;



display means for receiving and displaying said resultant display image data, including displaying each of said first and second image information according to its respective different display status; and

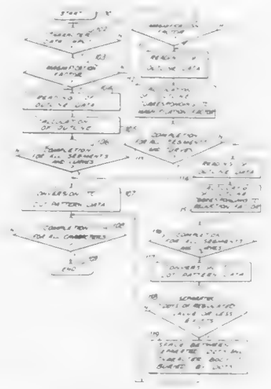
said image display control means further comprising selector means for selectively outputting one of said first and second image information in preference over the other when both said first and second image information are present at one pixel.

5,150,459

CHARACTER DOT PATTERN SIGNAL GENERATOR

Kazuhiro Kajimoto, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed May 11, 1990, Ser. No. 524,400
Claims priority, application Japan, May 10, 1989, 1-118095
Int. Cl.[5] G06F *3/14*
U.S. Cl. 395—151 **4 Claims**



1. A character pattern signal generator for generating a signal corresponding to a character having an outline formed as a plurality of dots forming a body of said character outline, comprising an outline memory means for storing character code data corresponding to an outline of standard size, outline data calculation means for receiving a magnification signal and

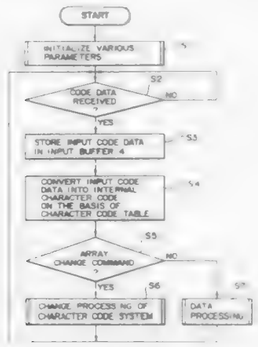
said character code data and calculating character outline data in response thereto, dot pattern generating means for converting said character outline data to dot pattern data, and dot pattern compensating means for detecting a number of said dots separated by a space from said body of said character outline in said dot pattern data and generating a number of dots to be added to said dot pattern data at said space when said magnification factor is other than one and said number of dots is less than a predetermined value.

5,150,460

APPARATUS FOR CHARACTER OUTPUT WITH MODIFICATION OF CHARACTER CODE ARRAY

Ken Onodera, Yokohama, and Shunji Saito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 687,091, Apr. 19, 1991, abandoned, which is a continuation of Ser. No. 299,633, Jan. 23, 1989, abandoned. This application Sep. 26, 1991, Ser. No. 765,466
Claims priority, application Japan, Feb. 1, 1988, 63-19494
Int. Cl.[5] G06F *3/14*
U.S. Cl. 395—151 **11 Claims**



1. An output apparatus comprising:

storage means for storing plural characters arranged in plural arrays of respective dimensions, each said array having a dimension from one to n, inclusive;

selection means for selecting one of the arrays of said storage means on the basis of the number of dimensions corresponding to input code data (m bytes (where $1<m, n$));

retrieval means for retrieving one of the characters stored in said storage means on the basis of data of the $(m-s)$th byte of the code data (where $1 \leqq s \leqq m$); and

pattern generating means for generating a character pattern corresponding to the character retrieved by said retrieval means

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5,150,461

FIXED POINT METHOD OF VIDEO DISPLAY SCALING

Neal S. Reynolds, Schaumburg, Ill., assignor to Sun Electric Corporation, Crystal Lake, Ill.

Filed May 25, 1988, Ser. No. 198,226
Int. Cl.[5] G06F *15/66*
U.S. Cl. 395—164 **5 Claims**

1. A high speed software method of operating a video display having a fixed number of pixels for displaying data having a different number of points, comprising the steps of:

calculating an increment, expressed as an integer portion and a fraction portion, that relates the number of pixels to the number of data points;

multiplying the fraction portion by the dynamic range of a counter;

successively combining the integer portions and fraction portions separately in counters and providing a carry to the integer portion counter when the counter for the fraction portion overflows; and

correlating pixels and points based upon the total count in the integer portion counter.

5,150,462

IMAGE DATA DISPLAY SYSTEM

Haruo Takeda, Kawasaki, and Kuniaki Tabata, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 67,014, Jun. 29, 1987, abandoned. This application Nov. 16, 1989, Ser. No. 437,706
Claims priority, application Japan, Jun. 27, 1986, 61-149510
Int. Cl.[5] G06F *5/14*
U.S. Cl. 395—166 **16 Claims**

1. An image data display system comprising:

a file unit for storing a plurality of variable length image data in compressed form;

a display unit having a display screen for displaying image data;

table means for storing address information of a plurality of image data to be read from said file unit;

a buffer memory having a plurality of memory areas corresponding to at least two image frames for temporarily storing compressed image data read out from said file unit;

means for expanding compressed image data read out from one of the memory areas of said buffer memory;

a bit map memory having at least two image frame memory regions for storing expanded image data to be displayed on said display screen;

means for outputting expanded image data in either one of said two image frame memory regions of said bit map memory to the display unit;

input means for inputting from a user a first command instructing a successive display of image data and a second command instructing a halt of the successive display; and

control means responsive to said first command for automatically switching between at least first and second memory

areas of said plurality of memory areas and between said two image frame memory regions of said bit map memory in a predetermined order, respectively, such that said first memory area of said buffer memory is used for storing compressed image data read out from said file unit and said second memory area of said buffer memory and one of said at least two image frame memory regions of said bit map memory are used by the expanding means, and for successively reading out image data from said file unit to said first memory area by referring to said table means while said means for outputting expanded image data is displaying the contents of the other of said two image frame memory regions of said bit map memory on said display screen and said expanding means is processing compressed image data in said second memory area to write expanded image data into said one region of said bit map memory, and responsive to said second command for halting said automatic switching operation of the memory areas and frame memory regions and said successive reading operation of image data from said file unit,

whereby a desired image data on the display screen is rendered by said control means to stay on the display screen in response to the second command inputted by said user from said input means during when a plurality of frames of image data are successively displayed on the display screen.

5,150,463

MULTI PROCESSOR DATA PROCESSING SYSTEM WITH REMOTE PACKET COPYING MECHANISM

Michael Ward, Bolton; Ian Watson, Stockport, and Pak S. Wong, Manchester, all of Great Britain, assignors to International Computers Limited, London, England

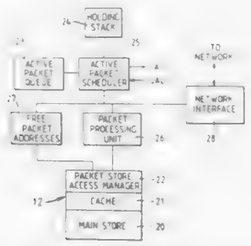
Filed Aug. 22, 1989, Ser. No. 396,954

Claims priority, application United Kingdom, Sep. 13, 1988, 8821410

The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.

Int. Cl.[5] G06F *15/16*

U.S. Cl. 395—200 **1 Claim**



1. A multi-processor data processing system comprising a plurality of processing nodes, and a communications network interconnecting the processing nodes, each processing node comprising a data processor and a local store coupled to the data processor, said local store including a packet store holding a plurality of function packets and a plurality of argument packets, each function packet comprising a function field and a pointer field pointing to one of said argument packets, wherein said data processor comprises:

(a) first means coupled to the packet store for accessing a function packet from the packet store and determining from the pointer field of that function packet whether that pointer field points to an argument packet that is resident in a remote node,

(b) second means coupled to said packet store and to said communications network and responsive to said first means determining that said pointer field points to an argument packet that is resident in a remote node, for fetching a copy of said argument packet from said remote node into the local store,

(c) third means coupled to said packet store and responsive to said second means fetching a copy of said argument packet, for creating in said packet store an indirection packet containing a first pointer to the argument packet in the remote node and a second pointer to the copy of that argument packet in the local store, and

(d) fourth means coupled to said packet store for referencing said indirection packet in the packet store to obtain said second pointer and then using said second pointer to access said copy of the argument packet in the local store indirectly.

5,150,464

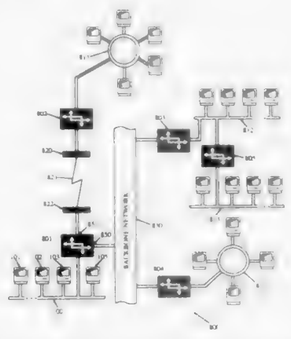
LOCAL AREA NETWORK DEVICE STARTUP PROCESS

Gursharan S. Sidhu, Menlo Park; Alan B. Oppenheimer, Cupertino, and James E. Mathis, San Carlos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 6, 1990, Ser. No. 534,144

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—200 **34 Claims**



1. In a communication system for transferring data between a plurality of entities coupled together in said communication system, said communication system including subsets of said plurality of entities which each have at least one routing means interconnecting each of said subsets with other subsets in said communication system, said subsets including a local subset of entities which comprises a first entity, a method used by the first entity for assigning itself a unique address on the communication system, comprising the steps of:

a. if a first value is stored in a first storage means, then performing the following steps:

i. storing the first value in a second storage means;

ii. transmitting a first signal to said local subset of entities to determine if the first value is used for the unique identification of another entity in said local subset of entities;

iii. if the first value is used for the unique identification of said another entity in said local subset of entities then receiving a second signal from another entity in said local subset of entities within a first predetermined amount of time;

iv. storing the value in said second storage means in said first storage means;

b. if the first value has not been stored in the first storage means, or if the first value has been stored in the first storage means and the second signal is received then performing the following steps:

i. randomly selecting a third value and storing said third value in the second storage means;

ii. transmitting a third signal to said local subset of entities to determine if the third value is used for the unique identification of said another entity;

iii. if the third value is used for the unique identification of said another entity then receiving a fourth signal from said another entity in said local subset of entities, randomly selecting a fourth value, storing the fourth value in the second storage means and repeating steps b.ii and b.iii until the fourth signal is not received, the fourth value becoming the third value at the beginning of each repetition of step b.ii;

iv. storing the value in said second storage means in said first storage means;

c. transmitting a fifth signal to said local subset of entities to request information from a first routing means coupled to the local subset of entities;

d. if a sixth signal is received from the routing means within a second predetermined period of time, the sixth signal including a list of values for the local subset of entities, then performing the following steps:

i. if a first portion of the value contained within the second storage means does not equal one value in the list of values provided in the sixth signal, then randomly selecting a fifth value from the list of values provided in said sixth signal and storing said fifth value in the second storage means;

ii. transmitting a seventh signal to said local subset of entities to determine if the value contained in the second storage means is used for the unique identification of said another entity;

iii. if the value contained in the second storage means is used for the unique identification of said another entity then receiving an eighth signal from another entity in said local subset of entities, randomly selecting a sixth value from the list of values provided in the sixth signal, and storing the sixth value in the second storage means, said sixth value having a first portion equivalent to the first portion of said second storage means and repeating steps d.ii and d.iii until the eighth signal is not received or until all possible sixth values have been stored in said second storage means;

iv. if all possible sixth values have been stored in the second storage means then randomly selecting a seventh value from said list of values in said sixth signal, and storing said seventh value in said second storage means and repeating step d.ii.;

v. storing the value in said second storage means in said first storage means;

e. using said value in said first storage means as said unique identification for said first entity.

5,150,465

MODE-SELECTABLE INTEGRATED DISK DRIVE FOR COMPUTER

Kenneth L. Bush, Cypress; Ralph S. Perry, Houston; Thomas W. Grieff, Houston, and George J. Scholhamer, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 277,760, Nov. 30, 1988. This application Dec. 31, 1991, Ser. No. 815,900

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—275 **14 Claims**

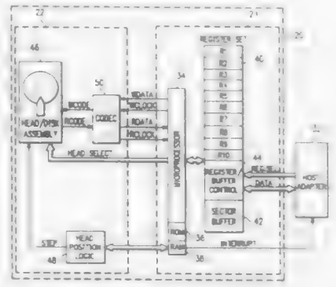
1. A method of selectively operating a peripheral input/output device in a computer system in one of first and second exclusive modes of operation, comprising the steps of:

a) defining a peripheral I/O address space within a peripheral controller to include a plurality of registers for controlling the transfer of multiple word data blocks and data words to and from a CPU and to and from a peripheral input/output device, said registers including a data port and a plurality of control and/or status ports;

b) in a first exclusive mode of operation, writing command information to one or more of said registers in said peripheral I/O address space to activate said peripheral controller to accept a multiple-word data block, said one or more registers to which command information is written including said data port and selected ones of said status and/or control ports;

c) while in said first exclusive mode of operation, transferring said multiple-word data block from said CPU to said peripheral controller along a first data path by writing said multiple-word data block to a data buffer within said peripheral controller and outside said peripheral I/O address space;

d) and, while in said first exclusive mode of operation, thereafter transferring data between said peripheral input/output device and said CPU along said first data path by



writing multiple-word data blocks to and reading multiple-word data blocks from said data buffer; or

e) in a second exclusive mode of operation, writing command information to said plurality of registers to activate said peripheral controller for a data transfer, said plurality of registers to which command information is written including selected ones of said status and/or control ports;

f) and, while in said second exclusive mode of operation, thereafter transferring data between said peripheral input/output device and said CPU along a second data path by writing data words to and reading data words from said data port.

5,150,466

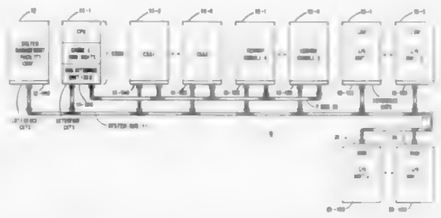
FLEXIBLE DISTRIBUTED BUS PRIORITY NETWORK

George J. Barlow, Tewksbury, and Donald L. Smith, Bedford, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Oct. 5, 1990, Ser. No. 593,436

Int. Cl.[5] G06F *13/37*

U.S. Cl. 395—325 **8 Claims**



1. Apparatus for enabling units of a multiprocessor system to be connected to a common system bus for high performance operation, said bus includes a distributed priority network, said system comprising a system management facility (SMF) unit, a plurality of central subsystem (CSS) units, a plurality of memory subsystem units and first and second pluralities of input/output system units which connect in a predetermined order to different physical positions along said common system bus for asynchronously transferring requests between different ones of said units, the transferring of requests proceeding on a priority basis controlled by a plurality of like priority network

bus request interface sections, one of said sections being included in a different one of said plurality of units and in which said interface sections collectively form said distributed bus priority network of said common system bus for granting access to said bus on the basis of each unit's physical position on said common system bus relative to one end of said bus as indicated by positional priority signals received and generated by corresponding ones of said priority network sections included in said units, said apparatus including:

first bus request logic circuits included in the interface section of said SMF unit which connects to said one end so as to have a highest positional priority, said first bus request logic circuits including input circuit means for detecting when either a high or low priority request has placed said priority network in a busy state, and fast recovery bus request circuit means connected tos aid input circuit means and to said bus priority network for applying high priority requests when said priority network is not busy to said system bus to be granted bus cycles without restriction and for being reset at the end of each bus cycle granted to said SMF unit;

second bus request logic circuit included in each interface section of each CSS unit which connects between said SMF unit and either side of said memory subsystem units, said second bus request logic circuits including input circuit means for detecting when either a high or low priority request has placed said priority network in a busy state and detector circuit means for generating an output signal for indicating when no high or low priority requests are being applied by said units to said bus priority network thereby indicating that said system bus is in an idle state, and bus request circuit means connected to said second bus request logic circuits and to said bus priority network for applying low priority requests to said system bus when said priority network is not busy only when said output signal indicates that said system bus is in said idle state and being granted bus cycles as a function of said positional priority signals; and,

third bus request logic circuits included in each interface section of each memory subsystem unit, said third bus request logic circuits including input circuit means for detecting when either a high or low priority request has placed said priority network in a busy state, and bus request circuit means connected to said third bus request logic circuits and to said bus priority network, for applying high priority requests to said system bus when said priority network is not in a busy state and being granted bus cycles as a function of said positional priority signals so as to provide a desired logical priority among said units based upon the functions performed by said units independent of physically positioning said units for high performance operation.

5,150,467

METHOD AND APPARATUS FOR SUSPENDING AND RESTARTING A BUS CYCLE

Dennis F. Hayes, and Gerald Sturk, both Westford, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 496,097, Mar. 15, 1990, abandoned, which is a continuation of Ser. No. 93,188, Sep. 4, 1987, abandoned. This application Jul. 31, 1991, Ser. No. 740,867

Int. Cl.[5] G06F 13/38

U.S. Cl. 395—325 16 Claims

1. A method for resolving conflicts between a bus transaction initiated by a processor and another bus transaction initiated by a device on a bus in a computer system, the computer system comprising the processor, the device coupled to the bus, and a control logic device coupled to the processor, comprising the steps of:

(a) initiating a bus transaction by the processor by transmitting an address and a plurality of control signals from the processor to the bus so that the processor bus transaction is in progress;

(b) issuing a control signal by the device which causes the control logic device to suspend the processor bus transaction that is in progress when the other bus transaction initiated by the device is already in progress by:

1) storing the address,

2) deasserting the plurality of control signals,

3) isolating the processor from the bus, and

4) delaying issuance of a completion signal indicative of completion of the processor bus transaction, the processor being noncognizant of the suspension; and

(c) subsequently restarting the processor bus transaction by the control logic device when the other bus transaction initiated by the device is completed by:

1) reissuing the address and control signals,

2) coupling the processor to the bus, and

3) allowing completion of the processor bus transaction, the processor being noncognizant of the restart.

5,150,468

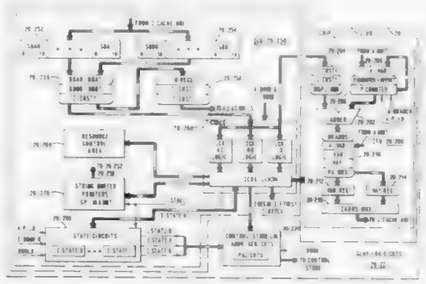
STATE CONTROLLED INSTRUCTION LOGIC MANAGEMENT APPARATUS INCLUDED IN A PIPELINED PROCESSING UNIT

Deborah K. Staplin, Chelmsford, and Jian-Kuo Shen, Belmont, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Jun. 30, 1989, Ser. No. 374,881

Int. Cl.[5] G06F 9/30, 9/38

U.S. Cl. 395—375 24 Claims



1. Instruction apparatus for controlling the execution of a plurality of different types of instructions of an instruction set in a pipelined mode by a plurality of serially coupled stages of a pipelined processing unit, each stage for performing a different operation in the execution of each instruction received by said processing unit, said instructions being received by a first one of said stage, in succession, and said apparatus being included in a first one of said stages and comprising:

(a) crack decode means for generating a plurality of signals in response to each instruction of said instruction set, said plurality of signals differing for each different type of instruction;

(b) control state means coupled to said crack decode means for generating a plurality of state signals corresponding to a number of machine states in response to different ones of said plurality of signals, said state signals generated by said control state means being determined in part by said plurality of signals and each one of said state signals generated defining a current machine state of said control state means; and,

(c) means for applying said state signals to one or both of said first stage and a second one of said pipeline stages for causing said stages to execute different operations for each instructions causing the generation of a corresponding one of said state signals.

5,150,469

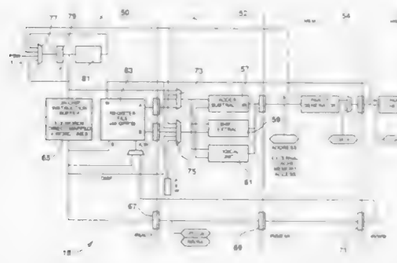
SYSTEM AND METHOD FOR PROCESSOR PIPELINE CONTROL BY SELECTIVE SIGNAL DEASSERTION

Norman P. Jouppi, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 283,499, Dec. 12, 1988, abandoned. This application Jul. 13, 1990, Ser. No. 554,131

Int. Cl.[5] G06F 9/38, 9/30

U.S. Cl. 395—375 18 Claims



1. A system for processor pipeline control of a pipeline having a plurality of sequential pipestages, which comprises a means for generating a like plurality of pipeline control signals each corresponding to an action carried out in one of said plurality of sequential pipestages, the like plurality of pipeline control signals controlling whether each of said like plurality of sequential pipestages stalls or advances, and means, connected to said means for generating pipeline control signals, for selective deassertion of each one of the like plurality of pipeline control signals in response to an exceptional event requiring one of a stall and interruption of one of the plurality of sequential pipestages corresponding to a selected one of the like plurality of pipeline control signals, and for deasserting ones of the like plurality of pipeline control signals corresponding to all those of the plurality of sequential pipestages sequentially previous to the pipestage corresponding to the selected one of the like plurality of pipeline control signals, said means for selective deassertion being configured so that a first exceptional event causing a deassertion of the pipeline control signal for a later one of the like plurality of sequential pipestages necessarily includes deassertion of any pipeline control signal appropriate for a second exceptional event causing deassertion of a previous one of the like plurality of pipeline control signals for a previous pipestage, said system being free of pipeline control logic for prioritizing the exceptional events and to translate the exceptional events into control signals.

5,150,470

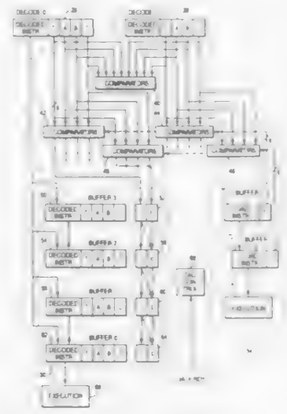
DATA PROCESSING SYSTEM WITH INSTRUCTION QUEUE HAVING TAGS INDICATING OUTSTANDING DATA STATUS

Troy N. Hicks, and MyHong NguyenPhu, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1989, Ser. No. 453,529

Int. Cl.[5] G06F 9/30

U.S. Cl. 395—375 9 Claims



1. A data processing system comprising;

an instruction execution means for executing first instructions;

fetch means, connected to a memory, for fetching instructions from said memory and for fetching data from the memory in response to second instructions;

instruction decoding means connected to said fetch means, for decoding fetched instructions, for dispatching said first instructions to an instruction queuing means, and for dispatching said second instructions to said fetch means; and

said instruction queuing means, connected to said instruction decoding means, said fetch means and said instruction execution means, for storing decoded first instructions, determining if data required for said stored first instruction execution has not been fetched, tagging a stored first instruction when data required for execution has not been fetched, clearing tags on said first instructions when the data required for execution is fetched, and providing the untagged first instructions to the instruction execution means and storing said second instructions.

5,150,471

METHOD AND APPARATUS FOR OFFSET REGISTER ADDRESS ACCESSING

Donald G. Tipon, San Diego, and Jan P. Stubbs, Leucadia, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 20, 1989, Ser. No. 341,081

Int. Cl.[5] G06F 9/26, 12/02

U.S. Cl. 395—400 7 Claims

1. An apparatus for use with a data processor which fetches and executes instructions for addressing a memory address location using a variable offset from a preselected memory address, comprising:

register means, connected to the data processor for storing a preselected memory address;

means, connected to the data processor for transferring an offset value from an offset data field of a most recently fetched instruction;

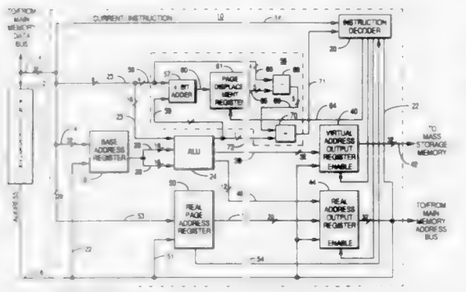
means for adding said offset value to said preselected memory address and outputting an interim memory address;

means for determining if said most recently fetched instruction is an offset memory access instruction; and

means for either finalizing said interim memory address into a final memory address if said most recently fetched instruction is an offset memory access instruction or invalidating said interim memory address if said most recently fetched instruction is not an offset memory access instruction;

wherein said finalizing or invalidating means includes:

a second register having a page displacement value representing a displacement of an immediately previous offset memory access instruction stored therein;



means for subtracting at least one overlap bit of said offset value from said page displacement value;

means for comparing an output of said subtracting means with a carry-out bit of said adding means thereby determining if the most recently fetched instruction is located on the same page as the immediately previous offset memory access; and

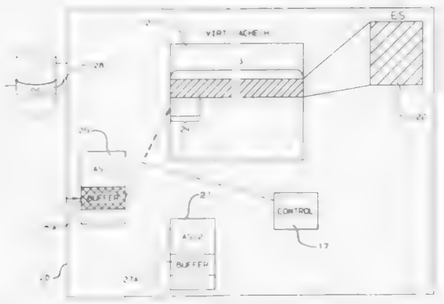
means for outputting the final memory address to a memory storage device for fetching data stored at the final memory address location.

5,150,472

CACHE MANAGEMENT METHOD AND APPARATUS FOR SHARED, SEQUENTIALLY-ACCESSED, DATA

Ted E. Blank, Wappingers Falls; Donald F. Ferguson, Port Jefferson Station; Jeffrey A. Frey, Highland; Angelo Pruscino, Poughkeepsie; Robert R. Rogers, Beacon, all of N.Y., and Erhard Rahm, Kaiserslautern, Fed. Rep. of Germany, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 20, 1989, Ser. No. 424,455
Int. Cl.[5] G06F *12/08*
U.S. Cl. 395—425 16 Claims



1. In a data processing system having a host processor, attached I/O devices, and a virtual storage cache for caching data sequentially read from a dataset on an attached I/O device by multiple readers executing on the host processor and sharing the cache, a method for managing the cache comprising the steps of:

(1) Determining that page-stealing is required to free a page of a backing store backing a virtual page in said virtual storage cache before additional data can be placed in the cache;

(2) determining the page of backing storage to steal based on a sequential usage-based estimate of time until reuse of said page by one of said sequential readers;

(3) stealing the page of backing storage on demand;

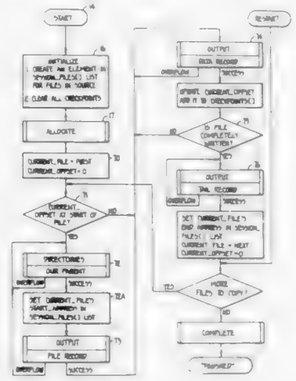
(4) continuing to steal as necessary until a target of stolen pages is reached.

5,150,473

DATA STORAGE FORMAT FOR ADDRESSABLE OR SEQUENTIAL MEMORY MEDIA

Richard C. Zulch, Berkeley, Calif., assignor to Dantz Development Corporation, Berkeley, Calif.

Filed Jan. 16, 1990, Ser. No. 466,145
Int. Cl.[5] G06F *12/16*
U.S. Cl. 395—425 13 Claims



1. A process for the archiving of data from a non-volatile computer memory including means to write to said non-volatile computer memory and a non-volatile archive memory having means to write to said non-volatile archive memory, said archiving being devoted to a computer session wherein each session includes a root directory with at least first and second files, said archiving including the steps of:

writing a first file from said session from said non-volatile computer memory to said non-volatile archive memory using said means for writing to said non-volatile archive memory;

creating in said non-volatile computer memory a direction portion for an archive directory using said means for writing to said non-volatile computer memory;

after said writing of said first file step, writing to said non-volatile computer memory using said means for writing to said non-volatile computer memory in said archive directory portion of said non-volatile computer memory the directory portion for said first file whereby said non-volatile computer memory maintains a directory of said non-volatile archive directory permitting access of the address of said first file;

writing a second file to archive memory using said means for writing to said archive memory;

after said writing of said second file step, writing to said non-volatile computer memory in the directory archive portion of said non-volatile computer memory the directory portion of said second file in said non-volatile archive memory from said root to said file, said writing step being restricted to only writing that portion of said directory portion linking said root and said second file and omitting all portions of said directory portion previously written to said directory information for said first file whereby said non-volatile computer memory has the directory portion of said non-volatile archive portion of both said first and second files.

5,150,474

METHOD FOR TRANSFERRING ARGUMENTS BETWEEN OBJECT PROGRAMS BY SWITCHING ADDRESS MODES ACCORDING TO MODE IDENTIFYING FLAG

Takashi Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,614
Claims priority, application Japan, Apr. 29, 1988, 63-105954
Int. Cl.[5] G06F *9/45*
U.S. Cl. 395—500 4 Claims

1. A method for computer system in transferring arguments from a calling object program to a called object program using a parameter list contained in said calling object program, said parameter list containing addresses of said arguments, comprising the steps of:

storing an address mode identifying flag into said parameter list when said calling object program is generated from a calling source program by a first computer system, said flag identifying an address mode of said first computer system;

executing said calling object program in a second computer system; and

upon execution of said called object program in said second computer system, detecting said address mode identifying flag in said parameter list, referencing said argument addresses stored in said parameter list in the address mode specified by said detected flag, and transferring the arguments at said referenced addresses from said calling object program to said called object program

DESIGN PATENTS

GRANTED September 22, 1992

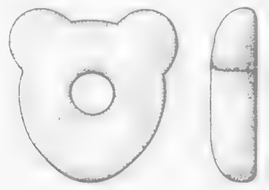
ERRATA

For CLASS	See PATENT NO.
D21-237	329,633
D04-104	9642
D02-320	329,689

DESIGNS

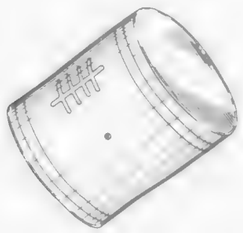
SEPTEMBER 22, 1992

329,524
CAT FOOD
Robert L. Bonilla, 7903 Hershey St., Rosemead, Calif. 91770
Filed Feb. 14, 1990, Ser. No. 479,725
Term of patent 14 years
U.S. Cl. D1—107



329,525
PRALINE
Marika Kesdekogiu, Brussels, Belgium, assignor to S.A. Confiserie Leonidas, Brussels, Belgium
Filed Nov. 21, 1988, Ser. No. 274,791
Claims priority, application Benelux, May 19, 1988, 10.977
Term of patent 14 years
U.S. Cl. D1—111

329,526
MARSHMALLOW
John Monzon, 222 W. Beaver Ave. #304, State College, Pa. 16801
Filed May 16, 1990, Ser. No. 523,926
Term of patent 14 years
U.S. Cl. D1—127

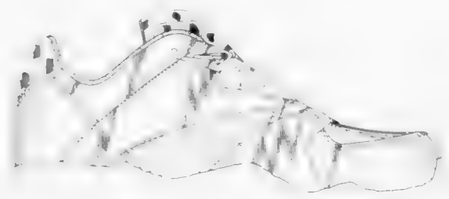


329,527
SURGICAL SHOE
Jack Cohen, 811 Avenue S, Brooklyn, N.Y. 11223
Filed Dec. 17, 1990, Ser. No. 628,664
Term of patent 14 years
U.S. Cl. D2—265

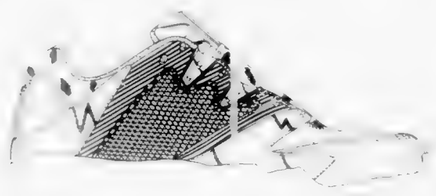
329,528
PERIPHERY OF A SHOE SOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International Ltd., Bermuda
Filed Apr. 22, 1991, Ser. No. 688,332
Term of patent 14 years
U.S. Cl. D2—314

329,529
MIDSOLE OF A SHOE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike Int'l. Ltd., Bermuda
Division of Ser. No. 539,047, Jun. 15, 1990, Pat. No. Des. 316,626. This application May 6, 1991, Ser. No. 695,779
Term of patent 14 years
U.S. Cl. D2—314

329,530
SHOE UPPER
Catherine M. Bailey, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Aug. 5, 1991, Ser. No. 740,473
Term of patent 14 years
U.S. Cl. D2—314

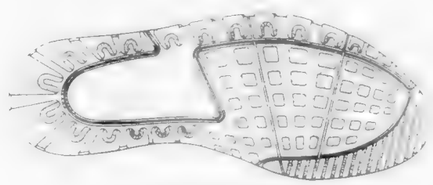


329,531
SHOE UPPER
Wilson W. Smith, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Aug. 5, 1991, Ser. No. 740,474
Term of patent 14 years
U.S. Cl. D2—314

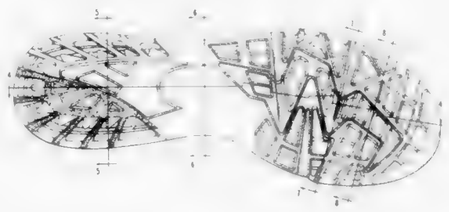


329,532
SHOE MIDSOLE
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International Ltd., Bermuda
Filed Dec. 13, 1991, Ser. No. 806,414
Term of patent 14 years
U.S. Cl. D2—318

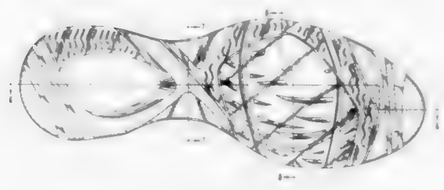
329,533
SHOE SOLE BOTTOM
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International Ltd., Bermuda
Division of Ser. No. 431,138, Nov. 3, 1989, Pat. No. Des. 311,810. This application Oct. 31, 1990, Ser. No. 607,654
Term of patent 14 years
U.S. Cl. D2—320



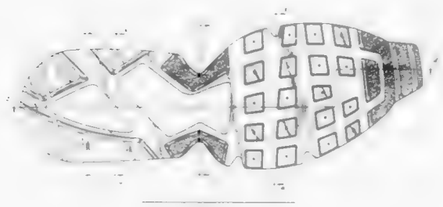
329,534
SHOE OUTSOLE
William J. Worthington, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg. and Nike International, Ltd., Bermuda
Filed Oct. 10, 1991, Ser. No. 774,299
Term of patent 14 years
U.S. Cl. D2—320



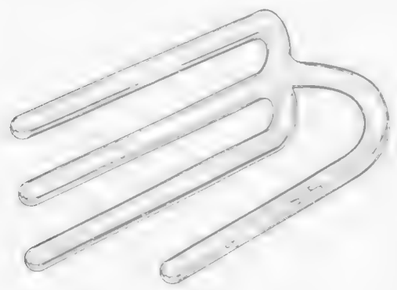
329,535
SHOE OUTSOLE
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,413
Term of patent 14 years
U.S. Cl. D2—320



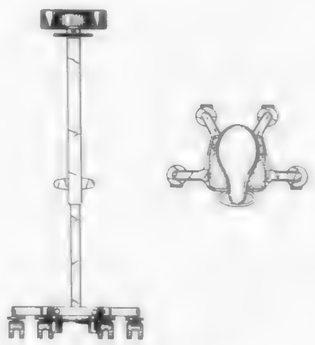
329,536
SHOE OUTSOLE
Robert J. Lucas, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., both of Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,549
Term of patent 14 years
U.S. Cl. D2—320



329,537
SEAT BELT SIZING ACCESSORY
J. Michael McLean, 2380 Bobwhite Ct., Missoula, Mont. 59802
Filed Jan. 16, 1990, Ser. No. 464,764
Term of patent 14 years
U.S. Cl. D2—639

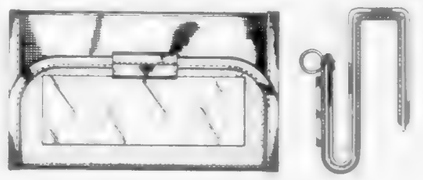


329,538
. SUPPORT FOR A STANDING PERSON
Siegfried Rau, Zeller-Strasse 14, D-7323 Hattenhofen, Fed. Rep. of Germany
Filed Mar. 2, 1990, Ser. No. 487,709
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, M8906147.0
Term of patent 14 years
U.S. Cl. D3—9



329,539
CANTEEN OR THE LIKE
Mark Klien, Belleville, N.J., and Albert Turick, Westport, Conn., assignors to C4 Marketing, Ltd., N.Y.
Filed Jun. 28, 1990, Ser. No. 545,456
Term of patent 14 years
U.S. Cl. D3—30.1

329,540
SUNGLASSES HOLDER FOR A VEHICLE VISOR
Robert J. Kunes, and Lupe J. Kunes, both of Ventura, Calif., assignors to Regina Coeli Enterprises, Inc., Oxnard, Calif.
Filed Apr. 18, 1990, Ser. No. 510,899
Term of patent 14 years
U.S. Cl. D3—40

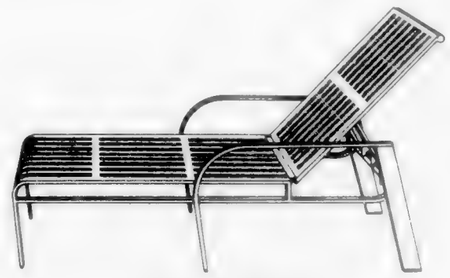


329,541
LUGGAGE CARRIER
Allen L. Giblet, 137 Quail Dr., Cordell, Okla. 73632
Filed Mar. 5, 1990, Ser. No. 487,818
Term of patent 14 years
U.S. Cl. D3—76

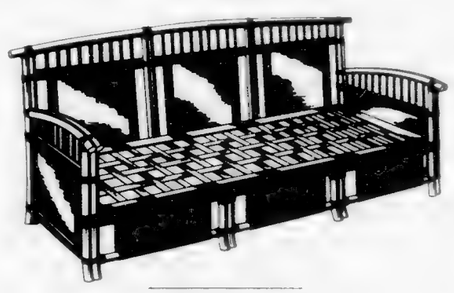
329,542
CARRYING CASE FOR A PORTABLE TELEPHONE
Ali R. Jayez, 14528 Calvert St., Van Nuys, Calif. 91411
Continuation-in-part of Ser. No. 424,967, Oct. 23, 1989, Pat. No. Des. 322,788, and a continuation-in-part of Ser. No. 457,542, Dec. 27, 1989, abandoned, and a continuation-in-part of Ser. No. 527,814, May 24, 1990, Pat. No. Des. 322,719. This application Jul. 20, 1990, Ser. No. 556,201
Term of patent 14 years
U.S. Cl. D3—106

329,543
SEAT
Michael R. Shields, Greensboro, N.C., assignor to Brayton International Collection, High Point, N.C.
Filed Jul. 2, 1991, Ser. No. 724,949
Term of patent 14 years
U.S. Cl. D6—334

329,544
CHAISE LOUNGE
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904
Filed Oct. 5, 1989, Ser. No. 417,684
Term of patent 14 years
U.S. Cl. D6—361

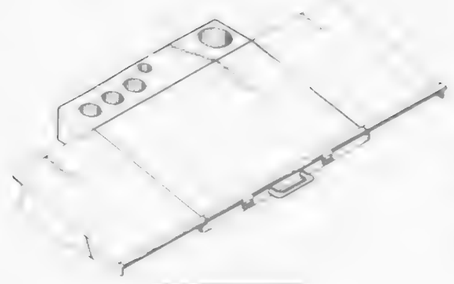


329,545
SOFA FRAME
Miller Y. Fong, Pasadena, Calif., assignor to Ficks Reed Company, Cincinnati, Ohio
Filed Dec. 2, 1991, Ser. No. 801,729
The portion of the term of this patent subsequent to Sep. 1, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—369

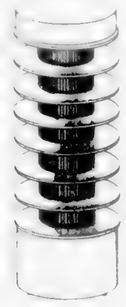


329,546
CHAIR
Warren H. Snodgrass, 223 Woodland, Kentfield, Calif. 94904
Filed Oct. 5, 1989, Ser. No. 417,683
Term of patent 14 years
U.S. Cl. D6—374

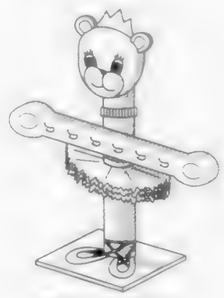
329,547
PORTABLE DESK
Hugh W. Hageman, 912 Audrey Way, Roseville, Calif. 95661
Filed Nov. 20, 1989, Ser. No. 438,231
Term of patent 14 years
U.S. Cl. D6—406



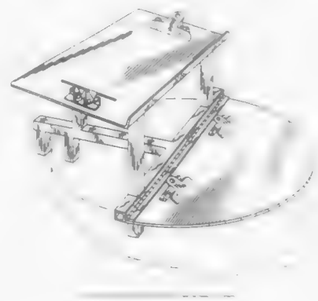
329,548
COMPACT DISC DISPLAY STAND
Stanleigh Weils, Bridgewater, Conn.; Robert W. Ackley, Brewerton, and James R. Dokoupil, Liverpool, both of N.Y., assignors to The Croydon Company, Inc., Liverpool, N.Y.
Filed Oct. 29, 1990, Ser. No. 604,627
Term of patent 14 years
U.S. Cl. D6—407



329,549
CLOTHES RACK
Roberta P. Begley, and John B. Begley, both of 137-D Seminary Dr., Mill Valley, Calif. 94941
Filed Nov. 15, 1988, Ser. No. 271,763
Term of patent 14 years
U.S. Cl. D6—412

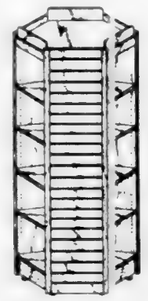


329,550
PORTABLE DESK FOR USE ATOP AN OPEN TRASH RECEPTACLE
Philip D. Moriarity, 3319 NE. 69th, Portland, Oreg. 97213
Filed Dec. 5, 1990, Ser. No. 622,808
Term of patent 14 years
U.S. Cl. D6—420

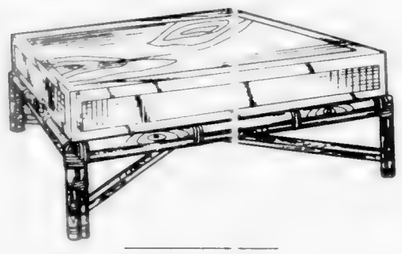


329,551
DESK
John N. Lechman, Effingham, Ill., assignor to Nova Office Furniture, Inc., Effingham, Ill.
Filed Jul. 11, 1990, Ser. No. 551,576
Term of patent 14 years
U.S. Cl. D6—422

329,552
BOOK DISPLAY STAND
Stanleigh Wells, Bridgewater, Conn., and James R. Dokoupil, Liverpoor, N.Y., assignors to The Croydon Company, Inc., Liverpool, N.Y.
Filed Oct. 29, 1990, Ser. No. 604,641
Term of patent 14 years
U.S. Cl. D6—461

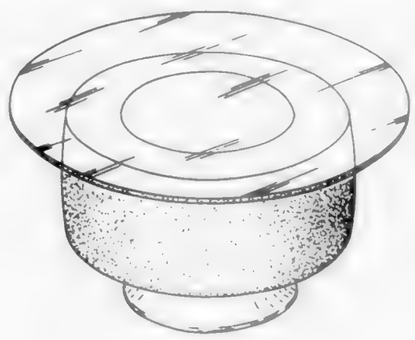


329,553
TABLE
Winsor D. White, Chicago, Ill., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Jul. 5, 1989, Ser. No. 375,768
Term of patent 14 years
U.S. Cl. D6—484

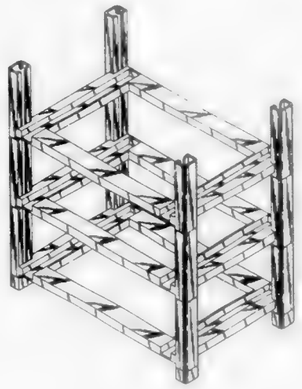


329,554
TABLE
Niels Diffrient, Ridgefield, Conn., assignor to Howe Furniture Corporation, Trumbull, Conn.
Filed May 12, 1988, Ser. No. 193,489
Term of patent 14 years
U.S. Cl. D6—486

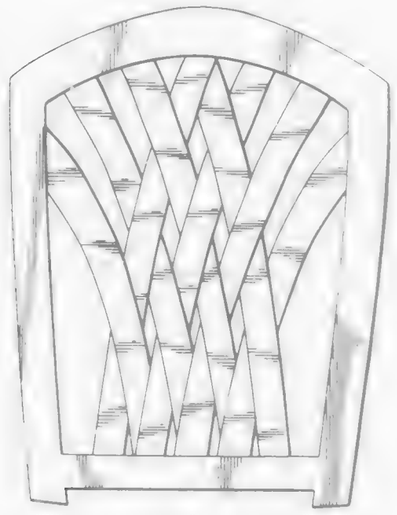
329,555
TABLE
Thomas J. Tenhove, 2120 Hidden Valley Dr., Crown Point, Ind. 46307
Filed Mar. 5, 1990, Ser. No. 493,839
Term of patent 14 years
U.S. Cl. D6—486



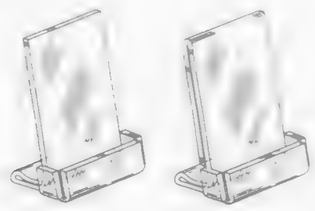
329,556
STAND FOR STACKING SLIDABLE TRAYS
Bernd Brüssing, Ulm/Donau, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed May 23, 1990, Ser. No. 528,111
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1989, M8908288.5
Term of patent 14 years
U.S. Cl. D6—468



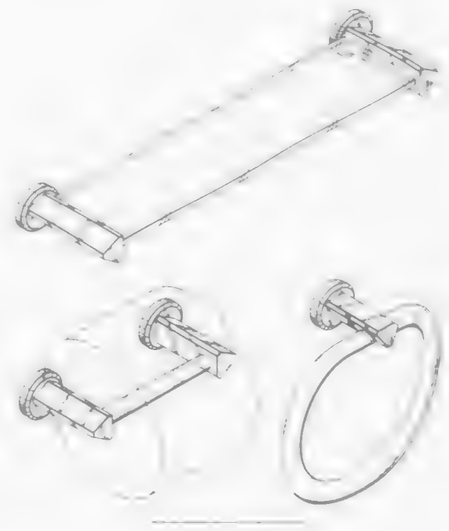
329,557
OPENWORK SEAT BACK
Manfred Hubert, Meylan, France, assignor to Allibert S.A., Grenoble, France
Filed May 18, 1990, Ser. No. 524,824
Claims priority, application World Int. Prop. O., Nov. 20, 1989, DM/015 120
Term of patent 14 years
U.S. Cl. D6—502



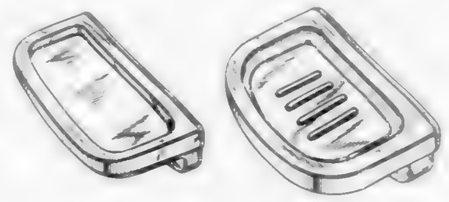
329,558
CARD HOLDER
Ronald T. Keown, Chicago, Ill., assignor to USA Enterprises, Inc., Chicago, Ill.
Filed Oct. 10, 1990, Ser. No. 595,010
Term of patent 14 years
U.S. Cl. D6—515



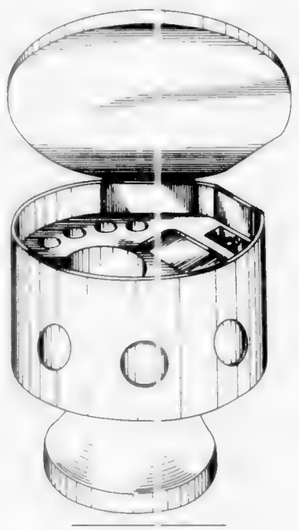
329,559
BATHROOM ACCESSORY FIXTURE
Stanley M. Paul, Long Island City, N.Y., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 31, 1989, Ser. No. 331,924
Term of patent 14 years
U.S. Cl. D6—524



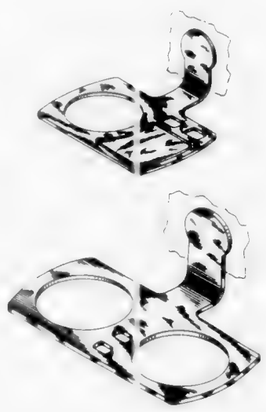
329,560
BATHROOM ACCESSORY
Robin H. Levien, London, England, assignor to American Standard Inc., New York, N.Y.
Filed Mar. 15, 1990, Ser. No. 494,267
Claims priority, application United Kingdom, Sep. 19, 1989, 2001106; Sep. 19, 1989, 2001107
Term of patent 14 years
U.S. Cl. D6—524



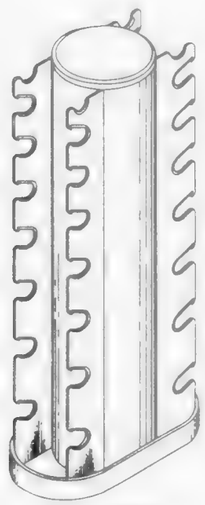
329,561
BATHROOM CADDY/ORGANIZER
Sahr A. Nyorkor, 6550 E. 55th Pl., Indianapolis, Ind. 46226
Filed Dec. 20, 1990 Ser. No. 630,954
Term of patent 14 years
U.S. Cl. D6—525



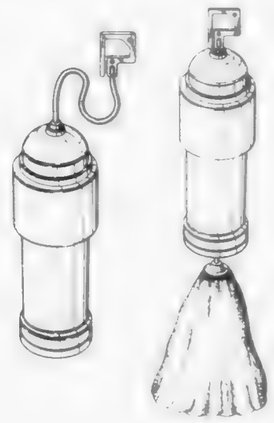
329,562
COMBINATION TOOTHBRUSH AND TUMBLER HOLDER OR THE LIKE
William C. McKeone, and Mary J. Reid, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Continuation of Ser. No. 332,669, Mar. 31, 1989, abandoned. This application Jan. 26, 1990, Ser. No. 476,106
Term of patent 14 years
U.S. Cl. D6—531



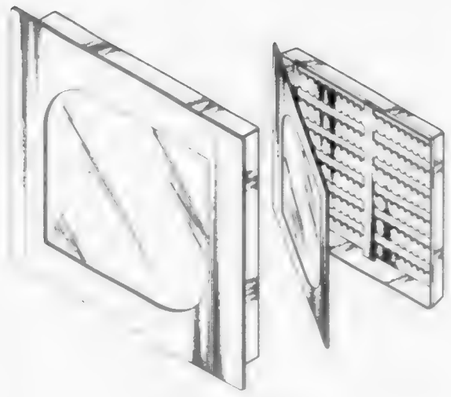
329,563
STORAGE RACK FOR DUMBBELLS
Robert A. Rasmussen, Bellevue, Wash., assignor to Vectra Fitness, Inc., Redmond, Wash.
Filed May 7, 1990, Ser. No. 519,554
Term of patent 14 years
U.S. Cl. D6—552



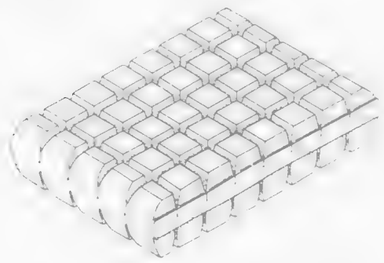
329,564
RETRACTABLE TOWEL OR CLOTH ASSEMBLY
Barrie Levison, 39 Beaumont Avenue, St Albans, Herts AL1 4TW, England
Filed Apr. 9, 1990, Ser. No. 507,720
Term of patent 14 years
U.S. Cl. D6—553



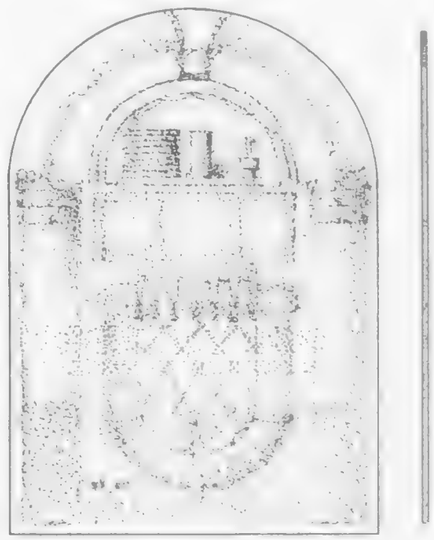
329,565
EARRING CABINET WITH MIRRORED DOOR
Jeanne R. Kane, Carson City, Nev., and Maurus E. Jackson, Los Angeles, Calif.
Continuation-in-part of Ser. No. 546,774, Jun. 29, 1990. This application Dec. 24, 1990, Ser. No. 630,961
Term of patent 14 years
U.S. Cl. D6—559



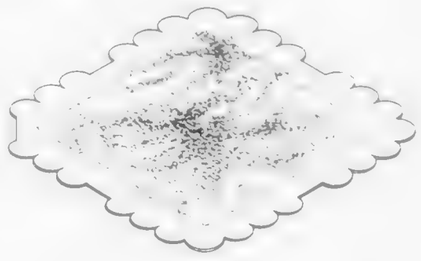
329,566
PILLOW
Paul R. Davidson, Jr., Richmond, Va., assignor to E.R. Carpenter Company, Inc., Richmond, Va.
Filed Jun. 11, 1991, Ser. No. 713,336
Term of patent 14 years
U.S. Cl. D6—601



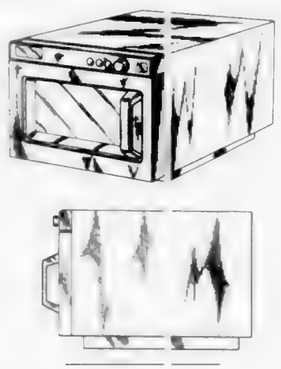
329,567
BEACH BLANKET
Andrew W. Pysz, 16, Carriage Creek Way, Ormond Beach, Fla. 32174
Filed Nov. 20, 1990, Ser. No. 616,016
Term of patent 14 years
U.S. Cl. D6—603



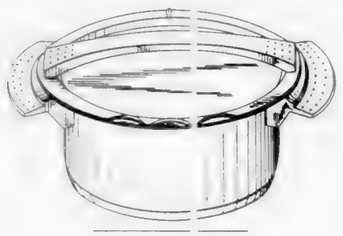
329,568
TOWELETTE FOR REMOVING STAINS
Linda J. Staggs, 3605 Arctic Blvd., #1635, Anchorage, Ak. 99503-5789
Filed Sep. 25, 1990, Ser. No. 591,001
Term of patent 14 years
U.S. Cl. D6—608



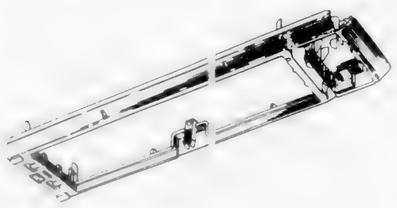
329,56[illegible]
MICROWAVE OVEN
Masuo Ichihara, Kyoto, and Akira Takebata, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 2, 1990, Ser. No. 562,078
Term of patent 14 years
U.S. Cl. D7—351



329,57[illegible]
COVERED COOK NG VESSEL
Thomas Gerlach, Altensteig, Fed. Rep. of Germany, assignor to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany
Filed Aug. 17, 1989, Ser. No. 394,960
Claims priority, application Fed Rep. of Germany, Feb. 17, 1989, 8901234
Term of patent 14 years
U.S. Cl. D7—360

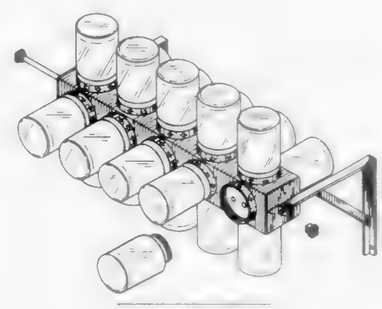


329,571
ELECTRIC TOASTER BASE
Bernard P. Fehon, Mount Riverview, Australia, assignor to Sunbeam Corporation Limited, Campsie, Australia
Filed Dec. 14, 1989, Ser. No. 450,385
Claims priority, application Australia, Sep. 6, 1989, 2885/89
Term of patent 14 years
U.S. Cl. D7—390

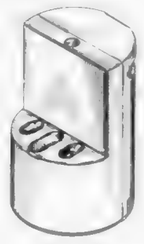


329,572
CONTAINER WITH COVER
Calvin S. Krupa, Plymouth, Minn., assignor to Ultra Pac, Inc., Rogers, Minn.
Filed Jun. 3, 1991, Ser. No. 709,395
Term of patent 14 years
U.S. Cl. D7—542

329,573
CONTAINER STORAGE ASSEMBLY
Serge Picard, 8340 de la Brise, Charny, Quebec, Canada G6X-1E7
Filed May 30, 1990, Ser. No. 529,274
Term of patent 14 years
U.S. Cl. D7—616

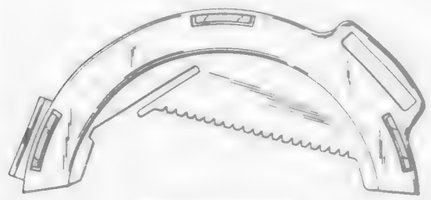


329,574
HOLDER FOR KITCHEN UTENSILS AND THE LIKE
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Continuation-in-part of Ser. No. 528,808, May 31, 1990, Pat. No. Des. 325,150. This application Aug. 10, 1990, Ser. No. 564,712
Term of patent 14 years
U.S. Cl. D7—641



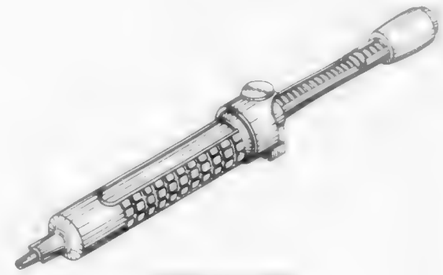
329,575
BORDER EDGING
Ray Eberhart, 417 E. Jefferson Blvd., Mishawaka, Ind. 46544
Continuation of Ser. No. 188,120, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 900,292, Aug. 25, 1986, abandoned. This application May 29, 1991, Ser. No. 706,737
Term of patent 14 years
U.S. Cl. D8—1

329,576
PAINTER'S TOOL
Warren Desjardin, 34 Bonita Rd., East Quogue, N.Y. 11942
Filed Oct. 11, 1990, Ser. No. 595,992
Term of patent 14 years
U.S. Cl. D8—14

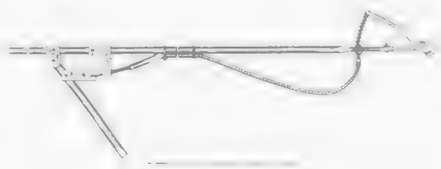


329,577
DEEP WELL SOCKET
Michael D. Massey, 1913 W. Fairview Dr., Dekalb, Ill. 60115
Filed Feb. 21, 1990, Ser. No. 482,727
Term of patent 14 years
U.S. Cl. D8—29

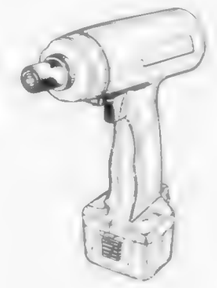
329,578
SOLDER REMOVING IMPLEMENT OR THE LIKE
William S. Fortune, 29866 Cuthbert Rd., Malibu, Calif. 90265
Filed Feb. 26, 1990, Ser. No. 485,078
Term of patent 14 years
U.S. Cl. D8—30



329,579
TOOL FOR REMOVING WIRE AND BOLTS FROM CEILINGS
Phillip M. Guerin, Lawrence, Mass., assignor to Professional Engineering Co., Inc., Lawrence, Mass.
Filed Mar. 26, 1990, Ser. No. 501,621
Term of patent 14 years
U.S. Cl. D8—52

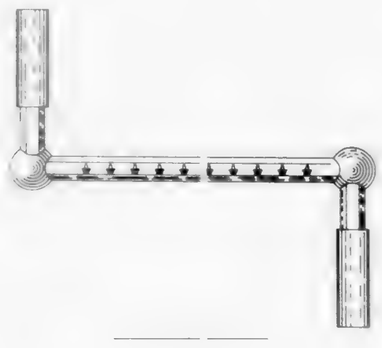


329,580
PORTABLE ELECTRIC DRIVER
Yuichiro Sasaki, and Toshiaki Uchida, both of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed May 24, 1990, Ser. No. 527,795
Claims priority, application Japan, Nov. 24, 1989, 1-42782
Term of patent 14 years
U.S. Cl. D8—68

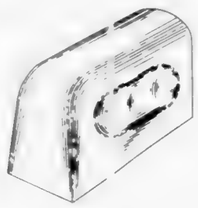


329,581
RATCHET ADAPTER FOR A DRILL CHUCK
Henry A. Vest, 8908 Graves Rd., Petersburg, Va. 23803
Filed Jul. 10, 1989, Ser. No. 377,199
Term of patent 14 years
U.S. Cl. D8—70

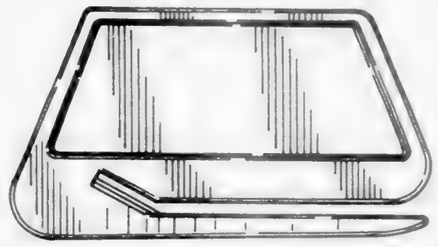
329,582
ANGLE DRIVE FOR CORDLESS SCREWDRIVER
Donald W. Bowling, 223 Richland Ave., Smyrna, Tenn. 37167
Filed Jun. 27, 1990, Ser. No. 544,367
Term of patent 14 years
U.S. Cl. D8—70



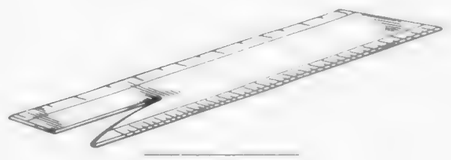
329,583
SANDING BLOCK
George Medina, 226 Turkeyfoot St., Malinta, Ohio 43835
Filed Jan. 19, 1990, Ser. No. 467,232
Term of patent 14 years
U.S. Cl. D8—90



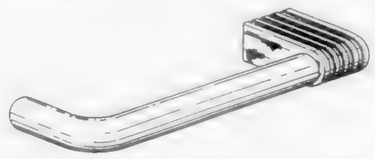
329,584
LETTER OPENER
Cary Shevin, Skokie, and Mary M. Mantelos, Chicago, both of Ill., assignors to DARD Products, Inc., Evanston, Ill.
Filed May 23, 1990, Ser. No. 527,721
Term of patent 14 years
U.S. Cl. D8—102



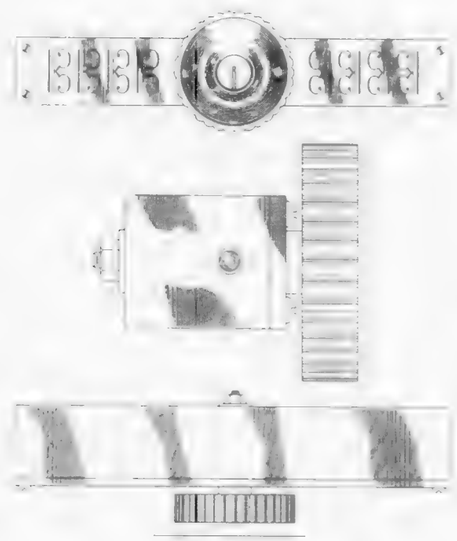
329,585
LETTER OPENER
Henry Sawatsky, 63 Main Street South, Brampton, Ontario, Canada L6W 1M9 , and David P. Sawatsky, 12 Ballycastle Crescent, Brampton, Ontario, Canada L6Z 2V5
Filed Dec. 13, 1990, Ser. No. 627,425
Claims priority, application Canada, Jun. 15, 1990, 15-06-90-11
Term of patent 14 years
U.S. Cl. D8—103



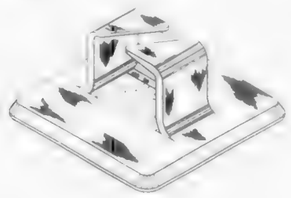
329,586
FURNITURE HANDLE
Mario Primeau, 8710, Marjolaine Street, St-Léonard, Québec, Canada H1R 2H6
Filed Dec. 21, 1990, Ser. No. 631,774
Term of patent 14 years
U.S. Cl. D8—320



329,587
VIDEO CASSETTE RECORDER LOCK
Randall A. Calloway, 3905 Hammock Rd., and James L. Barrett, 3764 E. R. Smyth Dr., both of Mims, Fla. 32754
Filed Mar. 29, 1990, Ser. No. 501,195
Term of patent 14 years
U.S. Cl. D8—341

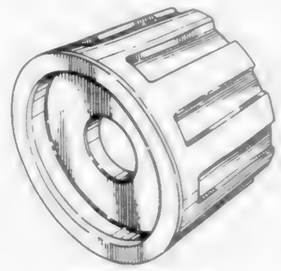


329,588
CORD CLIP
Richard E. Michel, Jr., Dover, Ohio, assignor to Miller Products, Inc., New Philadelphia, Ohio
Filed Jul. 12, 1990, Ser. No. 551,848
Term of patent 14 years
U.S. Cl. D8—395



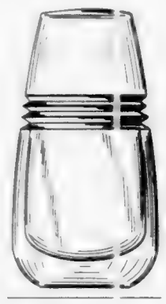
329,589
COMBINED POLE AND BASE STABILIZING CLAMP
Philip Parduhn, 320 SW. 18th, Edmond, Okla. 73013
Filed Jul. 30, 1990, Ser. No. 560,420
Term of patent 14 years
U.S. Cl. D8—396

329,590
DOOR KNOB DOOR STOP
Terence J. Chapman, 1127 S. 63rd St., Tacoma, Wash. 98408-3314
Filed Jul. 12, 1990, Ser. No. 551,733
Term of patent 14 years
U.S. Cl. D8—402



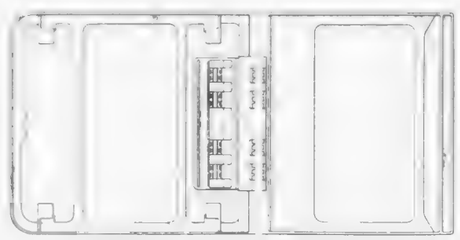
329,591
INK REFILL CARTRIDGE FOR A COMPUTER PRINTER
Jacob A. Levy, Sudbury, Mass., assignor to Graphic Utilities, Incorporated, Fort Fairfield, Me.
Filed May 17, 1990, Ser. No. 529,162
Term of patent 14 years
U.S. Cl. D9—301

329,592
COMBINED BOTTLE AND CAP
John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 24, 1990, Ser. No. 571,903
Term of patent 14 years
U.S. Cl. D9—301



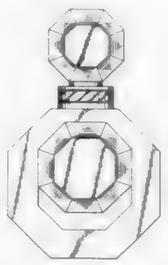
329,593
CAN
Akihiko Otsuka, Nishinomiya, Japan, assignor to Otsuka Foods Co., Ltd., Osaka, Japan
Filed Oct. 16, 1989, Ser. No. 421,688
Claims priority, application Japan, May 10, 1989, 1-16762
Term of patent 14 years
U.S. Cl. D9—332

329,594
COMPACT DISK PACKAGE
Barry Gregerson, Shoreview, and Larry Dessen, Waconia, both of Minn., assignors to Empak, Inc., Chanhassen, Minn.
Filed Aug. 15, 1990, Ser. No. 567,824
Term of patent 14 years
U.S. Cl. D9—341



329,595
COMBINED BOTTLE AND CAP
Eduard R. Küng, Oberwil, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland
Filed Jul. 20, 1989, Ser. No. 382,339
Claims priority, application Hague, Feb. 6, 1989, DM012764
Term of patent 14 years
U.S. Cl. D9—528

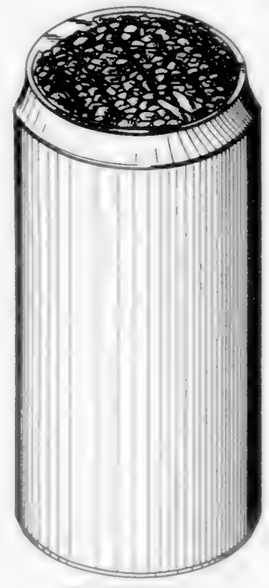
329,596
COMBINED PERFUME BOTTLE AND CLOSURE OR SIMILAR ARTICLE
Pierre Dinand, Levallois-Perret, France, assignor to Donatella Pecci Blunt Srl, Milan, Italy
Filed Nov. 3, 1989, Ser. No. 431,144
Term of patent 14 years
U.S. Cl. D9—544



329,597
COMBINED CAN AND CLOSURE
Thomas A. Gallagher, Chagrin Falls, Ohio; Leon Patarini, Palos Hills, and Paul Knowlton, Tinley Park, both of Ill., assignors to Van Dorn Company, Cleveland, Ohio
Filed Apr. 17, 1989, Ser. No. 341,051
Term of patent 14 years
U.S. Cl. D9—532

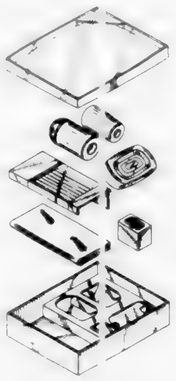
329,598
COMBINED BOTTLE AND CAP
Curtis F. Altmann, Los Angeles, and David A. Villani, Newbury Park, both of Calif., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 10, 1990, Ser. No. 508,016
Term of patent 14 years
U.S. Cl. D9—572

329,599
MERCHANDIZING DISPLAY BIN FOR BEVERAGE CANS
Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Division of Ser. No. 511,520, Apr. 20, 1990. This application Aug. 7, 1991, Ser. No. 741,177
Term of patent 14 years
U.S. Cl. D9—414

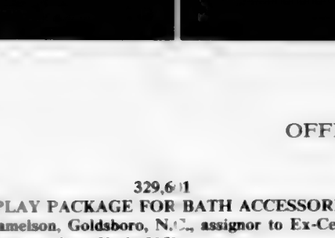


329,600
CLAM SHELL PACKAGE
Aldran H. LaJoie, Mission Viejo, Calif., assignor to Cosmar Corporation, Huntington Beach, Calif.
Filed May 15, 1990, Ser. No. 523,651
Term of patent 14 years
U.S. Cl. D9—418

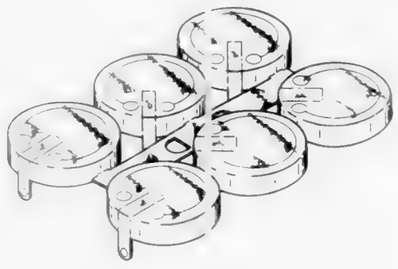
329,601
DISPLAY PACKAGE FOR BATH ACCESSORIES
Samuel Samelson, Goldsboro, N.C., assignor to Ex-Cell Home Fashions, Inc., New York, N.Y.
Filed Nov. 8, 1990, Ser. No. 611,007
Term of patent 14 years
U.S. Cl. D9—418



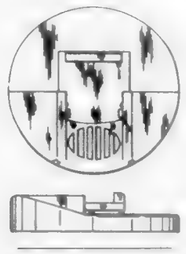
329,602
BOTTLE CLOSURE
Benjamin A. Cochrane, 181 Sonoma Ave., Danville, Calif. 94526
Filed Jun. 19, 1989, Ser. No. 368,428
Term of patent 14 years
U.S. Cl. D9—435



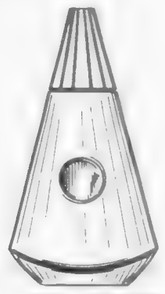
329,603
COVER FOR BEVERAGE CANS
Patrick J. Barrett, 3128 N. Alexander, Royal Oak, Mich. 48073
Filed Nov. 30, 1990 Ser. No. 620,292
Term of patent 14 years
U.S. Cl. D9—435



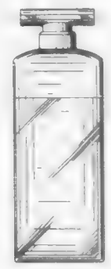
329,604
RE-CLOSABLE CONTAINER CAP
Ronald R. Kuczer, Chesterfield, Mo., assignor to Maverick Ventures, Inc., Chesterfield, Mo.
Filed Nov. 1, 1990, Ser. No. 607,500
Term of patent 14 years
U.S. Cl. D9—449



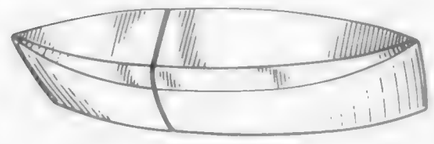
329,605
COMBINED BOTTLE AND CAP
John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 24, 1990, Ser. No. 571,905
Term of patent 14 years
U.S. Cl. D9—529



329,606
COMBINED SPRAY BOTTLE AND CLOSURE
Pierre Dinand, Paris, France; Robert Luzzi, and Dena Seigel, both of New York, N.Y., assignors to Estee Lauder, Inc., New York, N.Y.
Filed Apr. 19, 1991, Ser. No. 687,522
Term of patent 14 years
U.S. Cl. D9—529

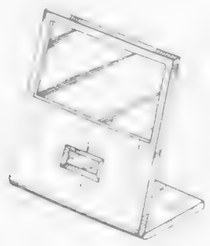


329,607
COMBINED SPRAY BOTTLE AND CLOSURE
Pierre Dinand, Paris, France; Robert Luzzi, and Dena Seigel, both of New York, N.Y., assignors to Estee Lauder, Inc., New York, N.Y.
Filed Apr. 19, 1991, Ser. No. 698,298
Term of patent 14 years
U.S. Cl. D9—529



329,608
BOTTLE
Frank W. Bech, Kokkedal Industripark 11, 1980 Kokkedal, Denmark
Filed Jul. 11, 1990, Ser. No. 550,891
Claims priority, application Denmark, Jan. 12, 1990, 0037/1990
Term of patent 14 years
U.S. Cl. D9—551

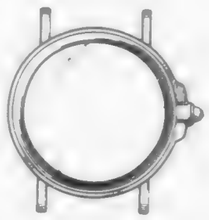
329,609
COMBINED CLOCK AND PICTURE FRAME
Stephen H. Wolff, 222 E. 35th St., New York, N.Y. 10016
Filed Sep. 25, 1989, Ser. No. 412,267
Term of patent 14 years
U.S. Cl. D10—2



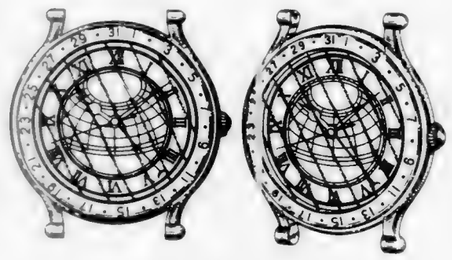
329,610
CLOCK
Louis A. Lara, 7355 NW. 54th Ct., Ft. Lauderdale, Fla. 33319
Filed Feb. 28, 1990, Ser. No. 486,268
Term of patent 14 years
U.S. Cl. D10—21

329,611
WATCH
Eddy Burgener, Moutier, Switzerland, assignor to Roventa Henex SA, Bienne, Switzerland
Filed Oct. 10, 1989, Ser. No. 420,132
Claims priority, application World Int. Prop. O., Apr. 12, 1989, DMA/000981
Term of patent 14 years
U.S. Cl. D10—30

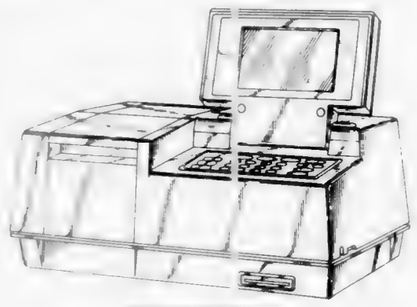
329,612
WATCH OR SIMILAR ARTICLE
Jörg Hysek, 35, route de Morges, CH-1162 Saint-Prex, Switzerland
Filed Oct. 18, 1989, Ser. No. 423,154
Claims priority, application World Int. Prop. O., Apr. 18, 1989, DM/013 383
Term of patent 14 years
U.S. Cl. D10—39



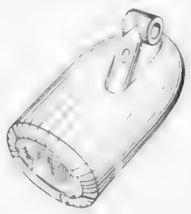
329,613
WRISTWATCH
Masanobu Yano, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Feb. 20, 1990, Ser. No. 482,355
Claims priority, application Japan, Aug. 21, 1989, 1-30512
Term of patent 14 years
U.S. Cl. D10—39



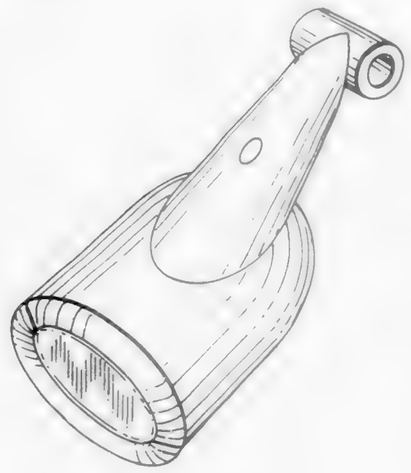
329,614
SPECTROPHOTOMETER
Osamu Ando, Kyoto, and Susumu Ogiwara, Chiba, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan
Filed Aug. 24, 1990, Ser. No. 571,893
Claims priority, application Japan, Apr. 30, 1990, 2-15007
Term of patent 14 years
U.S. Cl. D10—46



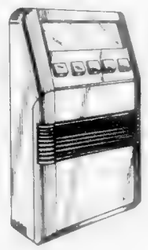
329,615
TRANSDUCER FOR ATTACHMENT TO A BOAT OR SIMILAR ARTICLE
Roy E. Stiner, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.
Filed Nov. 16, 1990, Ser. No. 614,439
Term of patent 14 years
U.S. Cl. D10—46



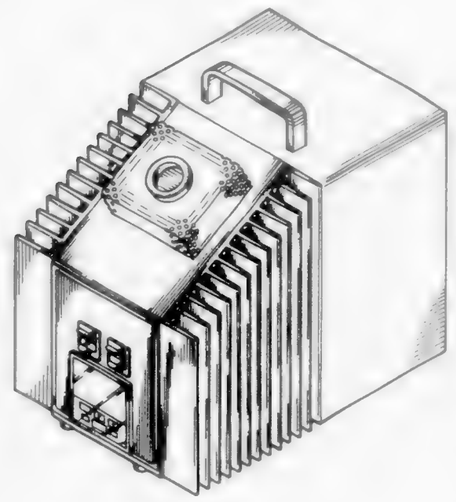
329,616
TRANSDUCER FOR ATTACHMENT TO A BOAT OR SIMILAR ARTICLE
Roy E. Stiner, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.
Filed Nov. 16, 1990, Ser. No. 615,822
Term of patent 14 years
U.S. Cl. D10—46



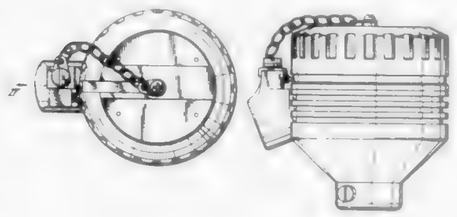
329,617
COMBINED THERMOSTAT AND TIMER
Bernhard H. Tinz, Reutlingen, Fed. Rep. of Germany, assignor to Graesslin KG, Fed. Rep. of Germany
Filed Jun. 19, 1989, Ser. No. 368,427
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, 8803941
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—51



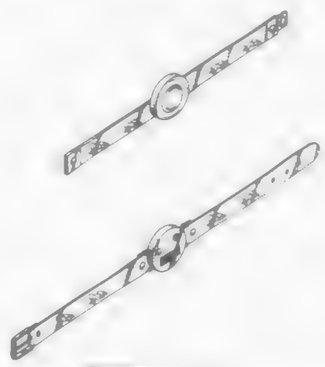
329,618
COMBINED THERMOCOUPLE AND RTD CALIBRATOR
Milton B. Hollander, Stamford, and Thomas E. Pyzik, Naugatuck, both of Conn., assignors to Omega Engineering, Inc., Stamford, Conn.
Filed Oct. 19, 1990, Ser. No. 601,324
Term of patent 14 years
U.S. Cl. D10—52



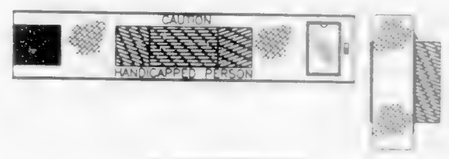
329,619
TERMINAL HOUSING FOR INDUSTRIAL THERMOMETER
Richard G. Cartwright, Hertfordshire, Great Britain, assignor to Rosemount Limited, West Sussex, United Kingdom
Filed Dec. 6, 1990, Ser. No. 624,745
Claims priority, application United Kingdom, Jun. 8, 1990, 2007428
Term of patent 14 years
U.S. Cl. D10—52



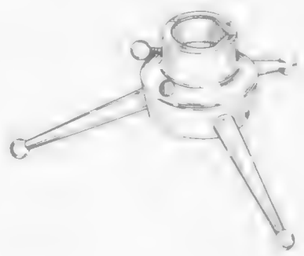
329,620
COMBINED TRANSMITTER AND RECEIVER FOR LOCATING CHILDREN
Gabriel Salazar, 5004 Hartwood Ct., Bartonville, Ill. 61607
Filed Jun. 4, 1990, Ser. No. 532,509
Term of patent 14 years
U.S. Cl. D10—106



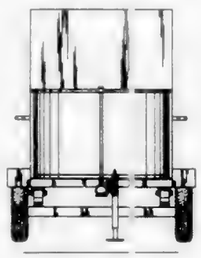
329,621
SIGNALLING WRIST BAND FOR HANDICAPPED INDIVIDUALS
Mary K. Green-Melkonian, 2118 Canoas Garden, #167, San Jose, Calif. 95125
Filed Jun. 15, 1990, Ser. No. 538,516
Term of patent 14 years
U.S. Cl. D10—106



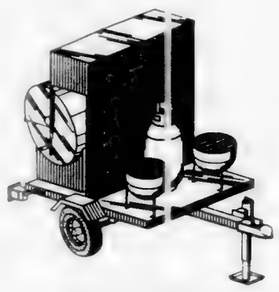
329,622
CHRISTMAS TREE HOLDER
David W. Smith, Calgary, Canada, assignor to Ladds Products, LTD, Calgary, Canada
Filed Feb. 2, 1990, Ser. No. 473,688
Claims priority, application Canada, Oct. 31, 1989, 3110891
Term of patent 14 years
U.S. Cl. D11—130.1



329,623
TRAILER MOUNTED BARBE CUE AND BEVERAGE DISPENSER UNIT
John N. Dodgen, Ft. Dodge, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa
Filed Jan. 9, 1990, Se . No. 462,422
Term of patent 14 years
U.S. Cl. D12—102



329,624
TRAILER MOUNTED BARBECUE UNIT
John N. Dodgen, Ft. Dodge, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa
Filed Jan. 9, 1990, Se . No. 462,424
Term of patent 14 years
U.S. Cl. D12—102

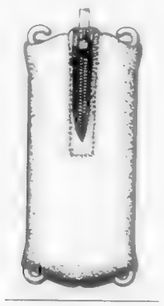


329,625
BICYCLE
Marc Muller, Waterford, and Robert Jennik, Milwaukee, both of Wis., assignors to Schwinn Bicycle Company, Chicago, Ill.
Filed Sep. 27, 1990, Ser. No. 589,482
Term of patent 14 years
U.S. Cl. D12—111

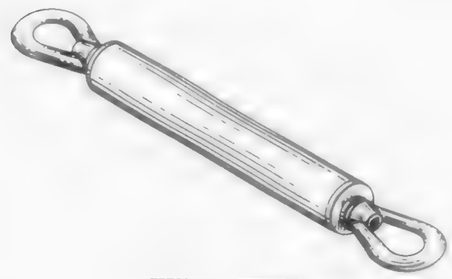
329,626
PNEUMATIC TIRE TREAD AND BUTTRESS
René Goergen, Colmar-Berg, and Pierre Kummer, Bereldange, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 16, 1990, Ser. No. 552,734
Term of patent 14 years
U.S. Cl. D12—146

329,627
PNEUMATIC TIRE TREAD AND BUTTRESS
John S. Attinello, Hartville; William E. Glover, Akron; Samuel P. Landers, Uniontown, and Paul B. Maxwell, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 20, 1990, Ser. No. 616,298
Term of patent 14 years
U.S. Cl. D12—151

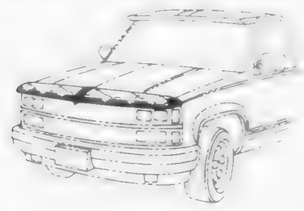
329,628
POTABLE BEVERAGE HOLDER
Kevin D. Runkel, Midkiff, Tex., assignor to Bikestream, Inc., Midland, Tex.
Filed Sep. 11, 1989, Ser. No. 405,854
Term of patent 14 years
U.S. Cl. D12—158



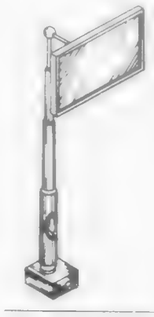
329,629
MOORING LINE SHOCK ABSORBER
Frank E. Ciccone, P.O. Box 180, Lakeshore Dr., Center Harbor, N.H. 03226
Filed Apr. 10, 1990, Ser. No. 507,262
Term of patent 14 years
U.S. Cl. D12—168



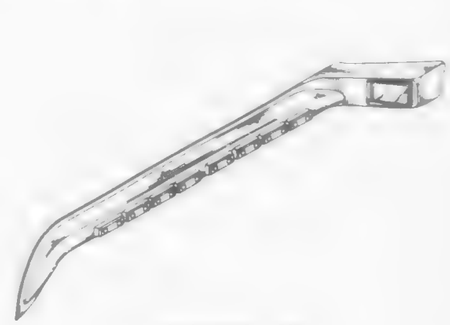
329,630
COMBINED VEHICLE HOOD SHIELD AND WINDSHIELD DEFLECTOR
James R. Lund, Champlin, and Alan B. Eke, Blaine, both of Minn., assignors to Lund Industries, Incorporated, Minneapolis, Minn.
Continuation-in-part of Ser. No. 531,112, May 31, 1990. This application Oct. 5, 1990, Ser. No. 591,661
Term of patent 14 years
U.S. Cl. D12—181



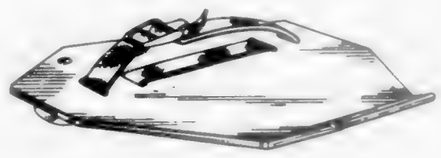
329,631
TRAILER HITCH MIRROR
Kevan C. Cameron, 1078 Sleepy Hollow Dr., Bailey, Colo. 80421
Filed Mar. 7, 1990, Ser. No. 489,657
Term of patent 14 years
U.S. Cl. D12—187



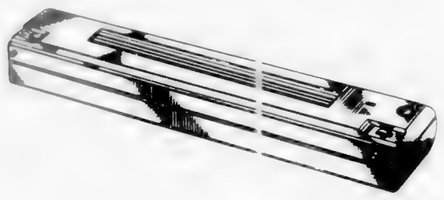
329,632
VEHICLE TRIM PANEL
Robert R. Masters, 1516 Beltway 8 East, Pasadena, Tex. 77503
Filed Nov. 16, 1990, Ser. No. 616,113
Term of patent 14 years
U.S. Cl. D12—190



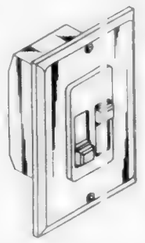
329,633
HANDBOARD FOR BODY SURFING
Michael L. Rodgers, Jr., 18532-B Mayall St., Northridge, Calif. 91324
Filed Jan. 4, 1988, Ser. No. 140,325
Term of patent 14 years
U.S. Cl. D21—237



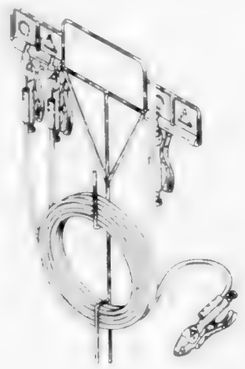
329,634
BATTERY CASE FOR A NOTEBOOK COMPUTER
Kanji Mizusugi; Kensho Tsuji, and Fumikazu Shimanuki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 18, 1990, Ser. No. 584,183
Claims priority, application Japan, Mar. 20, 1990, 2-9338
Term of patent 14 years
U.S. Cl. D13—103



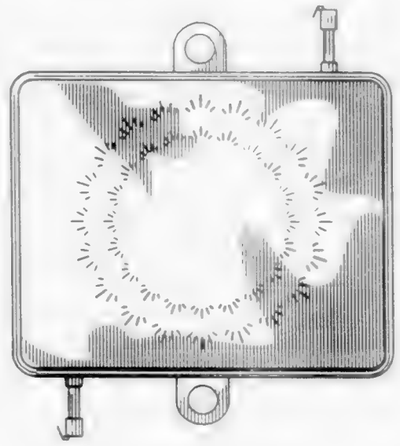
329,635
DOUBLE-POLE, WALL MOUNTED VOLTAGE REGULATOR
Powell Tsai, No. 2, Alley 23, Lane 345, Ta Ya Rd., Tai Chung City, Taiwan
Filed Sep. 11, 1990, Ser. No. 581,642
Term of patent 14 years
U.S. Cl. D13—110



329,636
COMBINED SET OF FOUR LOCKING JUMPER CABLES AND SUPPORTING HOLDER
Marvin Nesiba, P.O. Box 141, Farewell, Nebr. 68838
Filed Mar. 7, 1990, Ser. No. 489,610
Term of patent 14 years
U.S. Cl. D13—120

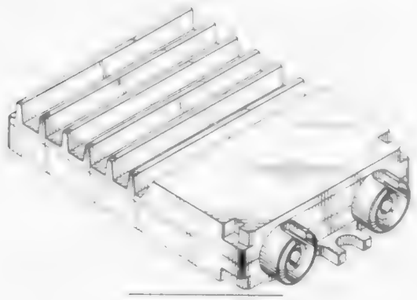


329,637
RETRACTABLE TELEPHONE EXTENSION CORD
Kevin E. Sutton, 44303 S. Fork Dr., Three Rivers, Calif. 93271
Filed Mar. 29, 1990, Ser. No. 501,196
Term of patent 14 years
U.S. Cl. D13—140

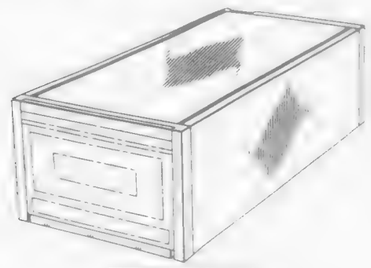


329,638
BUS BAR SUPPORT PANEL FOR AN ELECTRICAL LOAD CENTER
Jeffrey O. Sharp, Lexington; Michael R. Harris, Winchester, and Robert J. Cooper, Lexington, all of Ky., assignors to Square D Company, Del.
Filed Jul. 19, 1989, Ser. No. 382,810
Term of patent 14 years
U.S. Cl. D13—154

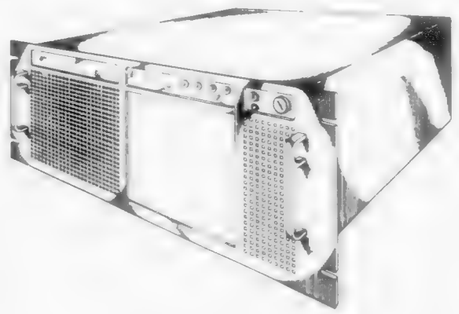
329,639
OPTOELECTRONIC ASSEMBLY
Nicolaos C. Arvanitakis, Vestal, N.Y.; Vincent J. Black, Austin, Tex., and Richard G. Nolan, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 26, 1990, Ser. No. 499,832
Term of patent 14 years
U.S. Cl. D13—165



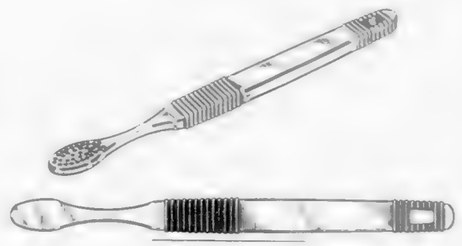
329,640
ENCLOSURE FOR ELECTRONIC EQUIPMENT
Robert T. Harvey, Wichita, Kans., and David C. White, Cincinnati, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Oct. 20, 1989, Ser. No. 424,837
Term of patent 14 years
U.S. Cl. D14—100



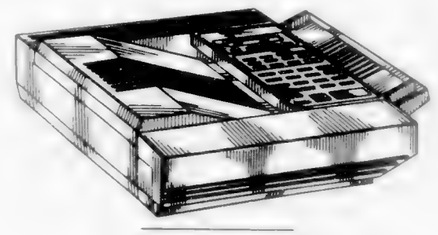
329,641
ENCLOSURE FOR MAINFRAME PERSONAL COMPUTER
Clifford L. R. Goff, 1 Rhynas Dr., Mt. Vernon, N.Y. 10552
Filed May 9, 1990, Ser. No. 520,869
Term of patent 14 years
U.S. Cl. D14—100



329,642
TOOTHBRUSH HEAD AND HANDLE UNIT
Anthony Booth, Chester; Anthony Piano, Sparta; Byron Woodrum, Flemington; Michael J. Allsop, West Windsor, all of N.J.; Robert L. Berger, New Hope, Pa., and Richard M. Hyman, Sr., Iowa City, Iowa, assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 24, 1990, Ser. No. 514,494
Term of patent 14 years
U.S. Cl. D4—104

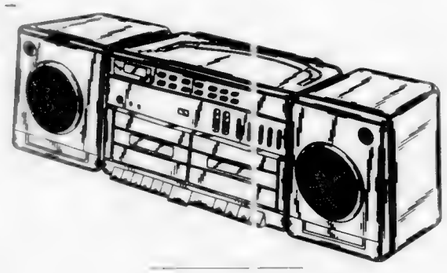


329,643
FACSIMILE TRANSCEIVER
Shin-ichi Hiroki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 7, 1990, Ser. No. 578,411
Claims priority, application Japan, Mar. 19, 1990, 2-8945
Term of patent 14 years
U.S. Cl. D14—118

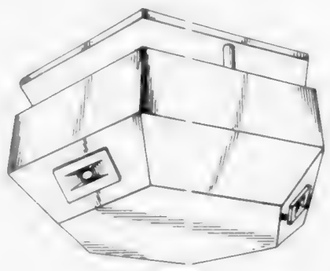


329,644
FACSIMILE MACHINE
Fuk F. Cheung, Hong Kong, Hong Kong, assignor to Wang Lee Corporation, Tortola, British Virgin Isls.
Filed Oct. 17, 1990, Ser. No. 600,213
Claims priority, application United Kingdom, Apr. 18, 1990, 9008745
Term of patent 14 years
U.S. Cl. D14—118

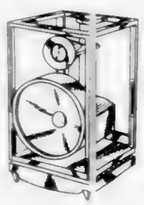
329,645
PORTABLE CASSETTE TAPE RECORDER
Soon H. Baik, Kyounggi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jun. 21, 1990, Ser. No. 541,406
Claims priority, application Rep. of Korea, Nov. 8, 1989, 1989-15038
Term of patent 14 years
U.S. Cl. D14—165



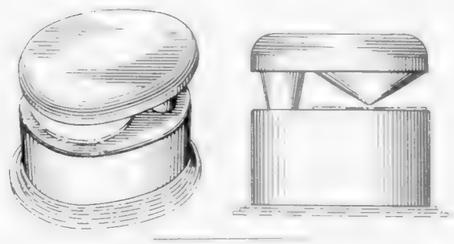
329,646
SPEAKER
Philip D. Stone, 17159 Park Ave., Lansing, Ill. 60438
Filed Oct. 1, 1990, Ser. No. 591,003
Term of patent 14 years
U.S. Cl. D14—209



329,647
SPEAKER
Nikolaus Frank, Stockholm, Sweden, assignor to Yamaha Corporation, Japan
Filed Aug. 28, 1990, Ser. No. 574,226
Claims priority, application Japan, Feb. 28, 1990, 2-6490
Term of patent 14 years
U.S. Cl. D14—215

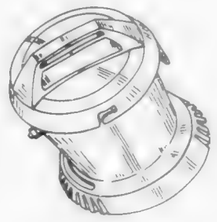


329,648
MID-RANGE LOUDSPEAKER
Barry S. Goldfarb, 519 N. Clara Ave., DeLand, Fla. 32720, and John F. Goad, 2933 E. Floral Way, Apopka, Fla. 32703
Filed Jul. 6, 1989, Ser. No. 375,853
Term of patent 14 years
U.S. Cl. D14—216



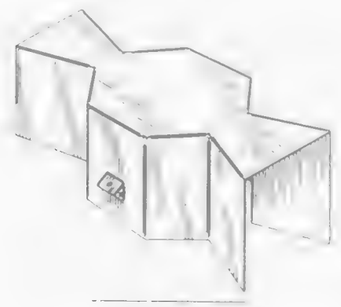
329,649
HOUSING EXTENSION FOR A SELECTIVE CALL RECEIVER
Douglas K. Stamps, Jr., Boynton Beach, and Leo V. Krolak, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Fla.
Filed Aug. 27, 1990, Ser. No. 573,594
Term of patent 14 years
U.S. Cl. D14—217

329,650
PUMP
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed May 17, 1990, Ser. No. 524,819
Term of patent 14 years
U.S. Cl. D15—7



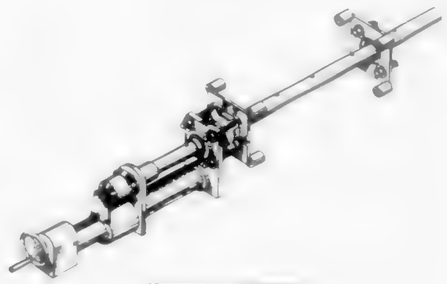
329,651
AUTOMOTIVE FUEL PUMP HOUSING
Hisashi Kuwada, and Hajime Takaie, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1990, Ser. No. 485,080
Claims priority, application Japan, Sep. 25, 1989, 1-34844
Term of patent 14 years
U.S. Cl. D15—9.1

329,652
CROP SPRAYER SHROUD
Arthur Killian, 5233 NW. 111th Dr. R. 2, Grimes, Iowa 50111
Filed Dec. 17, 1990, Ser. No. 628,676
Term of patent 14 years
U.S. Cl. D15—13

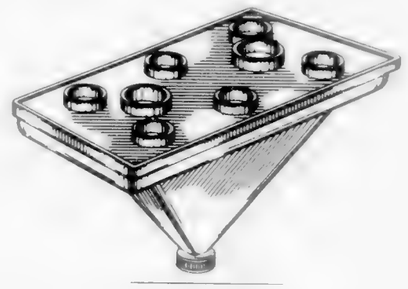


329,653
COVERING FOR REFRIGERATORS OR THE LIKE
Marion W. Coats, 550 Acacia Ave., Shafter, Calif. 93263
Filed Dec. 11, 1990, Ser. No. 625,596
Term of patent 14 years
U.S. Cl. D15—89

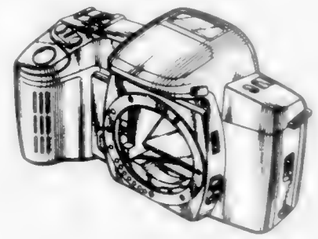
329,654
PORTABLE LINE-BORING MACHINE
Robert J. Smith, 430 Coventry Rd., Hoyt Lakes, Minn. 55750
Filed Feb. 28, 1990, Ser. No. 486,196
Term of patent 14 years
U.S. Cl. D15—132



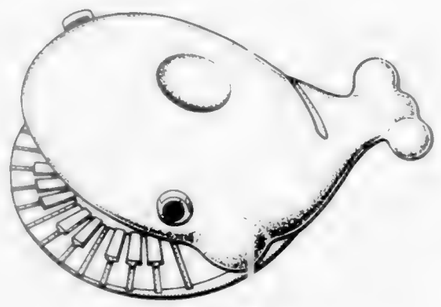
329,655
MULTI INPUT PORT OIL COLLECTION FUNNEL
Donald G. Bonnell, 4649 W. Sierra, Glendale, Ariz. 85304
Filed Aug. 13, 1990, Ser. No. 566,714
Term of patent 14 years
U.S. Cl. D15—150



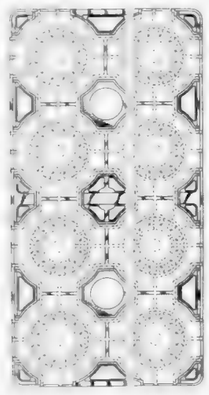
329,656
SINGLE-LENS REFLEX CAMERA BODY
Takenao Shishikura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan
Filed Aug. 20, 1990, Ser. No. 569,663
Claims priority, application Japan, Feb. 27, 1990, 2-6218; Feb. 27, 1990, 2-6219
Term of patent 14 years
U.S. Cl. D16—217



329,657
CASTANET
Keiji Nakamura, Kanagawa, Japan, assignor to Kabushiki Kaisha Zen-on Gakufu Shuppansha, Tokyo, Japan
Filed Jun. 25, 1990, Ser. No. 543,078
Claims priority, application Japan, Mar. 20, 1990, 2-9506
Term of patent 14 years
U.S. Cl. D17—22



329,658
PAPER MARGIN STRIPPER
H. Charles Hassel, Los Angeles, Calif., assignor to MicroComputer Accessories, Inc., Los Angeles, Calif.
Filed May 2, 1991, Ser. No. 694,862
Term of patent 14 years
U.S. Cl. D18—34

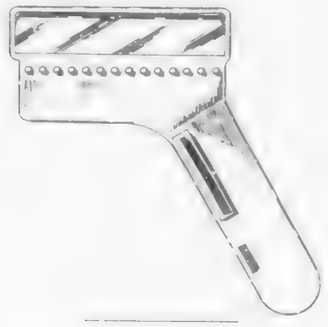


329,659
TONER CONTAINER FOR PHOTO-COPIER
Atsushi Mizukami, Yokohama; Masatoshi Ikkatai, Kawasaki, and Yutaka Ban, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 11, 1990, Ser. No. 551,271
Claims priority, application Japan, Jan. 25, 1990, 2-2156
Term of patent 14 years
U.S. Cl. D18—43

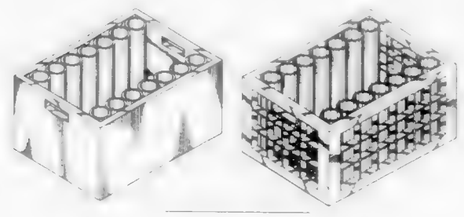
329,660
WRITING INSTRUMENT
Shizuo Yamanaka, 16-13-301, Shimo-Renjaku 4-chome, Mitaka-shi, Tokyo, Japan
Filed Aug. 7, 1989, Ser. No. 390,266
Claims priority, application Japan, Feb. 2, 1989, 1-7387
Term of patent 14 years
U.S. Cl. D19—48

329,661
CORRECTION FLUID DISPENSER
Shigeru Kimura, Tokyo, Japan, assignor to Tombow Pencil Co., Ltd., Tokyo, Japan
Filed Jul. 23, 1990, Ser. No. 556,916
Term of patent 14 years
U.S. Cl. D19—53

329,662
READING PACER
Gary W. Spong, 114 Bowman Dr., Vallejo, Calif. 94591
Filed Mar. 2, 1989, Ser. No. 317,798
Term of patent 14 years
U.S. Cl. D19—60



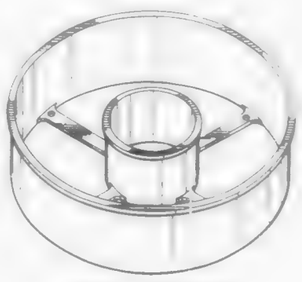
329,663
MULTI-PURPOSE ORGANIZER
Carl J. Galante, 1837 Dixie Beach Blvd., Sanibel, Fla. 33957
Continuation-in-part of Ser. No. 208,025, Jul. 17, 1988, which is a continuation-in-part of Ser. No. 257,304, Oct. 13, 1988, Pat. No. D. 321,371. This application Aug. 23, 1989, Ser. No. 397,302
Term of patent 14 years
U.S. Cl. D19—78



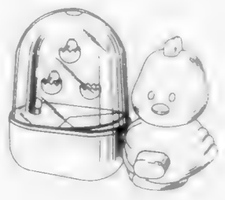
329,664
VIDEO MANNEQUIN
Maarten Wagener, 1021 Cliff Dr. #12, Santa Barbara, Calif. 93109
Filed Jun. 18, 1990, Ser. No. 541,934
Term of patent 14 years
U.S. Cl. D20—31

329,665
COMBINED STAND AND TARGET FOR SHOOTING
James P. Carroll, 2333 S. Marion St., Denver, Colo. 80210
Filed May 11, 1990, Ser. No. 522,237
Term of patent 14 years
U.S. Cl. D21—5

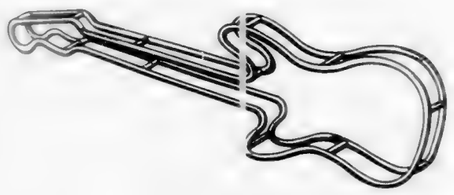
329,666
GAME TARGET
Barry Dougherty, 2241 Burloak Drive, RR #2, Burlington, Ontario, Canada L7R 3X5
Filed Jul. 12, 1990, Ser. No. 552,263
Term of patent 14 years
U.S. Cl. D21—5



329,667
WATER GAME
Chieko Nakazawa, Tokyo, Japan, assignor to Tomy Company Ltd., Tokyo, Japan
Filed Oct. 19, 1989, Ser. No. 423,858
Claims priority, application Japan, Apr. 28, 1989, 1-16246
Term of patent 14 years
U.S. Cl. D21—12



329,668
NOVELTY GUITAR
Steven J. Connelly, 3140 Chowen Ave., South #208, Minneapolis, Minn. 55416
Filed Sep. 26, 1990, Ser. No. 588,463
Term of patent 14 years
U.S. Cl. D21—59

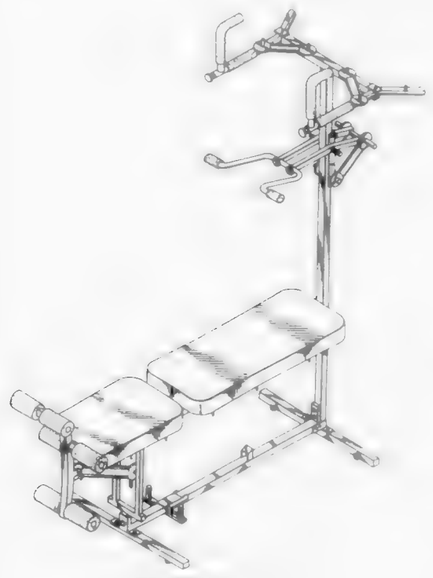


329,669
HEAD FOR A TOY BUILDING SET
Erik H. Rasmussen, Kokkedal, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,939
The portion of the term of this patent subsequent to Sep. 1, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—108

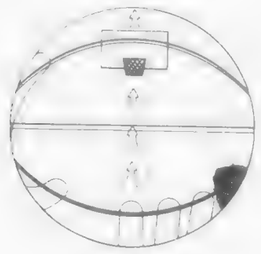
329,670
PUPPET FIGURE
Kenneth V. Kuszynski, and Donald Lydian, both of 526 E. Adair St., Louisville, Ky. 40209
Filed Dec. 20, 1989, Ser. No. 453,502
Term of patent 14 years
U.S. Cl. D21—152

329,671
AUDIBLE TOY GHOST FIGURE
John Y. Yang, Red Bank, N.J., assignor to C&F Trading Corp., Marlboro, N.J.
Filed Apr. 27, 1990, Ser. No. 515,251
Term of patent 14 years
U.S. Cl. D21—168

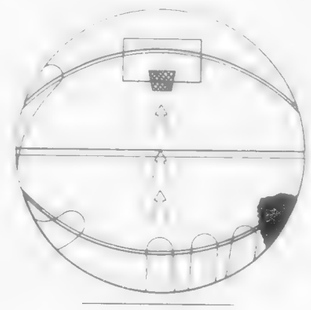
329,672
EXERCISER
Wen-Shyong Shieh, No. 581-1, Sec. 4, Chang-Shui Rd., Pi-Tou Hsiang, Changhwa Hsien, Taiwan
Filed Jan. 14, 1991, Ser. No. 641,077
Term of patent 14 years
U.S. Cl. D21—195



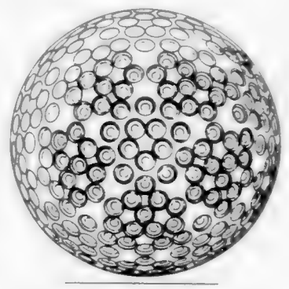
329,673
TRAINING AID BASKETBALL OR THE LIKE
Roy G. Williams, 6048 Pimlico Ct., Tallahassee, Fla. 32308
Filed Oct. 5, 1989, Ser. No. 417,667
The portion of the term of this patent subsequent to Sep. 15, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—204



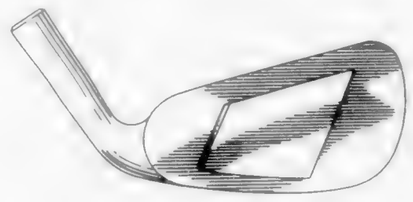
329,674
TRAINING AID BASKETBALL FOR RIGHT HAND
Roy G. Williams, 6048 Pimlico Ct., Tallahassee, Fla. 32308
Filed Dec. 26, 1989, Ser. No. 456,289
The portion of the term of this patent subsequent to Sep. 15, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—204



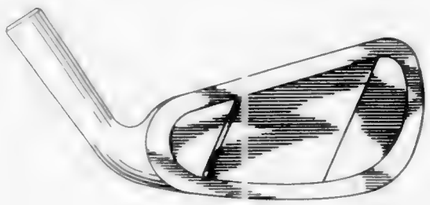
329,675
GOLF BALL
Brian F. Machin, Horbury, and David Matthewman, Crigglestone, both of England, assignors to Dunlop Limited a British Company, United Kingdom
Filed Jul. 22, 1988, Ser. No. 223,176
Claims priority, application United Kingdom, Feb. 19, 1988, 1048643
The portion of the term of this patent subsequent to Jul. 28, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—205



329,676
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Nov. 8, 1989, Ser. No. 433,172
Term of patent 14 years
U.S. Cl. D21—220



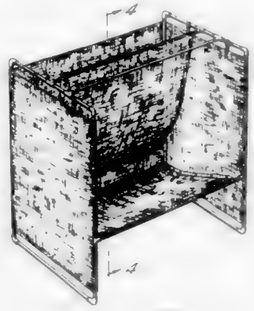
329,677
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Nov. 8, 1989, Ser. No. 433,176
Term of patent 14 years
U.S. Cl. D21—220



329,678
GOLF TRAINING AID
John E. Mehrholz, 114 S. Racine Ave., Chicago, Ill. 60607
Filed Apr. 9, 1990, Ser. No. 506,376
Term of patent 14 years
U.S. Cl. D21—234

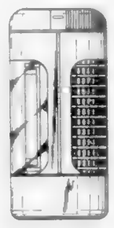
329,679
INSECT REPELLENT COIL
Marissa A. Klapwald, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jul. 19, 1990, Ser. No. 555,545
Term of patent 14 years
U.S. Cl. D22—122

329,680
FIREARM TARGET BACKSTOP
David J. Burn, 12831 Western Ave., Ste. A, Garden Grove, Calif. 92641
Filed Aug. 14, 1989, Ser. No. 393,474
Term of patent 14 years
U.S. Cl. D22—113



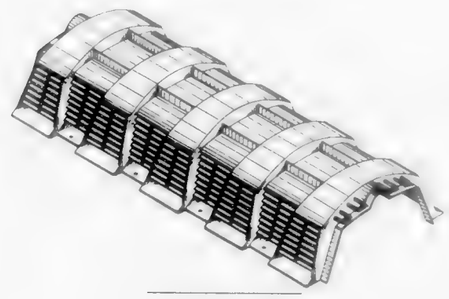
329,681
INSECT LIQUID BAIT STATION
Scott W. Demarest, Caledonia, and Russell H. Petersen, Mt. Pleasant, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 10, 1990, Ser. No. 595,938
Term of patent 14 years
U.S. Cl. D22—122

329,682
COMBINED BLINKER LANTERN AND INSECT KILLER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Mar. 5, 1990, Ser. No. 487,799
Claims priority, application United Kingdom, Oct. 3, 1989, 2001429
Term of patent 14 years
U.S. Cl. D22—123

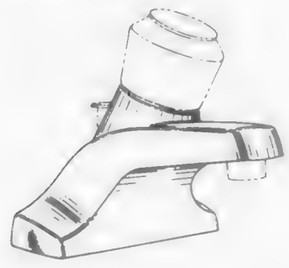


329,683
SUPPORT FOR A FISHING ROD
George R. Sant, Endeavour Hills, Australia, assignor to Sant Marine Pty., Ltd., Carrum Downs, Australia
Filed Jan. 22, 1990, Ser. No. 467,394
Claims priority, application Australia, Jul. 27, 1989, 2403/89
Term of patent 14 years
U.S. Cl. D22—147

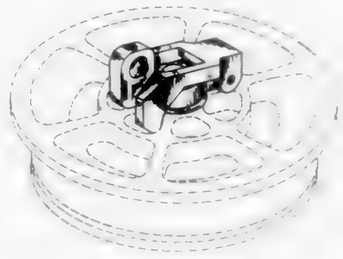
329,684
LEACHING CHAMBER
Terrance H. Gray, 28 Webber Ave., Bath, Me. 04530
Filed Jun. 23, 1989, Ser. No. 370,577
Term of patent 14 years
U.S. Cl. D23—207



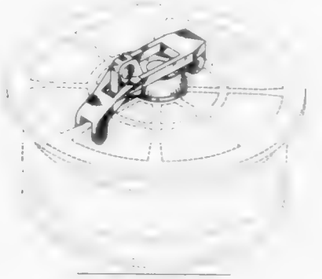
329,685
FAUCET BODY
Michael A. Brattoli, Elyria, and Kevin W. Rosenbaum, Parma, both of Ohio, assignors to Moen Incorporated, Elyria, Ohio
Filed Aug. 17, 1990, Ser. No. 568,696
Term of patent 14 years
U.S. Cl. D23—238



329,686
PIPE PLUG LATCH UNIT
Allen D. Mathison, Richfield, and Bryan R. Benson, North Branch, both of Minn., assignors to Cherne Industries Incorporated, Minneapolis, Minn.
Filed Jun. 14, 1990, Ser. No. 538,176
Term of patent 14 years
U.S. Cl. D23—249

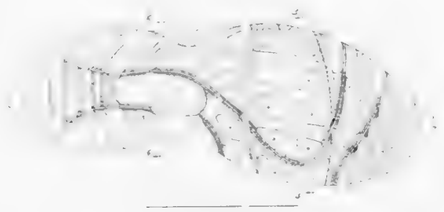


329,687
PIPE PLUG LOCK UNIT
Bryan R. Benson, North Branch, and Allen D. Mathison, Richfield, both of Minn., assignors to Cherne Industries Incorporated, Minneapolis, Minn.
Filed Jun. 14, 1990, Ser. No. 538,177
Term of patent 14 years
U.S. Cl. D23—249

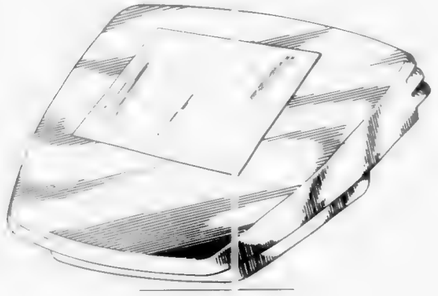


329,688
SPOUT FOR PLUMBING FIXTURE
Holly K. Yost, Santa Monica, Calif., assignor to Emhart Inc., Newark, Del.
Filed Jan. 14, 1988, Ser. No. 144,394
The portion of the term of this patent subsequent to Feb. 25, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—255

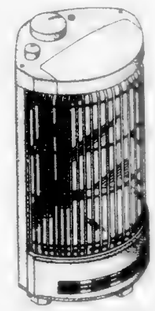
329,689
SHOE OUTSOLE
Tinker L. Hatfield, and William J. Worthington, both of Portland, Oreg., assignors to Nike, Inc. and Nike International, Ltd., both of Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,542
Term of patent 14 years
U.S. Cl. D2—320



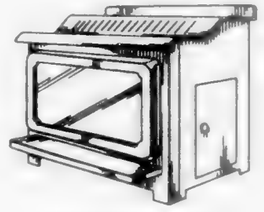
329,691
VEHICLE VENTILATOR
Martin J. Herrick, 19 Stillwell Road, Mount Albert, Auckland, and Errol J. O'Dea, 84 Hukanui Road, Hamilton, both of New Zealand
Filed Nov. 22, 1991, Ser. No. 796,135
Claims priority, application New Zealand, Jun. 4, 1991, 23895
Term of patent 14 years
U.S. Cl. D23—324



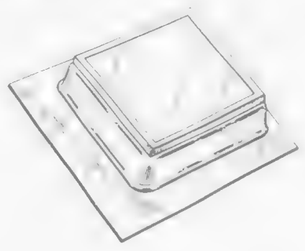
329,692
RADIANT HEATER
David B. Chaney, Powell, and Barry W. Smith, Dublin, both of Ohio, assignors to The W. B. Marvin Manufacturing Company, Urbana, Ohio
Filed Dec. 19, 1991, Ser. No. 812,969
Term of patent 14 years
U.S. Cl. D23—340



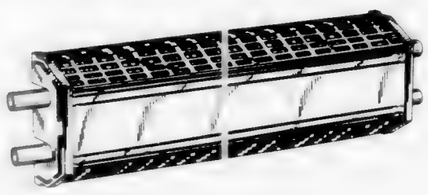
329,693
FIREPLACE INSERT
Bob T. Mills, Victoria, Canada, assignor to Osburn Manufacturing Inc., Victoria, Canada
Filed May 18, 1989, Ser. No. 354,421
Claims priority, application Canada, Dec. 23, 1988, 23-12-88-1
Term of patent 14 years
U.S. Cl. D23—344



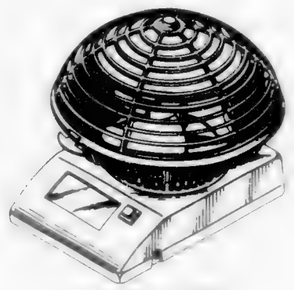
329,694
SOLAR ROOF FAN HOUSING OR SIMILAR ARTICLE
Joseph W. Wimberly, Villa Park, Ill., assignor to Taurus Safety Products, Inc., Lombard, Ill.
Division of Ser. No. 562,619, Aug. 3, 1991, Pat. No. 5,078,047.
This application Oct. 8, 1991, Ser. No. 773,093
Term of patent 14 years
U.S. Cl. D23—373



329,695
RADIATOR
Leif Söderberg, Norrköping, Sweden, assignor to Uwe-verken AB, Norrköping, Sweden
Filed Nov. 26, 1990, Ser. No. 617,871
Claims priority, application Sweden, May 25, 1990, 90-1181
Term of patent 14 years
U.S. Cl. D23—330

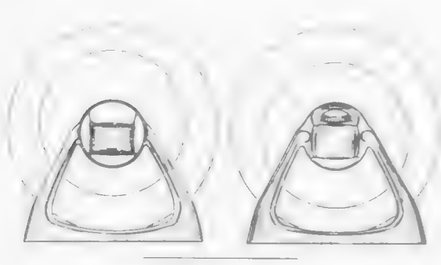


329,695
ELECTRIC FAN
Kun-Yuan Lin, Taichung, Taiwan, assignor to Deng-Huei Huang, Taipei, Taiwan
Filed Sep. 24, 1991, Ser. No. 764,472
Term of patent 14 years
U.S. Cl. D23—382

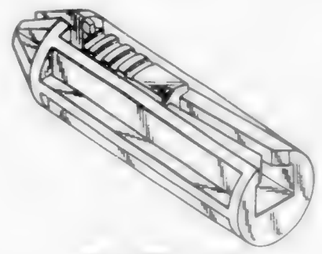


329,696
FAN BASE
Glen W.. Ediger, Newton; Michael C. Coup, Wichita; Donald J. Moore, Wichita; Gary P. Israel, Wichita, and Neill E. Bryan, Wichita, all of Kans., assignors to Vornado Air Circulation Systems, Inc., Wichita, Kans.
Filed Sep. 24, 1991, Ser. No. 765,697
Term of patent 14 years
U.S. Cl. D23—411

329,697
BELTED DIAPER
Anne M. Fahrenkrug, Oshkosh, and Patrick R. Lord, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 2, 1990, Ser. No. 504,786
Term of patent 14 years
U.S. Cl. D24—126

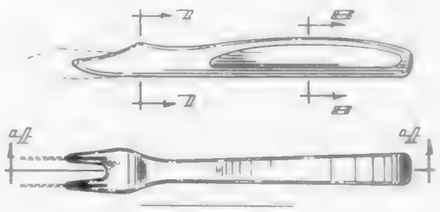


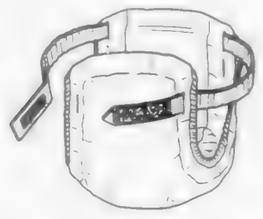
329,698
CLAMP FOR GRIPPING A GUIDE WIRE OR HOLLOW TUBE FOR A CATHETER
Carol Loney, St. Louis Park, and David B. Robinson, Chanhassen, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.
Division of Ser. No. 704,668, May 20, 1991, which is a continuation of Ser. No. 442,246, Nov. 28, 1989. This application Dec. 13, 1991, Ser. No. 806,412
Term of patent 14 years
U.S. Cl. D24—143

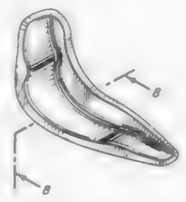


329,699
SCALPEL HANDLE
Michael J. Schutte, and Jerry J. King, both of 2831 Fort Missoula Rd., Missoula, Mont. 59801
Filed Apr. 3, 1990, Ser. No. 503,691
Term of patent 14 years
U.S. Cl. D24—147

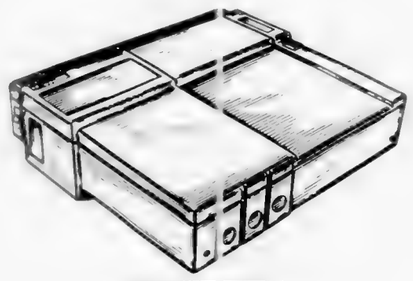
329,700
BACK JAW SURGICAL IMPLANT
Edward O. Terino, 28222 Agoura Rd., Agoura Hills, Calif. 90301
Filed Apr. 20, 1990, Ser. No. 511,604
Term of patent 14 years
U.S. Cl. D24—155



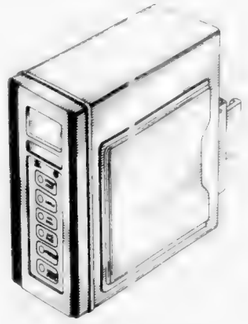




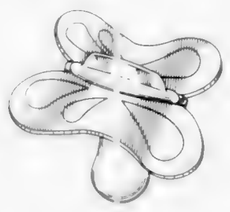
329,701
CARDIOTOCOGRAPH FOR FETAL MONITORING
Dietrich Rogler, Horb, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 20, 1990, Ser. No. 496,506
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, M8906645.6
Term of patent 14 years
U.S. Cl. D24—167



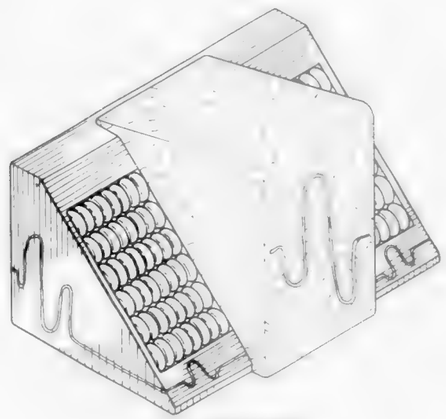
329,702
DIRECT PRESSURE MONITOR
Stephens N. Sato, Del Mar, and Wallace L. Knute, Leucadia, both of Calif., assignors to Camino Laboratories, Inc., San Diego, Calif.
Filed Feb. 8, 1990, Ser. No. 477,214
Term of patent 14 years
U.S. Cl. D24—169



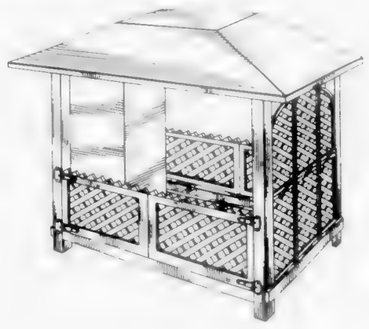
329,703
BABY PACIFIER
Vivian E. Wilson, 7127 Youngstown, Hudsonville, Mich. 49426-9386
Filed Mar. 19, 1990, Ser. No. 495,204
Term of patent 14 years
U.S. Cl. D24—194



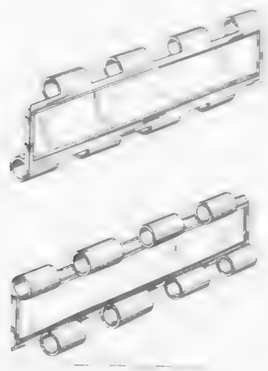
329,704
FOOT STOOL MASSAGER
Richard Blankenburg, 131 Parrish Dr., Kensington, Conn. 06037-2102
Filed Mar. 6, 1990, Ser. No. 488,854
Term of patent 14 years
U.S. Cl. D24—213



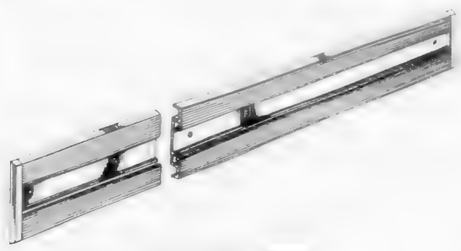
329,705
SHED
Gordon J. Forsyth, P.O. Box 11187, Arlington, Va. 22210
Filed Mar. 28, 1990, Ser. No. 500,822
Term of patent 14 years
U.S. Cl. D25—16



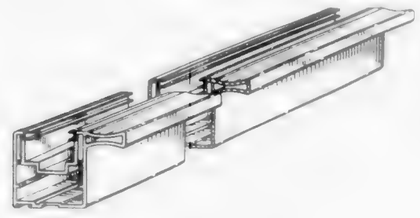
329,706
LINK FOR A ROLL-DOWN SHUTTER
Herman R. Hermens, Sterrenbosweg 85, 5953 GN Reuver, and Leonardus M. L. J. Schoeren, Dijckersingel 16, 5953 CK Reuver, both of Netherlands
Filed May 12, 1989, Ser. No. 351,555
Term of patent 14 years
U.S. Cl. D25—53



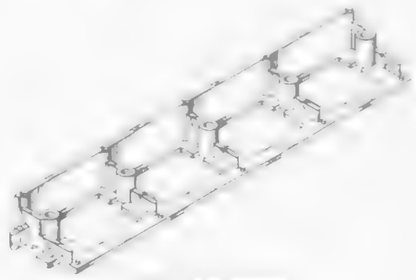
329,707
SLOTTED WALL STRIP
Donald Embree, Copley, and David L. Hamann, Cincinnati, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 27, 1988, Ser. No. 224,782
Term of patent 14 years
U.S. Cl. D25—119



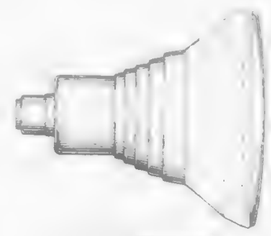
329,708
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,033
Term of patent 14 years
U.S. Cl. D25—125



329,709
EDGE RESTRAINT FOR PAVING BLOCKS
Frederick P. Strobl, Jr., 204 N. Shore Dr., Cary, Ill. 60013
Filed Apr. 24, 1990, Ser. No. 514,345
Term of patent 14 years
U.S. Cl. D25—164

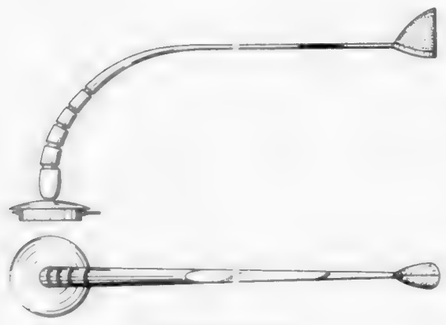


329,710
FLUORESCENT LIGHTING UNIT OR SIMILAR ARTICLE
Peter Muller, 135 Charles St., Los Gatos, Calif. 95030, and Peter E. Lowe, 2655 Broderick St., San Francisco, Calif. 94123
Filed Oct. 22, 1990, Ser. No. 601,171
Term of patent 14 years
U.S. Cl. D26—26



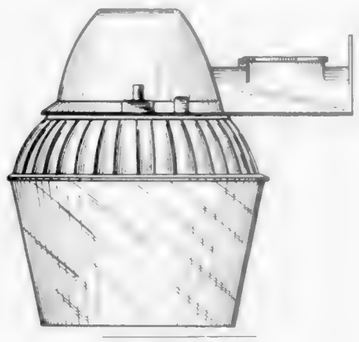
329,711
COMBINED TABLE LAMP AND CLOCK
Timothy J. Adams, and Margaret T. Adams, both of 64 Laurie Dr., Novato, Calif. 94947
Filed May 25, 1990, Ser. No. 528,448
Term of patent 14 years
U.S. Cl. D26—54

329,712
ADJUSTABLE LAMP
Denis Santachiara, Campagnola Emilia, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Nov. 9, 1990, Ser. No. 611,856
Claims priority, application Italy, May 10, 1990, 53007/90[U]
Term of patent 14 years
U.S. Cl. D26—62

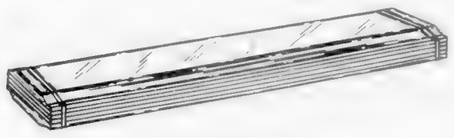


329,713
ADJUSTABLE LAMP
Carl X. Meyer, Grantwood Village; Louis O. Vitto, St. Louis; David P. Burchell, Valley Park, and James A. Schmid, St. Louis, all of Mo., assignors to Lazor Manufacturing Corp., St. Louis, Mo.
Filed Oct. 12, 1990, Ser. No. 596,905
Term of patent 14 years
U.S. Cl. D26—65

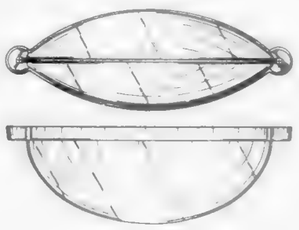
329,714
EXTERIOR LIGHTING FIXTURE
James D. McIngvale, Jr., Hernando, Miss., and Robert Scofield, Cordova, Tenn., assignors to F. L. Industries, Inc., Livingston, N.J.
Filed Nov. 5, 1990, Ser. No. 610,981
Term of patent 14 years
U.S. Cl. D26—71



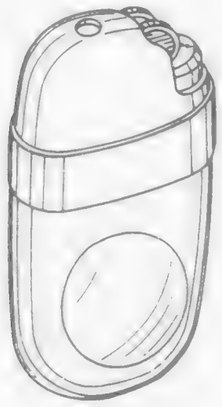
329,715
LUMINAIRE
Menno Dieperink, Amsterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 13, 1990, Ser. No. 509,544
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—76



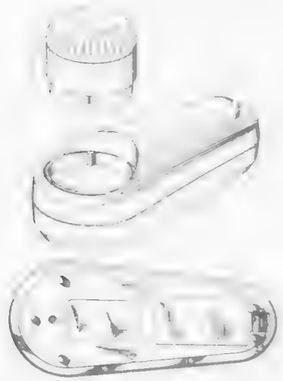
329,716
WALL MOUNTED LIGHTING FIXTURE OF THE LIKE
Ernesto Gismondi, Milano, Italy, assignor to Artemide S.p.A., Milano, Italy
Filed Nov. 9, 1990, Ser. No. 611,854
Claims priority, application Italy, May 10, 1990, 53007/90[U]
Term of patent 14 years
U.S. Cl. D26—85



329,717
LIGHTER OR THE LIKE
Kaname Ichikawa, Tokyo, Japan, assignor to Modern Royal Co., Ltd., Tokyo, Japan
Filed Apr. 30, 1990, Ser. No. 516,219
Claims priority, application Japan, Mar. 23, 1990, 2-9598
Term of patent 14 years
U.S. Cl. D27—156



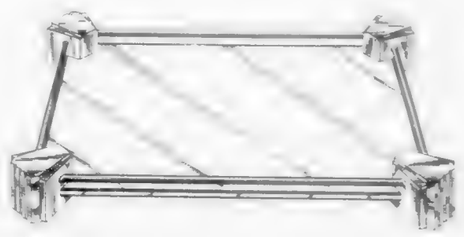
329,718
NAIL POLISH REMOVER
Joseph M. Sulik, Beacon Falls, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.
Filed Jun. 22, 1990, Ser. No. 542,012
Term of patent 14 years
U.S. Cl. D28—58



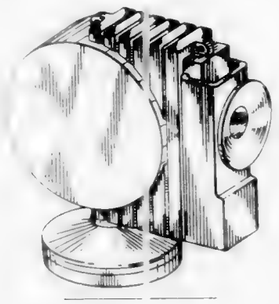
329,719
HAND MIRROR
Victor Carranza, Mexico, Mexico, assignor to Godinger Silver Artsco., Ltd., New York, N.Y.
Division of Ser. No. 227,743, Aug. 3, 1988, abandoned. This application Jul. 15, 1991, Ser. No. 729,810
The portion of the term of this patent subsequent to Dec. 31, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—64.6

329,720
BACKSCRATCHER
Donald P. Feliks, 429 Summer Sea - Mgr., Tavernier, Fla. 33070
Filed Apr. 20, 1988, Ser. No. 184,038
Term of patent 14 years
U.S. Cl. D28—99

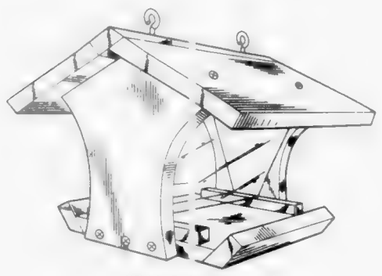
329,721
MIRRORED VANITY TRAY
Judith Kruger, Highland Park, Ill., assignor to Paris Presents Incorporated, Gurnee, Ill.
Filed Aug. 3, 1990, Ser. No. 562,643
Term of patent 14 years
U.S. Cl. D28—99



329,722
HUMMINGBIRD FOOD HOUSING
Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Mar. 23, 1990, Ser. No. 497,634
Term of patent 14 years
U.S. Cl. D30—124

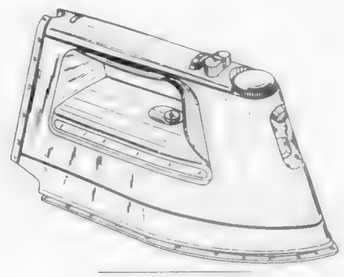


329,723
BIRD FEEDER
James R. Carpenter, Indianapolis, Ind., assignor to Wild Birds Unlimited, Inc., Indianapolis, Ind.
Filed Oct. 19, 1990, Ser. No. 600,089
Term of patent 14 years
U.S. Cl. D30—126

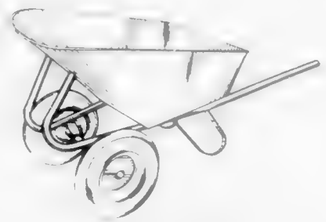


329,724
PET WATER BOTTLE
Tammy J. Singh, and Silver Torres, both of 1191 Lombard Dr. Apt. "A", Anaheim, Calif. 92801
Filed Feb. 8, 1990, Ser. No. 476,642
Term of patent 14 years
U.S. Cl. D30—132

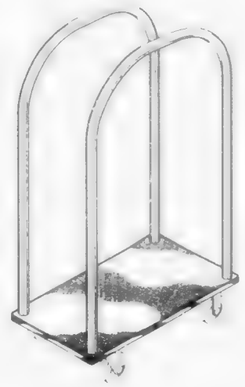
329,725
ELECTRIC IRON
Jan Klok, Hoogezand, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 9, 1991, Ser. No. 756,378
Claims priority, application World Int. Prop. O., Mar. 25, 1991, DM/019.212
Term of patent 14 years
U.S. Cl. D32—70



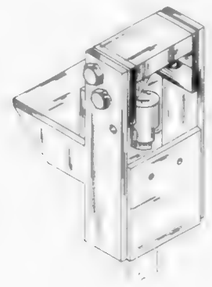
329,726
DUAL WHEELED WHEELBARROW
Brad L. Loveless, P.O. Box 998, Hughson, Calif. 95326
Filed Jan. 11, 1991, Ser. No. 640,003
Term of patent 14 years
U.S. Cl. D34—16



329,727
LUGGAGE CART
Chuck DeWitt, 1 S. Eudora, Denver, Colo. 80222
Filed Apr. 17, 1990, Ser. No. 511,506
Term of patent 14 years
U.S. Cl. D34—23



329,728
PIER LIFTING FOR ELEVATING BUILDING FOOTINGS
Francis P. Ladek, St. Louis, Mo., assignor to Central States Waterproofing of Missouri, Inc., St. Louis, Mo.
Filed Feb. 28, 1990, Ser. No. 486,718
Term of patent 14 years
U.S. Cl. D34—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF SEPTEMBER, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Ishizuka, Masahiro and Hayashi, Kazuyuki, 5,148,908, Cl 198-774.300.

A. Ahlstrom Corporation: *See*—
Mattelmaki, Esko, 5,149,448, Cl. 210-784.000
Sellakumar, Karukkampalayam M., 5,148,669, Cl. 60-39.092

A. B. Chance Company: *See*—
Kamp, Eugene L., 5,149,928, Cl. 200-147.00R.

A.M. Logistics Corporation: *See*—
Maguina-Larco, Alfredo, 5,148,616, Cl. 37-141.00T.

A. O. Smith Corporation: *See*—
Ruehl, Phillip C.; and Coursin, Benjamin E., 5,149,132 Cl 280-800.000.

A. Schonbek & Co., Inc.: *See*—
Schonbek, Arnold, 5,150,285, Cl. 362-405.000.

A.W.A.X. Progettazione E Ricerca S.R.L.: *See*—
Cappi, Angelo; and Rimondi, Renato, 5,149,316, Cl. 493-194.000.

Aalderink, Friedrich, to Eno Electronic GmbH. Arrangement for generation of fancy twists arranged and/or formed at random on a yarn. 5,148,663, Cl. 57-91.000

ABB Stromberg Drives Oy: *See*—
Suomela, Martti, 5,149,997, Cl. 310-63.000

ABB Vetco Gray Inc.: *See*—
Fernandez, Randolfo; and Mosley, Andrew S., 5,148,870, Cl 166-344.000

Abbey Etna Machine Company: *See*—
Abbey, Nelson D., III; and Lewandowski, Timothy J., 5,148,960, Cl. 228-17.500

Abbey, Nelson D., III; and Lewandowski, Timothy J., to Abbey Etna Machine Company. Rotary seam guide. 5,148,960, Cl. 228-17.500

Abbott Biotech, Inc.: *See*—
Gillies, Stephen D., 5,149,635, Cl. 435-69.100.

Abbott Laboratories: *See*—
Brown, William E.; Clemens, John M.; Devereaux, Sharon M.; Hofler, John G.; Knigge, Kevin M.; and Safford, Sarah E., 5,149,622, Cl. 435-5.000.
Chu, Alexander H. T., 5,149,784, Cl. 530-344.000.
English, Kenneth P.; Micek, Stanley E., III; O'Connell, Michael B., and Tripp, Edward S., 5,149,505, Cl. 422-99.000
Katz, Leonard; Tuan, James; and McAlpine, James B., 5,149,639, Cl. 435-76.000.
Summers, James B.; Davidsen, Steven K.; Steinman, Douglas H.; Phillips, James G.; Martin, Michael B.; and Guinn, Denise E., 5,149,704, Cl. 514-342.000
Zaha, Juergen H., 5,149,328, Cl. 604-177.000.

Abe, Nobuaki; and Kurosawa, Yuichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Head cleaning device for disk-type data storage unit 5,150,268, Cl. 360-128.000.

Abler, Norman C., to Oscar Mayer Foods Corporation. Method and apparatus for transferring food material slices. 5,149,554, Cl 426-420.000.

Abo, Kimitaka; Osada, Yoshio; and Kikuchi, Junichi, to Hitachi Koki Company, Limited. Power tool with improved internal wiring structure. 5,149,999, Cl. 310-239.000.

Abramov, Igor; Buhler, Steven A.; and Mazdiyasni, Parviz P., to Xerox Corporation. Laser diode carrier with a semiconductor cooler 5,150,371, Cl. 372-34.000.

ACR Electronics, Inc.: *See*—
Sunshine, Morton, 5,149,598, Cl. 429-1.000.

Acuson Corporation: *See*—
Maslak, Samuel H.; Larsen, Hugh G.; Chaffin, Joel S.; Chandler, Paul E.; Galton, Ian A.; and Karmali, Mehebub S., 5,148,810, Cl 128-661.010.

Adachi, Nokihisa; Naito, Minoru; and Watanabe, Shinji, to Isowa Industry Company Ltd. Decentralized control method for corrugator line. 5,150,302, Cl. 364-471.000

Adachi, Tadao: *See*—
Nakamura, Norimi; Adachi, Tadao; Matsui, Akio; Fujiwara, Kouji; Kobayashi, Mitsugu; Yamaguchi, Tetsuo; and Fukuda, Minoru, 5,149,308, Cl. 475-203.000

Adams, Bruce C.: *See*—
Orman, Charles R.; Johnson, Paul E.; and Adams, Bruce C., 5,148,738, Cl. 99-487.000.

Adams, Julian; DiMaio, John; and Plante, Raymond, to Bio-Mega, Inc Cyclic peptides for treating herpes infections. 5,149,778, Cl 530-317.000.

Adan, Alberto O., to Sharp Kabushiki Kaisha. Static ram cell 5,150,190, Cl. 357-59.000.

Adaptec, Inc.: *See*—
Goldberg, Jules, 5,150,081, Cl. 331-109.000.

Adelmann, Fred: *See*—
Pettigrew, Robert M.; Harry, Alan J.; Nailor, Paul R.; Adelmann, Fred; Franzen, Peter; and Schoon, Juergen, 5,149,211, Cl. 400-88.000.

Adir et Compagnie: *See*—
Bousquet, Pascal-Pierre, 5,149,713, Cl. 514-567.000
Thevignot, Roger, 5,149,812, Cl. 546-23.000

Adler, Meryle D. W.; Nelson, John W.; and Shafer, Harold G., Jr., to Corning Incorporated. Cavity forming in plastic body. 5,148,632, Cl. 51-55.000.

Adler, Wilfried: *See*—
Jacobs, Jochen; Jahnke, Ulrich; Jung, Dieter; Oleffelmann, Rudolf; and Adler, Wilfried, 5,149,455, Cl. 252-174.130.

Advanced Robotics (A.R.L.) Ltd.: *See*—
Chen, Yehuda Y.; and Siev, Aharon, 5,148,600, Cl. 33-1.00M

Advantest Corporation: *See*—
Hayashi, Mishio; and Sotome, Tetsuo, 5,150,390, Cl. 377-116.000.

Aeroflex International Incorporated: *See*—
Snaith, Raymond E.; Barrasso, Max; and Jansson, Eric, 5,149,066 Cl. 267-136.000

Aerospatiale Societe Nationale Industrielle: *See*—
Flament, Patrick, 5,149,022, Cl. 244-168.000

AG Processing Technology, Inc.: *See*—
McDiarmid, James, 5,148,714, Cl. 74-89.150.

Agfa Gevaert Aktiengesellschaft: *See*—
Tappe, Gustav; Wichmann, Ralf; Meckl, Heinz; and Draber, Edgar, 5,149,618, Cl. 430-393.000

Agnew, Robert M.: *See*—
Mason, Stuart V.; and Agnew, Robert M., 5,148,924, Cl 211-41.000

Agracetus, Inc.: *See*—
McCabe, Dennis E.; and Martinell, Brian J., 5,149,655, Cl 435-287.000

Agrawal, Sudhir; and Zamecnik, Paul C., to Worcester Foundation for Experimental Biology. Process for synthesizing oligonucleotides and their analogs adaptable to large scale syntheses. 5,149,798, Cl 536-27.000

Agrawal, Sudhir: *See*—
Pederson, Thoru; Agrawal, Sudhir; Mayrand, Sandra; and Zamecnik, Paul C., 5,149,797, Cl. 536-27.000

Agrimont S.p.A.: *See*—
Camaggi, Giovanni; Meazza, Giovanni; and Preziuso, Ciro, 5,149,359, Cl. 71-94.000

Agroteam Consultants Ltd.: *See*—
Gil, Jacob; and Rubenstein, Zvi, 5,148,825, Cl. 137-78.300.

Aguro, Masayuki; Tanaka, Hidekazu; Yoshida, Kimiyoshi; and Sakano, Akio, to Sony Corporation. On-line character recognition apparatus 5,150,424, Cl. 382-13.000.

Ahlert, Richard H.; Howard, James K.; and Lambert, Steven E., to International Business Machines Corporation. Process for fabricating thin film metal alloy magnetic recording disks to selectively variable coercivities. 5,149,409, Cl. 204-192.200.

Ahn, Si Yoll, to Ahn, Si Yoll. Beverage carton with telescopic floating straw. 5,148,971, Cl. 229-103.100

Aichelmann, Frederick J., Jr., to Internation Business Machines Corporation. Memory organization with arrays having an alternate data port facility. 5,150,328, Cl. 365-189.030

Aichi Sangyo, Co., Ltd.: *See*—
Imaizumi, Hiroshi; Kato, Toshio; Nakashima, Hideaki; Murakami, Yasuo; Kashimura, Hideki; and Katayama, Kiichi, 5,149,939, Cl 219-125.120.

Aichinger, Horst; Joite-Barfuss, Sigrid; and Koehler, Karlheinz, to Siemens Aktiengesellschaft. X-Ray diagnostics installation for mammography. 5,150,393, Cl. 378-37.000.

Aikoh, Hideki; Nakamura, Tohru; Shinoda, Masayuki; and Kikuchi, Noboru, to Matsushita Electric Industrial Co., Ltd. Magneto-optical data recording and reproducing device. 5,150,350, Cl. 369-112.000

Air Industries Corporation: *See*—
Williamson, Herman L., 5,148,727, Cl. 81-121.100

Air Products and Chemicals, Inc.: *See*—
Li, Yuejin; and Armor, John N., 5,149,512, Cl. 423-239.000
Marsella, John A.; and Machado, Reinaldo M., 5,149,383 Cl 568-564.000
Nichols, James D.; and Dickenson, John B., 5,149,844 Cl 556-89.000

Aisan Kogyo Kabushiki Kaisha: *See*—
Ueda, Hironori; Hanai, Kazumichi; Takeuchi, Hitoshi; Nakamichi, Kazutaka; and Kubota, Takashi, 5,148,678, Cl. 60-602.000

Aisin AW Co., Ltd.: *See*—
Tanaka, Satoru; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,148,883, Cl. 180-165.000

Aisin Seiki K.K.: *See—*
Saito, Tadao; Sugisawa, Masakazu; and Watanabe, Yoshio, 5,149,178, Cl. 303-116.00R

Aisin Seiki Kabushiki Kaisha: *See—*
Birch, Peter H., Kondo, Toshiyuki; and Mori, Katsuhiro, 5,148,670, Cl. 60-39.142.
Shibayama, Hitoshi, 5,150,341, Cl. 369-36.000
Takashi, Yukihisa; and Fukaya, Nobuki, 5,148,904, Cl. 192-89.00B

Ajinomoto Co., Inc.: *See—*
Oonishi, Norimasa; and Yokozeki, Kenzo, 5,149,640, Cl 435-100.000

Akagi, Motoo: *See—*
Kato, Atsushi; Nagashiro, Waichi, and Akagi, Motoo, 5,149,564, Cl. 427-127.000

Akahira, Nobuo: *See—*
Ohno, Eiji; Nishiuchi, Kenichi; Yamada, Noboru; Ishibashi, Kenzou; Kimura, Kunio; and Akahira, Nobuo, 5,150,351, Cl. 369-116.000

Akamatsu, Hironori: *See—*
Matsushima, Junko; and Akamatsu, Hironori, 5,150,327, Cl 365-189.010

Akami, Noboru; and Tsukahara, Daici, to Nikon Corporation. Camera with improved ability to photograph moving objects. 5,150,148, Cl 354-413.000

Akamine, Masami: *See—*
Yoshikawa, Hidetaka; Miseki, Kimio; and Akamine, Masami, 5,150,387, Cl. 375-122.000

Akerberg, Dag E., to Telefonaktiebolaget L M Ericsson. Beacon carrier. 5,150,362, Cl. 370-95.100.

Akhtar, Muhammad M., to Johnson Products Co., Inc. Hair straightening method and texturing strengthener compositions therefor 5,148,822, Cl. 132-204.000

Akiyama, Keiji; and Misu, Hiroshi, to Fuji Photo Film Co., Ltd. Developer compositions for PS plates and method for developing the same wherein the developer composition contains a surfactant having an aryl group, an oxyalkylene group and a sulfate ester or sulfonic acid group. 5,149,614, Cl. 430-302.000

Aksoy, Adnan: *See—*
Savovic, Niko M.; and Aksoy, Adnan, 5,149,602, Cl. 429-96.000.

Aktiebolaget Hassle: *See—*
Lundberg, Per J.; Wingstrand, Karin; Andersson, Kjell H.; and Simonsson, Leif, 5,149,523, Cl. 424-78.100

Aladdin Synergetics, Incorporated: *See—*
DeGrow, Gary C., 5,148,936, Cl. 220-254.000

Alaers, Belinda; Ernsting, Peter B.; Holemans, Pieter M.; and Van Der Struis, Cornelis, to Van den Bergh Foods Co., Division of Conopco, Inc. Process for the preparation of a low calorie butter spread and products obtained by said process 5,149,559, Cl. 426-602.000.

Albert, Glenn D., to Seagate Technology, Inc. Hard disk drive adaptation based on approach time measurement. 5,150,266, Cl. 360-78.040.

Alcan International Limited: *See—*
Allaire, Claude, 5,149,412, Cl. 204-243.00R
Mueller, Friedrich P.; and LeBlanc, Guy, 5,148,856, Cl 164-487.000
Smits, Paul; Rosenfeld, Aron M.; and DeFerrari, Howard F., 5,149,386, Cl. 156-150.000

Alcatel Cit: *See—*
Bouzidi, Jean-Pierre, 5,150,071 Cl. 330-84.000

Alcatel Network Systems, Inc.: *See—*
Weber, William F., 5,149,027, Cl. 248-68.100.

Alcon Laboratories, Inc.: *See—*
Cagle, Gerald D.; McDonald, Thomas O.; and Rosenthal, Allan L., 5,149,693, Cl. 514-40.000
Cagle, Gerald D.; McDonald, Thomas O.; and Rosenthal, Allan L., 5,149,694, Cl. 514-40.000

Alev, Necip: *See—*
Winston, Ronald H.; and Alev Necip, 5,149,938, Cl. 219-121.690.

Alexander Faller Maschinenbau: *See—*
Faller, Alexander, 5,149,014, Cl. 244-17.190.

Alfano, Robert R.; Ho, Ping-Pei and Baldeck, Patrice. Terahertz repetition rate optical computing systems, and communication systems and logic elements using cross-phase modulation based optical processors. 5,150,248, Cl. 359-161.000

Alfred, Peter J.: *See—*
Turner, Kenneth W.; Du Bois, Patti S.; Alfred, Peter J.; and Greer, Thomas W., 5,149,347, Cl. 55-446.000

Alfred Teves GmbH: *See—*
Reinartz, Hans-Dieter; and Pickel, Hajo, 5,148,834, Cl. 138-31.000

Allaire, Claude, to Alcan International Limited. Electrolysis cell and refractory material therefor. 5,149,412, Cl. 204-243.00R.

Allcock, Harry R.: *See—*
Cohen, Smadar; Bano, Carmen Visscher, Karyn B.; Chow, Marie; Allcock, Harry R.; and Langer, Robert S., 5,149,543, Cl 424-499.000

Alldredge, Rodney H. Convertible stroller and car seat. 5,149,113, Cl 280-30.000

Allen, Roger D. Wire support apparatus. 5,149,026, Cl. 248-68.100.

Allentown Caging Equipment Co Inc.: *See—*
Coiro, Michael A., Sr.; Murray, Dale R.; and Lastowski, Philip A., 5,148,766, Cl. 119-17.000

Allergan, Inc.: *See—*
Chandraratna, Roshantha A. S., 5,149,705, Cl. 514-356.000

Allied-Signal Inc: *See—*
Green, George D.; Munk, Stephen A.; and Barnes, Darryl K., 5,149,754, Cl. 526-309.000

Allied-Signal Inc.: *See—*
Das, Santosh K.; Chang, Chin-Fong; and Raybould, Derek, 5,149,496, Cl. 419-17.000
Eddy, William C., Jr., 5,148,894, Cl. 188-72.600.
Keating, Patrick N., 5,150,321, Cl. 364-759.000.
Li, Hsin L.; and Prevorsek, Dusan C., 5,149,391, Cl. 156-441.000.
Mashayekhi, Mansour; Haley, Roger L.; Payne, Joe E.; and Kempton, C. Conrad, 5,149,447, Cl. 210-767.000

Alligood, John H.; Minnick, John H.; and Castor, David A., to Eastman Kodak Company. Multi-aperture electromagnetic camera shutter 5,150,149, Cl. 354-441.000

Allstot, David J.; and Kiasei, Sayfe, to State of Oregon Acting by and Through the State Board of Higher Education on Behalf of Oregon State University, The. MOS folded source-coupled logic. 5,149,992, Cl. 307-448.000

Allwood, Searle & Timney (Holdings) Limited. *See—*
Searle, John G., 5,148,957, Cl. 228-2.000

Alongi, Vincent: *See—*
Feller, Richard; and Alongi, Vincent, 5,148,617, Cl. 37-281.000.

Alper, Mark D.; and Myers, Marion M., to Findey Adhesives, Inc. Hot melt construction adhesives for disposable soft goods. 5,149,741. Cl 525-95.000

Alps Electric Co., Ltd.: *See—*
Bannai, Hiroyuki; and Kato, Hironori, 5,149,273, Cl. 439-15.000

AlSiMag Technical Ceramics, Inc.: *See—*
Sedman, Benny M., 5,149,476, Cl. 264-67.000

Alten, Kurt; and Bottcher, Albert, to Alten, Kurt. Bridging mechanism for crossing railroad tracks with vertically moving pivot carriage for bridge plate. 5,148,751, Cl. 104-31.000.

Althoff, Donald J.; and Hunt, Glen P. Wall mounted rack. 5,148,925, Cl. 211-41.000

Aluminium Pechiney: *See—*
Dablainville, Raymond; and Dufour, Jean, 5,149,502, Cl. 422-62.000

Aluminum Company of America: *See—*
Gates, Thomas A., 5,149,301, Cl. 454-365.000.
Lyon, Jay W., 5,148,935, Cl. 220-208.000.
Sucech, Steven W.; Marhanka, John E.; and Pearson, Alan, 5,149,520, Cl. 423-625.000.
Yu, Ho; Bruce, Douglas L.; Stiffler, Richard C.; Leon, David D.; and Glogowski, Francis J., 5,148,853, Cl. 164-455.000.

Alvarado, Alfredo. Seat belt system for motor vehicle. 5,149,133, Cl. 280-804.000

ALZA Corporation: *See—*
Ledger, Philip W.; Cormier, Michel J. N.; and Amkraut, Alfred, 5,149,539, Cl. 424-449.000.

Amada Company, Limited: *See—*
Sartorio, Franco; and Nicoletta, Bruno, 5,148,693, Cl. 72-12.000.
Sartorio, Franco; and Scavino, Mario, 5,149,072, Cl. 269-111.000.
Tokiwa, Toru, 5,148,907, Cl. 198-468.200.

Amamiya, Shoji: *See—*
Sakai, Kiyoshi; Sakakibara, Teigo; Sakou, Harumi; and Amamiya, Shoji, 5,148,639, Cl. 51-328.000.

Amano, Yoshikazu: *See—*
Kimura, Mitsuyoshi; and Amano, Yoshikazu, 5,150,055, Cl 324-322.000.

Amemiya, Izumi: *See—*
Arai, Yasunari; Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji; and Ihara, Takeshi, 5,150,280, Cl. 361-401.000.

Amemiya, Kyoko: *See—*
Okada, Kenichi; Amemiya, Kyoko; Terabayashi, Takao; Sasaki, Hideaki; Imai, Kuninori; and Kazui, Shinichi, 5,150,274, Cl. 361-382.000

American Auto-Matrix, Inc.: *See—*
Cecchini, Warren, 5,150,244, Cl. 359-113.000.

American Colloid Company: *See—*
Beggs, Lawrie, 5,149,549, Cl. 426-2.000.

American Cyanamid Company: *See—*
Asato, Goro, 5,149,832, Cl. 549-264.000.
Cortes, David A., 5,149,825, Cl. 548-515.000

American Home Products Corporation: *See—*
Ellingboe, John W.; Nikaido, Madelene; and Bagli, Jehan, 5,149,699, Cl. 514-258.000
Ellingboe, John W.; Bagli, Jehan F.; and Winkley, Michael W., 5,149,700, Cl. 514-275.000.
Sabb, Annmarie L., 5,149,815, Cl. 546-163.000.

American Packaging Corporation: *See—*
Muhs, Jeffrey D., 5,149,315, Cl. 493-189.000.

American Research Corporation of Virginia: *See—*
Whitman, Douglas L.; and Sarrafzadeh, Adel K., 5,150,175, Cl. 356-429.000.

Amgen Inc.: *See—*
Thomason, Arlen R., 5,149,792, Cl. 530-399.000.

Amkraut, Alfred: *See—*
Ledger, Philip W.; Cormier, Michel J. N.; and Amkraut, Alfred, 5,149,539, Cl. 424-449.000.

Amoco Corporation: *See—*
Harris, Stephen L.; and Yanchak, Dennis A., 5,150,331, Cl. 367-50.000
LeDuc, Edward C., 5,149,473, Cl. 264-51.000.

AMP Incorporated: *See—*
Dixon, Dirk R., 5,149,276, Cl. 439-159.000.
Ito, Tsukasa, 5,150,086, Cl. 333-182.000.

Ampferer, Herbert; and Grandhuber, Rudolf, to Dr. Ing. h.c.F. Porsche AG. Torsional-vibration damper. 5,148,719, Cl. 74-604.000.

Amphenol Corporation: *See—*
Gallusser, David O.; and LeBaron, James B., 5,149,274, Cl 439-76.000

AMT (Holdings) Ltd.: *See—*
Hunt, David J., 5,150,290, Cl. 364-736.000.

Amvest Corporation: *See—*
Hills, Robert C., 5,149,175, Cl. 299-1.900.

Analog Devices, Inc.: *See—*
Gosser, Royal A., 5,150,074, Cl. 330-263.000.

Analytic Laboratories, Inc.: *See—*
Barrington, Barry L., 5,149,422, Cl. 210-85.000.

Anan, Yoshiaki; Ando, Satoru; and Murai, Takeshi, to Mazda Motor Corporation. Automatic fuzzy speed control system for vehicle 5,148,721, Cl. 74-866.000

Anand, Kranti V., deceased: *See—*
Thomas, Michael E.; and Anand, Kranti V., deceased, 5,150,019, Cl. 315-350.000.

Anand, Madhu, heir: *See—*
Thomas, Michael E.; and Anand, Kranti V., deceased, 5,150,019 Cl. 315-350.000

Anderson, Bror: *See—*
Chang, Wei-Min; and Anderson, Bror, 5,149,577, Cl. 428-207.000

Anderson, Clyde G.: *See—*
Mestemaker, Jerald L.; and Anderson, Clyde G., 5,149,342, Cl. 55-59.000

Anderson, David B., to Quixpenser, Inc. Apparatus for and method of dispensing food product such as hard ice cream. 5,149,551, Cl 426-231.000.

Anderson, David M.: *See—*
Maugh, Kathy J.; and Anderson, David M., 5,149,657, Cl 435-320.100.

Anderson, Mason H.: *See—*
Varnam, O'Neal, 5,149,443, Cl. 210-739.000.

Anderson, Richard H.; Anderson, Robert R.; and Anderson, Richard R Spherical drawing template. 5,148,601, Cl. 33-21.200.

Anderson, Richard R.: *See—*
Anderson, Richard H.; Anderson. Robert R.; and Anderson, Richard R., 5,148,601, Cl. 33-21.200.

Anderson, Robert R.: *See—*
Anderson, Richard H.; Anderson, Robert R.; and Anderson, Richard R., 5,148,601, Cl. 33-21.200.

Anderson, Steven J.: *See—*
Behr, Leonard W.; Anderson, Steven J.; Duda, Donald A.; and Colten, Robert B., 5,149,925, Cl. 200-61.45M

Andersson, Kjell H.: *See—*
Lundberg, Per J.; Wingstrand, Karin; Andersson, Kjell H.; and Simonsson, Leif, 5,149,523, Cl. 424-78.100

Andes, David K.: *See—*
Swenson, Richard M.; Andes, David K.; Witcher, Donald H.; Licklider, Robert A.; and Barbieri, James F., 5,150,450, Cl. 395-23.000

Andin International, Inc.: *See—*
Azrielant, Ofer; Gal, Alex; and Lautman, Kenneth, 5,148,689, Cl 63-4.000

Ando, Dale G.; Levenson, Corey H.; and Braude, Irwin, to Cetus Corporation. Methods, compounds, and compositions for immunosuppression. 5,149,688, Cl. 514-254.000

Ando, Hiromitsu: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Ando, Hiromitsu; Takemura, Jun; Koujina, Eiichi; and Kojima, Ichiyo, 5,150,300, Cl. 364-431.036

Ando, Satoru: *See—*
Anan, Yoshiaki; Ando, Satoru; and Murai, Takeshi, 5,148,721, Cl 74-866.000.

Andreadakis, Nicholas C., to Bell Communications Research, Inc Non-phosphor full-color plasma display device. 5,150,007, Cl. 313-586.000

Anno, Masahiro: *See—*
Kohri, Toshitaro; Machida, Junji; and Anno, Masahiro, 5,149,611, Cl. 430-110.000.

Anquita, Manuel: *See—*
Bartroli, Javier; and Anquita, Manuel, 5,149,707, Cl. 514-396.000

Anthony, Robert C.: *See—*
Lewandowski, Mark S.; Gessner, David M.; and Anthony, Robert C., 5,149,114, Cl. 280-33.992

Antinoro, James A.: *See—*
Antinoro, James E.; Antinoro, James A.; and Antinoro, Randy D., 5,149,226, Cl. 405-65.000.

Antinoro, James E.; Antinoro, James A.; and Antinoro, Randy D Flexible oil spill containment boom. 5,149,226, Cl. 405-65.000

Antinoro, Randy D.: *See—*
Antinoro, James E.; Antinoro, James A., and Antinoro, Randy D 5,149,226, Cl. 405-65.000

Ants-Away, Inc.: *See—*
Haake, Kenneth H., Sr., 5,148,626, Cl. 43-121.000.

Aoki, Kazuma: *See—*
Yoshida, Hitoshi; Kawamoto, Naoyuki; Kanegae, Takahiro; and Aoki, Kazuma, 5,150,431, Cl. 382-56.000.

Aoki, Tomohiro: *See—*
Nemura, Masaharu; Aoki, Tomohiro; Kobayashi, Tohru; Ikkatai Masatoshi; Murayama, Yasushi; Uchida, Takashi; and Mitomi, Tatsuo, 5,149,049, Cl. 248-674.000.

Aoki, Yasushi, to NEC Corporation. Register file capable of high speed read operation. 5,150,326, Cl. 365-189.010.

Apache Building Products Company: *See—*
Soukup, Thomas G., 5,149,722, Cl. 521-99.000

Apogee Designs, Ltd.: *See—*
Flesher, Robert W., 5,149,418, Cl. 204-299.00R

Apple Computer, Inc.: *See—*
Sidhu, Gursharan S.; Oppenheimer, Alan B.; and Mathis, James E 5,150,464, Cl. 395-200.000

Appliance Control Technology, Inc.: *See—*
Jones, William H., 5,150,095, Cl. 338-196.000

Applied Chemical Solutions: *See—*
Geatz, Tobin, 5,148,945, Cl. 222-1.000

Applied Magnetics Corporation: *See—*
Inbar, Michael, 5,150,337, Cl. 368-118.000

Applied Materials, Inc.: *See—*
Webber, Herbert; and Edwards, Peter, 5,149,244, Cl. 414-417.000

Aqualogic Systems, Inc.: *See—*
Martin, Paul F., 5,148,554, Cl. 4-394.000

Aquila, Werner: *See—*
Brenner, Karl; Ruppel, Wilhelm; Woerz, Otto; Halbritter, Klaus, Scheiper, Hans-Juergen; Aquila, Werner; and Fuchs, Hartwig, 5,149,884, Cl. 568-471.000.

Arai, Atsushi: *See—*
Hirabayashi, Hiromitsu; Kusaka, Kensaku; Arai, Atsushi; and Takayanagi, Yoshiaki, 5,149,941, Cl. 219-216.000

Arai, Kenichi: *See—*
Hirose, Kazuko; Maeda, Kouji; Arai, Kenichi; and Inoue, Takeshi 5,149,521, Cl. 424-58.000.

Arai, Kenji; Oikawa, Hirohide; and Nagasaka, Hideo, to Kabushiki Kaisha Toshiba. Reactor containment vessel. 5,149,492, Cl 376-283.000

Arai, Makoto; and Fukuda, Hideki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for concentration and separation of highly unsaturated fatty acid ester. 5,149,852, Cl. 554-193.000.

Arai, Yasunari; Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji, and Ihara, Takeshi, to Fujitsu Limited. Electronic circuit package 5,150,280, Cl. 361-401.000

Arakaki, Steven Y. Forced expanding bullet. 5,149,913, Cl. 102-506.000

Aramaki, Minoru: *See—*
Hakuta, Kohzo; Aramaki, Minoru; Suen. A, Takashi; Kodama Mitsuo; Nakano, Hisaji; and Nakagawa, Shinsuke, 5,149,659, Cl 436-55.000

Arbed S.A.: *See—*
Plumier, Andre; Baus, Raymond; Pepin, Rene; and Schleich, Jean-Baptiste, 5,148,642, Cl. 52-167.00R

Arc Plan, Inc.: *See—*
Porter, Benny R., 5,148,635, Cl. 51-135.00R

Arch Development Corporation: *See—*
Hoffmann, Kenneth R.; and Doi, Kunio, 5,150,292, Cl. 364-413.070

Arco Chemical Technology, L.P.: *See—*
Jubin, John C., Jr., 5,149,885, Cl. 568-571.000.

Arenberg, Jonathan W.: *See—*
Pierce, Brian M.; Lawrence, George D.; Chang, David B.; and Arenberg, Jonathan W., 5,149,957, Cl. 250-211.00R

Arison, Byron H.: *See—*
Shafiee, Ali; Kaplan, Louis; Chen, Shieh-Shung T.; Arison, Byron H.; Colwell, Lawrence F., Jr.; and Dumont, Francis, 5,149,701 Cl. 514-291.000

Ariyama, Takayuki: *See—*
Gonda, Takashi; Hasegawa, Hirofumi; Yamada, Motohiro; and Ariyama, Takayuki, 5,150,167, Cl. 355-313.000

Ariyama, Tatsurou: *See—*
Matsuo, Masahiro; Kanatani, Genji; Kawata, Hitoshi; Ariyama, Tatsurou; Mase, Jirou; Kitano, Yoshiyuki; Tsuboi, Haruhito; and Isozaki, Shinichi, 5,149,487, Cl. 266-172.000

Armor, John N.: *See—*
Li, Yuejin; and Armor, John N., 5,149,512, Cl. 423-239.000

Armstrong, Gale L.; Dunn-Coleman, Nigel S.; and Wach, Mark, to Monterey Mushroom, Inc. Control of fungal diseases in the production of mushrooms. 5,149,715, Cl. 514-701.000

Armstrong, Jody: *See—*
Edwards, Patricia; and Armstrong, Jody, 5,149,289, Cl. 446-321.000.

Armstrong, Nancy J.: *See—*
Penner, Thomas L.; Robello, Douglas R.; Armstrong, Nancy J and Williams, David J., 5,150,446, Cl. 385-122.000

Arndt, Otto; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the production of high-purity tetrachloro-1,4-benzoquinone. 5,149,850, Cl. 552-308.000

Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; Zeuschner, Ulrich; and Harten, Gunter, to Wilhelm Fette GmbH, Firma. Rotary pelletizing machine with matrix disc having copper and lower plungers. 5,148,740, Cl. 100-264.000

Arnold, Keith P.: *See—*
Yang, Steve S.; and Arnold, Keith P., 5,150,078, Cl. 331-2.000

Arnold, Timothy G.; and Barlow, Arthur J., to EG&G, Ltd. Method and apparatus for optical fiber length determination. 5,149,961, Cl 250-227.110.

Arnold, William D., to Lee-Rowan Company. Shelf system. 5,148,928 Cl. 211-187.000

Aronov, Evgeny: *See—*
Doron, Benjamin; Assaf, Gad; Fisher, Uriyel; and Aronov Evgeny, 5,148,677, Cl. 60-641.500.

Arrigoni, Virginio: *See—*
Bellussi, Giuseppe; Cavani, Fabrizio; Arrigoni, Virginio; and Ghezzi, Roberto, 5,149,896, Cl. 585-532.000

Arrow Lock Manufacturing Company: *See—*
Caeti, Ben J.; Raybary, Paul; and Grinshpon, Boris, 5,149,155, Cl 292-336.300

Arthur D. Little, Inc.: *See—*
Young, Neils O., 5,149,255, Cl. 4 8-55.300.
Arthur, David; and Swei, Gwo S., to Rogers Corporation. Electrical substrate material. 5,149,590, Cl. 42 -421.000.
Arthur, Hugh M., to Molins plc. Cigarette manufacture. 5,148,818, Cl. 131-281.000.
Artzberger, Thomas G., to M-B-W Inc. Reversible drive for a vibratory compactor. 5,149,225, Cl. 404-133.100.
Asa, Masahito; and Nakajima, Masayuki, to Tokimec, Inc. Power divider. 5,150,084, Cl. 333-128.000.
Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Endo, Akira; and Koike, Seiji, 5, 49,641, Cl. 435-125.000.
Asahi Glass Company Ltd.: *See—*
Gunkima, Tomoki; Yuki, Masanori; Kunigita, Masaya; Hirai, Yoshinori; Yoshikawa, Yukio; and Shidoji, Eiji, 5,150,232, Cl. 359-51.000.
Shimohira, Tetsuji; Higuchi, Yoshiaki; Saito, Yoshihiko; and Suzuki, Kohji, 5,149,403, Cl. 2 4-98.000.
Yaba, Susumu; Takigawa, Tomoya; Kikugawa, Sinya; Osada, Koichi; Sato, Katsuhito; and Omae, Masaru, 5,149,351, Cl. 565-60.200.
Asahi Kasei Microsystems Co. Ltd.: *See—*
Takasuka, Kaoru; and Takahashi, Ken'ichi, 5,150,324, Cl. 364-807.000
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Abe, Nobuaki; and Kurosawa, Yuichi, 5,150,268, Cl. 360-128.000.
Enomoto, Shigeo, 5,150,150, Cl. 354-456.000.
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl 354-403.000.
Kitazawa, Toshiyuki, 5,150,140, Cl. 354-145.100.
Kobayshi, Takeo; Tabata, Yasuhi; Numako, Norio; and Nagai, Katsutoshi, 5,150,147, Cl. 354-412.000
Minakuchi, Tadashi, 5,150,346, Cl. 369-44.360.
Soshi, Isao; and Takebayashi, Tatsuhide, 5,150,144, Cl. 354-400.000.
Asai, Jun, to Canon Kabushiki Kaisha. Image forming apparatus having image transfer member. 5,150,165, Cl. 355-274.000.
Asakawa, Shiro: *See—*
Saito, Yukihiro; Waragai, Katsunori; and Asakawa, Shiro, 5,149,751, Cl. 526-178.000.
Asakura, Tsutou: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Shinonaga, Hirohiko; and Tai, Hiromichi, 5,150,226, Cl 358-471.000
Asato, Goro, to American Cyanamid Company. Mono and diacyl derivatives of LL-F28249 Compounds. 5,149,832, Cl. 549-264.000.
Asazawa, Hiroshi, to NEC Corporation. Emitter-grounded amplifier circuit with bias circuit. 5,150,076 Cl. 330-296.000.
Asea Brown Boveri Aktiengesellschaft: *See—*
Esrom, Hilmar; and Kogelschatz, Ulrich, 5,149,377, Cl. 118-722.000
Asea Brown Boveri Ltd.: *See—*
Frutschi, Hansulrich, 5,148,668, Cl. 60-39.050.
Gruning, Horst, 5,150,287, Cl. 3 3-135.000.
Asgard Medical Systems, Inc.: *See—*
Biegeleisen-Knight, Robert M.; and Duke, Keith A., 5,148,809, Cl. 128-660.070
Ashby, James C., III; Burkhart, Clark; Favors, Frankie B.; Tiemann, Roy G.; Vandaveer, Robert L.; and Krause, Lothar A., Jr., to Chips International, Inc. Retrofittable encryption/decryption apparatus using modified frequency modulation. 5,150,401, Cl. 380-29.000
Ashok, Sankaranarayanan, to Olin Corporation. Feeding system for belt casting of molten metal. 5,148,85 Cl. 164-479.000.
Aslakson, John K.: *See—*
Karlsson, Haraldur; Jacques, Gary E.; Hatten, James L.; and Aslakson, John K., 5,148,875, Cl. 175-62.000.
ASSA AB: *See—*
Wallden, Lars, 5,148,691, Cl. 70-279.000.
Assaf, Gad: *See—*
Doron, Benjamin; Assaf, Gad; Fisher, Uriyel; and Aronov, Evgeny, 5,148,677, Cl. 60-64 500
Asselin, Andre E.: *See—*
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Pun, Joseph H. K., 5,150,032, Cl. 320-14.000
Asten Group, Inc.: *See—*
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Bainbridge, Gary D.; and Palaszewski, Stephen J., 5,150,277, Cl 361-384.000
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Kimball, Robert M.; and Mcintosh, Thomas F., 5,150,246, Cl. 359-118.000
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Vannucci, Giovanni, 5,150,377 Cl. 375-1.000.
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Um, Gregory; and Szilagyi, Andrei, 5,150,205, Cl. 358-60.000.
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Sianesi, Dario; Marraccini, Antonio; and Marchionni, Giuseppe, 5,149,842, Cl. 549-550.000.
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Scanlon, John F.; and Wigell, Gary, 5,149,251, Cl. 416-245.00R.
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Gill, Antony, 5,149,547, Cl. 425-145.000.
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Aw, Kenneth, to United States of America, Navy. Portable radar simulator. 5,150,127, Cl. 342-169.000.
Awazu, Shoji; Horie, Toshiharu; Kodera, Yukihiro; Nagae, Shinji; Matsuura, Hiromichi; and Itakura, Yoichi, to Wakunaga Seiyaku Kabushiki Kaisha. Polysulfides compounds and lipid peroxidation inhibitor containing the polysulfide compounds as active ingredient. 5,149,879, Cl. 568-21.000.
Axel, Richard; and Roberts, James M., to Columbia University in the City of New York, Trustees of. Method for introducing cloned, amplifiable genes into eucaryotic cells and for producing proteinaceous products. 5,149,636, Cl. 435-69.100.
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Santandrea, Luciano; and Lombardi, Massimo, 5,149,000, Cl. 242-1.10R.
Azria, Moise; and Steiger, Michel, to Sandoz Ltd. Use of taurocholic acid and its salts as enhancers for calcitonin containing pharmaceutical compositions. 5,149,537, Cl. 424-436.000.
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Bognar, Alajos; Csepes, Gusztav; and Hamos, Istvan, 5,150,059, Cl. 324-551.000
B&W Nuclear Service Company: *See—*
Brown, Steve K.; Dixon, Larry D.; and Moses, Samuel J., 5,149,490, Cl. 376-260.000.
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Peet, William J., 5,148,775, Cl. 122-451.00R.
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Babini, Ezio, to Fittings For Industry S.r.l. Fuse block, particularly for printed circuits. 5,150,094, Cl. 337-214.000.
Babkes, Mitchell H.: *See—*
Jones, Stephen W.; Babkes, Mitchell H.; and McCormick, David D., 5,149,032, Cl. 248-154.000.
Babson, Arthur L.; Palmieri, Thomas; and Olson, Douglas R., to Cirrus Diagnostics, Inc. Multichambered container and instrument for performing diagnostic tests. 5,149,501, Cl. 422-58.000.
Bacher, Bruce E., to Zebco Corporation. Two-part front cover for spincast reels. 5,149,010, Cl. 242-311.000.
Bacu, Theodor: *See—*
Kramer, Michael; Zeilinger, Karl; and Bacu, Theodor, 5,148,782, Cl. 123-195.00R.
Badali, Joseph A., to Browning. Lever action for firearms. 5,148,619, Cl. 42-16.000.
Badavas, Paul C., to Foxboro Company, The. Method and apparatus for process control. 5,150,289, Cl. 364-154.000.
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Greenspun, Philip G.; and Baecher, Gregory B., 5,150,310, Cl. 364-516.000.
Baek, Young S.: *See—*
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Bagli, Jehan: *See—*
Ellingboe, John W.; Nikaido, Madelene; and Bagli, Jehan, 5,149,699, Cl. 514-258.000.

Bagli, Jehan F.: *See—*
Ellingboe, John W.; Bagli, Jehan F.; and Winkley, Michael W., 5,149,700, Cl. 514-275.000.
Bahrmann, Helmut: *See—*
Kampmann, Detlef; Weber, Jurgen; Bahrmann, Helmut; and Kniep Claus, 5,149,876, Cl. 564-467.000
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Kolb, Achim; Baier, Manfred; and Muller, Klaus, 5,150,373, Cl 372-61.000
Bailon, Pascal; Smart, John E.; and Weber, David V., to Hoffmann-La Roche, Inc. Purification of chimeric proteins containing an IL-2 moiety by receptor-affinity chromatography. 5,149,788, Cl. 530-350.000.
Bain, Orville J.: *See—*
Jelinek, Jerry G.; and Bain, Orville J., 5,149,109, Cl. 277-199.000.
Bainbridge, Gary D.; and Palaszewski, Stephen J., to AT&T Bell Laboratories. Cooling of electronic equipment cabinets. 5,150,277. Cl. 361-384.000
Baker, Byron L.: *See—*
Hill, Marilyn; and Baker, Byron L., 5,149,587, Cl. 428-354.000.
Baker, Harry; and Postill, Alan, to Bicc plc. Termination of mineral insulated electric cable. 5,149,916, Cl. 174-74.00R.
Baker Hughes Incorporated: *See—*
Karlsson, Haraldur; Jacques, Gary E.; Hatten, James L.; and Aslakson, John K., 5,148,875, Cl. 175-62.000.
Meurer, Charles L., 5,149,057, Cl. 254-276.000.
Baker, Melvin C.: *See—*
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Baker, Norman L. Filter for removing contaminants from refrigerant 5,149,429, Cl. 210-291.000.
Baker, R. Terry K.; and Rodriguez, Nelly M. Carbon fiber structures having improved interlaminar properties. 5,149,584, Cl. 428-297.000.
Baker, Richard L.; Bernstein, Jeffrey; Girod, Bernd; Yuan, Xiancheng; and Thompson, Edmund, to PictureTel Corporation. Hierarchical entropy coded lattice threshold quantization encoding method and apparatus for image and video compression. 5,150,209. Cl 358-133.000
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Zornes, David A., 5,149,208, Cl. 384-551.000.
Baldeck, Patrice: *See—*
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Baldwin, Richard R.: *See—*
Ertel, John; Holland, William D.; Vincent, Kent D.; Jamp, Rueiming; and Baldwin, Richard R., 5,149,980, Cl. 250-561.000
Baldwin, William C.: *See—*
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Baltusis, Paul A.: *See—*
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Banba, Susumu; Teranishi, Junichi; Sakai, Shoji; Uramoto, Makoto; and Uchida, Hiroshi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for separation of doubled yarn. 5,149,001, Cl. 242-42.000.
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Bank, Harvey L.: *See—*
McNally, Robert T.; McCaa, Cameron; Brockbank, Kelvin G. M.; Heacox, Albert E.; and Bank, Harvey L., 5,149,621, Cl. 435-1.000.
Bannai, Hiroyuki; and Kato, Hironori, to Alps Electric Co., Ltd. Clock spring. 5,149,273, Cl. 439-15.000
Bano, Carmen: *See—*
Cohen, Smadar; Bano, Carmen; Visscher, Karyn B.; Chow, Marie; Allcock, Harry R.; and Langer, Robert S., 5,149,543, Cl 424-499.000
Bantien, Frank, to Robert Bosch GmbH. Micromechanical tilt sensor 5,148,604, Cl. 33-366.000.
Barbero, Giancarlo: *See—*
Bressan, Giancarlo; Troglia, Claudio; Brichta, Corrado; and Barbero, Giancarlo, 5,149,735, Cl. 524-450.000
Barbieri, James F.: *See—*
Swenson, Richard M.; Andes, David K.; Witcher, Donald H.; Licklider, Robert A.; and Barbieri, James F., 5,150,450, Cl 395-23.000
Bardell, Paul H., Jr.; and McAnney, William H., to International Business Machines Corp. Reduced delay circuits for shift register latch scan strings. 5,150,366, Cl. 371-22.300.
Bardes, Dale L. Disposable collector and container. 5,149,159, Cl 294-1.300
Barkan, Edward: *See—*
Swartz, Jerome; Shepard, Howard M.; Darkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; and Barkan, Edward, 5,149,950. Cl 235-472.000
Barlow, Arthur J.: *See—*
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Barmag AG: *See—*
Bauer, Karl; Bartkowiak, Klaus; Dammann, Peter; Streppel, Herbert; and Morhenne, Siegfried, 5,148,666, Cl. 57-290.000
Barnes, Darryl K.: *See—*
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Barnes, Keith D.: *See—*
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Barnes, Ronny L.; and Ray, Jimmy C., to Gar-Bar Corporation. Row follower. 5,148,873, Cl. 172-5.000.
Barrasso, Max: *See—*
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Barrett, Michael R. Method of construction of pre-balanced air handling system. 5,149,300, Cl. 454-338.000
Barrington, Barry L., to Analytic Laboratories, Inc. Finite particle removal system. 5,149,422, Cl. 210-85.000
Bartelt, Robert J.: *See—*
Dowd, Patrick F.; and Bartelt, Robert J., 5,149,525, Cl. 424-84.000
Bartkowiak, Klaus: *See—*
Bauer, Karl; Bartkowiak, Klaus; Dammann, Peter; Streppel, Herbert; and Morhenne, Siegfried, 5,148,666, Cl. 57-290.000.
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BASF Aktiengesellschaft: *See—*
Brenner, Karl; Ruppel, Wilhelm; Woerz, Otto; Halbritter, Klaus, Scheiper, Hans-Juergen; Aquila, Werner; and Fuchs, Hartwig 5,149,884, Cl. 568-471.000
Bruchmann, Bernd, 5,149,766, Cl. 528-49.000
Goepel, Wolfgang; and Wiemhoefer, Hans-Dieter, 5,149,685, Cl 505-1.000.
Gross, Bernd; Weber, Heinz; and Schuon, Georg, 5,149,574. Cl 428-116.000
Jessen, Joerg L.; Pandl, Klaus; Loeffler, Hermann; Siegel, Bernd and Patsch, Manfred, 5,149,789, Cl. 534-618.000
Matthies, Paul, 5,149,758, Cl. 528-318.000
Merger, Franz; Hettinger, Peter; Hupfer, Leopold; Paetsch, Juergen; Deck, Heribert; Auer, Heinz; and Brunner, Erwin 5,149,861, Cl. 560-234.000
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Batail, Patrick: *See—*
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Battelle-Institut e.V.: *See—*
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Battler, John R.: *See—*
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Bauer, Karl; Bartkowiak, Klaus; Dammann, Peter; Streppel, Herbert; and Morhenne, Siegfried, to Barmag AG. Yarn heating apparatus 5,148,666, Cl. 57-290.000
Bauer, Martin L.: *See—*
McElhaney, Stephanie A.; Bauer, Martin L.; and Chiles, Marion M., 5,149,971, Cl. 250-361.00R
Baugh, Richard A.; Chiu, Ran-Fun; Hart, Darlene L.; Jam, Merban; and Leung, Sui-hing, to Hewlett-Packard Company. Signal processing system for adaptive equalization. 5,150,379, Cl. 375-14.000.
Baus, Raymond: *See—*
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Bausch & Lomb Incorporated: *See—*
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Bauth, Edgar: *See—*
Gudehus, Hans C.; Ellmann, Josef; and Bauth, Edgar, 5,148,710, Cl 73-335.060.
Baxter International Inc.: *See—*
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Woodgrift, Randal W.; and Welsh, Gregory P., 5,149,326, Cl 604-163.000
Bay Industrial and Mine Tech Inc.: *See—*
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Bayard, Robert G.; Walsh, Anthony J.; and Weseloh, Roger J., to Mark IV Transportation Products Corporation. Pneumatic door operator having pneumatic actuator and lock. 5,148,631, Cl. 49-449.000

Bayer AG: *See—*
Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Plempel, Manfred, 5,149,795, Cl. 536-23.000.

Bayer Aktiengelselschaft: *See—*
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Lindel, Hans; Hallenbach, Werner; and Gallenkamp, Bernd, 5,149,822, Cl. 546-315.000.
Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., 5,149,356, Cl. 71-90.000.
Rauchschwalbe, Gunther; Blank, Heinz-Ulrich; Deibele, Ludwig; Hallenberger, Kaspar; and Ruffert, Gerhard, 5,149,890, Cl 568-934.000
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; and Dhein, Rolf, 5,149,761, Cl. 528-353.000.
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Bayern-Chemie Gesselschaft fur Flugchemische Antriebe mbH: *See—*
Unterforsthuber, Karl; and Greisreiter, Christian, 5,149,129, Cl 280-740.000.

Beamer, Henry E., to General Motors Corporation. Air/liquid heat exchanger. 5,148,859, Cl. 165-41.000

Beard, George W.; and Hamer, Frank, to Gravenhurst Plastics Ltd Non-collapsible tire building drum. 5,149,390, Cl. 156-414.000.

Beatrice/Hunt-Wesson, Inc.: *See—*
Raetzel, David W., 5,148,611, Cl. 33-783.000.

Beaver, Phillip R.; Henke, Thomas E.; Bergen, Charles R.; and Loechelt, Cecil P., II, to Ethyl Corporation. Method and apparatus for repairing vessels. 5,149,105, Cl. 277-1.000.

Bechtel Group, Inc.: *See—*
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Beck, Michael P. Glow in the dark artwork. 5,149,568, Cl. 428-14.000.

Becker, Klaus; and Ostholt, Rudiger, to Mannesmann Aktiengesellschaft. Roller conveyor train. 5,148,909, Cl. 198-780.000.

Becker, Wilfried; Bethmann, Karl W.; Bisping, Bernhard; and Theis, Ulrich, to Rheinmetall GmbH Unitary projectile. 5,148,750, Cl 102-439.000

Beckmann, Robert J.; Cox, Karen E.; and Seno, Eugene T., to Eli Lilly and Company. Tylosin biosynthetic genes tylA, tylB and tylI 5,149,638, Cl. 435-76.000.

Beckworth Davis International Inc.: *See—*
Davis, Clint A.; and Trail, Melvin P., 5,149,940, Cl. 219-130.210.

Bedford, Mark J., to Pilkington Visioncare, Inc. Lens wafer, laminate lens and method of fabrication thereof. 5,149,181, Cl. 351-166.000

Beggs, Lawrie, to American Colloid Company. Method and composition for achieving animal weight gain with mycotoxin-contaminated animal food. 5,149,549, Cl. 426-2 000.

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Behr, Leonard W.; Anderson, Steven J.; Duda, Donald A.; and Colten, Robert B., to Automotive Systems Laboratory, Inc. Quick-response accelerometer. 5,149,925, Cl. 20 -61.45M.

Beitel, Bradley J.; and Gordon, Robert D., to International Business Machines Corporation. Animation processor method and apparatus 5,150,312, Cl. 395-118.000

Belcher, Samuel L., to Sabel Plastechs, Inc. Method and apparatus for extrusion blow molding polyethylene terephthalate articles 5,149,485, Cl. 264-532.000

Belgium Tool and Die Company: *See—*
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Bell Communications Research, Inc.: *See—*
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Patel, Jayantilal S., 5,150,236, Cl. 359-71.000.

Bell, Richard E., Jr., to Hikes Point Industries, Inc. Handheld fluid leak sealing apparatus. 5,149,395, Cl 156-581.000

Bell, Stephen W., to GEC-Marconi Limited. Military aircraft 5,150,122, Cl. 342-8.000.

Bellas, Michael; Kuo, Yeong-Jen; and Rash, Fred H. Process for the preparation of quinhydrones. 5, 49,849, Cl. 552-293.000.

Beller, Kevin, to Seymour Duncan Corporation. Pole piece for an electric string instrument to decrease magnetic flux intensity around strings. 5,148,733, Cl. 84-726.000

Bellussi, Giuseppe; Cavani, Fabrizio; Arrigoni, Virginio; and Ghezzi, Roberto, to Eniricerche S.p.A Process for oligomerizing light olefins. 5,149,896, Cl. 585-532.000.

Beloit Corporation: *See—*
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Bennickson, Lowell W.: *See—*
Judge, Edward E.; Bennickson, Lowell W.; and Reiser, Arthur G., 5,148,636, Cl. 51-142.000

Benoit, Gordon L. Angle sealed bottom grocery sack. 5,149,201, Cl. 383-8.000

Benson, James V.: *See—*
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Berchem, Rutger; and Schnitzler, Volkhard, to Metalpraecis Berchem + Schaberg Gesellschaft fur Metallformgebung mbH. Method of making an implantable joint prosthesis. 5,150,304, Cl. 364-474.240

Berek, Dennis W.: *See—*
Edgley, Richard R.; Ingwersen, Peter; and Berek, Dennis W., 5,149,280, Cl. 439-457.000.

Berg, Charles J.: *See—*
Lahrman, Frank H.; Berg, Charles J.; and Roe, Donald C., 5,149,334, Cl. 604-367.000.

Berg, Kenneth A.; Witt, Reinhard H.; and Derolf, M. Robert, to PQ Corporation. Beer processing and composition. 5,149,553, Cl 426-330.400.

Berge, Gary L.: *See—*
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Bergen, Charles R.: *See—*
Beaver, Phillip R.; Henke, Thomas E.; Bergen, Charles R.; and Loechelt, Cecil P., II, 5,149,105, Cl. 277-1.000.

Berger, Alvin H., to Ford Motor Company. Method and apparatus for locking out the clutch of a manual transmission. 5,148,899, Cl 192-3.630.

Berkenheger, Bobby; and Spector, George. VCR video keeper 5,148,764, Cl. 116-318.000

Berkey, George E.; Hawk, Robert M.; and Tarcza, Steven H., to Corning Incorporated. Method of making polarization retaining fiber with an elliptical core, with collapsed apertures. 5,149,349, Cl. 65-3.110.

Bernard, Thierry, to Rhone-Poulenc Agrochimie. Herbicidal combination based on bromoxynil alkanoates and 2-[[(4,6-dimethoxypyrimidin-2-yl)aminocarbonyl]amino-sulfonyl]-N,N-dimethyl-3-pyridine carboxamide. 5,149,358, Cl. 71-92.000.

Bernstein, Jeffrey: *See—*
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Berntsen International, Inc.: *See—*
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Berry, Wayne F., to Touchstone Computers, Inc. VGA controller card 5,150,109, Cl. 340-811.000

Bertoldi, Massimo: *See—*
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Bertrand, John, to ITT Corporation. Secure digital conferencing system. 5,150,410, Cl. 380-28.000.

Besson, Bernard: *See—*
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Best, Freddie W.; and White, Jackie L., to R. J. Reynolds Tobacco Company. Processes for producing a smokable and/or combustible tobacco material. 5,148,821, Cl. 131-370.000.

Bethmann, Karl W.: *See—*
Becker, Wilfried; Bethmann, Karl W.; Bisping, Bernhard; and Theis, Ulrich, 5,148,750, Cl. 102-439.000.

Bettini, Ronald G. Thermal control apparatus for satellites and other spacecraft. 5,148,860, Cl. 165-41.000

Beutler, Robert C., to Robertson, Kenneth, a part interest. Illuminated rear peep sight for a projectile device. 5,148,603, Cl. 33-265.000.

Beverly, Richard P.: *See—*
Brown, Marvin A.; Wolfe, Gerald D.; and Beverly, Richard P., 5,149,427, Cl. 210-274.000.

BFGoodrich Company, The: *See—*
Lee, Biing-lin, 5,149,739, Cl. 525-66.000.

Bhardwaj, Pradeep: *See—*
Newell, Gerald R.; and Bhardwaj, Pradeep, 5,150,121, Cl. 341-157.000.

Bianchi, William J. Jigsaw puzzle game board having corresponding indicia. 5,149,098, Cl. 273-157.00R

Bianchini, Michael J.; Lyons, Christopher T.; Michalik, Richard A.; and Waterman, Raymond C., Jr., to Raytheon Company. Frequency agile switched resonator oscillator with noise degeneration. 5,150,080, Cl. 331-99.000

Bic Corporation: *See—*
Winner, William K., 5,148,761, Cl. 114-39.200.

Bicc plc: *See—*
Baker, Harry; and Postill, Alan, 5,149,916, Cl. 174-74.00R.

Bich, Gary L.; and Diederich, Anthony F., Jr., to Ford New Holland, Inc. Forage harvester row crop attachment with cantilevered front idlers. 5,148,659, Cl. 56-102.000.

Bicker, Richard: *See—*
Vertesy, Laszlo; Geisen, Karl; and Bicker, Richard, 5,149,716, Cl. 514-3.000.

Biegeleisen-Knight, Robert M.; and Duke, Keith A., to Asgard Medical Systems, Inc. Method and apparatus for detecting blood vessels and displaying an enhanced video image from an ultrasound scan 5,148,809, Cl. 128-660.070.

Bienert, Horst: *See—*
Matsubara, Hirco; Meier, Kurt; Kohlpaintner, Georg; and Bienert, Horst, 5,149,170, Cl. 296-213.000.

Bierman, Jeffrey J.: *See—*
Klearman, Jeffrey D.; Bierman, Jeffrey J.; Pott, Lambert J.; and Watson, Glen E., Jr., 5,148,563, Cl. 5-652.000.

Bigliano, Robert P.; and Friel, Daniel D., to Edgecraft Corp. Scissor sharpening apparatus with magnetic guide. 5,148,634, Cl. 51-128.000.

Bilinski, Joseph R.: *See—*
Crowley, H. W.; and Bilinski, Joseph R., 5,149,075, Cl. 270-39.000

Bilodeau, Francois: *See—*
Hill, Kenneth O.; Bilodeau, Francois; Malo, Bernard; and Johnson Derwyn C., 5,150,439, Cl. 385-39.000.

Bindicator Company: *See—*
Crosby, David J., 5,150,334, Cl. 367-98.000.

Binoptic International Systems, Inc.: *See—*
Tacke, David J.; and Perhacs, Leslie, 5,148,905, Cl. 194-210.000.

Bio-Mega, Inc.: *See—*
Adams, Julian; DiMaio, John; and Plante, Raymond, 5,149,778, Cl 530-317.000

Birattari, Claudio: *See—*
Silari, Marco; and Birattari, Claudio, 5,149,966, Cl. 250-309.000

Birch, Peter H.; Kondo, Toshiyuki; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Gas turbine cogeneration apparatus for the production of domestic heat and power. 5,148,670, Cl. 60-39.142.

Birchall, James D., to Imperial Chemical Industries PLC. Water treatment agent. 5,149,439, Cl. 210-702.000

Bird Environmental Systems & Services, Inc.: *See—*
Moller, James W., 5,149,440, Cl. 210-708.000.

Birecki, Henryk; and Clifford, George M., Jr., to Hewlett-Packard Company. Optical disk reading and writing system having magnetic write head mounted on an air-bearing slider. 5,150,338, Cl 369-13.000.

Bisping, Bernhard: *See—*
Becker, Wilfried; Bethmann, Karl W.; Bisping, Bernhard; and Theis, Ulrich, 5,148,750, Cl. 102-439.000.

Bissell Inc.: *See—*
Jailor, John J.; and Rosendall, Henry J., 5,148,569, Cl. 15-041.100

Bissinger GmbH: *See—*
Bissinger, Heinz, 5,149,348, Cl. 55-478.000.

Bissinger, Heinz, to Bissinger GmbH. Filter system for large containers 5,149,348, Cl. 55-478.000

Bitar, Ali A., to Caterpillar Inc. Multiplexed radio frequency linear position sensor system. 5,150,060, Cl. 324-635.000

Bitton, Gabriel; and Koopman, Ben, to University of Florida Research Foundation, Inc. Microbiological assay pad and kit for selective detection of toxicants. 5,149,656, Cl. 435-288.000.

Bivens Winchester Corporation: *See—*
Crotts, Lonnie M.; and Rambo, William W., 5,148,570, Cl 15-97.300.

Bjordal, Audun: *See—*
Olaussen, Stein; Bjordal, Audun; and Solland, Geir, 5,149,370, Cl 106-737.000

Blaas, Dieter: *See—*
Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blaas, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, 5,149,783, Cl. 530-326.000.

Black, David G.; and Wilson, Edwin P., to Minatronics Corporation Security system. 5,150,100, Cl. 340-555.000.

Black, Gregory R.: *See—*
Hietala, Alexander W.; and Black, Gregory R., 5,150,075, Cl 330-279.000

Blackaby, Colin T.; and Blackaby, Yvonne M. Lawn bag support frame 5,149,028, Cl. 248-101.000

Blackaby, Yvonne M.: *See—*
Blackaby, Colin T.; and Blackaby, Yvonne M., 5,149,028, Cl 248-101.000.

Blackwell, Bruce A., executor: *See—*
Blackwell, Jennings P., deceased; and Ramsey, Bruce L., 5,149,749, Cl. 525-537.000.

Blackwell, Jennings P., deceased (by Blackwell, Bruce A., executor); and Ramsey, Bruce L., to Phillips Petroleum Company. Poly(phenylene sulfide) composition and articles having improved thermal stability at high temperatures. 5,149,749, Cl. 525-537.000.

Blair, Wayne R. Perch eye fishing lure. 5,148,622, Cl. 43-42.000.

Blakeley, James, to Sprink, Inc. Pipe branch fitting and branch appliance therefor. 5,149,144, Cl. 285-23.000.

Blank, Heinz-Ulrich: *See—*
Rauchschwalbe, Gunther; Blank, Heinz-Ulrich; Deibele, Ludwig; Hallenberger, Kaspar; and Ruffert, Gerhard, 5,149,890, Cl 568-934.000

Blank, Ted E.; Ferguson, Donald F.; Frey, Jeffrey A.; Pruscino, Angelo; Rogers, Robert R.; and Rahm, Erhard, to International Business Machines Corp. Cache management method and apparatus for shared, sequentially-accessed, data. 5,150,472, Cl. 395-425.000.

Blankenship, Betty A.: *See—*
Ekin, John W.; Panson, Armand J.; and Blankenship, Betty A., 5,149,686, Cl. 505-1.000.

Blaser, Peter-Theobald; and Hofheinz, Walter, to Heidelberger Druckmaschinen AG. Actuator or adjusting drive. 5,148,715, Cl 74-325.000.

Blaudin de THE, Hugues; Marchio, Agnes; Tiollais, Pierre; and Dejean, Anne, to Institut Pasteur. Steroid/thyroid hormone receptor-related gene inappropriately expressed in human hepatocellular carcinoma. 5,149,781, Cl. 530-326.000.

Blevins, Richard W.: *See—*
Turner, S. Richard; Perry, Robert J.; and Blevins, Richard W., 5,149,824, Cl. 548-435.000.

Bloink, Raymond L.; Kibbel, Bradley W.; and Powell, Bob R., to General Motors Corporation. Electrorheological compositions including $am_{5-11}Og_{-17}$. 5,149,454, Cl. 252-74.000.

Blonder, Greg E; and Fulton, Theodore A., to AT&T Bell Laboratories. Fine line scribing of conductive material. 5,149,404, Cl 204-129.100.

Blood Center Research Foundation, The: *See—*
Kunicki, Thomas J.; and Montgomery, Robert R., 5,149,787, Cl 530-383.000

Bloom Engineering Company, Inc.: *See—*
Finke, Harry P., 5,149,265, Cl. 432-24.000

Blum, Alvin S.: *See—*
Di Franco, Jack E.; and Blum, Alvin S., 5,149,291, Cl. 446-488.000

Bluthgen, Bjorn, to Philips and Du Pont Optical Company. Method and apparatus for transmitting an information signal together with data packets of related and unrelated textual information and receiving apparatus therefor. 5,150,113, Cl. 340-825.300

Blytas, George C.: *See—*
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 5,149,460, Cl 252-191.000

BMC Industries: *See—*
Deibler, Dean T.; and Marcanio, Joseph A., 5,149,608, Cl 430-23.000

Board of Supervisors of Louisiana State University and Agricultural and Mechanical College: *See—*
Price, Geoffrey L.; Kanazirev, Vladislav I.; and Dooley, Kerry M 5,149,679, Cl. 502-61.000

Board of Trustees, operating Michigan State University: *See—*
Buxbaum, Robert E.; and Hsu, Peter C., 5,149,420, Cl. 205-219.000

Bobel, Andrzej, to Motorola, Inc. Power converter employing a multivibrator-inverter. 5,150,013, Cl. 315-209.00R.

Bobo, Melvin, to General Electric Company. Hydraulic shaft damper pressure control. 5,149,206, Cl. 384-99.000

Bobo, Melvin: *See—*
Plemmons, Larry W.; Bobo, Melvin; Wilds, Alan P.; and Liotta, Gary C., 5,149,250, Cl. 415-209.300.

Bochumer Eisenhutte Heintzmann GmbH & Co. KG: *See—*
Mennekes, Werner; and Podjadtke, Rudi, 5,149,044, Cl 248-357.000

Boehringer Ingelheim GmbH: *See—*
Hess, Joachim; Muller, Klaus R.; and Muller, Manfred, 5,149,833 Cl. 549-274.000

Boehringer Ingelheim International GmbH: *See—*
Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blaas, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, 5,149,783, Cl. 530-326.000

Boehringer Ingelheim KG: *See—*
Weber, Karl-Heinz; Walther, Gerhard; Schneider, Claus; Hinzen, Dieter; Kuhn, Franz J.; and Lehr, Erich, 5,149,808, Cl 544-141.000

Boehringer Mannheim Corporation: *See—*
Wu, Yih-Shiong; Bohannon, Jeanne; White, Yolanda; and Simmons, Mark J., 5,149,272, Cl. 436-97.000

Boehringer Mannheim GmbH: *See—*
Vogt, Bernd; Schellong, Liselotte; Siedel, Joachim; and Ziegenhorn, Joachim, 5,149,633, Cl. 435-25.000

Boeing Company, The: *See—*
Capps, C. David; and Falk, R. Aaron, 5,150,182, Cl. 357-30.000
Chakravorty, Kishore K.; and Tanielian, Minas H., 5,149,615, Cl. 430-313.000
Clark, Larry T., 5,149,018, Cl. 244-117.00A
Collier, Scott M., 5,149,563, Cl. 427-27.000.
Countryman, Lauren P., 5,150,317, Cl. 364-724.010
Morris, David J., 5,150,170, Cl. 356-28.500
Ralph, Harry C., 5,148,896, Cl. 188-314.000
Sakurai, Seiya; Hoener, Dieter W.; and Schweizer, Erwin V., 5,149,023, Cl. 244-229.000

Boerner, Juergen. Device for cutting fruit, vegetables or the like into slices. 5,148,731, Cl. 83-85.700

Boes, Roger T. Method of fabricating an ornamental fence post or fence column structure. 5,149,060, Cl. 256-21.000

Boge AG: *See—*
Fruhauf, Frank; Mayerbock, Wilhelm; and Quast, Jorn-Rainer, 5,149,067, Cl. 267-140.130.

Bognar, Alajos; Csepes, Gusztav; and Hamos, Istvan, to B & C Diagnostics Kft. Method and apparatus for testing the condition of insulating system. 5,150,059, Cl. 324-551.000

Bohan, William L.: *See—*
Schultz, Roger L.; Manke, Kevin R.; Skinner, Neal G.; Bohan, William L.; and Young, Allen R., 5,149,984, Cl. 290-54.000

Bohannon, Jeanne: *See—*
Wu, Yih-Shiong; Bohannon, Jeanne; White, Yolanda; and Simmons, Mark J., 5,149,272, Cl. 436-97.000

Bojar, James A.; and Shaw, Richard J., to Professional Dental Technologies, Corp. Apparatus and method for making an end brush with a male projection. 5,148,568, Cl. 15-28.000

Bol, Igor I., to Xerox Corporation. Fabrication methods for micromechanical elements. 5,149,397, Cl. 156-657.000.

Bonnardel, Patrick; Vernay, Jacques; Filiputti, Hugues; Humbert, Thierry; and Rigaud, Marcel, to Merlin Gerin. Operating mechanism of a three-position switch. 5,148,913, Cl. 200-400.000

Bonnema, Mark J.; and Morrison, David J., to Shaw-Walker Company, The. Chair base and post assembly for an office chair. 5,149,035, Cl. 248-188.700

Booda Products, Inc.: *See—*
O'Rourke, Anthony, 5,148,770, Cl. 119-29.000.

Boon, John R.: *See—*
Simpson, Sahron M.; Boon, John R.; Bucci, Marco; Bertoldi, Massimo; Soncini, Cristina; and Sakizadeh, Kumars, 5,149,620, Cl. 430-617.000

Boor, Celeste: *See—*
Boor, Mark C.; and Boor, Celest , 5,149,901, Cl. 84-327.000
Boor, Mark C.; and Boor, Celeste. Guitar support apparatus. 5,149,901, Cl. 84-327.000
Booth, Bruce L., to Du Pont de Nemours, E. I., and Company. Coupling of optical fiber to optical waveguide device. 5,150,440, Cl. 385-49.000
Borders, Richard L.; Stafford, Daniel G.; Richards, Sandy M.; and Walke, Allen L., to Hill-Rom Company, Inc. Birthing bed adjustable to Trendelenburg position. 5,148,5 2, Cl. 5-610.000.
Boren, Kelly: *See—*
Dalebout, William T.; Burk, Michael; and Boren, Kelly, 5,149,084, Cl. 482-3.000
Borgnini, Arsenio. Panel for road construction. 5,149,061, Cl. 256-24.000
Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M., and Oftebro, Reider, to Norsk Hydro A.S. Deuterated compounds. 5,149,820, Cl. 548-215.000
Bosisio, Claudio; and Campana, Antonio, to Pirelli Cavi S.p.A. Optical fiber cables and components thereof containing an homogeneous barrier composition capable of protecting optical fibers from hydrogen, and relative homogeneous barrier composition. 5,150,444, Cl 385-109.000.
Bosshart, Patrick: *See—*
Shaw, Ching-Hao; Bosshart, Patrick; Matzke, Douglas; Kalyan, Vibhu; and Houston, Theodor , 5,150,309, Cl. 364-491.000
Bossoutrot, Pierre: *See—*
Perbet, Jean-Noel; Bossoutrot, Pierre; and Geneste, Philippe, 5,150,105, Cl. 340-701.000.
Bostik, Inc.: *See—*
Epp, Edwin H.; and Dupray, Joseph W., Jr., 5,148,947, Cl. 222-146.500.
Bot, Frederick R. Sickle section blade replacement tool. 5,148,589, Cl. 29-243.540.
Botha, Jeremia J. Ratchet action open ended spanner. 5,148,725, Cl. 81-91.200.
Bottcher, Albert: *See—*
Alten, Kurt; and Bottcher, Albert, 5,148,751, Cl. 104-31.000
Bottoms, John E., Jr.; and Bottoms Veronica M. Wall-cantilevered showering apparatus. 5,148,556, Cl 4-567.000
Bottoms, Veronica M.: *See—*
Bottoms, John E., Jr.; and Bottoms, Veronica M., 5,148,556, Cl. 4-567.000
Bouchard, Christian; and Brulez, Francois, to GEC Alsthom SA Centrifuge purifier for a gas flow. 5,149,345, Cl. 55-406.000.
Boucher, Bernard J.; Dinsmore, Kerry S.; Malesky, John A.; and Brochu, Douglas A., to Digital Equipment Corporation. Component reclamation apparatus and method 5,148,969, Cl. 228-264.000
Bourque, James A.: *See—*
Langevin, Eric T.; and Bourque, James A., 5,149,401, Cl. 162-207.000.
Bousquet, Pascal-Pierre, to Adir et Compagnie. Use of baclofen for the treatment of angina pectoris. 5,149 713, Cl. 514-567.000.
Boust, Dale. Funnel-adapter for use in dispensing water and ice from a refrigerator water and ice dispenser. 5,148,842, Cl. 141-98.000.
Bouzidi, Jean-Pierre, to Alcatel Cit. Differential output stage for electronic equipment. 5,150,071, Cl. 3 0-84.000.
Bowers-Daines, Margaret M.: *See—*
Sherba, Samuel E.; Mehta, Raj J.; Bowers-Daines, Margaret M.; and Chi-Tung Hsu, Adam, 5, 49,524, Cl. 424-78.360.
Bowles Fluidics Corporation: *See—*
Stouffer, Ronald D., 5,149,263, Cl. 431-2.000
Bowling, Rod A.; and Clayton, Robert P., to Monfort Inc. Method for de-hairing animals. 5,149,295, Cl. 52-71.000.
Bowling, Roy E. Counterbore. 5,14 ,231, Cl. 408-82.000.
Bowman, Terrance L.: *See—*
Smith, Douglas D.; and Bowman, Terrance L., 5,149,988, Cl. 307-296.600.
Bradley, Brian P., to University of Maryland, The. Bioassay for environmental quality. 5,149,634, Cl. 435-29.000.
Brady, John J.: *See—*
Waidner, Robert A.; and Brady, John J., 5,149,912, Cl. 102-343.000.
Braeger, Horst H.; and Finke, Hans, to Nordischer Maschinenbau Rud. Baader GmbH+Co KG. Apparatus for severing the muscle flesh of fish. 5,149,297, Cl. 452-162.000.
Brahmbhatt, Sudhir R.; and Timberlake, George A., Jr., to MG Industries. Compact system for recovery of sterilizing gas mixtures. 5,149,500, Cl. 422-31.000.
Bran, Mario E., to Verteg, Inc. Single chamber megasonic energy cleaner. 5,148,823, Cl. 134-184.00
Brandeis University: *See—*
Perlman, Daniel, 5,149,408, Cl. 204-182.300.
Brandenburg, Ernest: *See—*
Chesnut, M. Gaines; Wood, William L.; and Brandenburg, Ernest, 5,149,898, Cl. 42-69.010.
Brandener, Louis, to Societe Jacques Dubois. Resilient anti-vibration sleeve, in particular for an exhaust coupling. 5,149,068, Cl. 267-147.000.
Braude, Irwin: *See—*
Ando, Dale G.; Levenson, Corey H.; and Braude, Irwin, 5,149,688, Cl. 514-254.000.
Brazis, William E.; and Mast, Rex R., to Rubbermaid Incorporated. Lint brush assembly. 5,148,571, Cl. 15-104.200.
Breeden, Robert L., to Motorola, Inc. Selective call communication system with remotely generated repeat messages. 5,150,110, Cl. 340-825.440
Breitenberger, Konrad: *See—*
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Brennan, George A., to Rexworks, Inc. Truck mixer mounting frame. 5,149,126, Cl. 280-704.000.
Brenner, Karl; Ruppel, Wilhelm; Woerz, Otto; Halbritter, Klaus; Scheiper, Hans-Juergen; Aquila, Werner; and Fuchs, Hartwig, to BASF Aktiengesellschaft. Tube bundle reactor, use thereof in exothermic organic reactions, and preparation of ketones and aldehydes using same. 5,149,884, Cl. 568-471.000.
Bressan, Giancarlo; Troglia, Claudio; Brichta, Corrado; and Barbero, Giancarlo, to Enimont Augusta Industriale S.R.L. Self-extinguishing polymeric compositions. 5,149,735, Cl. 524-450.000.
Brewer, Melvin L.: *See—*
Wills, Kendall S.; Rodriguez, Paul A.; and Brewer, Melvin L., 5,149,675, Cl. 437-248.000.
Brewster, Blair M. Sealed tag. 5,148,618, Cl. 40-626.000.
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Bressan, Giancarlo; Troglia, Claudio; Brichta, Corrado; and Barbero, Giancarlo, 5,149,735, Cl. 524-450.000.
Bridgestone Flowtech Corporation: *See—*
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,149,145, Cl. 285-101.000.
Brierley, Philip R., to Nicolet Instrument Corporation. Interferometer spectrometer having tiltable reflector assembly and reflector assembly therefor. 5,150,172, Cl. 356-346.000.
Bright, Michael W., to Motorola, Inc. Key distribution communication system. 5,150,408, Cl. 380-21.000.
Brightbill, Jerry R., to Kendall Company, The. Catheter convertible from single to multilumen. 5,149,330, Cl. 604-280.000.
Briles, Owen M.: *See—*
Okey, David W.; Briles, Owen M.; and Carriglitto, Francis T., 5,149,483, Cl. 264-272.190.
British-American Tobacco Company Limited: *See—*
Klammer, Barbara C.; and Prowse, Roy L., 5,148,820, Cl. 131-311.000.
British Broadcasting Corporation: *See—*
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British Petroleum Company p.l.c., The: *See—*
Kitson, Melanie; and Williams, Peter S., 5,149,680, Cl. 502-185.000.
Britton, Douglas. Spinal restraint device. 5,148,815, Cl. 128-869.000
Broadband Technologies, Inc.: *See—*
Sharpe, Randall B.; Jones, J. Richard; O'Shea, Thomas E.; Casper, Paul W.; Toy, James W.; Evans, Gregory M.; and Sears, Richard N., 5,150,247, Cl. 359-135.000.
Brochu, Douglas A.: *See—*
Boucher, Bernard J.; Dinsmore, Kerry S.; Malesky, John A.; and Brochu, Douglas A., 5,148,969, Cl. 228-264.000.
Brockbank, Kelvin G. M.: *See—*
McNally, Robert T.; McCaa, Cameron; Brockbank, Kelvin G. M.; Heacox, Albert E.; and Bank, Harvey L., 5,149,621, Cl 435-1.000.
Brockhurst, John V., to JVB Development, Inc. Method of, and apparatus for, killing marine life in and about the cooling system of a marine vehicle. 5,148,777, Cl. 123-41.150.
Brooks, Jerry M.; and Huang, Chender, to Micron Technology, Inc. Anti-bow zip lead frame design. 5,150,194, Cl. 357-70.000.
Brooktree Corporation: *See—*
Colles, Joseph H., 5,150,077, Cl. 331-1.00A.
Brother Kogyo Kabushiki Kaisha: *See—*
Kuwabara, Satoru, 5,150,154, Cl. 355-208.000.
Murakami, Atsushi, 5,149,212, Cl. 400-121.000
Yamane, Mitsuo; and Kawaguchi, Takashi, 5,149,548, Cl 425-174.400
Yoshida, Hitoshi; and Yokoi, Katsuhiko, 5,149,213, Cl. 400-124.000.
Yoshida, Hitoshi; Kawamoto, Naoyuki; Kanegae, Takahiro; and Aoki, Kazuma, 5,150,431, Cl. 382-56.000
Brotz, Gregory R. Pulse thruster. 5,148,672, Cl. 60-200.100.
Brown, Alison M.: *See—*
Heyes, Peter J.; Middleton, Nicholas J.; and Brown, Alison M., 5,149,389, Cl. 156-272.400.
Brown, Clem H., to Motorola, Inc. Optocoupler apparatus with reflective overcoat. 5,150,438, Cl. 385-14.000.
Brown, James E., to Miles, Inc. Immunoassay for cell proteins. 5,149,627, Cl. 435-7.100.
Brown, John J., to Washington State University Research Foundation. Domestic water tester. 5,148,701, Cl. 73-61.410.
Brown, Marvin A.; Wolfe, Gerald D.; and Beverly, Richard P., to F.B. Leopold Company, Inc., The. Cap for underdrains in gravity filters. 5,149,427, Cl. 210-274.000.
Brown, Steve K.; Dixon, Larry D.; and Moses, Samuel J., to B&W Nuclear Service Company. Method and apparatus for replacing a nozzle. 5,149,490, Cl. 376-260.000.
Brown, William E.; Clemens, John M.; Devereaux, Sharon M.; Hofler, John G.; Knigge, Kevin M.; and Safford, Sarah E., to Abbott Laboratories. Solid phase analytical device and method for using same. 5,149,622, Cl. 435-5.000.
Browning: *See—*
Badali, Joseph A., 5,148,619, Cl. 42-16.000.
Broxmeyer, Hal E.: *See—*
Gentile, Patrick S.; Mantel, Charlie R.; and Broxmeyer, Hal E., 5,149,544, Cl. 424-577.000.
Bruce, Douglas L.: *See—*
Yu, Ho; Bruce, Douglas L.; Stiffler, Richard C.; Leon, David D.; and Glogowski, Francis J., 5,148,853, Cl. 164-455.000.

Bruchmann, Bernd, to BASF Aktiengesellschaft. Process for the preparation of uretdione group containing polyisocyanates. 5,149,766, Cl. 528-49.000
Brueton, Stephen J., to Honeywell Limited-Honeywell Limitee. Setup-setback thermostat having a simple setup-setback visual indicator 5,148,979, Cl. 236-94.000
Bruker Analytische MeBtechnik GmbH: *See—*
Dupree, Raymond, 5,150,054, Cl. 324-318.000.
Brulez, Francois: *See—*
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Brunell, Phillip A., to Cedars Sinai Medical Center. Method of vaccine or toxoid preparation and immunization by colonization with recombinant microorganisms. 5,149,532, Cl. 424-89.000.
Bruning, Gert W.; Casey, Leo F.; Veldman, Paul R.; and Vegter, Klaus, to North American Philips Corporation. Gas discharge lamp with grid and control circuits therefor. 5,150,018, Cl. 315-349.000.
Brunker, David L.; Crane, Burke J.; and Lopata, John E., to Molex Incorporated. Hybrid shielded cable. 5,149,915, Cl. 174-36.000
Brunn, Erik. Curved escalator. 5,148,906, Cl. 198-328.000.
Brunner, Erwin: *See—*
Merger, Franz; Hettinger, Peter; Hupfer, Leopold; Paetsch, Juergen; Deck, Heribert; Auer, Heinz; and Brunner, Erwin, 5,149,861, Cl. 560-234.000
Bruns, Norbert A.; Fussner, Richard F.; and Reynolds, John S., to Lehr Precision Inc. Four-axis ECM machine and method of operation 5,149,405, Cl. 204-129.100.
Bryan, Philip S.: *See—*
Van Slyke, Steven A.; Bryan, Philip S.; and Lovecchio, Frank V 5,150,006, Cl. 313-504.000
Bryson, John D., Jr.; and Kopp, Robert G., to Vaportek, Inc. Device for dispensing a vaporizable material. 5,148,984, Cl. 239-58.000.
Bucalo, Brian D. Biopsy instrument with tissue specimen retaining and retrieval device. 5,148,813, Cl. 128-754.000
Bucci, Marco: *See—*
Simpson, Sahron M.; Boon, John R.; Bucci, Marco; Bertoldi, Massimo; Soncini, Cristina; and Sakizadeh, Kumars, 5,149,620, Cl. 430-617.000
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Merzhanov, Alexandr G.; Stolin, Alexandr M.; Buchatsky, Leonid M.; and Vedeneev, Sergei V., 5,149,677, Cl. 501-96.000
Buck, Bruce, to Buck, Virgil J. Firearm support with seat. 5,149,900, Cl 42-94.000
Buck, Virgil J.: *See—*
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Budert, Gunter H.; Platte, Willi; Riess, Gerhard; Rau, Georg; and Hitzler, Werner, to Georg Knoblauch, Firma. Box for display and storage of elongated objects. 5,148,914, Cl. 206-1.500.
Buecken, Hans-Juergen: *See—*
Hemel, Richard; Herold, Julius; Buecken, Hans-Juergen; and Hofmann, Peter, 5,149,742, Cl. 525-124.000.
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Garratt, John D.; Scott, Paul J.; and Buehring, Ian K., 5,150,314 Cl. 364-571.020.
Buhler, Steven A.: *See—*
Abramov, Igor; Buhler, Steven A.; and Mazdiyasni, Parviz P 5,150,371, Cl. 372-34.000
Bujese, David P., to Olin Corporation. Color printing apparatus and process using first and second transfer surfaces. 5,150,161. Cl 355-256.000.
Bull, David N.: *See—*
Ozimek, Edward J.; Carnall, Edward, Jr.; and Bull, David N 5,149,935, Cl. 219-121.650.
Bull HN Information Systems Inc.: *See—*
Barlow, George J.; and Smith, Donald L., 5,150,466, Cl 395-325.000.
Staplin, Deborah K.; and Shen, Jian-Kuo, 5,150,468, Cl 395-375.000.
Bull S.A.: *See—*
Neu, Georges, 5,149,994, Cl. 307-491.000
Pitta, Philippe, 5,149,275, Cl. 439-98.000
Bullock, Norma K.; and Petersen, Ralph A., to Globe-Union Inc. Method of treating a battery electrode with persulfate. 5,149,606. Cl 429-228.000
Bullock, Wesley P., to W. R. Grace & Co.-Conn. Parallel path catalytic converter. 5,149,508, Cl. 422-174.000.
Burk, Michael: *See—*
Dalebout, William T.; Burk, Michael; and Boren, Kelly, 5,149,084. Cl. 482-3.000
Burke, Rae L.: *See—*
Ho, Rodney; Merigan, Thomas; Burke, Rae L.; and Dina, Dino 5,149,529, Cl. 424-88.000.
Burkeen, Darrell L.: *See—*
Kupcikevicius, Vytautas; Cilia, Philip F.; and Burkeen, Darrell L., 5,149,943, Cl. 219-243.000.
Burkhard, Wolfgang; and Danzeisen, Klaus, to Rohde & Schwarz GmbH & Co. KG. Bridge for measuring the reflection coefficient. 5,150,063, Cl. 324-646.000
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Burling, Hans, to Svenska Mejerierna Riksforenings Ekonomi-Aktiebolag. Process for extracting pure fractions of lactoperoxidase and lactoferrin from milk serum. 5,149,647, Cl. 435-192.000.
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Leis, Paul D., Jr.; Burns, Larry E.; and Hafer, Karen R., 5,149,541 Cl. 424-489.000
Burton, Scott A.: *See—*
Ferber, Richard H.; and Burton, Scott A., 5,149,719, Cl 514-772.000
Burzler, Donald R. Extremity support apparatus. 5,149,033. Cl 248-176.000.
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Bush, Kenneth L.; Perry, Ralph S.; Grieff, Thomas W.; and Scholhamer, George J., to Compaq Computer Corporation. Mode-selectable integrated disk drive for computer. 5,150,465, Cl. 395-275.000
Butel, Pascal; Dahiot, Alain; and Ferrier, Joel, to U.S. Philips Corporation. Programmable digital signal delay device and its use for a error correction code device. 5,150,066, Cl. 328-55.000
Butler, Donald E.; Deering, Carl F.; Millar, Alan; Nanninga, Thomas N.; and Roth, Bruce D., to Warner-Lambert Company Process for trans-6-[2-(substituted-pyrrol-1-yl)alkyl]pyran-2-one inhibitors of cholesterol synthesis. 5,149,837, Cl. 549-333.000
Buxbaum, Robert E.; and Hsu, Peter C., to Board of Trustees, operating Michigan State University. Method for plating palladium. 5,149,420, Cl. 205-219.000.
Buysch, Hans-Josef: *See—*
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Byers, Robert W.: *See—*
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Byford, Ivan W.: *See—*
Eastin, Steven M.; and Byford, Ivan W., 5,150,041, Cl. 324-158.00F
Byrnes, Herbert P.; and Wahl, Richard, to International Business Machines Corporation. Dual-mode Z-stage. 5,150,040, Cl. 324-158.00F.
Byron, David L., to Bausch & Lomb Incorporated. Lens edging system with programmable feed and speed control. 5,148,637, Cl. 51-165.710.
Caeti, Ben J.; Raybary, Paul; and Grinshpon, Boris, to Arrow Lock Manufacturing Company. Lever handle lock assembly. 5,149,155. Cl 292-336.300.
Cagle, Gerald D.; McDonald, Thomas O.; and Rosenthal, Allan L., to Alcon Laboratories, Inc. Combination of tobramycin and fluorometholone for topical ophthalmic use. 5,149,693, Cl. 514-40.000
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Cahill, Stephen V., to Motorola, Inc. Carrier recovery method and apparatus having an adjustable response time determined by carrier signal parameters. 5,150,384, Cl. 375-97.000.
Cain, Christopher B.: *See—*
McAuliffe, Robert E.; Cain, Christopher B.; and Siefers, John E 5,150,048, Cl. 324-158.00R
Cain, Earl S.; and Carlson, Jerome A., to Tribotech. Wedge bonding tool. 5,148,959, Cl. 228-4.500
Cain, Merrie. Peel-off puzzle. 5,149,570, Cl. 428-33.000
Calaresu, Paolo: *See—*
Messina, Giuseppe; Lorenzoni, Loreno; Calaresu, Paolo; and Sechi, Giovanni M., 5,149,872, Cl. 564-151.000
Calgon Carbon Corporation: *See—*
Mestemaker, Jerald L.; and Anderson, Clyde G., 5,149,342. Cl 55-59.000
California Institute of Technology: *See—*
Collins, Earl R., Jr., 5,149,339, Cl. 55-6.000.
Camaggi, Giovanni; Meazza, Giovanni; and Preziuso, Ciro, to Agrimont S.p.A. Derivatives from 3,4-dehydro-piperidin-5-one exhibiting a herbicidal activity. 5,149,359, Cl. 71-94.000
Camco International Inc.: *See—*
Willis, Jurgen A.; and Metzger, Mark A., 5,148,864, Cl. 166-65.100
Camitz, Peter; and Gadelius, Ichi S., to Proclino Golv AB. Method and apparatus for handling floor coverings. 5,148,592, Cl. 29-426.400
Campana, Antonio: *See—*
Bosisio, Claudio; and Campana, Antonio, 5,150,444, Cl 385-109.000
Canada, Her Majesty the Queen in right of, as represented by the Minister of Communications: *See—*
Hill, Kenneth O.; Bilodeau, Francois; Malo, Bernard; and Johnson Derwyn C., 5,150,439, Cl. 385-39.000.
Candat, Pierre, to L'Oreal. Valve for an aerosol can having a seated valve that remains closed during an underpressure condition of the can. 5,148,952, Cl. 222-402.220.
Candelet, Ronald J.: *See—*
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Candelora, Andrew M.: *See—*
Hart, Marshall B.; Lesslie, David J.; Candelora, Andrew M.; and Guerrette, Michael C., 5,150,091, Cl. 335-202.000
Canon Kabushiki Kaisha: *See—*
Asai, Jun, 5,150,165, Cl. 355-274.000.
Chigira, Tatsuo, 5,150,260, Cl. 359-694.000.
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; and Uzawa, Shunichi, 5,150,391, Cl. 378-34.000.
Enomoto, Takashi; Yoshioka, Toshifumi; and Nishida, Naoya, 5,150,233, Cl. 359-54.000.
Fukushima, Nobuo, 5,150,219, Cl. 358-335.000.
Hara, Toshitami; Tsuda, Hisanori; and Hirasawa, Shinichi, 5,150,129, Cl. 346-1.100.

Hirabayashi, Hiromitsu; Kusaki, Kensaku; Arai, Atsushi; and Takayanagi, Yoshiaki, 5,149,941, Cl. 219-216.000
Hoshi, Hidenori; Fukuzawa, Kenichi; and Ishii, Yoshiki, 5,150,210, Cl. 358-135.000
Isobe, Kazuhito; and Hirano, Reiji, 5,150,173, Cl. 356-401.000
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Ito, Noriaki; and Hiramatsu, Soichi, 5,150,030, Cl. 318-811.000
Iwamoto, Hirofumi; Tajima, Hisao; Uehara, Makoto; Onitsuka, Yoshihiro; Miyamoto, Takao; Takabayashi, Hiroshi; and Yoshihara, Satoshi, 5,150,231, Cl. 359-44.000
Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, 5,149,610, Cl. 430-106.000
Kurihara, Hideo, 5,150,352, Cl. 369-258.000
Matsuyama, Jinsho, 5,149,375, Cl. 118-719.000
Mochizuki, Noritaka; and Ebinuma, Ryuichi, 5,150,151, Cl. 355-53.000
Nemura, Masaharu; Aoki, Tomohiro; Kobayashi, Tohru; Ikkatai, Masatoshi; Murayama, Yasushi; Uchida, Takashi; and Mitomi, Tatsuo, 5,149,049, Cl. 248-674.000
Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Tohshihiko; Oguchi, Takahiro; and Yamano, Akihiko, 5,150,035, Cl. 324-71.100
Oguchi, Takahiro; and Ohzu, Hiroyao, 5,149,989, Cl. 307-311.000
Onodera, Ken; and Saito, Shunji, 5,150,460, Cl. 395-151.000
Sakai, Kiyoshi; Sakakibara, Teigo; Sakou, Harumi; and Amamiya, Shoji, 5,148,639, Cl. 51-328.000
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Shikichi, Satoshi; and Kanda, Shigeto, 5,150,345, Cl. 369-44.340
Shimomura, Masako; Noguchi, Hiromichi; and Shimomura, Akihiko, 5,150,132, Cl. 346-140.00R
Shirai, Takahiro; Yoshinari, Tsuneori; and Muto, Kazuhiko, 5,150,189, Cl. 357-53.000
Takeda, Shinichi; and Yamanobe, Masato, 5,150,181, Cl. 357-30.000
Tomita, Yasuo; Oda, Hitoshi; and Okuda, Masahiro, 5,150,251, Cl. 359-246.000
Watanabe, Yasuyuki; Shimamune, Masayuki; and Suzuki, Masaaki, 5,150,239, Cl. 359-80.000
Yamamoto, Shinji, 5,149,080, Cl. 271-265.000
Yamazaki, Yasuyuki, 5,150,204, Cl. 358-44.000

Cantor, Harvey I.; Patarca, Roberto; and Freeman, Gordon J., to Dana-Farber Cancer Institute. Proteins which regulate gene expression of the interleukin-2 receptor and of human lymphotropic retroviruses. 5,149,785, Cl. 530-350.000

Cappi, Angelo; and Rimondi, Renato, to A.W.A.X. Progettazione E Ricerca S.R.L. Die cutting and welding device for an on-demand bag forming machine incorporated in a checkout counter. 5,149,316, Cl. 493-194.000

Capps, C. David; and Falk, R. Aaron, to Boeing Company, The. Semiconductor device enhanced for optical interaction. 5,150,182, Cl. 357-30.000

Carefree/Scott Fetzer Company: *See*—
Faludy, Thomas G., 5,148,849, Cl. 160-67.000
Murray, Brent W.; and Faludy, Thomas G., 5,148,848, Cl. 160-67.000.

Cares, George, to Sheldon Company. Shielded inflatable side bags for shirt presser bag assembly. 5,148,955, Cl. 223-70.000

Carlson, James R.; Mertens, Steve C.; and Yee, Joann L., to Virotest, Inc. Rapid, easy, and economical screening test for antibodies to human immunodeficiency virus. 5,149,623, Cl. 435-5.000.

Carlson, Jerome A.: *See*—
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Ozimek, Edward J.; Carnall, Edward, Jr.; and Bull, David N., 5,149,935, Cl. 219-121.650

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Carriglitto, Francis T.: *See*—
Okey, David W.; Briles, Owen M.; and Carriglitto, Francis T., 5,149,483, Cl. 264-272.190.

Caryk, Paul J.: *See*—
Taylor, John A.; and Caryk, Paul J., 5,149,341, Cl. 55-36.000.

Casey, Brendan C.; and Gary, William L., to Xerox Corporation Current sensing development control system for an ionographic printing machine. 5,150,135, Cl. 346-159.000

Casey, Leo F.: *See*—
Bruning, Gert W.; Casey, Leo F.; Veldman, Paul R.; and Vegter, Klaus, 5,150,018, Cl. 315-340.000

Casio Computer Co., Ltd.: *See*—
Kamiya, Yukio; Watanabe, Touru; and Hayashi, Ryutaroh, 5,149,904, Cl. 84-723.000
Nakanishi, Hiroaki, 5,149,604, Cl. 429-97.000.

Casper, Paul W.: *See*—
Sharpe, Randall B.; Jones, J. Richard; O'Shea, Thomas E.; Casper, Paul W.; Toy, James W.; Evans, Gregory M.; and Sears, Richard N., 5,150,247, Cl. 359-135.000.

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Cass, William: *See*—
McCourt, Carroll T.; Emerna, Charles J.; Laurence, Douglas S.; Eckhart, Roy A.; and Cass, William, 5,150,307, Cl. 364-478.000.

Cassaday, Michael M.; Christiano, Vito F.; and Vasudeva, Bachalli, to Technicon Instruments Corporation. Method for the separation and/or formation of immiscible liquid streams. 5,149,658, Cl. 436-53.000

Cassano, James R.: *See*—
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; Lockwood, Dan F.; Swanson, Roger M.; and Tanniscoli, Robert J., 5,150,163, Cl. 355-271.000

Cassar, Aladino: *See*—
Smith, Derrell; and Cassar, Aladino, 5,149,050, Cl. 248-679.000

Cassese Society: *See*—
Rapayelian, Christian, 5,149,236, Cl. 411-439.000.

Castel, Yvon; Lynch, John; and Burzynski, Jean-Pierre, to Institut Francais Du Petrole. Method and device for measuring the qualities of a multiphase fluid. 5,150,061, Cl. 324-640.000.

Castelaz, Patrick F., to Hughes Aircraft Company. Adaptive network for in-band signal separation. 5,150,323, Cl. 364-807.000.

Castile, Brett D.: *See*—
Sullivan, Shelby F.; Gordon, Frank E.; and Castile, Brett D., 5,150,336, Cl. 367-103.000

Castillo, Sergio A., Jr.: *See*—
Taeuber, Ralph, Jr.; Castillo, Sergio A., Jr.; and Ungchusri, Tep, 5,149,148, Cl. 285-276.000.

Castle, Charles D.: *See*—
Castle, Robert L., 5,149,411, Cl. 204-237.000

Castle, Richard: *See*—
Castle, Robert L., 5,149,411, Cl. 204-237.000

Castle, Robert L., to Castle, Robert L.; Castle, Richard; and Castle, Charles D. Toxic fumes removal apparatus for plating tank 5,149,411, Cl. 204-237.000

Castor, David A.: *See*—
Alligood, John H.; Minnick, John H.; and Castor, David A., 5,150,149, Cl. 354-441.000

Catanzaro, John C.; and Sparer, Ronald M., to Cincinnati Milacron Inc Clamp force control. 5,149,471, Cl. 264-40.500.

Caterpillar Inc.: *See*—
Bitar, Ali A., 5,150,060, Cl. 324-635.000

Cavani, Fabrizio: *See*—
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Cawelti, Dale W.: *See*—
Gabaldon, John B.; Evans, Daniel D., Jr.; and Cawelti, Dale W., 5,148,967, Cl. 228-179.000

Cecchini, Warren, to American Auto-Matrix, Inc. Fiber optic interface 5,150,244, Cl. 359-113.000.

Cecili, Federico: *See*—
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Cedars Sinai Medical Center: *See*—
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Langlois, Edouard E.; Kehoe, Kathryn T.; Smith, Warren R.; Muscato, Mark; Ceglinski, Barbara D.; Kirchoff, Alan C.; Dunham, Robert F.; and Stair, Michael D., 5,149,612, Cl. 430-132.000

Celeste Industries Corporation: *See*—
Granville, Richard C.; Mourlas, James C.; and Patrick, Michael K., 5,148,948, Cl. 222-173.000.

Celotex Corporation, The: *See*—
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Central Glass Company, Limited: *See*—
Hakuta, Kohzo; Aramaki, Minoru; Suen. A, Takashi; Kodama, Mitsuo; Nakano, Hisaji; and Nakagawa, Shinsuke, 5,149,659, Cl. 436-55.000

Central Research Institute of Electric Power Industry: *See*—
Wada, Takahiro; Suzuki, Nobuo; Ichinose, Ataru; Yaegashi, Yuji; Yamauchi, Hisao; and Tanaka, Shoji, 5,149,683, Cl. 505-1.000.

Centre de Recherche Industrielle du Quebec: *See*—
Ledinh, Chon T.; and Huynh, Huu L., 5,150,202, Cl. 358-31.000.

Centre International de Recherches Dermatologiques Galderma (CIRD Galderma): *See*—
Shroot, Braham; and Darmon, Michel, 5,149,631, Cl. 435-7.210.

Centre National de la Recherche Scientifique (CNRS): *See*—
Jerome, Denis; Tevanian, Georges; Batail, Patrick; and Fourmigue, Marc, 5,149,946, Cl. 235-439.000

Cetus Corporation: *See*—
Ando, Dale G.; Levenson, Corey H.; and Braude, Irwin, 5,149,688, Cl. 514-254.000

CGC Inc.: *See*—
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Chae, Jong E.: *See*—
Lee, Young H.; Baek, Young S.; Lee, Seok G.; Lee, Kun W.; Chae, Jong E.; and Lee, Hyun T., 5,150,405, Cl. 379-230.000

Chaffin, Joel S.: *See*—
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Chafin, Andrew P.: *See*—
Christian, Stephen L.; Chafin, Andrew P.; Nielsen, Arnold T.; Atkins, Ronald L.; Norris, William P.; and Hollins, Richard A., 5,149,818, Cl. 548-126.000

Chai, Sang H.; Koo, Yong S.; Kim, Kwang S.; and Nam, Kee S., to Korean Electronics and Telecommunications. Method for manufacturing a Bi-CMOS semiconductor device. 5,149,663, Cl. 437-31.000.

Chakravorty, Kishore K.; and Tanielian, Minas H., to Boeing Company, The. Method for producing a planar surface on which a conductive layer can be applied. 5,149,615, Cl. 430-313.000.

Champion, Nancy: *See*—
Varnam, O'Neal, 5,149,443, Cl. 210-739.000.

Chan, Steve S. C. Secured data storage devices. 5,150,407, Cl. 380-4.000.

Chandler, Paul E.: *See*—
Maslak, Samuel H.; Larsen, Hugh G.; Chaffin, Joel S.; Chandler, Paul E.; Galton, Ian A.; and Karmali, Mehebub S., 5,148,810, Cl. 128-661.010

Chandraratna, Roshantha A. S., to Allergan, Inc. Acetylenes disubstituted with a heteroaromatic group and a tetralin group and having retinoid like activity. 5,149,705, Cl. 514-356.000

Chang, C. F.: *See*—
Chen, Sam H. S.; and Chang, C. F., 5,149,090, Cl. 273-73.00D

Chang, Chin-Fong: *See*—
Das, Santosh K.; Chang, Chin-Fong; and Raybould, Derek, 5,149,496, Cl. 419-17.000

Chang, David B.: *See*—
Pierce, Brian M.; Lawrence, George D.; Chang, David B.; and Arenberg, Jonathan W., 5,149,957, Cl. 250-211.00R

Chang, Pairoj: *See*—
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Chang, Sheng-Huei: *See*—
Collins, William E.; Chang, Sheng-Huei; and Westfield, Mark J., 5,149,959, Cl. 250-226.000

Chang, Tse-wen; deVilliers, Jean; and Gordon, Wayne, to Tanox Biosystems, Inc. Molecular conjugates containing cell membrane-blending agents. 5,149,782, Cl. 530-326.000

Chang, Wei-Min; and Anderson, Bror, to Mallace Industries Corporation. Dual purpose stencil-forming sheet containing a red pigment. 5,149,577, Cl. 428-207.000

Charash, Ruth A., to Charash, Ruth A. Ergonomic stand. 5,149,174, Cl. 297-423.000

Charbonnel, Pierre; and Thepaut, Bernard, to L'Etat Francais represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications-CNET); and Telediffusion de France. Method and system for multiplexing audio and video signals to distribute still pictures with accompanying sound. 5,150,211, Cl. 358-143.000

Charles Machine Works, Inc., The: *See*—
Lee, Douglas W.; Deken, Arthur D.; Franklin, James E.; and Dunn, Richard P., 5,148,880, Cl. 175-393.000

Cheetham, Anthony K.: *See*—
Green, Malcolm L. H.; Cheetham, Anthony K.; and Vernon, Patrick D. F., 5,149,464, Cl. 252-373.000

Chembiomed, Ltd. *See*—
Mazid, M. Abdul, 5,149,425, Cl. 210-198.200

Chen, Clay T.; and Chen, Mary S., to Hatco Corporation. Crystallization of water-insoluble dicarboxylic acid. 5,149,867, Cl. 562-486.000

Chen, Gao-Yuan: *See*—
Cuculo, John A.; Tucker, Paul A.; Chen, Gao-Yuan; and Lundberg, Ferdinand, 5,149,480, Cl. 264-178.00F

Chen, Liang-Yuh: *See*—
MacDonald, Noel C.; Chen, Liang-Yuh; and Zhang, Zuoying L., 5,149,673, Cl. 437-192.000

Chen, Mary S.: *See*—
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Chen, Robert Y.: *See*—
Martin, Gregory J.; Chen, Robert Y.; Cook, John F.; and Mason, James A., 5,150,425, Cl. 382-14.000

Chen, Sam H. S.; and Chang, C. F. Vibration damping device for sports racquet. 5,149,090, Cl. 273-73.00D

Chen, Shieh-Shung T.: *See*—
Shafiee, Ali; Kaplan, Louis; Chen, Shieh-Shung T.; Arison, Byron H.; Colwell, Lawrence F., Jr.; and Dumont, Francis, 5,149,701, Cl. 514-291.000

Chen, Tzu H.; and Kumar, Mahesh, to Siemens Aktiengesellschaft. Digitally controlled monolithic switch matrix using selectable dual gate FET power dividers and combiners. 5,150,083, Cl. 333-103.000

Chen, Yehuda Y.; and Siev, Aharon, to Advanced Robotics (A.R.L.) Ltd. Precision measuring apparatus. 5,148,600, Cl. 33-1.00M

Cheney, Paul S., II: *See*—
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Cheng, Li-Jen: *See*—
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Cheng, Paul G.: *See*—
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,149,760, Cl. 528-353.000
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,149,772, Cl. 528-353.000

Chesnut, M. Gaines; Wood, William L.; and Brandenburg, Ernest, to Ram-Line, Inc. Fire control assembly. 5,149,898, Cl. 42-69.010

Chevron Research Company: *See*—
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Holtermann, Dennis L.; and Innes, Robert A., 5,149,894, Cl. 585-467.000

Chezak, Norman A. Powder drum. 5,148,941, Cl. 220-408.000

Chi-Tung Hsu, Adam: *See*—
Sherba, Samuel E.; Mehta, Raj J.; Bowers-Daines, Margaret M.; and Chi-Tung Hsu, Adam, 5,149,524, Cl. 424-78.360

Chiang, John S. C.; and Nicholson, Charles J., to FMC Corporation. Oxygen gas diffusion electrode. 5,149,414, Cl. 204-294.000

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Behm, Jason L.; and Chiang, Wei-Hwan, 5,150,457, Cl. 395-120.000

Chiba, Hirotaka: *See*—
Yoshida, Shigeru; Okada, Yoshiyuki; Nakano, Yasuhiko; and Chiba, Hirotaka, 5,150,119, Cl. 341-51.000

Chiba, Seishi: *See*—
Okutomi, Tsutomu; Yamamoto, Atsushi; Chiba, Seishi; Seki, Tsuneyo; Okawa, Mikio; Honma, Mitsutaka; Otobe, Kiyofumi; Satoh, Yoshinari; and Sekiguchi, Tadaaki, 5,149,362, Cl. 75-240.000

Chigira, Tatsuo, to Canon Kabushiki Kaisha. Optical apparatus 5,150,260, Cl. 359-694.000

Chikamori, Yoshihiro: *See*—
Fukui, Yasuhiro; Mitsui, Kazuyuki; Kato, Hiroshi; and Chikamori, Yoshihiro, 5,148,806, Cl. 128-639.000

Chiles, Marion M.: *See*—
McElhaney, Stephanie A.; Bauer, Martin L.; and Chiles, Marion M., 5,149,971, Cl. 250-361.00R

Chino, Shinji: *See*—
Matsuo, Shigeru; Murakami, Shigeru; Chino, Shinji; Higuchi, Hiroyuki; and Hayashi, Mikiya, 5,149,581, Cl. 428-224.000

Chiou, Huh-Sun; Rubino, Mark R.; Jahoda, Susan W., Lindley, Daniel, and Battler, John R., to Hoechst Celanese Corporation. Process for the preparation of omega-arylalkanoic acids. 5,149,866, Cl. 562-478.000

Chiparvestors, Inc.: *See*—
Robison, Milan W., 5,148,844, Cl. 144-208.00J

Chips International, Inc.: *See*—
Ashby, James C., III; Burkhart, Clark; Favors, Frankie B.; Tiemann, Roy G.; Vandaveer, Robert L.; and Krause, Lothar A., Jr., 5,150,401, Cl. 380-29.000

Chiron Corporation: *See*—
Ramirez, Victor D.; and Marcus, Frank, 5,149,786, Cl. 530-350.000

Chisholm, Thomas J., to Computer Identics. Improved bar code reader system for reading bar codes under high specular reflection conditions with a variety of surface effects. 5,149,948, Cl. 235-462.000

Chisso Corporation: *See*—
Murata, Shizuo; and Nakayama, Minoru, 5,149,771, Cl. 528-353.000
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi, Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,149,461, Cl. 252-299.610
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi, and Sawai, Toshiya, 5,149,839, Cl. 556-413.000

Chiu, Ran-Fun: *See*—
Baugh, Richard A.; Chiu, Ran-Fun; Hart, Darlene L., Jam, Merhan; and Leung, Sui-hing, 5,150,379, Cl. 375-14.000

Chlean Plants & Engineering Establishment: *See*—
Kaiblinger, Heinz J., 5,149,983, Cl. 250-575.000

Choi, Jeongdal, to Samsung Electronics Co., Ltd. Mask ROM device having double polycrystalline silicone and process for producing the same. 5,149,667, Cl. 437-52.000

Choji, Shinichiro: *See*—
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko, and Shigeta, Teruaki, 5,149,186, Cl. 362-75.000

Cholinski, Andrzej: *See*—
Vertesy, Josef, and Cholinski, Andrzej, 5,148,893, Cl. 187-20.000

Chopin, Thierry; and Fourre, Patrick, to Rhone-Poulenc Chimie. Preparation of sulfur-free titanium dioxide 5,149,519, Cl. 423-610.000

Chorev, Michael; and Roubini, Eli, to Merck & Co., Inc. Humoral hypercalcemic factor antagonists. 5,149,779, Cl. 530-317.000

Chow, Marie: *See*—
Cohen, Smadar; Bano, Carmen; Visscher, Karyn B.; Chow, Marie, Allcock, Harry R.; and Langer, Robert S., 5,149,543, Cl. 424-499.000

Christian, J. B. Method and apparatus for perforating tubing 5,148,868, Cl. 166-297.000

Christian, Stephen L.; Chafin, Andrew P.; Nielsen, Arnold T., Atkins, Ronald L.; Norris, William P., and Hollins, Richard A., to United States of America, Navy. Synthesis of aminonitrobenzodifuroxan. 5,149,818, Cl. 548-126.000

Christiano, Vito F.: *See*—
Cassaday, Michael M.; Christiano, Vito F.; and Vasudeva, Bachalli, 5,149,658, Cl. 436-53.000

Christy, Kenneth G., Jr.: *See*—
Osterhoudt, Hans W., Ponticello, Ignazio S.; Christy, Kenneth G., Jr.; and LaTart, David B., 5,149,416, Cl. 204-299.00R

Chrysler Corporation: *See*—
Mehta, Hemang S., 5,148,722, Cl. 74-866.000

Chu, Alexander H. T., to Abbott Laboratories. Process for making vancomycin. 5,149,784, Cl. 530-344.000

Chu, Ke-Chiang, to Leland Stanford Junior University, The Board of Trustees of the. Lossless data compression circuit and method 5,150,430, Cl. 382-56.000

Chubu Electric Power Company, Inc.: *See*—
Kato, Masami; Tanaka, Tadashi; Nakamura, Satoshi, Higashi, Tsuneo; Fujike, Hiroshi; Makino, Katsuaki; and Miyamoto, Hiroshi, 5,148,857, Cl. 165-1.000

Chung, Harvey H.: *See*—
Liu, Sung-Tsuen; and Chung, Harvey H., 5,149,368, Cl. 424-602.000

Chung, In S.: *See*—
Kim, Jae K.; and Chung, In S., 5,149,676, Cl. 437-228.000

Church, George M.; and Kieffer-Higgins, Stephen, to President and Fellows of Harvard College. Multiplex analysis of DNA. 5,149,625, Cl. 435-6.000

Ciba-Geigy AG: *See*—
Rody, Jean; and Leppard, David G., 5,149,828, Cl. 549-13.000

Ciba-Geigy Corporation: *See*—
Munk, Kurt; and Roth, Martin, 5,149,767, Cl. 528-71.000
Patel, Ambelal R.; and Pastor, Stephen D., 5,149,774, Cl. 528-492.000
Schaffner, Werner, 5,149,841, Cl. 549-520.000
Tzikas, Athanassios; and Lauk, Urs, 5,149,791, Cl. 534-638.000
von Sprecher, Andreas; Beck, Andreas; Schaub, Bruno; and Lang, Robert W., 5,149,717, Cl. 514-456.000
Zink, Rudolf, 5,149,689, Cl. 503-221.000

Cilia, Philip F.: *See*—
Kupcikevicius, Vytautas; Cilia, Philip F.; and Burkeen, Darrell L., 5,149,943, Cl. 219-243.000

Cincinnati Milacron Inc.: *See*—
Catanzaro, John C.; and Sparer, Ronald M., 5,149,471, Cl. 264-40.500

Cioffi, John: *See*—
Hung, Paul L. K.; Cioffi, John; and Lavach, Mark L., 5,148,765, Cl. 118-100.000

Ciolino, Peter A.: *See*—
Ciolino, Peter N.; and Ciolino, Peter A., 5,149,314, Cl. 482-111.000

Ciolino, Peter N.; and Ciolino, Peter A., to Ciolino, Peter A. Enhanced exercise float. 5,149,314, Cl. 482-111.000

Cipriano, Rocco. Framing and in particular, in frames or casings of wood. 5,148,649, Cl. 52-656.000

Cirrus Diagnostics, Inc.: *See*—
Babson, Arthur L.; Palmieri, Thomas; and Olson, Douglas R., 5,149,501, Cl. 422-58.000

City of Hope: *See*—
Rossi, John J.; Chang, Pairoj; and Kaplan, Bruce E., 5,149,796, Cl. 536-27.000

Claar, Terry D.; Johnson, William B.; and Rapp, Robert A., to Lanxide Technology Company, LP. Method of modifying ceramic composite bodies by a post-treatment process and articles produced thereby. 5,149,678, Cl. 501-134.000

Clader, John; Dugar, Sundeep; Kogan, Timothy; Tait, Bradley; and Vaccaro, Wayne, to Schering Corporation. Inhibitors of acyl-coenzyme A: cholesterol acyl transferase. 5,149,709, Cl. 514-486.000.

Clairol Incorporated: *See*—
Jachowicz, Janusz; and Ramireddy, Chittamuru, 5,149,752, Cl. 526-240.000

Clapper, Millard. Security mail box with improved anti-tamper means 5,148,974, Cl. 232-17.000

Clarion Co., Ltd.: *See*—
Takai, Kazuki; Teraguchi, Yuuji; and Nakatani, Mitsuo, 5,150,349, Cl. 369-75.200

Clark, Graham: *See*—
Pienaar, Frans R. P.; Lewis, Brian P.; and Clark, Graham, 5,149,228, Cl. 405-289.000

Clark, Jim W. Well casing pipe thread protector. 5,148,835, Cl. 138-96.00T.

Clark, Larry T., to Boeing Company, The Cooling system for a hypersonic aircraft. 5,149,018, Cl. 244-117.000.

Clarke, Haley C.; and Panoz, Lisa C. Disposal breast pads for nursing mothers. 5,149,336, Cl. 604-388.000

Clarke, Martin D. H.; and Davis, Ronald M., to ITW Plastiglide. Cord lock device. 5,148,578, Cl. 24-41.000

Claussner, Andre ; Nedelec, Lucien; Philibert, Daniel; and Van De Velde, Patrick, to Roussel Uclaf. 19—nor—steroids. 5,149,696, Cl. 514-179.000

Clawson, Benjamin S., to Surgical Dynamics, Inc. Surgical needle with removable hub. 5,149,324, Cl. 604-110.000

Clawson Machine Company: *See*—
Fletcher, Charles J.; and Fletcher, Mark J., 5,148,996, Cl. 241-36.000

Clayton, Robert E. Fast food container. 5,148,972, Cl. 229-113.000.

Clayton, Robert P.: *See*—
Bowling, Rod A.; and Clayton, Robert P., 5,149,295, Cl. 452-71.000

Clemens, John M.: *See*—
Brown, William E.; Clemens, John M.; Devereaux, Sharon M.; Hofler, John G.; Knigge, Kevin M.; and Safford, Sarah E., 5,149,622, Cl. 435-5.000

Clement, Heinz, to Rieter Machine Works, Ltd. Combing head with lower nipper plate guide elements. 5,149,575, Cl. 19-235.000

Clemson University: *See*—
Fain, Charles C.; and Edie, Danny D., 5,149,517, Cl. 423-447.200.

Clifford, George M., Jr.: *See*—
Birecki, Henryk; and Clifford, George M., Jr., 5,150,338, Cl. 369-13.000

Clorox Company, The: *See*—
Peterson, David, 5,149,463, Cl. 252-301.210.

CMB Foodcan plc: *See*—
Heyes, Peter J.; Middleton, Nicholas J.; and Brown, Alison M., 5,149,389, Cl. 156-272.400

Coach and Car Equipment Corporation: *See*—
Gilevich, Leonid; and Masters, James C., 5,149,171, Cl. 297-94.000.

Cobbs Manufacturing Company: *See*—
Hartmann, Jerome, 5,148,581, Cl. 24-551.000

Cockett, Keith R. F.: *See*—
Concannon, Martin; Webb, Maurice; and Cockett, Keith R. F., 5,149,456, Cl. 252-174.250

Cockrill, Todd G., to Summa A.N.T.S. Advanced neonatal transport system. 5,149,030, Cl. 248-129.000.

Cocuzzo, Daniel; and Deegan, Charles. Bottle holder. 5,148,926, Cl. 211-118.000

Codex Corporation: *See*—
Forney, G. David, Jr.; and Eyuboglu, Vedat M., 5,150,381, Cl. 375-39.000

Coen, David S. Filter canister with a plastic pipe and a metal bushing. 5,149,431, Cl. 210-323.200

Cohen, Gary H.; and Eisenberg, Roselyn J., to University Patents, Inc. Diagnostic reagents relating to herpes simplex virus. 5,149,660, Cl. 436-87.000

Cohen, Smadar; Bano, Carmen; Visscher, Karyn B.; Chow, Marie; Allcock, Harry R.; and Langer, Robert S., to Massachusetts Institute of Technology; and Pennsylvania Research Corporation. Ionically cross-linked polymeric microcapsules. 5,149,543, Cl. 424-499.000.

Coiro, Michael A., Sr.; Murray, Dale R.; and Lastowski, Philip A., to Allentown Caging Equipment Co., Inc. Ventilated rack and animal cage system. 5,148,766, Cl. 119-17.000

Colbaugh, Richard D.: *See*—
Seraji, Homayoun; Colbaugh, Richard D.; and Glass, Kristin L., 5,150,026, Cl. 318-568.110.

Colles, Joseph H., to Brooktree Corporation. Generation of horizontal sync pulse. 5,150,077, Cl. 331-1.00A

Collier, Scott M., to Boeing Company, The. Method for electrostatically coating plaster mandrels. 5,149,563, Cl. 427-27.000.

Collins, Clive A.; and McDonald, James A., to International Business Machines Corporation. High performance computer system with platters and unidirectional storage modules therebetween. 5,150,279, Cl. 361-393.000

Collins, Donald A., Jr., to NCR Corporation. Portable checkout system. 5,149,947, Cl. 235-462.000

Collins, Earl R., Jr., to California Institute of Technology. Rotary device for removing particulates from a gas stream. 5,149,339, Cl. 55-6.000.

Collins, Peter L.: *See*—
Wertz, Gail W.; and Collins, Peter L., 5,149,650, Cl. 435-243.000.

Collins, William E.; Chang, Sheng-Huei; and Westfield, Mark J., to Geophysical & Environmental Research Corporation. Airborne multiband imaging spectrometer. 5,149,959, Cl. 250-226.000.

Colonna, John P. Self destruct double syringe. 5,149,323, Cl. 604-110.000.

Colorocs Corporation: *See*—
Lak, Khosrow; and Tompkins, E. Neal, 5,150,158, Cl. 355-239.000.

Colten, Robert B.: *See*—
Behr, Leonard W.; Anderson, Steven J.; Duda, Donald A.; and Colten, Robert B., 5,149,925, Cl. 200-61.45M.

Columbia University in the City of New York, Trustees of: *See*—
Axel, Richard; and Roberts, James M., 5,149,636, Cl. 435-69.100.

Colvin, David P.; Mulligan, James C.; and Gravely, Benjamin T., to Triangle Research and Development Corporation. Quick disconnect thermal coupler. 5,148,861, Cl. 165-78.000.

Colwell, Lawrence F., Jr.: *See*—
Shafiee, Ali; Kaplan, Louis; Chen, Shieh-Shung T.; Arison, Byron H.; Colwell, Lawrence F., Jr.; and Dumont, Francis, 5,149,701, Cl. 514-291.000

Comau S.p.A.: *See*—
Deplano, Stefano, 5,150,451, Cl. 395-83.000.

Commissariat a l'Energie Atomique: *See*—
Latge, Christian, 5,149,493, Cl. 376-312.000.
Pourprix, Michel, 5,150,036, Cl. 324-71.400.

Compaq Computer Corporation: *See*—
Bush, Kenneth L.; Perry, Ralph S.; Grieff, Thomas W.; and Schollhamer, George J., 5,150,465, Cl. 395-275.000.
Eastin, Steven M.; and Byford, Ivan W., 5,150,041, Cl. 324-158.00F.

Computer Identics: *See*—
Chisholm, Thomas J., 5,149,948, Cl. 235-462.000.

Concannon, Martin; Webb, Maurice; and Cockett, Keith R. F., to Lever Brothers Company, Division of Conopco, Inc. Detergent compositions comprising a hydrotalcite-like material for reducing colorant migration. 5,149,456, Cl. 252-174.250.

Concoyle Oil Fields Tools, Inc.: *See*—
Coyle, Gary W., 5,148,867, Cl. 166-213.000.

Condrey, Richard M.; and Lorant, Jerry O., to Lorant, Jerry O. Hair dryer with audible unplug alarm. 5,149,209, Cl. 392-379.000.

Congdon, Steven P.; and Fawcett, Russell M., to General Electric Company. Seed and blanket fuel arrangement for dual-phase nuclear reactors. 5,149,491, Cl. 376-267.000

Connor, Michael J. Coordinated water and fuel injection system. 5,148,776, Cl. 123-25.000

Conolly, Steven M.: *See*—
Pauly, John M.; Conolly, Steven M.; and Nishimura, Dwight G., 5,150,053, Cl. 324-309.000

Consiglio Nazionale Delle Ricerche: *See*—
Silari, Marco; and Birattari, Claudio, 5,149,966, Cl. 250-309.000.

Consolve, Inc.: *See*—
Greenspun, Philip G.; and Baecher, Gregory B., 5,150,310, Cl. 364-516.000

Contrucci, Marcos A.; Rizzo, Henrique P.; Schwarz, Herbert; Costa, Pedro H. C.; Gonzales, Enrique L.; Duran, Pedro V.; Jacomini, Norberto; and de Souza Santos, Adalberto B. Process for smelting or melting ferrous or non-ferrous metal from self-reducing agglomerates or metal. 5,149,363, Cl. 75-414.000

Conway, David W., to Norand Corporation. Flat plate sealed lead-acid battery charging system and method. 5,150,033, Cl. 320-51.000.

Cook, John F.: *See*—
Martin, Gregory J.; Chen, Robert Y.; Cook, John F.; and Mason, James A., 5,150,425, Cl. 382-14.000.

Coolbaugh, Thomas S.; Loveless, Frederick C.; Matthews, Demetreos N.; and Rudnick, Leslie R., to Mobil Oil Corporation. Vulcanizable liquid compositions. 5,149,895, Cl. 585-507.000.

Cooltronic B.V., Abbinksweg: *See*—
Stapelbroek, Weinand A. M., 5,148,978, Cl. 236-68.00R.

Coons, Andrew M., III, to BASF Corporation. Crimped continuous filament yarn with color-point heather appearance. 5,148,586, Cl. 28-271.000

Cooper Industries, Inc.: *See*—
Gullion, Steven D., 5,148,871, Cl. 166-345.000.
Gurevich, Leon, 5,150,093, Cl. 337-163.000.

Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, to Pfizer Inc. Alkyl 2-benzylidene-4-(2-alkylimidazopyrid-1-yl) benzoylacetate esters as intermediate compounds. 5,149,814, Cl. 546-118.000

Corbin, Linn E.: *See*—
Sidwell, John N.; and Corbin, Linn E., 5,149,306, Cl. 474-135.000.

Cormier, Michel J. N.: *See*—
Ledger, Philip W.; Cormier, Michel J. N.; and Amkraut, Alfred, 5,149,539, Cl. 424-449.000

Cornell Research Foundation, Inc.: *See*—
MacDonald, Noel C.; Chen, Liang-Yuh; and Zhang, Zuoying L., 5,149,673, Cl. 437-192.000.

Corning Incorporated: *See*—
Adler, Meryle D. W.; Nelson, John W.; and Shafer, Harold G., Jr., 5,148,632, Cl. 51-55.000
Berkey, George E.; Hawk, Robert M.; and Tarcza, Steven H., 5,149,349, Cl. 65-3.110.
Johnson, Ronald E.; Kirk, Kenneth A.; and Wexell, Kathleen A., 5,149,565, Cl. 427-215.000.

Cortes, David A., to American Cyanamid Company. 2-azabicyclo(2.2.1)hept-5-ene-2-acetic acid, derivatives thereof and related compounds, process for the preparation of said compounds and the use of said compounds for the manufacture of N-phosphonomethylglycine. 5,149,825, Cl. 548-515.000.

Costa, Pedro H. C.: *See*—
Contrucci, Marcos A.; Rizzo, Henrique P.; Schwarz, Herbert; Costa, Pedro H. C.; Gonzales, Enrique L.; Duran, Pedro V.; Jacomini, Norberto; and de Souza Santos, Adalberto B., 5,149,363, Cl. 75-414.000.

Costa, Tony M.; and Resuta, Robert. High-speed convolutional decoder. 5,150,369, Cl. 371-43.000.

Costantini, Michel; Garcin, Eric; Gubelmann, Michel; and Popa, Jean-Michel, to Rone-Poulenc Chimie. Hydroxylation of phenols/phenol ethers. 5,149,888, Cl. 568-771.000.

Costanzo, Ralph D.; Durwin, Robert J.; Hager, Lee N.; and Noehren, William L., to United Technologies Corporation. Retractable helicopter rotor. 5,149,013, Cl. 244-17.110.

Cote, Jean-Marie. Tree delimber with tree feeding means. 5,148,843, Cl. 144-2.00Z

Count, William S. Moveable musical instrument support apparatus. 5,149,905, Cl. 84-744.000

Countryman, Lauren P., to Boeing Company, The. Adaptive digital filter which is responsive to the rate of change of an input signal. 5,150,317, Cl. 364-724.010.

Coursin, Benjamin E.: *See*—
Ruehl, Phillip C.; and Coursin, Benjamin E., 5,149,132, Cl. 280-800.000

Courtaulds Coatings Limited: *See*—
Morton, David; and Handyside, Timothy M., 5,149,566, Cl. 427-235.000

Cowan, Ronald T.: *See*—
Daubenmier, John A.; Baltusis, Paul A.; Cowan, Ronald T.; El-Khoury, Joseph E.; and Williams, Roy S., 5,150,297, Cl. 364-424.100

Cox, Karen L.: *See*—
Beckmann, Robert J.; Cox, Karen L.; and Seno, Eugene T., 5,149,638, Cl. 435-76.000.

Coyle, Gary W., to Concoyle Oil Fields Tools, Inc. Stop for an oil well swabbing device. 5,148,867, Cl. 166-213.000.

Craig, Donald B.; McCluhan, Thomas K.; and Kaiser, Robert H., to Elkem Metals Company. Desulfurization agent. 5,149,364, Cl. 75-566.000

Cramer, Edward P., to Westinghouse Electric Corp. Apparatus and method for adapting an enlarged flow guide to an existing steam turbine. 5,149,248, Cl. 415-169.200.

Crane, Burke J.: *See*—
Brunker, David L.; Crane, Burke J.; and Lopata, John E., 5,149,915, Cl. 174-36.000.

Crane, Laura J.; Mazur, Adam W.; Nau, David R.; and Kluesener, Bernard W., to Procter & Gamble Company, The. Process for isolating galactose oxidase. 5,149,646, Cl. 435-190.000.

Crawford, Carl R.: *See*—
Frazee, David M.; and Crawford, Carl R., 5,150,427, Cl. 382-48.000

Creative BioMolecules, Inc.: *See*—
Rutherford, Robert B., 5,149,691, Cl. 514-12.000.

Creighton, Andrew M.; and Jeffery, William A., to National Research Development Corporation. Pharmaceutical compositions for treating psoriasis. 5,149,710, Cl. 514-547.000.

Crewe, Albert V., to Orchid One Corporation. Field emission electron gun and method having complementary passive and active vacuum pumping. 5,150,001, Cl. 313-7.000.

Crews, Robin. Illuminated ski boots and poles. 5,149,489, Cl. 362-32.000

Croce, Carlo M., to Temple University. Methods for detecting bcl-3 gene in human leukemias. 5,149,628, Cl. 435-6.000.

Croell, Richard C. License plate. 5,149,571, Cl. 428-40.000

Croft, Harold B.; and Jones, Ken C., to Proform Fitness Products, Inc. Quick disconnect linkage for exercise apparatus. 5,149,312, Cl. 482-62.000

Cromar, Larry D.: *See*—
Gonzalez, Fernando; and Cromar, Larry D., 5,150,276, Cl. 361-313.000

Crompton & Knowles Corporation: *See*—
Faillace, Louie M., 5,149,193, Cl. 366-145.000

Crosby, David J., to Bindicator Company. System and method for ultrasonic measurement of material level. 5,150,334, Cl. 367-98.000

Cross, Michael J.; and Jasionowski, Joe, to Federal Equipment Company. Ball deflator. 5,148,712, Cl. 73-756.000

Crotts, Lonnie M.; and Rambo, William W., to Bivens Winchester Corporation. Car wash system. 5,148,570, Cl. 15-97.300

Crowley, H. W.; and Bilinski, Joseph R., to Roll Systems, Inc. Apparatus for separating folded web. 5,149,075, Cl. 270-39.000

CryoLife, Inc. & Medical Univ. of South Carolina: *See*—
McNally, Robert T.; McCaa, Cameron; Brockbank, Kelvin G. M.; Heacox, Albert E.; and Bank, Harvey L., 5,149,621, Cl. 435-1.000

Crystal Semiconductor Corporation: *See*—
Stern, Kenneth J.; Sooch, Navdeep S.; and Hein, Jerrell P., 5,150,386, Cl. 375-118.000.

Crystals International: *See*—
Little, Cindy E.; and Cully, Eric, 5,149,558, Cl. 426-588.000

Csepes, Gusztav: *See*—
Bognar, Alajos; Csepes, Gusztav; and Hamos, Istvan, 5,150,059, Cl. 324-551.000

Cuculo, John A.; Tucker, Paul A.; Chen, Gao-Yuan; and Lundberg, Ferdinand, to North Carolina State University. Melt spinning of ultra-oriented crystalline polyester filaments. 5,149,480, Cl. 264-178.00F.

Cullen, John S., to Multiform Desiccants, Inc. Closet drier 5,148,613, Cl. 34-81.000

Cully, Eric: *See*—
Little, Cindy E.; and Cully, Eric, 5,149,558, Cl. 426-588.000

Cummings, Charles C.; and Prince, Robert I., to Puritan-Bennett Corporation. Respiratory ventilation apparatus. 5,150,291, Cl. 364-413.030

Curator of the University of Missouri, The: *See*—
Mazurkiewicz, Marian, 5,148,728, Cl. 82-1.110.

Curfman, Robert M.; and Roach, J. Phil, to Farm Shop, Inc. Animal feed mixing system. 5,148,999, Cl. 241-260.100.

Cusack, Robert F., to GTE Valenite Corporation. Precision parallel mechanical float. 5,148,610, Cl. 33-644.000

Cyclofur Company, L.P.: *See*—
Poulson, Larry, 5,148,737, Cl. 99-327.000.

Cyprus Foote Mineral Company: *See*—
Smith, W. Novis, 5,149,457, Cl. 252-182.120

Dablainville, Raymond; and Dufour, Jean, to Aluminium Pechiney Colorimetric apparatus for continuous control of impurities on hydrate of alumina. 5,149,502, Cl. 422-62.000

Dabrowski, Gary, to O.F. Mossberg & Sons, Inc. Gunstock having interchangeable combs. 5,149,899, Cl. 42-72.000.

Dachiku, Kenshi: *See*—
Ueno, Hideyuki; and Dachiku, Kenshi, 5,150,432, Cl. 382-56.000

Daf Special Products: *See*—
Luijten, Waltherus J. T. H., 5,149,311, Cl. 475-343.000.

Dahiot, Alain: *See*—
Butel, Pascal; Dahiot, Alain; and Ferrier, Joel, 5,150,066, Cl. 328-55.000

Dahlquist, Brian J.: *See*—
Doggett, David E.; and Dahlquist, Brian J., 5,148,595, Cl. 29-840.000

Daicel Chemical Industries, Ltd.: *See*—
Kanno, Tatsuya; and Yamato, Tsutomu, 5,149,770, Cl. 528-199.000.

Daikin Industries, Ltd.: *See*—
Inukai, Hiroshi; and Kitahara, Takahiro, 5,149,753, Cl. 526-245.000

Dainippon Screen Mfg. Co. Ltd.: *See*—
Hoki, Tetsuo, 5,150,423, Cl. 382-8.000
Kitakado, Ryuji; Yano, Hironobu; Kakuma, Hiroaki; Hoki, Tetsuo; and Kanai, Takao, 5,150,422, Cl. 382-8.000.
Masuda, Yoshihiro; Murata, Akira; Togawa, Hitoshi; and Miura, Nobuaki, 5,150,142, Cl. 354-324.000

Daiwa Seiko: *See*—
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Eccleston, Larry, to Tekonsha Engineering Company. Controller for electric braking systems. 5,149,176, Cl. 303-20.000.

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Eckman, Richard E., to Dresser Industries, Inc. Mechanical peck drill. 5,149,232, Cl. 408-137.000.

Eddy, William C., Jr., to Allied-Signal Inc. Disk brake/parking brake with threaded piston rod and motor. 5,148,894, Cl. 188-72.600

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Enomoto, Shigeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for preventing image from being blurred in camera. 5,150,150, Cl. 354-456.000

Enomoto, Takashi; Yoshioka, Toshifumi; and Nishida, Naoya, to Canon Kabushiki Kaisha. Liquid crystal device and display apparatus with a three-layered electrode of ITO, molybdenum, and aluminum. 5,150,233, Cl. 359-54.000

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Erico International Corporation: *See—*
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Ernst, Leonard; and Quam, David, to Dowty RFL Industries, Inc. Transformer circuit and method with saturation prevention. 5,150,270, Cl. 361-64.000.

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Ertel, John; Holland, William D.; Vincent, Kent D.; Jamp, Rueiming; and Baldwin, Richard R., to Hewlett-Packard Company. Substrate advance measurement system using cross-correlation of light sensor array signals. 5,149,980, Cl. 250-561.000

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Fahey, Timothy E.; and Falter, Julia A., to Lonza Inc. Anti-static and anti-fogging compositions for use in polyvinyl chloride and polyolefin films. 5,149,724, Cl. 524-110.000

Faillace, Louie M., to Crompton & Knowles Corporation. Extruder temperature controller and method for controlling extruder temperature. 5,149,193, Cl. 366-145.000

Fain, Charles C.; and Edie, Danny D., to Clemson University. High strength, melt spun carbon fibers and method for producing same 5,149,517, Cl. 423-447.200

Fairhurst, Jon A., to Grass Valley Group, Inc., The. Variable chrominance filtering for encoding television signals. 5,150,203, Cl. 358-40.000

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Fetzer, Andreas: *See*—
Gross, Heinz; Fetzer, Andreas; and Dickhaut, Gunther, 5,149,481, Cl. 264-210.200.

Fialla, Peter, to Isovolta Osterreichische Isolierstoffwerke. Process for the production of aromatic polyesters. 5,149,769, Cl. 528-193.000.

Fiber-Lite Corporation: *See*—
Meeker, Brian L.; and Harmon, Walter D., 5,149,920, Cl. 181-290.000

Field, George F.: *See*—
Hammond, Peter R.; and Field, George F., 5,149,807, Cl. 544-99.000

Fields, Walter G. Litter bag frame. 5,148,774, Cl. 119-165.000.

Filiputti, Hugues: *See*—
Bonnardel, Patrick; Vernay, Jacques; Filiputti, Hugues; Humbert, Thierry; and Rigaud, Marcel, 5,148,913, Cl. 200-400.000

Findley Adhesives, Inc.: *See*—
Alper, Mark D.; and Myers, Marion M., 5,149,741, Cl. 525-95.000.

Findlay, Russell K.: *See*—
Vaughan, Rodney G.; Findlay, Russell K.; Jakabek, Ivan; Richardson, Ralph; McLachlan, Myles J.; and Venn-Brown, Geoffrey C., 5,148,703, Cl. 73-123.000

Finke, Hans: *See*—
Braeger, Horst H.; and Finke, Hans, 5,149,297, Cl. 452-162.000

Finke, Harry P., to Bloom Engineering Company, Inc. Method for firing direct-fired burner. 5,149,265, Cl. 432-24.000.

Finkle, Thomas W.; and Swanson, Ralph M., to Hewlett-Packard Company. Interchangeable coded key pad assemblies alternately attachable to a user definable keyboard to enable programmable keyboard functions. 5,150,118, Cl. 341-23.000

Fischer, Herbert; and Nehb, Wolfgang, to Metallgesellschaft Aktiengesellschaft. Apparatus for a catalytic reaction of a gas mixture, which contains H2S and SO2, by the claus process. 5,149,509, Cl. 422-177.000

Fischer, Karl H.: *See*—
Kosanetzky, Josef; and Fischer, Karl H., 5,150,395, Cl. 378-86.000.

Fisher, Robert A.; Gray, Keith N.; and Wallace, Lawrence R., to General Electric Company. Highly filled thermoplastic polyester molding compositions. 5,149,734, Cl. 524-423.000.

Fisher, Uriyel: *See*—
Doron, Benjamin; Assaf, Gad; Fisher, Uriyel; and Aronov, Evgeny, 5,148,677, Cl. 60-641.500.

Fittings For Industry S.r.l.: *See*—
Babini, Ezio, 5,150,094, Cl. 337-214.000

Flambeau Products Corporation: *See*—
Lanius, Charles A., 5,149,152, Cl. 292-37.000

Flament, Patrick, to Aerospatiale Societe Nationale Industrielle. Satellite roll and yaw attitude control method. 5,149,022, Cl. 244-168.000.

Flanigan, Sean: *See*—
Sampson, Robert; and Flanigan, Sean, 5,148,643, Cl. 52-200.000

Fleming, Nigel, to McLean Hospital Corporation. Multiple antigen immunoassay. 5,149,626, Cl. 435-7.900

Fleming, Thomas W.; Gorton, Lanny A.; and Cheney, Paul S., II, to Pacesetter Infusion, Ltd. Battery pack for medical instruments. 5,149,603, Cl. 429-98.000

Flesher, Robert W., to Apogee Designs, Ltd. Vertical gel electrophoresis apparatus having universal gel assembly support structure. 5,149,418, Cl. 204-299.00R.

Flesner, Larry D., to United States of America, Navy. Apparatus and method for non-contact surface voltage probing by scanning photoelectron emission. 5,150,043, Cl. 324-158.00R

Fletcher, Charles J.; and Fletcher, Mark J., to Clawson Machine Company. Ice crusher. 5,148,996, Cl. 241-36.000

Fletcher, Mark J.: *See*—
Fletcher, Charles J.; and Fletcher, Mark J., 5,148,996, Cl. 241-36.000

Flexible Environmental Systems, Inc.: *See*—
Saly, Udi E.; and Dibner, Brent, 5,148,758, Cl. 110-220.000

Flindall, Richard C., to Kraft General Foods Canada Inc. Method for forming an open textured product. 5,149,555, Cl. 426-448.000

FMC Corporation: *See*—
Chiang, John S. C.; and Nicholson, Charles J., 5,149,414, Cl. 204-294.000
Dixson, John A.; Murugesan, Natesan; and Barnes, Keith D., 5,149,357, Cl. 71-92.000
McKee, Gregg L., 5,149,910, Cl. 89-36.020.
Taeuber, Ralph, Jr.; Castillo, Sergio A., Jr.; and Ungchusri, Tep, 5,149,148, Cl. 285-276.000

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Holloch, Johannes, 5,149,162, Cl. 294-64.100

Focke, Heinz; and Holloch, Johannes, to Focke & Co. (GmbH & Co.) Device for conveying layers comprising a multitude of individual objects. 5,149,162, Cl. 294-64.100

Fohl, Artur, to TRW Repa GmbH. Control mechanism for pretensioners in vehicles. 5,149,128, Cl. 280-734.000

Fohl, Artur, to TRW Repa GmbH. Safety mechanism for a safety belt pretensioner. 5,149,134, Cl. 280-806.000.

Foley, Brian D.; and Iovaine, John, to Millipore Corporation Gel electrophoresis cassette. 5,149,417, Cl. 204-299.00R.

Fonda, Jacob H.: *See*—
Pimm, Annette R.; and Fonda, Jacob H., 5,148,688, Cl. 62-457.300.

Fong, Stewart O.: *See*—
Yamamoto, Kio; and Fong, Stewart O., 5,150,196, Cl. 357-74.000.

Foppe, Werner, to Technologie Transfer Establishment. High-pressure pipe string for continuous fusion drilling of deep wells, process and device for assembling, propelling and dismantling it. 5,148,874, Cl. 175-11.000

Ford Meter Box Co., Inc., The: *See*—
Farnham, Scott C., 5,148,828, Cl. 137-454.600

Ford Motor Company: *See*—
Berger, Alvin H., 5,148,899, Cl. 192-3.630.
Daubenmier, John A.; Baltusis, Paul A.; Cowan, Ronald T.; El-Khoury, Joseph E.; and Williams, Roy S., 5,150,297, Cl. 364-424.100
Montreuil, Clifford N.; and Shelef, Mordecai, 5,149,511, Cl. 423-212.000

Ford New Holland, Inc.: *See*—
Bich, Gary L. and Diederich, Anthony F., Jr., 5,148,659, Cl. 56-102.000

Formax, Inc.: *See*—
Lindee, Scott A., 5,149,298, Cl. 452-174.000

Forney, G. David, Jr.; and Eyuboglu, Vedat M., to Codex Corporation Trellis shaping for modulation systems. 5,150,381, Cl. 375-39.000.

Forrest, Gordon C.; Hill, Hugh A. O.; Rattle, Simon J.; and Robinson, Grenville A. Methods of assay. 5,149,630, Cl. 435-7.900

Fortmiller, Edward G.: *See*—
Hooper, Donald F.; Fortmiller, Edward G.; and Wall, David F., 5,150,308, Cl. 364-489.000

Fouilloy, Jean-Pierre; and Loy, Fernand R., to Thomson-TRT Defense. Infrared surveillance device. 5,149,969, Cl. 250-334.000

Fourmigue, Marc: *See*—
Jerome, Denis; Tevanian, Georges; Batail, Patrick; and Fourmigue, Marc, 5,149,946, Cl. 235-439.000.

Fournes, Jean-Paul; and Morbioli, Rene J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Process and apparatus for the simultaneous deposition of a protective coating on internal and external surfaces of heat-resistant alloy parts 5,149,376, Cl. 118-719.000

Fourre, Patrick: *See*—
Chopin, Thierry; and Fourre, Patrick, 5,149,519, Cl. 423-610.000.

Foust, Harry D. Device and method for combustion of waste oil 5,149,260, Cl. 431-11.000

Fouts, Craig: *See*—
Fouts, Robert F.; Fouts, Craig; and Fouts, Earl J., 5,148,863, Cl. 165-149.000

Fouts, Earl J.: *See*—
Fouts, Robert F.; Fouts, Craig; and Fouts, Earl J., 5,148,863, Cl. 165-149.000

Fouts, Robert F.; Fouts, Craig; and Fouts, Earl J., to Earl's Supply Co Modular cooler. 5,148,863, Cl. 165-149.000.

Fox, Anthony, to Fox, Marcella M. Trash handling and storage system. 5,148,739, Cl. 100-45.000

Fox, Marcella M.: *See*—
Fox, Anthony, 5,148,739, Cl. 100-45.000.

Fox Valley Systems, Inc.: *See*—
Smrt, Thomas J., 5,148,988, Cl. 239-150.000

Foxboro Company, The. *See*—
Badavas, Paul C., 5,150,289, Cl. 364-154.000

Fraenkel, Herbert; and Mills, Stewart J., to Sortex Limited. Apparatus for sorting or otherwise treating objects. 5,148,923, Cl. 209-539.000

Framatome: *See*—
Carra, Olivier, and Delevallee, Alain, 5,148,882, Cl. 180-9.640

France Bed Co., Ltd.: *See*—
Masuda, Teruo; Morita, Masayasu; and Matsuzaki, Masahiro, 5,148,706, Cl. 73-172.000

Frangesh, Thomas P.: *See*—
Owens, William W., II; and Frangesh, Thomas P., 5,150,137, Cl. 351-210.000

Frank, Jean P.: *See*—
Donze, Pierre; and Frank, Jean P., 5,149,116, Cl. 280-47.260

Franken, Dominicus J.; Jacobs, Franciscus M.; Van Kimmenade, Johannes M. M.; Van Dijk, Cornelis D.; and Van Eijk, Jan, to U.S. Philips Corp. Lithographic device with a suspended object table. 5,150,153, Cl. 355-53.000

Franklin, James E.: *See*—
Lee, Douglas W.; Deken, Arthur D.; Franklin, James E.; and Dunn, Richard P., 5,148,880, Cl. 175-393.000

Franzen, Peter: *See*—
Pettigrew, Robert M.; Harry, Alan J.; Nailor, Paul R.; Adelmann, Fred; Franzen, Peter; and Schoon, Juergen, 5,149,211, Cl. 400-88.000

Fraser, Michael J., to Refurbished Turbine Components Limited. Apparatus for use in the repair of machines. 5,149,073, Cl. 269-297.000

Fray, Michael J.: *See*—
Cooper, Kelvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,149,814, Cl. 546-118.000

Frazee, David M.; and Crawford, Carl R., to General Electric Company. Three dimensional disarticulation. 5,150,427, Cl. 382-48.000

Fredriksson, Ove R.: *See*—
Levoska, Ilmari; and Fredriksson, Ove R., 5,149,930, Cl. 219-10.55R

Freedman, Jules, to Merrell Dow Pharmaceuticals Inc. Antidepressants. 5,149,714, Cl. 514-655.000

Freeman, Gordon J.: *See*—
Cantor, Harvey I.; Patarca, Roberto, and Freeman, Gordon J., 5,149,785, Cl. 530-350.000

Freeman, John L., Jr.; and Tracy, Clarence J., to Motorola, Inc Method for making a planar multi-layer metal bonding pad. 5,149,674, Cl. 437-195.000

Freitag, Dieter: *See*—
Reuter, Knud; Freitag, Dieter; Weymans, Gunther; and Dhein, Rolf, 5,149,761, Cl. 528-353.000

Freund, Wolfgang: *See*—
Schaefer, Bernd; Freund, Wolfgang; and Reissenweber, Gernot, 5,149,882, Cl. 568-438.000

Frey, Jeffrey A.: *See*—
Blank, Ted E.; Ferguson, Donald F.; Frey, Jeffrey A.; Pruscino, Angelo; Rogers, Robert R.; and Rahm, Erhard, 5,150,472, Cl. 395-425.000

Fridman, Vladimir; and Rosen, Stanley R. Invalid lift and transport apparatus. 5,148,557, Cl. 5-81.100

Fried.Krupp GmbH: *See*—
Grewe, Hans; and Schlump, Wolfgang, 5,149,381, Cl. 148-513.000

Friedman, Michael; Harrington, Owen; and Dunn, David, to Memtec Corporation. Home gaussmeter with filter-integrator circuit for measuring elf radiation. 5,150,051, Cl. 324-258.000

Friedrich Grohe Armaturenfabrik GmbH + Co *See*—
Humpert, Jurgen; and Pawelzik, Manfred, 5,148,551, Cl. 4-192.000

Friel, Daniel D. *See*—
Bigliano, Robert P.; and Friel, Daniel D., 5,148,634, Cl. 51-128.000

Fritz, Dieter; Ossberger, Heinz; and Oswald, Johannes R., to Voest-Alpine Zeltweg Gesellschaft m.g.h. Device for securing in position guide rails. 5,148,980, Cl. 238-17.000

Fruhauf, Frank; Mayerbock, Wilhelm; and Quast, Jorn-Rainer, to Boge AG. Bearing. 5,149,067, Cl. 267-140.130.

Frutschi, Hansulrich, to Asea Brown Boveri Ltd. Combined gas/steam turbine power station plant. 5,148,668, Cl. 60-39.050

Frye, Stephen V.: *See*—
Johnson, Michael R.; and Frye, Stephen V., 5,149,697, Cl. 514-185.000

Fuchs, Hartwig: *See*—
Brenner, Karl; Ruppel, Wilhelm; Woerz, Otto; Halbritter, Klaus; Scheiper, Hans-Juergen; Aquila, Werner; and Fuchs, Hartwig, 5,149,884, Cl. 568-471.000.

Fudalla, Manfred, to Weener-Plastik GmbH & Co. KG. Device for the apportioned delivery of liquids. 5,148,953, Cl. 222-442.000

Fuji Electric Co., Ltd.: *See*—
Kamoshita, Tomoyoshi, 5,149,599, Cl. 429-13.000

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kobayashi, Toshio; Maruyama, Keiichi; and Ohnuki, Yukio, 5,148,903, Cl. 192-85.0AA
Kyoukane, Yasuaki; and Nagano, Toshihiro, 5,150,034, Cl. 320-62.000
Nagano, Toshihiro; and Kyoukane, Yasuaki, 5,150,045, Cl. 320-62.000

Fuji Photo Film Co., Ltd.: *See*—
Akiyama, Keiji; and Misu, Hiroshi, 5,149,614, Cl. 430-302.000
Masui, Shin, 5,150,160, Cl. 355-256.000
Mihara, Yuji; and Ukai, Toshinao, 5,149,619, Cl. 430-572.000
Mizuta, Akira; and Shibuya, Takeaki, 5,148,946, Cl. 222-1.000
Morita, Naoyuki, 5,149,082, Cl. 271-276.000

Takagi, Akira; Tsuruta, Masao; Ita, Akihisa; and Sawahara, Shingo, 5,149,005, Cl. 242-67.10R

Fuji Zerox Co., Ltd.: *See—*
Tateno, Masakazu, 5,150,294, Cl. 361-419.000

Fujibayashi, Kentaro: *See—*
Sasaki, Takao; Fujibayashi, Kentaro; and Kageyama, Shintaro, 5,150,025, Cl. 318-571.000

Fujieda, Keishi; and Kawamura, Takesh to Sumitomo Electric Industries, Ltd. Apparatus for and method of detecting an abnormality in a signal. 5,150,111, Cl. 340-825.300

Fujieda, Yoshihiro, to Matsushita Elec ronics Corporation. Gas discharge display device. 5,150,011, Cl. 15-169.400

Fujii, Atsuhiko: *See—*
Sawada, Kazuo; Fujii, Atsuhiko; Nakai, Yoshihiro; Ohkubo, Naoyuki; Shiraishi, Hajime; Ono, Fumio; Matsuda, Katsushi; and Tsuji, Kazunori, 5,149,917, Cl. 17-129.00R.

Fujii, Syuso: *See—*
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Fujii, Yasushi: *See—*
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Fujike, Hiroshi: *See—*
Kato, Masami; Tanaka, Tadashi Nakamura, Satoshi; Higashi, Tsuneo; Fujike, Hiroshi; Makin , Katsuaki; and Miyamoto, Hiroshi, 5,148,857, Cl. 165-1.000

Fujikura Ltd.: *See—*
Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma, Mikio; and Kato, Yasuyuki, 5,149,350, Cl. 65-12.000

Fujimoto, Hiroyuki: *See—*
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Fujimoto, Yasuyuki: *See—*
Kushi, Kenji; Inukai, Ken-ichi; Isek , Takayuki; Koyanagi, Seiya; and Fujimoto, Yasuyuki, 5,149,77 , Cl. 430-288.000

Fujinuma, Michio: *See—*
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Fujioka, Hideaki; and Takata, Koji, to umitomo Electric Industries, Ltd. Automotive wheel speed control 5,149,177, Cl. 303-110.000

Fujioka, Hideaki; and Katayama, Yoshic to Sumitomo Electric Industries, Ltd. Brake control device i an antilock brake system 5,150,298, Cl. 364-426.020.

Fujioka, Hideaki, to Sumitomo Electric Industries, Ltd. Antilock wheel speed control device having first and second brake pressure controllers. 5,150,299, Cl. 364-426.020.

Fujirebio Inc.: *See—*
Matumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko; and Kusunoki, Jun, 5,149,834, Cl. 549-292.000

Fujita, Bunichi: *See—*
Kawashima, Seiichi; Masuda, Nobo u; Ishii, Shuichi; and Fujita, Bunichi, 5,150,068, Cl. 328-155.00

Fujita, Shuichi, to Mitsubishi Denki Kabushiki Kaisha. Tracking servo utilizing beam splitter. 5,150,348, Cl. 369-44.410

Fujitsu Limited: *See—*
Arai, Yasunari; Hamano, Hiroshi; memiya, Izumi; Yamamoto, Takuji; and Ihara, Takeshi, 5,150, 80, Cl. 361-401.000.
Kakuguchi, Kazuhiro; Uchimura, irozi; and Nishino, Sekizi, 5,148,718, Cl. 74-553.000
Kikuchi, Hideo; and Tanizawa, Tets , 5,149,993, Cl. 307-465.100.
Masuko, Takayuki; Satoh, Shunichi Ishizaka, Tetsuo; and Ohya, Toshio, 5,150,230, Cl. 359-34.000.
Miura, Takashi; and Kamiya, Yoshiaki, 5,150,090, Cl. 335-84.000.
Suzuki, Hiroyuki, 5,150,243, Cl. 359 110.000
Tomura, Masashi; and Takagi, Hisamitsu, 5,150,282, Cl 361-424.000
Yamada, Hiroshi, 5,150,185, Cl. 357 4.000
Yamazaki, Hirokazu; and Yoshid , Masanobu, 5,149,990, Cl 307-443.000
Yanagi, Shigenori, 5,150,347, Cl. 36 -44.370
Yoshida, Shigeru; Okada, Yoshiyuki; Nakano, Yasuhiko; and Chiba, Hirotaka, 5,150,119, Cl. 34 -51.000.

Fujiwara, Kouji: *See—*
Nakamura, Norimi; Adachi, Tadao; Matsui, Akio; Fujiwara, Kouji; Kobayashi, Mitsugu; Yamaguchi, Tetsuo; and Fukuda, Minoru, 5,149,308, Cl. 475-203.000

Fujiwara, Ryuhei, to NEC Corporation Two-battery supply for operating and waiting modes of a carphon . 5,149,985, Cl. 307-10.700.

Fukaya, Nobuki: *See—*
Takashi, Yukihisa; and Fukaya, Nobuki, 5,148,904, Cl. 192-89.00B

Fukaya, Yasushi; and Mizukami, Yuto, to Kabushiki Kaisha Okuma Tekkosho. Numerical control informa ion generating apparatus and method for determining machining mode thereof. 5,150,303, Cl 364-474.140.

Fukuda, Eiji: *See—*
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Fukuda, Hideki: *See—*
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Fukuda, Minoru: *See—*
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Fukuda, Tatsuya: *See—*
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Fukui, Yasuhiro; Mitsui, Kazuyuki; Kato, Hiroshi; and Chikamori, Yoshihiro. Electrode for use with a living body. 5,148,806, Cl. 128-639.000

Fukushima, Nobuo, to Canon Kabushiki Kaisha. Electronic camera wherein the nonrecording head moving period is a multiple of the vertical synchronizing period. 5,150,219, Cl. 358-335.000.

Fukushima, Toshiharu; and Okada, Takashi, to Yamaha Corporation. Fitting pad for ski boots. 5,149,588, Cl. 428-411.100.

Fukuzawa, Keiichi: *See—*
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Fulcher, Carol A.: *See—*
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Fuller, Douglas D; Williams, Richard A.; Gardiner, John P.; and Roberts, Harry, to Presstek, Inc. Print-head and plate-cleaning assembly. 5,148,746, Cl. 101-142.000

Fulton, Kenneth W. Superpolishing agent, process for polishing hard ceramic materials, and polished hard ceramics. 5,149,338, Cl 51-293.000

Fulton, Theodore A.: *See—*
Blonder, Greg E; and Fulton, Theodore A., 5,149,404, Cl 204-129.100.

Funatsu, Ryoji; Mitsui, Susumu; Kurose, Shigeru; and Gato, Atsuko, to Somar Corporation. Stabilized isothiazolone. 5,149,706, Cl 514-372.000.

Funayama, Masanori: *See—*
Iwaki, Yuji; and Funayama, Masanori, 5,150,269, Cl. 360-133.000.

Funayama, Yoshiyuki: *See—*
Ishiwata, Shinichi; Ueyama, Michio; Nakae, Hiroyuki; Funayama, Yoshiyuki; Iwamoto, Kazushige; and Noguchi, Isamu, 5,149,586, Cl. 428-345.000

Funk, Gerald D. Article carrier. 5,148,956, Cl. 224-209.000.

Furay, David M.: *See—*
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Furukawa Electric Co., Ltd.: *See—*
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Furukawa, Hiroshi; Inagaki, Hiroyuki; Ishii, Masaharu; and Ueno, Hiroshi, to Tonen Corporation. Process for producing methylnorbornene dicarboxylic acid anhydride. 5,149,831, Cl. 549-237.000.

Furukawa, Kenji: *See—*
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,149,461, Cl. 252-299.610

Furukawa, Yasunori; and Sato, Masayoshi, to Hitachi Metals, Ltd. Harmonics generation element. 5,150,252, Cl. 359-252.000.

Furuya, Masato: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Shinonaga, Hirohiko; and Tai, Hiromichi, 5,150,226, Cl. 358-471.000.

Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichiro; and Miyata, Takeo, to Matsushita Electric Industrial Co., Ltd. Narrow-band laser apparatus. 5,150,370, Cl. 372-106.000.

Fussner, Richard F.: *See—*
Bruns, Norbert A.; Fussner, Richard F.; and Reynolds, John S., 5,149,405, Cl. 204-129.100.

Futaba Denshi Kogyo K.K.: *See—*
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Futagawa, Yoshikiya; and Nishizawa, Katsuhiko, to Seiko Epson Corporation. Print wire driving apparatus. 5,149,214, Cl. 400-157.200

Gabaldon, John B.; Evans, Daniel D., Jr.; and Cawelti, Dale W., to Hughes Aircraft Company. Apparatus and method for detecting missing interconnect material. 5,148,967, Cl. 228-179.000.

Gable, Lisa. Brassiere accessory. 5,149,293, Cl. 450-86.000.

Gabriel, Dean W., to University of Florida. Method for detecting bacterial or fungal diseases in plants. 5,149,624, Cl. 435-6.000.

Gabriel, William L.; Lat, Geronimo E.; and Shelton, Lawrence S., to Illinois Tool Works Inc. Coated metal fastener and coating composition therefor. 5,149,237, Cl. 411-446.000.

Gadelius, Ichi S.: *See—*
Camitz, Peter; and Gadelius, Ichi S., 5,148,592, Cl. 29-426.400.

Gaggero, Joseph W.; and Sullivan, Michael W., to Lawrence Paper Company, The. Disposable, rollup temporary floor mat. 5,149,572, Cl. 428-43.000

Gajewski, Arno: *See—*
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Gal, Alex: *See—*
Azrielant, Ofer; Gal, Alex; and Lautman, Kenneth, 5,148,689, Cl. 63-4.000.

Galasso, Francis S., to United Technologies Corporation. Method for making oriented bismuth and thallium superconductors comprising cold pressing at 700 MPa. 5,149,687, Cl. 505-1.000.

Gallenkamp, Bernd: *See—*
Lindel, Hans; Hallenbach, Werner; and Gallenkamp, Bernd, 5,149,822, Cl. 546-315.000

Galli, Rosaria, to Rosaria Galli & C. S.A.S. Disconnection-preventing safety device for liquefied gas bottle valve for use with quick-coupling connector. 5,149,053, Cl. 251-149.900.

Gallivan, James B.: *See—*
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Gallusser, David O.; and LeBaron, James B., to Amphenol Corporation. Electrical connector with combined circuits. 5,149,274, Cl. 439-76.000.

Galperin, Anatoly: *See—*
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Galton, Ian A.: *See—*
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Gamarra, Jose P., to Raychem Corporation. Heat resistant gel compositions. 5,149,736, Cl. 524-490.000.

Ganaja, Scott. Saddle positioning device for bicycles. 5,149,034, Cl. 248-178.000

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GAO Gesellschaft fur Automation und Organisation mbH: *See—*
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Gar-Bar Corporation: *See—*
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Garavuso, Gerald M.: *See—*
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Gardiner, John P.: *See—*
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Garnier, Francis: *See—*
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Garratt, John D.; Scott, Paul J.; and Buehring, Ian K., to Rank Taylor Hobson Limited. Metrological apparatus and calibration method therefor. 5,150,314, Cl. 364-571.020.

Garrett, James A. Hot mirror to prevent condensation in humid environments. 5,149,942, Cl. 219-219.000

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Casey, Brendan C.; and Gary, William L., 5,150,135, Cl. 346-159.000

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Green, Malcolm L. H.; Cheetham, Anthony K.; and Vernon, Patrick D. F., 5,149,464, Cl. 252-373.000.

Gates, Thomas A., to Aluminum Company of America. Baffle means for roof ridge ventilator. 5,149,301, Cl. 454-365.000.

Gato, Atsuko: *See—*
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White, Victor A. M., 5,148,921, Cl. 209-20.000.

Geatz, Tobin, to Applied Chemical Solutions. Apparatus and method for the transfer and delivery of high purity chemicals. 5,148,945, Cl. 222-1.000

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Bouchard, Christian; and Brulez, Francois, 5,149,345, Cl. 55-406.000
Gros, Jean-Pierre; and Laffont, Patrick, 5,149,247, Cl. 415-108.000

GEC-Marconi Limited: *See—*
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GECO A.S.: *See—*
Bale, Richard; and Hale, Richard, 5,150,332, Cl. 367-73.000

Geens, Rudy E. A.; and Wyner, Elliot F., to GTE Products Corporation; and GTE Sylvania N.V. High pressure sodium discharge lamp. 5,150,017, Cl. 315-326.000.

Geibel, Stephen A.: *See—*
Koehler, Paul C.; Geibel, Stephen A.; and Whitlock, Michael B., 5,149,360, Cl. 75-228.000

Geisen, Karl: *See—*
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Gellert, Jobst U. Method of manufacturing an injection molding probe. 5,148,594, Cl. 29-611.000

GenCorp Inc.: *See—*
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Geneco Services, Inc.: *See—*
Matysik, Richard C., 5,148,756, Cl. 110-115.000.

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Ohkawa, Tihiro; Stephens, Richard B.; and Lieber, Albert J., 5,149,681, Cl. 505-1.000
Woolf, Lawrence D.; Elsner, Frederick H.; and Shearer, Clyde H., 5,149,684, Cl. 505-1.000.

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Bobo, Melvin, 5,149,206, Cl. 384-99.000.
Congdon, Steven P.; and Fawcett, Russell M., 5,149,491, Cl. 376-267.000.
Elkins, Robert B., 5,149,495, Cl. 376-444.000
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Jones, Marshall G.; Harrison, Jerry T.; Piel, Joseph E., Jr.; and Smith, Lowell S., 5,148,962, Cl. 228-49.100
Kast, Kevin H.; and Myers, William J., Jr., 5,148,671, Cl. 60-39.281.
Kastrup, Marie A.; Peterson, Ivan H.; and Hamblin, Bruce A., 5,149,147, Cl. 285-261.000.
McKee, Douglas W.; and Huang, Shyh-Chin, 5,149,497, Cl. 420-418.000
Mui, Shou Y., 5,150,378, Cl. 375-1.000
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Randzaao, Michael J., 5,150,397, Cl. 378-129.000.
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Bloink, Raymond L.; Kibbel, Bradley W.; and Powell, Bob R., 5,149,454, Cl. 252-74.000
Malloy, John D.; and Solt, Michael B., 5,149,307, Cl. 475-200.000
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Turner, Kenneth W.; Du Bois, Patti S.; Alfred, Peter J.; and Greer, Thomas W., 5,149,347, Cl. 55-446.000
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General Scanning, Inc.: *See—*
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Geneste, Philippe: *See—*
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Genheimer, Stephen R.; and Welty, Steven L., to Seagate Technology, Inc. Adaptive variable threshold qualification level circuit for signal processing in disk drives. 5,150,050, Cl. 324-212.000.

Gentex Corporation: *See—*
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Gentile, Patrick S.; Mantel, Charlie R.; and Broxmeyer, Hal E., to Research Corporation Technologies, Inc. Method of inhibiting progenitor cell proliferation. 5,149,544, Cl. 424-577.000

Gentry, Cecil C., to Phillips Petroleum Company. Method of fabricating exchanger U-bend tube support. 5,148,598, Cl. 29-890.043

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Collins, William E.; Chang, Sheng-Huei; and Westfield, Mark J., 5,149,959, Cl. 250-226.000

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Georgia-Pacific Corporation: *See—*
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Gerberit AG: *See—*
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Gerger, Jack F.; and Fellner, Lorne E. Crop feeding apparatus. 5,148,658, Cl. 56-14.500.

Gericke AG, Maschinenfabrik: *See—*
Gericke, Willi; Wirth, Karl-Ernst; and Siebenhaar, Wolfgang, 5,149,229, Cl. 406-75.000

Gericke, Willi; Wirth, Karl-Ernst; and Siebenhaar, Wolfgang, to Gericke AG, Maschinenfabrik. Method of and apparatus for pneumatically conveying granular solids. 5,149,229, Cl. 406-75.000.

Gersdorf, Joachim; and Kroggel, Matthias, to Hoechst Aktiengesellschaft. Carboxylic esters of hydroxyl-containing graft polymers and process for their preparation. 5,149,747, Cl. 525-454.000

Gessner, David M.: *See—*
Lewandowski, Mark S.; Gessner, David M.; and Anthony, Robert C., 5,149,114, Cl. 280-33.992.

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Getz, George: *See—*
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Gfeller, Fritz, to International Business Machines Corporation. Electro-optical scanner. 5,150,437, Cl. 385-7 000

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Bellussi, Giuseppe; Cavani, Fabrizio; Arrigoni, Virginio; and Ghezzi, Roberto, 5,149,896, Cl. 585-532.000

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Gilevich, Leonid; and Masters, James C., to Coach and Car Equipment Corporation. Walkover seat with inertial latch. 5,149,171, Cl 297-94.000

Gill, Antony, to Automotive Plastic Technologies, Inc. Apparatus for multi-cavity injection molding. 5,149,547, Cl. 425-145.000

Gill, Manzur, to Texas Instruments Incorporated. Diffusionless source/drain conductor electrically-erasable, electrically-programmable read-only memory and method for making and using the same. 5,150,179, Cl. 357-23.500

Gillies, Stephen D., to Abbott Biotech Inc. Messenger RNA stabilization in animal cells. 5,149,635, Cl. 435-69.100

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Girod, Bernd: *See—*
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Gjerde, Douglas T.; and Benson, James V., to Sarasep, Inc. Fluid analysis with particulate reagent suspension. 5,149,661, Cl. 436-178.000

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Glass, Kristin L.: *See—*
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Glaxo Group Limited: *See—*
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Globe-Union Inc.: *See—*
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Glogowski, Francis J.: *See—*
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Goe, Gerald L.; and Davis, Robert D., to Reilly Industries. High temperature process for selective production of 3-methylpyridine. 5,149,816, Cl. 546-251.000

Goepel, Wolfgang; and Wiemhoefer, Hans-Dieter, to BASF Aktiengesellschaft. Adjusting the transition temperature, the saturation current density with and without a magnetic field and the proportions of normally conducting phases of ceramic superconductors. 5,149,685, Cl. 505-1.000

Goldberg, Jules, to Adaptec, Inc. Integrated crystal oscillator with circuit for limiting crystal power dissipation. 5,150,081, Cl. 331-109.000

Golden Valley Microwave Foods Inc. *See—*
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Goldstar Co., Ltd.: *See—*
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Gonda, Takashi; Hasegawa, Hirofumi; Yamada, Motohiro; and Ariyama, Takayuki, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 5,150,167, Cl. 355-313.000

Gondrand, Michel, to Sames S.A. Installation for applying a coating product. 5,149,373, Cl. 118-634.000

Gonzales, Enrique L.: *See—*
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Gonzalez, Fernando; and Cromar, Larry D., to Micron Technology, Inc. Method of fabricating a vertical parallel cell capacitor having a storage node capacitor plate comprising a center fin effecting electrical communication between itself and parallel annular rings. 5,150,276, Cl. 361-313.000

Goodrich, Earl R., II: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
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Gordon Belt Scrapers, Inc.: *See—*
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Gordon, Frank E.: *See—*
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Gordon, James R., to Gordon Belt Scrapers, Inc. Continuously adjustable rotary bias device. 5,149,305, Cl. 474-101.000

Gordon, Robert D.: *See—*
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Gordon, Wayne: *See—*
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Goris, Donald L.; and Noorman, David A., to MiQuest Corporation Security system for cigarette display case. 5,150,101, Cl. 340-568.000.

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Fleming, Thomas W.; Gorton, Lanny A.; and Cheney, Paul S., II. 5,149,603, Cl. 429-98.000

Gosser, Royal A., to Analog Devices, Inc. Wide-band transconductance generator. 5,150,074, Cl. 330-263.000.

Goto, Makoto; Nara, Terukazu; Uchida, Yasukazu; Terasawa, Masato; Yukawa, Hideaki; and Yamagata, Hisashi, to Mitsubishi Petrochemical. Co., Ltd. Process for culturing microorganisms of the genus Pseudomonas and process for producing L-Alanine using said microorganisms. 5,149,651, Cl. 435-244.000.

Goto, Narito; Takeda, Katsuyuki; Sasaki, Kunitsuna; and Sekiguchi, Nobuyuki, to Konica Corporation. Magnetic recording medium 5,149,585, Cl. 428-323.000

Goto, Takao: *See—*
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Gotoh, Kazushi; and Nakanishi, Toshio, to Kabushiki Kaisha Daiki Aluminum Kogyosho. Slag crushing device. 5,148,997, Cl. 241-65.000

Gotoh, Masaru, to Mita Industrial Co., Ltd. Method of cleaning drums. 5,149,379, Cl. 134-10.000

Graffin, Andre, to Serac Group. Filling apparatus for filling receptacle with metered weights. 5,148,841, Cl. 141-83.000.

Grandhuber, Rudolf: *See—*
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Granger, Colin D.; and Simon, Thomas H., to Warner-Lambert Company. Misuse-resistive transdermal opioid dosage form. 5,149,538, Cl. 424-449.000

Grantham, Rodger P., to Dayco Products, Inc. Hose assembly having a venturi section wtih a slide member therein and method of making the hose assembly. 5,148,840, Cl. 141-44.000

Granville, Richard C.; Mourlas, James C.; and Patrick, Michael K., to Celeste Industries Corporation. Liquid soap dispenser with mounting base. 5,148,948, Cl. 222-173.000

GRAPHA-Holding AG: *See—*
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Gras, Rainer; Wolf, Elmar; Disteldorf, Josef; Huebel, Werner; and Schnurbusch, Horst, to Huels Aktiengesellschaft. Process for the production of monoblocked diisocyanates. 5,149,805, Cl. 540-485.000

Grass Valley Group, Inc., The: *See—*
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Gratt, Harvey J.; and Geswender, Chris E., to United States of America, Air Force. Radar boresight error compensator. 5,149,011, Cl. 224-3.190.

Gravely, Benjamin T.: *See—*
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Gravenhurst Plastics Ltd.: *See—*
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Gray, Henry F.: *See—*
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Gray, James. Golf driving range cart apparatus. 5,149,125, Cl 280-651.000.

Gray, Keith N.: *See—*
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Gray, Michael: *See—*
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Gray, Ralph C., to PPG Industries, Inc. Method of pretreating metal by means of composition containing S-triazine compound. 5,149,382, Cl. 148-257.000

Gray, Richard T.: *See—*
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Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, to International Business Machines Corporation. Stylus sensing system. 5,149,919, Cl. 178-19.000

Great Gasket Concepts, Inc.: *See—*
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Greco, Richard J., to JWP Air Technologies. Grateless regenerative incinerator. 5,149,259, Cl. 431-5.000

Green, George D.; Munk, Stephen A.; and Barnes, Darryl K., to Allied-Signal Inc. Stain-resistant polymers derived from itaconic acid useful as coatings for fibers. 5,149,754, Cl. 526-309.000

Green, Malcolm L. H.; Cheetham, Anthony K.; and Vernon, Patrick D F., to Gas Research Institute. Catalytic gas conversion method. 5,149,464, Cl. 252-373.000.

Green, Richard S., to GTE Valenite Corporation. Adjusting locator for cutting tools. 5,148,609, Cl. 33-628.000.

Greene, Richard F.; and Gray, Henry F., to United States of America, Navy. Field emitter array. 5,150,192, Cl. 357-68.000

Greenlee, Donald R., to Dresser Industries, Inc. Well tool anchoring mechanism with improved slip release. 5,148,866, Cl. 166-134.000

Greenspun, Philip G.; and Baecher, Gregory B., to Consolve, Inc. Method and apparatus for position detection. 5,150,310, Cl. 364-516.000

Greenway, John M., to Milliken Research Corporation. Method and apparatus for patterning of substrates. 5,148,583, Cl. 26-2.00R.

Greer, Joe: *See—*
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Greer, Thomas W.: *See—*
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Greinke, Ronald A.: *See—*
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Greive, Martin, to Heidelberger Druckmaschinen AG. Feed table unit of a sheet-fed printing machine. 5,149,081, Cl. 271-272.000

Agren, Lennart; and Holso, Eino, to Uponor N.V. Pipe for relining underground pipelines. 5,148,837, Cl. 138-121.000.

Grewe, Hans; and Schlump, Wolfgang, to Fried.Krupp GmbH Method of making a composite powder comprising nanocrystallites embedded in an amorphous phase. 5,149,381, Cl. 148-513.000

Grieff, Thomas W.: *See—*
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Grinshpon, Boris: *See—*
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Gros, Jean-Pierre; and Laffont, Patrick, to GEC Alsthom SA Single HP-MP internal stator for a steam turbine with controlled steam conditioning. 5,149,247, Cl. 415-108.000.

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Gross, Heinz; Fetzer, Andreas; and Diekhaut, Gunther, to Rohm GmbH Chemische Fabrik. Method of manufacturing thermoplastic sheet or film. 5,149,481, Cl. 264-210.200

Gross, Jurgen; Pufahl, Holger; Sanger, Dieter; Schaller, Karl-Heinz, and Wilmes, Hugo, to Hoechst Aktiengesellschaft. Incubation device for microtiter plates. 5,149,654, Cl. 435-287.000

Grubbs, Harvey J.: *See—*
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Grumman Aerospace Corporation: *See—*
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Grund, Peter: *See—*
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Gruning, Horst, to Asea Brown Boveri Ltd. Quarter-bridge circuit for high currents. 5,150,287, Cl. 363-135.000

Grusecki, Rodney G.: *See—*
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GTE Products Corporation: *See—*
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GTE Sylvania N.V.: *See—*
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Gudehus, Hans C.; Ellmann, Josef; and Bauth, Edgar. Method and apparatus for determining the relative humidity of gaseous materials. 5,148,710, Cl. 73-335.060

Guerrette, Michael C.: *See—*
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Guimbretiere, Pierre, to Glaenzer Spicer. Differential transmission device and controlled-slip coupling. 5,149,309, Cl. 475-234.000.

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Gulick, Joseph F., Jr. Fuel consumption rate detecting apparatus for a vehicle. 5,148,702, Cl. 73-114.000

Gullion, Steven D., to Cooper Industries, Inc. Tension adapter assembly for completion riser. 5,148,871, Cl. 166-345.000.

Gunji, Katsuhiko: *See—*
Komazaki, Tomokazu; Gunji, Katsuhiko, Onishi, Norio; and Mashimo, Akira, 5,150,089, Cl. 333-206.000

Gunkima, Tomoki; Yuki, Masanori; Kunigita, Masaya; Hirai, Yoshinori; Yoshikawa, Yukio; and Shidoji, Eiji, to Asahi Glass Company Ltd Active matrix liquid crystal display element and projection type active matrix liquid crystal display device. 5,150,232, Cl 359-51.000

Gurevich, Leon, to Cooper Industries, Inc. Time delay fuse for motor starter protection. 5,150,093, Cl. 337-163.000

Gurusamy, Narayanasamy: *See—*
Patton, Jerry R.; and Gurusamy, Narayanasamy, 5,149,875, Cl 564-412.000

Gutmark, Ephraim: *See—*
Schadow, Klaus C.; Gutmark, Ephraim, Wilson, Kenneth J., and Smith, Robert A., 5,149,908, Cl. 89-7.000

H B. Fuller Automotive Products, Inc.: *See—*
Parekh, Manher, 5,149,453, Cl. 252-68.000

H J L Projects & Developments Ltd.: *See—*
Laube, Hans-Jurgen, 5,149,435, Cl. 210-651.000

Haab, Karl; and Haab, Otto. Article of furniture with a door slidable into door compartment. 5,149,180, Cl. 312-322.000

Haab, Otto: *See—*
Haab, Karl; and Haab, Otto, 5,149,180, Cl. 312-322.000

Haag, Anthony P.: *See—*
White, Jerry E., Haag, Anthony P.; and Pews, R Garth, 5,149,768, Cl. 528-89.000

Haake, Kenneth H., Sr., to Ants-Away, Inc. Insect barrier and deterrent device. 5,148,626, Cl. 43-121.000

Haarmann & Reimer: *See—*
Mothes, Helmut A.; Patwardhan, Bhalchandra H., Schroeder, Theo G.; and Solow, David J., 5,149,643, Cl. 435-144.000

Haartz Corporation, The: *See—*
LaMarca, Louis J., II; and Hayes, James F., Sr., 5,149,582, Cl. 428-234.000

Haase, Dieter; Spiratos, Nelu; and Jolicoeur, Carmel, to Handy Chemicals Ltd. Polymeric basic aluminum silicate-sulphate. 5,149,400, Cl. 162-181.600

Haberle, Friedrich: *See—*
Kress, Dieter; and Haberle, Friedrich, 5,149,233, Cl. 408-199.000

Hafer, Karen R.: *See—*
Leis, Paul D., Jr.; Burns, Larry E., and Hafer, Karen R., 5,149,541, Cl. 424-489.000

Hafner, Hans W., to Pfister GbmH. Force measuring device. 5,149,121, Cl. 280-432.000

Hag, Ejaz U., to VLSI Technology, Inc Interblock dispersed-word memory architecture. 5,150,330, Cl. 365-230.030

Hagano, Hiroyuki: *See—*
Kasugai, Joji; Hagano, Hiroyuki; and Hosokawa, Norikazu, 5,148,934, Cl. 220-203.000.

Hagen, Richard L.; Baldwin, William C.; and Thompson, William W., to North American Dynamics. Opposed round parallel path single bay ammunition feed system. 5,149,909, Cl. 89-33.160

Hager, James R., to Honeywell Inc. High Doppler rate, high altitude capability coherent pulse Doppler radar altimeter. 5,150,125, Cl 342-120.000

Hager, Lee N.: *See—*
Costanzo, Ralph D.; Durwin, Robert J.; Hager, Lee N.; and Nochren, William L., 5,149,013, Cl. 244-17.110

Hagino, Hideyuki, to Kabushiki Kaisha Toshiba. Video signal-processing circuit for outputting a drop out signal superimposed on a correlation/noncorrelation signal. 5,150,220, Cl. 358-336.000

Hagiwara, Isao: *See—*
Takeda, Mutsuhiko; Hagiwara, Isao; Zaima, Fumiya; and Sakaguchi, Shuzabu, 5,149,857, Cl. 558-271.000

Hagiwara, Tsuneyuki; and Hayano, Fuminori, to Nikon Corporation. Foreign particle inspection apparatus. 5,149,982, Cl. 250-571.000.

Haglund, Richard: *See—*
McEntire, Jay; Haglund, Richard; Johnson, Ed; and MacFarlane, J. Garrett, 5,149,017, Cl. 244-114.00R

Haider, Franz; Zehentner, Martin; Lileg, Johann; and Obitz, Lars, to Maschinenfabrik Andritz Actiengesellschaft. Segment for drum refiners and structure provided therewith. 5,148,994, Cl. 241-261.100

Haim, Elias S.; Rupp, John A.; and Penn, Cecil W., to Honeywell Inc.; and Hosiden Corporation. Apparatus for improving the angle of view in a liquid crystal display. 5,150,235, Cl. 359-68.000

HaKansson, Christer L.; and Karlsson, Bengt L., to Rexolin Chemicals AB. Process for the purification of mandelic acid N,N-diethylamide. 5,149,873, Cl. 564-170.000

Hakuta, Kohzo; Aramaki, Minoru; Suen. A, Takashi; Kodama, Mitsuo, Nakano, Hisaji; and Nakagawa, Shinsuke, to Central Glass Company, Limited. Method and apparatus for analyzing fluorine containing gases. 5,149,659, Cl. 436-55.000

Hala, Joseph A.; and Johnson, Donald W., to United States of America, America. Capture of vector CRT display for hardcopy. 5,150,453, Cl. 395-106.000

Halbritter, Klaus: *See—*
Brenner, Karl; Ruppel, Wilhelm; Woerz, Otto; Halbritter, Klaus; Scheiper, Hans-Juergen; Aquila, Werner; and Fuchs, Hartwig, 5,149,884, Cl. 568-471.000

Hale, Richard: *See—*
Bale, Richard; and Hale, Richard, 5,150,332, Cl. 367-73.000

Hales, Jeffrey E., to U.S. Philips Corporation. Electronically tunable front end filter for radio apparatus. 5,150,085, Cl. 333-174.000

Haley, Roger L.: *See—*
Mashayekhi, Mansour; Haley, Roger L.; Payne, Joe E.; and Kempton, C. Conrad, 5,149,447, Cl. 210-767.000

Hallenbach, Werner: *See—*
Lindel, Hans; Hallenbach, Werner; and Gallenkamp, Bernd, 5,149,822, Cl. 546-315.000

Hallenbeck, Gary A.; Janson, Wilbert F. Jr.; and Jones, William B., to Eastman Kodak Company. Optoelectronic device component package. 5,149,958, Cl. 250-216.000

Hallenberger, Kaspar: *See—*
Rauchschwalbe, Gunther; Blank, Heinz-Ulrich; Deibele, Ludwig; Hallenberger, Kaspar; and Ruflert, Gerhard, 5,149,890, Cl 568-934.000

Halliburton Company: *See—*
Olaussen, Stein; Bjordal, Audun; and Solland, Geir, 5,149,370, Cl. 106-737.000
Schultz, Roger L.; Manke, Kevin R.; Skinner, Neal G.; Bohan, William L.; and Young, Allen R., 5,149,984, Cl. 290-54.000

Halliday, Thomas S. Wheelchair lock. 5,149,120, Cl. 280-304.100.

Halls, Partick M. E.: *See—*
MacAlpine, Gerald A.; Halls, Partick M. E.; and Asselin, Andre E., 5,149,452, Cl. 252-56.00R

Hamada, Hiroshi: *See—*
Nakanishi, Hiroshi; and Hamada, Hiroshi, 5,150,138, Cl. 353-38.000

Hamano, Hiroshi: *See—*
Arai, Yasunari; Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji; and Ihara, Takeshi, 5,150,780, Cl. 361-401.000
Imai, Shinji; Hamano, Hiroshi; Funuma, Michio; Shimanaka, Chikafumi; and Urushidani, Shinzo, 5,150,288, Cl. 364-132.000

Hamblin, Bruce A.: *See—*
Kastrup, Marie A.; Peterson, Ivan H.; and Hamblin, Bruce A., 5,149,147, Cl. 285-261.000

Hamburgen, William R., to Digital Equipment Corporation. Die attach structure and method. 5,150,197, Cl. 357-80.000

Hamer, Frank: *See—*
Beard, George W.; and Hamer, Frank, 5,149,390, Cl. 156-414.000

Hamilton, Bruce E.; Stiles, Lorren; and Harper, Howard P., to United Technologies Corporation. Power management symbology display system. 5,150,117, Cl. 340-973.000

Hamilton, Harriet W.: *See—*
Doherty, Annette M.; Hamilton, Harriet W.; and Steinbaugh, Bruce A., 5,149,692, Cl. 514-18.000

Hamilton, J. Gordon: *See—*
Sonenshine, Daniel E.; Hamilton, J. Gordon; and Lusby, William R., 5,149,526, Cl. 424-84.000

Hamm, Alton B.; and Ratliff, Grover C. to Mixer Products, Inc. System for mixing cementitious construction materials. 5,149,192, Cl 366-8.000

Hammes, Friedhelm: *See—*
Leclere, Klemens; Kessels, Hans-Willi; and Hammes, Friedhelm, 5,148,574, Cl. 15-415.100

Hammond, Peter R.; and Field, George F., to United States of America, Energy Oxazine laser dyes. 5,149,807 Cl. 544-99.000

Hamos, Istvan: *See—*
Bognar, Alajos; Csepes, Gusztav; and Hamos, Istvan, 5,150,059, Cl. 324-551.000

Hamu, Kaino J. Screen printing apparatus assembly. 5,148,745, Cl 101-127.100

Han, Hyeong-deok, to Samsung Electronics Co., Ltd. Control system for recording and reproducing a plurality of video signals. 5,150,212, Cl. 358-147.000

Han, Sang K.: *See—*
Kim, Young G.; Yoo, Han I.; Han, Sang K.; and Lee, Deung Y., 5,149,499, Cl. 420-495.000

Han, Scott; DeCaul, Lorenzo C.; Palermo, Robert E.; and Walsh, Dennis E., to Mobil Oil Corp. Partial oxidation of methane over perovskite catalyst. 5,149,516, Cl. 423/415.00A

Han, Sil. Distortion-free expansion/contraction arbor or chuck assembly. 5,149,111, Cl. 279-2.030.

Hanai, Kazumichi: *See—*
Ueda, Hironori; Hanai, Kazumichi; Takeuchi, Hitoshi; Nakamichi, Kazutaka; and Kubota, Takashi, 5,148,678, Cl. 60-602.000

Handy Chemicals Ltd.: *See—*
Haase, Dieter; Spiratos, Nelu; and Jolicoeur, Carmel, 5,149,400, Cl. 162-181.600

Handyside, Timothy M.: *See—*
Morton, David; and Handyside, Timothy M., 5,149,566, Cl. 427-235.000

Hannemann, Jurgen G.: *See—*
Schnorr, Thomas M.; and Hannemann, Jurgen G., 5,150,353, Cl. 369-270.000

Hansen, Finn B.; and Balschmidt, Per, to Novo Nordisk A/S. Human insulin analogs and preparations containing them. 5,149,777, Cl. 530-303.000

Hansen, Lorin K.; and White, Stephen D., to Xerox Corporation Counter electrode for an electrostatic recorder. 5,150,134, Cl 346-155.000

Hara, Kazuhiko. *See—*
Tabata, Yoichiro; Ueda, Yoshihiro; Ueguri, Shigeo; and Hara, Kazuhiko, 5,150,375, Cl. 372-98.00

Hara, Takahiko; and Fujii, Syuso, to Kabushiki Kaisha Toshiba. Reference voltage generating circuit device 5,150,188, Cl. 357-41.000

Hara, Toshitami; Tsuda, Hisanori; and Hirasawa, Shinichi, to Canon Kabushiki Kaisha. Liquid jet recording method and apparatus having electro-thermal transducer connected to a higher power source potential side through a switch. 5,150,29, Cl. 346-1.100

Hara, Yasushi; Ito, Yukio; and Sekizawa, Kazuhiko, to Tosoh Corporation. Process for producing alkylenamine. 5,149,877, Cl. 564-479.000

Harada, Nozomu; Endo, Yukio; and Ide, Yuji, to Kabushiki Kaisha Toshiba. Solid state image sensing device output. 5,150,388, Cl 377-60.000

Haraguchi, Kaoru, to Omron Tateisi Electronics Co. Signature identification system. 5,150,420, Cl. 382-3.000.

Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens shutter camera including zoom lens. 5,150,145, Cl. 354-403.000.

Hardin, Max L.: *See—*
Drewry, Thomas L.; and Hardin, Max L., 5,149,153, Cl 292-104.000

Harken, Inc.: *See—*
Monahan, J. Kevin, 5,149,059, Cl. 254-394.000

Harmon Industries, Inc.: *See—*
Utterback, Jeffery J.; and Mecca, Randall S., 5,149,025, Cl. 246-169.00A

Harmon, Walter D.: *See—*
Meeker, Brian L.; and Harmon, Walter D., 5,149,920, Cl 181-290.000

Harper, Howard P.: *See—*
Hamilton, Bruce E.; Stiles, Lorren; and Harper, Howard P 5,150,117, Cl. 340-973.000

Harreld, Donald R.: *See—*
Skiba, Barbara T.; Harreld, Donald R.; and Ponsi, Lawrence G., 5,149,506, Cl. 422-102.000

Harrington, Owen: *See—*
Friedman, Michael; Harrington, Owen; and Dunn, David. 5,150,051, Cl. 324-258.000

Harris, Beth E.: *See—*
Liu, Francis C.; and Harris, Beth E., 5,148,762, Cl. 114-253.000

Harris Corporation: *See—*
Malec, Jeffrey M., 5,150,072, Cl. 330-149.000.
Yunus, Mohammad, 5,150,120, Cl. 341-143.000.

Harris, Stephen L.; and Yanchak, Dennis A., to Amoco Corporation. Method for enhancing seismic data. 5,150,331, Cl. 367-50.000.

Harrison, James E., Jr.: *See—*
Sexton, Richard W.; and Harrison, James E., Jr., 5,149,419, Cl. 205-75.000

Harrison, Jerry T.: *See—*
Jones, Marshall G.; Harrison, Jerry T.; Piel, Joseph E., Jr.; and Smith, Lowell S., 5,148,962, Cl. 228-49.100

Harrow, George A. Sagger loading apparatus and a method of loading a sagger. 5,149,979, Cl. 250-561.000.

Harry, Alan J.: *See—*
Pettigrew, Robert M.; Harry, Alan J.; Nailor, Paul R.; Adelmann, Fred; Franzen, Peter; and Schoon, Juergen, 5,149,211, Cl. 400-88.000

Harry Winston, S.A.: *See—*
Winston, Ronald H.; and Alev, Necip, 5,149,938, Cl. 219-121.690.

Hart, Darlene L.: *See—*
Baugh, Richard A.; Chiu, Ran-Fun; Hart, Darlene L.; Jam, Merban; and Leung, Sui-hing, 5,150,379, Cl. 375-14.000.

Hart, Marshall B.; Lesslie, David J.; Candelora, Andrew M.; and Guerrette, Michael C., to General Electric Company. Bus cover and lug cover for a molded case circuit breaker. 5,150,091, Cl. 335-202.000

Harten, Gunter: *See—*
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; Zeuschner, Ulrich; and Harten, Gunter, 5,148,740, Cl. 100-264.000

Hartke, Dennis V. Portable holder to support a recapped container of effervescent liquid in an inverted position to retain the liquids freshness. 5,149,041, Cl. 248-146.000

Hartmann, Heinrich: *See—*
Niessner, Manfred; Wickel, Stefan; Heide, Wilfried; and Hartmann, Heinrich, 5,149,750, Cl. 526-81.000.

Hartmann, Jerome, to Cobbs Manufacturing Company. Clip device 5,148,581, Cl. 24-351.000

Hartmann, Uwe: *See—*
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,149,853, Cl. 556-1.000

Haruna, Shuji: *See—*
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Hasegawa, Akira: *See—*
Sakaguchi, Katsuyoshi; and Hasegawa, Akira, 5,149,545, Cl. 425-35.000

Hasegawa, Hirofumi: *See—*
Gonda, Takashi; Hasegawa, Hirofumi; Yamada, Motohiro; and Ariyama, Takayuki, 5,150,167, Cl. 355-313.000
Matsuura, Yasuhiro; Kojima, Hiroaki; Hasegawa, Hirofumi; Ohmori, Naoto; and Yamada, Yukio, 5,150,166, Cl. 355-308.000

Hashimoto, Akira: *See—*
Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., 5,149,533, Cl. 424-94.640.

Hashimoto Kasei Kabushiki-Kaisya: *See—*
Ohmi, Tadahiro; Miki, Nobuhiro; Maeno, Matagoroh; and Kikuyama, Hirohisa, 5,149,378, Cl. 118-725.000

Hashimoto, Masaru: *See—*
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Hashiura, Mitsuo; Negura, Kenji; Kamiya, Sadayuki; Yamauchi, Shigenori; Suzuki, Yuji; Kato, Kenji; Tokizane, Naoki; and Shoji, Yoshifusa, to Sumitomo Light Metal Industries, Ltd.; and Nippondenso Co., Ltd. Heat exchanger fin materials and heat exchangers prepared therefrom. 5,148,862, Cl. 165-134.100.

Hashizume, Hiroshi: *See—*
Matsumura, Hiromu; Yano, Toshisada; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 5,149,817, Cl. 546-281.000

Hashizume, Takeshi; and Sakashita, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device comprising scan paths having individual controllable bypasses. 5,150,044, Cl 324-158.00R

Haskell, Robert K. Downrigger weight and method. 5,148,623, Cl. 43-43.130.

Hasler, Rudolf, to U.S. Philips Corp. Electronic level control circuit for sound signals. 5,150,416, Cl. 381-104.000.

Hassler, William L., Jr., to Parker Hannifin Corporation. Fiber-optic position sensor including photovoltaic bi-cell. 5,149,963, Cl 250-227.210.

Hata, Seishichi: *See—*
Kunihiro, Yasuyuki; Tanaka, Ryo; Hata, Seishichi; and Yamada, Koji, 5,149,540, Cl. 424-489.000.

Hatco Corporation: *See—*
Chen, Clay T.; and Chen, Mary S., 5,149,867, Cl. 562-486.000.

Hatten, James L.: *See—*
Karlsson, Haraldur; Jacques, Gary E.; Hatten, James L.; and Aslakson, John K., 5,148,875, Cl. 175-62.000

Hawe, William: *See—*
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Hawk, Robert M.: *See—*
Berkey, George E.; Hawk, Robert M.; and Tarcza, Steven H., 5,149,349, Cl. 65-3.110.

Hayano, Fuminori: *See—*
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Hayasaki, Kiyoshi: *See—*
Kurauchi, Makoto; Hayasaki, Kiyoshi; Minami, Toshikazu; and Ohnishi, Mutsuhiko, 5,149,385, Cl. 156-85.000

Hayashi, Kazuyuki: *See—*
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Hayashi, Mikiya: *See—*
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Hayashi, Mishio; and Sotome, Tetsuo, to Advantest Corporation. High-rate pulse pattern generator. 5,150,390, Cl. 377-116.000.

Hayashi, Ryutaroh: *See—*
Kamiya, Yukio; Watanabe, Touru; and Hayashi, Ryutaroh, 5,149,904, Cl. 84-723.000

Hayashi, Seiji: *See—*
Sakashita, Keiichi; Hayashi, Seiji; Ikemoto, Tetsuya; and Yamamoto, Osamu, 5,149,462, Cl. 252-299.610.

Hayashi, Tetsuya: *See—*
Okumoto, Takaharu; Hayashi, Tetsuya; and Kato, Masahiro, 5,149,091, Cl. 273-80.200.

Hayes, Arthur F.; and Lemsky, Joseph A., to Ladish Co., Inc. Method of shear forge bonding and products produced thereby. 5,148,965, Cl 228-115.000

Hayes, Dennis F.; and Stark, Gerald, to Digital Equipment Corporation. Method and apparatus for suspending and restarting a bus cycle 5,150,467, Cl. 395-325.000

Hayes, James F., Sr.: *See—*
LaMarca, Louis J., II; and Hayes, James F., Sr., 5,149,582, Cl. 428-234.000

Hayes, Richard A., to Du Pont de Nemours, E. I., and Company. Stabilized polyacetal compositions containing a mixture of HALS having tertiary functionality. 5,149,723, Cl. 524-99.000.

Haymore, Ralph B.; and Johnson, Mark I., to Eaton-Kenway, Inc. Dual mast apparatus for storage and retrieval vehicles. 5,149,241, Cl. 414-279.000

Haymore, Ralph B., to Eaton-Kenway, Inc. Vertical drive apparatus for storage and retrieval vehicles. 5,149,242, Cl. 414-279.000.

Haynie, Timothy J.; and Lawrence, Glen S., to Ferranti Sciaky, Inc. High voltage electron beam gun. 5,149,934, Cl. 219-121.270.

Hayward, John S.: *See—*
Douwens, Robert J.; and Hayward, John S., 5,148,801, Cl. 128-203.160.

Hazato, Atsuo; and Kurozumi, Seizi, to Teijin Limited. 2-cyclopentenone derivatives. 5,149,711, Cl. 514-548.000

Hazato, Atsuo; Takeyasu, Takumi; Tomimori, Koji; and Kato, Yoshinori, to Teijin Limited. Naphthalene derivatives. 5,149,859, Cl 560-10.000

Heacox, Albert E.: *See—*
McNally, Robert T.; McCaa, Cameron; Brockbank, Kelvin G. M.; Heacox, Albert E.; and Bank, Harvey L., 5,149,621, Cl. 435-1.000

Health Tech Services Corporation: *See—*
Kaufman, Stephen B.; DiGianfilippo, Aleandro; Sager, Tamara L.; and DeVito, Ralph J., 5,148,944, Cl. 221-131.000.

Heath, Richard W., to Tolco, Incorporated. Side beam pipe hanger and method of making. 5,149,040, Cl. 248-300.000.

Heather Ruth Davis Trust: *See—*
Davis, Allen V. C., 5,149,150, Cl. 267-159.000

Hebert, Claude L. Method for magnetically treating water in a closed loop heat transfer system. 5,149,438, Cl. 210-695.000.

Hebert, Gerald D.; and Holloway, Oris E., to Nabisco, Inc. Product and process of coating nuts with edible protein. 5,149,562, Cl 426-632.000

Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Plempel, Manfred, to Bayer AG. Nikkomycin derivatives. 5,149,795, Cl. 536-23.000

Heffner, Joseph H.: *See—*
Leimbach, J. George; and Heffner, Joseph H., 5,148,684, Cl 62-197.000

Heide, Wilfried: *See—*
Niessner, Manfred; Wickel, Stefan; Heide, Wilfried; and Hartmann, Heinrich, 5,149,750, Cl. 526-81.000

Heidelberger Druckmaschinen AG: *See—*
Blaser, Peter-Theobald; and Hofheinz, Walter, 5,148,715, Cl 74-325.000
Greive, Martin, 5,149,081, Cl. 271-272.000
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Heilmann, Steven M.: *See—*
Moren, Dean M.; Heilmann, Steven M., Krepski, Larry R.; and Rasmussen, Jerald K., 5,149,806, Cl. 544-72.000

Hein, Jerrell P.: *See—*
Stern, Kenneth J., Sooch, Navdeep S.; and Hein, Jerrell P., 5,150,386, Cl. 375-118.000

Hein, Richard D., to GenCorp Inc. Spring seat/jounce bumper assembly. 5,149,069, Cl. 267-153.000

Heindl, Raymond A.; Duffy, Mark E.; Dakin, James T.; Witting, Harald L.; Nagle, Richard C.; and Mazza, Lawrence T., to General Electric Company. Electrodeless high intensity discharge lamp having an intergral quartz outer jacket. 5,150,015, Cl. 315-248.000

Heinemann, Otto; and Schmits, Heinz-Herbert, to Krupp Polysius AG. Method and apparatus for cooling hot material. 5,149,266, Cl. 432-77.000

Heinz, Hans-Detlef: *See—*
Kohler, Burkhard; Heinz, Hans-Detlef; and Reinking, Klaus, 5,149,728, Cl. 524-259.000

Heitmann, Uwe, to Korber AG. Method of and apparatus for making a tobacco stream with a core containing tobacco ribs. 5,148,816, Cl. 131-84.100.

Helber, Robert A. Adjustable hitch assembly. 5,149,122, Cl. 280-491.200

Held, Kurt. Method and apparatus for continuously fabricating laminates. 5,149,394, Cl. 156-555.000

Hellwarth, Robert W. *See—*
Mullen, Ruth A.; and Hellwarth, Robert W., 5,149,406, Cl 204-157.220

Hemel, Richard; Herold, Julius; Buecken, Hans-Juergen; and Hofmann, Peter, to Henkel Kommanditgesellschaft auf Aktien. Heat curable adhesives based on polymers having a polybutadiene chain backbone and containing hydroxyl groups. 5,149,742, Cl. 525-124.000

Henke, Thomas E.: *See—*
Beaver, Phillip R.; Henke, Thomas E.; Bergen, Charles R.; and Loechelt, Cecil P., II, 5,149,105, Cl. 277-1.000.

Henkel Corporation: *See—*
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Henkel Kommanditgesellschaft auf Aktien: *See—*
Hemel, Richard; Herold, Julius; Buecken, Hans-Juergen; and Hofmann, Peter, 5,149,742, Cl. 525-124.000
Jacobs, Jochen; Jahnke, Ulrich; Jung, Dieter; Oleffelmann, Rudolf, and Adler, Wilfried, 5,149,455, Cl. 252-174.130

Hennessy, Bernard M.: *See—*
Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., 5,149,846, Cl. 556-436.000

Henri, Jacques. Trash can holder. 5,149,031, Cl. 248-131.000

Henschel, Hans-Helmut: *See—*
Reiter, Friedemann; Grill, Helmut; Henschel, Hans-Helmut; Schliack, Michael; Seibel, Klaus; Loser, Roland; and Lang, Gerhard, 5,149,865, Cl. 562-473.000

Herkes, Frank E., to Du Pont de Nemours, E. I., and Company. Synthesis of 2-alkylhexahydropyrimidines from nitriles. 5,149,809, Cl. 544-242.000

Hernandez, Felipe: *See—*
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Herold, Julius: *See—*
Hemel, Richard; Herold, Julius; Buecken, Hans-Juergen; and Hofmann, Peter, 5,149,742, Cl. 525-124.000

Hershelman, James W., to Moldex/Metric Products, Inc. Method for producing filter material formed of melt-blown non-woven mat sandwiching additional material. 5,149,468, Cl. 264-12.000

Herstad, Solvie M.: *See—*
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Ho, Rodney; Merigan, Thomas; Burke, Rae L.; and Dina, Dino, to Leland Chiron Corporation, Board of Trustees of; and Stanford Junior University. Compositions and treatment for herpes simplex 5,149,529, Cl. 424-88.000
Hoch, Robert, to SDTX Technologies, Inc. Process for the decontamination of soils, sediments, and sludges. 5,149,444, Cl. 210-751.000
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Hofgraff, Hans G., to Transtechnik GmbH Electrical circuit for the switch-off relief of a controllable semiconductor switch. 5,149,995, Cl. 307-633.000
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Nakazawa, Yasuo, 5,149,283, Cl. 439-607.000
Hosokawa, Nobuo; and Togashi, Shigekazu, to Matsushita Electric Industrial Co., Ltd. Recording method in which recording signals are allocated into a plurality of data tracks. 5,150,262, Cl. 360-48.000
Hosokawa, Norikazu: *See*—
Kasugai, Joji; Hagano, Hiroyuki; and Hosokawa, Norikazu, 5,148,934, Cl. 220-203.000
Houminer, Yoram; and Grubbs, Harvey J., to Philip Morris Incorporated. Smoking compositions. 5,148,817, Cl. 131-278.000
Houston Industries Incorporated: *See*—
Williams, Danny R., 5,148,910, Cl. 200-43.190
Houston, Jay R.: *See*—
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Shaw, Ching-Hao; Bosshart, Patrick; Matzke, Douglas; Kalyan, Vibhu; and Houston, Theodore, 5,150,309, Cl. 364-491.000
Howard, James K.: *See*—
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Howard, Ronald A.: *See*—
Mercuri, Robert A.; Getz, George; Greinke, Ronald A.; and Howard, Ronald A., 5,149,518, Cl. 423-449.000
Howard, William J. See-through magazine. 5,149,897, Cl. 42-50.000
Howell, Robert M., to National-Oilwell. Connector assembly with detachable sleeve. 5,149,143, Cl. 285-18.000
Hsu, Hsiung, to Ohio State University. Non-contact tonometer. 5,148,807, Cl. 128-645.000
Hsu, Peter C.: *See*—
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Huang, Chender: *See*—
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Huang, Eddy C., to VLSI Technology, Inc. Input protection circuit for CMOS devices. 5,150,187, Cl. 357-43.000
Huang, Shyh-Chin: *See*—
McKee, Douglas W.; and Huang, Shyh-Chin, 5,149,497, Cl. 420-418.000
Huard, Albert, to Dero Enterprises Inc. Cap with perforating spike for container with a protective membrane. 5,148,937, Cl. 220-278.000
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Huber, Richard; and Wirz, Peter, to Klinger AG. Shut-off valve 5,149,055, Cl. 251-324.000
Huebel, Werner: *See*—
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Huebschen, David A.; Pagac, William T.; Mikic, Frank; Severson, Thomas S.; and Sorbie, Douglas M., to Snap-on Tools Corporation One-piece, open-end wrenching head with roughened jaws 5,148,726, Cl. 81-119.000.
Huels Aktiengesellschaft: *See*—
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August, Henry, 5,149,906, Cl. 89-1.810
Banh, Nam D.; Lo, Thomas K. Holthaus, Kelly D.; and Sacks, Jack M., 5,150,426, Cl. 382-48.000
Castelaz, Patrick F., 5,150,323, Cl. 364-807.000
Donner, Joseph E., 5,149,933, Cl. 219-113.000
Gabaldon, John B.; Evans, Daniel D., Jr.; and Cawelti, Dale W., 5,148,967, Cl. 228-179.000
Kongelbeck, Knut S., 5,150,128, Cl. 342-174.000
Mullen, Ruth A.; and Hellwarth, Robert W., 5,149,406, Cl 204-157.220.
Nourrcier, Charles E., 5,150,372, Cl. 372-38.000
Pierce, Brian M.; Lawrence, George D.; Chang, David B.; and Arenberg, Jonathan W., 5,149,957, Cl. 250-211.00R
Sherman, James D., 5,150,069, Cl. 328-171.000.
Sipma, Dale M., 5,149,976, Cl. 250-492.200.
Virga, Kathleen L.; Shoda, Craig; and Owens, Joseph N., 5,150,088, Cl. 333-238.000
Whitney, Colin G., 5,149,970, Cl. 250-339.000
Yamamoto, Kio; and Fong, Stewart O., 5,150,196, Cl. 357-74.000.
Yang, Steve S.; and Arnold, Keith P., 5,150,078, Cl. 331-2.000
Hughes, Dana N.: *See*—
Shoemaker, Martin L.; Hughes, Dana N.; and Kuchta, Steven L., 5,150,199, Cl. 358-21.00R
Hughes, Philip; and Terman, Michael. Work station with phototherapy light box. 5,149,184, Cl. 362-1.000.
Huhn, John; and Spector, George. Prop jet airplane propelling system. 5,149,016, Cl. 244-55.000
Huignard, Jean-Pierre: *See*—
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Humbert, Gary A.; and Lela, Robert W., to Motorola, Inc. Selective wave solder apparatus. 5,148,961, Cl. 228-37.000.
Humbert, Thierry: *See*—
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Humpert, Jurgen; and Pawelzik, Manfred, to Friedrich Grohe Armaturenfabrik GmbH + Co. Surface-mounting mixing valve. 5,148,551, Cl. 4-192.000
Humphrey, Guy R.; Madar, Ann M.; and Thompson, Andrew S., to Merck & Co., Inc. Intermediates for substituted azetidinones useful as anti-inflammatory and antidegenerative agents. 5,149,838, Cl. 549-471.000
Hung, Paul L. K.; Cioffi, John; and Lavach, Mark L., to Elf Atochem North America, Inc. Printed-wireboard photoimaging. 5,148,765, Cl. 118-100.000
Hunt, David J., to AMT (Holdings) Ltd. Processor array system incorporating n-bit scalar processor and m x m-bit processor array 5,150,290, Cl. 364-736.000
Hunt, Glen P.: *See*—
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Hurst, Richard F. Apparatus for decomposting compressed tablets 5,148,995, Cl. 241-30.000
Hurst, Roger C.: *See*—
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Hutchings, William F.: *See*—
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Hutchinson, Wilbur P.; and Smith, Gerald L., to Moore Business Forms, Inc. Edge sealer for multi-ply business forms. 5,149,393, Cl. 156-555.000
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Hwang, Tsong-Ching. Shock-absorbing folding bicycle. 5,149,119, Cl. 280-275.000
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I Q International, Inc.: *See*—
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Igarashi, Shigeru; Ozawa, Osamu; and Kitami, Tetsu, to Yokohama Rubber Co., Ltd., The. Rubber composition for polymer-metal bonding and method of hose-metal fitting attachment. 5,149,732, Cl. 524-315.000
Igawa, Shoji; and Kotani, Akio, to Minolta Camera Kabushiki Kaisha. Copying machine capable of providing indexes. 5,150,159, Cl. 355-243.000
Ihara, Takeshi. *See*—
Arai, Yasunari; Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji; and Ihara, Takeshi, 5,150,280, Cl. 361-401.000
Iida, Giichi; and Takahashi, Kazunori, to Kioritz Corporation. Pipe structure. 5,149,160, Cl. 294-16.000
Iida, Katsumi: *See*—
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Iimura, Haruo; Takiguchi, Yasuyuki; and Kanemoto, Akihiko, to Ricoh Company, Ltd. Liquid crystal display element. 5,150,237, Cl. 359-73.000
Iio, Masahiro, to Diesel Kiki Co., Ltd. Compressor with a cylinder having improved seizure resistance and improved wear resistance, and method of manufacturing the cylinder. 5,149,257, Cl 418-178.000
Iizuka, Akira; and Kawakami, Keiji, to Yamaha Corporation. Musical tone generating apparatus having means for controlling the amplitude of a musical tone signal envelope. 5,149,903, Cl. 84-627.000
Ikeda, Makoto *See*—
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Imai, Shinji; Hamano, Hiroshi; Fujinuma, Michio; Shimanaka, Chikafumi; and Urushidani, Shinzo, to Honda Giken Kogyo Kabushiki Kaisha. Production management system and method of transmitting data. 5,150,288, Cl. 364-132.000
Imaizumi, Hiroshi; Kato, Toshio, Nakashima, Hideaki; Murakami, Yasuo; Kashimura, Hideki; and Katayama, Kiichi, to Aichi Sangyo, Co., Ltd.; and Nippon Steel Corp. Automatic welding apparatus 5,149,939, Cl. 219-125.120.
Imasaka, Yoshinobu; Yonenc, Hiroshi; and Sumihara, Masanori, to Matsushita Electric Industrial Co., LTD Ultrasonic motor 5,150,000, Cl. 310-323.000
Imoto, Kiyoaki: *See*—
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King, Frank; and Fakley, Martin E., 5,149,893, Cl. 585-267.000
Perrior, Trevor R.; Tapolczay, David J.; and Whittle, Alan J., 5,149,810, Cl. 544-309.000
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Inamura, Susumu, to Ishikawa Gasket Co., Ltd. Metal gasket with fluid hole sealing sevices. 5,149,110, Cl. 277-235.00B
Inbar, Michael, to Applied Magnetics Corporation. Method and apparatus for measuring time elapsed between events. 5,150,337, Cl 368-118.000
Industrial Metal Products Corporation: *See*—
Judge, Edward E.; Bennickson, Lowell W.; and Reiser, Arthur G., 5,148,636, Cl. 51-142.000
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Inman, Frederick R. Marine exhaust manifold and header pipe system 5,148,675, Cl. 60-321.000
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Behm, Jason L.; and Chiang, Wei-Hwan, 5,150,457, Cl 395-120.000
Bettel, Bradley J.; and Gordon, Robert D., 5,150,312, Cl 395-118.000
Blank, Ted E.; Ferguson, Donald F.; Frey, Jeffrey A., Pruscino, Angelo; Rogers, Robert R.; and Rahm, Erhard, 5,150,472, Cl. 395-425.000
Byrnes, Herbert P.; and Wahl, Richard, 5,150,040, Cl. 324-158.00F
Collins, Clive A.; and McDonald, James A., 5,150,279, Cl 361-393.000
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inTest Corporation: *See*—
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Ishii, Kyoko: *See—*
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Ishikawa, Mikio; and Kobayashi, Toshiro, to Sekisui Kaseihin Kogyo K.K. Process for producing polystyrene resin foam. 5,149,721, Cl. 521-79.000
Ishiwata, Shinichi; Ueyama, Michio; Nakae, Hiroyuki; Funayama, Yoshiyuki; Iwamoto, Kazushige; and Noguchi, Isamu, to Furukawa Electric Co., Ltd. Radiation-curable adhesive tape. 5,149,586, Cl. 428-345.000
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Ishizuka, Masahiro; and Hayashi, Kazuyuki, to Mitsubishi Denki Kabushiki Kaisha; and. Apparatus for conveying lead frame. 5,148,908, Cl. 198-774.300
Isobe, Kazuhito; and Hirano, Reiji, to Canon Kabushiki Kaisha. Method and apparatus for alignment and exposure. 5,150,173, Cl. 356-401.000
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Isovolta Osterreichische Isolierstoffwerke: *See—*
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Ito, Tsukasa, to AMP Incorporated. Filter and electrical connector with filter. 5,150,086, Cl. 333-182.000.
Ito, Yukio: *See—*
Hara, Yasushi; Ito, Yukio; and Sekizawa, Kazuhiko, 5,149,877, Cl. 564-479.000
Ito, Yukiyoshi: *See—*
Satoh, Tsutomu; Shimizu, Ikuo; and Ito, Yukiyoshi, 5,149,819, Cl. 548-149.000.
Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma, Mikio; and Kato, Yasuyuki, to Fujikura Ltd.; and Nippon Telegraph & Telephone Corporation. Apparatus for fusion-splicing a pair of polarization maintaining optical fibers. 5,149,350, Cl. 65-12.000
Itoigawa, Masakatsu: *See—*
Iwamoto, Kenichi; Sugimoto, Yuji; Namba, Toyoaki; Itoigawa, Masakatsu; Shibano, Yoshihumi; and Okada, Kenzi, 5,149,079, Cl. 271-162.000
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Bertrand, John, 5,150,410, Cl. 380-28.000.
ITW Plastiglide: *See—*
Clarke, Martin D. H.; and Davis, Ronald M., 5,148,578, Cl. 24-41.000
Ives, Frank E., to PMC, Inc. Multiple roll impregnator. 5,149,372, Cl. 118-412.000
Iwaki, Tsutomu: *See—*
Seri, Hajime; Moriwaki, Yoshio; Shintani, Akemi; and Iwaki, Tsutomu, 5,149,383, Cl. 148-400.000
Iwaki, Yuji; and Funayama, Masanori, to Sony Corporation. Disk cartridge with write protect mechanism. 5,150,269, Cl. 360-133.000.
Iwamoto, Hirofumi; Tajima, Hisao; Uehara, Makoto; Onitsuka, Yoshihiro; Miyamoto, Takao; Takabayashi, Hiroshi; and Yoshihara, Satoshi, to Canon Kabushiki Kaisha. Impact resistant ferroelectric liquid crystal apparatus. 5,150,231, Cl. 359-44.000.
Iwamoto, Kazushige: *See—*
Ishiwata, Shinichi; Ueyama, Michio; Nakae, Hiroyuki; Funayama, Yoshiyuki; Iwamoto, Kazushige; and Noguchi, Isamu, 5,149,586, Cl. 428-345.000
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Iwamoto, Yasunori: *See—*
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Iwasaki, Hiroshi: *See—*
Masuda, Tadao; Tsukuda, Masahiro; Dotura, Shigeru; Kawanishi, Kaoru; and Iwasaki, Hiroshi, 5,148,651, Cl. 53-381.200.
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Iwata, Hirokimi; and Haruna, Shuji, to Sony Corporation. Disk cartridge. 5,150,354, Cl. 369-291.000.
Iwata, Ineo: *See—*
Ueki, Toru; Sakato, Kenji; Yoshimura, Masaji; Kanezaki, Kazuharu; and Iwata, Ineo, 5,149,465, Cl. 252-511.000.
Iwatani, Mitsuo; Kamoda, Hitoshi; Mikuriya, Masatoshi; Kashiyama, Tadao; and Kajino, Yoshio, to Sony Corporation. Printing apparatus with disengageable paper supply and two-stage discharge plate. 5,149,218, Cl. 400-625.000
Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, to Toyota Jidosha Kabushiki Kaisha. Shift control system and method for automatic transmission, including both a timer and an inertia phase start detector. 5,150,296, Cl. 364-424.100.
Iyori, Yusuke; and Shima, Nobuhiko, to Hitachi, Ltd.; and Hitachi Taga Engineering Co., Ltd. Cermet alloy. 5,149,361, Cl. 75-233.000.
J. E. Thomas Specialties Limited: *See—*
Lynes, Kenneth W.; and Nepovim, Zdenek, 5,150,278, Cl. 361-386.000
J.M. Voith GmbH: *See—*
Elsner, Ernst; and Junginger, Karl, 5,149,220, Cl. 403-5.000
J. Uriach & Cia, S.A.: *See—*
Bartroli, Javier; and Anquita, Manuel, 5,149,707, Cl. 514-396.000.
Jachowicz, Janusz; and Ramireddy, Chittamuru, to Clairol Incorporated. Cationic polymers. 5,149,752, Cl. 526-240.000.
Jacobs, Fransiscus M.: *See—*
Franken, Dominicus J.; Jacobs, Fransiscus M.; Van Kimmenade, Johannes M. M.; Van Dijk, Cornelis D.; and Van Eljk, Jan, 5,150,153, Cl. 355-53.000.
Jacobs, Jochen; Jahnke, Ulrich; Jung, Dieter; Oleffelmann, Rudolf; and Adler, Wilfried, to Henkel Kommanditgesellschaft auf Aktien. Process for increasing the density of spray dried, phosphate-reduced detergents. 5,149,455, Cl. 252-174.130.
Jacobson, Stephen E., to Du Pont de Nemours, E. I., and Company. Method for manufacturing 3-amino-2-cyclohexene-1-one, and a novel polymer ingredient and its preparation. 5,149,874, Cl. 564-248.000.
Jacomini, Norberto: *See—*
Contrucci, Marcos A.; Rizzo, Henrique P.; Schwarz, Herbert; Costa, Pedro H. C.; Gonzales, Enrique L.; Duran, Pedro V.; Jacomini, Norberto; and de Souza Santos, Adalberto B., 5,149,363, Cl. 75-414.000
Jacques, Gary E.: *See—*
Karlsson, Haraldur; Jacques, Gary E.; Hatten, James L.; and Aslakson, John K., 5,148,875, Cl. 175-62.000
Jaeger, Nicolas A. F.; and Lee, Zachary K. F., to University of British Columbia, The. Slow-wave electrode structure. 5,150,436, Cl. 385-2.000

Jaeger, Silvio, to Zellweger Uster AG. Device for manipulating drop wires for warp-thread drawing-in machines. 5,148,585, Cl. 28-205.000
Jaffee, James I.; and DeLuca, Michael J., to Motorola, Inc. Volume control circuit using pulse modulation. 5,150,415, Cl. 381-104.000
Jahnke, Ulrich: *See—*
Jacobs, Jochen; Jahnke, Ulrich; Jung, Dieter; Oleffelmann, Rudolf; and Adler, Wilfried, 5,149,455, Cl. 252-174.130.
Jahoda, Susan W.: *See—*
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Jailor, John J.; and Rosendall, Henry J., to Bissell Inc. Debris impeller 5,148,569, Cl. 15-041.100.
Jakabek, Ivan: *See—*
Vaughan, Rodney G.; Findlay, Russell K.; Jakabek, Ivan, Richardson, Ralph; McLachlan, Myles J.; and Venn-Brown, Geoffrey C., 5,148,703, Cl. 73-123.000
Jakubas, Ronald K.: *See—*
Keating, Michael D.; Norris, Robert W.; and Jakubas, Ronald K., 5,149,096, Cl. 273-128.00R
Jalbert, Vincent P., to Otis Elevator Company. Electronic control button operated by sound absorption. 5,149,986, Cl. 307-117.000
Jam, Merban: *See—*
Baugh, Richard A.; Chiu, Ran-Fun; Hart, Darlene L.; Jam, Merban; and Leung, Sui-hing, 5,150,379, Cl. 375-14.000.
James, Gordon W.; Sheridan, Joseph F.; and Moy, Wayne, to Motorola, Inc. Battery charging system. 5,150,031, Cl. 320-2.000
James River Corporation of Virginia: *See—*
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,149,579, Cl. 428-213.000
Jamp, Rueiming: *See—*
Ertel, John; Holland, William D.; Vincent, Kent D.; Jamp, Rueiming; and Baldwin, Richard R., 5,149,980, Cl. 250-561.000
Janisch, Andreas: *See—*
Wittmann, Heinz; Stritzl, Karl, and Janisch, Andreas, 5,149,124, Cl. 280-633.000
Janson, Wilbert F., Jr.: *See—*
Hallenbeck, Gary A.; Janson, Wilbert F., Jr.; and Jones, William B., 5,149,958, Cl. 250-216.000
Janssen-Weets, Peter, to Univam Armaturentechnologie GmbH. Fixture containing compact rotational positioning sensor. 5,150,103, Cl. 340-686.000
Jansson, Eric: *See—*
Snaith, Raymond E., Barrasso, Max; and Jansson, Eric, 5,149,066, Cl. 267-136.000
Japan Electronic Control Systems Company Limited: *See—*
Kashiwabara, Masuo; Kojima, Hideyuki; Yamaura, Hiromitsu; and Otani, Seiichi, 5,150,301, Cl. 364-431.050.
Jarin, Jean-Pierre, to General Electric CGR SA. Patient support having a long range of vertical displacement. 5,149,074, Cl. 5-601.000
Jasionowski, Joe: *See—*
Cross, Michael J.; and Jasionowski, Joe, 5,148,712, Cl. 73-756.000
Jay, Eric C.; and Runkles, Richard R., to Jay Medical, Ltd. Bolster with improved attachment means. 5,149,173, Cl. 297-284.900
Jay Medical, Ltd.: *See—*
Jay, Eric C.; and Runkles, Richard R., 5,149,173, Cl. 297-284.900
Jeffery, William A.: *See—*
Creighton, Andrew M.; and Jeffery, William A., 5,149,710, Cl. 514-547.000
Jelinek, Jerry G.; and Bain, Orville J., to Parker-Hannifin Corporation Interlocking segmented seal. 5,149,109, Cl. 277-199.000.
Jermann, Frederic. Child's urinal for hanging on side of toilet 5,148,553, Cl. 4-341.000
Jerome, Denis; Tevanian, Georges; Batail, Patrick; and Fourmigue, Marc, to Centre National de la Recherche Scientifique (CNRS). Method of authenticating an object by electron paramagnetic resonance, apparatus for implementing the method, and an object useable with the method. 5,149,946, Cl. 235-439.000.
Jespersen, Mark R.: *See—*
Waas, Charles W.; and Jespersen, Mark R., 5,149,278, Cl. 439-412.000
Jessen, Joerg L.; Pandl, Klaus; Loeffler, Hermann; Siegel, Bernd; and Patsch, Manfred, to BASF Aktiengesellschaft. Reactive dyes with two or three nitrogen-containing haloheterocycles as reactive system 5,149,789, Cl. 534-618.000
Jessup, Randall D.: *See—*
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Jiang, Ching-Lin: *See—*
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Jidosha Kiki Co., Ltd.: *See—*
Kamono, Shinobu; Shimura, Masayuki; and Ishii, Tomoyuki, 5,150,021, Cl. 318-488.000
Jingu, Nobuhisa: *See—*
Hiraoka, Toyoki; Kurosaka, Syuji; and Jingu, Nobuhisa, 5,148,784, Cl. 123-195.00C
Joffre, Pascal; Illiaquer, Gerard; and Huignard, Jean-Pierre, to Thomson-CSF. Liquid crystal electro-optical deflector having electrode array and comb shaped electrode formed on resistive layer. 5,150,241, Cl. 359-89.000
Johansson, Stig R., to U.S. Philips Corporation. Polling-type information transmission system. 5,150,114, Cl. 340-825.540.
Johnson, Derwyn C.: *See—*
Hill, Kenneth O.; Bilodeau, Francois; Malo, Bernard; and Johnson, Derwyn C., 5,150,439, Cl. 385-39.000.
Johnson, Donald W.: *See—*
Hala, Joseph A.; and Johnson, Donald W., 5,150,453, Cl. 395-106.000
Johnson, Ed: *See—*
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Johnson, Gary: *See—*
Pinney, David; Johnson, Gary; Roberts, Greg, and Casper, Steve, 5,150,186, Cl. 357-42.000
Johnson, Jerry W.; and Taskett, John M., to Micro Card Technologies, Inc. Method and coupler for interfacing a portable data carrier with a host processor. 5,149,945, Cl. 235-380.000
Johnson, Mark I.: *See—*
Haymore, Ralph B.; and Johnson, Mark I., 5,149,241, Cl. 414-279.000
Johnson Matthey Inc.: *See—*
Nguyen, My N., 5,150,195, Cl. 357-72.000
Johnson, Michael J. E-field detector and annunciator. 5,150,058, Cl. 324-519.000
Johnson, Michael R.; and Frye, Stephen V., to Glaxo Inc. Cobalt porphyrin pharmaceutical compositions. 5,149,697, Cl. 514-185.000
Johnson, Paul E.: *See—*
Orman, Charles R.; Johnson, Paul E.; and Adams, Bruce C., 5,148,738, Cl. 99-487.000
Johnson Products Co., Inc.: *See—*
Akhtar, Muhammad M., 5,148,822, Cl. 132-204.000
Johnson, Ronald E.; Kirk, Kenneth A.; and Wexell, Kathleen A., to Corning Incorporated. Additives for lead-free frits. 5,149,565, Cl. 427-215.000
Johnson, William B. Method of filling an endodontically prepared root canal. 5,149,268, Cl. 433-224.000
Johnson, William B.: *See—*
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Johnston, Alan, to Rexham Corporation. Tamper evident folding carton. 5,148,970, Cl. 229-102.000
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Jolly, Christopher H.: *See—*
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Jonatan HF: *See—*
Kristinsson, Sigurdur, 5,149,296, Cl. 452-108.000
Jones, Arthur A. Method for exercising and/or testing muscles of the lower trunk. 5,149,313, Cl. 482-100.000
Jones, Brian E. Wire puller for electrical conduits. 5,149,056, Cl. 254-134.3FT
Jones, Harry: *See—*
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Jones, J. Richard: *See—*
Sharpe, Randall B.; Jones, J. Richard; O'Shea, Thomas E.; Casper, Paul W.; Toy, James W.; Evans, Gregory M., and Sears, Richard N., 5,150,247, Cl. 359-135.000
Jones, Ken C.: *See—*
Croft, Harold B.; and Jones, Ken C., 5,149,312, Cl. 482-62.000
Jones, Marshall G.; Harrison, Jerry T.; Piel, Joseph E., Jr.; and Smith, Lowell S., to General Electric Company. Holder for soldering a flexible circuit board to a substrate. 5,148,962, Cl. 228-49.100.
Jones, Stephen W.; Babkes, Mitchell H.; and McCormick, David D. Universal cup holder for use in vehicles. 5,149,032, Cl. 248-154.000
Jones, William B.: *See—*
Hallenbeck, Gary A.; Janson, Wilbert F., Jr.; and Jones, William B., 5,149,958, Cl. 250-216.000
Jones, William H., to Appliance Control Technology, Inc. Multi-position rotary switch with position sensor. 5,150,095, Cl. 338-196.000
Joos, Joseph: *See—*
Schilling, Winston H.; Ritchie, Mark D.; Krutsch, John; and Joos, Joseph, 5,149,093, Cl. 273-118.00A
Jordan, H. Weaver. Coin fraud prevention system for coin telephones. 5,150,403, Cl. 379-145.000
Jordan, H. Weaver. Public telephone volume control. 5,150,404, Cl. 379-155.000
Jordan, William: *See—*
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Joshi, Rajendra K.: *See—*
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Jost, Johann M.: *See—*
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Jouppi, Norman P., to Digital Equipment Corporation. System and method for processor pipeline control by selective signal deassertion. 5,150,469, Cl. 395-375.000
Jouve, Isabelle: *See—*
Desmurs, Jean-Roger; Besson, Bernard; and Jouve, Isabelle, 5,149,858, Cl. 558-419.000
Joyce, Christopher C.: *See—*
Robinson, Murray J.; Joyce, Christopher C.; and Luk, Tim W., 5,150,177, Cl. 357-15.000
Joyce/Streater Inc.: *See—*
Fenwick, Jay G.; and Stemler, Jay R., Jr., 5,148,889, Cl. 182-17.000

Juang, William. Automatic solar-powered car ventilator. 5,148,736, Cl 454-131.000

Jubin, John C., Jr., to Arco Chemical Technology, L.P. Oxidation of isobutane to tertiary butyl hydroperoxide. 5,149,885, Cl 568-571.000

Juby, Robert M., II: *See—*
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Judge, Edward E.; Bennickson, Lowell W.; and Reiser, Arthur G., to Industrial Metal Products Corporation. Size control shoe for microfinishing machine. 5,148,636, Cl. 51-142.000

Juki America, Inc.: *See—*
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Julia, Juan L. Forming leveling tool. 5,148,605, Cl. 33-370.000.

Jung, Dieter: *See—*
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Junginger, Karl: *See—*
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Erdmann, Dietrich; Van Gheme, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,149,853, Cl. 556-1.000.

Juri, Tatsuro: *See—*
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JVB Development, Inc.: *See—*
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JWP Air Technologies: *See—*
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Kabushiki Kaisha Daiki Aluminum Kogyosho: *See—*
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Kabushiki Kaisha Daikin Seisakusho: *See—*
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Kabushiki Kaisha Japanic/Japanic Corporation: *See—*
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Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
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Kabushiki Kaisha Kobe Seiko Sho: *See—*
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Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kabushiki Kaisha Murao and Company: *See—*
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Kabushiki Kaisha Okuma Tekkosho: *See—*
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Kabushiki Kaisha Shinsei Industries: *See—*
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Kabushiki Kaisha Showa Seisakusho: *See—*
Kinoshita, Yutaka, 5,149,285, Cl. 440-61.000

Kabushiki Kaisha Toshiba: *See—*
Arai, Kenji; Oikawa, Hirohide; and Nagasaka, Hideo, 5,149,492, Cl. 376-283.000
Hagino, Hideyuki, 5,150,220, Cl. 358-336.000.
Hara, Takahiko; and Fujii, Syusi, 5,150,188, Cl. 357-41.000.
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Hori, Osamu; Okazaki, Akio; and Shimotsuji, Shigeyoshi, 5,150,434, Cl. 382-57.000
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Kawasaki, Soichi, 5,150,389, Cl. 377-67.000
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Koshiyouji, Takashi; Uno, Terutsuko; and Kizu, Shuuji, 5,150,227, Cl. 358-497.000
Mikata, Yuuichi; and Usami, Toshiro, 5,149,666, Cl. 437-43.000
Mori, Seiichi, 5,150,178, Cl. 357-23.500.
Motegi, Nawoto; Uemoto, Tsutomu; Kamata, Atsushi; and Mitsuhashi, Hiroshi, 5,150,191, Cl. 357-61.000
Nishioka, Takeshi; Shikanai, Tsutomu; and Marumo, Hitoshi, 5,150,398, Cl. 378-132.000
Okutomi, Tsutomu; Yamamoto, Atsushi; Chiba, Seishi; Seki, Tsuneyo; Okawa, Mikio; Honma, Mitsutaka; Otobe, Kiyofumi; Satoh, Yoshinari; and Sekiguchi, Tadaaki, 5,149,362, Cl 75-240.000
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Shimizu, Yasuhiko, 5,148,964, Cl. 228-102.000.
Shimomura, Nobuo, 5,149,944, Cl. 219-464.000
Tokitou, Yoshihiko; and Honjo, Atsushi, 5,150,216, Cl 358-213.110.
Ueno, Hideyuki; and Dachiku, Kenshi, 5,150,432, Cl. 382-56.000
Yoshikawa, Hidetaka; Miseki, Kimio; and Akamine, Masami, 5,150,387, Cl. 375-122.000.

Kabushiki Kaisha Yaskawa Denki Seisakusho: *See—*
Watanabe, Eiji; and Ohtani, Tsugutoshi, 5,150,029, Cl. 318-800.000

Kageyama, Katsuhiro, to Kabushiki Kaisha Toshiba. Discharge-in-magnetic-field type ion generating apparatus. 5,150,010, Cl. 315-111.810.

Kageyama, Shintaro: *See—*
Sasaki, Takao; Fujibayashi, Kentaro; and Kageyama, Shintaro, 5,150,025, Cl. 318-571.000

Kageyama, Shuhei; Suzuki, Takahiko; and Yamagishi, Yuichi, to Kotobuki & Co., Ltd. Swing-type mechanical pencil. 5,149,219, Cl. 401-65.000

Kah, Carl L. C., Jr. Adjustable arc spray and rotary stream sprinkler 5,148,990, Cl. 239-222.170

Kah, Carl L. C., Jr. Gear driven transmission for oscillating sprinklers 5,148,991, Cl. 239-242.000

Kahl, Stephen B.; and Koo, Myoung-Seo, to University of California, The Regents of the. Boronated porphyrin compounds. 5,149,801, Cl. 540-145.000

Kaiblinger, Heinz J., to Chlean Plants & Engineering Establishment. Method and apparatus for measuring the concentration of at least one material in a fluid medium mixed materials. 5,149,983, Cl. 250-575.000.

Kaiser, Robert H.: *See—*
Craig, Donald B.; McCluhan, Thomas K.; and Kaiser, Robert H., 5,149,364, Cl. 75-566.000

Kaitou, Junichi: *See—*
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Kajimoto, Kazuhiro, to Seiko Epson Corporation. Character dot pattern signal generator. 5,150,459, Cl. 395-151.000.

Kajino, Yoshio: *See—*
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Kakizaki, Shinobu, to Atsugi Motor Parts Company, Limited. Rotary actuator for variable damping force shock absorber. 5,148,895, Cl. 188-299.000

Kakuguchi, Kazuhiro; Uchimura, Hirozi; and Nishino, Sekizi, to Fujitsu Limited. Knob for rotating a shaft. 5,148,718, Cl. 74-553.000.

Kakuma, Hiroaki: *See—*
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Kakuno, Yumiko: *See—*
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Kalyan, Vibhu: *See—*
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Kamata, Atsushi: *See—*
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Kamath, Venkatesh H.; Malachowski, Michael A.; and Kamprath, David R., to Xerox Corporation. Duplex printer and method of printing. 5,150,168, Cl. 355-319.000.

Kamiya, Sadayuki: *See—*
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Kamiya, Yoshiaki: *See—*
Miura, Takashi; and Kamiya, Yoshiaki, 5,150,090, Cl. 335-84.000.

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Kitakado, Ryuji; Yano, Hironobu; Kakuma, Hiroaki; Hoki, Tetsuo; and Kanai, Takao, 5,150,422, Cl. 382-8.000.

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Shikichi, Satoshi; and Kanda, Shigeto, 5,150,345, Cl. 369-44.340.

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Yoshida, Hitoshi; Kawamoto, Naoyuki; Kanegae, Takahiro; and Aoki, Kazuma, 5,150,431, Cl. 382-56.000

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Arai, Makoto; and Fukuda, Hideki, 5,149,852, Cl. 554-193.000

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Iimura, Haruo; Takiguchi, Yasuyuki; and Kanemoto, Akihiko, 5,150,237, Cl. 359-73.000.

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Ueki, Toru; Sakato, Kenji; Yoshimura, Masaji; Kanezaki, Kazuharu; and Iwata, Ineo, 5,149,465, Cl. 252-511.000

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Patitsas, George P.; and Kansupada, Bharat K., 5,149,591, Cl. 428-423.100

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Hirose, Kazuko, Maeda, Kouji; Arai, Kenichi; and Inoue, Takeshi, 5,149,521, Cl. 424-58.000

Kaplan, Bruce E.: *See—*
Rossi, John J.; Chang, Pairoj; and Kaplan, Bruce E., 5,149,796, Cl 536-27.000

Kaplan, Louis: *See—*
Shafiee, Ali; Kaplan, Louis; Chen, Shieh-Shung T.; Arison, Byron H.; Colwell, Lawrence F., Jr., and Dumont, Francis, 5,149,701, Cl. 514-291.000

Karellas, Andrew, to University of Massachusetts Medical School Dual-energy system for quantitative radiographic imaging. 5,150,394, Cl. 378-62.000

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Ebinuma, Ryuichi; Mizusawa, Nobutoshi; Kariya, Takao; Suda, Shigeyuki; and Uzawa, Shunichi, 5,150,391, Cl. 378-34.000

Karlsson, Bengt L.: *See—*
HaKansson, Christer L.; and Karlsson, Bengt L., 5,149,873, Cl. 564-170.000

Karlsson, Haraldur; Jacques, Gary E.; Hatten, James L.; and Aslakson, John K., to Baker Hughes Incorporated. Method and apparatus for horizontal drilling. 5,148,875, Cl. 175-62.000

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Lee, Kiu H.; Karol, Frederick J.; and Samuels, Sari B., 5,149,738, Cl. 525-53.000

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Scharnberg, Lorne C., 5,148,805, Cl. 128-419.00D.

Kashimoto, Kiyoshi; and Mizunuma, Masanori, to Tomy Company, Ltd. Ball conveying game apparatus. 5,149,095, Cl. 273;121 B-

Kashimura, Hideki: *See—*
Imaizumi, Hiroshi; Kato, Toshio; Nakashima, Hideaki; Murakami, Yasuo; Kashimura, Hideki; and Katayama, Kiichi, 5,149,939, Cl 219-125.120

Kashino, Yoshinori: *See—*
Nishida, Tomoaki; Kashino, Yoshinori; Mimura, Akio; Takahara, Yoshimasa; and Sakai, Kokki, 5,149,648, Cl. 435-192.000

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Iwatani, Mitsuo; Kamoda, Hitoshi; Mikuriya, Masatoshi; Kashiyama, Tadao; and Kajino, Yoshio, 5,149,218, Cl. 400-625.000

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Kastelein, Lukas, to U. S. Philips Corporation. Lamp ballast control circuit and method. 5,150,014, Cl. 315-224.000.

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Imaizumi, Hiroshi; Kato, Toshio; Nakashima, Hideaki, Murakami, Yasuo; Kashimura, Hideki; and Katayama, Kiichi, 5,149,939, Cl 219-125.120

Katayama, Taiji: *See—*
Yamada, Nobutoshi; Sugi, Hideo; Mizukoshi, Sadanori; Kon, Kenji; and Katayama, Taiji, 5,149,793, Cl. 536-16.800

Katayama, Yoshio: *See—*
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Davis, Allen V. C., 5,149,150, Cl. 267-159.000

Kato, Atsushi; Nagashiro, Waichi; and Akagi, Motoo, to Hitachi, Ltd Method of forming lubricating film and a method of preparing magnetic recording medium. 5,149,564, Cl. 427-127.000

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Kato, Masahiro: *See—*
Okumoto, Takaharu; Hayashi, Tetsuya; and Kato, Masahiro, 5,149,091, Cl. 273-80.200

Kato, Masami; Tanaka, Tadashi; Nakamura, Satoshi; Higashi, Tsuneo; Fujike, Hiroshi; Makino, Katsuaki; and Miyamoto, Hiroshi, to Chubu Electric Power Company, Inc.; and Mitsubishi Jukogyo Kabushiki Kaisha. Method for removing soot by scattering steel balls in a heat-exchanger and heat-exchanger provided with a steel ball scatterer. 5,148,857, Cl. 165-1.000

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Kato, Yasuyuki: *See—*
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Katz, Leon: *See—*
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,149,579, Cl 428-213.000

Katz, Leonard; Tuan, James; and McAlpine, James B., to Abbott Laboratories. Biologically pure cultures of streptomyces and use thereof in macrolide antibiotic production. 5,149,639, Cl. 435-76.000

Katzin, Lawrence F. Electrical resistor value decoding calculator 5,150,315, Cl. 364-709.020.

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Kaul, Wilfried: *See—*
Strohm, Gerhard; Kaul, Wilfried; and Schmieder, Georg, 5,149,430, Cl. 210-321.800

Kaule, Wittich, to GAO Gesellschaft fur Automation und Organisation mbH. Stamp such as a postage stamp and a method for producing it 5,149,139, Cl. 283-70.000

Kawaguchi, Takashi: *See—*
Yamane, Mitsuo; and Kawaguchi, Takashi, 5,149,548, Cl. 425-174.400

Kawai, Takaji, to Sanshin Kogyo Kabushiki Kaisha. Exhaust system for an outboard motor. 5,149,284, Cl. 440-52.000

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Tanaka, Satoru, Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,148,883, Cl. 180-165.000

Kawamoto, Naoyuki: *See—*
Yoshida, Hitoshi; Kawamoto, Naoyuki; Kanegae, Takahiro; and Aoki, Kazuma, 5,150,431, Cl. 382-56.000

Kawamura, Hideaki; Sasaki, Takao; and Matsuura, Syuji, to Fanuc Ltd. Cutting tool stop-control apparatus. 5,150,306, Cl. 364-474.340

Kawamura, Takeshi: *See—*
Fujieda, Keishi; and Kawamura, Takeshi, 5,150,111, Cl 340-825.300

Kawamura, Yoshihisa, to Takata Corporation. Lateral illuminated buckle for vehicle seat belt system. 5,149,189, Cl. 362-108.000

Kawanishi, Kaoru: *See—*
Masuda, Tadao; Tsukuda, Masahiro; Doiura, Shigeru; Kawanishi, Kaoru; and Iwasaki, Hiroshi, 5,148,651, Cl. 53-381.200

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Kawasaki, Takashi: *See—*
Toyama, Osamu; Shimokoshi, Akira; and Kawasaki, Takashi, 5,150,023, Cl. 318-567.000

Kawase, Toshimitsu: *See—*
Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Tohsihiko; Oguchi, Takahiro; and Yamano, Akihiko, 5,150,035, Cl. 324-71.100.

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Kawashima, Seiichi, Masuda, Noboru; Ishii, Shuichi; and Fujita, Bunichi, to Hitachi, Ltd. Clock signal supply method and system 5,150,068, Cl. 328-155.000

Kawashima, Yoshikatsu: *See—*
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,149,200, Cl. 374-1[illegible]5.000

Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, to Sumitomo Chemical Company, Limited; and Daiwa Kaoka Chemical Company. Disazo compound and ink composition containing the same. 5,149,366, Cl 106-22.000

Kawata, Hitoshi: *See—*
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Kazui, Shinichi: *See—*
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Kealey, Kirk S.; and Quan, Nancy W., to Mars, Inc. Heat-resistant chocolate and method of making same. 5,149,560, Cl. 426-602.000

Keating, Michael D.; Norris, Robert W.; and Jakubas, Ronald K. Hockey puck. 5,149,096, Cl. 273-128.00R

Keating, Patrick N., to Allied-Signal Inc. Apparatus for performing serial binary multiplication. 5,150, 21, Cl. 364-759.000

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Langlois, Edouard E.; Kehoe, Kathryn T.; Smith, Warren R.; Muscato, Mark; Ceglinski, Barbara D.; Kirchoff, Alan C.; Dunham, Robert F.; and Stair, Michael D., 5,149,612, Cl 430-132.000

Kellar, Paul R. N.; and Nonweiler, Brian R. G., to Quantel Limited. Video signal processing systems. 5,150,213, Cl. 358-160.000

Kellenberger, Stanley R.; Shih-Schroeder, Wen-Huey; and Wisneski, Anthony J., to Kimberly-Clark Corporation. Absorbent structure 5,149,335, Cl. 604-372.000

Keller, Peter A., to Tektronix, Inc. Optical filter for an optical measurement instrument. 5,149,182, Cl. 35[illegible]405.000

Kelley, William J., to Mattel, Inc. Toy figure with interconnected retractable hair and tail. 5,149,288, Cl. 446-319.000

Kelly, Michael N. Shoe closure strap apparatus. 5,148,614, Cl 36-50.100

Kempton, C. Conrad: *See—*
Mashayekhi, Mansour; Haley, Roger L.; Payne, Joe E.; and Kempton, C. Conrad, 5,149,447, Cl 210-767.000

Kendall Company, The: *See—*
Brightbill, Jerry R., 5,149,330, Cl. 604-280.000

Kennedy, Jerry L. Tobacco harvester and use thereof. 5,148,661, Cl 56-27.500

Kennedy, Joseph P.; and Zsuga, Miklos L., to University of Akron, The. Halogen terminated poly (halostyrenes) and a process for the preparation thereof. 5,149,743, Cl. 525-[illegible]31.400

Kennedy Manufacturing, Inc.: *See—*
Kennedy, Paul G., 5,148,831, Cl. 137-614.110

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Kensey Nash Corporation: *See—*
Nash, John, 5,149,322, Cl. 604-110.000

Kerley, James J.; and Eklund, Wayne D., to United States of America, Administrator, National Aeronautics & Space Administration. Page turning system. 5,149,046, Cl. 248-453.000

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Mikosch, Falk; and Smith, Stanley D., 5,150,183, Cl. 357-32.000

Kessels, Hans-Willi. *See—*
Leclere, Klemens; Kessels, Hans-Willi; and Hammes, Friedhelm. 5,148,574, Cl. 15-415.100.

Keup, Karl F.; and Davidson-Keup, Ellen B. Woodworking rotary cutter apparatus. 5,148,845, Cl. 144-218.000

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Allstot, David J.; and Kiasei, Sayfe, 5,149,992, Cl. 307-448.000

Kibbel, Bradley W. *See—*
Blonk, Raymond L., Kibbel, Bradley W., and Powell, Bob R., 5,149,454, Cl. 252-74.000

Kidani, Shuji, to Kabushiki Kaisha Murao and Company. Roving bobbin carrier system. 5,148,665, Cl. 57-281.000

Kidz First, Inc.: *See—*
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Kieffer-Higgins, Stephen: *See—*
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Kiekert GmbH & Co.: *See—*
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Kikuchi, Hideo; and Tanizawa, Tetsu, to Fujitsu Limited. Circuit arrangement of semiconductor integrated circuit device. 5,149,993, Cl. 307-465.100

Kikuchi, Junichi: *See—*
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Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co., Ltd. Heating apparatus for hyperthermia. 5,148,814, Cl. 128-804.000

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Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,149,461, Cl. 252-299.610

Kikuchi, Noboru: *See—*
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Kikugawa, Sinya: *See—*
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Kikuya, Satoshi: *See—*
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Kikuyama, Hirohisa: *See—*
Ohmi, Tadahiro; Miki, Nobuhiro; Maeno, Matagoroh; and Kikuyama, Hirohisa, 5,149,378, Cl. 118-725.000.

Killian, Mark A.; and Zollinger, W. Thor. Apparatus for attaching a cleaning tool to a robotic manipulator. 5,148,573, Cl. 15-339.000.

Kim, Jae K.; and Chung, In S., to Hyundai Electronics Industries Co., Ltd. Silicon layer having increased surface area and method for manufacturing. 5,149,676, Cl. 437-228.000.

Kim, Jeong J., to Goldstar Co., Ltd. Thin film active matrix circuit 5,150,240, Cl. 359-87.000

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Chai, Sang H.; Koo, Yong S.; Kim, Kwang S.; and Nam, Kee S., 5,149,663, Cl. 437-31.000.

Kim, Young G.; Yoo, Han I.; Han, Sang K.; and Lee, Deung Y., to Poongsam Corporation. Cooper-Fe-P-Nb alloys for electrical and electronic parts and its manufacturing process. 5,149,499, Cl. 420-495.000

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Sasse, Philip A., 5,149,333, Cl. 604-367.000.

Kimsey, Ian M.: *See—*
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Kimura, Eiichi; Nagashima, Shinichi; Ono, Hitoshi; and Nara, Koji, to Mitsuba Electric Mfg. Co., Ltd. Starter system for an internal combustion engine. 5,148,713, Cl. 74-6.000

Kimura, Hiromichi: *See—*
Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, 5,150,296, Cl. 364-424.100

Kimura, Hiroshi: *See—*
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Kimura, Kunio: *See—*
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King, Arthur V., to Entech Design, Inc. Apparatus and method for locating sediment in a container. 5,148,700, Cl. 73-61.410.

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Kinoshita, Hitoshi; and Hashimoto, Masaru, to Kabushiki Kaisha Toshiba. Temperature detection circuit used in thermal shielding circuit 5,149,199, Cl. 374-178.000

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Kioritz Corporation: *See—*
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Langlois, Edouard E.; Kehoe, Kathryn T.; Smith, Warren R.; Muscato, Mark; Ceglinski, Barbara D.; Kirchoff, Alan C.; Dunham, Robert F.; and Stair, Michael D., 5,149,612, Cl. 430-132.000

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Kirk, Kenneth A.: *See—*
Johnson, Ronald E.; Kirk, Kenneth A.; and Wexell, Kathleen A., 5,149,565, Cl. 427-215.000

Kirschbaum, Robert N. Method and apparatus for electrically inhibiting bacteria growth in aquariums. 5,148,772, Cl. 119-5.000.

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Kishino, Kazuo: *See—*
Kita, Yuichi; Kishino, Kazuo; and Ueda, Hiroko, 5,149,827, Cl. 548-548.000

Kisters, Karl, to Kisters Maschinenbau GmbH. Packaging system 5,148,654, Cl. 53-462.000

Kisters Maschinenbau GmbH: *See—*
Kisters, Karl, 5,148,654, Cl. 53-462.000

Kita, Akihisa: *See—*
Takagi, Akira; Tsuruta, Masao; Kita, Akihisa; and Sawahara, Shingo, 5,149,005, Cl. 242-67.10R.

Kita, Yuichi; Kishino, Kazuo; and Ueda, Hiroko, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for handling maleimides. 5,149,827, Cl. 548-548.000

Kitaguchi, Yoshikazu: *See—*
Minakawa, Hiroshi; Kitaguchi, Yoshikazu; and Fukuda, Eiji, 5,149,929, Cl. 219-10.55B

Kitahara, Takahiro: *See—*
Inukai, Hiroshi; and Kitahara, Takahiro, 5,149,753, Cl. 526-245.000

Kitakado, Ryuji; Yano, Hironobu; Kakuma, Hiroaki; Hoki, Tetsuo; and Kanai, Takao, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for inspecting conductive pattern on printed board. 5,150,422, Cl. 382-8.000

Kitami, Tetsu: *See—*
Igarashi, Shigeru; Ozawa, Osamu; and Kitami, Tetsu, 5,149,732, Cl 524-315.000

Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; Ohta, Yasumitsu; and Sai, Kazuyoshi, to Nippon Steel Corporation. Full contact image sensor device with light blocking means. 5,149,955, Cl. 250-211.00J

Kitano, Yasunori: *See—*
Takayanagi, Hisao; Kitano, Yasunori; and Morinaka, Yasuhiro, 5,149,843, Cl. 549-561.000

Kitano, Yoshiyuki: *See—*
Matsuo, Masahiro; Kanatani, Genji; Kawata, Hitoshi; Ariyama, Tatsurou; Mase, Jirou; Kitano, Yoshiyuki; Tsuboi, Haruhito; and Isozaki, Shinichi, 5,149,487, Cl. 266-172.000

Kitazawa, Toshiyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Motor driven camera having strobe incorporated therein. 5,150,140, Cl. 354-145.100

Kitson, Kevin J.: *See—*
Rubin, David H., 5,148,919, Cl. 206-443.000

Kitson, Melanie; and Williams, Peter S., to British Petroleum Company p.l.c., The. Platinum group metal alloy catalysts for hydrogenation of carboxylic acids and their anhydrides to alcohols and/or esters 5,149,680, Cl. 502-185.000

Kitsukawa, Goro: *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000.

Kizak, Ulrich; and Leipold, Kurt, to Nokia Unterhaltungselektronik GmbH. Calotte-type treble loudspeaker. 5,150,419, Cl. 381-194.000

Kizu, Shuuji: *See—*
Koshiyouji, Takashi; Uno, Teruhiko; and Kizu, Shuuji, 5,150,227, Cl. 358-497.000

Klammer, Barbara C.; and Prowse, Roy L., to British-American Tobacco Company Limited. Processing of tobacco leaves. 5,148,820, Cl. 131-311.000

Klatz, Ronald M.; and Goldman, Robert M. Brain resuscitation device and method for performing the same. 5,149,321, Cl. 604-52.000

Klaue, Hermann, to Datwyler AG. Combustion chamber for a self-igniting or spark-ignited valveless two-stroke internal combustion engine. 5,148,778, Cl. 123-65.00R.

Klearman, Jeffrey D.; Bierman, Jeffrey J.; Pott, Lambert J.; and Watson, Glen E., Jr., to Lake Medical Products, Inc., by said Jeff Bierman. Custom orthotic bracing system. 5,148,563, Cl. 5-652.000

Kleefeldt, Frank, to Kiekert GmbH & Co. Power door-lock actuator with pivoting rocker and connecting gears. 5,149,156, Cl. 292-336.300

Kleffner, Hans W.: *See—*
Orth, Winfried; Pastorek, Emmerich; Weiss, Wolfgang; and Kleffner, Hans W., 5,149,886, Cl. 568-727.000

Klein, Peter: *See—*
Miess, Georg-Emrich; Klein, Peter; and Pressler, Wilfried, 5,149,759, Cl. 528-348.000

Kling, Michael R.; and Roche, William J., to GTE Products Corporation. Glow discharge lamp. 5,150,009, Cl. 315-107.000

Klinge Pharma GmbH: *See—*
Reiter, Friedemann; Grill, Helmut; Henschel, Hans-Helmut; Schliack, Michael; Seibel, Klaus; Loser, Roland; and Lang, Gerhard, 5,149,865, Cl. 562-473.000

Klingensmith, George B., to Shell Oil Company. Stabilized polymers. 5,149,733, Cl. 524-331.000

Klinger AG: *See—*
Huber, Richard; and Wirz, Peter, 5,149,055, Cl. 251-324.000

Kluesener, Bernard W.: *See—*
Crane, Laura J.; Mazur, Adam W.; Nau, David R., and Kluesener, Bernard W., 5,149,646, Cl. 435-190.000

Kluesing, Alvin D.: *See—*
Wieczorek, Alfred B.; Kluesing, Alvin D.; and Sasuta, Michael D., 5,150,361, Cl. 370-95.100.

Kluger, Edward W.; and Weaver, Max A., to Milliken Research Corporation. Poly(oxyalkylene) modified phthalocyanine colorants 5,149,800, Cl. 540-123.000

Knepper, Udo; and Speck, Ralph, to Dornier GmbH. Transmitting and receiving part of a pulse doppler radar. 5,150,126, Cl. 342-137.000

Knerr, Michael P., to U.S. Natural Resources, Inc. Method and apparatus for around the curve sawing. 5,148,847, Cl. 144-357.000

Kniep, Claus: *See—*
Kampmann, Detlef, Weber, Jurgen; Bahrmann, Helmut; and Kniep, Claus, 5,149,876, Cl. 564-467.000

Knigge, Kevin M.: *See—*
Brown, William E.; Clemens, John M.; Devereaux, Sharon M.; Hofler, John G.; Knigge, Kevin M.; and Safford, Sarah E., 5,149,622, Cl. 435-5.000

Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, to Canon Kabushiki Kaisha. Color toner and two-component developer containing same. 5,149,610, Cl. 430-106.000

Kobayashi, Mitsugu: *See—*
Nakamura, Norimi; Adachi, Tadao; Matsui, Akio; Fujiwara, Kouji, Kobayashi, Mitsugu; Yamaguchi, Tetsuo; and Fukuda, Minoru, 5,149,308, Cl. 475-203.000

Kobayashi, Nobuaki: *See—*
Suwa, Toshio; Kobayashi, Nobuaki; and Hirano, Takashi, 5,149,261, Cl. 431-207.000

Kobayashi, Shozo: *See—*
Shiratori, Akira; Kobayashi, Shozo; Takagi, Hiroshi; and Sakabe, Yukio, 5,149,601, Cl. 429-30.000

Kobayashi, Takeo: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl 354-403.000

Kobayashi, Tohru: *See—*
Nemura, Masaharu; Aoki, Tomohiro; Kobayashi, Tohru; Ikkatai, Masatoshi; Murayama, Yasushi; Uchida, Takashi, and Mitomi, Tatsuo, 5,149,049, Cl. 248-674.000

Kobayashi, Toshio; Maruyama, Keiichi; and Ohnuki, Yukio, to Fuji Jukogyo Kabushiki Kaisha. Power transmission system for a four-wheel drive motor vehicle. 5,148,903, Cl. 192-85.0AA

Kobayashi, Toshiro: *See—*
Ishikawa, Mikio; and Kobayashi, Toshiro, 5,149,721, Cl 521-79.000

Kobayashi, Yoshimasa: *See—*
Sakimae, Akihiro; Ozaki, Eiji; Enomoto, Kanehiko; Numazawa, Ryozo; and Kobayashi, Yoshimasa, 5,149,855, Cl. 558-255.000

Kobayashi, Yutaka: *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki, Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki, Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000

Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronically controlled camera. 5,150,147, Cl. 354-412.000

Kobe, James J.; and Nestegard, Susan K., to Minnesota Mining and Manufacturing Company. Highly transparent strip material used for forming fasteners. 5,149,573, Cl. 428-93.000

Kobishi Electric Co., Ltd.: *See—*
Sakaguchi, Mitsuo, 5,150,097, Cl. 340-396.000.

Kochan, Stephen: *See—*
Wood, Patrick; and Kochan, Stephen, 5,150,454, Cl. 395-114.000

Kodama, Mitsuo: *See—*
Hakuta, Kohzo; Aramaki, Minoru; Suen, A. Takashi, Kodama, Mitsuo; Nakano, Hisaji; and Nakagawa, Shinsuke, 5,149,659, Cl 436-55.000.

Kodera, Yukihiro: *See—*
Awazu, Shoji; Horie, Toshiharu; Kodera, Yukihiro; Nagae, Shinji; Matsuura, Hiromichi; and Itakura, Yoichi, 5,149,879, Cl 568-21.000

Koehler, Karlheinz: *See—*
Aichinger, Horst; Jotte-Barfuss, Sigrid; and Koehler, Karlheinz, 5,150,393, Cl. 378-37.000

Koehler, Paul C.; Geibel, Stephen A., and Whitlock, Michael B., to Pall Corporation. Liquid laydown process and metal filter. 5,149,360, Cl 75-228.000

Koga, Yoshiro; Nakazawa, Shizue; and Okamura, Takehiko, to Seiko Epson Corporation. Development apparatus using a flexible magnetic field forming layer. 5,149,914, Cl. 118-657.000

Kogan, Timothy: *See—*
Clader, John; Dugar, Sundeep; Kogan, Timothy; Tait, Bradley; and Vaccaro, Wayne, 5,149,709, Cl. 514-486.000

Kogelschatz, Ulrich: *See—*
Esrom, Hilmar; and Kogelschatz, Ulrich, 5,149,377, Cl. 118-722.000

Kogi, Kentaro: *See—*
Yamada, Shin-ichi; Goto, Takao; Yorita, Rie; Shimanuki, Eizi; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Senichi, 5,149,702, Cl. 514-303.000

Koh, Wei; and Kuipers, Wayne D., to Grumman Aerospace Corporation. Method for forming multilayer indium bump contact. 5,149,671, Cl. 437-183.000

Kohler, Burkhard; Heinz, Hans-Detlef; and Reinking, Klaus, to Bayer Aktiengesellschaft. Blends of polyarylene sulfides, phenolic resin nitroarylates, glass fibers and optionally other fillers. 5,149,728, Cl 524-259.000

Kohlpaintner, Georg: *See—*
Matsubara, Hiroo; Meier, Kurt; Kohlpaintner, Georg; and Bienert, Horst, 5,149,170, Cl. 296-213.000

Kohmoto, Shinsuke: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl 354-403.000

Kohno, Hiromasa; Honda, Hiroaki; and Nudeshima, Masahiro, to Terumo Kabushiki Kaisha. Apparatus for measuring hemoglobin concentration and oxygen saturation thereof. 5,149,503, Cl. 422-82.050

Kohno, Shigefumi: *See—*
Konishi, Takeshi; Otani, Fumiyuki; Muramoto, Hisao; Hirashima, Isao; Nomura, Yoshinobu; and Kohno, Shigefumi, 5,149,135, Cl. 280-806.000

Kohri, Toshitaro; Machida, Junji; and Anno, Masahiro, to Minolta Camera Kabushiki Kaisha. Color toner for developing electrostatic latent image. 5,149,611, Cl. 430-111.000

Koike, Seiji: *See—*
Endo, Akira; and Koike, Seiji, 5,149,641, Cl. 435-125.000

Koike, Takashi, to Sanshin Kogyo Kabushiki Kaisha. Separate oiling system for outboard motor. 5,149,787, Cl. 440-88.000.

Kojika, Yoshiteru: *See—*
Honma, Toru; Matsushita, Izumi; Kojika, Yoshiteru; and Sasaki, Noboru, 5,149,239, Cl. 413-31.000

Kojima, Hideyuki: *See—*
Kashiwabara, Masuo; Kojima, Hideyuki; Yamaura, Hiromitsu; and Otani, Senichi, 5,150,301, Cl. 364-431.050

Kojima, Hiroaki: *See—*
Matsuura, Yasuhiro; Kojima, Hiroaki; Hasegawa, Hirofumi; Ohmori, Naoto; and Yamada, Yukio, 5,150,166, Cl. 355-308.000

Kojima, Ichiyo: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Ando, Hiromitsu; Takemura, Jun; Koujina, Eiichi; and Kojima, Ichiyo, 5,150,300, Cl 364-431.030.

Kojima, Toshiaki: *See—*
Sakamoto, Hitoshi; and Kojima, Toshiaki, 5,150,263, Cl. 360-69.000

Kojo, Katsuhiko; Negishi, Akibumi; and Ida, Hisaaki, to Hitachi Metals Ltd.; and Hitachi Tool Engineering Ltd. Cermet alloy and process for its production. 5,149,595, Cl. 428-552.000.

Kolb, Achim; Baier, Manfred; and Muller, Klaus, to Richard Wolf GmbH. Device for rinsing a hollow guide for carbon dioxide lasers. 5,150,373, Cl. 372-61.000

Kolb, Arthur F., to Eaton Corporation. Control button adaptor for electric control apparatus. 5,150,082, Cl. 335-132.000.

Komatsuzaki, Shigeru; Hirayama, Toshinobu; and Toyokawa, Tetsuo, to Nippon Zeon Co., Ltd. Method of manufacturing a wound dressing. 5,149,469, Cl. 264-28.000.

Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; and Mashimo, Akira, to Oki Electric Industry Co., Ltd. Dielectric filter having an attenuation pole tunable to a predetermined frequency. 5,150,089, Cl 333-206.000

Kon, Kenji: *See—*
Yamada, Nobutoshi; Sugi, Hideo; Mizukoshi, Sadanori; Kon, Kenji; and Katayama, Taiji, 5,149,793, Cl. 536-16.800.

Konda, Masashi: *See—*
Ohikata, Naoharu; Yamamoto, Toshio; and Konda, Masashi, 5,150,198, Cl. 357-81.000.

Kondo, Toshiyuki: *See—*
Birch, Peter H.; Kondo, Toshiyuki; and Mori, Katsuhiro, 5,148,670, Cl. 60-39.142

Kondoh, Shigeru: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl. 354-403.000.

Kondou, Tamaiti, to Mitsubishi Denki Kabushiki Kaisha. Elevator load detector device using movable detector plates. 5,149,922, Cl. 187-131.000.

Kongelbeck, Knut S., to Hughes Aircraft Company. In-phase and quadrature conversion error compensator. 5,150,128, Cl. 342-174.000

Konica Corporation: *See—*
Goto, Narito; Takeda, Katsuyuki; Sasaki, Kunitsuna; and Sekiguchi, Nobuyuki, 5,149,585, Cl. 428-323.000.

Konigs, Jurgen E. Lubricant for trombone slide. 5,149,450, Cl. 252-17.000

Konishi, Isako: *See—*
Murata, Yasuyuki; Konishi, Isako; Tanaka, Ryohei; and Nakanishi, Yoshinori, 5,149,730, Cl. 523-466.000

Konishi, Takeshi; Otani, Fumiyuki; Muramoto, Hisao; Hirashima, Isao; Nomura, Yoshinobu; and Kohno, Shigefumi, to Mazda Motor Corporation. Front seat shoulder belt and seat back supporting structure. 5,149,135, Cl. 280-806.000.

Kontani, Tetsuro; and Miki, Yutaka, to LSI Logic Corp. Digital filter system with anomaly detection and indication. 5,150,318, Cl. 364-724.030

Koo, Myoung-Seo: *See—*
Kahl, Stephen B.; and Koo, Myoung-Seo, 5,149,801, Cl. 540-145.000

Koo, Yong S.: *See—*
Chai, Sang H.; Koo, Yong S.; Kim, Kwang S.; and Nam, Kee S., 5,149,663, Cl. 437-31.000

Koopman, Ben: *See—*
Bitton, Gabriel; and Koopman, Ben, 5,149,656, Cl. 435-288.000.

Kopp, Robert G.: *See—*
Bryson, John D., Jr.; and Kopp, Robert G., 5,148,984, Cl. 239-58.000

Korber AG: *See—*
Heitmann, Uwe, 5,148,816, Cl. 131-84.100

Korea Telecommunication Authority: *See—*
Lee, Young H.; Baek, Young S.; Lee, Seok G.; Lee, Kun W.; Chae, Jong E.; and Lee, Hyun T., 5,150,405, Cl. 379-230.000.

Korean Electronics and Telecommunications: *See—*
Chai, Sang H.; Koo, Yong S.; Kim, Kwang S.; and Nam, Kee S., 5,149,663, Cl. 437-31.000.

Kosanetzky, Josef; and Fischer, Karl H., to U.S. Philips Corporation. Device for examining a test object by means of gamma or X-rays. 5,150,395, Cl. 378-86.000

Koseki, Osamu: *See—*
Sugita, Toshio; and Koseki, Osamu, 5,149,415, Cl. 204-298.140.

Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Clutch damper disc assembly. 5,149,303, Cl. 464-68.000.

Koshiyouji, Takashi; Uno, Teruhiko; and Kizu, Shuuji, to Kabushiki Kaisha Toshiba. Apparatus for reading character or graphics image on document. 5,150,227, Cl. 358-497.000

Kosty, John W.: *See—*
Maringer, Martin M.; Traub, Henry A.; Kosty, John W.; and Mack, O. Theodor, 5,149,107, Cl. 277-165.000

Kosugi, Noriyuki: *See—*
Maekawa, Tetsuya; Nanbu, Yuichi; and Kosugi, Noriyuki, 5,149,136, Cl. 280-808.000

Kotani, Akio: *See—*
Igawa, Shoji; and Kotani, Akio, 5,150,159, Cl. 355-243.000.

Kotobuki & Co., Ltd.: *See—*
Kageyama, Shuhei; Suzuki, Takahiko; and Yamagishi, Yuichi, 5,149,219, Cl. 401-65.000.

Koujina, Eiichi: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Ando, Hiromitsu; Takemura, Jun; Koujina, Eiichi; and Kojima, Ichiyo, 5,150,300, Cl. 364-431.030.

Kouzuki, Chihiro, to Toa Medical Electronics Co., Ltd. Particle detector and particle detecting apparatus having the detector. 5,150,037, Cl. 324-71.400

Kowalski, Heinrich: *See—*
Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blaas, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, 5,149,783, Cl. 530-326.000.

Koyama, Haruo, to Mita Industrial Co., Ltd. Electrostatic image recording machine capable of multiple gradations. 5,150,156, Cl. 355-214.000

Koyanagi, Seiya: *See—*
Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; Koyanagi, Seiya; and Fujimoto, Yasuyuki, 5,149,776, Cl. 430-288.000.

Koyo Jidoki Company Limited: *See—*
Yamashita, Kyoichi, 5,148,752, Cl. 104-44.000.

Koyo Seiko Co., Ltd.: *See—*
Okuse, Hirotsugu; Sato, Hiroshi; Takahashi, Kenji; and Uchida, Kazuo, 5,148,779, Cl. 123-90.280.

Kozik, Andrew F.; and Taylor, Dennis M., to International Business Machines Corporation. Touch sensitive overlay. 5,149,918, Cl. 178-18.000.

Kozlow, Woodruff: *See—*
Pigott, Michael; and Kozlow, Woodruff, 5,148,633, Cl. 51-126.000.

Kozo Iizuka, Director Genral, Agency of Industrial Science and Technology: *See—*
Ueyama, Satoshi; and Isoda, Satoru, 5,149,811, Cl. 544-345.000.

Kraft General Foods Canada Inc.: *See—*
Flindall, Richard C., 5,149,555, Cl. 426-448.000.

Kraft General Foods, Inc.: *See—*
Vidal, Susan; and Saleeb, Fouad Z., 5,149,552, Cl. 426-321.000

Kramer, Michael; Zeilinger, Karl; and Bacu, Theodor, to Mercedes-Benz AG. Casing of a trunk piston internal combustion engine. 5,148,782, Cl. 123-195.00R.

Krause, Lothar A., Jr.: *See—*
Ashby, James C., III; Burkhart, Clark; Favors, Frankie B.; Tiemann, Roy G.; Vandaveer, Robert L.; and Krause, Lothar A., Jr., 5,150,401, Cl. 380-29.000.

Kreitman, Haim, to Scitex Corporation Ltd. Apparatus for generating a screened reproduction of an image. 5,150,225, Cl. 358-456.000.

Krepski, Larry R.: *See—*
Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 5,149,806, Cl. 544-72.000

Kress, Dieter; and Haberle, Friedrich, to Mapal. Reamer. 5,149,233, Cl. 408-199.000

Kress, Jurgen; and Breitenberger, Konrad, to Gerberit AG. Assembly space cover for an installation module. 5,148,552, Cl. 4-252.200.

Krichever, Mark J.: *See—*
Swartz, Jerome; Shepard, Howard M.; Darkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; and Barkan, Edward, 5,149,950, Cl 235-472.000

Kristinsson, Sigurdur, to Jonatan HF. Machine for processing belly flaps from a front part of a fish. 5,149,296, Cl. 452-108.000

Kristoffersen, Stein: *See—*
Robinson, Victor E.; Kristoffersen, Stein; and Laezza, Joseph, 5,149,410, Cl. 204-199.000

Krivanec, Kari H.: *See—*
Karner, Wilhelm; Wurmbauer, Dieter; Krivanec, Kari H.; and Horn, Juanito, 5,149,515, Cl. 423-393.000

Kroggel, Matthias: *See—*
Gersdorf, Joachim; and Kroggel, Matthias, 5,149,747, Cl. 525-454.000

Krumdieck, Carlos. Biological tissue slicer. 5,148,729, Cl. 83-411.100

Krupp Polysius AG: *See—*
Heinemann, Otto; and Schmits, Heinz-Herbert, 5,149,266, Cl. 432-77.000

Kruse, Robert W. Push-in electrical connector assembly. 5,149,279, Cl. 439-441.000

Krutsch, John: *See—*
Schilling, Winston H.; Ritchie, Mark D.; Krutsch, John; and Joos, Joseph, 5,149,093, Cl. 273-118.00A.

Kubota Corporation: *See—*
Shiraishi, Yasunori; Nagahama, Masahiro; Murata, Mutsumi; Umeda, Yuzo; Yamada, Setsuo; and Morioka, Kazuyoshi, 5,148,789, Cl. 123-367.000

Kubota, Ltd.: *See—*
Nakamura, Norimi; Adachi, Tadao; Matsui, Akio; Fujiwara, Kouji; Kobayashi, Mitsugu; Yamaguchi, Tetsuo, and Fukuda, Minoru, 5,149,308, Cl. 475-203.000

Kubota, Masaru: *See—*
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Kubota, Takashi: *See—*
Ueda, Hironori; Hanai, Kazumichi; Takeuchi, Hitoshi; Nakamichi, Kazutaka; and Kubota, Takashi, 5,148,678, Cl. 60-602.000

Kuchta, Steven L.: *See—*
Shoemaker, Martin L.; Hughes, Dana N.; and Kuchta, Steven L., 5,150,199, Cl. 358-21.00R

Kuechler, Ernst: *See—*
Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blaas, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, 5,149,783, Cl. 530-326.000

Kuhn, Franz J.: *See—*
Weber, Karl-Heinz; Walther, Gerhard; Schneider, Claus; Hinzen, Dieter; Kuhn, Franz J.; and Lehr, Erich, 5,149,808, Cl 544-141.000

Kuipers, Wayne D.: *See—*
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Kumada, Akira: *See—*
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Kumar, Mahesh: *See—*
Chen, Tzu H.; and Kumar, Mahesh, 5,150,083, Cl. 333-103.000

Kume, Atsuya, to Mitsubishi Denki Kabushiki Kaisha. Frequency error detecting apparatus. 5,150,382, Cl. 375-88.000.

Kunicki, Thomas J.; and Montgomery, Robert R., to Blood Center Research Foundation, The. Method for maintaining intact, nondegraded factor VIII/von-Willebrand factor during blood processing. 5,149,787, Cl. 530-383.000

Kunigita, Masaya: *See—*
Gunkima, Tomoki; Yuki, Masanori; Kunigita, Masaya; Hirai, Yoshinori; Yoshikawa, Yukio; and Shidoji, Eiji, 5,150,232, Cl 359-51.000

Kunihiro, Yasuyuki; Tanaka, Ryo; Hata, Seishichi; and Yamada, Koji, to Mochida Pharmaceutical Co., Ltd. Thrombin composition for oral administration. 5,149,540, Cl. 424-489.000

Kuo, Jing-wen: *See—*
Ferdman, Ariel; Kuo, Jing-wen; Miller, David; Pinsky, Vladimir; Richards, William D.; and Swann, David, 5,149,331, Cl 604-290.000

Kuo, Yeong-Jen: *See—*
Bellas, Michael; Kuo, Yeong-Jen; and Rash, Fred H., 5,149,849, Cl. 552-293.000

Kupcikevicius, Vytautas; Cilia, Philip F.; and Burkeen, Darrell L., to Viskase Corporation. Heat sealing member for making contoured heat seals. 5,149,943, Cl. 219-243.000

Kurauchi, Makoto; Hayasaki, Kiyoshi; Minami, Toshikazu; and Ohnishi, Mutsuhiko, to Shinko Kosen Kogyo Kabushiki Kaisha. Tendons for prestressed concrete structures and method of using such tendons. 5,149,385, Cl. 156-85.000

Kurihara, Hideo, to Canon Kabushiki Kaisha. Information recording and reproducing apparatus having an emergency conveying device for moving a carriage member to an ejecting port. 5,150,352, Cl. 369-258.000

Kurihara, Sakuo; and Sakamoto, Kazuhiro, to Tochigifujisangyo Kabushiki Kaisha. Hub clutch for automotive vehicle. 5,148,901, Cl. 192-67.00R

Kurisu, Motohiro, to Zilog, Inc. System for controlling the display of images in a region of a screen. 5,150,107, Cl. 340-724.000

Kurosaka, Syuji: *See—*
Hiraoka, Toyoki; Kurosaka, Syuji; and Jingu, Nobuhisa, 5,148,784, Cl. 123-195.00C

Kurosawa, Yuichi: *See—*
Abe, Nobuaki; and Kurosawa, Yuichi, 5,150,268, Cl 360-128.000

Kurose, Shigeru: *See—*
Funatsu, Ryoji; Mitsui, Susumu; Kurose, Shigeru; and Gato, Atsuko, 5,149,706, Cl. 514-372.000

Kurozumi, Seizi: *See—*
Hazato, Atsuo; and Kurozumi, Seizi, 5,149,711, Cl. 514-548.000

Kurtz, William L.: *See—*
Shaffer, John H.; Kurtz, William L.; and Hubbard, John H., 5,149,398, Cl. 159-4.010.

Kusaka, Kensaku: *See—*
Hirabayashi, Hiromitsu; Kusaka, Kensaku; Arai, Atsushi, and Takayanagi, Yoshiaki, 5,149,941, Cl. 219-216.000

Kusakabe, Masahiro: *See—*
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,149,200, Cl. 374-185.000

Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; Koyanagi, Seiya; and Fujimoto, Yasuyuki, to Mitsubishi Rayon Co., Ltd. Cross-linking hardenable resin composition, metal laminates thereof and metal surface processing method therewith. 5,149,776, Cl. 430-288.000

Kusunoki, Jun: *See—*
Matumoto, Masakatsu; Watanabe, Nobuko; Mori, Eiko, and Kusunoki, Jun, 5,149,834, Cl. 549-292.000

Kuwabara, Satoru, to Brother Kogyo Kabushiki Kaisha. Apparatus for forming images discharge lamp and current, tone and temperature control means. 5,150,154, Cl. 355-208.000

Kvitrud, James R.: *See—*
Longhini, Ross A.; Neisse, Daryl L.; Drake, Gerald E.; and Kvitrud, James R., 5,149,267, Cl. 433-26.000

Kwang-Chien, Fong. Pointing device for rapid moving control of a cursor on a single axis. 5,150,106, Cl 340-709.000

Kyoukane, Yasuaki; and Nagano, Toshihiro, to Fuji Jukogyo Kabushiki Kaisha. Automatically charging system for electric automobile. 5,150,034, Cl. 320-62.000

Kyoukane, Yasuaki. *See—*
Nagano, Toshihiro; and Kyoukane, Yasuaki, 5,150,045, Cl 320-62.000

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Satoh, Tsutomu; Shimizu, Ikuo; and Ito, Yukiyoshi, 5,149,819, Cl. 548-149.000

Laarman, Hans-Wilhelm. *See—*
Schellong, Helmut; Victor, Karl-Heinz; Laarman, Hans-Wilhelm, Maser, Gustav; and Dedeken, Ralf, 5,149,249, Cl. 415-170.100

Ladish Co., Inc.: *See—*
Hayes, Arthur F.; and Lemsky, Joseph A., 5,148,965, Cl 228-115.000

Laezza, Joseph: *See—*
Robinson, Victor E.; Kristoffersen, Stein; and Laezza, Joseph, 5,149,410, Cl. 204-199.000

Laffont, Patrick: *See—*
Gros, Jean-Pierre; and Laffont, Patrick, 5,149,247, Cl. 415-108.000

Lagache, Michel P., to Bechtel Group, Inc. Passive emergency ventilation system. 5,148,681, Cl. 62-48.100.

Lahrman, Frank H.; Berg, Charles J.; and Roe, Donald C., to Procter & Gamble Company, The. Absorbent articles containing interparticle crosslinked aggregates. 5,149,334, Cl. 604-367.000

Lahti, Richard; and Thomas, Kent, to Tab Products Company. Carriage lock for a mobile storage system with rotatable actuator knob 5,148,754, Cl. 105-96.000

Lai, Daniel: *See—*
Autruong, Tho; and Lai, Daniel, 5,150,368, Cl. 371-31.000

Laia, Joseph R., Jr.: *See—*
Smith, David C.; Pattillo, Stevan G.; Laia, Joseph R., Jr., and Sattelberger, Alfred P., 5,149,596, Cl. 428-656.000

Lak, Khosrow; and Tompkins, E. Neal, to Colorocs Corporation. Flat screen for an electrophotographic printing device. 5,150,158, Cl 355-239.000

Lake Medical Products, Inc.: *See—*
Klearman, Jeffrey D.; Bierman, Jeffrey J.; Pott, Lambert J.; and Watson, Glen E., Jr. (said Jeff Bierman assignor to), 5,148,563, Cl 5-652.000

Lake, Samuel H., Jr. Emergency map apparatus and method of use thereof. 5,150,096, Cl. 340-286.140

LaMarca, Louis J., II; and Hayes, James F., Sr., to Haartz Corporation, The. Tailorable, flame barrier, puncture-resistant fabric sheet material and method of manufacturing same. 5,149,582, Cl. 428-234.000

Lambert, Steven E.: *See—*
Ahlert, Richard H.; Howard, James K.; and Lambert, Steven E., 5,149,409, Cl. 204-192.200

Landis, Abraham L.: *See—*
Lau, Kreisler S. Y.; Landis, Abraham L.; and Dougherty, Thomas K., 5,149,764, Cl. 528-14.000

Landmann, Howard. Ball retriever. 5,149,245, Cl. 414-440.000

Landsiedel, Horst; and Plum, Hans, to Schering Aktiengesellschaft. Diorganotin compounds, and agents which have a bactericidal and fungicidal action and contain these compounds. 5,149,365, Cl 106-18.320

Lang, Gerhard: *See—*
Reiter, Friedemann; Grill, H lmut; Henschel, Hans-Helmut; Schliack, Michael; Setbel, K aus; Loser, Roland; and Lang, Gerhard, 5,149,865, Cl. 562-47 .000.

Lang, Robert W.: *See—*
von Sprecher, Andreas; Beck, A dreas; Schaub, Bruno; and Lang, Robert W., 5,149,717, Cl. 514- 56.000

Langer, Robert S.: *See—*
Cohen, Smadar; Bano, Carmen; Visscher, Karyn B.; Chow, Marie; Allcock, Harry R.; and La ger, Robert S., 5,149,543, Cl. 424-499.000

Langevin, Eric T.; and Bourque, Jar es A., to Thermo Electron Web Systems, Inc. Simultaneously cont olled steam shower and vacuum apparatus and method of using sam e. 5,149,401, Cl. 162-207.000

Langlois, Edouard E.; Kehoe, Kathryn T.; Smith, Warren R.; Muscato, Mark; Ceglinski, Barbara D.; Kirch off, Alan C.; Dunham, Robert F.; and Stair, Michael D., to Xerox C rporation. Fabrication of electrophotographic imaging members. 5 49,612, Cl. 430-132.000.

Lanius, Charles A., to Flambeau Pro ucts Corporation. Lockable latch assembly with flexible band lock ng member surrounding a cam surface. 5,149,152, Cl. 292-37.000.

Lanxide Technology Company, LP: *See—*
Claar, Terry D.; Johnson, Wi iam B.; and Rapp, Robert A., 5,149,678, Cl. 501-134.000

Lapp, Stephen P.; van Huuksloot, onald F.; Timan, Peter E.; and Skoblenick, Harry. Transit system 5,148,753, Cl. 104-290.000

Larsen, Hugh G.: *See—*
Maslak, Samuel H.; Larsen, Hu h G.; Chaffin, Joel S.; Chandler, Paul E.; Galton, Ian A.; and K rmali, Mehebub S., 5,148,810, Cl 128-661.010

Larsen, Rolf O.: *See—*
Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M., and Oftebro, Reider, 5,149,820, Cl. 548-215.000.

Larsson, Kenneth O.: *See—*
Nystrom, Mats G.; Larsson, Ke neth O.; Skogby, Anna K.; and Herstad, Solvie M., 5,149,442, Cl. 210-724.000

Lasiter, Rupert W. Fish holding and measuring device and method of use. 5,148,607, Cl. 33-549.000

Lastowski, Philip A.: *See—*
Coiro, Michael A., Sr.; Murray, Dale R.; and Lastowski, Philip A., 5,148,766, Cl. 119-17.000

Lat, Geronimo E.: *See—*
Gabriel, William L.; Lat, Geron mo E.; and Shelton, Lawrence S., 5,149,237, Cl. 411-446.000

LaTart, David B.: *See—*
Osterhoudt, Hans W.; Ponticello Ignazio S.; Christy, Kenneth G., Jr.; and LaTart, David B., 5,1 9,416, Cl. 204-299.00R

Latge, Christian, to Commissariat a l Energie Atomique. Installation to regenerate cold traps loaded with he hydride and oxide of a liquid metal. 5,149,493, Cl. 376-312.000.

Lau, Cheuk K.; and Dufresne, Clau e, to Merck Frosst Canada, Inc Quinoline-substituted chromans a d related compounds as leukotriene antagonists. 5,149,703, Cl. 5 4-311.000

Lau, Kreisler S. Y.; Landis, Abraham L.; and Dougherty, Thomas K., to United States of America, Navy. Substituted silyl-terminated compounds and polymers thereof. 5,149,764, Cl. 528-14.000

Laube, Hans-Jurgen, to H J L Project & Developments Ltd. Molecular sieve arrangement and filtering method for removal of a selected constituent. 5,149,435, Cl. 210-651.000

Lauck, Anthony: *See—*
Perlman, Radia J.; Hawe, William; and Lauck, Anthony, 5,150,360, Cl. 370-94.300

Laugery, Charles M.; and Mombell, Paul A., to Mecanismes Electroniques Realises Innovation Conception Brevets. Device for locking an emergency exit. 5,149,157, Cl. 292-341.160.

Laughlin, Raymond S.: *See—*
Lynch, Edward J., Jr.; and Laughlin, Raymond S., 5,148,981, Cl. 238-351.000

Lauk, Urs: *See—*
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Laurence, Douglas S.: *See—*
McCourt, Carroll T.; Emering, Charles J.; Laurence, Douglas S.; Eckhart, Roy A.; and Cass, William, 5,150,307, Cl. 364-478.000

Lautman, Kenneth: *See—*
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Lavach, Mark L.: *See—*
Hung, Paul L. K.; Cioffi, John; and Lavach, Mark L., 5,148,765, Cl. 118-100.000

Lavie, Gad: *See—*
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Lavin, Aaron. Centrifuge for separating liquids of different specific gravities. 5,149,432, Cl. 210-381.000

Lawrence, George D.: *See—*
Pierce, Brian M.; Lawrence, George D.; Chang, David B.; and Arenberg, Jonathan W., 5,149,957, Cl. 250-211.00R.

Lawrence, Glen S.: *See—*
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Lawrence, James L., to Dayco Products, Inc. Flexible hose construction. 5,148,836, Cl. 138-121.000

Lawrence Paper Company, The: *See—*
Gaggero, Joseph W.; and Sullivan, Michael W., 5,149,572, Cl. 428-43.000

Lean, Meng H.: *See—*
deJong, Joannes N. M.; Lean, Meng H.; Wolf, Barry; Ricciardelli, John J.; Schweid, Stuart A.; and Lofthus, Robert M., 5,150,115, Cl. 340-870.310.

LeBaron, James B.: *See—*
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LeBlanc, Guy: *See—*
Mueller, Friedrich P.; and LeBlanc, Guy, 5,148,856, Cl. 164-487.000

LeBrun, Martin R. Multiple tool organizing and storing carrier. 5,148,917, Cl. 206-372.000

Lechanteur, Jean-Paul: *See—*
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Leclere, Klemens; Kessels, Hans-Willi; and Hammes, Friedhelm, to Saint-Gobain Vitrage. Process and device for coating a glass sheet with a flexible film. 5,148,574, Cl. 15-415.100.

Ledger, Philip W.; Cormier, Michel J. N.; and Amkraut, Alfred, to ALZA Corporation. Reduction or prevention of sensitization to drugs. 5,149,539, Cl. 424-449.000.

Ledinh, Chon T.; and Huynh, Huu L., to Centre de Recherche Industrielle du Quebec. Separable diamond shaped multidimensional filters for composite video encoding/decoding applications. 5,150,202, Cl. 358-31.000

LeDuc, Edward C., to Amoco Corporation. Method for production of styrenic foam. 5,149,473, Cl. 264-51.000.

Lee, Biing-lin, to BFGoodrich Company, The. Fiber-reinforced thermoplastic elastomer polyurethane compositions with either modified and/or unmodified polyolefins. 5,149,739, Cl. 525-66.000.

Lee, Deung Y.: *See—*
Kim, Young G.; Yoo, Han I.; Han, Sang K.; and Lee, Deung Y., 5,149,499, Cl. 420-495.000

Lee, Douglas W.; Deken, Arthur D.; Franklin, James E.; and Dunn, Richard P., to Charles Machine Works, Inc., The. Apparatus for drilling a horizontal controlled borehole in the earth. 5,148,880, Cl. 175-393.000

Lee, Franklin P.: *See—*
Stirbis, James S.; and Lee, Franklin P., 5,148,742, Cl. 101-40.000.

Lee, Henry J., to Asten Group, Inc. Papermakers fabric with orthogonal machine direction yarn seaming loops. 5,148,838, Cl. 139-383.0AA

Lee, Hyun T.: *See—*
Lee, Young H.; Baek, Young S.; Lee, Seok G.; Lee, Kun W.; Chae, Jong E.; and Lee, Hyun T., 5,150,405, Cl. 379-230.000.

Lee, Joung-Sang: *See—*
Shin, Yun-Bok; and Lee, Joung-Sang, 5,150,214, Cl. 358-166.000.

Lee, Kiu H.; Karol, Frederick J.; and Samuels, Sari B., to Union Carbide Chemicals & Plastics Technology Corporation. Process for the in situ blending of polymers. 5,149,738, Cl. 525-53.000.

Lee, Kun W.: *See—*
Lee, Young H.; Baek, Young S.; Lee, Seok G.; Lee, Kun W.; Chae, Jong E.; and Lee, Hyun T., 5,150,405, Cl. 379-230.000

Lee-Rowan Company: *See—*
Arnold, William D., 5,148,928, Cl. 211-187.000.

Lee, Ruojia, to Micron Technology, Inc. Conductive source line for high density programmable read-only memory applications. 5,149,665, Cl. 437-43.000

Lee, Seok G.: *See—*
Lee, Young H.; Baek, Young S.; Lee, Seok G.; Lee, Kun W.; Chae, Jong E.; and Lee, Hyun T., 5,150,405, Cl. 379-230.000

Lee, Shang-Lun. Plug-in type electrical bulb apparatus. 5,150,008, Cl. 315-71.000.

Lee, Shih-Ying; and Li, Sen Z., to Setra Systems, Inc. Capacitive pressure sensor. 5,150,275, Cl. 361-283.000.

Lee, Soo-Cheol: *See—*
Shin, Yun-seung; and Lee, Soo-Cheol, 5,149,664, Cl. 437-41.000.

Lee, Young H.; Baek, Young S.; Lee, Seok G.; Lee, Kun W.; Chae, Jong E.; and Lee, Hyun T., to Electronics and Telecommunications Research Institute; and Korea Telecommunication Authority. Duplex structure signal transfer point system for common channel signalling system No. 7. 5,150,405, Cl. 379-230.000.

Lee, Zachary K. F.: *See—*
Jaeger, Nicolas A. F.; and Lee, Zachary K. F., 5,150,436, Cl. 385-2.000.

Lehnert, Charles W.; and Randall, Brian G., to Georgia-Pacific Corporation. Use of fibrous mat-faced gypsum board in shaft wall assemblies and improved fire resistant board. 5,148,645, Cl. 52-443.000.

Lehr, Erich: *See—*
Weber, Karl-Heinz; Walther, Gerhard; Schneider, Claus; Hinzen, Dieter; Kuhn, Franz J.; and Lehr, Erich, 5,149,808, Cl. 544-141.000.

Lehr Precision Inc.: *See—*
Bruns, Norbert A.; Fussner, Richard F.; and Reynolds, John S., 5,149,405, Cl. 204-129.100

Leimbach, J. George; and Heffner, Joseph H., to Sporlan Valve Company. Injection valve for a refrigeration system. 5,148,684, Cl. 62-197.000

Leipold, Kurt: *See—*
Kizak, Ulrich; and Leipold, Kurt, 5,150,419, Cl. 381-194.000.

Leis, Paul D., Jr.; Burns, Larry E.; and Hafer, Karen R., to Procter & Gamble Company, The. Psyllium-containing produces with a distribution of particle size. 5,149,541, Cl. 424-489.000

Leisinger, Roger, to Mettler - Toledo AG. Electronic weighting apparatus with calibration weight arrangement. 5,148,881, Cl. 177-50.000.

Leiszter, Karoly, to Great Gasket Concepts, Inc. Multi-piece gasket joint. 5,149,108, Cl. 277-199.000

Leithe, Ulrich: *See—*
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Le Jaoudour, Thierry, to OCE Graphics France, S.A. Graphics printer including device for maintaining print medium contact. 5,150,131, Cl. 346-134.000

Lela, Robert W.: *See—*
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Leland Chiron Corporation, Board of Trustees of: *See—*
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Leland Stanford Junior University, The Board of Trustees of the: *See—*
Chu, Ke-Chiang, 5,150,430, Cl. 382-56.000
Pauly, John M.; Conolly, Steven M.; and Nishimura, Dwight G., 5,150,053, Cl. 324-309.000

LeMaster, Dolan M. Connectivity management system. 5,149,277, Cl. 439-207.000

Lemsky, Joseph A.: *See—*
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Lenz, Robert W.: *See—*
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Leone, Anthony J.; and Spaulding, Kevin E., to Eastman Kodak Company. Method for generating halftone image data with randomly selected threshold array. 5,150,428, Cl. 382-50.000.

Leppard, David G.: *See—*
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Le Vantine, Allan D. Device for removing dust, lint and static charge from film and plastic surfaces. 5,150,273, Cl. 361-221.000.

Levenson, Corey H.: *See—*
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Lever Brothers Company, Division of Conopco, Inc.: *See—*
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Le Viet, Toai; and Raetz, Eberhard, to Nestec S.A. Process for pasteurizing and precooking uncooked pizza bases. 5,149,556, Cl 426-521.000

Levin, James P.: *See—*
Kirch, Steven J.; Levin, James P.; and Wagner, Alfred, 5,149,974, Cl. 250-492.200

Levoska, Ilmari; and Fredriksson, Ove R., to Whirlpool International B.V. Microwave oven with lamp and microwave seal. 5,149,930, Cl 219-10.55R

Lewandowski, Daniel J.; Evans, James R.; and Jessup, Randall D., to Pillsbury Company, The. Method for cutting and positioning dough in a pan. 5,149,594, Cl. 426-503.000.

Lewandowski, Mark S.; Gessner, David M.; and Anthony, Robert C., to Smarte Carte Inc. Nestable cargo cart. 5,149,114, Cl. 280-33.992.

Lewandowski, Timothy J.: *See—*
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Lewin, Ian; and Greer, Joe. Combination louver/lens light fixture shield. 5,149,191, Cl. 362-290.000

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Lewis, William D.: *See—*
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Li, Hsin L.; and Prevorsek, Dusan C., to Allied-Signal Inc. Prepreg machine with a single endless conveyor belt. 5,149,391, Cl. 156-441.000

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Li, Yuejin; and Armor, John N., to Air Products and Chemicals, Inc. Catalytic reduction of NOx using methane in the presence of oxygen. 5,149,512, Cl. 423-239.000

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Lien, Larry A., to Desalination Systems, Inc. Method and apparatus for supply of decontaminated fuel to diesel engine. 5,149,433, Cl 210-641.000

Lienau, Richard M. Home security system and methodology for implementing the same. 5,150,099, Cl. 340-552.000

Lifshitz, Nadia; and Schutz, Ronald J. Process for fabricating integrated circuits having shallow junctions. 5,149,672, Cl. 437-189.000

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Lightolier Division of The Genlyte Group, Inc.: *See—*
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Lileg, Johann: *See—*
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Lilly, Eugene V., to United States of America, Air Force. Universal aircraft rocket/missile launcher (UARML) and triple launcher adapter (TLA). 5,148,734, Cl. 89-1.815

Lim, Seok G., to Goldstar Electric Machinery Co. Noise-shielded transformer. 5,150,046, Cl. 323-356.000

Lin, Fu-Tung. Faucet having resiliently-packed rotatable spout 5,148,832, Cl. 137-615.000

Lin, Shen-Yuan. Binocular with shading device. 5,150,255, Cl. 359-409.000

Lindee, Scott A., to Formax, Inc. Vertical valve food patty molding machine. 5,149,298, Cl. 452-174.000

Lindel, Hans; Hallenbach, Werner; and Gallenkamp, Bernd, to Bayer Aktiengesellschaft. Preparation of 2,3-dichloro-5-acetylpyridine. 5,149,822, Cl. 546-315.000

Lindley, Daniel: *See—*
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Lindsay, Erin J., to Minnesota Mining and Manufacturing Company Quick-changeover blood handling apparatus. 5,149,318, Cl 604-4.000

Liotta, Gary C.: *See—*
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Liquid Carbonic Inc.: *See—*
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Lisco, Inc.: *See—*
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Little, Cindy E.; and Cully, Eric, to Crystals International. Freeze dried sweetened condensed skim milk crystals and its process of making 5,149,558, Cl. 426-588.000

Liu, Francis C.; and Harris, Beth E., to United States of America, Navy Safety line harness. 5,148,762, Cl. 114-253.000

Liu, Hung. Flow control device. 5,148,830, Cl. 137-513.700

Liu, Kou-Chang, to ISP Investments Inc. Processless imaging to maximize blue light absorption of an image. 5,149,616, Cl. 430-346.000

Liu, Kou-Chang, to ISP Investments Inc. Imageable diacetylene ethers 5,149,617, Cl. 430-346.000

Liu, Sung-Tsuen; and Chung, Harvey H. Resorbable bioactive calcium phosphate cement. 5,149,368, Cl. 424-602.000

Liu, Tsuen-Hsi; and Cheng, Li-Jen, to United States of America, National Aeronautics and Space Administration. Real-time edge-enhanced optical correlator. 5,150,228, Cl. 359-7.000

Llorens, Mario. Security assembly for a sliding glass door. 5,148,630, Cl 49-425.000

Lo, Thomas K.: *See—*
Banh, Nam D.; Lo, Thomas K., Holthaus, Kelly D.; and Sacks, Jack M., 5,150,426, Cl. 382-48.000

Locatell, Louis; Norland, Kenneth; Roberts, F. Donald; and Zepp, Charles, to Steadfast, Inc. Substituted xanthene compounds 5,149,830, Cl. 549-223.000

Lockwood, Dan F.: *See—*
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Loechelt, Cecil P., II: *See—*
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Lofgren, Stefan. Agitator. 5,149,195, Cl. 366-343.000

Lofthus, Robert M.: *See—*
deJong, Joannes N. M.; Lean, Meng H.; Wolf, Barry; Ricciardelli, John J.; Schweid, Stuart A.; and Lofthus, Robert M., 5,150,115, Cl. 340-870.310.

Lohmann, Jean J.: *See—*
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Lombardi, Massimo: *See—*
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Long, Robert J.; and Miles, Barry D. R., to Quantel Limited. Electronic print-dot generation. 5,150,311, Cl. 395-108.000

Longhini, Ross A.; Neisse, Daryl L.; Drake, Gerald E.; and Kvitrud, James R., to Minnesota Mining and Manufacturing Company. Dental shade guide assembly. 5,149,267, Cl. 433-26.000

Lonza Inc.: *See—*
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Meul, Thomas; and Kampfen, U ich, 5,149,869, Cl. 562-506.000
Look, David C.; and Mumford, Philip D., to United States of America, Air Force. On-wafer Hall-effect measurement system. 5,150,042, Cl 324-158.00R
Lopata, John E.: *See—*
Brunker, David L.; Crane, Burke J.; and Lopata, John E., 5,149,915, Cl. 174-36.000
Lorant, Jerry O.: *See—*
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Lorenzoni, Loreno: *See—*
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Loveless, Frederick C.: *See—*
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Kontani, Tetsuro; and Miki, Yutaka, 5,150,318, Cl. 364-724.030.
Lu, Ching-Shui. Quick stand adjusting device. 5,148,892, Cl. 182-201.000
Lubitz, Werner, to PCD Polymere Gesellschaft m.b.H. Process for the release of poly(3-hydroxy carboxylic acids). 5,149,644, Cl 435-146.000
Luca, Frank. Detachable dispenser for distributing scent or lure. 5,148,949, Cl. 222-175.000.
Lucas Duralith Corporation: *See—*
Demeo, Gregory B., 5,149,923, Cl. 200-5.00A
Luijten, Waltherus J. T. H., to Daf Special Products. Gear unit, particularly for use in a helicopter. 5,149,11..., Cl. 475-343.000
Luk, Tim W.: *See—*
Robinson, Murray J.; Joyce, Christopher C.; and Luk, Tim W., 5,150,177, Cl. 357-15.000.
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Zarian, Jamshid J., 5,149,467, Cl. 264-1.500.
Luna, Damian, to Nalco Chemical Company. Flexible holder for a corrosion-detecting coupon. 5,150,...65, Cl. 324-700.000
Lundberg, Ferdinand: *See—*
Cuculo, John A.; Tucker, Paul A.; Chen, Gao-Yuan; and Lundberg, Ferdinand, 5,149,480, Cl. 264-178.00F.
Lundberg, Per J.; Wingstrand, Karin Andersson, Kjell H.; and Simonsson, Leif, to Aktiebolaget Hassle Polystyrenesulfonate-drug complex and solid dosage forms thereof. 5,149,523, Cl. 424-78.100.
Lundquist, Lynn C. Centrifuge apparatus for residual liquid waste removal from recyclable container material. 5,149,424, Cl 210-174.000
Luneburg, Peter: *See—*
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Luniewski, Robert S., to Medical Sterilization, Inc. Irradiation device for fluoropolymers. 5,149,727, Cl. 22-156.000
Lunts, Lawrence H. C., to Glaxo Group Limited. Chloroaniline derivatives. 5,149,698, Cl. 514-211.000
Lusby, William R.: *See—*
Sonenshine, Daniel E.; Hamilton, J. Gordon; and Lusby, William R., 5,149,526, Cl. 424-84.000
Lutostanski, Leonard A. Convertible enclosure for hot tubs and the like 5,148,646, Cl. 52-66.000
Lynch, Edward J., Jr.; and Laughlin, Raymond S., to Erico International Corporation. Track circuit retainer clip. 5,148,981, Cl 238-351.000
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Lynes, Kenneth W.; and Nepovim, Zdenek, to J. E. Thomas Specialties Limited. Finned housing. 5,150,27..., Cl. 361-386.000
Lyon, Jay W., to Aluminum Company of America. Venting resealable container closure and associated closure container-combination. 5,148,935, Cl. 220-208.000
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Bianchini, Michael J.; Lyons, Christopher T.; Michalik, Richard A.; and Waterman, Raymond C., Jr., 5,150,080, Cl. 331-99.000
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MacAlpine, Gerald A.; Halls, Partick M. E.; and Asselin, Andre E., to Exxon Research and Engineering Company. Wax isomerate having a reduced pour point. 5,149,452, Cl. 252-56.00R.
MacDonald, J. Gavin: *See—*
Potts, David C.; Young, George A.; Everhart, Dennis S.; MacDonald, J. Gavin; and Nohr, Ronald S., 5,149,576, Cl. 428-198.000
MacDonald, Noel C.; Chen, Liang-Yuh; and Zhang, Zuoying L., to Cornell Research Foundation, Inc. Selective chemical vapor deposition of tungsten for microdynamic structures. 5,149,673, Cl. 437-192.000
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MacGregor, Donald C. Apparatus for lateral drain hole drilling in oil and gas wells. 5,148,877, Cl. 175-79.000.
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Mack, O. Theodor: *See—*
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MacKenzie, Robert, to Bay Industrial and Mine Tech Inc. Portable safety device. 5,149,190, Cl. 362-234.000.
Macy, Daniel H., to Texaco Inc. Multi-phase flow and separator. 5,149,344, Cl. 55-167.000.
Madar, Ann M.: *See—*
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Maekawa, Tetsuya; Nanbu, Yuichi; and Kosugi, Noriyuki, to Takata Corporation. Shoulder adjuster. 5,149,136, Cl. 280-808.000.
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Maes, Felix-Victor; and Lechanteur, Jean-Paul. Priming chamber for a firearm cartridge. 5,148,749, Cl. 102-204.000.
Magara, Takuji, to Mitsubishi Denki K.K. Power source for electric discharge machining. 5,149,931, Cl. 219-69.130.
Maget, Henri J. R. Efficient electrochemical motor. 5,149,413, Cl. 204-258.000.
Maguina-Larco, Alfredo, to A.M. Logistics Corporation. Adaptor for earth working cutting teeth and holding clamp. 5,148,616, Cl. 37-141.00T.
Maho Aktiengesellschaft: *See—*
Babel, Werner; Grund, Peter; Eberl, Gunter; and Sutor, Ulli, 5,149,937, Cl. 219-121.680
Maitlen, C. Gene; and Maitlen, Randall E., to VMI Inc. Dredging apparatus. 5,148,615, Cl. 37-64.000
Maitlen, Randall E.: *See—*
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Makino, Atsushi: *See—*
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Makino, Katsuaki: *See—*
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Malachowski, Michael A.: *See—*
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Malesky, John A.: *See—*
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Mallace Industries Corporation: *See—*
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Malloy, John D.; and Solt, Michael B., to General Motors Corporation. Multispeed power transmission. 5,149,307, Cl. 475-200.000
Malm, Douglas N., to Standard Products Company, The. Forming decorative trim strips from continuous extrusions. 5,149,478, Cl. 264-162.000
Malo, Bernard: *See—*
Hill, Kenneth O.; Bilodeau, Francois; Malo, Bernard; and Johnson, Derwyn C., 5,150,439, Cl. 385-39.000.
Manabe, Toshiyuki; Iwamoto, Yasunori; Sakakida, Masafumi; Muramoto, Hisao; Inada, Haruhiro; and Matsunaga, Masahiro, to Mazda Motor Corporation. Air bag structure for an automotive vehicle. 5,149,127, Cl. 280-731.000.

Mandy, Robert R. Emergency hall lighting. 5,149,185, Cl. 362-20.000
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Mansell, J. Douglas: *See—*
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Mantel, Charlie R.: *See—*
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Kress, Dieter; and Haberle, Friedrich, 5,149,233, Cl. 408-199.000
Maraganore, John M.; and Kindsvogel, Wayne R., to ZymoGenetics, Inc. Cytotoxic protein from *Trichosanthes kirilowii*. 5,149,528, Cl 424-85.910.
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Maringer, Martin M.; Traub, Henry A.; Kosty, John W.; and Mack, O. Theodor, to W. S. Shamban & Company. Elastomer energized sealing and exclusion device. 5,149,107, Cl. 277-165.000
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Markham, Roger, to Xerox Corporation. Method for slanting a generic font format while inserting corrective pixels to improve print quality. 5,150,108, Cl. 340-735.000
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Marsella, John A.; and Machado, Reinaldo M., to Air Products and Chemicals, Inc. Preparation of aliphatic dihydroperoxides. 5,149,883, Cl. 568-564.000
Marshall, Forrest A. Determining and marking apparatus and method for use in optometry and ophthalmology. 5,148,602, Cl. 33-28.000
Martin, Gregory J.; Chen, Robert Y.; Cook, John F.; and Mason, James A., to Eastman Kodak Company. Character recognition method using correlation search. 5,150,425, Cl. 382-14.000.
Martin, Lawrence L.; Payack, Joseph F.; and Ong, Helen H., to Hoechst-Roussel Pharmaceuticals Incorporated. Process for (1,2,3,4-tetrahydro-9-acridinimino)cyclohexane carboxylic acid and related compounds. 5,149,813, Cl. 546-105.000.
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Martin, Michael J.; Moore, Steven R.; Sokac, Russell J.; Siegel, Robert P.; and Garavuso, Gerald M., to Xerox Corporation. Hybrid nudger roll. 5,149,077, Cl. 271-18.300
Martin, Paul F., to Aqualogic Systems, Inc. Variable flush valve for a toilet. 5,148,554, Cl. 4-394.000.
Martin, William C., to VLSI Technology, Inc. Provision of circuit reset without a dedicated I/O pin. 5,149,987, Cl. 307-272.300.
Martinell, Brian J.: *See—*
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Maru, Tsuguo, to NEC Corporation. Security module for radio telephone. 5,150,412, Cl. 380-43.000
Marumo, Hitoshi: *See—*
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Maruyama, Takashi; and Mizuno, Kukio, to Sumitomo Chemical Company, Limited. Resin composition. 5,149,740, Cl. 525-92.000
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Mason, Bradley R.: *See—*
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Mason, James A.: *See—*
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Masuda, Tadao; Tsukuda, Masahiro; Doiura, Shigeru; Kawanishi, Kaoru; and Iwasaki, Hiroshi, to Oji Seitai Kaisha, Ltd. Unwrapping apparatus with swing arms and grippers. 5,148,651, Cl. 53-381.200
Masuda, Teruo; Morita, Masayasu; and Matsuzaki, Masahiro, to France Bed Co., Ltd. Apparatus for selecting mattress. 5,148,706, Cl 73-172.000
Masuda, Yoshihiro; Murata, Akira; Togawa, Hitoshi; and Miura, Nobuaki, to Dainippon Screen Mfg. Co., Ltd. Device for replenishing fixing solution employed in automatic processor. 5,150,142, Cl. 354-324.000
Masui, Shin, to Fuji Photo Film Co., Ltd. Liquid electrophotographic apparatus having an improved back electrode. 5,150,160, Cl. 355-256.000.
Masuko, Takayuki; Satoh, Shunichi; Ishizaka, Tetsuo; and Ohya, Toshio, to Fujitsu Limited. Rod lens fixing method and fiber collimator manufactured thereby. 5,150,230, Cl. 359-34.000
Masuzaki, Hidefumi; and Ito, Satoshi, to Hitachi, Ltd. Electronic image information filing apparatus displaying editing corrections. 5,150,458, Cl. 395-135.000
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Matsubara, Hirco; Meier, Kurt; Kohlpaintner, Georg; and Bienert, Horst, to Webasto AG Fahrzeugtechnik. Vehicle roof with water catching headliner. 5,149,170, Cl. 296-213.000
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Matsuda, Naoyuki; Murasaki, Sadanobu; Takei, Hajime; and Yamakoshi, Yukiyoshi, to Minolta Camera Co., Ltd. Recording sheet storing apparatus for an image forming system. 5,149,078, Cl. 271-145.000

Matsui, Akio: *See*—
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Matsumoto, Takaaki: *See*—
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Matsumoto, Tetsurou: *See*—
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Manabe, Toshiyuki; Iwamoto, Yasunori; Sakakida, Masafumi; Muramoto, Hisao; Inada, Haruhiro; and Matsunaga, Masahiro, 5,149,127, Cl. 280-731.000

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Matsuo, Hirofumi: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl. 354-403.000

Matsuo, Kenji: *See*—
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Mattelmaki, Esko, to A. Ahlstrom Corporation. Method and apparatus for thickening lime sludge. 5,149,448, Cl. 210-784.000

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Mazur, Adam W.; Hiler, George D., II; and El-Nokaly, Magda, to Procter & Gamble Company, The. Process for preparing 2-acylglycerides or 1,2 or 2,3-diacylglycerides. 5,149,642, Cl. 435-135.000

Mazur, Adam W.: *See*—
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McCaw, Ronald A. Sawmark guide. 5,148,730, Cl. 83-745.000

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McCourt, Carroll T.; Emering, Charles J.; Laurence, Douglas S., Eckhart, Roy A.; and Cass, William, to Automation Industrial Control, Inc. Computer-controlled system and method for sorting plastic items. 5,150,307, Cl. 364-478.000

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McDonald, James A. *See*—
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McEldowney, Carl; and Spangler, Philip, to Stolle Corporation, The. Pressure resistant sheet metal end closure. 5,149,238, Cl. 413-8.000

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Brahmbhatt, Sudhir R.; and Timberlake, George A., Jr., 5,149,500, Cl. 422-31.000

Micek, Stanley E., III: *See—*
English, Kenneth P.; Micek, Stanley E., III; O'Connell, Michael B.; and Tripp, Edward S., 5,149,505, Cl. 422-99.000

Michalik, Richard A.: *See—*
Bianchini, Michael J.; Lyons, Christopher T.; Michalik, Richard A.; and Waterman, Raymond C., Jr., 5,150,080, Cl. 331-99.000

Micro Card Technologies, Inc.: *See—*
Johnson, Jerry W.; and Taskett, John M., 5,149,945, Cl. 235-380.000

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Brooks, Jerry M.; and Huang, Chender, 5,150,194, Cl. 357-70.000.
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Lee, Ruojia, 5,149,665, Cl. 437-43.000.
Pinney, David; Johnson, Gary; Roberts, Greg; and Casper, Steve, 5,150,186, Cl. 357-42.000
Rhodes, Howard E.; and Lowrey, Tyler A., 5,149,668, Cl. 437-52.000.

Microtek Medical, Inc.: *See—*
Mendise, Nicholas E., 5,148,940, Cl. 220-404.000

Microvision, Inc.: *See—*
Schriner, Michael J., 5,149,051, Cl. 248-918.000

Microwave Sensors: *See—*
Orlowski, David P.; Eccleston, Larry; and Goodrich, Earl R., II, 5,150,123, Cl. 342-28.000.

Middleton, Nicholas J.: *See—*
Heyes, Peter J.; Middleton, Nicholas J.; and Brown, Alison M., 5,149,389, Cl. 156-272.400.

Mier-Langner, Alejandro: *See—*
Donato, Anthony C.; Newman, Albert L.; and Mier-Langner, Alejandro, 5,149,282, Cl. 439-530.000.

Miess, Georg-Emrich; Klein, Peter; and Pressler, Wilfried, to Hoechst Aktiengesellschaft. Process for preparing aromatic polyamides of high hydrolysis resistance with controlled water content of diamine 5,149,759, Cl. 528-348.000

Mihara, Hirokata: *See—*
Kimura, Yutaka; Okumura, Hiroshi; Mihara, Hirokata; and Yoshida, Mitsutoshi, 5,150,024, Cl. 318-568.100

Mihara, Yuji; and Ukai, Toshinao, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 5,149,619, Cl. 430-572.000

Mihashi, Kazuo: *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000.

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Ohmi, Tadahiro; Miki, Nobuhiro; Maeno, Matagoroh; and Kikuyama, Hirohisa, 5,149,378, Cl. 118-725.000.

Miki, Yutaka: *See—*
Kontani, Tetsuro; and Miki, Yutaka, 5,150,318, Cl. 364-724.030.

Mikic, Frank: *See—*
Huebschen, David A.; Pagac, William T.; Mikic, Frank; Severson, Thomas S.; and Sorbie, Douglas M., 5,148,726, Cl. 81-119.000

Mikosch, Falk; and Smith, Stanley D., to Kernforschungszentrum Karlsruhe GmbH. Switch matrix including optically non-linear elements. 5,150,183, Cl. 357-32.000

Mikuriya, Masatoshi: *See—*
Iwatani, Mitsuo; Kamoda, Hitoshi; Mikuriya, Masatoshi; Kashiyama, Tadao; and Kajino, Yoshio, 5,149,218, Cl. 400-625.000

Miles, Barry D. R.: *See—*
Long, Robert J.; and Miles, Barry D. R., 5,150,311, Cl. 395-108.000

Miles, Inc.: *See—*
Brown, James E., 5,149,627, Cl. 435-7.100.
Nodelman, Neil H., 5,149,458, Cl. 252-182.260.

Millar, Alan: *See—*
Butler, Donald E.; Deering, Carl F.; Millar, Alan; Nanninga, Thomas N.; and Roth, Bruce D., 5,149,837, Cl. 549-333.000.

Millburn, James E.: *See—*
Dickerson, Jon E.; and Millburn, James E., 5,148,975, Cl. 232-44.000

Miller, Bearge D.; and Galperin, Anatoly, to Miller Edge, Inc. Sensing edge switch. 5,148,911, Cl. 200-61.430.

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Ferdman, Ariel; Kuo, Jing-wen; Miller, David; Pinsky, Vladimir; Richards, William D.; and Swann, David, 5,149,331, Cl. 604-290.000

Miller Edge, Inc.: *See—*
Miller, Bearge D.; and Galperin, Anatoly, 5,148,911, Cl. 200-61.430.

Miller, executor; Wayne M.: *See—*
Olson, Donald C.; Miller, John J., deceased; and Miller, executor; Wayne M., 5,149,459, Cl. 252-191.000

Miller Harness Company, Inc.: *See—*
Meaghan, Robert C., 5,148,656, Cl. 54-36.000

Miller, John J., deceased. *See—*
Olson, Donald C.; Miller, John J., deceased; and Miller, executor; Wayne M., 5,149,459, Cl. 252-191.000.
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 5,149,460, Cl. 252-191.000

Miller, Rodney L.; and Smith, Craig M., to Eastman Kodak Company Image processor with error diffusion modulated threshold matrix 5,150,429, Cl. 382-50.000

Miller, Stephen J., to Chevron Research Company. Catalytic dewaxing process for lube oils using a combination of a silicoaluminophosphate molecular sieve catalyst and an aluminosilicate zeolite catalyst 5,149,421, Cl. 208-114.000

Miller, Wayne R., executor: *See—*
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 5,149,460, Cl. 252-191.000

Milliken Research Corporation: *See—*
Greenway, John M., 5,148,583, Cl. 26-2.00R.
Kluger, Edward W.; and Weaver, Max A., 5,149,800, Cl. 540-123.000

Millipore Corporation: *See—*
Foley, Brian D.; and Iovaine, John, 5,149,417, Cl. 204-299.00R

Mills, Stewart J.: *See—*
Fraenkel, Herbert; and Mills, Stewart J., 5,148,923, Cl. 209-539.000

Mimura, Akio: *See—*
Nishida, Tomoaki; Kashino, Yoshinori; Mimura, Akio; Takahara, Yoshimasa; and Sakai, Kokki, 5,149,648, Cl. 435-192.000

Mimura, Hidenori: *See—*
Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; Ohta, Yasumitsu; and Sai, Kazuyoshi, 5,149,955, Cl. 250-211.00J

Minakawa, Hiroshi; Kitaguchi, Yoshikazu; and Fukuda, Eiji, to Sharp Kabushiki Kaisha. Microwave oven with inverter controlled power source. 5,149,929, Cl. 219-10.55B.

Minakuchi, Tadashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic tracking servo gain control apparatus. 5,150,346, Cl. 369-44.360

Minami, Kangi, to Osaka Kanagu Co., Ltd. Right-handed and left-handed openable door device. 5,148,629, Cl. 49-193.000

Minami, Toshikazu: *See—*
Kuruuchi, Makoto; Hayasaki, Kiyoshi; Minami, Toshikazu; and Ohnishi, Mutsuhiko, 5,149,385, Cl. 156-85.000.

Minase, Akira; and Murayama, Kinzo, to Nippon Stainless Steel Kozai Co., Ltd. Method for producing outer skin for electric deposition foil producing drum. 5,148,966, Cl. 228-149.000.

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Black, David G.; and Wilson, Edwin P., 5,150,100, Cl. 340-555.000.

Mine, Kenji: *See—*
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,149,145, Cl. 285-101.000.

Minegishi, Takeshi; Yoneshige, Yasuo; Takehana, Toshihiro; and Sakai, Toru, to NHK Spring Co., Ltd. Cushion and method of manufacturing the same. 5,149,567, Cl. 427-240.000.

Minh, Do Le. Safety closures for threaded containers. 5,148,931, Cl. 215-220.000

Minnesota Mining and Manufacturing Company: *See—*
Ferber, Richard H.; and Burton, Scott A., 5,149,719, Cl. 514-772.000.
Kobe, James J.; and Nestegard, Susan K., 5,149,573, Cl. 428-93.000.
Lindsay, Erin J., 5,149,318, Cl. 604-4.000.
Longhini, Ross A.; Neisse, Daryl L.; Drake, Gerald E.; and Kvitrud, James R., 5,149,267, Cl. 433-26.000
Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 5,149,806, Cl. 544-72.000.
Simpson, Sahron M.; Boon, John R.; Bucci, Marco; Bertoldi, Massimo; Soncini, Cristina; and Sakizadeh, Kumars, 5,149,620, Cl. 430-617.000.

Minnesota Mining & Manufacturing Company, a Corporation of Delaware: *See—*
Vogelgesang, Peter J., 5,149,951, Cl. 235-485.000

Minnick, John H.: *See—*
Alligood, John H.; Minnick, John H.; and Castor, David A., 5,150,149, Cl. 354-441.000.

Minolta Camera Co., Ltd.: *See—*
Matsuda, Naoyuki; Murasaki, Sadanobu; Takei, Hajime; and Yamakoshi, Yukiyoshi, 5,149,078, Cl. 271-145.000.
Matsuura, Yasuhiro; Kojima, Hiroaki; Hasegawa, Hirofumi; Ohmori, Naoto; and Yamada, Yukio, 5,150,166, Cl. 355-308.000

Minolta Camera Kabushiki Kaisha: *See—*
Gonda, Takashi; Hasegawa, Hirofumi; Yamada, Motohiro; and Ariyama, Takayuki, 5,150,167, Cl. 355-313.000.
Igawa, Shoji; and Kotani, Akio, 5,150,159, Cl. 355-243.000
Kohri, Toshitaro; Machida, Junji; and Anno, Masahiro, 5,149,611, Cl. 430-110.000
Morikawa, Takashi; and Yamaguchi, Ikunori, 5,150,455, Cl. 395-114.000
Ueda, Hiroshi; Matsui, Toru; and Okisu, Noriyuki, 5,150,146, Cl. 354-403.000

Minto Kensetsu Co. Ltd.: *See—*
Toyoda, Takashi; and Takesako, Masafumi, 5,150,445, Cl. 385-116.000

MiQuest Corporation: *See—*
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Misaizu, Kouei; and Ohnishi, Hiroshi, to Matushita Electric Industrial Co., Ltd. Asynchronous quadrature demodulator. 5,150,383, Cl. 375-94.000

Miseki, Kimio: *See—*
Yoshikawa, Hidetaka; Miseki, Kimio; and Akamine, Masami, 5,150,387, Cl. 375-122.000.

Misu, Hiroshi: *See—*
Akiyama, Keiji; and Misu, Hiroshi, 5,149,614, Cl. 430-302.000

Mita Industrial Co., Ltd.: *See—*
Gotoh, Masaru, 5,149,379, Cl. 134-10.000
Koyama, Haruo, 5,150,156, Cl. 355-214.000
Mizude, Kazuhiro; Matsuda, Hirofumi; Yamamoto, Haruo; and Tone, Eiichi, 5,150,224, Cl. 358-449.000.

Mita, Kikuo, to Eastman Kodak Company. Document reader apparatus. 5,149,977, Cl. 250-556.000

Mitchell, Michael L., to Digital Audio Disc Corporation. Serial input-/output multiplexing apparatus. 5,150,363, Cl. 370-112.000

Mitomi, Tatsuo: *See—*
Nemura, Masaharu; Aoki, Tomohiro; Kobayashi, Tohru; Ikkatai, Masatoshi; Murayama, Yasushi; Uchida, Takashi; and Mitomi Tatsuo, 5,149,049, Cl. 248-674.000

Mitsuba Electric Mfg. Co., Ltd.: *See—*
Kimura, Eiichi; Nagashima, Shinichi; Ono, Hitoshi; and Nara, Koji, 5,148,713, Cl. 74-6.000

Mitsubishi Denki K.K.: *See—*
Inada, Masanori; and Ohtani, Hichiro, 5,148,707, Cl. 73-204.260
Magara, Takuji, 5,149,931, Cl. 219-69.130
Sekikawa, Katsuhide, 5,150,305, Cl. 364-474.260

Mitsubishi Denki Kabushiki Kaisha: *See—*
Baba, Fumiaki, 5,149,486, Cl. 264-553.000
Fujita, Shuichi, 5,150,348, Cl. 369-44.410
Hashizume, Takeshi; and Sakashita, Kazuhiro, 5,150,044, Cl. 324-158.00R
Ishizuka, Masahiro; and Hayashi, Kazuyuki, 5,148,908, Cl. 198-774.300.
Isshiki, Kunihiko, 5,149,670, Cl. 437-129.000
Kondou, Tamaiti, 5,149,922, Cl. 187-131.000
Kume, Atsuya, 5,150,382, Cl. 375-88.000
Morimoto, Hiroaki, 5,149,973, Cl. 250-492.200
Nakayama, Norio, 5,150,222, Cl. 358-400.000
Tabata, Yoichiro; Ueda, Yoshihiro; Ueguri, Shigeo; and Hara, Kazuhiko, 5,150,375, Cl. 372-98.000
Yama, Yomiyuki, 5,150,180, Cl. 357-29.000

Mitsubishi Gas Chemical Company, Inc.: *See—*
Takeda, Mutsuhiko; Hagiwara, Isao; Zaima, Fumiya; and Sakaguchi, Shuzabu, 5,149,857, Cl. 558-271.000

Mitsubishi Jidosha Kogyo K.K.: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Ando, Hiromitsu; Takemura, Jun; Koujina, Eiichi; and Kojima, Ichiyo, 5,150,300, Cl. 364-431.030

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kato, Masami; Tanaka, Tadashi; Nakamura, Satoshi; Higashi, Tsuneo; Fujike, Hiroshi; Makino, Katsuaki; and Miyamoto, Hiroshi, 5,148,857, Cl. 165-1.000
Kimura, Yutaka; Okumura, Hiroshi; Mihara, Hirokata; and Yoshida, Mitsutoshi, 5,150,024, Cl. 318-568.100.
Sakaguchi, Katsuyoshi; and Hasegawa, Akira, 5,149,545, Cl. 425-35.000

Mitsubishi Kasei Corporation: *See—*
Takayanagi, Hisao; Kitano, Yasunori, and Morinaka, Yasuhiro, 5,149,843, Cl. 549-561.000
Ushikubo, Takashi; Kakuno, Yumiko; and Tsujiura, Hisako, 5,149,881, Cl. 568-396.000

Mitsubishi Pencil Co., Ltd.: *See—*
Suda, Yoshihisa, 5,149,470, Cl. 264-29.600

Mitsubishi Petrochemical. Co., Ltd.: *See—*
Goto, Makoto; Nara, Terukazu; Uchida, Yasukazu; Terasawa, Masato; Yukawa, Hideaki; and Yamagata, Hisashi, 5,149,651, Cl. 435-244.000
Kishimoto, Manabu; Seo, Iwao; Oda, Atsushi; Ohashi, Yukiko; and Zou, Dechun, 5,149,580, Cl. 428-220.000

Mitsubishi Rayon Co., Ltd.: *See—*
Kushi, Kenji; Inukai, Ken-ichi; Iseki, Takayuki; Koyanagi, Seiya; and Fujimoto, Yasuyuki, 5,149,776, Cl. 430-288.000
Miyamori, Takao; Uchida, Makoto; Enomoto, Kanehiko; Sakimae, Akihiro; and Numazawa, Ryozo, 5,149,649, Cl. 435-240.242
Murashige, Yoshio; and Soga, Junko, 5,149,762, Cl. 528-353.000
Oishi, Noriji, 5,150,259, Cl. 359-619.000
Sakashita, Keiichi; Hayashi, Seiji; Ikemoto, Tetsuya; and Yamamoto, Osamu, 5,149,462, Cl. 252-299.610
Sakimae, Akihiro; Ozaki, Eiji; Enomoto, Kanehiko; Numazawa, Ryozo; and Kobayashi, Yoshimasa, 5,149,855, Cl. 558-255.000

Mitsuhashi, Hiroshi: *See—*
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Mitsui, Kazuyuki: *See—*
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Mitsui, Susumu: *See—*
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Mitsui Toatsu Chemicals, Incorporated: *See—*
Ueki, Toru; Sakato, Kenji; Yoshimura, Masaji; Kanezaki, Kazuharu; and Iwata, Ineo, 5,149,465, Cl. 252-511.000

Mitsumi Electric Co., Ltd.: *See—*
Yoshie, Hiroto; and Sato, Hironobu, 5,150,087, Cl. 333-185.000

Mitsuoka, Yasuyuki: *See—*
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Miura, Nobuaki: *See—*
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Miura, Tadayuki: *See—*
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Miura, Takashi; and Kamiya, Yoshiaki, to Fujitsu Limited. Electromagnetic polar relay. 5,150,090, Cl. 335-84.000
Miura, Tohru; Umeda, Miya; and Enami, Katsuya, to Teac Corporation. Disc apparatus for reading out information from disc recording medium. 5,150,340, Cl. 369-33.000
Miwa, Hitoshi. *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000
Mixer Products, Inc.: *See—*
Hamm, Alton B.; and Ratliff, Grover C., 5,149,192, Cl. 366-8.000.
Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, to Pioneer Electric Corporation. Device for forming LB film. 5,149,374, Cl 118-691.000
Miyamori, Takao; Uchida, Makoto; Enomoto, Kanehiko; Sakimae, Akihiro; and Numazawa, Ryozo, to Mitsubishi Rayon Co., Ltd Multi-layered porous hollow fiber membrane for use in cell culture 5,149,649, Cl. 435-240.242.
Miyamoto, Eiji; Ojima, Yoshinori; Yakabe, Tadashi; and Kanamori, Toshiya, to Ebara Corporation. Magnet pumps. 5,149,253, Cl 417-353.000
Miyamoto, Hiroshi: *See—*
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Miyamoto, Takao: *See—*
Iwamoto, Hirofumi; Tajima, Hisao; Uehara, Makoto; Onitsuka, Yoshihiro; Miyamoto, Takao; Takabayashi, Hiroshi; and Yoshihara, Satoshi, 5,150,231, Cl. 359-44.000
Miyanaga, Hirofumi: *See—*
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Miyata, Ryoichi: *See—*
Yoshioka, Takeo; Miyata, Ryoichi; Tsuchida, Toshio; Tone, Hiroshi; and Okamoto, Rokuro, 5,149,802, Cl. 540-200.000
Miyata, Takeo: *See—*
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichiro; and Miyata, Takeo, 5,150,370, Cl. 372-106.000
Miyauchi, Takashi, to Juki America, Inc. Method and apparatus using clamps and movable plates for producing pleats. 5,148,760, Cl 112-144.000
Miyazaki, Benichi: *See—*
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Miyazaki, Tohshiko: *See—*
Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Tohshiko; Oguchi, Takahiro; and Yamano, Akihiko, 5,150,035, Cl. 324-71.100
Mizude, Kazuhiro; Matsuda, Hirofumi; Yamamoto, Haruo; and Tone, Eiichi, to Mita Industrial Co., Ltd. Image forming apparatus with selectable automatic document size or copy paper size priority modes. 5,150,224, Cl. 358-449.000
Mizukami, Yuto: *See—*
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Mizukoshi, Sadanori: *See—*
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Mizuno, Kukio: *See—*
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Mizunuma, Masanori: *See—*
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Mizusawa, Nobutoshi. *See—*
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Mizuta, Akira; and Shibuya, Takeaki; to Fuji Photo Film Co., Ltd. Method and apparatus for delivering predetermined amounts of fluids. 5,148,946, Cl. 222-1.000
Mizutani, Kazunori: *See—*
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MMTC, Inc.: *See—*
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Mobil Oil Corporation: *See—*
Coolbaugh, Thomas S.; Loveless, Frederick C.; Matthews, Demetreos N.; and Rudnick, Leslie R., 5,149,895, Cl. 585-507.000.
Han, Scott; DeCaul, Lorenzo C.; Palermo, Robert E.; and Walsh, Dennis E., 5,149,516, Cl. 423-4 5.00A
Sanchez, J. Michael, 5,148,869, C 166-303.000
Mochida, Akitoshi: *See—*
Obayashi, Hisashi; Matsumura, Yasuhiro; and Mochida, Akitoshi, 5,149,534, Cl. 424-195.100
Mochida Pharmaceutical Co., Ltd.: *See—*
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Mochizuki, Nontaka; and Ebinuma, Ryuichi, to Canon Kabushiki Kaisha. Reflecting device and pattern transfer apparatus using the same. 5,150,151, Cl. 355-53.000
Moeschler, Heinrich F.: *See—*
Hector, Richard F.; Schaller, Klaus; Moeschler, Heinrich F.; and Plempel, Manfred, 5,149,795, Cl. 536-23.000
Mohabbatizadeh, Akbar; and Weidenhammer, Barry J., to Eaton Corporation. High reliability, low intensity back lit SR and NVGC indicator assembly. 5,150,257, Cl. 359-601.000.
Mohan, Sankar K., to New Venture Gear, Inc. Viscous coupling apparatus with coined plates and method of making the same. 5,148,900, Cl. 192-58.00C.
Mohilef, David M., to Pet Center, Inc. Methods for making pet chews 5,149,550, Cl. 426-3.000.
Mohr, Dieter: *See—*
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Molex Incorporated: *See—*
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Edgley, Richard R.; Ingwersen, Peter, and Berek, Dennis W., 5,149,280, Cl. 439-457.000
Molinaro, James; and Stupp, Eric, to SubMicron Systems, Inc. Wafer carrier holder for wafer carriers. 5,149,158, Cl. 294-1.100
Molins plc: *See—*
Arthur, Hugh M., 5,148,818, Cl. 131-281.000.
Moller, James W., to Bird Environmental Systems & Services, Inc Emulsion resolution. 5,149,440, Cl. 210-708.000
Moller, Richard W., to Hydreclaim Corporation. Method and apparatus for metering and blending different material ingredients. 5,148,943, Cl. 222-1.000
Mombelli, Paul A.: *See—*
Laugery, Charles M.; and Mombelli, Paul A., 5,149,157, Cl. 292-341.160
Monahan, J. Kevin, to Harken, Inc. Low profile multiple bearing block fairlead. 5,149,059, Cl. 254-394.000
Monfort Inc.: *See—*
Bowling, Rod A.; and Clayton, Robert P., 5,149,295, Cl 452-71.000
Monroe Auto Equipment Company: *See—*
Vanroye, Bert E., 5,148,897, Cl. 188-322.220.
Monroe Truck Equipment, Inc.: *See—*
Feller, Richard; and Alongi, Vincent, 5,148,617, Cl. 37-281.000
Monsanto Company: *See—*
Demarey, David W., 5,149,756, Cl. 528-230.000.
Montagu, Jean I., to General Scanning, Inc. Two-mirror scanner with pincushion error correction. 5,150,249, Cl. 359-202.000
Monterey Mushroom, Inc.: *See—*
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Mooney Chemicals, Inc.: *See—*
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Mooradian, Aram, to Massachusetts Institute of Technology. Method of fabricating a waveguide optical resonant cavity. 5,150,374, Cl. 372-92.000
Moore, Bernard S.; and Urban, Frank J., to Pfizer Inc. Process and intermediates for optically active 3-formyltetrahydropyrans. 5,149,821, Cl. 548-215.000
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Moore, Kevin D.: *See—*
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Moore, Steven R.: *See—*
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Moore, Thomas C., Sr., to United States of America, National Aeronautics and Space Administration. Flush mounting of thin film sensors. 5,149,387, Cl. 156-241.000
Morales, Benny B. Utility tray for attachment to a wall, or the like. 5,148,755, Cl. 108-47.000
Morbioli, Rene J.: *See—*
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Morehouse, James H.; Dunckley, James A.; Furay, David M.; Mount, John A.; Rondestvedt, Bernard J.; and Volk, Steven B., to Integral Peripherals. Shock absorbent mounting arrangement for disk drive or other component. 5,149,048, Cl. 248-632.000.
Moren, Dean M.; Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., to Minnesota Mining and Manufacturing Company. Azlactone Michael adducts. 5,149,806, Cl. 544-72.000
Morey, William W., to Electric Power Research Institute. Gas turbine flame diagnostic monitor. 5,148,667, Cl. 60-39.020.
Morgan, Howard W., Jr. Pressure vessel. 5,148,938, Cl. 220-316.000.
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Morhenne, Siegfried: *See—*
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Mori, Katsuhiro: *See—*
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Mori, Seiichi, to Kabushiki Kaisha Toshiba. Gate structure for a semiconductor memory device. 5,150,178, Cl. 357-23.500.
Mori, Shinsaku: *See—*
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Morikawa, Takashi; and Yamaguchi, Ikunori, to Minolta Camera Kabushiki Kaisha. Image data processor. 5,150,455, Cl. 395-114.000.
Morimoto, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for wiring semiconductor device using energy beam and wiring method by using the same. 5,149,973, Cl. 250-492.200.
Morimoto, Takeshi; Sasabe, Mikio; Maeda, Toshiyuki; and Fujimoto, Hiroyuki, to Osaka Gas Company Limited. Method for preparing pitch fluoride. 5,149,891, Cl. 570-148.000
Morimoto, Yukichi, to Atlas Corporation. Water filter with extended operational period. 5,149,428, Cl. 210-283.000
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Morishita, Koichi; Yokoyama, Tetsuo; and Sato, Kazuhiro, to Hitachi, Ltd.; and Hitachi Medical Corporation. System for automated transformation of gray level of image. 5,150,421, Cl. 382-6.000
Morita, Akitaka; Matsuda, Eichika; Oba, Toshiro; and Inamori, Yoshimitsu, to Sharp Kabushiki Kaisha. Electronic apparatus. 5,150,316, Cl. 364-709.120.
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Moriya, Yukio; Yokoyama, Toshio; Takamura, Fujitoshi; and Onoda, Takumi, to Kabushiki Kaisha Komatsu Seisakusho. Confluence valve circuit of a hydraulic excavator. 5,148,676, Cl. 60-429.000.
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Morris, Brian G. Method and apparatus for providing real-time control of a gaseous propellant rocket propulsion system. 5,148,674, Cl. 60-240.000
Morris, Charles W. Patient conveyance device. 5,148,559, Cl. 5-86.100
Morris, David J., to Boeing Company, The. Optical phase conjugate velocimeter and tracker. 5,150,170, Cl. 356-28.500.
Morrison, Anthony; Kimsey, Ian M.; and Marks, Heather, to Van den Bergh Foods Co., Division of Conopco, Inc. Whippable non-dairy creams. 5,149,557, Cl. 426-570.000
Morrison, David J.: *See—*
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Morrow, Cary J.; and Eridon, Joseph M., to University of New Mexico. Substituted mevalonolactones, and methods for stereoselective preparation thereof and desmethyl homologues thereof. 5,149,835, Cl. 549-292.000
Morrow, John A., to Textron Inc. Washing accessory for a string trimmer. 5,148,992, Cl. 239-289.000
Morse, Robert L., to Pollution Control Specialty, Inc. Stuffing box leak detector. 5,148,699, Cl. 73-40.000
Morton, David; and Handyside, Timothy M., to Courtaulds Coatings Limited. Metal plating process. 5,149,566, Cl. 427-235.000.
Moses, Samuel J.: *See—*
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Motegi, Nawoto; Uemoto, Tsutomu; Kamata, Atsushi; and Mitsuhashi, Hiroshi, to Kabushiki Kaisha Toshiba. P-type II-VI compound semiconductor doped. 5,150,191, Cl. 357-61.000.
Mothes, Helmut A.; Patwardhan, Bhalchandra H.; Schroeder, Theo G.; and Solow, David J., to Haarmann & Beimer. Method for the production of granular citric acid and salts thereof. 5,149,643, Cl 435-144.000
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Bright, Michael W., 5,150,408, Cl. 380-21.000
Brown, Clem H., 5,150,438, Cl. 385-14.000.
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Jaffee, James I.; and DeLuca, Michael J., 5,150,415, Cl 381-104.000
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Wieczorek, Alfred B.; Kluesing, Alvin D.; and Sasuta, Michael D., 5,150,361, Cl. 370-95.100
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Moure, Juan C. V.; and Ramos, Juan C. R. R., to Procter & Gamble Company, The. Container with flexible resilient dispensing sheet for viscous and semi-solid cleaning compositions. 5,148,951, Cl 222-386.000
Mourlas, James C.: *See—*
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Mowry, William H., Jr.; and Neitman, Robert L., to Standard Register Company, The. Security, information document. 5,149,140, Cl. 283-93.000
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Mueller, Friedrich P.; and LeBlanc, Guy, to Alcan International Limited. Direct chill casting mould with controllable impingement point 5,148,856, Cl. 164-487.000
Muhs, Jeffrey D., to American Packaging Corporation. Method of making lined square bottom bag. 5,149,315, Cl. 493-189.000
Mui, Shou Y., to General Electric Company. Method and apparatus for coherent communications in non-coherent frequency-hopping system. 5,150,378, Cl. 375-1.000
Mullen, Ruth A.; and Hellwarth, Robert W., to Hughes Aircraft Company. Electrical field quenching of optical breakdown. 5,149,406, Cl. 204-157.220
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Muller, Gottfried; and Hipp, Paul, to SCHAKO Metallwarenfabrik Ferdinand Schad KG. Device for introducing cold air into a room 5,148,683, Cl. 62-180.000.
Muller, Klaus: *See—*
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Muller, Klaus-Helmut, Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal sulphonylaminocarbonyltriazolinones having substituents which are bonded via sulphur. 5,149,356, Cl. 71-90.000
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Muller, Manfred: *See—*
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Munk, Kurt; and Roth, Martin, to Ciba-Geigy Corporation. Thermosetting mixtures utilizing araliphatic sulfonium salts. 5,149,767, Cl. 528-71.000
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Murakami, Atsushi, to Brother Kogyo Kabushiki Kaisha. Dot printer with changeable quality dot pattern. 5,149,212, Cl. 400-121.000
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Murari, Bruno; Rossi, Domenico; and Savino, Pierantonio. Low-noise preamplifier stage, in particular for magnetic heads. 5,150,073, Cl. 330-261.000
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Murashige, Yoshio; and Soga, Junko, to Mitsubishi Rayon Company Ltd. Process for preparation of silicone-modified thermoplastic resin 5,149,762, Cl. 528-353.000
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Murata, Michihiro; Kumada, Akira; Yamazaki, Shigeo; and Matsuo, Kenji, to Murata Mfg. Co., Ltd. Liquid level sensor which prevents liquid absorption. 5,148,708, Cl. 73-304.00R
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Murata, Shizuo; and Nakayama, Minoru, to Chisso Corporation. Liquid crystal-aligning film and a liquid crystal display element. 5,149,771, Cl. 528-353.000
Murata, Yasuyuki; Konishi, Isako; Tanaka, Ryohei; and Nakanishi, Yoshinori, to Shell Oil Company. Epoxy resin composition. 5,149,730, Cl. 523-466.000
Murata, Yutaka, to Sintokogio Ltd. Method of charging sand and molding machine utilizing thereof. 5,148,851, Cl. 164-20.000
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Murphy, John A., to Gentex Corporation. Earcup assembly incorporating mechanical active noise reduction, 5,148,887, Cl. 181-129.000
Murray, Brent W.; and Faludy, Thomas G., to Carefree/Scott Fetzer Company. Lift assist mechanism for retractable awning. 5,148,848, Cl. 160-67.000
Murray, Dale R.: *See*—
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Nagano, Masami; and Sakamoto, Masahide, to Hitachi, Ltd. Method of electronic engine control for internal combustion engine having a plurality of cylinders. 5,148,791, Cl. 123-417.000.
Nagano, Toshihiro; and Kyoukane, Yasuaki, to Fuji Jukogyo Kabushiki Kaisha. Electric automobile. 5,150,045, Cl. 320-62.000
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Nakajima, Hideo, to Takata Corporation. Method of manufacturing modular cover of air bag. 5,149,479, Cl. 264-163.000

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Nakamoto, Toshinori, to Toshiba Kikai Kabushiki Kaisha. Counting die cast manufactured goods. 5,148,854, Cl. 164-457.000
Nakamura, Hiroaki, to Shinko Denki Kabushiki Kaisha. Electromagnetic coupling device. 5,148,902, Cl. 192-84.00B
Nakamura, Masayuki: *See*—
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000
Nakamura, Mitsuki: *See*—
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Nakamura, Satoshi: *See*—
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Nakamura, Shogo: *See*—
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Nakamura, Susao: *See*—
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Nakamura, Tohru: *See*—
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Nakanishi, Eiichi, to Nakanishi Optical Co., Ltd. Structure for connecting eyeglass parts. 5,150,136, Cl. 351-111.000.
Nakanishi, Hiroaki, to Casio Computer Co. Ltd. Battery accommodating structure. 5,149,604, Cl. 429-97.000.
Nakanishi, Hiroshi; and Hamada, Hiroshi, to Sharp Kabushiki Kaisha. Projection type image display apparatus. 5,150,138, Cl. 353-38.000.
Nakanishi Optical Co., Ltd.: *See*—
Nakanishi, Eiichi, 5,150,136, Cl. 351-111.000
Nakanishi, Toshio: *See*—
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Nakanishi, Yoshinori: *See*—
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Nakashima, Hideaki: *See*—
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Nakatani, Mitsuo: *See*—
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Nakatani, Tomofumi; and Nakamura, Shogo, to Ricoh Company, Ltd. Extraction of phonemic information. 5,150,413, Cl. 381-46.000
Nakayama, Minoru: *See*—
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Nakayama, Norio, to Mitsubishi Denki Kabushiki Kaisha. Facsimile apparatus with improved handle configuration. 5,150,222, Cl. 358-400.000
Nakayama, Susumu: *See*—
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Nakayama, Takashi, to NEC Corporation. Floating-point multiplier device comprising three carry propagate adders operable in parallel 5,150,320, Cl. 364-748.000
Nakazawa, Shizue: *See*—
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Nakazawa, Yasuo, to Hosiden Corporation. Plug and socket. 5,149,283, Cl. 439-607.000
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Luna, Damian, 5,150,065, Cl. 324-700.000
Nam, Kee S.: *See*—
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Namba, Toyoaki: *See*—
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Butler, Donald E.; Deering, Carl F.; Millar, Alan; Nanninga, Thomas N.; and Roth, Bruce D., 5,149,837, Cl. 549-333.000
Nappier, Thomas E., to Mooney Chemicals, Inc. Preparation of platinum group metal and rhenium carboxylates. 5,149,854, Cl. 556-49.000
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Narita, Hiroshi, to Seiko Epson Corporation. Selectively actuatable multiple medium feed mechanism for a micro printer. 5,149,217, Cl. 400-608.400
Narita, Senichi: *See*—
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Naritomi, Masanori; and Ogawa, Noritaka, to Taisei Purasu Co., Ltd. Thermoplastic elastomer composition of excellent fusion bond property. 5,149,589, Cl. 428-412.000.
Nash, John, to Kensey Nash Corporation. Motor driven apparatus having means to prevent reuse and method of use of said apparatus. 5,149,322, Cl. 604-110.000
Nash, Terrance E. Automatic container cover. 5,149,179, Cl. 312-275.000
National-Oilwell: *See*—
Howell, Robert M., 5,149,143, Cl. 285-18.000
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National Semiconductor Corporation: *See*—
Robinson, Murray J.; Joyce, Christopher C.; and Luk, Tim W., 5,150,177, Cl. 357-15.000
Rogers, Alan C., 5,149,991, Cl. 307-443.000
Smith, Douglas D.; and Bowman, Terrance L., 5,149,988, Cl. 307-296.600.
Thomas, Michael E.; and Anand, Kranti V., deceased, 5,150,019, Cl. 315-350.000.
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Nau, David R.: *See*—
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Nauman, Leonard G.; and Stenberg, Dale E., to Kidz First, Inc. Bicycle conversion bar. 5,149,112, Cl. 280-7.110
Naumann, Peter: *See*—
Gethoffer, Hanspeter; Reinhardt, Gerd; and Naumann, Peter, 5,149,864, Cl. 562-2.000
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Wike, Charles K., Jr., 5,149,949, Cl. 235-467.000
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NEC Corporation: *See*—
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Asazawa, Hiroshi, 5,150,076, Cl. 330-296.000
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Kaneko, Takashi, 5,150,474, Cl. 395-500.000.
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Nakayama, Takashi, 5,150,320, Cl. 364-748.000
Okanoue, Kazuhiro, 5,150,380, Cl. 375-16.000
Tsutsui, Takashi, 5,150,356, Cl. 370-16.100
Yamada, Masayuki, 5,150,402, Cl. 379-93.000
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Nedelec, Lucien: *See*—
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Negus, Kevin J., to Hewlett-Packard Company. Interleaved time-division demultiplexor. 5,150,364, Cl. 370-112.000
Nehb, Wolfgang: *See*—
Fischer, Herbert; and Nehb, Wolfgang, 5,149,509, Cl. 422-177.000
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Neitman, Robert L.: *See—*
Mowry, William H., Jr.; and Neitman, Robert L., 5,149,140, Cl 283-93.000

Nelson, Brian, Shotshell size adapter. .148,620, Cl. 42-77.000

Nelson, John W.: *See—*
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Nelson, William A., to Automotive Plastic Technologies, Inc. Check valve for a fluid-assisted plastic injection molding apparatus. 5,149,546, Cl. 425-130.000

Nemura, Masaharu; Aoki, Tomohiro; Kobayashi, Tohru; Ikkatai, Masatoshi; Murayama, Yasushi; Uchida, Takashi; and Mitomi, Tatsuo, to Canon Kabushiki Kaisha. Support device for motor 5,149,049, Cl. 248-674.000

Nepovim, Zdenek: *See—*
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Nestec S.A.: *See—*
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Nestegard, Susan K.: *See—*
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Nett, Daniel R. Rotating dual attachment receptacle apparatus tool. 5,149,230, Cl. 408-42.000

Neu, Georges, to Bull S.A. Method and apparatus for compensating inherent non-uniformity of electrical properties among MOS integrated circuits. 5,149,994, Cl. 307-491.000

New SD, Inc.: *See—*
Newell, Gerald R.; and Bhardwaj, Pradeep, 5,150,121, Cl 341-157.000

New Venture Gear, Inc.: *See—*
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Newberth, Frederick F., III: *See—*
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Newell, Gerald R.; and Bhardwaj, Pradeep, to New SD, Inc. Parameter sensing and processing system. 5,150,121, Cl. 341-157.000

Newhouse, Brian L., to Westinghouse Electric Corp. Internally-located rotating union for a motor-generator set. 5,149,141, Cl. 285-13.000.

Newman, Albert L.: *See—*
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Newman, Robert D., Jr.: *See—*
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Newman, Robert D., Sr.; and Newman, Robert D., Jr. Light bulb changer. 5,148,723, Cl. 81-53.110.

Newton, Patrick H.: *See—*
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Ng, Kam W., to United States of America, Navy. Method and apparatus for signal prediction in a time-varying signal system. 5,150,414, Cl. 381-47.000

NGK Insulators, Ltd.: *See—*
Horikawa, Osamu; and Wada, Yutaka, 5,149,264, Cl. 432-2.000.
Horikawa, Osamu; and Ikeshima, Koichi, 5,149,475, Cl. 264-67.000

Nguyen, My N., to Johnson Matthey Inc. Rapid-curing adhesive formulation for semiconductor devices. 5,150,195, Cl. 357-72.000

NguyenPhu, MyHong: *See—*
Hicks, Troy N.; and NguyenPhu, MyHong, 5,150,470, Cl. 395-375.000

NHK Spring Co., Ltd.: *See—*
Minegishi, Takeshi; Yoneshige, Yasuo; Takehana, Toshihiro; and Sakai, Toru, 5,149,567, Cl. 427-240.000

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Nichols, James D.; and Dickenson, John B., to Air Products and Chemicals, Inc. Heterocyclic diorganotin catalysts for use in polyurethane systems. 5,149,844, Cl. 556-89.000

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Niessner, Manfred; Wickel, Stefan; Heide, Wilfried; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Preparation of finely divided, gel-like, water-swellable copolymers. 5,149,750, Cl. 526-81.000

Niimi, Atsushi: *See—*
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Nikaido, Madelene: *See—*
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Nilmen, Fehmi; and Winter, Heinrich, to Battelle-Institut e.V. Method of producing tarnish-resistant and oxidation-resistant alloys using Zr and B. 5,149,498, Cl. 420-492.000.

Nilsson, William B.: *See—*
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Nippon Connecticut Saw Co.: *See—*
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Nippon Sanso Kabushiki Kaisha: *See—*
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Nippon Seiko Kabushiki Kaisha: *See—*
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Nippon Sheet Glass Co., Ltd.: *See—*
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Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Kita, Yuichi; Kishino, Kazuo; and Ueda, Hiroko, 5,149,827, Cl. 548-548.000
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Nippon Sieko Kabushiki Kaisha: *See—*
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Nippon Stainless Steel Kozai Co., Ltd.: *See—*
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Nippon Telegraph & Telephone Corporation: *See—*
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Nishibayashi, Seitaro. Continuous washing apparatus. 5,148,566, Cl. 15-3.210.

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Nishida, Tomoaki; Kashino, Yoshinori; Mimura, Akio; Takahara, Yoshimasa; and Sakai, Kokki, to Kabushiki Kaisha Kobe Seiko Sho Enzymes employed for producing pulps. 5,149,648, Cl. 435-192.000

Nishimoto, Masaru: *See—*
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Nishimura, Yosaku, to Vital Kogyo Kabushiki Kaisha. Lever-operated hoist. 5,149,058, Cl. 254-369.000

Nishino, Masakazu: *See—*
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Nishioka, Takeshi; Shikanai, Tsutomu; and Marumo, Hitoshi, to Kabushiki Kaisha Toshiba. Bearing and rotary anode X-ray tube employing the bearing. 5,150,398, Cl. 378-132.000

Nishiuchi, Kenichi: *See—*
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Nitto Boseki Co., Ltd.: *See—*
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Kizak, Ulrich; and Leipold, Kurt, 5,150,419, Cl 381-194.000.

Nomura, Katsuhiko: *See—*
Haraguchi, Keisuke, Kohmoto, Shinsuke, Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl. 354-403.000

Nomura, Yoshinobu: *See—*
Konishi, Takeshi; Otani, Fumiyuki, Muramoto, Hisao, Hirashima, Isao; Nomura, Yoshinobu, and Kohno, Shigefumi, 5,149,135, Cl 280-806.000

Nonweiler, Brian R. G.: *See—*
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Noorman, David A.: *See—*
Goris, Donald L.; and Noorman, David A., 5,150,101, Cl 340-568.000

Norand Corporation: *See—*
Conway, David W., 5,150,033, Cl. 320-51.000

Norcross Footwear, Inc.: *See—*
Devasthali, Prakash, 5,148,565, Cl. 12-142.0EV

Nordischer Maschinenbau Rud. Baader GmbH + Co KG: *See—*
Braeger, Horst H.; and Finke, Hans, 5,149,297, Cl. 452-162.000

Norland, Kenneth: *See—*
Locatell, Louis; Norland, Kenneth, Roberts, F. Donald, and Zepp, Charles, 5,149,830, Cl. 549-223.000

Norris, Robert W.: *See—*
Keating, Michael D.; Norris, Robert W.; and Jakubas, Ronald K., 5,149,096, Cl. 273-128.00R

Norris, William P.: *See—*
Christian, Stephen L.; Chafin, Andrew P.; Nielsen, Arnold T.; Atkins, Ronald L.; Norris, William P.; and Hollins, Richard A., 5,149,818, Cl. 548-126.000

Norsk Hydro A.S.: *See—*
Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M.; and Oftebro, Reider, 5,149,820, Cl. 548-215.000

North American Dynamics: *See—*
Hagen, Richard L.; Baldwin, William C.; and Thompson, William W., 5,149,909, Cl. 89-33.160

North American Philips Corporation: *See—*
Bruning, Gert W.; Casey, Leo F.; Veldman, Paul R.; and Vegter, Klaus, 5,150,018, Cl. 315-349.000

North Carolina State University: *See—*
Cuculo, John A.; Tucker, Paul A.; Chen, Gao-Yuan, and Lundberg, Ferdinand, 5,149,480, Cl. 264-178.00F

Northern Telecom Limited: *See—*
Rokos, George H. S.; and Morley, Peter E., 5,149,197, Cl. 374-117.000

Norton, Paul R., to Santa Barbara Research Center. Two-color radiation detector array and methods of fabricating same. 5,149,956, Cl 250-211.00J

Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Tohshihiko; Oguchi, Takahiro; and Yamano, Akihiko, to Canon Kabushiki Kaisha Encoder having atomic or molecular structure reference scale. 5,150,035, Cl. 324-71.100

Notermans, Servatius H. W.; Van Boom, Jacobus H., and Veeneman, Gerrit H., to De Staat Der Nederlanden Vertengwoordigd Door De Minister Van Welzijn. Method for the detection of molds in foodstuffs and human and animal body fluids. 5,149,632, Cl. 435-7.310.

Nourrcier, Charles E., to Hughes Aircraft Company. Frequency sweeping phase-locked-loop synthesizer power supply for CO_2 waveguide laser. 5,150,372, Cl. 372-38.000

Novo Nordisk A/S: *See—*
Hansen, Finn B.; and Balschmidt, Per, 5,149,777, Cl. 530-303.000

Nozaki, Masahiro, to Toyoda Gosei Co., Ltd. Seal structure for the engine hood of a motor vehicle. 5,149,169, Cl. 296-206.000

Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Cap closing member for container opening. 5,148,912, Cl. 220-339.000

Nozick, Irwin, to United States of America, Navy. Method and apparatus for determining parameters of a transmission line deployed in a seawater environment. 5,150,064, Cl 324-691.000

Nozoe, Atsushi. *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu, Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki, Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki, Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000

Nudeshima, Masahiro: *See—*
Kohno, Hiromasa; Honda, Hiroaki; and Nudeshima, Masahiro, 5,149,503, Cl. 422-82.050

Numako, Norio: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke, Kobayashi, Takeo, Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl 354-403.000
Kobayshi, Takeo; Tabata, Yasushi; Numako, Norio; and Nagai, Katsutoshi, 5,150,147, Cl. 354-412.000

Numazawa, Ryozo: *See—*
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nView Corporation: *See—*
Vogeley, James H.; and Newton, Patrick H., 5,150,238, Cl 359-74.000

Nystrom, Mats G.; Larsson, Kenneth O., Skogby, Anna K.; and Herstad, Solvie M., to Eka Nobel AB. Reduction of halogenated organic compounds in spent bleach liquor. 5,149,442, Cl. 210-724.000

O F. Mossberg & Sons, Inc.: *See—*
Dabrowski, Gary, 5,149,899, Cl 42-72.000

O. R. Concepts, Inc.: *See—*
Dunn, James L., 5,148,558, Cl. 5-81.100

Oba, Toshiro: *See—*
Morita, Akitaka; Matsuda, Eichika, Oba, Toshiro, and Inamori, Yoshimitsu, 5,150,316, Cl. 364-709.120

Obayashi, Hisashi; Matsumura, Yasuhiro; and Mochida, Akitoshi, to Takeda Garden Product Co., Ltd. Spirogyra controlling and deodorant composition. 5,149,534, Cl 424-195.100

Obitz, Lars. Apparatus for the treatment of milling products. 5,148,998, Cl 241-241.000

Obitz, Lars: *See—*
Haider, Franz; Zehentner, Martin; Lileg, Johann; and Obitz, Lars, 5,148,994, Cl. 241-261.100

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Le Jaoudour, Thierry, 5,150,131, Cl 346-134.000

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Hill, Reginald J.; and Ochs, Gerard R., 5,150,171, Cl 356-128.000

O'Connell, Michael B.: *See—*
English, Kenneth P.; Micek, Stanley E., III, O'Connell, Michael B.; and Tripp, Edward S., 5,149,505, Cl 422-99.000

Oda, Atsushi: *See—*
Kishimoto, Manabu, Seo, Iwao, Oda, Atsushi, Obashi, Yukiko, and Zou, Dechun, 5,149,580, Cl 428-220.000

Oda, Hitoshi: *See—*
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Oftebro, Reider: *See—*
Borretzen, Bernt; Larsen, Rolf O Pettersen, Erik O.; Dornish, John M.; and Oftebro, Reider, 5, 49,820, Cl. 548-215.000

Ogata, Hiromi: *See—*
Sawase, Kensuke; and Ogata, Hiromi, 5,150,016, Cl. 315-294.000

Ogawa, Noritaka: *See—*
Naritomi, Masanori; and Ogawa, Noritaka, 5,149,589, Cl. 428-412.000

Ogino, Kazuya: *See—*
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,149,366, Cl. 106-22.000

Oguchi, Takahiro; and Ohzu, Hayao, to Canon Kabushiki Kaisha. Method for resetting a photo-electric converter. 5,149,989, Cl 307-311.000

Oguchi, Takahiro: *See—*
Nose, Hiroyasu; Kawase, Toshimitsu; Miyazaki, Tohsihiko; Oguchi, Takahiro; and Yamano, Akiriko, 5,150,035, Cl. 324-71.100

Oguni, Kensaku: *See—*
Hibino, Yozo; Nakayama, Susumu; Yasuda, Hiromu; Oguni, Kensaku; and Tokusa, Kenji, 5,148,977, Cl. 236-49.300

O'Hara, Patrick J. Wedge shaped golf tee. 5,149,088, Cl. 273-33.000

Ohashi, Yukiko: *See—*
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Ohba, Toshio: *See—*
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Ohgushi, Masuhito: *See—*
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,149,839, Cl. 55[illegible]-413.000

Ohigashi, Chiaki, to Matsushita Graphic Communication Systems, Inc. Electrostatic latent image forming apparatus. 5,150,133, Cl 346-155.000

Ohikata, Naoharu; Yamamoto, Toshio; and Konda, Masashi, to Nippon Steel Corporation. Radiator for semiconductor chip. 5,150,198, Cl. 357-81.000

Ohikata, Naoharu: *See—*
Saito, Tamio; Yamamoto, Toshio, Ohikata, Naoharu; and Ono, Jiro, 5,150,047, Cl. 324-158.00R

Ohio State University: *See—*
Hsu, Hsiung, 5,148,807, Cl. 128-645.000.

Ohkawa, Tihiro; Stephens, Richard B.; and Lieber, Albert J., to General Atomics. Melt texturing of long superconductor fibers. 5,149,681, Cl. 505-1.000

Ohkubo, Hideki: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 5,150,145, Cl 354-403.000

Ohkubo, Naoyuki: *See—*
Sawada, Kazuo; Fujii, Atsuhiko Nakai, Yoshihiro; Ohkubo, Naoyuki; Shiraishi, Hajime; Ono, Fumio; Matsuda, Katsushi; and Tsuji, Kazunori, 5,149,917, Cl. 174-129.00R.

Ohmi, Tadahiro; Miki, Nobuhiro; Maeno, Matagoroh; and Kikuyama, Hirohisa, to Hashimoto Kasei Kabushiki-Kaisya. Tungsten film forming apparatus. 5,149,378, Cl. 118-725.000.

Ohmori, Naoto: *See—*
Matsuura, Yasuhiro; Kojima, Hiroaki; Hasegawa, Hirofumi; Ohmori, Naoto; and Yamada, Yukio, 5,150,166, Cl. 355-308.000.

Ohmori, Shigeru; and Sasai, Yoichi, to Matsushita Electric Industrial Co., Ltd. Laser source. 5,150,376, Cl. 372-107.000.

Ohnishi, Hiroshi: *See—*
Misaizu, Kouei; and Ohnishi, Hiroshi, 5,150,383, Cl. 375-94.000.

Ohnishi, Mutsuhiko: *See—*
Kurauchi, Makoto; Hayasaki, Kiyoshi; Minami, Toshikazu; and Ohnishi, Mutsuhiko, 5,149,385, Cl. 156-85.000.

Ohno, Eiji; Nishiuchi, Kenichi; Yamada, Noboru; Ishibashi, Kenzou; Kimura, Kunio; and Akahira, Nobuo, to Matsushita Electric Industrial Co., Ltd. Optical information recording apparatus for recording an input signal having variable width pulse duration and pulse spacing periods. 5,150,351, Cl. 369-116.00.

Ohno, Yoshimi; and Shinohara, Junichi, to Ricoh Company, Ltd. Trimming information recordable camera. 5,150,143, Cl. 354-400.000

Ohnuki, Yukio: *See—*
Kobayashi, Toshio; Maruyama, Keiichi; and Ohnuki, Yukio, 5,148,903, Cl. 192-85.0AA.

Ohta, Mituhiro: *See—*
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Ohta, Tatsuyuki: *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000

Ohta, Yasumitsu: *See—*
Kitamura, Koichi; Mimura, Hideyori; Yamamoto, Kazuo; Ohta, Yasumitsu; and Sai, Kazuyoshi, 5,149,955, Cl. 250-211.00J

Ohtani, Hichiro: *See—*
Inada, Masanori; and Ohtani, Hichiro, 5,148,707, Cl. 73-204.260

Ohtani, Tsugutoshi: *See—*
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Ohura, Osami. *See—*
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Ohya, Toshio: *See—*
Masuko, Takayuki; Satoh, Shunichi; Ishizaka, Tetsuo; and Ohya, Toshio, 5,150,230, Cl. 359-34.000

Ohzu, Hayao: *See—*
Oguchi, Takahiro; and Ohzu, Hayao, 5,149,989, Cl. 307-311.000.

Oi, Takeshi, to Shimano Industrial Co., Ltd. Spinning reel with adjustable drag member. 5,149,008, Cl. 242-246.000

Oikawa, Hirohide: *See—*
Arai, Kenji; Oikawa, Hirohide; and Nagasaka, Hideo, 5,149,492, Cl. 376-283.000

Oishi, Noriji, to Mitsubishi Rayon Company Ltd. Optical imaging device. 5,150,259, Cl. 359-619.000

Oishi, Ukichi, to Sintokogio, Ltd. Compressed air blowing apparatus for use in green sand mold molding facility. 5,148,852, Cl. 164-169.000

Oji Seitai Kaisha, Ltd.: *See—*
Masuda, Tadao; Tsukuda, Masahiro; Doiura, Shigeru; Kawanishi, Kaoru; and Iwasaki, Hiroshi, 5,148,651, Cl. 53-381.200.

Ojima, Yoshinori: *See—*
Miyamoto, Eiji; Ojima, Yoshinori; Yakabe, Tadashi; and Kanamori, Toshiya, 5,149,253, Cl. 417-353.000

Okada, Kenichi; Amemiya, Kyoko; Terabayashi, Takao; Sasaki, Hideaki; Imai, Kuninori; and Kazui, Shinichi, to Hitachi, Ltd. Multi-chip-module. 5,150,274, Cl. 361-382.000.

Okada, Kenzi: *See—*
Iwamoto, Kenichi; Sugimoto, Yuji; Namba, Toyoaki; Itoigawa, Masakatsu; Shibano, Yoshihumi; and Okada, Kenzi, 5,149,079, Cl. 271-162.000.

Okada, Sumio: *See—*
Yasuhara, Toshihiro; Masuda, Masachika; Murakami, Gen; Nishi, Kunihiko; Sakimoto, Masanori; Shimizu, Ichio; Hoshi, Akio; Okada, Sumio; and Nagamine, Tooru, 5,150,193, Cl. 357-70.000.

Okada, Takashi: *See—*
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Okada, Yoshiyuki: *See—*
Yoshida, Shigeru; Okada, Yoshiyuki; Nakano, Yasuhiko; and Chiba, Hirotaka, 5,150,119, Cl. 341-51.000

Okado, Kenji: *See—*
Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, 5,149,610, Cl. 430-106.000.

Okamoto, Rokuro: *See—*
Yoshioka, Takeo; Miyata, Ryoichi; Tsuchida, Toshio; Tone, Hiroshi; and Okamoto, Rokuro, 5,149,802, Cl. 540-200.000

Okamura, Izumi: *See—*
Matsuno, Yoshio; Matsui, Hitoshi; Okamura, Izumi; Shigeta, Teruaki; and Tanabe, Yoshinori, 5,149,187, Cl. 362-80.000.

Okamura, Takehiko: *See—*
Koga, Yoshiro; Nakazawa, Shizue; and Okamura, Takehiko, 5,149,914, Cl. 118-657.000.

Okano, Makoto: *See—*
Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, 5,149,374, Cl. 118-691.000

Okanoue, Kazuhiro, to NEC Corporation. Receiver capable of removing both intersymbol interference and frequency offset. 5,150,380, Cl 375-16.000.

Okawa, Mikio: *See—*
Okutomi, Tsutomu; Yamamoto, Atsushi; Chiba, Seishi; Seki, Tsuneyo; Okawa, Mikio; Honma, Mitsutaka; Otobe, Kiyofumi; Satoh, Yoshinari; and Sekiguchi, Tadaaki, 5,149,362, Cl. 75-240.000

Okazaki, Akio: *See—*
Hori, Osamu; Okazaki, Akio; and Shimotsuji, Shigeyoshi, 5,150,434, Cl. 382-57.000

O'Keeffe, Lonnie R.: *See—*
Peterson, Bradley J.; and O'Keeffe, Lonnie R., 5,149,039, Cl. 248-300.000

Okey, David W.; Briles, Owen M.; and Carriglitto, Francis T., to Sundstrand Corporation. Method of resin impregnating electric machinery. 5,149,483, Cl. 264-272.190.

Oki Electric Industry Co., Ltd.: *See—*
Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; and Mashimo, Akira, 5,150,089, Cl. 333-206.000
Tanuma, Jiro; and Katakura, Shinichi, 5,149,216, Cl. 400-320.000

Okisu, Noriyuki: *See—*
Ueda, Hiroshi; Matsui, Toru; and Okisu, Noriyuki, 5,150,146, Cl. 354-403.000

Okon, Toshihiro: *See—*
Shimizu, Takaaki; Okon, Toshihiro; Ohba, Toshio; and Inokuchi, Yoshinori, 5,149,748, Cl. 525-477.000

Okuda, Masahiro: *See—*
Tomita, Yasuo; Oda, Hitoshi; and Okuda, Masahiro, 5,150,251, Cl. 359-246.000

Okumoto, Takaharu; Hayashi, Tetsuya; and Kato, Masahiro, to Yokohama Rubber Co., Ltd., The. Golf club head. 5,149,091, Cl. 273-80.200.

Okumura, Hiroshi: *See—*
Kimura, Yutaka; Okumura, Hiroshi; Mihara, Hirokata; and Yoshida, Mitsutoshi, 5,150,024, Cl. 318-568.100.

Okuse, Hirotsugu; Sato, Hiroshi; Takahashi, Kenji; and Uchida, Kazuo, to Koyo Seiko Co., Ltd. Valve rotating apparatus of internal-combustion engine. 5,148,779, Cl. 123-90.280.

Okutomi, Tsutomu; Yamamoto, Atsushi; Chiba, Seishi; Seki, Tsuneyo; Okawa, Mikio; Honma, Mitsutaka; Otobe, Kiyofumi; Satoh, Yoshinari; and Sekiguchi, Tadaaki, to Kabushiki Kaisha Toshiba Contact forming material for a vacuum interrupter. 5,149,362, Cl. 75-240.000

Olaussen, Stein; Bjordal, Audun; and Solland, Geir, to Halliburton Company. Well cement compositions having improved properties and methods. 5,149,370, Cl. 106-737.000

Oleffelmann, Rudolf: *See—*
Jacobs, Jochen; Jahnke, Ulrich; Jung, Dieter; Oleffelmann, Rudolf; and Adler, Wilfried, 5,149,455, Cl. 252-174.130.

O'Lenick, Anthony J., Jr., to Siltech Inc. Terminal phosphated silicone polymers. 5,149,765, Cl. 528-25.000.

Oliehandel de Kock B.V.: *See—*
de Kock, Gerardus J. A., 5,148,798, Cl. 126-10.000

Olin Corporation: *See—*
Ashok, Sankaranarayanan, 5,148,855, Cl. 164-479.000
Bujese, David P., 5,150,161, Cl. 355-256.000
Shaffer, John H.; Kurtz, William L.; and Hubbard, John H., 5,149,398, Cl. 159-4.010

Oliveira, Paul L. Double-jaw vice for holding workpieces. 5,149,071, Cl. 269-43.000

Ollis, Martin G. Nut. 5,149,235, Cl. 411-41.000.

Olson, Donald C.; Miller, John J., deceased; and Miller, executor; Wayne M., to Shell Oil Company. H_2S removal composition 5,149,459, Cl. 252-191.000

Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, to Shell Oil Company Composition for H_2S removal. 5,149,460, Cl. 252-191.000

Olson, Douglas R.: *See—*
Babson, Arthur L.; Palmieri, Thomas; and Olson, Douglas R., 5,149,501, Cl. 422-58.000

Olympus Optical Co., Ltd.: *See—*
Takahashi, Susumu; Takano, Akira; Miyanaga, Hirofumi, Shimazu, Hisanari; Nishioka, Kimihiko; Toda, Akitoshi; Shiraiwa, Masaru; and Taniguchi, Akira, 5,150,234, Cl. 359-65.000.
Watanabe, Masaki, 5,149,337, Cl. 51-284.00R.

Omae, Masaru: *See—*
Yaba, Susumu; Takigawa, Tomoya; Kikugawa, Sinya; Osada, Koichi; Sato, Katsuhito; and Omae, Masaru, 5,149,351, Cl. 565-60.200

Omnisec: *See—*
Maurer, Ueli, 5,150,411, Cl. 380-30.000

Omron Tateisi Electronics Co.: *See—*
Haraguchi, Kaoru, 5,150,420, Cl. 382-3.000

Onaka, Toru: *See—*
Tsuyama, Toshiaki; Nobumoto, Kazutoshi; Sotoyama, Kaoru; and Onaka, Toru, 5,148,884, Cl. 180-197.000.

Oncotech, Inc.: *See—*
Weisenthal, Larry M., 5,149,527, Cl. 424-85.200.

Ong, Helen H.: *See—*
Martin, Lawrence L.; Payack, Joseph F.; and Ong, Helen H., 5,149,813, Cl. 546-105.000.

Onishi, Norio: *See—*
Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; and Mashimo, Akira, 5,150,089, Cl. 333-206.000

Onitsuka, Yoshihiro: *See—*
Iwamoto, Hirofumi; Tajima, Hisao; Uehara, Makoto; Onitsuka, Yoshihiro; Miyamoto, Takao; Takabayashi, Hiroshi; and Yoshihara, Satoshi, 5,150,231, Cl. 359-44.000

Ono, Fumio: *See—*
Sawada, Kazuo; Fujii, Atsuhiko; Nakai, Yoshihiro; Ohkubo, Naoyuki; Shiraishi, Hajime; Ono, Fumio; Matsuda, Katsushi; and Tsuji, Kazunori, 5,149,917, Cl. 174-129.00R

Ono, Hitoshi: *See—*
Kimura, Eiichi; Nagashima, Shinichi; Ono, Hitoshi; and Nara, Koji, 5,148,713, Cl. 74-6.000

Ono, Jiro: *See—*
Saito, Tamio; Yamamoto, Toshio; Ohikata, Naoharu; and Ono, Jiro, 5,150,047, Cl. 324-158.00R.

Ono, Katsuyasu, to Nippon Seiko Kabushiki Kaisha. Acceleration sensor. 5,149,926, Cl. 200-61.45M

Ono, Takuhiro: *See—*
Furuya, Nobuaki; Ono, Takuhiro; Horiuchi, Naoya; Yamanaka, Keiichiro; and Miyata, Takeo, 5,150,370, Cl. 372-106.000.

Onoda, Takumi: *See—*
Moriya, Yukio; Yokoyama, Toshio; Takamura, Fujitoshi; and Onoda, Takumi, 5,148,676, Cl. 60-429.000.

Onodera, Ken; and Saito, Shunji, to Canon Kabushiki Kaisha. Apparatus for character output with modification of character code array 5,150,460, Cl. 395-151.000.

Onodera, Tsutomu: *See—*
Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma, Mikio; and Kato, Yasuyuki, 5,149,350, Cl. 65-12.000.

Ontiveros, Fabio J. T. Forced air incubator. 5,148,773, Cl. 119-37.000

Oonishi, Norimasa; and Yokozeki, Kenzo, to Ajinomoto Co., Inc. Method for producing galactose transfer products. 5,149,640, Cl 435-100.000

Oppenheimer, Alan B.: *See—*
Sidhu, Gursharan S.; Oppenheimer, Alan B.; and Mathis, James E., 5,150,464, Cl. 395-200.000

Oppliger, Jean-Claude: *See—*
Merkli, Peter; and Oppliger, Jean-Claude, 5,149,083, Cl 271-277.000

Opsal, Jon; and Rosencwaig, Allan, to Therma-Wave, Inc. Apparatus for measuring grain sizes in metalized layers. 5,149,978, Cl 250-560.000

ORC Manufacturing Co., Ltd.: *See—*
Watanuki, Minoru, 5,150,253, Cl. 359-360.000

Orchid One Corporation: *See—*
Crewe, Albert V., 5,150,001, Cl. 313-7.000

Orefice, Richard. Materials-recycling collection bin assembly 5,148,932, Cl. 220-23.200.

Orient Chemical Industries, Ltd : *See—*
Yamasaki, Yasuhiro, 5,149,847, Cl. 558-192.000

Orlowski, David P.; Eccleston, Larry; and Goodrich, Earl R., II, to Microwave Sensors. Field disturbance monitor system. 5,150,123, Cl. 342-28.000

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Ota, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. High-speed flow control valve. 5,148,833, Cl. 137-625.650

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Oxford, Stuart G. All-terrain wheelchair. 5,149,118, Cl. 280-250.100.
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Parekh, Manher, to H. B. Fuller Automotive Products, Inc. Method for detecting leakage in a refrigeration system. 5,149,453, Cl. 252-68.000
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Patel, Arvind D.; and McLaurine, Henry C., to M-I Drilling Fluids Company. Drilling fluid additive and method for inhibiting hydration. 5,149,690, Cl. 507-131.000
Patel, Jayantilal S., to Bell Communications Research, Inc. Tunable liquid crystal etalon filter. 5,150,236, Cl. 359-71.000.
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Perrior, Trevor R.; Tapolczay, David J.; and Whittle, Alan J., to Imperial Chemical Industries PLC. Pyrimidine compounds. 5,149,810, Cl. 544-309.000
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Plow, Edward F.; D'Souza, Stanley E.; and Ginsberg, Mark H., to Scripps Research Institute, The. Peptides and antibodies that inhibit integrin-ligand binding. 5,149,780, Cl. 530-324.000
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Landsiedel, Horst; and Plum, Hans, 5,149,365, Cl. 106-18.320
Plumier, Andre; Baus, Raymond, Pepin, Rene; and Schleich, Jean-Baptiste, to Arbed S.A. Antiseismic steel structural work. 5,148,642, Cl. 52-167.00R

PMC, Inc: *See—*
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Pollack, Steven H.; and Hoffman, Brian D., to Megamation Incorporated. Method and apparatus for anti-collision and collision protection for multiple robot system. 5,151,452, Cl. 395-90.000
Pollution Control Specialty, Inc.: *See—*
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Ponticello, Ignazio S.; and Sutton, Richard C., to Eastman Kodak Company. Carboxy containing monomers and polymers and latices prepared from same. 5,149,737, Cl. 524-564.000
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Poorman, Richard M.; and Weeks, Jack L., to United States of America, National Aeronautics and Space Administration. Arc/gas electrode. 5,149,932, Cl. 219-75.000
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Popat, Pravin N.: *See—*
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Porter, Benny R., to Arc Plan, Inc. Method and apparatus hydraulic turbine repair. 5,148,635, Cl. 51-135.00R.
Postill, Alan: *See—*
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Potts, David C.; Young, George A.; Leverhart, Dennis S.; MacDonald, J. Gavin; and Nohr, Ronald S., to Kimberly-Clark Corporation. Multilayer nonwoven laminiferous structure. 5,149,576, Cl. 428-198.000
Poulson, Larry, to Cyclofur Company, L.P. Hot air circulating oven and food heating apparatus. 5,148,737, Cl. 99-327.000
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PPG Industries, Inc.: *See—*
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Gray, Ralph C., 5,149,382, Cl. 143-257.000
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Proform Fitness Products, Inc.: *See—*
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Reddy, S. Raghuma, to General Motors Corporation. Compartmental evaporative canister and pressure control valve assembly. 5,148,793, Cl. 123-520.000
Reder, Larry M. Miniature portable support construction. 5,148,564, Cl. 5-636.000
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Reveen, Tyrone J. Confetti cannon. 5,149,290, Cl. 446-475.000
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Rieck, Frank G.; and van Schaik, Marcellinus A. M., to Hoogovens Groep B.V. Body panel for a vehicle. 5,149,167, Cl. 296-191.000

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Riehl, Fred, to Robertshaw Controls Company. Burner construction, igniter assembly therefor. 5,149,262, Cl. 431-258.000

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Rinehart, Kenneth; and Sakai, Ryuichi, to University of Illinois, The Board of Trustees of the. Ecteinascidins 736 and 722. 5,149,804, Cl 540-466.000

Ringbloom, Vernon D.; and Savage, Matthew O., to United States of America, Navy. Flexible sheet explosive. 5,149,911, Cl. 102-302.000

Rishpon, Judith; and Rosen, Ilara, to Ramot University Authority for Applied Research and Industrial Development Ltd. Coulometric assay system. 5,149,629, Cl. 435-7.900

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Vaughan, Rodney G.; Findlay, Russell K.; Jakabek, Ivan; Richardson, Ralph; McLachlan, Myles J.; and Venn-Brown, Geoffrey C., 5,148,703, Cl. 73-123.000

Robbins, Steven, to Solar Outdoor Lighting, Inc. Solar powered exterior lighting system. 5,149,188, Cl 362-183.000

Robello, Douglas R.: *See—*
Penner, Thomas L.; Robello, Douglas R.; Armstrong, Nancy J.; and Williams, David J., 5,150,146, Cl. 385-122.000

Robert Bosch GmbH: *See—*
Bantien, Frank, 5,148,604, Cl. 33-366.000
Riehemann, Thomas, 5,150,112, Cl. 340-825.300

Roberts, Alan, to British Broadcasting Corporation. Video display system using an improved color signal technique. 5,150,206, Cl 358-30.000

Roberts, F. Donald: *See—*
Locatell, Louis; Norland, Kenneth; Roberts, F. Donald; and Zepp, Charles, 5,149,830, Cl. 549-22.000

Roberts, Greg: *See—*
Pinney, David; Johnson, Gary; Roberts, Greg; and Casper, Steve, 5,150,186, Cl. 357-42.000

Roberts, Harry: *See—*
Fuller, Douglas D; Williams, Richard A.; Gardiner, John P.; and Roberts, Harry, 5,148,746, Cl 101-142.000

Roberts, James M.: *See—*
Axel, Richard; and Roberts, James M., 5,149,636, Cl. 435-69.100

Robertshaw Controls Company: *See—*
Riehl, Fred, 5,149,262, Cl. 431-258.000

Robertson, Allan J.; and Gallivan, James B. 1,4-disubstituted-2,3,5,6-tetrahyddroxy-1,4-diphosphorinanes and their oxides or sulfides. 5,149,878, Cl. 568-12.000

Robertson, Kenneth: *See—*
Beutler, Robert C., 5,148,603, Cl. 33-265.000

Robinson, Grenville A.: *See—*
Forrest, Gordon C.; Hill, Hugh A. O.; Rattle, Simon J.; and Robinson, Grenville A., 5,149,630, Cl. 435-7.900.

Robinson, Murray J.; Joyce, Christopher C.; and Luk, Tim W., to National Semiconductor Corporation. Schottky diode structure with localized diode well. 5,150,177, Cl. 357-15.000

Robinson, Victor E.; Kristoffersen, Stein; and Laezza, Joseph, to Falconbridge Limited. Cathode stripping apparatus. 5,149,410, Cl. 204-199.000

Robinson, Wilbur A, to I Q International, Inc. Light-pulsing, visual stimulus entertainment device and method. 5,149,317, Cl 600-27.000

Robison, Milan W., to Chiparvestors, Inc. Flail drum system. 5,148,844, Cl. 144-208.00J

Roche, William J.: *See—*
Kling, Michael R.; and Roche, William J., 5,150,009, Cl. 315-107.000

Rochester Gauges, Inc.: *See—*
Ross, Herbert G., Jr., 5,148,709, Cl. 73-320.000

Rockwell Automotive Body Systems-France: *See—*
Prillard, Charles B., 5,148,588, Cl. 29-91.100.

Rodi, Anton; Muller, Bernd; and Muller, Robert, to Heidelberger Druckmaschinen AG. Process for setting a production run ink zone profile. 5,148,747, Cl. 101-450.100

Rodriguez, Nelly M.: *See—*
Baker, R. Terry K.; and Rodriguez, Nelly M., 5,149,584, Cl. 428-297.000.

Rodriguez, Paul A.: *See—*
Wills, Kendall S.; Rodriguez, Paul A., and Brewer, Melvin L., 5,149,675, Cl. 437-248.000

Rody, Jean; and Leppard, David G., to Ciba-Geigy AG. Stabilizers for color photography recording materials. 5,149,828, Cl. 549-13.000.

Roe, Donald C.: *See—*
Lahrman, Frank H.; Berg, Charles J.; and Roe, Donald C., 5,149,334, Cl. 604-367.000

Rogers, Alan C., to National Semiconductor Corporation. Ground bounce blocking output buffer circuit. 5,149,991, Cl. 307-443.000.

Rogers Corporation: *See—*
Arthur, David; and Swei, Gwo S., 5,149,590, Cl. 428-421.000
Owens, Mark J., 5,150,281, Cl. 361-413.000

Rogers, Robert R.: *See—*
Blank, Ted E.; Ferguson, Donald F.; Frey, Jeffrey A.; Pruscino, Angelo; Rogers, Robert R.; and Rahm, Erhard, 5,150,472, Cl. 395-425.000.

Rohatyn, Pierre. Method of making glass forming molds of an amorphous fused silica composition. 5,149,474, Cl. 264-63.000

Rohde & Schwarz GmbH & Co. KG: *See—*
Burkhard, Wolfgang; and Danzeisen, Klaus, 5,150,063, Cl. 324-646.000

Rohm Co., Ltd.: *See—*
Sawase, Kensuke; and Ogata, Hiromi, 5,150,016, Cl. 315-294.000.

Rohm GmbH Chemische Fabrik: *See—*
Gross, Heinz; Fetzer, Andreas; and Dickhaut, Gunther, 5,149,481, Cl. 264-210.200

Rohm and Haas Company: *See—*
Owens, Joseph M.; and Gray, Richard T., 5,149,745, Cl. 525-366.000
Sherba, Samuel E.; Mehta, Raj J.; Bowers-Daines, Margaret M., and Chi-Tung Hsu, Adam, 5,149,524, Cl. 424-78.360.

Rohrmoser, Alois, to Varpat Patentverwertungs AG. Ski binding with front and heel jaws connected by a carrier plate for the sole. 5,149,123, Cl. 280-618.000.

Rokos, George H. S.; and Morley, Peter E., to Northern Telecom Limited. Piezo electric resonator temperature sensor. 5,149,197, Cl. 374-117.000

Roll Systems, Inc.: *See—*
Crowley, H. W.; and Bilinski, Joseph R., 5,149,075, Cl. 270-39.000.

Rolm Systems: *See—*
Autruong, Tho; and Lai, Daniel, 5,150,368, Cl. 371-31.000.

Rondestvedt, Bernard J.: *See—*
Morehouse, James H.; Dunckley, James A.; Furay, David M.; Mount, John A.; Rondestvedt, Bernard J.; and Volk, Steven B., 5,149,048, Cl. 248-632.000

Rone-Poulenc Chimie: *See—*
Costantini, Michel; Garcin, Eric; Gubelmann, Michel; and Popa, Jean-Michel, 5,149,888, Cl. 568-771.000

Rooftop Systems Inc.: *See—*
Rutledge, Phillip R., 5,148,647, Cl. 52-488.000

Rorer Biotechnology Inc.: *See—*
Scandella, Dorothea H.; Drohan, William N.; Zimmerman, Theodore S.; and Fulcher, Carol A., 5,149,637, Cl. 435-69.600

Rosaria Galli & C. S.A.S.: *See—*
Galli, Rosaria, 5,149,053, Cl. 251-149.900.

Rosen, Howard L. Deer repelling apparatus. 5,148,621, Cl. 43-1.000.

Rosen, Ilara: *See—*
Rishpon, Judith; and Rosen, Ilara, 5,149,629, Cl. 435-7.900.

Rosen, Stanley R.: *See—*
Fridman, Vladimir; and Rosen, Stanley R., 5,148,557, Cl. 5-81.100.

Rosenbloom, Howard: *See—*
Piacentino, Thomas J.; Piacentino, Thomas J., Jr.; and Rosenbloom, Howard, 5,149,196, Cl. 366-345.000

Rosencwaig, Allan: *See—*
Opsal, Jon; and Rosencwaig, Allan, 5,149,978, Cl. 250-560.000

Rosendall, Henry J.: *See—*
Jailor, John J.; and Rosendall, Henry J., 5,148,569, Cl. 15-041.100.

Rosenfeld, Aron M.: *See—*
Smits, Paul; Rosenfeld, Aron M.; and DeFerrari, Howard F., 5,149,386, Cl. 156-150.000

Rosenthal, Allan L.: *See—*
Cagle, Gerald D.; McDonald, Thomas O.; and Rosenthal, Allan L., 5,149,693, Cl. 514-40.000
Cagle, Gerald D.; McDonald, Thomas O.; and Rosenthal, Allan L., 5,149,694, Cl. 514-40.000

Rosenthal, Dieter: *See—*
Sudau, Peter; and Rosenthal, Dieter, 5,149,004, Cl. 242-57.000.

Roser, Bruce J., to Quadrant Bioresources Limited. Preservation of viruses. 5,149,653, Cl. 435-260.000.

Roser, Georges, to Soltralentz S.A. Container for storing and transporting a liquid. 5,148,939, Cl. 220-401.000.

Ross, Alice A. Word extracting word game and method. 5,149,103, Cl. 273-432.000

Ross, Herbert G., Jr., to Rochester Gauges, Inc. Spiral gauge with integral support tube. 5,148,709, Cl. 73-320.000

Ross, Laurence P., executor: *See—*
Bank, Graham; Pinfold, Harold C., deceased; and Ross, Laurence P., executor, 5,148,888, Cl. 181-171.000

Rosse, Meinrad, to Nestec S.A. Extrusion nozzle. 5,149,258, Cl. 425-190.000

Rossi, Domenico: *See—*
Murari, Bruno; Rossi, Domenico; and Savino, Pierantonio, 5,150,073, Cl. 330-261.000.

Rossi, John J.; Chang, Pairoj; and Kaplan, Bruce E., to City of Hope. Chimeric DNA-RNA catalytic sequences. 5,149,796, Cl. 536-27.000.

Roth, Bruce D.: *See—*
Butler, Donald E.; Deering, Carl F.; Millar, Alan; Nanninga, Thomas N.; and Roth, Bruce D., 5,149,837, Cl. 549-333.000

Roth, Martin: *See—*
Munk, Kurt; and Roth, Martin, 5,149,767, Cl. 528-71.000

Rothacker, Andreas: *See—*
Genz, Manfred; and Rothacker, Andreas, 5,149,725, Cl. 521-110.000

Roubini, Eli: *See—*
Chorev, Michael; and Roubini, Eli, 5,149,779, Cl. 530-317.000

Roussel Uclaf: *See—*
Claussner, Andre; Nedelec, Lucien; Philibert, Daniel; and Van De Velde, Patrick, 5,149,696, Cl. 514-179.000

Rozelle, Paul F.: *See—*
Twerdochlib, Michael; Rozelle, Paul F.; and Sarasas, Santitavee, 5,148,711, Cl. 73-660.000

Rubbermaid Incorporated: *See—*
Brazis, William E.; and Mast, Rex R., 5,148,571, Cl. 15-104.200

Rubens, Roger W., to National Starch and Chemical Investment Holding Corporation. Method and apparatus for cooking and spray-drying starch. 5,149,799, Cl. 536-102.000

Rubenstein, Zvi: *See—*
Gil, Jacob; and Rubenstein, Zvi, 5,148,825, Cl. 137-78.300.

Rubin, David H., to Kitson, Kevin J., a part interest. Blood tube safety box. 5,148,919, Cl. 206-443.000

Rubino, Mark R.: *See—*
Chiou, Huh-Sun; Rubino, Mark R.; Jahoda, Susan W.; Lindley, Daniel; and Battler, John R., 5,149,866, Cl. 562-478.000

Rudesill, John: *See—*
Spencer, Nicholas D.; Pan, Wie H.; and Rudesill, John, 5,149,682, Cl. 505-1.000

Rudnick, Leslie R.: *See—*
Coolbaugh, Thomas S.; Loveless, Frederick C.; Matthews, Demetreos N.; and Rudnick, Leslie R., 5,149,895, Cl. 585-507.000.

Ruehl, Phillip C.; and Coursin, Benjamin E., to A. O. Smith Corporation. Split rear truck frame. 5,149,132, Cl. 280-800.000.

Ruffert, Gerhard: *See—*
Rauchschwalbe, Gunther; Blank, Heinz-Ulrich; Deibele, Ludwig; Hallenberger, Kaspar; and Ruffert, Gerhard, 5,149,890, Cl. 568-934.000

Rundle, Craig V.; and Hooten, Gary L. Tethered rotary kite. 5,149,020, Cl. 244-153.00A.

Runkles, Richard R.: *See—*
Jay, Eric C.; and Runkles, Richard R., 5,149,173, Cl. 297-284.900.

Rupp, John A.: *See—*
Haim, Elias S.; Rupp, John A.; and Penn, Cecil W., 5,150,235, Cl 359-68.000

Ruppel, Wilhelm: *See—*
Brenner, Karl; Ruppel, Wilhelm; Woerz, Otto; Halbritter, Klaus; Scheiper, Hans-Juergen; Aquila, Werner; and Fuchs, Hartwig, 5,149,884, Cl. 568-471.000

Rusch, William P., to Perkin-Elmer Corporation, The. High pressure thermal spray gun. 5,148,986, Cl. 239-85.000

Rushing, Allen J., to Eastman Kodak Company. Normalizing aim values and density patch readings for automatic set-up in electrostatographic machines. 5,150,155, Cl. 355-208.000.

Rushing, William C.; and Hohol, John D., to Berntsen International, Inc. Finned sleeve for driven type survey monuments. 5,148,641, Cl 52-103.000

Russell, Virginia. Protecting personnel and the environment from radioactive emissions by controlling such emissions and safely disposing of their energy. 5,149,494, Cl. 376-320.000

Rutgerswerke AG: *See—*
Orth, Winfried; Pastorek, Emmerich; Weiss, Wolfgang; and Kleffner, Hans W., 5,149,886, Cl. 568-727.000

Rutherford, Robert B., to Creative BioMolecules, Inc. Issue repair and regeneration through the use of platelet derived growth factor (PDGF) in combination with dexamethasone. 5,149,691, Cl 514-12.000

Rutledge, Phillip R., to Rooftop Systems Inc. Roof mounting curb. 5,148,647, Cl. 52-488.000

Ryan, Daniel P. Golf bag compartmentalizer. 5,148,915, Cl 206-315.600

Ryczek, Lawrence J.; Taranowski, Michael G.; and Duncan, Eugene F., to Eaton Corporation. Photoelectric color sensor. 5,150,174, Cl 356-402.000

Saarikettu, Jukka. Oriented thread structure and a method for manufacturing same. 5,149,583, Cl. 428-253.000

Sabb, Annmarie L., to American Home Products Corporation. N-substituted-2-aminoquinolines. 5,149,815, Cl. 546-163.000

Sabel Plastechs, Inc.: *See—*
Belcher, Samuel L., 5,149,485, Cl. 264-532.000

Sacks, Jack M.: *See—*
Banh, Nam D.; Lo, Thomas K.; Holthaus, Kelly D.; and Sacks, Jack M., 5,150,426, Cl. 382-48.000

Sacks, Michael, to Dowty Armourshield Limited. Bullet-proof bag. 5,149,203, Cl. 383-111.000

Safford, Sarah E.: *See—*
Brown, William E.; Clemens, John M.; Devereaux, Sharon M.; Hofler, John G.; Knigge, Kevin M.; and Safford, Sarah E., 5,149,622, Cl. 435-5.000

Sage Products, Inc.: *See—*
Skiba, Barbara T.; Harreld, Donald R., and Ponsi, Lawrence G., 5,149,506, Cl. 422-102.000

Sager, Tamara L.: *See—*
Kaufman, Stephen B.; DiGianfilippo, Aleandro; Sager, Tamara L.; and DeVito, Ralph J., 5,148,944, Cl. 221-131.000.

Sai, Kazuyoshi: *See—*
Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; Ohta, Yasumitsu; and Sai, Kazuyoshi, 5,149,955, Cl. 250-211.00J

Saikalis, George; Yamauchi, Teruo; and Byers, Robert W., to Hitachi America, Ltd. Air-assist fuel injection system. 5,148,788, Cl 123-339.000

Saikawa, Yasuhiko: *See—*
Yoshizawa, Hideo; Saikawa, Yasuhiko; Kanda, Noriaki; and Higashide, Norihiko, 5,149,352, Cl. 65-106.000

Saiki, Shuji: *See—*
Honda, Kazuki; Takewa, Hiroyuki; Saiki, Shuji; and Satoh, Kazue, 5,150,418, Cl. 381-159.000

Saint-Gobain Vitrage: *See—*
Leclere, Klemens; Kessels, Hans-Willi; and Hammes, Friedhelm, 5,148,574, Cl. 15-415.100.

St-Louis, Eric R.; St-Louis, Jonathan P.; and St-Louis, Kai G., to Equipments St. Louis & Fils, Inc. Infrared asphalt heater. 5,148,799, Cl. 126-271.20A.

St-Louis, Jonathan P.: *See—*
St-Louis, Eric R.; St-Louis, Jonathan P.; and St-Louis, Kai G., 5,148,799, Cl. 126-271.20A.

St-Louis, Kai G.: *See—*
St-Louis, Eric R.; St-Louis, Jonathan P.; and St-Louis, Kai G., 5,148,799, Cl. 126-271.20A.

Saito, Masaji, to Daiwa Seiko. Drag mechanism for spinning reel for fishing. 5,149,007, Cl. 242-246.000.

Saito, Shunji: *See—*
Onodera, Ken; and Saito, Shunji, 5,150,460, Cl. 395-151.000

Saito, Tadao; Sugisawa, Masakazu; and Watanabe, Yoshio, to Aisin Seiki K.K. Hydraulic braking system for an automotive vehicle 5,149,178, Cl. 303-116.00R

Saito, Takeshi, to Ricoh Company, Ltd. Toner supply device for an image forming apparatus. 5,150,162, Cl. 355-260.000.

Saito, Tamio; Yamamoto, Toshio; Ohikata, Naoharu; and Ono, Jiro, to Nippon Steel Corporation. Member for use in assembly of integrated circuit elements and a method of testing assembled integrated circuit elements. 5,150,047, Cl. 324-158.00R.

Saito, Yoshihiko: *See—*
Shimohira, Tetsuji; Higuchi, Yoshiaki; Saito, Yoshihiko; and Suzuki, Kohji, 5,149,403, Cl. 204-98.000

Saito, Yukihiro; Waragai, Katsunori; and Asakawa, Shiro, to Matsushita Electric Industrial Co., Ltd. Process for the preparation of 1-monoalkyl-dimethylsilylpropyne polymers. 5,149,751, Cl. 526-178.000

Saitoh, Masaki: *See—*
Tamada, Hitoshi; Yamada, Atsuo; Taneyama, Yukie, and Saitoh, Masaki, 5,150,447, Cl. 385-130.000

Saitou, Satoshi, to Kabushiki Kaisha Toshiba. Endoscope with shape recognition mechanism. 5,150,254, Cl. 359-367.000

Sakabe, Yukio: *See—*
Shiratori, Akira; Kobayashi, Shozo; Takagi, Hiroshi; and Sakabe, Yukio, 5,149,601, Cl. 429-30.000

Sakaguchi, Katsuyoshi; and Hasegawa, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Central mechanism of tire vulcanizer. 5,149,545, Cl. 425-35.000

Sakaguchi, Mitsuo, to Kobishi Electric Co., Ltd. Motor driven bell striking mechanism. 5,150,097, Cl. 340-396.000

Sakaguchi, Shuzabu: *See—*
Takeda, Mutsuhiko; Hagiwara, Isao; Zaima, Fumiya; and Sakaguchi, Shuzabu, 5,149,857, Cl. 558-371.000.

Sakai, Kiyoshi; Sakakibara, Teigo; Sakou, Harumi; and Amamiya, Shoji, to Canon Kabushiki Kaisha. Surface roughening method for organic electrophotographic photosensitive member. 5,148,639, Cl. 51-328.000.

Sakai, Kokki: *See—*
Nishida, Tomoaki; Kashino, Yoshinori; Mimura, Akio; Takahara, Yoshimasa; and Sakai, Kokki, 5,149,648, Cl. 435-192.000.

Sakai, Ryuichi: *See—*
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Sakai, Shoji: *See—*
Banba, Susumu; Teranishi, Junichi; Sakai, Shoji; Uramoto, Makoto; and Uchida, Hiroshi, 5,149,001, Cl. 242-42.000.

Sakai, Toru: *See—*
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Sakakibara, Teigo: *See—*
Sakai, Kiyoshi; Sakakibara, Teigo; Sakou, Harumi; and Amamiya, Shoji, 5,148,639, Cl. 51-328.000.

Sakakida, Masafumi: *See—*
Manabe, Toshiyuki; Iwamoto, Yasunori; Sakakida, Masafumi; Muramoto, Hisao; Inada, Haruhiro; and Matsunaga, Masahiro, 5,149,127, Cl. 280-731.000.

Sakamoto, Hitoshi; and Kojima, Toshiaki, to Sony Corporation. Tape tension servo-system for video tape recording and/or reproducing apparatus. 5,150,263, Cl. 360-69.000.

Sakamoto, Kazuhiro: *See—*
Kurihara, Sakuo; and Sakamoto, Kazuhiro, 5,148,901, Cl. 192-67.00R.

Sakamoto, Masahide: *See—*
Nagano, Masami; and Sakamoto, Masahide, 5,148,791, Cl. 123-417.000.

Sakano, Akio: *See—*
Aguro, Masayuki; Tanaka, Hidekazu; Yoshida, Kimiyoshi; and Sakano, Akio, 5,150,424, Cl. 382-13.000

Sakashita, Kazuhiro: *See—*
Hashizume, Takeshi; and Sakashita, Kazuhiro, 5,150,044, Cl. 324-158.00R

Sakashita, Keiichi; Hayashi, Seiji; Ikemoto, Tetsuya; and Yamamoto, Osamu, to Mitsubishi Rayon Company Ltd. Optically active compound. 5,149,462, Cl. 252-299.610.

Sakato, Kenji: *See—*
Ueki, Toru; Sakato, Kenji; Yoshimura, Masaji; Kanezaki, Kazuharu; and Iwata, Ineo, 5,149,465, Cl. 252-511.000.

Sakimae, Akihiro; Ozaki, Eiji; Enomoto, Kanehiko; Numazawa, Ryozo; and Kobayashi, Yoshimasa, to Mitsubishi Rayon Co., Ltd. Process for racemizing optically active carboxylic acid esters. 5,149,855, Cl. 558-255.000.

Sakimae, Akihiro: *See—*
Miyamori, Takao; Uchida, Makoto; Enomoto, Kanehiko; Sakimae, Akihiro; and Numazawa, Ryozo, 5,149,649, Cl. 435-240.242.

Sakimoto, Masanori: *See—*
Yasuhara, Toshihiro; Masuda, Masahika; Murakami, Gen; Nishi, Kunihiko; Sakimoto, Masanori; Shimizu, Ichio; Hoshi, Akio; Okada, Sumio; and Nagamine, Toru, 5,150,193, Cl. 357-70.000.

Sakizadeh, Kumars: *See—*
Simpson, Sahron M.; Boon, John R.; Bucci, Marco; Bertoldi, Massimo; Soncini, Cristina; and Sakizadeh, Kumars, 5,149,620, Cl. 430-617.000.

Sakou, Harumi: *See—*
Sakai, Kiyoshi; Sakakibara, Teigo; Sakou, Harumi; and Amamiya, Shoji, 5,148,639, Cl. 51-328.000.

Sakurai, Seiya; Hoener, Dieter W.; and Schweitzer, Erwin V., to Boeing Company, The. Mechanically-linked side stick controllers with isolated pitch and roll control movement. 5,149,023, Cl. 244-229.000.

Sakurai, Yoshihiko: *See—*
Takano, Akihiko; Sakurai, Yoshihiko; and Iida, Katsumi, 5,148,685, Cl. 62-229.000.

Saleeb, Fouad Z.: *See—*
Vidal, Susan; and Saleeb, Fouad Z., 5,149,552, Cl. 426-321.000.

Saleman, Walter M. Roach trap. 5,148,525, Cl. 43-121.000.

Salinas, Bart. Slicer and bagger for substantially flat food products 5,148,655, Cl. 53-514.000

Salomon, Thomas, to Melitta Haushalt-Produkte GmbH & Co., KG Beverage flow heater utilizing heated tube with discrete heating zone. 5,150,448, Cl. 392-480.000.

Saly, Udi E.; and Dibner, Brent, to Flexible Environmental Systems, Inc. Floating recycling and transfer station. 5,148,758, Cl. 110-220.000

Sames S.A.: *See—*
Gondrand, Michel, 5,149,373, Cl. 118-634.000.

Sampedro, Tony. Compact storage stroller. 5,149,115, Cl. 280-33.998

Sampson, Robert; and Flanigan, Sean, to Wasco Products, Inc. Skylight construction. 5,148,643, Cl. 52-200.000.

Samsung Eectronics Co., Ltd.: *See—*
Shin, Yun-seung; and Lee, Soo-Cheol, 5,149,664, Cl. 437-41.000.

Samsung Electronics: *See—*
Shin, Hyunjeong, 5,150,003, Cl. 313-440.000.

Samsung Electronics Co., Ltd.: *See—*
Choi, Jeongdal, 5,149,667, Cl. 437-52.000.
Han, Hyeong-deok, 5,150,212, Cl. 358-147.000.
Shin, Yun-Bok; and Lee, Joung-Sang, 5,150,214, Cl. 358-166.000.
You, Han J., 5,148,686, Cl. 62-234.000.

Samuels, Sari B.: *See—*
Lee, Kiu H.; Karol, Frederick J.; and Samuels, Sari B., 5,149,738, Cl. 525-53.000.

Sanchez, J. Michael, to Mobil Oil Corporation. Single horizontal wellbore process/apparatus for the in-situ extraction of viscous oil by gravity action using steam plus solvent vapor. 5,148,869, Cl. 166-303.000

Sanchez, William. Training aid for shooting a basketball. 5,149,085, Cl. 273-1.50A.

Sanders, Mark H.; and Zdrojkowski, Ronald J., to Respironics Inc. Method and apparatus for maintaining airway patency to treat sleep apnea and other disorders. 5,148,802, Cl. 128-204.180.

Sandoz Ltd.: *See—*
Azria, Moise; and Steiger, Michel, 5,149,537, Cl. 424-436.000

Sanger, Dieter: *See—*
Gross, Jurgen; Pufahl, Holger; Sanger, Dieter; Schaller, Karl-Heinz; and Wilmes, Hugo, 5,149,654, Cl. 435-287.000.

Sanjurjo, Angel, to SRI International. Low temperature method of forming materials using one or more metal reactants and a halogen-containing reactant to form one or more reactive intermediates. 5,149,514, Cl. 423-344.000.

Sano, Hiroyuki: *See—*
Uota, Katsumi; Sano, Hiroyuki; Serizawa, Hajime; and Kubota, Masaru, 5,149,731, Cl. 524-265.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Kawai, Takaji, 5,149,284, Cl. 440-52.000.
Koike, Takashi, 5,149,287, Cl. 440-88.000.
Tsujii, Eiichiro, 5,149,286, Cl. 440-61.000.

Santa Barbara Research Center: *See—*
Norton, Paul R., 5,149,956, Cl. 250-211.00J
Pettijohn, Kevin L.; Sessler, Todd E.; and Stineman, John A., 5,149,954, Cl. 250-208.100.

Santandrea, Luciano; and Lombardi, Massimo, to Axis S.p.A. Machine for winding two-pole stators. 5,149,000, Cl. 242-1.10R.

Santel, Hans-Joachim: *See—*
Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim; and Schmidt, Robert R., 5,149,356, Cl. 71-90.000

Santrade Ltd.: *See—*
Schermutzki, Konrad; and Wurmseher, Herbert, 5,149,445, Cl. 210-773.000.

Sarasas, Santitavee: *See—*
Twerdochlib, Michael; Rozelle, Paul F.; and Sarasas, Santitavee, 5,148,711, Cl. 73-660.000.

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Gjerde, Douglas T.; and Benson, James V., 5,149,661, Cl. 436-178.000.

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Kawamura, Hideaki; Sasaki, Takao; and Matsuura, Syuji, 5,150,306, Cl. 364-474.340.

Sasse, Philip A., to Kimberly-Clark Corporation. Polymeric web compositions for use in absorbent articles. 5,149,333, Cl. 604-367.000.

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Yoshie, Hiroto; and Sato, Hironobu, 5,150,087, Cl. 333-185.000

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Okuse, Hirotsugu; Sato, Hiroshi; Takahashi, Kenji; and Uchida, Kazuo, 5,148,779, Cl. 123-90.280.

Sato, Jun, to Shimano Industrial Co., Ltd. Fishing reel. 5,149,009, Cl. 242-268.000.

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Yaba, Susumu; Takigawa, Tomoya; Kikugawa, Sinya; Osada, Koichi; Sato, Katsuhito; and Omae, Masaru, 5,149,351, Cl. 565-60.200.

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Furukawa, Yasunori; and Sato, Masayoshi, 5,150,252, Cl. 359-252.000.

Sato, Mitsugu, to Hitachi, Ltd. Scanning electron microscope. 5,149,968, Cl. 250-310.000.

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Honda, Kazuki; Takewa, Hiroyuki; Saiki, Shuji; and Satoh, Kazue, 5,150,418, Cl. 381-159.000

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Masuko, Takayuki; Satoh, Shunichi; Ishizaka, Tetsuo; and Ohya, Toshio, 5,150,230, Cl. 359-34.000.

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Ringbloom, Vernon D.; and Savage, Matthew O., 5,149,911, Cl. 102-302.000

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Murari, Bruno; Rossi, Domenico; and Savino, Pierantonio, 5,150,073, Cl. 330-261.000.

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Sawase, Kensuke; and Ogata, Hiromi, to Rohm Co., Ltd. LED light source with easily adjustable luminous energy. 5,150,016, Cl. 315-294.000

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Schaffner, Werner, to Ciba-Geigy Corporation. N,N,N',N'-tetraclycidyl-4,4'-diaminodiphenylmethanes. 5,149,841, Cl. 549-520.000.

SCHAKO Metallwarenfabrik Ferdinand Schad KG: *See—*
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Scharnberg, Lorne C., to Kas Products, Inc. Defibrillator pad system and method for using same. 5,148,805, Cl. 128-419.00D.

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von Sprecher, Andreas; Beck, Andreas; Schaub, Bruno; and Lang, Robert W., 5,149,717, Cl. 514-456.000.

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Scherbatskoy, Serge A. Method and apparatus for providing improved pressure pulse characteristics for measuring while drilling. 5,150,333, Cl. 367-83.000

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Landsiedel, Horst; and Plum, Hans, 5,149,365, Cl. 106-18.320

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Scheuermann, Johannes W. J. M.: *See—*
Snoeren, Rudolph M.; and Scheuermann, Johannes W. J. M., 5,150,396, Cl. 378-99.000

Schilling, Winston H.; Ritchie, Mark D.; Krutsch, John; and Joos, Joseph, to Williams Electronics Games, Inc. Amusement device with trading card dispenser. 5,149,093, Cl. 273-118.00A.

Schilperoort, Robert A.: *See—*
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Schleich, Jean-Baptiste: *See—*
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Schlaack, Michael: *See—*
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Wijnberg, Willem A., 5,150,443, Cl. 385-107.000

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Muller, Klaus-Helmut; Babczinski, Peter; Santel, Hans-Joachim, and Schmidt, Robert R., 5,149,356, Cl. 71-90.000.

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Heinemann, Otto; and Schmits, Heinz-Herbert, 5,149,266, Cl. 432-77.000

Schmitz, Lothar P., to Drum Engineering Company Limited, The Rotary, positive displacement machine with specific lobed rotor profile. 5,149,256, Cl. 418-150.000

Schneider, Claus: *See—*
Weber, Karl-Heinz; Walther, Gerhard; Schneider, Claus, Hinzen, Dieter; Kuhn, Franz J.; and Lehr, Erich, 5,149,808, Cl. 544-141.000

Schneider, Roger: *See—*
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Schneider, Georg: *See—*
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Schnitzler, Volkhard: *See—*
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Schnorr, Thomas M.; and Hannemann, Jurgen G., to Philips and Du Pont Optical Company. Apparatus for scanning a disc, and suction device for holding a disc flat during scanning. 5,150,353, Cl. 369-270.000

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Schonbek, Arnold, to A. Schonbek & Co., Inc. Chandelier assemblies made of interlocking components. 5,150,285, Cl. 362-405.000

Schoon, Juergen: *See—*
Pettigrew, Robert M.; Harry, Alan J.; Nailor, Paul R.; Adelmann, Fred; Franzen, Peter; and Schoon, Juergen, 5,149,211, Cl. 400-88.000

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Schriner, Michael J., to Microvision Inc. Keyboard flip stand. 5,149,051, Cl. 248-918.000.

Schroeder, Theo G.: *See—*
Mothes, Helmut A.; Patwardhan, Bhalchandra H.; Schroeder, Theo G.; and Solow, David J., 5, 49,643, Cl. 435-144.000.

Schuett, Daniel L.; and McIlmurray, ohn. Veterinarian infectious waste containment system. 5,148,771, l. 119-17.000.

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Schultz, Roger L.; Manke, Kevin R.; Skinner, Neal G.; Bohan, William L.; and Young, Allen R., to Halliburton Company. Electric power supply for use downhole. 5,149,984, C . 290-54.000.

Schulz, Martin, Jr., to Steadley Compa y. Foundation unit edge support system. 5,149,064, Cl. 267-97.000

Schumann, Herbert: *See—*
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Vassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5, 49,853, Cl. 556-1.000.

Schuon, Georg: *See—*
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Schutz, Ronald J.: *See—*
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Schwar, Rudolf, to Ernst Thielenhaus K G. Apparatus for grinding an annular workpiece. 5,148,638, Cl. 51-215.0CP.

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Contrucci, Marcos A.; Rizzo, Henrique P.; Schwarz, Herbert; Costa, Pedro H. C.; Gonzales, Henrique L.; Duran, Pedro V.; Jacomini, Norberto; and de Souza Santos, Adalberto B., 5,149,363, Cl. 75-414.000

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Scitex Corporation Ltd.: *See—*
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Scott, Paul J.: *See—*
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Scouten, Douglas G. Fuel agitating device for internal combustion engine. 5,148,794, Cl. 123-538.000

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Scandella, Dorothea H.; Drohan, William N.; Zimmerman, Theodore S.; and Fulcher, Carol A., 5 149,637, Cl. 435-69.600

Scripps Research Institute, The: *See—*
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Scully, Stephen P.: *See—*
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SDTX Technologies, Inc.: *See—*
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Seagate Technology, Inc.: *See—*
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Genheimer, Stephen R.; and Welty, Steven L., 5,150,050, Cl. 324-212.000
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Seals, Michael T.; and Wegner, Eugene H., to Phillips Petroleum Company. Fermentation broth degassification. 5,149,652, Cl 435-246.000

Searle, John G., to Allwood, Searle & Timney (Holdings) Limited. Friction welding. 5,148,957, Cl. 228-.000

Sears, Richard N.: *See—*
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Sechi, Giovanni M.: *See—*
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Sedman, Benny M., to AlSiMag Technical Ceramics, Inc. Applicator trap guide. 5,149,476, Cl. 264-67.000

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Seibel, Klaus: *See—*
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Seiko Epson Corporation: *See—*
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Seiko Instruments Inc.: *See—*
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Seitz-Filter-Werke GmbH und Co.: *See—*
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Seki, Tsuneyo: *See—*
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Sekisui Kaseihin Kogyo K.K.: *See—*
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Sekizawa, Kazuhiko: *See—*
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Sendak International Corp.: *See—*
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Seno, Eugene T.: *See—*
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Sensor Adaptive Machines, Inc.: *See—*
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Senuma, Satoko; and Tsuruta, Masaaki, to Sony Corporation. Method and apparatus for autofocus control using large and small image contrast data. 5,150,217, Cl. 358-227.000

Seo, Iwao: *See—*
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Seri, Hajime; Moriwaki, Yoshio; Shintani, Akemi; and Iwaki, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage alloy electrode. 5,149,383, Cl. 148-400.000.

Serizawa, Hajime: *See—*
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Sessler, Todd E.: *See—*
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Setani, Michitaka, to Canon Kabushiki Kaisha. Light scanning optical system for an image output scanner using an electro-mechanical light modulator. 5,150,250, Cl. 359-221.000.

Setra Systems, Inc.: *See—*
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Severson, Thomas S.: *See—*
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Sevey, Douglas: *See—*
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Shaanan, Gad, to Ideal Security Inc. Door latch. 5,149,154, Cl. 292-226.000.

Shafer, Harold G., Jr.: *See—*
Adler, Meryle D. W.; Nelson, John W.; and Shafer, Harold G., Jr., 5,148,632, Cl. 51-55.000.

Shaffer, John H.; Kurtz, William L.; and Hubbard, John H., to Olin Corporation. Apparatus for producing a fast dissolving granular product. 5,149,398, Cl. 159-4.010.

Shafiee, Ali; Kaplan, Louis; Chen, Shieh-Shung T.; Arison, Byron H.; Colwell, Lawrence F., Jr.; and Dumont, Francis, to Merck & Co., Inc. C-31 methylated FR-900520 cyclic hemiketal immunosuppressant agents. 5,149,701, Cl. 514-291.000

Shanzer, Abraham; Libman, Jacqueline; and Lifson, Shneior, to Yeda Research and Development Co. Ltd. Extractants for the separation of transition and related metal ions. 5,149,845, Cl. 556-110.000

Sharp Kabushiki Kaisha: *See—*
Adan, Alberto O., 5,150,190, Cl. 357-59.000.
Iwamoto, Kenichi; Sugimoto, Yuji; Namba, Toyoaki; Itoigawa, Masakatsu; Shibano, Yoshihumi; and Okada, Kenzi, 5,149,079, Cl. 271-162.000
Minakawa, Hiroshi; Kitaguchi, Yoshikazu; and Fukuda, Eiji, 5,149,929, Cl. 219-10.55B.
Morita, Akitaka; Matsuda, Eichika; Oba, Toshiro; and Inamori, Yoshimitsu, 5,150,316, Cl. 364-709.120.
Murata, Kaoru; and Matsuda, Eichika, 5,150,293, Cl. 364-419.000.
Nakanishi, Hiroshi; and Hamada, Hiroshi, 5,150,138, Cl. 353-38.000

Sharpe, Randall B.; Jones, J. Richard; O'Shea, Thomas E.; Casper, Paul W.; Toy, James W.; Evans, Gregory M.; and Sears, Richard N., to Broadband Technologies, Inc. Fiber optic telecommunication system employing continuous downlink, burst uplink transmission format with preset uplink guard band. 5,150,247, Cl. 359-135.000.

Shaw, Ching-Hao; Bosshart, Patrick; Matzke, Douglas; Kalyan, Vibhu; and Houston, Theodore, to Texas Instruments Incorporated. Comprehensive logic circuit layout system. 5,150,309, Cl. 364-491.000.

Shaw, Richard J.: *See—*
Bojar, James A.; and Shaw, Richard J., 5,148,568, Cl. 15-28.000.

Shaw-Walker Company, The: *See—*
Bonnema, Mark J.; and Morrison, David J., 5,149,035, Cl. 248-188.700.

Shea, Robert H., to Eastman Kodak Company. Transfer apparatus. 5,150,164, Cl. 355-271.000

Shearer, Clyde H.: *See—*
Woolf, Lawrence D.; Elsner, Frederick H.; and Shearer, Clyde H., 5,149,684, Cl. 505-1.000.

Sheehan, Gerald F. Device for attaching an IV pole to a hospital bed or the like. 5,149,036, Cl. 248-215.000

Sheldon Company: *See—*
Cares, George, 5,148,955, Cl. 223-70.000

Shelef, Mordecai: *See—*
Montreuil, Clifford N.; and Shelef, Mordecai, 5,149,511, Cl. 423-212.000.

Shell Oil Company: *See—*
Drent, Eit, 5,149,868, Cl. 562-497.000.
Klingensmith, George B., 5,149,733, Cl. 524-331.000.
Murata, Yasuyuki; Konishi, Isako; Tanaka, Ryohei; and Nakanishi, Yoshinori, 5,149,730, Cl. 523-466.000.
Olson, Donald C.; Miller, John J., deceased; and Miller, executor; Wayne M., 5,149,459, Cl. 252-191.000.
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 5,149,460, Cl 252-191.000
Wang, Pen-Chung, 5,149,823, Cl. 548-410.000

Shelton, Lawrence S.: *See—*
Gabriel, William L.; Lat, Geronimo E.; and Shelton, Lawrence S., 5,149,237, Cl. 411-446.000

Shen, Chao C. Adjustable latch assembly of lever lock. 5,149,151, Cl 292-1.500.

Shen, Jian-Kuo: *See—*
Staplin, Deborah K.; and Shen, Jian-Kuo, 5,150,468, Cl. 395-375.000.

Shepard, Howard M.: *See—*
Swartz, Jerome; Shepard, Howard M.; Darkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; and Barkan, Edward, 5,149,950, Cl. 235-472.000.

Sherba, Samuel E.; Mehta, Raj J.; Bowers-Daines, Margaret M.; and Chi-Tung Hsu, Adam, to Rohm and Haas Company. Antimicrobial polymeric quaternary ammonium salts. 5,149,524, Cl. 424-78.360.

Sheridan, Joseph F.: *See—*
James, Gordon W.; Sheridan, Joseph F.; and Moy, Wayne, 5,150,031, Cl. 320-2.000.

Sherman, James D., to Hughes Aircraft Company. Waveform tracking clipper circuit. 5,150,069, Cl. 328-171.000.

Sheu, Ceshing: *See—*
Sawyer, Donald T.; Sheu, Ceshing; Sobkowiak, Andrzej; and Tung, Hui-Chan, 5,149,880, Cl. 568-342.000.

Shi, Zhimin. Single lens reflex camera having film and still video functions. 5,150,215, Cl. 358-209.000.

Shibano, Yoshihumi: *See—*
Iwamoto, Kenichi; Sugimoto, Yuji; Namba, Toyoaki; Itoigawa, Masakatsu; Shibano, Yoshihumi; and Okada, Kenzi, 5,149,079, Cl. 271-162.000.

Shibayama, Hitoshi, to Aisin Seiki Kabushiki Kaisha. Disk file apparatus. 5,150,341, Cl. 369-36.000.

Shibuya, Takeaki: *See—*
Mizuta, Akira; and Shibuya, Takeaki, 5,148,946, Cl. 222-1.000

Shidoji, Eiji: *See—*
Gunkima, Tomoki; Yuki, Masanori; Kunigita, Masaya; Hirai, Yoshinori; Yoshikawa, Yukio; and Shidoji, Eiji, 5,150,232, Cl 359-51.000.

Shigeta, Teruaki: *See—*
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,149,186, Cl. 362-75.000.
Matsuno, Yoshio; Matsui, Hitoshi; Okamura, Izumi; Shigeta, Teruaki; and Tanabe, Yoshinori, 5,149,187, Cl. 362-80.000

Shih-Schroeder, Wen-Huey: *See—*
Kellenberger, Stanley R.; Shih-Schroeder, Wen-Huey; and Wisneski, Anthony J., 5,149,335, Cl. 604-372.000

Shikanai, Tsutomu: *See—*
Nishioka, Takeshi; Shikanai, Tsutomu; and Marumo, Hitoshi, 5,150,398, Cl. 378-132.000.

Shikichi, Satoshi; and Kanda, Shigeto, to Canon Kabushiki Kaisha. Optical information recording apparatus provided with means for sampling and holding a servo signal when the intensity of a light beam varies between intensity levels. 5,150,345, Cl. 369-44.340

Shima, Nobuhiko: *See—*
Iyori, Yusuke; and Shima, Nobuhiko, 5,149,361, Cl. 75-233.000

Shima, Yasuji, to Tosoh Corporation. Simple electronic file system 5,150,221, Cl. 358-403.000

Shimadzu Corporation: *See—*
Watabe, Katsunori; and Motokawa, Osamu, 5,149,426, Cl 210-198.200

Shimamune, Masayuki: *See—*
Watanabe, Yasuyuki; Shimamune, Masayuki; and Suzuki, Masaaki, 5,150,239, Cl. 359-80.000.

Shimanaka, Chikafumi: *See—*
Imai, Shinji; Hamano, Hiroshi; Fujinuma, Michio; Shimanaka, Chikafumi; and Urushidani, Shinzo, 5,150,288, Cl. 364-132.000

Shimano Industrial Co., Ltd.: *See—*
Hitomi, Yasuhiro, 5,149,006, Cl. 242-231.000
Oi, Takeshi, 5,149,008, Cl. 242-246.000
Sato, Jun, 5,149,009, Cl. 242-268.000

Shimanuki, Eizi: *See—*
Yamada, Shin-ichi; Goto, Takao; Yorita, Rie; Shimanuki, Eizi; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Semichi, 5,149,702, Cl. 514-303.000

Shimasaki, Kenichi: *See—*
Takenaka, Akira; Shimasaki, Kenichi; and Kanayama, Hiroshi, 5,149,106, Cl. 277-37.000

Shimazu, Hisanari: *See—*
Takahashi, Susumu; Takano, Akira; Miyanaga, Hirofumi; Shimazu, Hisanari; Nishioka, Kimihiko; Toda, Akitoshi; Shiraiwa, Masaru and Taniguchi, Akira, 5,150,234, Cl. 359-65.000

Shimizu Construction Co., Ltd.: *See—*
Yamada, Toshiyuki; Takahama, Yoshihiro; Nakajima, Hajime; and Nishiya, Takayuki, 5,148,650, Cl. 52-747.000

Shimizu, Ichio: *See—*
Yasuhara, Toshihiro; Masuda, Masachika; Murakami, Gen; Nishi, Kunihiko; Sakimoto, Masanori; Shimizu, Ichio; Hoshi, Akio, Okada, Sumio; and Nagamine, Tooru, 5,150,193, Cl. 357-70.000.

Shimizu, Ikuo: *See—*
Satoh, Tsutomu; Shimizu, Ikuo; and Ito, Yukiyoshi, 5,149,819, Cl. 548-149.000

Shimizu, Takaaki; Okon, Toshihiro; Ohba, Toshio; and Inokuchi, Yoshinori, to Shin-Etsu Chemical Co., Ltd. Process of preparing surface-modified polymethylsilsesquioxane spherical fine particles 5,149,748, Cl. 525-477.000.

Shimizu, Yasuhiko, to Kabushiki Kaisha Toshiba. Wire bonding method. 5,148,964, Cl. 228-102.000

Shimohira, Tetsuji; Higuchi, Yoshiaki; Saito, Yoshihiko; and Suzuki, Kohji, to Asahi Glass Company Ltd. Fluorine-containing cation exchange membrane for electrolysis and process for producing alkali metal hydroxide by using the same. 5,149,403, Cl. 204-98.000

Shimokoshi, Akira: *See—*
Toyama, Osamu; Shimokoshi, Akira; and Kawasaki, Takashi, 5,150,023, Cl. 318-567.000

Shimomura, Akihiko: *See—*
Shimomura, Masako; Noguchi, Hiromichi, and Shimomura, Akihiko, 5,150,132, Cl. 346-140.00R

Shimomura, Masako; Noguchi, Hiromichi; and Shimomura, Akihiko, to Canon Kabushiki Kaisha. Material containing a cured substance for use with a liquid ejection recording head and apparatus. 5,150,132, Cl. 346-140.00R

Shimomura, Nobuo, to Kabushiki Kaisha Toshiba. Electric cooking appliance. 5,149,944, Cl. 219-464.000

Shimotsuji, Shigeyoshi: *See—*
Hori, Osamu; Okazaki, Akio; and Shimotsuji, Shigeyoshi, 5,150,434, Cl. 382-57.000

Shimp, David A.; and Vanderlip, Jeffrey T., to Hi-Tek Polymers, Inc. Low temperature curable dicyanate esters of dihydric phenols. 5,149,863, Cl. 560-301.000

Shimura, Masayuki: *See—*
Kamono, Shinobu; Shimura, Masayuki; and Ishii, Tomoyuki, 5,150,021, Cl. 318-488.000

Shin-Etsu Chemical Co., Ltd.: *See—*
Shimizu, Takaaki; Okon, Toshihiro; Ohba, Toshio; and Inokuchi, Yoshinori, 5,149,748, Cl. 525-477.000

Shin, Hyunjeong, to Samsung Electronics. Separator for deflection yoke. 5,150,003, Cl. 313-440.000

Shin, Yun-Bok; and Lee, Joung-Sang; to SamSung Electronics Co., Ltd. Method and circuit for correction of horizontal edges. 5,150,214, Cl. 358-166.000.

Shin, Yun-seung; and Lee, Soo-Cheol; to Samsung Eectronics Co., Ltd. Self-aligning ion-implantation method for semiconductor device having multi-gate type MOS transistor structure. 5,149,664, Cl. 437-41.000.

Shinkai, Tatsuya; Suzuki, Kazuhiko; and Yokogi, Younosuke, to Suzuki Kabushiki Kaisha. Valve actuating mechanism in four-stroke cycle engine. 5,148,783, Cl. 123-90.160.

Shinko Denki Kabushiki Kaisha: *See*—
Nakamura, Hiroaki, 5,148,902, Cl. 192-84.00B.

Shinko Kosen Kogyo Kabushiki Kaisha: *See*—
Kurauchi, Makoto; Hayasaki, Kiyoshi; Minami, Toshikazu; and Ohnishi, Mutsuhiko, 5,149,385, Cl. 156-85.000.

Shinoda, Masayuki: *See*—
Aikoh, Hideki; Nakamura, Tohru; Shinoda, Masayuki; and Kikuchi, Noboru, 5,150,350, Cl. 369-112.000.

Shinohara, Junichi: *See*—
Ohno, Yoshimi; and Shinohara, Junichi, 5,150,143, Cl. 354-400.000.

Shinonaga, Hirohiko: *See*—
Takanashi, Itsuo; Nakagaki, Shinjaro; Asakura, Tsutou; Furuya, Masato; Shinonaga, Hirohiko; and Tai, Hiromichi, 5,150,226, Cl. 358-471.000.

Shintani, Akemi: *See*—
Seri, Hajime; Moriwaki, Yoshio; Shintani, Akemi; and Iwaki, Tsutomu, 5,149,383, Cl. 148-400.000.

Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, to Terumo Kabushiki Kaisha. Temperature measuring probe and electronic clinical thermometer equipped with same. 5,149,200, Cl. 374-185.000.

Shionogi & Co., Ltd.: *See*—
Matsumura, Hiromu; Yano, Toshikazu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masaru, 5,149,817, Cl. 546-281.000.

Shirai, Takahiro; Yoshinari, Tsuneori; and Muto, Kazuhiko, to Canon Kabushiki Kaisha. Semiconductor apparatus. 5,150,189, Cl. 357-53.000.

Shiraishi, Hajime: *See*—
Sawada, Kazuo; Fujii, Atsuhiko; Nakai, Yoshihiro; Ohkubo, Naoyuki; Shiraishi, Hajime; Ono, Fumio; Matsuda, Katsushi; and Tsuji, Kazunori, 5,149,917, Cl. 74-129.00R.

Shiraishi, Motoatsu; Nagamitsu, Tatsuo; and Nakamura, Mitsuki, to Honda Giken Kogyo Kabushiki Kaisha. Method for withdrawing workpiece from drawing mold. 5,148,697, Cl. 72-405.000.

Shiraishi, Yasunori; Nagahama, Masaharu; Murata, Mutsumi; Umeda, Yuzo; Yamada, Setsuo; and Morioka, Kazuyoshi, to Kubota Corporation. Governor device of diesel engine. 5,148,789, Cl. 123-367.000.

Shiraiwa, Masaru: *See*—
Takahashi, Susumu; Takano, Akira; Miyanaga, Hirofumi; Shimazu, Hisanari; Nishioka, Kimihiko; Toda, Akitoshi; Shiraiwa, Masaru; and Taniguchi, Akira, 5,150,23 , Cl. 359-65.000.

Shiratori, Akira; Kobayashi, Shozo; Takagi, Hiroshi; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. Solid oxide fuel cell. 5,149,601, Cl. 429-30.000.

Shiveley, Thomas M.: *See*—
DesMarais, Thomas A.; Dick, Stephen T.; and Shiveley, Thomas M., 5,149,720, Cl. 521-63.000.

Shoda, Craig: *See*—
Virga, Kathleen L.; Shoda, Craig; and Owens, Joseph N., 5,150,088, Cl. 333-238.000.

Shoemaker, Martin L.; Hughes, Dana N.; and Kuchta, Steven L., to Megatronics, Inc. Method for correlating color measuring scales. 5,150,199, Cl. 358-21.00R.

Shoji, Yoshifusa: *See*—
Hashiura, Mitsuo; Negura, Kenji; Kamiya, Sadayuki; Yamauchi, Shigenori; Suzuki, Yuji; Kato, Heinji; Tokizane, Naoki; and Shoji, Yoshifusa, 5,148,862, Cl. 165-1 4.100.

Shroot, Braham; and Darmon, Michel, to Centre International de Recherches Dermatologiques Galderma (CIRD Galderma). Compound marked with tritium, its preparation and its use in the location of nuclear receptors of retinoids. 5,149,631, Cl. 435-7.210.

Sianesi, Dario; Marraccini, Antonio; and Marchionni, Giuseppe, to AUSTIMONT S.r.l. Process for preparing peroxide perfluoropolyethers. 5,149,842, Cl. 549-550.000.

Sidhu, Gursharan S.; Oppenheimer, Allan B.; and Mathis, James E., to Apple Computer, Inc. Local area network device startup process. 5,150,464, Cl. 395-200.000.

Sidwell, John N.; and Corbin, Linn E., to Dayco Products, Inc. Belt tensioner and method of making the same. 5,149,306, Cl. 474-135.000.

Siebenhaar, Wolfgang: *See*—
Gericke, Willi; Wirth, Karl-Ernst; and Siebenhaar, Wolfgang, 5,149,229, Cl. 406-75.000.

Siedel, Joachim: *See*—
Vogt, Bernd; Schellong, Liselotte; Siedel, Joachim; and Ziegenhorn, Joachim, 5,149,633, Cl. 435-25.000.

Siefers, John E.: *See*—
McAuliffe, Robert E.; Cain, Christopher B.; and Siefers, John E., 5,150,048, Cl. 324-158.00R.

Siegel, Bernd: *See*—
Jessen, Joerg L.; Pandl, Klaus; Loeffler, Hermann; Siegel, Bernd; and Patsch, Manfred, 5,149,78 , Cl. 534-618.000.

Siegel, Robert P.: *See*—
Martin, Michael J.; Moore, Steven R.; Sokac, Russell J.; Siegel, Robert P.; and Garavuso, Gerald M., 5,149,077, Cl. 271-18.300.

Siemens Aktiengesellschaft: *See*—
Aichinger, Horst; Joite-Barfuss, Sigrid; and Koehler, Karlheinz, 5,150,393, Cl. 378-37.000.
Chen, Tzu H.; and Kumar, Mahesh, 5,150,083, Cl. 333-103.000

Siev, Aharon: *See*—
Chen, Yehuda Y.; and Siev, Aharon, 5,148,600, Cl. 33-1.00M.

Signitz, Gary L.: *See*—
Wells, James M.; and Signitz, Gary L., 5,148,572, Cl. 15-118.000.

Silari, Marco; and Birattari, Claudio, to Consiglio Nazionale Delle Ricerche. Apparatus and method for the absolute determination of the energy of a ion beam. 5,149,966, Cl. 250-309.000.

Silicon Technology Corporation: *See*—
Steere, Robert E., Jr., 5,148,797, Cl. 125-13.020.

Siltech Inc.: *See*—
O'Lenick, Anthony J., Jr., 5,149,765, Cl. 528-25.000.

Silvey, Elmer R. Forming tool for wire clamp. 5,148,577, Cl. 24-27.000.

Simmonds Precision Products, Inc.: *See*—
Maurice, Lisa B., 5,149,962, Cl. 250-227.170.

Simmons, Mark J.: *See*—
Wu, Yih-Shiong; Bohannon, Jeanne; White, Yolanda; and Simmons, Mark J., 5,149,272, Cl. 436-97.000.

Simo, Miroslav A. Arrow rest being laterally adjustable and instantly replaceable in a predetermined fixed position. 5,148,796, Cl. 124-44.500.

Simon, Artur; and Simon, Eva Z. n., to Muanygipari Kutato Intezet. Process for transforming amino- or hydroxy-containing materials of plant seed origin into plastics feedstocks. 5,149,763, Cl. 528-1.000.

Simon, Eva Z. n.: *See*—
Simon, Artur; and Simon, Eva Z. n., 5,149,763, Cl. 528-1.000.

Simon, Thomas H.: *See*—
Granger, Colin D.; and Simon, Thomas H., 5,149,538, Cl. 424-449.000.

Simoni, Giancarlo, to Siroflex S.r.l. Double knuckle joint for a wide range orientation of a liquid distributor with respect to a feeder pipe. 5,149,146, Cl. 285-166.000.

Simonsson, Leif: *See*—
Lundberg, Per J.; Wingstrand, Karin; Andersson, Kjell H.; and Simonsson, Leif, 5,149,523, Cl. 424-78.100.

Simpson, Sahron M.; Boon, John R.; Bucci, Marco; Bertoldi, Massimo; Soncini, Cristina; and Sakizadeh, Kumars, to Minnesota Mining and Manufacturing Company. Post processing stabilized photothermographic emulsions. 5,149,620, Cl. 430-617.000.

Sintokogio Ltd.: *See*—
Murata, Yutaka, 5,148,851, Cl. 164-20.000.
Oishi, Ukichi, 5,148,852, Cl. 164-169.000.

Sipe, Linus A. Portable utility platform unit. 5,148,890, Cl. 182-45.000.

Sipila, Eero; and Yli-Vakkuri, Erkki, to Tamglass Oy. Method for intermittently storing pairs of glass sheets in a windshield production line. 5,149,353, Cl. 65-107.000.

Sipma, Dale M., to Hughes Aircraft Company. Charged particle beam pattern generation apparatus and method. 5,149,976, Cl. 250-492.200.

Siroflex S.r.l: *See*—
Simoni, Giancarlo, 5,149,146, Cl. 285-166.000.

Skern, Timothy: *See*—
Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blaas, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, 5,149,783, Cl. 530-326.000.

SKF Industrie S.p.A.: *See*—
Vignoito, Angelo, 5,149,207, Cl. 384-478.000.

Skiba, Barbara T.; Harreld, Donald R.; and Ponsi, Lawrence G., to Sage Products, Inc. Stool collection and transport device. 5,149,506, Cl. 422-102.000.

Skinner, Burr W. Insect dispensing apparatus and method. 5,148,989, Cl. 239-171.000.

Skinner, Neal G.: *See*—
Schultz, Roger L.; Manke, Kevin R.; Skinner, Neal G.; Bohan, William L.; and Young, Allen R., 5,149,984, Cl. 290-54.000.

Skoblenick, Harry: *See*—
Lapp, Stephen P.; van Huuksloot, Ronald F.; Timan, Peter E.; and Skoblenick, Harry, 5,148,753, Cl. 104-290.000.

Skogby, Anna K.: *See*—
Nystrom, Mats G.; Larsson, Kenneth O.; Skogby, Anna K.; and Herstad, Solvie M., 5,149,442, Cl. 210-724.000.

Skrbis, Stan: *See*—
Passerell, David P.; and Skrbis, Stan, 5,149,054, Cl. 251-309.000.

Skruch, Harry J.; and Ward, John R., to United States of America, Navy. Apparatus for reduction of vibration in liquid-injected gas compressor system. 5,149,346, Cl. 55-438.000

Skyline Displays, Inc.: *See*—
Sorenson, Gary R.; and Gerberding, Philip C., 5,148,648, Cl. 52-646.000.

Slapsys, Michael, to CGC Inc. Angled connection of suspended ceiling tees. 5,149,221, Cl. 403-201.000.

Sloan Valve Company: *See*—
Wilson, John R.; and Vuong, Nhon T., 5,148,824, Cl. 137-3.000.

Smart, John E.: *See*—
Bailon, Pascal; Smart, John E.; and Weber, David V., 5,149,788, Cl. 530-350.000.

Smarte Carte Inc.: *See*—
Lewandowski, Mark S.; Gessner, David M.; and Anthony, Robert C., 5,149,114, Cl. 280-33.992.

Smith, Alan. Wall hanger. 5,149,037, Cl. 248-216.100.

Smith, Craig M.: *See*—
Miller, Rodney L.; and Smith, Craig M., 5,150,429, Cl. 382-50.000

Smith, David C.; Pattillo, Stevan G.; Laia, Joseph R., Jr.; and Sattelberger, Alfred P., to United States of America, Energy. Vapor deposition of thin films. 5,149,596, Cl. 428-656.000.

Smith, Derrell; and Cassar, Aladino. Machinery base pad. 5,149,050, Cl. 248-679.000.

Smith, Donald L.: *See*—
Barlow, George J.; and Smith, Donald L., 5,150,466, Cl. 395-325.000.

Smith, Douglas D.; and Bowman, Terrance L., to National Semiconductor Corporation. BICMOS positive supply voltage reference. 5,149,988, Cl. 307-296.600

Smith, Franklin G. Cookie dropper. 5,149,161, Cl. 294-26.500.

Smith, Gerald L.: *See*—
Hutchinson, Wilbur P.; and Smith, Gerald L., 5,149,393, Cl. 156-555.000.

Smith International, Inc.: *See*—
Hooper, Michael E., 5,148,879, Cl. 175-371.000.

Smith, Lowell S.: *See*—
Jones, Marshall G.; Harrison, Jerry T.; Piel, Joseph E., Jr.; and Smith, Lowell S., 5,148,962, Cl. 228-49.100.

Smith, Nathan R., to inTest Corporation. Electronic test head positioner for test systems. 5,149,029, Cl. 248-124.000.

Smith, Robert A.: *See*—
Schadow, Klaus C.; Gutmark, Ephraim; Wilson, Kenneth J.; and Smith, Robert A., 5,149,908, Cl. 89-7.000

Smith, Rodney I. Interlocking highway structure. 5,149,224, Cl. 404-6.000

Smith, Stanley D.: *See*—
Mikosch, Falk; and Smith, Stanley D., 5,150,183, Cl. 357-32.000.

Smith, Stewart G.; Morgan, Ralph W.; and Payne, Julian G., to VLSI Technology, Inc. Mixed-radix serial/parallel multipliers. 5,150,322, Cl. 364-760.000

Smith, W. Novis, to Cyprus Foote Mineral Company. Stable mixed lithium amide reagent compositions. 5,149,457, Cl. 252-182.120.

Smith, Warren R.: *See*—
Langlois, Edouard E.; Kehoe, Kathryn T.; Smith, Warren R.; Muscato, Mark; Ceglinski, Barbara D.; Kirchoff, Alan C.; Dunham, Robert F.; and Stair, Michael D., 5,149,612, Cl. 430-132.000

Smithgall, William T., to International Business Machines Corporation. Multiprocessor computer with optical data switch. 5,150,245, Cl. 359-117.000

Smits, Paul; Rosenfeld, Aron M.; and DeFerrari, Howard F., to Alcan International Limited. Tamper-evident structures. 5,149,386, Cl. 156-150.000

Smrt, Thomas J., to Fox Valley Systems, Inc. Spraying apparatus. 5,148,988, Cl. 239-150.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Sudau, Peter; and Rosenthal, Dieter, 5,149,004, Cl. 242-57.000

Snaith, Raymond E.; Barrasso, Max; and Jansson, Eric, to Aeroflex International Incorporated. Isolator with improved symmetrical response to shock and vibration forces. 5,149,066, Cl. 267-136.000.

Snap-on Tools Corporation: *See*—
Huebschen, David A.; Pagac, William T.; Mikic, Frank; Severson, Thomas S.; and Sorbie, Douglas M., 5,148,726, Cl. 81-119.000

Snoeren, Rudolph M.; and Scheuermann, Johannes W. J. M., to U.S. Philips Corporation. X-ray examination apparatus comprising an X-ray image intensifier tube. 5,150,396, Cl. 378-99.000.

Snook, Steven E. Filing box with adjustable and selectible position dividers, having corrugated box and divider walls. 5,148,942, Cl. 220-533.000

Sobkowiak, Andrzej: *See*—
Sawyer, Donald T.; Sheu, Ceshing; Sobkowiak, Andrzej; and Tung, Hui-Chan, 5,149,880, Cl. 568-342.000.

Societe Europeen des Produits Refractaires: *See*—
Recasens, Joseph; Urffer, Daniel; and Ferlanda, Pierre, 5,149,510, Cl. 423-84.000.

Societe Jacques Dubois: *See*—
Brandener, Louis, 5,149,068, Cl. 267-147.000

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Fournes, Jean-Paul; and Morbioli, Rene J., 5,149,376, Cl. 118-719.000.

Socon AB: *See*—
Stahl, Karl-Erik, 5,150,417, Cl. 381-154.000

Soga, Junko: *See*—
Murashige, Yoshio; and Soga, Junko, 5,149,762, Cl. 528-353.000

Sohma, Kiyoshi: *See*—
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,149,200, Cl. 374-185.000

Soifer, Martin T. Corner edge bumpers. 5,149,575, Cl. 428-188.000.

Sokac, Russell J.: *See*—
Martin, Michael J.; Moore, Steven R.; Sokac, Russell J.; Siegel, Robert P.; and Garavuso, Gerald M., 5,149,077, Cl. 271-18.300.

Solar Outdoor Lighting, Inc.: *See*—
Robbins, Steven, 5,149,188, Cl. 362-183.000.

Solland, Geir: *See*—
Olaussen, Stein; Bjordal, Audun; and Solland, Geir, 5,149,370, Cl. 106-737.000.

Solow, David J.: *See*—
Mothes, Helmut A.; Patwardhan, Bhalchandra H.; Schroeder, Theo G.; and Solow, David J., 5,149,643, Cl. 435-144.000.

Solt, Michael B.: *See*—
Malloy, John D.; and Solt, Michael B., 5,149,307, Cl. 475-200.000.

Soltralentz S.A.: *See*—
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Somar Corporation: *See*—
Funatsu, Ryoji; Mitsui, Susumu; Kurose, Shigeru; and Gato, Atsuko, 5,149,706, Cl. 514-372.000

Someya, Ikuo, to Sony Corporation. Video signal transmitting system. 5,150,207, Cl. 358-133.000.

Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blaas, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, to Boehringer Ingelheim International GmbH. Expression of the virally coded protease P2A of HRV2. 5,149,783, Cl. 530-326.000.

Soncini, Cristina: *See*—
Simpson, Sahron M.; Boon, John R.; Bucci, Marco; Bertoldi, Massimo; Soncini, Cristina; and Sakizadeh, Kumars, 5,149,620, Cl. 430-617.000.

Sonenshine, Daniel E.; Hamilton, J. Gordon; and Lusby, William R., to United States of America, Agriculture. Use of cholesteryl esters as mounting sex pheromones in combination with 2,6-dichlorophenol and pesticides to control populations of hard ticks. 5,149,526, Cl. 424-84.000

Sony Corporation: *See*—
Aguro, Masayuki; Tanaka, Hidekazu; Yoshida, Kimiyoshi; and Sakano, Akio, 5,150,424, Cl. 382-13.000
Ezaki, Tadashi, 5,150,218, Cl. 358-310.000
Iwaki, Yuji; and Funayama, Masanori, 5,150,269, Cl. 360-133.000
Iwata, Hirokimi; and Haruna, Shuji, 5,150,354, Cl. 369-291.000.
Iwatani, Mitsuo; Kamoda, Hitoshi; Mikuriya, Masatoshi; Kashiyama, Tadao; and Kajino, Yoshio, 5,149,218, Cl. 400-625.000
Nakabayashi, Toshiya, 5,150,264, Cl. 360-71.000.
Sakamoto, Hitoshi; and Kojima, Toshiaki, 5,150,263, Cl. 360-69.000
Senuma, Satoko; and Tsuruta, Masaaki, 5,150,217, Cl. 358-227.000
Someya, Ikuo, 5,150,207, Cl. 358-133.000
Tamada, Hitoshi; Yamada, Atsuo; Taneyama, Yukie; and Saitoh, Masaki, 5,150,447, Cl. 385-130.000.

Sooch, Navdeep S.: *See*—
Stern, Kenneth J.; Sooch, Navdeep S.; and Hein, Jerrell P., 5,150,386, Cl. 375-118.000.

Sorbie, Douglas M.: *See*—
Huebschen, David A.; Pagac, William T.; Mikic, Frank; Severson, Thomas S.; and Sorbie, Douglas M., 5,148,726, Cl. 81-119.000

Sorensen, Jens O., to Primtec. Injection-molding dimension-control and clamp-reduction. 5,149,482, Cl. 264-255.000.

Sorenson, Gary R.; and Gerberding, Philip C., to Skyline Displays, Inc. Quick-release frame connector. 5,148,648, Cl. 52-646.000

Sork, Frank J.: *See*—
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Sortex Limited: *See*—
Fraenkel, Herbert; and Mills, Stewart J., 5,148,923, Cl. 209-539.000

Soshi, Isao; and Takebayashi, Tatsuhide, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens driving device. 5,150,144, Cl. 354-400.000.

Sotome, Tetsuo: *See*—
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Sotoyama, Kaoru: *See*—
Tsuyama, Toshiaki; Nobumoto, Kazutoshi; Sotoyama, Kaoru; and Onaka, Toru, 5,148,884, Cl. 180-197.000

Soukup, Thomas G., to Celotex Corporation, The; and Apache Building Products Company. Dispersant for carbon black-filled foam 5,149,722, Cl. 521-99.000

Sowinski, Richard F. Method for filtering radon from a gas stream 5,149,343, Cl. 55-66.000.

Spangler, Philip: *See*—
McEldowney, Carl; and Spangler, Philip, 5,149,238, Cl. 413-8.000

Sparer, Ronald M.: *See*—
Catanzaro, John C.; and Sparer, Ronald M., 5,149,471, Cl. 264-40.500

Spaulding, Kevin E.: *See*—
Leone, Anthony J.; and Spaulding, Kevin E., 5,150,428, Cl. 382-50.000

Speck, Ralph: *See*—
Knepper, Udo; and Speck, Ralph, 5,150,126, Cl. 342-137.000

Spector, George: *See*—
Berkenheger, Bobby; and Spector, George, 5,148,764, Cl. 116-318.000
Huhn, John; and Spector, George, 5,149,016, Cl. 244-55.000

Spectra Products Corporation: *See*—
Visscher, Paul R., 5,148,696, Cl. 72-348.000.

Speiser, Peter P.; and Joshi, Rajendra K. Fumaric acid derivatives, process for the production thereof and pharmaceutical compositions containing same. 5,149,695, Cl. 514-75.000.

Spence, Jerry L.: *See*—
Hill, Dennis M.; and Spence, Jerry L., 5,148,804, Cl. 128-402.000

Spencer, Nicholas D.; Pan, Wie H.; and Rudesill, John, to W. R. Grace & Co. -Conn. Manufacturing method for superconducting ceramics and products thereof. 5,149,682, Cl. 505-1.000

Spiewak, John W.: *See*—
Yu, Robert C. U.; Spiewak, John W.; and Nichol-Landry, Deborah, 5,149,609, Cl. 430-58.000

Spiratos, Nelu: *See*—
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Sporlan Valve Company: *See*—
Leimbach, J. George; and Heffner, Joseph H., 5,148,684, Cl. 62-197.000

Sprink, Inc.: *See—*
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SRI International: *See—*
Sanjurjo, Angel, 5,149,514, Cl. 423-344.000.
Stafford, Daniel G.: *See—*
Borders, Richard L.; Stafford, Daniel G.; Richards, Sandy M.; and Walke, Allen L., 5,148,562, Cl. 5-610.000.
Stafford, Vondie A.; and Dennis, Linda. Dog boot. 5,148,657, Cl. 54-82.000.
Stahl, Karl-Erik, to Socon AB. Bass reflex type speaker system. 5,150,417, Cl. 381-154.000.
Stahl, Ted. Pre-sewn letter and method. 5,149,388, Cl. 156-250.000.
Stahlhofen, Paul; and Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for producing images on a photosensitive material. 5,149,613, Cl. 430-296.000.
Stahly, Daniel, to Eaton Corporation. Binary action pressure switch. 5,149,927, Cl. 200-83.00P.
Stair, Michael D.: *See—*
Langlois, Edouard E.; Kehoe, Kathryn T.; Smith, Warren R.; Muscato, Mark; Ceglinski, Barbara D.; Kirchoff, Alan C.; Dunham, Robert F.; and Stair, Michael D., 5,149,612, Cl. 430-132.000
Standard Fusee Corporation: *See—*
Waidner, Robert A.; and Brady, John J., 5,149,912, Cl. 102-343.000
Standard Products Company, The: *See—*
Malm, Douglas N., 5,149,478, Cl. 264-162.000
Standard Register Company, The. *See—*
Mowry, William H., Jr.; and Neitman, Robert L., 5,149,140, Cl. 283-93.000
Stanford Junior University: *See—*
Ho, Rodney; Merigan, Thomas Burke, Rae L.; and Dina, Dino, 5,149,529, Cl. 424-88.000.
Stanley Electric Corporation: *See—*
Tanaka, Hirokazu; Ishikawa Kiyomitsu; and Yamaguchi, Tomohiro, 5,149,952, Cl. 250-361.000.
Stapelbroek, Weinand A. M., to Coo tronic B.V., Abbinksweg. Cooling machine and an optimalized thermostatic expansion valve therefor 5,148,978, Cl. 236-68.00R
Staplin, Deborah K.; and Shen, Jian-Kuo, to Bull HN Information Systems Inc. State controlled instruction logic management apparatus included in a pipelined processing unit. 5,150,468, Cl. 395-375.000.
Stark, Gerald: *See—*
Hayes, Dennis F.; and Stark, Gerald, 5,150,467, Cl. 395-325.000.
State of Oregon: *See—*
Yatvin, Milton B.; Parks, David W.; McClard, Ronald W.; Stowell, Michael H. B.; and Witte, John F., 5,149,794, Cl. 536-29.000.
State of Oregon Acting by and Through the State Board of Higher Education on Behalf of Oregon State University, The: *See—*
Allstot, David J.; and Kiasei, Sayfe, 5,149,992, Cl. 307-448.000
Steadfast, Inc.: *See—*
Locatell, Louis; Norland, Kenneth; Roberts, F. Donald; and Zepp, Charles, 5,149,830, Cl. 549-227.000.
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Steere, Robert E., Jr., to Silicon Technology Corporation. Mounting for an internal diameter saw blade. 5,148,797, Cl. 125-13.020.
Steiger, Michel: *See—*
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Stein, Frank L.: *See—*
Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, 5,149,919, Cl. 178-19.000
Steinbaugh, Bruce A.: *See—*
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Steinman, Douglas H.: *See—*
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Stemler, Jay R., Jr.: *See—*
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Stenberg, Dale E.: *See—*
Nauman, Leonard G.; and Stenberg, Dale E., 5,149,112, Cl. 280-7.110
Stenlund, Sigvard J., to University Corporation for Atmospheric Research. Balloon parachute. 5,149,019, Cl. 244-145.000.
Stenz, Reinhard. Envelope feeder with adjustable constant overlap. 5,149,076, Cl. 271-2.000.
Stephens, Richard B.: *See—*
Ohkawa, Tihiro; Stephens, Richard B.; and Lieber, Albert J., 5,149,681, Cl. 505-1.000
Stern, Kenneth J.; Sooch, Navdeep S.; and Hein, Jerrell P., to Crystal Semiconductor Corporation. Clock multiplier/jitter attenuator. 5,150,386, Cl. 375-118.000
Sterzer, Fred, to MMTC, Inc. Temperature-measuring microwave radiometer apparatus. 5,149,198, Cl. 374-139.000.
Stewart & Stevenson Power, Inc.: *See—*
Dorn, Russell J., 5,149,246, Cl. 414-541.000.
Stiefel, Joseph F.: *See—*
Melvin, Terence; and Stiefel, Joseph F., 5,149,100, Cl. 273-232.000.
Stiffler, Richard C.: *See—*
Yu, Ho; Bruce, Douglas L.; Stiffler, Richard C.; Leon, David D.; and Glogowski, Francis J., 5,148,853, Cl. 164-455.000.
Stiles, Lorren: *See—*
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Stineman, John A.: *See—*
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Stingle, Frederick W.: *See—*
Preston, Mark A.; and Stingle, Frederick W., 5,149,996, Cl. 310-12.000.
Stirbis, James S.; and Lee, Franklin P., to Belgium Tool and Die Company. Can coater with improved deactivator responsive to absence of a workpiece. 5,148,742, Cl. 101-40.000.
Stockham, Thomas G., Jr.: *See—*
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Stokdijk, Willem: *See—*
van den Engh, Gerrit J.; and Stokdijk, Willem, 5,150,313, Cl. 364-569.000.
Stolin, Alexandr M.: *See—*
Merzhanov, Alexandr G.; Stolin, Alexandr M.; Buchatsky, Leonid M.; and Vedeneev, Sergei V., 5,149,677, Cl. 501-96.000.
Stolle Corporation, The: *See—*
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Yearkley, Lester M., 5,149,222, Cl. 403-291.000.
Storesund, Jan R. Processing machine for boiled/cooked crab 5,149,294, Cl. 452-10.000.
Stouffer, Ronald D., to Bowles Fluidics Corporation. Torch burner method and apparatus. 5,149,263, Cl. 431-2.000.
Stout, Virginia F.; Gaughlitz, Erich J., Jr.; and Nilsson, William B., to United States of America, Commerce. Process for preparing triglycerides containing polyunsaturated fatty acid moieties. 5,149,851, Cl. 554-165.000.
Stowell, Michael H. B.: *See—*
Yatvin, Milton B.; Parks, David W.; McClard, Ronald W.; Stowell, Michael H. B.; and Witte, John F., 5,149,794, Cl. 536-29.000.
Stoy, George P.: *See—*
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Stoy, Vladimir A.; and Stoy, George P., to Kingston Technologies, Inc. Precision molding of polymers. 5,149,052, Cl. 249-105.000.
Straeter, Joseph G.: *See—*
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Straeter, William F.: *See—*
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,148,918, Cl. 206-423.000
Strandberg, Charles F., Jr.; and Strandberg, Robert C. Method for monitoring size encapsulation of yarn by determining hairiness of the yarn. 5,149,981, Cl. 250-571.000.
Strandberg, Robert C.: *See—*
Strandberg, Charles F., Jr.; and Strandberg, Robert C., 5,149,981, Cl. 250-571.000
Strawson, Colin J.: *See—*
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Strid, Kent; and Oswaldsson, Rolf. Method and device for filturing of suspensions. 5,149,449, Cl. 210-798.000.
Striebig AG: *See—*
Striebig, Ludwig, 5,148,732, Cl. 83-863.000.
Striebig, Ludwig, to Striebig AG. Saw unit for a vertical board saw. 5,148,732, Cl. 83-863.000
Stritzl, Karl: *See—*
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Strohm, Gerhard; Kaul, Wilfried; and Schnieder, Georg, to Seitz-Filter-Werke GmbH und Co. Fluid distributing head for a membrane filter module for filtration of fluids. 5,149,430, Cl. 210-321.800.
Strouf, Marlin P.: *See—*
Wernecke, Charles R.; and Strouf, Marlin P., 5,148,929, Cl. 212-180.000.
Stubbs, Jan P.: *See—*
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Stupp, Eric: *See—*
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Molinaro, James; and Stupp, Eric, 5,149,158, Cl. 294-1.100.
Sucech, Steven W.; Marhanka, John E.; and Pearson, Alan, to Aluminum Company of America. Small sized alpha alumina particles and platelets. 5,149,520, Cl. 423-625.000
Suda, Hiroharu, to Nippon Connecticut Saw Co.; and Una Data Ltd. Plane motion mechanism. 5,148,716, Cl. 74-479.000
Suda, Shigeyuki: *See—*
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Suda, Yoshihisa, to Mitsubishi Pencil Co., Ltd. Method of making a diaphragm of carbonaceous material. 5,149,470, Cl. 264-29.600
Sudau, Peter; and Rosenthal, Dieter, to SMS Schloemann-Siemag Aktiengesellschaft. Method for coiling strip in reeling installations. 5,149,004, Cl. 242-57.000
Suen, A. Takashi: *See—*
Hakuta, Kohzo; Aramaki, Minoru; Suen, A. Takashi; Kodama, Mitsuo; Nakano, Hisaji; and Nakagawa, Shinsuke, 5,149,659, Cl. 436-55.000.

Suganuma, Masashi, to Nissei Jushi Kogyo Kabushiki Kaisha. Fuzzy inference thermocontrol method for an injection molding machine. 5,149,472, Cl. 264-40.600.
Sugasawa, Fukashi; Yokote, Masatsugu; and Yamamura, Tomohiro, to Nissan Motor Co., Ltd. Hydraulic damping device for vehicles. 5,149,131, Cl. 280-772.000
Sugawara, Saburo: *See—*
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Sugi, Hideo: *See—*
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Sugino, Koichi, to Seikosha Co., Ltd. Carriage position error detection in a serial printer. 5,149,215, Cl. 400-279.000.
Sugioka, Takami, to Teijin Seiki Co., Ltd. Yarn traversing apparatus. 5,149,002, Cl. 242-43.00A.
Sugisawa, Masakazu: *See—*
Saito, Tadao; Sugisawa, Masakazu; and Watanabe, Yoshio, 5,149,178, Cl. 303-116.00R.
Sugishima, Noboru; Ikeda, Noriaki; Fujii, Yasushi; and Inoue, Akira, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for producing 1-aminoanthraquinones. 5,149,848, Cl. 552-238.000.
Sugita, Toshio; and Koseki, Osamu, to Department of Electrical Engineering, Science University of Tokyo; and Seiko Instruments Inc. Film forming apparatus. 5,149,415, Cl. 204-298.140.
Sullivan, Michael W.: *See—*
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Sullivan, Shelby F.; Gordon, Frank E.; and Castile, Brett D., to United States of America, Navy. Frequency dispersive transmitting array. 5,150,336, Cl. 367-103.000.
Sumihara, Masanori: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,149,366, Cl. 106-22.000.
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Sumitomo Electric Industries, Ltd.: *See—*
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Fujioka, Hideaki, 5,150,299, Cl. 364-426.020.
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Sumitomo Wiring Systems, Ltd.: *See—*
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Summers, James B.; Davidsen, Steven K.; Steinman, Douglas H.; Phillips, James G.; Martin, Michael B.; and Guinn, Denise E., to Abbott Laboratories. Platelet activating antagonists. 5,149,704, Cl. 514-342.000
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Sunshine, Morton, to ACR Electronics, Inc. Battery arrangement. 5,149,598, Cl. 429-1.000.
Suomela, Martti, to ABB Stromberg Drives Oy. Fan for an electrically operated machine. 5,149,997, Cl. 310-63.000.
Suptitz, Eric; and Diaferia, Joseph, to Merlin Gerin. Continuous monitoring system of the electrical conduction of a mains system 5,150,057, Cl. 324-508.000.
Surgical Dynamics, Inc.: *See—*
Clawson, Benjamin S., 5,149,324, Cl. 604-110.000
Sutor, Uli: *See—*
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Suwa, Toshio; Kobayashi, Nobuaki; and Hirano, Takashi, to Nippon Sanso Kabushiki Kaisha. Oxygen heater and oxygen lance using oxygen heater. 5,149,261, Cl. 431-207.000.
Suzuki, Hiroyuki, to Fujitsu Limited. Method and apparatus for monitoring an optical network interface. 5,150,243, Cl. 359-110.000
Suzuki Kabushiki Kaisha: *See—*
Shinkai, Tatsuya; Suzuki, Kazuhiko; and Yokogi, Younosuke, 5,148,783, Cl. 123-90.160
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Watanabe, Yasuyuki; Shimamune, Masayuki; and Suzuki, Masaaki, 5,150,239, Cl. 359-80.000.
Suzuki, Morio: *See—*
Nitoh, Hirohisa; Ohura, Osami; and Suzuki, Morio, 5,149,871, Cl. 562-556.000
Suzuki, Nobuhiro, to Futaba Denshi Kogyo K.K. Motor drive circuit for radio-controlled model. 5,150,027, Cl. 318-581.000.
Suzuki, Nobuo: *See—*
Wada, Takahiro; Suzuki, Nobuo; Ichinose, Ataru; Yaegashi, Yuji; Yamauchi, Hisao; and Tanaka, Shoji, 5,149,683, Cl. 505-1.000
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Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzurtha, Teruaki; and Nexo, Bjorn A., 5,149,533, Cl. 424-94.640
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Suzuki, Tadashi: *See—*
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Suzuki, Takahiko: *See—*
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Hashiura, Mitsuo; Negura, Kenji; Kamiya, Sadayuki; Yamauchi, Shigenori; Suzuki, Yuji; Kato, Kenji; Tokizane, Naoki; and Shoji, Yoshifusa, 5,148,862, Cl. 165-134.100
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Burling, Hans, 5,149,647, Cl. 435-192.000
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Ferdman, Ariel; Kuo, Jing-wen; Miller, David; Pinsky, Vladimir, Richards, William D.; and Swann, David, 5,149,331, Cl. 604-290.000
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Swartz, Jerome; Shepard, Howard M., Darkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; and Barkan, Edward, to Symbol Technologies, Inc. Hand-held laser scanning head having detachable handle portion. 5,149,950, Cl. 235-472.000
Swei, Gwo S.: *See—*
Arthur, David; and Swei, Gwo S., 5,149,590, Cl. 428-421.000
Swenson, Richard M.; Andes, David K.; Witcher, Donald H., Lickleider, Robert A.; and Barbieri, James F., to United States of America, Navy. Method and circuits for neuron perturbation in artificial neural network memory modification. 5,150,450, Cl. 395-23.000.
Swenson, Roger M., Jr.: *See—*
Swenson, Roger M., Sr.; and Swenson, Roger M., Jr., 5,148,720, Cl. 74-606.00R
Swenson, Roger M., Sr.; and Swenson, Roger M., Jr. Lock-up solenoid assembly. 5,148,720, Cl. 74-606.00R.
Swirczewski, John W.: *See—*
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Sydor, Robin M., to Ergodyne Corporation. Back support with side openings and attached apron. 5,148,549, Cl. 2-44.000
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Swartz, Jerome; Shepard, Howard M.; Darkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; and Barkan, Edward, 5,149,950, Cl. 235-472.000
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Doggett, David E.; and Dahlquist, Brian J., 5,148,595, Cl. 29-840.000

Szarka, Sandor, to Precision Screen Machines, Inc. Vacuum track and pallets. 5,149,045, Cl. 248-363.000.
Szilagyi, Andrei: *See—*
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Tab Products Company: *See—*
Lahti, Richard; and Thomas, Kent, 5,148,754, Cl. 105-96.000
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Tabata, Yasushi: *See—*
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Tabata, Yoichiro; Ueda, Yoshihiro; Ueguri, Shigeo; and Hara, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Substance vaporizing apparatus. 5,150,375, Cl. 372-98.000.
Tacke, David J.; and Perhacs, Leslie, to Binoptic International Systems, Inc. Binocular vending apparatus and method. 5,148,905, Cl. 194-210.000
Taeuber, Ralph, Jr.; Castillo, Sergio A., Jr.; and Ungchusri, Tep, to FMC Corporation. Pipe swivel joint with improved bore seal. 5,149,148, Cl. 285-276.000.
Tai, Hiromichi: *See—*
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Taisei Purasu Co., Ltd.: *See—*
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Tait, Bradley: *See—*
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Tajima, Hisao: *See—*
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Takagi, Akira; Tsuruta, Masao; Kita, Akihisa; and Sawahara, Shingo, to Fuji Photo Film Co., Ltd. Magnetic tape wind-up method. 5,149,005, Cl. 242-67.10R
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Takagi, Hisamitsu: *See—*
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Takahama, Kouichi; Hirao, Shozo; Yokoyama, Masaru; Kishimoto, Takashi; Yokogawa, Hiroshi; and Makino, Atsushi, to Matsushita Electric Works, Ltd. Method of preparing inorganic porous member 5,149,513, Cl. 423-328.000.
Takahama, Yoshihiro: *See—*
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Takahara, Yoshimasa: *See—*
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Takahashi, Kazunori: *See—*
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Takahashi, Susumu; Takano, Akira; Miyanaga, Hirofumi; Shimazu, Hisanari; Nishioka, Kimihiko; Toda, Akitoshi; Shiraiwa, Masaru; and Taniguchi, Akira, to Olympus Optical Co., Ltd. Imaging apparatus having electrooptic devices comprising a variable focal length lens. 5,150,234, Cl. 359-65.000.
Takai, Kazuki; Teraguchi, Yuuji; and Nakatani, Mitsuo, to Clarion Co., Ltd. Disc loading structure. 5,150,749, Cl. 369-75.200
Takamura, Fujitoshi: *See—*
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Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Shinonaga, Hirohiko; and Tai, Hiromichi, to Victor Company of Japan, Ltd. Method and apparatus for repeatedly recording optical image information and image pickup device. 5,150,226, Cl. 358-471.000
Takano, Akihiko; Sakurai, Yoshihiko; and Iida, Katsumi, to Zexel Corporation. Control system for variable-capacity compressor in air conditioner. 5,148,685, Cl. 62-229.000
Takano, Akira: *See—*
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Takashi, Yukihisa; and Fukaya, Nobuki, to Aisin Seiki Kabushiki Kaisha. Clutch cover assembly. 5,148,704, Cl. 192-89.00B.
Takashima, Hidenori, to Fanuc Ltd. Machining fluid temperature deviation alarm. 5,150,102, Cl. 340-584.000.
Takasuka, Kaoru; and Takahashi, Ken'ichi, to Asahi Kasei Microsystems Co. Ltd. Analog arithmetic circuit that can perform multiplication division expansion and compression by using delta sigma modulator. 5,150,324, Cl. 364-807.000.
Takata Corporation: *See—*
Kawamura, Yoshihisa, 5,149,189, Cl. 362-108.000
Maekawa, Tetsuya; Nanbu, Yuichi; and Kosugi, Noriyuki, 5,149,136, Cl. 280-808.000.
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Yano, Hideaki, 5,149,302, Cl. 464-52.000
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Takayanagi, Hisao; Kitano, Yasunori; and Morinaka, Yasuhiro, to Mitsubishi Kasei Corporation. Conjugated diene compounds. 5,149,843, Cl. 549-561.000.
Takayanagi, Yoshiaki: *See—*
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Takebayashi, Tatsuhide: *See—*
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Takeda Garden Product Co., Ltd.: *See—*
Obayashi, Hisashi; Matsumura, Yasuhiro; and Mochida, Akitoshi, 5,149,534, Cl. 424-195.100.
Takeda, Haruo; and Tabata, Kuniaki, to Hitachi, Ltd. Image data display system. 5,150,462, Cl. 395-166.000.
Takeda, Katsuyuki: *See—*
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Takeda, Mutsuhiko; Hagiwara, Isao; Zaima, Fumiya; and Sakaguchi, Shuzabu, to Mitsubishi Gas Chemical Company, Inc. Process for production of sulfonium compounds. 5,149,857, Cl. 558-271.000.
Takeda, Shinichi; and Yamanobe, Masato, to Canon Kabushiki Kaisha. Amorphous thin film semiconductor device with active and inactive layers. 5,150,181, Cl. 357-30.000.
Takehana, Toshihiro: *See—*
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Takemura, Jun: *See—*
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Takenaka, Akira; Shimasaki, Keiichi; and Kanayama, Hiroshi, to Taiho Kogyo Co., Ltd. Lip seal device. 5,149,106, Cl. 277-37.000
Takesako, Masafumi: *See—*
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Takeshita, Fusayuki: *See—*
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Takeuchi, Kiyoshi, to Nissan Motor Co., Ltd. Electrostatic capacitance sensing circuit. 5,150,062, Cl. 324-675.000.
Takeuchi, Takashi: *See—*
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Takewa, Hiroyuki: *See—*
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Takeyasu, Takumi: *See—*
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Takigawa, Tomoya: *See—*
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Takiguchi, Yasuyuki: *See—*
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Tamada, Hitoshi; Yamada, Atsuo; Taneyama, Yukie; and Saitoh, Masaki, to Sony Corporation. Optical waveguide which is formed by liquid phase epitaxial growth. 5,150,447, Cl. 385-130.000.
Tamei, Akira; Oshio, Katsuhiro; Sumoto, Tadaaki; Tozawa, Yoshihisa; Nakahara, Takashi; Nishimoto, Masaru; and Yasui, Yasuhiko, to Hitachi Zosen Corporation. Cooling apparatus for bulk material. 5,148,687, Cl. 62-266.000.
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Tanabe, Yoshinori: *See—*
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Tanaka, Hirokazu; Ishikawa, Kiyomitsu; and Yamaguchi, Tomohiro, to Stanley Electric Corporation. Optical gauging apparatus using dual beams and intermittent interruption. 5,149,952, Cl. 250-561.000

Tanaka, Hiroshi: *See—*
Nagai, Toshinari; Tanaka, Hiroshi; and Suzuki, Makoto, 5,148,795, Cl. 123-697.000
Tanaka, Ryo: *See—*
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Tanaka, Ryohei: *See—*
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Tanaka, Satoru; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, to Aisin AW Co., Ltd. Regenerative braking electric vehicle with four motors. 5,148,883, Cl. 180-165.000.
Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Tape tensioning device for tape recorder. 5,150,265, Cl. 360-71.000.
Tanaka, Shoji: *See—*
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Tanaka, Toshiaki. Apparatus for assessing gas odor intensity. 5,149,504, Cl. 422-88.000
Tanashin Denki Co., Ltd.: *See—*
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Tanielian, Minas H.: *See—*
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Taniguchi, Vernon T.; and Doty, Allen W., to Union Oil Company of California. Continuous displacement chromatographic method. 5,149,436, Cl. 210-657.000
Tanizawa, Tetsu: *See—*
Kikuchi, Hideo; and Tanizawa, Tetsu, 5,149,993, Cl. 307-465.100.
Tanniscoli, Robert J.: *See—*
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Tanox Biosystems, Inc.: *See—*
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Tanuma, Jiro; and Katakura, Shinichi, to Oki Electric Industry Co., Ltd. Printer carriage assembly having thermal dissipating means 5,149,216, Cl. 400-320.000
Taoka Chemical Company: *See—*
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,149,366, Cl. 106-22.000
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Tappe, Gustav; Wichmann, Ralf; Meckl, Heinz; and Draber, Edgar, to Agfa Gevaert Aktiengesellschaft. Bleach fixing process. 5,149,618, Cl. 430-393.000.
Tarancon, Gregorio, to Liquid Carbonic Inc. Process for the direct fluorination of polymeric resins. 5,149,744, Cl. 525-356.000.
Taranowski, Michael G.: *See—*
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Tastad, Gregory J., to William Electronics Games, Inc. Player-operated control system for pinball games. 5,149,094, Cl. 273-121.00A
Tateno, Masakazu, to Fuji Zerox Co., Ltd. Plural dictionary apparatus with automatic retrieval from more than one plug-in IC dictionary card. 5,150,294, Cl. 364-419.000.
Tateuchi, Makoto; and Ozue, Kentaro, to Mazda Motor Corporation. Conveying system. 5,149,371, Cl. 118-56.000.
Taue, Jun, to Yamaha Hatsudoki Kabushiki Kaisha. High pressure fuel injection device for engine. 5,148,987, Cl. 239-96.000.
Taylor, Dennis M.: *See—*
Kozik, Andrew F.; and Taylor, Dennis M., 5,149,918, Cl. 178-18.000
Taylor, John A.; and Caryk, Paul J. Paper coater skip prevention and deaeration apparatus and method. 5,149,341, Cl. 55-36.000.
Taylor, John A., to Imperial Chemical Industries plc. Bis chlorotriazine reactive dyes containing a benzylamine linking group. 5,149,790, Cl. 534-634.000
Taylor, Paul D.: *See—*
De Thomas, Waldo; Taylor, Paul D.; and Tomfohrde, Heinn F., III, 5,149,836, Cl. 549-325.000
Teac Corporation: *See—*
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Teijin Limited: *See—*
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Teikoku Piston Ring Co., Ltd.: *See—*
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Tektronix, Inc.: *See—*
Keller, Peter A., 5,149,182, Cl. 356-405.000
Telang, Anil M.; and McDowell, Douglas J., to Baxter International Inc. Vacuum system for auto transfusion device. 5,149,325, Cl. 604-119.000
Telavag Energiteknikk A/S: *See—*
Ovretveit, Hans A., 5,148,858, Cl. 165-38.000
Telediffusion de France: *See—*
Charbonnel, Pierre; and Thepaut, Bernard, 5,150,211, Cl. 358-143.000
Teledyne Industries, Inc.: *See—*
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Teledyne Inet: *See—*
McEntire, Jay; Haglund, Richard; Johnson, Ed; and MacFarlane, J Garrett, 5,149,017, Cl. 244-114.00R
Telefonaktiebolaget L M Ericsson: *See—*
Akerberg, Dag E., 5,150,362, Cl. 370-95.100
Telephonic Equipment Corporation: *See—*
Yasuda, Jerry, 5,150,399, Cl. 379-67.000
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Rinaldi, Paolo; and Cecili, Federico, 5,150,070, Cl. 329-307.000
Telle, Lawrence B., to Eastman Kodak Company. Copier with single pass auto exposure. 5,150,223, Cl. 358-448.000.
Teltronics, Inc.: *See—*
Hills, Gerritt G.; and Hills, Vicki L., 5,149,281, Cl. 439-521.000
Temple University: *See—*
Croce, Carlo M., 5,149,628, Cl. 435-6.000
Marks, Lloyd A., 5,149,965, Cl. 250-252.100
Tennessee Gas Pipeline Company: *See—*
Weeks, Andrew M., 5,148,597, Cl. 29-890.080
Tennichi, Kazuhito, to Nippon Seiko Kabushiki Kaisha. Dust seal device of a linear guide apparatus. 5,149,204, Cl. 384-15.000
Terabayashi, Takao: *See—*
Okada, Kenichi; Amemiya, Kyoko; Terabayashi, Takao; Sasaki, Hideaki; Imai, Kuninori; and Kazui, Shinichi, 5,150,274, Cl. 361-382.000
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Terumo Kabushiki Kaisha: *See—*
Kohno, Hiromasa; Honda, Hiroaki; and Nudeshima, Masahiro, 5,149,503, Cl. 422-82.050.
Oshiyama, Hiroaki, 5,149,327, Cl. 604-167.000
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,149,200, Cl. 374-185.000
Tevanian, Georges: *See—*
Jerome, Denis; Tevanian, Georges; Batail, Patrick; and Fourmigue, Marc, 5,149,946, Cl. 235-439.000
Texaco Inc.: *See—*
Macy, Daniel H., 5,149,344, Cl. 55-167.000
Texas A & M University System, The: *See—*
Sawyer, Donald T.; Sheu, Ceshing; Sobkowiak, Andrzej; and Tung, Hui-Chan, 5,149,880, Cl. 568-342.000.
Texas Instruments Incorporated: *See—*
Eklund, Robert H., 5,150,184, Cl. 357-34.000
Gill, Manzur, 5,150,179, Cl. 357-23.500
Maxey, Jay A., Jr.; and Ovens, Kevin M., 5,150,385, Cl 375-106.000
Shaw, Ching-Hao; Bosshart, Patrick; Matzke, Douglas; Kalyan, Vibhu; and Houston, Theodore, 5,150,309, Cl. 364-491.000

Unterweger, Diethard; Popat, Pravin N.; and Candelet, Ronald J., 5,150,271, Cl. 361-119.000
Wills, Kendall S.; Rodriguez, Paul A.; and Brewer, Melvin L., 5,149,675, Cl. 437-248.000
Textron Inc.: *See—*
Morrow, John A., 5,148,992, Cl. 239-289.000
Thai, Jwohaw: *See—*
Hickman, Lawrence G.; Lewis, William D.; Thai, Jwohaw; and Wirt, Joseph C., 5,148,741, Cl. 101-32.000.
Tharalson, Diana M.: *See—*
Tharalson, Douglas E.; and Tharalson, Diana M., 5,148,561, Cl. 5-95.000.
Tharalson, Douglas E.; and Tharalson, Diana M. Baby crib adjacent to parental bed. 5,148,561, Cl. 5-95.000
Tharp, Glen D. Toilet paper holder and paper towel holder. 5,149,003, Cl. 242-55.200.
Theis, Ulrich: *See—*
Becker, Wilfried; Bethmann, Karl W.; Bisping, Bernhard; and Theis, Ulrich, 5,148,750, Cl. 102-439.000
Thepaut, Bernard: *See—*
Charbonnel, Pierre; and Thepaut, Bernard, 5,150,211, Cl. 358-143.000
Therma-Wave, Inc.: *See—*
Opsal, Jon; and Rosencwaig, Allan, 5,149,978, Cl. 250-560.000
Thermo Electron Web Systems, Inc.: *See—*
Langevin, Eric T.; and Bourque, James A., 5,149,401, Cl. 162-207.000
Thevignot, Roger, to Adir et Compagnie. Industrial process for the preparation of (1S)-1-[N-(4-O-deacetyl-23-vinblastinoyl)amino]-2-methylpropyl diethyl phosphonate and its salts. 5,149,812, Cl. 546-23.000
Thiesen, Stefan, to Rheinmetall GmbH. Weapon. 5,149,907, Cl. 89-7.000
Thomann, Pierre, to Oscilloquartz S.A. Microwave interaction module, in particular for an atomic or molecular beam resonator. 5,149,964, Cl. 250-251.000
Thomas, Alexander R.; and Pruszenski, Anthony S., Jr., to Thomas, Alexander Rhys. Attitude indicator device utilizing capacitance measurement. 5,150,104, Cl. 340-686.000
Thomas, Alexander Rhys: *See—*
Thomas, Alexander R.; and Pruszenski, Anthony S., Jr., 5,150,104, Cl. 340-686.000
Thomas, Kent: *See—*
Lahti, Richard; and Thomas, Kent, 5,148,754, Cl. 105-96.000
Thomas, Matthew J. Method for treating mausoleums against phorid fly infestation. 5,148,627, Cl. 43-125.00
Thomas, Michael E.; and Anand, Kranti V., deceased (by Anand, Madhu, heir), to National Semiconductor Corp. Integrated circuit electronic grid device and method. 5,150,019, Cl. 315-350.000
Thomason, Arlen R., to Amgen Inc. Platelet-derived growth factor B chain analogs. 5,149,792, Cl. 530-399.000.
Thompson, Andrew S.: *See—*
Humphrey, Guy R.; Madar, Ann M.; and Thompson, Andrew S., 5,149,838, Cl. 549-471.000.
Thompson, Edmund: *See—*
Baker, Richard L.; Bernstein, Jeffrey; Girod, Bernd; Yuan, Xiancheng; and Thompson, Edmund, 5,150,209, Cl. 358-133.000
Thompson, James W., Jr. Turf repair tool including club support. 5,149,087, Cl. 273-32.00B
Thompson, William W.: *See—*
Hagen, Richard L.; Baldwin, William C.; and Thompson, William W., 5,149,909, Cl. 89-33.160.
Thomson-CSF: *See—*
Joffre, Pascal; Illiaquer, Gerard; and Huignard, Jean-Pierre, 5,150,241, Cl. 359-89.000
Perbet, Jean-Noel; Bossoutrot, Pierre; and Geneste, Philippe, 5,150,105, Cl. 340-701.000
Thomson-TRT Defense: *See—*
Foulloy, Jean-Pierre; and Loy, Fernand R., 5,149,969, Cl. 250-334.000
Thomson Video Equipement: *See—*
Desmons, Gerard, 5,150,442, Cl. 385-101.000.
Tiemann, Roy G.: *See—*
Ashby, James C., III; Burkhart, Clark; Favors, Frankie B.; Tiemann, Roy G.; Vandaveer, Robert L.; and Krause, Lothar A., Jr., 5,150,401, Cl. 380-29.000
Tillyer, John N., Sr. Razor blade carrier. 5,148,916, Cl. 206-352.000
Timan, Peter E.: *See—*
Lapp, Stephen P.; van Huuksloot, Ronald F.; Timan, Peter E.; and Skoblenick, Harry, 5,148,753, Cl. 104-290.000
Timberlake, George A., Jr.: *See—*
Brahmbhatt, Sudhir R.; and Timberlake, George A., Jr., 5,149,500, Cl. 422-31.000
Tiollais, Pierre: *See—*
Blaudin de THE, Hugues; Marchio, Agnes; Tiollais, Pierre; and Dejean, Anne, 5,149,781, Cl. 530-326.000.
Tipon, Donald G.; and Stubbs, Jan P., to NCR Corporation. Method and apparatus for offset register address accessing. 5,150,471, Cl. 395-400.000
TMC Corporation: *See—*
Wittmann, Heinz; Stritzl, Karl; and Janisch, Andreas, 5,149,124, Cl. 280-633.000
Toa Eiyo Ltd.: *See—*
Yamada, Shin-ichi; Goto, Takao; Yorita, Rie; Shimanuki, Eizi; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Senichi, 5,149,702, Cl. 514-303.000
Toa Medical Electronics Co., Ltd.: *See—*
Kouzuki, Chihiro, 5,150,037, Cl. 324-71.400
Tochigifujisangyo Kabushiki Kaisha: *See—*
Kurihara, Sakuo; and Sakamoto, Kazuhiro, 5,148,901, Cl. 192-67.00R
Toda, Akitoshi: *See—*
Takahashi, Susumu; Takano, Akira; Miyanaga, Hirofumi; Shimazu, Hisanari; Nishioka, Kimihiko; Toda, Akitoshi; Shiraiwa, Masaru; and Taniguchi, Akira, 5,150,234, Cl. 359-65.000.
Togai, Kazuhide: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Ando, Hiromitsu; Takemura, Jun; Koujina, Eiichi; and Kojima, Ichiyo, 5,150,300, Cl. 364-431.030
Togashi, Shigekazu: *See—*
Hosokawa, Nobuo; and Togashi, Shigekazu, 5,150,262, Cl. 360-48.000.
Togawa, Hitoshi: *See—*
Masuda, Yoshihiro; Murata, Akira; Togawa, Hitoshi; and Miura, Nobuaki, 5,150,142, Cl. 354-324.000.
Tohoku Electric Power Co., Inc.: *See—*
Wada, Takahiro; Suzuki, Nobuo; Ichinose, Ataru; Yaegashi, Yuji; Yamauchi, Hisao; and Tanaka, Shoji, 5,149,683, Cl. 505-1.000.
Tokai Denka Kogyo Kabushiki Kaisha: *See—*
Nitoh, Hirohisa; Ohura, Osami; and Suzuki, Morio, 5,149,871, Cl. 562-556.000.
Tokai Kogyo Co. Ltd.: *See—*
Yada, Yukihiko; and Wato, Yasuhiro, 5,149,168, Cl. 296-201.000.
Tokimec, Inc.: *See—*
Asa, Masahito; and Nakajima, Masayuki, 5,150,084, Cl. 333-128.000
Tokitou, Yoshihiko; and Honjo, Atsushi, to Kabushiki Kaisha Toshiba. Solid-state image sensing device having an optimum overflow drain voltage generation circuit. 5,150,216, Cl. 358-213.110.
Tokiwa, Toru, to Amada Company, Limited. Cut sections conveying device for a cutting machine. 5,148,907, Cl. 198-468.200.
Tokizane, Naoki: *See—*
Hashiura, Mitsuo; Negura, Kenji; Kamiya, Sadayuki; Yamauchi, Shigenori; Suzuki, Yuji; Kato, Kenji; Tokizane, Naoki; and Shoji, Yoshifusa, 5,148,862, Cl. 165-134.100.
Tokusa, Kenji: *See—*
Hibino, Yozo; Nakayama, Susumu; Yasuda, Hiromu; Oguni, Kensaku; and Tokusa, Kenji, 5,148,977, Cl. 236-49.300.
Tokyo Electric Power Co., Inc., The: *See—*
Wada, Takahiro; Suzuki, Nobuo; Ichinose, Ataru; Yaegashi, Yuji; Yamauchi, Hisao; and Tanaka, Shoji, 5,149,683, Cl. 505-1.000.
Tokyo Keiki Co., Ltd.: *See—*
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 5,148,814, Cl. 128-804.000
Tolco, Incorporated: *See—*
Heath, Richard W., 5,149,040, Cl. 248-300.000
Tomfohrde, Heinn F., III: *See—*
De Thomas, Waldo; Taylor, Paul D.; and Tomfohrde, Heinn F., III, 5,149,836, Cl. 549-325.000.
Tomimori, Koji: *See—*
Hazato, Atsuo; Takeyasu, Takumi; Tomimori, Koji; and Kato, Yoshinori, 5,149,859, Cl. 560-10.000
Tomita, Yasuo; Oda, Hitoshi; and Okuda, Masahiro, to Canon Kabushiki Kaisha. Optical polarization-state converting apparatus for use as isolator, modulator and the like. 5,150,251, Cl. 359-246.000.
Tompkins, E. Neal: *See—*
Lak, Khosrow; and Tompkins, E. Neal, 5,150,158, Cl. 355-239.000.
Tomura, Masashi; and Takagi, Hisamitsu, to Fujitsu Limited. Electromagnetic shielding structure of high-frequency circuit arrangements. 5,150,282, Cl. 361-424.000.
Tomy Company, Ltd.: *See—*
Kashimoto, Kiyoshi; and Mizunuma, Masanori, 5,149,095, Cl. 273;121 B-
Tone, Eiichi: *See—*
Mizude, Kazuhiro; Matsuda, Hirofumi; Yamamoto, Haruo; and Tone, Eiichi, 5,150,224, Cl. 358-449.000.
Tone, Hiroshi: *See—*
Yoshioka, Takeo; Miyata, Ryoichi; Tsuchida, Toshio; Tone, Hiroshi; and Okamoto, Rokuro, 5,149,802, Cl. 540-200.000.
Tonello, John H.; and Tonello, Michael J. Crossword puzzle aid. 5,149,097, Cl. 273-148.00R.
Tonello, Michael J.: *See—*
Tonello, John H.; and Tonello, Michael J., 5,149,097, Cl. 273-148.00R
Tonen Corporation: *See—*
Furukawa, Hiroshi; Inagaki, Hiroyuki; Ishii, Masaharu; and Ueno, Hiroshi, 5,149,831, Cl. 549-237.000.
Tong, David W.; Zalondek, Kevin C.; and Jolly, Christopher H., to General Electric Company. Composite range constraint propagation control. 5,150,367, Cl. 371-23.000
Tong, Hua Sou; and Prando, Gregory, to Zenith Electronics Corporation. Cathode ray tube antiglare coating. 5,150,004, Cl. 313-479.000.
Torchio, John A. Window mounted pet enclosure. 5,148,767, Cl. 119-19.000
Toro Company, The: *See—*
Bancroft, Richard H., 5,148,985, Cl. 239-64.000.
Torres, Nelia R. Sheet garter. 5,148,560, Cl. 5-496.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Nakamoto, Toshinori, 5,148,854, Cl. 164-457.000.
Tosoh Corporation: *See—*
Hara, Yasushi; Ito, Yukio; and Sekizawa, Kazuhiko, 5,149,877, Cl. 564-479.000

Shima, Yasuji, 5,150,221, Cl. 358-403.000
Touchstone Computers, Inc.: *See—*
Berry, Wayne F., 5,150,109, Cl. 340-811.000.
Toy, James W.: *See—*
Sharpe, Randall B.; Jones, J. Richard; O'Shea, Thomas E.; Casper, Paul W.; Toy, James W.; Evans, Gregory M.; and Sears, Richard N., 5,150,247, Cl. 359-135.000.
Toyama, Osamu; Shimokoshi, Akira; and Kawasaki, Takashi, to Toyoda Koki Kabushiki Kaisha. Method and apparatus for indexing moving portion of robot to origin. 5,150,023, Cl. 318-567.000.
Toyoda Gosei Co., Ltd.: *See—*
Kasugai, Joji; Hagano, Hiroyuki; and Hosokawa, Norikazu, 5,148,934, Cl. 220-203.000.
Nozaki, Masahiro, 5,149,169, Cl. 296-206.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Toyama, Osamu; Shimokoshi, Akira; and Kawasaki, Takashi, 5,150,023, Cl. 318-567.000.
Toyoda, Takashi; and Takesako, Masafumi, to Minto Kensetsu Co. Ltd. Luminous display system incorporating optical fibers. 5,150,445, Cl. 385-116.000.
Toyokawa, Tetsuo: *See—*
Komatsuzaki, Shigeru; Hirayama, Toshinobu; and Toyokawa, Tetsuo, 5,149,469, Cl. 264-28.000
Toyota Jidosha Kabushiki Kaisha: *See—*
Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, 5,150,296, Cl. 364-424.100.
Nagai, Toshinari; Tanaka, Hiroshi; and Suzuki, Makoto, 5,148,795, Cl. 123-697.000
Tozawa, Yoshihisa: *See—*
Tamei, Akira; Oshio, Katsuhiro; Sumoto, Tadaaki; Tozawa, Yoshihisa; Nakahara, Takashi; Nishimoto, Masaru; and Yasui, Yasuhiko, 5,148,687, Cl. 62-266.000
Tracy, Clarence J.: *See—*
Freeman, John L., Jr.; and Tracy, Clarence J., 5,149,674, Cl. 437-195.000
Trail, Melvin P.: *See—*
Davis, Clint A.; and Trail, Melvin P., 5,149,940, Cl. 219-130.210
Transtechnik GmbH: *See—*
Hofgraff, Hans G., 5,149,995, Cl. 307-633.000
Traub, Henry A.: *See—*
Maringer, Martin M.; Traub, Henry A.; Kosty, John W.; and Mack, O. Theodor, 5,149,107, Cl. 277-165.000.
Triangle Research and Development Corporation: *See—*
Colvin, David P.; Mulligan, James C.; and Gravely, Benjamin T., 5,148,861, Cl. 165-78.000.
Tribotech: *See—*
Cain, Earl S.; and Carlson, Jerome A., 5,148,959, Cl. 228-4.500.
Tripp, Edward S.: *See—*
English, Kenneth P.; Micek, Stanley E., III; O'Connell, Michael B.; and Tripp, Edward S., 5,149,505, Cl. 422-99.000.
Troglia, Claudio: *See—*
Bressan, Giancarlo; Troglia, Claudio; Brichta, Corrado; and Barbero, Giancarlo, 5,149,735, Cl. 524-450.000
TRW Inc.: *See—*
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,149,760, Cl. 528-353.000.
Serafini, Tito T.; Cheng, Paul G.; Ueda, Kenneth K.; and Wright, Ward F., 5,149,772, Cl. 528-353.000
TRW Repa GmbH: *See—*
Fohl, Artur, 5,149,128, Cl. 280-734.000.
Fohl, Artur, 5,149,134, Cl. 280-806.000.
Tsai, Allen. Combined screwdriver and magnifying glass. 5,150,261, Cl. 359-810.000
Tsai, Yu-Hui. Tire monitoring and repairing device. 5,148,704, Cl. 73-146.800
Tsuboi, Haruhito: *See—*
Matsuo, Masahiro; Kanatani, Genji; Kawata, Hitoshi; Ariyama, Tatsurou; Mase, Jirou; Kitano, Yoshiyuki; Tsuboi, Haruhito; and Isozaki, Shinichi, 5,149,487, Cl. 266-172.000
Tsuchida, Toshio: *See—*
Yoshioka, Takeo; Miyata, Ryoichi; Tsuchida, Toshio; Tone, Hiroshi; and Okamoto, Rokuro, 5,149,802, Cl. 540-200.000.
Tsuda, Hisanori: *See—*
Hara, Toshitami; Tsuda, Hisanori; and Hirasawa, Shinichi, 5,150,129, Cl. 346-1.100.
Tsuji, Kazunori: *See—*
Sawada, Kazuo; Fujii, Atsuhiko; Nakai, Yoshihiro; Ohkubo, Naoyuki; Shiraishi, Hajime; Ono, Fumio; Matsuda, Katsushi; and Tsuji, Kazunori, 5,149,917, Cl. 174-129.00R.
Tsujii, Eiichiro, to Sanshin Kogyo Kabushiki Kaisha. Tilting device for marine propulsion unit. 5,149,286, Cl. 440-61.000.
Tsujiura, Hisako: *See—*
Ushikubo, Takashi; Kakuno, Yumiko; and Tsujiura, Hisako, 5,149,881, Cl. 568-396.000.
Tsukada, Hiromi: *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000.
Tsukada, Toru, to Nippon Sieko Kabushiki Kaisha. Dust seal device of linear guide apparatus. 5,149,205, Cl. 384-15.000.
Tsukahara, Daiki, to Nikon Corporation. Electric camera equipped with data imprinting device. 5,150,139, Cl. 354-106.000.
Tsukahara, Daiki: *See—*
Akami, Noboru; and Tsukahara, Daiki, 5,150,148, Cl. 354-413.000.
Tsukuda, Masahiro: *See—*
Masuda, Tadao; Tsukuda, Masahiro; Doiura, Shigeru; Kawanishi, Kaoru; and Iwasaki, Hiroshi, 5,148,651, Cl. 53-381.200.
Tsuruta, Masaaki: *See—*
Senuma, Satoko; and Tsuruta, Masaaki, 5,150,217, Cl. 358-227.000
Tsuruta, Masao: *See—*
Takagi, Akira; Tsuruta, Masao; Kita, Akihisa; and Sawahara, Shingo, 5,149,005, Cl. 242-67.10R
Tsutsui, Shinji: *See—*
Isohata, Junji; and Tsutsui, Shinji, 5,150,152, Cl. 355-53.000
Tsutsui, Takashi, to NEC Corporation. Dual-ring ATM communications system. 5,150,356, Cl. 370-16.100.
Tsuyama, Toshiaki; Nobumoto, Kazutoshi; Sotoyama, Kaoru; and Onaka, Toru, to Mazda Motor Corporation. Slip control system for automotive vehicle. 5,148,884, Cl. 180-197.000
Tuan, James: *See—*
Katz, Leonard; Tuan, James; and McAlpine, James B., 5,149,639, Cl. 435-76.000
Tucker, Annabelle D. Foldable add-on easel with spring page holders for bookcovers/folders, with line guide attachment. 5,149,047, Cl. 248-459.000
Tucker, Paul A.: *See—*
Cuculo, John A.; Tucker, Paul A.; Chen, Gao-Yuan; and Lundberg, Ferdinand, 5,149,480, Cl. 264-178.00F.
Tuckey, Charles H., to Walbro Corporation. Pressure-responsive fuel delivery system. 5,148,792, Cl. 123-497.000.
Tuckey, Charles H.; and Tuckey, J. D., to Walbro Corporation. Two-stage pump for handling hot fuel. 5,149,252, Cl. 417-205.000
Tuckey, J. D.: *See—*
Tuckey, Charles H.; and Tuckey, J. D., 5,149,252, Cl. 417-205.000
Tull, Thomas W., to Henkel Corporation. Water soluble salt precoats for wire drawing. 5,149,451, Cl. 252-18.000.
Tung, Hui-Chan: *See—*
Sawyer, Donald T.; Sheu, Ceshing; Sobkowiak, Andrzej; and Tung, Hui-Chan, 5,149,880, Cl. 568-342.000.
Turner, Kenneth W.; Du Bois, Patti S.; Alfred, Peter J.; and Greer, Thomas W., to General Motors Corporation. Water separator for fuel canister purge. 5,149,347, Cl. 55-446.000.
Turner, S. Richard; Perry, Robert J.; and Blevins, Richard W., to Eastman Kodak Company. Process for preparing arylamide bisnadimides. 5,149,824, Cl. 548-435.000.
Twerdochlib, Michael; Rozelle, Paul F.; and Sarasas, Santitavee, to Westinghouse Electric Corp. Apparatus and method for removing common mode vibration data from digital turbine blade vibration data. 5,148,711, Cl. 73-660.000
Tyton Corporation: *See—*
Dyer, Edward P., 5,148,576, Cl. 24-20.00R.
Tzikas, Athanassios; and Lauk, Urs, to Ciba-Geigy Corporation. Chlorotriazine reactive dyes having a 4-methoxy-2-sulfoaniline diazo component and 2-amino-5-naphthol-7-sulfonic acid coupling component. 5,149,791, Cl. 534-638.000
Uarco Incorporated: *See—*
Hill, Marilyn; and Baker, Byron L., 5,149,587, Cl. 428-354.000
Ucar Carbon Technology Corporation: *See—*
Mercuri, Robert A.; Getz, George; Greinke, Ronald A.; and Howard, Ronald A., 5,149,518, Cl. 423-449.000
Uchida, Hiroshi: *See—*
Banba, Susumu; Teranishi, Junichi; Sakai, Shoji; Uramoto, Makoto, and Uchida, Hiroshi, 5,149,001, Cl. 242-42.000
Uchida, Kazuo: *See—*
Okuse, Hirotsugu; Sato, Hiroshi; Takahashi, Kenji; and Uchida, Kazuo, 5,148,779, Cl. 123-90.280
Uchida, Makoto: *See—*
Miyamori, Takao; Uchida, Makoto; Enomoto, Kanehiko; Sakimae, Akihiro; and Numazawa, Ryozo, 5,149,649, Cl. 435-240.242.
Uchida, Mitsuru: *See—*
Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, 5,149,610, Cl. 430-106.000
Uchida, Takashi: *See—*
Nemura, Masaharu; Aoki, Tomohiro; Kobayashi, Tohru; Ikkatai, Masatoshi; Murayama, Yasushi; Uchida, Takashi; and Mitomi, Tatsuo, 5,149,049, Cl. 248-674.000
Uchida, Yasukazu: *See—*
Goto, Makoto; Nara, Terukazu; Uchida, Yasukazu; Terasawa, Masato; Yukawa, Hideaki; and Yamagata, Hisashi, 5,149,651, Cl. 435-244.000
Uchimura, Hirozi: *See—*
Kakuguchi, Kazuhiro; Uchimura, Hirozi; and Nishino, Sekizi, 5,148,718, Cl. 74-553.000.
Uchino, Kinji: *See—*
Shiokawa, Masahiro; Ikeda, Makoto; Sohma, Kiyoshi; Iriki, Masami; Uchino, Kinji; Kawashima, Yoshikatsu; and Kusakabe, Masahiro, 5,149,200, Cl. 374-185.000
Udagawa, Tetsu: *See—*
Yanagisawa, Kazumasa; Ohta, Tatsuyuki; Udagawa, Tetsu; Ishii, Kyoko; Miwa, Hitoshi; Nozoe, Atsushi; Nakamura, Masayuki; Matsumoto, Tetsurou; Kinoshita, Yoshitaka; Ouchi, Yoshiaki; Tsukada, Hiromi; Wada, Shoji; Mihashi, Kazuo; Kobayashi, Yutaka; and Kitsukawa, Goro, 5,150,325, Cl. 365-177.000
Ueda, Hiroko: *See—*
Kita, Yuichi; Kishino, Kazuo; and Ueda, Hiroko, 5,149,827, Cl. 548-548.000.
Ueda, Hironori; Hanai, Kazumichi; Takeuchi, Hitoshi; Nakamichi, Kazutaka; and Kubota, Takashi, to Aisan Kogyo Kabushiki Kaisha. Exhaust gas flow control valve for internal combustion engine 5,148,678, Cl. 60-602.000.

Ueda, Hiroshi; Matsui, Toru; and Okamu, Noriyuki, to Minolta Camera Kabushiki Kaisha. Focus detecting device utilizing auxiliary illumination. 5,150,146, Cl. 354-403.000.

Ueda, Hirotada; Yonezawa, Seiji; and Takeuchi, Takashi, to Hitachi, Ltd. Optical disk medium and its application method and system. 5,150,339, Cl. 369-32.000.

Ueda, Kenneth K.: *See—*
Serafini, Tito T.; Cheng, Paul G. Ueda, Kenneth K.; and Wright, Ward F., 5,149,760, Cl. 528-35 .000.
Serafini, Tito T.; Cheng, Paul G. Ueda, Kenneth K.; and Wright, Ward F., 5,149,772, Cl. 528-35 .000.

Ueda, Yoshihiro: *See—*
Tabata, Yoichiro; Ueda, Yoshihiro; Ueguri, Shigeo; and Hara, Kazuhiko, 5,150,375, Cl. 372-9 .000.

Ueda, Yutaka; and Suzuki, Tadashi, to Murata Kikai Kabushiki Kaisha. Driving controlling method for drums of automatic winder. 5,150,020, Cl. 318-87.000.

Ueguri, Shigeo: *See—*
Tabata, Yoichiro; Ueda, Yoshihiro; Ueguri, Shigeo; and Hara, Kazuhiko, 5,150,375, Cl. 372-9 .000.

Uehara, Makoto: *See—*
Iwamoto, Hirofumi; Tajima, Hisao; Uehara, Makoto; Onitsuka, Yoshihiro; Miyamoto, Takao; Takabayashi, Hiroshi; and Yoshihara, Satoshi, 5,150,231, Cl. 359-44.000.

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von Sprecher, Andreas; Beck, Andreas; Schaub, Bruno; and Lang, Robert W., to Ciba-Geigy Corporation. Alkanophenones useful for treating allergies. 5,149,717, Cl. 514-456.000.

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W. L. Gore & Associates, Inc.: *See—*
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Waas, Charles W.; and Jespersen, Mark R., to PSI Telecommunications, Inc. Terminal block. 5,149,278, Cl. 439-412.000.

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Wada, Takahiro; Suzuki, Nobuo; Ichinose, Ataru; Yaegashi, Yuji; Yamauchi, Hisao; and Tanaka, Shoji, to Matsushita Electric Industrial Co., Ltd.; Tokyo Electric Power Co., Inc., The; Central Research Institute of Electric Power Industry; Tohoku Electric Power Co., Inc.; and International Superconductivity Technology Center. Method for producing oxide superconductor. 5,149,683, Cl. 505-1.000.

Wada, Yukihisa: *See—*
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Waddington Electronics, Inc.: *See—*
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Waddington, John E., to Waddington Electronics, Inc. Press feeder and pilot release using servo control. 5,150,022, Cl. 318-563.000.

Wagner, Alfred: *See—*
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Wagoner, Earl V., to Hoggan Health Industries, Inc. Method and apparatus for sensing and measuring relative position and motion between two points. 5,150,169, Cl. 356-1.000.

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Waidner, Robert A.; and Brady, John J., to Standard Fusee Corporation. Method and apparatus for assembling a fusee and wire support stand. 5,149,912, Cl. 102-343.000.

Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, to Nitto Boseki Co., Ltd.; and Chisso Corp. Silane coupling agent and glass fiber product for laminates. 5,149,839, Cl. 556-413.000.

Wakunaga Seiyaku Kabushiki Kaisha: *See—*
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Walbro Corporation: *See—*
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Walke, Allen L.: *See—*
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Walker, Michael R., to Zimmer, Inc. Package and package insert. 5,148,920, Cl. 206-588.000.

Walko, Lee E.; and Gruseckl, Rodney G., to Dow Chemical Company, The. Vent collar for plastic lined pipe. 5,149,142, Cl. 285-14.000.

Wall, David F.: *See—*
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Wallace, Lawrence R.: *See—*
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Wallden, Lars, to ASSA AB. Electrically and mechanically activatable lock mechanism. 5,148,691, Cl. 70-279.000.

Walser, Carl S.; and Jost, Johann M., to Industrie-und-Handels-AG. Apparatus for measuring distances on a workpiece, and sliding gage designed for the digital measurement of such distances. 5,148,612, Cl. 33-784.000.

Walsh, Anthony J.: *See—*
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Walsh, Dennis E.: *See—*
Han, Scott; DeCaul, Lorenzo C.; Palermo, Robert E.; and Walsh, Dennis E., 5,149,516, Cl. 423-415.00A.

Walter, Jeffrey A., to W. L. Gore & Associates, Inc. Method for jointing a dielectric waveguide. 5,148,593, Cl. 29-600.000.

Walther, Gerhard: *See—*
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Walton, James F., II, to Mechanical Technology Incorporated. Multiplane balancing process and apparatus using powder metal for controlled material addition. 5,149,936, Cl. 219-121.650.

Walton, Richard C.: *See—*
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Walton, Richard R.; Walton, Richard C.; Munchbach, George E.; and Young, Robert W., to Walton, Richard R., a part interest. Absorbent and cushioning products and their manufacture. 5,149,332, Cl. 604-358.000

Wang, Pen-Chung, to Shell Oil Company. Sulfonamide substituted spirodilactams. 5,149,823, Cl. 548-410.000.

Wang, Ruei-Fang. Two-section type pickproof lock assembly 5,148,690, Cl. 70-38.00A.

Wang, Xiao Y.: *See—*
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Ward, John R.: *See—*
Skruch, Harry J.; and Ward, John R., 5,149,346, Cl. 55-438.000.

Ward, Michael; Watson, Ian; and Wong, Pak S., to International Computers Limited. Multi processor data processing system with remote packet copying mechanism. 5,150,463, Cl. 395-200.000.

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Warner-Lambert Company: *See—*
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Washimi, Kouichi, to Sumitomo Electric Industries, Ltd. Signal processing system of optical fiber gyro. 5,150,435, Cl. 385-1.000.

Washington State University Research Foundation: *See—*
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Washiyama, Yutaka, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument using filters for timbre control. 5,149,902, Cl. 84-622.000.

Wassermann, Wilfried: *See—*
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Watabe, Katsunori; and Motokawa, Osamu, to Shimadzu Corporation Stationary phase for enantiomeric resolution in liquid chromatography. 5,149,426, Cl. 210-198.200

Watanabe, Akihiko: *See—*
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Watanabe, Eiji; and Ohtani, Tsugutoshi, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Method and apparatus for controlling the magnetic flux of an induction motor. 5,150,029, Cl. 318-800.000.

Watanabe, Kenichi: *See—*
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Watanabe, Masaki, to Olympus Optical Company Limited. Lens grinder and method of grinding lens. 5,149,337, Cl. 51-284.00R.

Watanabe, Nobuko: *See—*
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Watanabe, Shinji: *See—*
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Watanabe, Takao: *See—*
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Watanabe, Touru: *See—*
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Watanabe, Yasuyuki; Shimamune, Masayuki; and Suzuki, Masaaki, to Canon Kabushiki Kaisha. One-pack type epoxy sealant with amine-type curing agent, for liquid crystal cell, display apparatus and recording apparatus. 5,150,239, Cl. 359-80.000.

Watanabe, Yoshio: *See—*
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Waterman, Raymond C., Jr.: *See—*
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Wato, Yasuhiro: *See—*
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Watson, Ian: *See—*
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Watts, Geoffrey, to Xerox Corporation. Drive coupling. 5,149,223, Cl. 403-359.000.

Waycuilis, John J., to Marathon Oil Company. Process and apparatus for separating impurities from hydrocarbons. 5,149,340, Cl. 55-16.000.

Wayne State University: *See—*
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Webber, Herbert; and Edwards, Peter, to Applied Materials, Inc. Apparatus for aligning wafers within a semiconductor wafer cassette 5,149,244, Cl. 414-417.000.

Weber, David V.: *See—*
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Weber, Heinz: *See—*
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Weber, Jurgen: *See—*
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Weber, Karl-Heinz; Walther, Gerhard; Schneider, Claus; Hinzen, Dieter; Kuhn, Franz J.; and Lehr, Erich, to Boehringer Ingelheim KG. N-heterocyclic substituted -pyrrolidin-2-ones. 5,149,808, Cl. 544-141.000.

Weber, William F., to Alcatel Network Systems, Inc. Multiple leg height snap fit cable holder apparatus. 5,149,027, Cl. 248-68.100

Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., to Highland Supply Corporation. Shipping carton for floral grouping assemblies. 5,148,918, Cl. 206-423.000

Weeks, Andrew M., to Tennessee Gas Pipeline Company. Method of making a collector device. 5,148,597, Cl. 29-890.080

Weeks, Jack L.: *See—*
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Weir, Randy S. Protective covering strip. 5,148,644, Cl. 52-300.000

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Welch, Edward K., II; and Newberth, Frederick F., III, to Loctite Corporation. Method of treating wastewater containing heat-curable (meth) acrylic monomer compositions. 5,149,441, Cl. 210-719.000

Well-o Oil Service, Inc.: *See—*
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Wells, James M.; and Sigritz, Gary L. Video game console and cartridge cleaning kit. 5,148,572, Cl. 15-118.000

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Wernecke, Charles R.; and Strouf, Marlin P., to Manitowoc Company Inc., The. Multi-coupling device for crane hydraulic lines. 5,148,929, Cl. 212-180.000

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Weseloh, Roger J.: *See—*
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West, Harold B. Traffic-light timed advertising center. 5,150,116, Cl. 340-928.000.

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Wheatley, John A.; and Schrenk, Walter J., to Dow Chemical Company, The. Multilayer film for tamper indication by use of optical interference reflection. 5,149,578, C . 428-213.000.
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White Consolidated Industries, Inc.: *See—*
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White, Denny A., to White and Cater Partnership. Knockdown boat. 5,148,763, Cl. 114-352.000.
White, Jackie L.: *See—*
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White, Stephen D.: *See—*
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White, Victor A. M., to GBE International PLC. Pneumatic separation of particulate material. 5,148,921, Cl. 209-20.000.
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Whitlock, Michael B.: *See—*
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Whitman, Douglas L.; and Sarrafzadeh, Adel K., to American Research Corporation of Virginia. Optical imaging system for fabric seam detection. 5,150,175, Cl. 356-429.000.
Whitney, Colin G., to Hughes Aircraft Company. Dual-band optoelectronic imaging apparatus including "venetian blind" dichroic plate arrangement. 5,149,970, Cl. 250-33 .000.
Whittle, Alan J.: *See—*
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Wijnberg, Willem A., to Schlumberger Techonolgy Corporation. Cable for data transmission and method for manufacturing the same. 5,150,443, Cl. 385-107.000.
Wike, Charles K., Jr., to NCR Corporation. Optical scanner with counterrotating reflector elements. 5,149,949, Cl. 235-467.000.
Wilcock, Norman B. Method and device for locating the longitudinal axis of a branch pipe from a main pipe. 5,150,056, Cl. 324-326.000.
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Wilkinson, Theodore L.; and Sork, Frank J. Water filter. 5,149,437, Cl. 210-665.000.
Will, Edward A. Lawn mower blade lift wing protector. 5,148,660, Cl. 56-295.000.
Willden, Charles M.; and Willden, Dee E., to Insta-Foam Products, Inc. Foam cushion with labyrinthine side seams. 5,149,065, Cl. 267-136.000.
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Williams, Clark R.; and Jiang, Ching-Lin, to Dallas Semiconductor Corporation. Two-mode oscillator. 5,150,079, Cl. 331-75.000.
Williams, Danny R., to Houston Industries Incorporated. Circuit breaker tagging/lockout apparatus. 5,148,910, Cl. 200-43.190.
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Williamson, Herman L., to Air Industries Corporation. Installation tool for locking fasteners and method of use. 5,148,727, Cl. 81-121.100
Willis, Jurgen A.; and Metzger, Mark A., to Camco International Inc. High pressure electrical cable packoff and method of making. 5,148,864, Cl. 166-65.100.
Wills, Kendall S.; Rodriguez, Paul A.; and Brewer, Melvin L., to Texas Instruments Incorporated. Ring crystallization of wafers to prevent thermal shock. 5,149,675, Cl. 437-248.000.
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Winner, William K., to Bic Corporation. Daggerfin adjustable sailboard skeg. 5,148,761, Cl. 114-39.200.
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Wirth, Rudi, to LIBA Maschinenfabrik GmbH. Threading a hooked wire needle in a tie sewing machine. 5,148,759, Cl. 112-121.220.
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Yamada, Masayuki, to NEC Corporation. ISDN terminal having diagnostic function. 5,150,402, Cl. 379-93.000.
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Yamada, Shin-ichi; Goto, Takao; Yorita, Rie; Shimanuki, Eizi; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Senichi, to Toa Eiyo Ltd. Cycloheptenopyridine derivatives, process for preparation thereof and antiulcer agents containing the same. 5,149,702, Cl. 514-303.000.
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Yamase, Osamu; Yoshizawa, Sumio; and Miura, Tadayuki, to Petroleum Energy Center and Showa Shell Sekiyu Kabushiki Kaisha. Fuel cell electricity generation process. 5,149,600, Cl. 429-17.000.
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Yatvin, Milton B.; Parks, David W.; McClard, Ronald W.; Stowell, Michael H. B.; and Witte, John F., to State of Oregon. Covalent lipid-drug conjugates for drug targeting. 5,149,794, Cl. 536-29.000.
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Yoshida, Akihiko; and Imoto, Kiyoaki, to Matsushita Electric Industrial Co. Ltd. Electric double layer capacitor and method for producing the same. 5,150,283, Cl. 361-502.000.
Yoshida, Hitoshi; and Yokoi, Katsuhiko, to Brother Kogyo Kabushiki Kaisha. Noise reducing back stopper for an impact print head 5,149,213, Cl. 400-124.000.
Yoshida, Hitoshi; Kawamoto, Naoyuki; Kanegae, Takahiro; and Aoki, Kazuma, to Brother Kogyo Kabushiki Kaisha. Device for converting normal outline data into compressed outline data, or vice versa. 5,150,431, Cl. 382-56.000
Yoshida, Kazunaga; and Watanabe, Takao, to NEC Corporation. Speech recognition apparatus of speaker adaptation type. 5,150,449, Cl. 395-2.000.
Yoshida, Kimiyoshi: *See*—
Aguro, Masayuki; Tanaka, Hidekazu; Yoshida, Kimiyoshi; and Sakano, Akio, 5,150,424, Cl. 382-13.000.
Yoshida, Masanobu: *See*—
Yamazaki, Hirokazu; and Yoshida, Masanobu, 5,149,990, Cl 307-443.000.
Yoshida, Mitsutoshi: *See*—
Kimura, Yutaka; Okumura, Hiroshi; Mihara, Hirokata; and Yoshida, Mitsutoshi, 5,150,024, Cl. 318-568.100.
Yoshida, Shigeru; Okada, Yoshiyuki; Nakano, Yasuhiko; and Chiba, Hirotaka, to Fujitsu Limited. Data compression method and apparatus. 5,150,119, Cl. 341-51.000.
Yoshie, Hiroto; and Sato, Hironobu, to Mitsumi Electric Co., Ltd.; and Regal Technologies Ltd. Electrical signal filter and method for manufacture of electrical signal filter internal circuit board. 5,150,087. Cl. 333-185.000.
Yoshihara, Satoshi: *See*—
Iwamoto, Hirofumi; Tajima, Hisao; Uehara, Makoto; Onitsuka, Yoshihiro; Miyamoto, Takao; Takabayashi, Hiroshi; and Yoshihara, Satoshi, 5,150,231, Cl. 359-44.000
Yoshikawa, Hidetaka; Miseki, Kimio; and Akamine, Masami, to Kabushiki Kaisha Toshiba. Variable rate encoding and communicating apparatus. 5,150,387, Cl. 375-122.000.
Yoshikawa, Yukio: *See*—
Gunkima, Tomoki; Yuki, Masanori; Kunigita, Masaya; Hirai, Yoshinori; Yoshikawa, Yukio; and Shidoji, Eiji, 5,150,232, Cl. 359-51.000
Yoshimura, Masaji: *See*—
Ueki, Toru; Sakato, Kenji; Yoshimura, Masaji; Kanezaki, Kazuharu; and Iwata, Ineo, 5,149,465, Cl. 252-511.000
Yoshinari, Tsuneori: *See*—
Shirai, Takahiro; Yoshinari, Tsuneori; and Muto, Kazuhiko, 5,150,189, Cl. 357-53.000
Yoshino Kobyosho Co., Ltd.: *See*—
Ota, Akiho; and Ishii, Hiroichi, 5,148,930, Cl. 215-1.00C.
Yoshino Kogyosho Co., Ltd.: *See*—
Nozawa, Takamitsu, 5,148,912, Cl. 220-339.000.
Yoshinuma, Mikio: *See*—
Itoh, Kenichiro; Yamada, Takeshi; Onodera, Tsutomu; Yoshinuma, Mikio; and Kato, Yasuyuki, 5,149,350, Cl. 65-12.000.
Yoshioka, Takeo; Miyata, Ryoichi; Tsuchida, Toshio; Tone, Hiroshi; and Okamoto, Rokuro, to Mercian Corporation. Process for producing azetidinone derivatives. 5,149,802, Cl. 540-200.000.
Yoshioka, Toshifumi: *See*—
Enomoto, Takashi; Yoshioka, Toshifumi; and Nishida, Naoya, 5,150,233, Cl. 359-54.000
Yoshitake, Shinji: *See*—
Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., 5,149,533, Cl. 424-94.640
Yoshizawa, Hideo; Saikawa, Yasuhiko; Kanda, Noriaki; and Higashide, Norihiko, to Nippon Sheet Glass Co., Ltd. Method of and system for bending sheet glass. 5,149,352, Cl. 65-106.000.
Yoshizawa, Sumio: *See*—
Yamase, Osamu; Yoshizawa, Sumio; and Miura, Tadayuki, 5,149,600, Cl. 429-17.000
You, Han J., to Samsung Electronics Co., Ltd. Defrost control apparatus for a refrigeration system. 5,148,686, Cl. 62-234.000.
Young, Allen R.: *See*—
Schultz, Roger L.; Manke, Kevin R.; Skinner, Neal G.; Bohan, William L.; and Young, Allen R., 5,149,984, Cl. 290-54.000
Young, Donald C., to Union Oil Company of California. Adduct compositions. 5,149,355, Cl. 71-83.000.
Young, George A.: *See*—
Potts, David C.; Young, George A.; Everhart, Dennis S.; MacDonald, J. Gavin; and Nohr, Ronald S., 5,149,576, Cl. 428-198.000.
Young, Neils O., to Arthur D. Little, Inc. Gearing system having interdigital concave-convex teeth formed as involutes or multifaceted polygons. 5,149,255, Cl. 418-55.300.
Young, Robert W.: *See*—
Walton, Richard R.; Walton, Richard C.; Munchbach, George E and Young, Robert W., 5,149,332, Cl. 604-358.000.
Youngner, Julius S.; and Dowling, Patricia W., to University of Pittsburgh of the Commonwealth System of Higher Education. Method of using cold-adapted live influenza virus vaccine as an antiviral agent against influenza. 5,149,531, Cl. 424-89.000
Yu, Ho; Bruce, Douglas L.; Stiffler, Richard C.; Leon, David D.; and Glogowski, Francis J., to Aluminum Company of America. Method and apparatus for controlling the heat transfer of liquid coolant in continuous casting. 5,148,853, Cl. 164-455.000
Yu, Robert C. U.; Spiewak, John W.; and Nichol-Landry, Deborah, to Xerox Corporation. Polymers for photoreceptor overcoating for use as protective layer against liquid xerographic ink interaction. 5,149,609, Cl. 430-58.000
Yuan, Xiancheng: *See*—
Baker, Richard L.; Bernstein, Jeffrey; Girod, Bernd; Yuan, Xiancheng; and Thompson, Edmund, 5,150,209, Cl. 358-133.000.
Yukawa, Hideaki: *See*—
Goto, Makoto; Nara, Terukazu; Uchida, Yasukazu; Terasawa, Masato; Yukawa, Hideaki; and Yamagata, Hisashi, 5,149,651, Cl. 435-244.000.
Yuki, Masanori: *See*—
Gunkima, Tomoki; Yuki, Masanori; Kunigita, Masaya; Hirai, Yoshinori; Yoshikawa, Yukio; and Shidoji, Eiji, 5,150,232, Cl 359-51.000.
Yunus, Mohammad, to Harris Corp. Multiplexed sigma-delta A/D converter. 5,150,120, Cl. 341-143.000
Yuzuriha, Teruaki: *See*—
Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., 5,149,533, Cl. 424-94.640.
Zaha, Juergen H., to Abbott Laboratories. Intravenous needle assembly having interlocking wings. 5,149,328, Cl. 604-177.000.
Zahn, Irwin, to Autosplice, Inc. Continuous molded electronic component assembly. 5,148,596, Cl. 29-842.000
Zaima, Fumiya: *See*—
Takeda, Mutsuhiko; Hagiwara, Isao; Zaima, Fumiya; and Sakaguchi, Shuzabu, 5,149,857, Cl. 558-271.000
Zalondek, Kevin C.: *See*—
Tong, David W.; Zalondek, Kevin C.; and Jolly, Christopher H., 5,150,367, Cl. 371-23.000
Zamecnik, Paul C.: *See*—
Agrawal, Sudhir; and Zamecnik, Paul C., 5,149,798, Cl. 536-27.000
Pederson, Thoru; Agrawal, Sudhir; Mayrand, Sandra; and Zamecnik, Paul C., 5,149,797, Cl. 536-27.000
Zarian, Jamshid J., to Lumenyte International Corporation. Improved method of manufacture for clad optical conduit. 5,149,467, Cl 264-1.500.
Zdrojkowski, Ronald J.: *See*—
Sanders, Mark H.; and Zdrojkowski, Ronald J., 5,148,802, Cl. 128-204.180.
Zebco Corporation: *See*—
Bacher, Bruce E., 5,149,010, Cl. 242-311.000
Zehentner, Martin: *See*—
Haider, Franz; Zehentner, Martin; Lileg, Johann; and Obitz, Lars, 5,148,994, Cl. 241-261.100.
Zeilinger, Karl: *See*—
Kramer, Michael; Zeilinger, Karl; and Bacu, Theodor, 5,148,782 Cl. 123-195.00R.
Zeit Company: *See*—
Dickerson, Jon E.; and Millburn, James E., 5,148,975, Cl 232-44.000
Zelinger, Alan, to Ethical Products, Inc. Amusement device having suction cup base and interchangeable pet toy. 5,148,769, Cl 119-29.000
Zelinski, George. Method of locating gripping holes in bowling ball. 5,149,089, Cl. 273-63.00E.
Zellweger Uster AG: *See*—
Jaeger, Silvio, 5,148,585, Cl. 28-205.000.
Zemsky, Michael D. Method of applying a fluorescent marking composition. 5,149,138, Cl. 283-70.000
Zenith Electronics Corporation: *See*—
Tong, Hua Sou; and Prando, Gregory, 5,150,004, Cl. 313-479.000.
Zepp, Charles: *See*—
Locatell, Louis; Norland, Kenneth; Roberts, F. Donald; and Zepp, Charles, 5,149,830, Cl. 549-223.000
Zeuschner, Ulrich: *See*—
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; Zeuschner, Ulrich; and Harten, Gunter, 5,148,740, Cl 100-264.000.
Zexel Corporation: *See*—
Takano, Akihiko; Sakurai, Yoshihiko; and Iida, Katsumi, 5,148,685, Cl. 62-229.000.
Zhang, Zuoying L.: *See*—
MacDonald, Noel C.; Chen, Liang-Yuh; and Zhang, Zuoying L., 5,149,673, Cl. 437-192.000
Ziegenhorn, Joachim: *See*—
Vogt, Bernd; Schellong, Liselotte; Siedel, Joachim; and Ziegenhorn, Joachim, 5,149,633, Cl. 435-25.000.
Ziff, Irving. Poolside basketball game. 5,149,086, Cl. 273-15.00R.
Zilog, Inc.: *See*—
Kurisu, Motohiro, 5,150,107, Cl. 340-724.000

Zimmer, Inc.: *See*—
Walker, Michael R., 5,148,920, C . 206-588.000.
Zimmer, Johannes. Coating machine with magnetically operated doctor blade (squeegee). 5,148,743, Cl. 101-123.000.
Zimmerman Metals, Inc.: *See*—
Pearson, Bruce M.; and Worrell, W. Wayne, 5,148,694, Cl. 72-131.000.
Zimmerman, Theodore S.: *See*—
Scandella, Dorothea H.; Drohan, William N.; Zimmerman, Theodore S.; and Fulcher, Carol A. 5,149,637, Cl. 435-69.600.
Zimmermann, John, to Paperboard Industries Corporation. Interlocking carton and lid. 5,148,973, Cl. 229-125.280.
Zink, Rudolf, to Ciba-Geigy Corporation. Fluoran color former mixture and use thereof in recording materials. 5,149,689, Cl. 503-221.000.
Zinnen, Hermann A., to UOP. Separation of alkyl-substituted phenolic isomers with barium-potassium exchanged zeolitic adsorbent. 5,149,887, Cl. 568-751.000.
Zoller-Kipper GmbH: *See*—
Naab, Jakob; and Gajewski, Arno, 5,149,243, Cl. 414-408.000.
Zollinger, W. Thor: *See*—
Killian, Mark A.; and Zollinger, W. Thor, 5,148,573, Cl. 15-339.000.
Zorn, Manfred: *See*—
Sommergruber, Wolfgang; Fessl, Friederike; Kuechler, Ernst; Blass, Dieter; Skern, Timothy; Zorn, Manfred; Duechler, Markus; Kowalski, Heinrich; Volkmann, Peter; Maurer-Fogy, Ingrid; and Pallai, Peter, 5,149,783, Cl. 530-326.000.
Zornes, David A., to Balanced Engines, Inc. Bearing with lubricating and non-lubricating spacers. 5,149,208, Cl. 384-551.000.
Zou, Dechun: *See*—
Kishimoto, Manabu; Seo, Iwao; Oda, Atsushi; Ohashi, Yukiko; and Zou, Dechun, 5,149,580, Cl. 428-220.000.
Zsuga, Miklos L.: *See*—
Kennedy, Joseph P.; and Zsuga, Miklos L., 5,149,743, Cl. 525-331.400.
Zulch, Richard C., to Dantz Development Corporation. Data storage format for addressable or sequential memory media. 5,150,473, Cl. 395-425.000.
ZymoGenetics, Inc.: *See*—
Maraganore, John M.; and Kindsvogel, Wayne R., 5,149,528, Cl. 424-85.910.
Mulvihill, Eileen R.; Yoshitake, Shinji; Ikeda, Yasunori; Suzuki, Suguru; Hashimoto, Akira; Yuzuriha, Teruaki; and Nexo, Bjorn A., 5,149,533, Cl. 424-94.640.
Zyner, Grzegorz B., to Sun Microsystems, Inc. Circuitry for rounding in a floating point multiplier. 5,150,319, Cl. 364-745.000.
Zysman, Alexandre; Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Lipid compounds derived from sphingosines, process for preparing these and their applications, in particular in cosmetics and in the pharmacy of skin conditions. 5,149,860, Cl. 560-160.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF SEPTEMBER, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asakura, Toshimitsu; and Tagami, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. Re. 34,072, Cl. 180-68.300.
Cryomedical Sciences, Inc.: *See*—
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, Re. 34,077, Cl. 604-52.000.
Fujii, Takeo: *See*—
Takeshita, Akira; Masaki, Shinzaburo; Fujii, Takeo; Tokumaru, Tooru; and Murakami, Akira, Re. 34,076, Cl. 568-790.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asakura, Toshimitsu; and Tagami, Tomoyuki, Re. 34,072, Cl. 180-68.300.
Ingram Cactus Company: *See*—
Van Bilderbeek, Bernard H., Re. 34,071, Cl. 166-342.000.
Masaki, Shinzaburo: *See*—
Takeshita, Akira; Masaki, Shinzaburo; Fujii, Takeo; Tokumaru, Tooru; and Murakami, Akira, Re. 34,076, Cl. 568-790.000.
Molecular Design International, Inc.: *See*—
Purcell, William P.; and Parish, Harlie A., Re. 34,075, Cl. 514-529.000.
Murakami, Akira: *See*—
Takeshita, Akira; Masaki, Shinzaburo; Fujii, Takeo; Tokumaru, Tooru; and Murakami, Akira, Re. 34,076, Cl. 568-790.000.
Parish, Harlie A.: *See*—
Purcell, William P.; and Parish, Harlie A., Re. 34,075, Cl. 514-529.000
Purcell, William P.; and Parish, Harlie A., to Molecular Design International, Inc. Dermal uses of trans-retinoids for the treatment of cancer Re. 34,075, Cl. 514-529.000.
Regimand, Ali, to Troxler Electronic Laboratories, Inc. Method and system for transferring calibration data between calibrated measurement instruments. Re. 34,070, Cl. 73-1.00R.
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, to Cryomedical Sciences, Inc. Blood substitute. Re. 34,077, Cl. 604-52.000
Sternberg, Hal: *See*—
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, Re. 34,077, Cl. 604-52.000.
Sumitomo Chemical Company Limited: *See*—
Takeshita, Akira; Masaki, Shinzaburo; Fujii, Takeo; Tokumaru, Tooru; and Murakami, Akira, Re. 34,076, Cl. 568-790.000.
Suzuki, Takeo, to Toho Plastic Co., Ltd. Method of announcing low level of remaining liquid in dropper. Re. 34,073, Cl. 324-687.000
Tagami, Tomoyuki: *See*—
Asakura, Toshimitsu; and Tagami, Tomoyuki, Re. 34,072, Cl 180-68.300.
Takeshita, Akira; Masaki, Shinzaburo; Fujii, Takeo; Tokumaru, Tooru; and Murakami, Akira, to Sumitomo Chemical Company Limited. Method for producing hydroxy-containing alkylated aromatic compounds. Re. 34,076, Cl. 568-790.000.
Toho Plastic Co., Ltd.: *See*—
Suzuki, Takeo, Re. 34,073, Cl. 324-687.000.
Tokumaru, Tooru: *See*—
Takeshita, Akira; Masaki, Shinzaburo; Fujii, Takeo; Tokumaru, Tooru; and Murakami, Akira, Re. 34,076, Cl. 568-790.000.
Troxler Electronic Laboratories, Inc.: *See*—
Regimand, Ali, Re. 34,070, Cl. 73-1.00R.
Van Bilderbeek, Bernard H., to Ingram Cactus Company. Surface wellhead. Re. 34,071, Cl. 166-342.000.
Waitz, Harold D.: *See*—
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, Re. 34,077, Cl. 604-52.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Barbier, Jean-Pierre: *See*—
Rialland, Jean-Paul; and Barbier, Jean-Pierre, B1 4,782,138, Cl. 530-366.000
Drexelbrook Controls, Inc.: *See*—
Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., B1 4,146,834, Cl. 324-610.000.
Drexler, Jerome, to Drexler Technology Corporation (Deleware). Data system employing wallet-size optical card. B1 4,680,456, 9-22-92, Cl. 235-454.000.
Drexler Technology Corporation (Deleware): *See*—
Drexler, Jerome, B1 4,680,456, Cl. 235-454.000.
Elliott, Glenaan M., to Glenaan, Inc. Handbag. B1 8,300,184, 9-22-92, Cl. D3-51.000.
Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., to Intel Corporation. Electrically programmable and erasable MOS floating gate memory device employing tunneling and method of fabricating same. B1 4,203,158, 9-22-92, Cl 365-185.000.
Glenaan, Inc.: *See*—
Elliott, Glenaan M., B1 8,300,184, Cl. D3-51.000.
Intel Corporation: *See*—
Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., B1 4,203,158, Cl. 365-185.000.
Johnson, William S.: *See*—
Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., B1 4,203,158, Cl. 365-185.000.
Kramer, Jonathan: *See*—
Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., B1 4,146,834, Cl. 324-610.000
Laiteries E. Bridel, Societe Anonyme: *See*—
Rialland, Jean-Paul; and Barbier, Jean-Pierre, B1 4,782,138, Cl. 530-366.000.
Loewenstern, Kenneth M.: *See*—
Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., B1 4,146,834, Cl. 324-610.000.
Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., to Drexelbrook Controls, Inc. Admittance measuring system for monitoring the condition of materials. B1 4,146,834, 9-22-92, Cl. 324-610.000.
Mar, Jerry: *See*—
Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., B1 4,203,158, Cl. 365-185.000.
Neumann, Charles G., to Society National Bank. Auger type icemaker. B1 4,741,173, 9-22-92, Cl. 62-298.000.
Perlegos, George: *See*—
Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., B1 4,203,158, Cl. 365-185.000.
Rialland, Jean-Paul; and Barbier, Jean-Pierre, to Laiteries E. Bridel, Societe Anonyme. Process for selectively separating the alpha-lactalbumin from the proteins of whey. B1 4,782,138, 9-22-92, Cl. 530-366.000.
Society National Bank: *See*—
Neumann, Charles G., B1 4,741,173, Cl. 62-298.000.
Stencel, Edgar L., to VSI Corporation. Self-locking fastener, fastener system and process. B1 4,260,005, 9-22-92, Cl. 411-3.000.
VSI Corporation: *See*—
Stencel, Edgar L., B1 4,260,005, Cl. 411-3.000.

LIST OF DESIGN PATENTEES

Ackley, Robert W.: *See—*
Wells, Stanleigh; Ackley, Robert W.; and Dokoupil, James R., 329,548, Cl. D6-407.000.
Adams, Margaret T.: *See—*
Adams, Timothy J.; and Adams, Margaret T., 329,711, Cl. D26-54.000.
Adams, Timothy J.; and Adams, Margaret T. Combined table lamp and clock. 329,711, 9-22-92, Cl. D26-54.000.
Allibert S.A.: *See—*
Hubert, Manfred, 329,557, Cl. D6-502.000.
Allsop, Michael J.: *See—*
Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., 329,642, Cl. D4-104.000.
Altmann, Curtis F.; and Villani, David A., to Procter & Gamble Company, The. Combined bottle and cap. 329,598, 9-22-92, Cl. D9-572.600.
American Standard Inc.: *See—*
Levien, Robin H., 329,560, Cl. D6-524.000.
Paul, Stanley M., 329,559, Cl. D6-524.000.
Ancona, Bruce; and Ancona, Jane, to M. Kamenstein, Inc. Holder for kitchen utensils and the like. 329,574, 9-22-92, Cl. D7-641.000.
Ancona, Jane: *See—*
Ancona, Bruce; and Ancona, Jane, 329,574, Cl. D7-641.000.
Ando, Osamu; and Ogiwara, Susumu, to Shimadzu Corporation. Spectrophotometer. 329,614, 9-22-92, Cl. D10-46.000.
Antonious, Anthony J. Iron golf club head. 329,676, 9-22-92, Cl. D21-220.000.
Antonious, Anthony J. Iron golf club head. 329,677, 9-22-92, Cl. D21-220.000.
Artemide S.p.A.: *See—*
Gismondi, Ernesto, 329,716, Cl. D26-85.000.
Santachiara, Denis, 329,712, Cl. D26-62.000.
Arvanitakis, Nicolaos C.; Black, Vincent J.; and Nolan, Richard G., to International Business Machines Corporation. Optoelectronic assembly. 329,639, 9-22-92, Cl. D13-165.000.
Asahi Kogaku Kogyo K.K.: *See—*
Shishikura, Takenao, 329,656, Cl. D16-217.000.
Attinello, John S.; Glover, William E.; Landers, Samuel P.; and Maxwell, Paul B., to Goodyear Tire & Rubber Company, The. Pneumatic tire tread and buttress. 329,627, 9-22-92, Cl. D12-151.000.
Attwood Corporation: *See—*
Whitley, Warwick M., II, 329,660, Cl. D15-7.000.
Baik, Soon H., to Samsung Electronics Co., Ltd. Portable cassette tape recorder. 329,645, 9-22-92, Cl. D14-165.000.
Bailey, Catherine M., to Nike, Inc. Shoe upper. 329,530, 9-22-92, Cl. D2-314.000.
Ban, Yutaka: *See—*
Mizukami, Atsushi; Ikkatai, Masatoshi; and Ban, Yutaka, 329,659, Cl. D18-43.000.
Barrett, James L.: *See—*
Calloway, Randall A.; and Barrett, James L., 329,587, Cl. D8-341.000.
Barrett, Patrick J. Cover for beverage cans. 329,603, 9-22-92, Cl. D9-435.000.
Bech, Frank W. Bottle. 329,608, 9-22-92, Cl. D9-551.000.
Begley, John B.: *See—*
Begley, Roberta P.; and Begley, John B., 329,549, Cl. D6-412.000.
Begley, Roberta P.; and Begley, John B. Clothes rack. 329,549, 9-22-92, Cl. D6-412.000.
Benson, Bryan R.; and Mathison, Allen D., to Cherne Industries Incorporated. Pipe plug lock unit. 329,687, 9-22-92, Cl. D23-249.000.
Benson, Bryan R.: *See—*
Mathison, Allen D.; and Benson, Bryan R., 329,686, Cl. D23-249.000.
Berger, Robert L.: *See—*
Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., 329,642, Cl. D4-104.000.
Bikestream, Inc.: *See—*
Runkel, Kevin D., 329,628, Cl. D12-158.000.
Black, Vincent J.: *See—*
Arvanitakis, Nicolaos C.; Black, Vincent J.; and Nolan, Richard G., 329,639, Cl. D13-165.000.
Blankenburg, Richard. Foot stool massager. 329,704, 9-22-92, Cl. D24-213.000.
Bonilla, Robert L. Cat food. 329,554, 9-22-92, Cl. D1-107.000.
Bonnell, Donald G. Multi input port oil collection funnel. 329,655, 9-22-92, Cl. D15-150.000.
Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., to Warner-Lambert Company. Toothbrush head and handle unit. 329,642, 9-22-92, Cl. D4-104.000.
Bowling, Donald W. Angle drive for cordless screwdriver. 329,582, 9-22-92, Cl. D8-70.000.
Brattoli, Michael A.; and Rosenbaum, Kevin W., to Moen Incorporated. Faucet body. 329,685, 9-22-92, Cl. D23-238.000.
Brayton International Collection: *See—*
Shields, Michael R., 329,543, Cl. D6-334.000.
Brussing, Bernd, to Hefendehl, Hans Friedrich. Stand for stacking slidable trays. 329,556, 9-22-92, Cl. D6-468.000.
Bryan, Neill E.: *See—*
Ediger, Glen W.; Coup, Michael C.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 329,696, Cl. D23-411.000.
Burchell, David P.: *See—*
Meyer, Carl X.; Vitto, Louis O.; Burchell, David P.; and Schmid, James A., 329,713, Cl. D26-65.000.
Burgener, Eddy, to Roventa Henex SA. Watch. 329,611, 9-22-92, Cl. D10-30.000.
Burn, David J. Firearm target backstop. 329,680, 9-22-92, Cl. D22-113.000.
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Carranza, Victor, to Godinger Silver Artsco., Ltd. Hand mirror. 329,719, 9-22-92, Cl. D28-64.600.
Carroll, James P. Combined stand and target for shooting. 329,665, 9-22-92, Cl. D21-5.000.
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Mathison, Allen D.; and Benson, Bryan R., 329,686, Cl. D23-249.000.
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269 5,148,664
281 5,148,665
290 5,148,666

CLASS 60

39.02 5,148,667
39.05 5,148,668
39.092 5,148,669
39.142 5,148,670
39.281 5,148,671
200.1 5,148,672
225 5,148,673
240 5,148,674
321 5,148,675
429 5,148,676
602 5,148,678
641.5 5,148,677

CLASS 62

10 5,148,679
24 5,148,680
48.1 5,148,681
59 5,148,682
180 5,148,683
197 5,148,684
229 5,148,685
234 5,148,686
266 5,148,687
298 B1 4,741,173
457.3 5,148,688

CLASS 63

4 5,148,689

CLASS 65

3.11 5,149,349
12 5,149,350
106 5,149,352
107 5,149,353

CLASS 70

38 A 5,148,690
279 5,148,691
290 5,148,692

CLASS 71

67 5,149,354
83 5,149,355
90 5,149,356
92 5,149,357
5,149,358
94 5,149,359

CLASS 72

12 5,148,693
131 5,148,694
158 5,148,695
348 5,148,696
405 5,148,697
410 5,148,698

CLASS 73

1 R Re.34,070
40 5,148,699
61.41 5,148,700
5,148,701
114 5,148,702
123 5,148,703
146.8 5,148,704
152 5,148,705
172 5,148,706
204.26 5,148,707
304 R 5,148,708
320 5,148,709
335.06 5,148,710
660 5,148,711
756 5,148,712

CLASS 74

6 5,148,713
89.15 5,148,714
325 5,148,715
479 5,148,716
493 5,148,717
553 5,148,718
604 5,148,719
606 R 5,148,720
866 5,148,721
5,148,722

CLASS 75

228 5,149,360
233 5,149,361
240 5,149,362
414 5,149,363
566 5,149,364

CLASS 81

53.11 5,148,723
60 5,148,724
91.2 5,148,725
119 5,148,726
121.1 5,148,727

CLASS 82

1.11 5,148,728

CLASS 83

85.7 5,148,731
411.1 5,148,729
745 5,148,730
863 5,148,732

CLASS 84

327 5,149,901
622 5,149,902
627 5,149,903
723 5,149,904
726 5,148,733
744 5,149,905

CLASS 89

1.810 5,149,906
1.815 5,148,734
7 5,149,907
5,149,908
33.16 5,149,909
36.02 5,149,910

CLASS 91

459 5,148,735

CLASS 99

327 5,148,737
487 5,148,738

CLASS 100

45 5,148,739
264 5,148,740

CLASS 101

32 5,148,741
40 5,148,742
123 5,148,743
124 5,148,744
127.1 5,148,745
142 5,148,746
450.1 5,148,747

CLASS 102

201 5,148,748
204 5,148,749
302 5,149,911
343 5,149,912
439 5,148,750
506 5,149,913

CLASS 104

31 5,148,751
44 5,148,752
290 5,148,753

CLASS 105

96 5,148,754

CLASS 106

18.32 5,149,365
22 5,149,366
5,149,367
479 5,149,369
737 5,149,370

CLASS 108

47 5,148,755

CLASS 110

115 5,148,756
216 5,148,757
220 5,148,758

CLASS 112

121.22 5,148,759
144 5,148,760

CLASS 114

39.2 5,148,761
253 5,148,762
352 5,148,763

CLASS 116

318 5,148,764

CLASS 118

56 5,149,371
100 5,148,765
412 5,149,372
634 5,149,373
657 5,149,914
691 5,149,374
719 5,149,375
5,149,376
722 5,149,377
725 5,149,378

CLASS 119

5 5,148,772
17 5,148,766
5,148,771
19 5,148,767
5,148,768
29 5,148,769
5,148,770
37 5,148,773
165 5,148,774

CLASS 122

451 R 5,148,775

CLASS 123

25 J 5,148,776
41.15 5,148,777
65 R 5,148,778
90.16 5,148,783
90.28 5,148,779
193.2 5,148,780
193.5 5,148,781
195 C 5,148,784
195 R 5,148,782
196 R 5,148,785
198 E 5,148,786
337 5,148,787
339 5,148,788
367 5,148,789
399 5,148,790
417 5,148,791
497 5,148,792
520 5,148,793
538 5,148,794
697 5,148,795

CLASS 124

44.5 5,148,796

CLASS 125

13.02 5,148,797

CLASS 126

10 5,148,798
271.2 A 5,148,799

CLASS 128

25 B 5,148,800
203.16 5,148,801
204.18 5,148,802
205.27 5,148,803
402 5,148,804
419 D 5,148,805
639 5,148,806
645 5,148,807
660.05 5,148,808
660.07 5,148,809
661.01 5,148,810
673 5,148,811
704 5,148,812
754 5,148,813
804 5,148,814
869 5,148,815

CLASS 131

84.1 5,148,816
278 5,148,817
281 5,148,818
297 5,148,819
311 5,148,820
370 5,148,821

CLASS 132

204 5,148,822

CLASS 134

10 5,149,379
22.13 5,149,380
184 5,148,823

CLASS 137

3 5,148,824
78.3 5,148,825
80 5,148,826
209 5,148,827
454.6 5,148,828
486 5,148,829
513.7 5,148,830
614.11 5,148,831
615 5,148,832
625.65 5,148,833

CLASS 138

31 5,148,834
96 T 5,148,835
121 5,148,836
5,148,837

CLASS 139

383 AA 5,148,838

CLASS 141

1 5,148,839
44 5,148,840
83 5,148,841
98 5,148,842

CLASS 144

2 Z 5,148,843
208 J 5,148,844
218 5,148,845
249 R 5,148,846
357 5,148,847

CLASS 148

257 5,149,382
400 5,149,383
513 5,149,381

CLASS 149

19.1 5,149,384

CLASS 156

85 5,149,385
150 5,149,386
241 5,149,387
250 5,149,388
272.4 5,149,389
414 5,149,390
441 5,149,391
542 5,149,392
555 5,149,393
5,149,394
581 5,149,395
656 5,149,396
657 5,149,397

CLASS 159

4.01 5,149,398
22 5,149,399

CLASS 160

67 5,148,848
5,148,849
231.1 5,148,850

CLASS 162

181.6 5,149,400
207 5,149,401
336 5,149,402

CLASS 164

20 5,148,851
169 5,148,852
455 5,148,853
457 5,148,854
479 5,148,855
487 5,148,856

CLASS 165

1 5,148,857
38 5,148,858
41 5,148,859
5,148,860
78 5,148,861
134.1 5,148,862
149 5,148,863

CLASS 166

65.1 5,148,864
76 5,148,865
134 5,148,866
213 5,148,867

297 5,148,868
303 5,148,869
342 Re.34,071
344 5,148,870
345 5,148,871

CLASS 168

11 5,148,872

CLASS 172

5 5,148,873

CLASS 174

36 5,149,915
74 R 5,149,916
129 R 5,149,917

CLASS 175

11 5,148,874
62 5,148,875
76 5,148,876
79 5,148,877
296 5,148,878
371 5,148,879
393 5,148,880

CLASS 177

50 5,148,881

CLASS 178

18 5,149,918
19 5,149,919

CLASS 180

9.64 5,148,882
68.3 Re.34,072
165 5,148,883
197 5,148,884
253 5,148,885
275 5,148,886

CLASS 181

129 5,148,887
171 5,148,888
290 5,149,920

CLASS 182

17 5,148,889
45 5,148,890
120 5,148,891
201 5,148,892

CLASS 187

20 5,148,893
130 5,149,921
131 5,149,922

CLASS 188

72.6 5,148,894
299 5,148,895
314 5,148,896
322.22 5,148,897

CLASS 191

6 5,148,898

CLASS 192

3.63 5,148,899
58 C 5,148,900
67 R 5,148,901
84 B 5,148,902
85 AA 5,148,903
89 B 5,148,904

CLASS 194

210 5,148,905

CLASS 198

328 5,148,906
468.2 5,148,907
774.3 5,148,908
780 5,148,909

CLASS 200

5 A 5,149,923
5 R 5,149,924
43.19 5,148,910
61.43 5,148,911
61.45 M 5,149,925
5,149,926
83 P 5,149,927
147 R 5,149,928
400 5,148,913

CLASS 204

98 5,149,403
129.1 5,149,404
5,149,405
157.22 5,149,406
157.41 5,149,407
182.3 5,149,408
192.2 5,149,409
199 5,149,410
237 5,149,411
243 R 5,149,412
258 5,149,413
294 5,149,414
298.14 5,149,415
299 R 5,149,416
5,149,417
5,149,418

CLASS 205

75 5,149,419
219 5,149,420

CLASS 206

1.5 5,148,914
315.6 5,148,915
352 5,148,916
372 5,148,917
423 5,148,918
443 5,148,919
588 5,148,920

CLASS 208

114 5,149,421

CLASS 209

20 5,148,921
489 5,148,922
539 5,148,923

CLASS 210

85 5,149,422
148 5,149,423
174 5,149,424
198.2 5,149,425
5,149,426
274 5,149,427
283 5,149,428
291 5,149,429
321.8 5,149,430
323.2 5,149,431
381 5,149,432
521 5,149,434
641 5,149,433
651 5,149,435
657 5,149,436
665 5,149,437
695 5,149,438
702 5,149,439
708 5,149,440
719 5,149,441
724 5,149,442
739 5,149,443
744 5,149,446
751 5,149,444
767 5,149,447
773 5,149,445
784 5,149,448
798 5,149,449

CLASS 211

41 5,148,924
5,148,925
118 5,148,926
184 5,148,927
187 5,148,928

CLASS 212

180 5,148,929

CLASS 215

1 C 5,148,930
220 5,148,931

CLASS 219

10.55 B 5,149,929
10.55 R 5,149,930
69.13 5,149,931
75 5,149,932
113 5,149,933
121.27 5,149,934
121.65 5,149,935
5,149,936
121.68 5,149,937
121.69 5,149,938
125.12 5,149,939
130.21 5,149,940
216 5,149,941
219 5,149,942
243 5,149,943
464 5,149,944

CLASS 220

4.31 5,148,933
23.2 5,148,932
203 5,148,934
208 5,148,935
254 5,148,936
278 5,148,937
316 5,148,938
339 5,148,912
401 5,148,939
404 5,148,940
408 5,148,941
533 5,148,942

CLASS 221

131 5,148,944

CLASS 222

1 5,148,943
5,148,945
5,148,946
146.5 5,148,947
173 5,148,948
175 5,148,949
5,148,950
386 5,148,951
402.22 5,148,952
442 5,148,953

CLASS 223

25 5,148,954
70 5,148,955

CLASS 224

3.19 5,149,011
209 5,148,956

CLASS 228

2 5,148,957
3.1 5,148,958
4.5 5,148,959
17.5 5,148,960
37 5,148,961
49.1 5,148,962
102 5,148,963
5,148,964
115 5,148,965
149 5,148,966
179 5,148,967
180.2 5,148,968
264 5,148,969

CLASS 229

102 5,148,970
103.1 5,148,971
113 5,148,972
125.28 5,148,973

CLASS 232

17 5,148,974
44 5,148,975

CLASS 235

380 5,149,945
439 5,149,946
454 B1 4,680,456
462 5,149,947
5,149,948
467 5,149,949
472 5,149,950
485 5,149,951

CLASS 236

12.2 5,148,976
49.3 5,148,977
68 R 5,148,978
94 5,148,979

CLASS 238

17 5,148,980
351 5,148,981

CLASS 239

1 5,148,982
56 5,148,983
58 5,148,984
64 5,148,985
85 5,148,986
96 5,148,987
150 5,148,988
171 5,148,989
222.17 5,148,990
242 5,148,991
289 5,148,992

CLASS 241

24 5,148,993
30 5,148,995
36 5,148,996
65 5,148,997
241 5,148,998
260.1 5,148,999
261.1 5,148,994

CLASS 242

1.1 R 5,149,000
42 5,149,001
43 A 5,149,002
55.2 5,149,003
57 5,149,004
67.1 R 5,149,005
231 5,149,006
246 5,149,007
5,149,008
268 5,149,009
311 5,149,010

CLASS 244

12.2 5,149,012
17.11 5,149,013
17.19 5,149,014
31 5,149,015
55 5,149,016
114 R 5,149,017
117 A 5,149,018
145 5,149,019
153 A 5,149,020
155 A 5,149,021
168 5,149,022
229 5,149,023

CLASS 246

66 5,149,024
169 A 5,149,025

CLASS 248

68.1 5,149,026
5,149,027
101 5,149,028
124 5,149,029
129 5,149,030
131 5,149,031
146 5,149,041
154 5,149,032
176 5,149,033
178 5,149,034
188.7 5,149,035
215 5,149,036
216.1 5,149,037
297.2 5,149,038
300 5,149,039
5,149,040
317 5,149,042
349 5,149,043
357 5,149,044
363 5,149,045
453 5,149,046
459 5,149,047
632 5,149,048
674 5,149,049
679 5,149,050
918 5,149,051

CLASS 249

105 5,149,052

CLASS 250

205 5,149,953
208.1 5,149,954
211 J 5,149,955
5,149,956
211 R 5,149,957
216 5,149,958
226 5,149,959
5,149,960
227.11 5,149,961
227.17 5,149,962
227.21 5,149,963
251 5,149,964
252.1 5,149,965
309 5,149,966
310 5,149,967
5,149,968
334 5,149,969
339 5,149,970
361 R 5,149,971
461.1 5,149,972
492.2 5,149,973
5,149,974
5,149,975
5,149,976
556 5,149,977
560 5,149,978
561 5,149,952
5,149,979
5,149,980
571 5,149,981
5,149,982
575 5,149,983

CLASS 251

149.9 5,149,053
309 5,149,054
324 5,149,055

CLASS 252

17 5,149,450
18 5,149,451
56 R 5,149,452
68 5,149,453
74 5,149,454
174.13 5,149,455
174.25 5,149,456
182.12 5,149,457
182.26 5,149,458
191 5,149,459
5,149,460
299.61 5,149,461
5,149,462
301.21 5,149,463
373 5,149,464
511 5,149,465

CLASS 254

134.3 FT 5,149,056
276 5,149,057
369 5,149,058
394 5,149,059

CLASS 256

21 5,149,060
24 5,149,061

CLASS 261

18.2 5,149,466

CLASS 264

1.5 5,149,467
12 5,149,468
28 5,149,469
29.6 5,149,470
40.5 5,149,471
40.6 5,149,472
51 5,149,473
63 5,149,474
67 5,149,475
5,149,476
112 5,149,477
162 5,149,478
163 5,149,479
178 F 5,149,480
210.2 5,149,481
255 5,149,482
272.19 5,149,483
328.17 5,149,484
532 5,149,485
553 5,149,486

CLASS 266

172 5,149,062
5,149,487
204 5,149,063
242 5,149,488

CLASS 267

97 5,149,064
136 5,149,065
5,149,066
140.13 5,149,067
147 5,149,068
153 5,149,069
159 5,149,150

CLASS 269

32 5,149,070
43 5,149,071
111 5,149,072
297 5,149,073

CLASS 270

39 5,149,075

CLASS 271

2 5,149,076
18.3 5,149,077
145 5,149,078
162 5,149,079
265 5,149,080
272 5,149,081
276 5,149,082
277 5,149,083

CLASS 273

1.5 A 5,149,085
15 R 5,149,086
32 B 5,149,087
33 5,149,088
63 E 5,149,089
73 D 5,149,090
80.2 5,149,091
84 R 5,149,092
118 A 5,149,093
121 A 5,149,094
128 R 5,149,096
148 R 5,149,097
157 R 5,149,098
189 R 5,149,099
232 5,149,100
246 5,149,101
258 5,149,102
432 5,149,103
434 5,149,104

CLASS 277

1 5,149,105
37 5,149,106
165 5,149,107
199 5,149,108
5,149,109
235 B 5,149,110

CLASS 279

2.03 5,149,111

CLASS 280

7.11 5,149,112
18.1 5,149,117
30 5,149,113
33.992 5,149,114
33.998 5,149,115
47.26 5,149,116
250.1 5,149,118
275 5,149,119
304.1 5,149,120
432 5,149,121
491.2 5,149,122
618 5,149,123
633 5,149,124
651 5,149,125
704 5,149,126
731 5,149,127
734 5,149,128
740 5,149,129
743 5,149,130
772 5,149,131
800 5,149,132
804 5,149,133
806 5,149,134
5,149,135
808 5,149,136

CLASS 281

31 5,149,137

CLASS 283

70 5,149,138
5,149,139
93 5,149,140

CLASS 285

13 5,149,141
14 5,149,142
18 5,149,143
23 5,149,144
101 5,149,145
166 5,149,146
261 5,149,147
276 5,149,148
402 5,149,149

CLASS 290

54 5,149,984

CLASS 292

1.5 5,149,151
37 5,149,152
104 5,149,153
226 5,149,154
336.3 5,149,155
5,149,156
341.16 5,149,157

CLASS 293

28 5,149,166

CLASS 294

1.1 5,149,158
1.3 5,149,159
16 5,149,160
26.5 5,149,161
64.1 5,149,162
86.31 5,149,163

CLASS 296

50 5,149,164
68.1 5,149,165
191 5,149,167
201 5,149,168
206 5,149,169
213 5,149,170

CLASS 297

94 5,149,171
250 5,149,172
284.9 5,149,173
423 5,149,174

CLASS 299

1.9 5,149,175

CLASS 303

20 5,149,176
110 5,149,177
116 R 5,149,178

CLASS 307

10.7 5,149,985
117 5,149,986
272.3 5,149,987
296.6 5,149,988
311 5,149,989
443 5,149,990
5,149,991
448 5,149,992
465.1 5,149,993
491 5,149,994
633 5,149,995

CLASS 310

12 5,149,996
63 5,149,997
105 5,149,998
239 5,149,999
323 5,150,000

CLASS 312

275 5,149,179
322 5,149,180

CLASS 313

7 5,150,001
417 5,150,002
440 5,150,003
479 5,150,004
495 5,150,005
504 5,150,006
586 5,150,007

CLASS 315

71 5,150,008
107 5,150,009
111.81 5,150,010

169 4 5,150,011
200 A 5,150,012
209 R 5,150,013
224 5,150,014
248 5,150,015
294 5,150,016
326 5,150,017
349 5,150,018
350 5,150,019

CLASS 318

87 5,150,020
488 5,150,021
563 5,150,022
567 5,150,023
568 1 5,150,024
568 11 5,150,026
571 5,150,025
581 5,150,027
701 5,150,028
800 5,150,029
811 5,150,030

CLASS 320

2 5,150,031
14 5,150,032
51 5,150,033
62 5,150,034
5,150,045

CLASS 323

356 5,150,046

CLASS 324

71 1 5,150,035
71 4 5,150,036
5,150,037
72 5 5,150,038
127 5,150,039
158 F 5,150,040
5,150,041
158 R 5,150,042
5,150,043
5,150,044
5,150,047
5,150,048
207 12 5,150,049
212 5,150,050
258 5,150,051
309 5,150,052
5,150,053
318 5,150,054
322 5,150,055
326 5,150,056
508 5,150,057
519 5,150,058
551 5,150,059
610 B1 4,146,834
635 5,150,060
640 5,150,061
646 5,150,063
675 5,150,062
687 Re 34,073
691 5,150,064
700 5,150,065

CLASS 328

55 5,150,066
64 5,150,067
155 5,150,068
171 5,150,069

CLASS 329

307 5,150,070

CLASS 330

84 5,150,071
149 5,150,072
261 5,150,073
263 5,150,074
279 5,150,075
296 5,150,076

CLASS 331

1 A 5,150,077
2 5,150,078
75 5,150,079
99 5,150,080
109 5,150,081

CLASS 332

128 5,150,082

CLASS 333

103 5,150,083
128 5,150,084
174 5,150,085
182 5,150,086
185 5,150,087
206 5,150,089
238 5,150,088

CLASS 335

84 5,150,090
132 5,150,092
202 5,150,091

CLASS 337

163 5,150,093
214 5,150,094

CLASS 33

196 5,150,095

CLASS 34

286 14 5,150,096
396 5,150,097
479 5,150,098
552 5,150,099
555 5,150,100
568 5,150,101
584 5,150,102
686 5,150,103
5,150,104
701 5,150,105
709 5,150,106
724 5,150,107
735 5,150,108
811 5,150,109
825 3 5,150,111
5,150,112
5,150,113
825 44 5,150,110
825 54 5,150,114
870 31 5,150,115
928 5,150,116
973 5,150,117

CLASS 341

23 5,150,118
51 5,150,119
143 5,150,120
157 5,150,121

CLASS 342

8 5,150,122
28 5,150,123
68 5,150,124
120 5,150,125
137 5,150,126
169 5,150,127
174 5,150,128

CLASS 346

1.1 5,150,129
76 PH 5,150,130
134 5,150,131
140 R 5,150,132
155 5,150,133
5,150,134
159 5,150,135

CLASS 351

111 5,150,136
166 5,150,9,181
210 5,150,137

CLASS 353

38 5,150,138

CLASS 354

106 5,150,139
145.1 5,150,140
152 5,150,141
324 5,150,142
400 5,150,143
5,150,144
403 5,150,145
5,150,146
412 5,150,147
413 5,150,148
441 5,150,149
456 5,150,150

CLASS 355

53 5,150,151
5,150,152
5,150,153
208 5,150,154
5,150,155
214 5,150,156
219 5,150,157
239 5,150,158
243 5,150,159
256 5,150,160
5,150,161
260 5,150,162
271 5,150,163
5,150,164
274 5,150,165
308 5,150,166
313 5,150,167
319 5,150,168

CLASS 356

1 5,150,169
28.5 5,150,170
128 5,150,171
346 5,150,172
401 5,150,173
402 5,150,174
405 5,149,182
429 5,150,175

CLASS 357

13 5,150,176
15 5,150,177
23.5 5,150,178
5,150,179
29 5,150,180
30 5,150,181
5,150,182
32 5,150,183
34 5,150,184
5,150,185
5,150,188
41 5,150,186
42 5,150,187
43 5,150,189
53 5,150,190
59 5,150,191
61 5,150,192
68 5,150,193
70 5,150,194
5,150,195
72 5,150,196
74 5,150,197
80 5,150,198
81 5,150,199

CLASS 358

21 R 5,150,200
22 5,150,201
23 5,150,206
30 5,150,202
31 5,150,203
40 5,150,204
44 5,150,205
60 5,150,207
133 5,150,208
5,150,209
135 5,150,210
143 5,150,211
147 5,150,212
160 5,150,213
166 5,150,214
209 5,150,215
213.11 5,150,216
227 5,150,217
310 5,150,218
335 5,150,219
336 5,150,220
400 5,150,222
403 5,150,221
448 5,150,223
449 5,150,224
456 5,150,225
471 5,150,226
497 5,150,227

CLASS 359

7 5,150,228
5,150,229
34 5,150,230
44 5,150,231
51 5,150,232
54 5,150,233
65 5,150,234
68 5,150,235
71 5,150,236
73 5,150,237
74 5,150,238
80 5,150,239
87 5,150,240
89 5,150,241
108 5,150,242
110 5,150,243
113 5,150,244
117 5,150,245
118 5,150,246
135 5,150,247
160 5,150,248
202 5,150,249
221 5,150,250
246 5,150,251
252 5,150,252
360 5,150,253
367 5,150,254
409 5,150,255
428 5,150,256
601 5,150,257
608 5,150,258
619 5,150,259
694 5,150,260
810 5,150,261
885 5,149,183

CLASS 360

48 5,150,262
69 5,150,263
71 5,150,264
5,150,265
78.04 5,150,266
97.020 5,150,267
128 5,150,268
133 5,150,269

CLASS 361

64 5,150,270
119 5,150,271
144 5,150,272
221 5,150,273
283 5,150,275
313 5,150,276
382 5,150,274
384 5,150,277
386 5,150,278
393 5,150,279
401 5,150,280
413 5,150,281
424 5,150,282
502 5,150,283

CLASS 362

1 5,149,184
20 5,149,185
32 5,149,489
75 5,149,186
80 5,149,187
83 1 5,150,284
108 5,149,189
183 5,149,188
234 5,149,190
290 5,149,191
405 5,150,285

CLASS 363

56 5,150,286
135 5,150,287

CLASS 364

132 5,150,288
154 5,150,289
413 03 5,150,291
413 07 5,150,292
419 5,150,293
5,150,294
420 5,150,295
424 1 5,150,296
5,150,297
426 02 5,150,298
5,150,299
431.03 5,150,300
431 05 5,150,301
471 5,150,302
474 14 5,150,303
474 24 5,150,304
474.26 5,150,305
474 34 5,150,306
478 5,150,307
489 5,150,308
491 5,150,309
516 5,150,310
569 5,150,313
571 02 5,150,314
709 02 5,150,315
709 12 5,150,316
724 01 5,150,317
724 03 5,150,318
736 5,150,290
745 5,150,319
748 5,150,320
759 5,150,321
760 5,150,322
807 5,150,323
5,150,324

CLASS 365

177 5,150,325
185 B1 4,203,158
189.01 5,150,326
5,150,327
189 03 5,150,328
222 5,150,329
230.03 5,150,330

CLASS 366

8 5,149,192
145 5,149,193
282 5,149,194
343 5,149,195
345 5,149,196

CLASS 367

50 5,150,331
73 5,150,332
83 5,150,333
98 5,150,334
101 5,150,335
103 5,150,336

CLASS 368

118 5,150,337

CLASS 369

13 5,150,338
32 5,150,339
33 5,150,340
36 5,150,341
44.14 5,150,342
44.22 5,150,343
44.28 5,150,344
44.34 5,150,345
44.36 5,150,346
44.37 5,150,347
44.41 5,150,348
75.2 5,150,349
112 5,150,350
116 5,150,351
258 5,150,352
270 5,150,353
291 5,150,354

CLASS 370

16 5,150,355
16 1 5,150,356
68 1 5,150,357
84 5,150,358
85 11 5,150,359
94 3 5,150,360
95 1 5,150,361
95 100 5,150,362
112 5,150,363
5,150,364
123 5,150,365

CLASS 371

22 3 5,150,366
23 5,150,367
31 5,150,368
43 5,150,369

CLASS 372

34 5,150,371
38 5,150,372
61 5,150,373
92 5,150,374
98 5,150,375
106 5,150,370
107 5,150,376

CLASS 374

117 5,149,197
139 5,149,198
178 5,149,199
185 5,149,200

CLASS 375

1 5,150,377
5,150,378
5,150,379
14 5,150,380
16 5,150,381
39 5,150,382
88 5,150,383
94 5,150,384
97 5,150,385
106 5,150,386
118 5,150,387
122

CLASS 376

260 5,149,490
267 5,149,491
283 5,149,492
312 5,149,493
320 5,149,494
444 5,149,495

CLASS 377

60 5,150,388
67 5,150,389
116 5,150,390

CLASS 378

34 5,150,391
5,150,392
37 5,150,393
62 5,150,394
86 5,150,395
99 5,150,396
129 5,150,397
132 5,150,398

CLASS 379

67 5,150,399
93 5,150,400
5,150,403
145 5,150,404
155 5,150,405
230 5,150,406
446

CLASS 380

4 5,150,407
21 5,150,408
23 5,150,409
28 5,150,410
29 5,150,401
30 5,150,411
43 5,150,412

CLASS 381

46 5,150,413
47 5,150,414
104 5,150,415
5,150,416
154 5,150,417
159 5,150,418
194 5,150,419

CLASS 382

1 5,150,420
6 5,150,421
8 5,150,422
5,150,423
13 5,150,424
14 5,150,425
48 5,150,426
50 5,150,427
5,150,428
56 5,150,429
5,150,430
5,150,431
5,150,432
5,150,433
5,150,434

CLASS 383

8 5,149,201
106 5,149,202
111 5,149,203

CLASS 384

15 5,149,204
5,149,205
99 5,149,206
478 5,149,207
551 5,149,208

CLASS 385

1 5,150,435
2 5,150,436
7 5,150,437
14 5,150,438
39 5,150,439
49 5,150,440
101 5,150,442
107 5,150,443
109 5,150,444
116 5,150,445
122 5,150,446
130 5,150,447

CLASS 392

379 5,149,209
480 5,150,448

CLASS 395

2 5,150,449
23 5,150,450
83 5,150,451
90 5,150,452
106 5,150,453
108 5,150,311
114 5,150,454
5,150,455
5,150,456
118 5,150,312
120 5,150,457
135 5,150,458
151 5,150,459
5,150,460
164 5,150,461
166 5,150,462
200 5,150,463
5,150,464
275 5,150,465
325 5,150,466
5,150,467
375 5,150,468
5,150,469
5,150,470
400 5,150,471
425 5,150,472
5,150,473
500 5,150,474

CLASS 400

56 5,149,210
88 5,149,211
121 5,149,212
124 5,149,213
157 2 5,149,214
279 5,149,215
320 5,149,216
608 4 5,149,217
625 5,149,218

CLASS 401

65 5,149,219

CLASS 403

5 5,149,220
201 5,149,221
291 5,149,222
359 5,149,223

CLASS 404

6 5,149,224
133.1 5,149,225

CLASS 405

65 5,149,226
73 5,149,227
289 5,149,228

CLASS 406

75 5,149,229

CLASS 408

42 5,149,230
82 5,149,231
137 5,149,232
199 5,149,233
211 5,149,234

CLASS 411

3 B1 4,260,005
41 5,149,235
439 5,149,236
446 5,149,237

CLASS 413

8 5,149,238
31 5,149,239

CLASS 414

277 5,149,240
279 5,149,241
5,149,242
408 5,149,243
417 5,149,244
440 5,149,245
541 5,149,246

CLASS 415

108 5,149,247
169.2 5,149,248
170.1 5,149,249
209.3 5,149,250

CLASS 416

245 R 5,149,251

CLASS 417

205 5,149,252
353 5,149,253
569 5,149,254

CLASS 418

55.3 5,149,255
150 5,149,256
178 5,149,257

CLASS 419

17 5,149,496

CLASS 420

418 5,149,497
492 5,149,498
495 5,149,499

CLASS 422

31 5,149,500
58 5,149,501
62 5,149,502
82.05 5,149,503
88 5,149,504
99 5,149,505
102 5,149,506
112 5,149,507
174 5,149,508
177 5,149,509

CLASS 423

84 5,149,510
212 5,149,511
239 5,149,512
328 5,149,513
344 5,149,514
393 5,149,515
415 A 5,149,516
447.2 5,149,517
449 5,149,518
610 5,149,519
625 5,149,520

CLASS 424

58 5,149,521
70 5,149,522
78.1 5,149,523
78.36 5,149,524
84 5,149,525
5,149,526
85.2 5,149,527
85 91 5,149,528
88 5,149,529
89 5,149,530
5,149,531
5,149,532
94.64 5,149,533
195.1 5,149,535
195.100 5,149,534
401 5,149,536
436 5,149,537
449 5,149,538
5,149,539
489 5,149,540
5,149,541
493 5,149,542
499 5,149,543
577 5,149,544
602 5,149,368

CLASS 425

35 5,149,545
130 5,149,546
145 5,149,547
174.4 5,149,548
190 5,149,258

CLASS 426

2 5,149,549
3 5,149,550
231 5,149,551
321 5,149,552
330 4 5,149,553
420 5,149,554
448 5,149,555
503 5,149,594
521 5,149,556
570 5,149,557
588 5,149,558
602 5,149,559
5,149,560
614 5,149,561
632 5,149,562

CLASS 427

27 5,149,563
127 5,149,564
215 5,149,565
235 5,149,566
240 5,149,567

CLASS 428

14 5,149,568
31 5,149,569
33 5,149,570
40 5,149,571
43 5,149,572
93 5,149,573
116 5,149,574
188 5,149,575
198 5,149,576
207 5,149,577
213 5,149,578
5,149,579
220 5,149,580
224 5,149,581
234 5,149,582
253 5,149,583
297 5,149,584
323 5,149,585
345 5,149,586
354 5,149,587
411.1 5,149,588
412 5,149,589
421 5,149,590
423 1 5,149,591
447 5,149,592
552 5,149,595
656 5,149,596
680 5,149,597

CLASS 429

1 5,149,598
13 5,149,599
17 5,149,600
30 5,149,601
96 5,149,602
97 5,149,604
98 5,149,603
160 5,149,605
228 5,149,606

CLASS 430

17 5,149,607
23 5,149,608
58 5,149,609
106 5,149,610
110 5,149,611
132 5,149,612
288 5,149,776
296 5,149,613
302 5,149,614
313 5,149,615
346 5,149,616
5,149,617
393 5,149,618
572 5,149,619
617 5,149,620

CLASS 431

2 5,149,263
5 5,149,259
11 5,149,260
207 5,149,261
258 5,149,262

CLASS 432

2 5,149,264
24 5,149,265
77 5,149,266

CLASS 433

26 5,149,267
224 5,149,268

CLASS 434

203 5,149,269
262 5,149,270
295 5,149,271

CLASS 435

1 5,149,621
5 5,149,622
5,149,623
6 5,149,624
5,149,625
7.1 5,149,627
7.21 5,149,631
7.31 5,149,632
7 9 5,149,626
5,149,629
5,149,630
25 5,149,633
29 5,149,634
69 1 5,149,635
5,149,636
69 6 5,149,637
76 5,149,638
5,149,639
100 5,149,640
125 5,149,641
135 5,149,642
144 5,149,643
146 5,149,644
172.3 5,149,645
190 5,149,646
192 5,149,647
5,149,648
240 242 5,149,649
243 5,149,650
244 5,149,651
246 5,149,652
260 5,149,653
287 5,149,654
5,149,655
288 5,149,656
320.1 5,149,657

CLASS 436

53 5,149,658
55 5,149,659
87 5,149,660
97 5,149,272
178 5,149,661

CLASS 437

8 5,149,662
31 5,149,663
41 5,149,664
43 5,149,665
5,149,666
52 5,149,667
5,149,668
72 5,149,669
129 5,149,670
183 5,149,671
189 5,149,672
192 5,149,673
195 5,149,674
228 5,149,676
248 5,149,675

CLASS 439

15 5,149,273
76 5,149,274
98 5,149,275
159 5,149,276
207 5,149,277
412 5,149,278
441 5,149,279
457 5,149,280
521 5,149,281
530 5,149,282
607 5,149,283

CLASS 440

52 5,149,284
61 5,149,285
5,149,286
88 5,149,287

CLASS 446

319 5,149,288
321 5,149,289
475 5,149,290
488 5,149,291

CLASS 449

1 5,149,292

CLASS 450

86 5,149,293

CLASS 452

10 5,149,294
71 5,149,295
108 5,149,296
162 5,149,297
174 5,149,298

CLASS 454

131 5,148,736
195 5,149,299
338 5,149,300
365 5,149,301

CLASS 464

52 5,149,302
68 5,149,303

CLASS 472

131 5,149,304

CLASS 474

101 5,149,305
135 5,149,306

CLASS 475

200 5,149,307
203 5,149,308
234 5,149,309
329 5,149,310
343 5,149,311

CLASS 482

3 5,149,084
62 5,149,312
100 5,149,313
111 5,149,314

CLASS 493

189 5,149,315
194 5,149,316

CLASS 501

96 5,149,677
134 5,149,678

CLASS 502

61 5,149,679
185 5,149,680

CLASS 503

221 5,149,689

CLASS 505

1 5,149,681
5,149,682
5,149,683
5,149,684
5,149,685
5,149,686
5,149,687

CLASS 507

131 5,149,690

CLASS 514

3 5,149,716
12 5,149,691
18 5,149,692
40 5,149,693
5,149,694
75 5,149,695
179 5,149,696
185 5,149,697
211 5,149,698
254 5,149,688
258 5,149,699
275 5,149,700
291 5,149,701
303 5,149,702
311 5,149,703
342 5,149,704
356 5,149,705
372 5,149,706
396 5,149,707
410 5,149,708
456 5,149,717
486 5,149,709
529 Re 34,075
547 5,149,710
548 5,149,711
563 5,149,712
567 5,149,713
655 5,149,714
701 5,149,715
732 5,149,718
772 5,149,719

CLASS 521

63 5,149,720
79 5,149,721
99 5,149,722
110 5,149,725
143 5,149,726

CLASS 522

156 5,149,727

CLASS 523

466 5,149,730

CLASS 524

99 5,149,723
110 5,149,724
259 5,149,728
265 5,149,731
315 5,149,732
331 5,149,733
366 5,149,729
423 5,149,734
450 5,149,735
490 5,149,736
564 5,149,737

CLASS 525

53 5,149,738
66 5,149,739
92 5,149,740
95 5,149,741
124 5,149,742
331.4 5,149,743
356 5,149,744
366 5,149,745
422 5,149,746
454 5,149,747
477 5,149,748
537 5,149,749

CLASS 526

81 5,149,750
178 5,149,751
240 5,149,752
245 5,149,753
309 5,149,754

CLASS 528

1 5,149,763
14 5,149,764
25 5,149,765
49 5,149,766
71 5,149,767
89 5,149,768
193 5,149,769
199 5,149,770
210 5,149,755
230 5,149,756
271 5,149,757
318 5,149,758
348 5,149,759
353 5,149,760
5,149,761
5,149,762
5,149,771
5,149,772
423 5,149,773
492 5,149,774
493 5,149,775

CLASS 530

303 5,149,777
317 5,149,778
5,149,779
324 5,149,780
326 5,149,781
5,149,782
344 5,149,783
350 5,149,784
5,149,785
5,149,786
5,149,788
366 B1 4,782,138
383 5,149,787
399 5,149,792

CLASS 534

618 5,149,789
634 5,149,790
638 5,149,791

CLASS 536

16 8 5,149,793
23 5,149,795
27 5,149,796
5,149,797
5,149,798
29 5,149,794
102 5,149,799

CLASS 540

123 5,149,800
145 5,149,801
200 5,149,802
225 5,149,803
466 5,149,804
485 5,149,805

CLASS 544

72 5,149,806
99 5,149,807
141 5,149,808
242 5,149,809
309 5,149,810
345 5,149,811

CLASS 546

23 5,149,812
105 5,149,813
118 5,149,814
163 5,149,815
251 5,149,816
281 5,149,817
315 5,149,822

CLASS 548

126 5,149,818
149 5,149,819
215 5,149,820
5,149,821
410 5,149,823
435 5,149,824
515 5,149,825
518 5,149,826
548 5,149,827

CLASS 549

13 5,149,828
222 5,149,829
223 5,149,830
237 5,149,831
264 5,149,832
274 5,149,833
292 5,149,834
5,149,835
325 5,149,836
333 5,149,837
471 5,149,838
477 5,149,840
520 5,149,841
550 5,149,842
561 5,149,843

CLASS 552

238 5,149,848
293 5,149,849
308 5,149,850

CLASS 554

165 5,149,851
193 5,149,852

CLASS 556

1 5,149,853
49 5,149,854
89 5,149,844
110 5,149,845
413 5,149,839
436 5,149,846

CLASS 558

192 5,149,847
255 5,149,855
270 5,149,856
271 5,149,857
419 5,149,858

CLASS 560

10 5,149,859
160 5,149,860
234 5,149,861
240 5,149,862
301 5,149,863

CLASS 562

2 5,149,864
473 5,149,865
478 5,149,866
486 5,149,867
497 5,149,868
506 5,149,869
507 5,149,870
556 5,149,871

CLASS 564

151 5,149,872
170 5,149,873
248 5,149,874
412 5,149,875
467 5,149,876
479 5,149,877

CLASS 565

60.2 5,149,351

CLASS 568

12 5,149,878
21 5,149,879
342 5,149,880
396 5,149,881
438 5,149,882
471 5,149,884
564 5,149,883
571 5,149,885
727 5,149,886
751 5,149,887
771 5,149,888
790 Re 34,076
878 5,149,889
934 5,149,890

CLASS 570

148 5,149,891
210 5,149,892

CLASS 585

267 5,149,893
467 5,149,894
507 5,149,895
532 5,149,896

CLASS 600

27 5,149,317

CLASS 604

8 5,149,318
22 5,149,319
49 5,149,320
52 Re 34,077
5,149,321
110 5,149,322
5,149,323
5,149,324
119 5,149,325
163 5,149,326
167 5,149,327
177 5,149,328
272 5,149,329
280 5,149,330
290 5,149,331
358 5,149,332
367 5,149,333
5,149,334
372 5,149,335
388 5,149,336

CLASSIFICATION OF DESIGNS

D1—	107	329,524		502	329,557	D9—	301	329,591		111	329,625		53	329,661		382	329,695
	111	329,525		515	329,558			329,592		146	329,626		60	329,662		411	329,696
	127	329,526		524	329,559		332	329,593		151	329,627		78	329,663	D24—	126	329,697
D2—	265	329,527			329,560		341	329,594		158	329,628	D20—	31	329,664		143	329,698
	314	329,528		525	329,561		414	329,599		168	329,629	D21—	5	329,665		147	329,699
		329,529		531	329,562		418	329,600		181	329,630			329,666		155	329,700
		329,530		552	329,563			329,601		187	329,631		12	329,667		167	329,701
		329,531		553	329,564		435	329,602		190	329,632		59	329,668		169	329,702
	318	329,532		559	329,565			329,603	D13—	103	329,634		108	329,669		194	329,703
	320	329,533		601	329,566		449	329,604		110	329,635		152	329,670		213	329,704
		329,534		603	329,567		528	329,595		120	329,636		168	329,671	D25—	16	329,705
		329,535		608	329,568		529	329,605		140	329,637		195	329,672		53	329,706
		329,536	D7—	351	329,569			329,606		154	329,638		204	329,673		119	329,707
		329,689		360	329,570			329,607		165	329,639			329,674		125	329,708
	639	329,537		390	329,571		532	329,597	D14—	100	329,640		205	329,675		164	329,709
D3—	9	329,538		542	329,572		544	329,596			329,641		220	329,676	D26—	26	329,710
	30.1	329,539		616	329,573		551	329,608		118	329,643			329,677		54	329,711
	40	329,540		641	329,574		572	329,598			329,644		234	329,678		62	329,712
	76	329,541	D8—	1	329,575	D10—	2	329,609		165	329,645		237	329,633		65	329,713
	106	329,542		14	329,576		21	329,610		209	329,646	D22—	113	329,680		71	329,714
D4—	104	329,642		29	329,577		30	329,611		215	329,647		122	329,679		76	329,715
D6—	334	329,543		30	329,578		39	329,612		216	329,648			329,681		85	329,716
	361	329,544		52	329,579			329,613		217	329,649		123	329,682	D27—	156	329,717
	369	329,545		68	329,580		46	329,614	D15—	7	329,650		147	329,683	D28—	58	329,718
	374	329,546		70	329,581			329,615		9.1	329,651	D23—	207	329,684		64.6	329,719
	406	329,547			329,582			329,616		13	329,652		238	329,685		99	329,720
	407	329,548		90	329,583		51	329,617		89	329,653		249	329,686			329,721
	412	329,549		102	329,584		52	329,618		132	329,654			329,687	D30—	124	329,722
	420	329,550		103	329,585			329,619		150	329,655		255	329,688		126	329,723
	422	329,551		320	329,586		106	329,620	D16—	217	329,656		324	329,690		132	329,724
	461	329,552		341	329,587			329,621	D17—	22	329,657		330	329,691	D32—	70	329,725
	468	329,556		395	329,588	D11—	130.1	329,622	D18—	34	329,658		340	329,692	D34—	16	329,726
	484	329,553		396	329,589	D12—	102	329,623		43	329,659		344	329,693		23	329,727
	486	329,554		402	329,590			329,624	D19—	48	329,660		373	329,694		28	329,728
		329,555															

CLASSIFICATION OF PLANTS

P.—	1	7,978		18	7,980												
	11	7,979		21	7,981		68.1	7,983			7,984		82.4	7,985		87.12	7,982

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PATENTS

01 :	5,148,729	5,148,826	5,149,482	5,150,053		4,680,456	5,148,605
	5,149,113	5,148,842	5,149,491	5,150,069	08 :	5,148,653	5,148,625
	5,149,209	5,148,846	5,149,495	5,150,077		5,148,682	5,148,630
	5,149,254	5,148,863	5,149,514	5,150,078		5,148,692	5,148,633
	5,149,584	5,148,865	5,149,527	5,150,081		5,148,694	5,148,640
	5,149,650	5,148,931	5,149,529	5,150,088		5,148,695	5,148,660
	5,149,932	5,148,942	5,149,532	5,150,096		5,148,742	5,148,711
	5,150,295	5,148,950	5,149,539	5,150,099		5,148,772	5,148,809
04 :	5,148,599	5,148,958	5,149,550	5,150,107		5,148,848	5,148,813
	5,149,191	5,148,959	5,149,597	5,150,109		5,148,849	5,148,836
	5,149,277	5,148,967	5,149,603	5,150,118		5,149,019	5,148,860
	5,149,319	5,148,982	5,149,623	5,150,120		5,149,021	5,148,989
	5,149,384	5,148,983	5,149,627	5,150,121		5,149,048	5,148,990
	5,149,674	5,148,985	5,149,657	5,150,127		5,149,057	5,148,991
	5,150,058	5,149,003	5,149,661	5,150,128		5,149,125	5,148,995
	5,150,124	5,149,017	5,149,671	5,150,134		5,149,173	5,149,012
	5,150,176	5,149,034	5,149,681	5,150,137		5,149,222	5,149,015
	5,150,235	5,149,036	5,149,684	5,150,187		5,149,231	5,149,133
	5,150,281	5,149,037	5,149,688	5,150,195		5,149,246	5,149,188
	5,150,438	5,149,040	5,149,705	5,150,196		5,149,295	5,149,226
05 :	5,149,030	5,149,042	5,149,715	5,150,197		5,149,571	5,149,245
	5,149,317	5,149,047	5,149,736	5,150,203		5,149,686	5,149,291
	5,149,921	5,149,086	5,149,760	5,150,205		5,149,898	5,149,313
06 :	Re.34,077	5,149,088	5,149,764	5,150,228		5,150,048	5,149,323
	5,148,556	5,149,090	5,149,772	5,150,257		5,150,171	5,149,342
	5,148,561	5,149,098	5,149,780	5,150,267	09 :	5,148,667	5,149,380
	5,148,564	5,149,109	5,149,792	5,150,273		5,148,855	5,149,395
	5,148,572	5,149,117	5,149,795	5,150,312		5,148,970	5,149,558
	5,148,582	5,149,126	5,149,796	5,150,313		5,149,013	5,149,575
	5,148,595	5,149,137	5,149,801	5,150,319		5,149,100	5,149,598
	5,148,600	5,149,150	5,149,807	5,150,323		5,149,193	5,149,602
	5,148,601	5,149,181	5,149,818	5,150,330		5,149,441	5,149,624
	5,148,606	5,149,183	5,149,830	5,150,334		5,149,687	5,149,656
	5,148,611	5,149,278	5,149,894	5,150,336		5,149,691	5,149,722
	5,148,620	5,149,288	5,149,905	5,150,337		5,149,752	5,150,031
	5,148,623	5,149,324	5,149,906	5,150,338		5,149,778	5,150,110
	5,148,624	5,149,325	5,149,908	5,150,357		5,149,821	5,150,361
	5,148,669	5,149,326	5,149,909	5,150,364		5,149,899	5,150,403
	5,148,675	5,149,339	5,149,910	5,150,368		5,149,986	5,150,404
	5,148,681	5,149,343	5,149,933	5,150,371		5,150,052	5,150,415
	5,148,714	5,149,355	5,149,954	5,150,372		5,150,091	13 :	5,148,602
	5,148,727	5,149,368	5,149,956	5,150,379		5,150,117		5,148,645
	5,148,733	5,149,397	5,149,957	5,150,399		5,150,161		5,148,760
	5,148,734	5,149,406	5,149,963	5,150,406		5,150,453		5,148,850
	5,148,737	5,149,409	5,149,970	5,150,426	10 :	5,148,593		5,149,101
	5,148,738	5,149,411	5,149,976	5,150,430		5,148,634		5,149,333
	5,148,745	5,149,413	5,149,978	5,150,450		5,149,561		5,149,336
	5,148,755	5,149,421	5,149,980	5,150,456		5,149,678		5,149,473
	5,148,762	5,149,433	5,149,991	5,150,464		5,149,809		5,149,576
	5,148,764	5,149,436	5,150,012	5,150,469	11 :	5,148,679		5,149,621
	5,148,770	5,149,463	5,150,019	5,150,471		5,149,682		5,149,765
	5,148,810	5,149,467	5,150,026	5,150,473	12 :	5,148,554		5,149,847
	5,148,823	5,149,468	5,150,043	4,260,005		5,148,560		5,149,942

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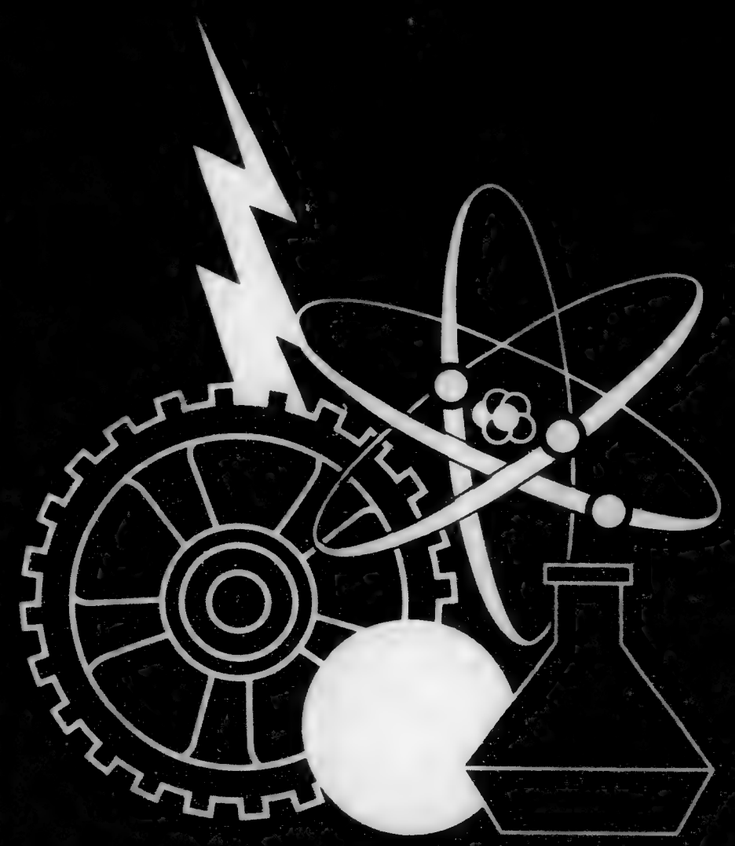

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Patent Cooperation Treaty Update
Ratification by Ireland

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization that Ireland deposited its instrument of ratification to the Patent Cooperation Treaty (PCT) on 01 May 1992. Ireland became the 50th Contracting State of the PCT on 01 August 1992. Consequently, nationals and residents of Ireland are entitled to file international applications on and after 01 August 1992, and from the same date it is possible to file international applications designating Ireland. The designation of Ireland has the effect of an indication of the wish to obtain a European patent for Ireland under the European Patent Convention (EPC); a national (Irish) patent cannot be obtained through an international application.

Accession by Portugal

The Uinted States Patent and Trademark Office has received notification from the World Intellectual Property Organization that Portugal deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on 24 August 1992. Portugal will become the 51st Contracting State of the PCT on 24 November 1992. Consequently, nationals and residents of Portugal are entitled to file international applications on and after 24 November 1992, and from the same date it is possible to file international applications designating Portugal.

Accession by New Zealand

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization that New Zealand deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on 01 September 1992. New Zealand will become the 52nd Contracting State of the PCT on 01 December 1992. Consequently, nationals and residents of New Zealand are entitled to file international applications on and after 01 December 1992, and from that date it is possible to file international applications designating New Zealand.

Listing of PCT Member Countries

	Country	Ratification or Accession	Date of Ratification or Accession	Effective Date
(1)	Central African Republic*	Accession	15 September 1971	01 June 1978
(2)	Senegal*	Ratification	08 March 1972	01 June 1978
(3)	Madagascar	Ratification	27 March 1972	01 June 1978
(4)	Malawi	Accession	16 May 1972	01 June 1978
(5)	Cameroon*	Accession	15 March 1973	01 June 1978
(6)	Chad*	Accession	12 February 1974	01 June 1978
(7)	Togo*	Ratification	28 January 1975	01 June 1978
(8)	Gabon*	Accession	06 March 1975	01 June 1978
(9)	United States of America	Ratification	26 November 1975	01 June 1978
(10)	Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)	Congo*	Accession	08 August 1977	01 June 1978
(12)	Switzerland**	Ratification	14 September 1977	01 June 1978
(13)	United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)	France**	Ratification	25 November 1977	01 June 1978
(15)	Russian Federation	Ratification	29 December 1977	01 June 1978
(16)	Brazil	Ratification	09 January 1978	01 June 1978
(17)	Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)	Sweden**	Ratification	17 February 1978	01 June 1978
(19)	Japan	Ratification	01 July 1978	01 October 1978
(20)	Denmark**	Ratification	01 September 1978	01 December 1978
(21)	Austria**	Ratification	23 January 1979	23 April 1979
(22)	Monaco	Ratification	22 March 1979	22 June 1979
(23)	Netherlands**	Ratification	10 April 1979	10 July 1979
(24)	Romania	Accession	23 April 1979	23 July 1979
(25)	Norway	Ratification	01 October 1979	01 January 1980
(26)	Liechtenstein**	Accession	19 December 1979	19 March 1980
(27)	Australia	Accession	31 December 1979	31 March 1980
(28)	Hungary	Ratification	27 March 1980	27 June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30)	Finland	Ratification	01 July 1980	01 October 1980
(31)	Belgium**	Ratification	14 September 1981	14 December 1981
(32)	Sri Lanka	Accession	26 November 1981	26 February 1982
(33)	Mauritania*	Accession	13 January 1983	13 April 1983
(34)	Sudan	Accession	16 January 1984	16 April 1984
(35)	Bulgaria	Accession	21 February 1984	21 May 1984
(36)	Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37)	Mali*	Accession	19 July 1984	19 October 1984
(38)	Barbados	Accession	12 December 1984	12 March 1985
(39)	Italy**	Ratification	28 December 1984	28 March 1985
(40)	Benin*	Accession	26 November 1986	26 February 1987
(41)	Burkina Faso*	Accession	21 December 1988	21 March 1989
(42)	Spain**	Accession	16 August 1989	16 November 1989
(43)	Canada	Ratification	02 October 1989	02 January 1990
(44)	Greece**	Accession	09 July 1990	09 October 1990
(45)	Poland	Accession	25 September 1990	25 December 1990
(46)	Cote d'Ivoire*	Ratification	31 January 1991	30 April 1991
(47)	Guinea*	Accession	27 February 1991	27 May 1991
(48)	Mongolia	Accession	27 February 1991	27 May 1991
(49)	Czechoslovakia	Accession	20 March 1991	20 June 1991
(50)	Ireland**	Ratification	01 May 1992	01 August 1992
(51)	Portugal**	Accession	24 August 1992	24 November 1992
(52)	New Zealand	Accession	01 September	01 December 1992

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium, Italy, Ireland and Greece for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

Sept. 4, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the mainte-

nance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 26, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,868,925 through 4,870,704
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 24, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,542,537 through 4,543,666
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 26,1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,461,047	06/391,126	7/24/84
4,461,048	06/376,404	7/24/84
4,461,052	06/423,675	7/24/84
4,461,054	06/328,585	7/24/84
4,461,055	06/393,681	7/24/84
4,461,058	06/377,273	7/24/84
4,461,059	06/362,222	7/24/84
4,461,061	06/372,670	7/24/84
4,461,062	06/406,045	7/24/84
4,461,064	06/324,857	7/24/84
4,461,066	06/444,650	7/24/84
4,461,068	06/397,032	7/24/84
4,461,075	06/393,918	7/24/84
4,461,077	06/432,636	7/24/84
4,461,080	06/293,154	7/24/84
4,461,097	06/336,053	7/24/84
4,461,106	06/376,081	7/24/84
4,461,107	06/412,029	7/24/84
4,461,133	06/403,711	7/24/84
4,461,118	06/299,596	7/24/84
4,461,123	06/335,666	7/24/84
4,461,124	06/352,729	7/24/84
4,461,125	06/284,971	7/24/84
4,461,127	06/340,130	7/24/84
4,461,130	06/268,598	7/24/84
4,461,133	06/343,844	7/24/84
4,461,134	06/280,803	7/24/84
4,461,135	06/317,451	7/24/84
4,461,138	06/451,449	7/24/84
4,461,139	06/393,186	7/24/84
4,461,145	06/433,561	7/24/84
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4,759,723	06/879,593	7/26/88
4,759,725	07/112,301	7/26/88
4,759,728	07/073,011	7/26/88
4,759,736	06/828,619	7/26/88
4,759,741	06/916,538	7/26/88
4,759,742	07/035,469	7/26/88
4,759,745	06/494,566	7/26/88
4,759,752	06/930,784	7/26/88
4,759,755	06/929,756	7/26/88
4,759,762	07/062,572	7/26/88
4,759,768	07/015,107	7/26/88
4,759,779	07/042,909	7/26/88
4,759,781	07/023,712	7/26/88
4,759,790	07/052,611	7/26/88
4,759,792	07/053,915	7/26/88
4,759,795	06/859,783	7/26/88
4,759,796	06/920,008	7/26/88
4,759,810	07/044,828	7/26/88
4,759,811	06/625,577	7/26/88
4,759,815	06/817,282	7/26/88
4,759,822	06/660,172	7/26/88
4,759,835	06/771,436	7/26/88
4,759,846	07/093,119	7/26/88
4,759,847	06/675,076	7/26/88
4,759,869	06/928,295	7/26/88
4,759,872	07/028,578	7/26/88
4,759,873	07/083,473	7/26/88
4,759,878	06/708,606	7/26/88
4,759,880	06/655,196	7/26/88
4,759,887	06/862,006	7/26/88
4,759,889	06/663,019	7/26/88
4,759,892	06/283,735	7/26/88
4,759,893	06/713,651	7/26/88
4,759,898	06/912,002	7/26/88
4,759,904	06/848,178	7/26/88
4,759,905	07/033,953	7/26/88
4,759,908	06/914,902	7/26/88
4,759,914	07/113,141	7/26/88
4,759,918	07/039,138	7/26/88
4,759,927	06/944,851	7/26/88
4,759,928	06/824,733	7/26/88
4,759,929	07/011,156	7/26/88
4,759,930	07/060,105	7/26/88
4,759,934	06/930,256	7/26/88
4,759,945	07/047,240	7/26/88
4,759,952	06/898,073	7/26/88
4,759,963	07/051,723	7/26/88
4,759,971	06/785,205	7/26/88
4,759,986	06/922,431	7/26/88
4,759,994	06/890,894	7/26/88
4,760,000	06/846,735	7/26/88
4,760,006	06/739,024	7/26/88
4,760,014	06/891,883	7/26/88
4,760,016	06/918,762	7/26/88
4,760,018	06/745,431	7/26/88
4,760,028	06/889,406	7/26/88
4,760,035	06/942,023	7/26/88
4,760,047	07/036,443	7/26/88
4,760,050	07/002,391	7/26/88
4,760,052	07/043,658	7/26/88
4,760,059	06/762,248	7/26/88
4,760,062	06/662,178	7/26/88
4,760,063	06/929,921	7/26/88
4,760,065	06/829,594	7/26/88
4,760,066	06/928,614	7/26/88
4,760,076	07/008,137	7/26/88
4,760,080	06/893,155	7/26/88
4,760,082	07/015,188	7/26/88
4,760,089	06/773,694	7/26/88
4,760,097	06/782,544	7/26/88
4,760,108	06/811,472	7/26/88
4,760,111	07/119,124	7/26/88
4,760,115	07/031,845	7/26/88
4,760,121	07/017,289	7/26/88
4,760,139	06/909,911	7/26/88
4,760,146	06/830,592	7/26/88
4,760,147	06/941,176	7/26/88
4,760,167	06/909,285	7/26/88
4,760,172	06/945,426	7/26/88
4,760,191	06/914,911	7/26/88

Patent Number	Serial Number	Issue Date
4,760,199	07/081,36(	7/26/88
4,760,205	06/948,03(	7/26/88
4,760,210	06/684,80(	7/26/88
4,760,215	07/117,50(	7/26/88
4,760,221	07/003,55(	7/26/88
4,760,225	07/003,20(	7/26/88
4,760,227	06/925,71(	7/26/88
4,760,232	07/095,91(	7/26/88
4,760,234	06/943,64	7/26/88
4,760,242	06/926,84(	7/26/88
4,760,243	07/088,25(	7/26/88
4,760,244	06/929,28(	7/26/88
4,760,284	07/025,46	7/26/88
4,760,296	06/634,33	7/26/88
4,760,297	07/033,12(	7/26/88
4,760,305	06/905,09	7/26/88
4,760,309	06/479,98	7/26/88
4,760,313	07/097,43(	7/26/88
4,760,316	07/060,01(	7/26/88
4,760,318	06/917,00	7/26/88
4,760,326	06/944,93(	7/26/88
4,760,356	06/852,32	7/26/88
4,760,363	07/036,25	7/26/88
4,760,367	07/001,65	7/26/88
4,760,371	07/113,41	7/26/88
4,760,372	07/039,44	7/26/88
4,760,373	06/893,99	7/26/88
4,760,380	06/900,79	7/26/88
4,760,383	06/939,62	7/26/88
4,760,403	06/850,74	7/26/88
4,760,432	06/923,86	7/26/88
4,760,436	06/865,53	7/26/88
4,760,438	07/059,22	7/26/88
4,760,447	06/891,74	7/26/88
4,760,454	06/937,21	7/26/88
4,760,460	06/693,01	7/26/88
4,760,473	06/904,62	7/26/88
4,760,477	06/886,20	7/26/88
4,760,486	06/901,37	7/26/88
4,760,492	07/107,71	7/26/88
4,760,493	06/781,75	7/26/88
4,760,496	07/035,45	7/26/88
4,760,499	07/047,91	7/26/88
4,760,504	07/006,11	7/26/88
4,760,507	07/070,19	7/26/88
4,760,513	07/115,55	7/26/88
4,760,521	06/799,17	7/26/88
4,760,525	06/872,73	7/26/88
4,760,535	06/699,40	7/26/88
4,760,548	06/873,90	7/26/88
4,760,558	06/742,61	7/26/88
4,760,581	06/860,81	7/26/88
4,760,585	06/936,81	7/26/88
4,760,589	06/853,94	7/26/88
4,760,590	07/110,57	7/26/88
4,760,594	07/093,01	7/26/88
4,760,607	06/891,31	7/26/88

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,218,690, Re. S.N. 07/930,855, Filed Aug. 14, 1992, Cl. 346/149, SELF-CONTAINED PROGRAMMABLE TERMINAL FOR SECURITY SYSTEMS, Bryan D. Ulch, et. al., Owner of Record: *Casi-Rusco, Inc., Boca Raton, Fla.,* Attorney or Agent: John C. Lambertsen, Ex. Gp.: 2604

4,497,015, Re. S.N. 07/924,789, Filed Aug. 6, 1992, Cl. 362, LIGHT ILLUMINATION DEVICE, Kunio Konno, et. al., Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: John R. Inge, Ex. Gp.: 2201

4,710,008, Re. S.N. 07/836,816, Filed Feb. 19, 1992, Cl. 354/289.1, CAMERA WITH OPERATION SWITCH, Yoichi Tosaka, et. al., Owner of Record: *Cannon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Anthony M. Zupcic, Ex. Gp.: 2101

4,888,500, Re. S.N. 07/810,682, Filed Dec. 19, 1991, Cl. 307/475, TTL-COMPATIBLE CELL FOR CMOS INTERGRATED CIRCUITS, German Nicollini, et. al., Owner of Record: *SGS-Thompson Microelectronics, SPA, Catinia, Italy,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2509

4,908,937, Re. S.N. 07/855,086, Filed Mar. 20, 1992, Cl. 29/840, METHOD TO INSTALL AN ELECTRONIC COMPONENT AND ITS ELECTRICAL CONNECTIONS ON A SUPPORT, AND PRODUCT OBTAINED THEREBY, Jean-Pierre Gloton, et. al., Owner of Record: *SGS Thompson Microelectronics, S.A., Gentilly, France,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 3206

4,940,410, Re. S.N. 07/910,603, Filed July 8, 1992, Cl. 433/102, DENTAL TOOL HOLDER, Marc Francois Charles Apap, et. al., Owner of Record: *Dentalwerk Burmoos Gesellschaft, Burmoos, Austria,* Attorney or Agent: David Toren, Ex. Gp.: 3303

4,979,303, Re. S.N. 07/896,541, Filed Nov. 12, 1991, Cl. 30/210, SELF HAIR CUTTING DEVICE, Sherwin X. Han, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 3204

5,051,002, Re. S.N. 07/931,877, Filed Aug. 18, 1992, Cl. 384/49, GUIDE SLEEVE, GUIDE POST AND MODIFIED BALL BEARING ASSEMBLY, Ronald L. Hanaway, Owner of Record: *Inventor,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 2405

5,051,940, Re. S.N. 07/931,624, Filed Aug. 18, 1992, Cl. 364/736, DATA DEPENDENCY COLLASPING HARDWARE APPARATUS, Stamatis Vassiliadis, et. al., Owner of Record: *International Bussiness Machines Corp., Armonk, N.Y.,* Attorney or Agent: Terrance A. Meader, Ex. Gp.: 2306

5,054,937, Re. S.N. 07/931,610, Filed Aug. 18, 1992, Cl. 384/49, GUIDE SLEEVE, GUIDE POST AND BALL BEARING ASSEMBLY WITH ROLLER PLUG, Ronald L. Hanaway, Owner of Record: *Inventor,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 2405

5,096,307, Re. S.N. 07/931,876, Filed Aug. 18, 1992, Cl. 384/49, GUIDE SLEEVE GUIDE POST AND IMPROVED BALL BEARING ASSEMBLY, Ronald L. Hanaway, Owner of Record: *Inventor,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 2405

5,101,939, Re. S.N. 07/904,248, Filed June 25, 1992, Cl. 188/171, DISK BRAKE FOR ELEVATOR, William Sheridan, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 3103

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,246,102, Reexam. No. 90/002,817, Requested Aug. 14, 1992, Cl. 210/702, METHOD FOR SEPARATING POLLUTANTS FROM LIQUID, Ulf R. Hjelmner, et. al., Owner of Record: *Rederiaktiebolaget Nordstjernan, Stockholm, Sweden,* Attorney or Agent: Brumbaugh, Graves, Donohue & Raymond, New York, N.Y., Ex. Gp.: 1308, Requester: Irving Powers, St. Louis, Mo.

4,642,666, Reexam. No. 90/002,818, Requested Aug. 24, 1992, Cl. 357/23.4, HIGH POWER MOSFET WITH LOW ON RESISTANCE AND HIGH BREAKDOWN VOLTAGE, Alexander Lidow, et. al., Owner of Record: *International Rectifier Corp., Los Angeles, Calif.,* Attorney or Agent: Samuel H. Weiner, Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 2508, Requester: SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

4,826,712, Reexam. No. 90/002,819, Requested Aug. 24, 1992, Cl. 428/004, DECORATIVE RIBBONS, Mark H. Theno, Owner of Record: *Inventor,* Eden Prairie, Minn., Attorney or Agent: Carl L. Johnson, Jacobson & Johnson, St. Paul, Minn., Ex. Gp.: 1508, Requester: Leland D. Schultz, St. Paul, Minn.

5,045,016, Reexam. No. 90/002,820, Requested Aug. 25, 1992, Cl. 446/409, TOY VEHICLE WITH ELECTRONIC SOUNDER AND DIRECTION SENSOR, Carl M. Stern, et. al., Owner of Record: *Innova Development Corp., Pennington, N.J.,* Attorney or Agent: Norman E. Lehrer, Cherry Hill, N.J., Ex. Gp.: 3301, Requester: William H. Meserole, Dennison, Meserole, Pollack & Scheiner, Arlington, Va.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

PR Products, Ltd., Denver, Colo., Reg. No. 1,413,900 for the mark "SHAMPAGNE AND DESIGN", Canc. No. 20,541.

Containwares, Inc., Costa Mesa, Calif., Reg. No. 1,573,967, for the mark "CONTAINWARES AND DESIGN", Canc. No. 20,591.

Marketing & Distribution, Resources, Inc., Waltham, Mass., Reg. No. 973,075 for the mark "MDR AND DESIGN", Canc. No. 20,634.

Kenneth Carl Johnson, Carmichael, Calif., Reg. No. 1,450,965 for the mark "ALL STAR FACE-OFF", Canc. No. 20,605.

The Catamore Company, East Providence, R.I., Reg. No. 1,057,519 for the mark "CONTESSA AND DESIGN", Canc. No. 20,274.

Edwin A. Moll and Associates, Ltd., Glenview, Ill., Reg. No. 1,650,068 for the mark "CRYSTAL-PURE SYSTEMS AND DESIGN", Canc. No. 20,709.

Aprim, Inc., Frankenmuth, Mich., Reg. No. 1,626,630 for the mark "APRIM", Canc. No. 20,711.

Decks, Inc., Arlington Heights, Ill., Reg. No. 1,507,097 for the mark "BUSINESS RESOURCE", Canc. No. 20,660.

Discovery Airways, Inc., Honolulu, Hi., Reg. No. 1,635,029 for the mark "DISCOVERY AIRWAYS", Canc. No. 20,678.

Empire Systems, Inc., Los Angeles, Calif., Reg. No. 958,597 for the mark "EASY RITER", Canc. No. 20,360.

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from July through September 1992. Information includes:

- o subclasses established or abolished (major changes)
- o subclass title, indent, or position change
- o definitions changes to existing classes and subclass definitions (minor changes)

This Reclassification Alert Report may appear from time to time in the *Official Gazette* and is intended to provide an interim notice of classification and changes pending publication of the Manual of Classification and revisions thereto.

Sept. 1, 1992

WILLIAM S. LAWSON
Administrator for Search and Information Resources

Reclassification Alert Report
July 1992-September 1992

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
PLT	007	008	ABOLISH	1414
PLT	007.1		ESTABLISH	1414
PLT	008.1	008.2	ESTABLISH	1414
PLT	010.1		ESTABLISH	1414
PLT	030		ABOLISH	1414
PLT	030.1		ESTABLISH	1414
PLT	032.2		ESTABLISH	1414
PLT	033	034	ABOLISH	1414
PLT	033.1		ESTABLISH	1414
PLT	034.1		ESTABLISH	1414
PLT	035.1	035.2	ESTABLISH	1414
PLT	038		ABOLISH	1414
PLT	038.1	038.2	ESTABLISH	1414
PLT	040	043	ABOLISH	1414
PLT	040.1		ESTABLISH	1414
PLT	041.1	041.4	ESTABLISH	1414

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
PLT	042.1		ESTABLISH	1414
PLT	043.1	043.3	ESTABLISH	1414
PLT	046	047	ABOLISH	1414
PLT	046.1	046.2	ESTABLISH	1414
PLT	047.1	047.3	ESTABLISH	1414
PLT	049.1		ESTABLISH	1414
PLT	050	051	ABOLISH	1414
PLT	050.1	050.3	ESTABLISH	1414
PLT	051.1		ESTABLISH	1414
PLT	053.1	053.7	ESTABLISH	1414
PLT	054		ABOLISH	1414
PLT	054.1		ESTABLISH	1414
PLT	067.1	067.8	ESTABLISH	1414
PLT	068	075	ABOLISH	1414
PLT	068.1		ESTABLISH	1414
PLT	069.1	069.2	ESTABLISH	1414
PLT	070.1	070.7	ESTABLISH	1414
PLT	071.1		ESTABLISH	1414
PLT	072.1		ESTABLISH	1414
PLT	073.1	073.3	ESTABLISH	1414
PLT	074.1		ESTABLISH	1414
PLT	082.1	082.5	ESTABLISH	1414
PLT	086		ABOLISH	1414
PLT	086.1	086.4	ESTABLISH	1414
PLT	087.1		ESTABLISH	1414
PLT	087.11	087.18	ESTABLISH	1414
PLT	087.2	087.9	ESTABLISH	1414
PLT	088	089	ABOLISH	1414
PLT	088.1		ESTABLISH	1414
PLT	088.1		ESTABLISH	1414
PLT	088.2	088.9	ESTABLISH	1414
PLT	090		ESTABLISH	1414
PLT	090.1	090.2	ESTABLISH	1414
PLT	095		ESTABLISH	1414
PLT	100		ESTABLISH	1414
002			DEFN CHANGE	1413
002			DEFN CHANGE	1415
004			DEFN CHANGE	1415
004			DEFN CHANGE	1421
007			DEFN CHANGE	1415
015			DEFN CHANGE	1425
015	104		ABOLISH	1415
015	104.001	104.002	ESTABLISH	1415
015	104.095	104.096	ESTABLISH	1415
015	104.1		ABOLISH	1415
015	119		ABOLISH	1415
015	119.1	119.2	ESTABLISH	1415
015	120		ABOLISH	1415
015	120.1	120.2	ESTABLISH	1415
015	143		ABOLISH	1415
015	143.1		ESTABLISH	1415
015	144		ABOLISH	1415
015	144.1	144.4	ESTABLISH	1415
015	147		ABOLISH	1415
015	147.1	147.2	ESTABLISH	1415
015	154.2		ESTABLISH	1415
015	159		ABOLISH	1415
015	159.1		ESTABLISH	1415
015	191		ABOLISH	1415
015	191.1		ESTABLISH	1415
015	205.2		ESTABLISH	1415
015	207.2		ESTABLISH	1415
015	209		ABOLISH	1415
015	209.1		ESTABLISH	1415
015	210		ABOLISH	1415
015	210.1		ESTABLISH	1415
015	220		ABOLISH	1415
015	220.1	220.4	ESTABLISH	1415
015	229.11	229.14	ESTABLISH	1415
015	245.1		ESTABLISH	1415
015	246.2	246.4	ESTABLISH	1415
015	248		ABOLISH	1415
015	248.2		ESTABLISH	1415
015	250		ABOLISH	1415
015	250.001	250.003	ESTABLISH	1415
015	257		ABOLISH	1415

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
015	257.01		ESTABLISH	1415
015	DIG. 14	DIG. 15	ESTABLISH	1415
016			DEFN CHANGE	1415
024			DEFN CHANGE	1413
024			DEFN CHANGE	1417
030			DEFN CHANGE	1415
033			DEFN CHANGE	1413
033			DEFN CHANGE	1426
034			DEFN CHANGE	1415
034			DEFN CHANGE	1418
036	050		ABOLISH	1417
036	050.1		ESTABLISH	1417
036	050.5		ESTABLISH	1417
040			DEFN CHANGE	1416
043			DEFN CHANGE	1413
043			DEFN CHANGE	1415
049			DEFN CHANGE	1417
049			DEFN CHANGE	1421
052			DEFN CHANGE	1415
053			DEFN CHANGE	1416
054	001		TITLE CHANGE	1413
054	006		ABOLISH	1413
054	006.1	006.2	ESTABLISH	1413
054	018		ABOLISH	1413
054	018.1	018.3	ESTABLISH	1413
054	019		ABOLISH	1413
054	019.1	019.3	ESTABLISH	1413
054	037	046	ABOLISH	1413
054	037.1		ESTABLISH	1413
054	038.1		ESTABLISH	1413
054	039.1		ESTABLISH	1413
054	040.1		ESTABLISH	1413
054	041.1		ESTABLISH	1413
054	042.1		ESTABLISH	1413
054	043.1		ESTABLISH	1413
054	044.1	044.7	ESTABLISH	1413
054	045.1		ESTABLISH	1413
054	046.1	046.2	ESTABLISH	1413
054	079	081	ABOLISH	1413
054	079.1	079.4	ESTABLISH	1413
054	080.1	080.5	ESTABLISH	1413
054	083		ABOLISH	1413
054	083.1	083.2	ESTABLISH	1413
056			DEFN CHANGE	1415
062			DEFN CHANGE	1421
068			DEFN CHANGE	1423
073	054.16		TITLE CHANGE	1422
073	064.47		TITLE CHANGE	1422
073	622		TITLE CHANGE	1422
073	641		TITLE CHANGE	1422
073	820		TITLE CHANGE	1422
073	862.04		ABOLISH	1422
073	862.041	862.046	ESTABLISH	1422
073	862.19		ABOLISH	1422
073	862.191	862.195	ESTABLISH	1422
073	862.32	862.36	ABOLISH	1422
073	862.321	862.329	ESTABLISH	1422
073	862.331	862.339	ESTABLISH	1422
073	862.38	862.39	ABOLISH	1422
073	862.381	862.382	ESTABLISH	1422
073	862.391	862.393	ESTABLISH	1422
073	862.45		ABOLISH	1422
073	862.451	862.454	ESTABLISH	1422
073	862.47	862.48	ABOLISH	1422
073	862.471	862.474	ESTABLISH	1422
073	862.54		ABOLISH	1422
073	862.541	862.543	ESTABLISH	1422
073	862.58		ABOLISH	1422
073	862.581	862.584	ESTABLISH	1422
073	862.62	862.67	ABOLISH	1422
073	862.621	862.629	ESTABLISH	1422
073	862.631	862.639	ESTABLISH	1422
073	862.641	862.642	ESTABLISH	1422
081			DEFN CHANGE	1415
086			DEFN CHANGE	1423
091			DEFN CHANGE	1427

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
092			DEFN CHANGE	1427
099			DEFN CHANGE	1425
100			DEFN CHANGE	1418
100			DEFN CHANGE	1425
102			DEFN CHANGE	1425
108			DEFN CHANGE	1421
112			DEFN CHANGE	1413
116			DEFN CHANGE	1426
128			DEFN CHANGE	1415
128			DEFN CHANGE	1426
132			DEFN CHANGE	1415
132			DEFN CHANGE	1421
134	094	103	ABOLISH	1423
134	094.1		ESTABLISH	1423
134	095.1	095.3	ESTABLISH	1423
134	096.1		ESTABLISH	1423
134	097.1		ESTABLISH	1423
134	098.1		ESTABLISH	1423
134	099.1	099.2	ESTABLISH	1423
134	100.1		ESTABLISH	1423
134	102.1	102.3	ESTABLISH	1423
134	103.1	103.3	ESTABLISH	1423
135			DEFN CHANGE	1413
137			DEFN CHANGE	1415
150			DEFN CHANGE	1421
162	125		TITLE CHANGE	1418
162	357		TITLE CHANGE	1418
162	358		ABOLISH	1418
162	358.1	358.5	ESTABLISH	1418
162	359		ABOLISH	1418
162	359.1		ESTABLISH	1418
162	360.1		ABOLISH	1418
162	360.2	360.3	ESTABLISH	1418
162	411		TITLE CHANGE	1418
162	900	904	ESTABLISH	1418
162	DIG. 01		ABOLISH	1418
166			DEFN CHANGE	1415
177			DEFN CHANGE	1422
180			DEFN CHANGE	1415
188			DEFN CHANGE	1424
202			DEFN CHANGE	1415
206			DEFN CHANGE	1425
206	459		ABOLISH	1416
206	459.1		ESTABLISH	1416
206	459.5		ESTABLISH	1416
211			DEFN CHANGE	1421
219			DEFN CHANGE	1415
220	091	096	ABOLISH	1425
220	212.5		ESTABLISH	1425
220	578	580	ESTABLISH	1425
220	710.5		ESTABLISH	1425
220	751	776	ESTABLISH	1425
221			DEFN CHANGE	1421
221			DEFN CHANGE	1425
222			DEFN CHANGE	1415
222			DEFN CHANGE	1425
225			DEFN CHANGE	1415
225			DEFN CHANGE	1421
226			DEFN CHANGE	1421
235			DEFN CHANGE	1415
239			DEFN CHANGE	1415
242			DEFN CHANGE	1421
248			DEFN CHANGE	1421
261	122		ABOLISH	1419
261	122.1	122.2	ESTABLISH	1419
267	140.1		ABOLISH	1424
267	140.1	140.15	ESTABLISH	1424
273	164		ABOLISH	1426
273	164.1	164.2	ESTABLISH	1426
273	183		ABOLISH	1426
273	183.1		ESTABLISH	1426
273	186		ABOLISH	1426
273	186.1	186.5	ESTABLISH	1426
273	187.1	187.6	ESTABLISH	1426
273	282		ABOLISH	1426
273	282.1	282.3	ESTABLISH	1426

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
294			DEFN CHANGE	1415
294			DEFN CHANGE	1425
297			DEFN CHANGE	1413
297	264		TITLE CHANGE	1420
297	281		TITLE CHANGE	1420
297	283		TITLE CHANGE	1420
297	284		ABOLISH	1420
297	284.1		ESTABLISH	1420
297	284.11		ESTABLISH	1420
297	284.2	284.9	ESTABLISH	1420
297	309		TITLE CHANGE	1420
297	31		TITLE CHANGE	1420
297	321		TITLE CHANGE	1420
297	410		TITLE CHANGE	1420
297	457		TITLE CHANGE	1420
297	83		TITLE CHANGE	1420
312			DEFN CHANGE	1416
312			DEFN CHANGE	1425
312	007.2		TITLE CHANGE	1421
312	008	020	ABOLISH	1421
312	008.1		ESTABLISH	1421
312	008.11	008.16	ESTABLISH	1421
312	008.2	008.9	ESTABLISH	1421
312	009.1		ESTABLISH	1421
312	009.11	009.19	ESTABLISH	1421
312	009.2		ESTABLISH	1421
312	009.21	009.29	ESTABLISH	1421
312	009.3		ESTABLISH	1421
312	009.31	009.38	ESTABLISH	1421
312	009.4		ESTABLISH	1421
312	009.41	009.48	ESTABLISH	1421
312	009.5		ESTABLISH	1421
312	009.51	009.59	ESTABLISH	1421
312	009.6		ESTABLISH	1421
312	009.61		ESTABLISH	1421
312	009.63		ESTABLISH	1421
312	009.64		ESTABLISH	1421
312	009.7	009.9	ESTABLISH	1421
312	010.1		ESTABLISH	1421
312	034.1		ESTABLISH	1421
312	034.11	034.19	ESTABLISH	1421
312	034.2		ESTABLISH	1421
312	034.21	034.24	ESTABLISH	1421
312	034.3	034.9	ESTABLISH	1421
312	037	041	ABOLISH	1421
312	193.4		ESTABLISH	1421
312	208		ABOLISH	1421
312	208.1	208.6	ESTABLISH	1421
312	223		ABOLISH	1421
312	223.1	223.6	ESTABLISH	1421
312	228.1		ESTABLISH	1421
312	249	256	ABOLISH	1421
312	249.1		ESTABLISH	1421
312	249.11	249.13	ESTABLISH	1421
312	249.2	249.9	ESTABLISH	1421
312	319	320	ABOLISH	1421
312	319.1	319.9	ESTABLISH	1421
312	332.1		ESTABLISH	1421
312	334	348	ABOLISH	1421
312	334.1		ESTABLISH	1421
312	334.11	334.19	ESTABLISH	1421
312	334.2		ESTABLISH	1421
312	334.21	334.29	ESTABLISH	1421
312	334.3		ESTABLISH	1421
312	334.31	334.39	ESTABLISH	1421
312	334.4		ESTABLISH	1421
312	334.41	334.47	ESTABLISH	1421
312	334.5	334.9	ESTABLISH	1421
312	348.6		ESTABLISH	1421
312	351.1		ESTABLISH	1421
312	351.11	351.14	ESTABLISH	1421
312	351.2	351.9	ESTABLISH	1421
312	410		ESTABLISH	1421
312	901	902	ESTABLISH	1421
312	DIG. 33		ABOLISH	1421
322			DEFN CHANGE	1422

FIRST CLASS	LAST SUBCLASS	SUBCLASS	ORDER ACTION	NUMBER
324			DEFN CHANGE	1422
338			DEFN CHANGE	1422
340			DEFN CHANGE	1422
352			DEFN CHANGE	1421
353			DEFN CHANGE	1421
354			DEFN CHANGE	1421
354			DEFN CHANGE	1423
356			DEFN CHANGE	1421
362			DEFN CHANGE	1421
362			DEFN CHANGE	1425
369			DEFN CHANGE	1421
383			DEFN CHANGE	1416
384			DEFN CHANGE	1421
401			DEFN CHANGE	1415
401			DEFN CHANGE	1425
403			DEFN CHANGE	1415
417	222		ABOLISH	1427
417	222.1	222.2	ESTABLISH	1427
417	464		TITLE CHANGE	1427
424			DEFN CHANGE	1415
493			DEFN CHANGE	1415
902			DEFN CHANGE	1421

Status of PTO Services

The following is an update of the status of PTO services for Aug. 1992:

Service Item	FY 1992 Level (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	17
Trademarks	30	45
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	See Note
Window Coupons	5	2
Mail Coupons	12	5
Letter Orders	16	15
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	29
Patent Applications-As-Filed	17	16
Patent Applications Expedited	7	11
Patent File-Wrapper/Contents	N/A	19
TM Applications-As-Filed	17	13
TM Applications Expedited	7	6
Trademark Search Library:		
Filing Pending Marks	23	50
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	14
Assignments:		
Recording Patents-New Applications	20	32
Recording Patents-Mail Room Recpts.	20	26
Return Patents-New Applications	34	48
Return Patents-Mail Room Recpts.	34	39
Recording Trademarks	20	39
Returning Trademark Documents	34	44
Avg. Days from Issue Fee Payment to Issue Date	90-100	110
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.
Note: Special service temporarily discontinued May 5. It was resumed on August 24 but meaningful statistics will not be available until next month.

Sept. 3, 1992

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT NOTICES

Certificates of Correction For Week of September 29, 1992

D. 313,057	4,964,762	4,992,720	5,011,805
D. 313,292	4,964,776	4,993,014	5,012,024
D. 315,022	4,965,133	4,993,097	5,012,271
Re. 33,352	4,965,154	4,993,130	5,012,366
Re. 33,464	4,965,258	4,993,204	5,012,367
Re. 33,542	4,965,722	4,993,641	5,012,970
3,863,114	4,966,717	4,993,893	5,013,279
4,522,807	4,966,828	4,994,600	5,013,515
4,772,392	4,966,862	4,994,773	5,013,554
4,794,320	4,967,216	4,995,011	5,013,567
4,794,388	4,967,364	4,995,289	5,013,761
4,800,472	4,968,514	4,995,876	5,013,792
4,810,692	4,968,692	4,996,359	5,013,837
4,820,997	4,968,818	4,997,564	5,013,866
4,835,478	4,969,112	4,997,877	5,014,355
4,835,809	4,970,229	4,998,043	5,014,705
4,838,132	4,971,419	4,998,535	5,015,087
4,838,889	4,971,694	4,999,142	5,015,155
4,845,196	4,972,068	4,999,220	5,015,253
4,864,302	4,972,509	4,999,519	5,015,337
4,865,883	4,972,969	4,999,805	5,015,338
4,866,293	4,973,486	5,000,554	5,016,621
4,871,906	4,973,585	5,000,568	5,017,269
4,875,664	4,974,501	5,000,698	5,017,392
4,885,474	4,974,738	5,001,240	5,017,627
4,886,302	4,975,206	5,001,246	5,018,151
4,887,613	4,975,881	5,001,814	5,018,517
4,894,095	4,976,048	5,001,945	5,018,627
4,894,920	4,976,256	5,002,112	5,018,646
4,894,156	4,977,243	5,002,116	5,018,664
4,894,162	4,977,502	5,002,699	5,018,814
4,899,111	4,977,584	5,002,869	5,018,892
4,900,074	4,978,389	5,003,129	5,018,905
4,900,671	4,978,512	5,003,152	5,018,937
4,900,675	4,979,607	5,003,169	5,019,043
4,911,463	4,979,765	5,003,960	5,019,396
4,911,832	4,979,805	5,004,274	5,019,707
4,911,176	4,979,860	5,004,623	5,019,709
4,920,030	4,980,250	5,004,673	5,019,745
4,927,341	4,980,302	5,004,833	5,019,790
4,924,424	4,980,510	5,004,860	5,020,113
4,931,711	4,980,850	5,005,088	5,020,263
4,935,319	4,981,007	5,005,417	5,020,309
4,935,100	4,981,103	5,005,675	5,020,434
4,940,900	4,981,448	5,006,025	5,020,678
4,941,190	4,981,513	5,006,333	5,020,744
4,941,886	4,981,585	5,006,499	5,021,246
4,942,058	4,981,617	5,006,525	5,021,396
4,942,396	4,981,727	5,006,941	5,021,412
4,942,921	4,982,217	5,007,112	5,021,704
4,944,279	4,982,420	5,007,343	5,021,824
4,944,785	4,982,622	5,007,629	5,022,377
4,945,534	4,983,208	5,007,711	5,022,610
4,945,806	4,984,024	5,007,907	5,023,000
4,945,912	4,984,042	5,008,117	5,023,140
4,947,110	4,984,143	5,008,224	5,023,148
4,947,422	4,984,297	5,008,324	5,023,619
4,948,053	4,984,358	5,008,327	5,024,354
4,949,115	4,985,474	5,008,338	5,027,249
4,949,444	4,985,929	5,008,403	5,028,723
4,950,214	4,986,232	5,008,438	5,028,724
4,950,233	4,986,333	5,008,733	5,029,128
4,952,618	4,986,445	5,008,971	5,029,315
4,952,812	4,987,460	5,009,173	5,029,333
4,953,514	4,988,463	5,009,223	5,029,462
4,953,550	4,988,598	5,009,270	5,032,817
4,957,206	4,988,627	5,009,303	5,040,301
4,959,182	4,988,700	5,009,966	5,041,525
4,959,198	4,989,218	5,010,130	5,043,704
4,960,135	4,989,751	5,010,223	5,051,784
4,960,711	4,990,216	5,010,611	5,071,802
4,962,131	4,990,665	5,010,774	5,083,713
4,962,187	4,991,030	5,010,881	5,084,753
4,962,502	4,991,222	5,011,003	5,122,749
4,964,147	4,991,299	5,011,532	
4,964,365	4,992,417	5,011,572	
4,964,483	4,992,424	5,011,586	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box 14	Invoices directed to the Office of Finance.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
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Box ITU	All intent to use documents, excluding the initial application and amendments to allege use
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
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Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
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Alaska	Anchorage: Z. J. Loussac Public Library	(907) 562-7323
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	Springfield: Illinois State Library	(217) 782-5659
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Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
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	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Columbus: Ohio State University Libraries	(614) 292-6175
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Oregon	Salem: Oregon State Library	(503) 378-4239
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	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	5/23/91
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	12/18/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	7/22/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/16/91
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Acting Director	308-0196	3/15/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	3/20/91
SPECIAL LAWS ADMINISTRATION GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	3/16/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	6/02/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	8/14/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	308-0962	1/19/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	3/23/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	9/07/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	9/30/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	8/16/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	9/27/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-0651	7/09/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during August 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,897,596 to 3,902,195 inclusive
Plant Patents ..... 3,755 to 3,775

REISSUES

SEPTEMBER 29, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,078

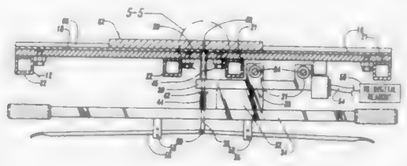
METHOD AND MEANS FOR MEASURING PLATE STRUCTURES

Dennis R. Hesseltine, 1800 Grand Ave., Apt. #235, West Des Moines, Iowa 50265

Original No. 4,969,275, dated Nov. 13, 1990, Ser. No. 482,031, Feb. 20, 1990. Application for reissue Nov. 14, 1991, Ser. No. 792,176

Int. Cl.[5] G01B *5/08*

U.S. Cl. 33—803 11 Claims



7. A measuring device for fabricated plate structures, comprising,

a flat table surface means, having opposite sides and ends,

a support means for such flat table surface means,

a straight reference gauge means adjacent one end of said table surface means, and extending across said table surface means at right angles to said sides,

an elongated straight slot in said table surface means extending in a direction at right angles to said gauge means,

a carriage means movably mounted below said table surface, and adapted to be moved in a direction parallel to said slot,

a retractable measuring reference pin on said carriage and extending upwardly through said slot and having an upper end normally terminating above said table surface,

and measuring means operative with the location of said pin and said gauge means to measure the linear distance between the location of said pin with respect to said gauge means so that measurements relating to the location of apertures in a plate structure with reference to one end of said plate abutted against gauge means can be determined while said pin is in its upper position and penetrating an aperture in said plate structure.

Re. 34,079

METHOD AND APPARATUS FOR CONSERVING BATTERY POWER IN A SNOWMOBILE ELECTRICAL SYSTEM

Ward K. Gatza, and Ronald E. Chasteen, both of Colorado Springs, Colo., assignors to Pacer Industries Inc., Branford, Conn.

Original No. 5,024,205, dated Jun. 18, 1991, Ser. No. 502,410, Mar. 30, 1990. Application for reissue Jul. 24, 1991, Ser. No. 735,396

Int. Cl.[5] F02P *11/00*

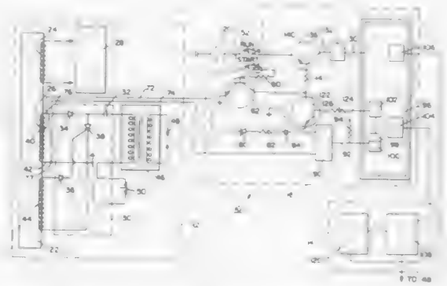
U.S. Cl. 123—632 23 Claims

1. In a snowmobile engine having a battery and at least one spark plug, an electronically controlled fuel system comprising:

fuel injection means for the delivery of fuel to said engine during the operation thereof;

ignition means for providing an electrical output to said spark plug sufficient to enable said plug to ignite said fuel delivered by said fuel injection means;

electronic control means electrically connected to said battery for controlling the operation of said fuel injection means, said electronic control means comprising a microprocessor having detector means therein electrically coupled to said ignition means for determining when said electrical output of said ignition means drops below a minimum threshold level, said microprocessor further comprising signal generator means for generating a battery disconnection signal when said detector means determines that said electrical output of said ignition means is below said threshold level; and



switch means electrically coupled between said battery and said microprocessor for receiving said battery disconnection signal from said signal generator means and disconnecting said electronic control means from said battery when said battery disconnection signal is received.

Re. 34,080

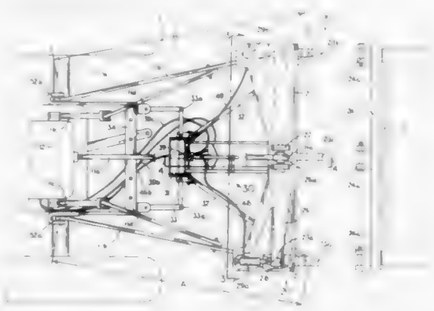
ROW FOLLOWING GUIDANCE DEVICE FOR A TRACTOR-DRAWN ROW CROP IMPLEMENT

Eugene H. Schmidt, Madrid, Nebr., assignor to New Tek Manufacturing, Inc., North Platt, Nebr.

Original No. 4,640,365, dated Feb. 3, 1987, Ser. No. 726,802, Apr. 24, 1985. Application for reissue Dec. 14, 1987, Ser. No. 132,321

Int. Cl.[5] A01B *69/00*

U.S. Cl. 172—5 22 Claims



20. A row following guidance device for a tractor-drawn implement, comprising:

a first horizontal elongated member having means for attachment to the forward end of a farm implement, which attachment means is adapted to be arranged transversely of crop rows;

a second horizontal elongated member having means for attachment to a tractor, said second member being pivotally attached about a vertical axis at a point thereon intermediate its

ends to said first member at a point thereon intermediate its ends, wherein one of said first and second members is characterized as having a portion thereof located between said intermediate point and an end thereof;

a hydraulic cylinder pivotally connected at one end to a point within said portion of said one of said first and second members and pivotally connected at its other end to said other member at a point away from said intermediate point thereon; and

means pulled by said tractor and adapted to be responsive to lateral movements of the implement in relation to the crop rows for transmitting signals proportionate to said lateral movement to a hydraulic pressure means for actuating said hydraulic cylinder to cause pivotal movement between said first and second members.

RE34,081

Patent Not Issued For This Number

Re. 34,082

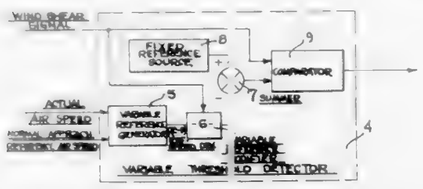
VARIABLE THRESHOLD WIND SHEAR WARNING SYSTEM

Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Original No. 4,855,738, dated Aug. 8, 1989, Ser. No. 79,905, Jul. 31, 1987. Application for reissue Jan. 25, 1991, Ser. No. 646,850

Int. Cl.[5] G08B *23/00*

U.S. Cl. 340—968 **6 Claims**



1. An improved aircraft wind shear warning system for warning of hazardous wind shear conditions during an aircraft landing approach of the type having means for generating a signal [representing] *which is a function of* the rate of change of the instantaneous airspeed of aircraft, means for generating a signal [representing] *which is a function of* the horizontal inertial acceleration of the aircraft, means for subtracting the horizontal inertial acceleration signal from the rate of change of the instantaneous airspeed signal to provide a wind shear signal [representing] *which is a function of* wind shear and warning device means for generating a warning signal wherein the improvement comprises:

means for generating a warning threshold the value of which warning threshold is negative and the magnitude of which warning threshold is the arithmetic combination of a pre-selected negative constant and a variable number which variable number is a function of the excess, if any, of the airspeed of the aircraft over a normal approach reference airspeed and which variable number is adjusted in response to the wind shear signal, when the wind shear signal has exceeded a pre-selected value during the landing approach; and

detector means responsive to the wind shear signal for actuating said warning device means when the wind shear signal is more negative than said warning threshold.

Re. 34,083

CAMERA WITH MOTORIZED FILM REWINDING DEVICE

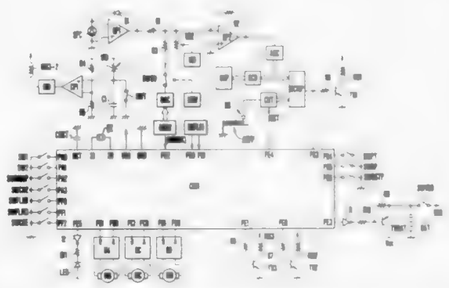
Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi; Masayuki Suzuki, all of Kanagawa; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 4,752,793, dated Jun. 21, 1988, Ser. No. 945,359, Dec. 22, 1986. Application for reissue Jun. 19, 1990, Ser. No. 540,192

Claims priority, application Japan, Dec. 26, 1985, 60-29668; Jan. 30, 1986, 61-016756

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—173.11 **22 Claims**



12. A camera with a motorized film rewinding device, comprising:

(a) a motor;

(b) film rewinding means for rewinding a film and having said motor as a drive source.

(c) detecting means operative for detecting the rewinding movement of said film and producing a signal upon detection of such rewinding movement; and

(d) control means for automatically stopping said motor responsively to operation of said detecting means, said control means stopping said motor when said signal is not detected within a first time under an initial condition of said film rewinding and stopping said motor when the signal is not detected within a second time different from said first time so as to prevent a leader part of said film from being entangled in a film cartridge.

Re. 34,084

VERTICAL ACTION CONTACT SPRING

Rocco J. Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Original No. 4,961,709, dated Oct. 9, 1990, Ser. No. 310,325, Feb. 13, 1989. Application for reissue May 24, 1991, Ser. No. 705,488

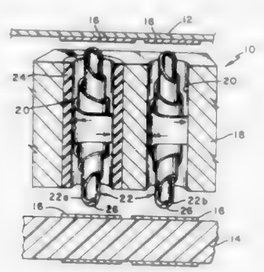
Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—66 **15 Claims**

10. An electrical connector comprising:

a matrix block having holes therein; and

spring contacts connected to the matrix block and at least partially located in the holes, the contacts having ends extending out of the holes from opposite sides of the matrix block, each contact being comprised of a one-piece member rolled into a column shape and adapted to radially frictionally hold the contact in a hole of the matrix block and adapted to be longitudinally deflectable between two members such that the



contacts can contact the two members at various different distances therebetween.

Re. 34,085

THERMOPLASTIC AROMATIC POLYETHERKETONES

John B. Rose, Letchworth, and Philip A. Staniland, Tewin Wood, both of England, assignors to Imperial Chemical Industries, London, England

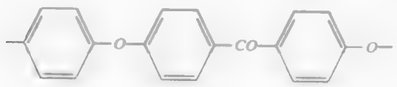
Original No. 4,320,224, dated Mar. 16, 1982, Ser. No. 956,045, Oct. 31, 1978. Continuation-in-part of Ser. No. 873,477, Jan. 30, 1978, abandoned. Application for reissue May 25, 1983, Ser. No. 498,116

Claims priority, application United Kingdom, Sep. 7, 1977, 37345; Jan. 13, 1978, 1412

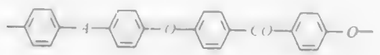
Int. Cl.[5] C08G *65/40*

U.S. Cl. 528—125 **14 Claims**

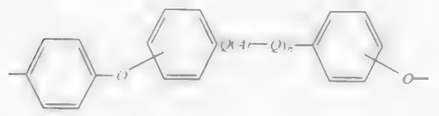
14. A tough crystalline thermoplastic aromatic polyetherketone consisting essentially of the repeat unit I



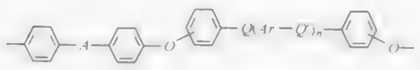
alone or in conjunction with at most 50 mole %, based on the total repeating units, of other repeating units selected from the group consisting of the repeating units IV



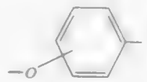
the repeat units V



and the repeat units VI



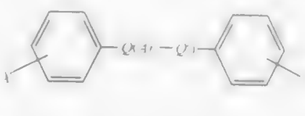
divalent hydrocarbon radical, the oxygen atoms in the subunits



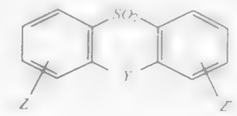
are ortho or para to the groups Q and Q'. Q and Q' which may be the same or different are —CO— or —SO_2—. Ar' is a divalent aromatic radical, and n is 0, 1, 2 or 3, said polymer having an inherent viscosity IV, as measured at 25° C. on a solution of the polymer in concentrated sulphuric acid of density 1.84 g.cm^3 said solution containing 0.1 g of polymer in 100 cm^3 of solution, of at least 0.7 (which corresponds to a reduced viscosity RV, as measured at 25° C. on a solution of the polymer in concentrated sulphuric acid of density 1.84 g.cm^3 of solution, of at least 0.8) said solution containing 1 g of polymer in 100 cm^3.

15. A process for the production of a tough crystalline thermoplastic polyetherketone which process comprises polycondensing, under substantially anhydrous conditions, at least one bisphenol which is hydroquinone or hydroquinone and at least one other co-condensate bisphenol of the formula

where A is a direct link, oxygen, sulphur, —SO_2—, —CO—, or a divalent hydrocarbon radical, and at least one aromatic dihalide which is 4,4'-difluorobenzophenone or 4,4'-difluorobenzophenone and at least one co-condensate aromatic dihalide of formula



where X and X' which may be the same or different are halogen atoms and are ortho or para to the groups Q and Q', Q and Q, which may be the same or different are —CO— or —SO_2—, Ar' is a divalent aromatic radical at most 50 mole % of the total amount of bisphenol and/or aromatic dihalide being said co-condensates, there being substantially equimolar amounts of bisphenol and aromatic dihalide, in the presence of at least one alkali metal carbonate or bicarbonate used in an amount providing at least 2 gram atoms of alkali metal per mole of bisphenol, the alkali metal or metals being selected from sodium, potassium, rubidium, and caesium provided that the sole use of sodium carbonate and/or bicarbonate is excluded, and in the presence of a solvent having the formula



where Y is a direct link, an oxygen atom or two hydrogen atoms (one attached to each benzene ring) and Z and Z' are hydrogen or a phenyl group, within the temperature range 150° C. to 400° C., the final temperature level during the polycondensation being sufficiently high to maintain the final polymer in solution, such that a polymer having an IV of at least 0.7 (which corresponds to an RV of at least 0.8) is obtained.

PLANT PATENTS

GRANTED SEPTEMBER 29, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing

7,986

HYBRID MINIATURE ROSE PLANT NAMED WEKHELEN

Thomas F. Carruth, Altadena, Calif., assignor to Weeks Wholesale Rose Grower, Inc., Upland, Calif.

Filed Feb. 7, 1991, Ser. No. 651,752
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—7.1 **1 Claim**

1. A new and distinct variety of hybrid miniature rose plant substantially as shown and described.

7,987

MINIATURE ROSE PLANT NAMED SAVAFACE

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Jan. 8, 1991, Ser. No. 639,251
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

7,988

FLORIBUNDA ROSE PLANT CARALE

Robert Strahle, Carlton, Oreg., assignor to Carlton Rose Nurseries, Inc., Carlton, Oreg.

Filed Nov. 29, 1990, Ser. No. 619,562
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class obtained as a seedling from a seed parent entitled "Escort" and a pollen parent entitled "Golden Nugget," characterized by its solid yellow color which is maintained from flower opening through petal drop, and its ability to yield flowers on a continuous basis when grown in a greenhouse, substantially as shown and described.

7,989

HYBRID TEA ROSE PLANT NAMED LIVERPOOL REMEMBERS

Gareth Fryer, Knutsford, England, assignor to Roses by Fred Edmunds, Inc., Wilsonville, Oreg.

Filed Jan. 18, 1991, Ser. No. 643,717
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—16 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

7,990

"AUTUMN ROSE" PEACH TREE

Roy D. Richardson, Rte. 2, Box 520, Bakersfield, Calif. 93307

Filed Apr. 1, 1991, Ser. No. 680,245
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—43.2 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is closely similar to the "Autumn Gem" peach tree (U.S. Plant Pat. No. 3,582), producing large freestone fruit of a yellow ground color and a streaked and mottled red blush coloration, but from which it is distinguished and characterized principally as to novelty by producing such fruit which are mature for commercial harvesting and shipment approximately November 1st to November 20th in the Southern San Joaquin Valley of central California

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7,991

GERBERA PLANT NAMED TERTALA

Lambertus J. M. Stravers, Kudelstaart, Netherlands, assignor to Terra Nigra BV, De Kwakel, Netherlands

Filed Jan. 25, 1991, Ser. No. 645,603
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Gerbera plant named Tertala, as illustrated and described.

7,992

CHRYSANTHEMUM PLANT NAMED HOLLY

Peter S. Hesse, Nipoma, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 8, 1991, Ser. No. 659,556
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Holly, as described and illustrated.

7,993

CHRYSANTHEMUM PLANT NAMED SHELLEY

Peter S. Hesse, Nipoma, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 6, 1991, Ser. No. 652,418
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct Chrysanthemum plant named Shelley, as described and illustrated.

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PATENTS

GRANTED September 29, 1992

ERRATA

29-033 5,150,496
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430-548 5,151,356
430-610 5,151,357
548-530 5,151,536
335-172 5,151,671
357-017 5,151,724
351-156 5,151,778
395-750 5,151,855
378-065 5,151,931
379-058 5,151,946
379-093 5,151,972

PATENTS

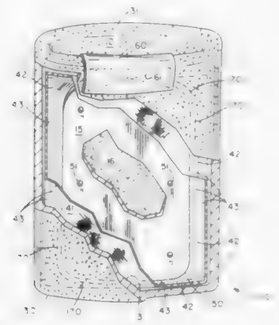
GRANTED SEPTEMBER 29, 1992

GENERAL AND MECHANICAL

5,150,475
PROTECTIVE WRISTBAND

Brian J. Hansen, 5717 21st Ave. S., Minneapolis, Minn. 55417, and Stewart L. Hansen, 8305 West Bend Rd., Golden Valley, Minn. 55427

Filed Dec. 10, 1990, Ser. No. 625,074
Int. Cl.[5] A41D *13/08*
U.S. Cl. 2—16 **19 Claims**



17. A protective wristband for protecting a wrist, comprising:

a) a band to encircle the wrist and comprising inner and outer layers of absorbent, stretchable material, the inner layer confronting the wrist, the inner and outer layers being integral along a pair of integral ledges to form an endless hollow interior, the band being applied by being stretched over the hand of the wrist,

b) a shield with inner and outer faces, the shield being at least semirigid, the shield including a curvature such that the shield fits comfortably over the wrist, the shield including at least one hole for ventilation,

c) a cushion secured to the inner face of the shield to be disposed between the shield and the wrist, the cushion having approximately the same width and height of the shield, the cushion also having approximately the same curvature as the shield, the cushion having an aperture aligned with the hole of the shield for ventilation, and

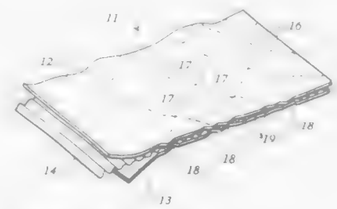
d) the shield including a periphery and being retained in generally one place between the inner and outer layers by stitching disposed at least partially about the periphery, the stitching connecting the inner and outer layers.

5,150,476
INSULATING FABRIC AND METHOD OF PRODUCING SAME

Denise N. Statham, Powder Springs; Michael T. Stanhope, Atlanta, and Thomas J. Hejhal, Dunwoody, all of Ga., assignors to Southern Mills, Inc., Union City, Ga.

Filed Mar. 22, 1991, Ser. No. 673,950
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—93 **21 Claims**

1. An insulating textile fabric for use in protective garments of the type commonly worn by fire fighters, said insulating fabric comprising an outer layer of material, an inner layer of material, and an intermediate layer of material sandwiched between said outer and inner layers of material, said intermediate layer of material extending substantially continuously throughout the length and breadth between said inner and outer layers of material and including an array of pleats having a series of alternately oppositely extending peaks extending alternately into engagement with said outer and inner layers of material and maintaining said outer and inner layers of material in mutually spaced relationship, with said pleats of said intermediate layer of materil defining a plurality of air channels between said outer and inner layers of material, spaced lines of stitching extending across said pleats and securing together said outer, intermediate, and inner layers of material along a

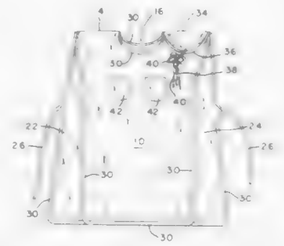


plurality of spaced paths extending across said air channels and maintaining said intermediate layer of material in position between said outer and inner layers of material and in its pleated configuration between said lines of stitching, and said spaced lines of stitching collapsing together the outer, inner and intermediate layers of material along the lines of stitching.

5,150,477
HOSPITAL GOWN

Joyce E. Elberson, c/o Jacob and Betty Walters, Box 307, Saxton, Pa. 16678, and Mary F. Ritchey, 435 Lincolnway Dr., York, Pa. 17404

Filed Mar. 6, 1992, Ser. No. 846,888
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—114 **2 Claims**



1. A one-piece hospital gown formed from a unitary area of woven sheet-like material and comprising a relatively narrow front panel having parallel opposite side edges and being of predetermined length and said front panel being integral at shoulder regions with a corresponding end of a wider rear panel of which opposite side edge portions comprise integral elongated flaps having smoothly tapering and diverging outer edges respectively adapted to overlap appreciable opposite side edge portions of said front panel in a manner to effectively cover especially a person's torso when wearing the gown, said gown also having an opening in said shoulder region where said panels are integrally connected and through which a person's head is adapted to extend when mounting the gown for wearing, and said flaps respectively intermediately of said opposite elongated edges thereof having elongated tie members connected to and formed by extensions of channel-type textile binding extending around and secured to substantially all edges of said integral front and rear panels and said tie members being adapted to extend across the exterior of said front panel when the gown is worn and are releasably con-

nected to each other, said arrangement of the panels being such as to provide substantially complete encirclement and coverage of the torso of a person when wearing said gown and said panels being adapted to permit ready movement thereof to expose said torso of the person for medical, as well as toilet operations.

5,150,478

METHOD FOR THE PRODUCTION OF MODULABLE GARMENTS

Mauricette Niedajkasza, 58, Avenue du Rouquet, 33700 Merignac; Bruno Niedajkasza, and Catherine Niedajkasza, both of Merignac, all of France, assignors to Mauricette Niedajkasza, Merignac, France

PCT No. PCT/FR89/00216, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO89/10706, PCT Pub. Date Nov. 16, 1989

PCT Filed May 3, 1989, Ser. No. 601,806

Claims priority, application France, May 3, 1988, 88 05932

Int. Cl.[5] A41D *27/00*

U.S. Cl. 2—243 R 8 Claims

1. A method for producing a modulable garment comprising the steps of:

providing a plurality of elementary pieces of a material containing a diamond shaped contour with corners at each end of a small diagonal of said diamond shaped contour and corners at each end of a large diagonal of said diamond shaped contour,

arranging four of said elementary pieces in side by side relation, with the large diagonals of the contours of said elementary pieces substantially parallel to one another; and

joining said four elementary pieces together using fastening means at said corners at each end of said small diagonals of said diamond shaped contour to provide a garment to fit around a hip or chest portion of an intended wearer.

5,150,479

PROTECTIVE HELMET

Richard A. Oleson, Lexington, Ky., assignor to E. D. Bullard Company, Sausalito, Calif.

Filed Sep. 23, 1991, Ser. No. 763,619

Int. Cl.[5] A42B *3/00*

U.S. Cl. 2—414 14 Claims

14. A protective helmet comprising:

an outer shell,

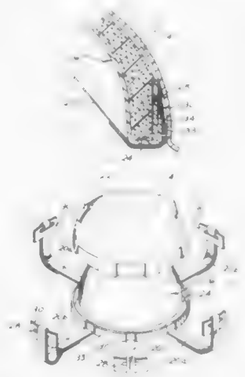
a compressible foam liner disposed in said outer shell,

a rigid inner shell disposed at least partially within said foam liner,

an annularly extending channel attached to an outer edge portion of said inner shell, an edge portion of said liner being disposed within said channel,

a suspension system including a series of flexible, stretchable, resilient straps, and

incompressible, non-resilient means disposed in said channel between a surface of said foam liner and said outer shell for securing distal end portions of said straps thereto such that an apex impact loading force applied to said shell within design limits of said helmet is absorbed without



producing deformation of said liner at the location of said strap securing means.

5,150,480

SUPPORT FOOTING FOR TOILET

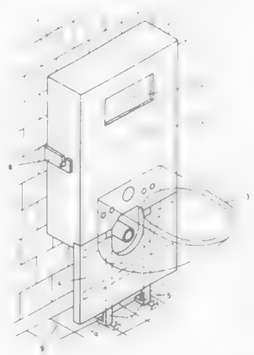
Peter Schmucki, Eschenbach, Switzerland, assignor to Geberit AG, Switzerland

Filed Oct. 31, 1990, Ser. No. 606,883

Claims priority, application Switzerland, Nov. 10, 1989, 4057/89

Int. Cl.[5] E03D *11/14*

U.S. Cl. 4—252.3 7 Claims



1. A foot support for mounting an installation block of a toilet arrangement in front of or in a building wall, comprising:

an H-shaped beam including two vertically extending side supports, said side supports being formed of metal pipe elements which are rectangular in cross section having two broad sides and two narrow sides, said metal pipe elements being formed open at the bottom and having bent top portions, said top portions being fastened to the installation block, said vertically extending side supports being exposed substantially in parallel to and at a spaced location from the building wall; foot elements including vertically extending generally rectangular members having two broad sides and two narrow sides and having bent foot members, said foot elements being inserted into corresponding ones of said open bottoms of adjusting the height of said H-shaped beam; and, fixing means for fixing said

foot elements relative to said H-shaped beam, said side supports include a broad side with a depression substantially in the middle of said broad side, said depression extending in a longitudinal direction of said side support, thereby reducing the clearance between said side supports and said vertically extending members of said foot elements when said members are inserted in said side supports, wherein said fixing means are threaded into one of the narrow sides of said vertically extending side supports so as to engage a narrow side of said foot elements and clamp said foot elements between said fixing means, said depression, one broad side and one narrow side of said vertically extending side supports.

5,150,481

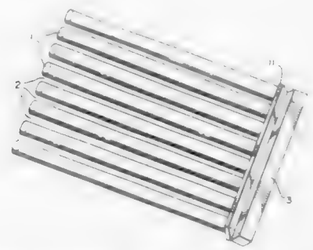
ANTI-LIQUID SPLASH DEVICE

Hian S. Pang, 7 Watten Drive, Singapore, Singapore 1128

Filed Mar. 26, 1991, Ser. No. 675,178

Int. Cl.[5] E03D *9/00*

U.S. Cl. 4—300.3 10 Claims



1. An anti-liquid splash device for a receptacle having an upright wall, a top and containing a body of liquid therein, said device comprising a plurality of distinct elongate floats (1) secured to and extending substantially parallel to one another from a support (3), the support including attachment means for attachment to the wall (5) of the receptacle or flow passage, wherein the elongate floats can be arranged to extend across substantially the entire surface (10) of the liquid in the receptacle or flow passage in a direction generally transverse to the wall of the receptacle, and wherein the elongate floats (1) can then be arranged to be impacted by any solid or fluid matter entering the top of the receptacle to deflect such solid or fluid matter from immediate impact with a major part of the liquid surface thereby inhibiting the splashing effect of that impact

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5,150,482

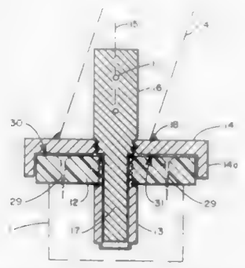
BATH CHAIR SWIVEL FOOT

Leo Shapiro, 5287 Ascott Bend, Boca Raton, Fla. 33496

Filed Jul. 25, 1991, Ser. No. 735,856

Int. Cl.[5] A47K *3/12*

U.S. Cl. 4—562.1 9 Claims



1. In a bath chair having a base with suction cups for rigidly attaching to the floor of a bath tub or shower stall and a stem with a chair body attached thereto, the improvement comprising a swivel connector for pivotally connecting the base to the chair stem, said swivel connector including a rotator disk rigidly attached to said base, said rotator disk having an upper supporting rotator surface, a surface opposite said supporting rotator surface, and a central opening formed therethrough, a hollow swivel cylinder rigidly attached to said rotator disk in said central opening, said swivel cylinder extending perpendicularly to said supporting rotator surface and extending from said surface of said rotator disk opposite said supporting rotator surface, a lid-shaped rotator shell rigidly attached to said stem, said rotator shell having a lower rotator surface engaging on said supporting rotator surface and having an encompassing lateral extension snugly surrounding said rotator disk when said rotator shell is placed on said rotator disk, and a cylindrical rotator pin depending perpendicularly from said lower swivel surface and received in said hollow swivel cylinder for frictionally rotating in said swivel cylinder when said rotator shell is placed on said rotator disk.

5,150,483

AUTOMATICALLY LOWERING TOILET SEAT

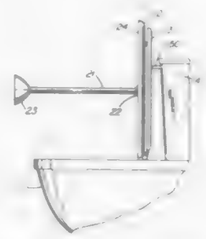
Harold J. M. Lochrie, R.R. #5, Brockville, Ontario, Canada K6V 5T5

Filed Apr. 10, 1991, Ser. No. 682,949

Claims priority, application Canada, Apr. 11, 1990, 2,014,345

Int. Cl.[5] A47K *13/10*

U.S. Cl. 4—246.1 18 Claims



1. An automatic seat lowering mechanism for a toilet seat pivotally mounted on a toilet bowl comprising:

arm means having a first end adapted to be attached to an outer edge portion of a toilet seat, the arm means projecting downwardly away from the plane of the toilet seat so as to be disposed clear of the toilet bowl when the toilet seat is in a horizontal position, and having a second end adapted to be supported by the front of a leg of a user when the toilet seat is in a generally upright position, the arm means being of sufficient length to extend between the toilet seat and the front of the user's leg to permit the toilet seat to be maintained in the generally upright position to allow use of the toilet from a standing position,

whereby in use, when the toilet seat has been raised by the user from the horizontal position, the toilet seat will fall under the force of gravity acting on the arm means or on the toilet seat and the arm means in combination when the second end of the arm means is not supported by the front of the leg of the user.

5,150,484

SUPPORT STRUCTURE FOR BEDS AND THE LIKE

Gordon Whitten, Jr., 1120 Saunders St., Hastings, Nebr. 68901

Filed Aug. 13, 1990, Ser. No. 566,132

Int. Cl.[5] A47C *19/00*

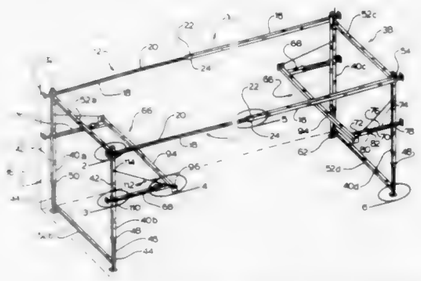
U.S. Cl. 5—9.1 10 Claims

1. A load bearing scaffold adapted to be supported on the floor of a room and to extend between opposite walls thereof for supporting articles, comprising:

a pair of vertical support beams adapted to be supported on a floor adjacent one wall;

a horizontal beam connected adjacent one end to and extending generally horizontally outwardly from at least one of said vertical support beams to resist movement of the vertical support beam toward an opposite wall;

means for adjusting the length of said horizontal beam wherein said means comprises a combination of a horizontal gross adjustment means whereby said horizontal beam may be adjusted to fit approximately between said opposite walls of a room, and a horizontal fine adjustment means, whereby said horizontal beam may be further



adjusted to substantially engage said opposite walls of a room;

means for adjusting the length of said vertical beams wherein said means comprises a combination of a vertical gross adjustment means, whereby said vertical beams may be adjusted to change the height of the articles, and a vertical fine adjustment means, whereby said vertical beams may be adjusted to make fine changes in the height of the articles; and

a platform means supported on said vertical support beams and extending outwardly therefrom toward said opposite wall.

5,150,485

BEACH BLANKET ANCHOR APPARATUS

Sean P. Maguire, 26 Barbie Dr., Rochester, N.Y. 14626

Filed Oct. 31, 1991, Ser. No. 785,686

Int. Cl.[5] A47G *9/06*

U.S. Cl. 5—417 **6 Claims**

1. A beach blanket anchor apparatus in combination with a flexible blanket web, including at least a plurality of anchor members securable to the anchor web, each of the anchor members are arranged in spaced adjacency relative to one another, and wherein each anchor member includes a planar base floor, and

a clamp plate, the clamp plate including a spring hinge, the spring hinge mounted to the planar base floor to bias the clamp plate in contiguous communication with the planar base floor to receive the blanket web between the clamp plate and the planar base floor, and

the anchor member includes a base member, and the base member is defined by the planar base floor at a lower terminal end of the base member, and the base member includes an externally threaded cylindrical upper end, the cylindrical upper end includes an upper end axis, and the upper end axis defines an acute included angle between the planar base floor and the externally threaded cylindrical upper end, and the base member further including a base member hollow cap, the hollow cap including an internally threaded lower end securable to the externally threaded cylindrical upper end, and the hollow cap further including a plurality of hollow leverage body legs projecting laterally of the hollow cap and oriented orthogonally relative to the spring hinge, wherein the hollow leverage body legs are in communication with the hollow cap to receive ballast material within the hollow leverage body legs and the hollow cap.

5,150,486

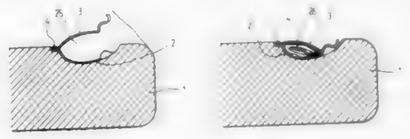
MATTRESS WITH SHEET RETAINING MEANS

Chang-Fu Wu, No. 69, Alley 69, Lane 285, Sec. 1, Nei Hu Rd., Taipei, Taiwan

Filed Apr. 17, 1992, Ser. No. 869,965

Int. Cl.[5] A47C *27/00*

U.S. Cl. 5—460 **1 Claim**



1. A mattress comprised of a rectangular mattress body, and a plurality of channel plates and clamps and characterized in that said mattress body has channels on a bottom edge along the four sides thereof with said channel plates respectively secured therein, said clamps being respectively secured to said channel plates said channel plates each having an elongated projection along a longitudinal peripheral edge thereof, said elongated projection having raised portions over a top edge thereof for clamping down said clamps in securing a sheet over said mattress body.

5,150,487

EVACUATION RESTRAINT

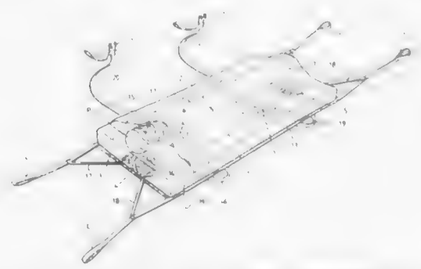
Desmond J. Hemphill, Ballarat1, Australia, assignor to Hemco Industries Pty. Ltd., Australia

Continuation of Ser. No. 603,778, filed as PCT/AU 89/00142, Mar. 31, 1989, abandoned. This application Feb. 11, 1992, Ser. No. 835,001

Claims priority, application Australia, Mar. 31, 1988, P17672

Int. Cl.[5] A61C *1/00*

U.S. Cl. 5—625 **9 Claims**



1. An evacuation restraint comprising a substantially rectangular base sheet (1) of strong flexible material, a substantially rectangular support member (2) located centrally of said base sheet (1) and joined thereto on top of said base sheet, said support member being formed of a continous sheet of lightweight non-bulky material having greater rigidity than said base sheet and being capable of deformation transversely of the support member and being substantially equally rigid across its full width, said base sheet (1) extending substantially from either side of said support member (2) to enable the base sheet and support member in use to be flexed together and to uniformly envelop a patient to be evacuated, strap members (12,13,14,17,18,20,21) secured at least to said base sheet (1) and extending from the sides of the base sheet (1), said strap members including means (16,19,22,23) for connecting opposite strap members (12,13) together at at least two longitudinally spaced positions, and further strap members (12,13) extending from at least one end of said base sheet (1) by means of which the restraint can be manipulated during evacuation procedures, said support member (2) having substantially greater rigidity in the longitudinal direction than the transverse direction and providing with said base sheet a smooth relatively rigid base on which the restraint can slide during evacuation procedures.

5,150,488

MULTIFUNCTIONAL TOOL

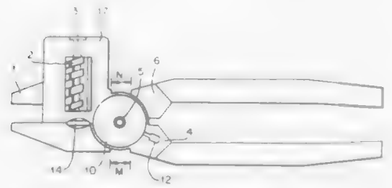
Gu F. Yuan; Kou M. Yuen; Zhao Q. Wei, and Gu Z. Ying, all of Kowloon, Hong Kong, assignors to Neng-Shi (Hong Kong) Industrial Co., Tokwawan, Hong Kong

Filed May 31, 1991, Ser. No. 708,678

Claims priority, application China, Jun. 9, 1990, 90207321

Int. Cl.[5] B25B *7/22*

U.S. Cl. 7—137 **3 Claims**



1. A multifunctional hand tool comprising:

a first handle with a front end and a back end including a hollow frame and a sliding jaw both mounted on the front end thereof;

a core pin and a regulating screw rotatably mounted on said core pin both located within said hollow frame;

a second handle with a front end and an back end, having a fixed jaw located at the front end thereof;

a pivotal joint pin for pivotally connecting said first and second handles together, with said jaws generally facing each other so that said handles are movable between an open and closed position and the hand tool is usable as pliers; and

locking means for locking said handles in the closed position so that said hollow frame is usable as a hammer head, and wherein said sliding jaw is operatively connected to said regulating screw so that rotation of said regulating screw moves said sliding jaw with respect to said fixed jaw whereby the hand tool is useable as a monkey wrench in the closed position.

5,150,489

APPARATUS AND METHOD FOR CONTROLLING A WASHING MACHINE

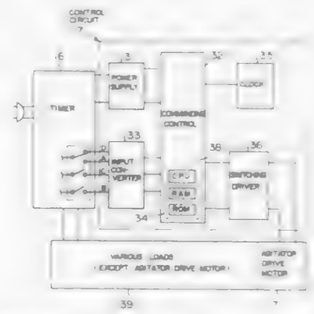
Shinichi Kaji, Katsuta; Kazuyuki Yano, Hitachi; Yoshitaka Shibata, Hitachi; Toshihiro Takahashi, Hitachi; Kiyomi Takamaru, Hitachi; Hideyuki Tobita, Hitachi, and Isao Hiyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,885

Claims priority, application Japan, Mar. 9, 1990, 2-056375

Int. Cl.[5] D06F *33/02*

U.S. Cl. 8—159 **11 Claims**



1. An apparatus for controlling a washing machine comprising a mechanical timer including a plurality of cam switches for controlling individual steps of washing, rinsing and dehydrating of the washing machine, a drive motor to drive the washing machine, electrical components and a control circuit including a controller, said cam switches for controlling an operation sequence and an operation timing of he individual steps of washing, rinsing and dehydrating of the washing machine and also controlling said electrical components, except said drive motor, to be controlled in each of the individual steps, and wherein said controller receives input signals from said cam switches of said mechanical timer to control the on and off timing of the drive motor.

11. A method for controlling a washing machine comprising the steps of:

selectively actuating cam switches of a mechanical timer for opening and closing a feed water valve for feeding water into a washing tub, and opening and closing a drain valve to drain the water from the washing tub;

controlling a control circuit to drive a drive motor according to a selected operation pattern; and

controlling said drive motor, the washing tub and an agitating member by said control circuit according to an operation pattern stored in memory means of said control circuit being controlled by said cam switches.

5,150,490

PROCESS FOR PRODUCING A RESILIENT OR PADDED INSERT FOR FOOTWEAR

Waldemar Busch, Heilbronn-Böckingen, and Norbert Lutz, Postbauer-Heng, both of Fed. Rep. of Germany, assignors to Storopack Hans Reichenecker GmbH & Co., Weinstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00008, § 371 Date Jun. 19, 1990, § 102(e) Date Jun. 19, 1990, PCT Pub. No. WO89/06501, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 7, 1989, Ser. No. 499,411

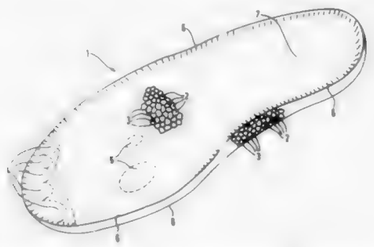
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802035

Int. Cl.[5] A43D *9/00*; A43B *13/38*

U.S. Cl. 12—146 M **21 Claims**

1. A cushioning or padding body for insertion into footwear, consisting of a thermoplastically deformable, resiliently cush-

ioning foam material comprising a plurality of individual foam material beads each provided with a closed surface and each being generally impermeable to air, said cushioning or padding body being formed by the process of:



introducing a plurality of said beads into a mold having a desired body shape and filling the mold; and

applying heat to the mold to sinter the beads causing cross-linking of the beads, thereby fixing the beads in their position relative to each other.

5,150,491

HAIR BRUSH

Shigeki Ikemoto, Higashi-Osaka, Japan, assignor to Ikemoto Burashi Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP90/00620, § 371 Date Dec. 14, 1990, § 102(e) Date Dec. 14, 1990, PCT Pub. No. WO90/14030, PCT Pub. Date Nov. 29, 1990

PCT Filed May 17, 1990, Ser. No. 623,420

Claims priority, application Japan, May 25, 1989, 1-61154

Int. Cl.[5] A46B *9/08*

U.S. Cl. 15—1.52 10 Claims

1. A hair brush comprising an electrically conductive brush base, a handle, a multiplicity of electrically conductive bristles provided upright on the surface of the brush base, and an antistatic member made of electrically conductive fiber and provided at each of widthwise opposite end portions of the brush base surface running longitudinally of the brush base; wherein the handle has a mount toward one end in the longitudinal direction thereof, and the conductive brush base is fitted to the mount; a multiplicity of small holes are formed in the brush base at each widthwise end portion thereof and arranged at a spacing in a row longitudinally of the base, the antistatic member being so provided as to project from the multiplicity of small holes slightly beyond the surface; and wherein the small holes communicate at the rear side thereof with an elongated groove formed in the rear surface of the brush base, and the antistatic member is fitted at its base portion in the groove, a barlike fixing member being inserted between the inner wall defining the groove and the base portion of the antistatic member to fix the antistatic member.

5,150,49[illegible]

ULTRASONIC TOOTHBRUSH

Leonard W. Suroff, 12 Tompkins Ave., Jericho, N.Y. 11753

Filed Feb. 8, 1991, Ser. No. 652,628

Int. Cl.[5] A61C *17/32* A46B *13/02*

U.S. Cl. 15—22.1 55 Claims

1. An ultrasonic toothbrush apparatus comprising:

A. an exchangeable toothbrush implement including;

a. an elongated body portion of vibration transmitting material having an oral contact portion disposed on one distal end of said body portion,

b. the other end of said body portion being hollow and provided with a centrally disposed opening,

c. an elongated member of magnetostrictive material having one end thereof extending within said opening and coupled to said body portion in vibration transmitting relationship,

B. an ultrasonic power means for supplying vibratory energy in the ultrasonic range, said power means including;

i) an elongated hollow housing having an opening at one end for receiving said toothbrush implement, and

ii) mating locking means disposed proximate said one end of said elongated hollow housing;

C. means for rigidly and removably mounting said exchangeable toothbrush implement upon said ultrasonic power means for transmitting vibratory energy through said body portion to said oral contact portion substantially free from absorbing ultrasonic energy in said ultrasonic power means including;

i) locking means, said locking means cooperating with said mating locking means disposed upon said power means to retain said toothbrush implement in fixed relationship to said ultrasonic power means during use of said toothbrush, said exchangeable toothbrush implement being removed from said ultrasonic power means with a relatively small separating force therebetween; and

D. closure means encompassing said elongated magentrostrictive member of said body portion wherein said elongated magnetostrictive member is sealed for preventing moisture and liquid from entering said implement.

5,150,493

PIPELINE PIG

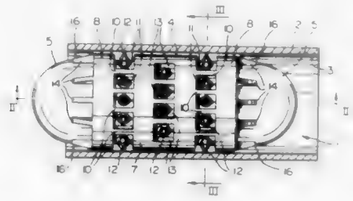
Orlande Sivacoe, 4700 - 55 Street, #601, Red Deer, Alberta, Canada T4N 2H8

Filed Mar. 25, 1991, Ser. No. 674,386

Int. Cl.[5] B08B *9/04*

U.S. Cl. 15—104.061 5 Claims

1. A pig for use in a pipeline comprising onepiece, elongated, flexible, cylindrical body means; a plurality of annular rib means integral with said body means; longitudinal rib means integral with said body means extending between adjacent said annular rib means and defining recesses with said annular rib means; and tooth means extending out of said body means in each said recess, said tooth means and said rib means simultaneously engaging the interior of a pipeline when the pig is moved through the pipeline by a pressure differential in the pipeline.



5,150,494

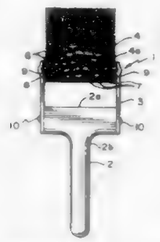
PAINT BRUSH WITH DOME SHAPED MEMBER FOR PREVENTING PAINT FROM COLLECTING IN THE FERRULE

Kenneth C. Wenzer, 14011 Chestnut La., Laurel, Md. 20707

Filed Apr. 12, 1991, Ser. No. 684,265

Int. Cl.[5] A46B *3/02*

U.S. Cl. 15—159.1 3 Claims



1. A paint brush configured so as to facilitate cleaning the brush bristles comprising a handle having a flat rectangular end portion, an annular metal ferrule secured to said handle a binder evenly dispersed in said ferrule and secured by grooves formed in said ferrule, (and) said binder being spaced from said end portion of said handle, a dome-like shaped hard plastic member having a flat lower end adhesively bonded to said binder and having a plurality of perforations extending through said dome shaped member, a plurality of bristles extending through said perforations and having butt ends, said butt ends being immersed and fixed in the binder, said dome-like shaped member having a first portion which protrudes away from the handle and second portions on opposite sides of the first portion which taper to the ferrule to form a generally convex barrier between the exposed bristles and the binder, whereby paint collected during painting settles on the dome-like shaped member rather than in the binder to facilitate mechanical removal of the paint.

5,150,495

DISPOSABLE DENTAL BRUSH

John Discko, Jr., Hamden, and William B. Dragan, Easton, both of Conn., assignors to Centrix, Inc., Shelton, Conn.

Continuation-in-part of Ser. No. 325,888, Mar. 20, 1989, Pat. No. 5,001,803. This application Mar. 19, 1991, Ser. No. 671,523

Int. Cl.[5] A46B *9/04, 17/02*

U.S. Cl. 15—167.1 4 Claims

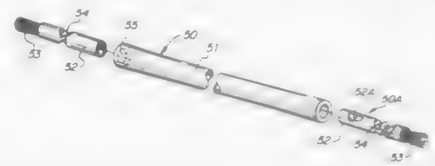
1. A readily disposable dental brush for applying various dental materials to a tooth in thin, even coatings comprising

an elongated tubular handle member having a bore extending co-extensively therethrough,

said handle member being open on at least one end,

a relatively short tubular brush holder having an external diameter sized to be frictionally received within the bore of said handle member at said one end thereof,

a tuft of bristles connected to one end of said brush holder,



and means intermediate the ends of said brush holder defining a hinge section about which said bristles can be angularly disposed relative to the axis of said brush holder.

5,150,496

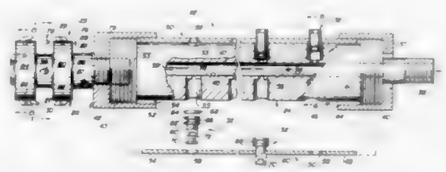
INTERNAL GRINDING AND CUTTING DEVICE FOR PIPE AND CASING

Scott Bromley, Lovington, N. Mex., assignor to Scott Tech International, Inc., Lovington, N. Mex.

Continuation-in-part of Ser. No. 575,263, Aug. 30, 1990, Pat. No. 5,062,187, which is a continuation-in-part of Ser. No. 413,540, Sep. 7, 1989, Pat. No. 4,954,023. This application Aug. 2, 1991, Ser. No. 739,377

Int. Cl.[5] B23B *47/00*

U.S. Cl. 29—33 T 19 Claims



6. The method of removing a plastic coating from the inside surface of a pipe section, comprising the steps of:

arranging a grinderhead having a mandrel axially aligned respective to the pipe section;

mounting the mandrel to a rotatable shaft that can be moved axially along the interior of the pipe section by connecting one end of the mandrel to one end of the shaft;

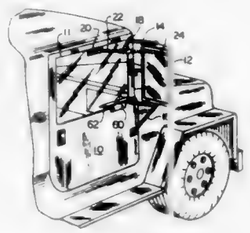
forming a plurality of piston receiving cylinders in said mandrel in spaced relationship respective to one another;

reciprocatingly receiving a radially active piston within each of the piston receiving cylinders to be moved radially respective to the mandrel;

reciprocating and rotating the grinderhead through the interior of the pipe section by reciprocating and rotating the shaft;

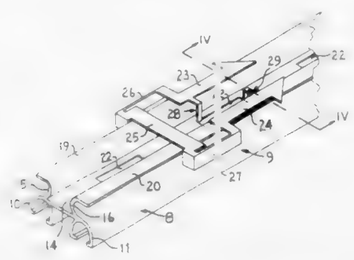
connecting the piston receiving cylinders to a common source of pressure and thereby effect a pressure drop across each of the radially active pistons of a magnitude to extend the outer face of the pistons into contact with the interior wall surface of the pipe section, thereby removing material from the interior wall surface of the pipe section during rotation of said grinderhead while permitting said grinderhead to be moved axially within the pipe section and thereby provide the pipe section with a minimum inside diameter.

5,150,497
TRUCK MIRROR WIPER
Marc R. Preik, 121 Boyette Dr., Lenoir, N.C. 28645
Filed Dec. 3, 1991, Ser. No. 802,050
Int. Cl.[5] B60S *1/06, 1/14, 1/44*
U.S. Cl. 15—250.003 9 Claims



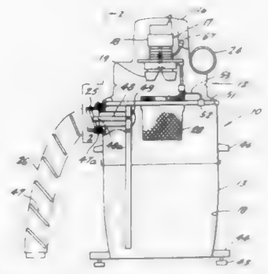
1. A truck mirror wiper for a truck having a side mirror to be wiped and a side window glass which may be raised and lowered and through which a driver looks to view the mirror, comprising
a mount to mount the truck mirror wiper to the window glass,
a bracket extending from said mount to the proximity of the mirror when said mount is mounted on the window glass, and
a wiper blade affixed to said bracket in contact with said mirror when said mount is mounted on the window glass,
whereby a driver may lower or raise the window glass, thereby causing said wiper blade to pass over the mirror to wipe it.

5,150,498
WIPER REFILL UNIT WITH IMPROVED CLIP
Cedric S. K. Charng, Taipei, Taiwan, assignor to China Wiper Special Rubber Co., Ltd., Taipei, Taiwan
Filed Dec. 17, 1990, Ser. No. 628,493
Int. Cl.[5] B60S *1/04, 1/38, 1/28*
U.S. Cl. 15—250.42 12 Claims



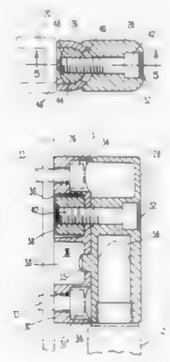
1. A wiper refill unit for removable attachment to a wiper blade superstructure having a set of claw members, the refill unit comprising:
an elongate flexible backing strip having
at least one slot means defining at least one elongate slot for receiving at least one elongate resilient wiping element;
an elongate side flange extending along each side of the backing strip, the two side flanges being intended in use to be slidably received and retained by the set of claw members of the wiper blade superstructure; and
an elongate central portion disposed between said side flanges and provided with a plurality of aperture means spaced apart in the elongate direction, said central portion including parts which surround each said aperture means; and
a clip having a body portion and a pair of spaced apart legs extending in opposed, spaced relationship to each other from said body portion, said legs being resiliently deflectable toward and away from each other and being positionable to overlie respective ones of said side flanges, each leg having latching means extending therefrom which project through a selected one of said aperture means, the latching means on each leg being positioned thereon in spaced relationship to the body portion whereby, when said legs are deflected toward each other, the latching means on each leg approaches the opposite leg, and said latching means having means respectively projecting outwardly beneath the central portion in opposite directions such that engagement of said outwardly projecting means with said central portion holds the clip in engagement with the backing strip unless the legs are squeezed toward each other to allow said outwardly projecting means to pass through said selected aperture means, whereby the clip can be detachably secured at a selected position on the backing strip, thereby enabling, when the set of claw members receive and retain the backing strip, releasable fastening of one of the claw members of the wiper superstructure to the clip to resist sliding of the backing strip relative to the set of claw members, and whereby the clip is prevented from accidental removal from the backing strip even when the backing strip is not secured to claw members of the wiper superstructure.

5,150,499
STATIC ELECTRIC DISCHARGE FOR DUST COLLECTOR
Robert C. Berfield, Jersey Shore, Pa., assignor to Shop Vac Corporation, Williamsport, Pa.
Filed Nov. 16, 1990, Ser. No. 614,711
Int. Cl.[5] H05F *3/02*
U.S. Cl. 15—327.1 17 Claims



1. A dust collector comprising:
a dust collecting tank having an internal chamber, an open top and an air inlet duct into the tank chamber;
a separable lid attached to the tank over the open top;
suction means, supported on the lid, responsive to electrical power for generating reduced air pressure within the chamber;
first electrical connecting means, including a grounding element, for connecting the suction means to a source of electric power including a source of ground potential;
an electrically non-conductive hose having an outlet end connecting to the air inlet duct and having an inlet end through which air may be drawn into the hose when reduced air pressure is generated within the chamber;
an electrically conductive element extending along and contacting the hose and providing a low resistance path to any electrostatic charge which may develop on the hose; and
second electrical connecting means for connecting the electrically conductive element to the ground element of the first electrical connecting means, the second electrical connecting means comprising a tank contact on the tank electrically connectable with the electrically conductive element, the tank contact including a first metallic strap at the inlet duct to the tank and a lid contact on the lip connected with the grounding element, and arranged for engaging the first metallic strap regardless of the orientation of the lid when the lid is on the tank to thereby assure electrical contact between the tank contact and the ground element

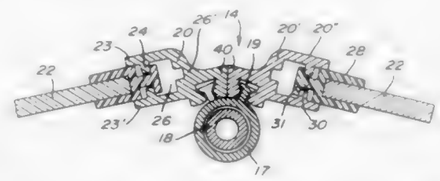
5,150,500
ADJUSTABLE LIFT-OFF HINGE
Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Jul. 11, 1991, Ser. No. 728,346
Int. Cl.[5] E05D *7/04*
U.S. Cl. 16—239 30 Claims



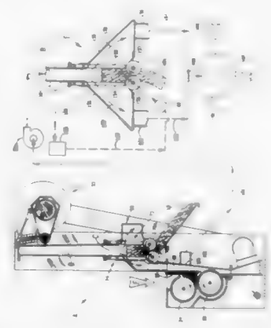
1. An adjustable lift-off hinge assembly comprising:
(a) a support member mounted onto a frame, said support member having a longitudinal axis, and further having at least one generally planar mounting surface;
(b) a knuckle assembly mounted onto a door comprising, in combination;
(i) a longitudinal adjustable knuckle member rotatably coupled to said support member along said longitudinal axis; and
(ii) a longitudinal fixed base member having at least one generally planar outer surface mounted onto said door, and further having a generally convex outer surface pivotally connected to a longitudinal side of said adjustable knuckle member;
(c) rotatable coupling means for rotatably coupling said support member to said knuckle assembly; and
(d) pivotal coupling means for pivotally coupling said convex outer surface of said fixed base member to said longitudinal side of said adjustable knuckle member.

5,150,501
HINGE CONNECTING POST FOR FOLDING CLOSURES
Jeffrey Pasternak, Pierre Fonds, Canada, assignor to Dynaflair Corporation Canada Inc., Point Claire, Canada
Filed Dec. 12, 1989, Ser. No. 448,967
Int. Cl.[5] E05D *7/12, 15/26*
U.S. Cl. 16—272 9 Claims

1. A folding closure displaceably supportable in an opening to secure said opening, said closure being comprised of a plurality of elongated vertical panels interconnected along their vertical edges by a hinge assembly to permit said panels to fold in an accordion fashion for storage and to extend in an undulating stretched manner to obstruct said opening, said hinge assembly having hinge attaching members to pivotally secure respective pairs of opposed panel connecting posts thereto, each said connecting post having detachable securement means for connection to said hinge attaching members, said connecting posts further having a connecting slot for securing panel elements thereto, the improvement comprising said connecting slot having an extension protective flange at least on an outer side portion of said connecting post to overlap and conceal an attachment member of a connector strip removably secured in said connecting slot, said connector strip being connected along a side edge of said vertical panels, said detachable securement means being a connection member formed integral with a bottom wall of said connecting slot and extending along the entire length of said connecting post, said connection member having a flat outer abutment face spaced from said bottom wall and a substantially transverse connecting face having an elongated slot therein.



5,150,502
TEXTILE FIBER LENGTH SORTING APPARATUS AND METHOD
James H. Roberson, 10 Ashwood Ave., Greenville, S.C. 29607
Continuation-in-part of Ser. No. 339,058, Apr. 14, 1989, Pat. No. 4,970,759. This application Nov. 19, 1990, Ser. No. 615,258
Int. Cl.[5] D01G *9/08, 15/40*
U.S. Cl. 19—105 61 Claims



1. Textile apparatus for forming a fibrous batt having a prescribed density profile and being comprised of sorted textile fibers, said apparatus comprising:
fiber supply means for supplying raw textile fibers;
a first air flow path;
fiber opening means receiving said raw textile fibers from said fiber supply means for loosening and separating said raw textile fibers to produce opened fibers and for introducing said opened fibers to said first air flow path;
air propelling means creating an air flow for transporting said opened fibers along said first air flow path;
first fiber extraction means associated with said first air flow path for extracting fibers having an average length greater than or equal to a preselected length from said air flow to produce useful long fibers and create a separated air flow containing useful short fibers having an average fiber

length less than said preselected length to continue along in said separated air flow;

fiber compacting means for compacting said useful long fibers into a compacted batt and discharging said compacted batt from said apparatus.

5,150,503

CONTINUOUS TENSIONING RING FOR MOUNTING CONVOLUTED BOOTS

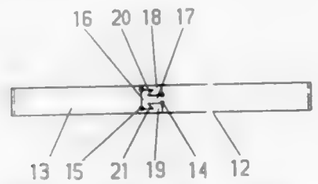
Karl-Heinz Müller, Wissen, Fed. Rep. of Germany, assignor to GKN Automotive AG, Siegburg, Fed. Rep. of Germany

Filed Jun. 19, 1991, Ser. No. 717,388

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1990, 4021746

Int. Cl.[5] F16B *2'08*

U.S. Cl. 24—20 EE **11 Claims**



1. A continuous tensioning ring for mounting convoluted boots, consisting of an annular member rolled from flat strip material so as to be round, with free ends of the strip being connected to each other in such a way that a first free end and a second free end of the strip are provided with connecting clips whose shapes are adapted to each other, and connected to each other in the strip plane so as to engage each other, comprising externally positioned connecting clips at the first free end and an internally positioned connecting clip at the second free end, said external clips, each having a claw with an engaging face in a plane at an acute angle with respect to a longitudinal axis of the strip, each embrace, and engage from behind, said internal clip having a pair of claws with engaging faces in a plane at an acute angle with respect to the strip longitudinal axis such that said internal clip claws engaging faces engage said external clip engaging faces such that the clips are aligned in such a way that when a tensile load is applied to the connection between the free ends inwardly directed forces act on the externally positioned connecting clips.

5,150,504

UNIVERSAL TETHER APPARATUS

Carl M. Cohen, Evanston, Ill., assignor to Sassy, Inc., Northbrook, Ill.

Filed May 6, 1991, Ser. No. 696,352

Int. Cl.[5] A44B *21/00*

U.S. Cl. 24—302 **20 Claims**

1. A universal tether apparatus for releasably attaching juvenile articles such as pacifiers, teething devices, rattles and toys, to the clothing worn by an infant, through releasable attachment means capable of alternatively restraining male post-type, and female loop-type, elements of said juvenile articles, said universal tether apparatus comprising:

apparatus body means having a front side, a back opposite said front side, and a peripheral edge,

said apparatus body means including said attachment means for removably attaching said apparatus body means to said clothing worn by an infant;

flexible connection means having a first end and a second end opposite said first end for operable deployment and securement between said apparatus body means and said juvenile articles; and

receiving means operably positioned on said apparatus body means for facilitating releasable affixation of at least one of said first and second ends of said flexible connection means to said receiving means,

said receiving means including post means having a top end and a bottom end opposite said top end wherein said top end projects outwardly from said apparatus body means, said top end and said bottom end forming therebetween a connection attachment region for alternatively restrainably affixing and releasing from affixation said at least one of said first and second ends of said flexible connection means,

at least said first end of said flexible connection means including post attachment means for said releasable affixation about the connection attachment region of said post means of said apparatus body means and, alternatively, releasably affixable to said male post-type element of said juvenile articles,

said second end of said flexible connection means including second attachment means for releasable affixation to said receiving means operably positioned on said apparatus body means and, alternatively, releasably affixable to said female loop-type element of said juvenile articles.

5,150,505

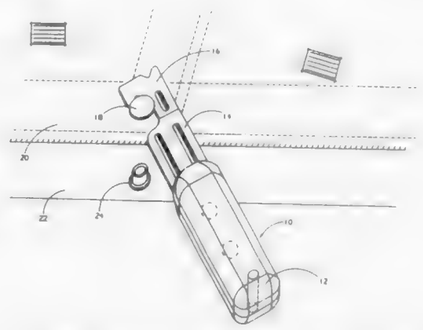
HAND TOOL FOR FASTENING SNAPS

David F. Drabek, 245 Seabury Rd., Bolingbrook, Ill. 60439

Filed Nov. 13, 1990, Ser. No. 612,888

Int. Cl.[5] B25B *27/14*

U.S. Cl. 29—278 **5 Claims**



1. A hand tool for facilitating the coupling of a male and female snap fastener member, wherein said female snap member is fixedly mounted on a substrate material, said hand tool comprising:

first means to engage in tension said female snap member attached to said substrate material,

said first means comprising a tension notch edge, said tension notch edge being capable of engaging in tension said female snap member attached to said substrate material,

second means to engage in compression said female member of a snap fastener attached to a substrate material,

said second means comprising a compression notch edge, said compression notch edge being capable of engaging in compression said female snap member attached to said substrate material, and

handle means,

said handle means comprising a textured thermoplastic resin material formed about said hand tool so as to allow the exertion of a tensile or compressive force through said first or second means engaging said female snap member attached to said substrate material;

said first and second means being adapted to selectively apply a bi-directional force exerted through said handle means to said female snap member within a plane substantially along the plane of the said substrate material, and

said first and second means engaging said female snap member attached to said substrate material such that tensile or compressive forces exerted through said first and second means creates substantially zero rotational moments about an axis located in the transverse plane of said substrate material.

5,150,506

METHOD OF ASSEMBLING EXTERIOR PARTS OF A MOTORCAR ONTO A MOTORCAR BODY

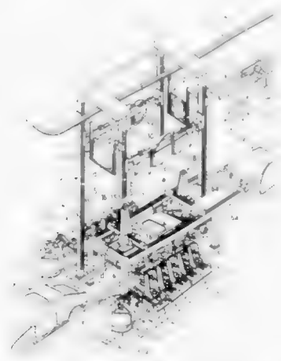
Katuo Kotake; Michihiro Kitahama; Keizaburo Otaki; Akira Miyazaki; Masayuki Abe; Shoji Okahara; Manabu Tuchida; Yukihiro Yaguchi; Hiroyuki Furuya, and Takeshi Nakamura, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 628,880

Claims priority, application Japan, Dec. 20, 1989, 1-328397; Feb. 22, 1990, 2-39753; Mar. 5, 1990, 2-51796; Mar. 15, 1990, 2-64771; Mar. 17, 1990, 2-67764; Mar. 26, 1990, 2-75932

Int. Cl.[5] B23Q *17/00*

U.S. Cl. 29—407 **5 Claims**



1. A method of assembling exterior parts of a motorcar onto a motorcar body comprising the steps of:

measuring assembling accuracy errors of a motorcar body by measuring positions of a plurality of reference points of said motorcar body;

calculating correction data relating to respective assembling positions of plural kinds of exterior parts which form an external shape of the motorcar, said calculation being performed on the basis of measured data obtained in the previous step, while maintaining a correlative relationship among said parts, to eliminate correlative misalignment among said parts due to said assembling accuracy errors of said motorcar body; and

assembling each of said parts by respective assembling robots to a respective assembling position which has been corrected in accordance with said calculated correction data.

5,150,507

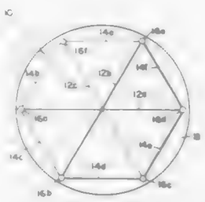
METHOD OF FABRICATING LIGHTWEIGHT HONEYCOMB STRUCTURES

Jitendra S. Goela, Andover; Michael Pickering, Dracut, and Raymond L. Taylor, Saugus, all of Mass., assignors to CVD Incorporated, Woburn, Mass.

Division of Ser. No. 389,248, Aug. 3, 1989, abandoned. This application Dec. 12, 1990, Ser. No. 626,608

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—460 **7 Claims**



1. A method of fabricating a lightweight structure from a plurality of ribs each of which have substantially the same height and thickness with the height and length greatly exceeding the thickness, with each of said ribs having a center, a first elongated edge and a second elongated edge, comprising the steps of:

(a) forming from a first set of said ribs, each of which are of substantially the same length, a hexagonal cell having a plurality of pairs of most widely spaced corners and a depth equal to the height of said ribs,

(b) forming slots in the center of first, second and third ones of a second set of said ribs which ribs are all of the same length and substantially equal to the distance between the most widely spaced corners of said hexagonal cell, with a first slot from the first elongated edge of a first one of said ribs, a second slot from the second elongated edge of said second one of said ribs, and third and fourth slots from the first elongated edge and the second elongated edge, respectively, of said third one of said ribs, with the lengths of said first and second slots being greater than half the height of said ribs and the lengths of said third and fourth slots being less than half the height of said ribs,

(c) interlocking said first, second and third ones of said second set of ribs at the centers thereof by bringing said first and second slots into cooperative relation with said third and fourth slots, respectively,

(d) positioning said interlocked first, second and third ones of said second set of ribs relatively to said hexagonal cell to connect the most widely spaced corners thereof thereby forming a structure core having six regions each of equilateral triangular cross section with each such region comprising a cell, and

(e) exposing the structure core to a vapor deposition process thereby depositing and coating thereon a stiffening and strengthening material thereby enclosing said structure core in a monolithic structure of such material.

5,150,508

HEMMING MACHINE AND METHOD

Lucen St. Denis, Windsor, Canada, assignor to E. R. St. Denis & Sons, Limited, Oldcastle, Canada

Filed Jun. 28, 1991, Ser. No. 723,383

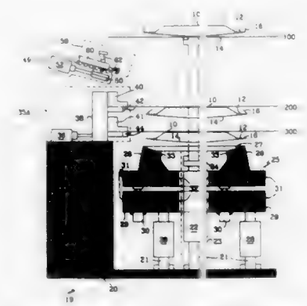
Int. Cl.[5] B21D *39/02;* **B23P** *11/00*

U.S. Cl. 29—463 **13 Claims**

1. A machine for forming a unitary structure from a first steel panel having an upturned flange and a second steel panel having a flat edge portion, comprising:

(a) a support surface unit including a support surface for receiving said first panel and said second panel in a superimposed relation with said edge portion of said second panel proximate to said flange of said first panel;

(b) a plurality of first flange engaging members having bevelled engaging surfaces, said first flange engaging members being located at a pre-hem position;
(c) a plurality of second flange engaging members having substantially right-angled engaging surfaces, said second flange engaging members being located at a final-hem position;
(d) means for moving said support surface unit to said pre-hem position such that said flange of said first panel is pressed against said bevelled engaging surfaces of said first



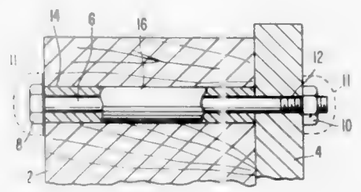
flange engaging members, wherein said flange of said first panel is bent by approximately 45° with respect to the plane of said first panel to form a pre-hemmed flange;
(e) means for moving said support surface to said final hem position such that said pre-hemmed flange is pressed against said substantially right-angled engaging surfaces of said second flange engaging members, wherein said pre-hemmed flange of said first panel is bent to fully clinch said edge portion of said second panel to form said unitary structure.

5,150,509

METHOD OF PRODUCING A STABILIZED BOLT JOINT BETWEEN A TIMBER ELEMENT AND ANOTHER CONSTRUCTION ELEMENT AND THE TIMBER CONSTRUCTION

Tom L. Wils, Fruens Böge, Denmark assignor to Kompan A/S, Denmark

Continuation of Ser. No. 672,564, Mar. 29, 1991, which is a continuation of Ser. No. 440,873, Nov. 24, 1989, abandoned, which is a continuation of Ser. No. 124,681, Nov. 23, 1987, abandoned, which is a continuation of Ser. No. 730,189, May 3, 1985, abandoned. This application Oct. 1, 1991, Ser. No. 769,224
Claims priority, application Denmark, May 3, 1984, 1293/84
Int. Cl.[5] B23P *11/02*; F16B *43/02*
U.S. Cl. 29—525.1 **20 Claims**



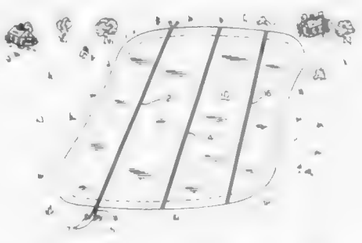
1. A method of joining a timber element with at least one construction element by a clamping bolt, each of said timber element and the at least one construction element having at least on through hole therein for accommodating the clamping bolt, a diameter of the through hole in the timber element is oversized relative to a diameter of the clamping bolt, the method comprising the steps of mounting a rigid inflexible lining bushing having two interconnected opposed end portions and formed of a hard and substantially non-shrinkable pressure-resistant material in the through hole in the timber element with a tight fit therein and with a length substantially corresponding to an axial length of the through hole in the timber element, joining the timber element and the at least one construction element together by a tightening of the clamping bolt projecting through the lining bushing such that opposed end portions of the rigid lining bushing are acted upon by a tightening pressure of said clamping bolt with the portion of the hard and substantially non-shrinkable pressure-resistance material of the rigid lining bushing interconnecting the end portions being substantially nondeformed by the tightening pressure of the clamping bolt so that the timber element and the at least one construction element, upon a shrinking of the at least one timber element are mutually held by engagement with the lining bushing.

5,150,510

METHOD OF MANUFACTURING LARGE SCALE MEMBRANES FOR COVERING EXTREMELY LARGE AREAS

Jack Moreland, Dolton, Ill., assignor to MPC Containment Systems, Ltd., Chicago, Ill.

Continuation of Ser. No. 886,917, Jul. 16, 1986, Pat. No. 4,987,657, which is a continuation of Ser. No. 523,657, Aug. 15, 1983, Pat. No. 4,641,400. This application Dec. 27, 1990, Ser. No. 634,418
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—525.1 **6 Claims**



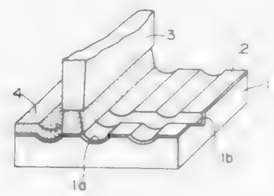
1. A two-step method of manufacturing large scale membranes for covering extremely large areas, the method comprises:
step one, in a factory:
(1) making a plurality of panels of industrial strength fabric which are shaped and proportioned to be fitted together to make said membrane;
(2) reinforcing the edges of said panels at least in the area where said panels confront each other when fitted together;
(3) forming a plurality of non-contiguous spaced apart areas in association with said reinforced edges, said spaced apart areas being at locations where said panels may be mechanically joined to each other;
(4) bonding a plastic slide closure means to each of said panels at a location which is parallel to said edges, said bonding to said panel enabling said slide closure to complete a waterproof surface between said panels and across said edges including said spaced apart areas;
(5) shipping said panels to an installation site;
step two, in the field at said installation site:
(6) laying out said panels in the form of said membrane;
(7) mechanically joining said panels to each other by adding mechanical couplings at each of said spaced apart areas; and
(8) closing said plastic slide closure means to form said waterproof surface across a seam in said membrane which is formed by said mechanical couplings.

5,150,511

METHOD FOR MANUFACTURING A MAGNETIC TRANSDUCER HEAD

Katsumi Sakata; Tatsuo Kumura; Atsushi Suzuki; Yoshito Ikeda; Kaoru Aoki; Naoto Kojima, all of Miyagi, and Akio Mishima, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,388
Claims priority, application Japan, May 31, 1990, 2-143093
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **18 Claims**



1. A method for manufacturing a magnetic transducer head, comprising the steps of:
providing a pair of magnetic core members shaped to provide a magnetic gap extending up to a tape running surface of the head when they are bonded together, said magnetic gap having a width corresponding to a recording track width on a travelling magnetic recording medium, said width being smaller than a thickness of said core members;
providing in each magnetic core member a groove at each opposite end of the magnetic gap so as to define said width of the magnetic gap corresponding to said recording track width, said grooves running towards and terminating at said running surface of the head;
blowing with air pressure nonmagnetic powder material into said grooves such that the powder material creates a deposition which fills said grooves but not said gap;
removing excess nonmagnetic powder alongside said grooves so that substantially no nonmagnetic powder is present in said gap; and
bonding the core members together in a relatively low temperature process which does not substantially affect magnetic characteristics of the core members.

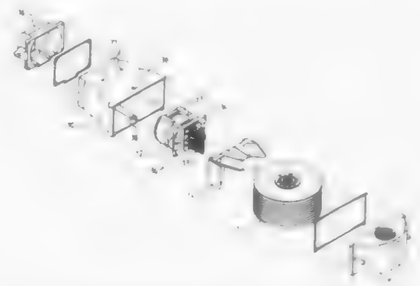
5,150,512

METHOD OF ASSEMBLING A DISK FILE

Michael R. Hatchett, Chandlers Ford; Anthony R. Hearn, South Wonston, and Charles M. Lacey, Emsworth, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/GB89/00267, § 371 Date Nov. 13, 1990, § 102(e) Date Nov. 13, 1990, PCT Pub. No. WO90/10934, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 15, 1989, Ser. No. 602,241
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **7 Claims**

1. A method of assembling a disk file in which information is recorded on and read from a stack of disks (11) during rotation thereof by means of air bearing magnetic heads (27) supported on resilient suspensions (28) in a head arm stack (13) and positionable over selected tracks of the disks by means of an actuator mechanism on which the head arm stack is mounted to form an actuator assembly (12), both disk stack and actuator assembly being mounted on a common base (10),
the method comprising the steps of:
pre-assembling such a disk stack assembly and such an actuator assembly;
temporarily collapsing the head suspensions (28) of the actuator assembly;
temporarily supporting the pre-assembled actuator assembly and disk stack assembly for relative movement towards each other;
measuring and adjusting the relative position of the actuator assembly and the disk stack assembly in a direction parallel to the disk axis of rotation so that the collapsed heads are aligned with the spaces between the disks;
merging the actuator assembly with the disk stack by relative movement so that said heads enter the spaces between the disks;
releasing the heads to contact the disk surfaces;
registering the common base with the merged disk stack and actuator assembly in the position it will adopt in the finished product; and
fastening the common base, actuator assembly and disk stack assembly together.

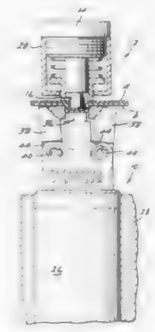


5,150,513

APPARATUS FOR JOINING SHEET MATERIAL

Edwin G. Sawdon, St. Clair, Mich., assignor to BTM Corporation, Marysville, Mich.

Division of Ser. No. 468,579, Jan. 23, 1990, Pat. No. 5,027,503, which is a division of Ser. No. 175,941, Mar. 31, 1988, Pat. No. 4,910,853, which is a division of Ser. No. 853,130, Apr. 17, 1986, Pat. No. 4,757,609, which is a continuation-in-part of Ser. No. 607,948, May 7, 1984, abandoned, which is a division of Ser. No. 495,440, May 17, 1983, Pat. No. 4,459,735, which is a continuation of Ser. No. 184,951, Sep. 8, 1980, abandoned. This application May 1, 1991, Ser. No. 694,141
The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.
Int. Cl.[5] B23Q *1/00*
U.S. Cl. 29—798 **1 Claim**



1. An apparatus for joining sheet material, comprising:
punch means;
a number of die portions defining an opening in said apparatus for receiving said punch means, said punch means and said die portions being movable relative to one another in a generally longitudinal direction;

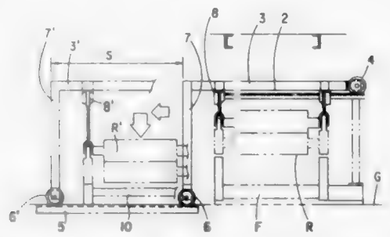
fixed anvil means located in said opening;
die movement means providing for movement of said die portions away from one another in response to said punch means compressing the sheet material against said anvil means and causing the sheet material to deform generally laterally outwardly in said opening;
die engagement portions longitudinally fixed relative to said fixed anvil means on said apparatus for longitudinally supporting said die portions in slidable engagement with said die engagement portions during said movement of said die portions away from one another; and
biasing means for resiliently urging said die portions in a generally outward lateral direction in order to resiliently bias said die portions generally toward one another.

5,150,514

CORRUGATING ROLL UNIT EXCHANGING APPARATUS FOR A SINGLE FACER

Yukuharu Seki; Hiroaki Sasashige, and Haruo Ohkawa, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 643,299
Claims priority, application Japan, Jan. 22, 1990, 2-3864
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—824 **9 Claims**



1. A corrugating roll unit exchanging apparatus for exchanging a corrugating roll unit in a single facer in a corrugating machine, wherein the corrugating roll unit includes at least one corrugating roll having a longitudinal axis, said exchange apparatus comprising:
(a) guide rail means disposed horizontally above said single facer and extending in a direction substantially parallel to said longitudinal axis of said corrugating roll;
(b) a beam means having at least a first end and a second end, said first end being supported along said guide rail means, said second end being supported by a support means, said support means and said beam means being horizontally movable in a direction substantially parallel to the longitudinal axis of said corrugating roll; and
(c) suspension means mounted to said beam means for suspending said corrugating roll unit.

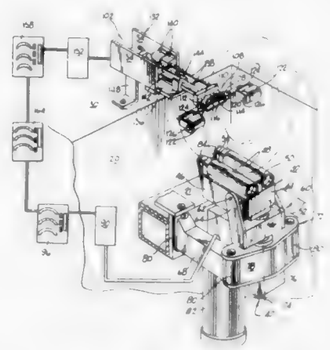
5,150,515

KINETIC WHEEL ALIGNMENT SYSTEM AND METHOD

M. Stanley Merrill, Denver, and Thomas B. Chapin, Lakewood, both of Colo., assignors to Merilla, Inc., Englewood, Colo.

Filed Mar. 12, 1991, Ser. No. 667,980
Int. Cl.[5] G01B *7/3 5, 5/255*
U.S. Cl. 33—203.12 **8 Claims**

5. A method for auditing the tires of a vehicle, comprising the steps of:
(a) positioning a wheeled vehicle on a vehicle wheel alignment system having a first aligning means including means for measuring at least the toe angle of the wheels with reference to the sidewall of the tires of the wheels for aligning said wheels, and said wheel alignment system having a second aligning means including means for measuring at least the toe angle of the wheels with reference to the tread of the tires of the wheels for aligning said wheels;
(b) obtaining measurements from each of the first aligning means and the second aligning means; and



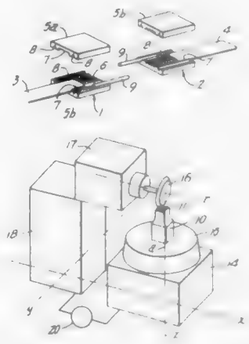
(c) obtaining a number which is the difference between said measurements, said number being used for auditing the tires.

5,150,516

PROCESS FOR MAKING DETACHABLE CONNECTING MEANS FOR RIBBON OPTICAL FIBER CABLES AND THE CONNECTING MEANS OBTAINED THEREBY

Paolo Boero, Milan, and Bruno Bortolin, Cinisello Balsamo, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 555,907, Jul. 20, 1990, Pat. No. 5,037,179. This application Sep. 11, 1990, Ser. No. 580,590
Claims priority, application Italy, Sep. 28, 1989, 21866 A/89
Int. Cl.[5] H01R *43/00;* **B21D** *35/00*
U.S. Cl. 29—877 **7 Claims**



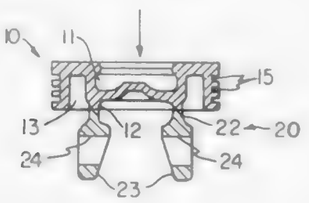
1. A process for making a connector for connecting optical fibers of a ribbon cable having a number of longitudinally extending, parallel optical fibers greater than one therein to optical fibers of a like cable, said connector being interchangeable with and connectible to another like connector and having a pair of opposed metal plates, at least one of said plates having a face facing a face of the other of said plates and having a plurality of parallel grooves therein at least equal in number to the number of optical fibers to be interconnected, said process comprising:
providing a punch body with a punch face having a plurality of parallel ridges which are dihedral in cross-section and which correspond to said grooves, said punch body having a longitudinal axis perpendicular to said punch face and said ridges being symmetrically disposed with respect to a plane co-incident with said longitudinal axis, said ridges being formed, at least in part, by grinding said punch face in successive passes with relative movement of a grinding means and said punch face parallel to said ridges and intermediate one or more passes by rotating said punch face around said longitudinal axis; and
forming said grooves in at least said one of said plates by pressing said punch face against said face of said one plate and causing plastic flow of the metal of said one plate corresponding to said grooves;
whereby said grooves formed in said metal plates correspond to said ridges of said punch face.

5,150,517

METHOD OF MANUFACTURING A PISTON

Jose M. Martins Leites; Jose A. Cardosomendes; Andre Lippai, all of Sao Paulo, and Paulo T. Dellanoce, Sao Caetano Do Sul, all of Brazil, assignors to Metal Leve S/A Industria E Comercio, Sao Paulo, Brazil

Filed Apr. 16, 1991, Ser. No. 687,468
Claims priority, application Brazil, Apr. 17, 1990, PI 9001859
Int. Cl.[5] B23P *15/10*
U.S. Cl. 29—888.04 **5 Claims**



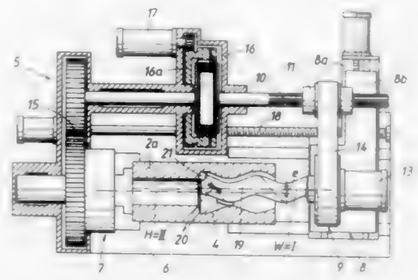
1. Method of manufacture of a piston of the articulated type, comprising a head with a top portion and a pin boss portion with at least one pin boss and a skirt independent from the said head and mounted on the at least one pin boss by means of a wrist pin bearing in a hole provided on the at least one pin boss, wherein the head is made in accordance with the following steps:
a. subjecting a first metal blank having a substantially cylindrical cross section to machining operations to define an upper combustion bowl, a lower circumferential groove and a lower central recess;
b. subjecting a second metal blank to machining operations to define a circumferential central recess on one of the ends of said blank and narrowing the cross section of said blank around said circumferential central recess thereby defining a collar;
c. bringing the top face of collar in facing relationship with the lower end of the inner wall of said circumferential groove and joining the first and second metal blanks together to form the head;
d. subjecting the head to final machining operations to define ring grooves, the at least one pin boss portion and the holes for the pin boss portion.

5,150,518

PROCESS FOR MANUFACTURING INNER AND OUTER PARTS FOR A ROTARY PISTON MACHINEIN WHICH THE INNER AND OUTER PARTS HAVE PARALLEL AXES

Erwin Fuchs, Altmünster, Austria, assignor to Weingärtner Maschinenbau Gesellschaft m.b.H., Kirchham, Austria

Filed Mar. 22, 1991, Ser. No. 673,956
Claims priority, application Austria, Mar. 29, 1990, 728/90
Int. Cl.[5] B23P *15/10*
U.S. Cl. 29—888.04 **2 Claims**



1. A process for manufacturing inner and outer parts of a rotary piston machine, the inner and outer parts having respective axes extending parallel to, and spaced apart from each other, and having respective outer and inner interengaging helical surfaces, the surfaces having convolutions differing in number by one, and the parts being operable to rotate and to revolve eccentrically about the axes thereof relative to each other in a basic operating movement, which process comprises machining the interengaging surface of either the inner or the outer part with a cutting tool rotating about an axis extending parallel to the axis of the part, the cutting tool having cutting teeth at an end face thereof and on a peripheral surface thereof, and the cutting teeth on the peripheral surface being arranged to conform in shape to the surface of the part, the machining being effected by a compound movement of the tool and the part relative to each other, the compound movement being composed of a movement simulating the basic operating movement of the part and a superposed movement of the cutting teeth on the surface of the part along a helical path simulating the shape of the helical surface.

5,150,519

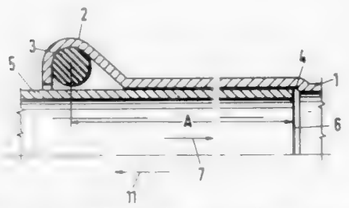
METHOD FOR PRODUCING A LOCKED, TIGHT PIPE-CONNECTION

Heinz Unewisse, Mülheim, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 12, 1991, Ser. No. 685,401
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4012504
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—890.14 **11 Claims**

1. A process for making a permanent, tight pipe joint between a pipe end and a press fitting surrounding the pipe, the press fitting having a stop on the inside at some distance from an open end for receiving the pipe, said process comprising the steps of:
providing relative movement between the pipe and the press fitting to axially engage the pipe with the press fitting;
disposing a pressing tool around the press fitting, the pressing tool for pressing the press fitting and the pipe together to form a joint;
applying an axial force between the pipe and the press fitting, said axial force being in the engagement direction of the pipe and the press fitting;
preventing the pressing action of the pressing tool for the

pressing of the press fitting until there is a substantial increase in said axial force, being applied between the pipe and the press fitting, to a value greater than a first force; and



releasing the pressing action of the pressing tool for the pressing of the press fitting when said axial force being applied between the pipe and the fitting assumes a value greater than said first force.

5,150,520

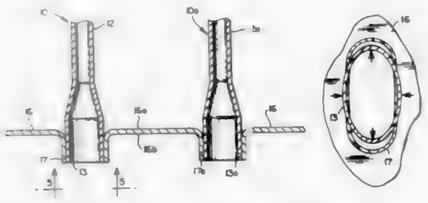
HEAT EXCHANGER AND METHOD OF ASSEMBLY THEREOF

Joseph F. DeRisi, Hamden, Conn.; assignor to The Allen Group Inc., New Haven, Conn.

Continuation-in-part of Ser. No. 450,677, Dec. 14, 1989, abandoned. This application Feb. 11, 1991, Ser. No. 657,422

Int. Cl.[5] B21D *39/06*; B23K *31/02*

U.S. Cl. 29—890.013 7 Claims



1. A method of securing a plurality of oval tubes to a plurality of oval openings in the wall of a header in a heat exchanger comprising the steps of:

(a) sizing the ends of said oval tubes or header openings such that the minor diameter of the tube ends is greater than the minor diameter of the header openings and the major diameter of the tube ends is less than the major diameter of the header openings, the circumference of said tube ends and said header openings being substantially equal;

(b) inserting said tube ends into corresponding openings in said header wall whereupon the minor diameter of said tube ends is reduced and the major diameter of said tube ends is increased to create a substantially fully contacting fit around the circumference with said header openings; and

(c) bonding said tube ends to corresponding openings in said header wall to form a plurality of bonded tube-to-header joints.

5,150,521

NAIL COLLECTION BOX FOR A NAIL CLIPPER

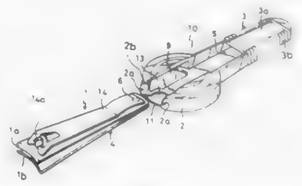
Kyung Soo Han, Seoul, Rep. of Korea, assignor to Chi K. Chang, Houston, Tex.

Filed Feb. 12, 1992, Ser. No. 834,349

Claims priority, application Rep. of Korea, Feb. 12, 1991, 2133/1991[U]

Int. Cl.[5] A45D *29/00, 29.18*

U.S. Cl. 30—28 6 Claims



1. A nail collection box assembled or disassembled with nail clipper comprising:

a nail collecting portion having a cylindrical configuration, said nail collection box including a front opening, at least one bottom opening, and a pair of slits formed in a pair of side walls of said front opening in line with a gap between upper and lower cutting jaws of said nail clipper,

a handle portion extending said collecting portion, said handle portion including a hollow interior space for conforming to the exterior configuration of a body of said nail clipper so as to receive said body and an engaging protrusion disposed at the rear end of the bottom surface thereof for being adapted to engage with a locking hole disposed at the rear end of an outer cutting jaw member of said body of the nail clipper, and

a separate concave collector for easily engaging with and disengaging from said collecting portion.

5,150,522

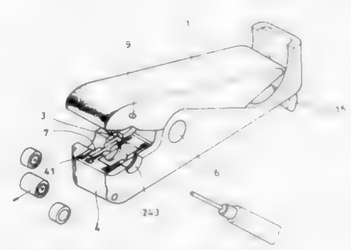
COAXIAL CABLE STRIPPER WITH MEANS TO REMOVE INSULATOR CHIPS

Liaw Gwo-Jiang, No. 44, Chung Cheng Rd.,, Hsin Chuang City, Taiwan

Filed Dec. 3, 1991, Ser. No. 801,225

Int. Cl.[5] H02G *1/12*

U.S. Cl. 30—91.2 2 Claims



1. A coaxial cable stripper comprising:

a pressure bar, said pressure bar comprising two vertical side walls at two opposite sides, a receiving chamber at one end, and a curved tail at an opposite end, the two vertical side walls of said pressure bar each having an axle hole aligned with each other and a curved edge at a suitable location, the receiving chamber of said pressure bar having two recessed portions and two axle holes at two opposite sides;

a base pivoted to said pressure bar, said base comprising two vertical side walls at two opposite sides, a second receiving chamber at one end, and an opening at an opposite end, the two vertical side walls of said base each having an axle hole aligned with each other, the receiving chamber of said base having two opposite grooves at two opposite sides, a gap at the front, two opposite axle holes aligned at two opposite sides, and two opposite curved notches on the two opposite top edges thereof;

a crank holder fastened in the receiving chamber of said pressure bar, said crank holder comprising two opposite flanges at two opposite sides respectively retained in said recessed portions, a crank at one end, an axle hole longitudinally aligned with the two axle holes on the receiving chamber of said pressure bar;

a cutter holder fastened in the receiving chamber of said base, said cutter holder having a plurality of slots, a plurality of cutters fastened in said slots, said cutters each having a notch on the cutting edge thereof, a recessed hole at the middle for moving said crank, a bottom flange engaged into said gap, an axle hole through said bottom flange aligned with the two opposite axle holes on the receiving chamber of said base and locked in place by a lock pin, and two side rails at two opposite sides respectively engaged in the two opposite grooves in the receiving chamber of said base; and

a spring retained between said pressure bar and said base, said spring having two opposite loops at the middle secured to the axle holes on the two vertical side walls of said pressure bar and the axle holes on the two vertical side walls of said base by a lock pin.

5,150,523

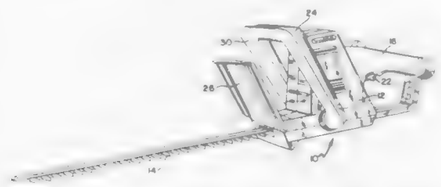
DEADMAN SWITCH ARRANGEMENT FOR A HEDGE TRIMMER

Ronald C. McCurry, West Union, S.C., assignor to Ryobi Motor Products Corporation, Easley, S.C.

Filed Jul. 11, 1991, Ser. No. 728,374

Int. Cl.[5] B26B *15/00*; B27B *17/00, 17/02*

U.S. Cl. 30—228 4 Claims



1. In a hedge trimmer having a housing, a motor supported within said housing, a cutting blade extending forwardly from said housing and driven by said motor, a main handle secured to said housing and extending rearwardly therefrom, a primary power switch having an actuator supported in proximity to said main handle and in circuit with said motor for selectively controlling the application of power thereto, and an auxiliary bailtype handle supported on said housing between said main handle and said cutting blade, a deadman switch arrangement comprising:

normally open secondary switch means in circuit with said primary power switch for preventing power from being supplied to said motor when said secondary switch means is open, said secondary switch means having an actuator pin yieldably biased in a first direction to allow said secondary switch means to remain open, movement of said actuator pin in a direction opposite said first direction causing said secondary switch means to close;

means for supporting said secondary switch means in said housing with said actuator pin extending through an opening in said housing;

a cover member mounted for pivoting movement on said auxiliary handle within an angular range between a first position where said cover member closely overlies said auxiliary handle and a second position where said cover member is angularly spaced from said auxiliary handle;

means for yieldably biasing said cover member toward said second position; and

actuating means mounted on said cover member for engaging said secondary switch means actuating pin and moving said secondary switch means actuating pin in said opposite direction to close said secondary switch means as said cover member is moved from said second position toward said first position.

5,150,524

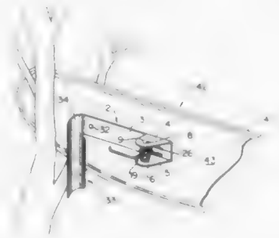
BRUSH DEFLECTOR ATTACHMENT FOR CHAIN SAW

James A. Hall, 6197 W. Wagstaff Rd., Paradise, Calif. 95969

Filed Aug. 12, 1991, Ser. No. 743,610

Int. Cl.[5] B23D *59/00*; B27B *17/00*

U.S. Cl. 30—382 12 Claims



1. A safety attachment for a chain saw having a chain guide in the form of an elongated metal plate extending from a chain saw housing longitudinally along a longitudinal axis to support the upper and lower reaches of a chain, said safety attachment prevents the lower reach of the chain from whipping small diameter flexible branches sought to be cut toward an operator, comprising:

a) a base member detachably latchable to the chain guide adjacent the end thereof remote from the housing and latchable against movement relative to the chain guide when the chain saw is in use;

b) means on the base member manipulable to selectively latch or unlatch the base member from the chain guide; and

c) deflector means mounted on the base member and adapted to project from the base member perpendicularly to the longitudinal axis and spaced rearwardly of the chain guide end remote from the housing and below the lower reach of the chain when the chain saw is in use with the safety attachment latched thereon whereby small diameter flexible branches impelled rearwardly toward an operator by the lower reach of the chain impinge upon the deflector means and are stopped from striking an operator.

5,150,525

DRAWING DEVICE FOR USE IN DRAFTING MACHINE

Kenichiro Iai, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 672,574

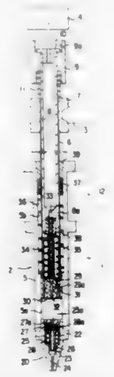
Claims priority, application Japan, Mar. 20, 1990, 2-27625

Int. Cl.[5] B43L *13/00*

U.S. Cl. 33—18.1 2 Claims

1. A drawing device for use in a drafting machine including one length of long casing fixedly secured to a base serving as a holder, said casing having a leading end and a rear end; a lead guide fixedly secured to the leading end of the casing; one length of long pipe member inserted into said casing from said rear end of said casing in such a manner as to be axially slidably moved freely; a chuck ring fixedly secured to the interior of a

leading end portion of the pipe member; a sleeve fitted closely over and fixedly secured to the outer peripheral surface of an end side portion of said pipe member, said sleeve being connected to a driving arrangement; one length of a lead stock having a leading end inserted into said pipe member in such a manner as to be slidably moved freely and in opposed relationship to a rear end of said chuck ring said lead stock having a centrally and axially extending lead insertion hole formed in a leading end side thereof, and also a lead stock space formed therein so as to extend axially from the lead insertion hole to a rear end side of said casing; a lead chuck fixedly secured to the leading end of said lead stock in such a manner that a leading end side portion of said lead chuck may be radially deformed or expanded and contracted in cooperation with said chuck ring, said lead chuck having a centrally extending lead insertion hole formed therein and in aligned relationship with the lead insertion hole in the lead stock; a compression coiled spring mounted between said chuck ring and said lead stock so as to bias normally said lead stock and said lead chuck, toward the rear end of said casing, in a longitudinal direction relative to said pipe member and said chuck ring; and means for radially deforming or contacting the lead chuck to enable the lead stock to hold a lead firmly when said lead chuck is biased by resilient force of the coiled spring a regulating piece fitted over a rear end of said lead stock in such a manner as to be slidably moved freely by a predetermined stroke, an auxiliary compression coiled spring mounted between said regulating piece and said sleeve so as to normally bias the regulating piece towards the rear end of said lead stock, and a knocker provided movably up and down above said regulating piece so as to move said regulating piece down.



5,150,526

Patent Not Issued For This Number

5,150,527

GUN SIGHTING ARBOR

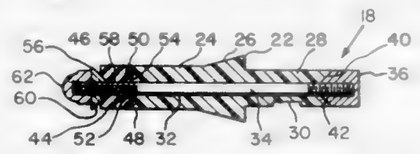
Richard G. Knoster, R.D. 2, Box 211, New Paris, Pa. 15554

Filed May 21, 1991, Ser. No. 703,373
Int. Cl.[5] F41G *1/54*
U.S. Cl. 33—234 15 Claims

1. An arbor for securing a sighting device to a firearm having a barrel with a muzzle, said arbor comprising:

A body having a front portion, a conical intermediate portion, rear portion and an axial throughbore;

a shaft having a first end and a second end journaled in said throughbore and having a threaded portion at each end;



a knob threaded on said first end of said shaft adjacent said rear portion of said body;

a resilient plug slideably carried on said shaft adjacent said front portion of said body, said plug having a radially expandable rim on an end opposite said front portion;

a recessed plug seat formed in the front portion of said body for receiving said plug;

a travelling spreader disk carried on the threaded portion of said shaft adjacent said plug;

an end nut threaded on said second end of said shaft; and

means on said rear portion of said body for securing a sighting device to said arbor;

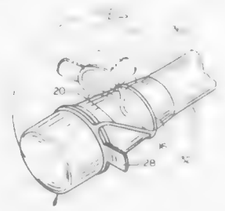
wherein said plug and said front portion are received by the barrel, said conical portion engages the muzzle, and said knob may be rotated to draw said spreader disk toward said body to expand said plug and secure said arbor concentrically within the barrel.

5,150,528

SCOPE COVER

Michael H. Shire, Belgrade, Mont., assignor to Quake Industries, Inc., Belgrade, Mont.

Filed Mar. 25, 1991, Ser. No. 675,530
Int. Cl.[5] G02B *23/16*; F41A *35/02*
U.S. Cl. 33—244 2 Claims



1. A scope cover for a scope having opposite ends comprising,

a resilient attachment ring;

a pair of spaced-apart, resilient attachment bands extending from said ring in substantially the same plane as said ring,

a resilient, cup-shaped cover means having an inner open-end and outer end,

said bands being secured to the inner end of said cover means,

said ring having sufficient resiliency to permit it to be stretched and positioned around one end of the scope,

said cover means having sufficient resiliency to permit it to be stretched and positioned over said one end of the scope,

said bands of such a length and resiliency and located to permit said cover means to be stretched and moved away from said attachment ring so that said cover means may be positioned on top of the scope and in engagement therewith adjacent to said one end,

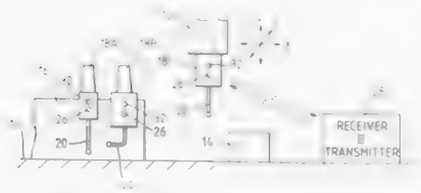
said bands extending downwardly from said ring, when said ring is mounted on the scope, and are bent upwardly from the ring when the cover means is placed in an inoperative position on top of the scope.

5,150,529

SIGNAL TRANSMISSION SYSTEM FOR MACHINE TOOLS, INSPECTION MACHINES, AND THE LIKE

David Collingwood, Kings Stanley, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom

Filed Apr. 7, 1989, Ser. No. 334,536
Claims priority, application United Kingdom, Apr. 12, 1988, 8808611; Apr. 12, 1988, 8808612
Int. Cl.[5] G01B *5/03*; G08C *19/26*
U.S. Cl. 33—503 9 Claims



1. A machine tool signal transmission system comprising:

a plurality of battery-powered wireless sensor signal transmitting means, each having receiving means for receiving a given switch-on signal and means for switching on the battery power upon receipt of that given switch-on signal, and

means remote from the sensor signal transmitting means for generating and transmitting a plurality of given switch-on signals, one given switch-on signal for each sensor signal transmitting means, each given switch-on signal having a unique characteristic for each sensor signal transmitting means,

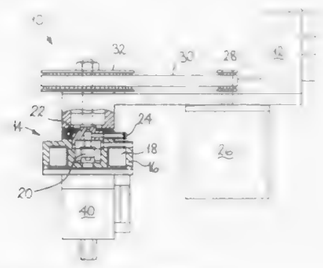
said receiving means on each sensor signal transmitting means having means responsive to the unique characteristic of the given switch-on signal associated with that sensor signal transmitting means for switching on the battery power in response thereto, but not reacting to other given switch-on signals for other sensor signal transmitting means in said plurality of sensor signal transmitting means.

5,150,530

TOOL EXCHANGE SYSTEM FOR HYBRID DIE BONDER

Karl Schweitzer, Mitte, and Gerhard Zeindl, Munster, both of Austria, assignors to Emhart, Inc., Newark, Del.

Filed Feb. 27, 1991, Ser. No. 661,888
Claims priority, application United Kingdom, Mar. 16, 1990, 9006037
Int. Cl.[5] B23B *49/00*
U.S. Cl. 33—626 4 Claims



1. A hybrid die bonder comprising

a tool bank supporting a plurality of tool holders each including a tool defining a pick up axis and a magnetic body,

a pick up head adapted to sequentially pick up said tool holders,

said pick up head including magnetisable means so that a tool holder can be secured thereto,

means for aligning said axis and preventing relative rotation about said axis when a tool holder is magnetically secured to said pick up head, and

means for rotating said pick up head.

5,150,531

SLUDGE DRYING APPARATUS AND METHOD

William J. Meglio, Monroeville, Pa., assignor to Keystone Rustproofing, Inc., Arnold, Pa.

Filed Jun. 5, 1991, Ser. No. 710,540
Int. Cl.[5] F26B *3/22*
U.S. Cl. 34—11 11 Claims

8. A method for drying industrial and other sludge comprising the steps of:

loading a mass of industrial and other sludge into a sludge drying box;

mixing said industrial and other sludge in said sludge drying box by rotation of a mixing shaft attached laterally within a mixing tub for rotary motion of said industrial and other sludge wherein said mixing shaft has a plurality of mixing forks fastened perpendicular and axially to said mixing shaft, said mixing forks being interspersed with a plurality of stationary mixing pins fastened vertically at a lowermost point of a bottom surface area of said mixing tub;

simultaneously with said mixing of industrial and other sludge heating said industrial and other sludge over a timed period until said industrial and other sludge reaches dehydrated and compact status;

disposing said industrial and other sludge by lifting said sludge drying box vertically and releasing said mixing tub for pivoting to a disposing position by gravitational force for unloading said industrial and other sludge.

5,150,532

LID MEMBER HAVING A FILTER MEDIUM FOR A SPIN DRYER

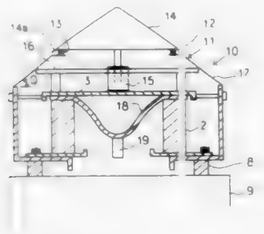
Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Oct. 2, 1991, Ser. No. 769,796
Claims priority, application Japan, Oct. 4, 1990, 2-104050[U]
Int. Cl.[5] F26B *17/24*
U.S. Cl. 34—58 3 Claims

1. A lid member having a filter medium therein mounted on a spin dryer body for filtering air drawn into the spin dryer body, wherein the lid member comprises:

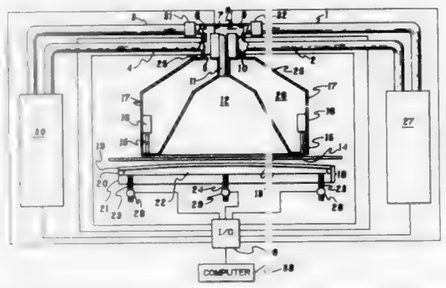
a top convex surface having an upper portion and a lower portion, wherein said upper portion is vertically movable between a closed position and an open position, and wherein a gap through which air can be introduced is

formed between said upper portion and said lower portion when said upper portion is in the open position; and



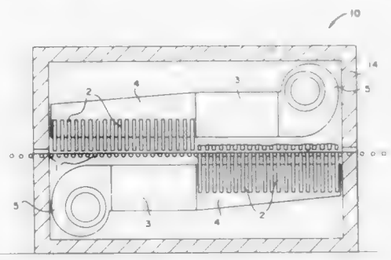
actuator means for activating said upper portion so as to open and close said gap.

5,150,533
SINGLE UNIT APPARATUS FOR CHILLING, DRYING AND INCUBATING PHOTOGRAPHIC EMULSIONS
Duane J. Farling, Webster, and Gary A. Smith, Greece, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 22, 1992, Ser. No. 823,919
Int. Cl.[5] F26B *13/00*
U.S. Cl. 34—62 5 Claims



1. An apparatus for curing photographic emulsions comprising:
(a) a single chamber having walls and a top integral therewith, a floor discontinuous with at least two of said walls; said chamber having provision for the ingress and egress of an airflow;
(b) said floor being in the form of a platen disposed so as to provide a channel for a photographic emulsion-coated web interposed between said platen and said chamber walls;
(c) means for heating and cooling said platen;
(d) means for urging said photographic emulsion-coated web into substantially uniform contact with said platen;
(e) means for delivering air of predetermined temperature, humidity and flow rate into said chamber; and
(f) control means for regulating the temperature of said platen, and for regulating the delivery of said air of predetermined temperature, humidity and flow rate.

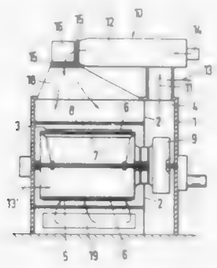
5,150,534
APPARATUS FOR THE BILATERAL BLOWING ONTO A WEB-LIKE OR SHEET-LIKE MATERIAL
Carl Kramer, Aachen, Fed. Rep. of Germany, assignor to WSP Ingenieurgesellschaft fur Warmetechnik, Stromungstechnik und Prozesstechnik mit beschrankter Haftung, Aachen, Fed. Rep. of Germany
Filed Mar. 19, 1991, Ser. No. 671,241
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1990, 4010280
Int. Cl.[5] F26B *13/00*
U.S. Cl. 34—155 11 Claims



1. An apparatus for the bilateral blowing of a treatment gas onto a sheet material moving in a substantially linear direction through a treatment chamber, comprising:
a treatment space for the sheet material comprising a unit length of said treatment chamber;
a plurality of nozzle ribs arranged on both sides of the sheet material in the treatment space for introducing the treatment gas into the treatment space, said nozzle ribs being parallel to a plane of the sheet material and normal to the direction of movement of the sheet material; and
radial fans arranged on both sides of the sheet material in a space adjacent each edge of the sheet material in the treatment space for generating a stream of treatment gas supplied to said nozzle ribs at one edge of the sheet material in the treatment space and for recirculating the treatment gas from the treatment space adjacent the opposite edge of the sheet material, each of said radial fans comprising a radial fan installed in a 360° spiral housing with the axis of rotation of said fan parallel to the sheet material and perpendicular to the direction of movement of said sheet material, two radial fans on each side of the sheet material are arranged point-symmetrically at 180° relative to a reference line traversing the sheet material at the center of said treatment space and each radial fan blows into a blow-out duct extending longitudinally at one side of the treatment space adjacent one edge of the sheet material, each blow-out duct includes a first region of substantially constant cross-section and a distributor piece downstream of said first region, and said plurality of nozzle ribs are attached in fluid communication with one of said distribution pieces.

5,150,535
AIR MIXER APPARATUS
Gerold Fleissneer, Aspermontstr. 28, Chur CH-7000, Switzerland
Filed Oct. 1, 1990, Ser. No. 591,366
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932837
Int. Cl.[5] F26B *13/00*
U.S. Cl. 34—155 12 Claims

1. An apparatus comprising an air mixer arranged in the flow direction of an at least partially heated air stream within an air flow duct in front of a heat chamber, for drying lengths of textile material, and provided for mixing air strata of differing temperatures present in the air stream, said air mixer comprising a plurality of air deflection and turbulence generating sections arranged in series in the flow duct, characterized in



that in each section several mutually parallel-arranged air deflecting plates are arranged to extend over the entire cross section of the flow duct.

5,150,536
WINTER WEATHER FOOTWEAR ARTICLE
Molly Strong, 205 South Ferndale Dr., Big Fork, Mont. 59911
Filed Jan. 9, 1990, Ser. No. 462,637
Int. Cl.[5] A43B *3/16*
U.S. Cl. 36—7.10 R 18 Claims

1. A winter weather footwear article comprising a single sole piece, an over-sized insole and means for removably securing and, optionally, adjustable tightening said article to the wearer, wherein said single sole piece consists of a layer of synthetic felt material woven by a needle punch technique, which is porous, breathable and pliable, and wherein said single sole piece covers the entire bottom surface of said footwear article and wherein said over-sized insole comprises at least one layer of closed-cell foam material which has an indented portion on the top of the insole roughly in the shape of the bottom of the shoe or boot over which the footwear article is worn, which has a flat heel, and which significantly extends outside the indented area on the sides, heel and toe such that the surface area of the bottom of the insole, which is flat, is significantly greater than the surface area of the indented portion; wherein said insole is placed inside, and optionally attached to, the inner surface of the sole piece in a manner such that the sole piece layer covers the entire bottom of the insole and, also, wraps around the side of the insole at the sides, heel and toe such that the sole piece takes on a concave shape and the surface area of the sole piece which contacts the surface when worn is significantly greater than the surface area of said indented portion.

5,150,537
SECURING AND ADJUSTER DEVICE, PARTICULARLY FOR SKI BOOTS
Maurizio Tacchetto, Noventa Padovano; Claudio Zorzi, Silea; Giuseppe De Bortoli, Montebelluna; Alessandro Pozzobon, Paderno Di Ponzano Veneto, and Renato Serafin, Vedelago, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy
Division of Ser. No. 378,341, Jul. 10, 1989, Pat. No. 5,048,204.
This application Jul. 1, 1991, Ser. No. 724,031
Claims priority, application Italy, Jul. 22, 1988, 82572 A/88; Jan. 20, 1989, 82503 A/89
Int. Cl.[5] A43C *11/00*
U.S. Cl. 36—50.5 12 Claims

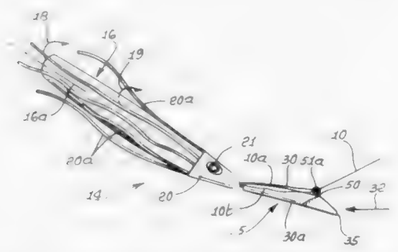
1. Securing device particularly for a ski boot comprising:
a circular winding device for winding a first traction element which is connected thereto; and
a pivoting lever for tensioning a second traction element which is connected thereto;
said circular winding device comprising a rotatable cable pulley element and a knob element which is manually actuatable to rotate said cable pulley element in a winding direction of said first traction element, the securing device further comprising:
means for blocking said cable pulley element from rotating in an unwinding direction of said first traction element;
said means for blocking being releasable to allow said cable pulley element to rotate in an unwinding direction of said first traction element, said pivoting lever being positionable in a first position for tensioning said second traction element and in a second position for releasing tension of said second traction element, wherein a pivoting movement of said lever from said first position to said second position releases said means for blocking said cable pulley element which is thus enabled to rotate in the unwinding direction of said first traction element.

5,150,538
SUBMERGING FISHING LURE
William R. Buchanan, Long Beach, Calif., assignor to Sevenstrand Tackle Corporation, Long Beach, Calif.
Filed Feb. 25, 1991, Ser. No. 660,128
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.28 13 Claims

1. In a fishing lure, the combination comprising
a) a lure head and a lure tail spaced apart longitudinally, the tail being longitudinally elongated and including plastic strands,
b) the head having a front edge, and two laterally spaced, elongated edges tapering rearwardly and toward the tail, the head having opposed faces with spacing therebetween substantially less than the length dimension of each of said elongated edges, the head having weight substantially greater than the weight of said lure tail, one of said opposed faces being generally dome shaped and having a

crest and two forward bevels, the other of said opposed faces being substantially flat,

c) and there being means to connect a fishing line to the dome shaped face at said crest,



d) the tail having a substantially stiff portion extending rearwardly from a rotary connection to the head,

e) said bevels terminating rearwardly along two rearwardly convex lines that extend at opposite sides of said crest, said bevels also intersecting said substantially flat face.

5,150,539

SWIVEL CONSTRUCTION

Bret S. Sorola, 882 N. Salem #3, Evesexville, Mich. 48732

Filed Feb. 28, 1991, Ser. No. 662,416
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—43.1 19 Claims

1. A swivel construction for attaching a fishing tackle element to a fishing line, said construction comprising a body; a connector having one end thereof rotatably coupled to said body and its opposite end extending beyond one end of said body; anchor means carried by said opposite end of said connector and on which one end of a fishing line may be wound; releasable clasp means carried by said connector for movement into and out of a position in which a fishing line wound on said anchor means is trapped thereon; and coupling means carried by said body at its opposite end for removably coupling a fishing tackle element to said body.

5,150,540

SINKER SLIDER

Robert A. Bennett, Easton, Conn. assignor to Charlotte Ambrogio, Stratford and Sally Conant, Orange, both of, Conn., a part interest

Filed Mar. 9, 1992, Ser. No. 848,043
Int. Cl.[5] A01K *91/02*
U.S. Cl. 43—43.12 5 Claims

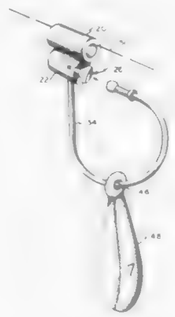
1. An integral plastic sinker slider structure comprising:

a first hollow cylinder open at both ends;

a second hollow cylinder open at both ends and parallel to the first cylinder, the two cylinders being disposed side by side and secured together, the second cylinder being disposed below the first cylinder the second cylinder having an outer wall with a plurality of equidistantly spaced elongated slots that extend in parallel from one end of the second cylinder to a point intermediate the ends of the second cylinder and form a flexible region with the said one end, the region having an first internal longitudinal bore with a first cross sectional area, the remainder of the second cylinder having a second internal longitudinal bore which is a continuation of the first bore with a second and larger cross sectional area;

an elongated member secured at one end to the outer wall of the second cylinder and having a third cross sectional area intermediate its ends which is smaller than the first area; and

means secured to the other end of the member and adapted



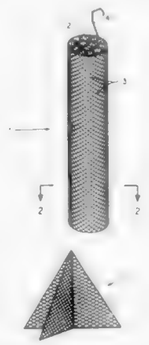
be engagable with manual pressure into said one end of the second cylinder and held locked therein by the flexure of said region, the means having at least one fourth cross sectional area larger than the first area and smaller than the second area, the locked means being unlocked with the means being released from the second cylinder when a sufficient force is exerted on the means in a direction away from the cylinders.

5,150,541

DEVICE FOR KILLING INSECTS

James P. Foster, Chadds Ford, Pa., and Philip V. Jennings, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 340,287, Apr. 19, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 597,404
Int. Cl.[5] A01M *1/20*
U.S. Cl. 43—131 12 Claims



1. A device for killing insects, which device is in the shape of a solid cylinder, intersecting rectangles, or intersecting triangles whose surface comprises:

(i) a toxin-containing element which is visible and available to target insects except for about 22% to 50% of its surface which is covered by

(ii) a mesh that protects nontarget organisms from contact with the toxin; the toxin being

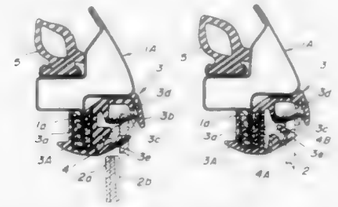
(iii) tetrahydro-2-(nitromethylene)-2H-1,3-thiazine or its N-formyl derivative; wherein the device operates dry.

5,150,542

GLASS RUNNER STRUCTURE OF VEHICULAR DOOR

Shuichi Hanaya, Chigasaki, and Nozomi Iida, Hadano, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 17, 1989, Ser. No. 297,739
Claims priority, application Japan, Jan. 22, 1988, 63-11984
The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—441 11 Claims



1. In a glass runner structure installed in a window frame of a door for guiding upward and downward movement of a window panel,

an elongate base portion secured to and extending along said window frame;

an elongate main seal portion integral with said elongate base portion, said elongate main seal portion being so arranged that when said window panel assumes a fully closed position, an upper edge of said window panel abuts sealingly against said elongate main seal portion;

an elongate seal lip integral with said elongate base portion, said elongate seal lip contacting sealingly to an inner surface of said window panel when said window panel assumes said fully closed position; and

means for directing the upward movement of said window panel toward a desired portion of said elongate main seal portion when, upon contact of said seal lip with said inner surface of said window panel, said elongate seal lip is flexed by said window panel to such a degree as to contact with said elongate base portion.

5,150,543

DOOR

Klaus Wessiepe, Essen, and Wilhelm Stewen, Oberhausen, both of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 508,493, Apr. 10, 1990, Pat. No. 4,986,032, which is a continuation of Ser. No. 285,837, Dec. 15, 1988, abandoned. This application Nov. 6, 1990, Ser. No. 609,721
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743692
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—477 24 Claims

1. A door assembly for substantially closing a door opening, said door assembly comprising:

a sealing element for being disposed adjacent to an outer surface of the periphery of said door opening, and substantially closing said door opening; and

frame member means for being disposed about and adjacent to an outer surface of the periphery of said door opening;

said frame means comprising inflatable means and a plurality of force generating means for applying a purality of forces to said sealing element about the periphery of said door opening;

said inflatable means being disposed to extend said plurality of force generating means adjacent said sealing element at a plurality of points for pressing said sealing element against the periphery of said door opening;

wherein said sealing element comprises a light weight shield; and

wherein said light weight shield comprises sheet metal;

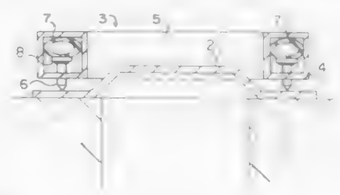
wherein said frame member means comprises a hollow profile frame having at least one end;

wherein said inflatable means is disposed within said hollow profile frame;

wherein said inflatable means comprises at least one inflatable hose;

wherein said plurality of force generating means comprise slidable tappets for sliding back and forth within said frame means;

wherein said slidable tappets comprise elongated cylindrical



elements disposed in holes in said frame member means which comprise a hollow profile frame;

wherein said tappets include head means for being in contact with said at least one inflatable hose;

wherein said at least one inflatable hose applies substantially equal force to all said slidable tappets;

wherein said at least one inflatable hose is configured to receive a coolant therein;

wherein said at least one inflatable hose is positioned at the end of said frame that is farthest away from said door opening; and

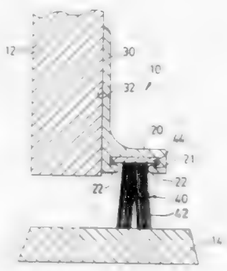
wherein said tappets are interposed between said at least one inflatable hose and said sealing element to maintain a sufficient separation between said at least one inflatable hose and said door opening to minimize heat transfer from said door opening to said at least one inflatable hose.

5,150,544

MAGNETICALLY MOUNTED DOOR SWEEP

Viola C. Burnett, Farmington, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Aug. 28, 1991, Ser. No. 750,989
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—493 7 Claims



1. A door sweep for engaging a metallic door to position a non-magnetic seal relative to a threshold and the door, the non-magnetic seal having a sealing portion and a backing portion, the door sweep comprising:

(a) retaining means for cooperatively engaging the backing

portion of the seal to secure the seal relative to the door sweep; and

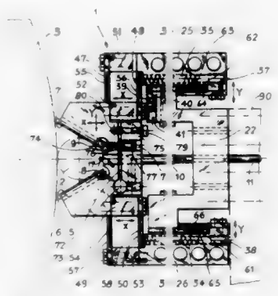
(b) integral magnetic fastening means for releasably magnetically securing the door sweep to the metallic door with sufficient attractive force to dispose the sealing portion of the seal in a non-magnetic adhesive free substantially sealing relation with the threshold.

5,150,545

ARRANGEMENT FOR MEASURING THE DIAMETER OF CYLINDRICAL PARTS DURING THE MACHINING THEREOF

Xavier Estéve, Marin, Switzerland, assignor to Meseltron S.A., Corcelles, Switzerland

Filed Aug. 1, 1991, Ser. No. 738,862
Claims priority, application France, Aug. 2, 1990, 90 10018
Int. Cl.[5] B24B *49/04*
U.S. Cl. 51—165.74 9 Claims



1. A measuring arrangement, in particular in a machine tool, for interrupting the machining operation on a cylindrical part when such part has attained a predetermined diameter, such arrangement including:

a head exhibiting an opening provided with two rectilinear ridges positioned in the form of a V and adapted to bear against the part to be machined, said head showing two parallel faces substantially perpendicular to the axis of the part to be machined, said parallel faces defining the thickness of the head,

a sensor mounted on such head and arranged along the bisector of the angle formed by the two ridges, said sensor furnishing a signal representative of the diameter of the cylindrical part, the head being oriented relative to the part to be machined in a manner such that said bisector is situated in a plane substantially parallel to the horizontal,

means coupling the head to a base fixed to the machine frame in order to assure contact of said ridges with the cylindrical part during the machining operation, said coupling means being arranged so as to assure the mobility and the retention of the head in a plane X-Y substantially perpendicular to the axis of the cylindrical part to be machined,

elastic urging means urging the head against the part to be machined, and

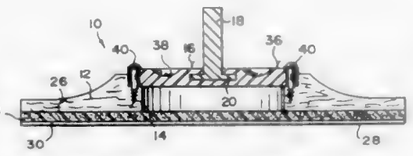
elastic sustaining means for sustaining the head with its coupling means on the base fixed to said machine frame, said sensor, said coupling means, said elastic urging means, and said elastic sustaining means all being located within a space bounded by the extension of said two parallel faces defining the thickness of the head.

5,150,546

DISC SANDER IMPLEMENT

Clifton E. Tucker, 11000 Tom Weiskopf, El Paso, Tex. 79936

Filed Dec. 2, 1991, Ser. No. 801,427
Int. Cl.[5] B24B *23/02*
U.S. Cl. 51—170 T 5 Claims



1. A disc sander implement which comprises:

a) a circular rigid pad fabricated out of a durable material having a rigid circumferential periphery extending around a circumferential periphery of the implement and having a large central aperture therethrough;

b) an elastometric disc shaped flexible connector having an annular concave recess formed at a central location in a top surface thereof, to permit the elastometric connector to flex on said rigid pad in said large central aperture and the elastometric connector being secured only at a circumferential periphery secured to said rigid pad in said large central aperture;

c) a spindle having an enlarged head embedded into the elastometric connector at a location concentric with the annular recess for detachably connecting said rigid pad to a driving unit and for rotation relative to a portion of the driving unit, so that said large central aperture in said rigid pad will give clearance for bending and flexing of said elastometric connector when rotating;

d) a cushion member of sponge rubber attached to said rigid pad by a permanent adhesive; and

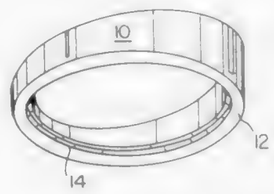
e) an abrasive sheet removably affixed to a front side of said cushion member by adhesive, said elastometric connector being the sole means of connecting the spindle to the rigid pad so that the flexure of the elastometric connector permits said abrasive sheet always to remain in a flat contact with a work surface with a slight pressure and little effort when a user of the driving unit moves said sander in a pendulum motion across the work surface.

5,150,547

OPHTHALMIC LENS PRISM BLOCKING RING

David O. Johnson, 2104 Shenandoah Rd., Raleigh, N.C. 27603

Filed May 6, 1991, Ser. No. 695,929
Int. Cl.[5] B24B *41/06*
U.S. Cl. 51—216 LP 2 Claims



1. An ophthalmic lens prism blocking ring for holding a lens during grinding to introduce a prism correction therein and comprising:

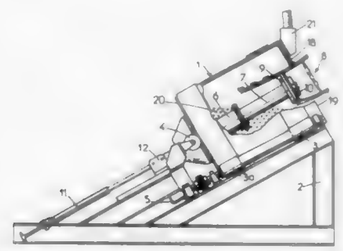
a substantially circular annulus adapted to be detachably connected between an ophthalmic lens to be ground and a blocking body, said annulus having a flat lower annular surface and having a first thickness at the first end of a diameter and a second thickness at the opposite end of said diameter and defining an inclined plane therebetween, said incline defining the amount of prism that will be introduced into the lens upon the completion of grinding and further including means for detachably connecting said ophthalmic lens prism blocking ring to the blocking body comprising an annular recessed slot in the lower surface of said ophthalmic prism blocking ring, said slot adapted to frictionally engage and contact the blocking body along its entire perimeter, said slot being the sole means by which said ophthalmic lens prism blocking ring and the blocking body are connected.

5,150,548

METHOD FOR TREATING THE SURFACE OF AN ARTICLE WITH SOLID PARTICLES

Jean P. M. Boquet, Le Perray en Yvelines; Daniel J. A. Ermisse, Pecqueuse, and Gabriel J. L. Cattin, Pont de Roide, all of France, assignors to Bertin & Cie, Plaisir Cedex and Cattin-Air SA, Pont de Roide, both of, France

Division of Ser. No. 912,108, Sep. 29, 1986, Pat. No. 5,027,558.
This application Jul. 2, 1991, Ser. No. 724,853
Claims priority, application France, Sep. 27, 1985, 85 14335
Int. Cl.[5] B24B *1/00, 9/00, 31/00*
U.S. Cl. 51—313 3 Claims



1. A method for treating a surface of an article by contacting said surface with solid particles, comprising the steps of:

providing a vessel having an axis of symmetry oblique in relation to the horizontal around which it can rotate, said vessel having walls and an upper axial end with an opening of sufficient size to permit the passage of an article to be treated,

filling said vessel with solid particles substantially to a level such that when said vessel is in said oblique position, said particles are retained in said vessel by the walls of the vessel,

driving said vessel in rotation on the axis at a speed so that the solid particles are caused to be driven by the walls of the vessel and fall as a shower inside the vessel,

moving said article from a load/unload position, where the article is outside the solid particles, to a working position inside the vessel, said movement being done while the vessel rotates and while the particles fall as a shower onto said article, the article being moved obliquely in relation to the horizontal and parallel to the axis of the vessel,

maintaining the article substantially fixed in said working position during treatment, and

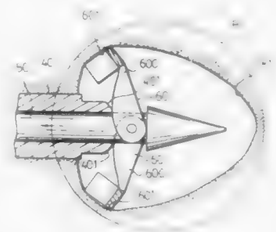
moving back said article to said load/unload position after treatment.

5,150,549

ANCHOR PILE AND CONCRETE PROTECTION WALL CONSTRUCTION USING SAID ANCHOR PILE

Chin-Lang Chen, No. 55-2, Pen-Chou Rd., Kang-Shan Chen, Kaohsiung Hsien, Taiwan

Filed Jan. 3, 1992, Ser. No. 816,261
Int. Cl.[5] E02D *5/74*
U.S. Cl. 52—162 10 Claims



1. An anchor pile for reinforcing a concrete protection wall on a mountainside, comprising:

an elongated tubular member having a rear end and a front end, with an annular recess formed therein;

a shaft slidably extending into said tubular member and having a first end portion which extends out of said rear end of said tubular member and a second end portion which extends out of said front end of said tubular, member and which is provided with an enlarged head; and

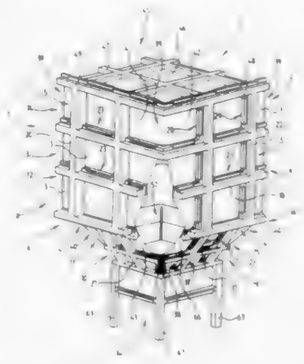
a foldable anchor means having at least one anchor arm, which is pivoted to said second end portion of said shaft inward of said enlarged head and which extends radially outward when in use, and a curved anchor flange integrally connected to said anchor arm, said anchor flange being extended over said front end of said tubular member and being received in said annular recess when said anchor is folded.

5,150,550

SILO MADE OF SUSPENDED SHEETS

Guy Rionde, La Samaritaine, 88800 Vittel, France

Filed Feb. 11, 1991, Ser. No. 653,376
Int. Cl.[5] E04H *7/00*
U.S. Cl. 52—192 11 Claims



1. A silo, comprising:

a framework comprising a plurality of vertically spaced horizontal support members, and a plurality of horizontally spaced vertical support members connected to said horizontal support members so as to define with said

horizontal support members a lattice-type framework comprising windows having perimeter portions defined by said horizontal and vertical support members; and

a plurality of plates suspendingly supported directly from said horizontal support members so as to cove said windows and fixedly connected to each other so as to define a closed interior surface for said silo.

5,150,551

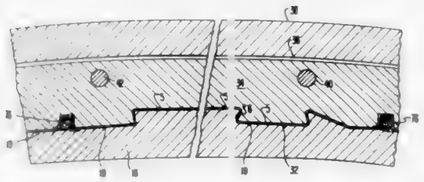
PRESTRESSED COMPOSITE CONCRETE TANK WITH IMPROVED PUMP JOINT AND METHOD FOR CONSTRUCTING THE SAME

Theodore R. Crom, Hawthorne, and Gerald C. Bevis, Archer, both of Fla., assignors to The Crom Corporation, Gainesville, Fla.

Continuation-in-part of Ser. No. 558,866, Jun. 30, 1990, abandoned. This application Mar. 12, 1991, Ser. No. 669,063

Int. Cl.[5] E04D *1/00*; E04C *3/10*

U.S. Cl. 52—223 R **23 Claims**



1. In a prestressed composite tank, a vertical wall extending around a storage area, said wall comprising a substantially vertical diaphragm, said diaphragm being formed of a plurality of side-by-side vertical panels, said panels each having a vertically extending edge portion on each side thereof, the adjacent vertical edge portions of each side-by-side panels being interlocked to assist in holding the panels together during construction and being configured to present an initially hollow channel extending the entire vertical extent of the interlocked edge portions, said hollow channels being completely enclosed and surrounded by said edge portions to thereby resist damage and exclude contamination, said wall further including an initially fluid sealant material filling each of said channels, said sealant material having hardened in said channels to thereby present fluid impervious joints between the panels.

5,150,552

BUILDING SYSTEM FOR EXTENSION OF PROGRESSIVE HOUSING

Craig Davis-Arzac, Pino Number 30, Colonia Florida, 01030, Mexico

Continuation of Ser. No. 431,111, Nov. 3, 1989. This application Feb. 26, 1992, Ser. No. 839,292

Claims priority, application Mexico, May 19, 1989, 16107

Int. Cl.[5] E04B *1/00*

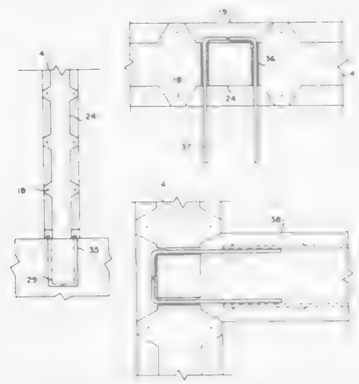
U.S. Cl. 52—259 **6 Claims**

1. A building structure comprising:

a plurality of vertical wall reinforcements comprised of elongate precast concrete members of rectangular form having internal longitudinal and transverse reinforcing bars and four planar outer surfaces, said longitudinal and transverse reinforcing bars being disposed with adjacent ones of said longitudinal reinforcing bars and adjacent ones of said transverse reinforcing bars defining rectangular patterns inward of said outer surfaces, and a plurality of indentations cast in said outer surfaces, each indentation being of substantial depth and positioned to overlay one of said rectangular patterns,

brickwork joined to said vertical wall reinforcements, said brickwork being laid adjacent one of said outer surfaces of said precast concrete members and keyed to said precast concrete member by mortar in said indentations, and

a plurality of steel reinforcements with a portion of each



steel reinforcement embedded between two successive courses of brick and an end of each steel reinforcement embedded in mortar in an indentation of the precast concrete member facing said consecutive brick courses.

5,150,553

HOLDOWN STRAP

Alfred D. Commins, Danville, and Ernest A. Romeo, Healdsburg, both of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Aug. 9, 1990, Ser. No. 564,869

Int. Cl.[5] E02D *27/02*; E04B *1/38*

U.S. Cl. 52—264 **10 Claims**

1. A holdown strap connection comprising:

a concrete foundation having an upper surface and a side surface;

b. a generally horizontally extending wood mudsill having an outside edge and an upper side and a lower side resting on said concrete foundation;

c. a rim joist member having an upper edge, a side, and a lower edge resting on said upper side of said wood mudsill;

d. a subfloor member having an upper face, an edge, and a lower face resting on said upper edge of said rim joist member;

e. a wood sole plate having an upper side, an edge and a lower side resting on said upper face of said subfloor member;

f. a generally vertical wood frame member having an outside edge and a side face and mounted on said wood upper side of said wood sole plate;

g. an elongated sheet metal holdown strap connector comprising:

1. a foot section embedded in said concrete foundation,

2. a transition section having an upper portion and a lower portion connected to said foot section and extending from said concrete foundation past said outside edge of said wood mudsill, along said side of said rim joist, along said edge of said subfloor; along said edge of said sole plate and along a portion of said edge of said vertical wood frame member, and

3. an elongated strap section connected to said upper portion of said transition section and extending and in registration with said side face of said vertical wood frame member and formed with a plurality of fastener openings therethrough; and

h. fastener means dimensioned for insertion through said fastener openings in said elongated strap section of said elongated sheet metal holdown strap connector and into said vertical wood frame member.

5,150,554

PANEL-POST ARRANGEMENT

Roger J. Quinlan, Jr., and Stephen J. Simpson, both of Holland, Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Dec. 19, 1990, Ser. No. 630,036

Int. Cl.[5] E04B *1/00*; E04F *17/08*

U.S. Cl. 52—282 **14 Claims**

1. In an upright space divider system including a plurality of horizontally interconnected upright space divider panels, said system also including a post assembly joined to and projecting upwardly along one vertical end edge of at least one said panel, the improvement wherein said post assembly includes:

a hollow upright post extending upwardly along said one end edge of said one panel throughout substantially the full vertical height thereof, said post having a generally tubular outer wall having a cross section which is substantially greater than the width of said one panel;

said post being defined by a plurality of separate vertically elongate post segments which circumferentially cooperate to define the cross section of the post, each said post segment having a peripheral wall segment which defines only part of the outer wall of said post;

securing means including a vertically elongate securing element which is separate from said post segments for joining circumferentially adjacent pairs of post segments together;

each said post segment having a securing flange fixed to the respective peripheral wall segment and projecting inwardly into the interior of the post;

said post having a slotlike opening which opens inwardly thereof through said outer wall and extends vertically throughout substantially the full height thereof;

said one panel begin positioned so that said one end edge thereof projects horizontally through said slotlike opening into the interior of said post; and

connecting means disposed interiorly of said post for connecting the one end edge of said one panel to one of said securing flanges, said connecting means including a vertically elognate connecting element which is separate from said post segments and said panel.

5,150,555

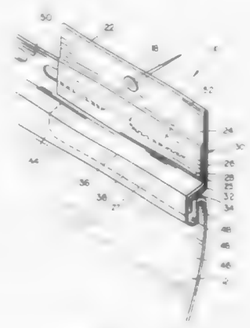
SIDING CLIP

Larry A. Wood, 9000 Kolbrook Rd., Denton, Nebr. 68339

Filed Jul. 12, 1991, Ser. No. 729,033

Int. Cl.[5] E04D *1/34*

U.S. Cl. 52—544 **9 Claims**



1. A siding clip, comprising:

a generally vertically planar sheet of rigid material folded upon itself to form a generally horizontal upper folded edge with depending forward and rearward legs having lower free ends and upper ends connected together to form said upper folded edge;

said forward leg extending downwardly parallel and adjacent to the rearward leg;

said forward leg being bent forwardly intermediate its upper and lower ends and thence downwardly parallel to the rearward leg, to form a downwardly opening vertical slot between said forward and reward legs;

said rearward leg being bent forwardly at a first horizontal bend below the lower end of said forward leg; and

the lower end of side rearward leg being bent downwardly at a second horizontal bend, so as to be oriented generally parallel to said forward leg.

5,150,556

CHORD TRUSS ROOF STRUCTURE

Toshiyuki Yamada; Yoshihiro Takahama; Kazushige Kurihara, and Hajime Nakajima, all of Tokyo, Japan, assignors to Shimizu Construction Co., Tokyo, Japan

Filed Sep. 25, 1990, Ser. No. 587,679

Claims priority, application Japan, Oct. 6, 1989, 1-261622; Oct. 6, 1989, 1-261623

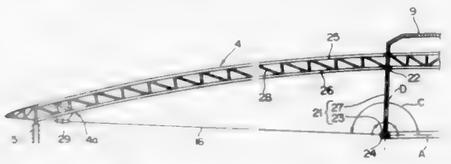
Int. Cl.[5] E04B *1/32, 7/08*; E04C *3/38*

U.S. Cl. 52—639 **4 Claims**

1. A chord truss roof structure for mounting on side wall sections comprising:

a ring-girder having a tension ring disposed approximately at the center of the chord truss roof, a compression ring located above the tension ring and in parallel thereto, and struts connected between the compression ring and the tension ring;

cross beams radially erected between the compression ring and said side wall sections, each cross beam having one side portion and another side portion, each one side portion being coupled to the compression ring and each other side portion being coupled to the side wall sections;



chord members, each having a first end and a second end, said chord members extending under tension, with said first ends being connected to said tension ring and said second end being connected to said another side portions, said first ends defining a plane through said tension ring;

connection members each connection member being connected between two end portions. said connection members being disposed in said plane, so that the chord members and the connection members therebetween form a unitary structure;

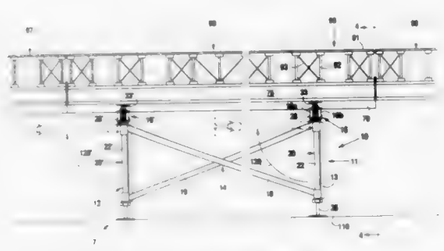
whereby the chord truss roof structure can be erected without a support base for supporting thereof.

5,150,557

ADJUSTABLE SHORING SYSTEM

Robert K. Gregory, 1110 Eikel, Ste. C, New Braunfels, Tex. 78130

Filed Dec. 17, 1990, Ser. No. 629,116
Int. Cl.[5] E04H *12/00*
U.S. Cl. 52—646 **13 Claims**



1. An improved shoring leg, comprising:

a timber post having a longitudinally-oriented central hole there through, said post being cut to a desired length for its intended use, and said post having first and second opposing longitudinal ends;

a first end cap fit snugly on the first end of said post, said first end cap including an end plate having a central hole there through for receiving the shank of a screw jack, said central hole being oriented concentric with the pilot hole of said post to enable boring of a bore sized to receive:

a screw jack operably mounted to said post at said first end cap for enabling employment of the shoring leg in a shoring system, the shank of said screw jack fitting within a similarly-sized bore in the first end of said post which is bored with the guidance of said pilot hole;

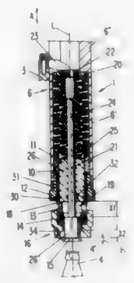
said post comprises first and second mating members which are laminated together on mating faces, at least one of said mating members being provided with a groove along its length in a position such that, upon mating of said mating members, said groove defines the pilot hole through said post.

5,150,558

CLOSING MECHANISM FOR A CAPPING MACHINE

Herbert Bernhard, Wolfsheim, Fed. Rep. of Germany, assignor to SEITZ ENZINGER NOLL Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Jul. 5, 1991, Ser. No. 726,387
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021959; May 10, 1991, 4115285
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] B65B *7/28, 55/24*
U.S. Cl. 53—167 **26 Claims**



1. A closing mechanism, for a rotary-type capping machine, for capping bottles with crown caps, said closing mechanism being disposed over a bottle support and means for lowering said closing mechanism out of a starting position and raising again into said starting position by vertical movement, said closing mechanism comprising:

a deformation member for placing a crown cap on a mouth portion of a bottle and for subsequently fixing said crown cap on said mouth portion by permanent deformation;

a hold-down mechanism that extends centrally through said deformation member and cooperates with at least one spring, with said hold-down mechanism having a hold-down surface that faces said bottle support and is provided with a holding means for holding said crown cap;

a centering means for centering said crown cap before same is placed on said bottle, with said centering means being provided on a lower end of said closing mechanism, which end faces said bottle support, and with said centering means having a centering opening through which said hold-down mechanism also centrally extends, with said centering opening having at least a first centering portion that narrows upwardly in a frusto-conical manner and a second centering portion that adjoins said first centering portion on an upper side thereof, said second centering portion having a diameter greater than that of said crown cap prior to deformation thereof, whereby said bottle support is provided with means that permits a movement of said bottle in directions perpendicular to a vertical axis for alignment of said bottle relative to said centering means;

a first closing mechanism part that cooperates with said at least one spring by being displaceable against the action thereof, with said hold-down mechanism being displaceable on said first closing mechanism part and being centrally spaced from said lowering means to permit said hold-down mechanism an unrestricted upward free stroke into said space for centering said crown cap; and

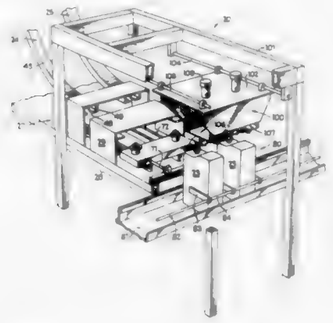
means for making said at least one spring effective such that upon placement of said crown cap on said mouth portion of said bottle and upon further lowering of said closing mechanism, said at least one spring is effective via said hold-down mechanism upon said crown cap and via said crown cap upon said mouth portion of said bottle only after said crown cap, which is already disposed on said mouth portion, is completely received by said second centering portion.

5,150,559

FLUID CONTAINER CAPPER APPARATUS

Edward O. Winfield, Kanasasville, Wis., assignor to Plant Services Corp., Kenosha, Wis.

Filed Oct. 7, 1991, Ser. No. 772,474
Int. Cl.[5] B65B *7/28, 61/00, 1/00*
U.S. Cl. 53—306 **16 Claims**



1. An apparatus for mounting caps onto fluid containers in a particular predetermined orientation relative to said fluid containers, said caps each having a top portion, a bottom portion, with a substantially radially symmetrical seating portion and a substantially radially symmetrical central portion, intermediate said top and bottom portions, a radially outwardly extending element at a predetermined circumferential position on said central portion, said containers each having a neck portion and an opening arranged at an end of said neck portion, said apparatus for mounting caps onto fluid containers comprising;

a source of caps for said fluid containers;

means for transporting each of said caps in succession from said source to a cap drop position, said caps arriving at said cap drop position in random relative orientation between successive caps;

means for seating each of said caps after each of said caps has arrived at said cap drop position;

means for transferring said seating means from said cap drop position to a delivery position;

means for aligning said caps, one at a time, from said random relative orientation, into a predetermined seated alignment in said seating means, prior to arrival of said seating means at said delivery position, so as to orient said seating means and said caps, respectively, into a predetermined position for pick-up and securement of each of said caps onto said neck portion of a corresponding one of said fluid containers, said means for aligning said caps cooperating with said radially outwardly extending elements;

means for moving said fluid containers from a source of said fluid containers, successively, to a capping position; and

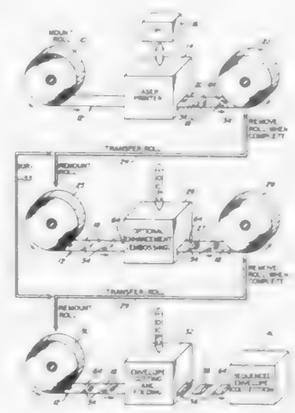
means for picking up said caps at said delivery position and positioning said caps onto said neck portions of said corresponding fluid containers at said capping position to substantially cover the openings of said corresponding fluid containers.

5,150,560

SYSTEM AND METHOD FOR MANUFACTURING ENVELOPES

H. W. Crowley, Newton, Mass., assignor to Roll Systems, Inc., Burlington, Mass.

Filed Jun. 12, 1991, Ser. No. 714,232
Int. Cl.[5] B65B *11/48, 61/02*
U.S. Cl. 53—411 **35 Claims**



1. A method for manufacturing printed envelopes comprising the steps of:

feeding web from a source roll into a variable information printer;

printing envelope information by means of a variable information printer on selected consecutive locations of the web;

outputting the web from the printer to an output roll;

re-orienting the output roll so that the web may be unrolled;

subsequent to outputting, cutting and folding individual envelopes from the output roll in response to detection of the locations; and

directing the envelopes to a collection point in a predetermined sequence, the envelope being formed into sequenced bundles of predetermined size, the bundles being contained by a containing means to enable transfer to a contents insertion location.

5,150,561

METHOD FOR MAKING SIDE OPENING FLEXIBLE BAG WITH LONGITUDINALLY ORIENTED CARRYING HANDLE SECURED TO SIDE PANELS

Delmar R. Muckenfuhs, Middletown, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 451,498, Dec. 15, 1989, Pat. No. 5,054,619.
This application Jun. 17, 1991, Ser. No. 716,441
Int. Cl.[5] B65B *43/04, 61/14, 61/18, 63/02*
U.S. Cl. 53—412 **7 Claims**

1. A method for making an easy open substantially rectangular bag of compressed flexible articles having a carrying handle extending in a direction substantially parallel to the direction of compression of said articles, said flexible articles being arranged in a stack and held in compression in a direction substantially parallel to their thickness, said method comprising the steps of:

(a) providing at least two discrete and separate portions of a final continuous line of weakness in a web of flexible material comprising said bag at predetermined locations, a section of each said portion being substantially perpendicular to the length of said web;

(b) forming a "W"-shaped cross-section in said web of flexible material comprising said bag so that said discrete

portions of said continuous line of weakness are located in the outermost legs of said "W" and so that said discrete portions of said continuous line of weakness substantially coincide with one another, wherein said substantially perpendicular sections extend toward the "W fold" of said web;

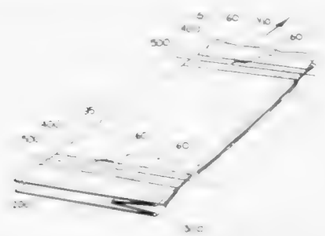
(c) feeding a web of the material comprising said handle parallel to the web of material comprising said bag;

(d) nesting said web of handle material within the "V"-shaped portion of said web of "W"-shaped flexible material comprising said bag;

(e) sealing said nested webs to one another at predetermined locations along their length to form said continuous line of weakness by sealing together ends of said discrete portions and a web of interconnected, unerected flexible bags, each having a carrying handle secured thereto;

(f) severing said discrete unerected flexible bags from said web in the sealed areas of said web;

(g) partially erecting each of said severed flexible bags to form a substantially rectangular cross-section comprising a front and a back panel connected to one another by means of a pair of opposed side panels, said partially erected flexible bag having a top panel secured about its periphery to said front, back and end panels and a carrying handle secured at its ends to the side panels of said partially erected flexible bag, said flexible bag having an easy open device comprising a substantially continuous line of weakness located at least partially within one of said side panels, said substantially continuous line of weakness defining a predetermined portion of said side panel to be at



least partially separated from the remainder of said side panel without impairing the functionality of said carrying handle, said partially erected flexible bag further having an open bottom end;

(h) forming a stack of flexible articles oriented so that the substantially planar surface of said articles is aligned substantially parallel to the side panels of said bag and the outermost peripheral edges of the articles contained in said stack are aligned substantially parallel to the front, back and top panels of said bag;

(i) compressing said stack of flexible articles between a pair of opposed knife belt assemblies in a direction substantially parallel to the thickness of said articles contained in said stack until said knife belt assemblies and said stack of compressed articles can pass through the open bottom end of said partially erected bag without causing interference between the outermost surfaces of said knife belt assemblies and the innermost surfaces of the adjacent side panels of said partially erected bag;

(j) moving said knife belt assemblies and said partially erected bags relative to one another so that said knife belt assemblies pass into the open bottom end of each of said partially erected flexible bags;

(k) simultaneously driving the opposed knife belts associated with said knife belt assemblies in a direction which advances said stack of compressed articles into contact with the innermost surface of said top panel of said partially erected flexible bag;

(l) moving said knife belt assemblies and said partially erected flexible bags relative to one another at a first velocity V_1 so that said knife belt assemblies are completely retracted from the open end of each of said partially erected flexible bags while simultaneously driving the knife belts associated with said knife belt assemblies at a second velocity V_2 which is equal to or greater than said first velocity V_1 to maintain said stack of compressed articles in intimate contact with the innermost surface of said top panel of each of said partially erected flexible bags as said stack is released from said knife belts and said knife belt assemblies pass through the open bottom end of each of flexible bags;

(m) folding said open bottom end of each of said partially erected, filled flexible bags to form a closed bottom panel adjacent said stack of compressed flexible articles; and

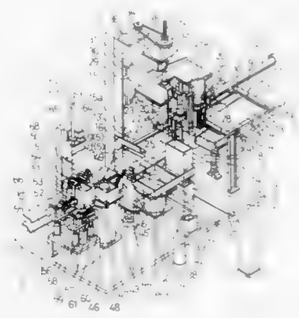
(n) securing said bottom panel in a closed position to complete said bag.

5,150,562

METHOD AND APPARATUS FOR PACKAGING RESILIENTLY DEFORMABLE ARTICLES

Yozo Araki; Isamu Ito, both of Nagoya; Tohru Sugimura, Kawanoe; Migaku Suzuki, Kawanoe, and Mitsuzo Ochi, Kawanoe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Uni-Charm Corporation, Ehime, both of, Japan

Filed Jun. 28, 1991, Ser. No. 722,499
Claims priority, application Japan, Jul. 2, 1990, 2-172663
Int. Cl.[5] B65B *13/20*
U.S. Cl. 53—438 **8 Claims**



1. A method for packaging resiliently deformable articles comprising the steps of:

providing an inner cassette having an open top and bottom and pairs of opposite end and side surfaces extending therebetween;

inserting a stack of resiliently deformable articles into the inner cassette;

placing a rectangular sheet of film having rectangular cardboard flaps affixed thereto along respective middle portions of opposite sides thereof on the open top of the inner cassette; folding said sheet of film, bringing said cardboard flaps into covering engagement with opposite end surfaces of the inner cassette and bringing flaps defined by portions of said sheet of film into covering engagement with opposite side surfaces of the inner cassette and then sealing margins projecting outwardly from the respective side surfaces of the inner cassette onto said cardboard flaps;

providing an outer cassette;

aligning the inner and outer cassettes;

thrusting the stack of the resiliently deformable products together with the film sheet and the cardboard flaps extending over the inner cassette upwardly through the open top out from said inner cassette into the outer cassette; and,

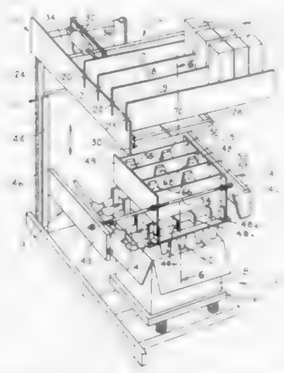
folding, overlapping and sealing lower ends of the respective film flaps.

5,150,563

SQUARE AND/OR ROUND CONTAINER PACKING DEVICE

Robert G. Hartness, Greer, S.C., assignor to Hartness International, Inc., Greenville, S.C.

Filed Sep. 25, 1991, Ser. No. 765,430
Int. Cl.[5] B65B *35/30*
U.S. Cl. 53—539 **8 Claims**



6. A guiding grid for an article loading machine for guiding articles having a substantially rectangular shaped cross-section dropped from a charge loading grid into a carton having sockets provided therein, said guiding grid comprising:

a plurality of parallel spaced grid plates,

a plurality of parallel spaced divider plates positioned transverse to and below said grid plates so that said grid plates and said divider plates define rectangularly shaped openings of a cross-section slightly greater than the cross-section of said articles;

a plurality of spaced guide blocks affixed to said grid plates in a staggered oppositely facing manner with one said guide block being positioned above each said opening defined by said grid plates and said divider plates; and

inclined surfaces provided on the top and sides of said guide blocks for contacting and directing said articles to a predetermined position in each of said openings as said articles are dropped through said openings, said inclined surfaces preventing said articles from contacting said divider plates.

5,150,564

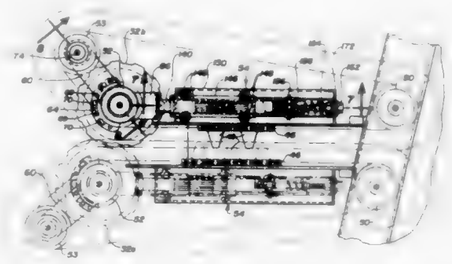
APPARATUS FOR CONVERTING GATHERING CHAIN PROFILES IN FORAGE HARVESTER ROW CROP ATTACHMENTS

Gary L. Bich, and Larry D. Hall, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 6, 1991, Ser. No. 665,050
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—98 **9 Claims**

1. In a row crop attachment for forage harvesters including a base frame, a plurality of row crop divider units arranged side-by-side on said base frame to define a plurality of crop conveying paths, a pair of gathering chains arranged to pass through each of said crop conveying paths from an entrance to an exit thereof for conveying crop material rearwardly through said crop conveying paths, a pair of rotary knives disposed adjacent the entrance of each of said crop conveying paths, an improvement comprising:

apparatus for converting each of said gathering chains between an extended profile where it is wrapped around a drive sprocket and a pair of idler sprockets with one of the idler sprockets being located forwardly of the rotary knives and a non-extended profile where it is wrapped



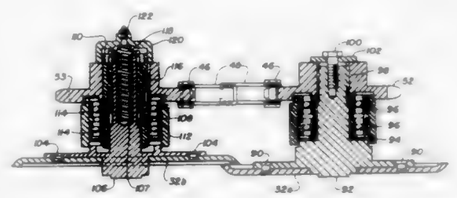
around said drive sprocket and the other idler sprocket so that said forwardly located idler sprocket and said converting apparatus are eliminated.

5,150,565

KNIFE MOUNTING ARRANGEMENT FOR FORAGE HARVESTER ROW CROP ATTACHMENTS

Gary L. Bich, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 6, 1991, Ser. No. 665,046
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—102 **4 Claims**



1. In a row crop attachment for forage harvesters including a base frame, a plurality of row crop divided units arranged side-by-side on said base frame to define a plurality of crop conveying paths through which gathering chains pass for conveying crop material through said crop conveying paths, a pair of rotary knives with cooperating cutting edges disposed on opposite sides and adjacent an entrance of each of said crop conveying paths for cutting off crop material before it is conveyed through said crop conveying paths by said gathering chains, a mounting arrangement for each pair of rotary knives comprising:

one knife of each pair of rotary knives fastened to a hub shaft which has a splined portion cooperating with a mating splined portion of a sleeve that is rotatably supported on said base frame;

said splined portion of said hub shaft being longer than said splined portion of said sleeve to permit limited upward and downward movement of said hub shaft and said one knife relative to said sleeve; and

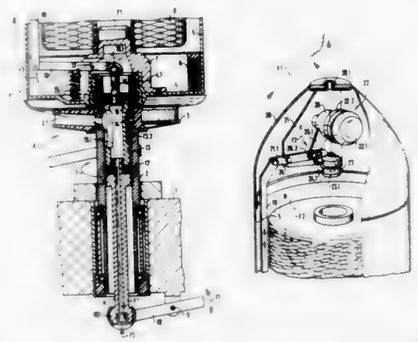
a spring urging said hub shaft in a direction to urge the cutting edge of said one knife into contact with the cutting edge of the other knife of each pair of rotary knives.

5,150,56(

THREAD PROCESSING MACHINE SPINDLE ASSEMBLY HAVING MECHANICAL ADJUSTMENT MECHANISMS FOR DEVICES WITHIN A ROTATING THREAD BALLOON

Heinz Stenmans, Grefrath, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Fed. Rep. of Germany

Filed Mar. 25, 1991, Ser. No. 674,676
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 4010017
Int. Cl.[5] D01H 7/90, 1/10, 7/44
U.S. Cl. 57—58.83 18 Claims



1. In a spindle assembly of a thread processing machine, of the type comprising a cabling or double twisting machine, wherein said spindle assembly includes top and bottom portions, a driven rotor mechanism having an axially-extending hollow shaft defining a thread passageway, a thread storage disk mounted for rotation with the rotor mechanism and having a radially-extending thread passageway communicating with said thread passageway of said rotor mechanism to define a first deflection means for changing the direction of thread travel from axial to radial during thread processing, a pot mechanism axially-extending upwardly from said rotor mechanism and around which a balloon of thread rotates during thread processing, axially-extending thread guide means positioned above said pot mechanism for receiving thread being processed and defining a second deflection means for changing the direction of thread travel from generally radial to axial during thread processing, and adjustable means for influencing the mode of operation of said spindle assembly and mounted thereon within the rotating thread balloon formed during thread processing; the improvement of:

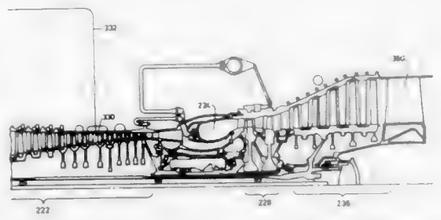
movable mechanical linkage extending from outside the rotating thread balloon to within such rotating thread balloon and to said spindle assembly operation influencing means, operating said spindle assembly operating influencing means and including hollow sleeve having an outside surface and upper and lower ends and mounted for axial movement in the vicinity of at least one of said thread deflection means and coaxial with said hollow shaft and having at least one lateral aperture for receiving thread to pass axially through said sleeve and radially out of said aperture at said one deflection means and for axial movement with said linkage during movement thereof for adjustment of said spindle assembly operation influencing means

5,150,567

GAS TURBINE POWERPLANT

William M. Farrell, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 361,070, Jun. 5, 1989. This application Dec. 3, 1990, Ser. No. 620,956
Int. Cl.[5] F02G 3/00
U.S. Cl. 60—39.02 7 Claims



1. A method of converting an aircraft turbofan engine to a non-aeronautical application, said aircraft engine having a fan, a first compressor downstream of said fan, a second compressor downstream of said first compressor, a combustor downstream of said combustor, a first turbine which is coupled to said second compressor through a first shaft and a second turbine downstream of said first turbine which is coupled to said first compressor and said fan through a second shaft, wherein said method comprises the steps of:

removing said fan from said second shaft;

attaching a means for coupling a load to the second shaft; and

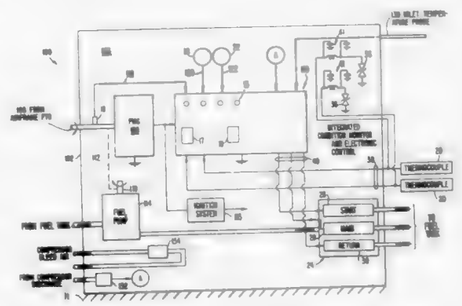
attaching a means for balancing the forces on said second shaft to compensate for the removal of said fan.

5,150,568

CONTROL AND PROTECTION SYSTEM FOR TURBINE ENGINES CONTAINED WITHIN A PROTECTIVE HOUSING

Robert C. White, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 769,471, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 497,714, Mar. 23, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 834,986
Int. Cl.[5] F02C 7/32
U.S. Cl. 60—39.31 25 Claims



1. A control for a power unit of an airframe including a prime mover providing non-propulsive output power to the airframe comprising:

a housing mounted on an exterior surface of the prime mover;

a power takeoff providing rotary power from the prime mover into the housing;

an electrical power generator contained within the housing which is driven by the power takeoff for providing electrical power within the housing;

at least one sensor mounted within the housing for sensing an operational parameter of the prime mover;

at least one electrical communication line between the at least one sensor within the housing and the controller with the at least one electrical communication line being electrically isolated from a filter, a voltage protection device and an overcurrent protection device and

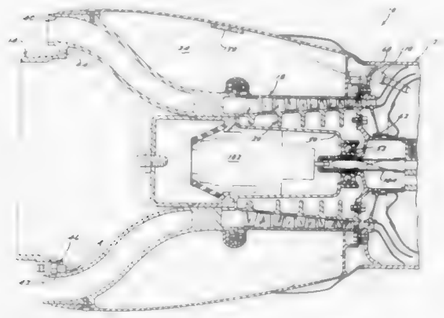
a controller contained within the housing for controlling operation of the prime mover in response to signals coupled to the control from the at least one sensor mounted within the housing.

5,150,569

INTEGRATED PROPULSION SYSTEM

William I. Chapman, Birmingham, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Dec. 14, 1990, Ser. No. 628,108
Int. Cl.[5] F02C 7/26
U.S. Cl. 60—39.142 4 Claims



1. An integrated propulsion system comprising:

an air intake;

a compressor stator supported by said air intake;

a front turbine shaft bearing supported by said air intake;

a compressor rotor on the front end of said turbine shaft;

an annular combustion chamber communicating with the outlet end of said stator; said turbine shaft being disposed internally of said combustion chamber;

a fuel passage having a fuel discharge nozzle therein disposed internally of said turbine shaft and rotatable therewith;

a turbine rotor on said turbine shaft;

a rear housing supported by said combustion chamber and having a turbine exhaust duct and rear bearing for the turbine shaft; and

an annular fuel tank coaxially related and radially aligned with said compressor stator.

5,150,570

UNITIZED FUEL MANIFOLD AND INJECTOR FOR A TURBINE ENGINE

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 21, 1989, Ser. No. 455,563
Int. Cl.[5] F02C 7/22; F23R 3/32
U.S. Cl. 60—39.36 11 Claims

1. A gas turbine comprising:

a rotary compressor;

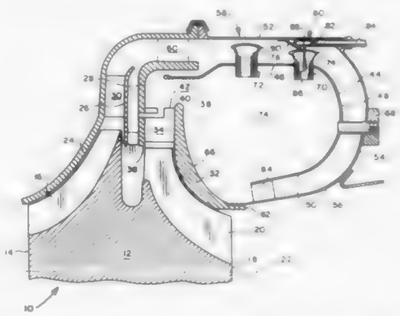
a rotatable turbine wheel coupled to said compressor to drive the same;

an annular nozzle for directing gases of combustion at said turbine wheel;

an annular combustor having an outlet connected to said nozzle;

a case in spaced relation to said combustor to define a plenum connected to said compressor;

angularly spaced inlet tubes oriented generally tangentially to the interior of the combustor and extending into the same from said plenum to create circumferential gas flow within said combustor;



a flattened tube of generally annular configuration within said plenum and adapted to be connected to a source of fuel under pressure; and

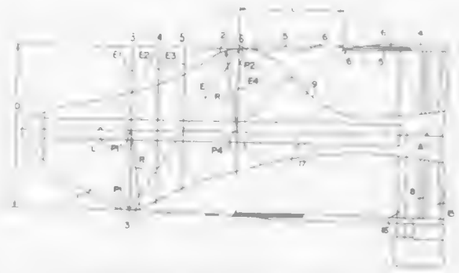
apertures in said flattened tube at angularly spaced location corresponding to at least some of said inlet tubes and each aligned with a corresponding inlet tube.

5,150,571

DEVICE FOR EXPOSING OR SHUTTING OFF A TURBO-ENGINE ON THE INTAKE AIR SIDE OF THE ENGINE

Claus Herzog, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- Und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 631,886
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942323
Int. Cl.[5] F02K 1/08, 1/04; F02C 7/00
U.S. Cl. 60—200.1 20 Claims



1. A device for exposing and shutting off a turbojet engine on an air intake side of the turbojet engine, comprising:

an engine shroud having a face end forming a casing lip;

a stationary centerbody arranged in front of said turbojet engine and including at least two vaulted areas axially and circumferentially displaced approximately 180° with respect to one another along a largest relative diameter, said stationary centerbody enclosing an axially spaced circumferential opening between said at least two vaulted areas and said casing lip; and

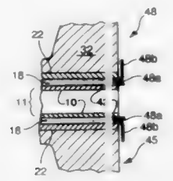
an annular slide valve which selectively extends from said engine shroud to expose or shut off the axially spaced circumferential opening.

5,150,572

INSULATED EXHAUST PORT LINER

Kenneth L. Johnson, Cincinnatti, Ohio, and William A. Updike, St. Louis, Mo., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 21, 1991, Ser. No. 659,037
Int. Cl.[5] F01N 07/14
U.S. Cl. 60—272 4 Claims



1. An exhaust port liner assembly for a cylinder head having at least one exhaust port and at least one exhaust valve seat comprising:

a tubular exhaust port liner composed of spaced inner and outer tubular metal shells having a mass of heat insulating material within the spaced inner and outer shells,

said inner and outer shells being secured together adjacent the inlet port end thereof and having a space therebetween adjacent the outlet port end thereof, and

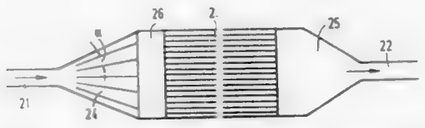
a gasket disposed within said space between the inner and outer shells adjacent the outlet port.

5,150,573

CATALYST ARRANGEMENT WITH FLOW GUIDE BODY

Wolfgang Maus, and Helmut Swars, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie MBH, Lohmar, Fed. Rep. of Germany

Division of Ser. No. 469,565, Mar. 28, 1990, Pat. No. 5,103,641.
This application Dec. 30, 1991, Ser. No. 814,870
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733402; claims priority, application European Pat. Off., Aug. 23, 1988, PCT/EP 88/00756
Int. Cl.[5] F01N 3/28
U.S. Cl. 60—299 18 Claims



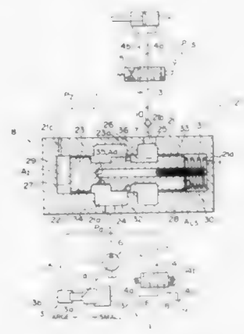
1. A catalyst configuration comprising a catalyst body through which a fluid can flow in a flow direction, a diffusor disposed upstream of said catalyst body and widening in the flow direction, a converger disposed downstream of said catalyst body and narrowing in the flow direction, a flow guide body having an upstream end and a downstream end each with a given cross-sectional area, said flow guide body being disposed in said diffusor and having a multiplicity of channels through which a fluid can flow, at least some of said channels having an increasing cross section as seen in the flow direction, the cross-sectional area of said downstream end being greater than the cross-sectional area of said upstream end, and said flow guide body including catalytically active material.

5,150,574

HYDRAULIC DRIVE SYSTEM FOR CIVIL ENGINEERING AND CONSTRUCTION MACHINE

Toichi Hirata, Ushiku; Hideaki Tanaka, Tsuchiura; Genroku Sugiyama, Ibaraki, and Yusuke Kajita, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00573, § 371 Date Sep. 24, 1990, § 102(e) Date Sep. 24, 1990, PCT Pub. No. WO90/13748, PCT Pub. Date Nov. 15, 1990
PCT Filed May 1, 1990, Ser. No. 573,138
Claims priority, application Japan, May 2, 1989, 1-112207
Int. Cl.[5] F16D 31/02
U.S. Cl. 60—465 13 Claims



1. A hydraulic drive system for a civil engineering and construction machine comprising a hydraulic pump, an actuator driven by a hydraulic fluid delivered from said hydraulic pump, a flow control valve disposed between said hydraulic pump and said actuator, a pressure compensating valve for controlling a differential pressure across said flow control valve, and pump delivery rate control means for controlling a flow rate of said hydraulic fluid delivered from said hydraulic pump dependent on a differential pressure between a pump pressure and a load pressure of said actuator, said pressure compensating valve including a valve body, first control means adapted to apply a first control force based on the differential pressure across said flow control valve to said valve body for urging said valve body in the valve-closing direction, and second control means adapted to apply a second predetermined control force to said valve body for urging said valve body in the valve-opening direction, wherein:

said pressure compensating further includes third control means adapted to apply third control force based on the differential pressure between said pump pressure and the load pressure of said actuator to said valve body for urging said valve body in the valve-opening direction for counteracting a flow force generated by a flow of hydraulic fluid through said pressure compensating valve.

5,150,575

HYDRAULIC BRAKE BOOSTER

Donald L. Parker, Middletown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

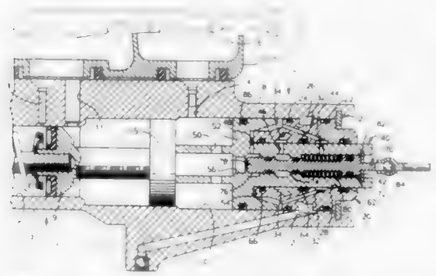
Filed Jul. 22, 1991, Ser. No. 734,006
Int. Cl.[5] B60T 13/00; F15B 9/10
U.S. Cl. 60—547.1 1 Claim

1. A low hysteresis hydraulic brake booster for a vehicle master cylinder which includes a longitudinal bore with a sealed piston mounted therein, the booster comprising:

frame means with a longitudinal bore being generally aligned and exposed to the bore of the master cylinder, and the frame having a first intersecting passage fluidly connected with a sump, the first intersecting passage being generally at an end of the frame longitudinal bore adjacent to the master cylinder, and the frame having a second intersecting passage with the frame longitudinal bore spaced generally opposite from the first intersecting passage for influx of pressurized fluid;

a sleeve located at an end of the frame longitudinal bore opposite the master cylinder piston, the sleeve being fixably mounted within the frame longitudinal bore, the sleeve being sealed with the frame longitudinal bore at two places forming with the frame longitudinal bore a first seal annular chamber, the sleeve having an interior bore generally parallel with the frame longitudinal bore, the sleeve interior bore having a first intersecting passage fluidly connecting a portion of the sleeve interior bore generally opposite the master cylinder piston with an outer periphery of the sleeve at a portion of the sleeve more adjacent to said master cylinder piston than the first annular sealed chamber, and the sleeve having a second passage intersecting with the sleeve interior bore, the second intersecting passage fluidly connecting the sleeve interior bore with the first annular sealed chamber at a portion of the sleeve interior bore more adjacent to the master cylinder piston than the location of the intersection of the first interior retainer passage with the sleeve interior bore;

a power piston contacting the master cylinder piston and the sleeve with a portion slidably mounted within the interior bore of the sleeve, the power piston being generally in the



shape of a cross with a T-section and with a bore generally parallel with the sleeve interior bore, the T-section of the power piston having means of sealing with the longitudinal bore of the frame means, and the power piston having first, second, third and fourth radial passages intersecting with the interior bore of the power piston, the first radial passage when the power piston T-section is contacting the sleeve being generally aligned with the first intersecting passage of the sleeve, the second radical passage being generally aligned with the second intersecting passage of the sleeve and the third intersecting passage being generally adjacent an end of the sleeve most adjacent to the master cylinder piston, and a fourth radial passage intersecting the interior bore of the power piston with the longitudinal bore of the frame and exposed to the sump and being more adjacent to the master cylinder piston than the T-section of the power piston, and the power piston having an orifice generally parallel with the power piston interior bore axially juxtaposed between the third and fourth radial passages of the power piston, and the power piston having three means of sealing with the interior bore of the sleeve the first means of sealing being at an end of the sleeve interior bore generally opposite the master cylinder piston, a second means of sealing being located between intersections of the first and second intersecting passages of the sleeve with the sleeve bore, and a third means of sealing generally at an end of the sleeve most adjacent to the master cylinder piston juxtaposed when the power piston is contacting the sleeve between the second and third radial passages of the power piston;

and a spool valve operatively associated with an operator controlled brake panel of the vehicle having a first landing sealing off the interior of the power piston along and generally opposite the master cylinder piston, a second landing with means of sealing between the second and third radial bores of the power piston, and a third landing with means of sealing with the interior bore of the power piston between the second and third radial passages of the power piston and a head of the spool valve for sealing the orifice of the power piston;

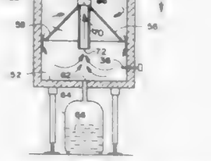
a spring biasing the spool valve to a position away from the master cylinder mounted within the power piston whereby movement of the spool valve towards the master cylinder allows pressurized fluid to flow into the second sleeve intersecting passage through the second radial bore of the power piston around the second landing of the spool valve through the first radial bore of the power piston into the first intersecting passage of the sleeve and to force the power piston forward as the head of the spool valve closes off the orifice preventing the fluid from the side of the T-section of the power piston generally opposite the master cylinder piston from escaping through the third radial passage of the power piston through the orifice and then out the fourth radial passage to the sump.

5,150,576

VAPOR COLLECTING APPARATUS

Richard A. Minzenberger, Chicago, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Nov. 16, 1990, Ser. No. 614,708
Int. Cl.[5] F26B 21/06; B01D 47/00; F28C 1/00
U.S. Cl. 62—11 8 Claims



1. Apparatus for collecting a condensable vapor from a gas mixture including the vapor and a carrier gas, comprising:

a condenser vessel;

a first input means for inputting the gas mixture into the condenser vessel;

a second input means for inputting a cryogen component into the condenser vessel so as to condense the vapor;

a first output means for outputting a first portion of the condensed vapor from the condenser vessel, leaving a modified gas mixture with condensed vapor droplets entrained therein in the condenser vessel;

a second output means for outputting the modified gas mixture from the condenser vessel;

separator means coupled to the second output means for separating condensed vapor droplets from the modified gas mixture and for collecting the condensed vapor droplets; and

means disposed within the condenser vessel to divide the interior thereof into a turbulent flow region and a quiescent flow region;

wherein the first and second input means are located in the

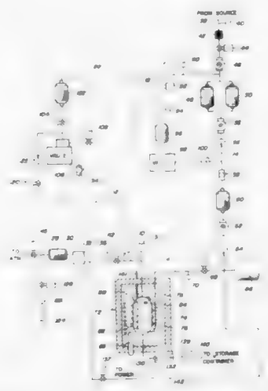
turbulent flow region and the first and second output means are located in the quiescent flow region.

5,150,577

SYSTEM AND METHOD FOR RECOVERING AND PURIFYING A HALOCARBON COMPOSITION

Mark D. Mitchell, 1313 Queen Anne Rd., Wilson, N.C. 27893, and David J. Spring, 25, Springate Field, Langley, England SL3 7DH

Filed Jun. 11, 1991, Ser. No. 713,970
Int. Cl.[5] F25B *3/04*
U.S. Cl. 62—18 30 Claims



1. A halocarbon recovery and purification system for removing nitrogen gas from a halocarbon composition source comprising:
a) a liquid heat exchange unit for holding a liquid heat transfer medium;
b) means for cooling the heat exchange unit and the liquid heat transfer medium therein
c) a halocarbon recovery tank submerged in the heat exchange unit;
d) inlet means for transferring the halocarbon composition from the source into the recovery tank;
e) means for cooling the heat exchange unit, the liquid heat transfer medium therein, the recovery tank and the halocarbon composition therein to a sufficient level to separate nitrogen gas from the halocarbon composition; and
f) vent means associated with the recovery tank for venting the separated nitrogen gas from the recovery tank.

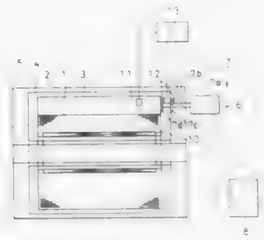
5,150,578

CRYOSTAT

Hisasi Oota, and Kazuki Moritsu both of Akou, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,240
Claims priority, application Japan, Sep. 5, 1990, 2-238691; Nov. 15, 1990, 2-307163
Int. Cl.[5] F17C *5/02*
U.S. Cl. 62—47.1 32 Claims

1. A cryostat comprising:
a cryogen container (2) for containing a liquid cryogen;
a refrigerator system (6) for recondensing a cryogen gas resulting from evaporation of the liquid cryogen;
a pressure sensor (11) for detecting the pressure of the interior of the cryogen container (2); and
pressure control means responsive to a detected pressure for maintaining the interior of the cryogen container (2) at a predetermined constant pressure, wherein said pressure control means comprises:
a heater (12) for heating the interior of the container; and
a pressure controller (13) responsive to a signal from the pressure sensor (11) for controlling energization of the



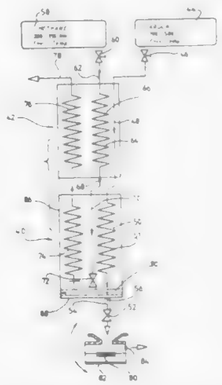
heater (12) to maintain the interior of the cryogen container (2) at a predetermined, constant pressure.

5,150,579

TWO STAGE COOLER FOR COOLING AN OBJECT

Uwe Hingst, Oberteuringen, Fed. Rep. of Germany, assignor to Bodenseewerk Gerätetechnik GmbH, Fed. Rep. of Germany

Filed Dec. 14, 1990, Ser. No. 628,186
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 3941314
Int. Cl.[5] F25B *19/02, 9/10;* F25D *3/10;* H01L *23/46*
U.S. Cl. 62—51.2 10 Claims



1. A cooling apparatus for cooling an object, comprising:
a first cooler constituting an expansion cooler for cooling the object;
said first cooler containing a depressurization outlet;
a first gas source containing a pressurized first gas and connected to said first cooler;
a second cooler for precooling said pressurized first gas to a temperature below a predetermined inversion temperature of said pressurized first gas;
said depressurization outlet of said first cooler depressurizing and thereby further cooling said precooled pressurized first gas;
said depressurization outlet of said first cooler being associated with said object and directing said depressurized and further cooled first gas toward said object for cooling said object;
said object to be cooled being arranged to vent said depressurized first gas after heat exchange of said first gas with said object;
said second cooler constituting a Joule-Thomson cooler containing a depressurization nozzle;
a second gas source containing a pressurized second gas and connected to said second cooler;

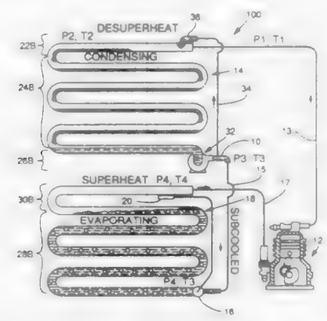
said depressurization nozzle of said second cooler depressurizing and thereby cooling said second gas;
said second cooler further containing a countercurrent heat exchanger disposed upstream of said depressurization nozzle of said second cooler;
said countercurrent heat exchanger of said second cooler precooling said pressurized second gas infed into said second cooler from said second gas source,
by means of said depressurized and cooled second gas originating from said depressurization nozzle;
said first cooler further containing a heat exchanger disposed upstream of said depressurization outlet of said first cooler; and
said heat exchanger of said first cooler receiving said pressurized first gas from said first gas source for heat exchange exclusively with said depressurized and cooled second gas originating from said depressurization nozzle of said second cooler in order to thereby precool said pressurized first gas to said temperature below said predetermined inversion temperature.

5,150,580

LIQUID PRESSURE AMPLIFICATION WITH SUPERHEAT SUPPRESSION

Robert E. Hyde, 2229 SE. 170th, Portland, Oreg. 97233

Filed Mar. 8, 1991, Ser. No. 666,251
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—86 22 Claims



1. An air-conditioning or refrigeration system comprising:
a compressor, a condenser, an expansion valve, an evaporator, and conduit means interconnecting the compressor, condenser, expansion valve and evaporator in series in a closed loop for circulating refrigerant therethrough, the conduit means including:
first conduit means coupling an outlet of the compressor to an inlet to the condenser to convey superheated vapor refrigerant from the compressor into the condenser at a first pressure and temperature;
centrifugal pump means having an inlet coupled to an outlet of the condenser for receiving condensed liquid refrigerant at a second pressure less than said first pressure and boosting the second pressure of the condensed liquid refrigerant by a substantially constant increment of pressure within a predetermined range to discharge the condensed liquid refrigerant from an outlet of the pump means at a third pressure greater than said second pressure;
second conduit means coupling the outlet of the pump means to an inlet to the expansion valve to transmit a first portion of the condensed liquid refrigerant from outlet of the pump means at said third pressure through the expansion valve into the evaporator to vaporize and effect cooling for air conditioning or refrigeration; and
third conduit means coupling the outlet of the pump means to the condenser to transmit a second portion of the condensed liquid refrigerant from outlet of the pump means into the condenser together with the superheated vapor refrigerant to vaporize therein and effect cooling of the superheated vapor refrigerant entering the condenser to a reduced temperature, thereby reducing said first pressure.

5,150,581

HEAD PRESSURE CONTROLLER FOR AIR CONDITIONING AND REFRIGERATION SYSTEMS

Glenn W. Smith, Mt. Airy, Md., assignor to Baltimore Aircoil Company, Baltimore, Md.

Filed Jun. 24, 1991, Ser. No. 720,023
Int. Cl.[5] F25B *39/04*
U.S. Cl. 62—115 12 Claims

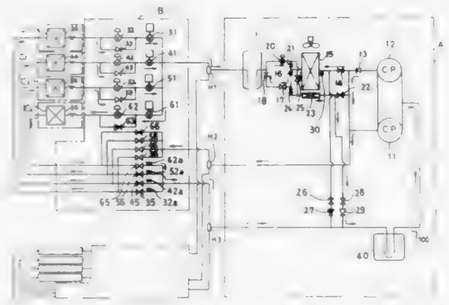
1. A method of controlling the head pressure in a refrigeration or air conditioning system comprising the steps of:
measuring a suction pressure of a working fluid at a point just prior to the working fluid entering a compressor means,
converting said suction pressure into a first signal,
transmitting said first signal to a controller means,
calculating an internal discharge pressure of the compressor by multiplying the first signal representing the suction pressure by a signal representing the internal pressure ratio of the compressor,
measuring a discharge line pressure of the working fluid at a point just after the compressor means outlet,
converting said discharge line pressure into a second signal,
transmitting said second signal to the controller means,
then comparing the calculated internal discharge pressure with the second signal representing the discharge line pressure;
if the absolute value of the difference between the internal discharge pressure and the discharge line pressure is less than a pre-set tolerance, operating in a first mode whereby the controller means does not output any control signal to change the capacity of the condenser means,
if the absolute value of the difference between the internal discharge pressure and the discharge line pressure is greater than the pre-set tolerance, and if the internal discharge pressure is greater than the discharge line pressure, operating in a second mode to decrease the capacity of the condenser means, thereby increasing the discharge line pressure to within the pre-set tolerance of the internal discharge pressure,
and if the absolute value of the difference between the internal discharge pressure and the discharge line pressure is greater than the pre-set tolerance, and if the internal discharge pressure is less than the discharge line pressure, operating in a third mode to increase the capacity of the condenser means, thereby decreasing the discharge line pressure to within the pre-set tolerance of the internal discharge pressure.

5,150,582

MULTIPLE AIR CONDITIONING APPARATUS

Yukifumi Gotou, Shizuoka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 31, 1991, Ser. No. 648,645
Claims priority, application Japan, Feb. 14, 1990, 2-31483
Int. Cl.[5] F25D *21/00*
U.S. Cl. 62—155 13 Claims



1. A multiple air conditioning apparatus having at least one outdoor unit and a plurality of indoor units comprising:
a compressor disposed in said outdoor unit for compressing a refrigerant fluid;
a main outdoor heat exchanger arranged in said outdoor unit, the main outdoor heat exchanger being connected to said compressor;
an auxiliary outdoor heat exchanger arranged in vicinity of said main outdoor heat exchanger, said auxiliary outdoor heat exchanger being connected to said compressor;
means for diverting refrigerant from said auxiliary outdoor heat exchanger except during cooling operation mode and during defrosting of said main outdoor heat exchanger;
a plurality of indoor heat exchangers arranged in said indoor units respectively; and
means for defrosting said main outdoor heat exchanger, wherein in heating operation, said defrosting means supplies said refrigerant discharged from said compressor to said main outdoor heat exchanger and said indoor heat exchangers, and returns said refrigerant which has passed through said main outdoor heat exchanger and said indoor heat exchangers to said compressor through said auxiliary outdoor heat exchanger.

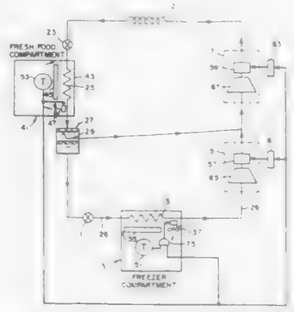
5,150,583

APPARATUS FOR CONTROLLING A DUAL EVAPORATOR, DUAL FAN REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS

Heinz Jaster, and Warren F. Bessler, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 739,364, Aug. 2, 1991, Pat. No. 5,109,678, which is a division of Ser. No. 561,044, Aug. 1, 1990, Pat. No. 5,056,328, which is a division of Ser. No. 293,034, Jan. 3, 1989, Pat. No. 4,966,010. This application Feb. 12, 1992, Ser. No. 834,089
Int. Cl.[5] F25D *17/00*
U.S. Cl. 62—179 1 Claim

1. A refrigerator apparatus comprising:
a freezer compartment;
a fresh food compartment;
a refrigerator system having a compressor, a condenser, a first expansion valve, a first evaporator situated in said freezer compartment, a second expansion valve, a second evaporator situated in said fresh food compartment said refrigerator system elements connected in series in a closed loop in a refrigerant flow relationship;
a first fan situated in said freezer compartment for providing air flow over said first evaporator;
a second fan situated in said fresh food compartment for providing air flow over said second evaporator;
a first thermostatic controller situated in said freezer compartment for maintaining a desired temperature in said



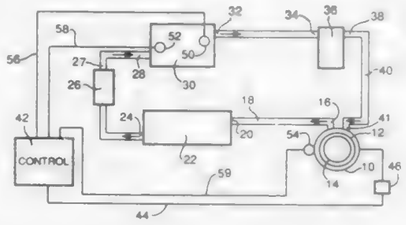
freezer compartment by causing said first fan to operate as necessary when said compressor is operating; and
a second thermostatic controller situated in said fresh food compartment for maintaining a desired temperature in said fresh food compartment by causing said compressor and said second fan to operate.

5,150,584

METHOD AND APPARATUS FOR DETECTING LOW REFRIGERANT CHARGE

Glenn E. Tomasov, Lockport, and Annette M. Schmidt, Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 26, 1991, Ser. No. 765,794
Int. Cl.[5] F25B *1/00*
U.S. Cl. 62—209 5 Claims



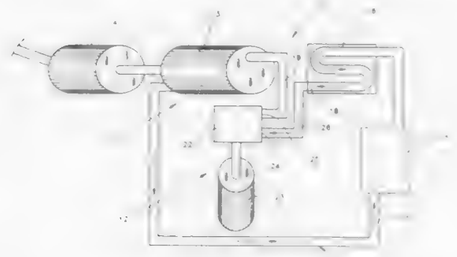
1. In an air conditioning system having a compressor, a condenser, and an evaporator, the evaporator having refrigerant inlet and outlet ends normally at different temperatures, and the system containing a refrigerant which carries a lubricant to lubricate the compressor; control apparatus for protecting the system against loss of refrigerant comprising:
a first sensor on the compressor for sensing the compressor temperature and having a first output signal;
a second sensor for sensing the temperature at the inlet end of the evaporator and having a second output signal;
a third sensor for sensing the temperature at the outlet end of the evaporator and having a third output signal; and
control means for determining the temperature differential across the evaporator from the second and third output signals and for issuing a signal when the temperature differential is below a first threshold indicative of low refrigerant charge and the first output signal is above a second threshold indicative of abnormal compressor temperature.

5,150,585

ENERGY RECOVERY SYSTEM FOR COLD STORAGE WAREHOUSE

Stanley Markiewicz, 842 Shoreview Dr., Henderson, Nev. 89015

Filed Apr. 17, 1991, Ser. No. 687,583
Int. Cl.[5] F25B *9/00*; F25D *9/00*
U.S. Cl. 62—467 20 Claims



1. An energy recovery system, comprising a combination of a refrigeration apparatus including refrigerant compressor, condenser and evaporator components operatively connected by a first conduit system forming a refrigerant flow circuit through which refrigerant is cycled with the refrigerant passing through fluid, vapor and gaseous stages,
a motor for actuating the compressor to effect compression of the refrigerant,
the motor being coupled to the compressor by a thermostatically controlled clutch,
and an energy recovery unit including an electromotive generator coupled to a turbine for extracting kinetic energy from refrigerant flowing through the first conduit system,
the turbine having a refrigerant suction intake and a refrigerant exhaust outlet connected to the conduit system,
wherein kinetic energy extracted from refrigerant flow channelled through the turbine from the turbine suction intake and exhausted through the turbine exhaust outlet impels rotation of the turbine to drive the electromotive generator,
and at least one auxiliary voltage generator is coupled to the motor for rotation thereby to produce electricity independently of the turbine driven electromotive generator upon the energy recovery unit being rendered inoperative when the refrigeration compressor is declutched from the motor.

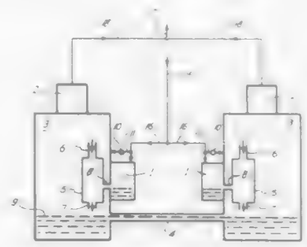
5,150,586

SYSTEM AND PROCESS OF COMPRESSING MISCIBLE FLUIDS

Narcizo O. Basseggio, Rua Pensilvania, 354/13, Sao Paulo, Brazil SP-04564

Filed Nov. 9, 1990, Ser. No. 611,024
Claims priority, application Brazil, Nov. 16, 1989, 8905970
Int. Cl.[5] F25B *43/02*; F04B *39/02*
U.S. Cl. 62—468 14 Claims

1. A system of parallel compressors for compressing fluids miscible with oil, comprising:
a plurality of compressors connected in parallel;
a suction chamber, a discharge chamber, a crankcase chamber and an ejector contained within each said compressor and independent of one another, said ejector including return lubricating oil means used to create an ejector motive force;
conduit means for connecting the crankcase chambers in oil and gas flow communication with one another;
a suction manifold connected to each said suction chamber;
capillary means connected between said suction manifold and said crankcase chambers for equalizing the pressure of



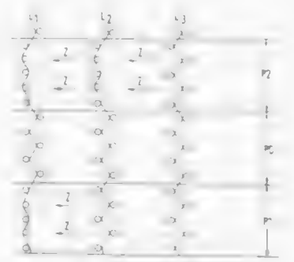
each said crankcase chamber with the pressure of said suction manifold; and
means connected between said ejector and said suction chamber within each said compressor for transferring the oil level between said crankcase chamber and said suction chamber.

5,150,587

WARP KNITTING MACHINE PROCESS AND THE PILE WARE PRODUCED THEREBY

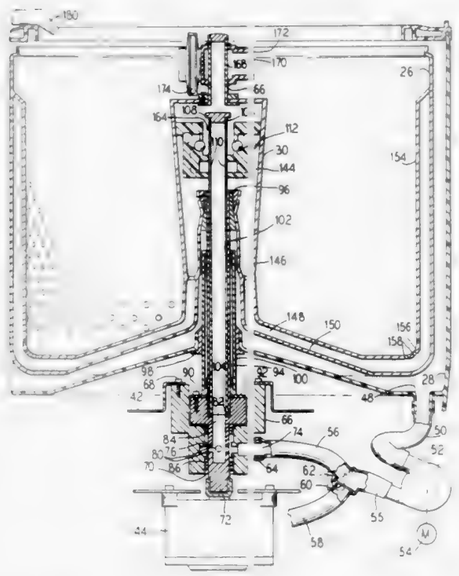
Gerhard Bergmann, Heusentstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertschausen, Fed. Rep. of Germany

Filed Jan. 8, 1991, Ser. No. 638,640
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001621
Int. Cl.[5] D04B *21/02*
U.S. Cl. 66—195 15 Claims



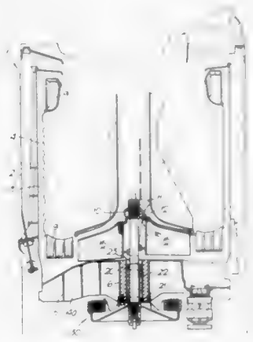
1. A warp knitting machine for producing pile ware with threads, comprising:
a pile sinker bar having a plurality of pile sinkers displaceable in the longitudinal direction, said pile sinkers being operable to hold and be encircled by pile loops; and
at least two guide bars each having a plurality of guides, at least one of said guide bars (a) having jacquard guide means for displacing its guides and (b) being arranged to shog by an amount that selectively produces, in dependence upon the jacquard guide means, either ground ware or pile loops, ground ware being formed by laying the threads without crossing over said pile sinkers, pile loops being formed by laying the threads across the pile sinkers.

5,150,588
CONCENTRATE WASH AUTOMATIC WASHER WITH RECIPROCATING BASKET
Devinder Singh, St. Joseph; Anthony H. Hardaway, Lincoln Township, Berrien County; John W. Euler, St. Joseph, and Jim J. Pastryk, Weesaw Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 28, 1990, Ser. No. 635,777
Int. Cl.[5] D06F 39/08
U.S. Cl. 68—23.5 13 Claims



10. An automatic washer for laundering a textile wash load comprising:
a rotatable wash zone including a peripheral wall;
means for providing agitation to said wash load within said wash zone comprising means for oscillating said peripheral wall and means associated with said wall for imparting an agitation force to said wash load;
means for introducing said wash load into said wash zone;
means for rotating said wash load and said peripheral wall at a speed that is sufficient to maintain said load against said peripheral wall;
spray means mounted centrally within said wash zone for directing a detergent solution against said wash load;
means for continuously passing a concentrated detergent solution, in the range of not less than approximately 0.5% to 4% detergent concentration, through said spinning wash load in the absence of mechanical agitation of said wash load during at least a portion of the time said load is being spun so that the total effective amount passed through is greater than the amount necessary to saturate said wash load;
means for introducing water to said wash zone to dilute said detergent solution;
means for agitating said load in said dilute detergent solution for a second predetermined period; and
means for rinsing said detergent solution from said wash load;
said spray means being mounted on a post which is rotatable with said wash zone

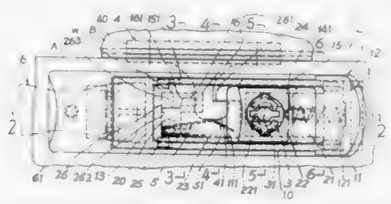
5,150,589
LAUNDRY MACHINE
John J. A. Williams; Frank W. Shacklock, and Keith D. Ferguson, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand
Division of Ser. No. 412,309, Sep. 26, 1989, Pat. No. 5,040,285.
This application Jun. 4, 1991, Ser. No. 709,967
Claims priority, application New Zealand, Sep. 28, 1988, 226374
Int. Cl.[5] D06F 37/40
U.S. Cl. 68—23.7 12 Claims



1. A clothes washing machine including a cabinet and a stationary water container mounted in the cabinet and having a base and a side wall, comprising:
a plurality of downwardly extending ribs on said base;
a bearing tube on said base supported by said ribs;
a pair of vertically spaced bearings mounted in said bearing tube;
a vertical shaft rotatably mounted in said bearings;
a seal between said shaft and said tube mounted above said bearings;
an agitator mounted on said shaft for rotation therewith;
a perforated spin tub within said container;
spin tub bearing means mounted on said shaft for rotatably supporting said spin tub;
a drive system comprising an electric motor having a stator and a rotor and driving means including said vertical shaft to rotatably oscillate said agitator to rotate said spin tub and said agitator together in one direction;
said stator of said motor being fixed to said container and said rotor being fixed to said shaft in a manner so that said spaced bearings act as bearings providing relative rotation of said stator and rotor of said electric motor; and
interconnecting means between said spin tub and said agitator adapted on appropriate operation of operating means to interconnect said spin tub and said agitator for rotation together in one direction by said shaft to produce a spin action and to disconnect said spin tub from said agitator so that only said agitator is rotatably oscillated by rotating oscillation of said rotor to produce a washing action.

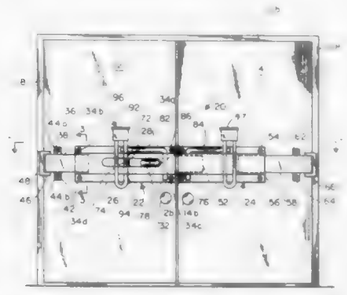
5,150,590
EJECTIVELY OPENABLE LATCH FOR LUGGAGE
Chong-Kuan Ling, c/o Sinox Co., Ltd. P.O. Box 96-156, Taipei, Taiwan
Filed Apr. 23, 1991, Ser. No. 689,541
Int. Cl.[5] E05B 65/52
U.S. Cl. 70—69 3 Claims

1. A latch for luggage comprising:
a housing secured on a first luggage body;
a trigger means slidably held in said housing including a push button protruded frontwardly from a front portion of the trigger means normally sidewardly urged by a restoring spring retained in a first side plate of said housing towards a second side plate of said housing opposite to said first side plate;
a lock means mounted in said trigger means including a lock bolt eccentrically secured to a rear portion of said lock means operatively rotatively biased towards said first side portion of said housing to be retarded by a limiting block formed in said housing for locking said trigger means or rotatively oppositely biased to separate from the limiting block ready for opening said trigger means;
a latch means having a latch base secured to a second luggage body pivotally combinable and coverable with said first luggage body, and a hook portion protruding downwardly to be lockable and engageable with a recess portion formed in a hook socket formed in said trigger means normally urged upwardly by an ejecting spring held in



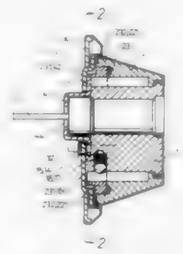
said socket of said trigger means, whereby upon an opening of said lock means for rotatively biasing said lock bolt to separate from said limiting block and a sliding of said trigger means to disengage the recess portion of said trigger means from said hook portion of said latch means, said hook portion will be resiliently ejected upwardly by said ejecting spring to automatically open said second luggage body from said first luggage body; and
said trigger means including an inversion preventing means for preventing unlocking of the latch and locking means when turning a luggage upside down having an inversed-L-shaped ball slot formed in said trigger means including: a horizontal slot having a wedge block secured on a front plate of said housing located in the horizontal slot, a vertical slot perpendicular to the horizontal slot for slidably holding a ball in the vertical slot, and a right-angle corner portion defined between the horizontal slot and the vertical slot.

5,150,591
NORDEN DOUBLE DOOR LOCK
Howard P. Norden, Jr., 3 Crest Hill Pl., Smithtown, N.Y. 11787
Filed Mar. 25, 1991, Ser. No. 674,108
Int. Cl.[5] E05B 65/06
U.S. Cl. 70—129 5 Claims



1. A door locking mechanism for use on a pair of outswinging doors mounted in an opening formed by a frame in which said doors are hinged at opposite edges thereof and having free edges adjacent each other and free to be moved between an open and closed position, said mechanism comprising a first extended member U-shaped in cross section having a pocket facing the first of said doors and having a flange for attaching said first member to the aforesaid first door, said first member extending horizontally with one end terminating substantially flush with the free edge of said first door and permitting the free edge of the second door to move, latching means mounted for sliding movement within said pocket of said first member, said latching means being provided with a handle, said first member having a slot to permit said handle to pass through said slot and extend out of said first member whereby said handle can be employed to move said latching means within said pocket, said slot being of sufficient length to permit said latching means to be moved between a closed position wherein said latching means extends past the free edges of said doors to overlap said second door and an open position where said latching means is positioned so as not to interfere with movement of said second door, first lever means mounted in said first member rotatable between a first position clamping said latching means against said member and a second position releasing said latching means for free movement within said pocket, an opening passing through said first U-shaped member located so that when said latching means is in its closed position said handle is located within said slot between said opening and the free edge of said first door, and when said latching means is in its open position said handle is located on the other side of said opening, locking means for insertion through said opening to lock said latching means in either said open or closed position, a second extended U-shaped member having a pocket mounted on said second door aligned with said first member and having an end flush with the free edge of said second door for receiving said latching means when said latching means is in its closed position, and second lever means being rotatable between a first position clamping said latching means against said second member and a second position unclamping said latching means.

5,150,592
LOCKING DEVICE FOR AN AUXILIARY LOCK
Jui C. Lin, Kaohsiung Hsien, Taiwan, assignor to Taiwan Fu Hsing Industry Co., Ltd., Kaohsiung, Taiwan
Filed Dec. 2, 1991, Ser. No. 800,979
Int. Cl.[5] E05B 9/04
U.S. Cl. 70—190 1 Claim



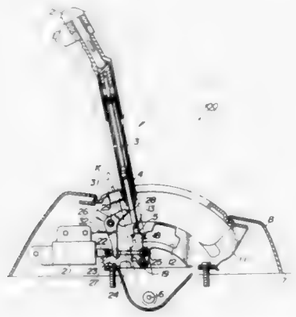
1. A locking device comprising a key cylinder lock, a rotatable ring, a base and an actuating wheel combined together, said lock being additionally provided with a lateral hole for fitting therein a spring and a steel ball elastically pushed by the spring to extend out of the lateral hole a little and to engage with side faces of two adjacent teeth around a toothed ring provided in an inner peripheral surface of the rotatable ring, said toothed ring and the rotatable ring being able to rotate together.

5,150,593

SHIFT LEVER DEVICE FOR AUTOMATIC TRANSMISSION

Tsutomu Kobayashi, and Kazuo Kojima, both of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,281
Claims priority, application Japan, Mar. 4, 1988, 63-28857
Int. Cl.[5] B60R 25/06
U.S. Cl. 70—248 4 Claims



1. A shift lever device for use with an automatic transmission, comprising:

a shift lever having a lock pin and reversibly movable from a parking position to a selected one of a plurality of gear range positions;

a guide plate disposed at least along a range of movement of said shift lever and having a first recess for receiving said lock pin therein, said first recess corresponding to said parking position, and a second recess region corresponding to said plurality of gear range positions, said first recess and second recess region being defined in said guide plate, such that said guide plate allows said lock pin to move through said first recess and second recess region in response to movement of said shift lever;

a lock plate movable for selectively locking said lock pin in said first recess and releasing said lock pin for movement from said first recess;

an actuator for actuating said lock plate to lock and release said lock pin;

release means operable for actuating said lock plate independently of said actuator, in order to release said lock pin for movement from said first recess, wherein said release means is operable manually by a key; and

wherein said actuator comprises a solenoid having a return spring and a rod coupled between said return spring and said lock plate for actuating said lock plate to lock said lock pin in said first recess under the bias of said return spring when said solenoid is de-energized, and wherein said release means includes means for urging said rod to move said lock plate against the bias of said return spring in order to release said lock pin for movement from said first recess.

5,150,594

MACHINE FOR BEADING CYLINDRICAL CANS OR CAN BODIES

Luigi Pazzaglia, Bologna, Italy, assignor to Cefin S.p.A., Bologna, Italy

Filed Nov. 20, 1990, Ser. No. 616,107
Claims priority, application Italy, Nov. 29, 1989, 3732 A/89
Int. Cl.[5] B21D 17/04
U.S. Cl. 72—92 14 Claims

1. A machine for beading cylindrical cans or can bodies, comprising:

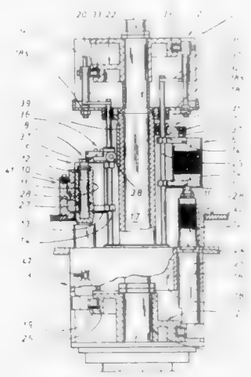
a revolving head or carousel rotatable about a vertical axis and comprising a plurality of work stations passing singly and in succession through a station at which unbeaded can bodies are fed in and a station at which beaded can bodies run out;

means associated with each of the work stations, by which a can body is supported during passage of the work station from the infeed station to the runout station;

fixed reaction means, extending substantially parallel with and externally of the trajectory followed by a can body carried by the support means of each work station, of which an internal face is positioned to enter into contact with a can body during passage of the work station from the infeed station to the runout station and bears a beaded profile with which the can body is to be invested;

means associated with each of the work stations and positioned so as to constrain a single can body during its passage from the infeed station to the runout station, embodied essentially as a revolving mandrel comprising a vertical center shaft ensheathed by a removable barrel of which the external diameter is significantly less than the internal diameter of the can body and of which an external surface affords a profile complementary to that of the fixed reaction means, in such a way that a can body constrained forcibly between the revolving mandrel and the fixed reaction means will be deformed and invested with an beaded profile during passage of the work station from the infeed station to the runout station;

means by which the mandrel and the support means of each work station are moved toward and away from one another through a distance substantially equal to half the height of the can body.



5,150,595

PROCESS AND APPARATUS FOR WORKING AN EDGE PORTION OF A CONTAINER FLANGE

Eugen F. Ihly, Denver, Colo., assignor to Ihly Industries, Inc., Englewood, Colo.

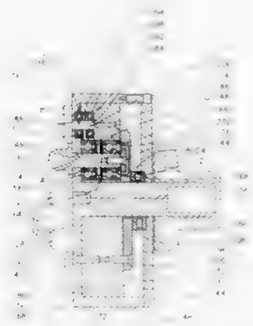
Filed May 9, 1991, Ser. No. 697,751
Int. Cl.[5] B21B 19/14
U.S. Cl. 72—124 26 Claims

1. An apparatus for working an edge portion of a flange, said flange extending in a first direction and being positioned on an open end of a container body, said container body having a longitudinal axis with said flange extending away from said longitudinal axis of the container body, comprising:

a housing having a central axis;

a plurality of rotatable rollers mounted on said housing and circumferentially positioned about said central axis of said housing, said rollers being radially outwardly from the flange edge of the container body when said central axis of said housing and the longitudinal axis of the container body are substantially aligned, said rollers each having a working surface;

rotational driving means associated with said apparatus for imparting rotation to at least one of said container body or said housing to cause relative rotational motion between the container body about its longitudinal axis and said rollers about said central axis of said housing; and



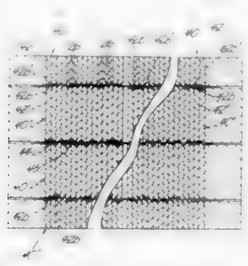
forcing means associated with said housing radially inwardly of said rollers and positionable inside the open end of the container body, for forcing the edge of said alone of the container body radially outwardly toward said rollers, wherein said working surface of each of said rollers engagable with the edge portion is disposed to substantially restrict movement of the flange edge in the first direction and to work the edge portion when engaged therewith.

5,150,596

HEAT TRANSFER FIN WITH DAMMED SEGMENTS

Terry J. Hunt, Lockport, and Michael A. Breda, East Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 11, 1991, Ser. No. 728,419
Int. Cl.[5] B21D 13/04
U.S. Cl. 72—186 4 Claims



1. In a method for forming an air center for a tube and convoluted fin heat exchanger in which a flat strip of roll stock is directed through a pair of rotatable forming discs the steps of:

preshaping the pairs of forming discs to have a series of convolution forming and louver cutting teeth; shaping intermittent ones of cutting teeth to form a dammed convolution panel in the roll stock directed therethrough;

rotating the discs for forming first and second series of convoluted panels in the roll stock having louvers while generating a periodic dammed panel in the convolutions.

5,150,597

HOT STRIP PLANT

Teruo Sekiya, Takahagi; Tomoaki Kimura, Hitachi, and Sadao Nishimura, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1991, Ser. No. 698,390
Claims priority, application Japan, Jun. 12, 1990, 2-152991
Int. Cl.[5] B21B 1/34
U.S. Cl. 72—229 4 Claims

1. A hot strip plant, comprising:

a reversing roughing mill; and

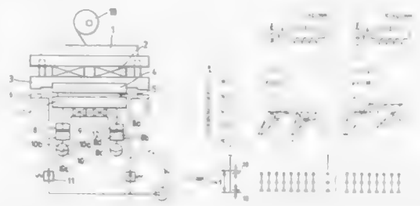
a finishing mill, comprising a reversing finishing stand immediately preceeding two tandem unidirectional six-high rolling stands with relatively small diameter work rolls, said finishing mill being disposed downstream to and at an exit side of said roughing mill, whereby said two six-high rolling stands provide for improved shape control.

5,150,598

APPARATUS FOR SCRIBING GRAIN-ORIENTED ELECTRICAL STEEL STRIP

Takayuki Uchida; Satoshi Ide; Masahiro Yamamoto, and Atsushi Yumoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corp., Tokyo and Nittetsu Plant Designing Corp., Kitakyushu, both of, Japan

Continuation-in-part of Ser. No. 480,824, Feb. 16, 1990, abandoned. This application Aug. 22, 1991, Ser. No. 750,759
Claims priority, application Japan, Feb. 20, 1989, 1-38424
Int. Cl.[5] B21D 28/10, 28/20, 28/18
U.S. Cl. 72—325 10 Claims



1. An apparatus for scribing grain-oriented electrical steel strip which comprises:

a movable die;

a drive unit to reciprocate the movable die;

a fixed die positioned opposite to and within the stroke of the movable die;

a scribing tool having linear teeth that is attached to at least either of the movable and fixed dies, the scribing tool forming linear impressions on strip to the desired depth held either between a die and a scribing tool or between two scribing tools;

a plurality of cylinders each having a piston and piston rod with the piston rods thereof supportingly connected to the fixed die, each cylinder having a back pressure side which increases in pressure by movement of said piston in each cylinder as a result of the scribing tool pressing against said strip; and

an accumulator individually connected to the back pressure side of each cylinder, the accumulator divided into two chambers by a diaphragm, one of the chambers filled with a hydraulic fluid, the hydraulic fluid chamber communicating directly with the back pressure side of the cylinder

with the piston of the cylinder and the diaphragm of the accumulator spaced apart from each other by a distance by which the time the pressure wave spreading throughout the hydraulic fluid takes in traveling from the piston to the diaphragm of the accumulator is kept shorter than the time the teeth of the scribing apparatus takes in reaching the desired depth.

5,150,599

TREATMENT OF METAL SLABS

Geoffrey Wilson, Fulwood; Timothy J. Bradshaw, Bradway, and Kenneth T. Lawson, Hathersage near Sheffield, all of England, assignors to Davy Mckee (Sheffield) Limited, Sheffield, England

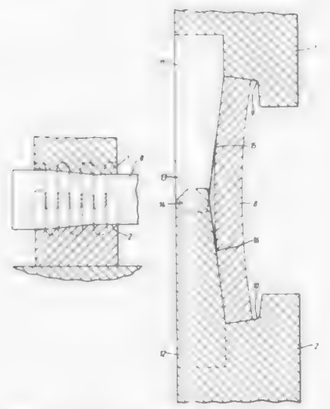
PCT No. PCT/GB89/00986, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/02003, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 24, 1989, Ser. No. 659,345

Claims priority, application United Kingdom, Aug. 26, 1988, 8820296; Apr. 14, 1989, 8908448

Int. Cl.[5] B21J *13/02*, B21B *15/00*

U.S. Cl. 72—399 **13 Claims**



1. A pressing machine comprising

two platens positioned one above the other with at least one of said platens being reciprocatable vertically with respect to the other platen;

means to incrementally feed a hot elongate metal slab in the direction of its length with its width dimension extending substantially vertical and its thickness dimension extending substantially horizontal between the platens so that the platens are engageable with respective upper and lower opposite sides of the slab;

a restraint positioned adjacent to, and horizontally to one side of, the portion of the slab which, in use, is being pressed between the platens so as to control the buckling of the slab in the horizontal direction towards the restraint, the vertical dimension of the restraint being substantially equal to the width dimension of said portion of the slab and being variable so as to accommodate slabs which, before pressing, are of different width dimensions;

and whereby, as a hot elongate metal slab is incrementally fed between the platens, at least said one platen is vertically reciprocated during successive feeding of the slab to cause the platens to engage said upper and lower opposite sides of the slab to reduce the width dimension of the slab and the buckling of the portion of the slab which is being pressed is controlled by the restraint.

5,150,600

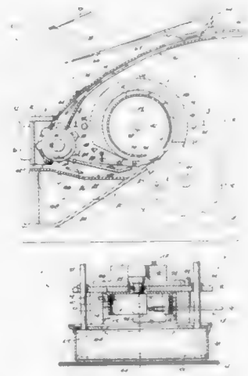
RESILIENT MEMBER NESTING APPARATUS

Horst Wentzek, and Michael Kozak, both of Kenosha, Wis., assignors to Frank L. Wells Company, Kenosha, Wis.

Filed Jan. 22, 1991, Ser. No. 643,725

Int. Cl.[5] B21D *45/00*; B21F *35/04*

U.S. Cl. 72—426 **24 Claims**



1. A nesting apparatus for positioning resilient members in nested relation, said nesting apparatus comprising a frame, means stationarily mounted on said frame for defining a primary chamber adapted to receive a resilient member, means fixed on said frame against movement relative to said frame for defining a secondary chamber adapted to receive resilient members from said primary chamber, means on said frame for feeding resilient members one at a time into said primary chamber, means on said frame for transferring resilient members one at a time from said primary chamber to said secondary chamber to form a nested complement of the resilient members in said secondary chamber, a closure adapted to contain the resilient members within said secondary chamber, and means for displacing said closure to a position affording removal of said resilient members from said secondary chamber.

5,150,601

FLUID SAMPLING FOR GAS CHROMATOGRAPH WITH MODIFIED SAMPLING VALVE

David L. Simeroth, Lake Jackson, Tex.; David S. Brink, Antioch, Calif.; Reid S. Willis, Martinez, Calif., and Dale J. Backlund, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1990, Ser. No. 631,553

Int. Cl.[5] G01N *1/14*

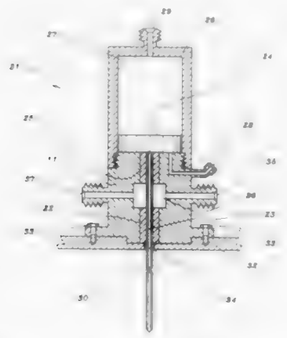
U.S. Cl. 73—23.41 **3 Claims**

1. A process analysis method which is a new use for a process gas chromatography liquid injection valve of the type having a distal heated vaporization chamber portion, a sample chamber portion, a valve stem bore intersecting both chambers, a grooved valve stem positioned within the valve stem bore and a means for moving the valve stem back and forth in the valve stem bore, the vaporization chamber portion of the valve being removed and discarded, the remainder of the valve containing the remaining chamber portion being mounted on a process conduit containing a process liquid or being mounted on a process vessel containing a process liquid, the method comprising the steps of:

(a) flowing a stream of carrier gas through the remaining chamber of the valve to an analyzer;

(b) extending the valve stem from the valve so that the groove is positioned outside the valve and into the process liquid so that the process liquid can fill the groove in the valve stem; and

(c) retracting the valve stem into the valve so that the groove is positioned within the remaining chamber so that



the liquid in the groove can evaporate into the carrier gas and be carried to the analyzer.

5,150,602

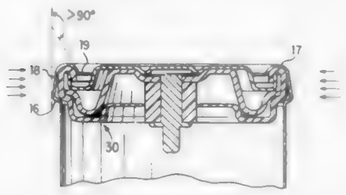
CRIMPING METHOD FOR ELECTROCHEMICAL CELLS

Robert J. Payne, Wellesley, Mass., and Robert A. Yoppolo, Woonsocket, R.I., assignors to Duracell Inc., Bethel, Conn.

Filed Sep. 10, 1990, Ser. No. 580,069

Int. Cl.[5] H01M *2/04*

U.S. Cl. 29—623.2 **12 Claims**



1. An improved method for sealing a cylindrical electrochemical cell having an open ended metal container comprising placing a circular, resilient sealing member in the open end of the container and onto an outwardly directed step near the open end with the top of the sealing member being placed below the upper edge of container; folding the edge of the container inwardly over a peripheral rib of the sealing member and simultaneously compressing said rib between the folded container edge and the container wall and holding said member downwardly onto the step; and reducing the diameter of the stepped portion of the container to the same as that of the remainder of the container whereby the diameter of the sealing member is reduced and said member is compressingly held in place.

5,150,603

HYDROCARBON VAPOR SENSOR AND SYSTEM

Robert A. Boenning, Timonium, and David L. Blair, Cockeysville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 13, 1991, Ser. No. 819,896

Int. Cl.[5] G01N *27/12*; G01M *3/16*

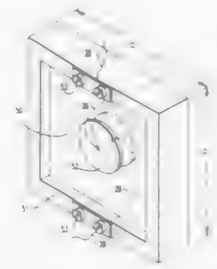
U.S. Cl. 73—31.05 **7 Claims**

1. A hydrocarbon vapor sensor, comprising:

a sensor mount having members for supporting an elastomeric material on all edges;

an elastomeric matrix mounted to said sensor mount having a resistance responsive to hydrocarbon vapor and including metal coated glass spheres;

comparator means for receiving a voltage when said elastomeric matrix senses hydrocarbon vapor, for comparing said voltage with a predetermined threshold voltage and for outputting a signal;



latch means for outputting a signal indicating hydrocarbon vapor has been sensed in accordance with the output signal from said comparator means; and

display means for providing a readout indicative of the sensed hydrocarbon vapor.

5,150,604

METHOD FOR DETERMINING THE END OF USEFUL LIFE OF AN INERT GAS PURIFIER AND APPARATUS THEREFORE

Marco Succi, and Fabrizio Doni, both of Milan, Italy, assignors to Saes Getters SpA, Milan, Italy

Filed Nov. 13, 1990, Ser. No. 611,652

Claims priority, application Italy, Jan. 5, 1990, 19012 A/90

Int. Cl.[5] G01N *15/00*

U.S. Cl. 73—38 **21 Claims**

1. An apparatus for determining the end of useful life of an inert gas purifier (**104**) having an impure inert gas inlet (**106**) in fluid communication with a housing (**108**) containing a gas sorbing material (**110**), said housing being in fluid communication with a purified gas outlet (**112**), said apparatus comprising:

A. a means (**114**) for measuring the gas pressure (P1) at the inlet (**106**), and

B. a means (**116**) for measuring the gas pressure (Po) at the outlet (**112**); and

C. a means (**118**) for determining the gas pressure difference (Pd = P1 − Po) between the inlet (**106**) and the outlet (**112**); and

D. a means (**120**) for comparing (Pd) with a predetermined pressure value (Pp) and indicating when Pd is greater than Pp thus indicating that the inert gas purifier (**104**) has reached the end of useful life

in which the predetermined pressure value (Pp) is that value corresponding to the pressure difference (Pd) when the

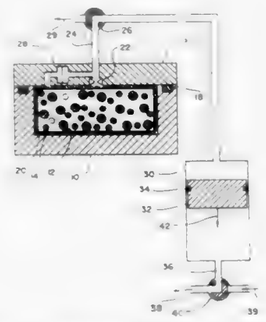
impurity level of the purified gas reaches a critical value above which the purified gas is considered insufficiently pure.

5,150,605

PACKAGE INTEGRITY DETECTION METHOD

Edwin K. Simpson, P.O. Box 266, Hurley, Mo. 65675

Continuation-in-part of Ser. No. 444,530, Dec. 1, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 663,541
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—49.3 8 Claims



1. A method for determining the integrity of a hermetically sealed package without affecting the physical integrity of the package, comprising the steps of,

providing a pressure source for effecting a movement of air mass,

providing an enclosable vacuum chamber suitable for accommodating a hermetically sealed package therein and being enclosable in sealing tight engagement,

providing an airflow path from said vacuum chamber to said pressure source, said airflow path having valve means interposed therein to isolate said vacuum chamber from said pressure source,

further providing said airflow path with mass flow measuring means for measuring the flow of gas mass between said vacuum chamber and said pressure source,

placing a hermetically sealed package in said vacuum chamber and enclosing said vacuum chamber in fluid tight sealing engagement,

effecting a mass flow of gas as between said vacuum chamber and said pressure source through said airflow path,

activating said mass flow measuring means to measure the rate of mass flow through the said airflow path as between said vacuum chamber and said pressure source as a function of time,

providing a standard reference index of mass flow as a function of time for said vacuum chamber when containing hermetically sealed packages thereon,

and comparing said mass flow rate as a function of time against said standard reference index to determine the integrity of said sealed package as tested against said standard reference index.

5,150,606

ACCELERATION DETECTOR

Satoshi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

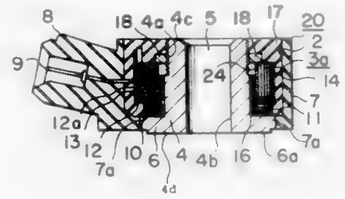
Filed Jul. 30, 1990, Ser. No. 559,798
Claims priority, application Japan, Aug. 1, 1989, 1-198023
Int. Cl.[5] G01P *15/09*
U.S. Cl. 73—35 3 Claims

1. An acceleration detector comprising:

a housing defining a cavity therein and including a substantially cylindrical threaded bushing;

a substantially hollow cylindrical acceleration transducer assembly mounted on said bushing in said cavity and including a piezoelectric element, an inertial weight and an output terminal in a stacked relationship; and

a stop nut thread-engaged on said bushing and having a contact surface at which said stop nut contacts and supports said inertial weight of said transducer assembly for securing said transducer assembly to said bushing, said contact surface maintaining a radial width dimension



smaller than a radial width dimension of said inertial weight to enable said acceleration detector to obtain a substantially constant output over an oscillation frequency range of the acceleration to be detected;

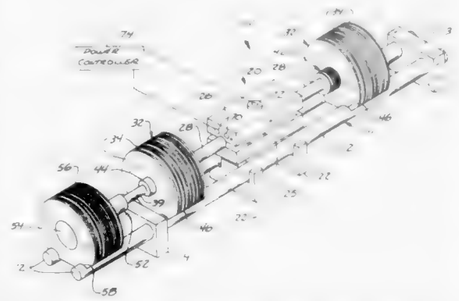
wherein said stop nut has a substantially rectangular cross section, said contact surface is substantially annular, and the radial width dimension of said contact surface is of about 70% of the radial width dimension of said inertial weight.

5,150,607

SPINNING DROP TENSIOEXTENSIOMETER

Daniel D. Joseph, 1920 S. First St., Apt. 2302, Minneapolis, Minn. 55454, and Dave A. Hultman, Anoka, Minn., assignors to Daniel D. Joseph, Minneapolis, Minn.

Filed Aug. 8, 1991, Ser. No. 742,291
Int. Cl.[5] G01N *13/02*
U.S. Cl. 73—64.48 19 Claims



1. An apparatus for determining properties related to the relaxation function of polymers of two different densities comprising:

a tubular member defining an internal chamber, and removable means for sealing at least one end of the tubular member;

means for supporting said tubular member for rotation about a longitudinal axis of the tubular member, said means for supporting including precision bearings for rotationally supporting the tubular member at locations spaced from the ends of the tubular member;

heat dissipating means in heat transfer relationship with said precision bearings for conducting heat away from the bearings;

a furnace member mounted on the apparatus and supported adjacent to substantial portions of said tubular member to provide heat to the contents of said tubular member; and

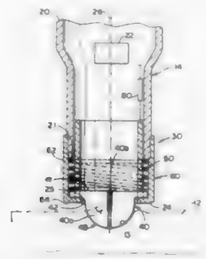
the furnace having an opening through which the tubular member can be observed for measuring diameters of a quantity of less dense polymer formed into a drop on the interior of said tubular member.

5,150,608

CENTERING DEVICE FOR USE WITH BRINELL HARDNESS-MEASURING PROBE

Giancarlo Mazzoleni, 4 Logger Mill Rd., Horsham, Pa. 19044, and Gordon M. Baker, 5592 Long La., Doylestown, Pa. 18901

Filed Feb. 19, 1991, Ser. No. 657,596
Int. Cl.[5] G01N *3/48*
U.S. Cl. 73—81 11 Claims



1. A centering device to improve a Brinell hardness-determining instrument, the instrument having one end configured for placement on a specimen surface to be examined and an opening through the one end providing to optics within the instrument a field of view of the specimen surface on which the one end of the instrument is placed, the centering device comprising:

an alignment member having a central axis and two opposing axial sides, a portion of the alignment member protruding generally concentrically with respect to the central axis from one axial side of the alignment member through the opening to form a centering structure of the alignment member shaped to mate with a generally circular indentation in the specimen surface, a central portion of the alignment member further being configured to freely pass light axially through the alignment member generally around the central axis whereby the field of view of the instrument through the opening is at least substantially unblocked.

5,150,609

ON BOARD COMPUTER FOR A MOTOR VEHICLE

Roland Ebner, Eberdingen, and Dieter Hannig, Weissach, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 572,236
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927921
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 3 Claims

1. An on-board computer arrangement for a motor vehicle comprising:

signal generators providing input signals which are at least one of: analog signals and digital signals;

a microprocessor coupled to receive said input signals and having stored in a memory thereof a plurality of sets of information which comprise at least one of: programs and data for varying processing of said input signals and display of output information derived from said input signals, a desired set from among said programs and data being freely selectable from said sets of information;

a display system arranged in an instrument cluster within a dashboard of said motor vehicle and coupled to receive and display said output information from said microprocessor;

a diagnostic system for a plurality of control systems installed in said motor vehicle, said control systems having a self monitoring function and nonvolatile storage devices for storing error reports concerning said control systems;

a connecting arrangement coupled to said on-board computer;

diagnostic connector means connectable to said connecting arrangement, for switching said on-board computer arrangement from a computer mode to a diagnostic mode for reading said error reports from said nonvolatile storage devices; and

function switch means for selecting at least display functions of said on-board computer in the computer mode, and for

controlling a diagnostic sequence in the diagnostic mode, said function switch means being operable in said diagnostic mode for selecting desired specific sets from said sets of programs and data and output information, said selection being initiated through the diagnostic connector connected to the connecting arrangement, by continuous actuation of a switching alternative of said function switch means for a predetermined time period;

wherein said function switch means is operable for preselecting sequentially a desired set from among said programs, data and output information, in response to at least one short actuation of a switching alternative thereof; and

wherein said microprocessor is adapted to select a preselected set from among said programs, data and output information, in response to removal of the diagnostic connector from the connecting arrangement.

5,150,610

AUXILIARY STARTER SWITCH WITH ILLUMINATED GUARD

Dean E. Myers, South Solon, Ohio, assignor to MAC Tools, Inc., Washington Court House, Ohio

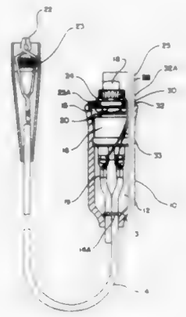
Filed Apr. 22, 1991, Ser. No. 688,456
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.1 6 Claims

1. An auxiliary control switch including a housing and a manually actuatable control button on said switch extending from said housing,

electrical leads connected to said switch and having clips for attachment to a starting motor control to allow temporary auxiliary actuation of the starting motor,

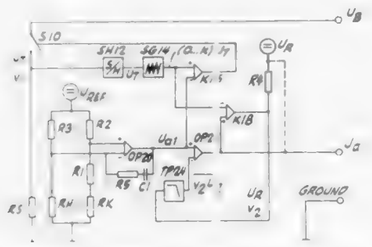
a translucent guard member supported on said housing and extending partially about said control button to limit access thereto,

a warning lamp connected to said leads separately from said switch and supported in optically close-coupled relation



to said guard member, whereby when power is applied to said leads said guard member is illuminated by said lamp.

5,150,611
FLOW SENSOR
Josef Kleinhans, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE88/00776, § 371 Date Oct. 5, 1990, § 102(e) Date Oct. 5, 1990, PCT Pub. No. WO89/07243, PCT Pub. Date Aug. 10, 1989
PCT Filed Dec. 21, 1988, Ser. No. 555,386
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803611
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—204.14 19 Claims



1. A circuit for measuring a mass flow rate of air flowing over a probe, comprising:

a first closed loop control circuit which comprises

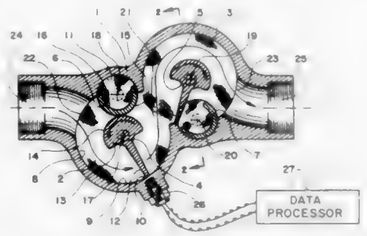
a resistance bridge circuit having a diagonal voltage and including the probe, and

a switching device for receiving a supply voltage, the switching device being controlled by the diagonal voltage across the resistance bridge circuit to generate voltage pulses based on the supply voltage, the voltage pulses heating the probe;

the first closed loop control circuit generating a first output signal based on the diagonal voltage across the resistance bridge circuit; and

a second closed loop control circuit coupled to the first closed loop control circuit, the second closed loop control circuit receiving the first output signal and a reference voltage, and generating a second output signal based thereon, the second output signal being proportional to the mass flow rate of air flowing over the probe.

5,150,612
DUAL REVOLVING VANE PUMP-MOTOR-METER
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Filed Oct. 16, 1990, Ser. No. 598,161
Int. Cl.[5] G01F *3/08*
U.S. Cl. 73—253 9 Claims



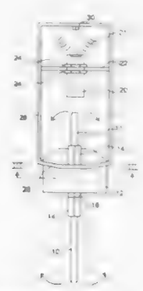
1. An apparatus for measuring rate of fluid flow comprising in combination:

a) a body including a pair of cylindrical cavities having closed end walls and connected to one another by an opening, each of said pair of cylindrical cavities having a cylindrical wall with at least one half thereof substantially coinciding with a circular cylindrical surface of a first diameter, and a cylindrical hub member having at least one half of the cylindrical surface thereof substantially coinciding with another circular cylindrical surface of a second diameter less than said first diameter and coaxial to said a circular cylindrical surface, and including a vane radially extending from the cylindrical hub member in a direction opposite to said circular cylindrical surface portion thereof, said cylindrical hub member disposed within the cylindrical cavity rotatably about an axis of rotation coinciding with the common axis of said a and another circular cylindrical surfaces wherein radial edge of the vane describes said a circular cylindrical surface during rotation of the cylindrical hub member; each of said pair of cylindrical cavities further including a recess included in a portion of wall thereof in a parallel relationship to said common axis, and a cylindrical roller rotatably disposed partially in the recess and having a major portion of cylindrical surface thereof substantially coinciding with a circular cylindrical surface tangential to said another circular cylindrical surface and a minor portion of cylindrical surface thereof including an axially disposed cavity radially extending inwardly from said minor portion of the cylindrical surface, said cavity large enough to accommodate said vane extending from the cylindrical hub member; wherein said combinations of the recess and the cylindrical roller respectively included in said pair of cylindrical cavities are respectively disposed on two opposite sides of a plane including the axes of rotation of said cylindrical hub members respectively included in said pair of cylindrical cavities, and each combination of the circular cylindrical portions of cylindrical surfaces of the cylindrical hub member and the cylindrical roller included in each of said pair of cylindrical cavities provides a barrier against fluid flow thereacross;

b) a first port open to one of said pair of cylindrical cavities through a portion of cylindrical wall thereof adjacent to the circular cylindrical portion thereof and located on one side of the cylindrical roller included in the cylindrical cavity opposite to the side including said opening connecting said pair of cylindrical cavities to one another, and a second port open to the other of said pair of cylindrical cavities through a portion of cylindrical wall thereof adjacent to the circular cylindrical portion thereof and located on the other side of the cylindrical roller included in the cylindrical cavity opposite to the side including said opening connecting said pair of cylindrical cavities to one another; and

c) rotating motion coupling means coupling rotating motions of the cylindrical hub members and the cylindrical rollers in such a way that the cylindrical hub members respectively included in said pair of cylindrical cavities rotate at the same speed in opposite directions, and the cylindrical hub member and the cylindrical roller included in each of said pair of cylindrical cavities rotate at the same speed in opposite directions wherein the cavity included in the cylindrical roller accommodates the vane extending from the cylindrical hub member during rotation thereof, and that the radial edge of at least one of the two vanes slides on respective circular cylindrical portions of the cylindrical walls of said pair of cylindrical cavities at all instances; wherein fluid entering through said first port and exiting through said second port flows across said plane including the axes of rotation of the cylindrical hub members through a space between the cylindrical hub members respectively included in said pair of cylindrical cavities, and produces rotation of the two vanes and vice versa.

5,150,613
MATERIAL LEVEL SENSING DEVICE
Johnny E. Etheridge, 1744 Old Powhatan Estates Dr., Powhatan, Va. 23139
Filed Apr. 10, 1991, Ser. No. 683,059
Int. Cl.[5] G01K *23/60;* B02C *9/04*
U.S. Cl. 73—291 11 Claims



1. A probe for sensing the level of accumulated material in an enclosure, comprising:

a housing;

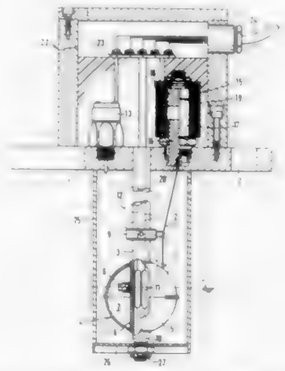
first means for sensing the level of an accumulated material, including a first portion of the first means arranged within said housing to be displaced from a nominal quiescent point due to the presence of a predetermined level of the accumulated material;

second means located within said housing for sensing the relative proximity of the first portion of the first means to the second means; and

means for transmitting a signal to external circuitry to indicate that the relative proximity of the first portion of the first means to the second means has changed by a predetermined value as an indication that the predetermined level of accumulated material has been reached;

wherein the first means further includes a second portion arranged to cause the first portion to be displaced from the nominal quiescent point when the second portion is contacted by the accumulated material as an indication that the predetermined level of accumulated material has been reached.

5,150,614
LIQUID LEVEL SENSING DEVICE
Manfred Urich, Anton-Bruckner-Strasse 3, D-6390 Usingen, Fed. Rep. of Germany
Filed Jun. 25, 1991, Ser. No. 719,733
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1990, 9007189; Dec. 29, 1990, 4042235
Int. Cl.[5] H01H *5/02;* G01F *23/36*
U.S. Cl. 73—308 13 Claims



1. A liquid level sensing device for a liquid tank, with a movably mounted float (4) which includes a permanent magnet (8) and is mounted on a slide tube (3) fabricated of a nonmagnetic material, said slide tube being arranged on a plate (1) in a manner closing an opening of a tank and said device being provided with a switching device (11) which is actuatable in non-contact fashion by magnetic force, the improvement comprising a float (4) movable independently of a liquid level in the tank by a magnetic actuation device (15) into a position in which the switching device is actuated, the actuation device (15) including an armature (16) which is connected to the float (4) by a means (21) providing freedom of movement of the float (4) due to buoyancy and which armature is slidably mounted in a sleeve (17) of nonmagnetic material connected tight with the plate (1) and closed relative to the outside.

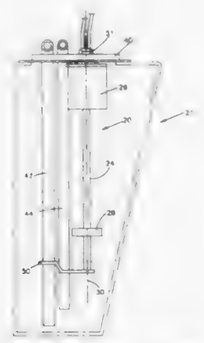
5,150,615
LIQUID LEVEL SENSOR
Michael J. Rymut, Cadillac; Stephen R. W. Cooper, Tustin, and John M. Washeleski, Reed City, all of Mich., assignors to Nartron Corporation, Reed City, Mich.
Continuation of Ser. No. 643,536, Jan. 18, 1991, abandoned. This application Aug. 7, 1991, Ser. No. 742,272
Int. Cl.[5] G01D *5/20;* G01F *23/62*
U.S. Cl. 73—313 13 Claims

1. A fuel level sensor comprising:

a) an elongated probe adapted for insertion into a fuel container including side by side primary and secondary transformer coils wound around first and second coil forms insulated from contact with fuel in the fuel container by an elongated probe housing;

b) a fuel level float positioned within the fuel container for movement along a travel path as the fuel level changes with fuel consumption; said fuel level float including a coupling material that alters the transformer coupling between the primary and secondary transformer coils of said elongated probe as the fuel level float moves along the travel path; and

c) sensing circuitry for exciting the primary transformer coils with an excitation signal and evaluating a position of



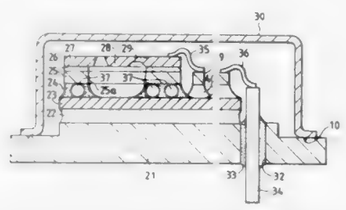
the fuel level float along said travel path from an output signal from the secondary transformer coil.

5,150,616

SEMICONDUCTOR STRAIN SENSOR AND MANUFACTURING METHOD THEREOF

Munenari Kondo, Mie; Masahito Imai, Aichi; Ryoichi Narita, Aichi, and Takushi Maeda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 31, 1990, Ser. No. 575,526
Claims priority, application Japan, Sep. 21, 1989, 1-245852
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—517 R **5 Claims**



1. A semiconductor accelerometer comprising:
a stem having a front and back surface;
a sensor chip for sensing acceleration and bonded to said front surface of said stem by an adhesive, said adhesive having a thickness of 100 to 200 μm; and
a shell for covering said sensor chip attached to said front surface of said stem by a projection welding technique.

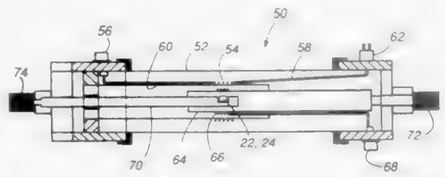
5,150,617

MAGNETOSTRICTIVE RESONANCE EXCITATION

Ricardo B. Schwarz, Los Alamos, N. Mex., and Veli-Tapani Kuokkala, Tampere, Finland, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1990, Ser. No. 574,404
Int. Cl.[5] G01N *29/12*
U.S. Cl. 73—579 **10 Claims**

1. A resonance excitation system for remotely determining the resonance spectrum of a material sample, where the resonance spectrum is input to the rectangular parallelepiped resonance (RPR) method for determining material elastic moduli, comprising:
a material sample having magnetostrictive properties;
excitation coil means for exciting said sample with an oscillating magnetic field over a frequency range selected to include resonance frequencies within said resonance spectrum of said material sample; and



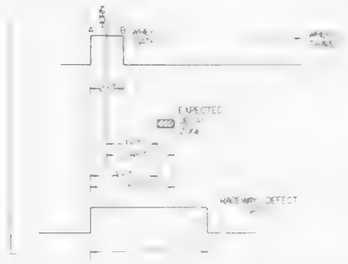
detection coil means coaxial with said exciting coil means and adapted for axially mounting said material sample therein to detect the response of said material sample to said oscillating magnetic field.

5,150,618

ACOUSTIC BEARING DEFECT DETECTOR

Joseph E. Bambara, North Babylon, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Continuation of Ser. No. 376,890, Jul. 6, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 622,176
Int. Cl.[5] G01N *29/00*; **B61K** *1/00*; **G08B** *21/00*
U.S. Cl. 73—660 **18 Claims**



1. In an apparatus for acoustically scanning bearings of wheels of a train during operation of said train as said train moves through a scanning zone of a track, said apparatus being of the type including means for transducing acoustic vibrations into electrical signals and means for processing said electrical signals to isolate signals of predetermined impact frequencies indicative of particular bearing defects, the improvement comprising wheel presence transducers on said track for generating signals indicative of the beginning and the end of a window during which an isolated signal is expected to occur for a particular bearing of said train and means to determine if an actual isolated signal associated with said particular bearing occurs within said window.

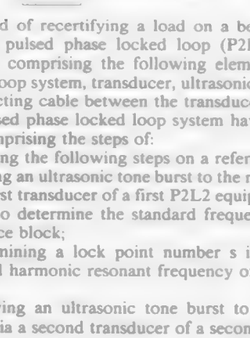
5,150,619

VORTEX FLOWMETERS

John T. Turner, Stockport, England, and Czeslaw O. Popiel, Poznan, Poland, assignors to Schlumberger Industries, Limited, Farnborough, United Kingdom

Filed Jul. 5, 1990, Ser. No. 548,396
Claims priority, application United Kingdom, Jul. 12, 1989, 8915994
Int. Cl.[5] G01F *1/32*
U.S. Cl. 73—861.22 **14 Claims**

1. A flowmeter for measuring the rate of flow of fluid, the flowmeter comprising:
a flow tube forming a passage for the fluid to be measured:
bluff body disposed in the flow tube for inducing vortices in the flowing fluid, the bluff body comprising a first, upstream, cylinder having an arcuate front surface and a planar front surface and a planar or concave rear surface, the two cylinders being separated at their adjacent surfaces by a gap whose width is up to fifty per cent of the diameter of the upstream cylinder; and



a sensing means for measuring the frequency of the vortices shed by the bluff body;
wherein said second cylinder has front edges which are slightly rounded to facilitate fluid flow from the gap.

5,150,620

METHOD OF RECERTIFYING A LOADED BEARING MEMBER

Sidney G. Allison, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 19, 1991, Ser. No. 717,755
Int. Cl.[5] F16B *31/02*
U.S. Cl. 73—862.59 **10 Claims**

1. A method of recertifying a load on a bearing member using various pulsed phase locked loop (P2L2) equipment configurations comprising the following elements of pulsed phase locked loop system, transducer, ultrasonic couplant, and an interconnecting cable between the transducer and the system, each pulsed phase locked loop system having an output frequency comprising the steps of:
(a) performing the following steps on a reference block:
(i) applying an ultrasonic tone burst to the reference block via a first transducer of a first P2L2 equipment configuration to determine the standard frequency F1 of the reference block;
(ii) determining a lock point number s indicative of a selected harmonic resonant frequency of the reference block;
(iii) applying an ultrasonic tone burst to the reference block via a second transducer of a second P2L2 equipment configuration comprising at least one element different from the elements of the first equipment configuration, to determine the resonant frequency F1a of the reference block at lock point s;
(iv) determining a first dimensionless offset compensation factor Fo1 by the relationship

$$Fo1=((F1-F1a)/F1)1000000.$$

(b) performing the following steps on the unloaded bearing member:
(i) applying an ultrasonic tone burst to the unloaded bearing member using the second equipment configuration to determine the reference frequency F2 of the unloaded bearing member;
(ii) determining a lock point number b indicative of a selected harmonic resonant frequency of the bearing member; and
(iii) compensating the unloaded bearing member frequency F2 for equipment offset errors between the first and second equipment configurations by the relationship $F2c=F2+F2(Fo1)/1000000$; wherein F2c is the compensated frequency;
(c) performing the following steps on the reference block:
(i) applying an ultrasonic tone burst to the reference block via a third equipment configuration having at least one element different from the first and second equipment configuration, to determine a resonant frequency F3 at lock point number s of the reference block; and
(ii) determining a second dimensionless offset compensation factor Fo2 by the relationship $((F1-F3)/F1)1000000$;
(d) performing the following steps on the bearing member after a load is applied thereto:
(i) applying an ultrasonic tone burst to the loaded bearing member via the third equipment configuration to determine a resonant frequency F4 (at lock point number b) of the loaded bearing member; and
(ii) determining the bolt load equal to (-1000000) $Cl(((F2c-F4)/F2c)-Fo2)$, wherein Cl is a bearing member calibration factor correlating the measured frequency shift to the applied load

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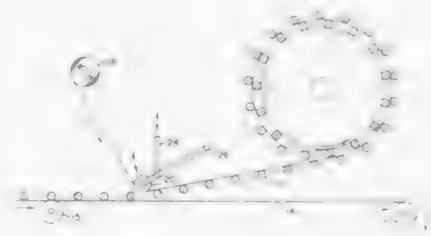
5,150,621

APPARATUS FOR COLLECTING SAMPLES OF ARTICLES CONVEYED AT HIGH SPEED IN CONSECUTIVE ORDER

Jack S. Moore, Jr., Blountville; Johnny R. Cox, and Mark L. Williams, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1990, Ser. No. 607,967
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.91 **6 Claims**



1. Apparatus for intermittently sampling articles comprising
a) a conveyor for advancing articles along a predetermined path,
b) a supply source of adhesive-coated tape adapted to be advanced along a path adjacent to and co-directional with said articles,

c) a drum adapted to have an end of said tape attached thereto and the tape to be wound thereon,
d) an idler roller adapted to bear against the uncoated side of said tape and guide it between said supply source and said drum, said idler roller having a first position guiding said tape out of contact with said articles and a second position guiding said tape into contact with said articles, and
e) means for rotating said drum in a direction and at a speed so as to advance said tape at approximately the same speed as said articles whereby when said idler roller is moved into said second position, articles are picked up by said tape and wound onto said drum

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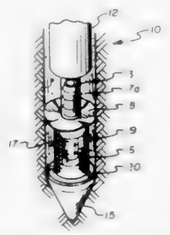
5,150,622
VAPOR PROBE FOR SOIL GAS VAPOR SAMPLER
Arthur R. Vollweiler, 105 Harrison, American Falls, Id. 83211
Filed Feb. 19, 1991, Ser. No. 657,669
Int. Cl.[5] G01N *1/10*
U.S. Cl. 73—864.74 **5 Claims**



1. A soil gas sampling probe for obtaining soil gas samples in the earth, comprising in combination:
a. an elongate cylindrical sampling tube provided with an upper and a lower end and having a multiplicity of gas intake apertures on a surface of the tube;
b. a conically shaped probe tip attached to the lower end of said elongate sampling tube for penetrating the earth as the probe is inserted into the earth to a predetermined depth, said tip having a circumference larger than said cylindrical tube and having a circumferential shelf therein;
c. screening means surrounding the apertures in said cylindrical sampling tube;
d. a flexible disc attached to the upper section of said sampling tube for preventing soil from falling downwardly into a void surrounding said sampling tube and its apertures;
e. flexible tubing attached to the upper end of said sampling tube for transporting gas samples collected through the sampling tube upwardly to the earth's surface; and
f. a removable rigid driving tube surrounding said cylindrical sampling tube and flexible disc for driving said sampling tube into the earth to a predetermined depth; said driving tube being adapted to rest on the circumferential shelf of said conical probe tip while the tip is driven into the earth, and to be removed when the predetermined depth is reached

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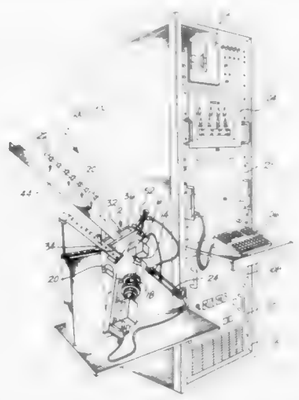
5,150,623
INSPECTION DEVICE FOR FLUSH HEAD BOLTS AND RIVETS
Mark A. Woods, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Jul. 17, 1990, Ser. No. 554,674
Int. Cl.[5] B21J *15/28*
U.S. Cl. 73—865.8 **8 Claims**

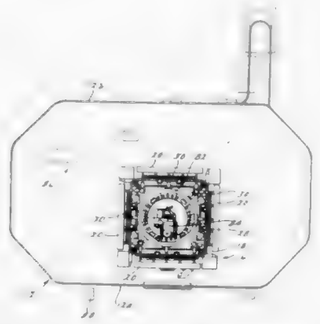
1. A video imaging system for measuring the dimensions of a fastener, comprising:
a pair of orthogonally-oriented cameras;
a feed gate operable to position said fastener at a certain predefined location;
reciprocating chuck member operable to move said fastener from said predefined location into the field of view of said cameras;
a pair of orthogonally-oriented back-lights, one each of said back-lights being directly opposite the field of view of one of said cameras, and oriented so that said fastener is positioned between said camera and said back-light when said fastener is moved into said camera's field of view;
wherein each back-light includes a plurality of light-emitting diodes forming an array of diodes, said array being longer and wider, respectively, than the length and width of any fastener dimensions to be measured, for providing a uniform silhouette of said fastener, without shadows, for each camera; and
wherein said feed gate includes:
a frame;
a guide rail support member slidably mounted to said frame for vertical movement upwardly or downwardly relative to said frame;
a spring interconnecting said frame and guide rail support member, with said spring being biased to urge said guide rail support member normally upwardly;
a guide rail having an upwardly-opening channel shaped to



hold a plurality of fasteners along a line in substantially head-to-toe fashion, wherein an end of said guide rail is connected to said guide rail support member, and defines a lower part of a feed gate region, said guide rail extending outwardly from one side of said frame;
a guillotine gate that is movable vertically upwardly and downwardly over said end of said guide rail, said guillotine gate defining an upper part of said feed gate region, wherein said guillotine gate is operable to block fastener travel through said gate region when it is in its downwardmost position; and
an adjustment screw having a first threaded portion with a certain pitch, and a second threaded portion with another pitch, said first threaded portion being in threaded engagement with said frame, and drivingly connected to said guide rail support member, for adjusting the vertical position of said end of said guide rail relative to said guillotine gate in response to a turning movement of said screw, said second threaded portion being in driving engagement with said guillotine gate for simultaneously adjusting the downwardmost position of said gate relative to said guide rail as said screw turns, wherein said first and second thread pitches are selected in a manner so that said end of said guide rail and said downwardmost position of said gate approach or move away from each other generally

symmetrically depending on the direction of screw rotation.

5,150,624
METHOD OF CALIBRATING A ROTARY TOOL UNIT FOR AN ASSEMBLY LINE
James S. Kaczmarek, 21317 Woodhill, Northville, Mich. 48167, and James M. Steimel, 2436 Lassiter, Rochester Hills, Mich. 48309
Continuation-in-part of Ser. No. 649,537, Feb. 1, 1991. This application Mar. 21, 1991, Ser. No. 672,839
Int. Cl.[5] B23Q *41/02;* **B62D** *65/00;* **B65G** *37/00*
U.S. Cl. 73—865.9 **1 Claim**



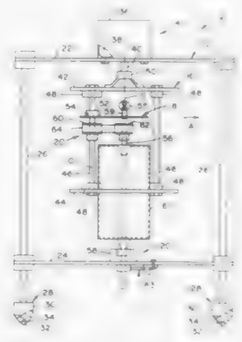
1. A method of calibrating a rotary tool unit for an assembly line or the like, said rotary unit having a motor having at least a normal rotation speed and a creep speed, a plurality of tool stations, and externally positioned clamping blocks for precisely positioning one of said tool stations at a work station, said method comprising:
measuring a necessary angular deceleration distance for said unit;
determining a desired angular creep distance, including margins of safety;
identifying angular positions for tooling on said unit,
determining the range of said clamping blocks;
empirically determining angular switch points for decelerating and engaging the creep speed of said motor to minimize the time to rotate said unit to precisely position any one of said tooling stations at said work station, and inputting said switch points into programmable controller through a multiple resolver rotation transducer.

5,150,625
GYROSCOPIC DEVICE
Frederick H. Mishler, 38561 Tindle Creek Rd., Willamina, Oreg. 97396
Filed Jan. 7, 1991, Ser. No. 638,337
Int. Cl.[5] A63B *69/00, 11/04*
U.S. Cl. 74—5 R **3 Claims**

1. A gyroscopic device comprising:
a housing,
a balance gyroscopic rotor in said housing,
shaft means integrated with said rotor providing a spin axis for said rotor,
support means in said housing receiving opposite ends of said shaft means for rotation of said shaft means and rotor about said spin axis and providing for rotation of said shaft means and rotor relative to said housing about a second axis at right angles to said spin axis,
said support means including continuous circular track means in said housing concentric with said second axis and positioned on opposite sides of and adjacent the ends of said shaft means for rolling contact by end portions of said shaft means when a torque is applied to said housing about a third axis at right angles to both said spin axis and second axis to cause precession of said shaft means and rotor about said second axis,
said track means comprising a circumferential race in said housing with opposed lining portions of a type having a friction surface engagement with said end portions of said shaft means to provide an improved non-slipping, rolling movement of said shaft means and rotor,

and guide ring means in said race having notches receiving end portions of said shaft means and establishing a drive connection between said shaft means and said guide ring means in the rotation of said shaft means and rotor about said second axis, said guide ring means having free sliding movement against said opposed surfaces of said groove.

5,150,626
APPARATUS WITH ROTATABLY-DRIVEN ASYMMETRICALLY-ACCELERATED ECCENTRIC MASS FOR GENERATING TRANSLATIONAL FORCE
Thomas L. Navarro, 2914 Benton St., Wheatridge, Colo. 80214, and James D. Isaacson, 535 Pennsylvania St., Denver, Colo. 80203
Continuation-in-part of Ser. No. 675,700, Mar. 27, 1991, abandoned. This application Jul. 22, 1991, Ser. No. 733,294
Int. Cl.[5] F16H *33/20*
U.S. Cl. 74—84 R **12 Claims**



1. A translational force generating apparatus, comprising:
(a) means for generating rotary drive motion;
(b) orbital means attached to said rotary drive motion generating means for undergoing revolution about a central axis

upon operation of said rotary drive means, said orbital means having a portion defining an orbital axis located radially outwardly of and substantially parallel to said central axis;

(c) an orbital mass mounted to said portion of said orbital means for undergoing revolution with said orbital means about said central axis, said orbital mass also mounted to said orbital means portion for undergoing rotation about said orbital axis and for predisposing the center of mass of said orbital mass in an eccentric relation, and at a preset angular position relative, to said orbital axis;

(d) at least one weight;

(e) a resiliently stetchible means mounting said weight on said orbital mass such that said weight can oscillate primarily along a line extending radially relative to said orbital axis so as to define said center of mass of said orbital mass at a variable location relative to said orbital axis; and

(f) rotation-producing coupling means coupled to said orbital mass for producing rotation of said orbital mass in a first direction about said orbital axis at the same frequency as said orbital mass undergoes revolution with said orbital means in a second opposite direction about said central axis so as to maintain the eccentric center of mass of said orbital mass at said preset angular position relative to said orbital axis and thereby produce an asymmetrical acceleration of said orbital mass relative to said central axis so as to impart a substantially translational force to said apparatus.

5,150,627

CONTROL DEVICE FOR A TILTABLE MOUNTING HEAD

Richard A. Lindsay, Suffolk, United Kingdom, assignor to Vinten Group PLC, United Kingdom

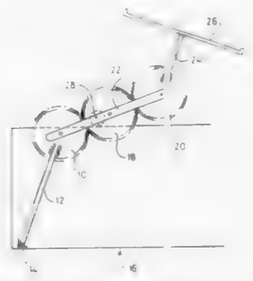
PCT No. PCT/GB90/00158, § 371 Date Jul. 26, 1991, § 102(e) Date Jul. 26, 1991, PCT Pub. No. WO90/09543, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 2, 1990, Ser. No. 730,801

Claims priority, application United Kingdom, Feb. 10, 1989, 8902976

Int. Cl.[5] F16H *37/12*; A47G *29/00*

U.S. Cl. 74—98 **6 Claims**



1. A control device for a tiltable mounting head, comprising a pantographic-type linkage including first and second elements which are movable angularly with respect to one another and means for controlling the relative angular positions of said elements including meshing rotational members to transmit rotation between the first and second elements and means for constraining an intermediate point of the linkage to move along a horizontal path throughout said relative angular movement of the first and second elements of the linkage.

5,150,628

GEARBOX FOR AUTOMOTIVE VEHICLES

Sverker Alfredsson, Västra Frölunda, Sweden, assignor to AB Volvo, Gothenburg, Sweden

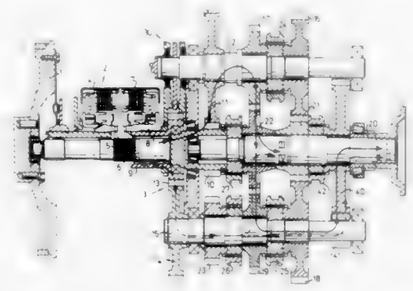
Continuation of Ser. No. 394,413, Aug. 14, 1989, abandoned.

This application Dec. 10, 1991, Ser. No. 804,497

Claims priority, application Sweden, Aug. 12, 1988, 8802885

Int. Cl.[5] F16H *3/38*

U.S. Cl. 74—330 **1 Claim**



1. In a gearbox for automotive vehicles, comprising two mutually concentrically journalled and alternately driven input shafts and two lay-shafts which are driven by the input shafts and which carry gear wheels which mesh with gear wheels on an output shaft, wherein at least one gear wheel rotatably mounted on each lay-shaft and capable of being locked on said each shaft by coupling means meshes with a common gear wheel on the output shaft; the improvement wherein said common gear wheel (22) on the output shaft (20) is journalled for free rotation and can be selectively locked on the shaft with the aid of movable coupling means (27) which in another position release said common gear wheel (22) and lock said output shaft (20) and one of said input shafts (6) together for direct drive, and wherein when in its freely rotatable state the common gear wheel is operative to transmit torque from one to the other of said lay-shafts (12 and 15 respectively).

5,150,629

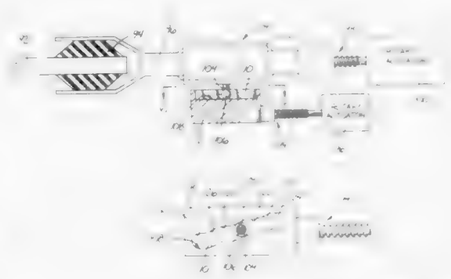
ELECTRO-MECHANICAL POWER CONTROLLER FOR A GEAR SHIFT MECHANISM

Robert L. Morris, Livonia, and Andrew L. Bartos, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1991, Ser. No. 758,019

Int. Cl.[5] F16H *59/10*; G05G *11/00*

U.S. Cl. 74—337.5 **2 Claims**



1. An electro-mechanical controller in a transmission gear selector having a plurality of forward gear ratios, a reverse gear ratio and a neutral condition, said gear selector being movable linearly for selection of the gear ratios, and rotatably for movement in the neutral condition between gear ratios; said controller comprising: a first rotary drive means for providing a gear selection input including a first drive translating means for converting rotary motion to linear motion; a selector rod drivingly connected with said first drive translating means for selective movement thereby to provide linear movement thereof for controlled selection of the forward and reverse gear ratios; a second rotary drive means for providing movement in said neutral condition including a cam member comprising a plurality of ramp portions and a dwell portion between adjacent ramp portions; cam follower means operatively connected with said selector rod and drivingly connected with said cam member and cooperating with said ramp portions for enforcing rotary movement of said selector rod to provide movement in said neutral condition and cooperating with said dwell portion for permitting linear movement of said first drive translating means for gear ratio selection; and compliant coupling means operatively connected between said first drive translating means and said selector rod for providing compliance and damping therebetween in response to input motion.

5,150,630

POWER SWITCHING APPARATUS WITH POWER SWITCHING TIMING

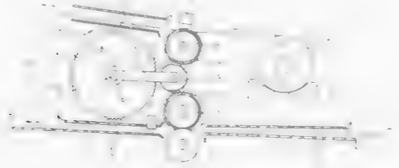
Shigeru Kida, Yamatokouriyama, and Katsuyuki Sakai, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1991, Ser. No. 703,670

Claims priority, application Japan, May 23, 1990, 2-134311

Int. Cl.[5] F16H *3/34*

U.S. Cl. 74—354 **12 Claims**



1. A power switching apparatus, comprising:

a sun gear which can be driven to rotate in a first direction and a second direction which is opposite to said first direction;

an arm having a first and second end, the first end attached to the rotating axis of the sun gear by means for allowing said arm to swing freely relative to the rotating axis of said sun gear;

a transfer gear pivotally provided at said second end of said arm for engaging with said sun gear;

a pair of driven gear disposed a prescribed distance apart from each other in the circumferential direction of said sun gear so that each of said driven gears can engage with said planetary gear independently; and

control means for controlling the position of said transfer gear so as to engage said transfer gear with one of said driven gears, before the initiation of the rotation of said sun gear, wherein said transfer gear moves by its own weight to engage with one of said driven gears when said sun gear is not rotated.

5,150,631

FLEXIBLE THERMOPLASTIC RACK BAR

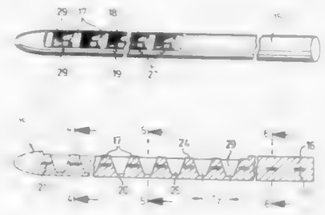
Manfred Faerber, Wielenbach; Otto Wienchol, Pullach, and Bernd Schleicher, Munich, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,666

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1990, 4029011

Int. Cl.[5] F16H *29/20*; F16C *1/20*

U.S. Cl. 74—422 **20 Claims**



1. A flexible thermoplastic toothed rack bar for meshing with a gear wheel, comprising an elongated body of a plastic material, said body being formed with a series of teeth that are supported by a pull-resistant reinforcement that is embedded in the body substantially parallel to a pitch line of the rack bar; wherein the teeth are connected at each lateral side of the rack bar; and wherein the reinforcement is confined to a cross-sectional area of the rack bar which lies heightwise between a head and a root of said teeth.

5,150,632

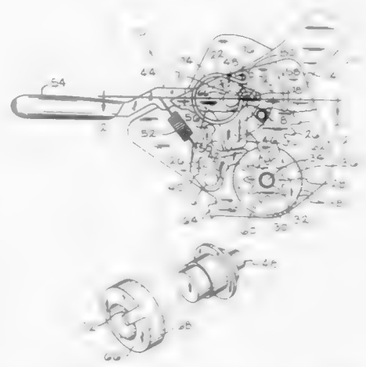
SELF ADJUSTING ECCENTRIC PIVOT MECHANISM

Richard A. Hein, Rochester, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Jun. 27, 1991, Ser. No. 722,250

Int. Cl.[5] A47C *1/026*

U.S. Cl. 74—530 **7 Claims**



4. Recliner mechanism for a seat assembly comprising:

support means;

a seat back arm pivotally mounted to said support means about a first pivot, said seat back arm forming a sector gear portion along a peripheral portion of said seat back arm about said first pivot;

a pinion gear pivotally mounted to said support means about a second pivot, the teeth of said pinion gear meshing with the teeth of said sector gear portion of said seat back support arm;

means for locking said pinion gear to prevent rotation of said pinion gear about said second pivot whereby said seat back support arm is held in a fixed position about said first pivot, said first pivot including a pivot pin fixed to said support means defining a first axis and an eccentric member rotatably mounted on said pivot pin forming an eccentric shoulder having a second axis about which said support arm is rotated; and

bias means for rotating said eccentric member in a direction to urge said second axis toward second pivot whereby said sector gear portion is urged against said pinion gear to eliminate backlash between the teeth of said sector and pinion gears.

5,150,632

SHIFTING ARRANGEMENT FOR A MOTOR VEHICLE TRANSMISSION

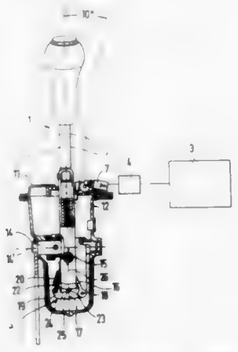
Klaus Hillgärtner, Wimsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Sep. 9, 1991, Ser. No. 756,784

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1990, 4029330

Int. Cl.[5] **B60K** *20/00* **G05G** *5/06*

U.S. Cl. 74—475 **11 Claims**



1. A shifting arrangement for a motor vehicle transmission, comprising:

a shift control housing having a first shifting channel, a second shifting channel parallel to the first shifting channel, and a transverse channel

a selector lever arranged in a cardan joint and which can be swivelled in the first shifting channel for preselecting transmission gears and, via the transverse channel, can be changed over into the second shifting channel;

a joint hub coupled to the selector lever;

a resilient detent link and a detent member that holds the selector lever, in both end positions of the change-over movement, in the detent link and

a tension spring coupled to the detent link;

wherein said detent link includes a detent lever which, on a first side, is rotatably disposed in the joint hub, and on a second side, is braced by the tension spring against the detent member.

5,150,634

CONTROL ARRANGEMENT FOR AUTOMATIC AUTOMOTIVE TRANSMISSION

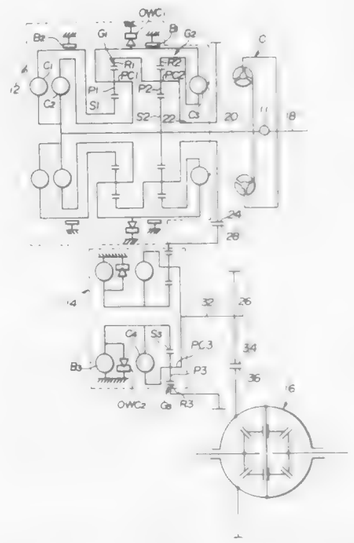
Tatsuo Wakahara, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 18, 1991, Ser. No. 792,526

Claims priority, application Japan, Nov. 21, 1990, 2-316809

Int. Cl.[5] **F16H** *61/16*

U.S. Cl. 74—866 **4 Claims**



1. In a transmission having an input shaft which is operatively connected with a prime mover, and an output shaft

a first gear train capable of selectively producing a plurality of gear ratios, said first gear train being operatively connected with the transmission input shaft and having an output shaft;

a second gear train which is operatively connected with the output shaft of the first gear train and which is capable of producing a plurality of gear ratios, the second gear train being operatively connected with the transmission output shaft;

a one-way clutch which is included in one of said first and second gear trains and which is subject to load when the transmission output shaft is driven to rotate by the torque applied to the transmission input shaft;

load sensor means for determining the load under which the prime mover is operating;

means for determining the rotational speed of the transmission input shaft;

means for determining the rotational speed of the transmission output shaft;

transmission control means responsive to the engine load sensor means, the transmission input shaft rotational speed sensing means and the transmission output shaft rotational speed sensing means, said transmission control means including means for determining if an upshift is required and for, in the event that the prime mover is operating under minimal load and an upshift is indicated as being necessary, inhibiting the upshift until such time as the rotational speed of the transmission output shaft exceeds the product of the input rotational speed and the gear ratio which the transmission is currently conditioned to produce.

5,150,635

METHOD AND APPARTAUS FOR CONTROLLING DRIVING POWER OF MOTOR VEHICLE

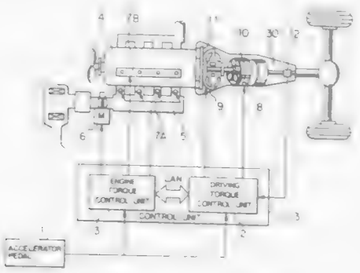
Toshimichi Minowa, Ibaraki, and Yoshishige Ohyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 17, 1991, Ser. No. 686,527

Claims priority, application Japan, Apr. 18, 1990, 2-100321

Int. Cl.[5] **B60K** *41/04*

U.S. Cl. 74—866 **35 Claims**



1. An apparatus for controlling driving power of a vehicle having an engine, a transmission, means for detecting vehicle speed and means for detecting the stroke of an accelerator pedal, comprising:

first means for obtaining a desired driving torque of a vehicle required by a driver on the basis of a detected value of vehicle speed and a detected value of accelerator pedal stroke; and

second means responsive to said first means for controlling the transmission gear ratio of said transmission and engine torque so as to drive an engine substantially in a smallest fuel-cost ratio region on the basis of the obtained desired driving torque.

5,150,636

ROCK DRILL BIT AND METHOD OF MAKING SAME

Thomas E. Hill, Mercersburg, Pa., assignor to London Enterprises, Inc., Mercersburg, Pa.

Filed Jun. 28, 1991, Ser. No. 721,767

Int. Cl.[5] **B21K** *5/02*

U.S. Cl. 76—108.2 **19 Claims**

1. A method of making a rock drill bit having a shank and a replaceable cutting head, comprising steps of

producing a steel shank having a tip with an outer surface having a predetermined cross-sectional shape,

producing a steel head having a working face at one end and a recess at the other end with a cross-section corresponding in shape to that of said shank tip, and having a size at least in the range of 0.012% to 0.38% less than that of said shank tip when the components are at the same temperature,

cooling said shank with a cryogenic fluid to reduce its size to less than that of said recess,

installing said head on said shank tip, and permitting the components to return to ambient temperature, to establish a shrink fit between the head and the shank.

5,150,637

TRANSFER CASE SHIFTING APPARATUS FOR FOUR WHEEL DRIVE VEHICLE

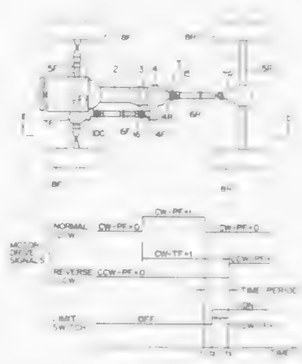
Hiroshi Ninomiya, and Satoshi Fujikawa, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation-in-part of Ser. No. 438,176, Nov. 20, 1989, abandoned. This application Feb. 27, 1991, Ser. No. 663,053

Claims priority, application Japan, Nov. 18, 1988, 63-290186

Int. Cl.[5] **F16H** *59/02;* **B60K** *17/35*

U.S. Cl. 74—335 **4 Claims**



1. An apparatus for shifting a transfer gear assembly of a vehicle, having a center differential, between at least two wheel drive and four wheel drive conditions, the apparatus comprising:

shift means driven by a reversible motor for moving between at least two positions and shifting said transfer gear assembly between said at least two wheel drive and four wheel drive conditions;

a drive condition sensor for providing position signals which direct said shift means to move to a desired one of said at least two positions and shift said transfer gear assembly into a desired drive condition of said at least two wheel drive and four wheel drive conditions;

control means for providing a drive signal which continuously causes said reversible motor to rotate in one direction of rotation according to said position signals so as to move said shift means to said desired one of said at least two positions; and

over load detecting means for being actuated when loads larger than a set load are on said reversible motor, said over load detecting means providing a motor stop signal for stopping said reversible motor when said over load detecting means is actuated;

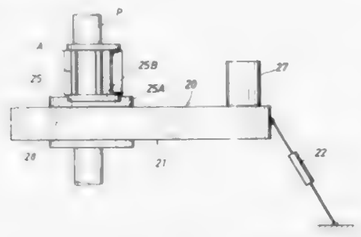
wherein said control means includes a timer for counting down a set time period after a disappearance of said drive signal from said control means and forbids said reversible motor to rotate in another direction of rotation while said time counting means counts down said set time period.

5,150,638

POWER TONG FOR MAKING UP OR BREAKING OUT THREADED JOINTS OF PIPE

Dennis J. Penisson, Raceland, La., assignor to Bilco Tools, Inc., Houma, La.

Filed Feb. 4, 1992, Ser. No. 830,683
Int. Cl.[5] B25B *21/00*
U.S. Cl. 81—57.17 10 Claims



1. A power tong for making up or breaking out threaded joints of pipe, comprising

a housing adapted to be held against rotation,

a head rotatably mounted on the housing,

each of the housing and head having slots adapted to be aligned with one another to receive a joint of the pipe along the axis of rotation of the head,

flexible band means having a length adapted to surround a major circumferential portion of the pipe joint,

an arm mounting a first portion of the band means on the head for swinging between a first position adjacent one side of the pipe joint and a second position to one side of the slot in the head,

means for locking the arm in said first position, and

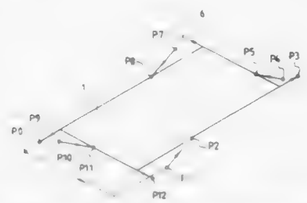
fluid operated means on the head for moving a second portion of the band means in a direction tangentially of the one side of the pipe joint and toward said first portion of the band means so that the pipe joint is tightly gripped by the band means for rotation with the head.

5,150,639

METHOD OF CUTTING THIN FILM OUT AND DEVICE FOR PRACTICING SAME

Fumio Hamamura, Kanagawa, and Katsuyoshi Watanabe, Yamaguchi, both of Japan, assignors to Somar Corporation and Hitachi Techno Engineering Co., Ltd., both of Tokyo, Japan

Filed Oct. 7, 1991, Ser. No. 772,301
Claims priority, application Japan, Dec. 20, 1990, 2-404310
Int. Cl.[5] B26D *1/45*
U.S. Cl. 83—39 9 Claims



5. A device by which a first thin continuous film for conveying a base plate put on said first film and a second thin continuous film stuck to a main surface of said plate are cut out along the contour of said plate, comprising:

a cut-out table on which said plate put on the first film and stuck with the second film is removably placed;

means for initially setting a cutter in a position between both the ends of and offset from one edge of said plate, moving said cutter from said position to said edge to put said cutter into contact therewith, and moving said cutter along said edge;

means for performing the movement of said cutter along all the edges of said plate sequentially in first directions; and

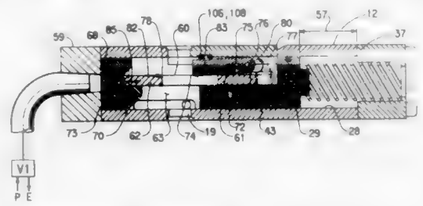
means for moving said cutter along all said edges in directions reverse to the movement of said cutter in the first directions.

5,150,640

HIGH-SPEED CUTTER FOR YARNS

Tadeusz E. Schnitzer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 461,470, Dec. 28, 1989, Pat. No. 5,033,345. This application Apr. 23, 1991, Ser. No. 689,586
Int. Cl.[5] B26D *1/08*
U.S. Cl. 83—583 12 Claims



2. A yarn cutter, comprising:

a) a cutter body containing a bore therethrough with a body notch extending transversely from one side of the cutter body through the bore to a notch bottom, the body notch adapted to receive a yarn;

b) a cutting means for cutting the yarn received in the body notch, comprising:

i) a piston slideably fitted into the bore and adapted to move from a first end of the bore to a second end, the piston having a notch extending transversely from one side of the piston to a notch bottom, which is aligned with the bottom of the body notch,

ii) a cutting element having a notch, the cutting element affixed to the piston, having a planar surface and a cutting edge at one side of the element notch, the edge positioned adjacent to a side of the piston notch adjacent to the first end of the bore, wherein the surface is continuously parallel to the longitudinal axis of the bore, extends from one side of the piston notch to the other, and is supported on both side of the piston notch, and

iii) a cutting element affixed to the cutter body, having a straight line cutting edge that is in contact with the surface of the notched cutting element, thereby creating a line-to-surface contact between the cutting elements throughout the piston travel from the first end to the second end of the bore; and

c) a rigid stop means continuously engaging a surface on the cutter body and a surface on the piston throughout the piston travel, thereby preventing rotation of the piston.

5,150,641

APPARATUS FOR SLICING A WORKPIECE

Peter G. Werner, Pestalozzistrasse 38, 5014 Kerpen, Fed. Rep. of Germany

Filed Sep. 14, 1990, Ser. No. 583,391
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1989, 3931837
Int. Cl.[5] B26D *1/10*
U.S. Cl. 83—647 4 Claims

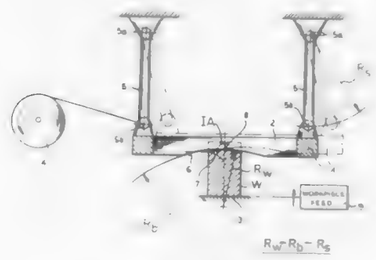
1. In an apparatus for slicing a workpiece, the apparatus comprising:

a support member carrying the workpiece to be sliced;

an elongated cutting blade member juxtaposed with the workpiece and having an arcuate cutting edge in the shape of a circular arc with a blade-edge radius R_b in contact with the workpiece;

a pair of links forming a parallelogrammatic linkage carrying one of the members for oscillating the one member relative to the other of the members parallel to the elongated blade member with an oscillation radius R_S equal to an effective link length; and

drive means coupled with the linkage for oscillating same and including means for displacing the one member toward the other member and causing the blade to cut into



$R_W = R_b - R_S$

the workpiece therein and form therein a kerf having a floor with a circularly arcuate contour having a curvature radius R_W extending between two kerf ends, the improvement wherein

the effective link length and blade are constructed such that the blade-edge radius R_b is greater than the oscillation radius R_S;

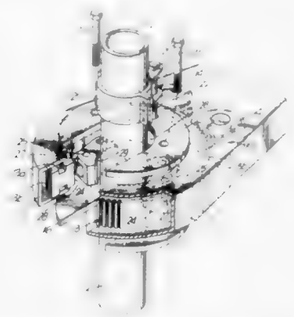
the difference between the blade-edge radius R_b and the oscillation radius R_S is equal to the curvature radius R_W of the kerf and is such that the blade edge contacts the kerf in quasi-point contact along its entire length between the kerf ends as the linkage is oscillated.

5,150,642

DEVICE FOR APPLYING TORQUE TO A TUBULAR MEMBER

Victor Moody, Lowestoft, and Andrew Jenner, St. Olaves, both of Great Britain, assignors to Frank's International Ltd., Norfolk, England

Filed Sep. 5, 1991, Ser. No. 755,158
Claims priority, application United Kingdom, Sep. 6, 1990, 9019416
Int. Cl.[5] B25B *17/00*
U.S. Cl. 81—57.2 4 Claims



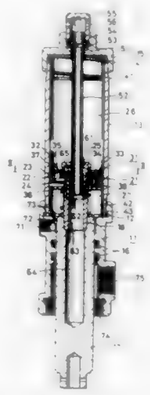
1. A device for applying torque to a tubular member, comprising a primary support for disposition about the tubular member, a drive member mounted on the support for rotation relative thereto about the axis of the tubular member, a secondary support disposed coaxially with the drive member, the drive member being capable of rotation relative to the secondary support, gripping elements pivotally mounted on the secondary support for movement into and out of gripping engagement with the tubular member, cam means and follower means one of which means is carried by the drive member and the other of which means is carried by the gripper elements, whereby the drive member operates the gripping elements through the cam and follower means so that rotation of the drive member relative to the secondary support in one direction actuates pivotal movement of the gripping elements into said gripping engagement with the tubular member and in the opposite direction causes the gripping elements to release their grip on the tubular member, and releasable means whereby the secondary support can be rotationally fixed relative to the tubular member.

5,150,643

RECIPROCATING ACTUATOR

Seiji Saita, Yokohama, Japan, assignor to Kabushiki Kaisha Yamada Corp., Tokyo, Japan

Filed Oct. 22, 1990, Ser. No. 602,119
Claims priority, application Japan, Nov. 16, 1989, 1-297945
Int. Cl.[5] F01L *21/04, 25/02*
U.S. Cl. 91—229 1 Claim



1. A reciprocating actuator comprising:

a cylinder;

a single-rod piston slidably fitted in said cylinder;

said single-rod piston dividing said cylinder into first and second working fluid chambers;

a plunger connected to said single-rod piston;

means for permitting said single-rod piston and said plunger to move in a reciprocating motion within said cylinder;

a directional control valve mechanism;

said directional control valve mechanism including means, effective at ends of said reciprocating motion, for switching the supplying anal discharging of working fluid into and from said first and second working fluid chambers;

a working fluid discharge pipe extending from one end through an entire length of said cylinder;

means for sealing said working fluid discharge pipe to said single-rod piston;

at least one inner hole running the length of said working fluid discharge pipe;

and said directional control valve mechanism including means for releasing said working fluid from said first working fluid chamber into said at least one inner hole

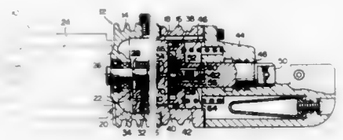
during travel of said single-rod piston in one direction of its reciprocating motion;
said directional control valve includes:
an upper valve plate;
a washer below said upper valve plate;
at least one working fluid discharge hole in said washer;
a valve seat in said washer;
at least one ventilation hole in said washer;
at least one coupler passing slidably through said washer;
said at least one working fluid discharge hole communicating with said at least one inner hole, thereby allowing working fluid to enter said at least one inner hole and exhaust through said at least one inner hole;
said at least one ventilation hole communicating, between said first and second working fluid chambers;
means for closing said at least one working fluid discharge hole by said upper valve plate at a first extreme of motion;
a lower valve plate; and
means for closing said at least one ventilation hole by said lower plate at a second extreme of motion.

5,150,644

RELEASE VALVE MECHANISM IN A FLUID OPERATED LINEAR ACTUATOR FOR A PORTABLE CUTTER OR THE LIKE

Kiyoshi Kimura, Fujisawa, Japan, assignor to Kabushiku Kaisha Ogura, Kanagawa, Japan

Filed Apr. 10, 1991, Ser. No. 683,074
Claims priority, application Japan, Apr. 17, 1990, 2-40945; May 21, 1990, 2-52841
Int. Cl.[5] F15B *15/22*
U.S. Cl. 91—395 **9 Claims**



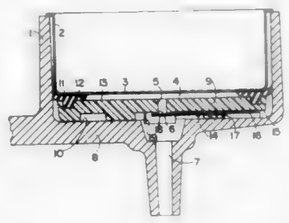
1. A fluid operated linear actuator comprising:
(a) a housing having a pair of opposite ends;
(b) a piston slidably received in the housing and defining therein a fluid chamber between the piston and one end of the housing, the piton having formed therein a hollow and a hole communicating the hollow with the fluid chamber;
(c) there being a fluid intake port and a fluid discharge port defined in the housing for the intake of a fluid under pressure into the fluid chamber and for the discharge of the fluid therefrom, at least the fluid discharge port being formed in said one end of the housing;
(d) release valve means disposed in the fluid chamber and extending through the hole in the piston and into the hollow in the piston so as to permit the movement of the piston relative to the release valve means, the release valve means having a valve head which is disposed in the hollow in the piston and which is movable relative to the housing for opening and closing the fluid discharge port wherein the release valve means further comprises:
a valve stem extending through the hole in the piston and having the valve head formed on one end thereof, the valve stem being movable with the valve head into and out of abutment against said one end of the housing for opening and closing the fluid discharge port; and
resilient means acting between the housing and the valve stem for biasing the latter in a direction for opening the fluid discharge port;
(e) the hole in the piston being formed to include at least one fluid passageway for the admission of the pressurized fluid from the fluid chamber into the hollow in the piston at least during the travel of the piston away from said one end of the housing under the fluid pressure, with the release valve means held closing the fluid discharge port under the fluid pressure acting on the valve head during such piston travel, the maximum diameter of the hole inclusive of the fluid passageway being less than the diameter of the valve head of the release valve means whereby the pressurized fluid being admitted into the hollow in the piston through the fluid passageway acts on the valve head at or toward the end of the travel of the piston away from said one end of the housing thereby causing the release valve means to open the fluid discharge port.

5,150,645

FILTER HOLDER FOR A COFFEE MACHINE OF THE "ESPRESSO" TYPE

Patrice J. C. Schiettecatte, Alencon, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France

Filed May 29, 1991, Ser. No. 707,004
Claims priority, application France, May 30, 1990, 90 06734
Int. Cl.[5] A23F *5/24*
U.S. Cl. 99—295 **4 Claims**



1. Filter holder adapted to be mounted on a coffee machine of the "espresso" type, said filter holder comprising a receptacle (**1**) adapted to receive a filter (**2**) in the form of a cup which is intended to contain an amount of ground coffee and whose bottom (**3**) is perforated, and an infusion collection chamber (**4**) situated beneath the bottom (**3**) of said filter and comprising a bottom wall (**9, 8'**) which has an infusion outlet channel (**5**) therein, said channel (**5**) having an opening (**6**) communicating with a distributing funnel (**7**) permitting coffee to flow out from the receptacle, said filter holder further comprising a device for making foam comprising a flexible blade (**14**) disposed transversely across the opening (**6**) of the channel (**5**), one end (**16**) of which is anchored on a base (**17**) integrated with the bottom wall (**9, 8'**) of the chamber (**4**), and the other end (**18**) of which is free and is applied with a predetermined spring force against said opening (**6**) so as to produce a laminar infusion jet only when the pressure in the chamber (**4**) is greater than the force with which the free end (**18**) of the blade is applied against the opening (**6**), and a partition (**19**) arranged around the blade (**14**) and extending downwardly such that the infusion jet becomes atomized on the partition thereby forming the foam.

5,150,646

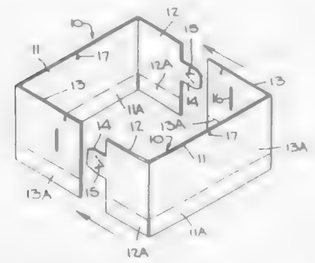
STACKING AND BUNDLING FORM FOR NEWSPAPERS TO BE RECYCLED

John Lonczak, 14 Park Pl., Newburgh, N.Y. 12550

Filed Feb. 11, 1991, Ser. No. 653,620
Int. Cl.[5] B65B *13/18*
U.S. Cl. 106—34 **5 Claims**

1. A rectangular form having an open top adapted to facilitate a neat stacking and bundling of newspapers to be recycled, said form having rectangular dimensions substantially the same as those of a standard folded newspaper and of an unfolded tabloid, said form being composed of a pair of complementary sections, each section comprising:
(a) a broad side wall;

(b) a minor end wall at right angles to one end of the side wall and provided with a projecting locking tongue; and
(c) a major end wall at right angles to the other end of the side wall and having a slot therein adjacent its edge to receive the locking tongue of the other section, said major end wall being wider than said minor end wall, said sections being assembled in opposed relation with the major and minor walls partially overlapped, to an extent permitting the tongue of each section to be inserted in the slot of the other section whereby the form has a width determined by the combined dimensions of the partially overlapped major and minor end walls, said side wall and said end walls each being provided with a fold-in, relatively narrow bottom flap, the flaps of the sections overlapping at the corners of the form to maintain its rectangular shape without closing the bottom of the form, the side walls of the sections including upper edges provided with keyhole slots to retain ends of a first cord which extends transversely along the bottom of the form, the major end walls of the sections including upper edges provided with keyhole slots to retain ends of a second cord which extends longitudinally along the bottom of the form, whereby when the form is loaded with a pile of papers which overlie the cords, the ends of the cords may then by removed from said slots and be tied to bundle the pile.

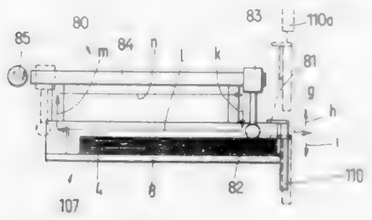


5,150,647

APPARATUS FOR SEVERING STACKS OF SHEETS

Wolfgang Mohr, Hundshager Weg 42, D-6238 Hofheim, Fed. Rep. of Germany

Continuation of Ser. No. 38,886, Apr. 15, 1987, abandoned. This application Oct. 26, 1989, Ser. No. 427,979
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613315
Int. Cl.[5] B30B *9/20*
U.S. Cl. 100—90 **1 Claim**



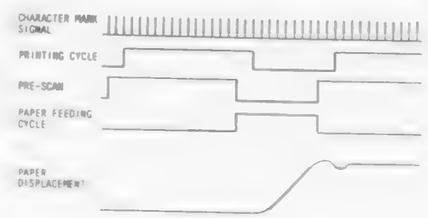
1. Apparatus for manipulating stacks of paper sheets at a treating station where the stacks are subdivided into smaller stacks and a transfer station at which the stacks are positioned for transfer to the treating station, comprising a support including a working section at the treating station and a mobile section; guide means defining a path for movement of the mobile section between the transfer station and the treating station so that the mobile section can deliver stacks to the treating station; means for manipulating stacks at the treating station; means defining a loading station adjacent said transfer station and arranged to support stacks prior to delivery to said transfer station; and means for expelling air from between the sheets of stacks at said loading station, including an elongated hold-down device for stacks on the mobile section, an air expelling element including an elongated roller which is parallel to said hold-down device, and means for urging said air expelling element against the stacks on the mobile section from above and for moving said element along the mobile section.

5,150,648

METHOD AND APPARATUS FOR DETECTING PRINT-TERMINATION IN LINE PRINTER

Kenji Okada, and Tsukasa Ogawa, both of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,235
Claims priority, application Japan, Jun. 23, 1989, 1-161782
Int. Cl.[5] B41J *1/20*
U.S. Cl. 101—93.14 **18 Claims**



1. In a line printer comprising: a character carrier adapted to continuously move along a print line; a plurality of print hammers arranged side by side along the print line so as to be in opposition to said character carrier; a code generator for storing character codes according to the arrangement of characters carried on said character carrier; a print line buffer for storing print data; a comparing means for comparing a character code supplied from said code generator with a print datum supplied from said print line buffer and for generating a print hammer drive signal when the type element code and the print datum accord with each other; and a pre-scanning flag for storing information indicating presence/absence of print data for every print hammer column when the print data is stored in said print line buffer;
a method of detecting termination of printing comprising the steps of:
performing anticipatory comparison to judge whether a character X columns after a character currently opposing one of said print hammer columns accords with the print data or not, when comparison between the character currently opposing to said one print hammer column and the print data is made by said comparing means;
rewriting contents of a corresponding column of said pre-scanning flag to indicate "absence of print data" when the step of anticipatory comparison determines that the character X columns after said character currently opposing to said one print hammer column accords with the print data; and
recognizing termination of printing when all the columns of said pre-scanning flag indicate "absence of print data".

5,150,649

INK POT DEVICE FOR PRINTING MACHINE

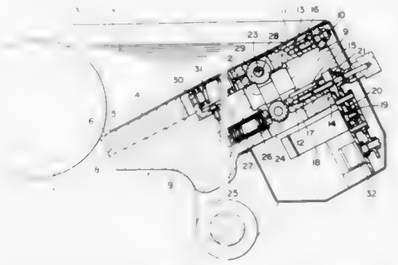
Tuneo Kumaki; Toshikatu Nagase, both of Omiya, and Yasuhisa Shichijo, Saitama, all of Japan, assignors to JPE Co., Ltd., Saita Ma Ken, Japan

Continuation of Ser. No. 363,281, Jun. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 92,237, Sep. 2, 1987, abandoned. This application Jan. 11, 1991, Ser. No. 639,752

Claims priority, application Japan, Sep. 11, 1986, 61-214259; Sep. 11, 1986, 61-214261; Sep. 12, 1986, 61-140481[U]; Sep. 12, 1986, 61-269333; Mar. 26, 1987, 62-44036[U]

Int. Cl.[5] B41F *31/04, 31/06, 27/06*

U.S. Cl. 101—365 9 Claims



1. In an ink pot device of the divided ink key blades type comprising an ink gate roller having a peripheral face, a body, a plurality of ink keys, each ink key of said ink keys having a front end adjacent to said peripheral face and a rear end; links, each link of said links being associated with a respective ink key and having one end which is pivotally supported by a pivot shaft behind said respective said ink key; individual eccentric means associated with and connected to a respective said link, each eccentric means being fixedly mounted on the pivot shaft and moveably together with said respective link and being in constant contact with the rear end of a respective said ink key, and means for swinging each respective link by acting on the other end thereof so that, by swinging each respective link to shift the eccentric means, the distance between the front end of each respective ink key and the peripheral face of the ink gate roller may be changed to adjust the amount of ink supplied onto the ink gate roller; the improvements which comprises:

a means for moveably holding the pivot shaft of each respective link in the moving direction of each respective ink key, and

a means for shifting the holding means, so that each respective ink key may be shifted independently of the means for swinging each respective link, thereby changing the distance between the front end of each respective ink key and the peripheral face of the ink gate roller.

5,150,650

CLEANER FOR ROTARY BODIES SUCH AS BLANKET CYLINDER, IMPRESSION CYLINDER, INK SUPPLY ROLLERS AND THE LIKE

Yoshichika Murakami, 17-4, Sugao 5-Chome, Miyamae-ku, Kawasaki-shi, Kanagawa-ken, Japan

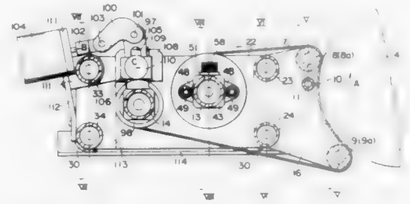
Filed Aug. 31, 1990, Ser. No. 576,018

Claims priority, application Japan, Sep. 1, 1989, 1-224560; Apr. 6, 1990, 2-91778

Int. Cl.[5] B41F *35/00*

U.S. Cl. 101—425 26 Claims

1. A cleaner for cleaning a rotary body such as a blanket cylinder, impression cylinder, ink supply rollers and the like, comprising: a cleaning cloth having a portion stretched between two supporting points so that said portion is in full surface contact with and may be pressed against a peripheral surface of a rotary body to be cleaned; means for supplying a washing material onto the back of the cleaning cloth; means for advancing the cleaning cloth in a direction opposite to the rotation of the peripheral surface of the rotary body, the means for advancing comprising a supply roll for supplying the cleaning cloth between the supporting points and a take-up roll for taking up the cleaning cloth from the supporting points; bearings for supporting both ends of the supply roll; and braking means for braking the supply roll comprising a brake shoe



disposed in at least one of the bearings and means for controlling the brake force of each brake shoe to thereby control the stretched force of the cleaning cloth; wherein the bearings include an opening for attaching and detaching the supply roll and a cover rotatably connected to the brake shoe to open and shut the opening for attachment and detachment.

5,150,651

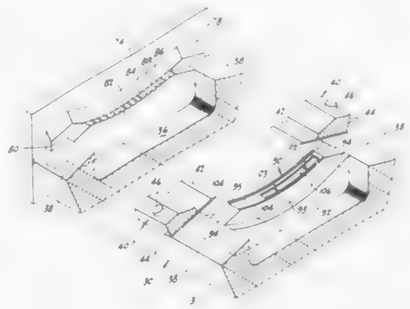
DOCTOR-BLADE ASSEMBLY FOR FLEXOGRAPHIC PRESS

Carlos R. Flores, 931 Craven Dr., Suisun City, Calif. 94585

Filed Jun. 10, 1991, Ser. No. 712,570

Int. Cl.[5] B41F *31/06*

U.S. Cl. 101—207 18 Claims



1. An improved doctor-blade assembly for a flexographic press having an anilox ink metering roll, the assembly comprising:

an ink fountain having an elongated tray with a base, sides and ends, forming an interior ink chamber, the sides each having a sloped mounting lip with a doctor blade and clamp means for clamping the doctor blade along the lip wherein the doctor blades are oppositely arranged on the lips, each blade having a projecting portion defining in part the formed ink chamber; and,

actuator means for positioning the ink fountain in juxtaposition with the anilox roll, wherein the ends of the ink fountain tray have end plates and improved end seals fabricated from an elastomeric material, wherein the ink tray and clamped doctor blades form a cross section of the ink chamber with an irregular configuration, the end seals having a unitary construction with a contoured central portion, and a contoured flared portion,

wherein the contoured central portion of the end seals projects into the ink chamber and under slight compression has a configuration conforming to the irregular cross section of the ink chamber, the central portion including an arcuate edge surface that contacts the anilox roll when the ink fountain is in position against the roll, and,

wherein the contoured flared portion of the end seals extends from the central portion and seats between the end of the ink tray and the end plates when the central portion is projected into the ink chamber for sealing the ends of the ink fountain at their juncture with a rotating anilox roll.

5,150,652

DEVICE FOR PUSHING PRINTING MATERIAL FOR USE IN A PRINTING APPARATUS

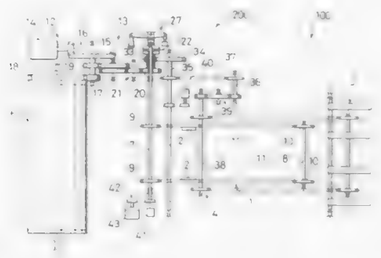
Hiroshi Yamamoto, Higashihiroshima, and Mitsuhiro Hanato, Kouchi, both of Japan, assignors to Fuji Kikai Kogyo Kabushiki Kaisha, Hiroshima and Dainippon Ink and Chemicals, Inc., Tokyo, both of, Japan

Filed Mar. 5, 1992, Ser. No. 846,314

Claims priority, application Japan, Mar. 11, 1991, 3-13448[U]

Int. Cl.[5] B41F *21/00*

U.S. Cl. 101—232 6 Claims



1. A device for pushing printing material for use in a printing apparatus comprising:

an impression cylinder for applying a specified printing to printing material;

first drive means for driving the impression cylinder;

pusher means for feeding the print material to the impression cylinder;

a drive shaft for driving the pusher means;

drive transmission means for transmitting driving force from the first drive means to the drive shaft;

first clutch means which engages and disengages to permit and prohibit transmission of driving force from the first drive means to the drive shaft;

actuating means for actuating the first clutch to engage and disengage;

second drive means for rotating the drive shaft;

second clutch means which engages and disengages to permit and prohibit transmission of driving force from the second drive means to the drive shaft;

control means for controlling the second clutch means to engage and disengage; and

operation means for operating the control means.

5,150,653

METHOD OF AND APPARATUS FOR CLEANING A CYLINDER

Akira Hara, Tokyo, Japan, assignor to B-J Trading Limited, Tokyo, Japan

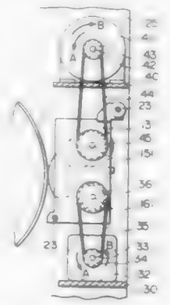
Division of Ser. No. 249,953, Sep. 27, 1988. This application Feb. 10, 1992, Ser. No. 833,551

Claims priority, application Japan, Nov. 6, 1987, 62-280644

Int. Cl.[5] B41F *35/00*

U.S. Cl. 101—483 1 Claim

1. A method of cleaning a cylinder comprising: pressing a cleaning cloth onto the outer peripheral surface of said cylinder while said cylinder is rotating; forwardly feeding said cleaning cloth so as to wipe off contaminant on said outer peripheral surface of said cylinder; and partially feeding backwardly the portion of said cleaning cloth which has been fed forwardly during the preceding cleaning operation, before the



next cleaning operation is started, whereby said portion of said cleaning cloth is partially used again for the cleaning in the next cleaning operation.

5,150,654

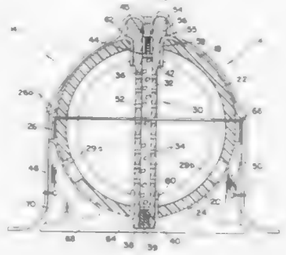
SPHERICAL IGNITER FOR FULL HEAD-END WEB ROCKET MOTORS

Roger A. Grosgebauer, Ogden, and C. Max White, Brigham City, both of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Oct. 15, 1987, Ser. No. 109,882

Int. Cl.[5] F42C *19/08*

U.S. Cl. 102—202 9 Claims



1. An igniter for a rocket motor including a solid propellant having an aft-end surface, comprising:

a first plastic hemispherical shell,

a second plastic hemispherical shell,

said first and second hemispherical shells each being lined with a layer of solid igniter propellant fuel and joined together to form a solid propellant fuel lined spherical pressure vessel,

an igniter initiator for effecting ignition of the solid igniter propellant fuel lining said spherical pressure vessel, said initiator including an elongated tubular housing having an axis, a first end, and a second end and extending through said spherical pressure vessel from substantially the center of said first hemispherical shell to substantially the center of said second hemispherical shell, said elongated tubular housing being attached at said first end thereof to said first hemispherical shell and being attached at said second end thereof to said second hemispherical shell whereby said elongated tubular housing serves as a structural tie between said first and said second hemispherical shells, and

a mounting foot incorporated in said second hemispherical shell to facilitate bonding of said igniter to the aft-end

surface of the rocket motor propellant with the axis of said elongated tubular housing substantially perpendicular thereto,

said second hemispherical shell having a plurality of nozzle ports therein spaced about the periphery thereof for igniter gas discharge against the aft-end surface of the rocket motor propellant and subsequent ignition of said rocket motor propellant.

5,150,655

HORIZONTALLY FLEXIBLE RAIL

Hideyuki Sakai, Okazaki, Japan, assignor to Nichidai Industrial Co. Ltd., Aichi and Daiwa Paint Trading Co. Ltd., Nagoya, both of, Japan

Filed Apr. 23, 1991, Ser. No. 689,327
Claims priority, application Japan, Apr. 24, 1990, 2-108220
Int. Cl.[5] B61B 7/00
U.S. Cl. 104—89 19 Claims

1. A flexible rail comprising

(i) rail pieces (R_0–R_n) which are in contact with each other, intermediate ones (R_1–R_{n-1}) of the rail pieces each having a concave front end face and a convex rear end face and being in contact with adjacent rail pieces at its concave front end face and its convex rear end face, respectively,

a foremost one (R_0) of the rail pieces having a straight and flat front end face and a convex rear end face and being in contact with the adjacent rail piece (R_1) at its convex rear end face, and

a rearmost one (R_n) of the rail pieces having a concave front end face and a straight and flat rear end face and being in contact with the adjacent rail piece (R_{n-1}) at its concave front end face,

(ii) connecting plates (S_0–S_n) for connecting the rail pieces (R_0–R_n) together,

each of the connecting plates (S_1–S_n) except a foremost one (S_0) bridging adjacent rail pieces,

(iii) means for fixing each of the connecting plates (S_1–S_n) except the foremost connecting plate (S_0) on a top of one of adjacent rail pieces,

(iv) pivotal connecting means (P_1–P_n) located along a longitudinal centerline of the flexible rail for connecting each of the connecting plates (S_1–S_n) to the other one of the adjacent rail pieces such that the connecting plate, together with the rail piece to which the connecting plate is fixed, can move in an arc, in a horizontal plane, relative to the other one of the adjacent rail pieces, and

the pivotal connecting means thus connecting the adjacent rail pieces together for relative arcing motion,

(v) means for fixing the foremost connecting plate (S_0) on a top of the foremost rail piece (R_0),

(vi) arcing-motion limiting means for limiting the arcing motion of the connecting plate to a relatively small range,

(vii) the convex rear end face of each of the intermediate rail pieces (R_1–R_n) and the concave front end face of the adjacent rail piece which is in contact therewith, coinciding with a curved line produced by drawing a circle with a predetermined radius round a center of an opening of the rail piece into which the pivotal connecting means connecting the adjacent rail pieces together is inserted,

(viii) the convex rear end face of the foremost rail piece (R_0) and the concave front end face of the rail piece (R_1) located immediately behind the foremost rail piece (R_0), coinciding with a curved line produced by drawing a circle with a first given radius round a center of an opening of the foremost rail piece into which the pivotal connecting means connecting the foremost rail piece and the rail piece (R_1) together is inserted, and

said first given radius being equal to said predetermined radius, and

(ix) the concave front end face of the rearmost rail piece (Rn) and the convex rear end face of the rail piece (R_{n-1}) located immediately in front of the rearmost rail piece, coinciding with a curved line produced by drawing a circle with a second given radius round a center of an opening of the rail piece (R_{n-1}) into which the pivotal connecting means connecting the rearmost rail piece and the rail piece (R_{n-1}) together is inserted, and

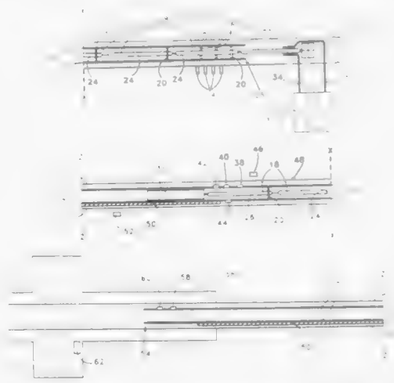
said second given radius being equal to said predetermined radius.

5,150,656

RAILROAD CAR POSITIONING APPARATUS

Ernest W. Lobb; Bruce A. Robbins, both of Aurora, and David L. Depew, Boling Brook, all of Ill., assignors to Svedala Industries, Inc., Milwaukee, Wis.

Filed Aug. 10, 1990, Ser. No. 565,644
Claims priority, application Canada, Sep. 28, 1989, 615556
Int. Cl.[5] B60J 3/08
U.S. Cl. 104—162 18 Claims



1. A railroad car positioning apparatus for positioning a railroad car, the railroad car having at least two axle members spaced apart along a longitudinal axis of the railroad car, each of the at least two axle members being provided with wheels on the opposing ends thereof, each of the at least two axle members being disposed at a given height, said railroad car positioning apparatus comprising:

a carriage member;

dog means mounted on said carriage member;

means for selectively positioning said dog means and for

extending at least a portion of said dog means to at least either of a first position wherein at least a portion of said dog means extends from said carriage member to at least the height of the axle members of the railroad car for contacting at least one of the axle members of the railroad car, and a second position wherein at least a portion of said dog means is fully disposed beneath the height of the axle members of the railroad car;

said dog means comprising a first dog member and a second dog member;

each of said first and second dog members comprising at least one dog;

said first dog member for contacting a portion of each of said axle members;

said second dog member for contacting a substantially opposite portion of each of said axle members;

displacement means for displacing said carriage member in a direction parallel to the longitudinal axis of the railroad car and for exerting a force between at least a portion of said dog means and at least one of the axle members of the railroad car and for thereby moving the railroad car;

said displacement means comprising a plurality of hydraulic cylinders;

at least one of said hydraulic cylinders being disposed in series with at least another of said hydraulic cylinders;

said positioning means comprising at least one of:

a hydraulic cylinder; and

a cable;

said hydraulic cylinder being attached to said cable for moving said cable; and

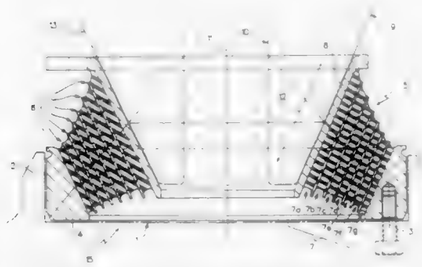
said cable being connected to at least one of said first and second dog members for moving at least one of said first and second dog members.

5,150,657

TRAIN OF RAILWAY CARS HAVING TRUNCATED CONICAL RESILIENT ARTICULATION ON SHARED TRUCK BETWEEN TWO ADJACENT CARS

Jacques Bourgeot, Taverny, France, assignor to Caoutchouc Manufacture et Plastiques S.A., Versailles, France

Filed Dec. 28, 1990, Ser. No. 635,961
Claims priority, application France, Dec. 29, 1989, 89 17531
Int. Cl.[5] B61D 17/00; B61G 5/02
U.S. Cl. 105—3 19 Claims



11. Connecting means for connecting first and second car bodies of a railway train, the first and second car bodies being supported on a truck means, said connecting means comprising:

a resilient member;

first attaching means for attaching said first car body to said resilient member;

second attaching means for attaching said second car body to said resilient member;

said resilient member comprising:

a stack of seven truncated conical resilient elements and six truncated conical rigid elements;

said resilient elements being alternately positioned relative to said rigid elements such that each adjacent pair of resilient elements is separated by one rigid element;

said stack defining a symmetrical axis;

each said resilient element defining an average radius measured from said symmetrical axis;

each said resilient element defining a linear dimension along a straight line segment of its conical surface, such linear dimension of each said resilient element having a magnitude inversely related to the square of its corresponding average radius;

each said linear dimension of each said resilient element having two extreme ends and a midpoint between the two extreme ends;

each average radius of each said resilient element being a radius measured from the midpoint of said linear dimension to said symmetrical axis;

each said resilient element being configured to define a generally constant thickness having a magnitude inversely related to its corresponding average radius as 1/R where R is the corresponding average radius;

said first attaching means being a first armature;

said second attaching means being a second armature; and wherein,

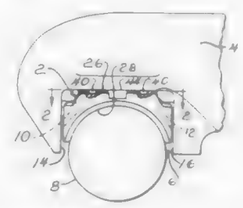
said resilient elements have opposite exposed ends, each of said exposed ends defining a line thereacross, a first of said lines across said exposed ends intersecting a straight line segment defined by the conical surface of said second armature at a first angle, said first line intersecting a straight line segment defined by the inner surface of said first armature at a second angle, a second of said lines across said exposed ends intersecting said straight line segment defined by the conical surface of said second armature at a third angle, said second of said lines intersecting said straight line segment defined by the inner surface of said first armature at a fourth angle, whereby, said first angle is substantially less than said third angle, and said second angle is substantially greater than said fourth angle.

5,150,658

RAILCAR ADAPTER

Robert S. Grandy, Hinsdale, Ill., assignor to Unity Railway Supply Co., Inc., Bensenville, Ill.

Filed Nov. 23, 1990, Ser. No. 617,186
Int. Cl.[5] B61F 5/32
U.S. Cl. 105—218.1 5 Claims



1. A bearing adapter for a railcar pedestal side frame having outboard and inboard lugs and a roof comprising

an adapter body having an upper crown and a lower saddle for contacting a bearing element,

said adapter body having a pair of opposed spaced lugs defining tracks for the outboard and inboard lugs of the pedestal side frame,

said adapter body having means for permitting lateral movement of said adapter body relative to the roof of said pedestal side frame,

said upper crown having a surface for contacting the pedestal side frame, said upper crown includes lubrication means for facilitating relative lateral movement between said adapter body and the roof of said pedestal side frame,

said lubrication means being embedded beneath said at least one surface and having a portion exposed at said surface for reducing the friction of said surface, and

said lubrication means releasing a lubricant over said surface through wiping action between said surface and the pedestal side frame during lateral movement,

said means for permitting lateral movement between said adapter body and the pedestal side frame is provided by the distance between said opposed spaced lugs being greater than the distance between the outboard and inboard lugs of the pedestal side frame for creating a clearance for said lateral movement.

5,150,659

ENTERING AND EXITING STEP SYSTEM FOR VEHICLES WITH TWO STEP PIVOTAL SUPPORT FOR ACCOMMODATING PLATFORMS OF VARYING HEIGHTS

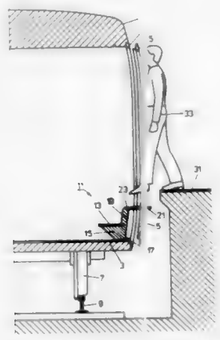
Hans Bickel, Beringen, Switzerland, assignor to Renfe, Spain

Filed Mar. 15, 1991, Ser. No. 670,350

Claims priority, application Switzerland, Nov. 29, 1990, 3778/90; Spain, Mar. 1, 1991, 9100526

Int. Cl.[5] B61D *23/02*

U.S. Cl. 105—447 **16 Claims**



1. Apparatus for enabling boarding and getting off a vehicle, wherein the vehicle includes a floor and an entry door into the vehicle for moving onto and off the floor, and wherein the floor of the vehicle is at one of either the same level as a platform outside the vehicle door, or higher than the platform, or lower than the platform;

the apparatus comprising

at least a first step generally at the floor and at the door,

height adjustable means mounting the first step in a height adjustable manner with respect to the floor of the vehicle selectively at the level of the floor of the vehicle, above the floor of the vehicle or lower than the floor of the vehicle for enabling a person boarding or getting off the floor of the vehicle through the door to move from or to the platform outside the door of the vehicle, the height adjustable means comprising a support and a pivot axis for the support, the pivot axis extending generally longitudinally of the vehicle at the door and generally at the floor of the vehicle, the first step being supported on the support at a location spaced away from the pivot axis and being pivotable around the pivot axis between a first pivot position where the first step is at one height and a second pivot position where the first step is at another height with respect to the floor of the vehicle, wherein in the first pivot position of the support, the first step is supported above the floor of the vehicle, and at the second pivot position of the support, the first step is supported below the floor of the vehicle, and

a second step supported by the support above the first step when the first step is in the first position above the floor of the vehicle, and the second step then also being located further toward the floor of the vehicle than the first step.

5,150,660

FABRIC MATERIAL AND CLOTHING APPAREL AND APPAREL ACCESSORIES MADE THEREFROM

Charles P. Kuczynski, Bayonne, N.J., assignor to Ty-Breakers Corp., Hackensack, N.J.

Filed Feb. 5, 1991, Ser. No. 650,499

Int. Cl.[5] D05B *93/00*

U.S. Cl. 112—402 **15 Claims**

1. A fabric material having a good hand and substantial feel which is suitable for making clothing apparel and apparel accessories said material comprising an outer layer of a non woven spun bonded olefin fabric material which is waterproof, windproof and weather-resistant to which is sewn or bonded a fabric lining layer of a natural or synthetic fiber or a blend thereof, said lining may be optionally fleeced.

5,150,661

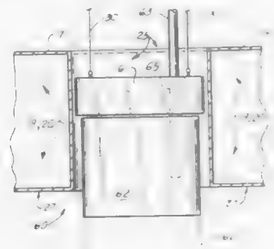
RETRACTABLE STEERING DEVICE FOR CARGO BARGES THAT INCREASES MANEUVERABILITY BY PROVIDING A PIVOT POINT OR POINTS WHEN ALTERING COURSE

William B. Rudolf, 10001 Point Aux Chenes Rd., Ocean Springs, Miss. 39564

Filed May 30, 1990, Ser. No. 530,639

Int. Cl.[5] B63H *25/00*

U.S. Cl. 114—26 **9 Claims**



1. A retractable steering device for maneuvering liquid/bulk cargo carrying barges that can be lashed together to form a tow, comprising:

a) a rectangular barge hull having a generally flat bottom and upper deck, and generally vertical port and starboard sidewalls;

b) a cargo hold contained at the central portion of and extending over a substantial portion of the barge hull area for containing a bulk or liquid cargo;

c) port and starboard wing tanks positioned respectively between the port and starboard sidewalls of the hull and the cargo hold;

d) a pair of longitudinally extending slots positioned adjacent the respective port and starboard wing tanks and defining an opening that communicates at least with the barge bottom to provide an opening to the sea under the barge bottom at the respective wing tanks; and

e) a pair of respective port and starboard steering members adapted to move within the respective slots and each being movable between an extended position wherein the steering member extends downwardly well below the barge hull bottom to increase tow maneuverability by creating a steering pivot point when the barge is being pushed, and a retracted position wherein the steering member is protectively contained within the slot, said steering members including a lower steerable portion that can be rotated when the steering member is in the extended position.

5,150,662

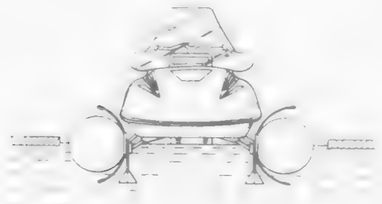
SNOWMOBILE FLOTATION SYSTEM

James A. Boyd, RR #2, Port Carling, Ontario, Canada P1B 3C6, and Dan Melanson, 1267 Bancroft Drive, Sudbury, Ontario, Canada P3B 1R6

Filed Apr. 12, 1991, Ser. No. 684,235

Int. Cl.[5] B63B *5/24*

U.S. Cl. 114—68 **8 Claims**



1. In a snowmobile having a body with a forward end and a rearward end, a steerable ski at said forward end and motive power means, the improvement comprising a flotation system comprising:

(a) a plurality of flotation devices mounted at spaced locations on said snowmobile including two flotation devices on opposed sides exterior of said forward end and two flotation devices on opposed sides exterior of said rearward end;

(b) a source of inflation gas;

(c) fluid passageway means for fluidly connecting said source with said flotation devices;

(d) means for releasing said inflation gas from said source to inflate said flotation devices;

(e) each of said flotation devices including:

(i) an inflatable float fluidly connected to said fluid passageway means;

(ii) said float having a collapsed configuration, before inflation, wherein said float lies adjacent said body;

(iii) further wherein, in said collapsed configuration, said float is enclosed by a cover having first and second halves meeting at an elongated interface outward of said float with respect to said body, and fastening means at said interface releasably fastening said halves together to cover and enclose said float, said fastening means releasing upon inflation of said float.

5,150,663

SIGNAL DEVICE FOR SMALL BOAT

Noboru Kobayashi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

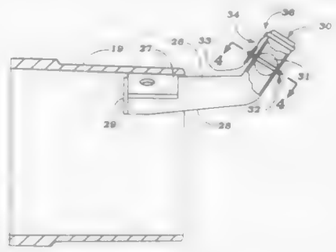
Continuation-in-part of Ser. No. 922,280, Oct. 23, 1986. This application Dec. 4, 1990, Ser. No. 624,067

Claims priority, application Japan, Dec. 5, 1989, 1-317110

Int. Cl.[5] B63H *11/10*

U.S. Cl. 116—209 **6 Claims**

1. A signalling device for a jet propelled watercraft having an outer housing assembly defining a water inlet to receive water from a body of water in which the watercraft is operating, an impeller portion containing an impeller for drawing water through said inlet, and a discharge nozzle through which water is discharged by said impeller for propelling said watercraft, a signalling device having an inlet opening fixed permanently within said discharge nozzle and adapted to receive water under pressure from said impeller and a discharge portion having an upwardly facing opening for upward discharge of water from said signaling device, and a butterfly type valve



for precluding the upward discharge of water from said signalling device.

5,150,664

DISPENSING DEVICE

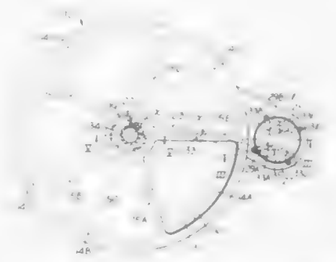
Christopher P. Kirk, Sunbury-on-Thames, United Kingdom, assignor to Pet Mate Limited, Shepperton, United Kingdom

Filed Aug. 22, 1991, Ser. No. 748,821

Claims priority, application United Kingdom, Aug. 24, 1990, 9018674

Int. Cl.[5] A01K *5/02*

U.S. Cl. 119—51.12 **12 Claims**



1. A dispensing device comprising a main element, means biassing the main element to tend to rotate in one sense about an axis of the main element, a control element, means for driving the control element in constant rotation about an axis of the control element, a series of abutments of the main element in an array stepped circumferentially about said axis thereof, a series of cam surfaces of the control element in an array stepped circumferentially about said axis thereof, a cam follower and means for maintaining one end of the cam follower in contact with one of said series of abutments and its other end in contact with said series of cam surfaces such that as the cam follower passes relatively from one cam surface to another it disengages said one abutment to permit an indexing movement of the main element under the bias thereof which is arrested when the cam follower engages an abutment next adjacent said one abutment.

5,150,665

BIRD POWER FEEDER

John M. D. Boaz, 14222 Rock Canyon Dr., Centreville, Va. 22020

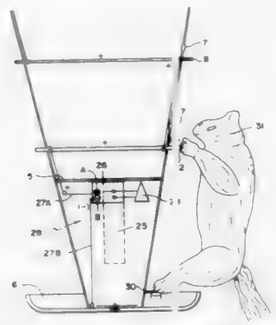
Continuation-in-part of Ser. No. 594,625, Oct. 9, 1990, abandoned. This application Aug. 22, 1991, Ser. No. 748,546

Int. Cl.[5] A01K *39/00*

U.S. Cl. 119—52.3 **22 Claims**

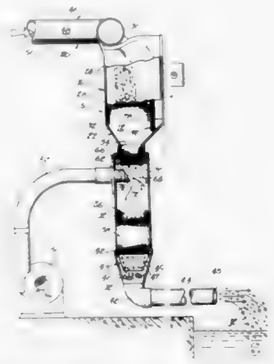
1. A bird feeder for feeding multiple sized birds comprising:

a hollow geometrically shaped reservoir with a top opening an sidewalls which extend down to a bottom;
a door at the top of said reservoir shaped to close the top opening;
a feed tray assembly attached to the bottom of said reservoir; and,



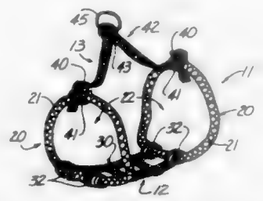
a plurality of access holes through the sidewalls of said reservoir;
a removable trim mechanism engaging one or more of said access holes, wherein each trim mechanism includes a snap-fit connection means, an opening, and a removable disc positioned in said opening for varying the size of said access hole.

5,150,666
FEEDING APPARATUS
Timothy W. Momont, Wolcottville, and Charles R. Bird, Milford, both of Ind., assignors to C B, Inc., Milford, Ind.
Filed Nov. 1, 1991, Ser. No. 786,580
Int. Cl.[5] A01K 5/02, 61/02
U.S. Cl. 119—57.91 16 Claims



1. A feeding apparatus for dispersing food to an organism comprising: feed conveyor means and feed dispersion means; the feed dispersion means having a feed inlet, a feed outlet, an upper chamber and a lower chamber; the feed inlet being connected to the upper chamber and the feed outlet being connected to the lower chamber, the feed conveyor means being connected to the feed inlet for filling the upper chamber with food; expulsion means connected with the lower chamber for supplying a driven fluid to the feed dispersion means for forcibly expelling food therefrom; valve means disposed within the feed dispersion means shiftable between a filling position and a dispersing position; and the filling position being defined by the valve means allowing food to flow from the upper chamber into the lower chamber, and the dispersing position being defined by the valve means allowing dispersion of the food from the lower chamber while preventing food from flowing from the upper chamber to the lower chamber.

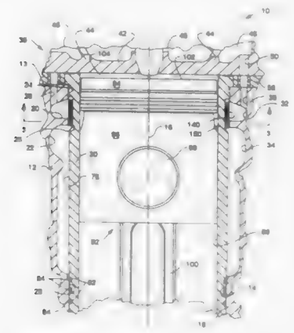
5,150,667
RESTRAINING APPARATUS FOR SMALL ANIMALS
Cecilia Salidrigas, 7519 Palm Rd., West Palm Beach, Fla. 33406
Filed Dec. 4, 1991, Ser. No. 802,103
Int. Cl.[5] A01K 29/00
U.S. Cl. 119—96 8 Claims



1. An animal restraining apparatus for restraining and controlling an animal without applying any force to the animal's neck; wherein, the apparatus consists of:
a pair of enlarged generally circular leg engaging members wherein each leg engaging member is provided with an upper portion and a lower portion and is dimensioned to loosely surround the animal's foreleg, and to extend substantially around the animals shoulders;
first connection means extending underneath the chest of the animal and operatively engaged with the lower portions of said leg engaging members; and,
an elongated flexible strap member having opposite ends provided with adjustment means operatively associated with the upper portions of said leg engaging members and extending across the animals back; wherein, said adjustment means form a second operative connection between the leg engaging members; wherein, said elongated flexible strap member is further provided with a ring element intermediate the opposite ends of the strap member; wherein, the ring element is dimensioned to be engaged by a conventional leash.

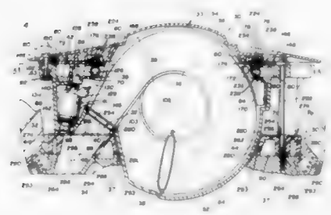
5,150,668
CYLINDER LINER WITH COOLANT SLEEVE
Allyn P. Bock, Chillicothe, Ill., assignor to Caterpillar, Inc., Peoria, Ill.
Filed Feb. 20, 1992, Ser. No. 838,182
Int. Cl.[5] F02F 1/14
U.S. Cl. 123—41.8 35 Claims

1. An internal combustion engine comprising:
a block defining a cylinder bore, an upper annular recess, and a lower annular recess;
a cylinder liner having a central axis located in the cylinder bore and cooperating with the upper and lower annular recesses to define upper and lower, axially spaced, annular coolant chambers; and
a sleeve being disposed between the upper and lower coolant chambers, extending into the upper coolant chamber, and surrounding the cylinder liner, the sleeve and the cylinder liner defining a plurality of circumferentially



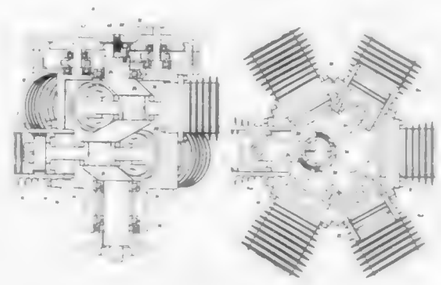
spaced venturi throats adapted to communicating the lower coolant chamber with the upper coolant chamber.

5,150,669
PRESSURE RELIEF MEANS FOR INTEGRATED INDUCTION SYSTEM
William B. Rush, II, Clarkston; Jack E. Elder, Rochester, and Richard K. Shier, Livonia, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 432,295, Nov. 6, 1989, Pat. No. 5,003,933. This application Aug. 30, 1990, Ser. No. 575,532
Int. Cl.[5] F02B 75/26
U.S. Cl. 123—52 MF 5 Claims



1. An integrated induction system to provide fluids to the cylinders in an engine, comprising:
a casing adapted for mounting on the engine, said casing having an air inlet and a plurality of fluid outlets, each of said fluid outlets being adapted to communicate with a respective cylinder, said casing comprising an enclosure defined by two casing members, said casing including a fastener to securely hold the casing members together;
a component comprising a plurality of air tubes mounted in the casing to facilitate provision of fluids to the cylinders, said air tubes occupying a portion of the interior of said casing with the unoccupied portion of said casing constituting a plenum, said air tubes being positioned within said casing so that said plenum provides a flow path from said air inlet to said air tubes, one end of each of said air tubes opening from said plenum and the other end of each of said air tubes engaging said casing adjacent one of said fluid outlets to allow communication between said plenum and the cylinders so that air entering into said plenum through said air inlet is introduced via each of said air tubes into the respective cylinders; and
means for venting said casing when the pressure therein reaches or exceeds a predetermined limit.

5,150,670
RADIAL INTERNAL COMBUSTION ENGINE
William G. Sadler, Scottsdale, Ariz., assignor to Harold W. Gewald, Coupeville, Wash.
Filed Apr. 6, 1990, Ser. No. 506,443
Int. Cl.[5] F02B 75/22
U.S. Cl. 123—55 R 6 Claims



1. A radial internal combustion engine, comprising:
(a) an engine housing;
(b) a plurality of pistons and cylinders equally spaced in two rows about the periphery of said engine housing, a piston received within each of said cylinders;
(c) a crankshaft axially positioned along the longitudinal axis of said housing, said crankshaft including crankshaft journal means defining a circular translatory path about the longitudinal axis of said crankshaft;
(d) three connecting rods retained on said crankshaft journal means, said connecting rods lying in a common plane about said crankshaft journal means, wherein each of said connecting rods terminate in an arcuate flange at a lower end thereof, said arcuate flanges having a radius of curvature equal to the radius of curvature of said crankshaft means;
(e) retaining ring means journaled about a lower end of said connecting rods for retaining said connecting rods on said crankshaft journal means, wherein said retaining ring means comprises a pair of split rings journaled about said crankshaft journal means and said arcuate flanges of said connecting rods; and
(f) wherein said crankshaft includes a lubricant passage extending through said crankshaft, said lubricant passage branching and terminating at separate outlet ports, which outlet ports are periodically exposed by the circular translatory path of said crankshaft journal means permitting lubricant to spray into said engine housing.

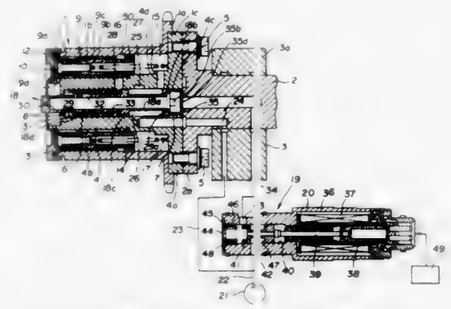
5,150,671
INTAKE- AND/OR EXHAUST-VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE
Seiji Suga, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Kanagawa, Japan
Filed Oct. 30, 1991, Ser. No. 784,765
Claims priority, application Japan, Oct. 31, 1990, 2-294942
Int. Cl.[5] F01L 1/34
U.S. Cl. 123—90.17 8 Claims

1. In an intake- and/or exhaust-valve timing control system

for an internal combustion engine including a ring gear member disposed between a rotating member having a driven connection with an engine crankshaft and a camshaft for adjusting the phase angle between said rotating member and said camshaft, a drive mechanism provided for drivingly controlling said ring gear member via fluid pressure depending upon the operating state of said engine; the improvement comprising:

said drive mechanism including;

a first hydraulic circuit for creating one axial movement of said ring gear member in one axial direction of said camshaft;



a second hydraulic circuit for creating the other axial movement of said ring gear member in the opposing axial direction of said camshaft;

switching means disposed in said camshaft for selectively switching from one of said first and second hydraulic circuits to the other; and

fluid pressure control means for generating a control fluid pressure depending upon the operating state of said engine to control said switching means via said control fluid pressure.

5,150,672

CYLINDER HEAD OF AN INTERNAL COMBUSTION ENGINE

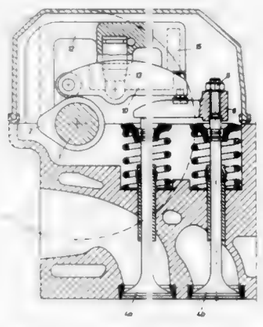
Christof D. Fischer; Wolfgang Pettauschnig, and Karl Wojik, all of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz Austria

Filed Mar. 5, 1992, Ser. No. 846,045

Claims priority, application Austria, Mar. 12, 1991, A545/91

Int. Cl.[5] F01L *1/26*

U.S. Cl. 123—90.22 3 Claims



1. Cylinder head of an internal combustion engine, comprising two rocker arms for each cylinder, each of said rocker arms having a pivot being individually supported on said cylinder head by means of a bridge, wherein at least one of said rocker arms acts on a valve bridge actuating two overhead valves of indentical function, wherein said at least one valve bridge is suspended by said bridge, and wherein said pivots of said rocker arms have different distances from a center plane of said cylinder.

5,150,673

FUEL SUPPLYING DEVICE FOR MARINE PROPULSION ENGINE

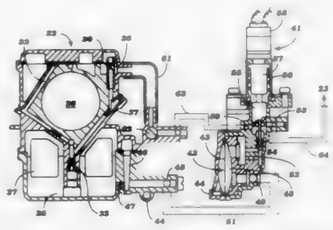
Akihiro Hoshiba; Masaki Okazaki, and Junichi Hasegawa, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 12, 1991, Ser. No. 685,129

Claims priority, application Japan, Apr. 13, 1990, 2-98396

Int. Cl.[5] F02M *1/08*

U.S. Cl. 123—179.15 20 Claims



1. In an enrichment device for providing additional fuel to an engine for accommodating a certain condition, said engine comprising a charge former having a fuel bowl for containing a head of fuel, a discharge circuit comprised of a fuel conduit connecting said fuel bowl with a discharge port in an induction passage of said charge former, an air conduit continuously communicating a source of atmospheric air with said fuel conduit for mixture of air with the fuel delivered through said discharge port under all discharge conditions, said enrichment device comprising means for delivering fuel and air to said engine in addition to that supplied by said charge former under certain conditions, the improvement comprising said additional air being supplied to said engine by said enrichment device being drawn from said air conduit for reducing the pressure in said fuel conduit of said charge former for further increasing the fuel delivered to said engine in response to the certain condition.

5,150,674

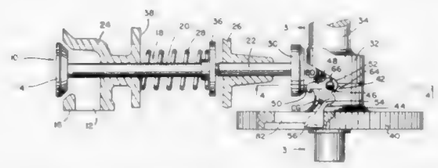
CENTRIFUGALLY RESPONSIVE COMPRESSING RELEASE MECHANISM

Gary J. Gracyalny, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed May 21, 1991, Ser. No. 703,616

Int. Cl.[5] F01L *13/08*

U.S. Cl. 123—182.1 32 Claims



1. An internal combustion engine having a combustion chamber, comprising:

valve means for controlling the flow of a gas to said combustion chamber, said valve means including a valve seat;

valve operating means for unseating said valve means from said valve seat;

a camshaft having an outer surface and also including:

at least one pivot pin extending from the outer surface of said camshaft;

at least one shoulder means near said pivot pin for bearing load forces of said valve operating means;

a cam disposed on said camshaft that engages said valve operating means to unseat said valve means;

a compression release means for releasing compression in said combustion chamber at engine cranking speeds, comprising:

a compression release member that partially surrounds said camshaft and that is pivotally connected to said camshaft by said pivot pin;

an auxiliary cam member affixed to said compression release member that engages said valve operating means to unseat said valve means at engine cranking speeds;

a first surface on said compression release member that abuts said shoulder means when said auxiliary cam member engages said valve operating means to transfer loads from said auxiliary cam member to said shoulder means; and

weight means, responsive to centrifugal force, for pivoting said compression release member about said pivot pin at engine running speeds to disengage said auxiliary cam member from said valve operating means.

5,150,675

CYLINDER HEAD ASSEMBLY FOR USE IN INTERNAL COMBUSTION ENGINE

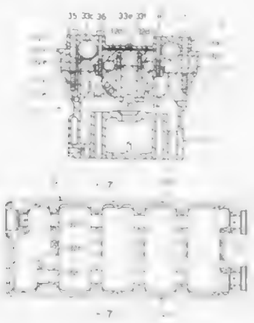
Shinichi Murata, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 798,753

Claims priority, application Japan, Nov. 29, 1990, 2-126833[U]

Int. Cl.[5] F02F *3/00*

U.S. Cl. 123—193.5 4 Claims



1. A cylinder head assembly for use in an internal combustion engine, which includes a valve drive mechanism having a plurality of pairs of a rocker-arm shaft and a rocker arm, the rocker-arm shafts being rotatably supported by journal portions of a cylinder head, and the rocker arms being swingable together with the rocker-arm shafts, said cylinder head assembly comprising:

rocker shaft supporting means for supporting the rocker-arm shafts incorporated in the cylinder head, said rocker shaft supporting means having a plurality of cap portions supporting the rocker-arm shafts, disposed in parallel with each other in one direction, and corresponding in number to journal portions of the cylinder head, and pairs of beam portions respectively supporting both sides of the plurality of cap portions, and extending in parallel with each other in another direction, wherein the cap portions and pairs of beam portions are formed to be integral with each other in a ladder frame structure.

5,150,676

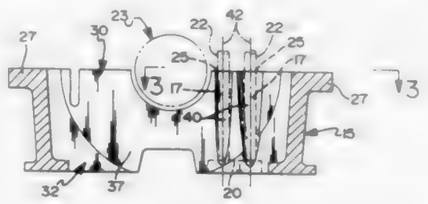
SEALED MACHINED MEMBER

John E. Brevick, Livonia; Steven P. Bittner, Flint, and Briant J. Kling, Redford, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1991, Ser. No. 773,163

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 R 3 Claims



1. A sealed machined member comprising:

a casted block member having an outer surface including a machined portion and a scalloped portion which adjoins said machined portion, said scalloped portion being cast into said outer surface when said block member is casted;

a wet passage formed in said block member for containing fluid having a pressure which is greater than the pressure adjacent to the outer surface, said wet passage having a longitudinal axis which defines a passage plane, said passage plane extending between the longitudinal axis of said wet passage and the part of said outer surface nearest to said wet passage; and

said scalloped portion being oriented so that its longitudinal axis lies in said passage plane, said scalloped portion being recessed from said outer surface so that said scalloped portion is not machined when said outer surface is machined.

5,150,677

DIRECT INJECTION DIESEL ENGINE

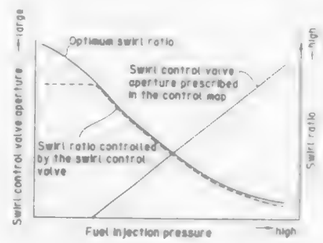
Shunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1991, Ser. No. 746,012

Claims priority, application Japan, Aug. 16, 1990, 2-216166

Int. Cl.[5] F02M *35/10*; F02D *9/10*

U.S. Cl. 123—302 11 Claims



11. A direct injection diesel engine wherein fuel is injected directly into a combustion chamber formed by a cylinder, a cylinder head, and a piston, comprising:

a fuel injector fitted to the cylinder head and facing the center of said combustion chamber,

a fuel injection pump which supplies high pressure fuel to said fuel injector in synchronization with the engine,

two air intake ports and two exhaust ports disposed in opposition to each other around said fuel injector,

air intake valves and exhaust valves which respectively open and close said air intake ports and exhaust ports in synchronization with the engine,

a swirl control valve provided in one of said air intake ports, and

a control means to adjust the aperture of the swirl control valve as a function of the injection pressure of said fuel injector,

wherein said control means is an electronic control unit provided with a control map specifying the relation between the injection pressure and the aperture of said swirl control valve and wherein said control map causes the aperture of said swirl control valve to vary in linear proportion to said injection pressure.

5,150,673

MOTOR BRAKE FOR AIR-COMPRESSING INTERNAL COMBUSTION ENGINES

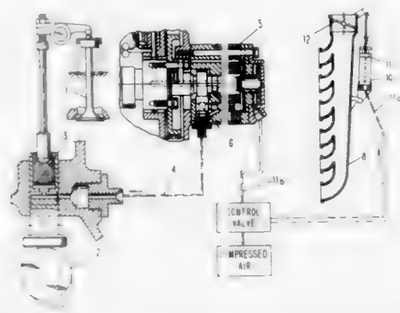
Dieter Wittmann, and Heribert Kubis, both of Nürnberg, Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Jul. 12, 1990, Ser. No. 552,180

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922884

Int. Cl.[5] F02D 9/06, 13/04

U.S. Cl. 123—321 6 Claims



1. A motor brake for an air-compressing internal combustion engine, comprising:

piston means built into a valve drive as an additional means for an exhaust valve that is actuatable by a cam drive, with said piston means being supplied with hydraulic fluid from a hydraulic pump unit having pump pistons, a respective one of which is associated with each piston means of an exhaust valve, with said pump pistons being controlled by a cam that rotates synchronously with said cam drive;

a butterfly valve disposed in an engine exhaust manifold;

a control mechanism for controlling said butterfly valve; and

a common control valve for activating said hydraulic pump unit and said control mechanism synchronously at least at full braking power.

5,150,679

ELECTRONIC BUTTERFLY VALVE ADJUSTER HAVING CONTINUOUS FAULT MONITORING SYSTEM

Cornelius Peter, Ottersweiher, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/00024, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/08251, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1989, Ser. No. 720,460

Int. Cl.[5] F02D 1/10, 41/22

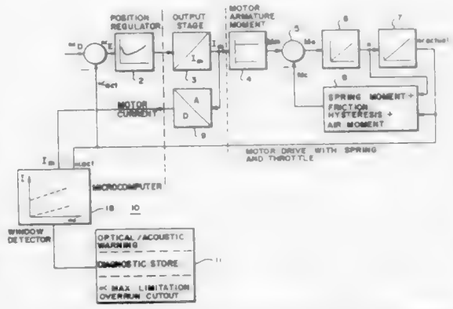
U.S. Cl. 123—397 2 Claims

1. An electronic control system of a butterfly valve in the intake system of a motor vehicle engine wherein the operating position of the butterfly valve is controlled according to an accelerator position, the electronic control system comprising:

an electronically controlled adjusting device including an adjusting motor for driving the butterfly valve in an opening or closing direction in accordance with a control signal; and, a current supply for supplying a supply current to said adjusting motor;

a return spring which continuously biases the butterfly valve towards a closed or idling position of the valve;

a position sensor which outputs an electrical signal representative of the actual prevailing position of the butterfly valve;



means for monitoring the supply current to said adjusting motor of the adjusting device;

means for determining limit values as a function of the actual position of the throttle flap according to the sum of all the mechanical moments occurring in the adjusting device; and,

means for detecting a fault condition when the supply current is outside the predetermined limits.

5,150,680

INTERNAL COMBUSTION ENGINE CONTROL METHOD AND APPARATUS

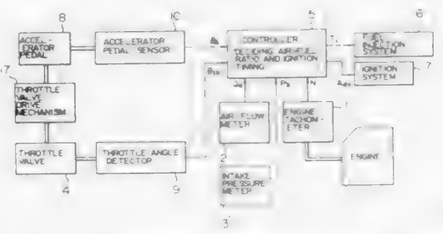
Yutaka Nishimura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 661,477

Claims priority, application Japan, Feb. 2, 1990, 2-22025

Int. Cl.[5] F02D 41/18; F02P 5/15; F02M 25/07

U.S. Cl. 123—399 15 Claims



1. An internal combustion engine control method by which the engine output is controlled by controlling a throttle valve of an intake air passage by an accelerator pedal, comprising the steps of:

setting an operation of said throttle valve so that a throttle opening angle changes according to a travel amount of said accelerator pedal in the range from the minimum value to a predetermined value less than the maximum value of said accelerator pedal travel amount and that said throttle valve is in a full-open state in the range from said predetermined value to the maximum value of said accelerator pedal travel amount;

supplying an air-fuel mixture of a first air-fuel ratio in said throttle opening angle range corresponding to the range of said accelerator pedal travel amount from the minimum value until said predetermined value is reached; and

supplying an air-fuel mixture of a second air-fuel ratio different from said first air-fuel ratio in said throttle opening angle range corresponding to the range of said accelerator pedal travel amount from said predetermined value to the maximum value.

5,150,681

SUPERVISORY SYSTEM FOR A VEHICLE ACCELERATOR PEDAL TRAVEL TRANSDUCER

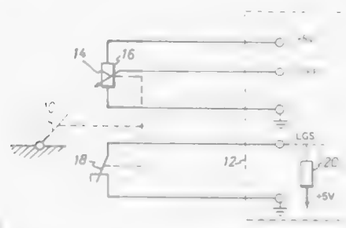
Hermann Kull, Stuttgart; Joachim Berger, Winterbach; Ulrich Gerstung, Vaihingen/Enz, and Klaus Bleuel, Oestrich-Winkel, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/01099, § 371 Date May 21, 1991, § 102(e) Date May 21, 1991, PCT Pub. No. WO91/04400, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 21, 1989, Ser. No. 688,489

Int. Cl.[5] F02D 11/10, 41/22; B60Q 1/44

U.S. Cl. 123—399 27 Claims



1. A supervisory system for monitoring an accelerator pedal travel transducer in an electronic control system for a combustion engine, the system comprising:

an idling pressure switch for detecting the idling position of the accelerator pedal;

means for actuating said pressure switch by taking up lost motion travel of the accelerator pedal from said idling position before said pedal transducer is displaced from said idling position;

means for providing an additional idle position signal; composite means having respective inputs for receiving said additional idle position signal, the signal of said idling pressure switch and the signal of said accelerator pedal transducer; and,

said composite means being provided for generating an alarm signal in response to said signals applied to said inputs when at least one of said signals applied to said inputs is not plausible to the remaining ones of said signals applied to said inputs.

5,150,682

METHOD OF MONITORING EMISSION OF NITROGEN OXIDES BY AN INTERNAL COMBUSTION ENGINE

Jean-Louis Magnet, St. Germain en Laye, France, assignor to S.E.M.T. Pielstick, France

Filed Sep. 26, 1991, Ser. No. 765,735

Claims priority, application France, Sep. 26, 1990, 90 11860

Int. Cl.[5] F02B 77/08; F02P 5/155

U.S. Cl. 123—417 9 Claims

1. Method of monitoring the emission of nitrogen oxides, NOx, in the exhaust gas of an internal combustion engine, comprising the steps of:

installing an accelerometer on a component delimiting a combustion chamber of a control engine analogous to the engine to be monitored,

installing a known device for measuring the emission of nitrogen oxides in the exhaust gas of the control engine,

operating the control engine at various loads and various speeds to cover the full operating range of the control engine,

simultaneously recording data concerning an accelerometer signal, a characteristic parameter of which is calculated, the measured quantity of nitrogen oxides NOx contained in the exhaust gas of the control engine and characteristic engine operating parameters, including at least its speed, load and cylinder air inlet temperature,

establishing, on the basis of the recorded data, a correlation between the measured quantity of nitrogen oxides and the characteristic parameter of the accelerometer signal,

installing an accelerometer on the engine to be monitored subject to the same conditions as on the control engine,

simultaneously recording, foe the engine to be monitored in operation, data concerning the accelerometer signal, the characteristic parameter of which is calculated, and the characteristic engine parameters including at least its speed, load and cylinder inlet air temperature,

establishing, from the data recorded in the previous stage and from the correlations established for the control engine, an equivalent nitrogen oxide emission value for the engine to be monitored,

taking decisions, if appropriate, as to actions needed to comply with a set point value imposed of the emission of nitrogen oxides.

5,150,683

FLEXIBLE FUEL SENSOR SYSTEM

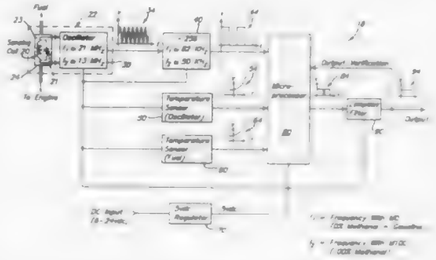
Henry F. Depa, Sterling Heights, and John J. C. Kopera, Rochester Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 12, 1991, Ser. No. 667,911

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] F02P 5/15; F02D 41/06

U.S. Cl. 123—417 23 Claims



1. A method of determining the respective percentages of first and second liquids in a mixture thereof, comprising the steps of:

immersing an inductive element in said mixture such that said mixture at least partially determines a value of the distributed capacitance exhibited by the inductive element;

energizing said inductive element to generate a signal having a frequency determined by said inductive element and by its distributed capacitance; and

detecting the frequency of said signal.

5,150,684

HIGH PRESSURE FUEL INJECTION UNIT FOR ENGINE

Taue Jun, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 21, 1990, Ser. No. 632,911

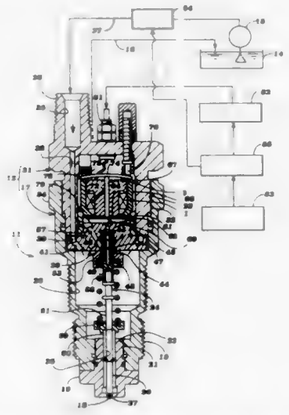
Claims priority, application Japan, Dec. 25, 1989, 1-336929

Int. Cl.[5] F02M 39/00

U.S. Cl. 123—446 20 Claims

1. An accumulator type of fuel injection nozzle comprised of an accumulator chamber adapted to be supplied with high

pressure fuel, a nozzle port leading from said accumulator chamber, an injector valve moveable between a closed position and an opened position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injector valve for retaining said injector valve in its closed position when said control chamber is pressurized and for movement of said injector valve to its opened position when pressure is relieved in said control chamber, and relief valve means moveable between a closed



position for maintaining pressure in said control chamber and an opened position for relieving said control chamber for effecting fuel discharge through said nozzle port, the improvement comprising means for opening the relief valve at a substantially fixed output shaft angle of the associated engine which does not vary by more than about 5° regardless of the engine running condition, and closing the control valve at an approximately fixed output shaft angle which does not vary by more than about 10° regardless of the engine running condition, and means for varying the fuel pressure delivered to the accumulator chamber to vary the output of the engine.

5,150,685

APPARATUS AND METHOD FOR CONVERTING CONVENTIONALLY FUELED ENGINES TO OPERATE ON AN ALTERNATIVE FUEL

Fred C. Porter, 31065 Stafford Dr. Birmingham, Mich. 48010, and Garth J. Schultz, 2111 Lovington Ave., Apt. #106, Troy, Mich. 48083

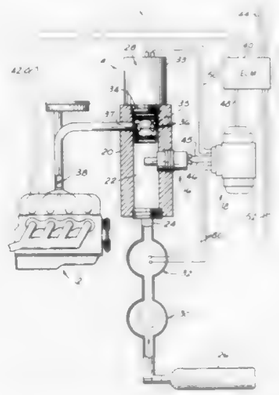
Filed Sep. 11, 1991, Ser. No. 758,894
Int. Cl.[5] F02D *41/04* F02M *21/02*
U.S. Cl. 123—478 **13 Claims**

1. Apparatus for converting a conventionally fueled internal combustion engine to operate with an alternative fuel, the engine having an electronic control module which generates a control signal for output to a conventional fuel injector, the apparatus comprising:

an alternative fuel introduction assembly including a housing having an interior chamber, an inlet passage in fluid communication with a source of alternative fuel, and an alternative fuel injector moveable between an open position adapted to place the interior chamber in fluid communication with the engine and a closed position adapted to seal the interior chamber from fluid communication with the engine;

a temperature sensor adapted to measure the temperature of the alternative fuel and to generate an output signal indicative of the measured temperature; and

an electronic translator in electrical contact with the alternative fuel introduction assembly, the temperature sensor, and the electronic control module, the electronic translator adapted to receive the control signal and the output signal, and to generate an alternative fuel injector control signal in accordance with the energy content differential of conventional fuel and the alternative fuel, and also in accordance with the flow characteristics and operating



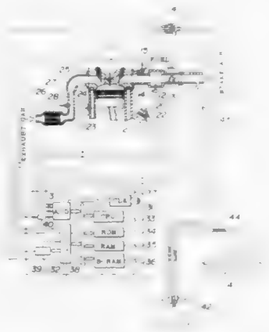
characteristics of the alternative fuel injector, for output to the alternative fuel introduction assembly, the alternative fuel injector control signal controlling the period of time the alternative fuel injector remains in the open position so as to meter the flow of the alternative fuel to the engine.

5,150,686

EVAPORATIVE FUEL CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

Koji Okawa, and Kazuhiko Norota, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 7, 1991, Ser. No. 741,583
Claims priority, application Japan, Aug. 8, 1990, 2-211261
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—698 **7 Claims**



1. An evaporative fuel control apparatus comprising:

detection means for detecting operating conditions of an internal combustion engine and for supplying signals indicative of said operating conditions;

purge means for controlling a flow of fuel vapor from a fuel tank into an intake passage of the internal combustion engine;

calculation means for calculating a fuel injection amount in response to said signals supplied by said detection means;

fuel injection control means for varying a feedback correction factor of an air-fuel ratio of air fuel mixture, in response to said signals supplied by said detection means, so as to maintain the air-fuel ratio at a stoichiometric value, and for correcting the fuel injection amount being calculated by the calculation means on the basis of the varied feedback correction factor;

purge correction means for correcting a purging amount of fuel vapor which is fed by said purge means into the intake passage, in response to the feedback correction factor varied by the fuel injection control means, so that the feedback correction factor is adjusted to be within a predetermined range; and

prohibition means for preventing said purge correction means from correcting said purging amount of fuel vapor when the feedback correction factor is not within said predetermined range and it is determined based on said signals that the feedback correction factor has changed from a value outside the predetermined range to a value within the predetermined range.

5,150,687

SUPPLY CIRCUIT FOR OPERATION OF AN ELECTROMAGNETIC LOAD

Henri Paganon, Venissieux, and Guy Pichon, Roussillon, both of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00405, § 371 Date Oct. 2, 1991, § 102(e) Date Oct. 2, 1991, PCT Pub. No. WO91/00421, PCT Pub. Date Jan. 10, 1991
PCT Filed May 30, 1990, Ser. No. 768,916
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921308
Int. Cl.[5] F02D *41/20*
U.S. Cl. 123—490 **18 Claims**

1. A supply circuit for operation of an electromagnetic load of a vehicle having a generator and battery, and a load including at least one solenoid valve of a fuel-injection system of an internal-combustion engine of the vehicle, comprising:

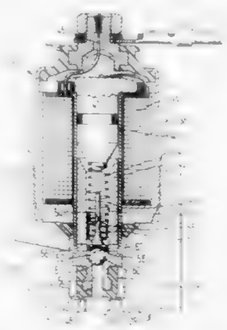
a circuit arrangement which connects the load to the generator for a buildup of excitation of the load, and then establishes a connection of the load to the battery and interrupts the connection of the load to the generator for the maintenance of sufficient excitation of the load.

5,150,688

MAGNET VALVE, IN PARTICULAR FOR FUEL INJECTION PUMPS

Heinz Nothdurft, Stuttgart; Reinhard Trunk, Schwieberdingen; Kurt Sprenger, Illingen-Schützing, and Carlos Alvarez-Avila, Freiberg/Neckar, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00740, § 371 Date Jun. 7, 1991, § 102(e) Date Jun. 7, 1991, PCT Pub. No. WO91/05950, PCT Pub. Date May 2, 1991
PCT Filed Sep. 28, 1990, Ser. No. 687,926
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934953
Int. Cl.[5] F02M *37/04*
U.S. Cl. 123—506 **8 Claims**



1. A magnet valve for controlling a fuel supply to injection pumps for supplying fuel to internal combustion engines, which comprises an intake line (**10**) that connects a pump work chamber (**6**) of the fuel injection pump to a fuel supply source (**11**), said magnet valve is positioned relative to said intake line (**10**) to block fuel flow to control an end of the fuel injection and to permit fuel through said intake line (**10**) said pump work chamber during an intake stroke of a pump piston (**4**); said magnet valve includes a closing element (**28**) connected to an armature (**42**) of said magnet valve, said closing element and said armature are retained by a restoring spring (**43**) in a closed position of said closing element on a valve seat (**29**) formed in said intake line (**10**) from which the intake line (**10, 31, 32, 33**) leads to said pump work chamber (**6**), and said closing element is acted upon in the closing position by a pressure prevailing in the intake line toward the valve seat, said closing element includes a bore (**50**) which connects a portion of said intake line (**10**) to parts of the intake line toward said pump work chamber which bore is closable by a valve member (**61**) acted upon by a closing spring (**57**) counter to the pressure in the portion of the intake line toward the pump work chamber, said closing spring (**57**) is supported in the armature (**42**) and said restoring spring (**43**) is supported in a stationary manner at one end.

5,150,689

FUEL TANK VAPOR CONTROL SYSTEM WITH MEANS FOR WARNING OF MALFUNCTION OF CANISTER

Hirofumi Yano, Yokohama, and Seiji Yokoi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 12, 1991, Ser. No. 758,911
Claims priority, application Japan, Sep. 14, 1990, 2-244687
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—519 **8 Claims**

1. A fuel tank vapor control system for an automotive vehicle comprising:

a fuel tank with hydrocarbon vapors;

a canister for adsorbing the hydrocarbon vapors from said fuel tank;

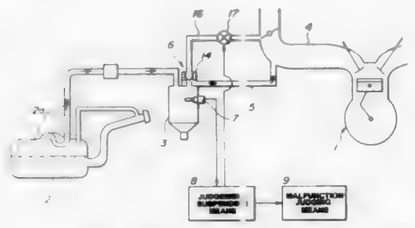
engine induction passage means;

purge passage means for supplying the hydrocarbon vapors regenerating from said canister to said engine induction passage means;

valve means for selectively opening and closing said purge passage means;

temperature sensor means for detecting an inside temperature of said canister;

judgement suspending means for suspending a judgement on malfunction of said canister when opening of said purge



passage means is ineffective for causing an inside temperature fall of said canister, and once closing said purge passage means so that said canister fully adsorbs the hydrocarbon vapors; and

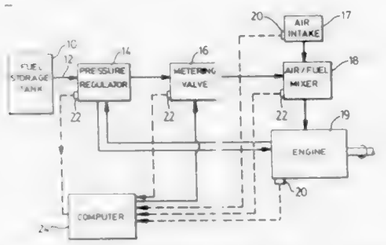
malfunction judging means for judging that said canister is malfunctioning when opening of said purge passage means after said closing thereof by said malfunction suspending means is still ineffective for causing an inside temperature fall of said canister.

5,150,690

FLOW CONTROL SYSTEM

Stephen A. Carter, Mississauga; Brian C. Williamson, Burlington, and Karl H. Kozole, Weston all of Canada, assignors to Ortech Corporation, Ontario, Canada

Filed Apr. 20, 1990, Ser. No. 512,300
Claims priority, application Canada, Sep. 29, 1989, 614540
Int. Cl.[5] F02B *43/00*
U.S. Cl. 123—527 **24 Claims**



1. Apparatus for controlling the rate of flow of a fluid from a common inlet to a common outlet comprising:

(a) a plurality of fluid conducting lines having a plurality of flow capacities, said plurality of lines being connected in parallel between said common inlet and said common outlet such that the total flow from said common inlet to said common outlet is equal to the sum of the separate flows through the individual lines;

(b) a pulsing fluid control valve in each of at least two of said lines, and a bi-stable fluid control valve in each of the remaining lines;

(c) sensors for measuring parameters of the fluid sufficient to determine the potential mass flow of said measured fluid through each control valve when open;

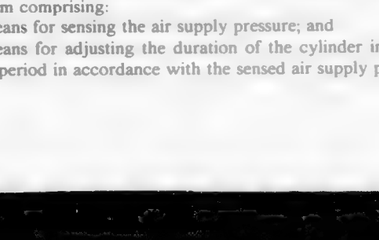
(d) control means adapted to control selectively the opening and closing of said control valves and monitor the sensors to determine the potential mass flow through each control valve in accordance with the measured fluid parameters, the total fluid flow passing outwardly of said common outlet comprising abase flow component established by opening selected control valves to provide a continuous predetermined flow, discrete step changes in the base flow component being provided by opening and closing combinations of control valve, increments of fluid flow between said discrete steps being provided by opening at least one predetermined pulsing valve for a fraction of a predetermined time period to provide a desired average flow over said time period.

5,150,691

ENGINE FUEL INJECTOR

Minoru Imajo, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jan. 23, 1992, Ser. No. 824,624
Claims priority, application Japan, Jan. 25, 1991, 3-7803
Int. Cl.[5] F02M *69/46*
U.S. Cl. 123—531 **6 Claims**



1. A fuel injector adapted to be installed in an engine provided with a cylinder head, a combustion chamber situated below the cylinder head, a plurality of intake ports in the cylinder head facing the combustion chamber, a branch where these intake ports divide, an intake manifold connected to the intake ports via the branch, intake valves which open and close the intake ports, and stems passing through the intake ports which support the intake valves on the cylinder head, said fuel injector comprising:

a fuel injector body situated between the branch and the intake manifold, and

a guide pipe having branched ends for ejecting fuel delivered from said fuel injector body near the stem of each intake valve.

5,150,692

SYSTEM FOR CONTROLLING AIR SUPPLY PRESSURE IN A PNEUMATIC DIRECT FUEL INJECTED INTERNAL COMBUSTION ENGINE

Douglass E. Trombley, Grosse Pointe; Steven D. Stiles, Clarkston; Kenneth J. Buslepp, Shelby Township, Macomb County, all of Mich., and Kenneth J. Buslepp, Shelby Township, Macomb County, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1991, Ser. No. 807,315
Int. Cl.[5] F02M *23/00*
U.S. Cl. 123—533 **3 Claims**

1. A system for controlling pressure within a pressurized air supply for an engine having pneumatic direct fuel injection, wherein the pressurized air is utilized to inject fuel held within a fuel injector directly into an engine cylinder, against opposing cylinder compression pressure, while the injector is opened during a cylinder injection period in the engine cycle, the system comprising:

means for sensing the air supply pressure; and

means for adjusting the duration of the cylinder injection period in accordance with the sensed air supply pressure to maintain the air supply pressure above the compression pressure in each cylinder during the cylinder injection

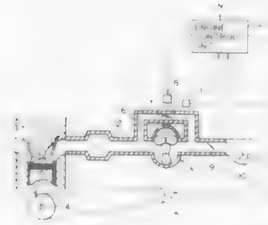
period, thereby preventing the backflow of fuel through the cylinder fuel injector into the air supply system.

5,150,693

BOOST PRESSURE CONTROL SYSTEM FOR A SUPERCHARGED ENGINE

Hidemi Ohnaka; Masaaki Tanaka; Yuuichi Kato; Michio Furuhashi; Koichi Satoya, and Yasuhiro Ooi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,765
Claims priority, application Japan, Sep. 29, 1990, 2-262648
Int. Cl.[5] F02B *33/00*
U.S. Cl. 123—559.3 **8 Claims**



1. A boost pressure control system for an engine comprising:

a supercharger disposed at an inlet air passage of the engine and driven by said engine via a power transmission clutch, an operation of said supercharger being started or stopped by connecting or disconnecting said clutch;

an air bypass passage being connected, at one end thereof, to an inlet air passage upstream of the supercharger, and at the other end thereof, to an inlet air passage downstream of the supercharger;

an air bypass valve disposed in said air bypass passage and controlling an air flow through the air bypass passage in accordance with a degree of opening of the air bypass valve; and

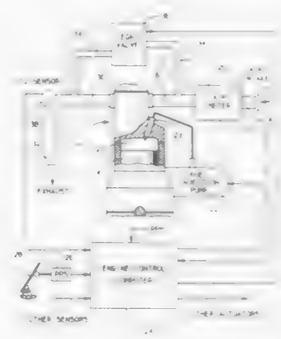
a bypass control means for controlling said air bypass valve by setting the degree of opening thereof to a value given as a function of an engine load, said function being selected by the bypass control means from among a plurality of predetermined functions in accordance with whether the operation of the supercharger is started or stopped.

5,150,694

DIESEL ENGINE CLOSED LOOP AIR/FUEL RATIO CONTROL

James H. Currie, Rochester; Richard A. Peden, Livonia; David P. Sczomak, Troy; Mark A. Mitchell, Dryden, and Michael J. Brown, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1991, Ser. No. 796,140
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—569 **2 Claims**



1. A method of controlling the air/fuel ratio in a diesel engine having an intake space coupled to atmosphere and from which air is drawn into cylinders of the engine, an exhaust passage into which exhaust gases are discharged from the cylinders, fuel injectors for injecting fuel into the cylinders to establish an air and fuel mixture to undergo combustion, and EGR means for recirculating a portion of the exhaust gases from the exhaust passage into the intake space, the EGR means including a valve operable between closed and full open for regulating the amount of exhaust gases recirculated, the method comprising the steps of:

sensing the air/fuel ratio of the cylinder air and fuel mixture;

storing (A) a first schedule of air/fuel ratio values as a predetermined function of a first engine operating condition and (B) a second schedule of air/fuel ratios as a predetermined function of a second predetermined engine operating condition;

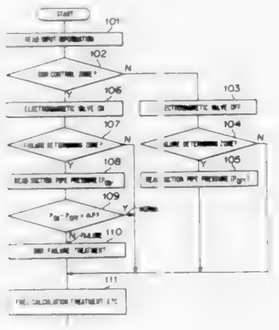
controlling the fuel injectors to inject a fuel amount to each cylinder in accord with an operator fuel request;

determining if the EGR valve is closed;

when the EGR valve is not closed, (A) sensing the second engine operating condition and (B) adjusting the EGR valve in direction to vary the amount of exhaust gases recirculated to restore the sensed air/fuel ratio to the air/fuel ratio in the second schedule corresponding to the sensed second engine operating condition; and

when the EGR valve is closed, (A) sensing the first engine operating condition, (B) determining if the sensed air/fuel ratio is rich or lean relative to the air/fuel ratio in the first schedule corresponding to the sensed first engine operating condition, (C) when the sensed air/fuel ratio is determined to be rich, decreasing the fuel amount injected by the injectors to restore the sensed air/fuel ratio to the air/fuel ratio in the first schedule corresponding to the sensed first engine operating condition, and (D) when the sensed air/fuel ratio is determined to be lean, increasing the fuel amount injected by the injectors to restore the sensed air/fuel ratio to the air/fuel ratio in the first schedule corresponding to the sensed first engine operating condition only when the operator fuel request is at a predetermined maximum.

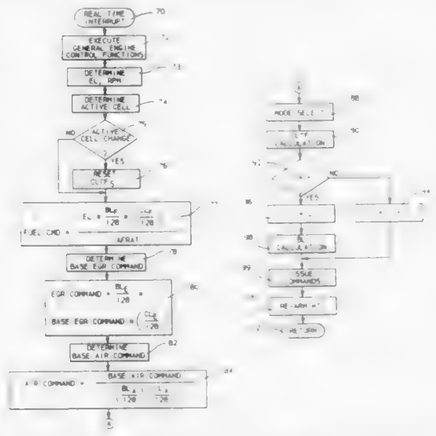
5,150,695
ELECTRONIC CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Katsuhiko Kondo, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Apr. 8, 1991, Ser. No. 681,818
Claims priority, application Japan, May 22, 1990, 2-133060
Int. Cl.[5] F02M 25/07
U.S. Cl. 123—571 3 Claims



1. An electronic control apparatus for an internal combustion engine comprising:
a control device having a control valve operative to control an amount of return of exhaust gas from an exhaust gas passage to a suction gas passage such that when said engine is in a predetermined control zone, said control valve is closed and when said engine is not in said predetermined control zone, said control valve is open;
a pressure sensor for detecting pressure in a suction gas pipe; and
a failure detecting means for passively detecting failure of said control device based on a difference between first and second pressure values in said suction gas pipe, said first pressure value being detected by said pressure sensor when said control valve is open, and said second pressure value being detected by said pressure sensor when said control valve is closed, wherein said first pressure value is stored in memory until said second pressure value is detected at which time said first and second pressure values are compared.

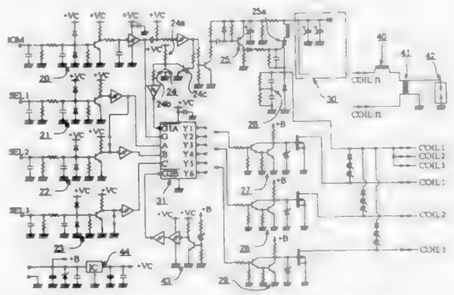
5,150,696
ADAPTIVE MEMORY CONTROL FOR NORMALIZED DILUTION
Daniel F. Kabasin, Rochester, and Donald D. Stoltman, Henrietta, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 22, 1991, Ser. No. 796,185
Int. Cl.[5] F02M 25/07
U.S. Cl. 123—571 8 Claims

1. An apparatus for controlling an air-fuel ratio in an internal combustion engine equipped with an intake manifold, comprising:
means for delivering a quantity of fuel to the engine;
means for sensing the air-fuel ratio in the engine;
means for recirculating a quantity of exhaust gas into the intake manifold of the engine when operating in a predetermined engine operating region;
means responsive to the sensed air-fuel ratio to adjust the quantity of exhaust gas recirculated into the intake manifold of the engine in response thereto when operating in the predetermined engine operating region in direction to maintain the air-fuel ratio at a predetermined air-fuel ratio; and
means responsive to the sensed air-fuel ratio to adjust the



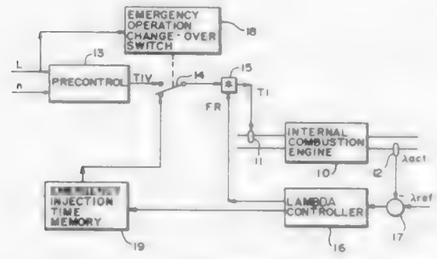
quantity of fuel delivered to the engine in response thereto when operating in a region other than the predetermined engine operating region in direction to maintain the air-fuel ratio at the predetermined air-fuel ratio.

5,150,697
IGNITION SYSTEM
Motonobu Akagi; Nobuyuki Oota, and Yasutoshi Yamada, all of Aichi, Japan, assignors to Aisin Seiki K.K., Kariya, Japan
Filed Mar. 29, 1991, Ser. No. 677,062
Claims priority, application Japan, Mar. 29, 1990, 2-83633
Int. Cl.[5] F02P 3/12
U.S. Cl. 123—643 11 Claims



1. An ignition system for an automobile comprising:
a spark circuit;
a power supply circuit including a capacitor for supplying power;
a switching circuit operable for supplying power from said power supply circuit to said spark circuit;
a distributing circuit for controlling said switching circuit in accordance with an ignition timing signal; and
a control circuit, coupled to receive the ignition timing signal, said control circuit operable for providing a disabling control signal which disables said distributing circuit for a predetermined period of time in accordance with a first value of said ignition timing signal so that said switching circuit does not supply power from said power supply circuit to said spark circuit during the predetermined period of time, said control circuit also being coupled to said power supply circuit for charging said capacitor during the predetermined period of time when said distributing circuit is disabled.

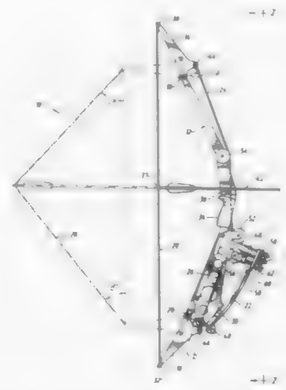
5,150,698
METHOD AND ARRANGEMENT FOR ADJUSTING FUEL FOR EMERGENCY OPERATION
Rolf Kohler; Alfred Kratt, both of Schwieberdingen, and Klaus Franzke, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE89/00635, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/04092, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 5, 1989, Ser. No. 671,879
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835282
Int. Cl.[5] F02D 41/72, 41/34, 41/78
U.S. Cl. 123—690 11 Claims



1. A method for setting the amount of fuel to be metered to an internal combustion engine having a lambda controller and an idling contact during normal operation as well as during emergency operation wherein the load signal, which coacts during normal operation for determining the amount of fuel, is not available, and for the condition of non-idle operation and with the lambda probe in operational readiness, the method comprising the steps of:
predetermining at least one emergency injection time;
forming an output variable of a lambda controller from the difference between the lambda actual value and a lambda desired value;
modifying each emergency injection time with the output variable of the lambda controller thereby forming an emergency injection time duration having a width dependent upon a selected maximum amplitude of said output variable;
selecting the number of emergency injection time durations and maximum amplitude of said output variable so as to cause the emergency injection time durations to cover all injection times which can occur during the operation of the engine; and,
in the case of the presence of at least two emergency injection times extending over respective time spans with said time spans having respective ends, if one of the ends of the time span associated with the emergency injection time actually present is reached, switching over to the next time span lying in the direction of said one of said ends.

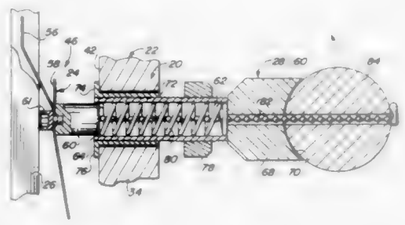
5,150,699
COMPOUND BOW
Mathew G. Boissevain, 27181 Sherlock Rd., Los Altos, Calif. 94022
Filed Nov. 22, 1989, Ser. No. 441,049
Int. Cl.[5] F41B 5/00
U.S. Cl. 124—25.6 16 Claims

1. An archery bow which is supported by one hand of an archer and moved from a braced position to a drawn position and maintained in the drawn position prior to release by the other hand of the archer, comprising:
a central handle section;
first and second arms pivotally coupled to opposite ends of the handle section;
a spring mounted to the handle section, the spring having connection locations; and



first and second members, one end of each of the first and second members being connected to the spring at the connection locations, the other end of the first member being connected to the first arm and the other end of the second member being connected to the second arm, such that when the arms are pivoted from a braced position toward a drawn position, the spring is deformed and exerts a restoring force on the arms through the members to return the arms toward the braced position.

5,150,700
ARCHERY BOW ASSEMBLY
Vincent F. Troncoso, Montrose, Colo., assignor to Golden Key Futura, Inc., Montrose, Colo.
Filed Aug. 13, 1991, Ser. No. 744,270
Int. Cl.[5] F41B 5/00
U.S. Cl. 124—44.5 6 Claims



1. An improved archery bow assembly comprising, in combination:
a) an archery bow comprising a pair of spaced limbs interconnected by a bowstring and by a handle riser having an about vertical sidewall and an about horizontal shelf defining an arrow window; and,
b) an archery arrow rest having an archery arrow releasably disposed thereon, said rest being disposed in said window by a transverse plunger extending through said sidewall above said shelf, said plunger including
i. an elongated tubular housing having a central cavity

extending therethrough and having an expanded head on the side of said bow away from said window, said head having a generally dish-shaped recess on the free end thereof,

i.i. a transverse rod releasably connected to said arrow rest and passing into said cavity

i.i.i. a spring trapped in said cavity between said rod and said head and biasing said rod and rest towards said window,

i.i.i.i. an enlarged weight with a curved surface seated in said recess, said weight projecting latterally of said head, and

v. tether means in said cavity interconnecting said rod and weight, whereby said rest, rod and weight are biased by said spring into a resting position with said rest away from said sidewall in said window, said weight during shooting of said arrow from said bowstring being activated by the resultant bow vibration to move forward ,rotating out of said recess, thus drawing along with it said rest and rod toward said sidewall against said spring bias, for improved clearance of said arrow during its flight through said window, said weight, rod and rest thereafter returning to said resting position , due to said spring bias.

5,150,701

AIR GUN WITH ROTARY MAGAZINE

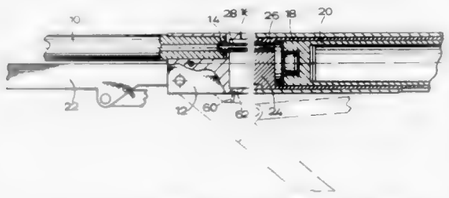
Roger D. Wackrow, Redditch; Kenneth W. White, Solihull, and Harold C. Jones, Studley, all of England, assignors to B.S.A. Guns (UK) Limited, Great Britain

Filed May 3, 1991, Ser. No. 695,211

Claims priority, application United Kingdom, May 5, 1990, 9010201; Sep. 17, 1990, 9020238

Int. Cl.[5] F41B *11/00*

U.S. Cl. 124—67 6 Claims



1. An air gun comprising an exchangeable magazine arranged to hold a plurality of pellets for loading one at a time into a breech of the gun, the magazine comprising:

(a) a carrier located in the gun adjacent to the breech;

(b) a drum which is rotatably mounted on the carrier and presents a plurality of pellet-holding slots distributed around its rotational axis;

(c) a drive spring acting between the drum and the carrier to rotate the drum to bring the slots successively into alignment with the breech for insertion of pellets into the breech; and

(d) an escapement mechanism acting between the drum and the carrier to arrest rotation of the drum by the drive spring and operable intermittently to release the drum for rotation in indexing steps; and the gun comprising also:

(i) a reciprocable loading ram adapted to be driven longitudinally into an aligned one of said slots in the drum to drive a pellet from the drum and into the breech;

(ii) escapement-actuating means; and

(iii) cocking mechanism operable in a cocking action to cock the gun for firing and being operatively associated with said loading ram for causing reciprocating of the ram and being operatively associated with said escapement-actuating means for causing operation of said escapement mechanism subsequently in the cocking action to withdrawal of the loading ram from the drum.

5,150,702

IRIS DIAPHRAGM DEVICE AND ENDOSCOPE HAVING THE SAME

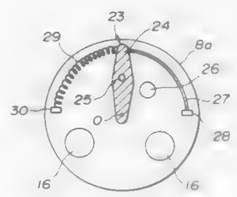
Hirofumi Miyanaga; Nobuyuki Sakamoto; Koichi Yoshimitsu, all of Tokyo, and Yasundo Tanaka, Urawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,191

Claims priority, application Japan, Jun. 18, 1990, 2-160485; Jan. 17, 1991, 3-4019

Int. Cl.[5] A61B *1/06*; G03B *9/02*; H04N *5/238*

U.S. Cl. 128—6 27 Claims



1. An iris diaphragm device comprising:

iris diaphragm means which is displaced so as to change the diameter of a diaphragm aperture;

operating means including a shape-memory material which is deformed in accordance with temperatures, so as to displace said iris diaphragm means; and

temperature changing means for changing the temperature of said shape-memory material of said operating means.

5,150,703

LIQUID SHIELD VISOR FOR A SURGICAL MASK WITH A BOTTOM NOTCH TO REDUCE GLARE

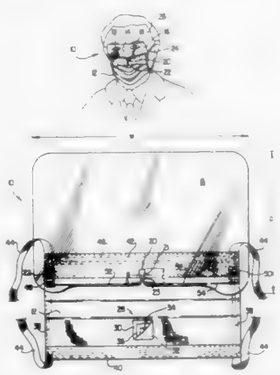
Vance M. Hubbard, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol Medical Products, Inc., N. Richland Hills, Tex.

Continuation of Ser. No. 268,558, Nov. 8, 1988, Pat. No. 5,020,533, which is a continuation-in-part of Ser. No. 104,807, Oct. 2, 1987, Pat. No. 4,920,960. This application Feb. 25, 1991, Ser. No. 661,435

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.[5] A62B *18/00, 18/02*; A61F *9/04*

U.S. Cl. 128—206.12 10 Claims



1. A liquid shield to protect the eyes, nose and mouth of a wearer, comprising:

a fluid impervious transparent visor for being affixed over the eyes of the wearer to protect the eyes from liquids directed from exterior said visor;

a notch in the lower portion of said visor to allow said visor to gradually bend and approximately conform to the face of the wearer without causing creasing of said visor; and

a mask connected to said visor for covering the mouth and nose of the wearer, said mask impervious to liquids from exterior said mask and comprising a first layer means of a material for slowing the velocity of the liquid therethrough, a second layer means of a material applied to said first layer means, said second layer means being pervious to gases to allow breathability by the wearer through the mask, and substantially impervious to the passage of liquids external of the mask for preventing the passage of liquids through the mask into the portion of the face of the wearer covered by the mask, a third layer means of a nonwoven fabric applied to said second layer means to prevent wicking of liquid through said second layer means to be the face of the wearer, and means for removably attaching the mask to the face of the wearer.

5,150,704

LASER THERAPEUTIC APPARATUS

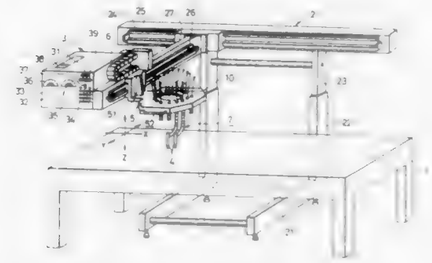
Tsuneo Tatebayashi; Yoshio Uno, and Masaichi Hiei, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 64,651, Jun. 22, 1987, abandoned. This application May 18, 1989, Ser. No. 355,103

Claims priority, application Japan, Jun. 23, 1986, 61-146680; Jul. 15, 1986, 61-165890; Jul. 15, 1986, 61-165891; Jul. 15, 1986, 61-165892; Jul. 15, 1986, 61-165893; Jul. 15, 1986, 61-165894; Jul. 24, 1986, 61-174091; Jan. 9, 1987, 62-2702

Int. Cl.[5] A61N *5/06*

U.S. Cl. 128—395 21 Claims



1. A laser therapeutic apparatus comprising:

a power supply for supplying power;

a plurality of laser probes operatively coupled to said power supply and selectively activated to convert the power to beam radiation;

control means operatively coupled to said laser probes for selecting an irradiation time and an irradiation output for each of said laser probes and for controlling activation of said laser probes in accordance with the selected irradiation times and irradiation outputs;

a probe support table having a rigid substantially planar surface to which each of said laser probes is movably coupled so that said laser probes are movable in two dimensions, said probe support table selectively positioning and supporting said plurality of laser probes in spaced relation; and

positioning means coupled to said probe support table for selectively positioning said probe support table.

5,150,705

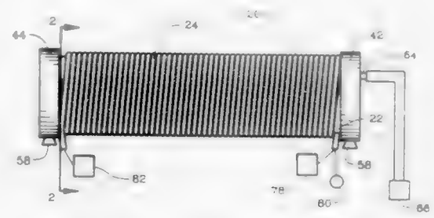
APPARATUS AND METHOD FOR IRRADIATING CELLS

Randy L. Stinson, 42 Glen Way, Baltimore, Md. 21236

Filed Jul. 12, 1989, Ser. No. 378,994

Int. Cl.[5] A61N *5/00*

U.S. Cl. 128—396 28 Claims



1. An apparatus for subjecting cells to irradiation by an ultraviolet light source comprising:

an ultraviolet light source;

an outer cylinder surrounding said light source;

carrying means separate from and encircling an outer peripheral surface of said outer cylinder for carrying suspended cells that are to be subjected to irradiation by the light source; and

means for ensuring that suspended cells within said carrying means are subjected to light from said light source having a wavelength equal to or greater than about 280 nanometers.

5,150,706

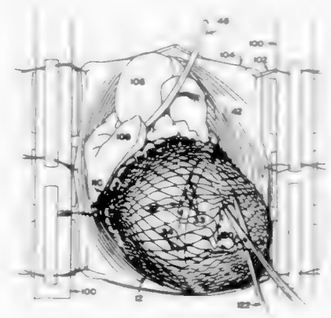
COOLING NET FOR CARDIAC OR TRANSPLANT SURGERY

James L. Cox, 7 Dromara Rd., Ladue, Mo. 63124, and Robert D. B. Jaquiss, 465 Fourwynd, Creve Coeur, Mo. 63141

Filed Aug. 15, 1991, Ser. No. 745,519

Int. Cl.[5] A61F *7/00*

U.S. Cl. 128—400 13 Claims



1. A device for cooling an internal organ during surgery, comprising:

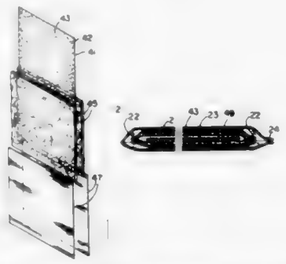
a. a net made of a water-permeable fabric having a size and shape that allow the net to be fitted in a conforming manner around at least a portion of the organ; and

b. a conduit having (1) an inlet adapted to be coupled to a source of a chilled liquid during use, and (2) at least one outlet for the chilled liquid to exit the conduit,

wherein, when the net is in use during surgery, at least one outlet of the conduit is in fluid communication with the fabric of the net and positioned in a manner which directs chilled liquid exiting the conduit through said outlet into the fabric of the net, thereby causing the liquid to permeate into and diffuse

through the fabric of the net so that the chilled liquid will contact the surface of the organ.

5,150,707
ABSORBENT ASSEMBLY FOR USE AS A THERMAL PACK
Leslie B. Anderson, Easton, Pa., assignor to Medico International, Inc., Palmer, Pa.
Filed Jun. 18, 1990, Ser. No. 539,841
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—402 **20 Claims**



1. A hot/cold compress for application to an afflicted body portion comprising at least two thermal packs and a holder having at least two pockets disposed side-by-side for receiving said thermal packs, at least one in each pocket, and a strap adapted to encircle said body portion attached at one end to one by said pocket and having releasable fastening means to releasably engage said holder adjacent said pockets,

each said thermal pack comprising an absorbent assembly of hydrophilic material comprising a carrier film having a layer of water-soluble adhesive material on at least one surface thereof, a layer of hydrophilic particulate material adhered to said carrier film by said adhesive layer, said particulate hydrophilic material operable upon contact with water to expand in the form of a gel,

said carrier film and said particulate material adhered thereto forming the central layer of a multi-layer package, the outer layers of said multi-layer package comprising porous material having flow passages therethrough of a size sufficiently large to afford migration of water through the pores from outside the package into the central layer, and vice versa, and sufficiently small to restrict migration of the gel from the central layer outwardly through the outer layers,

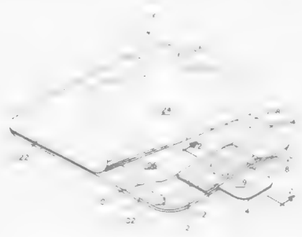
said outer layers having a seam extending around their periphery to form a hollow enclosure surrounding said carrier film, said hollow enclosure adapted to be expanded to accommodate the expansion of said particulate material caused by forming a gel upon contact with water, whereby upon contacting said assembly with water, water migrates through said outer layers into said enclosure to cause said particulate matter to form a gel and also to dissolve the adhesive material to free said particulate matter and the gel from adherence to said carrier film.

5,150,708
TABBED DEFIBRILLATOR ELECTRODE PAD
Robert J. Brooks, Everett, Wash., assignor to SpaceLabs, Inc., Redmond, Wash.
Filed Dec. 3, 1990, Ser. No. 621,863
Int. Cl.[5] A61N *01/04*
U.S. Cl. 128—419 D **26 Claims**

1. An electrode for conducting electricity between medical apparatus and the body of a patient, said electrode comprising:

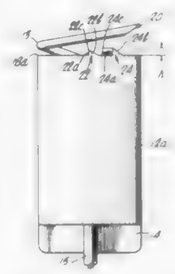
electrode pad means for conducting electricity to the body of the patient, said electrode pad means including an application surface having a periphery wherein a portion of said application surface includes electrode means for conducting electricity from said electrode pad means to the body of the patient, said electrode pad means further including adhesive means disposed upon said application surface of said electrode pad means for adhering said electrode pad means to the body of the patient, said electrode pad means including gripping means for providing a gripping edge to a user of the electrode, said gripping means including a gripping surface that is accessible to the user to provide the gripping edge; and

release sheet means for covering said application surface of said electrode pad means to prevent said adhesive means



from unintentionally sticking to objects other than the body of the patient, said release sheet means including means for substantially preventing said adhesive means from sticking to said release sheet means so that said release sheet means is easily removable from said electrode pad means, said release sheet means further including a tab portion constructed to extend beyond the periphery of said electrode pad means to provide an opposing gripping edge, opposite said gripping edge of said gripping means, to permit a user to remove said release sheet means from said electrode pad means.

5,150,709
SPIRAL ELECTRODE WITH CONTACT RETAINER
Theodore C. Neward, P.O. Box 725, Cucamonga, Calif. 91730
Filed Feb. 11, 1991, Ser. No. 654,268
Int. Cl.[5] A61B *5/0448*
U.S. Cl. 128—642 **19 Claims**



1. An electrode structure for use in fetal heart monitoring comprising

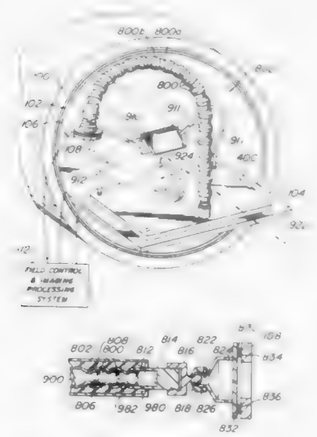
a substantially cylindrical electrode body formed of electrically insulating material and having a first end and a second end,

a spiral electrode extending from the first end of the body and terminating in a pointed end adapted to pierce a fetal epidermal layer,

a second electrode extending from the second end of the electrode body, said second electrode being electrically insulated from the spiral electrode, and

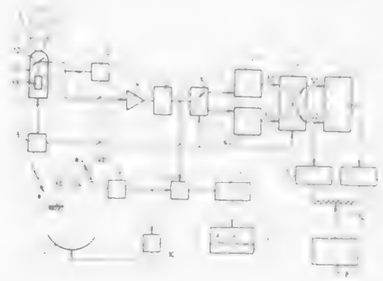
the first end of the electrode body having at least a protrusion underlying a portion of the spiral electrode to increase the resistance of the electrode structure from unwinding from the fetal epidermal layer.

5,150,710
VARIABLE POSITION SURFACE COIL STABILIZER FOR MAGNETIC RESONANCE IMAGING
Bradford D. Hall, Fairless Hills, and Steven B. Krupnick, Philadelphia, both of Pa., assignors to Webb Research II, Inc., Philadelphia, Pa.
Continuation-in-part of Ser. No. 342,232, Aug. 21, 1989, abandoned. This application Feb. 22, 1990, Ser. No. 483,244
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.5 **1 Claim**



1. In a magnetic resonance imagining system, a coil assembly comprising a surface coil, a portable base and support means for permitting said coil to be translated along any one of three orthogonal directions and to be rotated about any one of three orthogonal axes with respect to said base upon the application of a force, and for arresting the position of said coil upon removal of said force, said support means being a segmented joint assembly comprising a plurality of non-metallic, tubular segmented joint members connected together end-to-end, whereby said segmented joint assembly has a tubular interior extending along its length, each of said segmented joint members having a hollow skirt portion and a ball portion removably held in the skirt portion of an adjacent one of said segmented joint members, a powder filling said tubular interior for increasing the resistance between the ball and skirt portions of adjacent segmented joint members, whereby to increase the force required to move said ball portions with respect to said skirt portions.

5,150,711
ULTRA-HIGH-SPEED EXTRACORPOREAL ULTRASOUND HYPERTHERMIA TREATMENT DEVICE
Jacques Dory, Coupvray, France, assignor to EDAP International, S.A., France
Continuation-in-part of Ser. No. 696,992, May 3, 1991, which is a continuation of Ser. No. 427,429, Oct. 27, 1989, Pat. No. 5,054,255, which is a continuation-in-part of Ser. No. 368,906, Jun. 19, 1989, Pat. No. 5,080,101, which is a continuation of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application Jul. 23, 1991, Ser. No. 734,667
Claims priority, application France, Jul. 23, 1990, 90 09717
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.03 **8 Claims**



1. In an extracorporeal ultrasound hyperthermia target treatment device comprising:

a) means generating a treatment beam from an emitting surface; and means locating a treatment beam target in a body;

b) means aiming and focusing said beam at said target at a focal spot; the improvement comprising:

c) in said treatment beam generating means means for producing ultrasound wave trains at frequencies between about 1 MHz and about 6 MHz, as a function of frequency; and peak electric powers between about 10 KW and 1 KW, as a function of frequency; and peak acoustic powers between about 3 KW and 200 watts, as a function of frequency; which produce acoustic intensity at the focal spot between about 100 KW and 10 KW per square centimeter, as a function of frequency, for less than about three seconds.

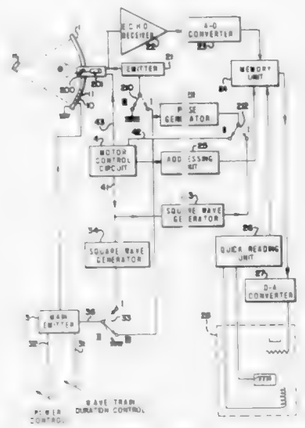
5,150,712
APPARATUS FOR EXAMINING AND LOCALIZING TUMORS USING ULTRA SOUNDS, COMPRISING A DEVICE FOR LOCALIZED HYPERTHERMIA TREATMENT
Jacques Dory, Coupvray-Esbly, France, assignor to EDAP International, S.A., France
Division of Ser. No. 352,516, May 16, 1989, which is a division of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application Jan. 9, 1991, Ser. No. 638,961
Claims priority, application France, Dec. 14, 1983, 83 20041; May 3, 1984, 84 06877
Int. Cl.[5] A61B *8/00;* **A61N** *5/00*
U.S. Cl. 128—660.03 **14 Claims**

1. An article of manufacture comprising:

(a) a concave focusing treatment wave transducer assembly for treating a target and a plurality of mounted juxtaposed piezoelectric elements, and

(b) separate target locating and treatment aiming ultrasound transducer means adapted to be positioned between a focal point of said treatment wave transducer assembly

and said target for scanning said target with echographic ultrasound and for generating a target image;
(c) means displaying said image of said target;



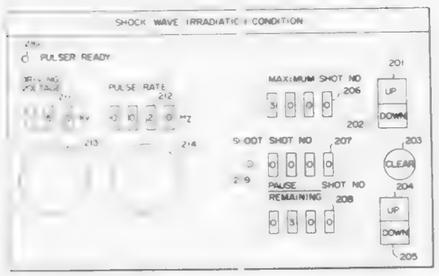
(d) means displaying a visible indication of said focal point of said treatment wave transducer assembly; and
(e) means bringing said image and said indication into coincidence.

5,150,713

METHOD AND SYSTEM FOR CONTROLLING SHOCK WAVE IRRADIATION IN A SHOCK WAVE THERAPY APPARATUS

Kiyoshi Okazaki, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1990, Ser. No. 569,909
Claims priority, application Japan, Aug. 21, 1989, 1-212942
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—660.03 24 Claims



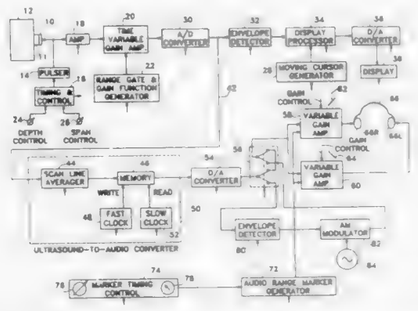
1. A system for controlling shock wave irradiation in a shock wave therapy apparatus, the system comprising:
acquiring means for acquiring an ultrasound tomogram image of a subject;
displaying means for displaying the acquired ultrasound tomogram image to detect a portion to be irradiated within the subject.
irradiating means for irradiating shock waves to the detected portion;
first setting means for setting a maximum number of irradiations of the shock waves;
second setting means for setting a number of pause irradiations of the shock waves; and
controlling means for controlling the irradiating means in accordance with the maximum number of irradiations of the shock waves and the number of pause irradiations of the shock waves to irradiate the shock waves to the detected portion during a plurality of irradiation periods determined by the maximum number of irradiations of the shock waves and the number of pause irradiations of the shock waves.

5,150,714

ULTRASONIC INSPECTION METHOD AND APPARATUS WITH AUDIBLE OUTPUT

Philip S. Green, Redwood City, Calif., assignor to SRI International, Menlo Park, Calif.

Filed May 10, 1991, Ser. No. 698,723
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.06 25 Claims



1. An ultrasonic inspection method employing reflections from discontinuities within an object of recurrent transmitted pulses of ultrasonic energy comprising:
recurrently transmitting pulses of ultrasonic energy into an object along a beam axis,
receiving by transducer means reflected ultrasonic wave pulses from over a range of distances within the object and converting the same to ultrasonic electrical signals,
converting ultrasonic electrical signals from the transducer means received during at least a portion of said range to an audio frequency signal,
converting the audio frequency signal to first and second audio frequency signals of simultaneously increasing and decreasing amplitude, respectively, and
converting the first and second audio frequency signals to audible signal form at first and second spaced locations to provide an audible presentation having a stereophonic spatial effect dependent upon distance of travel of the reflected ultrasonic wave pulses for an audible indication of depth of reflections.

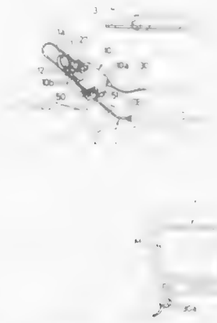
5,150,715

ULTRASOUND-IMAGING DIAGNOSTIC SYSTEM

Masaaki Ishiguro; Toshizumi Tanaka, and Yukio Takagi, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 10, 1991, Ser. No. 683,295
Claims priority, application Japan, Apr. 18, 1990, 2-100395; Apr. 18, 1990, 2-100396; Apr. 18, 1990, 2-100397
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 6 Claims

1. An ultrasound imaging system, comprising:
an ultrasound probe having an elongated flexible body rotatably supporting an ultrasound transducer on a tip end portion;
an operating unit including means for scanning said ultrasound probe;
a flexible cord having one end thereof securely fixed to said operating unit and the other end detachably connected to an ultrasound image observation terminal;
a rotary connector comprising a rotatable member having at least one rotatable electrode, a fixed member having at least one fixed electrode, and a fluid contact interposed between said rotatable and fixed members to electrically connect said rotatable and fixed electrodes with each other; and



a cable having a rotatable cable portion one end being fixedly wired to said ultrasound transducer and another end being detachably coupled with said rotatable member of said rotary connector, and a non-rotatable cable portion one end being fixedly wired to said fixed member of said rotary connector and a connector to be connected with said ultrasound image observation terminal.

5,150,716

SYSTEM FOR DIAGNOSIS AND STAGING OF DEMENTIA BY NEUROLOGIC EXAMINATION

Emile Franssen, 595 Main St., and Barry Reisberg, 20 Waterside Plz. #7K,, New York, N.Y. 10010

Filed Jan. 28, 1991, Ser. No. 646,688
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—774 11 Claims

1. The process for developing cognition independent tests for the diagnosis and staging of dementia comprising
(a) separation of cognition-dependent measures from the clinical neurologic examination
(b) selecting a group of cognition-independent measures from the clinical neurologic examination, more specifically, reflex phenomena, for the purpose of diagnosing and staging dementia
(c) developing and modifying scoring methodology of cognition-independent clinical measures, specifically, reflexes
(d) developing new neurologic measurements from specific combinations of individual quantified neurologic measurements, that is, from reflexes
(e) utilizing these quantified individual clinical neurologic measurements as well as the combination neurologic quantified measurements to diagnose and stage dementia.

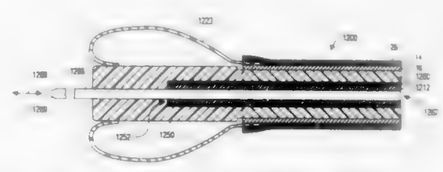
5,150,717

MICROWAVE AIDED BALLOON ANGIOPLASTY WITH GUIDE FILAMENT

Arye Rosen, 508 Heartwood Rd., Cherry Hill, N.J. 08003, and Paul Walinsky, 220 E. Mermaid La., Philadelphia, Pa. 19118

Division of Ser. No. 269,960, Nov. 10, 1988, abandoned. This application Sep. 18, 1990, Ser. No. 584,061
Int. Cl.[5] A61B *17/36*
U.S. Cl. 128—804 19 Claims

1. A flexible filament guided microwave catheter, comprising:
an elongated flexible tube defining a longitudinal bore, a distal and a proximal end, at least the outer portion of said tube being electrically conductive;
an elongated electrically conductive flexible sheath surrounding and spaced away from the exterior of said tube over at least a portion of its length to thereby define a coaxial electromagnetic transmission line including proximal and distal ends;



a flexible guide filament slideably disposed within said bore;
applying means for applying microwave power through said transmission line;
antenna means coupled to at least said conductive portion of said tube at said distal end, for radiating in response to said microwave power.

5,150,718

METHOD OF CONTRACEPTION

Hendrik De Nijs, Oss, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 541,559, Jun. 21, 1990, Pat. No. 5,088,505, Division of Ser. No. 229,066, Aug. 5, 1988, Pat. No. 4,957,119. This application Feb. 14, 1992, Ser. No. 836,632
Int. Cl.[5] A61K *9/22*
U.S. Cl. 128—832 8 Claims

1. A method of contraception comprising: subcutaneously or locally administering an implant said implant comprising:
core material of ethylene/vinyl acetate copolymer having such a molecular weight that the melt index is equal to or greater than 10 grams/10 minutes, and a vinyl acetate content of at least 20% by weight, which core material functions as a matrix for at least one highly active progestogen present in a quantity sufficient for a release rate of greater than 30 μg of said progestogen per day over a term of at least one year, and
a membrane having a layer thickness of 50–250 μm which encases the core material and also consists of ethylene/vinyl acetate copolymer, but with such a molecular weight that the melt index is less than or equal to 10 grams/10 minutes, and a vinyl acetate content of less than 20% by weight, which membrane, with the core material, forms a contact layer at the interface of the core material and membrane thus preventing the core material and membrane, from separating from one another.

5,150,719

APPARATUS AND METHOD FOR REMOVING TOBACCO SHREDS FROM A CIGARETTE FILTER

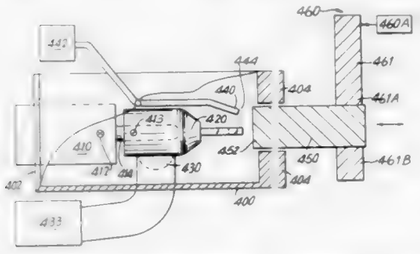
Wayne B. Adkins, New Kent, and Jose I. Roncero, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 19, 1991, Ser. No. 657,523
Int. Cl.[5] A24C *5/36*
U.S. Cl. 131—96 28 Claims

1. Apparatus for removing tobacco shreds from an end of a filter material in a severed filter portion of a smoking article, comprising:
means for gripping the severed filter portion and means for maneuvering the severed filter portion to a selected location so that a filter material tobacco end is presented to a deshredding area in the selected location;

means for maintaining the filter portion at the selected location for a period of time;

a deshredder tool for contacting and loosening tobacco shreds, said tool being located proximate to the selected



location so that the filter material is a preselected distance from said tool; and

means for directing a stream of gas at the selected location to loosen and remove tobacco shreds

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5,150,720

CUBOIDAL PACK, ESPECIALLY HINGE LID PACK FOR CIGARETTES

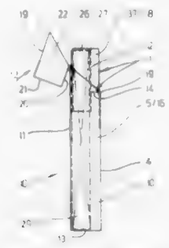
Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Feb. 20, 1991, Ser. No. 658,013

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005443

Int. Cl.[5] **A24F** *15/10*

U.S. Cl. 131—329 **4 Claims**



1. In a cuboidal hinge-lid pack made of thin cardboard and having a collar; said pack containing an interior cigarette block in the form of a group of cigarettes wrapped in a wrapper; said pack having a hinged lid (**12**), a pack rear wall (**11**) to which the lid is hinged, two pack side walls (**15**, **16**), a bottom wall (**13**) and a pack front wall (**14**), all of which walls define an interior volume having a height, width and depth; said pack having a front wall-to-rear wall depth which is greater than that of the cigarette block, thereby forming in said pack a front cavity (**30**) having a depth and a width which is equal to the width of said volume the improvement wherein:

said front cavity is located in a front portion of the pack and is bounded by the pack front wall (**14**);

the collar (**24**) is formed from a blank of thin cardboard and is angularly folded in three dimensions to form in said front cavity (**30**) a filling piece which supports the cigarette block between the pack rear wall (**11**) and the filling piece;

the collar (**24**) comprises only a collar front wall (**25**), located in aid front collar (**30**) near aid pack front wall (**14**), and collar side tabs (**26**, **27**) abutting said pack side wall (**15**, **16**), and has no rear wall, said collar front wall (**25**) and said collar side tabs (**26**, **27**) extending around only an upper portion of the pack and around only said pack front (**14**) and side (**15**, **16**) walls;

the collar (**24**) extends over the entire width of said front cavity (**30**); and

the folded collar comprises: in a lower portion of said collar front wall (**25**), a lower connecting tab (**33**) abutting, and secured to, the pack front wall (**14**); in an upper portion of said collar front wall (**25**), an upper upright supporting wall (**32**) for supporting the cigarette block, said upright supporting wall (**32**) being inwardly set back into the interior volume of the pack relative to said lower connecting tab (**33**); and a folding strip, interconnecting said upper upright supporting wall (**32**) and said lower connecting tab (**33**), and defining a step.

5,150,721

TOBACCO SMOKE FILTER MATERIAL AND PROCESS FOR PRODUCTION THEREOF

Benedict M. Lee, 1036 Hanover Ct., and James E. Harris, 2305 Norwich Pl., both of Kingsport, Tenn. 37660

Continuation-in-part of Ser. No. 486,322, Feb. 28, 1990. This application Oct. 10, 1990, Ser. No. 596,654

Int. Cl.[5] **A24D** *3/02*

U.S. Cl. 131—331 **7 Claims**

1. A process for preparing a tobacco smoke filter material comprising:

(a) dissolving about 5 to 32 wt. % of at least one acidic compound selected from nontoxic, nonvolatile organic acids, into cellulose acetate solution containing between about 1 and 15 wt. % water and about 35 to 75 wt. % acetone;

(b) adding the concentrate of (a) to an acetone spinning solution of cellulose acetate;

(c) spinning said solution into filaments; and

(d) combining said filaments to make filter tow.

5,150,722

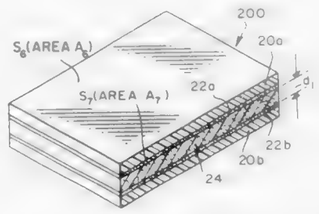
MULTI-LAYER SCENT EMITTING ARTICLE AND DEVICE ADAPTED TO EMPLOY SAME

Howard J. Rutherford, Highlands, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 407,064, Sep. 14, 1989, Pat. No. 5,069,231, which is a continuation-in-part of Ser. No. 379,175, Jul. 12, 1989. This application Nov. 9, 1990, Ser. No. 611,913

Int. Cl.[5] **A24F** *47/00*; **B67D** *5/10*; **B32B** *9/04*

U.S. Cl. 131—335 **9 Claims**



1. A multi-layer controlled release functional organoleptic material-emitting lamina article comprising:

(a) a controlled release functional organoleptic material-emitting substantially planar core lamina consisting of a microporous or macroporous polymer having included in the pores thereof a functional organoleptic material composition, said core lamina having a first upper planar surface S_1 of surface area A_1, a second lower planar surface, S_1', of surface area A_1', a substantially uniform finite cross section thickness d_1 and a lateral continuous or discretely interrupted surface area S_e having an area A_e which surface area A_e is exposed to the environment surrounding the article, being substantially in linear lateral

core planes, immediately adjacent or conterminous to and juxtaposed to one another or in a curvilinear lateral core plane or in curvilinear lateral core planes immediately adjacent or conterminous to and juxtaposd to one another, said lateral core plane or core planes being substantially perpendicular to said first upper planar surface and said second lower planar surface of said core lamina wherein:

$A_1 \geq A_1' > \ldots > A_e$

and:

$S_e \perp (S_1 \wedge S_1')$

(b) fixedly adhered to said first upper planar surface of said core lamina and contiguous or coplanar therewith at least one planar impermeable polymeric first barrier lamina or series of monoplanar spaced parallel first barrier laminae which has a first upper surface S_2 of surface area A_2 and a second lower surface S_3 of surface area A_3, said second lower surface being fixedly contiguous or coplanar with said first upper planar surface of said core lamina with the provisos that:

$A_1 = A_1' \geq A_2 \geq A_3$

and

$S_1 \parallel S_1' \parallel S_3 \parallel S_2$

(c) fixedly adhered to said lower planar surface S_1' of said core lamina and contiguous or coplanar therewith at least one planar impermeable polymeric second barrier lamina or a series of spaced parallel second barrier laminae which has a first upper surface S_4 or surface area A_4 and a second lower surface S_5 of surface area A_5, said first upper surface S_4 being fixedly contiguous or coplanar with said second lower planar surface S_1 of the core lamina with the provisos that:

$A_1' \geq A_4 \geq A_5$

and:

$S_1' \parallel S_4 \parallel S_5$.

5,150,723

PROCESS FOR THE PRODUCTION OF TOBACCO SMOKE FILTERS

Benedict M. Lee, and James E. Harris, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 250,690, Sep. 28, 1988, Pat. No. 4,964,426. This application Jun. 8, 1990, Ser. No. 535,009

Int. Cl.[5] **A24D** *3/16*; **C08B** *3/06, 1/02*

U.S. Cl. 131—342 **11 Claims**

1. A process for preparing a tobacco smoke filter material comprising the steps of:

(a) immersing a fibrous or sheet tobacco smoke filter element having surfaces for exposure to tobacco smoke in a solution comprising a liquid and about 1 to about 50 weight percent of a compound capable of forming micro acicular crystals,

(b) removing the filter element from said solution to result in a filter element in contact with residual solution, and

(c) removing the liquid from said residual solution under conditions such that a tobacco smoke filter material is formed comprising said tobacco smoke filter element having micro acicular crystals of said compound present on said surfaces in an amount of at least about 1 weight percent, based on the weight of the filter material.

5,150,724

METHOD OF MAKING NON-NICOTINE CIGARETTES

Chien-Ching Liu, No. 103, Yi Hua St., Taichung, Taiwan

Filed Mar. 20, 1991, Ser. No. 672,565

Int. Cl.[5] **A24B** *15/00*

U.S. Cl. 131—359 **5 Claims**

1. A method for making a non-nicotine cigarette which comprises the steps of: providing the stems and leaves of a non-nicotine containing plant selected from the group consisting of fennel and *foeniculum vulgare* and mixtures thereof; comminuting the stems and leaves; and forming the comminuted stems and leaves into a cigarette.

5,150,725

FILTER TIPPED SMOKING RODS

Linda J. Cunningham, Co. Down; Brian Adams, Templepatrick, and William Barham, Belfast, all of Ireland, assignors to Gallaher Ltd., England

Filed Feb. 13, 1991, Ser. No. 654,465

Claims priority, application United Kingdom, Feb. 13, 1990, 9003248

Int. Cl.[5] **A24D** *1/02*

U.S. Cl. 131—365 **23 Claims**

1. A tipped smoking rod comprising

a tobacco rod,

a filter tip adjacent one end of the tobacco rod and comprising a filter body enclosed within plugwrap material, and

a tipping overwrap material around the filter tip and the said adjacent end of the tobacco rod, and in this smoking rod,

the plugwrap material is selected from first and second sheet materials and the tipping overwrap material is the other of the first and second sheet materials,

the first sheet material is a substantially impermeable sheet material that has been provided with a first pattern of first perforations, and

the second sheet material is a substantially impermeable sheet material that has been provided with a second pattern of second perforations,

wherein the perforations are all between 0.01 and 1 mm in each dimension,

the first pattern comprises one or a plurality of parallel first rows of first perforations in a predetermined arrangement within each row,

the second pattern comprises one or a plurality of parallel second rows of second perforations in a predetermined arrangement within each row,

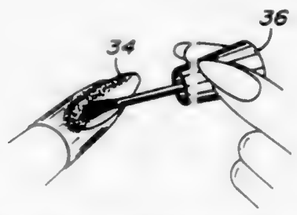
the first and second patterns are selected such that there is an area of overlap of first and second perforations that is at least 0.2 mm^2 and that is substantially unaffected by the relative positions of the tipping and the plugwrap materials.

5,150,726

METHOD AND APPARATUS FOR APPLICATION OF FINGER & TOENAIL COATINGS

Joie Rucker, P.O. Box 215, Sausalito, Calif. 94965

Division of Ser. No. 166,395, Mar. 10, 1988, Pat. No. 4,960,587.
This application Oct. 1, 1990, Ser. No. 591,423
Int. Cl.[5] B32B . */02*
U.S. Cl. 132—285 **9 Claims**



6. A mask for releasably covering, sealing and protecting the cuticle and immediately adjacent skin tissue of a person's finger or toe during application of a coating to an associated finger or toenail, the mask comprising a flat U-shaped sheet of pliable, elastic and manually stretchable and formable synthetic resin material having an adhesive coated on one surface thereof for releasably adhering said mask to said cuticle and skin tissue and said U-shaped mask including flat, elastic and manually stretchable and formable opposing side means and base means between said side means for covering, sealing and protecting said cuticle and skin tissue and bounding a cut out open to a forward edge of said sheet and having a size and shape of said nail to expose said nail for coating while said elastic and stretchable side and base means are manually stetched and formed to cover said cuticle and skin tissue surrounding said nail with a marginal edge exactly fitting a border of said nail.

5,150,727

FALSE BOTTOM SUMP

Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada

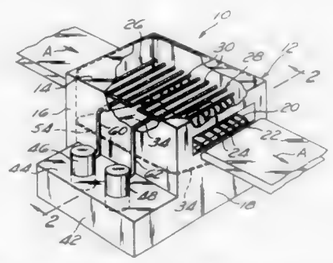
Filed Nov. 26, 1990, Ser. No. 617,693
Int. Cl.[5] B08B */02*
U.S. Cl. 134—104.2 **13 Claims**

1. A fluid baffle for use in facilitating recirculation of fluid discharged from a sprayer into a sump of a chemical processing machine for manufacturing printed circuit boards, the baffle being disposed within the processing machine between the spray and sump and being sized to substantially cover the sump so as to act as a barrier between the sprayer and sump, the baffle comprising:

an upper fluid contacting surface disposed at a sloped angle intermediate the sprayer and sump, the fluid contacting surface having an upper edge portion disposed proximate a sump pump, and a lower edge portion disposed distal to the sump pump; and

at least one opening formed in the fluid contacting surface adjacent the lower edge portion thereof;

wherein the fluid contacting surface is operative to receive fluid discharged from the sprayer and mix and aerate the fluid as the fluid is directed downwardly by the sloped



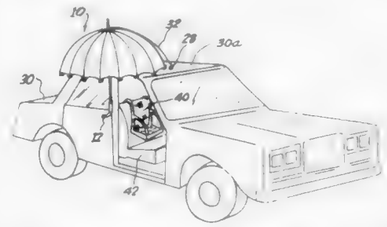
angle thereof towards the opening, were upon the fluid is drained into the sump distal the sump pump, thus preventing the settling and separation of particulate matter from the fluid within the sump due to the circulation of the fluid across the length of the sump before being pumped to the sprayer by the sump pump.

5,150,728

UMBRELLA WITH MAGNETIC FASTENERS

Catherine Stark, 431 Lake Helen Dr., West Palm Beach, Fla. 33411

Filed Aug. 20, 1991, Ser. No. 748,743
Int. Cl.[5] A45B */00*
U.S. Cl. 135—16 **2 Claims**



1. An umbrella that can be readily attached to a metallic magnetic surface such as found in an automobile comprising:

a fabric canopy;

a plurality of radially disposed supporting ribs attached to one side of said canopy;

a shaft operably connected to said radial ribs for moving said ribs from a first position to a second position causing the canopy to move from an open position to a closed position; and

magnetic fastening means strategically attached to at least one location on said umbrella for attachment to a metal magnetic surface, said magnetic fastening means includes a plurality of fabric pocket attached to said canopy, the plurality of magnetic fasteners strategically disposed and fastened in fabric pockets to said canopy;

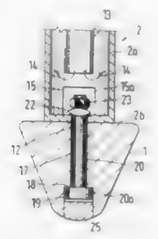
wherein said umbrella is supported and held in place about the metal magnetic surface without being hand held by the user thus allowing the user to perform other functions while retaining the benefits of said umbrella.

5,150,729

CONTROL SPEAR FOR USE IN A PASSAGE FOR CONDUCTING DUST-CONTAINING HOT GASES

Wolfgang Frank, Eschborn; Johannes Löffler, Bad Homburg, and Norbert Holle, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 9, 1991, Ser. No. 774,021
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1990, 4036487
Int. Cl.[5] F16K */49/00*
U.S. Cl. 137—340 **1 Claim**



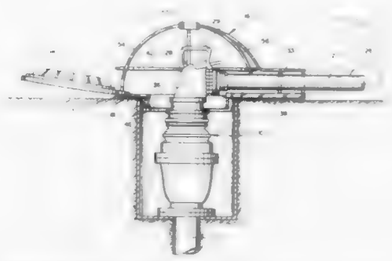
1. A control spear for a valve in a passage for conducting dust-containing hot gases, said valve closing and unclosing an opening in said passage, the control spear comprising a shaft and a frustoconical head movably mounted on the shaft, said head being made of ceramic material or hardened steel, said head cooperating with said opening to effect closing and unclosing of the valve, the shaft being hollow and being provided with means for a cooling liquid to flow therethrough, the shaft at its bottom end adjacent to the head being provided with a chamber, the head having a central bore and a shoulder within an enlarged portion of said bore, the bore containing a stressing bolt having an enlarged head bearing against said shoulder, one end of the stressing bolt extending from the head into the chamber, and a disk spring and a nut cooperating with the stressing bolt within said chamber, said spring being forced by the nut against the bottom end of the shaft.

5,150,730

PROVISIONAL PROTECTIVE MEANS FOR PIT VALVE CASING

Teddy G. Campbell, Brookfield, Conn., assignor to Texaco, Inc., White Plains, N.Y.

Filed Mar. 2, 1992, Ser. No. 844,053
Int. Cl.[5] F16L */5/00*
U.S. Cl. 137—364 **10 Claims**



1. The combination with a pit valve casing embedded into the ground, having a ground level flange at the casing upper end, said casing enclosing a subsurface pit valve communicated with a source of liquid to be transferred, said pit valve having adapted to provisionally engage a connector having a liquid transfer hose depending therefrom, of

a protective enclosure for engagement with said ground level flange during a liquid transfer operation, and comprising:

a base plate having upper and under surfaces and means defining an access opening therethrough,

at least one deflector element depending from said base plate upper surface and extending transversely above said means forming said access opening, and

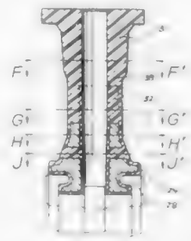
a hose deflector means depending laterally from said base to register about a segment of said liquid transfer hose adjacent to said connector.

5,150,731

BUTTERFLY VALVE TO PREVENT DEW CONDENSATION THEREFROM

Kamezawa Jiro, Daito, Japan, assignor to Tomoe Technical Research Co., Japan

Filed Dec. 27, 1990, Ser. No. 634,398
Claims priority, application Japan, Jul. 20, 1990, 2-192663[U]
Int. Cl.[5] F16L */7/00*
U.S. Cl. 137—375 **20 Claims**



1. A butterfly valve for preventing dew condensation which comprises:

a valve body having a cylindrical flow passage therein;

a disk-like valve located rotatably in said valve body;

a seated ring formed with a sealing material, inserted between an inner surface of said valve body and an outer surface of said disk-like valve, and connected to said outer surface of said disk-like valve;

a pair of valve stems comprising a driving side and an idling side, which sides extend radially and in the opposite direction;

a pair of shaft cylinders for the driving side and the idling side which extend outside of said valve body and in opposite radial directions from said valve body;

an insulating cover applied on the external surface of said valve body and applied around said shaft cylinder for prevention of dew condensation;

a thermal conducting breaking part set on a part of said shaft cylinder of driving side; and

said thermal conducting breaking part being located on the outside of said insulating cover.

5,150,732

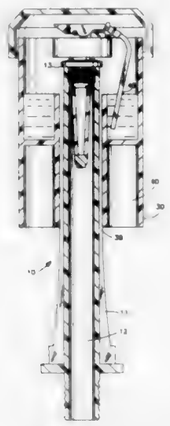
BOOSTED DIFFERENTIAL PRESSURE-TYPE TANK VALVE

Bruce A. Antunez, 1143 Indian Springs, Glendora, Calif. 91740

Filed Aug. 14, 1991, Ser. No. 745,600
Int. Cl.[5] F16K */31/18, 33/00*
U.S. Cl. 137—414 **2 Claims**

1. In a differential pressure type valve of the type having a vertically oriented water supply riser, a main valve mounted to said riser to control the flow of water from said riser, a pilot valve on said main valve to control the opening and closing of said main valve, a pivot member pivotally mounted to said main valve to control the opening and closing of said pilot valve, a float freely fitted over said valves and riser adapted to rise and fall with the level of water in a tank in which the riser is fitted, said float having an upwardly-facing abutment means,

said float being so disposed and arranged as to rest on said pivot member when the water level in the tank is below an intended storage level, and to rise free of the pivot member when the water level is at or above the intended storage level, the improvement comprising:



a boost link on said pivot member projecting downwardly toward said abutment means and so disposed and arranged as to be boosted by said abutment means when the water level is at or above the desired storage level to assure that the pilot valve is set in a condition to close the main valve.

5,150,733

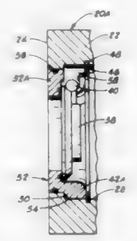
COMPACT SWING CHECK VALVE

John P. Scaramucci, 10724 Woodridder, Oklahoma City, Okla. 73170

Continuation of Ser. No. 430,169, Nov. 1, 1989, abandoned, Continuation-in-part of Ser. No. 286,979, Dec. 20, 1988, Pat. No. 4,982,759. This application Oct. 25, 1991, Ser. No. 783,722

Int. Cl.[5] F16K *15/03*

U.S. Cl. 137—454.2 **1 Claim**



1. A swing check valve, comprising:

a body having upstream and downstream ends and a bore therethrough interconnecting the upstream and downstream ends;

a ring-shaped unitary structure in the bore insertable through the downstream end of the bore having an upstream end and a downstream end and an annular shoulder formed on the outer periphery thereof intermediate the upstream and downstream ends thereof and facing upstream, said structure having a valve seat portion providing a seating face facing downstream, and a ring-shaped cage portion extending downstream from the seating face;

a disc pivotally supported by the cage portion and sized to mate with the seating face to prevent flow upstream through the valve;

said bore having an annular shoulder formed therein facing downstream to mate with the annular shoulder on the ring-shaped structure preventing upstream movement of the ring-shaped structure, the shoulder of said bore being positioned to locate the downstream end of the ring-shaped structure in spaced relation from the downstream end of the body; and

a retainer ring mounted in a mating groove in the bore engaging the downstream end of the ring-shaped structure to hold the ring-shaped structure against downstream movement in the body.

5,150,734

PROCESSING APPARATUS AT REDUCED PRESSURE AND VALVE USED THEREFOR

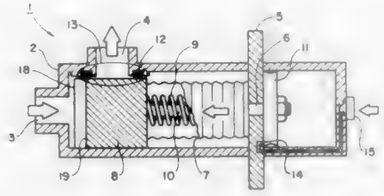
Takahiro Chiba, Iwate, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 13, 1990, Ser. No. 508,556

Claims priority, application Japan, Apr. 13, 1989, 1-93573

Int. Cl.[5] F16K *3/32, 31/122*

U.S. Cl. 137—567 **23 Claims**



1. An apparatus for processing semiconductor wafers at reduced pressure comprising a vacuum chamber and a pumping system connected with the chamber, said pumping system including at least a roughing pump, an exhaust pipe connecting the chamber with the roughing pump and a valve inserted in said exhaust pipe for opening and closing gas flow therethrough, said valve comprising:

a valve casing having valve inlet and outlet openings connected with said exhaust pipe;

a valve seat comprising a gasket surrounding at least one of said openings and having a first surface extending in a direction generally perpendicular to an axis of said opening; and

a valve plug having a second surface, the second surface being parallel with the first surface and contacting airtightly with said gasket at a valve closed position, the valve plug being movable substantially in the direction along the first surface for closing and opening said valve, thereby causing said opening for gas flow to be opened or closed gradually by the slide movement of the second surface of the valve plug on said valve seat along the first surface.

5,150,735

CONTAINMENT VALVE THAT ALLOWS CONTAMINATION FREE TRANSFER

Michael J. Bandy, Greenwood; Roy H. Byerly, and Robert T. Spoonmore, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 29, 1992, Ser. No. 827,357

Int. Cl.[5] F16L *37/28*

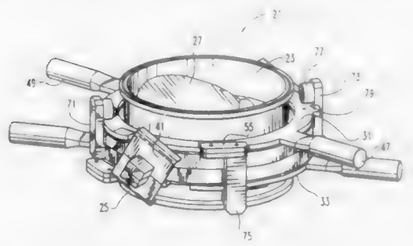
U.S. Cl. 137—614.06 **23 Claims**

1. A valve system, comprising:

a first container port and a second container port which are uncoupleable and coupleable with respect to each other between an uncoupled mode and a coupled mode respectively;

a first butterfly valve body pivotable about an axis which is oriented transverse to the first port and the second port, wherein said first butterfly valve body in a closed position seals the first port against flow of material therethrough;

a second butterfly valve body pivotable about said transverse axis, wherein said second butterfly valve body in a closed position seals the second port against flow of material therethrough, wherein in said coupled mode said first and second butterfly valve bodies are immediately adjacent each other and are simultaneously pivotable about



said transverse axis to an open position to allow flow of material through the first and second ports;

a first locking member which is rotatable circumferentially with respect to the first port from a first circumferential position to a second circumferential position, wherein in said first circumferential position said first locking member locks said first butterfly valve body in said closed position, and wherein in said second circumferential position said first locking member unlocks said first butterfly valve body to allow pivoting of said first butterfly valve body to said open position.

5,150,736

VALVE WITH CRENELLATED SEAT

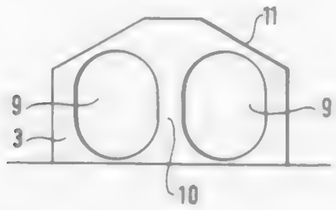
Michel Vincent de Paul, Senlis, and Francois Detanne, Paris, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Sep. 13, 1991, Ser. No. 759,281

Claims priority, application France, Sep. 13, 1990, 9011337

Int. Cl.[5] F16K *47/02*

U.S. Cl. 137—625.3 **4 Claims**



1. Valve comprising a cylindrical valve obturator engagable with an annular valve seat provided with circumferentially spaced crenellations disposed around the part of the valve seat on which the valve obturator rests, wherein each crenellation comprises on a radial surface thereof facing the cylindrical valve obrutartor, an axially extending central partition and two symmetrical openings with said radial surface extending respectively towards opposite lateral surfaces of the crenellation.

5,150,737

CERAMIC DISCS FOR TAPS AND TAPS EQUIPPED WITH SUCH DISCS

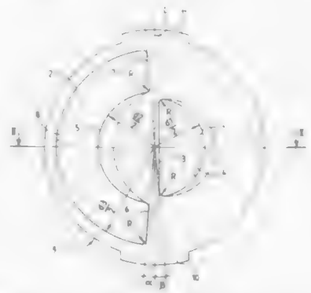
Daniel Clerc, Le Perreux, France, assignor to C.I.C.E. S.A., France

Filed May 24, 1990, Ser. No. 528,292

Claims priority, application France, Jun. 22, 1989, 89 08313

Int. Cl.[5] F16K *3/08, 3/32*

U.S. Cl. 137—625.3 **20 Claims**



1. A half-turn type liquid tap comprising two superimposed discs in contact capable of rotation relative to each other about a common central axis to adjust the flow rate of a liquid, each disc of said two superimposed discs comprising first and second apertures, said first and second apertures being situated on opposite sides of a radial diametral distance from said common central axis of each said two discs and on opposite sides of a diametrical axis of each said two discs, said first aperture being in the central part of each said two disc and said second aperture being in the peripheral part of each said two discs so that in a closed position of said tap said first and second apertures in one of said two superimposed discs are angularly displaced approximately 180 degrees from said first and second apertures, respectively, in the other of said two superimposed discs and in a fully open position of said tap said first and second apertures of said two superimposed discs are respectively superposed.

5,150,738

ROLL COVER FOR DAMPENING APPARATUS

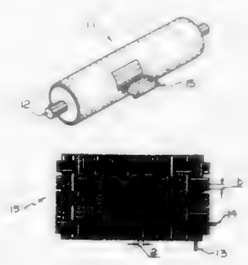
Hiroshi Nishiwaki, Izumi, Japan, assignor to Techno Roll Co. Ltd., Osaka, Japan and Jomac, Inc., Warrington, Pa.

Filed Apr. 3, 1991, Ser. No. 680,096

Claims priority, application Japan, Apr. 9, 1990, 2-94458; Jan. 1, 1991, 3-10004

Int. Cl.[5] D03D *3/02*

U.S. Cl. 139—420 R **12 Claims**



1. A cylindrically shaped woven cover used for a roller in dampening apparatus of an offset printing machine is characterized in that;

(1) said cover being comprised of a multiplicity of warps, said warps being composed of a hydrophilic fiber yarn, of

less than 220 denier, and arranged to run continuously in the direction of the axis of the roller with a setting density of more than 20 threads per centimeter in an unwetted state, and with one or several wefts of less than 220 denier, which are composed of a hydrophilic fiber yarn of which the hydroscopic shrinkage percentile is within 10 to 40%, said wefts having an inserting density of more than 20 threads per centimeter and of the same density as or less than said setting density of the warps before wetting;

(2) wherein the weight of a cloth of said cover is less than 200 g/m2; and

(3) the thickness of said cloth of said cover is less than 0.5 mm

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5,150,739

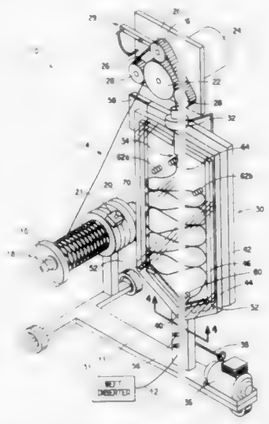
WEFT FEEDING THROUGH AN ACCUMULATOR WITHOUT SUBSTANTIAL TWIST

Daniel C. Blackwell, Bear, and Joseph E. Koskol, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 11, 1991, Ser. No. 728,457

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—452 **19 Claims**



1. Apparatus for the on-demand, low tension feeding of a filling member to weft insertion means of a loom without substantial twist, the demand for said filling member increasing rapidly as said loom accelerates from a stopped condition to process speed operation and decreasing rapidly as said loom decelerates from said process speed operation to said stopped condition, said filling member being taken up by said weft insertion means at a process speed take-up rate during said process speed operation, said apparatus comprising:

filling member supply means for supplying said filling member without substantial twist at an average rate equal to said process speed take-up rate by said weft insertion means;

a filling member accumulator having an inlet for receiving said filling member from said supply means and an outlet from which said filling member is withdrawn by said weft insertion means;

said filling member accumulator having two generally evenly spaced-apart walls with the distance between said walls being such that said filling member forms serpentine folds within said filling member accumulator which advance into said accumulator as said filling member is received through said inlet; and

control means for controlling said filling member supply means in response to said filling member being taken up by said weft insertion means and causing a sufficient amount of filling member to accumulate in said accumulator to meet the rapidly increasing demand for said filling member when said loom accelerates from said stopped condition to said process speed operation, said control means comprising:

first sensor means for detecting when said filling member is being withdrawn from said accumulator, said first sensor means being a throughbeam photocell positioned proximate said outlet;

means responsive to said first sensor for activating said supply means when said filling member is detected being withdrawn from said accumulator and deactivating said supply means after a predetermined time period when said first sensor means does not detect said filling member being withdrawn.

5,150,740

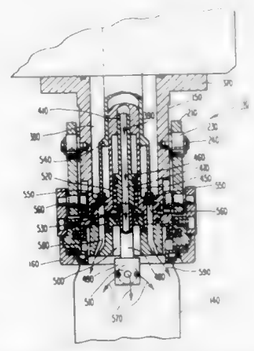
FILLING VALVE

Chung J. Yun, Baltimore, Md., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Division of Ser. No. 420,575, Oct. 12, 1989, abandoned. This application Oct. 11, 1990, Ser. No. 595,966

Int. Cl.[5] B67C *3/02*

U.S. Cl. 141—6 **4 Claims**



1. A method of dispensing carbonated liquids from a counterpressure filling machine to a container comprising the steps of:

moving the container in proximity to a counterpressure valve in the counterpressure filling machine;

operating a gas valve to permit counterpressure gas to flow into a cylinder associated with a piston connected to a vent tube, thereby

increasing the pressure in the cylinder and displacing the piston to permit counterpressure gas to flow into the vent tube and thereby moving the vent tube into the container from the counterpressure valve;

filling the container with counterpressure gas through the vent tube until a pressure equilibrium is reached, whereby a liquid valve is opened by the action of a spring to permit carbonated liquid to flow into the container;

filling the container with the carbonated liquid, thereby displacing a substantial portion of the counterpressure gas from the container through the vent tube;

closing the liquid valve and sealing the vent tube;

venting remaining counterpressure gas from the container;

moving the vent tube from the container; and

relieving pressure impedance in the cylinder developed by the migration of the piston in the vent tube.

5,150,741

DEVICE FOR CONTROLLING THE GAS STREAM DELIVERED BY A PRESSURIZED GAS RESERVOIR AND A GAS SUPPLY SYSTEM COMPRISING SUCH A DEVICE

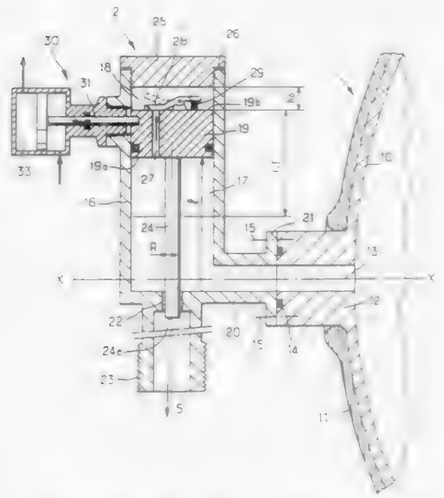
Yves H. G. Valy, Medard en Jalles; Pascal D. Coquet, Bordeaux, and Michel Amagat, St Aubin du Medoc, all of France, assignors to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 20, 1990, Ser. No. 631,331

Claims priority, application France, Dec. 27, 1989, 89 17265

Int. Cl.[5] B67D *1/12*; B65B *31/04*

U.S. Cl. 141—18 **9 Claims**



4. Pressurized gas supply system comprising in combination:

a reservoir containing a pressurized gas;

said reservoir having a first opening through which gas can flow out of said reservoir;

a device for controlling the rate of flow of gas from said first opening, said device comprising:

a cylinder having one closed end;

a movable piston within said cylinder dividing said cylinder into a first chamber and a second closed chamber;

said first chamber being adapted to receive a flow of gas from said first opening and being provided with an orifice through which a controlled stream of gas can flow out of said first chamber;

a conduit for gas flow from said first opening to said first chamber;

an elongated core connected to said piston and located within said first chamber,

said core passing through and cooperating with said orifice to define a second opening having a variable flow section as a function of the position of said piston in said cylinder;

a passage establishing gaseous communication between said first and second chambers of said cylinder;

a non-return valve associated with said passage permitting flow of gas from said first chamber to said second chamber but preventing flow of gas from said second chamber to said first chamber;

controllable locking means for locking said piston in position in said cylinder;

and a stop valve in fluid communication with said orifice for stopping the flow of gas delivered by said reservoir.

5,150,742

VAPOR RECOVERING DEVICE FOR VOLATILE LIQUID DISPENSING APPARATUS

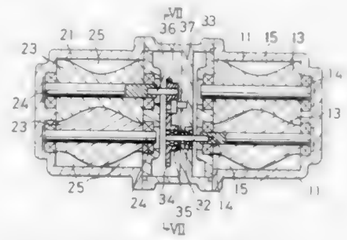
Toshiaki Motohashi, Kanagawa; Yooichi Harada, and Tsuyoshi Yanagihara, both of Kamakura, all of Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,908

Claims priority, application Japan, Jun. 8, 1990, 2-150495

Int. Cl.[5] B65B *31/00*; F04B *17/00*

U.S. Cl. 141—59 **6 Claims**



1. A vapor recovery system comprising:

a duct for liquid,

a gun nozzle mounted at a free end of said duct,

a motor driven pump supplying liquid to said duct,

a vapor duct having a free end positioned for collecting vapor at a free end of said gun nozzle,

a hydraulic motor located in said liquid duct between said gun nozzle and said motor driven pump,

said hydraulic motor having a sealed casing containing a pair of rotors meshing with each other and adapted to be revolved by said liquid flowing through said hydraulic motor,

a pneumatic pump having a sealed casing containing a pair of meshing rotors is located in said vapor duct,

said rotors of said hydraulic motor having the same size and configuration as said rotors of said pneumatic pump, said hydraulic motor driving said pneumatic pump through multiplying gearing, and

said casing of said hydraulic motor and said casing of said pneumatic pump having a connection therebetween, said connection including a small diameter aperture formed at a location upstream of said pump rotors so that liquid forcedly supplied through said hydraulic motor may leak little by little into the pneumatic pump.

5,150,743

APPARATUS FOR ADMITTING METERED QUANTITIES OF LIQUID INTO BOTTLES OR OTHER CONTAINERS

Jacek Walusiak, Hamburg, Fed. Rep. of Germany, assignor to Alfill Getränketechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 26, 1991, Ser. No. 675,428

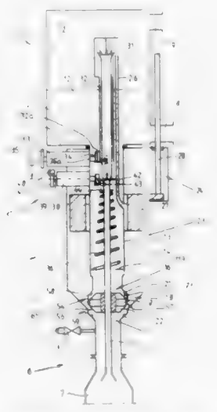
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010413

Int. Cl.[5] B65B *43/42*; B67C *3/00*

U.S. Cl. 141—147 **19 Claims**

1. Apparatus for filling successive containers of a series of containers with metered quantities of a liquid, such as a carbonated beverage, comprising a vessel arranged to store a supply of liquid and having outlet means including at least one first outlet; liquid metering means including at least one liquid metering chamber having an inlet arranged to receive liquid from said at least one first outlet and a second outlet for admission of metered quantities of liquid into successive containers; and container filling means including at least one filling unit having a valve with a component movable between a first position in which said at least one first outlet is sealed to prevent the flow of liquid from said vessel into said at least one chamber and said second outlet is open to permit a metered

quantity of liquid to flow from said at least one chamber into a container, and a second position in which said second outlet is sealed and said at least one first outlet is open to permit the liquid to flow from said vessel into said at least one chamber,



and means for moving said component between said positions, said moving means comprising means for biasing said component to one of said positions and means for shifting said component to the other of said positions against the opposition of said biasing means.

5,150,744

MOORING APPARATUS

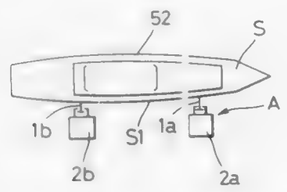
Nobuharu Hayashi, Kobe, and Hiroji Tanaka, Funabashi, both of Japan, assignors to Sumitomo Rubber Industries, Ltd. and Penta-Ocean Construction Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1991, Ser. No. 679,395

Claims priority, application Japan Apr. 3, 1990, 2-35454

Int. Cl.[5] B63B *21/00*

U.S. Cl. 114—230 **6 Claims**



1. A ship mooring apparatus, comprising:

first and second sliding members secured to a side of a ship, said sliding members being vertically disposed and having a predetermined space therebetween;

first and second dolphins securely disposed adjacent to said ship, and corresponding to said sliding members;

first and second engagement means horizontally movably disposed in said first and second dolphins, respectively, said engagement means for slidably engaging said sliding members in a vertical direction;

first buffer means disposed on said first dolphin, for elastically contacting said first engagement member, thereby absorbing a forward rocking of said ship;

said second buffer means secured to said second dolphin, for elastically contacting said second engagement member, thereby absorbing a backward rocking of said ship; and

third buffer means disposed on said first and second dolphins for elastically contacting said first and second engagement members, respectively, wherein said third buffer means prevents said first and second engagement members from moving beyond a predetermined distance in right and left lateral directions.

5,150,745

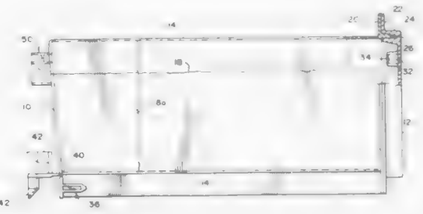
CONTAINER AND METHOD FOR FILLING BATTERIES WITH ELECTROLYTE

Dan Ford, Rte. 1, Box 480–A, and Benjamin J. Ford, Rte. 1, Box 484, both of Cosby, Tenn. 37722

Continuation-in-part of Ser. No. 456,846, Dec. 4, 1989, abandoned. This application Aug. 23, 1990, Ser. No. 571,496

Int. Cl.[5] H01M *2/36*

U.S. Cl. 141—241 **16 Claims**



1. For use with an acid cell battery having a plurality of cells to be charged with acid and inlets communicating with the cells respectively; a portable container having wall portion defining a chamber and acid in the chamber, one of said wall portions having a plurality of pouring spouts communicating with said chamber and alignable with the inlets of an associated battery such that said spouts may be simultaneously aligned with said inlets respectively to simultaneously pour acid from the chamber into the batter cells through the inlets when the container is placed into a pouring position relative to the battery, partition means in said chamber defining a plurality of cells, said spouts being in communication with said container cells respectively, and wherein said cells in the container are in communication with each other, and said wall portions include upper and lower opposite wall portions and opposite side wall portions, said partition means extend to and between said opposite side wall portions and from said upper wall portion towards said lower wall portion, and wherein said spouts are located in said upper wall portion and each spout includes a pouring passage, said container being charged with electrolyte at a level which is below all of the pouring passages when the container is positioned on a particular one of said side wall portions thereof.

5,150,746

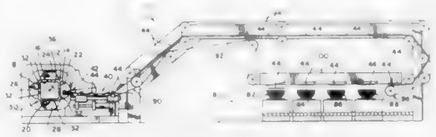
FLITCH TABLE

George Weil, Mississauga, Canada, assignor to David R. Webb Co., Inc., Edinburgh, Ind.

Continuation-in-part of Ser. No. 702,774, May 17, 1991, Pat. No. 5,101,874. This application Nov. 27, 1991, Ser. No. 800,642

Int. Cl.[5] B27L *5/02*

U.S. Cl. 144—209 B **17 Claims**



1. A flitch table for mounting a flitch for slicing of veneer from the flitch by a knife, the flitch including a mounting side which lies adjacent the table when the flitch is mounted to the table, the mounting side including an opening, the table including a dog for projecting into the opening when the flitch is mounted to the table to fix the flitch to the table for slicing of the flitch, the dog having a flitch fixing position in which the flitch is fixed to the table by the dog and a flitch releasing position in which the flitch is not fixed to the table by the dog, and means for driving the dog between the fixing and releasing positions.

5,150,747

METHOD OF FORMING METAL MATRIX COMPOSITES BY USE OF AN IMMERSION CASTING TECHNIQUE AND PRODUCT PRODUCED THEREBY

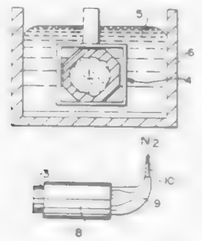
John T. Burke, Hockessin, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 269,371, Nov. 10, 1988, Pat. No. 5,000,249. This application Mar. 18, 1991, Ser. No. 671,049

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] B22D *19/14*

U.S. Cl. 164—97 **20 Claims**



1. A method for forming a metal matrix composite body comprising:

forming a molten source of aluminum matrix metal;

forming at least one preform comprising a mass of substantially nonreactive filler material;

providing magnesium to at least one of the matrix metal and the preform;

providing a nitrogenous atmosphere to be in communication with at least one of the preform and the matrix metal for at least a portion of the spontaneous infiltration;

reacting said nitrogenous atmosphere with said magnesium so as to form a magnesium nitride coating on at least a portion of the filler material comprising said preform;

immersing said preform into said molten source of aluminum matrix metal; and

spontaneously infiltrating at least a portion of the preform with molten aluminum matrix metal.

5,150,748

ADVANCED SURVIVABLE RADIATOR

James B. Blackmon, Irvine; Robert E. Drubka, Huntington Beach; John S. Kirby, Long Beach; Dave Johnson, Riverside; R. Andrew Gerrick, Santa Ana; Thomas Ingersoll, Laguna Niguel; Nelson Jones, Huntington Beach; Brian Seaworth, Huntington Beach, and Gary Glover, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 18, 1990, Ser. No. 539,135

Int. Cl.[5] B64G *1/50;* **F28F** *13/18*

U.S. Cl. 165—41 **5 Claims**

1. A spacecraft heat rejection system comprising:

a space vehicle having an excess of thermal energy;

a metallic surface attached to said space vehicle;

a braze material bonded to said metallic surface; and,

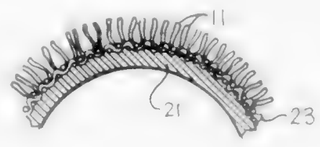
a multiplicity of elongate fibers each having a first end secured within said braze material and a second end extending away from said braze material, and wherein said multiplicity of elongate fibers are made from a material selected from the group consisting of:

fiberglass;

glass;

quartz;

saphire;



tantalum;

diamond;

carbon carbon;

stainless steel;

aluminum;

beryllium; and,

copper.

5,150,749

HEAT EXCHANGER APPARATUS, PARTICULARLY FOR HYBRID HEAT PUMPS OPERATED WITH NON-AZEOTROPIC WORK FLUIDS

György Bergmann; Geza Hivessy; Tamás Homola; Árpád Bakay, and Mihály Horváth, all of Budapest, Hungary, assignors to Energiagazdalkodasi Intezet, Budapest, Hungary

Filed Feb. 27, 1991, Ser. No. 661,311

Claims priority, application Hungary, Feb. 27, 1990, 1058/90

Int. Cl.[5] F28F *25/02;* **F25B** *39/00*

U.S. Cl. 165—115 **21 Claims**

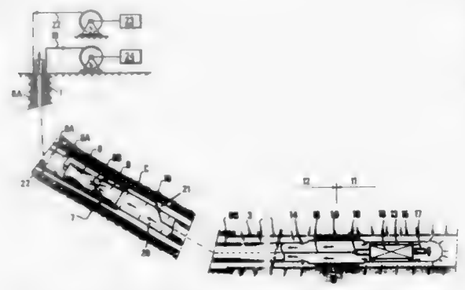
1. Heat exchanger apparatus comprising a substantially horizontal countercurrent heat exchanger of the shell-and-tube type having heat exchanger tubes and operating with non-azeotropic work fluids, characterized in that a fluid distributor with fluid outlets, the number of which corresponds to the number of the heat exchanger tubes of the heat exchanger, is provided upstream of the heat exchanger and the heat exchanger tubes are connected each to one fluid outlet of the fluid distributor.

5,150,750

DEVICE FOR ACTIVATING AND MEASURING NONFLOWING PRODUCING WELLS

Jacques Leasi, Maule, and Christian Wittrisch, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 28, 1991, Ser. No. 723,392
Claims priority, application France, Jun. 29, 1990, 90 08270
Int. Cl.[5] E21B 4/04
U.S. Cl. 166—66.4 6 Claims



1. A device for activating a non-flowing well traversing a subterranean zone containing effluents and for measuring effluents produced by an activation of the device, the well including a liner perforated at least in a portion thereof extending through said subterranean zone, the device comprising:

a flow string connected with a surface installation, said flow string having a diameter less than a diameter of the liner so as to define an annular space between the liner and the flow string;

means for closing the annular space to divide the liner into an upstream part and a downstream part on respective sides of the means for closing, said upstream part and said downstream part being isolated from each other by said means for closing;

means for measuring at least a portion of the produced effluents;

means for activating the production of the well including pumping means inserted in the flow string at a depth accessible to the effluents;

a side entry sub inserted in a portion of the string at a position between the pumping means and said means for measuring; and

a multiconductor cable associated with connecting means entering the flow string at the level of said side-entry sub for connecting the means for measuring to the surface installation.

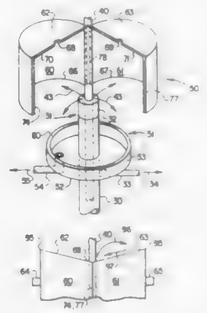
5,150,751

STUFFING BOX LEAK CONTAINMENT APPARATUS

Anthony R. Burton; Monte K. Mitchell, and Raymond Hernandez, all of Andrews, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 29, 1991, Ser. No. 736,840
Int. Cl.[5] E21B 33/08
U.S. Cl. 166—81 6 Claims

1. In a production wellhead for a well having a stuffing box through which a polished rod reciprocate when said well is producing fluid, the improvement comprising a liquid collection means carried by said wellhead below said stuffing box, said collection means encircling said wellhead and having a closed bottom member and an upstanding side means which encircles said wellhead and is fixed to said bottom member in a liquid tight manner, said bottom member having drain means operably connected thereto for draining liquid that collects on said bottom member within said side means, at least two separate upstanding hollow shapes each having an open bottom and a closed top means terminating in an apertured edge means, said closed top means of said hollow shapes slant downwardly toward their respective terminating apertured edge means and said polished rod so that any liquid that may collect on top of said top means will gravitate toward said polished rod and pass around said polished rod into the interior of said hollow shapes, each such shape terminating in a pair of opposing upstanding edge means, said shapes being unconnected to and separable from said liquid collection means, said shapes being of such cross-sectional configuration that when their upstanding edge means and apertured top edge means are brought into abutment with one another the volume enclosed within said abutting shapes encircles said wellhead and extends from said bottom member of said collection means to above said stuffing box and said apertured top edge means form an opening that encircles said polished rod, hinge means joining said shapes along one pair of abutting upstanding edge means so said shapes can be pivoted toward and away from one another, whereby said abutting shapes when resting upon said



bottom member enclose said stuffing box so that any liquid leakage from said stuffing box even when under pressure is kept contained within said abutting shapes and collected in said liquid collection means while at the same time allowing normal reciprocation of said polished rod in said stuffing box and holding means carried by at least one of said wellhead and said liquid collection means for slidably fixing said hollow shapes in place while allowing sufficient upward movement of said shapes so each entire shape can be raised above said upstanding side means and then moved apart from their abutting relationship along one pair of upstanding edge means to provide access to the stuffing box said shapes enclose when in their normal closed abutting relationship, said holding means being composed of a closed loop member having a plurality of eyes slidably engaging said loop member, each eye carrying a support arm, part of said support arms being connected to one of said hollow shapes and the remainder of said support arms being apportioned between the remainder of said hollow shapes.

5,150,752

OIL WELL-FIRE CONTAINMENT DEVICE

Ole Gunst, 19475 Grand View Dr., Topanga, Calif. 90290, and Gary R. Fisher, 2251 Federal Ave., Los Angeles, Calif. 90064

Filed Apr. 22, 1991, Ser. No. 690,168
Int. Cl.[5] E21B 35/00
U.S. Cl. 166—88 18 Claims

1. An apparatus for reaming, tapping and sealing an oil well casing against escaping oil comprising:

a sleeve with insertion means for introducing the sleeve into a well casing;

reaming means for preparing the casing for tapping;

alignment guide means for aligning said sleeve with said casing;

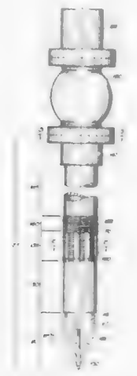
tapping means for tapping the casing;

threading means for threading said sleeve into said casing;

sleeve extension means for controlling the depth of the sleeve seal in said casing;

a valve-to-sleeve adaptor coupled to the sleeve;

a valve, detachably coupled to the valve-to-sleeve adaptor, for closing the casing opening after the sleeve is attached to the casing;



a valve-to-turntable adaptor, coupled to the valve; and

a turntable, detachably coupled to the valve-to-turntable adaptor, for driving the sleeve into threaded engagement with the well casing.

5,150,753

GRAVEL PACK SCREEN HAVING RETENTION MESH SUPPORT AND FLUID PERMEABLE PARTICULATE SOLIDS

John E. Gaidry, Lafayette; Larry J. Quebedeaux, Sunset, both of La.; Joseph F. Donovan, Spring, and Jefferson P. Ashton, Conroe, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 521,448, May 10, 1990, which is a continuation of Ser. No. 504,535, Apr. 4, 1990, abandoned, which is a continuation of Ser. No. 400,864, Aug. 30, 1989, abandoned, which is a continuation of Ser. No. 253,967, Oct. 5, 1988, Pat. No. 4,917,183. This application Nov. 26, 1991, Ser. No. 799,841
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] E21B 43/08
U.S. Cl. 166—278 17 Claims

1. An apparatus for use on a subterranean well conduit to prevent particulate matter in said well of a pre-determinable size from passing into said conduit with the well production fluids, comprising:

an inner member having an interior wall and an exterior wall, said exterior wall having a selected exterior wall shape;

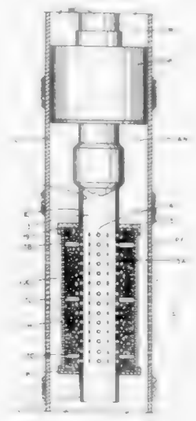
a fluid flow passageway defined within the interior wall of said inner member;

fluid flow passage means extending from the interior of said inner member through the exterior wall of said inner member and in communication with said fluid flow passageway;

a retention barrier disposed around and secured to the exterior wall of said inner member and passing across said fluid flow passage means, and having fluid flow openings therethrough, said retention barrier being at least in-part structurally dependent on said inner member and conforming in shape to said selected exterior wall shape of said inner member when secured thereto;

a fluid permeable bed of particulate solids around the exterior of said retention barrier sized to prevent effectively all such particulate matter in said well from passing inwardly with the production fluids through said fluid permeable bed and through said fluid flow passage means and into said fluid flow passageway when said conduit and said apparatus are positioned within said subterranean well;

whereby said retention barrier is sized to prevent the particulate solids of said fluid permeable bed from passing into said fluid flow passage means and further sized to permit any particulate matter in said well passing through said fluid permeable bed to pass through the retention mesh means and into said fluid flow passageway and through the subterranean well conduit;



a circumferentially shaped outer fluid permeable housing positioned around the exterior of said fluid permeable bed and having fluid passages therethrough for transmission of the production fluids within said well through and housing, said fluid passages in said outer housing being sized to prevent effectively all of said particulate solids of said fluid permeable bed from passing exteriorly through said housing and into said well; and

means for securing said apparatus to said subterranean well conduit.

5,150,754

AQUEOUS AND PETROLEUM GEL METHOD FOR PREVENTING WATER-INFLUX

Craig H. Phelps, Kern County, Calif., and E. Thomas Strom, Dallas, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 28, 1991, Ser. No. 706,438
Int. Cl.[5] E21B 33/138
U.S. Cl. 166—294 5 Claims

1. A method for preventing damage to a water-sensitive hydrocarbonaceous fluid-producing zone of a formation which is penetrated by a well which has a water-influx problem comprising:

a) injecting into the well at a water-sensitive hydrocarbonaceous fluid-producing zone a mixture capable of forming a solid hydrophobic gel in situ sufficient to temporarily close pores in said zone;

b) allowing the mixture from step a) to remain in the water-sensitive zone for a time sufficient to form a solid hydrophobic gel so as to preclude fluid entry into said zone;

c) injecting into the well at a water-influx zone an aqueous gel mixture capable of forming a substantially solid permanent hydrophilic gel in the water-influx zone so as to preclude fluid entry into said zone; and

d) allowing the mixture from step c) to form a solid hydrophilic gel sufficient to preclude fluid entry into the water-influx zone.

5,150,755

MILLING TOOL AND METHOD FOR MILLING MULTIPLE CASING STRINGS

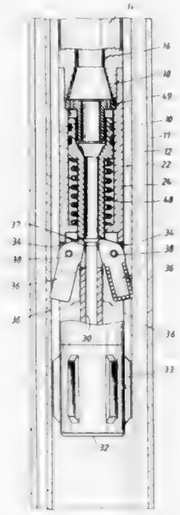
Terry E. Cassel, Bossier City; Harold E. Payne, Shreveport, and Gerald D. Lynde, Bossier City, all of La., assignors to Baker Hughes Incorporated

Continuation-in-part of Ser. No. 621,163, Dec. 3, 1990, which is a continuation of Ser. No. 181,812, Apr. 15, 1988, Pat. No. 4,978,260, which is a continuation-in part of Ser. No. 816,287, Jan. 6, 1986, Pat. No. 4,796,709. This application Apr. 4, 1991, Ser. No. 680,702

The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.

Int. Cl.[5] E21B *10/26*

U.S. Cl. 166—297 21 Claims



1. A method of cutting through the walls of a pair of generally concentric inner and outer casings and then simultaneously removing a predetermined length of said inner and outer casings; said method comprising the following steps:

providing a cutting tool having pivotally mounted blades adapted for swinging outwardly in a generally radial direction from a tool body received within a casing;

providing a plurality of hard cutting elements of a predetermined shape and size on selected areas along the outer periphery of said blades including the upper and lower sides and the outer ends of said blades when pivoted radially outwardly;

positioning said cutting tool within said inner casing;

rotating said tool at a predetermined rotational speed with said blades expanded radially outwardly into cutting engagement with the inner periphery of said inner casing;

first cutting through the wall of said inner casing with the outer ends of said blades engaging the inner periphery of said inner casing in cutting relation;

then cutting through the wall of said outer casing with the cutting elements on the outer ends of said blades engaging the inner periphery of said outer casing in cutting relation; and

next engaging simultaneously the upper annular cut ends of both said inner and outer concentric casings in a cutting action by the cutting elements on the lower sides of said blades resulting from downward movement of said tool for removing a predetermined length of said casings.

5,150,756

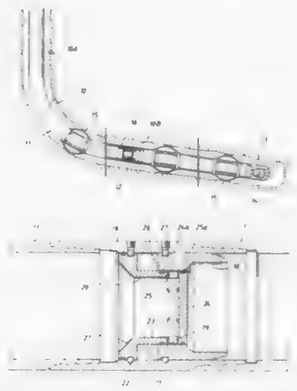
WELL COMPLETION APPARATUS

Hedayat H. Hassanzadeh, Houston, Tex., assignor to Davis-Lynch, Inc., Pearland, Tex.

Filed Feb. 25, 1991, Ser. No. 660,708

Int. Cl.[5] E21B *34/10*

U.S. Cl. 166—318 4 Claims



2. For use in completing a well having a well bore whose lower end extends substantially horizontally, a tool comprising

a tubular member connectible in a casing string to be lowered into the lower end of the well bore and having a back pressure valve installed near its lower end,

a plug having a passageway therethrough,

means connecting the plug to the tubular member,

a valve member, means mounting said valve member for vertical movement between one position closing the passageway and another position supported from the plug and opening the passageway,

means holding the valve member in its closed position, and

means sealing between the tubular member, plug and valve member when the valve member is in its closed position to separate a high density fluid thereabove from a low density fluid therebelow as the casing string is lowered into the well bore,

said holding means being releasable in response to a predetermined increase in pressure of the high density fluid to permit the valve member to be moved to its open position,

said valve means having a seat and said connecting means being releasable upon lowering of wiper plug means onto the seat to close the passageway and in response to a further predetermined increase in pressure of the high density fluid above the wiper plug means, whereby said plug and valve member may be lowered through the tubular member.

5,150,757

METHODS AND APPARATUS FOR DRILLING SUBTERRANEAN WELLS

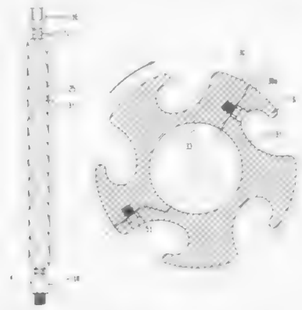
Dwight S. Nunley, 500 Oakwood Dr., Gretna, La. 70056

Continuation-in-part of Ser. No. 595,550, Oct. 11, 1990, Pat. No. 5,040,620. This application May 3, 1991, Ser. No. 695,520

Int. Cl.[5] E21B *17/22*

U.S. Cl. 175—323 6 Claims

1. A component for attachment to a drillpipe which is part of a drillstring carrying a drillbit or core barrel, said drillstring rotatably driven in a working direction, which drillpipe contains a standard box tool joint at one end and a standard pin tool joint at the other end, which tool joints are of a diameter greater than the section of drillpipe between the two joints, and which drillpipe component is comprised of two elongated cylindrical half sections for clamping over at least a portion of the narrower section of drillpipe and which components, on its outer surface, contains at least one helical pumping chamber having a twist, when viewed in axial elevation, opposite to that



in which said drillstring is rotatably driven in said working direction, said pumping chamber, when viewed in traverse section, having an undercut portion relative to the surface of the cylindrical half-section, said undercut portion defining a lip.

5,150,758

ROTARY RECEPTACLE SCALE

Bruno Gmuer, St. Gallen, Switzerland, assignor to Buehler AG, Uzwil, Switzerland

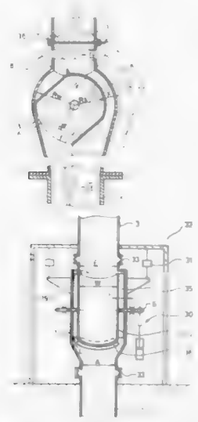
PCT No. PCT/CH90/00042, § 371 Date Oct. 24, 1990, § 102(e) Date Oct. 24, 1990, PCT Pub. No. WO90/11496, PCT Pub. Date Oct. 4, 1990

PCT Filed Feb. 26, 1990, Ser. No. 598,691

Claims priority, application Switzerland, Mar. 17, 1989, 01000/89

Int. Cl.[5] G01G *13/22, 23/14;* G01F *11/10*

U.S. Cl. 177—84 10 Claims



1. Rotary receptacle scale comprising: a casing:

a cup-shaped weighing receptacle and mechanical positive guidance means for moving the weighing receptacle in the casing from a filling position into an emptying position, said weighing receptacle and said casing being constructed as a rotary lock analogous to the lock rotor and lock wheel housing, wherein the weighing receptacle has a horizontal axis of rotation;

said weighing receptacle having a base and an opening area both with a rotationally cylindrical shape with reference to the center of rotation of an axle.

5,150,759

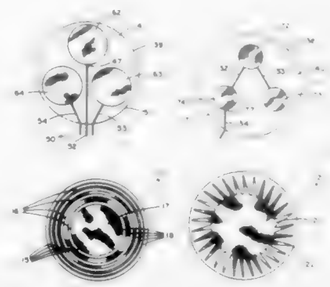
CAPACITOR-SENSOR

John S. Borchard, 97-A Lowell Ave., Newton, Mass. 02160

Filed Oct. 29, 1990, Ser. No. 604,174

Int. Cl.[5] G01G *3/14;* H01G *7/00;* G01L *9/12, 1/26*

U.S. Cl. 177—210 C 30 Claims



1. An improved capacitor-sensor formed between two rigid, closely-spaced and facing, first and second plates, each with a perimeter, facing and nonfacing surface and with specific electrode patterns on each facing surface thereby forming a plurality of capacitors sensitive to displacement between the plates, comprising:

a plurality of separate conductive regions on the facing surface of the second plate;

a plurality of separate conductive regions on the facing surface of the first plate, corresponding to and facing the second plate conductive regions; and

wherein one of each corresponding regions is a subset of the other.

5,150,760

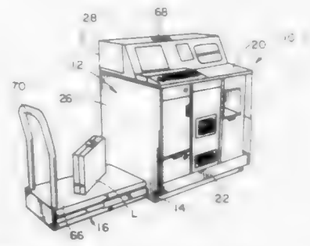
AUTOMATED CURBSIDE CHECK-IN COUNTER

James A. Johnson, 2012 Goldenrod La., Arlington, Tex. 76013

Filed Dec. 9, 1991, Ser. No. 803,985

Int. Cl.[5] G01G *19/00*

U.S. Cl. 177—245 28 Claims



1. A portable check-in counter comprising:

A) a cabinet unit having a top, a bottom first and second ends, a front and a rear, and further including

(1) a wheel unit mounted on said cabinet unit bottom,

(2) a plurality of access doors mounted on said cabinet unit,

(3) a turret unit mounted on said cabinet unit top, said turret unit including a window for displaying a computer screen, a window for displaying flight information, and a storage compartment door on said turret unit,

(4) a first scale readout on said cabinet unit;

B) a scale unit including

(1) a bed having a weighing mechanism therein,
(2) mounting means slidably mounting said bed on said cabinet unit for sliding movement between a use position extending from said cabinet unit and a storage position within said cabinet,
(3) lead means connecting said weighing mechanism to a computer located inside said cabinet unit;

C) a printer compartment in said cabinet unit and including
(1) a paper storage means, and
(2) a compartment for storing a printer;

D) a compartment for storing the computer in said cabinet unit;

E) a compartment for storing heating and air conditionng means in said cabinet unit; and

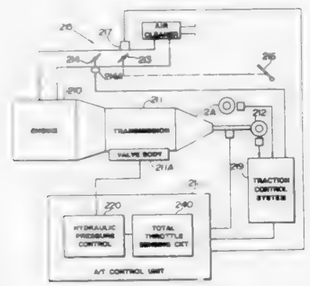
F) a compartment for storing an overall control panel in said cabinet unit.

5,150,761

LINE PRESSURE ARRANGEMENT FOR AUTOMOTIVE POWER TRAIN INCLUDING TRACTION COMPANY

Shigeki Shimanaka, Hadano, and Yuji Kato, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 14, 1990, Ser. No. 566,690
Claims priority, application Japan, Aug. 23, 1989, 1-216260
Int. Cl.[5] B60K *31/02*
U.S. Cl. 180—197 2 Claims



1. An automotive power train, comprising:

an internal combustion engine, said internal combustion engine having an induction passage in which first and second serially arranged throttle valves are disposed, the first throttle valve being responsive to the amount of displacement of a manually operable member, the second throttle valve being operatively connected to a servo device;

traction control means for controlling the operation of said servo device in accordance with selected operational parameters which are indicative of traction loss and the presence of wheel slip to adjust the amount of torque being generated by the engine, so thereby improve vehicle traction;

a transmission operatively connected with said internal combustion engine, said transmission including a source of selectively variable line pressure, the variable line pressure source being arranged to be responsive to an input indicative of the engine torque whereby selective application of the line pressure allows selection from four forward and one reverse gear ratios;

a transmission control unit, operatively connected with said traction control means and a sensor which detects the opening degree of the first throttle valve; and

total throttle sensing means for determining which of said first and second throttle valve is closed the most and for supplying an input indicative of engine torque to said line pressure source in accordance with the opening degree of the throttle valve which is closed the most, said total throttle opening sensing means being included in said transmission control unit.

5,150,762

PERSONAL MOBILITY VEHICLE

Aaron H. Stegeman, and Ronald F. Bechler, both of George, Iowa, assignors to Ranger All Season Corp., George, Iowa

Filed Apr. 26, 1991, Ser. No. 691,703
Int. Cl.[5] B60K *1/00*
U.S. Cl. 180—208 15 Claims

1. A personal mobility vehicle comprising, in combination:

(a) a first unit including a first frame, a wheel spindle pivotally mounted to said first frame, and a steering mechanism mounted to said spindle;

(b) a second unit including a second frame and axle means rotatably mounted to said second frame;

(c) motive means operatively connected to said axle means; and

(d) connection means for connecting said first and second frames, said connection means including

(i) a first substantially vertical plate having a depending lip,

(ii) a second substantially vertical plate having a depending J-shaped hook portion, the hook portion having a receiver portion facing said first plate and so disposed and arranged as to receive and engage the depending lip, one of said first and second plates being mounted to said first frame and the other of said first and second plates being mounted to said second frame,

(iii) a latch receiver mounted to one of said first and second frames,

(iv) a latch mounted to the other of said first and second frames, said latch including a reactive surface, said latch being arranged to engage said latch receiver when said first plate bears against said second plate,

(v) bias means biasing the latch to engage the latch receiver,

(vi) a latch operator connected to the latch for disengaging the latch from the latch receiver,

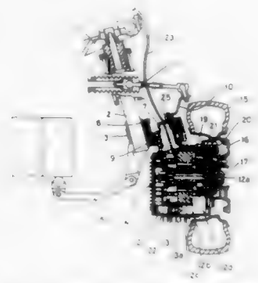
said second plate being so disposed and arranged relative to the first plate as to compressively bear against said first plate when the depending lip of the first plate is received and engaged by the J-shaped hook portion of the second plate and the latch engages the latch receiver to thereby assemble said first and second frames, said latch operator being operable to disengage the latch from the latch receiver to permit disassembly of the first and second frames, the reactive surface of the latch engaging the one frame to react against the bias means to permit the latch to engage the latch receiver without operation of the latch operator to permit assembly of the first and second frames.

5,150,763

WIRING AND PIPING ARRANGEMENT FOR A VEHICLE MOTOR

Mitugu Yamashita; Mutsumi Kawamoto, both of Tokyo, and Hidemitsu Inagaki, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Apr. 24, 1991, Ser. No. 690,158
Int. Cl.[5] B60K *17/30*
U.S. Cl. 180—252 5 Claims



1. A vehicle wheel motor apparatus providing for connection of a wheel motor to a power source, said apparatus comprising:

a wheel motor connected to a wheel;

a wheel support member connected to a vehicle frame through a damper;

an internal gear rotatably supported on the wheel support member;

a pivot fixed to a casing of said wheel motor and provided with a hollow interior portion and an external gear meshing with said internal gear; and

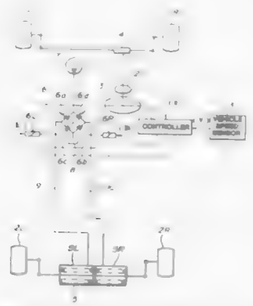
a power source lead connecting the power source to the wheel motor, said power source lead extending through said hollow interior portion of said pivot.

5,150,764

VEHICLE REAR WHEEL STEER ANGLE CONTROL SYSTEM

Takaaki Eguchi, Isehara, and Yuzo Sakita, Machida, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 284,414, Dec. 14, 1988, abandoned.
This application Oct. 1, 1990, Ser. No. 593,269
Claims priority, application Japan, Dec. 28, 1987, 62-330281
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—141 14 Claims



11. A rear wheel steering control system for a vehicle, comprising:

a steering actuator for steering the rear wheel of a vehicle in response to a control signal representing a desired rear wheel steer angle;

a steering input sensor for sensing a steering input of said vehicle; and

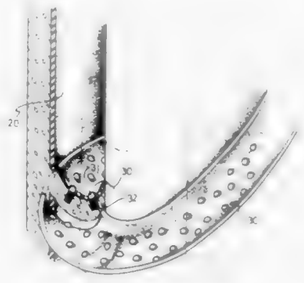
a controller which is connected with said steering input sensor, and which produces said control signal representing said desired rear wheel steering angle which is equal to the sum of a first term determined in accordance with said steering input, and a second term substantially proportional to a second derivative of said steering input with respect to time.

5,150,765

FIRE ESCAPE

Yen-Huang Chen, No. 5, Tapeng Rd., Taichung, Taiwan

Filed Aug. 8, 1991, Ser. No. 742,841
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—48 1 Claim



1. A fire escape comprising a housing formed in a building which includes a plurality of levels each having an opening formed therein and communicated with said housing; and means disposed in said housing for transferring people to any lower level and to the ground, said means including a helical pathway formed in said housing and communicated with each of said openings so that people can slide to any lower level and to the ground via said pathway, said pathway including a plurality of holes formed in said upper surface thereof, a protrusion disposed in each of said holes, each of said protrusions including a spring and a ball received in said holes of said pathway, said balls extending outward beyond said upper surface of said pathway such that said protrusions provide a frictional force to said people.

5,150,766

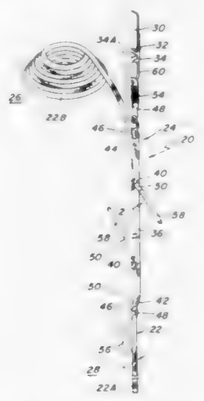
SLIDING ANCHOR SYSTEM AND METHOD OF USE

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976

Filed Oct. 4, 1991, Ser. No. 771,666
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—100 22 Claims

1. An anchor system for securement to a fixed anchor point at an elevated position on a structure, said system comprising a rope arranged to be extended between said elevated position and a lower position, and slidable connection means, said slidable connection means being arranged to be releasably secured to said fixed anchor point and comprising a flexible tubular member woven of strands of fibers, said tubular member having a pair of ends, a first one of said ends including an extension projecting therefrom, said one extension comprising a connector arranged to be releasably secured to said fixed anchor, said rope extending through said tubular member, said tubular member when compressed longitudinally having a sufficiently large internal diameter that said rope means may slide therethrough, said tubular member being arranged to be extended longitudinally upon the application of a pulling force

to each of said ends, whereupon said internal diameter is reduced so that said rope is tightly frictionally engaged by said



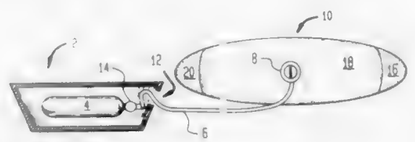
tubular member to preclude said rope means from sliding through said tubular member.

5,150,767

PORTABLE SELF-CONTAINED IMPACT SYSTEM

Ralph A. Miller, Monmouth Beach, N.J., assignor to Air Cruisers, Inc., Belmar, N.J.

Filed Feb. 19, 1991, Ser. No. 656,731
Int. Cl.[5] A62B *5/00*
U.S. Cl. 182—137 13 Claims



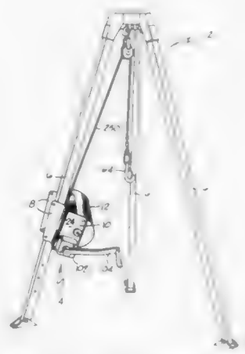
4. A portable self-contained impact system, comprising:
a closed reservoir for storing a inflating gas at a high pressure, and including a valve which is user-actuable for opening the reservoir;
an inflatable member including a plurality of adjacent chambers having a substantially central chamber;
a plurality of valve means interconnecting said plurality of adjacent chambers;
a hose and an ejector which entrains ambient air coupled to the reservoir and to the inflatable member, said hose and ejector effective for permitting gas flow from the reservoir to the inflatable member and through the plurality of valve means to inflate the plurality of adjacent chambers when the valve is user-actuated for opening the reservoir; and
the inflatable member being a closed member so as to avoid venting of the inflating gas when said member is impacted, with impacting energy being dissipated when gas flows through the plurality of valve means from impacted chambers at a high gas pressure to adjacent non-impacted chambers at a low gas pressure.

5,150,768

LOAD LIMITING APPARATUS FOR A HOIST

Wayne L. Olson, Central Point, Oreg., and Gary E. Choate, Lakewood, Colo., assignors to Rose Manufacturing Company, Englewood, Colo.

Continuation-in-part of Ser. No. 605,240, Oct. 29, 1990, Pat. No. 5,090,507. This application Oct. 3, 1991, Ser. No. 770,540
Int. Cl.[5] A62B *1/10*
U.S. Cl. 182—234 20 Claims



1. A fall arresting apparatus comprising:
a shaft mounted at a relatively fixed axial location to permit rotation thereof in a clockwise direction or a counter-clockwise direction;
drive means mounted on said shaft so that rotation of said drive means rotates said shaft in one of said clockwise or counter-clockwise directions;
holding means for preventing rotation of at least a portion of said drive means in the opposite of said one of said clockwise or counter-clockwise directions;
arresting means for applying a force to rotate said drive means and for permitting controlled rotation of said drive means in the opposite of said one of said clockwise or counter-clockwise directions but arresting uncontrolled rotation of said drive means in the opposite said one of said clockwise or counter-clockwise directions; and
control means mounted for axial movement on said shaft for automatically controlling the operation of said arresting means.

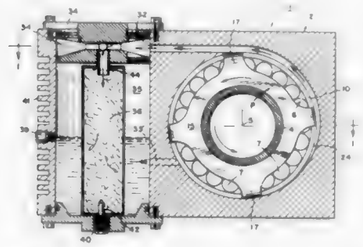
5,150,769

CONTROLLED-FLOW LUBRICATING SYSTEM

Kenneth E. Major; John L. Baker, and David K. Braunagel, all of Houston, Tex., assignors to Hy-Tech Hydraulics, Inc. and Michael P. Breston, both of Houston, Tex.

Continuation of Ser. No. 818,503, Jan. 13, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 126,307
Int. Cl.[5] F16N *13/20*
U.S. Cl. 184—31 32 Claims

1. An apparatus for controllably circulating liquid lubricant through a bearing supporting a rotating shaft, comprising:
a pressure pump mounted on said shaft adjacent to said bearing and being powered by said shaft to create a pumping action;
said pump having a discharge outlet in fluid communication with one side of said bearing; and
a liquid lubricant filter coupled to said discharge outlet of said pump, whereby when said shaft is rotating, said pump raising the pressure of said liquid lubricant flowing therethrough by an amount sufficient to maintain liquid lubricant flow across said filter and adequate liquid lubricant suction across said bearing so that, during each full cycle, liquid lubricant flows from said discharge outlet through said filter, through said one side of said bearing, through and across said bearing, through the opposite side of said



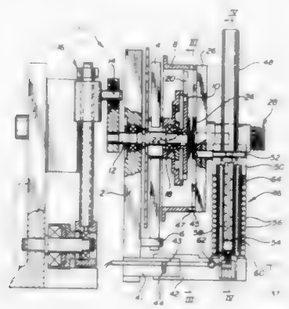
bearing, and returns back to said pump, thereby lubricating and cleansing the contact surfaces of said bearing.

5,150,770

RECHARGE DEVICE, PARTICULARLY FOR DRIVE MECHANISMS FOR EXTENDING AND WITHDRAWING OPERATIVE MEMBERS OF A SPACE VEHICLE

Giovanni Secci, Rome, Italy, assignor to Contraves Italiana S.p.A., Rome, Italy

Filed May 8, 1991, Ser. No. 697,074
Claims priority, application European Pat. Off., Jan. 25, 1991, 91830022
Int. Cl.[5] F03G *1/08;* G05G *17/00*
U.S. Cl. 185—40 R 8 Claims



1. Recharge device, particularly for spring operated drive mechanism for extending and withdrawing operative members of a space vehicle, comprising a frame having a spring means, said spring means being connected to a shaft, said shaft having an unwinding direction of rotation, in said unwinding direction of rotation said shaft turning for operating a drive mechanism under the action of said spring means, a wheel member having a winding direction of rotation being turned to wind and recharge said spring means, the device further comprising at least one actuator having a shape memory alloy member adapted to rotate said wheel member in said winding direction of rotation for recharging said spring means.

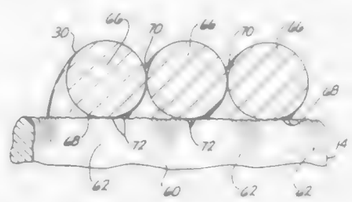
5,150,771

COIL SPRING OR FRICTION-LOCK MECHANISMS

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Filed May 11, 1990, Ser. No. 522,210
Int. Cl.[5] B65H *59/10*
U.S. Cl. 188—67 2 Claims

1. In a mechanical lock of the type having a housing, a cylindrical rod axially slidable through said housing, a coil spring of cylindrical wire helically wound about said rod and having a normal spring internal diameter for engaging the rod surface and thereby locking said rod against movement through said housing, and means for unwinding said coil spring to an unlocking condition, of enlarged internal diameter sufficient to allow sliding movement of said rod, the improvement wherein:
said rod surface has a surface finish characterized by circumferential scoring in the range of 15 to 50 R.M.S.; and
said coil spring has coil surfaces scored longitudinally along the coil windings, the scored surfaces extending less than



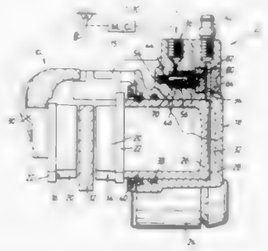
180 degrees of arc about the wire axis, said scored coil surfaces facing said rod surface, said coil spring including non-scored sliding contact surfaces between adjacent coils of said spring;
such that interlocking occurs between the rod and coil scored surfaces in said locking condition to enhance locking of said rod against axial movement through said coil spring while preserving low friction contact between adjacent coils for smooth winding and unwinding of the spring during actuation of the lock.

5,150,772

DISC BRAKE CALIPER WITH AN INTEGRAL PROPORTIONING VALVE

David Pantale, Epinay Surseine, and Eric Schonenberger, Bois Colombes, both of France, assignors to General Motors France, Gennevilliers, France

Filed Dec. 19, 1990, Ser. No. 630,994
Claims priority, application United Kingdom, Jan. 23, 1990, 9001565
Int. Cl.[5] F16D *55/18*
U.S. Cl. 188—72.4 3 Claims



1. A disc brake for a motor vehicle comprising:
a rotor;
inner and outer brake pads disposed on opposite sides of the rotor and movable into braking engagement therewith;
a caliper comprising a piston for urging one of the brake pads against the rotor, a caliper housing having a cylinder positioned on one side of the rotor within which the piston is slidably movable under action of fluid pressure in the cylinder, the cylinder defining a single working chamber for the piston, and a fluid line in the caliper for supplying fluid from a fluid pressure source to the cylinder for movement of the piston; and
a hydro-mechanically actuated proportioning valve in the fluid line and integral with the caliper for limiting the fluid

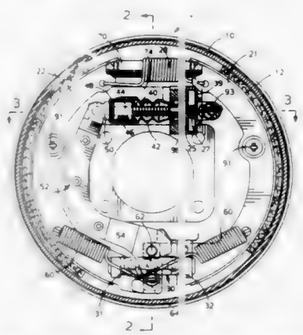
pressure acting on the piston when the fluid pressure from the fluid pressure source exceeds a predetermined level, the proportioning valve comprising a housing which makes a screw-threaded connection with the caliper housing extending into the cylinder of the caliper housing.

5,150,77[illegible]

ELECTRICALLY ACTUATED ELECTRIC BRAKE WITH WEAR COMPENSATING ADJUSTER

Gregory M. Hickey, Dayton; Norbert J. Green, Jr., Trotwood, and Michael J. Kozak, West Carrollton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1991, Ser. No. 672,816
Int. Cl.[5] F16D *65/58*
U.S. Cl. 188—79.55 11 Claims



1. A vehicle brake having an electrically powered actuator for moving a friction means into contact with a vehicle wheel, the brake having means for adjustment of the brake to compensate for wear of the friction mean, the brake including:

an electric motor with a rotor torsionally associated with the actuator to power the actuator for applying the friction means;

a first rotative member torsionally associated with the rotor;

means for returning the friction means from an actuated position to a release position causing the first rotative member to rotate in a releasing direction;

a second rotative member having a first surface to expose to the first rotative member for making torsional transferring engagement with the first rotative member when the first rotative member is rotating in a friction means applying or releasing direction, the second rotative member having a second surface distinct from the first surface only for a non-torsional transferring engagement which is exposed to the first rotative member when the first rotative member has rotated in an applying direction beyond a predetermined limit due to wear of the friction means;

stop means for limiting the rotation of the second rotative member when the first surface of the second rotative member is in torsionally transferring engagement with the first rotative member;

and

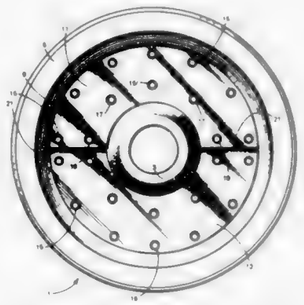
means for biasing the second rotative member to expose the first surface of the second rotative member to the first rotative member when the second surface of the second rotative member is exposed to the first rotative member.

5,150,774

WHEELS INCORPORATING BRAKE DISCS

John Adamson, Wirral, England, assignor to Sab Wabco Holdings, B.V., Heerhugowaard, Netherlands

Filed Mar. 8, 1991, Ser. No. 665,791
Claims priority, application United Kingdom, Mar. 10, 1990, 9005421
Int. Cl.[5] F16D *65/12*
U.S. Cl. 188—218 XL 4 Claims



1. A wheel comprising a central hub and an outer rim interconnected by a web having two oppositely facing sides, a pair of annular braking discs being mounted one on one side of said web and the other on the other side of said web, each annular braking disc being comprised of two curved segments, each segment being secured to said web and to an aligned segment on the opposite side of said web by a number of wide clearance bolts, two close clearance bolts and two further bolts, said wide clearance bolts passing through spaced apart apertures in the radially outer edge regions of said segments and being each a clearance fit both in aligned apertures in the respective segments and in a bore in the web, said close clearance bolts being a close fit both in aligned aperture located in the respective segments on each side of a radial center line midway between the ends of each said segment and in a bore in the web, and said further bolts being a close fit in aligned apertures located in the segments one at each end region of the respective curved segments in the radially inner edge region of the segments, and a wide clearance fit in a bore in the web.

5,150,775

STEER-SENSITIVE VARIABLE DAMPER AND METHOD UTILIZING A RING VALVE

Harlan W. Charles, Harper Woods, and Larry D. Miller, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1991, Ser. No. 810,058
Int. Cl.[5] B60G *17/00;* B62D *6/06*
U.S. Cl. 188—299 31 Claims

1. A hydraulic damper for controlling the compression and rebound action of a vehicular suspension spring, the damper comprising:

(a) a reservoir tube connected to a steerable wheel assembly;

(b) an inner cylinder fixedly mounted within the reservoir tube and cooperating therewith to form a reservoir for a damper fluid contained within the reservoir tube and the inner cylinder;

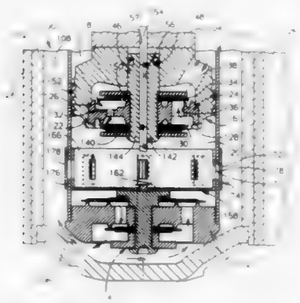
(c) base valve means operatively mounted at one end of the inner cylinder for controlling the flow between the inner cylinder and the reservoir tube;

(d) a piston rod operatively mounted for reciprocating movement in the inner cylinder and extending through an upper end of the damper;

(e) a piston secured to an inner end of the piston rod and dividing the interior of the inner cylinder into upper and lower chambers, the piston slidably mounted in the inner cylinder for both reciprocable and rotary motion with respect to the inner cylinder;

(f) piston valving means in the piston establishing a restricted flow path through the piston between the upper and lower chambers during compression and rebound of the damper;

(g) slit means provided in a portion of the inner cylinder in fluid communication with the lower chamber; and



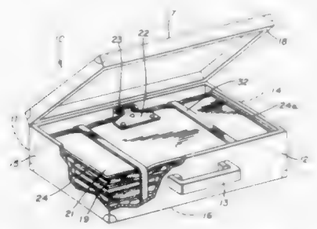
(h) control valving means establishing a variable flow from the lower chamber to the reservoir through the slit means, the control valving means actuated by the relative rotation between the reservoir tube and the piston provided by a steering motion of a vehicle.

5,150,776

TRAVEL CASE ORGANIZER

Frances S. Rebenack, 2095 Brookshire Rd., Akron, Ohio 44313

Filed Jan. 23, 1991, Ser. No. 644,382
Int. Cl.[5] A45C *13/02, 13/30*
U.S. Cl. 190—110 5 Claims



1. A travel case having a top, a bottom, two end walls, a back and an opening front, comprising:

a) C-shaped track means attached to the bottom of the travel case;

b) at least one flat dividing means for separating articles, the perimeter of each dividing means configured to fit neatly into the travel case;

c) lug means attached to each dividing means, each lug means releasably engaging said track means; and

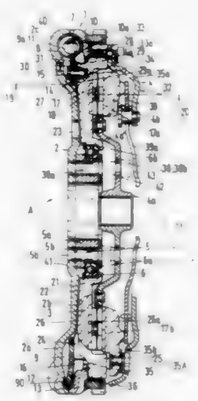
d) said dividing means being roughened by an abrasive material to eliminate the possible movement of articles positioned therebetween.

5,150,777

APPARATUS FOR TRANSMITTING TORQUE BETWEEN THE ENGINE AND THE TRANSMISSION OF A MOTOR VEHICLE

Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,930
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1990, 4041709; May 31, 1990, 4017519; Jun. 29, 1990, 4020759; Aug. 31, 1990, 4027542; Aug. 31, 1990, 4027593; Aug. 31, 1990, 4027614; Aug. 31, 1990, 4027629; Dec. 24, 1990, 4041722
Int. Cl.[5] F16F *15/12*
U.S. Cl. 192—70.17 67 Claims



1. Apparatus for transmitting torque in a motor vehicle, comprising a first rotary flywheel connectable with an engine of a vehicle; a second rotary flywheel connectable with a transmission of the vehicle by a clutch, each of said flywheels having a circumference; at least one antifriction bearing between said flywheels; and at least one damper operative to oppose rotation of said flywheels relative to each other and disposed in an at least partly sealed annular chamber which is defined at least in part by at least one of said flywheels, said flywheels having confronting portions disposed radially inwardly of said chamber and defining a clearance, said at least one damper having energy storing elements acting circumferentially of said flywheels and said clutch having a clutch plate adjacent an annular friction surface of one of said flywheels, said friction surface having a radially innermost portion and a radially outermost portion and said chamber having a radially inner portion extending radially inwardly at most halfway between said innermost and outermost portions.

5,150,778

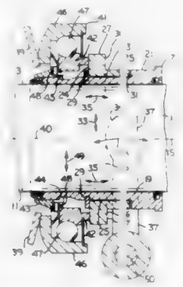
SELF-ALIGNING CLUTCH RELEASE BEARING ASSEMBLY

Eugene A. Wolbers, Northville, and Douglas A. Drewes, West Bloomfield, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed May 31, 1991, Ser. No. 708,539
Int. Cl.[5] F16D *23/14*
U.S. Cl. 192—98 19 Claims

1. A clutch release apparatus comprising a carrier sleeve slidable along a sleeve axis, an axially and radially movable thrust plate carried by said sleeve for engagement with a clutch actuator, a self-aligning anti-friction bearing assembly carried by said sleeve in axial alignment with said thrust plate for engagement with an array of clutch release levers, said thrust plate being axially and radially independently shiftable with

respect to said sleeve and with respect to said bearing assembly, said sleeve having a surface spaced radially from said

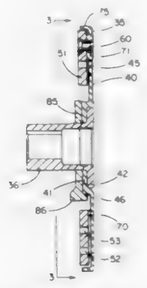


thrust plate so that said thrust plate can move transverse to the sleeve axis without exerting excessive force on said sleeve.

5,150,779
ARMATURE ASSEMBLY FOR AN ELECTROMAGNETIC COUPLING

Dwight E. Booth, Janesville, Wis. assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 14, 1992, Ser. No. 820,344
Int. Cl.[5] F16L 27/07
U.S. Cl. 192—106.1 17 Claims

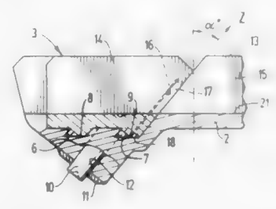


1. An armature assembly for a selectively energizable and de-energizable electromagnetic coupling, said armature assembly comprising a hub having a central axis, a sleeve telescoped over said hub and captivated against rotational and axial movement relative to the hub, web means projecting radially from said sleeve and having first and second axially facing sides, said sleeve and said web means being made of resiliently yieldable plastic, living hinge means integral with said sleeve and said web means and permitting said web means to flex axially back and forth relative to said sleeve, an annular armature disc made of low magnetic reluctance material, said armature disc being spaced radially outwardly from said hub and being secured to said first side of said web means, and spacer means integral with and projecting axially from said first side of said web means and engaging said armature disc to hold said disc in axially spaced relation with said web means.

5,150,780
TREAD ELEMENT FOR MOVING PAVEMENT OR ESCALATOR

Moritz Fischer, Hergiswil, Switzerland, assignor to Fischer Moritz AG, Hergiswill, Switzerland

Filed Mar. 27, 1991, Ser. No. 676,203
Claims priority, application Switzerland, Mar. 28, 1990, 1007/90; Jan. 7, 1991, 0026/91
Int. Cl.[5] B66B 23/12
U.S. Cl. 198—333 18 Claims

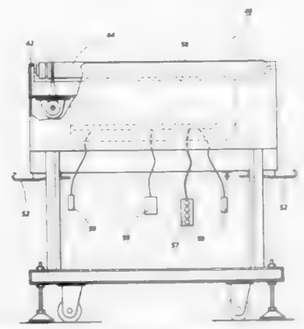


1. Step element for moving walkway or staircase, having a step plate for receiving the persons to be transported, this step plate being provided in the region of at least one of its longitudinal edges with an edge strip secured thereto, wherein the edge strip, of which there is at least one, is provided on its underside, at least along its two longitudinal edges, with a respective tongue, each tongue having a cross section with a shape consisting of one of: a parallelogram with mutually identical angles; and at least approximately a trapezoid, and each tongue engages in a corresponding groove in the step plate in the manner of a tongue-and-groove connection, and wherein this edge strip moreover has on its underside at least two locking pins which are arranged distributed over its length, which extend downwards and through the adjacent step plate, and on whose free ends projecting downwards out of the step plate a respective clamping ring supported under spring-loaded pressure on the step plate are associated with these locking pins being matched to one another such that they permit unimpeded insertion of the tongues of the edge strip into the grooves which are associated with the tongues and are in the step plate.

5,150,781
MODULAR CONVEYOR SYSTEM

Harold G. Deisenroth, and Jeffrey W. Drawe, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1990, Ser. No. 544,578
Int. Cl.[5] B65G 37/00
U.S. Cl. 198—349.8 12 Claims

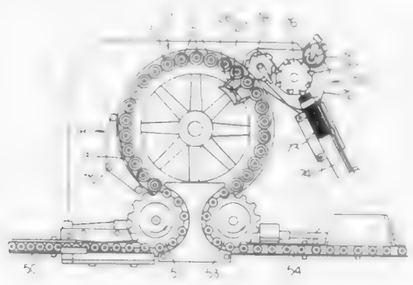


1. A system for transporting articles, comprising:
a first conveyor unit including first means for sensing the presence of articles on the first conveyor unit, first means for moving the articles positioned on the first conveyor unit, a first programmable controller mounted on the first conveyor unit in communication with the first sensing means and adapted to regulate the first moving means; and
at least a second conveyor unit attached to the first conveyor unit for receiving articles therefrom and for transporting articles thereto including a second means for sensing the presence of articles on the second conveyor unit, second means for moving the articles positioned on the second conveyor unit, a second programmable controller mounted on the second conveyor unit in communication with the second sensing means and coupled to the first programmable controller for communication therewith, and adapted to regulate the second moving means, the first programmable controller being responsive to communication from the first sensing means and the second controller for regulating the activation of the first moving means to move the articles along a programmable path.

5,150,782
DEVICE FOR POSITIONING BOTTLES SYMMETRICALLY TO THE ROTATIONAL AXES OF BOTTLE CARRIAGES IN LABELING MACHINES AND THE LIKE

Stefan Richter, Regensburg, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,794
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1990, 9006376[U]
Int. Cl.[5] B65G 47/24
U.S. Cl. 198—394 11 Claims

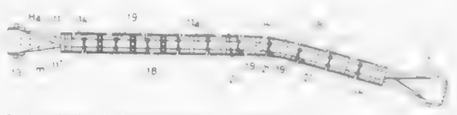


1. Apparatus for aligning bottles in a preselected angular position, said bottles having a conical recess and a groove displaced from said recess in their respective bottoms, comprising:
a rotary table for rotating about a vertical axis and a plurality of shafts arranged in a circle about said axis for orbiting with the table, each of said shafts having a bottle carriage mounted thereon including;
a conical bottle centering element and means supporting said element for rotating concentric to the shaft, said element having a shape which is substantially complementary to said conical recess in the bottom of the bottles for registering in said recess,
a bottle support disk having a central opening concentric to said conical centering element and means for guiding said bottle support disk for moving downwardly and upwardly relative to said conical centering element between upper and lower limits,
spring means for urging said bottle support disk toward its upper limit wherein it is substantially flush with said conical bottle centering element such that when a bottle bottom is pressed downwardly on said bottle support disk in opposition to said spring means said support disk lowers to provide for said conical centering element registering in said conical recess for driving said bottle rotationally,
an alignment element and a spring for pressing said element into contact with the bottom of the bottle when said bottle supporting disk is pressed toward said lower limit,
a friction wheel means connected to said conical centering element and rotatable about the axis of said shaft, and
a friction element positioned adjacent said rotating table in a bottle alignment and centering zone for frictionally engaging said friction wheel to rotate said conical centering element until said alignment element latches in said groove in the bottle to hold said bottle in a predetermined angular position.

5,150,783
TUBULAR BELT CONVEYOR

Kunio Hashimoto, Kitakyushu, Japan, assignor to Kabushiki Kaisha Nihon Pipe Conveyor Kenkyusho, Kitakyushu, Japan

Filed Mar. 22, 1991, Ser. No. 673,738
Claims priority, application Japan, Mar. 23, 1990, 2-72175
Int. Cl.[5] B65G 15/08
U.S. Cl. 198—819 1 Claim



1. A tubular belt conveyor, comprising,
an endless belt wound around drive and driven rollers and having upper and lower sections comprising outward and return runs, respectively,
said upper and lower sections being rolled up by deformation means into tubular form substantially along the entire length of said belt such that an object to be conveyed is wrapped in said outward run and conveyed in a wrapped-in state,
supporting frames with horizontal rollers being alternately located along the entire length of said tubular formed sections,
each of said supporting frames having upper and lower passages through which said upper and lower sections are inserted,
a plurality of horizontal holding rollers on said supporting frames; said rollers being located in a central portion between said supporting frames which are juxtaposed so as to support said lower section of said belt orthogonal to said tubularly formed sections, and each of said horizontal holding rollers is pivotally supported on a bracket which is attached to a coupling member of each of said supporting frames in such a manner that the orientation thereof can be varied with respect to a belt running direction,
vertical rollers for supporting curved inner peripheral side portions of said outward and return runs adjacent said horizontal rollers for supporting said sections on transversely curved portions of said outward and return runs,
each of said vertical rollers being pivotally supported on a bracket which is attached to said coupling member of each of said supporting frames in such a manner that the orientation thereof can be varied with respect to the running direction of said belt.

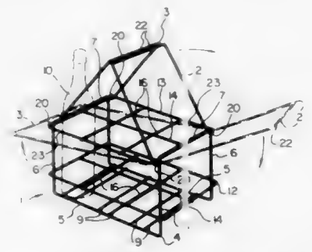
5,150,784
COMBINATION BOTTLE CARRIER AND RACK

Fouad-Michel Sayad, 5360, Cote St. Luc Apartment 4, Montreal, Quebec, Canada H3X 2C4

Filed Aug. 16, 1991, Ser. No. 746,347
Int. Cl.[5] B65D 75/00
U.S. Cl. 206—202 8 Claims

1. A combination bottle carrier and rack device comprising

body means for carrying a plurality of bottles, said body means including an open top end, two sides, two ends and a bottom; handle means for carrying the device; stop means extending outwardly from said sides of said body means at the open top end thereof for limiting rotation of said handle means; said handle means being pivotally connected to said stop means for rotation around said stop means from a carrying position above



the open top end of said body means, around one of said ends, around the bottom and around the other end of the body means to a rack position in which said handle means is approximately parallel to the plane of said top end for supporting the body means for use as a rack in a position in which the plane of the top end of the body means defines an acute angle with a horizontal support surface, said stop means preventing rotation of said handle means beyond the rack position.

5,150,785

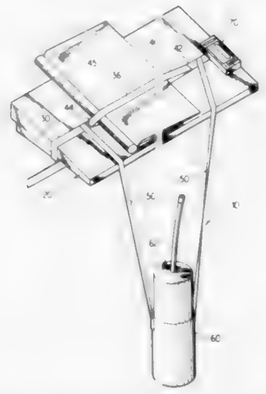
STORAGE CONTAINER

Richard L. Kelley, 666 Columbia Rd., Dorchester, Mass. 02125; Thuan N. Pham, 14 Earle St., Brockton, Mass. 02401, and Kevin J. Kearns, 41 Dartmouth St., Everett, Mass. 02149

Filed Apr. 26, 1991, Ser. No. 691,745

Int. Cl.[5] **B65D** *77/00;* **B42D** *17/00;* **A63B** *21/00, 22/00*

U.S. Cl. 206—217.0 **6 Claims**



1. An Exercise Machine Carry-all for use in combination with an exercise machine console comprising in combination:

a. an exercising machine having a frame, said frame supporting a planar console;

b. first elasticized strap means releasably disposable around said exercise machine console;

c. second strap means attached at an upper end thereof to said first strap means and depending therefrom to a lower end thereof;

d. holder means attached to said lower end to said lower end of said strap means.

5,150,786

THERMOPLASTIC TUBULAR CONTAINER FOR SEMICONDUCTOR DEVICES WITH LONGITUDINAL OPENING MEANS

Michael J. McAllister, Irving, Tex., assignor to Advanced Dynamics Corporation, Arlington, Tex.

Filed Dec. 31, 1991, Ser. No. 815,386

Int. Cl.[5] **B65D** *73/02, 43/18*

U.S. Cl. 206—328 **6 Claims**

1. A packaging container for semiconductor devices, comprising

(a) an elongated tubular housing defining a chamber within which a plurality of semiconductor devices are arranged, said housing being formed of thermoplastic material for shielding the semiconductor devices from static electricity; and

(b) opening means for opening said housing to permit visual inspection of the semiconductor devices within said housing chamber, said opening means including

(1) a first housing wall containing a longitudinal slit extending continuously between the ends thereof to define separable first wall portions movable between an open position where said wall portions are spaced from one another and a closed position where said wall portions are in contiguous relation; and

(2) a second housing wall arranged opposite said first housing wall and including a flexible portion normally biasing said first wall portions to the closed position.

5,150,787

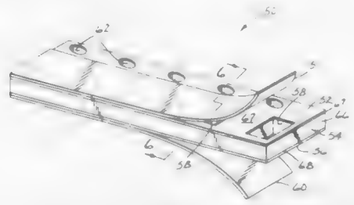
COMPONENT CARRIER TAPE

Gerald C. Bird, Woodbury, and Paul E. Hansen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 21, 1991, Ser. No. 659,028

Int. Cl.[5] **B65D** *73/02, 75/34, 85/30*

U.S. Cl. 206—329 **8 Claims**



1. In a carrier tape comprising a strip of flexible material having top and bottom major surfaces, a series of spaced openings through the strip of flexible material extending between said major surfaces, and a predetermined thickness between said major surfaces, the size of said openings along said major surfaces and said predetermined thickness being adapted to receive a component between the major surfaces of said strip of flexible material, the improvement wherein the strip of flexible material comprises a layer of nonwoven thermoplastic polymeric fibers, said fibers being adhered together at a substantial number of the fiber crossover points, and said layer of nonwoven thermoplastic polymeric fibers having in the range of 20 to 70 percent air filled open spaces between the fibers.

5,150,788

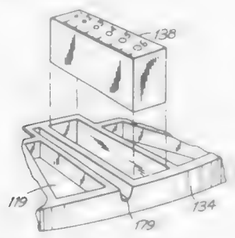
REAMER/WRENCH/POST KIT

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Apr. 1, 1991, Ser. No. 678,785

Int. Cl.[5] **B65D** *85/24*

U.S. Cl. 206—369 **23 Claims**



1. A dental tool container comprising:

an annular tool holder;

a plurality of primary tool-storage compartments for dental posts which compartments are disposed around the tool holder; one of said primary compartments being elongated to project centrally inwards beyond others of said primary compartments, to provide a reamer compartment to accommodate reamers;

a selector lid rotatably mounted on the tool holder and covering the compartments;

a primary opening in the selector lid for accessing said primary compartments

whereby rotation of the selector lid can register said primary opening with each primary compartment in turn, providing access thereto;

and wherein the tool container further comprises: a secondary tool storage compartment for dental post wrenches which secondary compartment is disposed centrally of the tool holder and surrounded by said primary compartments; and a secondary opening in the selector lid for accessing said secondary compartment;

whereby rotation of the selector lid on the tool holder can bring the secondary opening therein into and out of registration with said secondary compartment to access it.

10. A dental tool kit comprising dental posts and dental post wrenches loaded in a dental tool container which container comprises:

an annular tool holder;

a plurality of primary tool-storage compartments disposed around the tool holder and charged with dental posts;

a selector lid rotatably mounted on the tool holder and covering the compartments;

a primary opening in the selector lid for accessing said primary compartments;

whereby rotation of the selector lid can register said primary opening with each primary compartment in turn, providing access thereto;

and wherein the tool container further comprises:

a secondary tool storage compartment charged with dental post wrenches which secondary compartment is disposed centrally of the tool holder and surrounded by said primary compartments; and

a secondary opening in the selector lid for accessing said secondary compartment;

whereby rotation of the selector lid on the tool holder can bring the secondary opening therein into and out of registration with said secondary compartment to access it.

22. A dental tool container comprising:

an annular tool holder;

a plurality of primary tool-storage compartments for dental posts which compartments are disposed around the tool holder; a perforated platform located within and extending fully across one of said primary tool-storage compartments for the storage of dental reamer stops, the openings through the platform being of a size small enough to prevent passage of a reamer stop but sufficiently large to accept at least the end point portion of a reamer;

a selector lid rotatably mounted on the tool holder and covering the compartments; the perforated platform extending along a plane sufficiently distant from the selector lid to permit the placement of reamer stops in the compartment without interfering with the rotation of the lid;

a primary opening in the selector lid for accessing said primary compartments;

whereby rotation of the selector lid can register said primary opening with each primary compartment in turn, providing access thereto.

5,150,789

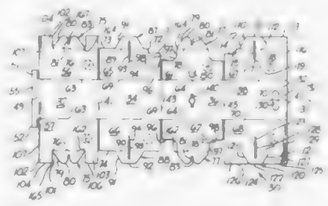
PACKAGE OF ELONGATED STRAND MATERIAL AND CARTON BLANK THEREOF

Benjamin A. Bass, Omaha, Nebr., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 31, 1991, Ser. No. 649,084

Int. Cl.[5] **B65D** *85/04*

U.S. Cl. 206—396 **23 Claims**



1. A package of coiled, elongated strand material which comprises:

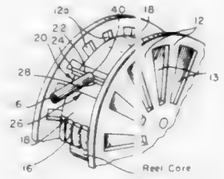
a coil of elongated strand material which is capable of being payed out from an interior of the coil without rotation of the coil; and

a carton in which is disposed said coil, said carton including a plurality of wall panels which confine laterally said coil with each said wall panel having opposed flaps and an associated tab which is located along an edge portion of each of said flaps opposite a hinged connection of the flap to an associated wall panel and with the tabs of the flaps on each of two opposing sides of said wall panels being interlocked to form a member extending into a portion of the coil to facilitate payout of the elongated strand material, and said carton having been assembled from a blank which has a longitudinal axis and which includes said wall panels in interconnected end to end relation in a strip such that said wall panels are connected together with each of flaps associated with each of end ones of said wall panels in said blank having a portion which extends at least to a free outer end of the tab that is associated with each said end one of said flaps and which has an end edge surface that is perpendicular and intersects with to an end edge surface of the blank.

14. A blank from which a carton may be assembled, said blank comprising a plurality of wall panels which are adapted to confine laterally a coil of elongated stand material with each said wall panel having opposed flaps and an associated tab which is located along an edge portion of each of said flaps opposite a hinged connection of the flap to an associated wall panel and with the tabs of said flaps on each of two opposing sides of said wall panel being adapted to be interlocked to form a member to extend into a portion of a coil to facilitate payout of the elongated strand material, said blank including said wall

panels in interconnected relation in a strip with each of said flaps associated with each of end ones of said wall panels in said blank having at least one portion which extends at least to a free outer end of the tab that is associated with each said end one of said flaps and which has an end edge surface that is normal to and intersects with an end edge surface of the blank.

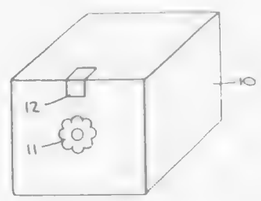
5,150,790
THEFT GUARD FOR CABLE REELS
Sidney M. Forgette, 20 Standish St., Plattsburgh, N.Y. 12901
Filed Jul. 23, 1991, Ser. No. 734,486
Int. Cl.[5] B65I *85/67*
U.S. Cl. 206—4 15 Claims



1. A theft guard for a cable reel having a core about which a cable is wound and having opposite radial end flanges with said end flanges having respective confronting recesses therein, comprising:
a flexible belt of a length generally sufficient to wrap circumferentially around a wound cable on a reel core, and of a width generally equal to that of the reel core,
first and second locking means adjacent respective ends of said belt for securement to each other,
said first locking means on one end of said belt being fixed thereto, and said second locking means on the other end of said belt having belt adjustment means for shortening of said belt with respect to said locking means to accommodate the diameter of a reel core wound cable at the time the belt is wrapped therearound, thereby to permit said belt to generally snugly embrace the wound cable and permit said first and second locking means to be in confronting relation irrespective of reel wound cable diameter,
means for securing said first and second locking means together, and,
said first and second locking means defining therebetween a generally radial opening through which a cable may generally tangentially extend when said belt is in locked position,
whereby said belt when associated with a reel having a wound cable thereon blocks access to the wound cable to preclude unauthorized unreeling thereof.

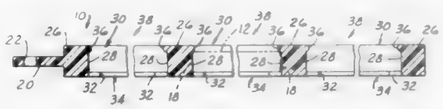
5,150,791
COSMETIC COLOR DISPLAY APPARATUS AND METHODS
Melvin E. Kamen, Highlands, and Philip Bernstein, Glen Ridge, both of N.J., assignors to Revlon, Inc., New York, N.Y.
Continuation of Ser. No. 329,650, Mar. 19, 1989, abandoned.
This application Feb. 8, 1991, Ser. No. 652,691
Int. Cl.[5] G09B *19/00*; B65D *73/00*
U.S. Cl. 206—457 9 Claims

1. A color display module for displaying the color of a cosmetic having a given color formulation, comprising:
a thin planar member of a thermoplastic material having a sample of said cosmetic product uniformly distributed within said thermoplastic material such that the cosmetic product is encapsulated within said thermoplastic material, said sample of said cosmetic product including said



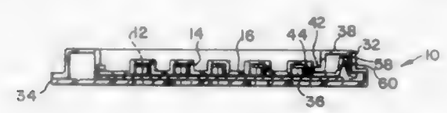
given color formulation, whereby said thin planar member replicated the color of said cosmetic product.

5,150,792
DISPLAY DEVICE FOR COIN CERTIFICATION ENCASEMENTS
David M. Munroe, 18815 Moore, Allen Park, Mich. 48101
Filed May 6, 1991, Ser. No. 695,947
Int. Cl.[5] B65D *85/58*; A45C *11/28*
U.S. Cl. 206—486 8 Claims



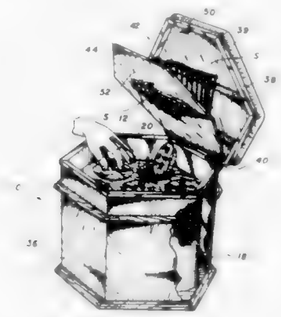
1. A display device for holding at least one article, each article having predetermined dimensions characterized by a first side, a second side and an edge located between said first and second sides, said display device comprising:
a substantially inflexible mounting frame having at least one seat for releasably holding one said article therein, each seat comprising:
seat sidewalls defining an aperture through said mounting frame, said aperture having a first end and a second end, said seat sidewalls being dimensioned to abuttably receive one said article;
peripheral rim means connected with said seat sidewalls at said first end of said aperture for abuttably engaging the article so as to prevent the article from exiting said aperture at said first end thereof; and
boss means connected with said seat sidewalls at said second end of said aperture for resiliently yielding when one said article is caused to be inserted into said seat and for releasably retaining the article in said seat;
wherein said boss means and said mounting frame are structured so that said boss means resiliently yields while said mounting frame is substantially unflexed when one said article is caused to be inserted into said seat, and said peripheral rim means is structured to abuttably engage the article to prevent the article from exiting said aperture at said first end thereof when the article is located in said seat; wherein further each of said peripheral rim means, said boss means and said seat sidewalls abut one said article so as to interferingly trap the article within said seat, said boss means being structured to extend a substantial length along at least two opposing said sidewalls of said aperture, said boss means being further structured to resiliently yield upon abutment with respect to the article so that the article is pressed into said seat and is pressed out from said seat by a user using only a comfortable amount of force which is substantially less than that which could damage said mounting frame so as to move the article past said boss means.

5,150,793
DEVICE FOR INHIBITING REMOVAL OF AN ARTICLE FROM A BLISTER-TYPE CONTAINER
Michael A. Tannenbaum, Freehold, N.J., assignor to PCI/-Delvco, Inc., Ivyland, Pa.
Filed Oct. 16, 1991, Ser. No. 778,047
Int. Cl.[5] B65D *83/04*
U.S. Cl. 206—531 12 Claims



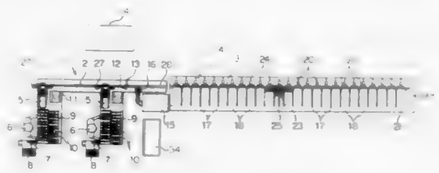
1. A device for inhibiting removal of an article from a blister-type container, said container comprising a first generally flat sheet having a first side and a second side and a blister for accommodating said article and a puncturable generally flat second sheet having a first side and a second side, said first side of said second sheet engaging a portion of said first side of said first sheet, whereby said article may be removed from said container by applying pressure to an outside surface of said blister to force said article to puncture said second sheet, said device comprising:
a housing surrounding at least a portion of said container, said housing being sized to permit movement of said container between a first position and a second position, said housing having a base positioned facing said second side of said second sheet, said base including a base opening in registry with said blister when said container is in said first position, said base opening being sized to permit passage of said article therethrough; and
biasing means for biasing said container toward said second position, whereby when said container is in said second position, said base of said housing is positioned facing said second side of said second sheet to inhibit removal of said article from said container and when said container is moved by an individual against the bias of said biasing means to said first position, said blister is in registry with said base opening to permit removal of said article by applying pressure to said outside surface of said blister to force said article to puncture said second sheet and pass through said base opening.

5,150,794
YARN CABINET
George E. Rooks, P.O. Box 368, Penrose, Colo. 81240-0368
Filed Sep. 9, 1991, Ser. No. 756,781
Int. Cl.[5] B65D *85/67*; B65H *75/06*
U.S. Cl. 206—574 11 Claims



1. A yarn storage device comprising:
a cabinet having a partition member disposed therein and defining a lower chamber therebeneath,
said lower chamber including a plurality of cylindrical cavities therein to maintain hanks of yarn,
said partition member having a plurality of openings respectively communicating with each said cavity,
a plurality of lids for enclosing said openings,
said lids provided with a hole therethrough to receive the distal portion of a hank of yarn,
said lids provided with means for retaining said distal portion of a hank of yarn atop each said lid,
whereby one can gauge what color yarn is contained within each said cavity by observing said distal portion atop said lids.

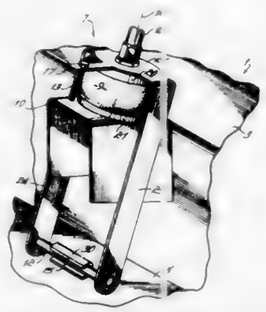
5,150,795
APPARATUS FOR SORTING SPECIMENS
Naoki Nakayama, Tsukube, and Katumi Hamasaki, Yokohama, both of Japan, assignors to Mitsubishi Petrochemical Engineering Company Ltd., Tokyo, Japan
Filed Jul. 16, 1991, Ser. No. 730,986
Claims priority, application Japan, Jul. 16, 1990, 2-185191
Int. Cl.[5] B07C *3/14*
U.S. Cl. 209—3.3 3 Claims



1. A specimen sorting apparatus, comprising:
a path of convey including a rack transporting conveyor and a rack sorting conveyor connected to the downstream end of said rack transporting conveyor;
a rack supply conveyor provided at one side of said rack transporting conveyor;
a first specimen bar code reader disposed in the vicinity of said rack supply conveyor;
a printer disposed near the downstream end of said rack transporting conveyor and adapted to operate in accordance with instructions given by a host computer;
a rack bar code reader and a second specimen bar code reader disposed along the path of convey between said rack supply conveyor and said printer;
a table disposed at one side of said rack sorting conveyor and having a predetermined number of storage sections defined thereon; and
a plurality of pusher mechanisms arranged along said rack sorting conveyor and associated with the respective storage sections;
whereby the sorting of specimens is conducted by loading predetermined racks with a predetermined number of specimen containers in accordance with a specimen identification number ID_0No marked on said specimen containers and read by the first specimen bar code reader; transferring the racks onto said rack supply conveyor and then to said rack transporting conveyor; reading the rack identification number of each rack by said rack bar code reader and reading the specimen identification numbers ID_0No of the specimen containers on said rack by said second specimen bar code reader during the running of said rack by said rack transporting conveyor; printing examination item identification numbers ID_2No on said specimen containers by said printer in accordance with instructions given by a host computer; transferring said racks after printing on said specimen containers thereon to said rack sorting conveyor from said rack transporting conveyor; and selectively operating said pusher mechanisms in accordance with instructions given by said host

computer thereby pushing said racks into corresponding storage sections.

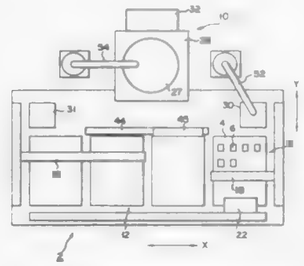
5,150,796
RETRACTABLE, AIR PRESSURE ACTUATED HOLD-DOWN CLAMP
Bruce A. Pierson, Cincinnati, Ohio, assignor to Rotex, Inc., Cincinnati, Ohio
Filed Jul. 18, 1991, Ser. No. 732,036
Int. Cl.[5] B07B *1/00*
U.S. Cl. 209—370 **12 Claims**



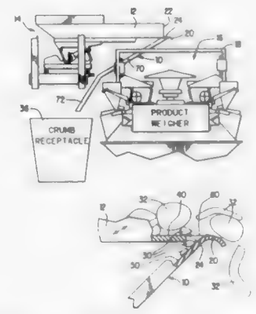
1. An air pressure actuated hold-down clamp for securing a first member and a second member comprising,
an inflatable air actuator having a fixed end and a movable end, said fixed end mounted to said first member, said actuator being expanded from a normal attitude by internal pressurization and contracted from the normal attitude by sub- atmospheric internal pressure,
a clamping surface provided by said second member,
a clamp arm mounted to a movable end of said actuator, said clamp arm being moved against said clamping surface when said actuator is pressurized thereby to clamp said second member relative to said first member, and
a stop asymmetrically mounted to said movable end of said actuator for movement therewith, contraction of said actuator under sub-atmospheric pressure moving said stop into engagement with a fixed surface, the asymmetric mounting of said stop thereupon tilting said actuator and swinging said clamp arm away from said clamping surface.

5,150,797
IC SORTING AND RECEIVING APPARATUS AND METHOD
Junichirou Shibata, Urawa, Japan, assignor to Tokyo Electron Limited, Tokyo and Tokyo Electron Yamanashi Limited, Nirasaki, both of, Japan
Filed Jul. 3, 1991, Ser. No. 725,518
Claims priority, application Japan, Jul. 18, 1990, 2-190122
Int. Cl.[5] B07C *5/344*
U.S. Cl. 209—573 **22 Claims**

1. An IC sorting and receiving apparatus comprising:
transportation means for transporting ICs to be sorted and received according to tested results; and
reception means for receiving said ICs transported by means of said transportation means and keeping them in groups according to the tested results said reception means comprising a vertically movable tray loader having vertical drive means, and a horizontally movable tray loader having horizontal drive means which can be moved in a horizontal direction away from a region over said vertically movable tray loader when said ICs are transported onto said vertically movable tray loader.

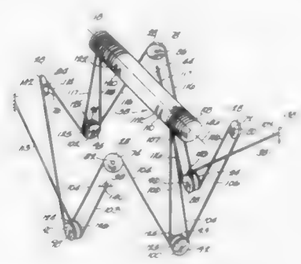


5,150,798
CRUMB REMOVAL SYSTEM
William C. Mills, Jr., Dallas, Tex., assignor to Recot, Inc., Plano, Tex.
Continuation of Ser. No. 600,880, Oct. 22, 1990, abandoned. This application Mar. 3, 1992, Ser. No. 844,870
Int. Cl.[5] B07B *13/05*
U.S. Cl. 209—660 **9 Claims**



1. An apparatus for separating substantially intact products from smaller, partial pieces of the intact products, comprising:
a conveyor means for transporting a product stream in a downstream direction, the product stream comprising substantially intact products and smaller, partial pieces of the intact products, and the conveyor means having a discharge end; and
an inclined chute extending underneath the conveyor means with an upper end of the chute being disposed downstream of and horizontally spaced from the discharge end by a distance forming an opening between the discharge end and the upper end of the chute, the size of the opening being variable and selected so as to allow the passage of the smaller, partial pieces down the inclined chute in a direction opposite to the downstream direction of the product stream and to allow the passage of the substantially intact product over the upper end of the chute in the downstream direction;
wherein the upper end of the discharge chute comprises a convex curved surface for receiving product discharged from the downstream end of the conveyor means and for preventing damage to the substantially intact products as they pass thereover.

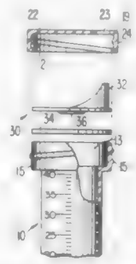
5,150,799
ANTI-SWAY REEVING SYSTEM
Herbert D. Long, Jr., West Allis, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.
Filed Nov. 5, 1990, Ser. No. 608,876
Int. Cl.[5] B66C *13/06, 17/00, 19/00*
U.S. Cl. 212—147 **13 Claims**



1. A reeving apparatus for a crane having an overhead frame, winding drum means mounted on the frame for raising and lowering a lifting beam and having a longitudinal axis, and a lifting beam positioned below the frame and subject to swaying forces and movement transverse to the vertical comprising:
first, second, third and fourth spaced-apart rotatable sheave means affixed to and swaying with the lifting beam for supporting and positioning the lifting beam, the first and second sheaves being spaced apart in directions horizontally transverse to the axis of the drum and the third and fourth sheave means being spaced apart from each other and from the first and second sheave means in directions parallel to the axis of the drum means;
alternate ones of the first, second, third and fourth sheave means comprising single sheaves having first and second grooves and the other ones of the first, second, third and fourth sheave means comprising a pair of sheaves each having single grooves;
a plurality of rope means each affixed to the drum means and overhead frame and wrapped around one of the first, second, third and fourth sheave means for supporting the lifting beam with the sheave means;
the plurality of rope means including first and second rope means extending to and wrapping around the same alternate one of the first, second, third and fourth sheave means in one of the first and second grooves for generating friction forces with said alternate one of the sheave means in response to swaying movement which dissipate the energy of the swaying forces on the lifting beam; and
said first and second rope means each extending to and wrapping around a single groove of a pair of sheaves of a different other one of the first, second, third and fourth sheave means for supplying rope to the alternate ones of the first, second, third and fourth sheave means to allow their swaying movement.

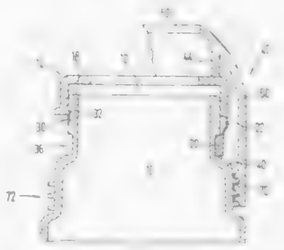
5,150,800
TRAINING CAP FOR NURSING BOTTLES
Celia Sarter, and Rick Sarter, both of 24 R St., NE., Washington, D.C. 20002
Continuation of Ser. No. 362,868, Jun. 7, 1989, abandoned. This application Jan. 2, 1991, Ser. No. 635,390
Int. Cl.[5] A61J *9/00, 11/04*
U.S. Cl. 215—11.4 **7 Claims**

3. In a nursing bottle combination including a nursing bottle having an open end and threads at said open end, and a cap having a top defining an opening and a flange having threads for mating with the threads of a bottle, the improvement comprising:
an insert member receivable in said cap, said insert member having a weaning spout projecting from the insert member and extending through the opening in the top of the cap, the weaning spout including an opening extending through said insert member;
a control member sized for mounting on the open end of the bottle, said control member having an opening being disposed to be registrable with the opening of the weaning spout, and said opening through said insert member including means for movement with respect to the opening of said control member to vary the size of said inlet and



thereby control the rate of fluid flow through the weaning spout; and
said weaning member having a first axially extending connecting portion and said control member having a corresponding second axially extending connecting portion, wherein said first axially extending connecting portion and said second axially extending connecting portion include means to facilitate the relative rotation between said control member and weaning member.

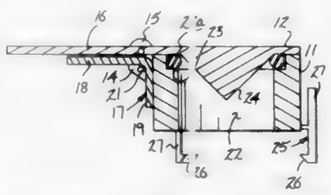
5,150,801
DETACHABLE CAP FOR A BOTTLE NECK
Wolfgang Held, Holzlutweg 7, A-6972 Hardt, Austria
PCT No. PCT/EP89/00309, § 371 Date Jun. 14, 1990, § 102(e) Date Jun. 14, 1990, PCT Pub. No. WO89/09591, PCT Pub. Date Oct. 19, 1989
PCT Filed Mar. 21, 1989, Ser. No. 499,398
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811730
Int. Cl.[5] A61J *9/08, 11/04*
U.S. Cl. 215—11.6 **11 Claims**



1. In a baby bottle having a neck with a mouth, and a nipple with a horizontal flange, which is supported by an annular cap that is detachably connectable to the neck, the annular cap being shaped as a portion of a hollow cylinder having a radial flange oriented inwardly, the radial flange pressing and sealing the horizontal flange of the nipple against a face end of the mouth, the improvement comprising:
the annular cap (**14**) connected with a joint (**22**) to a retaining body (**20**) having arcuate legs (**24**, **26**), the arcuate legs (**24**, **26**) of the retaining body (**20**) detachably snapped within a circumferential annular groove (**36**) about an outer wall of the neck (**12**), the arcuate legs (**24**, **26**) to-

gether extending about more than a 180° segment of a neck circumference of the neck (12); and
a first side wall of the annular cap (14) diametrically opposed with respect to the joint (22) having an inwardly directed detent protrusion (32) engageable within a correspondingly positioned detent recess (30) within said outer wall of the neck (12) for detachably connecting the annular cap (14) to the neck (12).

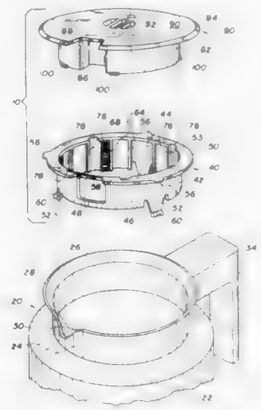
5,150,802
PUNCTURE AND SEAL CAP APPARATUS
Christopher M. Jeffers, 1548 Quirif St., Walled Lake, Mich. 48390
Filed Nov. 12, 1991, Ser. No. 790,829
Int. Cl.[5] B65D 51/24; B67B 7/50
U.S. Cl. 215—235 5 Claims



1. A puncture and seal cap apparatus for securement to a container, wherein the apparatus includes
a cylindrical cap body, the cap body including a body upper terminal end and a body lower terminal end, the cap body including a conduit bore coaxially directed coextensively through the cap body, and
a lid hingedly mounted to the cap body at the upper terminal end, the lid and the cap body including a hinge to pivotally mount the lid to the cap body, and
the lid including a lid piercing cone fixedly and integrally mounted to an interior surface of the lid, wherein the piercing cone is coaxially aligned with the bore in a first position when the lid is in a contiguous communication with the cap body upper terminal end, and
the container including a container spout, wherein the container spout includes a sealing web mounted to the spout at an upper terminal spout end, and
the spout including an annular flange, and the cap body including a plurality of spring legs for securement of the cap body to the flange.

5,150,803
DECANTER AND LID ASSEMBLY FOR AUTOMATIC DRIP COFFEE MAKER
Mark Cartellone, Rocky River, Ohio, assignor to Mr. Coffee, Inc., Bedford Heights, Ohio
Filed Jul. 25, 1991, Ser. No. 736,062
Int. Cl.[5] B65D 39/10
U.S. Cl. 215—357 15 Claims

1. An adjustable lid assembly for attachment to a decanter having an interior cavity and an open upper end, comprising:
a mounting sleeve which is attachable to the open upper end of the decanter, said sleeve having
an opening extending therethrough for communicating with the interior of the decanter, and
at least one column of vertically aligned, horizontally oriented slots, each of said slots having a side communicating with said opening through said sleeve, and
a generally vertically oriented recess formed in said sleeve adjacent said column, said recess being in communication with said opening through said sleeve and communicating with said slots, and
a lid dimensioned to be telescopically received within said opening in said sleeve and to be rotatable within said sleeve about a fixed axis, said lid having
an upper surface for substantially enclosing the open upper end of the decanter,
a central aperture through said upper surface which communicates with the interior of the decanter when said lid is within said sleeve, and



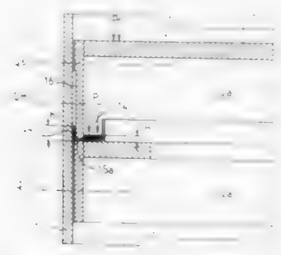
at least one outwardly extending, generally horizontal lug dimensioned to be movable within said recess in said sleeve and to be movable from said recess into one of said horizontally oriented slots when said lid is rotated about said axis.

5,150,804
ROTATIONALLY RESISTIVE PAIL, PAIL SUPPORT AND COUPLING FOR CEMENTATIOUS OR VISCOUS MATERIALS
Oscar Blanchet, 12219-105 St., Edmonton AB, Canada T5G2N9, and Donald Mills, 14518-31 St., Edmonton AB, Canada T5Y121
Filed Mar. 14, 1991, Ser. No. 669,676
Int. Cl.[5] B65D 51/00
U.S. Cl. 220—212 10 Claims

1. A rotationally resistive pail, pail support and coupling, comprising:
a hollow pail having an opening and a base;
said pail having a lid engaging means in said base of said pail; and,
a mating lid for said pail, separate from said pail for disengageable closure of said pail opening, and for removal from said disengageable closure of said pail opening and placement so as to be releasably engageable with said pail base for supporting and lockingly engaging said pail in a supporting position;

said lid having a pail engaging means for vertical interlocking and rotationally preventative engagement with said lid engaging means when said lid is in said supporting position, wherein:
(a) when said lid is in said supporting position, said lid supports said pail vertically, and said engaging means prevents forced relative rotation between said lid and said pail;
(b) said base of said pail includes a circumferential base rim depending from said pail, and said lid engaging means is at least one notch in said base rim; and
(c) said lid includes a circumferential lid rim circumscribing said lid, and said pail engaging means is at least one lug protruding from said lid rim for mating with said notch.

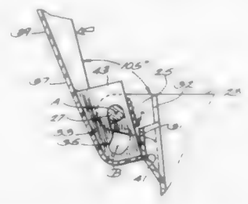
5,150,805
FLUID SEAL APPARATUS
Manuel Vinals, San Quirze del Valles, Spain, assignor to Schlumberger Industries, Montornes Del Valles, Spain
Filed Sep. 19, 1991, Ser. No. 762,146
Claims priority, application France, Sep. 28, 1990, 90 11953
Int. Cl.[5] B65D 88/48
U.S. Cl. 220—217 4 Claims



1. Apparatus for separating a first volume of fluid from a second volume of fluid, said apparatus comprising a substantially vertical cylinder, a piston and a seal, the piston being slidably mounted inside the cylinder and cooperating with a bottom portion of the cylinder to delimit the first volume fluid, the seal comprising a liquid filling an annular space formed between the piston and the cylinder, to provide fluid-tight sealing at this space, wherein the piston has a cavity opening out into the first volume of fluid, and wherein the piston includes at least one reservoir which is subjected to the pressure of the first volume of fluid, which is housed in said cavity, which contains the sealing liquid, and which communicates freely with said annular space via through orifices in the piston, the liquid thereby taking up respective levels firstly in the reservoir and secondly in the annular space, with the difference between these respective levels being a function of the difference between the respective pressures in the first and second volumes of fluid.

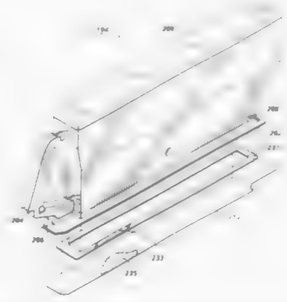
5,150,806
REFUSE CONTAINER WITH TWO-POSITION LID
Norman J. Glomski, Chattanooga, Tenn., assignor to The Heil Co., Milwaukee, Wis.
Division of Ser. No. 192,002, May 9, 1988, Pat. No. 4,836,394.
This application May 16, 1989, Ser. No. 352,568
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] B65D 90/00
U.S. Cl. 220—331 1 Claim

1. A method of uncovering a container for holding refuse or the like comprising the steps of:
a) providing an open top container body;
b) providing a shaft mounted in spaced relation to said container body;
c) pivotally attaching a lid to said body with said shaft extending through one end of a closed slot in said lid;
d) pivoting the lid through an angle of approximately 105° from a closed position to a first open position wherein said lid contacts said body in abutting cooperation to hold said lid in said first open position;



e) translating the lid a predetermined distance in a generally vertical direction to reposition said lid so that the shaft extends through the other end of said slot in said lid;
f) pivoting the lid another approximately 165° from the first open position to a second fully open position.

5,150,807
APPARATUS FOR STORING MARKING PARTICLES
Joseph A. Seyfried, Webster, and Chetan G. Patel, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 754,858, Sep. 4, 1991. This application Dec. 6, 1991, Ser. No. 802,977
Int. Cl.[5] B65D 41/00
U.S. Cl. 220—359 7 Claims



1. An apparatus for storing marking particles therein, comprising:
a container defining a chamber for storing the marking particles therein and having an opening defined therein for the discharge of the marking particles therefrom;
a seal member secured to said container, said seal member having an opening defined therein which is at least partially coextensive with the opening of said container for the passage of marking particles therethrough; and
a cover positionable over the opening defined in said seal member, said cover being removably secured to said seal member with an adhesive material.

5,150,808
CAP HOLDER DEVICE
Tyrone Hamilton, 5234 Stuyvesant, Houston, Tex. 77021
Filed Oct. 24, 1990, Ser. No. 602,862
Int. Cl.[5] B65D 55/16
U.S. Cl. 220—375 20 Claims

1. An apparatus for holding a vehicle filler cap comprising:
A. a flexible body with an opening to receive a filler cap;

B. a connector strap assembly that is foldable and attached to said flexible body;

C. means for attaching said connector strap assembly to the vehicle body; and

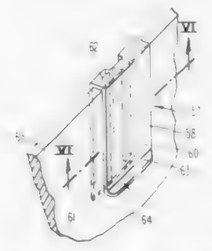
D. a suction cup to mount said flexible body.

5,150,809

ADJUSTABLE SUBDIVIDABLE MULTI-COMPARTMENT REFUSE CONTAINER

William E. Leigh, 205 Lochwood Ln., West Chester, Pa. 19380

Filed Apr. 2, 1991, Ser. No. 679,515
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—404 17 Claims



1. An adjustable subdividable multi-compartment refuse container for use with multiple flexible liners, the container comprising:

(a) a base and at least two pairs of opposing side walls extending perpendicularly therefrom, the side walls each having an inner and outer surface, a top edge portion, and a bottom edge portion, the container being open at an end opposite said base;

(b) a plurality of panel retaining means located on the inner surfaces of the side walls:

(c) at least one removable first panel having front and back panel faces, a top edge, a bottom edge, and a pair of side edges, the side edges being held in place by the panel retaining means, the at least one first panel dividing the container into separate multi-sizable compartments;

(d) liner retaining means comprising a plurality of grooves disposed in the top edge portion of at least one pair of opposing container side walls; and

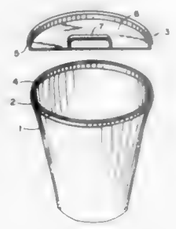
(e) at least one generally U-shaped clip member having a first wall opposing a pair of spaced-apart resiliently movable leg members, each leg member being attached at one end thereof to a connecting wall, the first wall having a tongue portion extending from the connecting wall lengthwise along the inner surface of the said first wall and disposed opposite the space between the leg members, the tongue portion being adapted to be slidably received within any of the grooves, whereby when a liner is placed over any groove, upon sliding receipt of the clip member tongue portion within the groove the liner is secured in place.

5,150,810

WASTE DISPOSAL BAG WITH A BAG COLLAR AND LID

Johannes Loebbert, Lindenstrasse 22, 4405 Nottuln 2, Fed. Rep. of Germany

Division of Ser. No. 660,964, Feb. 26, 1991, Pat. No. 5,074,500, which is a continuation of Ser. No. 391,230, Aug. 8, 1989, abandoned. This application Sep. 3, 1991, Ser. No. 745,034
Int. Cl.[5] B65D *33/00*
U.S. Cl. 220—404 8 Claims



1. In a closable bag suitable for the disposal of trash, garbage and other waste products, said bag comprising:

(a) a bag part made of flexible material having a closed lower end and an open upper end;

(b) a bag collar made of relatively stiff material which is firmly attached to said upper end of said bag part; and

(c) a lid adapted to be placed on said bag collar so as to close and seal said bag at its upper end;

the improvement wherein said collar includes support elements for said lid around its circumference so that the lid can be raised easily or can be placed on or inserted in said bag collar, wherein catch elements are disposed around said bag collar for interlocking with compatible elements on said lid to secure said lid tightly to said bag collar and wherein said lid includes a rim that has a U-shaped cross-section, said rim being adapted to cover the top of said bag collar and to overlap at least part of the inside and outside surfaces thereof, and wherein said catch elements are disposed on at least one of the inside, outside and top of said bag collar, whereby said lid, said bag collar and said bag are disposable as a unit.

5,150,811

SQUEEZE RESISTANT CARTON HOLDER

Henry J. Kelston, 23 Clinton Ave., Nyack, N.Y. 10960

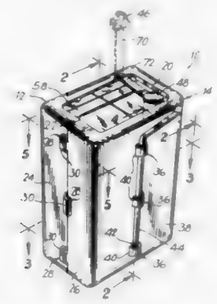
Continuation of Ser. No. 708,153, May 13, 1991, which is a continuation of Ser. No. 594,508, Oct. 9, 1990, abandoned, which is a continuation of Ser. No. 444,918, Dec. 4, 1989, abandoned, which is a continuation of Ser. No. 162,925, Mar. 2, 1988, abandoned. This application Oct. 3, 1991, Ser. No. 771,844
Int. Cl.[5] B65D *6/00*
U.S. Cl. 220—411 21 Claims

1. A housing of the type capable of receiving a drink-containing flexible carton, the drink carton being substantially a parallelepiped and being of the type having a presealed pierceable opening in its top wall so dimensioned as to receive a straw or the like, said housing comprising:

a) bottom and opposed side wall means defining an interior space for receiving therein the drink carton with the carton top wall at the top of said housing;

b) top means in conjunction with at least one of said side walls and proximate the top wall of the carton; said top means comprising an opening for exposing at least a part of the top wall of the carton such that access may be gained to the straw opening in any number of different locations; and

c) stopper means comprising an arm and a stopper; one end of said arm pivotally coupled to said top means; said stopper being selectively positionable so as to locate and move into and out of registry with the straw opening; said stopper means when in registry with the straw opening



being insertable into the straw opening for substantially sealing the opening.

5,150,812

PRESSURIZED AND/OR CRYOGENIC GAS CONTAINERS AND CONDUITS MADE WITH A GAS IMPERMEABLE POLYMER

Peter M. Adams, Charlotte, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 5, 1990, Ser. No. 548,034
Int. Cl.[5] B65D *25/34*
U.S. Cl. 220—414 13 Claims

1. A container or conduit for compressed gas and/or cryogenic gas comprising:

gas barrier means for containing the compressed gas and/or cryogenic gas, said gas barrier means comprising a gas impermeable synthetic polymer, said polymer being selected from the group consisting of liquid crystal polymers, polyacrylonitrile, polyether ketone, polyether ether ketone, polyether ether ketone ketone, high density polyethylene, and ultra high molecular weight polyethylene; and

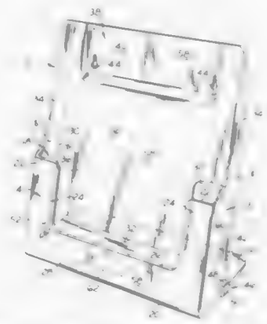
means for providing structural integrity to the container or conduit, said structural means overwrapping said gas barrier means.

5,150,813

RECEPTACLE AND MOULD FOR MAKING THE SAME

Sydney J. Harris, Berkshire, and Andrew C. Woolnough, London, both of England, assignors to Earley Marketing Limited, Aldermaston, England

Filed Feb. 15, 1991, Ser. No. 656,782
Claims priority, application United Kingdom, Feb. 16, 1990, 9003612
Int. Cl.[5] B65B *5/52*
U.S. Cl. 220—480 7 Claims



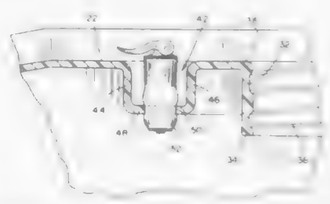
1. An injection moulded receptacle which is open at the top comprising a bottom, a front wall, a rear wall spaced from the front wall, said rear wall having a lowermost edge spaced from the bottom, and two side walls connecting the front and rear walls at either side of the receptacle, both side walls, or the front wall and both side walls, being connected to the bottom, an upper edge of the front wall being spaced from the bottom by less than the distance of the lowermost edge of the rear wall from the bottom, the rear wall being connected to the side walls only at positions spaced from the bottom a greater distance than the upper edges of the front wall adjacent the side walls.

5,150,814

CHEMICAL SPRAY TANK

Craig G. Broyhill, Dakota City, Nebr., assignor to The Broyhill Company, Dakota City, Nebr.

Filed Oct. 9, 1991, Ser. No. 774,717
Int. Cl.[5] B65B *3/06*
U.S. Cl. 220—601 3 Claims



1. A chemical spray tank comprising:

a hollow tank member having a bottom wall, front wall, back wall, side walls, and a top wall;

said top wall having a fill opening formed therein for receiving liquid chemicals;

said fill opening being defined by an annular, vertically disposed wall member having upper and lower ends;

the upper end of said fill opening wall member being located at level below the uppermost portion of said top wall;

means for closing said fill opening;

said top wall having an annular recessed area formed therein which extends around said wall member;

said annular recessed area having a bottom wall which is disposed between the upper and lower ends of said fill opening wall member;

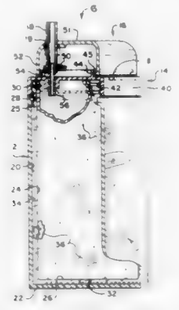
said annular recessed area having at least one closable opening formed therein which communicates with the interior of said tank member.

5,150,815

DRINK CONTAINER

Betty E. Saklad, Tarzana, Calif., assignor to Selandia Designs, Santa Clarita, Calif.

Filed Oct. 25, 1991, Ser. No. 782,806
Int. Cl.[5] B65D *47/12*
U.S. Cl. 220—708 6 Claims



1. A handheld drink container, comprising:

an open-top, double-walled drink liquid holder including a space sealed between the walls;

a quantity of a liquid received within the holder sealed space;

at least one object received within the holder sealed space and liquid contained therein, said object being movable within said space and liquid upon movement of the container;

a cap removably secured to the holder open top;

a tube extending through an opening in the cap having a first portion extending into the drink liquid holder and a second portion extending generally upwardly and outwardly of the holder;

a sipping straw secured to the tube second portion and extending generally upwardly; and

a cover rotatably secured over the cap and including an upwardly facing opening therein which can be aligned with the sipping straw allowing it to extend upwardly therethrough on rotatable adjustment of the cover to a given angular position, and on the cover being rotated to other positions bending the sipping straw to a condition where liquid cannot leak out.

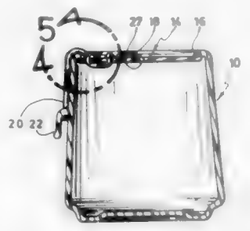
5,150,816

NON-SPILLABLE DRINKING CUP

Carlos DeCastro, 8980, Chateauneuf Anjou, Québec, Canada H1K 4H4

Filed Jun. 24, 1991, Ser. No. 719,348
Int. Cl.[5] A47G *19/22*
U.S. Cl. 220—711 8 Claims

1. A non-spillable drinking cup comprising a tubular container adapted to contain a drinkable liquid, said container having an aperture at its top end, said aperture being provided with an internal peripheral flange, a cover for said container, said cover having a top surface adapted to internally and upwardly abut on said flange for closing said aperture, a stretchable member laterally fixed on said container and on said top surface of said cover for resiliently maintaining said cover against said flange, whereby when said container, containing



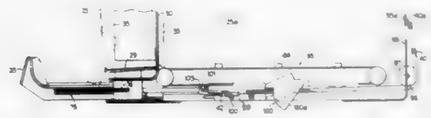
liquid, is knocked over, the liquid is projected against the cover to enhance the abuting relationship of the cover on the flange.

5,150,817

METHODS AND APPARATUS FOR DISPENSING ARTICLES

Troy W. Livingston, Northbrook, Ill., assignor to Inn-Room Systems, Inc., Sudbury, Mass.

Filed Jun. 15, 1990, Ser. No. 539,003
Int. Cl.[5] G07F *11/00*
U.S. Cl. 221—81 18 Claims



1. In a vending apparatus for vending a plurality of articles from a plurality of vending units, the combination comprising:

a housing having an access door:

a plurality of vending units in the housing each for vending an article;

a manually actuatable handle associated with each vend unit to be actuated by the vendee to cause a vending of an article;

an upright, substantially semi-cylindrical turnable access door in said vending units rotatable by the handle to turn from a closed position denying access to the article to an open vending position allowing access to the article being dispensed from the upright, substantially semi-cylindrical, turnable access door;

a conveyor means in the vending units for holding a plurality of articles and for conveying each of the articles on the conveyor to the vending position behind the upright, substantially cylindrical, turnable access door; and

electrical control means for disabling the access door to vending and operable by the vendee to enable the vending unit to allow the manually operated handle to be manually actuated to turn the upright, substantially cylindrical, turnable access door to allow removal of the article.

5,150,818

LITERATURE DISPENSING APPARATUS

Paul S. DeMoss, 2921 Lenox Rd. NE., No. 214, Atlanta, Ga. 30324

Filed Feb. 1, 1991, Ser. No. 649,698
Int. Cl.[5] B65H *1/08*
U.S. Cl. 221—228 3 Claims

1. A stand for display of advertising messages and dispensing of pieces of literature from a stack comprising the combination of:

an elongated upright cabinet having an internal storage compartment;

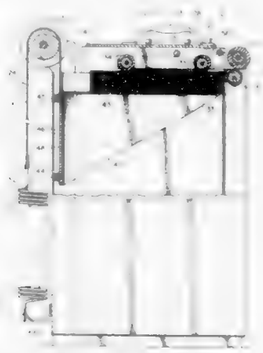
a movable carriage positionable within said storage compartment, in a vertical reciprocal and rectilinear direction so as to move a platform fixed on said carriage within said storage compartment in said vertical direction;

roller means carried on said carriage rollably engaging with an opposing wall surface of said cabinet while permitting stabilized carriage travel through said cabinet storage compartment in said vertical direction;

a stack of literature pieces disposed on said platform having the topmost piece of literature partially exposed in a preparatory position for removal from said cabinet;

a lid movably attached to said cabinet for opening and closing said storage compartment;

resilient means operably coupled between said carriage and said cabinet exteriorly of said cabinet normally biasing and urging said stack of literature pieces in a vertical rectilinear direction towards said lid;



advancement mechanism carried on the underside of said lid in frictional engagement with the uppermost piece of literature whereby manual advancement of said topmost piece of literature from said cabinet moves a secondmost piece of literature underlying said topmost piece into said preparatory position;

means movably mounting said advancement mechanism on said lid to accommodate for misalignment of said literature in a horizontal plane immediately beneath said advancement mechanism;

said cabinet having a dispensing slot immediately ahead of said advancement mechanism through which a portion of said topmost piece of literature is exposed when in said preparatory position; and

said resilient means comprising at least one coil spring having opposite ends connected to said cabinet and said carriage respectively.

5,150,819

DOUBLE TANK PINCH TRIGGER PUMP WATER GUN

Lonnie G. Johnson, 2923 N. Casitas Ave., Altadena, Calif. 91001, and Bruce M. D'Andrade, 3 Ten Eyck Rd., Whitehouse Station, N.J. 08889

Continuation of Ser. No. 680,247, Apr. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 578,145, Sep. 6, 1990, Pat. No. 5,074,437. This application Feb. 28, 1992, Ser. No. 841,762
Int. Cl.[5] A63H *33/18*
U.S. Cl. 222—79 19 Claims

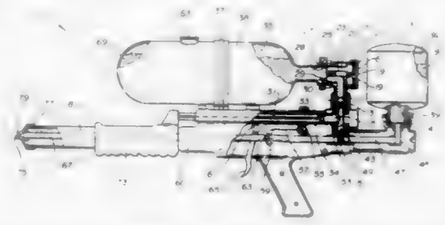
1. A toy water gun having a housing with extending handle, trigger and barrel, said water gun comprising:

(a) a water storage reservoir connected to said housing, said water storage reservoir having at least one orifice formed thereon for the addition and subtraction of water therefrom; and said water storage reservoir having at least one vent to the surrounding ambient air;

(b) a pressurized water storage tank connected to said housing, said pressurized water storage tank having only one orifice through which all liquids and gasses pass;

(c) a pumping means that can selectively draw air or water or a combination thereof from said vented water storage reservoir, depositing same into said pressurized water storage tank to thus vary the ratio of air to water therein;

(d) a plurality of one-way flow valves, wherein at least one of said one-way flow valves prohibits water and air from flowing from said pressurized water storage tank to said pumping means and another at least one of said one-way



flow valves prohibits water and air from flowing from said pumping means to said water storage reservoir;

(e) a nozzle having a narrow orifice therethrough, said nozzle being affixed to the end of said barrel;

(f) an avenue of release connecting said nozzle to said pressurized water storage tank; and

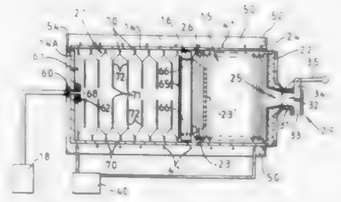
(g) a controlling means for regulating the flow of water and air through said avenue of release, said controlling means being attached to said trigger of said water gun and regulated by the movement of said trigger.

5,150,820

DISPENSING APPARATUS FOR FROZEN PRODUCT

Shane R. McGill, 3 Parrs Head Mews, George Lane, Rochester, Kent, England

Filed Jul. 20, 1990, Ser. No. 556,333
Claims priority, application United Kingdom, Jul. 20, 1989, 8916579; Aug. 24, 1989, 8919216; Jan. 13, 1990, 900792
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—95 9 Claims



1. A dispensing apparatus for dispensing a frozen product which comprises:

deformable container means for containing a frozen product in semi-solid form to be dispensed, said container means having outlet means including an outlet opening in one end of said container means through which the product is discharged;

drive means for deforming said container means whereby to discharge product in said container means through said outlet opening, said drive means being power operated and including:

a plunger engageable with the opposite end of said container means to said outlet opening, and a source of pressurized gas for application to said plunger so that said plunger acts on said container means to deform said container means and discharge said product through said outlet opening;

a housing for receiving said container means, said housing serving to releasably secure said container means during

operation, said housing being formed at one end with a door container an opening through which said container outlet means extends, said door providing an abutment against which said container means is engaged during discharge and said door, when opened, providing access to said housing for replacement of said container means, said door carrying shut-off valve means for controlling discharge of product through said outlet means;

said shut-off valve means includes duct means communicating sealingly at one end with said container outlet means and communicating at the other end with nozzle means through which the product is discharged under the control of said valve means, said shut-off valve means being releasable from said door means to permit cleaning of said shut-off valve means;

said container outlet means being in engagement with said shut-off valve means whereby said frozen product flows directly from said container outlet means to said shut-off valve means and through said shut-off valve means upon actuation of said drive means and opening of said shut-off valve means, said container outlet means extending into said duct means and preventing release of said shut-off valve means from said door means when said door is closed; and

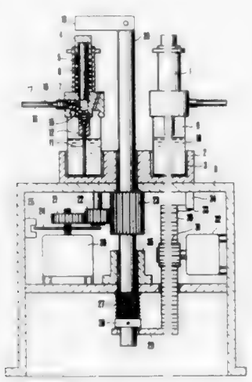
refrigeration means whereby the container means is kept at a low temperature.

5,150,821

APPARATUS FOR SEPARATE INJECTION OF REAGENT

Shuji Iwasaki, Fujisawa; Toshi Kamayama, Yokohama, and Kazuya Kamata, Ebina, all of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Apr. 6, 1990, Ser. No. 505,399
Claims priority, application Japan, Apr. 7, 1989, 1-88692
Int. Cl.[5] B67D 5/60
U.S. Cl. 222—132 **4 Claims**



1. An apparatus for selectively injecting a reagent into a reaction chamber comprising:

a plurality of reagent reservoirs, each adapted to contain a different reagent, support means for supporting said reagent reservoirs in a circular configuration, separate dispenser means mounted on top of each reservoir, each dispenser means including a liquid holding chamber, inlet means connected to said chamber and adapted to extend downwardly into a reagent in said reagent reservoir, outlet means connected to said chamber and spring biased plunger means extending into said chamber, dispenser actuating means adapted to be selectively aligned with said plunger means of each dispenser means for selectively depressing and releasing said spring biased plunger means and distribution means connected to said outlet means of each dispenser means for distributing each reagent separately to a reaction chamber,

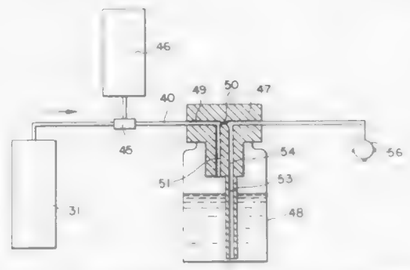
wherein said dispenser actuating means includes a vertically moveable support rod disposed centrally of said support means for supporting said reagent reservoirs and having horizontally extending lever means adapted to selectively engage said plunger means and drive means for rotating said support rod to selectivley position said lever means above a plunger means and for vertically moving said lever means into and out of engagement with said plunger means.

5,150,822

MIXING HEAD FOR DISPENSING AN ACTINE INGREDIENT

Joseph G. Eitner, Jr., Park Ridge, and Robert J. Tice, Jr., Stockholm, both of N.J., assignors to The Wellcome Foundation Limited, London, England

Continuation-in-part of Ser. No. 428,852, Oct. 27, 1989, Pat. No. 5,020,689. This application Jan. 30, 1991, Ser. No. 647,812
Claims priority, application European Pat. Off., Oct. 26, 1990, 90311754.7
Int. Cl.[5] G01F 11/00
U.S. Cl. 222—145 **8 Claims**



1. Apparatus for mixing and dispensing an active ingredient comprising

a source of liquid solvent/propellant;

a sample cylinder containing a charge of active ingredient;

a first conduit extending between said source and an inlet of said sample cylinder for connecting said sample cylinder to said source;

a first junction located in said first conduit intermediate said source and said sample cylinder and a second conduit extending from said junction to by-pass said sample cylinder for dividing a flow of said liquid solvent/propellant upstream of said sample cylinder to cause a first portion of said liquid solvent/propellant to flow into said sample cylinder to both absorb and force out said active ingredient and a second portion of said liquid solvent/propellant to by-pass said sample cylinder;

a third conduit extending from an outlet of said sample cylinder to a second junction with said second conduit;

a first flow restrictor interposed in said third conduit intermediate the sample cylinder outlet and the second junction with said second conduit and a second flow restrictor interposed in said second conduit downstream of said first junction and upstream of the second junction with said third conduit, said second flow restrictor being of higher pressure rating than said first flow restrictor for creating a pressure differential between said sample cylinder outlet and said second portion upstream of said second junction to enable total absorption of the active ingredient whereby said active ingredient passes through the outlet and said second portion of solvent/propellent absorbs and propels said active ingredient to a discharge station at which all liquid solvent/propellent vaporizes to discharge a mist of active ingredient particles;

wherein said flow restrictors and said conduits which create said pressure differential are located in a mixing head for said sample cylinder.

5,150,823

COMBINATION CONTAINER AND PUMP HAVING A CONICAL PISTON FOR VENTING

Koichi Sugita, Chiba, Japan, assignor to Kabushiki Kaisha Top, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,618
Claims priority, application Japan, Oct. 31, 1989, 1-127661[U]; Dec. 26, 1989, 1-149857[U]; Dec. 26, 1989, 1-149858[U]
Int. Cl.[5] G01F 11/00
U.S. Cl. 222—386 **5 Claims**

1. A combination container and pump comprising:

a cylindrical container for storing a liquid, said cylindrical container having first and second axial ends;

a pump mounted in said first axial end, for drawing the liquid stored in said cylindrical container and discharging the drawn liquid out of said cylindrical container;

a piston slidably disposed in said second axial end for keeping the liquid sealed in said cylindrical container, said piston being movable toward said pump as the amount of the liquid stored in said cylindrical container is reduced when the liquid is discharged from the cylindrical container by said pump;

said piston having a conical surface facing said pump for contact with the liquid stored in said cylindrical container, said conical surface projecting toward said first axial end and having a shape complementary to the shape of an inner surface of said first axial end of said cylindrical container, said piston also having a cylindrical surface defining a communication hole defined axially therethrough and having an inner end opening at said conical surface, said communication hole providing communication between the interior and the exterior of said cylindrical container, said piston having at least one radial slot therein extending from said conical surface to said communication hole, said radial slot having a slanted surface inclined progressively toward said second axial end in a direction opposite to said conical surface; and

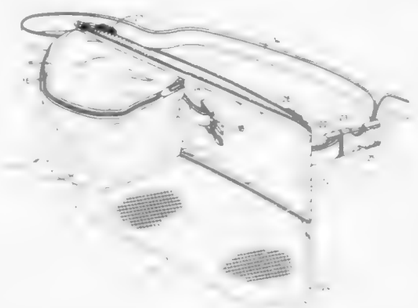
a cap comprising a cap body inserted in said communication hole and a flange closing an outer end of said communication hole, at least either one of said cap body and said cylindrical surface having at least one groove extending along the direction in which said cap body is inserted into said communication hole.

5,150,824

DUAL PURPOSE UNITIZED PACK

Vincent H. Alvarez, and Nancy C. Dendramis, both of Cincinnati, Ohio, assignors to Sally M. Key, Cincinnati, Ohio

Filed Aug. 1, 1991, Ser. No. 739,086
Int. Cl.[5] A45C 15/00
U.S. Cl. 224—151 **19 Claims**



1. A dual purpose unitized pack capable of use as a container for conveniently holding a limited measure of articles and as a container for holding a relatively substantial measure of articles, said dual purpose unitized pack comprising:

(a) a pouch for holding the limited measure of articles, said pouch having a free first attaching means capable of fastening to a belt;

(b) a substantially flat foldable enclosure member having a contiguous portion permanently attached to the pouch and further having a free portion folded to lie adjacent the contiguous portion in a non-use state and extending from the contiguous portion in an in-use state, said enclosure member having a first closure means along an upper edge and a second closure means along a lower edge and a free second attaching means capable of fastening to a belt;

(c) an open top collapsible sack dimensioned to fit within the enclosure member, said sack attached along one upper edge thereof to an inside wall of the enclosure member and positioned so that a main portion thereof is able to drop out the enclosure member when the second closure means is opened and to serve as a container for holding the substantial measure of articles; and

(d) an adjustable belt attached on one end to the pouch and having mating attaching means at the other end capable of releasably attaching to either of the free first or free second attaching means and capable of being worn around the waist of the user or capable of being worn over the shoulder of the user as desired.

5,150,825

HOLSTER WITH RETENTION DEVICE

Richard E. D. Nichols, 13223 Black Mountain Rd., #357, San Diego, Calif. 92129

Filed Jan. 9, 1991, Ser. No. 639,587
Int. Cl.[5] F41C 33/02
U.S. Cl. 224—243 **17 Claims**

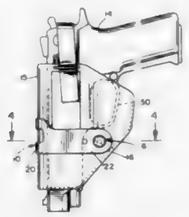
1. A holster for a handgun, comprising:

a holster body having an elongate, handgun receiving pocket extending along its length and open at least at one end for inserting a handgun into the pocket, the holster body having at least one fold and spaced, opposing side wall portions extending from the fold to form opposite sides of the pocket;

an elongate band of resilient material having a hardness greater than the material forming the holster body, the band extending transversely around the outside of at least part of the holster body in a direction substantially perpen-

dicular to the longitudinal axis of the pocket, and having a fold at a central portion in its length overlying said one fold in the holster body and opposite end portions extending over the respective side wall portions of the holster body;

fastener means for connecting opposite ends of the band together and securing the band to the holster body;



the end portions of the band comprising means for pinching underlying side wall portions of the holster inwardly to apply a retentive force to grip underlying portions of a handgun in the pocket; and

opposite ends of the band having aligned openings and said fastener means extending through said aligned openings and the aligned underlying portion of the holster body to secure said band ends to the holster body, said band being secured to the holster body only by said fastener means.

5,150,826

APPARATUS FOR FORMING AND DRIVING STAPLES

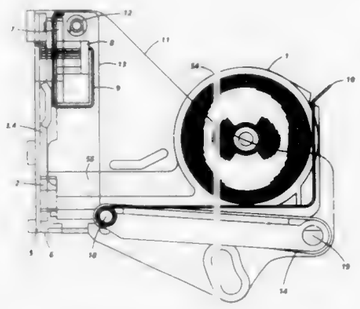
Jozef P. M. Logtens, Meerlo, Netherlands, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 7, 1991, Ser. No. 666,161

Claims priority, application United Kingdom, Mar. 7, 1990, 9005114

Int. Cl.[5] B25C *5/08*

U.S. Cl. 227—88 **5 Claims**



1. Apparatus for forming and driving staples in a single stroke, comprising:

a removable cartridge storing staple wire;

a first guide plate having a planar surface;

a second guide plate having a planar surface, said second guide plate being spaced apart from, and parallel to the first guide plate to define a guide channel between the planar surface of the first guide plate and the planar surface of the second guide plate and wherein said first guide plate defines a slot;

a former defining a cut-out portion adapted to form staples from the staple wire stored in the removable cartridge;

a forming block having staple wire bent thereabout by the former to produce a staple;

a driver for driving the staple into a workpiece, wherein the former and the driver each comprise a substantially flat plate of equal thickness, with the driver comprising a substantially rectangular plate aligned in the same plane as, and slideable within the cut-out portion of the former, and with both the former and the driver being arranged for coplanar sliding movement in the guide channel;

means for withdrawing the forming block from the staple;

a driving member defining an aperture;

a first link member attached to the driving member; and

a second link member within the aperture of and slideably attached to the driving member wherein the first link member extends through the slot in the guide plate for linking the driving member to the driver and the second link member extends through the slot for disengagingly linking the driving member to the former to initially drive the driver and former in unison to form the staple around the forming block and wherein said second link member is a retractable link member so that at a predetermined point during the driving stroke whereafter the driving member drives only the driver, so that the driver moves relative to the former to drive the staple into the workpiece.

5,150,827

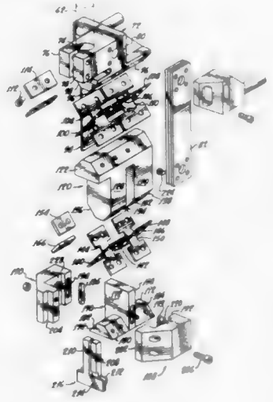
SELF-LEVELING REFLOW SOLDER HEAD WITH DOUBLE PIVOT

William M. Fries, San Diego, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 22, 1991, Ser. No. 796,208

Int. Cl.[5] B23K *3/00, 20/02*

U.S. Cl. 228—44.7 **12 Claims**



1. A self-leveling tool comprising:

a tool tip adapted to be moved in a selected direction to be pressed against a workpiece surface that has an unknown tilt relative to that direction,

drive arm means for moving said tool tip in said direction toward said workpiece, said drive arm means having a pivotal connection to said tool tip, whereby said tool tip tends to tilt upon initial contact with a tilted workpiece, and

means for mounting said drive arm means to enable lateral motion of said pivotal connection, wherein said means for mounting comprises a drive ram and wherein said drive arm means comprises a double pivot link pivotally connected at one of its ends to said tool tip and at its other end to said drive ram and wherein said pivot connections have mutually different stiffnesses.

5,150,828

WIRE BONDING METHOD AND APPARATUS FOR SAME CAPABLE OF PACKAGING SEMICONDUCTOR DEVICE INTO THIN PACKAGE

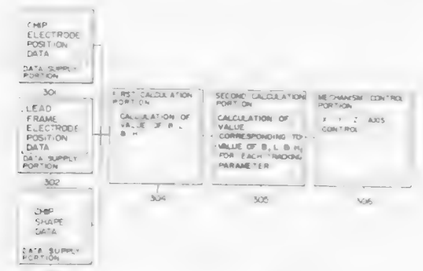
Yasuhiko Shimizu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 13, 1991, Ser. No. 791,169

Claims priority, application Japan, Nov. 13, 1990, 2-306451

Int. Cl.[5] H01L *21/90*

U.S. Cl. 228—102 **9 Claims**



1. A wire bonding method comprising:

a step of calculating the tracking parameters that determine the motion track of a capillary, from a function that has as its variables a tracking wire loop length equivalent to the distance between the bonding point on the lead frame and the bonding point on a chip electrode, and amounts that the chips protrude from the positions of the bonding points on said chip electrode to the side of a lead frame electrode, and

a step of performing drive control of said capillary in accordance with those calculated values.

5,150,829

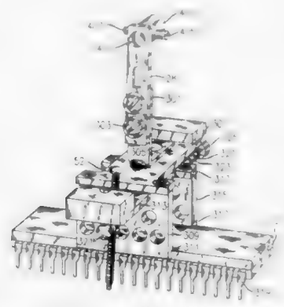
APPARATUS FOR HOLDING SAMPLES DURING SOLDERABILITY TESTING

Jonathan D. Knepper, Salisbury Township, Lehigh County, and Kenneth P. Moll, Philipsburg, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1990, Ser. No. 630,465

Int. Cl.[5] B23K *31/12*

U.S. Cl. 228—104 **13 Claims**



1. An apparatus for holding a smaple for immersion into a solder bath comprising:

a clamping mechanism having a first rod;

a spring circumscribing said first rod;

a first flat plate member, said first flat plate member defining a plane, said plane being generally perpendicular to the longitudinal axis of a first end of said first rod,

a second flat plate member parallel to said first flat plate member, whereby said spring, when compressed, urges said first flat plate member toward said second flat plate member;

and including means attatched to said clamping mechanism for making electrical contact with said solder bath

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5,150,830

METHOD OF BONDING A SHEET OF METAL, SUCH AS COPPER, ON AN ALUMINUM NITRIDE SUBSTRATE

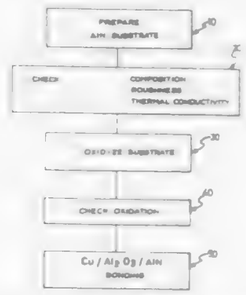
Jannick Guinet, Soisy Sous Montmorency; Jean-Claude Hubert, Sucy En Brie; Jean Jarrige; Jacques Mexmain, both of Limoges, and Jean-Pascal Michelet, Bessines, all of France, assignors to Telemecanique, France

Filed Feb. 20, 1991, Ser. No. 658,268

Claims priority, application France, Feb. 20, 1990, 90 02029

Int. Cl.[5] B23K *1/20; C23C 8/12*

U.S. Cl. 228—124 **7 Claims**



1. A method of bonding a sheet of metal such as copper on a substrate of aluminum nitride, the method comprising the following steps known per se:

i) growing a layer of alumina on the aluminum nitride substrate by means of heat treatment; and

ii) placing the sheet of metal on said alumina layer and then bonding them together;

wherein alumina-growing step i) is performed under a controlled oxidizing atmosphere comprising a water vapor content less than 5 ppm.

5,150,831

REACTOR VESSEL

Robert E. Jordan, Cleveland, and Michael J. Hughes, Hinkley, both of Ohio, assignors to The B.F. Goodrich Company, Brecksville, Ohio

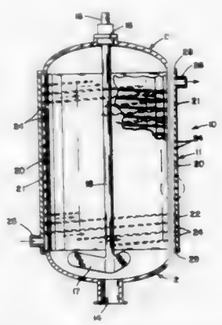
Division of Ser. No. 344,780, Apr. 28, 1989. This application Apr. 30, 1991, Ser. No. 693,832

Int. Cl.[5] B23K *31/02*

U.S. Cl. 228—184 **7 Claims**

1. A method of making a large capacity closed pressure proof reactor vessel for use in a suspension polymerization process for the manufacture of vinyl chloride comprising the steps of forming an inner cylindrical sleeve from a single continuous sheet of metal with a single lengthwise weld to form such cylindrical sleeve, welding one running edge of a longitudinally extending ribbon into a continuous spiral ribbon to the outer wall surface of said inner sleeve, forming from a single sheet of metal an outer cylindrical shell around said inner sleeve by pressing the inner surface of said shell firmly against the other running edge of said continuous spiral ribbon and thence welding two edges of said outer shell to form a cylindrical shape and forming a continuous spiral flow path around said inner sleeve by the cooperation of said shell and said sleeve with said spiral ribbon, providing an upper cap and a

lower dish like member to said outer cylindrical shell to form said closed pressure proof rector vessel, and providing an inlet



and an outlet port to said reactor vessel that communicates with said spiral flow path.

5,150,832

SOLDER PASTE

Yinon Degani, Highland Park, and John R. Morris, Jr., Cranbury, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1991, Ser. No. 724,561
Int. Cl.[5] B23K *35/26 35/363*
U.S. Cl. 228—224 10 Claims

1. A process for soldering comprising the steps of printing a solder paste on at least one of a first and second body bringing into close proximity said first and said second body in an oxygen containing ambient, and heating said paste at a reflow temperature characterized in that said paste comprises:

a) a solder;

b) a removing agent for metal oxides;

c) a low temperature component that substantially evaporates below or at said reflow temperature but does not substantially evaporate at room temperature;

d) a high temperature component that prevents reoxidation of said solder and that has a vapor pressure of less than 1 Torr at 180° C.; and

e) a rheological modifier that allows said printing whereby residue remaining after said reflow is substantially avoided or is substantially soluble in an aqueous based medium.

5,150,833

PAPER PACKAGE FOR BEVERAGE

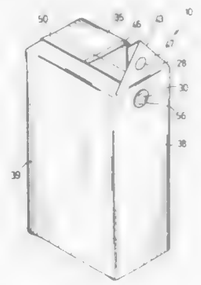
Pi-Lien Hong, 5F-5, No. 245, Pa-Der Road Section 2, Taipei, Taiwan

Filed Mar. 9, 1992, Ser. No. 848,289
Int. Cl.[5] B65D *5/74*
U.S. Cl. 229—125.15 2 Claims

1. A paper package for beverage in the form of a sealed hexahedral package made of a piece of paper material by folding and bonding, in which said hexahedral package having a front panel, a back panel, a left side panel, a right side panel, a top panel, and a bottom panel; said top panel having a first triangular flap and a second triangular flap formed by folding of a part of said top panel and a side panel, each extended from a side of said top panel, and adhered to a side panel; said bottom panel having a third triangular flap and a fourth triangular flap formed by folding of a part of said bottom panel and a side panel, each extended from a side of said bottom panel, and adhered to a side panel; and each of the said triangular flaps consisting of an inner wall and an outer layer covering said inner wall; and characterized by

at least one of the triangular flap having a pour spout opened at the inner wall; and

a protuberance made of soft material slightly greater than the size of said pour spout, adhered on a side panel at a position corresponding to the pour spout to block and seal



said pour spout; and said protuberance remaining adhered to said side panel after the flap with said pour spout has been pulled upwards.

5,150,834

NEWSPAPER DELIVERY BOX

Michael J. Bourke, 16 First Avenue, Ottawa, Ontario, Canada K1S 2G2

Filed Feb. 8, 1991, Ser. No. 652,598
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—1 C 13 Claims

1. A newspaper delivery box comprising:

(a) a lower body portion having a bottom and sides:

(b) an upper body portion hinged to the lower portion having a one-way newspaper-receiving slot therein communicating with the interior of the lower portion, said slot being adapted to allow a newspaper to be inserted into the lower portion but substantially preventing removal thereof;

(c) a lock adapted to lock together the upper and lower portions said lock comprising a hook extending from said upper portion engagable with an aperture in the lower portion, said hook being biased towards the aperture; and

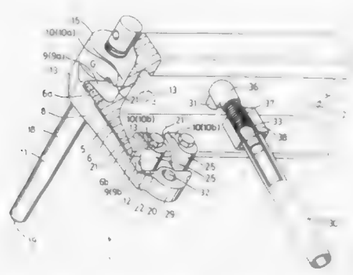
(d) a tether attached to said delivery box and adapted to pass around and be firmly secured behind a closed door, said tether slidably extending within a channel in said box, said channel communicating with said lock aperture, and said tether including lock release means comprising a projection extending from the tether and adapted to engage the hook and urge the hook away from the aperture when the tether is passed through the channel.

5,150,835

RAIL SUPPORT ADJUSTING AND FASTENING DEVICE

Akio Yamamoto, 1602-banchi, Kyoden, Fukui-shi, Fukui-ken, Japan

Filed Oct. 10, 1990, Ser. No. 594,131
Int. Cl.[5] E01B *9/66*
U.S. Cl. 238—50 3 Claims



1. A rail support adjusting and fastening device for parallel rails of a directly fastened track which is used to adjust a gage and tilting of the rails prior to laying the track, comprising:

a rail support plate (8) for supporting an under surface (6) of a bottom portion (5) of the rail in a state of a spot support, said rail support plate having at an outer side portion thereof a threaded portion (15) where a screw hole (16) is formed to extend vertically,

a supporting bolt (11) having an upper threaded portion (17) at an upper portion thereof to be threaded with the screw hole (16) and a lower portion of said bolt is formed to be tapered to gradually become more slender downwardly and constructed such that the height of the rail support plate (8) can be adjusted by rotation of the supporting bolt (11),

two spot supporting portions (7) projected from upper outside portions and one spot supporting portion projecting from an upper inside portion of the rail support plate (8) to form points of a triangle so as to support the under surface (6) of the rail bottom (5) at three points on the under surface (6) of the rail bottom, each of said spot supporting portions (7) being provided with rail spot support surfaces so as to form a plane which is tilted to fit a tilting of the rail,

inside and outside spot pressing portions (10) provided with the rail support plate (8) to press the inside portion and the outside portion of the upper surface (9) of the rail bottom portion (5) in the state of spot supporting, said inside and outside spot pressing portions being made rigidly so as not to deform at a time of being pressed by said pressing portions, said inside and outside spot pressing portions being further constructed to press the inside portion and outside portion, respectively, of the upper surface (9) of the rail bottom portion (5) at an intermediate portion between the two spot supporting portions (7) adjacent in a longitudinal direction of the rail and at both side portions of the one spot supporting portion opposite to said two spot supporting portions (7) respectively, such that all three spot supporting portions contact the under surface of the rail bottom portion,

said spot pressing portions (10) for pressing the upper surface (9) of the rail bottom portion (5) at the intermediate portion between the two spot supporting portions adjacent to one another being provided with the rail support plate (8) integrally, and said inside and outside spot pressing portions (10) for pressing the upper surface (9) of the rail bottom portion (5) at both side portions of the one spot supporting portion being constructed to be a movable pressing section,

said movable pressing section including a pair of pressing bolts (27) and pressing members (25),

said each pressing member (25) being provided with a base portion (20) of a semicircle configuration which is engaged with an engaging step (22) formed at an upper surface portion of the inside of the rail support plate (8), and provided with a forward end under surface portion (21) to be in contact with the upper surface (9) of the rail bottom portion, and also provided with an elongated vertically extending bolt hole (23) adapted to receive a pressing bolt therethrough, said rail support plate including pressing bolt screw holes, and

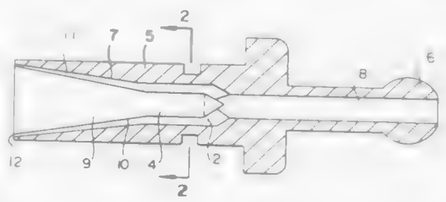
said each pressing bolt (27) being constructed to be screwed with each of said pressing bolt screw holes (26) of the rail support plate (8) through each of the elongated bolt holes (23), so that each of the forward ends under surface portions (21) of the pressing members (25) press the upper surface (9) of the rail bottom portion (5) onto the spot pressing portions.

5,150,836

METHOD OF FUEL INJECTION

Michael L. McKay, Willeton; Ian R. Thompson, Duncraig, and Ralph T. Sarich, Karrinyup, all of Australia, assignors to Orbital Engine Company Proprietary Limited, Western Australia, Australia

Continuation of Ser. No. 526,734, May 22, 1990, abandoned, which is a division of Ser. No. 377,742, Jul. 10, 1989, Pat. No. 4,945,886, which is a continuation of Ser. No. 16,115, Feb. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 694,311, Jan. 24, 1985, abandoned, and a continuation-in-part of Ser. No. 908,963, Sep. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 454,657, Dec. 30, 1982, abandoned. This application Jun. 10, 1991, Ser. No. 711,726
Claims priority, application Australia, Dec. 31, 1981, PF2124; Aug. 31, 1984, PG6875
Int. Cl.[5] F02M *61/02*
U.S. Cl. 239—5 17 Claims



1. A method of delivering liquid fuel to an internal combustion engine comprising the steps of:

delivering individual metered quantities of liquid fuel into a conduit communicating with a fixed size constantly open nozzle;

admitting an individual quantity of gas to said conduit immediately upstream of each metered quantity of fuel at a pressure and for a period sufficient to propel the preceding metered quantity of fuel to and discharge the fuel through said nozzle to the engine as an independent fuel pulse, said quantity of fuel in said fuel pulse being independent of the period of admission of gas.

5,150,837

BACKPACK SPRAYING EQUIPMENT

Alberto Ferrari, Gotra di Albareto (Parma), Italy 43051

Filed Jun. 22, 1990, Ser. No. 542,935
Claims priority, application Italy, Jul. 28, 1989, 3570 A/89
Int. Cl.[5] B05B *9/08*
U.S. Cl. 239—153 14 Claims

1. Backpack spraying equipment, comprising.

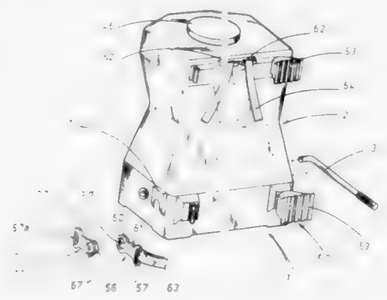
a base;

a tank for holding a liquid to be sprayed, said tank, affording a filler opening uppermost and a first and a second hole at the bottom, said tank being mounted onto and secured to

the base by means that are separable and do not penetrate the tank itself;

a pump system including two piston pumps of identical embodiment associated entirely with the base, the inlet of at least one said pump being connected with the interior of the tank by way of the first bottom hole, and said pumps being mounted for reciprocation in phase opposition;

a single manual control articulated with the base for reciprocating said pumps;



a compression chamber, insertable into the tank by way of the filler opening, and sealably accommodated at bottom by the second bottom hole of the tank, and sealably and removably secured to the base, and connected both to the outlet of the pumping system for receiving output of said pumps in operation and to the tank;

a plurality of elements for seating s to accommodate moving parts of the pumping system, a id for connecting the tank, pumping system and compression chamber, said plurality of elements being embodied together with the base as a single unit.

5,150,839
LAWN SPRINKLER SYSTEM
Donel L. Roberts, 1301 Slaughter La., Austin, Tex. 78748
Filed Apr. 13, 1990, Ser. No. 509,324
Int. Cl.[5] B05B *15/06*; A01G *25 00*; F16L *11/10, 55/02*
U.S. Cl. 239—201 7 Claims

1. In a lawn sprinkler system having a water supply line, a sprinkler head, and a length of flexible line connecting said sprinkler head to said water supply line, the improvement comprising:

said flexible line being a preformed flexible line having a first and a second end section and central section;

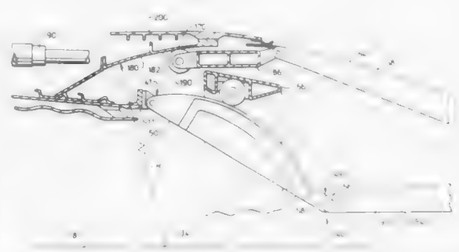
said first end section and said central section lying in a first plane and defining a first 90° bend in said preformed flexible line;

said second end section and said central section lying in a second plane and defining a second 90° bend in said preformed flexible line; and

said first and said second planes being generally orthogonal to each other,

whereby when said first end section of said preformed flexible line is coupled to said supply line, said central section will lie adjacent to and proximate said supply line and said second end section will be positioned for coupling to said sprinkler head.

5,150,839
NOZZLE LOAD MANAGEMENT
David V. Reedy, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Mar. 14, 1991, Ser. No. 669,242
Int. Cl.[5] B64C *15/02*
U.S. Cl. 239—265.41 9 Claims



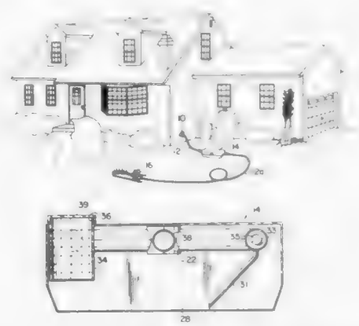
1. A nozzle flap load path means for an aircraft gas turbine engine having an engine casing and a vectoring nozzle including a plurality of vectorable nozzle flaps, said nozzle flap load path means comprising:

a track mounted to a relatively fixed portion of the engine casing,

a track follower engaging said track and,

a vectoring ring connected to the vectorable nozzle flaps and pivotably connected directly to said track follower and operable to transfer thrust loads from the nozzle flaps to the engine casing.

5,150,840
LAWN CHEMICAL DISPENSER
John M. Grynkiewicz, 68 Fox Hill Ln., Enfield, Conn. 06082
Filed Oct. 8, 1991, Ser. No. 772,923
Int. Cl.[5] B05B *7/26*
U.S. Cl. 239—305 6 Claims



1. A lawn chemical dispenser for use with a garden hose and sprinkler, said dispenser comprising:

a) a housing having hose fittings at one and an opposite end portion thereof, said fittings being adapted to receive conventional garden hose fittings, said housing defining a single chamber,

b) a three way valve provided in the one end portion of said housing and having at least three positions,

c) said housing defining at least three passageways, each passageway corresponding with one of said at least three valve positions,

d) two of said at least three passageways communicating with said chamber, a suction tube provide in one of said two passageways for communication between said one of said two passageways and said chamber and a container for dry chemicals interposed in the path of the other of said two passageways,

e) said chamber having an access port for receiving the chemical to be applied to the lawn,

f) of said at least three passageways a third passageway extending in uninterrupted fashion from said valve to said opposite end portion of said housing.

5,150,841
LIQUID SPRAY DISPENSER
Scott A. Silvenis, Midland, Mich.; Paul B. Monaghan, Lexington; Arthur A. Massucco, Natick, both of Mass.; Richard H. Spencer, Winchester, and William R. Gagné, Boston, both of Mass., assignors to DowBrands Inc., Indianapolis, Ind.
Continuation of Ser. No. 7,405,246, Sep. 11, 1989, abandoned.
This application May 23, 1991, Ser. No. 707,256
Int. Cl.[5] B05B *9/04*
U.S. Cl. 239—332 3 Claims

1. A process of dispensing a spray or stream of a liquid cleaning product comprising the steps of:

providing a hand held dispenser comprising;

a container for a liquid,

a dispensing nozzle assembly, said nozzle assembly including an outlet,

a screw-shaped structure within said nozzle assembly to impart a swirl motion to a liquid passing therethrough,

a cyclical pump for pumping said liquid from said container to said nozzle assembly, said pump being in communication with an electrical motor for driving said pump,

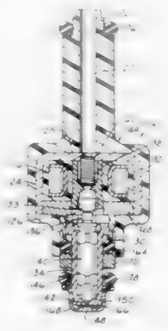
a flexible tube in liquid flow communication between said pump and said nozzle assembly for conducting liquid therethrough and for absorbing energy from said liquid as it is pumped and subsequently releasing said energy to said liquid,

cyclically pumping said liquid from said container to said nozzle assembly at a pressure differential of less than 45 pounds per square inch gauge, said liquid passing through said flexible tube during one part of said cycle imparting energy to said flexible tube and during another part of said cycle receiving energy from said flexible tube;

said liquid contacting said screw-shaped structure within said nozzle assembly with sufficient energy to create a turbulent flow adjacent said screw-shaped structure to pass through said outlet with said swirl motion imparted thereto;

said flow of liquid passing through said outlet having a moderated cyclical velocity due to the absorption and release of energy by said flexible tube.

5,150,842
MOLDED FUEL INJECTOR AND METHOD FOR PRODUCING
John C. Hickey, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Nov. 19, 1990, Ser. No. 615,835
Int. Cl.[5] B05B *1/30*
U.S. Cl. 239—585.4 9 Claims



1. An electromagnetic fuel injector, comprising:

a magnetic core comprised of a magnetic permeable material having an axial cavity and axial opening;

an electric oil assembly adapted for positioning within said magnetic core cavity and for coupling magnetic energy to said magnetic core;

molded means comprised of injection molded plastic for permanently positioning said magnetic core around said coil assembly and for forming a fuel passageway through said coil assembly and through said magnetic core opening, said molded means also hermetically sealing said coil assembly from said fuel passageway;

an armature comprised of a magnetic permeable material coupled to said fuel passageway and magnetically responsive to said magnetic cores; and

valve means communicating with said fuel passageway and mechanically responsive to said armature for controlling fuel flow in response to application of electrical energy to said assembly.

5,150,843
APPARATUS AND METHOD FOR PROCESSING SOLID WASTE
Charles R. Miller, Houston; Haskell B. Berry, Jr., Channelview, and Tod S. Johnson, Clear Lake Shores, all of Tex., assignors to Premier Medical Technology, Inc., Houston, Tex.
Filed Jan. 9, 1991, Ser. No. 639,214
Int. Cl.[5] B02C *18/22*
U.S. Cl. 241—27 19 Claims

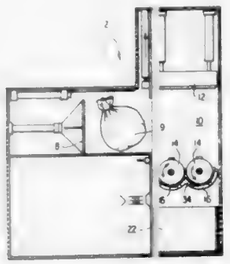
1. A method of grinding waste material comprising:

passing the waste material into a chamber;

grinding the waste material between two cutting heads rotating in opposite directions, said cutting heads compris-

ing alternating cutting blades and spacers, each of said cutting heads interdigitating closely with the other,

grinding the waster material between said alternating cutting blades and spacers and alternating grooves sized to interdigitate closely with said cutting blades and spacers formed in a pair of curved doors located below said interdigitating cutting heads for releasing the ground waste material,



circulating all of said waste material being ground between end surfaces of said cutting blades and spacers of said two interdigitating cutting heads spaced away from each other and from cooperating surfaces of said grooves in said pair of curved doors only sufficiently to allow said waste material to circulate between said cutting heads and said grooves in said doors;

opening the curved doors;

removing the waste material from said chamber through the opened doors.

5,150,844

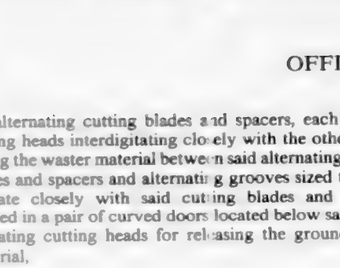
APPARATUS FOR SIZE REDUCTION OF HEAVY SOLID WASTE MATERIALS

R. Thomas McKie, Boise, Id., assignor to Shanley and Baker, Washington, D.C.

Continuation-in-part of Ser. No. 927,313, Nov. 4, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,349

Int. Cl.[5] B02C *12/284*

U.S. Cl. 241—73 **15 Claims**



1. Rotary-type apparatus for carrying out a plurality of size reduction actions, including impact fragmentation, crushing, cutting and shearing of heavy feedstock, comprising

(A) housing means defining

a feedstock inlet,

an outlet for finished product, and

a working chamber,

(B) unidirectional rotation rotor means,

such rotor means being mounted for solely unidirectional rotation within such working chamber for providing such plurality of size reduction actions on feedstock during each such unidirectional rotation of such rotor means,

such rotor means including

a drum presenting an external surface symmetrically disposed with relation to a centrally-located axis of rotation for such rotor means, and

impact-cutter bar means in a fixed positional relationship projecting from such drum external surface so as to maintain a fixed uniform diameter cylindrical-configuration peripheral path for such impact-cutter bar means during such rotation of such rotor means, and

(C) a plurality of work surface within such working chamber, including:

(i) an extended-area substantially-planar work surface presented by anvil means which can be selectively positioned in angled relationship with the peripheral path of rotation of such impact-cutter bear means to define a confined space between such anvil means work surface, such drum exterior surface and such peripheral path of such fixed impact-cutter bar means during rotation of such rotor means,

such anvil means work surface and rotor means coating to provide

size reduction by impact fragmentation of frangible feedstock impelled by such rotor means against such anvil means work surface, and

size reduction by a cutting and/or crushing action of other feedstock to form intermediate work product by coaction in such confined space between such anvil means work surface and such drum external surface and/or the impact-cutter bar means of the rotor means as the peripheral circumferential path of rotation defined by rotation of such drum and impact-cutter bar means approaches and passes in contiguous relationship to such anvil means work surface; and

(ii) an apertured grate surface presented by grate means for providing additional size-reduction by coaction between such rotor means and grate means,

such grate means circumscribing a major portion of such peripheral circumferential path of rotation of such impact-cutter bar means,

such portion circumscribed by such grate means being located subsequent to such anvil means in such direction of rotation of such impact-cutter bar means in passing contiguous to such anvil means work surface so as to define a zone which is between at least a portion of the drum surface and such grate means for carrying out such additional size reduction of intermediate product,

such grate means working surface confronting the interior of such working chamber with spacing between such circumscribing portion of the grate means working surface and such peripheral path of the impact-cutter bar means being controllably fixed during size reduction operation of the rotary-type apparatus,

such grate means presenting apertures which extend through such grate means from such working chamber to such outlet for finished product and which are positioned such that rotation of such rotor means drives intermediate product into such grate apertures,

such apertures having a cross-sectional configuration facilitating a shearing action along such peripheral circumferential path of rotation of such impact-cutter bar means,

such shearing action taking place on intermediate product being held by such grate apertures and protruding into such working chamber by passage of such impact-cutter bar means contiguous to such grate means working surface with such shearing action causing release of sheared product enabling passage through such apertures toward such outlet for discharge of finished product.

5,150,845

DEVICE AND METHOD FOR AUTOMATICALLY CONNECTING THE YARN TO THE TUBE OF A WINDING MACHINE

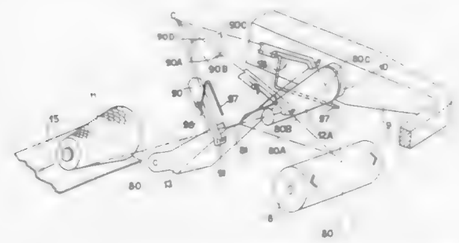
Luigi Colli, and Roberto Badiali, both of Pordenone, Italy, assignors to Savio S.p.A., Pordenone, Italy

Continuation-in-part of Ser. No. 483,320, Feb. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 155,211, Feb. 12, 1988, abandoned. This application Sep. 23, 1991, Ser. No. 764,980

Claims priority, application Italy, Feb. 27, 1987, 19509 A/87

Int. Cl.[5] B65H *67/04*

U.S. Cl. 242—35.5 A **6 Claims**



1. A device for automatically connecting yarn from a bobbin to be discharged, wherein the bobbin is held between a fixed holding center and a mobile holding center on bobbin support arms of a winding machine, to a new tube of said winding machine, and wherein the device has an arm to which members are attached which are able to rotate in two planes which are substantially mutually orthogonal, wherein the device comprises:

a member to seize the yarn connected to said arm of the device to seize the yarn from the bobbin to be discharged; and

a member for positioning the yarn connected to said arm of the device for positioning the yarn onto the new tube;

a yarn cutting member connected to said arm of the device to separate the yarn wound to the bobbin to be discharged from the yarn to be connected to the new tube; and

a tube rotating member connected to said arm of the device to wind initial turns of the yarn on the new tube including a motor driven belt slidable between two pulleys which are supportable by an arm able to descend in a plane orthogonal to the tube axis to bring said belt into engagement to rotate said tube.

5,150,846

UNIVERSAL DEVICE FOR WINDING CORDS, CABLES AND SUCHLIKE

Henri Giust, Trezzano Sul Naviglio, and Ennio Cippelletti, Roma, both of Italy, assignors to Somfy, Cluses, France

Filed Jul. 5, 1990, Ser. No. 548,095

Claims priority, application Italy, Jul. 17, 1989, 21444/89[U]

Int. Cl.[5] B65H *75/24, 75/28, 75/02*

U.S. Cl. 242—54 R **4 Claims**

1. A winding device which can be used in a variety of installations for winding a plurality of traction elements, said traction elements including cords or cables, comprising:

a substantially cylindrical box, said box having a longitudinal lengthwise slot,

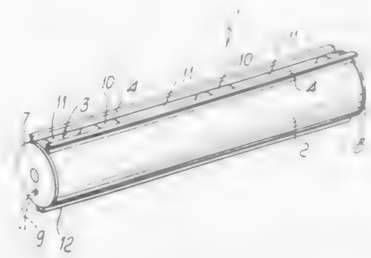
a winding drum within said box onto which said traction elements can be repeatedly wound and unwound, said winding drum being rotatable within said box, the difference between the inner diameter of said box and the outer diameter of said drum is substantially equal to twice the diameter of said traction element to force each said traction element to wind itself onto said drum in adjacent coils without said coils lying on top of each other;

said traction elements being able to wind themselves around said drum by passing through said slot,

a motor to rotate said winding drum,

a pair of end supports closing the ends of said box and supporting said winding drum for rotation,

a plurality of removably adjustable lock and associated guide means within said box and slidable on said drum to guide and lock said traction elements on said drum, each of said lock and guide means consists of a ring and an



associated lock wherein said ring can be releasably locked onto said drum in any desired position by its associated lock and is able to receive and lock the end of a traction element, the outer diameter of said ring being substantially equal to the inner diameter of said box,

whereby the positions of said lock and guide means adjustably determine the number and length of said traction elements that can be accommodated for each installation of the winding device.

5,150,847

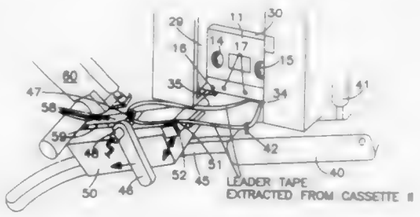
CASSETTE LOADER WITH LEADER TAPE EXTRACTION AND TRANSFER, AND METHOD

Robert I. Farrow, and Drey Johnson, both of Burlington, N.C., assignors to Concept Design, Graham, N.C.

Filed Nov. 6, 1990, Ser. No. 609,589

Int. Cl.[5] B65H *23/04*

U.S. Cl. 242—56 R **11 Claims**



1. A cassette loader for loading a length of magnetic tape into a cassette having a relatively short length of leader tape pre-loaded into the cassette and attached by opposite ends to respective first and second cassette hubs, said cassette loader including transfer means for transferring a length of leader tape extracted from the cassette at a leader tape extracting position on the loader to a splicing block on the loader for splicing to a length of magnetic tape, said transfer means comprising:

(a) a transfer arm mounted for movement on said cassette loader;

(b) leader tape guide means carried by said transfer arm for holding an extracted loop of leader tape;

(c) movement means for moving said transfer arm in an arc between the leader tape extracting position at one side of the splicing block and a leader tape delivery position on the loader being at a point past the opposite side of the splicing block remote from the leader tape extracting

position to deliver the leader tape to the splicing block for splicing, and returning the transfer arm to the leader tape extracting position;

(d) wherein said splicing block includes a planar splicing surface for supporting the tape during splicing, and wherein said planar splicing surface defines a plane, an extension of which plane is:

(i) above the leader tape guide means of the transfer arm when the transfer arm is at the leader tape extracting position and when the transfer arm is at the leader tape delivery position; and

(ii) below the leader tape guide means of the transfer arm when the transfer arm is moving over the splicing block with the loop of leader tape to cause the loop of tape to be wrapped over the splicing block and thereby securely placed in contact with the splicing surface along the length of the splicing block as the leader tape is carried from the leader tape extracting position on the loader to the leader tape delivery position on the loader.

5,150,848

RE-REELING MACHINE WORKING AT CONSTANT SPEED AND RELATED CUTTING DEVICE

Alberto Consani, Viareggio, Italy, assignor to Alberto Consani S.p.A., Borgo A. Mazzano, Italy

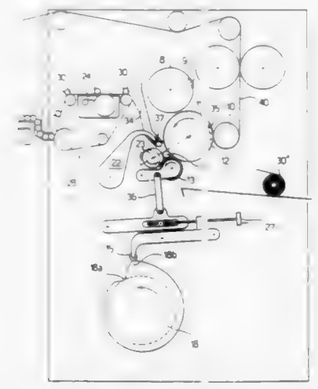
PCT No. PCT/IT89/00066, § 371 Date Feb. 4, 1991, § 102(e) Date Feb. 4, 1991, PCT Pub. No. WO90/04561, PCT Pub. Date May 3, 1990

PCT Filed Oct. 12, 1989, Ser. No. 613,679

Claims priority, application Italy, Oct. 21, 1988, 22390 A/88

Int. Cl.[5] B65H *18/10, 19/26*

U.S. Cl. 242—56 R **6 Claims**



1. A re-reeling machine for re-reeling sheet material on a core comprising:

a plurality of rollers suitable for making a sheet material advance at a constant speed;

said plurality of rollers including

a conveyor roller on which said sheet material is partially wound,

a winding roller, said winding roller being movable to accommodate the increasing diameter of the core as the sheet material is wound thereon, and

a transfer roller which cooperates with said conveyor roller and said winding roller during the winding of the core, said transfer roller being disposed upstream of said winding roller and displaceable with respect to said conveyor roller to allow insertion of the core in a space formed between said rollers and

means for inserting successive cores in the space formed between said rollers;

wherein said conveyor roller and said winding roller rotate at a first constant peripheral speed equal to an advancing speed of the sheet material, and said transfer roller rotates at a second constant peripheral speed which is lower than said first constant peripheral speed so as to facilitate introduction of a successive core in the space formed between said rollers.

5,150,849

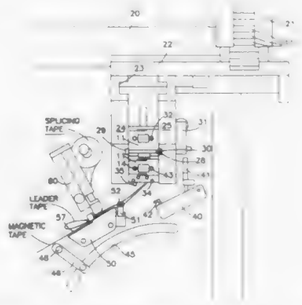
CASSETTE LOADER WITH IMPROVED LEADER TAPE EXTRACTION AND METHOD

Robert I. Farrow, Burlington; Paul DeMint, Snow Camp; Drey Johnson, Elon College; Robert Gaude, and Ray O. McNeill, both of Burlington, all of N.C., assignors to Concept Design, Graham, N.C.

Filed Nov. 6, 1990, Ser. No. 609,752

Int. Cl.[5] B65H *19/30*

U.S. Cl. 242—56 R **4 Claims**



1. A cassette loader for loading a length of magnetic tape into a cassette having a relatively short of leader tape preloaded into the cassette and attached by opposite ends to respective first and second cassette hubs, said cassette loader comprising:

(a) a leader equalization position;

(b) leader type equalization means for winding the leader tape onto one of the cassette hubs while the cassette is in the leader tape equalization position;

(c) a leader tape extraction position for holding a first cassette;

(d) leader tape extraction means for extracting the leader tape from the first cassette in preparation for splicing the leader tape to a length of magnetic tape;

(e) a cassette loading position spaced-apart from said leader tape extraction position for loading a length of magnetic tape into a second cassette the leader tape of which has previously been spliced to the magnetic tape in said leader tape extraction position, wherein said leader tape extraction position is horizontally spaced apart from said cassette loading position;

(f) cassette loading means for loading a length of magnetic tape into the second cassette at the cassette loading position simultaneously with the operation of the leader tape extraction means on the first cassette in the leader tape extraction position;

(g) transfer means for transferring successive cassettes from said leader tape extraction position in said cassette loading position; and

(h) ejection means for ejecting cassettes loaded with magnetic tape from the cassette loading position to permit loading of another cassette for loading.

5,150,850

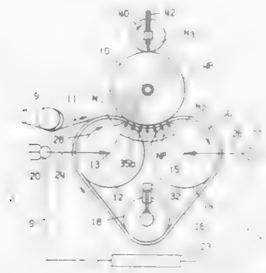
METHOD FOR WINDING A TRAVELING WEB ON A BELTED TWO DRUM WOUND WEB ROLL WINDER

Richard J. Adams, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 10, 1991, Ser. No. 698,034

Int. Cl.[5] B65H *18/22, 20/06*

U.S. Cl. 242—66 **4 Claims**



1. A method for winding a traveling web into a wound web roll supported on a two-drum type of winder wherein two winder drums are disposed on either side of the wound web roll, comprising the steps:

1) mounting a looped belt about the two winder drums to provide a wound web roll receiving and supporting span between the winder drums;

2) controlling the belt tension in the span by utilizing a control means for selectively producing graduated transitions between conditions of full tension, intermediate tension and tension relief of the looped belt about the winder drums;

3) actuating the control means to relieve the belt tension to provide a core-receiving depression in the belt in a notch between the winder drums;

4) depositing a core in the core-receiving depression and maintaining the core in nipping engagement with both winder drums through the belt;

5) bringing the end of the traveling web into wrapping engagement with the core to initiate the winding of the web into a wound web roll;

6) driving the winder drums to continue the process of winding the web into a wound web roll;

7) bringing a rider roll into nipping engagement with the wound web roll substantially simultaneously with the beginning of the driving of the winder drums.

5,150,851

CLUTCH FOR TAPE DISPENSER

Cristoph Manusch, Hemmingen, and Hans-Jurgen Harp, Hanover, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 431,608, Nov. 3, 1989, abandoned. This application Feb. 2, 1991, Ser. No. 653,853

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 8813861[U]

Int. Cl.[5] B65H *75/34*

U.S. Cl. 242—68.1 **16 Claims**

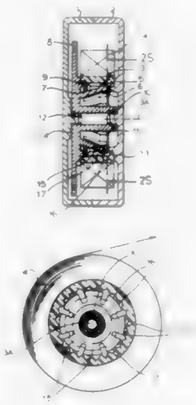
1. A tape dispenser comprising:

a housing;

a reel core rotatable in the housing about an axis and having an inner periphery formed with an annular array of inwardly directed core teeth;

a drive wheel rotatable in the housing about the axis;

a plurality of elastically deformable and axially elongated spring tongues formed unitarily with each other and each extending at an acute angle to the axis from a respective inner end fixed to the drive wheel to a respective outer end lying within the reel core adjacent the inner periphery thereof and offset axially from the respective inner end, each inner end being axially offset and radially inwardly offset from the respective outer end, each outer end being integrally formed with at least one tongue tooth engaging between the core teeth; and



a supply of tape wound on the reel core, whereby when the tape is payed out or wound up on the reel core it rotates relative to the drive wheel and the core teeth move angularly relative to the tongue teeth with elastic inward deflection of these tongue teeth.

5,150,852

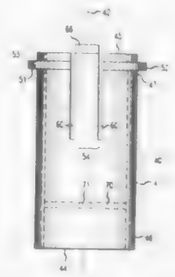
PAYOUT TUBE WITH IMPROVED LOCKING MEANS

Rodney J. Hunt, Omaha, Nebr., and Ruloff F. Kip, Jr., New Castle, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 21, 1991, Ser. No. 796,564

Int. Cl.[5] B65H *57/12, 57/18, 49/08*

U.S. Cl. 242—157 R **13 Claims**



1. A payout tube for a cable disposed in a coil in a container having an outlet hole for such tube in a wall of said container, said tube comprising: a tubular sleeve having an axis and having an axial passage therein with rear and front openings at entrance and exit ends of said sleeve for said cable, said sleeve being adapted in use to be mostly in said container but to have a portion at the exit end extend out through and beyond said hole, flange means radially projecting at said exit end away from the periphery of said sleeve, and a plurality of struts coupled to, and angularly spaced around, said sleeve and extending from rearward of said flange means axially forward to free ends of said struts disposed near to and in axially spaced relation from said flange means, said struts being radially movable between inner positions at which they are passable

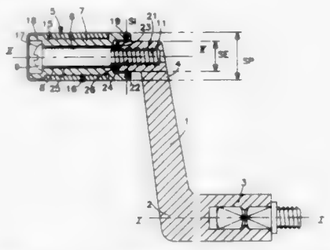
through said hole and outer positions at which said flange means and struts are adapted respectively to bear against opposite sides of portions of said wall adjacent to said hole so as to couple said tube and container.

5,150,853

CRANK-HANDLE FOR A FISHING REEL

Jean Bernard, 134 avenue des Lacs, 74300 Scionzier, and Jean Ruin, En Bud Thyez, 74300 Cluses, both of France

Filed Oct. 3, 1989, Ser. No. 416,518
Claims priority, application France, Oct. 7, 1988, 88 13453
Int. Cl.[5] A01K *89/00*
U.S. Cl. 242—283 **4 Claims**



1. A crank arm for coupling a handle to a main rotational shaft of a fishing reel comprising:
an arm coupling means on one side of a first end of said arm for attaching said arm to said main rotational shaft of the fishing reel;
a projection at the other end of said arm and on a side thereof opposite to said one side;
a handle;
an end bore in said handle, having a side wall and a planar bottom; and
a shoulder formed within said end bore and in a plane on said projection; and
means for mounting said handle on said projection for rotation about an axis perpendicular to said plane for limiting the movement of said handle along said axis perpendicular to said plane toward said arm, said mounting means including resilient means for urging said handle away from said arm.

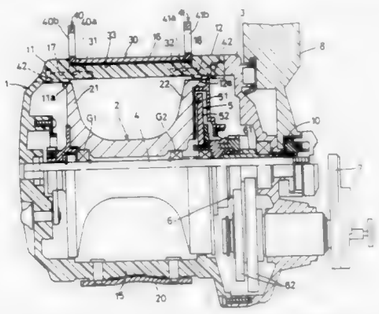
5,150,854

TWO-BEARING REEL PROVIDED WITH ENGAGING MEMBERS FOR SUSPENDER STRAP

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1990, Ser. No. 529,579
Claims priority, application Japan, May 29, 1989, 1-62871[U]
Int. Cl.[5] A01K *89/033*
U.S. Cl. 242—310 **5 Claims**

1. A two-bearing reel comprising:
a reel body (1) formed of a synthetic resin, said reel body (1) including a pair of cylindrical side frames (11, 12) opposed to and spaced from each other, and connecting rods (13, 14, 15, 16) rigidly interconnecting at least upper and lower positions of said side frames (11, 12), said connecting rods comprising an upper connecting rod (16) for rigidly interconnecting said upper positions of said side frames (11, 12), wherein said upper connecting rod (16) has opposite ends, wherein all of said connecting rods (13, 14, 15, 16) are formed of said synthetic resin, and wherein said side frames (11, 12) and said connecting rods (13, 14, 15, 16) are all integrally formed with each other,
a spool (2) rotatably supported between said side frames (11, 12) and including a pair of flanges (11*a*, 12*a*) opposed to and slightly spaced from inside walls of said side frames (11, 12),
a pair of engaging members (40, 41) for engaging a suspender strap, said engaging members (40, 41) being arranged at upper positions of said reel body (1) and spaced from each other in a direction in which said side frames (11, 12) are spaced from each other, and
a bridging member (30) formed of a highly rigid material for covering said upper connecting rod (16), for interconnecting the upper positions of said side frames (11, 12) and for reinforcing said engaging members (40, 41) and side



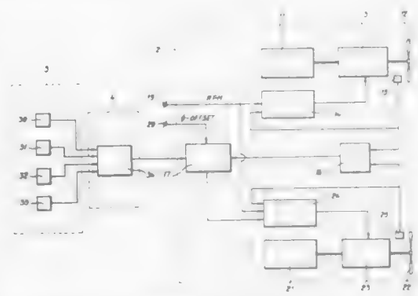
frames (11, 12), said bridging member (30) and upper connecting rod (16) being separate elements of said two-bearing reel, wherein said upper connecting rod (16) has opposite lateral surfaces which extend between said side frames (11, 12), wherein said opposite lateral surfaces have sharp edges, and wherein said bridging member (30) covers said sharp edges of said opposite lateral surfaces of said upper connecting rod (16).

5,150,855

PROPELLER BLADE POSITION CONTROLLER

Dick Kaptein, Alphen A/D Rijn, Netherlands, assignor to Fokker Aircraft B.C., Schiphol, Netherlands

Filed Oct. 19, 1990, Ser. No. 600,445
Claims priority, application United Kingdom, Oct. 20, 1989, 8923643
Int. Cl.[5] B64D *31/12*
U.S. Cl. 244—1 N **5 Claims**



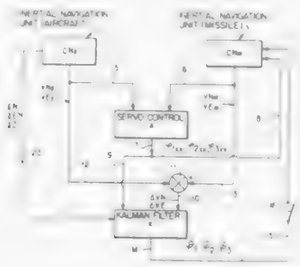
1. A method of reducing vibrations in the cabin of an aircraft driven by a plurality of propellers each having n blades, n being a plural integer, wherein said propellers have a relative phase angle which can be adjusted, the method comprising the steps of:
a) measuring the vibration level at one or more positions within the cabin and generating a vibration level signal corresponding thereto;
b) evaluating an error signal in response to said vibration level signal;
c) optimizing the relative phase angle of the propellers in response to said error signal to a first value at which said measured vibration level is reduced;
d) shifting said propellers relatively through $2\pi/n$ radians to a new relative phase angle where said propellers are substantially in phase and have new relative blade positions;
e) optimizing said new relative phase angle in response to a corresponding vibration level error signal to a second value at which said measured vibration level is reduced; and
f) selecting between said first and second values for improved vibration reduction in the cabin.

5,150,856

SYSTEM FOR ALIGNING THE INERTIAL UNIT OF A CARRIED VEHICLE ON THAT OF A CARRIER VEHICLE

Pierre Gaide, Paris, France, assignor to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 29, 1991, Ser. No. 783,903
Claims priority, application France, Oct. 29, 1990, 90 13386
Int. Cl.[5] F41G *7/36*
U.S. Cl. 244—3.2 **7 Claims**



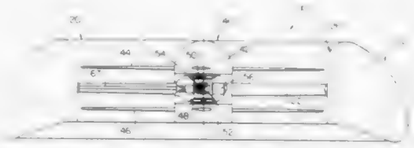
1. A system comprising:
a first moving vehicle provided with a first inertial navigation unit in operation and referenced on a first intrinsic reference axis system tied to a system of terrestrial axes;
a second vehicle provided with a second inertial navigation unit that is to be put into operation, said unit being referenced to a second intrinsic reference axis system similar to said first intrinsic reference axis system, said second vehicle being carried by said first vehicle and being stationary on average relative to said first vehicle;
a closed loop servo-control circuit enabling said second inertial navigation unit to be provided at the instant it is put into operation with angle data delivered by said first inertial navigation unit relative to said first system of reference axes, said servo-control circuit then delivering rotation commands that are applied to said second inertial navigation unit for the purpose of refining its angular initialization;
subtracter means receiving velocity or acceleration data from said first and second inertial navigation units each of which units delivers said data parallel to two non-vertical axes in the corresponding ones of said first and second calculation reference axis systems, said subtracter means delivering velocity or acceleration difference data parallel to the two corresponding non-vertical axes of said first calculation reference axis system; and
a Kalman filter simultaneously receiving said rotation commands from said servo-control circuit and said velocity or acceleration difference data, and calculating estimates of the angle offsets of the axes of said second calculation reference system as corrected by the preceding servo-control relative to the corresponding axes of said first calculation reference axis system, said Kalman filter applying said estimates to said second inertial navigation unit after the servo-control performed by said servo-control circuit has finished and after the Kalman filter has itself converged.

5,150,857

SHROUD GEOMETRY FOR UNMANNED AERIAL VEHICLES

Robert C. Moffitt, Seymour, and Stephen J. Owen, Cheshire, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 13, 1991, Ser. No. 744,560
Int. Cl.[5] B64C *39/06*
U.S. Cl. 244—12.2 **7 Claims**



1. An unmanned aerial vehicle, comprising:
a toroidal fuselage having a coaxial fuselage axis, said toroidal fuselage defining an inner duct flow channel; and
rotor assembly means for providing collective and cyclic pitch to control flight operations of said unmanned aerial vehicle, said rotor assembly means including a pair of multi-bladed, counter-rotating rotors coaxially mounted in said inner duct flow channel to provide high hover efficiency, said multi-bladed, counter-rotating rotors having an axis of rotation coaxial with said fuselage axis;
said toroidal fuselage having an outer aerodynamic surface optimized to retain said high hover efficiency provided by said pair of multi-bladed, counter-rotating rotors coaxially mounted in said inner duct flow channel, to produce a pressure distribution that provides high lift forces in translational flight, to counteract the undesirable nose-up pitching moment produced by lift generated by said rotor assembly means by reducing lift required from said rotor assembly means in translational flight, and to reduce the need for superimposed cyclic pitch for trimmed translational flight;
said outer aerodynamic surface including a leading edge and a trailing edge defined by the lower edge of said inner duct flow channel wherein said trailing edge lies in a plane above the plane of said leading edge.

5,150,858

JETTISONABLE AERODYNAMIC CONTROL SURFACES

Brian L. Hopwell; Nicholas C. Dale, both of Preston, and Bryan R. A. Burns, deceased, late of Treales, all of United Kingdom by Jean H. Burns, administrator, assignors to British Aerospace Public Limited Company, London, England

Filed Mar. 12, 1990, Ser. No. 491,934
Claims priority, application United Kingdom, Mar. 11, 1989, 8905631
Int. Cl.[5] B64C *39/12*
U.S. Cl. 244—45 A **8 Claims**

1. A flight vehicle including:
main wing means,
aerodynamic control surface means movably connected to said wing means for effecting control in at least the pitch sense of the vehicle,

foreplane means for providing the vehicle with a lift component, and

jettisoning means for jettisoning said foreplanes so as to cancel the lift component provided by said foreplane means

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5,150,859

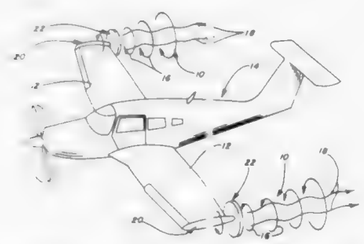
WINGTIP TURBINE

Thomas F. Ransick, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 944,960, Dec. 22, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,185

Int. Cl.[5] B64D *41/00*

U.S. Cl. 244—58 **12 Claims**



1. An apparatus for generating power from a trailing vortex induced at the wingtip of an aircraft, comprising:

turbine means mounted on the wingtip, said turbine means including a housing and propeller means disposed in the trailing vortex for extracting a portion of substantially only the rotational energy of the trailing vortex, said propeller means comprising a plurality of propeller blades adjustably oriented to remain generally parallel to the axial component of the vorted velocity of the vortex to utilize substantially only the radial component of the vorted velocity of the vortex to thereby reduce the vortex strength and decrease wing drag; and

means for coupling the wingtip turbine means to a wing de-icing system, and including compressor means located within the housing of the turbine means and coupled to the propeller means disposed in the trailing vortex for operating the wing de-icing system.

5,150,860

AIR VEHICLE LAUNCHING DEVICE

Manley A. Young, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 23, 1991, Ser. No. 690,063

Int. Cl.[5] B64F *1/10*

U.S. Cl. 244—63 **26 Claims**

1. A device for supporting, for taxi and take-off, an air vehicle having a fuselage and a pair of wings extending laterally outwardly from the fuselage, said device comprising:

a center carrier having at least one support for the fuselage and a member that engages a take-off surface and reacts centerline vertical loads to said surface;

a pair of outrigger assemblies spaced laterally from said carrier on opposite sides of said carrier; each said assembly including a wing support and a portion that engages said take-off surface to independently react wing weight vertical loads to said surface; and

a pair of connector structures connecting said assemblies, respectively, to said carrier; said connector structures allowing vertical movement of said outrigger assemblies relative to said carrier, wherein each connector structure includes a main boom, having a laterally inner end connected to said carrier and a laterally outer end and an outer boom pivotally attached to said outer end, to pivot about a horizontal axis between a support position and a release position,

wherein said engaging portion of said outrigger assembly extends downwardly from said main boom, and said wing support is carried by said outer boom.

5,150,861

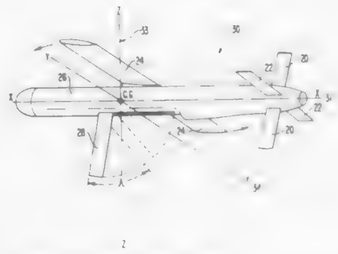
VARIABLE SWEEP SIDE FORCE GENERATOR AND ROLL CONTROL DEVICE

Edwin W. Merkel, Valley Center, and Stephen W. Koontz, Wichita, both of Kans., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 471,139, Jan. 26, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 770,729

Int. Cl.[5] B64C *5/12*

U.S. Cl. 244—91 **15 Claims**



1. An airborne vehicle comprising:

a main body having a roll axis, a yaw axis, and a pitch axis;

means, connected to said main body, for providing lift;

means, connected to said main body, for effecting yaw attitude control about said yaw axis to induce sideslip;

means, pivotably connected to said main body, for effecting roll attitude control about said roll axis to counteract said sideslip, said roll attitude control means comprising at least an airfoil variably positionable between a retracted position and a plurality of extended positions in a geometric plane defined by said yaw and roll axes; and

means responsive to a normal load factor for automatically positioning said airfoil in a position selected to produce a roll effect to counteract undesired roll effects inherent with sideslip.

5,150,862

IN-FLIGHT REVERSER

Jefre H. Cockerham, Lake Worth, and Edward B. Thayer, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 11, 1991, Ser. No. 640,333

Int. Cl.[5] B64C *15/02*

U.S. Cl. 244—110 B **8 Claims**

1. An in-flight reverser for gas turbine engine aircraft comprising:

a fuselage having a longitudinal fuselage axis from forward to rearward;

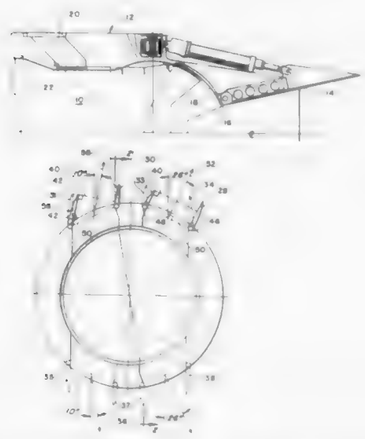
a gas turbine engine exhaust duct within said fuselage;

a closeable throat exhaust nozzle connected to receive gas from said gas turbine engine exhaust duct and to discharge the gas rearwardly;

a plurality of reverser flow passages from said exhaust duct through said fuselage, arranged to direct gas flow with a forward component with respect to the fuselage;

a reverser exhaust valve for selectively fluidly connecting said exhaust duct to said reverser flow passages;

a door set at the outlet of each reverser flow passage with no intervening space between said door set and said reverser flow passage;



each door set comprising a pair of vanes pivotally secured to said fuselage along a pivot axis parallel to said fuselage axis; and

means for controlling said doors to various positions around said pivot axis of each door, keeping each pair of doors parallel to each other, and maintaining the total effective flow area of all of said ports constant.

5,150,863

LAVATORY UNIT FOR A PASSENGER AIRPLANE

Hiroyuki Hozumi, Mitaka, Japan, assignor to Jamco Corporation, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,238

Claims priority, application Japan, Aug. 22, 1990, 2-220409

Int. Cl.[5] B64D *11/00*

U.S. Cl. 244—118.5 **8 Claims**

1. A lavatory unit for a passenger airplane having a front wall facing into a passenger compartment, said front wall being provided with an amenities opening for supply and removal of amenities from the passenger compartment, said amenities opening having a flexible amenities door hingedly mounted to said front wall along one edge of said amenities door adjacent one side of said amenities opening, a rigid rod secured to a middle portion of said amenities door adjacent to an edge thereof opposite to the hinged edge of said amenities door in a manner producing a lengthwise curvature of said door convexly in the direction of the passenger compartment along an unhinged edge of said amenities door, a door latch mounted on said amenities door and having an element thereof cooperating with a portion of the front wall adjacent said latch for securing and releasing said amenities door, whereby pressure exerted on said amenities door adjacent said latch depresses the convexly curved edge of said amenities door enabling said amenities door to be secured by means of the single latch.

5,150,864

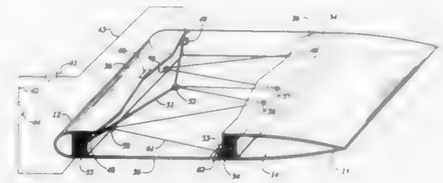
VARIABLE CAMBER CONTROL OF AIRFOIL

Robert L. Roglin, Duluth, and Sathyanaraya Hanagud, Atlanta, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Sep. 20, 1991, Ser. No. 763,163

Int. Cl.[5] B64L *3/44*

U.S. Cl. 244—219 **17 Claims**



1. An apparatus for altering the curvature of a curved surface of a member wherein the member has first and second laterally extending substantially parallel spaced walls and spaced side portions, said apparatus comprising:

an elongated means of a shape memory alloy having first and second ends, said first end being connected to the first wall of the member at one side thereof, and said second end being connected to the first wall of the member at a second side thereof,

tension means connected to the second wall of the member, said tension means including means for engaging said elongated means, and actuating means for causing at least a portion of said second wall to be moved relative to said first wall, said actuating means comprising means for causing said elongated means to revert to its remembered shape to apply tension to said tension means to alter the curvature of the curved surface of the member.

5,150,865

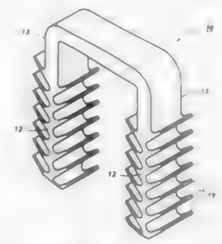
UNIVERSAL FASTENER

Gregory P. Miller, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1989, Ser. No. 451,662

Int. Cl.[5] F16L *3/08*

U.S. Cl. 248—71 **25 Claims**



1. A substantially U-shaped one piece universal fastener for

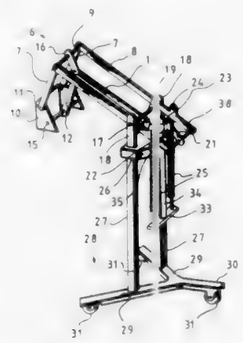
cooperative association with a pair of leg receptor slots in a substrate to fasten an elongated body therebetween, said fastener comprising two separated substantially parallel elongated flexible leg members joined at one end by a tying member, each of said elongated leg members having an interior and an exterior side, and on each of said interior and exterior sides, a plurality of flanged flexible stop members vertically inclined toward said tying member and forming an angle of from about 40° to about 50° with the axis of said leg member.

5,150,866

SUPPORT FOR A HOSE FOR FILLING LIQUID INTO A CONTAINER

Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah, New South Wales, Australia 2229

Filed May 9, 1991, Ser. No. 697,713
Claims priority, application Australia, May 14, 1990, PK0125
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—79 **5 Claims**



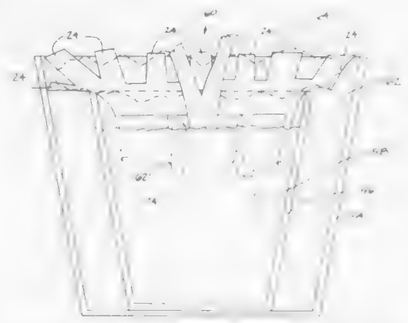
1. A hose support, comprising:
an arm having two arm parts and two ends with each of said arm parts being a parallel link arrangement and said two parallel link arrangements having a shared link so that said two arm parts are interconnected, said two ends of said arm being links of said parallel link arrangements which are both parallel to said shared link;
a hose mount fixed to one of said ends of said arm;
a base assembly fixed to one of said ends of said arm, other than said end affixed to said hose mount, with said parallel link arrangements lying in a common plane and said hose mount being able to travel in a straight line path in the common plane between a first limit of travel and a second limit of travel as said hose mount is being moved relative to said base assembly, said base assembly having a connection point thereon;
an arm extension projected beyond said end of said arm which is affixed to said base assembly with a connection point on said arm extension;
tensioned resilient means for connecting said connection point of said base assembly and said connection point of said arm extension for pivotally moving said arm relative to said base assembly and for biassing said hose mount towards its second limit of travel; and,
prop means having a first end connected to said base assembly and a second end connected to said arm extension releasably for maintaining said hose mount at its first limit of travel.

5,150,867

SUPPORT MEMBER

Joel J. Pesapane, 3954 W. Pine, St. Louis, Mo. 63108

Filed Apr. 6, 1990, Ser. No. 505,915
Int. Cl.[5] A01G *9/02*
U.S. Cl. 248—213.2 **22 Claims**



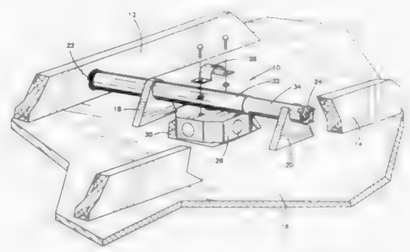
1. A support member for use in association with a plant container containing a plant, the support member for supporting decorative dressings, comprising:
collar means for generally enclosing a plant within a container, the collar means having opposing end portions, the collar means formed of a generally pliant material and in use contorted to bring the opposing end portions into a generally proximate relationship and during storage is generally planar;
extensions from the collar means adapted for insertion into an amount of soil contained in a soil receiving portion of the container; and
projections from the collar means adaptable for supporting a quantity of a dressing material and maintaining the dressing material substantially separate from the plant and associated containers.

5,150,868

EXTENSIBLE INTERJOIST HANGER SUPPORT ASSEMBLY

Milton E. Kaden, 446 Audrey Dr., Richmond Heights, Ohio 44143

Filed Apr. 23, 1991, Ser. No. 690,811
Int. Cl.[5] H02G *3/08*
U.S. Cl. 248—343 **10 Claims**



1. An extensible interjoist hanger support assembly for spanning between a pair of spaced-apart joists having opposing surfaces, comprising:
first and second telescopically extensible members movable in opposing axial directions between a fully collapsed length and a fully extended length, said members having cooperative means normally in threaded engagement with one another such that rotation of either of said members relative to the other results in axial movement between said fully collapsed length and said fully extended length;
each said member having a free end carrying joist-engaging means for engaging one of said opposing surfaces of a pair of said joists; and
said cooperative means including quick release means for releasing said members from said threaded engagement while permitting quick slidable axial movement of said members relative to each other in response to axially applied forces in opposing directions to cause said members to move toward said fully extended length while permitting only rotational threaded movement to achieve movement in the opposite axial direction toward said collapsed length.

5,150,869

MULTI-FUNCTIONAL COASTER

Murray J. Gould, Gaithersburg; Joshua L. Kohn, Owings Mills, and Matthew O. Kohn, Baltimore, all of Md., assignors to Longacre & White, Arlington, Va.

Filed Nov. 5, 1990, Ser. No. 608,743
Int. Cl.[5] A47G *19/22*
U.S. Cl. 248—346.1 **6 Claims**

1. A coaster for supporting a receptacle, said coaster comprising:
a platform having a periphery and a surface for supporting the base of said receptacle, said platform defining an axial direction substantially perpendicular to said surface and a radial direction substantially perpendicular to said axial direction;
a flange projecting generally radially outwardly from said periphery; and
a skirt projecting generally axially from said periphery, said skirt including a radially outwardly projecting portion along at least part of its length and spaced from said platform, said radially outwardly projecting portion of said skirt is formed on a segment of said skirt by a radially outwardly projecting portion of an insert fast with said skirt,
wherein said flange and said radially outwardly projecting portion of said skirt are together engagable with a cap on a vessel and said cap is removable from said vessel by leverage of said coaster when said flange and said radially outwardly projecting portion are in engagement with said cap.

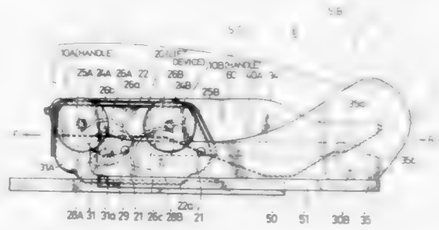
5,150,870

VEHICLE SEAT

Hiroshi Matsuura, Washizu, Japan, assignor to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 588,802
Claims priority, application Japan, Sep. 30, 1989, 1-115177[U]
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—421 **1 Claim**

1. A vehicle seat comprising:
a seat cushion frame for mounting a seat cushion having a front and a rear portion,
a pair of seat base plates arranged parallel to and spaced from each other,
front and rear seat lift handles,
front and rear seat lifting devices actuated by said front and rear seat lift handles, respectively, for adjustably lifting said front and rear portions, respectively, of the seat cushion, and
first and second spaced mounting frames removably affixed to an inside surface of one of said seat base plates for pivotably supporting said front and rear seat lift handles,
a front shaft rotatably supported between said pair of base plates under the front portion of said seat cushion frame,



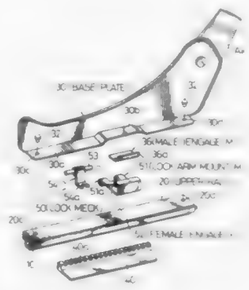
means for rotating said front shaft rotatably supported between said first and second mounting frames,
a rear shaft rotatably supported between said pair of base plates under the rear portion of said seat cushion frame, and
means for rotating said rear shaft rotatably supported between said first and second mounting frames,
whereby the pair of mounting frames can be assembled as one unit and removably mounted between a pair of said seat base plates in such a manner that the front and rear seat lift handles are disposed over and about one of said seat base plates.

5,150,871

VEHICLE SEAT

Yoshitaka Negi, and Hiroshi Matsuura, both of Kosai, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan

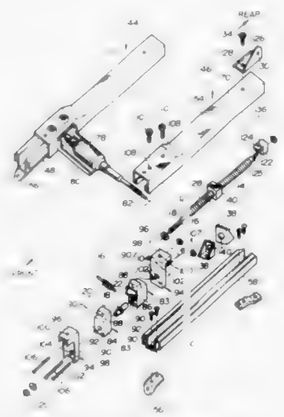
Division of Ser. No. 536,349, Jun. 11, 1990, Pat. No. 5,083,735.
This application Jan. 27, 1992, Ser. No. 826,369
Claims priority, application Japan, Jun. 30, 1989, 1-77320[U]; Jun. 30, 1989, 1-77321[U]
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—429 **3 Claims**



1. A vehicle seat, comprising:
(a) a pair of lower rails arranged on a vehicle body floor at an interval along a vehicle transversal direction;
(b) a pair of upper rails slidably disposed on said lower rails, respectively;

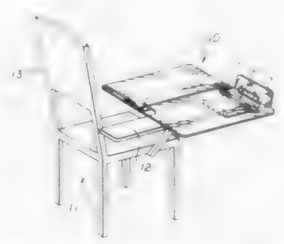
(c) a pair of base plates fixed to said upper rails, respectively on both ends thereof;
(d) engagement means for removably engaging said base plates and said upper rails at roughly middle portions thereof, respectively to prevent inward deformation of each of said base plates from each of said upper rails when a large load is applied to said base plates, a lock mechanism having a lock arm mounting member fixed to said upper rail at roughly middle thereof to lock the seat at any desired position in cooperation with a seat position locating member, said engagement means comprising:
(e) a female engagement portion formed integral with the lock arm mounting member of the lock mechanism; and
(f) a male engagement member fixed to said base plate at the middle thereof and engageable with said female engagement portion of the lock arm mounting member.

5,150,872
POWER SEAT SLIDE DEVICE
Tohru Isomura, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan
Filed May 16, 1991, Ser. No. 700,853
Claims priority, application Japan, May 29, 1990, 2-56053[U]
Int. Cl.[5] B60N */08*
U.S. Cl. 248—429 **13 Claims**



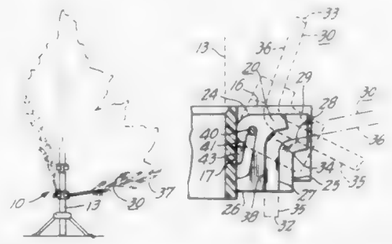
1. A power seat slide device comprising:
a stationary rail;
a movable rail axially slidably engaged with said stationary rail, said movable rail and said stationary rail being assembled to define therebetween an elongate tunnel which extends along a common axis of said stationary and movable rails;
a driven threaded shaft housed in said elongate tunnel and having both ends rotatably supported by said movable rail;
a nut received in said elongate tunnel and fixed to said stationary rail, said driven threaded shaft being operatively engaged with said nut so that rotation of said driven threaded shaft about its axis induces a longitudinal movement of said movable rail relative to said stationary rail;
a drive device mounted on said movable rail, said drive device having a drive shaft;
a gear mechanism arranged between said drive shaft and said driven threaded shaft for transmitting a power of said drive shaft to said driven threaded shaft;
a gear housing for housing therein said gear mechanism; and
a pair of holders secured to said movable rail, such that said gear housing is disposed between said holders, said holders having means to tightly clamp said gear housing therebetween and such that said gear housing and said holders are aligned along said driven threaded shaft.

5,150,873
PORTABLE AUXILIARY DESK TOP ARTICLE
James M. Donovan, 7821 Laurel Ave., Cincinnati, Ohio 45243
Filed May 16, 1991, Ser. No. 701,106
Int. Cl.[5] A47B */97/00*
U.S. Cl. 248—460 **19 Claims**



1. A portable auxiliary desk top article for use on a student desk to enlarge a work surface area of the desk, said auxiliary desk top article comprising a first substantially rigid flat surface member and a second substantially rigid flat surface member hingedly attached together so as to be capable of folding together, wherein one flat surface member has a pocket structure attached to an underside, said pocket structure having a bottom wall and two adjacent side walls and further being open-sided on two adjacent sides such that the pocket structure can be slipped over a work surface arm of the student desk and remain there so as to hold the flat surface member in place and further wherein folding out of the second flat surface member forms the enlarged work surface area.

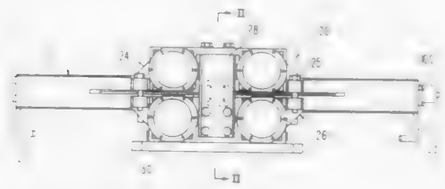
5,150,874
APPARATUS FOR MOUNTING FOLDABLE BRANCHES TO AN ARTIFICIAL TREE
Si Spiegel, Briar Cliff Manor, and Sherman Smith, Newburgh, both of N.Y., assignors to Hudson Valley Tree, Inc., Newburgh, N.Y.
Filed Mar. 26, 1990, Ser. No. 499,614
Int. Cl.[5] A47G */33/00*
U.S. Cl. 248—514 **22 Claims**



1. A bracket assembly for mounting foldable artificial tree branches to an artificial tree trunk comprising:
at least one branch member having an elbow adapted for pivotal engagement with said bracket upon movement of said member between a stowed and an operative position;
a hinge piece for mounting said member to said bracket for pivotal movement between the stowed and operative positions, said hinge piece haivng a bottom surface, and an open-sided groove extending downwardly and terminating proximate to said surface for snap fit reception of said member so as to suspend said member radially from said bracket in said operative position;

snaps along said groove for securing said member in said groove so as to limit movement of said member about said bracket when in the stowed and operative positions; and
means for guiding said hinge piece upon movement of said member between the stowed and operative positions,
said guiding means restricting movement of said member about said bracket when in the stowed and operative positions while assisting in securing said member to said hinge piece.

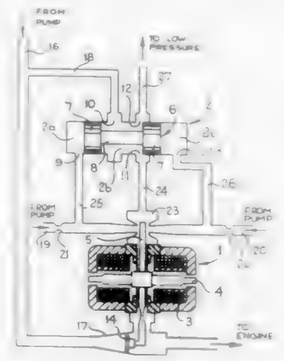
5,150,875
LINEAR MASS ACTUATOR
Sidney E. Holloway, III, Newport News; Edward A. Crossley, Jr., Gloucester Point; Irby W. Jones, Newport News; James B. Miller, Norfolk; C. Calvin Davis, Hampton; Vaughn D. Behun, Hampton, and Lewis R. Goodrich, Sr., Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Jul. 22, 1991, Ser. No. 735,149
Int. Cl.[5] F16M */13/00*
U.S. Cl. 248—550 **20 Claims**



1. A linear mass actuator comprising:
an upper housing and a lower housing connectable to each other and having a central passageway passing axially therethrough;
a mass linearly movable in the central passageway;
roller means, mounted in the upper and lower housings and being in frictional engagement with the mass, for translating the mass linearly in the central passageway; and
drive means, operatively coupled to the roller means, for rotating the roller means and thus driving the mass axially in the central passageway.

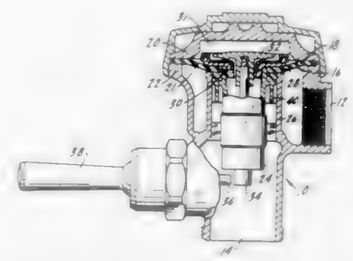
5,150,876
SERVO VALVE
Gerald W. Pickard, Bishops Waltham, Southhampton SO3 1RS, England
Filed May 13, 1991, Ser. No. 698,906
Claims priority, application United Kingdom, May 12, 1990, 9010706
Int. Cl.[5] F16K */11/02, 31/16*
U.S. Cl. 251—14 **2 Claims**

1. A servo valve for controlling a flow of fluid in a bore including:
at least one electrical winding;
an armature;
a flapper means securely fixed to the armature; and
a feedback arrangement comprising a radially extending plug attached to the flapper means;
wherein the flapper means has two arms which protrude outwardly from the armature, the ends of which arms are spatially independent from one another and to the end of one of which arms the feedback arrangement is attached such that said plug is located within a tapering portion of said bore, fluid flow in



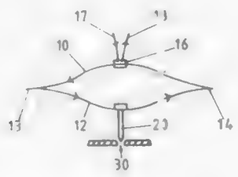
the bore causing deflection of the plug and the end of the other arm comprises a valve.

5,150,877
FLUSH VALVE REFILL RING
John F. Whiteside, Franklin Park, and Bradley S. Richardson, Chicago, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.
Filed Feb. 11, 1992, Ser. No. 833,749
Int. Cl.[5] F16K */31/385, 31/145*
U.S. Cl. 251—40 **6 Claims**



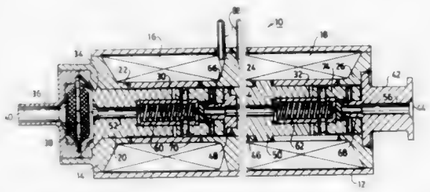
1. In a flush valve, a body having an inlet and an outlet, a passage connecting the inlet and outlet, a valve seat at one end of said passage, a diaphragm positioned to control the flow of water through said passage and to close upon said seat, a guide member attached to the underside of said diaphragm and positioned within said passage, a refill ring attached to said guide member adjacent the diaphragm, said refill ring having an upstream end which is in spaced peripheral contact with said passage when said diaphragm is closed on said valve seat, said refill ring having a plurality of exterior axially extending circumferentially spaced fins in contact with said passage, the spaces between fins providing water flow paths which modulate the flow of water through said passage as said diaphragm closes on said valve seat, each water flow path having a first portion of generally constant flow area adjacent the downstream end of said refill ring, and a second portion which connects the first portion with the upstream end of said refill ring, said second portion gradually decreasing in flow area from said first portion to the upstream end of said refill ring.

5,150,878
LINEAR ACTUATOR
William H. Woodward, 2 Sansome Close Hackleton, Northampton NN1 3QR, England
PCT No. PCT/GB90/00579, § 371 Date Dec. 9, 1991, § 102(e) Date Dec. 9, 1991, PCT Pub. No. WO90/13171, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 17, 1990, Ser. No. 778,121
Claims priority, application United Kingdom, Apr. 15, 1989, [illegible]
Int. Cl.[5] F16K 31/02; F02K 41/035
U.S. Cl. 251—129.01 8 Claims



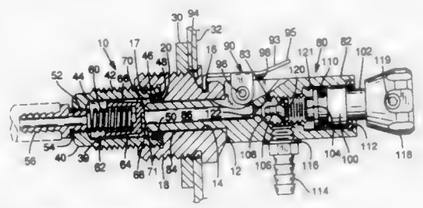
1. A linear actuator which comprise two elongate resilient elements joined together at their opposite ends, a first one of the elements being fixed at a point intermediate its ends and the two elements being arranged to carry an electric current, and means for providing a magnetic field transverse to the two elements so that when the electric current is passed through them, the two elements move apart

5,150,879
THRUSTER VALVE
Michael J. Mullally, Clifton Springs, N.Y., assignor to Valve Tech, Inc., Phelps, N.Y.
Filed May 8, 1991, Ser. No. 697,647
Int. Cl.[5] F16K 31/06
U.S. Cl. 251—129.21 26 Claims



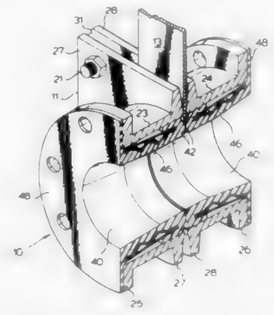
1. A solenoid valve for use in an environment that subjects the valve to shock comprising:
a core having a central bore formed therein;
a first plug mounted at one end of said central bore and having a first conduit formed therein interconnecting said central bore with a first port;
a second plug mounted at the other end of said central bore having a second conduit formed therein interconnecting said central bore with a second port;
a passage defined within said central bore interconnecting said first and second conduits;
a first guide member projecting from said first plug into said central bore;
a second guide member projecting from said second plug into said central bore;
a plunger having a guide bore formed therein supported on said first and second guide members for guiding movement of said plunger along said central bore between said first and second plugs;
a valve seal carried within said guide bore between said first and second guide members for opening and closing said passage interconnecting the first and second conduits; and
a valve seat forming one end of said second guide member within said guide bore and encompassing at one end of said second conduit an opening that is opened and closed by said valve seal.

5,150,880
VALVE ASSEMBLY WITH FLOW CONTROL
George K. Austin, Jr., 12755 NE. Parrett Mountain Rd., Newberg, Oreg. 97132, and Sandor Johannes, 2189 Hidden Springs Ct., West Linn, Oreg. 97068
Filed Feb. 14, 1991, Ser. No. 656,408
Int. Cl.[5] F16L 29/02
U.S. Cl. 251—149.3 3 Claims



1. A valve assembly comprising:
a female member connectable to a fluid source and having an internal bore having a longitudinal axis and located for receiving fluid from the source, the female member having a straight slot formed therein to extend along an axis perpendicular to the bore axis;
a male member including a body, an elongated nose and an internal bore for carrying fluid:
a flow-control valve mounted to the male member and operable for regulating the flow of fluid through the internal bore, the male member being connectable to the female member so that fluid in the bore of the female member may flow through the bore of the male member;
a latch carried on the male member and shaped to engage the straight slot on the female member when the male and female members are connected, the slot retaining the latch in a manner that prevents rotation of the connected male member relative to the female member.

5,150,881
GATE VALVE SLEEVE
Thomas P. McKavanagh, 95 Temperance Street, Aurora, Ontario, Canada L4G 2R1
Filed Nov. 18, 1991, Ser. No. 793,526
Int. Cl.[5] F16K 3/02, 3/312, 25/00
U.S. Cl. 251—174 17 Claims

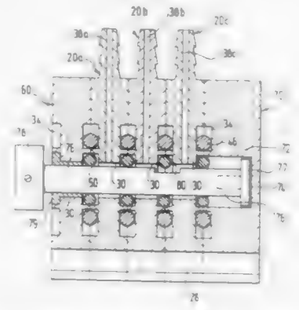


1. A sealing arrangement for a gate valve comprising at least one cylindrical-like seal, each cylindrical like seal having a body made of a resilient material and a cooperating buckling means, said at least one seal having a sealing end engaging a gate of the gate valve, an anchoring end securing said at least one seal in the gate valve, and an intermediate section joining said sealing end and said anchoring end and accommodating controlled buckling of said buckling means and said intermediate section as said sealing end is forced toward said anchoring end during movement of said gate in a closing direction; said intermediate section having a recess formed therein with said buckling means disposed within said recess, said controlled buckling being predetermined by the configuration of said buckling means to buckle in a radial direction of said seal distorting said recess as said sealing end moves towards said anchoring end, said buckling means transferring forces between said sealing end and said anchoring end and creating a bias during controlled buckling of said intermediate section urging said intermediate section to return to the wall configuration prior to controlled buckling of said intermediate section when said gate is moved in an opening direction.

5,150,882
TREATMENT SYSTEM HAVING GATE DEVICE FOR DECOMPRESSION CHAMBER
Satoshi Kaneko, Yokohama, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan
Filed Jul. 17, 1991, Ser. No. 731,474
Claims priority, application Japan, Jul. 20, 1990, 2-192472
Int. Cl.[5] F16K 25/00
U.S. Cl. 251—193 11 Claims

1. A treatment system having a gate device for a decompression chamber to be used for opening and closing a gate aperture through which an object to be treated is loaded and unloaded, comprising:
wall means for defining the gate aperture arranged on it;
a gate for being pressed against said wall means to hermetically cover the gate aperture;
a support member for supporting said gate, said support member being movable toward and away from said gate aperture in a first direction;
means for driving said support member in a second direction substantially perpendicular to said first direction;
a stopper plate arranged at an end of said gate in said second direction and having a surface inclined divergently from an edge remote from the gate aperture toward an edge close to the gate aperture, said stopper plate being made of a material selected from sapphire, ruby and an iron or nickel-based double boride hard alloy;
a roller arranged to abut said stopper plate, the axis of said roller being stationary relative to said wall means; and
converting means for converting part of a force applied to said roller by said gate through said stopper plate in said second direction into a force moving and urging said gate toward said wall means in said first direction.

5,150,883
FLUID MECHANICS DEVICES
David M. Cook-Martin, Rawtenstall, England, assignor to Unilab Holdings, Ltd., Lancashire, England
PCT No. PCT/GB89/00757, § 371 Date Dec. 31, 1990, § 102(e) Date Dec. 31, 1990, PCT Pub. No. WO90/00695, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 5, 1989, Ser. No. 634,124
Claims priority, application United Kingdom, Jul. 5, 1988, 8815923
Int. Cl.[5] F16K 31/00
U.S. Cl. 251—367 9 Claims

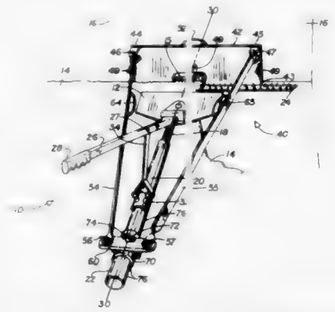


1. A fluid mechanics device comprising a plurality of wafer components assembled into a block, in which at least a first one of the wafer components has an axial port extending through it from one face to the opposite face; a radial port communicating with the axial port and extending to one edge of the wafer; and at least one resilient ring seal forming a static seal between the first wafer component and a mating face of another of the wafer components in the block, characterized in that there are two concentric annular recesses in each face of the wafer, each inner recess being open on its inside into the axial port, the two outer annular recesses being of the same dimensions and providing alternative locations for the static ring seal, and the two inner annular recesses being of the same dimensions and providing alternative locations for a further resilient ring seal operative between the wafer and an axially movable actuator movable relatively to the axial port.

5,150,884
CARPET STRETCHER ATTACHMENT UTILIZING PIVOTALLY MOUNTED PULLING PLATE
Raymond E. Hyer, 2194 Saragossa Ave., DeLand, Fla. 32725, and Michael L. Hyer, 835 W. Gaucho Cir., Deltona, Fla. 32724
Filed Aug. 3, 1990, Ser. No. 562,612
Int. Cl.[5] B66D 1/00
U.S. Cl. 254—209 11 Claims

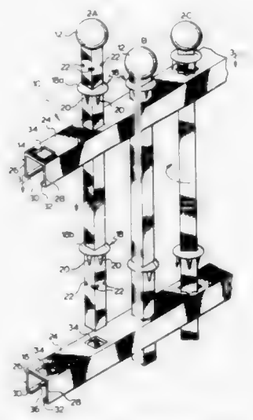
3. A portable carpet stretching device for enabling a user to stretch carpeting at an angle into engagement with a tack strip affixed along the base of an adjacent wall, said device comprising a carpet-engaging head member and a base member, each of said members having front and rear portions, with the front of said base member being attached by an extensible member to the rear of said head member, such that in a use position, said head member is closer to the adjacent wall than said base member, anchoring means for securing said base member with its front portion in a fixed relationship to the adjacent wall, power applying means for causing said head member and said base member to be forced apart, the anchoring of said base member with respect to the adjacent wall by said anchoring means resulting in a portion of the carpet engaged by said head member being forced toward the adjacent wall and into contact with the tack strip when said head member and said base member are forced apart by said power applying means,

said anchoring means comprising a pulling plate having elongate upper and lower edges, with the lower edge of said pulling plate including means for engaging the tack strip located along the base of the adjacent wall, a pair of elongate arms connecting the upper edge of said pulling plate to said base member, with one end of each of said arms being pivotally



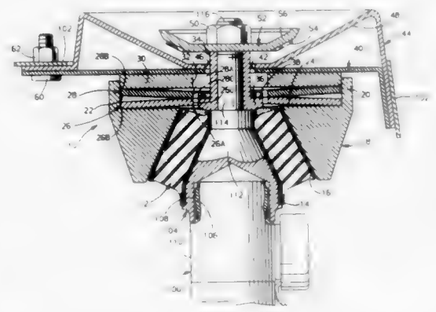
connected adjacent one upper corner of said pulling plate and the other end of each arm being pivotally connected to the rear portion of said base member, this pivotal connection of said arms enabling said head member to be moved into a non-symmetrical relationship to said pulling plate, whereby a pull at an angle to the adjacent wall can be applied to the carpet by said head member when said power applying means is utilized.

5,150,885
PICKET FENCE ASSEMBLY
Nicola Leone, 5652 - 8th Line, R.R. #2, Hornby, Ontario, Canada L0P 1E0
Filed Apr. 18, 1991, Ser. No. 687,347
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—22 3 Claims



1. A picket fence assembly comprising in combination: C-shaped upper and lower rails each having lower, spaced-apart, opposed flanges and a plurality of non-circular apertures therethrough in substantial vertical alignment; a plurality of vertically disposed pickets, each extending through one of said apertures in said upper rail and through one of said aligned apertures in said lower rail; said pickets having at least one pair of opposite corners and having thereon upper and lower indentations for engaging the upper and lower rails; said pickets being respectively in said apertures wherein said pickets are axially movable in said apertures to a locking position at which the indentations in the pickets are engaged by the rails and axial movement of said pickets relative to said rails is prevented; said rails being provided with a frictional locking means, wherein said pickets are engaged in a frictional fit therewith in said locking position wherein rotational movement of said pickets is restrained, said frictional locking means comprising a plurality of paired opposed indentations in said opposed flanges, said indentations conforming with the pair of opposite corners whereby said pair opposite corners frictionally abut with and engage the opposed indentations.

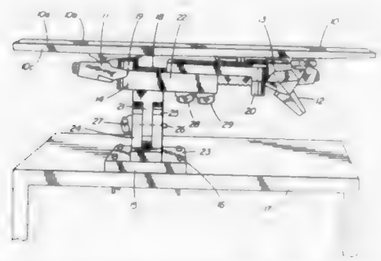
5,150,886
TOP MOUNT ASSEMBLY FOR A SUSPENSION ACTUATOR
James P. Hamberg, Beavercreek; Todd H. Baldini, Dayton; Stanley E. Smith, Dayton; Wendell Collins, Jr., Dayton, and Richard E. Longhouse, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 3, 1991, Ser. No. 751,925
Int. Cl.[5] F16F *3/10*
U.S. Cl. 267—220 12 Claims



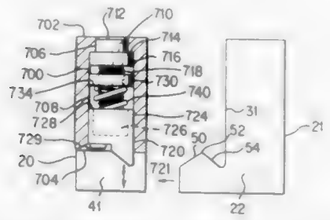
1. A vehicular suspension system comprising:
(A) a hydraulic actuator for supporting a vehicular body; and
(B) a top mount assembly attaching the actuator to the body, the mounting assembly including
(a) a resilient isolator seated on the actuator;
(b) a guiding sleeve seated on the simulator having a recessed cavity;
(c) Belleville spring means received within the cavity;
(d) thrust plate means seated on an uppermost surface of the Belleville spring means;
(e) means for securing the actuator to the thrust plate means; and
(f) means for securing the thrust plate means to the vehicular body.

5,150,887
SKI HOLDING DEVICE
Richard K. Weissenborn, and Gregory A. Komitsch, both of Calgary, Canada, assignors to James B. Anderson, by said Gregory A. Komitsch
Filed Feb. 15, 1991, Ser. No. 656,769
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—71 23 Claims

15. A ski holding device comprising a ski holding member and a mounting member, said mounting member comprising a base, a mounting bracket, pivot means to permit said ski holding portion to pivot between a position in which a ski engaged by the ski holding member has its base vertical with one side edge uppermost and a position in which the base is vertical with the other side uppermost, clamping means for tightening the pivot and stop means for locking the pivot with the ski in a horizontal and inverted position, the ski holding member having at one end an open ended slot adapted to engage said pivot means and also to permit downward movement of the ski holding member to engage the stop means when the ski holding member is upright while permitting pivotal movement free of the stop means at other positions of the ski holding portion, and said ski holding member having at its other end means for holding a ski.

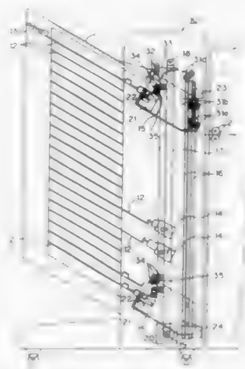


5,150,888
CLAMPING MECHANISM IN A VISE JAW ACCESSORY SYSTEM FOR ATTACHING AND RELEASING VISE ACCESSORIES WHILE MAINTAINING POSITIONAL ACCURACY OF THE ACCESSORIES
David L. Durfee, Meadville, Pa., assignor to Susan M. Durfee, Meadville, Pa.
Continuation-in-part of Ser. No. 636,250, Dec. 31, 1990, Pat. No. 5,065,990, which is a continuation-in-part of Ser. No. 495,777, Mar. 19, 1990, Pat. No. 5,037,075, which is a continuation of Ser. No. 223,428, Jul. 25, 1988, Pat. No. 4,923,186, which is a continuation-in-part of Ser. No. 941,717, Dec. 15, 1986, abandoned. This application Oct. 21, 1991, Ser. No. 780,119
Int. Cl.[5] B25B *1/24, 1/00*
U.S. Cl. 269—254 CS 21 Claims



1. A clamping mechanism in a clamping device for holding an element in a fixed position relative to the clamping device, the clamping mechanism comprising:
a bore extending through the clamping device and opening first and second surfaces of the clamping device, the bore including a first portion having a circular cross-section opening to the first surface and a second portion opening to the second surface;
an actuating screw having a head portion located within the first portion of the bore and a threaded shank extending into the second portion of the bore, the actuating screw being rotatable within the bore;
a plunger located in the second portion of the bore for non-rotatable axial movement within the second portion of the bore, the plunger having a first axial end projecting from the second surface for engaging the element and a second opposite axial end having a recess therein, a perimeter surface being defined on the second axial end by the recess, the plunger including means for retaining the plunger within the bore;
a lock member having an internally threaded aperture threadably engaged with the threaded shank and a contact surface surrounding the aperture, the lock member being located within the second portion of the bore for non-rotatable axial movement within the bore upon rotation of the threaded shank of the actuating screw; and
a spring located about the threaded shank and between the contact face of the lock member and the recess of the plunger, rotation of the actuating screw axially moving the lock member relative to the plunger to vary a biasing force exerted by the spring on the plunger, the contact face of the lock member selectively compressing the spring completely within the recess of the plunger to permit the contact face to contact the perimeter surface of the plunger to prevent axial movement of the plunger within the bore.

5,150,889
SORTER FOR STAPLING
Keiichi Taguchi, Kuse, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Oct. 17, 1991, Ser. No. 779,302
Claims priority, application Japan, Oct. 17, 1990, 2-279687; Oct. 17, 1990, 2-279688
Int. Cl.[5] B42B *1/02*
U.S. Cl. 270—53 9 Claims



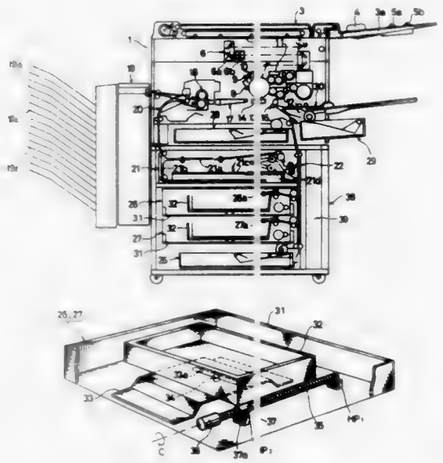
1. A sorter for stapling comprising:
a plurality of sorting bins arranged to hold copied papers therein;
a paper guide means which discharges the papers to predetermined bins in response to the setting of a sorting process mode and the number of copies to be sorted;
a stapling means which is capable of being moved to the positions that correspond to the predetermined bins, moves to a position that corresponds to a bin in which are held the papers that are to be stapled, and effects the stapling process under the condition where the papers are held in said bin;
a stapling number setting means that sets the number of bins in which are held the papers to be stapled by said stapling means; and
a control means which causes said stapling means to effect the stapling process for only those papers that are held in the bins of a number corresponding to the number of the bins set by said stapling number setting means after the papers have been discharged to said predetermined bins by said paper guide means.

5,150,890

FEEDING DEVICE FOR ENABLING CONTINUOUS COPY PAPER FEED FROM PLURAL COPY PAPER CASSETTES

Norihide Kunikawa, Yao; Yoshikado Yamada, Kashihara; Yoshiteru Mori, Nara, and Toshihisa Matsuo, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 3, 1990, Ser. No. 518,466
Claims priority, application Japan, May 15, 1989, 1-121806
Int. Cl.[5] B65H 3/44
U.S. Cl. 271—9 25 Claims



1. A feeding device comprising:

at least one copy material orientation changing means which is capable of shifting copy material housed within a corresponding rotatable copy material holding section to at least two feeding positions;

size detection means, provided in connection with said rotatable copy material holding section, for detecting a size of said copy material;

position detection means for detecting a feeding position of said copy material holding section;

a copy material feed unit for holding the copy material which is selected for the current feed;

copy material remaining amount detection means for detecting a remaining amount of copy material in the copy material feed unit selected for the current feed; and

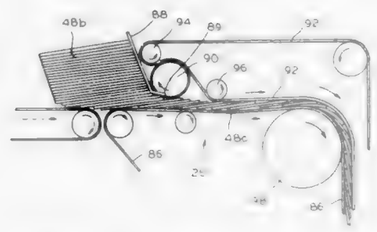
control means for controlling said at least one copy material orientation changing means upon detection of a size and position of copy paper within said corresponding rotatable copy material holding section so as to set said corresponding rotatable copy material holding section in the same feeding position for copy material as the copy material feed unit when copy material of the same size as that placed in the copy material feed unit is placed in said corresponding rotatable copy material holding section and it has been detected by said copy material remaining amount detection means that a remaining amount of the copy material is less than a predetermined amount.

5,150,891

SHINGLE DEVICE FOR USE IN MULTI-PASS SORTING MACHINE

Eduard M. Svyatsky, Libertyville; George Paroubek, Downers Grove, and Frederick P. Hegland, Des Plaines, all of Ill., assignors to Bell & Howell Company, Skokie, Ill.

Division of Ser. No. 501,556, Mar. 29, 1990, Pat. No. 5,119,954.
This application Jul. 26, 1991, Ser. No. 736,427
Int. Cl.[5] B65H 3/04
U.S. Cl. 271—35 14 Claims



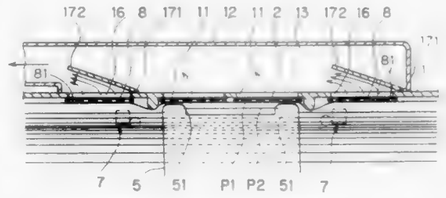
1. A shingler device for documents, suitable for use in a mail sorting apparatus, comprising, in combination, first movable belt means for receiving a vertically stacked array of documents from a document source and conveying said documents along a path defined by a movable reference plane, second movable belt means defining a reach adapted to receive the stack of documents from a terminal end of said first belt means and continue movement of the documents along the path, upstanding guide means for confronting said documents and having a lower end overlying and spaced above said reference plane to define a gap enabling passage of documents from the lower portion of the stack, rotatable roller means having a lower tangential surface adjacent said lower end of said guide means and spaced above said reference plane but below said lower end of said guide means, said roller means being rotatable such that said tangential surface moves in a direction opposite to the direction of movement of documents passing through said gap and causes shingling of documents passing through said gap, and third movable belt means cooperative with said second belt means downstream from said roller means to receive shingled documents from said gap, said third belt means being drivingly interconnected with said roller means so that said third belt means has a longitudinal velocity substantially equal to the tangential velocity of said roller means.

5,150,892

SHEET FEEDING APPARATUS

Tadafumi Shimizu, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1991, Ser. No. 674,911
Claims priority, application Japan, Mar. 30, 1990, 2-86671
Int. Cl.[5] B65H 3/14
U.S. Cl. 271—98 16 Claims



1. A sheet feeding apparatus comprising:

sheet supporting means for supporting a stack of sheets to be fed;

vacuum transporting means opposed to at least a leading end of said stack of sheets and adapted to suck a top sheet of said stack to advance it, said vacuum transporting means having a suction section to which a negative pressure is applied; and

means adjacent said vacuum transporting means for contacting at least two portions of said top sheet of said stack, which two portions are located in a region to be sucked by said suction section, so as to retain said two portions at a distance from said suction section so as to corrugate said top sheet;

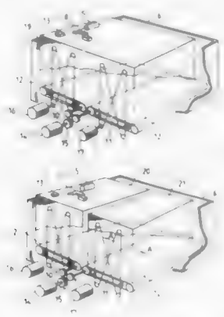
wherein said vacuum transporting means is opposed to a laterally central portion of said stack of sheets, and auxiliary vacuum transporting means is located adjacent to said vacuum transporting means and opposed to a laterally side end portion of said stack of sheets.

5,150,893

PAPER FEED MECHANISM WITH PLURAL SUPPORT TABLES FOR SUPPLYING CUT SHEETS TO A PRINTING APPARATUS

Kazuo Uno, and Junji Shirakawa, both of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1991, Ser. No. 710,480
Claims priority, application Japan, Jun. 8, 1990, 2-151212
Int. Cl.[5] B65H 1/26
U.S. Cl. 271—157 5 Claims



1. A paper feed mechanism for a printing apparatus comprising:

a case;

a plurality of tables provided in said case for supporting at least two sizes of cut sheets thereon, said two sizes of cut sheets including large-sized cut sheets larger than each of said tables and small-sized cut sheets substantially equal to each of said tables;

means for raising and lowering said plurality of tables in synchrony when said tables support said large-sized cut sheets;

means for raising and lowering said plurality of tables separately and independently of each other when said tables support said small-sized cut sheets;

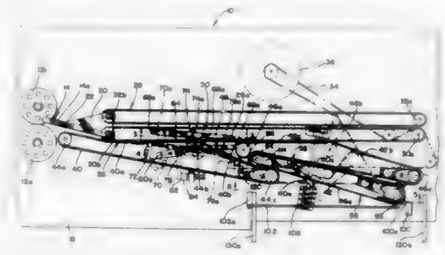
means for moving said small-sized cut sheets from one of said tables to another of said tables when said another of said tables becomes empty of said small-sized cut sheets.

5,150,894

DIVERTER MECHANISM FOR FLAT DOCUMENT CONVEYOR SYSTEM

Mario Ricciardi, Glenview, Ill., assignor to Bell & Howell Company, Skokie, Ill.

Filed Mar. 27, 1991, Ser. No. 676,157
Int. Cl.[5] B65H 39/10
U.S. Cl. 271—302 27 Claims



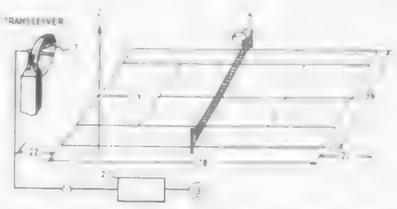
1. In a conveyor system for conveying generally flat documents on-edge, said system including a primary conveyor belt defining a primary conveyor path, at least one secondary conveyor belt having a first reach disposed in juxtaposed relation to a reach of said primary conveyor belt, means for effecting movement of said primary and secondary conveyor belts to convey a document received on-edge between said juxtaposed belt reaches along said primary path, said secondary conveyor belt having a second reach inclined to said primary conveyor belt so as to establish an open span along said primary conveyor belt immediately downstream from said juxtaposed belt reaches; the combination therewith comprising document diverter means including guide arm means supported adjacent said juxtaposed reaches of said primary and secondary conveyor belts, said guide arm means being selectively movable between a first position operative to guide a non-diverted document along said open span of said primary conveyor belt, and a second position operative to move said juxtaposed belt reaches from said primary conveyor path to divert and guide a document along the inclined reach of said secondary conveyor belt.

5,150,895

METHOD OF AND SYSTEM FOR DETERMINING A POSITION OF BALL RELATIVE TO A PLAYING FIELD, AND BALL PROVIDED THEREFOR

Richard Berger, 30 Cold Spring Hills Rd., Cold Spring Hills, N.Y. 11743

Continuation-in-part of Ser. No. 609,703, Nov. 6, 1990, Pat. No. 5,082,263. This application Sep. 11, 1991, Ser. No. 757,898
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] A63B 61/00
U.S. Cl. 273—29 R 4 Claims

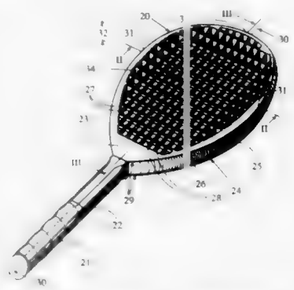


1. A method of determining a position of a ball relative to a playing field, comprising the steps of:

providing a radar sending and receiving device;

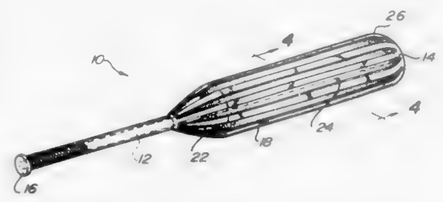
arranging a means for reflecting a radar signal against a radar reflective ball;
connecting the radar with a computer which stores various positions located upon said playing field, said positions being designated within a three dimensional spatial relationship defined by X, Y, Z coordinates;
determining the baseline of said playing field as an X coordinate, the sideline as a Y coordinate and the height above the playing field as a Z coordinate;
sending by radar said signal to a moving ball during a game and receiving a signal from said ball by said radar;
comparing said received signal by said computer with the stored position of said playing field so as to determine a position of said ball relative to said playing field;
locating said ball on said defined X, Y Z coordinates;
determining, whether said ball is located out of bounds as defined by said X, Y, Z coordinates, emitting a perceivable signal indicating said location, stopping said determination when said location of said ball is determined to be out of bounds as defined by said X, Y, Z coordinates, or, alternatively, redetermining the location of said ball if said ball is determined to be inbounds as defined by said X, Y, Z coordinates until said ball is struck again, and redetermining the position of said ball with respect to the X, Y, Z coordinates with each successive strike of said ball from the previously determined position of said ball on said playing field until said ball is determined to be out of bounds, emitting a second perceivable signal locating said ball and stopping said determination.

5,150,896
GAME RACKET WITH INCURVATE CONTACT SURFACES
David Holmes, 17577 Johnson Ave., Sonoma, Calif. 95476
Filed Mar. 3, 1992, Ser. No. 845,393
Int. Cl.[5] A63B *9/00*
U.S. Cl. 273—67 R **20 Claims**



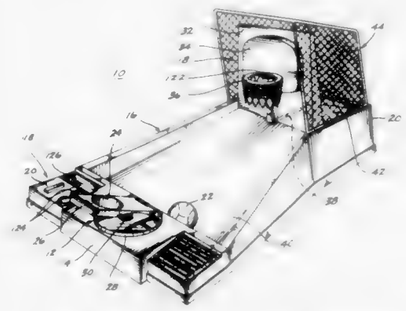
1. A game racket, comprising: a curvilinear head portion, connected to a handle shaft and grip through an intermediate throat portion; said head portion comprising two incurvate contact surfaces; at least said incurvate contact surfaces and the material elements of said head portion lying between said incurvate contact surfaces being perforated by a plurality of apertures for the passage of air through said head portion; said head portion having a nonuniform thickness with one location of least thickness in the central area of said head portion; each of said incurvate contact surfaces having a continuous, smooth corrective curvature wherein the degree of curvature of either of said incurvate contact surfaces at a given point of contact is defined by the angle of inclination of the tangent plane to said incurvate contact surface through said point of contact with respect to the general plane of said head portion as a whole, and wherein said angle of inclination of each of said tangent planes with respect to said general plane of said head portion is equal and opposite to the average angular displacement of said general plane of said head portion away from an intended plane of contact while said racket is swung by a player striking an incoming ball at said point of contact; said angular displacement being caused by torsional forces exerted differentially on said game racket at each of said points of contact by an incoming ball; and wherein said angular displacement at each of said points of contact and the resultant specific corrective curvature of said incurvate contact surfaces are determined empirically as an average across a random sampling of intended users.

5,150,897
SPORT STRIKING ARTICLES
Alex Wortman, 1705 Wells, Ann Arbor, Mich. 48104
Filed Dec. 4, 1990, Ser. No. 621,794
Int. Cl.[5] A63B *59/06*
U.S. Cl. 273—72 R **3 Claims**



1. A collapsable bat comprising:
an elongated member having a handle end and a hitting end;
a hitting profile defined by a diameter adjacent said hitting end, said hitting profile being that portion of said collapsable bat intended to strike a ball;
as cavity enclosed within said elongated member and adjacent said hitting end;
a plurality of slits disposed on said elongated member, said slits being contiguous with said cavity, said slits enabling said hitting profile to be selectively enlargeable; and
an inflatable bladder residing within said cavity, said bladder having inflation means attached thereto for inflating and deflating said bladder;
wherein said cavity is enlarged as said bladder is inflated so as to enlarge said hitting profile, said hitting surfaces being displaced radially outward.

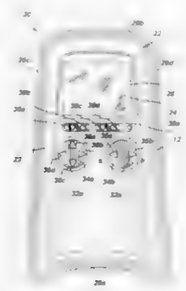
5,150,898
GAME APPARATUS
Joel Hochberg, Miami, Fla.; Timothy D. J. Stamper, Ravenstone, and Christopher T. J. Stamper, Twycross Warks, both of England, assignors to Rare Coin-It, Inc., Miami, Fla.
Filed Feb. 11, 1991, Ser. No. 653,253
Int. Cl.[5] A63F *7/20*
U.S. Cl. 273—85 C **17 Claims**



15. A game apparatus for propelling a game projectile towards a target, comprising:

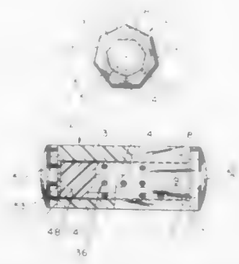
a housing defining a first end portion and a second end portion;
propelling means mounted on the first end portion of the housing for selectively propelling the game projectile towards the target;
translation means for supporting the target adjacent the second end portion of the housing to reciprocate the target along a longitudinal axis towards and away from the propelling means;
power means for powering the translation means to automatically reciprocate the target; and
means for delaying translational movement of the target for a fixed increment of time at a position closest to the propelling means and at a position farthest from the propelling means.

5,150,899
HAND HELD VIDEO GAME WITH SIMULATED RESCUE
Kazumi Kitaue, Kobeshi, Japan, assignor to Konami Co., Ltd., Kobe, Japan
Filed Jan. 26, 1990, Ser. No. 470,953
The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.
Int. Cl.[5] A63B *67/00;* **A63F** *7/06*
U.S. Cl. 273—85 G **1 Claim**



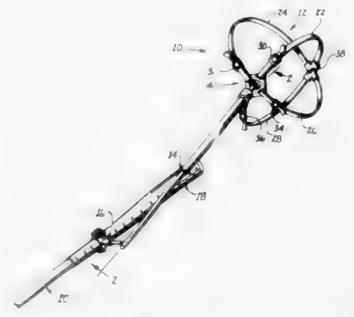
1. A hand-held electronic game comprising:
a plurality of manually operable control pushbutton switches for permitting control of the play of the game by a player;
sound transducer means for generating sound responsive to sound signals;
control circuit means coupled to the control switches and the sound transducer means, and including a processor, a read-only memory, and a random access memory, for generating game control signals and sound signals;
display means having selectively activatable image segments corresponding to a plurality of player-controlled turtle figures, to a plurality of game-controlled figures including throwing star image segments which may be displayed sequentially to simulate attacking motion, a digital counter, and a prisoner image segment enclosed by a capsule image segment and to alpha-numeric game information for selective display thereof, said display means responsive to said control circuit means control signals for display of game images responsive to the game control signals such that only one player-controlled figure is visually displayed at one time at only on of a plurality of pre-determined positions and the position at which the player-controlled figure is displayed is moveable to an adjacent position responsive to activation of a first set of the control switches, some of said plurality of positions corresponding to underwater positions with associated game controlled intermittently activated snare device image segments and some of said plurality of positions corresponding to above-water positions with associated game controlled attacking image segments, said processor comprising means for generating signals to display destruction of the player controlled image while in an underwater position in response to movement through one of the snare devices during an activated period and while in an above-water position in response to simulated collision with an attacking image segment, means responsive to a control switch for enabling the player to destroy an attacking image segment prior to simulated collision, means for controlling display of a punching arm image segment and a sword image segment associated with a displayed player controlled turtle figure, for simulating destruction of mouser image segments responsive to activation by the player of a punching and sword activating control switch pair, means for controlling the display of dynamite image segments to simulate availability of dynamite, and retrieval of dynamite by a player-controlled figure, means for accumulating a score responsive to simulated destruction of mouser image segments and for controlling display of the score, means for setting a predetermined number in response to the player-controlled turtle figure entering an underwater position, for decrementing the counter periodically until the player-controlled turtle figure exits the underwater position and for simulating destruction of a player-controlled turtle figure, and means for controlling the display of the capsule image segment and prisoner image segment to simulate freeing a prisoner.

5,150,900
HEPTAHEDRON RANDOM CHARACTER SELECTOR
Joseph J. Onzo, 1561 Fuchsia Dr., San Jose, Calif. 95125
Filed Dec. 18, 1991, Ser. No. 812,139
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—146 **13 Claims**



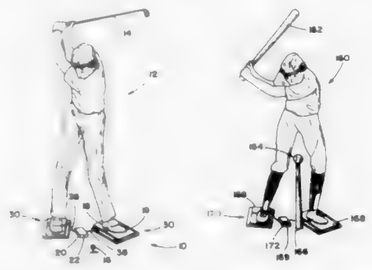
1. A random character selector, comprising a heptahedron body portion having an outer heptagonal periphery symmetrical about a central longitudinal axis and including seven facets, and indicia associated with each separate facet and visible on the outer periphery of the heptahedron body portion;
(a) said heptahedron body portion being formed with transparent outer and inner peripheries, and a plurality of sets of different indicia are spaced around the inner periphery of the heptahedron body portion and visible on the outer periphery thereof;
(b) said plurality of sets of different indicia being displayed on a thin flexible sheet, and said sheet is conformed to the inner periphery of said heptahedron body portion whereby said different sets of indicia are visible through the outer periphery of the heptahedron body portion; and
(c) and a core member provided within the conformed flexible sheet to retain the sheet intimately conformed to said inner periphery of the heptahedron body portion.

5,150,901
GOLF SWING TRAINING DEVICE
Raymond J. Stawicki, 1149 N. 92nd Street, #228, Scottsdale, Ariz. 85256
Filed Jan. 27, 1992, Ser No. 826,474
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.2 3 Claims



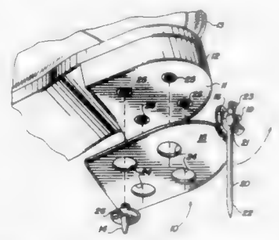
1. A golf swing practice device for use in properly guiding the swing of a golfer swinging a golf club comprising, in combination:
harness means for attaching to the upper portion of a person's body;
an elongated tubular golf club swing guiding member having upper and lower ends;
swivel means for swively coupling said upper and lower ends to said harness means and to a handle of a golf club, respectively, for permitting the golfer to achieve a proper swing of the golf club by swinging said golf club without significantly bending the front elbow of the golfer.

5,150,902
GOLFER WEIGHT DISTRIBUTION MEASUREMENT SYSTEM
Doyle J. Heisler, 528 11th Cir., Spearfish, S. Dak. 57783
Filed Jul. 9, 1991, Ser No. 727,470
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.1 22 Claims



1. An apparatus for measuring a sportsman's weight distribution during a practice swing, comprising:
detection means for sensing the sportsman's weight comprising first and second detection pads, each pad being constructed and arranged to receive one of the sportsman's feet, and for generating weight signals as a function of weight thereon;
reference detection means for sensing an event occurrence corresponding to a point in said practice swing and generating a reference signal corresponding to said event occurrence; and
control means for receiving said weight signals and said reference signal and for generating a data output set representative of the change in weight distribution upon said first and second detection pads prior to, at, and subsequent to said event occurrence during said practice swing.

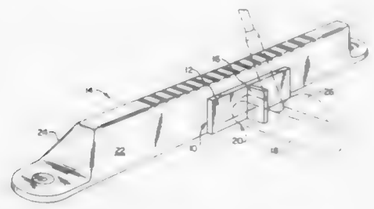
5,150,903
GOLFER'S TRAINING DEVICE
Adelio Percic, 210 E. Sharon Dr., Phoenix, Ariz. 85022
Filed Mar. 12, 1992, Ser. No. 851,006
Int. Cl.[5] A63B *69/36;* A43B *00/00*
U.S. Cl. 273—188 A 5 Claims



1. A training device for holding a golfer's leading foot stable during a golf club swinging function comprising:
an apertured base plate,
said plate being secured to the bottom surface of the heel of a golf shoe by removing threaded cleats from internally threaded apertures in the bottom surface of the heel of the shoe, placing one surface of said plate against the bottom surface of the heel and inserting the removed cleats through the apertures in said plate for threadedly engaging with corresponding apertures in the heel of the shoe,
said plate having a tab extending laterally thereof for extending over a portion of the periphery of the back of the heel of the shoe,
said tab having an aperture extending therethrough,
a threaded bolt attached to and extending outwardly from said tab substantially parallel to said plate, and having a collar extending around a part thereof adjacent said tab,
an elongated spike one end of which pivotally surrounds said collar and the other end of which is provided with a point for penetrating the ground, and
means for threadedly engaging said bolt for holding said spike in a position extending laterally outwardly of said plate.

5,150,904
GOLF PUTTING TRAINING DEVICE
Joseph L. Sindelar, 2121 Hancock Dr., Horseheads, N.Y. 14845
Continuation of Ser. No. 624,224, Dec. 7, 1990, Pat. No. 5,072,943, which is a continuation-in-part of Ser. No. 540,350, Jun. 19, 1990, Pat. No. 5,024,442. This application Oct. 2, 1991, Ser. No. 769,805
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—192 9 Claims

1. A golf club assembly having a shaft, a golf club head defined at one end of said shaft and a handle defined at a second end of said shaft, said golf club head having a longitudinal axis, a toe end portion at a first longitudinal end thereof, a heel end portion at a second longitudinal end thereof, a stabilizer portion provided on said heel end portion, a forward face, and a rearward face;
said stabilizer portion having an inner side and a substantially flat, planer outer surface and including a base portion having a first end, a second end, and a longitudinal axis,
said outer surface of said stabilizer portion having a length substantially greater than a thickness of said toe end portion of said golf club head, said longitudinal axis of said golf club head intersecting said planer outer surface of said stabilizer portion, said stabilizer portion being provided on said golf club head so that the plane of said outer surface is maintained perpendicular to a plane of said forward face, and so that said stabilizer portion is substantially immovable along said longitudinal axis of said golf club head, so that said planer outer surface presents a first flat, planer surface for sliding engagement with a second flat, planer surface disposed adjacent the second longitudinal end of the golf club head and the forward face of the golf club head is controlled to be maintained square with respect to said second planer surface and a corresponding stroke direction when said planer outer surface is slid along said second planer surface.



5,150,905
RUBBER COMPOSITION AND GOLF BALL COMPRISING IT
Syoji Yuki, Osaka; Yasuyuki Tokui, Takatsuki; Kihachiro Nishiuchi, Tokushima; Kenichi Wada, Itano; Masayoshi Suzue, Tokushima, and Takuo Morimoto, Kyoto, all of Japan, assignors to Asics Corporation, Kobe and Otsuka Chemical Company, Limited, Osaka, both of, Japan
Division of Ser. No. 204,310, Jun. 9, 1988, Pat. No. 4,955,966.
This application Jul. 11, 1990, Ser. No. 551,163
Claims priority, application Japan, Jun. 11, 1987, 62-146019; Jun. 12, 1987, 62-147218; Jun. 12, 1987, 62-147219; Jun. 12, 1987, 62-147220; Jun. 12, 1987, 62-147221
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] A63D *37/06;* A63B *37/12*
U.S. Cl. 273—218 6 Claims

1. A rubber composition for a cover layer of a golf ball, which comprises at least one natural and/or synthetic rubber component(s) and alkali metal titanate fibers subjected to a surface treatment with about 0.05 to 10% by weight based on the weight of the fibers of a surface treating agent prior to mixing with said rubber component(s), said surface treating agent being selected from the group consisting of compounds represented by the formula I:

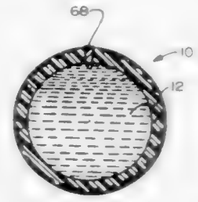
$$(HS-R^1\rightarrow_a Si-R^2 \quad (I)$$

wherein each R^1 independently represents a substituted or unsubstituted divalent hydrocarbon group of 2 to 6 carbon atoms, each R^2 independently represents a substituted or unsubstituted monovalent hydrocarbon group, each X independently represents a hydrolyzable group, a is an integer of from 1 to 3, and b is an integer of from 0 to 2 with the proviso that $1 \leqq (a+b) \leqq 3$;
and compounds represented by the formula II:

$$R^3{}_c-Si-R^4+S\rightarrow_n R^4-Si-R^3{}_c \quad (II)$$

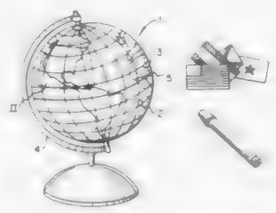
wherein each R^3 is independently represents a substituted or unsubstituted monovalent hydrocarbon group, each R^4 independently represents a substituted or unsubstituted hydrocarbon group of 2 to 4 carbon atoms, each Y independently represents a hydrolyzable group, c is an integer of from 0 to 2 and n is an integer of from 1 to 6.

5,150,906
MULTI-PIECE GOLF BALLS AND METHODS OF MANUFACTURE
Robert P. Molitor, Niles, Mich., and Terence Melvin, Somers, Conn., assignors to Lisco, Inc., Tampa, Fla.
Filed Mar. 10, 1989, Ser. No. 321,689
Int. Cl.[5] A63B *37/08;* B23P *25/00*
U.S. Cl. 273—220 5 Claims



1. A method of making a golf ball comprising the steps of:
(1) Forming a hollow shell in the configuration of a sphere from a deformable polymeric material; and
(2) Introducing into said shell a liquid material which forms a homogeneous core filling said shell, the structural characteristics of said shell and core being such that said golf ball has a high coefficient of restitution and conforms to the initial velocity requirements of the U.S.G.A., and said golf ball may be driven long distances in regulation play

5,150,907
METHOD OF PLAYING AN EDUCATIONAL GEOGRAPHY GAME
Daniel Desmarais, Cypress, and Jack R. Wallace, Tustin, both of Calif., assignors to 1-800 Geopoly, Laval, Canada
Filed Jun. 7, 1991, Ser. No. 712,249
Int. Cl.[5] A63F *3/04*
U.S. Cl. 273—240 14 Claims



1. Method of playing an educational geography game with a map, which comprises:
a) providing a map, an apparatus of chance and marking means;
b) determining locations on the map for a player by selecting the locations by chance and marking the selected locations;
c) drawing lines by the player on the map representing routes interconnecting the locations;
d) determining ownership of the routes for the player by marking the routes with markings distinctly associated with the respective player;
e) defining starting locations and destination locations on the map for the players and travelling along the routes by the

players from the starting locations to the destination locations; and

f) repeating steps a)–e) in a given order by a given player.

5,150,908

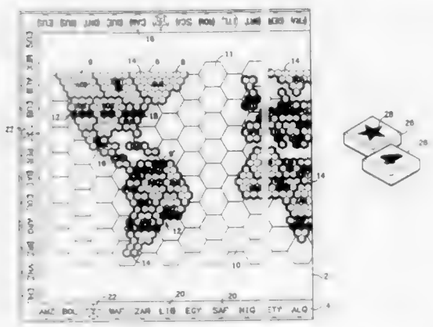
MILITARY CONFLICT BOARD GAME

J. Albert Codinha, 9260 Towne Center Dr., #27, San Diego, Calif. 92121-3008

Continuation-in-part of Ser. No. 347 289, May 4, 1989. This application Aug. 30, 1991, Ser. No. 753,306

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—262 12 Claims



1. A board game apparatus simulating international military conflict, which comprises:

a playing board comprising a map illustrating at least a portion of each of the principal oceans and nations of the world,

said map containing indicia assigning each of said nations to one of a plurality of continental regions;

the ocean portion of said map being overlaid by first network of cells and the land portion of said map being overlaid by a second network of cells,

each cell in said ocean network simulating coverage of a proportionately larger geographical area than each cell in said land network;

at least some of said nations illustrated on said map containing indicia designating missile facilities therein; and

said map being bordered by a path comprising a first plurality of spaces each identifying one of said nations and containing corresponding continental region indicia for each of said nations and regions and a second plurality of spaces denoting enhanced movement along said path;

first playing pieces for individual movement by each player along said path in the course of said game; second playing pieces representing individual military or naval forces in a nation or ocean;

third playing pieces designating nuclear annihilation of a nation; and

designators determining each player's permitted movement along said path at each point in said game;

each of said first pieces when moved along said path in response to the indication of one of said designators determining a military opportunity of the player represented by said piece with respect to the other players, said opportunity being determined by the path space on which said player's first piece resides after said movement and the number of said second pieces, third pieces, cells and missile facilities then associated with any nation indicated by said path space.

5,150,909

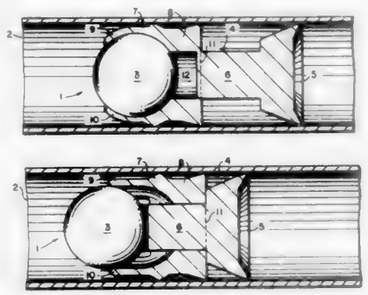
AIR GUN PELLET DESIGN

Edwin Fitzwater, 1370 Bryant St., Rahway, N.J. 07065

Filed Apr. 4, 1991, Ser. No. 680,432

Int. Cl.[5] F42B *6/10, 14/08*

U.S. Cl. 273—428 8 Claims



1. A gun pellet for use in a gun having a standard barrel of uniform diameter comprising:

a projectile and a skirt assembly;

said skirt assembly including means for removably retaining said projectile, and means for causing said projectile to disengage from the retention by said skirt assembly responsive to the force, and the consequence acceleration, developed within the standard gun barrel upon firing of the gun, such that disengagement of the projectile from the skirt assembly occurs before said projectile exits the open end of said standard gun barrel;

said skirt assembly further comprising:

a skirt body;

a shaft affixed to said skirt body; and

a projectile clutch assembly comprising a clutch body, at least two clutch jaws disposed about said projectile such that the projectile is removably retained within said clutch jaws, a retainer means disposed within said clutch body and detachably connected thereto, and a conduit disposed in said clutch body such that said shaft is capable of traversing through said conduit and propelling said projectile from said clutch jaws.

5,150,910

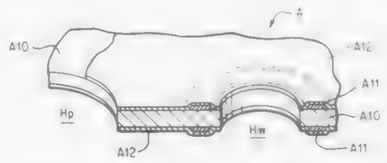
GASKET WITH SOFT AND HARD SEAL COATINGS

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 546,930

Int. Cl.[5] F16J *15/06*

U.S. Cl. 277—235 B 8 Claims



1. A gasket for sealing between two engine parts, comprising,

at least one main plate having at least one opening to be sealed therearound, and upper and lower surfaces,

hard coating formed on at least one of the upper and lower surfaces of the main plate and disposed around the opening with predetermined lateral width, said hard coating having hardness between H and 8H in pencil hardness and thickness between 2 and 100 micra so that aid hard coating provides high surface pressure around the opening when the gasket is tightened, and

soft coating formed on at least one of the upper and lower surfaces of the main plate with the hard coating for covering a substantial area of the main plate, said soft coating having hardness between F and 8B in pencil hardness and thickness between 5 and 100 micra to provide sealing ability on the gasket so that when the gasket is tightened, the hard coating provides surface pressure around the opening and the soft coating supported by the hard coating closely seals around the opening.

5,150,911

TOW BAR ASSEMBLY

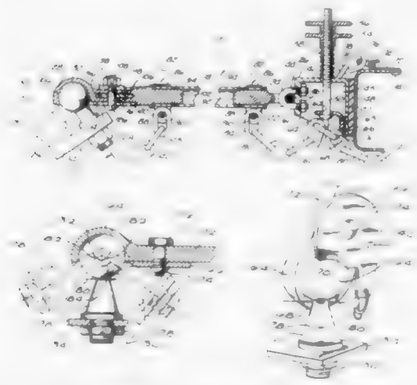
Gregory J. Williams, 523½ E. Sixth St., Reno, Nev. 89512

Continuation-in-part of Ser. No. 248,738, Sep. 23, 1988, Pat. No. 4,958,847. This application Sep. 24, 1990, Ser. No. 588,066

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] B60D *1/167*

U.S. Cl. 280—502 13 Claims



1. A tow bar assembly for use with a tow vehicle having an undercarriage supporting structure used to tow a disabled vehicle, comprising:

two elongated tow bars, each of said bars having first and second ends, said first ends being removably attached to said disabled vehicle;

a ball member attached to a stem member and mounted on said supporting structure of said tow truck;

socket means engaged to said second ends of said tow bars for removably and rotatably engaging said tow bar assembly to said ball member on said supporting structure of said tow vehicle; and

rotating latch means rotatably and directly engaged to said socket means for removably securing said socket means to said ball member on said supporting structure, said rotating latch means including a single integral member rotatably and directly engaged to said socket means and adapted to rotate so that said integral member will come into contact with said ball member in order to removably secure said socket means to said ball member, said socket means and said rotating latch means having means for increasing rotation of said socket means with respect to said ball member and for allowing said socket means to rotate with respect to said ball member until said stem member comes into contact with said means for increasing rotation of said socket means and said rotating latch means, said means for increasing rotation comprising depressions in said socket means and said rotating latch means.

5,150,912

SKI BRAKE

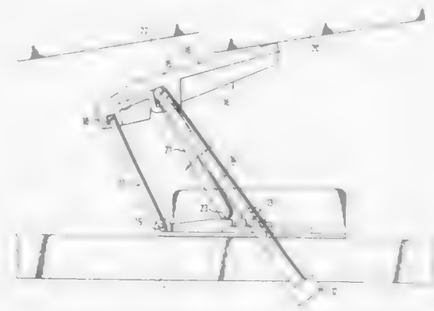
Christian Lucas, Nevers, and Roland Bardin, V. Vauzelles, both of France, assignors to Look S.A., Nevers cedex, France

Filed Jul. 29, 1991, Ser. No. 736,856

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027712

Int. Cl.[5] A63C *7/10*

U.S. Cl. 280—605 12 Claims



1. Ski brake for preventing runaway of a ski (**11**) released from a ski boot, the ski brake comprising brake arms (**12**) which are pivotable against a spring deployment force about a transverse axis (**13**) between a braking position, in which they extend downwardly from the running surface of the ski, and a rest position, in which they lie above the ski running surface essentially parallel to the longitudinal direction of the ski, wherein the brake arms extend to the side of the ski in at least the braking position and are rotationally fixedly connected at the opposite side of the transverse axis (**13**) from their braking ends (**12**) to an actuating arm arrangement (**14**) which is arranged above the ski (**11**) and is pivotally connected at an end remote from the transverse axis to a pedal (**16**) about a second transverse axis (**15**) with the pedal being kept essentially parallel to the ski (**11**) in all positions of use by a linkage arrangement (**17**) which extends essentially parallel to the actuating arm (**14**) and which is pivotally connected to the pedal (**16**) at a distance in the longitudinal direction of the ski from the second transverse axis (**15**) about a third transverse axis (**18**) and is pivotally mounted at a point fixed with respect to the ski (**11**) at a distance in the same direction from the first transverse axis (**13**) about a fourth transverse axis (**19**), characterized in that the distance between the second and third transverse axes (**15, 18**) is smaller than the distance between the first and fourth transverse axes (**13, 19**) and the distance between the third and fourth transverse axes (**18, 19**) is essentially correspondingly smaller than the distance between the first and second transverse axes (**13, 15**) in such a way that the pedal (**16**) on being pivoted out of the braking position into the rest position is pivoted in the opposite direction to the direction of pivoting of the actuating arm (**14**) relative to the ski (**11**).

5,150,913

FINGER OPERATED BUTTON ACTIVATING WIRELESS TRANSMISSION PATH FOR EFFECTING VOLUNTARY RELEASE OF A SKI BINDING

Klaus Hoelzl, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Continuation-in-part of Ser. No. 318,457, Mar. 1, 1989, abandoned, which is a continuation of Ser. No. 939,644, Dec. 9, 1986, abandoned. This application Nov. 18, 1991, Ser. No. 798,257

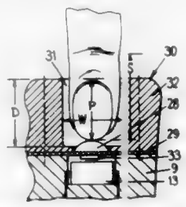
Claims priority, application Austria, Dec. 10, 1985, 3580/85

Int. Cl.[5] A63C *9/088*

U.S. Cl. 280—612 6 Claims

1. In a ski binding comprising a means for effecting a volun-

tary release of a lock mechanism of a jaw of a safety ski binding through a wireless transmission path, a switch means for operably controlling signal information in said wireless transmission path, said switch means including a manually operable button arranged on a base means separate from said safety ski binding and used in conjunction with said safety ski binding, the improvement wherein an outwardly opening recess means is provided on said base means, said button being located in said recess means so that a part thereof adapted to be manually engaged is oriented beneath an imaginary extension of the outer surface of said base means so as to protect said button from an unintentional manual engagement, support means on said base means for supporting the entirety of said button for



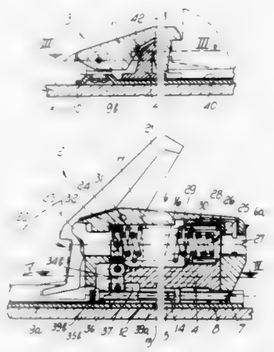
movement in the same direction relative to said base means, said recess means including surrounding wall means of finite dimensions defining a surface opening and a depth dimension to said button that is at least one of equal to and greater than a maximum width dimension for said surface opening, said surface opening having a cross sectional area sufficient to limit the reception of only one human finger into said surface opening, said depth dimension being sufficient to require a longitudinal axis of the finger to be generally aligned with a longitudinal axis of said recess means to enable the finger to be received into said recess means and to manually operate said button to cause said switch means to allow a transmission of signal information in said wireless transmission path to facilitate a release of said lock mechanism on a jaw of said safety ski binding.

5,150,914

FASTENING PARTICULARLY FOR SKIS

Roberto Gorza, Feltre, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Feb. 4, 1991, Ser. No. 650,357
Claims priority, application Italy, Feb. 6, 1990, 82518 A/90
Int. Cl.[5] A63C 9/08
U.S. Cl. 280—616 **15 Claims**



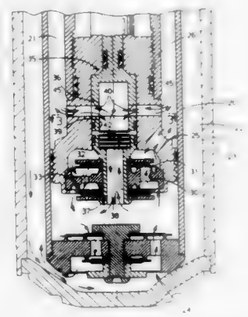
1. A fastening, particularly for skis, comprising a front engagement means for engaging a ski boot toe portion and a rear engagement means for engaging a ski boot heel portion, said front and rear engagement means both being mountable on a ski top portion which defines a separated distance therebetween, said rear engagement means comprising a pivoting heel locking element and a first adjustable biasing means for providing a first adjustable locking force acting on said pivoting heel locking element, said front engagement means comprising a pivoting tip locking element and a second adjustable biasing means for providing a second adjustable locking force acting on said pivoting tip locking element, said first adjustable biasing means comprising a first spring means and said second adjustable biasing means comprising a second spring means, wherein said rear engagement means comprises means for housing both of said first spring means and said second spring means, and wherein the rear engagement means further comprises means for simultaneously adjusting both said first and second adjustable locking forces.

5,150,915

MOTOR VEHICLE SUSPENSION WITH DAMPER HAVING ROTATABLE MEMBER POSITION FEEDBACK

David A. Hoptry, Grand Blanc, Mich.; James M. Petrofes, Tipp City; David A. Shal, Centerville, all of Ohio, and Gary R. Denton, Erie, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1991, Ser. No. 746,643
Int. Cl.[5] B60G 11/26
U.S. Cl. 280—707 **7 Claims**



1. A motor vehicle suspension system having a damper with a rotatable member producing separate discrete damping characteristics in a plurality of rotational positions, a motor adapted to drive the rotatable member through the rotational positions, and position feedback apparatus comprising, in combination:

a contact pad for each of the rotational positions of the rotatable member, the contact pads being separated by electrically insulating regions;

an electric contact member adapted for circular movement by the motor relative to the contact pads to contact the contact pads alternately with the insulating regions with such movement, the contact member contacting one of the contact pads with the rotatable member in each of the rotational positions;

electric circuit means connected to the contact pads and electrical contact member for generating an output voltage in a first voltage range when the electric contact member contacts any of the insulating regions, a second voltage range when the electric contact member contacts one of the contact pads defining a home position of the rotatable member and a third voltage range when the electric contact member contacts any of the remainder of the contact pads;

counting means responsive to the electric circuit means to change a count in response to a predetermined transition of the output voltage from the first range to either of the second and third ranges as the electric contact member contacts each of the contact pads, specific values of the count corresponding to rotational positions of the rotatable member; and

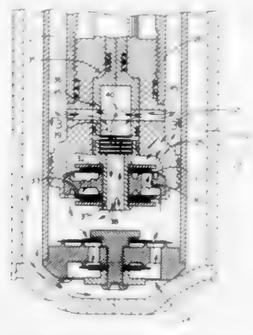
correction means responsive to the electric circuit means to establish a first predetermined value of the count corresponding to the home position of the rotatable member when the output voltage is in the second voltage range, whereby an error of the counting means is corrected.

5,150,916

MOTOR VEHICLE SUSPENSION WITH DAMPER HAVING ROTATABLE MEMBER OVERRUN DETECTION

James M. Petrofes, Tipp City; David A. Shal, Centerville, both of Ohio; Gary R. Denton, Erie, Pa., and David A. Hoptry, Grand Blanc, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1991, Ser. No. 746,644
Int. Cl.[5] B60G 11/26
U.S. Cl. 280—707 **2 Claims**



1. A motor vehicle suspension system having a damper with a rotatable member producing separate discrete damping characteristics in a plurality of rotational positions, a motor adapted to drive the rotatable member through the rotational positions, and position feedback apparatus comprising, in combination:

a contact pad for each of the rotational positions of the rotatable member, the contact pads being separated by electrically insulating regions;

an electric contact member adapted for circular movement by the motor relative to the contact pads to contact the contact pads alternately with the insulating regions with such movement, the contact member contacting one of the contact pads with the rotatable member in each of the rotational positions;

electric circuit means connected to the contact pads and electrical contact member for generating an output voltage in a first voltage range when the electric contact member contacts any of the insulating regions and a second voltage range when the electric contact member contacts any of the contact pads;

means for repeatedly sampling the output voltage and determining whether it is within the first voltage range or the second voltage range;

means for selecting one of the contact pads, activating the motor to rotate the rotatable member toward the selected contact pad, and deactivating the motor when the sampled output voltage changes from the first voltage range to the second voltage range at the selected contact pad to stop rotation of the rotatable member; and

overrun detection means responsive to a predetermined change of the sampled output voltage from the second voltage range to the first voltage range after deactivation of the motor at the selected contact pad to restart the motor so as to resume rotation of the rotatable member toward the selected contact pad.

5,150,917

ACTIVE SUSPENSION SYSTEM WITH CONTROL TO CHANGE VARIATION IN PRESSURE OF WORKING FLUID CYLINDER BETWEEN INCREASE AND DECREASE THEREOF

Kazunobu Kawabata, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 28, 1991, Ser. No. 706,443
Claims priority, application Japan, May 31, 1990, 2-142854
Int. Cl.[5] B60G 11/26; B60S 9/00
U.S. Cl. 280—707 **7 Claims**

1. An active suspension control system for a vehicle, comprising:

sensor means for sensing vehicle attitude change to provide a signal indicative thereof;

suspension assemblies including actuators which are respectively disposed between a vehicle body and suspension members supporting vehicle wheels rotatably, each of the actuators including a sliding member which slides in the actuator to adjust a relative distance between the vehicle body and the suspension member to suppress a vehicle attitude change;

a fluid power source unit which supplies pressurized fluid to the actuators for displacing the sliding member dependent upon the magnitude of fluid pressure; and

pressure control means responsive to the signal from said sensor means for controlling the fluid pressure supplied from said fluid power source unit of the actuators dependent upon an amount of vehicle attitude change to suppress said vehicle attitude change, said pressure control means decreasing the fluid pressure to the actuator associated with a portion of the vehicle body which is rising during the vehicle attitude change by a first ratio and increasing the fluid pressure to the actuator associated with a portion of the vehicle body which is lowering during the vehicle attitude change by a second ratio smaller than the first ratio by a preselected value for restricting friction caused by increase an in the fluid pressure in the actuator which impinges upon sliding movement of the sliding member.

5,150,918

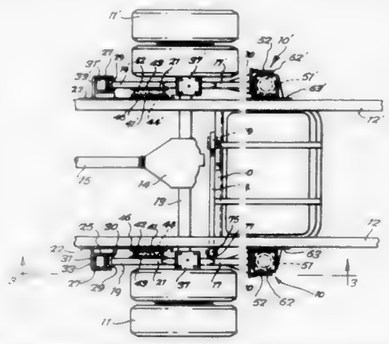
TRAILING ARM SUSPENSION FOR VEHICLE

David E. Heitzmann, Union, Mich., assignor to MOR/ryde International, Inc., Elkhart, Ind.

Filed May 1, 1991, Ser. No. 694,207
Int. Cl.[5] B60G 11/22
U.S. Cl. 280—716 **19 Claims**

1. In a vehicle having a frame including a frame portion which extends longitudinally of said vehicle and an axle posi-

tioned under the frame, a trailing arm axle suspension comprising an elongated trailing arm having fore and aft and central portions extending longitudinally of said vehicle, first means for pivotally mounting said fore portion directly on and laterally offset from said frame portion, shear rubber spring means, second means for mounting said shear rubber spring means



directly between and laterally offset from both said central portion of said trailing arm and said frame portion, third means for securing said axle to said central portion of said trailing arm, spring means, and fourth means for securing said spring means directly between said frame portion and said aft portion of said trailing arm.

5,150,919

AIR BAG SYSTEM FOR VEHICLE

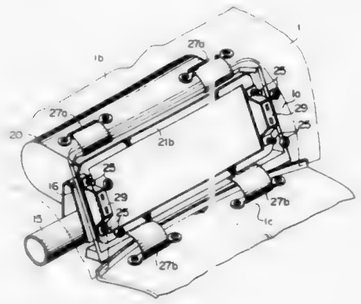
Masafumi Sakakida; Yasunori Iwamoto; Toshiyuki Manabe, all of Hiroshima; Hisao Muramoto, Yamaguchi; Haruhiro Inada, Hiroshima; Isao Hirashima, Hiroshima, and Kazuhiro Ushijima, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 28, 1990, Ser. No. 573,786

Claims priority, application Japan Aug. 30, 1989, 1-223885; Feb. 1, 1990, 2-20390; Feb. 26, 1990, 2-42687; Mar. 27, 1990, 2-75519; Mar. 29, 1990, 2-78701

Int. Cl.[5] B60R *1/16*

U.S. Cl. 280—732 21 Claims



1. An air bag system comprising

an instrument panel provided with an opening in the vicinity of a passenger's seat,

an air bag unit disposed in the opening and provided with an air bag and a casing for receiving the air bag,

lid means disposed at a rear end of the casing for covering the opening,

at least a pair of connecting means spaced transversely for connecting the lid means with the instrument panel,

one end of each of the connecting means being mounted on the lid means at a position offset from a transverse center line of the lid means.

5,150,920

STEERING WHEEL

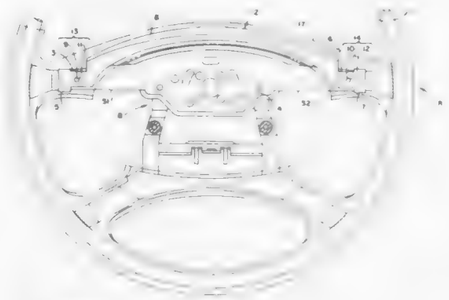
Yoshiyuki Fujita, and Katsunobu Sakane, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 19, 1991, Ser. No. 717,796

Claims priority, application Japan, Jul. 9, 1990, 2-181075

Int. Cl.[5] B62D *1/11*

U.S. Cl. 280—777 4 Claims



1. A steering wheel comprising:

a boss member;

a ring member provided in surrounding relation to said boss member;

a pair of spoke members connecting said boss member to said ring member;

an energy absorbing means for absorbing energy of an impact force subjected thereto, said energy absorbing means having first and second ends, said first end being fixed to one of said spoke members of said pair which extends in a first direction from said boss member to said ring member, said second end being fixed to the other one of said spoke members of said pair which extends in a second direction from said boss member to said ring member, said energy absorbing member being laterally offset from said boss member; and

a cover layer continuously and integrally covering said energy absorbing means, said ring member and at least a portion of said spoke members such that said boss member remains uncovered by said covering layer and thus is exposed.

5,150,921

FREE-ENDED BOOK MARK

Horace N. Broyles, 6981 Arbor Dr., Frederick, Md. 21701

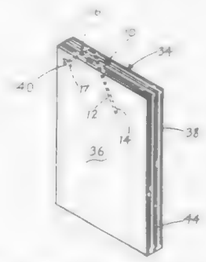
Filed Aug. 12, 1991, Ser. No. 744,353

Int. Cl.[5] B42D *9/00*

U.S. Cl. 281—42 5 Claims

1. The combination of a book and a selectively detachable book mark, wherein the combination comprises: a book having front and back covers and a body having opposed front and back end faces and being of a predetermined number of pages contained therebetween, said pages each having an upper edge, a lower edge, and an inner margin, said book further having at least one series of aligned apertures provided through said book pages so as to form a continuous passage within said book through said body; and a book mark which is moisture proof and of thin, stiff character and which is adapted for reasonable flexibility, said book mark comprising an elongated body terminating in opposed free ends and having a length substantially greater than the length of the passage formed by said aligned apertures, said book mark being threaded through said series of apertures in said book body of pages, and an anchoring element fixed to one free end, the anchoring element being of greater

cross section than a cross section of said apertures and being adapted for bringing into abutment against the corresponding end face of the book body at the inner margin, to thereby prevent complete passage in one direction of said book mark, said other free end of said book mark projecting beyond the



end of the passage opening through the other end face of the book body, and having a cross section smaller than the cross section of said apertures so as to be at all times free to pass through said apertures, and being relatively withdrawn from the book body as the book is continuously opened to the pages perused.

5,150,922

ELECTROFUSION JOINT AND HOT WATER SUPPLY HEADER USING THE SAME

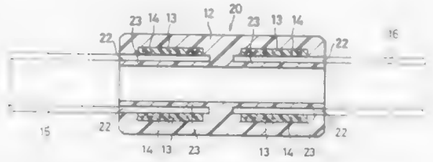
Akio Nakashiba; Hiroyuki Nishimura, both of Osaka; Fumio Nagatani; Kazunori Mito, both of Kuga; Toshio Shibabuchi, and Mikio Nakaoka, both of Osaka, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka; Mitsui Petrochemical Ind., Ltd., Tokyo and Shinwa Sangyo Co., Ltd., Osaka, all of, Japan

Filed Jan. 9, 1990, Ser. No. 462,717

Claims priority, application Japan, Jan. 11, 1989, 1-4496; Mar. 24, 1989, 1-72331; Mar. 24, 1989, 1-72332; Mar. 24, 1989, 1-72333; Mar. 24, 1989, 1-72337; Mar. 24, 1989, 1-72340; Mar. 28, 1989, 1-75955; Mar. 28, 1989, 1-75960

Int. Cl.[5] F16L *47/02*

U.S. Cl. 285—21 10 Claims



1. An electrofusion joint comprising

a main body portion comprised of a crosslinked thermoplastic resin, said main body portion having an interior surface and an exterior surface;

at least one joining portion comprising a non-crosslinkable thermoplastic resin embedded in the interior surface of said main body portion without extending to the extreme end of the electrofusion joint, said joining portion having an electrical heating wire associated in contact therewith so that the joining portion may be heat-welded to a pipe brought into contact with said joining portion; and

a supporting portion molded as one piece member with said main body portion of the joint and comprising the crosslinked thermoplastic resin, a groove into which the pipe is to be inserted being defined between the supporting portion and the interior surface of said main body portion wherein the joining portion is embedded.

5,150,923

PLASTIC PIPE JOINT ASSEMBLY FOR JOINING SECTIONS OF PLASTIC PIPE

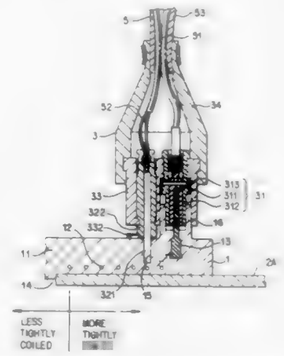
Hiroshi Ohya, Gifu, and Takeshi Kato, Mie, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 209,808, Jun. 22, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 467,341

Claims priority, application Japan, Jun. 29, 1987, 62-99888[U]; Oct. 29, 1987, 62-273907; Oct. 29, 1987, 62-273908; Jan. 7, 1988, 63-1732

Int. Cl.[5] F16L *13/02*

U.S. Cl. 285—21 28 Claims



1. A plastic socket pipe joint assembly for joining sections of plastic pipe, comprising:

a plastic socket joint body having an inner surface and an outer surface, said inner surface receiving the ends of the sections of plastic pipe;

an electric heating wire embedded near the inner surface of said plastic socket joint body, said electric heating wire being coiled more tightly at the ends of said joint body than at the middle thereof;

a first connector pin electrically connected to one end of the electric heating wire and a second connector pin electrically connected to the other end of the electric heating wire;

current supply means adapted to be connected to the first and second connector pins to enable a current to flow through said electric heating wire;

a first recess provided in said joint body proximate the first connector pin and a second recess provided in said joint body proximate the second connector pin, said first and second recesses being disposed near said electric heating wire;

temperature sensing means provided in each of the first and second recesses, respectively, for sensing the temperature of the joint body proximate the first and second connector pins;

a first fusion welding plug engaging the first connector pin and the first recess and a second fusion welding plug engaging the second connecting pin and the second recess; and

control means operatively connected to the temperature sensing means comprising means for disabling the current supply means to discontinue the supply of current to the first and second connector pins when said joint body has reached a first predetermined temperature, and means for indicating when the joint body has reached a second predetermined temperature, after the supply of current has been discontinued, where the second predetermined temperature is defined by the temperature at which the fusion welding plugs may be removed from the plastic joint body.

5,150,924

HOSE FITTING

Takahiro Yokomatsu; Kenji Mine, and Shinichiro Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

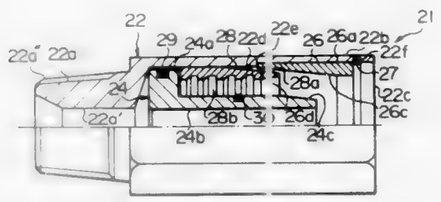
Continuation of Ser. No. 471,677, Jan. 25, 1990, abandoned, which is a continuation of Ser. No. 230,869, Aug. 11, 1988, abandoned. This application Feb. 1, 1991, Ser. No. 649,341

Claims priority, application Japan, Sep. 29, 1987, 62-246770; Aug. 3, 1988, 63-55389

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] F16L *33/16*

U.S. Cl. 285—101 6 Claims



1. A hose fitting for sealed connection to a multilayer hose, comprising:

a first, one-piece cylindrical member having a small diameter bore portion and a large diameter cylindrical bore portion connected to said small diameter bore portion, the small diameter bore portion being formed with an axial small bore extending therethrough, and the large diameter bore portion being formed with an axial large bore extending therethrough and having an inner peripheral surface;

a second cylindrical member provided within said large diameter bore portion of said first cylindrical member and having a radial flange portion and an axial tubular portion extending from said radial flange portion, the radial flange portion being provided with a first sealing member and being axially slidably received through said sealing member on said inner peripheral surface of said large diameter bore portion of said first cylindrical member, and the axial tubular portion being formed with a through bore communicating with said axial small bore of said small diameter bore portion of said first cylindrical member and provided with a second sealing member, said first sealing member serving so that said second cylindrical member is axially slid along and on said large diameter cylindrical bore portion of said first cylindrical member, as a piston, when internal pressure is applied to said hose fitting;

a sleeve axially fixedly mounted in said large diameter bore portion in a fixed position relative to said small diameter bore portion and rotatably received in said large diameter bore portion and having an inclined surface;

a collet provided within said large diameter bore portion and between said sleeve and said radial flange portion and having an outer surface engageable with said inclined surface of said sleeve and radially constrictible when moving axially outwardly within said sleeve, the multilayer hose being firmly fixed between said collet and said axial tubular portion of said second cylindrical member by the axial and outward movement of said second cylindrical member and said collet by internal fluid pressurization of the hose fitting; and

a stop member received in said large diameter bore portion and adapted to limit axial movement of said sleeve and collet.

5,150,925

HOSE FITTING

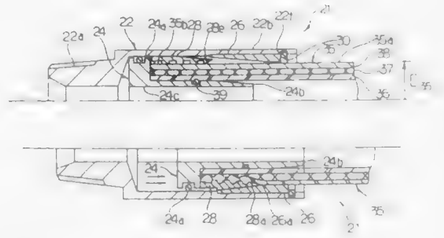
Takahiro Yokomatsu; Kenji Mine, and Shinichiro Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

Filed Sep. 25, 1990, Ser. No. 587,975

The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.[5] F16L *33/16*

U.S. Cl. 285—101 11 Claims



1. A hose fitting comprising:

a first cylindrical member having a small diameter bore portion and a large diameter bore portion connected to said small diameter bore portion, the small diameter bore portion being formed with an axial small bore extending therethrough and the large diameter bore portion being formed with an axial large bore extending therethrough;

a second cylindrical member axially slidable within said large diameter bore portion of said first cylindrical member and having a radial flange portion and an axial tubular portion extending from said radial flange portion, the radial flange portion being provided with a sealing member and the axial tubular portion being formed with a through bore communicating with said axial small bore of said small diameter bore portion of said first cylindrical member and provided with a sealing member;

a sleeve provided within said large diameter bore portion and having an inclined surface;

an axially movable and radially constrictible collet provided between said second cylindrical member and said sleeve and having an outer surface engageable with said inclined surface of said sleeve, the collet being further formed at its inner circumferential portion with a first annular projection with an inner circumferential edge having an inner diameter no greater than the outer diameter of said hose and formed with a plurality of second annular projections each having a land portion having an inner diameter at least equal to the inner diameter of said inner circumferential edge;

said inner circumferential edge of said collet being adapted to bite on said hose when no internal fluid pressure is applied within said small diameter bore portion of said first cylindrical member and when said hose is pulled out axially outwardly;

said hose being firmly fixed between said collet and said axial tubular portion of said second cylindrical member by axial and outward movement of said collet which is caused by axial and outward movement of said second cylindrical member when an internal fluid pressure is applied within said small diameter bore portion of said first cylindrical member; and

a stop member received in said large diameter bore portion and adapted to limit axial movement of said sleeve and collet.

5,150,926

DOUBLE PIPE CONNECTION ON PLASTIC PIPES

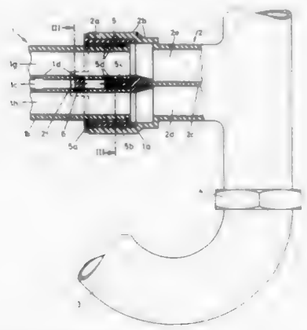
Anton Egli, Rieden, Switzerland, assignor to Geberit AG, Switzerland and "Keramag" Keramischewerke AG, Fed. Rep. of Germany

Filed Mar. 5, 1991, Ser. No. 665,405

Claims priority, application Switzerland, Mar. 6, 1990, 716/90

Int. Cl.[5] F16L *17/025*

U.S. Cl. 285—110 11 Claims



4. A pipe connection, comprising:

a first pipe having two channels separated by an intermediate space;

a one piece second pipe being divided into two channels by an inner wall;

a gasket having a circumferential wall and a partition, said gasket circumferential wall being fittable over said first pipe and said partition being fittable into said intermediate space, said gasket partition having a forward end defining a cavity, said inner wall extending into said cavity, said circumferential wall being fittable into said second pipe.

5,150,927

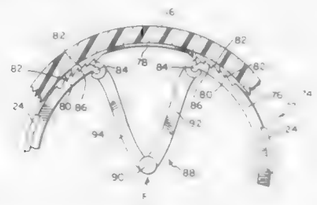
EXPANDABLE SEAL ARRANGEMENT

William O. Skinner, Fort Wayne, Ind., assignor to Press Seal Gasket Corporation, Forty Wayne, Ind.

Filed Jan. 22, 1991, Ser. No. 643,429

Int. Cl.[5] F16L *21/00*

U.S. Cl. 285—189 18 Claims



1. A compression sleeve capable of transmitting an outwardly, radially directed force to an inner surface of a tubular gasket for radially expanding the tubular gasket into compressive sealing engagement with the wall of an opening, comprising a first portion formed as a continuous strip of resiliently flexible material which comprises means for expanding said first portion from a first relaxed position to at least one expanded position, and a second portion for locking the first portion in said at least one expanded position, said first portion comprising a C-shaped strip of material having an outer circumference which defines more than 180 degrees, but less than 360 degrees, of the compression sleeve in the expanded position.

5,150,928

COUPLING SLEEVE FOR CONNECTION OF A BRANCH PIPE TO A MAIN PIPE

Bernhard Lodder, Hardenberg; Berend J. van Dijk, Slagharen; Adriaan Paulen, Zwolle, and Albertus A. Oostenbrink, Hardenberg, all of Netherlands, assignors to Wavin B.V., Netherlands

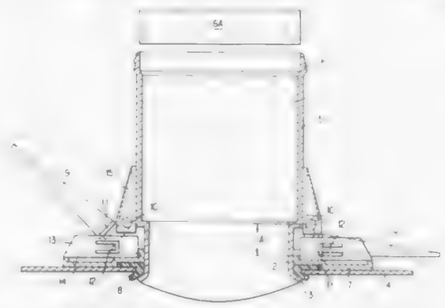
PCT No. PCT/NL88/00030, § 371 Date Dec. 21, 1989, § 102(e) Date Dec. 21, 1989, PCT Pub. No. WO88/10392, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 20, 1988, Ser. No. 460,321

Claims priority, application Netherlands, Jun. 23, 1987, 8701464; Mar. 1, 1988, 8800527

Int. Cl.[5] F16L *41/00*

U.S. Cl. 285—205 6 Claims



1. A coupling sleeve for connection of a branch pipe to a main pipe comprising: said coupling sleeve having a connecting end and an insertion end with a radially outwardly flanged edge which is inserted into an opening in said main pipe, an annular sealing means of resilient material for sealingly engaging said coupling sleeve and said main pipe disposed around the insertion end and resting against the flanged edge which can deform through the exertion of compressive stress occurring when fixing the insertion end in sealing fashion in the opening in said main pipe, a stop part positioned on the side of said opening opposite said flanged edge and defining a recess with said main pipe wall for receiving said sealing means and wherein said stop part rests against the external surface of said main pipe, stretching elements for moving said outwardly flanged edge in a direction outward relative to the wall of said main pipe and for exerting said compressive stress on said resilient sealing means while said resilient sealing means are confined between the flanged edge of the insertion end and said recess and wherein the stretching means comprises at least two identical lever stretching elements which are provided at equal spaced intervals about the periphery of the coupling sleeve.

5,150,929

PIPE JOINTS

Cyril B. Greatorex, Stapleford, United Kingdom, assignor to Stanton plc, United Kingdom

Continuation of Ser. No. 488,087, filed a PCT/GB88/01132, Dec. 19, 1988, abandoned.

This application Aug. 6, 1991, Ser. No. 742,059

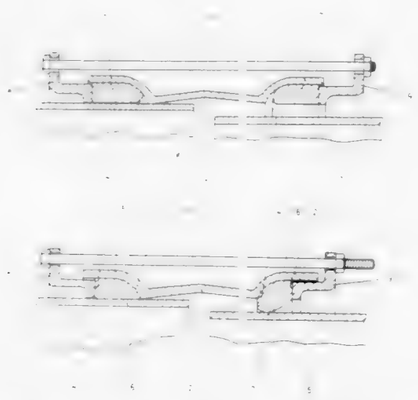
Claims priority, application United Kingdom, Jan. 6, 1988, [illegible]

Int. Cl.[5] F16L *21/04*

U.S. Cl. 285—231 9 Claims

1. A pipe joint comprising a sleeve (2) surrounding a socket chamber (3) for receiving a spigot (5), a sealing ring (7) for positioning between the sleeve (2) and the spigot (5), the sealing ring having an axially directed nose portion and an undercut portion spaced from the spigot when the sealing ring is in an unloaded state and a gland (9) around the spigot (5) for applying a load to the sealing ring (7) by axially moving the

gland (9) against a trailing heel portion (12) of the sealing ring (7), wherein the heel portion includes an inner diameter of a first size, characterized in that when the gland (9) applies a load to the sealing ring (7), the undercut portion is deflected radially inwardly together with the nose portion (14) of the



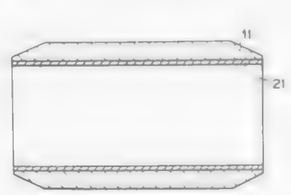
sealing ring (7) such that the nose portion is at least partially radially directed by the internal profile of the sleeve (2) against the external surface of the spigot (5), wherein the nose portion has an inner diameter of a second size less than said first size, whilst the inner diameter of the heel portion (12) of the sealing ring (7) maintains substantially said first size.

5,150,931

PIPE COUPLING USING SHAPE MEMORY ALLOY WITH INNER SOLDER FOIL MEMBER

Akira Hagio; Yoshimi Ono, and Hiroshi Honma, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,783
Claims priority, application Japan, Jul. 14, 1989, 1-082143[U]
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—381 2 Claims



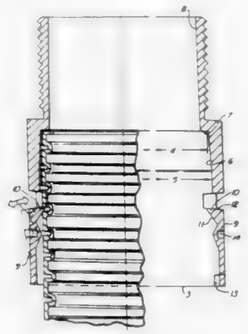
1. A pipe coupling comprising:
a cylindrical coupling member fabricated of a shape memory alloy, said cylindrical coupling member having an internal surface, and said shape memory alloy having a shape recovery temperature;
a metallic foil member of low melting point on said internal surface of said cylindrical coupling member;
said metallic foil member having a melting point which is lower than the shape recovery temperature of said shape memory alloy;
said foil being made of soft solder, said soft solder consisting essentially of 3 to 5 wt. % Ag and 97 to 95 wt. % Sn., and said soft solder having a melting point ranging from 200° to 250° C.; and wherein
when a pipe is inserted in said cylindrical coupling member, and said pipe coupling is heated to contract said cylindrical coupling member in the radial direction thereof, said metallic foil member melts and penetrates voids in said cylindrical coupling member and pipe inserted therein, and thereafter solidifies by cooling to provide a seal between said cylindrical coupling member and said pipe inserted therein.

5,150,931

CORRUGATED PIPE CONNECTOR AND METHOD OF MOLDING

John Petty, Bonnet Bay, and Sandy McNeil, Hunters Hill, both of Australia, assignors to Elconnex Pty Limited, Bonnet Bay, Australia

PCT No. PCT/AU88/00292, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO89/01109, PCT Pub. Date Feb. 9, 1989
Continuation of Ser. No. 342,515 May 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 137,539, Nov. 17, 1987, Pat. No. 4,923,227. This PCT application Aug. 4, 1988, Ser. No. 668,706
Claims priority, application Australia, Aug. 4, 1987, PI3598
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] F16L *37/12*
U.S. Cl. 285—319 22 Claims



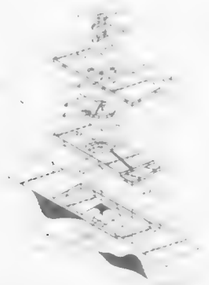
1. A one-piece plastic connector for affixing, in a liquid tight manner, to a conduit, having a ridge located adjacent its end, comprising:
a body open at one end to receive a conduit in a bore communicating with said open end;
sealing means, in said bore, remote from said open end, which are adapted to seal against, in a liquid tight manner, the conduit pushed into the said bore; and
locking means located in said body so as to project into the said bore so as to lock onto the ridge of conduit in said bore, so as to hold in said bore said conduit in a liquid tight seal against the said sealing means, wherein said locking means comprises:
an axially extending resilient finger, having a projection located at its free end being remote from the open end and which projects into the bore; and
an axially extending recess located in the bore, which extends from the base of the finger toward the open end, said recess acting to move the moment arm of the finger radially outwardly to enhance the over-center action of the finger;
wherein a force attempting to withdraw the conduit from the connector causes the projection of the finger to more firmly and deeply resiliently engage and retain said ridge such that a greater withdrawal force results in a firmer and deeper engagement with said ridge.

5,150,932

CENTRIFUGE LID SAFETY LOCK

Thomas E. Conn, Palo Alto, and Benson Kwan, Saratoga, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 14, 1991, Ser. No. 640,657
Int. Cl.[5] E05B *3/04*
U.S. Cl. 292—202 20 Claims



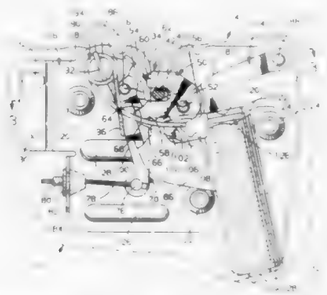
1. A lock for a lid on a housing of a centrifuge comprising:
a striker attached to the lid, the striker having a narrow portion and a wide depending end;
a member having an aperture sized to receive the wide depending end; the member being rotatably supported on the housing such that the member can be rotated from a first position where the depending end can be slid through the aperture to a second position where the depending end cannot be slid through the aperture, whereby by inserting the striker through the aperture of the member in its first position such that the wide depending end of the striker is past the member and the narrow portion of the striker is within the aperture of the member, and turning the member to the second position, the striker is restricted from being withdrawn through the aperture thereby locking the lid.

5,150,933

LATCH HAVING TORSION SPRING LEG AND LEAF SPRING LEG

Robert J. Myslicki, W. Bloomfield; Hecham R. Khalid, Dearborn Heights, and Michael E. Aubry, Shelby, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1991, Ser. No. 783,070
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—216 4 Claims



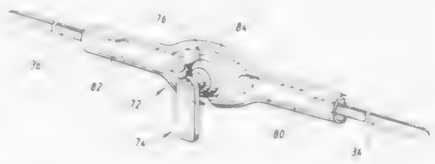
1. A latch assembly for latching and unlatching a pivotally movable closure panel of an automotive vehicle comprising:
a housing which is adapted to be mounted to a vehicle body structure of the vehicle adjacent to a striker on the closure panel;
a locking lever pivotally supported on the housing by a first pivot means for movement between an over-slam position in which an engaging portion thereof is latched to the striker on the closure panel and an unlatched position in which the engaging portion releases the striker to allow the closure panel to be moved toward an open position and through a latched position located between the over-slam position and the unlatched position and in which the engaging portion thereof is latched to the striker on the closure panel to hold the latter in its closed position;
a detent lever pivotally supported on the housing by a second pivot means for movement between an engaged position in which a first portion thereof engages the locking lever to retain the latter in its latched position and a released position in which the first portion thereof releases the locking lever to allow the latter to be moved to its unlatched position and the detent having a manually manipulable release means operatively associated with the detent lever for moving the latter from the engaged position to the released position; and
a spring having a coil portion carried by the housing distant from the first pivot means and the spring having a first leg, acting as a torsion spring, engaging the detent lever for biasing the detent lever towards the engaged position and having a second leg including an end and the end engaging the locking lever and the end being stationary relative to the locking lever when the locking lever is between the over-slam position and the latched position so that the second leg biases the locking lever towards the latched position and the end slideably engaging the locking lever when the locking lever is between the latched position and the unlatched position so that the second leg biases the locking lever towards the unlatched position whereby the locking lever is held in the latched position by the detent lever biased in the engaged position by the spring and when the detent lever is manually manipulable to the released position the spring rotates the locking lever to the unlatched position releasing the striker.

5,150,934

SHELL DOOR LOCKING DEVICE

Steven Grody, 427 Colyton St., #205, Los Angeles, Calif. 90013

Filed May 30, 1991, Ser. No. 707,698
Int. Cl.[5] E05C *5/00*
U.S. Cl. 292—288 12 Claims



1. A device for locking the door of a pick-up truck shell of the type having a door latching mechanism provided with a rotatable cam and an arm pivotally connected to the cam for pivotal movement with respect to the cam upon rotation of the cam, the arm having an end portion movable between a latched position and an unlatched position upon rotation of the cam, the device comprising:
a substantially rigid member having a first portion for abutting the cam and a second portion for abutting the arm of the latching mechanism;
means for fixing the first portion of the substantially rigid member with respect to the cam upon the first portion abutting the cam; and
means for fixing the second portion of the substantially rigid member with respect to the arm of the latching mechanism upon the second portion abutting the arm and while

the first portion of the substantially rigid member is fixed with respect to the cam;

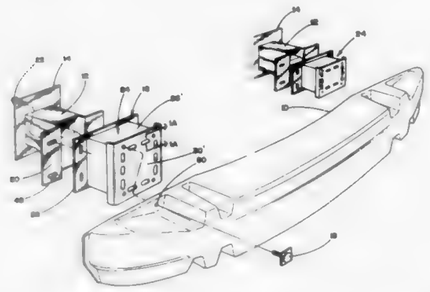
wherein the substantially rigid member prohibits pivotal movement of the arm with respect to the cam upon the substantially rigid member being simultaneously fixed with respect to the cam and arm.

5,150,935

ELASTOMERIC ENERGY ABSORBING MECHANISM FOR VEHICLE BUMPERS

Patrick M. Glance, Plymouth, and Paul Glance, Troy, both of Mich., assignors to Concept Analysis Corp., Plymouth, Mich.

Filed Nov. 6, 1990, Ser. No. 612,588
Int. Cl.[5] B60R *19/30*
U.S. Cl. 293—136 33 Claims



1. An improved elastomeric energy absorber unit for a vehicle system, wherein the elastomeric energy absorber unit is mounted between a bumper beam and a fixed position vehicle rail so as to permit resilient, energy absorbing deflection of the bumper beam with respect to the vehicle rail within predetermined force and deflection limits designed to minimize damage to the vehicle, the elastomeric energy absorber unit comprising a resiliently collapsible energy absorbing block formed of an elastomeric material, the block having an egg crate configuration comprising a plurality of substantially parallel elongated tubular channels extending axially between front and rear ends of the block, with elastomeric walls separating adjacent channels, each channel and the walls forming the periphery thereof being a cell, the block being offset from the center of the vehicle and having an inboard side designed to face inwardly toward the center of the vehicle and an outboard side designed to face outwardly toward the side of the vehicle, the inboard and outboard sides of the block each including means for resisting axial collapse thereof, the inboard means providing greater resistance to axial collapse than the outboard means, such that the inboard side of the block is more resistant to axial collapse than the outboard side of the block, the block resisting inward bending moments and urging the block to collapse axially in a front to rear direction in response to an impact load at the center of the bumper team.

5,150,936

GRAPPLE ASSEMBLY FOR ATTACHMENT TO WORKHEAD

Neal H. Avery, P.O. Box 348, West Concord, Minn. 55985

Filed Jan. 17, 1991, Ser. No. 645,184
Int. Cl.[5] B66C *3/04*
U.S. Cl. 294—104 15 Claims

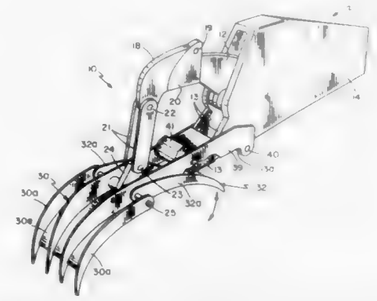
1. A grapple attachment for a demolition shear that permits the demolition shear to open and close a grapple comprising:

a first member having a first sleeve for extending partially around a first jaw of a demolition shear, means on said first member for engaging the first jaw to hold said member on the first jaw;

a second member having a second sleeve for extending partially around a second jaw of the demolition shear, further means on said second member for engaging the second jaw of the demolition shear to hold said second member on said second jaw of the demolition shear;

a first grapple jaw connected to said second member;

a second grapple jaw pivotally connected to said first grapple jaw; and



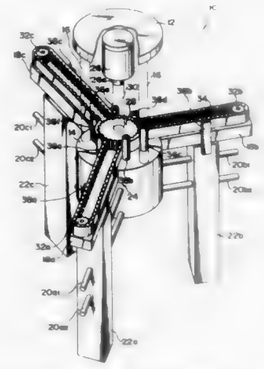
link means connected to said first jaw and to said second grapple jaw so that movement of said first jaw of the demolition shear toward said second jaw of the demolition shear causes said second grapple jaw to pivot toward said first grapple jaw to thereby enable an operator to pick up an article between said first grapple jaw and said second grapple jaw solely through the movement of said first jaw of the demolition shear toward said second jaw of the demolition shear.

5,150,937

WORK PICKUP APPARATUS

Takeshi Yakou, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,344
Claims priority, application Japan, Sep. 7, 1989, 1-230412; Sep. 3, 1990, 2-230604
Int. Cl.[5] B25J *15/10*
U.S. Cl. 294—119.1 11 Claims



1. A work pickup apparatus, comprising:

a hand main body;

at least first, second and third arm members extending radially from said main body;

angle changing means for changing an angle defined between at least first and second adjacent arm members;

a finger member disposed on each of said arm members and being supported to move in a radial direction with respect to said main body to pick up a workpiece; and

driving means for driving said finger members to change their respective radial positions on said arm members, said driving means including a rotary member rotatably attached to said hand main body, driving force transmission means for transmitting a rotational force of said rotary member into a radial driving force for driving said finger members, with said rotary member including a driving gear having teeth formed on its outer periphery, wherein

said driving force transmission means includes idle gears rotatably attached to distal ends of said arm members, a toothed timing belt having teeth on an inner surface thereof which mesh with said idle gears and said driving gear, and regulating means for regulating a travel path of said toothed timing belt so it remains in meshed contact with said driving gear, and wherein

said finger members are coupled to said toothed timing belt and extend in the same direction from said respective arm members.

5,150,938

BAG GRIP

David L. Gans, 50 Laguna St., Apt. 308, San Francisco, Calif. 94102

Filed May 9, 1991, Ser. No. 697,572
Int. Cl.[5] B65D *33/06*
U.S. Cl. 294—156 6 Claims

1. Grip apparatus for a shopping bag of the type having two handles, including:

a bar having first and second ends;

a flexible cord having an attached end and a free end, the attached end of the cord affixed to the first end of the bar and the free end of the cord having a stop of fixed predetermined shape for releasably securing the free end of the cord to the second end of the bar;

a socket in the second end of the bar, into which socket the stop may be releasably secured, at least one portion of the shape of the socket being closely congruent to at least one portion of the shape of the stop, the socket leading to a transverse aperture in the second end of the bar for directing the free end of the cord out of the socket when the stop is secured in the socket; and

a slot in the second end of the bar communicating with the socket and the aperture, through which slot the cord may releasably travel,

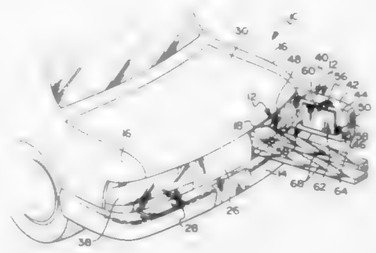
whereby the cord may fixedly engage the bag handles and the bar may be carried by grasping the bar.

5,150,939

SWING-OUT TAIL LAMP

Gerald L. Simin, Holly, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 10, 1992, Ser. No. 818,947
Int. Cl.[5] B60R *5/00*
U.S. Cl. 296—37.1 10 Claims



1. A tail lamp assembly for a vehicle having a trunk compartment,

said vehicle having parts thereof cooperating with said tail lamp assembly to define said trunk compartment,

said tail lamp assembly comprising a self-contained housing having a pair of laterally spaced end portions,

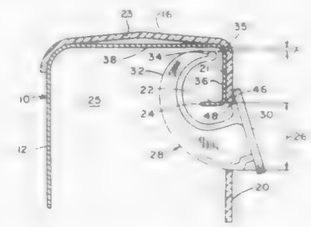
means connecting one of said end portions of said housing to said vehicle for allowing said housing to pivot outward from a closed position wherein said housing cooperates with said parts to define the trunk compartment and pivot to an open position wherein access is provided to said trunk compartment for the carrying of cargo that is longitudinally longer than said trunk compartment, and the other end of said portions having a lens mounted to therein so as to permit said tail lamp assembly to provide a stop light-turn signal warning to following vehicles when said tail lamp assembly is in said open position.

5,150,940

FASTENER FOR TRUCK BED LINER

John W. Kennedy, Spring Grove, Pa., assignor to York Products Inc., Hanover, Pa.

Filed Nov. 18, 1991, Ser. No. 793,626
Int. Cl.[5] B62D *33/02*
U.S. Cl. 296—39.2 10 Claims



1. In combination: a pick-up truck bed having a vertical outermost side which terminates into an upper rail having an upper horizontal portion and an inside vertical flange which forms an open side downwardly of the upper horizontal portion with the upper portion and flange having interior exposed walls, and a protective liner for at least the vertical side of the bed, the liner having an opening in an area below a lower end of the vertical flange and adjacent the open side of the rail, a fastener comprising:

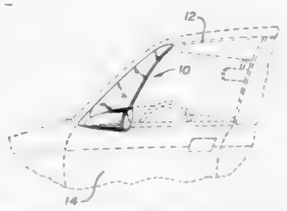
a body member;

said body member havingan integral elongated extending section with a free end at the end thereof,
said extending section having a length sufficient to extend and pass through said opening of the liner with said free end extending within the open side of the rail,
a base plate at the end of said extending section opposite said free end,
said base plate having a perimeter portion larger than the opening in the liner,
said base plate having at the junction thereof with the upper surface of said extending section an edge engagable with an adjacent portion of the liner formed by the opening to create a pivot surface for the fastener,
said base plate having an inside recess located at its lower end generally opposite said edge,
said recess having a transverse dimension to receive the thickness of the liner therein,
the vertical distance of the opening in the liner being smaller than the distance between said pivot surface and the exterior surface of said extending section adjacent said recess to an extend that when the fastener is inserted into the opening said free end will be brought into contact with the interior wall of the flange, in a manner to cause said extending section to deflect by forcible contact with the interior wall of the flange and wherein said recess will be caused to snap over the liner to fasten the liner to the bed.

5,150,941
SIDE WINDOW AIR DEFLECTOR INCORPORATING A SIDE VIEW MIRROR

Elmar Silzer, Laguna Beach, and Emil Y. Leung, Monterery Park, both of Calif., assignors to Arvan, Inc., Gardena, Calif.

Filed Nov. 20, 1991, Ser. No. 795,027
Int. Cl.[5] B60J *1/20*
U.S. Cl. 296—152 15 Claims

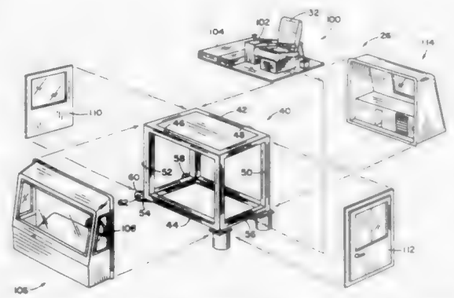


1. A combined automobile deflector and side view mirror unit for attachment to a front edge of a window frame of an automobile door, comprising:
a mirror housing secured to the window frame and supporting a side view mirror; and
a shroud having an elongated portion having a leading edge attached to the entire periphery of the front edge of the window frame, the elongated portion extending outwardly in a curved fashion from the front edge thereof to define an open space between the door and the elongated portion, the elongated portion further having a curved portion at a lower end thereof for enclosing the mirror housing.

5,150,942
SAFETY MODULAR CAB SYSTEM FOR A LARGE, OFF ROAD-MACHINE

Steven J. Fujan, Sand Springs, and Frederick W. Loeber, Tulsa, both of Okla., assignors to Terex Corporation, Green Bay, Wis.

Division of Ser. No. 607,905, Nov. 1, 1990, Pat. No. 5,064,242.
This application Apr. 8, 1991, Ser. No. 682,006
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] B62D *23/00*
U.S. Cl. 296—190 15 Claims



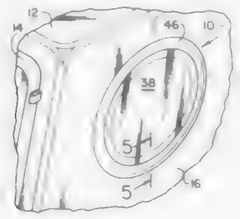
1. A safety modular cab system for a large, off-road machine having a frame and having a longitudinal axis in the direction of normal travel, and a front, the cab comprising:
a cab superstructure of generally rectangular box construction having a top, a front and an opposed back, a right side and an opposed left side, the superstructure having an interior and an exterior and having a bottom with an outer edge and an inner edge both of which are substantially parallel to the machine frame longitudinal axis;
closure means for enclosing said cab superstructure top, front, back, right side and left side, at least one of such closure means being modular so that it is attachable to and detachable from said cab supersturcture as a unit;
means of pivotally attaching one of said cab superstructure inner and outer bottom edges to the machine frame about an axis of pivotation substantially parallel to the machine frame longitudinal axis;
a lower plate having an opening therethrough;
a paralleled spaced apart upper plate having an opening therethrough, the upper plate being attached to a machine frame;
a crushable medium of selectable thickness between said lower and upper plate; and
a draw bolt received in said openings in said plates and through said crushable medium, one end of the bolt being in engagement with said lower plate and the other end in engagement with said cab superstructure.

5,150,943
VEHICLE WINDOW AND METHOD OF INSTALLING SAME

Peter Gold, 389 Peninsula Blvd., Hempstead, N.Y. 11550

Filed Feb. 14, 1992, Ser. No. 835,529
Int. Cl.[5] B62D *27/02;* B60J *1/10*
U.S. Cl. 296—201 3 Claims

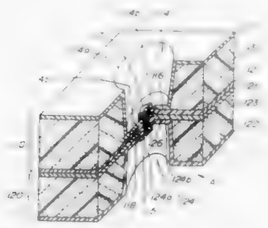
1. A wall-supported circular window for a van-type vehicle of the type having a wall and a circular-shaped window opening in said wall bounded by a peripheral edge, a mounting for said window comprising a U-shaped length in cross section of elastomeric construction material disposed in covering relation over said window opening peripheral edge along the entire circular shape thereof presenting inwardly and outwardly facing surfaces, a groove in said outwardly facing surface, an adhesive strip disposed in said groove, a circular window having a peripheral edge defining said circular shape adhesively secured to said adhesive strip at a location inwardly of said peripheral edge so that the peripheral edge extending beyond said location of adhesive attachment bounds a compartment between said window peripheral edge and an underlying area of said vehicle wall, an elastomeric flexible lip connected to extend radially of said window peripheral edge, and solidifying adhesive deposited beneath said lip in said compartment, whereby said window is connected by said adhesive to said vehicle wall and the solidification thereof contributes to the rigidity of the vehicle wall area circumferentially about said window.



5,150,944
JOINT STRUCTURE FOR SANDWICHED STRUCTURAL BODY

Suguru Yoshida; Isao Tsunoda, and Shoichi Sano, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 446,429, Dec. 5, 1989, Pat. No. 5,060,975. This application Apr. 10, 1991, Ser. No. 683,536
Claims priority, application Japan, Apr. 11, 1990, 2-38868[U]; Apr. 23, 1990, 2-43255[U]
Int. Cl.[5] B62D *25/00, 29/04;* E04C *2/36, 2/52*
U.S. Cl. 296—203 9 Claims

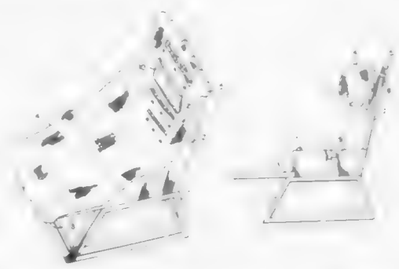


8. A joint structure comprising:
a first sandwiched structural body including a pair of first and second outer skin layers enclosing a space therebetween;
a substantially concave joint region defined in said first outer skin layer and comprising a side wall and a bottom wall contiguous to said side wall, said bottom wall being joined to said second outer skin layer to define a mated region;
a second sandwiched structural body including a pair of first and second outer skin layers enclosing a space therebetween, said second sandwiched structural body being joined to said first sandwiched structural body at least said substantially concave joint region thereof; and
said first outer skin layer of said second sandwiched structural body being bonded to said mated region of said first sandwiched structural body by an adhesive.

5,150,945
VEHICULAR CHILD SEAT COVER

Patricia C. Aupperlee, 5961 St. Barbara St., West Palm Beach, Fla. 33415, and Beth R. Wiswell, 1702 12th Ct. N., Lake Worth, Fla. 33460

Filed Apr. 15, 1991, Ser. No. 684,783
Int. Cl.[5] A47C *7/62*
U.S. Cl. 297—184 3 Claims



1. A removable cover assembly for a vehicular child's seat of the type having a backrest with a top edge and a sitting portion with a bottom edge and an exterior surface provided for direct contact with a seated child, the cover assembly preventing soiling or overheating of the exterior surface of the child's seat when unoccupied and being removable with one hand for occupation by the child, said cover assembly comprising:
a) an elongate flexible panel having a head end, a lower end and an intermediate section therebetween, said panel dimensioned to cover the entire outer surface of the child's seat and accessories thereto, said lower end provided with a stretchable band for stretching over the bottom edge of the child's seat and said head end provided with engagement means for engaging the top edge of the child's seat;
b) a fabric pouch having a top margin, two sides, a broad outer face sheet and a broad under face sheet, said top margin having an opening therein extending substantially to said two sides, said opening providing access to a chamber defined by said two sides and the two said face sheets;
c) adjustable support means connected to the under face sheet of said pouch for supporting said pouch at adjustable distances below the top edge of the child's seat to rest beneath the head of a child of a particular size when seated on the seat;
d) said cover assembly provided with two modes of operation relative to the seat, a covered mode for use when the seat is unoccupied, in which the seat is completely covered from sun and soil by said panel with said head end engaging the top edge of the seat and the lower end engaging the bottom edge of the seat and the intermediate section covering the seat and accessories and an uncovered mode for use when the seat is to be occupied by a child, in which said lower end is disengaged from the bottom edge of the seat and stuffed into the chamber of said pouch together with the portion of the intermediate section of the panel that was below the level of the pouch in the covered mode, thereby exposing the clean and cool exterior surface of the seat for contact with the child and the stuffed pouch serving as a pillow at head level and as a storage means for a portion of the panel; and
e) said pouch and panel being arranged for changing between said two modes of operation with one hand, said lower end being readily released and engaged by said stretchable band and said head end having engagement means secure enough to remain engaged to the top edge of the seat while changing from one mode to another, said engagement means including a first member of a set of hook-and-loop fastening means affixed to said head end with a second member of said set of hook-and-loop fasten-

ing means arranged for attachment to the top of the backrest of a child's seat.

5,150,946

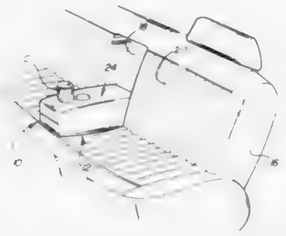
AUTOMOTIVE ARMREST W TH CUPHOLDER

Donald F. Marfilius, Farmington Hil s, and Steven A. Schulte, Northville, both of Mich., assignors to Lear Seating Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 4 12,184, Feb. 20, 1990, abandoned. This application Oct. 3, 1990, Ser. No. 592,642

Int. Cl.[5] A47C */62*

U.S. Cl. 297—194 7 Claims



1. An armrest assembly for use in an automotive vehicle comprising:

a cellular foam cushion pad (**12**, **112**, **212**) presenting an upper armresting surface (**24**, **124**, **224**), a pliable cover extending over said upper surfa e (**24**, **124**, **224**),

receptacle means (**46**, **146**, **246**) dis osed in said upper armresting surface (**24**, **124**, **224**) of said cushion pad (**12**, **112**, **212**) for receiving and support ng a beverage container (C),

characterized by said receptacle n eans (**46**, **146**, **246**) being fabricated of a pliable material fo rming a part of said cover so that said receptacle means (**46**, **146**, **246**) is soft and supple to the touch and readily y elding and distorted with said cover under the weight of a user's arm so as not to detract from the comfort of the armrest assembly but yet is resilient for regaining its rece tacle shape upon removing the weight of the arm.

5,150,947

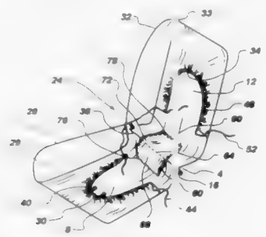
DUAL-TONGUE SEAT COVE R ATTACHMENT

Steven P. Croshaw, Mendon, Utah, a signor to Saddleman, Inc., Logan, Utah

Filed Sep. 20, 1991, Ser No. 763,221

Int. Cl.[5] A47C *1/00*

U.S. Cl. 297—229 13 Claims



1. A vehicle seat cover comprisi g

a seat cushion panel formed to fit over the seat cushion portion of a vehicle seat,

a seat back panel formed to fit ove r the seat back portion of a vehicle seat,

said seat cushion panel and seat back panel joined along a common transverse locus which lies adjacent the junction between the seat cushion portion and seat back portion of the vehicle seat when the cover is installed on the vehicle seat,

first and second flexible sheets jointed one above the other at respective contiguous forward edges to said common locus of the seat cushion panel and seat back panel to extend rearwardly thereof through the junction of the vehicle seat,

first means formed generally on a rear edge of the first sheet opposite the sheet's respective forward edge for coupling the first sheet to the seat cushion panel to secure the panel in place on the seat cushion portion of the vehicle seat, and

second means formed generally on a rear edge of the second sheet opposite the sheet's respective forward edge for coupling the second sheet to the seat back panel to secure the panel in place on the seat back portion of the vehicle seat.

5,150,948

RECLINING CHAIR

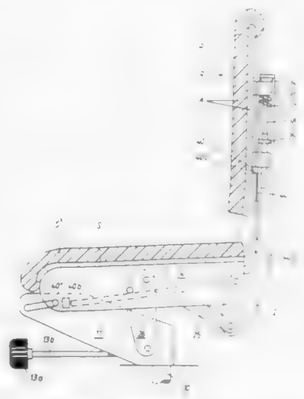
Rolf Völkle, Hohenholz 1, D-7298 Lossburg, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 580,461

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3930983

Int. Cl.[5] A47C *1/032*

U.S. Cl. 297—301 11 Claims



1. In a reclining chair comprising

a base structure including a vertically adjustable column,

a back rest,

a seat carrier supported by said column and having a forward end,

link means pivoted by a first pivot disposed in the front of said column to said seat carrier at the forward end thereof and by a second pivot disposed behind said column to said back rest,

a seat carried by said link means,

said chair being adapted to assume a position for work, in which said seat is approximately horizontal and includes an angle of about 90° with said back rest, a position for reclining, in which said seat is rearwardly inclined and includes an obtuse angle with said back rest, and a plurality of intermediate positions between said positions for work and for reclining,

locking means for locking said chair in any of said positions, and

spring means operatively connected to said back rest and said link means for urging said chair from said position for reclining to said position for work,

the improvement comprising shifting means connected to said back rest at a location spaced from said second pivot and to said link means for imparting to said link means forward and rearward displacements, respectively, in response to a pivotal movement imparted to said back rest by said occupant to shift said chair from said position for work to said position for reclining and from said position for reclining to said position for work; said first pivot being carried by said link means and being mounted in said seat carrier in slide bearings for guiding said first pivot relative to said seat carrier during said forward and rearward displacements of said link means.

5,150,949

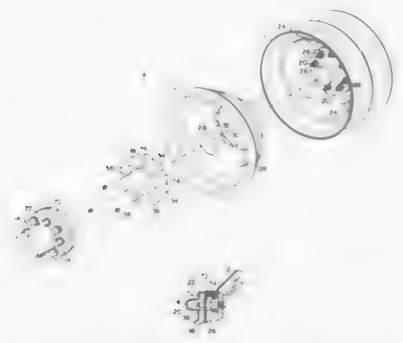
SIMULATED CUSTOM WHEELS

Mike Wang, 2049 W. 235th Pl., Torrance, Calif. 90501

Filed Mar. 5, 1991, Ser. No. 664,756

Int. Cl.[5] B60B *7/04, 7/06*

U.S. Cl. 301—37 S 5 Claims



1. A universal decorative wheel covering for use with automotive or truck wheels that can be inserted and removed without first removing the lug nuts holding the wheels to the drum of the vehicle comprising

a decorative wheel cover having a substantially concave shape and a circular central opening having a flanged rim;

a circular retaining ring having a flanged rim on the periphery adapted to mate with the flanged rim on said wheel cover for holding and supporting said wheel cover;

said retainer ring having a a plurality of openings of sufficient diameter to allow each stud to pass through but small enough to prevent the lug nuts from passing through, located against all of the lug nuts;

at least three nuts for securing said retaining ring to at least three studs for securing said ring against the lug nuts holding the wheel to the drum; and

a universal center hub having simulated lug nuts and lug covers, one for each stud whereby the wheel is covered by the cover and the lug nuts and studs are covered by the simulated lug nut covers;

said universal center hub having a flanged rim on the periphery adapted to mate with the flanged on said retainer ring whereby said ring supports and holds said hub and said cover.

5,150,950

ANTI-SKID BRAKE CONTROL METHOD

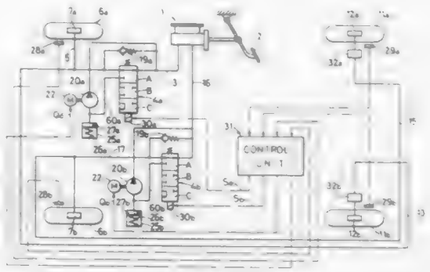
Tetsuro Arikawa, and Toshiyuki Abe, both of Yokohama, Japan, assignors to Nippon A B S Ltd., Kaigan, Japan

Filed Jul. 30, 1990, Ser. No. 559,331

Claims priority, application Japan, Jul. 31, 1989, 1-199012; Sep. 22, 1989, 1-246678

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—100 17 Claims



1. In a fluid-pressure control apparatus for an anti-skid braking control apparatus in a vehicle which includes:

(A) a pair of front wheels and a pair of rear wheels diagonally connected to said front wheels, respectively, in dual brake conduit systems;

(B) wheel speed sensors associated respectively with the front and rear wheels for detecting the rotational speeds of the respective wheels;

(C) a control unit for generating brake control signals corresponding to the rotational behaviors of the respective wheels and valve control signals on the basis of the outputs of said wheel speed sensors; and

(D) fluid pressure control valve means arranged in the respective brake conduit systems and operable by said valve control signals from said control unit;

an anti-skid brake control method in which brake control signals from said front wheels are used preferentially to brake control signals from said rear wheels as said valve control signals in the respective brake conduit system, comprising the steps of:

generating said brake control signal from any one of said wheels;

identifying the specific wheel from which said brake control signal is generated;

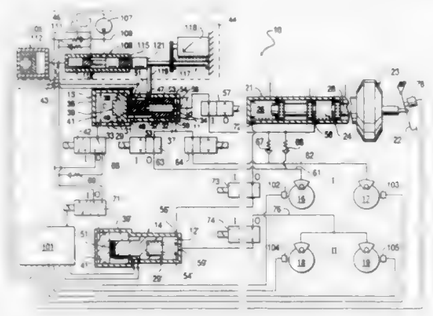
using said brake control signal as said valve control signal to operate said fluid pressure control valve means in the one brake conduit system to which said specific wheel belongs if said specific wheel is a front wheel of said vehicle and using said brake control signal as said valve control signal to operate said fluid pressure control valve means in the one brake conduit system to which said specific wheel belongs if a said specific wheel is a rear wheel of said vehicle and only if said vehicle is detected to be decelerating at a rate greater than a predetermined reference deceleration and, is further detected to be straight-running or, (b) the other rear wheel is detected to be slipping at a rate greater than a predetermined first reference slip.

5,150,95

HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM

Heinz Leiber, Oberriexingen; Manfred Steiner, Winnenden, and Walter Klinkner, Stuttgart, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Dec. 17, 1990, Ser. No. 628,171
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941408
Int. Cl.[5] B60T *8/34, 8/48, 13/12*; B60K *28/16*
U.S. Cl. 303—100 35 Claims



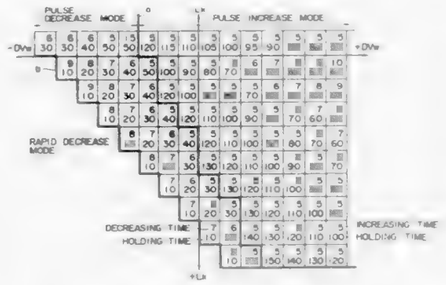
1. A hydraulic dual-circuit brake system for a road vehicle, with a division of a front-axle brake circuit and a rear-axle brake circuit, comprising a braking-pressure generator having two output pressure spaces, each allocated to one of the two brake circuits, in which static pressure is built up proportionally to an actuating force; and electro-hydraulic open-loop braking-pressure control device which, in at least one of closed-loop control phases of a closed-loop antiblocking and of a closed-loop drive slip control device with which the vehicle is also equipped, determines control of braking-pressure changing and braking-pressure holding phases, so as, in normal braking operation, to convey an adjustment of front-axle/rear-axle braking force distribution to an extent which at least approximately corresponds to an ideal braking force distribution both in a partial and in a full-braking range, the open-loop control device comprising sensors operatively arranged to generate electric output signals characteristic of the braking pressures and coupled into the brake circuits, an electronic open-loop control stage to which the output signals of the sensors are supplied as inputs to generate from a comparative processing of actual values, represented by the output signals of the sensors, of the braking force distribution with set points charcteristic of ideal braking force distribution, which are determined from vehicle-specific data in combination with data characteristic of ideal braking force distribution determined from vehicle-specific data in combination with data characteristic of at least one of an operating situation and a loading situation of the vehicle, electrical control signals required for driving the braking-pressure actuator, and a pressure modulator having an output pressure space movably delimited in a pressure-tight manner with respect to the drive pressure space by a piston and which is operatively connected to an associated brake circuit and also to an output pressure space of the braking-pressure generator, the output pressure space of the modulator being blocked off against the output pressure space of the braking-pressure generator with which the outlet pressure space of the braking-pressure actuator pressure modulator is associated in normal braking operation, and pressure build-up in one of the front-axle brake circuit and rear-axle brake circuit connected to the output pressure space of the pressure modulator is effected by valve-control pressure charging of the drive pressure space with output pressure of an auxiliary pressure source, the pressure build-up in the one brake circuit connected to the output pressure space of the pressure modulator being implemented by a servo control, for which a set point for the braking pressure in the brake circuit connected to the pressure modulator, correlated with the braking pressure in the other of the two brake circuits is an ideal value or approximately ideal value is utilized as a reference variable.

5,150,952

ANTI-SKID CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazutaka Kuwana, Toyota; Tsuyoshi Yoshida, Obu; Hiroyuki Ichikawa, Okazaki, and Kenji Tozu, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1990, Ser. No. 613,068
Claims priority, application Japan, Nov. 16, 1989, 1-298489
Int. Cl.[5] B60T *8/52*
U.S. Cl. 303—109 6 Claims



1. An anti-skid control system for an automotive vehicle having a wheel brake cylinder mounted on each of a plurality of road wheels for applying a braking force thereto and a master cylinder for supplying a hydraulic braking pressure to said wheel brake cylinder, comprising:

means for detecting wheel speed of each of said road wheels and providing an output signal corresponding to said wheel speed;

means for calculating an estimated vehicle speed for each of said plurality of road wheels on the basis of said wheel speed of each of said plurality of road wheels;

means for calculating a decreasing rate of said estimated vehicle speed of each of said plurality of road wheels;

means for modifying said estimated vehicle speed to provide a standard estimated vehicle speed for each of said plurality of road wheels in response to the decreasing rate of said estimated vehicle speed of at least one of said plurality of road wheels other than said estimated vehicle speed to be modified;

means for comparing said standard estimated vehicle speed and said wheel speed for each of said plurality of road wheels; and

pressure control means for increasing, holding or decreasing said hydraulic braking pressure in response to a comparison between said standard estimated vehicle speed and said wheel speed for each of said plurality of road wheels.

5,150,953

VIDEOTAPE STORAGE DEVICE

Edgar R. Benveniste, 336 Hillcrest Blvd., #419, Inglewood, Calif. 90301; Kenneth A. Tarlow, Santa Monica; Harold Goodman, Beverley Hills, both of Calif., and Gloria H. Benveniste, 101 Udine Way, Los Angeles, Calif. 90077, assignors to Edgar R. Benveniste and Gloria Benveniste, both of Los Angeles, Calif.

Filed Aug. 19, 1991, Ser. No. 747,005
Int. Cl.[5] A47B *81/06*
U.S. Cl. 312—9.58 8 Claims

1. A videotape cassette storage device comprising:

A frame having a pair of spaced side legs and an upper cross-bar interconnecting said legs;

a plurality of videotape cassette containers, each of said containers being generally rectangular having a plurality of interconnected walls forming the same, each container having four corners and having an upper end and a lower end, and having an opening extending therethrough at the upper end thereof adjacent one of said corners, said cross-bar extending through said openings of said containers thereby pendulously supporting said containers on said

cross-bar, the configuration of said openings and the cross-section of said cross-bar allowing freely movable rotation of said containers on said cross-bar, at least some of said containers having contrasting indicia therein; and

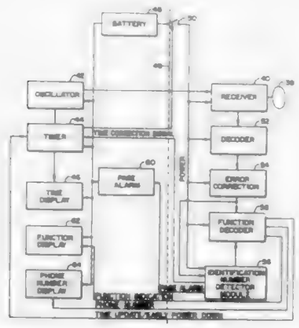
a normally closed door portion at the lower end of each of said containers forming a lower wall on each of said containers and door opening and container lifting means associated with each of said lower walls for both lifting each of said containers and opening each of said door portions for removing videotape cassettes from each of said containers.

5,150,954

PAGER WATCH SYSTEM UTILIZING TIME SLOT COMMUNICATION

Don G. Hoff, Tiburon, Calif., assignor to Seiko Corp. and Seiko Epson Corp., Japan

Continuation of Ser. No. 336,645, Apr. 7, 1989, abandoned, which is a continuation of Ser. No. 49,045, May 11, 1987, abandoned, which is a continuation of Ser. No. 678,603, Dec. 5, 1984, abandoned. This application Sep. 12, 1990, Ser. No. 581,431
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.44 4 Claims



1. A paging system for selectively communicating information to a plurality of receivers, comprising:

means for transmitting successive frames of information, each of said frames having substantially the same duration and being divided into a plurality of time slots, each time slot having a time reference point, selected time slots having an associated time slot number corresponding to the time reference point thereof,

a plurality of receivers for receiving said information, each of said receivers being associated with one of said selected time slots,

the time slot number of said selected time slots being transmitted during the associated time slot,

means for normally maintaining each of said receivers in an inactive power state and for periodically activating each of said receivers for an activation interval to receive information transmitted during the associated time slot, the periodicity of said activation interval corresponding to the occurrence of said associated time slot, each activation interval having a time reference point corresponding to initiation thereof,

means for interrogating the information received by a given receiver and for comparing the received time slot number with the time slot number associated with the given receiver, and

means in each of said receivers for changing the associated activation interval time reference point in response to comparison of the received time slot number with the time slot number associated with said receiver,

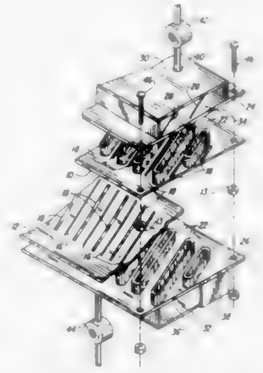
whereby a receiver can determine if it has been activated during its associated time slot and if not it can calculate the amount of change needed in its activation interval time reference point to cause said receiver to be activated during its associated time slot.

5,150,955

DRYING APPARATUS

Mark J. Devaney, Jr.; Lee F. Frank, both of Rochester; Jeffrey L. Helfer, Webster; Haribhajan S. Kocher, Penfield, and Paul W. Wagner, Holley, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 633,495, Dec. 28, 1990, abandoned. This application Oct. 31, 1991, Ser. No. 785,899
Int. Cl.[5] G03D *3/08*
U.S. Cl. 354—321 17 Claims



1. Apparatus for subjecting a web to treatment fluid, said apparatus comprising:

means defining a fluid treatment channel for receiving the web, said means including a plurality of elongated juxtaposed fluid injection openings on opposite sides of said channel and a plurality of juxtaposed fluid evacuation openings on opposite sides of the channel, said fluid injection openings being angularly oriented with respect to the longitudinal axis of the web; and

means for supplying treatment fluid under pressure to said

injection openings to inject treatment fluid under pressure into said channel on opposite sides of the web to establish a flow of treatment fluid from said injection openings to said evacuation openings in directions having an angular relationship with the longitudinal axis of the web.

5,150,956

SAGNAC-TYPE FIBER-OPTIC GYROSCOPE WITH AUXILIARY FIBER COIL

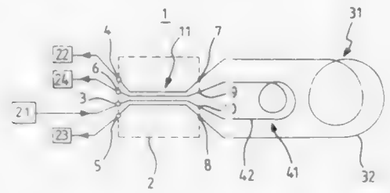
Wolfhardt Bühler, Munich; Hans Poisel, Dachau, and Gert Trommer, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1990, Ser. No. 564,751

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1989, 3926312

Int. Cl.[5] G01C *19/72*

U.S. Cl. 356—350 **5 Claims**



1. A fiber optic gyroscope comprising:

a light source emitting continuous light having a wide-band frequency range;

a main fiber coil comprising an optical fiber having two ends;

at least one auxiliary fiber coil comprising an optical fiber having two ends and having a length and radius the product of which is smaller than that of the main fiber coil;

said light source being optically coupled to said main fiber coil and said auxiliary fiber coil by a 4×4 directional coupler whereby light from said light source is fed into both ends of the optical fiber and is transmitted in mutually opposite directions in each of the respective main and auxiliary fiber coils;

means for combining light emitted from the ends of the fiber in said main coil to generate a first interference signal which is responsive to a speed of rotation of said gyroscope, and for combining the light emitted from the ends of the fiber in the auxiliary coil to generate a second interference signal which is responsive to a speed of rotation of said gyroscope;

means for combining said first and second interference signals to produce a third interference signal which is equal to the sum of the first and second interference signals;

and light detector means coupled to at least two gates of said 4×4 coupler means for detecting said third interference signal.

5,150,957

REAL TIME REGISTRATION WEAVE CORRECTION SYSTEM

David L. Walker, 731 Puma Canyon La., Glendora, Calif. 91740, and Steven A. Spears, 1569 Calle Ciervos, San Dimas, Calif. 91773

Filed Mar. 30, 1990, Ser. No. 502,472

Claims priority, application United Kingdom, Oct. 20, 1989, 8923654.1

Int. Cl.[5] H04N *3/36*

U.S. Cl. 358—347 **17 Claims**

1. A digital weave correction system operable to correct film weave in the transfer of film to video and video to film, comprising:

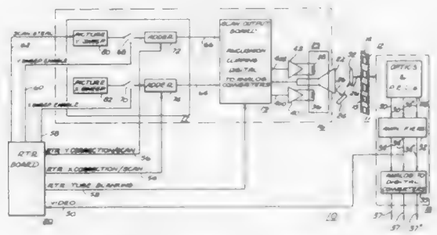
a light beam generating means operable to produce a light beam;

a reflective means operable to reflect said light beam received from said light beam generation means;

a focusing means operable to receive said reflected light beam from said reflective means and further operable to focus said reflected light beam to a position on a piece of multi-framed, sprocketed film stock;

an optical detection means positioned behind said multi-framed sprocketed film stock, operable to detect the changing intensity of said light beam as it passes through said multi-framed sprocketed film stock, further said optical detection means operable to produce a video signal when said focused light beam crosses an interior edge of a sprocket hole in said multi-framed, sprocketed film stock;

a real time registration means said real time registration means operable to receive said detected video signal from said optical detector means, and said real time registration



means operable to generate a vertical and a horizontal correction signal;

a scan generator means, said scan generator means operable to generate a normal vertical scanning signal and a normal horizontal scanning signal, said scan generator further operable to receive said vertical and said horizontal correction signal from said real time registration means, said scan generator means further operable to combine said normal vertical scan signal with said vertical correction signal and combine said normal horizontal scan signal with said horizontal correction signal; and

a light beam deflection assembly means said light beam deflection assembly means surrounding said light beam generation means, said light beam deflection assembly means operable to receive said combined vertical scan/correction signal and said combined horizontal scan/correction signal, said light beam deflection assembly means being further operable to deflect said light beam in the horizontal and the vertical directions.

5,150,958

VEHICULAR HEADLAMP HAVING INCLINATION MEASURING UNIT

Kenji Miyazawa, and Hidetoshi Terao, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 798,953

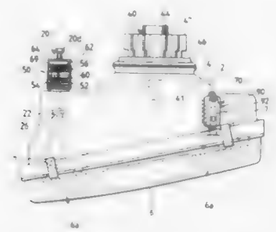
Claims priority, application Japan, Nov. 29, 1990, 2-325361

Int. Cl.[5] F21M *3/20*

U.S. Cl. 362—66 **20 Claims**

1. In a vehicular headlamp of a movable inclination member type in which an inclination member with a light reflecting surface for setting the direction of irradiation of said lamp is supported at three points of a swinging fulcrum supported on a reference member, and a horizontal aiming screw and a vertical aiming screw which penetrate said reference member and extend in directions generally parallel to an optical axis of said headlamp are supported by said reference member, said horizontal and vertical aiming screws being turned to adjust an inclination of said inclination member in a horizontal plane and in a vertical plane, respectively, to adjust the angle of irradiation of said headlamp, and an inclination measuring unit is

provided to measure an angle of inclination of said movable inclination member, the improvement wherein said inclination measuring unit is interposed between said reference member and a rear end portion of at least one of said aiming screws which protrudes rearward from said reference member, said inclination measuring unit determining said angle of inclination of said movable member by an amount of rotation of said at



least one of said aiming screws following a zero-point adjustment of said inclination measuring unit, said inclination measuring unit comprising a base member engaged with said rear end portion of said at least one of said aiming screws to be rotated by said screw, said base member having a male thread on an outer surface thereof, and a slide member threadably engaged with said male thread on said base member.

5,150,959

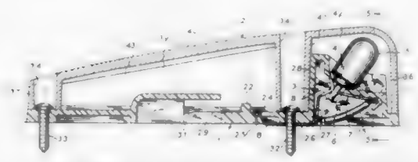
COMBINATION SIDE MARKER, CLEARANCE AND REFLEX LAMP FOR A VEHICLE

Edgar C. Paffrath, Barrington, Ill., and Brian A. Hanson, Theresa, Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed Feb. 6, 1991, Ser. No. 651,536

Int. Cl.[5] B60Q *1/26*

U.S. Cl. 362—80 **25 Claims**



1. A combination side marker, clearance and reflex lamp for a vehicle, comprising a base, connecting means for connecting the base to a vehicle, an outer surface of said base having an inwardly extending portion defining a recess, a lens mounted on the base and defining in combination with said base a bulb compartment, the inwardly extending portion of the base having an opening connecting the bulb compartment and the recess, a bulb disposed in the bulb compartment and having an electrically conductive base portion, said base portion extending through said opening and into said recess, sealing means for hermetically sealing said bulb compartment, and a plurality of electrical conductors mounted on the base and extending into said recess and connected to said bulb base portion.

5,150,960

REAR LICENSE PLATE ILLUMINATION

Morris R. Redick, Waterford, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1991, Ser. No. 802,801

Int. Cl.[5] B60Q *1/56*

U.S. Cl. 362—83.2 **9 Claims**

1. A vehicle illumination device for a license plate comprising:

a frame for supporting the license plate in a substantially vertical position wherein said frame comprises a two-piece structure and includes means permit a separation of said pieces so as to allow replacement of the vehicle plate;

a light pipe made of a solid clear material located within said frame in front of said license plate, and

a light source along one edge of said light pipe whereby said light pipe serves to uniformly illuminate said vehicle license plate when said light source is energized.

5,150,961

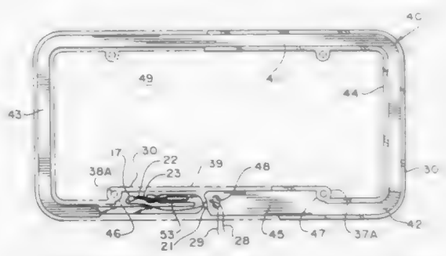
APPARATUS FOR ILLUMINATING A VEHICLE LICENSE PLATE AND METHOD OF USING SAME

Jaime D. Gonzalez, 9390 Suva St., Downey, Calif. 90240

Filed Aug. 6, 1991, Ser. No. 741,784

Int. Cl.[5] B60Q *1/56*

U.S. Cl. 362—83.2 **8 Claims**



1. A method of using an illuminating apparatus for illuminating a rear portion of a vehicle, comprising:

mounting a license plate to tube holder means;

placing a neon tube in said tube holder means;

connecting a set of conductors to electrodes of said neon tube;

connecting a free end of said conductors to a high frequency, high voltage transformer;

mounting said transformer adjacent to said neon tube in said tube holder means;

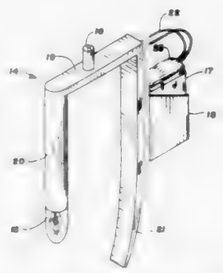
passing a set of input conductors attached to said transformer through an aperture disposed within a cover plate;

engaging said tube holder means with said cover plate to seal the neon tube and high voltage transformer within said tube holder;

coupling said input conductors to means for coupling said neon tube to an electrical system of the vehicle; and

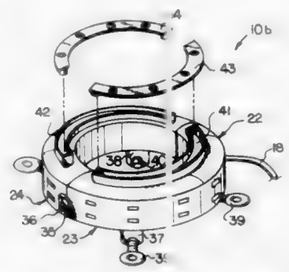
mounting said tube holder means and said cover plate to the rear portion of the vehicle.

5,150,96[illegible]
TOILET BOWL ILLUMI[illegible]NATING DEVICE
Michael Rauschenberger, 1938 Mis[illegible]y Dr., Benton, Ark. 72015
Filed Feb. 10, 1992, Se[illegible]r. No. 833,064
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 1 Claim



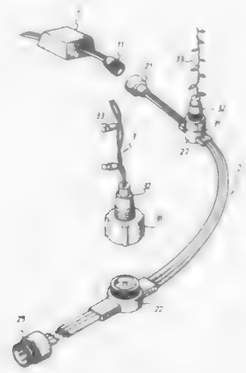
1. A toilet bowl illuminating de[illegible]ice comprising:
a body, comprising
an essentially flat horizontal [illegible]egment having an interior end, an exterior end and an upper surface,
an interior segment dependi[illegible]g downwardly from said interior end of said horizo[illegible]tal segment such that said interior segment extends in[illegible]o the interior of the toilet bowl when said horizontal [illegible]egment is positioned on the upper rim of the toilet bow[illegible], and
an exterior segment extending downwardly and inwardly from said exterior end of s[illegible]id horizontal segment, said exterior segment further b[illegible]ng comprised of a flexible material such that said ex[illegible]erior segment engages the exterior upper rim of the [illegible]oilet bowl in a releasably clamping manner,
said interior segment further [illegible]aving a lower end;
a lamp mounted on said lower [illegible]nd of said interior segment;
a momentary, normally-closed, [illegible]ush-button switch mounted on said upper surface of sa[illegible]d horizontal segment and communicating electrically w[illegible]th said lamp;
a battery housing mounted to s[illegible]id exterior segment; and
a battery contained within said [illegible]attery housing and communicating electrically with said push-button switch.

5,150,9[illegible]3
CHRISTMAS TREE LIGHT RE[illegible]CEPTACLE APPARATUS
Shirley J. Hill, 830 Douglas St., C[illegible]vington, Tenn. 38019
Filed Jan. 6, 1992, S[illegible]r. No. 817,343
Int. Cl.[5] F21[illegible] *23/00*
U.S. Cl. 362—123 1 Claim



1. A Christmas tree light recep[illegible]acle apparatus, comprising,
a torroidal ring housing, the tor[illegible]oidal ring housing including a central axial bore directe[illegible] coaxially therethrough arranged to receive a Christma[illegible] tree through the axial bore, and
the torroidal ring housing further including a cylindrical outer wall concentric with an inner wall, and
the cylindrical outer wall including a plurality of electrical receptacles directed into the housing from the outer wall, and
an electrical supply line directed into the housing in electrical communication with each receptacle, and
the ring housing includes a first semicylindrical housing and a second semi-cylindrical housing, with the first semicylindrical housing including a first housing first end wall and a first housing second end wall in coplanar relationship, the second semi-cylindrical housing including a second housing first end wall and a second housing second end wall arranged in a coplanar relationship, the first housing first end wall includes a first housing first end wall receptacle, and the first housing second end wall including a first housing second end wall plug, the second housing first end wall including a second housing first end wall plug and the second housing second wall including a second housing second end wall receptacle, the first housing first end wall receptacle received within the second housing first end wall plug, and the first housing second end wall plug received within the second housing second end wall plug received within the second housing second end wall receptacle to effect electrical communication of the first semi-cylindrical housing with the second semi-cylindrical housing and the electrical supply line, and
the first housing includes a first housing deflectable latch flange, including a first bore directed therethrough, wherein the first housing deflectable latch flange is tangentially aligned relative to the first housing extending orthogonally beyond the first housing first end wall, and the second housing including a second housing first end wall, and the second housing including a second housing boss plug positioned to the cylindrical outer wall adjacent the second housing first end wall, wherein the second housing boss plug is received within the first bore, and the first housing including a first housing boss plug mounted to the outer wall of the ring housing positioned adjacent the first housing second end wall, and the second housing including a second housing latch flange with a second bore directed therethrough positioned adjacent and orthogonally extending beyond the second housing second end wall tangentially mounted to the cylindrical outer wall to receive the first housing boss plug within the second bore, and
the first semi-cylindrical housing includes a plurality of first boss members mounted to a bottom surface of the first housing, and the second housing including a plurality of second boss members mounted to a bottom wall of the second housing, with the first boss members each receiving a threaded first rod directed therethrough, wherein each threaded first rod is radially aligned relative to the threaded second rods are radially aligned relative to the axial bore positioned therebelow, and
the first housing includes a first housing top wall and the first housing top wall includes a first trough mounted thereon, and the second housing includes a second housing top wall, and the second housing top wall includes a second trough mounted thereon, and the first trough and the second trough mounted thereon, and the first trough and the second trough are arranged for reception of fluid and potpourri therewithin, and the first trough includes a first aperture plate mounted to an upper distal end of the first trough, and the second aperture plate is arranged for securement to an upper distal end of the second trough, wherein the first aperture plate and the second aperture plate meter fragrance directed through the respective first and second apertured plate from the respective first and second trough.

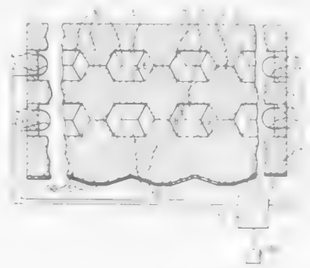
5,150,964
JOY LIGHT STRUCTURE
Pui-Hing Tsui, Room 1505, 15/F., Fullagar Industrial Building, 234 Aberdeen Main Road, Aberdeen, Hong Kong, Hong Kong
Filed Jun. 21, 1991, Ser. No. 719,029
Int. Cl.[5] F21V *23/04*; F21P *1/02*
U.S. Cl. 362—251 8 Claims



1. A joy light structure for variable connecting manner comprising:
(a) a controller (1) for providing an adjustable flashing module frequency signal and a plurality of channels;
(b) at least a main connecting wire (2) having a controller socket (21) at one end thereof for connecting of said main connecting wire (2) to the controller (1), a connecting plug (23) mounted at another end thereof for connecting of said main connecting wire (2) to a further main connecting wire, and at least a socket (22) being provided along said main connecting wire (2); and
(c) at least a string light (3) having a plurality of bulbs connected in series and a plug (32) disposed at one end thereof for connecting of the string light (3) to said main connecting wire (2) by inserting the plug (32) into the socket (22) and screwing a fastener (31) of said plug (32) onto said socket (22) the improvement comprising:
said main connecting wire (2) having at least three conductive wires, one being a common wire (221) and the others being controlled wires (222, 223);
at least three holes being provided within said socket (22), one for said common wire (221) and the others for said controlled wires (222, 223);
said plug (32) having two terminals, one terminal (321) for said common wire (221) and another terminal (322) for one of said controlled wires (222, 223);
a water-proof ring (323) being disposed between said plug (32) and socket (22) to prevent moisture permeation when said fastener (31) is screwed tight, whereby said string light (3) flashes in accordance with a flashing module controlled by said controller (1).

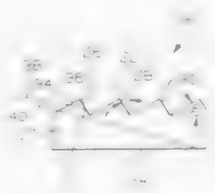
5,150,965
RADIATION-EMITTING PANELS AND DISPLAY ASSEMBLIES
Neil A. Fox, Eversham, England, assignor to Smiths Industries Public Limited Company, London, England
Filed Jul. 5, 1991, Ser. No. 726,176
Claims priority, application United Kingdom, Jul. 16, 1990, 9015575
Int. Cl.[5] F21K *7/00*
U.S. Cl. 362—260 10 Claims

1. A radiation-emitting panel of the kind including a first upper plate transparent to visible radiation, a second plate sealed with the first plate around its edge and enclosing a first gas-discharge volume at reduced pressure between a lower surface of the first plate and an upper surface of the second plate, at least one support member supporting the first and second plates within their edges internally of the first gas-discharge volume, and electrodes operable to excite discharge and radiation within said gas-discharge volume, the improvement wherein the panel includes a third lower plate, means sealing the third plate with the second plate around its edge and enclosing a second gas-discharge volume at reduced pressure between the lower surface of the second plate and the



upper surface of the third plate, at least one support member supporting the second and third plates within their edges internally of the second gas-discharge volume, and electrodes operable to excite discharge and radiation within the second gas-discharge volume, and wherein the second plate is transparent to visible radiation such that a part at least of the radiation produced in the second gas-discharge volume is transmitted through the second and first plates such that illumination can be provided by the panel even when there is no discharge within the first gas-discharge volume.

5,150,966
UNIFORM INTENSITY PROFILE CATADIOPTRIC LENS
John C. Nelson, The Sea Ranch, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Sep. 19, 1990, Ser. No. 585,308
Int. Cl.[5] F21V *5/02*
U.S. Cl. 362—337 12 Claims



1. A light fixture comprising:
a housing defining an optical cavity having an optical window for allowing light to escape from said optical cavity;
a light source in said optical cavity for producing light; and
a lens lying in said optical window for directing light from said optical cavity through said optical window, said lens having a first surface external to said optical cavity and a second surface internal to said optical cavity, said second surface being a structured surface, said structured surface having a plurality of triangular prisms formed thereon, each said prisms having a transmissive facet and a reflective facet positioned such that light from said light source will enter said lens through one of said transmissive facets, be totally internally reflected by one of said reflective facets and exit through said first surface, where each of said transmissive facets makes a first angle with said optical window and each of said reflective facets makes a second angle with a normal to said optical window, said

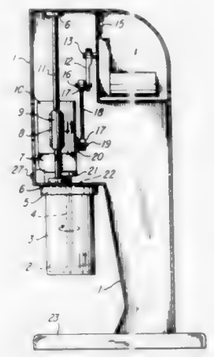
first and second angles for each of said prisms being selected to provide preselected light intensity distribution over said optical windown, said preselected light intensity distribution being provided by discarding a preselected percentage of said light from said light source.

5,150,967

MILKSHAKE MACHINE

Jim L. Neilson IV, 1021 Santa Cruz Way, Rohnert Park 94928, and Demont Neilson, Grassvalley, both of Calif., assignors to Jim L. Neilson, Elk Grove and Josefa N. Neilson, San Diego, both of Calif.

Continuation of Ser. No. 220,584, Jul. 18, 1988, abandoned. This application Oct. 25, 1991, Ser. No. 784,631
Int. Cl.[5] B01F *7/00, 7/16*
U.S. Cl. 366—206 9 Claims



1. An apparatus for blending ingredients comprising:
a) a housing;
b) a pair of mutually spaced vertical guide rods fixed in said housing;
c) a first motor slidably mounted on said guide rods by slider bearings such that said first motor may freely move up and down along said guide rods;
d) a mixing shaft including a mixing head drivingly connected to said first motor and movable up and down with said first motor;
e) a second motor operable simultaneously with said first motor mounted to said housing, said second motor including a drive shaft; and
f) means coupling said drive shaft of said second motor to said first motor such that rotation of said second motor drive shaft causes said first motor to slide up and down on said guide rods while said mixing shaft is rotatably driven by said first motor

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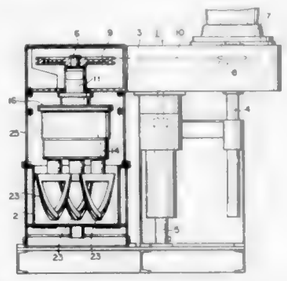
5,150,968

PLANETARY MIXER

Masakazu Inoue, Isehara, Japan, assignor to Inoue Seisakusho (Mfg) Co., Ltd., Japan

Filed Feb. 19, 1991, Ser. No. 657,421
Int. Cl.[5] B01F *7/14*
U.S. Cl. 366—288 15 Claims

1. A planetary mixer comprising:
an agitating head located above a tank;
a rotationally driven drive shaft downwardly extending from said head;
a rotary body connected to said drive shaft to rotate therewith;
three driven shafts rotatably carried by said rotary body and located at positions corresponding to respective apexes of an imaginary equilateral triangle surrounding said drive shaft;
three agitating blades connected to respective ones of said driven shafts and extending widthwise thereof, each blade having a maximum widthwise extent longer than the distance between the apexes of the imaginary equilateral triangle and long enough to allow said blade to rotate in close proximity to the inner wall of said tank; and



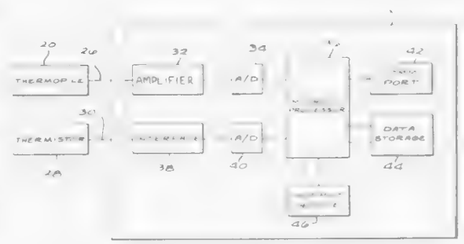
means responsive to rotation of said rotary body for rotating said driven shafts on their respective axes and revolving said driven shafts around said drive shaft thereby causing said three blades to undergo planetary motion in close proximity to the inner wall of said tank.

5,150,969

SYSTEM AND METHOD FOR TEMPERATURE DETERMINATION AND CALIBRATION IN A BIOMEDICAL PROBE

Jack Goldberg, San Diego, and Robert J. Rosati, Carlsbad, both of Calif., assignors to IVAC Corporation, San Diego, Calif.

Continuation of Ser. No. 492,655, Mar. 12, 1990, abandoned. This application Jul. 10, 1991, Ser. No. 729,866
Int. Cl.[5] G01J *5/18;* A61B *5/00*
U.S. Cl. 374—128 28 Claims



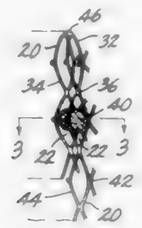
1. A thermometry system for providing a temperature signal representative of the temperature of a first target derived from the infrared energy received from the first target, comprising:
detector means having an infrared sensing area for receiving the infrared radiation from the first target and having a reference temperature area, the detector means providing a steady state detector signal which is a function of the temperature of the infrared sensing area and of the reference temperature area;
sensor means for providing a reference signal which is a function of the temperature of the reference temperature area;
processor means for providing a first polynomial function of the detector signal having a plurality of non-zero terms, for providing a second polynomial function of the reference signal having a plurality of non-zero terms, for combining the first polynomial function with the second polynomial function and for providing the temperature signal based on said combination.

5,150,970

OPEN MESH CARRYING BAG AND METHOD OF MAKING

Joseph M. Albarelli, 17 Denise Dr., Kinnelon, N.J. 07405

Filed Sep. 23, 1991, Ser. No. 763,553
Int. Cl.[5] B65D *30/06, 33/28*
U.S. Cl. 383—76 10 Claims



1. In a carrying bag for articles of maximum predetermined dimensions, the carrying bag including:
at least one side wall constructed of an open mesh material having mesh openings, the mesh openings all having dimensions in every direction smaller than the maximum predetermined dimensions of the articles to be carried, the side wall extending from a bottom end to a top end;
bottom closure means; and
top closure means for selectively closing the bag at the top end of the side wall;
an improvement in the top closure means, the improvement comprising:
a hem at the top end of the side wall, the hem including a folded-over portion of the side wall folded back toward the bottom end so as to overlap a further portion of the side wall adjacent the top end and register at least some of the mesh openings in the folded-over portion of the side wall with counterpart mesh openings in the overlapped further portion of the side wall; and
a drawstring threaded through at least some of the registered mesh openings such that the drawstring passes through both the folded-over portion and the overlapped further portion of the side wall to secure together the folded-over portion and the overlapped further portion of the side wall without the necessity for additional securing means and provide a carrying handle while enabling selective contraction and closing of the top end of the bag by drawing upon the drawstring.

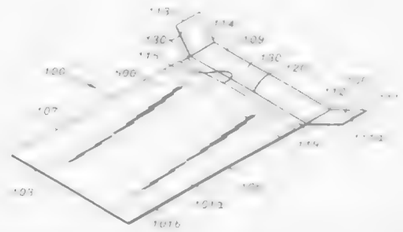
5,150,971

DIAGNOSTIC SPECIMEN MAILING DEVICE

Kathleen M. Strong, Sunnyvale, and Richard S. Matusewicz, San Jose, both of, assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 622,677, Dec. 7, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 813,065
Int. Cl.[5] B65D *30/08, 33/18*
U.S. Cl. 383—84 10 Claims

1. A mailing device useful for etiologic agents and biomedical materials comprising:
a) a substantially rectangular front panel and a substantially rectangular back panel where three sides of said front panel and three sides of said back panel are in sealed communication with each other, said sealed sides being impervious to liquids, and where a fourth side of said front panel and a fourth side of said back panel define an opening to an interior central region between said front panel and said back panel, said front panel and said back panel each comprising at least two layers, a first outer layer and a second interior layer, said second interior layer being exposed to said interior central region, said second interior layer being impervious to liquids, said second interior layer being chemically inert to etiologic agents and biomedical materials, the side of said back panel not in sealed communication with the side of said front panel further comprising a flap region, said flap region defining a first length, said flap region comprising:
i) adhesive means for sealing said flap region to said front panel;
ii) means for folding said flap region, said means being located along a line substantially parallel to said opening to said interior central region, said line being from about one-fourth to about one-half of the length of said flap region from said opening to said interior central region; and



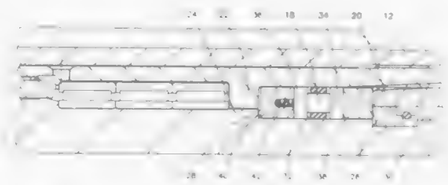
iii) at least two tabs, a first tab extending outwardly from said flap region in a direction parallel to the opening of said interior central region, and a second tab extending outwardly from said flap region in a direction parallel to the opening of said interior central region, said first tab and said second tab being on opposite ends of said flap region relative to each other, said first tab and said second tab each including means for folding said tabs, said first tab and said second tab each including adhesive means for sealing said tabs to said back panel.

5,150,972

METHOD OF INCREASING THE OFF BOTTOM LOAD CAPACITY OF A BEARING ASSEMBLY

William R. Wenzel, 3763 - 74 Avenue, Edmonton, Alberta, Canada T6B 2T7

Filed Sep. 26, 1991, Ser. No. 766,016
Claims priority, application Canada, Oct. 1, 1990, 2026630
Int. Cl.[5] E21B *4/00;* F16C *19/30;* B21D *53/10*
U.S. Cl. 384—97 3 Claims



1. A method of increasing the off bottom load capacity of a bearing assembly having an outer tubular member, an inner tubular member telescopically received within the outer tubular member, and bearings disposed between the inner tubular member and outer tubular member to facilitate relative rotation of the outer tubular member and inner tubular member while accommodating radial and axial loads, comprising the steps of:
a) firstly, forming a first shoulder and a second shoulder in opposed spaced relation on an interior surface of the outer tubular member;
b) secondly, forming a first shoulder and a second shoulder in opposed spaced relation on an exterior surface of the

inner tubular member, the shoulders on the inner tubular member being generally aligned with the shoulders on the outer tubular member thereby defining a containment chamber; and

c) thirdly, placing at least one thrust bearing in the containment chamber, the thrust bearing having a first side race and a second side race, such that when the bearing assembly is placed in compression the first shoulder of the outer tubular member bears against the first side race and the second shoulder of the inner tubular member bears against the second side race, and when the bearing assembly is placed in tension the second shoulder of the outer tubular member bears against the second side race and the first shoulder of the inner tubular member bears against the first side race.

2. An improvement in a bearing assembly having an outer tubular member, an inner tubular member telescopically received within the outer tubular member, and bearings disposed between the inner tubular member and outer tubular member to facilitate relative rotation of the outer tubular member and inner tubular member while bearing radial and axial loads, the improvement comprising:

a) a first shoulder and a second shoulder in opposed spaced relation on an interior surface of the outer tubular member;

b) a first shoulder and a second shoulder in opposed spaced relation on an exterior surface of the inner tubular member, the shoulders on the inner tubular member being generally parallel to the shoulders on the outer tubular member thereby defining a containment chamber; and

c) at least one thrust bearing disposed in the containment chamber, the thrust bearing having a first side race and a second side race, such that when the bearing assembly in placed in compression the first shoulder of the outer tubular member bears against the first side race and the second shoulder of the inner tubular member bears against the second side race, and when the bearing assembly is placed in tension the second shoulder of the outer tubular member bears against the second side race and the first shoulder of the inner tubular member bears against the first side race.

5,150,973

MOUNTING SLEEVE FOR ANTI-FRICTION BEARING

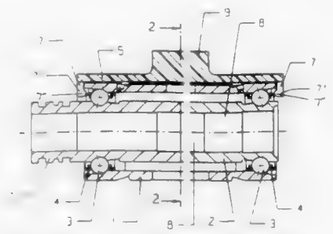
Ernst Masur, Untereuerheim; Gottfried Ruoff, Oberwerrn, and Werner Planek, Dittelbrunn, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KgaA, Fed. Rep. of Germany

Filed Dec. 16, 1991, Ser. No. 809,266

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1991, 9100928[U]

Int. Cl.[5] **F16C** *41/04 33/60, 43/04*

U.S. Cl. 384—448 **16 Claims**



1. A mounting sleeve for an anti-friction bearing, the bearing having an outer ring, an inner ring and at least one annular row of anti-friction rolling bodies between the rings;

the mounting sleeve being of approximately U-shaped cross-section with a slit opening extending along the axial length of the sleeve and the slit opening defining arms of and circumferential ends of the sleeve, the width of the opening between the ends of the arm being sufficient to enable the sleeve to be installed, slit opening first, over the outer ring and to enable the sleeve to be removed from the outer ring with the outer ring passing through the slit opening;

the row of rolling bodies being toward one axial end of the inner and the outer rings;

a flange extending at least partially around the sleeve, located at the one axial end of the sleeve and extending radially inward to at least indirectly engage the row of rolling bodies to help prevent the rolling bodies in the row from moving axially out from the outer ring.

5,150,974

GREASE-SEALED BEARING WITH OXIDE LAYERS

Kenji Tamada, Kuwana; Hirokazu Nakajima, Kaizu; Akio Okayama, and Takahiro Mizutani, both of Kuwana, all of Japan, assignors to NTN Corporation, Osaka, Japan

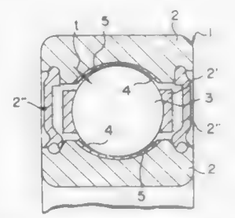
PCT No. PCT/JP90/00031, § 371 Date Sep. 10, 1990, § 102(e) Date Sep. 10, 1990, PCT Pub. No. WO90/08264, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1990, Ser. No. 576,498

Claims priority, application Japan, Jan. 14, 1989, 1-6557

Int. Cl.[5] **F16C** *33/10, 33/62*

U.S. Cl. 384—463 **2 Claims**



1. A grease-sealed bearing having inner and outer rings that enclose a plurality of rolling elements, a cage for guiding the plurality of rolling elements, seal members for sealing said plurality of rolling elements enclosed between said inner and outer rings, and grease sealed therebetween, characterized in that oxide coatings having a thickness of 0.1–2.5 microns are formed on rolling surfaces of the rings.

5,150,975

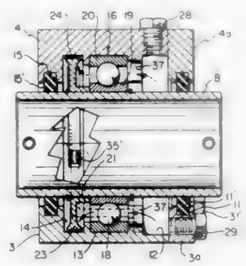
COMPACT SELF-LUBRICATING BEARING SYSTEM

Kenneth E. Major; John L. Baker, and David K. Braunagel, all of Houston, Tex., assignors to Hy-Tech Hydraulics, Inc. and Michael P. Breston, both of Houston, Tex.

Filed Feb. 12, 1987, Ser. No. 14,425

Int. Cl.[5] **F16C** *33/66*

U.S. Cl. 384—465 **18 Claims**



1. A bearing lubricating system, comprising:

a casing having a body defining a bore, a liquid lubricant reservoir, a circular well, and a return passage between said well and said reservoir;

said well having at least one expanding channel gradually tapering outwardly over an arcuate extent;

said channel having a discharge outlet communicating with said return passage;

a shaft extending through said reservoir and through said well;

at least one bearing between said reservoir and said well, said bearing having an inner race, an outer race, and bearing elements between said races for supporting said shaft for rotation within said bore;

a circular pumping mechanism concentrically mounted on said shaft for rotation within said well, said pumping mechanism having (1) an overall diameter corresponding substantially to the outside diameter of said outer race, and (2) at least two diametrically-opposed radial vanes, and each consecutive pair of vanes defining a pocket therebetween for accepting lubricant therein, whereby said pumping mechanism, when rotating with said shaft, (1) causing lubricant to flow by suction out of said reservoir through and across said bearing and into said well, thereby lubricating and cleansing said bearing elements, and (2) pressurizing said lubricant to flow out of said well and return to said reservoir through said discharge outlet and said return passage; and

a pair of end seals at the opposite ends of said bore for sealing off said bore from the ambient.

5,150,976

MATRIX PRINTING HEAD WITH FORWARD AND RETURN ARTICULATED-ARMATURE MAGNETS

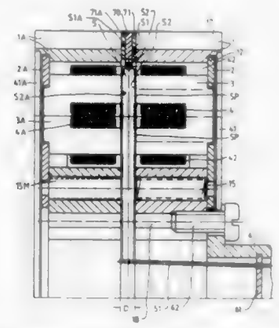
Jurgen Hilkenmeier, Paderborn, and Hans-Werner Volke, Salzkotten, both of Fed. Rep. of Germany, assignors to Siemens-Nixdorf Informationssysteme AG, Paderborn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 272,680, Nov. 7, 1988, Pat. No. 4,988,223. This application Nov. 19, 1990, Ser. No. 615,197

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715304; PCT Int'l Appl., May 7, 1988, EP88/00393

Int. Cl.[5] **B41J** *2/27*

U.S. Cl. 400—124 **3 Claims**



1. An electromagnetic drive mechanism for a matrix printing head pin, comprising: an articulated armature mounted for articulation at one end and having a free end for acting on a matrix printing head pin and having a longitudinal midplane; and forward mechanism for articulating the armature to move a pin into an engaged position comprising a first electromagnet with an exciter winding and a first yoke on one side of the armature having a pole surface; a return mechanism for articulating the armature to move a pin into a disengaged position, wherein the return mechanism comprises a second electromagnet acting upon the same armature as that of the first electromagnet and with an exciter winding and a second yoke identical to the first yoke and having a pole surface and mounted on a side of the armature facing away form the first yoke of the first electromagnet with the pole surfaces facing each other and wherein the first and second electromagnets are mirror symmetrical about the longitudinal midplane of the armature; and controls to alternate the flow of current through the exciter windings of the first and second electromagnets.

5,150,977

RECORDING APPARATUS WITH DETECTOR FOR PAPER EDGE AND END OF RIBBON SENSING

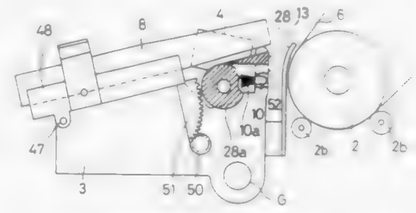
Junichi Yoshikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 322,920, Mar. 14, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,248

Claims priority, application Japan, Mar. 15, 1988, 63-59456; Feb. 27, 1989, 1-43301

Int. Cl.[5] **B41J** *35/36, 35/20, 29/44*

U.S. Cl. 400—703 **8 Claims**



1. A recording apparatus for recording on a recording medium, comprising:

a carriage;

a recording medium mounting portion for mounting the recording medium so it can be conveyed in a conveying direction;

an ink sheet mounting portion, supported on said carriage, for mounting an ink sheet having ink, with the ink sheet including an alarming portion indicating the end of the ink sheet, with said ink sheet mounting portion being reciprocally movable in a first direction across the recording medium and in a second direction along the conveying direction;

recording means for transferring the ink of the ink sheet to the recording medium, thereby recording on the recording medium;

detecting means, supported on said carriage, for detecting a size of the recording medium mounted on said recording medium mounting portion and for detecting the alarming portion on the ink sheet; and

driving means for driving said ink sheet mounting portion in the conveying direction and for eliminating the ink sheet from a position in front of said detecting means in order to detect the size of the recording medium.

5,150,978

WAX APPLICATOR WITH RUBBER BUMPER END

Bryan J. Stewart, and Victoria J. Stewart, both of 125 S. Santa Ynez, Santa Barbara, Calif. 93103

Filed Jul. 26, 1991, Ser. No. 736,712

Int. Cl.[5] **A47L** *13/30*

U.S. Cl. 401—14 **4 Claims**

1. A device for storing and applying wax-like substances comprising:

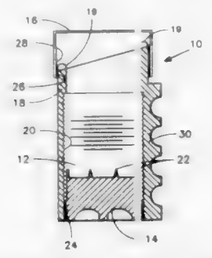
a tubular body having a threaded interior surface and a threaded exterior end, said exterior end being beveled;

a compliant ring affixed to said beveled end of said tubular body;

a plunger base having a plurality of projecting wax anchors for removably affixing solid wax to said base, said base being generally cylindrical and having a threaded exterior

surface for engaging with said tubular body's threaded interior surface, said plunger base having a thumb and finger groove oppositely disposed from said wax anchors;

a closed end cap having a threaded open end, said cap being threaded for removable engagement with said tubular body's threaded exterior end; and



means for threading said plunger base along said interior surface thereby moving any wax affixed to said anchors, in an undeformed manner, toward said threaded exterior end of said body and, without interference, beyond the circumferential confines of said body;

whereby said compliant ring affixed to said beveled end of said tubular body prevents abrasive contact between said tubular body and an object being waxed.

5,150,979
BALL POINT PEN WITH LIQUID INK
Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201
Continuation-in-part of Ser. No. 45,106, Jun. 4, 1979, abandoned. This application Sep. 16, 1985, Ser. No. 776,219
Int. Cl.[5] B43K *7/10*
U.S. Cl. 401—209 **17 Claims**

1. A writing pen comprising,

a barrel having a front end and an aperture in the front end and a writing ball operatively mounted in the aperture,

the barrel having a constantly rear-end vented reservoir constituted by an essentially open-space interior, and enabling free movement of the ink therein

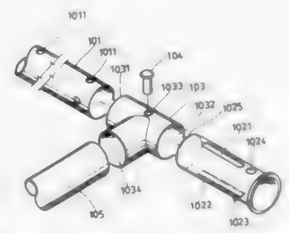
means for filling the barrel to a pre-determined effective capacity with aqueous ink,

control means forming a capillary space operative for receiving ink from the main reservoir and holding it therein by capillary action, and feeding it by capillary action to the writing ball, and that capillary space constituting the only communication between the reservoir and writing ball, and

the control means being operative, when the writing pen is in front-end-down position, for confining all ink in the barrel, except that in the capillary space, and holding it separated from and out of contact with or continuity with the ink in the capillary space, and holding it against bearing on or having any action or influence on the writing ball or capillary space, whereby when the writing pen is in that position, only the ink in the capillary space has communication with the writing ball,

the capillary space being so positioned that, when the writing pen is adjacent horizontal position, the ink in the main reservoir has communication with the capillary space, and flows thereinto by capillary action.

5,150,980
FIXTURE FOR A FOLDING BED
Yung-Hsiung Lin, No. 99 Tai Yuan Road, Taipei, Taiwan
Filed Oct. 17, 1991, Ser. No. 778,444
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 **3 Claims**



1. A fixture comprising:

a pipe connector made from a 3-way tube having a first outlet sleeved on a transverse frame tube on a folding bed at one end and firmly secured thereto by a rivet, a second outlet sleeved on a longitudinal frame tube on said folding bed at one side, a third outlet;

a side tube inserted through said third outlet and said first outlet into said transverse frame tube, said side tube having an elongated slot longitudinally made on the outer wall thereof at a suitable location through which said rivet is inserted, a unitary flexible strip formed thereon through the process of punching at a location opposite to said elongated slot, and a fastening hole on the outer wall thereof for fastening supporting means, said unitary flexible strip having a fixed end at one end secured to said side tube and a free end at an opposite end with a stop block made thereon at an outer side relative to said elongated slot; and

wherein said side tube is retained to said pipe connector by said rivet and can be moved in and out within the range of said elongated slot; said stop block on said flexible strip will be stopped against the peripheral edge of said third outlet to prohibit said side tube from moving back into said pipe connector again, or said stop block on said flexible strip can be squeezed inwards permitting said side tube to be moved inside said pipe connector.

5,150,981
BALL JOINT ASSEMBLY HAVING AN EXTENDED BALL SURFACE
Ikuhisa Miwa, Seki, Japan, assignor to Nippon Thompson Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 251,147, Sep. 29, 1988, abandoned. This application Sep. 10, 1991, Ser. No. 759,181
Claims priority, application Japan, Sep. 29, 1987, 62-242554
Int. Cl.[5] F16C *11/06*
U.S. Cl. 403—122 **4 Claims**

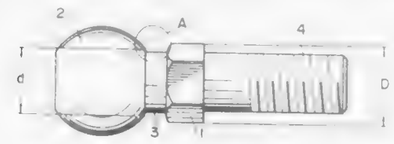
1. A ball unit for use in a ball joint assembly, said assembly including a ball unit, which is generally elongated in shape and

formed from a single columnar material, and a socket unit which may be operatively coupled thereto to provide a relative motion therebetween, said ball unit comprising:

a ball section formed at a top end of said ball unit and movably received in a socket section of said socket unit when assembled, said ball section providing a spherical contact surface contacting a spherical contact surface of said socket section;

a cut-away section formed immediately adjacent to said ball section and having a first diameter, said cut-away section being relatively short with respect to said ball section in a longitudinal direction of said ball unit;

a nut section formed adjacent to said cut-away section and

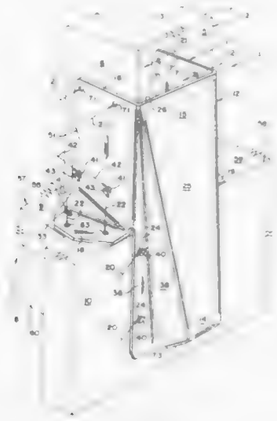


having a nut shape and a second diameter which is a diameter of a largest circle definable by said nut section and which is greater than said first diameter; and

a holding section formed adjacent to said nut section;

wherein said ball section includes an extended portion which partly extends longitudinally into and peripherally surrounds a space defined by said cut-away section and which is defined when said ball section is subjected to a ball deformation roll rolling process in the form of a circular cantilevered overhang having a substantially non-flat tip end of a predetermined portion of said ball section to thereby provide an extended spherical surface, said tip end defining a third diameter which is greater than said first diameter but smaller than said second diameter.

5,150,982
DECK POST TIE
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed Mar. 9, 1990, Ser. No. 491,325
Int. Cl.[5] F16B *9/00*; **E04B** *1/38*
U.S. Cl. 403—232.1 **9 Claims**



1. A wood post connection comprising:

a. an upright supported wood post member having a longitudinal axis, a base, a back side, and first and second sides;

b. a support structure having a first support surface for receiving said base of said upright supported wood post member thereon and a second support surface angularly related to said first support surface and substantially in the plane of said backside of said upright supported wood post member;

c. a rigid one piece connector having:

1. an elongated rigid overturnign moment resistant structural back member having a longitudinal axis including disposed upper flush portions in registration with said backside of said upright supported wood post member and disposed lower flush portions extending linearly beyond said base of said upright supported wood post member in registration with a portion of said second support surface of said support structure and an outer back member formed ins aid elongated rigid overturning moment resistant structural back member of said rigid one piece connector including a first triangular shaped side member integrally connected to said upper and lower flush portions of said rigid overturning moment resistant back member and said first triangular shaped side member extending angularly outwardly from said second support surface for resisting buckling upon the application of a selected moment force acting at an angle against said longitudinal axis of said upright supported wood post member;

2. a first side member angularly and integrally connected to a substantial portion of said upper flush portion of said elongated rigid overturning moment resistant structural back member and disposed for connection to said first side of said upright supported wood post member;

3. a second side member angularly and integrally connected to a substantial portion of said upper flush portion of said elongated rigid overturnign moment resistant structural back member and disposed for connection to said second side of said upright supported wood post member;

4. a first flange member angularly and integrally connected to a substantial portion of said first side member of said rigid one-piece connector and disposed for connection to said first support surface of said support structure;

5. a second flange member angularly and integrally connected to a substantial portion of said second side member of said rigid one-piece connector and disposed for connection to said first support surface of said support structure;

d. back connector fastening means joining said lower flush portion of said elongated rigid overturning moment resistant structural back member to said second support surface of said support structure;

e. side connector fastening means respectively joining said first and second sides of said rigid one-piece connector to said first and second sides of said upright supported wood post member; and

f. flange connector fastener means respectively joining said first and second flange members to said first support surface of said support structure.

5,150,983
CORNER LOCK
David R. Bogenhagen, Hudson, Wis., assignor to Andersen Corporation, Bayport, Minn.
Filed Jan. 8, 1991, Ser. No. 638,832
Int. Cl.[5] E06B *1/00*
U.S. Cl. 403—402 **7 Claims**

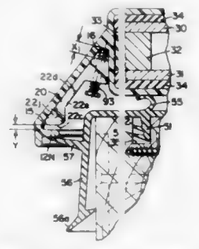
1. A corner fastener for use in securing first and second sash members together to form a corner of a sash, the sash members each having a mitred end and each sash member forming an opening and channel cavity at its mitred end, said channel cavities being a first channel cavity in said first sash member and a second channel cavity in said second sash member, said channel cavities having first corner surfaces and second, opposite corner surfaces, said fastener comprising:

(a) a first leg member having first and second ends and a

second leg member having first and second ends, said first ends operatively connected to each other at an intersection;

(b) said leg members generally conforming to a portion of the shape of said channel cavities;

(c) said leg members each having a threaded aperture formed therein for receiving fastening members, said



threaded apertures in general alignment to intersect the respective first corner surfaces; and

(d) wherein when the fastening members are tightened in said threaded apertures, the fastening members engage the first corner surfaces and move said leg members against said second corner surfaces, thereby tightening and securing the sash members together without the necessity of holes being formed in the sash members.

5,150,984

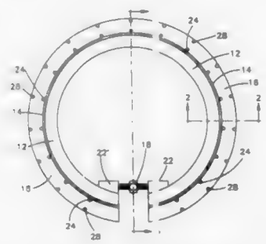
STIFFENING FLANGES FOR DEFORMATION RESISTANCE OF MANHOLE COVER SUPPORT

Harold M. Bowman, Fairview Park, and George T. Fuller, Chagrin Falls, both of Ohio, assignors to Harold M. Bowman, Fairview Park, Ohio

Continuation-in-part of Ser. No. 595,255, Oct. 12, 1990, Ser. No. 366,177, Jun. 13, 1989, Pat. No. 4,969,771, Ser. No. 362,257, Jun. 6, 1989, Pat. No. 4,963,053, Ser. No. 362,216, Jun. 6, 1989, Pat. No. 4,966,489, Ser. No. 536,641, Jun. 12, 1990, abandoned, and Ser. No. 560,184, Jul. 31, 1990, abandoned. This application Mar. 4, 1992, Ser. No. 846,518

Int. Cl.[5] E02D *29/14*

U.S. Cl. 404—26 18 Claims



1. In a manhole cover support adapted to raise the level of a manhole cover from a position of retention by a cover seat element and a housing element of an existing manhole cover-supporting structure to a new and higher level and there retaining it, the manhole cover support comprising a base that is adapted to fit into the housing element of the existing cover-supporting structure, said base having a top that is substantially in one plane for support of the cover, a bottom therebelow that is in another plane, and a cover keeper of sheet metal that is connected to and extends upwardly from the outer perimeter of the base, the improvement for increasing the resistance of the cover support to deformation which comprises:

a flanged outward top on said keeper, the resulting outward bend of said top being equipped with a succession of pressed-in gussets, the troughs of which slope with respect to the keeper.

5,150,985

METHOD OF DISPOSING OF SALT-CONTAINING DUSTS FROM INCINERATOR PLANTS

Werner Roesky, Overath; Dieter Deffner, Bergisch Gladbach, and Manfred Wolter, Leverkusen, all of Fed. Rep. of Germany, assignors to Sante Corporation, Largo, Fla.

Filed Oct. 17, 1990, Ser. No. 597,991

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1989, 3934948

Int. Cl.[5] B09B *3/00*

U.S. Cl. 405—128 16 Claims

1. A method of disposing of salt-containing dusts from incinerator plants comprising the steps of:

mixing salt-containing dusts, having approximately 1% or less lime, with cement and water, whereby the amount of cement is between 3% and 25% of the total mixture, and the amount of hydrothermally reactive powdered components is not less than 8% of the total mixture;

compacting the mixture into discrete compacts,

hardening the discrete compacts in an autoclave by saturated steam with a pressure of at least 1 bar to form stable compacts.

5,150,986

PROCESS AND APPARATUS FOR DEPOSITING SILT ON THE BOTTOM AND SLOPES OF THE WET OPEN WORKING OR DREDGING

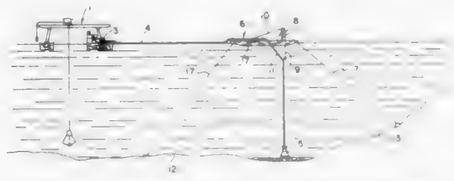
Wolfgang Rohr, Speyerer Str. 74-80, 6701 Otterstadt, Fed. Rep. of Germany

Filed Jan. 17, 1991, Ser. No. 642,348

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001630

Int. Cl.[5] E02F *5/22*

U.S. Cl. 405—223 3 Claims



1. Process for depositing silt on the bottom and the slopes of a wet open landscape working having a borrow pit, in which silt material in common with recovered sand and gravel material taken from the borrow pit is transported to a treatment installation, separated there from usable material and then deposited as sealing silt on the bottom and the slopes of the borrow pit of the wet open working, characterized in that separated out silt is recovered, pumped over a flexible conveyance line to a floating discharge station supporting an underwater silt depositing system at an exactly determined place of the bottom and/or slope of the wet open working, which place is regularly shifted, and deposited there as a sealing discharge in a determined stratum thickness, and shifting the depositing system after reaching a stratum thickness.

5,150,987

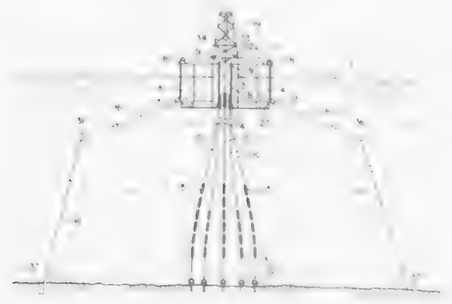
METHOD FOR INSTALLING RISER/TENDON FOR HEAVE-RESTRAINED PLATFORM

Charles N. White, and Riley G. Goldsmith, both of Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 695,231, May 2, 1991, abandoned. This application Jan. 2, 1992, Ser. No. 817,026

Int. Cl.[5] E02B *17/00*

U.S. Cl. 405—224 9 Claims



1. A method for installing a riser/tendon for maintaining a floating structure in a heave-restrained mode comprising:

(a) running a first surface conductor and disposing the first surface conductor in the floor of a body of water on which the floating structure floats,

(b) drilling a borehole of smaller diameter than the first surface conductor through the first surface conductor to a depth sufficient for control of drilling fluid pressure,

(c) emplacing and cementing a second conductor inside the first surface conductor and the borehole,

(d) drilling a second borehole of smaller diameter than the second conductor through the second conductor to a depth sufficient for control of subterranean formation pressure,

(e) emplacing and cementing a casing string inside the second conductor for a pressure containment distance but not above the floor of the body of water and inside the second borehole to provide a multiple walled system for redundant well control,

(f) thereupon installing a surface blowout preventer system (BOPS) on the floating structure and the multiple walled system,

(g) drilling one or more successive boreholes through the casing string or successive casing strings until a successive borehole has penetrated a hydrocarbon bearing formation and emplacing and cementing one or more successive casing strings inside the successive boreholes and inside next successive casing strings for a pressure containment distance but not above the floor of the body of water,

(h) thereupon, while the hydrocarbon-bearing formation is isolated by a cemented successive casing, disconnecting and retrieving from above the floor of the body of water in sequence from smaller to larger one or more casings and/or conductors,

(i) thereupon, running and connecting or leaving in place one or more conductors and/or risers such that at least two tubulars connect in fluid tight double wall isolation the innermost casing at the floor of the body of water to the floating structure, and

(j) imparting tension on at least one of the two tubulars from the floating structure such as to suppress heave of the floating structure.

5,150,988

COMBINATION VIBRATOR, AERATOR, AND LIQUID-INJECTION SYSTEM

Paul E. Powell, 1801 Westlake Dr., #104, Austin, Tex. 78746, and Larry N. Britton, Rte. 3, Box 2140, Spicewood, Tex. 78669

Filed Feb. 12, 1991, Ser. No. 654,006

Int. Cl.[5] E02D *3/00*

U.S. Cl. 405—258 18 Claims

1. A device for introducing materials selected from the group including gases, microorganisms, nutrients, and other chemicals, into sediments in-situ comprising:

a multi-orificed, non-jetting aeration means for diffusing gases under pressure,

a multi-orificed, non-jetting liquid-injection means for diffusing materials contained in liquids under pressure,

a vibration means,

said aeration means and said liquid-injection means being attached to said vibration means whereby vibration causes said device to penetrate the sediment while releasing gases and liquids containing said materials into the sediments without unduly dispersing said sediments.

5,150,989

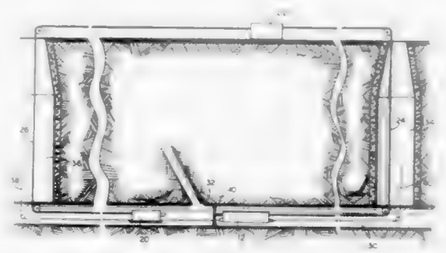
METHOD AND APPARATUS FOR LOCATING A SERVICE PIPE OUTLET TRANSVERSELY CONNECTED TO A LINED MAIN PIPE

Charles A. Long, Jr., and Todd W. Goodwin, both of Birmingham, Ala., assignors to Long Technologies, Inc., Birmingham, Ala.

Division of Ser. No. 517,121, May 1, 1990, Pat. No. 5,044,824. This application Jul. 9, 1991, Ser. No. 727,495

Int. Cl.[5] F16L *1/00*

U.S. Cl. 405—303 12 Claims



1. A remotely controlled locator material dispensing apparatus for use within a conduit having an axis to mark specific conduit locations for later identification, said locator material dispensing apparatus comprising:

control means located outside of the conduit for generating a plurality of control signals for controlling the operation of the locator material dispensing apparatus;

a first structural unit including a source of locator material to

be dispensed onto an interior surface of said conduit, said first structural unit being connected to said control means for receiving the control signals therefrom, and for dispensing the locator material from said first structural unit onto the interior surface of said conduit in accordance with the received control signals;

said first structural unit comprises:

a housing including a locator material storage chamber for storing locator material to be dispensed; and

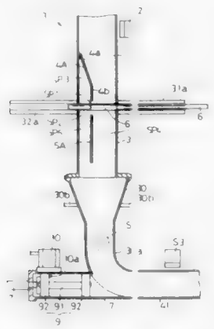
locator material distributing means positioned on said housing and in fluid communication with said storage chamber for dispensing and distributing said locator material in accordance with the received control signals.

5,150,990

HIGH DENSITY PNEUMATIC TRANSPORT SYSTEM FOR USE WITH SOLID MATERIALS

Kiyoshi Morimoto; Akikazu Iwamoto; Masahiko Shimizu; Teiichi Miwa, all of Shizuoka, and Hazue Murata, Nara, all of Japan, assignors to Kabushiki Kaisha Matsui Seisakusho, Osaka, Japan

Filed Oct. 31, 1990, Ser. No. 606,094
Claims priority, application Japan, Nov. 8, 1989, 1-290882
Int. Cl.[5] B65G *53/66*
U.S. Cl. 406—50 2 Claims



1. A high density pneumatic transport system for pneumatically transporting slid materials, said system comprising:

(a) a transport pipe;

(b) an airtight transport tank comprising:

an upper material storage chamber for storing solid materials supplied from a solid material manufacturing means;

a guide plate comprising a tapered upper portion and a vertical portion, said tapered upper portion being attached with the inner wall of said upper material storage chamber and said vertical portion extending from an end of said upper portion with space, at the bottom thereof, which is large enough to allow solid materials to pass therethrough;

a slide damper connected under said upper material storage chamber, said slide damper controlling the discharge of solid materials stored in said upper material storage chamber;

a lower material storage chamber connected under said slide damper;

a vertical partition provided in said lower material storage chamber with space, at the top thereof, which is large enough to allow solid materials to pass therethrough and also with space at the bottom thereof; and

a charge tank connected under said lower material storage chamber and provided with pressurized gas introduction pipes for taking materials out of the tank into said transport pipe;

(c) said transport pipe connected under said airtight transport tank comprising:

a lower horizontal pipe including accelerating means;

a vertical riser pipe connected with said lower horizontal pipe, said vertical pipe including decelerating means and accelerating means vertically arranged in the direction of material transportation; and

an upper horizontal pipe connected with said vertical riser pipe, said upper horizontal pipe including decelerating means at the upstream end thereof; and

(d) a collector connected with the terminal end of said upper horizontal pipe for receiving the transported materials,

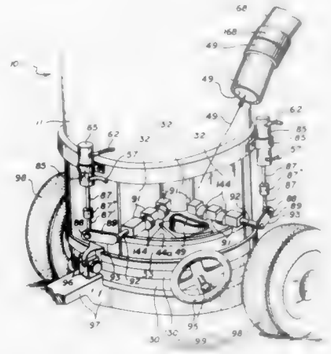
whereby solid materials fed into said charge tank by opening said slide damper of said airtight transport tank are supplied into said transport pipe by feeding a pressurized gas intermittently into said charge tank, pushed forward at high density through said lower pipe and said vertical pipe, then decelerated by said decelerating means provided at the upstream end of said upper horizontal pipe so as to form a long column and finally collected into said collector under substantially gravitational fall.

5,150,991

PARTICULATE-MATERIAL GUN WITH IMPROVED SEALING SYSTEM

David J. Stoner, Corona del Mar; Joseph M. Sanger, San Gabriel; Louis E. Pahoundis, La Crescenta, and James H. Riahi, San Dimas, all of Calif., assignors to Reed Manufacturing, Walnut, Calif.

Filed Jan. 24, 1991, Ser. No. 645,589
Int. Cl.[5] B65G *53/00*
U.S. Cl. 406—67 50 Claims



1. Apparatus for conveying particulate material such as gunite from a hopper to a delivery tube, and comprising:

means defining a receiving port for receiving such material from such a hopper;

means defining a discharge port for discharge of such material into such a delivery tube;

feed structure mounted for rotation and defining at least one chamber for receiving such material from the receiving port and for carrying received material by said rotation to the discharge port for discharge;

pneumatic means, defining and including a pneumatic supply orifice, for applying gas to blow material from the feed structure into the discharge port;

sealing means for substantially sealing a pneumatic path defined by the pneumatic supply orifice, the discharge port, such tube, and at least one chamber when generally in position for said discharge;

mechanical means for applying force to press the sealing means against the feed structure;

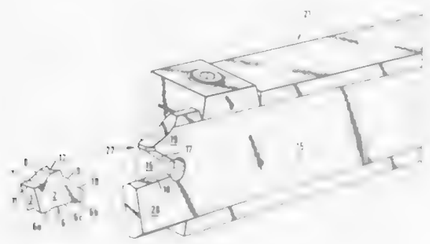
biasing means for applying a substantially regulated level of force to drive the mechanical means and to substantially stabilize the level of force applied by the mechanical means to press the sealing means against the feed structure.

5,150,992

CUTTING INSERT AND A CUTTING TOOL ASSEMBLY INCORPORATING SUCH AN INSERT

Jacob Friedmann, Kfar Havradim, Israel, assignor to Iscar Ltd., Tefen, Israel

Filed Sep. 27, 1990, Ser. No. 589,396
Claims priority, application Israel, Sep. 28, 1989, 91815
Int. Cl.[5] B23B *27/04*
U.S. Cl. 407—110 6 Claims



1. A cutting insert for use in a cutting tool assembly comprising first and second longitudinally directed insert surfaces directed at an acute angle with respect to each other and defining between them a centrally disposed, wedge-shaped body portion of the insert;

a leading end portion of the insert formed integrally with a wider end portion of the wedge-shaped body portion and formed with a cutting edge and with an abutment shoulder located between the cutting edge and an adjacent end of said first insert surface; and

a trailing end portion of the insert formed integrally with a narrower end portion of the wedge-shaped body portion and defined between a wholly recessed extension of said insert surface and said second insert surface, said second insert surface being formed with a central recessed portion.

5,150,993

PIVOT ASSEMBLY FOR TOOL GUIDE

Bernard Miller, 5600 Munhall Rd., Pittsburgh, Pa. 15217

Filed Jan. 30, 1992, Ser. No. 828,283
Int. Cl.[5] B23B *45/14*
U.S. Cl. 408—110 20 Claims

1. A tool guide pivot assembly for a hand held tool comprising:

a generally "U" shaped bracket having a base, a first leg and a second leg;

an adjustment shaft having a shaped extension near one end and an other end and being long enough to extend between said first and second legs of said "U" shaped bracket;

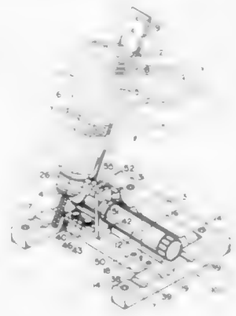
a post attachment means, shaped to fit between said first and second legs of said "U" shaped bracket, having a passage for said adjustment shaft;

a guide post attached to said post attachment means;

said first leg of said "U" shaped bracket having a shaped aperture for passage of said adjustment shaft;

said second leg of said "U" shaped bracket having an aperture for passage of said other end of said adjustment shaft;

a means for selectively adjusting the angle between said guide post and said "U" shaped bracket;



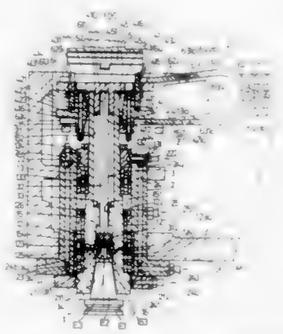
means for clamping said post attaching means in selected angular positions.

5,150,994

SPINDLE MEANS OF MACHINE CENTER

Kaven Hsu, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan

Filed Sep. 23, 1991, Ser. No. 763,576
Int. Cl.[5] B23C *9/00*; F16C *37/00*
U.S. Cl. 409—135 5 Claims



1. A spindle means of machine center comprising: a spindle rotatably mounted in a spindle sleeve fixed in a machine frame;

a tool holding means operatively connecting a tool chuck for clamping a tool thereon and held in a central portion in said spindle;

a driving motor operatively driving spindle for rotating said tool connected therewith by means of a transmission coupling means coupling said spindle and said motor; said spindle, said tool, said tool holding means, said transmission coupling means and said motor defining a common longitudinal axis about said axis said spindle and said tool being rotated; and

a tool-holding control means normally connecting said tool holding means with said spindle for rotating said spindle and said tool connected on said tool holding means, and operatively separating said tool holding means from said spindle;

said spindle sleeve including: a lower flange formed on a lower portion of the sleeve adjacent to a lower shoulder portion of the spindle and secured to a machine frame, a plurality of longitudinal cooling passages longitudinally formed through the sleeve parallel to the longitudinal axis of the spindle, a first perforated plug sealed in a first

longitudinal cooling passage of said plurality of said longitudinal cooling passages near a feeding port formed on a side portion of the spindle sleeve having a small orifice with a small inside diameter formed in the first perforated plug for directing a cooling liquid of high pressure fed in the first longitudinal cooling passage and a second perforated plug sealed in a second longitudinal cooling passage of said cooling passages distal from the feeding port having a large orifice formed in the second perforated plug with a large inside diameter larger than that of the small orifice of the first perforated plug for directing a cooling liquid of low pressure fed in the second longitudinal cooling passage for an even flow rate when delivering the cooling liquid through the longitudinal passages, a lower annular-ring groove annularly formed in a lower flange of the sleeve communicated with the feeding port, an upper annular ring groove annularly formed in an upper end portion of the sleeve communicated with a discharge port from which the cooling liquid is discharged, and at least a radial cooling passage radially formed in the sleeve for communicating a central sleeve hole formed in the sleeve and disposed around the spindle for delivering a cooling gas through a notch formed in a lower nut of a primary bearing set, which is formed between the spindle and the sleeve and is positioned below a secondary bearing set formed between said spindle and said sleeve for cooling the primary bearing set and the secondary bearing set.

5,150,995

COUPLING FOR A DETACHABLE FIXING OF COMPONENTS AT APPROPRIATE CARRIER MEMBERS

Josef Reinauer, Sigmaringen, Fed. Rep. of Germany, assignor to Gottlieb Guhring KG, Albstadt, Fed. Rep. of Germany

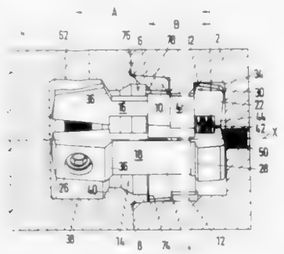
PCT No. PCT/EP90/00228, § 371 Date Sep. 13, 1990, § 102(e) Date Sep. 13, 1990, PCT Pub. No. WO90/09253, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 13, 1990, Ser. No. 573,218

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1989, 3904259

Int. Cl.[5] B23B *21/00*

U.S. Cl. 409—234 **15 Claims**



1. A coupling, which comprises:

a carrier member which includes a receiver having a shoulder and a recess;

a part having a plurality of centering extension means for being coupled to said receiver and an undercut recess;

chucking means including means for adjusting said chucking means which are actuable from the exterior of the part such that the carrier member and the part are forced against each other via a supporting surface pairing, said adjusting means including a set screw located in an axial plane of said centering extension means wherein said chucking means includes at least three circumferentially spaced clamp-like chuck claws which are respectively engaged substantially in a longitudinal axial plane of said centering extension, each of said chuck claws having an anchor portion for engaging said shoulder of said receiver and each having a radially outwardly projecting claw portion movable into said undercut recess of said part by screwing action of said set screw into one of said three claws for forcing a radially internal thrust head thereof against contacting portions of the two other chuck claws.

5,150,996

KEYWAY BROACH GUIDE ASSEMBLY

Glenn R. Thoroughman, 4925 Finance Way, Kingman, Ariz. 86401

Filed Aug. 1, 1991, Ser. No. 739,186

Int. Cl.[5] B23D *37/04*

U.S. Cl. 409—259 **10 Claims**

1. A broaching bushing means for guiding a broaching tool in a workpiece bore during the cutting of a keyway in an annular surface of the bore, consisting of:

an elongated wedge member and a broaching tool elongated guide member positionable in longitudinally abutting relation to one another to form a bushing means of substantially rectangular cross section for insertion in a workpiece bore,

the wedge member and the guide member each having a first side and a second side opposite the first side,

the first sides of each member having complementarily inclined surfaces which, when in abutting relationship, position the second side in parallel relationship to each other,

the wedge member and the guide member being longitudinally movable relative to one another to adjust the distance between the parallel sides of the bushing means,

wherein the rectangular cross section of the bushing means is adjustable to fit various sized bores.

5,150,997

ELASTIC CONNECTOR

Li J. Hsu, 4th Flr., No. 736 Ting Jou Rd., Taipei, Taiwan

Filed Feb. 25, 1991, Ser. No. 660,021

Int. Cl.[5] F16B *21/00*

U.S. Cl. 411—511 **13 Claims**

1. An elastic connector for securing mechanical parts together comprising:

a) a hollow base having a hole extending through the front and rear thereof, and including within its interior two wedge-shaped assembling grooves, a plate partioning the assembling grooves, two U-shaped grooves positioned at opposite corners, a hole adjacent a lateral side of each U-shaped groove, a pair of longitudinal holes at opposite ends of the plate, and a slanting groove connecting the longitudinal holes;

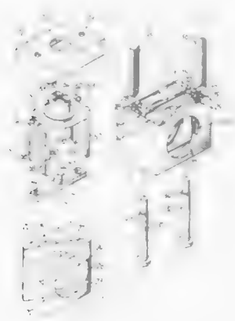
b) a pair of rivets received within the longitudinal holes;

c) an S-shaped spring member installed within the base and including two ends, a middle plate disposed within the slanting groove, two end plates disposed within the assembling grooves, and a hole formed in each of the middle and end plates corresponding in size to the hole through the base;

d) a pair of steel sheets disposed within the U-shaped grooves;

e) a supporting member including a pair of holes positioned at two ends thereof for receiving the rivets therethrough and a central axle rod extending upwardly therefrom;

f) a control member including a base plate, a pair of arc-shaped holes formed at each of two opposite ends for receiving the rivets therethrough and permitting the control member to move within the areas defined by the



arc-shaped holes, a bottom surface defining a concavity for receiving the supporting ember, an axle hole for receiving the axle rod, a rod extending downwardly from each of four corners of the base plate, each of two rods being disposed within a groove hole for urging the steel sheets into a U-shaped configuration, each of the other two rods being provided with a longitudinal gap therethrough for receiving the two ends of the spring members, and a handle extending upwardly from the base plate for engagement by a spanner to rotate the control member; and

g) a lid provided with a central hole and two end holes, the handle being disposed through the central hole and the rivets being disposed through the end holes, a bottom chamber, and the base plate of the control member being disposed within the bottom chamber.

5,150,998

SHEET BINDER

Koichi Murakami, Yokohama; Kazuhiro Matsuo, Tokyo; Kenichi Iizumi, Ibaraki, and Yoichi Tagawa, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Daiichi Seiki Kaisha Kabushiki Kaisha, Ibaraki, both of, Japan

Filed Jan. 8, 1992, Ser. No. 817,960

Claims priority, application Japan, Apr. 13, 1989, 1-094206; May 8, 1989, 1-114534; May 8, 1989, 1-114535; May 8, 1989, 1-114536; Jul. 19, 1989, 1-188290

Int. Cl.[5] B42C *13/00*

U.S. Cl. 412—14 **4 Claims**

1. A sheet binding apparatus, comprising:

supporting means for supporting a set of sheets;

punching means for punching the sets of sheets on said supporting means;

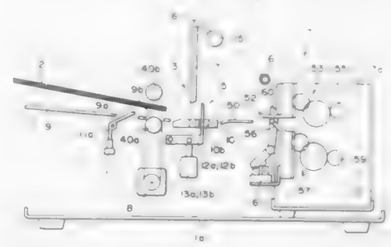
binding means for binding the sheets by penetrating a ring member through punched holes of the sheets punched by said punching means;

size signal generating means for generating a signal indicative of a size of the ring member supported on said binding means;

means for changing a degree of opening of the ring member in accordance with a size of the ring member;

conveying means for conveying the set of sheets punched by said punching means to the ring member supported on said binding means;

second supporting means for supporting said binding means for movement between an automatic mode position wherein said binding means receives the set of sheets



conveyed by said conveying means and a manual mode position wherein the set of sheets can be received without use of said conveying means;

detecting means for detecting the manual mode position of said binding means and for prohibiting conveyance of the sheets by said conveying means;

ring control means for controlling the degree of opening of the ring member during the manual mode;

wherein said ring control means opens the ring member to the degree of opening predetermined in accordance with the size of the ring member.

5,150,999

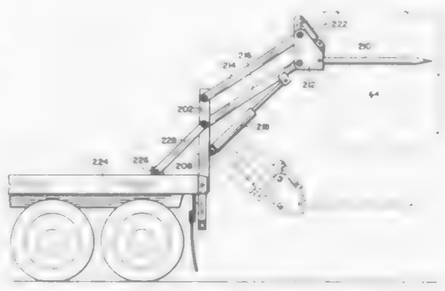
BALE LIFTER AND MOVER

Joe W. Dugan, Ballerina Cir., Box 87-A, Grove, Okla. 74344

Filed Oct. 9, 1990, Ser. No. 597,486

Int. Cl.[5] B66F *9/18*

U.S. Cl. 414—24.5 **6 Claims**



3. A device for lifting and moving a bale of hay and adapted to be connected to an end of a vehicle comprising a vertical support connected to the end of the vehicle; the vertical support having a horizontal first cross member located approximately midway of the height of the vertical support member; a second horizontal cross member pivotally mounted on the vertical support above the first cross member; a pair of horizontally spaced vertical plates disposed forward of the vertical support and having upper, lower, forward and rear ends; a horizontal bar extending across the forward ends of the spaced vertical plates; a spear connected to the center of the horizon-

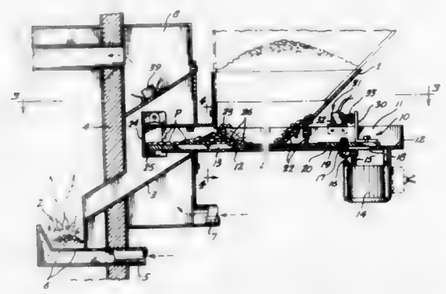
tal bar and projecting the forwardly and horizontally therefrom; a pair of spaced parallel links having forward ends and rear ends, the forward ends of the links being connected to the upper ends of the spaced vertical plates and the rear ends of the links being connected to the upper end of the vertical support; a third link having a forward end and a rear end, the forward end being connected to the lower end of the spaced vertical plates by means of a third cross member which extends across the lower rear ends of the spaced vertical plates, the rear end of the third link being connected to the second pivotal cross member on the vertical support; the third link being arranged below and parallel with the pair of links; a hydraulic cylinder having a piston rod extending outwardly therefrom, the hydraulic cylinder having a pivotal connection at one end thereof to the first cross member of the horizontal support, the piston rod having an outer end pivotally connected to the third link adjacent its point of connection to the pair of spaced vertical plates.

5,151,000

PELLET STOVE FEEDER

Rod Geraghty, 15731 SE. 224th, Kent Wash. 98042, and Robert D. Burgess, Seattle, Wash., assignors to Rod Geraghty, Kent, Wash.

Filed Jun. 24, 1991, Ser. No. 719,910
Int. Cl.[5] F23K *//12*
U.S. Cl. 414—187 10 Claims



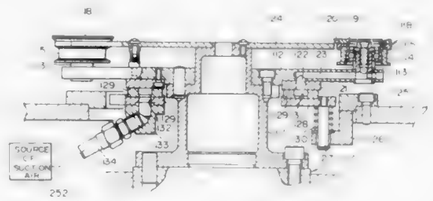
1. Mechanism for feeding fuel pellets to a firebox comprising a pellet hopper having a bottom outlet opening, a feed trough extending generally horizontally from below said hopper outlet opening and having a forward end portion adjacent to the firebox, a feed plate mounted in said trough below said hopper outlet opening such that pellets from said hopper are supported on said feed plate, means for reciprocating said feed plate in said trough between a rearward position adjacent to said hopper and a forward position adjacent to the firebox for advancing feed pellets along said trough from the hopper toward said firebox, a gate member mounted adjacent to said forward end portion of said feed trough and positioned such that said feed plate engages said gate member when said feed plate is in its forward position and closes said feed trough and said hopper from the firebox when said plate is in such position, and said feed plate discharging the pellets through a gap between said gate member and said forward end portion of said feed trough when said feed plate is moved from its forward position to its rearward position.

5,151,001

APPARATUS FOR ROTATING TOP ENDS OF CANS

Akira Kawaguchi; Tatsuyuki Suzuki, both of Asago, and Michihito Yoshida, Suntou, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 482,983
Claims priority, application Japan, Feb. 22, 1989, 1-42089; Feb. 22, 1989, 1-42090; Feb. 23, 1989, 1-43779
Int. Cl.[5] B65H *1/00*
U.S. Cl. 414—225 26 Claims



1. A rotating apparatus for a plurality of top-ends, each of said top-ends having a first annular projection projecting in an axial direction thereof and a second annular projection projecting radially outwardly thereof, said rotating apparatus comprising:

a turntable disposed so as to be rotatable intermittently about an axis thereof and defining a transport path for said top-ends along an outer periphery thereof;

a plurality of stationary work stations arranged along said transport path in spaced relation to each other;

a plurality of top-end holding platforms arranged on the outer periphery of said turntable in circumferentially spaced relation to each other along said transport path so as to correspond to said work stations, respectively, and being movable together with said turntable about the axis thereof along said transport path, at least one of said top-end holding platforms being rotatable about an axis thereof relative to said turntable;

means for rotating said at least one top-end holding platform about the axis thereof;

each of said top-end holding platforms having an annular positioning groove formed in an upper face thereof for receiving the annular projection of the top-end;

ventilation passage means having one end opening to the upper face of said top-end holding platform; and

suction-air source means connected to the other end of said ventilation passage means;

wherein each of said annular positioning grooves has opposite side faces formed so as to be equal to each other in an angle defined between each of the side faces and a center line therebetween which extends perpendicular to the upper face of a corresponding one of said top-end holding platforms.

5,151,002

FREIGHT CAR FOR BULK MATERIAL

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 31, 1991, Ser. No. 648,214
Claims priority, application Austria, Feb. 15, 1990, 351/90
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—339 2 Claims

1. A freight car for incorporation into a freight train of a series of successively arranged like freight cars, successive ones of the freight cars having facing ends which may be coupled together to form the train, the freight car comprising

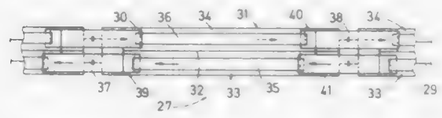
(a) a longitudinally extending carrier frame,

(b) a longitudinally extending box for storing bulk material, the box having a bottom affixed to the carrier frame and an open top,

(c) a longitudinally extending wall separating the box into two halves,

(d) a first longitudinally extending bulk material conveyor arrangement, the conveyor arrangement having opposite ends longitudinally spaced from each other and one of the conveyor arrangement ends being higher than the opposite conveyor arrangement end whereby the conveyor arrangement ends at facing ends of the successive freight cars overlap when the freight cars are coupled together,

(e) a second longitudinally extending bulk material conveyor



arrangement, the second conveyor arrangement also having opposite ends longitudinally spaced from each other and one of the second conveyor arrangement ends being higher than the opposite second conveyor arrangement end whereby the second conveyor arrangement ends at facing ends of the successive freight cards overlap when the freight cards are coupled together,

(f) the first and the second conveyor arrangements extending independently of each other at least partly along the bottom of the box in the respective halves of the box, and

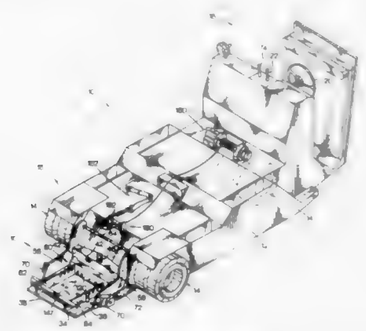
(g) drive means connected to the conveyor arrangements and arranged to drive the conveyor arrangements in opposite directions.

5,151,003

UNIVERSAL AIRCRAFT NOSEWHEEL CRADLE AND TUG ASSEMBLY

Robert A. Zachoche, Astoria, Oreg., assignor to Eric W. Paulson, Oreg.

Filed Nov. 30, 1990, Ser. No. 621,070
Int. Cl.[5] B60B *29/00*
U.S. Cl. 414—428 17 Claims



1. An aircraft nosewheel cradle assembly for an aircraft tug, comprising:

a cradle member having an upper surface with a front edge, a transverse axis extending substantially parallel with the front edge, and a longitudinal axis perpendicular to the transverse axis and substantially parallel with the upper surface, pivot attachment means for pivotally attaching the cradle member to the tug for rotatable motion solely about said transverse axis between a lowered aircraft loading position and an elevated aircraft transport position;

means for moving said cradle member between said loading position and said transport position;

a pair of lateral substantially mutually parallel arms adjustably mounted to the upper surface of the cradle member substantially parallel with the longitudinal axis, means for adjustably mounting said lateral arms to provide lateral adjustment in a direction parallel to said transverse axis, each lateral arm having plural rear gate receiving means for mounting a rear gate thereto; and

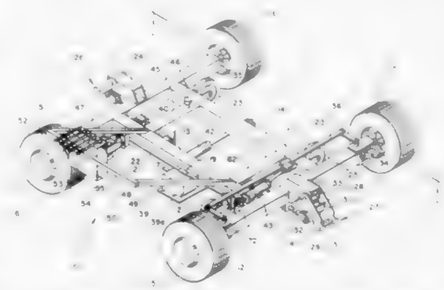
a rear gate adjustably mounted to one of the plural rear gate receiving means on each of the lateral arms substantially parallel with the transverse axis, said plural rear gate receiving means providing longitudinal adjustment of said rear gate in a direction parallel to said longitudinal axis, so as to define an aircraft nosewheel receiving corral on the upper surface of the cradle member between the lateral arms and the rear gate, with the corral size adjustable to accommodate varying sized aircraft nosewheels.

5,151,004

VEHICLE FOR MOVING AIRCRAFT

Lindley C. Johnson, Argyle, Minn., assignor to Johnson Airspray, Inc., Argyle, Minn.

Filed Apr. 5, 1991, Ser. No. 680,846
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—495 13 Claims



1. A parking carriage for lifting and conveying fixed wing aircraft in a generally lateral direction comprising:

a carriage chassis including a frame for supporting and conveying an airplane;

a first set of wheels including a pair of steerable wheels and at least one powered wheel mounted from the carriage chassis frame and deployed to support and convey the carriage chassis relative to a second set of wheels;

the second set of wheels deployed generally at an angle to the first set of wheels and used to maneuver the carriage chassis to address landing gear of an airplane of interest, the second set of wheels being mounted from the carriage chassis frame and arranged to alternatively support and convey the carriage frame in lieu of the first set of wheels when the second set of wheels is deployed in a supporting position;

mechanized steering means connected to the pair of steerable wheels for steering the carriage chassis when supported by the first set of wheels;

mechanized wheel deployed means using a single operating means for modulating the relative vertical position of the first and second sets of wheels to automatically change carriage chassis support between the first and second set of wheels;

load lifting means comprising a pair of vertically pivoting hook means, one located on either side of and associated with the carriage chassis, the hook means engaging and vertically displacing desired spaced portions of the landing gear of an airplane of interest, the hook means further

raising and lowering the airplane of interest thereby shifting support of the airplane of interest between the landing gear and the carriage chassis;

power-operated mechanical means for operating each of the mechanized; and

control means for controlling the power operating mechanical means.

5,151,005

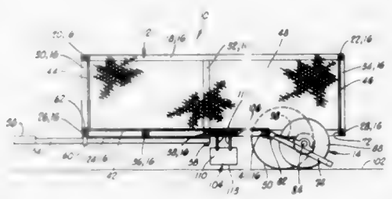
CAN COLLECTION APPARATUS

Kenneth W. Spigner, P.O. Box 77, Tatums, Okla. 73087

Filed Sep. 7, 1990, Ser. No. 579,161

Int. Cl.[5] B60P *1/00*

U.S. Cl. 414—437 **27 Claims**



1. An apparatus for collecting cans from a ground surface, said apparatus comprising:

can receiving means for receiving the cans therein, said can receiving means being characterized by a basket portion defining an opening in a lower portion thereof;

can collecting means disposed in said opening, movably connected to said can receiving means between an operating position adjacent to said ground surface and a non-operating position spaced above said ground surface, for engaging cans on said ground surface when in said operating position and moving said cans into said can receiving means; and

a carriage wheel attached to said can collecting means for supporting said can collecting means above said ground surface when said can collecting means is in said operating position, said carriage wheel being spaced above said ground surface when said can collecting means is in said non-operating position.

5,151,006

AUTOMATIC CHARGING MEMBER

Tom E. Marttila, Helsinki; Tuomo V. J. Kivistö, Kirkkonummi, and Pentti V. Ahola, Kokkola, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

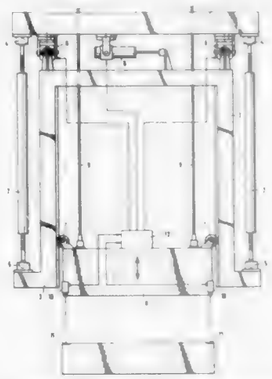
Filed Jun. 20, 1989, Ser. No. 369,055

Claims priority, application Finland, Jun. 22, 1988, 883012

Int. Cl.[5] B66C *3/08*

U.S. Cl. 414—626 **3 Claims**

1. Automatic charging member for the positioning of heavy loads, particularly of sheet-like objects as anodes and cathodes into electrolysis tanks, which charging member has a loading member and a gripping device for gripping the load and position detectors for positioning the gripping device relative to the load, wherein between the loading member and the gripping device there is attached a control frame movable with respect to the loading member so that on the basis of information received form said position detectors positioning of the gripping device is carried out by moving the control frame and wherein the control frame and the gripping device are supported on the loading member by separate suspension members.



5,151,007

INDUSTRIAL USE ROBOT WITH HORIZONTAL MULTIPLE ARTICULATED ARMS WITH MEANS TO MINIMIZE OR ELIMINATE INTERFERENCE AMONG DRIVING PORTIONS

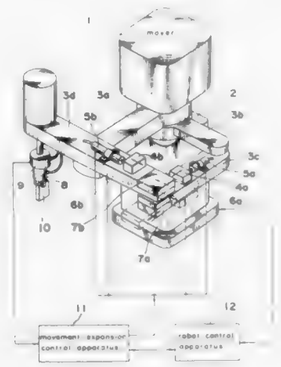
Tomohiro Maruo, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 20, 1991, Ser. No. 657,817

Claims priority, application Japan, Feb. 20, 1990, 2-37304

Int. Cl.[5] B25J *9/06*

U.S. Cl. 414—744.2 **9 Claims**



3. An industrial robot, comprising:

a first prime mover and a second prime mover each for producing horizontal rotational movement around coaxial shafts;

a plurality of horizontal articulated type arms connected in a parallelogram link arrangement and having a first arm having one end connected to said first prime mover for being driven in horizontal rotational movement around said one end, a second arm having one end connected to said second prime mover for being driven in horizontal rotational movement around said one end, a third arm coupled at one end to said second arm, and a fourth arm coupled at one end to said third arm and coupled to the other end of said first arm;

a first load movably mounted on said third arm for reciprocal movement therealong, and a second load movably mounted on said fourth arm for reciprocal movement therealong;

movement mechanisms on the respective third and fourth arms and connected to the respective first and second loads for moving the respective loads individually along said third and fourth arms;

a first extension portion movably mounted on said third arm for extension and retraction movement therealong, and a second extension portion movably mounted on said fourth arm for extension and retraction movement therealong;

extension mechanisms on the respective third and fourth arms and connected to the respective first and second extension portions for moving the respective extension portions individually along said third and fourth arms, whereby said extension portions change the length of the respective arms;

a grasping mechanism on said fourth arm for grasping an object and picking it up and moving it by the movement of said arms;

a force sensor in said grasping mechanism for sensing the weight of an object picked up by said grasping mechanism;

a control apparatus connected to said movement mechanisms and to which said force sensor is connected for controlling the movement of the respective loads and extension portions in response to signals from said force sensor; and

a further control apparatus connected to said prime movers and to said grasping mechanism for controlling the operations of said prime movers to drive said arms and the operation of said grasping mechanism to pick up and place an object, and to which said firstmentioned control apparatus is connected for supplying information relating to the movements of the respective loads and extension portions for modifying a formula for the relative movement of the first and second prime movers so as to offset the dynamic interference components thereof in accordance with the movements of the loads and extension portions in response to the change in weight of an object to be grasped.

5,151,008

SUBSTRATE TRANSFER APPARATUS

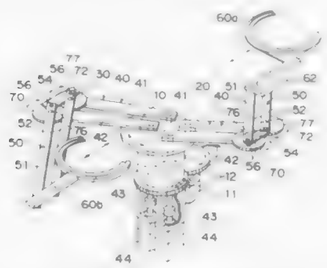
Toshimichi Ishida, and Masaki Suzuki, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 21, 1991, Ser. No. 703,777

Claims priority, application Japan, May 25, 1990, 2-135908

Int. Cl.[5] B25J *18/00*

U.S. Cl. 414—744.5 **3 Claims**



1. A substrate transfer apparatus comprising:

two transfer arms pivotably mounted on a support table on opposite sides thereof from each other with respect to a center of the support table;

each of the transfer arms having:

a first set of parallel links;

a second set of parallel links, a shaft pivotably connecting one end of each link in the first set of links to one end of a corresponding link in the second set of links, and a first gear fixed to one of the one ends of the first set of links, a second gear fixed to one of the one ends of the second set of links, said gears being engaged with each other, and a connecting link having each end connected to one of the shafts, the other ends of the first set of links being pivotably connected to the support table; and

a substrate holding member provided on the other end of the second set of links;

each of the substrate holding members being movable outward from the support table along a line by stretching of the transfer arms and being movable back to the support table by bending of the transfer arms, and the transfer arms being bent in the opposite direction to each other with respect to the support table

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5,151,009

MATERIALS STACKING EQUIPMENT

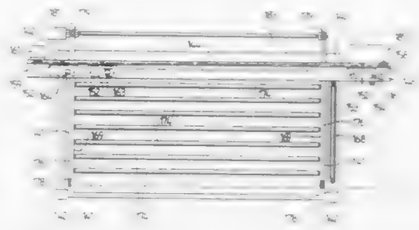
Timothy L. Lockert, 2604 Vestavia Forest Pl., Vestavia, Ala. 35216

Division of Ser. No. 374,543, Jun. 30, 1989, Pat. No. 5,049,030.

This application Mar. 25, 1991, Ser. No. 674,181

Int. Cl.[5] B65H *29/10*

U.S. Cl. 414—793.5 **2 Claims**



1. Apparatus for stacking onto a stacking table a plurality of semi-rigid sheet-like members received sequentially from a processing unit in an aligned condition comprising:

(a) means for grasping said sheet-like members along a margin on one side of said sheet-like member to maintain the alignment of said sheet-like member, said means for grasping being selectively movable in a first and second horizontal direction parallel to said one side between a receiving position and a releasing position;

(b) a plurality of elongated roller members extending parallel to said first horizontal direction, and selectively movable laterally to an extended position and to a retracted position subjacent said means for grasping with an outermost roller of said plurality of roller members being connected to means for selectively urging said outermost roller to said extended position and said retracted position;

(c) flexible connective means for connecting each of said elongated rollers such that movement of said outermost roller causes selective movement of said elongated rollers to an abutting position or a separated position relative to adjacent elongated rollers such that said plurality of roller members move laterally responsive to the movement of said outermost roller said rollers being maintained in mutual horizontal alignment in said retracted position; and

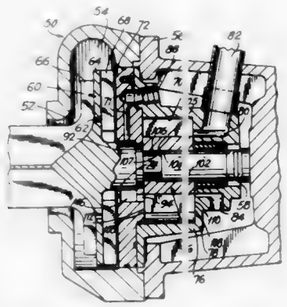
(d) first means for sensing the presence of said grasping means at said releasing position with said first sensing means being operatively connected to actuate movement of said roller members from said extended position to said retracted position.

5,151,010

COMBINED CENTRIFUGAL AND VACUUM PUMP

Reijo Vesala, Kotka, and Vesa Vikman, Kymi, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Sep. 7, 1990, Ser. No. 579,405
Int. Cl.[5] F01D 25/32
U.S. Cl. 415—169.1 10 Claims



1. A centrifugal pump for pumping gas containing medium comprising:

a centrifugal pumping chamber (54);

a centrifugal impeller (60) within said pumping chamber;

a liquid ring vacuum pump (70) having a vaned vacuum pump rotor (96) therein;

an intermediate wall (72) separating said pumping chamber (54) from said vacuum pump (70) and having a first non-annular opening (74) adjacent said pumping chamber for providing a passageway between said centrifugal pumping chamber (54) and said vacuum pump; and

a shaft (58) extending through said vacuum pump (70) and said intermediate wall (72) into said pumping chamber (54), said centrifugal impeller (60) and said vacuum pump rotor (96) being mounted on said shaft.

5,151,011

CEILING FAN WITH INTERCHANGEABLE BODY

Ron Rezek, Los Angeles, Calif., assignor to Beverly Hills Fan Company, Woodland Hills, Calif.

Continuation of Ser. No. 638,958, Jan. 9, 1991, abandoned. This application Feb. 27, 1992, Ser. No. 841,858
Int. Cl.[5] F04D 29/64
U.S. Cl. 416—5 4 Claims

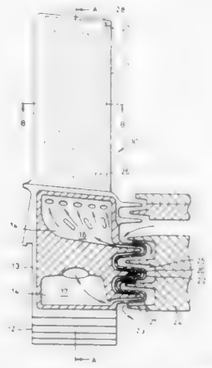
1. In a ceiling fan of the type supported from a ceiling by stationary down rod, a stationary assembly attached to the lower end of the down rod, an electric motor supported from the stationary assembly, fan blades driven by the motor, a top cover covering the motor and at least a lower portion of the down rod, and a bottom cover supported from a stationary assembly below the fan blades with improvements comprising, the top and bottom covers being removable, replaceable and interchangeable, the top and bottom covers formed of glass or translucent material and being of decorative shape and color, the interchangeability allowing different shapes and colors of the top and bottom covers to be utilized, bumper means on the stationary assembly for supporting a bottom edge portion of the top cover, a top nut annular member surrounding the down rod and postioned above the top cover for holding the top cover down against the stationary assembly bumper means by the top nut annular member cooperating with the top of the top cover.

5,151,012

LIQUID COOLED AEROFOIL BLADE

Geoffrey S. Hough, Littleover, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 2, 1982, Ser. No. 347,986
Claims priority, application United Kingdom, Mar. 20, 1981, 8108753
Int. Cl.[5] B63H 1/14
U.S. Cl. 416—95 6 Claims



1. A cooled aerofoil blade having a closed cycle cooling system comprising an aerofoil cross-section portion, a root portion for the attachment of said aerofoil blade to the periphery of a rotary disc, and a shank portion interconnecting said aerofoil portion and said root portion, said closed cycle cooling system comprising at least one pair of chambers enclosed within said shank portion and disposed so that one chamber is situated closer to said root portion than the other chamber, a heat exchanger for condensing a vapourised liquid passing therethrough, said heat exchanger being positioned on an external face of said shank portion and arranged in operation to be cooled by a flow of cooling air, said heat exchanger operatively interconnecting said at least one pair of chambers, and a plurality of passages provided within said aerofoil portion extending generally lengthwise thereof and terminating in a chamber defined within the tip of said aerofoil portion, at least one of said passages being located in the central region of said aerofoil portion and interconnecting said tip chamber with said shank chamber which is closer to said root portion, the remainder of said passages being located adjacent the external surface of said aerofoil portion and interconnecting said tip chamber with the other shank chamber, said closed cycle cooling system containing a liquid which is vapourised at the temperatures at which said aerofoil portion is adapted to operate and condensed at the temperatures at which said heat exchange is adapted to operate.

5,151,013

BLADE LOCK FOR A ROTOR DISK AND ROTOR BLADE ASSEMBLY

Jerry H. Moore, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,906
Int. Cl.[5] B63H 1/20
U.S. Cl. 416—221 10 Claims

1. A rotor disk and rotor blade assembly of the type having an axis of rotation which is adapted for use in an axial flow rotary machine having a working medium flowpath, the rotor disk including a first side and a second side facing in opposite axial directions and a rim region having a circumferentially continuous live rim region and a circumferentially discontinuous dead rim region, the dead rim region having a plurality of blade attachment slots extending in an axially oriented direction from the first side of the disk, the assembly including a plurality of rotor blades each having an airfoil extending outwardly from each of said attachment slots and having a root which engages the attachment slot, the improvement which comprises:

a rotor disk having a projection which extends axially from the live rim region of the first side of the rotor disk the projection having an inner part which extends axially form the first side of the disk and an outer part which extends radially outward form the inner part;

a blade lock which engages the outer part of the projection, and which extends from the projection to the dead rim to shield the dead rim, the blade lock being spaced for the first side of the dead rim of the disk over a portion of radial height of the blade lock to leave na insulating gap therebetween; and,

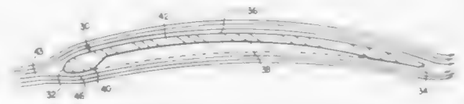
lock means from blocking axial movement of the blade lock; wherein shielding the dead rim of the disk reduces thermal gradients and stresses and wherein the axial projection supports at least part of the blade lock form the live rim of the disk and extends axially and radially about the blade lock to restrain the blade lock against radial and lateral movement.

5,151,014

LIGHTWEIGHT AIRFOIL

C. Kent Greenwald, Cambridge; Leslie M. Gray, Lincoln; R. Bart Read, Maynard, and William Stevens, Belmont, all of Mass., assignors to Airflow Research and Manufacturing Corporation, Watertown, Mass.

Continuation of Ser. No. 374,302, Jun. 30, 1989, abandoned. This application Jul. 26, 1991, Ser. No. 737,563
Int. Cl.[5] B64C 3/44
U.S. Cl. 416—237 9 Claims



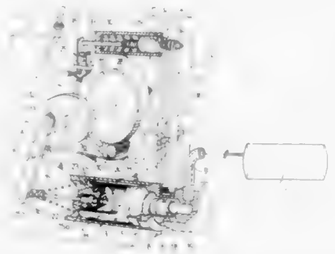
1. An airfoil comprising a suction surface and a pressure surface, said surfaces joined together at landing and trailing portions of said airfoil, said pressure surface converging toward said suction surface by an angle approximately equal to or greater than 30° to form an abrupt corner wherein during operation an air stream flowing from said leading edge and over said pressure surface separates from said pressure surface at said corner and reattaches to said pressure surface at a section of said pressure surface substantially closer to said trailing edge and wherein said abrupt corner is characterized by an abrupt change in the slope of said pressure surface at said corner and appears in a cross-sectional view of the airfoil to be formed by the intersection of a first and a second line wherein said first line corresponds to the pressure on one side of the abrupt corner and the second line corresponds to the pressure surface on the other side of the abrupt corner.

5,151,015

COMPRESSION DEVICE, PARTICULARLY FOR THE PRESSURE FILLING OF A CONTAINER

Daniel Bauer, Le Raincy; Frédéric Leroy, Saint-Cloud; Gérard Braque, Mitry-le-Neuf, and André Charon, Louvres, all of France, assignors to L'Oreal, Paris, France

Filed May 13, 1991, Ser. No. 698,684
Claims priority, application France, May 15, 1990, 90 06043
Int. Cl.[5] F04B 9/04
U.S. Cl. 417—415 17 Claims



1. Device for th compression of a fluid, particularly for the pressure filling of a container, comprising a motor, a pump body, a piston adapted to be displaced linearly in said pump body, transmission means between the motor and said piston adapted to convert the rotary motion generated by the motor into a reciprocating, translatory motion by the piston, speed varying means adapted to impart a different speed to said piston according to the resistance opposing the motor during one complete admission and compression cycle, so that the resisting torque is substantially constant, wherein:

the compression fluid is a gas;

the speed varying means includes a cam for controlling

displacement of piston to satisfy the relation PV=constant, for an isothermal compression of a perfect gas, where P is the pressure of the compressed fluid and V is the volume of the compressed fluid, and the cam allows for compression of the compressed fluid at constant power; and

the speed varying means limiting heating of the compressed fluid which results from a difference between theoretical properties of a perfect fluid and actual properties of the compressed fluid as well as friction by controlling piston speed thus ensuring substantial isothermal compression; and wherein

the pump body is a syringe body having a cylindrical wall connected by a truncated wall to a nose;

a casing is included having an end fitting at a closed end containing the syringe body, the end fitting being located at the nose and connected by a pipe to the container.

5,151,016

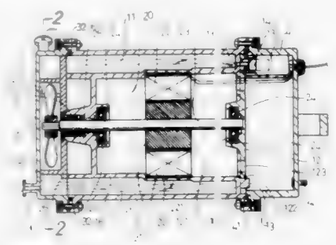
LIQUID PUMP RESPONSIVE TO TEMPERATURE

Tser W. Her, No. 16, Lane 946, Min su 1 Rd., Tsoying Dist., Kaohsiung, Taiwan

Filed Dec. 5, 1991, Ser. No. 802,512

Int. Cl.[5] F04D *15/00; 29/58*

U.S. Cl. 417—32 **6 Claims**



1. A liquid pump comprising;

an outer housing made together with an inner housing by means of injecting molding, having a cylindrical shape with a flange at both longitudinal sides to combine with a right cap and a left cap by means of bolts and nuts;

an inner housing of a cylindrical shape diametrically smaller than the outer housing to be axially fixed in the outer housing, having a metal cylinder inside for containing a motor consisting of a rotor, a stator and a shaft in its interior, and having its right side sealed up with an intermediate cap and its left side sealed up with a sealing disc;

an intermediate cap sealing up the right side of the inner housing, having a central shaft supporter with a copper ring for a bearing to fit in to support the motor shaft also supported in a bearing fitted in a copper ring of a shaft supporter of the inner housing, several curved slots for air to flow in and out of the inner housing, being sealed up by a right cap combined with the outer housing, and forming a pressure room with the right cap;

a liquid cooling room surrounded by the longitudinal walls of the inner and the outer housing, an annular bottom wall formed between the right side edges of both the inner and the outer housing and a sealing disc, the cooling room being for the liquid pumped by this pump to circulate therein to cool a motor contained in the inner housing;

a sealing disc sealing up the left side of the inner and the outer housing, having a central hole for the motor shaft to extend out for a fan to be fixed on the shaft end, an annular wall extending sidewise out of the outer surface, an opening just under the bottom portion of the annular wall, said opening being inserted by a projection extending out of the left side wall of the inner housing, and said annular wall having a passage;

a right cap combined with the right side flange of the outer housing, forming a pressure room with the intermediate cap; and

a left cap combined with the left side flange of the outer housing, defining a pumping room together with the sealing disc, said pumping room having the fan therein to rotate to push the liquid coming through an inlet in the left cap, then through the opening in the sealing disc into the liquid cooling room via the passage into the pumping room to flow out of an outlet in the left cap.

5,151,017

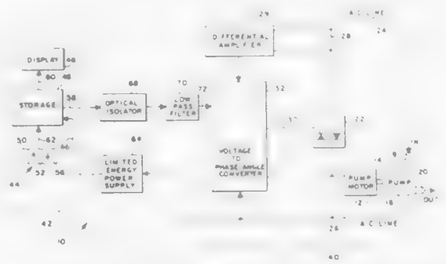
VARIABLE SPEED HYDROMASSAGE PUMP CONTROL

Lawrence Sears, Hunting Valley, and John T. Wall, Seven Hills, both of Ohio, assignors to ITT Corporation, New York, N.Y.

Filed May 15, 1991, Ser. No. 700,278

Int. Cl.[5] F04D *15/00*

U.S. Cl. 417—45 **23 Claims**



1. A control for a hydromassage pump motor for controlling the speed of the pump motor and a pump connected thereto to one of a plurality of predetermined preset speeds to thereby control the flow of water through the hydromassage pump comprising a low voltage user interface and a high voltage motor power control which is connected to, but electrically isolated from, said user interface, said low voltage user interface including storage means for storing therein a plurality of preset speeds, each of which is indicative of a desired pump motor speed, said storage means providing an output signal indicative of one of said plurality of said preset speeds, a first input means for energizing the pump motor at a speed indicated by said output signal of said storage means, second input means connected to said storage means for indexing the output signal of said storage means to the next sequential preset speed of said plurality of preset speeds, and display means responsive to said output signal of said storage means for usually displaying an indication of the speed of the pump motor, said high voltage power control including a solid state switch means adapted to be connected in series with the pump motor and a source of high voltage electrical energy to energize the pump motor when the solid state switch means is conductive, controller means for controlling the conduction of said solid state switch means and means including an opto-isolator for coupling said output signal from said storage means to said controller means to control the conduction of said switch means in dependence upon the output signal of said storage means.

5,151,018

SOUND ATTENUATION CHAMBER

Harry B. Clendenin, and James F. Fogt, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Jul. 31, 1990, Ser. No. 560,104

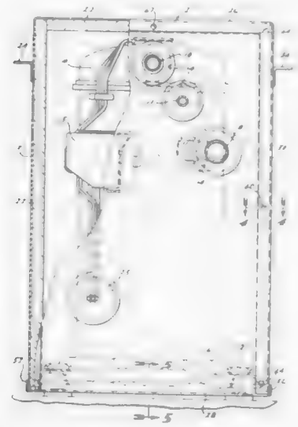
Int. Cl.[5] F04B *39/00;* **G10K** *11/00*

U.S. Cl. 417—312 **8 Claims**

1. A sound attenuation enclosure for a heremetic refrigerant compressor having refrigerant conduits connected thereto, said enclosure comprising:

(a) a first relatively fixed section onto which the compressor is adapted to be affixed, said first section having at least one aperture formed therein through which at least one refrigerant conduit passes;

(b) a second section attachable to said first section so that both said sections define a chamber which substantially encloses the compressor, said second section being detachable from said first section to permit access to the compressor; and



(c) means for attenuating the sound produced by the compressor comprising material having sound absorbing properties disposed in said chamber, said enclosure being shaped as a six-sided box, having a top, bottom, front, back and two sides wherein said second section is comprised of four integrally formed portions, one forming the top of said chamber and the remaining three forming two sides and the back of said chamber.

5,151,019

PUMPING DEVICE HAVING INLET AND OUTLET VALVES ADJACENT OPPOSED SIDES OF A TUBE DEFORMING DEVICE

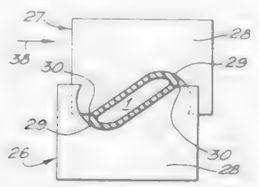
Hal C. Danby, Sudbury, and Eric A. Faulkner, Maidenhead, both of England, assignors to Danby Medical Engineering Ltd., Suffolk, England

Filed Nov. 2, 1989, Ser. No. 430,851

Claims priority, application United Kingdom, Nov. 4, 1988, 8825816

Int. Cl.[5] F04B *43/12*

U.S. Cl. 417—474 **34 Claims**



1. A pumping device comprising:

means for accommodating a length of tubing providing, in operation, passage for liquid through said device,

means for deforming said tubing whereby to reduce its volume, and

controllable valve means including independently controlled valve actuators provided adjacent opposed sides of said deforming means for restricting the flow of liquid through said tube,

wherein said deforming means comprises members arranged for controlled relative movement in opposed directions in parallel planes transverse to the direction of liquid passage within said tubing, said members adapted to engage said tubing between said actuators, whereby said tubing is first deformed in one transverse direction and then in the opposed transverse direction which tends to restore the original cross-sectional shape of said tubing, and

control means for controlling said value actuators to open and close in synchronism with deforming of said tubing so that liquid is displaced from an outlet side of said tubing as a function of change of volume of the tubing during deformation.

5,151,020

SCROLL TYPE COMPRESSOR HAVING GRADUALLY THINNED WALL THICKNESS

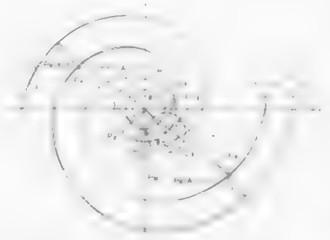
Tatsushi Mori; Hisao Kobayashi, and Yuji Izumi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 15, 1991, Ser. No. 745,488

Claims priority, application Japan, Sep. 13, 1990, 2-245364

Int. Cl.[5] F04C *18/04*

U.S. Cl. 418—55.2 **4 Claims**



1. A scroll type compressor comprising a stationary scroll and a movable scroll, outer and inner walls of the movable scroll confronting those of the stationary scroll and being supported to be subjected to an orbital motion along an orbital circle while prevented from spinning around its own axis, a sealed space being formed between both the scrolls which is reduced in volume when the movable scroll is subjected to the orbital motion, profiles of walls of both scrolls being defined by a curve generated from a modification of an involute curve of a basic circle, characterized in that

the curve defining a profile of the outer wall (outer wall curve) is generated from a basic involute curve by reducing a certain value from a length of the respective involute line of the basic involute curve, which value is increased as the involute angle is developed; and

the curve defining a profile of the inner wall (inner wall curve) is generated from the outer wall curve by first transferring the respective point on the outer wall curve substantially in the normal direction to the outer wall curve at the respective point by a distance equal to a radius of the orbital circle to form an intermediate curve and then symmetrically transferring the respective point on the intermediate curve around the center of the basic circle;

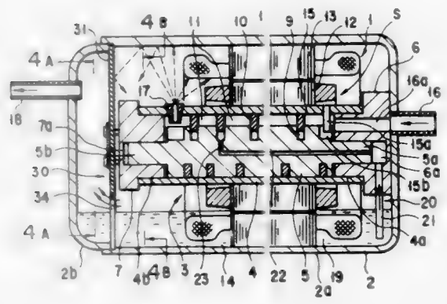
wherein the involute line is defined by a segment of tangent to the basic circle at the respective involute angle between the involute curve and the basic circle.

5,151,021

FLUID COMPRESSOR WITH ADJUSTABLE BEARING SUPPORT PLATE

Takayoshi Fujiwara, Kawasaki, and Hisanori Honma, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1992, Ser. No. 828,246
Claims priority, application Japan, Mar. 8, 1991, 3-43180
Int. Cl.[5] F04B 39/00
U.S. Cl. 418—93 14 Claims



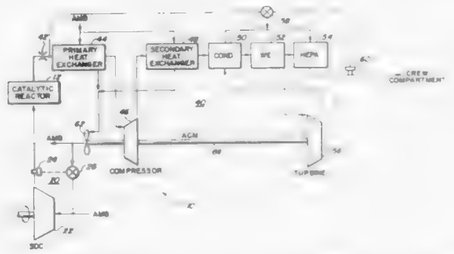
1. A fluid compressor comprising
a sealed casing at the bottom of which an oil reservoir for receiving a lubricating oil is formed;
suction means, connected to the sealed casing, for guiding a fluid to be compressed into the sealed casing, and exhaust means for exhausting the fluid compressed to a high pressure in the sealed casing;
a cylinder housed in the sealed casing and having first and second ends;
compression means including a columnar rotary body having at least one spiral groove and shaft portions at both ends, said rotary body being housed in the cylinder and arranged along the axis of the cylinder eccentrically to the axis of the cylinder such that the rotary body is rotatable relative to the cylinder with part of the outer periphery of the rotary body put in contact with the inner peripheral surface of the cylinder, and a spiral blade fitted in the spiral groove so as to freely project from and retreat in the groove in the radial direction of the rotary body, said blade having an outer peripheral surface put in contact with the inner peripheral surface of the cylinder, thereby partitioning the space between the inner peripheral surface of the cylinder and the outer periphery surface of the rotary body into a plurality of working chambers;
a suction passage for sucking the fluid from the suction means and supplying the fluid into a first one of the working chambers;
a discharge passage for discharging the compressed high-pressure fluid from the last one of the working chambers into the inside of the sealed casing;
a first bearing member inserted in an opening at said one end of the cylinder, and a second bearing member inserted in an opening at said second end of the cylinder, the second bearing member being situated closer to said exhaust means than the first bearing member, thereby rotatably supporting said cylinder and the shaft portions of the rotary body; and
support means for supporting the second bearing member and preventing the lubricating oil mixed in the high-pressure fluid and dispersed from the discharge passage from reaching the exhaust means.

5,151,022

ENVIRONMENTAL CONTROL SYSTEM WITH CATALYTIC FILTER

Terence P. Emerson, Hermosa Beach; Frank A. Bescoby, Rancho Palos Verdes; Colin M. Taylor, Lakewood, all of Calif., and George K. Payne, Baldwin, Ga., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 3, 1991, Ser. No. 771,699
Int. Cl.[5] F24F 11/00
U.S. Cl. 423—245.3 19 Claims



1. An integrated environmental control system for providing conditioned air free of nuclear, biological, and chemical warfare agents to the crew compartment of a vehicle, comprising in combination:
a refrigeration unit;
a catalytic reactor filter upstream of said refrigeration unit and in fluid communication therewith; and
means for compressing ambient air and supplying said compressed air to said catalytic filter at a constant temperature regardless of the ambient temperature.

5,151,023

HEPATITIS A,B-COMBINED ADJUVANTED VACCINE

Syoji Kuzuhara, Houtaku; Koichi Odo, Kumamoto, and Kyosuke Mizuno, Kumamoto, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Japan

Filed Apr. 27, 1989, Ser. No. 344,911
Claims priority, application Japan, Apr. 28, 1988, 63-106748
Int. Cl.[5] A61K 39/12; C12N 7/00
U.S. Cl. 424—89 10 Claims

1. A hepatitis A,B-combined adjuvanted vaccine comprising an inactivated hepatitis A virus antigen, a hepatitis B virus surface antigen and an adjuvant, wherein said vaccine comprises at least 50 ng/ml of the inactivated hepatitis A virus antigen and at least 2.5 μg/ml of the hepatitis B virus surface antigen, said antigens being adsorbed from 100 to 1000 μg/ml of the adjuvant.

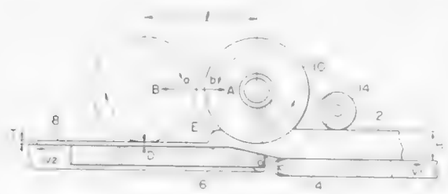
5,151,024

APPARATUS FOR STRETCHING DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Division of Ser. No. 547,655, Jul. 3, 1990. This application Dec. 6, 1990, Ser. No. 623,326
Int. Cl.[5] A21C 3/02; B29C 43/46, 43/58
U.S. Cl. 425—141 7 Claims

1. An apparatus for stretching dough comprising:
an upstream conveyor,
a downstream conveyor that is disposed serially with said upstream conveyor, the conveying speed of said downstream conveyor being higher than that of said upstream conveyor, said upstream conveyor and said downstream conveyor being aligned in a moving direction,
a single roller rotatable about its axis, and
means for reciprocating said single roller only over a predetermined distance (l) of said downstream conveyor, said single roller being reciprocated in the moving direction



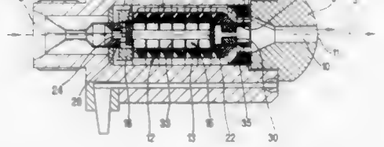
and being spaced apart from the conveying surface of said downstream conveyor.

5,151,025

ELECTRICALLY HEATABLE NOZZLE FOR AN INJECTION MOLDING MACHINE, A HOT RUNNER SYSTEM OR THE LIKE

Walter Müller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co. KG, Kirchlengern, Fed. Rep. of Germany

PCT No. PCT/DE90/00663, § 371 Date Aug. 16, 1991, § 102(e) Date Aug. 16, 1991, PCT Pub. No. WO91/06413, PCT Pub. Date May 16, 1991
PCT Filed Aug. 30, 1990, Ser. No. 691,029
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935667
Int. Cl.[5] B29C 45/20
U.S. Cl. 425—199 35 Claims



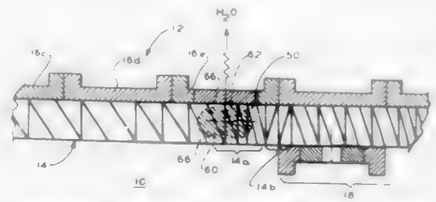
1. An apparatus for filtering flowable material, said apparatus comprising a nozzle, and said nozzle including a housing which defines a chamber, said housing having an inlet and an outlet for the flowable material, and said nozzle further including means for electrically heating said housing, and dividing means in said chamber for dividing said chamber into an inner compartment and an outer compartment surrounding said inner compartment, said dividing means including a strainer for the flowable material, and said nozzle also including a regulating member movable between a first position in which the flowable material entering said inlet is conducted into said inner compartment for flow through said strainer into said outer compartment and a second position in which flowable material entering said inlet is conducted into said outer compartment for flow through said strainer into said inner compartment, said strainer filtering the flowable material when the material is conducted into one of said compartments for flow through said strainer into the other of said compartments.

5,151,026

APPARATUS FOR REMOVING LIQUIDS FROM SOLIDS

Paul G. Andersen, Warwick, N.Y., and Kai L. Kite-Powell, Mahwah, N.J., assignors to Werner & Pfleiderer Corp., Ramsey, N.J.

Filed Oct. 31, 1990, Ser. No. 606,561
Int. Cl.[5] B29C 47/62; B29B 7/84
U.S. Cl. 425—204 10 Claims



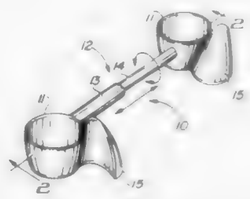
1. Apparatus for removing a liquid from a mass of a material, wherein the apparatus comprises:
first means for transporting the liquid-containing material to and through a liquid-extraction location therewithin, the first means applying to the material in a first direction first transporting and working forces;
second means for applying to the material within or slightly downstream of the extraction location second transporting and working forces, the second forces being applied in a second direction generally opposite to the first direction, the simultaneous application of the first and second forces to the material tending to compact the material to extract therefrom the liquid contained therein;
a liquid exit path along with liquid extracted from the material exits the extraction location, the path extending away from the extraction location generally transversely of the first and second directions; and
third means for preventing the material from exiting along the path while permitting the liquid to so exit, the first, second, and third means forming a pinch point on the material within or slightly downstream of the liquid extraction location to substantially eliminate liquid flow countercurrent to said first direction.

5,151,027

ORTHODONTIC DEVICE FOR SMALL ANIMALS

Lloyd J. Mann, 150 South Roosevelt, #3008, Mesa, Ariz. 85202

Filed Sep. 18, 1989, Ser. No. 408,774
Int. Cl.[5] A61D 5/00
U.S. Cl. 433—1 12 Claims



1. An animal orthodontic fixture for the correction of displaced mandibular canine teeth comprising:
a bite plane for emplacement within an animal's mouth to make interfering contact with a displaced mandibular canine tooth of an animal for bucally moving said mandibular canine tooth to its proper functioning position within an animal's mouth;
tooth coupling means coupled to said bite plane, for coupling said bite plane in position within an animal's mouth

to make interfering contact between said bite plane and a displaced mandibular canine tooth of an animal;

torque resisting means coupled to said tooth coupling means for resisting stress moments generated by interfering contact made between a displaced mandibular canine tooth and said bite plane;

a second said bite plane and a second said tooth coupling means; and

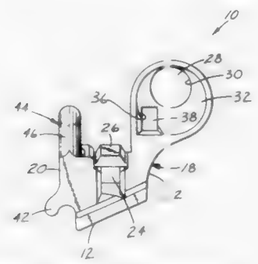
said torque resisting means comprises a rod connecting said tooth coupling means to said second tooth coupling means, said rod extending lingually from each said tooth coupling means within the mouth of an animal in which said fixture is emplaced.

5,151,028

TRIPLE PASSAGE ORTHODONTIC BUCCAL TUBE

Wilford A. Snead, San Dimas, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 14, 1992, Ser. No. 835,880
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—17 **8 Claims**



1. An orthodontic buccal tube comprising:

a tooth-facing base;

a body extending from the base and having spaced apart occlusal and gingival side portions, said body including a first passage between said occlusal and gingival side portions for receiving a main arch wire, said body including a second passage and a third passage, said second passage and said third passage extending alongside said first passage, said second passage including an enlarged mesial entrance, said third passage including a mesial opening that is located at least partially in said enlarged entrance.

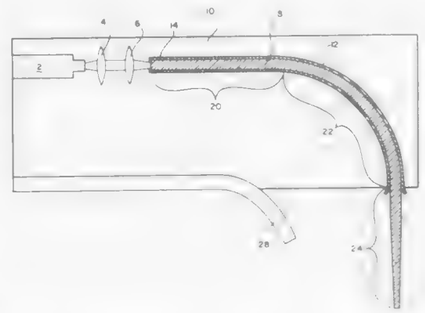
5,151,029

REMOVING PHYSIOLOGIC TISSUE FROM A TOOTH CANAL

Guy Levy, Tustin, Calif., assignor to Endo Technic Corporation, San Clemente, Calif.

Division of Ser. No. 615,789, Nov. 20, 1990, Pat. No. 5,092,773, which is a continuation-in-part of Ser. No. 299,472, Jan. 19, 1989, Pat. No. 5,020,995, and a continuation-in-part of Ser. No. 351,203, May 15, 1989, which is a continuation-in-part of Ser. No. 335,245, Feb. 10, 1989, abandoned. This application Oct. 30, 1991, Ser. No. 784,975
Claims priority, application France, Dec. 21, 1988, 88 17549
Int. Cl.[5] A61C 1/00
U.S. Cl. 433—29 **5 Claims**

1. In a device for removing physiologic tissue from a tooth canal by application to the tissue of laser radiation, which device includes a source of such laser radiation and an optical fiber having a proximal end disposed to receive the radiation and a distal end dimensioned to be insertable into the tooth canal, the improvement wherein said optical fiber is tapered in



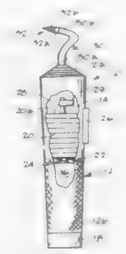
a region adjacent said distal end such that the diameter of said fiber decreases in the direction toward said distal end.

5,151,030

DENTAL FILLER APPLICATOR

Robert I. Comeaux, 12666 Brookshire Ave., Baton Rouge, La. 70815

Filed Jul. 12, 1991, Ser. No. 729,485
Int. Cl.[5] A61C 1/07
U.S. Cl. 433—118 **13 Claims**



1. A tool for causing a filling material to fill a cavity of a tooth comprising:

a. hollow housing means for grasping by the hand of the user, said housing means having a top end and a bottom end,

b. vibrator means located in said housing means for vibrating said housing means,

c. a single brush for molding and shaping a filling material, the brush having a fiber tip connected to a rigid base, said fiber tip being adapted to hold filling material thereon, said fiber tip being sable hair, and

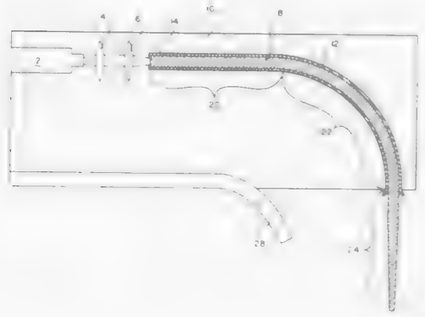
d. brush holder means connected to said top end of said housing means and to said brush for holding said rigid base of aid brush.

5,151,031

FILLING OR COATING MINERALIZED PHYSIOLOGIC TISSUE

Guy Levy, Tustin, Calif., assignor to Endo Technic Corporation, San Clemente, Calif.

Division of Ser. No. 615,789, Nov. 20, 1990, Pat. No. 5,092,773, which is a continuation-in-part of Ser. No. 299,472, Jan. 19, 1989, Pat. No. 5,020,995, and a continuation-in-part of Ser. No. 351,203, May 15, 1989, which is a continuation-in-part of Ser. No. 335,245, Apr. 10, 1989, abandoned. This application Oct. 30, 1991, Ser. No. 784,977
Claims priority, application France, Dec. 21, 1988, 88 17549
Int. Cl.[5] A61C 5/04
U.S. Cl. 433—226 **6 Claims**



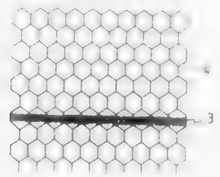
1. A method of filling or coating mineralized physiologic tissue, including tooth enamel and dentin and bone, with a calcium containing product capable of being bonded to a surface of the tissue, comprising: providing two starting components which when combined and exposed to light of a selected wavelength undergo a photochemical reaction to form the calcium containing product; projecting the components toward the surface; and causing light of the selected wavelength to impinge on the components at least partially before the components reach the surface in order to create the photochemical reaction and cause the resulting calcium containing product to bond to the tissue.

5,151,032

MAGNETOPHORETIC DISPLAY PANEL

Tatsuya Igawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Pilot, Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,345
Int. Cl.[5] B43L 1/00
U.S. Cl. 434—409 **20 Claims**



1. A magnetophoretic display panel comprising; a pair of substrates, a plurality of cells sandwiched between said substrates, each of said cells filled with a liquid dispersion comprising magnetic particles, a dispersion medium, and a colorant;

at least 90 wt % of said magnetic particles have a particle size in the range of 10–150 μm;

said magnetic particles have an apparent density in the range of 0.5–1.6 g/cm^3; and

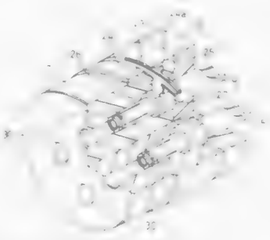
said magnetic particles have a saturation magnetization in the range of 40–150 emu/g.

5,151,033

ELECTRICAL CONNECTOR

Mitsuru Kawai; Masaru Yoshida, and Yoshiro Sasaki, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,421
Claims priority, application Japan, Sep. 13, 1990, 2-241291
Int. Cl.[5] H01R 4/66
U.S. Cl. 439—95 **2 Claims**



1. An electrical connector comprising:

a conductive shell having an inner stopper flange and an annular groove formed on an inside wall thereof;

an insulation housing placed within said conductive shell and having at least two terminal mounting apertures;

at least one detachable terminal mounted in one of said terminal mounting apertures;

a detachable ground terminal mounted in the other terminal mounting aperture;

a retention member for retaining said detachable terminal and said detachable ground terminal;

a conductive stopper ring set in said annular groove for cooperating with said inner stopper flange to hold said insulation housing and said retention member within said conductive shell; and

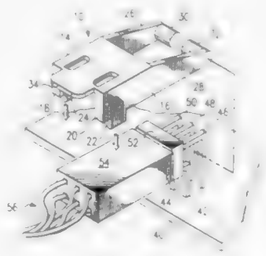
a detachable ground member attached to said ground terminal such that part of said ground member is brought into contact with said conductive stopper ring.

5,151,034

CONNECTOR RETAINER

Kirk R. Chandler, Garland, and Robert W. McKenzie, Lewisville, both of Tex., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Oct. 7, 1991, Ser. No. 772,076
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—79 **6 Claims**



1. Connector retainer apparatus for use with an electrical

connector slidably attached to a set of electrical right angle pins spaced apart by a distance D both directions from an apex of a right angle portion of said pins comprising, in combination:

U-shaped base means, including a bit portion and first and second legs, for enclosing a connector socket body having female portions slidably engaging a set of male right angle electrical connector pins nominally separated by a distance D;

snap action means, comprising a part of said legs of said base means, for positively engaging the connector body to prevent accidental removal therefrom;

third and fourth legs backwardly extending from said first and second legs respectively toward the right angle portion of said male connector pins and each having remote ends; and

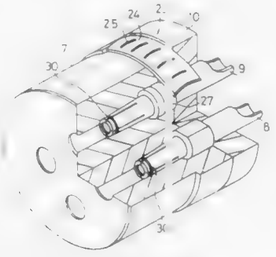
first and second hinge pin means extending inwardly toward each other from the remote ends of said third and fourth legs respectively and each of said pin means having a diameter of at least 5% greater than said distance D for insertion in the right angle portion of said set of male right angle pins in the right angle portion thereof, the hinge pin means in the right angle portion acting to prevent movement of said base means in other than a rotational direction around said pin means in a hinge-type action.

5,151,035

ELECTRICAL CONNECTOR

Mitsuru Kawai; Masaru Yoshida, and Yoshihiro Sasaki, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1991, Ser. No. 741,958
Claims priority, application Japan Sep. 13, 1990, 2-95564[U]
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—95 3 Claims



1. An electrical connector comprising:

a conductive shell made from a conductive material;

an insulation housing placed within said conductive shell and having at least two terminal mounting apertures, at least two ground member mounting recesses formed on a side surface thereof, and at least two linkage channels formed on a rear surface thereof for linking said ground member mounting recesses to said terminal mounting apertures;

at least one detachable terminal mounted in one of said terminal mounting apertures;

a detachable ground terminal mounted in the other terminal mounting aperture;

a retainer member for retaining said detachable terminal and said detachable ground terminal in said insulation housing; and

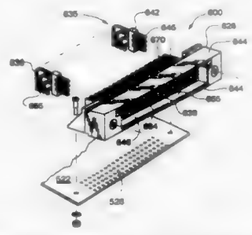
a detachable ground member with a circular mount strap attached to said ground terminal and having a linkage piece held between said retainer member and one of said linkage channels of said insulation housing, thereby securing said ground member to one of said terminal apertures.

5,151,036

CONNECTORS WITH GROUND STRUCTURE

David F. Fusselman, Middletown, and Peter K. Townsend, Camp Hill, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 536,855, Jun. 8, 1990, abandoned. This application Sep. 27, 1991, Ser. No. 766,930
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—108 5 Claims



1. An electrical connector for electrically and mechanically interconnecting a circuit assembly having a plurality of contact regions and a mating connector having first side walls, a plurality of first contact portions arranged in rows and columns within the first side walls and at least one second side contact portion, the electrical connector comprising:

a plurality of electrical contact elements wherein:

each of the contact elements has a first contact and a second contact,

the first contacts are arranged in rows and columns for contacting the first contact portions, and

each one of the contact elements includes a middle portion configured such that their second contacts extend at an angle with respect to the first contacts,

a housing including:

a conductive base having a plurality of passages arranged in rows and columns extending through the base, the contact elements positioned in the passages,

a plurality of insulative blocks positioned in the passages, the having passages, the contact elements being in the block passages such that their first contacts are on a first side of the base in a contact region and their second contacts are on a second side of the base, and

conductive baffles positioned between and spaced from columns of the middle portions of the contact elements, the baffles being connected to the conductive base.

5,151,037

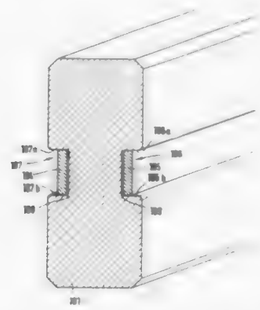
TRANSPARENT CONTACT RAIL

Helmut Range, Lemgo, and Gerhard Beigel, Detmold, both of Fed. Rep. of Germany, assignors to Staff GmbH & Co. KG, Lemgo, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 691,847
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013529
Int. Cl.[5] H01R *25/14*
U.S. Cl. 439—110 10 Claims

1. A contact rail for supporting at least one device insertable thereon to be in electrical contact with the contact rail, said contact rail comprising:

a transparent insulating support member having a rectangular cross section and two electrical conductors extending substantially along the length of said contact rail and arranged in longitudinal grooves at opposite broadsides of the support member, such that the conductors can be



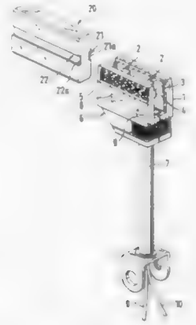
tapped from the outside at said two opposite sides, wherein said support member is made of glass.

5,151,038

ADAPTER FOR CONTACT RAILS

Helmut Range, Lemgo; Gerhard Beigel, Detmold; Friedemann Lotsch, Dortmund, and Peter Debie, Unna, all of Fed. Rep. of Germany, assignors to Staff GmbH & Co. KG, Lemgo, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 691,851
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1990, 4013863
Int. Cl.[5] H01R *25/14*
U.S. Cl. 439—122 22 Claims



11. An adapter for a contact rail having electrical conductors and grooves provided on opposite surfaces thereof, said adapter comprising:

a housing with two lateral legs forming a recess therebetween and each leg including an inside surface facing toward said recess, said legs being moveable away from and towards each other between an open and a closed position and adapted to be slidably and removably mounted to the contact rail placed in said recess;

at least two electrical contacts located in said recess of said housing, each said contact situated adjacent to a respective one of said legs, said electrical contacts facing said recess,

at least one holding element projecting from each said inside surface toward said recess,

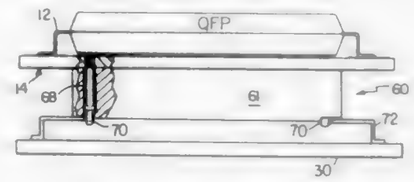
wherein with said adapter in said closed position, said holding elements engage grooves on said contact rail and said electrical contacts touch electrical conductors arranged in said grooves.

5,151,039

INTEGRATED CIRCUIT ADAPTER HAVING GULLWING-SHAPED LEADS

James V. Murphy, Warwick, R.I., assignor to Advanced Interconnections Corporation, West Warwick, R.I.

Continuation-in-part of Ser. No. 505,733, Apr. 6, 1990, abandoned. This application Apr. 29, 1991, Ser. No. 693,446
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—70 32 Claims



1. An adapter for removably electrically connecting the device leads of an electronic device to a circuit surface on which there are contacts arranged in a pattern having four rows of contacts, one row on each side of a rectangular pattern, the device leads of the electronic device being disposed in essentially the same rectangular pattern as that of the contacts on the circuit surface, said adapter comprising:

an insulative body bearing electrical attachment sites configured for making electrical connections with said device leads of the electronic device;

a plurality of adapter leads formed from lead frame portions, each said adapter lead extending outwardly from said body and bending downwardly below said body and then further outwardly in a pair of opposing curves to form a foot, said adapter leads together forming feet located in a pattern that matches both said contacts on said circuit surface and the device leads of the electronic device; and

a plurality of terminal elements supported by said body and electrically connecting said adapter leads to said electrical attachment sites,

said terminal elements being disposed such that each said terminal element lies substantially directly under the electronic device.

5,151,040

ELECTRICAL CONNECTOR FOR REPEATED CONNECTION TO INTEGRATED CIRCUIT GRID ARRAY DEVICES

Mitsuho Tanaka, Tama, Japan, assignor to Kel Corporation, Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 693,231
Claims priority, application Japan, Apr. 27, 1990, 2-112769
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—73 16 Claims

1. An electrical connector for repeated connection to integrated circuit devices of the kind having an array of individual contacts on a contact face thereof, and comprising:

an insulating housing body having an upper, contact face and a lower face for connection to an external circuit;

a corresponding array of individual terminals anchored in the housing and each comprising a tubular receptacle portion having a mouth at the contact face and a male terminal portion extending axially therefrom and protruding from the lower face;

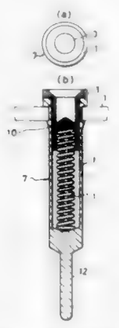
a contact member mounted in each receptacle portion for axial sliding movement therein towards and away from the mouth;

springs in respective receptacle portions in biassing engagement with the respective contact members to urge the contact members axially upwardly towards the contact face so that engagement of respective contacts with upper ends of respective members with an axial downward

contact force depresses the respective contact members against the action of the spring axially further into the receptacle to establish electrical connection therebetween, and, disengagement, of the contacts and contact members permits the spring to restore the respective contact members towards the upper face;

the housing body being molded from one piece of plastic material with front and rear ends and opposite sides extending between the ends, locking projections extending laterally from opposite sides at the front end and ears upstanding from opposite sides at the rear end, identical apertures being formed in respective ears, each aperture having an enlarged pivotal portion communicating forwardly with a slot-form locking portion; and

a one-piece cover member of generally U-shape having a pair of resilient arms extending rearwardly from a forward



transverse wall, flanges depending from opposite ends of the transverse wall and having forwardly opening locking pin receiving slots, forward, free ends of the arms having depending portions and tabs extending laterally outwardly therefrom, the cover member being mountable on the housing body by receipt of the respective tabs in respective enlarged portions of respective apertures, admitted therein by resilient flexure together of the free ends of the arms and the cover member being moveable between open, device receiving, and closed, device retaining positions, by pivotal movement of the front end between positions remote and adjacent the contact face, respectively, and subsequent forward movement of the cover member to bring the locking slots into registration with respective locking pins and the tabs into registration with the locking slots of the base member.

5,151,04

DEVICE FOR CONNECTING AND DISCONNECTING FIRST AND SECOND ELECTRICAL CONNECTOR PARTS

Lutz Kaiser, Herrenberg; Eugen Kimmerle, Holzgerlingen; Erich Mirbach, Sindelfingen, and Frank Notter, Nufringen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1991, Ser. No. 781,570

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1990, 4042060

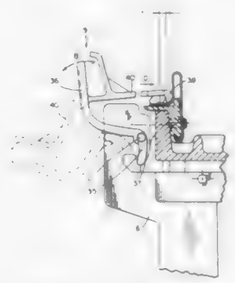
Int. Cl.[5] H01F *13/00*

U.S. Cl. 439—157 **9 Claims**

1. A device for connecting and disconnecting a first movable connector part from a fixedly positioned second connector part within a housing, said first movable connector part being guided within said housing and adapted for being moved in a first direction toward said housing in response to a predetermined insertion force until said first movable connector part and said fixedly positioned second connector part are connected, said device comprising:

at least two movable latches separately supported at spaced apart locations on said first movable connector part; and

at least two movable catch members separately positioned at spaced apart locations on said housing so that each of said latches is functionally associated with a respective one of said catch members, each of said catch members including an inflexible catch element and a flexible catch element positioned on said inflexible catch element and adapted for



engaging a respective one of said movable latches, said flexible catch element including a cam member for engaging said latch, said cam member movable in a direction away from said housing in a direction substantially opposite said first direction of said first movable connector part after said first and second connector parts are connected to thereby substantially reduce the force on said connected first and second connector parts.

5,151,042

ROTARY CONNECTOR

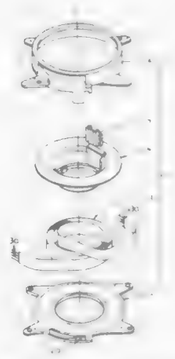
Tetsuya Okada, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 767,020

Claims priority, application Japan, Oct. 2, 1990, 2-103833[U]

Int. Cl.[5] H01R *39/02*

U.S. Cl. 439—169 **5 Claims**



1. In a rotary connector including a fixed case and a rotatable case, each case having an opening for connection with at least one lead wire; a flat cable spirally wound and housed in the fixed and rotatable cases, the flat cable having a plurality of electrical conductors; and a connection terminal having one end connected to the electrical conductors of the flat cable and another end connected to the at least one lead wire and arranged at the opening of the rotatable case; the flat cable being arranged in said cases so as to loosen and tighten to thereby permit the rotatable case to rotate relatively to the fixed case,

the improvement comprising:

a fixing member attached to the at least one lead wire; and

a retaining member arranged at the opening of the rotatable case for engagement with the fixing member, the retaining member having a retaining portion for holding the at least one lead wire in a predetermined position relative to the connection terminal; and

the fixing member having a clamping tab for holding the at least one lead wire and engaging with the retaining portion of the retaining member, and an engaging tab engaged with the retaining member for resisting a tensile force acting on the at least one lead wire.

5,151,043

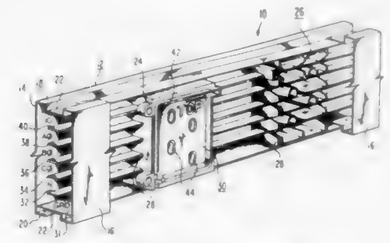
ELECTRICAL POWER DISTRIBUTION BUSWAY WITH ISOLATED GROUND BUS

Robert W. Morgan, Spartanburg, S.C., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Continuation of Ser. No. 288,530, Dec. 22, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 504,094

Int. Cl.[5] H01R *25/16, 13/648*

U.S. Cl. 439—212 **19 Claims**



1. A power distribution system, comprising:

a service entrance connectable to a source of electrical power;

first electrical equipment capable of introducing a power surge into the system;

second electrical equipment which is sensitive to a power surge; and

a busway that transmits electrical power from the service entrance to the first and second equipment, which busway include a conductive housing, a first busbar connected to a first power phase conductor of the service entrance, a second busbar connected to a second power phase conductor of the service entrance, a third busbar connected to a third power phase conductor of the service entrance, a fourth, neutral bushbar connected to a neutral conductor of the service entrance, a fifth, ground busbar connected to ground at the service entrance, electrically insulating spacers mounted within the housing, which spacers support the first through fifth busbars in a spaced-apart, generally parallel relationship inside the housing, whereby the ground busbar is isolated from the conductive housing of the busway, a ground conductor connected to the housing and to ground at the service entrance and electrically isolated from the isolated ground busbar within the housing, and electrical connections which connect the first and second electrical equipment to the busway, whereby the first equipment is connected to first through fourth busbars and to the ground conductor, and whereby the second, surge-sensitive equipment is connected to the first through fifth busbars and is free of contact with the ground conductor.

5,151,044

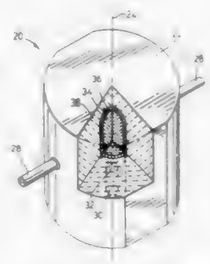
BLANKS FOR THE MANUFACTURE OF ARTIFICIAL TEETH AND CROWNS

Henri L. Rotzaert, 42 Brentwood Drive, Dundas, Ontario, Canada L8T 3V8

Continuation of Ser. No. 511,500, Apr. 20, 1990, abandoned, which is a division of Ser. No. 350,964, May 12, 1989, Pat. No. 4,970,032. This application May 22, 1991, Ser. No. 704,582

Int. Cl.[5] A61C *2/00*

U.S. Cl. 433—229 **23 Claims**



1. A blank for the manufacture therefrom of a single artificial tooth of a desired color by the removal of material from the blank, the blank comprising:

a core portion having lingual, labial, mesial, distal gingival and occlusal sides, the core portion approximating in shape at least at its libial, mesial and distal sides to the shape to a corresponding core portion of a single tooth to be manufactured therefrom;

reference means on the blank establishing a reference point from which the removal of material from the blank can be determined;

a first layer of another material overlaying at least the occlusal, labial, mesial and distal surfaces of the said core portion,

a second layer of a further material overlaying at least the occlusal, labial, mesial and distal surfaces of the first layer;

the thickness of the said first and second layers and the distributions of the their respective thicknesses over at least the said labial, mesial and distal sides cooperating together, and the materials of the said core portion and of the first and second layers cooperating together, to provide at least at the labial, mesial and distal surfaces the required color for the tooth upon selective removal of material of the first and second layers from the blank to leave a single tooth-shaped artificial tooth.

5,151,045

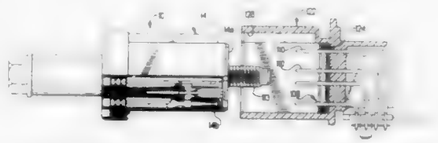
SEALS FOR AN ELECTRICAL CONNECTOR

David M. Cravens, Etters; Keith R. Denlinger, Lancaster; Richard W. Gryzbowski, Lebanon, and John M. Myer, Millersville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 751,366, Aug. 28, 1991, abandoned. This application Apr. 13, 1992, Ser. No. 870,200

Int. Cl.[5] H01R *13/432*

U.S. Cl. 439—271 **10 Claims**



1. Seals for use in an electrical connector comprising a receptacle and a pin header, said seals comprising:

a first seal for use in a rear end of a receptacle in conjunction with an end cap having arranged, inwardly projecting ribs, said first seal having a body portion with grooves therein arranged to receive said ribs when said end cap is oriented in a pre-determined position; and

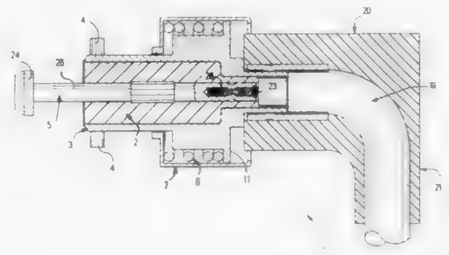
a second seal having a body portion and a rim portion extending normally outwardly from edges of said body portion, said rim portion having first and second inwardly facing surfaces and a outwardly facing mating surface, said second seal adapted for use in a cavity in a pin header with said mating surface adapted to be compressingly received by an edge of a receptacle inserted into said cavity whereupon said second surface bulges out into a space defined by said body and rim portions.

5,151,047

CONNECTOR FOR CONNECTON TO A CELLUAR TELEPHONE

Michael J. Phillips, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 8, 1991, Ser. No. 742,772
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—333 **6 Claims**



1. An electrical connector for connection to an antenna mount of a cellular telephone, comprising:

a dielectric body,

a conductive shell concentrically encircling said dielectric body and provided with projecting bayonet coupling prongs for connection to an antenna mount of a cellular telephone,

a conductive center contact having a stem concentrically surrounded by said dielectric body and projecting outwardly from said dielectric body and said shell,

said stem having a front end for receipt in an electrical receptacle of a cellular telephone,

said stem having a wire connection portion for connection to a signal carrying conductor of a coaxial cable,

said stem being moveable to project said stem outwardly from said dielectric body, and to retract said wire connection portion into said dielectric body after connection of said wire connection portion to a signal carrying conductor of a coaxial cable,

anchoring means for anchoring said shell to said coaxial cable after retraction of said wire connecting portion into said shell,

a coil spring encircling said shell, and

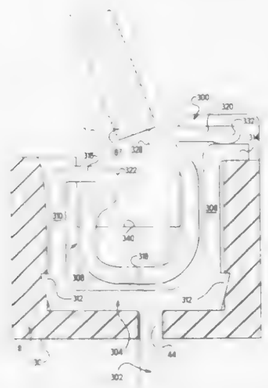
a ring retainer encircling said coil spring and being adapted to impinge an antenna mount of a cellular telephone, said coil spring being compressible between said retainer and an outer flange of the shell when said bayonet prongs are connected to said antenna mount.

5,151,04-

ELECTRICAL TERMINAL WHICH HAS OVERSTRESS PROTECTION

Iosif Korsunky, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 27, 1991, Ser. No. 766,869
Int. Cl.[5] H01R *13/08*
U.S. Cl. 439—326 **20 Claims**



1. An electrical contact for connecting contact pads of a first printed circuit board to contact areas of a second printed circuit board, the contact comprising:

a base;

a post for making electrical connection with the contact areas of the second printed circuit board, the post extends from the base;

a contact section extending from the base, the contact section has first and second contact surface which are provided to make electrical connection with the contact pads of the first printed circuit board;

a bight member provided proximate the second contact surface, an overstress member extending from the base to proximate the bight member the bight member and the overstress member are provided in frictional engagement whereby as the first printed circuit board is rotated from a first position to a second position the bight member cooperates with the overstress member to prevent the deformation of the contact section beyond its elastic limit.

5,151,048

FAILSAFE ELECTRICAL CONNECTOR

Kensaku Sato, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 712,910
Claims priority, application Japan, Jul. 27, 1990, 2-197725
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—357 **1 Claim**

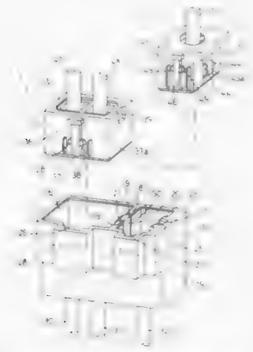
1. A failsafe electrical connector comprising:

an electrical connector plug including a main signal plug portion with a contact terminal mounted therein, a check signal plug portion with a contact terminal mounted therein, and a partition wall provided between said main signal plug portion and said check signal plug portion;

a main signal socket having a side wall with an engaging recess and a contact terminal for coming into contact with said contact terminal of said main signal plug portion when said main signal socket is fitted in said main signal plug portion;

a check signal socket having a contact terminal for coming into contact with said contact terminal of said check signal plug portion when said check signal socket is fitted in said check signal plug portion; and

block means provided on said partition wall in the form of a flexible block arm and having a projection toward said main signal plug portion so that when a connection of said main signal socket into said main signal plug portion is



complete, said recess engages said projection of said flexible block arm to permit insertion of said check signal socket into said check signal plug portion while if the connection is incomplete, said side wall flexes said block arm toward said check signal plug portion to thereby prevent insertion of said check signal socket into said check signal plug portion.

5,151,049

CONNECTOR LATCHING ARRANGEMENT

Rene A. Mosquera, Laguna Niguel, Calif., assignor to ITT Corporation, Secaucus, N.J.

Filed Jul. 11, 1991, Ser. No. 728,410
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—353 **10 Claims**

1. An electrical connector apparatus which includes a connector, a cover which is releasably held over said connector, and a latch pivotally mounted about a pivot axis on said cover, said latch having a latch block and said connector having a strike which is engaged by said latch block to prevent separation of said cover and connector, said latch being pivotable in a second direction to a position of maximum engagement with said strike and being pivotable in a first direction to disengage from said strike and allow separation of said cover and connector, said cover having a pair of spaced latch support brackets which pivotally support said latch, characterized by:

said latch support brackets which pivotally support said latch, are resiliently deflectable slightly together and apart;

of said brackets and latch, one of them has a slot extending largely radially to said axis with said slot having a pair of slot sides, and the other of them has a rib lying partially in the slot and having a pair of rib sides, with at least one of said sides being inclined so it is angled a plurality of degrees but less than 90° from parallelism with said pivot axis, so as said latch pivots in said first direction to release from said strike, said inclined side urges said support brackets to deflect apart to thereby provide a spring force urging said latch to pivot opposite to said first direction, said rib is wide enough and lies close enough to said pivot axis that at least part of said rib remains in said slot during pivoting of said latch from a position where said latch is in said position of maximum engagement to a position where said latch first disengages from said strike and allows separation of said cover and connector

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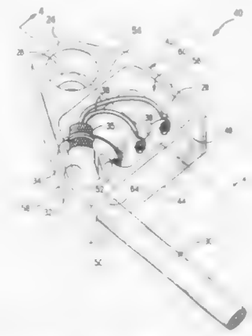
5,151,050

CABLE ASSEMBLY

James P. Scholz, Mechanicsburg, and Daniel E. Stahl, Dauphin, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 30, 1991, Ser. No. 768,125
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—456 **2 Claims**



1. A cable assembly comprising:

a one piece housing including a base having opposed front and rear walls and opposed first and second side walls extending upwardly from said base, said sidewalls extending between said front and rear walls, inner surfaces of said base and walls together defining a cable terminating cavity, at least one of said sidewalls extending at an oblique angle between said front and rear walls, said front wall of said housing further including a cable receiving opening extending therethrough and in communication with said cable terminating cavity, said front wall further including an inwardly directed peninsula shaped protrusion extending a selected distance into said cable receiving cavity, said protrusion being spaced from said obliquely extending sidewall such that said cable receiving opening is positioned between said protrusion and said obliquely extending sidewall, said protrusion and said obliquely extending sidewall defining a cable receiving channel therebetween;

a plurality of terminal members disposed in said housing and having first connecting portions extending into said cable terminating cavity;

an electrical cable having an insulating cover surrounding a plurality of discrete conductors, said cover having an end extending through said cable receiving opening and along

said cable channel and about said protrusion to be displaced within said cable terminating cavity, each of said conductors extending from said cover end and terminated to a respective one of said terminal members; and

potting materials disposed in and filling remaining portions of said cable terminating cavity whereby

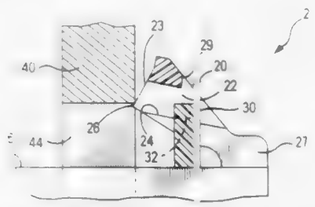
wall of said cable-receiving opening completely surround said cable, and said elongated cable receiving channel provide means for relieving strain on said cable when stress is applied thereto irrespective of said potting material bonding to said insulating cover surface, and further provide means for directing a desired exit path for said cable.

5,151,051

CONNECTOR LATCH WITH ANTI-OVERSTRESS

Akira Nagamine, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 14, 1992, Ser. No. 835,788
Claims priority, application Japan, Feb. 28, 1991, 3-16512[U]
Int. Cl.[5] H01R *3/74*
U.S. Cl. 439—557 **8 Claims**



1. An electrical connector housing of a type intended to be mounted in the aperture of a panel including a body of resilient plastic material, at least one latch integrally formed with the material of the housing to include a flexible hinge supporting an ear having a surface engaging the panel to latch the housing thereto, the hinge being elastically deflected to facilitate insertion of the housing as pushed through the aperture of the panel, characterized in that said latch includes an interior recess having an interior surface and the housing includes an integral stop residing within said interior recess and positioned to engage the surface and limit bending deflection of the said latch responsive to forces pulling said housing out of said aperture.

5,151,052

MICROPIN CONNECTOR SYSTEM

Willard B. McCardell, Rochester Hills, Mich., assignor to Cardell Corporation, Rochester Hills, Mich.

Division of Ser. No. 767,636, Sep. 30, 1991, which is a division of Ser. No. 670,751, Mar. 15, 1991, Pat. No. 5,100,346. This application Feb. 11, 1992, Ser. No. 833,761
Int. Cl.[5] H01R *13/42*
U.S. Cl. 439—598 **30 Claims**

1. An electrical connector system, comprising:

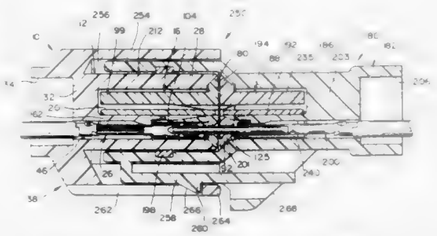
a socket connector component;

a plug connector component;

said socket and plug connector components each including a first unitary element having a plurality of elongated parallel locking fingers and a second unitary element having a plurality of elongated, parallel spacer fingers, said locking fingers and said spacer fingers being interdigitated to define a plurality of terminal receiver channels within each of the respective components;

a first plurality of electrical wires each having a socket terminal, said socket terminals being located in corresponding terminal receiver channels within said socket connector component and secured therein by latching engagement with corresponding interdigitated locking fingers, adjacent socket terminals being electrically isolated from each other by corresponding interdigitated spacer fingers; and

a second plurality of electrical wires each having a pin terminal, said pin terminals being located in corresponding



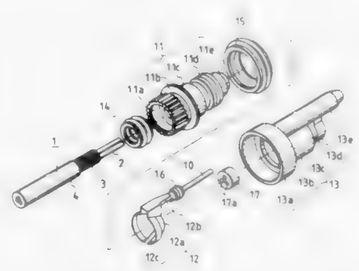
terminal receiver channels within said plug connector component and secured therein by latching engagement with corresponding interdigitated locking fingers, adjacent pin terminals being electrically isolated from each other by interdigitated spacer fingers.

5,151,053

ELECTRICAL CONNECTOR FOR SHIELDING CABLE

Yasuhisa Shinji; Toshiaki Hasegawa; Shinichi Akune, and Hirohiko Sakuhara, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 661,974
Claims priority, application Japan, Mar. 5, 1990, 2-21476[U]; Aug. 30, 1990, 2-90067[U]
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 **2 Claims**



1. An electrical connector for use at an end of a shielding cable having insulatingly-covered inner wires, an electrically-conductive braid wire covering said inner wires, and an outer insulating layer covering said braid wire, said connector comprising:

a tubular body adapted to fit on said outer insulating layer;

a tubular terminal, having a body portion and a connection portion, for connection to an external electric wire, said body portion cooperating with said tubular body to hold said braid wire, folded back at an end of said outer insulating layer, therebetween in such a manner that said folded braid wire is disposed in pressure contact with said body portion and said tubular body; and

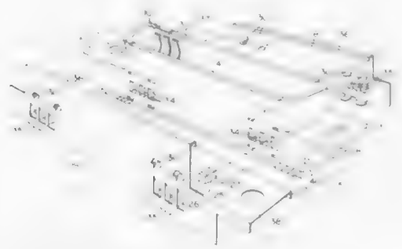
a tubular casing receiving and retaining said tubular body and said tubular terminal wherein said tubular body includes a flange portion, a cylindrical portion, a threaded portion, and a tapered surface, arranged sequentially and said tubular terminal includes a tapered annular body portion corresponding to said tapered surface, and a wire connection portion extending from said tapered annular body portion.

5,151,054

ELECTRICAL CONNECTOR SHELL AND GROUNDING SPRING THEREFOR

Francisco R. Briones, Markham, and Kamal S. Boutros, Downsview, both of Canada, assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 22, 1991, Ser. No. 704,117
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 **14 Claims**



1. An electrical connector, comprising:

a dielectric housing having an exterior surface;

electrical contact means including an electrical contact provided in a passage through said housing for electrically connecting a first conductor external to said connector with a second conductor external to said connector;

cavity defining means for defining a cavity in communication with said passage and having an opening in communication with the exterior of said housing;

filter means including a filter element positioned in said cavity for electrically connecting said contact to ground;

biasing means including an electrically conductive grounding spring having an integral finger which extends into said cavity from the exterior thereof to bias said filter element in a direction of engaging said electrical contact;

housing flange means on said housing for securing said housing to a device containing said first conductor;

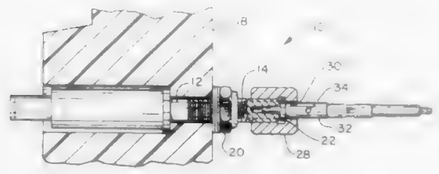
grounding spring flange means integrally formed as a part of said grounding spring for providing a direct uninterrupted electrical path from said filter element to ground upon being sandwiched between said housing flange means and a device to which the electrical connector is mated.

5,151,055

SELF LOCKING ELECTRICAL CONTACT

Anthony W. Lumbis, Watertown, N.Y., assignor to Knorr Brake Holding Corporation, Westminster, Md.

Continuation of Ser. No. 402,731, Sep. 5, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 776,883
Int. Cl.[5] H01R *13/621*
U.S. Cl. 439—784 **16 Claims**



1. An electrical connector which comprises:

a first elongated connecting element and a second elongated connecting element, said first elongated connecting element having a threaded surface along the exterior thereof, said second elongated connecting element having a shoulder thereon;

a compression nut extending around and against said shoulder of said second connecting element and engaging said first connecting element to force positive engagement between said first and second connecting elements; and

selection means for selectively allowing and preventing axial movement of said compression nut relative to said second elongated connecting element past a predetermined axial point on said second elongated connecting element without movement of a conductor mounted to said second elongated connecting element relative to said second elongated connecting element whereby said first and second elongated connecting elements are separated when said compression nut is disengaged from said first connecting element and said selection means prevents said axial movement.

5,151,056

ELECTRICAL CONTACT SYSTEM WITH CANTILEVER MATING BEAMS

Donald W. McClune, Hollidaysburg, Pa., assignor to Elco Corporation, Huntingdon, Pa.

Filed Mar. 29, 1991, Ser. No. 677,778
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—851 **7 Claims**

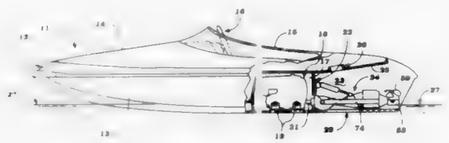
1. An unitary electrical socket contact for receiving an electrical contact pin, comprising:

a. an elongated, generally U-shaped contact body formed of electrically conductive material;

b. a mating region for receiving the contact pin, having two independent opposed cantilevered contact beams spaced apart by a spacing contact beam, (1) each contact beam attached to the contact body and extending to a pin-receiving end, (2) each contact beam having an embossment adjacent the pin-receiving end and projecting inwardly towards the axis of the contact body, so that constant frictional forces are exhibited on the contact pin by the embossments upon pin insertion, and (3) the opposed cantilevered contact beams being biased inwardly toward the axis of the contact body and the pin-receiving ends of the cantilevered contact beams being biased towards each other, so that a reliable mechanical and electrical contact is maintained on the contact pin due to the compressional and torsional forces produced on the contact pin by the opposed cantilevered contact beams upon pin insertion and;

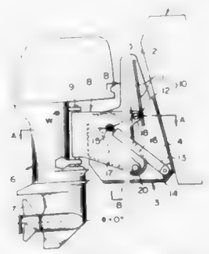
c. a retention means, attached to the contact body and extending from the mating region, for retaining the contact body in an insulating device.

5,151,057
WATER JET PROPULSION BOAT
Noboru Kobayashi, and Yoshiki Fukaki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Apr. 4, 1991, Ser. No. 680,709
Claims priority, application Japan, Apr. 4, 1990, 2-90636; Apr. 26, 1990, 2-113555
Int. Cl.[5] B63H *11/00*
U.S. Cl. 440—38 62 Claims



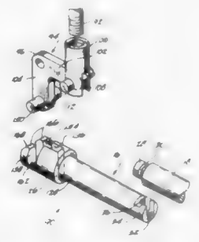
1. A water jet propelled boat comprised of a hull, a jet propulsion unit having an outer housing comprised of a water inlet portion having a water inlet opening, an impeller portion containing an impeller for drawing water through said water inlet portion from a body of water in which said boat is operating and a discharge nozzle portion for discharging water from said water inlet portion for propelling said boat, at least said water inlet portion being rotatable relative to another of said portions about an axis for raising said water inlet opening from a downwardly facing position to an elevated position when the boat remains in the body of water and means for supporting said discharge nozzle portion against rotation relative to said hull when said water inlet portion is rotated between its positions.

5,151,058
SUPPORTING DEVICE FOR OUTBOARD MOTOR
Hideo Tahara, and Nobuo Makihara, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 17, 1991, Ser. No. 686,449
Claims priority, application Japan, Apr. 20, 1990, 2-104750
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—61 6 Claims



1. A supporting device for an outboard motor, wherein the outboard motor is mounted to a transom of a hull, comprising:
a first bracket mounted to the transom;
a thrust rail mounted to said first bracket;
a reverse rail mounted to said first bracket, said reverse rail being arranged opposite said thrust rail;
a second bracket having one end supporting the outboard motor, and the other end including one portion;
a thrust roller rotatably mounted to said one portion of said second bracket and being engagable with said thrust rail and said reverse rail;
means for allowing said second bracket to slidably and rotatable move relative to said first bracket, said allowing means being formed on said first bracket and including a pair of guide rails and a guide roller, said pair of guide rails being arranged in parallel; and
means for driving said second bracket, said driving means having one end connected to the hull and the other end connected to said second bracket.

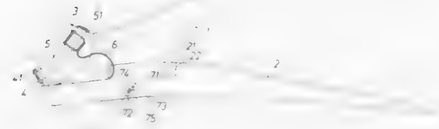
5,151,059
SHIFTABLE REVERSING TRANSMISSION FOR MARINE PROPULSION DEVICE
Jeffrey P. Higby, Wildwood, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of Ser. No. 506,622, Apr. 9, 1990, abandoned. This application Jun. 4, 1991, Ser. No. 710,163
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—75 66 Claims



1. A marine propulsion device comprising a lower unit including a gearcase, a propeller shaft mounted in said gearcase for rotation about a generally horizontal fore and aft axis and having an axially extending forwardly opening bore, a shift shaft including a rearward portion located in said bore, a forward portion, and means for connecting said forward portion to said rearward portion to effect common axial movement of said forward and rearward portions in both directions along said fore and aft axis, a shift lever supported by said lower unit for rotary movement about a horizontal axis transverse to said fore and aft axis, being adapted to be connected to a vertically shiftable link to thereby rock said lever about said transverse horizontal axis, and including a leg, and means for connecting said leg to said forward portion of said shift shaft to effect movement of said forward portion of said shift shaft in both directions along said fore and aft axis in response to rotary shift lever movement, one of said means for connecting said forward portion to said rearward portion and said means for connecting said leg to said forward portion including assembling means operable incident to forward displacement of said rearward portion of said shift shaft to effect such connection thereof so as thereafter to effect displacement of said shift shaft in both directions along said fore and aft axis in response to rocking movement of said shift lever about said transverse horizontal axis.

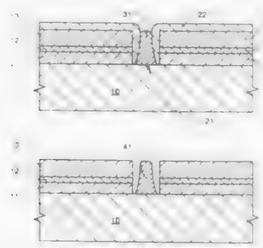
5,151,060
SWIMMING FLIPPER
Sek W. Lam, G.P.O. Box 13770, General Post Office, Hong Kong, Hong Kong
Filed Mar. 26, 1991, Ser. No. 674,934
Int. Cl.[5] A63B *31/11*
U.S. Cl. 441—62 4 Claims

1. A swimming flipper comprising a shoe having a heel portion, a fin, and hinge means for connecting said fin to said shoe rendering said shoe to rotate with respect to said fin,
wherein said fin comprises a front portion and a rear heel surrounding portion in which an opening having an area larger than that of said heel portion is provided, said swimming flipper further comprises:
two upwardly protruding and symmetrically disposed protruding strips, each being provided on one side of said fin front portion,
a strap orienting member being provided at the end of the heel surrounding portion of the fin with the upper end of the strap orienting member extending upwardly and having an opening through which a strap is passed,
said strap being connected to the heel surrounding portion, and



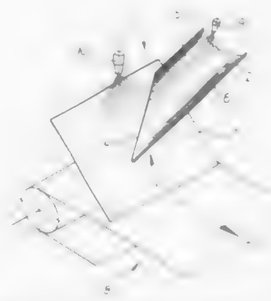
two buckles being provided on said strap and adapted to engage with or detach from the two protruding strips respectively, the strap, when detached, is adapted to be fastened against the portion between the lower end of the calf and the instep of the feet by means of an adjustable buckle provided on the strap.

5,151,061
METHOD TO FORM SELF-ALIGNED TIPS FOR FLAT PANEL DISPLAYS
Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Feb. 21, 1992, Ser. No. 839,606
Int. Cl.[5] H01J *9/02*
U.S. Cl. 445—24 42 Claims



1. A process for forming conductive self-aligned emission cathode tips on a starting substrate for use in flat panel displays, said process comprising the steps of:
a) forming a first dielectric layer superjacent and coextensive said starting substrate;
b) placing and patterning a first conductive layer superjacent and coextensive said first dielectric layer, said patterning of said first conductive layer resulting in a conductive grid structure having a plurality of a first set of parallel conductive lines in intersection with a plurality of a second set of parallel conductive lines and a plurality of exposed portions of said first dielectric layer;
c) forming a second dielectric layer superjacent and coextensive said conductive grid structure and exposed portions of said first dielectric layer;
d) etching a buried contact opening at each grid intersection thereby exposing portions of said starting substrate, and forming patterned edges in each layer bordering each said contact opening;
e) forming a sacrificial layer superjacent and coextensive said second dielectric layer and the patterned edges of said second dielectric layer, said first conductive layer and said first dielectric layer thereby forming cone-shaped voids at said exposed portions of said starting substrate;
f) placing a second conductive layer into said cone-shaped voids thereby connecting to said exposed portions of said starting substrate;
g) removing said sacrificial layer thereby forming said self-aligned cathode emission tips; and
h) sharpening said emission tips.

5,151,062
APPARATUS FOR TURNING OVER FISH FILLETS
Hugo Pontow, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lubeck, Fed. Rep. of Germany
Filed Jul. 3, 1991, Ser. No. 725,687
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1990, 4022451
Int. Cl.[5] A22B *3/08*
U.S. Cl. 452—179 9 Claims



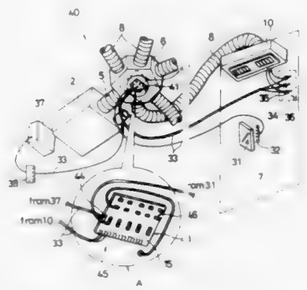
1. An apparatus for the automatic turning over of fish fillets having two main surfaces from one of said surfaces onto the other one in order to bring said fillets into a desired position for further processing, the apparatus comprising fillet supplying means for feeding said fillets to be turned over and fillet discharging means for discharging the turned-over fillets toward further processing, wherein:
a) said fillet supplying means includes guiding channel means having a longitudinal axis, arranged in an inclined manner for supporting the forward movement of the fillets by gravity from a starting end to a run-off end, and having two longitudinal edges opposing each other with a run-off edge along said run-off end terminating said longitudinal edges;
b) said run-off edge starts from one of said longitudinal edges and extends forward and across to at least a proximity of the second one of said longitudinal edges thereby deviating from the shortest distance between two opposing points on said opposing longitudinal edges; and
c) guiding face means are arranged adjacent said run-off edge at a predetermined distance thereto and extending essentially in the direction of said longitudinal axis of said guiding channel means, said guiding face means being arranged to extend underneath said guiding channel means when seen in the vertical dimension, and in an inclined manner.

5,151,06

AIR CONDITIONING DIST IBUTION SYSTEM

Ichiro Tanaka; Seiji Sasaki; Zen- chi Kakubari, and Osamu Kojima, all of Kohnan, Japan, ass gnors to Zexel Corporation, Japan

Filed Oct. 3, 1990, Se . No. 592,131
Claims priority, application Jap n, Oct. 3, 1989, 1-257154; Oct. 3, 1989, 1-257155; Oct. 3, 198 , 1-257156
Int. Cl.[5] F24F *7/08*
U.S. Cl. 454—258 15 Claims



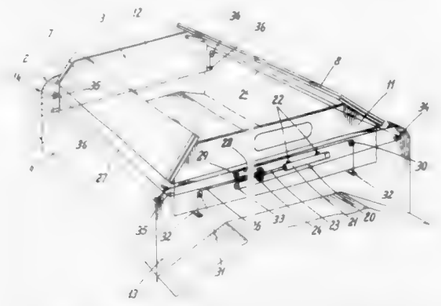
1. An air conditioning system co mprising:
an air conditioning unit,
a blower for blowing conditione l air,
a polygonal branch chamber of p escribed volume having an inspection hole in its bottom s rface covered by a removable cover,
a main duct for delivering cond itioned air from the blower to the polygonal branch cham er,
a plurality of branch ducts prov ded with respective dampers and connected between the polygonal branch chamber and a plurality of discrete spac s for delivering the conditioned air from the polygon l branch chamber to the plurality of discrete spaces, an l
an electrical circuit board provi ling means for controlling said respective dampers of the branch ducts,
said electrical circuit board be ng mounted on the outer bottom surface of said cover.

5,151,06

GRAIN TANK FOR A HAR\ ESTER THRESHER

Martin Damman, and Gerhard The sing, both of Harsewinkel, Fed. Rep. of Germany, assignors t › Class OHG, Harsewinkel, Fed. Rep. of Germany

Filed May 9, 1991, Se . No. 697,890
Claims priority, application Fed. Rep. of Germany, May 21, 1990, 4016319
Int. Cl.[5] A01F *12/60*
U.S. Cl. 460—23 12 Claims



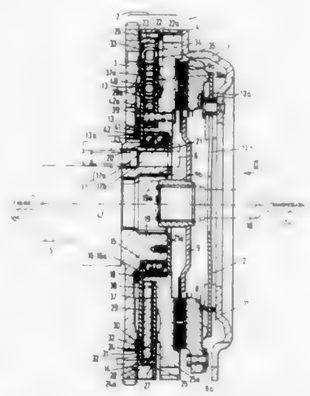
1. A grain tank for a harvester th resher, comprising a plurality of walls including side walls and end walls which together form an upper filling opening; a cover articulately connected with each of said side walls and adapted to close said filling opening; vertically displaceable plates connected with said end walls and associated with said covers so that said covers in an upwardly folded condition together with said upwardly placed plates form a box-shaped structure to increase a volume of the grain tank; straight guides mounted on an inner side of said end walls; power means operatively connected with said plates, so that said plates are upwardly and downwardly displaceable in said straight guides by said power means and said covers which are articulately connected with said side walls are turned by said plates.

5,151,065

TORSION DAMPING APPARATUS FOR USE WITH FRICTION CLUTCHES IN THE POWER TRAINS OF MOTOR VEHICLES

Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 416,954, Oct. 4, 1989, abandoned, which is a division of Ser. No. 256,236, Oct. 11, 1988, which is a continuation of Ser. No. 717,327, Mar. 29, 1985, abandoned. This application Jan. 18, 1991, Ser. No. 643,150
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421698; Jul. 7, 1984, 3425159
Int. Cl.[5] F16D *3/14, 3/66;* F16F *15/12*
U.S. Cl. 464—68 13 Claims



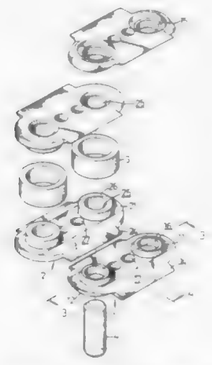
1. Apparatus for compensating for angular shocks, including fluctuations of torque, which are transmitted between an engine and an input element of a variable-speed transmission, comprising at least two coaxial flywheels including a first flywheel connectable with the engine and a second flywheel connectable with the input element by way of an engageable clutch; and damper means for opposign rotation of said first and second flywheels relative to each other, said damper means comprising an intermediate member rotatable with reference tos aid first and second flywheels, and first and second ampers provided between said intermediate member and said first and second flywheels, respectively, said intermediate member having a radially outermost portion and one of said first and second flywheels having means for centering said radially outermost portion, said intermediate member being centered only by said one flywheel and only at said radially outermost portion thereof and each of said first and second dampers having means for limiting the angular movability of said first and second flywheels relative to each other.

5,151,066

STREAMLINE CHAIN

Chia L. Wu, No. 734, Chung Shan Rd.,, Kuei Jen Hsiang, Tainan Hsien, Taiwan

Filed Feb. 1, 1991, Ser. No. 649,039
Int. Cl.[5] F16G *13/02*
U.S. Cl. 474—206 3 Claims



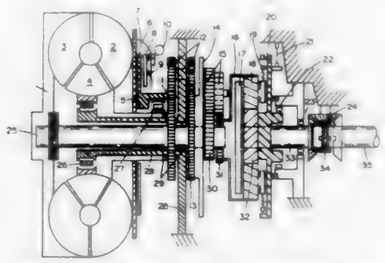
1. A chain comprising a plurality of pairs of outer and inner chain plates linked by rollers and pins, wherein the improvement comprises:
each said outer and inner chain plates being formed as a rectangle having a protuberant lateral arched portion on each transverse end thereof and having first and second countersunk through holes, respectively, on each lateral arched portion thereof to receive a chain pin; each said inner chain plate having inward cylindrical flanges on an inner face thereof around a periphery of said first and second through holes for supporting said roller; each said outer chain plate having frustum-like projections on a inner face thereof around a periphery of said first and second through holes being fittable to said first and second through holes on said inner chain plates; each said lateral arched portion of said outer chain plate having a blade portion along an edge on an inner face thereof, thereby allowing said outer chain plate to reduce a twisting angle formed between and adjacent sprocket and said chain.

5,151,067

VEHICLE AUTOMATIC TRANSMISSION SYSTEM

Chin-Fu Huong, No. 14-4, Lane 263, Sec. 2, Wen Hwa Rd., Panchiao, Taipei, Taiwan

Continuation-in-part of Ser. No. 426,885, Oct. 25, 1989, abandoned. This application May 13, 1991, Ser. No. 699,173
Int. Cl.[5] F16H *47/08*
U.S. Cl. 475—43 3 Claims



1. A fully automatic vehicle power transmission system for a vehicle engine, comprising in combination first and second annuli,
a torque output shaft and a front output shaft pivoted to said first and second annuli, respectively,
a centrifugal clutch lining and a drivable drum wheel set in series between said second annulus and said front output shaft a torque converter,
a clutch pressure bearing plate couplable to said torque converter,
a centrifugal weight controlling said clutch pressure plate and being coupled to said torque converter,
a clutch spring, a clutch pressure plate, and a clutch lining connector set in serial order between said clutch pressure bearing plate and said centrifugal weight,
a shifting gear couplable to said front output shaft,
a rear output shaft couplable to said shifting gear,
said centrifugal weight being drivable to urge said clutch pressure bearing plate to said clutch lining connector, thereby permitting power transmission from said vehicle engine through said torque converter and said first annulus for a first speed reduction, and further through said second annulus for a second speed reduction, so as to thereafter operate in a slow shift mode, said power transmission further passing through said front output shaft, and said shifting gear to said rear output shaft,
said centrifugal clutch lining driving said second annulus into coupling engagement with said drivable drum wheel upon the revolving speed of said second annulus reaching a predetermined range so as to shift power to a fast shift mode, or alternatively so as to shift power to an intermediate shift mode when the revolving speed of said second annulus is below said predetermined range.

5,151,068

DRIVING MECHANISM WITH TWO SPEED CLUTCH

Egon Mann; Helmut Eymüller, and Siegfried Stützle, all of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

PCT No. PCT/EP89/00240, § 371 Date Aug. 31, 1990, § 102(e) Date Aug. 31, 1990, PCT Pub. No. WO89/08796, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 8, 1989, Ser. No. 573,045
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808067
Int. Cl.[5] F16H *3/44*
U.S. Cl. 475—322 3 Claims

1. A drive mechanism for a mobile excavation vehicle having a housing (1) containing a power shiftable two-speed transmission designed as a planetary transmission and driven by an input shaft from a prime mover (3) with continuous speed and torque conversion starting from an initial speed of zero, a sun gear (5) being fixedly connected with the input shaft of said two-speed transmission (4), the two speeds of said transmission being alternately engageable and disengageable via hydraulically shiftable first and second friction clutches (9, 10), at least one fluid pump being provided for supplying pressurized lubricating fluid, and both said friction clutches (9, 10) being spring clutches biased into engagement by a resilient member and disengageable by fluid pressure and both serving to shift gears

of said two-speed transmission and as a parking and auxiliary service brake,

wherein said second friction clutch (**10**) is situated for optional locking of an annulus gear (**6**) of said two-speed transmission (**4**) with respect to said housing (**1**),

both said first and second friction clutches (**9, 10**) are radially telescoped and are actuatable independently of each other, and

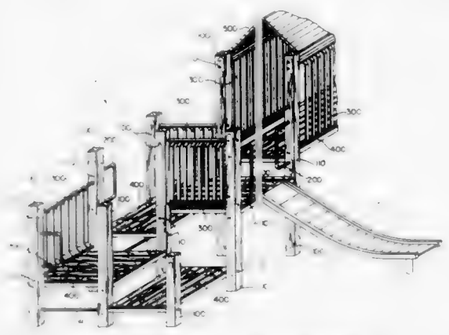
said first friction clutch (**9**) is a radially internal friction clutch situated for optional locking of said two-speed transmission and providing direct drive therethrough.

5,151,069

PLAYGROUND EQUIPMENT

Gerald P. Skalka, Washington, D.C., assignor to Recreation Technology, Inc., Dunkirk, Md.

Filed Nov. 5, 1990, Ser. No. 610,075
Int. Cl.[5] A63B *9/00*
U.S. Cl. 482—35 7 Claims



1. A vertically extending structure comprising:

a roof member, said roof member comprising first and second parallel, spaced-apart bars and a plurality of rafter members, said rafter members being parallel to each other, each said rafter member comprising first and second rafters extending upwardly at an angle from said first and second bars, respectively, and meeting to form a peak above said first and second bars, and each said rafter member extending upwardly from and being attached to both of said bars to form a unitary structure, each of said bars having first and second free ends, said rafter members being positioned between and offset from said first and second free ends, said free ends being coplanar and each of said free ends being provided with internal threads and including means for penetrating wood,

first, second, third, and fourth spaced wooden support members for supporting said roof member, said support member defining the vertices of a rectangle and each having therein a transverse opening extending therethrough, said transverse openings of said first and second support members being axially aligned with and receiving said first and second free ends, respectively, of said first bar, said transverse openings of said third and fourth support members being axially aligned with and receiving said first and second free ends, respectively, of said second bar, said transverse openings each including an inwardly-facing portion of a size and shape to matingly receive and to envelop in a supporting fashion one of said free ends, a central bolt-body-receiving portion having a transverse dimension less than that of said inwardly-facing portion, and an outer bolt-head-receiving portion having a greater transverse dimension than said central bolt-body-receiving portion, and

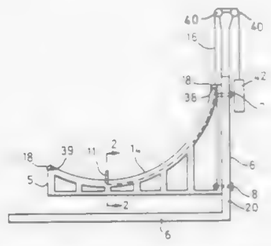
first, second, third, and fourth bolts extending through said transverse openings of said first, second, third, and fourth support members, respectively, each of said bolts having a head and a threaded end threadably engaged with said internal threads of one of said free ends of first and second bars, whereby tightening of said bolts pulls said first and second bars of said roof member into said support members at the innermost extent of said inwardly facing portion of said transverse openings to tend to prevent the removal of said roof member from said inwardly facing portions if any of said bolts is removed, and whereby said roof member rigidly connects said first, second, third, and fourth support members.

5,151,070

RESISTANCE TRAINING DEVICE

Peter G. Norman, 35 Cambridge Park Court, Twickenham, Middlesex TW1 2JN, England

Continuation of Ser. No. 399,465, filed as PCT/GB88/00104, Feb. 18, 1988, abandoned.
This application Aug. 5, 1991, Ser. No. 742,203
Claims priority, application United Kingdom, Feb. 19, 1987, 8703833; Mar. 17, 1987, 8706302
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—99 15 Claims



1. A resistance training device comprising a track defining a predetermined at least partially non-linear path and which path defines a plane, operating means coupled to the track, and resistance means for providing a resistance force coupled to the operating means, wherein the operating means is movable by action of a user along the path defined by the track against the resistance force provided by the resistance means, said operating means comprising a first bearing member and a handle, said handle connected to said first bearing member, said track comprising a second bearing member, said second bearing member comprising an elongate channel, the first bearing member comprising a runner coupled for movement relative to said second bearing member and coupling means comprising a flexible elongate member having a body part having a longitudinal axis and first and second ends, said body part comprising a first portion including said first end and a second portion including said second end, said first end connected to said runner and said second end connected to said resistance means, said first portion defined as that portion of the body part that is within said channel, said first portion being of variable length depending upon what length of said body part is within said channel at any given time, and said second portion being the remainder of said body part, said first portion of said body part being enclosed at all times within said channel and axially following the same path as said track, said first portion being disposed within said plane.

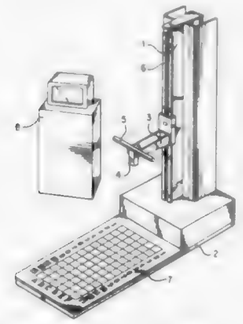
5,151,071

ISOINERTIAL LIFTING DEVICE

Sanjeev Jain, Columbia, and John E. Vermette, Baltimore, both of Md., assignors to Baltimore Therapeutic Equipment Co., Hanover, Md.

Filed Oct. 5, 1990, Ser. No. 593,886
Int. Cl.[5] A63B *21/062*
U.S. Cl. 482—101 5 Claims

1. A device for exercise and evaluating of both applied dynamic and static force which comprises an upright standard having a horizontal arm mounted thereon for vertical movement on said standard in a dynamic mode, said arm having a force sensor means for registering applied force attached on the distal end thereof and handle means attached to said force sensor means for applying force to said arm in either the horizontal or vertical direction; said arm being connected to first elongated, flexible connector means which is attached to a rotatable drive pulley mounted on a shaft such that said vertical movement of said arm causes rotation of said shaft; second flexible elongated connector means connecting a weight means



to a rotatable weight pulley also mounted on said shaft such that rotation of said weight pulley causes vertical displacement of said weight means; clutch means mounted on said shaft for causing engagement/disengagement of said drive pulley and weight pulley to cause the respective pulleys to turn together or independently of one another; said horizontal arm being provided with means for locking it in position on said standard in the static mode to prevent said vertical movement in response to force applied thereto; and said force sensor means being connected to means for evaluating and recording applied force in both the static and dynamic modes.

5,151,072

FREE WEIGHT BARBELL SPOTTING AND RACKING MACHINE

Dennis E. Cone, 1726 5th Ave., Oakland, Calif. 94606, and James H. Gibson, 1511 150 Ave. #14, San Leandro, Calif. 94578

Filed May 14, 1991, Ser. No. 699,916
Int. Cl.[5] A63B *21/078*
U.S. Cl. 482—104 3 Claims

1. A barbell exercise apparatus comprising:

a stationary frame;

a stationary rack for retaining a barbell thereon associated with said stationary frame;

a reciprocating frame having a pair of parallel horizontally extending arms, the arms having a distal end remote from the stationary frame, the reciprocating frame mounted within or about the stationary frame for vertical reciprocal movement thereon;

a pair of switches, one switch mounted on each arm between the ends thereof;

a pair of sleeves, one sleeve pivotally mounted to the distal end of each of the pair of arms, each sleeve overlaying the respective distal portion of the arm and switch such that downward pivotal movement of the sleeve activates its respective switch;

biasing means for normally biasing the sleeves upwardly away from the arms; and,

an electrically powered hydraulic cylinder mounted on the stationary frame, the reciprocating frame mounted to the electrically powered hydraulic cylinder such that actuation of the electrically powered hydraulic cylinder causes upward vertical movement of the reciprocating frame, the switches operatively connected to the electrically powered hydraulic cylinder such that activation of the switch causes actuation of the electrically powered hydraulic cylinder and concurrent upward vertical movement of the reciprocating frame;

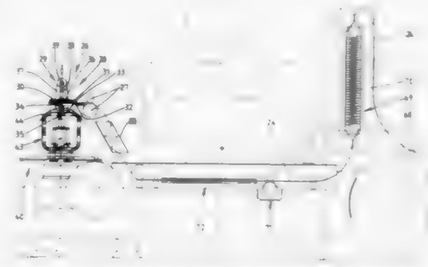
whereby engagement of the barbell on the sleeves and horizontally extending arms causes downward pivoting of the sleeve thus activating the switch, which in turn actuates the electrically powered hydraulic cylinder, which in turn causes upward vertical movement of the reciprocating frame having horizontally extending arms, thus removing the barbell from the weight lifter.

5,151,073

APPARATUS FOR THE PRODUCTION OF CIGARETTE PACKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 501,205, Mar. 29, 1990, Pat. No. 5,052,993. This application Jun. 20, 1991, Ser. No. 718,133
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3910986
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] B31B *3/14;* B65B *19/02*
U.S. Cl. 493—79 16 Claims



1. An apparatus for the production of hinge lid packs from thin cardboard blanks (**20**) which are folded and filled in a rotatable folding turret (**40**), wherein:

each of the blanks (**20**) is of a generally rectangular configuration and has two long edges, and the blanks are interconnected with one another at their long edges to form a web (**24**);

the blanks (**20**) are interconnected solely by a line of residual connections (**25**);

said apparatus comprises, in a blank station (**26**), severing means for severing the blanks (**20**) from the web (**24**) an transferring them to said folding turret (**40**);

said apparatus further comprises feeding means for continu-

ously feeding the web (**24**) to said blank station (**26**) while the blanks (**20**) are being severed from a stationary portion of the web in said blank station (**26**); and

said apparatus further comprises upstream of said blank station (**26**), a compensation store means (**88**) for temporarily storing the fed web (**24**) in a zig-zag configuration formed by the pivoting of adjacent pairs of blanks about the line of residual connections (**25**) to form included angles which vary during feeding of the web.

4. An apparatus for the production of hinge lid packs from thin cardboard blanks (**20**) which are folded and filled in a rotatable folding turret (**40**), wherein:

each of the blanks (**20**) is of a generally rectangular configuration and has two long edges, and the blanks are interconnected with one another at their long edges to form a web (**24**);

a collar (**21**) is connected to each blank (**20**) by webs (**22**) so that collars (**21**) of the interconnected blanks (**20**) are arranged at a border of the web (**24**); and

said apparatus comprises: severing means (**26**), in a blank station (**26**), for severing the blanks from the web; upstream of said blank station (**26**), a folding track (**72**) and rollers (**81**, **82**; **86**, **87**) for transporting the web (**24**) through said folding track (**72**); and folding means for folding the web in said folding track (**72**) and having a folding edge (**75**) for z-folding of said webs (**22**) of the collar (**21**).

5,151,074

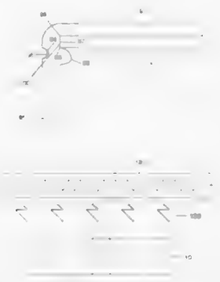
METHOD OF MANUFACTURING MEDICAL APPLIANCE DISPOSAL CONTAINER

James L. Simpson, Indialantic, Fla. assignor to Hemox, Inc., Melbourne, Fla.

Continuation of Ser. No. 449,675, Dec. 12, 1989, abandoned, which is a division of Ser. No. 300,946, Jan. 24, 1989, Pat. No. 4,927,076. This application Dec. 5, 1991, Ser. No. 803,105

Int. Cl.[5] B31B *3/14, 3/66*

U.S. Cl. 493—133 **3 Claims**



1. A method of making a container comprising the steps of:

(a) providing a substantially flat sheet material having a laminated structure containing compact fibrous material and an outer layer of material that is effectively impervious to the passage of fluid therethrough and which, when irradiated by infrared rays for a prescribed period of time, becomes tacky;

(b) forming, in the sheet material provided in step (a), a plurality of foldable panels that are to be folded and joined together to define bottom, sidewall and top portions of a body;

(c) irradiating said sheet material with infrared electromagnetic energy so as to heat said outer layer to its tacky condition; and

(d) folding and joining together sheet panels that have been irradiated in step (c), whereby folded and joined together sheet panels are bonded to one another by means of the outer layer of said sheet material, so as to form said container;

(e) coating interior intersections of bottom and sidewall portions of said body with fluid absorption resistant material; and

(f) prior to step (d), scoring said foldable panels of sheet material along lines spaced apart from folded corners thereof, so as to cause, during the folding of sheet panels in step (d), the formation of beads in said sheet material that are separated from the corners of fold in said sheet material, wherein the scoring of a respective one of said foldable panels of sheet material comprises scoring said respective one of said foldable panels of sheet material on one side thereof at a region adjacent to a fold location so as to cause the protrusion of a bead on an opposite, interior side of said respective one of said foldable panels of sheet material, such that a side edge of a respective one of said foldable panels of sheet material abuts against an interior fold corner of another of said foldable panels of sheet material that is folded to be contiguous therewith and is captured between said bead and interior folded corner of said another of said foldable panels of sheet material, thereby effectively providing a sealed joint thereat and preventing the formation of a leakage space between the interior of said container and the exterior thereof.

5,151,075

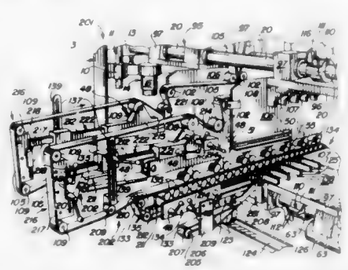
CARTON FOLDING APPARATUS

Norman R. Beaulieu, Nashua, N.H.; David E. Clark, Shreveport, La.; Arthur B. Clingman, III, Shreveport, La.; Richard F. Jeffrey, Shreveport, La.; James A. Mahlum, Stonewall, La., and Larry E. Reeves, West Monroe, La., assignors to J & L Industries, Inc., Keithville, La.

Filed Nov. 5, 1990, Ser. No. 608,910

Int. Cl.[5] B31B *1/06*

U.S. Cl. 493—179 **32 Claims**



1. A carton folding apparatus comprising a feed module for receiving and delivering unfolded cartons, said feed module comprising spaced first support means; a pair of first vertical guide means slidably carried by said first support means in substantially vertical relationship, respectively; first upper horizontal guide means connecting said first vertical guide means in substantially horizontal relationship; upper feed assembly means mounted on said first upper horizontal guide means in slidably adjustable relationship for aligning the leading edges of the cartons in feeding relationship and guiding the cartons through said feed module; a pair of first vertical adjusting means engaging said first vertical guide means for selectively raising and lowering said first vertical guide means, respectively, said first upper horizontal guide means and said upper feed assembly means in concert; first lower horizontal guide means connecting said first support means in substantially horizontal relationship, a plurality of feed belt roller frame means disposed on said first lower horizontal guide means in spaced, parallel, slidably adjustable relationship and a plurality of endless feed belts carried by said feed belt roller frame means, respectively, for supporting the unfolded cartons;

a feed belt drive motor carried by one of said first support means, a feed belt drum rotatably carried by said first support means in spaced, parallel relationship with respect to said lower horizontal guide means, said feed belt drum receiving said feed belts in non-encircling, driving relationship, and connecting means connecting said feed belt drive motor to said feed belt drum for rotating said feed belt drum and driving said feed belts on said feed belt roller frame means in concert at said selected speed and to feed said cartons through said feed module in linear, spaced relationship; and at least one carton folding module positioned in unconnected alignment with said feed module, said carton folding module having independently driven, synchronized upper belt means and lower belt means for receiving the unfolded cartons from said feed module and folding the cartons in a selected configuration.

5,151,076

MANUFACTURING METHOD FOR A FLEXIBLE CONTAINER

Olaf Strand, Porsgrunn, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

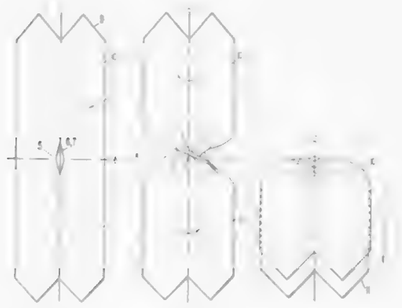
PCT No. PCT/NO89/00134, § 371 Date Jul. 11, 1991, § 102(e) Date Jul. 11, 1991, PCT Pub. No. WO90/06844, PCT Pub. Date Jun. 28, 1990

PCT Filed Dec. 21, 1989, Ser. No. 720,846

Claims priority, application Norway, Dec. 21, 1988, 885700

Int. Cl.[5] B31B *1/74*

U.S. Cl. 493—186 **7 Claims**



1. In a method of manufacturing a flexible container for use in lifting, transportation and storage of bulk material, wherein said container is formed form an elongated hose-like blank of material having a longitudinal axis and a circumference by turning a first half-length portion of said blank inside out and fitting said first half-length portion over a second half-length portion of said blank thereby forming inner and outer sacks to be fitted with a base construction, the improvement comprising:

forming in a middle length portion of said elongated blank at least two axially extending openings spaced equally around said circumference; and

rotating, in the area of said openings, said first half-length portion of said blank relative to said second half-length portion of said blank about said longitudinal axis, and thereby, after said turning said first half-length portion inside out and fitting said first half-length portion over said second half-length portion, forming areas of said material between said openings into at least two integrated lifting loops of rotated material.

5,151,077

METHOD AND APPARATUS FOR PERFORATING MATERIAL

William R. Cole, Jr.; Charles H. Sanborn, III, and J. Dwight Clanton, all of Shelbyville, Tenn., assignors to ARK, Inc., Shelbyville, Tenn.

Filed Jul. 31, 1991, Ser. No. 738,343

Int. Cl.[5] B26F *1/22, 1/24, 1/20*

U.S. Cl. 493—353 **14 Claims**

1. Apparatus for perforating paper, the apparatus comprising,

means for holding a supply of paper to be perforated,

means for taking up paper from said holding means, a reach of paper extending between said holding means and said take-up means having transversely opposite longitudinal edges,

means for driving the paper in a forward direction along the reach from said holding means to said take-up means at a selected speed,

means generally between said holding means and said take-up means for perforating the paper in the reach generally from edge to edge thereof, said perforating means comprising a perforating roller mounted for rotation about an axis generally parallel to the reach and perpendicular to the direction of travel of the paper in the reach, the perforating roller being disposed for engaging the paper in the reach and including teeth adapted to pierce the paper upon engagement therewith, the direction of travel of the teeth at the location of engagement with the paper being the same as the direction of travel of the paper along the reach,

each tooth having an upper portion and a lower portion, the upper portion being sharpened to facilitate penetration of the paper and including a generally triangular shaped planar surface facing rearwardly relative the direction of rotation of the perforating roller, the lower portion being unsharpened and including a generally rectangular shaped planar surface facing generally rearwardly relative to the direction of rotation of the perforating roller,

said driving means rotating the perforating roller at a rate such that the speed of the teeth is less than the speed of the paper in the forward direction along the reach whereby the paper moves forward relative the teeth and against the rectangular shaped planar surfaces thereof after penetration of the paper so that the teeth form elongate openings extending generally rearwardly of the points of penetration of the teeth, the teeth tearing away flaps of the paper to form the openings, the flaps remaining connected to the paper at the rearward edge of the openings.

5,151,078

METHOD FOR FOLDING PIECES OF PAPER INTO LETTERS OF THE ALPHABET

Yi-Teh Lin, Shihtsuo 76, 4th Lin, Shihtsuo Village, Mailiao Hsiang, Yunlin County, Taiwan

Filed Jan. 2, 1992, Ser. No. 816,875

Int. Cl.[5] B65H *45/12*

U.S. Cl. 493—405 **4 Claims**

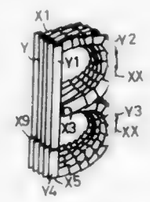
1. A method for folding paper into alphabet letter shapes, comprising:

defining a rectangular piece of paper with an X-axis parallel to a width thereof and a Y-axis parallel to a length thereof;

folding the piece of paper into an alphabetic letter at lines

parallel to X-axis, thereby dividing said piece of paper into a plurality of segments;

in segments to be formed into curves, defining a plurality of alternative lines X' and X" parallel to said X-axis so that a sub-segment of paper between every two sequential lines X' and X" is longer than a sub-segment of paper between every two sequential lines X" and X';



corrugating the piece of paper at said alternative lines X' and X";

corrugating the piece of paper at lines parallel to said Y-axis; and

bending said folded and corrugated piece of paper into an alphabetic letter shape.

5,151,075

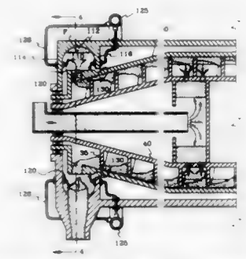
METHOD AND APPARATUS FOR REDUCTION OF PARTICLE DISINTEGRATION

David A. Flanigan, Cleveland, Okla., and John D. Boadway, Kingston, Canada, assignors to Conoco Specialty Products Inc., Houston, Tex.

Filed Sep. 27, 1990, Ser. No. 589,720

Int. Cl.[5] B04B *11/00, 1/20*

U.S. Cl. 494—27 31 Claims



1. A centrifugal separation device for separating the components of a fluid and particulate mixture, said device comprising:

a particulate receiving surface;

means for at least partially centrifugally separating the components of the mixture and propelling the particulates against said surface; and

means for absorbing impact forces as the particulates impact against said surface comprising an impact absorbing fluid interposed between said means for centrifugally separating the components and said surface.

5,151,080

METHOD AND APPARATUS FOR INDUCING AND ESTABLISHING A CHANGED STATE OF CONSCIOUSNESS

Claus Bick, Felsenland-Bick-Klinik, D-6783 Dahn, Fed. Rep. of Germany

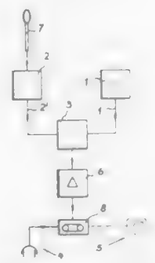
PCT No. PCT/CH89/00153, § 371 Date Apr. 27, 1990, § 102(e) Date Apr. 24, 1990, PCT Pub. No. WO90/01967, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 28, 1990, Ser. No. 490,552

Claims priority, application Switzerland, Aug. 30, 1988, 3219/88

Int. Cl.[5] A61M *21/00*

U.S. Cl. 600—28 2 Claims



1. A method for inducing and establishing a deepened state of consciousness in a human that is physically and psychically relaxed or changed by employing electroacoustic means for creating and generating electromagnetic sound signals and for producing electronically altered and synthetic human speech signals, the method comprising:

generating said sound signals;

producing said synthetic human speech signals;

superimposing said sound signals and said synthetic human speech signals to produce a superimposed signal; and

conveying said superimposed signal to the ears of a human by way of one of headphones and loudspeakers.

5,151,081

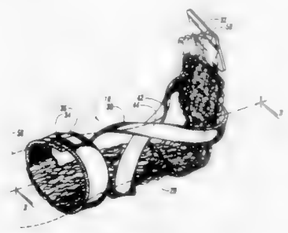
FOOT SPLINT

Paul J. Williams, Tampa, Fla., assignor to L'Nard Associates, Inc., Clearwater, Fla.

Filed Mar. 8, 1991, Ser. No. 666,370

Int. Cl.[5] A61F *5/00*

U.S. Cl. 602—27 3 Claims



1. A foot splint, comprising:

an L-shaped plastic splint means comprising an upstanding leg portion having inner and outer surfaces, opposite sides and upper and lower ends, a heel portion contiguous with the lower end of said leg portion, and a generally horizontal foot portion having opposite sides and extending forwardly from said heel portion, and

a stabilizer bar pivotally secured to the upper end of said leg portion on the outside surface thereof, and being pivotally movable between an inoperative position extending downwardly along the outside surface of said leg portion and an operative position extending transversely to the leg portion.

5,151,082

APPARATUS AND METHOD FOR KIDNEY DIALYSIS USING PLASMA IN LIEU OF BLOOD

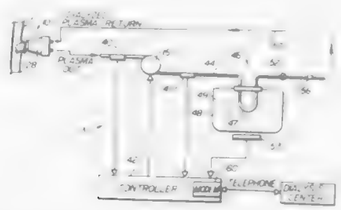
Reynolds G. F. Gorsuch, Yountville, and John Atkin, Corona Del Mar, both of Calif., assignors to Heathdyne, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 229,007, Aug. 5, 1988, Pat. No. 4,950,224. This application Aug. 20, 1990, Ser. No. 570,009

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.[5] H61M *37/00*

U.S. Cl. 604—4 11 Claims



1. An apparatus for kidney dialysis using in vivo separation of plasma from blood and extracorporeal separation of toxic metabolic waste from the separated plasma, comprising:

at least one elongated micorporous fiber having a hollow interior, said fiber being dimensioned to be received within a blood vessel without significantly obstructing fluid flow through said blood vessel, the pore size of the fiber being sufficient to allow plasma to diffuse through the pores into the hollow interior of the fiber but not sufficient to allow cellular components larger than plasma to diffuse therethrough;

the hollow interior of said elongated fiber being in fluid communication with a means for conducting plasma comprising a first hollow tube which connects to the hollow interior of the fiber and permits passage of plasma to said blood vessel;

extracorporeal dialysis means receiving the plasma passing through the first tube and removing toxic metabolic waste from the plasma; and

means conducting the plasma from the extracorporeal dialysis means to the second hollow tube for return to the blood vessel.

5,151,083

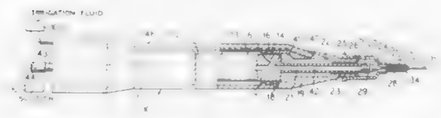
APPARATUS FOR ELIMINATING AIR BUBBLES IN AN ULTRASONIC SURGICAL DEVICE

Robert H. Pichler, Skokie, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed Jul. 29, 1991, Ser. No. 737,425

Int. Cl.[5] A61B *17/00*; A61M *1/00*

U.S. Cl. 604—22 2 Claims



1. An ultrasonic handpiece comprising, an ultrasonic motor with an aspirating passage therethrough mounted in said handpiece and formed with a tubular shaped extending portion, suction means connected to said aspirating passage, said passage extending through said tubular-shaped extending portion, a hollow needle attached to said tubular-shaped extending portion, a generally cylindrical-shaped member of said handpiece extending and enclosing said tubular-shaped extending portion to form a cavity and irrigation means adapted to supply irrigation fluid to said cavity and to an operating site at an end of said needle a and an opening formed in said ultrasonic motor between said aspirating passage and said cavity so as to remove bubbles from the irrigation fluid.

5,151,084

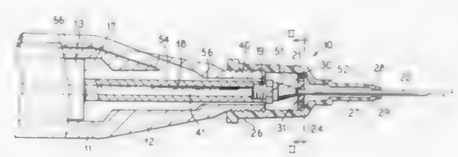
ULTRASONIC NEEDLE WITH SLEEVE THAT INCLUDES A BAFFLE

Sokhuom Khek, Chicago, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed Jul. 29, 1991, Ser. No. 737,424

Int. Cl.[5] A61B *17/00*; A61M *1/00*

U.S. Cl. 604—22 1 Claim



1. An ultrasonic handpiece for performing operations comprising, an ultrasonic motor mounted in said handpiece, a tubular portion extending from said ultrasonic motor, a hollow needle attached to an end of said tubular portion, a conical portion of said ultrasonic handpiece extending around said tubular portion and a first cavity formed therebetween, an irrigating tube connected to said conical portion and supplying irrigating fluid to said first cavity, a flexible sleeve connected to an end of said conical portion and extending around said needle, a second cavity formed between said sleeve and said needle and fluidly connected to said first cavity, a planar baffle mounted in and across said sleeve and formed with a plurality of equally spaced openings which extend in a direction parallel to said needle, a third cavity formed between said sleeve and said needle and said second and third cavities in fluid communication through said plurality of said openings in said planar baffle, and an outlet opening formed in said sleeve and in fluid communication with said third cavity, said planar baffle mounted so that its plane extends in a direction which is 90 degrees to said needle, wherein suction is applied to said tubular portion for aspiration, and wherein a shoulder is formed at the junction of said tubular portion and said ultrasonic motor.

5,151,085

APPARATUS FOR GENERATING ULTRASONIC OSCILLATION

Tomohisa Sakurai, Tokyo, and Masakazu Gotanda, Tsukui, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 513,230

Claims priority, application Japan, Apr. 28, 1989, 1-107788; May 15, 1989, 1-120958

Int. Cl.[5] A61B *17/32*

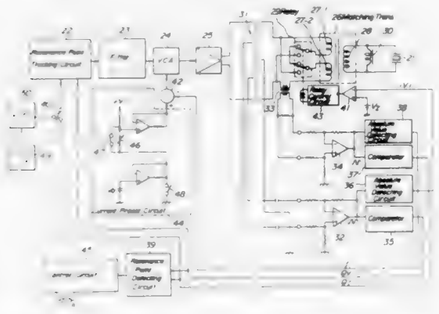
U.S. Cl. 604—22 11 Claims

1. An apparatus for generating an ultrasonic oscillation comprising:

an ultrasonic transducer having an ultrasonic vibrating element for producing an ultrasonic oscillation and a probe for transmitting the oscillation produced by the ultrasonic vibrating element;

a driving circuit for supplying a driving power to said ultrasonic vibrating element;

an impedance matching means connected between said ultrasonic transducer and said driving circuit for matching the output impedance of the driving circuit to the impedance of said ultrasonic transducer;



an impedance detecting means for detecting the impedance of said ultrasonic transducer to generate an impedance detection signal; and

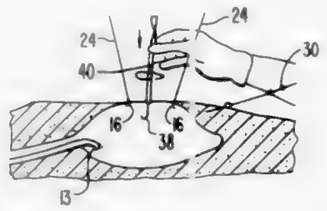
controlling means for automatically controlling said impedance matching means in accordance with said impedance detection signal supplied from said impedance detecting means such that the output impedance of said driving circuit is matched to the impedance of said ultrasonic transducer.

5,151,086

LAPAROSCOPIC TUBE PLACEMENT METHOD

Quan-Yang Duh, and Lawrence W. Way, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 22, 1991, Ser. No. 780,773
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—51 **15 Claims**



1. A method of placing a tube in a hollow body organ through a body wall having an interior surface juxtaposed with the body organ and separated therefrom by a space and an exterior surface outside the body comprising the steps of:

(a) performing a laparoscopy through the body wall in a location so as to bring the organ under direct vision;

(b) inserting a plurality of retraction device introducers through said body wall and into said space and into said organ under direct vision;

(c) fixing a like plurality of retraction devices to said organ by means of said introducers;

(d) fixing said body organ in contacting relation with said interior surface by means of said retraction devices;

(e) inserting a hollow tube through said body wall into said body organ; and

(f) fixing said tube in said body organ.

5,151,087

AORTIC ROOT CANNULA

Kenneth R. Jonkman, Grand Rapids, Mich., assignor to DLP, Inc., Grand Rapids, Mich.

Filed Aug. 30, 1991, Ser. No. 753,038
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 **9 Claims**

3. An introducer cannula for use with the human body which comprises:

(a) a cannula body having an insertable tip at a distal end and a connector end at a proximal end,

(b) a needle slidable in said body having a penetrating point projectable through said tip,

(c) a removable fitting at the proximal end of said cannula,

(d) a gas-pass-water occluding plug at a distal end of said fitting surrounding said needle,

(e) a stop means adjacent the distal end of said needle to contact said plug upon withdrawal of said needle into said fitting, and

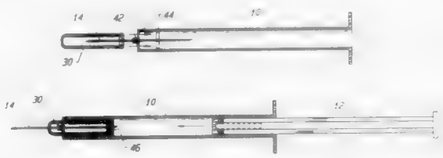
(f) said fitting having an axial length long enough to receive the point of said needle when the needle is withdrawn prior to the removal of said needle and said fitting from said cannula.

5,151,088

SAFETY NEEDLE AND SYRINGE ASSEMBLY

A. Christopher Allison, Pacifica, and Richard A. Jaffe, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 31, 1991, Ser. No. 738,419
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **11 Claims**



1. A disposable safety needle and syringe assembly comprising

a syringe including a housing having opposing open ends,

a plunger and plunger piston movably positioned within said housing from one end,

a needle and needle support positioned at the other end of said housing with said needle including an external portion extending from said housing, and

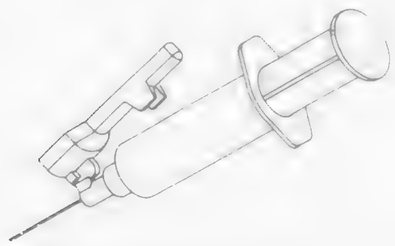
a needle shield movably positioned within said housing from said other end, said needle shield being movable from and extending out of said housing by movement of said plunger and said plunger piston following completion of an injection whereby said needle shield envelopes said needle portion extending from said housing to prevent accidental needle sticks.

5,151,089

RETRACTABLE PROTECTIVE NEEDLE SHEATH

William D. Kirk, III, St. Mary's Road, Lebanon, Ky. 40033; Anthony A. DeCaro, 574 T. P. Cundiff Rd., Columbia, Ky. 42728, and Wayne E. Perry, 233 N. 500 W, Columbus, Ind. 47201

Filed May 16, 1990, Ser. No. 524,009
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **7 Claims**



1. A protective needle sheath for enclosing a needle including a shaft with a puncturing end comprised of:

(a) A base means;

(b) A retractable arm secured to the base by a pivot means wherein said retractable arm extends beyond the puncturing end of the needle shaft and said retractable arm includes a needle channel for encasing the needle;

(c) An arm actuator secured to the retractable arm to rotate the retractable arm about the pivot means from a closed position wherein the retractable arm encases the needle to an open position wherein the needle is not encased by the retractable arm;

(d) A clasping means attached to the retractable arm for clasping the retractable arm to the needle shaft when the retractable arm is in the closed position, wherein the clasping means includes friction locking tabs located on each side of the needle channel; and

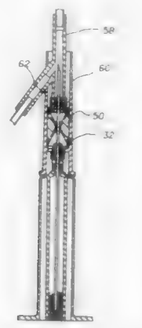
(e) Squeeze tabs secured to the retractable arm which when compressed unclasp the friction locking tabs from the needle shaft when the retractable arm is in a closed position.

5,151,090

SYRINGE AND NEEDLE GUARD ASSEMBLY

Robert J. Best, Winthrop Harbor; Mark E. Larkin, Lindenhurst, and Juergen H. Zaha, Winthrop Harbor, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 19, 1990, Ser. No. 600,556
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **12 Claims**



1. An additive-type syringe and needle guard assembly including a syringe housing having a front wall substantially closing one end of the housing and a needle hub extending forward from said front wall for securing a needle cannula, said needle cannula extending forward from the hub and terminating with a needle point, and a needle guard fixedly mounted coaxially with the needle hub on said front wall of the syringe housing to protect the needle cannula during use of the assembly in injecting fluids into I.V. administration sets including Y-sites, the syringe and needle guard assembly comprising:

an outwardly flared surface defined by said front wall of said syringe housing;

an elongated member defining said needle guard and having a cylindrical side wall extending forward beyond the needle point of the cannula a fixed distance and having a first open end at the front of the cylindrical side wall and a second outwardly flared open end at the rear of the cylindrical side wall and adjacent said outwardly flared surface defined by said front wall of said syringe housing;

a circumferential flange disposed on and within said elongated member inwardly of the sidewall and intermediate the first open end and the second end of the cylindrical sidewall, said circumferential flange defining an open sized for said needle hub; and

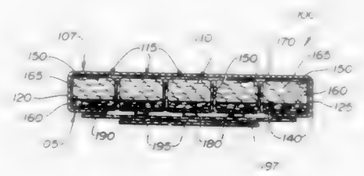
annular means disposed between said adjacent flared surfaces and joining the needle guard to the front wall of the syringe housing.

5,151,091

ABSORBENT STRUCTURE HAVING MULTIPLE CANALS

Frank S. Glaug, Spotswood, and William B. Mattingly, III, East Brunswick, both of N.J., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 247,820, Oct. 24, 1988, abandoned.
This application Feb. 21, 1991, Ser. No. 659,200
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—385.1 **1 Claim**

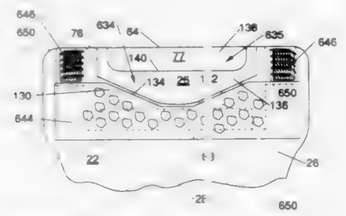


1. An absorbent structure having a body-facing side, a garment-facing side, a longitudinal axis and a transverse axis, which comprises:

(a) a fluid permeable cover on said body-facing side;

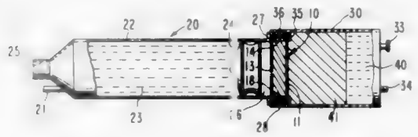
(b) at least two abutted absorbent chambers formed by fluid repellent walls comprising moisture impermeable polymeric film selected from the group consisting of impermeable dense polymeric film, microporous film or apertured polymeric film, wherein said film comprises a layer of ethyl, vinyl acetate film and an adjacent layer of polyethylene film, wherein said ethyl, vinyl acetate film is located on the garment-facing side of the absorbent structure, said chambers extending generally along the longitudinal axis of the absorbent structure, said chambers containing absorbent material such that the absorbent material in each of said chambers is separated from absorbent material in adjacent absorbent chambers by said fluid repellent walls, which are adapted to direct the flow of fluid along the longitudinal axis of the absorbent structure.

5,151,092
ABSORBENT ARTICLE WITH DYNAMIC ELASTIC WAIST FEATURE HAVING A PREDISPOSED RESILIENT FLEXURAL HINGE
Kenneth B. Buell, Cincinnati; Sandra H. Clear, Maineville, and Danielia T. Falcone, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 715,152, Jun. 13, 1991, abandoned. This application Aug. 21, 1991, Ser. No. 750,775
The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.
Int. Cl.[5] A61F 13/15, 13/20
U.S. Cl. 604—385.2 53 Claims



1. A disposable absorbent article comprising:
a containment assembly comprising an absorbent core having side edges and waist edges
an elastic waist feature at least extending longitudinally outwardly from one of said waist edges of said absorbent core, said elastic waist feature comprising
(a) an elasticized waistband comprising
(i) a shaping panel zone being elastically extensible in at least the lateral direction,
(ii) a waistline panel zone resiliently flexurally joined with said shaping panel zone, said waistline panel zone being elastically extensible in at least the lateral direction, and
(iii) a predisposed, resilient, waistband flexural hinge zone joining said shaping panel zone and said waistline panel zone for allowing relative flexural bending between said shaping panel zone and said waistline panel zone when forces are applied and for providing a restoring force/-moment to resiliently return said shaping panel zone and said waistline panel zone to essentially their preceding in-use configuration when the forces are removed, said waistband flexural hinge zone having a bending flexure restoring force greater than about 20 grams/; and
(b) a second flexural hinge zone joining said elasticized waistband to said containment assembly; and
a closure system disposed on the absorbent article for creating-/maintaining lateral tension through at least a portion of said elasticized waistband.

5,151,093
OSMOTICALLY DRIVEN SYRINGE WITH PROGRAMMABLE AGENT DELIVERY
Felix Theeuwes, and Su I. Yum, both of Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.
Filed Oct. 29, 1990, Ser. No. 605,593
Int. Cl.[5] A61K 9/22
U.S. Cl. 604—892.1 22 Claims

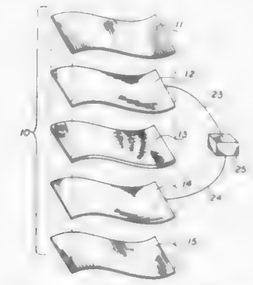


1. An osmotic engine for driving a device adapted to dispense a beneficial agent, the engine comprising a shaped wall surrounding a means for forming a driving fluid and a passageway through the wall for delivering the driving fluid from the engine, at least a portion of the wall being comprised of a material that is permeable to an external liquid, the wall having a sufficient degree of impermeability to an osmotically active material in the engine to generate an osmotic pressure differential across the wall when the wall is exposed to the external liquid;
wherein the means for forming a driving fluid comprises a bilayered tablet having a layer of a gas generating means and a layer of an osmotic solute, whereby the external liquid permeates through the wall portion and forms a solution of the solute, the solution being a first driving fluid which is pumped from the engine and through the passageway at a first rate over a first period of time and subsequently the external liquid permeates through the wall portion and causes the gas generating means to generate a gas, the gas being a second driving fluid which is pumped from the engine and through the passageway at a second rate over a second period of time which follows the first period of time, and second rate being unequal to the first rate.

5,151,094
SUCTION SWAB
Paul H. Hanifl, Barrington, Ill., assignor to Sage Products, Inc., Crystal Lake, Ill.
Filed Mar. 20, 1990, Ser. No. 496,423
Int. Cl.[5] A61C 17/04
U.S. Cl. 604—902 24 Claims

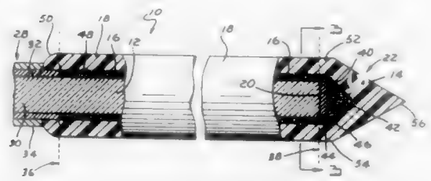
1. A disposable suction swab, comprising
a. an elongated, hollow stem having opposite ends,
b. means at one end of said stem for connecting said stem to a source of suction,
c. means for controlling suction within said stem,
d. an enlarged, solid and resilient tip mounted on the other end of said stem, said tip having a longitudinal central bore accommodating said stem and at least one transverse aperture connected to said central bore,
e. a hole in said stem contiguous to and in axial alignment with said aperture, said aperture being larger in cross-section than said hole, and
f. means securing said tip to said stem.

5,151,095
LASER SHIELD WITH INDICATOR MEANS
Edward Teeple, Jr., 641 Ridgefield Ave., Pittsburgh, Pa. 15216
Filed Nov. 22, 1989, Ser. No. 440,665
Int. Cl.[5] A61B 17/36
U.S. Cl. 606—2 15 Claims



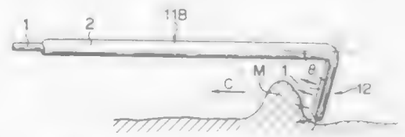
1. A laser shield for use during laser procedures comprising:
a flexible insulating layer;
a first flexible metallic layer positioned adjacent to the insulating layer;
a flexible opaque layer applied to the surface of the metallic layer so as to coextensively interpose the metallic layer between the insulating layer and the opaque layer;
a second flexible metallic layer positioned adjacent to and secured to the insulating layer so as to coextensively interpose the insulating layer between the metallic layers; and
a securing means for attaching the opaque layer, the first and second metallic layer and insulating layer together.

5,151,096
LASER CATHETER DIFFUSER
Adib I. Khoury, Bellows Falls, Vt., assignor to Angiolaz, Incorporated, Rockingham, Vt.
Filed Mar. 28, 1991, Ser. No. 676,307
Int. Cl.[5] A61B 17/36
U.S. Cl. 606—15 10 Claims



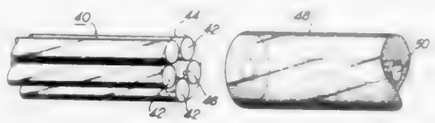
1. An apparatus for transmitting light from a medical laser along an optical fiber to a cancerous tumor, that comprises:
a. an unclad fiber-optic core extending from the optical fiber having any layers surrounding the fiber-optic core removed so that light travelling through the optical fiber and unclad fiber-optic core can pass out of the core;
b. a reflective cap affixed to a terminal end of the unclad fiber-optic core so that light travelling through the optical fiber and unclad fiber-optic core is reflected by the reflective cap back into and around the unclad fiber-optic core away from the terminal end;
c. a diffuser matrix that surrounds the unclad fiber-optic core and reflective cap so that light passing out of the core is diffused by the diffuser matrix; and
d. rigid penetration means for penetrating the cancerous tumor, wherein the penetration means includes a transparent tubular sleeve that encases the diffuser matrix, unclad fiber-optic core and reflective cap so that light diffused by the diffuser matrix moves through the sleeve into the cancerous tumor.

5,151,097
LASER LIGHT EMITTER
Norio Daikuzono, Ichihara, Japan, assignor to S.L.T. Japan Co., Ltd., Tokyo, Japan
Filed Aug. 28, 1990, Ser. No. 573,563
Claims priority, application Japan, Sep. 1, 1989, 1-227092
Int. Cl.[5] A61B 17/35
U.S. Cl. 606—15 11 Claims



1. A laser light emitter for excision of protruding tissue of an animal organism, the emitter comprising:
an optical transmission element having a holding portion through which light is transmitted into a bent portion that has an end surface and a side surface; and
a light impervious material covering a first portion of said side surface of the bent portion of the optical transmission element, such that a second portion of said side surface of the bent portion of the optical transmission element is uncovered, whereby laser light applied to the optical transmission element will be emitted from the uncovered second portion of said side surface of the bent portion to impinge on and excise protruding tissue.

5,151,098
APPARATUS FOR CONTROLLED TISSUE ABLATION
Hanspeter Loertscher, Zedtwitzweg 2, CH-3626, Hunibach, Switzerland
Continuation-in-part of Ser. No. 556,900, Jul. 23, 1990, abandoned. This application Mar. 26, 1991, Ser. No. 675,442
Int. Cl.[5] A61B 17/36
U.S. Cl. 606—16 20 Claims



1. A probe for performing endolaser microsurgery and ablating tissues in which said probe is connected to a laser delivery system for delivering pulsed laser power, said system having an optical fiber delivery means with an end surface abutting said probe for conducting said power, said probe comprising a walled tubular member for guiding the laser power through said walls by way of providing multiple reflections at the cylindrical surfaces of said walls and including a central canal through said tubular member for aspiration of liquids and ablated tissue debris and also for use in irrigation and as an instrument channel.

5,151,099

TOOL FOR REMOVAL OF PLASTICS MATERIAL

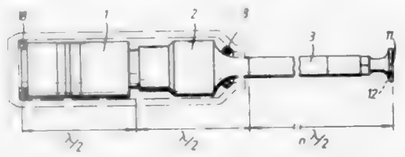
Michael J. R. Young, Bremridge Farm, Ashburton, South Devon, England, and Brian R. D Bradnock, 39 Blackford Road, Edinburgh, Scotland

Continuation of Ser. No. 499,585, Mar. 27, 1990, abandoned. This application Dec. 3, 199 , Ser. No. 804,617

Claims priority, application United Kingdom, Mar. 28, 1989, 8906898

Int. Cl.[5] A61B *17/38, 17/00, 17/32;* A61F *2/32*

U.S. Cl. 606—27 9 Claims



1. A tool for use in removing heat softenable plastics material from a hole in which said plastics material is in a substantially solid state comprising a disc having a work surface on one side adapted to contact said material, piezo electric transducer means operatively connected through a work horn to said disc to cause said work surface to vibrate ultrasonically and thereby to heat locally said plastics material until it is softened, cavity means on a second side of said disc opposite said work surface and adapted to receive said heated and softened plastics material, and passage means connecting said cavity means to a working zone of said plastics material ahead of said disc when engaged by said work surface to enable heated and softened plastics material to flow through said passage means into said cavity means.

5,151,100

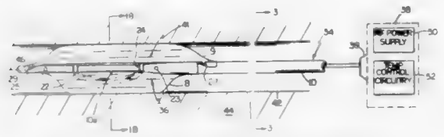
HEATING CATHETERS

John E. Abele, Concord, Mass.; Charles E. Lennox, Hudson, N.H.; Paul C. Nardella, Easton, and Sharad H. Joshi, Norwood, both of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 263 815, Oct. 28, 1988, Pat. No. 4,955,377. This application Jul. , 1990, Ser. No. 547,931

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—28 37 Claims



1. A catheter device for heating tissue, comprising

a longitudinally extending catheter shaft constructed for insertion into a patient's body said catheter shaft defining at least one lumen for fluid flow through said shaft,

at least a first liquid-expandable chamber mounted on said catheter shaft, said chamber defined at least in part by a flexible wall that engages body tissue, said chamber being associated with said lumen for liquid communication with a liquid source outside the body, said chamber being fillable thereby with said liquid after placement in the body,

a heating device, in contact with said liquid within said chamber when said chamber is expanded, for heating said liquid, so that heat of a controlled temperature can be transmitted from said liquid to surrounding tissue by thermal conduction through said wall of said first chamber, and

means for selectively directing said heat transmission to a selected portion of tissue engaged by said catheter device, said means being interposed between said heated liquid in said chamber and another portion of said tissue to inhibit thermal conduction of heat from said heated liquid to said other portion of said tissue while heat is transmitted from said heated liquid through the wall of said chamber to said selected portion of tissue.

5,151,101

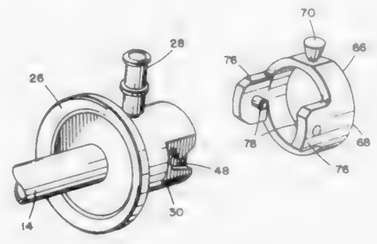
SYSTEM FOR DISCONNECTABLY MOUNTING AN ENDOSCOPE SHEATH WITH AN ENDOSCOPE TOOL

Benedetto Grossi, Stamford, Conn., and Richard P. Muller, Bronx, N.Y., assignors to Circon Corporation, Santa Barbara, Calif.

Division of Ser. No. 513,550, Apr. 24, 1990, which is a division of Ser. No. 203,152, Jun. 2, 1988, Pat. No. 4,920,961. This application Nov. 19, 1990, Ser. No. 615,461

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—46 10 Claims



1. A tool for use in resectoscopy comprising:

frame means defining a working element; and

means operatively connected to the frame means for removably connecting a cooperating sheath having a static latch receptacle means to said working element, said removably connecting means comprising a reciprocally movable latch means having at least one latch member, said reciprocally movable latch means having a biasing means for biasing said at least one latch member in a first position for retaining said at least one latch member within said static latch receptacle means removably connecting said cooperating sheath to said working element, but movable to a second position for disconnecting the at least one latch member from the static receptacle means wherein the static latch receptacle means cooperates with said at least one latch member to urge said working element away from the cooperating sheath whereby the working element is removable from the cooperating sheath without an operator touching the cooperating sheath.

5,151,102

BLOOD VESSEL COAGULATION/STANCHING DEVICE

Hiroyasu Kamiyama, 1-7-3-13 Shinkotoni, Kita-ku, Sapporo-shi, and Hirokazu Amino, Kyoto, both of Japan, assignors to Kyocera Corporation, Kyoto and Hiroyasu Kamiyama, Sapporo, both of, Japan

Filed May 31, 1990, Ser. No. 530,994

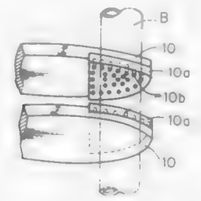
Claims priority, application Japan, May 31, 1989, 1-140192; May 30, 1990, 2-140376

Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—51 20 Claims

1. In a bipolar-type blood vessel coagulation/stanching device having a pair of conductive forceps including blood vessel holding sections provided at end portions of said forceps and adapted to cauterize, coagulate and stanch said blood vessel, the improvement comprising:

an electrically and thermally insulative blood vessel contact member of sintered substance provided at each of said end portions, each of said contact members having a blood vessel contact surface which includes a plurality of exposed electrodes at an areal ratio between 5% and 60% to



the entire surface area of said blood vessel contact surface of said blood vessel contact member.

5,151,103

POINT CONTACT BONE COMPRESSION PLATE

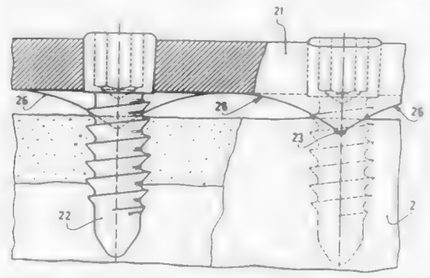
Slobodan Tepic, Davos; Stephen Perren, Davos Dorf; Fritz Straumann, Waldenburg, and Franz Sutter, Niederdorf, all of Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.

Division of Ser. No. 492,403, Mar. 8, 1990, Pat. No. 5,053,036, which is a continuation of Ser. No. 247,357, Sep. 21, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 662,634

Claims priority, application European Pat. Off., PCT/EP87/00663

Int. Cl.[5] A61F *5/24*

U.S. Cl. 606—69 14 Claims



1. An implant for osteosynthesis comprising a biocompatible device for attachment to a bone, and a plurality of screws for attaching the device to the bone, the heads of said screws and the device having a predetermined friction angle relative to one another, said screws having conical heads and said device having complementary conical holes for receiving said heads in surface contact therewith, the cone angle of the conical holes being less than the friction angle between the holes and the screw head, thereby locking said screws to said device to prevent said device from sliding down the screw heads.

5,151,104

SELF-LOCKING JOINT CONNECTOR

Robert V. Kenna, Hobe Sound, Fla., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Oct. 26, 1989, Ser. No. 427,652

Int. Cl.[5] A61B *17/56*

U.S. Cl. 606—73 8 Claims

1. A device to be placed into one side of a joint, said device comprising:

(a) a first portion comprising:

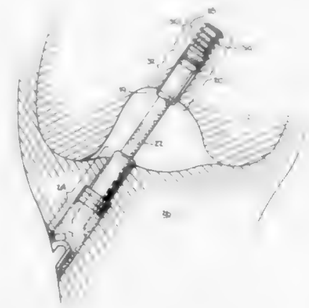
(1) a first screw portion to be screwed into bone in one side of said joint; and

(2) a first means for locking said first portion; and

(b) a second portion which is adapted to be inserted during surgery into proximity with and then remain self-locked with said first portion, said second portion comprising:

(1) a nose portion having a second means for locking said second portion,

wherein said first means for locking and said second means for locking are adapted to lock together,



wherein said first means for locking is a groove located either within said first portion or said second portion, and wherein said second means for locking comprises two spring-loaded collapsible pins located either within said second portion or said first portion respectively and which are adapted to snap into and remain self-locked within said groove.

5,151,105

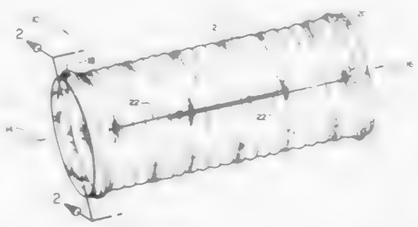
COLLAPSIBLE VESSEL SLEEVE IMPLANT

Clifford Kwan-Gett, 3017 St. Mary's Cir., Salt Lake City, Utah 84124

Filed Oct. 7, 1991, Ser. No. 772,067

Int. Cl.[5] A61F *2/06*

U.S. Cl. 623—1 29 Claims



1. An implantable collapsible tubular sleeve for implanting inside a live tissue fluid vessel, said sleeve comprising an open-ended generally cylindrical body portion being flexible and collapsible, a pair of resilient and substantially circular stiffening members positioned and integral with said sleeve at opposite annular ends of said body, a pair of longitudinal stiffening members extending parallel to a central axis of said sleeve, each member having one end attached to a body portion of the sleeve and opposite ends overlapping and loosely extending from a middle portion of said body for adjusting the length of said sleeve, and means for positioning and erecting said sleeve in said live tissue fluid vessel.

5,151,106

METHOD FOR TINTING A HYDROPHILIC POLYMER BY INCORPORATING A REACTIVE DYE INTO THE POLYMER PRIOR TO POLYMERIZATION

Debabrata Bhaumik, New York, N.Y., and Patrick K. Chen, Edison, N.J., assignors to Allergan, Inc., Irvine, Calif.

Filed Dec. 21, 1990, Ser. No. 632,466
Int. Cl.[5] D06P *5/00*
U.S. Cl. 8—507 26 Claims

1. A method for tinting a hydrophilic polymer which comprises:

a) subjecting a hydrophilic polymer-forming composition comprising (i) at least one hydrophilic ethylenically unsaturated monomer, (ii) a reactive dye and (iii) a polymerization initiator which does not chemically affect the reactive dye to polymer forming conditions to provide a hydrophilic polymer in which the reactive dye is substantially uniformly incorporated therein; and,

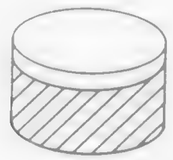
b) contacting the polymer with an aqueous solution of a base which catalyzes the reaction between the polymer and the reactive dye, the reactive dye thereby becoming covalently bound to the polymer.

5,151,107

CEMENTED AND CEMENTED/SINTERED SUPERABRASIVE POLYCRYSTALLINE BODIES AND METHODS OF MANUFACTURE THEREOF

Hyun S. Cho; Chien-Min Sung, both of Sandy; Leo Merrill, Orem, and Sy-Hwa Chen, Salt Lake City, all of Utah, assignors to Norton Company, Worcester, Mass.

Filed Jul. 29, 1988, Ser. No. 226,049
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—295 47 Claims



1. A superabrasive cutting element comprising a plurality of metal coated superabrasive particles, said superabrasive particles having a hardness at least equal to that of diamond or cubic boron nitride, said metal being selected from Groups IVA, VA, VIA or an alloy thereof; said coating being chemically bonded to said superabrasive particles and to the coatings of adjacent superabrasive particles, said coating forming a matrix cementing said superabrasive particles together into a coherent mass of high structural strength having a predetermined configuration; wherein said superabrasive particles comprise at least 70% by volume of said cutting element.

5,151,108

METHOD OF PRODUCING POROUS VITRIFIED GRINDER

Motohide Kitahara, Kyoto; Hiroshi Ozaki, Osaka, and Kouji Shishido, Mei, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 3, 1991, Ser. No. 680,142
Claims priority, application Japan, Apr. 5, 1990, 2-90927
Int. Cl.[5] B24D *3/18*
U.S. Cl. 51—296 5 Claims

1. A method of producing a porous vitrified grinder comprising: blending melamine cyanurate having a particle diameter of from 100μ to 600μ with grinder grains and at least one binder material to produce a blend; and applying compression molding to the blend.

5,151,109

GRINDER AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Kitabayashi, Neyagawa, and Tadayuki Ishikawa, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation of Ser. No. 42,064, Apr. 24, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,748
Claims priority, application Japan, Apr. 28, 1986, 61-96883
Int. Cl.[5] B24D *18/00*
U.S. Cl. 51—297 15 Claims

1. A method of manufacturing a grinder comprising the steps of:

forming a grinding particle fixing sheet of a predetermined configuration;

forming an adhesive layer adapted to form a pattern of an adhesive layer on a surface of said sheet;

sprinkling grinding particles each having a predetermined diameter on a surface of said sheet for selectively fixing said grinding particles only on said pattern;

preparing a plurality of sheets fixed with said grinding particles produced by the above described steps; and

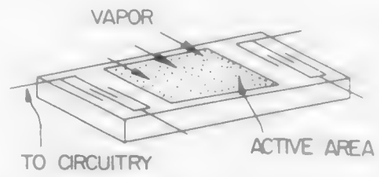
laminating said sheets fixed with said grinding particles one over another according to a predetermined lamination rule, and pressure molding a resulting lamination under a heated condition.

5,151,110

MOLECULAR SIEVE SENSORS FOR SELECTIVE DETECTION AT THE NANOGRAM LEVEL

Thomas Bein; Kelly D. Brown; Gregory C. Frye, and Charles J. Brinker, all of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Sep. 11, 1990, Ser. No. 580,373
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—75 12 Claims



1. A method of selectively detecting the presence of a chemical entity within an environment comprising placing a selective chemical sensor in said environment and detecting mass changes of the piezoelectric surface resulting from sorption of material thereon, said chemical sensor comprising:

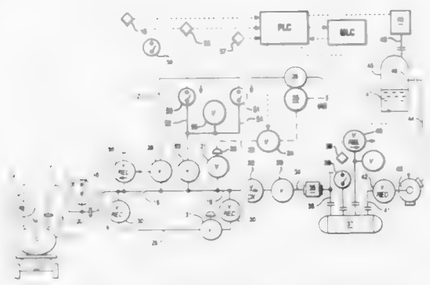
(a) a piezoelectric substrate capable of detecting mass changes resulting from sorption of material thereon; and

(b) a coating applied to said substrate, which selectively sorbs chemical entities of a size less than a preselected magnitude, wherein the chemical entity to be detected is CO or a hydrocarbon,

wherein element (a) is a surface acoustic wave (SAW) device or a quartz crystal microbalance (QCM) device,
wherein element (b) is a film containing zeolite crystals, wherein the pores within said zeolite crystals provide molecule sieving capability, and
wherein said film is an inorganic silica matrix having zeolite crystals embedded therein.

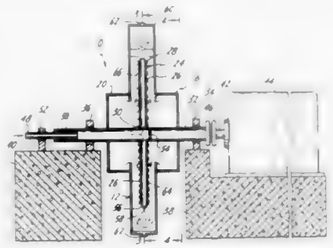
3. A chemical sensor comprising:
(a) a piezoelectric substrate capable of detecting mass changes resulting from sorption of material thereon; and
(b) a coating applied to said substrate, which selectively sorbs chemical entities of a size less than a pre-selected magnitude, wherein the chemical entity to be detected is CO or a hydrocarbon,
wherein element (b) is a film containing zeolite crystals, wherein the pores within said zeolite crystals provide molecule sieving capability, and
wherein said film is an inorganic silica matrix having zeolite crystals embedded therein.

5,151,111
VAPOR RECOVERY SYSTEM FOR VEHICLE LOADING OPERATION
Alistair A. Tees, Nederland, and Glen E. Kenney, Beaumont, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.
Filed Aug. 2, 1991, Ser. No. 739,545
Int. Cl.[5] B01D *53/00*
U.S. Cl. 55—164 **9 Claims**



1. A vapor recovery system for filling systems in vehicle loading terminals, adapted to collect and remove vapors from vehicles as they are being loaded with volatile substances; said recovery system comprising:
vapor recovery piping adapted to be sealingly connected to a vehicle transport tank;
a vacuum generator attached to said piping and adapted to pull a vacuum in said piping and thereby on said vehicle transport tank;
valving in said piping adapted to control vacuum therein;
actuators on said valving adapted to operate said valving between open and closed positions;
a logic controller connected to said actuators and adapted to activate said actuators to maintain a predetermined desirable level of vacuum in said piping and said vehicle transport tanks in the range of about −4″ to about −12″ W.C.; and,
a vapor collection assembly at the end of said piping arranged to receive said recovered vapor and dispose thereof.

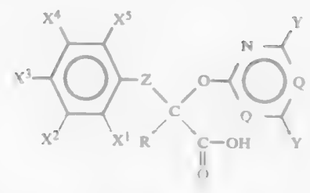
5,151,112
PRESSURE GENERATOR/GAS SCRUBBER
Daniel E. Pike, 19 Jay St., Harrington Park, N.J. 07640
Filed Jul. 24, 1990, Ser. No. 557,616
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—230 **12 Claims**



1. Apparatus for generating pressure and scrubbing gas comprising:
a casing having a scroll casing;
a gas outlet, tangential to and in fluid communication with said scroll casing, and at least one liquid outlet;
rotating means for generating a positive pressure and for scrubbing gases supplied to said casing, said rotating means including a plurality of radially extending feed tubes positioned in said scroll casing, each tube having an open outlet end and an inlet end;
liquid supply means for supplying liquid to said inlet ends of said feed tubes;
said casing further comprising gas inlet supply means for supplying a gas to said casing at a position adjacent said inlet ends of said feed tubes, wherein said gas supply means includes at least one gas inlet box positioned on one side of said scroll casing and in fluid communication with a central portion of said scroll casing, each said gas inlet box including a gas supply inlet; and
drive means for rotatably driving said rotating means such that said liquid exiting from said feed tubes rotates along a peripheral arc of said scroll casing, and said gas outlet is located in said scroll casing substantially along a tangent to said peripheral arc, wherein said liquid ejected from said open outlet ends of said feed tubes pulls said gas adjacent said inlet ends into scrubbing contact with said liquid and results in formation of said positive pressure at the gas outlet of said casing, with said scrubbed gas exiting through said gas outlet and said liquid exiting through said at least one liquid outlet.

5,151,113
HERBICIDAL 2-(PHENOXY OR PHENYLTHIO)-2-(PYRIMIDINYLOXY OR 1,3,5-TRIAZINYLOXY)-ALKANOIC ACIDS
Michael G. Smith; Wendy S. Jacks, both of Walnut Creek; William C. Lo, Hercules, and Robert J. Ehr, Vallejo, all of Calif., assignors to DowElanco, Indianapolis, Ind.
Filed Apr. 29, 1991, Ser. No. 692,742
Int. Cl.[5] A01N *43/54;* **C07D** *239/34, 239/52*
U.S. Cl. 71—92 **36 Claims**

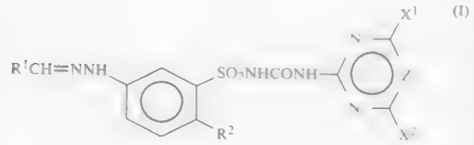
1. A compound of the formula



wherein
one of Q and Q′ represents N and the other represents C—Y″;
Y, Y′, and Y″ each independently represent H, R^1, OR^1, SR^1, NR^2_2, F, Cl, or Br;
X^1 and X^5 each independently represent H, F, Cl, Br, or (C_1–C_4)alkyl optionally mono- or disubstituted with fluorine;
X^2 and X^4 each independently represent H, F, Cl, Br, (C_1–C_4)alkyl optionally mono- or disubstituted with fluorine, SR^1, OR^1, or O-phenyl, O-pyridinyl, or O-pyrimidinyl each optionally substituted with up to two substituents selected from F, Cl, Br, CF_3, CH_3, and CN;
X^3 represents H or F;
with the proviso that of X^1, X^2, X^3, X^4, and X^5 at least two represent H and at least three represent H or F;
Z represents O or S;
R represents H, (C_1–C_3)alkyl, CO_2H, CN, CF_3, or F;
R^1 represents (C_1–C_3)alkyl optionally singly to completely substituted with fluorine; and
R^2 represents H or (C_1–C_3)alkyl;
or an agriculturally acceptable salt, ester, or amide thereof.

5,151,114
N-SUBSTITUTED-3-(SUBSTITUTED HYDRAZINO)BENZENESULFONAMIDE DERIVATIVES, AND HERBICIDAL COMPOSITIONS
Hideo Arahori, 3-48, Tateato, Ueda-machi, Iwaki-shi Fukushima-ken 974; Shiro Yamazaki, 59-2, Kaneyama, Joubann-Nishigou-machi, Iwaki-shi, Fukushima-ken 974; Masato Arahira, 55-1, Sekishita, Nishiki-machi, Iwaki-shi, Fukushima-ken 974, and Aiko Murakami, 128, Kaminakada, Nishiki-machi, Iwaki-shi, Fukushima-ken 974, all of Japan
Division of Ser. No. 473,768, Feb. 2, 1990, Pat. No. 5,059,238. This application Mar. 11, 1991, Ser. No. 667,132
Claims priority, application Japan, Feb. 8, 1989, 1-27369
Int. Cl.[5] C07D *403/12;* **A01N** *43/54*
U.S. Cl. 71—92 **7 Claims**

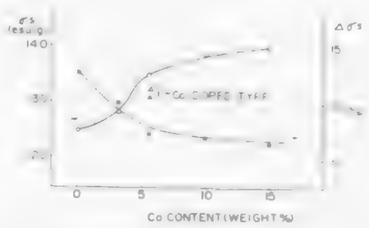
1. An N-substituted-3-(substituted hydrazino)-benzenesulfonamide derivative of the formula (I):



(I)

wherein R^1 is CF_3, COOH or CC1=CC1COOH, R^2 is H, Cl, C_1–C_3 alkyl or C_1–C_4 alkoxycarbonyl; Z is CH; X^1 is C_1–C_3 alkyl, C_1–C_3 akoxyl or Cl; and X^2 is C_1–C_3 alkyl or C_1–C_3 alkoxyl.

5,151,115
MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIA AND METHOD FOR PRODUCING SAME
Kiminori Tamai, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 320,254, Mar. 7, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 598,584
Claims priority, application Japan, Apr. 7, 1988, 63-84076
Int. Cl.[5] B22F *1/02*
U.S. Cl. 75—348 **2 Claims**

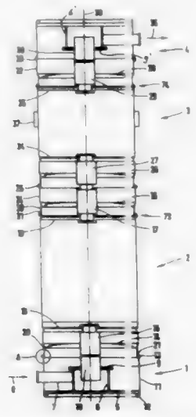


2. A method for producing a metal magnetic powder for magnetic recording media comprising the steps of providing a hydrous needle-like iron oxide powder not containing cobalt as a starting material wherein the long axis of the hydrous needle-like iron oxide is 0.25–0.50 μm, the short axis of said oxide is 0.015–0.035 μm, and the long axis/short axis ratio is 10–20, processing said powder in an alkaline aqueous solution containing an amount of cobalt ions sufficient for applying cobalt ions to the surface of the powder so that the cobalt content of the powder becomes not less than 6 weight % after reduction, subsequently processing the resultant powder in Na_2SiO_3, and then reducing the resultant powder in a reducing atmosphere, said powder having a coercive force greater than 1300 Oe, but not greater than 1600 Oe.

5,151,116
SORPTION COLUMN FOR WASTE-GAS CLEANING
Christoph Scholz, Scliersee, and Yassilios Sefalidis, München, both of Fed. Rep. of Germany, assignors to CS Halbleiter- und Solartechnologie GmbH, München, Fed. Rep. of Germany
Filed Jan. 29, 1992, Ser. No. 827,410
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1991, 4102969
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—387 **14 Claims**

1. A sorption column for waste-gas cleaning having at least one vat containing a solid, stationary sorbent and connected with a lower gas connecting piece and an upper gas connecting piece, characterized in that the lower gas connecting piece (1) has a coupling member (10), the vat (2, 3) adapted to be placed on the lower gas connecting piece (1) has a valve (17, 29) in the vat cover (16, 28) and a valve (15, 27) in the vat bottom (24, 26), and the upper gas connecting piece (4) has a coupling member (38, 80), whereby the coupling member (10) of the lower gas connecting piece (1) is adapted to be joined with the valve (15) in the vat bottom (14) and the coupling member (38, 80) of the upper gas connecting piece (4) is adapted to be joined with the valve (29) in the vat cover (28), and the valve (15) in the vat bottom (14) and the valve (29) in the vat cover (28) open when joined with the coupling member (10) of the lower

gas connecting piece (1) and the coupling member (38, 80) of the upper gas connecting piece (4), respectively, so as to form



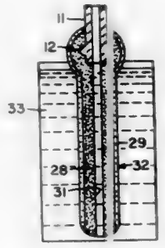
a gas space communicating from the lower gas connecting piece (1) to the upper gas connecting piece (4).

5,151,117

SOLUTION DOPING OF POROUS PREFORMS

Roger F. Bartholomew, Painted Post, and Andrea L. Sadd, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 14, 1991, Ser. No. 715,348
Int. Cl.[5] C03C *25/02*
U.S. Cl. 65—3.12 10 Claims



1. A method of making silica-containing glass optical fiber comprising

depositing heated glass particles on an exterior surface of an elongated support where they adhere together to form a porous glass preform having interconnective pores,

removing said support to form a tubular porous glass body,

adding dopant to said porous glass preform by flowing into the pores of said porous glass body a solution of a salt of the dopant dissolved in an organic solvent comprising, an OH-free solvent, said OH-free solvent further comprising 0–30 volume percent of an OH-containing solvent,

removing the organic solvent,

heat treating the porous glass preform to consolidate it into a non-porous glassy body containing the dopant dispersed through at least a portion of the body, and

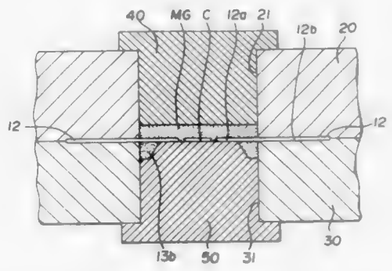
forming an optical fiber from said glassy body wherein the step of depositing comprises introducing one or more reactant compounds into a flame where they are oxidized to form glass particles that are deposited on said support to form said porous glass preform.

5,151,118

METHOD FOR PRODUCING A PACKAGE-TYPE SEMICONDUCTOR ASSEMBLY

Tadao Hirakawa; Sachio Tamura, both of Yokohama, and Hiromitsu Sasanami, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Goto Seisakusho, Yokohama, Japan

Continuation of Ser. No. 458,355, Dec. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 286,724, Dec. 20, 1988, abandoned. This application Oct. 4, 1991, Ser. No. 769,770
Claims priority, application Japan, Jul. 8, 1988, 63-168940
Int. Cl.[5] C03B *19/09*
U.S. Cl. 65—18.1 4 Claims



1. A method for producing a package casing for a package-type semiconductor assembly comprising the steps of:

providing at least one straight conductive lead having inner and outer lead sections and first and second lead surfaces;

providing a first mold having first and second end surfaces and a cavity open in the first and second end surfaces;

providing a second mold having first and second end surfaces and a cavity open in the first and second end surfaces of said second mold;

combining said first and second molds together in a manner such that said at least one conductive lead is clamped between said first surfaces of said first and second molds with said inner lead section being exposed in said cavities of said first and second molds and said first lead surface facing said cavity in said first mold and said second lead surface facing said cavity in said second mold;

inserting a first plunger into said cavity in said first mold to a first position spaced from said first lead surface of said inner lead section of said at least one conductive lead to provide an upper space;

inserting a second plunger into said cavity in said second mold to a position in contact with said second lead surface of said inner lead section of said at last one conductive lead;

providing a lower space between said second mold, said second plunger, and a portion of said second lead surface of said at least one lead adjacent said second end surface of said second mold;

placing at least one conductive island in said cavities in adjacent spaced relation to said inner lead section of said at least one conductive lead;

partly filling glass powder into said upper and lower spaces in said cavities of said first and second molds;

melting said glass powder by application of heat;

forcibly moving said first plunger in said cavity in said first mold to a second position closer to but spaced from said first surface of said inner lead section of said at least one conductive lead so that molten glass completely fills said spaces in said cavities; and

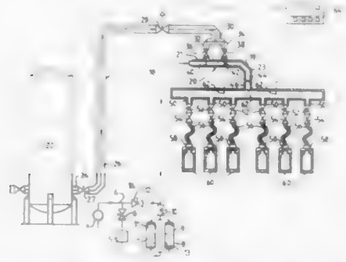
solidifying said molten glass by cooling to integrate said inner lead section of said at least one conductive lead and said conductive island in adjacent spaced relation in a unitary glass body.

5,151,119

COOLING OF MOLDED ARTICLES WITH A MIXTURE OF EVAPORATED CRYOGEN AND DRIED AIR

Stephen Clements, Wetherby, and Brian King, Godalming, both of England, assignors to The BOC Group plc, Windlesham, England

Filed Feb. 28, 1991, Ser. No. 663,234
Claims priority, application United Kingdom, Mar. 1, 1990, 9004640
Int. Cl.[5] C03B *9/00*
U.S. Cl. 65—84 8 Claims



1. A method of cooling a plurality of hot glass containers that have been hot shaped and at least partly formed in moulds, comprising the steps of drying a stream of air, passing the dried air into a vacuum-insulated mixing chamber, evaporating liquid cryogen selected from the group consisting of liquid nitrogen and liquid argon in the mixing chamber, allowing the resulting evaporated cryogen to mix with the dried air to form a mixture at a temperature below minus 20° C., passing the cooled gas mixture into a vacuum-insulated manifold, and causing the cooled gas mixture to flow from the manifold and into said glass containers while they are in said moulds.

5,151,120

SOLID INK COMPOSITIONS FOR THERMAL INK-JET PRINTING HAVING IMPROVED PRINTING CHARACTERISTICS

Young S. You, Los Altos, and John D. Meyer, Tracy, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 332,242, Mar. 31, 1989, abandoned, which is a division of Ser. No. 526,210, May 21, 1990, Pat. No. 5,065,167. This application Apr. 12, 1991, Ser. No. 684,632
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—27 8 Claims

1. An ink-jet composition comprising:

from about 30 to about 94.5 weight percent of a carrier that is solid at 25° C. and liquid at the operating temperature of an ink-jet;

at least about 5 weight percent of an added driver which is miscible with said carrier and which has a critical pressure of at least 15 atmospheres, a boiling point of from about 100° C. to about 300° C. and a vapor pressure at 20° C. of less than about 0.04 atmospheres; and

from about 0.05 to about 5 weight percent of a colorant

wherein said composition is a solid at 25° C., has a viscosity at 90° C. of 15 centipoise or less and has a surface tension at 90° C. of from about 20 to about 25 dynes per centimeter.

5,151,121

SILICATE BINDERS

Thomas Griffiths, Warrington, England, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

PCT No. PCT/GB89/00509, § 371 Date Mar. 13, 1990, § 102(e) Date Mar. 13, 1990, PCT Pub. No. WO89/10819, PCT Pub. Date Nov. 16, 1989
PCT Filed May 11, 1989, Ser. No. 460,875
Claims priority, application United Kingdom, May 13, 1988, 8811411
Int. Cl.[5] C04B *28/26;* B23K *35/22*
U.S. Cl. 106—600 3 Claims

1. In a method of preparing welding rods or sand moulds wherein the components of the rods or moulds are mixed in the presence of an effective amount of a binder, the improvement wherein a lithium silicate solution having a SiO_2:Li_2O weight ratio from about 7.5:1 to about 9:1 and a solids content of from about 18% to about 26% by weight, is used as the sole silicate binder.

5,151,122

PROCESS FOR PRODUCING AN ANTIBACTERIAL CERAMIC MATERIAL

Kiminori Atsumi; Tomoki Saito, and Masaaki Komori, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sangi, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,839
Claims priority, application Japan, Nov. 14, 1989, 1-293992; Aug. 30, 1990, 2-226738
Int. Cl.[5] C09K *3/00;* C09D *5/16;* A23L *1/20, 1/31*
U.S. Cl. 106—35 4 Claims

1. A method of preparing an antibacterial ceramic material comprising contacting at least one ceramic material selected from the group consisting of hydroxyapatite, calcium phosphate, calcium hydrogen phosphate, calcium carbonate, calcium silicate and zeolite with at least one aqueous metal salt selected from the group consisting of aqueous salts of silver, copper and zinc, and thereafter drying and heat firing the material to a temperature of from 800° C. to 1300° C.

5,151,123

RESILIENT SOIL COMPOSITION FOR ATHLETIC FIELDS

Boris Kviesitis, Des Moines, Iowa, assignor to True Pitch, Inc., Altoona, Iowa

Filed May 10, 1990, Ser. No. 521,409
Int. Cl.[5] C09K *17/00*
U.S. Cl. 106—287.17 11 Claims

1. A resilient soil composition for athletic fields which will not become hard and packed upon either drying or being stepped upon and which can be easily worked and shaped, resulting from the method of:

taking a quantity of sand comprised of a plurality of sand particles;

coating said sand particles with a liquid plasticizer material comprised of a mixture of water and at least one from the group of polyvinyl alcohol, polyvinyl acetate, silicon rubber latex or glycerol, and

adding a quantity of clay comprised of a plurality of clay particles, along with a quantity of said plasticizer material to said coated sand particles.

5,151,124

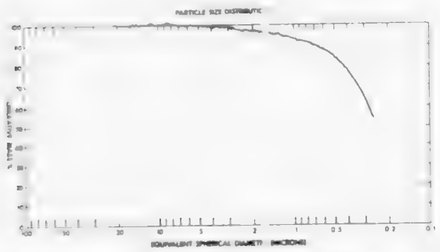
METHOD FOR FORMING AGGREGATED KAOLIN PIGMENT

C. Arlyn Rice, Sandersville, Ga., assignor to ECC America Inc., Atlanta, Ga.

Filed Jun. 4, 1990, Ser. No. 532,598
Int. Cl.[5] C04B *14/00*
U.S. Cl. 106—416 8 Claims

1. A method for forming a hydrothermally aggregated kaolin clay pigment, comprising: preparing an aqueous slurry of a

particulate kaolin clay, sodium silicate, and finely divided calcium carbonate, having a total solids concentration of from about 10 to 20% by weight; the non-aqueous components including 60 to 80 parts per hundred by weight of said kaolin



and from 10 to 20 pph by weight each of said sodium silicate and said calcium carbonate; and hydrothermally treating said slurry in a closed system to form aggregates of adherent kaolin platelets.

5,151,125

AQUEOUS COATING COMPOSITION

Teruaki Kuwajima, Higashiosaka; Shinichiro Umeda, Kyoto; Masakazu Watanabe, Toyonaka and Sakuichi Konishi, Ikoma, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed May 21, 1991, Ser. No. 703,804

Claims priority, application Japan May 21, 1990, 2-130862

Int. Cl.[5] C08K *5/00*

U.S. Cl. 106—503 **9 Claims**

1. An aqueous coating composition comprising

(a) an acryl resin having a number average molecular weitht of 1,000 to 50,000, an acid value of 15 to 200 and a hydroxyl value of 20 to 200, prepared by copolymerizing an ethylenic monomer and a phosphate monomer represented by

(I)

$$CH_2=C(X)-CO-(OY)_n-OPO(OH)_2$$

wherein X represents a hydrogen atom or a methyl group, Y represents an alkylene group having 2 to 4 carbon atoms and n is an integer of 3 to 30 and

(b) a pigment;

said acryl resin being present in an amount of 2 to 500 parts by weight, based on 100 parts by weight of said pigment.

5,151,126

CEMENT-BASE INJECTION GROUT FOR CONSOLIDATING STRUCTURES

Roger Ranc, Le Teil; Armand Brisset, Le Mee-sur-Seine, and Marcel Debos, Viviers, all of France, assignors to Lafarge Nouveaux Materiaux, Montrouge, France

Filed Aug. 10, 1990, Ser. No. 565,924

Claims priority, application France, Aug. 11, 1989, 89 10836

Int. Cl.[5] C04B *24/00* **E04G** *23/02*

U.S. Cl. 106—719 **13 Claims**

1. Cement-based injection grout for consolidating structures affected by fine cracks, comprising a Portland cement finely ground into cement particles, with removal of, as completely as possible, any cement particles of sizes greater than about 12 microns, a water-reducing plasticizer or thinner and water, wherein the water is present relative to the cement in a weight ratio not exceeding 0.6, and the plasticizer or thinner is capable of being present in a proportion of less than 2%.

5,151,127

WEATHER RESISTANT, FIRE RETARDANT PRESERVATIVE AND PROTECTIVE COMPOSITIONS FOR THE TREATMENT OF WOOD AND CELLULOSE PRODUCTS

Duncan C. Thompson, Box 201, Lethbridge, Alberta, Canada T1J 3Y5

Filed Nov. 26, 1990, Ser. No. 617,783

Int. Cl.[5] C09D *5/00*

U.S. Cl. 106—15.05 **9 Claims**

1. A fire retardation and wood preservation composition comprising the following ingredients in the approximate amounts indicated:

Compound	Parts by weight per thousand
Borax	50
Boric acid	30
Urea	100
Magnesium chloride	20
A water-based acrylic resin solution furthur comprising styrene, acrylic acid, hydroxymethylacrylate, ethylene glycol, dimethylaminoethanol, ammonia, and water	75
Triethylamine	10
Carrier water	715

5,151,128

INK, INK JET RECORDING METHOD EMPLOYING THE SAME, AND APPARATUS OR TOOL EMPLOYING THE SAME

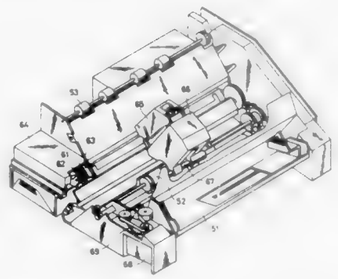
Kyouko Fukushima, Yokohama; Koromo Shirota, Inagi, and Shouji Koike, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,076

Claims priority, application Japan, Mar. 9, 1990, 2-058763; Jan. 23, 1991, 3-006384

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—20 **3 Claims**



1. An ink comprising

(i) a coloring agent in an amount ranging from 0.2 to 20 wt. % based on the total weight of the ink,

(ii) a liquid carrier medium comprising a mixture of water in an amount ranging from 50 to 95 wt. % based on the total weight of the ink and a water-soluble organic solvent in an amount ranging from 2 to 50 wt. % based on the total weight of the ink, and

(iii) an alkyl ether of a polyoxyethylene-polyoxypropylene random polymer having the following general formula [I]:

$$R1-(X)-O-R2 \qquad [I]$$

wherein R1 and R2 each is a hydrogen atom or an alkyl group,

with the proviso that they cannot both be a hydrogen atom, and X is a random polymer of (OC_2H_4) and (OC_3H_8) units with a degree of polymerization of 5–32, wherein the (OC_2H_4) units are in a larger proportion than the (OC_3H_6) units, and wherein said alkyl ether is in an amount ranging from 0.01 to 50 wt. % based on the total weight of the ink, said ink having a surface tension ranging from 30 to 68 dyne/cm at 25° C. and a viscosity of 15 cP or less.

5,151,129

PROCESS FOR THE PRODUCTION OF PIGMENTS IN THE PRESENCE OF AN AZO DYESTUFF

Donald J. Morrison; David McGregor, both of Glasgow, and James M. McCrae, Stewarton, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1991, Ser. No. 676,402

Claims priority, application United Kingdom, Mar. 31, 1990, 9007284

Int. Cl.[5] C09B *39/00*

U.S. Cl. 106—623 **23 Claims**

1. A process for the production of a pigment composition comprising precipitating a pigment coupling component from alkaline solution by adding to it an acid, in the presence of a pre-formed, water-soluble azo dyestuff; and subsequently coupling the precipitated coupling component, containing the azo dyestuff, with a pigment diazo or tetrazo component, ensuring that at no time is any substantial amount of uncoupled diazo or tetrazo component present, to form a pigment composition containing the water-soluble azo dyestuff.

5,151,130

AMINE-BASED CONSISTENCY REDUCERS FOR GYPSUM STUCCO SLURRIES

Alan P. Croft, Lake Jackson, and Brian D. Koblinski, Missouri City, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1991, Ser. No. 644,727

Int. Cl.[5] C04B *11/00*

U.S. Cl. 106—778 **19 Claims**

1. A method for reducing the consistency of a water and stucco slurry comprising admixing water, stucco, and an additive, the additive in an amount effective to reduce the consistency of the admixed slurry as compared to a slurry containing only water and stucco, and the additive comprising one or more polyalkylene polyamines having a molecular weight below 1,000.

5,151,131

CEMENT FLUID LOSS CONTROL ADDITIVES AND METHODS

John Burkhalter, and Jolinda K. Suson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 26, 1991, Ser. No. 750,151

Int. Cl.[5] C04B *7/02, 24/00*

U.S. Cl. 106—822 **4 Claims**

1. A liquid fluid loss control additive for an aqueous well cement composition wherein said additive consists of:

a liquid hydrocarbon,

an organophilic clay suspending agent present in said additive in an amount in the range of from about 0.5 to about 10 percent by weight of said liquid hydrocarbon,

a surfactant present in said additive in an amount in the range of from about 0.5 to about 8 percent by weight of said liquid hydrocarbon, and

at least one hydrophilic polymer present in said additive in an amount in the range of from about 40 to about 150 percent by weight of said liquid hydrocarbon;

wherein sad liquid hydrocarbon is selected from the group consisting of kerosene, diesel oil, light mineral oil and oils comprised of aliphatic hydrocarbons having in the range of from about 15 to about 19 carbon atoms,

said organophilic clay suspending agent is the reaction product of bentonite clay and an organic quaternary ammonium compound,

said surfactant is selected from the group consisting of aliphatic alcohols having in the range of from about 6 to about 18 carbon atoms reacted with in the range of from about 5 to about 10 moles of ethylene oxide per mole, and octyl, nonyl and dodecyl phenol reacted with in the range of from about 4 to about 20 moles of ethylene oxide per mole, and

said hydrophilic polymer is selected from the group consisting of polysaccharides, polyacrylates, polyacrylamides, xantham gum sulfonated polymers, carboxylated polymers and mixtures of such polymers.

5,151,132

ARRANGEMENT FOR APPLYING SUBSTANCES TO A WEB OF MATERIAL

Johannes Zimmer, Ebentaler Str. 133, A-9020 Klagenfurt, Austria

PCT No. PCT/AT90/00002, § 371 Date Sep. 10, 1990, § 102(e) Date Sep. 10, 1990, PCT Pub. No. WO90/07387, PCT Pub. Date Jul. 12, 1990

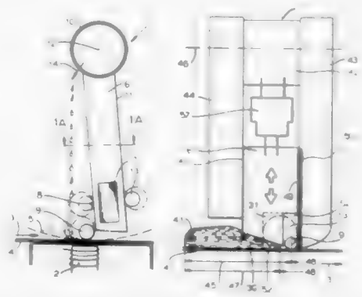
PCT Filed Jan. 5, 1990, Ser. No. 474,838

Claims priority, application Austria, Jan. 9, 1989, 33/89; Sep. 8, 1989, 2112/89

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] B05C *11/04;* **B41F** *15/44*

U.S. Cl. 118—126 **32 Claims**



1. An arrangement for applying substances to a web of material comprising:

a working magnet positioned below an application surface;

a profiled ledge positioned over said application surface;

a doctor device which is magnetically pressed against said application surface and when in an operating position rests against said profiled ledge; and

at least one restraining magnet which is provided within said profiled ledge for keeping said doctor device in rolling or sliding contact with said profiled ledge and for lifting said restraining magnet off said application surface when said working magnet is switched off.

17. An arrangement for applying substances to a web of material comprising:

a working magnet positioned below an application surface;

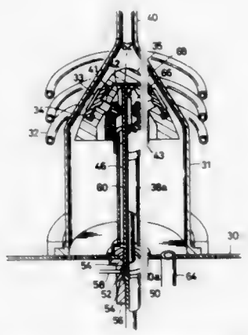
a profiled ledge having a front and a rear arm parallel to one another positioned over said application surface;

a doctor device which is magnetically pressed against said application surface by said working magnet in a working position and sealingly pressed against one of said two arms so that escape is prevented of said substances to be applied from an area located in front of said doctor device to an area behind said doctor device when considered in a direction of travel; and

a baffle ledge being vertically movable toward and away from said application surface, said baffle ledge bridging

between said front and rear arms of said profiled ledge, positioned above said doctor device and movable sealingly against at least one of said arms.

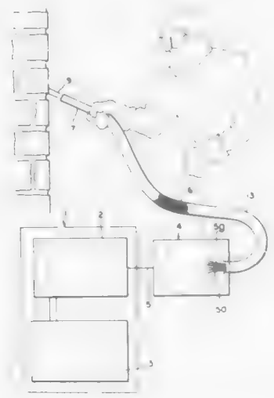
5,151,13
VAPOR DEPOSITION APPARATUS
Toshimitsu Ohmine, Tokyo; Keiichi Akagawa, Yamato, and Akira Ishihata, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 181,091, Apr. 13, 1988, Pat. No. 5,002,011. This application Jan. 9, 1991, Ser. No. 639,182
Claims priority, application Japan, Apr. 14, 1987, 62-089715; Sep. 25, 1987, 62-238830; Dec. 8, 1987, 62-308627; Dec. 8, 1987, 62-308758
Int. Cl.[5] C23C 16/00
U.S. Cl. 118—725 14 Claims



1. A chemical vapor deposition apparatus for forming thin films on substrates with reactive gases by rotating and revolving the substrates while heating the substrates in a reactor vessel, comprising:
(a) a hollow susceptor carrier rotatably disposed inside the reactor vessel, said hollow susceptor carrier having an opening on a downstream side in relation to the reactive gas flow;
(b) susceptors rotatably disposed on said susceptor carrier to hold the substrates respectively;
(c) means for rotating said susceptor carrier; and
(d) means located within a hollow of said susceptor carrier for rotating said susceptors with respect to said susceptor carrier.

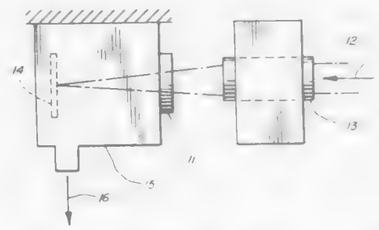
5,151,14
METHOD AND A DEVICE FOR CLEANING A SURFACE WITH A LASER
Jean-Pierre Boquillon, Dijon; Hubert Berger, Saint Apollinaire, and Philippe Bresson, Dijon, all of France, assignors to Agence Regionale de Developpements Technologiques, Dijon, France
Filed Sep. 14, 1990, Ser. No. 576,464
Claims priority, application France, Jan. 17, 1989, 8900496
Int. Cl.[5] B08B 3/12
U.S. Cl. 134—1 19 Claims

1. Process for removing pollutants from a surface of materials selected from the group consisting of stone, glass, steel, ceramics, wood, paper and cardboard, comprising the steps of:
employing a laser for producing a laser beam comprising laser pulses of high instantaneous pulses which is focused onto the surface to be cleaned;
pulsing the laser in pulse durations not exceeding 30 nanoseconds;
contacting the pulsating laser beam with an area on the surface;
cleaning the surface in the absence of an observable thermal effect to the object; and



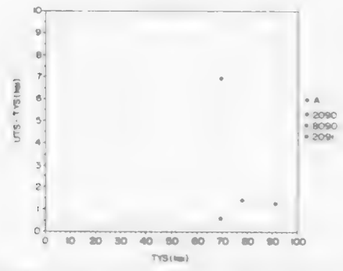
removing the laser from the area on the surface after the area is clean.

5,151,135
METHOD FOR CLEANING SURFACES USING UV LASERS
Thomas J. Magee, Belmont; Charles S. Leung, and Richard L. Press, both of San Jose, all of Calif., assignors to Amoco Corporation, Chicago, Ill.
Filed Sep. 15, 1989, Ser. No. 407,817
Int. Cl.[5] H01L 21/268; B08B 7/00
U.S. Cl. 134—1 17 Claims



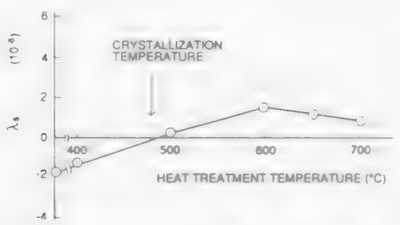
1. A method for treating a solid surface which surface is a member of the group of an essentially single crystalline material, an amorphous material and materials intermediate thereto, said method comprising irradiating said surface with one or more pulses of laser radiation wherein said radiation is essentially ultraviolet and wherein said pulses have a peak-power density that is sufficiently low and a pulse duration that is sufficiently short so that said pulses do not cause substantial chemical or physical change to said surface, and wherein said peak-power density and pulse duration are effective to result in substantial cleaning of said surface.

5,151,136
LOW ASPECT RATIO LITHIUM-CONTAINING ALUMINUM EXTRUSIONS
Jeffrey J. Witters, Pittsburgh, Pa.; Brian A. Cheney, Bettendorf, Iowa, and Roberto J. Rioja, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Dec. 27, 1990, Ser. No. 634,901
Int. Cl.[5] C22F 1/04
U.S. Cl. 148—689 19 Claims



1. A method of making lithium-containing aluminum base alloy extrusion having at least a section thereof having a low aspect ratio, the extrusions having improved properties in sections thereof having the low aspect ratio, the method comprising:
(a) providing a body of a lithium-containing aluminum alloy having about 0.05 to 1 wt. % Zn;
(b) extruding said body into an extrusion including a low aspect ratio section, the aspect ratio being in the range of 1 to 2.5; and
(c) maintaining said body in a temperature range of 400° to 1000° F. and including for said low aspect ratio section at least a 4:1 extrusion reduction during said extrusion step, the low aspect ratio extrusion section having tensile yield strength of at least 60 ksi and having an ultimate yield strength of at least 4.5 ksi greater than the tensile yield strength.

5,151,137
SOFT MAGNETIC ALLOY WITH ULTRAFINE CRYSTAL GRAINS AND METHOD OF PRODUCING SAME
Yoshihito Yoshizawa, Fukaya; Yoshio Bizen; Kiyotaka Yamauchi, both of Kumagaya; Toshikazu Nishiyama, Fukaya, and Shigekazu Suwabe, Kumagaya, all of Japan, assignors to Hitachi Metals Ltd., Tokyo, Japan
Filed Nov. 16, 1990, Ser. No. 614,487
Claims priority, application Japan, Nov. 17, 1989, 1-298878; Feb. 27, 1990, 2-46620
Int. Cl.[5] C22C 19/07
U.S. Cl. 148—313 23 Claims



8. A magnetic alloy with ultrafine crystal grains having a composition represented by the general formula:

$$Co_{100-x-y-z-a-b}Fe_aM_xB_yX_zT_b \text{ (atomic \%)}$$

wherein M represents at least one element selected from Ti, Zr, Hf, V, Nb, Mo, Ta, Cr, W and Mn, X represents at least one element selected from Si, Ge, P, Ga, Al and N, T represents at least one element selected from Cu, Ag, Au, platinum group elements, Ni, Sn, Be, Mg, Ca, Sr and Ba, $0<a\leqq30$, $2\leqq x\leqq15$, $10<y\leqq25$, $0<z\leqq10$, $0<b\leqq10$, and $12<x+y+z+b\leqq35$, at least 50% of the alloy structure being occupied by crystal grains having an average grain size of 200 Å or less.

5,151,138
BLASTING COMPOSITION AND METHOD
Charles M. Lownds, Johannesburg, South Africa, assignor to Mining Services International Corp., Salt Lake City, Utah
Filed Mar. 26, 1991, Ser. No. 675,142
Int. Cl.[5] C06G 45/02
U.S. Cl. 149—21 12 Claims

1. A blasting composition for use in boreholes of diameter not less than 80 mm which contains more than about 25% of solid oxidiser particles in the form of dense prills, granules or crystals and at least about 80% of the solid oxidiser particles having a minimum thickness in the range of about 1/200 to about 1/75 of the borehole diameter.

5,151,139
HEAVY DUTY RADIAL TIRE HAVING DURABLE BUTTRESS PORTION
Yoshiyuki Takada, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 8, 1991, Ser. No. 666,376
Claims priority, application Japan, Mar. 9, 1990, 2-58801
Int. Cl.[5] B60C 3/00, 3/04
U.S. Cl. 152—454 2 Claims

1. A heavy duty radial tire comprising
a radial carcass having at least one ply of cords extending between bead portions through sidewall portions and a tread portion of the tire,
a tread disposed radially outside the carcass, and
a belt including at least two plies of cords disposed radially outside the carcass and inside the tread,
in a state that the tire is mounted on its regular rim and inflated to its maximum pressure, the tread width between tread edges being not less than 0.73 times the tire maximum width (W), and
the tire profile between a tread edge and a tire maximum section width point including a radially outer part extending between the tread edge and a point Q, a radially inner part extending between the tire maximum section width point and a point R, and a middle part extending between said points Q and R,
said radially outer part being defined by a first circular arc arcing inwardly of the tire, the first circular arc having a

single radius of curvature R2 and a center outside of the tire,

said radially inner part being defined by a second circular arc arcing outwardly of the tire, the second circular arc having a single radius of curvature R1 and a center positioned inward of the tire on an axial straight line (Xm) drawn from the tire maximum section width point,

said point Q being located at a radial height in the range of the edge height of the widest ply of the belt plus or minus 5 mm,

said point R being located at a radial height defined such that the outwardly arcing second circular arc of the radially inner part and the inwardly arcing first circular arc of the radially outer part extended from said point Q to said point R are smoothly connected to each other at said point R as the inflection point therebetween,

said middle part being determined by a straight line (N) extended radially inwardly from said point Q toward said point R inclining axially outwardly at an angle of 4 to 15 degrees with respect to a line tangential to the inwardly arcing first circular arc at said point Q, such that said middle part is located axially outside of said inwardly arcing first arc of the radially outer part extended from said point Q to said point R and such that the distance between said middle part and said straight line (N) extended radially inwardly from said point Q toward said point R, measured normal to said middle part, is not more than 2 mm.

5,151,140

HEAVY-DUTY PNEUMATIC RADIAL TIRE

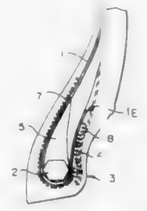
Makoto Takagi, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,781

Claims priority, application Japan, Dec. 30, 1988, 63-334896

Int. Cl.[5] B60C *15/06*

U.S. Cl. 152—543 **5 Claims**



1. A heavy-duty pneumatic radial tire having a bead portion comprising a carcass layer having its respective end portions turned up about a bead core from the axially inner side to the axially outer side of the tire and at least two reinforcing layers disposed along a portion of the carcass layer, said at least two reinforcing layers comprises an inner reinforcing layer of steel cords having a layer tenacity of 30 kg/mm of layer width to less than 80 kg/mm of layer width incorporated on the axially inner side of the bead portion and an outer reinforcing layer of steel cords having a greater layer tenacity than the inner reinforcing layer and of at least 80 kg/mm of layer width, incorporated on the axially outer side of the bead portion, wherein the inner reinforcing layer extends from the axially inner side of the bead portion to the axially outer side of the portion and terminates at an area corresponding to the radially inner end of the outer reinforcing layer, wherein cords in the inner reinforcing layer and cords in the outer reinforcing layer are inclined in a same direction relative to the radial direction of the tire, and wherein when mounted on a vehicle the direction of inclination of the cords in the inner and the outer reinforcing layers is opposite to the direction of forward rotation of the tire.

5,151,141

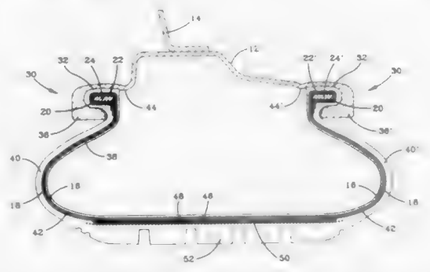
TIRE AND RIM

Chester E. Lunieski, Kent, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1991, Ser. No. 676,496

Int. Cl.[5] B60C *15/024, 13/00*

U.S. Cl. 152—544 **11 Claims**



1. A pneumatic tire of the open-torus type and rim assembly, the tire being configured for mounting on the rim assembly, the rim assembly including means for restraining the exterior of the tire at its portion forming the circumferential opening on the radially inner side of its toroidal form, thereby, to restrict radially outward movement of the portions of the tire accessed by such restraining means, the tire comprising:

(a) one or more radial-cord carcass plies extending between two axially spaced apart rim securing regions, the carcass plies in each rim securing region being folded axially and radially outwardly about an annular tensile member and being encased in an elastomeric material, the elastomeric material at the radially inner side of the tire being molded in a shape complementary with that of the restraining means of the rim assembly, thereby, to permit the rim restraining means to restrict radially outward movement of the rim securing regions of the tire engaged from its exterior by the restraining means of the rim;

(b) a belt structure positioned radially outwardly of the carcass plies, the belt structure having axially outermost edges and in one or more plies, cords oriented at both positive and negative angles with respect to the equatorial plane of the tire, the angles being in the magnitude range from 17°–30°, the belt structure providing circumferential restriction of the inflated tire profile;

(c) a tread positioned radially outwardly of the carcass plies and belt structure; and

(d) a sidewall having a flexible sidewall portion adjacent the rim for primary sidewall bending, a stiffer portion radially outward of the flexible sidewall portion, and a thinner cross sectional portion between the stiffer sidewall portion and the outermost edges of the belt structure.

5,151,142

HEAVY DUTY PNEUMATIC RADIAL TIRES USING RUBBER REINFORCING FIBER CORDS WITH IMPROVED ADHESION

Isamu Imai, Tokorozawa; Toshihiro Yotsumoto, Tokyo; Norio Inada, Tokyo; Shigeyuki Toki, Tokyo; Maki Sato, Tokyo, and Ichiro Wada, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 2,466, Jan. 12, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 290,827

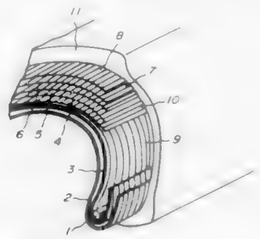
Claims priority, application Japan, Jan. 13, 1986, 61-3571; Jan. 13, 1986, 61-3572; Jan. 13, 1986, 61-5841; Jan. 16, 1986, 61-7733; Sep. 5, 1986, 61-209099

Int. Cl.[5] B60C *9/13, 1/00*

U.S. Cl. 152—565 **4 Claims**

1. A heavy duty pneumatic radial tire comprising at least one pair of bead wires on the right and left, at least one carcass ply

cord layer which is turned up and fixed around each of at least one of the bead wires and has cords arranged at an angle of 75° to 90° with respect to a tire circumferential direction, and at least one belt ply cord layer having cords arranged at an angle of 0° to 30° with respect to the tire circumference direction, wherein at least either one of twisted cords constituting the carcass cord ply layer and twisted cords constituting the belt cord ply layer are each formed by first obtaining a cord through twisting together a plurality of yarns made of at least one kind of fibers selected from the group consisting of aromatic polyamide fibers, entire aromatic polyester fibers and polyvinyl alcohol fibers having a tenacity of not less than 15 g/d or through first twisting yarns to form a cable twist and



then twisting a plurality of thus obtained cable twists; secondly immersing the resulting cord into an impregnating agent consisting essentially of a liquid rubber having a number average molecular weight of 1,000 to 60,000 and finally bonding the cord with an adhesive of a resorcinol-formaldehyde-latex under heating, said liquid rubber being selected from the group of polymers consisting of polybutadiene rubber, polyisoprene rubber, styrene-butadiene rubber, and acrylonitrilebutadiene rubber, terminals of molecular chains of the polymers of the liquid rubber or inner portions of the molecular chains having activating functional groups selected from the group consisting of carboxyl groups, epoxy groups, acrylonitril groups, and isocyanate groups.

5,151,143

MOISTURE-IMPERMEABLE ELECTRIC CONDUCTOR

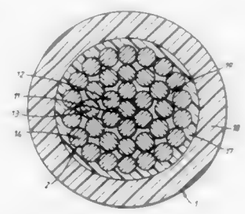
Ian Downie, Brockville, Canada, assignor to Bicc plc, England

Filed May 22, 1991, Ser. No. 703,887

Claims priority, application United Kingdom, May 30, 1990, 9012062

Int. Cl.[5] H01B *13/32*

U.S. Cl. 156—48 **14 Claims**



1. A method of manufacturing an electric cable comprising at least one cable core having a substantially moisture-impermeable multi-wire electric conductor, which method comprises causing a flexible elongate core of metal or metal alloy to travel continuously in the direction of its length; helically winding around the advancing metal core at least one layer of wires to form a flexible multi-wire conductor; extruding over the multi-wire conductor at least one fluid-impermeable layer of plastics material to form an electric cable core; winding the cable core around the hub of a cable drum in such a way that each end of the wound cable core is exposed and accessible; sealing the end of the multi-wire conductor at one exposed end of the wound cable core and evacuating air from the interstices bounded by the wires of the multi-wire conductor from the other exposed end of the wound cable core; connecting a source of semi-conductive moisture-impermeable compound in a liquid or semi-liquid state to the end of the multi-wire conductor at one exposed end of the wound cable core and filling the interstices with moisture-impermeable compound by allowing moisture-impermeable compound to be drawn into and to flow along the interstices throughout the length of the multi-wire conductor until the interstices are substantially filled throughout the length of the conductor and permitting or causing the moisture-impermeable compound in said interstices to thicken to such an extent that it will not readily flow from the conductor.

5,151,144

PROCESS FOR THE MANUFACTURING OF A PERFORATED TUBE FOR AN EXPANSION SHAFT

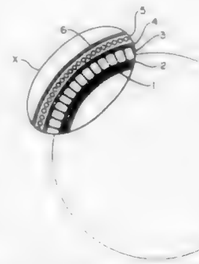
Otto Chlupsa, Goethestr 52, D-6070 Langen, Fed. Rep. of Germany, assignor to Walter Vetter and Otto Chlupsa, both of, Fed. Rep. of Germany

Filed Jun. 13, 1990, Ser. No. 537,511

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 8907321[U]; European Pat. Off., Jul. 20, 1989, 89113331; Jul. 20, 1989, 89113332

Int. Cl.[5] B65H *81/00;* **B31C** *13/00*

U.S. Cl. 156—171 **5 Claims**



1. Process for the manufacture of a perforated tube for an expansion shaft, said tube having a longitudinal axis and having apertures to be formed therein, which comprises:

(a) providing a mandrel having a diameter matching the desired inside diameter of said tube and having projections corresponding to apertures to be formed in the perforated tube;

(b) applying to the mandrel a plurality of spaced fiber strata, each comprising long continuous fibers, and one or more honeycomb layers, each honeycomb layer being sandwiched between successive fiber strata so that the fiber strata and the honeycomb layers are in alternating sequence forming a sandwich structure; the fibers of said fiber strata being applied around the projections such that substantially no fibers are severed;

(c) saturating the fiber strata of the sandwich structure with an epoxy resin and allowing the epoxy to harden;

(d) removing a resulting perforated tube from the mandrel

(e) wherein said plurality of spaced fiber strata comprises, from the inner diameter to an outer diameter of the tube, an inside fiber stratum and an outside fiber stratum with a honeycomb layer disposed therebetween, wherein the fibers of said inside and outside fiber stratum are carbon fibers, aramid fibers or a mixture of carbon and aramid fibers and wherein said inside fiber stratum comprises a first fiber layer and a fiber cable layer applied thereto wherein the fibers of said first fiber layer are in the form of a web which comprises a plurality of continuous fibers extending in two directions in crisscross relationship and wherein said fiber cable layer comprises said long continu-

ous fibers, said fibers of said cable being essentially aligned in the axial direction of said tube, and wherein said outside fiber stratum comprises a first fiber layer, a fiber cable layer and an outer fiber band arranged in that order, wherein the fibers of said first fiber layer are in the form of a web which comprises a plurality of continuous fibers extending in two directions in criss-cross relationship said first fiber layer being closer to the mandrel that said outer band, and wherein said fiber cable layer comprises said long, continuous fibers, said fibers of said cable being essentially aligned in the axial direction of said tube.

5,151,145

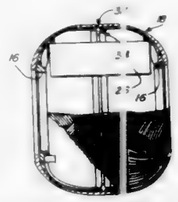
LINER/MANDREL FOR FILAMENT WOUND VESSELS

Alvin R. Cederberg, 2823 N. 74th St., Lincoln, Nebr. 68507

Continuation of Ser. No. 811,633, Dec. 20, 1985, abandoned. This application Jan. 2, 1991, Ser. No. 456,589

Int. Cl.[5] B32B *5/00*

U.S. Cl. 156—172 **6 Claims**



1. A liner for a filament wound vessel, comprising a thin casing fabricated of halves mating at a perimetral joint, reinforcing means formed integrally with the interior of the casing whereby the liner can be used as a mandrel for filament winding or applying composite material to the vessel and a splice ring at said joint, the splice ring being generally cross-shaped in diametral-section, with one leg of the cross centered between the two mating halves of the casing and the two legs of the cross normal to said one leg abutting the inside surfaces of the mating halves along the joint.

5,151,146

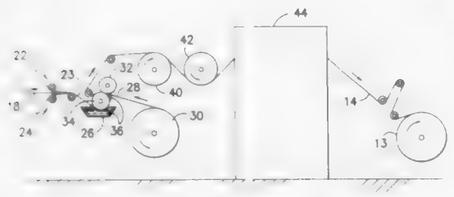
METHOD OF MAKING A ROOFING LAMINATE INCLUDING A TRIAXIAL WOUND NONWOVEN FIBERGLASS SCRIM

David E. Green, Mauldin, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 679,194, Apr. 2, 1991, Pat. No. 5,108,831. This application Jun. 10, 1991, Ser. No. 712,289

Int. Cl.[5] B32B *5/12*

U.S. Cl. 156—177 **1 Claim**



1. The method of manufacturing a roofing membrane comprising the steps of: supplying a triaxially wound nonwoven fiberglass scrim fabric, adhering a nonwoven fiberglass mat to the triaxially wound scrim fabric, supplying a second open mesh nonwoven fiberglass scrim fabric, laminating the second scrim fabric to the triaxial wound scrim fabric and saturating the laminate scrim fabric with a bituminous material to provide a roof membrane.

5,151,147

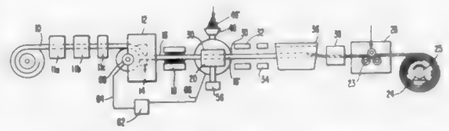
COATED ARTICLE PRODUCTION SYSTEM

Walter W. Foster, Henrico County; Gregory L. Boatwright, Glen Allen, and Thomas E. Lewis, Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 17, 1990, Ser. No. 569,356

Int. Cl.[5] B29C *47/02*

U.S. Cl. 156—244.12 **8 Claims**



1. Apparatus for producing polymer coated elongated magnet wire of uniform rectangular cross-section from a supply of metal feed stock, said apparatus comprising:

rotary extrusion press means for receiving incoming feed stock and for continuously extruding magnet wire having a uniform rectangular cross-section;

means for subjecting the extruded magnet wire to a cooling medium to thereby cool the wire to a temperature suitable for receiving a polymeric material coating;

extruding means for extruding a polymeric material into a tube extending around and initially spaced from extruded wire moving through the extruding means, said extruding means including an extrusion die orifice having outwardly bowed sides to reduce the accumulation of excess amounts of polymeric material at corners of the coated magnet wire;

vacuum means for drawing a vacuum within the tube to thereby cause the tube to be pressed into contact with the extruded wire; and

means for controlling the relative speeds of moving of the extruded wire and of the extruding of the polymeric material, said relative speed control means being operable to cause the tube to be drawn down in thickness between where the tube is extruded and where the tube makes contact with the moving extruded wire, thereby reducing the thickness of the polymeric material coated on the extruded wire relative to the initial thickness of the tube when extruded and producing polymer coated elongate magnet wire.

5,151,148

SYSTEM FOR RETREADING TIRES

Robert B. Lindsay, Akron, and Gary C. Parrish, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 357,148, May 26, 1989, Pat. No. 5,055,148. This application Aug. 27, 1990, Ser. No. 572,290

Int. Cl.[5] B29D *30/56*

U.S. Cl. 156—351 **5 Claims**

1. A tire retreading system comprising:

a fluid pressure chamber for receiving an assembly of a precured tread disposed over a crown portion of a tire casing, and a flexible airtight member for covering the tread and at least a portion of both sidewalls of the tire casing;

b) a first supply means for supplying fluid pressure to the chamber;

c) a manifold for receiving fluid pressure and for supplying said fluid pressure to said flexible airtight member;

d) a means for venting the manifold;

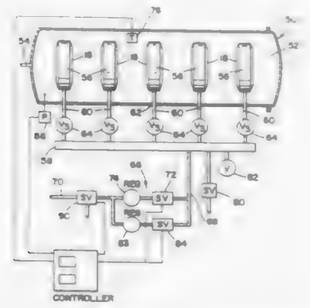
e) a second supply means for supplying fluid pressure to the manifold, the second supply means being a two stage device having a first and second portion connected in parallel to one another, each portion including a pressure regulator valve and a solenoid valve connected in series;

f) a pressure means for determining a predetermined pressure of the chamber;

g) a temperature means for determining when said fluid pressure of said chamber reaches a predetermined temperature;

h) a controller, the controller including a timing means for determining a predetermined amount of time; and

wherein the system can be operated such that the manifold is vented to the atmosphere until the predetermined temperature of the fluid pressure within the chamber is achieved



at which point the temperature means senses the temperature and signals the controller to activate the timing means, after a predetermined amount of time the manifold venting means closes and the solenoid valve opens and fluid pressure is received by the manifold the manifold supplying the fluid pressure to the flexible airtight member, the controller and solenoid valves prevent the flexible airtight member from receiving fluid pressure until the chamber has reached or exceeded the predetermined pressure.

5,151,149

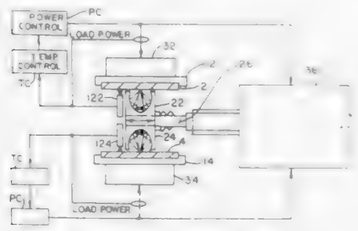
APPARATUS FOR BONDING OR MELT FUSING PLASTIC AND PLASTIC MATRIX COMPOSITE MATERIALS

Henry D. Swartz, Newton, Mass., assignor to The Entwistle Corporation, Hudson, Mass.

Continuation of Ser. No. 329,323, Mar. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 225,296, Jul. 28, 1988, abandoned. This application Sep. 5, 1991, Ser. No. 759,055

Int. Cl.[5] B27G *11/02*

U.S. Cl. 156—379.8 **3 Claims**



1. An apparatus for bonding two thermoplastic objects comprising:

first means for carrying a first thermoplastic object to be bonded along a predetermined first bonding area;

second means for carrying a second thermoplastic object to be bonded to such first thermoplastic object along a predetermined second bonding area;

heating means for producing a first focused beam of infrared heat impinging upon such first object within substantially only such first bonding area and for producing a second focused beam of infrared heat impinging upon such second object within substantially only such second bonding area;

means for effecting movement of said first and second focused beams relative to and impinging within such first and second bonding areas, respectively, to repeatedly heat such objects within such bonding areas to a melt fusion point; and

means effecting relative movement of said first means and said second means toward one another for joining such first and second objects along such predetermined bonding areas.

5,151,150

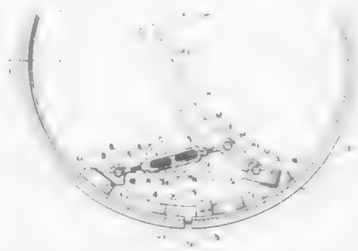
MANUALLY CONTRACTABLE RING FOR SEALING AN ENVELOPE AGAINST A BEAD OF A TIRE DURING RETREADING

Archie B. Davis, P.O. Box 134, Aroda, Va. 22709, and Joseph A. Troilo, Jr., P.O. Box 82, Brandy Station, Va. 22714

Filed Dec. 19, 1990, Ser. No. 629,883

Int. Cl.[5] B29D *30/56*

U.S. Cl. 156—384.1 **6 Claims**



1. A manually actuable, contractable split ring assembly for sealing an envelope against a bead of a tire to be retreaded or repaired in an autoclave by pressure and heat treatment, said contractable ring assembly comprising:

a split ring of substantially rigid, elastic material having aligned, first and second overlapping end portions, said end portions being movable relative to each other due to the elastic nature of the ring material to increase the diameter of the split ring to effect sealing action and to decrease the diameter thereof to permit placement and removal of the ring on the tire and about the bead thereof, said ring having a generally cylindrical sealing surface and an axially outer part including a radially extending circumferential lip,

an elongated lever having opposite ends,

means for pivotably mounting one end of said lever to the inner peripheral surface of said split ring adjacent said first overlapping end portion for rotation about a first pivot axis parallel to the axis of the ring,

a turnbuckle having a body with opposite ends,

means for pivotably mounting one end of said turnbuckle body to the inner peripheral surface of said ring at said second overlapping end portion, remote from said pivoted lever for pivoting about a second pivot axis, and the other end of said turnbuckle body to said lever at a point radially outwardly of said lever pivot axis on said ring first overlapping end position to form a toggle linkage, whereby rotation of said lever away from said turnbuckle pivot coupling to said ring second overlapped portion causes said ring to contract in diameter against the bias of the elastic material ring to permit insertion of the ring within the tire side wall opening proximate to said bead, and

wherein release of said lever allows said ring to expand radially under said bias, and pivoting said lever in the opposite direction results in ring expansion to the extent

that said toggle linkage pivot connection of said lever to said turnbuckle moves overcenter of a line between said first and second pivot axes, and

wherein by adjustment of the length of said turnbuckle the maximum expanded diameter of said ring may be preset.

5,151,151

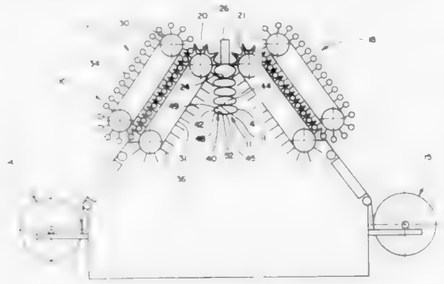
PLEATING MACHINE FOR DUAL FLUTED SHADE

Jamee Kao, 2400 S. Whitehall Dr. -#206Q, Mundelein, Ill. 60060, and Joseph C. S. Hsu, 35 Lane 461 Chung-Shan N. Road Sec. 5, Taipei, Taiwan 111

Continuation-in-part of Ser. No. 24,665, Mar. 11, 1987, Pat. No. 4,795,515, Ser. No. 286,368, Dec. 19, 1988, Division of Ser. No. 145,369, Jan. 19, 1988, Pat. No. 4,871,006. This application Dec. 19, 1988, Ser. No. 286,368

Int. Cl.[5] **B32B** *3/12;* **B65H** *37/04*

U.S. Cl. 156—471 **4 Claims**



1. A single machine for making a series of expandable tubular polygons, comprising: means for feeding a first flexible sheet to a first pleating area, means for feeding a second flexible sheet to a second pleating area directly adjacent the first pleating area, first and second pleaters for simultaneously pleating the first and second sheets in the first and second areas so successive pleats in the first sheet are adjacent and aligned with pleats in the second sheet, each of the pleaters having a pleated sheet discharge end directly adjacent a seal area with the discharge ends facing generally toward one another and on opposite sides of the seal area, means for feeding an attachment strip transverse to the first and second sheets, and seal means in the seal area positioned between the first and second pleating areas for attaching the adjacent pleats in the first and second sheets together with the attachment strip to form the series of tubular polygons, said seal means being closely adjacent both of the first and second pleating areas so that the need for pleat supporting and feeding structure between the pleating areas and the seal means is minimized, each of the pleaters having a plurality of conveying and pleat forming elements thereon constructed to hold the sheets in the seal area as the seal means attaches the pleats together.

5,151,152

METHOD FOR MANUFACTURING HEAT-ACTIVATABLE ARTICLES

Helmut Kaeufe, Mettmann, and Christian Kipfelsberger, Hepberg, both of Fed. Rep. of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Aug. 2, 1989, Ser. No. 388,702

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826429

Int. Cl.[5] **B29C** *61/02*

U.S. Cl. 156—645 **17 Claims**

1. Method for manufacturing heat-activatable articles from a thermoplastic material comprising the steps of:

forming a thermoplastic article into a first shape;

impressing a shape memory on said thermoplastic article by introducing molecular orientations and molecular structures as a result of deformation of said first shape thereby producing a second shape, said article capable of backdeforming from said second shape to said first shape upon application of heat to said article;

removing selected areas of thermoplastic material from said article after having impressed said shape memory to modify at least a portion of the molecular orientations and structures introduced in impressing said shape memory and thereby altering said second shape to form a final shape, said article being capable of deforming to a designated end use shape that differs from said first shape when said article is heated, the difference between said designated end use shape and said first shape resulting from said removal of said selected areas of material from said article; and,

selecting said areas in which said thermoplastic material is removed dependent upon said designated end use shape.

5,151,153

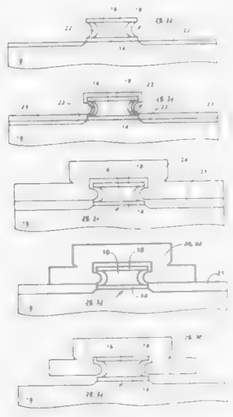
MANUFACTURE OF A SUSPENDED MICROMECHANICAL ELEMENT

Igor I. Bol, Sherman Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1991, Ser. No. 725,176

Int. Cl.[5] **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00;* **H01L** *21/306*

U.S. Cl. 156—657 **21 Claims**



1. A process for making a micromechanical device on a member comprising:

providing a member having a first generally planar surface and a second generally planar surface extending generally parallel to said first generally planar surface,

wall means extending between and joining said first and second generally planar surfaces,

said wall means having a generally concave surface,

forming a first sacrificial layer on said wall means and at least a portion of said first generally planar surface,

forming a second sacrificial layer on top of said first sacrificial layer and on at least a portion of said second generally planar surface so the second sacrificial layer on said second generally planar surface is thinner than the combined first and second sacrificial layers on said first generally planar surface,

forming a structural layer on top of at least a portion of said second sacrificial layer, and

patterning said structural layer to form a moving structure for movement relative to said member and exposing portions of said sacrificial layer, and

etching and removing said first and second sacrificial layers to release said moving structure from said member and providing relative movement between said moving structure and said member, whereby said moving structure is spaced from said first generally planar surface and contacts said second generally planar surface.

5,151,154

EVAPORATION ASSEMBLY WITH VAPOR CIRCULATING MEANS

Joaquin Huercanos, Paseo de los Arbustos, 2-1, 20009 San Sebastian, Spain

Filed Oct. 11, 1990, Ser. No. 596,047

Int. Cl.[5] **B01D** *1/12, 1/22*

U.S. Cl. 159—13.2 **11 Claims**

1. An evaporation assembly for concentrating liquids, comprising:

means for defining an evaporation area;

liquid inlet means, coupled to said evaporation area adjacent one end thereof, for conveying liquid to be concentrated into said evaporation area;

liquid and vapor outlet means, coupled to said evaporation area adjacent an opposite end of said evaporation area, for removing and separating concentrated liquid and vapors from said evaporation area;

heating means, positioned adjacent said evaporating area, for heating liquid conveyed through said evaporation area; and

vapor circulating means, coupled to said liquid and

vapor outlet means and said liquid inlet means, for conveying vapors from said liquid and vapor outlet means to said liquid inlet means and for mixing vapors from said outlet means with liquid to increase velocity of the mixture of liquid and vapors conveyed through said evaporation area.

5,151,155

PROCESS FOR DEINKING WASTEPAPER WITH ORGANICALLY MODIFIED SMECTITE CLAY

Charles A. Cody, Robbinsville, and Edward D. Magauran, Mount Holly, both of N.J., assignors to Rheox, Inc., Hightstown, N.J.

Filed May 9, 1991, Ser. No. 697,448

Int. Cl.[5] **D21C** *5/02*

U.S. Cl. 162—5 **18 Claims**

1. A process for deinking wastepaper, which comprises:

(a) contacting wastepaper with an aqueous system which contains an agent in an amount effective to deink the wastepaper, wherein the agent comprises: one or more organically modified smectite-type clays; and

(b) recovering deinked paper pulp from the aqueous system.

5,151,156

SUCTION ROLL WITH DEFLECTOR PIECES IN THE HOLES, FOR A DRYER GROUP OF A PAPER MAKING MACHINE

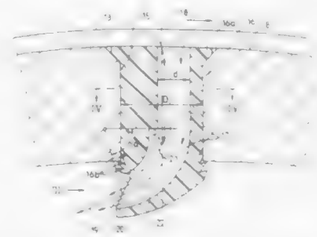
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 780,632

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1990, 4033597

Int. Cl.[5] **D21F** *5/00, 5/14*

U.S. Cl. 162—368 **16 Claims**



1. A suction roll for a dryer group of a paper making machine, the suction roll having a direction of rotation and comprising

an annular roll shell which is rotatable around its axis, the roll shell being provided with a plurality of substantially radial, continuous holes through the shell which are arrayed circumferentially around the shell and at least over the predominant part of the axial length of the shell; the roll shell being hollow and the hollow of the roll shell being connectable with a source of vacuum such that the vacuum source draws suction through the holes in the roll shell;

a respective deflector piece in at least some of the radial holes, each deflector piece including a portion extending a short radial distance inside the annular shell of the roll; each deflector piece including a continuous channel therethrough extending from an end that is toward the radial exterior of the shell toward another end that is radially inside of the shell, the channel extending through the shell in a direction at least substantially parallel to the direction of the respective hole, the portion of the channel radially inward of the roll shell being curved in a direction contrary to the direction of rotation of the roll shell.

5,151,157

HEAT EXCHANGER APPARATUS FOR A MOTOR VEHICLE, HAVING A MAIN HEAT EXCHANGER COMPRISING A WATER BOX CONTAINING A SECONDARY HEAT EXCHANGER

Philippe le Gauyer, Paris, France, assignor to Valeo, Le Mesnil-Saint-Denis, France

Filed Jul. 31, 1991, Ser. No. 738,675

Claims priority, application France, Jul. 31, 1990, 90 09767

Int. Cl.[5] **F28F** *9/02*

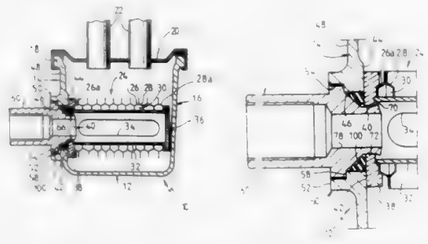
U.S. Cl. 165—140 **9 Claims**

1. A heat exchanger apparatus comprising:

a main heat exchanger including a water box having a side wall defining an external face of said water box, said side wall having a pair of access holes formed therethrough;

a secondary heat exchanger within said main heat exchanger, said secondary heat exchanger including two coupling tubes, each of said coupling tubes extending through a respective one of said access holes, whereby said secondary heat exchanger is adapted to be secured within said water box by said coupling tubes, said secondary heat exchanger further including a base ring coaxial

with each of said coupling tubes and having a hole formed therethrough; and



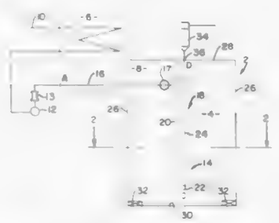
an O-ring seal in an annular space defined between said water box, one of said coupling tubes and one of said base rings.

5,151,158

THERMAL CRACKING FURNACE

Colin P. Bowen, Houston, and John R. Brewer, Katy, both of Tex., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 16, 1991, Ser. No. 730,560
Int. Cl.[5] C10G 9/20
U.S. Cl. 196—110 7 Claims



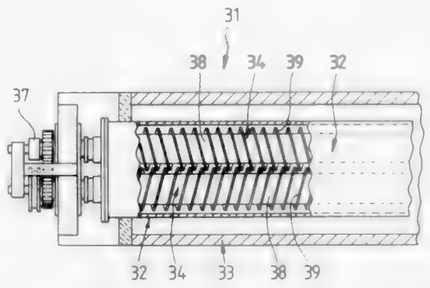
1. A thermal cracking furnace comprising:
a radiant section;
a convection section offset from the radiant section;
a horizontally disposed breeching section extending between the radiant section and the convection section;
a heating means comprising an array of floor burners in the radiant section; and
a plurality of radiant coils extending through the horizontally disposed breeching section and the radiant section, said radiant coils being comprised of a horizontal radiant coil section extending through the horizontal breeching section and vertical coil sections extending through the radiant section wherein the radiant coils of the horizontal breeching section have an internal cross-sectional diameter smaller than the internal cross-sectional diameter of the coils of the vertical coil sections of the radiant coils and the vertical coil sections of the radiant coils are comprised of an upstream and a downstream section wherein the radiant coils in the upstream section of the vertical coil sections have a larger internal cross-sectional diameter than the coils of the horizontal section of the radiant coils and the radiant coils in the downstream section of the vertical sections of the radiant coils have a larger internal cross-sectional diameter than the coils of the upstream section of the vertical section of the radiant coils.

5,151,159

METHOD AND APPARATUS FOR CONVERTING COAL INTO LIQUID FUEL AND METALLURGICAL COKE

Richard A. Wolfe; Chang J. Im, both of Abingdon, Va., and Robert E. Wright, Bristol, Tenn., assignors to Coal Technology Corporation, Bristol, Va.

Filed Nov. 15, 1990, Ser. No. 614,085
Int. Cl.[5] C10B 7/02, 7/10
U.S. Cl. 202—118 15 Claims



1. An apparatus for continuously processing coal into gaseous and liquid volatile hydrocarbons and into metallurgical coke suitable for use in a steel industry blast furnace, comprising:
(a) means for crushing said cola into coal particles:
(b) a coal pyrolyzer located subjacent said crushing means for receiving and heating said coal particles to temperatures greater than 800° F., whereby said coal particles are converted to char and volatile hydrocarbon gas, wherein said coal pyrolyzer includes:
(i) a retort chamber externally heated by a gas furnace connected thereto;
(ii) a pair of parallel interfolded drive screws rotatably connected to and encompassed within said retort chamber for conveying said coal particles therethrough;
(iii) means connected to said drive screws for rotating said drive screws, wherein said rotating means intermittently reverses the rotation of said drive screws to prolong the residency of the coal particles conveyed thereby within said retort chamber; and
(iv) a lost motion clutch connected to one of said drive screws and said rotating means for temporarily reducing the angular rotation speed of said one of said pair of drive screws, wherein said drive screws contact concurrently with said reduction in the angular rotational speed of said one of said drive screws to disengage any said coal or char adhering thereto;
(c) means connected to said pyrolyzer for separating said volatile hydrocarbons gas into water vapor, condensable hydrocarbon liquids and non-condensable gases, wherein said gas furnace is connected to said separating means and receives non-condensable gases therefrom for use as a fuel;
(d) means connected to said pyrolyzer for cooling said char to prevent the ignition thereof when exposed to air;
(e) means connected to said cooling means for pulverizing said char;
(f) means connected to said pulverizing means for mixing selected binders with said char;
(g) means connected to said mixing means for compressing said char and said selected binders into briquettes;
(h) means connected to said compressing means for heating said briquettes to temperatures ranging from 1800° F. to 2000° F., thereby calcining said briquettes into metallurgical coke; and
(i) means connected to said heating means for cooling said coke to prevent the ignition thereof when exposed to air.

5,151,160

DEHYDRATION OF 2-METHOXYETHANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 South Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Apr. 6, 1992, Ser. No. 864,229
Int. Cl.[5] B01D 3/40; C07C 41/42
U.S. Cl. 203—14 1 Claim

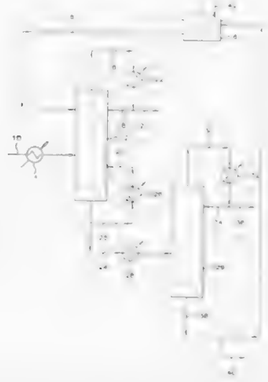
1. A method for recovering water from a mixture of water and 2-methoxyethanol which comprises distilling a mixture of water and 2-methoxyethanol in the presence of about one part of an extractive agent per part of water-2-methoxyethanol mixture, recovering the water as overhead product and obtaining the 2-methoxyethanol and the extractive agent from the stillpot, wherein said extractive agent consists of one material selected from the group consisting of dimethylsulfoxide, dimethylformamide, dimethylacetamide, sulfolane, ethylene glycol, 1,2-butanediol, 1,3-butanediol, 1,4-butanediol, 1,5-pentanediol, hexylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, tripropylene glycol, 2-methyl-1,3-propanediol and polyethylene glycol 200.

5,151,161

SEPARATION OF OLEFINIC HYDROCARBONS BY EXTRACTIVE DISTILLATION

Fu-Ming Lee, and Ronald E. Brown, both of, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 17, 1991, Ser. No. 731,686
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.[5] B01D 3/40
U.S. Cl. 203—51 13 Claims



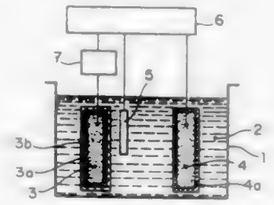
1. A process for separating at least one alkadiene containing 4–9 carbon atoms per molecule from at least one alkene containing 4–10 carbon atoms per molecule comprising extractive distillation of a feed which consists essentially of said at least one alkadiene and said at least one alkene employing a solvent consisting essentially of N-methyl-2-thiopyrrolidone;
wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one alkadiene and a larger volume percentage of said one alkene than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one alkadiene and a smaller volume percentage of said at least one alkene than said feed; and wherein said at least one alkadiene is separated from said solvent contained in said bottoms product.

5,151,162

RECHARGEABLE STORAGE BATTERY WITH ELECTROACTIVE ORGANIC POLYMER ELECTRODES IN POLAR SOLVENT ELECTROLYTE

Klaus Müller, Carouge-Geneve, and Antonin Kulhanek, Le Lignon, both of Switzerland, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1990, Ser. No. 536,162
Claims priority, application European Pat. Off., Jun. 12, 1989, 89810440.1
Int. Cl.[5] H01M 2/00, 4/00
U.S. Cl. 294—131 8 Claims



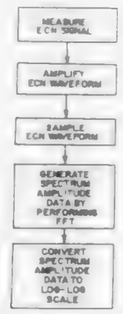
1. A method of conditioning the anode of a battery; comprising:
immersing said anode in a non-aqueous lithium salt solution with a counterelectrode; and
applying a conditioning current to said anode against said counterelectrode,
wherein the conditioning current comprises balanced or unbalanced alternating positive and negative pulses and said anode comprises a current collector substrate having deposited thereon at least one polypyrrole layer and at least one layer of ion exchange resin, the polypyrrole layer and the ion exchange resin layer being deposited alternately one over the other.

5,151,163

ELECTROCHEMICAL NOISE MEASUREMENT TECHNIQUE FOR THE DETERMINATION OF ALUMINUM ALLOY PIT INITIATION RATES

James E. Miller, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

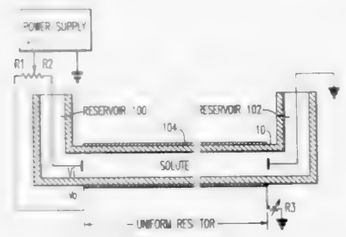
Filed May 26, 1991, Ser. No. 708,254
Int. Cl.[5] G01N 17/02
U.S. Cl. 204—153.11 3 Claims



1. A method of determining pit initiation rates for an aluminum alloy in an aqueous solution, comprising the steps of:
providing an aqueous solution, said aqueous solution being a halide solution in de-ionized water, whereby a pitting reaction occurs on the surface of the aluminum alloy;

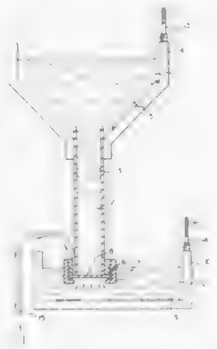
stabilizing the temperature of said aqueous solution;
bubbling dry inert gas through said temperature stabilized aqueous solution to provide a standardized gas content;
measuring electrochemical noise (ECN) signals in the time domain generated by the pitting reaction;
sampling said ECN signal in the time domain to create a digitized ECN signal;
processing said digital ECN signals to generate frequency spectrum amplitude data, including determining a mean value of each ECN signal, and thence subtracting each means value from each respective ECN signal whereby a DC offset is removed from each ECN signal, and thence performing a fast Fourier transform (FFT) after said step of subtracting; and
converting said frequency spectrum amplitude data to a log-log scale wherein the difference between the maximum and minimum spectral levels at the two sides of the frequency spectrum range are indicative of the pit initiation rates.

5,151,164
ENHANCED CAPILLARY ZONE ELECTROPHORESIS AND APPARATUS FOR PERFORMANCE THEREOF
William C. Blanchard, Phoenix, and Cheng S. Lee, Columbia, both of Md., assignors to The University of Maryland, College Park and Blanchard and Co., Phoenix, both of, Md.
Filed Feb. 9, 1990, Ser. No. 477,755
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—182.1 13 Claims



1. A method of separating elements of a mixture of substances in a solution or suspension by conducting capillary electrophoresis of said solution or suspension, said electrophoresis inducing an electroosmotic flow in said solution or suspension, said method comprising
1) applying an internal electric field internally along the length of a capillary tube having an interior filled with said solution or suspension bound by a capillary wall,
2) applying an external electric field across the interior of said capillary tube through a conductive member exterior to the interior of said capillary tube,
3) wherein the electric potential difference between the internal and external fields produces an electric field perpendicularly across the capillary wall, along the length of said tube, thereby altering the electroosmotic flow rate, and
4) permitting said solution to undergo electrophoresis under the influence of said electric fields, whereby separation of said elements is optimized.

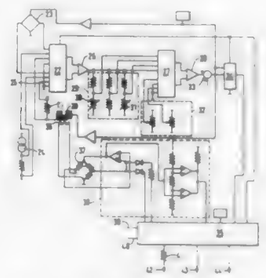
5,151,165
METHODS AND APPARATUSES FOR PREPARATIVE ELECTROPHORESIS
Van T. Huynh, Viry Chatillon, France, assignor to Institut National De La Sante Et De La Recherche Medicale, Paris, France
Continuation of Ser. No. 900,158, filed as PCT/FR85/00357, Dec. 10, 1985, abandoned. This application Apr. 25, 1990, Ser. application Apr. 25, 1990, Ser. No. 513,029
Claims priority, application France, Dec. 11, 1984, 84 18910
Int. Cl.[5] B01D *61/42*; C25D *13/00*
U.S. Cl. 204—299 R 5 Claims



1. An apparatus for preparative electrophoresis which does not include a pump consisting essentially of
a first zone containing an upper electrode and a first electrode buffer system;
a second zone containing a lower electrode and a second electrode buffer system;
an enclosed means having upper and lower ends connecting said first and second zones, the upper and lower ends of said enclosed means being immersed in said first and second electrode buffer systems, respectively;
a continuous separation gel having an upper and lower surface in said enclosed means the upper surface of the gel on which is placed the sample containing the product to be recovered;
a semi-permeable element having an electroendosmotic capacity maintained tightly and parallel to the lower gel surface;
an elution chamber defined by the lower surface of said gel and said semi-permeable element;
at least one outlet for the removal of products which emerge from the gel, without using a pump, by means of the buffer from the second electrode buffer system flowing in the direction opposite to that of the migration of the products to be separated across said semi-permeable element, said outlet being located between the gel and said semi-permeable element, and being with the gel and the molecules to be separated on the same side of the semi-permeable element, the gel and said semi-permeable element being separated by less than one millimeter.

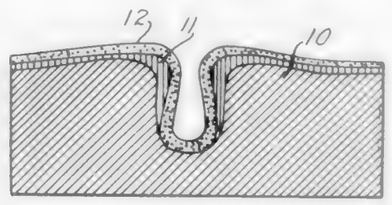
5,151,166
OXYGEN MONITORING METHOD AND APPARATUS
Michael W. Harral, and Eric L. Rendell, both of Yeovil, England, assignors to Normalair-Garrett (Holdings) Limited, England
Filed Oct. 1, 1990, Ser. No. 591,231
Claims priority, application United Kingdom, Oct. 2, 1989, 8922126
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—425 14 Claims

5. Apparatus for monitoring oxygen in oxygen-enriched air delivered by an aircraft on-board oxygen generating system comprising solid electrolyte amperometric sensor means, means for supplying a sample of oxygen-enriched air to said sensor means whereby a non-linear current signal having a logarithmic relationship with oxygen concentration is output by said sensor means, and means for converting the current signal to a voltage signal, means for converting the voltage



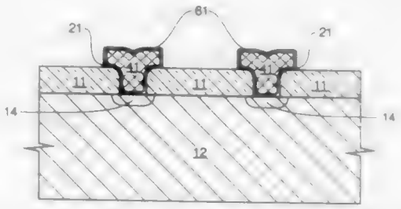
signal from analog to digital signal, means for delivering the digital signal to signal processing means storing an oxygen diffusion equation in the form of a look-up table, said signal processing means being adapted to process the digital signal and output a linear oxygen percentage concentration signal for control and/or warning purposes.

5,151,167
COINS COATED WITH NICKEL, COPPER AND NICKEL AND PROCESS FOR MAKING SUCH COINS
Hieu C. Truong, Orleans, and Maria Dilay, Ottawa, both of Canada, assignors to Royal Canadian Mint, Ottawa, Canada
Continuation of Ser. No. 568,739, Aug. 17, 1990, abandoned. This application Dec. 4, 1991, Ser. No. 801,636
Claims priority, application Canada, Jun. 21, 1990, 2019568
Int. Cl.[5] C25D *5/12, 5/18*
U.S. Cl. 205—102 14 Claims



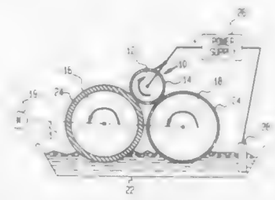
1. A process for making a coin blank or like articles comprising:
a) cleaning a ferrous metal blank so that it will be essentially free of oxide;
b) electroplating said blank with a strike of nickel;
c) electroplating the strike of nickel with a coating of copper by first depositing a thin, initial film of copper at a low current density in a bath that is about 1/6 to ¼ of the full current density and then depositing the remainder of the copper coating at a full current density in the same bath to minimize or avoid bridging of micropores in the ferrous metal blank.

5,151,168
PROCESS FOR METALLIZING INTEGRATED CIRCUITS WITH ELECTROLYTICALLY-DEPOSITED COPPER
Terry L. Gilton; Mark E. Tuttle, and David A Cathey, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Sep. 24, 1990, Ser. No. 587,302
Int. Cl.[5] C25D *5/02*
U.S. Cl. 205—123 25 Claims



1. A process for metallizing an integrated circuit chip with copper comprising the following sequence of steps:
forming electrical contact openings in a dielectric layer on the chip;
deposition of a conductive barrier layer on the surface of the chip;
creating a dielectric material mask on top of the barrier layer, said mask being a reverse image of the desired metallization pattern;
submersing the chip in an electrolytic bath having copper ions complexed with EDTA molecules, such that metallic copper is deposited to a desired thickness on portions of the barrier layer that are not covered by said dielectric material mask;
stripping the dielectric material mask; and
removal of those portions of the barrier layer that were exposed by removal of the dielectric material mask.

5,151,169
CONTINUOUS ANODIZING OF A CYLINDRICAL ALUMINUM SURFACE
George T. Galyon, Fishkill; George M. Jordhamo, Wappingers Falls, and Louis H. Wirtz, Highland, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Dec. 6, 1991, Ser. No. 802,792
Int. Cl.[5] C25D *11/04, 17/00*
U.S. Cl. 205—151 12 Claims



1. An apparatus for selectively anodizing the peripheral surface of a cylindrical member comprising in combination:
a roller having a peripheral surface;
means for rotating said roller;
means for supporting said member so that said peripheral surface of said member is in contact with the peripheral surface of said roller and said contact causes said member to rotate as said roller rotates;
an electrolyte carried by said peripheral surface of said roller;
a cathode electrically coupled to electrolyte;
a power supply having a positive terminal and a negative terminal; and

means for coupling said negative terminal to said cathode and means for coupling said positive terminal to said cylindrical member.

5,151,170

ACID COPPER ELECTROPLATING BATH CONTAINING BRIGHTENING ADDITIVE

Eda R. Montgomery, and Randal D. King, both of Wilmington, Del., assignors to McGean-Rohco Inc., Cleveland, Ohio

Filed Dec. 19, 1991, Ser. No. 810,190
Int. Cl.[5] C25D *3/38*
U.S. Cl. 205—298 **15 Claims**

1. An acid copper plating bath for producing smooth copper coatings of high brilliancy containing at least one brightener consisting of a peroxide oxidation product of a dialkylamino-thioxomethyl-thioalkane-sulfonic acid wherein each alkyl and alkane group individually contains from 1 to 6 carbon atoms and wherein the peroxide oxidation of the dialkylamino-thioxomethyl-thioalkanesulfonic acid is carried out in an acid, aqueous medium having a pH of not greater than about 1.

5,151,17

METHOD OF COOLING WITH AN ENDOTHERMIC FUEL

Louis J. Spadaccini; Pierre J. Marteney, both of Manchester, and Meredith B. Colket, III, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 15, 1991, Ser. No. 701,429
Int. Cl.[5] C10G *11/00*
U.S. Cl. 208—48 Q **11 Claims**

1. A method of cooling a heat source, comprising:

(a) transferring thermal energy with heat transfer means from the heat source, which is at a suitable temperature, to an endothermic fuel decomposition catalyst, wherein the catalyst comprises a metal selected from the group consisting of platinum, rhenium, rhodium, iridium, ruthenium, palladium, and mixtures thereof on a zeolite, thereby heating the catalyst to a temperature between about 1000° F. and about 1500° F. to catalytically crack at least a portion of a stream of an endothermic fuel selected from the group consisting of isoparaffinic hydrocarbons, blends of normal and isoparaffinic hydrocarbons, and conventional aircraft turbine fuels; and

(b) contacting the heated endothermic fuel decomposition catalyst with the endothermic fuel stream at a liquid hourly space velocity of at least about 10 hr^{-1}, thereby causing the fuel stream to catalytically crack into a reaction product stream with a conversion of greater than about 60% to produce a total heat sink of at least about 2000 Btu/lb of fuel, wherein the reaction product stream comprises hydrogen and unsaturated hydrocarbons;

thereby cooling the heat source to a temperature less than its original temperature.

5,151,172

DISTILLATE HYDROGENATION

Simon G. Kukes, Naperville; Frederick T. Clark, Wheaton; P. Donald Hopkins, St. Charles, and Lisa M. Green, Geneva, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,426
Int. Cl.[5] C10G *45/12*
U.S. Cl. 208—144 **25 Claims**

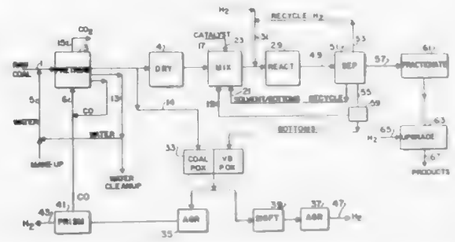
1. A process for hydrogenation of a hydrocarbon feedstock consisting essentially of material boiling between about 150° F. and about 700° F. which comprises reacting said feedstock with hydrogen at hydrogenation conditions in the presence of a catalyst comprising from about 0.1% to about 2.0% by weight each of palladium and platinum and a support comprising mordenite.

5,151,173

CONVERSION OF COAL WITH PROMOTED CARBON MONOXIDE PRETREATMENT

Stephen N. Vaughn, Baton Rouge, La.; Michael Siskin, Livingston, N.J.; Alan Katritzky, Gainesville, Fla.; Glen Brons, Phillipsburg, N.J.; Steve N. Reynolds, Baton Rouge, La.; Claude C. Culross, Baton Rouge, La., and Dan R. Neskora, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 21, 1989, Ser. No. 455,658
Int. Cl.[5] C10G *1/06*
U.S. Cl. 208—430 **16 Claims**



1. A process for pretreatment of coal preliminary to catalytic hydroconversion of coal material to a hydrocarbonaceous liquid, which process comprises forming in a pretreatment zone a mixture comprising coal, carbon monoxide, solvent and an effective amount of a promoter compound or mixtures thereof, and subjecting the coal containing mixture to a temperature from about 550° F. to 700° F. and a pressure effective to cause hydrogenation and/or depolymerization of the coal, but not to cause solubilization or liquification of said coal, wherein the promoter compound is selected from the group consisting of formic acid, acetic acid, propionic acid, lactic acid, hydrogen sulfide, or an ammonium, alkali or alkali earth metal salt of any of the foregoing acids.

5,151,174

INSTALLATION FOR THE DISINFECTION OF CLARIFIED SEWAGE WITH UV APPARATUS BUILT INTO SIPHONS

Rudolf Wiesmann, Bogenackerstrasse 26, 8630, Tann, Switzerland

Filed Mar. 13, 1991, Ser. No. 668,964
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4007898
Int. Cl.[5] A61L *9/20;* **F04F** *10/02*
U.S. Cl. 210—97 **11 Claims**

5. An installation designed for the disinfection of clarified sewage which is withdrawn from a sewage clarification plant by an open discharge conduit, said installation comprising:

a headwater conduit section of said open discharge conduit having a flow therein;

a low-water conduit section of said open discharge conduit, said low-water conduit section being separated from said headwater conduit section and having a flow therein;

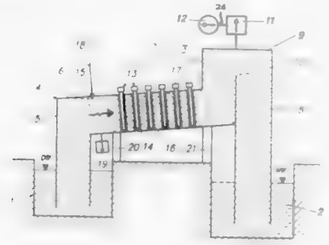
at least one overground tube connecting said two conduit sections, said at least one overground connecting tube being designed as a siphon; and

a UV irradiation source built into said siphon for irradiating the sewage;

said siphon comprising:

an ascending tube comprising a steeply ascending section dipping into the flow in said headwater conduit section;

a soil tube dipping into the flow in said low-water conduit section;



a rising overflow bend comprising a gently ascending tube section defining a reaction chamber and an overflow edge situated higher than said reaction chamber, said rising overflow bend connecting said ascending tube and said soil tube;

said UV irradiation source being built into said gently ascending tube section of said ascending tube.

6. An installation according to claim 5, said overflow bend having an upper side, said installation further comprising:

a vent valve provided at an upper portion of said overflow bend;

a lift pump for evacuating air from said siphon; and

a pipe connecting said vent valve to said lift pump.

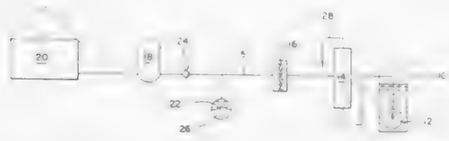
7. An installation according to claim 6, said installation further comprising a sensor within said overflow bend for monitoring the water level is said overflow bend, said sensor controlling the operation of said lift pump.

5,151,175

SYSTEM TO AUTOMATICALLY DRAIN FILTER BACKWASH WATER

Claude S. Royal, P.O. Box 2143, Lynchburg, Va. 24501

Filed Jul. 12, 1991, Ser. No. 729,205
Int. Cl.[5] G05D *7/00;* **B01D** *35/157;* **E21B** *34/16*
U.S. Cl. 210—108 **3 Claims**



1. A system constructed and arranged for filtering water from a well having a pump, comprising

a supply line having an upstream end connectable to the well and a downstream end connectable to a storage tank,

a check valve in said supply line upstream of the storage tank,

an accumulator containing a compressible fluid and water in communication with said supply line at a point upstream of the check valve,

a filter in said supply line upstream of the accumulator, and

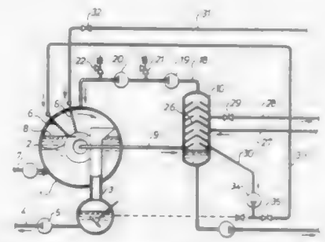
an automatic backwash valve installed in the supply line between the filter and the upstream end of the supply line, said backwash valve having an outlet connected to a drain line, and containing means for automatically directing any water driven backwards through the filter by the accumulator, in response to the pump deactivated, to the drain line, rather than to the pump.

5,151,176

FILTER FOR CONTINUOUS FILTRATION

Kent Strid, Svadenvägen 11, S-810 28 Järbo; Hans Å. Karlsson, Slanstigen 8, S-776 00 Hedemora, and Per Larsson, Gimlestigen 15, S-774 00 Avesta, all of Sweden

PCT No. PCT/SE90/00413, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/15655, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 13, 1990, Ser. No. 655,395
Claims priority, application Sweden, Jun. 14, 1989, 8902147
Int. Cl.[5] B01D *33/25*
U.S. Cl. 210—178 **8 Claims**



1. A filter for continuous filtration of a liquid under pressure, said filter including a vessel containing said liquid to a certain level and gas in a gas space located above said liquid, at least one rotatable filter element provided in said vessel and defining an inner space for filtrated liquid obtained by filtration, a washing device for washing material separated from said liquid and deposited on said filter element, communication between said inner space of said filter element and outlet means from said vessel for discharging said filtrated liquid and gas entrained therewith, and a separator connected to said outlet for separating said filtrated liquid from entrained gas, means being provided outside said vessel for generating overpressure in said gas space of said vessel and a lower pressure in said inner space of said filter element at least corresponding to an evaporation temperature of said filtrated liquid in order to maintain said filtrated liquid in a state of evaporation within said separator, said separator being provided with a cooling device for cooling the separated gas and with outlet means for discharging condensate obtained upon cooling.

5,151,177

METHOD AND APPARATUS FOR DISSOLVED AIR FLOTATION WITH AERATION

Mel Roshanravan, Coppell, and Michael W. Grosskopf, Carrollton, both of Tex., assignors to Darling-Delaware Company, Inc., Dallas, Tex.

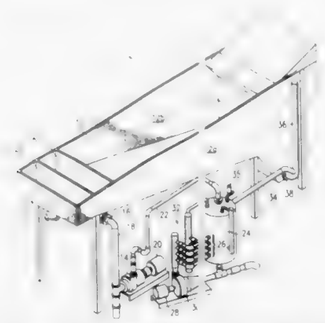
Filed May 10, 1990, Ser. No. 521,396
Int. Cl.[5] B01D *17/035;* **C02F** *1/24*
U.S. Cl. 210—194 **19 Claims**

4. Apparatus for aerating water in a dissolved air flotation system, comprising:

flotation container means for receiving waste water and for receiving and retaining aerated waste water to allow flotation of particles to the surface of the waste water held therein;

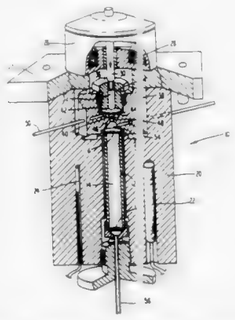
means for supplying waste water to the flotation container means;

pressure tank means pressurized to a predetermined pressure connected to receive waste water from said flotation container means;
means for pumping waste water from said flotation container means into said pressure tank means;
means for pressurizing said pressure tank means;
aeration means connected to receive waste water from said pressure tank means;
said aeration means comprising: a plurality of jets for entraining air in the waste water as the waste water is forced through the jets;



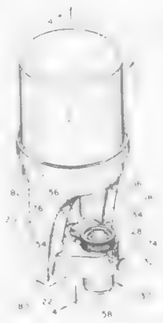
a water manifold for connecting the waste water from the pressure tank means to the jets
an air manifold for connecting pressurized air from the pressure tank means to the jets
connecting means separately connecting each of the jets to the air manifold;
connecting means separately connecting each of the jets to the water manifold; and
means connecting each of the jets to the pressure tank means
means for returning the aerated waste water from the pressure tank means to the flotation container means.

5,151,178
AXIALLY-DRIVEN VALVE CONTROLLED TRAPPING ASSEMBLY
Mark A. Nickerson; John S. Poole, and Lenore G. R. Frank, all of Landenberg, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 403,024, Aug. 31, 1989, Pat. No. 5,009,778, which is a continuation-in-part of Ser. No. 316,383, Feb. 27, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 659,244
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 **4 Claims**



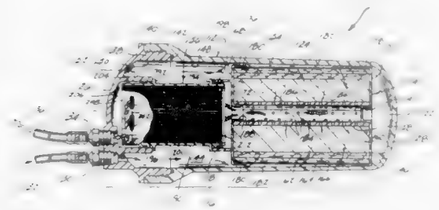
1. In a trapping assembly for use with fluid systems having a vessel at least partially packed with a material for removing a solute component of said fluid, the combination comprising:
an inlet for introducing the fluid under pressure into the trapping assembly;
an axially driven valve for controlling the mass flow of the fluid through the inlet, and
an annular orifice expansion nozzle leading from the valve to the vessel, wherein the valve is actuated and comprises an axially moving pin adapted to restrict the mass flow of the fluid through the valve by varying the size of the annular orifice in the expansion nozzle.

5,151,179
FAUCET CONNECTED WATER FILTER
Ulf-Eiel F. Bach, Mound; Rodney N. Rueter, and John N. Taylor, both of St. Louis Park, all of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.
Filed Apr. 20, 1992, Ser. No. 871,140
Int. Cl.[5] B01D *35/02, 35/30*
U.S. Cl. 210—250 **7 Claims**



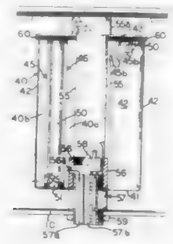
1. A faucet mounted water filter assembly for selecting between filtered and unfiltered water, said purifier comprising:
(a) a filter cartridge housing having a cylindrical shell configuration, said housing containing a filter cartridge therein, said filter cartridge having a filter exit;
(b) a base having an inlet for unfiltered water, an outlet for filtered water, first and second tubular legs projecting below said base, said first leg in fluid communication with the said inlet and having a lower end, said second leg in fluid communication with said outlet and having a lower end;
(c) means on said base for sealing said outlet from said inlet;
(d) a diverter valve support disposed between said lower ends of said tubular legs and connected thereto, said diverter valve support having a valve receiving socket therein; and
(e) a diverter valve received by said socket, said diverter valve having a faucet spout attachment, an unfiltered water exit port, a water outlet port, means to fluidly connect said water outlet port to said first tubular leg and a activator valve for selectively blocking and unblocking said water outlet port to cause water to flow through said unfiltered water exit and through said first tubular leg into said cartridge housing, respectively.

5,151,180
RADIAL AND AXIAL FLOW STAGE FILTER DEVICE
Edward C. Giordano; Mark O'Brien, both of Glastonbury; Raymond M. Petrucci, Middlebury, and Bruce G. Taylor, Kensington, all of Conn., assignors to Cuno, Incorporated, Meriden, Conn.
Continuation-in-part of Ser. No. 422,519, Oct. 17, 1989. This application Oct. 16, 1990, Ser. No. 599,227
Int. Cl.[5] B01D *25/02*
U.S. Cl. 210—264 **11 Claims**



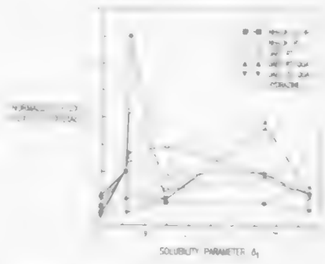
1. A filter device comprising, a container having a first end wall and a second end wall spaced and joined by a peripheral wall to enclose a cavity, opening means in said container for fluid inlet means and fluid outlet means, a filter unit supported in said cavity, a radial flow first stage subassembly in said filter unit communicating with said fluid inlet means and disposed for radially inward fluid flow, and an axial flow second stage subassembly in said filter unit disposed centrally within said radial flow first stage subassembly in fluid communication with said radial flow first stage subassembly and said fluid outlet means, thereby providing series fluid flow sequentially through said radial flow first stage subassembly and said axial flow second stage subassembly of said filter unit, said radial flow first stage subassembly having a central axial passage receiving said axial flow second stage subassembly, said axial flow second stage subassembly having a hollow outer shell having slot means therein for fluid flow from said central axial passage of said radial flow first stage subassembly into said axial flow second stage subassembly, and said hollow outer shell of said axial flow second stage subassembly having seal means at the longitudinal extremities engaging said radial flow first stage subassembly for maintaining separation of fluids therein except for fluid flow through said slot means.

5,151,181
FILTER SYSTEM FOR WET VACUUM CLEANING APPARATUS
Robert M. Barry, St. Paul, Minn., assignor to CFR Corporation, Roseville, Minn.
Filed Mar. 28, 1991, Ser. No. 676,830
Int. Cl.[5] B01D *29/15*
U.S. Cl. 210—338 **12 Claims**



1. A filter system for wet vacuum cleaning apparatus, said apparatus comprising,
a filter housing having a lower portion and adapted to be mounted in a liquid reservoir tank with the lower portion of the housing disposed below the normal liquid level in the tank, said housing having a top, a bottom, and sidewalls defining a filter chamber therein and having an inlet port disposed below the normal liquid level in the tank,
a filter assembly including a first supporting frame with filter element supported thereon, said assembly being mounted in the chamber and extending from the top to the bottom thereof to divide the chamber into an unfiltered liquid first housing section and a filtered liquid second housing section, said filter element having a sealed connection at the top and bottom of the housing to prevent solids from passing from the first section to the second section,
a pump intake port communicating with the filtered liquid second section,
and wherein the filter supporting frame constitutes a generally cylindrically shaped grid unit, a generally cylindrically shaped filter sleeve removably mounted on said unit and having ends which, with the grid unit, are respectively sealed against the top and bottom of the housing,
a second filter supporting frame concentrically mounted within the first frame and,
a filter element supported on the second frame and having upper and lower ends thereof sealed against the top and bottom of the housing to provide a two stage filter within the housing to provide a double filtered water supply for the pump intake port,
and said first and second filter having a predetermined annular spacing therebetween, and
a plurality of filter positioning posts mounted in said annular spacing for maintaining the alignment of the supporting frames and extending substantially from top to bottom of the chamber, and
a center stand pipe extending from the bottom to the top of said filter housing and having a removable cap connected to the top thereof for engaging the removable top of the housing and securely pressing the same downwardly into sealed engagement with the top of the housing sidewalls and the ends of the filter assemblies.

5,151,182
POLYPHENYLENE OXIDE-DERIVED MEMBRANES FOR SEPARATION IN ORGANIC SOLVENTS
Mordechai Perry, Petach Tikva; Henia Yacubowicz, Ness Ziona; Charles Linder, Rehovot; Mara Nemas, Neve Monosson, and Reuven Katraro, Rishon Lezion, all of Israel, assignors to Membrane Products Kiryat Weizmann Ltd., Rehovot, Israel
Filed Aug. 30, 1991, Ser. No. 752,842
Int. Cl.[5] B01D *71/00*
U.S. Cl. 210—500.27 **22 Claims**



20. A composite membrane comprising a substrate made from polyacrylonitrile, which substrate has been subjected to a stepwise treatment sequence comprising the steps of:
(1) insolubilizing said polymer by crosslinking, comprising treatment with a base selected from organic and inorganic bases, the base-treated polyacrylonitrile substrate then

being subjected to a heat-treatment sub-step at the temperature within the range of about 110°–130° C.;

(2) coating the insolubilized with a layer including at least one polymer selected from polyphenylene oxide type polymers and polysulfone type polymers, as well as at least one polymer derived from haloalkylated polyphenylene oxide type monomers; and

(3) crosslinking said layer by reaction with at least one member selected from the group consisting of ammonia; aliphatic, cycloaliphatic, araliphatic and aromatic amines monoamines and polyamines; hydroxylamine and substituted hydroxylamines; and hydrazine and substituted hydrazines.

5,151,183

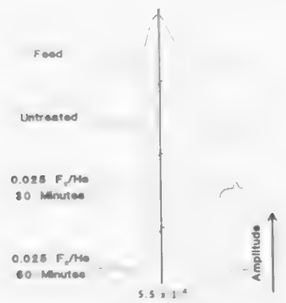
REDUCTION OF MEMBRANE FOULING BY SURFACE FLUORINATION

Robert H. Sedath, Bensenville, Ill.; Donald R. Taylor, Randolph, N.J., and Lloyd S. White, Columbia, Md., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 353,575, May 18, 1989. This application Aug. 23, 1991, Ser. No. 749,097

Int. Cl.[5] B01D *71/68*

U.S. Cl. 210—500.41 **9 Claims**



1. A membrane for removing organic products or impurities from an aqueous waste stream and having improved flux and improved fouling resistance, said membrane being prepared by treating a porous polysulfone membrane having a pore size ranging from 0.001 to 10 μm by the steps comprising:

(a) optionally treating said membrane with an aqueous methanol solution;

(b) drying said membrane;

(c) treating said dried membrane with a mixture of fluorine and an inert gas in an amount and for a period of time sufficient to increase the liquid flux and fouling resistance over that of a non-treated membrane and in the substantial absence of oxygen without significantly altering the pore size of said membrane; and,

(d) exposing said treated membrane to air.

5,151,184

FLUID COLLECTING AND DISPENSING SYSTEM

Michael A. Ferkany, Southfield, Mich., assignor to Biomedical Devices Company, Pontiac, Mich.

Filed Nov. 14, 1990, Ser. No. 613,335

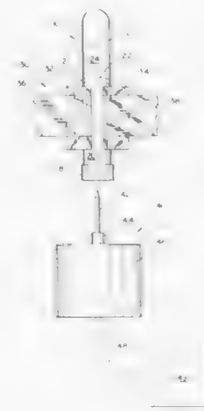
Int. Cl.[5] B01D *17 032, 17/12*

U.S. Cl. 210—514 **4 Claims**

1. A fluid collection system for a plurality of test tubes, the system comprising means for selectively determining the quantity of fluid required to be withdrawn from an individual test tube, wherein the test tube has a closed end and an open end, the open end being sealed by a self-sealing cap, and a fluid collection device which comprises:

a. gripping means for releasibly holding the test tube in a substantially inverted vertical posture such that the sealed open end is situated at the bottom of the test tubes;

b. a fluid collection device positioned below the test tube, the fluid collection device including a penetrating and fluid-extracting needle having a distal and proximal end,



wherein the distal end includes an orifice adapted to penetrate the self-sealing cap of the test tube such that the distal end of the needle barely penetrates the cap of the test tube, and a fluid collection container; and

c. vacuum means connected to the fluid collection device and adapted to create a fluid withdrawing vacuum, a means to selectively control the vacuum means to withdraw a quantity of fluid previously determined to be required for the individual test tube.

5,151,185

LIGHT-LIQUID SEPARATOR

Nikolaus Hammerschmitt, Kölner Str. 138, D-5350 Eurkirchen, Fed. Rep. of Germany

PCT No. PCT/DE90/00429, § 371 Date Mar. 27, 1991, § 102(e) Date Mar. 27, 1991, PCT Pub. No. WO90/14874, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 5, 1990, Ser. No. 671,889

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918343; Jul. 26, 1989, 3924787; Sep. 11, 1989, 3930226

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—521 **14 Claims**

1. A light-liquid separator comprising:

a housing provided with an inlet for a mixture including a heavy liquid and a light liquid;

at least one separator chamber operatively connected with a heavy liquid outlet and formed along the path between said inlet and outlet of the housing, said chamber being provided with means forming an overflow edge located above a bottom of said heavy liquid outlet;

a dip tube in said separator chamber extending downwardly from said overflow edge and having a respective inlet above said bottom of said heavy-liquid outlet for preseparating said light liquid from said heavy liquid in said separator chamber;

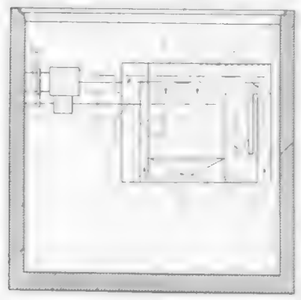
an underflow baffle positioned between said dip tube and said overflow edge;

means forming a light liquid outlet and comprising:

at least one light liquid balance room communicating with said separator chamber through said dip tube and receiving said light liquid and a part of said heavy liquid,

a light liquid discharge reservoir, and

a light liquid discharge tube means extending upwardly from said balance room into said reservoir, wherein said heavy liquid outlet is formed with a flow opening means



located between said bottom and said inlet of the dip tube, for connecting said heavy liquid outlet to said balance room for discharging heavy liquid from said balance room.

5,151,186

METHOD FOR CLEANING FILTER DISKS AND SYSTEM THEREFOR

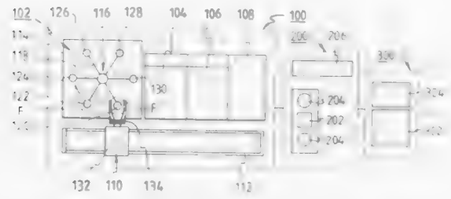
Taek J. Yoo; Yong N. Jang; Wook H. Oh, and Chan S. Jeong, all of Kyongi, Rep. of Korea, assignors to SKC Limited, Suwon, Rep. of Korea

Filed May 16, 1991, Ser. No. 701,679

Claims priority, application Rep. of Korea, May 21, 1990, 90-7259; Oct. 10, 1990, 90-15511

Int. Cl.[5] B01D *35/20*

U.S. Cl. 210—541 **5 Claims**



1. A system for continuously supplying, cleaning and recovering a succession of filter disks which comprises:

a turntable including a plurality of vertical posts capable of holding the filter disks in a stacked condition one above another and a plurality of horizontal arms adapted to support said vertical posts at their free ends, said horizontal arms extending radially outwardly from a common rotational shaft;

a robotic carrier movable along a given path for transporting each of the filter disks from one station to another within said system;

a first ultrasonic cleaner located adjacent to said turntable along the path of said robotic carrier for receiving the filter disk transported from said turntable and ultrasonically cleaning a first side of the filter disk;

a second ultrasonic cleaner positioned adjacent to said first cleaner along the path of said robotic carrier for receiving the filter disk transported from said first cleaner and ultrasonically cleaning a second side of the filter disk;

a water injection cleaner located adjacent to said second cleaner along the path of said robotic carrier for subjecting the filter disk transported from said second cleaner to a pressurized injection of water so as to remove residual contaminants from the ultrasonically cleaned filter disk; and

means for controlling the supplying, cleaning and recovering operations of said system.

5,151,187

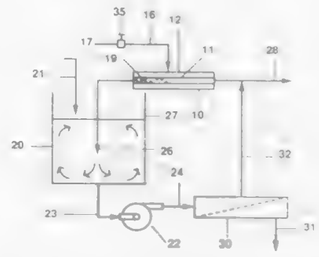
MEMBRANE BIOREACTOR SYSTEM WITH IN-LINE GAS MICRONIZER

Henry Behmann, Puslinch, Canada, assignor to Zenon Environmental, Inc., Burlington, Canada

Filed Nov. 19, 1991, Ser. No. 794,867

Int. Cl.[5] C02F *1/44, 3/12*

U.S. Cl. 210—607 **19 Claims**



9. In a continuous biodegradation process using live microorganisms in an aqueous environment to oxidize dissolved or suspended organic material in a bioreaction zone wherein biomass is aerated, and a portion of said biomass is withdrawn for circulation through a membranous ultrafiltration zone from which a permeate of high quality water is continuously withdrawn, and the remaining solids-containing concentrate is recycled to said bioreaction zone, the improvement comprising,

(a) flowing said solids-containing stream from said membranous zone into a micronizing zone comprising a microporous air diffuser element externally disposed relative to said bioreaction zone;

(b) contacting said solids-containing stream in said micronizing zone, with an oxygen-containing gas at a pressure in the range from about 150–1000 kPa so as to microaerate said stream infusing it with a multiplicity of gas bubbles in the range from 1–1000 μm in diameter, and adding the energy of said gas to the kinetic energy of said solids-containing stream so as to provide a tail-jet leaving said micronizing zone; and,

(c) introducing said tail-jet with sufficient motive force to establish a desired recirculation pattern of solids in said biomass, said motive force being provided by the sum of the energies in said solids-containing stream and said gas stream.

5,151,188

SUPERCRITICAL FLUID EXTRACTION ENHANCER

Marvin L. Hopper, Gladstone, Mo., and Jerry W. King, Peoria, Ill., assignors to The Government of the United States of America, as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jun. 12, 1990, Ser. No. 536,861

Int. Cl.[5] B01D *11/00, 15/08*

U.S. Cl. 210—634 **16 Claims**

1. A method of preparing a sample for supercritical fluid extraction which comprises:

mixing a sample with an extraction enhancing aid which increases the permeability of the sample to a supercritical extraction solvent and which adsorbs water from the sample, said sample comprising a solid matrix and said

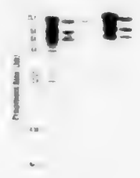
extraction enhancing aid compr sing flux-calcined diatomaceous earth; and

retaining the sample mixed with the extraction enhancing aid in an extraction column.

5,151,189
CATIONIC CHARGE MODIFIED MICROPOROUS MEMBRANE

Ho-Pin Hu; Inessa Katsnelson, and Alan Sellinger, all of Ann Arbor, Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Filed Sep. 17, 1990, Ser. No. 583,640
Int. Cl.[5] B01D 67/00
U.S. Cl. 210—635 38 Claims



23. A cationic charge modified microporous hydrophilic membrane, comprising:

a microporous membrane substrate comprising polyethersulfone and at least one non-leachable active polymeric additive selected from polyvinylpyrrolidone and polyethylene glycol, which additive enhances hydrophilicity and has functional groups latently reactive with reactive groups of charge modifying agents;

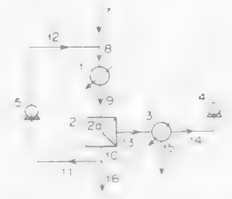
a primary charge modifying agent comprising polyethyleneimine-epichlorohydrin resin which contains polyamines, can chemically react with electrophile-containing compounds and thus impart a net positive charge, and is chemically grafted to said polymeric additive; and

a secondary charge modifying agent containing functionality that is reactive with the primary charge modifying agent, selected from the group consisting of partially phosphinated polyvinylbenzyl chloride ammonium and sulfonium analogs thereof, and quaternized poly(dimethylamine-co-epichlorohydrin) said secondary agent being reacted with the primary agent in an amount either such that the magnitude of the final formal positive charge is increased over that due to its reaction with the primary agent or such that the sensitivity of the primary agent to the variance of environmental pH is decreased.

5,151,190
METHOD FOR SEPARATING A LIQUID MIXTURE

Furuto Seiryo, Tokyo, Japan, assignor to Ryoka Techno Engineering & Construction Co. and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Filed Dec. 27, 1991, Ser. No. 813,783
Claims priority, application Japan, Dec. 27, 1990, 2-408428
Int. Cl.[5] B01D 61/36
U.S. Cl. 210—640 11 Claims

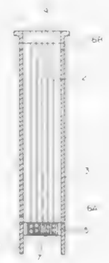


1. A method for separating water by pervaporation from a liquid mixture comprising isopropanol and water, which comprises (a) heating the liquid mixture, then supplying the heated mixture to a pervaporation membrane module unit using a polyimide-type separating membrane to conduct separation of the liquid mixture, recycling a part or whole of the liquid not permeated through the membrane to a feed liquid mixture, supplying a fresh feed liquid mixture to an optional place in the circulation route, and withdrawing the liquid mixture from an optional place in the circulation route, (b) controlling the amount of the liquid to be recycled among the liquid not permeated through the membrane to a level of at least 10 times by volume the amount of the fresh feed liquid mixture, and (c) controlling the difference between the liquid temperature at the inlet of the membrane module unit and the liquid temperature at the outlet of the membrane module unit to a level of at most 20° C.

5,151,191
FILTRATION PROCESS USING HOLLOW FIBER MEMBRANE MODULE

Yoshio Sunaoka, Higashimatsuyama; Keisuke Kitazato, Kumamoto, and Satoru Tsuda, Niiza, all of Japan, assignors to Japan Organo Co., Ltd., Japan

Filed Sep. 11, 1991, Ser. No. 757,857
Claims priority, application Japan, Sep. 26, 1990, 2-254170
Int. Cl.[5] B01D 69/08
U.S. Cl. 210—644 4 Claims



1. A filtration process using a hollow fiber membrane module including a large number of hollow fibers bundled together therein as porous hollow fiber membranes: comprising the filtration step of passing raw water containing fine particles through the pores of said hollow fibers from the outsides thereof to the insides thereof to trap said fine particles on the outer surfaces of said hollow fibers while draining filtrate

obtained on the insides of said hollow fibers out of said hollow fiber membrane module, the cooling step of lowering the temperature of water in said hollow fiber membrane sufficient to substantially reduce roughening of the surfaces and occlusion of the pores of said hollow fiber membranes when vibrated module to cool said porous hollow fiber membranes, the scrubbing step of charging bubbles into water around the outer surfaces of said hollow fibers dipped in water to agitate said water around the outer surfaces of said hollow fibers to vibrate said hollow fibers, thereby exfoliating said fine particles trapped on the outer surfaces of said hollow fibers, and the drain step of draining the resulting waste water containing the exfoliated fine particles out of said hollow fiber membrane module.

5,151,192
METHOD FOR REMOVING HEPARIN FROM BLOOD OR PLASMA

Vlado I. Matkovich, Glen Cove; Peter J. Degen, Huntington; Thomas C. Gsell, Glen Cove; Thomas Bormann, Seaford, and Isaac Rothman, Brooklyn, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 13, 1990, Ser. No. 552,138
Int. Cl.[5] B01D 61/00, 15/00
U.S. Cl. 210—646 39 Claims

1. A method for removing heparin from blood or plasma comprising:

contacting the blood or plasma with a porous medium having a positively charged surface and being capable of removing heparin from blood or plasma without pH adjustment; and

removing heparin from the blood or plasma without substantial removal of blood clotting factors.

5,151,193
POLYMER MEMBRANES ON THE BASIS OF POLYVINYLIDENE FLUORIDE, A PROCESS FOR THE PRODUCTION THEREOF AND THEIR USE

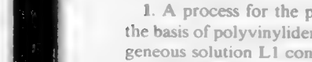
Anneliese Grobe, Esslingen, and Horst Chmiel, Leonberg, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung EV, Fed. Rep. of Germany

PCT No. PCT/DE90/00091, § 371 Date Nov. 2, 1990, § 102(e) Date Nov. 2, 1990, PCT Pub. No. WO90/09232, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 12, 1990, Ser. No. 613,861
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1989, 3904544
Int. Cl.[5] B01D 69/00
U.S. Cl. 210—651 35 Claims

1. A process for the production of polymer membranes on the basis of polyvinylidene fluoride (PVDF), wherein a homogeneous solution L1 containing

a) 5 to 30% by weight of PVDF and

b) 0.01 to 30% by weight of at least one sulfonic acid (PEEKSO$_3$H) salt obtained by sulfonating the polyetheretherketone (PEEK, poly(oxy-1,4-phenyleneoxy-1,4-phenylene-carbonyl-1,4-phenylene)) of formula (I)



(I)

is converted into a membrane by known techniques, and wherein the surface of the membrane is subsequently coated with a film by treating the membrane with a methanolic solution L2 containing 0.1 to 5% by weight of at least one sulfonic acid PEEKSO$_3$H or salt.

5,151,194
FILTER FOR REMOVING LIQUID HYDROCARBONS FROM WATER AND PROCESS OF REMOVING GASEOUS AND/OR HYDROCARBONS FROM WATER

Stewart A. Simpson, and Rock D. Dicke, both of Spring, Tex., assignors to Hydrocarbon Filtration Systems, Inc., El Campo, Tex.

Filed Oct. 31, 1990, Ser. No. 607,183
Int. Cl.[5] B01D 15/04, 39/04
U.S. Cl. 210—680 11 Claims

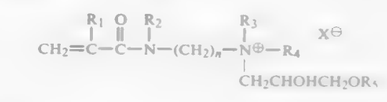
1. A packed filter for removing at least one hydrocarbon from water contaminated with said hydrocarbon which comprises a filter casing, an inlet for said contaminated water and an outlet for said contaminated water, said filter casing having contained therein fibrous peat which has been dried to a water content of 5 wt. % or less based on the weight of said peat and the water, which further comprises inside said casing first means oriented to introduce a first stream of said contaminated water into said peat and second means oriented substantially perpendicular to said first means to introduce a second stream of said contaminated water into said peat in a direction substantially perpendicular to said first stream of contaminated water.

5,151,195
FLOTATION-AID COMPOSITION AND METHOD OF USE THEREOF

Rudolf S. Buriks, and Allen R. Fauke, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 868,470, May 30, 1986. This application Aug. 11, 1988, Ser. No. 232,822
Int. Cl.[5] B01D 15/00
U.S. Cl. 210—705 5 Claims

1. A method of removing oils, solids and combinations thereof from an aqueous system which comprises the steps of dispersing within said system an effective coalescing amount of a reagent comprising a copolymer of an acrylic compound and a compound of the formula:



wherein

R_1 represents H or CH_3;

R_2 represents H or alkyl radicals having from 1 to about 4 carbon atoms;

R_3 and R_4 each represent an alkyl radical having from 1 to about 6 carbon atoms;

R_5 represents alkyl, alkenyl, cycloalkyl, alkyl substituted cycloalkyl, aryl, aralkyl, and alkaryl radicals having from 2 to about 18 carbon atoms;

n represents an integer from 2 to about 6; and

x represents a negatively charged salt-forming radical to

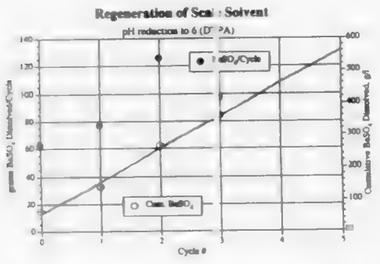
afford aqueous and non-aqueous layers and removing the non-aqueous layer from the aqueous system.

5,151,196

METHOD FOR REGENERATING SCALE SOLVENT

James M. Paul, Dallas, and Richard L. Morris, Duncanville, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 27, 1991, Ser. No. 766,313
Int. Cl.[5] C02F *1/62*
U.S. Cl. 210—712 10 Claims



1. In the method for removing alkaline earth sulfate scale by contacting the scale with an aqueous solvent having a pH of about 10 to about 14 and comprising a chelating agent comprising a polyaminopolycarboxylic acid or salt of such an acid, and a synergist anion selected from the group consisting of anions of at least one monocarboxylic acid, aminoacetic acid and hydroxyacetic acid, oxalates, and thiosulfates; the improvement comprising removing alkaline earth sulfate scale dissolved in said solvent by:

(a) acidifying said solvent with an acidic chelating agent that releases alkaline earth cations which react with sulfate ions present in the solvent to form a precipitate of an insoluble salt of the alkaline earth metal, and

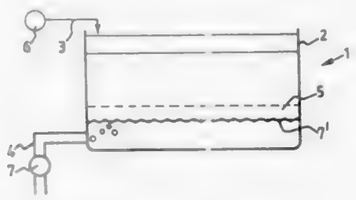
(b) separating the precipitate from the solvent and increasing the pH of the solvent to a pH of about 10 to about 14 to recover a regenerated solvent for reuse to dissolve scale.

5,151,197

FLUID TREATMENT

Alan J. Smith, Hemel Hempstead, and Jennifer J. Quinn, London, both of England, assignors to Thames Water Utilities Limited, United Kingdom

PCT No. PCT/GB90/00235, § 371 Date Dec. 7, 1990, § 102(e) Date Dec. 7, 1990, PCT Pub. No. WO90/09353, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 13, 1990 Ser. No. 576,526
Claims priority, application United Kingdom, Feb. 14, 1989, 8903292
Int. Cl.[5] C02F *1/72*
U.S. Cl. 210—758 11 Claims



7. A method of treating fluid, comprising:

(a) providing a treatment vessel containing a bed of inert separable treatment material;

(b) a first supplying step of supplying a fluid to be treated to said bed;

(c) a second supplying step of supplying a treatment fluid to said bed; and

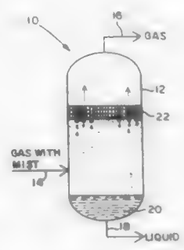
(d) controlling the first and second supplying steps to cause said fluid to be treated to be supplied to said bed in a first pulsed sequence and to cause said treatment fluid to be supplied to said bed in a second pulsed sequence of substantially equal pulse duration to said first pulsed sequence, but opposite to said first pulsed sequence, such that said bed is substantially quiescent with no substantial separation of said material thereof when said fluid to be treated flows into said bed.

5,151,198

METHOD AND APPARATUS FOR SEPARATING FLUIDS USING A CARBONACEOUS POLYMERIC FILTER HAVING A LOI GREATER THAN 40

Francis P. McCullough, Jr., Lake Jackson, and Stuart D. Stein, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 11, 1990, Ser. No. 581,339
Int. Cl.[5] B01D *39/08, 39/16*
U.S. Cl. 210—767 17 Claims



1. In an apparatus for separating fluids, which said apparatus has a fibrous element which permits flow of fluids therethrough and is capable of use in a corrosive atmosphere of non-oxidizing acids, the improvement which comprises said fibrous element being composed of non-graphitic carbonaceous polymeric fibers having an LOI greater than 40, and a carbon content of at least 65% which is the result of an irreversible chemical change whereby an increase of carbon content occurred.

5,151,199

PROCESS AND APPARATUS FOR CONTROLLING FROTH OF AN INSTANT COFFEE BEVERAGE

Jean-Marc Poulin, Chavornay, and Hervé Schmidely, Monthey, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Jul. 10, 1990, Ser. No. 550,456
Claims priority, application Switzerland, Jul. 21, 1989, 2738/89
Int. Cl.[5] B01D *29/085*
U.S. Cl. 210—773 19 Claims

1. In an apparatus for making and dispensing an instant coffee beverage comprising a mixing bowl and stirrer for mixing water and instant coffee to prepare a coffee beverage and a flow tube connected to the mixing bowl for receiving the coffee beverage from the mixing bowl, the improvement comprising:

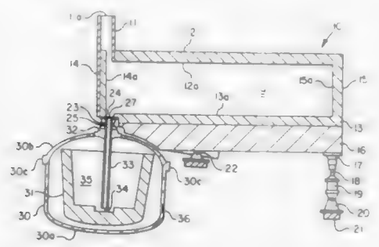
at least two screens positioned beneath an end of the flow tube displaced away from the bowl, each screen being in the form of a bag and having an open base and a closed end, the screens being coaxially and adjacently positioned at a distance from one another, one inside another, for receiving the coffee beverage from the flow tube through their open bases.

5,151,200

HIGH ALUMINIA TAR-IMPREGNATED PRESSURE POURING TUBES

John J. Stephansky, Fair Oaks, Pa., and John P. Sutton, Redmond, Wash., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 258,192, Oct. 14, 1988, abandoned.
This application Aug. 9, 1991, Ser. No. 744,676
Int. Cl.[5] B22D *41/54*
U.S. Cl. 222—590 7 Claims



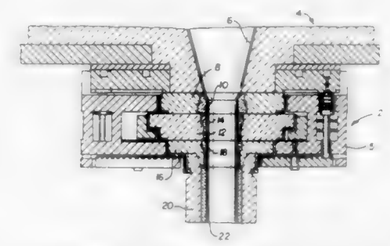
1. A vertical molten metal pressure pouring tube for vertical pressuring pouring of a mold from the bottom thereof wherein molten metal contacts said tube on the interior and exterior surfaces thereof, said tube having a substantially uniform wall thickness; said wall being formed of a carbon impregnated fired refractory composition consisting essentially of alumina and zirconia and wherein residual carbon is retained in said wall when said tube is utilized under oxidizing conditions in bottom pressure pouring of a molten metal under a temperature and pressure which would normally completely oxidize the carbon.

5,151,201

PREVENTION OF EROSION AND ALUMINA BUILD-UP IN CASTING ELEMENTS

Mark K. Fishler, DuPage County; Gilbert Rancoule, Beaver County, both of Ill.; Han K. Park, and Quentin K. Robinson, both of Allegheny County, Pa., assignors to Vesuvius Crucible Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 477,850, Feb. 12, 1990, Pat. No. 5,060,831. This application Jan. 7, 1991, Ser. No. 638,049
Claims priority, application France, Jul. 1, 1988, 8808945
Int. Cl.[5] B22D *41/08*
U.S. Cl. 222—600 7 Claims



1. In a slide gate for teeming molten metal from a ladle, tundish or like metallurgical vessel comprising at least one stationary ceramic plate with an orifice therein and at least one movable ceramic plate with an orifice therein such that when the orifices are brought into registry, the gate is open and when the orifices are offset, the gate is closed; the improvement comprising at least one of the ceramic plates comprising:

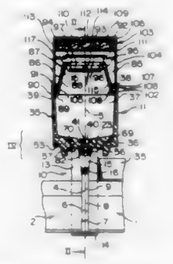
a shape having said orifice therein and adapted to resist oxide build-up during casting operations, said shape prepared from a batch consisting essentially of fused grains analyzing 20 to 50 percent by weight CaO and the remainder ZrO_2 and incidental impurities, said batch formed into said shape and sintered at elevated temperatures to form an oxide bonded structure.

5,151,202

ALUMINOTHERMIC WELDING DEVICE CRUCIBLE AND CRUCIBLE COVER FOR USE THEREWITH

Patrick Bommart, Rueil Malmaison, France, assignor to Delachaux S.A., France

Continuation of Ser. No. 538,149, Jun. 13, 1990, abandoned.
This application Sep. 30, 1991, Ser. No. 768,104
Claims priority, application France, Jun. 14, 1989, 89 07872
Int. Cl.[5] B23K *23/00*
U.S. Cl. 249—86 38 Claims



1. An aluminothermic welding device for the butt welding of two metal members such as railroad rails comprising:

a crucible defining an aluminothermic reaction chamber and adapted to be used in a predetermined crucible orientation in which the crucible has in its lower portion a discharge aperture opening upwardly into said chamber and down-

ward into a lower external face of the crucible along a predetermined vertical axis of the crucible; and

a mould adapted to be fitted locally onto the two metal members to define therearound a mould cavity in a predetermined mould orientation in which the mould has in its upper portion a pouring bush opening downwardly into said cavity and upwardly into an outer upper face of the mould along a predetermined vertical axis of the mould;

wherein said respective lower face of the crucible and upper face of the mould are formed with mutually complementary respective depressions and reliefs as to enable the crucible to be deposited on the mould to mutually interfit in an operative position in which the crucible and the mould occupy said crucible and mould orientations respectively and in which the discharge aperture and the pouring bush are coaxial.

5,151,203

COMPOSITION AND METHOD FOR CEMENTING A WELL

Wendell D. Riley, Marlow, and Jerry D. Childs, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 21, 1991, Ser. No. 718,679
Int. Cl.[5] E21B *33/138, 33/14;* C04B *7/353, 24/34*
U.S. Cl. 252—8.551 21 Claims

1. A thixotropic cementing composition consisting essentially of hydraulic cement, water, an alkali metal aluminate and an alkali metal halide:

wherein, said aluminate is present in said composition in an amount in the range of from about 0.2 to about 6.0 percent aluminate by weight of said hydraulic cement; said water is present in said composition in amount in the range of from about 35 to about 60 percent water by weight of said hydraulic cement; and said alkali metal halide is present in said composition in an amount in the range of from about a trace up to about 18 percent of said halide by weight water.

5,151,204

OLEAGINOUS COMPOSITIONS CONTAINING NOVEL ETHYLENE ALPHA-OLEFIN POLYMER VISCOSITY INDEX IMPROVER ADDITIVE

Mark J. Struglinski, Bridgewater, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 1, 1990, Ser. No. 473,590
Int. Cl.[5] C08F *210/16;* C10M *141/02*
U.S. Cl. 252—52 R 34 Claims

1. An oleaginous composition comprising oleaginous material and a viscosity modifying effective amount of ethylene alpha-olefin polymer comprising monomer units derived from ethylene and at least one alpha-olefin represented by the formula $H^2C{=}CHR^1$ wherein R^1 is an alkyl group of from 1 to 18 carbon atoms, and wherein said polymer has a number average molecular weight of from above 25,000 to about 500,000, and an average of at least about 30% of the polymer chains contain terminal ethenylidene unsaturation.

5,151,205

CHAIN AND DRIVE GEAR LUBRICANT

Douglas H. Culpon, Jr., Port Neches, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 13, 1991, Ser. No. 698,870
Int. Cl.[5] C10M *129/68*
U.S. Cl. 252—56 R 17 Claims

1. A lubricating oil composition comprising:

a major portion of a synthetic base lubricating oil,

a solubilizer comprising a trimethylol propane ester of C_6 to C_{12} carboxylic acids; and

2 to 4 wt % of a tackifier comprising a polybutene polymer of molecular weight 100,000 to 1,000,000.

5,151,206

ACICULAR IRON CARBIDE PARTICULATE MATERIAL AND PROCESS FOR PRODUCING SAME

Kazuo Okamura, Itami; Ikuo Kitamura, Kyoto; Hideki Aomi; Satoshi Koyama, both of Osaka; Katsushi Tokunaga, Habikino; Yoshiyuki Shibuya, and Shiego Daimon, both of Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 918,783, Oct. 14, 1986, Pat. No. 4,842,759, which is a continuation-in-part of Ser. No. 790,238, Oct. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 790,237, Oct. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 909,008, Sep. 16, 1986, abandoned, which is a continuation of Ser. No. 603,080, Apr. 23, 1984, abandoned. This application Mar. 22, 1989, Ser. No. 327,461
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[5] C01B *31/30*
U.S. Cl. 252—62.51 4 Claims

1. A process for producing acicular primary particles having an average axial ratio of 3 to 20 and an average particle size of 0.1 to 2 μm, said particles containing iron carbide, comprising Fe_5C_2 as its main component, as a main component, said process comprising:

mixing acicular particles of τ-Fe_2O_3 having said average axial ratio and said average particle size with an aqueous solution of an alkaline compound having a pH of at least 8;

filtering and drying said mixture to obtain an alkali treated τ-Fe_2O_3; and

contacting said alkali treated τ-Fe_2O_3 with a gas containing a component selected from the group consisting of CO and a mixture of CO and H_2 at a contact temperature of about 250° to about 400° C. at a gas flow rate of CO or a mixture thereof with H_2 of about 1 to 1000 ml(STP)/min per gram of said acicular Fe_2O_3.

2. Acicular, ferromagnetic particles, comprising at least 50 weight percent iron carbide, wherein a majority of the iron carbide is Fe_5C_2, the acicular particles being discrete, acicular particles at a magnification of 3000 to 6000, and having a size of about 0.1 to 2.0 μm, and average axial ratio of about 3 to 20, and a coercivity of at least 850 Oe.

5,151,207

DROP-IN SUBSTITUTE FOR DICHLORODIFLUOROMETHANE REFRIGERANT

George H. Goble, 286 W. Navajo, West Lafayette, Ind. 47906

Filed Jan. 7, 1991, Ser. No. 638,350
Int. Cl.[5] C09K *5/04*
U.S. Cl. 252—67 6 Claims

1. A ternary mixture of refrigerants that is a drop-in substitute for dichlorodifluoromethane refrigerant in dichlorodifluoromethane refrigeration systems, comprising about 2 to 20 weight percent isobutane, about 21 to 51 weight percent 1-chloro-1, 1-difluoroethane, and about 41 to 71 weight percent chlorofluoromethane, with the weight percentages of said components being weight percentages of the overall mixture.

5,151,208

DETERGENT POWDERS AND PROCESS FOR THEIR PREPARATION

Gregorius J. Huijben, Vlaardingen; Cornelis G. van Kralingen, Nieuwerkerk a/d/ IJssel; Seeng D Liem, Rhoon, and Michele E. Paoli, Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 399,387, Aug. 25, 1989, abandoned, which is a continuation of Ser. No. 180,660, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 36,610, Apr. 10, 1987, abandoned. This application Mar. 26, 1991, Ser. No. 679,166
Claims priority, application United Kingdom, Apr. 14, 1986, [redacted]
Int. Cl.[5] C11D *3/10*
U.S. Cl. 252—174.14 18 Claims

1. A process for the production of a granular solid suitable for use as a detergent powder or a component thereof, comprising the steps of:

(i) preparing an aqueous slurry comprising:

(a) from 8 to 80% by weight of sodium carbonate,

(b) not more than 2% sodium alkaline silicate,

(c) the weight ratio of any sodium bicarbonate to the sodium carbonate not exceeding 1:3;

(ii) adding to the slurry, simultaneously with or later than the addition of the sodium carbonate to sodium sesquicarbonate, the acid being added in an amount of from 0.05 top 0.8 equivalents per mole of sodium carbonate, the resulting slurry having a moisture content of at least 40% by weight;

(iii) drying the resulting slurry to form a powder containing sodium sesquicarbonate in the form of needle-like crystals;

the slurry and the dried powder having a temperature which throughout the process does not exceed 90° C., all percentages being based on the dried slurry.

5,151,209

SHAMPOO COMPOSITIONS

Patrick C. McCall, and Philip E. Cothran, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 316,714, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 122,986, Nov. 19, 1987, abandoned. This application Feb. 8, 1991, Ser. No. 654,114
Int. Cl.[5] A61K *35/555, 33/04, 31/615, 31/61*
U.S. Cl. 252—174.15 12 Claims

1. A lotion shampoo composition comprising:

(a) from about 10% to about 30% of a synthetic surfactant;

(b) from about 0.1% to about 5.0% of selenium sulfide having an average particle size of less than about 25 μm;

(c) from about 0.001% to about 0.1% of a nonionic polymer to aid in keeping said selenium sulfide particles dispersed in the composition selected from the group consisting of hydroxypropyl methyl cellulose, carboxymethyl cellulose, sodium carboxymethyl cellulose, hydroxyethyl cellulose, and mixtures thereof; and

(d) the remainder water.

5,151,210

SHAMPOO COMPOSITIONS

Christian Steuri, and Theresa B. Williams, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 412,578, Sep. 25, 1989, abandoned, which is a continuation of Ser. No. 266,302, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 173,020, Mar. 22, 1988, abandoned, which is a continuation of Ser. No. 887,317, Jul. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 856,326, Apr. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,612, Jul. 25, 1985, abandoned. This application Jan. 31, 1992, Ser. No. 830,777
Int. Cl.[5] C11D *3/22*
U.S. Cl. 252—174.017 15 Claims

1. A shampoo composition comprising:

(a) from about 15% to about 25% of a synthetic anionic surfactant;

(b) from about 0.1% to about 10% of a dispersed, insoluble, non-volatile silicone or mixtures thereof;

(c) a suspending agent consisting of mixtures of xanthan gum together with long chain acyl derivatives or long chain amine oxides selected from the group consisting of ethylene glycol esters of C_{16}–C_{22} fatty acids, alkanol amides of C_{16}–C_{22} fatty acids, C_{16}–C_{22} alkyl dimethyl amine oxides, and mixtures thereof, the level of xanthan gum being from about 0.25% to about 0.50% of the composition and the level of long chain derivative or long chain amine oxide being from about 1.0% to about 2.0% of the composition; and

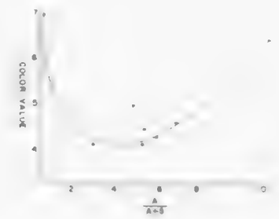
(d) the remainder water.

5,151,211

OIL BLEACHING METHOD AND COMPOSITION FOR SAME

David D. Brooks, Crystal Lake; Shirley A. Brophy, Ingleside, and George R. Goss, Quincy, all of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Division of Ser. No. 280,127, Dec. 5, 1988, Pat. No. 5,004,570.
This application Apr. 2, 1991, Ser. No. 679,265
Int. Cl.[5] C11B *3/00*
U.S. Cl. 252—186.1 6 Claims



1. A triglyceride oil bleaching composition suitable for removing color impurities from a triglyceride oil, the composition consisting essentially of an admixture of:

a neutral bleaching clay comprising an attapulgite-smectite clay composition in which the attapulgite-to-smectite weight ratio is in the range of about 0.3:1 to about 1.5:1, and the total weight of attapulgite and smectite is at least 65 weight percent of the clay composition; and

a chelating polycarboxylic acid having an even number of carboxyl groups, said carboxyl groups being paired, and the carboxyl groups in each pair being available to form an eclipsed configuration.

5,151,212

PEROXYGEN COMPOUND ACTIVATION

Jack H. Bell, West Paterson; Henry C. Zak, Great Notch, and Dominick A. De Santis, Somerville, all of N.J., assignors to The Belzak Corporation, Clifton, N.J.

Filed Mar. 21, 1990, Ser. No. 496,608
Int. Cl.[5] C09K 3/00
U.S. Cl. 252—186.38 110 Claims

1. A peroxygen composition comprising:

(a) at least one peroxygen bleaching compound selected from the group consisting of peroxyacids and alkali metal peroxygen bleaching compounds; and

(b) at least one polyhydric activator compound, substantially free of ester or ether hydroxyl group derivatives, said polyhydric activator compound having at least four carbon atoms, each of said carbon atoms having at least one hydroxyl group bonded thereto,

wherein said polyhydric activator compound is uncomplexed or in the form of a metal complex, said metal being selected from the group consisting of boron and aluminum.

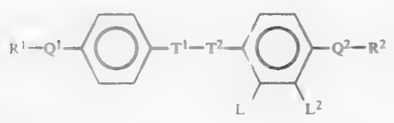
5,151,213

FLUORINE-CONTAINING AROMATIC COMPOUNDS

Volker Reiffenrath, Rossdorf, and Ulrich Finkenzeller, Plankstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 18, 1990, Ser. No. 553,808
Int. Cl.[5] C09K 19/06, 19/30, 19/52
U.S. Cl. 252—299.6 6 Claims

1. A fluorine-containing aromatic compound of formula I



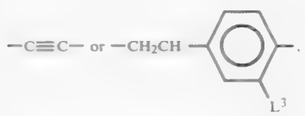
(I)

wherein

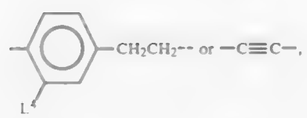
R^1 is C_{1-12}-alkyl or C_{1-12}-alkeny

Q^1 and Q^2 are each independently —O— or a single bond, or one of Q^1 and Q^2 is trans-1,4-cyclohexylene,

T^1 is



T^2 is



R^2 is F, Cl, —CF_3, —OCF_3, —$OCHF_2$ or one of the meanings of R^1, and

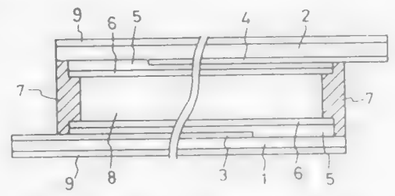
L^1, L^2, L^3 and L^4 are each independently H or F, with the proviso that one and only one of T^1 and T^2 is —C≡C—.

5,151,214

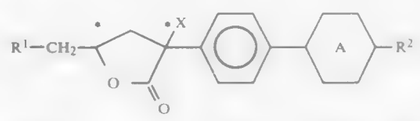
FERROELECTRIC LIQUID CRYSTAL DEVICE

Mitsuhiro Koden; Tomoaki Kurstate, both of Nara; Fumiaki Funada, Yamatokoriyama; Kazuhiko Sakaguchi, Toyonaka, and Tohru Kitamura, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1990, Ser. No. 592,909
Claims priority, application Japan, Oct. 6, 1989, 1-262789
Int. Cl.[5] C09K 19/34, 19/12; G02F 1/13
U.S. Cl. 252—299.61 7 Claims



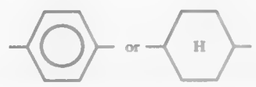
1. A ferroelectric liquid crystal device comprising a pair of substrates each provided with voltage applying means, at least one of the substrates having an orientation control layer, and a ferroelectric liquid crystal layer disposed between the pair of substrates, the ferroelectric liquid crystal layer comprising at least one compound represented by the following general formula (I):



(I)

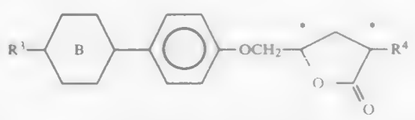
wherein R^1 and R^2 may be identical or different from each other and independently represent an alkyl group or an alkyloxy group, having 1 to 15 carbon atoms with straight or branched chains;

represents



X represents a hydrogen atom or a methyl group, and * represents that the carbon atom is asymmetric,

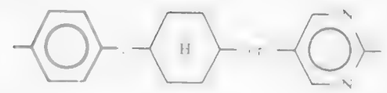
and at least one compound represented by the following general formula (II):



(II)

wherein R^3 and R^4 may be identical or different from each other and independently represent an alkyl group, having 1 to 15 carbon atoms with straight or branched chains;

represents



and * represents that the carbon atom is asymmetric.

5,151,215

PRE-WATER-BASED SUSPENSION ALUMINA COATED PHOSPHOR TREATMENT PROCESS

A. Gary Sigai, Lexington, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 746,162, Aug. 14, 1991, abandoned, which is a continuation of Ser. No. 306,129, Feb. 6, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 805,271
Int. Cl.[5] C09K 11/59
U.S. Cl. 252—301.6 F 3 Claims

1. An alumina coated phosphor treatment process comprising the following steps:

step 1—fluidizing a manganese activated zinc silicate phosphor having an alumina protective coating and having a particle size of about 10–12 microns in an isothermal fluidized bed to form a fluidized phosphor powder, the alumina coating having been applied through chemical vapor deposition;

step 2—heating said fluidized phosphor powder to form an annealed phosphor powder, wherein said heating is carried out at a temperature from about 200° C. to about 850° C. and for a period of time sufficient to preclude adversely affecting said alumina protective coating of said phosphor during subsequent water-based suspension processing and to preclude detrimentally altering said phosphor;

step 3—cooling said annealed phosphor powder from step 2 to form a cooled annealed phosphor powder; and

step 4—adding said cooled annealed phosphor powder from step 3 to a water-base suspension.

5,151,216

HIGH TEMPERATURE ABLATIVE FOAM

Matthew T. Liu, Slidell, La., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 12, 1991, Ser. No. 790,763
Int. Cl.[5] B01J 13/00; C08G 18/20, 18/24
U.S. Cl. 252—307 18 Claims

1. An ablative foam composition, comprising:

approximately 150 to 250 parts by weight polymeric isocyanate having an isocyanate functionality of 2.6 to 3.2;

approximately 15 to 30 parts by weight reactive flame retardant having a hydroxyl number range from 200–260;

approximately 10 to 40 parts by weight non-reactive flame retardant;

approximately 10 to 40 parts by weight non-hydrolyzable silicone copolymer having a hydroxyl number range from 75–205;

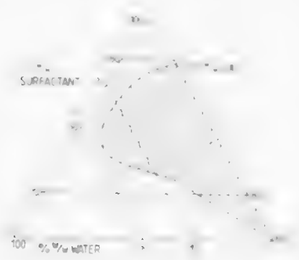
approximately 3 to 16 parts by weight amine initiated polyether resin having an isocyanate functionality greater than or equal to 3.0 and a hydroxyl number range from 400–800.

5,151,217

MICRO-EMULSIONS

Anthony Price, Runcorn, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 22, 1991, Ser. No. 673,310
Claims priority, application United Kingdom, Mar. 26, 1990, 9006726
Int. Cl.[5] B01J 13/00
U.S. Cl. 252—312 11 Claims



1. A bicontinuous microemulsion which comprises an aqueous phase, one or more addition-polymerisable water-immiscible organic materials and one or more addition-polymerisable surfactants.

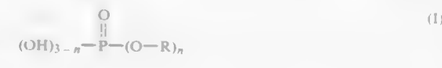
5,151,218

PHOSPHORIC ACID ESTERS, METHOD OF PRODUCING THEM, AND USE THEREOF AS DISPERSANTS

Karl-Heinz Haubennestel, and Wolfgang Pritschins, both of Wesel, Fed. Rep. of Germany, assignors to BYK-Chemie GmbH, Wesel, Fed. Rep. of Germany

Division of Ser. No. 562,847, Aug. 6, 1990. This application Jan. 3, 1992, Ser. No. 816,717
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930687
Int. Cl.[5] B01F 17/00; C08K 5/00
U.S. Cl. 252—351 26 Claims

1. A method of dispensing a powdered or fibrous solid in a liquid vehicle comprising incorporating said solid and a dispersion enhancing amount of a phosphoric acid ester corresponding to the formula (I)



(I)

wherein

R represents an aliphatic, cycloaliphatic and/or; aromatic moiety free of any Zerewitinoff hydrogen, containing at least one ether oxygen atom (—O—) and at least one carboxylic acid ester group (—COO—) or urethane group (—NHCOO—), and having an average molecular weight M_n of 200 to 10,000, wherein aliphatic hydrogen atoms may be partially replaced by halogen atoms, and wherein the ratio of the number of ether oxygen atoms to the number of carboxylic acid ester groups or urethane groups in each group R is in the range from 1:20,to 20:1, and

N represents 1 or 2, or a salt thereof in said liquid vehicle.

5,151,219

USE OF PARTICULAR MIXTURES OF ETHYL LACTATE AND METHYL ETHYL KETONE TO REMOVE UNDESIRABLE PERIPHERAL MATERIAL (E.G. EDGE BEADS) FROM PHOTORESIST-COATED SUBSTRATES

Thomas E. Salamy, North Kingstown, R.I.; Marvin L. Love, Jr., Mesa, and Mark E. Towner, Gilbert, both of Ariz., assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Division of Ser. No. 141,128, Jan. 6, 1988, Pat. No. 4,886,728. This application Jul. 31, 1989, Ser. No. 386,659

Int. Cl.[5] B01F *1/00*

U.S. Cl. 252—364 3 Claims

1. A solvent mixture consisting essentially of a mixture of ethyl lactate and methyl ethyl ketone present in a volume ratio of about 65:35 to about 25:75, respectively.

5,151,220

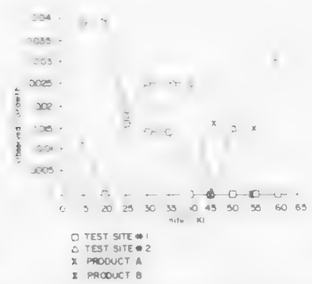
CHEMICAL ABATEMENT OF CARBONATE CRACKING

Veronica K. Majestic, Stafford, and Russell C. Strong, Richmond, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

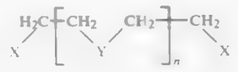
Filed Aug. 7, 1990, Ser. No. 563,452

Int. Cl.[5] C23F *11/12, 11/14*

U.S. Cl. 252—392 11 Claims



1. A method of inhibiting carbonate stress corrosion cracking of carbon steels exposed to refinery gaseous and/or liquid streams in a fluid catalytic cracking unit, which method comprises treating said fluid catalytic cracking unit refinery stream with an effective carbonate stress cracking inhibitory amount of the reaction product of a hydrocarbonaceous carboxylic acid having from about 8 to about 30 carbon atoms with a heterochemical having the structure:



wherein:

X is chosen from the group consisting of —NRH, —OH, and mixtures thereof;

Y is chosen from the group consisting of —NR—, —O—, and mixtures thereof;

R is chosen from the group consisting of H, CH_3, C_2H_5, C_3H_7, and mixtures thereof, and

n ranges from about 0 to about 6;

and further wherein the hydrocarbonaceous carboxylic acid is reacted with the heterochemical at a temperature ranging from 70° to 210° C. for at least one hour and in a mole ratio ranging from about 0.25:1.0 to about 7.5:1.0.

5,151,221

CONDUCTIVE PLASTIC COMPOSITES

Jan-Erik Österholm, Porvoo; Jukka Laakso, Helsinki; Sari Karjalainen, and Pirjo Mononen, both of Porvoo, all of Finland, assignors to Berggren Oy Ab, Helinski, Finland

Filed Feb. 28, 1989, Ser. No. 316,774

Claims priority, application Finland, Jul. 29, 1988, 873308

Int. Cl.[5] H01B *1/00;* C04B *35/00, 35/60*

U.S. Cl. 252—500 7 Claims

1. A process for the preparation of a conductive polymer composite wherein a matrix polymer is mixed with a poly (3-substituted thiophene) in the molten state to make a homogeneous composite, the poly (3-substituted thiophene) is doped with an electron acceptor, and thereafter a finished composite is formed.

5,151,222

FOAM ABSORBER

John M. Ruffoni, San Diego, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 26, 1991, Ser. No. 749,993

Int. Cl.[5] C08J *9/38, 9/40, 9/42*

U.S. Cl. 252—511 6 Claims

1. A process for producing a foam material having electromagnetic energy attenuation characteristics which comprises

providing a solution of a curable epoxy resin composition in a solvent,

adding carbon and a metal selected from the group consisting of silver, copper and nickel to said resin composition,

spraying the resulting mixture onto a surface of an open cell reticulated polyurethane foam substrate, causing said mixture to coat said surface of the foam substrate and to penetrate and filter through said foam substrate in gradually decreasing amount from said coated surface to a final depth in said foam to provide a dielectric gradient layer, and

curing said epoxy resin to form a carrier for said carbon and metal of said dielectric gradient, said cured epoxy carrier having substantially the same flexibility characteristics as said polyurethane foam.

5,151,223

LIQUID SOFTERGENT FORMULATIONS HAVING IMPROVED STABILITY AND SOFTENING PROPERTIES

Heidrun E. Maaser, Monmouth Junction, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 117,274, Nov. 5, 1987, abandoned. This application Mar. 7, 1990, Ser. No. 517,469

Int. Cl.[5] C11D *1/62;* D06M *13/46*

U.S. Cl. 252—547 13 Claims

1. A stable, liquid, softergent composition which simultaneously cleans, softens and controls the static of fabrics washed therewith in the wash cycle of the laundering process without reducing brightener and detergency performance comprising, by weight, about 10% to 30% of a nonionic surfactant; about 6% to 9% of a C6–C18 alkyl 2-ethyl hexyl dimethyl quaternary ammonium softening agent; 3.8% to 7% of a sulfated or sulfonated anionic surfactant, the molar ratio of said anionic surfactant to said cationic softener being about 1:1; and about 0.1% to 1% of an anionic optical brightener having a sulfonate moiety in its structure solubilized in an aqueous vehicle, said composition being stable and clear upon aging at 21° C. and 5° C.

5,151,224

TETRASULFONATED METAL PHTHALOCYANINE DOPED ELECTRICALLY CONDUCTING ELECTROCHROMIC POLY(DITHIOPHENE) POLYMERS

Marc J. Madou, Palo Alto; Subhash C. Narang, Redwood City; Takaaki Otagawa, Fremont, and Sharon Wing, Cupertino, all of Calif., assignors to Osaka Gas Company, Ltd., Osaka, Japan

Filed May 5, 1988, Ser. No. 190,540

Int. Cl.[5] G02B *5/23;* C08K *5/09;* C08G *75/00*

U.S. Cl. 252—586 6 Claims

1. A smooth electrically conductive electrochromic polymer consisting essentially of poly(dithiophene), which polymer is doped with an electrically conductive electrochromic tetrasulfonated metal phthalocyanine, wherein the polymer-dopant combination is produced by a process which comprises:

A. contacting a solution, itself comprising:

(a) dithiophene monomer present in between about 0.1 and 0.001M concentration;

(b) a water-soluble salt of a tetrasulfonated metal phthalocyanine wherein the metal is selected from the group consisting of iron, copper, cobalt and nickel, and the tetrasulfonated metal phthalocyanine is present at a concentration of between about 0.01 and 10 mM; and

(c) an electrolyte solution of acetonitrile and water in a ratio of between about 30:70 to 10:90 percent of acetonitrile to water by volume, with a cycling electrical potential of between about 0.01 volts and 10 volts and a variable current of between about 0.1 and 2 amperes,

at a temperature of between about 0° and 95° C. for between about 0.01 and 60 minutes, with a metal electrode wherein the metal electrode is selected from the group consisting of platinum, palladium, indium, gold, mixtures of these metals and indium-tin oxide (ITO) covered glass; and

B. recovering the smooth electrically conductive electrochromic polymer formed thereby, wherein the electrically conductive dopant is present in between about 0.01 and 5 percent by weight.

5,151,225

FLAME RETARDANT COMPOSITION AND METHOD FOR TREATING WOOD

James F. Herndon, Thomson, Ga., and Dennis J. Morgan, Springfield, Oreg., assignors to Hoover Treated Wood Products, Inc., Thomson, Ga.

Continuation-in-part of Ser. No. 345,969, May 1, 1989, abandoned. This application Sep. 26, 1990, Ser. No. 588,278

Int. Cl.[5] C09K *21/00*

U.S. Cl. 252—607 27 Claims

1. A substantially formaldehyde-free flame retardant composition for wood having reduced corrosive properties and having a pH of between 4.75 and 5.25 consisting essentially of from about 28% to about 38% by weight of an amide selected from the group consisting of urea, dicyanidiamide and combinations thereof; from about 22% to about 32% by weight of an oxy-acid of phosphorus; from about 10.5% to about 20.5% by weight of a metal salt of boron; from about 10.5% to about 20.5% by weight of an oxy-acid of boron; and sodium hydroxide.

5,151,226

PROCESS OF MAKING CONTOURED VEHICLE INTERNAL PANELLING SUPPORTS

Rainer Anton, Bardowick, and Dieter Harneit, Neetze, both of Fed. Rep. of Germany, assignors to Deutsche Fibrit Gesellschaft Abers & Dr Muller GmbH, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 515,547, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 393,638, Aug. 14, 1989, abandoned. This application Dec. 11, 1990, Ser. No. 626,601

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 3828655

Int. Cl.[5] B29C *35/12*

U.S. Cl. 264—25 3 Claims

1. A process for the production of a wood fiber-based contoured vehicle internal panelling support having surfaces smooth on both sides, consisting essentially of depositing onto a contoured preforming screen an aqueous suspension of wood fiber containing at least one bonding agent, dewatering the resulting preform to a residual water content of 20 to 50%, drying the preform in an electric alternating field at a temperature below the starting reaction temperature of the bonding agent to a residual moisture content in the range of 10 to 30% by weight of the wood fibers, then compression molding in a screenless tool, and hardening.

5,151,227

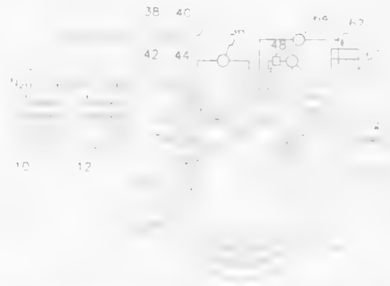
PROCESS FOR CONTINUOUS SPINNING OF HOLLOW-FIBER MEMBRANES USING A SOLVENT MIXTURE AS A PRECIPITATION MEDIUM

Thanh D. Nguyen, Billerica, and Christopher M. Hubby, Newton, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 18, 1991, Ser. No. 671,066

Int. Cl.[5] B29C *67/20*

U.S. Cl. 264—41 25 Claims



14. A process for forming a microporous polysulfone hollow fiber membrane, comprising:

(a) preparing, in a solvent for polysulfone, a casting solution comprising about 8.0 to about 35.0 wt.% of a polysulfone polymer, up to about 20.0 wt.% of a second polymeric component, and a pore-forming component,

(b) preparing an outer precipitation solution comprising a solvent for polysulfone, a non-solvent for polysulfone and a swelling agent,

(c) preparing a center precipitation solution comprising a solvent for polysulfone, a non-solvent for polysulfone and a swelling agent,

(d) providing a precipitation bath containing said outer precipitation solution and having a hollow fiber-forming spinnerette partially immersed therein,

(e) extruding said casting solution and said center precipitation solution through said spinnerette directly into said precipitation bath to form an extruded hollow fiber membrane,

(f) maintaining substantially constant concentrations of said

outer precipitation solution components by addition of non-solvent at a rate determined by the formula:

$$r_{X+\Delta t} = (r_{SL} \cdot C_{S\ in\ PPT}) - r_{SL}$$

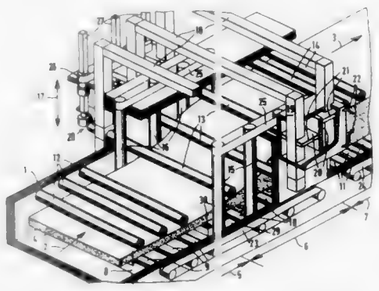
(g) drawing said extruded hollow fiber membrane through said precipitation bath, and
(h) drying said extruded hollow fiber membrane.

5,151,228

PROCESS FOR MANUFACTURING LARGE-SIZE POROUS SHAPED BODIES OF LOW DENSITY BY SWELLING

Wolfgang Vahlbrauk, Bad Gandersheim, Fed. Rep. of Germany, assignor to Loro-Holding K.H. Vahlbrauk KG, Bad Gandersheim, Fed. Rep. of Germany

Filed May 25, 1990, Ser. No. 529,234
Claims priority, application Fed. Rep. of Germany, May 27, 1989, 3917282
Int. Cl.[5] B29C *65/00*, C04B *40/00*
U.S. Cl. 264—42 **5 Claims**



1. A process of manufacturing large-size porous shaped bodies of low density by swelling clay masses by supplying heat thereto, comprising the steps of

introducing an unswollen plate-like, self-supporting clay mass in the form of a thin, compact clay slab

into a furnace and suddenly continuously rapidly swelling the slab by heat supplied exclusively from above and below at a maximum furnace temperature which remains constant from the beginning to the end of the swelling;

subjecting the surface of the swelling clay mass to constant oxidation by supply of oxidizing hot gases to the surface of the clay slab;

giving the swelling clay slab a support by direct-acting, multiple linear solid body contact, while maintaining the swelling clay slab in constant motion relative to the support, said support being effected by rollers being rotatably arranged below, above and on both sides of the swelling clay slab;

said introducing of said clay slab into said furnace being effected by driving said rollers;

guiding the clay slab during its movement through said furnace by said rollers in the downward and lateral directions in an unyieldable manner, while yieldably guiding the clay slab in the upward direction;

counting the yielding of the swelling clay slab upwards during increasing of its height by an adjustable structure-stabilizing counter-force against a swelling-force;

using said adjustable counter-force for variable geometrical expansion of the swelling mass for controlling the swelling process,

said controlling of the swelling process including creating an isostatic pressure controlled so that shaping occurs during the swelling by top rollers above the swelling clay mass to provide a fine distribution of pores,

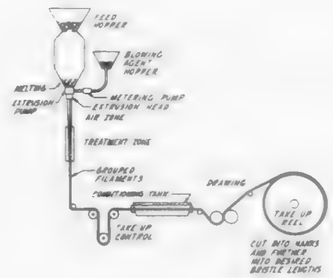
said guiding of the clay slab including supporting the swelling mass on all other sides so that at a rear it is supported by an unswollen clay mass, which is held by means of frictional resistance by rollers and at the front it is supported by an already swollen clay mass which is held by means of frictional resistance by rollers.

5,151,229

METHOD FOR PRODUCING PAINT BRUSH BRISTLES

Fredrick B. Burns, Milwaukee, Wis., assignor to EZ Paintr Corporation, Milwaukee, Wis.

Continuation of Ser. No. 199,095, May 26, 1988, abandoned, which is a division of Ser. No. 80,948, Aug. 3, 1987, Pat. No. 4,937,141, which is a division of Ser. No. 177,610, Apr. 5, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 597,284
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—51 **8 Claims**



1. A method of producing a cellular paint brush bristle containing axially elongated cells and composed of synthetic thermoplastic material selected from the group consisting of nylon, polyester, polyolefin and mixtures thereof, said bristle having a rough and irregular surface and being in the form of a filament, said cells being predominantly closed in the interior of the bristle and being open along a wall or outer surface of said bristle to form said rough and irregular surface, the method comprising the steps of:

melting synthetic material selected from the group consisting of polyester, nylon, polyolefin and mixtures thereof, which are extruded into a bristle;

incorporating a blowing agent which is compatible with said synthetic material into said synthetic material in an amount sufficient to generate a multiplicity of cells within the synthetic material in a randomly dispersed manner, in which at least some of said cells extend through the outer surface of said filament and create randomly disposed and variously sized crater-like interruptions in said outer surface; and

drawing the synthetic material to a degree sufficient to form a drawn, extruded filament, and to cause the randomly disbursed cells to be elongated in the direction of the axis of the filament.

5,151,230

PROCESS FOR PRODUCTION OF PRODUCTS FORMED OF POLYMER BONDED AND GRANULATED PARTICLES

Dirk H. Damberg, Tappen, Canada, assignor to Dinoflex Manufacturing Ltd., Salmon Arm, Canada

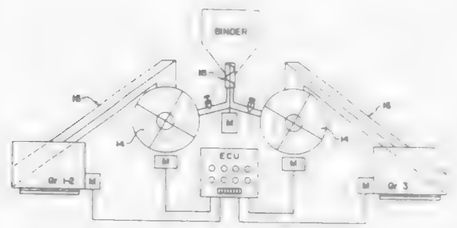
Filed Oct. 1, 1990, Ser. No. 591,476
Int. Cl.[5] B27N *3/00*; C08J *5/00*; D21B *1/04*
U.S. Cl. 264—83 **10 Claims**

1. A process of forming a compressed cured material from a mixture comprising:

(a) about 75 to 95.5 weight % of elastic or inelastic particles of a substance selected from the group consisting of granulated rubber, polymerized ethylenepropylenediene, neoprene, granulated cork, granulated polyvinylchloride and granulated sawdust, wherein the particles are of a size range of about 0.1 to 8.0 mm;

(b) about 2.5 to 25.0 weight % of a polymer binder selected from the group consisting of a one or two component polyurethane system and a one or two component polyacrylate resin system;

(c) about 0 to 20.0 weight % of a colouring pigment selected from the group consisting of iron oxide and chrome oxide; and



(d) about 0.1 to 0.5 weight % of water as a catalyst, the proportions of (a), (b), (c) and (d) adding up to 100% weight, which process comprises placing the mixture in a mold and applying heat in a form of steam at a temperature between 110° C. and 140° C. and at a pressure between about 3 to 8 bars and at a rate between 40 to 90 kg per hour to the mixture, and applying pressure of between about 25 to 160 bars to the mixture to compress the mixture and effect a cure of the mixture and thus form the compressed cured material.

5,151,231

METHOD FOR MAKING LIQUID CRYSTALLINE TUBE HAVING A POINT

James M. Lambert, Centerville, and Donald D. Solomon, Spring Valley, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 495,072, Mar. 19, 1990, Pat. No. 5,078,700. This application Sep. 26, 1991, Ser. No. 765,782
Int. Cl.[5] B29C *47/20*
U.S. Cl. 264—108 **6 Claims**

1. A method for preparing a liquid crystalline polymeric tubing having a point comprising:

a) heating a thermotropic liquid crystalline polymer to give a melt having a viscosity of 500 poise or less;

b) directing said melt into a tubing mold which includes a point whereby said melt completely fills said mold;

c) cooling said melt in said mold whereby said melt solidifies to a tubing having the shape of said mold; and

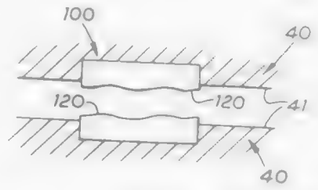
d) removing said tubing from said mold.

5,151,232

INJECTION MOULDING PROCESS

John B. Thornthwaite, and Robert Naismith, both of Nottingham, England, assignors to Games Workshop Limited, Nottinghamshire, England

Division of Ser. No. 551,647, Jul. 12, 1990, Pat. No. 5,013,228, which is a continuation of Ser. No. 248,068, Sep. 23, 1988, abandoned. This application Feb. 8, 1991, Ser. No. 652,674
Claims priority, application United Kingdom, Sep. 26, 1987, 8722668
Int. Cl.[5] B28B *7/20*; B29C *33/40, 43/00, 67/00*
U.S. Cl. 264—130 **5 Claims**



1. A process for producing injection moulded plastic mouldings, the process including the steps of:

a) producing separable mating resilient mould inserts which abut along opposed abutment faces to define therebetween a mould cavity;

b) inserting said resilient mould inserts into opposed movable mould parts of a plastic injection moulding apparatus such that upon movement of said movable mould parts, said resilient mould inserts abut to form said mould cavity prior to said movable mould parts abutting one another;

c) moving said movable mould parts into abutment such that said mould inserts abut each other to define said mould cavity and then said movable mould parts abut one another;

d) injecting molten plastic into said cavity to create a plastic moulding; and

e) moving said mould parts apart to separate said mould inserts to permit removal of said plastic moulding,

f) said separable mating mould inserts being produced by:

i) placing an article of which subsequent plastic mouldings are to be produced between opposed bodies of a mouldable material which is curable to form a resilient material;

ii) pressing said opposed bodies of mouldable material together so as to press said article into both bodies of mouldable material so as to create an impression of said article in said mouldable material;

iii) curing said mouldable material so as to retain said impression and form separable bodies of resilient material;

iv) separating said bodies of resilient material and removing said article to thereby create said mould cavity between said formed separable bodies of resilient material when said separable bodies are mated as said mould inserts.

5,151,233

APPARATUS AND METHOD FOR FORMING A PARTIBLE PORT IN A PRODUCTION PIECE

Michael L. Wendt, 1382 E. Hull Rd., Hope, Mich. 48628

Filed Nov. 30, 1990, Ser. No. 621,226
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—153 **38 Claims**

1. A method of thermoforming a sheet of material having a first thickness into a production piece having a breakaway port section

including the steps of:

heating said material into a plastic state;

positioning said material between a punch element on one

side thereof and a strike surface on another side thereof wherein said punch element has male features configured in the shape of the breakaway port section;

squeezing a portion of said material between a punch element and a strike surface whereby said material is forged around the male features thereby to form lines of reduced thickness partible by mechanical force exerted thereon; and

allowing said material to cool.

5,151,234

METHOD FOR THE MANUFACTURE OF THERMOPLASTIC RESIN SHEETS

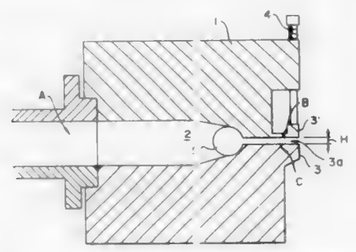
Makoto Ishihara, Ohtsu; Kazuhiro Kiminami, Kusatsu; Masakazu Wakabayashi; Hirokazu Hori, both of Shiga; Sancharu Tatsu, and Sachio Takeshita, both of Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 500,988

Claims priority, application Japan, Mar. 31, 1989, 1-83315; Mar. 31, 1989, 1-83316

Int. Cl.[5] B29C 47/92

U.S. Cl. 264—176.1 4 Claims



1. A method for the manufacture of polyvinyl butyral sheets comprising extruding molten polyvinyl butyral at an extrusion velocity V through a slot provided in an extrusion mold so as to form polyvinyl butyral sheets with embossed surfaces,

wherein said polyvinyl butyral is extruded from said slit in said extrusion mold under conditions such that the ratio V/H of said extrusion velocity V to the width H of said slit exceeds a critical value (V/H)c, said critical value (V/H)c being the ratio of the extrusion velocity to the width of the mold slit at which the roughness of said embossment begins to increase after initially decreasing when said polyvinyl butyral sheet is fabricated under conditions where said ratio V/H is progressively increased.

5,151,235

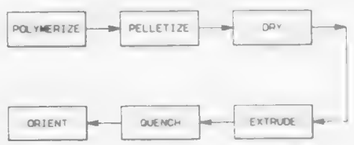
PROCESS OF MAKING PHENYLENE SULFIDE/BIPHENYLENE SULFIDE COPOLYMER PIPE

Jerry O. Reed, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1990, Ser. No. 556,685

Int. Cl.[5] B29C 55/22, 55/26

U.S. Cl. 264—209.5 19 Claims



11. A method of producing pipe which comprises:

a) pelletizing a phenylene sulfide/biphenylene sulfide copolymer by first extrusion means operated at temperatures in the range of from about 300° C. to about 320° C.;

b) drying the thus pelletized copolymer;

c) forming the thus dried, pelletized copolymer into essentially amorphous pipe by second extrusion means operated at temperatures in the range of from about 300° C. to about 310° C. followed by rapid and uniform quench to avoid pipe crystallization; and

d) orienting the thus formed essentially amorphous pipe by subsequent die extrusion by third extrusion means operated at temperatures in the range of from about 85° C. to about 110° C., wherein the subsequent extrusion is performed with a pipe pulloff rate in the range of from about 0.5 cm/minute to about 50 cm/minute with a longitudinal draw ratio in the range of about 2× to about 7× and a transverse draw ratio in the range of about 2× to about 3×.

5,151,236

METHOD FOR FORMING CONVEX NON-EXTRACTABLE FORMED PIECES MADE OF A COMPOSITE MATERIAL

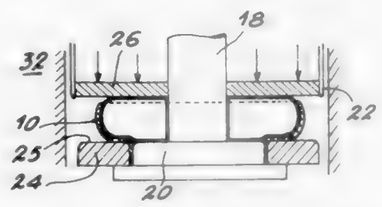
Sauveur A. Azzara, Sartrouville, and Hervé G. F. Coutant, Le Chesnay, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Nov. 30, 1990, Ser. No. 621,241

Claims priority, application France, Dec. 5, 1989, 89 16058

Int. Cl.[5] B29C 43/18

U.S. Cl. 264—257 9 Claims



1. A method for forming a non-extractable formed piece made of composite material from a flat preform strip including fibers preimpregnated with resin and orientated along at least two different non-longitudinal directions, the method comprising the steps of:

placing the preform strip in a forming tool along a cylindrical surface having one rectilinear generator and one convex directrix curve which has the shape of the piece to be formed, said tool including a forming die having a formed surface which has a section complementary to the piece to be formed;

applying a central portion of the preform strip against the formed surface of the forming die, by means of an inflatable bladder placed on the side of the preform strip with respect to the formed surface opposite said central portion;

forming an outer portion of the piece by moving a mobile hoop of the forming tool substantially parallel to said rectilinear generator, whereby said outer portion slides along said mobile hoop and is returned against the formed surface; and

solidifying the resin.

5,151,237

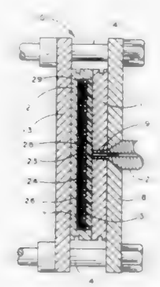
METHOD OF INJECTION MOLDING A FLAT DEFORMABLE LAMINATE

Siebolt Hettinga, 2123 NW. 111th St., Des Moines, Iowa 50322

Filed Jun. 11, 1990, Ser. No. 535,609

Int. Cl.[5] B29C 45/14, 45.16

U.S. Cl. 264—257 5 Claims



1. A process of injection molding for forming a flat deformable laminate having a thermoplastic substrate, as the bonding agent, said process comprising:

(a) providing a thermoplastic resin and a deformable material wherein the memory recovery of the deformable material is less than the memory recovery of the thermoplastic resin;

(b) providing a soft porous material;

(c) lining a flat surface area of an injection mold cavity with said soft material;

(d) placing the deformable material against said soft material;

(e) closing said mold cavity with a second flat surface spaced from said deformable material to form a plastic receiving chamber means;

(f) injecting the thermoplastic resin within said chamber means and about said deformable material and into said soft material;

(g) allowing said thermoplastic resin to at least partially cool and harden; and then

(h) removing the resultant flat deformable laminate from the cavity, said flat deformable laminate capable of further deformation into a preselected shape after removal from said cavity.

5,151,238

PROCESS FOR PRODUCING COMPOSITE MATERIALS

Harold A. Earl, Colwyn Bay, and William B. Banks, Port Dinorwic, both of Wales, assignors to National Research Development Corporation, London, England

Filed Jun. 5, 1989, Ser. No. 361,044

Claims priority, application United Kingdom, Jun. 7, 1988, 8813396

Int. Cl.[5] B29C 67/20

U.S. Cl. 264—136 11 Claims

1. A process for the production of a composite material, which process comprises the steps of:

immersing a cellulosic substrate in a solution of a di-functional isocyanate in an aprotic swelling solvent to cause said cellulosic substrate to swell, said cellulosic substrate reacting with said isocyanate; and

then compressing the substrate to form a composite material.

5,151,239

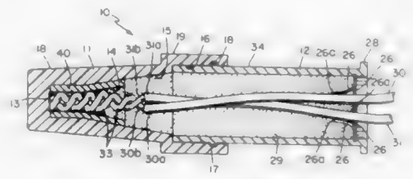
METHOD OF MAKING A WIRE JUNCTION ENCAPSULATING WIRE CONNECTOR

Lloyd H. King, Jr., Town & Country, Mo., assignor to King Technology of Missouri Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 574,808, Aug. 30, 1990, Pat. No. 5,113,037, which is a continuation-in-part of Ser. No. 478,687, Feb. 12, 1990, Pat. No. 5,023,402, which is a continuation-in-part of Ser. No. 450,156, Dec. 13, 1989, abandoned. This application Mar. 22, 1991, Ser. No. 673,792

Int. Cl.[5] H02G 15/08

U.S. Cl. 264—272.11 13 Claims



1. A method of making a sealant containing shell around a ready to use twist on wire connector comprising the steps of:

placing a ready to use twist on wire connector having an interior region and an exterior region in a mold to thereby form a mold cavity around the exterior region of the twist on wire connector, the interior region of the twist on wire connector having a wire engaging surface for gripping and holding an electrical lead;

injecting a moldable electrical insulating material into the mold cavity and allowing the moldable material to solidify and to thereby form an electrical insulating shell around the exterior region of the twist on wire connector and a chamber for a sealant; and

injecting a sealant into the interior region of the twist on wire connector to thereby form a shell having both a twist on wire connector and a chamber for a sealant located therein end subsequently forming a sealant covering low resistance electrical connection around an electrical lead in the presence of the sealant by inserting electrical leads into the shell and the twist on wire connector, and including the step of grasping and holding the electrical leads in one hand while rotating the shell with the other hand to thereby lock and seal the electrical lead in the twist on wire connector.

5,151,240

LEATHER-LIKE MATERIAL HAVING EXCELLENT WATER VAPOR PERMEABILITY AND SUPPLENESS AND ITS MANUFACTURE

Koin Asano, Takatsuki; Kenichi Tagawa, Hofu; Hiroshi Nakagawa, Hofu, and Hiroyuki Wakahara, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,701

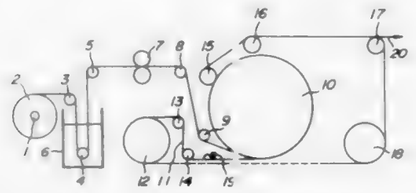
Claims priority, application Japan, Sep. 6, 1989, 1-229372

Int. Cl.[5] B29C 41/00

U.S. Cl. 264—284 6 Claims

5. A process for manufacturing an imitation leather material product comprising the steps of: applying a coating of a water-miscible solvent solution onto a release belt, said solvent solution containing a polyurethane elastomer; superimposing a water-moisturized substrate onto said coating, said water-moisturized substrate having a water add-on amount of 30–150% based on the weight of the substrate; applying heat to an upper surface of said water-moisturized substrate by means disposed above it to cause the formation of water vapor therein; coagu-

lating said polyurethane elastomer by said water vapor to cause said polyurethane elastomer to bond to said substrate and form a resultant imitation leather material; removing said resultant imitation leather material from said release belt; washing



said resultant imitation leather material to remove any remaining solvent therefrom; and drying said resultant imitation leather material to yield said imitation leather material product.

5,151,241

METHOD FOR SHAPING WORKPIECES FROM THERMOPLASTICS

Dieter Maier; Harald Egner, both of Stuttgart; Stefan Frohlich, Mutlangen, and Jurgen Hoffmann, Denkendorf, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.v., Munich, Fed. Rep. of Germany

Filed May 22, 1991, Ser. No. 703,922

Claims priority, application Fed. Rep. of Germany, May 23, 1990, 4016558; Mar. 22, 1991, 4109370

Int. Cl.[5] B29C *43/02*

U.S. Cl. 264—314 4 Claims

1. A method for shaping a tubular workpiece from thermoplastic plastics in a mold under the action heat, comprising:

applying an amount of heat required for shaping the workpiece to the workpiece to be shaped from the interior,

heating the workpiece to the softening temperature of the plastic,

maintaining the softening temperature until the workpiece assumes the shape determined by the mold, and leaving the workpiece in the mold until the workpiece has cooled off.

5,151,242

METHOD FOR VULCANIZING ELASTOMER PRODUCTS AND APPARATUS THEREFOR

Koji Soeda, Kobe; Yoshiya Kubota; Shoji Okamoto, both of Toyota; Akinori Kubota, Kobe; Michihito Kobayashi, Toyota; Masaaki Ijiri, Aichi; Nobuhiko Irie, Nagasaki; Akira Hasegawa, Nagasaki; Hideaki Katayama, Nagasaki; Toshifumi Murakami, Nagasaki; and Katsuyoshi Sakaguchi, Nagasaki, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

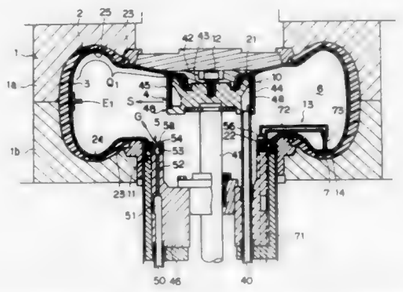
Filed Dec. 5, 1989, Ser. No. 446,260

Claims priority, application Japan, Dec. 8, 1988, 63-311332; Dec. 8, 1988, 63-311333

Int. Cl.[5] B29C *35/04*; B29D *30/00*

U.S. Cl. 264—572 22 Claims

1. A method for vulcanizing an elastomer product including a heating step, wherein said elastomer product is placed in a vulcanizing chamber formed in a mold, a heating steam at an elevated pressure is supplied to said vulcanizing chamber to heat and pressurize said elastomer product until said elastomer product reaches a prespecified temperature or for a prespecified period of time, said steam supply is stopped and inert gas, as a pressurizing gas at a pressure not lower than said steam supply pressure, is supplied to said vulcanizing chamber until the end of the heating step, and a discharging step subsequent



to said heating step, wherein said steam and said pressurizing gas are discharged to complete the vulcanizing, wherein said steam is blown in and supplied from an upper position of the center of said vulcanizing chamber into said vulcanizing chamber in a substantially horizontal direction, while said pressurizing gas is blown in and supplied from a lower position of the center of said vulcanizing chamber toward an upper region of said vulcanizing chamber.

5,151,243

METALLURGICAL VESSEL

Johann Auer, St. Florian; Wilfried Pirklbauer, Niederneukirchen; Norbert Ramaseder, and Hellmuth Smejkal, both of Linz, all of Austria, assignors to Voest-Alpine Industrieanlagenbau G.m.b.H, Linz, Austria

Division of Ser. No. 595,587, Oct. 11, 1990, Pat. No. 5,096,165. This application Nov. 22, 1991, Ser. No. 795,996

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1989, 3934340

Int. Cl.[5] C21C *5/46*

U.S. Cl. 266—78 16 Claims

1. In a metallurgical vessel comprised of an outer shell lined on its interior wall with a refractory brick lining and adapted for melting metal,

said vessel having a probe opening therein of a length extending from the outer shell to the interior of said vessel for introducing a measuring and/or sampling probe therein,

said probe opening entering said vessel through said brick lining along its longitudinal axis, the combination therewith of a probe opening stopper entering said probe opening and made of a material selected from the group consisting of graphite and a graphite/alumina mixture consisting essentially by weight of about 60% to 85% graphite, with the balance essentially alumina and fireclay.

5,151,244

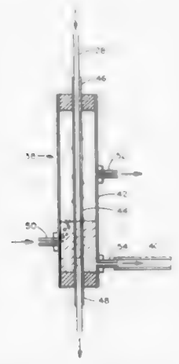
APPARATUS FOR FILTERING AND ADJUSTING THE PH OF NUCLEAR REACTOR COOLANT WATER FOR THE TESTING OF SOLUBLE CONTENTS THEREFOR

Robert J. Law; Michel N. Robles, both of Livermore, and Dane T. Snyder, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 11, 1991, Ser. No. 757,773

Int. Cl.[5] G21C *17/02*

U.S. Cl. 376—245 15 Claims



1. An apparatus for filtering and adjusting the pH of aqueous sample streams comprising the combination of a water cooled, heat producing nuclear reactor and an analytical testing device for evaluating soluble contents in the reactor coolant water, said nuclear reactor comprising a reactor vessel with a coolant water circulating system having at least one sampling water specimen conduit providing fluid communication between the reactor vessel coolant water circulating system and the analytical testing device for supplying test specimens of reactor coolant water to the testing device, a composite self-cleaning filtration and pH adjusting means for treating the sampled water specimens operatively located in the sampling water specimen conduit upstream from the analytical testing device, said filtration and pH adjusting device comprising an elongated housing having a hollow filter medium passing therethrough with an upstream external inlet into the hollow filter medium connected with the sampling water specimen conduit for feeding a flow of a sampled water specimen and a downstream external outlet from the hollow filter medium for discharging any excess of a water specimen, a downstream entry into the filter housing for supplying an acidifying gas into the filter housing external to the hollow filter medium for acidifying sampled water specimens introduced into the housing, a discharge outlet for the outflow of acidified and filtered sampled water specimen connected to the analytical testing device, and a discharge exit for disposing of excess acidifying gas and water specimen.

5,151,245

DEVICE FOR THE SEALED OPENING AND CLOSING OF A PASSAGE INTERCONNECTING A CENTRAL CHANNEL OF A TRANSPORTABLE HOLLOW BODY AND A VERTICAL WELL FORMED IN A FIXED STRUCTURE

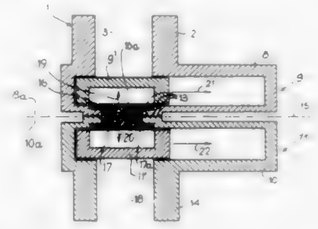
Nicolas de Seroux, and Dominique Limouzin, both of Lyons, France, assignors to Framatome, France

Filed Jun. 26, 1991, Ser. No. 721,416

Claims priority, application France, Jun. 27, 1990, 90 08116

Int. Cl.[5] G21C *19/00*

U.S. Cl. 376—271 6 Claims



1. Device for sealed opening and closing of a passage interconnecting a central channel (3) of a transportable container (1) and a vertical well (18) in a fixed structure (14) comprising a bearing surface (10*a*, 15) via which an upper part of said vertical well (18) opens out and on which rests, with the interposition of at least one O-ring seal (13), a corresponding bearing surface (8*a*) of said container (1) via which said central channel (3) opens out, in a connected position in which one end of said central channel (3) of said container (1) is located in an axial extension of said well (18) in order to form a connecting passage, said device comprising, in positions adjacent to a corresponding bearing surface (8*a*, 10*a*, 15), a first member (16) for plugging said central channel (3) of the container (1) and a second member (17) for plugging said upper end of said well (18), said first and second members being arranged in a contact zone of said at least one O-ring seal (13) with said bearing surface (8*a*, 10*a*, 15), wherein said first plugging member comprises a first plannar surface (16*a*, 17*a*) arranged, when in closing position, in said planar bearing surface (10*a*) of said fixed structure (14, 10), respectively, such that a space between said first and second plannar surfaces is reduced to a negligible value, at least one of said first and second plugging members (16, 17) being adapted to move in an axial direction of said well (18) and of said central channel (3) of said container (1) and in a transverse direction perpendicular to said axial direction, between said closing position and said opening position.

5,151,246

METHODS FOR MANUFACTURING FOAMABLE METAL BODIES

Joachim Baumeister, Bremen, and Hartmut Schrader, Schwanewede, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,350

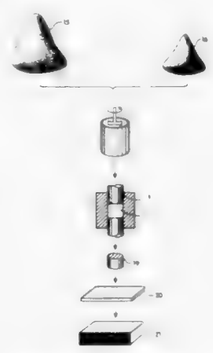
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1990, 4018360; Jan. 21, 1991, 4101630

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—2 22 Claims

1. A method for producing foamable metal bodies in which a mixture composed of at least one metal powder and at least one gas-splitting propellant powder is produced and hot-compacted to a semifinished product, comprising hot-compacting the mixture at a temperature at which the joining of the metal powder particles takes place primarily through diffusion and at

a pressure which is sufficiently high to hinder the decomposition of the propellant in such fashion that the metal particles



are permanently bonded to one another and form a gas-tight seal for the gas particles of the propellant.

5,151,247

HIGH PRESSURE ISOSTATIC DENSIFICATION PROCESS

Bengt O. Haglund, Älvsjö, and Bengt N. During, Upplands Väsby, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Nov. 1, 1991, Ser. No. 786,608
Claims priority, application Sweden, Nov. 5, 1990, 9003521
Int. Cl.[5] G22F *5/00*
U.S. Cl. 419—13 9 Claims

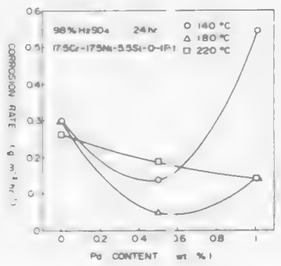
1. A method of liquid phase sintering of powder metallurgical parts in a high pressure furnace comprising applying a pressure to the part of from about 0.1–100 MPa at a temperature below the formation of eutectic liquid phase, T_{liq}, and maintaining this pressure during the remainder of the sintering cycle until the part has been subjected to substantial cooling.

5,151,248

PD-ADDED AUSTENITIC STAINLESS STEEL FOR USE FOR HIGH TEMPERATURE CONCENTRATED SULFURIC ACID

Ryuichiro Ebara; Hideo Nakamoto; Naohiko Ukawa; Tamotsu Yamada, all of Hiroshima, and Yasuo Nishimura, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 700,437, May 15, 1991, abandoned. This application Dec. 13, 1991, Ser. No. 807,633
Claims priority, application Japan, May 23, 1990, 2-131258
Int. Cl.[5] C22C *38/40*
U.S. Cl. 420—35 2 Claims



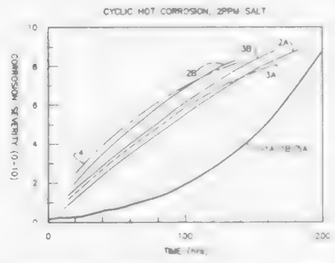
1. An austenitic stainless steel for use for high temperature concentrated sulfuric acid, comprising, on weight basis, 0.04% or less of C, 5–7% of Si, 2% or less of Mn, 15–25% of Cr, 4–24% of Ni, 0.01–1.07% of Pd and the rest consisting of Fe and unavoidable contaminant materials.

5,151,249

NICKEL-BASED SINGLE CRYSTAL SUPERALLOY AND METHOD OF MAKING

Curtiss M. Austin, Loveland; Ramgopal Darolia, Cincinnati, both of Ohio; Kevin S. O'Hara, Boxford, Mass., and Earl W. Ross, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 29, 1989, Ser. No. 459,400
Int. Cl.[5] C22C *19/03*
U.S. Cl. 420—445 35 Claims



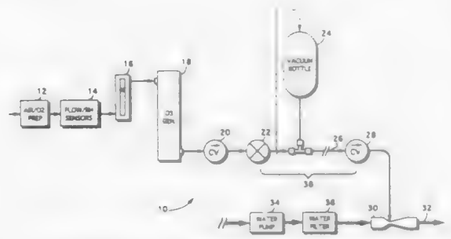
1. A nickel-based superalloy consisting essentially of, in weight percent, from about 4 to about 5 percent chromium, from about 12 to about 13 percent cobalt, from about 4 to about 8 percent tungsten, from about 6 to about 8 percent tantalum, from about 5 to about 7 percent aluminum, from about 5.7 to about 7 percent rhenium, from about 0.12 to about 0.18 percent hafnium, from about 0.4 to about 0.06 percent carbon, from 0 to about 0.0075 percent boron, from about 0.002 to about 0.030 percent yttrium, from 0 to about 6 percent ruthenium, from 0 to about 1 percent molybdenum, from 0 to about 1 percent niobium, and the balance essentially nickel, the superalloy further characterized by improved environmental resistance and stress rupture resistance.

5,151,250

AUTOMATIC PURGE METHOD FOR OZONE GENERATORS

Richard H. Conrad, P.O. Box 1300, Pt. Reyes Station, Calif. 94956

Filed Mar. 21, 1990, Ser. No. 497,126
Int. Cl.[5] C02F *1/78*; F15C *1/06*; F15D *1/02*
U.S. Cl. 422—2 19 Claims



1. An apparatus for regulating flow in an ozone generation system, and for automatically purging residual ozone upon shutdown of said ozone generation system, said apparatus comprising:

an ozone generator;

a negative pressure ozone injector device connected by a fluid flow line to said ozone generator;

a first check valve member interposed in said fluid flow line between said ozone generator and said negative pressure ozone injector device;

a vacuum reservoir interposed in said fluid flow line between said first check valve member and said negative pressure ozone injector device;

a second check valve member interposed in said fluid flow line between said vacuum reservoir and said negative pressure ozone injector device; and

a restrictive orifice member interposed in said fluid flow line between said ozone generator and said vacuum reservoir;

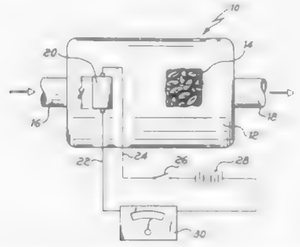
wherein while said negative pressure ozone injector device is in operation, a pressure differential exists across said restrictive orifice, with a lower pressure in said vacuum reservoir and a higher pressure in said ozone generator; and upon shutdown of said ozone generator and said negative pressure ozone injector device, said lower pressure causes said second check valve to close, and said pressure differential causes said residual ozone to be drawn from said ozone generator into said vacuum reservoir until said pressure differential becomes nearly equalized, whereupon said first check valve automatically closes.

5,151,251

GAS PURIFIER HAVING END OF LIFE DETECTOR

Carolina Solcia, and Marco Succi, both of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy

Filed May 20, 1991, Ser. No. 702,305
Claims priority, application Italy, Jun. 26, 1990, 20768 A/90
Int. Cl.[5] G01L *9/00*; G05D *15/00*; B01D *46/00*
U.S. Cl. 422—119 7 Claims



1. A gas purifier for impure gas having an end of life detector, said purifier comprising:

A. a housing; and

B. an impurity-sorbing material packed within the housing wherein said impurity-sorbing material has the property of reacting with impurities in the impure gas wherein the reaction causes expansion of the impurity-sorbing material, thereby causing the housing to expand; and

C. an impure gas inlet in fluid communication with the housing; and

D. a purified gas outlet in fluid communication with the housing; and

E. a strain gauge carried by the housing; and

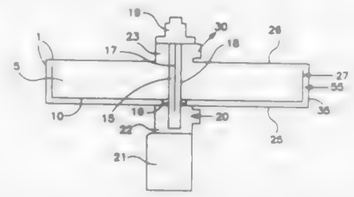
F. means for determining the strain of the strain gauge thereby determining the end of life of the impurity-sorbing material.

5,151,252

CHAMBER DESIGN AND LAMP CONFIGURATION FOR AN ULTRAVIOLET PHOTOCHEMICAL REACTOR

Barton Mass, San Jose, Calif., assignor to Purus, Inc., San Jose, Calif.

Filed Oct. 17, 1991, Ser. No. 778,651
Int. Cl.[5] B01J *19/12*
U.S. Cl. 422—186.3 25 Claims



1. A reactor for treatment of a fluid with a line-type light source which comprises:

a reactor housing forming an internal space comprising at least one fluid entry region, at least one fluid exit region,

a central photochemical treatment region comprising a housing and a means for circumferentially distributing fluid radially toward and perpendicular to a line-type light source, wherein the central photochemical treatment region is rotationally symmetrical about a central axis, and

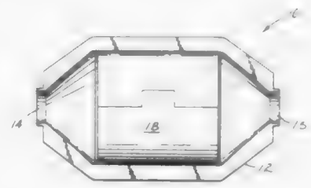
at least one line-type light source located in said treatment region substantially on the central axis of said treatment chamber region, the arc of said light source being oriented parallel to said central axis.

5,151,253

CATALYTIC CONVERTER HAVING A MONOLITH MOUNTING OF WHICH IS COMPRISED OF PARTIALLY DEHYDRATED VERMICULITE FLAKES

Richard P. Merry, White Bear Lake, Minn., and Roger I. Langer, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1991, Ser. No. 687,296
Int. Cl.[5] B01D *53/36*
U.S. Cl. 422—179 12 Claims



1. A catalytic converter comprising a casing and a monolithic catalytic element which is mounted in the casing by a layer comprising intumescent vermiculite flakes that have

a) from about 1.0 to 3.2% by weight of chemically bound water, and

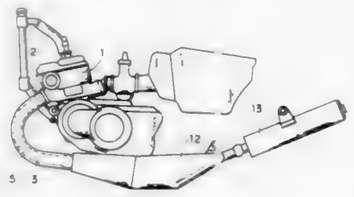
b) a uniform bulk density from about 0.2 to 0.9 g/cm^3.

5,151,254

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

Hideki Arai; Makoto Kawai, and Keiji Miyai, all of Shizuoka, Japan, assignors to Suzuki Jidoshi Kogyo Kabushiki Kaisha, Japan

Filed Aug. 28, 1990, Ser. No. 573,753
Claims priority, application Japan Aug. 29, 1989, 1-220264; Aug. 29, 1989, 1-220265; Aug. 29, 1989, 1-220266; Aug. 29, 1989, 1-220267; Aug. 29, 1989, 1-220268
Int. Cl.[5] F01N *3/10*
U.S. Cl. 422—180 17 Claims



1. An exhaust gas system for an internal combustion engine, comprising:

an exhaust pipe open at one end thereof and connected at said one end thereof to an exhaust port of said internal combustion engine for receiving exhaust gases discharged from said internal combustion engine, and open at an opposite end thereof for discharging said exhaust gases away from said internal combustion engine;

an inner pipe disposed coaxially within said exhaust pipe with an annular space defined between an outer surface of said inner pipe and an inner surface of said exhaust pipe, said inner pipe being open at a first end thereof and connected at said first end thereof to said exhaust port of said internal combustion engine for receiving said exhaust gases discharged from said internal combustion engine, and being open at a second end thereof for discharging said exhaust gases away from said internal combustion engine, said inner pipe also being provided with a plurality of perforations within sidewall portions thereof for providing fluidic communication between said inner pipe and said annular space defined between said inner pipe and said exhaust pipe; and

layer structures disposed upon inner and outer surfaces of said inner pipe and including a catalyst for cleaning unburned components of said exhaust gases flowing axially within said exhaust pipe and said inner pipe between said one and opposite ends of said exhaust pipe and between said first and second ends of said inner pipe, each of said layer structures being formed of a material which is non-deleterious to said catalyst.

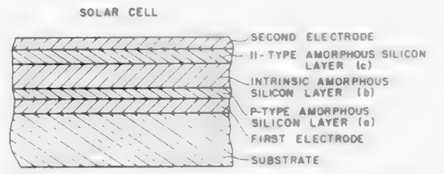
5,151,255

METHOD FOR FORMING WINDOW MATERIAL FOR SOLAR CELLS AND METHOD FOR PRODUCING AMORPHOUS SILICON SOLAR CELL

Nobuhiro Fukuda; Sadao Kobayashi; Kenji Miyachi; Hidemi Takenouchi, all of Yokohama; Yoji Kawahara, Hiroshima, and Takayuki Teramoto, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 439,433, Nov. 21, 1989, abandoned, which is a continuation of Ser. No. 114,595, Oct. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 766,968, Aug. 19, 1985, abandoned. This application Oct. 3, 1990, Ser. No. 593,410
Claims priority, application Japan, Aug. 20, 1984, 59-171436
Int. Cl.[5] B01J *19/08, 19/12*
U.S. Cl. 422—186.05 6 Claims

1. A window material for solar cell consisting of a dehydrogenated silicon (SiH_2)-based p-type amorphous silicon semiconductor film having an optical band gap of at least 1.8 eV and containing 29 to 39 atomic percent of hydrogen with 25 to 36 atomic percent thereof being in the form of dihydride (SiH_2) and 3 to 6 atomic percent thereof being in the form of monohydride (SiH), said window material being formed by decompos-



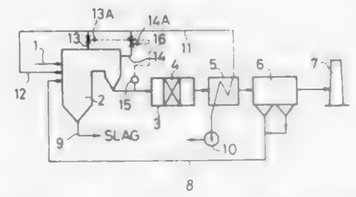
ing on a substrate a gaseous mixture composed of disilane, a substance capable of imparting p-type electrical conductivity and a diluent gas by applying a flow discharge energy in the range of 0.5 to 8.5 KJ/g-disilane.

5,151,256

COAL COMBUSTION APPARATUS PROVIDED WITH A DENITRATION

Yasuyoshi Kato; Kunihiko Konishi; Nobue Teshima; Toshiaki Matsuda, and Hiroshi Akama, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 296,209, Jan. 12, 1989, abandoned. This application May 2, 1991, Ser. No. 673,256
Claims priority, application Japan, Jan. 19, 1988, 63-9169
Int. Cl.[5] B01D *47/00;* B01J *8/00;* C01B *21/00*
U.S. Cl. 423—210 6 Claims



1. A method for eliminating volatile metal compounds present in an exhaust gas of a coal combustion apparatus provided with a denitration means for catalytic reduction with ammonia, comprising the steps of:

blowing an air into the exhaust gas prior to feeding the exhaust gas to the denitration means, the air having a temperature of at least 500° C., and blown into the exhaust gas until said exhaust gas contains at least about 2% by volume of oxygen to oxidize said volatile metal compounds; and

causing said oxidized metal compounds to adsorb onto fly ash present in the exhaust gas during the process of the exhaust gas moving downstream to the denitration means.

5,151,257

REMOVAL OF HYDROGEN SULFIDE FROM FLUID STREAMS

Dennis R. Kidd, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 499,847, Mar. 27, 1990, Pat. No. 5,045,522. This application Jun. 10, 1991, Ser. No. 712,839
Int. Cl.[5] C01B *17/16, 31/20*
U.S. Cl. 423—230 36 Claims

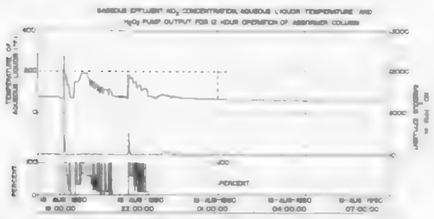
1. A process for removing hydrogen sulfide from a fluid stream containing hydrogen sulfide comprising the step of contacting said fluid stream under absorbing conditions with an absorbing composition comprising zinc titanate, alumina, silica and a promoter metal selected from the group consisting of phosphorus, tungsten, molybdenum, metals of Group VIII of the Periodic Table, and mixtures of any two or more thereof wherein said absorbing conditions comprise a temperature in the range of from about 150° C. to about 650° C., a total system pressure in the range of from about atmospheric to about 2000 psig and a residence time for said fluid stream in the presence of said absorbing composition in the range of from about 10 to about 10000 volumes of said fluid stream per volume of said absorbing composition per hour.

5,151,258

NO_x REDUCTION AND CONTROL USING HYDROGEN PEROXIDE IN THE ABSORBER COLUMN

David M. Gubanc, Franklin; Larry J. Liston, Westerville, and Jeffrey M. Zimmerman, Franklin, all of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed May 30, 1991, Ser. No. 708,135
Int. Cl.[5] C01B *21/60*
U.S. Cl. 423—235 10 Claims



1. A method for removing oxides of nitrogen (NO_x) from a gaseous effluent within an absorber column, said method comprising;

(a) feeding gaseous effluent and aqueous liquor into an absorber column,

(b) contacting the gaseous effluent with the aqueous liquid within said absorber column,

(c) discharging the gaseous effluent and aqueous liquor which have contacted from said absorber column, and

(d) selectively adding hydrogen peroxide to the aqueous liquor fed into the absorber column at periods determined by an increase in the temperature of the aqueous liquid discharged from the absorber column of 1° F./30 seconds and above.

5,151,259

MODIFIED CRYSTALLINE ALUMINOSILICATE AND METHOD OF PREPARING THE SAME

Niels J. Blom, Hillerod, Denmark, assignor to Haldor Topsoe A/S, Denmark

Filed Dec. 18, 1990, Ser. No. 629,634
Claims priority, application Denmark, Dec. 22, 1989, 6666/89
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—328 20 Claims

1. A crystalline aluminosilicate having in its anhydrous state a formula expressed in terms of mole ratios as follows:

$$xQ: 0.01\text{–}0.1\ M_{2/n}O{:}0\text{–}0.8\ Z_2O_3{:}SiO_2{:}0.0001\text{–}0.5\ MeS,$$

wherein:

Q is an organic nitrogen compound;

Z is aluminum, boron, gallium or mixtures thereof;

x is between 0 and 0.5;

M is at least one metal cation of valence n; and

Me is at least one of the metals which form an insoluble sulfide compound homogeneously distributed within said crystalline aluminosilicate.

5,151,260

PROCESS FOR PREPARING FINE POWDERS OF ALUMINUM NITRIDE

Luigi Contursi, Lugo, and Leandro Beaulardi, Imola, both of Italy, assignors to Temay S.p.A., Venice, Italy

Filed Dec. 19, 1990, Ser. No. 629,997
Claims priority, application Italy, Dec. 21, 1989, 22793 A/89
Int. Cl.[5] C01B *21/072*
U.S. Cl. 423—412 6 Claims

1. Process for preparing fine powders of aluminum nitride, by starting from an aqueous solution of an inorganic aluminum salt, wherein said process comprises:

(a) removing the anion of the inorganic aluminum salt at least partially by heating, with a colloidal solution of an aluminum compound being obtained;

(b) dispersing carbon powder in said colloidal solution, with a suspension of an aluminum compound and carbon being obtained;

(c) mixing said suspension with a carbohydrate, with a suspension being obtained of an aluminum compound and carbon in a solution which contains the carbohydrate;

(d) adding the suspension obtained from the (c) step to an alkaline solution, with spherical bodies being obtained which contain aluminum hydroxide and carbon;

(e) reducing and nitriding said spherical bodies carbothermally at a temperature of from 1350° to 1650° C. for a time of from 1 to 24 hours, so that powders containing aluminum nitride are obtained; and

(f) removing carbon from said powders by a calcination step carried out at a temperature of from 600° to 700° C., for a time of from 1 to 7 hours, under an oxygen-containing atmosphere.

5,151,261

METHOD OF PRODUCING BROMINE-TREATED GRAPHITE FIBERS

Hidenori Yamanashi, Shizuoka, Japan, assignor to Mitsubishi Corporation and Yazaki Corporation, both of Tokyo, Japan

Continuation of Ser. No. 219,635, Jul. 15, 1988, abandoned. This application Sep. 12, 1990, Ser. No. 581,267
Claims priority, application Japan, Jul. 17, 1987, 62-177244
Int. Cl.[5] C01B *31/04*
U.S. Cl. 423—448 4 Claims

1. A method for producing bromine-processed graphite fibers which comprises preparing gas phase grown carbon fibers by bringing a substrate carrying thereon ultrafine particles of metal catalyst into contact with a hydrocarbon compound at a temperature of 900° to 1500° C.; graphitizing the fibers at a temperature of at least 1500° C. to obtain graphite fibers having a crystal structure, said crystal structure having a carbon hexagonal network face substantially in parallel with the axis of fibers and oriented in a coaxial manner; and then bringing the graphite fibers and a liquid consisting essentially of bromine into contact with each other at a temperature of lower than 60° C. for at least 10 min., the length of the repeat distance along the c axis directions in the crystals having a specific value within a range from 10 to 40 Å

5,151,262

PYRITE CATHODE MATERIAL FOR A THERMAL BATTERY

J. Paul Pemsler, Lexington, and John K. Litchfield, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 7, 1991, Ser. No. 652,156
Int. Cl.[5] H01M *43/00;* C01B *17/00*
U.S. Cl. 423—561.1 13 Claims

1. In a process for the production of high purity synthetic pyrite by the sulfidation of iron powder at elevated temperatures, the improvement comprising the steps of:

(a) in an atmosphere of sulfur vapor and an inert gas of argon or nitrogen, reacting sulfur with iron powder at a tempera-

ture of from about 325–445° C., while mixing the reaction mass for a period of time sufficient to convert the iron powder to pyrrhotite, and

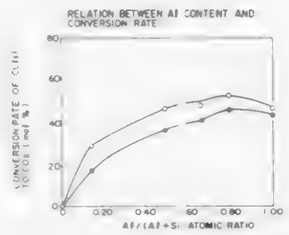
(b) in an atmosphere of sulfur vapor and an insert gas of argon nitrogen reacting the resultant pyrrhotite with sulfur vapor at a temperature of from about 475–525° C., while mixing the reaction mass for a period sufficient to convert the pyrrhotite to about 99% pure pyrite.

5,151,263

PROCESS FOR THE CATALYIC DECOMPOSITION OF CHLOROFLUORO ALKANES

Susumu Okazaki, and Akito Kurosaki, both of Mito City, Japan, assignors to Dupont-Mitsui Fluorochemicals Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1990, Ser. No. 557,478
Claims priority, application Japan, Aug. 5, 1989, 1-202297
Int. Cl.[5] C01B 9/00
U.S. Cl. 423—659 3 Claims



1. A process for the catalytic decomposition of chlorofluoroalkanes, which comprises reacting chlorofluoro-alkanes with steam in at least the stoichiometric amount necessary for the decomposition of the chlorofluoro-alkanes to CO_2, HCl and HF in the presence of a catalyst, which catalyst is an alumina-silica complex, wherein the range of Al/(Al+Si) atomic ratio is less than 1.0, said catalyst having a surface area of at least 100 m^2/g, at the temperature of 350° C. to 650° C.

5,151,26[illegible]

PARTICULATE VECTOR USEFUL IN PARTICULAR FOR THE TRANSPORT OF MOLECULES WITH BIOLOGICAL ACTIVITY AND PROCESS FOR ITS PREPARATION

Daniel Samain, Toulouse; Jean-Louis Bec, Ramonville S. Agne; Edith Cohen, L'Union; Frédérique Nguyen, and Marianne Peyrot, both of Toulouse, all of France, assignors to Centre National de la Recherch Scientifique, Paris, France

PCT No. PCT/FR89/00229, § 371 Date Jan. 26, 1990, § 102(e) Date Jan. 26, 1990, PCT Pub. No. WO89/11271, PCT Pub. Date Nov. 30, 1989
PCT Filed May 11, 1989 Ser. No. 465,068
Claims priority, application France, May 27, 1988, 88 07110
Int. Cl.[5] A61K 37/22, [illegible]/14, 9/16, 9/50
U.S. Cl. 424—1.1 24 Claims

1. Particulate carrier, characterized in that it comprises:

a hydrophilic, non-liquid core, said core having an average size of between 10 nm and 5 μm;

a first layer or ring of lipid nature bonded to the core by covalent bonds;

a second layer or outer shell of amphiphilic compounds bonded to the first lipid layer by hydrophobic interactions.

5,151,265

GAMMA INTERFERON FORMULATION

Jiin-Yu Hwang-Felgner, Los Altos; Richard E. Jones, Palo Alto, both of Calif., and James F. Maher, Broken Arrow, Okla., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 116,434, Nov. 3, 1987, abandoned. This application Apr. 25, 1990, Ser. No. 514,392
Int. Cl.[5] A61K 37/66; C07K 13/00
U.S. Cl. 424—85.5 17 Claims

1. A stable liquid pharmaceutical composition consisting essentially of an effective amount of gamma-interferon not subjected to prior lyophilization, a buffer maintaining the pH within the range of 4.0 to 6.0, a stabilizing agent, a non-ionic detergent and water, in which said gamma-interferon essentially retains its physical stability and biological activity during storage at a temperature of between about 2° and about 8° C. for a period of at least 14 months.

5,151,266

USE OF ANIONIC DETERGENTS WITH CONJUGATES OF MONOCLONAL OR POLYCLONAL ANTIBODIES

A. Charles Morgan, Jr., and Gowsala Pavanasasivam, both of Edmonds, Wash., assignors to NeoRx Corporation, Seattle, Wash.

Continuation of Ser. No. 767,493, Aug. 20, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 291,420
Int. Cl.[5] A61K 39/395
U.S. Cl. 424—85.8 43 Claims

1. A method for increasing the solubility of an immunoreactive immunoconjugate preparation without substantially affecting the immunoreactivity of the preparation, comprising:

incubating the immunoreactive immunoconjugate preparation with ananionic detergent at a concentration between about 0.01% and 1% by weight to volume; and

removing substantially any unbound anionic detergent.

5,151,267

BOVINE HERPESVIRUS TYPE 1 POLYPEPTIDES AND VACCINES

Lorne Babiuk; Sylvia van den Hurk, both of Saskatoon, Canada; Tim Zamb, Lincoln, Nebr., and David Fitzpatrick, Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Filed Jul. 15, 1988, Ser. No. 219,939
Int. Cl.[5] A61K 39/12; C07K 7/06, 7/08; C12N 7/00
U.S. Cl. 424—89 17 Claims

1. A method of protecting a bovine host from bovine herpesvirus type 1 (BHV-1) infection comprising:

(a) providing a vaccine composition consisting essentially of (i) a pharmaceutically acceptable vehicle and (ii) at least one recombinant polypeptide comprising a polypeptide neutralizing epitope of a BHV-1 glycoprotein selected from the group consisting of gI, gIII, and gIV; and

(b) administering an effective amount of said vaccine composition to said bovine host whereby neutralizing anti-BHV-1 antibodies are elicited in said bovine host.

5,151,268

METHODS OF USING RECOMBINANT HUMAN PROTEIN C

Nils U. Bang; Robert J. Beckmann; S. Richard Jaskunas, all of Indianapolis; Mei-Huei T. Lai, Carmel; Sheila P. Little; George L. Long, both of Indianapolis, and Robert F. Santerre, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 699,967, Feb. 8, 1985, Pat. No. 4,775,624. This application Jul. 5, 1988, Ser. No. 215,112
Int. Cl.[5] A61K 37/24; C12N 9/64, 15/57; C12Q 1/37
U.S. Cl. 424—94.64 6 Claims

1. A method of treating and preventing protein C related vascular disorders by administering an effective amount of protein C produced by the method comprising:

A. transforming a CHO-K1 or HepG-2 host cell with a recombinant DNA vector, said vector comprising:

i) a DNA sequence that provides for autonomous replication or chromosomal integration of said vector in said host cell;

ii) a promoter and translational activating sequence functional in said host cell;

iii) a constructed DNA compound that comprises a DNA that encodes a polypeptide with human protein C activity positioned in transcriptional and translational reading phase with said promoter and translational activating sequence; and

B. culturing said host cell transformed in Step A under conditions suitable for gene expression.

5,151,269

TOPICAL ANESTHETIC COMPOSITION COMPRISING A CAPPED POLYOXYALKYLENE ALCOHOL

James N. Greenshields, Hockessin, and Peter P. Walters, Claymont, both of Del., assignors to Imperial Chemical Industries PLC, Wilmington, Del.

Filed Aug. 8, 1988, Ser. No. 229,589
Claims priority, application United Kingdom, Aug. 10, 1987, 8718886
Int. Cl.[5] A61K 7/16, 7/44, 7/32, 7/15
U.S. Cl. 424—401 10 Claims

1. A composition for external use which contains at least one cosmetically or pharmaceutically active ingredient and which also contains from 10 ppm by weight up to 10% by weight of a compound of the general formula:

$$RO(AO)_xR^1$$

wherein:

A is a C_1–C_4 alkylene group;

R is phenyl, tolyl, benzyl or C_9–C_{13} alkyl; optionally substituted with halogen, nitro, cyano, a group of the formula OR^2, SR^2 or NR^2R^3 wherein R^2 and R^3 are C_1–C_{30} alkyl;

R^1 is phenyl, tolyl, benzyl or C_1–C_{13} alkyl; optionally substituted with halogen, nitro, cyano, or a group of the formula OR^2, SR^2 or NR^2R^3 wherein R^2 and R^3 are C_1–C_{30} alkyl; and

x has a value of 2–30.

5,151,270

SELF-EMULSIFIABLE DERMATOLOGIC CREAM

Georges S. Grimberg, 123 rue de l'Université , 75007 Paris, France

Filed Nov. 30, 1989, Ser. No. 443,407
Claims priority, application France, Dec. 2, 1988, 88 15827; Jun. 15, 1989, 89 07953
Int. Cl.[5] A61K 7/48, 7/02
U.S. Cl. 424—401 2 Claims

1. A self-emulsifiable, thixotropic dermatologic cream, produced by the following process:

first, mixing the following products at room temperature:

Sorbitan monostearate	8.55 g
Polyoxyethylenated sorbitan monostearate	8.55 g
Stearic acid	31.8 g
Petrolatum oil	17.1 g
Isopropyl myristate	42.0 g
Magnesian yeast	4.0 g
Triethanolamine	0.424 g
Methyl parahydroxybenzoate	0.159 g
Propyl parahydroxybenzoate	0.159 g
Distilled water	283.5 g
Fragrance	1.720 g

heating the mixture to a temperature between 80° C. and 120° C. for a period of time of 15 to 75 minutes, such that said products are all melted and solubilized; and

allowing the mixture to cool down while stirring.

5,151,271

PRESSURE-SENSITIVELY ADHERING COMPOSITE MEDICINAL PREPARATION

Saburo Otsuka; Yuusuke Ito; Toshiyuki Yoshikawa, and Shoichi Tokuda, all of Ibaraki, Japan, assignors to Nitti Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 224,214, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 406,726, Aug. 9, 1982, abandoned. This application Oct. 24, 1989, Ser. No. 426,526
Claims priority, application Japan, Aug. 27, 1981, 56-134888; Aug. 27, 1981, 56-134889
Int. Cl.[5] A61F 13/00
U.S. Cl. 424—443 11 Claims

1. A process for the preparation of a pressure-sensitively adhering composite medicinal preparation which

(1) comprises at least two layers, said layers being (a) a layer of a macromolecular substance, whose glass transition point is within the range from −70° C. to −10° C., having pressure-sensitive adhesiveness at ordinary temperatures and (b) a polymer layer, whose glass transition point is within the range from −50° C. to 75° C., said polymer layer being adjacent to said macromolecular substance layer,

(2) one of the said layers (a) and (b) contains a percutaneously absorbable drug and other of said layers contains an adjuvant capable of increasing percutaneous drug absorption, and

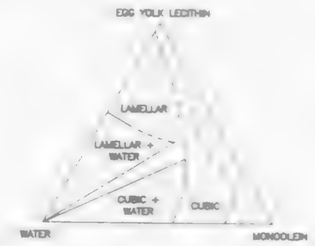
(3) the drug and adjuvant respectively can immigrate into the adjacent macromolecular substance layer and polymer layer, the process comprising lamenating one of layer (a) and (b) which contains a percutaneously absorbable drug to the other layer which contains an adjuvant capable of increasing percutaneous drug absorption.

5,151,272

METHOD OF PREPARING CONTROLLED-RELEASE PREPARATIONS FOR BIOLOGICALLY ACTIVE MATERIALS AND RESULTING COMPOSITIONS

Sven Engstrom; Bjorn Lindman, both of Lund, and Kare Larsson, Bjarred, all of Sweden, assignors to Fluid-Carbon International AB, Malmo, Sweden

Continuation of Ser. No. 166,759, Mar. 3, 1988, abandoned, which is a continuation of Ser. No. 638,221, Jul. 26, 1984, abandoned. This application Jun. 18, 1990, Ser. No. 540,441
Claims priority, application Sweden, Nov. 26, 1982, 8206744
Int. Cl.[5] A61K 9/127, 37/22; B01J 13/06
U.S. Cl. 424—450 40 Claims



1. A composition for controlled release of selected bioactive material, in vivo; the composition comprising:

(a) a cubic liquid crystalline phase formed from monoglyceride material and water; said cubic liquid crystalline phase comprising a lipid bilayer and a hydrophilic domain; and,

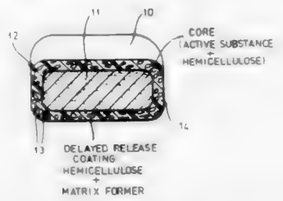
(b) an effective amount of selected bioactive material received within the hydrophilic domain of the cubic liquid crystalline phase.

5,151,27[illegible]

DELAYED-RELEASE PHARMACEUTICAL PREPARATION

Brigitta Korsatko-Wabnegg; Werner Korsatko, both of Graz, and Karlheinz Wegleitner, Linz, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Mar. 29, 1991, Ser. No. 676,977
Claims priority, application Austria, Apr. 4, 1990, A803/90
Int. Cl.[5] A61K *9/20*
U.S. Cl. 424—465 6 Claims



1. A delayed-release enterally active pharmaceutical preparation in a dosage form, comprising a core and a covering, at least one pharmaceutically effective active substance in said core capable of enteral administration and a release-delaying composition forming said covering and which comprises hemicellulose in combination with a non-disintegrating matrix-forming adjuvant, said non-disintegrating matrix-forming adjuvant being poly-D(−)-3-hydroxybutyrate-cohydroxyvalerate, the weight ratio of the hemicellulose to the poly-D(−)-3-hydrosybutyrate-cohydroxyvalerate in said composition being 5:95 to 20:80.

5,151,27[illegible]

CALCIUM AND TRACE MINERAL SUPPLEMENTS

Paul D. Saltman, La Jolla, Calif., and Kenneth T. Smith, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio and Regents of the University of California, Oakland, Calif.

Filed Aug. 6, 1990, Ser. No. 562,773
Int. Cl.[5] A61K *33/06, 33/30, 33/32, 33/34*
U.S. Cl. 424—630 17 Claims

1. A method, for building of bone in a human subject suffering from age-related bone loss comprising administering to said subject a safe and effective amount of a mineral supplement comprising calcium citrate malate, zinc, manganese and copper salts for a sufficient period of time to build bone in said subject.

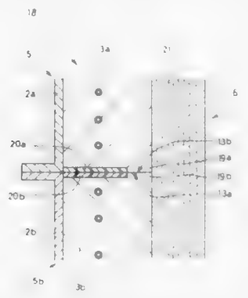
5,151,2[illegible]5

SEALING CONSTRUCTION FOR A PRESSURE CASTING MOLI

Takeshi Ito, and Kazushige Murata, both of Iokonami, Japan, assignors to INAX Corporation, Tokoname, Japan

Continuation-in-part of Ser. No. 38[illegible],050, Jul. 17, 1989, Pat. No. 5,046,937. This application May 22, 1991, Ser. No. 704,199
Claims priority, application Japan, Jun. 28, 1990, 2-69283[U]
Int. Cl.[5] B28[illegible] *13/00*
U.S. Cl. 425—84 3 Claims

1. A mold used in pressure casting comprising:
- a first mold unit, and a second mold unit contacting each other to form an exterior of the mold and forming an inner open space,
- each of said mold units including an inner porous filter medium layer,
- said first mold unit and said second mold unit having abutting surfaces,
- said abutting surfaces being made up of first portions and second portions,
- said first portions being made up of the same material as the inner porous filter medium layers, and extending part way from said inner space toward the exterior of the mold, and said second portions are made up of sealing members located between said porous filter medium layers of said mold



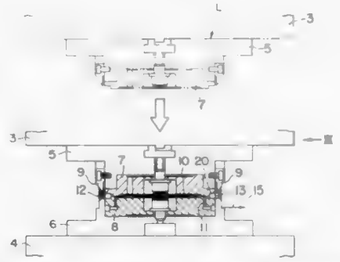
units and extending between said first portions and the exterior of the mold.

5,151,276

RESIN MOLDING APPARATUS

Mitsuo Sato, Zama; Hazime Shaura, and Megumi Tateishi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1990, Ser. No. 634,447
Claims priority, application Japan, Feb. 13, 1990, 2-31788
Int. Cl.[5] B29C *45/14*
U.S. Cl. 425—110 12 Claims



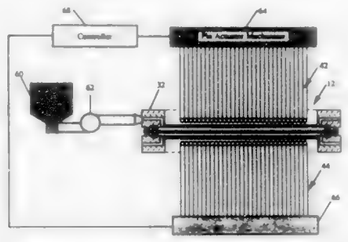
1. A resin molding apparatus for molding an insulating resin mold at the peripheral portion of a semiconductor wafer comprising:
- an upper metallic mold having an upper mold contact surface in contact with the semiconductor wafer,
- a lower metallic mold having a lower mold contact surface in contact with the semiconductor wafer, and for clamping the semiconductor wafer with the upper metallic mold, and
- first and second resin stoppers;
- wherein the upper lower metallic molds form a resin space therebetween which is to be filled with insulating resin through an injection port at the portion corresponding to the peripheral portion of the semiconductor wafer,
- the upper mold contact surface, the lower mold contact surface and the inner surface of the resin space are coated with an elastic material which does not adhere to the insulating resin;
- the resin space communicates with the outside environment through the injection port and a discharge port,
- the first resin stopper cooperates with the injection port to close an upper portion of the injection port, and the second resin stopper cooperates with the discharge port to close an upper portion of the discharge port.

5,151,277

RECONFIGURABLE FIBER-FORMING RESIN TRANSFER SYSTEM

Edward Bernardon, Bedford, and Michael F. Foley, Cambridge, both of Mass., assignors to The Charles Stark Draper Lab., Inc., Cambridge, Mass.

Filed Mar. 27, 1991, Ser. No. 675,819
Int. Cl.[5] B29C *45/14*
U.S. Cl. 425—112 8 Claims



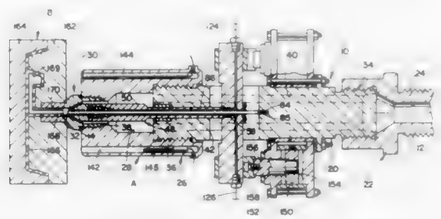
1. A reconfigurable fiber-forming resin transfer molding system comprising:
- a chamber including opposing flexible first and second spaced diaphragms, means for sealingly engaging the edges of the diaphragms, means for disposing an initially generally planar fiber workpiece between the diaphragms dividing the chamber into two sections, and means for introducing into at least one section a resin for impregnating said workpiece; and
- press and die means surrounding said chamber for embracing said chamber and forming a contained workpiece to conform to the shape of the press and die.

5,151,278

PLASTIC INJECTION MOLDING NOZZLE WITH GAS ASSIST

Indra R. Baxi, Solon, and Tom W. Johnson, Hunting Valley, both of Ohio, assignors to Nitrojection Corporation, Middlefield, Ohio

Filed Apr. 9, 1991, Ser. No. 682,616
Int. Cl.[5] B29C *45/23*
U.S. Cl. 425—130 19 Claims



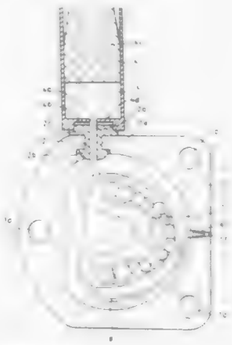
1. An apparatus for injecting a viscous fluid and a non-viscous fluid into a mold cavity of a mold body, the apparatus comprising:
- a nozzle body comprising an inlet end and a discharge end, and a flow passage for the viscous fluid extending from said inlet end to said discharge end;
- a valve element mounted for reciprocation in said nozzle body flow passage to control a flow of the viscous fluid through said nozzle body discharge end, said valve element comprising:
- a barrel having a first end, selectively engaging a portion of the nozzle body discharge end to prevent a flow of the viscous fluid therepast and a second end, and
- a bore extending longitudinally through said barrel;
- a pin located in said barrel bore, said pin having a first end located adjacent said barrel first end and a second end secured to said nozzle body such that said pin remains stationary as said barrel reciprocates in said nozzle body; and,
- a non-viscous fluid flow passage defined between said pin and said barrel, wherein said barrel bore has a substantially constant diameter at and adjacent said barrel first end.

5,151,279

METHOD FOR MAKING RESIN DENTAL PLATES AND FLASKS

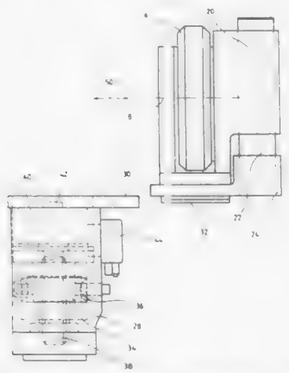
Hiroshi Kimura, No. 9-12, 5 Chome, Minamikasugaoka, Ibaraki-shi, Osaka, Japan

Continuation of Ser. No. 430,573, Nov. 1, 1989, abandoned. This application Sep. 6, 1991, Ser. No. 758,510
Claims priority, application Japan, Nov. 2, 1988, 63-276088
Int. Cl.[5] B29C *45/18*
U.S. Cl. 425—178 7 Claims



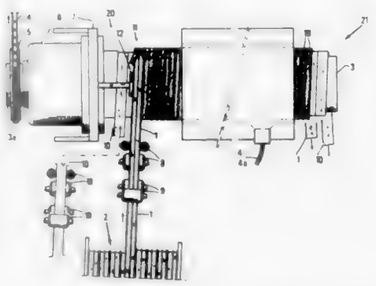
1. A flask comprising:
- a splittable flask body which comprises an upper lid member, a tray member and a lower lid member, all formed of a material through which microwaves are transmittable,
- an injection attachment mounted on a mounting port formed of axially aligned cut-out portions of said tray member and said lower lid member and having an axial resin injection hole, and a sprue-opening closure member for closing said resin injection hole in said injection attachment,
- a cylinder filled with a pasted resin and a plunger positioned in said cylinder for injecting said resin into said resin injection hole, said cylinder having an end wall with an outlet hole formed therein and a recessed portion formed on a side of said wall opposite said plunger; and
- said flask body being provided in the vicinity of a side edge thereof with at least two through-holes and tightening means inserted into said through holes, wherein said tightening means comprises securing members, each formed of a material through which microwaves are transmittable, and wherein said injection attachment is provided with a resin injection hole and with inner and outer stopper members formed of a material through which microwaves are transmittable in such opposite relation as to hold therebetween a wall region of the side of said flask body, said outer stopper member being positioned in said recessed portion formed at said one end of said cylinder.

5,151,28)
PELLETIZING MACHINE
Ulrich Arndt; Lauenburg; Peter L ineburg, Berkenthien; Kurt Marquardt, Hamburg; Hans-Jo chim Pierags, Lübeck, and Ulrich Zeuschner, Schwarzenbe , all of Fed. Rep. of Germany, assignors to Firma Wilhel n Fette GmbH, Schwarzenbek, Fed. Rep. of Germany
Filed Mar. 8, 1991, S r. No. 667,017
Claims priority, application Fed Rep. of Germany, Jun. 8, 1990, 4018453
Int. Cl.[5] B30E *11/08*
U.S. Cl. 425—186 8 Claims



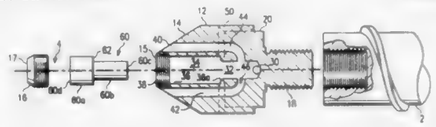
1. A rotary pelletizing machine comprising a rotatable matrix disc; a plurality of upper and l wer plungers guided in said matrix disc; a plurality of vertical y adjustable pressing rollers which control position of said u per and lower plungers; a drive housing; a drive in said driv housing for a height adjustment of said rollers; a bearing bl ck supporting said pressing rollers; and means for releasably c nnecting said bearing block and therefore said pressing roller s supported in said bearing block with said drive housing of s id drive for a height adjustment to facilitate exchange of sai matrix disc.

5,151,2 1
DEVICE FOR CONTINUOUS MANUFACTURE OF BENT RODS WITH SHAPED CROS S SECTIONS USING AN INTERMEDIA TE STRIP
Michel Huvey, Bougival, France, assignor to Institut Francais du Petrole, Reuil-Malmaison, F ance
Continuation of Ser. No. 269,071, Nov. 9, 1988, abandoned. This application Mar. 12, 199), Ser. No. 491,838
Claims priority, application Fra ice, Nov. 9, 1987, 87 14965
Int. Cl.[5] B29 *41/04*
U.S. Cl. 425—505 15 Claims



1. Apparatus for continuous manufacture of bent rods with shaped cross section, the apparatus comprising a mandrel, mans for rotating said mandrel around a longitudinal axis thereof, a supporting mold adapted to be wound around the mandrel, said mandrel having a cross section matching that of the shaped cross sections of the bent rods to be produced, mans for continuously winding the supporting mold on the mandrel, means for continuously winding reinforcing elements impregnated with stabilizable material within the supporting mold, stabilizing means extending over at least a part of a length of said mandrel, means for separating the shaped section of reinforcing elements with stabilizable material from the mandrel after the material has been subjected to at least partial stabilization, a helical intermediate strip disposed between said mandrel and said supporting mold, means for continuously winding said intermediate strip on said mandrel, means for causing said intermediate strip to progress longitudinally along said mandrel, and means for separating said intermediate strip from said mandrel.

5,151,282
POSITIVE-TYPE NON-RETURN VALVE
Robert F. Dray, Rte. No. 1, Box 281 D, Hamilton, Tex. 76531
Filed May 13, 1991, Ser. No. 699,277
Int. Cl.[5] B29C *45/23*
U.S. Cl. 425—562 21 Claims



1. A non-return valve for use with a feed screw in a barrel with an axis, said barrel defining an accumulation area downstream of said non-return valve, said valve comprising:
a) a frame with a distal end and a proximal end, said frame defining a primary chamber located in said frame, said primary chamber in fluid communication with said accumulation area;
b) a reduced diameter passage located in said frame upstream from and in contact with said primary chamber;
c) at least one inlet connected to said reduced diameter passage and leading to an outer surface of the proximal end;
d) at least one outlet passage extending from said reduced diameter passage to an outer surface on said distal end of said frame; and
e) a piston within said primary chamber, said piston having a first portion, a second portion, an upstream face, and a downstream face, said piston dimensioned to slidably engage said primary chamber and reduced diameter passage, said piston having an open position to allow communication between said at least one inlet and said at least one outlet passage and a closed position to seal said at least one outlet passage from said at least one inlet.

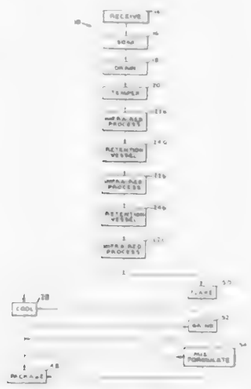
5,151,283
HIGH SOLUBLE FIBER BARLEY EXPANDED CEREAL AND METHOD OF PREPARATION
Karen B. Foehse; John D. Efstathiou, both of Plymouth, and James R. Stoll, Maple Grove, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 437,229, Nov. 16, 1989, Pat. No. 5,063,078 which is a continuation-in-part of Ser. No. 330,245, Mar. 29, 1989, Pat. No. 5,063,078, which is a continuation-in-part of Ser. No. 446,247, Dec. 5, 1989, Pat. No. 5,024,996. This application Jul. 3, 1990, Ser. No. 548,463
Int. Cl.[5] A23L *1/18*
U.S. Cl. 426—93 30 Claims

1. A puffed ready-to-eat cereal product of superior eating quality which is high in soluble fiber, comprising a puffed, cooked cereal dough composition including:
A. about 15% to 90% by weight of the composition of a barley extraction flour having a soluble fiber content of about 15% to 50% by weight of the flour;
B. about 2% to 4% moisture by weight of the composition, and the balance of the composition of a farinaceous material;
wherein the product has a bulk density ranging from about 0.05 to 0.15 g/cc,
wherein the insoluble fiber content is less than 7% by weight, and
wherein the soluble fiber to insoluble fiber content is in a ratio of at least 1:1.

5,151,284
METHOD OF PREPARING GREEN BEANS AND THE RESULTING PRODUCT
Jeffrey R. Twyman, 893 W. Wooster St., Bowling Green, Ohio 43402
Continuation-in-part of Ser. No. 38,501, Apr. 15, 1987, Pat. No. 4,867,996. This application Jan. 14, 1988, Ser. No. 143,841
Int. Cl.[5] A23L *1/212;* A23B *7/154*
U.S. Cl. 426—106 4 Claims

1. A plastic bag and a plurality of green beans therewithin, the bag having walls of about ½ to 3 mils in thickness, the walls being permeable to O_2 and moisture, the green beans being treated to reduce deterioration normally encountered in storage and on sale as fresh produce, the beans being stabilized against rapid deterioration by immersing freshly picked green beans in water at a temperature and for a time sufficient to clean, partially sterilize and preserve the green beans and thereafter, before placing the beans in the plastic bag, removing surface water on each of the beans at a temperature effective to thereby provide the beans with a shelf life of about 5 to 10 days as compared to only 2 days for untreated green beans.

5,151,285
COMESTIBLE PROCESSING SYSTEM AND METHOD
Rick L. Williams; Merton R. Leggott, both of Lincoln, Nebr., and Richard G. Bailey, Overland Park, Kans., assignors to Flakee Mills, Inc., Lincoln, Nebr.
Filed May 6, 1991, Ser. No. 695,648
Int. Cl.[5] A23L *1/00;* H05B *6/00*
U.S. Cl. 426—241 23 Claims

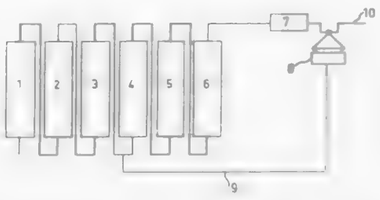


11. A method of processing a food material into a comestible product, which includes the step of:
(a) receiving said material;
(b) soaking said material;
(c) energizing said material with energy in the infrared range sufficient to partially cook the material;
(d) retaining at least a portion of said energy in said by means of a heated retention vessel to further cook the material, and
(e) cooling said material.

5,151,286
PROCESS FOR PACKAGING ACIDIFIED VEGETABLE
James Adams, Hartland, and Frank J. Meczkowski, Farmington Hills, both of Mich., assignors to Campbell Soup Company, Camden, N.J.
Continuation-in-part of Ser. No. 494,214, Mar. 15, 1990, abandoned. This application Mar. 26, 1991, Ser. No. 675,164
Int. Cl.[5] A23B *7/10*
U.S. Cl. 426—324 7 Claims

1. A process for packaging an acidified vegetable exhibiting a fresh deli-type flavor, said process consisting essentially of the steps of:
contacting a fresh vegetable with a quick equalization brine for less than about 4 hours to produce an acidified vegetable having a pH of less than about 4.5 and which exhibits a fresh deli-type flavor, said brine comprising salt in an amount within the range from about 4% to about 12% and either acetic acid or a mixture of acetic acid and phosphoric acid;
separating said acidified vegetable from said brine;
transferring said acidified vegetable to a sealable package that is opaque to the transmission of light through said package; and
sealing said acidified vegetable in said package having oxygen and carbon dioxide concentrations in the package atmosphere equal to that of ambient air but in the absence of a covering brine.

5,151,287
PROCESS FOR INCREASING COFFEE EXTRACTION YIELD
Klaus Schlecht, and Olaf Wehrspann, both of Orbe, Switzerland, assignors to Nestec S.A., Vevey, Switzerland
Filed Apr. 19, 1991, Ser. No. 688,054
Claims priority, application European Pat. Off., May 7, 1990, 90108583.7
Int. Cl.[5] A23F *5/26*
U.S. Cl. 426—432 8 Claims



1. A process for extracting roast and ground coffee comprising introducing an extraction liquid having a temperature sufficient to hydrolyze roast and ground coffee into a countercurrent extraction system comprising a plurality of extraction cells interconnected in series and passing the extraction liquid through roast and ground coffee contained in the cells to extract the coffee to obtain an extract from the system, centrifuging the extract to separate solids suspended in the extract from the extract to obtain a sludge and then introducing the sludge into at traction cell to hydrolyze the sludge by means of the extraction liquid during extraction.

5,151,288

FOOD PROCESSING APPARATUS AND METHOD

Ernest W. Curry, Wyckoff, N.J., and Marvin F. Beach, Louisville, Ky., assignors to Beast Frozen Products, Inc., Hackensack, N.J.

Continuation of Ser. No. 598,431, Oct. 16, 1990, Pat. No. 5,030,465. This application Mar. 18, 1991, Ser. No. 671,026
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] A23L *1/00*; A23G *9/00*
U.S. Cl. 426—474 18 Claims

12. A method for processing food substances, the method comprising the steps of:

mixing a gas with food substance to form a mixture;

introducing the mixture into the interior of a tube having an inlet end and an outlet end;

exposing the exterior of the tube to a fluid in order to change the temperature of the mixture within the tube; and

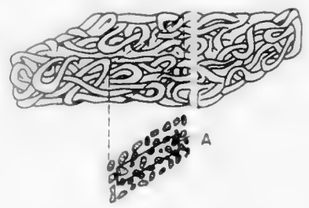
whipping the mixture by propelling a first portion of the mixture from the inlet end of the tube toward the outlet end thereof while simultaneously propelling a second portion of the mixture from a plurality of spaced apart areas within the tube, in a direction from the outlet end of the tube toward the inlet end thereof to mix the gas with the food substances.

5,151,289

PROCESS OF PREPARING FROZEN INSTANT COOKING NOODLES

Ryutaro Ozawa, Saitama; Tomoya Hayakawa, Kawagoe; Noriko Kato, Tokyo; Soichi Kobayashi, Tochigi, and Seisaku Fuse, Utsunomiya, all of Japan, assignors to Nisshin Flour Milling Co., Ltd. and MA MA-Macaroni Co., Ltd., both of Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,407
Claims priority, application Japan Dec. 28, 1989, 1-338361
Int. Cl.[5] A23L *1/162, 3/36*
U.S. Cl. 426—557 10 Claims



1. A process of preparing frozen instant cooking noodles having a cross-sectional void space percent of 40 to 80% which comprises the steps of:

subjecting noodles to a α conversion so as to control a yield of the noodles within the range of 200 to 280%;

quickly cooling the α converted noodles in cold water at 0° to 5° C.;

arranging individual strings of the noodles at random to form a noodle lump having a cross sectional void space percent of 40 to 80%; and

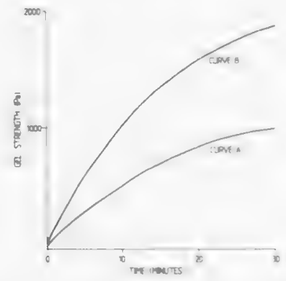
freezing the lump.

5,151,290

WATER-IN-OIL DISPERSION AND PROCESS FOR PREPARING SUCH DISPERSION

Ian T. Norton, Rushden, Great Britain, and Jeffrey Underdown, Hamburg, Fed. Rep. of Germany, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 521,517, May 10, 1990, abandoned.
This application Dec. 10, 1991, Ser. No. 807,023
Claims priority, application European Pat. Off., May 16, 1989, 89201209; Feb. 19, 1990, 90200386
Int. Cl.[5] A23D *7/02*
U.S. Cl. 426—576 9 Claims



1. Process for preparing a dispersion comprising a fat-continuous phase and a dispersed gelled aqueous phase comprising the steps of:

cooling a water-continuous composition containing at least 1% gelatin by weight of water from a temperature above the gel setting temperature of the water-continuous composition to a temperature below the gel setting temperature;

subjecting the water continuous composition to such conditions of shear that the water-continuous composition is converted into small gelled aqueous beads; and

forming a fat-continuous dispersion while maintaining the temperature at below the gel melting temperature either by inversion of the water-continuous composition or by combining the small aqueous beads with a separate fat-continuous stream.

5,151,291

GLYCERIDES OF EICOSAPENTAENOIC ACID, PROCESSES FOR PREPARING THE SAME AND OIL AND FAT PRODUCTS CONTAINING THE SAME

Shigeru Tokairin, Tokyo, and Tetsuo Nishimaki, Nagano, both of Japan, assignors to Nisshin Flour Milling Co., Ltd. and Tsukishima Foods Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 394,246, Aug. 15, 1989, abandoned, which is a continuation of Ser. No. 945,847, Dec. 23, 1986, abandoned. This application Jan. 16, 1990, Ser. No. 465,564
Claims priority, application Japan, Dec. 27, 1985, 60-292952
Int. Cl.[5] A23C *15/12*; A23D *7/00, 9/00*
U.S. Cl. 426—581 3 Claims

1. A product selected from the group consisting of margarine, shortening, mayonnaise, butter, dressing and edible oil, which comprises a glyceride of eicosapentaenoic acid represented by the formula

wherein R1, R2 and R3, which are the same or different, each represent eicosapentaenoyl group or an acyl radical of higher fatty acids other than eicosapentaenoic acid, provided that either one of R_1, R_2 and R_3 represents eicosapentaenoyl group and the remaining groups are all an acyl radical of higher fatty acids other that eicosapentaenoic acid.

5,151,292

FATBLEND AND PROCESS OF PRODUCING

Nico Zwikstra, Heemstede, Netherlands, assignor to Van den Bergh Foods Co., Division of Conopco Inc., Lisle, Ill.

Continuation of Ser. No. 454,336, Dec. 21, 1989, abandoned.
This application Jan. 6, 1992, Ser. No. 818,420
Int. Cl.[5] A23D *9/00*
U.S. Cl. 426—601 14 Claims

1. Fatblend, useful in chocolate compositions, comprising a mid-fraction of hardened, fractionated soybean oil, BO, and a mid-fraction of hardened, fractionated cottonseed oil, CS, wherein the weight ratio BO/CS of the two mid-fractions is 10:90–40:60.

5,151,293

SIMULATED RAW EGG AND METHODS OF MAKING AND PACKAGING

Eustathios Vassiliou, 12 S. Townview La., Newark, Del. 19711

Continuation-in-part of Ser. No. 551,160, Jul. 11, 1990, Pat. No. 5,073,399. This application Aug. 26, 1991, Ser. No. 750,116
Int. Cl.[5] A23L *1/32, 1/04*
U.S. Cl. 426—614 11 Claims

1. A simulated raw egg comprising:

egg-white, the egg-white being liquid at room temperature and containing an additive solute; and

a homogeneous shaped monolithic separate phase of a simulated non-flowable, egg-yolk disposed in the egg-white, said egg-yolk comprising an edible liquid, a colorant, and a positive thermoreversible gel former, the gel former being in an effective amount to render the egg-yolk

non-flowable, as to substantially retain its monolithic status in, and be substantially immiscible with the liquid egg-white at room temperature after the egg-yolk has been chilled, and

flowable at serving temperatures between cooking temperatures and room temperature for at least a finite period of time, after the egg-yolk has been brought to said serving temperatures from a higher temperature at which the egg-yolk becomes flowable;

the egg-yolk being characterized by an initial weight gain rate when it is in the egg-white in the absence of the additive solute; and

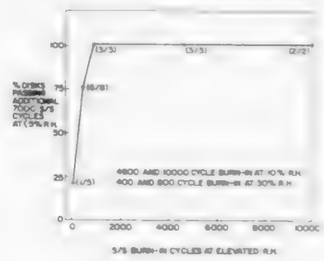
the additive solute being in an effective amount to decrease the initial weight gain rate by at least 10%.

5,151,294

METHOD FOR FORMING A PROTECTIVE FILM ON A SLIDER AIR BEARING SURFACE IN A MAGNETIC RECORDING DISK FILE

Herman E. Bleich, Morgan Hill; Luis P. Franco, Gilroy, and Ian L. Sanders, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 616,719, Nov. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 416,758, Oct. 3, 1989, abandoned. This application Nov. 19, 1991, Ser. No. 795,283
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—11 7 Claims



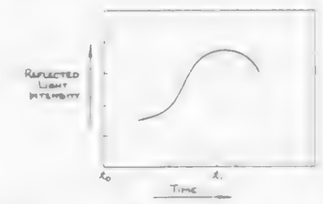
1. A method for depositing a film of essentially amorphous carbon on the air bearing surface of a slider in a magnetic recording disk file, the disk file being of the type wherein the disk associated with said slider has a thin film metal alloy or metal oxide magnetic layer and an essentially amorphous carbon protective overcoat, the method comprising the steps of causing the slider to move to a nondata region on the disk not accessible by the slider during normal operation of the disk file, and maintaining the disk at a rotational speed less than the speed required to cause the slider to ride on the air bearing by repetitively starting and stopping rotation of the disk while maintaining the air bearing surface of the slider in continuous contact with the carbon overcoat of the disk for a period of time sufficient to transfer carbon from the disk overcoat to the slider air bearing surface.

5,151,295

PROCESS FOR MANUFACTURING AN OPTICAL RECORDING MEDIUM

Katsumi Kawahara; Masami Uchida, both of Osaka; Kazumi Yoshioka, Kyoto; Takeo Ohta, Nara, and Keiichiro Horai, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1990, Ser. No. 599,692
Claims priority, application Japan, Jul. 11, 1990, 2-153250
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—12 27 Claims



1. A method for depositing a thin film layer of a multi-layer structure to a desired thickness during a thin film deposition process comprising the steps of:

(a) depositing said thin film layer onto a substrate;

(b) illuminating said substrate with incident light during said deposition;

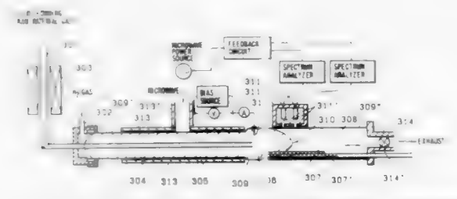
(c) monitoring the intensity of said incident light which interacts with said substrate during deposition of said thin film layer, said intensity varying in accordance with the thickness of said thin film layer;
(d) determining a time period corresponding to a predetermined variation in said intensity and calculating therefrom a deposition rate; and
(e) continuing to deposit said thin film layer to said desired thickness by controlling said thin film deposition process for a time in accordance with said calculated deposition rate.

5,151,296

METHOD FOR FORMING POLYCRYSTALLINE FILM BY CHEMICAL VAPOR DEPOSITION PROCESS

Hiroyuki Tokunaga, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP90/00433, § 371 Date Nov. 28, 1990, § 102(e) Date Nov. 28, 1990, PCT Pub. No. WO90/12126, PCT Pub. Date Oct. 18, 1990
PCT Filed Mar. 30, 1990, Ser. No. 613,705
Claims priority, application Japan, Mar. 31, 1989, 1-81107; Sep. 22, 1989, 1-247262
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 8 Claims



1. A method for forming a polycrystalline film, comprising the steps of:
(i) contacting hydrogen gas with an activating energy in a space different from a film forming space of a film forming chamber in which a substrate for film formation is arranged to excite the hydrogen gas into an active species (H),
(ii) introducing said active species (H) into the film forming chamber while simultaneously introducing a film forming raw material gas into the film forming chamber, independently from the active species (H),
(iii) mixing and contacting the active species (H) with the film forming raw material gas to produce a plasma region in the film forming space maintained at a predetermined pressure, and
(iv) periodically changing the distribution of the concentration of the active species (H) near the substrate maintained at a predetermined temperature.

5,151,297

THERMOPLASTIC ACRYLIC COATED STEEL SHEET

Douglas J. Robbins, Hamilton; Cynthia A. Gosselin, and Frederick A. Myers, both of Middletown, all of Ohio, assignors to Armco Steel Company, L.P., Middletown, Ohio

Filed Mar. 26, 1990, Ser. No. 499,230
Int. Cl.[5] B05D *3/02, 1/28, 7/14*
U.S. Cl. 427—46 5 Claims

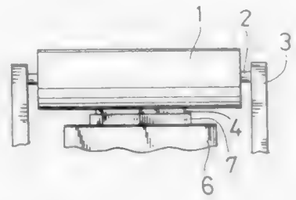
1. A method of forming a dry lubricant coating on steel ready for deep drawing, including the steps of:
providing a steel sheet,
the surfaces of said sheet being uncoated or metallic coated,
providing an aqueous solution of a thermoplastic polymer,
said thermoplastic polymer consisting essentially of acrylic and small amounts of auxiliary substances from the group of a rust inhibitor, a wetting agent, a wax and an antifoaming agent,
roll coating a continuous liquid film of said solution onto at least one side of said sheet,
inductively heating said sheet to a temperature of about 149°–246° C. for no more than 10 seconds to form a coating containing more than 50 wgt. % of said acrylic polymer,
the outer coated surface of said sheet being dry and tack free,
said coating being impervious to moisture, oil, dirt, and capable of being welded and adhesively bonded,
said coated sheet being ready for deep drawing without additional external lubricant.

5,151,298

PROCESS FOR PREPARING ORIENTATION FILM FOR LIQUID CRYSTALS

Akihiro Nammatsu, Tenri; Mitsuo Ishii, Yamatokoriyama, and Shigehiro Minezaki, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1989, Ser. No. 357,967
Claims priority, application Japan, May 30, 1988, 63-132476
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—77 16 Claims



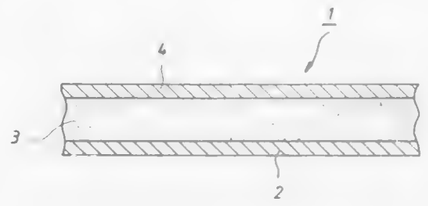
1. A process for preparing an orientation film for liquid crystals which comprises:
forming a base layer of a thermoplastic or non-thermoplastic resin, to be used for the orientation film, on a substrate for a liquid crystal display, and
rubbing the base layer while simultaneously heating the base layer at a temperature not lower than 50° C. and below the melting temperature or decomposition temperature of the resin.

5,151,299

METHOD FOR FORMING A CARBON RESISTANCE IN A PRINTED WIRING BOARD

Junichi Itsuji, Saitama, Japan, assignor to Nippon CMK Corp., Japan

Filed Apr. 9, 1991, Ser. No. 682,913
Claims priority, application Japan, Apr. 17, 1990, 2-100630
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—96 2 Claims



1. A method for forming a carbon resistance in the circuit of a printed wiring board, comprising the steps of:

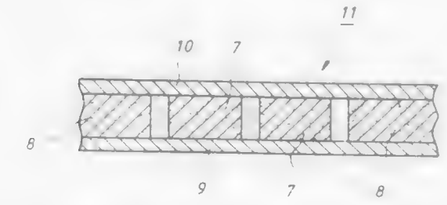
depositing a thermosettable carbon resistance layer coated on a laminated film on the surface of said circuit,
thermosetting areas of said carbon resistance layer at given positions for said circuit with the remaining areas uncured, and
removing the uncured areas of said carbon resistance layer after thermosetting.

5,151,300

METHOD FOR FORMING A CARBON RESISTANCE IN A PRINTED WIRING BOARD

Junichi Itsuji, Iruma, Japan, assignor to Nippon CMK Corp., Japan

Filed Apr. 9, 1991, Ser. No. 682,927
Claims priority, application Japan, Apr. 17, 1990, 2-100631
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—96 6 Claims



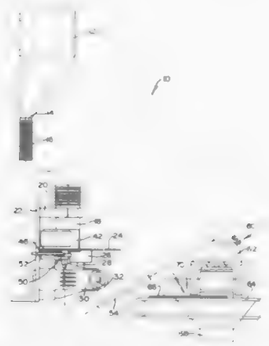
1. A method for forming a carbon resistance in a circuit of a printed wiring board, comprising the steps of:
depositing carbon resistance to be used in said circuit on a laminated film in positions corresponding to the surface of said circuit,
disposing a protective film on the carbon resistance, and
removing the protective film from the carbon resistance while on said laminated film.

5,151,301

METHOD AND APPARATUS FOR APPLYING A SUBSTANCE TO AN ARTICLE

Leon J. Kruger, and John A. Oatley, both of Cape Province, South Africa, assignors to McNeil-PPC, Inc., Milltown, N.J.

Filed Jul. 23, 1991, Ser. No. 734,388
Claims priority, application South Africa, Jul. 26, 1990, 90/5894
Int. Cl.[5] B05D *7/00*
U.S. Cl. 427—294 22 Claims



1. A method of applying a substance to an article, which method comprises
rotating a plurality of circumferentially spaced metering chambers about an axis so that the chambers pass successively through a loading zone;
depositing a flowable substance in the chambers as they move through the loading zone so that each chamber contains a fixed quantity of the substance as it passes from the loading zone;
extracting the quantities of substance successively from the chambers in a discharge zone spaced from the loading zone, by means of suction; and
applying the extracted quantities of substance to an article.

5,151,302

METHOD FOR MAINTAINING THE INTEGRITY OF HOSIERY

Carole L. Kent, 8 Hitching Post La., Chappaqua, N.Y. 10514, and Dieter Frank, Naperville, Ill., assignors to Carole L. Kent, Chicago, Ill.

Filed Jun. 18, 1991, Ser. No. 716,904
Int. Cl.[5] B32B *35/00*
U.S. Cl. 427—140 8 Claims

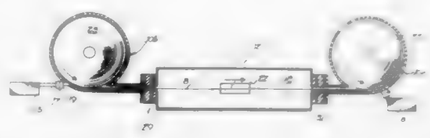
1. A method for preventing a tear, hole or run in hosiery from expanding, comprising the step of applying as a roll-on a composition to said tear, hole or run, in an amount effective to prevent the tear, hole or run from expanding said composition comprising:
(a) nitrocellulose;
(b) resin;
(c) dioctylphthalate; and
(d) a solvent or solvent mixture.

5,151,303

METHOD AND APPARATUS FOR USING EVACUATED, DETACHABLE WEB CONTAINERS WITH HIGH VACUUM TREATING MEANS

Crispin Hales, Winnetka, and Thomas E. Zabinski, Orland Park, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Aug. 7, 1990, Ser. No. 564,023
Int. Cl.[5] B05D *3/00;* C23C *14/56*
U.S. Cl. 427—178 2 Claims

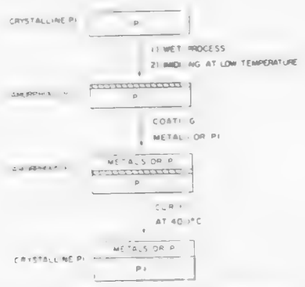


1. An apparatus for coating a strip or web in a high vacuum system operating in a high vacuum range of about 10^{-6} torr comprising:
container means having a dispensing reel compartment for dispensing a coiled strip and a take-up reel compartment for winding the strip into a coil;
said container means being substantially airtight and having means for being evacuated with the coiled strip therein;
means for treating the strip while at the high vacuum;
means for connection of said container means while under evacuation with said means for treating the strip without loss of the high vacuum at the treating means and at the container means;
said container means including two discrete cartridges, a first cartridge having the dispensing reel compartment, and a second cartridge having the take-up compartment.

2. A method of treating a strip of metal within a high vacuum in the range of about 10^{-6} torr, said method comprising the steps of:
providing a cartridge housing a coil of metal strip therein;
evacuating the cartridge housing with the coil strip therein;

connecting the evacuated cartridge housing to a treating housing having the high vacuum therein;
providing a take-up cartridge housing for coiling a treated strip;
evacuating the take-up cartridge housing and attaching the evacuated take-up housing to the treating housing which has a high vacuum therein;
processing the strip while in a high vacuum by a treating means in the treating housing; and
unwinding the coiled strip in the cartridge housing and coiling the treated strip in the evacuated take-up cartridge housing.

5,151,304
STRUCTURE AND METHOD FOR ENHANCING ADHESION TO A POLYIMIDE SURFACE
Kang-Wook Lee, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 22, 1991, Ser. No. 644,063
Int. Cl.[5] B05D *3/10*; C23C *14/00, 14/02*
U.S. Cl. 427—250 **14 Claims**



1. A process for forming a layer of substantially amorphous polyimide on at least part of the surface of a substantially crystalline polyimide article for subsequent coating of said article followed by recrystallizing said amorphous polyimide comprising:
treating at least a part of the surface of said substantially crystalline polyimide article with a base;
washing said base treated surface;
treating at least part of the surface of said substantially crystalline polyimide article with an acid to convert said treated substantially crystalline polyimide to polyamic acid;
heating said acid treated article to imidize said polyamic acid, thereby forming on said at least part of the surface a layer of amorphous polyimide

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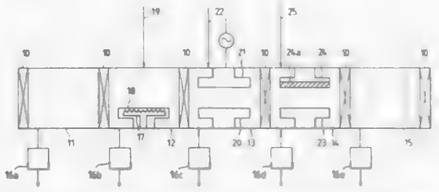
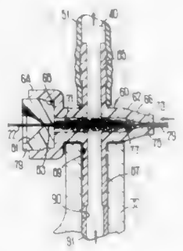
5,151,305
PROCESS FOR FORMING METAL DEPOSITED FILM CONTAINING ALUMINUM AS MAIN COMPONENT BY USE OF ALKYL ALUMINUM HYDRIDE
Shigeyuki Matsumoto, Atsugi, and Osamu Ikeda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 19, 1991, Ser. No. 656,960
Claims priority, application Japan, Feb. 19, 1990, 2-036194; Feb. 19, 1990, 2-036195; Feb. 19, 1990, 2-036196; Feb. 19, 1990, 2-036197
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—252 **12 Claims**

1. A process for forming a metal film comprising the steps of:
(i) providing a substrate comprising a semiconductor or a conductor portion and an insulator portion;
(ii) disposing said substrate in a first film-forming chamber of a metal film-forming apparatus, said film-forming apparatus comprising said first film-forming chamber, a second film-forming chamber for forming a metal film and a substrate conveying path for connecting said first and said second film-forming chambers to each other while being shielded from the atmosphere;
(iii) selectively forming a first metal film comprising aluminum on said semiconductor or said conductor portion in said first film-forming chamber using an organic aluminum;



(iv) conveying said substrate on which said first metal film is formed from said first film-forming chamber through said substrate conveying path to said second film-forming chamber and disposing said substrate in said second film-forming chamber, said film-forming apparatus being shielded from the atmosphere during conveying of said substrate; and
(v) nonselectively forming a second metal film on said substrate in said second film-forming chamber.

5,151,306
METHODS OF COATING ELONGATED STRAND MATERIAL
Jack E. Andrews, Stone Mountain; Roman J. Harmel, Lilburn; Gregory A. Lochkovic, Lawrenceville, and Francis A. Rotoloni, Alpharetta, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 26, 1990, Ser. No. 618,341
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—434.5 **3 Claims**



1. A method of coating elongated strand material, said method comprising the steps of
providing a housing which includes an entrance and an exit die each of which communicates with a chamber, and two aligned passageways, each of which opens to the chamber; and
moving an elongated strand material to advance successive increments of length of the strand material through the entrance, through the chamber and transversely past the aligned passageways and through the die; while
circulating a coating material through one of the passageways into the chamber into contact with the successive increments of length of strand material being advanced through the chamber and out through the aligned other passageway, the circulation of the coating material being effective to provide a flushing of the housing.

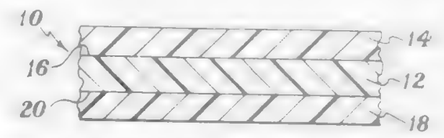
5,151,307
COLOR MATCH MOLDING AND WEATHERSTRIP
Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio
Continuation of Ser. No. 246,511, Sep. 19, 1988, Pat. No. 4,975,306. This application Aug. 20, 1990, Ser. No. 570,008
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] B60R *13/04*
U.S. Cl. 428—31 **19 Claims**

1. A molding for attachment to a vehicle, said molding comprising:
a support member;
a first selected colored layer secured to said support member;
a second selected colored layer secured to said support member; and
said first selected colored layer having a high gloss appearance matching a corresponding appearance of a portion of the vehicle.

5,151,308
HIGH DENSITY THERMAL SPRAY COATING
Larry N. Moskowitz, and Donald J. Lindley, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.
Division of Ser. No. 392,451, Aug. 11, 1989, Pat. No. 5,019,429, which is a continuation-in-part of Ser. No. 138,815, Dec. 28, 1987, Pat. No. 4,869,936. This application Nov. 5, 1990, Ser. No. 609,250
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—35.8 **5 Claims**

1. An article comprising a layer deposited upon a substrate wherein said layer is deposited by spray deposition on said substrate in an atmosphere containing ambient air having an oxygen content above about 1,000 parts per million by weight, wherein said layer comprises a metal alloy, the volume of voids and oxide inclusions in said layer represents less than about 1% of said layer volume, and oxide in said layer represents less than about 1% of the layer by weight, wherein said spray deposition is carried out with a thermal spray gun by directing a high velocity jet stream of hot gases carrying metal particles having a range of distribution between 10 microns and 45 microns, using hydrogen and oxygen as the combustion gases in said thermal spray gun, and wherein said high velocity jet stream carrying said metal particles is directed through a shroud effective to maintain a helically flowing stream of inert gas substantially concentrically around said particle carrying jet stream so as to essentially isolate said particle carrying jet stream from said atmosphere.

5,151,309
DIE-CUTTABLE AND DISPENSABLE DEFORMABLE LABELS
Susan E. Dollinger, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 375,566, Jul. 5, 1989, abandoned. This application Dec. 17, 1990, Ser. No. 628,796
Int. Cl.[5] B32B *7/06, 7/12, 27/32*
U.S. Cl. 428—40 **27 Claims**

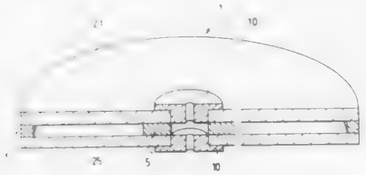


1. A deformable label suitable for attachment to a selected substrate, comprising:
a printable film facestock together with a usefully dispersed adhesive on one side of the facestock for affixing said film facestock to the substrate by means of the intervening adhesive, said film facestock including a layer of a polymer blend which comprises:
a first material selected from the group consisting of high impact polystyrene, rubber-modified polystyrene, general purpose polystyrene, and mixtures thereof;
a second material selected from the group consisting of linear low, ultra low density, low density and medium density polyethylene, copolymers of ethylene and propylene, of ethylene and acrylate monomers, of ethylene and vinyl acetate, and of ethylene and acrylic acid, and mixtures thereof; and
a compatibilizing material;
said adhesive being selected from the group of materials characterized by the ability to form a bond with said film facestock such that the strength of the film-adhesive interface and the substrate-adhesive interface and the cohesive strength of the adhesive itself are both greater than the forces required for deformation and recovery of the film itself; and
a release-coated liner material releasably bonded to said adhesive.

5,151,310
INFORMATION RECORDING MEDIUM
Shuichi Yanagisawa; Tatsuro Sakai; Yasushi Murata; Fumio Matsui, all of Saitama, and Yasuo Mitoh, Ibaraki, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo and Nitto Denko Corporation, Osaka, both of, Japan
Filed Dec. 18, 1990, Ser. No. 629,752
Claims priority, application Japan, May 28, 1990, 2-137445
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 **6 Claims**

1. An information recording medium comprising a pair of substrates each in the form of a disk, at least one of said sub-

strates has an optical recording layer on one surface thereof; said substrates being bonded to each other, directly or by



virture of a spacer, by use of a silicone adhesive so that said recording layer is disposed between said substrates;

wherein said silicone adhesive contains platinum.

5,151,311

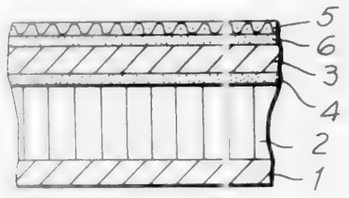
ACOUSTIC ATTENUATING LINER AND METHOD OF MAKING SAME

Charles A. Parente, Oyster Bay, and Sonya J. Westerback, North Bellmore, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 407,858, Sep. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 115,481, Nov. 2, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 611,633

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—116 **8 Claims**



1. An acoustic attenuating liner, comprising

a backsheet;

a honeycomb core on said backsheet and bonded thereto, said honeycomb core being coated with a corrosion-inhibiting adhesive primer;

a perforated sheet on said honeycomb core, said perforated sheet being coated with said corrosion-inhibiting adhesive primer and having a percent open area ranging from 27 to 35% of its surface and a maximum thickness of 0.025 inch for good mass reactance;

adhesive between said perforated sheet and said core for bonding said perforated sheet to said core;

a mesh woven to a determined weave pattern from corrosion-resistant metal on said perforated sheet, said perforated sheet being reticulated; and

additional adhesive between said mesh and said perforated sheet for bonding said mesh to said perforated sheet, said additional adhesive having predetermined characteristics including a minimum viscosity of 1000 poises during curing and a predetermined thickness.

5,151,312

HOLLOW, NON-NESTABLE PACKING PEANUTS OF RECYCLED NEWSPAPER

John L. Boeri, RR 1, Box 798, Woodstock, Vt. 05091

Filed Oct. 18, 1990, Ser. No. 599,545

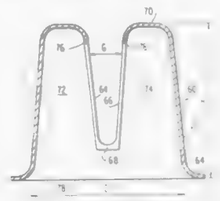
Int. Cl.[5] B65D *81/12;* **B32B** *3/00*

U.S. Cl. 428—156 **21 Claims**

1. A lightweight non-nestable packing peanut for use as a loose fill material in packing objects within sealed cartons, with the fill material under compression said packing peanut comprising:

a cellulose fiber, biodegradable molded hollow, thin walled shell of recycled newspaper,

said shell including means within a portion of said shell for providing shape stability thereto for resisting physical



crushing of said shell thereby structurally cushioning said packed objects, and

means for rendering said shell resilient over a portion thereof for absorbing the energy resulting from impact forces transmitted through said fill material towards said packaged objects.

5,151,313

OUTPUT SHEET FOR IMAGE FORMING DEVICE AND IMAGE FORMING DEVICE BY USE OF THE SHEET

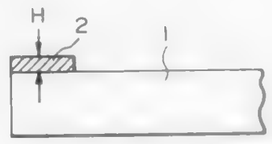
Tatsuo Takeuchi, Kawasaki, and Koji Amemiya, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 539,887

Claims priority, application Japan, Jun. 16, 1989, 1-154122; Sep. 14, 1989, 1-238955; Sep. 29, 1989, 1-255505

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—192 **29 Claims**



1. An output sheet of an image forming device, comprising:

an output sheet having optical transparency;

a marked portion for recognition provided at an edge part of the sheet, said mark being formed by printing with a colored ink having metallic powder, wherein the marked portion of the sheet has different optical properties than the unmarked portion of the sheet, which differences are detectable by light.

5,151,314

THREE-LAYER LAMINATED PANEL

Craig C. Brown, Arlington, Tex., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jan. 31, 1991, Ser. No. 648,715

Int. Cl.[5] B32B *27/14*

U.S. Cl. 428—198 **13 Claims**

1. A laminated reinforcing panel for a surgical drape, comprising

(a) a first outer layer that is liquid impermeable,

(b) an absorbent intermediate layer that overlies the first outer layer,

(c) a second outer layer that overlies the intermediate layer and is adhered to the intermediate layer by a cold cure adhesive, the second outer layer comprising a plastic web structure of spaced-apart bosses interconnected with strands, with the remaining area being open.

5,151,315

COMPOSITE MATERIAL FOR MEDICAL OR PARAMEDICAL PARTICULARLY ORTHOPAEDIC USE AND METHOD FOR MANUFACTURING IT

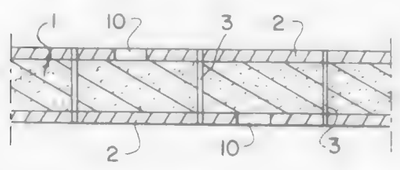
Tom P. M. G. Ponnet, Lode Vissenaekenstraat 2, B -2600 Berchem, Belgium

Continuation of Ser. No. 338,505, Apr. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 104,065, Oct. 5, 1987, abandoned. This application Jun. 14, 1991, Ser. No. 715,322

Claims priority, application Belgium, Oct. 8, 1986, 2/61067; Nov. 21, 1986, 2/61090; Dec. 19, 1986, 2/61130

Int. Cl.[5] B32B *7/02*

U.S. Cl. 428—212 **12 Claims**



1. A multi-layer composite material for medial or paramedical use, particularly orthopaedic, which comprises a multi-layer core having two sides with a thickness between 0.05 and 25 mm and on both sides of said multi-layer core a layer of soft non-thermoplastic resilient open cell foam plastic with a thickness outside the core between 0.05 and 1.5 mm, said core being comprised of three layers: a middle layer of a thermoplastic composition containing 20 to 70 weight % polyurethane and 80 to 30 weight % polycaprolactone and two outer layers containing a higher polycaprolactone content and having a lower weakening point than said middle layer.

5,151,316

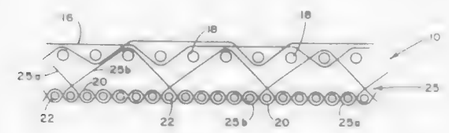
MULTI-LAYERED PAPERMAKER'S FABRIC FOR THRU-DRYER APPLICATION

Thomas B. Durkin, Depere, and Frank Biasone, Appleton, both of Wis., assignors to Asten Group, Inc., Charleston, S.C.

Continuation of Ser. No. 445,547, Dec. 4, 1989, Pat. No. 5,013,330. This application Oct. 2, 1990, Ser. No. 591,723

Int. Cl.[5] B32B *7/02*

U.S. Cl. 428—213 **10 Claims**



1. In a papermaking apparatus having at least one thru-dryer papermaker's fabric having a paper carrying surface for forming and transporting an aqueous paper web, the improvement wherein the thru-dryer papermaking fabric comprises:

a woven base fabric layer;

a woven upper fabric layer defining the paper carrying surface which assists in the further forming of the web;

said base layer being woven in a substantially finer mesh than said upper layer from yarns having a significantly smaller size than the upper layer yarns; and

means for interconnecting said upper and base layers into a unitary fabric such that the interconnection of said base layer with said upper woven layer provides structural support and stability to said upper woven layer as it forms and transports the aqueous web.

5,151,317

BIAXIALLY-ORIENTED POLYOLEFIN MULTI-LAYER FILM WHICH CAN BE SEALED ON BOTH SIDES, AND THE PREPARATION AND USE OF THE SAME

Lothar Bothe, Mainz-Gonsenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 5, 1990, Ser. No. 622,523

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1989, 3940173

Int. Cl.[5] B32B *7/02*

U.S. Cl. 428—216 **20 Claims**

1. A five layer, biaxially-oriented polyolefin film having two exterior surfaces which can be sealed, comprising a base layer comprised of a propylene polymer and having a first and second surface, first and second polyolefinic intermediate layers disposed on said first and second surfaces, respectively, of said base layer, and first and second sealing layers comprised of a sealable olefin polymer and disposed on said first and second intermediate layers, respectively, wherein said first and second intermediate layers each include about 0.5 to 2.0% by weight of a polydialkylsiloxane which has a viscosity of less than about 500 mm^2/s.

5,151,318

REINFORCING MATERIAL

Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany; Richard Stössel, Allschwil, Switzerland; Rolf Mülhaupt, Freiburg, Fed. Rep. of Germany, and Ursula Kreibich, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1990, Ser. No. 523,963

Claims priority, application Switzerland, May 26, 1989, 1980/89

Int. Cl.[5] B32B *7/12, 15/04, 27/34*

U.S. Cl. 428—246 **9 Claims**

1. A self-adhesive reinforcing material comprising

a) a UV-transparent plastic film to which

b) a woven fabric impregnated with a partially acrylate-modified epoxy resin is applied which, on the side facing away from the film a), is coated with

c) a layer of an epoxy resin which again is partially acrylate-modified, the resins of b) and c) being converted by UV irradiation to a gelled state which can be further cured by heat, and containing a heat-activatable hardener component, and

d) a release paper applied to the side opposite the film a).

5,151,319

ELECTRIFIED TAPE FOR ENCLOSURE FENCES

Bruno Schoutteten, Comines, France, assignor to Schoutteten & Froidure S.A., Comine and S.A. Copel Industrie, Houplines, France

Continuation of Ser. No. 332,980, Apr. 4, 1989, abandoned. This application Jul. 26, 1991, Ser. No. 735,707

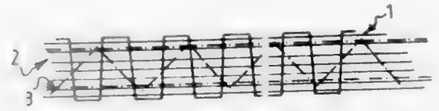
Claims priority, application France, Oct. 24, 1988, 88 14962

Int. Cl.[5] H01B *7/08*

U.S. Cl. 428—257 **8 Claims**

1. Electrified tape for enclosure fences, comprising a flexible support layer incorporating a network of electric conductors, wherein said support layer comprises interlaced weft and warp

textures interwoven by a knitted warp including knitted stitches, with said knitted stitches enclosing said interlaced



weft and warp textures and wires of the network of electric conductors to impart dimensional stability to said network.

5,151,320

HYDROENTANGLED SPUNBONDED COMPOSITE FABRIC AND PROCESS

Edward C. Homonoff, Brooklyn; Alan W. Meierhoefer, West Hartford, both of Conn., and Lori B. Flint, Westfield, Mass., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Feb. 25, 1992, Ser. No. 841,390
Int. Cl.[5] B32B *5/06*
U.S. Cl. 428—284 **20 Claims**

1. A process of producing a hydroentangled nonwoven fabric of enhanced cross direction properties comprising the steps of:

a) providing a bonded, continuous man-made filament, nonwoven base web material;

b) cross-stretching said base web by at least 5 percent its original extent but less than the cross direction elongation of said material under ambient-temperature stretching conditions;

c) stabilizing the base web material in its cross-stretched condition and relaxing the stabilized base web material to provide a prestretched web substantially free of cross direction tension;

d) applying a layer of fluid dispersible fibers to one surface of the relaxed prestretched web to form a multi-layer structure; and

e) subjecting said multi-layer structure to hydroentanglement while in its relaxed condition to affix the fibers to said one surface of the prestreched base web material.

5,151,321

METHOD OF MAKING CONDUCTIVE, WATER AND/OR ALCOHOL REPELLENT NONWOVEN FABRIC AND RESULTING PRODUCT

William G. Reeves, Woodstock; Michael D. Powers, Dunwoody; Michael P. Mathis, Marietta, and Leonard E. Duello, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 645,377, Aug. 29, 1984, abandoned. This application Mar. 2, 1987, Ser. No. 20,284
Int. Cl.[5] B32B *5/26, 27/02, 27/32, 33/00*
U.S. Cl. 428—286 **13 Claims**

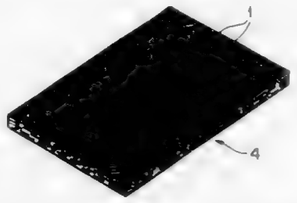
7. A nonwoven fabric comprising polypropylene-containing thermoplastic fibers or filaments and having a substantially continuous coating containing a polymer molecule having a combination of functional moieties and moieties having high affinity of polypropylene wherein the high affinity moieties are oriented towards and molecularly attached to the polypropylene fiber or filament surface of said fabric and said functional moieties are oriented outward forming the substantially continuous coating and imparting a desired alcohol and/or water repellent and/or electrical conductivity functional property to the nonwoven fabric.

5,151,322

THERMOPLASTIC COMPOSITE PLATE MATERIAL AND PRODUCTS MOLDED FROM THE SAME

Yukitane Kimoto, Otsu; Kohzou Murata, Nagoya, and Toshio Muraki, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,367
Claims priority, application Japan, Nov. 24, 1988, 63-296996
Int. Cl.[5] B32B *7/00, 9/04, 27/14*
U.S. Cl. 428—303 **10 Claims**



1. A thermoplastic composite plate material having a quasi isotropy, wherein the mechanical properties of the plate material in any two directions perpendicular to each other and in a direction having an angle of 45° to the two perpendicular directions are each in the range of ±10%, the plate material comprising:

a thermoplastic polyether-imide resin having a melt viscosity of 1,000–15,000 poise at the temperature at which said composite plate material is formed; and

strip pieces each constructed of unidirectionally oriented reinforcing fibers selected from the group consisting of carbon fibers, glass fibers and polyaramid fibers, said strip pieces being randomly distributed in a plane parallel to a surface of said composite plate material, each of said strip pieces having the following dimensions:

(a) a thickness not greater than 0.1 mm,

(b) a width in the direction perpendicular to the reinforcing fibers' orientated direction of from 5 to 20 mm,

(c) a length in the reinforcing fibers' orientated direction of from 5 to 30 mm, and

(d) a ratio of said width of said length of from 0.2 to 1.0;

the composite plate material having a thickness of from 2 to 10 mm and a content of said reinforcing fibers therein of from 30 to 50% v/v.

5,151,323

MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF

Setsuko Kawahara; Yasushi Nakano, and Noboru Koyama, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 28, 1990, Ser. No. 588,689
Claims priority, application Japan, Sep. 29, 1989, 1-256473
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—323 **18 Claims**

1. A magnetic recording medium comprising

a support,

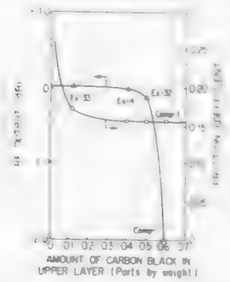
a plurality of magnetic layers being provided on a surface of said support,

a backcoat layer being provided on the other surface of said support and comprising a binder and a carbon black, wherein

an outermost magnetic layer being provided at the outermost portion from said support among said plurality of magnetic layers comprises a binder, a magnetic powder and a carbon black in which the weight ratio of said carbon black to said magnetic powder is 0.1 to 0.5:100,

a magnetic layer other than said outermost magnetic layer

comprises a binder, a magnetic powder different from said magnetic powder contained in said outermost magnetic



layer and a carbon black in which the weight ratio of said carbon black to said magnetic powder is zero to 0.4:100.

5,151,324

PATTERN COLORING MATERIAL FOR SYNTHETIC RESINS, METHOD FOR PRODUCING SAME AND SYNTHETIC RESIN MOLDED PRODUCTS USING SAME

Tadashi Hanatani, Takatsuki; Satoru Sanzen, Osaka, and Jichio Deguchi, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo and O.K.-Kasei Co., Ltd., Osaka, both of, Japan

Filed Oct. 9, 1990, Ser. No. 594,595
Claims priority, application Japan, Oct. 9, 1989, 1-263425; Jul. 13, 1990, 2-184157
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—323 **4 Claims**

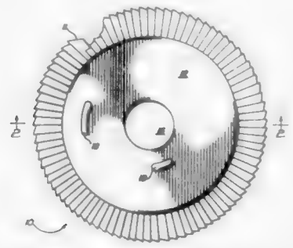
1. A pattern coloring material for synthetic resins, comprising particulate matter of a cross-linked olefin polymer containing pigment, said cross-linked olefin polymer being a product obtained by cross-linking a vinylsilane-modified ethylene polymer or a vinylsilane-modified propylene polymer, said particulate matter being in the form of a powder, pellets or beads having a mean particle size of 1 to 10,000 μm.

5,151,325

METHOD OF DYNAMICALLY BALANCING CERAMIC TURBINE WHEELS

Barry S. Draskovich, Mesa, Ariz., assignor to Allied-Signal Inc., Morris Township, N.J.

Division of Ser. No. 357,577, May 26, 1989, Pat. No. 5,047,264. This application Dec. 11, 1990, Ser. No. 625,509
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—325 **5 Claims**



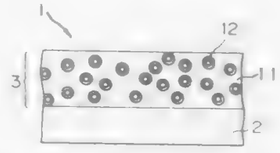
1. In a gas turbine engine, a ceramic turbine wheel having thereon a glassy balancing pad formed from a cured mixture of a fine powder of said ceramic in a sodium silicate solution.

5,151,326

REUSABLE INK SHEET FOR USE IN HEAT TRANSFER RECORDING

Genichi Matsuda, Kawasaki, and Takeshi Sugii, Nagano, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1990, Ser. No. 495,560
Claims priority, application Japan, Mar. 20, 1989, 1-068647
Int. Cl.[5] B41M *5/26*
U.S. Cl. 128—336 **16 Claims**



1. A reusable, heat transfer recording ink sheet which comprises a substrate and an ink layer applied to one surface of the substrate, the ink layer comprising:

at least one colorant selected from dyes and pigments;

a low-melting compound as a vehicle; and powders coated with ethylene/vinyl acetate copolymer, the powders having a particle size of 0.01 to 200 μm and being dispersed in a mixture of the colorant and the low-melting compound, the powders being transferred to an ink receiving recording medium together with the mixture in each heat transfer recording, and the ethyelene/vinyl acetate copolymer having a number average molecular weight of 30,000 or less and containing vinyl acetate units in an amount of 18 to 45% by weight of the copolymer.

5,151,327

ADHESIVE SHEET FOR REINFORCING THIN RIGID PLATES

Yukio Nishiyama, and Kazuo Shigeta, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Mar. 15, 1990, Ser. No. 493,641
Int. Cl.[5] B32B *7/12, 3/26*
U.S. Cl. 428—343 **13 Claims**

1. An adhesive sheet for reinforcing thin rigid plates consisting essentially of:

(a) a thermosetting resin composition layer, tacky at room temperature, comprising a thermosetting resin, a hardener, and a foaming agent that decomposes to produce foam; and,

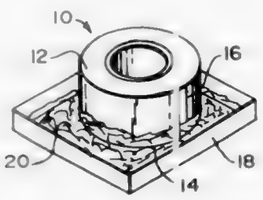
(b) a reinforcing substrate laminated or embedded with said thermosetting resin composition layer, said reinforcing substrate being treated with a heat-resistant resin to increase stiffness and maintain the uniformity of the thermosetting resin layer following foaming, and wherein the amount of said heat-resistant resin is from 2 to 20% by weight based on the amount of the reinforcing substrate before treatment.

5,151,328

MOISTURE-ACTIVATED ADHESIVE-BACKED TAPE

Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Sep. 6, 1991, Ser. No. 755,870
Int. Cl.[5] B32B 7/12, 7/14; B05D 1/18
U.S. Cl. 428—351 2 Claims



1. A moisture-activated adhesive-backed tape comprising:
a roll of tape with a top side and underside and two edges, including a layer of moisture activated adhesive applied to the underside of the tape, and motor oil absorbed into both edges to provide flexibility, waterproofing, and a vapor barrier to prevent activation of said adhesive when the tape is rolled up.

5,151,329

PROCESS FOR THE PRODUCTION OF PATENT LEATHER AND PATENT LEATHER PREPARED THEREFROM

Klaus Noll; Josef Pedain; Bruno Zorn, all of Koeln, and Rosemarie Schmid, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,357
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823048
Int. Cl.[5] B32B 9/02, 27/40
U.S. Cl. 428—423.4 16 Claims

9. A high gloss patent leather which is prepared by a process which comprises applying to a leather substrate a reactive mixture of a polyisocyanate with a hydroxyl group-containing oligourethane which comprises the reaction product of
A) 1) at least one macrodiol having an average molecular weight of 254 to 650 and comprising a member selected from the group consisting of an aromatic ring, a saturated cycloaliphatic ring and an unsaturated cycloaliphatic ring and
2) at least one macrodiol having an average molecular weight of about 1,200 to 3,000, provided that the molecular weight of macrodiol A/2 is at least 3 times the molecular weight of macrodiol A/1,
wherein macrodiols A/1 and A/2 are present in a molar ratio of about 1:6 to 6:1 with
B) at least one diisocyanate,
wherein the macrodiol A:diisocyanate B molar ratio is about 1.0:0.9 to 1.0:0.3.

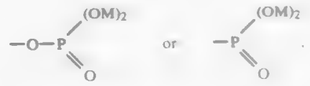
5,151,330

MAGNETIC RECORDING MEDIUM COMPRISING MAGNETIC PARTICLES AND A POLYURETHANE RESIN BINDER HAVING A POLYCAPROLACTONE STRUCTURAL UNIT

Kenji Kumamoto, and Kunitsuna Suzuki, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 614,009
Claims priority, application Japan, Nov. 17, 1989, 1-298963
Int. Cl.[5] G11B 5/00
U.S. Cl. 428—425.9 7 Claims

1. A magnetic recording medium comprising a support and provided thereon a magnetic layer containing a magnetic powder and a binder,
wherein the binder comprises a polyurethane resin having a polycaprolactone structural unit and a vinyl chloride resin having one group selected from —SO_3M, —COOM, —OSO_3M,



wherein M represents hydrogen, lithium, sodium or potassium.

5,151,331

SOLVENT BLOCKERS AND MULTILAYER BARRIER COATINGS FOR THIN FILMS

Charles L. Beeson, Hopewell; Raymond T. Cole, Midlothian, both of Va.; Gedeon I. Deak, Wilmington, Del., and Harbeson H. Leidolf, Jr., Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 565,124, Aug. 10, 1990, Pat. No. 5,102,699.
This application Feb. 5, 1992, Ser. No. 831,702
Int. Cl.[5] B32B 27/08; B65D 85/72
U.S. Cl. 428—475.5 13 Claims

1. A coated film prepared by the following process:
(a) applying a coating of solvent-borne polymeric composition to at least one surface of said film;
(b) removing substantially all of the solvent from said at least one coating;
(c) thereafter applying to the coated surface of said film a polymeric barrier layer;
(d) applying to said polymeric barrier layer a subsequent coating of solvent-borne polymeric composition, carried in a solvent to which said polymeric barrier layer is substantially impermeable; and
(e) removing the solvent from the subsequent coating;
whereby the solvent carrying said subsequent coating does not permeate the underlying coating.

5,151,332

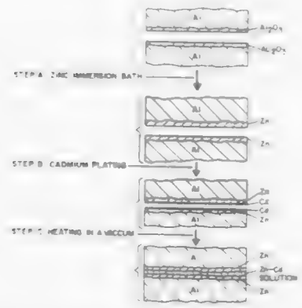
ALUMINUM SHEETS BONDED WITH CADMIUM

Charles E. De Clerck, Great River, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Division of Ser. No. 423,513, Dec. 18, 1989, Pat. No. 5,044,546, which is a continuation of Ser. No. 147,021, Jan. 19, 1988, Pat. No. 4,948,031, which is a continuation of Ser. No. 928,425, Nov. 10, 1986, abandoned. This application Dec. 13, 1990, Ser. No. 627,005
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] B32B 15/20
U.S. Cl. 428—650 2 Claims

1. An article of manufacture comprising:
a first aluminum member having a bonded surface comprising a first layer of zinc;

a second aluminum member having a bonded surface comprising a second layer of zinc; and



an interlayer comprising a solution of cadmium and zinc disposed between said first and second layers, and forming a bond between said first and second layers.

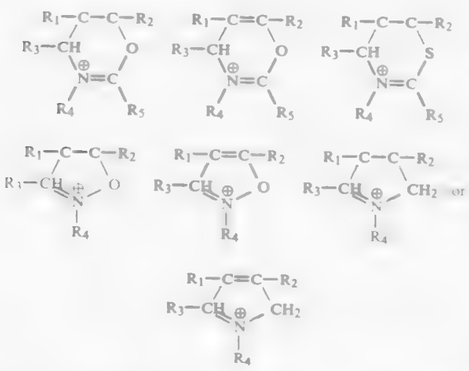
5,151,333

MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC LAYER OR BACKCOAT LAYER CONTAINING A SPECIFIED DISPERSANT

Shizno Kitahara; Eitaro Nakamura, and Yoichiro Kubo, all of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd, Tokyo, Japan

Filed Aug. 6, 1990, Ser. No. 562,993
Claims priority, application Japan, Aug. 7, 1989, 1-204374
Int. Cl.[5] G11B 5/00
U.S. Cl. 428—694 10 Claims

1. A magnetic recording medium which comprises a non-magnetic support and, formed thereon, a magnetic layer comprising a ferromagnetic powder and a binder, wherein the magnetic layer contains at least 0.1 part by weight, per 100 parts by weight of the ferromagnetic powder, of a dispersant compound or polymer having at least one >C=N⊕< bond in the molecule of the formula



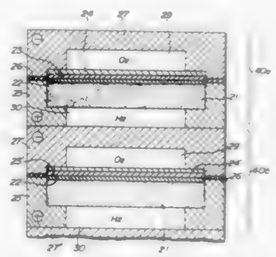
wherein R_1 and R_2 in the compound represent a hydrogen atom or a hydrocarbon group having not more than 6 carbon atoms, and in the polymer are hydrocarbon groups taken together to form the main chain of the polymer; R_3, R_4 and R_5 may be the same or different and each represents a hydrocarbon group optionally substituted by a halogen atom, a nitro group, an epoxy group, a carboxyl group or a hydroxyether group.

5,151,334

FUEL CELL UTILIZING SOLIDOUS ELECTROLYTE

Kazuo Fushimi, Saitama; Kaoru Kitakizaki, Kanagawa, and Kazuhiko Kawakami, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 573,245
Claims priority, application Japan, Aug. 24, 1989, 1-217777; Aug. 24, 1989, 1-217780
Int. Cl.[5] H01M 8/10, 4/86
U.S. Cl. 429—32 13 Claims



3. A fuel cell constructed of a plurality of cell unit structures stacked and connected in series, wherein said cell unit structure comprises;
a porous substrate,
a hydrogen electrode film stacked on said porous substrate, said film formed of a mixture of a first nickel powder having diameter of less than or equal to 1 μm and a second nickel powder having diameter of less than or equal to 3 μm, for forming fine voids of homogeneous diameter,
a coating of platinum stacked on said hydrogen electrode film,
a solid electrolyte film stacked on said platinum coating, and
an oxygen electrode film stacked on said solid electrolyte film.

5,151,335

CATHODE MATERIAL FOR ELECTROCHEMICAL CELLS

David M. Ryan, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1991, Ser. No. 834,731
Int. Cl.[5] H01M 4/24, 6/14
U.S. Cl. 429—223 13 Claims

1. A primary cell having an anode material, an electrolyte material and a cathode material wherein said cathode material, in the pre-discharge condition thereof, is $K_7(NiV_{13}O_{30})$.

5,151,336

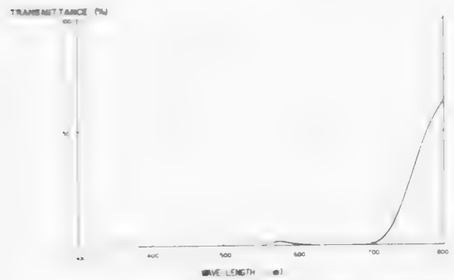
MASKING MATERIAL

Toshie Yokosuka, Yono, Japan, assignor to Kimoto Co., Ltd., Japan

Filed Sep. 10, 1990, Ser. No. 579,973
Claims priority, application Japan, Sep. 14, 1989, 1-238557
Int. Cl.[5] G03F 9/00
U.S. Cl. 430—7 4 Claims

1. A masking material for masking a photosensitive color element having three light-sensitive layers for developing cyan, magenta and yellow, respectively, said masking material comprising a layer containing a colorant and blocking trans-

mission of light in those areas of the visible spectrum to which said photosensitive color element is sensitive, while transmitting light within the range of 560–680 nm with a transmission density sufficiently high to avoid fogging of the color element.



5,151,337

METHOD OF ELECTROPHOTOGRAPHICALLY MANUFACTURING A LUMINESCENT SCREEN FOR A COLOR CRT HAVING A CONDUCTIVE CONTACT PATCH

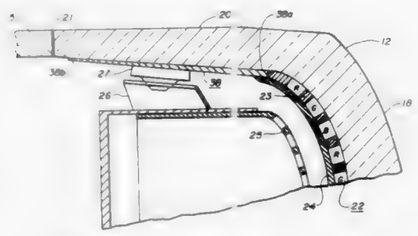
Charles M. Wetzel, Lititz; Peter M. Ritt, East Petersburg; Owen H. Roberts, Jr., Landisville, and Harry R. Stork, Adamstown, all of Pa., assignors to RCA Thomson Licensing Corp., Princeton, N.J.

Filed Jun. 26, 1990, Ser. No. 543,309

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—28 **12 Claims**



1. In a method of electrophotographically manufacturing a luminescent screen on a substrate of a color CRT comprising the steps of:

a) forming a photoreceptor by coating a surface of said substrate with a first solution to form a volatilizable conductive layer and overcoating said conductive layer with a second solution to form a volatilizable photoconductive layer;

b) establishing a substantially uniform electrostatic charge on said photoconductive layer;

c) exposing selected areas of said photoconductive layer to visible light to affect the charge thereon;

d) developing selected areas of said photoconductive layer with a triboelectrically charged, dry-powdered, first screen structure material; and

e) sequentially repeating steps b) c) and d) for triboelectrically charged, dry-powdered, color-emitting phosphor screen structure materials to form said luminescent screen comprising picture elements of color-emitting phosphor materials;

wherein the improvement comprises providing at least one wear-resistant conductive contact patch on a peripheral portion of said surface of said substrate, said contact patch having a first portion underlying at least one of said layers of said photoreceptor and in electrical contact therewith and a second portion extending therefrom;

grounding said contact patch during step b) to facilitate the establishing of said charge on said photoconductive layer; and

contacting said contact patch during step d) with suitable measuring means to monitor the deposition of said triboelectrically charged materials on said photoconductive layer.

5,151,338

TONER AND DEVELOPER COMPOSITIONS WITH CHARGE ENHANCING ADDITIVES

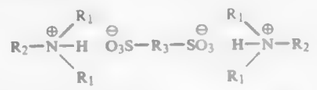
Robert D. Bayley, Fairport, and Thomas R. Hoffend, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1991, Ser. No. 797,633

Int. Cl.[5] G03G *9/09, 9/097*

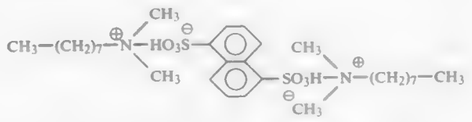
U.S. Cl. 430—106 **39 Claims**

1. A toner composition comprised of resin particles, pigment particles, and a charge enhancing additive as represented by the following formula



wherein R_1, R_2, and R_3 are independently selected from the group consisting of alkyl and aryl.

2. A toner composition comprised of resin particles, pigment particles, and a charge enhancing additive 1,5-di(octyldimethylammonium)naphthalenedisulfonate as represented by the following formula



3. A toner compositions in accordance with claim 1 wherein alkyl contains from 1 to about 25 carbon atoms.

5,151,339

PHOTORESIST COMPOSITION CONTAINING DIAZOQUINONE PHOTOSENSITIZER AND NOVALAK RESIN CHARACTERIZED BY THE COMPLETE AND SELECTIVE REMOVAL OF DIMERIC SPECIES FROM THE NOVOLAK RESIN

Thomas R. Sarubbi, Providence, R.I., assignor to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Continuation of Ser. No. 404,829, Sep. 8, 1989, abandoned. This application May 15, 1991, Ser. No. 702,155

Int. Cl.[5] G03F *7/023;* **G03C** *1/60*

U.S. Cl. 430—192 **5 Claims**

1. A photoresist composition comprising an admixture of, on a solvent-free weight basis, about 50% to about 95% by weight of an alkali-soluble novolak resin and about 5% to about 50% by weight of a diazoquinone photo-sensitizer, said novolak resin being characterized by the complete and selective removal of phenolic dimers therefrom without cross-linking or chemically altering the other constituents of said novolak resin, and said photoresist composition being characterized as producing scum-free image areas after exposure to actinic radiation and development with an alkaline developer solvent and said complete and selective removal of said phenolic dimers from said novolak resin being made by a process comprising the steps of:

(a) providing an impure novolak resin composition containing at least a minor amount by weight of one or more phenolic dimers;

(b) adding a capping agent to said impure novolak resin in an amount which provides at least one capping group for reaction with each phenolic hydroxy group present in said impure novolak resin under conditions which cause said capping agent to react with and cap each said phenolic hydroxy group of said novolak resin, rendering said novolak resin more heat-stable, and which convert said phenolic dimers to capped phenolic dimers which have a lower distillation temperature than the said dimers in uncapped form;

(c) subjecting the capped novolak resin to distillation conditions to effect selective evaporation and removal of the capped phenolic dimers;

(d) removing the capping group from remaining capped novolak resin thereby restoring the hydroxy groups originally present in said novolak resin; and

(e) isolating said novolak resin which has been purified of said phenolic dimers.

5,151,340

SELECTED PHOTOACTIVE METHYLOLATED CYCLOHEXANOL COMPOUNDS AND THEIR USE IN RADIATION-SENSITIVE MIXTURES

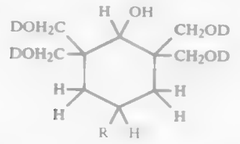
Sobhy Tadros, Seekonk, Mass., assignor to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Filed Jul. 2, 1990, Ser. No. 546,988

Int. Cl.[5] G03F *7/022, 7/023, 7/32;* **C07C** *245/00*

U.S. Cl. 430—192 **13 Claims**

1. A photoactive compound having formula (I):



(I)

wherein R is selected from the group consisting of hydrogen or a lower alkyl group having 1–4 carbon atoms and each D is individually selected from the group of hydrogen or photoactive o-napthoquinonediazide sulfonyl group; subject to the proviso that at least two of the four D's in formula (I) are photoactive o-naphthoquinonediazide sulfonyl moieties.

5,151,341

RADIATION-SENSITIVE MIXTURE AND PRODUCTION OF RELIEF STRUCTURES

Son N. Kim, 9 Zedernweg, 6944 Hemsbach, Fed. Rep. of Germany

Filed Nov. 20, 1990, Ser. No. 615,866

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3940965

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

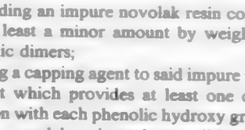
Int. Cl.[5] G03C *1/492*

U.S. Cl. 430—270 **11 Claims**

1. A negative-working radiation-sensitive mixture consisting essentially of

(a) a water-insoluble binder or binder mixture which is soluble in aqueous alkali and

(b) a compound which forms a strong acid on irradiation, wherein component (a) contains at least one group (I)



(I)

where R is alkyl of 1 to 5 carbon atoms and n is 2, 3 or 4.

5,151,342

MULTILAYER RECORDING MEDIUM FOR OPTICAL INFORMATION

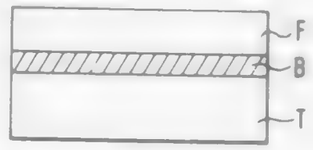
Wolfgang Wiedemann, Geisenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,346

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802031

Int. Cl.[5] G03C *1/735, 1/76*

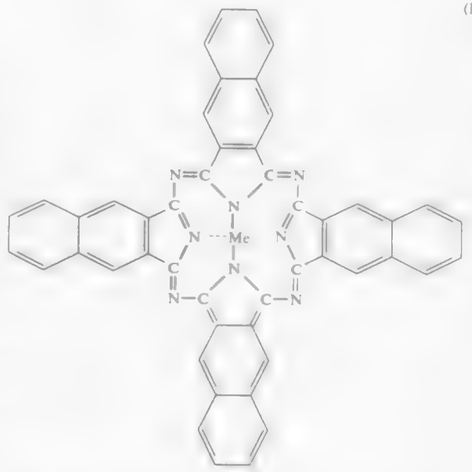
U.S. Cl. 430—271 **22 Claims**



1. A multilayer recording medium for optical information, which can be used for a single recording operation, comprising:

a support;

a layer having a thickness ranging from 30 to 200 nm, comprising an unsubstituted naphthalocyanine dye of the formula I;



(I)

wherein

Me either denotes two hydrogen atoms or a metal selected from the group consisting of Cu, Zn, Al, Ga, In, Si, G, Sn, Pb, Mg, Ti, V, Cr, Mn, Fe, Co, Ni and Pd; and a binder layer having a thickness in the range

from 30 to 300 nm positioned between the support and the naphthalocyanine-dye layer, wherein the binder comprises a

thermoplastic material having a low softening temperature, as compared with the dye.

5,151,343

PHOTOGRAPHIC MATERIAL AND PROCESS COMPRISING WASH-OUT NAPHTHOLIC COUPLER

William J. Begley, Webster; Teh-hsuan Chen, Fairport; Hans G. Ling, Rochester; John W. Harder Rochester, and Arlyce T. Bowne, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 733,554, Jul. 22, 1991, which is a continuation of Ser. No. 483,601, Feb. 22, 1990, abandoned.
This application Aug. 22, 1991, Ser. No. 748,499
Int. Cl.[5] G03C *7/34*
U.S. Cl. 430—382 8 Claims

1. A photographic element comprising a support bearing at least one photographic silver halide emulsion layer and an immobile naphtholic coupler capable upon oxidative coupling of forming a dye that is capable of being washed out of the photographic element upon photographic processing, wherein the immobile naphtholic coupler comprises a ballast-free naphtholic coupler moiety comprising a $-CONH_2$ group in the 2-position and in the 4-position a ballasted coupling-off group that comprises a releasable development inhibitor group.

6. A process of forming a photographic image which comprises developing an exposed photographic silver halide emulsion layer with a color developing agent in the presence of a naphtholic coupler as defined in claim 1.

5,151,344

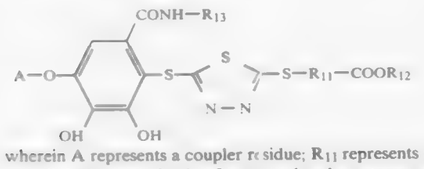
METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Akira Abe; Keiji Mihayashi, and Seiji Ichijima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 444,445, Nov. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 199,826, May 27, 1988, abandoned. This application Oct. 10, 1991, Ser. No. 774,741
Claims priority, application Japan, May 28, 1987, 62-133018
Int. Cl.[5] G03C *7/30*
U.S. Cl. 430—383 8 Claims

1. A method for processing a silver halide color photographic material comprising a support having thereon at least one of a light-sensitive silver halide emulsion layer and an adjacent layer thereof containing at least one compound represented by formula (V), wherein said silver halide color photographic material is subjected to a color-developing process with a color developing solution in which a replenisher is replenished in an amount of 700 ml or less per m^2 of the silver halide color photographic material:

(V)



wherein A represents a coupler residue; R_{11} represents a divalent aliphatic group having from 1 to 4 carbon atoms; and R_{12} and R_{13} each represents an aliphatic group having from 1 to 4 carbon atoms.

5,151,345

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Kazunori Hasebe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 13, 1990, Ser. No. 611,639
Claims priority, application Japan, Nov. 14, 1989, 1-297218
Int. Cl.[5] G03C *1/80*
U.S. Cl. 430—525 7 Claims

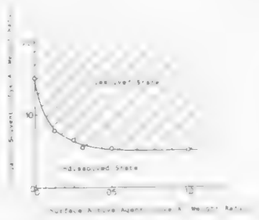
1. A silver halide color photographic material which is subject to color development with a color developer, said material comprising a reflective support comprising a support base material coated with a waterproof resin layer, and at least one silver halide emulsion layer thereon, wherein at least one silver halide emulsion layer thereon comprises silver halide grains containing silver chloride in an amount of from 90 to 99.9 mol %., having a silver bromide-rich region near at least one apex of the silver halide grain, and having a mean bromide content at the surface of the grain of not more than 15 mol %, wherein the waterproof resin layer having the silver halide emulsion layer thereon contains titanium oxide in an amount of from 15 to 60% by weight; and further the optical reflection density of the photographic material at 680 nm is not lower than 0.70.

5,151,346

PROCESS FOR PREPARING A SILVER HALIDE EMULSION

Fumitaka Terai, Saitama; Hiroyuki Yamagami, Kanagawa; Nobuhiko Uchino, Kanagawa, and Masaki Okazaki, Kanagawa, all of Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Continuation of Ser. No. 375,559, Jul. 5, 1989, Pat. No. 4,987,062. This application Oct. 31, 1990, Ser. No. 607,338
Claims priority, application Japan, Jul. 4, 1988, 63-164910; Jul. 4, 1988, 63-164911; Jul. 12, 1988, 63-171878
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] G03C *1/12, 1/38*
U.S. Cl. 430—546 5 Claims



1. A process for preparing a silver halide emulsion, comprising the steps of:

dissolving a surface active agent having a hydrophilic $-SO_3$ or $-OSO_3$ group in an alcohol, said alcohol being an aromatic primary alcohol or a halogenated alcohol, to make a solution of the surface active agent consisting essentially of the alcohol and the surface active agent;

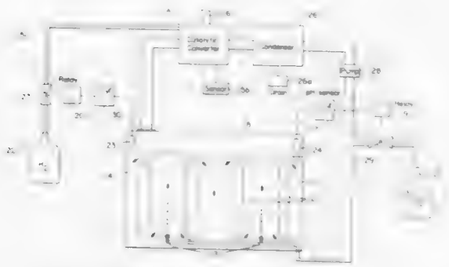
dissolving one or more substantially water-insoluble photographic additives in said solution of the surface active agent to make a solution of the surface active agent and the one or more substantially water-insoluble photographic additives, and then adding the resulting solution to a silver halide emulsion.

5,151,347

CLOSED PHOTOBIOREACTOR AND METHOD OF USE

Jacques J. Delente, Kensington; Paul W. Behrens, Ellicott City, and Scot D. Hoeksema, Elkridge, all of Md., assignors to Martek Corporation, Columbia, Md.

Filed Nov. 27, 1989, Ser. No. 441,553
Int. Cl.[5] C12N *1/12;* C12Q *3/00;* C12M *1/34*
U.S. Cl. 435—3 23 Claims



1. A closed photobioreactor comprising:

(a) container means for containing a photosynthetic algal culture in a substantially sealed environment;

(b) means for introducing light into said container means;

(c) means for introducing a reactant gas into said container means for photosynthetically reacting with a culture in said container means in the presence of light such that molecular oxygen is produced as a by-product, the molecular oxygen and unconsumed reactant gas forming a gas mixture;

(d) means for removing the molecular oxygen from the gas mixture without leaving by-products of the oxygen removal to be recirculated and without substantial leakage of the unconsumed reactant gas;

(e) means for recirculating the unconsumed reactant gas after oxygen removal through an algal culture in the substantially sealed environment when the reactant gas and the algal culture are present in said container means; and

wherein said means for removing molecular oxygen comprises means for enabling a combustion reaction with the oxygen and at least one other element to form a stable chemical compound thereof with said at least one other element.

17. A method of performing a continuous photosynthetic reaction process comprising:

(a) maintaining a photosynthetic algal culture in a substantially sealed environment;

(b) circulating a reactant gas through said culture in the presence of light and photosynthetically reacting said gas with said culture and thereby producing molecular oxygen in said reactant gas as a by-product, the molecular oxygen and unconsumed reactant gas forming a gas mixture;

(c) removing the molecular oxygen produced after photosynthetically reacting the reactant gas with said culture, from the gas mixture, said removing the molecular oxygen comprising enabling a combustion reaction with the molecular oxygen and at least one other element to form a stable chemical compound thereof with at least one other element, and without the stable chemical compound or other by-product of the chemical reaction being recirculated into said algal culture; and

(d) recirculating the unconsumed reactant gas after oxygen removal into said algal culture in said substantially sealed environment.

5,151,348

ENZYME-LINKED IMMUNOASSAY FOR MEASUREMENT OF CYCLOSPORIN A LEVELS IN WHOLE BLOOD SAMPLES

Hon-Peng P. Lau, Hockessin, Del., and Warren K. Miller, Lincoln University, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1988, Ser. No. 288,912
Int. Cl.[5] C12Q *1/00;* G01N *33/543, 33/553, 33/538*
U.S. Cl. 435—7.92 4 Claims

1. An enzyme-linked immunoassay for the measurement of cyclosporin A levels in whole blood samples comprising the steps of:

(a) lysing red blood cells in a sample of whole blood containing cyclosporin A;

(b) contacting the lysed whole blood sample with excess β-D-galactosidase-labeled anti-cyclosporin antibody to form a labeled antibody-cyclosporin A complex;

(c) separating unbound antibody from the complex by contacting the mixture formed in step (b) with a solid phase comprising cyclosporin immobilized on a solid support; and

(d) determining the amount the of β-D-galactosidase label in the complex as a measure of cyclosporin A by adding a β-D-galactosidase substrate selected from the group consisting of chlorophenol red-β-D-galactopyranoside and resorufin-β-D-galactopyranoside.

5,151,349

METHOD FOR EXPRESSING POLYPEPTIDE HAVING ANTI-TUMOR ACTIVITY

Shoji Tanaka; Masafumi Tsujimoto; Yayoi Wada; Nobuo Tsuruoka, and Hiroshi Nakazato, all of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Division of Ser. No. 123,316, Nov. 20, 1987, Pat. No. 4,948,875.
This application Jan. 31, 1990, Ser. No. 473,168
Claims priority, application Japan, Dec. 4, 1986, 61-289514
Int. Cl.[5] C12P *21/02*
U.S. Cl. 435—69.1 5 Claims

1. A method of preparing a polypeptide having an anti-tumor activity, wherein said polypeptide is obtained by culturing a strain of *Escherichia coli* which has been transformed by a plasmid containing a DNA fragment in which a promotor region and a ribosome binding sequence, derived from *Escherichia coli* or phage genes, are operably linked with the upstream end of the DNA sequence coding for the following amino acid sequence:

X—ValArgSerSerSerArgThrProSerAsp
10
LysProValAlaHisValValAlaAsnPro
20
GlnAlaGluGlyGlnLeuGlnTrpLeuAsn
30
AsnThrAlaAsnAlaLeuLeuAlaAsnGly
40
ValGluLeuArgAspAsnGlnLeuValVal
50
ProSerGluGlyLeuTyrLeuIleTyrSer
60
GlnValLeuPheLysGlyGlnGlyCysPro
70
SerThrHisValLeuLeuThrHisThrIle
80
SerArgIleAlaValSerTyrGlnThrLys
90
ValAsnLeuLeuSerAlaIleLysSerPro
100
CysGlnArgGluThrProGluGlyAlaGlu
110
AlaLysProTrpTyrGluProIleTyrLeu
120
GlyGlyValPheGlnLeuGluLysGlyAsp
130

-continued

ArgLeuSerAlaGluIleAsnArgProAsp
140
TyrLeuAspPheAlaGluSerGlyGlnVal
150
TyrPheGlyIleIleAlaLeu—OH

wherein X is Met, if present, followed by extraction and purification of the polypeptide from the culture.

5,151,350

CLONED GENES ENCODING RECOMBINANT PROTEIN A

Donald A. Colbert, Bedford, and Algis Anilionis, Arlington, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed Oct. 27, 1982, Ser. No. 436,955
Int. Cl.[5] C12P *21/02;* **C12N** *15/11, 15/31, 15/00*
U.S. Cl. 435—69.1 **45 Claims**

1. A microorganism comprising a recombinant plasmid containing a nucleotide sequence coding for the amino acid sequence of a protein A material having a protein A biological activity, and equivalent nucleotide sequences coding for molecules with substantially the same protein A-like biological activity, said nucleotide sequence and said amino acid sequence are as follows:

TTG AAA AAG AAA AAC ATT TAT TCA ATT CGT AAA
Met Lys Lys Lys Asn Ile Tyr Ser Ile Arg Lys

CTA GGT GTA GGT ATT GCA TCT GTA ACT TTA GGT
Leu Gly Val Gly Ile Ala Ser Val Thr Leu Gly

ACA TTA CTT ATA TCT GGT GGC GTA ACA CCT GCT
Thr Leu Leu Ile Ser Gly Gly Val Thr Pro Ala

GCA AAT GCT GCG CAA CAC GAT GAA GCT CAA CAA
Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln
—E→

AAT GCT TTT TAT CAA GTG TTA AAT ATG CCT AAC
Asn Ala Phe Tyr Gln Val Leu Asn Met Pro Asn

TTA AAC GCT GAT CAA CGT AAT GGT TTT ATC CAA
Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln

AGC CTT AAA GAT GAT CCA AGC CAA AGT GCT AAC
Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn

GTT TTA GGT GAA GCT CAA AAA CTT AAT GAC TCT
Val Leu Gly Glu Ala Gln Lys Leu Asn Asp Ser

CAA GCT CCA AAA GCT GAT GCG CAA CAA AAT AAG
Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Lys
←E—|—D→

TTC AAC AAA GAT CAA CAA AGC GCC TTC TAT GAA
Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu

ATC TTG AAC ATG CCT AAC TTA AAC GAG GAG CAA
Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln

CGC AAT GGT TTC ATT CAA AGT CTT AAA GAC GAT
Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp

CCA AGC CAA AGC ACT AAC GTT TTA GGT GAA GCT
Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala

AAA AAA TTA AAC GAA TCT CAA GCA CCG AAA GCT
Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
←D—|—A→

GAC AAC AAT TTC AAC AAA CAA CAA CAA AAT GCT
Asp Asn Asn Phe Asn Lys Gln Gln Gln Asn Ala

-continued

TTC TAT GAA ATC TTG AAC ATG CCT AAC TTG AAC
Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn

GAA GAA CAA CGC AAT GGT TTC ATC CAA AGC TTA
Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu

AAA GAT GAC CCA AGT CAA AGT GCT AAC CTT TTA
Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu

GCA GAA GCT AAA AAG TTA AAT GAA TCT CAA GCA
Ala Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala

CCG AAA GCT GAT AAC AAA TTC AAC AAA GAA CAA
Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln
←A—|—B→

CAA AAT GCT TTC TAT GAA ATC TTA CAT TTA CCT
Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro

AAC TTA AAT GAA GAA CAA CGC AAT GGT TTC ATC
Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile

CAA AGC TTA AAA GAT GAC CCA AGC CAA AGC GCT
Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala

AAC CTT TTA GCA GAA GCT AAA AAG CTA AAT GAT
Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Asp

GCA CAA GCA CCA AAA GCT GAC AAC AAA TTC AAC
Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn
←B—|—C→

AAA GAA CAA CAA AAT GCT TTC TAT GAA ATT TTA
Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu

CAT TTA CCT AAC TTA ACT GAA GAA CAA CGT AAC
His Leu Pro Asn Leu Thr Glu Glu Gln Arg Asn

GGC TTC ATC CAA AGC CTT AAA GAC GAT CCT TCA
Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser

GTG AGC AAA GAA ATT TTA GCA GAA GCT AAA AAG
Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys

CTA AAC GAT GCT CAA GCA CCA AAA GAG GAA GAC
Leu Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp
←C—|

AAC AAC AAG CCT GGT AAA GAA GAC GGC AAC AAA
Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys

CCT GGT AAA GAA GAC GGC AAC AAA CCT GGT AAA
Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys

GAA GAC AAC AAA AAC CTT GGC AAA GAA GAC GGC
Glu Asp Asn Lys Asn Leu Gly Lys Glu Asp Gly

AAC AAA CCT GGT AAA GAA GAC AAC AAA AAA CCT
Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro

GGC AAA GAA GAT GGC AAC AAA CCT GGT AAA GAA
Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu

GAC GGC AAC AAG CCT GGT AAA GAA GAT GGC AAC
Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn

AAA CCT GGT AAA GAA GAT GGC AAC AAG CCT GGT
Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly

AAA GAA GAT GGC AAC AAG CCT CGT AAA GAA GAC
Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp

GGC AAC GGA GTA CAT GTC GTT AAA CCT GGT GAT
Gly Asn Gly Val His Val Val Lys Pro Gly Asp

-continued

ACA GTA AAT GAC ATT GCA AAA GCA AAC GGC ACT
Thr Val Asn Asp Ile Ala Lys Ala Asn Gly Thr

ACT GCT GAC AAA ATT GCT GCA GAT AAC AAA TTA
Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys Leu

GCT GAT AAA AAC ATG ATC AAA CCT GGT CAA GAA
Ala Asp Lys Asn Met Ile Lys Pro Gly Gln Glu

CTT GTT GTT GAT AAG AAG CAA CCA GCA AAC CAT
Leu Val Val Asp Lys Lys Gln Pro Ala Asn His

GCA GAT GCT AAC AAA GCT CAA GCA TTA CCA GAA
Ala Asp Ala Asn Lys Ala Gln Ala Leu Pro Glu

ACT GGT GAA GAA AAT CCA TTC ATC GGT ACA ACT
Thr Gly Glu Glu Asn Pro Leu Ile Gly Thr Thr

GTA TTT GGT GGA TTA TCA TTA GCG TTA GGT GCA
Val Phe Gly Gly Leu Ser Leu Ala Leu Gly Ala

GCG TTA TTA GCT GGA CGT CGT CGC GAA CTA TAA
Ala Leu Leu Ala Gly Arg Arg Arg Glu Leu Stop

5,151,351

PROCESS FOR THE PRODUCTION OF 6-HYDROXYNICOTINIC ACID

Frans Hoeks, Naters, and Daniel Venetz, Brig, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Continuation of Ser. No. 629,673, Dec. 18, 1992. This application May 24, 1991, Ser. No. 705,659
Claims priority, application Switzerland, Dec. 20, 1989, 4555/89
Int. Cl.[5] C12P *17/12;* **C12R** *1/40, 1/025, 1/07*
U.S. Cl. 435—122 **4 Claims**

1. Process for the production of 6-hydroxynicotinic acid by microbiological hydroxylation of nicotinic acid under aerobic conditions, characterized in that nicotinic acid or a soluble salt of nicotinic acid or a solution containing nicotinic acid is added continuously or by portions to a starter culture of the microorganism, in that the microorganism is selected from the group consisting of *Achromobacter xylosoxydans* of strain DSM 2783, *Pseudomonas putida* of strain NCIB 10521 and *Pseudomonas putida* of strain NCIB 8176, and in that the nicotinic acid concentration in the culture during the period of addition is always greater than zero and at least remains substantially below the concentration, above which a growth inhibition of the microorganisms occurs, until the formed 6-hydroxynicotinic acid inhibits further growth, so that the multiplication of the microorganism and the formation of the 6-hydroxynicotinic acid take place in the same process step.

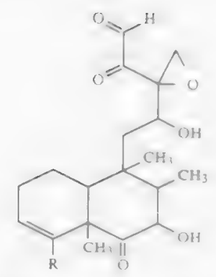
5,151,352

PROCESS FOR PRODUCING DITERPENE COMPOUNDS

Hirofumi Nakano, Tokyo; Shozo Kawada, Yamaguchi; Yoichi Uosaki; Yutaka Saito, both of Tokyo; Katsushige Gomi, and Toshiaki Iwazaki, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1991, Ser. No. 767,819
Claims priority, application Japan, Oct. 5, 1990, 2-267840
Int. Cl.[5] C12P *17/02, 1/04;* **C12R** *1/465*
U.S. Cl. 435—123 **2 Claims**

1. A process for producing a clerodane-type diterpene derivative represented by formula (I):



(I)

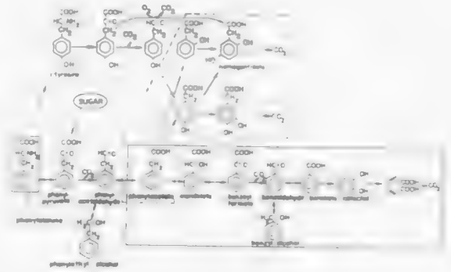
wherein R represents a $—CH_3$ or $—CH_2OH$ group; which process comprises culturing a microorganism belonging to the genus Streptomyces and capable of producing said clerodane diterpene derivative in a medium so as to accumulate said clerodane diterpene derivative in the culture and recovering the clerodane diterpene derivative from said culture.

5,151,353

PROCESS OF USING BACTERIA THAT METABOLIZE PHENYLACETATE THROUGH MANDELATE

Steven D. Geusz, Silver Spring, and David M. Anderson, Rockville, both of Md., assignors to ChemGen Corporation, Gaithersburg, Md.

Division of Ser. No. 140,108, Dec. 31, 1987, Pat. No. 4,999,292. This application Mar. 11, 1991, Ser. No. 667,661
Int. Cl.[5] C12P *39/00, 7/24;* **C12N** *9/88;* **C12R** *1/40*
U.S. Cl. 435—147 **4 Claims**



1. A process for the production of natural benzaldehyde comprising the steps of:

obtaining benzoylformate by a fermentation employing bacteria that can metabolize phenylacetate through a mandelate intermediate and that cannot metabolize benzoylformate,

converting the benzoylformate into benzaldehyde via action of bacterial benzoylformate decarboxylase to effect an accumulation of benzaldehyde, and recovering said benzaldehyde.

5,151,354

FERMENTATION PROCESSES USING AMYLOLYTIC ENZYME PRODUCING MICROORGANISMS

Alexander Strasser, Dusseldorf; Feodor B. Martens, HE Leiden; Jurgen Dohmes, Meerbusch, and Cornelius P. Hollenberg, Chopinstr 7, D-4000 Dusseldorf, all of Fed. Rep. of Germany, assignors to Cornelius Hollenberg, Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 85,107, Aug. 13, 1987, which is a continuation-in-part of Ser. No. 62,943, Jun. 16, 1987, abandoned. This application Aug. 21, 1991, Ser. No. 748,161

Claims priority, application European Pat. Off., Aug. 21, 1986, 86111586; Jul. 17, 1987, 87110370.1

Int. Cl.[5] C12P 7/06; C12N 1/19; C12C 11/00; A21D 8/04

U.S. Cl. 435—161 14 Claims

1. In a process for the production of ethanol, or of a fermented food or beverage, which comprises cultivating a Saccharomyces yeast culture in a suitable culture medium, the improvement comprising the use of a recombinant Saccharomyces yeast culture expressing a Schwanniomyces glucoamylase or alpha-amylase enzyme, said culture medium comprising fermentable material, at least a portion of which is fermentable by said Schwanniomyces enzyme but not by wild-type Saccharomyces amylolytic enzymes, under conditions favoring fermentation of said material.

5,151,355

PROCESS FOR THE PRODUCTION OF HIGH PURITY THROMBIN

Carmel Crowley, Dundrum; Timothy G. Sheehan, Ballincollig, and Frederick G. Ward, Kilpedder, all of Ireland, assignors to Warner Lambert Pottery Road Limited, Dun Laoghaire, Ireland

Filed Jan. 23, 1991, Ser. No. 644,800

Claims priority, application Ireland, Jan. 24, 1990, 266/90

Int. Cl.[5] C12N 9/74; A61K 37/547

U.S. Cl. 435—214 8 Claims

1. A process for the production of a liquid thrombin preparation, which process comprises reacting each unit of prothrombin measured as N.I.H. units of thrombin produced, with less than 5 units of thromboplastin, measured as N.I.H. units of thrombin produced, in the presence of calcium to produce thrombin contacting the resultant thrombin with a phosphate buffer to produce a suspension diluting and filtering the suspension to produce a filtrate applying the filtrate sequentially to an anion-exchange agarose column and a cation-exchange agarose column and step-wise eluting a thrombin fraction from the cation-exchange column with phosphate buffered saline.

5,151,356

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kei Sakanoue, and Tsumoru Hirano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

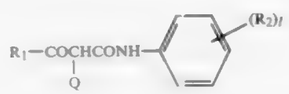
Continuation of Ser. No. 95,720, Sep. 14, 1987, abandoned. This application Mar. 8, 1990, Ser. No. 492,375

Claims priority, application Japan, Sep. 12, 1986, 61-215255

Int. Cl.[5] G03C 7/36, 7/26

U.S. Cl. 430—548 15 Claims

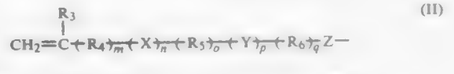
1. A silver halide color photographic material dye comprising a support having provided thereon at least one water-soluble yellow dye-forming polymer coupler which produces, upon coupling with the oxidation product of a color developing agent, a dye containing a repeating unit derived from at least one monomer represented by formula (I)



(I)

wherein

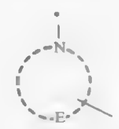
R_1 represents an alkyl group or an aryl group;
R_2 represents a monovalent group;
Q represents a group represented by formula (II)



(II)

wherein R_3 represents a hydrogen atom or an alkyl group; R_4, R_5, and R_6 each may be the same or different, and represents an alkylene group having from 1 to 20 carbon atoms, an arylene group having from 1 to 20 carbon atoms, or an aralkylene group having from 1 to 20 carbon atoms; X represents —CONH—, —NHCO—, —NHCONH—, —CCO—, —OCO—, —SO_2—, —S—, —CO—, —SO—, or —O—; Y represents —CONH—, —NHCO—, —NHCONH—, —COO—, —OCO—, —SO_2NH—, —NHSO_2—, or —SO_2—; m, n, o, p, and q each may be the same or different, and represent 0 or 1; and Z represents a coupling-off group represented by formula (III) or (IV)

(III)



(IV)

wherein * represents a position to be bound to the active site of said coupler; A represents an oxygen atom or a sulfur atom; B represents a non-metallic atomic group necessary for forming an aryl ring or a heterocyclic ring; and E represents a non-metallic atomic group necessary for forming a 5- or 6-membered heterocyclic ring together with the nitrogen atom; whereby said material is developable by a wet process.

5,151,357

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tomoyuki Koide; Naoto Matsuda; Koki Nakamura, and Tetsuro Kojima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

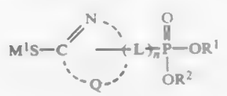
Filed Oct. 31, 1990, Ser. No. 606,279

Claims priority, application Japan, Nov. 1, 1989, 1-285154; Nov. 1, 1989, 1-285155

Int. Cl.[5] G03C 1/34

U.S. Cl. 430—610 9 Claims

1. A heat-developable silver halide photographic material, comprising a light-sensitive emulsion layer or other hydrophilic colloid layer containing a compound represented by formula (I);



(I)

wherein Q represents a nonmetallic atomic group required to be connected to carbon atom and nitrogen atom to form a monocyclic or condensed heterocyclic ring therewith; L represents a divalent group selected from the group consisting of an alkylene group, an arylene group and a heteroarylene group, each of which may be substituted, and each of which may be alone or in combination with another divalent group

selected from the group consisting of an ether bond, thioether bond, urethane bond, urea bond, ester bond, amide bond, sulfonamide bond, thiourea bond and carboxylic ester bond; n represents an integer of 0 to 2; M^1 represents a hydrogen atom, ammonium ion or metallic ion; and R^1 and R^2 each represents a hydrogen atom, alkyl group, ammonium ion or metallic ion and may be the same or different or may be connected to each other to form a 5- or 6-membered ring.

5,151,358

PROCESSES FOR THE RECOVERY OF NATURALLY PRODUCED CHYMOSIN

Henry G. Heinsohn, Pacifica; Jeffrey D. Lorch; Kirk J. Hayenga, both of San Mateo, and Raymond E. Arnold, San Francisco, all of Calif., assignors to Genencor International, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 365,937, Jun. 13, 1989. This application Jun. 13, 1990, Ser. No. 537,461

Int. Cl.[5] C12N 9/64

U.S. Cl. 435—226 28 Claims

1. A method for recovering and purifying chymosin from an aqueous solution which contains chymosin obtained from natural sources and which additionally contains pepsin and other contaminants which method comprises:

a) adding to the aqueous solution an effective amount of polyethylene glycol (PEG) and an inorganic salt so as to form a two phase system;

b) allowing the aqueous solution-polyethylene glycol-inorganic salt mixture to separate into a chymosin and pepsin-rich polyethylene glycol phase and a chymosin and pepsin-poor salt phase;

c) recovering the chymosin and pepsin-rich polyethylene glycol phase,

d) contacting the chymosin and pepsin-rich polyethylene glycol phase with an ion exchange resin under conditions wherein the chymosin binds to the resin and the polyethylene glycol and pepsin pass through the resin; and

e) recovering the chymosin from the resin.

5,151,359

METHOD FOR PRODUCING OF HUMAN TISSUE TYPE PLASMINOGEN ACTIVATOR

Shyoichiro Miyahara; Maki Suzuki, both of Yokohama; Atsunori Shindo, Kamakura; Nobumi Kusuhara, Yokohama, and Nobuyoshi Makiguchi, Fujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,649

Claims priority, application Japan, May 19, 1988, 63-122644; Dec. 16, 1988, 63-316118

Int. Cl.[5] C12N 9/64, 9/48, 9/72, 9/68

U.S. Cl. 435—226 6 Claims

1. A method of producing predominantly single-chain human tissue type plasminogen activator with only minor amounts of double-chain human tissue type plasminogen activator, said method comprising culturing human tissue type plasminogen activator-producing cells in a cell culture medium supplemented with p-aminomethyl benzoic acid or a derivative thereof, so that the p-aminomethyl benzoic acid or its derivative directly inhibits the conversion of single-chain t-PA into double-chain t-PA, whereby t-PA is produced predominantly as single-chain t-PA in parallel with the growth of the cells.

5,151,360

EFFECT OF N,N,N-TRIMETHYLSPHINGOSINE ON PROTEIN KINASE-C ACTIVITY, MELANOMA CELL GROWTH IN VITRO, METASTATIC POTENTIAL IN VIVO AND HUMAN PLATELET AGGREGATION

Kazuko Handa; Yasuyuki Igarashi; Mahammad N. Ahmad, all of Seattle, and Sen-Itiroh Hakomori, Mercer Island, all of Wash., assignors to Biomembrane Institute, Seattle, Wash.

Continuation-in-part of Ser. No. 636,353, Dec. 31, 1990. This application Jul. 2, 1991, Ser. No. 724,625

Int. Cl.[5] C12N 5/00

U.S. Cl. 435—240.2 6 Claims

1. A method of modulating intercellular contact comprising exposing cells to a biologically effective amount of N,N-dimethylsphingosine or N,N,N-trimethylsphingosine wherein said biologically effective amount is an amount that inhibits the expression or function of a cell adhesion molecule.

5,151,361

HOST CELLS EXPRESSING GIBBON APE LEUKEMIA VIRUS RECEPTOR

Bryan M. O'Hara, Pearl River, N.Y., assignor to American Cyanamid Company, Wayne, N.J.

Continuation of Ser. No. 398,351, Aug. 24, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 675,129

Int. Cl.[5] C12N 5/06, 5/10; C07K 13/00

U.S. Cl. 435—240.2 2 Claims

1. A non-human mammalian or yeast host cell expressing a human GALV receptor protein.

5,151,362

APPARATUS CONTAINING A SEPTUM WHICH IMPEDES CELL PERMEATION FOR CELL CULTURE AND METHOD OF USE

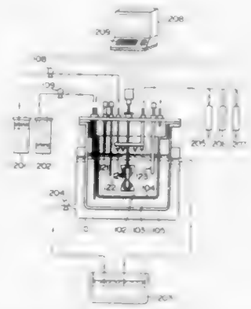
Hideo Kawaguchi, Hachioji; Kouji Takeuchi, Nagareyama; Tadashi Ishibashi, Kumagaya; Norio Shimizu, Sayama, and Yoji Odawara, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1990, Ser. No. 505,326

Claims priority, application Japan, Aug. 25, 1989, 1-217338

Int. Cl.[5] C12N 5/02; C12M 3/02, 1/12

U.S. Cl. 435—240.25 15 Claims



1. A method of culturing cells suspended in a liquid medium comprising the steps of:

placing cells to be cultured which are suspended in the liquid medium in a first zone;

continuously supplying the liquid medium to said first zone;

providing a second zone which is separated from said first zone by a septum which has pores having the size that allows the cultured cells and the liquid medium to permeate therethrough from said first zone to said second zone, but resist against the cells passing freely therethrough;

continuously withdrawing from said second zone, the liquid medium that has passed through said pores of said septum

from said first zone to said second zone to proliferate cell growth in said first zone; and

controlling the flow rate of liquid medium supplied to said first zone to control the number of cells passing through said pores of said septum from said first zone in said second zone, so that the number of cells passing through from said first zone to said second zone does not exceed the number of cells increased by cell growth in said first zone.

5,151,363

ISOLATES OF *BACILLUS THURINGIENSIS* THAT ARE ACTIVE AGAINST NEMATODES

Jewel M. Payne, San Diego, Calif., assignor to Mycogen Corporation, San Diego, Calif.

Filed Jul. 27, 1990, Ser. No. 558,738

Int. Cl.[5] C12N *1/20*; A01N *63/00*

U.S. Cl. 435—252.5 **9 Claims**

1. A biologically pure culture selected from the group consisting of *Bacillus thuringiensis* strain PS80JJ1, having an accession number NRRL B-18679; *Bacillus thuringiensis* strain PS158D5, having an accession number NRRL B-18680; *Bacillus thuringiensis* strain PS167P, having an accession number NRRL B-18681; *Bacillus thuringiensis* strain PS169E, having an accession number NRRL B-18682; *Bacillus thuringiensis* strain PS177F1, having an accession number NRRL B-18683; *Bacillus thuringiensis* strain PS177G, having an accession number NRRL B-18684; *Bacillus thuringiensis* strain PS204G4, having an accession number NRRL B-18685; and *Bacillus thuringiensis* strain PS204G6, having an accession number NRRL B-18686.

5,151,364

EXPRESSION VECTORS CONTAINING LAMBDAPL PROMOTER, T_1T_2 RRNA TERMINATION SEQUENCE, AND ORIGIN OF REPLICATION DERIVED FROM A CONSTITUTIVE HIGH COPY NUMBER PLASMID, AND HOSTS CONTAINING THE PLASMIDS

Avigdor Levanon, Netanya; Amos B. Oppenheim, and Hilla Locker-Giladi, both of Jerusalem, all of Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 220,781, Jul. 18, 1988, Pat. No. 5,081,020, which is a continuation of Ser. No. 645,119, Aug. 27, 1984, abandoned. This application Jan. 14, 1992, Ser. No. 822,054

Int. Cl.[5] C12N *15/70*; *15/73*, *1/21*

U.S. Cl. 435—252.33 **14 Claims**

14. A host plasmid system for production of a bovine growth hormone polypeptide analog selected from the group of analogs consisting of an analog having the amino acids methionine, aspartic acid and glutamine attached to the N-terminus of the naturally-occurring polypeptide or the analog having the amino acid methionine attached to the N-terminus of the phenylalanine form of the naturally-occurring polypeptide, said analog having substantially the same biological activity as the naturally-occurring polypeptide, comprising a plasmid for the production of a polypeptide analog of animal growth hormone, the analog having substantially the same biological activity as the naturally-occurring polypeptide, which upon introduction into a suitable *Escherichia coli* host cell containing the thermolabile repressor cI renders the host cell capable, upon increasing the temperature of the *Escherichia coli* host cell to a temperature at which the repressor is inactivated, of effecting expression of DNA encoding the animal growth hormone polypeptide analog comprising:

a double-stranded DNA molecule which includes in the 5' to 3' order the following:

a DNA sequence which contains the promoter and operator $P_L O_L$ from lambda bacteriophage;

a Nut_L N utilization site;

a unique EcoRI restriction site;

a DNA sequence containing the mutant cII ribosomal binding site from lambda bacteriophage having the sequence:

TAAGGAAGTACTTACAT
ATTCCTTCATGAATGTA;

an ATG initiation codon;

DNA encoding the animal growth hormone polypeptide analog;

a DNA sequence which contains a T_1 T_2 rRNA transcription termination sequence;

and which additionally includes a DNA sequence which contains an origin of replication from the bacterial plasmid pOP 1Δ6 capable of autonomous replication in the host cell and production of 200–300 constitutive copies of the vector and either a DNA sequence which contains a gene associated with a selectable or identifiable phenotypic trait which is manifested when the plasmid is present in the host cell or a DNA sequence which contains the fragment designated cI^{434}, such fragment including the gene for the cI^{434} repressor protein and its associated promoter and operator sequence, the distance between the 3' end of the $P_L O_L$ promoter and operator sequence and the 5' end of the N utilization site being less than about 80 base pairs and the distance between the 3' end of the N utilization site and the 5' end of the ribosomal binding site being less than about 300 base pairs in a suitable *Escherichia coli* host.

5,151,365

CULTURE OF *ASPERGILLUS VERSICOLOR* AND MUTANTS THEREOF

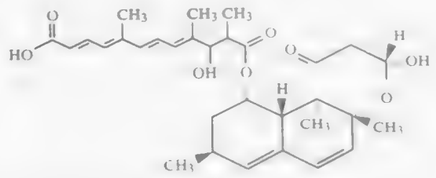
Anne W. Dombrowski, East Brunswick, and Lawrence Koupal, Colonia, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 18, 1991, Ser. No. 670,639

Int. Cl.[5] C12R *1/66*; C12P *12/06*

U.S. Cl. 435—254 **1 Claim**

1. A biologically pure culture of *Aspergillus versicolor* MF2664 (ATCC 74035), or active mutants of *Aspergillus versicolor* MF2664 (ATCC 74035) having essentially the characteristics of *Aspergillus versicolor* MF2664 (ATCC 74035) that are capable of producing a compound of structure:



in recoverable amounts.

5,151,366

CELL CULTURE FLASK

Jonathan M. Serkes, Oak View, and Richard C. St. Pierre, Thousand Oaks, both of Calif., assignors to Invitro Scientific Products, Inc., Ventura, Calif.

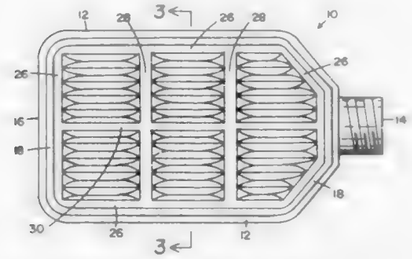
Filed May 24, 1991, Ser. No. 705,564

Int. Cl.[5] C12M *3/04*, *1/24*

U.S. Cl. 435—285 **19 Claims**

1. In a stackable, generally rectangular, cell culture flask having a top wall and a bottom wall connected to side walls and end walls, one of said end walls including a neck and closure, the improvement comprising:

said bottom wall comprising an extended surface area and having an interior surface capable of attachment and confluent growth of animal cells, said bottom wall containing a plurality of parallel, non-horizontal folds and at least one flat viewing panel disposed adjacent to said folds and said folds comprising a majority of the interior surface



of said bottom wall whereby the surface area for cell growth of said bottom wall is significantly increased.

5,151,367

DETECTOR FOR ENZYMATICALLY DETERMINING GAS SAMPLES

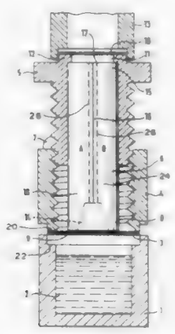
Klaus-Peter Rindt, and Stephan Scholtissek, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 577,540

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929541

Int. Cl.[5] G01N *21/75*

U.S. Cl. 435—288 **23 Claims**



1. A detector for enzymatically determining a component in a gas or aerosol sample, the detector comprising:

an aqueous reagent solution;

a supply vessel defining an interior for holding said aqueous reagent solution;

a holder having a first opening;

a filler for receiving a reagent and an enzyme;

said enzyme being contained in at least one of said solution and said filler;

said filler being disposed in said holder so as to be in tight contact engagement therewith, said filler having an upper portion defining an upper end face and a lower portion extending outwardly from said first opening;

said holder having a second opening facing away from said first opening and communicating with said filler for permitting the component to be enzymatically detected to reach said upper end face of said upper portion;

water-impermeable and penetrable membrane means for closing off said supply vessel and said reagent solution until said detector is ready for use;

said membrane means being mounted between said lower portion of said filler and said supply vessel;

displacement means for facilitating an advance of said filler from a first position wherein said filler is outside of said interior and a second position wherein said filler is moved into said interior to permit only said lower portion of said filler to be dipped into said solution thereby permitting said upper end face to remain exposed to the component to be detected;

penetrating means for penetrating said membrane as said filler is advanced from said first position to said second position to allow said filler to enter said interior; and,

said filler being porous to facilitate the liquid transport of said solution into and along said filler thereby bringing the reagent and enzyme to said upper end face where the enzyme enters into a reaction with the component to be detected acting as a substrate to the enzyme, and to build up a compound which reacts with the reagent to generate a color indication at said end face indicative of the concentration of the component in the sample.

5,151,368

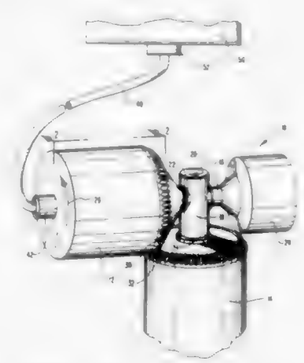
DUAL AXIS, CONTINUOUS FLOW BIOREACTOR APPARATUS

Owen D. Brimhall, South Jordan; Gail A. Bowers-Irons, and Joseph K. Weeks, Jr., both of Salt Lake City, all of Utah, assignors to Technical Research Associates, Inc., Salt Lake City, Utah

Filed Jan. 11, 1991, Ser. No. 639,966

Int. Cl.[5] C12M *1/10*

U.S. Cl. 435—312 **14 Claims**



1. A dual axis bioreactor system comprising:

a bioreactor vessel rotatably mounted on a horizontal axis with said horizontal axis being rotatably mounted to a rotatable vertical shaft so as to move said bioreactor vessel in a circular path about said vertical shaft while simultaneously rotating said bioreactor vessel about said horizontal axis;

interlock means between said horizontal axis and said vertical shaft so as to exactly limit one rotation of said bioreactor vessel about said horizontal axis for each traverse of said bioreactor vessel through said circular path about said vertical shaft;

conduit means for providing fluid communication with said bioreactor vessel, said conduit means comprising a flexible, multilumen conduit fixed to said bioreactor vessel at said horizontal axis of said bioreactor vessel and at a position opposite said vertical shaft; and

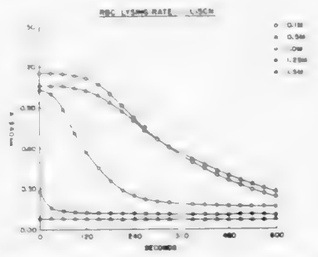
control means for limiting the rate of rotation of said vertical shaft to encourage internal mixing inside said bioreactor vessel, said internal mixing occurring preferentially over any centrifugal effects on said bioreactor vessel.

5,151,369

LITHIUM SALTS AS RED BLOOD CELL LYSING AND HEMOGLOBIN DENATURING REAGENTS

Lynette A. Lewis, Goshen, and M. Teresa Yip, Elkhart, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 379,582, Jul. 13, 1989, abandoned. This application May 14, 1990, Ser. No. 522,835
Int. Cl.[5] G01N *33/72, 33/50*
U.S. Cl. 436—67 6 Claims



1. In an analytical method for determining a particular hemoglobin derivative in a blood sample, wherein (a) the blood sample is treated with a lysing/denaturing reagent comprising (i) a salt form of an anion that is capable of lysing erythrocytes and denaturing said hemoglobin derivative and (ii) an oxidant capable of converting hemoglobin to the met-hemoglobin form, and (b) the resulting mixture is assayed by immunoassay for the amount of the denatured form of said hemoglobin derivative present therein,

the improvement which comprises employing a lithium salt form of said anion that is capable of lysing erythrocytes and denaturing said hemoglobin derivative, said lithium salt being present in said resulting mixture at a concentration of between about 1.0 and about 1.5 molar, whereby the erythrocyte lysis and denaturation of said hemoglobin derivative is accomplished in less than about one minute without interfering significantly with the immunoassay step.

5,151,370

REAGENT AND METHOD FOR SERUM IRON ASSAY

Jerry W. Denney, Lachine, Canada, assignor to Synermed, Inc., Quebec, Canada

Filed Oct. 11, 1990, Ser. No. 596,942
Int. Cl.[5] G01N *33/52*
U.S. Cl. 436—74 14 Claims

1. A method for the assay of iron in lipemic serum or heparinized plasma, comprising the steps of:

a. preparing a test sample by adding a first serum sample or heparinized plasma sample to the reagent comprising:

(1) a chromogen selected from the group consisting of chromazurol B, chromazurol S, and alkali metal, alkaline earth metal, rubidium, or ammonium salts thereof;

(2) a complexing surfactant selected from the group consisting of alkylammonium halides and polyhydroxyalkylene ethers;

(3) a buffer that will not complex iron and will provide a pH of from about 4.5 to about 5.5; and

(4) dimethylsulfoxide in an amount sufficient to solubilize the chromogen, eliminate protein interference in serum or heparinized plasma, and achieve an incubation time in the assay of from about 3 minutes to about 10 minutes;

b. preparing a test blank by adding iron-free water to said reagent;

c. preparing a test standard by adding an iron standard of known iron concentration to said reagent;

d. preparing a serum blank or heparinized plasma blank without masking reagent by adding a second serum sample or heparinized plasma sample to iron-free water;

e. incubating the test sample, the test blank, the test standard, and the serum blank or heparinized plasma blank without masking reagent at about 37° C. for at least about three minutes;

f. spectrophotometrically measuring absorbances (A) of the test sample, the rest blank, the test standard, and the serum blank or heparinized plasma blank without masking reagent; and

g. calculating the concentration of iron in the test sample by the equation

$$\frac{A_{test\ sample} - (A_{test\ blank} + A_{serum\ blank\ or\ plasma\ blank})}{A_{test\ standard} - A_{test\ blank}}$$

known concentration of iron in the test standard = concentration of iron in the test sample.

5,151,371

METHOD AND SCAVENGER GAS FOR THE ANALYSIS OF OXYGEN-CONTAINING COMPONENTS USING ATOMIC EMISSION SPECTROMETRY

Bruce D. Quimby, Landenberg, Pa., and James J. Sullivan, Newark, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 64,041, Jun. 18, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 394,316
Int. Cl.[5] G01N *21/73*
U.S. Cl. 436—127 25 Claims

1. In a method of an oxygen-containing compound in a sample comprising the steps of (i) introducing a mixture of the sample, an inert carrier gas therefor, and a reagent gas into an atomic emission spectrometer having plasma-excitation means, (ii) forming a plasma from said mixture, and (iii) detecting at least one oxygen-related optical emission generated thereby, wherein the improvement comprises introducing a controlled amount of a carbon-containing gas into said mixture prior to introducing said mixture into said spectrometer.

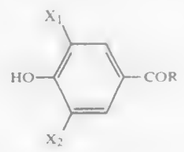
5,151,372

METHOD FOR DETERMINATION OF HYDROXYACETOPHENONE DERIVATIVES

Katsumasa Kuroiwa; Katsuhiro Katayama; Toshihide Miura, all of Koriyama, and Takeshi Nagasawa, Urawa, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Feb. 22, 1990, Ser. No. 483,903
Claims priority, application Japan, Mar. 8, 1989, 1-055696
Int. Cl.[5] G01N *21/00, 31/00, 33/00*
U.S. Cl. 436—164 6 Claims

1. A method for the determination of a hydroxyacetophenone derivative which comprises measuring a UV absorbance of said derivative, in association with a protein, said derivative represented by formula (I):



(I)

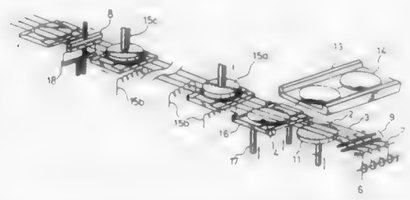
wherein R represents $-(CH_2)_nCH_3$ (n=0 to 3); and X_1 and X_2 independently represents a halogen atom or hydrogen atom.

5,151,373

METHOD OF MAKING A SOLAR CELL ELECTRODE

Mikio Deguchi; Takashi Itagaki, and Masaaki Umi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 482,712, Feb. 21, 1990, Pat. No. 5,084,107.
This application Sep. 23, 1991, Ser. No. 764,363
Claims priority, application Japan, Jun. 5, 1989, 1-142480
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—2 4 Claims



1. A method of making a solar cell electrode comprising:

applying an uncured electrically conductive adhesive to a portion of a metal wire by contacting the metal wire with a predetermined thickness of the adhesive spread on a substrate;

pressing the metal wire toward the light incident surface of the solar cell with the uncured electrically conductive adhesive between and contacting the metal wire and the light incident surface of the solar cell; and

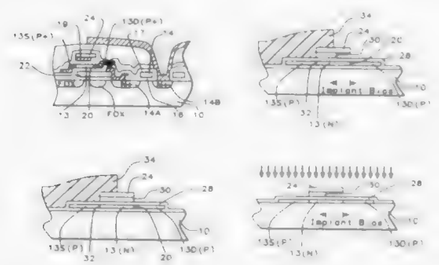
while pressing the metal wire toward the light incident surface, curing the conductive adhesive, thereby bonding the metal wire to the light incident surface of the solar cell.

5,151,374

METHOD OF FORMING A THIN FILM FIELD EFFECT TRANSISTOR HAVING A DRAIN CHANNEL JUNCTION THAT IS SPACED FROM THE GATE ELECTRODE

Neng-Wei Wu, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jul. 24, 1991, Ser. No. 735,086
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 19 Claims



1. A method of forming a thin film field effect transistor having a drain-channel P-N junction that is distanced from a gate electrode comprising:

depositing a first thin polycrystalline silicon layer doped with a first type impurity for semiconductors over a first thin insulating layer on a monocrystalline silicon substrate;

depositing a second thin insulating layer over the surface of said first polycrystalline silicon layer;

forming a second polycrystalline silicon layer over at least said second insulating layer; depositing a third insulating layer over said second polycrystalline silicon layer;

removing portions of said second polycrystalline silicon layer and overlying third insulating layer, leaving a gate area portion over a portion of the first polycrystalline silicon layer, the edges of the remaining portion of said second polycrystalline silicon layer being exposed;

introducing second opposite type impurity ions into said first polycrystalline layer by ion bombardment to form source and drain regions therein, the remaining gate electrode area portion of said second polycrystalline silicon layer and said third overlying insulating layer forming a mask thereby preventing ions from penetrating the underlying area of said first polysilicon layer to form a channel region positioned between said source and drain regions and defined by the drain channel P-N junction and the source channel P-N junction;

forming a masking layer that covers at least a portion of the edge of the second polycrystalline silicon layer over the source-channel P-N junction in said first polycrystalline silicon layer;

etching back the exposed edge portion of said second polycrystalline silicon layer above the drain-channel P-N junction in said first polycrystalline silicon 5 layer; and

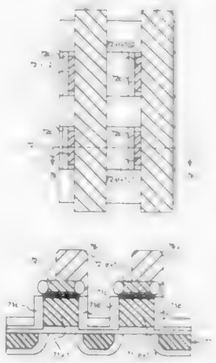
removing said masking layer and forming an overlying insulating layer over the surface of the resultant device.

5,151,375

EPROM VIRTUAL GROUND ARRAY

Reza Kazerounian, Alameda; Boaz Eitan, Sunnyvale, and Rustom F. Irani, Santa Clara, all of Calif., assignors to Waferscale Integration, Inc., Fremont, Calif.

Filed Jun. 13, 1990, Ser. No. 537,553
Int. Cl.[5] H01L *21/285, 21/76*
U.S. Cl. 437—43 8 Claims



7. The method of manufacturing a floating gate transistor in an array of such floating gate transistors comprising:

forming a gate oxide on a semiconductor substrate;

forming in a first direction on said gate oxide a plurality of strips of material, each strip comprising a conductive material covered by a selected dielectric covered by a conductive cap;

forming an insulating material on the sides of the conductive portions of said plurality of strips;

removing portions of the strips to form islands, each island comprising a conductive material covered by a selected dielectric covered by a conductive cap;

forming an insulating material on the conductive portions of the sides exposed by the removal of portions of the strips; and

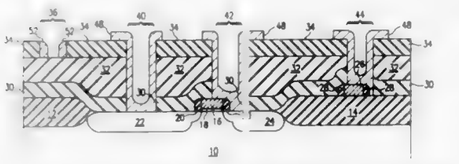
forming over the tops of said islands a multiplicity of conductive strips.

5,151,376

METHOD OF MAKING POLYCRYSTALLINE SILICON RESISTORS FOR INTEGRATED CIRCUITS

Charles R. Spinner, III, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed May 31, 1990, Ser. No. 531,012
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—47 15 Claims



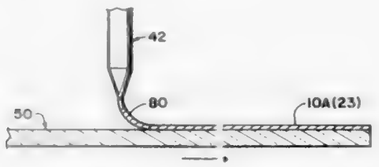
1. A method for fabricating a resistor structure between first and second laterally spaced regions in an integrated circuit device, comprising the steps of:
forming a first insulating layer over the device;
patterning the first insulating layer to define an elongate region between the first and second laterally spaced regions for formation of the resistor structure;
forming a second insulating layer over the device;
anisotropically etching the second insulating layer, leaving insulating sidewalls in the elongate region, wherein a narrowed region is defined;
depositing a layer of polycrystalline silicon over the device; and
anistropically etching the polycrystalline silicon layer, wherein polycrystalline silicon remains in the narrowed region to form the resistor structure connecting the first and second laterally spaced regions.

5,151,377

METHOD FOR FORMING CONTACTS

Jack I. Hanoka, Brookline, and Scott E. Danielson, Stoneham, both of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Mar. 7, 1991, Ser. No. 666,334
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—2 10 Claims



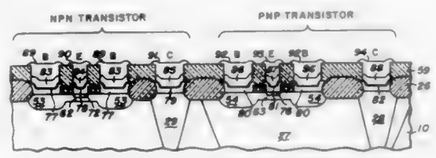
1. A method of forming a thick film in a predetermined circuit pattern on a substrate by depositing a viscous conductive ink thereon by means of a dispensing pen having a discharge orifice, said method comprising the following steps:
(a) disposing the pen so that its discharge orifice is directed downward;
(b) positioning a solar cell blank so that one surface thereof is located in a horizontal plane that is spaced from said discharge orifice by an amount exceeding the desired thickness of said thick film;
(c) dispensing a viscous conductive metal-containing ink onto said solar cell blank via said discharge orifice; and
(d) selectively providing relative movement between said solar cell blank and said pen in at least one horizontal direction so as to cause said ink to be deposited onto said solar cell blank as a thick film in a predetermined pattern;
said pen being disposed at a fixed height above said solar cell blank as steps (c) and (d) are being performed, said fixed height being sufficiently in excess of the thickness of the ink deposited on said solar cell blank so that the discharge orifice of the pen does not ride on the deposited thick film.

5,151,378

SELF-ALIGNED PLANAR MONOLITHIC INTEGRATED CIRCUIT VERTICAL TRANSISTOR PROCESS

Amolak R. Ramde, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 716,890, Jun. 18, 1991. This application Mar. 31, 1992, Ser. No. 861,404
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 2 Claims



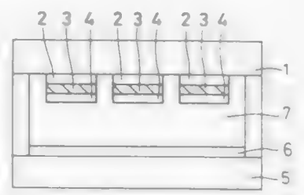
1. A process for simultaneously producing self-aligned NPN and PNP transistors, each one having a collector region, an emitter region, an extrinsic base region, an intrinsic base region and a link base region connecting said extrinsic and intrinsic base regions, said process comprising the steps:
starting with an epitaxially deposited N type semiconductor substrate wafer;
covering said substrate wafer surface with a relatively thin pad oxide;
applying an ion implant mask having openings that define where a PNP transistor will be located;
ion implanting aluminum at a dose that will provide a suitable PNP transistor collector resistivity;
applying an ion implant mask having openings that are located at the edge of said aluminum implant where a PNP transistor collector region sinker contact will be created;
ion implanting a relatively heavy dose of boron that will provide a suitable PNP transistor collector contact sinker;
applying an ion implant mask having openings that are located where an NPN transistor collector sinker contact is to be located;
ion implanting a relatively heavy dose of phosphorous that will provide a suitable NPN collector region sinker contact;
covering said substrate wafer with an oxidation resistant layer of silicon nitride;
applying an etch resist mask that covers said substrate wafer where said collector contact sinkers and the active regions of said transistors are to be located;
etching said silicon nitride away except where it is covered by said etch resist mask;
heating said substrate wafer in an oxidizing atmosphere to diffuse the previously ion implanted aluminum, boron and phosphorous into said substrate wafer and at the same time to grow a relatively thick field oxide on said substrate wafer except where it is covered with silicon nitride, thereby to create an aluminum doped P well surrounded by a field oxide, a boron doped PNP transistor collector sinker contact surrounded by a field oxide, a phosphorous doped NPN transistor collector region sinker contact surrounded by a field oxide and a region of epitaxial semiconductor where an NPN transistor will be located surrounded by a field oxide;
removing said silicon nitride in a selective etch thereby exposing said pad oxide where the PNP and NPN transistors are to be created;
applying an etch-resist mask that covers said pad oxide in the regions where transistor link base regions are to be located;
etching away the thus exposed pad oxide to remove it and thereby expose the surface of said substrate wafer except in transistor link base regions;
covering said substrate wafer with a layer of undoped polysilicon;
applying an ion-implant mask having openings that span the PNP transistor extrinsic base and NPN transistor collector sinker regions;
ion implanting a relatively heavy dose of phosphorous into the exposed polysilicon so that it becomes heavily phosphorous doped;
applying an ion-implant mask having openings that span the NPN transistor extrinsic base and PNP transistor collector sinker regions;
ion implanting a relatively heavy dose of boron into the exposed polysilicon so that it becomes heavily boron doped;
applying an etch-resist mask contoured to cover the NPN and PNP transistor emitter regions, extrinsic base regions and collector sinker regions;
etching away the thus exposed polysilicon so as to leave undoped polysilicon emitter contacts, along with heavily doped polysilicon extrinsic base and collector sinker diffusion contacts;
heating said wafer to diffuse the phosphorous and boron in the polysilicon into said substrate wafer to create transistor extrinsic bases and collector sinker diffusion contact caps;
applying an ion implant mask having openings that span the PNP transistor locations;
ion implanting phosphorous to a dose that will provide the desired PNP transistor intrinsic base region resistivity;
applying an ion implant mask having openings that span the NPN transistor locations;
ion implanting boron to a dose that will provide the desired NPN transistor intrinsic base resistivity;
heating said substrate wafer atmosphere to diffuse the previously ion-implanted intrinsic base phosphorous and boron to the desired depth in the silicon wafer substrate;
applying an ion-implant mask having openings located over the NPN transistor emitter region and its collector sinker diffusion and the PNP transistor extrinsic base region;
ion implanting a very heavy dose of arsenic thereby to heavily dope the thus exposed polysilicon;
covering said substrate wafer with a layer of oxide film and heating said wafer in a phosphorous oxychloride to convert the surface of said oxide to a low temperature glass and to reflow said glass film and to diffuse said arsenic, previously applied, into said NPN transistor emitter and collector contact sinker diffusion regions and into said PNP transistor extrinsic base regions;
applying an ion-implant mask having openings located over said PNP transistor emitter and collector sinker diffusion regions and the NPN transistor extrinsic base region;
ion implanting a very heavy dose of boron into the thus exposed polysilicon thereby to heavily dope it with boron and
heating said substrate wafer to activate the previously applied boron to provide the PNP transistor emitter, collector sinker diffusion cap regions and the NPN transistor extrinsic base regions.

5,151,379

METHOD FOR MANUFACTURING A COLOR FILTER

Mitsuru Suginoya; Hitoshi Kamamori, and Takakazu Fukuchi, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Feb. 24, 1992, Ser. No. 840,336
Claims priority, application Japan, Feb. 26, 1991, 3-31071
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—39 6 Claims



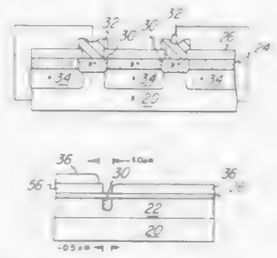
1. A method for manufacturing a color filter comprising the steps of:
forming a color filter made of an organic polymer on a substrate; and
forming a transparent conductive film on the color filter by a high-frequency ion plating method, wherein the transparent conductive film is deposited from an evaporated material which is ionized by a high-frequency glow discharge and accelerated by a DC electric field in a low pressure chamber.

5,151,380

METHOD OF MAKING TOP BUSS VIRTUAL PHASE FRAME INTERLINE TRANSFER CCD IMAGE SENSOR

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 19, 1991, Ser. No. 747,036
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—53 9 Claims



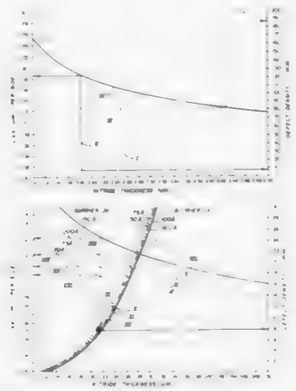
1. A method for fabricating a virtual phase image sensor comprising the steps of:
forming a semiconductor substrate of a first conductivity type;
forming a buried channel region of a second conductivity type in said substrate;
forming a virtual gate of said first conductivity type at a surface of said buried channel region;
implanting at least one channel stop region of said first conductivity type in said virtual gate, said at least one channel stop region contacting said buried channel; and
forming at least one conductive contact on an upper surface of said at least one channel stop wherein said at least one conductive contact is additionally coupled to said substrate.

5,151,381

METHOD FOR LOCAL OXIDATION OF SILICON EMPLOYING TWO OXIDATION STEPS

Yowjuang B. Liu, San Jose; Steven V. Longcor, Mountain View, and Jih-Chang Lein, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 15, 1989, Ser. No. 437,023
Int. Cl.[5] H01C 21/76
U.S. Cl. 437—69 20 Claims



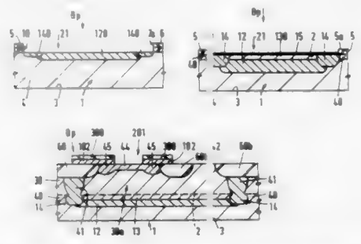
1. A method of forming field oxide regions in a semiconductor substrate, comprising the steps of:
(a) providing a barrier oxide layer overlying the substrate;
(b) providing a non-oxidizable masking layer overlying portions of the barrier oxide layer corresponding to active regions;
(c) oxidizing the substrate in a dry oxygen environment at a temperature less than 1,050° C. after said step (b); and
(d) oxidizing the substrate in a dry oxygen environment including HCl at a temperature greater than 1,050° C. after said step (c).

5,151,382

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY MASKLESS PN JUNCTION ISOLATION MEANS

Wilhelmus J. M. J. Josquin, Eindhoven; Wilhelmus C. M. Peters, Nijmegen, and Albertus T. M. Van De Goor, Eindhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 17, 1991, Ser. No. 761,098
Claims priority, application United Kingdom, Sep. 19, 1990, 9020434
Int. Cl.[5] H01I 21/76
U.S. Cl. 437—74 10 Claims



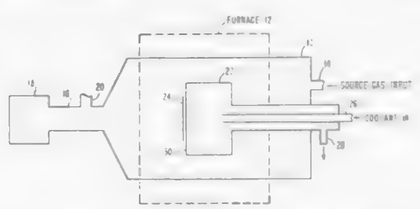
1. A method of manufacturing a semiconductor device, which method comprises providing a semiconductor body having a first region of one conductivity type adjacent one major surface, providing an insulating layer on the one major surface, using masking means to form windows in the insulating layer over first and second areas of the one major surface, introducing impurities to form a relatively highly doped region of the opposite conductivity type adjacent the first area and a relatively lowly doped region of the opposite conductivity type adjacent the second area, and introducing impurities of the one conductivity type for forming a region of the one conductivity type within the relatively lowly doped region of the opposite conductivity type, characterised by exposing the surface of the insulating layer prior to introducing the impurities of the one conductivity type and introducing the impurities of the one conductivity type through the windows in the insulating layer with a dose sufficient to form a region of the one conductivity type within the relatively lowly doped region of the opposite conductivity type but not within the relatively highly doped region of the opposite conductivity type, the thickness of the insulating layer being such that a proportion of the impurities of the one conductivity type penetrate the insulating layer to increase the doping of a surface layer of the first region adjacent the one major surface beneath the insulating layer.

5,151,383

METHOD FOR PRODUCING HIGH ENERGY ELECTROLUMINESCENT DEVICES

Bernard S. Meyerson, Yorktown Heights; Bruce A. Scott, Pleasantville, and Donald J. Wolford, Jr., Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 921,985, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 567,303, Dec. 30, 1983, abandoned. This application Feb. 6, 1989, Ser. No. 307,154
Int. Cl.[5] H01L 21/20
U.S. Cl. 437;101 13 Claims



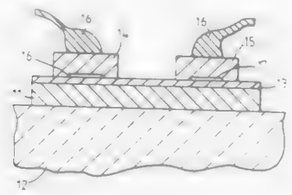
1. A method for preparing a device emitting visible electroluminescence at room temperature when said device is electrically contacted and carriers are injected therein, said device being comprised of at least one layer of doped amorphous hydrogenated silicon (a-Si:H) on a substrate, and wherein said method includes the steps of:
depositing a layer of a-Si:H by thermally induced homogeneous CVD onto a substrate held at a temperature not exceeding about 200° C., said a-Si:H having a bandgap E_o, where E_o is between 1.6 and 2.6 eV, the amount of hydrogen in said a-Si:H layer being in the range 12–50 atomic percent,
doping said a-Si:H layer in-situ while it is being deposited onto said substrate to a doping level at least about 10^{16} carriers/cm^3, and
electrically contacting said device.

5,151,384

AMORPHOUS SILICON SWITCH WITH FORMING CURRENT CONTROLLED BY CONTACT REGION

David M. Williams, Oxon, England, assignor to Raychem Limited, United Kingdom

PCT No. PCT/GB89/00797, § 371 Date Jan. 14, 1991, § 102(e) Date Jan. 14, 1991, PCT Pub. No. WO90/00817, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 13, 1989, Ser. No. 634,185
Claims priority, application United Kingdom, Jul. 13, 1988, 8816632
Int. Cl.[5] H01L 45/00
U.S. Cl. 437—170 10 Claims



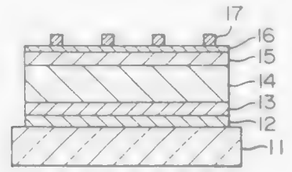
1. A method of producing an electrical device which comprises:
(a) reacting an amorphous silicon or silicon compound with a passivating agent in order to remove or reduce the number of unpaired electrons occurring in the silicon compound;
(b) providing a first electrode in association with the amorphous silicon compound either before or after step (a);
(c) providing a second electrode in association with the amorphous silicon compound either before or after step (a); and
(d) conducting a "forming" step in which at least part of the amorphous silicon compound layer is restructured by passing an electric current through the device;
the method including the formation of an n- or p- doped amorphous silicon layer which is adjacent to one of the electrodes and extends over part only of the device so that the maximum forming current passing through the device is limited to 400 mA.

5,151,385

METHOD OF MANUFACTURING A METALLIC SILICIDE TRANSPARENT ELECTRODE

Hideaki Yamamoto, Tokorozawa; Koichi Seki; Toshihiro Tanaka, both of Hachioji; Akira Sasano, Tokyo; Toshihisa Tsukada, Tokyo; Yasuharu Shimomoto, Tokyo; Toshio Nakano, Tokyo, and Hideto Kanamori, Okazaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,144
Claims priority, application Japan, Dec. 16, 1982, 57-220641
Int. Cl.[5] H01L 21/00, 21/02, 29/48
U.S. Cl. 437—181 17 Claims



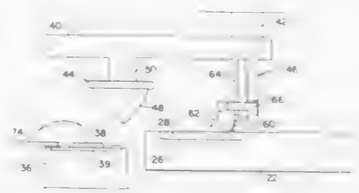
1. A method of manufacturing a semiconductor device comprising the steps of forming a hydrogenated amorphous silicon (a-Si:H) layer over a given substrate; forming a metallic film on said hydrogenated amorphous silicon layer; effecting a heat treatment of the metallic film after formation of the metallic film to produce a transparent conductive layer by an interfacial reaction between said hydrogenated amorphous silicon layer and said metallic film; and removing at least a desired area of the metallic film to expose a portion of the transparent conductive layer for light incidence.

5,151,386

METHOD OF APPLYING METALLIZED CONTACTS TO A SOLAR CELL

Frank J. Bottari, Acton; Jack Hanoka, Brookline, and Frank W. Sylva, North Billerica, all of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Aug. 1, 1990, Ser. No. 561,101
Int. Cl.[5] H01L 21/44, 21/48
U.S. Cl. 437—187 20 Claims



1. A method for applying a metallized conductor to an uneven surface of a crystalline silicon semiconductor solar cell substrate comprising the following steps:
(a) providing a pad printing apparatus comprising (1) a plate having a top surface in which is etched a cavity corresponding in size and shape to that of a metallized conductor to be applied to the surface of a semiconductor substrate, (2) a flexible pad, and (3) a support for releasably supporting a semiconductor substrate, said support being positioned adjacent and in fixed relation to said plate;
(b) positioning a crystalline silicon semiconductor substrate on said support so that said surface of said substrate is exposed;
(c) filling said cavity of said plate with a metal-containing printing ink;
(d) contacting said plate with said pad so as to permit said printing ink to adhere to said pad;
(e) moving said pad into engagement with said one surface of said substrate; the composition and configuration of said pad, the depth of said cavity, and the composition of said printing ink being selected so that said printing ink is transferred to said one surface of said substrate with a uniform thickness in the range of 2–4 mils; and
(f) moving said pad out of contact with said substrate, whereby said printing ink is transferred to said one surface.

5,151,387

POLYCRYSTALLINE SILICON CONTACT STRUCTURE

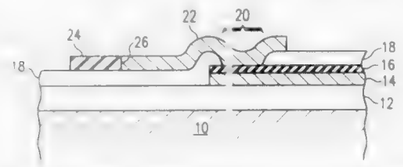
James Brady, Dallas; Tsiu C. Chan, Carrollton, and David S. Culver, The Colony, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Apr. 30, 1990, Ser. No. 516,272
Int. Cl.[5] H01L 21/44
U.S. Cl. 437—191 7 Claims

1. A method for forming a contact in a semiconductor integrated circuit device, comprising the steps of:
forming a first polycrystalline silicon interconnect layer having a first conductivity type;
forming a silicide layer on the first polycrystalline silicon interconnect layer;
forming an insulating layer over the entire device;
forming a contact opening in the insulating layer, wherein a

contact region on an upper surface of the silicide layer is exposed;

forming a second polycrystalline silicon interconnect layer



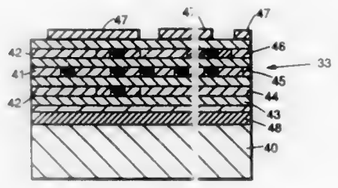
having a second conductivity type over the insulating layer, wherein the second polycrystalline silicon interconnect layer makes ohmic contact with the silicide layer through the contact opening.

5,151,383

FLIP INTERCONNECT

Gabriel G. Bakhit, Huntington Beach, and Kevin P. Shambrook, Laguna Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 7, 1991, Ser. No. 697,350
Int. Cl.[5] H01I *21/60*
U.S. Cl. 437—209 14 Claims



1. A method of packaging a plurality of densely disposed integrated circuit chips comprising the following steps:

applying the connection pads of a plurality of integrated circuit chips to a decal-like multilayer interconnect, said multilayer interconnect comprising alternate layers of insulator and metal formed on a substrate and separated from said substrate by a sacrificial layer;

applying heat to said integrated circuit chips and to said interconnect to form an electrical connection therebetween;

pretesting electrically the performance of said integrated circuit chips;

dissolving said sacrificial layer with a suitable solvent;

floating the decal-like multilayer interconnect off said substrate;

bonding a heat sink to said integrated circuit chips on the side opposite the face thereof; and

packaging said integrated circuit chips in a container.

5,151,389

METHOD FOR DICING SEMICONDUCTOR SUBSTRATES USING AN EXCIMER LASER BEAM

Pierino I. Zappella, Garden Grove, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 10, 1990, Ser. No. 580,036
Int. Cl.[5] H01L *21/302*
U.S. Cl. 437—226 8 Claims

1. A method for dicing mercury cadmium telluride detector arrays on sapphire substrates to exact tolerances without edge chipping or edge detector degradation, comprising the steps of:

using an excimer laser beam from an excimer laser operating in the deep ultraviolet bandwidth to supply dicing energy for cutting dies from the arrays; and,

establishing guided relative movement between the beam and an array substrate within the relative angle between and beam and the substrate being out of normal to the substrate in the range 4 to 8 degrees to achieve ablative photodecomposition to effect said dicing without tapering edges of the substrate where cut.

5,151,390

SILICON NITRIDE-BASED FIBERS AND COMPOSITE MATERIAL REINFORCED WITH FIBERS

Hiroyuki Aoki; Tadashi Suzuki; Toshio Katahata; Mutsuo Haino; Genshiro Nishimura; Hiroshi Kaya; Kozaburo Tamura, and Takeshi Isoda, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 319,418, Mar. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 253,916, Oct. 4, 1988, Pat. No. 4,833,107, which is a continuation of Ser. No. 48,054, May 11, 1987, abandoned. This application Jul. 18, 1991, Ser. No. 732,997
Claims priority, application Japan, Jun. 13, 1986, 61-136242; Mar. 5, 1988, 63-52461
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—95 9 Claims

1. An amorphous inorganic silicon nitride-based fiber composed of silicon, nitrogen and carbon, optionally with oxygen and hydrogen, and having atomic ratio between above respective elements of N/Si=0.3 to 3, O/Si=up to 15, C/Si=up to 7 and H/Si=up to 15, wherein ratios of X-ray scattering intensity thereof to that of air at 1° and 0.5° are from 1 to 10 respectively and the silicon nitride-based fiber is still amorphous after heating in an inactive atmosphere at 1200° C. for 1 hour.

5,151,391

REACTIVATION OF SPENT, METAL-CONTAINING CRACKING CATALYSTS

Chia-Min Fu; Michael K. Maholland, both of Bartlesville, Okla., and Richard E. Lowery, Muscatine, Iowa, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1991, Ser. No. 657,709
Int. Cl.[5] B01J *20/34*
U.S. Cl. 502—27 20 Claims

1. A catalyst reactivation process comprising the steps:

(a) contacting a spent zeolite-containing catalytic cracking catalyst composition which contains at least one metal contaminant with a non-oxidizing acid solution consisting essentially of water and at least one inorganic acid selected from the group consisting of hydrochloric acid, nitric acid and sulfuric acid;

(b) at least partially separating the acid-treated catalyst composition obtained in step (a) from the aqueous solution used in step (a);

(c) drying the at least partially separated catalyst composition obtained in step (b); and

(d) contacting the dried catalyst composition obtained in step (c) with a solution comprising at least one antimony compound;

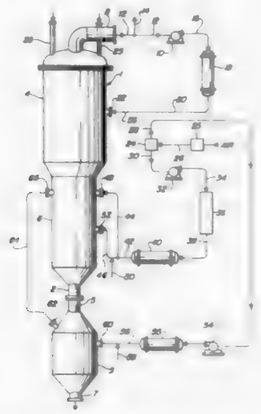
wherein said catalyst reactivation process is carried out under such conditions as to obtain a reactivated cracking catalyst composition exhibiting higher cracking activity and lower hydrogen generation than said spent zeolite-containing catalytic cracking catalyst composition, as determined during catalytic cracking of a hydrocarbon-containing oil substantially in the absence of added hydrogen gas.

5,151,392

MOVING BED REGENERATION PROCESS WITH SEPARATE DISPERSION AND CHLORIDING STEPS

Michael E. Fettis, Prospect Heights, and Paul R. Cottrell, Arlington Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 448,465, Dec. 11, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,302
Int. Cl.[5] B01J *38/44, 23/96, 8/12;* C10G *35/12*
U.S. Cl. 502—37 14 Claims



1. A process for reforming a hydrocarbon feedstock said process comprising:

(a) passing said hydrocarbon feedstock to a catalytic reforming reaction system and contacting said feedstock with reconditioned catalyst particles comprising a noble metal on an alumina carrier and a chloride compound, and recovering a hydrocarbon product;

(b) at least semicontinuously removing deactivated catalyst particles from said reforming reaction system and adding at least partially reconditioned catalyst particles to said reforming reaction system;

(c) passing deactivated catalyst particles from said reforming reaction system to a regeneration zone;

(d) contacting deactivated catalyst particles having coke deposited thereon in a first section of said regeneration zone with an oxygen containing gas to remove coke by combustion, said oxygen containing gas having an oxygen concentration of from 0.5 to 1.5% volume;

(e) contacting said catalyst particles having coke removed therefrom with a heated gas stream in a second section of said regeneration zone to remove water from said catalyst particles and produce dried catalyst particles having a moisture content of less than 1 wt. %;

(f) contacting said dried catalyst particles in a third section of said regeneration zone with a redispersion gas comprising 0.01 to 0.2 mol. % chlorine to redisperse said noble metal and produce catalyst particles having a redispersed noble metal;

(g) discontinuing the contacting of said catalyst particles with said redispersion gas and contacting said catalyst particles having a redispersed noble metal in a fourth section of said regeneration zone with a chloriding gas stream comprising 0.05 to 0.3 wt. % HCl based on the mass of catalyst particles in said fourth section and oxygen at a temperature of less than 1000° F. to maintain a concentration of chloride on said catalyst from 0.4 to 1.4 wt. % and produce a chlorided catalyst; and,

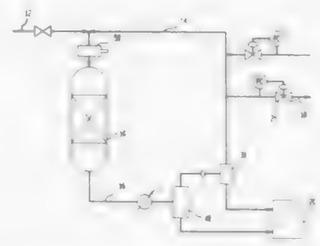
(h) recovering at least partially reconditioned catalyst particles from said regeneration zone for return to said reaction zone in step (b).

5,151,393

STAGED PROCESS FOR REACTIVATION OF SPENT ZEOLITE CATALYST PARTICLES

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 23, 1991, Ser. No. 689,570
Int. Cl.[5] B01J *38/10, 29/38;* C07C *11/20;* C10G *11/05*
U.S. Cl. 502—53 9 Claims



1. A process for the reactivation of spent medium pore metallosilicate catalyst particles containing carbonaceous deposits, comprising:

contacting said spent catalyst particles with hydrogen at pressure between about 3500 and 21000 kPa and temperature between 360° C. and 815° C. under first stage catalyst reactivation conditions to partially reactivate said spent particles; and

contacting said partially reactivated particles with a light gas stream selected from the group consisting of hydrogen, nitrogen, and refinery fuel gas at temperature greater than 760° C., under second stage catalyst reactivation conditions, at a pressure substantially lower than said first stage sufficient to provide a pressure differential between said first and said second stage of at least 3010 kPa, whereby reactivated metallosilicate catalyst particles are produced.

5,151,394

CRACKING CATALYSTS

Girish K. Chitnis, Chadds Ford, Pa., and Joseph A. Herbst, Turnersville, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 25, 1991, Ser. No. 645,761
Int. Cl.[5] B01J *29/04, 27/14*
U.S. Cl. 502—65 16 Claims

1. A catalyst composition comprising a catalytic molecular sieve material and a matrix material comprising boron phosphate compound.

2. The catalyst composition of claim 1 wherein the molecular sieve material is selected from a group consisting of large pore zeolites X, Y, USY, REX, REY, RE-USY, dealuminated Y, silicon enriched dealuminated Y, large pore materials SAPO-5, SAPO-37, pillared clays, intermediate pore zeolites ZSM-5, ZSM-11, ZSM-22, ZSM-23, ZSM-35, ZSM-48, ZSM-57, and MCM-22 and combinations thereof.

4. The catalyst composition of claim 1 wherein the matrix material further comprises at least one member of a group consisting of silica, alumina, titania, zirconia, magnesia, kaolin, bentonite and combinations thereof.

5,151,395

BULK GAS SORPTION AND APPARATUS, GAS CONTAINMENT/TREATMENT SYSTEM COMPRISING SAME, AND SORBENT COMPOSITION THEREFOR

Glenn M. Tom, New Milford, Conn., assignor to Novapure Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 295,719, Jan. 10, 1989, Pat. No. 5,037,624, which is a continuation-in-part of Ser. No. 163,792, Mar. 3, 1988, Pat. No. 4,953,792, which is a division of Ser. No. 29,632, Mar. 24, 1987, Pat. No. 4,761,395, which is a continuation-in-part of Ser. No. 323,311, Mar. 11, 1989. This application Mar. 16, 1990, Ser. No. 495,790

Int. Cl.[5] B01J 20/18, 20/02

U.S. Cl. 502—67 11 Claims

1. A sorbent composition comprising an arrangement of first and second sorbent beds, wherein the first sorbent bed comprises a hygroscopic aluminosilicate sorbent, and the second sorbent bed comprises an aluminosilicate sorbent impregnated with an aqueous base solution, wherein the first and second sorbent beds are arranged for initial gas contacting with the first sorbent bed and succeeding gas contacting with the second sorbent bed.

2. A composition according to claim 1, wherein the aluminosilicate sorbent comprises molecular sieve.

3. A sorbent composition according to claim 1, wherein the aqueous base solution comprises an alkali or alkaline earth metal hydroxide.

5,151,396

PROCESS FOR THE POLYMERIZATION OF ETHYLENE AND CATALYTIC COMPONENT THEREFOR

Roger Spitz, Saint-Symphorien d'Ozon; Jean Malinge, Orthez, and Jean-Francois Joly, Chatillon sous Bagneux, all of France, assignors to Atochem, Puteaux, France

Filed Nov. 13, 1989, Ser. No. 436,059

Claims priority, application France, Nov. 23, 1988, 88 15261

Int. Cl.[5] B01J 31/00

U.S. Cl. 502—104 18 Claims

1. A catalytic component for use in the homopolymerization of ethylene or copolymerization of ethylene with an alpha-olefin to form polymers having a broad molecular weight distribution, said component being a solid and consisting essentially of the combination of a chlorinated titanium compound mainly at the oxidation state of 3 and/or 4 and having the formula $Ti(OR)_{x}Cl_{4-x}$, in which:

(i) R is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, or COR^1 with R^1 being a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, and (ii) x is a number from 0 to 3, a magnesium compound and a chlorine compound, treating said solid component with a reducing agent capable of reducing the degree of oxidation of Ti^4 and/or Ti^3 and after such treatment contacting the component with a chlorine-containing transition metal compound consisting essentially of a chloride, an alkoxychloride or an oxychloride of a transition metal selected from among titanium, vanadium, chromium and zirconium.

5,151,397

METHOD OF PRODUCING METAL HALIDE CATALYST

Kent E. Mitchell, Bartlesville, and Stanley J. Marivil, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 16, 1991, Ser. No. 808,785

Int. Cl.[5] C08F 4/64

U.S. Cl. 502—107 18 Claims

1. A process for preparing a catalyst comprising:

(1) mixing a metal halide compound, a solvent and water to produce a metal halide solution, wherein the metal of said metal halide compound is selected from Group IIA metals and Group IIB metals of the Meneleev Periodic Table and said water is present in an an amount sufficient to increase particle size of said catalyst;

(2) contacting said metal halide solution with a transition metal compound to form a first catalyst component solution; and

(3) contacting said first catalyst component solution with a precipitating agent to form said catalyst.

5,151,398

CATALYST FOR THE SYNTHESIS OF CRYSTALLINE 3,4-POLYISOPRENE

Wen-Liang Hsu, Copley, and Adel F. Halasa, Bath, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 602,546, Oct. 24, 1990, Pat. No. 5,082,906.

This application Jun. 17, 1991, Ser. No. 716,475

Int. Cl.[5] C08F 4/70

U.S. Cl. 502—117 10 Claims

1. A catalyst system which can be utilized in the polymerization of isoprene monomer into 3,4-polyisoprene, said catalyst system being comprised of (a) an organoiron compound, which is soluble in the organic solvent, wherein the iron in the organiron compound is in the +3 oxidation state,(b) partially hydrolized organoaluminum compound, which was prepared by adding a protonic compound selected from the group consisting of water, alcohols and carboxylic acids to the organoaluminum compound, and (c) a chelating aromatic amine; wherein the molar ratio of the chelating amine to the organoiron compound is within the range of about 0.1:1 to about 1:1, wherein the molar ratio of the organoaluminum compound to the organoiron compound is within the range of about 5:1 to about 200:1, and wherein the molar ratio of the protonic compound to the organoaluminum compound is within the range of about 0.001:1 to about 0.2:1.

5,151,399

OLEFIN POLYMERIZATION CATALYST

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1990, Ser. No. 599,538

Int. Cl.[5] C08F 4/04

U.S. Cl. 502—127 15 Claims

1. An olefin polymerization catalyst produced by contacting (A) a solid olefin polymerization procatalyst obtained by contacting the solution resulting from the reaction of magnesium, a titanium tetraalkoxide, an alkyl borate ester and an alkanol, in inert diluent at elevated temperature, with a tetravalent titanium halide, a halohydrocarbon and an electron donor, with (B) an organoaluminum compound cocatalyst and a selectivity control agent.

5,151,400

PROCESS FOR THE ACTIVATION OF HALOGENATED CATALYSTS AND CATALYSTS OBTAINED BY SAID PROCESS FOR UTILIZATION IN HYDROCARBON CONVERSION PROCESSES

Georges Szabo, Montivilliers; Egbertus F. P. Schasfoort, Pays-Bas, and Alain Milan, Montivilliers, all of France, assignors to Compagnie de Raffinage et de Distribution Total France, Levallois, France

Filed Jul. 18, 1990, Ser. No. 554,298

Claims priority, application France, Jul. 18, 1989, 89 09630

Int. Cl.[5] B01J 27/125, 27/13, 27/132, 27/135

U.S. Cl. 502—203 14 Claims

1. A process for the preparation and activation of a catalyst, comprising:

fabricating a catalyst support consisting at least in part of at least one refractory oxide mineral,

depositing on the catalyst support at least one metal from the platinum group,

forming on the catalyst support, and thereby completing the preparation of the catalyst, at least two metal halides of the Lewis acid type, the first halide belonging to the family of halides of zirconium, molybdenum, tungsten or titanium, and the second halide belonging to the family of the halides of aluminum, boron or gallium, and

activating the prepared catalyst by maintaining in an acidic and nonoxidizing or reducing medium at a temperature between about 300° and 475° C. until the final content of zirconium, molybdenum, tungsten or titanium in the catalyst ranges from 0.15 to 1 percent, based on the weight of the support.

5,151,401

PREPARATION OF DEHYDROGENATING CATALYST

Paul F. Schubert, Sunnyvale, Calif.; Donald H. Kubicek, Bartlesville, and Dennis R. Kidd, Dewey, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 615,518, Nov. 19, 1990, abandoned.

This application Jan. 6, 1992, Ser. No. 818,417

Int. Cl.[5] B01J 37/06, 23/58, 23/60

U.S. Cl. 502—329 12 Claims

1. A process for preparing a dehydrogenation catalyst, said process comprising the following steps performed in the sequence set forth:

(a) impregnating a porous zinc aluminate catalyst support containing calcium aluminate with a solution containing a compound of platinum with chlorine to form a supported catalyst;

(b) drying the supported catalyst of step (a);

(c) calcining the dried catalyst of step (b); and

(d) washing the calcinated catalyst of step (c) with a wash media under conditions sufficient to remove substantially all chloride ions from said support while retaining substantially all platinum contained on said support, thereby producing said dehydrogenation catalyst wherein the chlorine content is less than about 0.05 weight percent.

5,151,402

SILYLATION OF CHARCOAL TO INCREASE ITS HYDROPHOBICITY

Marjory T. Craw, Chalk River; Kevin D. McCrimmon, Deep River, and Lyse L. Deschenes, Chalk River, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Nov. 28, 1990, Ser. No. 619,242

Int. Cl.[5] B01J 20/22, 20/32

U.S. Cl. 502—401 27 Claims

1. A process for chemically modifying charcoal to increase its hydrophobicity by exposing the charcoal to a non-chlorinated organo-silane for sufficient time and at a sufficient temperature to coat the charcoal with silane to yield a surface area reduction of the charcoal of not more than 50 percent.

10. The process of claim 1, further comprising the step of humidifying the charcoal, prior to silylation, by contacting the charcoal with water vapour for a sufficient time to produce a charcoal containing up to 10 weight percent water vapour.

17. The process of claim 10 wherein the charcoal is exposed to the non-chlorinated organo-silane by refluxing in the presence of an organic solvent from about 1 to about 5 hours.

22. Silylated vegetable-based charcoal wherein the charcoal has been silylated with a non-chlorinated organosilane to yield a silylated charcoal with a surface area from about 500 m^2/g to about 800 m^2/g.

5,151,403

THERMAL PRINTING MEDIUM, AND LABEL AND TAG INCORPORATING THE SAME

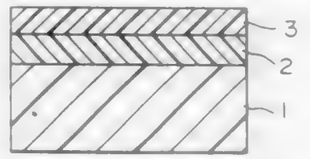
Akira Suzuki; Takayuki Norizuki, and Yasuhiro Yamanashi, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 655,860

Claims priority, application Japan, Feb. 16, 1990, 2-13692[U]; Feb. 16, 1990, 2-33801

Int. Cl.[5] B41M 5/30, 5/36, 5/40

U.S. Cl. 503—200 11 Claims



1. A thermal printing medium comprising:

a) a support substrate comprised of polyolefin cross-laminate film and having an upper and a lower surface; said cross-laminate film being characterized by at least two sheets of polyolefin having polyolefin adhesive therebetween, and being further characterized by said of said sheets having a linear, parallel aligned macromolecular orientation, the orientation of the macromolecules in one sheet forming an angle relative to the orientation of the macromolecules in a second sheet in the cross-laminated film;

b) a thermal developing layer formed on said upper surface of said support substrate, said thermal developing layer including at least one of a colorless and a lightly colored leuco dye, and a color developer agent as principle components thereof; and

c) a protective layer formed on said upper surface of said thermal developing layer.

5,151,404

THERMOSENSITIVE RECORDING PAPER

Aimi Suzuki, Numazu; Toshiaki Azuma, Mishima; Shigeaki Kimura, and Yasuyuki Hosogi, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 7, 1990, Ser. No. 623,528

Claims priority, application Japan, Dec. 7, 1989, 1-316553

Int. Cl.[5] B41M 5/30

U.S. Cl. 503—200 9 Claims

1. A thermosensitive recording paper comprising a support sheet and a thermosensitive coloring layer formed thereon, said support sheet comprising a needle-leaf tree pulp comprising fibers, in an amount of 10 to 50 wt. % of the absolute dry weight of said support sheet, with the maximum length of said fibers of said needle-leaf tree pulp being 4 mm or less.

5,151,405

MODIFIED DEXTRAN BINDER FOR USE IN THERMAL DYE TRANSFER

Wilhelmus Janssens, Langdorp; Herman J. Uytterhoeven, Bonheiden; Joan T. Vermeersch, Deinze, and Jan A. Van der Bogaert, Schilde, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Feb. 21, 1991, Ser. No. 658,584

Claims priority, application European Pat. Off., Mar. 1, 1990, 90200481.1

Int. Cl.[5] B41M 5/035, 5/26

U.S. Cl. 503—227 11 Claims

11. Method of image-wise heating a dye-donor element comprising a support and a dye layer comprising printing dyes carried by a polymeric binder medium, which at least partially is a dextran binder, at least some of the hydroxy groups of

which have been modified into ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, or acetal groups and, in case only part of the hydroxy groups of said dextran binder have been modified in such groups, at least part of the remaining hydroxy groups have been modified into groups that are more hydrophilic or more polar than said ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, and acetal groups and transferring said image-wise heated printing dyes to a dye-image-receiving layer of a receiving sheet, wherein said dye-image-receiving layer comprises a dextran binder, part of the hydroxy groups of which have been modified into ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, or acetal groups and the other part of the hydroxy groups have been modified into groups that are more hydrophilic or more polar than said ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, or acetal groups.

5,151,406

LAMINATED SUPERCONDUCTOR

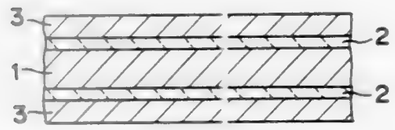
Kazuo Sawada; Kengo Okura; Noriyuki Yoshida; Satoshi Takano; Kenji Miyazaki, and Noriki Hayashi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 25, 1988, Ser. No. 160,115

Claims priority, application Japan, Feb. 26, 1987, 62-44266; Aug. 24, 1987, 62-209932

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 **6 Claims**



1. A laminated ceramic superconductor which comprises at least two layers of a ceramic superconductor having a layer perovskite crystal structure and a composition formula of

$$YBa_2Cu_3O_{6.8} \text{ or } (M^1_{1-x}M^2_x)_2M^3M^4_{4-y}$$

wherein M^1 is an element selected from the lanthanum series of elements M^2 is an element selected from the elements of the IA IIA, and IIIB groups, M^3 is an element selected from the group consisting of elements of the II, IIB and IIIA groups and transition elements, M^4 is an element selected from the group consisting of oxygen, Boron, carbon, nitrogen, flourine, and sulfur, x is a number larger than zero and smaller than one, and y is a number not smaller than zero and smaller than four; and a stabilizing conductive metal layer, formed from a material selected from the group consisting of copper, aluminum, silver and gold, interposed between said ceramic superconductor layers.

5,151,407

METHOD OF PRODUCING BI-SR-CA-CU-O SUPERCONDUCTING MATERIALS IN CAST FORM

Virgil Provenzano, Bethesda, Md.; Anand K. Singh, Middletown, N.J.; M. A. Imam, Annandale, Va.; Kuntimadi Sadananda, Springfield, and William F. Henshaw, Lorton, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1990, Ser. No. 489,313

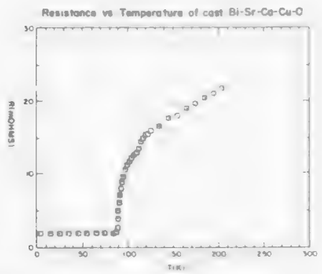
Int. Cl.[5] C01F *11/02;* **C01G** *1/02, 29/00;* **C04B** *35/60*

U.S. Cl. 505—1 **9 Claims**

1. A method of producing a superconducting material in bulk form, comprising the steps of:

heating a powder of a starting material for a perovskite superconducting material to a temperature at or above which it forms a pourable liquid, but below the decomposition or boiling point of said liquid;

casting a bulk form of said superconducting material by pouring said liquid into a mold, maintaining said liquid in said mold until said liquid begins to solidify to a hot, cast object, removing said hot, cast object from said mold and



cooling said hot, cast object to room temperature at a rate sufficiently slow to prevent the embrittlement or cracking of said cast object; and

annealing said cooled cast object, said temperature and time of annealing being sufficient to restore the level of O_2 in said cooled cast object to near equilibrium levels wherein said superconducting material is the Bi-Sr-Ca-Cu-O system with a 2:2:2:3 atomic ratio.

5,151,408

PROCESS FOR PREPARING A-AXIS ORIENTED HIGH-TEMPERATURE SUPERCONDUCTING THIN FILMS

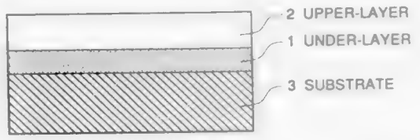
Saburo Tanaka; Hidenori Nakanishi, and Hideo Itozaki, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 11, 1991, Ser. No. 668,263

Claims priority, application Japan, Mar. 9, 1990, 2-58512; Mar. 9, 1990, 2-58513

Int. Cl.[5] B05D *5/12*

U.S. Cl. 505—1 **12 Claims**



1. A process for preparing a-axis oriented thin film of oxide superconducting material, characterized by the steps of:

depositing an under-layer of said oxide superconducting material on a substrate under such a condition that said substrate is heated at a temperature which is suitable to realize an a-axis orientation of crystal of said oxide superconducting material, and then

depositing an upper-layer of said oxide superconducting material on a surface of said under-layer under such a condition that said substrate is heated at a temperature which is higher by 10° to 100° C. than said temperature which is used in the first depositing step,

wherein said under-layer is deposited up to a thickness of 20 to 1,000 A.

5,151,409

SUPERCONDUCTING COMPOSITION COMPRISING LN-TH-CU-O, WHEREIN LN IS PR, ND, PM, SM, EU, GD, ER OR MIXTURES THEREOF

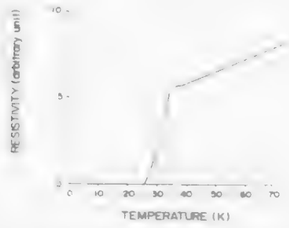
Masahiko Hiratani, Akishima; Shin'ichiro Saitoh, Tokyo; Katsuki Miyauchi, Hino, and Tsuyoshi Seko, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1990, Ser. No. 469,225

Claims priority, application Japan, Jan. 27, 1989, 1-016141; Jan. 27, 1989, 1-016142; Jan. 27, 1989, 1-016143; Feb. 17, 1989, 1-036128; Mar. 3, 1989, 1-049827; Mar. 10, 1989, 1-056418

Int. Cl.[5] C01B *13/00;* **C01F** *15/00;* **C01G** *3/02;* **H01L** *39/12*

U.S. Cl. 505—1 **3 Claims**



1. An oxide superconductor having a composition expressed by a chemical formula $Ln_{2-x}M_xCuOy$, where Ln indicates at least one element selected from a group consisting of Pr, Nd, Pm, Sm, Eu, Gd, and Er, wherein M is limited to Th and $3.5 \leqq y \leqq$.

5,151,410

USE OF A SPIRANIC COMPOUND AS A PERFUMING INGREDIENT

Wolfgang K. Giersch, Bernex; Pierre-Alain Blanc, Crassier, and Karl-Heinrich Schulte-Elte, Onex, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Feb. 6, 1992, Ser. No. 832,205

Claims priority, application Switzerland, Mar. 15, 1991, 796/91

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—9 **5 Claims**

1. A method to confer, improve, enhance or modify the odor properties of a perfuming composition or a perfumed article, which method comprises adding to said composition or article a fragrance effective amount of spiro[5.7]tridec-1-ene-3-one.

5,151,411

TRICYCLIC KETONES AND FRAGRANCE COMPOSITIONS CONTAINING SAME

Georg Fráter, Uster, and Daniel Helmlinger, Gockhausen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

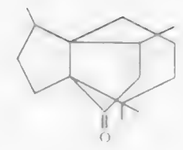
Filed Aug. 20, 1991, Ser. No. 747,816

Claims priority, application Switzerland, Aug. 24, 1990, 2756/90

Int. Cl.[5] A61K *7/46*

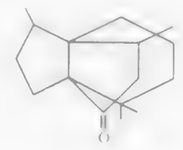
U.S. Cl. 512—15 **22 Claims**

1. A compound of the formula



wherein the dotted line represents an optional bond.

8. An odorant composition, which comprises an olfactorily effective amount of a compound of the formula



wherein the dotted line signifies an optional bond, and at least one other olfactive agent.

5,151,412

PHARMACEUTICALLY ACTIVE CONJUGATES HAVING IMPROVED BODY TISSUE BINDING SPECIFICITY

Robert A. Brown, St. Albans, Great Britain, assignor to Central Blood Laboratories Authority, Borehamwood, Great Britain

PCT No. PCT/GB87/00854, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO88/03810, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 27, 1987, Ser. No. 359,662

Claims priority, application United Kingdom, Nov. 27, 1986, 8628398

Int. Cl.[5] A61K *37/12, 47/48, 37/14;* **C07K** *17/02*

U.S. Cl. 514—8 **18 Claims**

1. A pharmaceutically active conjugate comprising an anti-rheumatic agent for treating rheumatic disease, wherein said anti-rheumatic agent is conjugated directly or indirectly with at least one fragment of fibronectin having improved gelatin-binding specificity compared with that of a whole parent fibronectin molecule, wherein said fibronectin fragment does not exhibit cell attachment activity.

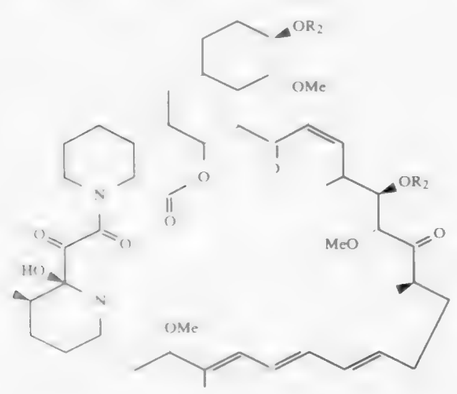
5,151,413

RAPAMYCIN ACETALS AS IMMUNOSUPPRESSANT AND ANTIFUNGAL AGENTS

Craig E. Caufield, Plainsboro, N.J. and Guy A. Schiehser, Yardley, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 6, 1991, Ser. No. 788,682
Int. Cl.[5] A61K *31/695, 31/395;* C07D *498/16, 7/04*
U.S. Cl. 514—63 13 Claims

5. A method of treating transplant ejection and host vs graft disease, autoimmunine disease and disease of inflammation in a mammal by administering thereto an effective amount of a compound having the formula:



wherein R^1 and R^2 independently are hydrogen, $—CH_2YX$, $—C(CH_3)_2YX$, $—CH_2(CH_3)YX$, or L;

Y is O or S; X is $—CH_3$, $—(CH_2)_nCH_3$, $—CH_2C_6H_6$, $—(CH_2)_2OCH_3$, $—CH_2Cl_3$ or $—CH_2CH_3Si(CH_3)_3$ and L is selected from tetrahydrofuran-2-yl, tetrahydrothiophen-2-yl, tetrahydrothiopyran-2-yl, tetrahydropyran-2-yl, 4-methoxytetrahydropyran-2-yl, 4-methoxytetrahydrothiopyran- 2-yl, or 4-methoxytetrahydrothiopyran-S, S-dioxide-2-yl with a proviso that R^1 and R^2 cannot simultaneously be hydrogen and n is 1–5.

8 A method according to claim 5 wherein the compound used is 31-[O-[2-(trimethylsilyl)ethoxy]methyl]rapamycin.

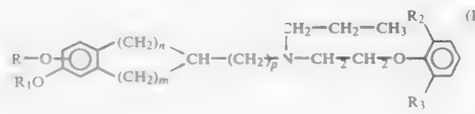
5,151,414

PHENOXYETHYL AMINE COMPOUNDS ACTIVE ON THE CARDIOVASCULAR SYSTEM

Cesare Casagrande, Arese; Gabriele Norcini, Somma Lombardo; Francesco Santangelo, Milan, and Claudio Semeraro, Bresso, all of Italy, assignors to SIMES Societa Italiana Medicinali e Sintetici S.p.A., Vicenza, Italy

Division of Ser. No. 659,542, Feb. 22, 1991, Pat. No. 5,070,106, which is a continuation of Ser. No. 288,263, Dec. 22, 1988, abandoned. This application Jul. 3, 1991, Ser. No. 738,608
Claims priority, application Italy, Dec. 23, 1987, 23183 A/87
Int. Cl.[5] C07C *229/38;* A61K *31/22, 31/24*
U.S. Cl. 514—114 8 Claims

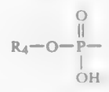
1. A compound of formula



(I)

wherein

R and R_1, the same or different, represent hydrogen atoms or acyl groups derived from optionally substituted aliphatic, aromatic or heteroaromatic carboxylic acids, from optionally substituted carbamic or carbonic acids, or from a phosphoric acid of formula



wherein

R_4 represents a hydrogen atom, a C_1–C_6 alkyl optionally substituted by one or more groups selected from hydroxy, alkoxy, acyloxy, amino, carboxy and alkoxycarbonyl; or a phenyl; provided that when one of R and R_1 represents an acyl derived from phosphoric acid, the other represents a hydrogen atom;

the group O-R is bonded to one of the positions adjacent to the O-R_1 group; with the proviso that at most one of R and R_1 is hydrogen;

n and p each represents an integer selected between 0 and 1;

m represents an integer selected from 1, 2, 3 and 4 such that n+p=1 and m+n represent an integer selected from 2, 3 and 4;

R_2 and R_3, the same or different, represent a hydrogen or a halogen atom, an alkyl or an alkoxy group;

and their salts with pharmaceutically acceptable acids.

8. A method for the treatment of hypertension, of cardiac insufficiency and decompensation and of cerebral and peripheral vascular diseases consisting in administering a therapeutically effective amount of a compound according to claim 1.

5,151,415

METHOD OF TREATING A PAPOVA-TYPE VIRAL INFECTION

Dallas Sirany, 5733 Dumas Ave., Minnetonka, Minn. 55345

Filed May 23, 1991, Ser. No. 704,452
Int. Cl.[5] A01N *37/36;* A61K *31/61, 31/615*
U.S. Cl. 514—163 27 Claims

1. A method for treating a body surface infection of a papova-type viral epithelial tumor, the method comprising:

applying an effective amount of a paste containing acetylsalicylic acid and water in a layer having a thickness of between about 0.8 mm and 10.0 mm over epithelial tumor; and

maintaining the paste in contact with the epithelial tumor for a treatment period sufficient to affect the infection.

5,151,416

METHOD OF EXTERMINATING RODENTS AND OTHER VERTEBRATE PESTS

Hector F. DeLuca, Deerfield, and Connie M. Smith, Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 352,963, May 17, 1989, abandoned. This application Apr. 24, 1991, Ser. No. 691,178
Int. Cl.[5] A01N *45/00;* G07J *172/00*
U.S. Cl. 514—167 11 Claims

1. A method for controlling vertebrate pest populations which comprises making available in a diet of such populations edible material acceptable to the vertebrate pest, which edible material contains ingredients toxic to said pest, said toxic ingredients consisting of 1α-hydroxyvitamin D_3 in an amount of from about 4 parts per million to about 5 parts per million and calcium in an amount of from about 2% to about 2.6% by weight in said diet.

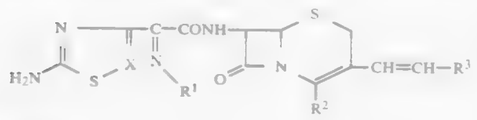
5,151,417

3-SUBSTITUTED VINYL CEPHALOSPORIN DERIVATIVES

Manabu Sasho; Hiroshi Yamauchi, both of Ibaraki; Motosuke Yamanaka; Takaharu Nakamura, both of Chiba; Kanemasa Katsu, Ibaraki; Isao Sugiyama, Ibaraki; Yuuki Komatu, Ibaraki, and Shigeto Negi, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,365
Claims priority, application Japan, Jul. 13, 1989, 1-178989; Jul. 18, 1989, 1-183689; Sep. 22, 1989, 1-244928; Oct. 13, 1989, 1-265153; Feb. 5, 1990, 2-24413
Int. Cl.[5] C07D *501/32;* A61K *31/545*
U.S. Cl. 514—202 12 Claims

1. A 3-substituted vinyl cephalosporin derivative represented by the following formula:



wherein

R^1 represents a hydroxyl or lower alkoxy group;

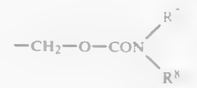
X represents —CH═;

R^2 represents a carboxyl group or a carboxyl group protected with a protecting group; and

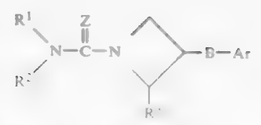
R^3 represents:

(1) a group represented by the formula $—CH_2OCONHR^4$ wherein R^4 is a hydrogen atom, a lower alkyl group, a halogenated lower alkyl group or a lower alkenyl group, or

(2) a group represented by the formula



wherein R^7 and R^8 are the same or different and are individually a hydrogen atom, a lower alkyl group, a halogenated lower alkyl group or a lower alkenyl group or R^7 and R^8 may form a morpholino ring together with the nitrogen atom to which R^7 and R^8 are bonded, or a pharmaceutically acceptable salt thereof.



wherein:

Ar is pyridyl in any of its positions optionally substituted by halo, phenyl or phenyl substituted by 1 or 2 groups selected from chloro, bromo, iodo, fluoro, loweralkyl, loweralkoxy, nitro, aminocarbonyl, or trifluoromethyl;

B is oxygen or sulfur;

Z is oxygen or sulfur;

R^1 and R^2 may be the same or different and are selected from hydrogen, loweralkyl, phenyl, phenyl substituted by halo, loweralkyl, loweralkoxy, nitro, cyano, trifluoromethyl, carbomethoxy or carboethoxy; allyl, substituted allyl, propargyl, cycloalkyl (3–9C), loweralkylcycloalkyl, cycloalkylloweralkyl, arylloweralkyl wherein aryl is phenyl or phenyl substituted by halo, loweralkyl, loweralkoxy, nitro, cyano, trifluoromethyl, carbomethoxy, or carboethoxy; and diloweralkylaminoloweralkyl, and R^1 and R^2 when taken together with the adjacent nitrogen atom may form a heterocyclic amino group selected from azetidinyl, pyrrolidinyl, piperidinyl, homopiperidinyl, imidazolyl, piperazinyl, (halophenyl) piperidin-yl, phenyl-1,2,3,6-tetrahydropyridin-1-yl, phenylpiperidin-1-yl, hydroxypiperidin-1-yl, 4-morpholino, 4-(3,5-diloweralkyl)morpholino, 1,2,3,6-tetrahydropyridin-1-yl, (halophenyl)(hydroxy)-piperidin-1-yl, 4-(2,6-diloweralkyl)morpholino, pyrrolo[1,2-a]pyrazin-2-yl, homopiperazinyl, 4-substituted piperazinyl, and 4-substituted homopiperazinyl;

R^3 is selected from hydrogen, loweralkyl, aryl or arylloweralkyl wherein aryl or the aryl moiety is phenyl or phenyl substituted by halo, loweralkyl, loweralkoxy, nitro, cyano, trifluoromethyl, carbomethoxy or carboethoxy; the geometrical isomers including cis, trans, (E) and (Z) isomers thereof, and the pharmaceutically acceptable acid addition salts thereof when R^1 and R^2 have one or more salt-forming basic amino groups, or Ar is pyridyl, and the hydrates thereof.

5,151,418

METHOD OF TREATING MUSCULAR TENSION, MUSCLE SPASTICITY AND ANXIETY WITH 3-ARYLOXY AND 3-ARYLTHIOAZETIDINECARBOXAMIDES

Chandler R. Taylor, Jr.; Albert D. Cale, Jr., both of Mechanicsville; David N. Johnson, Richmond, and Harold F. Stauffer, Jr., Midlothian, all of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation of Ser. No. 921,521, Oct. 22, 1986, Pat. No. 5,068,231, which is a continuation-in-part of Ser. No. 706,632, Feb. 28, 1985, abandoned. This application Aug. 9, 1991, Ser. No. 743,486
Int. Cl.[5] A61K *31/395;* C07D *205/04*
U.S. Cl. 514—210 17 Claims

1. A method of treating anxiety in animals, including humans, by administering an effective amount of a compound selected from the group having the formula:

5,151,419

COMPOSITION FOR THE TREATMENT OF SCHIZOPHRENIA

Andras Perenyi, Budapest, Hungary; Goswami Utpal, Calcutta, India; Mihály Arató, Budapest, Hungary; Ede Frescka, Budapest, Hungary; József Knoll, Budapest, and D. Arpad Béla, Gyongyos, Hungary, assignors to Chinoin Gyogyszer- ES Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU89/00044, § 371 Date Jun. 18, 1990, § 102(e) Date Jun. 18, 1990, PCT Pub. No. WO90/01928, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 17, 1989, Ser. No. 536,658
Claims priority, application Hungary, Aug. 17, 1988, 4374/88
Int. Cl.[5] A61K *31/54, 31/135, 31/445*
U.S. Cl. 514—226.2 6 Claims

1. A method of treating schizophrenia in a patient characterized by negative symptoms, which comprises administering to said patient, a therapeutically effective amount of (−)-N-(1-phenyl-isopropyl)-N-methyl-propynylamine or a pharmaceutically acceptable acid addition salt thereof.

5,151,420

SUBSTITUTED PYRIDAZINONES

Reijo J. Backstrom, Helsinki; Kalevi E. Heinola, Jarvenpaa; Pentti T. Nore, Helsinki; Jarmo J. Pystynen, Espoo; Erkki J. Honkanen, Vantaa, and Heimo O. Haikala, Espoo, all of Finland, assignors to Orion Corporation/Orion Pharmaceutica, Espoo, Finland

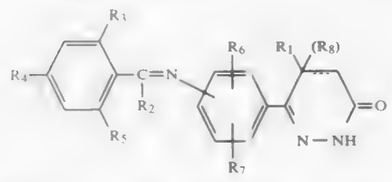
Continuation of Ser. No. 404,532, Sep. 8, 1989, abandoned. This application Mar. 8, 1990, Ser. No. 489,187

Claims priority, application United Kingdom, Oct. 19, 1988, [illegible]

Int. Cl.[5] **C07D** *237/14*

U.S. Cl. 514—247 **22 Claims**

1. A compound of formula I:



I

wherein R_1 and R_8 each independently is a member selected from the group consisting of hydrogen and a lower alkyl group; R_2 is selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, hydroxy C_{1-18} alkyl, halogen C_{1-18} alkyl, C_{1-18} alkoxy C_{1-8} alkyl, C_{3-6} cycloalkyl, phenyl optionally substituted with one to three members selected from the group consisting of halogen, hydroxy, C_{1-18} alkoxy, amino and cyano groups, phenyl C_{1-3} alkyl optionally substituted with one to three members selected from the group consisting of halogen, hydroxy, C_{1-18} alkoxy, amino and cyano groups, phenyl C_{2-3} alkenyl optionally substituted with one to three members selected from the group consisting of halogen, hydroxy, C_{1-18} alkoxy, amino and cyano groups; R_3 is selected from the group consisting of hydrogen, lower alkyl, hydroxy C_{1-18} alkyl, halogen, hydroxy, C_{1-18} alkoxy, lower acyloxy, arylcarbonyloxy in which the aryl group is a monocyclic or bicyclic group having from 6 to 10 carbon atoms in the ring portion, formyl, lower acyl, cyano, amino, carboxy and trifluoromethyl groups; R_4 and R_5 each independently is a member selected from the group consisting of lower alkyl, hydroxy C_{1-18} alkyl, halogen, hydroxy, C_{1-18} alkoxy, lower acyloxy, arylcarbonyloxy in which the aryl group is a monocyclic or bicyclic group having from 6 to 10 carbon atoms in the ring portion, formyl, lower acyl, cyano, amino, carboxy and trifluoromethyl groups; and R_6 and R_7 each independently is a member selected from the group consisting of hydrogen, amino, lower alkyl, hydroxy, nitro and cyano groups; or a pharmaceutically acceptable salt or a pharmaceutically acceptable ester thereof, with the proviso that said ester is formed only when one or more hydroxy groups are present on one or more of groups R_2, R_3, R_4, R_5, R_6, and R_7.

5,151,421

(1H-AZOL-1-YLMETHYL) SUBSTITUTED QUINOXALINE DERIVATIVES

Marc G. Venet, Paris; Gerard C. Sanz, Garges les Gonesse, both of France; Alfons H. M. Raeymaekers, Beerse, and Eddy J. E. Freyne, Rumst, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

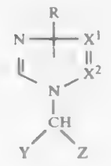
Division of Ser. No. 434,957, Nov. 13, 1989, Pat. No. 5,028,606. This application Mar. 20, 1991, Ser. No. 672,298

Claims priority, application United Kingdom, Nov. 29, 1988, 8827822

Int. Cl.[5] **A01N** *43/58, 43/40, 43/82;* **C07D** *241/36*

U.S. Cl. 514—249 **6 Claims**

1. A method of treating mammals suffering from disorders which are characterized by an increased proliferation or an abnormal differentiation of epithelial cells, which method comprises the systemic or topical administration to said mammals of an effective amount of a compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt thereof, and a stereochemically isomeric form thereof, wherein:

$-X^1=X^2-$ represents a bivalent radical of the formula:

(x),

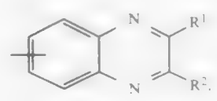
(y), or

(z);

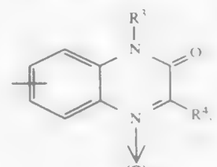
R represents hydrogen or C_{1-6}alkyl;

Y represents hydrogen, C_{1-10}alkyl, C_{3-7}cycloalkyl, Ar^1, Ar^2C_{1-6}alkyl, C_{2-6}alkenyl, or C_{2-6}alkynyl; and

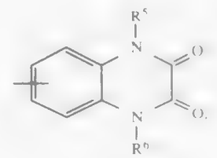
Z represents a radical of the formula:



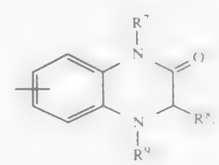
(a-1)



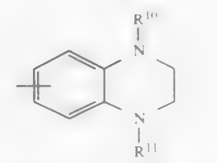
(a-2)



(a-3)



(a-4)



(a-5)

wherein:

R^1 represents hydrogen, halo, C_{1-6}alkyl, C_{1-6}alkyloxy, amino, mono- or di(C_{1-6}alkyl)amino, Ar^2, or imidazolyl;

R^2 represents hydrogen, C_{1-6}alkyl or Ar^1;

R^3 and R^7 each independently represent hydrogen, C_{1-6}alkyl, Ar^2C_{1-6}alkyl, amino, or mono(C_{1-6}alkyl)amino;

R^4 and R^8 each independently represent hydrogen, C_{1-6}alkyl, Ar^1, C_{1-6}alkylcarbonyl, Ar^2carbonyl, C_{1-6}alkyloxycarbonyl, carboxyl, C_{1-6}alkyloxycarbonylC_{1-4}alkyl, aminocarbonyl, or cyano;

R^5, R^6, R^9, R^{10}, and R^{11} each independently represent hydrogen, C_{1-6}alkyl, or Ar^2C_{1-6}alkyl; and

n represents 0 or 1;

wherein in the foregoing Ar^1 represents phenyl, substituted phenyl, naphthalenyl, pyridinyl, imidazolyl, triazolyl, thienyl, furanyl, or thiazolyl, and Ar^2 represents phenyl or substituted phenyl; wherein said substituted phenyl in Ar^1 or Ar^2 is phenyl substituted with 1, 2, or 3 substituents each independently selected from the group consisting of halo, hydroxy, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, cyano, amino, mono- and di(C_{1-6}alkyl)amino, nitro, carboxyl, formyl, and C_{1-6}alkyloxy-carbonyl.

5,151,422

Patent Not Issued For This Number

5,151,423

HETEROCYCLIC N-OXIDE DERIVATIVES OF SUBSTITUTED BENZO[5,6]CYCLOHEPTAPYRIDINES, COMPOSITIONS AND METHODS OF USE

John J. Piwinski, Parsippany; Michael J. Green, Skillman, and Jesse Wong, Union, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

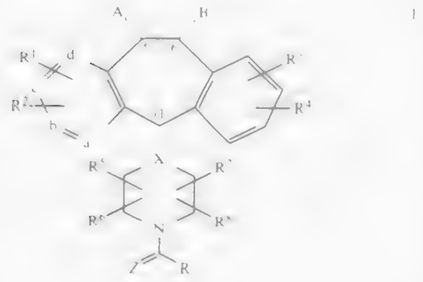
Continuation-in-part of Ser. No. 345,604, May 1, 1989, Pat. No. 5,089,496. This application Dec. 10, 1990, Ser. No. 625,261

Claims priority, application European Pat. Off., Apr. 30, 1990, 90108225.5

Int. Cl.[5] **A61K** *31/495, 31/50;* **C07D** *401/04, 221/06*

U.S. Cl. 514—254 **31 Claims**

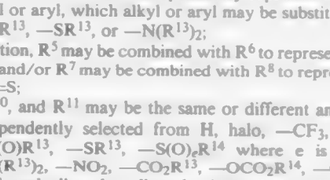
1. A compound having the structural formula



I

or a pharmaceutically acceptable salt or solvate thereof, wherein:

R represents an N-oxide heterocyclic group of the formula (i), (ii), (iii) or (iv)



(i) (ii)

(iii) (iv)

or R represents an alkyl group substituted with a heterocyclic N-oxide group of the formula (i), (ii), (iii) or (iv) above;

one of a, b, c and d represents N or NR^{12} where R^{12} is O, $-CH_3$ or $-(CH_2)_nCO_2H$ where n is 1 to 3, and the remaining a, b, c and d groups are CH, which remaining a, b, c and d groups optionally may be substituted with R^1 or R^2;

R^1 and R^2 may be the same or different and each independently represents halo, $-CF_3$, $-OR^{13}$, $-COR^{13}$, $-SR^{13}$, $-S(O)_eR^{14}$ where e is 1 or 2, $-N(R^{13})_2$, $-NO_2$, $-OC(O)R^{13}$, $-CO_2R^{13}$, $-OCO_2R^{14}$, $-CN$, $-NR^{13}OC(O)R^{13}$, alkynyl, alkenyl or alkyl, which alkyl group may be substituted with halo, $-OR^{13}$ or $-CO_2R^{13}$ and which alkenyl group may be substituted with halo, $-OR^{14}$ or $-CO_2R^{13}$;

R^3 and R^4 may be the same or different and each independently represents H or any of the substituents of R^1 and R^2, or R^3 and R^4 together may represent a saturated or unsaturated C_5–C_7 carbocyclic ring fused to the benzene ring;

R^5, R^6, R^7 and R^8 each independently represent H, $-CF_3$, alkyl or aryl, which alkyl or aryl may be substituted with $-OR^{13}$, $-SR^{13}$, or $-N(R^{13})_2$;

in addition, R^5 may be combined with R^6 to represent =O or =S and/or R^7 may be combined with R^8 to represent =O or =S;

R^9, R^{10}, and R^{11} may be the same or different and each is independently selected from H, halo, $-CF_3$, $-OR^{13}$, $-C(O)R^{13}$, $-SR^{13}$, $-S(O)_eR^{14}$ where e is 1 or 2, $-N(R^{13})_2$, $-NO_2$, $-CO_2R^{13}$, $-OCO_2R^{14}$, $-OCOR^{13}$, alkyl, aryl, alkenyl or alkynyl, which alkyl or alkenyl may be substituted with $-OR^{13}$, $-SR^{13}$ or $-N(R^{13})_2$ and which alkenyl may be substituted with OR^{14} or SR^{14};

R^{13} represents H, alkyl or aryl;

R^{14} represents alkyl or aryl;
R^{15} represents H or alkyl;
X represents N, CH or C;
when X represents C, an optional double bond indicated by the dotted lines to carbon atom 1 is present, and when X is N or CH, the double bond is absent;
the dotted line between carbon atoms 5 and 6 represents an optional double bond, such that when a double bond is present, A and B each independently represent $—R^{13}$, halo, $—OR^{14}$, $—OC(O)R^{13}$ or $—OCO_2R^{14}$ and when no double bond is present between carbon atoms 5 and 6, A and B each independently represent H_2, $—(OR^{14})_2$, [H and halo], dihalo, [alkyl and H], $(alkyl)_2$, [—H and $—OC(O)R^{13}$], [H and $—OR^{13}$], =O, [aryl and H], $=NOR^{15}$ or $—O—(CH_2)_p—O—$ where p is 2, 3 or 4 and R^{13} is as previously defined;
Z represents =O or =S;
alkyl as used herein represents a straight and branched carbon chain containing from one to twenty carbon atoms;
alkenyl as used herein represents a straight and branched carbon chain having at least one carbon to carbon double bond and containing from 2 to 12 carbon atoms;
alkynyl as used herein represents a straight and branched carbon chain having at least one carbon to carbon triple bond and containing from 2 to 12 carbon atoms; and
aryl as used herein represents a carbocyclic group containing from 6 to 15 carbon atoms and having at least one phenyl or fused phenylene ring with all available substitutable carbon atoms of the carbocyclic group being intended as possible points of attachment, said carbocyclic group being optionally substituted with one or more of halo, alkyl, hydroxy, alkoxy, phenoxy, CF_3, amino, alkylamino, dialkylamino, $—COOR^5$ or $—NO_2$.

5,151,424

PHARMACOLOGICALLY ACTIVE (BICYCLIC HETEROCYCLYL)METHYL- AND -HETERO) SUBSTITUTED HEXAHYDRO-1H-AZEPINES AND PYRROLIDINES

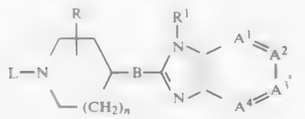
Frans E. Janssens, Bonheiden; Gaston S. M. Diels, Ravels, and Geert M. E. Pille, Edegem, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 609,989, Nov. 6, 1990, Pat. No. 5,071,846, which is a division of Ser. No. 338,440, Apr. 13, 1989, Pat. No. 4,988,689, which is a continuation of Ser. No. 198,960, May 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 68,515, Jul. 1, 1987, abandoned. This application Sep. 9, 1991, Ser. No. 756,573

Int. Cl.[5] A61K *31/505;* **C07D** *471/04*

U.S. Cl. 514—258 **21 Claims**

1. A compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:
$—A^1=A^2—A^3=A^4—$ represents a bivalent radical of the formula:

$—CH=CH—CH=CH—$, (a-1)

$—N=CH—CH=CH—$, (a-2)

$—CH=N—CH=CH—$, (a-3)

$—CH=CH—N=CH—$, (a-4)

$—CH=CH—CH=N—$, (a-5)

-continued

$—N=CH—N=CH—$, (a-6)

or

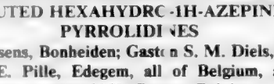
$—CH=N—CH=N—$, (a-7)

wherein one or two hydrogen atoms in said radicals (a-1)-(a-7) may, each independently from each other, be replaced by halo, C_{1-6}alkyl, C_{1-6}alkyloxy, trifluoromethyl, or hydroxy;
R^1 represents hydrogen, C_{1-10}alkyl, C_{3-6}cycloalkyl, Ar^1 or C_{1-6}alkyl substituted with one or two Ar^1 radicals;
B represents NR^2, CH_2, O, S, SO, or SO_2, wherein R^2 represents hydrogen, C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{1-6}alkylcarbonyl, C_{1-6}alkyloxycarbonyl, or Ar^2C_{1-6}alkyl;
R represents hydrogen or C_{1-6}alkyl;
n represents 0 or 2; and
L represents a group of the formula:

$—Alk—R^3$; (b-1)

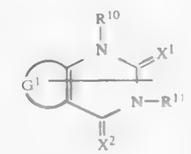
$—Alk—Y—R^4$; (b-2)

or

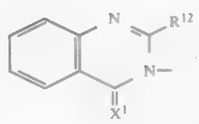


(b-3)

wherein:
R^3, R^4, and R^5 individually represent Het;
Y represents O, S, or NR^7, wherein R^7 represents hydrogen, C_{1-6}alkyl, C_{1-6}alkylcarbonyl, or Ar^1carbonyl;
Z^1 and Z^2 each independently represent O, S, NR^8, or a direct bond, wherein R^8 represents hydrogen or C_{1-6}alkyl;
X represents O, S or NR^9, wherein R^9 represents hydrogen, C_{1-6}alkyl, or cyano; and
each Alk independently represents C_{1-6}alkanediyl;
wherein in the foregoing:
Het represents a member selected from the group consisting of indolyl which is optionally substituted with C_{1-6}alkyl; quinolinyl which is optionally substituted with C_{1-6}alkyl; quinazolinyl which is optionally substituted with C_{1-6}alkyl; phthalazinyl which is optionally substituted with halo; 1,3-dioxo-1H-isoindol-2(3H)-yl; 2,3-dihydro-3-oxo-4H-benzoxazinyl and 2,3-dihydro-1,4-benzodioxinyl both being optionally substituted with C_{1-6}alkyl or halo; and 2-oxo-2H-1-benzopyranyl and 4-oxo-4H-1-benzopyranyl both being optionally substituted with C_{1-6}alkyl;
or Het represents a radical selected from the group of radicals of the formulas:

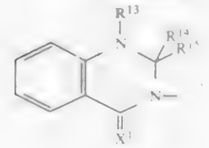


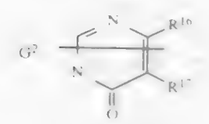
(c-1)

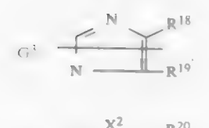


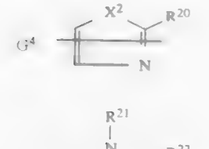
(c-2)

-continued

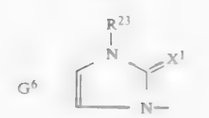








and



wherein:
X^1 and X^2 are each independently O or S;
R^{10}, R^{11}, R^{13}, R^{21} and R^{23} are each independently hydrogen, C_{1-6}alkyl, Ar^2C_{1-6}alkyl, hydroxyC_{1-6}alkyl, or C_{1-6}alkyloxycarbonyl;
R^{12}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20} and R^{22} are each independently hydrogen, C_{1-6}alkyl, hydroxy, mercapto, C_{1-6}alkyloxy, C_{1-6}alkylthio, halo and $(C_{1-6}$alkyloxycarbonyl)C_{1-6}alkyl;
G^1, G^3, G^4, G^5, and G^6 are $—CH=CH—CH=CH—$: and
G^2 is $—CH=CH—CH=CH—$ or $—(CH_2)_4—$;
wherein one or two hydrogen atoms in said radicals G^1, G^2, G^3, G^4, G^5, and G^6 or in the benzene part of the radicals of formula (c-2) or (c-3) may be replaced by C_{1-6}alkyl, C_{1-6}alkylthio, C_{1-6}alkyloxy or halo;
Ar^1 represents a member selected from the group consisting of phenyl which may optionally be substituted with 1, 2, or 3 substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylthio, mercapto, amino, mono- and di(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl; thienyl; halothienyl; furanyl; C_{1-6}alkyl substituted furanyl; pyridinyl; pyrimidinyl; pyrazinyl; thiazolyl; and imidazolyl optionally substituted with C_{1-6}alkyl; and
Ar^2 represents a member selected from the group consisting of phenyl which may optionally be substituted with 1, 2, or 3 substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylthio, mercapto, amino, mono- and di(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl.

5,151,425

METHOD OF AND COMPOSITION FOR TREATING INFLAMMATION AND THE IMMUNOLOGICAL RESPONSE THERETO

LeaLand L. Clark, 1025 S. 1200 East, Salt Lake City, Utah 84105

Filed Jun. 20, 1991, Ser. No. 718,362

Int. Cl.[5] A01N *43/90*

U.S. Cl. 514—261 **6 Claims**

1. A method for treating atopic dermatitis and the immunological response thereto comprising administering to a patient in need of such treatment an effective amount of 6-benzyl adenine in a compatible pharmaceutical preparation.

5,151,426

2-SUBSTITUTED-5-SUBSTITUTED-1,3-OXATHIOLANES WITH ANTIVIRAL PROPERTIES

Bernard Belleau, Westmount, and Nghe Nguyen-Ba, Brossard, both of Canada, assignors to BioChem Pharma Inc., Laval, Canada

Division of Ser. No. 308,101, Feb. 8, 1989, Pat. No. 5,047,407. This application Jun. 17, 1991, Ser. No. 716,627

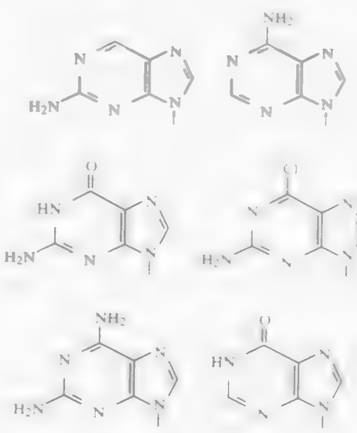
Int. Cl.[5] C07D *239/02, 473/00, 495/00;* **A61K** *31/52, 31/505*

U.S. Cl. 514—262 **10 Claims**

1. A 1,3-oxathiolane of formula (A), the geometric and optical isomers thereof, and mixtures of those isomers:

(A)

wherein:
Z is selected from a group consisting of sulfur, sulfoxide, and sulfone;
R_1 is selected from a group consisting of hydrogen, and an acyl group having 1 to 16 carbon atoms; and
R_2 is a heterocyclic radical selected from a group consisting of:



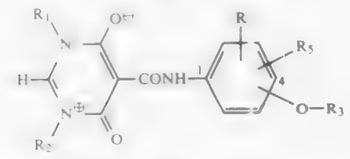
5,151,427

ANTHELMINIT CS

Louis-Pierre Molleyres, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

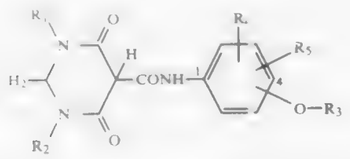
Filed Nov. 28, 1990, Ser. No. 619,272
Claims priority, application Switzerland, Dec. 1, 1989, 4297/89
Int. Cl.[5] A61K *31/505*; C07D *239/545*
U.S. Cl. 514—269 17 Claims

1. A compound of the general formula I



(I)

or in its hydrogenated form the formula (Ia)



(Ia)

in which R_1 and R_2 independently of one another are C_1–C_6alkyl, allyl, C_3–C_6cycloalkyl, benzyl or phenyl; R_3 is unsubstituted or substituted pyridyl or quinolyl and R_4 and R_5 independently of one another are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy or halogeno-C_1–C_3alkyl, including its tautomeric forms and physiologically tolerable salts.

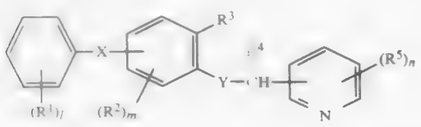
5,151,428

PYRIDINE DERIVATIVES AND THEIR COMPOSITIONS FOR THE CONTROL OF INSECT PESTS

Noriyasu Sakamoto, 4-1-404, Ryodo-cho, Nishinomiya, Hyogo; Hirosi Kisida, 2-1-12-402, Nigawatakamaru, Takarazuka, Hyogo; Hiroaki Fujimoto, 2-11-7-407, Sonehigashiono-cho, Toyonaka, Osaka; Kimitoshi Umeda, 2-11-8-307, Sonehigashino-cho, Toyonaka, Osaka, and Noritada Matsuo, 29-2, Minaminoazayamamichi, Itami, Hyogo, all of Japan

Filed May 24, 1991, Ser. No. 705,383
Claims priority, application Japan, May 24, 1990, 2-136497
Int. Cl.[5] A01N *43/40*; C07D *213/02*
U.S. Cl. 514—277 24 Claims

1. A pyridine derivative of the formula:



wherein R^1 is, the same or different, each a hydrogen atom, a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 haloalkyl group, a C_1–C_3 alkoxy group, a C_1–C_3 haloalkoxy group, a cyano group or a nitro group; R^2 is, the same or different, each a hydrogen atom, a halogen atom or a methyl group; R^3 is a halogen atom or a C_1–C_3 alkyl group; R_4 is a hydrogen atom or a C_1–C_3 alkyl group; R^5 is, the same or different, each a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 haloalkyl group, a C_1–C_3 alkoxy group or a C_1–C_3 haloalkoxy group; X is an oxygen atom, a sulfur atom, a carbonyl group, a sulfinyl group, a sulfonyl group, an imino group or a methylene group; Y is an oxygen atom or a sulfur atom; l is an integer of 1 to 5; m is an integer of 1 to 3; and n is an integer of 1 to 4.

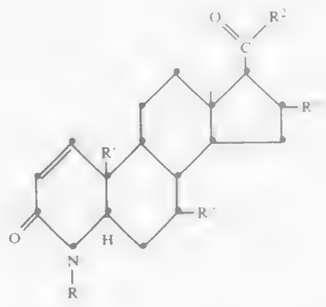
5,151,429

17β-ACYL-4-AZA-5α-ANDROST-1-ENE-3-ONES AS 5α REDUCTASE INHIBITORS

Gary H. Rasmusson, Watchung, and Glenn F. Reynolds, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 630,357, Dec. 18, 1990, abandoned, which is a continuation of Ser. No. 363,567, Jun. 8, 1989, abandoned, which is a continuation of Ser. No. 129,335, Dec. 3, 1987, Pat. No. 4,859,681, which is a continuation of Ser. No. 800,624, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 584,061, Feb. 27, 1984, abandoned. This application Sep. 23, 1991, Ser. No. 764,047
Int. Cl.[5] A61K *31/58*; C07J *73/00*
U.S. Cl. 514—284 6 Claims

1. A compound of formula:



I

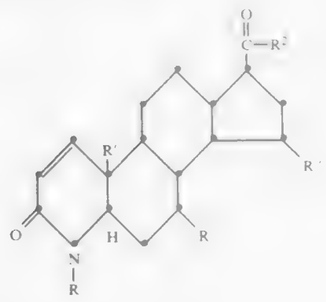
wherein

R is selected from hydrogen, methyl and ethyl; and

R^2 is a monovalent radical selected from benzyl and phenethyl or heterocyclic selected from 2- or 4-pyridyl, 2-pyrrolyl, 2-furyl or thiophenyl, and

R′, R″, R‴ are each selected from hydrogen or methyl.

5. A method of inhibiting testosterone 5α-reductase in a patient in need of such inhibiting treatment, comprising administration to such a patient of a therapeutically effective amount of a compound of the formula:



wherein

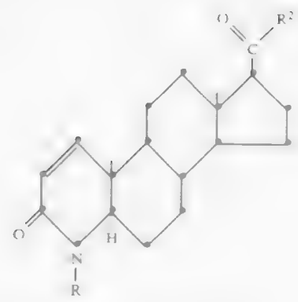
R and R^2 are defined as in claim 1,

R′ is hydrogen or methyl,

R″ is hydrogen of β-methyl,

R‴ is hydrogen, α-methyl or β-methyl.

6. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of formula:



I

wherein

R and R^2 are defined as in claim 1.

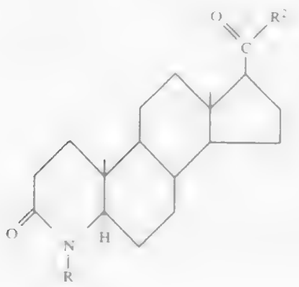
5,151,430

SPECIFIC 17β-THIOBENZOYL-4-AZA-5α-ANDROST-1-EN-3-ONES AS ANTIANDROGEN AGENTS

Nathan G. Steinberg, Clark; Gary H. Rasmusson, Watchung, and Thomas N. Salzmann, No. Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 540,965, Jun. 20, 1990, abandoned. This application Aug. 16, 1991, Ser. No. 745,659
Int. Cl.[5] A61K *31/58*; C07J *73/00*
U.S. Cl. 514—284 6 Claims

1. A compound of formula:



I

wherein

R is selected from hydrogen, methyl and ethyl and

R^2 is phenyl substituted with one or more of: —SC_1–C_4 alkyl, —SOC_1–C_4 alkyl, —SO_2C_1–C_4 alkyl, —SO_2N(C_1–C_4- alkyl)$_2$, C_1–C_4 alkyl, —$(CH_2)_m$SH, —S—$(CH_2)_n$—O—$COCH_3$, where m is 1–4, n is 1–3, providing C_1–C_4 alkyl is only present when one of the above sulfur-containing radicals is present, wherein the dotted line can represent a double bond, and pharmaceutically acceptable esters and salts thereof.

4. A method of treating the hyperandrogenic condition of acne vulgaris, seborrhea, female hirsutism, and benign prostatic hypertrophy comprising parenteral administration to a patient in need of such treatment of a therapeutically effective amount of a compound of formula:

I

wherein

R is selected from hydrogen, methyl and ethyl and

R^2 is phenyl substituted with one or more of: —SC_1–C_4 alkyl, —SOC_1–C_4 alkyl, —SO_2C_1–C_4 alkyl, —SO_2N(C_1–C_4-alkyl)$_2$, C_1–C_4 alkyl, —$(CH_2)_m$SH, —S—$(CH_2)_n$—$OCOCH_3$, where m is 1-4, n is 1-3, providing C_1–C_4 alkyl is only present when one of the above sulfur-containing radicals is present, wherein the dotted line can represent a double bond, and pharmaceutically acceptable esters and salts thereof.

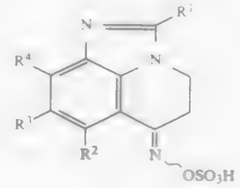
5,151,431

4,5-DIHYDRO-6H-IMIDAZO[4,5,1-IJ]QUINOLIN-6-ONE-6-OXIME-O-SULFONIC ACID DERIVATIVES USEFUL FOR TREATING HYPERTENSION OR EDEMA

Hitoshi Inaba; Kazumi Nishijima; Kazuo Kato; Ichiro Yamamoto; Ei Mochida, all of Shinjuku, and Kikuo Ohtomo, Kita, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd. and Hodogaya Chemical Co., Ltd., both of Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 540,950
Claims priority, application Japan, Jun. 26, 1989, 1-163190
Int. Cl.[5] C07D *471/04*; A61K *31/44*
U.S. Cl. 514—292 30 Claims

1. A 4,5-dihydro-6H-imidazo[4,5,1-ij]quinolin-6-one-6-oxime-O-sulfonic acid compound represented by the formula (I):



(I)

wherein R^1 represents

$-(A)_m-B$

wherein A represents an alkylene of straight or branched chain having 1 to 10 carbon atoms, an alkenylene of straight or branched chain having 2 to 10 carbon atoms, B represents a hydrogen atom, a hydroxy group, a cycloalkyl or cycloalkenyl group having 3 to 8 carbon atoms, a phenyl group, a phenoxy group, a naphthyl group or a mono- or fused- heterocyclic group selected from the group consisting of furyl, tetrahydropyranyl, quinolinyl, indolyl, pyridyl, and thienyl; any one of which is unsubstituted or substituted with one or more substituents which are identical or different and selected from a group consisting of a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a nitro group and an alkylamino group having 1 to 4 carbon atoms, m represents 0 or an integer of 1 and R^2, R^3 and R^4 are

identical or different and represent hydrogen atoms, halogen atoms, hydroxy groups, alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, or halogenated alkyl groups having 1 to 4 carbon atoms, provided that at least one of R^2, R^3 and R^4 represents a hydrogen atom, and that two adjacent groups of R^2, R^3 and R^4 are not groups at the same time selected from a group consisting of branched alkyl groups, branched alkoxy groups and branched halogenated alkyl groups, and the bond shown with a wavy line represents a bond of E-form or Z-form, or a salt or a solvate or a solvate of said salt thereof.

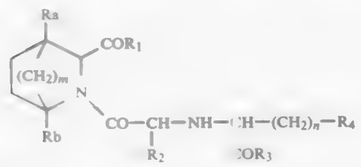
5,151,432

SUBSTITUTED AMINO ACID COMPOUNDS

Michel Vincent, Bagneux; Georges Remond, Versailles; Bernard Portevin, Elancourt; Yolande Herve, Puteaux, and Jean Lepagnol, Chatou, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Dec. 19, 1990, Ser. No. 629,823
Claims priority, application France, Dec. 20, 1989, 89 16881
Int. Cl.[5] C07D *453/06* A61K *37/02*
U.S. Cl. 514—299 **7 Claims**

1. A compound selected from those of formula (I):



(I)

in which:

R_1 represents linear or branched, lower or higher alkoxy, or amino unsubstituted or substituted with one or two linear or branched lower alkyl groups,

R_2 represents linear or branched lower alkyl unsubstituted or substituted with amino,

R_3 represents an amino group, a linear or branched, lower or higher alkoxy, or hydroxyl, with the proviso, however, that at least one amino group is present in R_1 or R_3,

R_4 represents hydrogen or phenyl,

m is equal to 1 or 2,

n is between 1 and 6, and

Ra and Rb, which may be identical or different, represent a hydrogen atom when m=1, or linear or branched lower alkyl or hydrogen when m=2,

the term lower indicating that the group so described comprise from 1 to 6 carbon atoms the term higher indicating that the group so described comprises 7 to 12 carbon atoms,

their enantiomers, diastereoisomers, and epimers, as well as their addition salts with a pharmaceutically-acceptable acid or base.

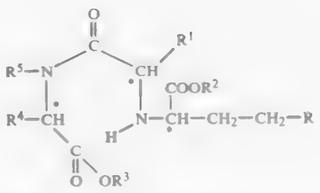
5,151,433

STABILIZED MEDICINAL SUBSTANCES, A PROCESS FOR THE PREPARATION THEREOF, AND STABLE MEDICINAL FORMULATIONS

Werner Fülbreth; Richard Leeb; Manfred Radau, all of Kelkheim, and Willi Stammberger, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 274,598
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739690
Int. Cl.[5] A61K *31/40, 31/7, 9/16;* C07K *5/06*
U.S. Cl. 514—299 **20 Claims**

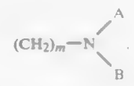
1. A stable pharmaceutical composition is compressed form containing a compound of the formula I



in which

R is hydrogen, C_1–C_4-alkyl or phenyl,

R^1 represents C_1–C_4-alkyl or



in which m is 1, 2, 3 or 4, and A and B are identical or different and denote hydrogen or C_1–C_4-alkyl,

R^2 is hydrogen, C_1–C_4-alkyl or benzyl,

R^3 is hydrogen or C_1–C_4-alkyl, and

R^4 and R^5 denote, together with the atoms carrying them, a heterocyclic, mono-, bi- or tricyclic hydrogenated or partially hydrogenated ring system which has one nitrogen atom and 4 to 15 ring carbon atoms and which is optionally mono- or disubstituted by C_1–C_4-alkoxy, or the physiologically tolerated salts thereof, which compound is in the form of an agglomerate and is stabilized with a polymeric protective coating, wherein the proportion by weight of the polymeric protective coating is 3 to 25% relative to said compound.

5,151,434

CONTROLLED-RELEASE COMPOSITION AND THE PREPARATION THEREOF

Tsutomu Irikura, Tokyo; Hirohsi Uchida, Saitama; Jun Imai, Kanagawa, and Masakatsu Komuro, Tochigi, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 143,225, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 711,031, Mar. 12, 1985, abandoned. This application Dec. 12, 1989, Ser. No. 448,889
Claims priority, application Japan, Mar. 14, 1984, 59-48441
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—300 **9 Claims**

1. A pharmaceutical composition comprising a blend of:

(a) a first component having a core of a pharmaceutically acceptable carrier and 3-isobutyryl-2-isopropylpyrazolopyridine and a first coating on said core capable of controllably releasing the 3-isobutyryl-2-isopropylpyrazolopyridine in the stomach and intestines; and

(b) a second component comprising a core of a pharmaceutically acceptable carrier and 3-isobutyryl-2-isopropylpyrazolopyridine, a first coating on said core capable of controllably releasing the 3-isobutyryl-2-isopropylpyrazolopyridine in the stomach and intestines, and a second enterosoluble coating on said first coating capable of controllably releasing the 3-isobutyryl-2-isopropylpyrazolo [1,5-a]pyridine only into the intestinal tract;

wherein the weight granule equivalent of said second component to said first component is from about 2:1 to 3:1 and the amount of 3-isobutyryl-2-isopropylpyrazolopyridine in the preparation is a vasodilating or bronchodilating effective amount.

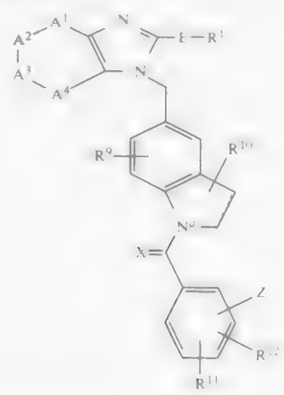
5,151,435

ANGIOTENSIN II ANTAGONISTS INCORPORATING AN INDOLE OR DIHYDROINDOLE

Scott Bagley, Rahway; William J. Greenlee, Teaneck; Daljit S. Dhanoa, Tinton Falls, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 8, 1991, Ser. No. 681,793
Int. Cl.[5] A61K *31/435;* C07D *470/04*
U.S. Cl. 514—303 **10 Claims**

1. A compound of structural formula I or a pharmaceutically acceptable salt



wherein:

R^1 is:

(a) $(C_1$–$C_6)$-alkyl, $(C_2$–$C_6)$-alkenyl or $(C_2$–$C_6)$-alkynyl each of which can be unsubstituted or substituted with a substituent selected from the group consisting of:

i) aryl as defined below in R^1(b),

ii) $(C_3$–$C_7)$-cycloalkyl,

iii) Cl, Br, I, F,

iv) OH,

v) NH_2,

vi) $NH(C_1$–$C_4)$-alkyl,

vii) $N[(C_1$–$C_4)$-alkyl$)]_2$,

viii) $NHSO_2R^2$,

ix) CF_3,

x) $COOR^2$, or

xi) SO_2NHR^{2a};

(b) aryl, wherein aryl is defined as phenyl or naphthyl, unsubstituted or substituted with 1 or 2 substituents selected form the group consisting of:

i) Cl, Br, I, F,

ii) $(C_1$–$C_4)$-alkyl,

iii) $(C_1$–$C_4)$-alkoxy,

iv) NO_2

v) CF_3

vi) $SO_2NR^{2a}R^{2a}$,

vii) $(C_1$–$C_4)$-alkylithio,

viii) hydroxy,

ix) amino,

x) $(C_3$–$C_7)$-cycloalkyl, or

xi) $(C_3$–$C_{10})$-alkenyl,

(c) heteroaryl, wherein heteroaryl is defined as a 5- or 6-membered heteroaromatic moiety, which can contain one or two members selected from the group consisting of N, O, S and wherein the heteroaryl is optionally mono- or disubstituted with substituents selected from the group consisting of:

i) Cl, Br, I, F,

ii) OH,

iii) SH,

iv) NO_2,

v) $(C_1$–$C_4)$-alkyl,

vi) $(C_2$–$C_4)$-alkenyl,

vii) $(C_2$–$C_4)$-alkynyl,

viii) $(C_1$–$C_4)$-alkoxy, or

ix) CF_3,

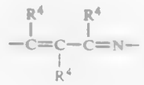
(d) $(C_1$–$C_4)$-perfluoroalkyl,

(e) $(C_3$–$C_8)$-cycloalkyl, or

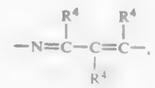
(f) $(C_1$–$C_4)$-alkyl-$(C_3$–$C_8)$-cycloalkyl;

$-A^1-A^2-A^3-A^4-$ is:

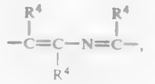
(a)



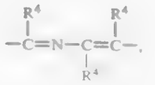
(b)



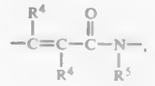
(c)



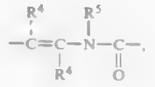
(d)



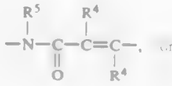
(e)



(f)



(g)



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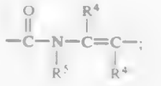
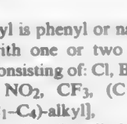


E is:

(a) a single bond,

(b) —S(O)$_n$(CH$_2$)$_s$—, or
(c) —O—;
n is 0 to 2;
s is 0 to 5;
a is a single bond or absent;
X is
(a) O,
(b) H; H,
(c) H; CO_2-(C_1–C_4)-alkyl,
(d) H; CO_2H,
(e) H; CN,
(f) H; 1H-tetrazol-5-yl, or
(g) H; $CONHSO_2R^{14}$;
R^2 is:
(a) H, or
(b) (C_1–C_6)-alkyl;
R^{2a} is:
(a) R^2,
(b) CH_2-aryl
(c) aryl;
R^4 groups are independently:
(a) H,
(b) (C_1–C_6)-alkyl, (C_2–C_6)-alkenyl, or (C_2–C_6)-alkynyl, each of which is unsubstituted or substituted with:
i) OH,
ii) (C_1–C_4)-alkoxy,
iii) CO_2R^2,
iv) $OCOR^2$,
v) $CONHR^2$,
vi) $CON(R^2)_2$,
vii) $N(R^2)C(=O)R^2$,
viii) NH_2,
ix) (C_1–C_4)-alkylamino,
x) di[(C_1–C_4)-alkyl]amino,
xi) aryl,
xii) heteroaryl, wherein heteroaryl is as defined in R^1 (c),
(c) —C(=O)-aryl,
(d) (C_3–C_7)-cycloalkyl,
(e) Cl, Br, I, F,
(f) —OH,
(g) $—OR^{21}$,
(h) $—CF_3$,
(i) —SH,
(j) —S(O)$_n$—(C_1–C_4)-alkyl,
(k) $—CO_2R^{2a}$,
(l) $—SO_3H$,
(m) $—NR^2R^{21}$,
(n) $—NR^2C(=O)R^{21}$,
(o) $—NR^2COOR^{21}$,
(p) $—SO_2NHR^{21}$,
(q) $—SO_2NR^2R^{2a}$,
(r) $—NO_2$,
(s) $—NHSO_2$—(C_1–C_4)—alkyl,
(t) $—C(O)NHSO_2R^{14}$,
(u) aryl,
(v) heteroaryl, wherein heteroaryl is as defined in R^1 (c), or
(w) morpholin-4-yl;
R^5 is:
(a) H, or
(b) (C_1–C_6)-alkyl or (C_2–C_5)-alkenyl, unsubstituted or substituted with:
i) hydroxy, or
ii) (C_1–C_4)-alkoxy;
R^9 and R^{10} are each independently:
(a) H,
(b) Cl, Br, I, F,
(c) NO_2,
(d) (C_1–C_6)-alkyl,
(e) (C_1–C_6)-acyloxy,
(f) (C_3–C_6)-cycloalkyl,
(g) (C_1–C_6)-alkoxy,
(h) $—NHSO_2R^{2a}$,
(i) hydroxy-(C_1–C_4)-alkyl,
(j) aryl-(C_1–C_4)-alkyl,
(k) (C_1–C_4)-alkylthio,
(l) (C_1–C_4)-alkylsulfinyl,
(m) (C_1–C_4)-alkylsulfonyl,
(n) NH_2,
(o) NH[(C_1–C_4)-alkyl],
(p) $N[(C_1–C_4)\text{-alkyl}]_2$,
(q) CF_3,
(r) $—SO_2—NHR^{2a}$,
(s) furyl, or
(t) aryl, wherein aryl is phenyl or naphthyl unsubstituted or substituted with one or two substituents selected from the group consisting of: Cl, Br, I, F, (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, NO_2, CF_3, (C_1–C_4)-alkylthio, OH, NH_2, —NH[(C_1–C_4)-alkyl], $—N[(C_1–C_4)\text{-alkyl}]_2$, $—CO_2H$, or $—CO_2$—(C_1–C_4)-alkyl;
(u) when R^9 and R^{10} are bonded to adjacent carbon atoms, they can be joined to form an aryl ring;
R^{11} and R^{12} are independently:
(a) H,
(b) Cl, Br, I, F,
(c) NO_2,
(d) NH_2,
(e) NH[(C_1–C_4)-alkyl],
(f) $N[(C_1–C_4)\text{-alkyl}]_2$,
(g) SO_2NHR^{2a},
(h) CF_3,
(i) (C_1–C_4)-alkyl,
(j) (C_1–C_4)-alkoxy, or
(k) when R^{11} and R^{12} are bonded to adjacent carbon atoms, they can be joined to form an aryl ring;
Z is:
(a) —H,
(b) $—CC_2R^{2a}$,
(c) $—SO_3R^{13}$,
(d) $—NHSO_2CF_3$,
(e) $—PO(OR^{13})_2$,
(f) $—SO_2NHR^{14}$,
(g) $—CONHOR^{13}$, or
(h) $—CR^{2a}(OH)PO(OR^{13})_2$;
(i) —CN,
(j) $—SO_2NH$-heteroaryl, wherein heteroaryl is as defined in R^1 (c) above,
(k) $—CH_2SO_2NH$-heteroaryl, wherein heteroaryl is as defined in R^1 (c) above,
(l) $—SO_2NH—CO—R^{14}$,
(m) $—CH_2SO_2NH—CO—R^{14}$,
(n) $—CONH—SO_2R^{14}$,
(o) $—CH_2CONH—SO_2R^{14}$,
(p) $—NHSO_2NHCO—R^{14}$,
(q) $—NHCONHSO_2—R^{14}$,
(r) $—NHCO_2R^{2a}$,
(s)



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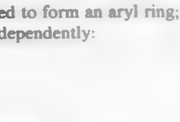

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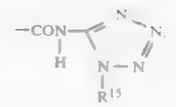
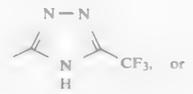
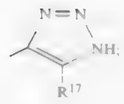


(v) —CONHNHSO$_2$CF$_3$,
(w)



(x)



R^{13} is H, or —CH(R^4)—O—C(O)R^4;
R^{14} is
(a) aryl,
(b) heteroaryl, wherein heteroaryl is as defined in R^1 (c),
(c) (C_3–C_7)-cycloalkyl,
(d) (C_1–C_4)-alkyl unsubstituted or substituted with a substituent selected from the group consisting of aryl, heteroaryl, wherein heteroaryl is as defined in R^1 (c), —OH, —SH, (C_1–C_4)-alkyl, —O(C_1–C_4)-alkyl, —S(C_1–C_4)-alkyl, $—CF_3$, Cl, Br, F, I, $—NO_2$, $—CO_2H$, CO_2-(C_1–C_4)-alkyl, $—NH_2$, $—NH[(C_1–C_4)\text{-alkyl}]_2$, $—PO_3H$, PO(OH) (O-(C_1–C_4)-alkyl);
R^{15} is H, (C_1–C_6)-alkyl, (C_2–C_4)-alkenyl, (C_1–C_4)-alkoxy alkyl, or benzyl, wherein the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of: $—NO_2$, $—NH_2$, —OH or $—OCH_3$;
R^{17} is —CN, $—NO_2$, $—CO_2R^{2a}$, or $—CF_3$; and
R^{21} is:
(a) H, or
(b) (C_1–C_4)-alkyl unsubstituted or substituted with:
i) NH_2,
ii) NH[(C_1–C_4)-alkyl],
iii) $N[(C_1–C_4)\text{-alkyl}]_2$,
iv) CO_2H,
v) CO_2(C_1–C_4)-alkyl,
vi) OH,
vii) SO_3H, or
viii) SO_2NH_2.

5,151,436

DERIVATIVES OF THIOFORMAMIDE

David C. Cook, London; Terance W. Hart, Brentwood; Iain M. Mc Lay, Loughton; Malcolm N. Palfreyman, Upminster; Brian W. Sharp, Hornchurch, and Roger J. A. Walsh, Rayleigh, all of England, assignors to Rhone-Poulenc Sante, Antony, France

Continuation-in-part of Ser. No. 285,219, Dec. 16, 1988. This application Aug. 23, 1990, Ser. No. 571,101
Claims priority, application United Kingdom, Dec. 18, 1987, 8729521; Jun. 16, 1989, 8913865
Int. Cl.[5] A61K *31/435, 31/47, 31/445;* C07D *215/06, 211/72, 211/84*
U.S. Cl. 514—314 8 Claims

1. A thioformamide derivative of the formula:

(I)

wherein R represents a straight- or branched-chain alkyl radical containing from 1 to 4 carbon atoms, Het represents a tetrahydroquinolin-3-yl, quinolin-3-yl, or pyrid-3-yl radical (optionally substituted by a straight- or branched-chain alkyl or alkoxy radical containing 1 to 4 carbon atoms or by a halogen atom), Y represents an ethylene or methylene radical, or a valency bond, and X represents a carbonyl or hydroxymethylene group or a group of the formula: >C=NOR^1, >C=NN(R^1)$_2$ or >C=NN(R^1)CON(R^1)$_2$ in which the symbols R^1, which may be the same or different, each represents a hydrogen atom or a straight- or branched-chain alkyl radical containing from 1 to 4 carbon atoms which is unsubstituted or substituted by one or more substituents selected from C_{2-4}-alkenyl, carboxy, C_{2-5}-alkoxycarbonyl, hydroxy, C_{1-4}-alkyl groups), amino, C_{1-4}-alkylamino and di-C_{1-4}-alkylamino groups or represents a benzyl, phenethyl, 1-naphthylmethyl, 2-naphthylmethyl or pyrid-3-ylmethyl radical each of which may be substituted on the ring by one or more halogen atoms or hydroxy, C_{1-4}-alkyl, C_{1-4}-alkoxy (alkoxy being unsubstituted or substituted as defined for alkyl groups represented by R^1), cyano, nitro, trifluoromethyl, carboxy, C_{1-4}-alkylamino, C_{2-5}-alkanoylamino, C_{2-5}-alkoxycarbonyl groups or two R^1 substituents on the same nitrogen atom may together form a straight- or branched-chain alkylene radical containing from 4 to 6 carbon atoms in the chain which is unsubstituted or substituted as defined for alkyl groups represented by R^1, or a pharmaceutically acceptable salt thereof.

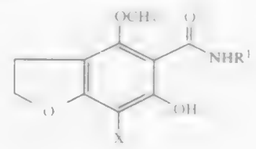
5,151,437

BENZOFURANCARBOXAMIDES HAVING BASIC SUBSTITUENTS AND THERAPEUTIC AGENTS CONTAINING THE SAME

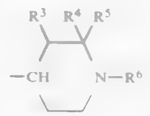
Rainer Schlecker, Bissersheim; Hans-Juergen Teschendorf, Dudenhofen, and Liliane Unger, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 221,653, Jul. 20, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 598,785
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724756
Int. Cl.[5] C07D *207/09;* A61K *31/40*
U.S. Cl. 514—320 13 Claims

1. A benzofurancarboxamide of the formula:



X is hydrogen or methoxy,
R^1 is a radical of the formula:



wherein R^3 to R^5 are each, independently of one another, hydrogen or C_{1-6} alkyl, R^6 is a branched or unbranched C_{1-6}

alkyl, or benzyl which may be methyl- or halogen-substituted on the nucleus, and E is a single or double bond.

5,151,438

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

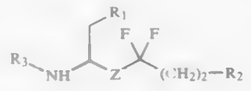
Hing L. Sham, Gurnee; Daniel W. Norbeck, Lindenhurst; Dale J. Kempf, Libertyville, and Chen Zhao, Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 518,730, May 9, 1990, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 675,780

Int. Cl.[5] **C07D** *213/40;* **A61K** *31/44*

U.S. Cl. 514—357 13 Claims

1. A compound of the formula:

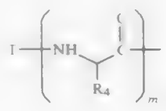


wherein

R_1 is loweralkyl, cycloalkyl, phenyl, substituted loweralkyl, substituted cycloalkyl or substituted phenyl wherein the loweralkyl, cycloalkyl or phenyl group is substituted with one or two substituents independently selected from hydroxy, alkoxy, thioalkoxy and halo;

R_2 is phenyl or substituted phenyl wherein the phenyl ring is substituted with one or two substituents independently selected from hydroxy, alkoxy, thioalkoxy and halo;

R_3 is



wherein

m is 2 and R_4 is independently selected at each occurrence from hydrogen, loweralkyl, cycloalkylalkyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, thioalkoxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, carboxyalkyl, alkoxycarbonylalkyl and aminocarbonylalkyl and

T is

wherein

R_6 is pyridyl or substituted pyridyl wherein the pyridyl ring is substituted with one or two substituents independently selected from hydroxy, halo, amino, alkylamino, dialkylamino, alkoxy, polyalkoxy, haloalkyl, cycloalkyl, aryl, arylalkyl, —COOH, —SO_3H and loweralkyl, V is O or S, W is CH_2, —CH_2CH_2—, —CH=CH—or —D—CH=CH—wherein D is O, S or NH and Y is absent, O, S or $N(R_7)$ wherein R_7 is hydrogen or loweralkyl; and

Z is —C(O)—or —CH(OH)—; or a pharmaceutically acceptable salt thereof wherein the term alkyl as used herein refers to a straight or branched chain alkyl radical containing from 1 to 6 carbon atoms; wherein the terms alkoxy and thioalkoxy as used herein refer to R_{32} is an alkyl group or benzyl and wherein the term aryl as used herein refers to phenyl, naphthyl, tetrahydronaphthyl or indanyl.

5,151,439

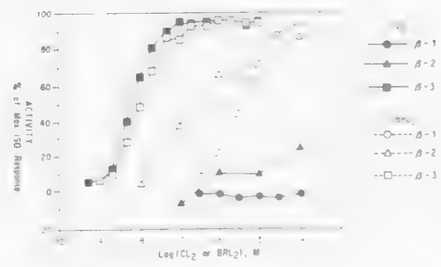
SUBSTITUTED 5-(2-((2-ARYL-2-HYDROXYETHYL)AMINO)PROPYL)-1,3-BENZODIOXOLES

Jonathan D. Bloom, Hartsdale, N.Y.; Thomas H. Claus, Montvale; Vern G. DeVries, Ridgewood, both of N.J.; Jo A. Dolan, Spring Valley, and Minu D. Dutia, West Nyack, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

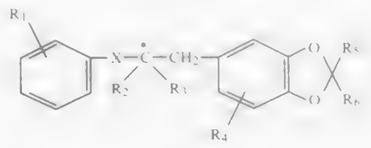
Division of Ser. No. 519,192, May 4, 1990, Pat. No. 5,061,727. This application Aug. 1, 1991, Ser. No. 742,409

Int. Cl.[5] **A61K** *31/42*

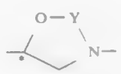
U.S. Cl. 514—376 26 Claims



1. A compound of the formula



wherein R_1 and R_4 may be one or more groups which may be the same or different and are selected from the group consisting of hydrogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, hydroxy, halogen, trifluoromethyl, carboxyl, hydroxyalkyl, alkoxycarbonyl, C_1 to C_4 thioalkyl, sulfonyl and sulfinyl; X is



wherein Y is selected from the group consisting of carbonyl, and thiocarbony; R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen and C_1 to C_4 alkyl; R_5 and R_6 are selected from the group consisting of hydrogen, carboxy, alkoxycarbonyl, hydroxymethyl, —$CH_2OCH_2COOR_7$ and —$CH_2OCH_2CH_2OR_7$ where R_7 is hydrogen or C_1 to C_4 alkyl; except that R_5 and R_6 may not both be hydrogen; the asterisks denote asymmetric carbon atoms; or a pharmaceutically acceptable salt or ester thereof, the enantiomers thereof, the racemic mixtures thereof and the diastereomeric mixtures thereof.

5,151,440

METHOD FOR REDUCING OR MAINTAINING INTRAOCULAR PRESSURE IN THE MAMMALIAN EYE BY ADMINISTERING PHARMACEUTICAL COMPOSITIONS CONTAINING 2-(2-ALKYLPHENYLAMINO)-OXAZOLINES 2-(2-ALKYLPHENYL-AMINO)-THIAZOLINES AND 2-(2-ALKYLPHENYLAMINO)-IMIDAZOLINES

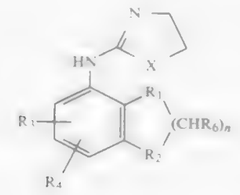
Charles Gluchowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Feb. 28, 1990, Ser. No. 486,381

Int. Cl.[5] **A61K** *31/42*

U.S. Cl. 514—377 13 Claims

1. A method of treating animals of the mammalian species, including humans, for the purpose of reducing or maintaining intraocular pressure in the eye of the mammal, the method of treatment comprising the steps of administering to the mammal a pharmaceutical composition which comprises as its active ingredient one or more compounds of the formula



where X is O;

n is an integer with the values of 0, 1 or 2; R_3 and R_4 independently are H or lower alkyl having 1 to 6 carbons;

R_6 is H or lower alkyl of 1 to 6 carbons, with the proviso that when n is 0 then R_1 is lower alkyl having 1 to 6 carbon atoms and R_2 is H or lower alkyl having 1 to 6 carbon atoms, when n is 1 or 2, then R_1 and R_2 both are CHR_5, where R_5 independently is H or lower alkyl of 1 to 6 carbons, or salts of compounds of said formula the active ingredient being present in the pharmaceutical composition in approximately 0.0001 to 1.0 per cent weight by volume concentration.

5,151,441

3-ISOXAZOLYLBENZYL ESTERS, THEIR PREPARATION AND THEIR USE

Stefan Mueller, Speyer; Hans Theobald, Limburgerhof; Bernd Wolf, Fussgoenheim; Peter Hofmeister, Neustadt; Uwe Kardorff, Mannheim, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

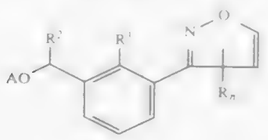
Filed May 14, 1991, Ser. No. 699,528

Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4016049

Int. Cl.[5] **A01N** *43/80;* **C07D** *413/04, 261/06, 277/20*

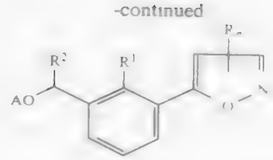
U.S. Cl. 514—378 7 Claims

1. A 3-isoxazolylbenzyl ester of the formula Ia or Ib



Ia

-continued



Ib

where

R is halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_2–C_4-alkenyl or C_2–C_4-haloalkenyl or is phenylethyenyl which may carry from one to five halogen atoms, or is C_2–C_4-alkynyl, C_3–C_6-cycloalkyl, phenyl, naphthyl, phyrrolyl, pyrazolyl, imidazolyl, isoxazolyl, oxazolyl, isothiazolyl, thiazolyl, furanyl, thienyl or pyridyl, CO_2R^3 or $CONR^4R^5$,

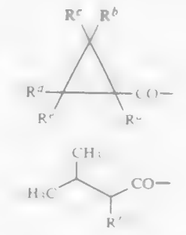
R^3, R^4 and R^5 are each hydrogen or C_1–C_6-alkyl,

n is 0, 1 or 2, and the radicals R may be different when n is 2,

R^1 is halogen or C_1–C_4-alkyl,

R^2 is hydrogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or cyano and

A is a carbonyl radical of the formula IIa or IIb



IIa

IIb

where

R^a is hydrogen, C_1–C_4-alkyl or phenyl, wherein the aromatic ring may carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio, R^b—, R^c and R^d are each hydrogen, halogen or C_1–C_4-alkyl, R^e is hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-haloalkyl or is C_2–C_6-alkenyl or C_2–C_6-alkadienyl which may carry from one to eight halogen atoms and/or one of the following radicals: C_1–C_4-alkoxycarbonyl or phenyl, where the phenyl radical in turn may carry from one to five halogen atoms and/or from one to three of the following groups: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio, or R^e is C_5–C_7-cycloalkylidenemethy, or R^a and R^a together form a 2,2H-indenespiro group and R^f is phenyl, 1-pyrrolyl or 2-isoindolyl radical, where this ring system may carry from one following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_4–C_4-alkylthio, or a phenylamino group where the phenyl ring in turn may carry from one to five halogen atoms and/or from one to three of the following radicals:

C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkythio.

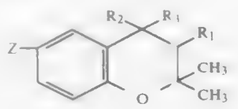
5,151,442

CHROMAN DERIVATIVE ACTIVE ON THE CENTRAL NERVOUS SYSTEM, THEIR METHOD OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Georges Garcia; Alain Di Malta, both of Saint-Gely-du-Fesc, and Philippe Soubrie, St Mathieu de Treviers, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 440,090, Nov. 22, 1989, Pat. No. 5,082,858. This application Oct. 23, 1991, Ser. No. 781,414
Claims priority, application France, Nov. 23, 1988, 88 15284
Int. Cl.[5] A61K *31/35*; C07D *311/68*
U.S. Cl. 514—456 4 Claims

1. A compound of the formula



(I)

in which:

Z represents a halogen or a cyano, acetyl, trifluoro-acetyl, nitro, C_1–C_4 alkylthio, carboxyl, phosphono, dialkoxy-phosphonyl or alkoxycarbony group, the alkylthio and alkoxy groups containing from 1 to 3 carbon atoms;

R_1 denotes a hydroxyl group and R_2 represents hydrogen, or R_1 and R_2 taken together form an additional bond between the carbon atoms by which they are carried; and

R_3 represents

a group —S—R_5, in which R_5 represents a C_1–C_4 alkyl group, a C_3–C_7 cycloalkyl or a phenyl group which is unsubstituted or monosubstituted or disubstituted by a halogen, a nitro group, a C_1–C_4 alkyl group, a trifluoromethyl group, an amino group, a group —N—$(Alk)_2$, a group —COOAlk or a group —OAlk, Alk denoting a C_1–C_4 alkyl group; or R_5 denotes a group —Alk-N—$(Alk)_2$ in which Alk is as defined above; or

a group SO_2R_5, in which R_5 is as defined above;

or the salts which the compounds of formula (I) are capable of producing with pharmaceutically acceptable acids when the substituent R_3 comprises an amino group.

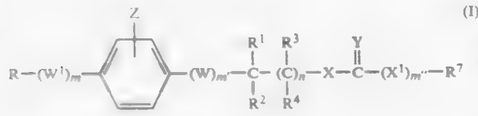
5,151,443

METHOD OF CONTROLLING TERMITES

Clive A. Henrick, Palo Alto, Calif., assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 556,492, Jul. 20, 1990, abandoned. This application Jan. 16, 1992, Ser. No. 823,574
Int. Cl.[5] A01N *47/10*
U.S. Cl. 514—486 6 Claims

1. A method for controlling termites which comprises applying to the termites, their locus or a locus where protection against termite infestation is desired an effective amount of a compound of the following formula I



(I)

wherein

each of m, m' and m'' is one;

n is zero, one, two or three;

R is hydrogen, lower alkenyl, lower alkynyl, lower halogenalkyl, lower haloalkenyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylthioalkyl, cycloalkyl or cycloalkylalkyl;

each of R^1, R^2, R^3, R^4 and R^8 is independently hydrogen or lower alkyl;

R^7 is lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl, lower haloalkenyl, lower haloalkynyl, cycloalkyl or cycloalkylalkyl;

W is oxygen or sulfur;

W^1 is oxygen or sulfur;

X is NR^8;

X^1 is oxygen or sulfur;

Y is oxygen or sulfur; and

Z is hydrogen, lower alkyl, lower haloalkyl or halogen.

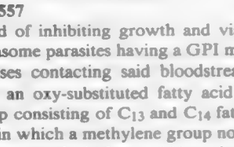
5,151,444

OCULAR HYPOTENSIVE AGENTS

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya, and Oda, Itami, all of Japan, assignors to K.K. Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Continuation of Ser. No. 246,059, Sep. 19, 1988, Pat. No. 5,001,153. This application Sep. 19, 1990, Ser. No. 584,669
Claims priority, application Japan, Sep. 18, 1987, 62-235890; Dec. 29, 1987, 62-334037
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] A61K *31/557*
U.S. Cl. 514—530 15 Claims

1. A topical ocular composition comprising an amount effective as an ocular hypotensive agent of a 13,14-dihydro-15- keto prostaglandin represented by the formula (I):



wherein each R is independently hydroxy, hydroxy C_{1-3} alkyl or C_{1-2} alkyl; Y is a saturated or unsaturated C_{2-6} hydrocarbon chain which is unsubstituted or substituted by oxo, halogen, an alkyl group or hydroxyl; Z is a C_{1-10} saturated or unsaturated hydrocarbon forming a straight-chain, a branched-chain or a ring, which is unsubstituted or substituted by halogen, an alkyl group, an alkoxy group, hydroxyl, a phenyl group or a phenoxy group; or the physiologically acceptable slats and carboxylic acid esters, said ester being a straight or branched-chain alkyl containing up to one unsaturated bond, cycloakly, benzyl, phenyl, hydroxyalkyl, alkoxyalkyl, alkylsilyl or tetrahydropyranyl ester, of the compounds of formula (I); and a pharamaceutically acceptable carrier.

5,151,445

METHOD OF INHIBITING PARASITIC ACTIVITY

Joseph K. Welply, St. Peters; Steven P. Adams, St. Charles, and Jeffrey I. Gordon, Olivette, all of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 208,192, Jun. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 151,774, Feb. 3, 1988, abandoned. This application Jan. 8, 1991, Ser. No. 638,709
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—557 6 Claims

1. A method of inhibiting growth and viability of bloodstream trypanasome parasites having a GPI membrane anchor which comprises contacting said bloodstream trypanosome parasites with an oxy-substituted fatty acid analog selected from the group consisting of C_{13} and C_{14} fatty acids or alkyl esters thereof in which a methylene group normally in carbon position from 4 to 13 of said fatty acid is replaced with oxygen, whereby the myristate in said GPI membrane is replaced with said oxy-substituted fatty acid analog.

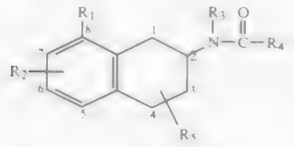
5,151,446

SUBSTITUTED 2-AMIDOTETRALINS AS MELATONIN AGONISTS AND ANTAGONISTS

Alan S. Horn, deceased, late of Noordhorn, Netherlands by Mark Horn, legal representative, and Margarita L. Dubocovich, Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 411,675, Sep. 25, 1989, Pat. No. 5,071,875. This application Mar. 28, 1991, Ser. No. 676,873
Int. Cl.[5] A61K *31/165, 31/16*
U.S. Cl. 514—617 7 Claims

1. A method for treatment of disorders associated with abnormal melatonin activity in an organism, said method comprising the step of administering a therapeutically effective amount of a composition comprising a compound of the formula:



I

wherein:

R_1 is hydrogen, halogen, amino, amino, a C_{1-4} alkyl, C_{1-4} alkoxyl, or C_{1-4} alkoxyl-C_6-aryl;

R_2 is hydrogen, hydroxyl, halogen, amino, amido, C_6 aryl, mono- or di- C_{1-4} alkylamino, C_{1-4} alkyl-C_6-aryl, or C_{1-4}alkoxyl-C_6-aryl, or C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{2-6}alkoxyl;

R_3 is hydrogen, aryl, C_{1-4} alkyl-C_6-aryl or C_{1-4}alkyl, C_{2-4} alkenyl, or C_{1-4} alkynl;

R_4 is C_6 aryl, C_{1-4} alkyl-C_6-aryl, or C_{1-4} alkyl, halo-C_{1-4}-alkyl or C_{3-6}cycloalkyl;

R_5 is hydrogen, hydroxyl, halogen, oxo, C_6 aryl, C_{1-4} alkyl-aryl, or C_{1-4} alkyl;

wherein aryl substituents of R_2, R_3, R_4, and R_5 may optionally be halogen, hydroxyl, amino, mono- or di-C_{1-4} alkyl or alkoxyl substituted.

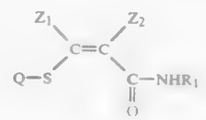
5,151,447

S-SUBSTITUTED BETA-THIOACRYLAMIDE BIOCIDES AND FUNGICIDES

David R. Amick, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 387,452, Jul. 28, 1989, abandoned. This application Jun. 5, 1990, Ser. No. 533,566
Int. Cl.[5] A01N *37/18*
U.S. Cl. 514—627 2 Claims

1. Method of controlling or inhibiting growth of bacteria in a locus comprising incorporating into or onto the locus a bacteriacidally effective amount of the compound of the formula

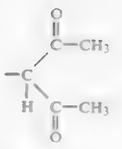


I

wherein

R_1 is selected from an unsubstituted or substituted phenyl, phenethyl and benzyl,

Q is



and Z_1 and Z_2 are independently selected from hydrogen, halogen and (C_1–C_4)alkyl.

5,151,448

METHOD FOR TREATING PREMATURE EJACULATION

Roger T. Crenshaw, Ste. 2132, and Mark G. Wiesner, Ste. 2131, both of 8950 Villa La Jolla, La Jolla, Calif. 92037

Filed Jul. 12, 1991, Ser. No. 729,221
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—651 7 Claims

1. A method of treating a male human patient suffering from premature ejaculation which comprises administering to the patient a dose of fluoxetine effective to delay the onset of ejaculation by the patient during subsequent sexual intercourse.

5,151,449

USE OF L-DEPRENYL FOR RETENTION OF SPECIFIC PHYSIOLOGICAL FUNCTIONS

Norton W. Milgram, Scarborough, Canada, assignor to Deprenyl Animal Health, Inc., Lawrence, Kans.

Filed Aug. 31, 1990, Ser. No. 576,011
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—654 4 Claims

1. A method of treating dogs for the purpose of inducing therein at least one physiological effect evidencing a decrease in cognitive dysfunction, said effect selected from the group consisting of spatial learning, exploratory behavior, and memory response acquisition, said method comprising:

administering to the dog from one to seven times weekly a small but cognitive dysfunction treating effective amount of the compound l-deprenyl or a pharmaceutically acceptable salt form thereof.

5,151,450

ANTIULCER SUBSTANCE

Kiyokazu Murakami, Yokohama, and Susumu Yokura, Kawagoe, both of Japan, assignors to Tokyo Tanabe Company, Limited, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 659,754
Claims priority, application Japan, Feb. 22, 1990, 2-39663
Int. Cl.[5] A61K *31/12*
U.S. Cl. 514—690 3 Claims

1. 4,5-Dihydroxy-2,6,6-trimethyl-2-cyclohepten-1-one.

2. Antiulcer agent containing 4,5-dihydroxy-2,6,6-trimethyl-2-cyclohepten-1-one as effective ingredient.

5,151,451

TRANSLUCENT, THIXOTROPIC HYGEL

Charles R. Brown, Bedford, and Peter Wilding, Wellingborough, both of Great Britain, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed May 29, 1991, Ser. No. 706,819
Claims priority, application United Kingdom, May 29, 1990, 90201357
Int. Cl.[5] A23J *3/00*; B01J *13/00*; A61K *47/42*
U.S. Cl. 514—773 31 Claims

1. Translucent, thixotropic, non-particulate denatured protein containing aqueous gel.

5,151,452

PURIFICATION OF POLYCARBONATE AND POLYESTER CARBONATE WASTE

Gerhard Fennhoff, Willich; Wolfgang Jakob, Moers; Manfred Ehlert, Dormagen, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 17, 1991, Ser. No. 761,209
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029886; Dec. 7, 1990, 4039014
Int. Cl.[5] C08J 11/04
U.S. Cl. 521—48 11 Claims

1. A process for the purification of resinous waste of at least one polycondensate selected from the group consisting of thermoplastic aromatic polycarbonates and thermoplastic aromatic polyester carbonates which waste contains lacquers and optionally dyes and/or metal contaminants comprising in sequence (i) size-reducing the waste to fragments having an average particle size of 0.1 to 5.0 cm, (ii) refluxing said fragments with an aqueous mineral acid while stirring to effect removing of said lacquer and/or dye from said polycondensate, (iii) water-washing while stirring until neutral and until all the lacquer and/or dye components removed from the polycondensate have been rinsed out, (iv) filtering the remaining liquids and drying the resultant fragments, with the proviso where said waste contains no metal contaminants, added metal is introduced to the process before said (ii).

5,151,453

LIGHT-CURABLE IONOMER DENTAL CEMENT

Robert L. Ibsen; Donald R. Pacropis, both of Santa Maria, and William R. Glace, Orcutt, all of Calif., assignors to Den-Mat Corporation, Santa Maria, Calif

Continuation of Ser. No. 333,904, Apr. 6, 1989, abandoned. This application Aug. 1, 1990 Ser. No. 561,194
Int. Cl.[5] C08F 2/50; C09K 3/00
U.S. Cl. 522—14 10 Claims

1. A two-part dental cement system composed of
a. a powder comprising:
   1. Alumina fluoride silicate glass
   2. Barium tungstate
   3. Zinc oxide
   4. Equilibrium mixture of Sodium N(p-tolyl)glycine-glycidyl methacrylate (Na NTG-GMA) with NTG-GMA
   5. Ethyl 4-dimethylamino benzoate; and,
b. a liquid comprising
   6. Ethoxylated bisphenol A dimethacrylate
   7. 2-hydroxyethyl methacrylate
   8. pyromellitic dianhydride-methyl methacrylate (PMDM)
   9. Polyacrylic acid
   10. 2,3-bornanedione
   11. Butylated hydroxytoluene
   12. Benzoyl peroxide
   13. Tartaric acid

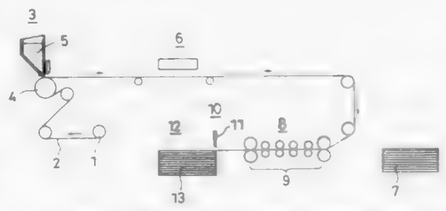
powder (a) and liquid (b) being stored separately and brought into use by mixing them in (a)/(b) weight ratios of 2/1–1/1.

5,151,454

PHOTOCURABLE ADHESIVE OF HYDROXY-POLYESTERURETHANE ACRYLATE, MONOMER AND POLYISOCYANATE

Jugo Goto, Kawanishi; Tsutomu Kubota, Mishima; Reiichi Kotani, Suita, and Masuo Miyaji, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

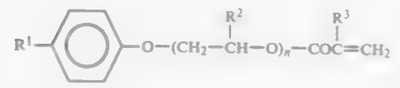
Continuation of Ser. No. 496,174, Mar. 20, 1990, abandoned, which is a continuation of Ser. No. 35,025, Apr. 6, 1987, abandoned. This application Dec. 30, 1991, Ser. No. 815,622
Claims priority, application Japan, Apr. 11, 1986, 61-84546; Apr. 11, 1986, 61-84547
Int. Cl.[5] C08F 2/50, 226/02, 283/04
U.S. Cl. 522—93 3 Claims



1. An adhesive composition for profile lapping which consists essentially of:
   (A) a photopolymerizable polyester-polyurethane-polyacrylate or polyester-polyurethane-polymethacrylate which has a number average molecular weight of not less than about 3000 and at least one photopolymerizable acryloyl or methacryloyl group together with one to three hydroxy groups in the molecule in an amount of 5–70% by weight;
   the photopolymerizable polyester-polyurethane-polyacrylate or polyester-polyurethane-polymethacrylate being an adduct of (a) a vinyl monomer having hydroxyl groups in its molecule, to (b) a polyester urethane;
   the vinyl monomer (a) being at least one member selected from the group consisting of N-methylol acrylic amide, N-methylol methacrylic amide, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, pentaerythritol monoacrylate, pentaerythritol monomethacrylate, allyl alcohol, monoacrylate esters of polyethylene glycol, monomethacrylate esters of polyethylene glycol, monovinyl ethers of ethylene glycol or polyethylene glycol, monovinyl ethers of propylene glycol or polypropylene glycol and a vinyl monomer represented by the formula of

$$CH_2=CHCOOCH_2CH_2OCO(CH_2)_5OH;$$

   the polyester urethane (b) being produced by the reaction of a polyester polyol (i) with a polyisocyanate (ii);
   the polyester polyol (i) being produced by the reaction of a polybasic carboxylic acid or a polybasic carboxylic anhydride with a polyhydric alcohol;
   the polybasic carboxylic acid or polybasic carboxylic anhydride being at least one member selected from the group consisting of maleic acid, succinic acid, adipic acid, fumaric acid, phthalic acid, terephthalic acid, isophthalic acid, methylterephthalic acid, methyltetrahydrophthalic acid, tetrahydrophthalic acid, sebacic acid, dodecanedioic acid, azelaic acid, glutaric acid, trimellitic acid, hexahydrophthalic acid, dimer acid and their anhydrides;
   the polyhydric alcohol being at least one member selected from the group consisting of ethylene glycol, propylene glycol, butylene glycol, hexylene glycol, decanediol, neopentyl glycol, diethylene glycol, dipropylene glycol, glycerine, trimethylolpropane, 1,4-cyclohexanedimethanol, neopentyl glycol ester of hydroxypivalic acid, 1,4-cyclohexanediol and hydrogenated bisphenol A;
   the polyisocyanate (ii) being at least one member selected from the group consisting of tolylene diisocyanate, diphenylmethane diisocyanate, 3,3'-dimethyldiphenylmethane-4,4'-diisocyanate, naphthylene-1,5-diisocyanate, phenylenediisocyanate, xylylenediisocyanate, 1,6-hexamethylenediisocyanate, 1,4-tetramethylenediisocyanate, isophorone diisocyante, hydrogenated tolylenediisocyanate, hydrogenated diphenylmethanediisocyanate, hydrogenated xylylenediisocyanate, and their dimers and trimers;
   (B) a photopolymerizable monomer which has a molecular weight of about 200–800 and a single photopolymerizable acryloyl group or methacryloyl group, the monomer being represented by the:



   wherein R^1 represents hydrogen or alkyl; R^2 and R^3 independently represent hydrogen or methyl; and n is a positive integer, but not less than 2 when all the R^1, R^2 and R^3 are hydrogens;
   (C) a polyisocyanate compound in an amount of 5–70% by weight, based on the composition.

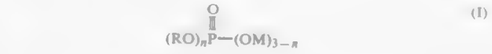
5,151,455

FLAME RETARDANT AND FLAME RETARDANT RESIN COMPOSITION

Shigeo Miyata, Takamatsu, and Makoto Yoshii, Kokubunji, both of Japan, assignors to Kyowa Chemical Industry, Kagawa, Japan

Filed Jul. 10, 1990, Ser. No. 550,364
Claims priority, application Japan, Jul. 10, 1989, 1-177763
The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.
Int. Cl.[5] C08K 9/02
U.S. Cl. 523—200 7 Claims

1. A flame retardant comprising 100 parts by weight of magnesium hydroxide which is surface-treated with a phosphoric ester of formula (I)



(I)

wherein R represents an alkyl or alkenyl group having 10 to 30 carbon atoms, M represents an atom belonging to group IA of the periodic table or NH^{4+}, and n represents 1 or 2, and 0.1 to 10 parts by weight of a salt of a metal other than alkali metals with a higher fatty acid.

5,151,456

EMULSIFIED SEALANT HAVING A HIGH SOLIDS CONTENT

Samir F. Elias, Wichita; Kevin Klausmeyer, Clearwater, and Kurt Holland, Pratt, all of Kans., assignors to Koch Industries, Inc., Wichita, Kans.

Filed May 28, 1991, Ser. No. 706,382
Int. Cl.[5] B01J 13/00
U.S. Cl. 524—60 22 Claims

1. An asphalt-rubber composition for use in forming an aqueous emulsion that is pourable at room temperature, said composition comprising:
   60–90% by weight asphalt;
   in excess of 8% by weight rubber elastomer, at least 2% by weight comprising a liquid rubber; and
   0.5–3% by weight of a polymeric surfactant,
   said asphalt and said rubber being reacted at 300°–400° F. with a peroxide cross-linking agent present in a quantity of 0.05 to 3% by weight of the combined asphalt and rubber mixture.

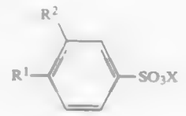
5,151,457

RESIN COMPOSITIONS HAVING IMPROVED ANTISTATIC PROPERTIES

Yuzuru Ishida; Haruo Inoue, both of Kanagawa; Ichiro Otsuka, Tokyo; Masato Takaku, Osaka; Masahiro Mitsuboshi; Keiji Iio, both of Kanagawa, and Atsushi Hashimoto, Osaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 593,066, Oct. 5, 1990. This application Oct. 22, 1991, Ser. No. 796,918
Claims priority, application Japan, Oct. 9, 1989, 1-262207; Feb. 23, 1990, 2-41118; May 24, 1990, 2-132712; Jul. 4, 1990, 2-175171
Int. Cl.[5] C08K 5/42, 5/06; C08F 220/18, 212/08
U.S. Cl. 524—157 23 Claims

1. A resin molding composition having excellent antistatic properties comprising:
   (i) a styrene resin selected from the group consisting of homopolymers of a styrene compound selected from the group of styrene and derivatives thereof, copolymers of at least two such styrene compounds and copolymers of a styrene compound with other copolymerizable monomers;
   (ii) 3 to 35 parts by weight based on 100 parts by weight of styrene resin of a polyethylene oxide having a viscosity-average molecular weight ranging from 15,000 to 1,200,000;
   (iii) either or both of a (meth)acrylate resin in an amount ranging from 4 to 100 parts by weight per 100 parts by weight of the styrene resin, and an oxide selected from the group consisting of titanium oxide, zinc oxide and magnesium oxide in an amount ranging from 0.7 to 5 parts by weight per 100 parts by weight, of the sum of components (i) and (ii); and
   (iv) either a surfactant selected from sulfonic acid salts represented by the formula:



   wherein R^1 and R^2 each represents a hydrogen atom or an alkyl group having not more than 12 carbon atoms and X represents at least one alkali metal selected from the group consisting of Na, Li and K or an alkyl sulfate represented by the formula:

$$R^3—OSO_3M$$

   wherein R^3 represents an alkyl group having 8 to 20 carbon atoms and M represents at least one ion selected form the group consisting of K, Na and NH_4, in an amount ranging from 0.4 to 5 parts by weight per 100 parts by weight of the sum of the components (i), (ii) and (iii) and wherein components (ii), (iii), and (iv) are mixed into the styrene resin to form said resin molding composition.

5,151,458

HIGHLY FLUID POLYARYLENE SULPHIDE MOULDING COMPOUNDS

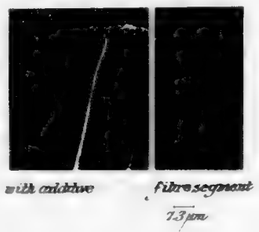
Hans-Detlef Heinz; Harald Pielartzik, both of Krefeld; Klaus Reinking, Wermelskirchen; Rolf-Volker Meyer, Krefeld, and Siegfried Korte, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1990, Ser. No. 515,705

Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3915067

Int. Cl.[5] C08L 3/20

U.S. Cl. 524—190 14 Claims



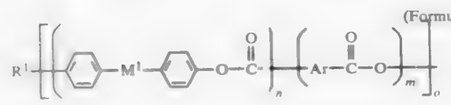
with additive fibre segment 7.3 μm

1. New, highly fluid polyarylene sulphide moulding compounds, comprising

A) from 70–99.9% by weight of polyarylene sulphides,

B) from 0.1 to 30% by weight of one or more low molecular weight, liquid crystalline esters or ester amides of the general structural type corresponding to formula (I) or formula (II):

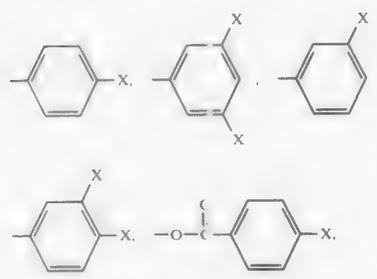
(Formula I)



wherein

Ar denotes an aromatic group with 6–20 carbon atoms which is mononuclear or polynuclear and the polynuclear group is linked through a bond or attached as a condensed group, and

R^1 and R^2 denote independently of one another, H, chlorine, O—C_1–C_4-alkyl, O—C_3–C_6-cycloalkyl, O—C_6–C_{14}-aryl, C_1–C_4-alkyl, C_3–C_6-cycloalkyl, C_6–C_{14}-aryl, fluorinated C_1–C_4-alkyl, fluorinated C_3–C_6-cycloalkyl, fluorinated C_6–C_{14}-aryl, or a group corresponding to one of the formulae (1)/a) to (1)/1):



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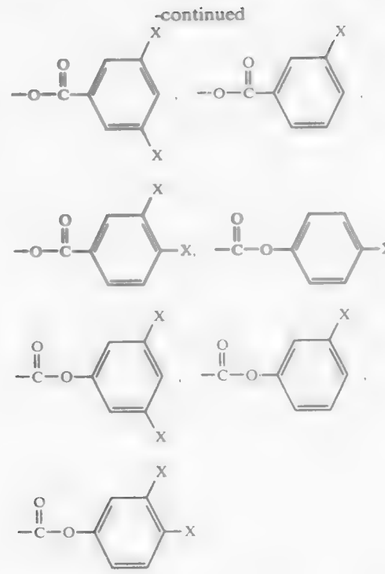
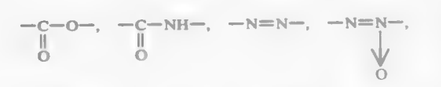


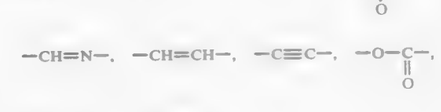
(groups (1.a)–(1.1), are shown in sequence)

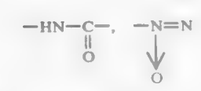
wherein

X again denotes the groups defined above for R^1 and R^2

M^1 and M^2 are identical or different and denote double bonded groups corresponding to the following formulae I.1 to I.11:







and —N=CH— formula (I.1)–(I.11) are given in their sequence, and

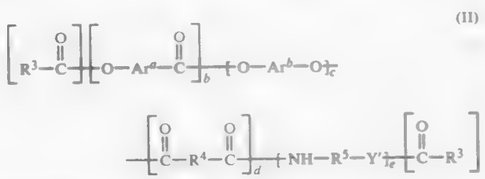
m=zero, 1 or 2,

n=1 or 2,

o=1, 2, 3 or 4 and

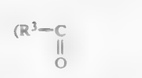
p=zero or 1, but when p=zero then R^2 can only be (1/a), (1/b), (1/c), or (1/d);

(II)



wherein the structural unites are randomly distributed and

R^3 denotes an alkyl group, or an optionally substituted, aryl group, and



is always and end group

Ar^a denotes bivalent, optionally substituted (with the substituents as in R^3) mononuclear or polynuclear aromatic groups having 6 to 24 carbon atoms,

Ar^b denotes bivalent, optionally substituted mononuclear or polynuclear aromatic groups having 6 to 30 carbon atoms,

R^4 and R^5 denote C_mH_{2m} wherein m=0 to 40 (R_4) or 3 to 40 (R_5) or they denote optionally substituted bivalent mononuclear or polynuclear aromatic groups which, in the case of polynuclear groups, are either linked by a bond or attached by condensation,

denotes O,

and when it is linked to an end group of the formula

then it denotes O or NH, and

b=zero to 10,

c=1 to 9,

d=zero to 9, and

e=zero to 3, and

the end groups are formed by structural elements of the type corresponding to the formula

and

C) optionally from 0.001 to approximately 300% by weight, based on the sum of the weight of components A) and B), of other additives.

5,151,459

SUBSTITUTED 1,4-DIAMINO-2-BUTYNE OR PROPARGYLAMINE AS STABILIZERS FOR COMPOSITIONS

Joseph E. Babiarz, Amawalk, N.Y., and Werner Rutsch, Fribourg, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1991, Ser. No. 701,267

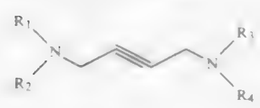
Int. Cl.[5] C08K 5/20, 5/18, 5/17

U.S. Cl. 524—255 13 Claims

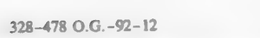
1. A composition stabilized against the deleterious effects of heat or oxygen which comprises

(a) a synthetic polymer, and

(b) an effective stabilizing amount of a compound of formula I, IA, II, IIA, III or IIIA



(I)



(IA)

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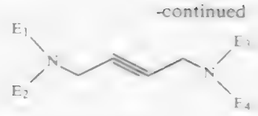
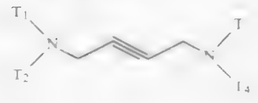


(II)



(IIA)

(III)

or

(IIIA)

wherein

R_1, R_2, R_3 and R_4 are independently a linear or branched alkyl of 1 to 30 carbon atoms; said alkyl substituted with cycloalkyl of 5 to 12 carbon atoms; or said alkyl terminated with —OR_5, —NR_6R_7, —$COOR_9$ or —$CONR_{10}R_{11}$, where R_5, R_6, R_7, R_8 and R_9 are independently alkyl of 1 to 20 carbon atoms or alkenyl of 3 to 18 carbon atoms, and R_{10} and R_{11} are independently hydrogen or the same meaning as R_5; or said alkyl interrupted by one or more —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —OCO—, —$CONR_{12}$—, —$NR_{12}CO$— or —NR_{13}— where R_{12} and R_{13} have the same meaning as R_{10}; or R_1, R_2, R_3 and R_4 are independently cycloalkyl of 5 to 12 carbon atoms; or alkenyl of 3 to 20 carbon atoms;

E_1 is phenylalkyl of 7 to 9 carbon atoms or said phenylalkyl substituted on the phenyl ring by one or two alkyl of 1 to 12 carbon atoms,

E_2, E_3 and E_4 are independently phenylalkyl of 7 to 9 carbon atoms or said phenylalkyl substituted on the phenyl ring by one or two alkyl of 1 to 12 carbon atoms; or aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms, and

T_1, T_2, T_3 and T_4 are independently aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms.

5,151,460

OLEFINIC IMPACT MODIFIERS FOR COMPATIBLE BLENDS OF POLYPHENYLENE ETHERS AND LINEAR POLYESTER RESINS

John B. Yates, III, Glemont, N.Y.; Charles F. Pratt, Brasschart, Belgium, and Angelika H. McHale, Mt. Vernon, Ind., assignors to General Electric Co., Selkirk, N.Y.

Division of Ser. No. 94,552, Sep. 9, 1987, Pat. No. 4,916,188.

This application Nov. 21, 1989, Ser. No. 439,768

Int. Cl.[5] C08K 5/09; C08L 51/04, 53/02, 71/12

U.S. Cl. 524—291 17 Claims

1. An impact-modified thermoplastic composition, comprising the following components and any reaction products thereof:

a) a compatible resin composition comprising:

i) at least one polyphenylene ether resin, alone, or in combination with a polystyrene resin;

ii)

(A) at least one poly(alkylene dicarboxylate) resin component which comprises poly(1,4-butylene terephthalate), and

(B) an agent which suppresses ester-carbonate exchange;

the weight ratio of component (i) to component (ii) having a maximum value of 1.5:1; and

iii) at least one polymer containing a substantial proportion of bisphenol A polycarbonate units; and

b) an effective amount of an impact modifier comprising an

EPDM terpolymer grafted with glycidyl methacrylate or glycidyl acrylate or a mixture thereof, alone, or grafted in further combination with a C_1-C_{18} alkyl methacrylate or acrylate or a mixture thereof.

5,151,461

EDGE PADDING ADHESIVE COMPOSITION FOR CARBONLESS PAPERS

Kenneth J. Perrington, and Clair J. Emery, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 306,327, Feb. 7, 1989, Pat. No. 5,079,068. This application Nov. 2, 1990, Ser. No. 618,451

Int. Cl.[5] C08J *3/05*

U.S. Cl. 524—387 **12 Claims**

1. An adhesive composition that is capable of adhesively edge padding a stack of sets of collated sheets to permit that stack to be fanned apart into individual sets, said adhesive composition comprising by weight:

a) from 7.5 to 20 dry weight % of a water-based latex adhesive polymer,

b) from 2.5 to 12.5% of a noncrystallizing low-molecular-weight, water-soluble, polyhydric alcohol, and as little as 0.5% when the polyhydric alcohol is non-crystalline sorbitol,

c) from 12.5 to 27.5% of a low-molecular-weight, water-soluble, monohydric alcohol, and

d) from 40 to 75% of water, wherein the latex adhesive polymer is selected from the group consisting of poly(vinyl acetate), poly(styrene/butadiene), poly(vinylidene chloride/butadiene), poly(ethylacrylate/methacrylate), and polyethylacrylate.

5,151,462

FLAME RETARDANT BLENDS OF POLYSULFONE AND POLYALKYLENE PHTHALATE

Mohammad J. El-Hibri; Gregory S. Jack; William E. Kelly, all of Roswell, and Sanjay R. Patel, Alpharetta, all of Ga., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 30, 1991, Ser. No. 768,016

Int. Cl.[5] C08K *3/38*

U.S. Cl. 524—405 **10 Claims**

1. A flame retardant polymer blend comprising (a) polysulfone; (b) polyalkylenephthalate; (c) borate salt; and (d) polytetrafluoroethylene.

5,151,463

RESIN COMPOSITIONS INCLUDING CERAMICS EMITTING FAR INFRARED RAYS

Koji Hayafune, Tokyo; Shinichi Nemura, Yokohama; Hiroshige Yasumoto, Osaka, and Hideo Amemiya, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP89/00884, § 371 Date Mar. 12, 1990, § 102(e) Date Mar. 12, 1990, PCT Pub. No. WO90/02152, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 30, 1989, Ser. No. 465,214

Claims priority, application Japan, Aug. 30, 1988, 63-213615

Int. Cl.[5] C08K *3/22*

U.S. Cl. 524—430 **7 Claims**

1. A resin composition comprising a hygroscopic resin and a ceramic effective for emitting far infrared rays, said hygroscopic resin having a water absorption rate not less than 0.1% when measured by ASTM D-570, wherein said hygroscopic resin is a high nitrile resin.

5,151,464

MISCIBLE POLYBLENDS OF ACID-AND ANHYDRIDE-CONTAINING COPOLYMERS

Lan S. Yang, Wilmington, Del., assignor to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Aug. 30, 1991, Ser. No. 752,753

Int. Cl.[5] C08L *35/06, 25/08*

U.S. Cl. 524—449 **21 Claims**

1. A miscible polyblend comprised of

(a) an acid-containing copolymer comprised of, in polymerized form, from 5 to 20 weight percent of an α,β-unsaturated carboxylic acid selected from methacrylic acid and acrylic acid and from 80 to 95 weight percent of a first vinyl aromatic monomer; and

(b) an anhydride-containing copolymer comprised of, in polymerized form, from 5 to 20 weight percent of an α,β-unsaturated dicarboxylic acid anhydride and from 80 to 95 weight percent of a second vinyl aromatic monomer;

with the proviso that the amount of α,β-unsaturated carboxylic acid in the acid-containing copolymer is not more than 75 percent greater than the amount of α,β-unsaturated dicarboxylic acid anhydride in the anhydride-containing copolymer and characterized by the absence of a styrene butadiene block copolymer.

5,151,465

POLYMER COMPOSITIONS AND ABSORBENT FIBERS PRODUCED THEREFROM

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Wilmington, Del.

Division of Ser. No. 460,681, Jan. 4, 1990. This application Apr. 1, 1991, Ser. No. 678,481

Int. Cl.[5] L08L *31/02*

U.S. Cl. 524—549 **22 Claims**

1. A fiberizable, aqueous, uncured but curable, polymer composition comprising the reaction product of:

(a) a partially neutralized aqueous polymer composition prepared by the reaction of a strong base with a polymer containing at least 25 mole percent recurring units of an α,β-unsaturated monomer having in its molecule one or two carboxyl groups or one or two other groups convertible to and converted to carboxyl groups, the degree of neutralization of said partially neutralized polymer being within the range of from about 0.2 to about 0.8 equivalent of total carboxyl groups of the α,β-unsaturated monomer, with

(b) from about 0.1 to about 10 total parts by weight of at least one reactive compound per 100 parts by weight of the partially neutralized aqueous polymer composition, the reactive compound being a water soluble compound bearing one amine group and at least one hydroxyl group, wherein the reaction product is formed by an ionic bonding reaction between the unneutralized carboxyl groups on the polymer and the amine groups on the reactive compound, and is stable at room temperature and can be made into absorbent fibers.

5,151,466

SINGLE STEP BULK PROCESS FOR HIGH IMPACT POLYESTER MASTERBATCHES, PRODUCTS THEREOF AND BLENDS WITH POLYESTERS

Shrikant V. Phadke, 14416 Brittmore Ave., Baton Rouge, La. 70817

Division of Ser. No. 235,315, Aug. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 183,437, Apr. 13, 1988, abandoned, which is a continuation of Ser. No. 4,090, Jan. 16, 1987, abandoned. This application Mar. 28, 1990, Ser. No. 500,550

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] C08L *67/02, 77/00*

U.S. Cl. 525—177 **10 Claims**

1. The method of preparing a masterbatch for blending with a polyester or polyamide based matrix resin to form a thermoplastic molding composition comprising reacting in a single step in the presence of a free radical initiator less than the full increment of the matrix resin, constituting from about 10 to about 80 percent by weight of the amount of matrix resin in the final composition, with a backbone rubber selected from the group consisting of a rubber component formed by interpolymerization of ethylene, one or more C_3-C_{16} mono-olefins, and a polyene, a copolymer rubber formed by the copolymerization of ethylene and one or more mono-olefins containing 3–16 carbon atoms, and mixtures thereof, and an ester of acrylic or methacrylic acid having an epoxide functionality, said ester being present in an amount within the range of 2–15 parts by weight per 100 parts by weight of said backbone rubber.

5,151,467

N-HALOTHIOSULFONAMIDE MODIFIED RUBBER PRODUCTS AND PROCESS FOR PREPARING THE SAME

Donald A. White, Edison, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 626,805, Dec. 13, 1990, abandoned, which is a division of Ser. No. 439,777, Nov. 20, 1989, Pat. No. 5,034,468, Continuation-in-part of Ser. No. 244,743, Sep. 15, 1988, Pat. No. 4,956,420. This application Oct. 24, 1991, Ser. No. 782,028

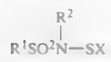
Int. Cl.[5] C08L *27/22*

U.S. Cl. 525—215 **3 Claims**

1. A composite comprising about 100 parts by weight of a modified rubber product, said modified rubber product comprising

(a) a rubber component selected from the group consisting of a polymer of an isoolefin containing from 4 to 7 carbon atoms and at least one conjugated multiolefin containing from 4 to 14 carbon atoms; a halogenated polymer of an isoolefin containing from 4 to 7 carbon atoms and at least one conjugated monoolefin containing from 4 to 14 carbon atoms; and mixtures thereof; and

(b) a N-halothiosulfonamide component of the formula:



Wherein X is chlorine or bromine, and wherein R^1 and R^2 are selected from the group consisting of alkyl groups having from 1 to 20 carbon atoms, aralkyl groups having from 7 to 20 carbon atoms, substituted aryl groups having from 6 to 10 carbon atoms, and wherein R^2 is also selected from a group having the formula:

Wherein R^3 and R^4 are individually selected from said alkyl, aryl, and substituted aryl groups and wherein R^3 and R^4 can be joined together to represent groups selected from the group consisting of

$$-(CH_2)_n-,$$

wherein n is an integer ranging from 4 to 7 and

$$-(CH_2)_2-O-(CH_2)_2-,$$

said N-halothiosulfonamide component being comprised is said modified rubber product in an amount from about 0.005 millimole to about 0.6 millimole per gram of said modified rubber product, in admixture with about 18 to about 670 parts by weight of a rubbery polymer selected from the group consisting of cis-1,4-polyisoprene natural rubber, synthetic cis-1,4-polyisoprene, polybutadiene, butadiene-styrene copolymer with a butadiene to styrene mole ratio in the range of about 60 to 40 to about 95 to 5, butadieneacrylonitrile copolymer, polypentenamer of the type derived from open ring polymerization of cyclopentene, bromobutyl rubber, chlorobutyl rubber and polychloroprene and mixtures thereof.

5,151,468

LOW HEAT GENERATION RUBBER COMPOSITIONS CONTAINING THIADIAZOLE COMPOUND

Ichiro Nakajima; Kazuya Hatakeyama, both of, Kodaira, and Yasushi Hirata, Sayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

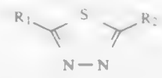
Continuation of Ser. No. 311549, Feb. 16, 1990, abandoned. This application Jul. 12, 1990, Ser. No. 552,360

Claims priority, application Japan, Feb. 16, 1988, 63-31868

Int. Cl.[5] C08C *19/20*

U.S. Cl. 525—332.7 **4 Claims**

1. A low heat generation type rubber composition consisting essentially of at least one rubber selected from the group consisting essentially of natural rubber, synthetic polyisoprene rubber, styrene-butadiene copolymer rubber, polybutadiene rubber, and butyl rubber, a reinforcing filler, and a thiadiazole compound expressed by the following general formula:



in which R_1 and R_2, which may be the same as or differ from each other, denote a mercapto group, an amino group, and a trifluoromethyl group, said reinforcing filler and said thiadiazole compound being 20 to 150 parts by weight and 0.1 to 10 parts by weight with respect to 100 parts by weight of said at least one rubber, respectively.

5,151,469

METHOD OF PREPARING ELASTOMERS HAVING REDUCED HYSTERESIS PROPERTIES WITH SULFOXIDES

William L. Hergenrother, Akron, and John M. Doshak, Mogadore, both of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 21, 1991, Ser. No. 703,533

Int. Cl.[5] C08F *8/34;* **C08C** *19/20*

U.S. Cl. 525—354 **9 Claims**

1. A method of preparing an elastomer having reduced hysteresis properties comprising the steps of:

reacting an anionic polymer having at least one functional site, with about one equivalent of a sulfoxide compound selected from the group consisting of diphenyl sulfoxide, dibutyl sulfoxide, di-para-tolyl sulfoxide, di-4-chlorophenyl sulfoxide and methyl methylsulfinylmethyl sulfide; and,

curing said adduct in the presence of a suitable cure catalyst.

wherein said anionic polymer is formed from a monomer solution comprising a monomer component selected from the group consisting of conjugated dienes having from about 4 to about 12 carbon atoms, monovinyl aromatic monomers having from 8 to about 18 carbon atoms, trienes and mixtures thereof.

5,151,476

AMINOCROTONATES AS CURING AGENTS FOR EPOXY RESINS

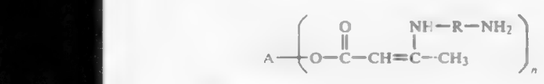
Joseph Sanders, Leverkusen, Fed. Rep. of Germany; Robson Mafoti, Pittsburgh, Pa., and Peter H. Markusch, McMurray, Pa., assignors to Miles Inc., Pittsburgh, Pa.

Filed Jan. 10, 1992, Ser. No. 819,029
Int. Cl.[5] C08G *59/52*
U.S. Cl. 525—407 4 Claims

1. A heat curable composition comprising:

a) an epoxide compound with, on average, more than one epoxide group in the molecule and

b) a β-aminocrotonate of the general formula:



where

R represents a hydrocarbon radical,

A represents the polyfunctional radical left by removal of the hydroxyl groups from a polyol of molecular weight of from about 800 to about 6000 and functionality n, and n is an integer of from 2 to 6,

with the ratio of component a) to component b) being such that at least one half moles of amine groups are present for each mole of epoxide group.

5,151,477

EPOXY MATRIX RESIN FORMULATIONS WITH IMPROVED STORAGE STABILITY CONTAINING POWDERED DIAMINE DISPERSIONS

Shahid P. Qureshi, Alpharetta, and Hugh C. Gardner, Roswell, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 23, 1990, Ser. No. 601,900
Int. Cl.[5] C08G *59/50*
U.S. Cl. 525—423 7 Claims

1. A composition comprising N,N,N',N'-tetraglycidylbis(4-amino-3-ethylphenyl) methane and from about 6 to about 150 pbw, per 100 pbw epoxy resin component, of a solid diamine hardener selected from the group consisting of 3,3'-diaminodiphenyl sulfone and 4,4'-bis(4-aminophenoxy) diphenyl sulfone dispersed therein as a finely divided solid at room temperature.

5,151,478

METHOD OF PREPARING RIGID ROD POLYMERS IN THERMOPLASTIC MATRICES

David A. Valia, San Diego, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Aug. 10, 1990, Ser. No. 565,394
Int. Cl.[5] C08L *79/08*
U.S. Cl. 525—432 14 Claims

1. The method of preparing a polymeric product comprising a substantially uniform mixture of rod shaped polyimide polymer molecules dispersed in a coil shaped polymer matrix, which comprises the steps of:

providing a polyetherimide having coil shaped polymer molecules;

dissolving said polyetherimide in a solvent;

adding thereto a dianhydride and a diamine;

reacting said dianhydride and diamine to form a polyamic acid;

adding thereto a cyclizing agent to cause said polyamic acid to partially cyclize to a polyimide;

removing excess cyclizing agent;

heating the resulting mixture to at least a shape-retaining structural state; and

heating the shape-retaining structure to complete polymerization of said polyimide;

whereby a structure having rod shaped molecules substantially uniformly dispersed in coil shaped matrix molecules results.

5,151,473

ORGANOPOLYSILOXANES CONTAINING SULFOSUCCINATE GROUPS

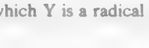
Christian Herzig, Taching, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 6, 1990, Ser. No. 609,680
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940536
Int. Cl.[5] C08F *283/00*
U.S. Cl. 525—474 6 Claims

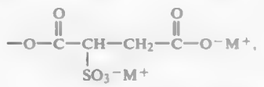
1. An organopolysiloxane which contains sulfo-succinate groups and contains average units of the general formula

(1)

in which R is selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atom(s) per radical and monovalent halogenated hydrocarbon radicals having from 1 to 18 carbon atom(s) per radical, Z is a radical of the formula



in which Y is a radical of the formula



R^1 is selected from the group consisting of a hydrogen atom and an alkyl radical having from 1 to 4 carbon atom(s) per radical and M^+ is selected from the group consisting of a hydrogen ion, an alkali metal ion, an ammonium ion and mixtures thereof, a is 0 or 1, with an average of from 0.03 to 1.0, b is 0, 1, 2 or 3, with an average of from 1.0 to 2.5, and the sum of a+b does not exceed 3, with the proviso that the compound contains at least one Z radical per molecule.

5,151,474

PROCESS CONTROL METHOD FOR MANUFACTURING POLYOLEFIN

Sandra V. Lange, Lake Jackson; David P. Denton, Richwood; Joseph P. Weller; Jean P. Chauvel, Jr., both of Lake Jackson; Stuart Farquharson, Freeport, all of Tex.; Harry D. Ruhl, Jr., Midland, Mich., and Gregory A. Winter, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 16, 1990, Ser. No. 481,020
Int. Cl.[5] C08F *2/06*
U.S. Cl. 526—60 18 Claims

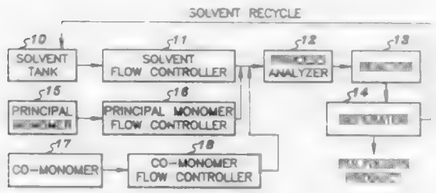
1. A process control method for controlling a polyolefin polymerization process, comprising the steps of:

(a) flowing a stream of recycled solvent into a polyolefin polymerization reactor;

(b) adding a principal olefin monomer to the stream of recycled solvent;

(c) adding a co-monomer to the stream of recycled solvent at a controllable rate;

(d) determining the concentration of the principal monomer and the concentration of the co-monomer in the stream of



recycled solvent by high resolution multi-wavelength vibrational spectroscopic analysis; and

(e) controlling the rate of addition of the co-monomer according to the determination of step (d).

5,151,475

TERMINATION OF ANIONIC POLYMERIZATION

Craig A. Stevens; Carma J. Gibler, both of Houston; Linda R. Chamberlain, Richmond, and Thomas F. Brownscombe, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 15, 1991, Ser. No. 685,111
Int. Cl.[5] C08F *2/38*
U.S. Cl. 526—83 20 Claims

1. In a process for anionically polymerizing monomers with an anionic polymerization initiator in a suitable solvent thereby creating a living polymer, the improvement which comprises terminating the polymerization by the addition of a terminating agent selected from the group consisting of, ammonia, and silanes.

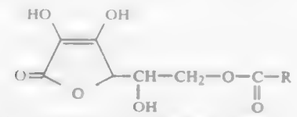
5,151,476

MICRO-SUSPENSION POLYMERIZATION OF VINYL CHLORIDE WITH ASCORBIC ACID AND WATER-SOLUBLE METAL SALTS

Richard A. Marshall, Akron; James W. Hershberger, and Susan A. Hershberger, both of Oxford, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 90,998, Aug. 31, 1987, abandoned. This application Jul. 12, 1990, Ser. No. 551,364
Int. Cl.[5] C08F *2/16*
U.S. Cl. 526—93 14 Claims

1. In a process for the micro-suspension polymerization of vinyl chloride monomer into polyvinyl chloride in the presence of water and an emulsifier, the improvement which comprises utilizing as the initiator a redox system which is comprised of (a) a free radical generator, (b) a reducing agent selected from the group consisting of ascorbic acid, isoascorbic acid, and ascorbic acid derivatives having the structural formula:



wherein R is an alkyl group containing from 1 to 30 carbon atoms, and (c) a water-soluble metal salt of iron, copper, cobalt, nickel, tin, titanium, vanadium, manganese, chromium or silver; wherein the molar ratio of said water-soluble metal salt to said free radical generator is within the range of 0.0001 to 0.01.

5,151,477

COPOLYMERIZATION OF VINYL ACETATE AND A FLUOROMONOMER IN AN AQUEOUS MEDIUM

Bryce C. Oxenrider, Florham Park, N.J.; David J. Loeg, Amherst, N.Y., and Frank Mares, Whippany, N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 424,441, Dec. 20, 1989, Pat. No. 5,070,162, which is a continuation-in-part of Ser. No. 123,480, Nov. 20, 1987, abandoned. This application Nov. 22, 1991, Ser. No. 796,184
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] C08F *2/00, 14/18*
U.S. Cl. 526—216 27 Claims

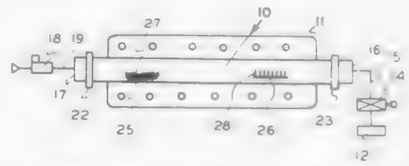
1. A process of forming a copolymer comprising 40 to 60 mole percent of fluorinated units having the formula (R_1R_2C—CR_3F) wherein R_1, R_2 and R_3 are the same or different and are selected from H and F, and R_3 is Cl, when R_1 and R_2 are F; and correspondingly from 60 to 40 mole percent of vinyl units having the formula (H_2C—CHR_x), wherein R_x is a radical of the formula O_2CR_y and wherein R_y is a radical selected from the group consisting of —CH_3, —C_2H_5, —CF_3 and C_2F_5 wherein the fluorinated units and vinyl units are in a substantially alternating distribution as determined by 1H Fourier Transform Nuclear Magnetic Resonance Spectroscopy; said process comprising copolymerizing a vinyl monomer of the formula: H_2C=CHO_2CR_y and a fluoromonomer of the formula R_1R_2C=CFR_3 in an aqueous reaction medium consisting essentially of a solution of water and one or more water miscible co-solvent in the absence or in the substantial absence of a distinct organic co-solvent phase in the reaction mixture and in the presence of an initiator; and maintaining the molar ratio of vinyl monomer to fluoromonomer dissolved in the reaction medium constant or substantially constant during said co-polymerizing to form a copolymer having an alternating or substantially alternating distribution of monomeric units derived from said vinyl monomer and said fluoromonomer in said copolymeric backbone.

5,151,478

HIGHLY CONDUCTING ORGANIC POLYMER THIN FILM COATINGS

Long Y. Chiang, Somerset, and Wen-Yih F. Lai, Fair Lawn, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 15, 1991, Ser. No. 745,298
Int. Cl.[5] C08F *126/06, 132/08;* C08G *73/06*
U.S. Cl. 526—258 4 Claims



1. A polymer formed by vaporizing a compound selected from the group consisting of anthracene, pyrene, pentacene, phenazine, pyrido-bipyrazine, terpyridine, bipyrazine and alkyl derivatives thereof in which the alkyl group has from 1 to about 10 carbon atoms said vaporizing being conducted in the presence of a substrate at temperatures and pressures and for a time sufficient to promote the polymerization of the compound and the deposition of the formed polymer on the substrate.

5,151,479

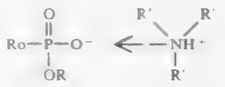
DENTAL ADHESIVE COMPOSITION

Nobuhiro Mukai; Hitoshi Ige; Takayuki Makino, and Junko Atarashi, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,742
Claims priority, application Japan, Apr. 20, 1989, 1-101291
Int. Cl.[5] C08F *230/02, 220/34;* A61K *6/10*
U.S. Cl. 526—277 10 Claims

1. A dental adhesive composition consisting essentially of

(a) an aliphatic amine salt of a polymerizable phosphoric ester represented by the following formula



where R is CH_2= $CHCO_2(CH_2)_nO(CH_2)$—, CH_2=$C(CH_3)CO_2(CH_2)_n$—, CH_2=$CHCO_2(CH_2)_n$—, CH_2=$C(CH_3)CO_2(CH_2)_nO(CH_2)$— or hydrogen, n is a whole number of 1 to 5, the two R radicals are not hydrogen at the same time, R′ is a hydrocarbon radical having 1 to 5 carbon atoms or any of the radicals described above for R, the three R′ radicals are not all hydrogen at the same time, the three R′ radicals do not all contain an unsaturated bond at the same time;

(b) at least one radical-polymerizable unsaturated monomer, and

(c) a radical polymerization initiator.

5,151,480

PROCESS FOR THE PRODUCTION OF MOULDINGS OF CROSSLINKED POLYMERS

Wolfgang Podszun, Koeln; Michael Müller, Bergisch Gladbach; Wilfried Cramer, Leverkusen, and Bodo Rehbold, Koeln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 3, 1991, Ser. No. 709,512
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018714
Int. Cl.[5] C08F *220/30/08*
U.S. Cl. 526—279 10 Claims

1. A process for the production of a molding of a crosslinked polymer comprising molding in a predetermined shape a cross-linkable but uncrosslinked copolymer of a vinyl compound and a polymerizable silane compound having 1 to 3 hydrolyzable groups, and treating the molding with an acidic or alkaline aqueous solution, thereby to effect cross-linking of the copolymer.

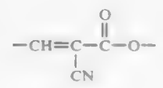
5,151,481

POLYMERS HAVING LIQUID CRYSTAL PHASES CONTAINING 2-CYANOACRYLIC ACID ESTER GROUP

Heino Finkelmann, and Bernfried Messner, both of Freiburg, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Aug. 29, 1989, Ser. No. 399,973
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 3829375
Int. Cl.[5] C08F *22/12, 122/32*
U.S. Cl. 526—298 8 Claims

1. In a polymer having a liquid crystalline phase and comprising a polymeric backbone and pendant mesogenic groups bonded directly or via a spacer to said backbone, the improvement wherein at least one of the mesogenic groups contains a 2-cyanoacrylic acid ester structural element of the formula I



5,151,482

PROCESS FOR THE PRODUCTION OF METHACRYLIC RESIN SHEETS

Hiroyuki Ikeda; Michitoshi Shinka, both of Toyama; Suehiro Tayama, Otake; Tetuya Sawano, Otake, and Masahiro Saruta, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Filed Aug. 12, 1991, Ser. No. 743,998
Claims priority, application Japan, Sep. 4, 1990, 2-233998
Int. Cl.[5] C08F *120/14, 4/34, 4/04*
U.S. Cl. 526—329.7 11 Claims

1. A process for producing a methacrylic resin sheet comprising forming a syrup by partially polymerising methyl methacrylate alone or a monomer mixture of at least 60% by weight of methyl methacrylate and up to 40% by weight of an acrylic or methacrylic ester adding a polymerization initiator comprising at least one peroxy ester having a 10-hour half-life temperature of from 50 to 58° C. and 2,2′-azobisisobutyronitrile to the syrup, introducing the syrup into a mold, polymerizing the syrup in the mold in a first step at a temperature of from 75° C. to 90° C. for a period of 5 to 15 minutes, further polymerizing the syrup in a second polymerization step at a temperature of from 3 to 12° C. below that of the first polymerization step until a conversion of monomer to polymer of 80 to 95% is attained and heat-treating the polymerization product at a temperature of 95° to 140° C. to substantially complete the polymerization thereby forming a methacrylic resin sheet.

5,151,483

PROCESS FOR THE PRODUCTION OF REINFORCED POLYURETHANE MOLDINGS BY THE REACTION INJECTION MOLDING PROCESS

Stephen J. Harasin, Morgan; David F. Sounik, Bridgeville, and Timothy J. Kelly, Oakdale, all of Pa., assignors to Miles Inc., Pittsburgh, Pa.

Filed Mar. 13, 1991, Ser. No. 669,145
Int. Cl.[5] C08G *18/08, 18/70;* B27N *3/10*
U.S. Cl. 528—44 3 Claims

1. In a process for producing a molded part comprising reacting an organic isocyanate with an active hydrogen group-containing material in the presence of a reinforcing fiber mat in a closed mold via the RIM process, the improvement wherein:

i) said isocyanate has a viscosity at 25° C. of at least 200 mPa.s and no more than 1000 mPa.s,

ii) said active hydrogen group-containing material has a viscosity at 25° C. of at least about 300 mPa.s and no more than 3000 mPa.s, and

iii) said mat comprises from about 14% by weight to about 60% by weight of said part.

5,151,484

ISOCYANATE PREPOLYMERS CONTAINING ETHER AND ESTER GROUPS A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE PRODUCTION OF COATING, SEALING OR CASTING COMPOSITION

Lutz Schmalstieg, Cologne; Peter Hihlein, Kempen; Josef Pedain, Cologne, and Wolfhart Wieczorrek, Kempen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 21, 1992, Ser. No. 823,226
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1991, 4102341
Int. Cl.[5] C08G *18/80*
U.S. Cl. 528—45 20 Claims

1. An isocyanate prepolymer containing ether and ester groups, having an isocyanate content of 1.9 to 25% by weight and comprising the reaction product of

A) a polyisocyanate component containing at least one organic polyisocyanate and having an average molecular weight of 168 to 1000,

B) an organic polyhydroxyl component containing

1) at least one polyhydroxyl compound containing ether and ester groups, having an average hydroxyl functionality of 2 to 3 and an average hydroxyl number of 40 to 90 and comprising the esterification product of

i) at least one polyether polyol having an average hydroxyl number of 200 to 600 with

ii) from 25 to 67 equivalent-%, based on the hydroxyl groups of component (i) and the carboxyl groups of component (ii), of an organic carboxylic acid component containing at least one organic monocarboxylic acid or a mixture of at least one organic monocarboxylic acid with up to 20 carboxyl equivalent-%, based on all the carboxylic acids, of polybasic organic carboxylic acids and

2) optionally an organic polyhydroxyl compound having a molecular weight of 62 to 200 in a quantity of up to 25 hydroxyl equivalent-%, based on component B1).

5,151,485

ADVANCED EPOXY COMPOSITIONS, CURABLE COMPOSITIONS AND CURED PRODUCTS

Duane S. Treybig; David S. Wang; Pong S. Sheih, and Loan A. Ho, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 616,506, Nov. 21, 1990, Pat. No. 5,095,050. This application Oct. 30, 1991, Ser. No. 785,380
Int. Cl.[5] C08G *59/06, 59/18*
U.S. Cl. 528—87 2 Claims

1. An advanced composition resulting from reacting (1) at least one of (a) at least one epoxidized triglyceride of a fatty acid, or (b) at least one epoxidized fatty acid having an average of more than one unsaturated group per molecule or (c) at least one diepoxyalkane, or (d) any combination of any two or more of (a), (b) or (c), or (e) a combination of any one or more of (a), (b) or (c) and (f) a diglycidyl ether of a dihydric phenol; with (2) a dihydric phenol.

5,151,486

METHOD OF MANUFACTURING RADIOACTIVE RAY MEASURING DEVICE USING PURE DGEBA AND DDM IN 1:1 MOLAR RATIO

Masakazu Washio, Yokohama, and Syun-ichi Kawanishi, Osaka, both of Japan, assignors to Sumitomo Heavy Industries, Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed May 1, 1990, Ser. No. 517,030
Claims priority, application Japan, May 1, 1989, 1-112559
Int. Cl.[5] C08G *59/58*
U.S. Cl. 528—124 4 Claims

1. A method of manufacturing a radioactive ray measuring device comprising the steps of:

mixing diglycidylether of bisphenol A and diaminodiphenylmethane at a 1:1 molar ratio, both not containing any metal salt;

pre-curing the mixture at a temperature of 80°–120° C. to align the two components and to achieve preliminary bridging; and

curing the pre-cured mixture at a temperature of 140°–180° C. to achieve sufficient bridging to produce epoxy resin of purity of at least 99%.

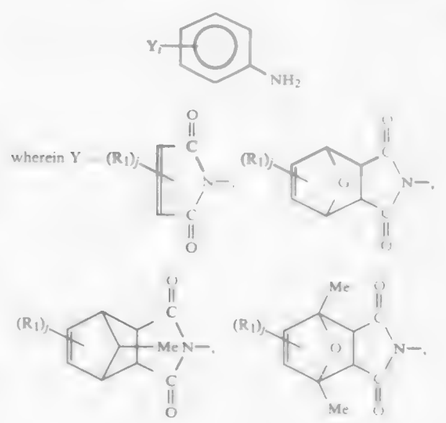
5,151,487

METHOD OF PREPARING A CROSSLINKING OLIGOMER

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 489,205, Mar. 5, 1990, Pat. No. 5,087,701, which is a continuation of Ser. No. 46,202, May 4, 1987, Pat. No. 4,935,523, which is a continuation-in-part of Ser. No. 865,228, May 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 781,487, Sep. 30, 1985, Pat. No. 4,685,620. This application Nov. 26, 1991, Ser. No. 798,626
Int. Cl.[5] C08G *73/10;* C07D *491/08*
U.S. Cl. 528—170 8 Claims

1. A method for preparing a crosslinking oligomer comprising reacting an imidophenylamine end cap monomer and a monomer having a functionality reactive with an amine group, the imidophenylamine end cap monomer corresponding to the formula:



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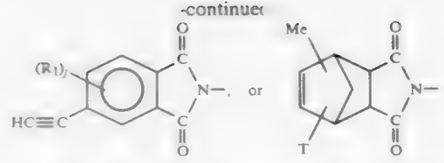


R_1=lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof, wherein the substituents for alkyl or aryl are selected from the group consisting of hydroxyl or halogeno;
Me=methyl;
T=allyl or methallyl;
i=1 or 2;
j=0, 1, or 2; and
G=—CH_2, —O—, —S—, or —SO_2—.

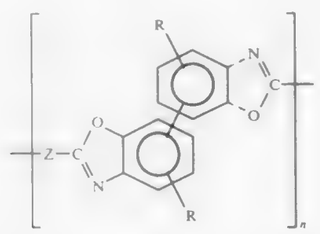
5,151,488

LIQUID CRYSTAL POLYMERS CONTAINING A REPEATING BISOXAZOLE STRUCTURE

David A. Hutchings, Tucker, Ga., and Richard L. Brandon, Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 12, 1991, Ser. No. 790,558
Int. Cl.[5] C08G *73/22*
U.S. Cl. 528—179 **18 Claims**

1. A liquid crystal polymer having a structure comprising repeating units selected from the group consisting of



(I)

where n is an integer of about 10 to 30; R is an alkyl group of about 1 to 9 carbon atoms; an aryl group of about 6 to 12 carbon atoms; an alkoxy group of about 1 to 4 carbon atoms; an aryloxy group of about 6 to 12 carbon atoms, an alkaryl group of about 7 to 13 carbon atoms, an aralkyl group of about 7 to 13 carbon atoms, or halogen; and Z is an arylene group having about 6 to 12 carbon atoms.

5,151,489

COPOLYMERS CONTAINING POLYBENZOXAZOLE, POLYBENZOTHIAZOLE AND POLYBENZIMIDAZOLE MOIETIES

William J. Harris, and Wen-Fang Hwang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 378,360, Jul. 7, 1989, which is a continuation of Ser. No. 327,925, Mar. 23, 1989, Pat. No. 5,030,706, which is a continuation-in-part of Ser. No. 256,338, Oct. 12, 1988, Pat. No. 5,089,568. This application Sep. 15, 1989, Ser. No. 407,973
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] C08G *75/32*
U.S. Cl. 528—183 **48 Claims**

1. A thermoplastic polymer composition comprising blocks of polybenzoxazole polymer chemically linked to blocks of thermoplastic polymer which contain polyamide, polyimide, polyquinoxaline, polyquinoline, poly(aromatic ketone), poly(aromatic sulfone), poly(aromatic ether) or a copolymer of one of those polymers, wherein the thermoplastic composition has a glass transition temperature of no more than about 400° C., is not substantially phase separated, and can be heated to its glass transition temperature without substantial phase separation.

5,151,490

POLYBENZOXAZOLES HAVING PENDANT METHYL GROUPS

William J. Harris, and Zenon Lysenko, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 425,159, Oct. 23, 1989, Pat. No. 5,021,580. This application Apr. 1, 1991, Ser. No. 678,491
Int. Cl.[5] C08G *65/48, 63/00*
U.S. Cl. 528—183 **10 Claims**

1. A polybenzoxazole polymer having a plurality of mer units, wherein at least one mer unit comprises:
(a) a first aromatic group;
(b) two oxazole rings fused with the first aromatic group;
(c) a methyl group bonded to the first aromatic group; and
(d) a divalent organic moiety which is stable and inert under polybenzoxazole polymerizing conditions bonded to one of the azole rings.

5,151,491

CATALYTIC MELT CONDENSATION PREPARATION OF POLYCARBONATE

Takeshi Sakashita, and Tomoaki Shimoda, both of Yamaguchi, Japan, assignors to GE Plastics Japan, Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,464
Claims priority, application Japan, Sep. 22, 1988, 63-238428; Sep. 22, 1988, 63-238429
Int. Cl.[5] C08G *64/20*
U.S. Cl. 528—199 **21 Claims**

1. A process for the production of polycarbonates comprising melt polycondensing an aromatic dihydroxy compound and a carbonic acid diaromatic ester having from 13 to 16 carbon atoms in the presence of (1) from 0.05 to 15 mol %, based on 1 mole of the aromatic dihydroxy compound, of a monohydric phenol having from about 10 to 40 carbon atoms and (2) a catalyst comprising
(a) a nitrogen containing basic compound, and
(b) from 10^{-8} to 10^{-3} mole, based on 1 mole of the aromatic dihydroxy compound, of an alkali metal or alkaline earth metal compound, with or without,
(c) boric acid or boric acid ester,
thereby producing a polycarbonate having hydroxy terminal groups not exceeding 30% of the whole terminal groups thereof and an intrinsic viscosity (η) of from 0.3 to 1.0 dl/g, as measured in methylene chloride at a temperature of 20° C.

5,151,492

PROCESS FOR PRODUCING PEROXIDE-VULCANIZABLE, FLUORINE-CONTAINING ELASTOMER

Masatoshi Abe, Kashima, and Haruyoshi Tatsu, Hitachi, both of Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan

Filed Jan. 22, 1992, Ser. No. 824,084
Claims priority, application Japan, Mar. 15, 1991, 3-75793
Int. Cl.[5] C08F *2/38*
U.S. Cl. 526—206 **5 Claims**

1. A process for producing a peroxide-vulcanizable, fluorine-containing elastomer, which comprises homopolymerizing or copolymerizing a fluorine-containing olefin having 2 to 8 carbon atoms in the presence of an iodine and bromine-containing compound represented by the general formula:

RBrnIm

wherein R is a fluorohydrocarbon group, a chlorofluorohydrocarbon group, a chlorohydrocarbon group or a hydrocarbon group, and n and m are integers of 1 and 2, and perfluoro-(unsaturated compound) selected from the group consisting of perfluoro(bromoalkylvinylether) and perfluoro(iodoalkylvinylether).

5,151,493

RADIATION-CURED FILM WEB AND A PROCESS FOR ITS PREPARATION

Hylton H. Smith, Prudhoe, England; Hans F. Huber, Lohmar, Fed. Rep. of Germany, and Hartmut Müller, Little Silver, N.J., assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 13, 1990, Ser. No. 582,653
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1989, 3931890
Int. Cl.[5] C08G *63/20*
U.S. Cl. 528—272 **6 Claims**

1. A radiation-cured film web composed of a copolyester containing a number of terminal hydroxyl groups which corresponds to hydroxyl numbers of 20 to 100 and 1 to 10 mol. % of trifunctional polyester components in the copolyester chain, based on the total number of polyester components being 100 mo. %, or mixture of copolyesters of this type, said copolyester having a glass transition temperature between −30° and +30° C., a flow point higher than 30° C., and an average molecular weight between 1,000 and 10,000, the terminal hydroxyl groups of said copolyester having been reacted with an acrylate or methacrylate compound, 35 to 90% of the terminal hydroxyl groups having been converted to acrylate groups, in which the optimum degree of acrylation is defined by the empirical formula

$$A_{opt} = 50 + x - y$$

wherein
A_{opt} is the optimum degree of acrylation as a percentage of the hydroxyl groups of the copolyester which have been reacted with acrylate or methacrylate groups,
x is the numerical value of the difference of 298 minus the glass transition temperature Tg of the copolyester in °K., and
y is the numerical value of the proportion of trifunctional polyester components, in mol. %, based on the total number of polyester components being 100 mol. %, multiplied by 2.

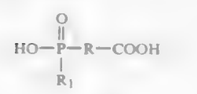
5,151,494

FLAME RESISTANT, LOW PILLING POLYESTER FIBER

Jerry T. Munday, Charlotte, and Theodore D. Meiss, Matthews, both of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 4, 1991, Ser. No. 640,132
Int. Cl.[5] C08G *63/68, 79/02*
U.S. Cl. 528—287 **18 Claims**

1. A polyester which is the polycondensation product consisting essentially of a dicarboxylic acid or a lower alkyl ester thereof, a diol, a chain branching agent having a functionality of at least 3 and a carboxyphosphinic acid monomer, said monomer being used in an amount of from 0.55 to 20 mol percent based on the total amount of dicarboxylic acid or lower alkyl ester thereof and monomer, said monomer of the general formula



or a lower alkyl ester or cyclic anhydride of said monomer wherein R is a saturated, open-chain or cyclic alkylene, arylene or aralkyl having one to 15 carbon atoms, and R_1 is an alkyl having up to 6 carbon atoms, aryl or aralkyl wherein the polycondensation product has an intrinsic viscosity of less than about 0.55 deciliters/gm in the solvent base dichloroacetic acid at 25° C.

5,151,495

PROCESS FOR PRODUCING POLY (PARA-PHENYLENE-SULFIDE)

Hiroshi Inoue; Toshikazu Kato, and Kensuke Ogawara, all of Mie, Japan, assignors to Tosoh Corporation, Yamaguchi and Toso Susteel Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 285,978, Dec. 19, 1988, abandoned. This application Nov. 5, 1990, Ser. No. 609,141
Claims priority, application Japan, Dec. 18, 1987, 62-318920
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] C08G *75/14*
U.S. Cl. 528—388 **10 Claims**

1. A process for producing a substantially linear poly (p-phenylenesulfide) which comprises providing a mixture comprising an alkali metal sulfide, a polar aprotic solvent, a sodium salt of an aliphatic carboxylic acid represented by the general formula: RCOONa (where R is an aliphatic hydrocarbon group having 1–20 carbon atoms), the content of water present in said mixture apart from any water of hydration of crystallization which may be contained in said sulfide and sodium salt being in the range of 5 to 20 moles per mole of said sulfide;
thermally dehydrating said sulfide component in said mixture by removing at least part of the water from said mixture; and
then contacting the resulting dehydrated mixture with a p-dihalobenzene so as to form the desired said poly (p-phenylenesulfide), wherein the preparation of said mixture of alkali metal sulfide and said dehydration step occurs at atmospheric pressure and said poly (p-phenylenesulfide) contains no tri- or higher functional units providing branching sites.

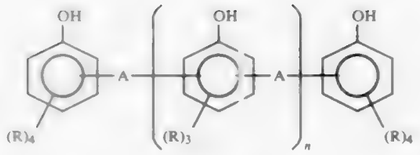
5,151,496

SUBSTITUTED PHENOL-FORMALDEHYDE NOVOLAC RESINS CONTAINING REDUCED QUANTITIES OF 2-FUNCTIONAL COMPONENTS AND EPOXY NOVOLAC RESINS PREPARED THEREFROM

James L. Bertram, Lake Jackson; Louis L. Walker, Clute; Avis L. McCrary, and Fermin M. Cortez, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 658,968, Feb. 21, 1991, Pat. No. 5,106,923, which is a continuation of Ser. No. 545,314, Jun. 27, 1990, abandoned, which is a division of Ser. No. 440,550, Nov. 17, 1989, Pat. No. 4,965,324, which is a continuation-in-part of Ser. No. 186,272, Apr. 26, 1988, abandoned, which is a division of Ser. No. 16,046, Feb. 18, 1987, Pat. No. 4,755,568, which is a continuation-in-part of Ser. No. 690,702, Jan. 11, 1985, abandoned. This application Dec. 18, 1991, Ser. No. 823,636
Int. Cl.[5] C08G *59/08*
U.S. Cl. 528—500 **14 Claims**

1. A novolac resin which results from removing at least about 25 weight percent of the 2-functional component from a novolac resin having an average functionality greater than 2 which results from reacting (1) a material having at least one aromatic hydroxyl group per molecule selected from the group consisting of (a) a substituted phenol wherein the substituent groups are hydroxyl, hydrocarbyl or hydrocarbyloxy groups having from 1 to about 9 carbon atoms, or a halogen; and (b) a mixture of said substituted phenol and phenol wherein more than about 50 molar percent of the mixture is a substituted phenol; with (2) an aldehyde; said novolac resin being represented by the formula



wherein each A is independently a divalent hydrocarbon group or a divalent hydrocarbon group substituted with any inert substituent group; each R is independently hydrogen, a halogen atom, a hydroxyl group or a hydrocarbon or hydrocarbyloxy group having from 1 to about 4 carbon atoms; and n has an average value of from 1 to about 10 with the proviso that more than 50 percent of the aromatic rings have at least one R group which is other than hydrogen.

5,151,497

HISTIDYL PEPTIDE DERIVATIVES

Itsuo Uchida; Akira Saito; Akihiro Yasuda, all of Yokohama; Kunio Iwata, Hatano; Hiroaki Hari, Tokushima; Katsuyoshi Hara, Yokohama; Mutsuyoshi Matsushita, Hatano; Koretake Anami, Nakatsu; Junichi Haruta, Yokohama, and Noboru Furukawa, Hatano, all of Japan, assignors to Japan Tobacco Inc., Tokyo and Yoshotomi Pharmaceutical Industries, Ltd., Osaka, both of, Japan

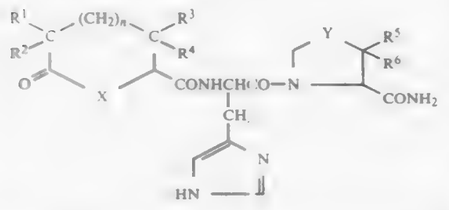
Continuation-in-part of Ser. No 481,559, Feb. 20, 1990, abandoned, and a continuation-in-part of Ser. No. 517,035, May 1, 1990, abandoned, and a continuation-in-part of Ser. No. 571,099, Aug. 21, 1990, abandoned. This application Jul. 12, 1991, Ser. No. 729,415

Claims priority, application Japan, Aug. 17, 1990, 2-215752

Int. Cl.[5] A61K *37/0.; C07K 5/08*

U.S. Cl. 530—331 11 Claims

1. A peptide derivative of the following formula



wherein R^1 and R^2 are the same or different and respectively means a hydrogen atom or a C_{1-5} alkyl group, R^3 and R^4 are the same or different and respectively mean a hydrogen atom or a C_{1-5} alkyl group or phenyl, or R^3 and R^4 combinedly means a C_{2-7} alkylene group, R^5 and R^6 are the same or different and respectively mean a hydrogen atom or a C_{1-5} alkyl group, X means —NH— or —O—, Y means $—CH_2—$ or —S—, and n means 0 or 1, provided that all of R^1, R^2, R^3 and R^4 do not mean hydrogen atoms at the same time, or a pharmaceutically acceptable acid addition salt thereof.

5,151,498

GLYCOPROTEIN FROM *AVENA SATIVA*, PROCESS FOR ITS PREPARATION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

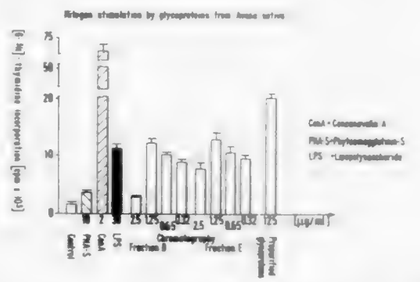
Norbert Beuscher, Salzgitter Bad, and Karl-Heinz Scheit, Goettingen, both of Fed. Rep. of Germany, assignors to Schaper & Bruemmer GmbH & Co. KG, Salzgitter, Fed. Rep. of Germany

Filed Apr. 30, 1990, Ser. No. 515,517

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914354

Int. Cl.[5] A61K *37/02; C07K 3/02, 15/10, 15/14*

U.S. Cl. 530—372 21 Claims



1. An *Avena sativa* glycoprotein that migrates as a single band during SDS electrophoresis, said glycoprotein having a molecular weight of 38 kD and mitogenic activity.

5,151,499

PRODUCTION METHOD FOR PROTEIN-CONTAINING COMPOSITION

Shoju Kameyama; Kenmi Miyano; Motonori Hashimoto; Kazuo Takechi; Takao Ohmura; Yutaka Hirao; Yahiro Uemura, and Kazumasa Yokoyama, all of Hirakata, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jan. 12, 1990, Ser. No. 464,077

Claims priority, application Japan, Jan. 13, 1989, 1-6736; Nov. 27, 1989, 1-308466

Int. Cl.[5] A61K *35/16, 35/14, 39/18, 37/00*

U.S. Cl. 530—381 16 Claims

1. A method for preparing a virus-inactivated protein-containing composition from a protein-containing composition which may be contaminated with virus and which composition is treated in a liquid state and in a dry state, comprising the steps of (a) contacting the protein-containing composition in a liquid state with a trialkyl phosphate, and (b) heat-treating the protein-containing composition in a dry state to the extent that a non-envelope virus contained therein is inactivated, wherein the steps (a) and (b) are performed in any order.

5,151,500

PROCESS FOR PRODUCING A SUBSTANTIALLY HEME-FREE BLOOD PROTEIN

Jorgen Wismer-Pedersen, deceased, late of Roskilde, and Jorn Frohlich, legal representative, Advokatfirmaet Kielberg, Hunderupvej 71, DK-5100 Odense C, both of Denmark

PCT No. PCT/DK88/00127, § 371 Date Mar. 29, 1990, § 102(e) Date Mar. 29, 1990, PCT Pub. No. WO89/00816, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 26, 1988, Ser. No. 469,557

Claims priority, application Denmark, Jul. 30, 1987, 3989/87

Int. Cl.[5] A61K *35/14; A23J 1/06; C07K 3/24*

U.S. Cl. 530—385 9 Claims

1. A process for producing a substantially heme-free blood protein product wherein said process comprises the steps of:

(A) adding a strong acid to a blood cell suspension to produce a pH of about 1.0 to 3.5 whereby a heme moiety is cleaved from majority of the hemoglobin in said suspension and said heme moiety forms a precipitate,

(B) removing said precipitate thereby producing a blood protein-containing solution,

(C) adjusting said blood protein-containing solution to a pH of about 4 to 5 by addition of a base, and

(D) degrading remaining heme moieties in said blood protein-containing solution by adding an amount of an oxidizing agent sufficient to degrade said remaining heme moieties.

5,151,501

METHOD FOR SOLUBILIZATION AND NATURATION OF SOMATOTROPINS UTILIZING SULFOLANE

Kevin M. McCoy, Hoboken, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1991, Ser. No. 811,494

Int. Cl.[5] C07K *3/12, 15/06*

U.S. Cl. 530—399 15 Claims

1. A process for solubilization and naturation of somatotropins, said process comprising: dispersing somatotropin refractrile bodies in an aqueous solution of about 2.5 to 3.5 M sulfolane at a pH and for sufficient time to solubilize said refractile bodies and then diluting said solution at least three-fold with water at a pH and for a time sufficient to result in properly folded monomeric somatotropin.

5,151,502

METHOD FOR SOLUBILIZING MEMBRANE RECEPTOR PROTEINS

Maria L. Webb, Neshanic Station, and Hossain Monshizadegan, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 30, 1991, Ser. No. 693,501

Int. Cl.[5] C07K *3/00, 3/02*

U.S. Cl. 530—402 5 Claims

1. A method for solubilizing membrane receptor proteins which are targets of reducing agents, said membrane receptor proteins being selected from the group consisting of angiotensin II receptor protein, thromboxane receptor protein and neuropeptide Y receptor protein, which comprises:

a. exposing an outer membrane having said receptor protein to an oxidizing agent;

b. treating said membrane with a detergent to extract and solubilize said protein; and

c. treating the membrane derived proteins with an inhibitory material lowering agent, said agent being a polymeric macroporous bead having a neutral charge.

5,151,503

PROCESS FOR REDUCING HYDROLYSED PROTEIN CHLOROHYDRIN CONTENT

Roland Fäsi, Bruetten, Switzerland, and Milo A. Nielsen, Granada Hills, Calif., assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 28, 1991, Ser. No. 676,899

Int. Cl.[5] C07K *3/12, 3/28*

U.S. Cl. 530—412 12 Claims

1. A process for reducing chlorohydrin content of hydrolysed protein comprising:

passing a flow of liquid, wherein the liquid comprises hydrolysed protein obtained by hydrolysis of protein with hydrochloric acid, under a pressure greater than atmospheric pressure through a system piping means for containing the flowing pressurized liquid;

introducing a quantity of alkali into the flowing pressurized liquid and mixing the alkali and liquid to increase the pH of the liquid and obtain a flowing pressurized pH-increased liquid;

heating the flowing pressurized pH-increased liquid to a temperature of from about 100° C. to 170° C.;

maintaining the temperature of the heated flowing pressurized pH-increased liquid at the temperature of from about 100° C. to 170° C. for a time sufficient for reducing the chlorohydrin content of hydrolysed protein contained in the pH-increased liquid to obtain a flowing pressurized chlorohydrin-reduced liquid; and

cooling the flowing pressurized chlorohydrin-reduced liquid to a temperature below 100° C. so that cooling is sufficient to suppress and substantially avoid ammonia gas evolution form the cooled liquid; and

releasing the pressure form the piping system means and the cooled liquid; and

collecting the liquid from which the pressure has been released.

5,151,504

METHOD FOR PURIFICATION OF MONOCLONAL ANTIBODIES

Edward M. Croze, San Ramon, Calif., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 438,548, Nov. 17, 1989. This application Mar. 26, 1990, Ser. No. 500,340

Int. Cl.[5] C07K *3/18, 3/28*

U.S. Cl. 530—413 16 Claims

1. An improved method for the purification of antibodies of the Class IgG or antibody fragments of the class IgG comprising:

(a) applying a preparation containing antibodies of the Class IgG or antibody fragments of the class IgG to an absorbant which removes contaminants from the preparation;

(b) eluting the antibodies of the Class IgG or antibody fragments of the class IgG from the absorbant;

(c) absorbing the antibodies of the Class IgG or antibody fragments of the class IgG onto Protein G bound to a substrate;

(d) eluting the antibodies of the Class IgG or antibody fragments of the class IgG from the substrate bound Protein G with a solution of alkaline pH; and

(e) recovering the purified antibodies of the Class IgG or antibody fragments of the class IgG, wherein the purified antibodies fragments of the class IgG, wherein the purified antibodies or antibody fragments retain the ability to bind antigen.

6. The method according to claim 5 wherein the pH of the eluant used to elute the antibodies of the Class IgG or antibody fragments of the class IgG from the substrate bound Protein G is about 9.5.

5,151,505

AMINE SALTS OF AZO PIGMENTS BASED ON PYRAZOLONE DERIVATIVES

Stefan Hari, Villars-sur-Glane, and Georg Cseh, Posat, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 207,414, Jun. 16, 1988, Pat. No. 4,992,495, which is a continuation of Ser. No. 20,059, Feb. 27, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 612,764

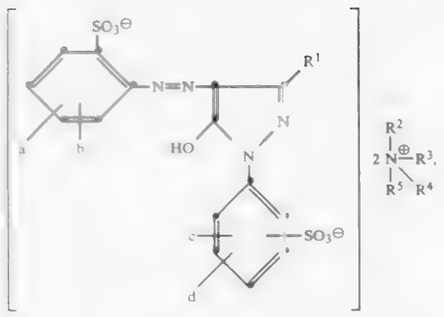
Claims priority, application Switzerland, Mar. 10, 1986, 961/86

Int. Cl.[5] C09B *29/03, 29/10; D06P 1/44, 5/00*

U.S. Cl. 534—728 2 Claims

1. A compound of formula I

(I)



wherein
a and b are each —Cl,
c and d are each independently of the other hydrogen, —Cl or —CH_3,
R^1 is —CH_3, and
R^2, R^3, R^4 and R^5 are each hydrogen.

5,151,506

PHENONEAZO DYES

Volker Bach, Neustadt; Guenter Hansen, Ludwigshafen; Gunther Lamm, Hassloch, and Ruediger Sens, Mannheim, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

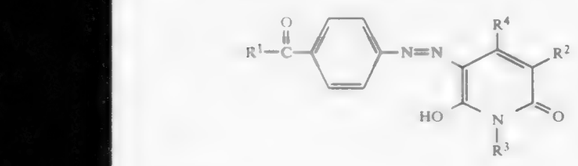
Filed Aug. 16, 1990, Ser. No. 568,087

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3927069

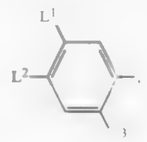
Int. Cl.[5] C09B . *9/42*

U.S. Cl. 534—772 **4 Claims**

1. A phenoneazo dye of the formula I



where
R^1 is a radical of the formula



where L^1, L^2 and L^3 are identical or different and each is independently of the others hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,
R^2 is cyano, carbamoyl or acetyl,
R^3 is C_4-alkyl or C_3–C_{12}-alkyl which is interrupted by from 1 to 3 oxygen atoms and may be substituted by C_1–C_4-alkanoyloxy, cyclohexyloxy, phenoxy which may be C_1–C_4-alkoxy-substituted or phenyl, and
R^4 is hydrogen or C_1–C_4-alkyl,
with the proviso that
(a) L^1, L^2, and L^3 are not all hydrogen at one end and the same time, and
(b) when two members of the set L^1, L^2, and L^3 are hydrogen, the third member is C_1–C_4-alkoxy.

5,151,507

ALKYNYLAMINO-NUCLEOTIDES

Frank W. Hobbs, Jr., and George L. Trainor, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 57,565, Jun. 12, 1987, Pat. No. 5,047,519, which is a continuation-in-part of Ser. No. 881,372, Jul. 2, 1986, abandoned. This application Jun. 12, 1991, Ser. No. 713,906

The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.

Int. Cl.[5] C07H *1/00*

U.S. Cl. 536—23 **9 Claims**

1. An alkynylamino-nucleotide having the structure:

Nuc—C≡C—R_1—NR_2R_3

wherein
R_1 is —$CH_2OCH_2(CH_2OCH_2)_nCH_2$— and n=2–5
R_2 and R_3 are, independently, H, C_1–C_4 alkyl or a protecting group, and
Nuc is R_4-Het having the structure

Z is H or NH_2, and
R_4 is

wherein
R_5 is H, PO_3H_2, $P_2O_6H_3$, $P_3O_9H_4$ or salts thereof, and
(i) when R_7=R_8=H, then R_6=H, OH, F, N_3 or NH_2; or
(ii) when R_7=H and R_8=OH, then R_6=H or OH; or
(iii) when R_7=OH and R_8=H, then R_6=OH.

5,151,508

PROMOTER REGION FOR DNA SEQUENCES WHICH ENCODE THE PRECURSOR OF THE HUMAN A4 AMYLOID PROTEIN

Johannes M. H. Salbaum, Waldkirchen, Fed. Rep. of Germany; Colin L. Masters, Darlington, Australia, and Konrad T. Beyreuther, Heidelberg, Fed. Rep. of Germany, assignors to Molecular Therapeutics, Inc., West Haven, Conn.

Continuation-in-part of Ser. No. 385,758, Jul. 26, 1989, abandoned. This application Aug. 14, 1989, Ser. No. 393,360

Claims priority, application United Kingdom, Aug. 30, 1988, 8820450

Int. Cl.[5] C07H *15/12;* **C12N** *15/00*

U.S. Cl. 536—27 **8 Claims**

1. The promoter region for DNA sequences which encode the precursor of the human A4 amyloid protein which regulates expression of said DNA sequences.

5,151,509

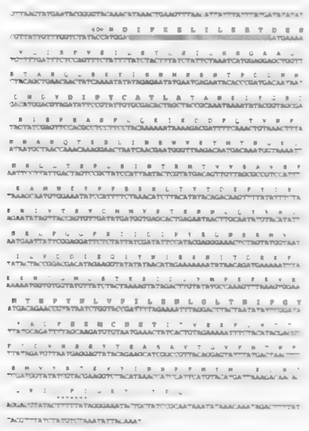
GENE ENCODING SERINE PROTEASE INHIBITOR

Girish J. Kotwal, and Bernard Moss, both of Bethesda, Md., assignors to United States of America, Washington, D.C.

Filed Dec. 16, 1988, Ser. No. 285,510

Int. Cl.[5] C12N *15/15*

U.S. Cl. 536—27 **2 Claims**



1. A cloned gene having the nucleotide sequence of FIG. 2A

5,151,510

METHOD OF SYNETHESIZING SULFURIZED OLIGONUCLEOTIDE ANALOGS

Wojciech J. Stec; Bogdan Uznanski, both of Lodz, Poland; B. John Bergot, Redwood City, Calif.; Bernard L. Hirschbein, San Francisco, Calif., and Karen L. Fearon, Union City, Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

Filed Apr. 20, 1990, Ser. No. 512,644

Int. Cl.[5] C07H *15/12, 17/00;* **A01N** *43/04;* **C12Q** *1/68*

U.S. Cl. 536—27 **17 Claims**

1. A method of synthesizing an oligonucleotide phosphorothioate or phosphorodithioate of a predetermined sequence, the method comprising the steps of:
(a) providing a protected nucleoside or analog thereof attached to a solid phase support, the protected nucleoside or analog thereof having a blocked hydroxyl;
(b) deblocking the blocked hydroxyl to form a free hydroxyl;
(c) reacting with the free hydroxyl a blocked protected nucleoside phosphoramidite or phosphorthioamidite monomer or analog thereof to form a correct-sequence chain having a phosphorous(III) linkage and a blocked hydroxyl;
(d) sulfurizing the phosphorous(III) linkage by exposing the correct-sequence chain to a thiophosphorus compound selected from the group consisting of thiophosphoric acid polysulfide dithiophosphoric acid polysulfide, and dithiophosphinic acid polysulfide;
(e) repeating steps (b) through (d) until the oligonucleotide phosphorothioate or phosphorodithioate of the predetermined sequence is obtained.

5,151,511

DNA ENCODING AVIAN GROWTH HORMONES

Lawrence M. Souza, Thousand Oaks, and Thomas C. Boone, Newbury Park, both of Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 690,463, Jan. 10, 1985, abandoned, which is a division of Ser. No. 529,879, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 418,846, Sep. 16, 1982, abandoned. This application Jan. 27, 1988, Ser. No. 148,110

Int. Cl.[5] C12N *15/18*

U.S. Cl. 536—27 **2 Claims**

1. A purified and isolated DNA sequence coding for expression of chicken growth hormone polypeptide.

5,151,512

INTERMEDIATES FOR PREPARING 2-(SUBSTITUTED-DIBENZOFURANYL AND DIBENZOTHIENYL) CARBAPENEM ANTIBACTERIAL AGENTS

Frank P. DiNinno, Old Bridge; Mark L. Greenlee, Rahway, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 15, 1990, Ser. No. 597,648

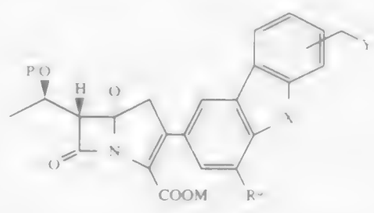
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] C07D *487/04;* **C07F** *7/08;* **A61K** *31/40*

U.S. Cl. 540—302 **4 Claims**

1. A compound of the formula:

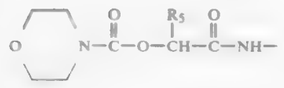
(I.'')

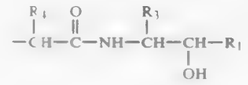


wherein;
R^a is selected from the group consisting of H, Cl, Br, I, SCH_3, CN, CHO, $SOCH_3$, SO_2CH_3, CO_2M, $CONH_2$, OP' and CH_2OP';
P' is a removable protecting group for hydroxy;
M is a removable protecting group for carboxy;
X is O or $S(O)_{0-2}$; and
Y is a leaving group selected from the group consisting of alkylsulfonyloxy, substituted alkylsulfonyloxy, arylsulfonyloxy, substituted arylsulfonyloxy, fluorosulfonyloxy, and halogen.

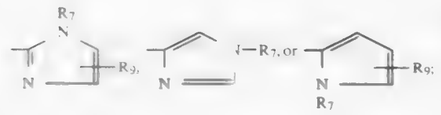
5,151,513
N-HETEROCYCLIC ALCOHOL DERIVATIVES
Harold N. Weller, III, Pennington, and Denis E. Ryono, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Apr. 29, 1988, Ser. No. 187,782
Int. Cl.[5] C07D *413/12*
U.S. Cl. 544—139 **3 Claims**

1. A compound of the formula

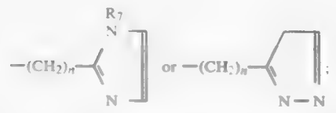




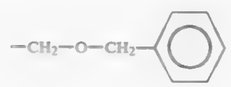
wherein
R_1 is



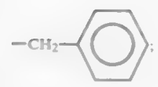
R_3 is hydrogen, lower alkyl, halo substituted lower alkyl or $-(CH_2)_n$-cycloalkyl;
R_4 is hydrogen, lower alkyl, halo substituted lower alkyl,



R_5 is hydrogen, lower alkyl, halo-substituted lower alkyl or $-(CH_2)_n$-aryl;
R_7 is hydrogen, alkyl,



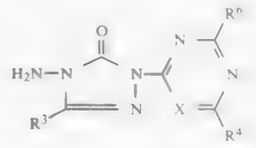
or



R_9 is hydrogen, lower alkyl or $-(CH_2)_n$cycloalkyl; and n = 1–3.

5,151,514
HERBICIDAL SUBSTITUTED 4-SULPHONYLAMINO-2-AZINYL-1,2,4-TRIAZOL-3-ONES
Klaus-Helmut Müller, Duesseldorf; Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus König, Odenthal; Hans-Jochem Riebel; Peter Babczinski, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 583,915, Sep. 17, 1990, Pat. No. 5,085,697, which is a division of Ser. No. 382,163, Jul. 19, 1989, Pat. No. 4,988,381. This application Oct. 28, 1991, Ser. No. 783,586
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825602; Jan. 16, 1989, 3901084
Int. Cl.[5] C07D *403/04*
U.S. Cl. 544—212 **6 Claims**

1. A compound of the formula



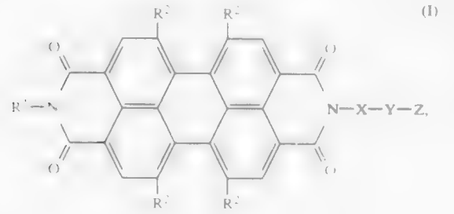
in which
R^3 represents hydrogen, fluorine, chlorine, bromine, iodine, hydroxyl, mercapto, amino or an optionally fluorine- and/or chlorine-substituted radical selected from the group consisting of C_1–C_4-alkyl, C_3–C_6-cycloalkyl, benzyl, phenyl, C_1–C_4-alkoxy, C_3–C_4-alkenyloxy, C_3–C_4-alkinyloxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_3–C_4-alkenylthio, C_3–C_4-alkinylthio, benzyloxy, benzylthio, C_1–C_4-alkylamino and di-(C_1–C_4-alkyl)-amino,
R^4 represents hydrogen, fluorine, chlorine, bromine, hydroxyl, amino, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_1–C_2-alkoxy-C_1–C_2-alkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkoxy, C_1–C_2-alkoxy-C_1–C_2-alkoxy, C_1–C_4-alkylthio, C_1–C_4-halogenoalkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylamino or di-(C_1–C_2-alkyl)-amino, and
R^6 represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylamino, dimethylamino or diethylamino,
or a salt thereof.

5,151,515
OXYGEN REDUCTION CATALYST BASED UPON METAL DIPYRIDYLAMINES
Alan J. Cisar, Sugar Land, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 4, 1991, Ser. No. 650,355
Int. Cl.[5] C07F *15/06*; B01J *31/18*; H01M *4/88*
U.S. Cl. 546—12 **2 Claims**

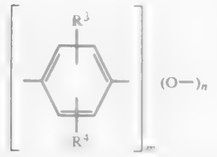
1. The compound Bis-di-2,2'-pyridylamine cobalt (II) chloride.
2. The compound Bis-di-2,2'-pyridylamine cobalt (II) acetate.

5,151,516
POLYMERIZABLE PERYLENE-3,4,9,10-TETRACARBIMIDES
Karin H. Beck, Ludwigshafen; Karl-Heinz Etzbach, Frankenthal, all of Fed. Rep. of Germany, and Hans-Werner Schmidt, Goleta, Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Oct. 12, 1990, Ser. No. 598,004
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934329
Int. Cl.[5] C07D *221/22*
U.S. Cl. 546—37 **3 Claims**

1. A perylimide of the formula



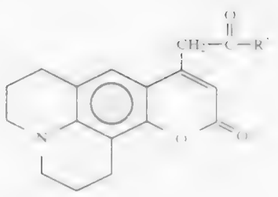
where
R^1 is C_1–C_{20}-alkyl, which may be interrupted by one or more oxygen atoms, or is phenyl which is monosubstituted or polysubstituted by C_1–C_{13}-alkyl or C_1–C_{13}-alkoxy,
R^2 is identical or different at each of its appearances, each appearance of R^2 being independently of the others hydrogen, chlorine, phenoxy or halogen-, C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenoxy,
X is a chemical bond or a radical of the formula



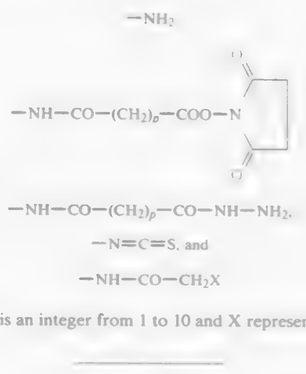
where R^3 and R^4 are identical or different and each is independently of the other hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, m is 1 or 2 and n is 0 or 1,
Y is C_8–C_{24}-alkylene, and
Z is vinyl or a radical of the formula W—CO—C(R^5)=CH_2, where R^5 is hydrogen, methyl or chlorine and W is oxygen, imino or C_1–C_4-alkylimino.

5,151,517
DERIVATIVES OF TETRAHYDRO-2,3,6,7,1H,5H,11H-(1)BENZOPYRANO(6,7,8,I,J)QUINOLIZINONE-11 USABLE AS MARKERS FOR ORGANIC COMPOUNDS, PARTICULARLY BIOLOGICAL COMPOUNDS WITH A VIEW TO THEIR DETECTION BY CHEMILUMINESCENCE OR FLUORESCENCE
Pierre Reveilleau; Georges Mahuzier; Joseph Chalom, all of Paris; Robert Farinotti, Champigny s/Marne; Michel Tod, Margency, and Edith Barre, Paris, all of France, assignors to Laboratories Eurobio, Les Ulis Cedex, France
Filed Nov. 27, 1990, Ser. No. 619,189
Claims priority, application France, Nov. 30, 1989, 89 15789
Int. Cl.[5] C07D *491/147*
U.S. Cl. 546—66 **10 Claims**

1. Compound in accordance with the formula:



in which R^1 represents:
1) —NH—$(CH_2)_n$—R^2 with n being an integer from 1 to 20 and R^2 representing —N=C=S or NH—CO—CH_2X with X representing I, Br or Cl, or
2) —NH—$(CH_2$—CH_2—O)m—CH_2—CH_2—R^3 with m being an integer from 1 to 30 and R^3 representing a group chosen from among those of formula

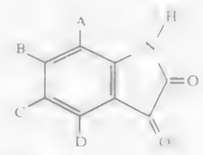


—NH—CO—$(CH_2)_p$—CO—NH—NH_2,
—N=C=S, and
—NH—CO—CH_2X

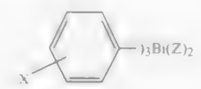
in which p is an integer from 1 to 10 and X represents I, Br or Cl.

5,151,518
N-ARYLATION OF ISATINS
James E. Dombrowski, Portland, Me., and Phillip G. Mattingly, Grayslake, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Continuation of Ser. No. 271,799, Nov. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 104,715, Oct. 2, 1987, abandoned. This application Nov. 30, 1989, Ser. No. 443,869
Int. Cl.[5] C07D *219/04, 209/38*
U.S. Cl. 546—107 **8 Claims**

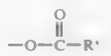
1. A process for N-arylation of isatins, comprising:
(a) reacting a compound of formula I wherein A,B,C, and D are selected independently in each instance from hydrogen, halogen, cyano, nitro, amino, carboxy, sulfone, alkyl, and alkoxy, or B and C together can form a fused aromatic ring;



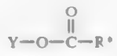
(b) with a compound of formula II:



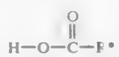
wherein Z is a halogen or a substituent of formula



with the proviso that where Z is a halogen, a salt of the formula



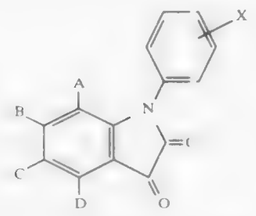
is added to the reaction of compounds I and II where Y is a group I or group II metal, and R^* in each instance is selected from a group such that the conjugate acid



of the group of formula II has a pKa in water of less than 5.0 and is other than trifluoroacetic acid;

(c) in the presence of a copper catalyst; whereby an N-arylated isatin of formula III is produced;

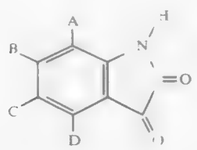
III



5. A process of producing an intermediate of formula IV, comprising:

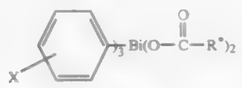
(a) reacting a compound of formula I;

I



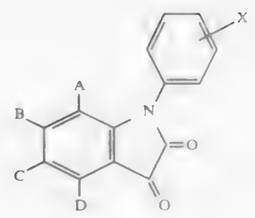
(b) with a compound of formula II;

II



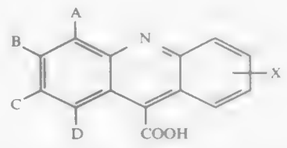
(c) in the presence of a copper catalyst to produce an N-arylated isatin of formula III;

III

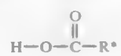


(d) and treating the N-arylated isatin of formula III with a strong base and heat to produce a compound of formula IV:

IV



wherein A,B,C, and D are selected independently in each instance from hydrogen, halogen, cyano, nitro, amino, carboxy, sulfone, alkyl, and alkoxy, or B and C together can form a fused aromatic ring; wherein X is selected from hydrogen, halogen, nitro, cyano, alkyl, and alkoxy; and R^* is selected from a group such that the conjugate acid



of the group of formula II has a pKa in water of less than 5.0 and is other than trifluoroacetic acid.

5,151,519

PROCESS FOR THE PREPARATION OF 1,5-(ALKYLIMINO)-1,5-DIDEOXY-D-GLUCITOL AND DERIVATIVES THEREOF

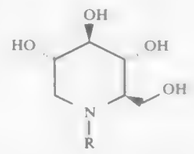
James R. Behling, Lindenhurst; Payman Farid, Deerfield; Ish Khanna, Vernon Hills; John R. Medich, Des Plaines; Mike Prunier, Vernon Hills; Mike G. Scaros, Arlington Heights, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 7, 1990, Ser. No. 521,282

Int. Cl.[5] C07D *211/46*

U.S. Cl. 546—219 **45 Claims**

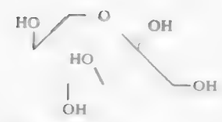
1. A method for the preparation of a compound of the formula I



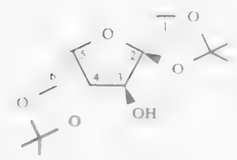
wherein R is hydrogen, alkyl of 1 to 13 carbon atoms, and aralkyl wherein alkyl is lower alkyl of 2 to 6 carbon atoms, and aryl is phenyl, unsubstituted or substituted with lower alkyl of 1 to 6 carbon atoms, halo, lower alkoxy of 1 to 4 carbon atoms or thio lower alkyl of 1 to 4 carbon atoms

which method comprises:

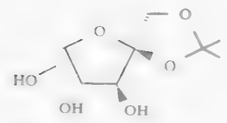
a) reacting a compound of the formula



with 2,2-dimethoxypropane in the presence of stannous chloride and a substantially pure solvent provided that if the solvent is not substantially pure, then the reaction is carried out in the presence of a combination of stannous chloride and a zinc salt, to produce a compound of the formula



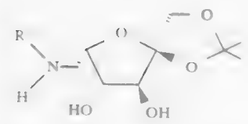
b) treating the product of step a) with aqueous sulfuric acid in the presence of a solvent to produce a compound of the formula



c) consecutively treating the product of step b) with a sulfonyl chloride in the presence of a base and with an amine of the formula

$R'—NH_2$

wherein R' is R as defined above or a benzyl group, to produce a compound of the formula



wherein R' is again as defined above;

d) adsorbing the compound produced in step c) on an ion exchange resin; and

e) hydrogenating said compound while adsorbed on the ion exchange resin and in the presence of a hydrogenation catalyst to yield the desired compound of formula I.

5,151,520

CATIONIC DYE-TRIARYLMONOALKYLORATE ANION COMPLEXES

Peter Gottschalk, Centerville; Douglas C. Neckers, Perrysburg, both of Ohio, and Gary B. Schuster, Champaign, Ill., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 180,915, Apr. 13, 1988, Pat. No. 4,977,511, which is a continuation-in-part of Ser. No. 944,305, Dec. 18, 1986, Pat. No. 4,772,530, which is a continuation-in-part of Ser. No. 860,367, May 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 800,014, Nov. 20, 1985, abandoned. This application Jan. 30, 1990, Ser. No. 472,998

Int. Cl.[5] C09B *23/01, 57/14;* A61K *6/00*

U.S. Cl. 548—110 **12 Claims**

1. A compound represented by the formula (I):

(I)

where D+ is a cationic dye moiety selected from the group consisting of cationic cyanine, carbocyanine, dicarbocyanine, tricarbocyanmine, hemicyanine, rhodamine, and azamethine dyes; R^1 is alkyl; and R^2, R^3, and R^4 are aryl

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5,151,521

1-AMINOETHYL PHOSPHONIC ACID DERIVATIVES

Yoshiharu Morita; Haruyuki Chaki, both of Yokohama; Yasuo Hoshide, Okegawa; Junko Takashima, Yokohama, all of Japan, and Arthur A. Patchett, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

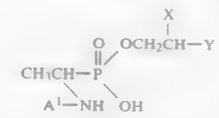
Division of Ser. No. 529,698, May 24, 1990, Pat. No. 5,061,806, which is a continuation of Ser. No. 211,658, Jun. 27, 1988, abandoned. This application Jun. 12, 1991, Ser. No. 714,423

Claims priority, application Japan, Jul. 6, 1987, 610354

Int. Cl.[5] C07F *9/40*

U.S. Cl. 548—112 **4 Claims**

1. A compound represented by the Formula (I):



(I)

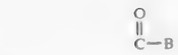
wherein A^1 is a hydrogen atom, or, a residue consisting of one or two amino acids optionally having a protecting group which is obtained by removing, from an oligopeptide optionally having a protecting group, the hydroxy group of the terminal carboxyl group; X is (a) a hydroxyl group,

(b)

wherein R^1 is an alkyl group, or (c) $—NHA^2$ wherein A^2 is a hydrogen atom, or a residue consisting of one or two amino acids optionally having a protecting group which is obtained by removing, from the amino acid or dipeptide optionally having a protecting group, the hydroxyl group of the terminal carboxyl group, or a protecting group for the amino group; and Y is (a) $—CH_2OH$,

(b)

wherein R^2 is an alkyl group, or



(c)

wherein B is a hydroxyl group, or a residue consisting of one or two amino acids optionally having a protecting group obtained by removing, from the amino acid or dipeptide optionally having a protecting group, the hydrogen atom of the terminal group, or a protecting group for the carboxyl group provided that at least one of A^1, A^2, or B is a dipeptide residue.

5,151,522

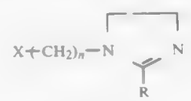
PROCESS FOR PREPARING POLYCARBOXYLIC ACID IMIDAZOLINES BY CONDENSATION REACTION

Hans Hitz; Rolf Schaefer, both of Arisdorf, Switzerland; Heinrich Baust, Plankstadt, and Wolfgang Gross, Mutterstadt, both of Fed. Rep. of Germany, assignors to Chemisches Institut Schaefer AG, Bubendorf, Switzerland and Joh. A. Benckiser GmbH, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 535,135, Jun. 8, 1990, Pat. No. 5,049,315.
This application Jul. 22, 1991, Ser. No. 733,851
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919863
Int. Cl.[5] C07D *233/02*
U.S. Cl. 548—112 3 Claims

1. A process for preparing a polycarboxylic acid imidazoline compound of the formula

in which
X is —Cl, —OH, —OSO_3H, —CPO_3H_2, —O—CH_2—CH_2—COOH, —NH_2, —NH(alk) or —N(alk)$_2$,
alk is an alkyl radical containing 1 to 6 carbon atoms,
n is a whole number from 2 to 4
m is a whole number from 2 to 5,
R is a C_{8-18} hydrocarbon chain which is straightchain or branched, and saturated or 1 to 3 times unsaturated,
R′ is H or a carboxyl group, and
R″ is H or —CH_3, which comprises the step of condensing a compound of the general formula



in which R, X and n are as defined above, with about a 2-to 5-fold excess of acrylic acid, methacrylic acid, maleic acid, or a mixture thereof.

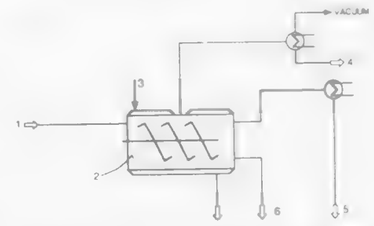
5,151,523

PREPARATION OF 2-METHYLBENZOXAZOLE

Manfred Gaeng, Bobenheim-Roxheim; Heinz Saukel, Friedelsheim; Wolfgang Hoffmann, Frankenthal, and Josef Koenig, Zellertal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,111
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1990, 4009027
Int. Cl.[5] C07D *263/56*
U.S. Cl. 548—217 3 Claims

1. In the process of preparing 2-methylbenzoxazole by the cyclization of acetamidophenol, the improvement consisting essentially of:
preparing a filtercake of acetamidophenol which is wet with water;
feeding the wet filtercake into a dryer;
drying the filtercake;
melting the dried filtercake;



simultaneously with the melting step, cyclizing the acetamidophenol to 2-methylbenzoxazole with the elimination of water of reaction;
removing the water of reaction by distillation during the cyclization step, starting at atmospheric pressure and reducing the pressure during the cyclization step;
removing the formed 2-methylbenzoxazole by distillation to leave a residue; and
removing the residue from the dryer.

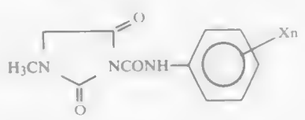
5,151,524

PROCESS FOR PREPARING IMIDAZOLIDINE-2,5-DIONE DERIVATIVE

Tetuya Imai, Naruto, Japan, assignor to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

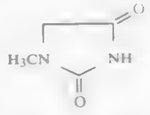
Filed Jul. 18, 1990, Ser. No. 553,519
Claims priority, application Japan, Jul. 19, 1989, 1-187064; Feb. 27, 1990, 2-48030
Int. Cl.[5] C07D *235/30*
U.S. Cl. 548—307 3 Claims

1. A process for preparing an imidazolidine-2,5-dione derivative of the formula



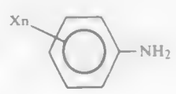
(IV)

which comprises reacting phosgene or trichloromethyl chloroformate with methylhydantoin of the formula



(VI)

in the presence of a dehydrogen chloride agent, and further reacting the resulting product with an aniline derivative of the formula



(VII)

in the presence of a dehydrogen chloride agent, wherein X is

halogen atom, lower alkyl, lower alkoxyl, lower haloalkyl, nitro, cyano or alkoxycarbonyl, n is an integer of 0 or 1 to 4.

5,151,525

PROCESS FOR PRODUCING 2-OXO-1,3-DIBENZYL-4,5-CIS-IMIDAZOLIDINEDICARBOXYLIC ACID

John J. Seiter, Houston, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 18, 1991, Ser. No. 717,146
Int. Cl.[5] C07D *233/32*
U.S. Cl. 548—321 14 Claims

1. In a process wherein:
(a) alkali metal salt of meso-2,3-bis(benzylamino)succinic acid, phosgene, and alkali metal hydroxide are reacted under alkaline conditions and in the presence of water and substantially water-immiscible inert liquid organic solvent in a multi-phase system to form a multi-phase mixture comprising:
(1) an aqueous solution of alkali metal salt of 2-oxo-1,3-dibenzyl-4,5-cis-imidazolidinedicarboxylic acid having a pH of at least about 7.5, and
(2) a liquid organic phase, and
(b) said aqueous solution is acidified to precipitate 2-oxo-1,3-dibenzyl-4,5-cis-imidazolidinedicarboxylic acid and to form an aqueous mother liquor,
the improvement wherein said substantially water-immiscible inert liquid organic solvent is anisole.

5,151,526

4-[1-(1-NAPHTHALENYL)ETHYL]-1H-IMIDAZOLE, METHOD OF MAKING AND USE AS AN ANESTHETIC

Fu-Lian Hsu, Rockville, and William P. Ashman, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 607,405, Oct. 11, 1990, abandoned.
This application Aug. 2, 1991, Ser. No. 739,650
Int. Cl.[5] C07D *233/58*
U.S. Cl. 548—335 1 Claim

1. 4-[1-(Naphthalenyl)ethyl]-1H-imidazole.

5,151,527

SYNTHESIS OF THE CARBANION 1,1,2-TRICYANO-2-(3,4-DICYANO-5-IMINO-2,5-DIHYDRO-1H-PYRROL-2-YLIDENE) ETHANIDE

Alberto Flamini, Rignano Flaminio, Italy, and Nicola Poli, Monterotondo, S.C., assignors to Consiglio Nazionale delle Ricerche, Rome, Italy

Filed Dec. 14, 1990, Ser. No. 627,576
Claims priority, application Italy, Dec. 28, 1989, 22867 A89
Int. Cl.[5] C07D *487/04*
U.S. Cl. 548—451 6 Claims

1. A process for preparing the sodium salt of the carbanion 1,1,2-tricyano-2-(3,4-dicyano-5-imino-2,5-dihydro-1H-pyrrol-2-ylidene) ethanide, characterised by reacting disodium-tetracyano-ethylene in an organic solvent, chosen from ethers, esters, aromatics and nitriles, with an excess of a Lewis acid, the solution then being treated with water.

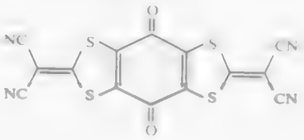
5,151,528

CHARGE TRANSFER COMPLEX FORMED BETWEEN BENZOQUINONE DERIVATIVE AND ELECTRON DONOR AND PROCESS FOR PRODUCING THE SAME

Toshio Mukai, 2-1-2, Tsunogoro, Sendai-shi, Miyagi; Yoshiro Yamashita, and Takanori Suzuki, both of Miyagi, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Toshio Mukai, Miyagi, both of, Japan

Division of Ser. No. 131,665, Dec. 11, 1987, Pat. No. 4,960,886.
This application Jun. 21, 1990, Ser. No. 541,517
Claims priority, application Japan, Dec. 15, 1986, 61-298371; Dec. 15, 1986, 61-298372; Dec. 15, 1986, 61-298373
Int. Cl.[5] C07D *339/00*
U.S. Cl. 549—31 2 Claims

1. A benzoquinone derivative representative by formula



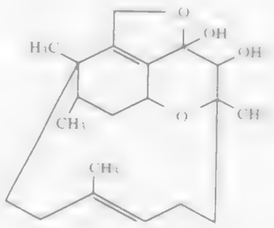
5,151,529

PLATELET ACTIVATING FACTOR ANTAGONISTS, NAMED "THE PHOMACTINS" THEIR PREPARATION AND USE

Aiya Sato; Michihiro Sugano; Koubei Furuya; Takeshi Oshima; Harumitsu Kuwano; Tadashi Hata, and Hideyuki Haruyama, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 440,235, Nov. 22, 1989, abandoned. This application Oct. 10, 1990, Ser. No. 596,580
Claims priority, application Japan, Nov. 28, 1988, 63-300278
Int. Cl.[5] C07D *313/00, 311/92*
U.S. Cl. 549—354 2 Claims

1. The compound of formula (I):



(I)

5,151,530

TREATMENT OF TERTIARY BUTYL HYDROPEROXIDE DISTILLATION FRACTION TO REMOVE ACIDIC CONTAMINANTS

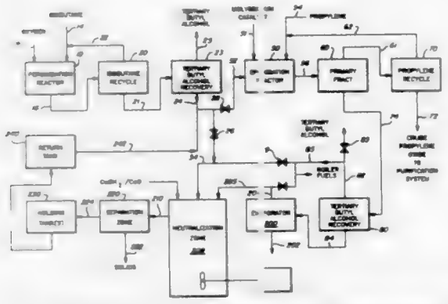
Edward T. Marquis, Austin; John R. Sanderson, Leander, and Robert A. Meyer, Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Division of Ser. No. 400,901, Aug. 30, 1989, Pat. No. 5,093,506.
This application Sep. 25, 1991, Ser. No. 765,610
Int. Cl.[5] C07D *301/32*; C07C *27/10*
U.S. Cl. 549—529 5 Claims

1. In a method wherein isobutane is reacted with oxygen to provide a reaction product comprising unreacted isobutane, tertiary butyl hydroperoxide, tertiary butyl alcohol and carboxylic acid impurities, including formic acid, acetic acid and isobutyric acid, the improvement for at least partially purifying said reaction product which comprises the steps of:
a. charging said reaction product to a distillation zone and

separating it therein into at least a lighter isobutane fraction and a heavier distillation fraction comprising tertiary butyl hydroperoxide, tertiary butyl alcohol and carboxylic acid impurities, including formic acid, acetic acid and isobutyric acid,

b. charging said heavier distillation fraction to a neutralization zone and treating said heavier distillation fraction therein with about ½ to 1 equivalent of calcium hydroxide or calcium oxide or a mixture of calcium hydroxide with calcium oxide, based on the carboxylic acid content of said heavier distillation fraction to thereby provide a slurry of solid precipitate in said thus-treated heavier distillation fraction,



c. charging said slurry to a separation zone and separating it therein into a solids fraction and a liquid filtrate fraction comprising said partially purified heavier distillation fraction comprising tertiary butyl hydroperoxide, and tertiary butyl alcohol, and

d. recovering said filtrate, whereby, use of said filtrate as a feed component in an epoxidation reaction wherein an olefin is reacted with tertiary butyl hydroperoxide in solution in tertiary butyl alcohol in the presence of a soluble molybdenum catalyst will not cause molybdenum to precipitate from said solution.

5,151,53

DIHYDRIC PHENOLS

Kazuyoshi Shigematsu; Takashi Nakagawa, and Shuji Sakamoto, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

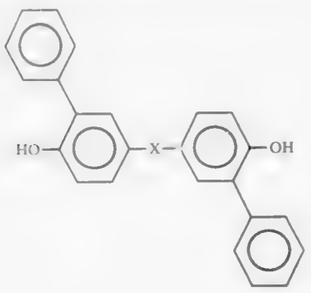
Division of Ser. No. 65,305, Jun. 18, 1987, abandoned. This application Aug. 25, 1988 Ser. No. 236,142

Claims priority, application Japan, Jun. 20, 1986, 61-142842; Jun. 20, 1986, 61-142843; Feb. 20, 1987, 62-37595

Int. Cl.[5] C07C *11/09 11/10, 43/21*

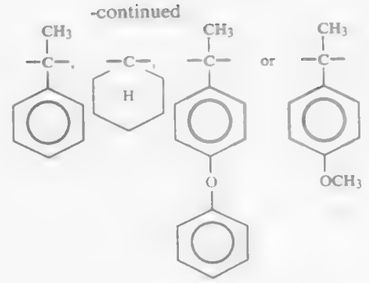
U.S. Cl. 552—115 **5 Claims**

1. A dihydric phenol having the following general formula



-continued

wherein X is



5,151,532

PROCESS FOR THE PRODUCTION OF HIGH-PURITY TETRACHLORO-1,4-BENZOQUINONE

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 151,893, Feb. 3, 1988, abandoned. This application Jun. 27, 1991, Ser. No. 724,499

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703567

Int. Cl.[5] C07C *50/24, 46/06*

U.S. Cl. 552—308 **8 Claims**

1. A process for the preparation of high-purity tetrachloro-1,4-benzoquinone by the action of hydrogen peroxide and hydrochloric acid on hydroquinone, which comprises causing 3.8 to 4.2 times the molar quantity of 30% to 37% hydrochloric acid and 1.9 to 2.1 times the molar quantity of 50% to 35% hydrogen peroxide, to act at 5° C. to 50° C. on 1 mole of hydroquinone in at least 12 times the molar quantity of 30% to 37% hydrochloric acid, then heating the resulting suspension, which essentially contains 2,5-dichlorohydroquinone, to 45° C. to 55° C. and again causing to act on the resulting suspension, at 50° C. to 95° C., 3.8 to 4.2 times the molar quantity of 30% to 37% hydrochloric acid and 1.9 to 2.1 times the molar quantity of 50% to 35% hydrogen peroxide, in each case based on the hydroquinone used, and finally adding to the suspension, which is now essentially composed of trichloro-1,4-benzoquinone, 1.9 to 2.1 times the molar quantity of hydrochloric acid of the said concentration range, and 0.95 to 1.05 times that molar quantity of hydrogen peroxide of the said concentration range, in each case based on the hydroquinone used, at 95° C. to 115° C., sufficiently slowly for no chlorine to escape, the process being carried out in the presence or absence or a secondary alkanesulfonate.

5,151,533

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-1,3,5(10)-ESTRATRIEN-17-ONE

Michael Buback, Gottingen; Josef Hader, Berlin; Hans-Peter Voegele, and ZaKarya Al-Massri, both of Göttingen, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Japan

PCT No. PCT/DE90/00690, § 371 Date Jun. 22, 1991, § 102(e) Date Jun. 22, 1991, PCT Pub. No. WO91/04264, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 6, 1990, Ser. No. 721,608

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1989, 3931820

Int. Cl.[5] C07J *1/00*

U.S. Cl. 552—625 **6 Claims**

1. A process for the production of 3-hydroxy-1,3,5(10)-estratrien-17-one by pyrolysis of 1,4-androstadiene-3,17-dione in the presence of 1,2,3,4-tetrahydronaphthalene as hydrogen donor, comprising:

preheating 1,2,3,4-tetrahydronaphthalene to a temperature of 450°–480° C.;

mixing the preheated 1,2,3,4-tetrahydronaphthalene in a mixing zone with a solution of 1,4-androstadiene-3,17-dione, in 1,2,3,4-tetrahydronaphthalene, said solution being heated to a temperature of up to 300° C.;

heating the resultant mixture in a pyrolysis zone to a temperature of 450°–700° C., under a pressure of 3.5×10^6–3×10^8 Pa, and a retention time of 0.001 to 60 seconds; and

removing the resultant product from said pyrolysis zone and cooling same.

5,151,534

SULPHUR-CONTAINING EICOSANOIDES AND THEIR APPLICATION IN PHARMACY AND IN COSMETICS

Braham Shroot, Antibes; Christopher Heasby, Biot; Jean Maignan, Tremblay les Gonesse; Gerard Lang, Saint Gratien, and Michel Colin, Livry Gargan, all of France, assignors to Centre International De Recherches Dermatologiques (CIRD), Valbonne, France

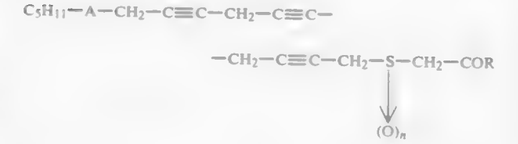
Filed May 10, 1989, Ser. No. 349,691

Claims priority, application France, May 10, 1988, 8806313

Int. Cl.[5] C08H *3/00*

U.S. Cl. 554—88 **12 Claims**

1. A compound having the formula



wherein

A represents $-(CH_2)_2$ or $-(C\equiv C)-$,

n is equal to 0, 1 or 2,

R represents hydroxyl or alkoxy having the formula OR_1 and

R_1 represents alkyl containing 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl, aryl or aralkyl,

and the salt of said compound and its optical and geometric isomers.

5,151,535

FLUORINE-CONTAINING α,β-BIFUNCTIONAL COMPOUNDS AND PROCESS FOR THEIR PRODUCTION

Takamasa Fuchikami, and Hisao Urata, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Jan. 31, 1990, Ser. No. 472,864

Claims priority, application Japan, Feb. 16, 1989, 1-35033; Feb. 16, 1989, 1-35034; May 2, 1989, 1-112081

Int. Cl.[5] C07C *53/21*

U.S. Cl. 554—226 **1 Claim**

1. A fluorine-containing α,ω-bifunctional compound having the formula:

wherein each of R^1 and R^2 independently is an alkyl group having 1 to 10 carbon atoms or an aralkyl group having 7 to 10 carbon atoms; X is —COOH, —$COOR^3$ or —COY, wherein R^3 is an alkyl group having 1 to 5 carbon atoms and Y is a halogen atom; and n is an integer of at least 1.

5,151,536

PROCESS FOR THE MANUFACTURE OF PESTICIDAL 1-(ALKOXYMETHYL) PYRROLE COMPOUNDS

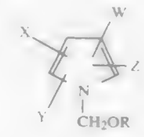
Venkataraman Kameswaran, Princeton Junction, and Jerry M. Barton, East Windsor, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1990, Ser. No. 628,744

Int. Cl.[5] C07D *207/30, 207/12, 207/30, 207/18*

U.S. Cl. 548—530 **10 Claims**

1. A process for the preparation of a compound of formula I



(I)

wherein

R is C_1–C_6 alkyl;

W is CN or NO_2;

X is H, CN, halogen or phenyl optionally substituted with one to three halogens, CN, NO_2, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CF_3, $R_1CF_2R_2$, R_3CO or NR_4R_5 groups;

Y is CF_3 or halogen;

Z is H, CF_3, halogen or phenyl optionally substituted with one to three halogen, CN, NO_2, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CF_3, $R_1CF_2R_2$, R_3CO or NR_4R_5 groups.

R_1 is H, F, CHF_2, CHFCl or CF_3;

R_2 is $S(O)_n$ or O;

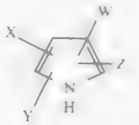
R_3 is C_1–C_3 alkyl, C_1–C_3 alkoxy or NR_4R_5;

R_4 is H or C_1–C_3 alkyl;

R_5 is H, C_1–C_3 alkyl or R_6CO;

R_6 is H or C_1–C_3 alkyl and

n is an integer of 0, 1 or 2 which comprises reacting a compound of formula II



(II)

wherein W, X, Y and Z are described above with at least one molar equivalent of a dihalomethane in the presence of at least two molar equivalents of an alkali metal C_1–C_6alkoxide and optionally about one molar equivalent of an alkali metal hydride and a solvent.

5,151,537

PROCESS FOR THE RECOVERY OF RHODIUM FROM THE RESIDUES OF DISTILLATION PROCESSES

Peter Lappe, Dinslaken, and Helmut Springer, Oberhausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 7, 1991, Ser. No. 741,643

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1990, 4025074

Int. Cl.[5] B01J *31/40; C07C 45/50, 47/02*

U.S. Cl. 556—136 **32 Claims**

1. A method for the recovery of rhodium present as homogeneously dissolved compounds from a residue of a reaction catalyzed by said rhodium, said method comprising

treatment of said residue with a first oxygen-containing gas in an initial reaction stage at an initial stage temperature of 60° to 120° C. under an initial stage pressure of at least one atmosphere in the presence of a first monocarboxylic acid

having 2 to 4 carbon atoms and a first alkali metal salt of a second carboxylic acid having 2 to 4 carbon atoms;

a first extraction of said rhodium as a water soluble compound from said residue with water to form an aqueous phase and an organic phase, separating said organic phase from said aqueous phase;

introducing an aldehyde into said organic phase in a second stage before oxidation with a second oxygen-containing gas at a second stage temperature of 60° to 120° C. under a second stage pressure of at least one atmosphere, a third monocarboxylic acid having 2 to 4 carbon atoms, and a second alkali metal salt of a fourth monocarboxylic acid having 2 to 4 carbon atoms; and

a second extraction of said rhodium from said organic phase with a water-containing substance.

5,151,538

ORGANOSILICON COMPOUND AND PROCESS FOR PRODUCING ORGANOSILICON COMPOUND

Teruyuki Hayashi; Toshiaki Kobayashi, and Masato Tanaka, all of Tsukuba, Japan, assignors to Agency of Industrial Science and Technology, Japan

Filed Jan. 12, 1990, Ser. No. 464,124

Claims priority, application Japan, Jan. 13, 1989, 1-7358; Mar. 3, 1989, 1-52654

Int. Cl.[5] C07F 7/08, 7/10

U.S. Cl. 556—431 **5 Claims**

1. A process for preparing an organosilicon compound having a Si—C—C—Si bond, a C=C—Si bond and/or a CH—CH—Si bond, comprising the step of (a) reacting an olefin compound represented by the following general formula (I):

$$R^1R^2C{=}CHR^3 \quad (I)$$

wherein R^1, R^2 and R^3 are each hydrogen atom, an alkyl group, a cycloalkyl group, an aliphatic heterocyclic group, an aralkyl group, an aryl group, an aromatic heterocyclic group, an alkoxycarbonyl group, a cyano group, an N,N-dialkylaminocarbonyl group, an alkoxy group, an N,N-dialkylamino group, an N-alkyl-N-acylamino group or an N,N-diacylamino group, and may link with each other to form a cyclic structure,

with a disilane represented by the following general formula (II):

$$R^4R^5R^6Si{-}SiR^7R^8R^9 \quad (II)$$

wherein R^4, R^5, R^6, R^7, R^8 and R^9 are each an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group, an alkoxy group, an acyloxy group, an N,N-dialkylamino group, fluorine atom, bromine atom or chlorine atom, and may link with each other to form a cyclic structure,

in the presence of a platinum-containing catalyst.

5,151,539

FORMATION OF TETRAARYLPYROPHOSPHATE

Danielle A. Bright, Spring Valley, and Alan M. Aaronson, Flushing Meadows, both of N.Y., assignors to Akzo America Inc., Dobbs Ferry, N.Y.

Continuation of Ser. No. 374,719, Jul. 3, 1989, Pat. No. 5,041,596. This application May 28, 1991, Ser. No. 706,138

Int. Cl.[5] C07F 9/02

U.S. Cl. 558—128 **5 Claims**

1. A process for the formation of a tetraarylpyrophosphate by the hydrolytic condensation of a diarylhalophosphate.

5,151,540

THIO CARBAMATES AND THEIR DERIVATIVES

Mohammad Aslam, and Kenneth G. Davenport, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 26, 1986, Ser. No. 935,461

Int. Cl.[5] C07C 333/00, 211/00

U.S. Cl. 558—232 **6 Claims**

1. As a new composition of matter, O-(6-acetyl-2-naphthyl)-N,N-dimethylthiocarbamate.

5,151,541

PROCESS FOR THE PREPARATION OF DIALKYL CARBONATES

Klaus Joerg, Limburgerhof; Rudolf Kummer, Frankenthal, and Franz-Josef Mueller, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 6, 1990, Ser. No. 562,708

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926710

Int. Cl.[5] C07C 69/96

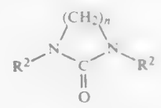
U.S. Cl. 558—277 **10 Claims**

1. In a process for the preparation of a dialkyl carbonate of the formula

$$R^1{-}O{-}\overset{\overset{O}{\|}}{C}{-}OR^1 \quad (I)$$

in which R^1 is C_1–C_{10}-alkyl, by reaction of an alcohol R^1OH with a gaseous carbon monoxide/oxygen mixture in the presence of a copper catalyst and a co-solvent at an elevated temperature of about 70° to 150° C. and under pressure of about 1 to 100 bar, the improvement which comprises:

using as the co-solvent at least one cyclic urea of the formula



(II)

in which n is equal to 2, 3 or 4 and R^2 denotes hydrogen or C_1–C_4-alkyl.

5,151,542

PROCESS FOR PREPARING DI-TERT.-BUTYL DICARBONATE

Isao Kurimoto, Toyonaka, and Masayoshi Minai, Moriyama, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1991, Ser. No. 731,007

Claims priority, application Japan, Jul. 23, 1990, 2-195412; Aug. 27, 1990, 2-226225; Feb. 18, 1991, 3-023491; Feb. 18, 1991, 3-023494

Int. Cl.[5] C07C 69/96

U.S. Cl. 558—277 **12 Claims**

1. A process for preparing di-tert.-butyl dicarbonate which comprises reacting alkali metal tert.-butyl carbonate with methanesulfonyl chloride.

5,151,543

SELECTIVE LOW PRESSURE HYDROGENATION OF A DINITRILE TO AN AMINONITRILE

Stanislaw B. Ziemecki, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1991, Ser. No. 708,945

Int. Cl.[5] C07C 253/30

U.S. Cl. 558—459 **14 Claims**

1. A process of selective partial hydrogenation of aliphatic dinitriles to aminonitriles comprising:

(i) reacting in the presence of hydrogen an aliphatic dinitrile containing 4 to 12 carbons in a reactor at temperatures of from about 25° to 150° C., and at a pressure of from about 50 to 2000 psi in the presence of

(a) a solvent, said solvent being present in at least a 2:1 molar excess and comprising (i) liquid ammonia or (ii) alcohol of from one to four carbon atoms and containing an inorganic base which is soluble in said alcohol and selected from the group consisting of alkali metal hydroxides, alkali metal methoxides, alkali metal carbonates, alkali earth metal hydroxides, alkali earth metal methoxides and alkali earth metal carbonates; and

(b) a raney-type catalyst selected from the group consisting of Raney nickel, Raney cobalt, and Raney nickel promoted with metals or metal oxides selected from Group VIB or promoted with the ferrous metals of Group VIII of the Periodic Table; and

(ii) recovering the corresponding aminonitrile as the major product, selectivity to the aminonitrile increasing to about 95% with decreasing conversion of the starting dinitrile to about 65%.

5,151,544

INTERMEDIATES IN THE PREPARATION OF CHIRAL SPIROFLUORENEHYDANTOINS

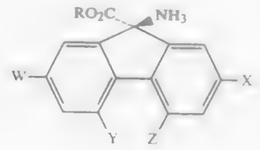
Mark T. DuPriest; Raymond E. Conrow, and Daniel Kuzmich, all of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed May 25, 1990, Ser. No. 530,766

Int. Cl.[5] C07C 321/00, 229/00

U.S. Cl. 560—10 **8 Claims**

1. A compound of the formula:



wherein:

R = C_1–C_5 alkyl;

W and X are each, independently of the other, selected from the group consisting of hydrogen, chloro and fluoro;

one of Y and Z is selected from the group consisting of hydrogen, chloro, fluoro, methyl, methoxyl and methylthio and the other is selected from the group consisting of hydrogen, chloro and fluoro;

with the proviso that the W, X, Y and Z are selected such that the resulting compounds are asymmetrical;

or a pharmaceutically acceptable salt thereof.

5,151,545

3,5-DIHYDROXY-6,8-NONADIENOIC ACIDS AND DERIVATIVES AS HYPOCHOLESTEROLEMIC AGENTS

Peter A. McCarthy, Pawcatuck, and Frederick J. Walker, Preston, both of Conn., assignors to Pfizer Inc., New York, N.Y.

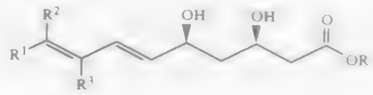
PCT No. PCT/US87/02623, § 371 Date Mar. 27, 1990, § 102(e) Date Mar. 27, 1990

PCT Filed Oct. 13, 1987, Ser. No. 499,489

Int. Cl.[5] C07C 69/76

U.S. Cl. 560—60 **6 Claims**

1. A compound having the relative stereochemical formula



(I)

wherein R is hydrogen, (C_1–C_3)alkyl, phenyl or benzyl; and R^1, R^2 and R^3 are each independently hydrogen, (C_1–C_3)alkyl, benzyl, naphthyl, phenyl or phenyl mono or disubstituted with the same or different substituents selected from the group consisting of F, Cl, Br, I, (C_1–C_3)alkyl, CF_3, (C_1–C_3)alkoxy, benzyl and phenyl, with the proviso that at least one of R^1 and R^2 is other than hydrogen or (C_1–C_3)alkyl;

or

a pharmaceutically acceptable cationic salt thereof when R is hydrogen.

5,151,546

PROCESS FOR THE PRODUCTION OF 4-ACETOXYSTYRENE, ITS POLYMERS AND HYDROLYSIS PRODUCTS

Bakulesh N. Shah, Corpus Christi, Tex.; Dung Q. Tran, North Kingstown, R.I., and Donna L. Keese, Carrollton, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 425,399, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 221,146, Jul. 19, 1988, abandoned, and a continuation-in-part of Ser. No. 221,145, Jul. 19, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 598,510

Int. Cl.[5] C07C 67/297

U.S. Cl. 560—130 **5 Claims**

1. In a method for producing 4-acetoxystyrene which comprises heating 4-acetoxyphenylmethylcarbinol, in the presence of a catalytic amount of an acid catalyst, at a temperature of from about 85° C. to 300° C. under a pressure of from about 0.1 mm HgA to about 760 mm HgA at about 0.2 minutes to about 10 minutes, the improvement which comprises contacting the 4-acetoxyphenylmethylcarbinol as a thin film at temperature and pressure limiting residence time at temperature to from about 0.2 minutes to about 2 minutes.

5,151,547

PROCESS FOR PRODUCING ORGANIC CARBOXYLIC ACID ESTERS

Hiroshi Sato, and Hiroshi Yoshioka, both of Ehime, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Mar. 4, 1991, Ser. No. 664,198

Claims priority, application Japan, Mar. 5, 1990, 2-54765; Oct. 11, 1990, 2-274982

Int. Cl.[5] C07C 69/52

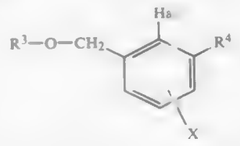
U.S. Cl. 560—205 **10 Claims**

1. A process for producing an organic carboxylic acid ester from an organic carboxylic acid selected from the group consisting of formic acid, acetic acid, propionic acid, butyric acid, acrylic acid, methacrylic acid and crotonic acid corresponding to said organic carboxylic acid ester and an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, iso-butanol, tert-butanol and 2-ethyl-hexanol by esterification reaction in gas phase

which comprises carrying out the reaction with continuously or intermittently feeding sulfuric acid as a catalyst component in the presence of a catalyst carrier.

5,151,548
BENZYL ALCOHOLS AND THEIR LOWER ALKANECARBOXYLIC ACID ESTERS
Dieter Hermeling, Neustadt; Dieter Degner, Dannstadt-Schauernheim; Albrecht Harreus, Ludwigshafen; Norbert Goetz, Worms; Jochen Wild, Deidesheim; Hans Theobald, Limburgerhof, and Bernd Wolf, Maxdorferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jun. 12, 1989, Ser. No. 365,129
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820897
Int. Cl.[5] C07C 33/50, 69/017, 69/157, 69/24
U.S. Cl. 560—255 1 Claim

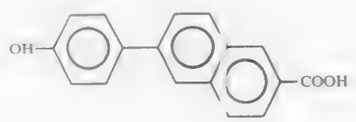
1. A benzene derivative of the formula



where Hal is fluorine, chlorine or bromine, R^4 is a cyclic alkyl radical of 3 to 12 carbon atoms, R^3 is hydrogen or an R^2—CO—radical, R^2 is hydrogen or alkyl of 1 to 6 carbon atoms and X is hydrogen or halogen.

5,151,549
NAPHTHALENE COMPOUNDS
Takeshi Koyama, Kanagawaa, and Takefumi Abe, Niigata, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Division of Ser. No. 478,869, Feb. 12, 1990. This application Mar. 5, 1992, Ser. No. 817,043
Claims priority, application Japan, Feb. 28, 1989, 1-45430; Feb. 28, 1989, 1-45431
Int. Cl.[5] C07C 63/34
U.S. Cl. 562—467 1 Claim

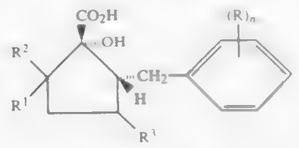
1. A compound represented by the formula:



(I)

5,151,550
CYCLOPENTANE DERIVATIVES
Paul H. Briner, Canterbury, England, assignor to Shell Research Limited, United Kingdom
Filed Aug. 19, 1991, Ser. No. 746,874
Claims priority, application United Kingdom, Sep. 3, 1990, 9019191
Int. Cl.[5] C07C 62/04
U.S. Cl. 562—468 5 Claims

1. A compound defined by the formula:

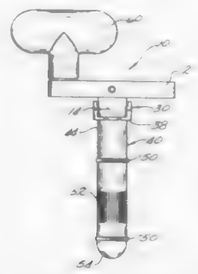


in which n represents an integer from 0 to 5;
each R represents a halogen atom, nitro, hydroxyl, alkyl, haloalkyl, alkoxy, haloalkoxy, amino, alkylamino, dialkylamino, carboxyl, alkanoyl, alkylthio, alkylamido, cycloalkyl or phenyl;
and R^1, R^2 and R^3 independently represent a hydrogen atom or an alkyl group.

5,151,551
METHOD FOR PURIFICATION OF IBUPROFEN COMPRISING MIXTURES
Edward G. Zey; Thomas H. Shockley; Debra A. Ryan, all of Corpus Christi, Tex., and Gary L. Moss, Greer, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Filed Sep. 6, 1990, Ser. No. 579,427
Int. Cl.[5] C07C 51/42
U.S. Cl. 562—494 21 Claims

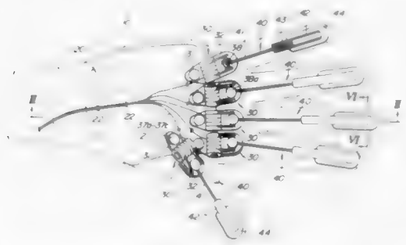
1. A method of purifying an ibuprofen-comprising first mixture, which mixture comprises at least one complex, said complex comprising at least one ibuprofen molecule, said method comprising the steps of:
(a) treating an ibuprofen-comprisign first mixture by heating said mixture, washing said mixture with a liquid comprising water, azeotroping uncomplexed acid from said mixture, or a combination thereof, thereby destabilizing or breaking up at least one complex comprising at least on ibuprofen molecule; and
(b) subsequently crystallizing ibuprofen at least once from a second solution or mixture comprising said first ibuprofen-comprisign mixture.

5,151,552
TUBULAR CHOKE WRENCH APPARATUS
Louis A. Alessandri, Jr., 24 French St., Rehoboth, Mass. 02769
Filed Jan. 10, 1992, Ser. No. 818,861
Int. Cl.[5] F41A 35/00; F41C 27/00
U.S. Cl. 42—90 12 Claims



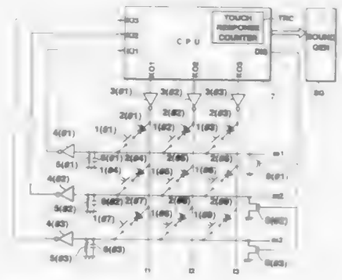
9. Choke wrench apparatus for installing and removing tubular chokes in and from respectively gun bores comprising:
a generally cylindrical hub, an integrally formed threaded shank extending along the longitudinal axis of the hub, a slot formed in the shank parallel to and passing through the longitudinal axis, the slot defining first and second legs spaced apart by a blade member seat,
a blade member comprising a central body portion forming a seating surface, a generally parallelepiped blade extending from the central body portion, the blade member received in the slot with the seating surface received on the seat,
a generally cylindrical guide member having a threaded aperture in a distal end face adapted to receive the threaded shank, the distal end face of the guide member adapted to engage the blade and lock the blade member in its seat, the blade extending radially beyond the hub and guide member and adapted to fit within the slots of a tubular choke.

5,151,553
MUSICAL TONE CONTROL APPARATUS EMPLOYING PALMAR MEMBER
Hideo Suzuki; Shunichi Matsushima; Takamichi Masubuchi; Masahiko Obata, and Masao Sakama, all of Hamamatsu, Japan, assignors to Yamahn Corporation, Hamamatsu, Japan
Filed Nov. 15, 1989, Ser. No. 437,850
Claims priority, application Japan, Nov. 16, 1988, 63-149521[U]; Nov. 16, 1988, 63-289868; Nov. 16, 1988, 63-289869; Nov. 16, 1988, 63-289870
Int. Cl.[5] G10H 7/00, 1/18
U.S. Cl. 84—600 16 Claims



1. A musical-tone-control apparatus comprising:
a palmar member worn on the palm of a performer;
one or more digit members, each of which is rotatably connected to the upper edge of said palmar member, an worn along the finger of th performer; and
one or more measuring means for measuring the angle of flexion of corresponding digit members relative to said palmar member and producing a musical-tone-control signal based on the measurement,
wherein each of said digit members is separated into two segments which are interconnected so as to contract or expand the digit member in the longitudinal direction of said digit member in response to the bending or straightening of the finger.

5,151,554
HIGH SPEED SWITCH SCANNING APPARATUS
Takashi Matsuda, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Apr. 19, 1990, Ser. No. 510,966
Claims priority, application Japan, Apr. 27, 1989, 1-105825
Int. Cl.[5] G10H 1/00; G08C 9/00
U.S. Cl. 84—655 17 Claims



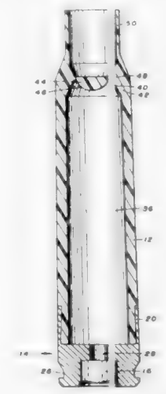
9. An electronic musical instrument, comprising:
a keyboard having a plurality of keys;
a plurality of switch means associated with said keys and arranged in a switch matrix at intersections of a switch matrix arranged by a plurality of input signal lines and a plurality of output signal lines, each for selectively connecting a corresponding output signal line to a corresponding input signal line electronically;
scanning means for cyclically scanning the switch matrix (i) by supplying voltage pulses to the plurality of output signal lines such that one voltage pulse from said voltage pulses is supplied to each of the plurality of output signal lines once in each of a plurality of cycles, with each of said cycles including a series of said voltage pulses, and (ii) by detecting voltage levels derived from the plurality of input signal lines in order to detect, in each of said cycles, the respective ON/OFF status of the plurality of switch means;
discharging means for rapidly discharging, in each of said cycles, the plurality of input signal lines at predetermined times between each set of adjacent voltage pulses of said series of voltage pulses from said scanning means; and
sound generating means coupled to said scanning means for generating a musical sound signal having a pitch designated by a switch means, an ON-operation of which is detected by said scanning means.

5,151,555

COMPOSITE CARTRIDGE FOR HIGH VELOCITY RIFLES AND THE LIKE

Mario K. Vatsvog, 10708 Country Club La. S., Seattle, Wash.

Division of Ser. No. 494,918, Mar. 12, 1990, Pat. No. 5,033,386.
This application May 28, 1991, Ser. No. 706,310
Int. Cl.[5] F42B 3/00 5/02, 33/00
U.S. Cl. 86—10 15 Claims



1. A method of manufacturing a rifle cartridge comprising the steps of:

molding a substantially cylindrical plastic cartridge having a bullet receiving end forming a bullet recess; an open, head receiving end with a circumferential head interlock surface thereon; a casing axially disposed between said ends with a thickened shoulder formed therein,; and a pressure regulating front partition extending across the casing separating the bullet recess from a powder chamber at said thickened shoulder, said partition having a frangible annular zone designed to be severed cleanly completely around the periphery thereof;

forming a cartridge head having a coaxial primer recess and a coaxial casing receiving recess, said casing receiving recess comprising a deformable skirt adapted to be swaged into contact about said circumferential head interlock surface;

placing a charge of gunpowder in said casing;

placing a primer in said primer recess;

assembling said casing and said head; and,

swaging said deformable skirt about said head interlock surface to firmly interconnect said casing and said head.

5,151,556

PROPELLANT MAGAZINE FOR FIELD ARTILLERY PIECE

David L. Maher, Hero; Callista M. Rodriquez, Milton, and Paul A. Trahan, St. Albans, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 24, 1990, Ser. No. 633,702
Int. Cl.[5] F4. B 39/08
U.S. Cl. 89—35.01 9 Claims

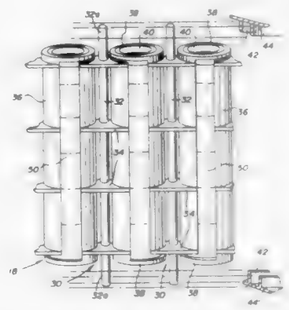
1. A chain conveyor for articles comprising a series of modular conveyor elements, each said conveyor element comprising:

A. an elongated member;

B. a pair of first hoops affixed to said member adjacent one end thereof;

C. a pair of second hoops affixed to said member adjacent the other end thereof, said second hoops having an outer diameter slightly less than the inner diameter of said first hoops;

D. said conveyor elements being arranged in alternating end-for-end orientations with said second hoops nested in said first hoops at each end of each adjacent pair of said



conveyor elements, whereby to pivotally interconnect said conveyor elements.

5,151,557

ADDITIVE FOR PROPELLING CHARGE

Arthur J. Bracuti, Randolph, and Louis A. Bottei, Hacketts-town, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1991, Ser. No. 724,252
Int. Cl.[5] F42B 5/02
U.S. Cl. 102—435 3 Claims

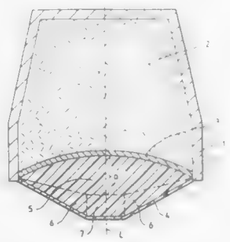
1. In an improved munition for a gun comprising a propellant charge and a composition for reducing muzzle flash and gun-barrel erosion, the improvement consisting of water glass as an admixture with or adjacent grains of said propellant charge.

5,151,558

AMMUNITION POSSESSING A SUPPORTING MEMBER CONSTITUTED FROM A FOAM MATERIAL

Karl Rudolf, Schrobenhausen, and Gunter Lehrieder, Rothenbach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Aug. 15, 1991, Ser. No. 746,126
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029876
Int. Cl.[5] F42B 12/10
U.S. Cl. 102—476 2 Claims



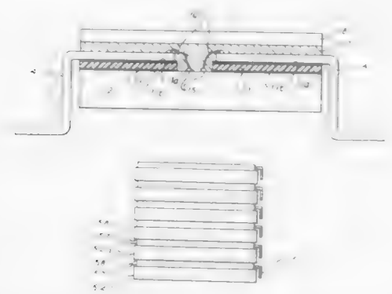
1. An article of ammunition including a projectile-forming insert; a supporting member consisting of a foam material being arranged intermediate the projectile-forming insert and a structural component, said foam material having at least two regions wherein a first region bordering the projectile-forming insert consists of foam having a maximum density of about 200 kg/m^3 and a second region arranged annularly about a centerline of said ammunition and adjacent the structural component consisting of foam having a density of greater than 200 kg/m^3.

5,151,559

PLANARIZED THIN FILM SURFACE COVERED WIRE BONDED SEMICONDUCTOR PACKAGE

H. Ward Conru, Essex Junction; Gary H. Irish, Jericho; Francis J. Pakulski, Shelburne; William J. Slattery; Stephen G. Starr, both of Essex Junction, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 694,719, May 2, 1991, Pat. No. 5,086,018.
This application Dec. 11, 1991, Ser. No. 805,214
Int. Cl.[5] H01L 23/02; H05K 7/00
U.S. Cl. 174—52.4 9 Claims



1. A semiconductor package comprising:

a semiconductor chip having a first major surface with input and output bonding pads thereon,

a lead frame having a plurality of leads adjacent said first major surface of said chip,

a respective bonding wire connecting a respective one of each of the leads to a respective bonding pad on the chip,

an insulating film secured over the lead frame and the bonding wires, the insulating film comprising a thermosetting plastic adhesive, the thermosetting plastic adhesive being positioned over and between each lead of the lead frame and the wires, with the wires being pressed against the respective pads and the respective leads to which they are connected.

5,151,560

GROUNDING CONNECTOR

Earl R. Kreinberg, Peoria, and Marty E. Adcock, Scottsdale, both of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 624,858, Dec. 10, 1990. This application Sep. 4, 1991, Ser. No. 754,884
Int. Cl.[5] H01R 11/00
U.S. Cl. 174—94 R 29 Claims

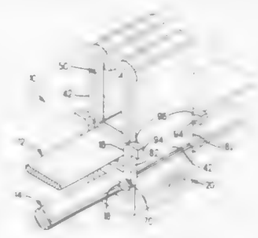
1. An electrical grounding connector for interconnecting lengths of a pair of conductive members, comprising:

an assembly of at least an outer body member including a first base section, and an inner body member including a second base section and being disposed within said outer body member, said first base section defining a first conductor-clamping surface and said second base section opposed therefrom and defining a second conductor-clamping surface, said first and second base sections defining a conductor-receiving region therebetween;

said assembly including corrosion-penetrating means defined along at least two opposed surface portions adjoining said conductor-receiving region and engageable with surfaces of lengths of each of a pair of conductors disposed within said conductor-receiving region, and said assembly defining a conductive path between said corrosion-penetrating means;

said outer body member having a pair of first extensions extending from at least proximate opposed lateral edges of said first base section, and said inner body member having a pair of second extensions extending from opposed lateral edges of said second base section, said first extensions diverging at a selected first angle from first joints at said conductor-receiving region, and said second extensions extending along inside surfaces of said first extensions and diverging at a slightly greater selected angle from second joints with said second base section at said conductor-receiving region;

said first extensions including engagement means proximate free ends thereof firmly engageable during crimping with cooperating engagement means of said second extensions



proximate free ends thereof, said cooperating engagement engagement means closer to said second joints than the distance of said means to said first joints,

whereby when said first extensions are deformed by being rotated toward each other about said first joints, said second extensions therebetween are correspondingly rotated by said first extensions toward each other about said second joints and said cooperating engagement means are engaged by said engagement means and cause said second extensions to urge said second base section of said inner body member toward said first base section pressing said conductor-clamping surfaces against conductors disposed in said conductor-receiving region and urging said corrosion-penetrating means against said conductors and through corrosion on surfaces thereof to establish an electrical interconnection sufficient to define a grounding connection therebetween.

5,151,561

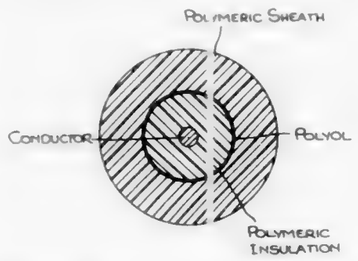
ELECTRICAL CABLE MANUFACTURE

Kenneth R. Emery, Winchester; Harold R. Bennett, Chilbolton, and Jack Clark, Chandlers Ford, all of England, assignors to Pirelli General plc, London, England

Division of Ser. No. 324,387, Mar. 16, 1989, Pat. No. 5,066,516.
This application Aug. 6, 1991, Ser. No. 740,989
Claims priority, application United Kingdom, Mar. 23, 1988, 8806939; Jan. 31, 1989, 8902074
Int. Cl.[5] H01B 7/02
U.S. Cl. 174—120 R 4 Claims

1. An electrical cable comprising a polymeric sheath extruded over at least one conductor core provided with polymeric insulation when made by a method including applying a

polyol-water mixture over the polymeric insulation of the at least one conductor core prior to extruding the polymeric



sheath thereover such that the polymeric sheath is prevented from adhering to the polymeric insulation.

5,151,561

SYSTEM FOR ADJUSTING HORIZONTAL DEVIATIONS OF AN ELEVATOR CAR DURING VERTICAL TRAVEL

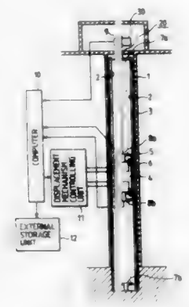
Akira Fujita, and Hisao Kato, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 12, 1991, Ser. No. 714,023

Claims priority, application Japan, Jun. 18, 1990, 2-157474; Jan. 25, 1991, 3-47213

Int. Cl.[5] B66B 3/02

U.S. Cl. 187—134 **9 Claims**



1. A system for reducing horizontal deviations of elevators in which a cage ascends or descends in an ascending/descending path while engaged with guide rails through guide shoes, said system comprising:

displacement means, disposed between the cage and the guide shoes, for displacing the cage relative to the guide rails in a direction perpendicular to a plane of the guide rails and in a direction parallel to the plane of the guide rails, wherein the parallel and perpendicular displacements are independent of each other;

position detecting means for detecting a position of the cage in the ascending/descending path;

storage means for storing error corresponding to guide rail installation errors with respect to positions of said cage in the ascending/descending direction;

control means for controlling said displacement means to correct positional deviations of the cage at a speed corresponding to an ascending/descending speed of the cage in accordance with error data stored in said storage means, the error data corresponding to the position detected by said position detecting means.

5,151,563

REMOTE CONTROL SWITCH FOR POSTURE ADJUSTMENT OF AUTOMOTIVE MIRRORS

Morimasa Tanaka, Atsugi, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

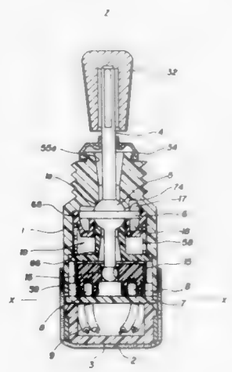
Continuation of Ser. No. 530,572, May 30, 1990, abandoned.

This application Jan. 29, 1992, Ser. No. 826,667

Claims priority, application Japan, May 30, 1989, 1-134560; Jul. 28, 1989, 1-194257

Int. Cl.[5] H01H 9/00, 25/04

U.S. Cl. 200—6 A **11 Claims**



1. A switch for controlling forward and rearward movement of first and second pairs of DC motors, each of said pairs being used for tilting the mirror surface of one of two mirrors about the horizontal and vertical axes, said switch comprising:

(a) a casing;

(b) a substrate housed in said casing and having a surface;

(c) first and second contact groups disposed on said surface of said substrate and being offset from one another by a predetermined angle, each of said first and second contact groups including sets of contacts controlling one pair of said first and second pairs of DC motors, each of said contact groups including first, second, third and fourth sets of contacts, each of said sets of contacts having four contacts;

(d) a rotary switch member including

first, second, third and fourth electrically conductive ball-like moving contacts, disposed in association with said first, second, third and fourth sets of contacts,

first means for electrically connecting said first and second moving contacts to each other,

second means for electrically connecting said third and fourth moving contacts to each other,

means for holding said moving contacts such that said moving contacts roll on said substrate while retaining their positions relative to each other;

(e) an operating shaft supported on said casing, which is tiltable upward, downward, leftward, and rightward with respect to said casing and which is rotatable along said predetermined angle about an axis of said operating shaft, said operating shaft having a first end connected to said rotary switching member and having a second end disposed remote from said first end;

(f) a knob, provided on said second end of said operating shaft, for providing manual positioning of said operating shaft; and

(g) a posture controller including resilient means for normally biasing said operating shaft into a neutral position in which said axis extends in a direction which is generally perpendicular to said surface of said substrate;

wherein, when said operating shaft lies in said neutral position, each of said moving contacts assumes a first neutral position between said contacts in a respective one of said sets of contacts of said first group, said moving contacts being movable to a second neutral position such that each of said moving contacts is disposed between said contacts in a respective one of said sets of contacts of said second group; and

wherein, when said operating shaft is tilted in any of said upward, downward, leftward, or rightward directions, said movable contacts are moved in an opposite direction to that of the tilting direction of said operating shaft causing electrical connection to occur (1) between a respective one of said contacts of said first set of contacts and a respective one of said contacts of said second set of contacts and (2) between a respective one of said contacts of said third set of contacts and a respective one of said contacts of said fourth set of contacts, and, when said operating shaft is moved through said predetermined angle, each of said moving contacts moves from said first neutral position to said second neutral position.

5,151,564

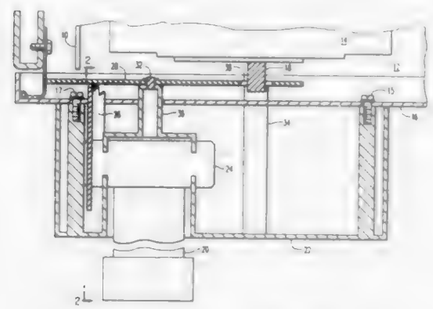
OPERATING MECHANISM FOR A CIRCUIT BREAKER

Neal E. Rowe, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1991, Ser. No. 653,608

Int. Cl.[5] H01H 3/00, 15/00

U.S. Cl. 200—17 R **18 Claims**



1. In a circuit breaker assembly, comprising:

a circuit breaker having switch handle means positioned for movement generally along the intersection of first and second intersecting planes;

toggle handle means associated with said switch handle means and mounted for movement in a third plane which is generally perpendicular to said first and said second planes, and

interconnecting and translating means for interconnecting said switch handle means and said toggle handle means and for translating said movement of said toggle handle means in said third plane into said movement of said switch handle means for several modes of operation for said circuit breaker.

5,151,565

MEDIUM TENSION CIRCUIT BREAKER

Michel Perret, Bourgoin-Jallieu, France, assignor to GEC Alsthom SA, Paris, France

Filed Aug. 7, 1990, Ser. No. 563,636

Claims priority, application France, Aug. 9, 1989, 89 10726

Int. Cl.[5] H01H 33/88

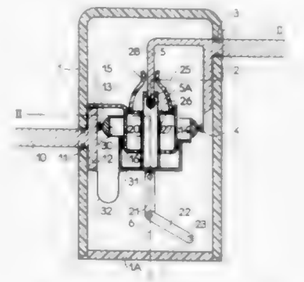
U.S. Cl. 200—148 A **4 Claims**

1. A medium tension circuit breaker comprising a casing of insulating material enclosing a gas having good dielectric properties and containing the following:

first contacts connected to a first current terminal and second contacts connected to a second current terminal;

a fixed arcing contact electrically connected to said first current terminal and a moving arcing contact in sliding contact with said fixed arcing contact and fixed to a reciprocable connecting rod mechanically connected to a drive member; and

a moving permanent contact fixed to the moving arcing



contact and providing an electrical connection between said first and second contacts when the circuit breaker is in the engaged position;

wherein said moving permanent contact is a short tubular part with said first and second contacts being stationary in a common plane and disposed respectively on two diametrically opposed circular arcs, and wherein the angular extent of each of the circular arcs of the first and second contacts is about 120°.

5,151,566

GAS CIRCUIT BREAKER

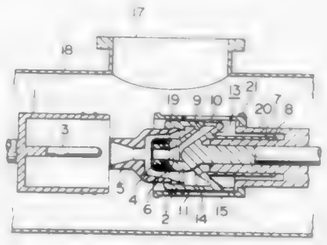
Osamu Koyanagi; Yasuharu Seki, and Masanori Tsukushi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1990, Ser. No. 635,251

Claims priority, application Japan, Jan. 8, 1990, 2-553

Int. Cl.[5] H01H 33/88

U.S. Cl. 200—110 A **4 Claims**



1. A gas circuit breaker comprising:

a main fixed element and a main movable element capable of contacting and moving apart from each other;

a fixed contact provided on the side of said main fixed element;

a movable contact provided on the side of said main movable element and capable of contacting and moving away from said fixed contact;

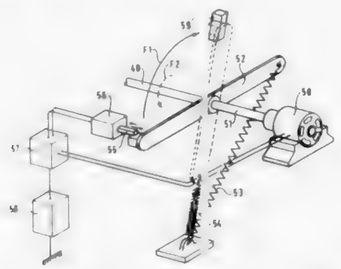
a hollow nozzle provided inside said movable contact;

a cylinder, a puffer cylinder and a fixed piston provided on said main movable element;

an insulation nozzle surrounding said movable contact, said insulating nozzle being capable of compressing a gas in a puffer chamber defined by said puffer cylinder and said

fixed piston and capable of guiding the gas to an opening when said contacts are disconnected;
an opening formed in a side surface of said cylinder to discharge the gas from said hollow nozzle;
a gas flow passage formed to provide a passage between said hollow nozzle and said opening; and
an exhaust guide provided outside said main movable element to close said opening;
wherein said exhaust guide is divided into a plurality of guide members connected by releasable fixing device.

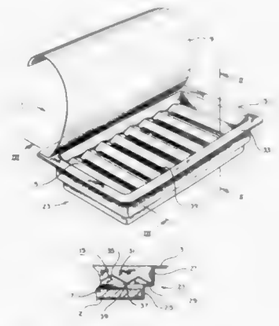
5,151,567
CIRCUIT BREAKER CONTROL APPARATUS
Edmond Thuries, Meyzieu, France, assignor to GEC Alsthom SA, Paris, France
Filed Sep. 10, 1991, Ser. No. 757,373
Claims priority, application France, Sep. 10, 1990, 90 11179
Int. Cl.[5] H01H *33/42 5/00, 3/00*
U.S. Cl. 200—148 F 1 Claim



1. Control apparatus for a medium tension or a high tension circuit breaker having a plurality of poles each provided with a drive rod, said control apparatus comprising a DC motor provided with a shaft controlling the motion of the drive rods of said poles, said shaft being fixed to an arm having a first end and a second end, said first end being fixed to a first end of a disengagement spring and said second end being fixed to a fixed point, said arm being capable of taking up a first position in which the spring stores energy and the poles of the circuit breaker are engaged, and a second position in which the spring is relaxed and the poles are disengaged, said second end of the arm being engagable with a retractable abutment capable of taking up a first position in which said abutment holds the arm in said first position and a second position in which said abutment releases the arm, said motor being powered by a power supply, the abutment being retractable by means of an electromagnetic actuator powered by said power supply, and said power supply to the motor and to the actuator being under the control of a programmed electronic circuit to perform a given cycle.

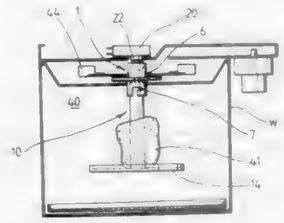
5,151,568
DISPOSABLE MICROWAVE COOKING UTENSIL
Martsey D. Rippley, 1500 N. Park Dr., Unit 140, Fort Worth, Tex. 76102
Filed Nov. 21, 1990, Ser. No. 616,429
Int. Cl.[5] H05B *6/60*
U.S. Cl. 219—10.55 E 8 Claims

1. A disposable microwave cooking utensil, comprising:
a) container means having a bottom wall and side walls, said side walls being coupled to said bottom wall so as to form a cavity inside of said container means;
b) corrugated wall means located in said cavity of said container means, said corrugated wall means having alternating ridges and hollows, said corrugated wall means having openings therethrough, said openings being located in said hollows, said corrugated wall means being adapted to support food thereon;
c) support means for supporting said corrugated wall means above the bottom wall of said container means such that there is a space between said container wall means and said container means bottom wall, said support means being coupled to said container means;
d) absorbing means for absorbing liquids produced by foods cooking on said corrugated wall means, said absorbing



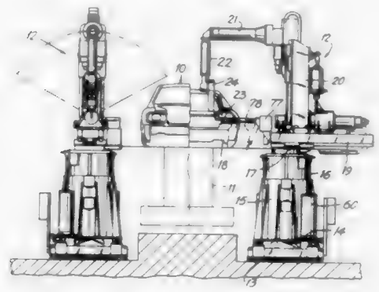
means being located in said space between said corrugated wall means and said bottom wall, said absorbing means being exposed to said openings in said hollows of said corrugated wall means, said absorbing means retaining said liquids within said container means and within said space between said corrugated wall means and said bottom wall;
e) said container means, corrugated wall means, support means and absorbing means being made of materials suitable for use in microwave ovens.

5,151,569
MICROWAVE COOKER HAVING A ROTARY STIRRER AND A ROTARY FOOD SUPPORT
Young S. Suh, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea
Filed May 21, 1991, Ser. No. 703,729
Claims priority, application Rep. of Korea, May 29, 1990, 90-7403[U]
Int. Cl.[5] H05B *6/78*
U.S. Cl. 219—10.55 F 13 Claims



1. A microwave cooker comprising:
a cooking compartment,
a motor having a housing and a rotary output which rotates about a stationary axis,
shaft means driven by said rotary output,
food supporting means for supporting food within said compartment and being mounted on said shaft means to be rotated thereby in spaced relation to said motor, and
a microwave stirrer disposed between said motor and said food supporting means for dispersing microwaves, said stirrer mounted on said shaft means for being rotated thereby in spaced relation to said motor.

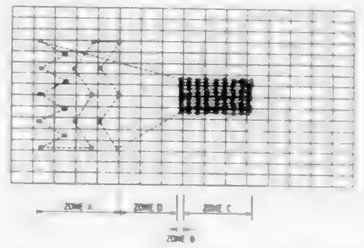
5,151,570
REVOLUTE WELDING ROBOT
Hiromi Sakurai, Nagoya, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 18, 1991, Ser. No. 793,813
Claims priority, application Japan, Nov. 22, 1990, 2-315734
Int. Cl.[5] B23K *11/36*
U.S. Cl. 219—86.25 17 Claims



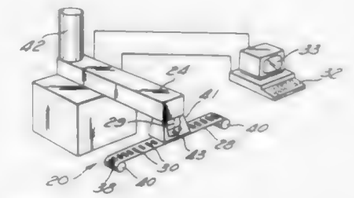
1. A revolute welding robot comprising a base table provided with a first electrode at one end, base table moving means for supporting said base table and for moving said base table between a working position for welding work and a standby position withdrawn from the working position for waiting until feeding of a workpiece, a column with its rear end supported on said base table and its front end extending upward, a slide arm with its rear end supported movable in the longitudinal direction of said column and its front end extending in the same direction as said first electrode, slide arm drive means disposed between said column and said slide arm for driving said slide arm, a swing arm with its rear end rotatably connected to the front end of said slide arm end extending in a direction perpendicular to said slide arm, swing arm drive means disposed between said swing arm and said slide arm for driving said swing arm, an electrode bracket with its rear end rotatably supported at the front end of said swing arm and provided with a second electrode opposing said first electrode provided at the front end extending in the same direction as said swing arm, electrode bracket drive means disposed between said electrode bracket and said slide arm for driving said electrode bracket, and electrode moving means disposed on at least one of said base table and said electrode bracket for driving at least one of said first and second electrodes to the other to a welding position, whereby pressing a plurality of work panels between said electrodes for welding.

5,151,571
ELECTRON BEAM WELDING
Allan Sanderson, and Colin N. Ribton, both of Cambridge, England, assignors to The Welding Institute, Cambridge, England
Filed Apr. 26, 1991, Ser. No. 692,233
Claims priority, application United Kingdom, May 4, 1990, 9010186
Int. Cl.[5] B23K *15/00*
U.S. Cl. 219—121.13 9 Claims

1. A method of electron beam welding wherein an electron beam is traversed along a weld zone, said electron beam being deflected from a nominal position so as to generate substantially distinct zones of different heat density about said nominal position of said electron beam.



5,151,572
METHOD OF MAKING A STENCIL FOR ETCHING GLASS
David E. Jack, Irvine, Calif., assignor to Prevent-A-Crime International, Inc., Santa Ana, Calif.
Continuation-in-part of Ser. No. 351,425, May 12, 1989, Pat. No. 4,987,287. This application Oct. 29, 1990, Ser. No. 605,518
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 19 Claims

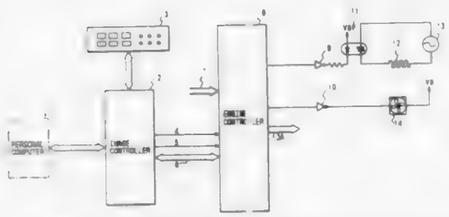


1. A method comprising:
applying a laser beam to the upper surface of a label, which includes a face stock layer, a layer of releasable adhesive applied to the lower surface of said face stock and a removable liner covering the adhesive; and
producing relative lateral movement between the laser beam and the label to remove the facestock layer and the adhesive layer to create a vehicle identification number in the label layers while not removing the liner, whereby a stencil is created that may be utilized by removing the liner from the adhesive layer and applying the releasable adhesive layer of the facestock to a surface onto which the number is to be marked.

5,151,573
IMAGE FORMING APPARATUS
Shunichi Masuda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1991, Ser. No. 731,873
Claims priority, application Japan, Jul. 24, 1990, 2-195879
Int. Cl.[5] G03G *15/20*
U.S. Cl. 219—216 9 Claims

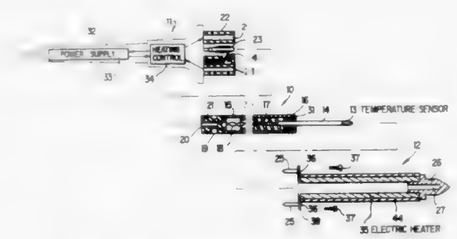
1. An image forming apparatus having thermal fixing means and a cooling fan, comprising:
input means for inputting print data which is sent from an external apparatus;
timer means for starting a timing operation upon completion of an image forming operation; and
control means for controlling the thermal fixing means and the cooling fan on the basis of counted time of the timer

means, wherein said control means turns off the thermal fixing means and the cooling fan when the timer means has



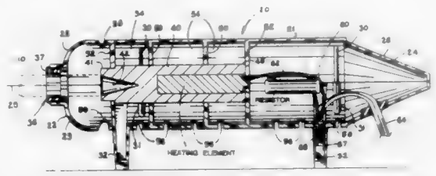
counted a predetermined time without starting a next image forming operation.

5,151,574
ELECTRIC SOLDERING IRON WITH PLUG-IN TIP TEMPERATURE SENSOR
Paul L. Urban, Cheraw, S.C., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Oct. 18, 1989, Ser. No. 423,353
Int. Cl.[5] H05B *1/02*; B23K *3/04*; H01C *7/00*; G01K *7/00*
U.S. Cl. 219—241 7 Claims



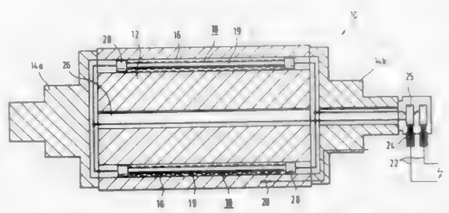
1. A heated iron comprising an operating element, a body and a detachable sensor unit:
said operating element comprising:
a barrel;
a heating element mounted in association with said barrel; and
a tip located at an end of said barrel in heat exchange relationship with said heating element, said tip having a hollow bore; said body comprising:
a handle connected to the end of said barrel opposite said tip;
means for monitoring the temperature of said operating element in relation to temperature measurements taken by said sensor unit; and
first contacts mounted within said handle for connecting said sensor unit to said monitoring means; and
said detachable sensor unit comprising:
a unit housing;
a temperature sensor mounted within said housing and positioned within said barrel and within said hollow bore of said tip to monitor the temperature of said tip; and
second contacts on said housing for connecting said temperature sensor to said monitoring means, said second contacts being readily detachably connected to said first contacts.

5,151,575
ELECTRICALLY HEATED COLOR CRAYON POINTER
Nathaniel W. Lilly, P.O. Box 67, Stratford, Wash. 98853
Filed Aug. 15, 1990, Ser. No. 568,365
Int. Cl.[5] B29C *33/02*; H05B *3/00*
U.S. Cl. 219—385 13 Claims



1. A color crayon pointer for pointing an end of an elongated color crayon having a longitudinal central axis wherein the coloring crayon has a known melting point, comprising:
a housing extending from a rear end to a forward end along a pointing axis with the forward end having an opening aligned with the pointing axis through which the crayon end to be pointed is inserted;
a heat conducting anvil mounted within the housing having a pointing cavity of a desired shape formed therein concentric with the pointing axis adjacent to the forward end for receiving the end of the color crayon when inserted through the housing opening;
a heating element associated with the heat conducting anvil for heating the anvil to a temperature above the melting point of the color crayon to melt the end of the color crayon and conform the end point to the desired shape of the pointing cavity; and
said housing having a crayon guide at the forward end spaced forward of the housing opening and of the heat conducting anvil and aligned with the pointing axis for guiding the color crayon coaxially with the pointing axis so that the conformed end point is coaxial with the longitudinal central axis of the color crayon.

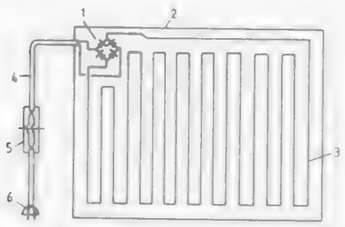
5,151,576
ROLL HAVING HEATING MEANS
Heinz-Michael Zaoralek, Königsbronn, Fed. Rep. of Germany, assignor to Schwabische Huttenwerke GmbH, Aalen-Wasseralfingen, Fed. Rep. of Germany
Filed Aug. 8, 1991, Ser. No. 741,906
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1990, 4024274; Oct. 25, 1990, 4033986
Int. Cl.[5] D06F *67/02*; D21F *5/16*
U.S. Cl. 219—469 7 Claims



1. A heatable roll, in particular for processing paper and other web-like material, comprising:
a) a roll body having a plurality of peripheral passages or bores which are formed substantially parallel to the axis of the roll body near the roll surface,
b) at least one removably attached journal pin, and
c) rod or tube-like heating elements arranged in said bores or passages and extending in the axial direction parallel to the roll body, wherein

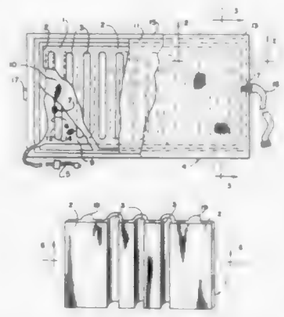
d) seals are disposed in said bores or passages at the respective ends of the heating elements to form sealed liquid cavities between the heating elements and the walls of the bores or passages, and
e) said sealed cavities are filled to a greater part with a convection liquid.

5,151,577
ELECTRIC SURFACE HEATING AND APPARATUS THEREFOR
Harold Aspden, Acres High, Hadrian Way, Chilworth, Southampton, SO1 7HZ, England
Filed Jan. 14, 1991, Ser. No. 640,833
Claims priority, application United Kingdom, Feb. 7, 1990, 9002718
Int. Cl.[5] H05B *3/34*
U.S. Cl. 219—528 4 Claims



1. Electric single-phase alternating current surface heating apparatus comprising, in combination, two heating elements formed by lengths of wire conductor which are spaced from adjacent wire lengths so as to distribute their heating effect over a surface to be heated, and a single-phase full-wave bridge rectifier circuit component having input connections for the supply of single-phase alternating current and output connections to the heating elements for the supply of unsmoothed full-wave rectified current, whereby ohmic resistance heating of the heating elements is powered primarily by a direct current component, but also by alternating current components at frequencies which are even multiples of the frequency of the single-phase alternating current supplied to the apparatus, said heating elements being connected in parallel so as to be powered from a common single-phase alternating current supply which feeds current for both elements through the common single-phase full-wave rectifier circuit component, the circuits of the two heating element being interconnected to form a bistable system operable to carry current through either of the elements as a function of temperature, the circuit being characterized by there being (a) no reactive components providing current smoothing, whereby the voltage applied across the heating elements is periodically zero-valued and the heating power input fluctuates at twice the power supply frequency, (b) electronically controlled switches in circuit with each of the heating elements, connected to by subject to the control of electric potentials at points of interconnection by cross-connections linking the circuits of the two heating elements, (c) different resistor segments of each of the heating elements comprising materials of different thermal resistance characteristics, whereby the relative electric potentials of the points of interconnection become a function of temperature, the circuit arrangement thereby assuring that both electronically controlled switches are non-conductive at times when the supply voltage is zero-valued and causing the bistable system to be reset at a frequency that is twice the supply frequency but allowing it, when energized, to adopt a state which is a function of temperature.

5,151,578
ANISOTROPICALLY BENDABLE HEATING PAD
Jerry G. Phillips, 6800 Cypress Rd. #304, Plantation, Fla. 33317
Filed Aug. 29, 1991, Ser. No. 751,555
Int. Cl.[5] H05B *3/34*; A61F *7/00*
U.S. Cl. 219—549 18 Claims

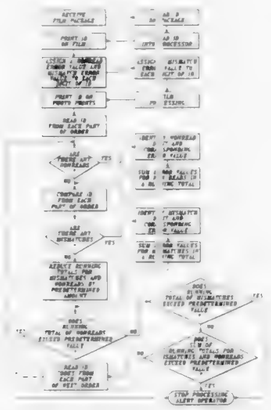


1. A planar heating pad that is substantially rigid in a first direction and substantially flexible in a second direction transverse to the first direction, said heating pad comprising:
a) at least one electrically resistive heating means arranged for heating substantially uniformly a large surface area;
b) electrical connection means for connecting a source of electric power to said heating means;
c) web means for supporting and protecting said heating means, said web means enclosing said heating means, said web means having two broad faces extending substantially in closely spaced parallel planes;
d) a water-tight envelope means for protecting said heating means from exposure to moisture, said envelope means closely enclosing said web means;
e) a flexurally anisotropic stiffening member means for making said heating pad rigid in a first direction and flexible in a second direction transverse to said first direction, both said directions being in a plane parallel to said broad faces of said web means, said stiffening member means being substantially planar and arranged in parallel relationship to said broad faces and extending over said large surface area; and
f) a removable outer covering arranged to enclose said water-tight envelope means and said stiffening member means therein to thereby provide a broad area heating pad having a thickness that is small relative to said area and that bends readily in a second direction for conforming to body contours and that resists bending in a first direction transverse to said second direction, where both directions are in a common plane parallel to said broad faces.

5,151,579
METHOD OF CHECKING CORRELATION BETWEEN PARTS OF A PHOTOFINISHING ORDER THROUGH THE USE OF ERROR WEIGHTS
Maxwell G. Maginness, Redmond, Wash., assignor to Gregtag Systems, Inc., Bothell, Wash.
Filed May 24, 1990, Ser. No. 528,743
Int. Cl.[5] G06F *15/46*; G06K *7/01*
U.S. Cl. 235—375 11 Claims

1. A method of checking correlation between multiple parts of a series of photofinishing orders during processing, comprising the steps of:
(a) assigning a multidigit control number to each order of said series of orders, wherein said multidigit control number changes with each order in the series;

(b) printing said multidigit control number on each part of each order;
(c) reading the multidigit control number from each part of each order;
(d) assigning a nonread error weight to each digit of said multidigit control number according to its position in the multidigit number, with a most frequently changing digit being weighted more than those digits that change with lesser frequency;



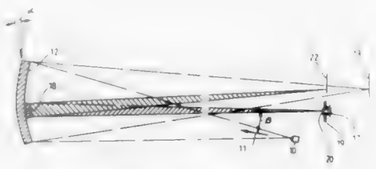
(e) comparing the multidigit control number read from each part of each order in order to match corresponding parts of each order;
(f) while comparing the multidigit control number read from each part of each order, monitoring whether a nonread occurs for each digit of said multidigit control number and summing the error weights corresponding to each nonread in a running total over the series of orders; and
(g) initiating corrective action if the running total of the nonread error weights exceeds a predetermined sum.

5,151,580

LIGHT EMITTING DIODE SCANNER

Boris Metlitsky, Stony Brook; Jerome Swartz, Old Field; Edward Barkan, South Setauket; Howard Shepard, Great Neck; David Goren, Ronkonkoma, and Tony Biuso, South Setauket, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Aug. 3, 1990, Ser. No. 562,130
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 30 Claims



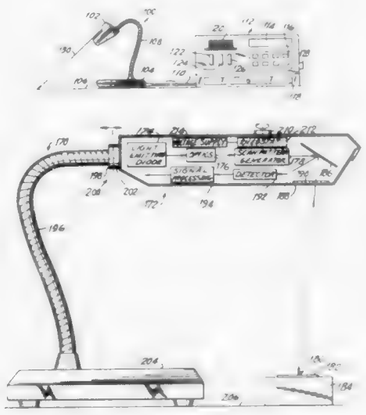
1. A system for reading symbols, comprising:
(a) light source means for generating a light beam;
(b) focusing means for focusing the light beam to a scan spot of predetermined area at a scan plane and for positioning the scan spot on a symbol located in a working distance range in the vicinity of the scan plane;
(c) scanning means for sweeping the scan spot across the symbol in a scan, thereby reflecting off the symbol reflected light, at least a returning portion of which travels away from the symbol back in the direction of said source means, said returning portion of the reflected light having a variable intensity over the scan;
(d) sensor means for viewing and detecting the variable intensity of said returning portion of the reflected light over a field of view, and for generating an electrical signal indicative of the detected variable light intensity;
(e) signal processing means for processing the electrical signal and for generating therefrom data description of the symbol; and
(f) imaging means for imaging a viewing window of the sensor means, said viewing window having an area smaller than that of the scan spot, and for focusing the viewing window at a viewing plane that is spaced away from the scan plane.

5,151,581

POINT-OF-SALE SYSTEM INCLUDING DETACHABLE INFINITELY ADJUSTABLE OPTICAL SCANNER WITH SELECTION OF SCAN PATTERN

Mark Krichever, Hauppauge, and Boris Metlitsky, Stony Brook, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 392,207, Aug. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 138,563, Dec. 28, 1987, Pat. No. 4,871,904. This application May 3, 1991, Ser. No. 695,076
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—467 33 Claims



1. A point-of-sale system for reading indicia having parts of different light reflectivity, comprising:
(A) a movable electro-optical scanner including
(i) means for propagating and directing a light beam toward indicia located in the vicinity of a work surface exteriorly of the scanner,
(ii) means for detecting at least a portion of light of variable intensity reflected off the indicia over a field of view, and for generating an electrical signal indicative of the detected light intensity,
(iii) means for processing the electrical signal into data descriptive of the indicia being read, and
(iv) means for scanning at least one of said light beam and said field of view in a scan pattern extending over the indicia;
(B) means for adjustably positioning the scanner and the light beam relative to the work surface, and for at least temporarily maintaining the scanner in a selected adjusted orientation during reading; and

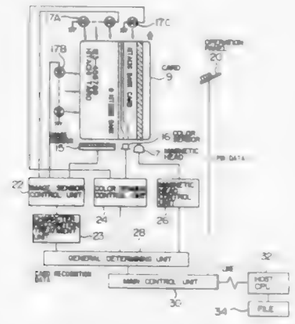
(C) user-selected means for selecting the scan pattern to be one of a plurality of predetermined scan patterns operative for reading the indicia.

5,151,582

AUTOMATIC TRANSACTION MACHINE SYSTEM FOR CHECKING CARD DATA AND EMBOSSED CHARACTERS

Toshinori Fujioka, Shibata, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,456
Claims priority, application Japan, Dec. 21, 1988, 63-320378
Int. Cl.[5] G06K 7/12, 5/00, 7/00, 7/14
U.S. Cl. 235—469 9 Claims



8. An automatic transaction machine system including a checking means for reading information recorded on a card before starting a transaction, said checking means having means for reading information stored in a magnetic stripe on said card, means for optically reading embossed information formed on a surface of said card, means for optically reading printed information formed on said card, and means for determining whether the information stored in the magnetic stripe is identical to the printed information and the embossed information.

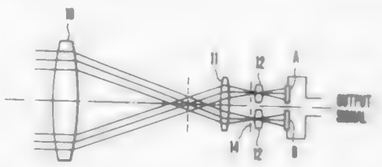
5,151,583

FOCUS ADJUSTMENT DEVICE HAVING RESTRICTING MEANS FOR RESTRICTING A SELECTING ACTION ACCORDING TO THE DEGREE OF NEARNESS OF A DISTANCE MEASUREMENT

Tatsuyuki Tokunaga; Keisuke Aoyama; Hidehiko Fukahori; Yasuo Suda, and Akira Akashi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 563,787, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 453,048, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 350,853, May 12, 1989, abandoned. This application Nov. 25, 1991, Ser. No. 799,029
Claims priority, application Japan, May 16, 1988, 63-118817; May 16, 1988, 63-118818
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—201.2 99 Claims

1. A focus adjustment device for measuring distances from a detector to a plurality of points on an image plane specified by an optical means to obtain distance measurement results, and for adjusting focus of said optical means on the basis of the distance measurement results, comprising:
a) selecting means for selecting information on a distance measurement result indicative of the smallest distance measurement results obtained at said plurality of points; and
b) restricting means for restricting said selecting means from selecting information according to a degree of nearness of said distance measurement result indicative of said nearest point in consideration of a focal length of said optical means, and a position of one of said plurality of points on



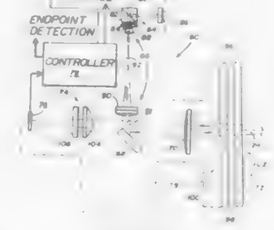
said image plane at which said distance measurement result indicative of said nearest point is obtained.

5,151,584

METHOD AND APPARATUS FOR ENDPOINT DETECTION IN A SEMICONDUCTOR WAFER ETCHING SYSTEM

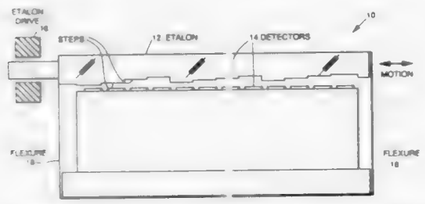
Peter Ebbing, Los Altos, and Manoocher Birang, Santa Clara, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 652,297, Feb. 5, 1991, Pat. No. 5,007,464, which is a continuation of Ser. No. 446,025, Dec. 5, 1989, abandoned, which is a division of Ser. No. 221,979, Jul. 20, 1988, Pat. No. 4,953,982. This application Oct. 15, 1991, Ser. No. 777,770
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—201.4 1 Claim



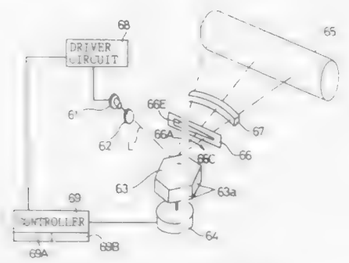
1. A method for detecting an etch process endpoint when a layer of material has been etched away from the surface of a substrate, comprising the steps of:
parking a beam of radiant energy on a spot on said layer;
producing an actual etching signal waveform by detecting the amplitude of a signal produced by interference between said beam of radiant energy and a portion of said beam reflected off of said layer;
comparing successive values of said actual etching signal waveform over a period of time with a sinusoidal projected etching curve and detecting the endpoint of the etch process when the waveform of the actual etching signal flattens so as to diverge from the projected etching curve.

5,151,585
COHERENT RADIATION DETECTOR
Edward T. Siebert, New Fairfield, Conn., assignor to Hughes Danbury Optical Systems, Inc., Danbury, Conn.
Filed Aug. 12, 1991, Ser. No. 744,204
Int. Cl.[5] G01V *1/20*
U.S. Cl. 250—201.9 32 Claims



1. Apparatus for detecting a presence of continuous wave and/or pulse coherent radiation, comprising:
radiation detector means having a plurality of discrete radiation detector elements disposed upon a surface thereof;
coherence length discriminator (CLD) means having a coherence length longer than a background radiation wavelength and shorter than a wavelength of coherent signals to be detected, said CLD means including means for varying an optical path length therethrough at a plurality of locations, said CLD means being disposed relative to said radiation detector means such that radiation passing through said CLD means is received by said discrete radiation detector elements; and
means, coupled to said CLD means, for moving said CLD means relative to said radiation detector means so as to modulate only coherent radiation passing through said CLD means.

5,151,586
SCANNING EXPOSURE DEVICE PROVIDED WITH INTENSITY CORRECTION TO COMPENSATE FOR SCAN ANGLE
Shougo Sato, Nagoya; Tsuyoshi Ohashi, Hashima, and Shinichi Hirahata, Kagamigahara, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 22, 1991, Ser. No. 733,614
Claims priority, application Japan, Aug. 1, 1990, 2-204250; Aug. 27, 1990, 2-224614; Aug. 27, 1990, 2-224615
Int. Cl.[5] G01J *1/26*
U.S. Cl. 250—205 19 Claims



1. A scanning exposure device comprising:
laser means for emitting a laser beam with a predetermined intensity;
a mirror for reflecting the laser beam emitted by said laser means;
a photoconductive means for receiving the laser beam reflected by said mirror;
a scanning exposure means for scanning the laser beam on said photoconductive means in accordance with a variation of an angular position of said mirror to deflect the laser beam, the laser beam impinging said mirror at an angle of incidence that varies with the angular position of said mirror; and
a correcting means for correcting the predetermined intensity of the laser beam so that an intensity of the laser beam on said photoconductive means is invariable regardless of a variation in a reflectance of said mirror due to a variation of the angle of incidence.

5,151,587
IMAGE SENSOR HAVING AN ARRAY OF OPERATIVE AND DUMMY BIPOLAR TRANSISTORS AND PAIRS OF PIXEL SELECTING SWITCHES CONNECTED THERETO
Satoshi Machida; Yukito Kawahara, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan
Filed Jan. 4, 1991, Ser. No. 637,489
Claims priority, application Japan, Jan. 10, 1990, 2-3241
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 14 Claims

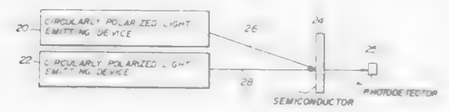
1. An image sensor comprising:
an array of operative bipolar transistors for effecting photoelectric conversion of incident light;
another array of dummy bipolar transistors optically shielded from incident light and disposed adjacently and correspondingly to the operative bipolar transistors to constitute pairs of the operative and dummy bipolar transistors;
pairs of reset switches connected to the corresponding pairs of the transistors at their base regions to concurrently reset each pair of the operative and dummy bipolar transistors; and
pairs of pixel selecting switches connected to the corresponding pairs of the transistors at their emitters.

5,151,588
RADIATION IMAGING APPARATUS HAVING DETECTION ELEMENTS OF VARYING SIZES
Motosada Kiri, Kyoto, and Susumu Adachi, Osaka, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan
Continuation of Ser. No. 612,958, Nov. 15, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 807,632
Claims priority, application Japan, Nov. 24, 1989, 1-305646
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 3 Claims

1. A radiation imaging apparatus comprising:
means for exposing an object to be examined to electromagnetic radiation;
a detector array comprising a plurality of radiation detector units each of which corresponds to one of the pixels of a display and comprises a plurality of radiation detecting elements for detecting the radiation from said object under examination, each of said detecting elements having a photosensitive surface of a different area from those of the other detecting elements;
a signal processing circuit of a photon counting type for processing the output signals of said detecting elements to produce an output corresponding to the number of the photons detected by each of said detecting elements; and
a data processor for selecting one or more of said detecting elements of each of said detector units in accordance with the radiation dose received by said detecting elements so

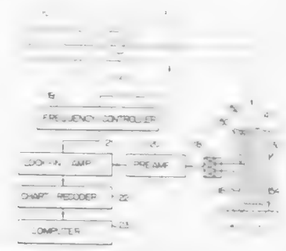
that the output of said selected one or more detecting elements is used as pixel information to form a radiation image of said object on said display.

5,151,589
OPTICAL SYSTEM USING SPIN-DEPENDENT OPTICAL NONLINEARITY
Atsushi Takeuchi, Isehara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 14, 1990, Ser. No. 627,460
Claims priority, application Japan, Dec. 15, 1989, 1-325297
Int. Cl.[5] H01J *31/50;* G02F *1/01*
U.S. Cl. 250—213 A 22 Claims



1. An optical system comprising:
first light emitting means for emitting a first nonlinearly polarized light beam;
second light emitting means for emitting a second nonlinearly polarized light beam, said second nonlinearly polarized light beam having a pulse waveform;
a semiconductor device receiving said first and second nonlinearly polarized light beams, said semiconductor device having heavy holes and light holes, each of said first and second nonlinearly polarized light beams having a wavelength which excites either heavy holes or light holes so that electrons are generated, said second nonlinearly polarized light beam being projected onto said semiconductor device in a state where said first nonlinearly polarized light beam is being projected onto said semiconductor device; and
first light receiving means for receiving said first nonlinearly polarized light beam which has an intensity peak caused by said second nonlinearly polarized light beam and which decreases due to a spin relaxation of said electrons.

5,151,590
PHOTOACOUSTIC CELL AND PHOTOACOUSTIC MEASURING DEVICE
Ryuichi Takamoto; Ryujiro Nanba; Masahiro Matsuoka, all of Yokohama, and Tsuguo Sawada, Kodaira, all of Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan
Filed Aug. 20, 1991, Ser. No. 748,320
Claims priority, application Japan, Aug. 20, 1990, 2-218574; Aug. 1, 1991, 3-193164
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—215 12 Claims



1. A photoacoustic cell, comprising:
a light guide having a fiber portion consisting of a bundle of a number of optical fibers and a covering portion by which the side surface of said fiber portion is covered, said covering portion of said light guide extending beyond said fiber portion in a manner that when a first end of said light guide is brought into contact with the surface of a material to be measured, a closed space is defined by the end surface of said fiber portion, by the inner wall of said covering portion, and by the surface of said material to be measured;
a pipe having a first end that is open in said closed space and a second end that penetrates through said covering portion and is open toward the outside of said covering portion; and
a microphone that is coupled to the second end of said pipe

5,151,591
ASYNCHRONOUS SIGNAL INTERROGATION CIRCUIT FOR AN DETECTION APPARATUS
Donald D. Johnson, Pearl City, and Jimmy Yee, Rockford, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 20, 1991, Ser. No. 702,566
Int. Cl.[5] H01J *40/14;* H03K *5/19*
U.S. Cl. 250—214 B 14 Claims

10. A signal interrogation method comprising:
receiving input signal pulses;
defining an acceptable time period having a predefined length, said acceptable time period beginning a predefined time following receipt of a first input signal pulse;
preventing receipt of said input signal pulses except during said acceptable time period;

providing a first record signal in response to receipt of a second input signal pulse coincident with said acceptable time period, said second input signal pulse being subsequent to said first input signal pulse; and

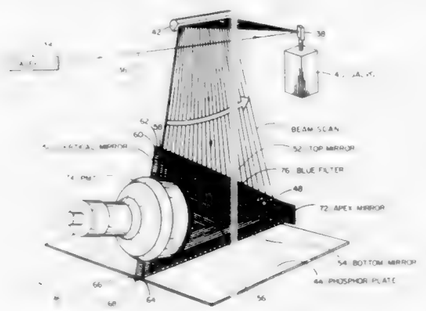
providing a second record signal in response to a lack of receipt of said second input signal pulse coincident with said acceptable time period.

5,151,592

FLARE MINIMIZATION IN SPLIT V-ROOF MIRROR COLLECTOR

John C. Boutet, Rochester, and Michael B. Brandt, Walworth, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1990, Ser. No. 632,450
Int. Cl.[5] G01J 1/00
U.S. Cl. 250—228 10 Claims



1. A light collector for collecting and detecting light emitted, reflected or transmitted from a scanned information medium comprising:

a vertical mirror extending the width of the scanned medium and having a lower edge adjacent to the scanned medium and an upper edge;

a V-roof mirror located adjacent to said vertical mirror and having upper and lower mirrors forming an apex facing said vertical mirror, said upper mirror having an edge adjacent to and spaced from said upper edge of said vertical mirror and said lower mirror having an edge adjacent to and spaced from the lower edge of said vertical mirror thereby to form aligned slots for the passage of a scanning beam of radiation to an information medium to be scanned and for allowing light emitted, reflected or transmitted by the scanned medium to enter the collector;

wherein said vertical mirror and said upper and lower mirrors of said V-roof mirror form a substantially triangular cross-section which tapers from a large end of said collector to a small end of said collector;

photodetector means having a light receiving face located at the large end of said light collector for receiving light reflected by said light collector and for generating an electrical signal in response thereto; and

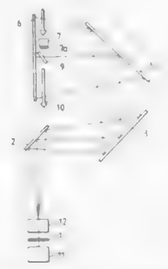
means, associated with said mirrors of said collector, for preventing light of one characteristic to be reflected and for allowing light of a different characteristic to be reflected.

5,151,593

IMAGE READING APPARATUS WITH CORRECTED OPTICAL LENGTH

Yoshitaka Masuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 529,545, May 29, 1990, abandoned.
This application May 13, 1991, Ser. No. 701,015
Claims priority, application Japan, Jun. 1, 1989, 1-140000
Int. Cl.[5] H01J 3/14
U.S. Cl. 250—234 20 Claims



1. An image reading apparatus, comprising:

illumination means for illuminating an image;

projection means for projecting the image illuminated by said illumination means onto a predetermined surface;

reflection means arranged between said projection means and said predetermined surface; and

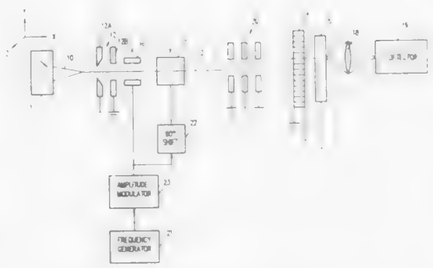
reading means for reading image information of the image projected by said projection means and deflected by said reflection means, an optical path length between said reading means and said reflection means being equal to an optical path length between said reflection means and said predetermined surface, wherein said reflection means and said reading means are arranged adjacent to said predetermined surface.

5,151,594

SUBPICOSECOND ATOMIC AND MOLECULAR MOTION DETECTION AND SIGNAL TRANSMISSION BY FIELD EMISSION

Gary M. McClelland, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1991, Ser. No. 780,655
Int. Cl.[5] H01J 37/285
U.S. Cl. 250—306 22 Claims



1. A method of generating a time-dependent record depicting the motion of one or more selected atoms with a time resolution equal to or shorter than 10-12 second, comprising the steps of:

applying an electric field to a field emission tip for emitting electrons from the selected atoms;

focusing the electrons into a beam; and

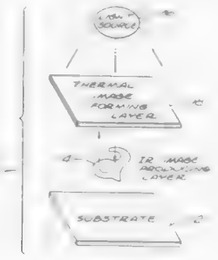
sweeping the beam over a spatially resolved electron detector for sensing the intensity of the beam as a function of time for creating the record.

5,151,595

IMAGING DEVICE AND METHOD FOR DEVELOPING, DUPLICATING AND PRINTING GRAPHIC MEDIA

Andrew S. Filo, Cupertino, Calif., assignor to Simon Marketing, Inc., Los Angeles, Calif.

Filed Oct. 16, 1990, Ser. No. 598,266
Int. Cl.[5] G03G 5/00
U.S. Cl. 250—316.1 25 Claims



1. An apparatus for developing, printing or duplicating graphic media, comprising:

a cold strobe light source for emitting visible light;

a substrate bearing an infrared image producing layer, said infrared image producing layer being disposed adjacent said light source, said infrared image producing layer having the property of converting visible light into infrared light; and

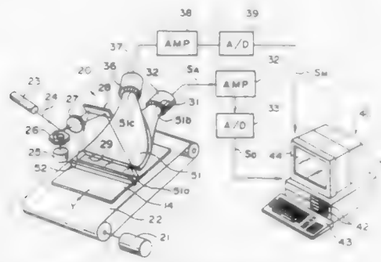
a thermal image forming layer disposed adjacent said infrared image producing layer, light from said light source causes said infrared image producing layer to convert visible light into infrared light and said infrared light to develop at least one portion of said thermal image forming layer.

5,151,596

METHOD AND APPARATUS FOR DETECTING THE LOCATION OF A PATTERN IN A RADIATION IMAGE STORED ON A STIMULABLE PHOSPHOR SHEET

Shigeru Saotome, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1991, Ser. No. 676,590
Claims priority, application Japan, Mar. 28, 1990, 2-80020; Mar. 28, 1990, 2-80022; Mar. 28, 1990, 2-80023
Int. Cl.[5] G01N 23/04
U.S. Cl. 250—327.2 9 Claims



1. A radiation image read-out apparatus, comprising:

stimulating ray irradiating means for irradiating stimulating rays to a stimulable phosphor sheets, on which a radiation image has been stored, said stimulating rays causing said stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation,

first photoelectric conversion means for photoelectrically detecting the emitted light, and thereby generating an image signal representing said radiation image,

second photoelectric conversion means for photoelectrically detecting the stimulating rays, which have been reflected from said stimulable phosphor sheet, and thereby generating a monitor signal, and

detection means for detecting location of a pattern caused to occur in said radiation image, which is represented by said image signal, by dust clinging to said stimulable phosphor sheet, the detection being based on said monitor signal,

wherein said first photoelectric conversion means and said second photoelectric conversion means are combined together such that a single common light input part serves both as a light input part of said first photoelectric conversion means and a light input part of said second photoelectric conversion means.

5. A method for displaying a radiation image in which a visible image reproduced from an image signal is displayed, said image signal having been obtained by exposing a stimulable phosphor sheet, on which a radiation image has been stored, to stimulating rays, which cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, the emitted light being detected, said method comprising the steps of:

(i) obtaining a specific pattern location signal, which represents the location of a specific pattern appearing in the radiation image represented by said image signal, said specific pattern being caused to occur by a defect, which is present on the surface or in the interior of said stimulable phosphor sheet,

(ii) putting a mark, which indicates said specific patter, on said visible image reproduced from said image signal, and

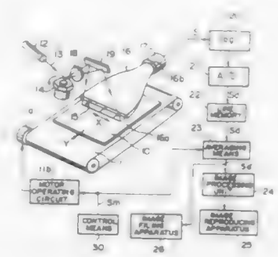
(iii) displaying said visible image.

5,151,597

METHOD FOR READING OUT RADIATION IMAGES

Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 9, 1991, Ser. No. 682,279
Claims priority, application Japan, Apr. 10, 1990, 2-94649
Int. Cl.[5] G01N 23/04
U.S. Cl. 250—327.2 16 Claims



1. A method for reading out a radiation image, wherein a stimulable phosphor sheet, on which a radiation image has been stored, is scanned with stimulating rays in a main scanning direction and in a sub-scanning direction, the stimulating rays cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, the light emitted by a portion of the stimulable phosphor sheet exposed to the stimulating rays is photoelectrically detected, and an image signal representing the radiation image is thereby obtained.

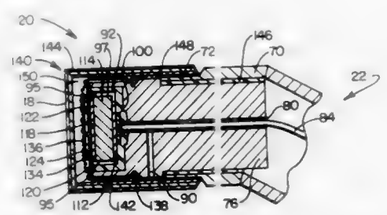
wherein the improvement comprises the steps of:
i) setting a main-scan speed, with which a stimulable phosphor sheet is scanned with said stimulating rays in the main scanning direction, to be the same for a plurality of stimulable phosphor sheets,
ii) setting a sub-scan speed, with which a stimulable phosphor sheet is scanned with said stimulating rays in the sub-scanning direction, to be equal to a value inherent to each of the plurality of stimulable phosphor sheets, and
iii) processing the image signal, which has been detected from each of the plurality of stimulable phosphor sheets, to obtain a processed image signal representing a processed image wherein resolution, with which picture elements in said processed image for each of the plurality of stimulable phosphor sheets are arrayed along the sub-scanning direction, is equal to a predetermined value, even through the speeds with which the plurality of stimulable phosphor sheets are scanned in the sub-scanning direction varies.

5,151,598

DETECTOR AND LOCALIZER FOR LOW ENERGY RADIATION EMISSIONS

Dennis J. Denen, Columbus, Ohio, assignor to Neoprobe Corporation, Columbus, Ohio

Division of Ser. No. 404,403, Sep. 8, 1989, Pat. No. 5,070,878, which is a continuation-in-part of Ser. No. 271,023, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 248,920, Sep. 23, 1988, Pat. No. 4,893,013, which is a continuation-in-part of Ser. No. 27,197, Mar. 17, 1987, Pat. No. 4,801,803. This application Dec. 18, 1990, Ser. No. 629,271
Int. Cl.[5] A61B *6/00*
U.S. Cl. 250—336.1 **13 Claims**



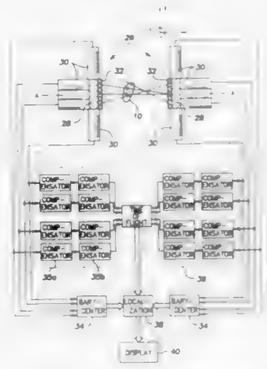
1. The method of fabricating an instrument for detecting and locating sources of radiation emission having predetermined energy levels, comprising the steps of:
providing a housing having a forwardly disposed portion;
providing a crystal mount formed of material attenuating radiation of said predetermined energy levels and having a forwardly disposed crystal receiving cavity of predetermined depth having a sidewall extending inwardly thereinto to an electrically insulative surface from a forwardly disposed opening;
locating an electrical biasing contact within said cavity upon said insulative surface;
positioning a first electrically conductive compliant member within said cavity and over and in freely-abutting contact with said biasing contact;
providing a radiation responsive crystal having a rearwardly disposed surface and a side portion extending to a forwardly disposed surface;
positioning said rearwardly disposed surface of said radiation responsive crystal within said cavity upon said first electrically conductive compliant member;
positioning a second electrically conductive compliant member over said crystal forwardly disposed surface;
positioning a flexible grounding contact in freely-abutting contact over said second electrically conductive compliant member;
compressing the assemblage of said electrical biasing contact, said first compliant member, said crystal, said second compliant member, and said grounding contact by stretching a resilient retainer thereover;
mounting said compressed assemblage with said crystal mount upon said housing forwardly disposed portion; and
locating a radiation transmissive cap having a forwardly disposed radiation acceptance window over said compressed assemblage and crystal mount in a manner deriving a dead air space between said window and the forwardmost portion of said compressed assemblage.

5,151,599

DEVICE TO DISPLAY DISINTEGRATIONS OF POSITRONS USING BARYCENTRIC AND TIME OF FLIGHT MEASUREMENTS

Olivier Monnet, Moirans, and Jacques Vacher, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 5, 1991, Ser. No. 665,551
Claims priority, application France, Mar. 12, 1990, 90 03101
Int. Cl.[5] G01T *1/164*
U.S. Cl. 250—363.03 **13 Claims**



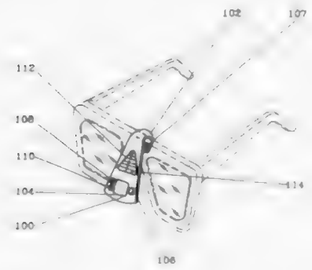
1. Device to display positron disintegrations, each disintegration being a source of simultaneous emissions of gamma radiations, said device comprising:
at least one pair of scintillators sensitive to gamma radiations and disposed opposite each other, each scintillator having a plurality of faces,
sets of photoelectron multipliers each associated with one scintillator,
for each scintillator, an electronic barycentric measuring device connected to the associated photoelectron multiplier set for measuring the position of the scintillations appearing in the scintillator in question,
for each pair of scintillators, electronic means connected to the associated sets of photoelectron multipliers for determining the times of flight of gamma radiations coincidence—detected in each of the scintillators of the pair in question,
an electronic device for localizing the disintegrations of positrons, said localizing device being connected to the electronic barycentric measuring devices and to the means for determining the times of flight and providing a three-dimensional location for the disintegrations, two dimensions being established by the electronic barycentric measuring devices and the third by the means for determining times for flight,
a display system connected to the localization device for displaying a visual indication in response to said three-dimensional locations.

5,151,600

NOSESHADE FOR MONITORING EXPOSURE TO ULTRAVIOLET RADIATION

Michael Black, Foster City, Calif., assignor to Reliant Laser Corporation, Foster City, Calif.

Filed Apr. 13, 1992, Ser. No. 867,433
Int. Cl.[5] G02C *11/00*
U.S. Cl. 250—372 **18 Claims**



1. A noseshade for monitoring a subject's exposure to UV radiation, comprising:
a contoured portion, having clip-on means for attaching said contoured portion to a pair of glasses; and
a UV dosimeter incorporated into said contoured portion.

5,151,601

NUCLEAR GAUGE WITH COMPENSATION FOR SAMPLE OF INSUFFICIENT NEUTRON MODERATING ACTIVITY

Ali Regimand, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Feb. 15, 1991, Ser. No. 656,959
Int. Cl.[5] G01N *23/09*
U.S. Cl. 250—390.04 **14 Claims**

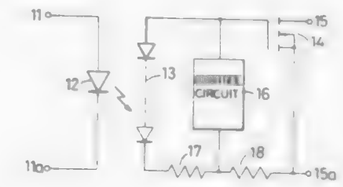
1. An apparatus for determining the hydrogen content of a hydrogen-containing material wherein the apparatus subjects a sample of the hydrogen-containing material to neutron radiation from a fast neutron source contained in the apparatus and then detects neutrons that become thermalized by interacting with hydrogen nuclei present in the hydrogen-containing material, the apparatus comprising, in combination:
a gauge housing adapted for receiving a sample therein so that the hydrogen-content thereof can be measured,
a neutron source provided in the housing for subjecting the sample to neutrons,
detector means provided in the housing for detecting thermalized neutrons,
means cooperating with said detector means for calculating from the thus detected thermalized neutrons the hydrogen content of the hydrogen-containing sample, and
a sample holder adapted to be positioned within said gauge housing, said sample holder being formed of a hydrogen-containing substance and having at least one receptacle formed therein of a size and shape adapted for closely receiving the hydrogen-containing sample and surrounding said sample with said hydrogen-containing substance, said sample holder thus increasing the interaction of neutrons from said source with hydrogen nuclei present in the sample.

5,151,602

SEMICONDUCTOR RELAY CIRCUIT USING PHOTOVOLTAIC DIODES

Yukio Idaka; Shuichiroh Yamaguchi; Hisakazu Miyajima; Takeshi Matsumoto, and Yasunori Miyamoto, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 31, 1991, Ser. No. 648,862
Claims priority, application Japan, Feb. 15, 1990, 2-34567; Oct. 26, 1990, 2-289463; Oct. 26, 1990, 2-289464
Int. Cl.[5] G02B *27/00*; H03K *3/42*
U.S. Cl. 250—551 **5 Claims**



1. A semiconductor relay circuit comprising:
a light-emitting element connected to input terminals of said circuit for generating a light signal upon presence of an input current at said input terminals,
a photovoltaic diode array optically coupled to said light-emitting element for generating a photovoltaic output responsive to said light signal from the light-emitting element,
an output MOS FET connected to said photovoltaic diode array and to output terminals of the circuit to vary from a first impedance state to a second impedance state upon application of said photovoltaic output across gate and source electrodes of said MOS FET,
a control means connected across said gate and source electrodes of said MOS FET to be in a high impedance state upon generation of said photovoltaic output and to be in a low impedance state upon disappearance of said photovoltaic output, and
resistors inserted in series with respect to a path of a charge current flowing from said photovoltaic diode array across the gate and source electrodes of said MOS FET and in a path of a discharge current flowing from a capacity across said gate and source electrodes of said MOS FET,
wherein said resistors comprise a first resistor inserted in said path of said charge current and a second resistor inserted in said path of said discharge current.

5,151,603

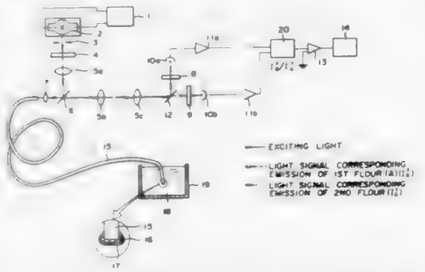
METHOD FOR OPTICAL DETERMINATION OF CONCENTRATION OF SUBSTANCE AND APPARATUS FOR THE DETERMINATION

Hideki Nakamura, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 465,239, Apr. 26, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 820,021
Claims priority, application Japan, Sep. 3, 1987, 62-219021; Sep. 2, 1988, PCT/JP88/00882
Int. Cl.[5] G01N *21/64*
U.S. Cl. 250—458.1 **10 Claims**

1. A method for optical detection of the concentration of a specific substance in a liquid or a gas by utilizing the quenching of a phosphor by said specific substance or a substance derived from said specific substance, which method is characterized by

accomplishing the detection of the concentration of said specific substance by inducing the presence of both a first phosphor (A) selected from the group consisting of tris(2,2'-bipyridine) ruthenium (II) complex, tris(1,10'-phenanthroline) ruthenium (II) complex, 1-pyrenebutyric acid and salts thereof, pyrene, aminopyrene, perylene, perylene dibutylate, and 2,7-dichlorofluorescein, quenched by the specific substance or a substance derived from said specific substance and a second



phosphor (B) selected from the group consisting of proflavine sulfate, fluorescein, and eosin Y not substantially quenched by said specific substance or a substance derived from said specific substance, determining a light signal corresponding to the intensity (I_A') of the emission from said first phosphor (A) and a light signal corresponding to the intensity (I_B') of emission from said second phosphor (B), and calculating the ratio between said light signals.

5,151,605

METHOD OF IRRADIATING AN OBJECT BY MEANS OF A CHARGED PARTICLE BEAM, AND DEVICE FOR PERFORMING THE METHOD

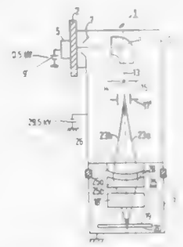
Jarig Politiek, and Henricus J. Ligthart, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1991, Ser. No. 679,976

Claims priority, application Netherlands, Apr. 9, 1990, 9000822

Int. Cl.[5] H01J *37/317*

U.S. Cl. 250—492.2 **18 Claims**



1. A method of irradiating an object with a charged particle beam comprising the steps of

(a) emitting a charged particle beam from a source,

(b) periodically deflecting said charged particle beam in a first scanning direction transverse to an optical axis,

(c) decelerating and focusing the deflected charged particle beam, and thereafter

(d) periodically deflecting the decelerated charged particle beam onto the object in a second scanning direction transverse to said first scanning direction.

5,151,606

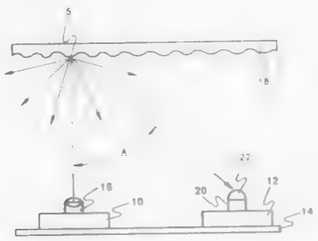
LAMBERTIAN MIRROR OPTICAL

Philip G. Grieve, New York, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,930

Int. Cl.[5] H04B *9/00*

U.S. Cl. 250—551 **15 Claims**



1. A method of facilitating communication among a plurality of components disposed in a substantially planar configuration, comprising the steps of:

a. associating each of first set of components with means for transmitting optical radiation representative of receiver-specific output information of the associated component;

b. associating each of a second set of components with means for detecting the optical radiation;

c. selectively operating the transmission means to irradiate, in a manner representative of the output information, a substantially directionally-invariant reflective surface to produce a reflection that impinges on each detection means; and

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5,151,604

RADIATION IMAGE STORAGE PANEL

Katsuhiro Kohda, and Terumi Matsuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 22, 1991, Ser. No. 688,271

Claims priority, application Japan, Apr. 20, 1990, 2-104470

Int. Cl.[5] B32B *5/16*

U.S. Cl. 250—484.1 **5 Claims**

1. A radiation image storage panel with improved sensitivity, sharpness and antistatic properties comprising a support made of a plastic film or a paper material, each containing a white pigment, and a stimulable phosphor layer on said support, wherein an electro-conductive zinc oxide whisker with an average diameter in the range of 0.3 to 3.0 μm and an average length in the range of 3 to 10 μm is contained in at least a portion of said radiation image storage panel.

d. operating each of the detection means to selectively accept the information.

5,151,607

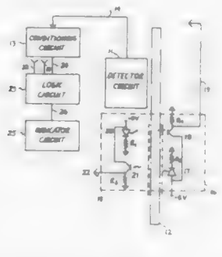
CURRENCY VERIFICATION DEVICE INCLUDING FERROUS OXIDE DETECTION

Timothy T. Crane, Box 78, Dalton, Mass. 01226; Richard A. Meneilly, 87 Belden Rd., Burlington, Conn. 06013, and Robert J. Danek, Hendee Rd., R.F.D. #1, Andover, Conn. 06232

Filed May 2, 1991, Ser. No. 694,912

Int. Cl.[5] G06K *5/00*

U.S. Cl. 250—556 **13 Claims**



1. Apparatus for determining authenticity of currency containing a security thread comprising:

a magnetic card reader having a slot for receiving a magnetically-coded card; and

means receiving currency adjacent said card reader, said currency receiving means including circuitry detecting a security thread within said currency and indicating authenticity of said currency.

5,151,608

OPTICAL DISTANCE SENSOR USING A LASER BEAM AND PROCESSING MEANS

Nobutoshi Torii, Hachioji, and Hiroshi Wakio, Oshino, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

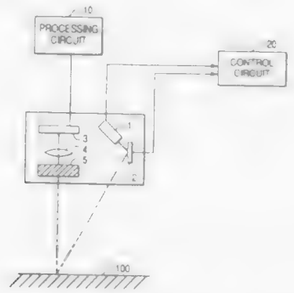
PCT No. PCT/JP90/00505, § 371 Date Dec. 11, 1990, § 102(e) Date Dec. 11, 1990, PCT Pub. No. WO90/13001, PCT Pub. Date Jan. 11, 1990

PCT Filed Apr. 18, 1990, Ser. No. 613,751

Claims priority, application Japan, Apr. 19, 1989, 1-97383

Int. Cl.[5] G01N *21/86;* **G01C** *3/00*

U.S. Cl. 250—561 **9 Claims**



1. An optical distance sensor having a light emitting section for projecting light toward a subject, and a light receiving section for receiving light reflected from the subject, and arranged to measure a distance from the subject in accordance with a light receiving position on the light receiving section, said optical distance sensor comprising:

said light receiving section having a group of light receiving elements each of which is arranged to generate an output corresponding to an incident light quantity;

scanning means for periodically scanning said light receiving section to successively send said outputs from said group of light receiving elements;

peak detection means for detecting a peak of the outputs from said group of light receiving elements;

processing means, said processing means comprising:

a CCD drive circuit, operatively connected to said light receiving section, controlling the output operation of said light receiving section by generating a scanning start signal at intervals having a first predetermined period and by generating a sample/hold signal at intervals having a second predetermined period shorter than the first predetermined period;

comparator means for comparing an output from one of said light receiving elements with a reference value generated within said comparator means;

first and second memory buffers each having address regions, the number of said address regions being equal to or greater than the number of said light receiving elements;

an address counter circuit, operatively connected to said CCD drive circuit, said light receiving section and said first and second memory buffers, for specifying an arbitrary one of said address regions of each of said memory buffers; and

a flip-flop circuit, operatively connected to said first and second memory buffers and said CCD drive circuit, for controlling write/read operations of said first and second memory buffers.

5,151,609

METHOD OF DETECTING SOLID SHAPE OF OBJECT WITH AUTOFOCUSING AND IMAGE DETECTION AT EACH FOCUS LEVEL

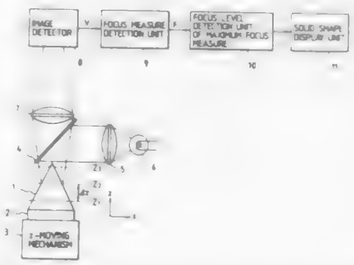
Yasuo Nakagawa, Chigasaki, Japan, and Shree K. Nayer, Pittsburgh, Pa., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1990, Ser. No. 561,823

Claims priority, application Japan, Aug. 2, 1989, 1-199223

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **31 Claims**



1. A method of detecting a solid shape of an object comprising the steps of:

picking up a plurality of object images with different focus levels with respect to an object whose shape is to be detected;

calculating the focus measure of each of pixels in each of said object images;

comparing the focus measures of the pixels on the same position in said object images with each other, so as to detect the maximum value among these focus measures; and

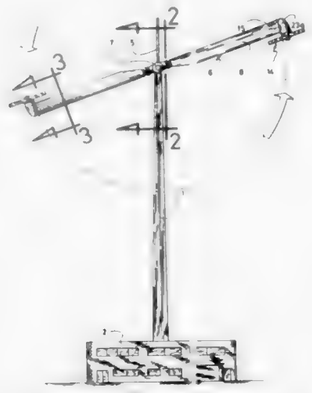
estimating a solid shape of said object based on the focus level of the object image having the maximum value of focus measure.

5,151,610

WIND MACHINE WITH ELECTRIC GENERATORS AND SECONDARY ROTORS LOCATED ON ROTATING VERTICAL BLADES

Jean St-Germain, 1364 rang St-Georges, St-Simon de Bagot, Canada J0H 1Y0

Filed Nov. 29, 1990, Ser. No. 619,423
Int. Cl.[5] F03D 9/00
U.S. Cl. 290—55 11 Claims



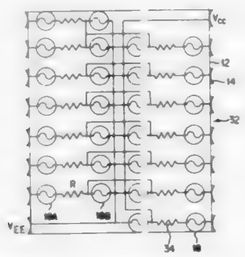
1. A wind machine comprising a wind-driven main rotor rotatable about a main axis and at least two wind-driven secondary rotors carried by said main rotor equally distant from and symmetrically arranged relative to said main axis and each rotatable about a second axis, which is substantially normal to said main axis, each secondary rotor having a smaller diameter than that of said main rotor whereby said main rotor serves to bodily move said secondary rotors through the air at a much greater speed than the wind speed to which said main rotor is exposed, said secondary rotors adapted to transmit torque to a rotary energy-producing device.

5,151,611

PROGRAMMABLE DEVICE FOR INTEGRATED CIRCUITS

Scott R. Rippey, Carney, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1990, Ser. No. 625,242
Int. Cl.[5] H05K 7/00
U.S. Cl. 307—202.1 12 Claims



1. A programmable device to be electrically connected to an integrated circuit and to be physically located beneath the integrated circuit on an integrated circuit board for providing predetermined logic levels to gates included in the integrated circuit, comprising:

a first and second voltage source;

an insulating body member;

a plurality of pins extending from said insulating body member;

a plurality of resistive members having a first and second end, one resistive member corresponding to each of predetermined ones of said plurality of pins, said second end of said one resistive member connected to said second voltage source; and

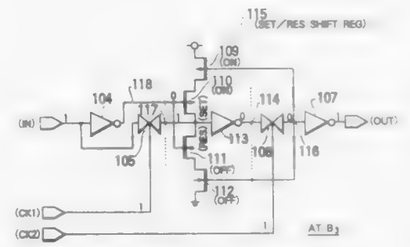
a plurality of programmable fuses, two of said programmable fuses corresponding to each of said predetermined ones of said plurality of pins, wherein a first end of a first one of said two programmable fuses is connected to the corresponding pin, a second end of the first one of said two programmable fuses is connected to said first end of the corresponding resistive member, a first end of a second one of said two programmable fuses is connected to said first voltage source, and a second end of the second one of said two programmable fuses is connected to said first end of said resistive member.

5,151,612

CIRCUIT FOR ELIMINATING DIGITAL NOISE OR SHORT PULSES UTILIZING SET/RESET SHIFT REGISTER

Masahiro Ishikawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 23, 1990, Ser. No. 527,442
Claims priority, application Japan, Jun. 22, 1989, 1-158188
Int. Cl.[5] H03K 5/22, 5/00
U.S. Cl. 307—234 6 Claims



1. A digital noise eliminator, comprising:

(a) clock generating means for generating a first clock and a second clock delayed in time with respect to said first clock;

(b) shift means, responsive to an input signal, for selectively transmitting said input signal as an output signal or eliminting said input signal as a noise signal, said shift means comprising

(1) a first transmission gate responsive to said input signal and said first clock, said first transmission gate being turned on in response to said first clock,

(2) a second transmission gate, responsive to said second clock, said second transmission gate being turned on in response to said second clock,

(3) a shift inverter, connected between said first transmission gate and said second transmission gate, for inverting a binary signal level of a signal inputted to said shift inverter;

(c) set means, responsive to said input signal and to said output signal, for setting said shift means when a binary level of said input signal and a binary level of said output signal are both at a first binary signal level; and

(d) reset means, responsive to said input signal and to said output signal, for resetting said shift means when a binary level of said input signal and a binary level of said output signal are both at a second binary signal level;

(e) said clock generating means activating said shift means on the basis of a time delay between said first and second clocks in such a way that said shift means transmits said

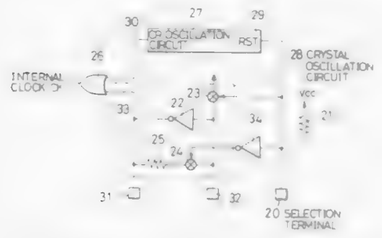
input signal when said input signal has a pulse width wider then a time duration between a down-edge of said first clock and a second-occurrence up-edge of said second clock, eliminates said input signal when said input signal has a pulse width narrower than a time duration between a down-edge of said first clock and a first-occurrence up-edge of said second clock, and transmits or eliminates said input signal when said input signal has a pulse width equal to a time duration extending from a down-edge of said first clock to a time between two next occurring up-edges of said second clock.

5,151,613

LARGE SCALE INTEGRATED CIRCUIT DEVICE FOR SWITCHING OSCILLATION CIRCUIT

Hiroki Satou, and Kazuyuki Horinouchi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Aug. 7, 1991, Ser. No. 741,264
Claims priority, application Japan, Aug. 22, 1990, 2-88292[U]
Int. Cl.[5] H03K 17/56, 5/13, 3/01; H01L 25/00
U.S. Cl. 307—243 19 Claims



1. An integrated circuit device having a CR oscillation circuit and a crystal oscillation circuit and capable of selecting either the CR oscillation circuit or the crystal oscillation circuit, said integrated circuit device comprising:

means connected to said CR oscillation circuit for receiving an electrical signal;

means connected to both of said CR oscillation circuit and said receiving means for selecting either said CR oscillation circuit or said crystal oscillation circuit in accordance with a state of said electrical signal received by said receiving means; and

means connected to said receiving means for holding said receiving means at a predetermined level of said electrical signal in accordance with a state of said receiving means.

5,151,614

CIRCUIT HAVING CHARGE COMPENSATION AND AN OPERATION METHOD OF THE SAME

Akira Yamazaki; Masaki Kumanoya; Yasuhiro Konishi, and Katsumi Dosaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,037
Claims priority, application Japan, Jul. 13, 1990, 2-186503
Int. Cl.[5] H03K 17/22
U.S. Cl. 307—272.3 29 Claims

1. A residual charge compensation circuit connected to circuit means, said circuit means having a node which is coupled to a power supply and in which a residual charge of a first polarity tends to remain stored on said node when said power supply is turned off, comprising:

charge storage means for storing a compensating charge of a second polarity opposite said first polarity; and

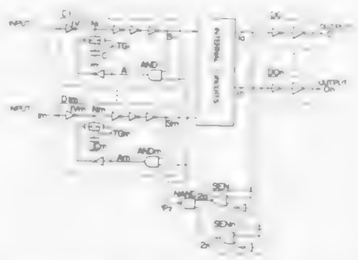
means for supplying the compensating charge to said node at a time of a turning-off of power supply.

5,151,615

NOISE ABSORBING CIRCUIT SUITABLE FOR SEMICONDUCTOR INTEGRATED CIRCUITS

Noboru Egawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,532
Claims priority, application Japan, Jul. 13, 1990, 2-185766
Int. Cl.[5] H03K 19/00
U.S. Cl. 307—443 18 Claims



1. A noise absorbing circuit comprising:

an output variation detecting circuit for detecting a variation in an output signal level of an output buffer circuit which changes from a high level to a low level;

an input level detecting circuit for detecting such a condition that an input signal line has a high voltage level;

a capacitor connected to said input signal line; and

a gate circuit connected between said capacitor and said input signal line; said gate circuit being closed so as to connect said capacitor to said input signal line if the voltage level of said input signal line is high when the output level of said output buffer circuit changes from a high level to a low level.

5,151,616

CMOS HIGH VOLTAGE SWITCH

Toshio Komuro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,655
Claims priority, application Japan, Jan. 23, 1990, 2-12975
Int. Cl.[5] H03K 17/16
U.S. Cl. 307—451 10 Claims

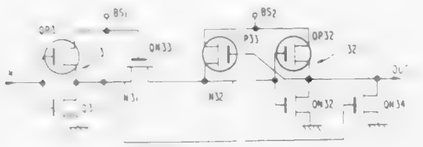
1. A semiconductor digital circuit comprising:

a first circuit section having complementary transistors connected between a first power terminal receiving a first voltage and a grounding terminal;

a second circuit section having complementary transistors

connected between a second power terminal receiving a second voltage different from said first voltage and said grounding terminal;

a first switch inserted between an output end of said first circuit section and an input end of said second circuit section operatively serving as a current path of the electric charge therebetween during a transition state of the circuit;



a second switch inserted between the input end of said second circuit section and said second power terminal and controlled by the output signal of said second circuit section; and

a third switch inserted between the output end and the grounding terminal of said second circuit section and controlled by the output signal of said first circuit section.

5,151,617

SUPERCONDUCTING LOGIC CIRCUIT

Eiichi Goto, Fujisawa; Willy Hioe, Kodaira; Mutsumi Hosoya, Kokubunji, and Ryotaro Kamikawai, Tokyo, all of Japan, assignors to Research Development Corporation of Japan and Ryotaro Kamikawai, both of Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,085

Claims priority, application Japan, Mar. 13, 1990, 61880

Int. Cl.[5] H03K *19/23, 19/195*

U.S. Cl. 307—462 **4 Claims**

1. A superconducting circuit comprising:

at least a periodically excited quantum flux parametron which is excited by periodically varying magnetic flux and used to amplify binary magnetic flux; and at least an arbitrarily excited quantum flux parametron which is excited by the output magnetic flux of one or more periodically excited quantum flux parametrons and used for logic operation of binary magnetic flux signals, said periodically excited quantum flux parametron and said arbitrarily excited quantum flux parametron, each comprising;

a first superconducting loop having a pair of circuits which respectively comprise a first Josephson junction and a first input inductor, and a second Josephson Junction, and a second input inductor;

an exciting line connected to the first superconducting loop;

an input line magnetically connected to said first and second input inductors;

a second superconducting loop having a pair of circuits which respectively comprise a third Josephson junction and a third input inductor, and a fourth Josephson junction and a fourth input inductor;

an exciting line connected to said second superconducting loop;

a direct current exciting input line magnetically connected to the third and the fourth input inductors; and

an output inductor connected to the first superconducting loop, wherein the exciting lines of the first and second superconducting loops are directly connected, and the output inductors of the periodically excited quantum flux parametron is magnetically connected to the exciting line of the arbitrarily excited quantum flux parametron.

5,151,618

RESONANT-TUNNELING HETEROJUNCTION BIPOLAR TRANSISTOR DEVICE

Naoki Yokoyama, and Kenichi Imamura, both of Atsugi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

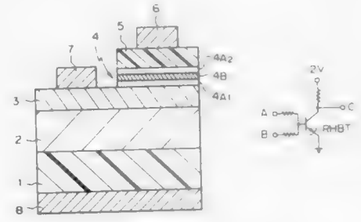
Division of Ser. No. 601,011, Oct. 22, 1990, Pat. No. 5,027,179, which is a continuation of Ser. No. 293,586, Jan. 4, 1989, abandoned, which is a continuation of Ser. No. 937,615, Dec. 3, 1986, abandoned. This application Feb. 22, 1991, Ser. No. 659,162

Claims priority, application Japan, Dec. 3, 1985, 60-270803

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] H01L *29/72, 29/161, 29/105*

U.S. Cl. 307—471 **2 Claims**



1. A logic circuit comprising:

a resonant-tunneling heterojunction bipolar transistor device having a differential negative-resistant characteristic, said resonant-tunneling heterojunction bipolar transistor device comprising:

a collector semiconductor layer having a first conductivity type;

a base semiconductor layer having a second conductivity type opposite the first conductivity type, a PN junction being formed at an interface between said base semiconductor layer and said collector semiconductor layer;

an emitter semiconductor layer having the first conductivity type and formed on said base semiconductor layer;

a superlattice structure formed between said emitter semiconductor layer and said base semiconductor layer, said superlattice structure comprising:

a first barrier layer contacting said emitter semiconductor layer, an energy level of said emitter semiconductor layer being lower than that of said first barrier layer for a carrier;

a second barrier layer contacting said base semiconductor layer, an energy level of said base semiconductor layer being lower than that of said second barrier layer for the carrier; and

a quantum well layer formed between said first and second barrier layers, an energy level of said quantum well layer being lower than that of said first and second barrier layers for the carrier, said quantum well layer defining a sub-band of energy in which the carrier resonant tunnels therethrough, the carriers being electrons and holes, the electrons and holes being generated in accordance with a mole fraction of material in said emitter semiconductor layer, and the differential negative resistance characteristic having at least one resonant point in common between a current flowing in said base semiconductor layer and a voltage between said base and emitter semiconductor layers, and having at least two stable base current values on both sides of the resonant point of the characteristic defined by a changeable base-emitter voltage;

current source means ohmically-connected to said base semiconductor layer of said resonant-tunneling heterojunction bipolar transistor device for supplying a constant current to said base semiconductor layer;

load means ohmically connected to said collector semiconductor layer; and

output means, operatively connected to a connection point of said load means and said collector semiconductor layer, for outputting a voltage defined by a change in current flowing through said collector semiconductor layer, the voltage being varied in response to the two stable base current values.

5,151,619

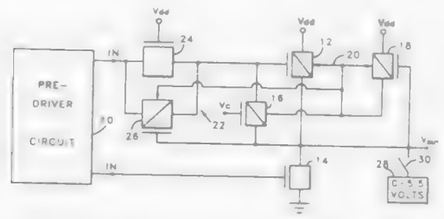
CMOS OFF CHIP DRIVER CIRCUIT

John S. Austin, Essex Junction; Ronald A. Piro, South Burlington, and Douglas W. Stout, Milton, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1990, Ser. No. 595,911

Int. Cl.[5] H03K *19/017, 19/096, 17/687, 17/04*

U.S. Cl. 307—473 **9 Claims**



1. An off-chip driver circuit comprising

a pull up transistor,

an output terminal,

voltage source means for providing a supply voltage of a given magnitude, said pull up transistor being disposed between said voltage source means and said output terminal,

a control transistor connected between a gate electrode of said pull up transistor and said output terminal having a gate electrode connected to a given point of reference potential,

a passgate including an N-channel field effect transistor having a gate electrode connected to a fixed point of reference potential and a first P-channel field effect transistor connected in parallel with said N-channel field effect transistor and having a gate electrode connected to said output terminal,

pre-driver circuit means for supplying a data in signal coupled to the gate electrode of said pull up transistor through said passgate, and

means for selectively applying a voltage to said output terminal having a magnitude significantly greater than that of said given magnitude.

5,151,620

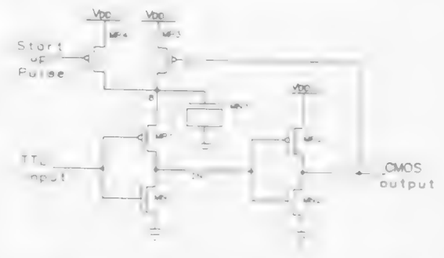
CMOS INPUT BUFFER WITH LOW POWER CONSUMPTION

Ming-Zen Lin, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Chutung, Taiwan

Filed Mar. 25, 1991, Ser. No. 674,209

Int. Cl.[5] H03K *17/16*

U.S. Cl. 307—475 **11 Claims**



1. In an integrated circuit device having a CMOS buffer circuit of the type having an input inverter stage having two FET's designated the "upper" FET (MP1) and the "lower" FET (MN1) and an output inverter stage (MN2, MP2) connected to provide a signal in a CMOS range in response to a binary input signal in a different range, an improvement for preventing both input stage FET's from conducting when the input signal is high enough to turn on the lower FET (downMN1) but not high enough to turn off the upper FET (MP1), comprising:

a controlled power supply stage connected between a node (18) to which the source terminal of the upper FET (MN1) is connected and the corresponding power supply terminal (V_{DD}) of the device,

means connecting the controlled power supply stage to receive a controlling signal from the output inverter stage,

a capacitor (MN3) connected between the controlled power supply node and a different potential point (ground),

means in the controlled power supply stage responsive to the controlling signal to supply current for charging the capacitor when the output of the stage is at a low logic level and for interrupting the current to the node when the output of the output stage is at a high logic level,

whereby the capacitor supplies current to switch the output inverter stage when the input signal falls to a low logic level and whereby the controlled power supply stage is turned off to prevent current flow in both the upper FET and the lower FET when the input signal rises to a high logic level, and

means for initially charging the capacitor when power is first applied to the circuit power supply terminals.

5,151,621

HIGH SPEED OUTPUT BUFFER UNIT THAT PRELIMINARILY SETS THE OUTPUT VOLTAGE LEVEL

Hiroyuki Goto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 9, 1991, Ser. No. 743,061

Claims priority, application Japan, Aug. 9, 1990, 2-211225

Int. Cl.[5] H03K *19/0175*

U.S. Cl. 307—475 **6 Claims**

1. An output buffer unit comprising

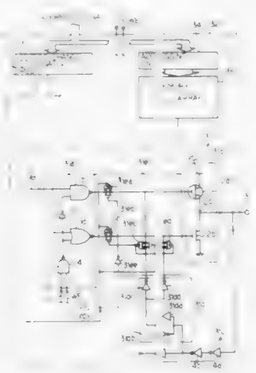
a) a controlling circuit responsive to an input signal for forming a first controlling signal,

b) a driving circuit implemented by a series combination of a first transistor of a first channel conductivity type and a second transistor of a second channel conductivity type opposite to said first channel conductivity type, said first and second transistors being complementarily shifted

between on and off states for producing an output signal at an output node between said first and second transistors,

c) a latching circuit for temporarily storing a previous output signal supplied from said output node and producing a second controlling signal, and

d) a gating circuit having a first input port coupled to said controlling circuit, a second input port coupled to said latching circuit and an output port coupled to said first



and second transistors, and responsive to a timing signal for transferring said second controlling signal to said first and second transistors in a first phase of operation for establishing an intermediate voltage level between high and low voltage levels at said output node of said driving circuit, said gating circuit being operative to supply said first controlling signal to said first and second transistors in a second phase of operation after said first phase.

5,151,623

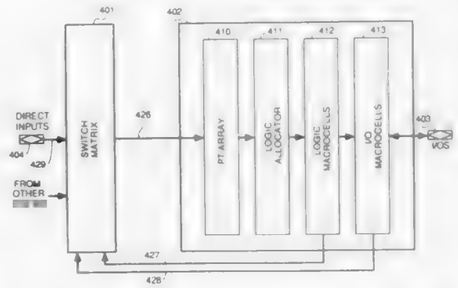
PROGRAMMABLE LOGIC DEVICE WITH MULTIPLE, FLEXIBLE ASYNCHRONOUS PROGRAMMABLE LOGIC BLOCKS INTERCONNECTED BY A HIGH SPEED SWITCH MATRIX

Om P. Agrawal, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 699,427, May 13, 1991, which is a continuation-in-part of Ser. No. 490,808, Mar. 7, 1990, Pat. No. 5,015,884, which is a continuation-in-part of Ser. No. 243,574, Sep. 12, 1988, Pat. No. 4,963,768, which is a continuation-in-part of Ser. No. 178,707, Apr. 7, 1988, Pat. No. 4,931,671, which is a continuation of Ser. No. 717,640, Mar. 29, 1985, Pat. No. 4,742,252. This application Oct. 18, 1991, Ser. No. 779,547

Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—465 **37 Claims**



1. An integrated circuit having a plurality of input/output (I/O) pins comprising:

a plurality of asynchronous programmable logic blocks, each asynchronous programmable logic block having a plurality of input lines and a plurality of output lines;

programmable switch interconnection means, operatively coupled to each of said asynchronous programmable logic blocks, for receiving signals on said pluralities of output lines from said plurality of asynchronous programmable logic blocks and for providing input signals to said pluralities of input lines of said plurality of asynchronous programmable logic blocks, wherein each asynchronous programmable logic block includes:

programmable array means, operatively coupled to said programmable switch interconnection means, for (i) receiving a plurality of input signals only from said plurality of asynchronous programmable logic block input lines; (ii) generating a plurality of logic output signals in response to said plurality of input signals; and (iii) generating a plurality of control signals in response to said plurality of input signals

a plurality of programmable output logic macrocell means, each programmable output logic macrocell means, operatively coupled to said programmable switch interconnection means, having at least one input line, and output line, and a control line wherein said control line is driven by one of said plurality of control signals;

logic allocator means, operatively coupled to said programmable array means and selectively operatively coupled to and decoupled from each of said plurality of programmable logic macrocell means, for steering said plurality of output signals of said programmable array

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5,151,622

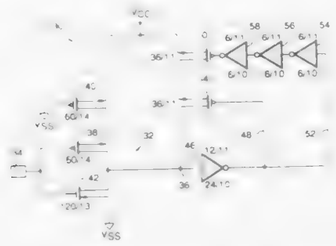
CMOS LOGIC CIRCUIT WITH OUTPUT COUPLED TO MULTIPLE FEEDBACK PATHS AND ASSOCIATED METHOD

Craig S. Thrower, San Jose, and King C. Wang, El Monte, both of Calif., assignors to Vitelic Corporation, San Jose, Calif.

Filed Nov. 6, 1990, Ser. No. 609,836

Int. Cl.[5] H03K *19/017, 19/0175*

U.S. Cl. 307—475 **25 Claims**



1. A TTL to CMOS input buffer circuit comprising:

level shifting means which includes an input terminal and an output node for receiving at the input terminal an input signal at a TTL logic voltage level and for providing at the output node an output signal at a CMOS logic voltage level, the output signal being a logically inverted version of the input signal;

first means for speeding a transition of the output signal from a low CMOS voltage level to a high CMOS voltage level; and

second means, operative throughout a transition of the output signal from the high CMOS voltage level to the low CMOS voltage level, for deactivating said first means when the output signal is static at the high CMOS voltage level and for maintaining said first means in a deactivated state throughout a transition from the high CMOS voltage level to the low CMOS voltage level.

means to selected input lined of said plurality of programmable output logic macrocell means and for decoupling said unselected input lines of said plurality of programmable output logic macrocell means from said programmable array means;

a plurality of programmable input/output (I/O) macrocells means, each I/O macrocell means, connected to one of said I/O pins, and to the output line of one of said programmable output logic macrocell means, for selectively connecting and disconnecting said programmable output logic macrocell means output line to said I/O pin; and

a plurality of programmable input logic macrocell means, each programmable input logic macrocell means, operatively coupled to said programmable switch interconnection means and to an I/O pin, having an input line and an output line wherein said input line is connected to said I/O pin and said output line is connected to said programmable switch interconnection means.

5,151,624

MULTIPLIER CIRCUIT

Michael Stegherr, Neubiberg, and Bruno Pfäffel, Höhenkirchen-Siegertsbrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

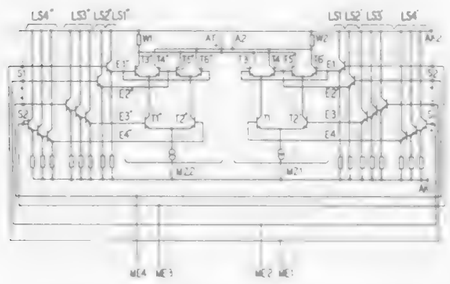
PCT No. PCT/DE90/00371, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO90/15397, PCT Pub. Date Dec. 13, 1990

PCT Filed May 17, 1990, Ser. No. 773,556

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917714

Int. Cl.[5] G06G *7/12, 7/00, 7/16*

U.S. Cl. 307—498 **8 Claims**



1. A multiplier circuit having a first pair and a second pair of input terminals and first and second output terminals comprising: at least first and second multiplier cells; the second multiplier cell having a lower circuit level and a downstream upper circuit level, a first pair of input terminals of the second multiplier cell assigned to the upper circuit level thereof and connected to the first pair of input terminals of the multiplier circuit, and a second pair of input terminals assigned to the lower circuit level thereof and connected to the second pair of input terminals of the multiplier circuit, the second multiplier cell connected to a first voltage terminal, the first output terminal of the multiplier circuit connected via a first resistance element to a second voltage terminal, and the second output terminal of the multiplier circuit connected to the second voltage terminal via a second resistance element, the first multiplier cell having a lower circuit level and a downstream upper circuit level, a first pair of input terminals of the first multiplier cell assigned to the upper circuit level thereof and connected to the second pair of input terminals of the second multiplier cell, and a second pair of input terminals of the first multiplier cell, assigned to the lower circuit level thereof and connected to the first pair of input terminals of the second multiplier cell, the first multiplier cell connected to the first voltage terminal, and a first output terminal of the second multiplier cell and a first output terminal of the first multiplier cell connected together and forming the first output terminal of the multiplier circuit, and a second output terminal of the second multiplier cell and a second output terminal of the first multiplier cell connected together and forming the second output terminal of the multiplier circuit.

5,151,625

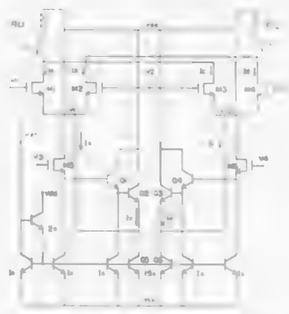
HIGH FREQUENCY BIMOS LINEAR V-I CONVERTER, VOLTAGE MULTIPLIER, MIXER

Seyed R. Zarabadi; Mohammed I. El-Naggar, and Nabil I. Khachab, all of Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Nov. 8, 1990, Ser. No. 610,233

Int. Cl.[5] H03B *19/00*

U.S. Cl. 307—529 **20 Claims**



1. A voltage to current converter, voltage multiplier and mixer circuit comprising:

(a) at least two differential output, common source connected, pairs of matched field effect transistors having cross connected drains, the transistors which do not have their drains connected together having their gates connected together to form a first pair of voltage input nodes, the two cross connections each forming an output node providing differential output currents;

(b) a pair of impedance transformation, buffer amplifiers each amplifier comprising a low output impedance, bipolar transistor, output stage and a high input impedance field effect transistor input stage, the outputs of the output stages each respectively connected to a different one of the common sources of said differential connected pairs and the input nodes of the input stages forming a second pair of voltage input nodes; and

(c) a low impedance, bipolar transistor, constant DC current biasing circuit means connected to said common sources for biasing the field effect transistors of the differential pairs in their saturation region and biasing all bipolar transistors in their active region.

5,151,626

REPETITIVE PULSED RAMAN CELL WITH VIBRATING BLADE

Donald R. Dewhirst, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 268,660, Nov. 2, 1988, abandoned, which is a continuation of Ser. No. 926,497, Nov. 4, 1986, abandoned. This application Feb. 19, 1991, Ser. No. 657,280

Int. Cl.[5] H01L *41/08*

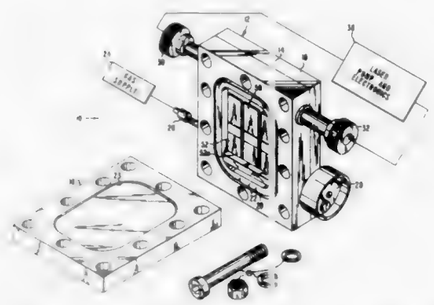
U.S. Cl. 310—331 **6 Claims**

1. In a Raman gas cell comprising: a sealed enclosure,

a gas contained within said sealed enclosure under pressure for providing a Raman conversion process, and means defining a laser beam path through said gas within said sealed enclosure;

and wherein a laser beam traversing said path and having a focus within said sealed enclosure is subject to optical distortion by heating of said gas from the Raman conversion process along said beam path;

the improvement consisting of at least one vibrating blade and means for driving said vibrating blades, said vibrating blades being positioned centrally within said sealed enclosure spanning approximately one-third of said beam path to agitatingly disturb said gas within said beam path so that a thermally homogeneous mixture of said agitated gas is provided within said beam path to thereby prevent optical distortion of said focused laser beam caused by localized heating of said gas from the Raman conversion process along said beam path.



5,151,627

CATHODE RAY TUBE HAVING STRONG DISPLAY WINDOW AND DISPLAY DEVICE

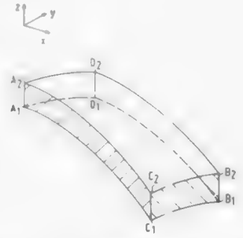
Johannes C. A. Van Nes, and Johannes Penninga, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1991, Ser. No. 653,954

Claims priority, application Netherlands, Feb. 12, 1990, 9000325

Int. Cl.[5] H01J *31/00; 29/86*

U.S. Cl. 313—477 R **22 Claims**



1. A cathode ray tube comprising; a display window, an electron gun and a display screen provided on an inner surface of the display window, characterized in that the thickness D_x of the display window along the long axis is defined by:

$$D_x = D_O + \Delta(x)$$

and the thickness D_y of the display window along the short axis is defined by:

$$D_y = D_O + \Delta(y),$$

where D_O is the thickness of the display window in the center of the display window and $\Delta(x)$ and $\Delta(y)$ are the increases in thickness along the long (x) axis and the short (y) axis, respectively, for which it holds that:

$$\Delta(y)_{max} > 1.5\Delta(x)_{max},$$

where $\Delta(x)_{max}$ and $\Delta(y)_{max}$ are maximum increases in thicknesses along the long (x) axis and the short (y) axis, respectively.

5,151,628

LIGHT EMITTING DIODE FOR PHOTOSENSOR AND PHOTOSENSOR WITH SUCH A DIODE

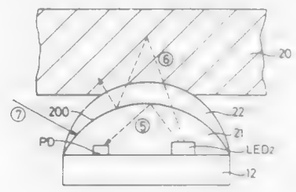
Masahiko Osawa, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 15, 1991, Ser. No. 745,152

Claims priority, application Japan, Aug. 27, 1990, 2-89655[U]; Aug. 27, 1990, 2-89656[U]

Int. Cl.[5] H01J *63/04*

U.S. Cl. 313—499 **8 Claims**



1. A light emitting diode for a photosensor, comprising: a substrate (12), a light emitting element provided on said substrate (12), a light receiving element disposed on said substrate (12) in the vicinity of said light emitting element for receiving light emitted by said light emitting element to detect a change in the amount of the light coming from said light emitting element in response to a change in ambient temperature, a first transparent layer (21) provided on said substrate (12) to cover said light emitting element and said light receiving element (PD), a second transparent layer (22) provided on said first transparent layer (21), and an air layer interposed between said first and said second transparent layers for substantially eliminating adverse influences of ambient temperature drifts on a measurement.

5,151,629

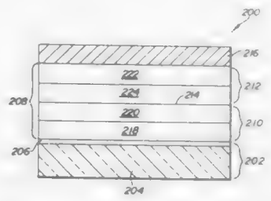
BLUE EMITTING INTERNAL JUNCTION ORGANIC ELECTROLUMINESCENT DEVICE (I)

Steven A. VanSlyke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1991, Ser. No. 738,776

Int. Cl.[5] H05B *33/26*

U.S. Cl. 313—504 **25 Claims**



1. An internal junction organic electroluminescent device comprised of, in sequence, an anode, an organic hole injecting and transporting zone, an organic electron injecting and transporting zone, and a cathode,

characterized in that said organic electron injecting and transporting zone is comprised of

an electron injecting layer in contact with the cathode and,

interposed between the electron injecting layer and the organic hole injecting and transporting zone, a blue emitting luminescent layer comprised of a charge accepting compound of the formula:

$$(R^5—Q)_2—Al—O—Al—(Q—R^5)_2$$

where

Q in each occurrence represents a substituted 8-quinolinolato ring nucleus and

R^5 represents an 8-quinolinolato ring substituent chosen to block sterically the attachment of more than two substituted 8-quinolinolato ring nuclei to any one aluminum atom.

5,151,630

TRIGGERABLE SWITCHING SPARK GAP

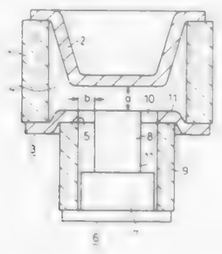
Jürgen Boy, and Matthias Jacubeit, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,150

Claims priority, application European Pat. Off., Nov. 2, 1989, 89250072.9

Int. Cl.[5] H01J *17/30*

U.S. Cl. 313—602 **1 Claim**



1. A triggerable switching spark gap for switching a voltage of approximately 2 kV, comprising:

a) a first main electrode having a flat discharge surface and a circular opening, said first main electrode being coated with an activating mass of silver or with a eutectic silver-aluminum compound constituent of approximately 10% to 40% by weight;

b) a second main electrode having a flat discharge surface;

c) an insulator disposed between the first main electrode and the second main electrode;

d) a gas-discharge space formed between the insulator, and the first and second main electrodes;

e) a cylindrical trigger electrode disposed inside the center of the circular opening and flush with the flat discharge surface of the first main electrode, forming a ring gap therebetween, having a circumferential edge with a radius of curvature less than or equal to 0.1 mm, and being coated with an activating mass of silver or with an eutectic silver-aluminum compound constituent of approximately 10% to 40% by weight, wherein a spacing between said first and second main electrodes is greater by a factor of 1.4 to 1.7 than a width of said ring gap.

5,151,631

LIGHTING CIRCUIT FOR VEHICULAR DISCHARGE LAMP

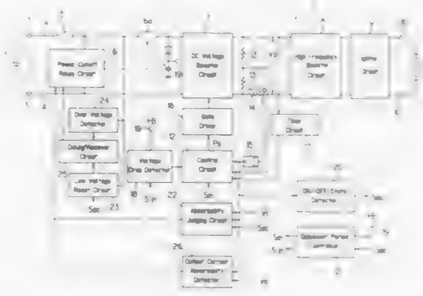
Goichi Oda; Atsushi Toda; Soichi Yagi, and Hiroki Shibata, all of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1991, Ser. No. 760,420

Claims priority, application Japan, Oct. 19, 1990, 2-281324

Int. Cl.[5] H05B *37/00;* **B60Q** *1/02*

U.S. Cl. 315—127 **10 Claims**



1. A lighting circuit for a vehicular discharge lamp for lighting a discharge lamp using a DC power supply, comprising:

an OFF state detector for detecting an OFF status of a discharge lamp;

a DC input voltage detector for detecting whether or not a DC input voltage is within a predetermined range; and

a power cutoff means for inhibiting power supply to the discharge lamp when the OFF status of the discharge lamp is detected by the OFF state detector and the DC input voltage lying off the predetermined range is detected by the DC input voltage detector, and permitting power supply to the discharge lamp upon reception of a signal indicating that the DC input voltage has returned within the predetermined range.

5,151,632

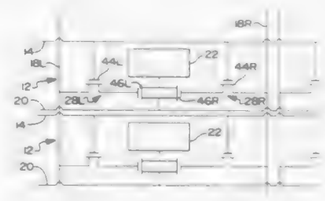
FLAT PANEL EMISSIVE DISPLAY WITH REDUNDANT CIRCUIT

John R. Troxell, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1991, Ser. No. 673,611

Int. Cl.[5] G09G *3/10;* **G02F** *1/13*

U.S. Cl. 315—169.1 **1 Claim**



1. A flat panel emissive display comprising:

a matrix of pixels arranged in rows and columns, each pixel comprising means for emitting light when pixel current is applied thereto;

at leas tone row electrode of each row of pixels;

a plurality of column electrodes for each column of pixels, each pixel having at least one corresponding row electrode and a plurality of corresponding column electrodes, the plurality of column electrodes for each column of pixels comprising a single conductor with sufficient resis-

tance to localize a short circuit condition of one of the column electrodes;

driver means for selectively energizing the row electrodes corresponding to selected rows of pixels and the pluralities of column electrodes corresponding to selected columns of pixels; and

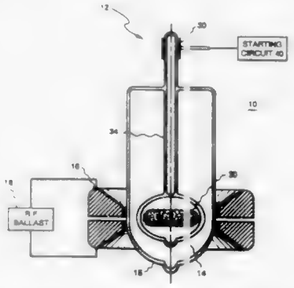
redundant sets of transistors means coupled to each pixel for jointly supplying pixel current, each set of transistor means being connected to at least the one row electrode and to one of the corresponding column electrodes such that each pixel is normally activated by signals from the one row electrode and at least one of the column electrodes.

5,151,633

SELF-EXTINGUISHING GAS PROBE STARTER FOR AN ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP

George A. Farrall, Rexford; John P. Cocoma, Clifton Park, both of N.Y.; James T. Dakin; Mark E. Duffy, both of Shaker Heights, Ohio, and Tommie Berry, Jr., East Cleveland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1991, Ser. No. 812,266
Int. Cl.[5] H05B *41/16*
U.S. Cl. 315—248 13 Claims



1. A gas probe starter for an electrodeless high intensity discharge lamp of the type having an excitation coil situated about an arc tube for exciting an arc discharge in an ionizable fill contained in said arc tube, comprising:

a starting chamber having a wall enclosing an interior containing a starter fill, said starting chamber being attached to the outer wall of said arc tube;

a starting electrode disposed proximate to the portion of said starting chamber opposite to the portion that is attached to said arc tube for coupling a starting voltage to the interior of said starting chamber;

means for coupling said starting voltage to said starting electrode for initiating a starting discharge in said starting chamber that in turn initiates an arc discharge in said arc tube; and

said starter fill including electronegative means for extinguishing the starting discharge in said starting chamber after initiation of said arc discharge in said arc tube.

5,151,634

DEVICE FOR CONTROLLING A GAS-DISCHARGE LAMP FOR USE IN A MOTOR VEHICLE

Andrea Nepote, Turin, and Marcello Boella, Ivrea, both of Italy, assignors to Marelli Autronica SpA, Milan, Italy

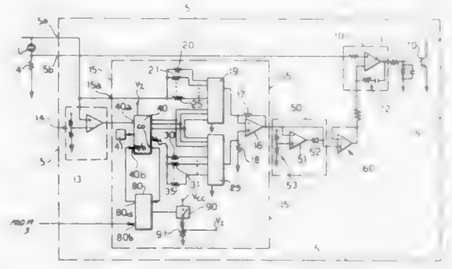
Filed Oct. 21, 1991, Ser. No. 779,858
Claims priority, application Italy, Oct. 22, 1990, 67812 A/90
Int. Cl.[5] H05B *37/02, 41/36*
U.S. Cl. 315—307 7 Claims

1. A device for controlling a gas-discharge lamp for use in a motor vehicle, including:

a supply device for the lamp, having an input for connection to the battery of the vehicle and an output for connection to the lamp and including an inverter with a control input for receiving a control signal which can modify the electrical power supplied to the lamp, and

regulating circuitry connected to the lamp and to the control input of the supply circuit for detecting the voltage across the lamp and the current flowing through the lamp and for applying to the control input of the supply device a control signal for causing a high electrical power to be supplied during the switching-on and warming-up of the lamp and a subsequent reduction of the power to a predetermined operating level;

the regulating circuitry comprising:



means for generating signals indicative of a reference current which is variable in steps and, during successive time intervals defined by a clock-signal generator, decreases according to respective predetermined functions as the voltage detected across the lamp increases, wherein the functions correspond to respective predefined constant values of the power supplied to the lamp, and

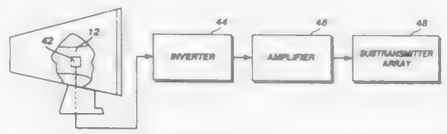
comparator means for comparing the reference-current values generated with the current detected in the lamp and, in dependence on the difference between them, generating an error signal usable for generating the control signal for the supply device.

5,151,635

APPARATUS AND METHOD FOR REDUCING THE MAGNITUDE OF TIME VARYING ELECTRIC FIELDS IN CRT DISPLAYS

Richard D. Cappels, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 20, 1991, Ser. No. 717,946
Int. Cl.[5] G09G *1/04*; H01J *29/06, 1/52*
U.S. Cl. 315—370 20 Claims



1. An electric field cancellation system for use in a CRT display comprising:

means for determining the magnitude and polarity of a source electric field in the display and developing a counter electrical signal of opposite polarity to the polarity of said source field; and,

counter electric field transmitting means, coupled to said determining and developing means, for using said counter-signal to establish a counter electric field of opposite polarity to said source field in a manner such that said counter electric field couples with said source electric field to produce a resultant electric field of substantially reduced magnitude in comparison to the magnitude of said source field, thereby reducing electric field emission from the display.

5,151,636

ROTARY DIE CUTTING APPARATUS AND METHOD WITH DISCONNECT

Kennith N. Winebarger, 2007 Woodbriar Loop South, Lakeland, Fla. 33813

Filed Mar. 12, 1990, Ser. No. 493,064
Int. Cl.[5] H02P *3/00*
U.S. Cl. 318—272 42 Claims

1. A rotary die cutting apparatus of the type having a power driven die roller mounted for rotary motion perpendicular to an axis of travel, and an anvil roller mounted for rotary motion in a spaced parallel relationship to said die roller, said rotary die cutting apparatus having a controller generating a feed signal in response to cardboard being fed into said rotary die cutting apparatus, the improvement comprising:

a) means for driving said anvil roller at a speed substantially the same speed as said die roller,

b) means for mechanically disconnecting said anvil roller from said means for driving, and

c) means for controlling said means for driving and said means for disconnecting in response to said controller generating said feed signal to prevent the shearing and crushing of said cardboard.

5,151,637

DECELERATION APPARATUS FOR MOTOR AND DRIVE CIRCUIT FOR USE IN MOTOR DECELERATION APPARATUS OR CONTROL APPARATUS FOR USE IN SEWING MACHINE

Kazuaki Takada, Katsuta; Masayuki Kanari, Iwaki; Makoto Yajima, and Eiji Toyoda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Taga Engineering Co., Ltd., Hitachi, both of, Japan

Filed Apr. 5, 1990, Ser. No. 504,864
Claims priority, application Japan, Apr. 19, 1989, 1-97343
Int. Cl.[5] H02P *3/14*
U.S. Cl. 318—376 16 Claims

1. A drive circuit for a motor, comprising:

motor drive means for driving a brushless multi-phase DC motor, the motor drive means including an inverter circuit including a plurality of switching elements; and

rotation speed control means for controlling the plurality of switching elements to drive the motor at a rotation speed specified by a rotation speed command in an operating mode, and to regeneratively brake the motor in a braking mode;

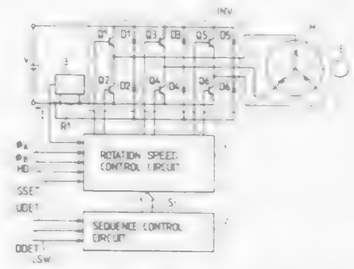
wherein the rotation speed control means controls the plurality of switching elements in the braking mode to regeneratively brake the motor intermittently in an intermittent braking mode during an initial braking period until the motor has decelerated to a predetermined rotation speed, and to regeneratively brake the motor continuously in a continuous braking mode during a subsequent braking period after the motor has decelerated to the predetermined rotation speed.

13. A drive circuit for a motor, comprising:

motor drive means for driving a brushless multi-phase DC motor, the motor drive means including an inverter circuit including a plurality of switching elements; and

rotation speed control means for controlling the plurality of switching elements to drive the motor at a rotation speed specified by a rotation speed command in an operating mode, and to regeneratively brake the motor in a braking mode; and

wherein the rotation speed control means controls the plurality of switching elements in the braking mode to provide a relatively small regenerative braking current to the motor for decelerating the motor during an initial braking period, and to provide a relatively large regenerative



braking current to the motor for decelerating the motor during a subsequent braking period

15. In a sewing machine having a brushless multi-phase DC motor, a control apparatus comprising:

motor drive means for driving the motor of the sewing machine, the motor drive means including an inverter circuit including a plurality of switching elements; and

rotation speed control means for controlling the plurality of switching elements to drive the motor at a rotation speed specified by a rotation speed command in an operating mode, and to regeneratively brake the motor in a braking mode; and

wherein the rotation speed control means controls the plurality of switching elements in the braking mode to provide a relatively small regenerative braking current to the motor and to provide a relatively large regenerative braking current to the motor for decelerating the motor during a subsequent braking period.

5,151,638

MOTOR OVERLOAD INDICATING ARRANGEMENT

Howard L. Beckerman, Middletown, N.J., assignor to Atlas Roll-Lite Door Corporation, Edison, N.J.

Filed Aug. 12, 1991, Ser. No. 743,939
Int. Cl.[5] H02P *7/36*
U.S. Cl. 318—434 9 Claims

1. An arrangement for indicating an overload condition of an AC motor, the overload condition being defined when the phase angle difference between the current and voltage within a single phase of the motor decreases below a predetermined threshold, the arrangement comprising:

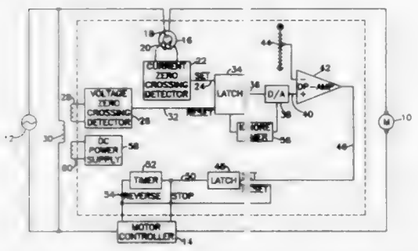
a saturable ferromagnetic core having a main winding in series with said single phase of the motor so that the motor current of said single phase passes through said main winding and a sense winding arranged to provide a first pulse of a first polarity when said motor current changes polarity in a first direction and a second pulse of a second polarity when said motor current changes polarity in a second direction;

means receiving said first and second pulses for providing a

current zero crossing pulse upon receipt of either said first or said second pulse;

means for providing a voltage zero crossing pulse in response to each zero crossing of the motor voltage of said single phase;

means utilizing said current zero crossing pulse and said voltage zero crossing pulse for providing a phase angle difference pulse initiated by each said current zero crossing pulse and terminated by each said voltage zero crossing pulse;



means for deriving a voltage representative of the duration of each said pulse angle difference pulse;

means activated in response to said derived voltage exceeding a predetermined threshold for stopping the motor; and

means responsive to activation of said stopping means for reversing the motor for a predetermined time;

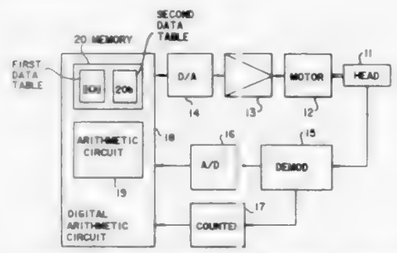
said stopping means including a latch circuit and said reversing means being responsive to the setting of said latch circuit for timing a first interval, and, after said first interval, reversing the motor for said predetermined time and resetting said latch circuit.

5,151,639

SYSTEM FOR POSITIONING A TRANSDUCER

Susumi Hasegawa, Kawasaki; Yoshifumi Mizoshita, Tama, and Kazuhiko Takaishi, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 8, 1991, Ser. No. 652,822
Claims priority, application Japan Feb. 9, 1990, 2-28197
Int. Cl.[5] G05B 19/407
U.S. Cl. 318—568.18 9 Claims



1. A system for positioning a control object comprising:

an actuator for moving and positioning said control object to a designated position;

an arithmetic control means for controlling a drive means of said actuator, wherein said arithmetic control means includes

target positioning means for determining a target position of each sample period in time for a target position generated based on acceleration and deceleration patterns which minimize a squared differential value of an acceleration of said control object,

target velocity means for computing a target velocity of each sample period in time for a target velocity generated based on acceleration and deceleration patterns which minimize said squared differential value of said acceleration of said control object, and

target acceleration means for computing a target acceleration of each sample period in time for a target acceleration generated based on acceleration and deceleration patterns which minimize said squared differential value of said acceleration of said control object;

position estimating means for estimating position of each sample period of said control object;

velocity estimating means for estimating velocity of each sample period of said control object;

error computing means for computing at least one error between the target position and target velocity output from said target positioning means and target velocity means and position and velocity output from said position estimating means and velocity estimating means; and

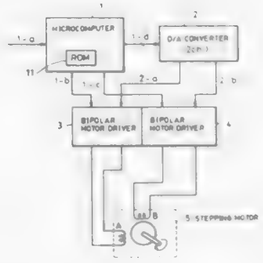
adding means for adding the target acceleration signal output from said target acceleration means and position error output from the position estimating means or velocity error signal output from the velocity estimating means and then outputting a control signal to said drive means of said actuator.

5,151,640

SCANNING DEVICE HAVING A MEMORY FOR STORING DRIVING STEPS FOR A STEPPING MOTOR

Masahiro Sakamoto, and Junnosuke Kataoka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 607,049
Claims priority, application Japan, Oct. 31, 1989, 1-281648; Oct. 31, 1989, 1-281649; Oct. 31, 1989, 1-281650
Int. Cl.[5] H02P 8/00
U.S. Cl. 318—696 12 Claims



1. A scanning device comprising:

a stepping motor driven by microsteps;

a memory for storing predetermined microstep drive information which indicates values and directions of phase currents supplied to said stepping motor, said microstep drive information being stored in a plurality of areas of a table which is provided in said memory, the number of said areas corresponding to a denominator which represents designated magnification ratios which are expressed as a fraction; and

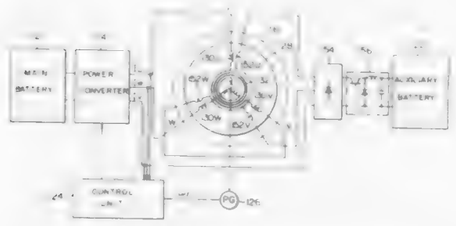
a motor driver for successively reading corresponding items of said microstep drive information from said memory in accordance with a designated magnification ratio.

5,151,641

ELECTRIC AUTOMOBILE DRIVING APPARATUS

Sumikazu Shamoto, Suntou, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 6, 1990, Ser. No. 563,209
Claims priority, application Japan, Aug. 21, 1989, 1-215706
Int. Cl.[5] H02P 3/18
U.S. Cl. 318—762 20 Claims



1. An electric automobile driving apparatus comprising:

a) a main battery for outputting a DC voltage having a predetermined value;

b) an inverter for converting said DC voltage output from said main battery into the same number of alternating currents as a predetermined number of phases;

c) a motor provided with the same number of primary coils as said predetermined number of phases for converting said alternating currents which are output from said inverter into a magnetic field and a secondary coil disposed in close proximity to at least one of said primary coils so that said magnetic field generated by said primary coils induces a secondary voltage in aid secondary coil, the magnetic filed also inducing a torque on a rotor of said motor;

d) a control unit for driving said motor by alternating said alternating currents output from said inverter;

e) an auxiliary battery for supplying an auxiliary voltage to electric appliances installed in an electric automobile; and

f) a rectifier for converting said secondary voltage into a DC voltage having a predetermined value as a charging voltage, and charging said auxiliary battery with, and driving said electrical appliances by, said charging voltage.

5,151,642

APPARATUS FOR CONTROLLING AN ELECTRIC MOTOR

Steven A. Lombardi, Waukesha, and Richard D. Marasch, Germantown, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed May 3, 1990, Ser. No. 518,352
Int. Cl.[5] H02P 1/28
U.S. Cl. 318—779 17 Claims

1. An apparatus for controlling the application of electricity to an alternating current electric motor comprising:

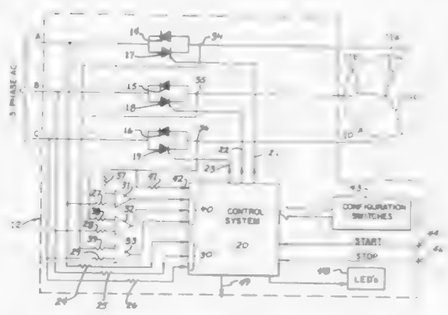
a switch means coupling the electric motor to a source of alternating electricity and being of a type which is conductive from the moment of application of a trigger pulse until the magnitude of alternating current therethrough goes to zero;

means for detecting a periodically occurring condition of the alternating electricity from the source, and producing a control signal indicating an occurrence of the condition;

means for producing a clock signal having a frequency which varies at different rates to alter the amount of electricity applied by said switch means to the motor;

a means for generating a count of cycles of the clock signal and producing a trigger pulse when the count reaches a first predefined number, said means for generating being coupled to said means for detecting to set the count to a second predefined number in response to the control signal; and

means for applying the trigger pulse to said switch means.

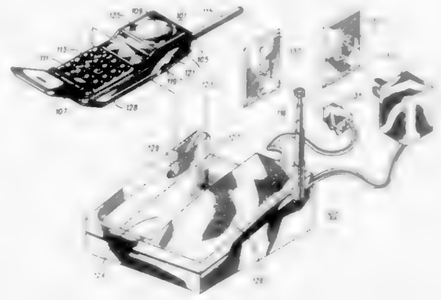


5,151,643

INTEGRAL HANG-UP AND BATTERY CHARGING APPARATUS

Steven C. Emmert, Arlington Heights; Carlson, Kenneth W., Hawthorn Woods; Louis J. Lundell, Buffalo Grove; Nicholas Mischenko, Mt. Prospect; Terrance N. Taylor, Barrington, and Albert L. Nagele, Wilmette, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1991, Ser. No. 664,145
Int. Cl.[5] H01M 10/16
U.S. Cl. 320—2 32 Claims



1. A base unit for charging a rechargeable electrical energy storage medium, the base unit comprising:

a housing enclosing an electrical energy supply;

a first side of the housing having an indentation disposed therein, said indentation having at least a first surface and a second surface, whereby the rechargeable electrical energy storage medium may be removably placed at least partially within said indentation;

first and second conductive protrusions disposed on said first and second surfaces, respectively;

means for coupling said electrical energy supply to said first and second conductive protrusions, whereby the rechargeable electrical energy storage medium may be charged by said electrical energy supply; and

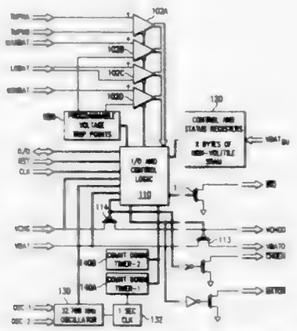
means for retracting said first and second conductive protrusions at least partially within said first surface and said second surface, respectively, of said indentation.

5,151,644

BATTERY MANAGEMENT CHIP WITH CRYSTAL-CONTROLLED TIME BASE

Ronald W. Pearson, Denton, and Brian W. Jones, Garland, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 21, 1990, Ser. No. 632,378
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—14 **3 Claims**



1. A battery management integrated circuit, comprising:
connections for ground, for a source of current, for an electrical load, for a high-Q crystal, and for a hot terminal of a rechargeable battery;
a first switch configured to selectively connect the source of current to the hot terminal;
a second switch configured to selectively connect the hot terminal to the electrical load;
a plurality of comparators, including at least one comparator connected to detect when the voltage of the hot terminal becomes smaller than a predetermined first voltage;
control logic, with inputs connected to outputs of said comparators, and configured to turn on said first switch when said rechargeable battery needs to be charged, and to turn on said second switch when said electrical load can be powered from said rechargeable battery;
memory space including control registers accessible to said control logic, said control logic being configured to operate in response to the contents of said control registers, and also including timekeeping registers;
a crystal-controlled oscillator connected to generate digital signals at regular time intervals;
wherein the output of said crystal-controlled oscillator is connected to said control logic, and said control logic updates said timekeeping registers with reference thereto.

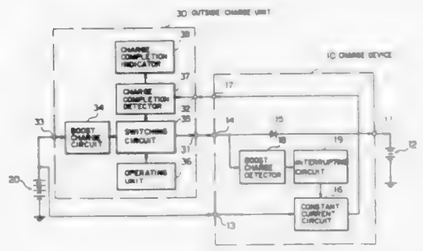
5,151,645

CHARGE DEVICE CAPABLE OF LENGTHENING A LIFETIME OF A STORAGE CELL

Yukio Murata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,656
Claims priority, application Japan, Jan. 23, 1990, 2-12845
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—23 **3 Claims**

1. A charge device comprising:
a storage cell terminal to be connected to a storage cell to be charged; a trickle charge terminal for receiving a trickle charge voltage;
a boost charge terminal connected to said storage cell terminal for receiving a boost charge voltage;
a constant current circuit connected between said storage cell terminal and said trickle charge terminal for causing a constant current to flow from said trickle charge terminal to said storage cell terminal;
boost charge detector means connected to said boost charge terminal for detecting said boost charge voltage to produce a boost charge signal when said boost charge terminal is supplied with said boost charge voltage; and



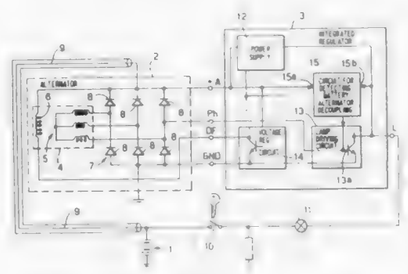
interrupting means connected to said boost charge detector means and said constant current circuit for interrupting said constant current when said boost charge detector means produces said boost charge signal.

5,151,646

BATTERY-RECHARGING SYSTEM FOR A MOTOR VEHICLE

Roberto Vercesi, and Roberto Bettini, both of Turin, Italy, assignors to Marelli Autronica SpA, Milan, Italy

Filed Mar. 22, 1991, Ser. No. 673,558
Claims priority, application Italy, Mar. 22, 1990, 67210 A/90
Int. Cl.[5] H02J 7/04
U.S. Cl. 322—28 **4 Claims**



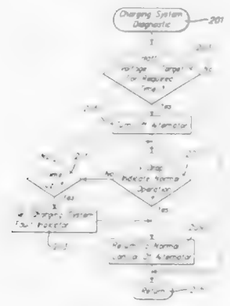
1. A battery-recharging system for a motor-vehicle, including,
a generator comprising an alternator with a polyphase armature winding, a field winding and a polyphase rectifier whose output is connected to a terminal of a battery by a conductor;
a switch connected to said terminal of the battery;
an indicator lamp connected with the switch; and
a control and regulator circuit for regulating a voltage output by the generator and for controlling operation of the indicator lamp;
the control and regulator circuit including:
a voltage regulating circuit having an input coupled to the output of said rectifier through a first terminal of said control and regulator circuit, and an output coupled to the field winding through a second terminal of the control and regulator circuit;
a lamp driving circuit, independent of said voltage regulating circuit and having an input coupled to one phase of the armature winding of the generator through a third terminal of said control and regulator circuit, and one phase of said rectifier and
a voltage monitoring circuit having a first input coupled to said first terminal of the control and regulator circuit, and a second, separate, input coupled to the battery through the switch and the indicator lamp; said voltage monitoring circuit being arranged for switching on the indicator lamp if the potential difference between the first and second inputs thereof is greater than a reference value when the generator is operating.

5,151,647

ENHANCED CHARGING SYSTEM DIAGNOSTIC METHOD

Douglas C. Frantz, Lake Orion, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 15, 1991, Ser. No. 700,748
Int. Cl.[5] H02K 11/00
U.S. Cl. 322—99 **16 Claims**



1. In a charging system for a vehicle having a battery and an alternator for charging the battery, a method for detecting full and partial alternator charging output failure comprising the steps of:
(a) monitoring output voltage of the battery;
(b) monitoring vehicular engine rotational speed;
(c) determining a desired minimum difference between the monitored battery output voltage and a target battery voltage level, the difference being a function of the vehicular engine rotational speed;
(d) turning off the alternator whenever the monitored battery voltage differs from the target voltage by an amount greater than the desired minimum difference;
(e) determining a minimum acceptable battery voltage drop in the absence of alternator charging current, the minimum acceptable battery voltage drop being a function of the vehicular engine rotational speed; and
(f) indicating a charging system fault whenever th minimum acceptable battery voltage drop is not present in the absence of alternator charging current.

5,151,648

SCINTILLATION TUBE DYNAMIC CALIBRATION MONITOR AND FEEDBACK REGULATOR

David E. Sharpe, Chesterfield, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed Jul. 23, 1990, Ser. No. 557,123
Int. Cl.[5] G01J 1/44
U.S. Cl. 323—282 **17 Claims**

1. A scintillation tube dynamic calibration monitor and regulator device comprising:
power out voltage regulator means including output means for providing a drive signal for an external high voltage power supply;
feedback means for dynamically adjusting said power out voltage regulator means, including first input means for receiving a high voltage feedback signal, and coarse calibration adjustment means for setting a calibration reference voltage, said feedback means being electrically connected to said power out voltage regulator means; and

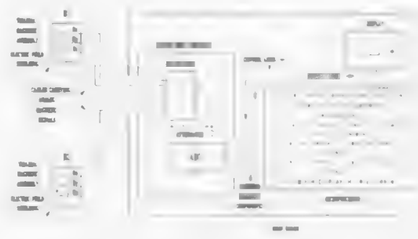
display means electrically connected to said feedback means for visually displaying present calibration status relative to said calibration reference voltage.

5,151,649

PAIR OF ELECTRICALLY SHIELDED TRIAXIAL MAGNETIC SENSORS FOR DETERMINATION OF ELECTRIC CURRENTS IN CONDUCTORS IN AIR WITH DISTANCE AND ANGLE COMPENSATION

Paul Héroux, 921 Jean-Paul Vincent, apt 6, Longueuil, Québec, Canada J4G 1V1

Continuation-in-part of Ser. No. 468,628, Jan. 23, 1990, abandoned. This application Apr. 5, 1991, Ser. No. 680,826
Int. Cl.[5] G01R 19/00, 19/08, 33/022
U.S. Cl. 324—127 **2 Claims**



1. An instrument designed to measure electric current flowing in a linear electrical conductor, the current thereby causing around the conductor a gradient of magnetic flux density, comprising
a) two assemblies of three orthogonal magnetic transducers at a set distance from each other, said two assemblies of three transducers being aligned on an axis normal to the electric conductor carrying the current, each assembly being used for the determination of the local magnetic flux density components x, y, z at two different locations within the instrument, the magnetic flux density components x, y, z at each location being represented by three electrical signals given by the three transducers of the corresponding assembly respectively;
b) means to shield each of said magnetic transducers against electric fields originating from the conductor passing the current to be measured; and
c) means to process said signals, said means including:
precision electronic amplifier circuitry for amplifying each of said six signals;
multiplexer-Analog-to-Digital-Converter combination for digitizing each of the amplified signals; and
a microprocessor, for finding the root-means-square value of each of said six signals, generating from the root-means-square values the vectorial sum of the components x, y, z at each assembly location to determine the amplitude value of the magnetic flux density vector at

each said assembly location, processing the amplitude values of said magnetic flux density vectors determined at said assembly locations into an electric current value using the equation

$$I = \frac{kB_1}{20\left(\frac{B_1}{B_2} - 1\right)}$$

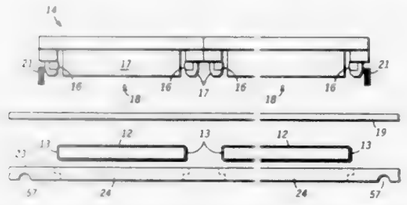
wherein B_1 represents the magnetic flux density vector at one of said assembly locations, B_2 represents the magnetic flux density vector at the other of said assembly locations and k is the distance between said assembly locations, and displaying said current value.

5,151,650

PACKAGED SEMICONDUCTOR DEVICE HANDLER

Milo W. Frisbie; Larry A. Nickerson, and Mavin C. Swapp, all of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1991, Ser. No. 753,455
Int. Cl.[5] G01R *31/28*; B07C *5/344*
U.S. Cl. 324—158 F **17 Claims**



14. A method for testing a number of semiconductor devices having a plurality of leads extending therefrom, the method comprising:

providing a test head having a plurality of contacts extending therefrom and said test head having a number of test pockets for holding the packaged semiconductor devices during testing;

providing a first boat having the same number of compartments as the number of semiconductor devices;

providing a boat travel path having an input staging section, a testing section which is adjacent to the test head, and an output staging section;

placing the number of semiconductor devices in the first boat;

positioning the first boat in the input staging section;

providing a first transport means moving between the input staging section and the testing section;

attaching the first boat to the first transport means;

indexing the first boat from the input staging section to the testing section;

coupling the plurality of contacts to the plurality of leads;

testing the semiconductor devices in the first boat

positioning a second boat in the input staging section;

returning the first transport means to the input staging section;

attaching the second boat to the first transport means;

providing a second transport means moving between the testing section and the output staging section;

attaching the first boat to the second transport means; and

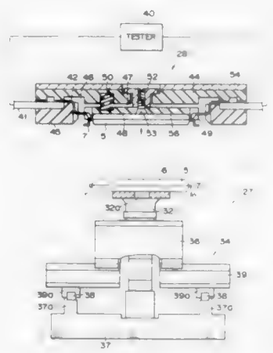
simultaneously indexing the first boat to the output staging section and the second boat to the testing section.

5,151,651

APPARATUS FOR TESTING IC ELEMENTS

Junichirou Shibata, Urawa, Japan, assignor to Tokyo Electron Limited, Tokyo and Tokyo Electron Yamanashi Limited, Nirasaki, both of, Japan

Filed Jul. 11, 1991, Ser. No. 728,275
Claims priority, application Japan, Aug. 16, 1990, 2-216188
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 P **29 Claims**



1. An apparatus for testing IC elements each having a mold and leads, comprising:

holding means for holding an IC element;

contact section having probes to be contacted with leads of said IC element and supporting means for supporting said probes;

contact means for moving at least one of said holding means and said contact section to cause them to approach each other and contacting said leads of said IC element to said probes; and

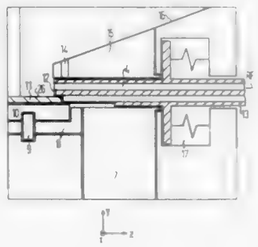
a mold guide provided adjacent said supporting means and movable toward said supporting means, said mold guide comprising an edge portion formed with grooves for receiving said probes and aligning means for aligning said IC element with said mold guide when said leads are contacted with said probes.

5,151,652

MEASURING POSITION FOR MICROWAVE COMPONENTS

Hugo Moschuering, Hoehenkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 589,214
Claims priority, application European Pat. Off., Sep. 29, 1989, 89118084
Int. Cl.[5] G01R *1/02*
U.S. Cl. 324—158 P **13 Claims**



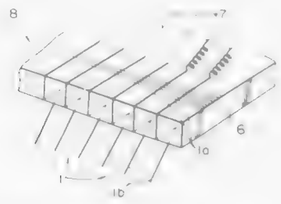
1. Measuring position for a microwave component, having a carrier for the microwave component and at least one test probe, comprising spatial positions of the at least one test probe being variable and adjustable in three spatial dimensions relative to a spatial position of the carrier, at least the one test probe being variable and adjustable in three spatial dimensions, and the at least one test probe having a structure for exerting mechanical pressure onto the microwave component such that a nose of the at least one test probe substantially contacts the microwave component.

5,151,653

INSPECTION PROBE HAVING THIN METAL WIRES WITH SELF RESILIENCY

Toshiaki Yutori, Takasago, and Yutaka Kanetsuki, Akashi, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 8, 1991, Ser. No. 666,806
Claims priority, application Japan, Mar. 8, 1990, 2-57445
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 P **4 Claims**



1. An inspection probe comprising:

a base; and

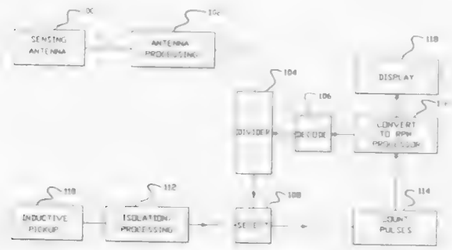
a plurality of thin metal wires having mounting portions mounted to said base, each of said wires having a diameter of no more than 120 μm, being formed from a low carbon two-phase structure steel having a tensile strength of 300 kg/mm^2 and being plated with a noble metal layer, each of said wires further having a contacting portion shaped to have self resiliency and being oriented such that said contacting portion may freely bend in a direction perpendicular to the axis of the contacting portion.

5,151,654

TACHOMETER SYSTEM FOR MEASURING THE RPM OF AN INTERNAL COMBUSTION ENGINE WITH NO PHYSICAL OR VISUAL CONNECTION

Stanley J. Krzywicki, Olney; Timothy S. Gibson, Columbia, and Joseph D. Orndorff, Baltimore, all of Md., assignors to Systems Control, Inc., Sunnyvale, Calif.

Filed Jul. 6, 1988, Ser. No. 215,642
Int. Cl.[5] G01P *3/42, 3/48, 3/54*
U.S. Cl. 324—160 **7 Claims**



1. A tachometer system for an internal combustion engine, comprising:

electromagnetic pulse sensing means, coupled in a non-contact manner to an operative area of said internal combustion engine, for sensing an electromagnetic signal produced by a firing of said engine, and producing an output signal indicative thereof;

means for sensing a parameter indicative of pulse timing in said output signal;

means for converting said parameter into a value indicative of revolutions of said internal combustion engine per unit time; and

said sensing means comprising:

means for receiving said output signal from said electromagnetic pulse sensing means;

means for detecting a pulse in said output signal;

means for counting an elapsed time;

means for selectively enabling and disabling said counting means;

means for selectively providing an accumulated count of said counting means to an external port; and

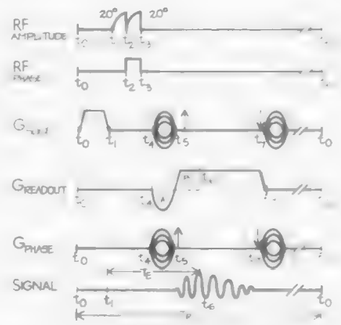
control means, connected to said receiving means, said detecting means, said counting means, said providing means and said selecting means, for initiating a sequence upon detecting a pulse by said detecting means, by, in order: 1) disabling said counting of said counting means, 2) commanding said providing means to provide said accumulated count, 3) resetting said counting means, and finally 4) enabling said counting means.

5,151,655

MAGNETIC RESONANCE IMAGING USING A BACK-TO-BACK PULSE SEQUENCE

Steven E. Harms, Dallas; Duane P. Flamig, Richardson, and Richard H. Griffey, Dallas, all of Tex., assignors to Baylor Research Institute

Continuation-in-part of Ser. No. 484,119, Feb. 23, 1990. This application Aug. 17, 1990, Ser. No. 569,100
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **27 Claims**



1. For a three dimensional object comprised of at least two components and having an x-axis, a y-axis and a z-axis, a method of producing a selective component suppressed MR image of the internal structure of said object comprising the steps of:

generating a uniform magnetic field to magnetize said object;

generating a first, second, and third changing magnetic fields along said x-axis, y-axis, and z-axis, respectively;

generating a series of back-to-back selective component suppressive RF pulses to produce transverse magnetization in said components of said object other than said component to be suppressed;

receiving a series of gradient echoes in response to said

generated series of back-to-back selective component suppressive RF pulses; and

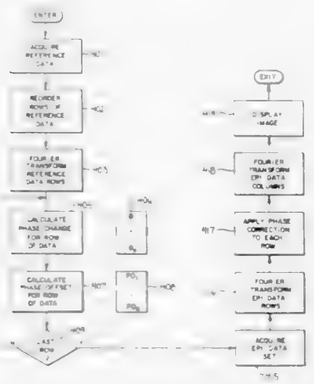
producing an image of said object in which said selected component is suppressed.

5,151,656

CORRECTION OF NMR DATA ACQUIRED BY AN ECHO-PLANAR TECHNIQUE

Joseph K. Maier, Milwaukee; Robert M. Vavrek, Waukesha, both of Wis., and Gary H. Glover, Menlo Park, Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 11, 1990, Ser. No. 625,733
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**



1. A method for correcting phase errors produced by an NMR system during the acquisition of an NMR image data array using an echo-planar pulse sequence, the steps comprising:

a) acquiring the NMR image data array with the NMR system using an echo-planar pulse sequence which applies a different phase encoding magnetic filed gradient for each row of acquired NMR image data in the array;

b) acquiring an array of complex NMR reference data with the NMR system using the same echo-planar pulse sequence, but with the phase encoding magnetic field gradient set to substantially zero during the acquisition of the entire array of complex NMR reference data;

c) Fourier transforming each row of the array of complex NMR reference data to produce an array of complex transformed reference data;

d) calculating a set of phase errors by determining the relative phase of data in each row of the array of complex transformed reference data;

e) Fourier transforming each row of the array of complex NMR image data to produce an array of complex transformed NMR image data;

f) correcting the complex transformed NMR image data by altering the phase of complex values therein as a function of the set of calculated phase errors;

g) Fourier transforming each column of the array of corrected, complex, transformed NMR image data to produce an array of display data; and

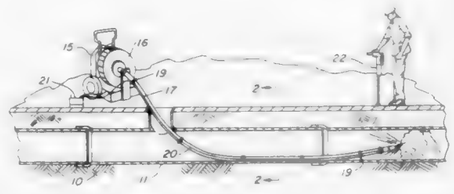
H) displaying the array of display data to produce an image.

5,151,657

UNDERGROUND PIPE LOCATING APPARATUS

Michael D. Tashjian, 604 Bryant La., Hatboro, Pa. 19040

Continuation-in-part of Ser. No. 356,793, May 24, 1989, abandoned. This application Nov. 23, 1990, Ser. No. 617,258
Int. Cl.[5] G01V *3/30*
U.S. Cl. 324—326 **5 Claims**



1. In an underground locating apparatus for use with devices to be inserted into underground pipes or conduits, which devices include a head, and a member for insertion into the pipe, the improvement which comprises

a signal transmitter,

at least one antenna wire connected to said signal transmitter and to said member to cause emission of a signal along its length,

a signal detector which detects the emitted signal and provides its depth and location, and

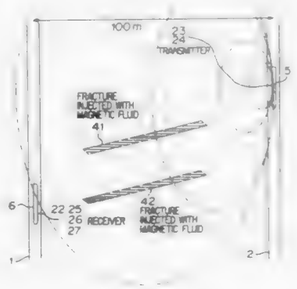
fluid means originating above ground and directed under pressure along said member for pulling said member forward into the pipe.

5,151,658

THREE-DIMENSIONAL DETECTION SYSTEM FOR DETECTING FRACTURES AND THEIR DISTRIBUTIONS IN THE EARTH CRUST UTILIZING AN ARTIFICIAL MAGNETIC FIELD AND MAGNETIC PARTICLE TRACER

Shigeki Muramatsu; Shinji Takasugi, and Kazumi Osato, all of Tokyo, Japan, assignors to Chinetsu Gijutsu Kaihatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,178
Int. Cl.[5] G01V *3/26, 3/40;* **E21B** *47/10*
U.S. Cl. 324—346 **9 Claims**



1. A three-dimensional detection system for detecting fractures and their distributions in the earth crust utilizing an artificial magnetic field which comprises:

a magnetic particle tracer being injected into the fractures of the earth crust, having high magnetic permeability and specific weight nearly equal to that of a fluid substance existing in the fractures; and

inner borehole magnetic field detecting devices being hung in a plurality of boreholes which are dug in the earth crust and having transmitters for transmitting said artificial magnetic field and/or receivers for receiving said artificial magnetic field, said transmitters and receivers operating at a predetermined frequency;

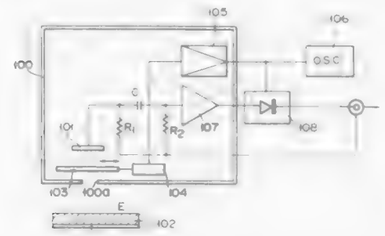
wherein said magnetic field detecting devices detect distortions in terrestrial magnetic force lines caused by said fractures being filled with said injected magnetic particle tracer.

5,151,659

SURFACE POTENTIAL MEASURING SYSTEM

Kuniyoshi Tanaka, Yokohama; Shunji Shirouzu, Ayase; Minoru Ohta, Tokyo, and Hideo Miyagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1990, Ser. No. 515,419
Claims priority, application Japan, Apr. 28, 1989, 1-111616; Jun. 30, 1989, 1-166985
Int. Cl.[5] G01R *29/12*
U.S. Cl. 324—458 **56 Claims**



1. A system for measuring a surface potential of a sample, comprising:

probe means, having a distal end located near a measurement surface of the sample with a gap therebetween and having a vibrating center, for probing the surface potential;

vibrating means for vibrating said probe means with respect to the vibrating center to change the gap between the distal end and the measurement surface;

detecting means for detecting a change in potential of the distal end of said probe means and converting the change into a measurement signal corresponding to the surface potential of the sample; and

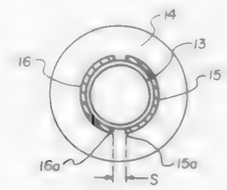
means for controlling said vibrating means to maintain a constant distance between the vibrating center and the measurement surface.

5,151,660

CERAMIC CAPACITANCE HIGH PRESSURE FLUID SENSOR

Kelly R. Powers, 6732 South 2485 East, Salt Lake City, Utah 84131; Tony G. Curtis, 253 East Whitlock Ave., Salt Lake City, Utah 84115; Santosh Y. Limaye, 1440 Sandpipe Cir. #38, Salt Lake City, Utah 84117, and Robert D. Roy, 715 East 4th Ave., Salt Lake City, Utah 84103

Filed Sep. 5, 1990, Ser. No. 577,862
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—689 **5 Claims**



1. An integral ceramic capacitive device for measuring changes in capacitance of a fluid flowing therethrough comprising:

a pair of opposed inner walls, said walls positioned and structured to have a fluid-containing channel therebetween, each of said walls comprising a thin layer of ceramic which is an electrical insulator and which is corrosion and erosion resistant and has a very low coefficient of thermal expansion;

an outer wall of ceramic which is an electrical insulator and which is sufficiently thick to provide structural strength for said device, said outer wall having a composition and coefficient of thermal expansion substantially similar to said inner wall;

a pair of thin, substantially continuous, electronically conductive films sandwiched between and adherent to said inner and outer walls of ceramic, said films each being of substantially the same size and shape and substantially opposed to one another and electrically isolated from one another;

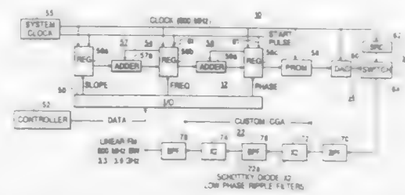
said conductive films each having an electrical conductor attached thereto which extends to an external surface of said outer wall.

5,151,661

DIRECT DIGITAL FM WAVEFORM GENERATOR FOR RADAR SYSTEMS

Stephen P. Caldwell, and Thomas D. Merrell, Jr., both of Columbia, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1991, Ser. No. 749,790
Int. Cl.[5] H03B *19/00;* **H03D** *13/00*
U.S. Cl. 328—14 **10 Claims**



1. A linear FM waveform generator employing direct digital synthesis, said generator comprising:

clock means for generating system clock signals at a predetermined frequency;

means driven by said system clock signals for generating a linear digital FM signal;

means clocked by said clock means for converting said linear digital FM signal to a linear analog FM waveform;

sampler means clocked by said clock means for sampling said linear analog FM waveform to generate a sampler linear analog FM waveform that can be directly employed for generation of an output linear FM waveform;

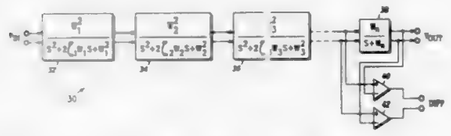
means for filtering said sampler linear analog FM waveform; and

means for multiplying said filtered sampler linear analog FM waveform to generate an output linear FM waveform,

wherein said linear digital FM signal generating means includes a first register generating a constant value representing the slope of the linear FM waveform, a first integration stage having a second register and a first adder coupled to the output of said first register, said second register generating a digital output representing frequency as a function of time, a second integration stage having a third register and a second adder coupled to the output of said second register, said third register generating a digital output representing phase as a function of the square of time, and means for generating in response to the digital output from said third register a digital signal representing

amplitude as a function of time and corresponding to said linear digital FM waveform that is coupled to said converting means for conversion to an analog waveform.

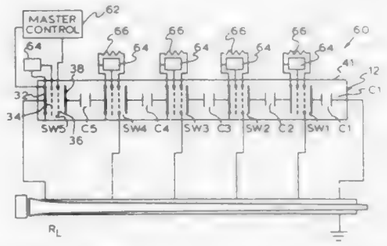
5,151,662
CIRCUIT AND METHOD OF SIGNAL DIFFERENTIATION
John E. Hanna, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 24, 1991, Ser. No. 720,069
Int. Cl.[5] H02J *7/00*; **G06G** *7/12*
U.S. Cl. 328—127 **11 Claims**



1. A circuit for differentiating a differential input signal having first and second components comprising:
first means for filtering the differential input signal and providing a filtered differential output signal having first and second components, said first means including a first filter having an input coupled for receiving the differential input signal and having an output for providing said filtered differential output signal; and
second means for subtracting said filtered differential output signal of said first means applied at a first input from the differential input signal applied at a second input for providing a differentiated differential output signal at an output having first and second components, said second means including,
(a) a first differential amplifier having first and second inputs and an output, said first input receiving said first component of the differential input signal, said second input receiving said first component of said filtered differential output signal from said first filter, said output providing said first component of said differentiated differential output signal, and
(b) a second differential amplifier having first and second inputs and an output, said first input receiving said second component of the differential input signal, said second input receiving said second component of said filtered differential output signal from said first filter, said output providing said second component of said differentiated differential output signal.

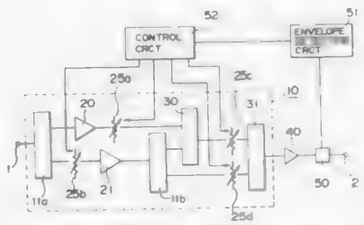
5,151,663
PLASMA SWITCH DEVICES
Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Division of Ser. No. 454,675, Dec. 2[illegible], 1989, Pat. No. 5,008,798. This application Feb. 21, 19[illegible]1, Ser. No. 644,781
Int. Cl.[5] H03F *21/00*; **H01J** *7/24*
U.S. Cl. 330—41 **5 Claims**

1. A current amplifier comprising:
a cold-cathode grid-controlled, crossed field plasma switch having a cathode, an anode and a control grid therebetween;
means for providing an input current between said cathode and said control grid; and



means for providing a loop for current to flow from said control grid to said anode, the current being proportional to said input current.

5,151,664
LOW-DISTORTION RADIO-FREQUENCY AMPLIFYING APPARATUS
Noriharu Suematsu; Tadashi Takagi, and Shuji Urasaki, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 26, 1990, Ser. No. 633,950
Claims priority, application Japan, Dec. 27, 1989, 1-341052
Int. Cl.[5] H03F *1/26*
U.S. Cl. 330—149 **7 Claims**

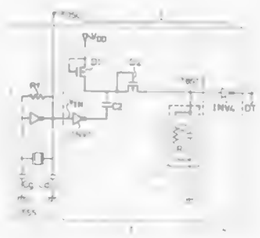


1. A distortion compensating circuit for a radio frequency amplifier, comprising:
distortion compensating means coupled to an input of said radio frequency amplifier;
control circuit means responsive to a signal indicative of the distortion generated due to the non-linearity of the input and output characteristics of the radio frequency amplifier and generating at least one control signal for controlling the distortion compensating means,
said distortion compensating means further comprising: first divider means for dividing the input signal of the low-distortion radio-frequency amplifying apparatus into two output signals;
distortion generating amplifier means, coupled to said first divider means, for amplifying a first output signal of said two output signals and for adding a distortion component thereto to output an amplified first output signal;
linear amplifier means, coupled to said first divider means, receiving a second output signal of said two output signals via a first variable attenuator, for amplifying said second output signal of said two output signals without distortion to output an amplified second output signal;
second divider means coupled to said linear amplifier means, for dividing said amplified second output signal into first and second divided signals;
distortion extraction combiner means, receiving said amplified first output signal of said distortion generating amplifier means via a second variable attenuator and said first divided signal output of said second divider means, for combining said amplified first output signal and said first divided signal in opposite phases to output a distortion signal;
combiner means, receiving said distortion signal via a third variable attenuator and said second divided signal of said second divider via a fourth variable attenuator; and
combiner means for combining said distortion signal and said second divided signal in opposite phases to output a combined signal including a distortion compensating component which cancels the distortion generated in the radio-frequency amplifier,
said control means adjusting an amount of attenuation of each of said variable attenuators in accordance with the said signal indicative of the distortion.

5,151,665
PHASE-LOCK-LOOP SYSTEM WITH VARIABLE BANDWIDTH AND CHARGE PUMP PARAMETERS
David D. Wentzler, North Richland Hills, Tex., assignor to Uniden America Corporation, Fort Worth, Tex.
Filed Feb. 7, 1991, Ser. No. 652,182
Int. Cl.[5] H03L *7/093*
U.S. Cl. 331—8 **13 Claims**

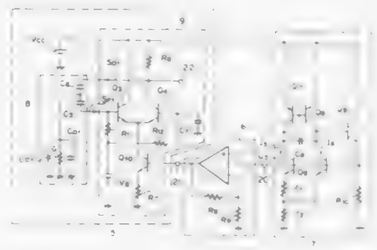
1. A frequency synthesizer including an input reference signal source of providing an input reference signal, a phase detector coupled to the input reference signal source for providing a phase error signal, a phase lock loop filter coupled to the phase detector for providing a steering signal, and a voltage controlled oscillator coupled to the phase lock loop filter and having an output signal coupled as a feedback signal to the phase detector, said phase lock loop filter, comprising:
a charge pump coupled to receive the phase error signal for providing a phase lock signal to a charge pump output node in response to the phase error signal, said phase lock signal being variable in response to a charge pump control signal; and
a filter coupled to the charge pump output node for filtering the phase lock signal at a given bandwidth, said bandwidth being variable in response to a filter control signal which is operated independently of the charge pump control signal.

5,151,666
OSCILLATION STOPPAGE DETECTION CIRCUIT
Akio Tamagawa, Tokyo, Japan, assignor to NEC Corpoation, Tokyo, Japan
Filed Jan. 30, 1992, Ser. No. 827,977
Claims priority, application Japan, Jan. 30, 1991, 3-9872
Int. Cl.[5] H03B *1/00*
U.S. Cl. 331—64 **8 Claims**



1. An oscillation stoppage detection circuit for use in an integrated circuit having an oscillation circuit, said detection circuit comprising:
a boost circuit which receives at its input node an output of said oscillation circuit and which includes a first diode having its anode connected to a power source terminal, a second diode having its cathode connected to an output node for outputting an output voltage of said boost circuit, a capacitor having one end connected to a common junction node between said first and second diodes, an inverter having its output terminal connected to the other end of said capacitor and its input terminal connected to said input node of said boost circuit, and a smoothing circuit connected between the output node of said boost circuit and a ground; and
a level detection circuit which is connected to said output node of said boost circuit and which detects said output voltage of said boost circuit thereby to detect an oscillation stoppage at said oscillation circuit when said output voltage of said boost circuit becomes lower than a predetermined detection level.

5,151,667
TEMPERATURE COMPENSATED OSCILLATION CIRCUIT
Kazunori Nishijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed May 17, 1991, Ser. No. 701,912
Claims priority, application Japan, May 17, 1990, 2-128055
Int. Cl.[5] H03B *5/04, 5/12*; **H03L** *1/02*
U.S. Cl. 331—117 R **5 Claims**



1. An oscillation circuit comprising:
an oscillator which has a differential amplifier including a constant current source having a resistor and a transistor whose emitter is grounded through said resistor, and a

feedback circuit through which an output of said differential amplifier is positively fed back to an input of the same differential amplifier;

a band-gap regulator which includes a pair of first and second transistors whose emitter areas are different from each other and which is for producing a band-gap voltage proportional to a thermal voltage of said pair of transistors; and

an operational amplifier for DC-amplifying said band-gap voltage and supplying the amplified band-gap voltage to the base of said transistor forming said constant current source.

5,151,668

FM MODULATOR FOR COMPENSATING MODULATION CHARACTERISTICS ON EACH CHANNEL

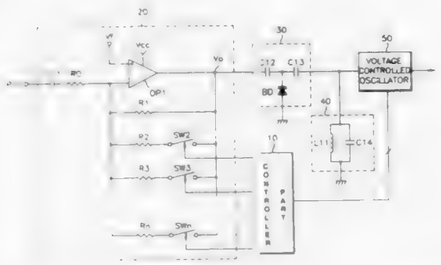
Jong-Hae Kim, Suwon, Rep. of Korea, assignor to Samsung electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 5, 1991, Ser. No. 788,290

Claims priority, application Rep. of Korea, May 23, 1991, 1991-8358

Int. Cl.[5] H03C *3/08*

U.S. Cl. 332—124 **4 Claims**



1. A frequency-modulation modulator for compensating for modulation characteristics to be suitable for each engaged channel in a cellular wireless telephone, said frequency-modulation modulator comprising:

control means for providing data to assign the channel by sensing a transmitting/receiving channel, and for generating switch control signals corresponding to said channels;

frequency compensation means for compensating for frequency characteristics of said respective channels by regulating gain of an input channel in response to said switch control signal from said control means;

a capacitance conversion means for converting into capacitance value a given voltage value from said frequency compensation means;

a resonator for generating a given resonance frequency according to said capacitance value of said capacitance conversion means; and

a voltage controlled oscillator for generating an oscillation frequency, to thereby perform the frequency modulation according to said resonance frequency.

5,151,669

DUAL-GATE FET ATTENUATOR CONTROLLED BY A VARIABLE LOAD CIRCUIT

Daniel Roques; Michel Pouysegur, and Jean-Louis Cazaux, all of Toulouse, France, assignors to Alcatel Espace, France

Filed Sep. 21, 1990, Ser. No. 586,113

Claims priority, application France, Sep. 26, 1989, 89 12587

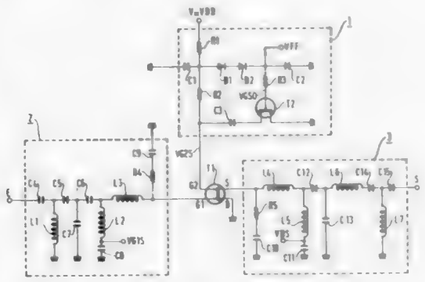
Int. Cl.[5] H03H *11/24*

U.S. Cl. 333—81 R **5 Claims**

1. A dual-gate field effect transistor (FET) attenuator, comprising:

a dual-gate FET having first and second gates and having a source and drain; and

a variable load comprising a single-gate FET having a gate, source, and drain, and a source-drain current path coupled



between the second gate of the dual gate FET and a reference potential; and

bias means coupled to said gate of said single-gate FET for applying a substantially zero drain-source bias voltage to said single-gate FET.

5,151,670

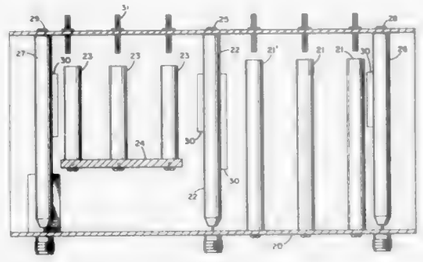
DUPLEXING FILTER

William D. Blair, Lanoka Harbor, and Salvatore Bentivenga, Manalapan, both of N.J., assignors to Radio Frequency Systems, Inc., Marlboro, N.J.

Filed Apr. 10, 1991, Ser. No. 686,325

Int. Cl.[5] H01P *1/205, 5/12*

U.S. Cl. 333—126 **7 Claims**



1. A duplexing filter comprising:

a) a housing;

b) a common coupling line electrically connected to the housing at one end of the coupling line;

c) a plurality of first resonators operating about a first predetermined frequency mounted within the housing and coupled to said common coupling line via one of said first resonators;

d) a plate mounted within the housing and electrically connected thereto;

e) a plurality of second resonators operating about a second predetermined higher frequency than the first predetermined frequency, said second resonators each having a first end mounted to the plate so that the plate forms a base upon which the resonators are mounted, wherein said plate is positioned within the housing so that one of the second resonators is electrically connected to the plate at said first end at a position from the one end of the common coupling line approximately one-quarter the wavelength of the second predetermined frequency so as to facilitate coupling of the second resonators to the common coupling line;

f) means for coupling electromagnetic energy to the plurality of first resonators; and

g) means for coupling electromagnetic energy to the plurality of second resonators.

5,151,671

CIRCUIT BREAKER

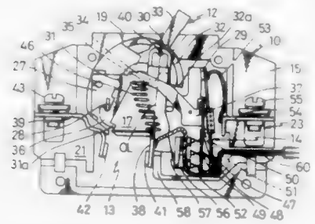
Akihiko Hirao; Tomoyuki Sawada; Shinji Takayama; Youichi Aoyama; Yukihiro Matsuoka, and Tatsuo Hiroshima, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 21, 1991, Ser. No. 658,506

Claims priority, application Japan, Feb. 23, 1990, 2-43382; Apr. 24, 1990, 2-112443; May 22, 1990, 2-133533

Int. Cl.[5] H01H *9/00*

U.S. Cl. 335—172 **11 Claims**



1. A circuit breaker comprising:

a handle having a coupling part;

a movable contact arm rotatably supported by said coupling part of said handle and having a first spring bearing part and a movable contact;

a fixed contact with respect to which said movable contact is engageable and disengageable;

a cradle having a second spring bearing part and a first locking part;

an abnormal current detecting means having a second locking part for releasably locking said first locking part of said cradle; and

a turning spring comprising a compression spring compressed between said first and second spring bearing parts for pressing said movable and fixed contacts against one another when said first locking part of said cradle is locked to said second locking part of said abnormal current detecting means and for turning to rotate said movable contact arm and cradle in a direction disengaging said movable contact from said fixed contact when said first locking part of said cradle is released from said second locking part of said abnormal current detecting means.

5,151,672

TRAP CIRCUIT COMPRISING PLURAL PIEZOELECTRIC RESONATORS INTERCONNECTED BY PLURAL RESISTORS AND AN INDUCTOR

Kazuyuki Noto, Kurobe, and Isao Toyoshima, Ishikawa, both of Japan, assignors to Murata Manufacturing Co., Nagaokakyo, Japan

Filed Dec. 13, 1990, Ser. No. 627,025

Claims priority, application Japan, Dec. 14, 1989, 1-325383

Int. Cl.[5] H03H *9/58*

U.S. Cl. 333—189 **3 Claims**

1. A trap circuit for eliminating unwanted signals with specific frequencies from an incoming signal, said trap circuit comprising:

an input end through which said incoming signal is received;

an output end;

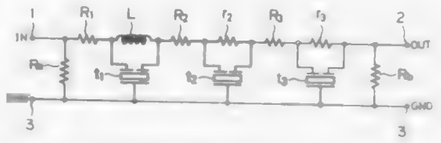
a plurality of three-terminal piezoelectric ceramic resonators each having an input terminal, an output terminal and a grounded common terminal, each of said resonators having a different resonance frequency, the input and output terminals of said resonators being coupled in cascade between said input and output ends;

an input-end parallel resistor connecting said input end with said grounded common terminals;

an input-end series resistor connecting said input end with the input terminal of one of said resonators;

an output-end parallel resistor connecting said output end with said grounded common terminals;

one or more inter-resonator resistors;



one or more inter-terminal resistors; and

an inductor;

one of said plurality of resonators having a lowest resonance frequency and having said inductor connected between its input and output terminals, the rest of said resonators each having one of said inter-terminal resistors connected between its input and output terminals, the input and output terminals of each mutually adjacent pair of said resonators being connected by one of said inter-resonator resistors.

5,151,673

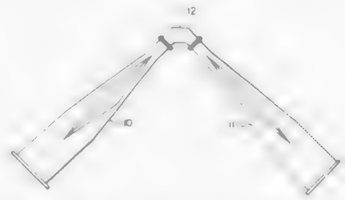
COMPACT BEND FOR TE_{01} MODE CIRCULAR OVERMODED WAVEGUIDE

Jeffery W. Waarren, Ellicott City, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 29, 1991, Ser. No. 736,846

Int. Cl.[5] H01P *1/02*

U.S. Cl. 333—249 **5 Claims**



1. A compact bend structure for use with TE_{01} mode circular overmoded waveguide, comprising:

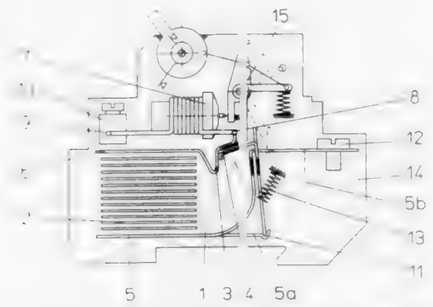
first and second waveguide transition sections, each configured as a circular waveguide at one end for circular TE_{01} mode operation and transitioning into a single rectangular waveguide for rectangular TE_{20} mode operation at its other end, and

a TE_{20} mode rectangular waveguide bend section connecting the said other ends of said first and second waveguide transition sections together at a desired angle relative to one another.

5,151,674
POWER CIRCUIT BREAKER

Peter Flohr, Messkirch, Fed. Rep. of Germany, assignor to Heinrich Kopp GmbH & Co. KG, Kahl, Fed. Rep. of Germany

PCT No. PCT/DE90/00316, § 371 Date Mar. 8, 1991, § 102(e) Date Mar. 8, 1991, PCT Pub. No. WO90/13903, PCT Pub. Date Nov. 15, 1990
PCT Filed May 2, 1990, Ser. No. 646,771
Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3915127
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—16 20 Claims



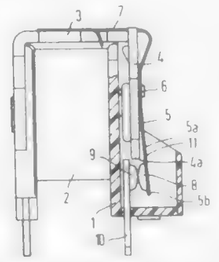
1. A power circuit breaker with one single interruption and electromagnetic, electrothermal and manual trip with contact arrangement disposed in the front of an arc-extinguishing plate stack in an arc chamber, wherein a first and a second arc deflector, delimiting the arc-extinguishing plate stack, as in each case galvanically connected to a connection terminal, and wherein the first arc deflector is formed as a fixed contact, and wherein the second arc deflector serves as a bearing position for a movable contact and is galvanically connected to the movable contact, wherein the movable contact (**4**) is canted and angled at its free end up to a contacting position such that this free end, together with the first arc deflector (**6**), used as a fixed contact (**3**), runs nearly parallel, and wherein the angled free end of the movable contact forms the tangent to a circle, and wherein the center of this circle is disposed in the neighborhood of the bearing position (**11**) of the movable contact (**4**), such that the current forces, occurring in the parallel arms increase the pressure at the bearing position as well as effect a torque in opening direction onto the movable contact.

5,151,675
ELECTROMAGNETIC RELAY WITH A CONTACT SPRING MOUNTED ON AN ARMATURE

Wilfried Biehl, and Bernhard Klemke-Onnibrink, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 718,247
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1990, 901540[U]
Int. Cl.[5] H01H *51/22*
U.S. Cl. 335—78 6 Claims

1. An electromagnetic relay, comprising:
a coil;
stationary contacts mounted in said relay;
an armature mounted for movement at an end of said coil about a pivot edge, said armature having a free edge;
a contact spring of leaf spring material secured to said armature to bias said armature toward a predetermined position, said contact spring having a contact end extending beyond said free edge of said armature, said contact spring being of a reduced width in a region adjacent said free edge of said armature and having a broadened portion extending beyond said free edge to form two transverse legs;
two contact pieces mounted on respective ones of said transverse legs, said contact pieces being movable into contact with said stationary contacts to define a closed position and alternately out of contact with said stationary contacts to define an open position upon movement of said armature by alternate application and discontinuation of electromagnetic forces by said coil; and

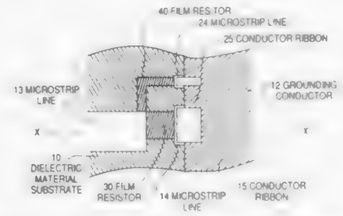


supporting tabs on respective ones of said transverse legs of said contact spring, said supporting tabs extending from said transverse legs for contact with said armature in a region adjacent said free edge upon movement of said armature in a direction to move said contact pieces from said closed position to said open position, said supporting tabs comprising edge sections of said contact spring which are bent toward said armature.

5,151,676
FILM RESISTANCE TERMINATOR

Shouichi Sato, Tagajo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP90/00080, § 371 Date Oct. 2, 1990, § 102(e) Date Oct. 2, 1990, PCT Pub. No. WO90/09040, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 24, 1990, Ser. No. 582,210
Claims priority, application Japan, Feb. 2, 1989, 1-24626; Sep. 19, 1989, 1-242647
Int. Cl.[5] H01C *3/02*
U.S. Cl. 338—61 8 Claims

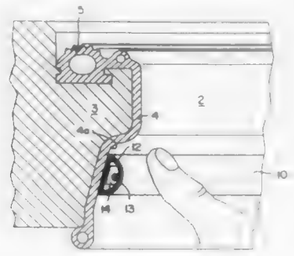


1. A film resistance terminator utilizing film resistors, comprising:
a dielectric material substrate;
a grounding conductor;
a first microstrip line formed on said dielectric material substrate to propagate an input signal;
a first film resistor having an inductive reactance and having a first end connected to an end part of said first microstrip line and a second end connected to said grounding conductor; and
a second film resistor electrically connected in parallel with said first film resistor, and having a capacitive reactance, a combined reactance of said first and second film resistors is lower than the inductive reactance of said first film resistor.

5,151,677
RAPID ORIENTATION APPARATUS FOR AN OBSERVATION AND/OR WEAPON-CARRYING VEHICLE

Pierre Gernet, Eanetbaden; Werner Steinemann, Rumlang, and Paul-Andre Margot, Zurich, all of Switzerland, assignors to Oerlikon-Contraves AG, Zurich, Switzerland

Filed Feb. 4, 1991, Ser. No. 650,286
Claims priority, application Switzerland, Feb. 9, 1990, 00424/90
Int. Cl.[5] H01C *10/10*
U.S. Cl. 338—99 17 Claims



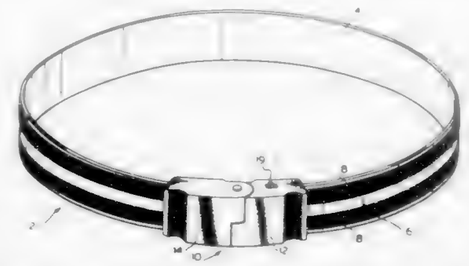
1. A rapid orientation apparatus for an observation and/or weapon-carrying vehicle provided with an observer's post and an observation hatch, comprising:
electric circuit means serving as an angle transmitter;
said electric circuit means containing a contact potentiometer;
said observation hatch defining a rim portion, said contact potentiometer being substantially annularly arranged around the observer's post and extending along said rim portion;
said contact potentiometer comprising:
(i) a arcuate, hose-like insulating envelope defining a radial direction;
(ii) a resistance track;
(iii) a contact track; and
said resistance track and said contact track being disposed within said arcuate, hose-like insulating envelope at a predeterminate spacing from each other as viewed in said radial direction.

5,151,678
SAFETY BELT

Jeffrey A. Veltri, and Joseph M. Souliere, both of P.O. Box 910, Thornhill, Ontario, Canada L3P 4A5

Filed May 4, 1990, Ser. No. 519,127
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—321 9 Claims

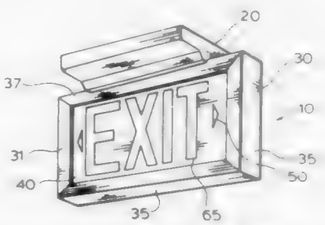
1. A safety belt comprising a flexible support member forming the body of the belt, a continuous electroluminescent flexible strip extending substantially the length of the belt and exposed to one side of the belt, power supply means connected to said electroluminescent flexible strip for exciting the same, and means for securing said belt at various positions wherein said flexible support member has a slotted area in the outer face thereof sized to receive and engage said electroluminescent strip in a manner to expose a light producing portion of said strip within the opening of said slot.



5,151,679
DISPLAY SIGN

Frederick Dimmick, R.R. No. 3, Parry Sound, Ontario, P2A 2W9, Canada, assignor to Frederick Dimmick, Parry Sound, Canada

Continuation of Ser. No. 271,296, Nov. 15, 1988, abandoned. This application Feb. 7, 1992, Ser. No. 831,661
Claims priority, application Canada, Mar. 31, 1988, 563009
Int. Cl.[5] G08B *27/00*; G09F *19/12*
U.S. Cl. 340—326 56 Claims



9. For use as a light source in a sign a light pipe having at least two ends of a suitable material of substantially uniform index of refraction, having a longitudinal axis of extension, and carrying at least one light source being a light emitting diode proximate at least one end wherein the at least one light source is contained in said at least one end, said light source directed towards another end of the light pipe in the direction of the longitudinal axis of extension of the light pipe, a portion of the outer surface of the light pipe being translucent permitting light to exit therefrom, whereby when light is transmitted in the light pipe, the light therefrom emerges through the translucent outer surface of the light pipe.

5,151,680
SPEAKER DRIVER

Koji Yamasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

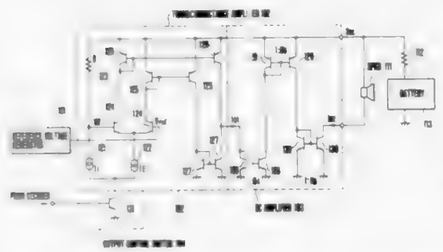
Continuation of Ser. No. 414,644, Sep. 27, 1989, abandoned, which is a continuation of Ser. No. 150,618, Feb. 1, 1988, abandoned. This application Apr. 26, 1991, Ser. No. 692,771
Claims priority, application Japan, Feb. 5, 1987, 62-25210
Int. Cl.[5] H04B *1/16*
U.S. Cl. 340—384 E 19 Claims

1. A speaker driver, operated by a battery, for driving a speaker to generate an alert tone in response to an externally output intermittent signal, said driver comprising:

a reference voltage generator for generating a reference voltage;

a transconductance amplifier for outputting a current corresponding to a differential voltage between a voltage of said battery and the reference voltage;

said transconductance amplifier comprising a series circuit of a resistor connected between said battery and said output control switch and a first constant current source, a differential transistor pair, bases of transistors of which are respectively connected to an output of said reference voltage generator and a point between said resistor and said first constant current source, emitters of both said transistors being connected to said output control switch



through a second constant current source, first and second current mirrors, one transistor of each of which is connected between each transistor of said differential transistor pair and said battery, and a third current mirror consisting of transistors, each of which is series-connected to the other transistor of each of said first and second current mirrors between said battery and ground; and an output from said transconductance amplifier being obtained at a point between said second and third current mirrors;

an output control switch for ON/OFF-controlling the output current from said transconductance amplifier in accordance with the intermittent signal; and

a DC amplifier for amplifying the ON/OFF-controlled output current as a driving current for said speaker.

5,151,681

BRAKE WEAR INDICATING DEVICE

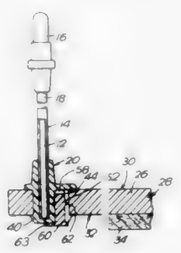
Francis Vaimir, Argenteuil; Yves Mazon, Paris, and Eric Schonenberger, Bois Colombes, all of France, assignors to General Motors France, Gennevilliers, France

Continuation of Ser. No. 549,305, Jul. 9, 1990, abandoned. This application Oct. 8, 1991 Ser. No. 772,633

Claims priority, application United Kingdom, Aug. 25, 1989, 8919343

Int. Cl.[5] B60T 17/22

U.S. Cl. 340—454 **11 Claims**



1. A brake wear indicating device comprising an insulated electrical conductor; connecting means electrically connected to one end of the electrical conductor for electrical connection with a warning device; and an end cap of electrically insulating material on the other end of the electrical conductor for securing the brake wear indicating device in an aperture in a backing plate of a brake pad or brake shoe with said other end of the electrical conductor passing through the aperture in the backing plate from an outer surface thereof to protrude from an inner surface thereof, and the end cap allowing the indicating device to be removed and later be resecured in the aperture of the backing plate, the end cap comprising an abutment edge for engaging the outer surface of the backing plate adjacent the periphery of the aperture, a cap portion secured to said other end of the electrical conductor and having a shoulder for engaging the inner surface of the backing plate adjacent the periphery of the aperture, the cap portion mounting the electrical conductor eccentrically within the aperture, and at least a first resiliently flexible finger positionable in and extensible through the aperture, and the finger within the aperture being separated from the cap portion within the aperture by a spacial gap between the finger and the cap portion, and the finger having a lip for making a latch engagement with the inner surface of the backing plate adjacent the periphery of the aperture and the brake wear indicating device including a plug member separated from the electrical conductor, the plug member being insertable in the spacial gap between the cap portion of the end cap and the at least one finger, the plug member having a rib for connection with a groove in the cap portion of the end cap.

5,151,682

FAIL-SAFE TESTING OF AN INFRARED SENSOR ARRANGEMENT

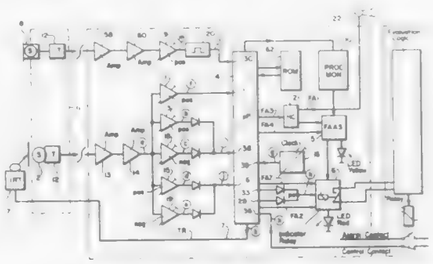
Waldemar Marinitsch, Putzbrunner Str. 43, 8 Munich 83, Fed. Rep. of Germany

Filed Jun. 10, 1991, Ser. No. 711,534

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1990, 4020175

Int. Cl.[5] G08B 29/00

U.S. Cl. 340—514 **24 Claims**



1. A system for fail-safe testing of an infrared sensor arrangement including at least a first infrared sensor having an output, an amplifying circuit connected to an output of the infrared sensor to produce an amplified infrared sensor output signal having a signal level, comprising:

a signal processing circuit connected to the amplifier and responding to the amplified infrared sensor output signal to transmit an output alarm signal to a condition indicating device to trigger a condition indication;

first comparator means, connected to the amplifying circuit, for receiving the amplified infrared sensor output signal and comparing the signal level with at least one first determined threshold value corresponding to a signal level produced when substantially no infrared activity is detected by the infrared sensor, to produce a pulse signal for transmission to the signal processing circuit whenever the amplified sensor output signal level exceeds said first threshold value;

second comparator means, for receiving the amplified infrared sensor output signal and comparing the signal level with at least one second determined threshold value, to produce a pulse signal for transmission to the signal processing circuit when infrared activity is detected; and

infrared signal transmitting means periodically actuated by the signal processing circuit for transmitting an infrared test pulse of defined level and duration detectable by the infrared sensor, and which produces a signal level of the amplified infrared sensor output signal which is above said first determined threshold value and below at least one said second determined threshold value;

wherein the signal processing circuit monitors the interval between successive pulse signals produced by the first comparator means and triggers a condition indication when no signals are produced by the first comparator means within a predetermined first time period; wherein the signal processing circuit, after triggering the infrared signal transmitting means, monitors said second comparator means for indications that said test pulse has been received during a predetermined second time period, and triggers a condition indication when no signals indicative of reception of the test pulse are produced by the second comparator means during the second time period; and

wherein, during the second predetermined time period, the signal processing circuit prevents processing of any response to the test pulse by the first comparator.

5,151,683

POWER SUPPLY CONTROL DEVICE IN FIRE ALARM SYSTEM

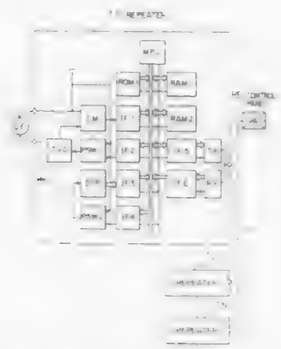
Kaoru Takahashi; Akio Tsumuji, and Ryuji Shutoku, all of Tokyo, Japan, assignors to Nohmi Bosai Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,865

Claims priority, application Japan, Jan. 31, 1989, 1-20988; Jan. 31, 1989, 1-20989

Int. Cl.[5] G08B 26/00

U.S. Cl. 340—518 **4 Claims**



1. In a fire alarm system terminal, an apparatus comprising:

a comparator for receiving a detection signal from a fire detection apparatus and for discriminating a fire phenomenon by comparing the detection signal with a reference voltage during a detection period in which the fire alarm system terminal is activated to detect the fire phenomenon;

a reference voltage supply means for selectively generating and outputting the reference voltage to said comparator; and,

a power supply control means for causing said reference voltage supply means to generate and output the reference voltage to said comparator only during said detection period.

5,151,684

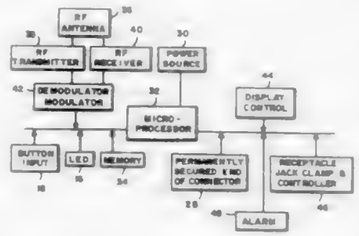
ELECTRONIC INVENTORY LABEL AND SECURITY APPARATUS

Edward L. Johnsen, 19 Bent Ave., Wayland, Mass. 01778

Filed Apr. 12, 1991, Ser. No. 684,574

Int. Cl.[5] G08B 13/14

U.S. Cl. 340—572 **35 Claims**



18. A security and tracking device comprising:

a tag device;

communication means on said tag device for transmitting and receiving wireless communications;

processor means coupled to said communication means;

means for attaching said tag device to a piece of merchandise;

means, coupled to said processor means, for detecting detachment of said tag device from said piece of merchandise; and

means, coupled to said processor means, for releasing said attaching means, wherein said processor means operates said releasing means in response to a signal received by said communication means, said signal indicating that said piece of merchandise has been purchased.

5,151,685

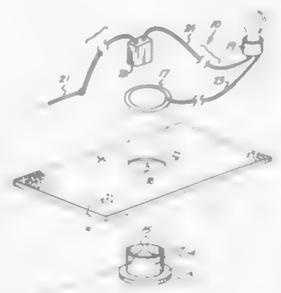
WATER LEVEL ALARM APPARATUS

William W. Spicer, 13050 Forts Lake Rd., Grand Bay, Ala. 36541, and Warren R. Spicer, 4565 Grand Bay Wilmer Rd., Mobile, Ala. 36695

Filed Mar. 12, 1991, Ser. No. 668,234

Int. Cl.[5] G08B 21/00

U.S. Cl. 340—605 **1 Claim**



1. A water level alarm apparatus comprising, in combination,

a floor, and

a collar positioned on the floor, and

a support tube defined by a predetermined external diameter, and

the collar fixedly mounted to a lower terminal end of the support tube orthogonally oriented relative to an axis defined by the support tube, and

expandable means mounted on the collar for expansion from a first dehydrated thickness to a second moistened thickness, and

switch means for actuating a signal member, wherein the switch means includes a first member mounted to the expandable means and a second member mounted to the support tube, whereupon the first member and the second member are in separated orientation relative to one another when the expandable means is defined by the first thickness, and wherein the first and second members are in electrical communication relative to one another when the expandable means is defined by the second thickness, and

a battery mounted within the support tube, wherein the first member, the second member, and the signal member are all in electrical communication through the switch means and the battery when the expandable means is defined by the second thickness, and

the expandable means includes a sponge sheet, the sponge sheet including a central bore defined by the predetermined external diameter mounted upon a top surface of the collar, and the first member includes a torroidal electrically conductive ring fixedly mounted on the sponge sheet about the central bore of the sponge sheet in sliding communication with the support tube, wherein the ring is defined by an internal diameter substantially equal to the predetermined external diameter of the support tube, and

the second member includes an electrically conductive pin, and the support tube includes a plurality of diametrically aligned openings orthogonally oriented relative to the axis of the support tube above the top surface of the collar wherein the second means is mounted.

5,151,687

APPARATUS FOR LOGGING ELECTRONIC MEDIA-TAPED MATERIAL

George G. Younger, 10553 Farallone Dr., Cupertino, Calif. 95014

Filed Jul. 16, 1990, Ser. No. 554,138
Int. Cl.[5] G09G 5/00
U.S. Cl. 340—706 16 Claims

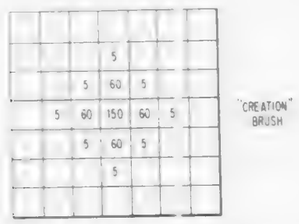
1. An apparatus for logging descriptive information, such as subject, duration, location, and tape status, pertaining to material recorded by a cassette-type electronic media tape recorder, comprising a case; a panel face, characterized by showing the read-out locations of individual elements of said descriptive information for specified combinations of said tape recorder designs, tape speed settings of said tape recorder, and cassette tape types; a display means, in combination with said panel face read-out locations, characterized by display of descriptive indications of states of fractional-hour time slots on said cassette tape and subjects of said material residing in said time slots, indexed numerical designations for said time slots on said cassette tape, duration of discrete recordings of said material in said time slots, cumulative time durations and, depending on the specified recorder design, numerical counter readings from beginning of said cassette tape installed in said tape recorder, and a data input means, whereby an operator logs said descriptive information relative to the recorded material.

5,151,68(

ELECTRONIC BRUSH GENERATION

Stephen Freeman, Bedfordshire, England, assignor to Crosfield Electronics Limited, England

Filed Feb. 5, 1991, Ser. No. 650,541
Claims priority, application United Kingdom, Feb. 5, 1990, 9002475
Int. Cl.[5] G09(1/28
U.S. Cl. 340—703 6 Claims



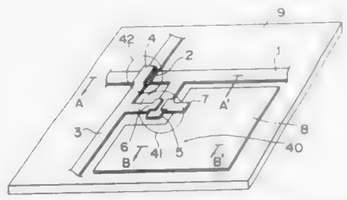
1. A method of generating and storing a representation of the profile of an electronic brush for use subsequently to create or modify electronically an image the method comprising the steps of electronically moving a previously defined brush to create an array of pixels having a shape corresponding to a new brush profile, wherein the previously defined brush profile comprises an array of pixels for each of which a value is stored, and wherein a value is stored for each pixel of the new array of the new brush profile computed in accordance with a predetermined algorithm from the values of the or each pixel of the previously defined brush profile which passes through the new array pixel during movement of the previously defined brush.

5,151,688

INPUT/OUTPUT DISPLAY PANEL WITH LIGHT PEN

Masaru Tanaka, and Yutaka Ishii, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1990, Ser. No. 509,178
Claims priority, application Japan, Apr. 19, 1989, 1-99618
Int. Cl.[5] G09G 3/02
U.S. Cl. 340—707 7 Claims



1. An information input and output apparatus comprising: display means for displaying an image according to an image signal, said display means having plural pixel electrodes formed in a matrix shape on transparent substrate;

plural row electrode lines being formed on said transparent substrate so as to be parallel to each other;

plural column electrode lines being formed on said transparent substrate, parallel to each other, so as to cross said row electrode lines with an intersecting angle of substantially right angles;

switching means for driving said display means responsive to a predetermined voltage to be applied to one of the row electrode lines and a predetermined voltage to be applied as said image signal to one of the column electrode lines;

a light pen for projecting light onto said display means;

a photoconductive layer, having a predetermined length and width, being formed only between each of said row electrode lines and each of said column electrode lines at each intersection of said row electrode lines and said column electrode lines, the electrode line located above said photoconductive layer being of a lesser width than the width of the photoconductive layer, so that the photoconductive layer can effectively receive light projected from said light pen; and

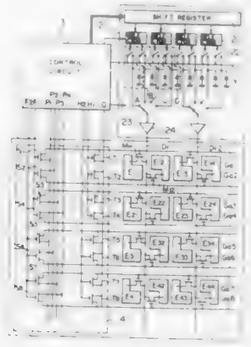
detecting means for detecting a position of said light pen located on said display means to a signal induced to each of said column electrode lines.

5,151,689

DISPLAY DEVICE WITH MATRIX-ARRANGED PIXELS HAVING REDUCED NUMBER OF VERTICAL SIGNAL LINES

Nobuaki Kabuto; Mayumi Igarashi; Fumio Inoue, and Kunio Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,789
Claims priority, application Japan, Apr. 25, 1988, 63-100304
Int. Cl.[5] G01G 3/36
U.S. Cl. 340—784 15 Claims



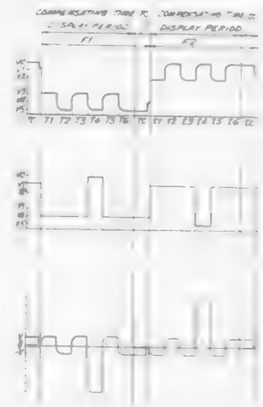
1. A display device comprising a display panel including a plurality of signal lines extending in a vertical direction, a plurality of scanning lines extending in a horizontal direction, and display elements disposed as pixels at respective intersections of a matrix formed by said signal lines and said scanning lines, said signal lines, said scanning lines and said display elements being disposed on a substrate, in which the total number of the display elements as pixels arranged in the horizontal direction is larger than the total number of said signal lines, and the total number of the display elements as pixels arranged in the vertical direction is smaller than the total number of said scanning lines, wherein each of said signal lines is disposed between pixel electrodes to drive adjacent display elements as pixels, each of said signal lines is operatively connected to at least two pixels adjacent to each other in the horizontal direction, and the two adjacent pixels in the horizontal direction are operatively connected to different scanning lines, respectively, whereby each of the two adjacent pixels in the horizontal direction is driven by a different combination of said signal lines and a different respective one of said different scanning lines.

5,151,690

METHOD AND APPARATUS FOR DRIVING A LIQUID CRYSTAL DISPLAY PANEL

Katsunori Yamazaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 232,750, Aug. 18, 1988, Pat. No. 5,010,326. This application Jan. 16, 1991, Ser. No. 642,107
Claims priority, application Japan, Jan. 16, 1990, 2-6677
Int. Cl.[5] G09G 3/36
U.S. Cl. 340—784 19 Claims



1. A method of driving a liquid crystal panel to produce a display pattern at display elements of a panel having a plurality of scanning electrodes on one of a pair of substrates between which a liquid crystal layer is interposed and a plurality of signal electrodes on the other substrate, a display element being defined at the intersection of a scanning electrode and a signal electrode, comprising the steps of:

providing, during the operation of said panel, periods of time during which said panel is driven to produce a display pattern (the driving times), and periods of time during which said panel is compensated at least in part for display unevenness during a preceding display time due to the display pattern (the compensation times);

applying a scanning driving waveform including at least a selective and a non-selective voltage to at least one end of each scanning electrode during said driving times;

applying a data driving waveform including at least a non-lighting and a lighting voltage to at least one end of each signal electrode during said driving times; and

during said compensating times, not applying the selective voltage to any of the plurality of scanning electrodes and applying a compensating waveform as required to one or more of the signal electrodes of the liquid crystal panel for compensating at least in part for display unevenness during a preceding display time due to the display pattern.

5,151,691

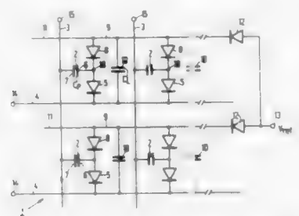
ACTIVE DISPLAY DEVICE

Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1990, Ser. No. 606,013
Claims priority, application Netherlands, Nov. 27, 1989, 8902922
Int. Cl.[5] G09G 3/36
U.S. Cl. 340—784 23 Claims

1. A display device comprising: an electro-optical display

medium between two supporting plates, a system of pixels arranged in rows and columns, with each pixel being defined by two picture electrodes arranged on the facing surfaces of the supporting plates, a system of row and column electrodes for driving the pixels, at least one first asymmetrical non-linear switching element connected in series with each pixel between



the pixel and a row electrode, wherein, at the location of a pixel, at least one second asymmetrical non-linear switching element is connected in series arrangement with the first asymmetrical non-linear switching element and between the pixel and a node and, at the location of a pixel, at least one capacitive element is connected parallel to the series arrangement of the first and second non-linear switching elements.

5,151,692

BOARDING GATE SEAT CHECKIN APPARATUS AND METHOD

Kazuaki Hirahara, Ibaraki, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

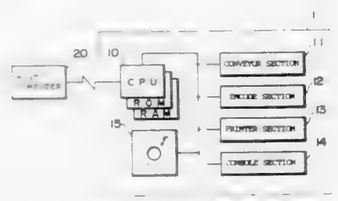
Continuation of Ser. No. 281,024, Dec. 7, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 517,483

Claims priority, application Japan, Dec. 11, 1987, 62-314783

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.28 **7 Claims**



1. A checkin apparatus comprising:

(a) a checkin gate disposed near a boarding gate for a passenger transport means, said checkin gate comprising:

(b) a seat table for said passenger transport means for storing data representative of the presence or absence of unoccupied seats;

(c) checking means for checking whether a current time is within a predetermined time period before departure of said passenger transport means;

(d) unoccupied seat deleting means, connected to said seat table and to said checking means, operative when said current time is before said predetermined time period, for receiving boarding cards on which a seat is assigned, checking the validity of said boarding cards, storing occupied data in said seat table with respect to seats read from boarding cards determined to be valid, and releasing a received boarding card;

(e) unoccupied seat assignment means, connected to said seat table and to said checking means operative when said current time reaches said predetermined time period, for receiving tickets on which a seat is not assigned, assigning a seat which is not yet occupied to said ticket with reference to said seat table, updating said seat table to identify the assigned seat as occupied, and discharging a boarding card containing data identifying said assigned seat; and

(f) means connected to said seat table and to said checking means, for determining, after said current time reaches said predetermined time period, whether all seats have been occupied with reference to said seat table.

5,151,693

WIRELESS SIGNAL TRANSMISSION SYSTEM WITH RANDOM ACCESS

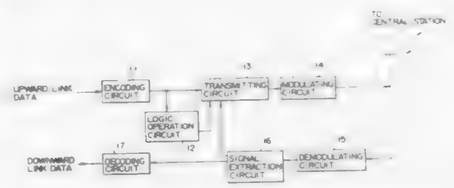
Seizo Onoe, and Narumi Umeda, both of Yokohoma, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,264

Claims priority, application Japan, Sep. 19, 1989, 1-240822

Int. Cl.[5] H04B *7/00*

U.S. Cl. 340—825.3 **4 Claims**



1. A digital wireless communication method is which data is transmitted and received by a central station and each of a plurality of terminal stations, said terminal stations being capable of randomly accessing said central station, the method comprising the steps of:

transmitting from said central station a first indication signal for indicating when said terminal stations are enabled to transmit an original data signal to said central station;

transmitting at least a portion of the original data signal from at least one of said terminal stations to said central station when the first indication signal received from said central station indicates that transmission is enabled;

generating another indication signal in said central station, said another indication signal including data generated in accordance with a predetermined rule, based on the at least a portion of the original data signal received from said at least one terminal station, said another indication signal further including at least one of a partial data of the at least a portion of the original data signal and a partially processed data of the at least a portion of the original data signal, said another indication signal further including proper receipt data indicating whether the at least a portion of the original data signal was correctly received by said central station and enabling data for enabling said at least one terminal station to transmit a remaining portion of the original data signal;

transmitting said another indication signal from said central station to said at least one terminal station;

then comparing at said at least one terminal station, data in the received another indication signal with data stored in said at least one terminal station;

determining in said at least one terminal station; using the at least one of the partial data and the partially processed data of the at least a portion of the original data signal and the proper receipt data in said another indication signal, whether said central station correctly received the at least a portion of the original data signal previously transmitted from said at least one terminal station; and

suspending transmission of data signals from said at least one terminal station for a predetermined period of time as soon as the determining step determines that the at least a portion of the original data signal transmitted from said at least one terminal station was not correctly received by said central station.

5,151,694

PAGING RECEIVER CAPABLE OF PREVENTING UNAUTHORIZED ACCESS TO MESSAGE MEANT THEREFOR

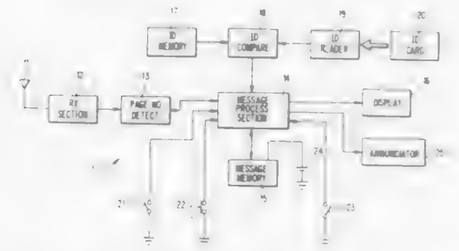
Koji Yamasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 374,020

Claims priority, application United Kingdom, Jun. 30, 1988, 63-164340

Int. Cl.[5] H04Q *7/00*

U.S. Cl. 340—825.44 **26 Claims**



1. A paging receiver comprising:

first storing means for storing a paging number;

means for receiving a paging number followed by a message;

first comparing means for comparing the stored paging number and received paging number and producing a coincidence signal when they are identical;

means responsive to said coincidence signal for receiving said message;

means for displaying the received message;

second storing means for storing a first identification number;

third storing means for storing a second identification number;

means for reading said second identification number out of said third storing means;

means for comparing said first identification number and the read-out second identification number; and

means for preventing said displaying means from displaying said message if said first and second identification numbers are not identical.

5,151,695

TELEMETRIC MEASURING DEVICE WITH HIGH POWER GENERATION

William L. Rollwitz; Armando De Los Santos; William D. Perry; Robert W. Burraham, and James K. Davis, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Oct. 2, 1990, Ser. No. 591,952

Int. Cl.[5] G08C *19/06;* **H02K** *11/00*

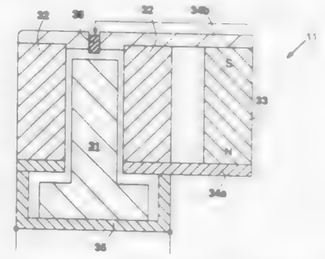
U.S. Cl. 340—870.33 **21 Claims**

1. A power generator for a telemetric measuring device for measuring physical conditions of machinery having a moving part, comprising:

a magnet for energizing a magnetic circuit, said magnet being fixed with respect to said moving part;

a coil for providing induced electrical current, said coil being fixed with respect to said moving part; and

a reciprocator slug, made from a magnetically conductive material, placed inside said coil and moveable with respect to said magnet and said coil, such that said slug is free to move in response to inertial forces provided by said moving part, thereby opening and closing said magnetic circuit and inducing an electrical current in said coil



5,151,696

MULTI-FUNCTION KEYBOARD FOR REMOTE CONTROL APPARATUS

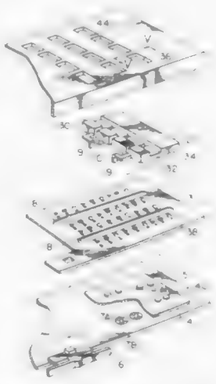
Yasuhiro Kasahara; Hiroshi Suzuki; Yasuhiro Yakushiji, all of Yokohama; Shoichi Ito, Hamamatsu, and Takashi Suzuka, Osaka, all of Japan, assignors to Hitachi, Ltd., Tokyo and Sanwa Electronics Instrument Co., Ltd., Higashiosaka, both of, Japan

Filed Mar. 28, 1990, Ser. No. 500,504

Claims priority, application Japan, Mar. 29, 1989, 1-075154

Int. Cl.[5] H03M *11/04;* **H04B** *1/034*

U.S. Cl. 341—22 **6 Claims**



1. A button switch apparatus, comprising:

a case formed with a plurality of windows;

a button array including a plurality of operating buttons adapted to said windows, respectively, each of said operating buttons having a transparent part;

a switch array including a plurality of switches associated with said buttons, respectively;

a mark sheet disposed between said button array and said switch array and having sets of marks recorded thereon, respective sets indicating respective sets of operating functions of said operating buttons such that at least two marks are recorded for each of said operating buttons, said marks being selectively viewable through the transparent parts of said operating buttons by movement of said mark sheet;

mode selecting means for selecting one of a plurality of predetermined modes, each mode determining a specific set of operating functions of said operating buttons, by

moving said mark sheet so that the marks indicating the respective set of operating functions of said operating buttons in a selected mode are viewed through the transparent parts of said operating buttons; and

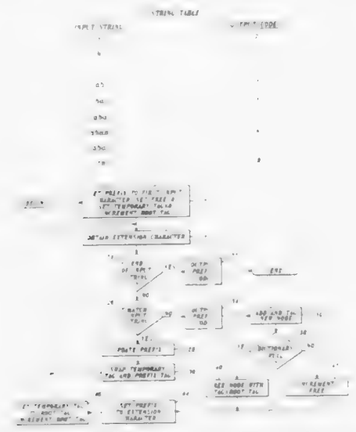
means for allowing each of said operating buttons to be operated with no contact with said mark sheet, including at least one elongated slit formed in a offset manner in said mark sheet so as not to overlap with the transparent parts of said operating buttons and through which slit, a plurality of said operating buttons are capable of actuating the associated switch with no contact with the mark sheet when the operating button is operated as said mark sheet is moved.

5,151,697

DATA STRUCTURE MANAGEMENT TAGGING SYSTEM

Suzanne Bunton, Seattle, Wash., assignor to Board of Regents of the University of Washington, Seattle, Wash.

Filed Oct. 15, 1990, Ser. No. 598,418
Int. Cl.[5] H03M 7/30
U.S. Cl. 341—51 19 Claims



1. An adaptive data compression and decompression method for compressing an input string of character signals over an alphabet Σ into a string of output code signals while maintaining a data dictionary of size D, the method comprising the steps of:

establishing an encoding dictionary in memory comprised of stored string entries, wherein each stored string entry in said encoding dictionary represents a string of character signals encountered in said input string of character signals and each stored string entry is related to a unique output code signal, and wherein each stored string entry of length greater than one character is related to a unique string entry tag,

maintaining an encoding master tag as an index to said string entry tags;

searching said input string of character signals by comparing said string to said stored string entries to determine a longest match;

outputting an output code signal related to said longest match;

adding an extended string entry related to said longest match followed by the next sequential unmatched character signal from said input string of character signals to said encoding dictionary;

associating an available output code with said extended string entry;

updating each string entry tag related to said extended string entry and to each stored string entry that is a prefix of said extended string entry based on said encoding master tag;

updating said encoding master tag; and

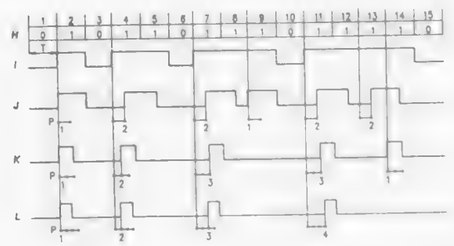
if said encoding dictionary is full, prior to performing said step of searching, freeing a stored string entry having a string entry tag with a value that is equal to said encoding master tag value, whereby a stored string entry that is not a prefix to another string entry and which was not recently referenced in the encoding process is freed so that the encoding dictionary may adapt to the input string of character signals.

5,151,698

METHOD FOR THE CODING OF A DIGITAL SIGNAL, CODER AND DECODER TO IMPLEMENT THIS METHOD, REGENERATION METHOD AND CORRESPONDING REGENERATOR UTILIZING PULSE POSITION MODULATION

Lucien Pophillat, Lannion, France, assignor to French State Represented by the Minister of Post, Telecommunications and Space (centre National d'Etudes des Telecommunications), France

Filed Sep. 18, 1990, Ser. No. 584,476
Claims priority, application France, Sep. 19, 1989, 89 12274
Int. Cl.[5] H03M 5/02
U.S. Cl. 341—52 15 Claims



10. A method of coding a series of binary bits into the form of unipolar pulses of constant duration, one of said bits occurring each period of time called a bit time, the method comprising:

providing "n" binary patterns having at least a first bit and a last bit each, said binary patterns matching less than all possible sequences in said series;

dividing the bit time into "n" temporal positions;

establishing a correspondence between each of said binary patterns and temporal positions;

detecting one of said binary patterns in said series;

generating one of said pulses in the temporal position corresponding to the binary pattern detected; and

after the last bit of the binary pattern detected, resuming said detecting step.

5,151,699

DATA CONVERTING APPARATUS

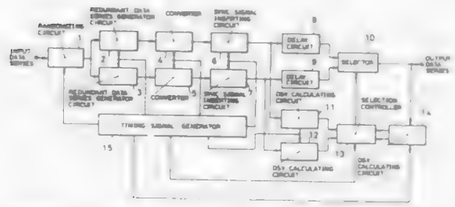
Yoshiaki Moriyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Japan

Continuation of Ser. No. 675,666, Mar. 27, 1991, abandoned.
This application Mar. 18, 1992, Ser. No. 855,113
Claims priority, application Japan, Sep. 5, 1990, 2-235402
Int. Cl.[5] H03M 5/14
U.S. Cl. 341—58 20 Claims

1. A data converting apparatus for converting an input data series being expressed in binary codes into an output data series, which comprises:

insertion means for repetitively inserting one of a predetermined number of DC control bits into an input data series, at every predetermined bit interval to thereby generate a redundant data series;

encoding means for subjecting said redundant data series to a code conversion operation under a preselected conversion rule so as to generate said output data series; and



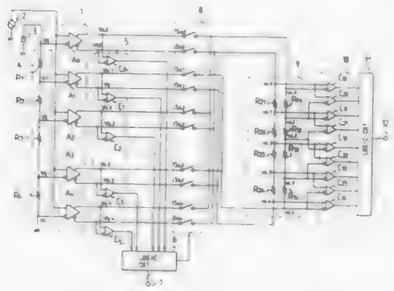
selection means for selecting a binary code for said one of predetermined number of DC control bits as a function of a DC component of said output data series.

5,151,700

SERIAL-PARALLEL TYPE A/D CONVERTER

Akira Matsuzawa; Masaaki Kanoh, and Shoichiro Tada, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1990, Ser. No. 559,088
Claims priority, application Japan, Aug. 4, 1989, 1-203328
Int. Cl.[5] H03M 1/14
U.S. Cl. 341—156 9 Claims



1. A serial-parallel type A/D converter comprising:

means for generating a plurality of different reference voltages;

a set of differential conversion circuits having first input terminals subjected in common to an analog input signal and second input terminals subjected to the respective reference voltages, and converting differences between voltages at the first and second input terminals into differential output voltages;

a first A/D conversion circuit comparing the analog input signal with the reference voltages to perform a higher-order A/D conversion of the input analog signal;

means for selecting at least two of the differential output voltages;

means for dividing an interval between the differential output voltages selected by the selecting means, and for generating divided voltages in accordance with said dividing; and

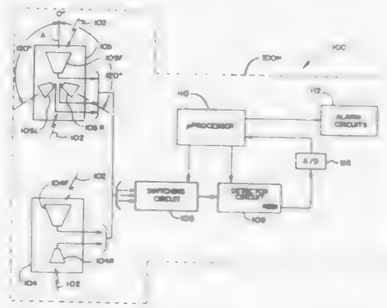
a second A/D conversion circuit comparing the divided voltages to perform a lower-order A/D conversion of the analog input signal.

5,151,701

POLICE RADAR DETECTORS FOR DETECTING RADAR SIGNALS AND DETERMINING THE DIRECTIONAL ORIGIN OF THE SIGNAL SOURCE

Michael D. Valentine; Clarence R. Groth; Stephen R. Scholl, and Marwan E. Nusair, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 659,625, Feb. 25, 1991, Pat. No. 5,083,129. This application Oct. 21, 1991, Ser. No. 780,262
Int. Cl.[5] G01S 7/40
U.S. Cl. 342—20 12 Claims



1. A motor vehicle radar signal detector for alerting an operator of a motor vehicle to incoming radar signals, said detector comprising:

receiver means comprising a first antenna aimed in a first direction relative to said motor vehicle, a second antenna aimed in a second direction relative to said motor vehicle, and a third antenna aimed in a third direction relative to said motor vehicle for receiving incoming radar signals at frequencies within at least one frequency band, said first, second and third directions being different from one another;

radar signal detector means for generating radar identification signals which identify incoming radar signals;

connector means for connecting signals from said receiver means to said radar signal detector means;

processor means for controlling said connector means to selectively connect signals from said first, second and third antennas to said radar signal detector means and responsive to radar identification signals generated by said radar signal detector means to identify radar signals coming from said first, second and third directions relative to said motor vehicle and to generate direction signals identifying the direction of origin of incoming radar signals; and

alarm means for alerting an operator of a motor vehicle upon identification of incoming radar signals, said alarm means including direction indicating means responsive to said direction signals for identifying the direction of origin of incoming radar signals.

5,151,702

COMPLEMENTARY-SEQUENCE PULSE RADAR WITH MATCHED FILTERING FOLLOWING DOPPLER FILTERING

Harry Urkowitz, Philadelphia, Pa., assignor to General Electric Company, Moorestown, N.J.

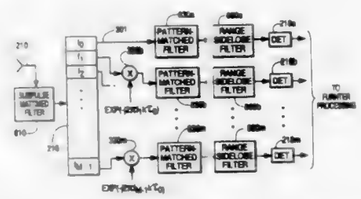
Filed Jul. 22, 1991, Ser. No. 734,003
Int. Cl.[5] G01S 13/28
U.S. Cl. 342—134 11 Claims

1. A method for detecting anomalies, comprising the steps of:

transmitting toward an anomaly a first pulse set consisting of a predetermined plurality of first pulses, said pulses of said first set being dispersed in time pursuant to a predetermined phase code;

transmitting toward said anomaly a second pulse set consisting of said predetermined plurality of second pulses, said pulses of said second set being dispersed in time pursuant to a second phase code selected to be complementary to said predetermined phase code in a manner such that, after pulse compression of said first and second pulses, the resulting range sidelobes are substantially equal in amplitude and opposite in sign;

receiving echoes of said first and second pulses reflected from said anomaly to produce received first and second pulse sets;



Doppler filtering said received first and second pulse sets into a plurality of frequency components to produce a sequence of range values for each frequency component, each of said sequence of range values including said first and second code sequences;

for each said frequency components, matched filtering each of said first and second code sequences of range values to produce first and second compressed pulses;

summing said first and second compressed pulses; and

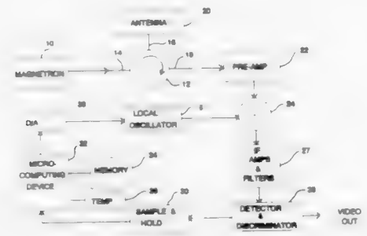
after said Doppler filtering step, converting at least some of said plurality of frequency components to a common frequency.

5,151,703

METHOD AND APPARATUS FOR IMPROVED AUTOMATIC FEQUENCY CONTROL

Mark G. Roos, Shawnee, Kans., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 6, 1991, Ser. No. 804,280
Int. Cl.[5] G01S 7/03
U.S. Cl. 342—199 10 Claims



6. An apparatus for providing automatic frequency control of a variable frequency oscillator in a pulsed radar, comprising:

(a) discriminator means for producing a DC signal having an amplitude which indicates the frequency difference between an actual intermediate frequency and a desired intermediate frequency;

(b) sample and hold means for sampling said DC signal to produce a digital signal in response to said DC signal, said DC signal being sampled during an RF pulse transmission and during a receive time; and

(c) microcomputing means for producing a control signal that modifies a frequency of the variable frequency local oscillator, said control signal being produced using said digital signal.

5,151,704

METHOD FOR SIMULATING THE EFFECT OF ALTERNATIVE ANTENNA PATTERNS ON THE COVERAGE AND INTERFERENCE PATTERN OF A MOBILE RADIO SYSTEM

Krister Gunmar, and Ulf Tegth, both of Haninge, Sweden, assignors to Televerket, Farsta, Sweden

Continuation of Ser. No. 591,465, Oct. 1, 1990, abandoned. This application Jan. 16, 1992, Ser. No. 821,868
Claims priority, application Sweden, Sep. 29, 1989, 8903210
Int. Cl.[5] H01Q 3/00; G01R 7/00; H04Q 7/00
U.S. Cl. 342—360 2 Claims

1. A method for simulating the effect of alternative antenna patterns on the coverage and interference pattern in cellular radio systems, comprising a number of base stations with associated individual coverage areas and mobile stations, characterized in that

signal strength values of an existing multi-directional antenna are measured for a plurality of relevant coordinates along a plurality of radials and at a plurality of distances from said existing antenna,

an ideal difference in antenna gain is formed by mathematically comprising an ideal radiation pattern of the antenna which is to be simulated with the ideal radiation pattern of the existing antenna, and

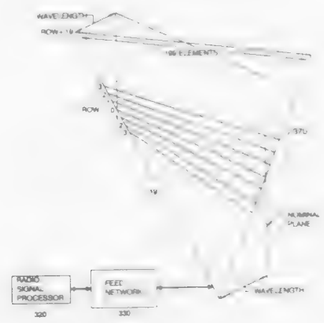
the measured field strength values are "weighted" with the ideal antenna gain difference to form a set of simulated field strength values.

5,151,705

SYSTEM AND METHOD OF SHAPING AN ANTENNA RADIATION PATTERN

Scott L. Badger, Renton; John P. Braun, Issaquah, and Sperry H. Goodman, Kent, all of Wash., assignors to Boeing Aerospace and Electronics, Seattle, Wash.

Filed Feb. 15, 1991, Ser. No. 656,276
Int. Cl.[5] H01Q 3/22
U.S. Cl. 342—368 34 Claims



1. An antenna having N subantennas, N being at least 3, each subantenna having a pattern having a main lobe and sidelobes on opposite sides of the main lobe, each pattern lying in a plane parallel to, and removed from, a pattern of an adjacent subantenna, comprising:

a first subantenna;

a second subantenna;

first means for pointing the pattern of the second subantenna at a non-zero angle relative to the pattern of the first subantenna; and

an Nth subantenna;

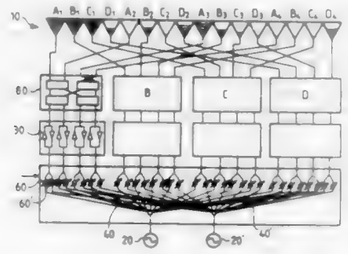
(N−1)th means for pointing the pattern of the Nth antenna at the non-zero angle relative to the pattern of the (N−1)th antenna.

5,151,706

APPARATUS FOR ELECTRONICALLY CONTROLLING THE RADIATION PATTERN OF AN ANTENNA HAVING ONE OR MORE BEAMS OF VARIABLE WIDTH AND/OR DIRECTION

Antoine Roederer, Noordwijk, and Cornelis Van't Klooster, Voorhout, both of Netherlands, assignors to Agence Spatiale Europeenne, France

Filed Jan. 29, 1992, Ser. No. 828,266
Claims priority, application France, Jan. 31, 1991, 91 01086
Int. Cl.[5] H01Q 3/26, 3/36, 3/40
U.S. Cl. 342—372 7 Claims



1. Apparatus for electronically controlling the radiation pattern of an antenna having one or more beams of variable width and/or direction, the apparatus comprising:

an array of N radiating elements, subdivided into P subarrays of M elements each, where $M \cdot P = N$, each beam of a specified pattern using a plurality of elements selected from the elements of at least some of the subarrays;

a signal source common to all of the elements of the array;

power divider means having one input and N outputs to distribute the signal delivered by the source;

amplifier means for amplifying said signal; and

means for selectively exciting at least some of the elements with the amplified signal at a controlled phase shift so as to obtain the specified radiation pattern for the antenna;

the apparatus further comprising, between the power divider means and the radiating elements:

P groups of M phase shifter-and-amplifier modules placed at the output of the power divider means; and

P couplers each having M inputs and M outputs, said M inputs being connected to the M corresponding outputs of the associated group of phase shifter-and-amplifier modules, and said M outputs being connected to the M elements of the associated subarray;

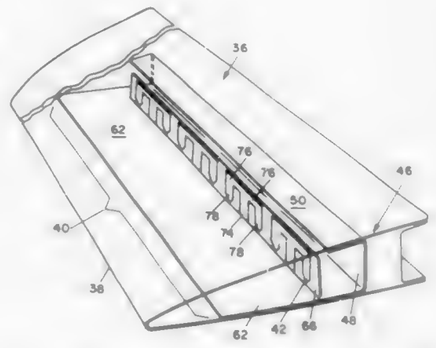
the phase shifts of the phase shifter-and-amplifier modules being selected in such a manner as to direct the power delivered by the source to those radiating elements that contribute to the specified radiation pattern, and thus to provide distributed amplification of the signal emitted by the source while maintaining an essentially identical and constant load on each amplifier regardless of the changes made to the radiation pattern.

5,151,707

LINEAR ARRAY ANTENNA WITH E-PLANE BACKLOBE SUPPRESSOR

Richard J. Kumpfbeck, Lloyd Harbor, and Peter W. Hannan, Smithtown, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Division of Ser. No. 339,883, Apr. 18, 1989, Pat. No. 5,111,214, which is a continuation of Ser. No. 917,743, Oct. 10, 1986, abandoned. This application Jan. 2, 1991, Ser. No. 636,752
Int. Cl.[5] H01Q 1/280, 9/380, 9/420
U.S. Cl. 343—705 12 Claims



1. A monopole antenna system with a radiation pattern primarily directed in a forward direction and a limited overall width in a transverse E-plane direction, having a composite reflector for providing operation with reduced E-plane back radiation, comprising:

an imaging ground plane section having a reflective surface substantially perpendicular to said transverse E-plane direction;

a plurality of monopole radiating elements spaced in a longitudinal direction transverse to said forward and transverse E-plane directions, each said element including a radiating segment extending in said transverse E-plane direction from a coupling point proximate to said reflective surface outward from said reflective surface to a furthermost point, for providing a free space radiation pattern having a low field strength region outward from said furthermost points of said plurality of elements; and

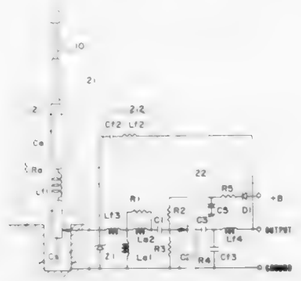
a composite reflector including:

a backwall section positioned behind said radiating segments and having a backwall width in said transverse E-plane direction substantially equal to said limited overall width of the antenna system, said backwall section terminating on one side at said reflective surface and on the other side in a backwall edge extending in said longitudinal direction; and

sidewall means, coupled along said backwall edge of said backwall section and extending forward substantially perpendicularly to said radiating segments and terminating in a longitudinally extending composite reflector edge, for positioning said composite reflector edge behind, and outward in said transverse E-plane direction from, said furthermost points in said low field strength region;

whereby, said composite reflector is effective to reduce E-plane back radiation as compared to a back reflector of similar width in said transverse E-plane direction, while having an overall width in said transverse E-plane direction approximately the width of said backwall section alone.

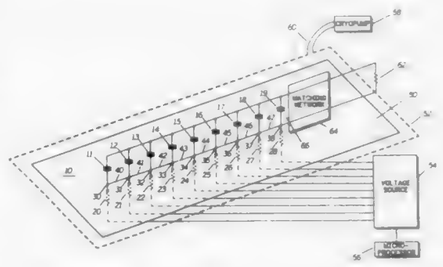
5,151,708
SHORTENED MAST ANTENNA WITH COMPENSATING CIRCUITS
Kazuhiko Nakase, Tokyo, and Moriyoshi Kawasaki, Kanagawa, both of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 491,489, Mar. 9, 1990. This application Nov. 15, 1990, Ser. No. 614,280
Claims priority, application Japan Mar. 10, 1989, 1-58790; Nov. 15, 1989, 1-297183
Int. Cl.[5] H01Q 1/00
U.S. Cl. 343—722 2 Claims



1. A shortened radio antenna provided with compensating circuits whose outputs are coupled to an input of an AM/FM radio receiver, said shortened radio antenna comprising a mast antenna shorter than a resonant state and being provided on an automobile, an FM compensating circuit coupled to said mast antenna comprising only passive circuit elements for compensating for FM broadcast signals and an AM compensating circuit coupled to said mast antenna comprising active and passive elements for converting a high impedance into a low impedance and for compensating for AM broadcast signals, wherein said FM compensating circuit comprises a primary resonance circuit and a secondary resonance circuit, said primary resonance circuit resonating in said FM broadcast frequency band and comprising an impedance of said mast antenna and a loading coil which is attached to said mast antenna, said secondary resonance circuit resonating in said FM broadcast frequency band and comprising a coil and a capacitor, and said primary and secondary resonance circuits are electrostatically coupled by an electrostatic capacitance of an antenna attachment section of said mast antenna so as to form a double-tuned circuit.

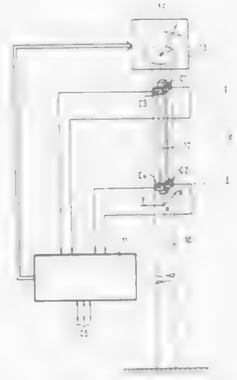
5,151,709
TUNABLE SUPERCONDUCTIVE ANTENNA
Quirino Balzano, Plantation, and Robert E. Stengel, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 10, 1989, Ser. No. 419,551
Int. Cl.[5] H01Q 7/00, 5/010
U.S. Cl. 343—741 8 Claims

1. An antenna, for receiving signals, each signal having a frequency, comprising:
a plurality of superconducting antenna segments;
decoupling means for selectively decoupling at least one antenna segment from the antenna in response to the frequency of the signal received; and
a plurality of superconducting transverse segments, each transverse segment being for coupling an antenna segment to an adjacent antenna segment when the transverse segment is in a superconducting state, and for decoupling the antenna segment from the adjacent antenna segment,



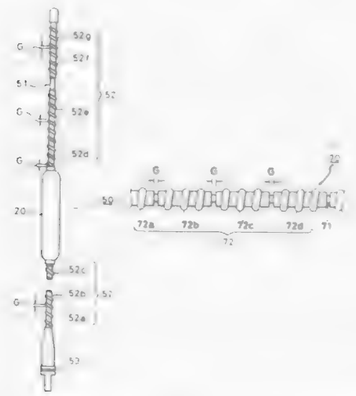
when the transverse segment is not in a superconducting state.

5,151,710
APPARATUS FOR MEASURING BENDING MOVEMENTS OF AN ANTENNA SUPPORT MAST, AND APPLICATION THEREOF TO CONTROLLING THE POINTING OF A MOTOR-DRIVEN ANTENNA
Alain de Place, Paris, France, assignor to Alcatel Transmission par Faisceaux Hertziens, France
Filed Dec. 19, 1990, Ser. No. 629,956
Claims priority, application France, Dec. 22, 1989, 89 17106
Int. Cl.[5] H01Q 3/00, 1/12; G01R 7/00
U.S. Cl. 343—766 5 Claims



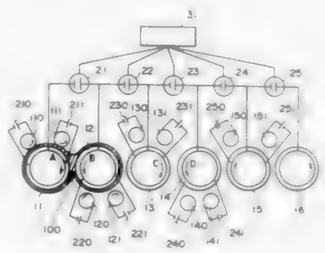
1. A device for measuring bending movements of an antenna support mast having a longitudinal axis, said device comprising:
a support fixed to the side of said antenna support mast, in the vicinity of the free end of said mast, and extending in the longitudinal direction of the mast, at least two sets of sensors fixed to said support including a first set of sensors in a first plane, and a second set of sensors in a second plane, said sensors of each set being at a determined, longitudinal distance d from each other, said first and second planes extending parallel to the axis of said mast, the planes being angularly offset around the perimeter of said support and said sets of sensors sensing bending of the mast in said two angularly offset planes; and
a processor for processing signals delivered by the sensors; said processor including means for memorizing said signals, whereby; said support stiffens the relative positions of the sets of sensors to accommodate distortion due to bending of the portion of mast bearing said support and permits the memorizing means of the processor to successively store the amplitude, pseudo-period and damping movement of the mast.

5,151,711
AUTOMOBILE ANTENNA AND METHOD OF MANUFACTURING THE SAME
Minoru Taguchi, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan
Filed Sep. 24, 1990, Ser. No. 586,806
Claims priority, application Japan, Sep. 25, 1989, 1-248917; Apr. 16, 1990, 2-99641
Int. Cl.[5] H01Q 1/320, 1/270
U.S. Cl. 343—715 5 Claims



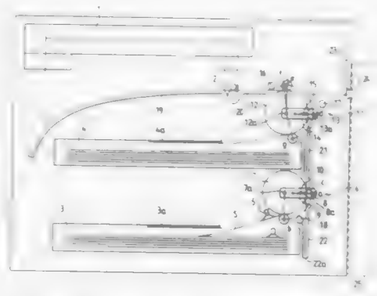
3. An automobile antenna which substantially reduces wind noise generated as wind moves past the antenna, the wind creating a reduced pressure area behind the antenna when viewed from a direction in which the wind is moving, said automobile antenna comprising:
a flexible rod antenna element having a longitudinal axis;
a plurality of independent identical cylindrical members, each having a first and a second end portion, said plurality of cylindrical members being mounted around the rod antenna element in spaced-apart relation along the longitudinal axis of the rod antenna element so that a plurality of gaps are formed between adjacent ones of the first and second end portions of the plurality of identical cylindrical members, said gaps enabling the rod antenna element to flex without hinderance from said plurality of identical cylindrical members mounted thereon; and
each of said plurality of identical cylindrical members having an outer surface and having a given length along a longitudinal axis thereof;
air turbulence generating means formed integrally on and projecting from said outer surface of each of said cylindrical members along a substantial portion of said given length of each of said cylindrical members for generating air turbulence around said antenna, said gaps between adjacent cylindrical members also generating air turbulence;
the thus generated air turbulence substantially eliminating the reduced pressure area formed behind the antenna, thereby substantially reducing the wind noise.

5,151,712
METHOD OF TRANSFERRING VISCOUS SUBSTANCE BY APPLYING PLURAL VOLTAGES TO REDUCE ITS ADHESIVENESS
Kohzoh Arahara, Kawasaki; Toshiya Yuasa, Mitaka; Takashi Kai, Hadano; Noboru Tohyama, Kawasaki; Akihiro Mouri, Atsugi, and Kenichi Matsumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1990, Ser. No. 527,178
Claims priority, application Japan, May 24, 1989, 1-128763; Jun. 7, 1989, 1-142898
Int. Cl.[5] B41J 2/005; G01D 15/16
U.S. Cl. 346—1.1 12 Claims



1. A method for transferring a viscous substance, comprising the steps of:
(a) providing a viscous substance which changes in adhesiveness corresponding to a polarity of a voltage applied thereto;
(b) disposing the viscous substance between a first electrode and a second electrode; and
(c) applying a voltage to a particular part of the viscous substance plural times before each transfer of said particular part of said viscous substance, thereby to reduce the adhesiveness of the viscous substance to the first electrode.

5,151,713
IMAGE RECORDING APPARATUS
Keiichi Kawasaki, Tokyo; Keiji Ohkoda, Yokohama; Tomohiro Kudo, Yokohama, and Satoshi Shimizu, Yokohama, all of Japan, assignors to Cannon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 27, 1990, Ser. No. 544,647
Claims priority, application Japan, Jun. 30, 1989, 1-169411; Jun. 30, 1989, 1-169412; Jun. 30, 1989, 1-169413; Dec. 15, 1989, 1-326926; Dec. 15, 1989, 1-326927; Mar. 26, 1990, 2-77654; Apr. 25, 1990, 2-109327
Int. Cl.[5] H04N 1/21
U.S. Cl. 346—108 24 Claims



1. An image recording apparatus, comprising:
non-used sheet stock means for stocking a stack of non-used recording sheets;
feeding means for taking a recording sheet out of said non-

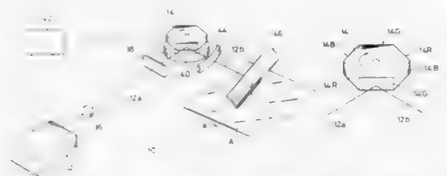
used sheet stock means and feeding the recording sheet to a recording position, the recording sheet being transported at a constant speed while at the recording position;
recording means for recording an image on the recording sheet at said recording position; and
recorded sheet stock means for stocking recorded recording sheets,
wherein said non-used sheet stock means and said recorded sheet stock means are arranged substantially in parallel, said recording position is disposed above said non-used sheet stock means and said recorded sheet stock means, a transport path for the recording sheet being recorded is arranged so as to almost surround at least one of said stock means, and the recording sheet is not in contact with a stack of sheets stocked in said non-used sheet stock means or a stack of sheets stocked in said recorded sheet stock means during a recording operation.

5,151,714

COLOR IMAGE RECORDING APPARATUS

Yoshiharu Okino, and Yoji Okazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 29, 1990, Ser. No. 529,404
Claims priority, application Japan, May 26, 1989, 1-134415
Int. Cl.[5] H04N 1/21
U.S. Cl. 346—108 **10 Claims**



1. A color image recording apparatus for recording a full color image by sequentially defining different scanning lines respectively corresponding to three primary colors on a material to be recorded by means of a laser beam deflected in a scanning direction, wherein the apparatus includes:
a laser light source capable of simultaneous emission of laser beams associated with exposure to red, green and blue light,
a light deflector for said laser beams having at least one reflecting face, and
means for selectively reflecting said laser beams, which changes the spectral characteristics of reflection of said laser beams in a sequential cycle defining scanning lines corresponding to the three primary colors, in order to choose the color to be recorded on the material.

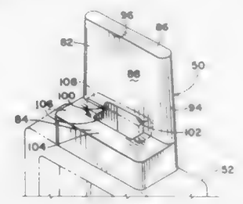
5,151,715

PRINTHEAD WIPER FOR INK-JET PRINTERS

Jefferson P. Ward, Brush Prairie; J. P. Harmon; Kris M. English, both of Vancouver, all of Wash., and Kenneth L. Christensen, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 30, 1991, Ser. No. 737,629
Int. Cl.[5] B41J 2/165
U.S. Cl. 346—140 R **19 Claims**

1. A unitary wiper for a printhead on a print cartridge in an ink-jet printer, said wiper being made from an elastomeric material and comprising:
a substantially planar beam having a pair of opposed substantially planar surfaces each of which terminates in a wiping edge at a first end of said beam and at a base at a second end of said beam; and



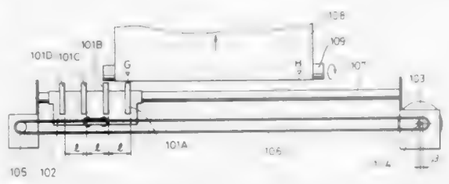
a slot formed in said beam, said slot extending into said beam from said second end and from one of said planar surfaces to the other.

5,151,716

RECORDING APPARATUS FOR COMPENSATING FOR ECCENTRICITIES IN DRIVE FORCE TRANSMISSION MEANS

Shinji Kanemitsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,591
Claims priority, application Japan, Feb. 26, 1990, 2-042514
Int. Cl.[5] G01D 15/24
U.S. Cl. 346—140 R **11 Claims**



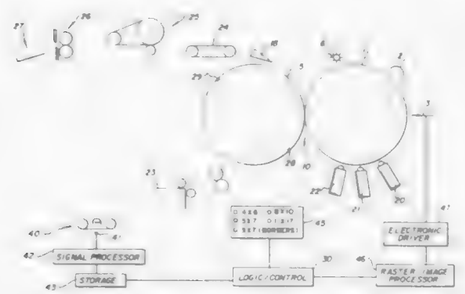
1. A recording apparatus for performing recording on a recording medium, said recording apparatus comprising:
a plurality of recording heads each for conducting recording on the recording medium;
a carriage for mounting said plurality of recording heads at predetermined spacings;
a motor for generating a driving force; and
driving force transmission means for transmitting the driving force from said motor to said carriage to move said carriage in a predetermined direction, said driving force transmission means being movable in transmission periods or fractions thereof, one transmission period corresponding to one period of movement of said transmission means beginning with a reference position and returning to the reference position,
wherein the spacings between said plurality of recording heads are made substantially equal either to a distance through which said plurality of recording heads are moved in one transmission period of said driving force transmission means or to an integral multiple of said distance.

5,151,717

IMAGING METHOD AND APPARATUS USING DISCRETE RECEIVING SHEETS

Fereidoon S. Jamzadeh, Fairport; Arun Chowdry, Pittsford, and Kevin M. Johnson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 533,237, Jun. 4, 1990, Pat. No. 4,994,827. This application Feb. 4, 1991, Ser. No. 651,844
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] G03G 15/01, 21/00; B41B 17/00
U.S. Cl. 346—157 **4 Claims**



1. A method of producing a plurality of reproductions from one or more originals, said method comprising:
forming an electrostatic image having a first size on an image member,
applying toner to said electrostatic image to form a toner image, and transferring said toner image to an intermediate transfer member and then transferring said toner image from said intermediate transfer member to a discrete receiving sheet having a leading edge and a trailing edge,
characterized in that said forming step includes forming said large size electrostatic image as an array of smaller images being formed from one of said originals, and said method further includes the step of cutting said receiving sheet according to the position of toner images transferred thereto corresponding to said smaller electrostatic images.

5,151,718

SYSTEM AND METHOD FOR SOLID STATE ILLUMINATION FOR DMD DEVICES

William E. Nelson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1990, Ser. No. 636,651
Int. Cl.[5] G01D 15/14
U.S. Cl. 346—160 **41 Claims**

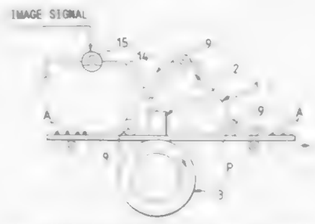
13. A xerographic printer comprising:
a spatial light modulator device operable to modulate light impacting a surface of said device wherein said device includes a plurality of individually controlled cells;
a plurality of individual solid state light emitting elements arranged in a unitary structure and focused on said spatial light modulator device; and
a receptor for receiving light from selected ones of said individually controlled cells.

5,151,719

DEVICE FOR THERMALLY FUSING AN UNFUSED IMAGE ON AN IMAGE HOLDING MEMBER

Eiichi Akutsu; Yoshio Shoji; Hiroo Soga, and Shigehito Ando, all of Kanagawa, Japan, assignors to Fuji Xerox Co, Ltd., Tokyo, Japan

Filed Aug. 19, 1991, Ser. No. 746,722
Claims priority, application Japan, Sep. 5, 1990, 2-233358
Int. Cl.[5] G01D 15/06
U.S. Cl. 346—160.1 **11 Claims**



1. An image fusing device for thermally fusing an unfused image formed of a colored image forming material mainly made of thermoplastic resin on an image holding member, said image fusing device comprising:
heating means pressable against the image holding member carrying the unfused image, for heating the unfused image;
power supply means, including a contact electrode part disposed in a width direction of the heating means, for supplying electric energy to the heating means, said contact electrode part including a plurality of divisional electrodes divided in the width direction of the heating means;
control means connected to the power supply means, for controlling the amounts of the electric energies to be supplied to the plurality of divisional electrodes, respectively, in accordance with an image signal used for forming the unfused image on the image holding member; and
pressurizing means disposed opposite the heating means with the image holding member interposed therebetween, for providing a pressure contact between the contact electrode part of the power supply means and the image holding member.

5,151,720

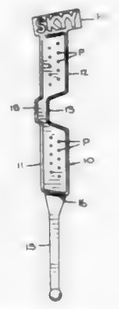
CONVERTIBLE SWIZZLE STICK

Maurice S. Kanbar, 4 E. 77th St., New York, N.Y. 10021

Filed Oct. 19, 1990, Ser. No. 600,596
Int. Cl.[5] G02C 7/16
U.S. Cl. 351—46 **7 Claims**

1. A swizzle stick which is convertible into a lensless ophthalmic device comprising:
(a) a generally flat rectangular elongated strip section having a nose piece notch at its midsection to define a pair of like rectangular eyepieces joined to a nose piece, and a short lorgnette handle extending from one of the eyepieces, said eyepieces each having a pattern of pin holes adapted to project a clear image of an object being viewed by a related eye of a user; and
(b) a swizzle shank extending from and in the same plane as the other eyepiece whereby in a swizzle stick mode, the strip section functions as a long handle for the stick, the

swizzle shank being connected to the strip section by a junction of reduced thickness so that in an ophthalmic



device mode the shank may be broken off to transform the stick into an ophthalmic device

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5,151,721

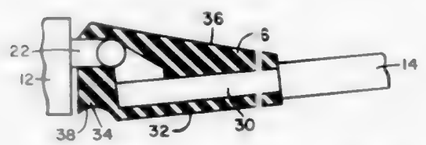
COMPRESSION JOINT FOR EYEGLASSES

Stephan C. Allendorf, Hoboken, N. ., and Thomas M. Dair, Valley Cottage, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 523,369, May 15, 1990, abandoned. This application Mar. 2 , 1991, Ser. No. 670,613

Int. Cl.[5] G02C *5/14, 5/22*

U.S. Cl. 351—121 14 Claims



1. In an eyeglass assembly embodying a lens frame and temples, and hinge systems connecting the lens frame to the temples, the temples being so hinged to the frames that the inner ends of the temples are spaced from the outer edges of the frame, a compression joint carried by each temple, the compression joint being composed of a sleeve portion fitted over the inner end of a temple, and a resiliently compressible portion at one end of the sleeve, the resiliently compressible portion being of greater thickness than the wall of the sleeve and having a vertical chamfer at its outer edge, the resiliently compressible portion occupying the space between the frame and the temple as the temple is opened so that the temple may swing beyond the normal stop-limiting position and will be biased toward a partially closed position, whereby one size eyeglass assembly fits a plurality of head sizes.

5,151,722

VIDEO DISPLAY ON SPECTACLE-LIKE FRAME

Robert W. Massof, Baltimore, Md.; Donald C. O'Shea, Atlanta, Ga., and Thomas W. Rassch, Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 5, 1990, Ser. No. 609,243

Int. Cl.[5] G02C *1/00, 11/00*

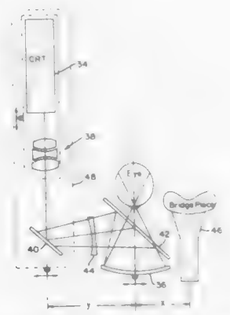
U.S. Cl. 351—158 22 Claims

1. A head mounted video display comprising:

a goggle like frame having side arms adapted to run alongside the users head;

a curved mirror secured to said frame and adapted to be positioned in front of a user's eye to relay and focus a video image onto the retina;

a small video display positioned in said side arm for generating a video image; and,



folding optics means for placing a magnified intermediate image of said video display into the focal plane of the curved mirror, so that an image of said video display subtending a large visual angle will be focused on the user's retina.

5,151,723

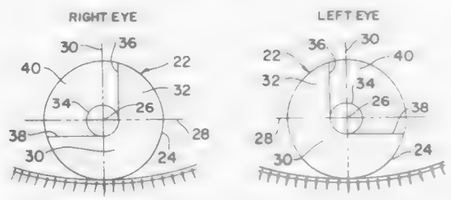
MULTIFOCAL CONTACT LENS

Akira Tajiri, 1630 Eleventh St., Reedley, Calif. 93654

Continuation of Ser. No. 336,122, Apr. 11, 1989, abandoned. This application Dec. 20, 1991, Ser. No. 810,569

Int. Cl.[5] G03B *21/46*

U.S. Cl. 351—161 21 Claims



1. A multifocal contact lens comprising:

a generally spherical lens body having,

a generally convex outer surface,

a generally concave inner surface operable to conform to the corneal curvature of an eye, and

the lens body includes an optical center point and a horizontal axis and a vertical axis which intersect through the optical center point of the lens body said axes being horizontal and vertical in the sense of the lens being worn on the eye of a patient in a generally erect posture;

at least one near vision prescriptive value fashioned onto a portion of the surface of said lens body and extending superiorly and inferior with respect to said horizontal axis and in the superior portion asymmetrically in a nasal direction with respect to the vertical axis and in the inferior temporal portion asymmetrically in the inferior direction with respect to the horizontal axis;

at least one far vision prescriptive value fashioned onto the remaining portion of the surface of said lens body, said remaining portion having the far vision prescriptive value including at least the optical center point of said lens body and the superior and temporal portions of the lens body with respect to the horizontal and vertical axis respectively.

5,151,724

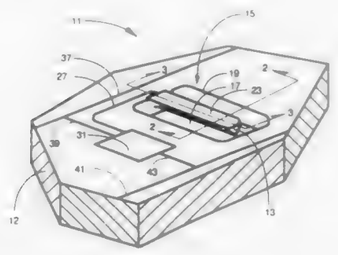
DYNAMIC HOLOGRAPHIC DISPLAY WITH CANTILEVER

Dan Kikinis, 3945 Freedom Cir., Ste. 320, Santa Clara, Calif. 95054

Filed Jan. 30, 1991, Ser. No. 648,152

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 13 Claims



1. A cell for a dynamic holographic display comprising:

cantilever means extending from a base structure, said cantilever means having a root end adjacent said base structure and a free end opposite said root end, said cantilever means comprising substantially electrically semi-conductive material;

an electrically non-conducting film extending from the root end of said cantilever means for a portion of the length of said cantilever means;

an electrically conductive and light reflecting film overlying said electrically nonconductive film, making electrical contact with the electrically semi-conductive material of said cantilever means away from the root end;

control means for supplying an electrical current to said cantilever means and for controlling said current; and

electrical connection means for connecting said control means to said electrically conductive and light reflecting film, such that said electrical current passes through said electrically conductive and light reflecting film away from said free end, into said cantilever means, and through the material of said cantilever means back to said base structure, said current causing heating of said cantilever means such that said cantilever means deforms, moving said electrically conductive and light-reflective film as a controllable light-reflective element of said holographic display.

5,151,725

APPARATUS AND METHOD FOR EDITING FILM

Gordon E. Liljegren, Burbank, and David S. Inglish, La Crescenta, both of Calif., assignors to The Walt Disney Company, Burbank, Calif.

Filed Jan. 8, 1991, Ser. No. 638,635

Int. Cl.[5] G03B *21/00*

U.S. Cl. 352—129 22 Claims

1. A film editing machine, comprising:

film transport means for providing a film pathway;

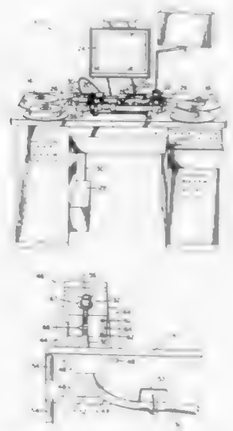
a light source that produces an illuminating light;

light transmitting means for receiving light from the light source transmitting the light while shifting the color temperature of the light;

optical transmission means for receiving the shifted light from the light transmitting means, further shifting the color of the light to a predetermined range, and directing it across the film pathway for producing a projected image; and

a viewing screen that can display the projected image;

wherein the light source is remotely mounted from the optical transmission means and the light transmitting means comprises a light guide that receives light from the light source at a first guide end and transmits that light to



a second guide end adjacent the optical transmission means.

5,151,726

CAMERA OR PRINTER CAPABLE OF AUTOMATICALLY CHANGING PRINT SIZE

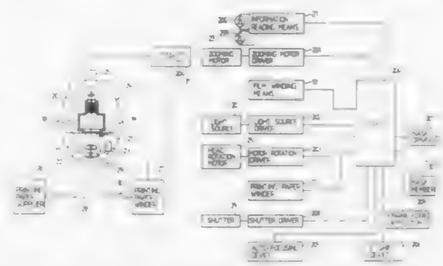
Tomonori Iwashita, Yokohama; Akira Egawa, Machida, and Yoshiaki Sugiyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1989, Ser. No. 349,531

Claims priority, application Japan, May 9, 1988, 63-113271; May 9, 1988, 63-113272; May 9, 1988, 63-113273; May 9, 1988, 63-113274

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—75 16 Claims



1. A photographic print control system comprising:

a camera which comprises:

(a) setting means for setting a size of an area to be printed on a recording medium;

(b) recording means for recording information pertaining to the set size, wherein said recording means comprises an optical recording means; and

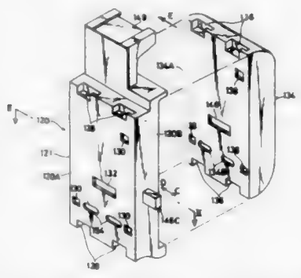
(c) cancelling means for cancelling the information recorded by said recording means; and

a printing apparatus which comprises:

(a) reading means for reading the information recorded by said recording means; and

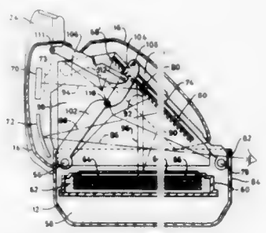
(b) printing means for printing a photographed image in the set size in response to the information read by said reading means.

5,151,72
BATTERY COUPLER
Hidemi Sasaki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 15, 1990, Ser. No. 597,222
Claims priority, application Japan, Oct. 17, 1989, 1-269860; Oct. 18, 1989, 1-271253; Dec. 19, 1989, 1-328750; Sep. 12, 1990, 2-139989
Int. Cl.[5] G03B 7/26, 15/03; H04N 5/225
U.S. Cl. 354—76 8 Claims



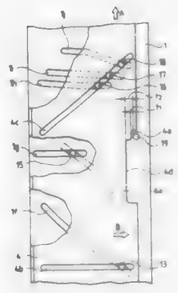
1. A battery coupler mountable to a battery mounting portion of a video tape recorder integral with a camera and allowing mounting of a camera battery thereto, said battery coupler comprising:
a means for electrically connecting said camera battery with said video tape recorder integral with a camera; and,
a holding means including a receiving portion to be in contact with a lower surface of box-type accessories and a press-down portion to be in contact with an upper surface of said box-type accessories for holding said box-type accessories between said receiving and press-down portions.

5,151,723
6-BAR ERECTING SYSTEM
Donald H. Hendry, Rockland; Bruce K. Johnson, Andover; Joanne M. Krawczyk, Dracut, and Bruce C. Vierstra, Rockport, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Aug. 1, 1991, Ser. No. 739,320
Int. Cl.[5] G03B 17/50
U.S. Cl. 354—83 12 Claims



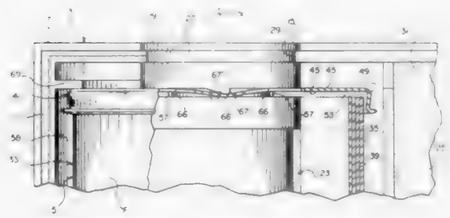
1. A compact folding camera comprising:
means for defining a film plane
a first housing section including means for supporting a film unit at said film plane;
a second housing section mounting an objective lens, said second housing section being pivotally attached to said first housing section for movement between an operative erect position and an inoperative folded position overlying said film plane;
a mirror assembly, including a mirror, pivotally attached to said first housing section for movement of said mirror between an operative erect position and an inoperative folded position wherein said mirror overlies said film plane; and
an erecting system for coordinating the movement of said second housing section and said mirror between their said erect and folded positions comprising a first link and a second link with each of said links having a distal end and a proximal end and with each of said links being pivotally attached to one another at their said distal ends, with a proximal end of said first link being pivotally attached to said first housing section and with a proximal end of said second link being pivotally attached to said mirror assembly, and a third link having an end thereof pivotally attached to said second housing section and another end pivotally attached to said second link intermediate of its said distal and proximal ends, whereby said erecting system coordinates the movement of said second housing member and said mirror assembly such that they are precluded from physically interfering with one another when manually actuated between their said erect and folded positions.

5,151,729
ZOOM LENS BARREL
Toru Takayama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Apr. 8, 1991, Ser. No. 681,780
Claims priority, application Japan, Apr. 10, 1990, 2-37711[U]
Int. Cl.[5] G03B 1/18
U.S. Cl. 354—195.12 1 Claim



1. A zoom lens barrel comprising:
a plurality of lens groups;
a fixed barrel having integrally and securely a mount portion for mounting said zoom lens barrel on a camera body;
a zoom operation ring which is moved along an optical axis relative to said fixed barrel and causes lens groups associated with zooming to shift along the optical axis so as to execute a zooming action;
a focus operation ring which is rotatably supported by said zoom operation ring and is moved with said zoom operation ring along the optical axis, and causes lens groups associated with focusing to shift along the optical axis through its own rotation so as to execute a focusing action;
a cam ring which, during the focus action cooperates with said focus operation ring and is moved along the optical axis relative to said fixed barrel to thereby shift lens groups associated with the focusing along the optical axis, and during the zooming action interlocks with said zoom operation ring to rotate to thereby shift the lens groups associated with the zooming along the optical axis;
a first nearest photographing distance limit mechanism provided between said focus operation ring and said zoom operation ring, the mechanism restraining rotation of said focus operation ring during the focus action so as to restrict a backward shift of said cam ring, thereby restricting a backward shift of the lens groups associated with the focusing; and
a second nearest photographing distance limit mechanism including a limit member provided on said fixed barrel and an abutment surface, adapted to abut with said limit member, provided on said cam ring, the mechanism restraining a backward shift of said cam ring through an abutment of said limit member with said abutment surface during the focusing action, thereby restricting a backward shift of the lens groups associated with the focusing;
wherein within a specified focal length range the rotation of said focus operation ring is restrained by said second limit mechanism before said first limit mechanism acts, and in a focal length range other than said specified range the rotation of said focus operation ring is restricted by said first limit mechanism.

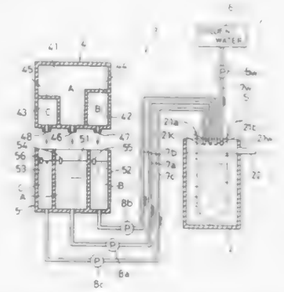
5,151,730
FILM CASSETTE
David B. Kemp, Fairport; Christopher P. McCormick, Rochester, and Mark D. Fraser, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 15, 1991, Ser. No. 655,944
Int. Cl.[5] G03B 17/26
U.S. Cl. 354—275 2 Claims



1. A film cassette wherein a film spool comprises (a) a spool core supported for rotation in an unwinding direction to thrust a leader section of a film roll coiled about said spool core to the exterior of said cassette, (b) a pair of flanges radially confining said film roll and loosely coupled coaxially with said spool core normally to permit the spool core to be rotated relative to said flanges in the unwinding direction, and (c) engagement means rotatably fixed to said spool core for rotation with the spool core relative to said flanges in the unwinding direction to move into engagement with one of the flanges to make said one flange rotate in unity with the spool core in the unwinding direction, is characterized in that:
said one flange is resiliently flexible; and
biasing means is positioned to distort said one flange for urging the one flange firmly against said engagement means to ensure the engagement means will engage the one flange when said spool core is rotated relative to said flanges in the unwinding direction.

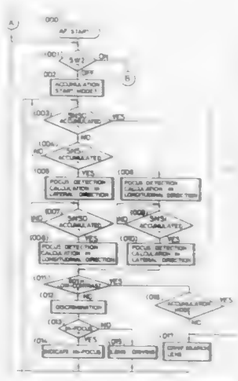
5,151,731
PROCESSING SOLUTION REPLENISHMENT
Minoru Yamada, Minami-ashigara, and Takashi Toyoda, Hatano, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 19, 1990, Ser. No. 600,365
Claims priority, application Japan, Oct. 20, 1989, 1-273304
Int. Cl.[5] G03D 3/02
U.S. Cl. 354—324 17 Claims

1. A method for replenishing a processing solution having a plurality of partial stocks diluted with a diluent to a processing tank, comprising the steps of:
providing a cartridge having discrete compartments partitioned therein and filled with the partial stocks in amounts corresponding to a desired mix proportion of the partial stocks,
transferring the partial stocks from the cartridge compartments into discrete compartments partitioned in a storage tank, respectively, and



delivering the partial stocks from the tank compartments in amounts corresponding to the desired mix proportion of the partial stocks to the processing tank along with the diluent.

5,151,732
AUTOMATIC FOCUSING APPARATUS
Akira Akashi, and Terutake Kadohara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 400,924, Aug. 30, 1989. This application Aug. 5, 1991, Ser. No. 742,475
Claims priority, application Japan, Aug. 31, 1988, 63-216903; Aug. 31, 1988, 63-216904
Int. Cl.[5] G03B 13/36
U.S. Cl. 354—402 16 Claims



1. A focus detection apparatus comprising:
a plurality of accumulation-type sensor sections for respectively receiving light from different areas, each said sensor section starting a signal accumulation operation in response to a first signal;
a monitor circuit for independently monitoring a signal accumulation state of each said sensor section, said monitor circuit outputting a second signal when the accumulation state of said each sensor section reaches a predetermined state;
a reading circuit for supplying said second signal to a said sensor section which has reached said predetermined

state, the said sensor section to which said second signal is supplied outputting the accumulated signal before another said sensor section outputs its accumulated signal; and

a signal processing circuit for receiving said accumulated signal from the said sensor section to which said reading circuit output said second signal, and for starting a focus calculation, whereby, if the accumulation state of the said sensor section reaches the predetermined state, the focus calculation is performed based on the accumulated signal of the said sensor section even if the accumulation operation of other said sensor section is still being performed.

5,151,733

APPARATUS AND METHOD FOR COPYING PHOTOGRAPHIC MASTERS AT VARIABLE MAGNIFICATIONS

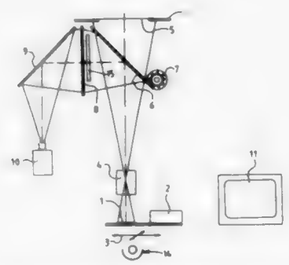
Günter Findeis, Sauerlach; Friedrich Jacob, Munich, and Eberhard Schulz, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,891

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1990, 4031111

Int. Cl.[5] G03B *13/28*

U.S. Cl. 355—45 **20 Claims**



1. A copier, particularly a photographic copier, comprising means for supporting a master to be reproduced at a predetermined location; means for directing light along a first path, which includes said predetermined location, in a direction towards the latter; means for deflecting light from said first path into a second path, said deflecting means being movable between an operative position in said first path downstream of said predetermined location and an inoperative position out of said first path; means in said second path for forming an image of the master; means for displaying the image at a second location removed from said second path; and means for positioning copying material in said first path adjacent to a predetermined plane.

5,151,734

PROCESS CARTRIDGE DETACHABLY MOUNTABLE TO IMAGE FORMING APPARATUS FEATURING A PERIPHERALLY SUPPORTED IMAGE BEARING DRUM

Tadayuki Tsuda, Kawasaki; Kazushi Watanabe, Yokohama; Isao Ikemoto, Kawasaki, and Shinichi Sasaki, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,563

Claims priority, application Japan Sep. 16, 1989, 1-238382

Int. Cl.[5] G03G *15/00*

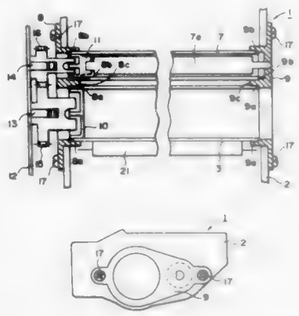
U.S. Cl. 355—200 **24 Claims**

1. A process cartridge detachably mountable to an image forming apparatus, comprising:

an image bearing member;

process means actable on said image bearing member;

a frame for supporting said process means; and



supporting means mounted on said frame for rotatably supporting an outer periphery of said image bearing member.

5,151,735

SHEET STORING APPARATUS WITH A PLURALITY OF TRAYS

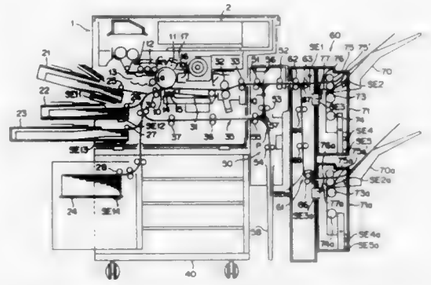
Hiroki Yamashita, Okazaki, and Kiyoshi Emori, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1991, Ser. No. 734,962

Claims priority, application Japan, Jul. 26, 1990, 2-200060

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—207 **16 Claims**



1. A sheet storing apparatus for stacking sheets discharged from an image forming machine and storing the sheets therein, the sheet storing apparatus comprising:

a plurality of sheet storing means each of which has driving means to enable independent sheet storing operation and a tray on which sheets are stacked, said driving means including a mechanism for moving the tray horizontally at predetermined intervals;

detection means for detecting failure in the sheet storing operation of each of the sheet storing means; and

control means for, when the detection means detects failure in the sheet storing operation of one of the sheet storing means, controlling another sheet storing means which is operative normally to move the tray thereof horizontally and to stack successive sheets on the tray.

5,151,736

IMAGE FORMING APPARATUS WITH CONTROLLED TRANSFER VOLTAGE

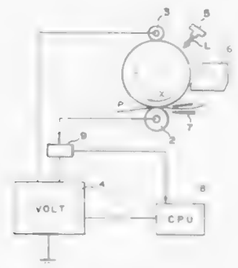
Yukihiro Ohzeki; Junji Araya; Tatsunori Ishiyama, all of Yokohama; Yasushi Sato, and Kimio Nakahata, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 515,871, Apr. 27, 1990, abandoned. This application Apr. 8, 1991, Ser. No. 682,404

Claims priority, application Japan, Apr. 28, 1989, 1-107415

Int. Cl.[5] G03G *15/16, 15/00*

U.S. Cl. 355—208 **39 Claims**



1. An image forming apparatus, comprising:

a movable image bearing member;

an image forming means for forming an image on said image bearing member;

an image transfer charging member contactable to a back side of a transfer material at an image transfer position for effecting transfer of an image from said image bearing member to the transfer material;

constant current control means for constant current controlling current through said image transfer charging member when there is no transfer material in the transfer position; and

determining means for determining a charging voltage for application to said image transfer charging member, said determining means determines the charging voltage in accordance with a voltage produced during the constant current control by said constant current control means, wherein a voltage or current applied to said image transfer charging member during an image transfer operation is limited within a predetermined range.

5,151,737

PHOTOCONDUCTIVE DRUM HAVING EXPANDABLE MOUNT

Kevin M. Johnson, and Michael S. Kowalczyk, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,215

Int. Cl.[5] G03G *15/00, 21/00*

U.S. Cl. 355—211 **9 Claims**

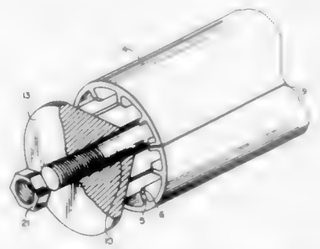
1. A photoconductive drum comprising:

a flexible photoconductive loop which may have opposite ends which differ in internal circumference,

an expandable mount for said loop, said mount including a generally cylindrical-shaped shell having an axis of rotation, opposing open ends and a slit between the ends, said slit permitting expansion of said shell,

a pair of wedges mounted radially closer to said axis than said shell,

means for exerting a force on said wedges tending to change the axial distance between said wedges, said wedges and said shell having cooperative cam surfaces which convert said force to a cooperative pair of forces sufficient to expand opposite ends of said shell to conform separately the ends of the shell to any conicity of the loop caused by



a difference in internal circumference of the opposite ends of the loop.

5,151,738

DEVICE FOR CONVEYING DEVELOPER IN A DEVELOPING DEVICE

Shinichi Takemoto, Toyokawa; Hirofumi Hasegawa, Hadano; Naoki Toyoshi, Toyohashi; Tateki Oka, Atsugi; Hiroshi Goto, and Narutaka Yoshida, both of Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1991, Ser. No. 721,308

Claims priority, application Japan, Jun. 27, 1990, 2-169606

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 **16 Claims**

1. A developing device for developing an electrostatic latent image formed on an electrostatic latent image support member, comprising:

developer supplying means for supplying a developer to said electrostatic latent image support member;

a developer containing portion containing the developer to be supplied to said developer supplying means;

a rotating member which is rotated about an axis of rotation in said developer containing portion;

a conveying member attached to an end of said rotating member in the radial direction of the axis of rotation for conveying the developer above the bottom part of the developer containing portion to said developer supplying means with the developer in the bottom part of the developer containing portion being left; and

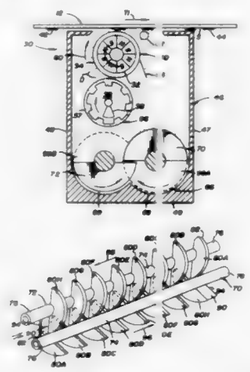
an agitating member attached to an end of the rotating member on the opposite side of said conveying member in the radial direction of the axis of rotation for agitating in the developer containing portion the developer remaining in the bottom part of the developer containing portion without being conveyed by the conveying member.

5,151,739

DEVELOPMENT APPARATUS AND IMPROVED AUGER DEVICE FOR USE THEREIN

Edwin A. Hediger, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1991, Ser. No. 737,304
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 15 Claims



1. A single piece auger device for use in a development apparatus of an electrostatographic reproduction machine to move, mix and triboelectrically charge developer material, the single piece auger device comprising:

(a) a rigid round shaft having a first end and a second end for mounting in a development apparatus housing;

(b) a plurality of semi-elliptical blade members for moving developer material longitudinally relative to said shaft, said plurality of semi-elliptical blade members being formed integrally with said shaft so as to require no blade-member-to-shaft assembly, said plurality of semi-elliptical blade members including a first blade member adjacent said first end of said shaft, and a last blade member towards said second end of said shaft, and each semi-elliptical blade member of said plurality of blade members extending radially relative to a longitudinal axis of said shaft;

(c) a cross-transfer member for moving developer material radially relative to said shaft, said cross-transfer member being formed connected to, and integrally with, said last blade member, and said cross transfer member extending longitudinally relative to said shaft from said last blade member to a mounting point adjacent said second end of said shaft so as to eliminate a dead spot in developer material movement from a longitudinal to a radial direction relative to said shaft.

5,151,740

IMAGE FORMING APPARATUS CAPABLE OF AUTOMATIC CONTROL OF DEVELOPER DENSITY

Hitoshi Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1991, Ser. No. 691,403
Claims priority, application Japan, Apr. 27, 1990, 2-114858
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 9 Claims

1. An image forming apparatus comprising:

means, detachably mounted on the image forming apparatus, for supplying a developer to the image carrier to develop a latent image formed on the image carrier;

a process unit detachably mounted on the image forming apparatus and containing the image carrier and developing apparatus;

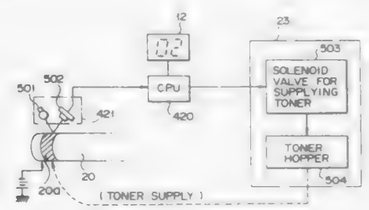
light generating means for generating a light to radiate the developer supplied on the image carrier by the supplying means;

means for discriminating whether or not a new process unit for forming the image has been mounted in the main body of the image forming apparatus;

means for generating a pulse signal to control the amount of the light generated by the light generating means, only when a discriminating means discriminates that a new process unit has been attached to the main body;

means for detecting the density of the developer supplied to the image carrier by detecting the light radiated onto the image carrier by the light generating means;

voltage generating means for generating a voltage value



corresponding to the density of the developer detected by the detecting means;

means for changing the pulse width of the pulse signal generated by the pulse signal generating means in accordance with the voltage value generated by the voltage generating means;

means for controlling the supplying means to make the density of the developer supplied to the image carrier at a predetermined density value respond to the voltage value generated by the voltage generating means; and

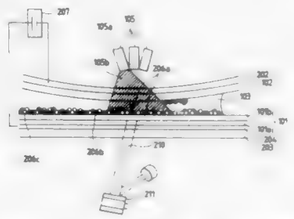
means for storing the pulse width of the pulse signal changed by the changing means when the density of the developer detected by the detecting means is the predetermined density value.

5,151,741

ELECTROPHORETIC IMAGING DEVICE

Toshiaki Kakutani; Nobuyuki Yanase; Hitoshi Fukushima, and Toshiya Takahata, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed May 9, 1991, Ser. No. 697,387
Claims priority, application Japan, May 14, 1990, 2-123283; Oct. 18, 1990, 2-279796; Oct. 18, 1990, 2-279797; Apr. 11, 1991, 3-79264
Int. Cl.[5] G03G *15/04, 15/10, 17/04*
U.S. Cl. 355—257 3 Claims



1. An electrophoretic imaging device, comprising:

an electrosensitive layer;

an insulating body being arranged to confront said electrosensitive layer, said electrosensitive layer and said insulating body allowing a developing solution to be filled therebetween said developing solution being prepared by dispersing at least two kinds of electrosensitive toners into an insulating solvent;

means for applying a voltage between said electrosensitive layer and said insulating body;

means for irradiating said developing solution with a toner selection light, said toner selection light causing at least one kind of said electrosensitive toner to be selectively sensitized; and

electrosensitive layer exposing means for causing image data to be photosensitively written to said electrosensitive layer;

wherein said electrosensitive layer comprises a photoelectric charge generating layer and a light-shielding layer, said light-shielding layer being arranged closer to said insulating body than said photoelectric charge generating layer; and

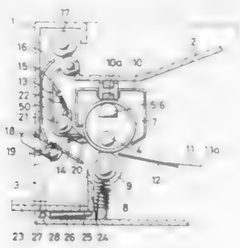
wherein said light-shielding layer of said electrosensitive layer comprises an electric charge transferring layer having a light-shielding property.

5,151,742

FIXING DEVICE SHEET GUIDE APPARATUS

Yasuyoshi Yamaguchi, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 611,294
Claims priority, application Japan, Nov. 22, 1989, 1-135613[U]
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 3 Claims



3. A sheet guide apparatus comprising:

a rotatable fixing roller having heating means;

a rotatable pressure roller pressed upwardly against said fixing roller so that a sheet may be ejected from between said fixing roller and said pressure roller;

a substantially vertically extending resilient leaf having an upper edge thereof brought into contact with the outer peripheral surface of said pressure roller on the sheet delivery side and extending downwardly; and

a sheet receiving unit for receiving an ejected sheet, said sheet receiving unit having an open top and having a rear end connected to a lower portion of said resilient leaf and having a bottom face extending in a direction in which sheet is to be delivered.

5,151,743

IMAGE FORMING APPARATUS HAVING FLASH LIGHT FIXING APPARATUS WITH IMPROVED HEAT CHARACTERISTICS

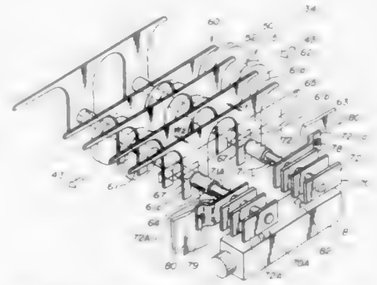
Masanori Yaguchi, Oyama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 7, 1991, Ser. No. 637,774
Claims priority, application Japan, 2-10399
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—288 11 Claims

1. An image forming apparatus having a flash light fixing apparatus with improved heat characteristics, comprising a flash light fixing unit to radiate a flash light onto paper to which toner has been transferred, and a paper feed apparatus provided opposite the flash light fixing unit

said paper feed apparatus comprising a paper feed mechanism and a paper guide mechanism that guides paper that is fed by said paper feed mechanism,

said paper guide mechanism comprises a plurality of metal plates vertically disposed, so that edge surfaces thereof are



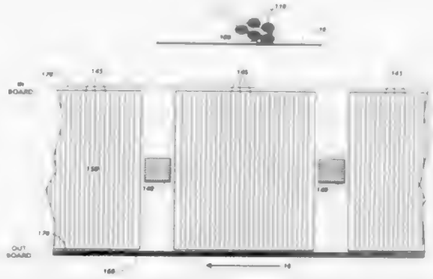
opposite said flash light fixing unit and are arranged so as to extend in the same direction as the direction of said paper feed, said edge surfaces of said metal plates guiding the paper.

5,151,744

CLEANER BRUSH RETONE FILM CONTROL

Douglas A. Lundy, Webster; Kip L. Jugle, Rochester; Daniel W. MacDonald, Farmington; Robin E. Berman, and Carl B. Hurwitch, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 9, 1991, Ser. No. 742,817
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—296 16 Claims



1. A method of replenishing particles of a first polarity in a cleaner brush adapted to contact a photoreceptor used in a printing machine of the type having at least two different color developer units and a sheet feeder for advancing a sheet to a transfer station for transferring an image, having particles of a second polarity opposite in polarity to the first polarity, developed on the photoreceptor to the sheet, comprising the steps of:

de-energizing the sheet feeder, transfer station and one of the developer units;

recording a latent image on the photoreceptor in an image region;

developing the latent image with particles of the first polarity from the other developer unit; and

removing the first polarity particles from the photoreceptor with the cleaning brush so that the first polarity particles adhere to the brush, and, subsequently, removing the second polarity particles from the photoreceptor with the cleaning brush having the first polarity particles adhering

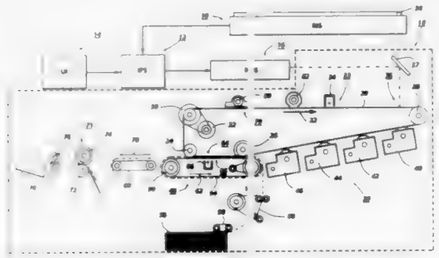
thereto preventing smearing on the photoreceptor and abrading film therefrom.

5,151,745

SHEET CONTROL MECHANISM FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Scott C. Durland, Rochester; James R. Cassano, Penfield; Richard M. Dastin, and Roger M. Swanson, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 5, 1991, Ser. No. 755,466
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—313 8 Claims



1. An apparatus for advancing a sheet in a predetermined path comprising:

means for advancing the sheet in the path;

first means for controlling movement of the sheet while it is being advanced in the path, said first controlling means being in contact with the sheet in a first mode of operation of said first controlling means and being spaced apart from the sheet in a second mode of operation of said controlling means;

second means for controlling movement of the sheet while it is being advanced in the path, said second controlling means being in contact with the sheet in a first mode of operation of said second controlling means and being spaced apart from the sheet in a second mode of operation of said second controlling means;

an intermediate member movable between a first location and a second location, each of said first controlling means and said second controlling means being positioned in one of its respective modes of operation in response to said intermediate member being positioned at its first location and being positioned in the other of its respective modes of operation in response to said intermediate member being positioned at its second location; and

third means for controlling movement of the sheet while it is being advanced in the path, said third controlling means being in contact with the sheet in a first mode of operation of said third controlling means and being spaced apart from the sheet in a second mode of operation of said third controlling means, and further, said third controlling means being positioned in one of its modes of operation in response to said intermediate member being positioned at its first location and being positioned in the other of its modes of operation in response to said intermediate member being positioned at its second location.

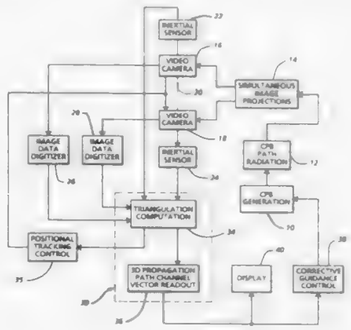
5,151,746

OPTICAL TRACKING OF CHARGED PARTICLE BEAMS

Irving L. Kofsky, Wellesley Hill, and Christian A. Trowbridge, Burlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1991, Ser. No. 677,899
Int. Cl.[5] G01J *1/20*
U.S. Cl. 356—1 13 Claims

1. In a method of optically determining the geometry of a beam propagated along a path remotely spaced from a monitoring platform, the steps of: recording images separately formed by said beam along said path and simultaneously projected to spaced points on the monitoring platform during beam tracking operation; measuring positional orientations of



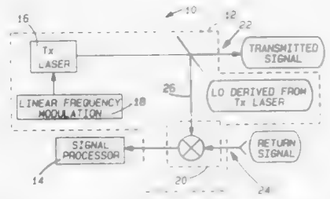
the recorded images at said spaced points relative to the platform; and calculating location and direction of the path in space from the measured orientations during the tracking operation.

5,151,747

LASER RADAR WIRE DETECTION

Charles E. Nourrcier, Lakewood, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 11, 1991, Ser. No. 774,914
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—5 13 Claims



1. A laser radar detection system which discriminates between unresolved and resolved detected objects, said system comprising:

a laser radar sensor for transmitting an optical scanning transmit signal within a desired field and receiving reflected signals from objects located therein;

said laser radar sensor including a photo mixer for receiving both said reflected signals and a local oscillator (LO) signal derived from said transmit signal and providing the difference therebetween as an output signal; and

processing means for receiving the output signal of said photo mixer and discriminating between resolved and unresolved signals detected therein said processing means comprising;

fourier transform means for providing an unweighted fourier transform of the received signal to thereby provide a power spectrum in the frequency domain; and

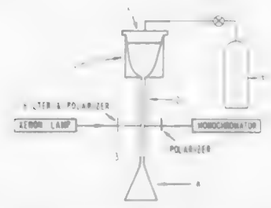
signal processing means for determining whether the power spectrum of said signal contains side lobes representing clutter or does not contain side lobes representing an unresolved object.

5,151,748

OPTICAL SENSOR FOR THE MEASUREMENT OF MOLECULAR ORIENTATION AND VISCOSITY OF POLYMERIC MATERIALS BASED ON FLUORESCENCE RADIATION

Anthony J. Bur, Rockville, Md.; Robert E. Lowry, Falls Church, Va.; Steven C. Roth, Frederick, Md.; Charles L. Thomas, Philadelphia, Pa., and Francis W. Wang, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 7, 1990, Ser. No. 563,762
Int. Cl.[5] G01N *21/64*
U.S. Cl. 356—32 7 Claims



1. A method for measuring fluid properties of a polymer melt undergoing shear or extensional flow which comprises:

incorporating a chromophore into the matrix of a polymer so that said chromophore is responsive to changes in the molecular orientation of said polymer, said chromophore comprises a polymeric chromophore having a polymer backbone and a chromophore bonded to said polymer backbone;

exposing said polymer to fluorescent excitation while subjecting said polymer to shear or extension stress;

detecting fluorescent emission spectra which results from said fluorescent excitation and;

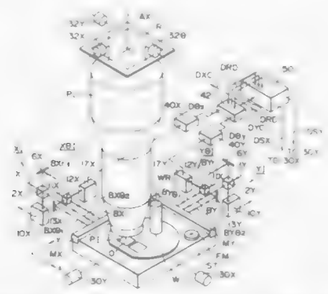
analyzing said fluorescent emission spectra to determine fluid properties of said polymer.

5,151,749

METHOD OF AND APPARATUS FOR MEASURING COORDINATE POSITION AND POSITIONING AN OBJECT

Akikazu Tanimoto, and Saburo Kamiya, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 529,662, May 29, 1990, abandoned.
This application May 28, 1991, Ser. No. 707,925
Claims priority, application Japan, Jun. 8, 1989, 1-145733
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—375 6 Claims



1. A method of measuring a position of a stage moved in a predetermined direction, the stage having a first plane mirror extending in said predetermined direction and a second plane mirror extending in a direction perpendicular to the predetermined direction, comprising the steps of:

(a) measuring a change in the distances to a reflecting surface of said first plane mirror in a direction perpendicular to the reflecting surface by a light wave interferometer;

(b) substantially simultaneously measuring local curving deviations of reflecting surface of said first and second plane mirrors, respectively, and

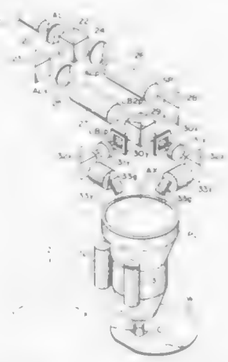
(c) correcting the position of the stage measured with the light wave interferometer on the basis of the measured values of said curving deviations.

5,151,750

ALIGNMENT APPARATUS

Nobutaka Magome, Kawasaki; Kazuya Ota, Tokyo; Hideo Mizutani, Yokohama, and Kouichiro Komatsu, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 6, 1990, Ser. No. 505,504
Claims priority, application Japan, Apr. 14, 1989, 1-94965; Apr. 25, 1989, 1-105198
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—401 13 Claims



1. An apparatus for relative alignment of a first object and a second object, comprising:

an objective optical system having a first side at which said first object is disposed and a second side at which said second object is disposed, and being telecentric at least at said second side;

an illuminating system for providing a first coherent light beam passing through a predetermined area of a pupil plane of said objective optical system, and a pair of second coherent light beams passing through two areas substantially point symmetrical with respect to said predetermined area of the pupil plane;

light receiving means for receiving optical information generated by an alignment mark formed on said second object, through said objective optical system and generating a corresponding output;

switch means for selectively supplying said objective optical system with said first light beam or said second light beams; and

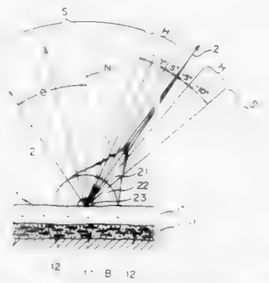
means for causing relative movement of said first and second objects in response to the output of said light receiving means.

5,151,751

METHOD FOR EVALUATING COLOR TONE OF COATING FILM AND DEVICE FOR THIS EVALUATION

Takashi Nakajima, deceased, late of Ashiya by Satoko Nakajima, legal representative, and Misao Morita, Kobe, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 18, 1990, Ser. No. 553,823
Claims priority, application Japan Jul. 19, 1989, 1-186699
Int. Cl.[5] G01J *3/46*; G01N *21/25, 21/27*
U.S. Cl. 356—402 2 Claims



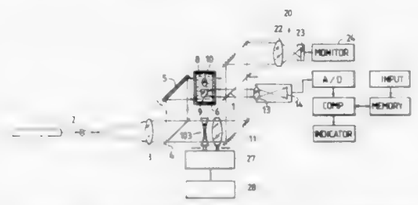
1. A method for evaluation of a color tone of a coating film, comprising the steps of projecting a luminous flux on a coating film, obtaining light reflected from said coating film; the reflected light including a regularly reflected luminous flux, obtaining a high light excitation purity of the coating film on a basis of a high light part of the reflected light which is at an angle of about 10° against the regularly reflected luminous flux in the reflected light, and deriving a transparency feeling and a deepness feeling of the coating film from said high light excitation purity.

5,151,752

METHOD OF MEASURING REFRACTIVE INDICES OF LENS AND SAMPLE LIQUID

Masahiro Oono, and Tohru Chiba, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 609,845, Nov. 7, 1990, abandoned, which is a continuation of Ser. No. 519,355, May 8, 1990, abandoned, which is a continuation of Ser. No. 367,290, Jun. 16, 1989, abandoned. This application May 28, 1991, Ser. No. 707,438
Claims priority, application Japan Jun. 16, 1988, 63-149831; Jun. 27, 1988, 63-158992; Jun. 27, 1988, 63-158993; Jul. 1, 1988, 63-165210; Jul. 1, 1988, 63-165211
Int. Cl.[5] G01B *9/10, 11/00*
U.S. Cl. 356—128 39 Claims



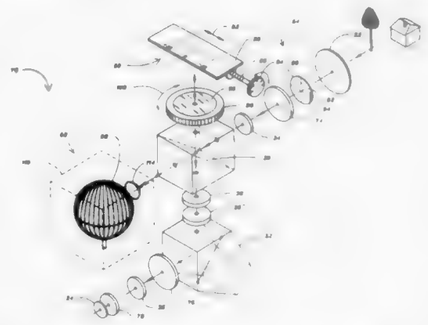
1. A method of measuring a refractive index distribution of a lens, comprising the following steps: immersing a glass sample and a lens under test within a matching fluid whose refractive index differs slightly from that of the lens to be tested, said glass sample having a refractive index and a shape which are both known and said lens to be tested having an unknown refractive index but a known shape allowing coherent light to pass through said glass sample and said lens under test; superposing the transmitted light wave on a reference light wave to generate interference fringes; outputting the intensity distribution of interference fringes that are generated by the light wave that has passed through said glass sample; determining the refractive index of said matching fluid on the basis of the resulting output; outputting the intensity distribution of interference fringes that are generated by the light wave that has passed through said lens under test; separating from the resulting output the defocus term and aberration terms in the polynomial which expresses the produced interference fringes; determining the average refractive index of said lens under test from the separated defocus term and the refractive index of the matching fluid; and determining the refractive index distribution of said lens under test from said aberrations terms.

5,151,753

NON-PARALLAX OPTICAL SIGHTING INSTRUMENT

Hobart A. Whitman, III, 149 Westwood Rd., Asheville, N.C. 28804

Filed Oct. 10, 1990, Ser. No. 595,182
Int. Cl.[5] G01C *1/06, 9/32, 17/08*; B23B *45/14*
U.S. Cl. 356—142 17 Claims



1. An optical sighting instrument comprising:
a main optical path including an objective lens and an eyepiece lens;
a beamsplitter positioned within said main optical path;
at least three image planes being defined with reference to said main optical path and said beamsplitter, at least one of said image planes being optically superimposed with the others of said image planes by said beamsplitter; and
a pair of moveable indicia elements respectively positioned in two of said image planes, and a fixed indicia element positioned in the third of said image planes such that images of all three of said indicia elements are superimposed for viewing through said eyepiece lens, the image of said fixed indicia element serving as a sighting reference.

5,151,754

METHOD AND AN APPARATUS FOR MEASURING A DISPLACEMENT BETWEEN TWO OBJECTS AND A METHOD AND AN APPARATUS FOR MEASURING A GAP DISTANCE BETWEEN TWO OBJECTS

Yoriyuki Ishibashi, Kawasaki; Ryoichi Hirano, Tokyo, and Jun Nishida, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 5, 1990, Ser. No. 593,871
Claims priority, application Japan, Oct. 6, 1989, 1-261568; Feb. 5, 1990, 2-25836
Int. Cl.[5] G01B *11/02*
U.S. Cl. 356—356 33 Claims

1. A method for measuring a displacement between first and second objects facing each other with respect to a direction perpendicular to the direction in which the objects face each other, said first object having at least first and second regions, said second object having at least first and second regions which correspond to the first and second regions of the first object, respectively, said first object having a transmitting surface at least in the first region thereof and a diffraction grating at least in the second region thereof, said second object having a diffraction grating at least in the first region thereof, said diffraction gratings of the first and second objects changing a light beam, which is emitted after being transferred to corresponding regions of the first and second objects, into two-dimensionally distributed diffracted light beams, said method comprising the steps of:
emitting a first light beam having a frequency f1 and a second light beam having a frequency f2 ($f2 \neq f2$) from light source means, which is arranged so as to face the second object, with the first object located between said light source means and said second object;
transferring the first and second light beams to the first and second regions of the first object, and then causing the first and second light beams to be diffracted and interfere

with each other in corresponding regions of the first and second objects, thereby to emit at least two two-dimensionally distributed, diffracted interference light beams, said two diffracted interference light beams including a first diffracted interference light beam which is diffracted only in the first region of the second object, and a second diffracted interference light beam which is diffracted at least in the second region of the first object;
detecting a light beam of a specific order from the first diffracted interference light beam and converting the detected light beam into a first beat signal having a frequency of Δf, where $\Delta f = |f1 - f2|$, and further detecting a light beam of an order identical with or different from said specific order, from the second diffracted interference light beam and converting the detected light beam into a second beat signal having said frequency (Δf); and
calculating a phase difference between the first and second beat signals and deriving the displacement between the first and second objects from the calculated phase difference.

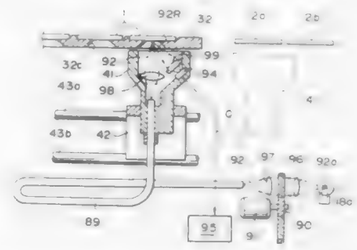
5,151,755

METHOD FOR DETECTING DEFECTS IN MEASUREMENT MEANS OF BIOCHEMICAL ANALYSIS APPARATUSES

Shunichi Seto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 16, 1990, Ser. No. 567,569
Claims priority, application Japan, Aug. 16, 1989, 1-211085
Int. Cl.[5] G01N *21/25*
U.S. Cl. 356—414 13 Claims

1. A method for detecting defects in a measurement means of a biochemical analysis apparatus wherein a droplet of liquid sample is applied to an analysis medium containing a reagent, which chemically reacts with a specific constituent in the liquid sample, the analysis medium is then incubated, the optical densities of the analysis medium are determined, and concentrations of the specific constituent in the liquid sample are determined from the optical densities of the analysis medium thus determined,
the method for detecting defects in the measurement means of the biochemical analysis apparatus comprising the steps of:



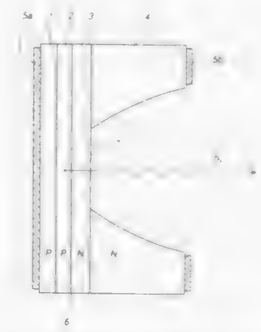
(a) irradiating light, which has passed through a plurality of interference filters by turns, to a reference density plate at predetermined time intervals,
(b) measuring amounts of light reflected by said reference density plate,
(c) comparing a set of the amounts of light reflected, which have thus been measured, with one another, and
(d) detecting defects in the measurement means from the results of the comparison.

5,151,756

SURFACE EMITTING HETEROJUNCTION LIGHT EMITTING DIODE

Hans K. Nettelbladt, Bromma, and Karl M. Widman, Kungsängen, both of Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Jul. 18, 1991, Ser. No. 731,776
Claims priority, application Sweden, May 8, 1991, 9101395
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 11 Claims



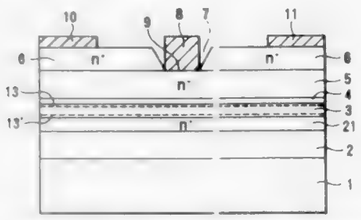
1. A surface emitting light emitting diode with at least one PN junction between two semiconductor layers, at least one of which is active, said diode being adapted to emit light through a predetermined exit surface wherein the diode further comprises at least one additional layer, a luminescence layer, which is made of a material with a narrower energy gap than that of the active layer and is arranged between the active layer and the exit surface.

5,151,757

HETEROJUNCTION FIELD-EFFECT TRANSISTOR

Takatomo Enoki; Naoteru Shigekawa, and Kunihiro Arai, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 24, 1991, Ser. No. 781,851
Claims priority, application Japan Oct. 26, 1990, 2-290187
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **9 Claims**



1. A heterojunction field-effect transistor comprising:
a first electron transit channel formation semiconductor layer formed on a substrate and consisting of a compound semiconductor;
a first electron supply semiconductor layer formed on said first electron transit channel formation semiconductor layer and consisting of a compound semiconductor;
a gate electrode, a source electrode, and a drain electrode formed on said first electron supply semiconductor layer; and
a second electron transit channel formation semiconductor layer formed between said substrate and said first electron transit channel formation semiconductor layer,
wherein said second electron transit channel formation semiconductor layer consists of a compound semiconductor which has electron affinity smaller than that of said first electron transit channel formation semiconductor layer and larger than that of said first electron supply semiconductor layer, and is different from said first electron transit channel formation semiconductor layer in field strength position where a maximum value of an electron velocity is obtained, and is arranged such that an energy level on a bottom of an electron conduction band of said second electron transit channel formation semiconductor layer is substantially the same as a Fermi level.

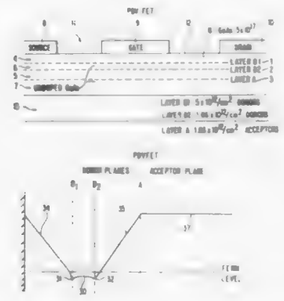
5,151,758

PLANAR-DOPED VALLEY FIELD EFFECT TRANSISTOR (PDVFET)

Thane Smith, Middletown, Md., assignor to Comsat, Clarksburg, Md.

Filed Feb. 20, 1991, Ser. No. 657,918
Int. Cl.[5] H01L *29/161, 29/20, 21/203, 21/20*
U.S. Cl. 357—22 **12 Claims**

1. A planar doped valley field effect transistor device, comprising:
a semi-insulating substrate;
a first doped or undoped layer formed above said semi-insulating substrate;
a first atomic plane layer formed above said first doped or undoped layer, said atomic plane layer being doped with donor or acceptor atoms, wherein said first doped or undoped layer and said first atomic plane layer constitute a first layer pair;
at least one additional layer pair, including an additional doped or undoped layer and an additional atomic plane layer, formed above said first layer pair, wherein said doped, undoped and atomic plane layers interact to create a potential well of a desired shape within an energy band diagram of said planar doped semiconductor in order for a two dimensional electron gas to exist therein, said energy band diagram having a wide conduction band wherein said potential well represents a portion of the conduction band which lies below a Fermi level and includes said first and additional atomic plane layers and any doped and undoped layers therebetween; and



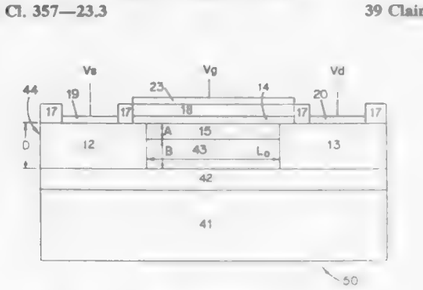
an upper doped or undoped layer formed above said at least one additional layer pair with source, drain, and gate electrodes formed thereon wherein said doped and undoped layers are formed from a single-crystalline homostructure.

5,151,759

FERMI THRESHOLD SILICON-ON-INSULATOR FIELD EFFECT TRANSISTOR

Albert W. Vinal, Cary, N.C., assignor to Thunderbird Technologies, Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 318,153, Mar. 2, 1989, Pat. No. 4,990,974. This application Jan. 25, 1991, Ser. No. 646,829
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.3 **39 Claims**



1. A field effect transistor comprising:
a thin semiconductor layer having a first surface and a second surface opposite said first surface;
source and drain regions of first conductivity type in said thin semiconductor layer;
a channel substrate of second conductivity type, in said thin semiconductor layer at said second surface, between said source and drain regions;
a channel of said first conductivity type in said thin semiconductor layer at said first surface, between said source and drain regions, said channel having a predetermined depth from said first surface;
a gate insulating layer on said thin semiconductor layer at said first surface adjacent said channel, at least one of the source doping, source depth, drain doping, drain depth, channel substrate doping, channel substrate depth, channel doping and channel depth being selected to produce zero static electric field perpendicular to said first surface

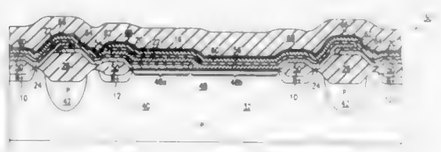
at said first surface between said channel and said gate insulating layer; and
source, drain and gate contacts for electrically contacting said source and drain regions and said gate insulating layer, respectively.

5,151,760

INTEGRATED CIRCUIT WITH IMPROVED CAPACITIVE COUPLING

Manzur Gill, Rosharon, and David J. McElroy, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 563,369, Aug. 6, 1990, Pat. No. 5,057,446. This application Jul. 30, 1991, Ser. No. 738,004
Int. Cl.[5] H01L *29/68, 27/02*
U.S. Cl. 357—23.5 **25 Claims**



1. A memory cell, formed at a face of a semiconductor layer of a first conductivity type, comprising:
a source region of a second conductivity type opposite that of said first conductivity type, formed at said face;
a drain region of said second conductivity type formed at said face and spaced from said source region by a channel area;
a merged pass gate conductor extending over a portion of said channel area;
a floating gate conductor, a first portion of said floating gate conductor insulatively adjacent a portion of said merged pass gate conductor, a second portion of said floating gate conductor insulatively adjacent a portion of said channel area;
a control gate conductor, said control gate conductor contacting said merged pass gate conductor and disposed insulatively adjacent said floating gate conductor;
first insulator regions overlying said respective source and drain regions; and
second insulator regions adjacent said source and drain regions, said second insulator regions remote from said channel area, said merged pass gate conductor extending over said first insulator region overlying said drain region and over a portion of said second insulator region adjacent said drain region.

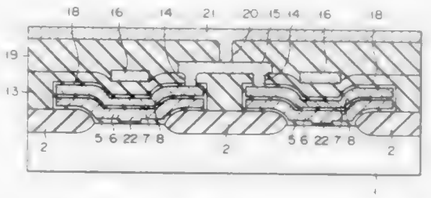
5,151,761

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH ISOLATED GATE ELECTRODES

Masataka Takebuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1990, Ser. No. 627,846
Claims priority, application Japan, Dec. 15, 1989, 1-325395
Int. Cl.[5] H01L *29/68, 23/48, 29/46*
U.S. Cl. 357—23.5 **28 Claims**

1. A nonvolatile semiconductor memory device comprising:
a semiconductor substrate;
a field oxidation film selectively formed on said semiconductor substrate;
a first gate insulating film formed on an exposed surface of said semiconductor substrate and on said field oxidation film, and
a plurality of memory cells formed on said first gate insulating film; wherein each of said plurality of memory cells includes said first gate insulating film, a floating gate electrode, a second gate insulating film, and a control gate electrode, and said floating gate electrode and said control gate electrode of each of said plurality of memory cells are



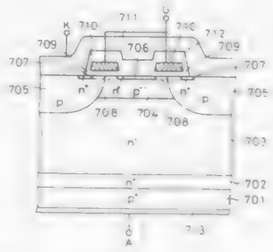
isolated from the floating gate electrodes and control gate electrodes of adjacent memory cells, respectively, so as to be formed into islands.

5,151,762

SEMICONDUCTOR DEVICE, FABRICATING METHOD THEREOF AND FLASH CONTROL DEVICE USING THE SEMICONDUCTOR DEVICE

Akio Uenishi; Hiroshi Yamaguchi, and Yasuaki Fukumochi, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 663,431
Claims priority, application Japan, Apr. 12, 1990, 2-98021; Apr. 26, 1990, 2-111119; Nov. 2, 1990, 2-298668
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 **11 Claims**



1. A semiconductor device, comprising:
a first conductivity type first semiconductor layer having first and second major surfaces;
a second conductivity type second semiconductor layer formed on said first major surface of said first semiconductor layer;
a first conductivity type first semiconductor region of first impurity concentration selectively formed in a surface of said second semiconductor layer;
a first conductivity type second semiconductor region of second impurity concentration higher than said first impurity concentration selectively formed in the surface of said second semiconductor layer adjacently to said first semiconductor region;
a second conductivity type third semiconductor region formed in at least a portion of a surface of said first semiconductor region;
a second conductivity type fourth semiconductor region selectively formed in a surface of said second semiconductor region at a distance from said first semiconductor region,
surface portions of said first and second semiconductor regions between said third and fourth semiconductor regions being defined as a channel;
a gate insulation film formed on said channel;
a gate electrode formed on said gate insulation film;

a first main electrode formed to spread on said second and fourth semiconductor regions; and

a second main electrode formed on said second major surface of said first semiconductor layer, wherein

said first impurity concentration is so set that said first semiconductor region is completely depleted when a working voltage is applied across said first and second main electrodes in an off state of said semiconductor device, and

said second impurity concentration is so set that said channel has a threshold voltage of a predetermined value in an enhancement mode.

5,151,763

ACCELERATION AND VIBRATION SENSOR AND METHOD OF MAKING THE SAME

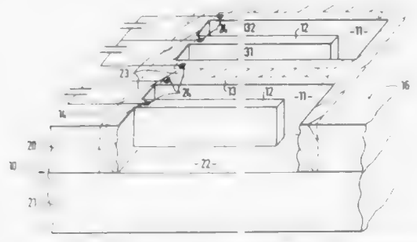
Jiri Marek, Reutlingen; Frank Bantien, Ditzingen; Dietmar Haack, Reutlingen, and Martin Warth, Schwaikhein, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 631,623

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1990, 4000903

Int. Cl.[5] **H01L** *29, 84, 29/96*

U.S. Cl. 357—26 **10 Claims**



1. A sensor for measurement of vibration or acceleration which is manufactured from a base plate of monocrystalline semiconductive material consisting of silicon containing minor amounts of other elements for affecting the conductivity types (p or n) of the material and having at least one tongue (12) etched out of said base plate and means for evaluating a deflection of said at least one tongue, characterized

in that said base plate comprises an upper layer (20) and a lower layer (21) which on account of n-type or p-type doping of said lower layer provides a pn junction in the case of said n-type doping or an np junction in the case of said p-type doping at its junction with said lower layer (21);

in that said at least one tongue has major sides perpendicular to a face surface of said base plate, has at least one major side facing, across a gap, a surface of said at least one electrode, has a firm root end which is integral with said base plate and has a free end longitudinally opposite to said root end, said electrode surface facing said tongue being perpendicular to a face surface of said base plate, said at least one tongue (12) and said at least one electrode (13) being formed entirely in said upper layer (20);

in that the surfaces respectively of said at least one tongue and of said at least one electrode are of said material consisting of silicon containing minor amounts of other elements;

in that said at least one tongue (12) and said at least one electrode (13) are insulated from each other by etched channels which extend in depth completely through said upper layer (20), and

in that, by virtue of electrical connections to said at least one tongue and said at least one electrode, a capacitance change between said at least one tongue and said at least one electrode is measurable whereby the deflection of said tongue by vibration or acceleration of said base plate is measurable.

5,151,764

SEMICONDUCTOR DEVICE

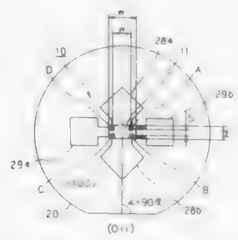
Yasutoshi Suzuki, Okazaki; Namoi Awano, Nagoya; Kouichi Hoshino, Oobu, and Hajime Inuzuka, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 4, 1990, Ser. No. 592,487

Claims priority, application Japan, Oct. 5, 1989, 1-260991

Int. Cl.[5] **H01L** *27/27, 29/82, 29/96, 43/00*

U.S. Cl. 357—27 **13 Claims**



1. A semiconductor device for detecting a strength of a magnetic field, comprising:

a semiconductor wafer;

an active layer of a Group III and V element compound semiconductor formed on said semiconductor wafer, said active layer comprising:

a) a first pair of convex portions of a generally convex shape, a first convex portion of said first pair being opposite to a second convex portion thereof and connected thereto at a connection portion;

b) a second pair of convex portions of a generally convex shape, a third convex portion of said second pair being opposite to a fourth convex portion thereof and connected thereto at a connection portion, said first and second pairs arranged so that said first pair of convex portions crosses said second pair of convex portions; and

c) a crossing portion having a same crystalline surface thereof exposed at all points where said first pair of convex portions crosses said second pair of convex portions;

a pair of input terminals each of which is electrically connected to each convex portion of said first pair and adapted to input electric current to said each convex portion of said first pair; and

a pair of output terminals each of which is electrically connected to each convex portion of said second pair and connected to output a voltage generated in said active layer in response to a magnetic field strength,

wherein said first pair of convex portions and said second pair of convex portions are formed so that a ratio of a width of said connection portion of said second pair to a length of said connection portion of said first pair is equal to or less than 0.23.

5,151,765

SEMICONDUCTOR DEVICE COMPRISING HIGH-SPEED AND HIGH-CURRENT TRANSISTORS FORMED IN A COMMON SUBSTRATE AND HAVING MATCHED CHARACTERISTICS

Tunenori Yamauchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

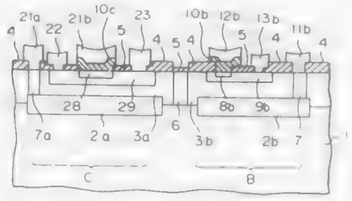
Continuation of Ser. No. 354,839, May 22, 1989, abandoned. This application Apr. 10, 1991, Ser. No. 685,153

Claims priority, application Japan, May 20, 1988, 63-124117

Int. Cl.[5] **H01L** *29/72, 27/02*

U.S. Cl. 357—34 **12 Claims**

1. A semiconductor device formed in a common semiconductor substrate, the substrate having an upper, main surface, comprising: a first bipolar transistor having a first, wide emitter width and a second bipolar transistor have a second, narrow emitter width relatively to the first, wide emitter width, the first and second transistors being formed in the common semiconductor substrate and respectively having first and second, emitter, base and collector regions, at successively lower positions within the substrate and relatively to the upper, main surface of the substrate, defining corresponding base-emitter and basecollector junctions with an associated active base region between the junctions, the first and second active base regions of the first and second transistors having respective thickness dimensions in a direction transverse to the upper,



main surface of the substrate, and the respective impurity concentrations int he base regions of the first and second transistor being selected so as to afford substantially equivalent, total amounts of impurities in the respective first and second active base regions and, correspondingly, balanced static emitter current gains h_{FE} of the respective first and second transistors, and first an second patterned portions of a layer of impurity-doped polycrystalline silicon having ion-implanted impurities therein formed on the upper, main surface of the substrate in correspondence to the first and second emitter regions, respectively, and functioning as respective first and second impurity diffusion sources from which impurities are diffused into the substrate thereby forming and defining the respective first and second emitter regions.

5,151,766

SEMICONDUCTOR COMPONENT

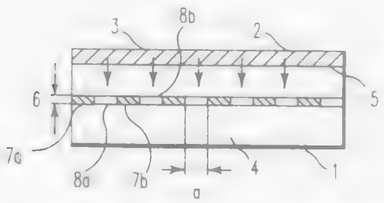
Marcel Hüppi, Zürich, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Continuation of Ser. No. 520,813, May 9, 1990, abandoned. This application Jun. 11, 1991, Ser. No. 713,018

Claims priority, application Switzerland, May 18, 1989, 1861/89

Int. Cl.[5] **H01L** *29/74*

U.S. Cl. 357—38 **5 Claims**



1. A semiconductor element having a current direction that can switch from a conducting into a non-conducting state, comprising

(a) a doped zone having minority charge carriers, which in the non-conducting state have a given mean bulk lifetime Tau_{SRH} and thus a mean bulk diffusion length $LD_{,Bulk}$ and in the conducting state, in which the doped zone is swamped by minority charge carriers in an axial direction parallel to the current direction, having a shortened lifetime Tau_{Aug} by virtue of the Auger recombination, and

(b) a region limited in said axial direction, located at a given depth in the doped zone, in which region there is a pulse shaped concentration profile of recombination centers for reducing the mean bulk lifetime Tau_{SRH} of the minority charge carriers; said axially limited region having a length in the axial direction which is smaller or equal to the length of said doped zone; wherein

(c) the recombination centers form a trap density profile varying periodically transverse to said axial direction, in which segments of low trap density alternate with segments of high trap density with a period corresponding approximately to the bulk diffusion length $L_{D,Bulk}$

5,151,767

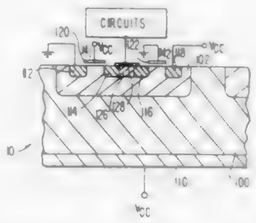
POWER INTEGRATED CIRCUIT HAVING REVERSE-VOLTAGE PROTECTION

Stephen L. Wong, Scarsdale, N.Y., assignor to North American Philips Corp., New York, N.Y.

Filed May 3, 1991, Ser. No. 695,490

Int. Cl.[5] **H01L** *27/02*

U.S. Cl. 357—43 **6 Claims**



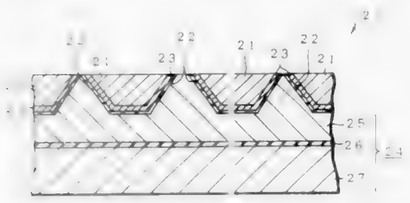
1. A power integrated circuit having a substrate of a first conductivity type, a first, surface-adjoining well of a second conductivity type opposite to the first, at least one low-power circuit being provided in said first well, a second, surface-adjoining well of said second conductivity type and spaced apart from aid first well, at least one power transistor being provided at least partly in said second well, characterized in that said power integrated circuit comprises a reverse-voltage protection circuit, which comprises:

a p-n junction for coupling said first well to a first power supply terminal, said p-n junction and a further p-n junction between said first well and said substrate together forming a bipolar transistor having a base region and two main regions defining a major current path, said substrate being coupled to a second power supply terminal;

a first MOS transistor in said first well and having a main current path coupled between said base region and a first of said two main regions of said bipolar transistor, and a gate terminal coupled to said second power supply terminal; and

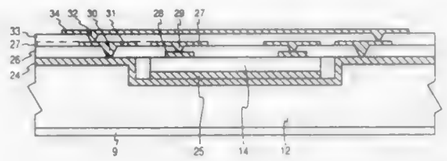
a second MOS transistor in said first well and having a main current path coupled between said base region and a second of said two main regions of said bipolar transistor, and a gate terminal coupled to said first power supply terminal.

5,151,768
DIELECTRIC ISOLATION SUBSTRATE
Tsuyoshi Aso, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 657,823, Feb. 20, 1991, abandoned. This application Mar. 6, 1992, Ser. No. 845,785
Claims priority, application Japan, Feb. 22, 1990, 2-39786
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—51 11 Claims

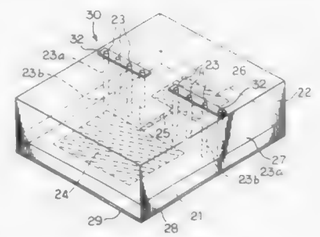


1. A dielectric isolation substrate comprising:
a plurality of single crystal semiconductor islands having surfaces substantially lying in a common plane;
a plurality of first insulating layers respectively underlying said semiconductor islands, said semiconductor islands being electrically isolated from each other by said first insulating layers; and
a supporting structure having a capacitor therein, said supporting structure including,
(a) a first conductive layer supporting and electrically isolated from said semiconductor islands, the first conductive layer having a first surface and an opposite second surface, the first surface having a flat region substantially lying in the common plane and a concave region underlying said first insulating layers, the first conductive layer constituting a first electrode of the capacitor and being electrically connected to a first potential,
(b) a second insulating layer having a first surface and an opposite second surface, the first surface of the second insulating layer formed on the second surface of the first conductive layer, the second insulating layer constituting a dielectric layer of the capacitor, and
(c) a second conductive layer formed on the second surface of the second insulating layer, the second conductive layer constituting a second electrode of the capacitor and being electrically connected to a second potential.

5,151,769
OPTICALLY PATTERNED RF SHIELD FOR AN INTEGRATED CIRCUIT CHIP FOR ANALOG AND/OR DIGITAL OPERATION AT MICROWAVE FREQUENCIES
Anthony A. Immorlica, Jr., Manlius, and Robert F. Chase, Fayetteville, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.
Filed Apr. 4, 1991, Ser. No. 680,376
Int. Cl.[5] H01L *29/40, 21/02, 23/16, 25/04*
U.S. Cl. 357—53 7 Claims
3. In combination,
(A) an integrated circuit chip for analog and/or digital operation at microwave frequencies,
(B) a substrate, a portion of which has a recess for supporting said integrated circuit chip with the upper surface flush with the substrate surface,
(C) an optically patterned RF shield enclosing said chip,
(1) the bottom and a part of the sides comprising a first metallization covering the interior of the recess and the upper surface of said substrate adjacent said recess, and
(2) another part of the sides comprising a first optically patterned dielectric layer having a first set of local perforations spaced along a line bounding said chip, and an optically patterned second metallization bonded to said first dielectric layer, to provide electrically conductive paths via said first set of perforations to said first metallization, the spacing between perforations being adequately small to prevent passage of RF waves at frequencies of interest.

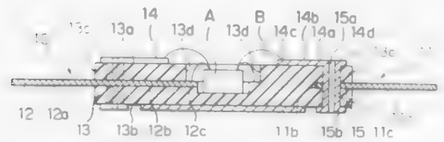


5,151,770
SHIELDED SEMICONDUCTOR DEVICE
Akira Inoue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 21, 1990, Ser. No. 616,366
Claims priority, application Japan, Nov. 24, 1989, 1-305125
Int. Cl.[5] H01L *29/40, 23/48, 29/46, 25/04*
U.S. Cl. 357—53 9 Claims



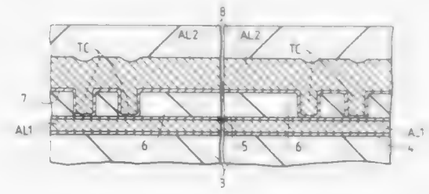
9. A semiconductor device comprising:
a substrate,
at least two integrated circuits adapted for operation at high frequency formed on a planar surface of the substrate, the integrated circuits being disposed such that electromagnetic radiation can be transmitted between the integrated circuits through a coupling region above the planar surface and cause electromagnetic coupling of the integrated circuits,
an insulator film on the substrate, the insulator film overlying the integrated circuits and extending in the direction normal to the planar surface of the substrate to a substantial height above the planar surface, the insulator film being disposed in the coupling region,
an array of pin-like conductors disposed along a shielding line between the integrated circuits, the pin-like conductors being embedded in and supported above the planar surface of the substrate in the coupling region by the insulator film, the pin-like conductors being oriented in a direction substantially normal to the surface of the substrate so as to be in intersect paths for transmission of electromagnetic radiation in the coupling region between the two integrated circuits, the pin-like conductors having a spacing between pins which is substantially less than the wavelength of the operating frequency of the integrated circuits, and extending into the coupling region to a height above the planar surface adapted to block the electromagnetic transmission between the integrated circuits, and
means for applying an effective ground to the pin-like conductors for providing an electromagnetic shield between the integrated circuits.

5,151,771
HIGH LEAD COUNT CIRCUIT BOARD FOR CONNECTING ELECTRONIC COMPONENTS TO AN EXTERNAL CIRCUIT
Atsushi Hiroi; Mitsuhiro Kondo, and Kinya Obshima, all of Oogaki, Japan, assignors to Ibiden Co., Ltd, Japan
Filed Jan. 28, 1991, Ser. No. 646,355
Claims priority, application Japan, May 31, 1990, 2-143977
Int. Cl.[5] H01L *23/48, 29/44*
U.S. Cl. 357—70 12 Claims

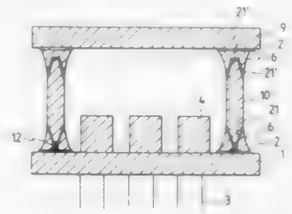


1. A circuit board for mounting an electronic component, the circuit board comprising:
an electrically insulating substrate having a first and a second major surfaces, an outer peripheral side surface, and a recess formed in said first major surface for mounting the electronic component therein;
a plurality of leads including a plurality of first leads disposed in said substrate in a substantially side-by-side relationship with a space therebetween and a plurality of second leads disposed between said first leads with a space therebetween, said first leads each having an outer end outwardly extending from said outer peripheral side surface of said substrate and an inner end within said substrate, and said second leads each having an outer end outwardly extending from said outer peripheral side surface of said substrate and an inner end exposed within said recess for electrical connection to said electronic component;
a plurality of first conductors, each attached to said first major surface of said substrate and having an outer end and an inner end disposed in the vicinity of said recess for electrical connection to said electronic component; and
a plurality of through-hole conductors, each extending through said substrate and electrically connected between said inner end of one of said first leads and said outer end of one of said first conductors.

5,151,772
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Yasushi Takahashi, Tachikawa; Hiromi Matsuura, Tokorozawa; Yoshihisa Koyama, Akishima; Masaya Muranaka, Akishima; Katsutaka Kimura, Akishima; Kazuyuki Miyazawa, Iruma; Masamichi Ishihara, Hamura, and Hidetoshi Iwai, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi VLSI Engineering Corp., Kodaira, both of, Japan
Continuation of Ser. No. 243,607, Sep. 13, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 616,705
Claims priority, application Japan, Sep. 19, 1987, 62-235901; Dec. 18, 1987, 62-320936
Int. Cl.[5] H01L *23/48, 29/46, 29/54, 29/04*
U.S. Cl. 357—71 32 Claims
1. A semiconductor integrated circuit device comprising:
(a) a memory cell array including a plurality of memory cells on a rectangular semiconductor substrate having a pair of opposing longer sides and a pair of opposing shorter sides;
(b) a first peripheral circuit adjacent one of said shorter sides and a second peripheral circuit adjacent the other of said shorter sides on said semiconductor substrate, wherein said memory cell array is located between said first and second peripheral circuits;
(c) an external terminal to be supplied with a predetermined signal other than a power supply signal, said external terminal being located on said semiconductor substrate;
(d) a first wiring coupling said external terminal to said first peripheral circuit to provide said predetermined signal to said first peripheral circuit, wherein said first peripheral circuit includes means for producing a predetermined output signal in response to said predetermined signal;
(e) a second wiring coupling said first peripheral circuit to said second peripheral circuit for providing said predetermined output signal of said first peripheral circuit to said second peripheral circuit, wherein said second wiring is located at a region of said substrate other than said memory cell array and extends along one of said longer sides in a peripheral area of said semiconductor substrate between said memory cell array and said one of said longer sides, and
(f) a third and a fourth wiring formed on both sides of said second wiring and extending along said second wiring,
wherein said second wiring comprises a first conductive layer and a second conductive layer on said first conductive layer, said first and second conductive layers being electrically coupled to each other to provide a reduced resistance to said second wiring along said one of said longer sides of the substrate between said first and second peripheral circuits, and
further wherein said third and fourth wirings are single-layer wirings each comprised either of said first conductive layer or said second conductive layer.



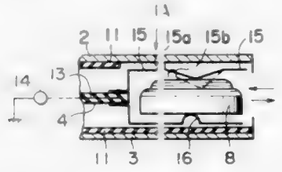
5,151,773
ELECTRONIC CIRCUIT APPARATUS COMPRISING A STRUCTURE FOR SEALING AN ELECTRONIC CIRCUIT
Kiyoshi Matsui; Ryohei Satoh, both of Yokohama; Toshitada Netsu, Hatano; Hideaki Sasaki, Hatano; Mitugu Shirai, Hatano, and Kenichi Hamamura, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 28, 1991, Ser. No. 676,389
Claims priority, application Japan, Mar. 30, 1990, 2-80712
Int. Cl.[5] H01L *23/02, 23/12, 39/02*
U.S. Cl. 357—74 3 Claims



1. An electronic circuit apparatus comprising a substrate, electronic circuit components mounted on said substrate, and a sealing unit for sealing said electronic components on said substrate, said electronic circuit apparatus further comprising:

a first solder joint portion;
a frame-like first sealing unit connected to said substrate by said first solder joint portion;
a second solder joint portion; and
a second sealing unit connected to said first sealing unit by said second solder joint portion, to enclose said electronic circuit components,
wherein said first sealing unit has at least one shaped end, and
wherein said first solder joint portion includes a first maintaining member for maintaining a predetermined space between said substrate and said first sealing unit, and said second solder joint includes a second maintaining member for maintaining said predetermined space between first sealing unit and said second sealing unit.

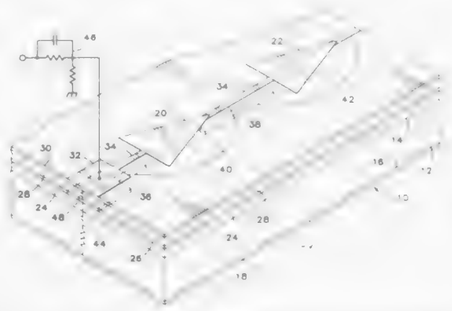
5,151,774
PORTABLE SEMICONDUCTOR DATA STORAGE DEVICE WITH DISCONNECTABLE GROUND CONNECTION
Yoshihide Mori, Kawanishi, and Takayuki Shinohara, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Apr. 18, 1991, Ser. No. 687,062
Claims priority, application Japan, Oct. 31, 1990, 2-291919
Int. Cl.[5] H01L *23/42, 23/44*
U.S. Cl. 357—79 **4 Claims**



1. A portable semiconductor data storage device comprising:
a board on which semiconductor devices are mounted and including a circuit ground;
a pair of conductive outer plates disposed on opposite sides of said board;
means electrically connecting said conductive outer plates to each other; and
first and second terminal members for respectively contacting positive and negative polarity terminals of a cell inserted into said device, said first terminal electrically connecting a first of the positive and negative polarity terminals of a cell to said conductive outer plates and the circuit ground when the cell is disposed between said first and second terminal members, said conductive outer plates being electrically disconnected from the circuit ground when the cell is not disposed between said first and second terminal members.

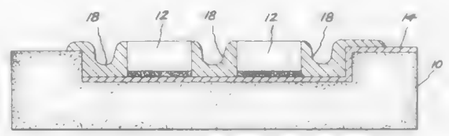
5,151,775
INTEGRATED CIRCUIT DEVICE HAVING IMPROVED SUBSTRATE CAPACITANCE ISOLATION
Matthew J. Hadwin, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.
Filed Oct. 7, 1991 Ser. No. 772,753
Int. Cl.[5] H01L *39/02, 23/48, 27/02*
U.S. Cl. 357—80 **7 Claims**

1. An integrated circuit having improved substrate capacitance isolation wherein the integrated circuit has a substrate with a metal layer formed on one surface thereof and a high impedance circuit with an input node formed on an opposite surface with the input node coupling an electrical signal to the high impedance circuit, the improvement comprising an electrically conductive layer having a geometry substantially equal to the input node and being disposed between the input node and the metal layer on the substrate with the electrically conductive layer being immediately underneath and insulated



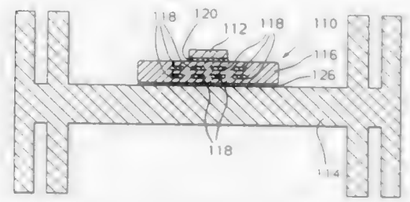
from the input node by an insulating layer with the electrically conductive layer being driven by the output of the high impedance circuit.

5,151,776
DIE ATTACHMENT METHOD FOR USE IN HIGH DENSITY INTERCONNECTED ASSEMBLIES
Robert J. Wojnarowski, Ballston Lake, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 329,478, Mar. 28, 1989, Pat. No. 5,019,535.
This application Mar. 19, 1991, Ser. No. 671,612
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—81 **18 Claims**



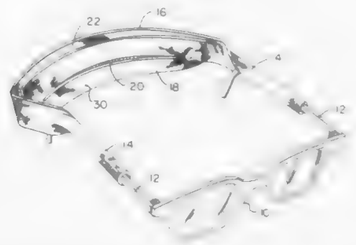
1. An interconnect system for an integrated circuit chip mounted on a substrate, said chip having an active surface, a mounting surface opposite said active surface, and side surfaces extending between said active and mounting surfaces, said system comprising:
a conductive layer on said substrate adapted to be maintained at a predetermined voltage level;
a nonconductive adhesive material affixing said mounting surface of said integrated circuit chip to said conductive layer, said nonconductive adhesive material not entirely covering said conductive layer; and
a layer of metallization electrically connecting said side surfaces of said integrated circuit chip to said conductive layer, said layer of metallization being sufficiently thick to provide thermal cooling for said integrated circuit chip over substantially the entire thickness of said chip.

5,151,777
INTERFACE DEVICE FOR THERMALLY COUPLING AN INTEGRATED CIRCUIT TO A HEAT SINK
Timur Akin, Toledo, Ohio; Bruce A. Myers, Kokomo, Ind.; William M. Maki, Fort Wayne, Ind., and Ponnusamy Palanisamy, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.
Continuation-in-part of Ser. No. 318,389, Mar. 3, 1989, abandoned. This application Oct. 16, 1989, Ser. No. 422,395
Int. Cl.[5] H01L *39/02, 23/02, 25/04*
U.S. Cl. 357—81 **6 Claims**



1. An interface device for thermally coupling an integrated circuit chip to a heat sink, the interface device comprising:
a layer of copper;
a plurality of regions comprising an iron-nickel alloy characterized by a low coefficient of thermal expansion, each of said plurality of regions are completely enveloped by said copper, and are disposed laterally with respect to each other and generally under the integrated circuit chip between the integrated circuit chip and heat sink, such that said copper is provided continuously between the integrated circuit and the heat sink; and
said interface device having an effective coefficient of thermal expansion intermediate between that of said copper and said iron-nickel alloy and characterized by a thermal conductivity similar to the thermal conductivity of said copper.

5,151,778
EYEGLASS CASE AND RETAINER
Paul Conley, N30 W29101 Hillcrest Dr., Pewaukee, Wis. 53072
Filed Sep. 23, 1991, Ser. No. 763,953
Int. Cl.[5] G02C *3/00;* **A45C** *11/04*
U.S. Cl. 351—156 **17 Claims**

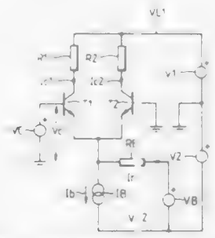


1. A case for holding eyeglasses of the type having a frame including a bridge adapted to be placed on the nose of a wearer and a pair of bows hingedly connected to the frame and adapted to be moved between a folded position against the frame and an open position wherein the bows can be placed on the ears of the wearer, the eyeglass case comprising:
a. an elongate base made of a flexible material and having a top side and an under side and an outer perimeter defined by spaced apart upper and lower edges and opposite end edges;
b. a pair of elongate straps extending outwardly from the opposite end edges of the base, one each of said straps adapted to be releasably secured to one of the bows;
c. a flexible sheet having a perimeter conforming substantially to the outer perimeter of the base and secured to the underside of the base about the sheet perimeter; and
d. an elongate, through slot in said sheet adapted for receiving the eyeglasses when said bows are in the folded position for enveloping the eyeglasses between the base and said sheet.

5,151,779
SIGNAL TRANSMISSION SYSTEM FOR HIGH DEFINITION TELEVISION
Yasuaki Kanatsugu; Taiichiro Kurita; Taiji Nishizawa; Yutaka Tanaka; Ryoichi Yajima; Shoichi Suzuki; Hisakazu Kato; Kazumasa Enami; Haruo Okuda; Satoru Koizumi; Hideki Suganami; Toshiyuki Takegahara, and Kaoru Watanabe, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan
Filed May 30, 1990, Ser. No. 530,760
Int. Cl.[5] H04N *7/08, 11/06*
U.S. Cl. 358—12 **20 Claims**

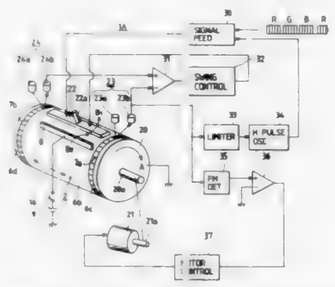
1. An encoder for encoding a television signal into a main signal to be transmitted by a main transmission line and an auxiliary signal to be transmitted by an auxiliary transmission line, said encoder comprising:
separation means for separating a second television signal having higher definition than a first television signal into a main television signal and an auxiliary television signal, said separation means including a dividing means for dividing said second television signal into a first band corresponding to that of said first television signal and a second band above said first band, said main television signal having a bandwidth corresponding to that of the first television signal, said auxiliary television signal having information, the amount of which corresponds to that of said second band;
main signal processing means for producing said main signal from said main television signal, said main signal having a bandwidth equal to that of said main transmission line; and
auxiliary signal processing means for producing said auxiliary signal from said auxiliary television signal, said auxiliary signal having a bandwidth equal to that of said auxiliary transmission line.

5,151,780
DIFFERENTIAL AMPLIFIERS
David M. Chapman, Southampton England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 9, 1999, Ser. No. 491,136
Claims priority, application United Kingdom, Mar. 10, 1989, 8905525
Int. Cl.[5] H04N 9/64
U.S. Cl. 358—21 R 3 Claims



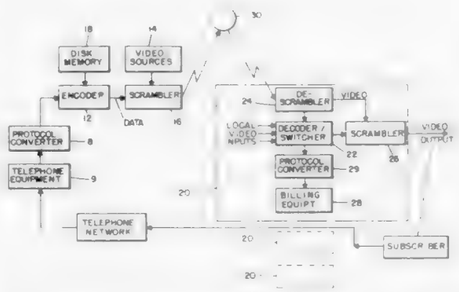
1. A differential amplifier comprising two transistors having their collectors connected through respective loads to one supply line, their emitters connected together and to a controllable constant current source which supplies a bias current and which is connected between the common connection of the emitters and return supply line, and their bases connected to receive a control voltage, which differential amplifier is characterized in that the common connection of the emitters is also connected through a by-pass resistance to a bias voltage source, the circuit parameters being such that flow of bias current will result in a small current being diverted through the by-pass resistance instead of flowing through said transistors, this small current approximating in value to the value of any residual bias current when the current source is switched off, and having a value which is negligible relative to the value of the bias current when the current source is switched on.

5,151,781
METHOD OF RECORDING COLOR IMAGE INFORMATION
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Miura; Tsutou Asakura; Masato Furuya, both of Yokohama; Yoshihisa Koyama, Yokosuka, and Yuji Uchiyama, Chigasaki, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Jul. 10, 1991, Ser. No. 727,633
Claims priority, application Japan, Jul. 13, 1990, 2-186074; Jul. 24, 1990, 2-196738; Jul. 24, 1990, 2-196741
Int. Cl.[5] H04N 3/15, 5/33, 9/07; G02F 1/135
U.S. Cl. 358—45 3 Claims



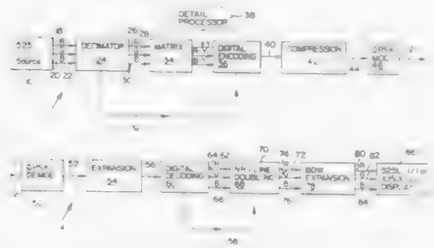
1. A method of recording color image information on a recording medium including a color stripe filter having different-color filter stripes, comprising the steps of:
providing marks on the recording medium in correspondence with the filter stripes of the color stripe filter;
detecting the marks on the recording medium;
recording color line sequential signals on the recording medium; and
synchronizing said recording of the color line sequential signals with said detecting of the marks on the recording medium.

5,151,782
CONTROL SYSTEM FOR SATELLITE DELIVERED PAY-PER-VIEW TELEVISION SYSTEM
Andrew G. Ferraro, Monroe, N.Y., assignor to Reiss Media Enterprises, New York, N.Y.
Filed May 17, 1989, Ser. No. 352,857
Int. Cl.[5] H04H 1/02; H04M 11/08; H04N 7/10
U.S. Cl. 358—86 20 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 15 Pages)



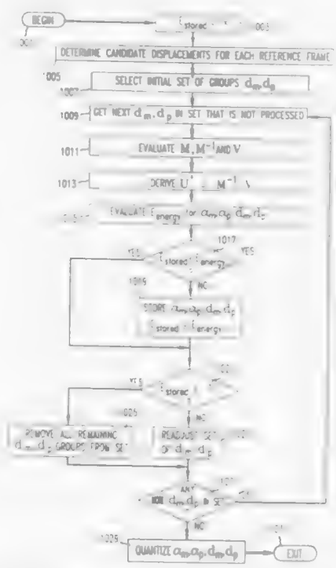
7. A system for providing automated ordering of television programs by a subscriber of a local cable television system by direct toll-free telephone dialing an originating source which provides television programs according to a predetermined schedule to a network of cable television systems including said subscriber's local cable television system for delivery, in turn, to respective subscribers according to a predetermined local schedule with each program identified by the time of day at which it is scheduled to start, said originating source including means for receiving toll-free telephone calls and providing Automatic Number Identification (ANI) information for callers, said system comprising:
data processing means at said originating source interconnected with said means for receiving telephone calls to receive ANI information regarding a caller and wherein the data processing means is programmed to compare area code and telephone exchange information contained in said ANI information with stored area code and telephone exchange information identifying the site of each said one or more local cable television systems for determining which of said local cable television systems serves the caller and, provided the telephone call is received within a prescribed time period relative to the scheduled start of an offered program, to automatically assemble and communicate to the local cable television system determined to serve the caller a message signal containing information signifying that an identified one of its subscribers has ordered a particular program.

5,151,783
DIGITAL TELEVISION WITH ENHANCEMENT
Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022
Filed Jun. 5, 1991, Ser. No. 710,823
Int. Cl.[5] H04N 7/13
U.S. Cl. 358—133 30 Claims



1. A television system comprising:
encoder means including digital picture source means for converting an electrical television picture image signal into a stream of digital values representing picture element signals at a recurrent picture frame rate, the digital values representing samples of the picture information at a predetermined sampling rate, compression means for compressing the stream of digital values, and digital modulation means translating the compressed stream of digital values into carrier modulation contained within a defined spectral modulation bandwidth, the encoder means for communicating the carrier modulation through a limited bandwidth medium means,
decoder means connected to the limited bandwidth medium means for receiving and detecting the carrier modulation and comprising:
digital demodulation means for demodulating the received modulation into a stream of received compressed digital values,
digital expansion means operating in a compatible manner with the compression means for expanding the received compressed digital values into received expanded values, and
single-ended picture resolution enhancement processing means for processing the received expanded digital values into resolution enhanced digital picture values for display upon an enhanced resolution display means connected to receive the enhanced digital picture values.

5,151,784
MULTIPLE FRAME MOTION ESTIMATION
Fabio Lavagetto, Genoa, Italy, and Riccardo Leonardi, Geneva, Switzerland, assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 30, 1991, Ser. No. 693,878
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—136 29 Claims

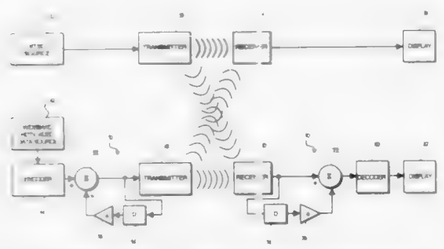


1. A method for developing an encoded signal of a block of pels to be encoded located at a predetermined location in a frame of an applied video signal comprised of frames, wherein each frame contains at least one image representation, by developing a set of signals representing displacements and corresponding weights from at least two frames of said video signal that are designated as reference frames and are divided into blocks of pels, comprising the steps of:
a. storing said reference frames in a memory;
b. selecting, in accordance with a predetermined selection criterion, for each of said reference frames, one or more candidate displacements, measured from said location of said block to be encoded, whose vector magnitude is less than or equal to the vector magnitude of a predetermined maximum displacement;
c. culling, from said candidate displacements that have been determined, a set of groups of candidate displacements such that each group of said set has one candidate displacement member from each of said reference frames;
d. ordering said groups of said set of groups in accordance with a predetermined ordering criterion;
e. assigning to each group a set of best candidate weights for said group, one candidate weight corresponding to each member of said group;
f. generating for each of said groups a composite error signal indicating differences between values of pels of said block being encoded and a weighted sum of values of pels of said blocks of said reference frames that are displaced, from said location of said block being encoded, by corresponding ones of said candidate displacements in said groups of said candidate displacements, said weighted sum being determined by multiplying corresponding ones of said values of pels of said blocks of said stored reference frames by corresponding ones of said set of best candidate weights for said group;
g. storing said best candidate weights, said corresponding group and said composite error signal for a group of said set of groups having a minimum composite error signal, if said composite error signal is less than any previously stored composite error signals or no composite error signal has been previously stored;
h. repeating steps (b) through (h) until a predetermined condition is met by a group of said candidate displacements and said corresponding set of best candidate weights for said group;
i. forming said encoded signal corresponding to said block, from which a version of said block can be reconstructed if a copy of said stored reference frames is available, by including in said encoded signal said group of candidate displacements and said set of best candidate weights for said group for which said predetermined condition is met; and
j. delivering said encoded signal to a transmission medium.

5,151,785
HDTV TRANSMISSION SYSTEM WITH REDUCED SUSCEPTIBILITY TO NTSC COCHANNEL INTERFERENCE

Richard W. Citta, Oak Park, Ill., assignor to Zenith Electronics Corporation

Filed Jun. 4, 1991, Ser. No. 709,960
Int. Cl.[5] H04N 7/04
U.S. Cl. 358—141 13 Claims

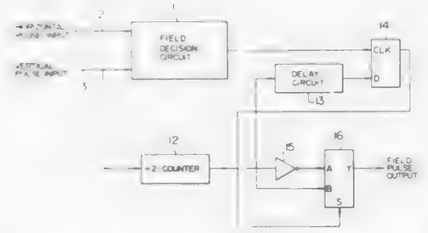


1. A method of transmitting an HDTV signal from a site within a first television service area using a channel also used to transmit an NTSC television signal from a site within a nearby television service area, comprising:
providing a digital signal representing said HDTV signal, said digital signal having a substantially flat frequency spectrum;
imposing a predetermined spectral periodicity on said digital signal corresponding to the spectral periodicity characterizing said NTSC television signal;
transmitting said digital signal over said channel such that the spectral periodicities of said digital and NTSC signals are substantially phase coincident; and
receiving said transmitted signal and subjecting the received signal to a filter response having a characteristic comprising the inverse of said predetermined spectral periodicity, whereby said received digital signal is substantially restored while any received components of said NTSC signal are substantially attenuated.

5,151,786
FIELD DECISION CORRECTION APPARATUS

Sigeharu Kawamoto, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 6, 1991, Ser. No. 711,132
Claims priority, application Japan, Jun. 21, 1990, 2-163326
Int. Cl.[5] H04N 5/04
U.S. Cl. 358—148 3 Claims

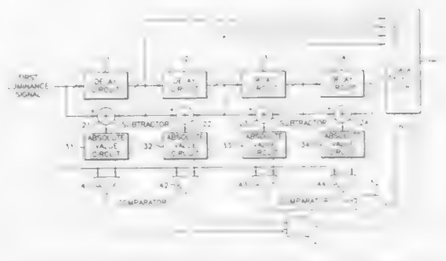


1. A field decision correction apparatus comprising:
a field decision circuit for providing as an output a field decision on the basis of a horizontal pulse and a vertical pulse, said horizontal pulse and said vertical pulse being video synchronizing pulses of a video signal;
a frequency division circuit for dividing the frequency of said vertical pulse in half, and providing said divided frequency as in output;
a flip-flop supplied with a decision from said field decision circuit on one of at least two input terminals thereof and supplied with the output of said frequency division circuit via a delay circuit on another of the at least two input terminals thereof; and
a selection circuit supplied with the output of said frequency division circuit via an inverter circuit on one of at least two input terminals thereof and supplied directly with the output of said frequency division circuit on another of the at least two input terminals thereof to select and output either of those input signals on the basis of the output of said flip-flop.

5,151,787
METHOD AND CIRCUIT FOR CORRECTING IMAGE EDGE

Young-Jun Park, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Dec. 21, 1990, Ser. No. 632,074
Claims priority, application Rep. of Korea, Dec. 23, 1989, 1989-19443
Int. Cl.[5] H04N 5/208
U.S. Cl. 358—162 12 Claims

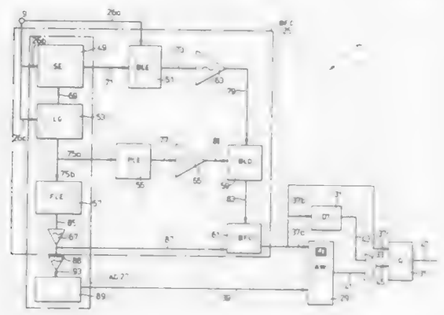


1. An edge correcting circuit which generates a edge correction signal by reducing the conversion time of a signal level at a edge region of a luminance signal said circuit comprising:
a first control signal generator which generates a first control signal by detecting a pixel where said luminance signal starts to change;
a second control signal generator which generates a second control signal by detecting a pixel prior to a stabilization of said luminance signal from a change;
wherein said second control signal generator comprises:
a first delay circuit and a second delay circuit which are in serial connection and generate a second luminance signal and a third luminance signal each delayed a predetermined time;
a first subtractor and a second subtractor which generate a first difference signal and a second difference signal by subtracting said second luminance signal and said third luminance signal from said luminance signal and said second luminance signal, respectively;
a first absolute value circuit and a second absolute value circuit which generate a first absolute value signal and a second absolute value signal in response to said first difference signal and said second difference signal, respectively;
a first comparator and a second comparator which generate a first comparator signal and a second comparator signal by comparing said first absolute value signal and said second absolute value signal to a reference signal, respectively, to reduce noise; and
a first gate which generates said second control signal when a level of said third luminance signal changes to a stable state signal level from an unstable state signal level by logically multiplying an inverse of said first comparator signal by said second comparator signal.

5,151,788
METHOD AND APPARATUS FOR IDENTIFYING AND ELIMINATING SPECIFIC MATERIAL FROM VIDEO SIGNALS

Dieter W. Blum, 104-969 Jervis Street, Vancouver, B.C. V6E 2B7, Canada

Filed Jan. 26, 1989, Ser. No. 301,769
Claims priority, application Canada, Jan. 26, 1988, 557321
Int. Cl.[5] H04N 5/44
U.S. Cl. 358—188 74 Claims

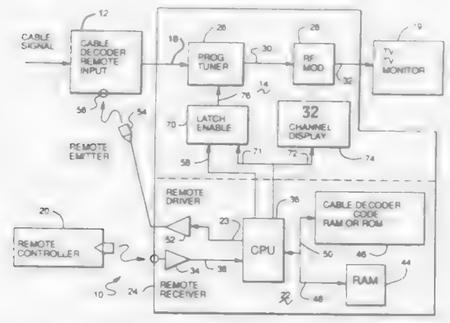


1. A method for detecting a blank frame in a video signal, the method comprising:
extracting the black level from the video signal to produce a black level signal;
gating undesired portions from the video signal to produce a gated signal;
continuously extracting the luminance level from the gated signal to produce an average luminance level signal representative of the average luminance level of a frame; and
comparing the black level signal and the average luminance signal to determine when the average luminance level signal is within a given threshold of the black level signal.

5,151,789
SYSTEM AND METHOD FOR AUTOMATIC, UNATTENDED RECORDING OF CABLE TELEVISION PROGRAMS

Patrick Young, San Mateo, Calif., assignor to Insight Telecast, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 428,620, Oct. 30, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 778,404
Int. Cl.[5] H04N 7/18, 5/44
U.S. Cl. 358—194.1 32 Claims

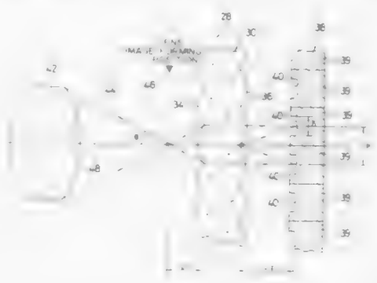


1. A video recording system to allow automatic, unattended recording of cable television programs supplied sequentially at different times on different channels of a cable system, comprising a television receiver, a remote controllable cable decoder and a remote controllable video recorder with unattended programming capability connected between said television receiver and said remote controllable cable decoder, a remote controller for said remote controllable video recorder coupled to said remote controllable video recorder, said remote controller including means for transmitting program selections from a television schedule to said remote controllable video recorder, said remote controllable video recorder including a channel selection coordinator, said channel selection coordinator including a memory means for storing channel tuning conversion information and program selections transmitted to said remote controllable video recorder by said remote controller, a means for converting channels of the program selections to channel tuning commands recognizable by said remote controllable cable decoder using the channel tuning conversion information and the program selections, a means for automatically transmitting the channel tuning commands to said remote controllable cable decoder at broadcast times of the program selections, and a means for automatically supplying recording commands to said remote controllable video recorder at the broadcast times of the program selections.

5,151,790
IMAGE PICKUP DEVICE FOR STABILIZING OPTICAL ABERRATIONS

Naoki Takatori, and Masaaki Orimoto, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1991, Ser. No. 726,054
Claims priority, application Japan, Jul. 23, 1990, 2-194131
Int. Cl.[5] H04N 5/225; G02B 13/16
U.S. Cl. 358—225 6 Claims



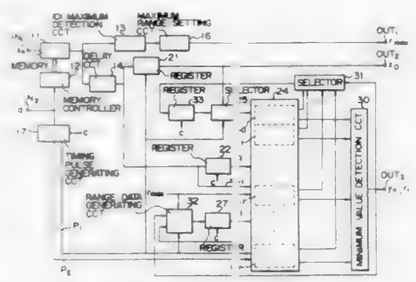
1. An image pickup device comprising:
an image pickup element including a plurality of photoelectric conversion elements each having a light receiving portion, wherein said light receiving portions of said photo-electric conversion elements are positioned at a constant pitch relative to said light receiving portions of adjacent photo-electric conversion elements;
a taking lens positioned in front of an image forming position for allowing an image of an object to be formed at said image forming position, said position being located in front of said image pickup element; and,
an optical filter interposed between said image forming position and said image pickup element for receiving a spot image formed by light diverging from said image forming position, to guide said diverging light to said plurality of photo-electric conversion elements.

5,151,79[illegible]

EFFICIENT ENCODING OF PICTURE SIGNAL

Yoshiaki Moriyama, and Satoni Kobayashi, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 587,006
Claims priority, application Japan, Sep. 26, 1989, 1-251138
Int. Cl.[5] H04N *1/41*
U.S. Cl. 358—261.2 12 Claims



1. A picture signal encoding method of a predictive encoding type that sequentially encodes picture elements such that a current picture element being encoded is preceded by a previous, already encoded, picture element and is followed by one or more next picture elements that are yet to be encoded, said method comprising the steps of:

for a current picture element to be encoded,

generating a plurality of error data values from a plurality of decoded values of the current picture element;

generating a plurality of predicted error data values from a value of a next picture element and from the plurality of decoded values of the current picture element;

summing individual ones of the plurality of error data values with a corresponding individual one of the plurality of predicted error data values to obtain a plurality of error estimation values; and

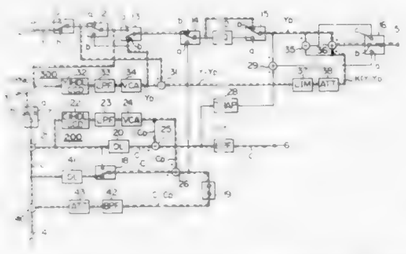
generating a code word for encoding the current picture element by selecting a minimum one of the plurality of error estimation values.

5,151,792

VIDEO SIGNAL REPRODUCING APPARATUS WITH MEANS FOR PRODUCING A CROSSTALK ELIMINATED LUMINANCE OUTPUT SIGNAL

Takao Yoshikawa, Chiba, and Isao Masuda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 659,268
Claims priority, application Japan, Feb. 27, 1990, 2-047012
Int. Cl.[5] H04N *9/71*
U.S. Cl. 358—327 14 Claims



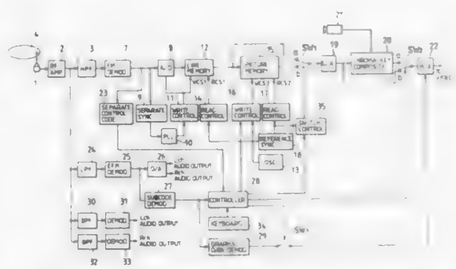
1. In apparatus for reproducing video signals from adjacent tracks on a record medium, the combination comprising: chrominance signal reproducing means for reproducing a chrominance signal with reduced cross talk; luminance signal reproducing means for reproducing a luminance signal; delay means for delaying the reproduced luminance signal by a horizontal line interval; difference means for producing a difference signal representing a difference between the delayed and undelayed luminance signals; first combining means for combining the difference signal and the delayed luminance signal to produce a crosstalk-eliminated delayed luminance signal; second combining means for combining the difference signal and the reproduced luminance signal to produce a crosstalk-eliminated undelayed luminance signal; and selector means for selecting the crosstalk-eliminated delayed luminance signal or the crosstalk-eliminated undelayed luminance signal as a luminance output signal.

5,151,793

RECORDING MEDIUM PLAYING APPARATUS

Hiroshi Ito, Saitama; Seigo Ando, Tokyo, and Bonpei Inaba, Saitama, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 574,873
Claims priority, application Japan, Feb. 26, 1990, 2-45048
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 5 Claims



1. A recording medium playing apparatus for playing at least a multiplexing signal from a recording medium on which said multiplexing signal is recorded, said multiplexing signal including a modulation carrier signal for carrying a composite video signal and a digital modulation signal for carrying a digital graphics signal, said apparatus comprising:

first extracting means for extracting said modulation carrier signal from said multiplexing signal;

second extracting means for extracting said digital modulation signal from said multiplexing signal;

first demodulating means for demodulating said composite video signal from said modulation carrier signal extracted by said first extracting means;

second demodulating means for demodulating said digital graphics signal included on said digital modulation signal extracted by said second extracting means;

chroma-key composing means for combining a video signal input from a video camera with said composite video signal from said first demodulating means to output a chroma-key composite signal; and

graphics composing means for superimposing said digital graphics signal from said second demodulating means on said chroma-key composite signal.

5,151,794

IMAGE PROCESSING METHOD

Ryohei Kumagai, Tokyo, Japan, assignor to Ezel Inc., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,350
Int. Cl.[5] H04H *1/40*
U.S. Cl. 358—447 10 Claims

1. An image processing method for smoothing without dulling edges, comprising the steps of:

representing an image as image pixels;

grouping image pixels of a predetermined convolution into a plurality of groups, each including a plurality of pixels;

calculating a median for each said group of image pixels;

calculating a median of all said group medians; and

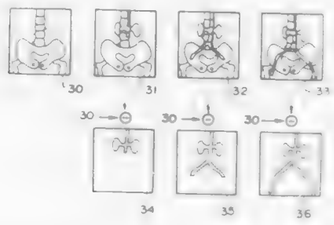
altering a pixel of a group in accordance with the median of said medians so as to generate a smoothed image.

5,151,795

METHOD FOR COMPRESSING AND EXTENDING IMAGE SIGNALS

Yuuma Adachi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1990, Ser. No. 564,823
Claims priority, application Japan, Aug. 11, 1989, 1-208754
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 12 Claims



1. A method for compressing and extending image signals, comprising the steps of:

i) obtaining a recording of a set of images, which represents a plurality of images, wherein the images of a single object are recorded simultaneously or sequentially,

ii) carrying out inter-image operation processing on the image signals representing the plurality of said images,

iii) carrying out signal compression processing on image signals, which have been obtained from said inter-image operation processing,

iv) in the course of reproducing said images, carrying out signal extension processing on image signals, which have been obtained from said signal compression processing, and

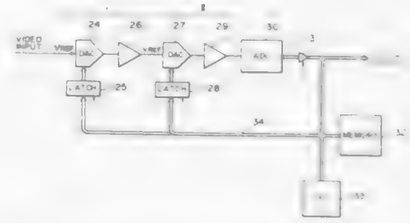
v) carrying out reversed inter-image operation processing, which corresponds to the reversed operation of said inter-image operation processing, on image signals, which have been obtained from said signal extension processing, whereby image signals corresponding to said images are obtained.

5,151,796

IMAGE READING APPARATUS HAVING A D/A CONVERTER WITH A CONTROLLABLE OUTPUT

Yasuo Ito, Inagi, and Hiroshi Kyogoku, Nishimine, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1990, Ser. No. 500,394
Claims priority, application Japan, Mar. 29, 1989, 1-74901; Jun. 1, 1989, 1-137423; Jun. 1, 1989, 1-137424
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—461 18 Claims



1. An image reading apparatus comprising:

a light source for illuminating an original image;

reading means for photoelectrically reading the original image illuminated by said light source and generating an analog image signal;

a D/A converter having a digital input terminal, an analog output terminal, and a reference terminal, the analog image signal generated from said reading means being applied to the reference terminal, said D/A converter attenuating a level of the analog image signal applied to the reference terminal based on a damping factor corresponding to digital data applied to the digital input terminal, the attenuated analog image signal being output from the analog output terminal;

amplifying means for amplifying the attenuated analog image signal outputted from the analog output terminal of said D/A converter;

an A/D converter for converting the amplified analog image signal outputted from said amplifying means into a digital image signal; and

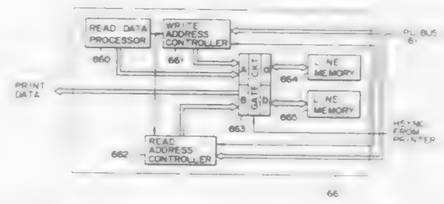
control means for controlling the digital data applied to the digital input terminal of said D/A converter to cause the analog image signal supplied to said A/D converter to have a predetermined level.

5,151,797

IMAGE FORMING APPARATUS WITH IMPROVED IMAGE FORMING SPEED

Takefumi Nosaki, Yokohama, and Kazuo Sasama, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 16, 1990, Ser. No. 465,362
Claims priority, application Japan, Jan. 27, 1989, 1-16211
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—474 17 Claims



1. An image forming apparatus provided with a scanner part and a printer part, comprising:

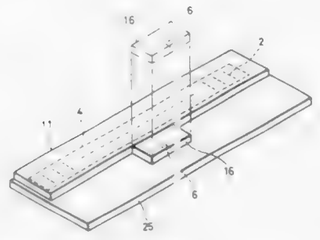
means for reciprocally scanning an original to convert an image of the original to image data;
means for driving said scanning means so that the image data converted by said scanning means includes first image data when said original is scanned in a first scanning direction and second image data when the original is scanned in a second scanning direction opposite to the first scanning direction;
means for storing said first and second image data;
means for alternately writing said first and second image data into said storing means;
means for reading the first image data from said storing means in accordance with a first reading order, and reading the second image data from said storing means in accordance with a second reading order, so that data containing said first and second image data is output from said storing means when said second reading order is opposite to said first reading order; and
means for sending to a first predetermined place a first print output corresponding to the first image data read by said reading means, and sending to a second predetermined place a second print output corresponding to the second image data read by said reading means.

5,151,798

HOLOGRAM SCALE

Hiroyuki Okubo, Kanagawa, Japan, assignor to Sony Magnescale Inc., Tokyo, Japan

Filed Aug. 16, 1991, Ser. No. 745,706
Claims priority, application Japan, Aug. 30, 1990, 2-229153
Int. Cl.[5] G02B *5/32*; G03H *1/02*
U.S. Cl. 359—1 **6 Claims**



1. A hologram scale comprising:
(a) a hologram grating plate in which a hologram grating is formed; and
(b) a protecting substrate on which an origin and/or fixed point detecting scale of said hologram grating is formed, wherein said protecting substrate is bonded to said hologram grating plate so as to cover said hologram grating plate at its surface on which said hologram grating is formed.

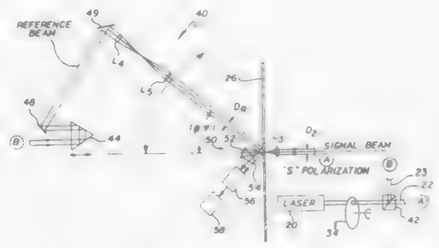
5,151,799

SYSTEM AND TECHNIQUE FOR MAKING HOLOGRAPHIC PROJECTION SCREENS

David A. Ansley, Long Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 11, 1991, Ser. No. 653,526
Int. Cl.[5] G03H *1/14, 1/30*
U.S. Cl. 359—11 **15 Claims**

15. A method for stabilizing an image in a system for making holographic projection screens including the steps of:
a) monitoring an interference pattern created by a signal beam and a reference beam;
b) providing control signals in response to said interference pattern created by the signal beam and the reference beam; and



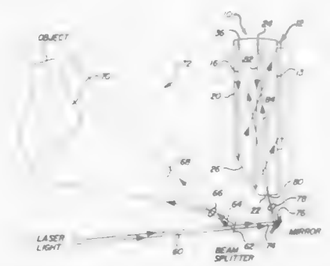
c) inducing a phase shift in said reference beam in response to said control signals using a movable roof prism.

5,151,800

COMPACT HOLOGRAM DISPLAYS & METHOD OF MAKING COMPACT HOLOGRAM

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 17, 1990, Ser. No. 627,984
Int. Cl.[5] G03H *1/22*
U.S. Cl. 359—14 **24 Claims**



1. A hologram display apparatus characterized by:
a transparent plate with a pair of opposing surfaces and edge surfaces therebetween;
one of said opposing surfaces having a hologram thereagainst;
an illuminating light source for producing a light beam for illuminating said hologram: and
said illuminating light source being optically mounted on one of said edge surfaces of said transparent plate such that expansion of said light beam from said source occurs within said transparent plate, and said illuminating light source further directing said light beam to reflect against at least one surface of said transparent plate before illuminating said hologram at said one of said opposing surface.

5,151,801

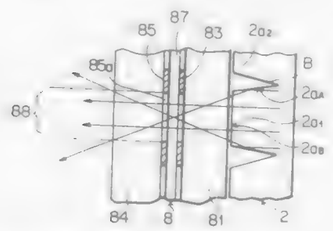
LIQUID CRYSTAL DISPLAY APPARATUS PROVIDING IMPROVED ILLUMINATION VIA TRUCATED PRISMS

Yasunori Hiroshima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,641
Claims priority, application Japan, Nov. 30, 1989, 1-308881
Int. Cl.[5] G02F *1/1335*
U.S. Cl. 359—40 **3 Claims**

1. A liquid crystal display apparatus comprising:
an active matrix type liquid crystal cell;
a light source to radiate illuminating light onto the back of the liquid crystal cell; and

optical means on the light source side of the liquid crystal cell and disposed close to and facing pixels of the liquid crystal cell, said optical means being adapted to focus the rays of light from the light source on each of the pixels,



wherein said optical means includes a transparent optical sheet having on a surface thereof a number of truncated prisms equal to the number of pixels, and wherein each of said prisms is aligned with a respective one of said pixels of the liquid crystal cell.

5,151,802

DEVICE FOR FORMING IMAGES ON A LARGE SURFACE AND SIMULATOR EQUIPPED WITH SUCH A DEVICE

Alain Couturier, Les Essarts Le Roi, France, assignor to Thomson-CSF, Puteaux, France

Filed May 30, 1991, Ser. No. 707,564
Claims priority, application France, Jun. 19, 1990, 90 07640
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—51 **10 Claims**

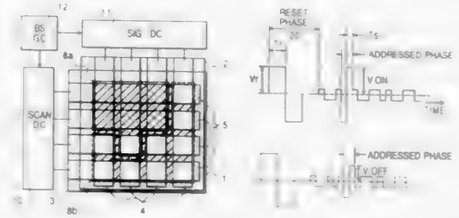
1. A simulator for simulating operation of a vehicle for an operator, comprising:
a control booth for duplicating controls of the vehicle; and
a display screen viewable from inside said booth for simulating a view from the vehicle, the display screen including an active screen at least a portion of which is spherical and having a display device which is formed at least partly by juxtaposed cells each constituting an image-forming surface of a device for producing images, the cells being excited individually, cells not excited being dark, wherein the cells comprise sheets of encapsulated liquid crystals.

5,151,803

PIXEL-GAP CONTROLLED FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE AND ITS DRIVING METHOD

Naohide Wakita, Osaka; Yoshio Iwai, Takatsuki; Tsuyoshi Uemura, Kadoma; Hiroyuki Ohnishi, Ikeda; Kazuhiro Johten, Hirakata; Satoshi Kimura, Osaka, and Shozo Fujiwara, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 3, 1990, Ser. No. 460,555
Claims priority, application Japan, Jan. 9, 1989, 1-2422; May 26, 1989, 1-133442
Int. Cl.[5] G02F *1/133*; G09G *3/36*
U.S. Cl. 359—56 **12 Claims**



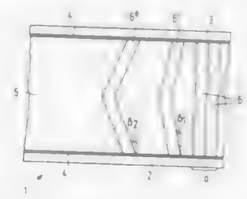
1. A liquid crystal display device comprising a liquid crystal panel in which a ferroelectric liquid crystal is sandwiched between upper and lower substrates each having a plurality of electrodes to form a plurality of pixels at intersection of said electrodes of said upper and lower substrates and means for applying a predetermined voltage to adjacent pixels in said plurality of pixels having a magnitude and pulse width which are sufficient to switch a stable condition of a gap at a non-intersection of said electroder of said upper and lower electrodes and between the adjacent pixels, wherein said predetermined voltage switches the stable condition of the gap to a dark condition when both of the adjacent pixels are set in a dark condition by said predetermined voltage, and to a bright condition or an intermediate condition when both of the adjacent pixels are set in a bright condition by said predetermined voltage.

5,151,804

FERROELECTRIC LIQUID CRYSTAL DISPLAY HAVING A SPREAD OF ANGLES FOR GRAYSCALE AND METHOD OF MANUFACTURE

Antonius G. H. Verhulst; Wilbert J. A. M. Hartmann; Franciscus J. Stommels, and Ana M. M. Luyckx-Smolders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1990, Ser. No. 535,809
Claims priority, application Netherlands, Jun. 12, 1989, 8901481
Int. Cl.[5] G02F *1/1343, 1/1339, 1/13*
U.S. Cl. 359—56 **33 Claims**



1. A liquid crystal device comprising a ferroelectric liquid crystal medium having smectic layers between two supporting plates provided with electrodes, said device has a transmission-

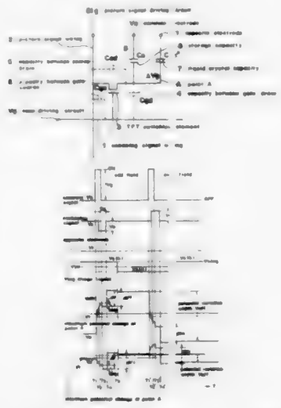
voltage characteristic, characterized in that the smectic layers exhibit a spread of angles with respect to at least one of the supporting plates, whereby a gradual transmission/voltage characteristic is achieved.

5,151,805

CAPACITIVELY COUPLED DRIVING METHOD FOR TFT-LCD TO COMPENSATE FOR SWITCHING DISTORTION AND TO REDUCE DRIVING POWER

Etsuya Takeda, Suita; Yutaka Nanao, Amagasaki, and Seiichi Nagata, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1990, Ser. No. 617,883
Claims priority, application Japan, Nov. 28, 1989, 1-308676
Int. Cl.[5] G02F *1/133* G09G *3/36*
U.S. Cl. 359—57 4 Claims



1. In a method for driving a display apparatus comprising matrix-arranged picture element electrodes each connected to a first wiring through a storage capacity, each picture electrode being connected to a thin film transistor which is electrically connected to a picture signal wiring and a scanning signal wiring, and liquid crystal material hold between each picture electrode and an opposite electrode and being driven by an alternative current voltage, the improvement thereof comprising the steps of:

transferring a picture signal voltage to the picture element electrode during an "on" period of the thin film transistor;

feeding a modulation signal which is equal in absolute value and is different in polarity for every field to the first wiring during an "off" period of the thin film transistor to change the voltage of the picture element electrode;

loading a voltage across the display material by adding to, or substracted from, the changed voltage of the picture element electrode and the voltage of the picture signal; and

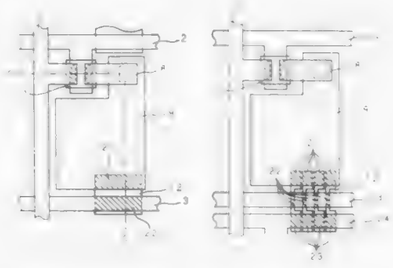
keeping at a constant voltage the difference between an average central voltage of picture signal voltage Vst and a voltage Vt of the opposite electrode.

5,151,806

LIQUID CRYSTAL DISPLAY APPARATUS HAVING A SERIES COMBINATION OF THE STORAGE CAPACITORS

Satoru Kawamoto; Noaki Nakagawa, and Masahiro Hayama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,591
Claims priority, application Japan, Apr. 27, 1990, 2-114301
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—59 3 Claims



1. A liquid crystal display apparatus comprising:

a TFT (thin film transistor) array in which a plurality of common electrode lines, a plurality of gate electrode lines and a plurality of source electrode lines intersecting said common electrode lines and gate electrode lines are provided on a transparent insulating substrate, with a TFT in the vicinity of each intersection of said gate electrode line and source electrode line, having a pixel electrode corresponding to a pixel connected to a drain electrode of said TFT, said pixel electrode being arranged so as not to overlap with said common electrode line;

counter electrodes provided confronting said TFT array;

a liquid crystal for display sandwiched between said counter electrodes and TFT array; and

a floating electrode arranged to overlap said pixel electrode to form a first storage capacitor and to overlap said common electrode line to form a second storage capacitor so that said pixel electrode and said common electrode line are connected by a series combination of said first storage capacitor and said second storage capacitor.

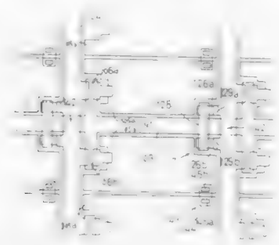
5,151,807

ACTIVE MATRIX SUBSTRATE AND ACTIVE MATRIX DISPLAY APPARATUS

Mikio Katayama, Ikoma; Hiroaki Kato, Nara; Takayoshi Nagayasu, Nara; Akihiko Imaya, Nara; Hidenori Negoto, Ikoma; Yuzuru Kanemori, Tenri, and Toshihiko Hirobe, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jan. 30, 1990, Ser. No. 472,604
Claims priority, application Japan, Jan. 31, 1989, 1-23486; Jun. 21, 1989, 1-159901; Aug. 14, 1989, 1-209769
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—59 6 Claims

1. An active matrix display apparatus comprising a pair of substrates at least one of which is translucent, a display medium charged between said substrates, the optical characteristics of said display medium being modulated in response to an applied voltage, picture element electrodes disposed in a matrix on one of said pair of substrates, each of said picture element electrodes being composed of a pair of divided electrodes, a first bus wiring disposed between said pair of divided electrodes, and a second bus wiring intersecting with said first bus wiring, wherein a connection region comprises a pair of electrical conductor layers disposed at both sides of said first bus wiring and extending in parallel thereto, a pair of electrical conductor pieces superposed on portions of said electrical conductor layers so as to sandwich an insulating film therebetween in a non-conductive state, respectively, portions of said divided electrode superposed on said electrical conductor pieces in a conductive state respectively, and a spare wiring intersecting with said first bus wiring so as to sandwich said



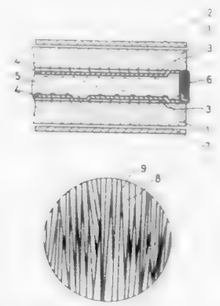
insulating film therebetween, said spare wiring being superposed on said electrical conductor layers so as to sandwich said insulating film therebetween in a non-conductive state, and said connection region being coated by a protective coat so as to be isolated from said display medium.

5,151,808

CHIRAL SMECTIC LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE HAVING DOMAINS FOR ALIGNMENT SMALLER THAN A PIXEL

Shunpei Yamazaki, Tokyo, and Masahiko Sato, Atugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 245,794, Sep. 19, 1988, Pat. No. 4,986,638.
This application Oct. 31, 1990, Ser. No. 606,186
Claims priority, application Japan, Sep. 18, 1987, 63-234196; Jun. 24, 1988, 63-157703; Jun. 24, 1988, 63-157704
The portion of the term of this patent subsequent to Apr. 20, 2008, has been disclaimed.
Int. Cl.[5] G02F *1/13, 1/1337, 1/1343*
U.S. Cl. 359—78 5 Claims



1. A liquid crystal device comprising:

a pair of substrates;

a chiral smectic liquid crystal layer interposed between said substrates;

an electrode arrangement for applying an electric field to said liquid crystal layer; and

an orientation control surface formed on at least one inside surface of said substrates;

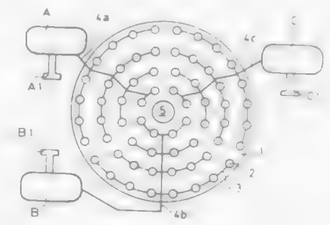
wherein said liquid crystal layer comprises a plurality of domains in each of which liquid crystal molecules are aligned in a direction which is determined by said orientation control surface.

5,151,809

MIRROR SUPPORT ARRANGEMENT FOR A PRIMARY MIRROR OF A TELESCOPE

Hans-J. Meier, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jul. 1, 1991, Ser. No. 722,884
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021647
Int. Cl.[5] G02B *7/18, 5/08*
U.S. Cl. 359—846 6 Claims



1. A mirror support arrangement for a primary mirror of a telescope for non-earthbound vehicles, the mirror being subjected to forces acting laterally on the mirror, the mirror having an optical axis and having a rear side, the mirror support arrangement comprising:

said mirror having a plurality of first support points arranged in a raster on said rear side thereof and a plurality of second support points also arranged on said rear side;

an axial support system having a plurality of axial support elements acting at respective ones of said first support points to simulate a three-point axial support of said mirror;

a lateral support system having a plurality of hydraulic lateral support elements acting at respective ones of said second support points for distributing said forces to said second support points;

said hydraulic lateral support elements being arranged into first and second groups, the support elements of said first group acting in a first direction on said first support points and the elements of said first support points and the elements of said second group acting in a second direction on said second support points to define a V-support whereby lateral forces are taken up within a V-angle conjointly defined by said first and second directions; and,

rotation stop means for preventing said mirror from rotating about said optical axis.

5,151,810

METHOD FOR ALIGNMENT OF SCAN LINE OPTICS WITH TARGET MEDIUM

Douglass L. Blanding, Rochester; Michael E. Harrigan, Webster, and David Kessler, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 785,346, Oct. 31, 1991. This application Nov. 4, 1991, Ser. No. 786,339
Int Cl.[5] G02B *26/10*
U.S. Cl. 359—198 16 Claims

1. A method for positioning an optical system relative to a scan line receiving medium in a printer, or the like; the optical system being mounted on a frame and being suitable for generating a beam along a z (beam path) direction and scanning the same along a scan line in a y (scan) direction; and the receiving medium being supported for movement in an x (cross-scan) direction on the printer; the method being characterized in that it comprises the steps of:

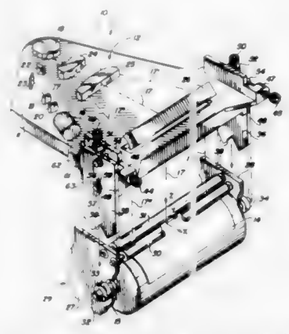
providing two curved surfaces on the printer;

providing two blocks attached to the frame, the blocks having upwardly-directed, inverted V-notches;

providing an alignment fixture having two curved surfaces.

relatively dimensioned, configured and adapted to correspond to the printer curved surfaces, and having a beam receiving element dimensioned, configured and adapted relative to the fixture curved surfaces to correspond to the position of the receiving medium relative to the printer curved surfaces;

placing the frame, with the blocks attached, onto the fixture with the block notches brought over the fixture curved surfaces;



selectively adjusting the positions of the blocks relative to the frame to establish a positional relationship between the scan line and the beam receiving element, corresponding to a desired positional relationship between the scan line and the receiving medium;

locking the blocks in their selectively adjusted positions relative to the frame; and

placing the frame, with the blocks locked, onto the printer, with the block notches brought over the printer curved surfaces.

5,151,811

LIGHT DEFLECTING APPARATUS

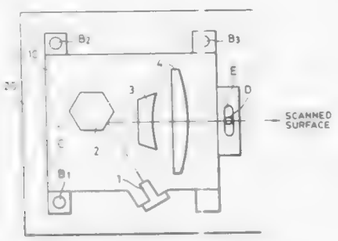
Jun Makino, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 512,197, Apr. 20, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 839,715

Claims priority, application Japan, Apr. 24, 1989, 1-105455

Int. Cl.[5] **G02B** *26/08, 27/00*

U.S. Cl. 359—198 **31 Claims**



1. A light deflecting apparatus comprising:

an optical box;

a light source unit for emitting a light beam;

a light deflecting unit mounted in said optical box and capable of deflecting the light beam in a deflection plane to scan a surface with an image surface of the light beam;

an optical system mounted in said optical box and capable of converging the light beam deflected by said deflecting unit; and

a mounting base on which said optical box is rotatably mounted, wherein said optical box is mounted for rotation within the light deflection plane to adjust the inclination of the image surface with the surface to be scanned.

5,151,812

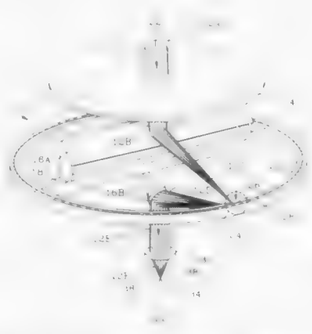
PASSIVE ENERGY DIAMETRIC SCANNER

Troy M. Watson, 5672 E. Kelso St., Tuscon, Ariz. 85712

Filed Aug. 30, 1991, Ser. No. 753,315

Int. Cl.[5] **G02B** *26/10*

U.S. Cl. 359—201 **14 Claims**



1. A diametric line scanner for sensing radiant energy intensity within a circular forward target field of view, comprising:

a first lens system adapted to collect radiant energy from the field of view and transmit the collected energy along a convergent primary beam so as to provide a first focal point at which a targeted object point in the field of view is focussed;

reflecting means in the vicinity of the first focal point adapted to reflect radiant energy of the primary beam and thus produce a divergent reflected secondary beam,

a second lens system adapted to converge the secondary beam into a convergent final beam path so as to provide a second focal point at which the point in the field of view is focussed;

a radiant-energy-sensitive cell located concentrically with the secondary beam at the second focal point, adapted to input to storage and processing means an electrical signal proportional to instantaneous energy intensity sensed; and

energy selection means, disposed between said first lens system and said second lens system and associated with said reflecting means, adapted to selectively expose said cell to radiant energy from the field of view in a manner to scan the field of view for localized energy level in continuous successive diametric scan lines, each starting at an edge of the field of view and progressing through a central point therein to an opposite edge, each scan line being advanced angularly about the central point by a predetermined angle.

5,151,813

METHOD AND APPARATUS FOR PRODUCING THREE-DIMENSIONAL OBJECTS

Masanobu Yamamoto, Kanagawa, and Kazumine Itoh, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 12, 1990, Ser. No. 492,607

Claims priority, application Japan, Mar. 14, 1989, 1-61422

Int. Cl.[5] **G02B** *26/08;* **G11C** *13/00;* **B29C** *35/08*

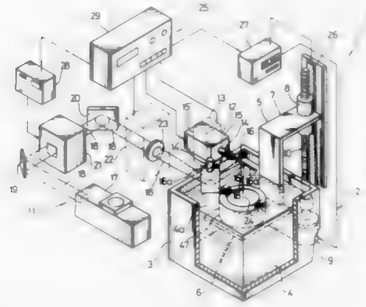
U.S. Cl. 359—202 **8 Claims**

6. A three-dimensional object producing apparatus including means for irradiating a beam on a liquid surface of a liquid photo-curable resin to form a succession of cured resin layers corresponding to successive cross-sectional laminae of a three-dimensional object and means for incrementally lowering the cured resin layers below the liquid surface as they are formed

to build up a three-dimensional copy of the object, the apparatus comprising:

(a) means for vector-scanning the beam on a first layer of photo-curable resin along one or more paths corresponding only to the contour or contours of a first one of the cross-sectional laminae of the object to thereby form a line or lines of cured resin in the shape of the contour or contours of a first one of the cross-sectional laminae of the object;

(b) means for lowering the line or lines of cured resin formed by the vector scanning means below the liquid surface by



a distance corresponding to the thickness of one crosssectional lamina of the three-dimensional object to thereby flow a layer of photo-curable liquid resin to cover the line or lines of cured resin;

(c) means for thereafter raster-scanning the beam on the layer of photo-curable resin covering the line or lines of cured resin; and

(d) wherein the vector-scanning means, the means for lowering, an the raster-scanning means operate repeatedly and sequentially until a complete copy of the object is thereby produced.

5,151,814

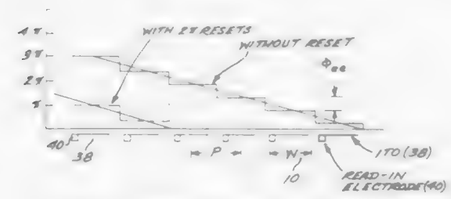
PHASED ARRAY FOR OPTICAL BEAM CONTROL

Jan Grinberg, Los Angeles; Thomas R. O'Meara, Malibu; Yuri Owechko, Newbury Park; Melvin E. Pedinoff, Thousand Oaks, and Bernard H. Soffer, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 420,077, Oct. 10, 1989, abandoned, which is a division of Ser. No. 87,173, Aug. 19, 1987, abandoned. This application Mar. 18, 1991, Ser. No. 673,175

Int. Cl.[5] **G02B** *26/08*

U.S. Cl. 359—209 **5 Claims**



1. A method of steering an optical beam incident on an array of a plurality of beam deflection elements, having a refractive medium, first and second drive electrodes in contact with a third electrode disposed on one side of said medium and a fourth electrode disposed on an opposed side of said medium, comprising the steps of:

applying drive voltages to said first and second drive electrodes for progressively linearly shifting the phase of the optical beam across the beam diameter in a direction perpendicular to the beam propagation direction; and

selecting said linear phase shifts according to the progressions;

$\phi'(n)=2\pi[n w\tan(\alpha)-K(n)\lambda]\lambda$

$\phi''(n)=2\pi[(n+1)w\tan(\alpha)-K(n)\lambda]\lambda$

where:

α is the desired deflection angle;

$\phi'(n)$ and $\phi''(n)$ are the phases introduced at the first and second electrodes located at the ends of the n^{th} element of the array;

w is the width of each element of the array

λ is the wavelength of the propagating beam

K(n) is the integer representing the number of wavelengths to be subtracted from the n^{th} element;

wherein said drive voltages are applied to first and second drive electrodes associated with each of said elements to linearly distribute the voltages between said first and second drive electrodes so as to create a linear phase change between said first and second drive electrodes and individually control the angle of deflection and phase shift induced by each of said elements in the optical beam such that the phase jump between abutting end points of adjacent elements in an integral number of the wavelength of the optical beam, and

the optical beam is steered as a spatially phase coherent deflected beam.

5,151,815

SCANNING DEVICE AND APPLICATION THEREOF TO ANALYSIS DEVICES

Gérard Baillet, St Benoit Vienne, France, assignor to SAT (Societe Anonyme de Telecommunications), Paris, France

Filed Dec. 26, 1990, Ser. No. 633,625

Claims priority, application France, Dec. 26, 1989, 89 17166

Int. Cl.[5] **G02B** *26/10*

U.S. Cl. 359—220 **25 Claims**

1. A system for scanning a light beam comprising:

reflecting means M receiving a rotating incident beam R_T at an angle of incidence $\frac{1}{2}B_1$ to provide a reflected beam R_f, said reflecting means M being movable about an axis of rotation R, the reflected beam R_f being fixed in space, in which system the axis of rotation R of said reflecting means M forms an angle i with a perpendicular A to a scanning plane P_f of said rotating incident beam R_T

5,151,816

METHOD FOR REDUCING CURRENT LEAKAGE AND ENHANCING UV STABILITY IN ELECTROCHEMICHROMIC SOLUTIONS AND DEVICES

Desaraju V. Varaprasad; Hamid R. Habibi; Niall R. Lynam, and Padma Desaraju, all of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

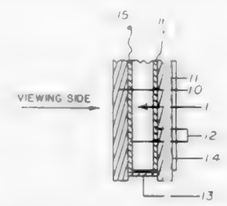
Filed Dec. 29, 1989, Ser. No. 458,969

Int. Cl.[5] **G02F** *1/01*

U.S. Cl. 359—275 **31 Claims**

1. A method for reducing leakage current and enhancing

UV stability/in an electrochemichromic cell having spaced plates, each having an inwardly facing conductive surface, and a solution located in said cell between said plates, said solution comprising a redox chemical pair which colors in the presence



of an applied voltage and which bleaches to a colorless condition in the absence of an applied voltage said method comprising:

using a solvent for said redox chemical pair comprising at least 25% by volume glutaronitrile.

5,151,817
OPTICAL FREQUENCY SECOND HARMONIC GENERATOR

Denise M. Krol, Murray Hill, and Jay R. Simpson, Fanwood, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

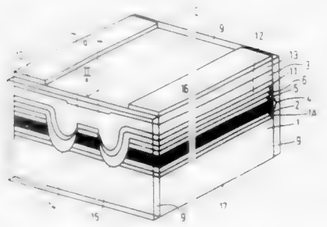
Filed May 8, 1991, Ser. No. 697,054
Int. Cl.[5] G02F 1/37
U.S. Cl. 359—328 **9 Claims**

1. A source of light of a desired frequency 2f comprising:
a waveguiding body of glass doped with cerium;
an optical input source of light at frequency f for directing an input beam into said body of glass; and
utilization means for receiving light passing through said body and utilizing light at frequency 2f.

5,151,818
SEMICONDUCTOR OPTICAL AMPLIFIER

Petrus J. A. Thijs, and Lukas F. Tiemeijer, both of Eindhoven, Netherlands, assignors to U. S. Philips Corp., New York, N.Y.

Filed Jul. 30, 1991, Ser. No. 738,062
Claims priority, application Netherlands, Aug. 3, 1990, 9001761
Int. Cl.[5] H01S 3/25, 3/19; C02F 3/00
U.S. Cl. 359—344 **9 Claims**

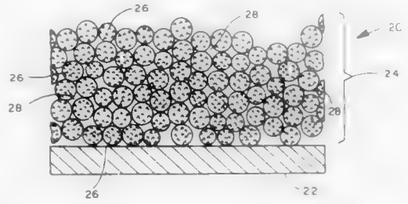


1. An optical amplifier having at least a semiconductor body comprising a substrate of a first conductivity type and at least a semiconductor layer structure situated thereon and comprising at least a first passive layer of the first conductivity type, a second passive layer of the second, opposite conductivity type, and between the first and the second passive layer an active layer and a pn junction, amplification of electromagnet radiation within a wavelength range taking place at at least a selected current strength in the forward direction through the pn junction within a strip-shaped amplification region of the active layer, which has a greater effective refractive index and a smaller bandgap for the radiation to be amplified than the first and second passive layers, which comprises a plurality of quantum well layers of a semiconductor material having a direct band transition and being mutually separated by barrier layers of a different semiconductor material, and in which a first portion of the quantum well and barrier layers which form part of the active layer are under tensile stress, the strip-shaped amplification region being bounded in the longitudinal direction by end faces which serve as input and output surfaces for the radiation to be amplified and which are of low reflection, the second passive layer and the substrate being electrically connected to connection conductors, characterized in that a second portion of the quantum well and barrier layers which form part of the active layer are under compressive stress.

5,151,819
BARRIER FOR SCATTERING ELECTROMAGNETIC RADIATION

Richard B. Stephens, Del Mar, Calif., assignor to General Atomics, San Diego, Calif.

Continuation-in-part of Ser. No. 283,289, Dec. 12, 1988, abandoned. This application Jul. 27, 1990, Ser. No. 558,600
Int. Cl.[5] G02B 5/02; B64G 1/54
U.S. Cl. 359—350 **15 Claims**



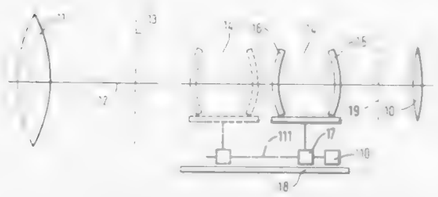
1. A barrier supported by an object, such as a satellite or missile for use in space, for scattering a coherent beam of electromagnetic radiation having a wavelength in a predetermined range of wavelengths, said predetermined range being within, but not necessarily fully including, the range of about 0.2 micron to about 11 microns and with said radiation emanating from a distant source of such radiation, said barrier comprising:

a non-metallic layer formed by a multiplicity of first components arranged in close proximity with each other and a multiplicity of second components, each of said components being disposed in the gaps formed between said first components, one of said components having a relatively low index of refraction such as for a vacuum or air and the other of said components having a substantially higher index of refraction, the optical thickness of at least a majority of said first components and at least a majority of said second components being within an order of magnitude of the wavelength of said radiation, both of said components being transparent at said wavelength, said layer having a thickness between about 0.2 micron and 1000 microns.

5,151,820
ZOOM LENS

Hilary G. Sillitto, West Lothian, and Alison B. Lessels, Edinburgh, both of United Kingdom, assignors to GEC Ferranti Defence Systems Limited, Stanmore, United Kingdom

Filed May 2, 1991, Ser. No. 694,298
Claims priority, application United Kingdom, May 18, 1990, 9011160
Int. Cl.[5] G02B 15/00
U.S. Cl. 359—354 **9 Claims**



1. A zoom lens for use in an infra-red telescope and providing a magnification which is adjustable to either of two predetermined values and comprising a pair of positive lens elements fixed relative to one another and each having an aspheric surface, the pair of lens elements being locatable between the two image planes formed in the telescope and being movable between two conjugate positions.

5,151,821
SYSTEM AND DEVICES FOR TIME DELAY 3D

Mortimer Marks, 166-17 Cryders La., Whitestone, N.Y. 11357

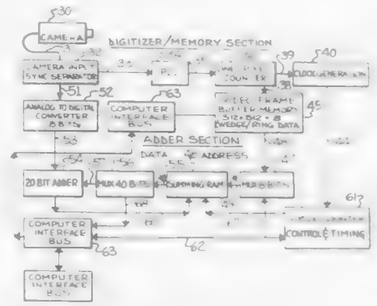
Filed Oct. 25, 1990, Ser. No. 604,089
Int. Cl.[5] G02B 27/22
U.S. Cl. 359—462 **20 Claims**

1. A panning-camera for the recording of time delay three dimensional images of objects in a scene, an arbitrary fixed point P in said scene, said panning-camera comprising a camera, a lens on said camera, said lens having a center C on its optical axis OZ, a deflector A having a reflecting plane at 45° intersecting said optical axis at point O, said point O being the origin of OXYZ rectangular coordinates with its OX axis horizontal, a second deflector B, a first means for respectively rotating and translating said deflector B with an angular velocity $-\omega/2$, and a linear velocity u_x, a mounting, said camera and said means being attached to said mounting, said deflector B having a reflecting plane intersecting the said OX axis at point R where $x=a$, the angle OPR being defined as $\theta=a/r$ radians, where r=distance PR from point R to said fixed object point P, and the angular velocity of said panning about said fixed point P being $(d\theta/dt)=\omega$, the plane of said deflector B making an angle of $(45°-\theta/2)$ between its normal RQ and the OX axis, said means rotating said deflector B with an angular velocity $-\omega/2$ from θ_1 to θ_2 about an axis parallel to the OY axis through point R, and simultaneously translating said point R on deflector B along the said OX axis with linear velocity $u_x=\pm\omega r$, from a minimum distance $x=a_1$ to a maximum distance $x=a_2$, said first means periodically returning said deflector to the position where $x=a_1$ and $\theta=\theta_1$, whereby said scene is continuously panned by said panning-camera relative to said optical axis OZ, thereby encoding in said recording a time-delay three dimensional image of said scene.

5,151,822
TRANSFORM DIGITAL/OPTICAL PROCESSING SYSTEM INCLUDING WEDGE/RING ACCUMULATOR

Roeland M. T. Hekker, Fairfield, Iowa; Izhak M. Livny, and Gregory S. Mercurio, both of San Jose, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 920,513, Oct. 17, 1986, abandoned. This application Mar. 19, 1990, Ser. No. 497,878
Int. Cl.[5] G02B 27/46; G06K 9/76, 9/36; G06E 3/00
U.S. Cl. 359—559 **62 Claims**



1. An apparatus for detecting the transform of an image comprising:

means for generating a transform image from an image;

means for generating a relatively large number of transform digital data points from the transform image, each transform digital data point including an area portion digital data value identifying an area located within the transform image, and a corresponding feature portion digital data value identifying a feature of the transform image in the located area;

means for associating each of said relatively large number of transform digital data points with at least one of a relatively small number of zones, in response to the area portion digital data value associated with the transform digital data point, such that the associated zone includes the located area of the transform image represented by the corresponding transform digital data points;

means for generating a summed transform digital data value for each of said relatively small number of zones, each summed transform digital data value being the cumulation of any previous feature portion digital data values for the predetermined zone, to obtain a relatively small number of summed transform image data values representing said relatively large number of transform digital data points; and

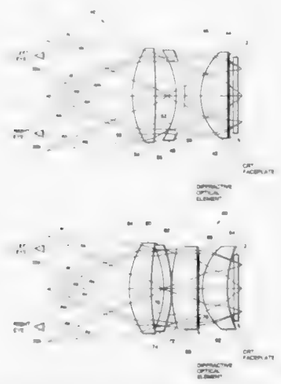
means for retrievably storing the summed transform image data value for each predetermined zone, to detect the transform of said image from said relatively small number of summed transform image data values, rather than said relatively large number of transform composite digital data points.

5,151,823

BIOCULAR EYEPIECE OPTICAL SYSTEM EMPLOYING REFRACTIVE AND DIFFRACTIVE OPTICAL ELEMENTS

Chungte W. Chen, Irvine, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 23, 1991, Ser. No. 764,285
Int. Cl.[5] G02B *5/18, 3/02, 3/08, 9/14*
U.S. Cl. 359—565 17 Claims



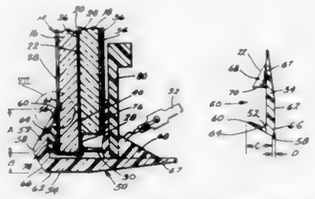
1. A biocular eyepiece optical system comprising:
a first optical element having at least one diffractive surface;
a second optical element having at least one refractive surface;
a third optical element having at least one refractive surface;
the first, second, and third optical elements being generally disposed along an optical axis; and
wherein the second optical element is optically intermediate the first and third optical element.

5,151,824

VEHICULAR OUTSIDE MIRROR ASSEMBLY

Desmond J. O'Farrell, Holland, Mich., assignor to Donnelly Corporation, Holland, Mich.

Filed Nov. 26, 1990, Ser. No. 618,169
Int. Cl.[5] G02B *17/00*
U.S. Cl. 359—604 35 Claims



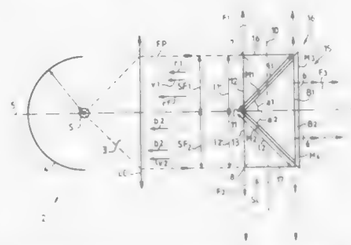
12. A rearview mirror assembly for vehicles comprising:
a rearview mirror including a mirror element having front and rear surfaces and peripheral top, bottom and opposing end edges and a reflective coating on one of said front and rear surfaces;
a bezel surrounding and holding said mirror and having a rim engaging said front surface of said mirror, a peripheral side adjacent said peripheral edges of said mirror, and means for holding said mirror within said bezel; and
mounting means for connection to a mirror support;
said bezel rim having a first width along said front mirror surface adjacent said top and bottom edges, the width of said bezel rim along said opposing end edges being less than said first width whereby when viewed at an angle from the front and adjacent one end, said bezel appears smaller at said end edges of said mirror thereby deemphasizing the size and appearance of said bezel on said assembly.

5,151,825

DEVICE FOR THE GENERATION OF SEVERAL BEAMS OF LIGHT INCLUDING A LIGHT SPLITTER

Christophe Nicolas, Paris, France, assignor to Thomson-CSF, Puteaux, France

Filed Sep. 19, 1991, Ser. No. 762,372
Claims priority, application France, Sep. 28, 1990, 90 11991
Int. Cl.[5] G02B *27/14, 5/28*
U.S. Cl. 359—634 13 Claims



1. A light beam generator device, comprising a light source producing a light beam called a primary beam, the spectrum of which is substantially that of visible light, a light splitter illuminated by the primary beam and producing, in return, at least two secondary beams corresponding to different wavelengths, the first and second of the secondary beams being obtained respectively by means of a first mirror and second mirror that are selective in wavelength, wherein the first and second selective mirrors are positioned so as to intercept different parts of the section of the primary beam, and wherein the light splitter further has a rear face at least partially constituting a total mirror, the rear face being, firstly, located opposite the light source with respect to the first and second selective mirrors and being, secondly, in a plane perpendicular to an axis of propagation of the primary beam.

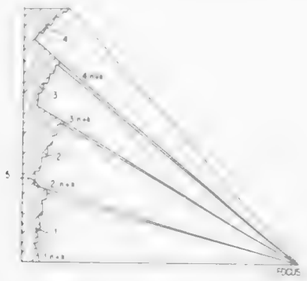
5,151,826

FRESNEL LENS

Ian K. Pasco, Bracknell, Great Britain, assignor to Combined Optical Industries Limited, Slough, United Kingdom

Continuation of Ser. No. 439,641, Nov. 20, 1989, abandoned.
This application Mar. 8, 1991, Ser. No. 668,814
Claims priority, application United Kingdom, Oct. 16, 1989, 8923265
Int. Cl.[5] G02B *3/08*
U.S. Cl. 359—742 7 Claims

1. A fresnel lens comprising a plate having a plurality of zones, a plurality of facets in each zone so dimensioned and configured that the distance between a face of the lens for each facet and a focal point of the lens on the same side thereof as said face is $(n+k)\lambda$ where n is an integer, λ is the wavelength of radiation passing through the lens and k is a fraction between 0 and 1 which is substantially constant for every facet across the entire face of the lens, the integer n being constant for all the facets of each zone, with the integer n being different for the facets of different zones, respectively, whereby the



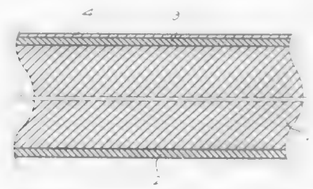
radiations from all of said zones arrives at said focal point substantially in phase.

5,151,827

SELF-SUPPORTING MIRROR AND METHOD FOR THE MANUFACTURE THEREOF

Kari K. M. Ven; Petri A. G. Ven; Irja L. L. M. Ven; Timo Ven, all of Antwerp, and Juha Ven, Brasschaat, all of Belgium, assignors to Aurinco Holdings Limited, Guernsey, Channel Islands

Filed May 17, 1991, Ser. No. 701,837
Claims priority, application Belgium, May 18, 1990, 9000527
Int. Cl.[5] G02B *5/08*
U.S. Cl. 359—848 6 Claims



1. A method for manufacturing a mirror for the utilization of solar rays, comprising the steps of:
preparing a core composed of hard foam and having two sides;
gluing protective coverings on both sides of said core under a vacuum; and
applying a reflective foil to at least one of said protective coverings.

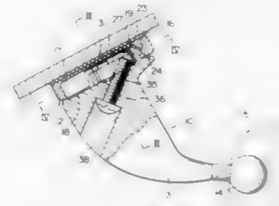
5,151,828

INSIDE REAR VIEW MIRROR FOR A VEHICLE

Naomi Sugimura, Shimada, Japan, assignor to Ltd. Murakami Kaimeido Co., Shizuoka, Japan

Filed Jun. 4, 1990, Ser. No. 532,966
Claims priority, application Japan, Jul. 14, 1989, 1-82152[U]
Int. Cl.[5] B60R *1/04*
U.S. Cl. 359—871 7 Claims

1. An inside rear view mirror for a vehicle, comprising:
a base to be secured to an interior surface of a vehicle and having a bottom surface and a cavity formed in said bottom surface;
a stay detachably mounted on said bottom surface of said base and having an upper surface;
a frame arranged at said upper surface of said stay and received in said cavity, said base having an inside wall surface defining said cavity and having a first semi-spherical dent arranged in the center of said inside wall surface and two second semi-spherical dents formed, respectively at opposite positions of said inside wall surface equally spaced from the center of said inside wall surface, said frame having a front end and a semi-spherical projection formed at said front end for engaging said first semi-spherical dent;
elastic engaging means comprising an arc-shaped leaf spring to be located in said frame and two stoppers arranged at opposite sides of said frame, respectively;



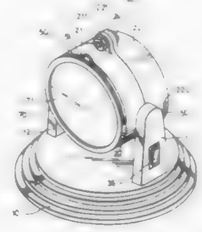
said elastic engaging means arranged in said frame to provide for engagement of said two stoppers in said two second semi-spherical dents, respectively; and
each of said two stoppers elastically engaging a respective end of said leaf spring and having a semi-spherical convex projecting through a respective end portion of said frame for engaging said respective second semi-spherical dent.

5,151,829

KINETIC ART ARTICLE ASSEMBLY WITH STACKED COLOR FILTERS

Ren-Yi Hwang, 2nd Floor, 9-1, Lane 161, Hsing An Road, Sec. 1, Tachung, Taiwan

Filed Jun. 24, 1991, Ser. No. 722,237
Int. Cl.[5] G02B *5/24;* G04F *13/24*
U.S. Cl. 359—886 5 Claims



1. A kinetic art article assembly with stacked color filters comprising:
a base;
two support plates on the top of said base;
a cylindrical main body supported by said two support plates;
a front main body and a rear main body defined by said cylindrical main body;
a fluid governor disposed in said cylindrical body and between said front main body and said rear main body;
a drive mechanism disposed in said base for controlling the motion of said cylindrical main body;
at least a plate assembly disposed in said front main body and said rear main body;
said plate assembly comprising a front plate, a flat plate, and a rear plate;
said front plate having a first recess therein;

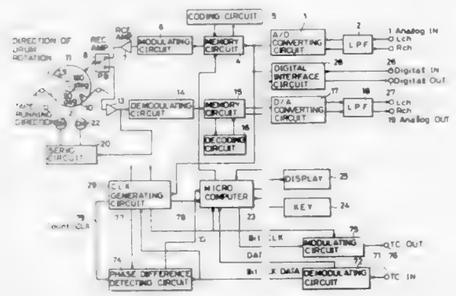
said rear plate having a corresponding second recess therein;
a first tube disposed on the rim of said flat plate with a liquid capable of flowing from said first tube to said first recess;
a second tube disposed on the rim of said rear plate with a liquid capable of flowing from said second tube to said second recess;
Wherein each of said front plate, flat plate, and rear plate of said front main body has a hole being passed through by said correcponding tubes of said rear main body and each of said front plate, flat plate, and rear plate of said rear main body has a hole being passed through by said corresponding tubes of said front main body.

5,151,830

MAGNETIC RECORDING AND REPRODUCING APPARATUS AND METHOD OF RECORDING AND REPRODUCING

Kenji Goto; Manabu Tsukamoto; Masayuki Ishida, and Yoshinobu Ishida, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 448,722, Dec. 11, 1989, Pat. No. 5,097,364. This application Oct. 9, 1991, Ser. No. 773,832
Claims priority, application Japan, Dec. 12, 1988, 63-314232; Dec. 22, 1988, 63-327035; Mar. 22, 1989, 1-71090; Mar. 23, 1989, 1-73129; Mar. 23, 1989, 1-73130; Mar. 24, 1989, 1-72625; Apr. 4, 1989, 1-86028; Apr. 14, 1989, 1-95682; May 12, 1989, 1-119248; Dec. 7, 1989, 1-318522
The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—32 **2 Claims**



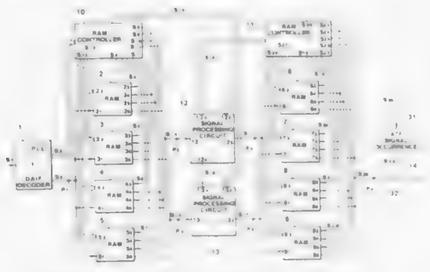
1. A magnetic recording and reproducing apparatus dividing inputted main signals at every prescribed frame period to process said divided main signals as 1 frame data to record the same on a prescribed area of a magnetic tape and recording sub signals in a different area of said magnetic tape, and reproducing the recorded main signals and sub signals, comprising:
information extracting means receiving time code signals having a frame period different from that of said main signals for extracting first time information included in said time code signals;
phase difference detecting means for detecting phase difference between a point of change of frames of said main signals and a point of change of frames of said time code signals by prescribed clock signals;
arithmetic means, in recording, responsive to the first time information extracted by said information extracting means and to the phase difference information detected by said phase difference detecting means for calculating second time information using said prescribed frame period as a minimum unit, and for calculating initial phase difference information between head of a frame as a reference of said time code signals and head of a frame of said main signals positioned at the frame as the reference of said time code signals, and in reproduction, for calculating said first time information and the phase difference information from said second time information and said initial phase difference information;
recording and reproducing means for recording, in recording, said second time information calculated by said arithmetic means, said initial phase difference information, and frequency identifying information indicative of the frequency of the said prescribed clock signals used for detecting said phase difference information in said sub signal recording area, and for reproducing, in reproduction, said second time information, said initial phase difference information, and said frequency identifying information from said sub signal recording area; and
time code signal generating means for composing a series of data of a prescribed transmission format of said time code signal based on said first time information calculated by said arithmetic means and for outputting the series of data of said composed time code signals in response to said phase difference information calculated by said arithmetic means.

5,151,831

DIGITAL SIGNAL PROCESSING CIRCUIT

Hitoshi Narusawa, and Michiaki Yoneda, both of Tokyo, Japan, assignors to Nakamichi Corporation, Kodaira, Japan

Filed Apr. 23, 1990, Ser. No. 513,236
Claims priority, application Japan, Apr. 28, 1989, 1-110344
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—39 **4 Claims**



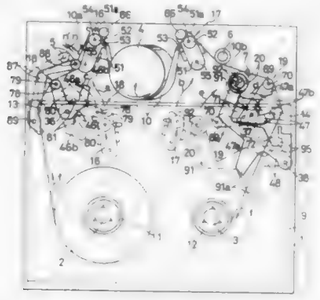
1. A digital signal processing circuit comprising:
first and second memory groups each including first through n_{th} memory means to sequentially store digital data of transmission rate t input by a frame unit;
first control means to control said first and second memory groups so that said first through n_{th} memory means in one of said first and second memory groups simultaneously output the stored digital data at transmission rate t/n while said first through n_{th} memory means in the other of said first and second memory groups store said sequential digital data;
first through n_{th} signal processing means to sequentially signal-process digital data of n systems alternately output from said first and second memory groups on a format of DAT, respectively;
third and fourth memory groups each including first through n_{th} memory means to alternately store the data signal-processed by said signal processing means, respectively;
and second control means to control said third and fourth memory groups so that said first through n_{th} memory means in one of said third and fourth memory groups output the stored digital data signal processed by said signal processing means at a velocity n times as great as that on memory in a predetermined sequential manner while said first through n_{th} memory means in the other of said third and fourth memory groups store the data signal processed by said signal processing means output from said first through n_{th} signal processing means.

5,151,832

TAPE LOADING DEVICE

Tsuyoshi Nagasawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,950
Claims priority, application Japan, Dec. 26, 1989, 1-337002
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 **16 Claims**



1. A tape loading device for use with a magnetic tape cassette, comprising:
rotary head drum means around which a magnetic tape is wrapped at a predetermined angle of contact and having a rotary head for recording and/or reproducing information from the magnetic tape;
tape loading means arranged for reciprocating movement to wrap the magnetic tape around the head drum means and withdraw the magnetic tape from around the head drum means, the magnetic tape being withdrawn from the tape cassette to be wrapped around the head drum means at the predetermined angle of contact;
a capstan motor rotatable in both normal and reverse directions to drive a capstan means so that the magnetic tape travels at a constant speed;
drive gear means driven by the capstan motor;
partially toothless gear means facing the drive gear means so as to be intermittently rotated thereby, and having a cam mechanism for causing the tape loading means to reciprocate over a predetermined distance;
a mode changing mechanism for changing the mode of the tape loading device;
a mode motor rotatable in both normal and reverse directions for putting the mode changing mechanism in action in correspondence with an angle of rotation thereof; and
trigger means for mechanically triggering a predetermined amount of rotation of the partially toothless gear, wherein the trigger means is driven due to torque of the mode motor so as to mesh the partially toothless gear with the drive gear means, the partially toothless gear is rotated due to torque of the capstan motor, and the tape loading means is reciprocated due to motion of the cam mechanism of the partially toothless gear.

5,151,833

MAGNETIC TAPE DEVICE HAVING A SWITCHING MECHANISM FOR DIVERTING ROTATION OF THE CAPSTAN TO ROTATION FOR LOADING/UNLOADING A CASSETTE IN THE DEVICE

Yasuyuki Nakanishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 579,972
Claims priority, application Japan, Sep. 12, 1989, 1-234745; Sep. 13, 1989, 1-235815; Sep. 19, 1989, 1-240553
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 **9 Claims**

1. A magnetic tape device for loading a tape cassette and for feeding and loading the magnetic tape in the tape cassette toward a rotary drum, comprising:
a capstan motor having a motor shaft operatively connected to a capstan;
a motor gear mounted on said motor shaft of said capstan motor;
a cam gear operatively connected to a drive motor so as to operate a tape loading mechanism for drawing out the magnetic tape from the tape cassette when the tape cassette is in a cassette playing position;
a movably mounted moving gear for engaging said motor gear to transmit rotation of said motor shaft to a cassette loading mechanism for moving a tape cassette to the cassette playing position; and

a first pivotal lever rotatably supported on a fixed axis and having said moving gear mounted for rotation thereon, said lever being operatively associated with said cam gear such that rotation of said first pivotal lever is is dependent upon the amount of rotation of said cam gear, whereby when said tape loading mechanism is in an inoperative position, said moving gear meshes with said motor gear to transmit rotation from said motor shaft to said cassette loading mechanism, and when said tape loading mechanism is moved to an operative position, said moving gear is brought out of meshing engagement with said motor gear.

5,151,834

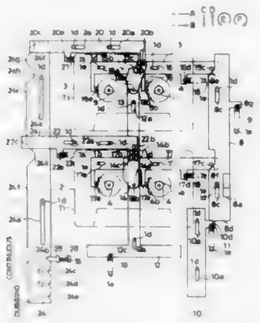
BRAKE RELEASING MECHANISM OF DUPLEX TAPE RECORDER

Satoru Koizumi, Higashi Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jun. 12, 1990, Ser. No. 536,799
Claims priority, application Japan, Jun. 30, 1989, 1-170662
Int. Cl.[5] G11B *15/68, 15/48, 5/008;* **B65H** *16/10*
U.S. Cl. 360—92 **9 Claims**

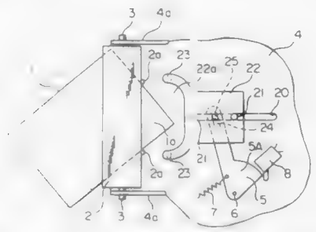
1. A duplex tape recorder which holds two tape cassettes laid one over another for recording and reproducing, the duplex tape recorder comprising:
a first reel engagable with an upper tape cassette for driving a tape in the upper tape cassette;
a second reel which is coaxial with the first reel and engagable with the lower tape cassette for driving a tape in the lower tape cassette;
cassette holder means for holding the upper and lower tape cassettes laid one over another, the cassette holder means being movable between a first position in which the upper and lower tape cassettes can be removed therefrom and a second position in which the upper and lower tape cassettes can engage the first and second reels, respectively;
mode selecting means for selecting one of a plurality of modes, the modes including a T_1 mode in which reproduction is performed only for the upper tape cassette, a T_2 mode in which reproduction is performed only for the

lower tape cassette, and a dubbing mode in which recorded output of one of the tape cassettes is recorded by the other tape cassette;
locking means for locking the cassette holder means in the second position;
eject means for releasing the locking means;
first braking means for braking the rotation of the first reel;
second braking means for braking the rotation of the second reel;
brake preset means for presetting the first and/or second braking means in accordance with the mode selected by the mode selecting means;



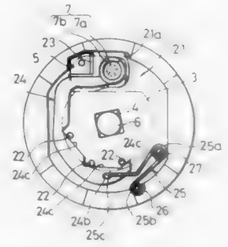
first brake releasing means for releasing the first and second braking means in response to the operation of the eject means;
tape-driving mode means which is driven with the operation for driving the upper and/or lower cassettes; and,
second brake releasing means for releasing braking force exerted on one of the first and second reels which drives the tape in correspondence with the preset state of the first and/or second braking means by the brake preset means, when the tape-driving mode means is operated.

5,151,835
CASSETTE DETECTING DEVICE FOR CASSETTE LOADING MECHANISM
Yasuyuki Nakanishi, Sanda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Dec. 17, 1990, Ser. No. 623,444
Claims priority, application Japan, Apr. 25, 1989, 1-103415
Int. Cl.[5] G11B *5/08, 17/02*
U.S. Cl. 360—96.5 **12 Claims**



1. A cassette detecting device, for use with a cassette loading mechanism having a frame and a cassette holder movably disposed on said frame,
said cassette detecting device comprising:
a detecting member movably supported on the frame, said detecting member being urged into an actuated position by a leading edge of a cassette inserted into the cassette holder in a push-in position;
biasing means for biasing said detecting member into a predetermined position; and
a detecting element responsive to movement of said detecting member for controlling a cassette loading device;
said detecting member further including engagement portions for engaging with leading edge of a cassette at two positions spaced apart from each other, said engagement portions defining therebetween a space for receiving therein a corner portion of a cassette when the cassette is not properly held within a cassette holder and for disabling said detecting member into said actuated position.

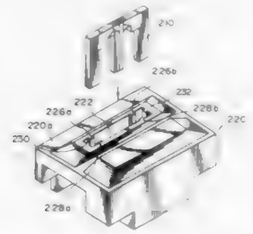
5,151,836
DISK CHUCKING DEVICE
Akira Ichihara, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Mar. 21, 1991, Ser. No. 672,813
Claims priority, application Japan, May 31, 1990, 2-56579[U]
Int. Cl.[5] G11B *17/022*
U.S. Cl. 360—99.08 **1 Claim**



1. A disk chucking device comprising:
a driving shaft engaged with a central hole formed in an information recording disk;
a turn table mounted on said driving shaft so as to rotate together with said driving shaft;
a plurality of holding pins disposed on said turn table and protruding therefrom;
a plate spring, comprising of a first and a second end portions, wherein a side edge of the first end portion is brought into contact with said holding pins, a driving pin engaged with a driving pin engaging hole formed at a position deviated from a center of the said information recording disk, said driving pin being disposed on the second end portion of said plate spring; and
elastic energizing means for elastically energizing the first end portion of said plate spring towards said holding pins.

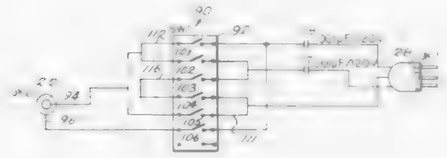
5,151,837
COMPOSITE MAGNETIC HEAD
Makoto Wakasugi, and Takao Kasai, both of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jan. 8, 1991, Ser. No. 638,766
Claims priority, application Japan, Jan. 12, 1990, 2-5981; Mar. 13, 1990, 2-60095
Int. Cl.[5] G11B *5/11, 5/60*
U.S. Cl. 360—103 **17 Claims**

1. A magnetic head comprising:
a) a core chip formed of magnetic material and including a plurality of gaps formed therein at the side of the core chip to contact a magnetic recording medium;
b) a slider including an aperture receiving said core chip, said aperture being opened at the surface of said slider and having longer and shorter side inner walls on which at least more than one protrusion extending into said aperture from said inner walls for positioning and constraining said core ship within said aperture are formed;
c) a fusible member in a clearance between said aperture and said core chip received in said aperture, said core chip being welded to the inner walls of said aperture by said fusible member; and



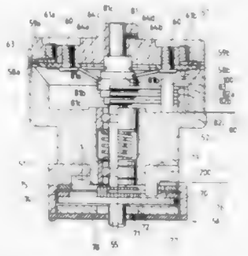
d) a layer of non-magnetic material provided on said inner walls of said aperture.

5,151,838
VIDEO MULTIPLYING SYSTEM
Gregory A. Dockery, 1938 Port La., Amarillo, Tex. 79106
Filed Sep. 20, 1989, Ser. No. 409,667
Int. Cl.[5] H04M *11/04*
U.S. Cl. 340—310 R **26 Claims**



1. A receiver for processing a video signal from a power line, comprising:
three input lines connected to a standard power adaptor, at least one input line carrying the video signal;
two output lines;
a processing means comprising conductive elements including switching means and arrangements of conductive paths in which
1) a first of said three input lines is connected to said switching means by multiple branch lines,
2) the second and third of said three input lines are connected to said switching means by multiple branch lines,
3) a first of said two output lines is connected to said switching means by multiple branch lines,
4) the second of said two output lines is connected to said switching means,
the switching means facilitates the selection of alternates of said conductive paths and said conductive elements to pass the video signal from the at least one input line carrying the video signal to at least one of said output lines thereby tuning the impedance of the receiver, and
the processing means enables the simultaneous electrical connection via said conductive elements of one of the output lines with two of the input lines.

5,151,839
CURRENT TRANSMITTING MECHANISM IN MAGNETIC RECORDING AND REPRODUCING APPARATUS
Hiroyuki Ota, Yonezawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Dec. 10, 1990, Ser. No. 625,240
Claims priority, application Japan, Jun. 6, 1990, 2-147951
Int. Cl.[5] G11B *5/52*
U.S. Cl. 360—108 **9 Claims**



1. A current transmitting mechanism to be mounted on a magnetic recording and reproducing apparatus having a magnetic head secured to a rotary drum, comprising:
a slip ring rotatable together with the rotary drum; and
a brush placed in contact with said slip ring in an electrically conductive manner so as to transmit an electric current signal from said slip ring, said brush comprising a brushing element made of an electrically conductive material contacting said slip ring, a support member for supporting said brushing element at a base end thereof and an elastic member secured to said brushing element on a side not contacting said slip ring, said elastic member having an elasticity different from that of said brushing element

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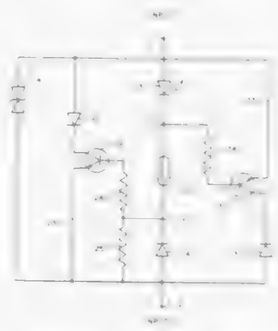
5,151,840
SWITCH PROTECTION CIRCUIT
Allen J. Siefken, Lake Oswego, Oreg., assignor to RAJ Industries, Inc., Lake Oswego, Oreg.
Filed Sep. 11, 1990, Ser. No. 580,639
Int. Cl.[5] H01H *9/30*
U.S. Cl. 361—13 **22 Claims**



1. A switch protective apparatus for protecting a switch device in a circuit having a first and a second input wherein the switch device controls the AC and DC electrical connection between said first and second inputs comprising:
switch means for providing a mechanical switch device to be protected in a primary branch between said first and said second input;
first diode means intermediate and in series with said switch

means and said first input for uni-directionally controlling the flow of current in said primary branch;

second diode means intermediate and in series with said switch means and said second input for uni-directionally controlling the current in said primary branch, and the polarity of said second diode means being opposite the polarity of said first diode means, thereby said primary branch comprises said first diode means connected directly from said first input directly to said switch means and said switch means connected directly to said second diode means and said second diode means connected directly to said second input;

a first parallel path between said first input and said second input and having a first controlled switching means for providing a low resistant current path between said first input and said second input when the polarity between said first and second input is the same as the polarity of said first diode means, and said switch means is in a closed position;

a second parallel path between said first input and said second input having a second controlled switching means for providing a current path between said first input and said second input when the polarity between said first and second inputs is the same as the polarity of said second diode means, said switch means is in a closed position; and

substantially all steady state load current is conducted through said first parallel path and said second parallel path when said switch means is maintained in a closed position and said first parallel path and said second parallel path cease to conduct steady state current when said switch means is maintained in an open position.

5,151,841

ELECTRICAL SAFETY APPARATUS

Douglas S. Knights, Sawbridgeworth, United Kingdom, assignor to B & R Electrical PLC, Harlow, England

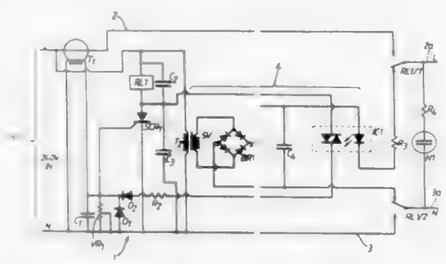
PCT No. PCT/GB89/00560, § 371 Date Mar. 21, 1990, § 102(e) Date Mar. 21, 1990, PCT Pub. No. WO89/11747, PCT Pub. Date Nov. 30, 1989

PCT Filed May 22, 1989, Ser. No. 458,613

Claims priority, application United Kingdom, May 23, 1988, 8812151

Int. Cl.[5] H02H *3/18, 3/26, 3/42*

U.S. Cl. 361—86 **26 Claims**



1. An electrical safety apparatus for connection between an electrical power source and a load comprising:

controllable connection means transferable between a first condition, in which the electrical power source is connected to the load, and a second condition, and including a switching means having one pole connected to each terminal of the load for switching connections to the terminals, the switching means having associated with each pole, a plurality of positions, including a first position, corresponding to said first condition, and a second position, corresponding to said second condition;

means for applying a low voltage, which is less than the voltage of electrical power source, to the load when said connection means is in the second condition;

monitoring means for monitoring a load impedance and for preventing the connection means from being transferred to or existing in said first condition when said impedance is indicative of the presence of a human being;

activation means responsive to the monitoring means, for controlling said means; and

said monitoring means including sensing means for directly sensing the current drawn by the load when said low voltage is applied thereto, and means for indicating the presence of a human being when the current sensed by the sensing means lies below a predetermined threshold value.

5,151,842

SWITCHBOARDS AND PANELBOARDS HAVING INTERLOCK AND LOAD SELECTION CAPABILITIES

Mark S. DeBiasi, Windsor, and Richard A. Menelly, Burlington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 19, 1991, Ser. No. 687,649

Int. Cl.[5] H02H *3/00;* **H02B** *1/04*

U.S. Cl. 361—93 **5 Claims**

4. A circuit breaker interconnect arrangement comprising in combination:

a main circuit breaker having a main electronic trip unit including a microprocessor said main circuit breaker arranged for interrupting current through a protected main circuit;

a main terminal board connecting with said microprocessor and with a plurality of main terminals arranged on said main terminal board;

a first branch circuit breaker having an associated first electronic trip unit and a first actuator unit, said first trip unit having means outputting a first pick-up signal upon occurrence of an overcurrent condition through an associated first branch circuit, electrically in series with said main circuit said first actuator unit having means for interrupting current through said first branch circuit;

a first branch terminal board connecting with said first electronic trip unit, said first actuator unit and said main terminal board;

a second branch circuit breaker having an associated second electronic trip unit and a second actuator unit, said second branch circuit breaker being electrically in series with said main circuit breaker and said first branch circuit breaker, said second trip unit having means outputting a second pick-up signal upon the occurrences of an overcurrent condition through an associated second branch circuit, said second actuator unit having means for interrupting current through said second branch circuit;

a second branch terminal board connecting with said second electronic trip unit, said second actuator unit and said main terminal board;

a third branch circuit breaker having an associated third electronic trip unit and a third actuator unit, said third branch circuit breaker being electrically in parallel with said second branch circuit breaker, said third branch circuit breaker having means outputting a third pick-up signal upon occurrence of an overcurrent condition through a third branch circuit, said third actuator unit having means for interrupting current through said third branch circuit; and

a third branch terminal board connecting with said third electronic trip unit, said third actuator unit and said main terminal board whereby said microprocessor inputs a trip signal to said second actuator unit to interrupt said second associated branch circuit upon receipt of said first pick-up signal.

5,151,843

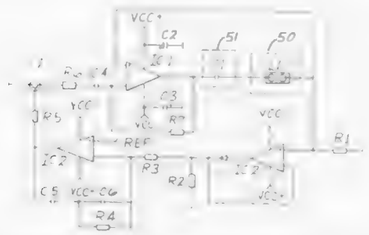
SENSITIZER FOR FERROMAGNETIC MARKERS USED WITH ELECTROMAGNETIC ARTICLE SURVEILLANCE SYSTEMS

Jurgen Sanetra, and Heinrich Schug, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 8, 1989, Ser. No. 447,666

Int. Cl.[5] H01F *13/00*

U.S. Cl. 361—149 **5 Claims**



1. A resensitizer apparatus adapted for use with an electronic article serveillance system for detecting a resensitizable marker secured to a moving article, in which the marker includes a first, low-coercive force, high-permeability ferromagnetic material and at least one section of a remanently magnetizable, relatively higher coercive force material which when magnetized magnetically biases the low coercive force material and thereby alters the detectability of the marker; the resensitizer apparatus comprising:

(a) an assembly comprising at least one section of a second ferromagnetic material having two substantially opposed major surfaces, the surfaces facing but not touching each other such that a gap exists between the surfaces;

(b) a conductor wound around outer and inner portions of the second ferromagnetic material; and

(c) an alternating current source capable of driving the assembly at a constant maximum amplitude such that the assembly concentrates external magnetic lines of flux near the gap to produce a sufficient number of field reversals in a spatially decreasing magnetic field outside the gap to resensitize the marker while the marker is moving away from the gap, the current source comprising:

(1) a coil in series with a capacitor and a current sense resistor;

(2) means for determining a voltage drop across the sense resistor and using the voltage drop as feedback into a proportional-integral control circuit which compares the voltage drop to a precision voltage reference and hold the amplitude of the alternating current in the coil at a constant level.

5,151,844

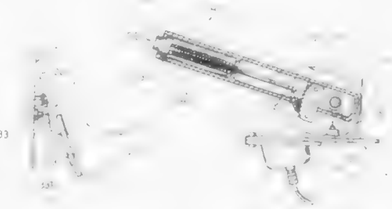
HANDBRAKE OPERATED CONTROL MEANS FOR CONTROLLING VEHICLE ACCELERATOR PEDAL

Yu Lin, P. O. Box 55-1670, Taipei, Taiwan

Filed Aug. 7, 1990, Ser. No. 564,425

Int. Cl.[5] B60D *1/62*

U.S. Cl. 361—179 **1 Claim**



1. A hand brake operated control means of a vehicle comprising:

an electrical control circuit including a normal-open switch positioned under a rear cam portion of a hand brake lever to be operatively depressed by said rear cam portion of said hand brake lever when upwardly pulling said hand brake lever for braking a vehicle;

a normal-close switch formed in a front portion of said hand brake lever to be operatively depressed by a push button of said hand brake lever; and

an electromagnetic switch positioned behind or under a pivotal end portion of an accelerator pedal pivotally mounted in the vehicle, and having a core latch surrounded by an electromagnetic coil electrically connected to two poles of a power source of said electrical control circuit and a restoring spring normally pulling said core latch inwardly, allowing a normal depression on said accelerator pedal, whereby upon an upwardly pulling of said hand brake lever for braking the vehicle, said normal-open switch will be closed by the rear cam portion of the hand brake lever to close said control circuit to actuate said electromagnetic switch to protrude said core latch outwardly for retarding a depression of said accelerator pedal for preventing the driving of a hand braked vehicle for protecting the vehicle and preventing driving accident; and upon a depression of the push button of said hand brake lever, said normal-close switch will be opened as being depressed by said push button to thereby open said control circuit so as to retract said core latch of said electromagnetic switch for a free depression of said accelerator pedal for normally driving said vehicle.

5,151,845

ELECTROSTATIC CHUCK

Toshiya Watanabe, and Tetsuo Kitabayashi, both of Kanagawa, Japan, assignors to Toto Ltd., Fukuoka, Japan

Continuation of Ser. No. 408,699, Sep. 18, 1989, abandoned. This application Oct. 11, 1991, Ser. No. 774,641

Claims priority, application Japan, Sep. 19, 1988, 63-234505

Int. Cl.[5] H02N *13/00*

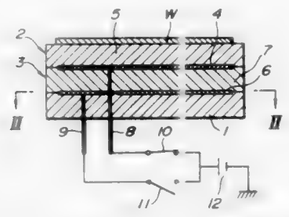
U.S. Cl. 361—234 **12 Claims**

1. An electrostatic chuck for electrostatically attracting and holding an object, comprising:

a base plate;

at least two attractive layers located on said base plate, each attractive layer including an electrically insulating film of a temperature-dependent electrically insulating material with an upper surface and a lower surface and at least one electrode pattern attached to the lower surface, said at least two attractive layers being stacked one on another so that an uppermost one of said at least two stacked attractive layers provides support for an object to be electrostatically attracted; and

voltage applying means for selectively and individually applying a voltage to the respective electrode patterns so that the voltage can be applied to any one of said electrode patterns depending on a temperature at which the electrostatic chuck is used, thereby to provide a stable electrostatic force to electrostatically attract the object located on the insulating film of the uppermost one of said stacked attractive layers.

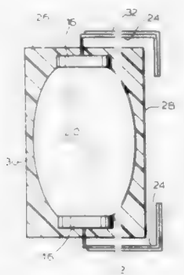


5,151,846

SURFACE MOUNTABLE RECTIFIER AND METHOD FOR FABRICATING SAME

Mohammad Sedigh, Merrick; Richard Shyr; Edward Shih, both of Greenlawn, and Muni Mitchell, Holbrook, all of N.Y., assignors to General Instrument Corp., Hatboro, Pa.

Filed Aug. 23, 1991, Ser. No. 748,876
Int. Cl.[5] H01G 9/16, 1/14; H01L 23/02
U.S. Cl. 361—306 13 Claims



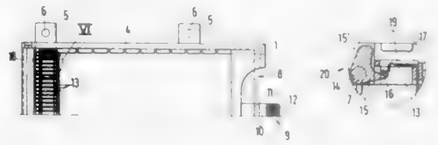
1. A rectifier suitable for surface mounting comprising semiconductor diode, electrodes and leads bonded together, said leads having enlarged head portions with elongated lead portions, said elongated lead portions extending substantially axially in substantially opposite directions a glass capsule substantially surrounding said diode and electrodes with said enlarged head portions substantially exposed, the exposed elongated lead portions having flattened sections, a heat conductive, electrically insulating epoxy body surrounding said capsule, said enlarged head portions and at least a portion of each of said flattened sections, said flattened sections having a bend therein and a solderable coating on a said flattened sections proximate said bend.

5,151,847

DEVICE FOR ELECTRICALLY CONTACTING AN ELECTRONIC APPARATUS WITH AN IC-MEMORY CARD

Paul-Georg Rautenberg, Wuppertal, Fed. Rep. of Germany, assignor to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,587
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010398
Int. Cl.[5] H05K 1/14
U.S. Cl. 361—395 8 Claims



1. A device for electrically contacting respective contacts of an electronic apparatus with an electronic card that has contacting poles along one side thereof, with a housing being arranged t said electronic apparatus, into which housing said electronic card with said side having said contacting poles and facing said housing is inserted via an insertion opening, with said housing being provided with contact elements, that correspond to said contacting poles of said electronic card and with which said contacting poles of said electronic card, after insertion of said card into said housing are in contact, and being provided with a spring-type ejecting means for ejecting said electronic card that is arrested in said housing, the improvement wherein:

said electronic card is inserted directly between a bottom and a cover of said housing, with said side of said electronic card having said contacting poles directly contacting said contacting elements and loading said ejecting means;

a releasable arresting device in the form of a catch that is formed as an integral part of said housing is disposed at said insertion opening of said housing for arresting a rear end of said electronic card that is inserted into said housing and is contacting said contact elements; and

said contact elements are in the form of contacting springs that have coordinated therewith a lever having two legs and being pivotably supported at said housing, with a first one of said two legs engaging said contacting springs and with a second one of said legs being contacted by said side of said electronic card having said contacting poles, when said electronic card is in an inserted position in said housing, thereby pivoting said lever against a force of said contacting springs.

5,151,848

SUPERCAPACITOR

Duane Finello, Shalimar, Fla., assignor to The United States of America as represented by The Secretary of The Air Force, Washington, D.C.

Filed Aug. 24, 1990, Ser. No. 573,935
Int. Cl.[5] H01G 9/00
U.S. Cl. 361—502 8 Claims

1. A supercapacitor, said supercapacitor comprising:

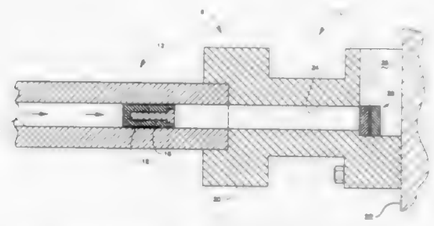
a first plate, said first plate having a porous surface;

a second plate, said second plate having a porous surface;

a solid polymer electrolyte, said solid polymer electrolyte impregnated into the porous surface of said first and said second plate;

means for electrically connecting to said plates; and

means for housing said plates with said solid polymer electrolyte therein and said means for electrically connecting,



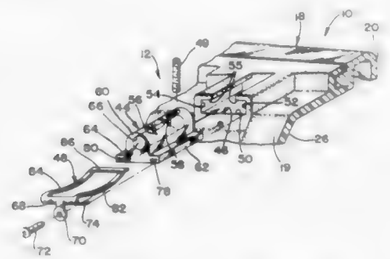
said supercapacitor having an energy density ranging from 0.1 to 2.0 joules per cubic centimeter.

5,151,849

HEADLAMP LEVELING ARRANGEMENT

William E. Nagengast, Anderson, and Philip C. Filosa, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1991, Ser. No. 740,743
Int. Cl.[5] F21M 3/18
U.S. Cl. 362—61 3 Claims



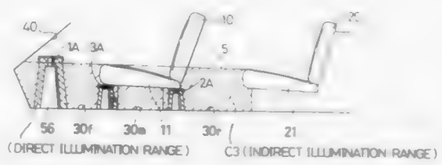
1. A leveling arrangement for a vehicle headlamp having a reflector member provided with a reflector cavity for projecting a light beam substantially parallel to an optical axis of the reflector cavity, a retainer slot formed in an upper portion of the reflector member, said slot being defined by a bottom wall, a top wall and a pair of side walls, a spirit level member provided with a pair of outwardly extending legs located in said retainer slot, a spring clip having an end thereof fastened to said reflector member and to a first end of said spirit level member and having a portion thereof located in said slot between said top wall and said legs for continuously biasing a second end of the spirit level member towards the bottom wall, and screw means threadably received by the spirit level member at the second end thereof and adapted to engage the bottom wall whereby rotation of said screw means causes pivoted adjustment of a position of the spirit level member about said first end and thereby allows the spirit level member to be calibrated relative to the optical axis of the reflector cavity.

5,151,850

VEHICLE ROOM FLOOR ILLUMINATING APPARATUS

Yoshio Matsuno; Shinichiro Choji, both of Tokyo; Kazuhiko Ito, Hirakata, and Teruaki Shigeta, Neyagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 538,332, Jun. 15, 1990. This application Dec. 6, 1991, Ser. No. 801,776
Claims priority, application Japan, Jun. 26, 1989, 1-164451
Int. Cl.[5] B60Q 3/00
U.S. Cl. 362—75 3 Claims



1. A vehicle room floor illuminating apparatus for an automotive vehicle provided with at least one front seat arranged in a vehicle room, comprising:

(a) power supplying means; and

(b) at least one first foot lamp means connected to said power supplying means, for illuminating only a lower room space roughly below a seat cushion of the front seat in the vehicle room, said first foot lamp means being mounted in a first foot lamp range A defined between uppermost and lowermost positions of the front seat cushion in height and between a lower surface of an instrument panel and a frontmost end of the front seat cushion in longitudinal length, when seen from side of a vehicle

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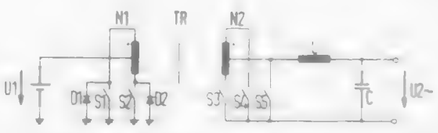
5,151,851

METHOD AND CIRCUIT ARRANGEMENT FOR GENERATING A SINUSOIDAL LINE AC VOLTAGE FROM A DC VOLTAGE

Peter Busch, Augsburg; Helmut Rettenmaier, Grossaitingen, and Willi Sterzik, Augsburg, all of Fed. Rep. of Germany, assignors to Siemens Nixdorf Informationssystem AG, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 717,939
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1990, 4019665
Int. Cl.[5] H02M 7/538
U.S. Cl. 363—25 10 Claims



1. A method for generating a sinusoidal line AC voltage from a DC voltage that, for transmission via a high-frequency transformer, is converted into alternatingly successive upward and downward square-wave voltage pulses having a respectively maximum pulse-duty factor of 50 percent and a constant pulse frequency, being tapped with a respectively given, fixed pulse-duty factor after the transmission and being then filtered, comprising the steps of:

varying the pulse-duty factor of the upward or, respectively, downward voltage pulses in the range between 0 and 50 percent in accordance with the sinusoidal change of the sinusoidal line AC voltage;

shorting the secondary side of the high-frequency transformer during voltage pulse pauses between the alternatingly successive upward or, respectively, downward volt-

age pulses, said voltage pulse pauses being caused by the variation of the pulse-duty factor given simultaneous constant pulse frequency.

5,151,852

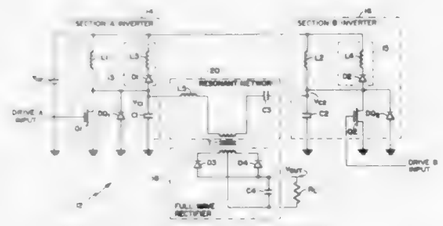
CLASS E POWER AMPLIFIER

Boris S. Jacobson, Plaistow, N.H., and Raymond A. DiPerna, Sherborn, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 666,770, Mar. 8, 1991, Pat. No. 5,065,300. This application Jul. 12, 1991, Ser. No. 729,254

Int. Cl.[5] H02M *7/537*

U.S. Cl. 363—131 **6 Claims**



1. A Class E power amplifier comprising:

a DC power source (V_{IN}) having a common port and a voltage port;

a parallel loaded network, having a first port, a second port and a third port, said first port being connected to said voltage port of said DC power source (V_{IN}) and said third port being connected to said common port of said DC power source (V_{IN});

switching means for turning ON and OFF in accordance with a control signal, said switching means having a first terminal connected to said common port of said DC power source and a second terminal connected to said second port of said parallel loaded network;

a load means coupled to said second port of said parallel loaded network; and

said parallel loaded network comprises a series circuit means in parallel with an inductor means connected between said first port and said second port and a capacitor means connected between said second port and said common port of said DC power source (V_{IN}), said series circuit means providing a fast discharge path for capacitance at said second port.

5,151,853

CYCLOCONVERTER AND THE METHOD OF CONTROLLING THE SAME

Shinji Tatara, and Masami Okayasu, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 13, 1991, Ser. No. 668,785

Claims priority, application Japan, Mar. 13, 1990, 2-61529

Int. Cl.[5] H02M *7/443*

U.S. Cl. 363—160 **11 Claims**

1. A cycloconverter comprising:

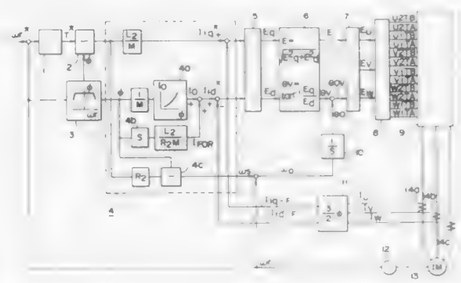
a converter group, having at least two cascade-connected converters for controlling a firing angle of each of said converter to convert an AC power given to each of said converters into an AC power having an arbitrary frequency;

reference voltage generating means for generating a reference voltage signal having a frequency corresponding to the frequency of the AC power to be output from said converter group;

first output voltage generating means for generating a first voltage signal obtained by adding a DC voltage to an AC signal having an amplitude corresponding to a difference between a maximum output voltage of said converter and the DC voltage, and a second voltage signal obtained by subtracting the first voltage signal from the reference voltage signal;

second output voltage generating means for generating a third voltage signal obtained by subtracting the DC voltage from an AC signal having an amplitude corresponding to a difference between the DC voltage and the maximum output voltage of said converter, and a fourth voltage signal obtained by subtracting the third voltage signal from the reference voltage signal;

DC component varying means for varying the DC voltage in accordance with the frequency of the reference voltage signal;



first firing angle control means for supplying, while the reference voltage signal is positive, a firing signal corresponding to a voltage value of the first voltage signal to one of said converters and a firing signal corresponding to a voltage value of the second voltage signal to the other of said converters; and

second firing angle control means for supplying, while the reference voltage signal is negative, a firing signal corresponding to a voltage value of the third voltage signal to said the other said converters and a firing signal corresponding to a voltage value of the fourth voltage signal to said one of said converters.

5,151,854

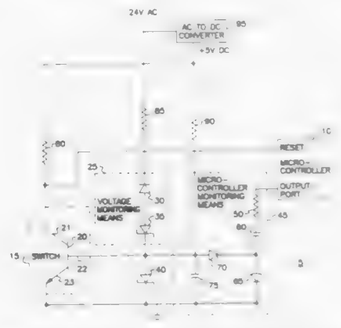
INTEGRATED LOW VOLTAGE DETECT AND WATCHDOG CIRCUIT

John T. Adams, Minneapolis, and Timothy M. Tinsley, Coon Rapids, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1990, Ser. No. 556,923

Int. Cl.[5] G05B *23/02*; **G06F** *11/30*

U.S. Cl. 364—184 **14 Claims**



1. A monitoring circuit for a microcontroller, the microcontroller including an output port and a reset port, the microcontroller being adapted to reset when a first signal is present at the reset port, the monitoring circuit comprising:

a switch having a control line, said switch being adapted to provide a continuous second signal different from the first signal, to the reset port when a low voltage is present at said control line, and the first signal otherwise;

a voltage monitoring means having an output port electrically connected to said control line, said voltage monitoring means being adapted to measure a desired voltage and producing a low voltage at said output port of said voltage monitoring means when said desired voltage is within a predetermined range of values, and a high voltage otherwise; and

microcontroller monitoring means having an input port connected to the output port of the microcontroller and an output port connected to said control line, said microcontroller monitoring means being adapted to produce a low voltage at said output port of said microcontroller monitoring means when the microcontroller produces an output signal within a predetermined frequency range, and a high voltage otherwise.

5,151,855

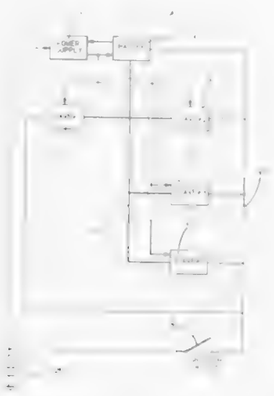
MULTIPLE MICROPROCESSOR SINGLE POWER SUPPLY SYSTEM SHUTDOWN

Charles A. Gray, Rochester; Rimas S. Milunas, Royal Oak, and Larry T. Nitz, Troy, all of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Oct. 19, 1989, Ser. No. 423,918

Int. Cl.[5] G06F *1/30*

U.S. Cl. 395—750 **2 Claims**



1. A power shutdown method for a system having a master microprocessor, a slave microprocessor having an analog-to-digital converter, and a single supply voltage source for the master and slave microprocessors, the master and the slave microprocessors communicating via a communication link therebetween, the method comprising the steps of:

sensing a power shutdown condition by the master microprocessor;

sending a shutdown command from the master microprocessor through the communication link to the slave microprocessor to initiate slave shutdown procedures including storing variables to memory when a shutdown condition is sensed by the master microprocessor;

powering down the system including the voltage source by the master microprocessor after a predetermined minimum time period after sending a shutdown command to the slave microprocessor, the minimum time period having a predetermined value that allows the slave microprocessor to complete the slave shutdown procedures;

sensing a failed condition of the communication link by the slave microprocessor;

sensing the power shutdown condition by the slave microprocessor analog-to-digital converter;

sensing a failed condition of the slave microprocessor analog-to-digital converter by the slave microprocessor;

executing shutdown procedures by the slave microprocessor (A) in response to a shutdown command received from the master microprocessor of (B) when the failed condition of the communication link is sensed by the slave microprocessor and the power shutdown condition is sensed by the slave microprocessor; and

bypassing the shutdown procedures by the slave microprocessor when (A) the failed condition of the communication link is sensed by the slave microprocessor and (B) the failed condition of the analog-to-digital converter is sensed by the slave microprocessor.

5,151,856

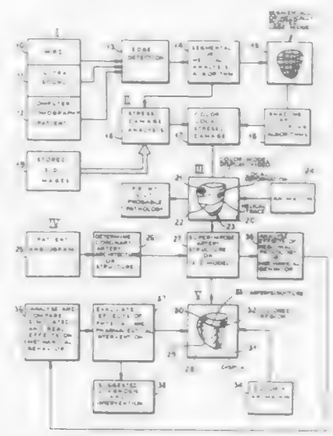
METHOD OF DISPLAYING CORONARY FUNCTION

Menachem Halmann; Haim Azhari; Rafael Beyar; Samuel Sideman, and Uri Dinnar, all of Haifa, Israel, assignors to Technion R & D Found. Ltd., Haifa, Israel

Filed Aug. 30, 1989, Ser. No. 400,689

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—413.03 **17 Claims**



10. A method of displaying the function of a mammalian heart, comprising the steps of:

(a) generating a plurality of two-dimensional sections of a mammalian heart;

(b) subjecting said sections automatically to a segmental or helical pattern analysis to generate a three-dimensional model of said mammalian heart;

(c) analyzing said sections for ascertaining a presence of mechanical degradation of certain zones of the heart,

(d) electronically coloring zones of the displayed model corresponding to said certain regions;

(e) displaying said model with said colored zones; and

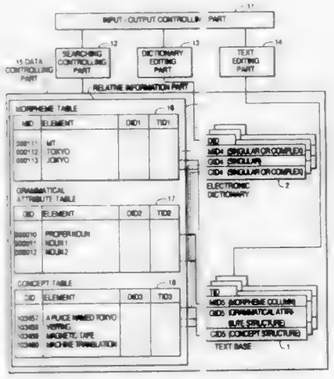
(f) subjecting the model displayed in step (e) to video animation.

5,151,857

DICTIONARY LINKED TEXT BASE APPARATUS

Kunio Matsui, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1990, Ser. No. 629,741
Claims priority, application Japan Dec. 18, 1989, 1-327671
Int. Cl.[5] G06F *5/38*
U.S. Cl. 364—419 11 Claims



1. A dictionary-linked text base apparatus for enabling a text search at a morpheme level in which, for a searched object word inputted in a form of a morpheme, all texts including the morpheme become searched objects, a text search at a syntactical level in which all texts related to a grammatical attribute of a registered item which is either the morpheme or a combination thereof in the dictionary-linked text base apparatus, become searched objects, a text search at a semantic level in which all texts related to at least one of the registered items become searched objects, said dictionary-linked text base apparatus having a function of searching a text in a text base comprising:

an electronic dictionary including information comprising:

a morpheme identifier the same as an item being searched or a combination comprising a plurality of morphemes forming said item;

a grammatical attribute identifier of said item; and

a concept identifier of said item, corresponding to an identifier for each registered item; and

a relative information part, operatively connected to said electronic dictionary, having an identifier for a related text in the text base and having an identifier for a related text in said electronic dictionary for each said morpheme identifier, said grammatical attribute identifier and said concept identifier appearing in said electronic dictionary.

5,151,858

MULTIPLE MODE ADAPTIVE PRESSURE CONTROL FOR AN AUTOMATIC TRANSMISSION

Rimas S. Milunas, Royal Oak, and Larry T. Nitz, Troy, both of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Oct. 5, 1990, Ser. No. 593,918
Int. Cl.[5] B60K *1'/10, 41/06*
U.S. Cl. 364—424.1 7 Claims

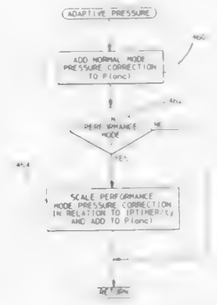
1. Control apparatus for a motor vehicle multiple speed ratio automatic shift transmission having a fluid operated clutch associated with a specified speed ratio, wherein shifting to said specified speed ratio includes a completion phase during which fluid is supplied to the clutch to initiate and progressively increase torque transmission therethrough, the control apparatus comprising:

driver operated switch means for selecting either a normal or performance shift mode;

base table means for storing a predetermined schedule of fluid pressure to be supplied to said clutch during said completion phase;

pressure correction means for developing an adaptive correction amount for said predetermined schedule in relation to a comparison between an expected duration of said completion phase and an actual duration of said completion phase;

means for applying the adaptive correction amount (1) to a normal mode correction table when said normal shift mode is selected, and (2) to a performance mode correction table when the performance shift mode is selected;



means for supplying the fluid to said clutch in accordance with a combination of said predetermined pressure schedule and a normal mode correction amount determined from said normal mode correction table when said normal shift mode is selected; and

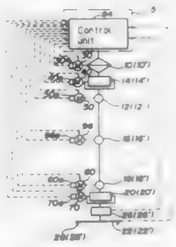
means for supplying the fluid to said clutch in accordance with a combination of said predetermined pressure schedule, a normal mode correction amount determined from said normal mode correction table, and a performance mode correction amount determined from said performance mode correction table when said performance shift mode is selected.

5,151,859

LEGGED WALKING ROBOT AND SYSTEM FOR CONTROLLING THE SAME

Ryutaro Yoshino; Hiroshi Gomi; Masao Nishikawa, and Masato Hirose, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 545,282
Claims priority, application Japan, Jun. 29, 1989, 1-167295
Int. Cl.[5] B62D *57/02*
U.S. Cl. 364—424.02 13 Claims



12. A system for controlling a drive joint of a walking robot having legs comprising:

an angle detector for detecting a drive joint angle;

means for setting desired angular movement of the drive joint;

a controller for determining a control value of the drive joint angle, linked to the means for setting and angle detector, to decrease any deviation of the detected drive joint angle and a desired angle of the drive joint, such that the robot moves with a desired gait;

a ground reaction detector on at least one of the legs and linked to the controller; and

a corrector associated with the controller to correct the control value in response to a detected ground reaction.

5,151,860

CONTROL METHOD FOR ELECTRIC POWER STEERING APPARATUS FOR VEHICLE

Yoshiaki Taniguchi; Masaki Watanabe, both of Saitama; Ryuji Iizawa, and Fumitoshi Mori, both of Kanagawa, all of Japan, assignors to Jidoshi Kiki Co., Ltd., Tokyo and Fujitsu, Ltd., Kanagawa, both of, Japan

Continuation of Ser. No. 290,697, Dec. 27, 1988, abandoned. This application Nov. 20, 1991, Ser. No. 798,026
Claims priority, application Japan, Dec. 29, 1987, 62-335531
Int. Cl.[5] B62D *5/04*
U.S. Cl. 364—424.05 4 Claims

1. A control system for an electric power steering apparatus for a vehicle, said control system comprising:

a torque sensor which is used to detect a steering torque resulting from a steering operation performed by a driver;

a target value setting means for setting a predetermined target value relating to a power steering control of said steering apparatus; and

a primary delay system setting means including:

a first comparator means for comparing said detected steering torque with said predetermined target value,

an arithmetic amplifier including an amplifier with a gain (F1), said gain being varied in accordance with the speed of the vehicle,

a second comparator means for comparing an output (P0) of said first comparator with an output of said amplifier,

an integrating means (26) for integrating an output of said second comparator means and generating said integrated output as an output of said arithmetic amplifier, and

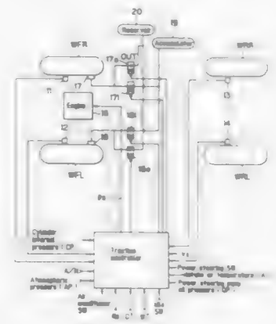
a third comparator means (30,28) for comparing said output of said integrating means with signals relating to mechanical and electrical compensation delay of said steering torque to generate a control signal transmitted to a motor means of said control system for preventing oversteering of said vehicle.

5,151,861

VEHICLE ENGINE OUTPUT CONTROL METHOD AND VEHICLE ENGINE

Yoshiaki Danno, Kyoto; Kazuhide Togai, Takatsuki; Masato Yoshida, Kyoto; Katsunori Ueda, Kyoto, and Makoto Shimada, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 482,169, Feb. 20, 1990, abandoned. This application Feb. 21, 1992, Ser. No. 840,646
Claims priority, application Japan, Feb. 22, 1989, 1-42421; Feb. 22, 1989, 1-42422
Int. Cl.[5] F02D *41/04;* G06F *15/50*
U.S. Cl. 364—426.02 8 Claims



1. A vehicle engine output control method comprising:

calculating a target torque of an engine in accordance with an operational condition of a vehicle;

calculating a target intake air amount per engine revolution cycle necessary to output said target engine torque;

calculating an opening of a sub throttle valve disposed in an intake path of the engine from an opening of a main throttle valve disposed in the intake path of which said opening of said main throttle valve is controlled in accordance with an operation amount of an accelerator pedal and said target intake air amount;

on/off controlling said sub throttle valve in accordance with said calculated sub throttle valve opening; and

correcting said target engine torque in accordance with a response delay of a torque converter signal, a transmission friction signal, an external load signal of the engine, an atmospheric condition signal, and said operational condition of the vehicle, and, calculating said target intake air amount in accordance with said corrected target engine torque.

5,151,862

VEHICULAR TRAVELING DIRECTION MEASURING SYSTEM

Okihiko Nakayama; Hiroshi Tsuda; Katsuhiko Mizushima; Toshiyuki Itoh, and Hiroshi Ueno, all of Kanagawa, Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 467,834, Jan. 11, 1990, abandoned. This application May 20, 1991, Ser. No. 704,719
Claims priority, application Japan, Jan. 13, 1989, 1-6620
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—454 12 Claims

1. A system for measuring a traveling direction of a vehicle, comprising:

first means for deriving a first variation representing a change in a traveling direction of the vehicle based on an output from a gyro sensor;

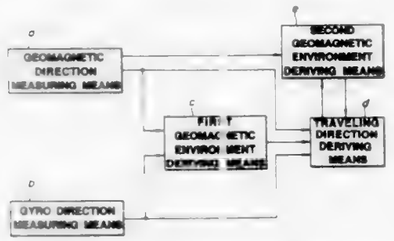
second means for deriving a first vehicle traveling direction based on said first variation;

third means for deriving a second vehicle traveling direction based on an output from a geomagnetic sensor, said geo-

magnetic sensor deriving said output based on a geomagnetic field around the vehicle.

fourth means for deriving a second variation representing a change in said second vehicle traveling direction;

fifth means for deriving a first index, said first index indicative of a difference between said first and second variations to represent a disturbance of the geomagnetic field on a short distance basis;



sixth means for deriving a second index, said second index indicative of a difference between said first and second vehicle traveling directions to represent a disturbance of the geomagnetic field on a long distance basis; and

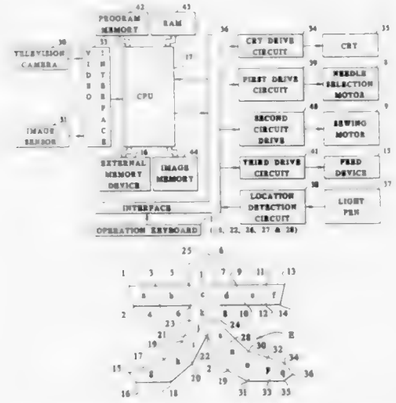
seventh means for calculating a third vehicle traveling direction based on said first and second directions, said seventh means changing a rate of dependence upon said first and second directions based on values of said first and second indicies to derive said third vehicle traveling direction.

5,151,863

EMBROIDERY PATTERN DATA PROCESSOR HAVING A SEWING ORDER DESIGNATION MECHANISM

Kyozi Komuro; Atsuya Hayakawa and Hideaki Shimizu, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 16, 1990, Ser. No. 552,995
Claims priority, application Japan, Jul. 19, 1989, 1-188054
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—470 **19 Claims**



1. An embroidery pattern data processor for a sewing machine that sews, under control of needle location data, an embroidery pattern comprising at least one closed area, comprising:

section data memory means for storing section data representing sections into which outlines representing the at least one closed area are divided;

designation means for designating a starting section and an ending section for each of the at least one closed areas; and

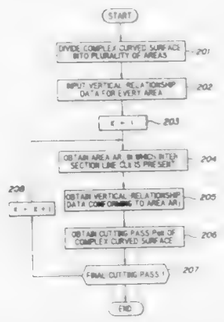
needle location computing means for computing needle location data so that the sewing machine embroiders the ending section of each closed area after embroidering all other sections of the closed area by determining, when the needle location computing means computes data for a given ending section, whether any other sections of the closed area containing the given ending section exist for which the needle location data computing means has not computed needle location data.

5,151,864

METHOD OF GENERATING CUTTING PASSES OF COMPLEX CURVED SURFACE

Masaki Seki, Tokyo; Koji Samukawa, and Osamu Hanaoka, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP89/00508, § 371 Date Jan. 31, 1990, § 102(e) Date Jan. 31, 1990, PCT Pub. No. WO89/12265, PCT Pub. Date Dec. 14, 1989
PCT Filed May 22, 1989, Ser. No. 460,069
Claims priority, application Japan, May 31, 1988, 63-133245
Int. Cl.[5] G05B *19/18*
U.S. Cl. 364—474.23 **10 Claims**



1. A method of generating cutting passes of a complex curved surface comprising the steps of:

(a) specifying a plurality of input curved surfaces constituting the complex curved surface, a vertical relationship among these input curved surfaces and a cutting pass on a reference plane;

(b) adopting, from among projected points obtained when a point on the cutting pass is projected onto each of the input curved surfaces, one of the projected points determined by said vertical relationship as a point on a cutting pass for cutting the complex curved surface;

(c) dividing the complex curved surface into areas and specifying vertical relationships of only the input curved surfaces in each of the areas;

(d) obtaining cutting passes of the complex curved surface in each of the areas by using the vertical relationships of said areas; and

(e) obtaining cutting passes of the complex curved surface by combining the cutting passes of all of the areas; and

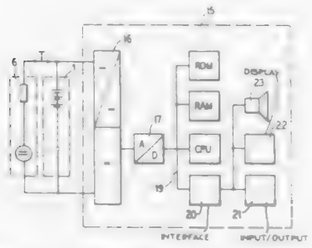
(f) machining a workpiece based on the cutting passes obtained.

5,151,865

METHOD AND APPARATUS FOR DETERMINING THE ENERGY CONTENT VALUE OF ELECTROCHEMICAL ENERGY STORES

Andreas Biessing, Teunenbronn; Jochen Griss, St. Georgen, and Gerd Kammerer, Lossburg, all of Fed. Rep. of Germany, assignors to Grassiin KG, Fed. Rep. of Germany

Continuation of Ser. No. 377,829, Oct. 22, 1988, abandoned. This application May 1, 1991, Ser. No. 693,046
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736481; Oct. 28, 1988, PCT/DE88/00647
Int. Cl.[5] G06F *15/20*; H02J *7/00*
U.S. Cl. 364—483 **7 Claims**



1. Method for determining an energy content value of an electrochemical energy store under operating conditions, comprising the steps of:

connecting the electrochemical energy store to one of a source and load;

connecting a measuring instrument to the electrochemical energy store;

sampling a terminal voltage of the electrochemical energy store in a measurement time with the measuring instrument;

providing a relative remaining capacity of the electrochemical energy store;

automatically retrieving at least three individual reference values from stored relationship of terminal voltages to sum currents for the provided relative remaining capacity;

automatically interpolating an assumed sum current from the sum currents that correspond to the at least three individual reference values;

calculating an absolute capacity by multiplying the assumed sum current by the measurement time;

using stored characteristics of the energy store to derive a maximum capacity corresponding to the assumed sum current for a maximum obtainable discharge time; and

calculating a new remaining capacity by subtracting from the initial remaining capacity a ratio of the absolute capacity to the maximum capacity, the new reaming capacity being the energy content value of the energy store;

displaying the new remaining capacity on the measuring instrument; and

disconnecting the electochemical energy store from the source or load when the energy content value reachers a predetermined value.

5,151,866

HIGH SPEED POWER ANALYZER

R. Steven Glaser, and Jeffrey M. Bade, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

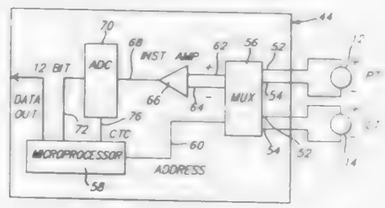
Continuation of Ser. No. 502,050, Mar. 30, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 809,021
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—483 **21 Claims**

1. A high speed power analyzer for measuring electrical parameters in an alternating waveform power system having a plurality of distribution circuits, comprising:

input means for receiving a plurality of analog input signals which represent electrical parameters of the distribution circuits being monitored, where at least one of said analog input signals represents a voltage signal and another of said analog input signals represents a current signal;

multiplexer means connected to said input means for sampling each of said analog input signals by individually transmitting selected ones of said analog input signals;

converter means, connected to said multiplexer means, for converting sampled analog input signals received from said multiplexer means into a digital representation of said analog input signals; and



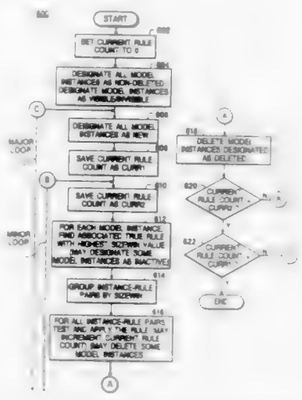
processor circuit means, coupled to said multiplexer means and said converter means, for controlling the sampling of said analog input signals by said multiplexer means in accordance with a predetermined sampling schedule which is nonsynchronous with the waveform of said power system, and for processing said digital representations of said analog input signals received from said converter means to produce a plurality of output signals which are indicative of predetermined electrical variables related to the power being used in said distribution circuits.

5,151,867

METHOD OF MINIMIZING SUM-OF-PRODUCT CASES IN A HETEROGENEOUS DATA BASE ENVIRONMENT FOR CIRCUIT SYNTHESIS

Donald F. Hooper, Northborough; James L. Finnerty, Lexington; David B. Fite, Northborough, and Snehamay Kundu, Marlboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 907,303, Sep. 12, 1986, abandoned. This application Jan. 28, 1989, Ser. No. 373,086
Int. Cl.[5] G06F *15/60, 15/40*
U.S. Cl. 364—489 **38 Claims**



1. A process of synthesizing a circuit design stored in a data processing system including a data base, by replacing a set of

current model instances each model instance consisting of a representation of a portion of an electrical circuit currently representing the circuit design in the data base with a new set of model instances and by altering attribute values stored in the data base and associated with objects in the data base by application of selected ones of a set of rules stored in the data base to associated ones of the current model instances, each of the rules including an antecedent portion that evaluates to one of TRUE and FALSE and including a consequence portion indicating an action, the antecedent portion comprising at least one test, the process comprising the steps, performed by the data processing system, of:

initializing a benefit variable stored in the data base to a predetermined threshold value representing a benefit that must be achieved by application of a rule;

testing an antecedent portion of a rule in the set of rules, the antecedent portion including a plurality of subportions including a benefit variable subportion, by performing the following substeps contained in the benefit variable subportion of the antecedent portion of the rule:

determining a benefit value representing a benefit that is achieved by application of the rule, and

determining the benefit variable subportion to be TRUE when the determined benefit value is greater than the benefit variable stored in the data base;

determining the antecedent portion to be TRUE when all subportions of the antecedent portion are TRUE; and

applying the rule by performing the action indicated by the consequence portion of the rule on items in the data base when the antecedent portion is TRUE.

5,151,868

SIGNAL LINE TERMINAL ALLOCATION METHOD

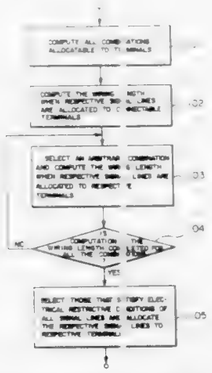
Yoshinori Nishiyama, Odawara; Tomoatsu Yanagita, Ebina; Masahiko Nagai, Kanagawa; Mitsuru Morikuni, Ebina, and Kenji Matsumoto, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of, Japan

Filed Jan. 31, 1990, Ser. No. 472,816

Claims priority, application Japan, Feb. 6, 1989, 1-025785

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—490 **7 Claims**



1. A signal line terminal allocation method executed by a computer for an electronic device which is hierarchically designed, said electronic device comprising high hierarchial components and low hierarchial components, the high hierarchial components being connected to the low hierarchial components by a plurality of signal lines through a plurality of signal line terminals, the method comprising the steps of:

obtaining all of the different plural combinations of an allocation of the plurality of signal lines to the plurality of signal line terminals;

calculating a plurality of the signal line lengths for all of the different plural combinations, each of the plurality of the signal line lengths corresponding to a sum of line lengths of each of the plurality of signal lines in the allocation;

selecting plural combinations of the allocation of the plurality of signal lines in which electrical restrictions corresponding to said each of the plurality of signal liens are satisfied, the electrical restrictions comprising an allowable maximum line length of said each of the plurality of signal lines; and

allocating said each of the plurality of signal lines to the plurality of signal line terminals in accordance with one combination from the plural combinations which satisfies said electrical restrictions.

5,151,869

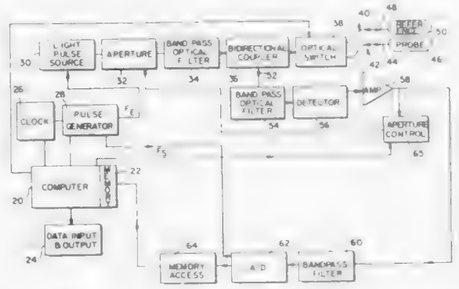
FREQUENCY DOMAIN FLUOROMETRY USING COHERENT SAMPLING

J. Ricardo Alcala, Chatham, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Feb. 16, 1990, Ser. No. 481,406

Int. Cl.[5] G06G *7/58*; G01N *21/64*

U.S. Cl. 364—497 **36 Claims**



1. Apparatus for determining a response of a chemical composition to light comprising:

(a) excitation means for producing excitation light having repetitive variations in amplitude, including a fundamental component varying at a fundamental frequency F_e and fundamental repetition period T_3 and also including harmonic components varying at harmonic frequencies which are integral multiplies of F_e and applying said excitation light to said composition whereby said composition will emit light having repetitive variations in amplitude at modulation frequencies corresponding to F_e and to said harmonic frequencies;

(b) sampling means for directly sampling the amplitude of light emitted by said composition repetitively at a sampling frequency F_s and sampling period T_s such that F_s is less than F_e and T_s is greater than T_e, and T_s is not an integral multiple of T_e and providing a response series of sample values representing said amplitude of said emitted light, whereby said response series of samples will represent a sampled response signal corresponding to the variations in amplitude of said emitted light at said modulation frequencies and;

(c) means for determining at least one characteristic of said sampled response signal.

5,151,870

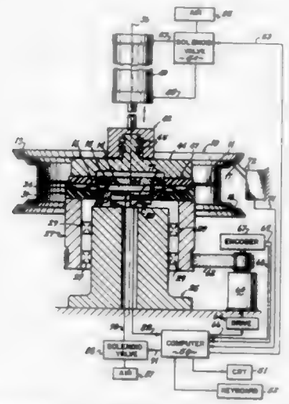
APPARATUS AND METHOD FOR DETERMINING A CENTER AND MEASURING WITH REFERENCE THERETO

James C. Beebe, Kent; Barry D. Cargould, Hudson, and David W. Lees, Sr., North Canton, all of Ohio, assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 17, 1989, Ser. No. 439,231

Int. Cl.[5] G01B *21/00*

U.S. Cl. 364—556 **44 Claims**



23. An apparatus for determining the center of a surface feature of an object, said apparatus comprising:

(a) positioning means for maintaining the position of the object fixed in relation to a measuring axis;

(b) probe means for generating a signal correlated to the distance between a point on said measuring axis and each of a series of points on the surface feature, said probe means and the surface feature being movable with respect to one another, and

(c) computer means coupled to said probe means for:

(i) processing said signal to repetitively:

(1) identify ones of said points incapable of lying on a maximum inscribed circle of said surface feature and

(2) effectively discard said ones of said points until only a predetermined number of said points remain in said series of points, said predetermined number of points specifying said maximum inscribed circle, and

(ii) calculating the center of said maximum inscribed circle, said center corresponding to the center of said surface feature of the object.

5,151,871

METHOD FOR HEAT-PROCESSING SEMICONDUCTOR DEVICE AND APPARATUS FOR THE SAME

Kimiharu Matsumura, Kumamoto; Hiroyuki Sakai, Nishigoshi; Masaaki Murakami, Kumamoto; Tetsuya Oda, Tamana, and Chizo Yamaguchi, Sencho, all of Japan, assignors to Tokyo Electron Limited, Tokyo and Tokyo Electron Kyushu Limited, Kumamoto, both of, Japan

Filed Jun. 15, 1990, Ser. No. 538,710

Claims priority, application Japan, Jun. 16, 1989, 1-154119; Oct. 24, 1989, 1-276564

Int. Cl.[5] H05B *3/68*

U.S. Cl. 364—557 **12 Claims**

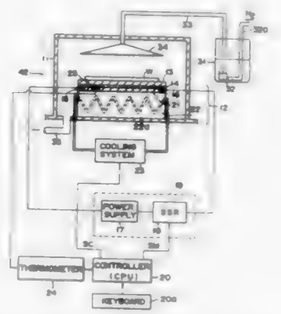
7. An apparatus for heat-processing an object, comprising:

a stage including heating means and cooling means, said heating means comprising a conductive thin film for heating the object;

detecting means for detecting temperatures of the object on the stage;

storing means for storing recipe information, said recipe information compriaing temperature-time points in a heating step for heating said object from ambient temperature to a process temperature, a cooling step for cooling the object from said process temperature to ambient temperature, and a processing step during which the process temperature is maintained; and

process control means for controlling the heating and cooling means in accordance with the time-temperature recipe information and temperature of the object.



5,151,872

METHOD AND APPARATUS FOR CORRECTING THE OUTPUT OF AN ONBOARD VEHICLE TERRESTRIAL MAGNETISM SENSOR

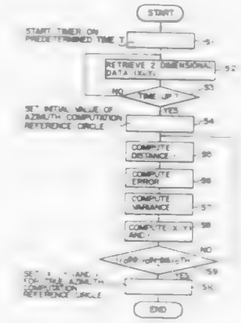
Kiyomi Suzuki, and Masaru Chijiiwa, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 556,545

Claims priority, application Japan, Oct. 17, 1989, 1-269386

Int. Cl.[5] G01C *17/38*

U.S. Cl. 364—571.05 **2 Claims**



1. A method for correcting the output of a terrestrial magnetism sensor mounted on a vehicle comprising the steps of:

generating an output from the terrestrial magnetism sensor;

detecting an error in the output of the terrestrial magnetism sensor caused by extraneous magnetic influence;

selecting a plurality of data pairs x_o, y_o form the output of the terrestrial magnetism sensor;

determining from said plurality of data pairs x_o, y_o an initial radius r_o and initial center coordinates x_o, y_o of an initial azimuth computation reference circle;

computing a distance r_o between each of said plurality of data pairs x_o, y_o and said initial center coordinates x_o, hd o;

calculating a difference between each distance r_o and said initial radius r_o;

obtaining a variance σ^2 from squares of the calculated differences;

determining an updated radius r'$_o$ and updated center coordinates x'$_o$, y'$_o$ of the azimuth computation reference circle such that said variance σ^2 is minimized with respect to changes in coordinates x, y and radius r;

establishing an updated azimuth computation reference circle from said updated radius r'$_o$ and said updated center coordinates x'$_o$, y'$_o$; and

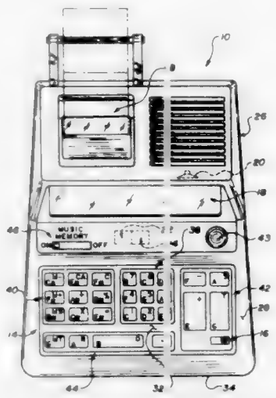
correcting the output of the terrestrial magnetism sensor using said updated azimuth computation reference circle.

5,151,873

CALCULATOR WITH MUSIC GENERATING DEVICE

John R. Hirsh, 5162 Cheswick Dr., Solon, Ohio 44139

Filed Sep. 17, 1990, Ser. No. 583,859
Int. Cl.[5] G06F *3/00*
U.S. Cl. 364—710.12 22 Claims



1. Apparatus comprising a housing having calculating means and music generating means therein and a keyboard attached thereto;

said housing and keyboard simulating the housing and keyboard layout of a desk-top electronic calculator, and said housing being adapted to rest on a surface;

said keyboard having a plurality of numerical keys and function keys attached to said calculating means for actuating said calculating means; and

each of said plurality of numerical and function keys being selectively actuatable to cause said music generating means to generate a respective musical note, said numerical and function keys corresponding to the following musical notes:

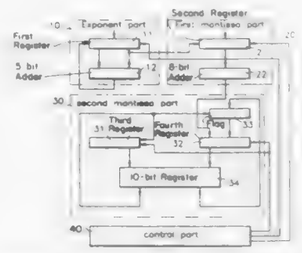
Key	Note	Key	Note
R	A	MS	B sharp
0	B	X	C sharp
1	C	=	E sharp
2	D	M+	F sharp
3	E		A sharp
4	F	%	B sharp
5	G	M-	C sharp
6	A	Clear All	E sharp
7	B	Clear	F sharp
8	C		
9	D		
.	E		
	F		
S	A		
T	G		

5,151,874

INTEGRATED CIRCUIT FOR SQUARE ROOT OPERATION USING NEURAL NETWORK

Ho-sun Jeong, and Hyo-jin Han, both of Taegu, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 26, 1990, Ser. No. 617,813
Claims priority, application Rep. of Korea, Apr. 3, 1990, 90-4516
Int. Cl.[5] G06F *7/552*
U.S. Cl. 364—752 13 Claims



1. An integrated circuit for computing a square root of an input member using neural network circuits, the integrated circuit comprising:

exponent means for computing the exponent of a square root of an input operand, said exponent means comprising a 5-bit adder and a first register, the 5-bit adder operating on the contents of the first register and the first register storing the result of the operation by the 5-bit adder;

first mantissa means for preprocessing the mantissa of the input operant and shifting the binary digits of the mantissa depending on an output from said exponent means;

second mantissa means for computing the square root of the output from said first mantissa means; and

control means for controlling the timing of signals inputted to and outputted from said exponent means, said first mantissa means, and said second mantissa means so that a sequence of procedures for computing a square root can be executed in a predetermined sequence,

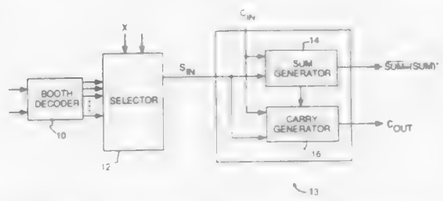
said second mantissa means outputting the mantissa of the square root of the input operand and said exponent means outputting the exponent of the square root of the input operand after said predetermined sequence of procedures for computing a square root has been completed.

5,151,875

MOS ARRAY MULTIPLIER CELL

Tai Sato, Mountain View, Calif., assignor to C-Cube Microsystems, Inc., San Jose, Calif.

Continuation of Ser. No. 494,607, Mar. 16, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 770,738
Int. Cl.[5] G06F *7/50, 7/52*
U.S. Cl. 364—784 5 Claims



1. An array multiplier cell, receiving first, second and third input signals, and providing a carry-out signal and a sum signal, said array multiplier cell comprises:

sum generation means receiving said first, second and third input signals for providing said sum signal, said sum generation means comprising first and second equivalence circuits, each equivalence circuit receiving first and second equivalence input signals and providing first and second equivalence output signals, said first equivalence output signal having a logic state in accordance with whether the logic states of said first and second equivalence input signals are the same, said second equivalence output signal being the inverted signal of said second equivalence input signal, said first equivalence circuit receiving as first and second equivalence input signals respectively said first and second input signals, and said second equivalence circuit receiving as first and second equivalence input signals respectively said first equivalence output signal of said first equivalence circuit and said third input signal, said sum generation means further comprises means for inverting said first equivalence output signal of said second equivalence circuit to provide said sum signal; and

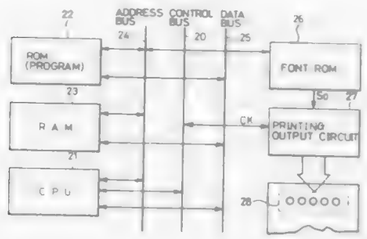
carry generation means receiving first, second, third and fourth input carry input signals, respectively coupled to said third signal, said first equivalence output signal of said first equivalence circuit, said second equivalence output signal of said first equivalence circuit, and said second equivalence output signal of said second equivalence circuit for providing said carry-out signal.

5,151,876

READ-ONLY MEMORY HAVING DATA REGISTER FOR HOLDING OUTPUT DATA

Toshio Ikeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,142
Claims priority, application Japan, Aug. 6, 1988, 63-196860
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—94 8 Claims



1. A read-only memory for supplying font data to a printer, comprising:

a read-only memory array having a plurality of cells in each of which said font data is capable of being stored,

decoder means responsive to an externally applied address signal for reading out said font data as parallel data from the address designated;

information holding means for holding said parallel data read out from said read-only memory array and supplying said font data as serial data in response to an externally applied clock signal received from said printer; and

first command signal generating means for generating a first command signal,

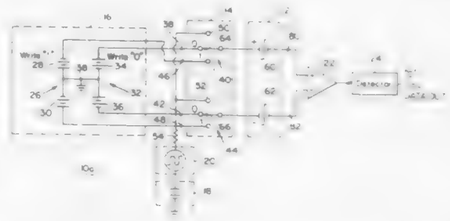
said information holding means holding said read out information in response to said first command signal generated by said first command signal generating means.

5,151,877

FERROELECTRIC SPACE CHARGE CAPACITOR MEMORY SYSTEM

Ciaran J. Brennan, Allston, Mass., assignor to The Charles Stark Draper Lab., Inc., Cambridge, Mass.

Filed Dec. 19, 1990, Ser. No. 630,027
Int. Cl.[5] G11C *11/22*
U.S. Cl. 365—145 4 Claims



1. A ferroelectric space charge capacitor memory system comprising:

a ferroelectric space charge capacitor memory cell including two ferroelectric space charge capacitor memory devices;

means for applying a coercive write voltage to each of said memory devices to establish internal polarization fields and space charge regions of opposite polarities in each said device, respectively;

means for applying, to each of said devices, a bias voltage less than the coercive voltage at a rate slower than the rate of space charge formation to define a capacitive level representative of one of the polarization states;

means for introducing to each said device a read signal at a rate faster than the rate of space charge formation which together with the bias voltage is less than the coercive voltage; and

means, responsive to the read signal, for indicating the difference in charge transferred by each memory device representing the logical state of said memory cell.

5,151,878

SEMICONDUCTOR MEMORY DEVICE

Toshio Yamada, Osaka, and Michihiro Inoue, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 463,077, Jan. 10, 1990. This application Nov. 5, 1991, Ser. No. 787,859
Claims priority, application Japan, Jan. 12, 1989, 1-5239
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—189.01 2 Claims

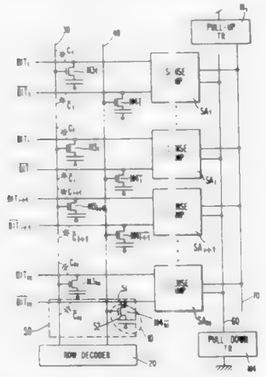
1. A semiconductor device comprising:

a plurality of memory cells capable of being selected for use or remaining unselected, at least one unselected memory cell having a logical value of "0" and having a first signal voltage potential;

at least one selected memory cell having a logical value of "1" and having a second signal voltage potential;

a first set of reading and restoring word lines connected to selected memory cells, said first set of word lines having a signal voltage potential which is higher than said second signal voltage potential by a first predetermined value; and

a second set of word lines connec ed to unselected memory cells, said second set of word lir es having a signal voltage



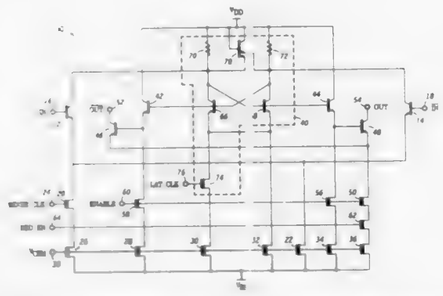
potential which is higher than said first signal voltage potential by a second and diffe rent predetermined value.

5,151,879

SENSE AMPLIFIER WITH LATCH

Paul W. Hsueh, Chandler, and Doug as D. Smith, Mesa, both of Ariz., assignors to Motorola, Inc. Schaumburg, Ill.

Filed Dec. 27, 1990, Ser. No. 634,630
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—190 **13 Claims**



11. A memory sense amplifier fo r detecting complementary logic signals applied at first and se cond inputs and for providing complementary output logic signals at first and second outputs, comprising:

current source means responsi ve to a bias potential and having a plurality of current s respectively provided at a plurality of outputs;

a first transistor having a colle tor, a base and an emitter, said base being coupled to the first input of the memory sense amplifier;

a second transistor having a col ector, a base and an emitter, said base of said second tran sistor being coupled to the second input of the memor y sense amplifier, and said emitter of said second trans stor being coupled to said emitter of said first transistor

a third transistor having first, se cond and control electrodes, said first electrode being co upled to said emitter of said first transistor, said second e lectrode being coupled to a first output of said current so irce means, and said control electrode being coupled to a first control signal;

a fourth transistor having a col ector, a base and an emitter, said collector of said fourth transistor being coupled to said collector of said first transistor;

a fifth transistor having a collector, a base and an emitter, said collector of said fifth transistor being coupled to said collector of said second transistor and to said base of said fourth transistor, said base of said fifth transistor being coupled to said collector of said fourth transistor, and said emitter of said fifth transistor being coupled to said emitter of said fourth transistor;

a sixth transistor having first, second and control electrodes, said first electrode of said sixth transistor being coupled to said emitter of said fourth transistor, said second electrode of said sixth transistor being coupled to a second output of said current source means, and said control electrode of said sixth transistor being coupled to a second control signal;

a seventh transistor having a collector, a base and an emitter, said collector of said seventh transistor being coupled to first supply voltage terminal, and said base of said seventh transistor being coupled to said base of said fourth transistor;

an eighth transistor having a collector, a base and an emitter, said collector of said eighth transistor being coupled to said first supply voltage terminal, and said base of said eighth transistor being coupled to said base of said fifth transistor;

a ninth transistor having first, second and control electrodes, said first electrode of said ninth transistor being coupled to said emitter of said seventh transistor, said second electrode of said ninth transistor being coupled to a third output of said current source means, and said control electrode of said ninth transistor being coupled to a third control signal;

a tenth transistor having first, second and control electrodes, said first electrode of said tenth transistor being coupled to said emitter of said eighth transistor, said second electrode of said tenth transistor being coupled to a fourth output of said current source means, and said control electrode of said tenth transistor being coupled to said third control signal;

an eleventh transistor having a collector, a base and an emitter, said collector of said eleventh transistor being coupled to the first output of the memory sense amplifier, and said base of said eleventh transistor being coupled to said emitter of said seventh transistor;

a twelfth transistor having a collector, a base and an emitter, said collector of said twelfth transistor being coupled to the second output of the memory sense amplifier, said base of said twelfth transistor being coupled to said emitter of said eighth transistor, and said emitter of said twelfth transistor being coupled to said emitter of said eleventh transistor;

a thirteenth transistor having first, second and control electrodes, said first electrode of said thirteenth transistor being coupled to said emitter of said twelfth transistor, said second electrode of said thirteenth transistor being coupled to a fifth output of said current source means, and said control electrode of said thirteenth transistor being coupled to said third control signal;

a first resistor coupled between said collector of said fourth transistor and said first supply voltage terminal; and

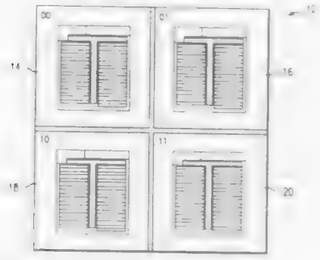
a second resistor coupled between said collector of said fifth transistor and said first supply voltage terminal.

5,151,880

METHOD AND APPARATUS FOR DETERMINING THE FIELD POSITION OF AN INTEGRATED CIRCUIT WITHIN A RETICLE AREA

John F. Schreck, and Phat C. Truong, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 14, 1989, Ser. No. 450,808
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—201 **28 Claims**



25. An integrated circuit, comprising:

an array of memory cells, said array producing an output signal on an output line during a normal operation mode;

a test mode memory, said test mode memory producing an output signal on said output line during a test mode;

a coupling circuit for coupling said output line to an output node in response to a control signal, said coupling circuit having a control input for receiving said control signal; and

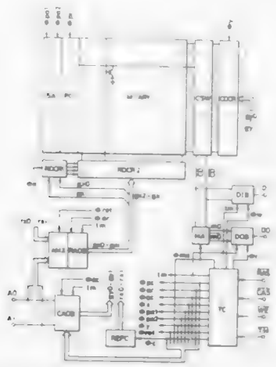
a switch for selectively coupling a normal operation mode address input to said control input in response to a first state of a test mode signal and coupling a test mode address input to said control input in response to a second state of said test mode signal.

5,151,881

SEMICONDUCTOR MEMORY INCLUDING AN ARRANGEMENT TO PERMIT EXTERNAL MONITORING OF AN INTERNAL CONTROL SIGNAL

Kazuhiko Kajigaya, Ohme, and Jiro Sawada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 485,406
Claims priority, application Japan, Apr. 24, 1987, 62-99777
Int. Cl.[5] G11C *7/00, 11/412*
U.S. Cl. 365—233 **30 Claims**



1. A semiconductor memory comprising:

a memory array including therein a plurality of memory cells for storing data;

select means coupled to said memory array for selecting at least one memory cell from said plurality of memory cells;

control means coupled to said select means for forming at least one internal control signal for controlling said select means;

a first external terminal coupled to said select means; and

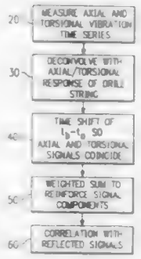
control signal transmitting means for transmitting said at least one internal control signal to said first external terminal under predetermined conditions to permit external monitoring of said internal control signal.

5,151,882

METHOD FOR DECONVOLUTION OF NON-IDEAL FREQUENCY RESPONSE OF PIPE STRUCTURES TO ACOUSTIC SIGNALS

John E. E. Kingman, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 564,621, Aug. 8, 1990, abandoned. This application Dec. 20, 1990, Ser. No. 630,866
Int. Cl.[5] G01V *1/36, 1/40*
U.S. Cl. 367—82 **16 Claims**



1. A method for reducing the effects of frequency-dependent distortion on vibrations generated at a first location of a structure and detected over time at a second location, said detected vibrations represented as a first time series corresponding to vibrations having a first transmission velocity along said structure and a second time series corresponding to vibrations having a second transmission velocity along said structure, said method comprising:

storing a first frequency response characteristic for said vibrations having a first transmission velocity along said structure;

storing a second frequency response characteristic for said vibrations having a second transmission velocity along said structure;

retrieving the values of said time series over at ime interval;

combining said first frequency response characteristic with a first time delay value to arrive at a first deconvolution operator;

combining said second frequency response characteristic with a second time delay value to arrive at a second deconvolution operator;

wherein the product of said first velocity and said first time delay value is approximately the same as the product of said second velocity and said second time delay value; and

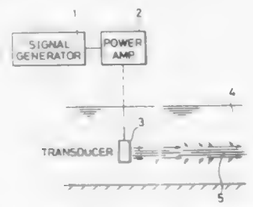
deconvolving said retrieved time series values with deconvolution operator.

5,151,885

FLUID DRIVE METHOD USING ULTRASONIC WAVES

Hideto Mitome, Tsukuba, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,407
Claims priority, application Japan, Mar. 28, 1990, 2-79678
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—138 2 Claims



1. A method of driving a fluid by transmitting ultrasound through the fluid, comprising the steps of:

applying electrical signals to a transducer disposed in the fluid to cause the transducer to emit tone burst waves in the fluid; and

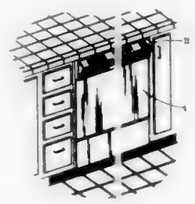
adjusting the electric signals to be applied so as to change the duty ratio and amplitude of the tone burst waves to be emitted, thereby controlling the intensity distribution of a streaming driving force acting on the fluid, such that effective use is made of ultrasonic energy by controlling of the intensity at at least one desired location, wherein the duty ratio is the ratio of the time in a burst cycle during which the transducer generates wave motion to the total time of a burst cycle.

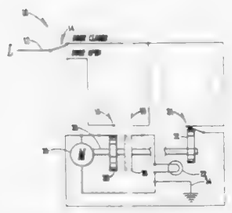
5,151,884

CONTROL SYSTEM FOR APPLIANCE INDICATOR LIGHT AND METHOD FOR USING SAME

Scott E. Griffith; Barry E. Tuller, and Charles L. Jackson, all of Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa

Filed Mar. 2, 1992, Ser. No. 844,148
Int. Cl.[5] G04B *47/00*; G06F *15/46*
U.S. Cl. 368—10 17 Claims





1. A control system for controlling an indicator light for an appliance after said appliance has completed an operational cycle, said appliance having an access door being in a closed position during said operational cycle and movable to an open position, said control system comprising:

an electrical power source;

door switch means connected to said power source and being movable to a first posture in response to said door being moved to said open position and being movable to a second posture in response to said door being moved to said closed position;

timing means connected to said door switch and being operable responsive to said door switch moving to said first posture after completion of said operational cycle for causing initiation of a timing cycle which continues for a predetermined period of time;

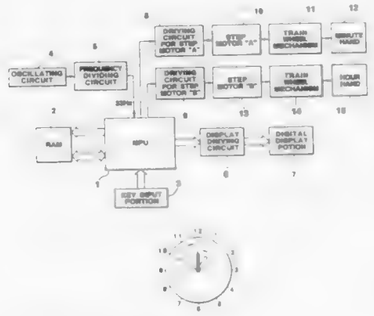
controller means connected to said timing means and said power source for connecting said power source to said indicator light until said timing means completes said timing cycle, and for disconnecting said indicator light from said power source when said timing means completes said timing cycle.

5,151,885

STOPWATCH

Tomoo Kasuo, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1992, Ser. No. 858,342
Claims priority, application Japan, Mar. 29, 1991, 3-66845
Int. Cl.[5] G04F *8/00, 10/00*
U.S. Cl. 368—110 18 Claims



1. A stopwatch comprising:

time measuring means which starts time measurement on a basis of a start command;

a lap switch to be operated during a time measurement by the time measuring means;

lap time means for obtaining time information from the preceding operation of the lap switch when the lap switch is operated; and

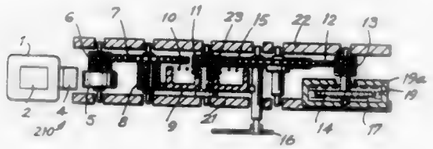
hand means rotatably driven to a position of "0" o'clock when said lap switch is operated, and to a position of "10" o'clock when the same time as the time information obtained by said lap time means is elapsed.

5,151,886

ANALOG ELECTRIC TIMEPIECE USING AN INTERMITTENT DRIVING SIGNAL

Osamu Miyazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 414,288, Sep. 29, 1989, abandoned, which is a continuation of Ser. No. 114,315, Oct. 28, 1987, Pat. No. 4,885,730. This application Feb. 27, 1992, Ser. No. 845,513
Claims priority, application Japan, Oct. 28, 1986, 61-256311; Nov. 7, 1986, 61-265204; Nov. 28, 1986, 61-183447; Feb. 27, 1987, 62-28635; Feb. 27, 1987, 62-28636; Mar. 9, 1987, 62-53454; Jun. 3, 1987, 62-139281; Jul. 6, 1987, 62-168179
Int. Cl.[5] G04C *3/00*; H02K *47/10*
U.S. Cl. 368—157 26 Claims



1. An electronic timepiece, comprising:

transducer means for producing an intermittent driving force;

energy storage means coupled to the transducer means for converting the intermittent driving force to stored energy;

viscous control means for continuously releasing the stored energy as a driving force; and

hand means for indicating time and for continuous rotation in response to the release of stored energy as a driving force, the amount of rotation being based on said intermittent driving force;

wherein said energy storage means and said control means are positioned away from the center of the timepiece and separated from each other.

5,151,887

SEPARATION-TYPE OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS PRODUCING OFFSET-ELIMINATED FOCUS ERROR SIGNAL

Yasuhiro Miyazaki, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,301
Claims priority, application Japan, Apr. 20, 1989, 1-98674; Jul. 27, 1989, 1-192711; Oct. 9, 1989, 1-263387
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.32 7 Claims

1. An optical information recording and reproducing apparatus, comprising:

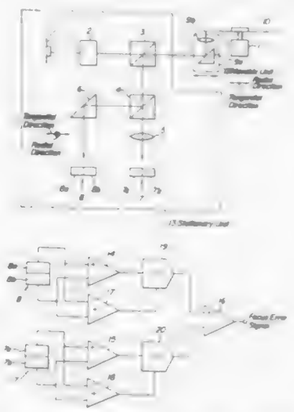
(a) a stationary unit which is fixed with respect to an optical record disk in which at least one circular information track is formed; and

(b) a movable unit which is arranged movably in a radial direction of the information track in the optical record disk,

said stationary unit comprising a light source for emitting a light beam, a first beam splitting means for directing the light beam emitted from the light source to the movable unit and directing a light beam transmitted from the movable unit in a direction which is different from a direction toward the light source, a second beam splitting means for separating the light beam emanating from the first beam splitting means into two sub-beams, a first photodetecting means having a least two light receiving regions arranged in a tangetial direction of the information track, a second photodetecting means having at least two light receiving elements arranged in the tangetial direction of the information track, and a focusing error detecting optical element arranged in the first sub-beam emanating from the second beam splitting means, said focusing error detecting optical element introducing a change in a light amount distribution of the first sub-light beam in the tangential direction;

said movable unit comprising an objective lens for projecting the light beam emanating from said first beam splitting means onto the optical record disk as a light spot; and

(c) a calculating circuit means for deriving a focus error signal from a first signal supplied from the first photodetecting means and including a signal component representing the focus error and a second signal supplied from said second photodetection means and having a signal component representing a change in the light amount distribution in the tangential direction due to factors other than the focus error, wherein said calculating circuit means comprises a first differential amplifier for deriving a first difference signal between the output signals supplied from the first photodetecting means, a first adder for deriving a first sum of the output signals supplied from the first photodetecting means, a first divider for deriving as said first signal a first division signal between the first difference and sum signals, a second differential amplifier for deriving a second difference signal between the output signals supplied from the second photodetecting means, a second adder for deriving a second sum of the output signals supplied from the second photodetecting means, a second divider for deriving as said second signal a second division signal between the second difference signal and the sum signal, and a third differential amplifier for deriving a third difference signal between said first and second division signals as the actual focus signal.



5,151,888

OPTICAL INFORMATION PROCESSING APPARATUS IN WHICH THE OUTPUT OF AN OPTICAL SENSOR IS REPLACED BY A REFERENCE SIGNAL DURING THE OCCURRENCE OF MALFUNCTION

Satoshi Shikichi, and Takashi Nakahara, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

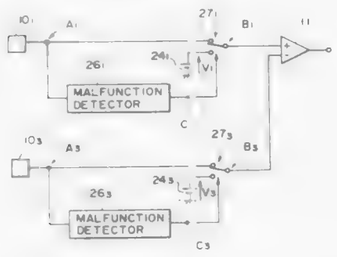
Filed Aug. 29, 1989, Ser. No. 400,107
Claims priority, application Japan, Aug. 31, 1988, 63-215254
Int. Cl.[5] G11B *7/095*
U.S. Cl. 369—44.32 8 Claims

1. An optical information processing apparatus for effecting the recording and/or reproduction of information by scanning information tracks of an optical recording medium by at least one condensed light beam while effecting tracking and/or focusing control, said apparatus comprising:

at least two groups of optical sensors for receiving light of the light beam reflected by the medium and for generating respective output signals;

a control signal producing circuit for producing a signal for effecting the tracking and/or focusing control using the output signal of each of said groups of optical sensors;

a plurality of reference signal generating sources for generating a plurality of reference signals; and



a switching circuit for cuasing, when at least one of the output signals of said groups of optical sensors exhibits an abnormal value, a respective reference signal, instead of the at lest one output signal having an abnormal value, to be input to said control signal producing circuit.

5,151,889

OPTICAL HEAD DEVICE USING CROSS-POLARIZED FROM A LIGHT SOURCE FOR USE IN OPTICAL DISK SYSTEM

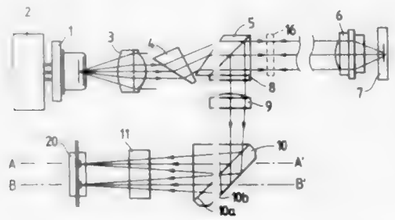
Tetsuo Saimi, and Kazuo Momoo, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1990, Ser. No. 467,119

Claims priority, application Japan, Jan. 20, 1989, 1-12328; Jan. 20, 1989, 1-12329

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.37 **8 Claims**



1. An optical head device for optically recording and reproducing information on and from an optical recording medium, comprising:

light source means for emitting a light beam;

collimator means for causing said light beam from said light source means to become a parallel light beam;

objective lens means for converging said parallel light beam from said collimator means on said optical recording medium;

first optical means provided between said collimator means and said objective lens means for reflecting the light beam returned from said optical recording medium;

converging means for converging the light beam reflected by said first optical means;

second optical means for separating the light beam from said converging means to generate two light beams which are optically cross-polarized, said two separated light beams directing in the substantially same direction and being separated by a predetermined distance from each other, said second optical means being arranged to cause the optical path length of one of said two separated light beams to be longer than that of the other separated light beam; and

photodetector means for respectively receiving the two separated light beams from said second optical means.

5,151,890

OPTICAL SYSTEM FOR OPTICAL MEMORY DEVICE

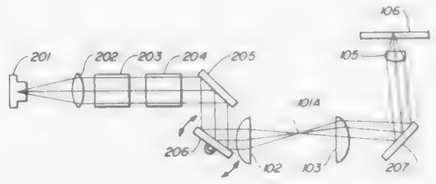
Masatoshi Yonekubo, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 520,515, May 8, 1990, abandoned. This application Feb. 26, 1992, Ser. No. 842,729

Claims priority, application Japan, May 8, 1989, 1-114621; May 18, 1989, 1-124737; Jul. 28, 1989, 1-195846

Int. Cl.[5] G11B *7/09*

U.S. Cl. 369—44.110 **12 Claims**



1. An optical system for an optical storage medium having a light source for producing a light beam, an afocal optical system, an objective lens and a reflection device, said reflection device having a deflecting mechanism for changing the propagating angle of said light beam through the optical system so as to enable a light spot focused from said light beam to follow a change in position of a track on said optical storage medium, the improvement comprising the positioning of said afocal optical system in the light path between said objective lens and said deflecting mechanism wherein said deflection mechanism is located before said afocal optical system and said objective lens is located after said afocal optical system to enable said afocal optical system to correct for displacement of said light beam due to the mechanics of said deflection mechanism, said afocal optical system comprising a first optical system having a positive focal length to receive the light beam from said deflecting mechanism and a second optical system with a positive focal length to transmit the light beam to said objective lens.

5,151,891

METHOD AND APPARATUS FOR ASSIGNING BINARY VALUES TO SAMPLE VALUES OF A WAVEFORM REPRESENTING A PATTERN OF RECORDING MARKS ON A RECORD CARRIER

Johannes W. M. Bergmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1989, Ser. No. 427,674

Claims priority, application United Kingdom, Nov. 9, 1988, 8826266

Int. Cl.[5] H04N *5/76*; G11B *5/09, 7/00*

U.S. Cl. 369—59 **13 Claims**

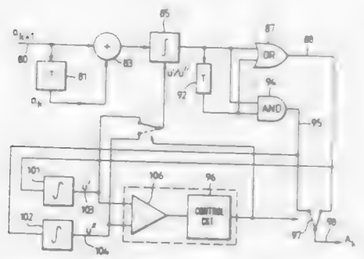
1. A method of assigning binary values to each of a series of successive sample values taken periodically from a waveform representing a binary pattern of marks on a record carrier, the pattern of marks having a nominal minimum run length of more than one sampling period, the method comprising the steps of:

(a) determining whether the pattern of marks is subject to a first or a second type of systematic error, the first type causing the marks on the record carrier to be systematically too short and the second type causing the marks on the record carrier to be too long relative to the nominal minimum run length; and

for each sample value a_k in said series:

(b) combining a series of successive sample values which include the sample value a_k to generate one or more combined sample values;

(c) establishing a threshold value;



(d) comparing each combined sample value determined in step (b) with said threshold value; and

(e) assigning a binary value to the sample value a_k in accordance with the results of the comparisons in step (d) and a logic relationship dependent on which type of systematic error, if any, is determined to be present in step (a).

5,151,892

OPTICAL HEAD DEVICE FOR OPTIMALLY DETECTING A FOCUSSING ERROR

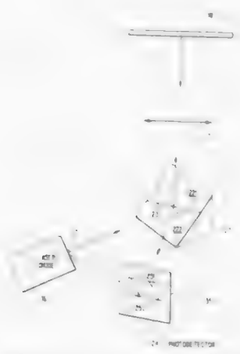
Yasuo Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 453,894

Claims priority, application Japan, Dec. 20, 1988, 63-322496; Dec. 20, 1988, 63-322497; Dec. 20, 1988, 63-322498

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—109 **12 Claims**



12. An optical head device for use in combination with an optical source for generating an optical beam along an optical axis from a source point and comprising a lens system having a magnification for focussing said optical beam substantially on an optical recording medium which reflects said optical beam to make said lens system produce a reflected beam; a reflection optical grating element, arranged between said optical source and said lens system, comprising first and second regions partitioned by a partition line intersecting said optical axis for diffracting said reflected beam into first and second diffracted beams; and an optical detector comprising first through fourth segments, segmented by a first segmentation line and a second segmentation line orthogonally intersecting said first segmentation line, for receiving said first and second diffracted beams at first and second points of convergence to produce electric output signals from said first through fourth segments, said first and second points of convergence being on said first segmentation line, wherein said partition line and said first segmentation line each has a position and direction such that said first and second points of convergence substantially follow said first segmentation line even when a wavelength of said optical beam varies.

5,151,893

OPTICAL DATA RECORDING AND REPRODUCING APPARATUS

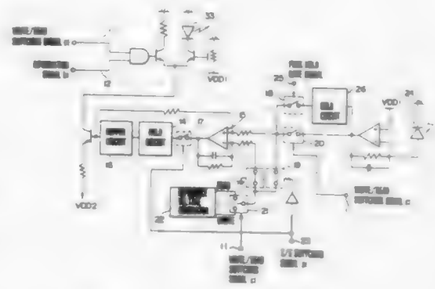
Yukihiro Yamasaki, Hirakata; Toshio Saetsuga, Katano; Tamotsu Matsuo, Osaka, and Hideo Okamura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 30, 1990, Ser. No. 530,795

Claims priority, application Japan, Jun. 5, 1989, 1-142508; Jun. 5, 1989, 1-142509; Jun. 5, 1989, 1-142510; Jun. 5, 1989, 1-142512

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **5 Claims**



1. An optical data recording and reproducing apparatus comprising:

means using a laser beam source for recording and reproducing data on and from an optical recording medium;

means for applying an information signal modulating said laser beam source, said information signal having added thereto a dummy signal having a predetermined frequency and lasting for a predetermined period of time to terminate immediately before a data write mode is started; and

means responding to said dummy signal for actuating a power servo circuit for said laser beam source.

5,151,894

DISK CARTRIDGE SHUTTER

Minoru Fujita, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 407,924, Sep. 15, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,254

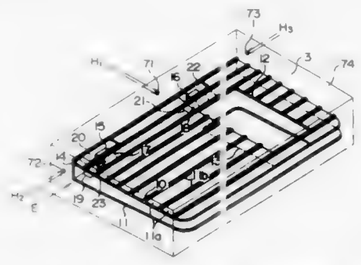
Claims priority, application Japan, Sep. 20, 1988, 63-233621

Int. Cl.[5] B11B *3/70, 5/84, 7/26, 23/03*

U.S. Cl. 369—291 **11 Claims**

1. A disk cartridge comprising a cartridge case and an integrally molded plastic shutter for shutting and opening an aperture formed in said cartridge case, said cartridge case rotatably accommodating a disk-shaped recording medium, said plastic shutter comprising face plates having an outer surface which includes a ridged surface of a multiplicity of ridges and grooves therein arranged in the form of a pattern wherein said multiplicity of ridges and grooves extend in a direction which intersects a direction of molten plastic flow when said shutter is molded, said face plate of said plastic shutter near said outer

surface, including said multiplicity of ridges and grooves, comprises a degree of molecular orientation lower in comparison with that of that portion of said surface plate near an opposite inner surface thereof.

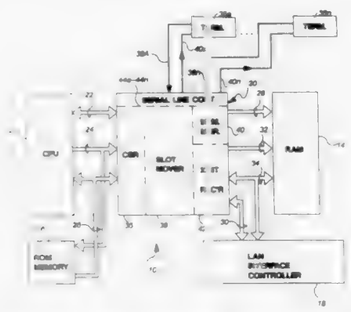


5,151,895

TERMINAL SERVER ARCHITECTURE

Gary Vacon, Melrose; John A. Visse , Wakefield; Willem A. H. Engelse, Townsend, and Stephen D Metzger, Lancaster, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Se . No. 546,104
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.1 5 Claims



2. A method for passing data from a selected one of a plurality of terminals to a local area network (LAN) using a terminal server having central processing means, data movement means for performing selected data movement operations substantially independent of said central processing means, memory and serial interface means, said serial interface means connected with each of said plurality of terminals, and said local area network (LAN) being connected to said terminal server, said method comprising the steps of:

generating first control signals from said central processing means, said first control signals identifying selected locations in said memory;

providing said first control signals to said data movement means;

generating second control signals from said data movement means;

providing said second control signals to said serial interface means for moving said data from said terminal to said serial interface means;

generating third control signal from said data movement means;

providing said third control signals to said memory for moving said data from said serial interface means to said selected locations;

generating fourth control signals from said data movement means; and

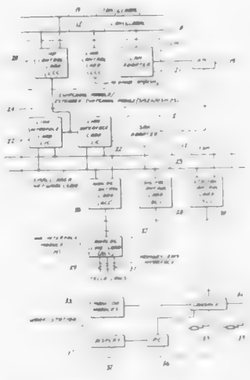
providing said fourth control signals to said LAN and said memory for moving said data from said selected locations in said memory to said LAN.

5,151,896

MODULAR DIGITAL TELEPHONE SYSTEM WITH FULLY DISTRIBUTED LOCAL SWITCHING AND CONTROL

Donald J. Bowman, 135 Grayson Ct., Colorado Springs, Colo. 80906; Jerry D. Crane, 29335 Nole Hace, Boerne, Tex. 78006; Scott G. Edwards; Kathryn M. Edwards, both of 17 Edith La., Wilton, Conn. 06895, and Sven R. Englund, 9 Fairty Dr., New Canaan, Conn. 06840

Filed Sep. 21, 1990, Ser. No. 586,440
Int. Cl.[5] H04L *12/46, 12/66*
U.S. Cl. 370—85.13 18 Claims



1. A method of switched communication between nodes, workstations and other resources of a modular digital telephone system and public network resources such as central office telephone lines, tie lines, private and hybrid wide area networks using shared time division multiplexed (TDM) highway signal paths comprising the steps of:

mounting a plurality of circuit cards having selectable circuitry thereon in at least one card cage having a backplane;

interfacing the cards with the backplane of the card cage in which the cards are mounted;

forming a plurality of TDM highways, token passing communications media, Local Area Network (LAN) and Small Area Network (SAN), by interconnecting selected circuitry on said circuit cards on said backplane;

coupling resources to said cards permitting the intercommunication between said resources via said TDM highways;

dividing said signal paths on said TDM highways into time slots; and

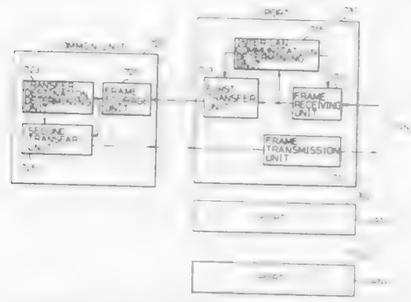
performing all call processing between resources by exchanging requests directly on said token passing communications media, SAN and LAN, between the resources wishing to communicate whereby signaling between resources is directly exchanged without establishing a direct current connection or using a central processing unit.

5,151,897

INTER-LAN CONNECTION APPARATUS AND INTER-LAN CONNECTION METHOD

Hideo Suzuki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 6, 1991, Ser. No. 651,570
Claims priority, application Japan, Mar. 20, 1990, 2-071118
Int. Cl.[5] H04J *3/08*
U.S. Cl. 370—85.13 20 Claims



1. An inter-LAN connection apparatus having a plurality of ports which operatively connect to a plurality of LANs, respectively, to transmit and receive frames to and from the LANs, and a common unit that is commonly connected to the plurality of ports to transfer the frames among the LANs, each of the plurality of ports comprising:

frame receiving means for receiving a frame supplied from a corresponding LAN;

first transfer means for transferring the received frame to the common unit;

inter-LAN communication determining means for instructing said frame receiving means to abort the frame when a destination of the received frame is the LAN which is a source of transmission and for instructing said first transfer means to transfer the frame when the destination of the received frame a LAN different from the LAN that is the source of transmission; and

frame transmitting means for transmitting the frame transferred from said common unit to the corresponding LAN; and

said common unit comprises:

frame storage means for storing the frame transferred by said first transfer means;

transfer destination determining means for determining a frame transfer destination based on a destination address which is included in the frame that is stored in said frame storage means; and

second transfer means for transferring the frame stored in the frame storage means to a port designated by the frame transfer destination.

5,151,898

SYNCHRONIZED SLAVE STATION CONNECTION APPARATUS FOR A DATA COMMUNICATION NETWORK

Haruhiko Kondo, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

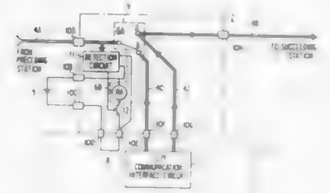
Filed Oct. 31, 1990, Ser. No. 606,974
Claims priority, application Japan, Feb. 5, 1990, 2-25601
Int. Cl.[5] H04J *3/02;* H04L *12/42*
U.S. Cl. 370—85.15 15 Claims

1. A ring-type data communication network having plural nodes, comprising:

a plurality of transmission means, each connecting respective pairs of nodes and collectively joining said nodes in said ring-type network;

a master station located at a first of said nodes and operative to generate a transmission frame comprising an information space and an idle space;

a plurality of slave stations, located at others of said nodes, at least one being a detachable slave station; and



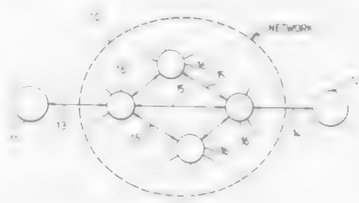
connection means located respectively at at least one of said nodes and being operative to switch between a slave station bypass state and a slave station insert state to detachably connect said at least one detachable slave station into said network in response to the appearance of said idle space.

5,151,899

TRACKING SEQUENCE NUMBERS IN PACKET DATA COMMUNICATION SYSTEM

Robert E. Thomas, Hudson; George Varghese, Bradford, both of Mass.; Robert J. Souza, Windham, N.H., and George A. Harvey, Maynard, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 11, 1991, Ser. No. 654,067
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—94.1 34 Claims



1. A method of tracking sequence numbers for message packets in a packet data transmission system, comprising the steps of:

a) assigning sequence numbers in order to a series of packets transmitted from a source to a destination;

b) at said destination, defining an acceptable range of said sequence numbers, said range beginning at a base sequence number and extending for a window which is a small fraction of the available sequence numbers;

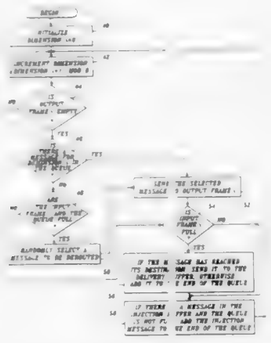
c) comparing the sequence number of each message packet received at said station with said acceptable range;

d) discarding all message packets having sequence numbers not within said range;

e) maintaining at said destination a first bit map, and indexing into said first bit map to a sequence number index position representing the sequence number of a packet received at said destination; and

f) for said packet received at said destination, checking its sequence number index position in said first bit map, and discarding said packet if said sequence number index position contains an indication that a packet of the sequence number of this index position has already been received, or, if said index position does not contain said indication, then storing an indication at said index position that a packet has been received.

5,151,900
CHAOS ROUTER SYSTEM
Lawrence Snyder, Seattle, Wash., and Smaragda Konstantinidou, Los Gatos, Calif., assignors to Washington Research Foundation, Seattle, Wash.
Filed Jun. 14, 1991, Ser. No. 715,828
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—94.3 9 Claims



1. A message router system for routing messages from a source node to a destination node in a multinode processing system, the multinode processing system includes a multiplicity of nodes connected by channels such that a message may be routed along a profitable channel so that it is closer to its destination or derouted along a random channel so that it is further from its destination, wherein each node includes a routing subsystem having a set of input frames corresponding to the channels for receiving messages from the channels, a set of output frames corresponding to the channels for sending messages to the channels, and a fixed-size message queue for storing messages at the node,

the message router system comprising at each node:

(a) a routing controller for identifying an empty output frame, selecting a profitable message from the message queue such that the channel corresponding to said empty output frame is a profitable channel for said message, and, if said profitable message is available, writing said profitable message to said empty output frame; and

(b) a random selector for randomly selecting a message to be derouted from said message queue if said routing controller does not identify a profitable message and if said message queue is full, and writing said derouted message to said empty output frame.

5,151,901
DS1 TRUNK PACKING AND UNPACKING APPARATUS AND METHOD
Kishan Shenoi, Milpitas; Patrick L. Hanagan; Helena S. Ho, both of San Jose, and Frank I. Yu, Saratoga, all of Calif., assignors to DSC Communications Corporation, Plano, Tex.
Filed Apr. 9, 1990, Ser. No. 506,691
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—110.1 22 Claims

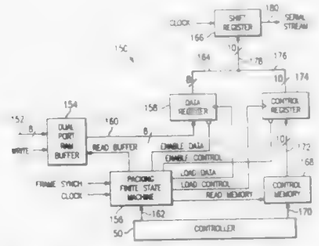
1. Apparatus for packing compressed data from a plurality of telecommunication lines, comprising:

a buffer for receiving and storing said compressed data from said plurality of telecommunication lines;

a data register coupled to said buffer for reading said compressed data from said plurality of telecommunication lines stored in said buffer;

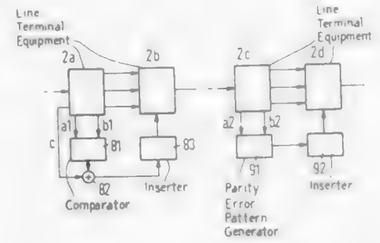
a control memory for storing control parameters;

a control register coupled to said control memory for reading said control memory and storing said control parameters; and



a shift register coupled to both said data register and said control register for receiving one of said data and control parameters therefrom respectively and providing a serial output thereof.

5,151,902
METHOD AND APPARATUS FOR QUALITY MONITORING OF AT LEAST TWO TRANSMISSION SECTIONS OF A DIGITAL SIGNAL TRANSMISSION LINK
Hans-Joachim Grallert, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 22, 1990, Ser. No. 497,324
Claims priority, application European Pat. Off., Mar. 22, 1989, 89105172.4
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—51 7 Claims

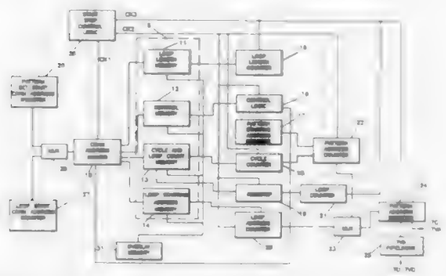


1. A method for quality monitoring of at least two series connected line sections of a digital signal transmission link having transmission equipment operating according to a synchronous hierarchy, wherein digital signals are transmitted in virtual containers of synchronous transport modules and section overhead of synchronous transport modules and having module parity bytes and a special parity byte in a path overhead of each virtual container, for each line section module parity bytes derived from digital signals received at an end of the respective line section being compared to received module parity bytes received at a start of the respective line section and an error signal being formed in a prescribed dependency on a result of the comparison, comprising the steps of:

deriving an error message byte, in at least one intermediate link location of the transmission link at which an end of one line section is connected to a start of a following line section, from the error signal and transmitting the error message byte over the following line section as the special parity byte, and the error message byte being transmitted on lines that carry the digital signals between synchronous line multiplexers of the at least one intermediate link location; deriving in the following line section, a new error message byte from the error message byte received from the one line section and an error signal formed at the end of the following line section;

repeating the steps of forming an error message byte to produce a sequence of error message bytes of the transmission link and acquiring a quality criterion for the monitored transmission link by evaluating the sequence of error message bytes.

5,151,903
HIGH EFFICIENCY PATTERN SEQUENCE CONTROLLER FOR AUTOMATIC TEST EQUIPMENT
Marc R. Mydill, and Sheila O'Keefe, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 28, 1989, Ser. No. 414,050
Int. Cl.[5] G06F 11/00, 9/40
U.S. Cl. 371—27 12 Claims



4. A pattern sequence control system for controlling the sequence of pattern memory addresses applied to pattern memory during the execution of a functional test, comprising;

a control RAM for storing the changes in the sequence of patterns that are to be executed;

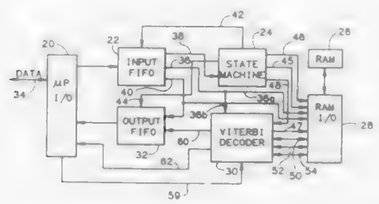
a single pattern address counter for incrementing the pattern addresses in memory for sequential patterns; and

a single loop address counter for incrementing the pattern address in memory for looping patterns; and

a cycle and loop count memory storing a cycle count which represents the number of times a single pattern is to be repeated and a loop count which represents the number of times a loop is to be executed;

wherein the cycle count also represents the number of sequential pattern addresses to be executed in a straight line mode, and the loop count represents the maximum number of times a match loop is to be executed before logging a failure.

5,151,904
RECONFIGURABLE, MULTI-USER VITERBI DECODER
Thomas C. Reiner, Carlsbad; Mark J. Lindsey, and Krishnanand Kelkar, both of San Diego, all of Calif., assignors to The Titan Corporation, San Diego, Calif.
Filed Sep. 27, 1990, Ser. No. 590,238
Int. Cl.[5] G06F 11/10
U.S. Cl. 371—43 12 Claims



1. A decoding system for decoding a digital data stream that has been convolutionally encoded in accordance with a selected constraint length and selected polynomial codes, comprising

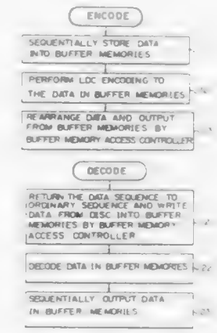
means for processing said encoded data stream in accordance with said constraint length and in accordance with said selected polynomial codes to decode said encoded data stream;

a memory for storing data of said selected constraint length and data of said selected polynomial codes in accordance with which said data stream was encoded; and

means responsive to a user channel identification signal for retrieving said selected constraint length data and said selected polynomial code data from said memory and configuring the processing means in accordance with said selected constraint length and said selected polynomial codes;

wherein the memory stores different sets of combinations of constraint length data and polynomial code data corresponding to different user channels, with said different sets being retrievable from the memory by the retrieving means in response to different user channel identification signals for respectively configuring the processing means for different user channels.

5,151,905
DATA RECORDING METHOD
Shigeru Yokono, Kanagawa, and Minoru Tobita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 419,388
Claims priority, application Japan, Oct. 14, 1988, 63-259143
Int. Cl.[5] H03M 13/00
U.S. Cl. 371—39.1 7 Claims



1. A method for recording digital data onto a disc-shaped recording medium having a sector construction, comprising the steps of:

receiving input digital data and dividing it into predetermined lengths;

two-dimensionally arranging the predetermined lengths of the divided digital data into n separate arrays, each array having rows and columns, where n is an integer greater than one;

for each array, generating separate error correction codes and adding the separate error correction codes to the columns of the array and storing each of the n arrays of digital data and error correction codes at different addresses in a digital memory means; and

sequentially reading out the digital data and error correction codes from the digital memory means and recording the read out digital data and error correction codes to each sector in series on the disc-shaped recording medium, wherein the step of reading out the digital data and error correction codes follows a sequence that the digital data or error correction code at any given set of row and column coordinates in a first one of the n arrays is read out

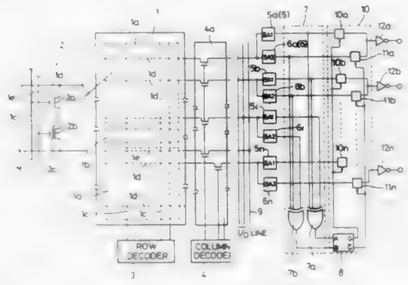
and recorded, followed by reading out and recording the digital data or the error correction code at the same given set of row and column coordinates in a second one of the n arrays, followed by reading out and recording the digital data or error correction code at the same given set of row and column coordinates in a third and each subsequent one of the n arrays.

5,151,907

SEMICONDUCTOR MEMORY DEVICE HAVING SELF-CORRECTING FUNCTION

Kikuzo Sawada, Koganei, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed May 2, 1990, Ser. No. 517,694
Claims priority, application Japan, May 25, 1989, 1-132177
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—51.1 **33 Claims**



1. A semiconductor memory device having a self-correcting function, comprising:
a plurality of nonvolatile memory cells;
first and second read circuits for reading a plurality of bits from the plurality of memory cells;
one part of the memory cells comprises memory cells for storing data bits, another part thereof being memory cells for storing parity bits on data bits stored, wherein each memory cell selectively stores bits of "0" or "1" by an electric charge;
the first read circuit having a criterion of detecting the bits of "0" and "1" set smaller in value than a current value read in such a state that the electric charge charged in the memory cell stored with data of one of either "0" or "1" becomes depleted;
the second read circuit having a criterion of detecting the bits of "0" and "1" set greater in value than a current value read in such a state that the electric charge charged in the memory cell stored with data of the other of either "1" or "0" becomes depleted; and
the first and the second read circuits being connected to respectively receive the same bits from the plurality of the same selected memory cells and having means to output correct data with correct parity out of the plurality of bits.

5,151,909

AUXILIARY POWER SUPPLY FOR CONTINUATION OF COMPUTER SYSTEM OPERATION DURING COMMERCIAL AC POWER FAILURE

Walter A. Robbins, 1110 Bel Marin Keys Blvd., Novato, Calif. 94949

Filed Feb. 20, 1990, Ser. No. 482,294
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—66 **20 Claims**

1. A means to provide auxiliary direct current power to a device to be protected utilizing low voltage direct current power converted from alternating current power, to provide uninterrupted operation during an alternating current power failure, comprising:
a) a monitoring means for monitoring an alternating current power source for failure and providing a first indication of failure when said alternating current power source falls below a predetermined voltage, and a second indication of restoration of said alternating current power whenever said alternating current power source returns to and rises above said predetermined voltage for longer than a predetermined period of time,
b) a power supply means receiving energy from said alternating current power source for converting and delivering power to said auxiliary direct current power system during nominal operation of said alternating current power source,
c) a source or sources of stored direct current power means, including storage batteries, connected to a change-over switch means,
d) said change-over switch means to connect the direct current power source(s) to a device to be protected's

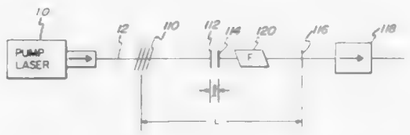
internal direct current power bus, and connector means therefor, controlled by said first and second indications of power failure and restoration,
e) a means to monitor a device to be protected's on/off status,
f) a means to inhibit said change-over switch means when said device to be protected is in a turned off state,
g) a means to inhibit said change-over switch means change-of-state, following said second indication of commercial alternating current power restoral, until such time as said device to be protected's internal main direct current power supply is capable of providing nominal power,
whereby an efficient and direct means is provided for substitute or auxiliary direct current power following a loss of commercial alternating current power and thereby maintaining the device to be protected's system operation for the duration of said loss.

5,151,908

LASER WITH LONGITUDINAL MODE SELECTION

David R. Huber, Warrington, Pa., assignor to General Instrument Corporation, Hatboro, Pa.

Continuation-in-part of Ser. No. 616,024, Nov. 20, 1990. This application Oct. 9, 1991, Ser. No. 770,762
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—6 **20 Claims**



1. A laser for providing an optical carrier comprising:

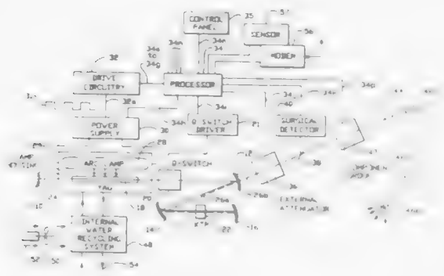
a first Fabry-Perot cavity of length L formed from an optical material containing a laser medium to provide a laser cavity; and
a second Fabry-Perot cavity of length $l < L$ at least approximately centered within said first Fabry-Perot cavity;
wherein the length L of said first Fabry-Perot cavity is selected to limit the longitudinal modes of said laser cavity and the length l of said second Fabry-Perot cavity is selected to minimize gain except at a desired lasing wavelength.

5,151,909

FREQUENCY DOUBLED SOLID STATE LASER HAVING PROGRAMMABLE PUMP POWER MODES AND METHOD FOR CONTROLLABLE LASERS

Scott A. Davenport, Montara; Mark V. Ortiz, San Jose; Linda Chen, Fremont, and Dirk J. Kuizenga, Sunnyvale, all of Calif., assignors to Laserscope, San Jose, Calif.

Continuation-in-part of Ser. No. 598,485, Oct. 16, 1990, abandoned. This application Apr. 22, 1991, Ser. No. 689,356
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—22 **101 Claims**



1. A laser system comprising:
a laser resonator for resonating at a first frequency;
a gain medium, mounted within the laser resonator;
controllable means, coupled with the gain medium, for supplying pump power in response to at least one control signal, to the gain medium to induce laser gain;
means, mounted with the laser resonator, for extracting an output beam at a second frequency derived from the resonating first frequency, the output beam having an output power; and
control means, connected to the controllable means, for supplying the at least one control signal to control the output power, wherein the control means supplies the at least one control signal in a first mode to generate a low output power, in a second mode to generate a high output power.

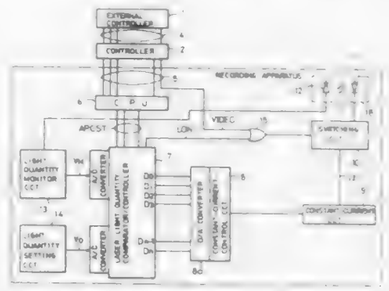
5,151,910

LIGHT QUANTITY CONTROL DEVICE

Toshihiko Inuyama; Junichi Kimizuka, both of Kanagawa; Makoto Abe, Chiba; Akihisa Kusano; Kaoru Sato, both of Kanagawa; Kazuhiko Okazawa; Masanori Ishiza, both of Tokyo, and Toshiyuki Ito, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,331
Claims priority, application Japan, Sep. 26, 1989, 1-247929
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—31 **17 Claims**

1. A light quantity control device comprising:
beam generating means; monitor means for monitoring a quantity of light of beam generated by said beam generating means and providing an output; and control means for controlling the light quantity of the beam generated by said beam generating means in response to the output of said monitor means, wherein said control means comprises:
digital value output means for outputting a digital value representing the quantity of light of the beam and a light



quantity control circuit for controlling the quantity of light in response to the digital value, and means for varying the timing of output of the digital value in accordance with the output of said monitor means so as to cause the quantity of light to be a predetermined level

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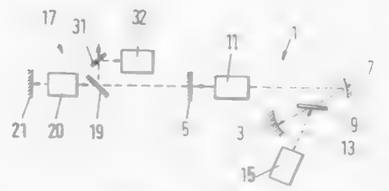
5,151,911

PROCESS FOR REDUCING HIGH-FREQUENCY ENERGY NOISE COMPONENTS IN THE OUTPUT RADIATION OF A LASER, PROCESS FOR GENERATING SHORT LASER PULSES, AND LASERS UTILIZED FOR THIS PURPOSE

Jungieg Bi, Worblaufen; Paul A. Beaud, Bern; Jürg A. Schütz, Jegenstorf; Walter Hodel, Bern, and Heinz P. Weber, Breitägertenstrasse 2, 3122 Kehrsatz, all of Switzerland, assignors to Heinz P. Weber, Kehrsatz, Switzerland

Filed Apr. 23, 1991, Ser. No. 689,487
Claims priority, application Switzerland, May 11, 1990, 1610/90
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—32 **19 Claims**



8. A laser for emitting an output radiation with reduced high-frequency energy noise, comprising
a laser resonator (1) with an active medium (9) and a mode volume,
a pumping device (15) for pumping said active medium (9),
two resonator mirrors (3, 5) in said laser resonator defining the mode volume of the oscillating laser radiation created by said active medium (9) inside said laser resonator (1),
secondary feedback means (17), including a secondary feedback path, connected to receive said output laser radiation from said laser resonator and produce a radiation feedback which is a fraction of said output laser radiation,
said secondary feedback means (17) being connected to feed back to said mode volume said fraction radiation feedback,
said secondary feedback path containing no optically nonlinearly acting components, and
said fraction radiation feedback having an intensity between

10^{-6} and 10^{-10} of the intensity of said laser radiation inside said resonator (1), and having a magnitude range of 0.5 to 50,000 times the intensity of the spontaneous output radiation of said laser resonator

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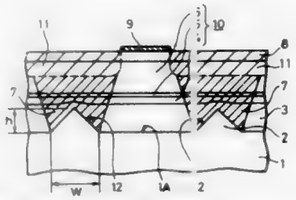
5,151,912

SEMICONDUCTOR LASER

Koushi Tamamura, Tokyo, and Hiroyuki Iwamoto, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 29, 1991, Ser. No. 783,787
Claims priority, application Japan, Nov. 2, 1990, 2-298166
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—46 28 Claims



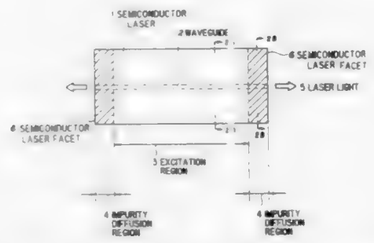
1. A semiconductor laser comprising:
a semiconductor substrate having first and second surfaces opposing to each other;
first and second cladding layers formed on the first surface of said substrate;
an active layer of a superlattice structure sandwiched between said first and second cladding layers;
a capping layer formed on said second cladding layer;
a first electrode provided on said capping layer; and
a second electrode connected to the second surface of said substrate, wherein the first surface of said substrate has at least two slanted surfaces whose crystalline planes differ from that of a major surface of said first surface of said substrate, each of said first and second cladding layers and said active layer formed on said substrate has a higher carrier density region above said slanted surfaces, and the higher carrier density regions of said active layer are placed in an alloy state, and light is emitted in a region of said active layer which is sandwiched between the alloy regions of said active layer and not placed in an alloy state.

5,151,913

SEMICONDUCTOR LASER

Yoshiyasu Ueno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 638,921
Claims priority, application Japan Jan. 9, 1990, 2-3091
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—46 4 Claims



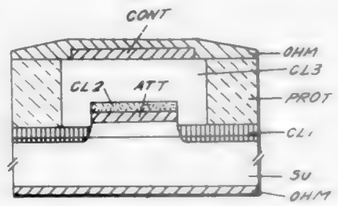
1. In a semiconductor laser, comprising:
a semiconductor substrate which has one type of conductivity;
a first cladding layer formed on said substrate, said first cladding layer having the same type of conductivity as said substrate;
a super-lattice active layer formed on said first cladding layer;
a second cladding layer formed on said active layer, said second cladding layer having the opposite type of conductivity as said first cladding layer, and said second cladding layer with said first cladding layer and said active layer forming a double-hetero structure;
impurity diffusion regions formed in all the layers of the double-hetero structure in the vicinity of both laser facets of said semiconductor laser, said active layer in said impurity diffusion regions having the impurity density of equal to or over 1×10^{17} cm^{-3}; and
a blocking layer formed on said second cladding layer in said impurity diffusion regions, said blocking layer having the same type of conductivity as said first cladding layer.

5,151,914

PROCESS TO MANUFACTURE LASER STRUCTURES WITH LATERAL CONFINEMENT AT VERY LOW THRESHOLD CURRENT AND RELEVANT LASER DEVICES SO OBTAINED

Fabio Vidimari, Milan, and Sergio Pellegrino, Turin, both of Italy, assignors to Telettra S.p.A., Italy

Filed Dec. 21, 1990, Ser. No. 631,644
Claims priority, application Italy, Dec. 21, 1989, 22770 A/89
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—46 8 Claims



6. A multilayer laser structure, comprising:
a substrate with an electrode formed on one surface and with the following layers, formed in the order recited, on an opposite surface:
a first epitaxial layer for optical and electric confinement;
an active layer for emitting luminous radiation of a desired wavelength;
at least one further layer for optical and electric confinement comprising a semiconductor material implanted with ions of a transition metal;
an electric contact layer; and
a second electrode attached to said electric contact layer.

5,151,915

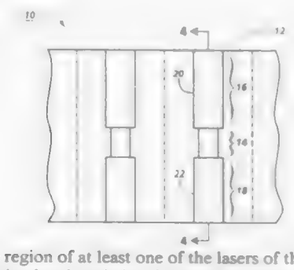
ARRAY AND METHOD OF OPERATING A MODULATED SOLID STATE LASER ARRAY WITH REDUCED THERMAL CROSSTALK

Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,989
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—50 16 Claims

13. A light emitting device, comprising:
an array of monolithically formed independently addressable semiconductor lasers, comprising:
a semiconductor substrate;
a plurality of semiconductor layers formed on said substrate such that at least one of said layers forms an active layer of narrower bandgap than layers adjacent thereto;
a first active region formed in said active layer for each

laser, including a two dimensional optical cavity for functioning as a laser;
a second active region formed in said active layer of at least one of the lasers of the array, including a two dimensional optical cavity coaxial with said optical cavity of said first active region for functioning as an optical modulator;
means electrically connected to said second active region for selectively applying a bias across said second active region;
wherein a sufficient forward bias is applied to said first



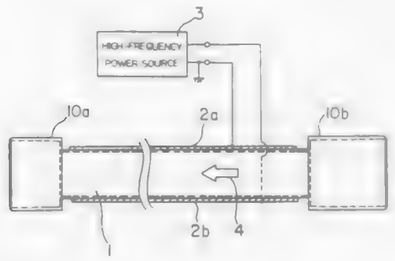
active region of at least one of the lasers of the array such that stimulated emission is caused to occur therein, a portion of said stimulated emission being directed into said second active region of said at least one laser, and the internal loss of the second active region of said at least one laser is varied by selectively applying the voltage to said second active region such that when said voltage is applied to said second active region the stimulated emission is prevented from causing lasing within said at least one laser, and when said voltage is not applied to said second active region the stimulated emission is allowed to cause lasing within said at least one laser.

5,151,916

ELECTRIC DISCHARGE TUBE FOR GAS LASER

Nobuaki Iehisa, Yamanashi, and Etsuo Yamazaki, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP89/00856, § 371 Date Apr. 18, 1990, § 102(e) Date Apr. 18, 1990, PCT Pub. No. WO90/03052, PCT Pub. Date Mar. 22, 1990
PCT Filed Aug. 22, 1989, Ser. No. 474,043
Claims priority, application Japan, Sep. 9, 1988, 63-226994
Int. Cl.[5] H01S 3/03
U.S. Cl. 372—61 7 Claims



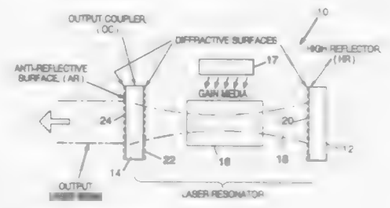
1. An electric discharge tube for a gas laser in which a laser gas flow axis and a laser oscillation optical axis are coaxial and a discharge direction for discharge pumping is perpendicular to said axes, comprising:
a discharge section made of quartz glass and having two opposite axial ends, an internal cross-sectional shape of said discharge section being square and measuring approximately 19 mm by 19 mm; and
a non-discharge section disposed at each opposite axial end of said discharge section for supporting the discharge section;
an internal sectional form of said discharge section perpendicular to the laser oscillation optical axis is made rectangular and an internal diameter of said non-discharge section is made larger than a diagonal line extending across a cross-section of said discharge section.

5,151,917

LASER RESONATORS EMPLOYING DIFFRACTIVE OPTICAL ELEMENTS

Bruce Perilloux, Grass Valley; Arnold Bloom, Menlo Park; Dennis Fischer, Auburn; Larry Giammona, Grass Valley, and Thomas F. Johnston, Auburn, all of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Apr. 18, 1991, Ser. No. 687,334
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—102 26 Claims



1. A laser comprising:
a resonant cavity;
a gain medium located within the resonant cavity;
means for exciting the gain medium to generate a laser beam; and
a diffractive optical element (DOE) for focusing the beam, said DOE being defined by an optical microstructure formed on a substrate, said optical microstructure for diffracting the laser beam, said DOE being located either within the resonant cavity or formed integrally with said resonant cavity such that the beam must be diffracted by the DOE before it exits the resonant cavity

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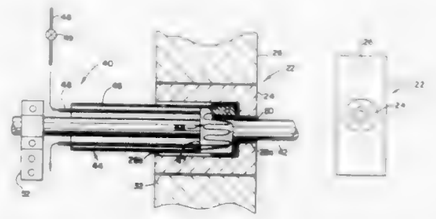
5,151,918

ELECTRODE BLOCKS AND BLOCK ASSEMBLIES

Ronald D. Argent, 9319 Chase Pl., Allison Park, Pa. 15101; Richard A. Ruthers, 4308 Lynnbrook Dr., Louisville, Ky. 40220, and Roy A. Webber, 72 S. Florida St., Buckhannon, W. Va. 26201

Filed Aug. 28, 1990, Ser. No. 574,332
Int. Cl.[5] C03B 5/02
U.S. Cl. 373—27 19 Claims



1. An electrode block assembly for use with electrode means melting glass in a glass melting furnace receiving the block assembly, the block assembly comprising:
a first block of a first refractory composition, the first block having a passageway therethrough configured to receive at least part of an electrode means extended entirely through the first block; and

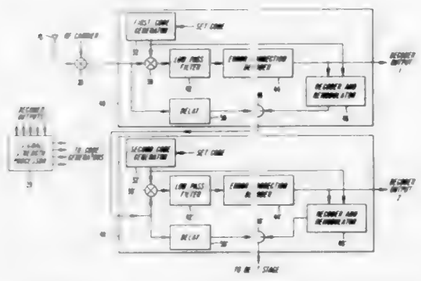
a second block of a second refractory composition, the second block having a passageway therethrough configured to receive at least part of the first block and an electrode means extended entirely through the first block.

5,151,919

CDMA SUBTRACTIVE DEMODULATION

Paul W. Dent, Stehag, Sweden, assignor to Ericsson-GE Mobile Communications Holding Inc., Paramus, N.J.

Filed Dec. 17, 1990, Ser. No. 628,359
Int. Cl.[5] H04K 1/00
U.S. Cl. 375—1 **35 Claims**



1. A multiple access, spread spectrum communications system for communicating information signals between plural stations using code division spread spectrum communications signals, each station comprising:

transmission means for spreading an information signal with a corresponding spreading code and for transmitting a spread-coded signal, and

receiving means for receiving a composite signal of plural, overlapping spread-coded signals, including:

code ordering means for ordering individual spreading codes in an order according to relative strengths of said information signals;

decoding means for recursively decoding said composite signal with a first ordered spreading code received from said code ordering means to generate a series of decoded signals;

recoding means for successively recoding said decoded signals using corresponding spreading codes to generate a series of recoded signals;

signal removal means for successively removing said recoded signals from said composite signal; and

code selection means for successively selecting a next, ordered code from said code ordering means.

5,151,920

RADIO LAN STATION WITH IMPROVED FRAME DELIMITER DETECTION IN A SPREAD SPECTRUM ENVIRONMENT

Johannes P. N. Haagh, Eindhoven; Hans van Driest, Bilthoven, and Gerrit Smit, Haaften, all of Netherlands, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 10, 1991, Ser. No. 757,392
Int. Cl.[5] H04L 27/30, 9/00
U.S. Cl. 375—1 **10 Claims**

2. A radio LAN station for receiving information frames including start and end delimiters, said start and end delimiters including data symbols and non-data symbols, said data symbols and non-data symbols being transmitted via a spread spectrum signal and being spread via first and second spreading codes, respectively, said station comprising:

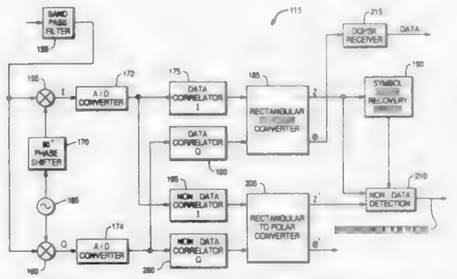
down-converting means for down-converting said spread spectrum signal to produce a down-converted spread spectrum signal;

analog to digital conversion means, coupled to said down-converting means, for providing a digital representation of said down-converted spread spectrum signal;

first correlating means, coupled to said analog to digital conversion means, for correlating a digital representation of said down-converted spread spectrum signal against said first spreading code to produce a rectangular representation of said data symbols;

second correlating means, coupled to said analog to digital conversion means, for correlating a digital representation of said down-converted spread spectrum signal against said second spreading code to produce a rectangular representation of said non-data symbols;

first converting means, coupled to said first correlating means, for converting said rectangular representation of



said data symbols into a polar representation of said data symbols to produce a vector length Z representative thereof;

second converting means, coupled to said second correlating means, for converting said rectangular representation of said non-data symbols into a polar representation of said non-data symbols to produce a vector length Z′ representative thereof; and

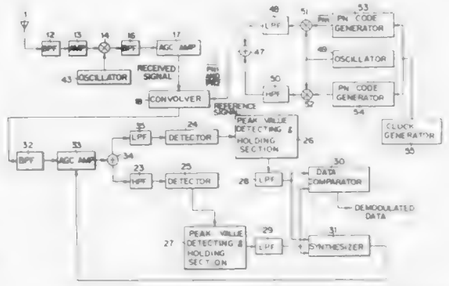
comparing means, coupled to said first and second converting means, for comparing said vector lengths Z and Z′ to determine that a symbol is a data symbol if Z—Z′ is greater or equal to a constant A, or that a symbol is a non-data symbol if Z—Z1 is less than said constant A, such that the data and non-data symbols representing said start and end delimiters are detected.

5,151,921

SPREAD SPECTRUM COMMUNICATION DEVICE

Takeshi Hashimoto, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 748,941
Claims priority, application Japan, Aug. 28, 1990, 2-227537
Int. Cl.[5] H04L 27/30
U.S. Cl. 375—1 **6 Claims**



1. A spread spectrum communication system, comprising:

a transmitter which includes:

a first PN code generator for generating a first PN code;

first modulating means for modulating a predetermined carrier wave with said first PN code outputted by said first PN code generator;

switching means for separating modulated signals from said first modulating means into two parts in response to information data;

a first filter which passes the lower band of one of the two parts separated by said switching means;

a second filter which passes the upper band of the other of the two parts separated by said switching means; and

synthesizing means for combining outputs of said first and said second filters; and

a receiver which includes:

a second PN code generator for generating a second PN code, which is inverted in time with respect to said first PN code in the transmitter;

second modulating means for converting the second PN code outputted by said second PN code generator in frequency by using a predetermined carrier signal;

correlating means for correlating a received signal with the output of said second modulating means;

a third filter which passes the lower band component of the spectre outputted by said correlating means;

a fourth filter which passes the upper band component of the spectre outputted by said correlating means; and

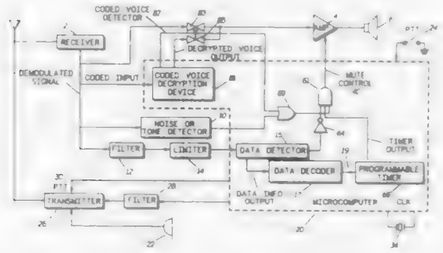
data comparing means, which reproduced the information data, while comparing the output level of said third filter with the output level of said fourth filter.

5,151,922

VARIABLE SPEAKER MUTING BASED ON RECEIVED DATA

Karl R. Weiss, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1990, Ser. No. 586,667
Int. Cl.[5] H04L 25/00
U.S. Cl. 375—5 **12 Claims**



1. A method for muting audio output of a first communication device by a second communication device, comprising the steps of:

in said second communication device:

transmitting a data signal and a subsequent signal having a signal type, in the same transmission, said data signal specifying the signal type of said subsequent signal, and said signal type of said subsequent signal having a specified mute time variable for setting a mute duration for said audio output; and

in said first communication device:

receiving and detecting said data signal and said subsequent signal;

muting said audio output of said first communication device from the end of the time when said data signal is received, to the end of said mute duration, when said subsequent signal is detected, in response to said specified mute duration; and

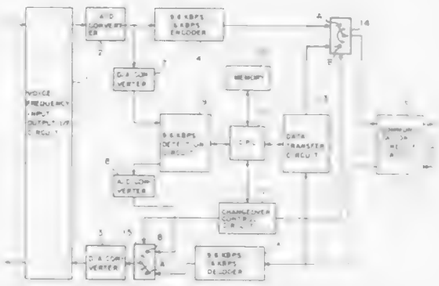
unmuting the audio output of said first communication device after said specified mute duration, if said subsequent signal, is a voice type signal.

5,151,923

VOICE FREQUENCY COMMUNICATION APPARATUS

Genichi Fujiwara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,822
Claims priority, application Japan, Jun. 28, 1988, 63-157947; May 24, 1989, 1-128870
Int. Cl.[5] H04B 1/38, 1/46
U.S. Cl. 375—5 **16 Claims**



1. A voice frequency communication apparatus for converting an original analog signal of voice frequency bandwidth to an original digital signal through a first A/D converter, encoding the original digital signal to a signal of predetermined transmission rate, outputting the encoded original digital signal to a communication line through a communication line I/F circuit, decoding a return digital signal of the predetermined transmission rate input through the communication line I/F circuit from the communication line, converting the decoded return digital signal into a return analog signal and outputting the return analog signal to a transmission line, said apparatus comprising:

a predetermined level D/A converter for converting a branched signal of the original digital signal, generated from said first A/D converter, into a duplicate of the original analog signal,

a detection circuit for receiving the duplicate of the original analog signal, for determining whether the duplicate of the original analog signal is a non-voice frequency terminal signal or a voice frequency terminal signal, for generating a voice/non-voice flag dependent on the determination, for converting the duplicate of the original analog signal to a duplicate digital signal,

a CPU for receiving the duplicate digital signal from said detection circuit,

a data transfer circuit for receiving the duplicate digital signal from said CPU, for selecting one of the encoded original digital signal and the duplicate digital signal from said CPU depending on the generated voice/non-voice flag using a first selector and temporarily storing the selected digital signal,

branching means for receiving the return digital signal from said communication line I/F circuit and generating a duplicate of the return digital signal,

said detection circuit receiving the duplicate of the return digital signal from said branching means via said data transfer circuit and said CPU and converting the duplicate of the return digital signal into a duplicate return analog signal,

an A/D converter for converting the duplicate return analog signal to a duplicate return digital signal, and

a changeover control circuit for selecting either the decoded

return digital signal or the duplicate return digital signal depending on the generated voice/non-voice flag,

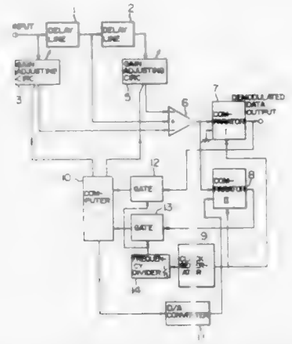
said CPU controlling said data transfer circuit and said changeover control circuit to ensure proper two-way communication by said voice frequency communication apparatus.

5,151,924

AUTOMATIC EQUALIZATION METHOD AND APPARATUS

Seiichi Mita, Kanagawa; Morishi Izumita, Inagi; Hiroshi Ide, Kodaira; Nobukazu Doi, Hachioji; Yoshinori Okada, Yokohama, and Yasuo Inagaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 21, 1989, Ser. No. 454,406
Claims priority, application Japan, Dec. 23, 1988, 63-323294
Int. Cl.[5] H03H *7/30*
U.S. Cl. 375—12 **6 Claims**



1. An automatic equalization apparatus, comprising:

first and second delay lines in cascade connection for delaying an input signal;

a first gain adjusting circuit connected to an input side of said first delay line;

a second gain adjusting circuit connected to an output side of said second delay line;

an adder for adding an output signal of said first delay line and output signals of said first and second gain adjusting circuits;

a first comparator for identifying an output signal of said adder;

a second comparator for detecting an equalization error of the output signal of said adder;

means for controlling said first and second gain adjusting circuits on the basis of the result of identification in said first comparator and the equalization error detected in said second comparator; and,

conversion means for converting a digital signal to an analog signal, wherein the conversion means is interposed between the second comparator and the controlling means.

5,151,925

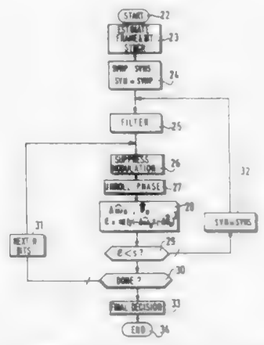
COHERENT DEMODULATION METHOD FOR A DIGITALLY MODULATED SIGNAL HAVING A CONTINUOUS PHASE AND A CONSTANT ENVELOPE

Benoit Gelin, Bonneuil, and Michel Lebourg, Marcoussis, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 22, 1989, Ser. No. 370,214
Claims priority, application France, Jun. 28, 1988, 88 08651
Int. Cl.[5] H04L *7/22*
U.S. Cl. 375—82 **16 Claims**

1. Method of coherent demodulation of a digitally modulated received signal having a continuous phase and a constant envelope, a modulated term of the continuous phase being equal to the convolution product of a phase impulse response extending over a plurality of bit periods, and binary information transmitted in packets, each packet having a known preamble of N bits, the received signal being transposed in a baseband over two quadrature channels, converted into a digital signal, and transferred to a digital signal processor which carries out the demodulation method, comprising the steps of:

detecting approximately, the frame-synchronization and the bit-synchronization of a packet by correlating said known preamble of N bits with a differential phase of the received signal;



beginning an estimation of approximate values $\hat{\theta}_0$ and Δf_0 of an initial phase θ_0 and residual frequency offset Δf_0, respectively, of the received signal;

progressively refining the approximate values of the initial phase and residual frequency offset by means of two interleaved digital loops: a slow loop for detecting the bit-synchronization, said slow loop being activated when a predetermined threshold value is exceeded by a difference ϵ which is a function of the approximate values θ_0 and Δf_0, and a fast loop for effecting intermediate decisions over additional blocks of bits for extracting decided bits and for estimation of θ_0 and Δf_0, said fast loop being activated following a determination that said predetermined threshold is not exceeded by said difference ϵ.

5,151,926

SAMPLE TIMING AND CARRIER FREQUENCY ESTIMATION CIRCUIT FOR SINE-COSINE DETECTORS

Sandeep Chennakeshu, Clifton Park, and Gary J. Saulnier, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 21, 1991, Ser. No. 703,516
Int. Cl.[5] H04L *27/22*
U.S. Cl. 375—84 **12 Claims**

1. In the receiver of a cellular telephone for receiving phase angles encoded in a received signal, a digital discriminator, said discriminator comprising:

a) heterodyne for converting said received signal to an intermediate frequency (IF) signal;

b) an analog to digital (A/D) converter coupled to sample said IF signal and create a digital output signal comprised of a plurality of samples, each sample comprising a quadrature coefficient and an in-phase coefficient;

b) a sorter circuit coupled to receive the digital output signal and provide a predetermined number of samples for decoding;

c) a sample and phase adjustment (SPA) circuit coupled to receive the samples provided by the sorter circuit and receive a carrier phase adjustment, for creating output samples each having an in-phase coefficient and a quadrature coefficient based upon the carrier phase adjustment and for selecting samples for decoding based upon a received sample timing index;

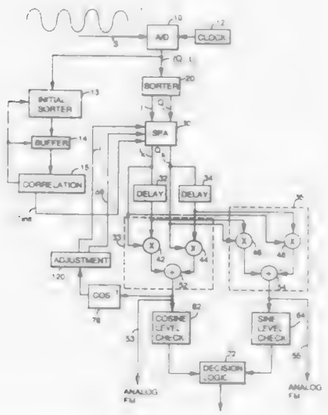
d) a first delay circuit coupled to the SPA circuit, to receive and delay the quadrature coefficient of the output sampels of the SPA circuit for a predetermined period representing a single symbol period, creating a first delayed signal;

d) a second delay circuit coupled to the SPA circuit, to receive and delay the in-phase coefficient of the output samples of the SPA circuit for a predetermined period representing a single symbol period, creating a second delayed signal;

f) a cosine detector coupled to receive the quadrature coefficient, the first delayed signal, the in-phase coefficient and the second delayed signal, for creating an output signal that is a cosine function of a phase angle encoded in the in-phase coefficient and quadrature coefficient;

g) a sine detector coupled to receive the quadrature coefficient, the first delayed signal, the in-phase coefficient and the second delayed signal, for creating an output signal that is a sine function of a phase angle encoded in the in-phase coefficient and quadrature coefficient;

h) a cosine level check circuit coupled to receive the output signal from the cosine detector for producing an output



signal based upon the amplitude of the cosine detector output signal;

i) a sine level check circuit coupled to receive the output signal from the sine detector for producing an output signal based upon the amplitude of the sine detector output signal;

j) a decision logic circuit coupled to receive the output signals of the sine level check circuit and the cosine level check circuit and for producing an output signal consisting of pairs of encoded bits based upon the signals received, one bit of each pair being determined by the cosine level check circuit output signal and the other bit of said pair being determined by the sine level check circuit output signal;

k) an inverse trigonometric function circuit coupled to a corresponding trigonometric level check circuit for creating a symbol phase angle; and

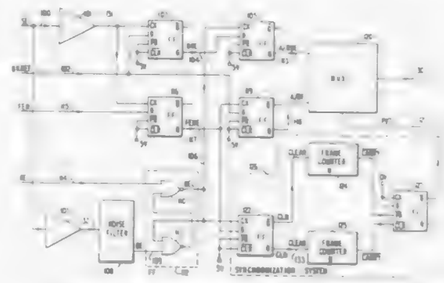
l) an adjustment circuit coupled to said inverse trigonometric circuit for calculating a decoding error between the decoded phase angle for each symbol in a preamble and a respective one of a predetermined set of phase angles stored by the adjustment circuit, and for adjusting the sample timing and carrier phase adjustment to minimize the decoding error.

5,151,927

DUAL-MODE SYNCHRONIZATION DEVICE, IN PARTICULAR FOR FRAME CLOCK PHASE RECOVERY IN A HALF-DUPLEX TRANSMISSION SYSTEM

Mark Medlicott, Ilkirch, France, assignor to Alcatel Business Systems, Paris, France

Filed Sep. 11, 1990, Ser. No. 580,733
Claims priority, application France, Sep. 12, 1989, 89 11895
Int. Cl.[5] H03D *3/24;* **H04J** *3/06*
U.S. Cl. 375—119 **6 Claims**



1. A synchronization device, in particular for recovering phase synchronization of a local frame clock of a receiver, in the case of a digital signal formed by frames received at regular intervals, said signal being coded in a code having a detectable line pulse density, which device comprises:

coded signal detection means for detecting the presence of said coded signal at said receiver;

phase locking means delivering an indication of a phase difference between the local clock and the received signal when the presence of said coded signal is detected,

phase reference point detection means for detecting a received frame phase reference point in a time window centered on the phase of the local clock;

phase recovery means supplying an indication of the phase difference between the local clock and the received signal when said received frame phase reference point is detected in said time window centered on the phase of the local clock, and

selecting means for selecting one of the phase difference indications supplied by said phase locking means and said phase recovery means.

5,151,928

METHOD AND APPARATUS FOR GENERATING X RAYS

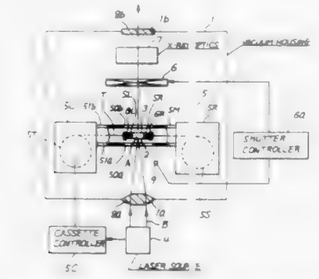
Hideo Hirose, Wako, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Aug. 20, 1991, Ser. No. 747,332
Claims priority, application Japan, Aug. 31, 1990, 2-231785
Int. Cl.[5] H01J *35/26;* **G21G** *4/00*
U.S. Cl. 378—119 **17 Claims**

1. A method of generating X rays, comprising:

a) providing a target in a vacuum enclosure, said target comprising a first film made of a metal and a second film made of a material transparent to X rays superimposed on one surface of said metal film;

b) forming a space between opposite parts of said first and second films; and



c) irradiating said part of said first film which corresponds to said space with a laser beam to generate in said space plasma to emit X rays.

5,151,929

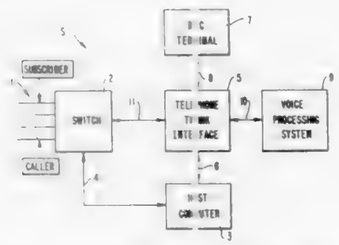
COMPUTER-CONTROLLED RADIO-PAGING AND TELEPHONE COMMUNICATION USING RECORDED VOICE MESSAGES

Sherman Wolf, 369 Boston Post Rd., Amherst, N.H., assignor to Sherman Wolf, Amherst, N.H.

Continuation of Ser. No. 133,214, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 776,913, Sep. 17, 1985, abandoned. This application Dec. 27, 1989, Ser. No. 457,663

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—57 7 Claims



1. A method of providing communication between a remote subscriber of a paging system and a caller to the system, that comprises receiving a call from the caller via telephone trunk line means; obtaining an identification number of a remote subscriber from the caller and verifying the identification number in a host computer; employing the host computer to cause a radio carrier terminal to page the subscriber; and, if the subscriber answers the page by calling the host computer via the telephone trunk line means and providing the subscriber's identification number within a preselected time, thereupon automatically switching the subscriber and the caller into direct telephone connection via the telephone trunk line means under the direction of the host computer, but if the subscriber fails to so answer the page within said preselected time, thereupon, under the control of the host computer, providing a recorded voice message to the caller via the telephone trunk line means indicating that the subscriber has not answered the page, inviting the caller to leave a voice message for the subscriber, and recording the caller's voice message for later retrieval by the subscriber in response to the subscriber's calling the host computer.

5,151,930

METHOD FOR PERSONAL PAGING A TELEPHONE PRIVATE BRANCH EXCHANGE WITH THE ASSISTANCE OF A PERSONAL PAGING DEVICE THAT OFFERS MUTUALLY DIFFERENT OPERATING MODES FOR PERSONAL PAGING

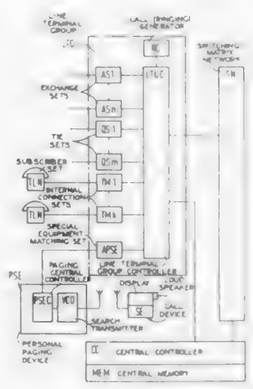
Ernst Hagl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1990, Ser. No. 586,209

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931533

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—57 2 Claims



1. A method for personal paging in a telephone private branch exchange comprising a central controller, a central memory, a personal paging device for selective communication with a plurality of call devices each assigned to a respective person to be paged, a plurality of external connection sets for connecting calls external of the telephone private branch exchange and a plurality of internal connection sets connected to subscriber telephone instruments of the telephone private branch exchange; the personal paging device, in a predetermined operating mode of the type wherein calls originating in the telephone private branch exchange from one of the telephone instruments cause call information including the subscriber line number of the calling subscriber to be communicated to the personal paging device from the central controller, hence in addition to a call signalization the line number of the calling subscriber is reproduced; at the call device in the case in which a calling subscriber is external of the private branch exchange and the line number of the calling subscriber is absent, the method for personal paging comprising the steps of:

generating a calling line identifier information in the central controller;

communicating said identifier information from the central controller to the personal paging device and reproducing said identifier information of the signaled call device;

storing data in the central memory for designating the external connection set of the calling subscriber and the subscriber line of the called subscriber in allocation thereto;

transmitting an acknowledgment to the external connection set of the calling subscriber to indicate to the calling subscriber that the exchange has received the page requested and to hold the line; and

receiving the identifier information from an arbitrary subscriber telephone instrument causing the central controller to connect the internal connection set of the arbitrary subscriber telephone instrument to the external connection set of the calling subscriber.

5,151,931

THERAPEUTIC BED OF RADIOTHERAPEUTIC SYSTEM

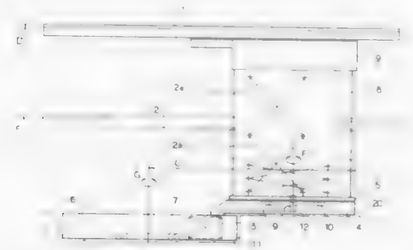
Kozo Terashi, and Toshio Oba, both of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 21, 1991, Ser. No. 718,758

Claims priority, application Japan, Jan. 21, 1990, 2-161208

Int. Cl.[5] A61N *5/10*

U.S. Cl. 378—65 4 Claims



1. A therapeutic bed of a radiotherapeutic system including a radioactive ray irradiator in which a radioactive ray irradiating source is disposed to one position on a side of a back of a living human body to be inspected and which radiates radioactive rays for treatment of an effected portion of a living human body, comprising:

a top board on which the living human body to be inspected is to be laid,

a support base rotatably mounted on a floor of a therapeutic room in which the therapeutic bed is disposed;

an elevating mechanism supported by the support base and supporting the top board for vertical elevation, said elevating mechanism comprising a hydraulic link mechanism;

a vertically expandable and contractible casing covering the elevating mechanism so as to be vertically contractible and expandable in association with a vertical motion of the elevation mechanism; and

a hydraulic means for driving the elevating mechanism, said hydraulic driving means being embedded in the floor of the therapeutic room.

5,151,932

METHOD AND SYSTEM FOR SELECTIVELY COMMUNICATING WITH A TELEPHONE OR A NON-TELEPHONE TERMINAL THROUGH A PUBLIC TELEPHONE NETWORK

Masato Arizumi; Norio Ozawa; Yasuo Haruta, and Yoshinobu Mabuchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 382,066, Jul. 14, 1989, abandoned. This application May 6, 1991, Ser. No. 694,979

Claims priority, application Japan, Nov. 17, 1987, 62-290084; Nov. 17, 1987, 62-290085

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—106 21 Claims

1. A communication system, comprising:

a telephone network for switching a plurality of telephone lines;

a telephone accessible to the telephone network;

a non-telephone terminal for performing data communication via the telephone network;

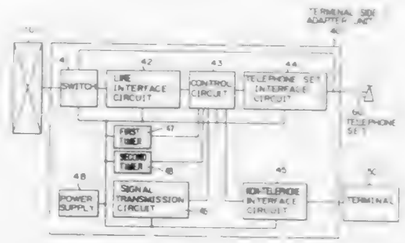
first control means, connected to a first telephone line of the plurality of telephone lines, for controlling the connection of the telephone and the non-telephone terminal to the telephone network, the first control means including timer means for monitoring predetermined time zones and for measuring first and second predetermined time periods;

center apparatus means for supervising data communication with the non-telephone terminal; and

second control means, connected to a second telephone line of the plurality of telephone lines, for controlling the connection of the center apparatus means to the telephone network, the second control means including means for initiating a predetermined sequence of calls to the first control means via the telephone network in response to the center apparatus means, and means for interrupting each call after receiving a respective ring back signal from the telephone network to restore the lines,

wherein the first control means additionally includes means for determining whether a ringing signal for a call is received within a time zone and interrupted within the first time period, means for determining whether a call is received in the predetermined sequence, and means for calling the second control means if the first control means receives a plurality of calls in the predetermined sequence and each of the plurality of calls in the predetermined sequence was received during a respective time zone and interrupted within the first time period, and

wherein the first control means additionally includes means for connecting the first telephone line to the non-telephone terminal if the first control means receives an answer signal from the second control means in response to the call from the first control means within the second time period.



5,151,933

KEY TELEPHONE SYSTEM

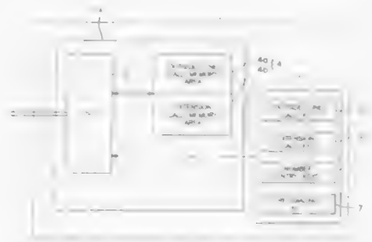
Kazuyuki Abe, Yokohama, Japan, assignor to Nitsuko Corporation, Kawasaki, Japan

Filed Aug. 14, 1991, Ser. No. 744,503

Claims priority, application Japan, Aug. 16, 1990, 2-216758

Int. Cl.[5] H04M *1/272*

U.S. Cl. 379—159 3 Claims



1. A key telephone system with a re-dialing feature, which has number entry push-buttons for dialing a telephone number of an intended call, comprising:

control means for controlling said key telephone system so as to place a call to a location having a number dialed through said number entry push-buttons;

a memory, having two separate telephone number memory

areas for memorizing both a first dialed number for placing an intended outside-line call and a second dialed number for placing a call to an intended extension through said control means so as to replace dialed numbers for placing previous calls, memorized in said memory areas, with said first and second dialed numbers;

line selecting means for selecting one or an outside-line and an inside-line, and causing said control means to gain access to the outside-line to place said intended outside-line call and select said memory area for memorizing said first dialed number when an outside-line is selected, and causing said control means to gain access to the inside-line to place said call to said intended extension and select said memory area for memorizing said second dialed number when an inside-line is selected and

re-dialing means for causing said control means to automatically retrieve one of said first and second dialed numbers memorized in one of said memory areas for a line selected by said line selecting means so as to place the intended call over said line selected by said line selecting means to said number dialed through said number entry push-buttons, thereby automatically re-dialing one of the first and second numbers.

5,151,934

KEY TELEPHONE APPARATUS

Takashi Hayashi, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

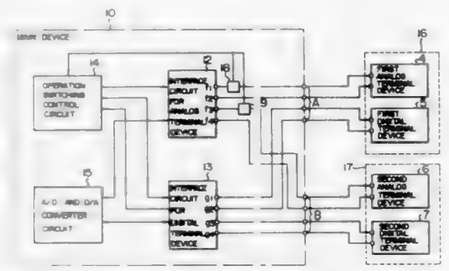
PCT No. PCT/JP91/00095, § 371 Date Sep. 13, 1991, § 102(e) Date Sep. 13, 1991, PCT Pub. No. WO91/11888, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 29, 1991, Ser. No. 761,853

Claims priority, application Japan, Jan. 30, 1990, 2-019516

Int. Cl.[5] H04M *9/00*

U.S. Cl. 379—159 **1 Claim**



1. A key telephone apparatus comprising:

an interface circuit for analog terminal device including four terminals associated with two pairs having four wires;

an interface circuit for digital terminal device including four terminals associated with two pairs having four wires;

a first analog terminal device connected to two terminals of said interface circuit for analog terminal device, said two terminals being associated with one pair having two wires;

a second analog terminal device connected to two remaining terminals of said interface circuit for analog terminal device, said two remaining terminals being associated with remaining one pair having two wires;

a first digital terminal device connected to two terminals of said interface circuit for digital terminal device, said two terminals being associated with one pair having two wires;

a second digital terminal device connected to two remaining terminals of said interface circuit for digital terminal device, said two remaining terminals being associated with remaining one pair having two wires; and

switching control means for handling the first analog terminal device and the first digital terminal device as a first hybrid terminal device sharing one port and handling the second analog terminal device and the second digital terminal device as a second hybrid terminal device sharing another port.

5,151,935

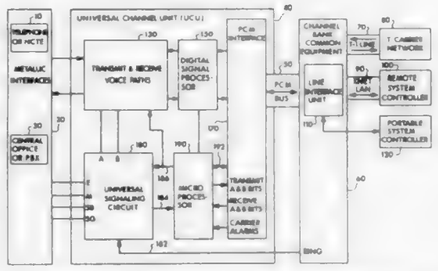
PROGRAMMABLE UNIVERSAL SIGNALING CIRCUIT FOR A TELEPHONE NETWORK

Jimmy D. Slife, Aurora, and David Farrell, Lafayette, both of Colo., assignors to XEL Communications, Inc., Aurora, Colo.

Continuation-in-part of Ser. No. 453,814, Dec. 20, 1989, abandoned. This application Nov. 2, 1990, Ser. No. 609,083

Int. Cl.[5] H04J *3/12;* **H04M** *7/10*

U.S. Cl. 379—240 **11 Claims**



1. A programmable universal signaling circuit (**180**) for use in a universal channel unit (**40**) of a telephone network; said universal channel unit having: A, B, E, M SB, and SG telephone network signaling paths, a microprocessor (**190**) and a PCM interface (**170**); said PCM interface being connected to a PCM bus (**50**), said programmable universal signaling circuit comprising:

means (**200**) connected to said microprocessor and receptive of data from said microprocessor for generating a unique set of configuration signals corresponding to said received data, said generating means further generating a plurality of different sets of configuration signals corresponding to a plurality of different data received from said microprocessor,

first means (**210**) connected to said generating means, to said microprocessor, and to said A and B signaling paths for selectively configuring to function as a preselected one of a number of loop circuits, said first generating means being receptive of a first portion of said unique set of configuration signals to configure into said preselected one of said number of loop circuits so as to provide A and B signals over said A and B signaling paths necessary for said preselected one loop circuit, said first configuring means delivering the sensed loop current value or loop voltage value for said A and B signaling paths to said microprocessor, and

second means (**220**) connected to said generating means, to said microprocessor, and to said E, M, SG, and SB signaling paths for selectively configuring to function as a preselected one of a number of E & M circuits, said second configuring means being receptive of a second portion of said unique set of configuration signals to configure into said preselected one of said number of E & M circuits so as to provide E, M, SB, and SG signals over said E, M, SB and SG signaling paths necessary for said selected one E & M circuit, said second configuring means further delivering the sensed E & M current value or E & M voltage value for said E & M signaling paths to said microprocessor.

5,151,936

INTERFACE MEANS

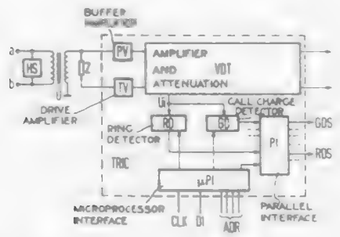
Ulrich Riedle, Feldkirchen-Westerham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich

Filed May 29, 1990, Ser. No. 529,613

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917713

Int. Cl.[5] H04M *9/00*

U.S. Cl. 379—403 **14 Claims**



1. Interface means having amplification and attenuation elements as well as different signalization detectors between a bidirectional transmission channel with analog signals and a signal processor-codec filter having a four-wire input for matching line signalization voltages to the interface messages of a digital communication system, the amplification and attenuation elements for a voice signal arranged in a four-wire circuit, a transformer for connecting the bidirectional transmission channel to the interface means being an attenuation element in a lower frequency range and a transmission and terminating complex impedance connected to the interface means and selected such that all signalization voltages are transformed into a range that can be interpreted by a 10 V technology system, the signalization voltages taken following the complex impedance, and, for suppressing higher-frequency noise signals, the signalization voltages supplied via a low-pass filter to a ringing signal detector or, respectively, via at least one selective band-pass filter to a call charge signal detector.

5,151,937

ADAPTIVE ECHO CANCELLER

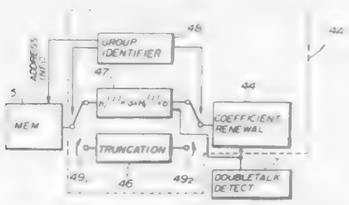
Kaoru Chujo, Hachiouji; Mitsuo Kakuishi, and Hirokazu Fukui, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1990, Ser. No. 551,485

Claims priority, application Japan, Jul. 12, 1989, 1-180984

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—410 **15 Claims**



1. An adaptive echo canceller for suppressing an echo in an input signal by a pseudo echo, said adaptive echo canceller comprising:

a pseudo echo generation filter having a predicted impulse response sequence of an echo path as filter coefficients thereof for generating a pseudo echo;

coefficient renewal means for adaptively renewing the filter coefficients of said pseudo echo generation filter to produce renewed filter coefficients, said coefficient renewal means including

means for dividing the renewed filter coefficients into a plurality of groups each having a certain number of renewed filter coefficients, and

means for successively selecting one group with a predetermined period and carrying to a correction process with respect to the renewed filter coefficients within the selected group, the correction process correcting an accumulation of errors of renewal processes; and

means for suppressing an echo by the pseudo echo generated by said pseudo echo generation filter.

5,151,938

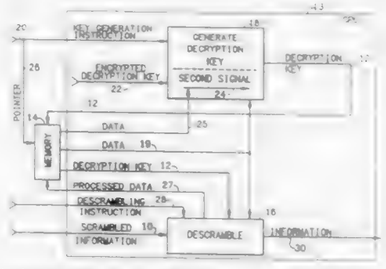
SECURITY ENHANCEMENT IN A DATA PROCESSOR THROUGH USE OF DYNAMIC PARAMETER AUTHENTICATION

Roy A. Griffin, III, Oceanside; James N. Esserman, San Diego, and Steven E. Anderson, La Jolla, all of Calif., assignors to General Instrument Corporation, Chicago, Ill.

Filed Mar. 13, 1990, Ser. No. 493,006

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—43 **23 Claims**



1. A data processing system, comprising

processing means for processing data in accordance with a number of different data processing routines; and

memory means for storing data for use in said data processing routines;

wherein the processing means includes

means for responding to an instruction for generating a given signal by processing a first signal with a second signal to generate said given signal; and

means for providing at least a portion of said second signal for processing with said first signal by retrieving a portion of said stored data from a portion of said memory means identified by a dynamic pointer contained in said instruction for generating said predetermined signal;

wherein the given signal has a predetermined content that is essential to at least one of said data processing routines.

5,151,939

ADAPTIVE AUDIO PROCESSOR FOR AM STEREO SIGNALS

Jeffrey J. Marrah; Gregory J. Manlove, both of Kokomo; Richard A. Kennedy, Russiaville, and Mark A. Kady, Sharpsville, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 21, 1990, Ser. No. 496,711

Int. Cl.[5] H04H *5/00*

U.S. Cl. 381—15 **14 Claims**

1. A signal processing system comprising:

means for receiving signals in a prescribed frequency band including a first signal and interference from frequencies adjacent the prescribed frequency band;

means responsive to the received signals for adjustably limiting the prescribed frequency band of the received signals

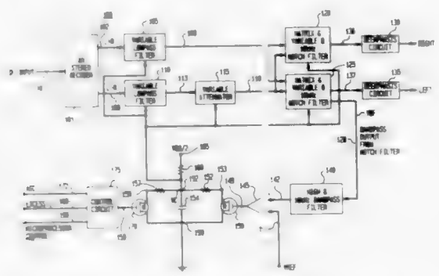
to produce a output signal representative of the first signal;

means responsive to the interference from frequencies adjacent to the prescribed frequency band for producing a band adjustment signal;

means responsive to the band adjustment signal for adjusting the prescribed frequency band to reduce the interference in the output signal;

said means for producing the band adjustment signal comprising means responsive to the interference from the frequencies adjacent to the prescribed frequency band for forming an interference representative signal, means for generating a predetermined threshold signal, means for detecting the difference between the interference representative signal and the predetermined threshold, and means responsive to the detected difference for producing the band adjustment signal;

said means for forming the interference representative signal comprising means for forming a narrow frequency band signal centered at the edge of the prescribed frequency band;



said predetermined threshold signal generating means comprising means for producing a prescribed voltage;

said difference detecting means comprising means for producing a difference detecting means comprising means for producing a difference representative signal having a first value when the interference representative signal exceeds the prescribed voltage and a second value when the interference representative signal is less than or equal to the prescribed voltage;

said difference detecting means further comprising means responsive to the difference representative signal for forming a continuously varying band adjustment signal;

said narrow band difference signal being a narrow band sine wave like signal representative of the interference from the frequencies adjacent to the prescribed frequency band; and

said difference detecting means further comprising means for comparing the narrow band sine wave like signal to the prescribed threshold voltage to produce a pulse having a prescribed voltage when the narrow band sine wave like signal exceeds the prescribed threshold voltage.

5,151,940

METHOD AND APPARATUS FOR EXTRACTING ISOLATED SPEECH WORD

Makoto Okazaki, Higashimurayama, and Koji Eto, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 287,284, Dec. 21, 1988, abandoned.
This application Dec. 7, 1990, Ser. No. 622,285
Claims priority, application Japan Dec. 24, 1987, 62-333852
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—43 **10 Claims**

1. A method for extracting an isolated speech word, having a starting point and a finishing point, from an input speech signal, said method comprising the steps of:

(a) dividing the input speech signal into a high frequency band signal within a high frequency band and a low frequency band signal within a low frequency band, including the substeps of:

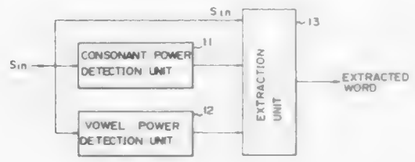
i) obtaining the high frequency band signal from a consonant of the input speech signal; and

ii) obtaining the low frequency band signal from a vowel of the input speech signal;

iii) calculating an average high frequency band signal power of signal components of the high frequency band signal having predetermined frequencies within the high frequency band;

iv) calculating an average low frequency band signal power of signal components of the low frequency band signal having predetermined frequencies within the low frequency band;

(d) determining the starting point of the isolated speech word from the input speech signal when one of the average high frequency band signal power and the average low frequency band signal power is higher than first and



second predetermined threshold levels, respectively, including the substeps of:

i) comparing the average high frequency band signal power with the first threshold level;

ii) comparing the average low frequency band signal power with the second threshold level;

iii) detecting whether one of a first state and a second state is maintained for a predetermined term, in the first state the average high frequency band signal power is higher than the first threshold level and in the second state the average low frequency band signal power is higher than the second threshold level; and

iv) identifying a starting point of the isolated speech word where one of the first and second states begins; and

(e) determining the finishing point of the isolated speech word from the input speech signal when one of the average high frequency band signal power and the average low frequency band signal power is lower than third and fourth predetermined threshold levels, respectively.

5,151,941

DIGITAL SIGNAL ENCODING APPARATUS

Masayuki Nishiguchi; Yoshihito Fujiwara, and Tomoko Umezawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 588,715
Claims priority, application Japan, Sep. 30, 1989, 1-255798
Int. Cl.[5] G10L *3/00, 5/00, 7/02*
U.S. Cl. 381—46 **6 Claims**

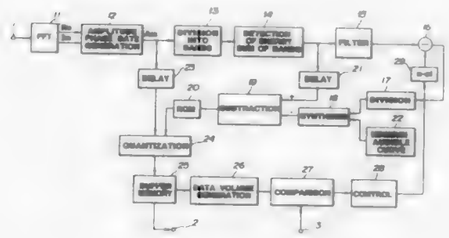
1. A digital signal encoding apparatus comprising

noise level setting means for dividing input digital signals into a plurality of frequency bands so that the bandwidth of each frequency band is broader as the frequency of the frequency bands increases, said noise level setting means setting the allowable noise level of each of the plurality of frequency bands on the basis of the energy of each said frequency band,

quantization means for quantizing components of each frequency band with a number of bits consistent with the level difference between the energy of each frequency band and that of the output of said noise level setting means, and

means for detecting the number of bits allocated to the

output information of said quantization means and for adjusting the number of bits of the output information



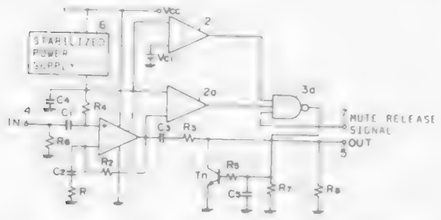
over a predetermined time interval to be constant as a function of the detection output.

5,151,942

CIRCUIT FOR MUTING NOISES FOR AN AUDIO AMPLIFIER

Yoshio Sasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,696
Claims priority, application Japan, Oct. 25, 1990, 2-287990
Int. Cl.[5] H04B *15/00*
U.S. Cl. 381—94 **3 Claims**



1. A circuit for muting noises for an audio amplifier circuit having an output terminal comprising:

an amplifier for amplifying an input signal;

a stabilized power supply for supplying a constant voltage to the amplifier;

a first comparator for comparing an output voltage of the stabilized power supply with a reference value and for producing a first comparator signal when the output voltage coincides with the reference value;

a second comparator for comparing an output bias voltage of the amplifier with the output voltage of the stabilized power supply and for producing a second comparator signal when the output bias voltage coincides with the output voltage;

gate means responsive to the first and second comparator signals and to a mute release signal for producing a mute release control signal, and for producing a mute control signal when either of the first or second comparator signals or the mute release signal is not applied; and

a grounding circuit responsive to the mute control signal for grounding the output of the amplifier to attenuate an output to be produced from the output and responsive to the mute release control signal for cutting the grounding of the output of the amplifier.

5,151,943

LOW DISTORTION DYNAMIC LOUDSPEAKER

Carl Van Gelder, Tioga Center, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Nov. 13, 1990, Ser. No. 611,552
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—189 **14 Claims**

1. A dynamic loudspeaker distinguished by increased power output with decreased distortion, said dynamic loudspeaker having a cone movably supported within a basket, said basket supported upon a front plate, a back plate disposed behind said front plate, an annular magnet disposed between said front plate and said back plate, a cylindrical stepped pole piece disposed within said annular magnet and supported by said back plate, said cylindrical stepped pole piece comprising a first cylinder disposed adjacent said back plate, and a second, wider cylinder integrally disposed upon said first cylinder, the outer surface of said second, wider cylinder forming an air gap with said front plate, across which a magnetic flux is created, a voice coil disposed within said air gap between said cylindrical stepped pole piece and said front plate, and first and second, spaced-apart shield members, each comprising tube-like members, each of which is disposed adjacent said cylindrical stepped pole piece on distal sides thereof, said first shield member disposed between said cylindrical stepped pole piece and said cone, and said second shield member disposed between said cylindrical stepped pole piece and said annular magnet, said first and second shield members shielding said cylindrical stepped pole piece from magnetic flux interactions created in said air gap and reducing non-symmetrical voice coil inductances, whereby said dynamic loudspeaker has increased power output with decreased distortion.

5,151,944

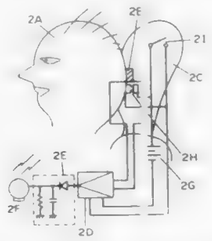
HEADREST AND MOBILE BODY EQUIPPED WITH SAME

Soubei Yamamura, Takarazuka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP89/00958, § 371 Date May 15, 1990, § 102(e) Date May 15, 1990, PCT Pub. No. WO90/03136, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 21, 1989, Ser. No. 460,334
Claims priority, application Japan, Sep. 21, 1988, 63-236916
Int. Cl.[5] H04R *3/00*
U.S. Cl. 381—151 **9 Claims**

1. A headrest comprising a bone-condition microphone mounted thereon in a position so as to be in contact with a back side of the head of the operator during use and a power switch mounted on said headrest adjacent said bone-conduction microphone, said switch having a contact which is turned on

substantially simultaneously with po itive pressing of the bone-conduction microphone, such that s uid switch detects contact



between the back side of the heac of the operator and said bone-conduction microphone.

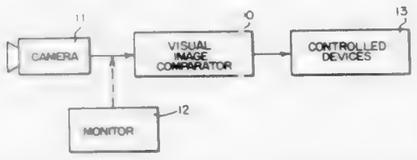
5,151,945

DETERMINATION OF AMB ENT LIGHT LEVEL CHANGES IN VISU AL IMAGES

George C. Lee, Williamsville, N.Y , and Xianyi Sun, Beijing, Taiwan, assignors to The Researc n Foundation of State Univ. of N.Y., Albany, N.Y.

Filed Sep. 11, 1990, Se . No. 580,629
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—1 3 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 2 Pages)



1. A visual image comparison m ethod for automated video surveillance, comprising the steps of:

a. obtaining a first digital repr sentation of a first visual image, said first digital repre entation comprising a first plurality of pixels, wherein e ch pixel has a gray scale indicative of light intensity;

b. obtaining a second digital epresentation of a second visual image, said second dig tal representation comprising a second plurality of pixe s, wherein each pixel has a gray scale indicative of light ntensity;

c. selectively making a first predetermined number of first comparisons of correspondin ; remotely displaced pixels from said first and second dig tal representations to determine whether a difference in mbient light intensity exists between said first and second visual images, wherein said difference in ambient light ntensity is defined to exist when a first percentage of said first predetermined number of first remotely displaced comparisons result in pixels having a difference in gray s ale of a first predetermined amount; and,

d. selectively making a secon predetermined number of second comparisons of corr sponding near neighboring pixels from said first and sec nd digital representations if and only if no significant diff rence in ambient light intensity exists between said first nd second visual images,

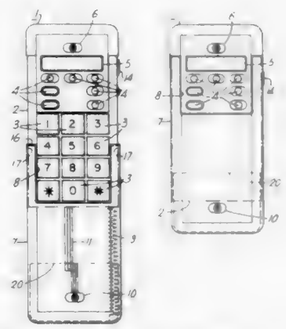
e. and indicating an alarm cond tion when a second percentage of said second predeterm ined number of second near neighboring comparisons res lt in pixels having a difference in gray scale of a secon d predetermined amount.

5,151,946

VARIABLE CONFIGURATION PORTABLE TELEPHONE

Nils E. Martensson, Woking, England, assignor to Technophone Limited, Surrey, England

Continuation of Ser. No. 568,349, Aug. 15, 1990, abandoned.
This application Feb. 24, 1992, Ser. No. 841,264
Claims priority, application United Kingdom, Aug. 24, 1989, 8919215
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—38 28 Claims



1. A portable radio telephone comprising:

transceiver means,

a housing enclosing said transceiver means, said housing having a main body and an extending portion mounted for longitudinal slidable movement between a first position at which the main body and the extending portion are in a substantial overlapping relationship and a second position at which the extending portion extends from the main body,

first transducer means present in the main body;

second transducer means present in the extending portion;

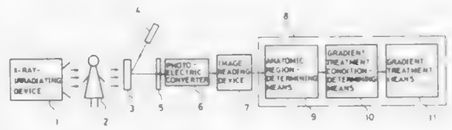
and a keypad which comprises a plurality of keys which can be selectively actuated for operating the telephone, wherein the extending portion comprises a window through which at least one of the keys is accessible when the extending portion is in the first position.

5,151,947

METHOD AND APPARATUS FOR PROCESSING RADIATION IMAGE

Sumiya Nagatsuka; Hiroshi Takeuchi, and Haruo Karasawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 26, 1990, Ser. No. 617,602
Claims priority, application Japan, Nov. 28, 1989, 1-306462; Oct. 17, 1990, 2-276484
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—6 6 Claims



1. A method of processing an image, comprising the steps of:

limiting an area of the image from which to obtain a gradation processing condition;

determining the gradation processing condition of the limited area; and

processing the gradation of the image based upon the condition determined by the determining means,

wherein the step of limiting an area of the image from which to obtain a gradation processing condition, where the image extends in lateral and longitudinal directions, comprises the sub-steps of:

obtaining projection values in the longitudinal direction for at least the central portion of the image, each projection value being the cumulative image density along a respective line oriented in the specified direction;

determining a longitudinal median location P_c of one of the projection values having the least cumulative image density in the central one third of the image, said central one third being measured in the lateral direction;

establishing a longitudinally oriented line passing through the median location P_c as a longitudinal median line;

comparing projection values on each side of the longitudinal line with a respective threshold projection value;

establishing a respective right and left boundary, responsive to the comparison, for each side within which said gradation processing condition is determined;

obtaining projection values in the lateral direction;

establishing a lateral median line at the midpoint of the image, said midpoint measured along a longitudinally oriented line;

identifying the minimum lateral projection value P_{bn} below the lateral median line and the minimum lateral projection value above the lateral median line P_{tn};

identifying the maximum lateral projection value P_{tx} within the ¼ of the image above the lateral median line, as measured along the longitudinally oriented line, and the maximum lateral projection value P_{bx} within the 3/10 of the image below the median line, as measured along the longitudinally oriented line;

comparing the projection values on each side of the lateral median line with a respective threshold value, wherein the upper threshold value T_t and lower threshold value T_b are determined using the following formulas:

$$T_t=((k3-1)\times P_{tx}+P_{tn})/k3, \text{ and}$$

$$T_b=((k4-1)\times P_{bx}+P_{bn})/k4,$$

where k3 and k4 are constants; and

establishing a respective upper and lower boundary, responsive to the comparison, within which said gradation processing condition is determined.

5,151,948

SYSTEM AND METHOD FOR PROCESSING DOCUMENTS HAVING AMOUNTS RECORDED THEREON

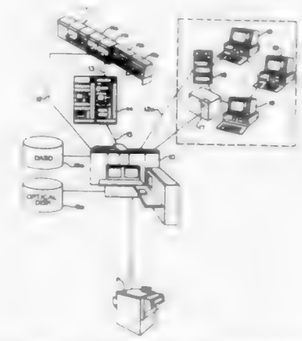
David G. Lyke, and Mark Ominsky, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 492,461, Mar. 12, 1990, Pat. No. 5,040,227. This application Apr. 29, 1991, Ser. No. 693,320
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—7 44 Claims

1. A method of processing documents in groups which include a summary document, such as a customer deposit slip, and a plurality of associated transaction documents, such as checks, with each transaction document having an amount recorded thereon from which a coded data amount is derived, and with the summary document containing a listing of the respective transaction amounts, said method comprising the steps of:

generating on a display screen a first display containing images of a series of transaction amounts listed on a summary document;

also generating on the display screen concurrently with the first display a second display containing coded data amounts associated with each individual transaction document so that an operator may compare the transaction amount images in said first display to the corresponding transaction coded data amounts in said second display to identify a discrepancy;



receiving input by an operator of an identified discrepancy; and

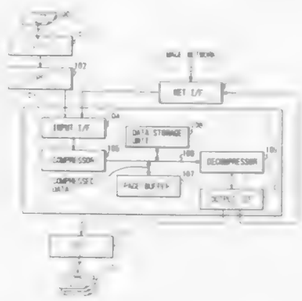
responding to the thus input operator indication of an identified discrepancy.

5,151,949

SYSTEM AND METHOD EMPLOYING MULTIPLE PREDICTOR SETS TO COMPRESS IMAGE DATA HAVING DIFFERENT PORTIONS

Masahiko Miyata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 594,130
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—9 8 Claims



1. A processor-implemented method of predicting a series of input pixels comprising the steps of:

determining, in accordance with a bit pattern of a current pixel, whether the current pixel is a first type or a second type;

detecting, in response to the determining step, whether the current pixel type is different than the pixel type of a preceding pixel;

inserting, in response to the detecting step, a boundary code into the pixel series before the current pixel if the pixel type of the current pixel is different than the pixel type of the preceding pixel;

selecting one set of predictors from a plurality of sets of predictors including the substep of detecting a boundary code;

processing the previous pixel with multiple predictors in the selected set of predictors; and

selecting one of the predictors in the selected set of predic-

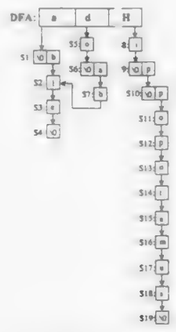
tors in accordance with a number of error bits generated by processing the previous pixel.

5,151,950

METHOD FOR RECOGNIZING HANDWRITTEN CHARACTERS USING SHAPE AND CONTEXT ANALYSIS

Gregory N. Hullender, Foster City, Calif., assignor to Go Corporation, Foster City, Calif.

Filed Oct. 31, 1990, Ser. No. 607,125
Int. Cl.[5] G06K 9/00, 9/62, 9/72, 9/46
U.S. Cl. 382—13 13 Claims



5. A method for recognition of sequences of characters, including the steps of:

(1) storing a plurality of input strokes which are in a sequence;

(2) generating a first set of recognition hypotheses for a first subset of said strokes, beginning at one end of the sequence of strokes, each hypothesis including: (i) a hypothesized character, (ii) the number of strokes required to construct the hypothesized character, and (iii) a probability assigned to the hypothesized character;

(3) comparing each hypothesized character with a predetermined database of character sequences;

(4) for each hypothesized character which is found as a first character in the predetermined database of character sequences, generating a pointer which is correlated with that hypothesis and which points to that character's position in the database;

(5) for each character which is not found as a first character in the predetermined database of character sequences, assigning a lower probability to that character's recognition hypothesis;

(6) designating the recognition hypothesis having the highest probability as the current active hypothesis in the set of recognition hypotheses of which that recognition hypothesis is a member;

(7) placing that set of recognition hypotheses as the first element on a stack of sets of recognition hypotheses;

(8) from a plurality of strokes following the last stroke which is a part of the current active hypothesis from the set of recognition hypotheses at the top of the stack, generating a new set of new recognition hypotheses, each said new recognition hypothesis including: (i) a hypothesized character, (ii) the number of strokes required to construct the hypothesized character, and iii) a probability assigned to the hypothesized character;

(9) replacing the probability assigned to each new recognition hypothesis with a value derived from the current value of the probability for the new recognition hypothesis and the value of the probability of the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(10) if the current active hypothesis from the set of recognition hypotheses at the top of the stack has an assigned pointer to the database, then for each new hypothesis which is found in the predetermined database of character sequences as a new character following the character corresponding to said current active hypothesis, generating a pointer which is correlated with that hypothesis and which points to the new character's position in the database;

(11) if the current active hypothesis from the set of the recognition hypotheses at the top of the stack does not have an assigned pointer to the database, then for each new hypothesis, reduce the probability of every recognition hypotheses in the new set by a predetermined factor;

(12) designating the recognition hypothesis which is a member of the new set of recognition hypotheses and which has the highest probability in that set as the current active hypothesis in that set;

(13) placing the new set of recognition hypotheses on top of the stack;

(14) repeating steps 8 through 13, until no additional strokes are found in step 8 following the last stroke which is a part of the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(15) generating a first hypothesis string from the current active hypothesis of each set of recognition of hypotheses, in order from the bottom of the stack to the top;

(16) generating a probability for the first hypothesis string, based upon the value of the probability for the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(17) storing the first hypothesis string as the best hypothesis string and storing its probability as the best probability, and proceeding to step 20;

(18) generating a new hypothesis string from the current active hypothesis of each set of recognition of hypotheses, in order from the bottom of the stack to the top;

(19) generating a probability for the new hypothesis string, based upon the value of the probability for the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(20) if the probability of the new hypothesis string is higher than the stored best probability, storing the new hypothesis string as the best probability string and storing its probability as the best probability;

(21) if the set of recognition hypotheses at the top of the stack includes a subset of at least one other recognition hypothesis having a probability lower than the current active hypothesis, then designating the recognition hypothesis of said subset which has the highest probability value as the current active hypothesis and repeating steps 8–14 and 18–20;

(22) removing the set of recognition hypotheses at the top of the stack, and if the stack is not empty as a result of such removal, proceeding to step 21, but if it is empty then proceeding to step 23; and

(23) outputting the best stored string.

5,151,951

CHARACTER RECOGNITION DEVICE WHICH DIVIDES A SINGLE CHARACTER REGION INTO SUBREGIONS TO OBTAIN A CHARACTER CODE

Toru Ueda, Nara; Yasushi Ishizuka, Yamatokooriyama, both of Japan; Fumio Togawa, and Takashi Aramaki, both of Hillsboro, Oreg., assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1991, Ser. No. 667,340
Claims priority, application Japan, Mar. 15, 1990, 2-65055; Mar. 20, 1990, 2-70345
Int. Cl.[5] G06K 9/46
U.S. Cl. 382—19 4 Claims

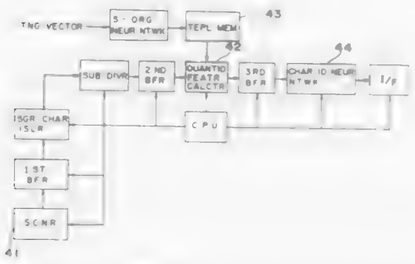
1. A character recognition device which isolates the image data for a single character area from scanned character image data, and recognizes a character code corresponding to the

character image data based on the image data of this single character area, comprising:

a region divider which divides the image data of the single character area into plural subregions,

a features calculator which calculates quantified features of each subregion based on degrees of resemblance between image data of each subregion divided by said region divider and templates which express in each subregion differences in shape of characters in a recognition character group,

a character code recognition means which recognizes the character code corresponding to the scanned character image data based on the quantified features calculated by the features calculator in all subregions composing the single character area, and



a neural network which during training refreshes contents of a specified weight vector corresponding to an input training vector to approach the contents of the input training vector, and which

trains the neural network using training vectors generated for each subregion based on character image data of plural training characters representative of the recognition character group, and

defines as the templates used during calculation of the quantified features of the subregions by the feature calculator the weight vectors set, as a result of being refreshed to approach the contents of each training vector, to express differences in shapes of characters in each of training characters representative of the recognition character group.

5,151,952

CHARACTER RECOGNITION APPARATUS WHICH OBTAINS DISTANCE RATIOS BETWEEN EDGES IN A CHARACTER FOR IDENTIFICATION

Jean Pierre Canu, Yvetot; Bernard DesForges, Darbetal, and Gerard Huette, Rouen, all of France, assignors to Unisys Corp., Blue Bell, Pa.

Filed Jun. 14, 1991, Ser. No. 689,072
Int. Cl.[5] G06K 9/46
U.S. Cl. 382—29 8 Claims

1. An apparatus for identifying a predetermined font character moving relative to a scanning head from among a predetermined set of characters, said apparatus comprising:

edge detector means for scanning the character and providing a single analog output signal indicative of the position of the leading and trailing edges in the scanned character;

controller means operative to measure a first distance between the first leading edge and a first selected edge in the scanned character,

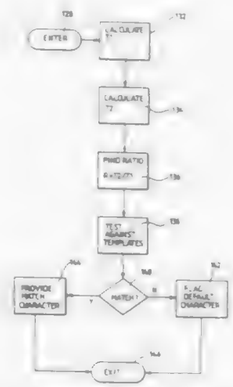
also being operative to measure a second distance between the first leading edge and a second selected edge in the scanned character,

controller means operative to measure a first distance between the first leading edge and a first selected edge in the scanned character,

also being operative to measure a second distance between the first leading edge and a second selected edge in the scanned character,

and operative to take the ratio between said first and second distance to create a novel character ratio;

said controller means comprising a stored set of character signals each representative of the expected ratio for a



respective one of the characters in said predetermined set of characters;

said controller means being operative to compare the character ratio with each character signal and to provide an indication of the character, from said set, with whose character signals the character ratio matches.

5,151,953

SINGLE CHIP 2-D CONVOLVER

David S. Landeta, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 10, 1990, Ser. No. 624,964
Int. Cl.[5] G06K 9/64
U.S. Cl. 382—41 35 Claims

1. A system for Q×R kernel convolution of an M×N array of words, where Q×R is a subset of M×N comprising:

input means for receiving, in sequence, words P from said M×N array;

coefficient means for storing coefficients C_1 through $C_{Q\times R}$;

Q×R matrix of multiplying means, each multiplying means having a first input receiving Pi and a second input receiving a dedicated Cj for producing a product PiCj where i varies from 1 to M×N and j is one of 1 to Q×R;

said first input of each of said multiplying means is connected to a first input of a preceding multiplying means in its respective row of a one stage buffer means;

said first input of a first multiplying means in each row is connected to a first input of a last multiplying means of a previous row by a row buffer means having M−R+1 stages; and

adder means connected to said Q×R matrix of multiplying

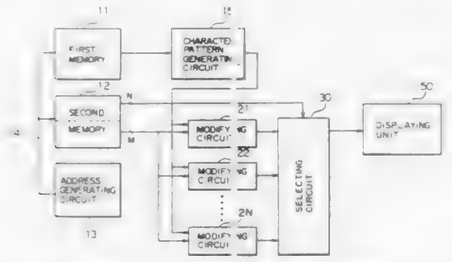
means for adding said products PiCj to providing an output convolution Pc as a first output.

5,151,954

DEVICE CAPABLE OF MODIFYING A CHARACTER ACCORDING TO A SELECTED ATTRIBUTE CODE

Kazuhito Takai, Tokyo, and Yukihiro Kimura, Gunma, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 633,608
Claims priority, application Japan, Dec. 26, 1989, 1-337333
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—41 4 Claims



1. A modifying device for modifying a character into a modified signal, said modifying device comprising:

a first memory for memorizing a character code representative of said character;

a second memory for memorizing an attribute code and a selection code which cooperatively determine modification of said character;

supplying means for supplying an address signal to said first and said second memories to read out said character code, said attribute code, and said selection code;

a character pattern generating circuit responsive to the character code read out of said first memory for producing a character pattern;

first through N-th modifying means responsive to the attribute code read out of said second memory for modifying said character pattern into first through N-th modification signals, respectively, where N represents a positive integer which is not less than two; and

selecting means for selecting at least one of said first through said N-th modification signals as said modified signal in response to the selection code read out of said second memory.

5,151,955

OPTICAL ISOLATOR

Hiroshi Ohta, and Noriyuki Nakamura, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Shinkosha, Tokyo, Japan

Filed Nov. 9, 1990 Ser. No. 612,016
Claims priority, application Japan, Jun. 20, 1990, 2-160017; Oct. 12, 1990, 2-272335
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—6 2 Claims

1. An optical isolator comprising:

a pair of light waveguides;

plate-like first, second, third and fourth birefringent elements;

a first magneto-optic element interposed between said first and second birefringent elements; and

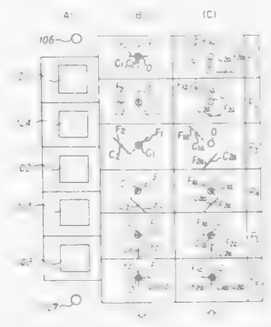
a second megneto-optic element interposed between said third and fourth birefringent elements,

said first birefringent element having a light penetrating end face and a plane of polarization which is perpendicular to said light penetrating end face and including a direction in which light is separated so that light emitted from one of said light waveguides and being incident on said first birefringent element is separated into two polarized components,

said second birefringent element having a light penetrating end face and a plane of polarization which is angled at nearly 45° relative to that of said first birefringent element about the normal line of said light penetrating end face of said second birefringent element,

said third birefringent element having a light penetrating end face and a plane of polarization which is angled at nearly 45° relative to that of said first birefringent element about said light penetrating end face of said third birefringent element and substantially perpendicular to that of said second birefringent element,

said fourth birefringent element having a light penetrating end face and a plane of polarization which is angled at nearly 45° relative to that of said third birefringent element about said light penetrating end face of said fourth birefringent element so as to synthesize two polarized



components transmitted across said second magneto-optic element,

said first magento-optic element being disposed to magnetically change directions of polarization of said polarized components transmitted across said first birefringent element,

said second magneto-optic element being disposed to magnetically change directions of polarization of said polarized components transmitted across said third birefringent element,

said first and second magneti-optic elements having a thickness which is so determined that said directions of polarization of said polarized components emanating from said first and second magneto-optic elements are angled at nearly 45° relative to those incident thereupon, and

said first and fourth birefringent elements being equal in thickness and said second and third birefringent elements having a thickness $\sqrt{2}$ times that of said first or fourth birefringent element.

5,151,956

WAVEGUIDE POLARIZER USING LOCALIZED SURFACE PLASMONS

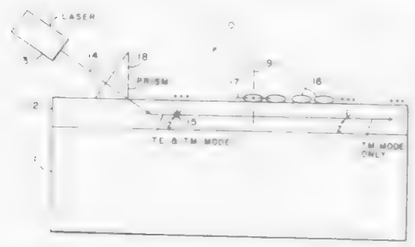
Mark J. Bloemer, Athens, Ala., assignor to The United Staes of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1991, Ser. No. 811,279
Int. Cl.[5] G02B 6/00, 6/36
U.S. Cl. 385—11 11 Claims

1. A waveguide polarizer utilizing the surface plasmon resonances in submicrometer-size metallic particles to polarize electromagnetic radiation comprising:

(i) a waveguide substrate for supporting said submicrometer-size metallic particles within an electromagnetic field of electromagnetic radiation propagating said waveguide polarizer;

(ii) submicrometer-size metallic particles selected from the group of metals consisting of silver, gold, copper, and aluminum deposited within said electromagnetic field and supported by said waveguide substrate, said submicrometer-size metallic particles having nonspherical shapes and having their major axes parallel to the surface of said waveguide substrate, said nonspherical shapes of submicrometer-size metallic particles having particles size up to 500 nanometers as measured along side of major axes, said nonspherical shapes of submicrometer-size metallic particles having a predetermined minor to major axis ratio and having two surface plasmon modes with each of said surface plasmon modes having a surface plasmon resonance within the wavelength of electromagnetic radiation propagating in said waveguide, said surface plasmon reso-



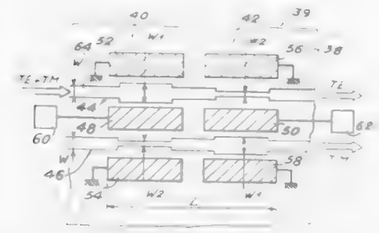
nance wavelength achieving polarization of electromagnetic radiation by absorbing the wavelength of said electromagnetic radiation of plasmon resonance wavelength of one of said surface plasmon modes and passing the wavelength of said electromagnetic radiation of the surface plasmon resonance wavelength of the other of said surface plasmon modes, said electromagnetic radiation wavelength when impinging on said nonspherical shapes of submicrometer-size metallic particles with its electric field parallel to said major axis being passed and said electromagnetic radiation wavelength when impinging on said nonspherical shapes of submicrometer-size metallic particles with its electric field parallel to said minor axis being absorbed to thereby achieve polarization of said electromagnetic radiation propagating said waveguide.

5,151,957

POLARIZATION BEAM SPLITTER FOR GUIDED LIGHT

Luc Riviere, Valbonne, France, assignor to France Telecom Etablissement Autonome de Droit Public (Centre National d'Etudes des Telecommunications), Issy les Moulineaux, France

Filed Oct. 23, 1991, Ser. No. 780,908
Claims priority, application France, Oct. 31, 1990, 90 13529
Int. Cl.[5] G02B 6/10
U.S. Cl. 385—41 8 Claims



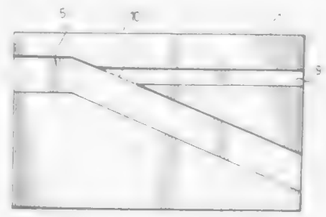
1. Polarization beam splitter for guided light, which comprises a directional coupler (39) having an alternating delta beta electrode structure, said coupler incorporating two sections (40, 42) adjacent to one another and two light guides (44, 46), one end (64) of one (44) of the two guides serving to receive an input lightwave, which is a combination of the two optical guided modes, namely a transverse-electrical mode TE and a transverse-magnetic mode TM, characterized in that the coupler is produced on a substrate (38) made from a material having a refractive index associated with the TE mode and a refractive index associated with the TM mode and which makes it possible to induce opposite variations respectively on the refractive indexes and in that the coupler is able to introduce, in the absence of a voltage between the electrodes, a delta beta variation between the propagation constants respectively corresponding to the symmetrical and anti-symmetrical propagation modes of the coupler, which is on the one hand independent of the polarization state of the lightwave guided by the splitter and on the other is such that the representative point of the coupler (M1, M2, M3, M4) on its control diagram is the centre of a segment parallel to the abscissa axis of the reference frame in which the diagram is plotted and which is defined by two points (A1, B1; A2, B1; A1, B2; A2, B2) respectively belonging to a curve (I) corresponding to crossed states of the coupler and to a curve (II) corresponding to parallel states of said coupler, so that for an appropriate electrical polarization of the latter, one of the two TE and TM modes of the input lightwave is obtained at the other end of the guide (44), which receives said input lightwave and the other mode at the corresponding end of the other guide.

5,151,958

ADAPTOR DEVICE FOR COUPLING TOGETHER OPTICAL WAVEGUIDES PRODUCED BY K-NA ION EXCHANGE WITH OPTICAL WAVEGUIDES PRODUCED BY AG-NA ION EXCHANGE

Seppo Honkanen, Naavatie, Finland, assignor to Oy Nokia AB, Helsinki, Finland

Filed Jul. 26, 1991, Ser. No. 736,514
Claims priority, application Finland, Aug. 23, 1990, 904186
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—50 4 Claims



1. An adaptor device for coupling together optical waveguides produced by K-Na ion exchange and optical waveguides produced by Ag-Na ion exchange, wherein the adaptor device comprises an optical waveguide produced on a glass substrate by ion-exchange technique, in the fundamental mode of which waveguide the field distribution of light changes adiabatically in a longitudinal direction of the optical waveguide from the field distribution of light of the fundamental mode of an optical waveguide produced by K-Na ion exchange at a first end portion to the field distribution of light of the fundamental mode of an optical waveguide produced by Ag-Na ion exchange at a second end portion.

5,151,959

CONTROLLABLE INTEGRATED OPTICAL MACH-ZEHNDER INTERFEROMETER

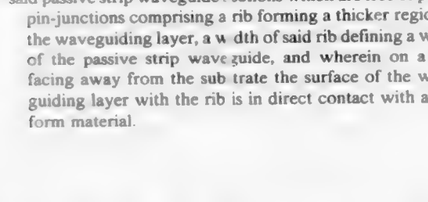
Gustav Mueller, and Lothar Stoll, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 14, 1991, Ser. No. 744,898

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1990, 4030755

Int. Cl.[5] G02B 6/26

U.S. Cl. 385—50 17 Claims



13. A controllable integrated optical Mach-Zehnder interferometer, comprising:

a substrate of semiconductor material;

first and second strip waveguides of a defined width integrated on the substrate and defined by waveguiding layers at the substrate;

in two coupling sections, the strip waveguides proceeding side-by-side and at a spacing from one another which is sufficiently small such that an optical wave guided in the waveguiding layer of one of the strip waveguides can couple over into the waveguiding layer of the other strip waveguide;

in a phase shifting section, the two waveguides being in side-by-side relationship and at a spacing which is sufficiently great such that an over-coupling of optical waves between the two strip waveguides is substantially prevented;

in said phase shifting section at least one of the strip waveguides having a rib of semiconductor material and a spacer layer arranged over its waveguiding layer and which defines a width of the at least one strip waveguide where the rib is present;

a semiconductor junction which is electrically controllable via contacts is integrated within said phase shifting section in a region of said rib of said at least one strip waveguide such that a transition from p-doped material of said rib to n-doped or undoped material of said spacer layer is arranged at a specified distance from the waveguiding layer, and wherein the rib of p-doped material is situated at a side of this transition facing away from the waveguiding layer;

the section of the strip waveguide within the phase shifting section which is adjacent the semiconductor junction comprising an electrically controllable strip waveguide section;

sections of the strip waveguides situated outside of the electrically controllable strip waveguide section forming passive strip waveguides which are free of semiconductor junctions; and

said passive strip waveguide sections which are free of pn- or pin-junctions comprising a rib forming a thicker region of the waveguiding layer, a width of said rib defining a width of the passive strip waveguide, and wherein on a side facing away from the substrate the surface of the waveguiding layer with the rib is in direct contact with a uniform material.

5,151,960

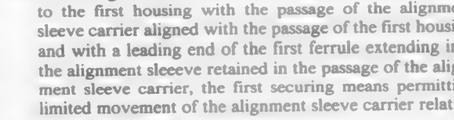
UNITARY OPTICAL FIBER CONNECTOR

Gary N. Warner, Harrisburg; Jason L. White, Duncannon; Edmund J. Haley, Dillsburg; Wallace R. Savitsky, and Ronald R. Schaffer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 8, 1991, Ser. No. 682,042

Int. Cl.[5] G02B 6/00, 6/36

U.S. Cl. 385—53 17 Claims



1. An optical fiber connector having an optical fiber holder fabricated in a molding die, and comprising:

an optical fiber and a flexible buffer and strength members of an optical fiber cable, and a holder of plastics material for aligning the fiber imbedding the fiber in the plastics material at a front end of the holder, and imbedding the buffer and the strength members and an exterior of the cable in the plastics material.

5,151,961

FERRULE ALIGNMENT ASSEMBLY FOR BLIND MATING OPTICAL FIBER CONNECTOR

Jaroslav M. Hvezda, Nepean; Robert W. Fisher, Ottawa; Edward J. Olszewski, Kanata; Hugh F. C. Morrin, and Richard J. Glover, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 20, 1992, Ser. No. 838,170

Int. Cl.[5] G02B 6/36, 6/42

U.S. Cl. 385—60 20 Claims

1. An assembly for axially aligning two ferrules, the assembly comprising:

a first housing having a passage;

a first ferrule ridigly mounted within the passage of the first housing;

an alignment sleeve carrier having a passage extending therethrough;

an alignment sleeve retained with the passage of the alignment sleeve carrier;

first securing means for securing the alignment sleeve carrier to the first housing with the passage of the alignment sleeve carrier aligned with the passage of the first housing and with a leading end of the first ferrule extending into the alignment sleeeve retained in the passage of the alignment sleeve carrier, the first securing means permitting limited movement of the alignment sleeve carrier relative to the first housing;

a second housing;

a socket member having a passage extending therethrough for receiving a second ferrule at one end of the passage of the socket member and a leading end of the alignment sleeve carrier at another end of the passage of the socket member such that a leading end of the second ferrule can extend into the alignment seeve for axial alognment with said first ferrule when the alignment sleeve carrier is received in the passage of the socket member;

second securing means for securing the socket member to the second housing, the second securing means permitting limited movement of the socket member on the second housing;

the limited movement of the alignment sleeve carrier relative to the first housing and the socket member relative to the second housing faciliating entry of the alignment sleeve carrier into the passage of the socket member and alignment of the first and second ferrules within the alignment sleeve.

5,151,962

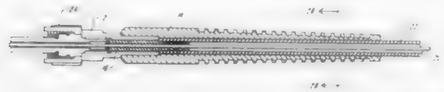
FIBER OPTIC CABLE ASSEMBLIES FOR LASER DELIVERY SYSTEMS

James P. Walker, Arlington; Jack Aucoin, S. Attleboro, both of Mass., and Randall Drew, Cumberland, R.I., assignors to Fiber Delivery Concepts, Inc., Hudson, Mass.

Filed May 20, 1991, Ser. No. 703,020

Int. Cl.[5] G02B 6/44

U.S. Cl. 385—86 17 Claims



1. A fiber optic cable assembly for use in a laser delivery system comprising:

an elongate optical fiber;

a jacket member axially surrounding said optical fiber,

means for optically coupling the optical fiber to a laser,

a cylindrical strain relief boot attached to said coupling means and axially surrounding a substantial length of said jacket member and said fiber, said boot having a proximal end with a first outer diameter and a distal end with a second outer diameter which is less than the first outer diameter, the boot further having a length wherein the ratio of the boot length to the first outer diameter is at least 7:1;

a support element axially surrounding a portion of said optical fiber and separating said optical fiber from said jacket member and said coupling means for maintaining the optical fiber in axial alignment with said laser.

5,151,963

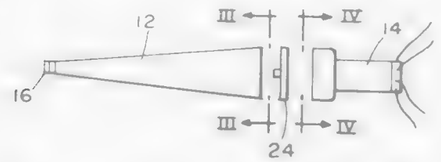
APPARATUS FOR COUPLING AN OPTICAL TRANSDUCER TO A LIGHT GUIDE

Thomas E. Coan, Los Alamos, N. Mex., and Steven P. Ahlen, Brookline, Mass., assignors to Boston University, Boston, Mass.

Filed Mar. 5, 1991, Ser. No. 665,553

Int. Cl.[5] G02B 6/00, 6/36

U.S. Cl. 385—88 39 Claims



1. An apparatus for coupling an electro-optical device to a transparent material, comprising:

a stud extending parallel to a coupling axis along which the electro-optical device and transparent material are coupled, the stud engaging a receiving hole in which the stud is removably secured, the stud and the hole permitting light to be transmitted therethrough with each being fixedly located relative to a different one of the electro-optical device and the transparent material, and being located opposite one another during coupling such that relative motion of the electro-optical device and the transparent material toward one another along the coupling axis results in the engagement of the stud with the hole.

5,151,964

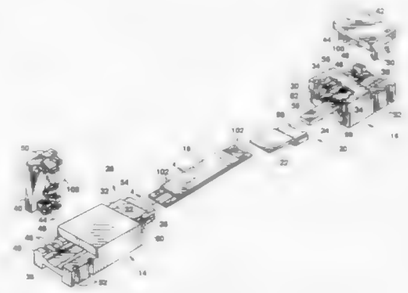
WEDGE-ACTUATED MULTIPLE OPTICAL FIBER SPLICE

James B. Carpenter; Donald G. Doss, both of Austin, and Frank J. Glatzl, Leander, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1991, Ser. No. 753,332

Int. Cl.[5] G02B 6/38

U.S. Cl. 385—98 19 Claims



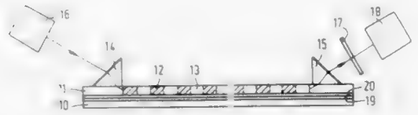
19. A multiple optical fiber splice device comprising:

a splice body having a slot therein and a cavity adjacent said slot, said cavity having a ramp, said splice body further having a generally rectangular tongue extending into said cavity, parallel with said slot, said tongue having first and second, generally parallel surfaces;

a splice element located in said slot of said splice body, said splice element including two generally rectangular plates, a central portion of one of said plates contacting said first surface of said tongue, and both of said plates having a width approximately equal to the width of said tongue, and a length greater than the length of said tongue; and

a wedge having first and second surfaces defining an acute angle of less than about 9°, said first surface of said wedge being generally parallel with and contacting said second surface of said tongue, and said second surface of said wedge being generally parallel with and contacting said ramp, said wedge further being locatable in first and second positions within said cavity, said plates being sufficiently separated when said wedge is in said first position to allow insertion of a plurality of optical fibers between said plates, and said wedge applying a clamping force to said splice element, urging said plates toward one another, when said wedge is in said second position.

5,151,965
DEVICE FOR DOUBLING THE FREQUENCY OF A LIGHT WAVE
Gerardus L. J. A. Rikken, and Constance J. E. Seppen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jan. 8, 1991, Ser. No. 638,881
Claims priority, application Netherlands, Jun. 20, 1990, 9001398
Int. Cl.[5] G02F *1/35*
U.S. Cl. 385—122 5 Claims



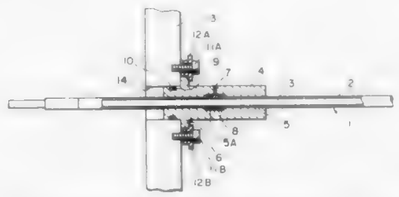
1. A device for doubling the frequency of a light wave comprising a non-linear optical medium of a synthetic resin composition for guiding a fundamental light wave, while forming a second harmonic wave, said medium comprising a waveguide having a spatially periodic structure for phase matching, characterized in that the waveguide is composed of a uniformly oriented synthetic resin composition in which alternately areas having a mutually different second order susceptibility are present in accordance with the desired spatially periodic structure.

5,151,966
OPTICAL FIBER SUITABLE FOR USE IN OPTICAL TIME DOMAIN REFLECTOMETRY AND METHOD OF MANUFACTURING IT
Claude Brehm, Montrouge; Jean-Yves Boniort, Limours; André Tardy, Egly, and Jacques Corbineau-Nougue, Paris, all of France, assignors to Alcatel Fibres Optiques, Cedex, France
Filed Jun. 25, 1991, Ser. No. 720,338
Claims priority, application France, Jun. 26, 1990, 90 08017
Int. Cl.[5] G02B *6/10*; B21K *26/00*; B05D *5/06*
U.S. Cl. 385—128 8 Claims

1. In a method of manufacturing an optical fiber suitable for use in optical time domain reflectometry comprising drawing of the fiber and depositing a thin continuous coating on the fiber during drawing, the improvement comprising removably ablating part of said coating to form a coating free helix coaxial with the fiber by rotating a laser beam in a plane orthogonal to said axis simultaneously with axial movement of the fiber to optimize microcurvature of the fiber according to its subsequent use.

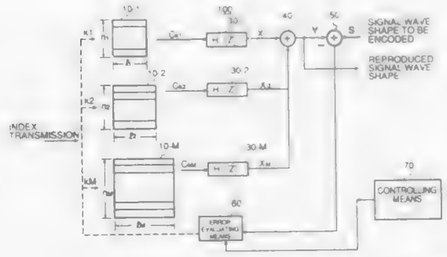
6. Optical fiber suitable for use in optical time domain reflectometry comprising a thin coating on said optical fiber of carbon, silicon carbide, silicon nitride, a metal or a metal alloy, wherein said coating is interrupted in an area defining a coating free helix coaxial with the fiber to optimize the microcurvature of the fiber according to its subsequent use.

5,151,967
OPTICAL FIBER SEALING ASSEMBLY
Ryuichi Ebinuma, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1991, Ser. No. 737,023
Claims priority, application Japan, Jul. 31, 1990, 2-201155
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—138 8 Claims



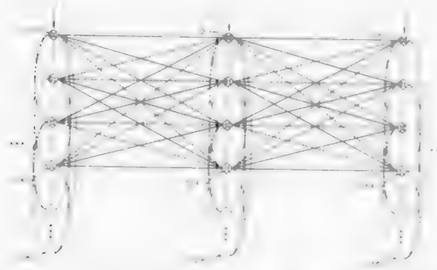
1. A light guide device for guiding light from one side of a wall member to another side thereof, said device comprising:
light guide means having an optical fiber covered with a covering member, with said optical fiber having an uncovered portion not covered by said covering member;
a first member having a throughbore for receiving said light guide means, with said first member being partially inserted into a mounting bore formed in the wall member, wherein said uncovered portion of optical fiber is positioned within said first member, and said first member includes an introduction hole for allowing introduction of a filling material around said uncovered portion of optical fiber; and
a second member for fixing said first member to the wall member, wherein said second member is positioned around the mounting bore and secured to the wall member.

5,151,968
VECTOR QUANTIZATION ENCODER AND VECTOR QUANTIZATION DECODER
Yoshinori Tanaka, Kawasaki; Tomohiko Taniguchi, Yokohama; Fumio Amano, Tokyo; Yasuji Ohta, Yokohama, and Sigeyuki Unagami, Atsugi, all of Japan, assignors to Fujitsu Limited, Japan
Filed Aug. 3, 1990, Ser. No. 562,604
Claims priority, application Japan, Aug. 4, 1989, 1-202418
Int. Cl.[5] G10L *3/00*
U.S. Cl. 395—2 17 Claims



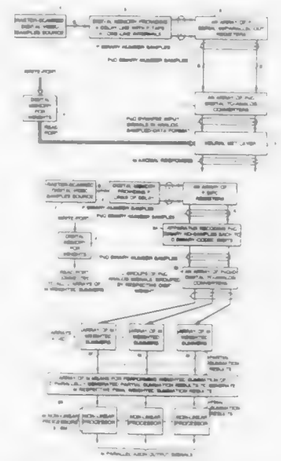
1. A vector quantization encoder in a vector quantization device comprising:
codebook means for storing a plurality of indexed code vectors and for providing one of the indexed code vectors in response to an code vector index signal,
synthesis filters for reproducing speech signals based on the indexed code vector provided by said codebook means,
addition means for adding the reproduced speech signals provided by said synthesis filters together to form a reproduced speech signal,
error computing means for receiving an input speech signal and for computing a minimum error power valve by determining a difference between the reproduced speech signal and the input speech signal; and
evaluating means for selecting the code vector index which minimizes the minimum error power value due to the difference between the reproduced speech signal and the input speech signal to be encoded and for supplying the selected code vector index to said codebook means, wherein:
said codebook means includes a plurality of separate codebooks, each stores indexed code vectors for a different frequency band;
each of said separate codebooks is provided with one of said synthesis filters;
said addition means forms the reproduced speech signal based on which the minimum error power value is to be found; and
said evaluating means includes means for selecting indices corresponding to said respective separate codebooks as well as indices for the indexed code vectors of said respective separate codebooks based on the minimum error power value.

5,151,969
SELF-REPAIRING TRELLIS NETWORKS
Thomas Petsche, Cranbury, N.J., assignor to Siemens Corporate Research Inc., Princeton, N.J.
Filed Mar. 29, 1989, Ser. No. 330,340
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—24 11 Claims



1. A network for storing and processing signal representations, the network comprising:
a plurality of stages and weighting matrix means interconnecting stages together;
each stage comprising a plurality of processing means grouped into two sets wherein one set includes active processing means and a second set includes spare processing means, the active processing means being nodes in the network, and the weighting matrix means connecting each node in a stage via paths to all the nodes in adjacent stages wherein selected paths according to an underlying convolution code are favored over remaining paths;
inhibiting means connecting the processing means of the two sets together, the inhibiting means cooperating with the processing means to favor the activation of a single processing means in each stage; and
the weighting matrix means allowing only the activation of one processing means in a stage when activated nodes in different successive stages are interconnected by selected paths through the weighting matrix means.

5,151,970
METHOD OF GENERATING, IN THE ANALOG REGIME, WEIGHTED SUMMATIONS OF DIGITAL SIGNALS
William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 546,970, Jul. 2, 1990. This application Jun. 28, 1991, Ser. No. 722,801
Int. Cl.[5] G06F *7/52*, *15/40*
U.S. Cl. 395—24 8 Claims

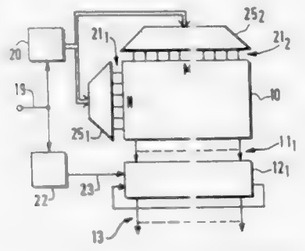


1. A method for operating electronic apparatus for generating a weighted summation of digital input signals as manifested in electric signal form, each sample of said digital input signals having a plurality B in number of bits identified by respective ones of consecutive ordinal numbers first through B^{th} assigned in order of decreasing significance, said method for operating electronic apparatus comprising the steps of:
supplying each of said digital input signals in a respective stream of samples of only that said digital input signal, such that there are corresponding samples of said digital input signals in each of said streams which corresponding samples are parallel in time with each other;
recoding each B-bit sample of said digital input signals into a plurality D in number of binary-coded digits, as manifested in electric signal form and as identified by consecutive ordinal numbers first through D^{th} assigned in order of decreasing significance of weightings respectively assigned to the D binary-coded digits, B and D being respectively a relatively larger positive integer and a relatively smaller positive integer;
converting each set of temporally aligned digits to a set of corresponding analog electric signals consisting of D subsets each containing analog electric signals corresponding to digits of similar assigned weighting;
performing a weighted summation procedure on each of said D subsets of analog electric signals to obtain a respective partial weighted summation result manifested in electric signal form, thereby to generate streams of partial weighted summation results as manifested in electric signal form suitable for the next step of said method for generating a weighted summation of digital input signals; and
performing a weighted summation procedure on corresponding samples of said streams of partial weighted summation results, thereby to obtain a stream of final weighted summation results as manifested in electric signal form.

5,151,971
ARRANGEMENT OF DATA CELLS AND NEURAL NETWORK SYSTEM UTILIZING SUCH AN ARRANGEMENT

Christian P. M. Jousselin, Puteaux, and Marc A. G. Duranton, Boissy Saint Leger, both of France assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 439,717, Nov. 20 1989, Pat. No. 5,075,889.
This application Oct. 10, 1991, Ser. No. 775,653
Claims priority, application France Nov. 18, 1988, 88 14999
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—27 11 Claims



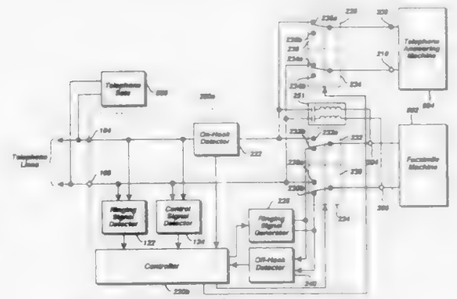
1. A layered neural network system comprising:
a) resolving means for determining, for each layer, states of output neurons i based on input neurons j which are interconnected by way of synapses,
b) means for storing synaptic coefficients C_{ij} associated with these synapses,
c) means for training and for updating the synaptic coefficients C_{ij}, and
d) means for storing the neuron states,
wherein the improvement comprises that
the means for storing the synaptic coefficients comprises at least one word-organized memory arrangement comprising:
a plurality of data cells arranged in rows and columns to form a matrix,
a single output bus comprising a plurality of lines for supplying a data word corresponding to a plurality of the bits stored in a row or column of the matrix;
at least a plurality of first and a plurality of second switches, each of said first switches being connected in series with a different one of said second switches between one of said cells and one of said lines of said output bus;
means for addressing said matrix in a first mode such that the stored bits appear as a word in a first bit arrangement on said single output bus,
means for addressing said matrix in a second mode such that, with the same cell contents in the matrix, the stored bits appear as a word in a second bit arrangement on said same single output bus, and
said addressing means being connected to such matrix such that, in either addressing mode, a same selection signal when applied to the matrix will activate the same switches thereby addressing the same word stored in the matrix.

5,151,972
APPARATUS FOR AUTOMATICALLY CONNECTING TERMINAL DEVICE TO TELEPHONE LINES

Alan S. Lorenz, Seattle, and Christopher K. Sutton, Everett, both of Wash., assignors to Lynx Automation, Inc., Seattle, Wash.

Continuation of Ser. No. 329,576, Mar. 28, 1989, abandoned.
This application Mar. 13, 1991, Ser. No. 668,730
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 23 Claims

1. An apparatus for automatically routing an incoming data telephone signal on a pair of telephone lines to a data receiving terminal device such as a facsimile machine for use with a telephone system with one or more telephone devices connected directly to the telephone lines and independent of and unaffected by the connection of the apparatus to the telephone lines, the apparatus being operable in at least one response mode which allows an incoming call on the telephone lines to be answered by any one of the telephone devices connected directly to the telephone lines, comprising:
a connector to connect the apparatus in parallel with the telephone lines;
a ringing signal detector operable in said response mode to detect a ringing signal of an incoming call on the telephone lines without taking the telephone system off-hook, and generate a ringing detection signal if a ringing signal is detected;
a control signal detector operable in said response mode to detect a predetermined control signal on the telephone lines during an incoming call which has been answered by one of the telephone devices connected directly to the



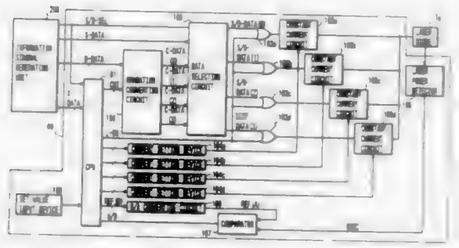
telephone lines, and generate a control detection signal if said predetermined control signal is detected;
a controller, coupled to said ringing signal detector and said control signal detector, and operable in said response mode to generate a switching control signal in response to receipt of said ringing detection signal from said ringing signal detector followed by receipt of said control detection signal from said control signal detector; and
a first switch, coupled between the telephone lines and the terminal device, which selectively connects the terminal device to the telephone lines, said first switch having an idle first mode during which the terminal device is disconnected from the telephone lines, and a second mode during which the terminal device is connected to the telephone lines, said first switch being in said first mode while the apparatus is awaiting detection of both a ringing signal of an incoming call and said predetermined control signal on the telephone lines, and said first switch switching to said second mode in response to receipt of said switching control signal from said controller.

5,151,973
PRINTING APPARATUS AND INFORMATION PROCESSING APPARATUS USING THE SAME

Akira Sasaki; Takeshi Kato, and Akiyoshi Hakoyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,042
Claims priority, application Japan, May 18, 1990, 2-126720
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—109 19 Claims

1. In a printing apparatus in which a dot printing element is controlled in accordance with an image information signal transmitted from an image information signal generating unit and a visual image expressed by dots is formed, said dot printing element is controlled through a main control unit, said main control unit comprises a first control means, said first control means of the main control unit controls said dot printing element so as to print a dot having a predetermined dot size in accordance with an existence of a dot signal in said image information signal, the printing apparatus characterized in that, said main control unit includes further a second control means and a control selection means;

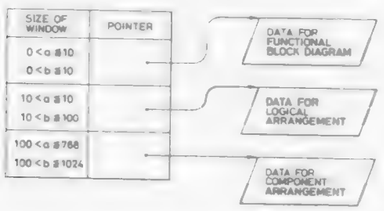


said second control means of said main control unit controls said dot printing element so as to vary a size of the dot of a dither dot matrix which is expressed in accordance with a gradation signal of said image information signal; and
said control selection means of said main control unit operates selectively said first control means of said main control unit and said second control means of said main control unit.

5,151,974
DATA DISPLAY METHOD

Masayuki Tani; Kunio Nakanishi; Atsushi Kawabata; Norito Watanabe, all of Hitachi; Takanori Yokoyama, Hitachioota, and Shinya Tanifuji, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,046
Claims priority, application Japan, Jul. 31, 1986, 61-178659
Int. Cl.[5] G06F *3/153*
U.S. Cl. 395—128 15 Claims

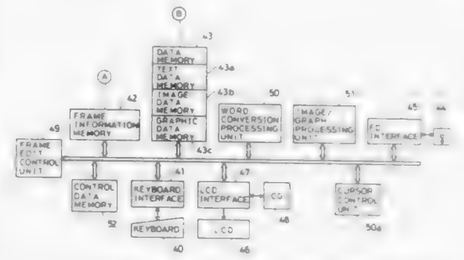


8. A data display method in a graphic data processing system having a display screen, a storage which stores graphic data, and a pointing device for designating a window of a given size at a desired position within the display screen, characterized by the following steps:
storing the graphic data structured in a hierarchy of plural concept levels in the storage;
setting plural criteria for judging a parameter of the window, each of the judging criteria being made to a correspond to respective one of the concept levels of the graphic data stored in the storage;
designating a window within the display screen by the pointing device;
judging to what criterion of the parameter the designated window belongs and selecting the graphic data of the concept level corresponding to the criterion of the parameter, to which the designated window belongs, from among the graphic data stored in the storage; and
displaying the selected graphic data within the designated window.

5,151,975
WORD PROCESSOR WITH TEXT LAYOUT DISPLAY FUNCTION

Tatsuya Shiraki, Nara, and Makoto Kado, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 409,424, Sep. 19, 1989, abandoned. This application Aug. 22, 1991, Ser. No. 750,770
Claims priority, application Japan, Sep. 30, 1988, 63-247748
Int. Cl.[5] G06F *3/14, 3/153*
U.S. Cl. 395—153 4 Claims



1. A word processor with a text layout display function, comprising:
input means for entering character string text data and for inputting instructions to readout a text frame;
text frame storage means for storing a plurality of text frame types;
format storage means for storing a text format for display within a text frame;
text frame readout means for reading out from the text frame storage means, in response to an instruction from the input means, a single text frame;
displaying means including a screen for concurrently displaying on the screen an input region within which text data entered from said input means is displayable as the text data is entered from said input means and a text frame display region within which the text data entered from said input means is displayable, as the text data is entered from said input means, in a layout format defined by the text format stored in said format storage means;
display control means for concurrently displaying test data entered from said input means in said input region and the text frame read out from said text frame storage means in said text frame display region;
first cursor display means for displaying a first position-identifying cursor within the input region at a location at which text data is entered from said input means;
output means for displaying, in said text frame display region, the text data in said input region in a layout format defined by the text format stored in said format storage means, and for concurrently displaying in the text frame display region of the display means screen, as new character string text data is entered from said input means and is displayed in the input region of the display means screen, the new text data in a layout format defined by the text format stored in said format storage means;
dividing means for dividing the text frame into a plurality of concurrently displayed frame regions;
frame region selecting means for selecting any one of the plural frame regions for receiving new text data entered from said input means in layout format;
second cursor display means for displaying, concurrently with the display of said first cursor in the input region, a second cursor within said selected frame region at a location relative to the layout formatted text data displayed in said selected frame region that corresponds to the location of the first cursor in the input region relative to the text data concurrently displayed in said input region; and

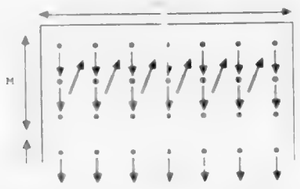
input region identifying means for identifying and displaying in the selected frame region, in layout format, the new text data concurrently entered and displayed in the input region.

5,151,976

DEVICE FOR CONVERTING A LINE SCANNING INTO A VERTICAL SAW TOOTH SCANNING THROUGH STRIPES

Alain Artieri, Meylan, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 26, 1990, Ser. No. 557,862
Claims priority, application France, Jul. 27, 1989, 89 10385
Int. Cl.[5] G06F *15/68*
U.S. Cl. 395—166 4 Claims



1. A device for converting a horizontal scanning of successive lines of N data into a saw tooth scanning of stripes, each stripe having a height of M lines, said device comprising:

M×N words of memory, wherein are sequentially written into the first MN horizontally scanned data then wherein following horizontally scanned data are sequentially written while stored data are read out at same successive addresses $A_{i,j}$ to provide saw tooth scanning output data, where i is a sequence number of the data in the memory ($0<i<MN-1$) and j is a stripe number ($1<j<n$); and

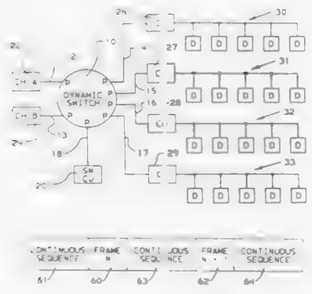
an address generator circuit for supplying said addresses $A_{i,j}$ to said memory, wherein $A_{i+1,j}=(A_{i,j}+x_j)$ Modulo (MN-1), x_j being a number such that $x_{j+1}=N.x_j$ Modulo (MN-1) and $x_1=1$.

5,151,977

MANAGING A SERIAL LINK IN AN INPUT/OUTPUT SYSTEM WHICH INDICATES LINK STATUS BY CONTINUOUS SEQUENCES OF CHARACTERS BETWEEN DATA FRAMES

Kenneth J. Fredericks, Poughkeepsie, and Kenneth R. Lynch, Rhinebeck, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 575,923
Int. Cl.[5] H04L *7/00*; G06F *3/04, 15/16, 11/20*
U.S. Cl. 395—200 9 Claims



1. A link-level facility for sending and receiving data transfers over a link in an input/output system, said link-level facility comprising:

continuous sequence generating means connected to said link for generating continuous sequences for transmission over said link from said link-level facility, said continuous sequence indicating the operating status of said link;

frame generating means connected to said link for generating frames for transmission over said link from said link-level facility;

synchronizing means connected to said continuous sequence generating means and said frame generating means for synchronizing the transmission of frames with the transmission of said continuous sequences such that said frames are intermediate successive ones of said continuous sequences;

receiving means connected to said link for receiving continuous sequences and frames transmitted over said link to said link-level facility; and

state machine means connected to said receiving means, said frame generating means and said continuous sequence generating means, said state machine means for controlling said frame generating means and said continuous sequence generating means, said state machine having a recognition means connected to said receiving means for recognizing continuous sequences received by said receiving means from said link for determining if said link has a frame-transmitting status or a non-frame-transmitting status, a first state means connected to said frame generating means for allowing transmission of frames from said frame generating means over said link when said recognition means determines that the last continuous sequence received by said receiving means indicates said link has a frame-transmitting status, and

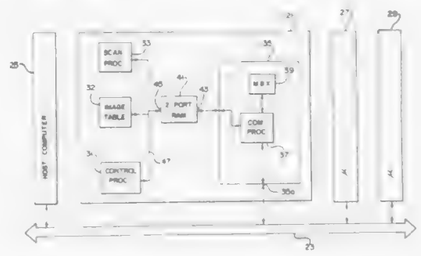
a second state means connected to said frame generator for preventing transmission of frames from said frame generating means over said link when said recognition means determines that the last continuous sequence received by said receiving means indicates said link has a non-frame-transmitting status.

5,151,978

LAN INTERFACE WHICH PERMITS A HOST COMPUTER TO OBTAIN DATA WITHOUT INTERRUPTING A LADDER PROGRAM EXECUTING IN THE INTERFACE

Joseph T. Bronikowski, Milwaukee; Brian T. Hill, Mequon; David J. Sackmann, Milwaukee, and Mark S. Weber, Germantown, all of Wis., assignors to Square D Company, Palatine, Ill.

Filed Mar. 22, 1990, Ser. No. 497,451
Int. Cl.[5] G06F *13/12*
U.S. Cl. 395—200 10 Claims



1. A programmable logic controller for communication on a high speed serial data communication network, said programmable logic controller having means for executing a ladder program and including integral means for directly coupling to said communications network, said programmable logic controller comprising:

(a) first port, said first port adapted to couple to said communications network;

(b) a communications processor coupled to said first port;

(c) a random access memory means coupled to said communications processor for storing messages from said communications network as a mailbox register;

(d) a data bus;

(e) a scan processor means coupled to said data bus for executing said ladder program;

(f) an image table coupled to said data bus, said image table having means for storing data directly from said communication network for use by said scan processor means and means for storing data from said scan processor means for use by said communication network;

(g) a two port RAM having a first port coupled to said communications processor and a second port coupled to said data bus;

(h) a control processor means coupled to said data bus for controlling said storing means of said image table and for transferring data between said image table and said mailbox register or said communications network through said two-port RAM; and

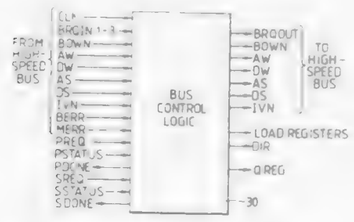
(i) wherein said first port, said communications processor, and said mailbox register combine to form said integral means for directly coupling said programmable logic controller to said communications network, said integral means functioning as an equivalent network interface module.

5,151,979

DATA PROCESSING SYSTEM WITH INFORMATION TRANSFER BUS AND WAIT SIGNAL

Geoffrey Poskitt, Camberley, Great Britain, assignor to International Computers Limited, London, England

Filed Mar. 20, 1989, Ser. No. 325,785
Claims priority, application United Kingdom, Apr. 9, 1988, 8808353
Int. Cl.[5] G06F *13/36, 13/42*
U.S. Cl. 395—325 2 Claims



1. A data processing system comprising:

(a) a plurality of functional units,

(b) a bus interconnecting the functional units to allow transfer of addresses and data between the functional units, and

(c) an ADDRESS WAIT signal path and a DATA WAIT signal path interconnecting the functional units,

(d) wherein at least a first one of the functional units comprises means for asserting an ADDRESS WAIT signal on said ADDRESS WAIT signal path whenever that functional unit is unable to accept an address from the bus, and for asserting a DATA WAIT signal on said DATA WAIT signal path whenever that functional unit is unable to accept data from the bus,

(e) wherein at least a second one of the functional units comprises means for placing an address on the bus for one clock cycle, means responsive to absence of the ADDRESS WAIT signal during said one clock cycle for withdrawing said address from the bus at the end of said clock cycle, means responsive to assertion of the ADDRESS WAIT signal for holding the address on the bus for as long as the ADDRESS WAIT signal is asserted, means for placing data on the bus for a single clock cycle, means responsive to absence of the DATA WAIT signal during said single clock cycle for withdrawing said data from the bus at the end of said single clock cycle, and means responsive to assertion of the DATA WAIT signal for holding the data on the bus for as long as the DATA WAIT signal is asserted,

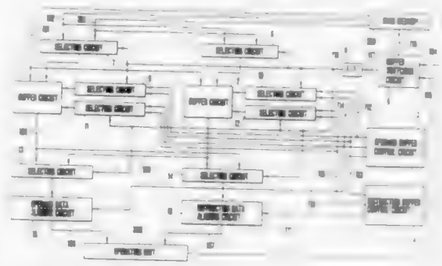
(f) and wherein each said clock cycle is substantially equal to the time required for one-way propagation of information over said bus between said second one of the functional units and said first one of the functional units.

5,151,980

BUFFER CONTROL CIRCUIT FOR DATA PROCESSOR

Atsushi Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 348,507, May 8, 1989, abandoned. This application Feb. 21, 1992, Ser. No. 837,607
Claims priority, application Japan, May 11, 1988, 63-114386
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—375 1 Claim



1. A buffer control circuit for a data processor, said buffer control circuit comprising:

a buffer switching flip-flop, said buffer switching flip-flop inverting its output whenever a branch condition of a conditional branch instruction is satisfied;

a first buffer circuit selectively serving as an instruction buffer and as an operand buffer in accordance with said output of said buffer switching flip-flop;

a second buffer circuit serving as an operand buffer when said first buffer circuit serves as an instruction buffer and serving as an instruction buffer when said first buffer circuit serves as an operand buffer;

writing means for reading out prefetched instruction data at a branch destination from a main memory and for writing said instruction data into one of said first and second buffer circuits serving as an operand buffer when an instruction decode signal indicates a branch instruction; and

buffer selecting means for selecting one of said first and second buffer circuits serving as an operand buffer, for reading out instruction data at said branch destination from the selected buffer circuit, and for outputting said instruction data to an operating unit in accordance with said output of said buffer switching flip-flop when satisfaction of a condition of said branch instruction is signaled

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5,151,981

INSTRUCTION SAMPLING INSTRUMENTATION

Douglas W. Westcott, Rhinebeck, and Valerie White, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1990, Ser. No. 552,389
Int. Cl.[5] G06F *11/30, 9/34*
U.S. Cl. 395—375 7 Claims

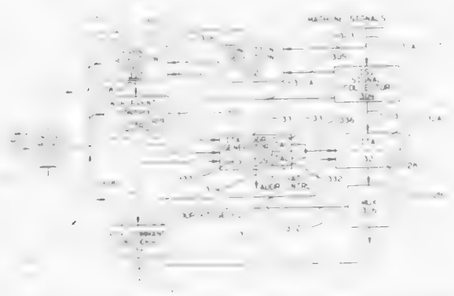
1. An apparatus for monitoring execution of instructions in an out-of-sequence execution machine of a type that tags each

instruction in an execution pipeline with an instruction identification number, comprising:

a memory;

first detection means for detection processing by said machine, of an instruction having a preselected instruction identification number;

temporary storage for capturing data associated with the processing of said instruction having said preselected instruction identification number, said temporary storage means being in communication with and responsive to said first detection means;



second detecting means for detecting a signal from said machine indicating that said machine has completed execution of said instruction having said preselected instruction identification number; and

trigger means, in communication with said second detecting means, said temporary storage means and said memory, for causing said data captured in said temporary storage means to be stored in said memory responsive to completion of execution of said instruction having said preselected instruction identification number,

wherein, only data associated with processing of completed ones of said instructions having said preselected instruction identification number is captured in said memory.

5,151,982

DATA PROCESSING SYSTEM

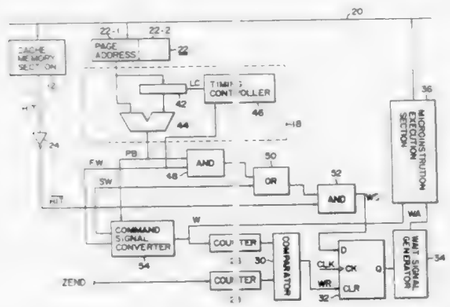
Shohei Suzuki, Tachikawa, and Isao Sakuma, Oome, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1989, Ser. No. 329,210

Claims priority, application Japan, Mar. 30, 1988, 63-76942; Apr. 8, 1988, 63-85431

Int. Cl.[5] **G06F** *12/08*

U.S. Cl. 395—425 **7 Claims**



1. A system with a cache memory for executing a series of write microinstructions at high speed, comprising:

memory means, including a main memory for storing data and a cache memory, said cache memory being accessed at a higher speed than said main memory and storing a copy of data stored in said main memory;

execution means for receiving a series of write microinstructions, generating an access virtual address including a page address and a write instruction signal, and writing data to said memory means;

miss-hit discrimination means for discerning whether or not a page indicated by the virtual address output from said execution means is present in said cache memory and for generating a miss-hit signal representing a cache miss-hit when the page is not present;

detection means for detecting whether or not a virtual address, generated by said execution means and associated with a currently executed write microinstruction, represents a new page not addressed by the previously executed write microinstruction, and generating the resulting detection signal;

wait means for causing said execution means to wait before executing the currently executed write microinstruction when a new page is indicated and a miss-hit of the cache memory occurs, all in response to the miss-hit signal and the detection signal representing the new page;

said detection means comprising:

holding means for holding a page address generated for a new write microinstruction before the current write microinstruction is executed, and

comparing means for comparing the page address held in said holding means with a page address generated for the currently executed write microinstruction, and generating a signal in accordance with the comparative result; and

said wait means including:

an instruction convertor for generating a first signal indicative of an initial write microinstruction and a second signal indicative of subsequent write microinstructions, in response to the write instruction signal supplied from said execution means,

AND circuit for outputting an output signal of the second signal and the signal supplied from said comparing means,

an OR circuit for outputting a signal from said AND circuit and the first signal,

a second AND circuit for outputting a signal from said OR circuit and a miss-hit signal, and

setting means for setting said execution means in a wait state in response to a signal output from said second AND circuit.

5,151,983

MICROCOMPUTER SYSTEM WITH SELECTIVELY BYPASSED MEMORY OUTPUT LATCHES

Yukihiro Nishiguchi, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,803

Claims priority, application Japan, Mar. 18, 1988, 63-66455; May 25, 1988, 63-128842

Int. Cl.[5] **G06F** *13/00, 13/12;* **G11C** *7/00*

U.S. Cl. 395—425 **4 Claims**

1. A microcomputer system which includes a memory storing processing data including instruction codes, and a data processor for executing a given instruction, the system comprising:

address indication means for storing an address for the memory and for supplying a stored address to the memory,

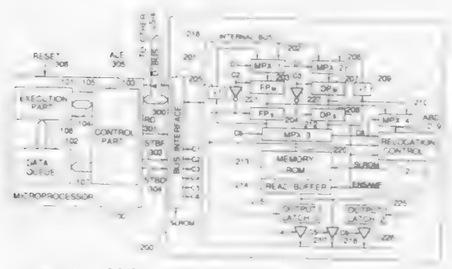
updating means for updating contents of the address indication means,

hold means for holding a content read out from the memory in accordance with the address supplied from the address indication means,

control means for controlling the updating means and the hold means,

first transfer means for controlling the address indication means and the hold means so as to cause a one-time transfer to be performed, without using the hold means as an intermediary, between the memory and the data processor after an address is supplied from the data processor to the address indication means, and

second transfer means for putting the control means in an operating condition to cause the hold means to hold the



contents which are read out from the memory at the address supplied by the address indication means, and also to cause the updating means to update the contents of the address indication means such that a continuous transfer is realized between the memory and the data processor through the hold means as an intermediary without continuously supplying addresses from the data processor.

5,151,984

BLOCK DIAGRAM SIMULATOR USING A LIBRARY FOR GENERATION OF A COMPUTER PROGRAM

William C. Newman, 191 Madison Ave., San Bruno, Calif. 94066; Paul F. Titchener, 361 Arlington St., San Francisco, Calif. 94131, and Douglas B. Powell, 201 Fifth Ave., Apt. 12, San Francisco, Calif. 94118

Continuation of Ser. No. 173,771, Mar. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 65,372, Jun. 22, 1987, abandoned. This application Dec. 20, 1990, Ser. No. 631,186

Int. Cl.[5] **G06F** *15/00*

U.S. Cl. 395—500 **41 Claims**

1. In a method using a programmed computer for generation of a computer program which represents any of a plurality of different systems where each such system comprises first and second system blocks interconnected between inputs and outputs of the system blocks in a functionally operative system, some of said system blocks being functionally different from others,

any said input connected to any said output defined by such output, any said second system block having a delay and an output, which at one time, is dependent on the condition of at least one said input to the same said second system block at a prior time or the condition of both at least one said input to the same second system block at a prior time and at least one said input to the same second system block at a current time,

the method using sequencer program, a stored library and a stored network list,

the library comprising a plurality of different library blocks, a different said library block corresponding to and representing each functionally different one of the system blocks in all of said systems,

any said stored network list for a system representing the identity of each system block and the interconnections of the inputs and outputs of the system blocks in such system,

each said library block comprising representations of the functional characteristics of the corresponding first or second system block, the representations of characteristics for each library block, for a corresponding system block, comprising

if such system block is a first system block, representations of at least one update output procedure which defines, at a current time, the output of the corresponding first system block as a function of each input thereof at the current time, and

if such system block is a second system block, representations of an update state procedure which, at a current time, defines a state for the corresponding second system block as a function of at least one input for the corresponding second system block at a prior time, and representations of at least one update output procedure which, at a current time, defines the output of the corresponding second system block as a function of either the current state of the corresponding second system block or the current state of the corresponding second system block and at least one input of the corresponding second system block at the current time,

the method comprising the steps of

using the sequencer program for operating the computer for thereby processing the content of the network list and the library for forming a sequence of representations of the procedures in the library blocks, which library blocks correspond to those system blocks which are identified in the network list, and comprising the steps of checking the library blocks which correspond to system blocks identified in the network list to determine if each such library block corresponds to a second system block and if so including in the sequence for each such library block which corresponds to a second system block a representation of the update state procedure separate from the update output procedure for such library block.

5,151,985

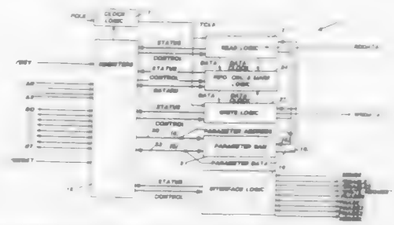
DISK DRIVE CONTROLLER

Wendell Sander, and Brian Sander, both of Campbell, Calif., assignors to Apple Computer Inc., Cupertino, Calif.

Continuation of Ser. No. 55,443, May 28, 1987, abandoned. This application Apr. 27, 1990, Ser. No. 518,307

Int. Cl.[5] **G06F** *3/00, 13/10*

U.S. Cl. 395—500 **3 Claims**



1 A disk drive controller for controlling the transfer of data

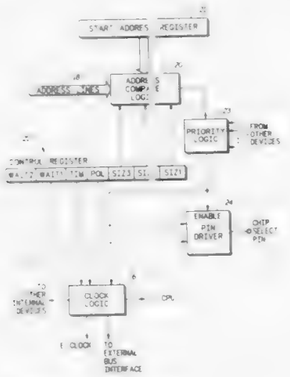
between a computer and a disk drive which puts data generated by the computer on a magnetic media based upon a write signal generated by the controller and which reads data on the magnetic media and generates a read signal representing the read data, said computer including a clock for generating a clock signal which operates at a predetermined clock speed, an address bus and a data bus, said controller comprising a register block means coupled to said address bus and said data bus for temporarily storing data for use by said controller and said computer, read logic means coupled to said register block means for receiving and converting said read signal generated by the drive to data for placement on the data bus, and write logic means coupled to said register block means for converting data on the data bus to said write signal for recording on the magnetic media, a random access memory coupled to said read logic means, said write logic means and said register block means, said memory for storing parameters generated by said computer and used by said read logic means and said write logic means to enable the controller to read data and write data to constant angular velocity disk drives and constant linear velocity disk drives.

5,151,986

MICROCOMPUTER WITH ON-BOARD CHIP SELECTS AND PROGRAMMABLE BUS STRETCHING

John A. Langan, Austin, and James M. Sibigtroth, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1987, Ser. No. 90,180
Int. Cl.[5] G06F *1/04*
U.S. Cl. 395—550 **10 Claims**



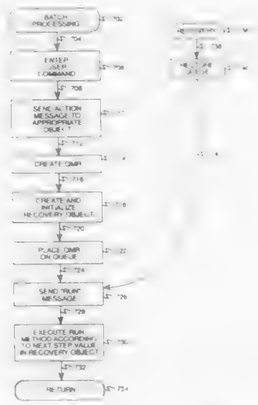
1. A microcomputer comprising:
central processing unit means for executing instructions, operating on data and interacting with peripheral devices;
internal address and data buses internal to said microcomputer and coupled to said central processing unit means;
a peripheral device;
external bus interface means coupled to said internal address and data buses for coupling external peripheral devices external to said microcomputer to said internal address and data buses, said external bus interface means further comprising:
(1) first programmable chip select means for providing a first chip select output signal if an address provided by said central processing unit means is within a first address range which has been selected by said central processing unit means; and
(2) programmable bus cycle stretch means for asserting a first control signal if an address provided by said central processing unit means is within said first address range and if said central processing unit has programmed said programmable bus cycle stretch means to be active concurrent with said first chip select output signal; and
clock logic means for providing timing signals to said central processing unit means, said peripheral device, said external bus interface means and to said external peripheral devices, said clock logic means being responsive to a first control signal to freeze said timing signals provided to said central processing unit, said external bus interface means and said external peripheral devices and to leave said timing signal provided to said peripheral device unaffected.

5,151,987

RECOVERY OBJECTS IN AN OBJECT ORIENTED COMPUTING ENVIRONMENT

Robert L. Abraham; Michael P. Priven, both of Marietta, and Thomas P. Moorman, Atlanta, all of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1990, Ser. No. 602,443
Int. Cl.[5] G06F *15/00, 12/00*
U.S. Cl. 395—575 **29 Claims**



1. A method for recovering from computer failures in an object oriented computing environment, said method adapted to operate on one or more computer platforms and comprising the steps of:
(a) creating persistent recovery objects associated with object instances having object instance methods, each of said object instance methods comprising:
(1) multiple committable actions which cannot safely be re-executed; and
(2) multiple commit messages;
(b) storing recovery information sufficient to recover from the failures in said recovery objects;
(c) committing committable data, including said recovery information, to a non-volatile storage device.

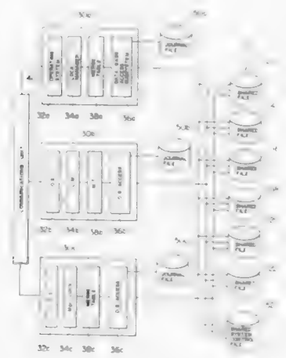
5,151,988

INTERSYSTEM DATA BASE SHARING JOURNAL MERGE METHOD

Mamio Yamagishi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 154,952, Feb. 10, 1988, abandoned. This application Sep. 6, 1990, Ser. No. 579,110
Claims priority, application Japan, Feb. 18, 1987, 62-33279
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—600 **19 Claims**

1. A computer system comprising:
a plurality of shared files for storing shared information:
a plurality of host processors for each independently processing transactions and for generating and maintaining end transaction counts each indicating a number of transactions processed by each host processor, each transaction altering information in one of the shared files when communicated thereto, the host processors being operatively connected with the shared files such that each processor can alter shared information in each of the shared files when communication between each processor and the shared files is established;
a plurality of journal files, each journal file being operatively connected with one of the host processors for storing an accumulated history record of transactions processed thereby and the end transaction counts;
a communication unit for connecting the processors and providing communication therebetween such that at least the end transaction counts are exchanged among the host processors for updating the end transaction counts stored in the journal files to establish a relative time sequence among the transactions independently performed by the plurality of host processors and stored in the plurality of journal files.



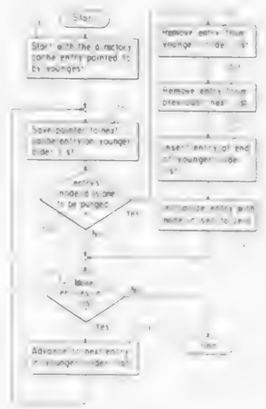
5,151,989

DIRECTORY CACHE MANAGEMENT IN A DISTRIBUTED DATA PROCESSING SYSTEM

Donavon W. Johnson, Georgetown; Amal A. Shaheen-Gouda, and Todd A. Smith, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1987, Ser. No. 14,889
Int. Cl.[5] G06F *15/16, 13/00*
U.S. Cl. 395—600 **8 Claims**

1. A directory caching method for a network of data processing systems comprising:
saving, at a first system, a first unit of directory information about a second system in response to an inquiry by said first system regarding a directory structure of said second system;
automatically sensing a first notification from said second system to said first system in response to a subsequent change in said directory structure of said second system, wherein said first notification instructs said first system to erase said first unit of directory information;
detecting an inhibiting condition associated with said network of data processing systems, wherein said inhibiting condition is a saturation of second system process resources; and



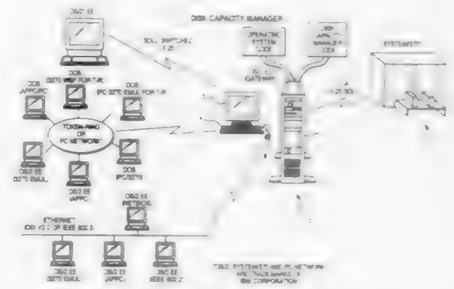
automatically sending a second notification from said second system to said first system to erase said first unit of directory information in response to said inhibiting condition.

5,151,990

NONVOLATILE MEMORY MANAGEMENT IN A DATA PROCESSING NETWORK

James D. Allen, and Steven A. King, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,745
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—650 **14 Claims**



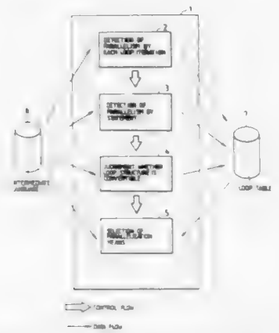
1. A system for managing memory capacity in a data processing network connected to communicate data in specified protocol between multiple workstations with resident nonvolatile memory devices, comprising:
means for selectively querying a workstation connected on the network to determine the respective unused nonvolatile memory;
means for comparing the determined unused nonvolatile memory to a respective minimum capacity threshold value; and
means for generating event response data in the network to signify that the unused nonvolatile memory at the queried workstation is below the threshold value.

5,151,991

PARALLELIZATION COMPILE METHOD AND SYSTEM

Kyoko Iwasawa, Tokyo; Yoshikazu Tanaka, Oomiya, and Shizuo Gotou, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,243
Claims priority, application Japan, Oct. 21, 1987, 62-263788
Int. Cl.[5] G06F *9/45*
U.S. Cl. 395—700 **17 Claims**



1. A parallelization method for compiling at least a part of a source program into object code representing processes executable in parallel, comprising steps executed by a data processor apparatus, the method comprising:

before converting the part of the source program into object code, estimating execution time each required for execution of one group of parallel processes within groups of parallel processes which groups will be respectively obtained by application of a plurality of predetermined parallelization conversions to the part of the source program;

selecting one of the predetermined plurality of parallelization conversions which produces one group of parallel processes having the shortest execution time among the estimate execution times;

applying the selected one parallelization conversion to the part of the source program; and,

converting a source program obtained by said applying step, into an object code representing the one group of parallel processes.

5,151,992

PERSONAL COMPUTER FOR CUTTING OFF POWER WHEN A LOCK MECHANISM OF HARD DISK PACK IS RELEASED

Akihito Nagae, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 1, 1990, Ser. No. 591,269
Claims priority, application Japan, Oct. 3, 1989, 1-258155
Int. Cl.[5] G06F *9/00, 1/00, 11/00*
U.S. Cl. 395—750 **8 Claims**

1. A computer system, comprising:

a power supply for supplying power to the computer system;

an external storage unit removably connected to said computer system;

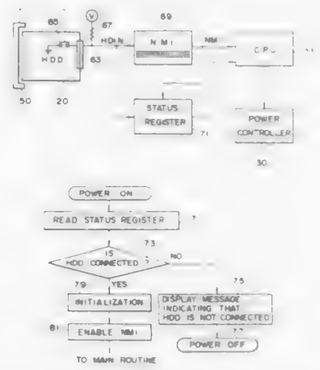
lock means for locking the external storage unit when it is attached to the computer system, and for releasing the external storage unit when it is removed from the computer system;

a switch turned on and off in response to the locking and releasing operations of the lock means, respectively;

specified signal generating means for outputting a specified signal in response to a state change of the switch means;

storage means for storing the attachment or detachment state of the external storage unit; and

control means, connected to the power supply and the specified signal generating means, for cutting off the power



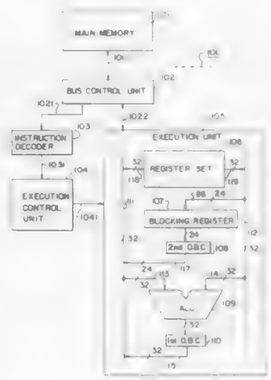
from the power supply supplied to the computer system in response to the specified signal.

5,151,993

DATA PROCESSOR PERFORMING OPERATION ON DATA HAVING LENGTH SHORTER THAN ONE-WORD LENGTH

Hitoshi Yamahata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,399
Claims priority, application Japan, Mar. 10, 1988, 63-56808
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—775 **10 Claims**



1. A data processor for processing operand data and updating one portion of a destination area with processed data while maintaining data stored in a remaining portion of said destination area, said data processor comprising:

an operation unit for processing data supplied thereto,

storage means for temporarily storing data supplied thereto,

register means having said destination area, means for supplying said operand data to said operation unit,

means coupled to said register means for supplying said storage means with data of said destination area including said data stored in said remaining portion of said destination area simultaneously with said operand data being supplied to said operation unit, said operation unit producing said processed data in response to said operand data,

a data bus,

first transfer means coupled between said operation unit and said data but for transferring onto one portion of said data bus one portion of said processed data corresponding to said one portion of said destination area,

second transfer means coupled between said storage means and said data bus for transferring onto a remaining portion of said data bus data stored in said storage means corresponding to said remaining portion of said destination area simultaneously with said first transfer means transferring said one portion of said processed data, and

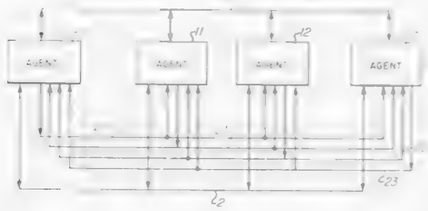
means for writing data on said data bus into said destination area.

5,151,994

DISTRIBUTED FAIR ARBITRATION SYSTEM USING SEPARATE GRANT AND REQUEST LINES FOR PROVIDING ACCESS TO DATA COMMUNICATION BUS

Ross M. Wille, Sunnyvale, and Richard J. Carter, Palo Alto, both of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 436,144, Nov. 13, 1989, abandoned.
This application Oct. 22, 1991, Ser. No. 780,578
Int. Cl.[5] G06F *9/46, 13/368*
U.S. Cl. 395—800 **16 Claims**



1. A method in a computing system for arbitrating access to a bus by a plurality of agents, the method comprising the steps of:

(a) maintaining a distributed priority access list in which each agent in the plurality of agents has a higher priority register which indicates the agent's relative priority level for obtaining access to the bus;

(b) when more than one agent from the plurality of agents requests access to the bus, obtaining bus access by an agent from among the agents requesting access which is highest on the distributed priority access list, including the following substeps

(b.1) signaling, by each agent requesting access to the bus, a request on a plurality of request lines, each of the plurality of request lines being coupled to each of the plurality of agents, and

(b.2) signaling on grant lines, by the agent from among the agents requesting access which is highest on the distributed priority access list, the identity of the agent from among the agents requesting access which is highest on the distributed priority access list, each of the grant lines being coupled to each of the plurality of agents and being separate from the request lines; and,

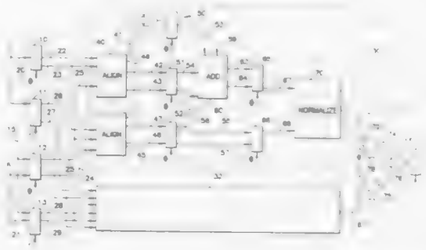
(c) once an agent from the plurality of agents has gained access to the bus, modifying each higher priority register to move the agent which gained access to the bottom of the distributed priority access list, wherein only the agent which gained access is moved lower on the distributed priority access list.

5,151,995

METHOD AND APPARATUS FOR PRODUCING SUCCESSIVE CALCULATED RESULTS IN A HIGH-SPEED COMPUTER FUNCTIONAL UNIT USING LOW-SPEED VLSI COMPONENTS

Susan J. Garcia, Eau Claire, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Continuation of Ser. No. 478,758, Feb. 12, 1990, abandoned, which is a continuation of Ser. No. 229,136, Aug. 5, 1988, abandoned. This application Nov. 28, 1990, Ser. No. 622,325
Int. Cl.[5] G06F *15/16, 1/06*
U.S. Cl. 395—800 **1 Claim**



1. A multipath functional unit for a computer operative for producing successive calculated results at the frequency of the system clock of the computer, comprising:

a system clock having a fixed frequency and having a single phase;

n path clocks each having a frequency which is equal to the frequency of the system clock of the computer divided by n and each path clock having a different phase;

n substantially identical data processing paths within a single functional unit for performing operations on operands applied thereto, wherein each data processing path comprises:

at least one purely combinational logic block having a propogation delay greater than the period of the system clock;

at least one input data latch connected to said purely combinational logic block and which is clocked by one of said path clocks;

at least on output data latch connected to said purely combinational logic block and which is clocked by the same path clock which clocks said input data latch;

data input means connected to the input data latch of each of said n plurality of substantially identical data processing paths for receiving operands at the frequency of the system clock;

data output means connected to the output data latch of each of said plurality of substantially identical data processing paths for producing results at the frequency of the system clock; and

each of said plurality of substantially identical data processing paths being clocked by a different path clock so as to send successive operands to different ones of said plurality of substantially identical data processing paths.

5,151,996

MULTI-DIMENSIONAL MESSAGE TRANSFER ROUTER

W. Daniel Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

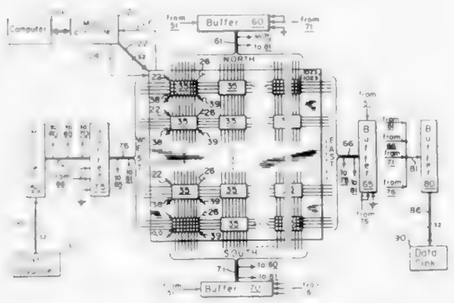
Division of Ser. No. 478,082, Feb. 9, 1990, which is a division of Ser. No. 184,739, Jun. 27, 1988, Pat. No. 5,088,815, which is a continuation of Ser. No. 499,474, May 31, 1983, Pat. No. 4,814,973. This application Mar. 20, 1990, Ser. No. 497,003
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—800 **14 Claims**

1. A router comprising a plurality of routing nodes (180, 200)

interconnected by a plurality of communications links (**38**, **39**) in a multi-dimensional pattern for transferring messages (FIG. **4**), each message including an address including a series of address digits each associated with one of the series of dimensions, each router node including:

A a plurality of message input circuits (**405**) each connected to one of said communications links of a selected dimension for receiving messages from another router node over that dimension;

B a plurality of message output circuits (**415**) each connected to one of said communications links of a selected dimension for transmitting messages to another route node over that dimension;



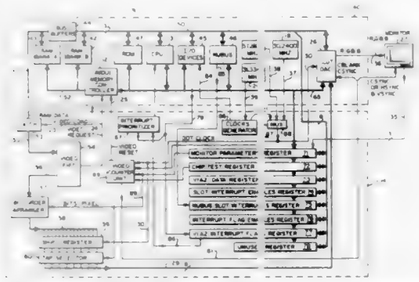
C a switch circuit (collection of cells **400**) for selectively coupling messages from said input circuits to said output circuits in accordance with the address, said switch circuit including a series of message coupling circuits (cells **400**) each associated with a dimension, each message coupling circuit being connected to the message output circuit of the associated dimension, the message input circuit of a preceding dimension and to the message coupling circuits of proximate dimensions, said message coupling circuits selectively coupling a message at the message input circuit to either the message output circuit or the message coupling circuit of a proximate dimension in response to the condition of the address digit associated with the dimension.

5,151,997

COMPUTER WITH ADAPTABLE VIDEO CIRCUITRY

Robert L. Bailey, San Jose, and Brian D. Howard, Menlo Park, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 10, 1989, Ser. No. 392,094
Int. Cl.[5] **G06F** *7/00*
U.S. Cl. 395—800 **19 Claims**



1. A computer which provides a video signal adaptable to different types of displays, said computer comprising:

a single central processing unit (CPU) which executes a program to provide video data for a given display;

a random-access memory (RAM) coupled to said CPU, a portion of said RAM storing said video data, wherein said RAM comprises a first bank and a second bank;

a video circuit coupled to said RAM for providing N bits of said video data per pixel to said given display at a predetermined rate, said video circuit sharing access to said RAM with said CPU, said video circuit comprises a first-in-first-out memory (FIFO) for temporarily storing said video data and a shift register coupled to said FIFO, said FIFO being divided into first and second halves, each half alternately receiving said video data from said first bank of said RAM and then loading previously received video data into said shift register, said shift register transferring N bits of said previously received video data per pixel to said given display at said predetermined rate;

a memory controller means for arbitrating access to said RAM by said CPU and said video circuit, said memory controller means assigning accesses to said RAM depending upon the particular video demands of said given display in a manner which optimizes the efficiency of said RAM, wherein said CPU is denied access to said RAM whenever said video circuit accesses said RAM;

a buffer means controlled by said memory controller means for decoupling said CPU from said first bank whenever said video circuit is accessing said first bank, said CPU retaining access to said second bank whenever said CPU is decoupled from said first bank;

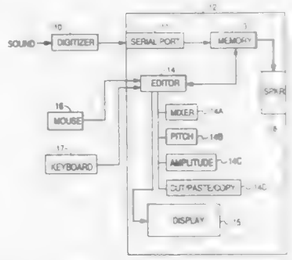
wherein said CPU, RAM, video circuit, memory controller means, and buffer means are housed on a single electronic circuit board.

5,151,998

SOUND EDITING SYSTEM USING CONTROL LINE FOR ALTERING SPECIFIED CHARACTERISTIC OF ADJACENT SEGMENT OF THE STORED WAVEFORM

Stephen P. Capps, San Carlos, Calif., assignor to Macromedia, Inc., San Francisco, Calif.

Filed Dec. 30, 1988, Ser. No. 292,299
Int. Cl.[5] **G11B** *27/28, 27/02, 7/36*
U.S. Cl. 395—800 **35 Claims**



1. A device for editing sounds comprising:

means for storing a sound waveform;

means for visually displaying the stored waveform;

means for editing the appearance of a predetermined portion of the visually displayed waveform by manipulation of said visually displayed waveform; and

means for changing the sound waveform stored in the means for storing in accordance with changes made in the visually displayed waveform by the means for editing;

wherein the means for storing stores a digital representation of the waveform, and the means for displaying displays an analog representation of the waveform; and

wherein the means for displaying comprises a display displaying the amplitude of the waveform along a first associated axis and time along a second associated axis;

and wherein the means for editing comprises:

means for displaying a sound characteristics control line adjacent to the displayed waveform; and

means for displacing at least one segment of the sound characteristics control line adjacent to the portion of the displayed waveform;

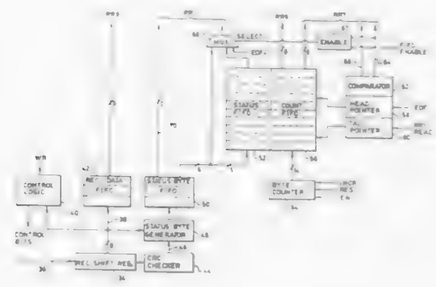
wherein the means for editing comprises means for altering a specified characteristic of a portion of the stored waveform corresponding to the portion of the displayed waveform adjacent to the displaced line segment.

5,151,999

SERIAL COMMUNICATIONS CONTROLLER FOR TRANSFER OF SUCCESSIVE DATA FRAMES WITH STORAGE OF SUPPLEMENTAL DATA AND WORD COUNTS

Teresa Marzucco, Waltham, Mass.; John Korpusik, Hudson, N.H., and Patricia A. Martin, Westford, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 846,337, Mar. 31, 1986, Pat. No. 4,942,515. This application Nov. 3, 1989, Ser. No. 431,607
The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.
Int. Cl.[5] **G06F** *13/00*
U.S. Cl. 395—800 **15 Claims**



1. Input/output (I/O) control circuitry for a data communication system for receiving sequential frames of incoming data words and transferring said data words to memory which is separate from said I/O control circuitry, said I/O control circuitry comprising:

means for generating supplemental data to be read from said I/O control circuitry, supplemental data being information which is different from but is associated with each frame of incoming data;

means for counting the number of words within each frame to provide a word count; and

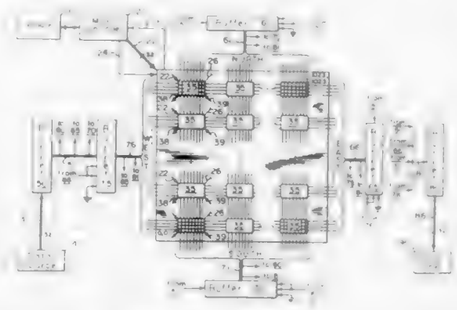
means, coupled to the means for generating and the means for counting, for storing said supplemental data and associated word counts with continued transfer of sequential frames of data to said memory, storage capacity in said I/O control circuitry for frames of data being limited such that successive frames of data are not stored in said I/O control circuitry but said supplemental data and word counts are stored and are available to be read from said I/O control circuitry after transfer of frames with which the supplemental data is associated.

5,152,000

ARRAY COMMUNICATIONS ARRANGEMENT FOR PARALLEL PROCESSOR

Daniel W. Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Division of Ser. No. 184,739, Jun. 27, 1988, Pat. No. 5,008,815, which is a continuation of Ser. No. 499,474, May 31, 1983, Pat. No. 4,814,973. This application Feb. 9, 1990, Ser. No. 478,082
Int. Cl.[5] **G06F** *15/80*
U.S. Cl. 395—800 **10 Claims**



1. A parallel computer comprising:

A. a plurality of integrated circuit chips (**35**) for connection in a chip array, each chip comprising:

i. a plurality of processors (**36**) each including data generation means (**280**, **287**) for generating data and data receiving means (**290**) for receiving data in parallel during a data transfer operation,

ii. a plurality of on-chip links for interconnecting the processors on each chip to form a processor array on said chip to facilitate the transfer of data generated by said processors in unison along selected directions in said processor array during a data transfer operation;

iii. a plurality of sets of selectively-energizable data transfer terminals (**104** and **117**, **110** and **118**, **106** and **119**), each set of data transfer terminals facilitating the transfer of data transmitted by the processors along an edge of the processor array defined on the chip, between chips along a selected direction in the chip array during a data transfer operation, at least one set of data transfer terminals (**106**) selectively facilitating the transfer of data from processors along at least two edges of the processor array defined on the chip in corresponding non-collinear directions in the chip array;

B. a plurality of communications links (**102**) connected between sets of data transfer terminals of respective chips to interconnect said chips to form the chip array, the communications link that is connected to the one set of data transfer terminals (**106**) of each chip being connected to sets of data transfer terminal (specifically, **104** and **110**) of each of at least two other chips along at least two non-collinear directions in said chip array to selectively facilitate the transfer of data therethrough with the at least two other chips that are connected thereto so that separate data transfer terminals are not required to accommodate data transfer operations along the two non-collinear directions by the processing elements along the respective two edges of the array; and

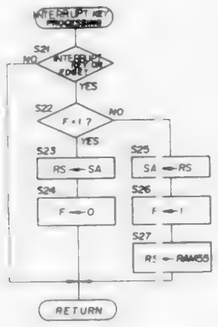
C. a control circuit for controlling the processors and selectively energizing the data transfer terminals of said integrated circuit chips in unison to facilitate the transfer of data in parallel by all processors along a selected direction in said processor array and said chip array during a data transfer operation.

5,152,001

COPYING APPARATUS THAT AUTOMATICALLY SETS MANUALLY INPUTTED CONDITIONS OF IMMEDIATELY PRECEDING INTERRUPT AS INITIAL COPY CONDITION FOR PRESENT INTERRUPT

Hiroyuki Hanamoto, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 110,412, Oct. 20, 1987, abandoned.
This application Jun. 25, 1990, Ser. No. 542,643
Claims priority, application Japan, Oct. 21, 1986, 61-251093
Int. Cl.[5] G06F *13/24*; G03G *15/00*
U.S. Cl. 395—800 5 Claims



1. A copying apparatus having an interrupt copying function for performing an interrupt copying operation by interrupting a normal copying operation, comprising:

input means for manually inputting copying conditions;

first memory means for storing said copying conditions inputted by said input means;

copying control means for performing the normal copying operation and the interrupt copying operation according to the copying conditions stored in the first memory means;

mode switching means for switching between a normal copying mode in which the normal copying operation is performed by said copying control means and an interrupt copying mode in which the interrupt copying operation is performed by said copying control means;

second memory means for temporarily saving the copying conditions of the normal copying operation interrupted by the interrupt copying operation;

third memory means for storing the copying conditions, including manually inputted copying conditions, of an immediately preceding interrupt copying operation performed by the copying control means;

means for temporarily saving in said second memory means, when the normal copying mode is switched to the interrupt copying mode by said mode switching means, the copying conditions stored in said first memory means, and for initially setting up in the first memory mean the copying conditions of the immediately preceding interrupt copying operation which are stored in said third memory means; and

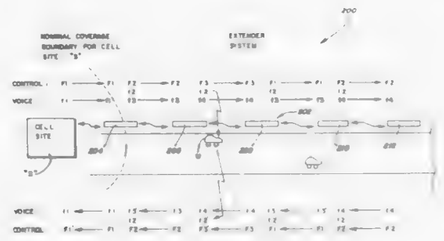
means for saving in the third memory means, when the interrupt copying mode is switched to the normal copying mode by said mode switching means, the copying conditions, including manually inputted copying conditions, stored in said first memory means, and for setting up the copying conditions stored in said second memory means in said first memory means, whereby copying conditions in a preceding interrupt copying mode are initially set in the first memory means when the interrupt copying mode is selected by the mode switching means.

5,152,002

SYSTEM AND METHOD FOR EXTENDING CELL SITE COVERAGE

Samuel A. Leslie, Forest, and Robert T. Gordon, Lynchburg, both of Va., assignors to Orion Industries, Inc., Solon, Ohio

Division of Ser. No. 81,120, Aug. 3, 1987, Pat. No. 4,941,200.
This application Feb. 13, 1990, Ser. No. 479,511
Int. Cl.[5] H04B *7/14, 7/15*
U.S. Cl. 455—11.1 4 Claims



1. An apparatus for extending a primary coverage area of a cell site transceiver in a cellular radio telephone system so that a movable cellular transceiver in communication with the cell site can move out of the primary coverage area into an extended area while continuing to remain in communication with the cell site transceiver, wherein the primary coverage area consists of the intended coverage area of the cell site transceiver, the apparatus comprising:

a first bidirectional cellular booster in radio frequency communication with the cell site transceiver and with a booster coverage area that overlaps the primary coverage area only in part with said booster including means for communicating with a movable transceiver in said booster coverage area but outside of the primary coverage area of the cell site transceiver;

a plurality of series coupled, substantially identical cellular boosters with each said booster having a respective coverage area outside of the primary coverage area and overlapping a said coverage area of at least one adjacent member of said plurality with each member of said plurality including means for communicating with the movable transceiver in said respective booster coverage area and outside of the primary coverage area of the cell site transceiver as well as means for transferring the movable transceiver from one booster in said plurality to an adjacent booster in said plurality in response to the movable transceiver moving from said coverage area of said one booster into said coverage area of said adjacent booster; and

with a selected member of said plurality having a booster coverage area that overlaps, at least in part, said coverage area of said first bidirectional booster.

5,152,003

RECORD MESSAGE DELIVERY SYSTEM

Neil Poch, Toronto, Canada, assignor to Tour-Mate Systems Canada Limited, Toronto, Canada

Continuation of Ser. No. 422,812, Oct. 18, 1989, abandoned.
This application Nov. 22, 1991, Ser. No. 799,731
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—18 11 Claims

1. A system for the delivery of pre-recorded messages in response to selection by a listener, comprising:

recorded messages stored in a computer memory, each message being present in a plurality of languages, and each message irrespective of its language being associated with a message identification datum;

a transmitter settable to transmit each message on separate non-interfering frequencies in a locality cell, each of the messages in different languages being transmitted on separate non-interfering frequencies in each locality cell;

at least one receiver, each receiver including a programmable and reprogrammable computer microchip and having a plurality of receiving channels each for reception of a particular frequency, the receiver being programmable and reprogrammable for reception of particular frequencies associated with any messages in a chosen one of the languages; and

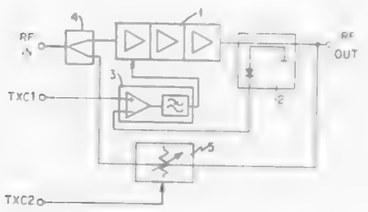
manually operable selection means to select a particular reception channel in accordance with a message identification datum, thereby to receive in the chosen language the message associated with the message identification datum.

5,152,004

PROCEDURE FOR FORMING LOW POWER LEVELS IN A RADIO TELEPHONE TRANSMITTER

Risto Väisänen; Jukka Sarasmo, and Vesa Pekkarinen, all of Salo, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Apr. 30, 1990, Ser. No. 516,762
Claims priority, application Finland, May 12, 1989, 892314
Int. Cl.[5] H04B *1/04*
U.S. Cl. 455—68 11 Claims



1. A circuit for forming lower power levels in a transmitter of a radio telephone, in which a radio frequency signal (RF signal) is conducted through an amplifier stage to an output of the transmitter, comprising:

a source divider for dividing the RF signal which is before the amplifier stage (1) into two branches;

means for forming high power levels by conducting in one of the branches the RF signal into said amplifier stage (1) by which the high power levels are formed;

means for forming low power levels by conducting in the other of the branches the RF signal to an element (b) by which the low power levels are produced; and

means for combining said branches in the output (RFout) of the transmitter, the high power levels each having a magnitude greater than each of the low power levels, each of the means for forming high power levels and the means for forming low power levels receiving respective control signals derived from control logic of the radio telephone so as to allow the means for forming low power levels to conduct the RF signal to the element and thereby bypass the amplifier stage when low power levels are desired and so as to allow the means for forming high power levels to conduct the RF signal into the amplifier stage when high power levels are desired.

5,152,005

HIGH RESOLUTION FREQUENCY SYNTHESIS

Robert H. Bickley, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 468,440, Jan. 22, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 774,173
Int. Cl.[5] H04B *1/40, 17/02*; H03L *7/00*
U.S. Cl. 455—76 37 Claims

26. A frequency synthesizer of output frequency Fo, comprising:

means for receiving a first signal of a first frequency;

means for receiving a second signal of a second frequency and generating therefrom another frequency proportional to the second frequency divided by a first number;

first circuit means for receiving the another frequency and providing a third frequency proportional to a product of the another frequency by a second number;

second circuit means for combining the first and third frequencies to provide a fourth frequency proportional to a sum of the first and third frequencies; and

third circuit means for receiving the fourth frequency and providing output frequency Fo which is proportional to a product of the fourth frequency times the first number.

5,152,006

RECEIVER CONTROLLER METHOD AND APPARATUS

Thomas R. Klaus, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1991, Ser. No. 660,195
Int. Cl.[5] H04B *1/38, 1/16*
U.S. Cl. 455—89 8 Claims

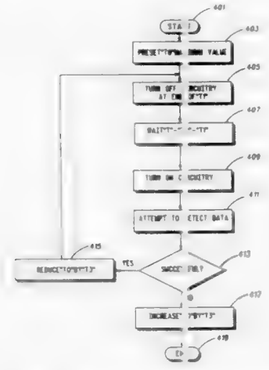
1. A method of adaptively controlling a radio receiver's on-time, the receiver circuitry including a data detector, a mixer and a frequency synthesizer, and receiving a first of a plurality of radio frequency signals, the radio frequency signals being received for a first predetermined time period at intervals of a second predetermined time period, the method comprising the steps of:

setting a first time parameter to a third predetermined time period;

turning off the radio receiver at the end of the first time period;

subtracting the sum of the magnitude of the first predetermined time period and the magnitude of said first time

parameter from the magnitude of the second predetermined time period, forming a second time parameter;
waiting a length of time equal to said second time parameter;
turning on the radio receiver circuitry;



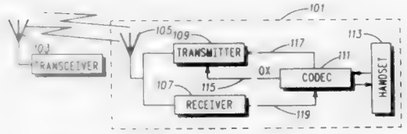
attempting to detect data from the received radio frequency signals; and
increasing said first time parameter by a fourth time period when data is not detected.

5,152,007

METHOD AND APPARATUS FOR DETECTING SPEECH

Juan R. Uribe, Brookfield, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 23, 1991, Ser. No. 690,033
Int. Cl.[5] H01Q *11/12*; H04M *11/04*
U.S. Cl. 455—116 **7 Claims**



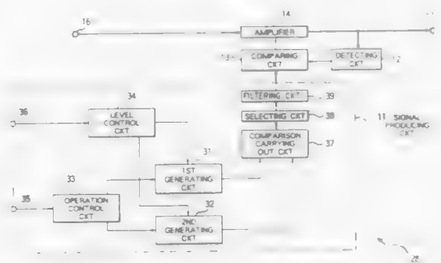
1. A method of generating a first signal representing the detection of speech on a second signal having background noise, a magnitude, a zero crossing rate and is divided in time by frames having a predetermined time period, the method comprising the steps of:
characterizing, in absence of speech, the background noise of the second signal comprising the steps of:
computing an average of the magnitude of the second signal for a second predetermined number of frames, and
computing an average of the zero crossing rate of the second signal for said second predetermined number of frames;
computing background noise magnitude and zero crossing rate thresholds for the second signal;
computing an average of the magnitude of the second signal for a first frame;
computing a zero crossing rate of the second signal for said first frame;
comparing said average of the magnitude of the second signal to said background noise magnitude threshold;
comparing said zero crossing rate of the second signal to said background noise zero crossing rate threshold; and
generating, upon said average of the magnitude or said zero crossing rate consecutively exceeding said background noise threshold a first predetermined number of frames, the first signal.

5,152,008

SIGNAL CONTROL APPARATUS CAPABLE OF READILY CHANGING AN APPARATUS OUTPUT SIGNAL

Tsuguo Hori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1991, Ser. No. 648,689
Claims priority, application Japan, Jan. 30, 1990, 2-17718; Jan. 30, 1990, 2-20324
Int. Cl.[5] H04B *1/04*
U.S. Cl. 455—127 **5 Claims**



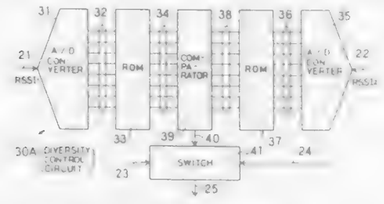
2. A signal control apparatus for controlling an apparatus input signal to produce an apparatus output signal, including signal producing means for producing a reference signal, detecting means for detecting said apparatus output signal to produce an output waveform signal representative of a waveform of said apparatus output signal, comparing means for comparing said output waveform signal with said reference signal to produce a difference signal representative of a difference between said output waveform signal and said reference signal, and signal processing means for processing said apparatus input signal into said apparatus output signal under control of said difference signal, wherein said signal producing means comprises:
signal generating means for generating a plurality of original waveform signals which have signal levels, respectively;
internal producing means connected to said generating means for producing said reference signal in accordance with a selected one of said original waveform signals, said internal producing means comprising:
comparison carrying out means connected to said signal generating means for carrying out comparison among said signal levels to produce a result signal representative of said comparison;
selecting means connected to said comparison carrying out means for selecting, as a selected signal, one of said original waveform signals with reference to said result signal; and
internal processing means connected to said selecting and said comparing means for processing said selected signal into said reference signal.

5,152,009

DIVERSITY RECEPTION CONTROL CIRCUIT

Kazuyoshi Sato, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,522
Claims priority, application Japan, Aug. 8, 1989, 1-205253
Int. Cl.[5] H04B *17/02, 17/00, 7/00*
U.S. Cl. 455—134 **17 Claims**



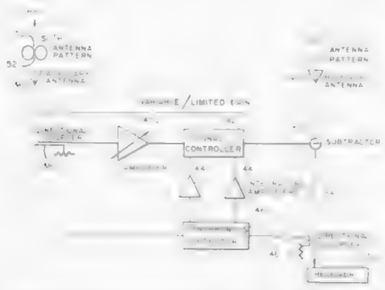
1. A diversity control circuit comprising:
a plurality of antennas positioned at a distance apart from each other so as to be exposed to different receiving electric field strengths of a transmitted signal;
a plurality of measuring systems each connected to one of said antennas for measuring the receiving electric field strength of each of said antennas and providing measuring signals to permit selection of the antenna positioned in the strongest receiving electric strength location;
said measuring systems including receiving systems for demodulating and detecting radio signals received by said antennas to provide said measuring signals;
correction means connected to at least one of said measuring systems for modifying the response thereof and providing a corrected response whereby the output signal of said at least one measuring system is corrected to conform to a preselected relationship relative to the input thereof over an operating range of input signal levels;
said correction means including A/D conversion means for converting said measuring signals into digital values and memory means storing correction data and having address inputs connected to respond to said digital values of said measuring signals;
comparison means for comparing the relative levels of the outputs of said measuring systems; and
switching means responsive to said comparison means for making electrical connection to the antenna determined by said comparison means to be in the strongest receiving electric strength location.

5,152,010

HIGHLY DIRECTIVE RADIO RECEIVER EMPLOYING RELATIVELY SMALL ANTENNAS

Ashok K. Talwar, Westlake Village, Calif., assignor to American Nucleonics Corporation, West Lake Village, Calif.

Filed Dec. 29, 1989, Ser. No. 458,842
Int. Cl.[5] H04B *17/02, 7/00*
U.S. Cl. 455—136 **5 Claims**



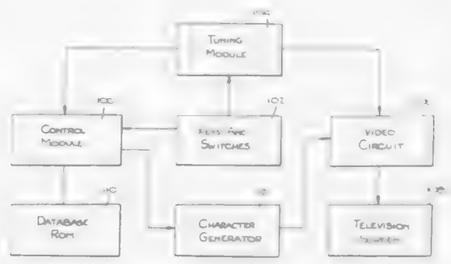
1. A narrow beamwidth radio receiver, which comprises:
a receiver antenna, the receiver antenna being of the omnidirectional type;
a receiver;
a receiver transmission line electrically coupling the receiver antenna to the receiver;
an auxiliary antenna, the auxiliary antenna having at least one null in the auxiliary antenna pattern;
a first directional coupler electrically coupled to the auxiliary antenna;
a second directional coupler electrically coupled to the receiver transmission line;
a synchronous detector electrically coupled to the first and second directional couplers, the first directional coupler providing a portion of a reference signal to the synchronous detector, and the second directional coupler providing a sample signal to the synchronous detector, the synchronous detector comparing the reference signal with the sample signal and providing at least one detector output signal in response to the comparison thereof;
at least one integrator/amplifier, the integrator/amplifier providing a control signal in response to the detector output signal;
variable amplification means, the variable amplification means being electrically coupled to the first directional coupler and providing a variably amplified reference signal in response to the reference signal provided by the first directional coupler;
a signal controller, the signal controller being electrically coupled to the variable amplification means and to the integrator/amplifier and providing a cancellation signal in response to the amplified reference signal and the control signal; and
a subtractor, the subtractor being electrically coupled to the signal controller and to the receiver transmission line and effectively injecting the cancellation signal into the receiver transmission line for reducing the power of any signals received outside of a predetermined angle from the center of the null of the auxiliary antenna to effectively provide the radio receiver with a narrow beamwidth;
the variable amplification means being adjustable in gain to vary and control the effective beamwidth of the radio receiver.

5,152,011

BROADCAST RECEIVER CAPABLE OF AUTOMATIC STATION IDENTIFICATION AND FORMAT-SCANNING BASED ON AN INTERNAL DATABASE UPDATABLE VIA DATA RECEPTION OVER THE AIRWAVES

Pierre R. Schwob, 257 Central Park W., New York, N.Y. 10024-4108

Continuation-in-part of Ser. No. 515,629, Apr. 27, 1990, which is a continuation-in-part of Ser. No. 212,863, Jun. 29, 1988, Pat. No. 4,969,209, which is a continuation-in-part of Ser. No. 78,286, Jul. 27, 1987. This application Jun. 19, 1990, Ser. No. 540,130
Int. Cl.[5] H04B *1/08*
U.S. Cl. 455—158.5 **10 Claims**



1. A broadcast receiver system comprising:
a receiver for receiving a plurality of frequencies broadcast from a plurality of geographic regions;

tuning means for tuning said receiver to one of the plurality of broadcast frequencies for reception thereof;

memory means for storing a database of information in one or more band files relating to frequencies broadcast into each of the plurality of geographic regions, said information including data identifying attributes of each frequency broadcast into each geographic region;

input means for inputting a geographic region corresponding to a location of said broadcast receiver system and a datum representing a desired attribute;

searching means responsive to the inputted geographic region and the inputted datum representing the desired attribute for searching said one or more band files for a frequency broadcast into the geographic region of said broadcast receiver system having the desired attribute;

display means for displaying the frequency and the desired attribute for the broadcast frequency identified by said searching means; and

data receiving means for receiving updating data to update said database in said memory means.

5,152,012

BROADCAST RECEIVER CAPABLE OF AUTOMATICALLY UPDATING LOCATION AND PERFORMING SPIRAL SEARCHING

Pierre R. Schwob, 257 Central Park West, New York, N.Y. 10024-4108

Continuation-in-part of Ser. No. 212,863 Jun. 29, 1988, Pat. No. 4,969,209, which is a continuation-in-part of Ser. No. 078,286, Jul. 27, 1987, abandoned. This application Apr. 27, 1990, Ser. No. 515,629

Int. Cl.[5] H04B 1/ 6

U.S. Cl. 455—158.5 **20 Claims**

1. A broadcast receiver system comprising:

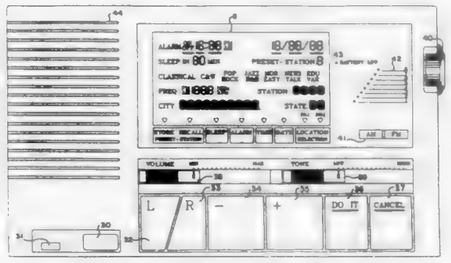
a receiver for receiving a plurality of frequencies broadcast from a plurality of geographic regions;

tuning means for tuning said receiver to one of the plurality of broadcast frequencies for reception thereof;

memory means for storing a database of information in one or more band files relating to frequencies broadcast into each of the plurality of geographic regions, said information including data identifying attributes of each frequency broadcast into each geographic region;

input means for inputting a geographic region corresponding to a location of said broadcast receiver system and a datum representing a desired attribute;

searching means responsive to the inputted geographic region and desired attribute for searching said one or more band files for frequencies broadcast into the geographic



region of said broadcast receiver system having the desired attribute; and

display means for displaying the frequency and the attribute data for a broadcast frequency identified by said searching means.

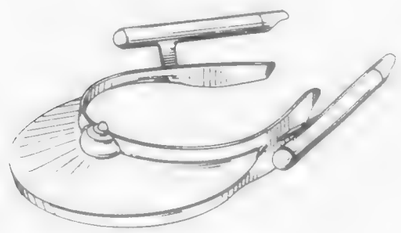
DESIGN PATENTS

GRANTED September 29, 1992

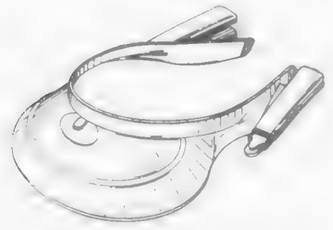
ERRATA

For CLASS	See PATENT NO.
D21-220	329,904
D21-220	9905
D21-219	9906
D22-141	9907
D22-142	9908
D22-142	9909
D23-215	9910
D23-250	9911
D23252	329,912

329,729
VISOR
Robert E. Coyle, 542 E. Broadway, Mesa, Ariz. 85204
Filed Nov. 23, 1990, Ser. No. 617,540
Term of patent 14 years
U.S. Cl. D2—248



329,730
VISOR
Robert E. Coyle, 542 E. Broadway, Mesa, Ariz. 85204
Filed Nov. 23, 1990, Ser. No. 617,541
Term of patent 14 years
U.S. Cl. D2—248



329,731
SANDAL
Bob E. Adcock, 20564 Exbury Pl., Covina, Calif. 91723, and Edwin C. Laird, 9660 Rindge Cir., Fountain Valley, Calif. 92708

Filed Aug. 29, 1990, Ser. No. 574,256
Term of patent 14 years
U.S. Cl. D2—270

329,732
HEEL CUP
John L. Molet, 1940 Phillips, Northglenn, Colo. 80233; Andrew J. Harrison, deceased, late of Denver, and by Sara L. Harrison, legal representative, 3601 Monroe St., Denver, Colo. 80205

Filed Sep. 27, 1990, Ser. No. 589,192
Term of patent 14 years
U.S. Cl. D2—277

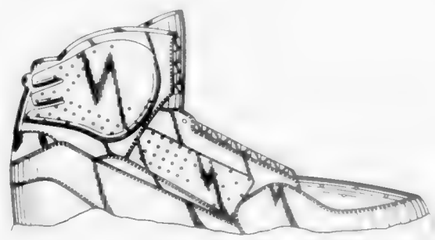
329,733
TONGUE ELEMENT OF A SHOE UPPER
David E. Miller, Carver; Paul D. Brown, Hingham; Andrew R. Jones, Roslindale, and Eric D. Cohen, Boston, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Division of Ser. No. 370,291, Jun. 23, 1989, Pat. No. Des. 307,508. This application Dec. 11, 1989, Ser. No. 448,583
Term of patent 14 years
U.S. Cl. D2—314

329,734
SHOE UPPER
David J. Preskar, North Quincy, and Paul D. Brown, Hingham, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 11, 1991, Ser. No. 713,325
Term of patent 14 years
U.S. Cl. D2—314

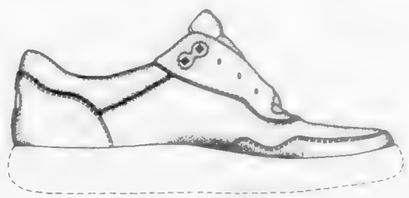
329,735
SHOE UPPER
Janelle Dahlsten, Lake Oswego, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Dec. 4, 1991, Ser. No. 802,425
Term of patent 14 years
U.S. Cl. D2—314

329,736
SHOE UPPER
Robert Byrne, Hermosa Beach, and James Agnew, Lakeview Terrace, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Filed Oct. 7, 1991, Ser. No. 772,025
Term of patent 14 years
U.S. Cl. D2—314

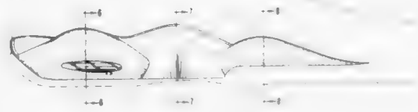
329,737
SHOE UPPER
Brian Elliot, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., Beaverton, Oreg.
Filed Oct. 10, 1991, Ser. No. 774,278
Term of patent 14 years
U.S. Cl. D2—314



329,738
SHOE UPPER
Peter C. Keen, N. Andover, Mass., assignor to The Rockport Company, Inc., Marlboro, Mass.
Filed Dec. 19, 1991, Ser. No. 810,028
Term of patent 14 years
U.S. Cl. D2—314

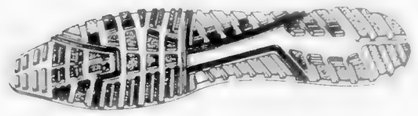


329,739
SHOE MIDSOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,463
Term of patent 14 years
U.S. Cl. D2—318



329,740
SHOE SOLE
Junichi Kiyosawa, Kobe, and Toshikazu Ujishima, Higashi-Osaka, both of Japan, assignors to Asics Corporation, Hyogo, Japan
Filed Sep. 11, 1990, Ser. No. 580,910
Claims priority, application Japan, Mar. 17, 1990, 2-9052
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320

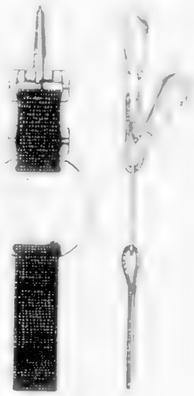
329,741
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Dec. 21, 1990, Ser. No. 631,781
Claims priority, application Japan, Jul. 3, 1990, 2-22619
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320



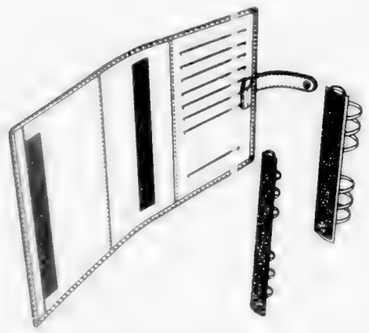
329,742
SHOE SOLE
Robert Byrne, Hermosa Beach, and James Agnew, Lakeview Terrace, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Filed Oct. 7, 1991, Ser. No. 772,023
Term of patent 14 years
U.S. Cl. D2—320

329,743
SKI BAG
Keith D. Heisick, 2212 William Tell Rd., St. Paul, Minn. 55119
Filed Feb. 16, 1990, Ser. No. 480,530
Term of patent 14 years
U.S. Cl. D3—36

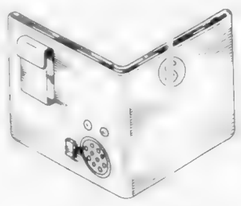
329,744
GOLF BAG TAG AND GLOVE HOLDER ATTACHMENT
Joseph A. Moore, Atlanta, Ga., assignor to Hang 5, Inc., Atlanta, Ga.
Filed Mar. 30, 1990, Ser. No. 502,025
Term of patent 14 years
U.S. Cl. D3—37



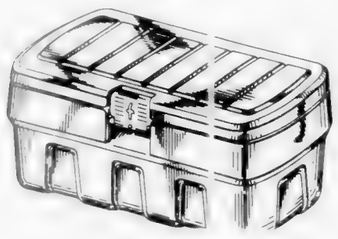
329,745
PERSONAL ORGANISER
Dermot C. O'Brien, 34 Roland Gardens, London SW7 3PL, England
Filed Feb. 1, 1990, Ser. No. 474,592
Claims priority, application United Kingdom, Aug. 9, 1989, 2000129
Term of patent 14 years
U.S. Cl. D3—56



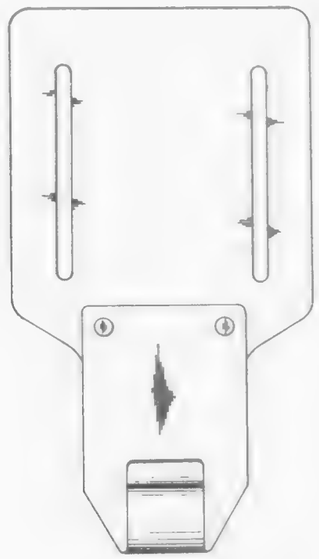
329,746
SECURE WALLET
Richard McGallaird, 6101 Whitby Rd., #1207, San Antonio, Tex. 78240
Filed Jul. 12, 1990, Ser. No. 551,606
Term of patent 14 years
U.S. Cl. D3—56



329,747
STORAGE LOCKER
Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 26, 1990, Ser. No. 558,841
Term of patent 14 years
U.S. Cl. D3—78

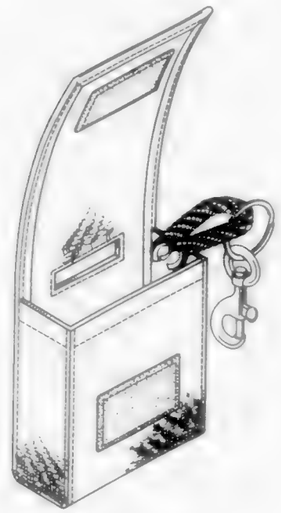


329,748
BELT ATTACHABLE TOOL HOLDER
Thomas O. Ehlin, 7138 Sanddollar St., Coos Bay, Oreg. 97420
Filed Jul. 30, 1990, Ser. No. 559,883
Term of patent 14 years
U.S. Cl. D3—105

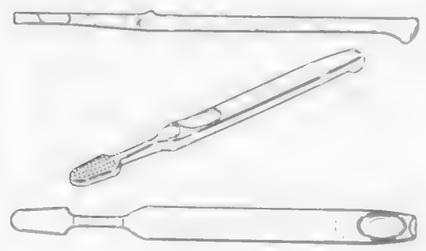


329,749
RADIO PAGER CARRYING CASE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 27, 1990, Ser. No. 559,880
Term of patent 14 years
U.S. Cl. D3—106

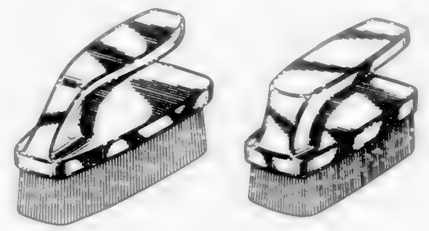
329,750
PAGER CARRYING CASE
John A. Gilmore, and Leslie C. Gilmore, both of 4934 S. Evanston St., Aurora, Colo. 80015
Filed Oct. 19, 1990, Ser. No. 600,234
Term of patent 14 years
U.S. Cl. D3—106



329,751
TOOTHBRUSH HEAD AND HANDLE UNIT
Anthony Booth, Chester; Anthony Piano, Sparta; Byron Woodrum, Flemington; Michael J. Allsop, West Windsor, all of N.J.; Robert L. Berger, New Hope, Pa., and Richard M. Hyman, Sr., Iowa City, Iowa, assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 24, 1990, Ser. No. 514,495
Term of patent 14 years
U.S. Cl. D4—104



329,752
SCRUB BRUSH
Kent W. Murphy, Wooster, Ohio, and Joseph Lapin, Montreal, Canada, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 2, 1990, Ser. No. 548,725
Term of patent 14 years
U.S. Cl. D4—129

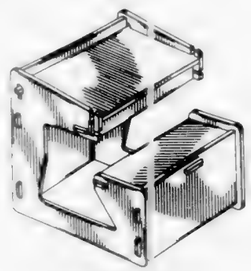


329,753
CHEVAL MIRROR
Frederick Delafield, 2406 Goldfield Ct., Greensboro, N.C. 27408
Filed Oct. 18, 1991, Ser. No. 779,564
Term of patent 14 years
U.S. Cl. D6—311

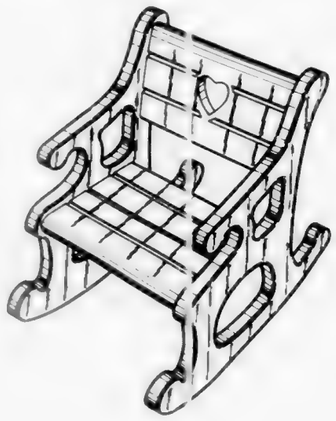
329,754
GARMENT HANGER
Stanley F. Gouldson, Northport, N.Y., and David Marshall, East Doncaster, Australia, assignors to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Sep. 14, 1990, Ser. No. 583,028
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—326

329,755
GARMENT HANGER
Stanley F. Gouldson, Northport, N.Y., assignor to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Sep. 14, 1990, Ser. No. 583,343
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—326

329,756
COMBINED DESK AND BENCH UNIT
Paul J. Gandy, Tuscon, Ariz., assignor to MUPI Children Products Inc., Marana, Ariz.
Filed May 8, 1989, Ser. No. 349,331
Term of patent 14 years
U.S. Cl. D6—338

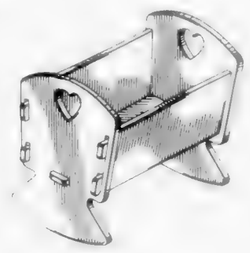


329,757
CHILD'S ROCKER
Paul K. Meeker, 113 W. Mennoni e Rd., Aurora, Ohio 44202, assignor to Paul K. Meeker, Aurora, Ohio
Filed Oct. 16, 1989, Ser. No. 422,916
Term of patent 14 years
U.S. Cl. D6—348

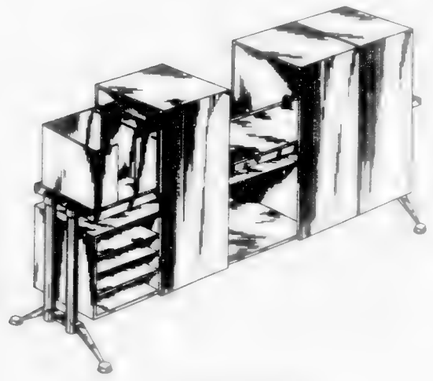


329,758
CHILD'S BENCH SEAT
Paul K. Meeker, Aurora, Ohio, assignor to Paul K. Meeker, Aurora, Ohio
Filed Oct. 16, 1989, Ser. No. 422,919
Term of patent 14 years
U.S. Cl. D6—381

329,759
CRIB
Paul J. Gandy, Tucson, Ariz., assignor to MUPi Children's Products, Tucson, Ariz.
Filed Nov. 13, 1989, Ser. No. 434,834
Term of patent 14 years
U.S. Cl. D6—385



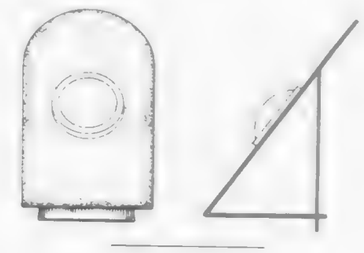
329,760
COMBINED STORAGE SHELF AND SLIDABLE CABINET UNIT
Urs Greutmann, and Carmen Greutmann, both of Zürich, Switzerland, assignors to Deaz Design, Kempten, Switzerland
Filed Mar. 26, 1990, Ser. No. 499,826
Claims priority, application Switzerland, Sep. 25, 1989, 117,742
Term of patent 14 years
U.S. Cl. D6—397



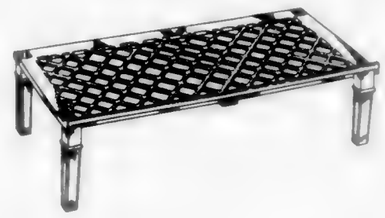
329,761
SEAT ATTACHABLE UMBRELLA SUPPORT
Raymond J. Pieper, 1386 Reale Ave., St. Louis, Mo. 63138
Filed May 11, 1989, Ser. No. 350,327
Term of patent 14 years
U.S. Cl. D6—416

329,762
COPYHOLDER
Andrew J. Weeks, 137 Old Ford End Rd., Queens Park, Bedford MK40 4 NG, England
Filed May 30, 1989, Ser. No. 359,053
Claims priority, application United Kingdom, Dec. 1, 1988, 1055352
Term of patent 14 years
U.S. Cl. D6—419

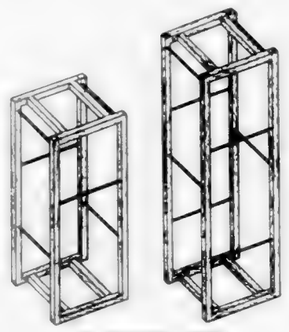
329,763
JEWELRY DISPLAY STAND
Raymond J. Caminale, New York, N.Y., assignor to Art Deco, Inc., Boca Raton, Fla.
Filed Jul. 25, 1990, Ser. No. 557,510
Term of patent 14 years
U.S. Cl. D6—429



329,764
SHOE RACK
David Evans, Acton, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Division of Ser. No. 324,336, Mar. 16, 1989, Pat. No. D. 323,259. This application Aug. 26, 1991, Ser. No. 734,876
Term of patent 14 years
U.S. Cl. D6—462

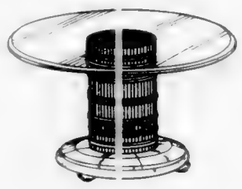


329,765
HANGER BAR DISPLAY STAND
Robert Ackley, Brewerton, N.Y.; Stanleigh Wells, Bridgewater, Conn.; Robert Beehner, East Syracuse, and James Dokoupil, Liverpool, both of N.Y., assignors to The Croydon Company, Inc., Liverpool, N.Y.
Filed Oct. 30, 1990, Ser. No. 605,479
Term of patent 14 years
U.S. Cl. D6—465



329,766
STORAGE UNIT FOR TOOLS
Bruce Ancona, and Jane Ancona, both of New York City, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Feb. 28, 1991, Ser. No. 486,716
Term of patent 14 years
U.S. Cl. D6—467

329,767
TABLE
Winsor D. White, Chicago, Ill., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Jun. 29, 1989, Ser. No. 374,390
Term of patent 14 years
U.S. Cl. D6—486

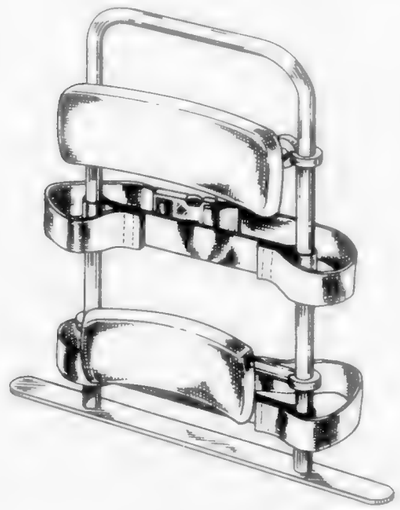


329,768
TABLE BASE
Alfred J. Intardonato, 271 Skip La., Bay Shore, N.Y. 11706
Filed Mar. 21, 1991, Ser. No. 673,106
Term of patent 14 years
U.S. Cl. D6—495

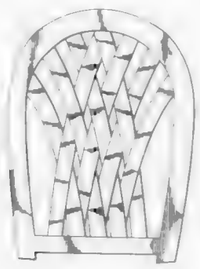
329,769
FURNITURE BASE
Leo Martin, Coconut Grove, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.
Filed May 3, 1990, Ser. No. 518,204
Term of patent 14 years
U.S. Cl. D6—497

329,770
ARMREST FOR A CHAIR
Fredrich W. Grahl, Coldwater, Mich., and Jack Litewka, Seattle, Wash., assignors to Grahl Industries, Inc., Coldwater, Mich.
Filed Feb. 2, 1989, Ser. No. 305,496
Term of patent 14 years
U.S. Cl. D6—501

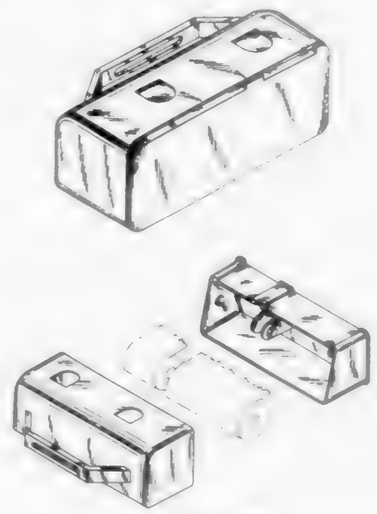
329,771
ADJUSTABLE BACKREST
Dennis Zacharkow, 1532 - 10th St. SE., Apt. 6-C, Rochester, Minn. 55904
Filed Aug. 24, 1989, Ser. No. 398,097
Term of patent 14 years
U.S. Cl. D6—502



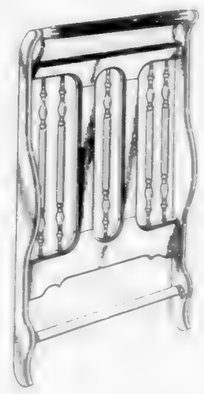
329,772
OPENWORK DESIGN FOR SEAT BACKS
Manfred Hubert, Meylan, France, assignor to Allibert S.A., Grenoble, France
Filed May 18, 1990, Ser. No. 524,823
Claims priority, application World Int. Prop. O., Nov. 20, 1989, DM/015120
Term of patent 14 years
U.S. Cl. D6—502



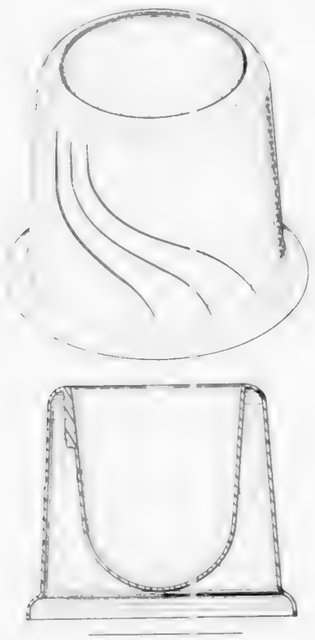
329,773
DISPENSER FOR ROLLED MATERIAL
F. Clark Addison, 3804 W. Eisenhower Ave., Loveland, Colo. 80537, and Peder J. Thorstensen, P.O. Box 1025, Loveland, Colo. 80539
Filed Apr. 26, 1990, Ser. No. 514,572
Term of patent 14 years
U.S. Cl. D6—520



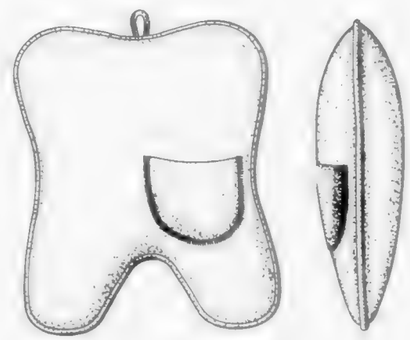
329,774
CRIB ENDBOARD
Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Mar. 27, 1990, Ser. No. 500,264
Term of patent 14 years
U.S. Cl. D6—508



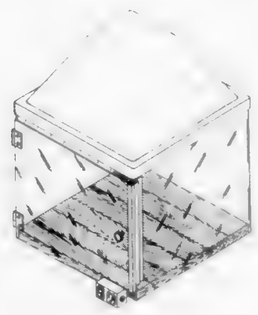
329,775
TOILET BOWL BRUSH HOLDER
Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 25, 1990, Ser. No. 528,778
Term of patent 14 years
U.S. Cl. D6—551



329,777
PILLOW
Bernadette M. Picco, 821 Countrywood Pl., Fort Wayne, Ind. 46845
Filed Oct. 3, 1990, Ser. No. 592,062
Term of patent 14 years
U.S. Cl. D6—601

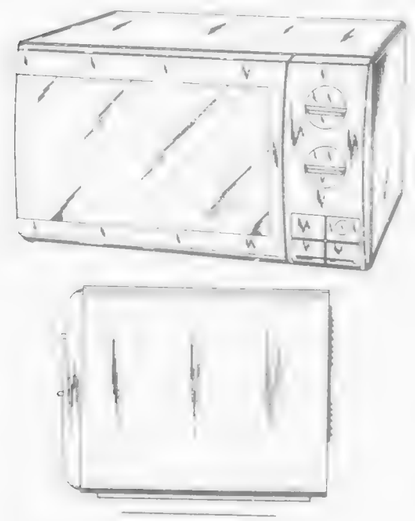


329,778
PIZZA WARMER
Jimmy W. Easterling, and Michael Cooper, both of Clanton, Ala., assignors to Wayne Industries, Inc., Clanton, Ala.
Filed Sep. 18, 1989, Ser. No. 408,791
Term of patent 14 years
U.S. Cl. D7—323

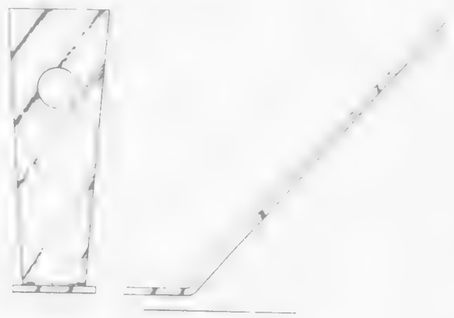


329,77[illegible]
KITCHEN ARTICLES HOLDER
Mark Ma, 1415 Martens Dr., Hammond, La. 70401
Filed Jul. 27, 1990, Ser. No. 558,396
Term of patent 14 years
U.S. Cl. D6—570

329,779
MICROWAVE OVEN
Philippe Piret, Cormelles-Le-Royal, France, assignor to Moulinex Societe Anonyme, Bagnolet, France
Filed Sep. 11, 1990, Ser. No. 580,872
Claims priority, application France, May 2, 1990, 90 2841
Term of patent 14 years
U.S. Cl. D7—351

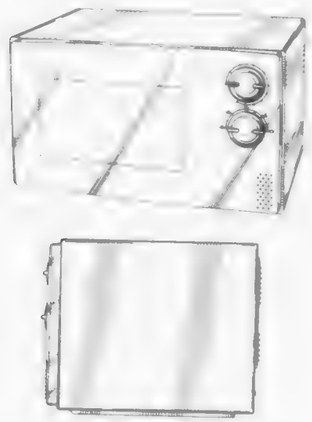


329,781
HOLDER FOR WINE BOTTLE AND THE LIKE
Kuniro Ito, No. 4-6, Nihonbashi Ningyo-cho 1-chome, Chuo-ku, Tokyo, Japan
Filed Oct. 22, 1990, Ser. No. 602,974
Term of patent 14 years
U.S. Cl. D7—619

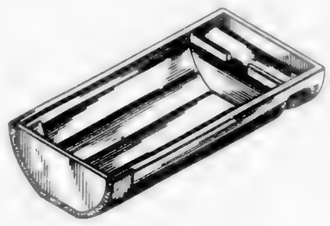


329,782
COVERED CONTAINER
JoEllen N. Narsutis, Oak Park, Ill., assignor to Kraft General Foods, Inc., Northfield, Ill.
Filed Dec. 14, 1990, Ser. No. 628,730
Term of patent 14 years
U.S. Cl. D7—629

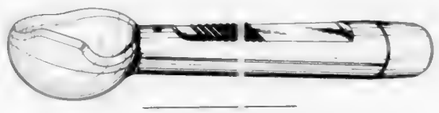
329,780
MICROWAVE OVEN
Philippe Piret, 1876, route de Bretteville, F-14123 IFS, France
Filed Apr. 24, 1991, Ser. No. 690,803
Claims priority, application France, Oct. 26, 1990, 90 6718
Term of patent 14 years
U.S. Cl. D7—351



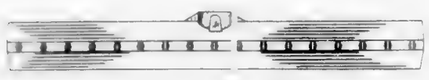
329,783
HOLDER FOR A GRATER OR THE LIKE
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 23, 1990, Ser. No. 465,001
Term of patent 14 years
U.S. Cl. D7—641



329,78[illegible]
ICE CREAM SCOOP
Joseph F. Wong, Kowloon, Hong Kong, assignor to Motor Electric Mfg. C., Ltd., Hong Kong
Filed Jan. 17, 1990, Ser. No. 466,688
Term of patent 14 years
U.S. Cl. D7—681

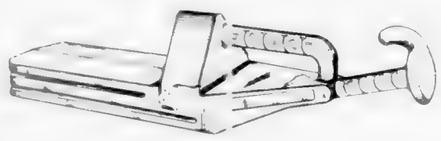


329,7[illegible]5
SAND RAKE HEAD
Alexander Colonello, 2756 Assiniboine Ave., Winnipeg, Manitoba, Canada R3J 0B1
Filed Apr. 23, 1990, Ser. No. 516,825
Term of patent 14 years
U.S. Cl. D8—13

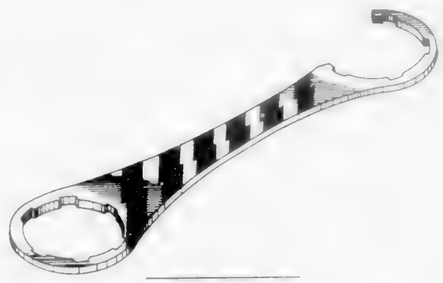


329,7[illegible]6
BROKEN BOLT EXTRACTOR
Eli Polonsky, Aurora, Colo., assignor to Alden Corporation, Wolcott, Conn.
Filed Oct. 11, 1989, Ser. No. 419,835
Term of patent 14 years
U.S. Cl. D8—14

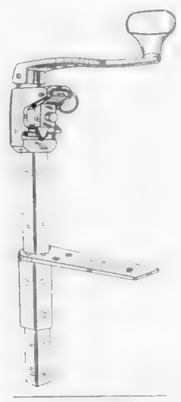
329,[illegible]87
TAMPING TOOL FOR A CHIPPER/SHREDDER
Kevin J. Connolly, Ballston Lake; James M. D'Aleo, Clifton Park, both of N.Y., and Clifford J. Griffith, Clemmons, N.C., assignors to Garden Way Incorporated, Troy, N.Y.
Filed Jul. 17, 1990, Ser. No. 555,141
Term of patent 14 years
U.S. Cl. D8—14



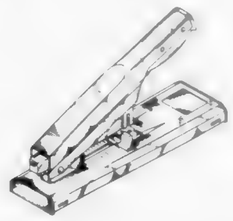
329,788
COMBINATION WRENCH FOR LOCK NUTS
Peter Andrew, 3013 39th St., Tampa, Fla. 33605
Filed May 23, 1990, Ser. No. 527,250
Term of patent 14 years
U.S. Cl. D8—17



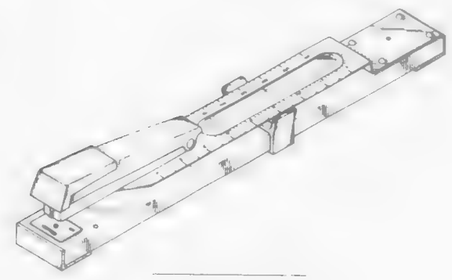
329,789
CAN OPENER
Laurence Bartlett, Colchester, and John Cowan, Richmond, both of Vt., assignors to Edlund Company, Inc., Burlington, Vt.
Filed Jul. 23, 1990, Ser. No. 557,484
Term of patent 14 years
U.S. Cl. D8—33



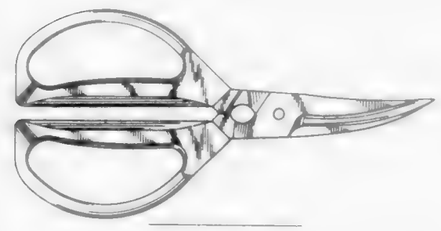
329,790
STAPLER
William H. N. Chi, No. 32, Kwangcheng Rd., Tali Hsiang, Taichung hsien, Taiwan
Filed Sep. 26, 1991, Ser. No. 765,715
Term of patent 14 years
U.S. Cl. D8—50



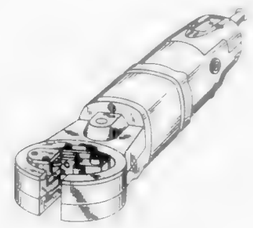
329,791
STAPLER
William H. N. Chi, No. 32, Kwangcheng Rd., Tali Hsiang, Taichung Hsien, Taiwan
Filed Sep. 26, 1991, Ser. No. 765,718
Term of patent 14 years
U.S. Cl. D8—50



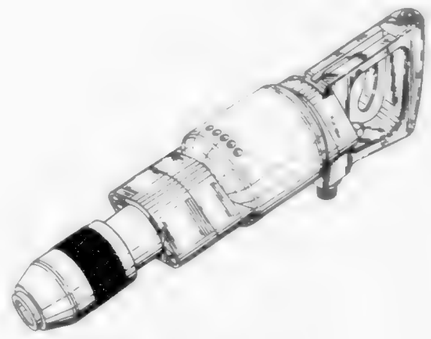
329,792
CULINARY SCISSORS
Helen Chen, 114 East St., Lexington, Mass. 02173
Filed Aug. 1, 1990, Ser. No. 562,159
Term of patent 14 years
U.S. Cl. D8—57



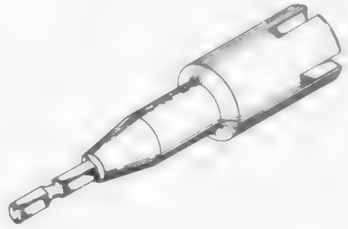
329,793
PIPE CUTTER
Kenji Fukuda, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Jul. 3, 1990, Ser. No. 547,157
Claims priority, application Japan, Jan. 16, 1990, 2-470
Term of patent 14 years
U.S. Cl. D8—60



329,794
DRILL
Michael Graham, Cramlington, England, assignor to Thor Tools Limited, United Kingdom
Filed Apr. 10, 1990, Ser. No. 514,046
Claims priority, application United Kingdom, Oct. 10, 1989, 2001598
Term of patent 14 years
U.S. Cl. D8—68

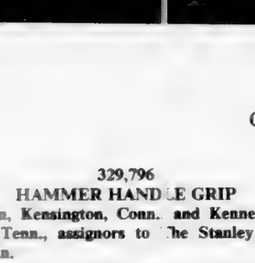


329,795
WIRE CONNECTOR DRIVER
Samuel K. Bird, 10421 Markein Ave., Mission Hills, Calif. 91345, and Jimmy J. Bennett, 6036 Stafford Ave., Huntington Park, Calif. 90255
Filed Aug. 14, 1990, Ser. No. 567,350
Term of patent 14 years
U.S. Cl. D8—70



329,796
HAMMER HANDLE GRIP
John D. Olson, Kensington, Conn. and Kenneth W. Hreha, Tullahoma, Tenn., assignors to The Stanley Works, New Britain, Conn.
Filed Jul. 21, 1988, Ser. No. 222,235
Term of patent 14 years
U.S. Cl. D8—80

329,797
KNIFE SHARPENER
John M. Baker, Rte. 3, Box 365-E, Sylva, N.C. 28779
Filed Dec. 4, 1989, Ser. No. 445,020
Term of patent 14 years
U.S. Cl. D8—93

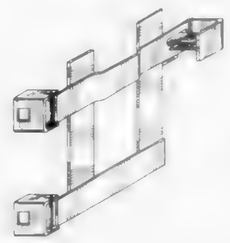


329,798
LETTER OPENER
Jeffrey A. Kramer, 1241 NE. 83rd St., Miami, Fla. 33138, and William W. Rosenfeld, 8810 NW 15th St., Pembroke Pines, Fla. 33024
Filed Jan. 14, 1991, Ser. No. 641,114
Term of patent 14 years
U.S. Cl. D8—102

329,799
PORTABLE SWINGING DOOR LOCK
Eva C. Conklin, 4666 Garrett Dr., Norton, Ohio 44203
Filed Sep. 26, 1990, Ser. No. 588,958
Term of patent 14 years
U.S. Cl. D8—331

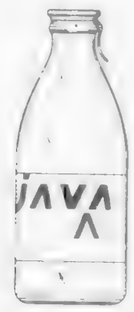
329,800
COMBINATION SECURITY BAR AND PADLOCK COVER
Stanley W. Pearson, Rte. 1 Box 654-A, Beaufort, N.C. 28516
Filed Jan. 28, 1991, Ser. No. 646,334
Term of patent 14 years
U.S. Cl. D8—346

329,801
ANTI-THEFT ASSEMBLY FOR A VIDEO GAME CABINET ACCESS DOOR
Stanley W. Pearson, Rt. 1 70 box 654-A Hwy. 101, Beaufort, N.C. 28516
Filed Jul. 29, 1991, Ser. No. 736,819
Term of patent 14 years
U.S. Cl. D8—346



329,802
SPRAYER BOTTLE OR SIMILAR ARTICLE
Donald D. Foster, St. Charles, Mo., and Douglas F. Wolff, Marshall, Mich., assignors to Contico International, Inc., St. Louis, Mo.
Filed May 30, 1990, Ser. No. 530,975
Term of patent 14 years
U.S. Cl. D9—300

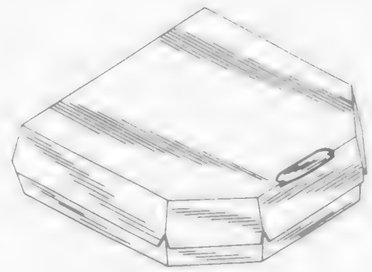
329,803
BOTTLE
Akihiko Otsuka, Nishinomiya, Japan, assignor to Otsuka Foods Co., Ltd., Osaka, Japan
Filed Oct. 16, 1989, Ser. No. 421,686
Claims priority, application Japan, Apr. 21, 1989, 14913
Term of patent 14 years
U.S. Cl. D9—332



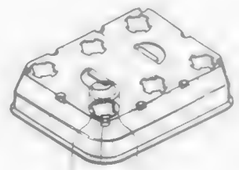
329,804
COMBINED PACKAGE WITH PAPER ROLLS
Donald D. Dearwester, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 31, 1990, Ser. No. 606,645
Term of patent 14 years
U.S. Cl. D9—341

329,805
COMBINED BOTTLE AND CAP
M. Laurent Normand, Paris, France, assignor to Parfum Rochas
Filed Dec. 11, 1990, Ser. No. 625,987
Term of patent 14 years
U.S. Cl. D9—520

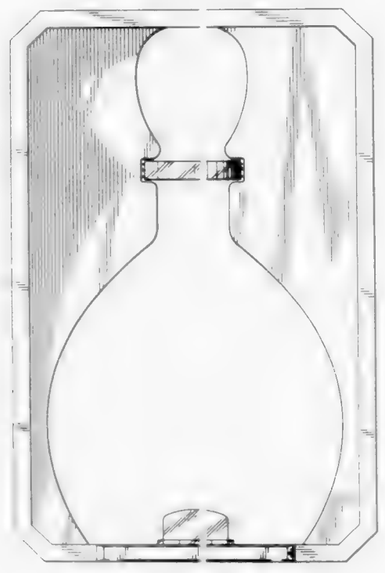
329,806
PAPER BOX
Donald T. Kindt, 1100 Pidco Dr., Plymouth, Ind. 46563
Filed Nov. 5, 1990, Ser. No. 608,890
Term of patent 14 years
U.S. Cl. D9—430



329,807
CONTAINER CARRIER
James E. Heider, 811 W. Wooster, Bowling Green, Ohio 43402
Filed Mar. 16, 1990, Ser. No. 473,697
Term of patent 14 years
U.S. Cl. D9—344

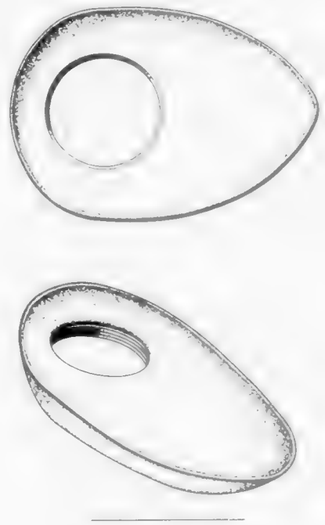


329,808
BOTTLE PACKAGE
Jean-Pierre Girand, Cognac, France, assignor to E. Remy Martin & Cie, S.A., Cognac, France
Filed May 18, 1990, Ser. No. 524,834
Claims priority, application Hague, Nov. 21, 1989, DM/015126
Term of patent 14 years
U.S. Cl. D9—415

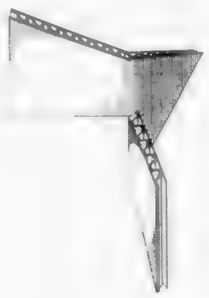


329,809
TAMPERPROOF CAP
John I. Bloomfield, Massey, New Zealand, assignor to Plastic Consulting and Design Limited, Auckland, New Zealand
Filed Oct. 3, 1990, Ser. No. 592,065
Claims priority, application New Zealand, Apr. 6, 1990, 23193
Term of patent 14 years
U.S. Cl. D9—443

329,810
POURING SPOUT FOR A DISPOSABLE LIQUID CONTAINER
Akhil Rastogi, 9416 Mirror Pond Dr., Fairfax, Va. 22032
Filed Jan. 17, 1991, Ser. No. 643,656
Term of patent 14 years
U.S. Cl. D9—447

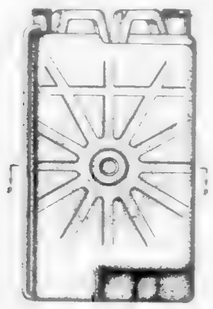


329,811
LOOSE PACKING MATERIAL
Russell W. Tether, 6258 Woodcrest, Dallas, Tex. 75214
Filed Feb. 11, 1991, Ser. No. 653,104
Term of patent 14 years
U.S. Cl. D9—456

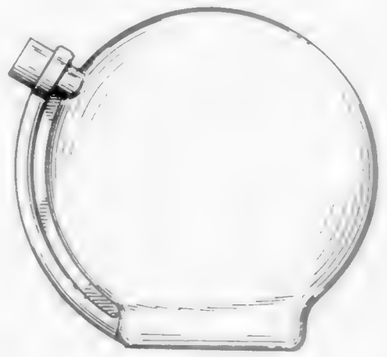


329,812
BOTTLE
Eugene J. Clarke, Winnetka; Joseph H. Riemer, Chicago; Stuart H. Feen, Libertyville, all of Ill., and Charles R. Smith, Independence, Mo., assignors to Stewart Warner Alemite Corporation, Charlotte, N.C.
Filed Mar. 27, 1991, Ser. No. 676,721
Term of patent 14 years
U.S. Cl. D9—523

329,813
CONTAINER
Simon J. Richter, Marietta, Ga., and Frank G. Hohmann, Tenafly, N.J., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 429,339, Oct. 31, 1989, abandoned. This application Feb. 5, 1992, Ser. No. 831,761
Term of patent 14 years
U.S. Cl. D9—524



329,814
SQUEEZE BOTTLE
Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022
Filed Oct. 4, 1990, Ser. No. 594,991
Term of patent 14 years
U.S. Cl. D9—526

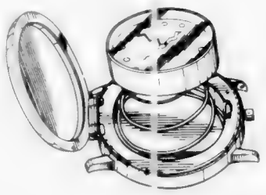


329,815
BOTTLE
Theodore L. Beaver, Roselle, Ill.; Diane J. Pinson, San Ramon, and Craig A. Wissman, Pleaston, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Continuation-in-part of Ser. No. 110,384, Oct. 19, 1987, Pat. No. Des. 313,349. This application Aug. 30, 1989, Ser. No. 400,892
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—528

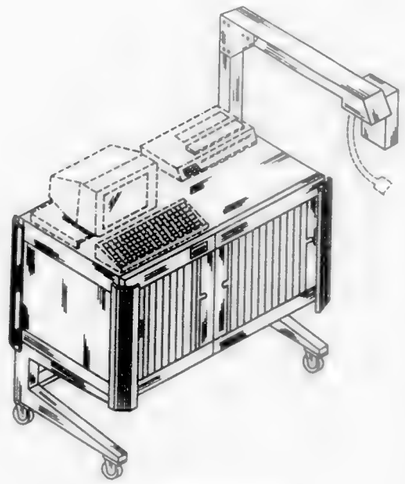
329,816
BOTTLE
Theodore L. Beaver, Roselle, Ill.; Di ne J. Pinson, San Ramon, and Craig A. Wissman, Pleasonton both of Calif., assignors to The Clorox Company, Oakland, C lif.
Continuation-in-part of Ser. No. 110, 85, Oct. 19, 1987, Pat. No. Des. 313,350. This application Aug. 30, 1989, Ser. No. 400,894
The portion of the term of this pat nt subsequent to Sep. 29, 2006, has been dis laimed.
Term of patent 14 years
U.S. Cl. D9—528

329,817
BOTTLE
Philip C. Best, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 30, 1990, Ser. No. 605,876
Term of patent 14 years
U.S. Cl. D9—556

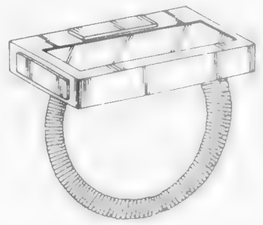
329,818
WRISTWATCH WITH COVER
Leslie Lam, 502 Join-in Hang Sing Centre, 71-75 Container Port Road, Kwai Chung N.T., Hong Kong
Filed Jul. 25, 1990, Ser. No. 557,662
Term of patent 14 years
U.S. Cl. D10—39



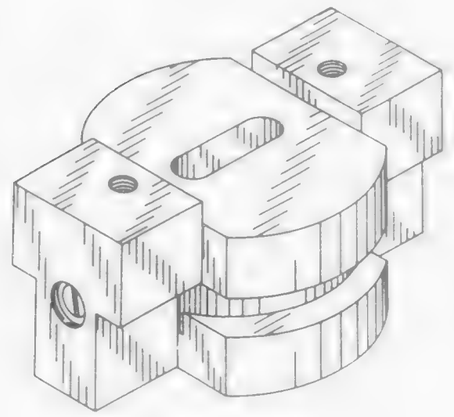
329,819
AUTOMOTIVE DIAGNOSTIC SYSTEM
Thomas D. Bottcher, Boynton Beach, and William E. Bratton, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 29, 1990, Ser. No. 471,989
Term of patent 14 years
U.S. Cl. D10—75



329,820
COMBINATION RING TIMER AND LAP COUNTER
Sally Lawlor, 23 Henry St., Bergenfield, N.J. 07621
Filed Nov. 20, 1991, Ser. No. 795,088
Term of patent 14 years
U.S. Cl. D10—97



329,821
APPARATUS FOR THE MEASUREMENT OF FINE PARTICLES IN LIQUID SUSPENSION BY THE LIGHT SCATTERING PROCEDURE
Philip J. Wyatt, Santa Barbara, and Richard F. Shuck, Goleta, both of Calif., assignors to Wyatt Technology Corporation, Santa Barbara, Calif.
Filed Feb. 21, 1989, Ser. No. 380,551
Term of patent 14 years
U.S. Cl. D10—103

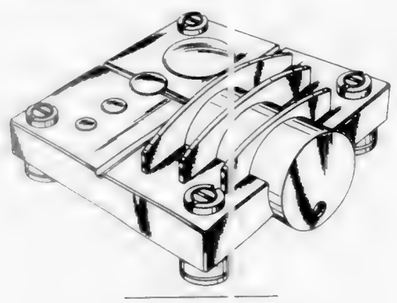


329,822
ILLUMINABLE WALKING CANE
Juan Francisco, New York, N.Y., assignor to See See, Inc., New York, N.Y.
Filed Jan. 11, 1991, Ser. No. 641,104
Term of patent 14 years
U.S. Cl. D10—104

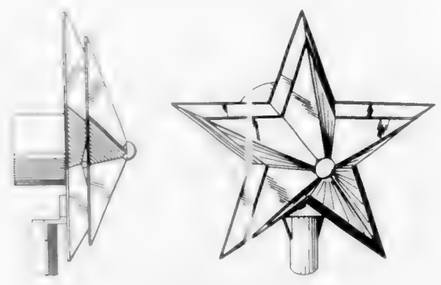
329,823
COMBINED PEN AND SIGNALLING LIGHT
Juan Francisco, New York, N.Y., assignor to See See, Inc., New York, N.Y.
Filed Jan. 11, 1991, Ser. No. 641,106
Term of patent 14 years
U.S. Cl. D10—104

329,824
COMBINED SIGNALLING LIGHT AND POCKET CLIP THEREFOR
Juan Francisco, New York, N.Y., assignor to See See, Inc., New York, N.Y.
Filed Jan. 11, 1991, Ser. No. 641,108
Term of patent 14 years
U.S. Cl. D10—104

329,825
LONG JUMP FOOT FAULT DETECTOR
Michael C. Taylor, 229 N. Lancaster, Bolingbrook, Ill. 60439, and Martin Thaler, Chicago, Ill., assignors to Michael C. Taylor, Bolingbrook, Ill.
Filed Aug. 13, 1990, Ser. No. 566,491
Term of patent 14 years
U.S. Cl. D10—106

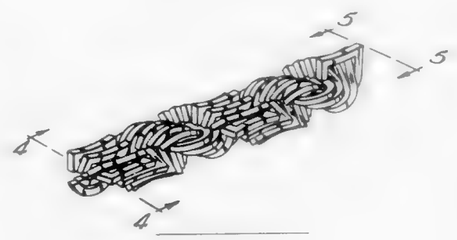


329,826
LIGHTED TREE ORNAMENT
Thomas G. Taylor, Box 486, Liberty, Mo. 64068
Filed Dec. 20, 1990, Ser. No. 630,945
Term of patent 14 years
U.S. Cl. D11—124

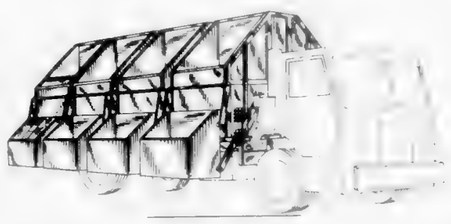


329,827
DESKTOP NOVELTY FIGURINE
Fred Hollinger, King Park, N.Y., assignor to E & B Giftware, Inc., Mount Vernon, N.Y.
Filed Apr. 3, 1989, Ser. No. 332,764
Term of patent 14 years
U.S. Cl. D11—160

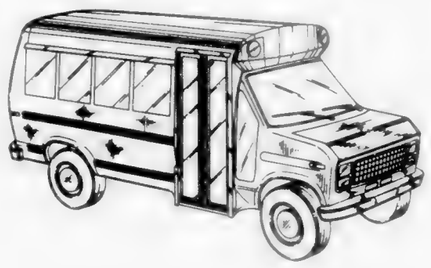
329,828
JEWELRY CHAIN
Krikor Bedoyan, North Hollywood, Calif., assignor to Oroamerica, Inc., Burbank, Calif.
Filed Aug. 31, 1990, Ser. No. 576,706
Term of patent 14 years
U.S. Cl. D11—13



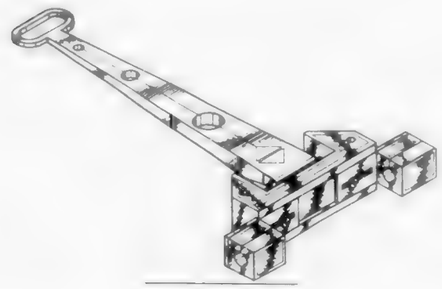
329,829
RECYCLING UNIT FOR WASTE COLLECTION VEHICLE
Rudolfo Mangino; Rudolfo Mangino, Jr., and Virgil Collins, all of 53-24 98th St., Corona, Queens, N.Y. 11368
Filed Aug. 20, 1990, Ser. No. 569,462
Term of patent 14 years
U.S. Cl. D12—15



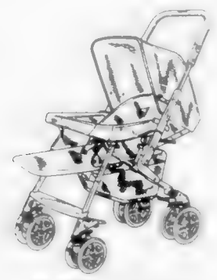
329,830
BUS
Jean-Marc Girardin, 33 High Ridge Ct., Cambridge, Ont., Canada N1R 7L3
Filed Jun. 5, 1989, Ser. No. 361,102
Term of patent 14 years
U.S. Cl. D12—84



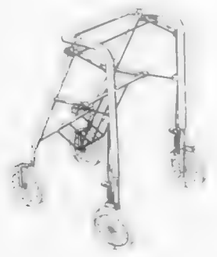
329,831
PULLING HANDLE UNIT FOR ATTACHMENT TO THE HANDLEBARS OF A TRICYCLE OR THE LIKE
William F. Chambless, P.O. Box 993, Jerome, Ariz. 86331
Filed Sep. 10, 1990, Ser. No. 579,495
Term of patent 14 years
U.S. Cl. D12—114



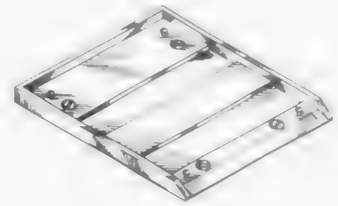
329,832
BABY STROLLER
Takashi Ishikura, and Tatsuo Nakamata, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed Feb. 14, 1991, Ser. No. 655,910
Claims priority, application Japan, Oct. 8, 1990, 2-33630
Term of patent 14 years
U.S. Cl. D12—129



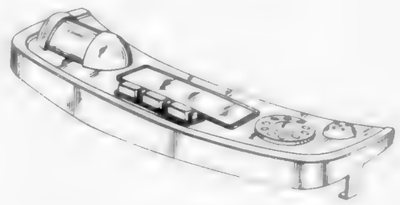
329,833
WALKER
Karl A. Andersson, and Morgan Ferm, both of Malmo, Sweden, assignors to Etac AB, Anderstorp, Sweden
Filed Oct. 5, 1990, Ser. No. 593,938
Claims priority, application Sweden, Apr. 6, 1990, 90-0803
Term of patent 14 years
U.S. Cl. D12—130



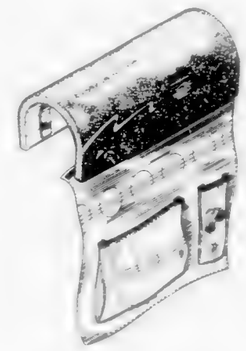
329,834
WHEELCHAIR RESTRAINT
Ronald K. Miller, 157 Rangeview Dr., Bailey, Colo. 80421
Filed Feb. 4, 1991, Ser. No. 649,929
Term of patent 14 years
U.S. Cl. D12—133



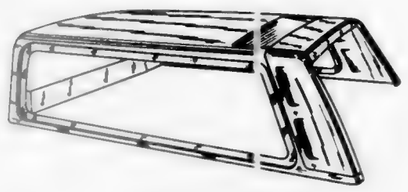
329,835
BABY'S WALKER TRAY
Jeffrey I. Scheinrock, Sherman Oaks, Calif., assignor to Phoenix Prams, Inc., Woodland Hills, Calif.
Filed Apr. 1, 1991, Ser. No. 678,632
Term of patent 14 years
U.S. Cl. D12—133



329,836
COMBINED VEHICLE WINDOW ARM REST AND DETACHABLE ARTICLE HOLDER
Marvin Meyers, 10817 SW. 90th Ct. (Oak Run), Ocala, Fla. 32676
Filed Jan. 5, 1990, Ser. No. 461,447
Term of patent 14 years
U.S. Cl. D12—155

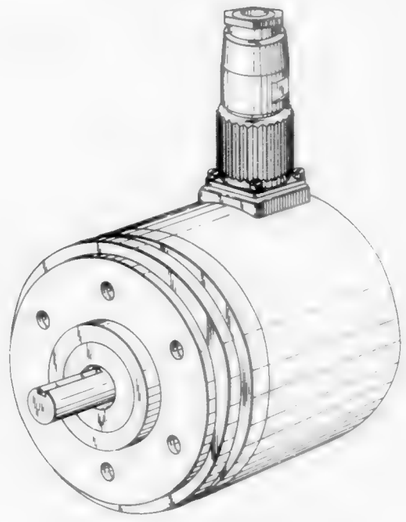


329,837
CAP FOR THE BED OF A PICKUP TRUCK
Charles R. Rogers, 1500 North St., Apt. D39, Jackson, Mich. 49202
Filed Jan. 28, 1991, Ser. No. 646,337
Term of patent 14 years
U.S. Cl. D12—156

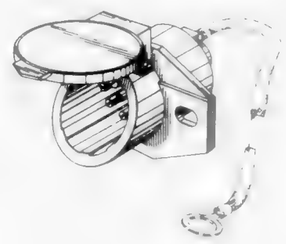


329,838
MULTI-PURPOSE STORAGE RACK FOR MOUNTING ABOVE THE ENGINE ON A BOAT
Michael R. Dean, 1843 Surf and Sand, Bullhead City, Ariz. 86442
Filed Jul. 27, 1990, Ser. No. 559,561
Term of patent 14 years
U.S. Cl. D12—318

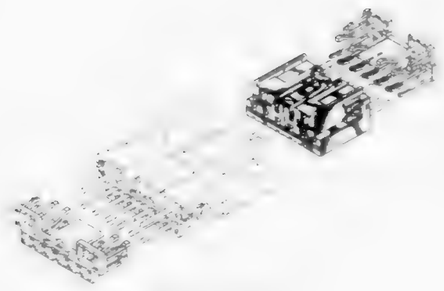
329,839
INCREMENTAL CODER
Michel Ehrhart, Strasbourg, France, assignor to Hohner Automation Societe Anonyme, Eckbolsheim, France
Filed Jul. 6, 1990, Ser. No. 548,843
Claims priority, application France, Jan. 31, 1990, 632
Term of patent 14 years
U.S. Cl. D13—118



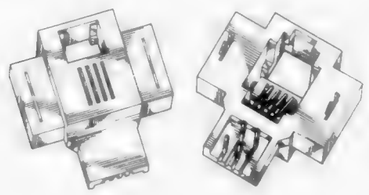
329,840
ELECTRICAL RECEPTACLE
Emil R. Nociar, Calgary, Canada, assignor to Seismic Products Canada Inc., Calgary, Canada
Filed Nov. 20, 1990, Ser. No. 616,009
Claims priority, application Canada, Jun. 27, 1990, 27-06-90-7
Term of patent 14 years
U.S. Cl. D13—146



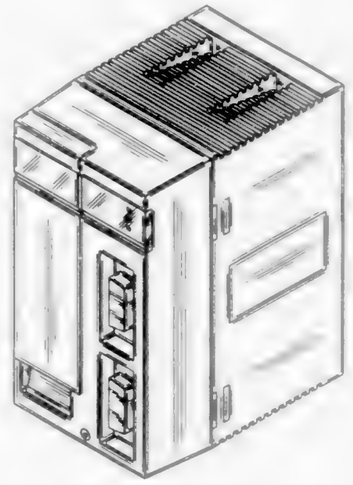
329,841
ELECTRICAL CONNECTOR HOUSING
Makoto Yamanashi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Jul. 2, 1990, Ser. No. 547,346
Claims priority, application Japan, Jan. 16, 1990, 2-000469
Term of patent 14 years
U.S. Cl. D13—147



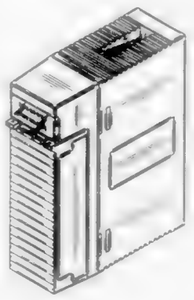
329,842
ELECTRICAL CONNECTOR FOR A PRINTED CIRCUIT BOARD
Toru Watanabe, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed May 18, 1990, Ser. No. 525,394
Claims priority, application Japan, Dec. 8, 1989, 1-44449
Term of patent 14 years
U.S. Cl. D13—147



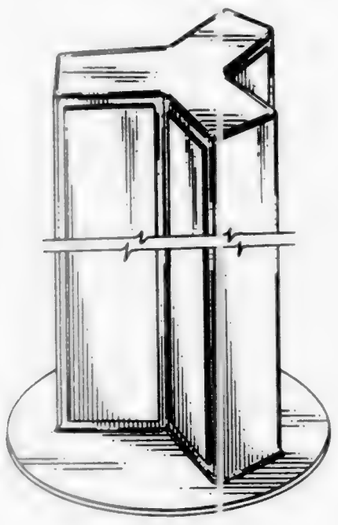
329,843
CONTROL UNIT OF SEQUENCE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 8, 1990, Ser. No. 490,973
Claims priority, application Japan, Sep. 13, 1989, 1-33565
Term of patent 14 years
U.S. Cl. D13—162



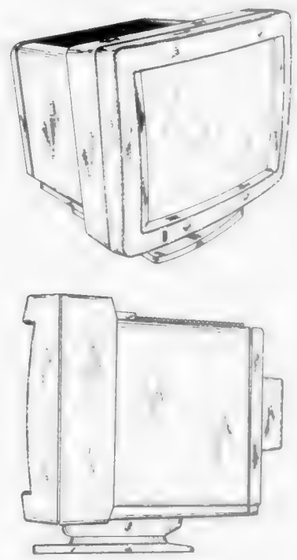
329,844
INPUT/OUTPUT UNIT OF SEQUENCE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 8, 1990, Ser. No. 490,974
Claims priority, application Japan, Sep. 13, 1989, 1-33566
Term of patent 14 years
U.S. Cl. D13—162



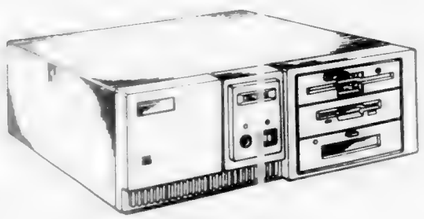
329,845
COVER FOR A MAGNETIC SEPARATOR
Robert Wysolmerski, P.O. Box 26, Hollis, N.H. 03049
Filed Dec. 20, 1989, Ser. No. 453,466
Term of patent 14 years
U.S. Cl. D13—183



329,847
VIDEO DISPLAY TERMINAL
Margaret L. Hetfield, Belmont, and Marcus Koepke, Concord, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Apr. 2, 1990, Ser. No. 503,167
Term of patent 14 years
U.S. Cl. D14—113

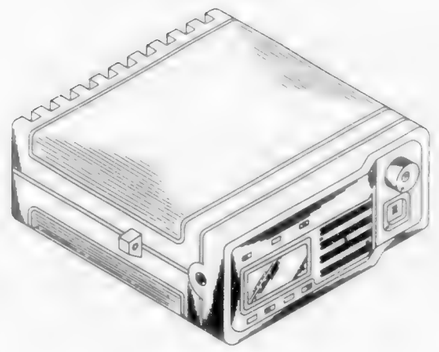


329,846
COMPUTER
Richard V. Haner, Spring, Tex., assignor to Dell USA, L.P.
Filed Feb. 8, 1990, Ser. No. 477,103
Term of patent 14 years
U.S. Cl. D14—100

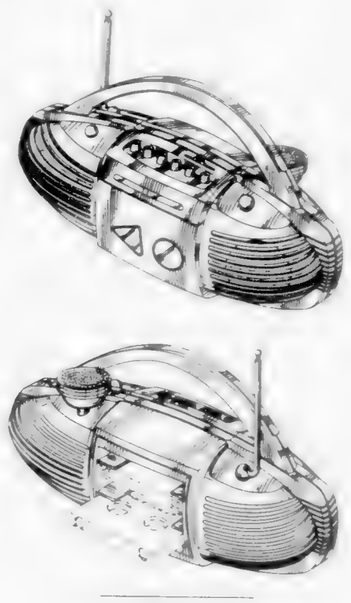


329,848
NUMERICAL KEYBOARD FOR NOTEBOOK COMPUTER
Kanji Mizusugi; Kensho Tsuji, and Fumikazu Shimanuki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 18, 1990, Ser. No. 584,182
Claims priority, application Japan, Mar. 20, 1990, 2-9336
Term of patent 14 years
U.S. Cl. D14—115

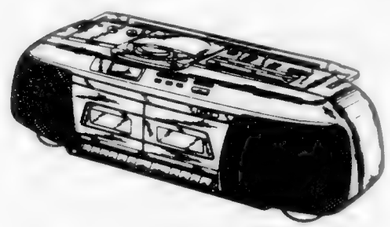
329,849
MOBILE RADIO
Mas Tokiyama, Arlington, Tex., and Manabu Sasaki, Kawasaki, Japan, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 30, 1990, Ser. No. 516,875
Term of patent 14 years
U.S. Cl. D14—137



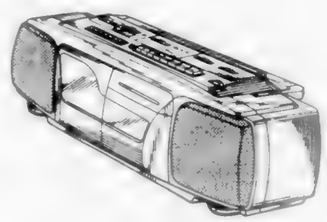
329,851
PORTABLE CASSETTE TAPE RECORDER
Seon I. Yoo, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea
Filed Apr. 6, 1990, Ser. No. 505,545
Claims priority, application Rep. of Korea, Oct. 11, 1989, 13665/1989[U]
Term of patent 14 years
U.S. Cl. D14—165



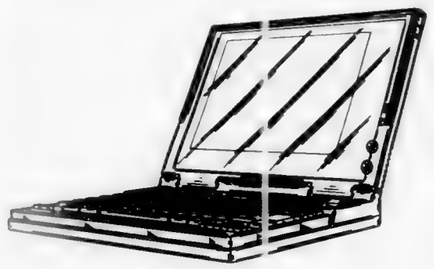
329,850
PORTABLE CASSETTE TAPE RECORDER
Tae Soo Kang, Suwon, Rep. of Korea, assignor to Samsang Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Feb. 2, 1990, Ser. No. 473,700
Term of patent 14 years
U.S. Cl. D14—164



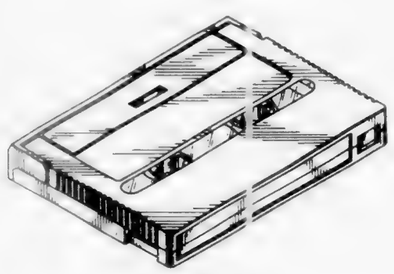
329,852
CASSETTE TAPE RECORDER
Jong B. Lee, Inchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 25, 1990, Ser. No. 543,176
Claims priority, application Rep. of Korea, Dec. 29, 1989, 17856/1989[U]
Term of patent 14 years
U.S. Cl. D14—165



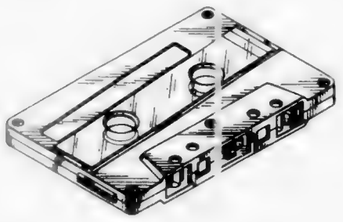
329,853
COMPUTER
Kanji Mizusugi, and Kensbo Tsuji, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 18, 1990, Ser. No. 539,665
Claims priority, application Japan, Dec. 22, 1989, 1-47011
Term of patent 14 years
U.S. Cl. D14—106



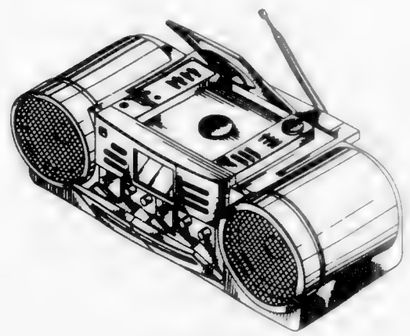
329,854
DIGITAL AUDIO TAPE CASSETTE
Makoto Isozaki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 23, 1990, Ser. No. 483,787
Claims priority, application Japan, Sep. 8, 1989, 1-33021
Term of patent 14 years
U.S. Cl. D14—121



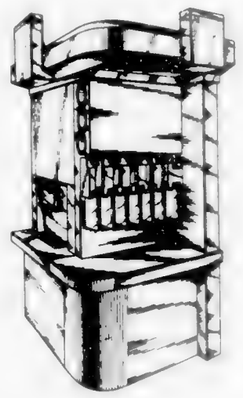
329,855
AUDIO TAPE CASSETTE
Kazuhisa Horikiri, and Makoto Isozaki, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 28, 1990, Ser. No. 493,838
Claims priority, application Japan, Sep. 25, 1989, 1-34856
Term of patent 14 years
U.S. Cl. D14—121



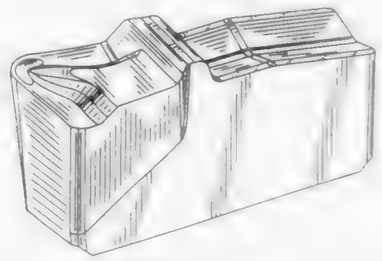
329,856
COMBINED DIGITAL AUDIO DISC PLAYER, RADIO TUNER AND TAPE RECORDER
Hidetoshi Tamaki, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 19, 1990, Ser. No. 601,052
Claims priority, application Japan, Apr. 23, 1990, 2-13907
Term of patent 14 years
U.S. Cl. D14—168



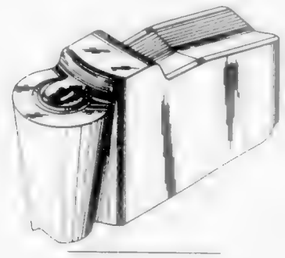
329,857
YOGURT BAR
David W. Laituri, and Vincent L. Haley, both of Worthington, Ohio, assignors to TYS, Inc., Rockville, Md.
Filed Dec. 26, 1989, Ser. No. 456,777
Term of patent 14 years
U.S. Cl. D15—82



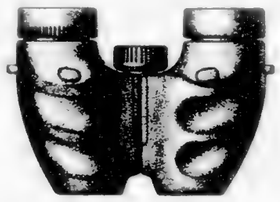
329,858
CUTOFF INSERT
Lars-Erik Gustafsson, Sandviken, Sweden, and Lars T. Petterson, Glen Rock, N.J., assignors to Sandvik AB, Sandviken, Sweden
Filed Sep. 12, 1989, Ser. No. 406,116
Claims priority, application Sweden, Mar. 14, 1989, 890653
Term of patent 14 years
U.S. Cl. D15—139



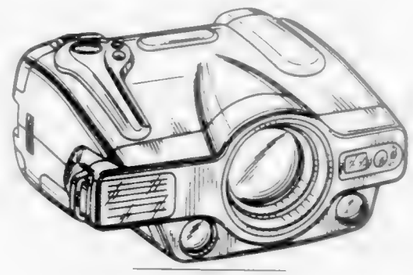
329,859
CUTOFF INSERT
Lars-Erik Gustafsson, Sandviken, Sweden, and Lars T. Petterson, Glen Rock, N.J., assignors to Sandvik AB, Sandviken, Sweden
Filed Oct. 10, 1989, Ser. No. 418,483
Term of patent 14 years
U.S. Cl. D15—139



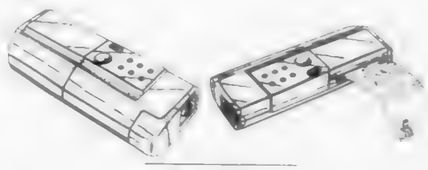
329,860
BINOCULARS
Hitoshi Suyama, Kawasaki, and Yasuki Nagaoka, Ohmiya, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Nov. 9, 1990, Ser. No. 611,367
Claims priority, application Japan, May 15, 1990, 2-16290; May 15, 1990, 2-16291
Term of patent 14 years
U.S. Cl. D16—133



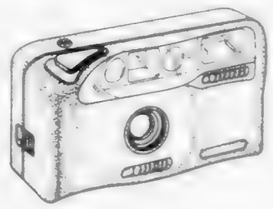
329,861
CAMERA
Makoto Isozaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 10, 1990, Ser. No. 565,419
Claims priority, application Japan, Mar. 27, 1990, 2-10190
Term of patent 14 years
U.S. Cl. D16—209



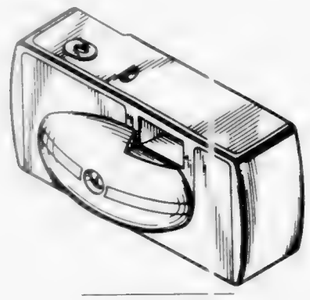
329,862
COMBINED INSTANT CAMERA AND PRINTER
Kenji Watanabe; Takanobu Kameda; Hideto Yokota; Tetsuo Yamaguchi; Tomoyuki Yamaguchi; Yuichiro Taniguchi, and Atsuko Yamaguchi, all of Tokyo, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan
Filed Jun. 20, 1990, Ser. No. 541,295
Claims priority, application Japan, Dec. 20, 1989, 1-46124
Term of patent 14 years
U.S. Cl. D16—208



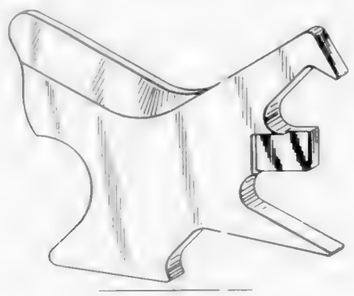
329,863
PHOTOGRAPHIC CAMERA
Steven W. Shull, Sherman Oaks, and Brent M. Kikawa, Monrovia, both of Calif., assignors to Vivitar Corporation, Chatsworth, Calif.
Filed Oct. 2, 1990, Ser. No. 591,866
Term of patent 14 years
U.S. Cl. D16—209



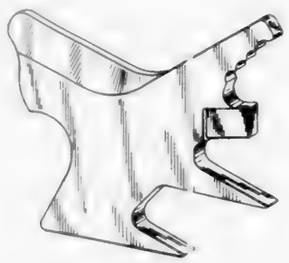
329,864
CAMERA
Hiroaki Kawagoe, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 23, 1990, Ser. No. 617,353
Claims priority, application Japan, Jul. 17, 1990, 2-24207
Term of patent 14 years
U.S. Cl. D16—218



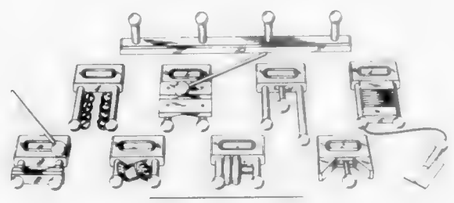
329,865
GUITAR BODY
Joel M. Harriott, P.O. Box 542, Minneapolis, Minn. 55458
Filed Dec. 11, 1989, Ser. No. 448,566
Term of patent 14 years
U.S. Cl. D17—20



329,866
GUITAR BODY
Joel M. Harriott, P.O. Box 542, Minneapolis, Minn. 55458
Filed Dec. 11, 1989, Ser. No. 448,569
Term of patent 14 years
U.S. Cl. D17—20

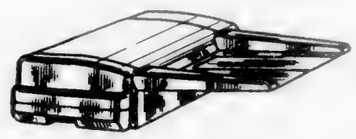


329,867
COMBINED SET OF MUSICAL INSTRUMENTS AND SUPPORT THEREFOR
Erich Hoerz, Muensingen, Fed. Rep. of Germany, assignor to Helmut Leismann OHG, Ingbert, Fed. Rep. of Germany
Filed Jan. 3, 1989, Ser. No. 292,876
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1988, M 88 00 041.9
Term of patent 14 years
U.S. Cl. D17—22

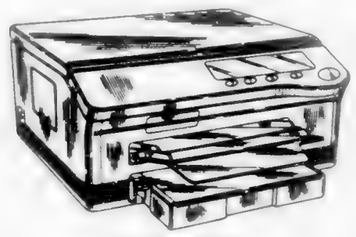


329,868
TONER CASE FOR COPYING MACHINE
Eiji Sakaguchi, Machida, and Yutaka Ban, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1990, Ser. No. 586,596
Claims priority, application Japan, Apr. 3, 1990, 2-11497
Term of patent 14 years
U.S. Cl. D18—43

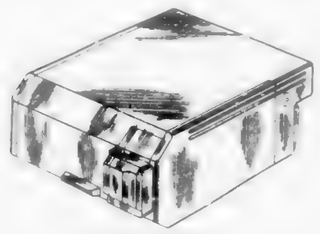
329,869
AUTOMATIC DOCUMENT FEEDER FOR COPYING MACHINE
Noriyuki Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 22, 1990, Ser. No. 526,617
Claims priority, application Japan, Nov. 22, 1989, 1-42889
Term of patent 14 years
U.S. Cl. D18—49



329,870
THERMAL PRINTER
Yoshio Hanasaki, Hiroshima; Masaharu Sawatani, and Toshiya Yoshida, both of Kanagawa, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Aug. 23, 1989, Ser. No. 402,587
Term of patent 14 years
U.S. Cl. D18—55



329,871
PRINTING HEAD FOR PRINTER
Toshio Umino, Yokohama, and Nobuyuki Kuwabara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 14, 1990, Ser. No. 493,377
Claims priority, application Japan, Sep. 14, 1989, 1-33781
Term of patent 14 years
U.S. Cl. D18—56

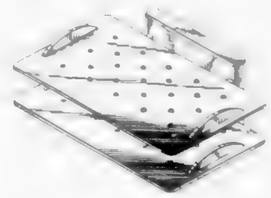


329,872
PAD OF PAPER
Bruce W. Carlson, Minneapolis; Cindy L. Knoblock, St. Paul, and Scott E. Michel, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 10, 1990, Ser. No. 595,377
Term of patent 14 years
U.S. Cl. D19—26

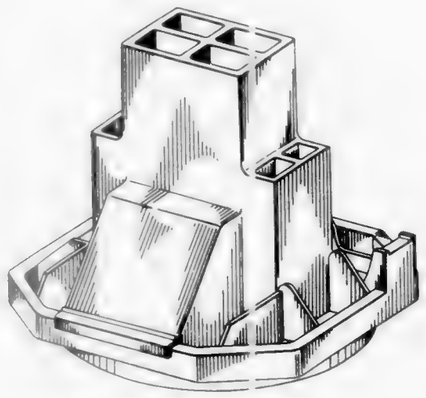
329,873
MARKING INSTRUMENT
Charlie Tu, Taipei, Taiwan, assignor to Chuang Tao Corporation, Taipei, Taiwan
Filed Oct. 18, 1990, Ser. No. 599,905
Term of patent 14 years
U.S. Cl. D19—48

329,874
PEN
Manuel Cuadrado, C/ Sagrera, 53-57, 08027 Barcelona, Spain
Filed Dec. 4, 1990, Ser. No. 622,087
Term of patent 14 years
U.S. Cl. D19—48

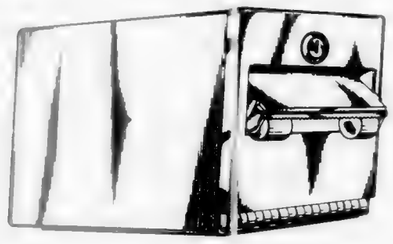
329,875
VERTICALLY-MOUNTABLE, PLURAL-LEVEL PAPER TRAY
Timothy R. Stern, and Paul B. Siebert, both of Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 307,588, Feb. 7, 1989, abandoned. This application Sep. 5, 1989, Ser. No. 402,250
Term of patent 14 years
U.S. Cl. D19—92



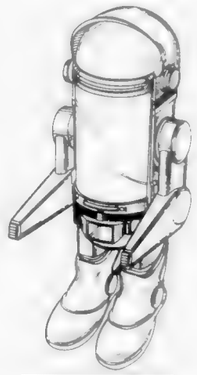
329,876
COMPARTMENTED ORGANIZER FOR OFFICE SUPPLIES
John D. Breen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 4, 1991, Ser. No. 637,505
Term of patent 14 years
U.S. Cl. D19—75



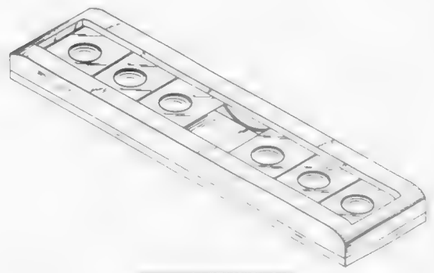
329,877
LOTTERY TICKET DISPENSER
Christopher E. Schafer, R.R. 2, Adair, Iowa 50002
Filed Apr. 16, 1990, Ser. No. 510,784
Term of patent 14 years
U.S. Cl. D20—2



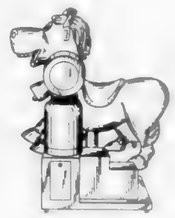
329,878
VENDING MACHINE OR SIMILAR ARTICLE
Chieh-Ju Chen, No. 84-22, Tung-Ping Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan
Filed Nov. 28, 1990, Ser. No. 619,336
Term of patent 14 years
U.S. Cl. D20—3



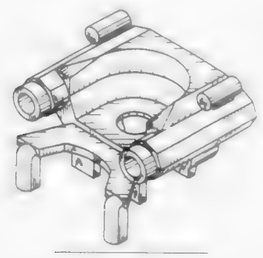
329,879
SLIDING BLOCK GAME
Gwo-Hwa Chern, No. 8-3, Alley 16, Lane 140, Shih Chuan Rd., Sec. 2, Pan chiao, Taipei Hsien, Taiwan
Filed Jan. 13, 1989, Ser. No. 296,715
Term of patent 14 years
U.S. Cl. D21—14



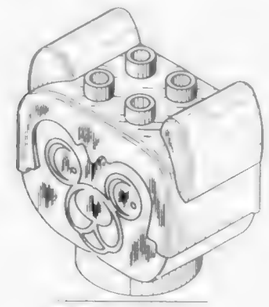
329,880
COIN-OPERATED AMUSEMENT RIDE
Alfonso Cimasa, Nocera Interiore, Italy, assignor to Cimagiochi S.R.L., Nocera Inferiore, Italy
Filed Dec. 10, 1990, Ser. No. 625,591
Term of patent 14 years
U.S. Cl. D21—74



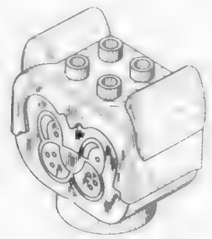
329,881
ELEMENT FOR A TOY BUILDING SET
Stig Alexander M. Spangsberg, Vejle, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,915
Term of patent 14 years
U.S. Cl. D21—108



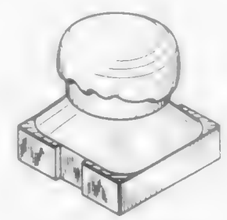
329,882
HEAD FOR A TOY BUILDING SET
Erik H. Rasmussen, Kokkedal, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,942
Term of patent 14 years
U.S. Cl. D21—108



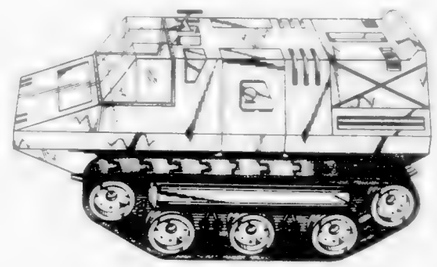
329,883
HEAD FOR A TOY BUILDING SET
Erik H. Rasmussen, Kokkedal, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,943
Term of patent 14 years
U.S. Cl. D21—108



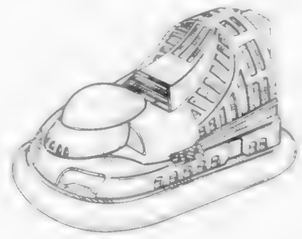
329,884
FIGURE FOR A TOY BUILDING SET
Berit Holmstrøm, Roskilde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,951
Term of patent 14 years
U.S. Cl. D21—108



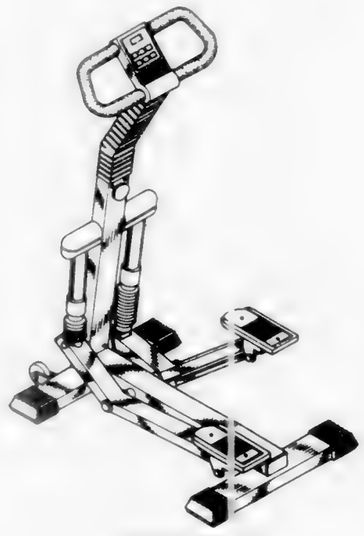
329,885
TOY TRACKED CARRIER VEHICLE
Norman C. Maarschalkerweerd, and Bernadette E. Maarschalkerweerd, both of 3773-B Elmside Village La., Norcross, Ga. 30092
Filed Jul. 15, 1991, Ser. No. 731,716
Term of patent 14 years
U.S. Cl. D21—131



329,886
AIR CUSHION BOAT TOY
Takashi Fujitani, Tokyo, Japan, assignor to Kabushiki Kaisha Gakushu Kenkyusha, Tokyo, Japan
Filed Jul. 9, 1990, Ser. No. 549,711
Claims priority, application Japan, Apr. 17, 1990, 2-13030
Term of patent 14 years
U.S. Cl. D21—130



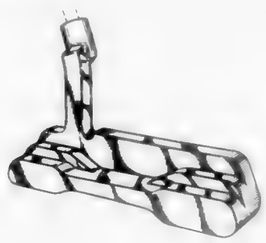
329,887
CLIMBING EXERCISER
Lien C. Yang, 11F. No. 149, Roosevelt Rd. Sec. 3, Taipei, Taiwan
Filed Jul. 5, 1990, Ser. No. 548,420
Term of patent 14 years
U.S. Cl. D21—195



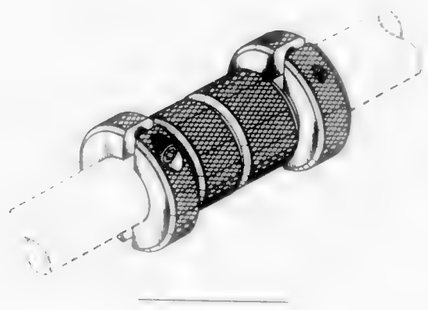
329,888
HOCKEY STICK
William D. Christian, Warroad, Minn., assignor to Christian Brothers, Inc., Warroad, Minn.
Filed Dec. 19, 1989, Ser No. 452,941
Term of patent 14 years
U.S. Cl. D21—211

329,889
GOLF PUTTER
Eric J. Scott, 9846 Rose Hill Rd. #12, Berrien Springs, Mich. 49103
Filed Nov. 21, 1989, Ser. No. 439,561
Term of patent 14 years
U.S. Cl. D21—217

329,890
GOLF PUTTER
Bernard L. Pinder, Grand Haven, Mich., assignor to Pinnich, Ltd., Grand Haven, Mich.
Continuation-in-part of Ser. No. 511,582, Apr. 20, 1990, abandoned. This application Nov. 21, 1990, Ser. No. 617,070
Term of patent 14 years
U.S. Cl. D21—217

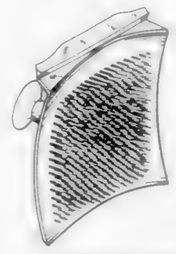


329,891
GARDEN HOSE CLAMP
Stanley Sievers, 2422 1st St., Corona del Mar, Calif. 92660
Filed Feb. 5, 1990, Ser. No. 475,083
Term of patent 14 years
U.S. Cl. D23—262

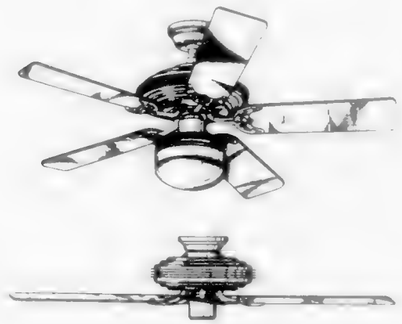


329,892
LIQUID DISPENSER FOR ADDING SKIN TONER TO SHOWER WATER
Richard C. Brister, 3516 W. 43rd, Anchorage, Ak. 99517
Filed Apr. 10, 1990, Ser. No. 506,891
Term of patent 14 years
U.S. Cl. D23—228

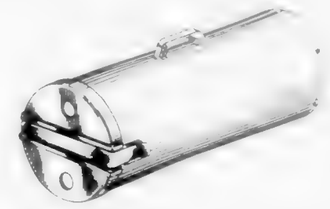
329,893
ANTI-SPLASH MAT FOR URINAL OR THE LIKE
Richard C. Luedtke, Whiteladyes, Sandy Way, Cobham, Surrey KT11, and Kandiah Mahanandan, Wooden Cottage, Firs Road, Kenley, Surrey CR2, both of United Kingdom
Filed Mar. 11, 1991, Ser. No. 668,422
Term of patent 14 years
U.S. Cl. D23—310



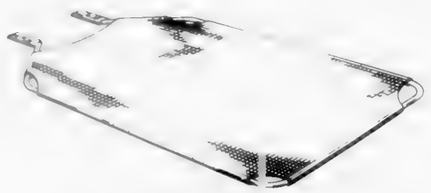
329,894
COMBINED CEILING FAN AND LIGHT
Robert L. Scofield, Cordova, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.
Filed Feb. 14, 1991, Ser. No. 655,891
Term of patent 14 years
U.S. Cl. D23—377



329,895
DUCT CANISTER FOR CARRYING AND STORING SECTIONS OF A FLEXIBLE DUCT USED WITH PORTABLE VENTILATORS
Mark S. Chumsae, Shrewsbury, Mass., assignor to Coppus Engineering Corporation, Millbury, Mass.
Filed Jun. 18, 1990, Ser. No. 539,676
Term of patent 14 years
U.S. Cl. D23—393



329,896
CEILING FAN BLADE
William N. Taylor, III, P.O. Box 810121, Dallas, Tex. 75381-0121
Continuation-in-part of Ser. No. 490,950, Mar. 9, 1990, Pat. No. Des. 325,778. This application May 21, 1991, Ser. No. 703,354
The portion of the term of this patent subsequent to Mar. 13, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—413

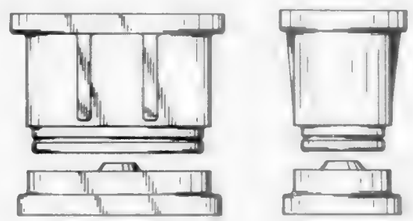


329,897
WINGED EARPLUG
Howard S. Leight, 4061 Glencoe Ave., Marina Del Rey, Calif. 90292
Filed Dec. 11, 1990, Ser. No. 625,606
Term of patent 14 years
U.S. Cl. D24—106

329,898
MYOCARDIAL LEAD INTRODUCER
Robert G. Dutcher, and John C. Hill, both of 8325 10th Ave. North, Minneapolis, Minn. 55427
Filed Nov. 2, 1989, Ser. No. 430,482
Term of patent 14 years
U.S. Cl. D24—133

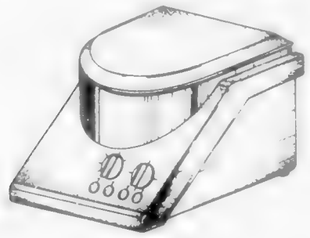
329,899
DENTAL MIRROR
Munir Rihani, 187 Belevedere Dr., Cranston, R.I. 02920
Filed Dec. 26, 1990, Ser. No. 634,337
Term of patent 14 years
U.S. Cl. D24—139

329,900
COMBINED DENTAL MOLD AND BASE
Robert P. Berger, 20600 Plummer St., Chatsworth, Calif. 91311-5121
Filed Jun. 24, 1991, Ser. No. 721,203
Term of patent 14 years
U.S. Cl. D24—181

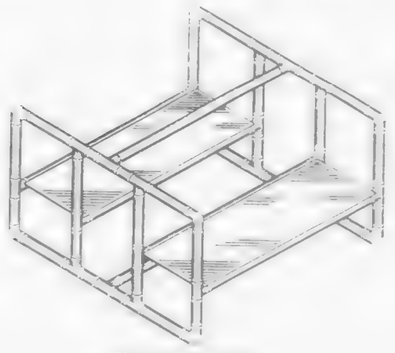


329,901
PEDIATRIC ENDOSCOPIC BITE BLOCK
Frank W. Jackson, Mechanicsburg, Pa., assignor to G. I. Supply, Inc., Camp Hill, Pa.
Filed May 13, 1991, Ser. No. 699,554
Term of patent 14 years
U.S. Cl. D24—176

329,902
MICROCENTRIFUGE
Young R. Kim, 271-19 Samjeong-Dong, Jung-Ku, Buchun, Rep. of Korea
Filed May 11, 1990, Ser. No. 521,932
Term of patent 14 years
U.S. Cl. D24—219

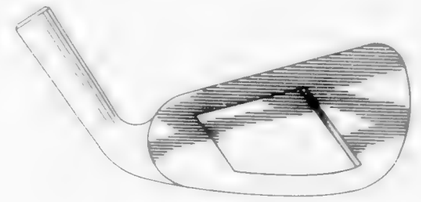


329,903
UNDERWATER PLATFORM
Michael P. Craig, 2302 Sorret Tree Ct., Austin, Tex. 78744-2826
Filed Jun. 21, 1990, Ser. No. 541,347
Term of patent 14 years
U.S. Cl. D25—62

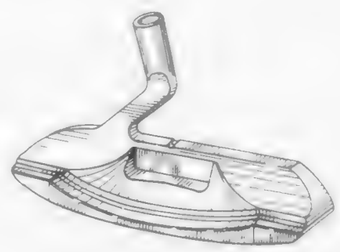


329,904
GOLF CLUB IRON
Geoffrey W. Gorman, Greer, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.
Filed May 29, 1990, Ser. No. 529,956
Term of patent 14 years
U.S. Cl. D21—220

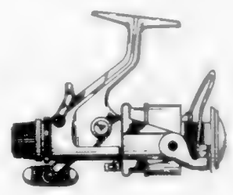
329,905
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Nov. 8, 1989, Ser. No. 433,171
The portion of the term of this patent subsequent to Sep. 12, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—220



329,906
GOLF PUTTER HEAD
Timothy R. Reed, Buffalo Grove, and James E. Karner, Grayslake, both of Ill., assignors to Tommy Armour Golf Company, Morton Grove, Ill.
Filed Jan. 24, 1990, Ser. No. 470,046
Term of patent 14 years
U.S. Cl. D21—219



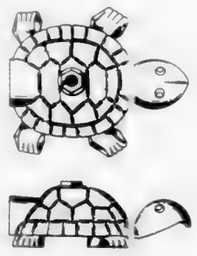
329,907
FISHING REEL
Toru Yui, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Jan. 8, 1990, Ser. No. 461,792
Term of patent 14 years
U.S. Cl. D22—141



329,908
GRIP OF FISHIN G ROD
Kenji Onishi, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Feb. 20, 1990, Ser. No. 482,684
Term of patent 14 years
U.S. Cl. D22—142

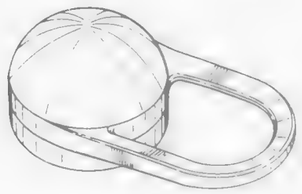
329,909
REEL SEAT FOR FIS HING ROD
Mitsuyoshi Oyama, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 23, 1990, Ser No. 617,537
Claims priority, application Japan, May 31, 1990, 2-18334; Jun. 1, 1990, 2-18515
Term of patent 14 years
U.S. Cl. D22—142

329,910
SPRINKLER HEAD
John A. Yanniell, Horseshoe Bay, and Milton C. Merka, Marble Falls, both of Tex., assignors to Wood Apple Inc., Mill Valley, Calif.
Filed Feb. 19, 1991, Ser. No. 657,545
Term of patent 14 years
U.S. Cl. D23—215

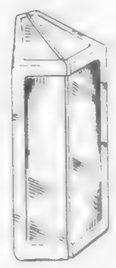


329,911
FAUCET KNOB
Holly K. Yost, Sherman Oaks, Calif., assignor to Emhart Inc., Newark, Del.
Continuation of Ser. No. 9,380, Jan. 30, 1987, abandoned. This application May 11, 1990, Ser. No. 521,002
Term of patent 14 years
U.S. Cl. D23—250

329,912
FAUCET HANDLE
Klaus Grohe, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed May 11, 1989, Ser. No. 350,536
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1988, M8803312.0
Term of patent 14 years
U.S. Cl. D23—252



329,913
TRANSLUCENT BLOCK
Harry A. Fleming, Jr., Smethport, Pa., and Donald E. Hock, Olean, N.Y., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.
Filed Dec. 14, 1990, Ser. No. 627,968
Term of patent 14 years
U.S. Cl. D25—103

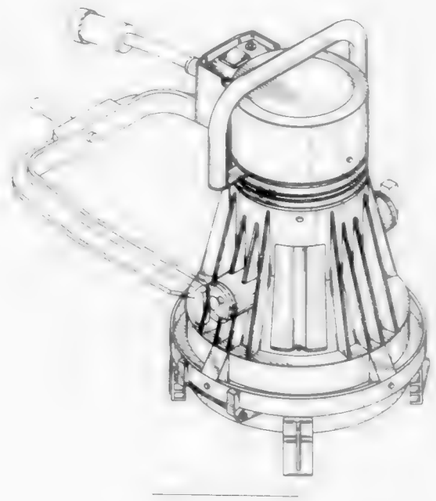


329,914
BOARD FOR FLOORING
Clément Veilleux, St-Basile-Le Grand, Canada, assignor to Les Profiles D'Extrusion Plastival Inc., Laval, Canada
Filed Mar. 26, 1990, Ser. No. 498,375
Term of patent 14 years
U.S. Cl. D25—138

329,915
PATIO BLOCK
Patrick Gutierrez, 600 Webster, Bay City, Mich. 48708
Filed Jun. 4, 1990, Ser. No. 532,983
Term of patent 14 years
U.S. Cl. D25—151

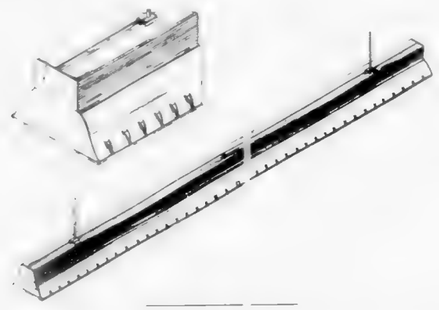
329,916
TABLE LAMP
Stephan Copeland, Venice, Calif., assignor to Flos S.p.A., Brescia, Italy
Filed Nov. 8, 1989, Ser. No. 434,821
Claims priority, application Italy, May 8, 1989, 6990/89[U]
Term of patent 14 years
U.S. Cl. D26—63

329,917
ARC LAMP FOR MOTION PICTURE PHOTOGRAPHY
Jean Galerne, 11 Rue Beauregard, Fresnel-Guerville 78930, France
Filed Dec. 15, 1989, Ser. No. 451,727
Term of patent 14 years
U.S. Cl. D26—63

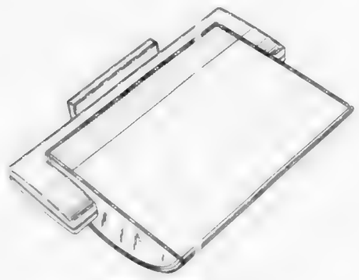


329,918
ADJUSTABLE DESK LAMP
Wang Y. Hsia, P.O. Box 82-144, Taipei, Taiwan
Filed Apr. 30, 1991, Ser. No. 693,419
Term of patent 14 years
U.S. Cl. D26—65

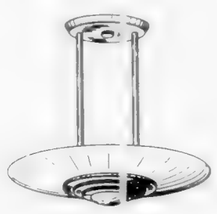
329,919
SUSPENDED FLUORESCENT LIGHTING FIXTURE
Gerhard Jahn, Secaucus, N.J., assignor to Zumtobel Lighting, Inc., Garfield, N.J.
Filed Jan. 15, 1991, Ser. No. 641,361
Term of patent 14 years
U.S. Cl. D26—77



329,92[illegible]
WALL MOUNTED LUMINAIRE
Menno Dieperink, Amsterdam, and Stefanus F. W. Joosten, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 9, 1990, Ser. No. 506,651
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—87

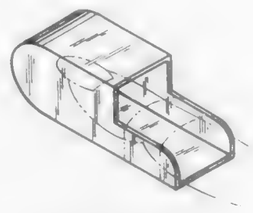


329,9[illegible]1
CEILING LAMP
Simon V. Benghozi, 406 Champagneur, Outremont, Quebec, Canada H2V 3P5
Filed Sep. 11, 1990, Ser. No. 581,094
Term of patent 14 years
U.S. Cl. D26—88

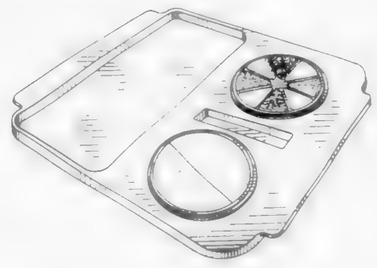


329,922
FLEXIBLE RAZOR CARTRIDGE
Evan N. Chen, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 10, 1990, Ser. No. 508,017
Term of patent 14 years
U.S. Cl. D28—47

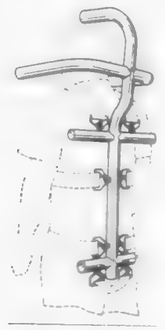
329,923
FINGERNAIL PROTECTOR GUARD
Marcine L. Thaxton, 10910 Canyon Mesa La., San Diego, Calif. 92126
Filed Aug. 22, 1990, Ser. No. 570,727
Term of patent 14 years
U.S. Cl. D28—56



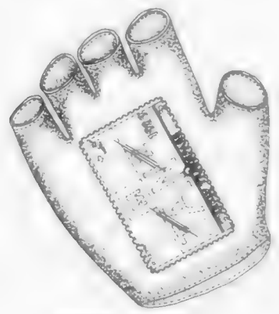
329,924
COMBINED COSMETIC TRAY AND CARTRIDGES FOR A COSMETIC PRODUCT
Carl M. Lombardi, Jr., Huntington, N.Y., assignor to Anna Young Associates, Ltd., Freeport, N.N.Y.
Filed Jul. 2, 1990, Ser. No. 547,112
Term of patent 14 years
U.S. Cl. D28—77



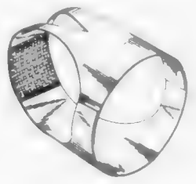
329,925
FRAMEWORK FOR PROTECTING HUMAN SPINE DURING ACCIDENT
Warrick A. Tilury, 1730 Jackson Ave., Escalon, Calif. 95320, assignor to Warrick A. Tilury, Escalon, Calif.
Filed Dec. 26, 1989, Ser. No. 456,262
Term of patent 14 years
U.S. Cl. D29—10



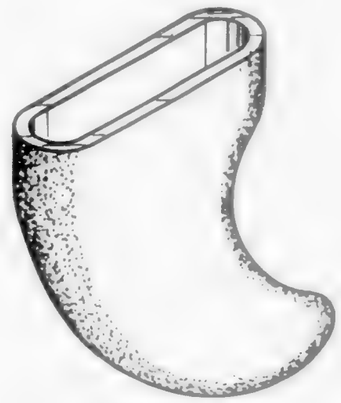
329,926
GLOVE FOR A TRANSIT CARD
Thelma C. Winder, 3118 N. Judson St., Philadelphia, Pa. 19132, assignor to Thelma C. Winder, Philadelphia, Pa.
Filed Feb. 17, 1989, Ser. No. 312,237
Term of patent 14 years
U.S. Cl. D29—22



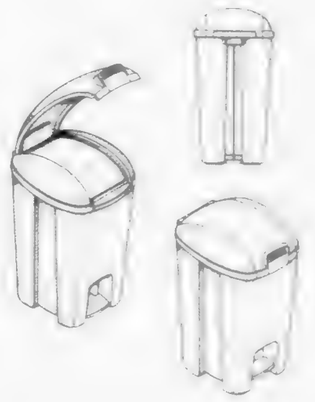
329,927
SANITARY GARMENT FOR AN ANIMAL
Miriam W. Thomas, 1883 Millson Cir., State College, Pa. 16801
Filed Jul. 30, 1990, Ser. No. 559,598
Term of patent 14 years
U.S. Cl. D30—145



329,928
CLAW PROTECTOR FOR CATS
Toby Wexler, 458 "D" Heymann Blvd., Lafayette, La. 70503
Filed Aug. 22, 1991, Ser. No. 748,387
Term of patent 14 years
U.S. Cl. D30—146

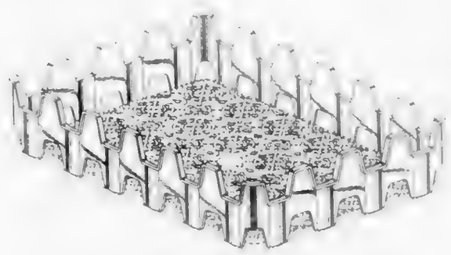


329,929
DIAPER CONTAINER
Roy E. Knoedler; Jeffery T. Samson, both of Boulder, and T. Brent Freese, Westminster, all of Colo., assignors to Gerry Baby Products Company, Denver, Colo.
Filed Sep. 4, 1991, Ser. No. 754,686
Term of patent 14 years
U.S. Cl. D32—37

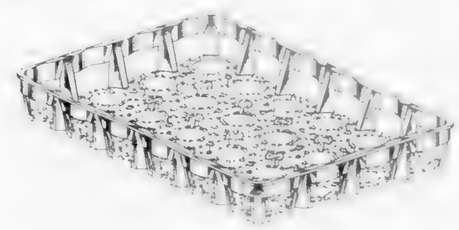


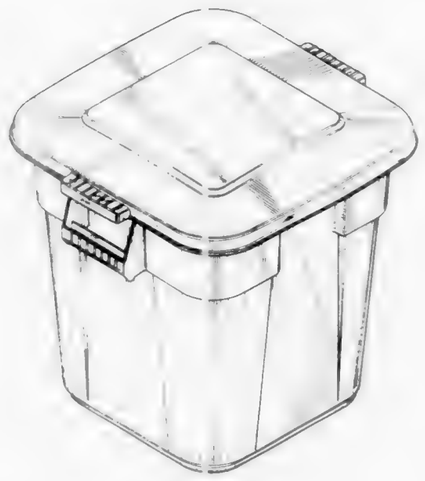
329,930
REFUSE CONTAINER WITH LID
Paul E. Delmerico, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products-Inc., Winchester, Va.
Filed Mar. 14, 1990, Ser. No. 493,236
Term of patent 14 years
U.S. Cl. D34—7

329,931
OUTER WALL STRUCTURE FOR A NESTABLE TRAY
William P. Apps, Anaheim, Calif., assignor to Rehrig-Pacific Company, Inc., Los Angeles, Calif.
Division of Ser. No. 724,433, Apr. 7, 1992, Pat. No. Des. 325,279, which is a continuation of Ser. No. 425,972, Oct. 20, 1989, abandoned. This application Mar. 29, 1990, Ser. No. 501,102
Term of patent 14 years
U.S. Cl. D34—40



329,932
OUTER WALL STRUCTURE FOR A NESTABLE TRAY
William P. Apps, Anaheim, Calif., assignor to Rehrig Pacific Company, Inc., Los Angeles, Calif.
Division of Ser. No. 357,068, May 23, 1989, Pat. No. Des. 317,670. This application May 25, 1990, Ser. No. 528,965
Term of patent 14 years
U.S. Cl. D34—40





329,933
COIN BANK
Jerzy Perkitny, Bay Village, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 18, 1990, Ser. No. 525,479
Term of patent 14 years
U.S. Cl. D99—35

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PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
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A. H. Robins Company, Incorporated: *See*—
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000.

Aaronson, Alan M.: *See*—
Bright, Danielle A.; and Aaronson, Alan M., 5,151,539, Cl 558-128.000.

AB Volvo: *See*—
Alfredsson, Sverker, 5,150,628, Cl. 74-330.000

Abbott Laboratories: *See*—
Best, Robert J.; Larkin, Mark E.; and Zaha, Juergen H., 5,151,090, Cl. 604-192.000.
Dombrowski, James E.; and Mattingly, Phillip G., 5,151,518, Cl 546-107.000.
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Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.

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Abe, Makoto: *See*—
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Murphy, James V., 5,151,039, Cl. 439-70.000

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Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, 5,151,360, Cl. 435-240.200

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Aisin Seiki K.K.: *See*—
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Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko Suda, Yasuo; and Akashi, Akira, 5,151,583, Cl. 250-201.200.

Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, to Delco Electronics Corporation. Interface device for thermally coupling an integrated circuit to a heat sink. 5,151,777, Cl. 357-81.000.

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Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000
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Yang, Lau S., 5,151,464, Cl. 524-449.000.
Argent, Ronald D.; Ruthers, Richard A.; and Webber, Roy A. Electrode blocks and block assemblies. 5,151,918, Cl. 373-27.000.
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Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J Dwight, 5,151,077, Cl. 493-353.000.
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Arvan, Inc.: *See—*
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Asahi Kogaku Kogyo K.K.: *See—*
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Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, to Kanebo, Ltd. Leather-like material having excellent water vapor permeability and suppleness and its manufacture 5,151,240, Cl. 264-284.000.
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Ashton, Jefferson P.: *See—*
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Aslam, Mohammad; and Davenport, Kenneth G., to Hoechst Celanese Corporation. Thio carbamates and their derivatives. 5,151,540, Cl 558-232.000.
Aso, Tsuyoshi, to Oki Electric Industry Co., Ltd. Dielectric isolation substrate. 5,151,768, Cl. 357-51.000.
Aspden, Harold. Electric surface heating and apparatus therefor. 5,151,577, Cl. 219-528.000.
Asten Group, Inc.: *See—*
Durkin, Thomas B.; and Biasone, Frank, 5,151,316, Cl. 428-213.000
AT&T Bell Laboratories: *See—*
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Hunt, Rodney J.; and Kip, Ruloff F., Jr., 5,150,852, Cl. 242-157.00R
Knepper, Jonathan D.; and Moll, Kenneth P., 5,150,829, Cl. 228-104.000.
Krol, Denise M.; and Simpson, Jay R., 5,151,817, Cl. 359-328.000.
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Atlantic Richfield Company: *See—*
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Kingman, John E. E., 5,151,882, Cl. 367-82.000
Atlas Roll-Lite Door Corporation: *See—*
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Atochem: *See—*
Spitz, Roger; Malinge, Jean; and Joly, Jean-Francois, 5,151,396, Cl. 502-104.000
Atomic Energy of Canada Limited: *See—*
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., 5,151,402, Cl. 502-401.000.
Atsugi Unisia Corporation: *See—*
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Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, to Kabushiki Kaisha Sangi. Process for producing an antibacterial ceramic material. 5,151,122, Cl. 106-35.000
Aubry, Michael E.: *See—*
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Auer, Johann; Pirklbauer, Wilfried; Ramaseder, Norbert; and Smejkal, Hellmuth, to Voest-Alpine Industrieanlagenbau G.m.b.H. Metallurgical vessel. 5,151,243, Cl. 266-78.000.
Aupperlee, Patricia C.; and Wiswell, Beth R. Vehicular child seat cover. 5,150,945, Cl. 297-184.000
Aurinco Holdings Limited: *See—*
Ven, Kari K. M.; Ven, Petri A. G.; Ven, Irja L. L. M.; Ven, Timo and Ven, Juha, 5,151,827, Cl. 359-848.000
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., to General Electric Company. Nickel-based single crystal superalloy and method of making. 5,151,249, Cl. 420-445.000.
Austin, George K., Jr.; and Johannes, Sandor. Valve assembly with flow control. 5,150,880, Cl. 251-149.300.
Austin, John S.; Piro, Ronald A.; and Stout, Douglas W., to International Business Machines Corporation. CMOS off chip driver circuit 5,151,619, Cl. 307-473.000.
Avery, Neal H. Grapple assembly for attachment to workhead 5,150,936, Cl. 294-104.000.
AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List: *See—*
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Azzara, Sauveur A.; and Coutant, Herve G. F., to Societe Nationale Industrielle et Aerospatiale. Method for forming convex non-extractable formed pieces made of a composite material. 5,151,236, Cl 264-257.000
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B-J Trading Limited: *See—*
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B & R Electrical PLC: *See—*
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B.S.A. Guns (UK) Limited: *See—*
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Babcock-Hitachi Kabushiki Kaisha: *See—*
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Babczinski, Peter: *See—*
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Babiarz, Joseph E.; and Rutsch, Werner, to Ciba-Geigy Corporation Substituted 1,4-diamino-2-butyne or propargylamine as stabilizers for compositions. 5,151,459, Cl. 524-255.000.

Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, to University of Saskatchewan. Bovine herpesvirus type 1 polypeptides and vaccines. 5,151,267, Cl. 424-89.000

Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., to Northland Aluminum Products, Inc. Faucet connected water filter 5,151,179, Cl. 210-250.000.

Bach, Volker; Hansen, Guenter; Lamm Gunther; and Sens, Ruediger, to BASF Aktiengesellschaft. Phenoneazo dyes. 5,151,506, Cl. 534-772.000.

Backlund, Dale J.: *See—*
Simeroth, David L.; Brink, David S.; Willis, Reid S.; and Backlund, Dale J., 5,150,601, Cl. 73-23.410

Backstrom, Reijo J.; Heinola, Kalevi J.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., to Orion Corporation/Orion Pharmaceutica Substituted pyridazinones 5,151,420, Cl. 514-247.000

Bade, Jeffrey M.: *See—*
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Badger, Scott L.; Braun, John P.; and Goodman, Sperry H., to Boeing Aerospace and Electronics. System and method of shaping an antenna radiation pattern. 5,151,705, Cl. 342-368.000.

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Bagley, Scott; Greenlee, William J.; Dhanoa, Daljit S.; and Patchett, Arthur A., to Merck & Co., Inc. Angiotensin II antagonists incorporating an indole or dihydroindole. 5, 51,435, Cl. 514-303.000.

Bailey, Richard G.: *See—*
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Bailey, Robert L.; and Howard, Brian D., to Apple Computer, Inc. Computer with adaptable video circuitry. 5,151,997, Cl. 395-800.000.

Baillet, Gerard, to SAT (Societe Anonyme de Telecommunications) Scanning device and application thereof to analysis devices 5,151,815, Cl. 359-220.000.

Bakay, Arpad: *See—*
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Baker Hughes Incorporated: *See—*
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Major, Kenneth E.; Baker, John L.; and Braunagel, David K., 5,150,769, Cl. 184-31.000.
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., 5,150,975, Cl. 384-465.000.

Bakhit, Gabriel G.; and Shambrook, Kevin P., to Hughes Aircraft Company. Flip interconnect. 5,151, 88, Cl. 437-209.000.

Baldini, Todd H.: *See—*
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Baltimore Therapeutic Equipment Co: *See—*
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Balzano, Quirino; and Stengel, Robert E., to Motorola, Inc. Tunable superconductive antenna. 5,151,709, Cl. 343-741.000

Bambara, Joseph E., to Servo Corporation of America. Acoustic bearing defect detector. 5,150,618, Cl. 73-660.000.

Bandy, Michael J.; Byerly, Roy H.; and Spoonmore, Robert T., to Eli Lilly and Company. Containment valve that allows contamination free transfer. 5,150,735, Cl. 137-614.060.

Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., to Eli Lilly and Company. Methods of using recombinant human protein C. 5,151,268, Cl. 424-94.640

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Bantien, Frank: *See—*
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Barry, Robert M., to CFR Corporation. Filter system for wet vacuum cleaning apparatus. 5,151,181, Cl. 210-338.000.

Bartholomew, Roger F.; and Sadd, Andrea L., to Corning Incorporated. Solution doping of porous preforms. 5,151,117, Cl. 65-3.120.

Barton, Jerry M.: *See—*
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Bartos, Andrew L.: *See—*
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BASF Aktiengesellschaft: *See—*
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Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000.
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000.
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, 5,151,541, Cl. 558-277.000.
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000
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Bass, Benjamin A., to AT&T Bell Laboratories. Package of elongated strand material and carton blank thereof. 5,150,789, Cl. 206-396.000.

Basseggio, Narcizo O. System and process of compressing miscible fluids. 5,150,586, Cl. 62-468.000.

Bauer, Daniel; Leroy, Frederic; Braque, Gerard; and Charon, Andre, to L'Oreal. Compression device, particularly for the pressure filling of a container. 5,151,015, Cl. 417-415.000.

Baumeister, Joachim; and Schrader, Hartmut, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Methods for manufacturing foamable metal bodies. 5,151,246, Cl. 419-2.000.

Baust, Heinrich: *See—*
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Baxi, Indra R.; and Johnson, Tom W., to Nitrojection Corporation. Plastic injection molding nozzle with gas assist. 5,151,278, Cl. 425-130.000.

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Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, 5,151,458, Cl. 524-190.000.
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400.
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Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.

Bayley, Robert D.; and Hoffend, Thomas R., to Xerox Corporation. Toner and developer compositions with charge enhancing additives. 5,151,338, Cl. 430-106.000

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Beaulleu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., to J & L Industries, Inc. Carton folding apparatus. 5,151,075, Cl. 493-179.000.

Bec, Jean-Louis: *See—*
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,264, Cl. 424-1.100.

Bechler, Ronald F.: *See—*
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Beck, Karin H.; Etzbach, Karl-Heinz; and Schmidt, Hans-Werner, to BASF Aktiengesellschaft. Polymerizable perylene-3,4,9,10-tetracarbimides. 5,151,516, Cl. 546-37.000.

Beckerman, Howard L., to Atlas Roll-Lite Door Corporation. Motor overload indicating arrangement. 5,151,638, Cl. 318-434.000.

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Begley, William J.; Chen, Teh-hsuan; Ling, Hans G.; Harder, John W., and Bowne, Arlyce T., to Eastman Kodak Company. Photographic material and process comprising wash-out naphtholic coupler 5,151,343, Cl. 430-382.000.

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Brinker, Charles J.: *See—*
Bein, Thomas; Brown, Kelly D.; Frye, Gregory C.; and Brinker Charles J., 5,151,110, Cl. 55-75.000.
Briones, Francisco R.; and Boutros, Kamal S., to Amphenol Corporation. Electrical connector shell and grounding spring therefor 5,151,054 Cl. 439-620.000
Brisset, Armand: *See—*
Ranc, Roger; Brisset, Armand; and Debos, Marcel, 5,151,126, Cl 106-719.000.
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Hopwell, Brian L.; Dale, Nicholas C.; and Burns, Bryan R. A deceased, 5,150,858, Cl. 244-45.00A.
Britton, Larry N.: *See—*
Powell, Paul E.; and Britton, Larry N., 5,150,988, Cl. 405-258.000.
Bromley, Scott, to Scott Tech International, Inc. Internal grinding and cutting device for pipe and casing. 5,150,496, Cl. 29-33.00T.
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., to Square D Company. LAN interface which permits a host computer to obtain data without interrupting a ladder program executing in the interface. 5,151,978, Cl. 395-200.000
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Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000
Brooke, David D.; Brophy, Shirley A.; and Goss, George R., to Oil-Dri Corporation of America. Oil bleaching method and composition for same. 5,151,211, Cl. 252-186.100
Brooks, Robert J., to SpaceLabs, Inc. Tabbed defibrillator electrode pad. 5,150,708, Cl. 128-419.00D
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Brother Kogyo Kabushiki Kaisha: *See—*
Komuro, Kyozi; Hayakawa, Atsuya; and Shimizu, Hideaki, 5,151,863, Cl. 364-470.000
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, 5,151,586 Cl. 250-205.000
Brown, Charles R.; and Wilding, Peter, to Van den Bergh Foods Co., Division of Conopco, Inc. Translucent, thixotropic hygel. 5,151,451, Cl. 514-773.000
Brown, Craig C., to Johnson & Johnson Medical, Inc. Three-layer laminated panel. 5,151,314, Cl. 428-198.000
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Brown, Robert A., to Central Blood Laboratories Authority. Pharmaceutically active conjugates having improved body tissue binding specificity. 5,151,412, Cl. 514-8.000
Brown, Ronald E.: *See—*
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Brownscombe, Thomas F.: *See—*
Stevens, Craig A.; Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., 5,151,475, Cl. 526-83.000
Broyhill Company, The: *See—*
Broyhill, Craig G., 5,150,814, Cl. 220-601.000
Broyhill, Craig G., to Broyhill Company, The. Chemical spray tank 5,150,814, Cl. 220-601.000
Broyles, Horace N. Free-ended book mark. 5,150,921, Cl. 281-42.000
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Hubbard, Vance M.; and Brunson, Welton K., 5,150,703, Cl. 128-206.120.
BTM Corporation: *See—*
Sawdon, Edwin G., 5,150,513, Cl. 29-798.000.
Buback, Michael; Hader, Josef; Voegele, Hans-Peter; and Al-Massri, ZaKarya, to Schering Aktiengesellschaft. Process for the production of 3-hydroxy-1,3,5(10)-estratrien-17-one. 5,151,533, Cl. 552-625.000.
Buchanan, William R., to Sevenstrand Tackle Corporation. Submerging fishing lure. 5,150,538, Cl. 43-42.280
Buehler AG: *See—*
Gmuer, Bruno, 5,150,758, Cl. 177-84.000.
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., to Procter & Gamble Company, The. Absorbent article with dynamic elastic waist feature having a predisposed resilient flexural hinge 5,151,092, Cl. 604-385.200.
Buhler, Wolfhardt; Poisel, Hans; and Trommer, Gert, to Messerschmitt-Bolkow-Blohm GmbH. Sagnac-type fiber-optic gyroscope with auxiliary fiber coil. 5,150,956, Cl. 356-350.000
Bunton, Suzanne, to University of Washington, Board of Regents of the. Data structure management tagging system. 5,151,697, Cl 341-51.000
Bur, Anthony J.; Lowry, Robert E.; Roth, Steven C., Thomas, Charles L.; and Wang, Francis W., to United States of America, Commerce Optical sensor for the measurement of molecular orientation and viscosity of polymeric materials based on fluorescence radiation 5,151,748, Cl. 356-32.000
Burgess, Robert D.: *See—*
Geraghty, Rod; and Burgess, Robert D., 5,151,000, Cl. 414-187.000.
Burks, Rudolf S.; and Fauke, Allen R., to Petrolite Corporation. Flotation-aid composition and method of use thereof. 5,151,195, Cl. 210-705.000.
Burke, John T., to Lanxide Technology Company, LP. Method of forming metal matrix composites by use of an immersion casting technique and product produced thereby. 5,150,747, Cl. 164-97.000.
Burkhalter, John; and Suson, Jolinda K., to Halliburton Company Cement fluid loss control additives and methods. 5,151,131, Cl. 106-822.000.
Burnett, Viola C., to Schlegel Corporation. Magnetically mounted door sweep. 5,150,544, Cl. 49-493.000.
Burns, Bryan R. A., deceased: *See—*
Hopwell, Brian L.; Dale, Nicholas C.; and Burns, Bryan R. A deceased, 5,150,858, Cl. 244-45.00A
Burns, Fredrick B., to EZ Paintr Corporation. Method for producing paint brush bristles. 5,151,229, Cl. 264-51.000
Burns, Jean H., administrator: *See—*
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Rollwitz, William L.; De Los Santos, Armando; Perry, William D Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl 340-870.330.

Burton, Anthony R.; Mitchell, Monte K.; and Hernandez, Raymond, to Atlantic Richfield Company. Stuffing box leak containment apparatus. 5,150,751, Cl. 166-81.000

Busch, Peter; Rettenmaier, Helmut; and Sterzik, Willi, to Siemens Nixdorf Informationssystem AG. Method and circuit arrangement for generating a sinusoidal line AC voltage from a DC voltage 5,151,851, Cl. 363-25.000.

Busch, Waldemar; and Lutz, Norbert, to Soropack Hans Reichenecker GmbH & Co. Process for producing a resilient or padded insert for footwear. 5,150,490, Cl. 12-146.00M.

Buslepp, Kenneth J.: *See—*
Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., 5,150,692, Cl. 123-533.000.
Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., 5,150,692, Cl. 123-533.000.

Byerly, Roy H.: *See—*
Bandy, Michael J.; Byerly, Roy H.; and Spoonmore, Robert T., 5,150,735, Cl. 137-614.060.

BYK-Chemie GmbH: *See—*
Haubennestel, Karl-Heinz; and Pritschins, Wolfgang, 5,151,218, Cl. 252-351.000

C-Cube Microsystems, Inc.: *See—*
Sato, Tai, 5,151,875, Cl. 364-784.000

C.I.C.E. S.A.: *See—*
Clerc, Daniel, 5,150,737, Cl. 137-625.300

Caldwell, Stephen P.; and Merrell, Thomas D., Jr., to Westinghouse Electric Corp. Direct digital FM waveform generator for radar systems. 5,151,661, Cl. 328-14.000

Cale, Albert D., Jr.: *See—*
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000

Campbell Soup Company: *See—*
Adams, James; and Meczkowski, Frank J., 5,151,286, Cl. 426-324.000

Campbell, Teddy G., to Texaco, Inc. Provisional protective means for pit valve casing. 5,150,730, Cl. 137-36[illegible]000.

Cannon Kabushiki Kaisha: *See—*
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, 5,151,713, Cl. 346-108.000.

Canon Kabushiki Kaisha: *See—*
Akashi, Akira; and Kadohara, Terutake, 5,151,732, Cl. 354-402.000.
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.
Ebinuma, Ryuichi, 5,151,967, Cl. 385-138.000.
Fukushima, Kyouko; Shirota, Kiromo; and Koike, Shouji, 5,151,128, Cl. 106-20.000.
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000
Ito, Yasuo; and Kyogoku, Hiroshi, 5,151,796, Cl. 358-461.000.
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,151,726, Cl. 354-75.000.
Kanemitsu, Shinji, 5,151,716, Cl. 345-140.00R.
Makino, Jun, 5,151,811, Cl. 359-198.000.
Masuda, Shunichi, 5,151,573, Cl. 219-216.000
Masuda, Yoshitaka, 5,151,593, Cl. 250-234.000
Matsumoto, Shigeyuki; and Ikeda, Osamu, 5,151,305, Cl. 427-252.000.
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000
Sakamoto, Masahiro; and Kataoka, Junnosuke, 5,151,640, Cl. 318-696.000
Shikichi, Satoshi; and Nakahara, Takashi, 5,151,888, Cl. 369-44.320.
Takeuchi, Tatsuo; and Amemiya, Koji, 5,151,313, Cl. 428-192.000.
Tokunaga, Hiroyuki, 5,151,296, Cl. 427-38.000.
Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira 5,151,583, Cl. 250-201.200.
Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, 5,151,734, Cl. 355-200.[illegible]00.
Yakou, Takeshi, 5,150,937, Cl. 294-119.100.
Yoshikawa, Junichi, 5,150,977, Cl. 400-703.000.

Canu, Jean Pierre; DesForges, Bernard; and Huette, Gerard, to Unisys Corp. Character recognition apparatus which obtains distance ratios between edges in a character for identification. 5,151,952, Cl. 382-29.000

Caoutchouc Manufacture et Plastiques S.A.: *See—*
Bourgeot, Jacques, 5,150,657, Cl. 105-3.000

Cappels, Richard D., to Apple Computer, Inc. Apparatus and method for reducing the magnitude of time varying electric fields in CRT displays. 5,151,635, Cl. 315-370.000.

Capps, Stephen P., to Macromedia, Inc. sound editing system using control line for altering specified characteristic of adjacent segment of the stored waveform. 5,151,998, Cl. 395-800.000.

Cardell Corporation: *See—*
McCardell, Willard B., 5,151,052, Cl. 439-598.000.

Cardosomendes, Jose A.: *See—*
Martins Leites, Jose M.; Cardosomendes, Jose A.; Lippai, Andre; and Dellanoce, Paulo T., 5,150,517, Cl. 29-888.040.

Cargould, Barry D.: *See—*
Beebe, James C.; Cargould, Barry D.; and Lees, David W., Sr., 5,151,870, Cl. 364-556.000.

Carl-Zeiss-Stiftung: *See—*
Meier, Hans-J., 5,151,809, Cl. 359-846.000

Carlson, Kenneth W.: *See—*
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N.; and Nagele, Albert L., 5,151,643, Cl. 320-2.000

Carpenter, James B.; Doss, Donald G.; and Glatzl, Frank J., to Minnesota Mining and Manufacturing Company. Wedge-actuated multiple optical fiber splice. 5,151,964, Cl. 385-98.000.

Cartellone, Mark, to Mr. Coffee, Inc. Decanter and lid assembly for automatic drip coffee maker. 5,150,803, Cl. 215-357.000.

Carter, Richard J.: *See—*
Wille, Ross M.; and Carter, Richard J., 5,151,994, Cl. 395-800.000.

Carter, Stephen A.; Williamson, Bryan C.; and Kozole, Karl H., to Ortech Corporation. Flow control system. 5,150,690, Cl. 123-527.000.

Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, to SIMES Societa Italiana Medicinali e Sintetici S.p.A. Phenoxyethyl amine compounds active on the cardiovascular system. 5,151,414, Cl. 514-114.000

Casio Computer Co., Ltd.: *See—*
Kasuo, Tomoo, 5,151,885, Cl. 368-110.000.
Matsuda, Takashi, 5,151,554, Cl. 84-655.000.

Cassano, James R.: *See—*
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., 5,151,745, Cl. 355-313.000.

Cassel, Terry E.; Payne, Harold E.; and Lynde, Gerald D., to Baker Hughes Incorporated. Milling tool and method for milling multiple casing strings. 5,150,755, Cl. 166-297.000.

Caterpillar, Inc.: *See—*
Bock, Allyn P., 5,150,668, Cl. 123-41.800.

Cathey, David A: *See—*
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Cattin, Gabriel J. L.: *See—*
Boquet, Jean P. M.; Ermisse, Daniel J. A.; and Cattin, Gabriel J. L., 5,150,548, Cl. 51-313.000.

Cattin'Air SA: *See—*
Boquet, Jean P. M.; Ermisse, Daniel J. A.; and Cattin, Gabriel J. L., 5,150,548, Cl. 51-313.000.

Caufield, Craig E.; and Schiehser, Guy A., to American Home Products Corporation. Rapamycin acetals as immunosuppressant and antifungal agents. 5,151,413, Cl. 514-63.000.

Cazaux, Jean-Louis: *See—*
Roques, Daniel; Pouysegur, Michel; and Cazaux, Jean-Louis, 5,151,669, Cl. 333-81.00R.

Cederberg, Alvin R. Liner/mandrel for filament wound vessels. 5,151,145, Cl. 156-172.000.

Cefin S.p.A.: *See—*
Pazzaglia, Luigi, 5,150,594, Cl. 72-92.000.

Central Blood Laboratories Authority: *See—*
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Centre International de Recherches Dermatologiques (CIRD): *See—*
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000.

Centre National de la Recherche Scientifique: *See—*
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,264, Cl. 424-1.100.

Centrix, Inc.: *See—*
Discko, John, Jr.; and Dragan, William B., 5,150,495, Cl. 15-167.100.

CFR Corporation: *See—*
Barry, Robert M., 5,151,181, Cl. 210-338.000.

Chaki, Haruyuki: *See—*
Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000.

Chalom, Joseph: *See—*
Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, 5,151,517, Cl. 546-66.000.

Chamberlain, Linda R.: *See—*
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Chan, Tsiu C.: *See—*
Brady, James; Chan, Tsiu C.; and Culver, David S., 5,151,387, Cl. 437-191.000.

Chandler, Kirk R.; and McKenzie, Robert W., to Alcatel Network Systems, Inc. Connector retainer. 5,151,034, Cl. 439-79.000.

Chang, Chi K.: *See—*
Han, Kyung Soo, 5,150,521, Cl. 30-28.000.

Chapin, Thomas B.: *See—*
Merrill, M. Stanley; and Chapin, Thomas B., 5,150,515, Cl. 33-203.120.

Chapman, David M., to U.S. Philips Corporation. Differential amplifiers. 5,151,780, Cl. 358-21.00R.

Chapman, William I., to Williams International Corporation. Integrated propulsion system. 5,150,569, Cl. 60-39.142.

Charles, Harlan W.; and Miller, Larry D., to General Motors Corporation. Steer-sensitive variable damper and method utilizing a ring valve. 5,150,775, Cl. 188-299.000.

Charles Stark Draper Lab., Inc., The: *See—*
Bernardon, Edward; and Foley, Michael F., 5,151,277, Cl. 425-112.000.
Brennan, Ciaran J., 5,151,877, Cl. 365-145.000.

Charng, Cedric S. K., to China Wiper Special Rubber Co., Ltd. Wiper refill unit with improved clip. 5,150,498, Cl. 15-250.420.

Charon, Andre : *See—*
Bauer, Daniel; Leroy, Frederic; Braque, Gerard; and Charon, Andre , 5,151,015, Cl. 417-415.000.

Chase, Robert F.: *See—*
Immorlica, Anthony A., Jr.; and Chase, Robert F., 5,151,769, Cl. 357-53.000.

Chauvel, Jean P., Jr.: *See—*
Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.

ChemGen Corporation: *See—*
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Chemisches Institut Schaefer AG: *See—*
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, 5,151,522, Cl. 548-112.000.

Chen, Chin-Lung. Anchor pile and concrete protection wall construction using said anchor pile. 5,150,549, Cl. 52-162.000.

Chen, Chungte W., to Hughes Aircraft Company. Biocular eyepiece optical system employing refractive and diffractive optical elements. 5,151,823, Cl. 359-565.000.

Chen, Linda: *See—*
Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., 5,151,909, Cl. 372-22.000

Chen, Patrick K.: *See—*
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Chen, Sy-Hwa: *See—*
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Chen, Teh-hsuan: *See—*
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Chen, Yen-Huang. Fire escape. 5,150,765, Cl. 182-48.000.

Cheney, Brian A.: *See—*
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Chennakeshu, Sandeep; and Saulnier, Gary J., to General Electric Company. Sample timing and carrier frequency estimation circuit for sine-cosine detectors. 5,151,926, Cl. 375-84.000

Chiang, Long Y.; and Lai, Wen-Yih F., to Exxon Research and Engineering Company. Highly conducting organic polymer thin film coatings. 5,151,478, Cl. 526-258.000.

Chiba, Takahiro, to Fujitsu Limited. Processing apparatus at reduced pressure and valve used therefor. 5,150,734, Cl. 137-567.000.

Chiba, Tohru: *See—*
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Chijiiwa, Masaru: *See—*
Suzuki, Kiyomi; and Chijiiwa, Masaru, 5,151,872, Cl. 364-571.050.

Childs, Jerry D.: *See—*
Riley, Wendell D.; and Childs, Jerry D., 5,151,203, Cl. 252-8.551.

China Wiper Special Rubber Co., Ltd.: *See—*
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Chinetsu Gijutsu Kaihatsu Kabushiki Kaisha: *See—*
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Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt.: *See—*
Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.

Chitnis, Girish K.; and Herbst, Joseph A., to Mobil Oil Corporation Cracking catalysts. 5,151,394, Cl. 502-65.000.

Chlupsa, Otto, to Vetter, Walter; and Chlupsa, Otto. Process for the manufacturing of a perforated tube for an expansion shaft. 5,151,144, Cl. 156-171.000.

Chmiel, Horst: *See—*
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Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, to Norton Company. Cemented and cemented/sintered superabrasive polycrystalline bodies and methods of manufacture thereof. 5,151,107, Cl. 51-295.000.

Choate, Gary E.: *See—*
Olson, Wayne L.; and Choate, Gary E., 5,150,768, Cl. 182-234.000.

Choji, Shinichiro: *See—*
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Chowdry, Arun: *See—*
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Christensen, Kenneth L.: *See—*
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Chrysler Corporation: *See—*
Depa, Henry F.; and Kopera, John J. C., 5,150,683, Cl. 123-417.000.
Frantz, Douglas C., 5,151,647, Cl. 322-99.000.

Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, to Fujitsu Limited. Adaptive echo canceller. 5,151,937, Cl. 379-410.000.

Ciba-Geigy Corporation: *See—*
Babiarz, Joseph E.; and Rutsch, Werner, 5,151,459, Cl. 524-255.000.
Hari, Stefan; and Cseh, Georg, 5,151,505, Cl. 534-728.000.
Molleyres, Louis-Pierre, 5,151,427, Cl. 514-269.000.
Morrison, Donald J.; McGregor, David; and McCrae, James M., 5,151,129, Cl. 106-623.000.
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000.

Cippelletti, Ennio: *See—*
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Circon Corporation: *See—*
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Cisar, Alan J., to Dow Chemical Company, The. Oxygen reduction catalyst based upon metal dipyridylamines. 5,151,515, Cl. 546-12.000

Citizen Watch Co., Ltd.: *See—*
Wakasugi, Makoto; and Kasai, Takao, 5,151,837, Cl. 360-103.000.

Citta, Richard W., to Zenith Electronics Corporation. HDTV transmission system with reduced susceptibility to NTSC cochannel interference. 5,151,785, Cl. 358-141.000

Clanton, J. Dwight: *See—*
Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J Dwight, 5,151,077, Cl. 493-353.000

Clarion Co., Ltd.: *See—*
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Clark, David E.: *See—*
Beaulieu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.

Clark, Frederick T.: *See—*
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Clark, Jack: *See—*
Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, 5,151,561, Cl. 174-120.00R

Clark, LeaLand L. Method of and composition for treating inflammation and the immunological response thereto. 5,151,425, Cl. 514-261.000

Class OHG: *See—*
Damman, Martin; and Theissing, Gerhard, 5,151,064, Cl. 460-23.000

Claus, Thomas H.: *See—*
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Clear, Sandra H.: *See—*
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., 5,151,092, Cl. 604-385.200.

Clements, Stephen; and King, Brian, to BOC Group plc, The. Cooling of molded articles with a mixture of evaporated cryogen and dried air. 5,151,119, Cl. 65-84.000

Clendenin, Harry B.; and Fogt, James F., to Copeland Corporation. Sound attenuation chamber. 5,151,018, Cl. 417-312.000

Clerc, Daniel, to C.I.C.E. S.A. Ceramic discs for taps and taps equipped with such discs. 5,150,737, Cl. 137-625.300.

Clingman, Arthur B., III: *See—*
Beaulieu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.

Coal Technology Corporation: *See—*
Wolfe, Richard A.; Im, Chang J.; and Wright, Robert E., 5,151,159, Cl. 202-118.000

Coan, Thomas E.; and Ahlen, Steven P., to Boston University. Apparatus for coupling an optical transducer to a light guide. 5,151,963, Cl. 385-88.000

Cockerham, Jefre H.; and Thayer, Edward B., to United Technologies Corporation. In-flight reverser. 5,150,862, Cl. 244-110.00B

Cocoma, John P.: *See—*
Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.

Codinha, J. Albert. Military conflict board game. 5,150,908, Cl. 273-262.000

Cody, Charles A.; and Magauran, Edward D., to Rheox, Inc. Process for deinking wastepaper with organically modified smectite clay. 5,151,155, Cl. 162-5.000

Cohen, Carl M., to Sassy, Inc. Universal tether apparatus. 5,150,504, Cl. 24-302.000

Cohen, Edith: *See—*
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,264, Cl. 424-1.100.

Coherent, Inc.: *See—*
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000

Colbert, Donald A.; and Anilionis, Algis, to Repligen Corporation. Cloned genes encoding recombinant protein A. 5,151,350, Cl. 435-69.100

Cole, Raymond T.: *See—*
Beeson, Charles L.; Cole, Raymond T.; Deak, Gedeon I.; and Leidolf, Harbeson H., Jr., 5,151,331, Cl. 428-475.500

Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J. Dwight, to ARK, Inc. Method and apparatus for perforating material. 5,151,077, Cl. 493-353.000.

Colgate-Palmolive Company: *See—*
Maaser, Heidrun E., 5,151,223, Cl. 252-547.000.

Colin, Michel: *See—*
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000

Colket, Meredith B., III: *See—*
Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, 5,151,171, Cl. 208-48.00Q

Colli, Luigi; and Badiali, Roberto, to Savio S.p.A. Device and method for automatically connecting the yarn to the tube of a winding machine. 5,150,845, Cl. 242-35.50A

Collingwood, David, to Renishaw plc. Signal transmission system for machine tools, inspection machines, and the like. 5,150,529, Cl. 33-503.000

Collins, Wendell, Jr.: *See—*
Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., 5,150,886, Cl. 267-220.000

Com-Nougue, Jacques: *See—*
Brehm, Claude; Boniort, Jean-Yves Tardy, Andre ; and Com-Nougue, Jacques, 5,151,966, Cl. 385-128.000
Comasat: *See—*
Smith, Thane, 5,151,758, Cl. 357-22.000.
Combined Optical Industries Limited: *See—*
Pasco, Ian K., 5,151,826, Cl. 359-742.000.
Comeaux, Robert I. Dental filler applicator. 5,151,030, Cl. 433-118.000
Commins, Alfred D.; and Romeo, Ernest A., to Simpson Strong-Tie Company, Inc. Holdown strap. 5,150,553, Cl. 52-264.000.
Commissariat a l'Energie Atomique: *See—*
Monnet, Olivier; and Vacher, Jacques, 5,151,599, Cl. 250-363.030
Compagnie de Raffinage et de Distribution Total France: *See—*
Szabo, Georges; Schasfoort, Egberrus F. P.; and Milan, Alain, 5,151,400, Cl. 502-203.000
Conant, Sally: *See—*
Bennett, Robert A., 5,150,540, Cl. 43-43.120.
Concept Analysis Corp.: *See—*
Glance, Patrick M.; and Glance, Paul, 5,150,935, Cl. 293-136.000
Concept Design: *See—*
Farrow, Robert I.; and Johnson, Drey, 5,150,847, Cl. 242-56.00R
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R
Cone, Dennis E.; and Gibson, James H. Free weight barbell spotting and racking machine. 5,151,072, Cl. 482-104.000.
Conley, Paul. Eyeglass case and retainer 5,151,778, Cl. 351-156.000
Conn, Thomas E.; and Kwan, Benson, to Beckman Instruments, Inc Centrifuge lid safety lock. 5,150,932, Cl. 292-202.000
Conoco Inc.: *See—*
White, Charles N.; and Goldsmith, Riley G., 5,150,987, Cl. 405-224.000
Conoco Specialty Products Inc.: *See—*
Flanigan, David A.; and Boadway, John D., 5,151,079, Cl. 494-27.000
Conrad, Richard H. Automatic purge method for ozone generators. 5,151,250, Cl. 422-2.000
Conrow, Raymond E.: *See—*
DuPriest, Mark T.; Conrow, Raymond E.; and Kuzmich, Daniel, 5,151,544, Cl. 560-10.000
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., to International Business Machines Corporation. Planarized thin film surface covered wire bonded semiconductor package. 5,151,559, Cl. 174-52.400
Consani, Alberto, to Alberto Consani S.p.A. Re-reeling machine working at constant speed and related cutting device. 5,150,848, Cl. 242-56.00R
Consiglie Nazionale delle Ricerche: *See—*
Flamini, Alberto; and Poli, Nicola, 5,151,527, Cl. 548-451.000
Contraves Italiana S.p.A.: *See—*
Secci, Giovanni, 5,150,770, Cl. 185-40.00R.
Contursi, Luigi; and Beaulardi, Leandro to Temay S.p.A. Process for preparing fine powders of aluminum nitride. 5,151,260, Cl. 423-412.000
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., to Rhone-Poulenc Sante. Derivatives of thioformamide. 5,151,436, Cl. 514-314.000
Cook-Martin, David M., to Unilab Holdings, Ltd. Fluid mechanics devices. 5,150,883, Cl. 251-367.000
Cooper Industries, Inc.: *See—*
Urban, Paul L., 5,151,574, Cl. 219-2-1.000.
Cooper, Stephen R. W.: *See—*
Rymut, Michael J.; Cooper, Stephen R. W.; and Washeleski, John M., 5,150,615, Cl. 73-313.000
Copeland Corporation: *See—*
Clendenin, Harry B.; and Fogt James F., 5,151,018, Cl. 417-312.000
Coquet, Pascal D.: *See—*
Valy, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, 5,150,741, Cl. 141-18.000
Corning Incorporated: *See—*
Allendorf, Stephan C.; and Dair, Thomas M., 5,151,721, Cl. 351-121.000
Bartholomew, Roger F.; and Sadd, Andrea L., 5,151,117, Cl. 65-3.120.
Cortez, Fermin M.: *See—*
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 5,151,496, Cl. 528-500.000
Cothran, Philip E.: *See—*
McCall, Patrick C.; and Cothran, Philip E., 5,151,209, Cl. 252-174.150.
Cottrell, Paul R.: *See—*
Fettis, Michael E.; and Cottrell, Paul R., 5,151,392, Cl. 502-37.000.
Coutant, Herve G. F.: *See—*
Azzara, Sauveur A.; and Coutant, Herve G. F., 5,151,236, Cl. 264-257.000.
Couturier, Alain, to Thomson-CSF. Device for forming images on a large surface and simulator equipped with such a device. 5,151,802, Cl. 359-51.000
Cox, James L.; and Jaquiss, Robert D. B. Cooling net for cardiac or transplant surgery. 5,150,706, Cl. 128-400.000.
Cox, Johnny R.: *See—*
Moore, Jack S., Jr.; Cox, Johnny R.; and Williams, Mark L., 5,150,621, Cl. 73-863.910.
Cramer, Wilfried: *See—*
Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, 5,151,480, Cl. 526-279.000
Crane, Jerry D.: *See—*
Bowman, Donald J.; Crane, Jerry D.; Edwards, Scott G., Edwards, Kathryn M.; and Englund, Sven R., 5,151,896, Cl. 370-85.130.
Crane, Timothy T.; Menelly, Richard A.; and Danek, Robert J. Currency verification device including ferrous oxide detection. 5,151,607, Cl. 250-556.000.
Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., to AMP Incorporated. Seals for an electrical connector. 5,151,045, Cl. 439-271.000.
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., to Atomic Energy of Canada Limited. Silylation of charcoal to increase its hydrophobicity. 5,151,402, Cl. 502-401.000.
Cray Research, Inc.: *See—*
Garcia, Susan J., 5,151,995, Cl. 395-800.000
Crenshaw, Roger T.; and Wiesner, Mark G. Method for treating premature ejaculation. 5,151,448, Cl. 514-651.000
Croft, Alan P.; and Koblinski, Brian D., to Dow Chemical Company, The. Amine-based consistency reducers for gypsum stucco slurries. 5,151,130, Cl. 106-778.000.
Crom Corporation, The: *See—*
Crom, Theodore R.; and Bevis, Gerald C., 5,150,551, Cl. 52-223.00R.
Crom, Theodore R.; and Bevis, Gerald C., to Crom Corporation, The Prestressed composite concrete tank with improved pump joint and method for constructing the same. 5,150,551, Cl. 52-223.00R
Crosfield Electronics Limited: *See—*
Freeman, Stephen, 5,151,686, Cl. 340-703.000
Croshaw, Steven P., to Saddleman, Inc. Dual-tongue seat cover attachment. 5,150,947, Cl. 297-229.000
Crossley, Edward A., Jr.. *See—*
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.
Crowley, Carmel; Sheehan, Timothy G.; and Ward, Frederick G., to Warner Lambert Pottery Road Limited. Process for the production of high purity thrombin. 5,151,355, Cl. 435-214.000
Crowley, H. W., to Roll Systems, Inc. System and method for manufacturing envelopes. 5,150,560, Cl. 53-411.000.
Crown Cork & Seal Company, Inc.: *See—*
Yun, Chung J., 5,150,740, Cl. 141-6.000
Croze, Edward M., to E. R. Squibb & Sons, Inc. Method for purification of monoclonal antibodies. 5,151,504, Cl. 530-413.000
CS Halbleiter- und Solartechnologie GmbH: *See—*
Scholz, Christoph; and Sefalidis, Yassilios, 5,151,116, Cl. 55-387.000.
Cseh, Georg: *See—*
Hari, Stefan; and Cseh, Georg, 5,151,505, Cl. 534-728.000
CTB, Inc.: *See—*
Momont, Timothy W.; and Bird, Charles R., 5,150,666, Cl. 119-57.910.
Culpon, Douglas H., Jr., to Texaco Inc. Chain and drive gear lubricant. 5,151,205, Cl. 252-56.00R.
Culross, Claude C.: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000
Culver, David S.: *See—*
Brady, James; Chan, Tsiu C.; and Culver, David S., 5,151,387, Cl. 437-191.000
Cummins Engine Company, Inc.: *See—*
Johnson, Kenneth L.; and Updike, William A., 5,150,572, Cl. 60-272.000
Cunningham, Linda J.; Adams, Brian; and Barham, William, to Gallaher Ltd. Filter tipped smoking rods. 5,150,725, Cl. 131-365.000.
Cuno, Incorporated: *See—*
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210-264.000.
Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., to General Motors Corporation. Diesel engine closed loop air/fuel ratio control. 5,150,694, Cl. 123-569.000.
Curry, Ernest W.; and Beach, Marvin F., to Bessi Frozen Products, Inc. Food processing apparatus and method. 5,151,288, Cl. 426-474.000.
Curtis, Tony G.: *See—*
Powers, Kelly R.; Curtis, Tony G.; Limaye, Santosh Y.; and Roy, Robert D., 5,151,660, Cl. 324-689.000
CVD Incorporated: *See—*
Goela, Jitendra S.; Pickering, Michael; and Taylor, Raymond L., 5,150,507, Cl. 29-460.000.
D.E.M. Controls of Canada: *See—*
D'Amato, Mark, 5,150,727, Cl. 134-104.200.
Daiichi Seiki Kaisha Kabushiki Kaisha: *See—*
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.
Daikin Industries, Ltd.: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.
Daikuzono, Norio, to S.L.T. Japan Co., Ltd. Laser light emitter. 5,151,097, Cl. 606-15.000.

Daimon, Shiego: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.
Dainippon Ink and Chemicals, Inc.: *See—*
Yamamoto, Hiroshi; and Hanato, Mitsuhiro, 5,150,652, Cl. 101-232.000.
Dair, Thomas M.: *See—*
Allendorf, Stephan C.; and Dair, Thomas M., 5,151,721, Cl. 351-121.000
Daiwa Paint Trading Co. Ltd.: *See—*
Sakai, Hideyuki, 5,150,655, Cl. 104-89.000
Dakin, James T.: *See—*
Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.
Dale, Nicholas C.: *See—*
Hopwell, Brian L.; Dale, Nicholas C.; and Burns, Bryan R. A., deceased, 5,150,858, Cl. 244-45.00A.
Dallas Semiconductor Corporation: *See—*
Pearson, Ronald W.; and Jones, Brian W., 5,151,644, Cl. 320-14.000
D'Amato, Mark, to D.E.M. Controls of Canada. False bottom sump. 5,150,727, Cl. 134-104.200.
Damberg, Dirk H., to Dinoflex Manufacturing Ltd. Process for production of products formed of polymer bonded and granulated particles. 5,151,230, Cl. 264-83.000
Damman, Martin; and Theissing, Gerhard, to Class OHG. Grain tank for a harvester thresher. 5,151,064, Cl. 460-23.000
Dana Corporation: *See—*
Booth, Dwight E., 5,150,779, Cl. 192-106.100.
Danby, Hal C.; and Faulkner, Eric A., to Danby Medical Engineering Ltd. Pumping device having inlet and outlet valves adjacent opposed sides of a tube deforming device. 5,151,019, Cl. 417-474.000.
Danby Medical Engineering Ltd.: *See—*
Danby, Hal C.; and Faulkner, Eric A., 5,151,019, Cl. 417-474.000
D'Andrade, Bruce M.: *See—*
Johnson, Lonnie G.; and D'Andrade, Bruce M., 5,150,819, Cl. 222-79.000
Danek, Robert J.: *See—*
Crane, Timothy T.; Menelly, Richard A.; and Danek, Robert J., 5,151,607, Cl. 250-556.000
Danielson, Scott E.: *See—*
Hanoka, Jack I.; and Danielson, Scott E., 5,151,377, Cl. 437-2.000
Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle engine output control method and vehicle engine. 5,151,861, Cl. 364-426.020.
Darling-Delaware Company, Inc.: *See—*
Roshanravan, Mel; and Grosskopf, Michael W., 5,151,177, Cl. 210-194.000.
Darolia, Ramgopal: *See—*
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000
Dastin, Richard M.: *See—*
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., 5,151,745, Cl. 355-313.000.
Davenport, Kenneth G.: *See—*
Aslam, Mohammad; and Davenport, Kenneth G., 5,151,540, Cl. 558-232.000.
Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., to Laserscope. Frequency doubled solid state laser having programmable pump power modes and method for controllable lasers. 5,151,909, Cl. 372-22.000.
David R. Webb Co., Inc.: *See—*
Weil, George, 5,150,746, Cl. 144-209.00B.
Davis, Archie B.; and Troilo, Joseph A., Jr. Manually contractable ring for sealing an envelope against a bead of a tire during retreading 5,151,150, Cl. 156-384.100.
Davis-Arzac, Craig. Building system for extension of progressive housing. 5,150,552, Cl. 52-259.000.
Davis, C. Calvin: *See—*
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.
Davis, James K.: *See—*
Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl. 340-870.330.
Davis-Lynch, Inc.: *See—*
Hassanzadeh, Hedayat H., 5,150,756, Cl. 166-318.000.
Davy Mckee (Sheffield) Limited: *See—*
Wilson, Geoffrey; Bradshaw, Timothy J.; and Lawson, Kenneth T., 5,150,599, Cl. 72-399.000.
Deak, Gedeon I.: *See—*
Beeson, Charles L.; Cole, Raymond T.; Deak, Gedeon I.; and Leidolf, Harbeson H., Jr., 5,151,331, Cl. 428-475.500.
DeBiasi, Mark S.; and Menelly, Richard A., to General Electric Company. Switchboards and panelboards having interlock and load selection capabilities. 5,151,842, Cl. 361-93.000.
Debie, Peter: *See—*
Range, Helmut; Beigel, Gerhard; Lotsch, Friedemann; and Debie, Peter, 5,151,038, Cl. 439-122.000.
De Bortoli, Giuseppe: *See—*
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.
Debos, Marcel: *See—*
Ranc, Roger; Brisset, Armand; and Debos, Marcel, 5,151,126, Cl. 106-719.000
DeCaro, Anthony A.: *See—*
Kirk, William D., III; DeCaro, Anthony A.; and Perry, Wayne E., 5,151,089, Cl. 604-192.000
DeCastro, Carlos. Non-spillable drinking cup. 5,150,816, Cl. 220-711.000
De Clerck, Charles E., to Hazeltine Corporation. Aluminum sheets bonded with cadmium. 5,151,332, Cl. 428-650.000
Deffner, Dieter: *See—*
Roesky, Werner; Deffner, Dieter; and Wolter, Manfred, 5,150,985, Cl. 405-128.000.
Degani, Yinon; and Morris, John R., Jr., to AT&T Bell Laboratories. Solder paste. 5,150,832, Cl. 228-224.000.
Degen, Peter J.: *See—*
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000
Degner, Dieter: *See—*
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000
Deguchi, Jichio: *See—*
Hanatani, Tadashi; Sanzen, Satoru; and Deguchi, Jichio, 5,151,324, Cl. 428-323.000
Deguchi, Mikio; Itagaki, Takushi; and Usui, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Method of making a solar cell electrode 5,151,373, Cl. 437-2.000.
Deisenroth, Harold G.; and Drawe, Jeffrey W., to Xerox Corporation. Modular conveyor system. 5,150,781, Cl. 198-349.800.
Delachaux S.A.: *See—*
Bommart, Patrick, 5,151,202, Cl. 249-86.000
Delco Electronics Corporation: *See—*
Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., 5,151,939, Cl. 381-15.000
Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D., to Martek Corporation. Closed photobioreactor and method of use. 5,151,347, Cl. 435-3.000.
Dellanoce, Paulo T.: *See—*
Martins Leites, Jose M.; Cardosomendes, Jose A.; Lippai, Andre; and Dellanoce, Paulo T., 5,150,517, Cl. 29-888.040.
De Los Santos, Armando: *See—*
Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl. 340-870.330.
DeLuca, Hector F.; and Smith, Connie M., to Wisconsin Alumni Research Foundation. Method of exterminating rodents and other vertebrate pests. 5,151,416, Cl. 514-167.000.
DeMint, Paul: *See—*
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R.
DeMoss, Paul S. Literature dispensing apparatus. 5,150,818, Cl. 221-228.000
Den-Mat Corporation: *See—*
Ibsen, Robert L.; Pacropis, Donald R.; and Glace, William R., 5,151,453, Cl. 522-14.000
Dendramis, Nancy C.: *See—*
Alvarez, Vincent H.; and Dendramis, Nancy C., 5,150,824, Cl. 224-151.000
Denen, Dennis J., to Neoprobe Corporation. Detector and localizer for low energy radiation emissions. 5,151,598, Cl. 250-336.100
De Nijs, Hendrik, to Akzo N.V. Method of contraception. 5,150,718, Cl. 128-832.000
Denissen, Jon F.: *See—*
Rosenberg, Saul H.; and Denissen, Jon F., 5,151,422, Cl. 514-252.000
Denlinger, Keith R.: *See—*
Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,151,045, Cl. 439-271.000
Denney, Jerry W., to Synermed, Inc. Reagent and method for serum iron assay. 5,151,370, Cl. 436-74.000
Dent, Paul W., to Ericsson-GE Mobile Communications Holding Inc. CDMA subtractive demodulation. 5,151,919, Cl. 375-1.000
Denton, David P.: *See—*
Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.
Denton, Gary R.: *See—*
Hoptry, David A.; Petrofes, James M.; Shal, David A.; and Denton, Gary R., 5,150,915, Cl. 280-707.000
Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., 5,150,916, Cl. 280-707.000
Depa, Henry F.; and Kopera, John J. C., to Chrysler Corporation. Flexible fuel sensor system. 5,150,683, Cl. 123-417.000.
Depew, David L.: *See—*
Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., 5,150,656, Cl. 104-162.000
de Place, Alain, to Alcatel Transmission par Faisceaux Hertziens Apparatus for measuring bending movements of an antenna support mast, and application thereof to controlling the pointing of a motor-driven antenna. 5,151,710, Cl. 343-766.000
Deprenyl Animal Health, Inc.: *See—*
Milgram, Norton W., 5,151,449, Cl. 514-654.000

DeRisi, Joseph F.; Winston, Lonnie E.; Harrison, Dudley; and Rawson, Ken, to Allen Group Inc., The. Heat exchanger and method of assembly thereof. 5,150,520, Cl. 29-890.013.
De Santis, Dominick A.: *See*—
Bell, Jack H.; Zak, Henry C.; and De Santis, Dominick A., 5,151,212, Cl. 252-186.380.
Desaraju, Padma: *See*—
Varaprasad, Desaraju V.; Habibi, Hamid R.; Lynam, Niall R.; and Desaraju, Padma, 5,151,816, Cl. 359 275.000.
Deschenes, Lyse L.: *See*—
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., 5,151,402, Cl. 502-401.000.
de Seroux, Nicolas; and Limouzin, Dominique, to Framatome. Device for the sealed opening and closing of a passage interconnecting a central channel of a transportable hollow body and a vergical well formed in a fixed structure. 5,151,245, Cl. 376-271.000.
DesForges, Bernard: *See*—
Canu, Jean Pierre; DesForges, Bernard; and Huette, Gerard, 5,151,952, Cl. 382-29.000.
Desmarais, Daniel; and Wallace, Jack R., to 1-800 Geopoly. Method of playing an educational geography game 5,150,907, Cl. 273-240.000.
Detanne, Francois: *See*—
Vincent de Paul, Michel; and Detanne, Francois, 5,150,736, Cl. 137-625.300.
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Anton, Rainer; and Harneit, Dieter, 5,151,226, Cl. 264-25.000.
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Thomas, Robert E.; Varghese, George; Souza, Robert J.; and Harvey, George A., 5,151,899, Cl. 370-94.100.
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Dockery, Gregory A. Video multiplying system. 5,151,838, Cl. 340-310.00R.
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Ebner, Roland; and Hannig, Dieter, 5,150,609, Cl. 73-117.300.
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Dow Chemical Company, The: *See*—
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Cisar, Alan J., 5,151,515, Cl. 546-12.000.
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Glaser, R. Steven; and Bade, Jeffrey M., 5,151,866, Cl. 364-483.000.
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Smith, Michael G.; Jacks, Wendy S.; Lo, William C.; and Ehr, Robert J., 5,151,113, Cl. 71-92.000.
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Drabek, David F. Hand tool for fastening snaps. 5,150,505, Cl. 29-278.000.
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Dray, Robert F. Positive-type non-return valve. 5,151,282, Cl. 425-562.000.
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Dubocovich, Margarita L.: *See*—
Horn, Alan S., deceased; and Dubocovich, Margarita L., 5,151,446, Cl. 514-617.000.
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Foster, James P.; and Jennings, Philip V., 5,150,541, Cl. 43-131.000.
Fusselman, David F.; and Townsend, Peter K., 5,151,036, Cl. 439-108.000
Hekker, Roeland M. T.; Livny, Izhak M.; and Mercurio, Gregory S., 5,151,822, Cl. 359-559.000.
Hobbs, Frank W., Jr.; and Trainor, George L., 5,151,507, Cl. 536-23.000
Lau, Hon-Peng P.; and Miller, Warren K., 5,151,348, Cl. 435-7.920.
Schnitzer, Tadeusz E., 5,150,640, Cl. 83-583.000
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Okazaki, Susumu; and Kurosaki, Akito, 5,151,263, Cl. 423-659.000.
DuPriest, Mark T.; Conrow, Raymond E.; and Kuzmich, Daniel, to Alcon Laboratories, Inc. Intermediates in the preparation of chiral spirofluorenehydantoins. 5,151,544, Cl. 560-10.000.
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Duranton, Marc A. G.: *See*—
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Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., to Xerox Corporation. Sheet control mechanism for use in an electrophotographic printing machine. 5,151,745, Cl. 355-313.000
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Oleson, Richard A., 5,150,479, Cl. 2-414.000
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St. Denis, Lucen, 5,150,508, Cl. 29-463.000.
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Earl, Harold A.; and Banks, William B., to National Research Development Corporation. Process for producing composite materials. 5,151,238, Cl. 264-136.000
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Harris, Sydney J.; and Woolnough, Andrew C., 5,150,813, Cl. 220-480.000.
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EDAP International, S.A.: *See*—
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Ichisa, Nobuaki; and Yamazaki, Eisuo, 5,151,916, Cl. 372-61.000.
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 5,151,864, Cl. 364-474.230.

Fanuc Ltd: *See—*
Torii, Nobutoshi; and Wakio, Hiroshi, 5,151,608, Cl. 250-561.000.

Farid, Payman: *See—*
Behling, James R.; Farid, Payman Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Farinotti, Robert: *See—*
Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, 5,151,517, Cl. 546-66.000.

Farling, Duane J.; and Smith, Gary A., to Eastman Kodak Company. Single unit apparatus for chilling, drying and incubating photographic emulsions. 5,150,533, Cl. 34-62.000.

Faroudja, Yves C. Digital television with enhancement. 5,151,783, Cl. 358-133.000.

Farquharson, Stuart: *See—*
Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.

Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., to General Electric Company. Self-extinguishing gas probe starter for an electrodeless high intensity discharge lamp. 5,151,633, Cl. 315-248.000.

Farrell, David: *See—*
Slife, Jimmy D.; and Farrell, David, 5,151,935, Cl. 379-240.000.

Farrell, William M., to General Electric Company. Gas turbine powerplant. 5,150,567, Cl. 60-39.020.

Farrow, Robert I.; and Johnson, Drey, to Concept Design. Cassette loader with leader tape extraction and transfer, and method. 5,150,847, Cl. 242-56.00R.

Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., to Concept Design. Cassette loader with improved leader tape extraction and method. 5,150,849, Cl. 242-56.00R.

Fasi, Roland; and Nielsen, Milo A., to Nestec S.A. Process for reducing hydrolysed protein chlorohydrin content. 5,151,503, Cl. 530-412.000.

Fauke, Allen R.: *See—*
Buriks, Rudolf S.; and Fauke, Allen R., 5,151,195, Cl. 210-705.000.

Faulkner, Eric A.: *See—*
Danby, Hal C.; and Faulkner, Eric A., 5,151,019, Cl. 417-474.000.

Fearon, Karen L.: *See—*
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000

Federal-Mogul Corporation: *See—*
Wolbers, Eugene A.; and Drewes, Douglas A., 5,150,778, Cl. 192-98.000.

Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, to Bayer Aktiengesellschaft. Purification of polycarbonate and polyester carbonate waste. 5,151,452, Cl. 521-48.000.

Ferguson, Keith D.: *See—*
Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., 5,150,589, Cl. 68-23.700.

Ferkany, Michael A., to Biomedical Devices Company. Fluid collecting and dispensing system. 5,151,184, Cl. 210-514.000.

Ferrari, Alberto. Backpack spraying equipment. 5,150,837, Cl. 239-153.000.

Ferraro, Andrew G., to Reiss Media Enterprises. Control system for satellite delivered pay-per-view television system. 5,151,782, Cl. 358-86.000.

Fettis, Michael E.; and Cottrell, Paul R., to UOP. Moving bed regeneration process with separate dispersion and chloriding steps. 5,151,392, Cl. 502-37.000.

Fiber Delivery Concepts, Inc.: *See—*
Walker, James P.; Aucoin, Jack; and Drew, Randall, 5,151,962, Cl. 385-86.000.

Fibra-Sonics, Inc.: *See—*
Khek, Sokhuom, 5,151,084, Cl. 604-22.000.
Pichler, Robert H., 5,151,083, Cl. 604-22.000.

Filo, Andrew S., to Simon Marketing, Inc. Imaging device and method for developing, duplicating and printing graphic media. 5,151,595, Cl. 250-316.100.

Filosa, Philip C.: *See—*
Nagengast, William E.; and Filosa, Philip C., 5,151,849, Cl. 362-61.000.

Fina Technology, Inc.: *See—*
Tees, Alistair A.; and Kenney, Glen E., 5,151,111, Cl. 55-164.000.

Findeis, Gunter; Jacob, Friedrich; and Schulz, Eberhard, to Agfa-Gevaert Aktiengesellschaft. Apparatus and method for copying photographic masters at variable magnifications. 5,151,733, Cl. 355-45.000.

Finello, Duane, to United States of America, Air Force. Supercapacitor. 5,151,848, Cl. 361-502.000.

Finkelmann, Heino; and Messner, Bernfried, to Merck Patent Gesellschaft mit beschrankter Haftung. Polymers having liquid crystal phases containing 2-cyanoacrylic acid ester group. 5,151,481, Cl. 526-298.000.

Finkenzeller, Ulrich: *See—*
Reiffenrath, Volker; and Finkenzeller, Ulrich, 5,151,213, Cl. 252-299.600.

Finnerty, James L.: *See—*
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, 5,151,867, Cl. 364-489.000.

Firmenich S.A.: *See—*
Giersch, Wolfgang K.; Blanc, Pierre-Alain; and Schulte-Elte, Karl-Heinrich, 5,151,410, Cl. 512-9.000.

Fischer, Christof D.; Petutschnig, Wolfgang; and Wojik, Karl, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List. Cylinder head of an internal combustion engine. 5,150,672, Cl. 123-90.220.

Fischer, Dennis: *See—*
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000.

Fischer, Moritz, to Fischer Moritz AG. Tread element for moving pavement or escalator. 5,150,780, Cl. 198-333.000.

Fischer Moritz AG: *See—*
Fischer, Moritz, 5,150,780, Cl. 198-333.000.

Fisher, Gary R.: *See—*
Gunst, Ole; and Fisher, Gary R., 5,150,752, Cl. 166-88.000.

Fisher & Paykel Limited: *See—*
Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., 5,150,589, Cl. 68-23.700

Fisher, Robert W.: *See—*
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000

Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., to Vesuvius Crucible Company. Prevention of erosion and alumina build-up in casting elements. 5,151,201, Cl. 222-600.000.

Fite, David B.: *See—*
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, 5,151,867, Cl. 364-489.000.

Fitzpatrick, David: *See—*
Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, 5,151,267, Cl. 424-89.000

Fitzwater, Edwin. Air gun pellet design. 5,150,909, Cl. 273-428.000.

Flakee Mills, Inc.: *See—*
Williams, Rick L.; Leggott, Merton R.; and Bailey, Richard G., 5,151,285, Cl. 426-241.000.

Flamig, Duane P.: *See—*
Harms, Steven E.; Flamig, Duane P.; and Griffey, Richard H., 5,151,655, Cl. 324-309.000.

Flamini, Alberto; and Poli, Nicola, to Consiglie Nazionale delle Ricerche. Synthesis of the carbanion 1,1,2-tricyano-2-(3,4-dicyano-5-imino-2,5-dihydro-1H-pyrrol-2-ylidene) ethanide. 5,151,527, Cl. 548-451.000

Flanigan, David A.; and Boadway, John D., to Conoco Specialty Products Inc. Method and apparatus for reduction of particle disintegration. 5,151,079, Cl. 494-27.000.

Fleissneer, Gerold. Air mixer apparatus. 5,150,535, Cl. 34-155.000.

Flint, Lori B.: *See—*
Homonoff, Edward C.; Meierhoefer, Alan W.; and Flint, Lori B., 5,151,320, Cl. 428-284.000

Flohr, Peter, to Heinrich Kopp GmbH & Co. KG. Power circuit breaker. 5,151,674, Cl. 335-16.000.

Flores, Carlos R. Doctor-blade assembly for flexographic press. 5,150,651, Cl. 101-207.000.

Fluid-Carbon International AB: *See—*
Engstrom, Sven; Lindman, Bjorn; and Larsson, Kare, 5,151,272, Cl. 424-450.000.

Focke & Co.: *See—*
Focke, Heinz; and Bretthauer, Hans-Jurgen, 5,150,720, Cl. 131-329.000

Focke & Co. (GmbH & Co.): *See—*
Focke, Heinz, 5,151,073, Cl. 493-79.000

Focke, Heinz; and Bretthauer, Hans-Jurgen, to Focke & Co. Cuboidal pack, especially hinge lid pack for cigarettes. 5,150,720, Cl. 131-329.000

Focke, Heinz, to Focke & Co. (GmbH & Co.). Apparatus for the production of cigarette packs. 5,151,073, Cl. 493-79.000.

Foehse, Karen B.; Efstathiou, John D.; and Stoll, James R., to General Mills, Inc. High soluble fiber barley expanded cereal and method of preparation. 5,151,283, Cl. 426-93.000.

Fogt, James F.: *See—*
Clendenin, Harry B.; and Fogt, James F., 5,151,018, Cl. 417-312.000

Fokker Aircraft B.C.: *See—*
Kaptein, Dick, 5,150,855, Cl. 244-1.00N.

Foley, Michael F.: *See—*
Bernardon, Edward; and Foley, Michael F., 5,151,277, Cl. 425-112.000.

Ford, Benjamin J.: *See—*
Ford, Dan; and Ford, Benjamin J., 5,150,745, Cl. 141-241.000.

Ford, Dan; and Ford, Benjamin J. Container and method for filling batteries with electrolyte. 5,150,745, Cl. 141-241.000

Ford Motor Company: *See—*
Hickey, John C., 5,150,842, Cl. 239-585.400.

Ford New Holland, Inc.: *See—*
Bich, Gary L.; and Hall, Larry D., 5,150,564, Cl. 56-98.000.
Bich, Gary L., 5,150,565, Cl. 56-102.000.

Forgette, Sidney M. Theft guard for cable reels. 5,150,790, Cl. 206-4.000

Foster, James P.; and Jennings, Philip V., to Du Pont de Nemours, E. I., and Company. Device for killing insects. 5,150,541, Cl. 43-131.000.

Foster, Walter W.; Boatwright, Gregory L.; and Lewis, Thomas E., to Reynolds Metals Company. Coated article production system. 5,151,147, Cl. 156-244.120.

Fox, Neil A., to Smiths Industries Public Limited Company. Radiation-emitting panels and display assemblies. 5,150,965, Cl. 362-260.000.

Framatome: *See—*
de Seroux, Nicolas; and Limouzin, Dominique, 5,151,245, Cl. 376-271.000

France Telecom Etablissement Autonome de Droit Public (Centre National d'Etudes des Telecommunications): *See—*
Riviere, Luc, 5,151,957, Cl. 385-41.000.

Franco, Luis P.: *See—*
Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., 5,151,294, Cl. 427-11.000

Frank, Dieter: *See—*
Kent, Carole L.; and Frank, Dieter, 5,151,302, Cl. 427-140.000

Frank L. Wells Company: *See—*
Wentzek, Horst; and Kozak, Michael, 5,150,600, Cl. 72-426.000

Frank, Lee F.: *See—*
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,150,955, Cl. 354-321.000

Frank, Lenore G. R.: *See—*
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,151,178, Cl. 210-198.200

Frank, Wolfgang; Loffler, Johannes; and Holle, Norbert, to Metallgesellschaft AG. Control spear for use in a passage for conducting dust-containing hot gases. 5,150,729, Cl. 137-340.000

Frank's International Ltd.: *See—*
Moody, Victor; and Jenner, Andrew, 5,150,642, Cl. 81-57.200

Franssen, Emile; and Reisberg, Barry. System for diagnosis and staging of dementia by neurologic examination. 5,150,716, Cl. 128-774.000

Frantz, Douglas C., to Chrysler Corporation. Enhanced charging system diagnostic method. 5,151,647, Cl. 322-99.000

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Oellerer, Friedrich, 5,151,002, Cl. 414-339.000.

Franzke, Klaus: *See—*
Kohler, Rolf; Kratt, Alfred; and Franzke, Klaus, 5,150,698, Cl. 123-690.000

Fraser, Mark D.: *See—*
Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., 5,151,730, Cl. 354-275.000

Frater, Georg; and Helmlinger, Daniel, to Givaudan Corporation. Tricyclic ketones and fragrance compositions containing same 5,151,411, Cl. 512-15.000

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Baumeister, Joachim; and Schrader, Hartmut, 5,151,246, Cl. 419-2.000
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, 5,151,241, Cl. 264-314.000.

Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung EV. *See—*
Grobe, Anneliese; and Chmiel, Horst, 5,151,193, Cl. 210-651.000

Fredericks, Kenneth J.; and Lynch, Kenneth R., to International Business Machines Corp. Managing a serial link in an input/output system which indicates link status by continuous sequences of characters between data frames. 5,151,977, Cl. 395-200.000

Freeman, Stephen, to Crosfield Electronics Limited. Electronic brush generation. 5,151,686, Cl. 340-703.000.

Freitag, Dieter: *See—*
Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, 5,151,452, Cl. 521-48.000.

French State Represented by the Minister of Post, Telecommunications and Space (Centre National d'Etudes des Telecommunications): *See—*
Pophillat, Lucien, 5,151,698, Cl. 341-52.000.

Frescka, Ede: *See—*
Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200

Freyne, Eddy J. E.: *See—*
Venet, Marc G.; Sanz, Gerard C.; Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., 5,151,421, Cl. 514-249.000.

Friedmann, Jacob, to Iscar Ltd. Cutting insert and a cutting tool assembly incorporating such an insert. 5,150,992, Cl. 407-110.000

Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Apparatus for transmitting torque between the engine and the transmission of a motor vehicle. 5,150,777, Cl. 192-70.170.

Friedmann, Oswald: *See—*
Maucher, Paul; and Friedmann, Oswald, 5,151,065, Cl. 464-68.000

Fries, William M., to Hughes Aircraft Company. Self-leveling reflow solder head with double pivot. 5,150,827, Cl. 228-44.700.

Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., to Motorola, Inc. Packaged semiconductor device handler. 5,151,650, Cl. 324-158.00F

Frohlich, Jorn, legal representative: *See—*
Wismer-Pedersen, Jorgen, deceased; and Frohlich, Jorn, legal representative, 5,151,500, Cl. 530-385.000

Frohlich, Stefan: *See—*
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, 5,151,241, Cl. 264-314.000.

Frye, Gregory C.: *See—*
Bein, Thomas; Brown, Kelly D.; Frye, Gregory C.; and Brinker, Charles J., 5,151,110, Cl. 55-75.000.

Fu, Chia-Min; Maholland, Michael K.; and Lowery, Richard E., to Phillips Petroleum Company. Reactivation of spent, metal-containing cracking catalysts. 5,151,391, Cl. 502-27.000.

Fuchikami, Takamasa; and Urata, Hisao, to Sagami Chemical Research Center. Fluorine-containing α,β-bifunctional compounds and process for their production. 5,151,535, Cl. 554-226.000

Fuchs, Erwin, to Weingartner Maschinenbau Gesellschaft m.b.H. Process for manufacturing inner and outer parts for a rotary piston machinein which the inner and outer parts have parallel axes 5,150,518, Cl. 29-888.040.

Fujan, Steven J.; and Loeber, Frederick W., to Terex Corporation Safety modular cab system for a large, off road-machine. 5,150,942, Cl. 296-190.000

Fuji Electric Co., Ltd.: *See—*
Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, 5,150,704, Cl. 128-395.000

Fuji Kikai Kogyo Kabushiki Kaisha: *See—*
Yamamoto, Hiroshi; and Hanato, Mitsuhiro, 5,150,652, Cl. 101-232.000

Fuji Photo Film Co., Ltd.: *See—*
Abe, Akira; Mihayashi, Keiji; and Ishijima, Seiji, 5,151,344, Cl. 430-383.000
Adachi, Yuuma, 5,151,795, Cl. 358-443.000
Agano, Toshitaka, 5,151,597, Cl. 250-327.200.
Hasebe, Kazunori, 5,151,345, Cl. 430-325.000
Kohda, Katsuhiro; and Matsuda, Terumi, 5,151,604, Cl. 250-484.100
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000
Okino, Yoshiharu; and Okazaki, Yoji, 5,151,714, Cl. 346-108.000
Sakanoue, Kei; and Hirano, Tsumoru, 5,151,356, Cl. 430-548.000
Saotome, Shigeru, 5,151,596, Cl. 250-327.200.
Sasaki, Hidemi, 5,151,727, Cl. 354-76.100
Seto, Shunichi, 5,151,755, Cl. 356-414.000.
Takatori, Naoki; and Orimoto, Masaaki, 5,151,790, Cl. 358-225.000.
Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, 5,151,346, Cl. 430-546.000
Yamada, Minoru; and Toyoda, Takashi, 5,151,731, Cl. 354-324.000
Fuji Photo Optical Co., Ltd.: *See—*
Ishiguro, Masaaki; Tanaka, Toshiumi; and Takagi, Yukio, 5,150,715, Cl. 128-662.060
Fuji Xerox Co., Ltd.: *See—*
Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100
Miyata, Masahiko, 5,151,949, Cl. 382-3.000
Mukai, Toshio; Yamashita, Yoshio; and Suzuki, Takanori, 5,151,528, Cl. 549-31.000
Fujikawa, Satoshi: *See—*
Ninomiya, Hiroshi; and Fujikawa, Satoshi, 5,150,637, Cl. 74-335.000
Fujikko Kabushiki Kaisha: *See—*
Matsuura, Hiroshi, 5,150,870, Cl. 248-421.000.
Negi, Yoshitaka; and Matsuura, Hiroshi, 5,150,871, Cl. 248-429.000.
Fujimoto, Hiroaki: *See—*
Sakamoto, Noriyasu; Kisida, Hirosi, Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.
Fujimoto, Hitoshi, to Kabushiki Kaisha Toshiba. Image forming apparatus capable of automatic control of developer density. 5,151,740, Cl. 355-246.000
Fujioka, Toshinori, to Hitachi, Ltd. Automatic transaction machine system for checking card data and embossed characters. 5,151,582, Cl. 235-469.000
Fujita, Akira; and Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. System for adjusting horizontal deviations of an elevator car during vertical travel. 5,151,562, Cl. 187-134.000
Fujita, Minoru, to Hitachi Maxell, Ltd. Disk cartridge shutter. 5,151,894, Cl. 369-291.000
Fujita, Yoshiyuki; and Sakane, Katsunobu, to Toyoda Gosei Co., Ltd. Steering wheel. 5,150,920, Cl. 280-777.000.
Fujitsu Limited: *See—*
Chiba, Takahiro, 5,150,734, Cl. 137-557.000.
Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, 5,151,937, Cl. 379-410.000.
Hasegawa, Susumi; Mizoshita, Yoshitami; and Takaishi, Kazuhiko, 5,151,639, Cl. 318-568.180.
Matsuda, Genichi; and Sugii, Takesi, 5,151,326, Cl. 128-336.000
Matsui, Kunio, 5,151,857, Cl. 364-41[illegible].000
Okazaki, Makoto; and Eto, Koji, 5,151,940, Cl. 381-43.000.
Sato, Shouichi, 5,151,676, Cl. 338-61.000.
Suzuki, Hideo, 5,151,897, Cl. 370-85.30.
Takeuchi, Atsushi, 5,151,589, Cl. 250-213.00A.
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000.
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-424.050
Yaguchi, Masanori, 5,151,743, Cl. 355-288.000
Yamauchi, Tunenori, 5,151,765, Cl. 357-34.000
Yokoyama, Naoki; and Imamura, Kenichi, 5,151,618, Cl. 307-471.000
Fujiwara, Genichi, to Mitsubishi Denki Kabushiki Kaisha. Voice frequency communication apparatus. 5,151,923, Cl. 375-5.000.
Fujiwara, Shozo: *See—*
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Fujiwara, Takayoshi; and Honma, Hisanori, to Kabushiki Kaisha Toshiba. Fluid compressor with adjustable bearing support plate 5,151,021, Cl. 418-93.000
Fujiwara, Yoshihito: *See—*
Nishiguchi, Masayuki; Fujiwara, Yoshihito; and Umezawa, Tomoko, 5,151,941, Cl. 381-46.000
Fukahori, Hidehiko: *See—*
Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, 5,151,583, Cl. 250-201.200
Fukuchi, Takakazu: *See—*
Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, 5,151,379, Cl. 427-39.000.
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, to Mitsui Toatsu Chemicals, Inc. Method for forming window material for solar cells and method for producing amorphous silicon solar cell. 5,151,255, Cl. 422-186.050.
Fukui, Hirokazu: *See—*
Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, 5,151,937, Cl. 379-410.000
Fukumochi, Yasuaki: *See—*
Uenishi, Akio; Yamaguchi, Hiroshi; and Fukumochi, Yasuaki, 5,151,762, Cl. 357-23.400.
Fukushima, Hitoshi. *See—*
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.
Fukushima, Kyouko; Shirota, Koromo; and Koike, Shouji, to Canon Kabushiki Kaisha. Ink, ink jet recording method employing the same, and apparatus or tool employing the same. 5,151,128, Cl. 106-20.000
Fulbreth, Werner; Leeb, Richard; Radau, Manfred; and Stammberger, Willi, to Hoechst Aktiengesellschaft. Stabilized medicinal substances, a process for the preparation thereof, and stable medicinal formulations. 5,151,433, Cl. 514-299.000
Fuller, George T.: *See—*
Bowman, Harold M.; and Fuller, George T., 5,150,984, Cl. 404-26.000.
Funada, Fumiaki: *See—*
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.
Furuhashi, Michio: *See—*
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300
Furukawa Electric Co., Ltd., The: *See—*
Okada, Tetsuya, 5,151,042, Cl. 439-169.000.
Furukawa, Noboru: *See—*
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hara, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000
Furuya, Hiroyuki: *See—*
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.
Furuya, Kouhei: *See—*
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000
Furuya, Masato: *See—*
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Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,151,045, Cl. 439-271.000.
Gsell, Thomas C.: *See*—
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000.
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Gubanc, David M.; Liston, Larry J.; and Zimmerman, Jeffrey M., to General Electric Company. NO_x reduction and control using hydrogen peroxide in the absorber column. 5,151,258, Cl. 423-235.000.
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Gunmar, Krister; and Tegth, Ulf, to Televerket. Method for simulating the effect of alternative antenna patterns on the coverage and interference pattern of a mobile radio system. 5,151,704, Cl. 342-360.000.
Gunst, Ole; and Fisher, Gary R. Oil well-fire containment device 5,150,752, Cl. 166-88.000.
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Haagh, Johannes P. N.; van Dnest, Hans; and Smit, Gerrit, to NCR Corporation. Radio LAN station with improved frame delimiter detection in a spread spectrum environment. 5,151,920, Cl. 375-1.000.
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Buback, Michael; Hader, Josef; Voegele, Hans-Peter; and Al-Massri, ZaKarya, 5,151,533, Cl. 552-625.000.
Hadwin, Matthew J., to Tektronix, Inc. Integrated circuit device having improved substrate capacitance isolation. 5,151,775, Cl 357-80.000.
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, to NKK Corporation. Pipe coupling using shape memory alloy with inner solder foil member. 5,150,931, Cl. 285-381.000.
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Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, 5,151,360, Cl. 435-240.200.
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Hsu, Wen-Liang; and Halasa, Adel F., 5,151,398, Cl. 502-117.000.
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Blom, Niels J., 5,151,259, Cl. 423-328.000.
Hales, Crispin; and Zabinski, Thomas E., to IIT Research Institute. Method and apparatus for using evacuated, detachable web containers with high vacuum treating means. 5,151,303, Cl. 427-178.000.
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Warner, Gary N.; White, Jason L.; Haley, Edmund J.; Savitsky, Wallace R.; and Schaffer, Ronald R., 5,151,960, Cl. 385-53.000.
Hall, Bradford D.; and Krupnick, Steven B., to Webb Research II, Inc. Variable position surface coil stabilizer for magnetic resonance imaging. 5,150,710, Cl. 128-653.500.
Hall, James A. Brush deflector attachment for chain saw. 5,150,524, Cl 30-382.000.
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Burkhalter, John; and Suson, Jolinda K., 5,151,131, Cl. 106-822.000.
Riley, Wendell D.; and Childs, Jerry D., 5,151,203, Cl. 252-8.551.
Halmann, Menachem; Azhari, Haim; Beyar, Rafael; Sideman, Samuel; and Dinnar, Uri, to Technion R & D Found. Ltd. Method of displaying coronary function. 5,151,856, Cl. 364-413.030.
Hamamura, Fumio; and Watanabe, Katsuyoshi, to Somar Corporation; and Hitachi Techno Engineering Co., Ltd. Method of cutting thin film out and device for practicing same. 5,150,639, Cl. 83-39.000.
Hamamura, Kenichi: *See*—
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki, Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.
Hamasaki, Katumi: *See*—
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Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., to General Motors Corporation. Top mount assembly for a suspension actuator. 5,150,886, Cl. 267-220.000.
Hamilton, Tyrone. Cap holder device. 5,150,808, Cl. 220-375.000.
Hammerschmitt, Nikolaus. Light-liquid separator. 5,151,185, Cl. 210-521.000.
Han, Hyo-jin: *See*—
Jeong, Ho-sun; and Han, Hyo-jin, 5,151,874, Cl. 364-752.000.
Han, Kyung Soo, to Chang, Chi K. Nail collection box for a nail clipper. 5,150,521, Cl. 30-28.000.
Hanagan, Patrick L.: *See*—
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Hanamoto, Hiroyuki, to Minolta Camera Kabushiki Kaisha. Copying apparatus that automatically sets manually inputted conditions of immediately preceding interrupt as initial copy condition for present interrupt. 5,152,001, Cl. 395-800.000.
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Yamamoto, Hiroshi; and Hanato, Mitsuhiro, 5,150,652, Cl. 101-232.000.
Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, to Biomembrane Institute. Effect of N,N,N-trimethylsphingosine on protein kinase-C activity, melanoma cell growth in vitro, metastatic potential in vivo and human platelet aggregation. 5,151,360, Cl. 435-240.200.
Hanifl, Paul H., to Sage Products, Inc. Suction swab. 5,151,094, Cl 604-902.000.
Hanna, John E., to Motorola, Inc. Circuit and method of signal differentiation. 5,151,662, Cl. 328-127.000.
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Kumpfbeck, Richard J.; and Hannan, Peter W., 5,151,707, Cl. 343-705.000.
Hannig, Dieter: *See*—
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Hanoka, Jack: *See*—
Bottari, Frank J.; Hanoka, Jack; and Sylva, Frank W., 5,151,386, Cl. 437-187.000.
Hanoka, Jack I.; and Danielson, Scott E., to Mobil Solar Energy Corporation. Method for forming contacts. 5,151,377, Cl. 437-2.000.
Hansen, Brian J.; and Hansen, Stewart L. Protective wristband. 5,150,475, Cl. 2-16.000.
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Hansen, Paul E.: *See*—
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Paffrath, Edgar C.; and Hanson, Brian A., 5,150,959, Cl. 362-80.000.
Hara, Akira, to B-J Trading Limited. Method of and apparatus for cleaning a cylinder. 5,150,653, Cl. 101-483.000.
Hara, Katsuyoshi: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.
Harada Industry Co., Ltd.: *See*—
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Harada Kogyo Kabushiki Kaisha: *See*—
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Harada, Yooichi: *See*—
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Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Staged process for reactivation of spent zeolite catalyst particles. 5,151,393, Cl. 502-53.000.
Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., to Miles Inc. Process for the production of reinforced polyurethane moldings by the reaction injection molding process. 5,151,483, Cl. 528-44.000.
Hardaway, Anthony H.: *See*—
Singh, Devinder; Hardaway, Anthony H.; Euler, John W.; and Pastryk, Jim J., 5,150,588, Cl. 68-3.500.
Harder, John W.: *See*—
Begley, William J.; Chen, Teh-hsuan; Ling, Hans G.; Harder, John W.; and Bowne, Arlyce T., 5,151,343, Cl. 430-382.000.
Hari, Hiroaki: *See*—
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Hari, Stefan; and Cseh, Georg, to Ciba-Geigy Corporation. Amine salts of azo pigments based on pyrazolone derivatives. 5,151,505, Cl. 534-728.000.
Harmel, Roman J.: *See*—
Andrews, Jack E.; Harmel, Roman J.; Lochkovic, Gregory A.; and Rotoloni, Francis A., 5,151,306, Cl. 427-434.500.
Harmon, J. P.: *See*—
Ward, Jefferson P.; Harmon, J. P.; English, Kris M.; and Christensen, Kenneth L., 5,151,715, Cl. 346-140.00R.
Harms, Steven E.; Flamig, Duane P.; and Griffey, Richard H., to Baylor Research Institute. Magnetic resonance imaging using a back-to-back pulse sequence. 5,151,65[illegible], Cl. 324-309.000.
Harneit, Dieter: *See*—
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Harnischfeger Corporation: *See*—
Long, Herbert D., Jr., 5,150,799, Cl. 212-147.000.
Harp, Hans-Jurgen: *See*—
Manusch, Cristoph; and Harp, Hans-Jurgen, 5,150,851, Cl. 242-68.100.
Harral, Michael W.; and Rendell, Eric I., to Normalair-Garrett (Holdings) Limited. Oxygen monitoring method and apparatus. 5,151,166, Cl. 204-425.000.
Harreus, Albrecht: *See*—
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Harrigan, Michael E.: *See*—
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Landeta, David S., 5,151,953, Cl. 342-41.000.
Harris, James E.: *See*—
Lee, Benedict M.; and Harris, James E., 5,150,721, Cl. 131-331.000.
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Harris, Sydney J.; and Woolnough, Andrew C., to Earley Marketing Limited. Receptacle and mould for making the same. 5,150,813, Cl. 220-480.000.
Harris, William J.; and Hwang, Wen-Fang, to Dow Chemical Company, The. Copolymers containing polybenzoxazole, polybenzothiazole and polybenzimidazole moieties. 5,151,489, Cl. 528-183.000.
Harris, William J.; and Lysenko, Zenon, to Dow Chemical Company, The. Polybenzoxazoles having pendant methyl groups. 5,151,490, Cl. 528-183.000.
Harrison, Dudley: *See*—
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Hart, Terance W.: *See*—
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.
Hartmann, Wilbert J. A. M.: *See*—
Verhulst, Antonius G. H.; Hartmann, Wilbert J. A. M.; Stommels, Franciscus J.; and Luyckx-Smolders, Ann M. M., 5,151,804, Cl. 359-56.000.
Hartness International, Inc.: *See*—
Hartness, Robert G., 5,150,563, Cl. 53-539.000.
Hartness, Robert G., to Hartness International, Inc. Square and/or round container packing device. 5,150,563, Cl. 53-539.000.
Haruta, Junichi: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.
Haruta, Yasuo: *See*—
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Haruyama, Hideyuki: *See*—
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Harvey, George A.: *See*—
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Harvey, Robin J., to Hughes Aircraft Company. Plasma switch devices. 5,151,663, Cl. 330-41.000.
Hasebe, Kazunori, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 5,151,345, Cl. 430-525.000.
Hasegawa, Akira: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Hasegawa, Haruhiro: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000
Hasegawa, Hirofumi: *See*—
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Hasegawa, Junichi: *See*—
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Hasegawa, Susumi; Mizoshita, Yoshifumi; and Takaishi, Kazuhiko, to Fujitsu Limited. System for positioning a transducer. 5,151,639, Cl. 318-568.180.
Hasegawa, Toshiaki: *See*—
Shinji, Yasuhisa; Hasegawa, Toshiaki; Akune, Shinichi; and Sakuhara, Hirohiko, 5,151,053, Cl. 439-610.000.
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Hashimoto, Kunio, to Kabushiki Kaisha Nihon Pipe Conveyor Kenkyusho. Tubular belt conveyor. 5,150,783, Cl. 198-819.000.
Hashimoto, Motonori: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000
Hashimoto, Takeshi, to Clarion Co., Ltd. Spread spectrum communication device. 5,151,921, Cl. 375-1.000.
Hassanzadeh, Hedayat H., to Davis-Lynch, Inc. Well completion apparatus. 5,150,756, Cl. 166-318.000.
Hata, Tadashi: *See*—
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.
Hatakeyama, Kazuya: *See*—
Nakajima, Ichiro; Hatakeyama, Kazuya; and Hirata, Yasushi, 5,151,468, Cl. 525-332.700.
Hatano, Mutsuko: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.
Hatchett, Michael R.; Hearn, Anthony R.; and Lacey, Charles M., to International Business Machines Corporation. Method of assembling a disk file. 5,150,512, Cl. 29-603.000.
Haubennestel, Karl-Heinz; and Pritschins, Wolfgang, to BYK-Chemie GmbH. Phosphoric acid esters, method of producing them, and use thereof as dispersants. 5,151,218, Cl. 252-351.000.
Haworth, Inc.: *See*—
Quinlan, Roger J., Jr.; and Simpson, Stephen J., 5,150,554, Cl. 52-282.000.
Hayafune, Koji; Naemura, Shinichi; Yasumoto, Hiroshige; and Amemiya, Hideo, to Mitsui Toatsu Chemicals, Inc. Resin compositions including ceramics emitting far infrared rays. 5,151,463, Cl. 524-430.000.
Hayakawa, Atsuya: *See*—
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Hayakawa, Tomoya: *See*—
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Hayama, Masahiro: *See*—
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Hayashi, Nobuharu; and Tanaka, Hiroji, to Sumitomo Rubber Industries, Ltd.; and Penta-Ocean Construction Co., Ltd. Mooring apparatus. 5,150,744, Cl. 114-230.000.
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Hayashi, Takashi, to Matsushita Electric Industrial Co., Ltd. Key telephone apparatus. 5,151,934, Cl. 379-159.000.
Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato, to Agency of Industrial Science and Technology. Organosilicon compound and process for producing organosilicon compound. 5,151,538, Cl. 556-431.000.
Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for stretching dough. 5,151,024, Cl. 425-141.000.
Hayenga, Kirk J.: *See*—
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Hazeltine Corporation: *See*—
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Kumpfbeck, Richard J.; and Hannan, Peter W., 5,151,707, Cl. 343-705.000.
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Heathdyne, Inc.: *See*—
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Hediger, Edwin A., to Eastman Kodak Company. Development apparatus and improved auger device for use therein. 5,151,739, Cl. 355-245.000.
Hegland, Frederick P.: *See*—
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Heil Co., The: *See*—
Glomski, Norman J., 5,150,806, Cl. 220-331.000
Hein, Richard A., to Hoover Universal, Inc. Self adjusting eccentric pivot mechanism. 5,150,632, Cl. 74-530.000.
Heinola, Kalevi E.: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000
Heinrich Kopp GmbH & Co. KG: *See*—
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Heinsohn, Henry G.; Lorch, Jeffrey D.; Hayenga, Kirk J.; and Arnold, Raymond E., to Genencor International, Inc. Processes for the recovery of naturally produced chymosin. 5,151,358, Cl. 435-226.000.
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, to Bayer Aktiengesellschaft. Highly fluid polyarylene sulphide moulding compounds. 5,151,458, Cl. 524-190.000.
Heisler, Doyle J. Golfer weight distribution measurement system 5,150,902, Cl. 273-186.100.
Heitzmann, David E., to MOR/ryde International, Inc. Trailing arm suspension for vehicle. 5,150,918, Cl. 280-716.000.
Hejhal, Thomas J.: *See*—
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., 5,150,476, Cl. 2-93.000.
Hekker, Roeland M. T.; Livny, Izhak M.; and Mercurio, Gregory S., to Du Pont de Nemours, E. I., and Company. Transform digital/optical processing system including wedge/ring accumulator. 5,151,822, Cl. 359-559.000
Held, Wolfgang. Detachable cap for a bottle neck. 5,150,801, Cl. 215-11.600.
Helfer, Jeffrey L.: *See*—
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,150,955, Cl. 354-321.000.
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Hemon, Inc.: *See*—
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Hemphill, Desmond J., to Hemco Industries Pty. Ltd. Evacuation restraint. 5,150,487, Cl. 5-625.000
Hendry, Donald H.; Johnson, Bruce K.; Krawczyk, Joanne M.; and Vierstra, Bruce C., to Polaroid Corporation. 6-bar erecting system. 5,151,728, Cl. 354-83.000.
Henrick, Clive A., to Sandoz Ltd. Method of controlling termites 5,151,443, Cl. 514-486.000.
Hensby, Christopher: *See*—
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Her, Tser W. Liquid pump responsive to temperature. 5,151,016, Cl. 417-32.000.
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Hergenrother, William L.; and Doshak, John M., to Bridgestone Corporation. Method of preparing elastomers having reduced hysteresis properties with sulfoxides. 5,151,469, Cl. 525-354.000
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, to BASF Aktiengesellschaft. Benzyl alcohols and their lower alkanecarboxylic acid esters. 5,151,548, Cl. 560-255.000.
Hernandez, Raymond: *See*—
Burton, Anthony R.; Mitchell, Monte K.; and Hernandez, Raymond, 5,150,751, Cl. 166-81.000.
Herndon, James F.; and Morgan, Dennis J., to Hoover Treated Wood Products, Inc. Flame retardant composition and method for treating wood. 5,151,225, Cl. 252-607.000
Heroux, Paul. Pair of electrically shielded triaxial magnetic sensors for determination of electric currents in conductors in air with distance and angle compensation. 5,151,649, Cl. 324-127.000.
Hershberger, James W.: *See*—
Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., 5,151,476, Cl. 526-93.000.
Hershberger, Susan A.: *See*—
Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., 5,151,476, Cl. 526-93.000
Herve, Yolande: *See*—
Vincent, Michel; Remond, Georges; Portevin, Bernard; Herve, Yolande; and Lepagnol, Jean, 5,151,432, Cl. 514-299.000.
Herzig, Christian, to Wacker-Chemie GmbH. Organopolysiloxanes containing sulfosuccinate groups. 5,151,473, Cl. 525-474.000.
Herzog, Claus, to MTU Motoren- Und Turbinen-Union Munchen GmbH. Device for exposing or shutting off a turbo-engine on the intake air side of the engine. 5,150,571, Cl. 60-200.100.
Hettinga, Siebolt. Method of injection molding a flat deformable laminate. 5,151,237, Cl. 264-257.000
Hewlett-Packard Company: *See*—
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,151,178, Cl. 210-198.200.
Quimby, Bruce D.; and Sullivan, James J., 5,151,371, Cl. 436-127.000.
Ward, Jefferson P.; Harmon, J. P.; English, Kris M.; and Christensen, Kenneth L., 5,151,715, Cl. 346-140.00R.
Wille, Ross M.; and Carter, Richard J., 5,151,994, Cl. 395-800.000
You, Young S.; and Meyer, John D., 5,151,120, Cl. 106-27.000.
Hickey, Gregory M.; Green, Norbert J., Jr.; and Kozak, Michael J., to General Motors Corporation. Electrically actuated electric brake with wear compensating adjuster. 5,150,773, Cl. 188-79.550
Hickey, John C., to Ford Motor Company. Molded fuel injector and method for producing. 5,150,842, Cl. 239-585.400
Hiei, Masaichi: *See*—
Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, 5,150,704, Cl. 128-395.000
Higby, Jeffrey P., to Outboard Marine Corporation. Shiftable reversing transmission for marine propulsion device. 5,151,059, Cl. 440-75.000
Hihlein, Peter: *See*—
Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.
Hilkenmeier, Jurgen; and Volke, Hans-Werner, to Siemens-Nixdorf Informationssysteme AG. Matrix printing head with forward and return articulated-armature magnets. 5,150,976, Cl. 400-124.000
Hill, Brian T.: *See*—
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., 5,151,978, Cl. 395-200.000.
Hill, Shirley J. Christmas tree light receptacle apparatus. 5,150,963, Cl. 362-123.000
Hill, Thomas E., to Loudon Enterprises, Inc. Rock drill bit and method of making same. 5,150,636, Cl. 76-108.200.
Hillgartner, Klaus, to Dr. Ing. h.c.F. Porsche AG. Shifting arrangement for a motor vehicle transmission. 5,150,633, Cl. 74-475.000
Hillis, Daniel W., to Thinking Machines Corporation. Array communications arrangement for parallel processor. 5,152,000, Cl. 395-800.000.
Hillis, W. Daniel, to Thinking Machines Corporation. Multi-dimensional message transfer router. 5,151,996, Cl. 395-800.000.
Hingst, Uwe, to Bodenseewerk Geratetechnik GmbH. Two stage cooler for cooling an object. 5,150,579, Cl. 62-51.200
Hioe, Willy: *See*—
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai Ryotaro, 5,151,617, Cl. 307-462.000.
Hirahara, Kazuaki, to Omron Tateisi Electronics Co. Boarding gate seat checkin apparatus and method. 5,151,692, Cl. 340-825.280.
Hirahata, Shinichi: *See*—
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, 5,151,586, Cl. 250-205.000
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, to Kabushiki Kaisha Goto Seisakusho. Method for producing a package-type semiconductor assembly. 5,151,118, Cl. 65-18.100.
Hirano, Ryoichi: *See*—
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, 5,151,754 Cl. 356-356.000
Hirano, Tsumoru: *See*—
Sakanoue, Kei; and Hirano, Tsumoru, 5,151,356, Cl. 430-548.000.
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, to Matsushita Electric Works, Ltd. Circuit breaker. 5,151,671, Cl. 335-172.000.
Hirao, Yutaka: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000
Hirashima, Isao: *See*—
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system for civil engineering and construction machine. 5,150,574, Cl. 60-465.000
Hirata, Yasushi: *See*—
Nakajima, Ichiro; Hatakeyama, Kazuya; and Hirata, Yasushi, 5,151,468, Cl. 525-332.700
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, to Hitachi, Ltd. Superconducting composition comprising Ln-Th-Cu-O, wherein Ln is Pr, Nd, Pm, Sm, Eu, Gd, Er or mixtures thereof. 5,151,409, Cl. 505-1.000
Hirobe, Toshihiko: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, to Ibiden Co., Ltd. High lead count circuit board for connecting electronic components to an external circuit. 5,151,771, Cl. 357-70.000.
Hirose Electric Co., Ltd.: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshiro, 5,151,033, Cl. 439-95.000
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, 5,151,035, Cl. 439-95.000
Sato, Kensaku, 5,151,048, Cl. 439-357.000

Hirose, Hideo, to Shimadzu Corporation. Method and apparatus for generating X rays. 5,151,928, Cl. 378 119.000.
Hirose, Masato: *See—*
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020.
Hiroshima, Tatsuo: *See—*
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000
Hiroshima, Yasunori, to Pioneer Electronic Corporation. Liquid crystal display apparatus providing improved illumination via trucated prisms. 5,151,801, Cl. 359-40.000.
Hirschbein, Bernard L.: *See—*
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen ..., 5,151,510, Cl. 536-27.000.
Hirsh, John R. Calculator with music generating device. 5,151,873, Cl 364-710.120.
Hitach Metals, Ltd.: *See—*
Ohya, Hiroshi; and Kato, Takeshi, 5,150,923, Cl. 285-21.000.
Hitachi Computer Engineering Co., Ltd.: *See—*
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000
Hitachi Construction Machinery Co., Ltd.: *See—*
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000.
Hitachi Koki Co., Ltd.: *See—*
Okada, Kenji; and Ogawa, Tsukasa, 5,150,648, Cl. 101-93.140
Uno, Kazuo; and Shirakawa, Junji, 5,150,893, Cl. 271-157.000.
Hitachi, Ltd.: *See—*
Fujioka, Toshinori, 5,151,582, Cl. 335-469.000.
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,151,991, Cl. 395-700.000.
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.00.
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.
Kajigaya, Kazuhiko; and Sawada, Jiro, 5,151,881, Cl. 365-233.000.
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.
Kawaguchi, Hideo; Takeuchi, Koji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.
Koyanagi, Osamu; Seki, Yasuhiro; and Tsukushi, Masanori, 5,151,566, Cl. 200-110.00A.
Matsui, Kiyoshi; Satoh, Ryohei; Metsu, Toshitada, Sasaki, Hideaki, Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.
Minowa, Toshimichi; and Ohyama, Yoshishige, 5,150,635, Cl. 74-866.000
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.
Nakagawa, Yasuo; and Nayer, Shree K., 5,151,609, Cl. 250-561.000
Nishimura, Yutaka, 5,150,680, Cl. 123-399.000.
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000
Sasaki, Akira; Kato, Takeshi, and Hakoyama, Akiyoshi, 5,151,973, Cl. 395-109.000.
Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, 5,150,597, Cl. 72-229.000.
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl 395-128.000
Yamagishi, Mamio, 5,151,988, Cl. 395-600.000.
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.
Hitachi Maxell, Ltd.: *See—*
Fujita, Minoru, 5,151,894, Cl. 369-291.000
Hitachi Metals Ltd.: *See—*
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, 5,151,137, Cl. 148-313.000
Hitachi Taga Engineering Co., Ltd.: *See—*
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000
Hitachi Techno Engineering Co., Ltd.: *See—*
Hamamura, Fumio; and Watanabe, Katsuyoshi, 5,150,639, Cl 83-39.000
Hitachi VLSI Engineering Corp.: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa, Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, to Chemisches Institut Schaefer AG and Joh. A. Benckiser GmbH Process for preparing polycarboxylic acid imidazolines by condensation reaction. 5,151,522, Cl. 548-112.000.
Hivessy, Geza: *See—*
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.
Hiyama, Isao: *See—*
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.
Ho, Helena S.: *See—*
Shenoi, Kishan; Hanagan, Patrick L.; Ho, Helena S.; and Yu, Frank I., 5,151,901, Cl. 370-110.100.
Ho, Loan A.: *See—*
Treybig, Duane S.; Wang, David S.; Sheih, Pong S.; and Ho, Loan A., 5,151,485, Cl. 528-87.000.
Hobbs, Frank W., Jr.; and Trainor, George L., to Du Pont de Nemours, E. I., and Company. Alkynylamino-nucleotides. 5,151,507, Cl. 536-23.000
Hochberg, Joel; Stamper, Timothy D. J.; and Stamper, Christopher T. J., to Rare Coin-It, Inc. Game apparatus. 5,150,898, Cl. 273-85.00C.
Hodel, Walter: *See—*
Bi, Junging; Beaud, Paul A.; Schutz, Jurg A.; Hodel, Walter; and Weber, Heinz P., 5,151,911, Cl. 372-32.000.
Hodogaya Chemical Co., Ltd.: *See—*
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000
Hoechst Aktiengesellschaft: *See—*
Arndt, Otto; and Papenfuhs, Theodor, 5,151,532, Cl. 552-308.000.
Bothe, Lothar, 5,151,317, Cl. 428-216.000.
Fulbreth, Werner; Leeb, Richard; Radau, Manfred; and Stammberger, Willi, 5,151,433, Cl. 514-299.000.
Lappe, Peter; and Springer, Helmut, 5,151,537, Cl. 556-136.000.
Wiedemann, Wolfgang, 5,151,342, Cl. 430-271.000.
Hoechst Celanese Corporation: *See—*
Adams, Peter M., 5,150,812, Cl. 220-414.000.
Aslam, Mohammad; and Davenport, Kenneth G., 5,151,540, Cl. 558-232.000.
Munday, Jerry T.; and Meiss, Theodore D., 5,151,494, Cl. 528-287.000
Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., 5,151,546, Cl. 560-130.000.
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.
Hoeks, Frans; and Venetz, Daniel, to Lonza Ltd. Process for the production of 6-hydroxynicotinic acid. 5,151,351, Cl. 435-122.000.
Hoeksema, Scot D.: *See—*
Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D., 5,151,347, Cl. 435-3.000.
Hoelzl, Klaus, to TMC Corporation. Finger operated button activating wireless transmission path for effecting voluntary release of a ski binding. 5,150,913, Cl. 280-612.000.
Hoff, Don G., to Seiko Corporation; and Seiko Epson Corp. Pager watch system utilizing time slot communication. 5,150,954, Cl. 340-825.440.
Hoffend, Thomas R.: *See—*
Bayley, Robert D.; and Hoffend, Thomas R., 5,151,338, Cl. 430-106.000.
Hoffmann, Jurgen: *See—*
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, 5,151,241, Cl. 264-314.000.
Hoffmann, Wolfgang: *See—*
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000
Hofmeister, Peter: *See—*
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.
Holland, Kurt: *See—*
Elias, Samir F.; Klausmeyer, Kevin; and Holland, Kurt, 5,151,456, Cl. 524-60.000.
Holle, Norbert: *See—*
Frank, Wolfgang; Loffler, Johannes; and Holle, Norbert, 5,150,729, Cl. 137-340.000
Hollenberg, Cornelius: *See—*
Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., 5,151,354, Cl. 435-161.000.
Hollenberg, Cornelius P.: *See—*
Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., 5,151,354, Cl. 435-161.000.
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., to United States of America, National Aeronautics and Space Administration. Linear mass actuator. 5,150,875, Cl. 248-550.000
Holmes, David. Game racket with incurvate contact surfaces. 5,150,896, Cl. 273-67.00R.
Homola, Tamas: *See—*
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.
Homonoff, Edward C.; Meierhoefer, Alan W.; and Flint, Lori B., to Dexter Corporation, The. Hydroentangled spunbonded composite fabric and process. 5,151,320, Cl. 428-284.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Tsutomu; and Kojima, Kazuo, 5,150,593, Cl. 70-248.000

Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000
Muller, Klaus; and Kulhanek, Antonin, 5,151,162, Cl. 294-131.000.
Yoshida, Suguru; Tsunoda, Isao; and Sano, Shoichi, 5,150,944, Cl 296-203.000
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020.
Honeywell Inc.: *See—*
Adams, John T.; and Tinsley, Timothy M., 5,151,854, Cl 364-184.000
Johnson, Donald D.; and Yee, Jimmy, 5,151,591, Cl. 250-214.00B.
Hong, Pi-Lien. Paper package for beverage. 5,150,833, Cl. 229-125.150
Honkanen, Erkki J.: *See—*
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000
Honkanen, Seppo, to Oy Nokia AB. Adaptor device for coupling together optical waveguides produced by K-Na ion exchange with optical waveguides produced by Ag-Na ion exchange. 5,151,958, Cl 385-50.000.
Honma, Hiroshi: *See—*
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, 5,150,931, Cl 285-381.000.
Honma, Hisanori: *See—*
Fujiwara, Takayoshi; and Honma, Hisanori, 5,151,021, Cl 418-93.000
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, to Digital Equipment Corporation. Method of minimizing sum-of-product cases in a heterogeneous data base environment for circuit synthesis. 5,151,867, Cl. 364-489.000.
Hoover Treated Wood Products, Inc.: *See—*
Herndon, James F.; and Morgan, Dennis J., 5,151,225, Cl 252-607.000.
Hoover Universal, Inc.: *See—*
Hein, Richard A., 5,150,632, Cl. 74-530.000.
Hopkins, P. Donald: *See—*
Kukes, Simon G.; Clark, Frederick T.; Hopkins, P. Donald; and Green, Lisa M., 5,151,172, Cl. 208-144.000.
Hopper, Marvin L.; and King, Jerry W., to United States of America, Health and Human Services. Supercritical fluid extraction enhancer 5,151,188, Cl. 210-634.000.
Hoptry, David A.; Petrofes, James M.; Shal, David A.; and Denton, Gary R., to General Motors Corporation. Motor vehicle suspension with damper having rotatable member position feedback. 5,150,915, Cl. 280-707.000.
Hoptry, David A.: *See—*
Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., 5,150,916, Cl. 280-707.000.
Hopwell, Brian L.; Dale, Nicholas C.; and Burns, Bryan R. A., deceased (by Burns, Jean H., administrator), to British Aerospace Public Limited Company. Jettisonable aerodynamic control surfaces. 5,150,858, Cl. 244-45.00A.
Horai, Keiichiro: *See—*
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000.
Hori, Hirokazu: *See—*
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.
Hori, Tsuguo, to NEC Corporation. Signal control apparatus capable of readily changing an apparatus output signal. 5,152,008, Cl 455-127.000
Horinouchi, Kazuyuki: *See—*
Satou, Hiroki; and Horinouchi, Kazuyuki, 5,151,613, Cl 307-243.000.
Horn, Alan S., deceased (by Horn, Mark, legal representative); and Dubocovich, Margarita L., to Northwestern University. Substituted 2-amidotetralins as melatonin agonists and antagonists. 5,151,446, Cl 514-617.000.
Horn, Mark, legal representative: *See—*
Horn, Alan S., deceased; and Dubocovich, Margarita L., 5,151,446, Cl. 514-617.000
Horvath, Mihaly: *See—*
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.
Hoshiba, Akihiro; Okazaki, Masaki; and Hasegawa, Junichi, to Sanshin Kogyo Kabushiki Kaisha. Fuel supplying device for marine propulsion engine. 5,150,673, Cl. 123-179.150.
Hoshide, Yasuo: *See—*
Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000.
Hoshino, Kouichi: *See—*
Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, 5,151,764, Cl. 357-27.000.
Hosogi, Yasuyuki: *See—*
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Hosoya, Mutsumi: *See—*
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000
Hough, Geoffrey S., to Rolls-Royce plc. Liquid cooled aerofoil blade 5,151,012, Cl. 416-95.000
Howard, Brian D.: *See—*
Bailey, Robert L.; and Howard, Brian D., 5,151,997, Cl. 395-800.000.
Hozumi, Hiroyuki, to Jamco Corporation. Lavatory unit for a passenger airplane. 5,150,863, Cl. 244-118.500.
Hsu, Fu-Lian; and Ashman, William P., to United States of America, Army. 4-[1-(1-naphthalenyl)ethyl]-1H-imidazole, method of making and use as an anesthetic. 5,151,526, Cl. 548-335.000
Hsu, Joseph C. S.: *See—*
Kao, Jamee; and Hsu, Joseph C. S., 5,151,151, Cl. 156-471.000.
Hsu, Kaven. Spindle means of machine center. 5,150,994, Cl 409-135.000
Hsu, Li J. Elastic connector. 5,150,997, Cl. 411-511.000.
Hsu, Wen-Liang; and Halasa, Adel F., to Goodyear Tire & Rubber Company, The. Catalyst for the synthesis of crystalline 3,4-polyisoprene. 5,151,398, Cl. 502-117.000
Hsueh, Paul W.; and Smith, Douglas D., to Motorola, Inc. Sense amplifier with latch. 5,151,879, Cl. 365-190.000.
Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, to Gelman Sciences, Inc. Cationic charge modified microporous membrane. 5,151,189, Cl. 210-635.000.
Hubbard, Vance M.; and Brunson, Welton K., to Tecnol Medical Products, Inc. Liquid shield visor for a surgical mask with a bottom notch to reduce glare. 5,150,703, Cl. 128-206.120.
Hubby, Christopher M.: *See—*
Nguygen, Thanh D.; and Hubby, Christopher M., 5,151,227, Cl 264-41.000
Huber, David R., to General Instrument Corporation. Laser with longitudinal mode selection. 5,151,908, Cl. 372-6.000
Huber, Hans F.: *See—*
Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, 5,151,493, Cl. 528-272.000.
Hubert, Jean-Claude: *See—*
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000
Hudson Valley Tree, Inc.: *See—*
Spiegel, Si; and Smith, Sherman, 5,150,874, Cl. 248-514.000.
Huercanos, Joaquin. Evaporation assembly with vapor circulating means. 5,151,154, Cl. 159-13.200
Huette, Gerard: *See—*
Canu, Jean Pierre; DesForges, Bernard; and Huette, Gerard, 5,151,952, Cl. 382-29.000
Hughes Aircraft Company: *See—*
Ansley, David A., 5,151,799, Cl. 359-11.000.
Bakhit, Gabriel G.; and Shambrook, Kevin P., 5,151,388, Cl 437-209.000
Chen, Chungte W., 5,151,823, Cl. 359-565.000.
Dewhirst, Donald R., 5,151,626, Cl. 310-331.000
Fries, William M., 5,150,827, Cl. 228-44.700.
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000
Harvey, Robin J., 5,151,663, Cl. 330-41.000.
Nourrcier, Charles E., 5,151,747, Cl. 356-5.000
Hughes Danbury Optical Systems, Inc.: *See—*
Siebert, Edward T., 5,151,585, Cl. 250-201.900.
Hughes, Michael J.: *See—*
Jordan, Robert E.; and Hughes, Michael J., 5,150,831, Cl 228-184.000
Huijben, Gregorius J.; van Kralingen, Cornelis G.; Liem, Seeng D; and Paoli, Michele E., to Lever Brothers Company, Division of Conopco, Inc. Detergent powders and process for their preparation. 5,151,208, Cl. 252-174.140.
Hullender, Gregory N., to Go Corporation. Method for recognizing handwritten characters using shape and context analysis. 5,151,950 Cl. 382-13.000.
Huls Aktiengesellschaft: *See—*
Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, 5,151,493 Cl. 528-272.000.
Hultman, Dave A.: *See—*
Joseph, Daniel D.; and Hultman, Dave A., 5,150,607, Cl. 73-64.480
Hunt, Rodney J.; and Kip, Ruloff F., Jr., to AT&T Bell Laboratories Payout tube with improved locking means. 5,150,852, Cl. 242-157.00R.
Hunt, Terry J.; and Breda, Michael A., to General Motors Corporation. Heat transfer fin with dammed segments. 5,150,596, Cl. 72-186.000
Huong, Chin-Fu. Vehicle automatic transmission system. 5,151,067, Cl 475-43.000.
Huppi, Michael, to Asea Brown Boveri Ltd. Semiconductor component. 5,151,766, Cl. 357-38.000.
Hurwitch, Carl B.: *See—*
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl 355-296.000
Hutchings, David A.; and Brandon, Richard L., to Mead Corporation, The. Liquid crystal polymers containing a repeating bisoxazole structure. 5,151,488, Cl. 528-179.000
Huvey, Michel, to Institut Francais du Petrole. Device for continuous manufacture of bent rods with shaped cross sections using an intermediate strip. 5,151,281, Cl. 425-505.000.
Huynh, Van T., to Institut National de la Sante et de la Recherche Medicale. Methods and apparatuses for preparative electrophoresis. 5,151,165, Cl. 204-299.00R
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., to Northern Telecom Limited Ferrule alignment assembly for blind mating optical fiber connector. 5,151,961, Cl. 385-60.000.

Hwang-Felgner, Jiin-Yu; Jones, Richar l E.; and Maher, James F., to Genentech, Inc. Gamma interferon formulation. 5,151,265, Cl. 424-85.500.

Hwang, Ren-Yi. Kinetic art article assembly with stacked color filters 5,151,829, Cl. 359-886.000.

Hwang, Wen-Fang: *See—*
Harris, William J.; and Hwang Wen-Fang, 5,151,489, Cl 528-183.000.

Hy-Tech Hydraulics, Inc.: *See—*
Major, Kenneth E.; Baker, John ..; and Braunagel, David K., 5,150,769, Cl. 184-31.000.
Major, Kenneth E.; Baker, John ..; and Braunagel, David K., 5,150,975, Cl. 384-465.000.

Hyde, Robert E. Liquid pressure amplification with superheat suppression. 5,150,580, Cl. 62-86.000.

Hydrocarbon Filtration Systems, Inc.: *See—*
Simpson, Stewart A.; and Dickie, Rock D. 5,151,194, Cl 210-680.000.

Hyer, Michael L.: *See—*
Hyer, Raymond E.; and Hyer, Michael L., 5,150,884, Cl. 254-209.000.

Hyer, Raymond E.; and Hyer, Michael L. Carpet stretcher attachment utilizing pivotally mounted pulling plate. 5,150,884, Cl. 254-209.000.

Hynecek, Jaroslav, to Texas Instruments Incorporated. Method of making top buss virtual phase frame interline transfer CCD image sensor. 5,151,380, Cl. 437-53.000.

Iai, Kenichiro, to Yoshida Kogyo K.K. Drawing device for use in drafting machine. 5,150,525, Cl. 33-1..100.

Ibiden Co., Ltd: *See—*
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, 5,151,771, Cl. 357-70.000.

Ibsen, Robert L.; Pacropis, Donald ..; and Glace, William R., to Den-Mat Corporation. Light-curable ionomer dental cement. 5,151,453, Cl. 522-14.000.

Ichihara, Akira, to Alps Electric Co., Ltd. Disk chucking device 5,151,836, Cl. 360-99.080.

Ichijima, Seiji: *See—*
Abe, Akira; Mihavashi, Keiji; and Ichijima, Seiji, 5,151,344, Cl. 430-383.000.

Ichikawa, Hiroyuki: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; and Tozu, Kenji, 5,150,952, Cl. 303-09.000.

Ichikoh Industries, Ltd.: *See—*
Tanaka, Morimasa, 5,151,563, Cl 00-6.00A.

Idaka, Yukio; Yamaguchi, Shuichiro; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, to Matsushita Electric Works, Ltd. Semiconductor relay circuit using photovoltaic diodes. 5,151,602, Cl. 250-551.000.

Ide, Hiroshi. *See—*
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.

Ide, Satoshi: *See—*
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl 72-325.000.

Idemitsu Kosan Co., Ltd.: *See—*
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 5,151,531, Cl. 552-115.000.

Ichisa, Nobuaki; and Yamazaki, Etsuo, to Fanuc Ltd. Electric discharge tube for gas laser. 5,151,916, Cl. 372 61.000.

Igarashi, Mayumi: *See—*
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.000.

Igarashi, Yasuyuki: *See—*
Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, 5,151,36 . Cl. 435-240.200.

Igawa, Tatsuya, to Kabushiki Kaisha Pilot. Magnetophoretic display panel. 5,151,032, Cl. 434-409.000.

Ige, Hitoshi: *See—*
Mukai, Nobuhiro; Ige, Hitoshi; Nakino, Takayuki; and Atarashi, Junko, 5,151,479, Cl. 526-277.00.

Ihly, Eugen F., to Ihly Industries, Inc Process and apparatus for working an edge portion of a container flange. 5,150,595, Cl. 72-124.000.

Ihly Industries, Inc.: *See—*
Ihly, Eugen F., 5,150,595, Cl. 72-124.000.

Iida, Nozomi: *See—*
Hannya, Shuichi; and Iida, Nozomi, 5,150,542, Cl. 49-441.000.

Iio, Keiji: *See—*
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.

IIT Research Institute: *See—*
Hales, Crispin; and Zabinski, Thomas E., 5,151,303, Cl 427-178.000.

Iizawa, Ryuji: *See—*
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-4 4.050.

Iizumi, Kenichi: *See—*
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl 412-14.000.

Ijiri, Masaaki: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Ikeda Bussan Co., Ltd.: *See—*
Isomura, Tohru, 5,150,872, Cl. 248-429.000.

Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, to Mitsubishi Rayon Co., Ltd. Process for the production of methacrylic resin sheets. 5,151,482, Cl. 526-329.700.

Ikeda, Osamu: *See—*
Matsumoto, Shigeyuki; and Ikeda, Osamu, 5,151,305, Cl. 427-252.000.

Ikeda, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Read-only memory having data register for holding output data. 5,151,876, Cl. 365-94.000.

Ikeda, Yoshito: *See—*
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.

Ikemoto Burashi Kogyo Kabushiki Kaisha: *See—*
Ikemoto, Shigeki, 5,150,491, Cl. 15-1.520.

Ikemoto, Isao: *See—*
Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, 5,151,734, Cl. 355-200.000.

Ikemoto, Shigeki, to Ikemoto Burashi Kogyo Kabushiki Kaisha. Hair brush. 5,150,491, Cl. 15-1.520.

Illinois Tool Works Inc.: *See—*
Beebe, James C.; Cargould, Barry D.; and Lees, David W., Sr., 5,151,870, Cl. 364-556.000.

Im, Chang J.: *See—*
Wolfe, Richard A.; Im, Chang J.; and Wright, Robert E., 5,151,159, Cl. 202-118.000.

Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, to Bridgestone Corporation. Heavy duty pneumatic radial tires using rubber reinforcing fiber cords with improved adhesion. 5,151,142, Cl. 152-565.000.

Imai, Jun: *See—*
Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, 5,151,434, Cl. 514-300.000.

Imai, Masahito: *See—*
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, 5,150,616, Cl. 73-517.00R.

Imai, Tetuya, to Otsuka Kagaku Kabushiki Kaisha. Process for preparing imidazolidine-2,5-dione derivative. 5,151,524, Cl. 548-307.000.

Imajo, Minoru, to Nissan Motor Co., Ltd. Engine fuel injector. 5,150,691, Cl. 123-531.000.

Imam, M. A.: *See—*
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.

Imamura, Kenichi: *See—*
Yokoyama, Naoki; and Imamura, Kenichi, 5,151,618, Cl. 307-471.000.

Imaya, Akihiko: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Immorlica, Anthony A., Jr.; and Chase, Robert F., to General Electric Company. Optically patterned RF shield for an integrated circuit chip for analog and/or digital operation at microwave frequencies. 5,151,769, Cl. 357-53.000.

Imperial Chemical Industries PLC: *See—*
Greenshields, James N.; and Walters, Peter P., 5,151,269, Cl. 424-401.000.
Price, Anthony, 5,151,217, Cl. 252-312.000.

Inaba, Bonpei: *See—*
Ito, Hiroshi; Ando, Seigo; and Inaba, Bonpei, 5,151,793, Cl. 358-335.000.

Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, to Mochida Pharmaceutical Co., Ltd.; and Hodogaya Chemical Co., Ltd. 4,5-dihydro-6H-imidazo[4,5,1-ij]quinolin-6-one-6-oxime-O-sulfonic acid derivatives useful for treating hypertension or edema. 5,151,431, Cl. 514-292.000.

Inada, Haruhiro: *See—*
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Inada, Norio: *See—*
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000.

Inagaki, Hidemitsu: *See—*
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,150,763, Cl. 180-252.000.

Inagaki, Yasuo: *See—*
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.

INAX Corporation: *See—*
Ito, Takeshi; and Murata, Kazushige, 5,151,275, Cl. 425-84.000.

Industrial Technology Research Institute: *See—*
Lin, Ming-Zen, 5,151,620, Cl. 307-475.000.
Wu, Neng-Wei, 5,151,374, Cl. 437-40.000.

Ingersoll, Thomas: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.

Inglish, David S.: *See—*
Liljegren, Gordon E.; and Inglish, David S., 5,151,725, Cl. 352-129.000.

Inn-Room Systems, Inc.: *See—*
Livingston, Troy W., 5,150,817, Cl. 221-81.000.

Inoue, Akira, to Mitsubishi Denki Kabushiki Kaisha. Shielded semiconductor device. 5,151,770, Cl. 357-53.000.

Inoue, Fumio: *See—*
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.000.

Inoue, Haruo: *See—*
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.

Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, to Tosoh Corporation; and Toso Susteel Co., Ltd. Process for producing poly (para-phenylene-sulfide). 5,151,495, Cl. 528-388.000.

Inoue, Masakazu, to Inoue Seisakusho (Mfg) Co., Ltd. Planetary mixer 5,150,968, Cl. 366-288.000.

Inoue, Michihiro: *See—*
Yamada, Toshio; and Inoue, Michihiro, 5,151,878, Cl. 365-189.010.

Inoue Seisakusho (Mfg) Co., Ltd.: *See—*
Inoue, Masakazu, 5,150,968, Cl. 366-288.000.

Insight Telecast, Inc.: *See—*
Young, Patrick, 5,151,789, Cl. 358-194.100.

Institut Francais du Petrole: *See—*
Huvey, Michel, 5,151,281, Cl. 425-505.000
Lessi, Jacques; and Wittrisch, Christian, 5,150,750, Cl. 166-66.400.

Institut National de la Sante et de la Recherche Medicale: *See—*
Huynh, Van T., 5,151,165, Cl. 204-299.00R.

International Business Machines Corporation: *See—*
Abraham, Robert L.; Priven, Michael P.; and Moorman, Thomas P., 5,151,987, Cl. 395-575.000.
Allen, James D.; and King, Steven A., 5,151,990, Cl. 395-650.000.
Austin, John S.; Piro, Ronald A.; and Stout, Douglas W., 5,151,619 Cl. 307-473.000.
Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., 5,151,294 Cl. 427-11.000.
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559 Cl. 174-52.400.
Fredericks, Kenneth J.; and Lynch, Kenneth R., 5,151,977, Cl 395-200.000.
Galyon, George T.; Jordhamo, George M.; and Wirtz, Louis H. 5,151,169, Cl. 205-151.000.
Hatchett, Michael R.; Hearn, Anthony R.; and Lacey, Charles M 5,150,512, Cl. 29-603.000.
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., 5,151,989, Cl. 395-600.000.
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000.
Lee, Kang-Wook, 5,151,304, Cl. 427-250.000.
Lyke, David G.; and Ominsky, Mark, 5,151,948, Cl. 382-7.000.
McClelland, Gary M., 5,151,594, Cl. 250-306.000.
Meyerson, Bernard S.; Scott, Bruce A.; and Wolford, Donald J Jr., 5,151,383, Cl. 437;101-.
Westcott, Douglas W.; and White, Valerie, 5,151,981, Cl 395-375.000.

International Computers Limited: *See—*
Poskitt, Geoffrey, 5,151,979, Cl. 395-325.000.

International Flavors & Fragrances Inc.: *See—*
Rutherford, Howard J., 5,150,722, Cl. 131-335.000.

Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, to Canon Kabushiki Kaisha. Light quantity control device. 5,151,910, Cl. 372-31.000.

Inuzuka, Hajime: *See—*
Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka Hajime, 5,151,764, Cl. 357-27.000.

Invitro Scientific Products, Inc.: *See—*
Serkes, Jonathan M.; and St. Pierre, Richard C., 5,151,366, Cl 435-285.000.

Irani, Rustom F.: *See—*
Kazerounian, Reza; Eitan, Boaz; and Irani, Rustom F., 5,151,375 Cl. 437-43.000.

Irie, Nobuhiko: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, to Kyorin Seiyaku Kabushiki Kaisha. Controlled-release composition and the preparation thereof. 5,151,434, Cl. 514-300.000.

Irish, Gary H.: *See—*
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559 Cl. 174-52.400.

Isaacson, James D.: *See—*
Navarro, Thomas L., and Isaacson, James D., 5,150,626, Cl. 74-84.00R.

Iscar Ltd.: *See—*
Friedmann, Jacob, 5,150,992, Cl. 407-110.000.

Ishibashi, Tadashi: *See—*
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.

Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, to Kabushiki Kaisha Toshiba. Method and an apparatus for measuring a displacement between two objects and a method and an apparatus for measuring a gap distance between two objects. 5,151,754, Cl. 356-356.000.

Ishida, Masayuki: *See—*
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, 5,151,830, Cl. 360-32.000.

Ishida, Toshimichi; and Suzuki, Masaki, to Matsushita Electric Industrial Co., Ltd. Substrate transfer apparatus. 5,151,008, Cl 414-744.500.

Ishida, Yoshinobu: *See—*
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, 5,151,830, Cl. 360-32.000.

Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, to Mitsui Toatsu Chemicals, Inc. Resin compositions having improved antistatic properties. 5,151,457, Cl. 524-157.000.

Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, to Fuji Photo Optical Co., Ltd. Ultrasound-imaging diagnostic system 5,150,715, Cl. 128-662.060.

Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for the manufacture of thermoplastic resin sheets. 5,151,234, Cl. 264-176.100.

Ishihara, Masamichi: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki, Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.

Ishihata, Akira: *See—*
Ohmine, Toshimitsu; Akagawa, Kenichi; and Ishihata, Akira, 5,151,133, Cl. 118-725.000.

Ishii, Mitsuo: *See—*
Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro 5,151,298, Cl. 427-77.000.

Ishii, Yutaka: *See—*
Tanaka, Masaru; and Ishii, Yutaka, 5,151,688, Cl. 340-707.000.

Ishikawa Gasket Co., Ltd.: *See—*
Udagawa, Tsunekazu, 5,150,910, Cl. 277-235.00B.

Ishikawa, Masahiro, to Nissan Motor Co., Ltd. Circuit for eliminating digital noise or short pulses utilizing set/reset shift register. 5,151,612 Cl. 307-234.000.

Ishikawa, Tadayuki: *See—*
Kitabayashi, Hiroyuki; and Ishikawa, Tadayuki, 5,151,109, Cl 51-297.000.

Ishiyama, Tatsunori: *See—*
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.

Ishizu, Masanori: *See—*
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori, and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.

Ishizuka, Yasushi: *See—*
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio, and Aramaki, Takashi, 5,151,951, Cl. 382-19.000.

Isoda, Takeshi: *See—*
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo and Isoda, Takeshi, 5,151,390, Cl 501-95.000.

Isomura, Tohru, to Ikeda Bussan Co., Ltd. Power seat slide device 5,150,872, Cl. 248-429.000.

Itagaki, Takushi: *See—*
Deguchi, Mikio; Itagaki, Takushi; and Usui, Masaaki, 5,151,373, Cl 437-2.000.

Ito, Hiroshi; Ando, Seigo; and Inaba, Bonpei, to Pioneer Electronic Corporation. Recording medium playing apparatus. 5,151,793, Cl 358-335.000.

Ito, Isamu: *See—*
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.

Ito, Kazuhiko: *See—*
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta Teruaki, 5,151,850, Cl. 362-75.000.

Ito, Shoichi: *See—*
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Ito, Takeshi; and Murata, Kazushige, to INAX Corporation. Sealing construction for a pressure casting mold. 5,151,275, Cl. 425-84.000.

Ito, Toshiyuki: *See—*
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.

Ito, Yasuo; and Kyogoku, Hiroshi, to Canon Kabushiki Kaisha. Image reading apparatus having a D/A converter with a controllable output. 5,151,796, Cl. 358-461.000.

Ito, Yuusuke: *See—*
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.

Itoh, Kazumine: *See—*
Yamamoto, Masanobu; and Itoh, Kazumine, 5,151,813, Cl 359-202.000.

Itoh, Toshiyuki: *See—*
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.

Itozaki, Hideo: *See—*
Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo 5,151,408, Cl. 505-1.000.

Itsuji, Junichi, to Nippon CMK Corp. Method for forming a carbon resistance in a printed wiring board. 5,151,299, Cl. 427-96.000.

Itsuji, Junichi, to Nippon CMK Corp. Method for forming a carbon resistance in a printed wiring board. 5,151,300, Cl 427-96.000.

ITT Corporation: *See—*
Mosquera, Rene A., 5,151,049, Cl. 439-353.000.

Sears, Lawrence; and Wall, John T., 5,151,017, Cl. 417-45.000.

IVAC Corporation: *See—*
Goldberg, Jack; and Rosati, Robert J., 5,150,969, Cl. 374-128.000

Iwai, Hidetoshi: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000

Iwai, Yoshio: *See—*
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000

Iwamoto, Akikazu: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.

Iwamoto, Hiroyuki: *See—*
Tamamura, Koushi; and Iwamoto, Hiroyuki, 5,151,912, Cl. 372-46.000

Iwamoto, Yasunori: *See—*
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, to Tosoh Corporation. Apparatus for separate injection of reagent. 5,150,821, Cl. 222-132.000

Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, to Hitachi, Ltd. Parallelization compile method and system. 5,151,991, Cl. 395-700.000

Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, to Canon Kabushiki Kaisha. Camera or printer capable of automatically changing print size. 5,151,726, Cl. 354-75.000

Iwata, Kunio: *See—*
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.

Iwazaki, Toshiaki: *See—*
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000

Izumi, Yuji: *See—*
Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, 5,151,020, Cl. 418-55.200.

Izumita, Morishi: *See—*
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000

J & L Industries, Inc.: *See—*
Beaulieu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.

J. M. Voith GmbH: *See—*
Schiel, Christian, 5,151,156, Cl. 162-368.000

Jack, David E., to Prevent-A-Crime International, Inc. Method of making a stencil for etching glass. 5,151,572, Cl. 219-121.690

Jack, Gregory S.: *See—*
El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 324-405.000.

Jacks, Wendy S.: *See—*
Smith, Michael G.; Jacks, Wendy S.; Lo, William C.; and Ehr, Robert J., 5,151,113, Cl. 71-92.000.

Jackson, Charles L.: *See—*
Griffith, Scott E., Tuller, Barry E.; and Jackson, Charles L., 5,151,884, Cl. 368-10.000.

Jackson, Norman C., to Standard Products Company, The. Color match molding and weatherstrip. 5,151,307, Cl. 428-31.000.

Jacob, Friedrich: *See—*
Findeis, Gunter; Jacob, Friedrich; and Schulz, Eberhard, 5,151,733, Cl. 355-45.000.

Jacobson, Boris S.; and DiPerna, Raymond A., to Raytheon Company. Class E power amplifier. 5,151,852, Cl. 363-131.000.

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Boy, Jurgen; and Jacubeit, Matthias, 5,151,630, Cl. 313-602.000.

Jaffe, Richard A.: *See—*
Allison, A. Christopher; and Jaffe, Richard A., 5,151,088, Cl. 604-192.000.

Jain, Sanjeev; and Vermette, John E., to Baltimore Therapeutic Equipment Co. Isoinertial lifting device. 5,151,071, Cl. 482-101.000.

Jakob, Wolfgang: *See—*
Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, 5,151,452, Cl. 521-48.000.

Jamco Corporation: *See—*
Hozumi, Hiroyuki, 5,150,863, Cl. 244-118.500.

Jamzadeh, Fereidoon S.; Chowdry, Arun; and Johnson, Kevin M., to Eastman Kodak Company. Imaging method and apparatus using discrete receiving sheets. 5,151,717, Cl. 346-157.000.

Jang, Yong N.: *See—*
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.

Janssen Pharmaceutica N.V.: *See—*
Janssens, Frans E.; Diels, Gaston S. M.; and Pille, Geert M. E., 5,151,424, Cl. 514-258.000.
Venet, Marc G.; Sanz, Gerard C. Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., 5,151,421, Cl. 514-249.000.
Janssens, Frans E.; Diels, Gaston S. M.; and Pille, Geert M. E., to Janssen Pharmaceutica N.V. Pharmacologically active (Bicyclic heterocyclyl)methyl and -hetero) substituted hexahydro-1H-azepines and pyrrolidines. 5,151,424, Cl. 514-258.000.

Janssens, Wilhelmus; Uytterhoeven, Herman J.; Vermeersch, Joan T.; and Van der Bogaert, Jan A., to Agfa-Gevaert, N.V. Modified dextran binder for use in thermal dye transfer. 5,151,405, Cl. 503-227.000.

Japan Atomic Energy Research Institute: *See—*
Washio, Masakazu; and Kawanishi, Syun-ichi, 5,151,486, Cl. 528-124.000

Japan Organo Co., Ltd.: *See—*
Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, 5,151,191, Cl. 210-644.000.

Japan Tobacco Inc.: *See—*
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000

Jaquiss, Robert D. B.: *See—*
Cox, James L.; and Jaquiss, Robert D. B., 5,150,706, Cl. 128-400.000

Jarrige, Jean: *See—*
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.

Jaskunas, S. Richard: *See—*
Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., 5,151,268, Cl. 424-94.640.

Jaster, Heinz; and Bessler, Warren F., to General Electric Company. Apparatus for controlling a dual evaporator, dual fan refrigerator with independent temperature controls. 5,150,583, Cl. 62-179.000.

Jeffers, Christopher M. Puncture and seal cap apparatus. 5,150,802, Cl. 215-235.000.

Jeffrey, Richard F.: *See—*
Beaulieu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.

Jenner, Andrew: *See—*
Moody, Victor; and Jenner, Andrew, 5,150,642, Cl. 81-57.200.

Jennings, Philip V.: *See—*
Foster, James P.; and Jennings, Philip V., 5,150,541, Cl. 43-131.000.

Jeong, Chan S.: *See—*
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.

Jeong, Ho-sun; and Han, Hyo-jin, to Samsung Electronics Co., Ltd. Integrated circuit for square root operation using neural network. 5,151,874, Cl. 364-752.000.

Jidoshu Kiki Co., Ltd.: *See—*
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-424.050.

Jiro, Kamezawa, to Tomoe Technical Research Co. Butterfly valve to prevent dew condensation therefrom. 5,150,731, Cl. 137-375.000.

Job, Robert C., to Shell Oil Company. Olefin polymerization catalyst. 5,151,399, Cl. 502-127.000.

Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, to BASF Aktiengesellschaft. Process for the preparation of dialkyl carbonates. 5,151,541, Cl. 558-277.000.

Joh. A. Benckiser GmbH: *See—*
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, 5,151,522, Cl. 548-112.000.

Johannes, Sandor: *See—*
Austin, George K., Jr.; and Johannes, Sandor, 5,150,880, Cl. 251-149.300.

Johns Hopkins University, The: *See—*
Massof, Robert W.; O'Shea, Donald C.; and Raasch, Thomas W., 5,151,722, Cl. 351-158.000.
Waarren, Jeffery W., 5,151,673, Cl. 333-249.000.

Johnsen, Edward L. Electronic inventory label and security apparatus. 5,151,684, Cl. 340-572.000.

Johnson Airspray, Inc.: *See—*
Johnson, Lindley C., 5,151,004, Cl. 414-495.000.

Johnson, Bruce K.: *See—*
Hendry, Donald H.; Johnson, Bruce K.; Krawczyk, Joanne M.; and Vierstra, Bruce C., 5,151,728, Cl. 354-83.000.

Johnson, Dave: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.

Johnson, David N.: *See—*
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000.

Johnson, David O. Ophthalmic lens prism blocking ring. 5,150,547, Cl. 51-216.0LP.

Johnson, Donald D.; and Yee, Jimmy, to Honeywell Inc. Asynchronous signal interrogation circuit for an detection apparatus. 5,151,591, Cl. 250-214.00B.

Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., to International Business Machines Corporation. Directory cache management in a distributed data processing system. 5,151,989, Cl. 395-600.000.

Johnson, Drey: *See—*
Farrow, Robert I.; and Johnson, Drey, 5,150,847, Cl. 242-56.00R.
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R.

Johnson, James A. Automated curbside check-in counter. 5,150,760, Cl. 177-245.000.

Johnson & Johnson Medical, Inc.: *See—*
Brown, Craig C., 5,151,314, Cl. 428-198.000.

Johnson, Kenneth L.; and Updike, William A., to Cummins Engine Company, Inc. Insulated exhaust port liner. 5,150,572, Cl. 60-272.000

Johnson, Kevin M.; and Kowalczyk, Michael S., to Eastman Kodak Company. Photoconductive drum having expandable mount. 5,151,737, Cl. 355-211.000.

Johnson, Kevin M.: *See—*
Jamzadeh, Fereidoon S.; Chowdry, Arun; and Johnson, Kevin M., 5,151,717, Cl. 346-157.000.

Johnson, Lindley C., to Johnson Airspray, Inc. Vehicle for moving aircraft. 5,151,004, Cl. 414-495.000.

Johnson, Lonnie G.; and D'Andrade, Bruce M. Double tank pinch trigger pump water gun. 5,150,819, Cl. 222-79.000.

Johnson, Tod S.: *See—*
Miller, Charles R.; Berry, Haskell B., Jr.; and Johnson, Tod S., 5,150,843, Cl. 241-27.000.

Johnson, Tom W.: *See—*
Baxi, Indra R.; and Johnson, Tom W., 5,151,278, Cl. 425-130.000.

Johnston, Thomas F.: *See—*
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000

Johten, Kazuhiro: *See—*
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.

Joly, Jean-Francois: *See—*
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Jomac, Inc.: *See—*
Nishiwaki, Hiroshi, 5,150,738, Cl. 139-420.00R.

Jones, Brian W.: *See—*
Pearson, Ronald W.; and Jones, Brian W., 5,151,644, Cl. 320-14.000.

Jones, Harold C.: *See—*
Wackrow, Roger D.; White, Kenneth W.; and Jones, Harold C., 5,150,701, Cl. 124-67.000

Jones, Irby W.: *See—*
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000

Jones, Nelson: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.

Jones, Richard E.: *See—*
Hwang-Felgner, Jiin-Yu; Jones, Richard E.; and Maher, James F., 5,151,265, Cl. 424-85.500

Jonkman, Kenneth R., to DLP, Inc. Aortic root cannula. 5,151,087, Cl. 604-164.000.

Jordan, Robert E.; and Hughes, Michael J., to B. F. Goodrich Company, The. Reactor vessel. 5,150,831, Cl. 228-184.000.

Jordhamo, George M.: *See—*
Galyon, George T.; Jordhamo, George M.; and Wirtz, Louis H., 5,151,169, Cl. 205-151.000

Joseph, Daniel D.; and Hultman, Dave A., to Joseph, Daniel D. Spinning drop tensioextensiometer. 5,150,607, Cl. 73-64.480.

Joshi, Sharad H.: *See—*
Abele, John E.; Lennox, Charles E.; Nardella, Paul C.; and Joshi, Sharad H., 5,151,100, Cl. 606-28.000.

Josquin, Wilhelmus J. M. J.; Peters, Wilhelmus C. M.; and Van De Goor, Albertus T. M., to U.S. Philips Corp. Method of manufacturing a semiconductor device by maskless pn junction isolation means. 5,151,382, Cl. 437-74.000

Jousselin, Christian P. M.; and Duranton, Marc A. G., to U.S. Philips Corporation. Arrangement of data cells and neural network system utilizing such an arrangement. 5,151,971, Cl. 395-27.000.

JPE Co., Ltd.: *See—*
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, 5,150,649, Cl. 101-365.000

Jugle, Kip L.: *See—*
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl. 355-296.000

Jun, Taue, to Yamaha Hatsudoki Kabushiki Kaisha. High pressure fuel injection unit for engine. 5,150,684, Cl. 123-446.000.

Juridical Foundation the Chemo-Sero-Therapeutic Research Institute: *See—*
Kuzuhara, Syoji; Odo, Koichi; and Mizuno, Kyosuke, 5,151,023, Cl. 424-89.000.

Kabasin, Daniel F.; and Stoltman, Donald D., to General Motors Corporation. Adaptive memory control for normalized dilution 5,150,696, Cl. 123-571.000

Kabushiki Kaisha Goto Seisakusho: *See—*
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, 5,151,118, Cl. 65-18.100.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Yutori, Toshiaki; and Kanetsuki, Yutaka, 5,151,653, Cl. 324-158.00P.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kitabayashi, Hiroyuki; and Ishikawa, Tadayuki, 5,151,109, Cl. 51-297.000

Kabushiki Kaisha Matsui Seisakusho: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.

Kabushiki Kaisha Meidensha: *See—*
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Kabushiki Kaisha Nihon Pipe Conveyor Kenkyusho: *See—*
Hashimoto, Kunio, 5,150,783, Cl. 198-819.000

Kabushiki Kaisha Pilot: *See—*
Igawa, Tatsuya, 5,151,032, Cl. 434-409.000.

Kabushiki Kaisha Sangi: *See—*
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Kabushiki Kaisha Shinkosha: *See—*
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Kabushiki Kaisha Top: *See—*
Sugita, Koichi, 5,150,823, Cl. 222-386.000.

Kabushiki Kaisha Toshiba: *See—*
Fujimoto, Hitoshi, 5,151,740, Cl. 355-246.000
Fujiwara, Takayoshi; and Honma, Hisanori, 5,151,021, Cl. 418-93.000
Gotou, Yukifumi, 5,150,582, Cl. 62-155.000
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, 5,151,754, Cl. 356-356.000.
Nagae, Akihito, 5,151,992, Cl. 395-750.000
Nosaki, Takefumi; and Sasama, Kazuo, 5,151,797, Cl. 358-474.000.
Ohmine, Toshimitsu; Akagawa, Keiichi; and Ishihata, Akira, 5,151,133, Cl. 118-725.000
Okazaki, Kiyoshi, 5,150,713, Cl. 128-660.030.
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, 5,151,276, Cl. 425-110.000
Shimizu, Yasuhiko, 5,150,828, Cl. 228-102.000
Suzuki, Shohei; and Sakuma, Isao, 5,151,982, Cl. 395-425.000
Takebuchi, Masataka, 5,151,761, Cl. 357-23.500.
Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, 5,151,659, Cl. 324-458.000.
Tatara, Shinji; and Okayasu, Masami, 5,151,853, Cl. 363-160.000
Terashi, Kozo; and Oba, Toshio, 5,151,931, Cl. 378-65.000

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, 5,151,020, Cl. 418-55.200

Kabushiki Kaisha Yamada Corp.: *See—*
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K.K. Ueno Seiyaku Oyo Kenkyujo: *See—*
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Kabushiku Kasisha Ogura: *See—*
Kimura, Kiyoshi, 5,150,644, Cl. 91-395.000.

Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, to Hitachi, Ltd. Display device with matrix-arranged pixels having reduced number of vertical signal lines. 5,151,689, Cl. 340-784.000

Kaczmarek, James S.; and Steimel, James M. Method of calibrating a rotary tool unit for an assembly line. 5,150,624, Cl. 73-865.900

Kaden, Milton E. Extensible interjoist hanger support assembly 5,150,868, Cl. 248-343.000

Kado, Makoto: *See—*
Shiraki, Tatsuya; and Kado, Makoto, 5,151,975, Cl. 395-153.000

Kadohara, Terutake: *See—*
Akashi, Akira; and Kadohara, Terutake, 5,151,732, Cl. 354-402.000

Kady, Mark A.: *See—*
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A. and Kady, Mark A., 5,151,939, Cl. 381-15.000

Kaeufe, Helmut; and Kipfelsberger, Christian, to RXS Schrumpftechnik-Garnituren GmbH. Method for manufacturing heat-activatable articles. 5,151,152, Cl. 156-645.000

Kagayama, Toshi: *See—*
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, 5,150,821, Cl. 222-132.000

Kai, Takashi: *See—*
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100

Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, to International Business Machines Corporation. Device for connecting and disconnecting first and second electrical connector parts 5,151,041, Cl. 439-157.000

Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, to Hitachi, Ltd. Apparatus and method for controlling a washing machine. 5,150,489, Cl. 8-159.000.

Kajigaya, Kazuhiko; and Sawada, Jiro, to Hitachi, Ltd. Semiconductor memory including an arrangement to permit external monitoring of an internal control signal. 5,151,881, Cl. 365-233.000

Kajita, Yusuke: *See—*
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000

Kakubari, Zen-ichi: *See—*
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Kakuishi, Mitsuo: *See—*
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Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, to Seiko Epson Corporation. Electrophoretic imaging device. 5,151,741, Cl. 355-257.000

Kamamori, Hitoshi: *See—*
Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, 5,151,379, Cl. 427-39.000

Kamata, Kazuya: *See—*
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, 5,150,821, Cl. 222-132.000

Kamen, Melvin E.; and Bernstein, Phillip, to Revlon, Inc. Cosmetic color display apparatus and method. 5,150,791, Cl. 206-457.000

Kameswaran, Venkataraman; and Barton, Jerry M., to American Cyanamid Company. Process for the manufacture of pesticidal 1-(alkoxymethyl) pyrrole compounds. 5,151,136, Cl. 548-530.000.

Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, to Green Cross Corporation, The. Production method for protein-containing composition. 5,151,499, Cl. 530-381.000

Kamikawai, Ryotaro: *See—*
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000.

Kamiya, Saburo: *See—*
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Kamiyama, Hiroyasu; and Amino, Hirokazu, to Kyocera Corporation; and Kamiyama, Hiroyasu. Blood vessel coagulation/stanching device. 5,151,102, Cl. 606-51.000

Kammerer, Gerd: *See—*
Blessing, Andreas; Griss, Jochen; and Kammerer, Gerd, 5,151,865, Cl. 364-483.000.

Kanamori, Hideto: *See—*
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Kanari, Masayuki: *See—*
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000

Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, to Nippon Hoso Kyokai. Signal transmission system for high definition television 5,151,779, Cl. 358-12.000.

Kanbar, Maurice S. Convertible swizzle stick. 5,151,720, Cl. 351-46.000

Kanebo, Ltd.: *See—*
Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, 5,151,240, Cl. 264-284.000

Kaneko, Satoshi, to Tokyo Electron Limited. Treatment system having gate device for decompression chamber. 5,150,882, Cl. 251-193.000

Kanemitsu, Shinji, to Canon Kabushiki Kaisha. Recording apparatus for compensating for eccentricities in drive force transmission means 5,151,716, Cl. 346-140.00R

Kanemori, Yuzuru: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000

Kanetsuki, Yutaka: *See—*
Yutori, Toshiaki; and Kanetsuki, Yutaka, 5,151,653, Cl. 324-158.00P.

Kanoh, Masaaki: *See—*
Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, 5,151,700, Cl. 341-156.000.

Kao, Jamee; and Hsu, Joseph C. S. Pleating machine for dual fluted shade. 5,151,151, Cl. 156-471.000.

Kaptein, Dick, to Fokker Aircraft B.C. Propeller blade position controller. 5,150,855, Cl. 244-1.00N

Karasawa, Haruo: *See—*
Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, 5,151,947, Cl. 382-6.000.

Kardorff, Uwe: *See—*
Mueller, Stefan; Theobald, Hans Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuerzast, Christoph, 5,151,441, Cl. 514-378.000

Karjalainen, Sari: *See—*
Osterholm, Jan-Erik; Laakso, Jukka; Karjalainen, Sari; and Mononen, Pirjo, 5,151,221, Cl. 252-500.000.

Karl Mayer Textilmaschinenfabrik: *See—*
Bergmann, Gerhard, 5,150,587, Cl. 66-195.000

Karlsson, Hans A.: *See—*
Strid, Kent; Karlsson, Hans A; and Larsson, Per, 5,151,176, Cl. 210-178.000

Karpisek, Ladislav S. Support for a hose for filling liquid into a container. 5,150,866, Cl. 248-79.000.

Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, to Hitachi, Ltd.; and Sanwa Electronics Instrument Co., Ltd. Multi-function keyboard for remote control apparatus. 5,151,696, Cl. 341-22.000.

Kasai, Takao: *See—*
Wakasugi, Makoto; and Kasai, Takao, 5,151,837, Cl. 360-103.000.

Kasuo, Tomoo, to Casio Computer Co., Ltd. Stopwatch. 5,151,885, Cl. 368-110.000

Katahata, Toshio: *See—*
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Kataoka, Junnosuke: *See—*
Sakamoto, Masahiro; and Kataoka, Junnosuke, 5,151,640, Cl. 318-696.000.

Katayama, Hideaki: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Katayama, Katsuhiro: *See—*
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Miura, Toshihide; and Nagasawa, Takeshi, 5,151,372, Cl. 436-164.000

Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, to Sharp Kabushiki Kaisha. Active matrix substrate and active matrix display apparatus. 5,151,807, Cl. 359-59.000.

Kato, Hiroaki: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Kato, Hisakazu: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000

Kato, Hisao: *See—*
Fujita, Akira; and Kato, Hisao, 5,151,562, Cl. 187-134.000.

Kato, Kazuo: *See—*
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000

Kato, Noriko: *See—*
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku. 5,151,289, Cl. 426-557.000.

Kato, Shinichiro: *See—*
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,150,924, Cl. 285-101.000.
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,150,925, Cl. 285-101.000.

Kato, Takeshi: *See—*
Ohya, Hiroshi; and Kato, Takeshi, 5,150,923, Cl. 285-21.000
Sasaki, Akira; Kato, Takeshi; and Hakoyama, Akiyoshi, 5,151,973, Cl. 395-109.000

Kato, Toshikazu: *See—*
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, 5,151,495, Cl. 528-388.000.

Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, to Babcock-Hitachi Kabushiki Kaisha. Coal combustion apparatus provided with a denitration. 5,151,256, Cl. 423-210.000.

Kato, Yuji: *See—*
Shimanaka, Shigeki; and Kato, Yuji, 5,150,761, Cl. 180-197.000.

Kato, Yuuichi: *See—*
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.

Katraro, Reuven: *See—*
Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, 5,151,182, Cl. 210-500.270.

Katritzky, Alan: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.

Katsnelson, Inessa: *See—*
Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, 5,151,189, Cl 210-635.000

Katsu, Kanemasa: *See—*
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Kawabata, Atsushi: *See—*
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl. 395-128.000.

Kawabata, Kazunobu, to Nissan Motor Company, Limited. Active suspension system with control to change variation in pressure of working fluid cylinder between increase and decrease thereof. 5,150,917, Cl. 280-707.000.

Kawada, Shozo: *See—*
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.

Kawaguchi, Akira; Suzuki, Tatsuyuki; and Yoshida, Michihito, to Mitsubishi Materials Corporation. Apparatus for rotating top ends of cans. 5,151,001, Cl. 414-225.000.

Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, to Hitachi, Ltd. Apparatus containing a septum which impedes cell permeation for cell culture and method of use. 5,151,362, Cl. 435-240.250.

Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, to Matsushita Electric Industrial Co., Ltd. Process for manufacturing an optical recording medium. 5,151,295, Cl. 427-12.000

Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, to Konica Corporation. Magnetic recording medium and manufacturing method thereof. 5,151,323, Cl. 428-323.000

Kawahara, Yoji: *See—*
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.

Kawahara, Yukito: *See—*
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, 5,151,587, Cl. 250-208.100.

Kawai, Makoto: *See—*
Arai, Hideki; Kawai, Makoto; and Miyai, Kenji, 5,151,254, Cl. 422-180.000.

Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshiro, to Hirose Electric Co., Ltd. Electrical connector. 5,151,033, Cl. 439-95.000.

Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, to Hirose Electric Co., Ltd. Electrical connector. 5,151,035, Cl. 439-95.000.

Kawakami, Kazuhiko: *See—*
Fushimi, Kazuo; Kitakizaki, Kaoru; and Kawakami, Kazuhiko. 5,151,334, Cl. 429-32.000.

Kawamoto, Mutsumi: *See—*
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,150,763, Cl. 180-252.000.

Kawamoto, Satoru; Nakagawa, Noaki; and Hayama, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Liquid crystal display apparatus having a series combination of the storage capacitors. 5,151,806, Cl 359-59.000.

Kawamoto, Sigeharu, to Matsushita Electric Industrial Co., Ltd. Field decision correction apparatus. 5,151,786, Cl. 358-148.000.

Kawanishi, Syun-ichi: *See—*
Washio, Masakazu; and Kawanishi, Syun-ichi, 5,151,486, Cl 528-124.000.

Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, to Cannon Kabushiki Kaisha. Image recording apparatus 5,151,713, Cl. 346-108.000.

Kawasaki, Moriyoshi: *See—*
Nakase, Kazuhiko; and Kawasaki, Moriyoshi, 5,151,708, Cl 343-722.000

Kaya, Hiroshi: *See—*
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Kazerounian, Reza; Eitan, Boaz; and Irani, Rustom F., to Waferscale Integration, Inc. EPROM virtual ground array. 5,151,375, Cl 437-43.000

Kearns, Kevin J.: *See—*
Kelley, Richard L.; Pham, Thuan N.; and Kearns, Kevin J., 5,150,785, Cl. 206-217.000.

Keene, Donna L.: *See—*
Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., 5,151,546, Cl. 560-130.000.

Kel Corporation: *See—*
Tanaka, Mitsuho, 5,151,040, Cl. 439-73.000.

Kelkar, Krishnanand: *See—*
Reiner, Thomas C.; Lindsey, Mark J.; and Kelkar, Krishnanand, 5,151,904, Cl. 371-43.000.

Kelley, Richard L.; Pham, Thuan N.; and Kearns, Kevin J. Storage container. 5,150,785, Cl. 206-217.000.

Kelly, Timothy J.: *See—*
Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., 5,151,483, Cl. 528-44.000

Kelly, William E.: *See—*
El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 524-405.000

Kelston, Henry J. Squeeze resistant carton holder. 5,150,811, Cl. 220-411.000.

Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., to Eastman Kodak Company. Film cassette. 5,151,730, Cl. 354-275.000

Kempf, Dale J.: *See—*
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.

Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Self-locking joint connector. 5,151,104, Cl. 606-73.000.

Kennedy, John W., to York Products Inc. Fastener for truck bed liner 5,150,940, Cl. 296-39.200.

Kennedy, Richard A.: *See—*
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A and Kady, Mark A., 5,151,939, Cl. 381-15.000.

Kenney, Glen E.: *See—*
Tees, Alistair A.; and Kenney, Glen E., 5,151,111, Cl. 55-164.000

Kent, Carole L.; and Frank, Dieter, to Kent, Carole L. Method for maintaining the integrity of hosiery. 5,151,302, Cl. 427-140.000.

"Keramag" Keramischewerke AG: *See—*
Egli, Anton, 5,150,926, Cl. 285-110.000.

Kessler, David: *See—*
Blanding, Douglass L.; Harrigan, Michael E.; and Kessler, David, 5,151,810, Cl. 359-198.000.

Key, Sally M.: *See—*
Alvarez, Vincent H.; and Dendramis, Nancy C., 5,150,824, Cl. 224-151.000.

Keystone Rustproofing, Inc.: *See—*
Meglio, William J., 5,150,531, Cl. 34-11.000.

Khachab, Nabil I.: *See—*
Zarabadi, Seyed R.; El-Naggar, Mohammed I.; and Khachab, Nabil I., 5,151,625, Cl. 307-529.000.

Khalid, Hecham R.: *See—*
Myslicki, Robert J.; Khalid, Hecham R.; and Aubry, Michael E., 5,150,933, Cl. 292-216.000.

Khanna, Ish: *See—*
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Khek, Sokhuom, to Fibra-Sonics, Inc. Ultrasonic needle with sleeve that includes a baffle. 5,151,084, Cl. 604-22.000.

Khoury, Adib I., to Angioloz, Incorporated. Laser catheter diffuser. 5,151,096, Cl. 606-15.000.

Kida, Shigeru; and Sakai, Katsuyuki, to Sharp Kabushiki Kaisha. Power switching apparatus with power switching timing. 5,150,630, Cl 74-354.000.

Kidd, Dennis R., to Phillips Petroleum Company. Removal of hydrogen sulfide from fluid streams. 5,151,257, Cl. 423-230.000.

Kidd, Dennis R.: *See—*
Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., 5,151,401, Cl. 502-329.000.

Kikiuis, Dan. Dynamic holographic display with cantilever. 5,151,724. Cl. 357-17.000.

Kim, Jong-Hae, to Samsung Electronics Co., Ltd. FM modulator for compensating modulation characteristics on each channel. 5,151,668. Cl. 332-124.000.

Kim, Son N. Radiation-sensitive mixture and production of relief structures. 5,151,341, Cl. 430-270.000.

Kimberly-Clark Corporation: *See—*
Reeves, William G.; Powers, Michael D.; Mathis, Michael P.; and Duello, Leonard E., 5,151,321, Cl. 428-286.000.

Kiminami, Kazuhiro: *See—*
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio. 5,151,234, Cl. 264-176.100

Kimizuka, Junichi: *See—*
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.

Kimmerle, Eugen: *See—*
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000.

Kimoto Co., Ltd.: *See—*
Yokosuka, Toshie, 5,151,336, Cl. 430-7.000

Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio, to Toray Industries, Inc. Thermoplastic composite plate material and products molded from the same. 5,151,322, Cl. 428-303.000.

Kimura, Hiroshi. Method for making resin dental plates and flasks 5,151,279, Cl. 425-178.000.

Kimura, Katsutaka: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl 357-71.000

Kimura, Kiyoshi, to Kabushiku Kasisha Ogura. Release valve mechanism in a fluid operated linear actuator for a portable cutter or the like. 5,150,644, Cl. 91-395.000

Kimura, Satoshi: *See—*
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000

Kimura, Shigeaki: *See—*
Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi Yasuyuki, 5,151,404, Cl. 503-200.000.

Kimura, Tomoaki: *See—*
Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, 5,150,597 Cl. 72-229.000

Kimura, Yasuo, to NEC Corporation. Optical head device for optimally detecting a focussing error. 5,151,892, Cl. 369-109.000

Kimura, Yukihiro: *See—*
Takai, Kazuhito; and Kimura, Yukihiro, 5,151,954, Cl. 382-41.000

King, Brian: *See—*
Clements, Stephen; and King, Brian, 5,151,119, Cl. 65-84.000

King, Jerry W.: *See—*
Hopper, Marvin L.; and King, Jerry W., 5,151,188, Cl. 210-634.000

King, Lloyd H., Jr., to King Technology of Missouri Inc. Method of making a wire junction encapsulating wire connector. 5,151,239, Cl 264-272.110.

King, Randal D.: *See—*
Montgomery, Eda R.; and King, Randal D., 5,151,170, Cl 205-298.000

King, Steven A.: *See—*
Allen, James D.; and King, Steven A., 5,151,990, Cl. 395-650.000.

King Technology of Missouri Inc.: *See—*
King, Lloyd H., Jr., 5,151,239, Cl. 264-272.110.

Kingman, John E. E., to Atlantic Richfield Company. Method for deconvolution of non-ideal frequency response of pipe structures to acoustic signals. 5,151,882, Cl. 367-82.000.

Kip, Ruloff F., Jr.: *See—*
Hunt, Rodney J.; and Kip, Ruloff F., Jr., 5,150,852, Cl 242-157.00R

Kipfelsberger, Christian: *See—*
Kaeufe, Helmut; and Kipfelsberger, Christian, 5,151,152, Cl. 156-645.000

Kirby, John S.: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.

Kiri, Motosada; and Adachi, Susumu, to Shimadzu Corporation. Radiation imaging apparatus having detection elements of varying sizes. 5,151,588, Cl. 250-208.100.

Kirk, Christopher P., to Pet Mate Limited. Dispensing device. 5,150,664, Cl. 119-51.120.

Kirk, William D., III; DeCaro, Anthony A.; and Perry, Wayne E. Retractable protective needle sheath. 5,151,089, Cl. 604-192.000.

Kirsten, Rolf. *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-

Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl 544-212.000.
Kisida, Hirosi: *See*—
Sakamoto, Noriyasu; Kisida, Hiroshi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000
Kitabayashi, Hiroyuki; and Ishikawa, Tadayuki, to Kabushiki Kaisha Komatsu Seisakusho. Grinder and method of manufacturing the same. 5,151,109, Cl. 51-297.000.
Kitabayashi, Tetsuo: *See*—
Watanabe, Toshiya; and Kitabayashi, Tetsuo, 5,151,845, Cl. 361-234.000
Kitahama, Michihiro: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.
Kitahara, Motohide; Ozaki, Hiroshi; and Shishido, Kouji, to Nissan Chemical Industries, Ltd. Method of producing porous vitrified grinder. 5,151,108, Cl. 51-296.000.
Kitahara, Shizuo; Nakamura, Eitaro; and Kubo, Yoichiro, to Nippon Zeon Co., Ltd. Magnetic recording medium comprising a magnetic layer or backcoat layer containing a specified dispersant. 5,151,333, Cl. 428-694.000.
Kitakizaki, Kaoru: *See*—
Fushimi, Kazuo; Kitakizaki, Kaoru; and Kawakami, Kazuhiko, 5,151,334, Cl. 429-32.000.
Kitamura, Ikuo: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510
Kitamura, Tohru: *See*—
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.
Kitaue, Kazumi, to Konami Co., Ltd. Hand held video game with simulated rescue. 5,150,899, Cl. 273-85.00G.
Kitazato, Keisuke: *See*—
Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, 5,151,191, Cl. 210-644.000
Kite-Powell, Kai L.: *See*—
Andersen, Paul G.; and Kite-Powell, Kai L., 5,151,026, Cl 425-204.000
Kivisto, Tuomo V. J.: *See*—
Marttila, Tom E.; Kivisto, Tuomo V. J.; and Ahola, Pentti V., 5,151,006, Cl. 414-626.000
Klaus, Thomas R., to Motorola, Inc. Receiver controller method and apparatus. 5,152,006, Cl. 455-89.000
Klausmeyer, Kevin: *See*—
Elias, Samir F.; Klausmeyer, Kevin; and Holland, Kurt, 5,151,456, Cl. 524-60.000
Kleine-Onnebrink, Bernhard: *See*—
Biehl, Wilfried; and Kleine-Onnebrink, Bernhard, 5,151,675, Cl. 335-78.000
Kleinhans, Josef, to Robert Bosch GmbH Flow sensor. 5,150,611, Cl. 73-204.140.
Kling, Briant J.: *See*—
Brevick, John E., Bittner, Steven L.; and Kling, Briant J., 5,150,676, Cl. 123-195.00R.
Klinkner, Walter: *See*—
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Kluth, Joachim: *See*—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000
Knepper, Jonathan D.; and Moll, Kenneth P., to AT&T Bell Laboratories. Apparatus for holding samples during solderability testing. 5,150,829, Cl. 228-104.000.
Knights, Douglas S., to B & R Electrical PLC. Electrical safety apparatus. 5,151,841, Cl. 361-86.000
Knoll, Jozsef: *See*—
Perenyi, Andras; Utpal, Goswani; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.
Knorr Brake Holding Corporation: *See*—
Lumbis, Anthony W., 5,151,055, Cl. 439-784.000
Knoster, Richard G. Gun sighting armor. 5,150,527, Cl. 33-234.000
Kobayashi, Hisao: *See*—
Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, 5,151,020, Cl 418-55.200
Kobayashi, Michihito: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Signal device for small boat. 5,150,663, Cl. 116-209.000
Kobayashi, Noboru; and Futaki, Yoshiki, to Yamaha Hatsudoki Kabushiki Kaisha. Water jet propulsion boat. 5,151,057, Cl. 440-38.000.
Kobayashi, Sadao: *See*—
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yuji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.
Kobayashi, Satomi: *See*—
Moriyama, Yoshiaki; and Kobayashi, Satomi, 5,151,791, Cl 358-261.200
Kobayashi, Soichi: *See*—
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.
Kobayashi, Toshiaki: *See*—
Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato, 5,151,538, Cl. 556-431.000
Kobayashi, Tsutomu; and Kojima, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Shift lever device for automatic transmission. 5,150,593, Cl. 70-248.000
Koblinski, Brian D.: *See*—
Croft, Alan P.; and Koblinski, Brian D., 5,151,130, Cl. 106-778.000.
Koch Industries, Inc.: *See*—
Elias, Samir F.; Klausmeyer, Kevin; and Holland, Kurt, 5,151,456, Cl. 524-60.000.
Kocher, Haribhajan S.: *See*—
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,150,955, Cl. 354-321.000.
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, to Sharp Kabushiki Kaisha. Ferroelectric liquid crystal device. 5,151,214, Cl. 252-299.610.
Koenig, Josef: *See*—
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000
Kofsky, Irving L.; and Trowbridge, Christian A., to United States of America, Navy. Optical tracking of charged particle beams. 5,151,746, Cl. 356-1.000.
Kohda, Katsuhiro; and Matsuda, Terumi, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 5,151,604, Cl. 250-484.100.
Kohler, Rolf; Kratt, Alfred; and Franzke, Klaus, to Robert Bosch GmbH. Method and arrangement for adjusting fuel for emergency operation. 5,150,698, Cl. 123-690.000.
Kohn, Joshua L.: *See*—
Gould, Murray J.; Kohn, Joshua L.; and Kohn, Matthew O., 5,150,869, Cl. 248-346.100.
Kohn, Matthew O.: *See*—
Gould, Murray J.; Kohn, Joshua L.; and Kohn, Matthew O., 5,150,869, Cl. 248-346.100.
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,151,357, Cl. 430-610.000.
Koike, Shouji: *See*—
Fukushima, Kyouko; Shirota, Koromo; and Koike, Shouji, 5,151,128, Cl. 106-20.000.
Koito Manufacturing Co., Ltd.: *See*—
Miyazawa, Kenji; and Terao, Hidetoshi, 5,150,958, Cl. 362-66.000.
Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, 5,151,631, Cl. 315-127.000.
Koizumi, Satoru, to Sharp Kabushiki Kaisha. Brake releasing mechanism of duplex tape recorder. 5,151,834, Cl. 360-92.000.
Koizumi, Satoru: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.
Kojima, Kazuo: *See*—
Kobayashi, Tsutomu; and Kojima, Kazuo, 5,150,593, Cl 70-248.000.
Kojima, Naoto: *See*—
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl 29-603.000.
Kojima, Osamu: *See*—
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000
Kojima, Tetsuro: *See*—
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Komatsu, Kouichiro: *See*—
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Komatu, Yuuki: *See*—
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.
Komitsch, Gregory A.: *See*—
Weissenborn, Richard K.; and Komitsch, Gregory A., 5,150,887, Cl. 269-71.000
Komori, Masaaki: *See*—
Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, 5,151,122, Cl. 106-35.000
Kompan A/S: *See*—
Wils, Tom L., 5,150,509, Cl. 29-525.100.
Komurasaki, Satoshi, to Mitsubishi Denki K.K. Acceleration detector. 5,150,606, Cl. 73-35.000.
Komuro, Kyozi; Hayakawa, Atsuya; and Shimizu, Hideaki, to Brother Kogyo Kabushiki Kaisha. Embroidery pattern data processor having a sewing order designation mechanism. 5,151,863, Cl. 364-470.000.
Komuro, Masakatsu: *See*—
Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, 5,151,434, Cl. 514-300.000
Komuro, Toshio, to NEC Corporation. CMOS high voltage switch. 5,151,616, Cl. 307-451.000.
Konami Co., Ltd.: *See*—
Kitaue, Kazumi, 5,150,899, Cl. 273-85.00G.

Kondo, Haruhiko, to Mitsubishi Denki K.K. Synchronized slave station connection apparatus for a data communication network. 5,151,898, Cl. 370-85.150.
Kondo, Katsuhiko, to Mitsubishi Denki K.K. Electronic control apparatus for an internal combustion engine. 5,150,695, Cl. 123-571.000
Kondo, Mitsuhiro: *See*—
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, 5,151,771, Cl. 357-70.000.
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, to Nippondenso Co., Ltd. Semiconductor strain sensor and manufacturing method thereof. 5,150,616, Cl. 73-517.00R.
Konica Corporation: *See*—
Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, 5,151,323, Cl. 428-323.000.
Kumamoto, Kenji; and Sasaki, Kunitsuna, 5,151,330, Cl 428-425.900.
Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, 5,151,947, Cl. 382-6.000.
Konig, Klaus: *See*—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.
Konishi, Kunihiko: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.
Konishi, Sakuichi: *See*—
Kuwajima, Teruaki; Umeda, Shinichiro; Watanabe, Masakazu; and Konishi, Sakuichi, 5,151,125, Cl. 106-503.000.
Konishi, Yasuhiro: *See*—
Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,151,614, Cl. 307-272.300.
Konstantinidou, Smaragda: *See*—
Snyder, Lawrence; and Konstantinidou, Smaragda, 5,151,900, Cl 370-94.300
Koontz, Stephen W.: *See*—
Merkel, Edwin W.; and Koontz, Stephen W., 5,150,861, Cl 244-91.000.
Kopera, John J. C.: *See*—
Depa, Henry F.; and Kopera, John J. C., 5,150,683, Cl. 123-417.000
Korpusik, John: *See*—
Marzucco, Teresa; Korpusik, John; and Martin, Patricia A., 5,151,999, Cl. 395-800.000.
Korsatko-Wabnegg, Brigitta; Korsatko, Werner; and Wegleitner, Karlheinz, to Lenzing Aktiengesellschaft. Delayed-release pharmaceutical preparation. 5,151,273, Cl. 424-465.000.
Korsatko, Werner: *See*—
Korsatko-Wabnegg, Brigitta; Korsatko, Werner; and Wegleitner Karlheinz, 5,151,273, Cl. 424-465.000.
Korsunky, Iosif; and Grabbe, Dimitry G., to AMP Incorporated. Electrical terminal which has overstress protection. 5,151,046, Cl 439-326.000.
Korte, Siegfried: *See*—
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, 5,151,458, Cl. 524-190.000
Koskol, Joseph E.: *See*—
Blackwell, Daniel C.; and Koskol, Joseph E., 5,150,739, Cl 139-452.000
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Method of assembling exterior parts of a motorcar onto a motorcar body. 5,150,506, Cl. 29-407.000
Kotani, Reiichi: *See*—
Goto, Jugo; Kubota, Tsutomu; Kotani, Reiichi; and Miyaji, Masuo. 5,151,454, Cl. 522-93.000
Kotwal, Girish J.; and Moss, Bernard, to United States of America, America. Gene encoding serine protease inhibitor. 5,151,509, Cl 536-27.000
Koupal, Lawrence: *See*—
Dombrowski, Anne W.; and Koupal, Lawrence, 5,151,365, Cl 435-254.000.
Kowalczyk, Michael S.: *See*—
Johnson, Kevin M.; and Kowalczyk, Michael S., 5,151,737, Cl 355-211.000.
Koyama, Noboru: *See*—
Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, 5,151,323, Cl. 428-323.000.
Koyama, Satoshi: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.
Koyama, Takeshi; and Abe, Takefumi, to Mitsubishi Gas Chemical Company, Inc. Naphthalene compounds. 5,151,549, Cl. 562-467.000
Koyama, Yoshihisa: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl 358-45.000
Koyanagi, Osamu; Seki, Yasuharu; and Tsukushi, Masanori, to Hitachi, Ltd. Gas circuit breaker. 5,151,566, Cl. 200-110.00A
Kozak, Michael: *See*—
Wentzek, Horst; and Kozak, Michael, 5,150,600, Cl. 72-426.000.
Kozak, Michael J.: *See*—
Hickey, Gregory M.; Green, Norbert J., Jr.; and Kozak, Michael J., 5,150,773, Cl. 188-79.550.
Kozole, Karl H.: *See*—
Carter, Stephen A.; Williamson, Bryan C.; and Kozole, Karl H., 5,150,690, Cl. 123-527.000
Kramer, Carl, to WSP Ingenieurgesellschaft fur Warmetechnik, Stromungstechnik und Prozesstechnik mit beschrankter Haftung. Apparatus for the bilateral blowing onto a web-like or sheet-like material 5,150,534, Cl. 34-155.000
Kratt, Alfred: *See*—
Kohler, Rolf; Kratt, Alfred; and Franzke, Klaus, 5,150,698, Cl 123-690.000.
Krawczyk, Joanne M.: *See*—
Hendry, Donald H.; Johnson, Bruce K.; Krawczyk, Joanne M.; and Vierstra, Bruce C., 5,151,728, Cl. 354-83.000.
Kreibich, Ursula: *See*—
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000
Kreinberg, Earl R.; and Adcock, Marty E., to AMP Incorporated Grounding connector. 5,151,560, Cl. 174-94.00R.
Krichever, Mark; and Metlitsky, Boris, to Symbol Technologies, Inc Point-of-sale system including detachable infinitely adjustable optical scanner with selecuon of scan pattern. 5,151,581, Cl. 235-467.000.
Krol, Denise M.; and Simpson, Jay R., to AT&T Bell Laboratories. Optical frequency second harmonic generator. 5,151,817, Cl 359-328.000.
Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Richter, Stefan, 5,150,782, Cl. 198-394.000.
Kruger, Leon J.; and Oatley, John A., to McNeil-PPC, Inc. Method and apparatus for applying a substance to an article. 5,151,301, Cl 427-294.000
Krupnick, Steven B.: *See*—
Hall, Bradford D.; and Krupnick, Steven B., 5,150,710, Cl 128-653.500.
Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., to Systems Control, Inc. Tachometer system for measuring the RPM of an internal combustion engine with no physical or visual connection 5,151,654, Cl. 324-160.000
Kubicek, Donald H.: *See*—
Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., 5,151,401, Cl. 502-329.000
Kubis, Heribert: *See*—
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Kubo, Yoichiro: *See*—
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Kubota, Akinori: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000
Kubota, Tsutomu: *See*—
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Kubota, Yoshiya: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Kuczynski, Charles P., to Ty-Breakers Corp. Fabric material and clothing apparel and apparel accessories made therefrom. 5,150,660 Cl. 112-402.000.
Kudo, Tomohiro: *See*—
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu Satoshi, 5,151,713, Cl. 346-108.000
Kuenast, Christoph: *See*—
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl 514-378.000
Kuijk, Karel E., to U.S. Philips Corporation. Active display device 5,151,691, Cl. 340-784.000
Kuizenga, Dirk J.: *See*—
Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., 5,151,909, Cl. 372-22.000.
Kukes, Simon G.; Clark, Frederick T.; Hopkins, P. Donald; and Green, Lisa M., to Amoco Corporation. Distillate hydrogenation. 5,151,172 Cl. 208-144.000.
Kulhanek, Antonin: *See*—
Muller, Klaus; and Kulhanek, Antonin, 5,151,162, Cl. 294-131.000
Kull, Hermann; Berger, Joachim; Gerstung, Ulrich; and Bleuel, Klaus, to Robert Bosch GmbH. Supervisory system for a vehicle accelerator pedal travel transducer. 5,150,681, Cl. 123-399.000
Kumagai, Ryohei, to Ezel Inc. Image processing method. 5,151,794, Cl 358-447.000
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, to JPE Co., Ltd. Ink pot device for printing machine. 5,150,649, Cl. 101-365.000
Kumamoto, Kenji; and Sasaki, Kunitsuna, to Konica Corporation. Magnetic recording medium comprising magnetic particles and a polyurethane resin binder having a polycaprolactone structural unit 5,151,330, Cl. 428-425.900.
Kumanoya, Masaki: *See*—
Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,151,614, Cl. 307-272.300

Kummer, Rudolf: *See—*
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, 5,151,541, Cl. 558-277.000

Kumpfbeck, Richard J.; and Hannan, Peter W., to Hazeltine Corporation. Linear array antenna with e-plane backlobe suppressor 5,150,707, Cl. 343-705.000.

Kumura, Tatsuo: *See—*
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl 29-603.000

Kundu, Snehamay: *See—*
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Kunikawa, Norihide; Yamada, Yoshikado; Mori, Yoshiteru; and Matsuo, Toshihisa, to Sharp Kabushiki Kaisha. Feeding device for enabling continuous copy paper feed from plural copy paper cassettes 5,150,890, Cl. 271-9.000

Kuokkala, Veli-Tapani: *See—*
Schwarz, Ricardo B.; and Kuokkala, Veli-Tapani, 5,150,617, Cl 73-579.000

Kuratate, Tomoaki: *See—*
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.

Kurihara, Kazushige: *See—*
Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, 5,150,556, Cl. 52-639.000.

Kurimoto, Isao; and Minai, Masayoshi, to Sumitomo Chemical Co. Ltd. Process for preparing di-tert.-butyl dicarbonate. 5,151,542, Cl 558-277.000

Kurita, Taiichiro: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000

Kuroiwa, Katsumasa; Katayama, Katsuhiro; Miura, Toshihide; and Nagasawa, Takeshi, to Nitto Boseki Co., Ltd. Method for determination of hydroxyacetophenone derivatives. 5,151,372, Cl. 436-164.000

Kurosaki, Akito: *See—*
Okazaki, Susumu; and Kurosaki, Akito, 5,151,263, Cl. 423-659.000.

Kusano, Akihisa: *See—*
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-1.000

Kusuhara, Nobumi: *See—*
Miyahara, Shyoichiro; Suzuki, Makio; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000

Kuwajima, Teruaki; Umeda, Shinichiro; Watanabe, Masakazu; and Konishi, Sakuichi, to Nippon Paint Co., Ltd. Aqueous coating composition. 5,151,125, Cl. 106-503.000.

Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ishikawa, Hiroyuki; and Tozu, Kenji, to Aisin Seiki Kabushiki Kaisha. Anti-skid control system for an automotive vehicle. 5,150,952, Cl. 303-109.000.

Kuwano, Harumitsu: *See—*
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Kuzmich, Daniel: *See—*
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Kuzuhara, Syoji; Odo, Koichi; and Mizuno, Kyosuke, to Juridical Foundation the Chemo-Sero-Therapeutic Research Institute. Hepatitis A,B-combined adjuvanted vaccine 5,151,023, Cl. 424-89.000

Kvesitis, Boris, to True Pitch, Inc. Resilient soil composition for athletic fields. 5,151,123, Cl. 106-287.170

Kwan, Benson: *See—*
Conn, Thomas E.; and Kwan, Benson, 5,150,932, Cl. 292-202.000.

Kwan-Gett, Clifford. Collapsible vessel sleeve implant. 5,151,105, Cl 623-1.000

Kyocera Corporation: *See—*
Kamiyama, Hiroyasu; and Aminaka, Hirokazu, 5,151,102, Cl. 606-51.000.

Kyogoku, Hiroshi: *See—*
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Kyorin Seiyaku Kabushiki Kaisha: *See—*
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Kyowa Chemical Industry: *See—*
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Kyowa Hakko Kogyo Co., Ltd.: *See—*
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000

Laakso, Jukka: *See—*
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Laboratories Eurobio: *See—*
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Lacey, Charles M.: *See—*
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Lafarge Nouveaux Materiaux: *See—*
Ranc, Roger; Brisset, Armand; and Debos, Marcel, 5,151,126, Cl. 106-719.000

Lai, Mei-Huei T.: *See—*
Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., 5,151,268, Cl. 424-94.640

Lai, Wen-Yih F.: *See—*
Chiang, Long Y.; and Lai, Wen-Yih F., 5,151,478, Cl. 526-258.000.

Lam, Sek W. Swimming flipper. 5,151,060, Cl. 441-62.000.

Lambert, James M.; and Solomon, Donald D., to Becton, Dickinson and Company. Method for making liquid crystalline tube having a point. 5,151,231, Cl. 264-108.000.

Lamm, Gunther: *See—*
Bach, Volker; Hansen, Guenter; Lamm, Gunther; and Sens, Ruediger, 5,151,506, Cl. 534-772.000.

Landeta, David S., to Harris Corporation. Single chip 2-D convolver. 5,151,953, Cl. 382-41.000.

Lang, Gerard: *See—*
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000.

Langan, John A.; and Sibigtroth, James M., to Motorola, Inc. Microcomputer with on-board chip selects and programmable bus stretching. 5,151,986, Cl. 395-550.000.

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Langer, Roger I.: *See—*
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Lin, Ming-Zen, to Industrial Technology Research Institute. CMOS input buffer with low power consumption. 5,151,620, Cl. 307-475.000.

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Liu, Matthew T., to Martin Marietta Corporation. High temperature ablative foam. 5,151,216, Cl. 252-307.000

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Lo, William C.: *See—*
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Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., to Svedala Industries, Inc. Railroad car positioning apparatus. 5,150,656, Cl 104-162.000

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Lockert, Timothy L. Materials stacking equipment. 5,151,009, Cl 414-793.500

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Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, to Osaka Gas Company, Ltd. Tetrasulfonated metal phthalocyanine doped electrically conducting electrochromic poly(dithiophene) polymers. 5,151,224, Cl. 252-586.000.

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Magee, Thomas J.; Leung, Charles S.; and Press, Richard L., to Amoco Corporation. Method for cleaning surfaces using UV lasers 5,151,135, Cl. 134-1.000.

Maginness, Maxwell G., to Gregtag Systems, Inc. Method of checking correlation between parts of a photofinishing order through the use of error weights. 5,151,579, Cl. 235-375.000.

Magnet, Jean-Louis, to S.E.M.T. Pielstick. Method of monitoring emission of nitrogen oxides by an internal combustion engine. 5,150,682, Cl. 123-417.000.

Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, to Nikon Corporation. Alignment apparatus. 5,151,750, Cl. 356-401.000.

Maguire, Sean P. Beach blanket anchor apparatus. 5,150,485, Cl. 5-417.000.

Maher, David L.; Rodriquez, Callista M.; and Trahan, Paul A., to General Electric Company. Propellant magazine for field artillery piece. 5,151,556, Cl. 89-35.010.

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Mahuzier, Georges: *See—*
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Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Method for shaping workpieces from thermoplastics. 5,151,241, Cl. 264-314.000.

Maier, Joseph K.; Vavrek, Robert M.; and Glover, Gary H., to General Electric Company. Correction of NMR data acquired by an echo-planar technique. 5,151,656, Cl. 324-309.000.

Maignan, Jean: *See—*
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Majestic, Veronica K.; and Strong, Russell C., to Nalco Chemical Company. Chemical abatement of carbonate cracking. 5,151,220, Cl. 252-392.000.

Major, Kenneth E.; Baker, John L.; and Braunagel, David K., to Hy-Tech Hydraulics, Inc.; and Breston, Michael P. Controlled-flow lubricating system. 5,150,769, Cl. 184-31.000.

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Maki, William M.: *See—*
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MAN Nutzfahrzeuge Aktiengesellschaft: *See—*
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Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., 5,151,939, Cl. 381-15.000.

Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, to Zahnradfabrik Friedrichshafen AG. Driving mechanism with two speed clutch 5,151,068, Cl. 475-322.000.

Mann, Lloyd J. Orthodontic device for small animals. 5,151,027, Cl. 433-1.000

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Unewisse, Heinz, 5,150,519, Cl. 29-890.140.

Manusch, Cristoph; and Harp, Hans-Jurgen, to Pelikan Aktiengesellschaft. Clutch for tape dispenser. 5,150,851, Cl. 242-68.100

Marasch, Richard D.: *See—*
Lombardi, Steven A.; and Marasch, Richard D., 5,151,642, Cl. 318-779.000.

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Nepote, Andrea; and Boella, Marcello, 5,151,634, Cl. 315-307.000
Vercesi, Roberto; and Bettini, Roberto, 5,151,646, Cl. 322-28.000

Mares, Frank: *See—*
Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, 5,151,477, Cl. 526-216.000.

Marfilius, Donald F.; and Schulte, Steven A., to Lear Seating Corporation. Automotive armrest with cupholder. 5,150,946, Cl. 297-194.000

Margot, Paul-Andre: *See—*
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Marks, Mortimer. System and devices for time delay 3D. 5,151,821, Cl. 359-462.000

Markusch, Peter H.: *See—*
Sanders, Joseph; Mafoti, Robson; and Markusch, Peter H., 5,151,470, Cl. 525-407.000

Marquardt, Kurt: *See—*
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; and Zeuschner, Ulrich, 5,151,280, Cl. 425-186.000.

Marquis, Edward T.; Sanderson, John R.; and Meyer, Robert A., to Texaco Chemical Company. Treatment of tertiary butyl hydroperoxide distillation fraction to remove acidic contaminants. 5,151,530, Cl. 549-529.000

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Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., to Goodyear Tire & Rubber Company, The. Micro-suspension polymerization of vinyl chloride with ascorbic acid and water-soluble metal salts. 5,151,476, Cl. 526-93.000

Martek Corporation: *See—*
Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D. 5,151,347, Cl. 435-3.000

Marteney, Pierre J.: *See—*
Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B. III, 5,151,171, Cl. 208-48.00Q.

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Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., 5,151,354, Cl. 435-161.000

Martensson, Nils E., to Technophone Limited. Variable configuration portable telephone. 5,151,946, Cl. 379-38.000.

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Marzucco, Teresa; Korpusik, John; and Martin, Patricia A., to Wang Laboratories, Inc. Serial communications controller for transfer of successive data frames with storage of supplemental data and word counts. 5,151,999, Cl. 395-800.000.

Mass, Barton, to Purus, Inc. Chamber design and lamp configuration for an ultraviolet photochemical reactor. 5,151,252, Cl. 422-186.300.

Massof, Robert W.; O'Shea, Donald C.; and Raasch, Thomas W., to Johns Hopkins University, The. Video display on spectacle-like frame. 5,151,722, Cl. 351-158.000.

Massucco, Arthur A.: *See—*
Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., 5,150,841, Cl. 239-332.000

Masters, Colin L.: *See—*
Salbaum, Johannes M. H.; Masters, Colin L.; and Beyreuter, Konrad T., 5,151,508, Cl. 536-27.000

Masubuchi, Takamichi: *See—*
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Masuda, Isao: *See—*
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Masuda, Shunichi, to Canon Kabushiki Kaisha. Image forming apparatus. 5,151,573, Cl. 219-216.000.

Masuda, Yoshitaka, to Canon Kabushiki Kaisha. Image reading apparatus with corrected optical length. 5,151,593, Cl. 250-234.000.

Masur, Ernst; Ruoff, Gottfried; and Planek, Werner, to FAG Kugelfischer Georg Schafer KgaA. Mounting sleeve for anti-friction bearing. 5,150,973, Cl. 384-448.000

Mathis, Michael P.: *See—*
Reeves, William G.; Powers, Michael D.; Mathis, Michael P.; and Duello, Leonard E., 5,151,321, Cl. 428-286.000.

Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, to Pall Corporation. Method for removing heparin from blood or plasma. 5,151,192, Cl. 210-646.000.

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Matsuda, Naoto: *See—*
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000.

Matsuda, Takashi, to Casio Computer Co., Ltd. High speed switch scanning apparatus. 5,151,554, Cl. 84-655.000

Matsuda, Terumi: *See—*
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Matsuda, Toshiaki: *See—*
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.

Matsui, Fumio: *See—*
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000

Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, to Hitachi, Ltd. Electronic circuit apparatus comprising a structure for sealing an electronic circuit. 5,151,773, Cl. 357-74.000

Matsui, Kunio, to Fujitsu Limited. Dictionary linked text base apparatus. 5,151,857, Cl. 364-419.000

Matsumoto, Kenichi: *See—*
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.

Matsumoto, Kenji: *See—*
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000

Matsumoto, Shigeyuki; and Ikeda, Osamu, to Canon Kabushiki Kaisha. Process for forming metal deposited film containing aluminum as main component by use of alkyl aluminum hydride. 5,151,305, Cl. 427-252.000

Matsumoto, Takeshi: *See—*
Idaka, Yukio; Yamaguchi, Shuichiroh; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, 5,151,602, Cl. 250-551.000

Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, to Tokyo Electron Limited; and Tokyo Electron Kyushu Limited. Method for heat-processing semiconductor device and apparatus for the same. 5,151,871, Cl. 364-557.000

Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, to Nissan Motor Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Vehicle room floor illuminating apparatus. 5,151,850, Cl. 362-75.000.

Matsuo, Kazuhiro: *See—*
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.

Matsuo, Noritada: *See—*
Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.

Matsuo, Tamotsu: *See—*
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Matsuo, Toshihisa: *See—*
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Matsuoka, Masahiro: *See—*
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.

Matsuoka, Yukihiro: *See—*
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000

Matsushima, Shunichi: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Hayashi, Takashi, 5,151,934, Cl. 379-159.000
Ishida, Toshimichi; and Suzuki, Masaki, 5,151,008, Cl. 414-744.500.
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000
Kawamoto, Sigeharu, 5,151,786, Cl. 358-148.000

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Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, 5,151,700, Cl. 341-156.000.
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Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, 5,151,805, Cl. 359-57.000.
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Yamada, Toshio; and Inoue, Michihiro, 5,151,878, Cl. 365-189.010.
Yamamura, Souhei, 5,151,944, Cl. 381-151.000.
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu, and Okamura, Hideo, 5,151,893, Cl. 369-116.000.

Matsushita Electric Works, Ltd.: *See*—
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.
Idaka, Yukio; Yamaguchi, Shuichiro; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, 5,151,602, Cl. 250-551.000.

Matsushita, Mutsuyoshi: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.

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Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.

Matsuura, Hiroshi, to Fujikiko Kabushiki Kaisha. Vehicle seat. 5,150,870, Cl. 248-421.000.

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Negi, Yoshitaka; and Matsuura, Hiroshi, 5,150,871, Cl. 248-429.000.

Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, to Matsushita Electric Industrial Co., Ltd. Serial parallel type A/D converter. 5,151,700, Cl. 341-156.000.

Mattingly, Phillip G.: *See*—
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Mattingly, William B., III: *See*—
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Strong, Kathleen M.; and Matusewicz, Richard S., 5,150,971, Cl. 383-84.000.

Maucher, Paul; and Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Torsion damping apparatus for use with friction clutches in the power trains of motor vehicles. 5,151,065, Cl. 464-68.000.

Maus, Wolfgang, and Swars, Helmut, to Emitec Gesellschaft fuer Emissionstechnologie MBH. Catalyst arrangement with flow guide body. 5,150,573, Cl. 60-299.000.

Maytag Corporation: *See*—
Griffith, Scott E.; Tuller, Barry E.; and Jackson, Charles L., 5,151,884, Cl. 368-10.000.

Mazda Motor Corporation: *See*—
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Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Mazon, Yves: *See*—
Valmir, Francis; Mazon, Yves; and Schonenberger, Eric, 5,151,681, Cl. 340-454.000.

Mazzoleni, Giancarlo; and Baker, Gordon M. Centering device for use with Brinell hardness-measuring probe. 5,150,608, Cl. 73-81.000.

McAllister, Michael J., to Advanced Dynamics Corporation. Thermoplastic tubular container for semiconductor devices with longitudinal opening means. 5,150,786, Cl. 206-328.000.

McCall, Patrick C.; and Cothran, Philip E., to Procter & Gamble Company, The. Shampoo compositions. 5,151,209, Cl. 252-174.150.

McCardell, Willard B., to Cardell Corporation. Micropin connector system. 5,151,052, Cl. 439-598.000.

McCarthy, Peter A.; and Walker, Frederick J., to Pfizer Inc. 3,5-dihydroxy-6,8-nonadienoic acids and derivatives as hypocholesterolemic agents. 5,151,545, Cl. 560-60.000.

McClelland, Gary M., to International Business Machines Corporation. Subpicosecond atomic and molecular motion detection and signal transmission by field emission. 5,151,594, Cl. 250-306.000.

McClune, Donald W., to Elco Corporation. Electrical contact system with cantilever mating beams. 5,151,056, Cl. 439-851.000.

McCormick, Christopher P.: *See*—
Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., 5,151,730, Cl. 354-275.000.

McCoy, Kevin M., to American Cyanamid Company. Method for solubilization and naturation of somatotropins utilizing sulfolane. 5,151,501, Cl. 530-399.000.

McCrae, James M.: *See*—
Morrison, Donald J.; McGregor, David; and McCrae, James M., 5,151,129, Cl. 106-623.000.

McCrary, Avis L.: *See*—
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McCrimmon, Kevin D.: *See*—
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., 5,151,402, Cl. 502-401.000.

McCullough, Francis P., Jr.; and Stein, Stuart D., to Dow Chemical Company, The. Method and apparatus for separating fluids using a carbonaceous polymeric filter having a LOI greater than 40. 5,151,198, Cl. 210-767.000.

McCurry, Ronald C., to Ryobi Motor Products Corporation. Deadman switch arrangement for a hedge trimmer. 5,150,523, Cl. 30-228.000.

McDonnell Douglas Corporation: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.
Ruffoni, John M., 5,151,222, Cl. 252-511.000.

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McGean-Rohco, Inc.: *See*—
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McGill, Shane R. Dispensing apparatus for frozen product. 5,150,820, Cl. 222-95.000.

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McHale, Angelika H.: *See*—
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McKavanagh, Thomas P. Gate valve sleeve. 5,150,881, Cl. 251-174.000.

McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., to Orbital Engine Company Proprietary Limited. Method of fuel injection. 5,150,836, Cl. 239-5.000.

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Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.

McNeil-PPC, Inc.: *See*—
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Kruger, Leon J.; and Oatley, John A., 5,151,301, Cl. 427-294.000.

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Mead Corporation, The: *See*—
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., 5,151,520, Cl. 548-110.000.
Hutchings, David A.; and Brandon, Richard L., 5,151,488, Cl. 528-179.000.

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Medich, John R.: *See*—
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Medico International, Inc.: *See*—
Anderson, Leslie B., 5,150,707, Cl. 128-402.000.

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Meglio, William J., to Keystone Rustproofing, Inc. Sludge drying apparatus and method. 5,150,531, Cl. 34-11.000.

Meier, Hans-J., to Carl-Zeiss-Stiftung. Mirror support arrangement for a primary mirror of a telescope. 5,151,809, Cl. 359-846.000.

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Homonoff, Edward C.; Meierhoefer, Alan W.; and Flint, Lori B., 5,151,320, Cl. 428-284.000.

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Melvin, Terence: *See*—
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Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, 5,151,182, Cl. 210-500.270.

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DeBiasi, Mark S.; and Menelly, Richard A., 5,151,842, Cl. 361-93.000.

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Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000.
Rasmusson, Gary H.; and Reynolds, Glenn F., 5,151,429, Cl. 514-284.000.
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Reiffenrath, Volker; and Finkenzeller, Ulrich, 5,151,213, Cl. 252-299.600.

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Merkel, Edwin W.; and Koontz, Stephen W., to Boeing Company, The. Variable sweep side force generator and roll control device. 5,150,861, Cl. 244-91.000.

Merrell, Thomas D., Jr.: *See*—
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Merrill, Leo: *See*—
Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, 5,151,107, Cl. 51-295.000.

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Esteve, Xavier, 5,150,545, Cl. 51-165.740.

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Messner, Bernfried: *See*—
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Metal Leve S/A Industria E Comercio: *See*—
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Frank, Wolfgang; Loffler, Johannes; and Holle, Norbert, 5,150,729, Cl. 137-340.000.

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Mitsubishi Kasei Corporation: *See—*
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Miyamoto, Yasunori: *See—*
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Miyazaki, Kenji: *See—*
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Miyazaki, Yasuhiro, to Olympus Optical Co., Ltd. Separation-type optical information recording and reproducing apparatus producing offset-eliminated focus error signal. 5,151,887, Cl. 369-44.320.
Miyazawa, Kazuyuki: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Miyazawa, Kenji; and Terao, Hidetoshi, to Koito Manufacturing Co., Ltd. Vehicular headlamp having inclination measuring unit. 5,150,958, Cl. 362-66.000.
Miyazawa, Osamu, to Seiko Epson Corporation. Analog electric timepiece using an intermittent driving signal. 5,151,886, Cl. 368-157.000.
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Mizuno, Kyosuke: *See—*
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Harandi, Mohsen N.; and Owen, Hartley, 5,151,393, Cl. 502-53.000.
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Molitor, Robert P.; and Melvin, Terence, to Lisco, Inc. Multi-piece golf balls and methods of manufacture. 5,150,906, Cl. 273-220.000.
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Monnet, Olivier; and Vacher, Jacques, to Commissariat a l'Energie Atomique. Device to display disintegrations of positrons using barycentric and time of flight measurements. 5,151,599, Cl. 250-363.030.
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Montgomery, Eda R.; and King, Randal D., to McGean-Rohco, Inc. Acid copper electroplating bath containing brightening additive. 5,151,170, Cl. 205-298.000.
Moody, Victor; and Jenner, Andrew, to Frank's International Ltd. Device for applying torque to a tubular member. 5,150,642, Cl. 81-57.200.
Moore, Jack S., Jr.; Cox, Johnny R.; and Williams, Mark L., to Eastman Kodak Company. Apparatus for collecting samples of articles conveyed at high speed in consecutive order. 5,150,621, Cl. 73-863.910.
Moore, Jerry H., to United Technologies Corporation. Blade lock for a rotor disk and rotor blade assembly. 5,151,013, Cl. 416-221.000.
Moorman, Thomas P.: *See—*
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Morgan, A. Charles, Jr.; and Pavanasasivam, Gowsala, to NeoRx Corporation. Use of anionic detergents with conjugates of monoclonal or polyclonal antibodies. 5,151,266, Cl. 424-85.800.
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Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Scroll type compressor having gradually thinned wall thickness. 5,151,020, Cl. 418-55.200.
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Morrin, Hugh F. C.: *See—*
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000.
Morris, John R., Jr.: *See—*
Degani, Yinon; and Morris, John R., Jr., 5,150,832, Cl. 228-224.000.
Morris, Richard L.: *See—*
Paul, James M.; and Morris, Richard L., 5,151,196, Cl. 210-712.000.
Morris, Robert L.; and Bartos, Andrew L., to General Motors Corporation. Electro-mechanical power controller for a gear shift mechanism. 5,150,629, Cl. 74-337.500.
Morrison, Donald J.; McGregor, David; and McCrae, James M., to Ciba-Geigy Corporation. Process for the production of pigments in the presence of an azo dyestuff. 5,151,129, Cl. 106-623.000.
Moschuering, Hugo, to Siemens Aktiengeselischaft. Measuring position for microwave components. 5,151,652, Cl. 324-158.00P.
Moskowitz, Larry N.; and Lindley, Donald J., to Amoco Corporation High density thermal spray coating. 5,151,308, Cl. 428-35.800.
Mosquera, Rene A., to ITT Corporation. Connector latching arrangement. 5,151,049, Cl. 439-353.000.
Moss, Bernard: *See—*
Kotwal, Girish J.; and Moss, Bernard, 5,151,509, Cl. 536-27.000.
Moss, Gary L.: *See—*
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.
Motohashi, Toshiaki; Harada, Yooichi; and Yanagihara, Tsuyoshi, to Tokyo Tatsuno Co., Ltd. Vapor recovering device for volatile liquid dispensing apparatus. 5,150,742, Cl. 141-59.000.
Motorola, Inc.: *See—*
Balzano, Quirino; and Stengel, Robert E., 5,151,709, Cl. 343-741.000.
Bickley, Robert H., 5,152,005, Cl. 455-76.000.
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N.; and Nagele, Albert L., 5,151,643, Cl. 320-2.000.
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., 5,151,650, Cl. 324-158.00F.
Hanna, John E., 5,151,662, Cl. 328-127.000.
Hsueh, Paul W.; and Smith, Douglas D., 5,151,879, Cl. 365-190.000.
Klaus, Thomas R., 5,152,006, Cl. 455-89.000.
Langan, John A.; and Sibigtroth, James M., 5,151,986, Cl. 395-550.000.
Uribe, Juan R., 5,152,007, Cl. 455-116.000.
Weiss, Karl R., 5,151,922, Cl. 375-5.000.
Moulinex (Societe Anonyme): *See—*
Schiettecatte, Patrice J. C., 5,150,645, Cl. 99-295.000.
Mouri, Akihiro: *See—*
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.
MPC Containment Systems, Ltd.: *See—*
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MTU Motoren- Und Turbinen-Union Munchen GmbH. *See—*
Herzog, Claus, 5,150,571, Cl. 60-200.100.
Muckenfuhs, Delmar R., to Procter & Gamble Company, The. Method for making side opening flexible bag with longitudinally oriented carrying handle secured to side panels. 5,150,561, Cl. 53-412.000.
Mueller, Franz-Josef: *See—*
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, 5,151,541, Cl. 558-277.000.
Mueller, Gustav; and Stoll, Lothar, to Siemens Aktiengesellschaft Controllable integrated optical Mach-Zehnder interferometer 5,151,959, Cl. 385-50.000.
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, to BASF Aktiengesellschaft. 3-isoxazolylbenzyl esters, their preparation and their use 5,151,441, Cl. 514-378.000.
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, to Mitsubishi Rayon Co., Ltd. Dental adhesive composition. 5,151,479, Cl. 526-277.000.
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, to Fuji Xerox Co., Ltd.; and Mukai, Toshio. Charge transfer complex formed between benzoquinone derivative and electron donor and process for producing the same. 5,151,528, Cl. 549-31.000.
Mukainakano, Hiroshi: *See—*
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, 5,151,587, Cl. 250-208.100.

Mulhaupt, Rolf: *See—*
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000

Mullally, Michael J., to Valve Tech, Inc. Thruster valve. 5,150,879, Cl. 251-129.210.

Muller, Hartmut: *See—*
Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, 5,151,493, Cl. 528-272.000

Muller, Karl-Heinz, to GKN Automotive AG. Continuous tensioning ring for mounting convoluted boots. 5,151,503, Cl. 24-20.0EE

Muller, Klaus; and Kulhanek, Antonin, to Honda Giken Kogyo Kabushiki Kaisha. Rechargeable storage battery with electroactive organic polymer electrodes in polar solvent electrolyte. 5,151,162, Cl 294-131.000

Muller, Klaus-Helmut; Kirsten, Rolf; Klutt, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft Herbicidal substituted 4-sulphonylamino-2-azinyl-1,2,4-triazol-3-ones. 5,151,514, Cl. 544-212.000

Muller, Michael: *See—*
Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, 5,151,480, Cl. 526-279.000

Muller, Richard P.: *See—*
Grossi, Benedetto; and Muller, Richard P., 5,151,101, Cl. 606-46.000

Muller, Walter, to Ewikon Entwicklung und Konstruktion GmbH & Co. KG. Electrically heatable nozzle for an injection molding machine, a hot runner system or the like. 5, 51,025, Cl. 425-199.000

Munday, Jerry T.; and Meiss, Theodore D. to Hoechst Celanese Corporation. Flame resistant, low pilling polyester fiber. 5,151,494, Cl 528-287.000

Munroe, David M. Display device for conformal certification encasements. 5,150,792, Cl. 206-486.000.

Murakami, Aiko: *See—*
Arahori, Hideo; Yamazaki, Shiro; Arahara, Masato; and Murakami, Aiko, 5,151,114, Cl. 71-92.000

Murakami Kaimeido Co., Ltd.: *See—*
Sugimura, Naomi, 5,151,828, Cl. 359-871.000

Murakami, Kiyokazu, and Yokura, Susumu, to Tokyo Tanabe Company, Limited. Antiulcer substance. 5,15 ,450, Cl. 514-690.000.

Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, to Canon Kabushiki Kaisha; and Daiichi Seiki Kaisha Kabushiki Kaisha. Sheet binder. 5,150,998, Cl 412-14.000

Murakami, Masaaki: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,1 1,871, Cl. 364-557.000

Murakami, Toshifumi: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-5 2.000

Murakami, Yoshichika. Cleaner for rotary bodies such as blanket cylinder, impression cylinder, ink supply rollers and the like. 5,150,650, Cl 101-425.000

Muraki, Toshio: *See—*
Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio, 5,151,322, Cl. 428-303.000.

Muramatsu, Shigeki; Takasugi, Shinji; and Osato, Kazumi, to Chinetsu Gijutsu Kaihatsu Kabushiki Kaisha. Three-dimensional detection system for detecting fractures and their distributions in the earth crust utilizing an artificial magnetic field and magnetic particle tracer 5,151,658, Cl. 324-346.000

Muramoto, Hisao: *See—*
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiko; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 2 0-732.000

Muranaka, Masaya: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000

Murata, Kazue: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,900, Cl. 406-50.000

Murata, Kazushige: *See—*
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Murata, Kohzou: *See—*
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Murata Manufacturing Co.: *See—*
Noto, Kazuyuki; and Toyoshima, Isao, 5,151,672, Cl. 333-189.000.

Murata, Shinichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Cylinder head assembly for use in internal combustion engine. 5,150,675, Cl. 123-193.500

Murata, Yasushi: *See—*
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000

Murata, Yukio, to NEC Corporation. Charge device capable of lengthening a lifetime of a storage cell. 5,151,045, Cl. 320-23.000.

Murphy, James V., to Advanced Interconnections Corporation. Integrated circuit adapter having gullwing shaped leads. 5,151,039, Cl 439-70.000

Mycogen Corporation: *See—*
Payne, Jewel M., 5,151,363, Cl. 435-2 2.500.

Mydill, Marc R.; and O'Keefe, Sheila, to Texas Instruments Incorporated. High efficiency pattern sequence controller for automatic test equipment. 5,151,903, Cl. 371-27.000.

Myer, John M.: *See—*
Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,151,045, Cl. 439-271.000.

Myers, Bruce A.: *See—*
Akin, Timur; Myers, Bruce A.; Maki, William M., and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000.

Myers, Dean E., to MAC Tools, Inc. Auxiliary starter switch with illuminated guard. 5,150,610, Cl. 73-118.100.

Myers, Frederick A.: *See—*
Robbins, Douglas J.; Gosselin, Cynthia A.; and Myers, Frederick A., 5,151,297, Cl. 427-46.000.

Myslicki, Robert J.; Khalid, Hecham R.; and Aubry, Michael E., to General Motors Corporation. Latch having torsion spring leg and leaf spring leg. 5,150,933, Cl. 292-216.000.

Naemura, Shinichi: *See—*
Hayafune, Koji; Naemura, Shinichi; Yasumoto, Hiroshige; and Amemiya, Hideo, 5,151,463, Cl. 524-430.000

Nagae, Akihito, to Kabushiki Kaisha Toshiba. Personal computer for cutting off power when a lock mechanism of hard disk pack is released. 5,151,992, Cl. 395-750.000.

Nagai, Masahiko: *See—*
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000

Nagamine, Akira, to AMP Incorporated. Connector latch with anti-overstress. 5,151,051, Cl. 439-557.000.

Nagasawa, Takeshi: *See—*
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Miura, Toshihide; and Nagasawa, Takeshi, 5,151,372, Cl. 436-164.000.

Nagasawa, Tsuyoshi, to Sony Corporation. Tape loading device. 5,151,832, Cl. 360-85.000

Nagase, Toshikatu: *See—*
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, 5,150,649, Cl. 101-365.000

Nagata, Seiichi: *See—*
Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, 5,151,805, Cl. 359-57.000

Nagatani, Fumio: *See—*
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000

Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, to Konica Corporation. Method and apparatus for processing radiation image. 5,151,947, Cl. 382-6.000.

Nagayasu, Takayoshi: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000

Nagele, Albert L.: *See—*
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N., and Nagele, Albert L., 5,151,643, Cl. 320-2.000

Nagengast, William E.; and Filosa, Philip C., to General Motors Corporation. Headlamp leveling arrangement. 5,151,849, Cl. 362-61.000

Naismith, Robert: *See—*
Thornthwaite, John B.; and Naismith, Robert, 5,151,232, Cl. 264-130.000

Nakagaki, Shintaro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl. 358-45.000

Nakagawa, Hiroshi: *See—*
Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, 5,151,240, Cl. 264-284.000

Nakagawa, Noaki: *See—*
Kawamoto, Satoru; Nakagawa, Noaki; and Hayama, Masahiro, 5,151,806, Cl. 359-59.000.

Nakagawa, Takashi: *See—*
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 5,151,531, Cl. 552-115.000.

Nakagawa, Yasuo; and Nayer, Shree K., to Hitachi, Ltd. Method of detecting solid shape of object with autofocusing and image detection at each focus level. 5,151,609, Cl. 250-561.000.

Nakahara, Takashi: *See—*
Shikichi, Satoshi; and Nakahara, Takashi, 5,151,888, Cl. 369-44.320.

Nakahata, Kimio: *See—*
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.

Nakajima, Hajime: *See—*
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Nakajima, Hirokazu: *See—*
Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, 5,150,974, Cl. 384-463.000

Nakajima, Ichiro; Hatakeyama, Kazuya; and Hirata, Yasushi, to Bridgestone Corporation. Low heat generation rubber compositions containing thiadiazole compound. 5,151,468, Cl. 525-332.700.

Nakajima, Satoko, legal representative: *See—*
Nakajima, Takashi, deceased; and Morita, Misao, 5,151,751, Cl. 356-402.000.

Nakajima, Takashi, deceased (by Nakajima, Satoko, legal representative); and Morita, Misao, to Nippon Paint Co., Ltd. Method for evaluating color tone of coating film and device for this evaluation 5,151,751, Cl. 356-402.000.

Nakamichi Corporation: *See—*
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Nakamoto, Hideo: *See—*
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Nakamura, Eitaro: *See—*
Kitahara, Shizuo; Nakamura, Eitaro; and Kubo, Yoichiro, 5,151,333, Cl. 428-694.000.

Nakamura, Hideki, to Terumo Kabushiki Kaisha. Method for optical determination of concentration of substance and apparatus for the determination. 5,151,603, Cl. 250-458.100

Nakamura, Koki: *See—*
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000

Nakamura, Noriyuki: *See—*
Ohta, Hiroshi; and Nakamura, Noriyuki, 5,151,955, Cl. 385-6.000

Nakamura, Takaharu: *See—*
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Nakamura, Takeshi: *See—*
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000

Nakane, Hideaki: *See—*
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000

Nakanishi, Hidenori: *See—*
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Nakanishi, Kunio: *See—*
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Nakanishi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Magnetic tape device having a switching mechanism for diverting rotation of the capstan to rotation for loading/unloading a cassette in the device 5,151,833, Cl. 360-85.000.

Nakanishi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Cassette detecting device for cassette loading mechanism. 5,151,835, Cl 360-96.500

Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, to Kyowa Hakko Kogyo Co., Ltd. Process for producing diterpene compounds. 5,151,352, Cl 435-123.000

Nakano, Toshio: *See—*
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Nakano, Yasushi: *See—*
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Nakaoka, Mikio: *See—*
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000

Nakase, Kazuhiko; and Kawasaki, Moriyoshi, to Harada Kogyo Kabushiki Kaisha. Shortened mast antenna with compensating circuits 5,151,708, Cl. 343-722.000.

Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, to Osaka Gas Co., Ltd.; Mitsui Petrochemical Ind., Ltd.; and Shinwa Sangyo Co., Ltd. Electrofusion joint and hot water supply header using the same 5,150,922, Cl. 285-21.000

Nakayama, Naoki; and Hamasaki, Katumi, to Mitsubishi Petrochemical Engineering Company Ltd. Apparatus for sorting specimens. 5,150,795, Cl. 209-3.300.

Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, to Nissan Motor Company, Ltd. Vehicular traveling direction measuring system. 5,151,862, Cl 364-454.000

Nakazato, Hiroshi: *See—*
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.

Nalco Chemical Company: *See—*
Majestic, Veronica K.; and Strong, Russell C., 5,151,220, Cl 252-392.000

Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro, to Sharp Kabushiki Kaisha. Process for preparing orientation film for liquid crystals. 5,151,298, Cl. 427-77.000.

Nanba, Ryujiro: *See—*
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.

Nanno, Yutaka: *See—*
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Narang, Subhash C.: *See—*
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, 5,151,224, Cl. 252-586.000.

Nardella, Paul C.: *See—*
Abele, John E.; Lennox, Charles E.; Nardella, Paul C.; and Joshi Sharad H., 5,151,100, Cl. 606-28.000

Narita, Ryoichi: *See—*
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, 5,150,616, Cl. 73-517.00R

Nartron Corporation: *See—*
Rymut, Michael J.; Cooper, Stephen R. W.; and Washeleski, John M., 5,150,615, Cl. 73-313.000

Narusawa, Hitoshi; and Yoneda, Michiaki, to Nakamichi Corporation Digital signal processing circuit. 5,151,831, Cl. 360-39.000.

National Research Development Corporation: *See—*
Earl, Harold A.; and Banks, William B., 5,151,238, Cl. 264-136.000.

National Semiconductor Corporation: *See—*
Ramde, Amolak R., 5,151,378, Cl. 437-31.000.

Navarro, Thomas L.; and Isaacson, James D. Apparatus with rotatably-driven asymmetrically-accelerated eccentric mass for generating translational force. 5,150,626, Cl. 74-84.00R

Nayer, Shree K.: *See—*
Nakagawa, Yasuo; and Nayer, Shree K., 5,151,609, Cl. 250-561.000.

NCR Corporation: *See—*
Haagh, Johannes P. N.; van Driest, Hans; and Smit, Gerrit, 5,151,920, Cl. 375-1.000

NEC Corporation: *See—*
Goto, Hiroyuki, 5,151,621, Cl. 307-475.000
Hori, Tsuguo, 5,152,008, Cl. 455-127.000.
Kimura, Yasuo, 5,151,892, Cl. 369-109.000
Komuro, Toshio, 5,151,616, Cl. 307-451.000.
Murata, Yukio, 5,151,645, Cl. 320-23.000
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Takai, Kazuhito; and Kimura, Yukihiro, 5,151,954, Cl. 382-41.000
Tamagawa, Akio, 5,151,666, Cl. 331-64.000
Ueno, Yoshiyasu, 5,151,913, Cl. 372-46.000
Yamahata, Hitoshi, 5,151,993, Cl. 395-775.000
Yamasaki, Koji, 5,151,680, Cl. 340-384.00E.
Yamasaki, Koji, 5,151,694, Cl. 340-825.440
Yamazaki, Atsushi, 5,151,980, Cl. 395-375.000

Neckers, Douglas C.: *See—*
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Negi, Shigeto: *See—*
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Negi, Yoshitaka; and Matsuura, Hiroshi, to Fujikiko Kabushiki Kaisha Vehicle seat. 5,150,871, Cl. 248-429.000

Negoto, Hidenori: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000

Neilson, Demont: *See—*
Neilson, Jim L.; and Neilson, Demont, 5,150,967, Cl. 366-206.000

Neilson, Jim L.; and Neilson, Demont, to Neilson, Jim L.; and Neilson, Josefa N. Milkshake machine. 5,150,967, Cl. 366-206.000

Neilson, Josefa N.: *See—*
Neilson, Jim L.; and Neilson, Demont, 5,150,967, Cl. 366-206.000

Nelson, John C., to Minnesota Mining and Manufacturing Company Uniform intensity profile catadioptric lens. 5,150,966, Cl. 362-337.000

Nelson, William E., to Texas Instruments Incorporated. System and method for solid state illumination for DMD devices. 5,151,718, Cl 346-160.000

Nemas, Mara: *See—*
Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, 5,151,182, Cl. 210-500.270.

Neng-Shi (Hong Kong) Industrial Co.: *See—*
Yuan, Gu F.; Yuen, Kou M.; Wei, Zhao Q.; and Ying, Gu Z., 5,150,488, Cl. 7-137.000

Neoprobe Corporation: *See—*
Denen, Dennis J., 5,151,598, Cl. 250-336.100

NeoRx Corporation: *See—*
Morgan, A. Charles, Jr.; and Pavanasasivam, Gowsala, 5,151,266, Cl. 424-85.800

Nepote, Andrea; and Boella, Marcello, to Marelli Autronica SpA. Device for controlling a gas-discharge lamp for use in a motor vehicle. 5,151,634, Cl. 315-307.000

Neskora, Dan R.: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000

Nestec S.A.: *See—*
Fasi, Roland; and Nielsen, Milo A., 5,151,503, Cl. 530-412.000.
Poulin, Jean-Marc; and Schmidely, Herve , 5,151,199, Cl. 210-773.000
Schlecht, Klaus; and Wehrspann, Olaf, 5,151,287, Cl. 426-432.000.

Netsu, Toshitada: *See—*
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000

Nettelbladt, Hans K.; and Widman, Karl M., to Asea Brown Boveri AB. Surface emitting heterojunction light emitting diode. 5,151,756, Cl. 357-17.000

Neward, Theodore C. Spiral electrode with contact retainer. 5,150,709, Cl. 128-642.000

Newman, William C.; Titchener, Paul F.; and Powell, Douglas B. Block diagram simulator using a library for generation of a computer program. 5,151,984, Cl. 395-500.000

Nguyen-Ba, Nghe: *See—*
Belleau, Bernard; and Nguyen-Ba, Nghe, 5,151,426, Cl. 514-262.000.

Nguyen, Frederique: *See—*
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,764, Cl. 424-1.100.

Nguygen, Thanh D.; and Hubby, Christopher M., to W. R. Grace & Co.-Conn. Process for continuous spinning of hollow-fiber membranes using a solvent mixture as a precipitation medium. 5,151,227, Cl. 264-41.000

Nichidai Industrial Co. Ltd.: *See—*
Sakai, Hideyuki, 5,150,655, Cl. 104-89.000.

Nichols, Richard E. D. Holster with retention device. 5,150,825, Cl 224-243.000

Nickerson, Larry A.: *See—*
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., 5,151,650, Cl. 324-158.00F.

Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., to Hewlett-Packard Company. Axially-driven valve controlled trapping assembly. 5,151,178, Cl. 210-198.200.

Nicolas, Christophe, to Thomson-CSF. Device for the generation of several beams of light including a light splitter. 5,151,825, Cl. 359-634.000

Niedajkasza, Bruno: *See—*
Niedajkasza, Mauricette; Niedajkasza, Bruno; and Niedajkasza, Catherine, 5,150,478, Cl. 2-243.00R

Niedajkasza, Catherine: *See—*
Niedajkasza, Mauricette; Niedajkasza, Bruno; and Niedajkasza, Catherine, 5,150,478, Cl. 2-243.00R

Niedajkasza, Mauricette; Niedajkasza, Bruno; and Niedajkasza, Catherine, to Niedajkasza, Mauricette. Method for the production of modulable garments. 5,150,478, Cl. 2-243.00R

Nielsen, Milo A.: *See—*
Fasi, Roland; and Nielsen, Milo A., 5,151,503, Cl. 530-412.000.

Nikon Corporation: *See—*
Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,151,750, Cl. 356-401.000
Takayama, Toru, 5,151,729, Cl. 354-195.120
Tanimoto, Akikazu; and Kamiya, Saburo, 5,151,749, Cl. 356-375.000.

Ninomiya, Hiroshi; and Fujikawa, Satoshi, to Mazda Motor Corporation. Transfer case shifting apparatus for four wheel drive vehicle. 5,150,637, Cl. 74-335.000.

Nippon A B S Ltd.: *See—*
Arikawa, Tetsuro; and Abe, Toshiyuki, 5,150,950, Cl. 303-100.000.

Nippon CMK Corp.: *See—*
Itsuji, Junichi, 5,151,299, Cl. 427-96.000.
Itsuji, Junichi, 5,151,300, Cl. 427-96.000.

Nippon Hoso Kyokai: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000

Nippon Mektron, Limited: *See—*
Abe, Masatoshi; and Tatsu, Haruyoshi, 5,151,492, Cl. 526-206.000.

Nippon Paint Co., Ltd.: *See—*
Kuwajima, Teruaki; Umeda, Shinichiro; Watanabe, Masakazu; and Konishi, Sakuichi, 5,151,125, Cl. 156-503.000.
Nakajima, Takashi, deceased; and Morita, Misao, 5,151,751, Cl. 356-402.000

Nippon Steel Corp.: *See—*
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Nippon Telegraph and Telephone Corporation: *See—*
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Onoe, Seizo; and Umeda, Narumi, 5,151,693, Cl. 340-825.300.

Nippon Thompson Company, Ltd.: *See—*
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Nippon Zeon Co., Ltd: *See—*
Kitahara, Shizuo; Nakamura, Eitaro; and Kubo, Yoichiro, 5,151,333, Cl. 428-694.000.

Nippondenso Co., Ltd.: *See—*
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Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, 5,151,764, Cl. 357-27.000.

Nishida, Jun: *See—*
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, 5,151,754, Cl. 356-356.000

Nishiguchi, Masayuki; Fujiwara, Yoshihiro; and Umezawa, Tomoko, to Sony Corporation. Digital signal encoding apparatus. 5,151,941, Cl. 381-46.000

Nishiguchi, Yukihiro. Microcomputer system with selectively bypassed memory output latches. 5,151,983, Cl. 395-425.000.

Nishijima, Kazumi: *See—*
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.

Nishijima, Kazunori, to NEC Corporation. Temperature compensated oscillation circuit. 5,151,667, Cl. 331-176.00R.

Nishikawa, Masao: *See—*
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020

Nishimaki, Tetsuo: *See—*
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Nishimura, Hiroyuki: *See—*
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Nishimura, Sadao: *See—*
Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, 5,150,597, Cl. 72-229.000.

Nishimura, Yasuo: *See—*
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, 5,151,248, Cl. 420-35.000

Nishimura, Yutaka, to Hitachi, Ltd. Internal combustion engine control method and apparatus. 5,150,680, Cl. 123-399.000.

Nishino, Toshikazu: *See—*
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.

Nishiuchi, Kihachiro: *See—*
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Nishiwaki, Hiroshi, to Techno Roll Co. Ltd.; and Jomac, Inc. Roll cover for dampening apparatus. 5,150,738, Cl. 139-420.00R.

Nishiyama, Toshikazu: *See—*
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Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Signal line terminal allocation method. 5,151,868, Cl. 364-490.000.

Nishiyama, Yukio; and Shigeta, Kazuo, to Nitto Denko Corporation. Adhesive sheet for reinforcing thin rigid plates. 5,151,327, Cl. 428-343.000.

Nishizawa, Taiji: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Nissan Chemical Industries, Ltd.: *See—*
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Nissan Motor Co., Ltd.: *See—*
Aoyama, Shunichi, 5,150,677, Cl. 123-302.000.
Eguchi, Takaaki; and Sakita, Yuzo, 5,150,764, Cl. 180-141.000.
Hannya, Shuichi; and Iida, Nozomi, 5,150,542, Cl. 49-441.000.
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Ishikawa, Masahiro, 5,151,612, Cl. 307-234.000.
Kawabata, Kazunobu, 5,150,917, Cl. 280-707.000.
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.
Shimanaka, Shigeki; and Kato, Yuji, 5,150,761, Cl. 180-197.000.
Tahara, Hideo; and Makihara, Nobuo, 5,151,058, Cl. 440-61.000.
Wakahara, Tatsuo, 5,150,634, Cl. 74-866.000.
Yano, Hirofumi; and Yokoi, Seiji, 5,150,689, Cl. 123-519.000.

Nisshin Flour Milling Co., Ltd.: *See—*
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.
Tokairin, Shigeru; and Nishimaki, Tetsuo, 5,151,291, Cl. 426-581.000.

Nitrojection Corporation: *See—*
Baxi, Indra R.; and Johnson, Tom W., 5,151,278, Cl. 425-130.000.

Nitsuko Corporation: *See—*
Abe, Kazuyuki, 5,151,933, Cl. 379-159.000.

Nittetsu Plant Designing Corp.: *See—*
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.

Nitti Electric Industrial Co., Ltd.: *See—*
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Nitto Boseki Co., Ltd.: *See—*
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Nitto Denko Corporation: *See—*
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Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000.

Nitz, Larry T.: *See—*
Gray, Charles A.; Milunas, Rimas S.; and Nitz, Larry T., 5,151,855, Cl. 395-750.000.
Milunas, Rimas S.; and Nitz, Larry T., 5,151,858, Cl. 364-424.100.

NKK Corporation: *See—*
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, 5,150,931, Cl. 285-381.000.

Noda, Hideo, to Shimano Industrial Co., Ltd. Two-bearing reel provided with engaging members for suspender strap. 5,150,854, Cl. 242-310.000.

Nohmi Bosai Co., Ltd.: *See—*
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,151,683, Cl. 340-518.000.

Nokia Mobile Phones Ltd.: *See—*
Vaisanen, Risto; Sarasmo, Jukka; and Pekkarinen, Vesa, 5,152,004, Cl. 455-68.000.

Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, to Bayer Aktiengesellschaft. Process for the production of patent leather and patent leather prepared therefrom. 5,151,329, Cl 428-423.400

Norbeck, Daniel W.: *See—*
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000

Norcini, Gabriele: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000

Norden, Howard P., Jr. Norden double door lock. 5,150,591, Cl 70-129.000

Nordica S.p.A.: *See—*
Gorza, Roberto, 5,150,914, Cl. 280-616.000
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.

Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See—*
Pontow, Hugo, 5,151,062, Cl. 452-179.000

Nore, Pentti T.: *See—*
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000.

Norizuki, Takayuki: *See—*
Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro, 5,151,403, Cl. 503-200.000

Normalair-Garrett (Holdings) Limited: *See—*
Harral, Michael W.; and Rendell, Eric L., 5,151,166, Cl 204-425.000

Norman, Peter G. Resistance training device. 5,151,070, Cl. 482-99.000

Norota, Kazuhiko: *See—*
Okawa, Koji; and Norota, Kazuhiko, 5,150,686, Cl. 123-698.000

Norsk Hydro A.S.: *See—*
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North American Philips Corp.: *See—*
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Northern Telecom Limited: *See—*
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000

Northland Aluminum Products, Inc.: *See—*
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Northwestern University: *See—*
Horn, Alan S., deceased; and Dubocovich, Margarita L., 5,151,446, Cl. 514-617.000

Norton Company: *See—*
Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, 5,151,107, Cl. 51-295.000

Norton, Ian T.; and Underdown, Jeffrey, to Van den Bergh Foods Co., Division of Conopco, Inc. Water-in-oil dispersion and process for preparing such dispersion. 5,151,290, Cl. 426-576.000.

Nosaki, Takefumi; and Sasama, Kazuo, to Kabushiki Kaisha Toshiba. Image forming apparatus with improved image forming speed. 5,151,797, Cl. 358-474.000.

Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, to Robert Bosch GmbH. Magnet valve, in particular for fuel injection pumps. 5,150,688, Cl. 123-506.000.

Noto, Kazuyuki; and Toyoshima, Isao, to Murata Manufacturing Co. Trap circuit comprising plural piezoelectric resonators interconnected by plural resistors and an inductor. 5,151,672, Cl. 333-189.000

Notter, Frank: *See—*
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000

Nourrcier, Charles E., to Hughes Aircraft Company. Laser radar wire detection. 5,151,747, Cl. 356-5.000.

Novapure Corporation: *See—*
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NTN Corporation: *See—*
Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, 5,150,974, Cl. 384-463.000.

Nunley, Dwight S. Methods and apparatus for drilling subterranean wells. 5,150,757, Cl. 175-323.000.

Nusair, Marwan E.: *See—*
Valentine, Michael D.; Groth, Clarence R.; Scholl, Stephen R.; and Nusair, Marwan E., 5,151,701, Cl. 342-20.000

O.K.-Kasei Co., Ltd.: *See—*
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Oatley, John A.: *See—*
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Oba, Toshio: *See—*
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Obata, Masahiko: *See—*
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O'Brien, Mark: *See—*
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OCG Microelectronic Materials, Inc.: *See—*
Salamy, Thomas E.; Love, Marvin L., Jr.; and Towner, Mark E. 5,151,219, Cl. 252-364.000
Sarubbi, Thomas R., 5,151,339, Cl. 430-192.000.
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Ochi, Mitsuzo: *See—*
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Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, to Koito Manufacturing Co., Ltd. Lighting circuit for vehicular discharge lamp. 5,151,631, Cl. 315-127.000

Oda, Tetsuya: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000

Oda, Tomio: *See—*
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Odawara, Yoji: *See—*
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.

Odo, Koichi: *See—*
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Oellerer, Friedrich: *See—*
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O'Farrell, Desmond J., to Donnelly Corporation. Vehicular outside mirror assembly. 5,151,824, Cl. 359-604.000

Ogawa, Tsukasa: *See—*
Okada, Kenji; and Ogawa, Tsukasa, 5,150,648, Cl. 101-93.140

Ogawara, Kensuke: *See—*
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Oh, Wook H.: *See—*
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.

O'Hara, Bryan M., to American Cyanamid Company. Host cells expressing gibbon ape leukemia virus receptor. 5,151,361, Cl 435-240.200

O'Hara, Kevin S.: *See—*
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000.

Ohashi, Tsuyoshi: *See—*
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, 5,151,586, Cl. 250-205.000

Ohio State University, The: *See—*
Zarabadi, Seyed R.; El-Naggar, Mohammed I.; and Khachab, Nabil I., 5,151,625, Cl. 307-529.000

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Ohkoda, Keiji: *See—*
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Ohmine, Toshimitsu; Akagawa, Keiichi; and Ishihata, Akira, to Kabushiki Kaisha Toshiba. Vapor deposition apparatus. 5,151,133, Cl 118-725.000

Ohmura, Takao: *See—*
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000

Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, to Toyota Jidosha Kabushiki Kaisha. Boost pressure control system for a supercharged engine 5,150,693, Cl. 123-559.300

Ohnishi, Hiroyuki: *See—*
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Ohshima, Kinya: *See—*
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Ohta, Hiroshi; and Nakamura, Noriyuki, to Kabushiki Kaisha Shinkosha. Optical isolator. 5,151,955, Cl. 385-6.000

Ohta, Minoru: *See—*
Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, 5,151,659, Cl. 324-458.000.

Ohta, Takeo: *See—*
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000

Ohta, Yasuji: *See—*
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000

Ohtomo, Kikuo: *See—*
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Ohya, Hiroshi; and Kato, Takeshi, to Hitach Metals, Ltd. Plastic pipe joint assembly for joining sections of plastic pipe. 5,150,923, Cl. 285-21.000

Ohyama, Yoshishige: *See—*
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Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Image forming apparatus with controlled transfer voltage. 5,151,736, Cl. 355-208.000.

Oil-Dri Corporation of America: *See*—
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Oka, Tateki: *See*—
Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, 5,151,738, Cl. 355-245.000.

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Mydill, Marc R.; and O'Keefe, Sheila, 5,151,903, Cl. 371-27.000

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Arizumi, Masato; Ozawa, Norio; Haruta, Yasuo; and Mabuchi, Yoshinobu, 5,151,932, Cl. 379-106.000.
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Miyanaga, Hirofumi; Sakamoto, Noriyuki; Yoshimitsu, Koichi, and Tanaka, Yasundo, 5,150,702, Cl. [illegible]128-6.000.
Miyazaki, Yasuhiro, 5,151,887, Cl. 36[illegible]44.320.

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Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.

Ominsky, Mark: *See*—
Lyke, David G.; and Ominsky, Mark, 5,151,948, Cl. 382-7.000.

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Hirahara, Kazuaki, 5,151,692, Cl. 340-825.280.

1-800 Geopoly: *See*—
Desmarais, Daniel; and Wallace, Jack R., 5,150,907, Cl. 273-240.000.

Ono, Yoshimi: *See*—
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, 5,150,931, Cl. 285-381.000.

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Lodder, Bernhard; van Dijk, Berend J.; Paulen, Adriaan; and Oostenbrink, Albertus A., 5,150,928, Cl. 285-205.000.

Oota, Hisasi; and Moritsu, Kazuki, to Mitsubishi Denki K.K. Cryostat. 5,150,578, Cl. 62-47.100.

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Akagi, Motonobu; Oota, Nobuyuki; and Yamada, Yasutoshi, 5,150,697, Cl. 123-643.000

Oppenheim, Amos B.: *See*—
Levanon, Avigdor; Oppenheim, Amos B.; and Locker-Giladi, Hilla, 5,151,364, Cl. 435-252.330.

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McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., 5,150,836, Cl. 239-5.000.

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Takatori, Naoki; and Orimoto, Masaaki, 5,151,790, Cl. 358-225.000.

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Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000.

Orion Industries, Inc.: *See*—
Leslie, Samuel A.; and Gordon, Robert T., 5,152,002, Cl. 455-11.100.

Orndorff, Joseph D.: *See*—
Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., 5,151,654, Cl. 324-160.000.

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Carter, Stephen A.; Williamson, Bryan C.; and Kozole, Karl H., 5,150,690, Cl. 123-527.000.

Ortiz, Mark V.: *See*—
Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., 5,151,909, Cl. 372-22.000

Osaka Gas Company, Ltd.: *See*—
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, 5,151,224, Cl. 252-586.000.
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

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Massof, Robert W.; O'Shea, Donald C.; and Raasch, Thomas W., 5,151,722, Cl. 351-158.000.

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Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Osterholm, Jan-Erik; Laakso, Jukka; Karjalainen, Sari; and Mononen, Pirjo, to Berggren Oy Ab. Conductive plastic composites. 5,151,221, Cl. 252-500.000.

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Otaki, Keizaburo: *See*—
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Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000

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Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.

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Imai, Tetuya, 5,151,524, Cl. 548-307.000.

Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, to Nitti Electric Industrial Co., Ltd. Pressure-sensitively adhering composite medicinal preparation. 5,151,271, Cl. 424-443.000.

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Higby, Jeffrey P., 5,151,059, Cl. 440-75.000

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Marttila, Tom E.; Kivisto, Tuomo V. J.; and Ahola, Pentti V., 5,151,006, Cl. 414-626.000.

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Harandi, Mohsen N.; and Owen, Hartley, 5,151,393, Cl. 502-53.000.

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Moffitt, Robert C.; and Owen, Stephen J., 5,150,857, Cl. 244-12.200.

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Honkanen, Seppo, 5,151,958, Cl. 385-50.000.

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Kitahara, Motohide; Ozaki, Hiroshi; and Shishido, Kouji, 5,151,108, Cl. 51-296.000

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Arizumi, Masato; Ozawa, Norio; Haruta, Yasuo; and Mabuchi, Yoshinobu, 5,151,932, Cl. 379-106.000.

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Porter, Clyde R., 5,150,771, Cl. 188-67.000.

Pacropis, Donald R.: *See*—
Ibsen, Robert L.; Pacropis, Donald R.; and Glace, William R., 5,151,453, Cl. 522-14.000

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Paganon, Henri; and Pichon, Guy, to Robert Bosch GmbH. Supply circuit for operation of an electromagnetic load. 5,150,687, Cl. 123-490.000

Pahoundis, Louis E.: *See*—
Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., 5,150,991, Cl. 406-67.000

Pakulski, Francis J.: *See*—
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.

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Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000.

Palfreyman, Malcolm N.: *See*—
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000

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Stenmans, Heinz, 5,150,566, Cl. 57-58.830.

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Pang, Hian S. Anti-liquid splash device. 5,150,481, Cl. 4-300.300

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Arndt, Otto; and Papenfuhs, Theodor, 5,151,532, Cl. 552-308.000.

Parente, Charles A.; and Westerback, Sonya J., to Grumman Aerospace Corporation. Acoustic attenuating liner and method of making same 5,151,311, Cl. 428-116.000

Park, Han K.: *See*—
Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., 5,151,201, Cl. 222-600.000.

Park, Young-Jun, to SamSung Electronics Co., Ltd. Method and circuit for correcting image edge. 5,151,787, Cl. 358-162.000.

Parker, Donald L., to General Motors Corporation. Hydraulic brake booster. 5,150,575, Cl. 60-547.100.

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Svyatsky, Eduard M.; Paroubek, George; and Hegland, Frederick P., 5,150,891, Cl. 271-35.000.

Parrish, Gary C.: *See*—
Lindsay, Robert B.; and Parrish, Gary C., 5,151,148, Cl. 156-351.000

Pasco, Ian K., to Combined Optical Industries Limited. Fresnel lens. 5,151,826, Cl. 359-742.000

Pasternak, Jeffrey, to Dynaflair Corporation Canada Inc. Hinge connecting post for folding closures. 5,150,501, Cl. 16-272.000

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Singh, Devirder; Hardaway, Anthony H.; Euler, John W.; and Pastryk, Jim J., 5,150,588, Cl. 68-23.500.

Patchett, Arthur A.: *See*—
Bagley, Scott; Greenlee, William J.; Dhanoa, Daljit S.; and Patchett, Arthur A., 5,151,435, Cl. 514-303.000

Patel, Chetan G.: *See*—
Seyfried, Joseph A.; and Patel, Chetan G., 5,150,807, Cl. 220-359.000.

Patel, Sanjay R.: *See*—
El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 524-405.000.

Paul, James M.; and Morris, Richard L., to Mobil Oil Corporation Method for regenerating scale solvent. 5,151,196, Cl. 210-712.000

Paulen, Adriaan: *See*—
Lodder, Bernhard; van Dijk, Berend J.; Paulen, Adriaan; and Oostenbrink, Albertus A., 5,150,928, Cl. 285-205.000

Paulson, Eric W.: *See*—
Zschoche, Robert A., 5,151,003, Cl. 414-428.000

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Morgan, A. Charles, Jr.; and Pavanasasivam, Gowsala, 5,151,266, Cl. 424-85.800

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Emerson, Terence P.; Bescoby, Frank A.; Taylor, Colin M.; and Payne, George K., 5,151,022, Cl. 423-245.300

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Cassel, Terry E.; Payne, Harold E.; and Lynde, Gerald D., 5,150,755, Cl. 166-297.000

Payne, Jewel M., to Mycogen Corporation. Isolates of *Bacillus thuringiensis* that are active against nematodes. 5,151,363, Cl. 435-252.500

Payne, Robert J.; and Yoppolo, Robert A., to Duracell Inc. Crimping method for electrochemical cells. 5,150,602, Cl. 29-623.200

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Tannenbaum, Michael A., 5,150,793, Cl. 206-531.000

Pearson, Ronald W.; and Jones, Brian W., to Dallas Semiconductor Corporation. Battery manager chip with crystal-controlled time base. 5,151,644, Cl. 320-14.000

Pedain, Josef: *See*—
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400
Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.

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Pellegrino, Sergio: *See*—
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Penisson, Dennis J., to Bilco Tools, Inc. Power tong for making up or breaking out threaded joints of pipe. 5,150,638, Cl. 81-57.170.

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Van Nes, Johannes C. A.; and Penninga, Johannes, 5,151,627, Cl. 313-477.00R

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Hayashi, Nobuharu; and Tanaka, Hiroji, 5,150,744, Cl. 114-230.000.

Percic, Adelio. Golfer's training device. 5,150,903, Cl. 273-188.00A.

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Perren, Stephen: *See*—
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.

Perret, Michel, to GEC Alsthom SA. Medium tension circuit breaker. 5,151,565, Cl. 200-148.00A.

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Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara, and Katraro, Reuven, to Membrane Products Kiryat Weizmann Ltd. Polyphenylene oxide-derived membranes for separation in organic solvents. 5,151,182, Cl. 210-500.270

Perry, Wayne E.: *See—*
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Rollwitz, William L.; De Los Santos, A mando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl 340-870 330.
Pesapane, Joel J. Support member. 5,150,8(7, Cl. 248-213.200.
Pet Mate Limited: *See—*
Kirk, Christopher P., 5,150,664, Cl. 11(-51.120.
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Josquin, Wilhelmus J. M. J.; Peters, W helmus C. M.; and Van De Goor, Albertus T. M., 5,151,382, Cl 437-74 000
Petrofes, James M.; Shal, David A.; Den on, Gary R.; and Hoptry, David A., to General Motors Corporatio Motor vehicle suspension with damper having rotatable member o errun detection. 5,150,916, Cl. 280-707.000
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Hoptry, David A.; Petrofes, James M Shal, David A.; and Denton, Gary R., 5,150,915, Cl. 280-707)00
Petrolite Corporation: *See—*
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Petrucci, Raymond M.: *See—*
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210 264.000
Petsche, Thomas, to Siemens Corporate Research Inc. Self-repairing trellis networks. 5,151,969, Cl. 395-24.00
Petty, John; and McNeil, Sandy, to Elconn x Pty Limited. Corrugated pipe connector and method of molding. 5,150,930, Cl. 285-319.000
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Peyrot, Marianne: *See—*
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Pfaffel, Bruno. *See—*
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Kenna, Robert V., 5,151,104, Cl. 606- 3.000
Pfizer Inc.: *See—*
McCarthy, Peter A.; and Walker, Frederick J., 5,151,545, Cl. 560-60.000
Phadke, Shrikant V. Single step bulk proce s for high impact polyester masterbatches, products thereof and blends with polyesters. 5,151,466, Cl. 525-177.000
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Phelps, Craig H.; and Strom, E. Thomas to Mobil Oil Corporation Aqueous and petroleum gel method f r preventing water-influx. 5,150,754, Cl. 166-294.000
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Adkins, Wayne B.; and Roncero, Jose L., 5,150,719, Cl. 131-96.000
Sharpe, David E., 5,151,648, Cl. 323-2 32.000
Phillips, Jerry G. Anisotropically bendabl heating pad. 5,151,578, Cl. 219-549.000
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Fu, Chia-Min; Maholland, Michael K ; and Lowery, Richard E., 5,151,391, Cl. 502-27.000
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Pierson, Bruce A., to Rotex, Inc. Retra table, air pressure actuated hold-down clamp. 5,150,796, Cl. 209-37).000
Pike, Daniel E. Pressure generator/g s scrubber. 5,151,112, Cl 55-230.000.
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Winfield, Edward O., 5,150,559, Cl. 53-306.000.
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Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, to Bayer Aktiengesellschaft. Process for the production of mouldings of crosslinked polymers. 5,151,480, Cl. 526-279.000.
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Politiek, Jarig; and Ligthart, Henricus J., to U.S. Philips Corporation. Method of irradiating an object by means of a charged particle beam, and device for performing the method. 5,151,605, Cl. 250-492.200.
Ponnet, Tom P. M. G. Composite material for medical or paramedical particularly orthopaedic use and method for manufacturing it. 5,151,315, Cl. 428-212.000.
Pontow, Hugo, to Nordischer Maschinenbau Rud Baader GmbH & Co. KG. Apparatus for turning over fish fillets. 5,151,062, Cl. 452-179.000
Poole, John S.: *See—*
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,151,178, Cl. 210-198.200.
Pophillat, Lucien, to French State Represented by the Minister of Post, Telecommunications and Space (Centre National d'Etudes des Telecommunications). Method for the coding of a digital signal, coder and decoder to implement this method, regeneration method and corresponding regenerator utilizing pulse position modulation. 5,151,698, Cl. 341-52.000
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Vincent, Michel; Remond, Georges; Portevin, Bernard; Herve, Yolande; and Lepagnol, Jean, 5,151,432, Cl. 514-299.000.
Poskitt, Geoffrey, to International Computers Limited. Data processing system with information transfer bus and wait signal. 5,151,979, Cl. 395-325.000
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Powell, Paul E.; and Britton, Larry N. Combination vibrator, aerator, and liquid-injection system. 5,150,988, Cl. 405-258.000.
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PPG Industries, Inc.: *See—*
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Pratt, Charles F.: *See—*
Yates, John B., III; Pratt, Charles F.; and McHale, Angelika H., 5,151,460, Cl. 524-291.000.
Preik, Marc R. Truck mirror wiper. 5,150,497, Cl. 15-250.003.

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Haubennestel, Karl-Heinz; and Pritschins, Wolfgang, 5,151,218, Cl. 252-351.000
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Quimby, Bruce D.; and Sullivan, James J., to Hewlett-Packard Company. Method and scavenger gas for the analysis of oxygen-containing components using atomic emission spectrometry. 5,151,371, Cl 436-127.000
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Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., 5,151,201, Cl. 222-600.000.
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Rauschenberger, Michael. Toilet bowl illuminating device. 5,150,962 Cl. 362-101.000
Rautenberg, Paul-Georg, to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co. Device for electrically contacting an electronic apparatus with an IC-memory card. 5,151,847, Cl. 361-395.000
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Reed, Jerry O., to Phillips Petroleum Company. Process of making phenylene sulfide/biphenylene sulfide copolymer pipe. 5,151,235, Cl. 264-209.500
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Reedy, David V., to General Electric Company. Nozzle load management. 5,150,839, Cl. 239-265.410.
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Regimand, Ali, to Troxler Electronic Laboratories, Inc. Nuclear gauge with compensation for sample of insufficient neutron moderating activity. 5,151,601, Cl. 250-390.040
Rehbold, Bodo: *See—*
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Reiffenrath, Volker; and Finkenzeller, Ulrich, to Merck Patent Gesellschaft mit beschrankter Haftung. Fluorine-containing aromatic compounds. 5,151,213, Cl. 252-299.600.
Reinauer, Josef, to Gottlieb Guhring KG. Coupling for a detachable fixing of components at appropriate carrier members. 5,150,995, Cl 409-234.000
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Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith to Laboratories Eurobio. Derivatives of tetrahydro-2,3,6,7,11H,5H,11H-(1)benzopyrano(6,7-8,1,j)quinolizinone-11 usable as marker for organic compounds, particularly biological compounds with a view to their detection by chemiluminescence or fluorescence. 5,15 ,517, Cl. 546-66.000.

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Ricciardi, Mario, to Bell & Howell Company. Diverter mechanism for flat document conveyor system. 5,150,84 4, Cl. 271-302.000

Rice, C. Arlyn, to ECC America Inc. Method for forming aggregated kaolin pigment. 5,151,124, Cl. 106-416.000

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Ricoh Company, Ltd.: *See*—
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Riedle, Ulrich, to Siemens Aktiengesellschaft. Interface means. 5,151,936, Cl. 379-403.000

Rikken, Gerardus L. J. A.; and Seppen, Constance J. E., to U.S. Philips Corp. Device for doubling the frequency of a light wave. 5,151,965, Cl. 385-122.000

Riley, Wendell D.; and Childs, Jerry D., to Halliburton Company. Composition and method for cementing a well. 5,151,203, Cl 252-8.551.

Rindt, Klaus-Peter; and Scholtissek, Stephan, to Dragerwerk Aktiengesellschaft. Detector for enzymatically determining gas samples. 5,151,367, Cl. 435-288.000

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Rionde, Guy. Silo made of suspended sheets. 5,150,550, Cl. 52-192.000.

Rippey, Scott R., to Westinghouse Electric Corp. Programmable device for integrated circuits. 5,151,611, Cl. 307-202.100

Rippley, Martsey D. Disposable microwave cooking utensil. 5,151,568, Cl. 219-10.55E.

Ritchey, Mary F.: *See*—
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Robbins, Bruce A.: *See*—
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Robbins, Douglas J.; Gosselin, Cynthia A. and Myers, Frederick A., to Armco Steel Company, L.P. Thermoplastic acrylic-coated steel sheet. 5,151,297, Cl. 427-46.000

Robbins, Walter A. Auxiliary power supply for continuation of computer system operation during commercial AC power failure 5,151,907, Cl. 371-66.000.

Roberson, James H. Textile fiber length sorting apparatus and method 5,150,502, Cl. 19-105.000

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Roberts, Donel L. Lawn sprinkler system. 5,150,838, Cl. 239-201.000.

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Roederer, Antoine; and Van't Klooster, Cornelis, to Agence Spatiale Europeene. Apparatus for electronically controlling the radiation pattern of an antenna having one or more beams of variable width and/or direction. 5,151,706, Cl. 342-372.000

Roesky, Werner; Deffner, Dieter; and Wolter, Manfred, to Sante Corporation. Method of disposing of salt-containing dusts from incinerator plants. 5,150,985, Cl. 405-128.000.

Roglin, Robert L.; and Hanagud, Sathyanaraya, to Georgia Tech Research Corporation. Variable camber control of airfoil. 5,150,864, Cl. 244-219.000

Rohm Co., Ltd.: *See*—
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Rohr, Wolfgang. Process and apparatus for depositing silt on the bottom and slopes of the wet open working or dredging. 5,150,986, Cl 405-223.000

Roll Systems, Inc.: *See*—
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Rolls-Royce plc: *See*—
Hough, Geoffrey S., 5,151,012, Cl. 416-95.000.

Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., to Southwest Research Institute. Telemetric measuring device with high power generation. 5,151,695, Cl. 340-870.330.

Romeo, Ernest A.: *See*—
Commins, Alfred D.; and Romeo, Ernest A., 5,150,553, Cl. 52-264.000

Roncero, Jose I.: *See*—
Adkins, Wayne B.; and Roncero, Jose I., 5,150,719, Cl. 131-96.000.

Rooks, George E. Yarn cabinet. 5,150,794, Cl. 206-574.000.

Roos, Mark G., to Allied-Signal Inc. Method and apparatus for improved automatic fequency control. 5,151,703, Cl. 342-199.000.

Roques, Daniel; Pouysegur, Michel; and Cazaux, Jean-Louis, to Alcatel Espace. Dual-gate FET attenuator controlled by a variable load circuit. 5,151,669, Cl. 333-81.00R

Rosati, Robert J.: *See*—
Goldberg, Jack; and Rosati, Robert J., 5,150,969, Cl. 374-128.000.

Rose Manufacturing Company: *See*—
Olson, Wayne L.; and Choate, Gary E., 5,150,768, Cl. 182-234.000

Rosen, Arye; and Walinsky, Paul. Microwave aided balloon angioplasty with guide filament. 5,150,717, Cl. 128-804.000.

Rosenberg, Saul H.; and Denissen, Jon F., to Abbott Laboratories. Renin inhibitors. 5,151,422, Cl. 514-252.000.

Roshanravan, Mel; and Grosskopf, Michael W., to Darling-Delaware Company, Inc. Method and apparatus for dissolved air flotation with aeration. 5,151,177, Cl. 210-194.000

Ross, Earl W.: *See*—
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000

Rotex, Inc.: *See*—
Pierson, Bruce A., 5,150,796, Cl. 209-370.000.

Roth, Steven C.: *See*—
Bur, Anthony J.; Lowry, Robert E.; Roth, Steven C.; Thomas, Charles L.; and Wang, Francis W., 5,151,748, Cl. 356-32.000.

Rothman, Isaac: *See*—
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000

Rotoloni, Francis A.: *See*—
Andrews, Jack E.; Harmel, Roman J.; Lochkovic, Gregory A.; and Rotoloni, Francis A., 5,151,306, Cl. 427-434.500.

Rotsaert, Henri L. Blanks for the manufacture of artificial teeth and crowns. 5,151,044, Cl. 433-229.000

Rowe, Neal E., to Westinghouse Electric Corp. Operating mechanism for a circuit breaker. 5,151,564, Cl. 200-17.00R.

Roy, Robert D.: *See*—
Powers, Kelly R.; Curtis, Tony G.; Limaye, Santosh Y.; and Roy, Robert D., 5,151,660, Cl. 324-689.000

Royal Canadian Mint: *See*—
Truong, Hieu C.; and Dilay, Maria, 5,151,167, Cl. 205-102.000.

Royal, Claude S. System to automatically drain filter backwash water. 5,151,175, Cl. 210-108.000.

Rucker, Joie. Method and apparatus for application of finger & toenail coatings. 5,150,726, Cl. 132-285.000.

Rudolf, Karl; and Lehnieder, Gunter, to Diehl GmbH & Co. Ammunition possessing a supporting member constituted from a foam material. 5,151,558, Cl. 102-476.000

Rudolf, William B. Retractable steering device for cargo barges that increases maneuverability by providing a pivot point or points when altering course. 5,150,661, Cl. 114-26.000.

Rueter, Rodney N.: *See*—
Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., 5,151,179, Cl. 210-250.000

Ruffoni, John M., to McDonnell Douglas Corporation. Foam absorber. 5,151,222, Cl. 252-511.000.

Ruhl, Harry D., Jr.: *See*—
Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.

Ruhrkohle AG: *See*—
Wessiepe, Klaus; and Stewen, Wilhelm, 5,150,543, Cl. 49-477.000.

Ruin, Jean: *See*—
Bernard, Jean; and Ruin, Jean, 5,150,853, Cl. 242-283.000

Ruoff, Gottfried: *See*—
Masur, Ernst; Ruoff, Gottfried; and Planek, Werner, 5,150,973, Cl 384-448.000

Rush, William B., II; Elder, Jack E.; and Shier, Richard K., to General Motors Corporation. Pressure relief means for integrated induction system. 5,150,669, Cl. 123-52.0MF

Rutherford, Howard J., to International Flavors & Fragrances Inc Multi-layer scent emitting article and device adapted to employ same 5,150,722, Cl. 131-335.000

Ruthers, Richard A.: *See*—
Argent, Ronald D.; Ruthers, Richard A.; and Webber, Roy A., 5,151,918, Cl. 373-27.000

Rutsch, Werner: *See*—
Babiarz, Joseph E.; and Rutsch, Werner, 5,151,459, Cl. 524-255.000

RXS Schrumpftechnik-Garnituren GmbH: *See*—
Kaeufe, Helmut; and Kipfelsberger, Christian, 5,151,152, Cl. 156-645.000

Ryan, David M., to United States of America, Air Force. Cathode material for electrochemical cells. 5,151,335, Cl. 429-223.000

Ryan, Debra A.: *See*—
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000

Rye, Grover W.: *See*—
Lunieski, Chester E.; and Rye, Grover W., 5,151,141, Cl 152-544.000

Rymut, Michael J.; Cooper, Stephen R. W.; and Washeleski, John M., to Nartron Corporation. Liquid level sensor. 5,150,615, Cl. 73-313.000.

Ryobi Motor Products Corporation: *See*—
McCurry, Ronald C., 5,150,523, Cl. 30-228.000

Ryoka Techno Engineering & Construction Co.: *See*—
Seiryo, Furuto, 5,151,190, Cl. 210-640.000

Ryono, Denis E.: *See*—
Weller, Harold N., III; and Ryono, Denis E., 5,151,513, Cl 544-139.000

Ryotaro Kamikawai: *See*—
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000.

S.E.M.T. Pielstick: *See*—
Magnet, Jean-Louis, 5,150,682, Cl. 123-417.000.

S.L.T. Japan Co., Ltd.: *See*—
Daikuzono, Norio, 5,151,097, Cl. 606-15.000.

Sab Wabco Holdings, B.V.: *See*—
Adamson, John, 5,150,774, Cl. 188-218.0XL.

Sackmann, David J.: *See*—
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., 5,151,978, Cl. 395-200.000.

Sadananda, Kuntimadi: *See*—
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000

Sadd, Andrea L.: *See*—
Bartholomew, Roger F.; and Sadd, Andrea L., 5,151,117, Cl. 65-3.120.

Saddleman, Inc.: *See*—
Croshaw, Steven P., 5,150,947, Cl. 297-229.000.

Sadler, William G., to Gewald, Harold W. Radial internal combustion engine. 5,150,670, Cl. 123-55.00R.

SAES Getters SpA: *See*—
Solcia, Carolina; and Succi, Marco, 5,151,251, Cl. 422-119.000
Succi, Marco; and Doni, Fabrizio, 5,150,604, Cl. 73-38.000.

Sagami Chemical Research Center: *See*—
Fuchikami, Takamasa; and Urata, Hisao, 5,151,535, Cl. 554-226.000

Sage Products, Inc.: *See*—
Hanifl, Paul H., 5,151,094, Cl. 604-902.000.

Saimi, Tetsuo; and Momoo, Kazuo, to Matsushita Electric Industrial Co., Ltd. Optical head device using cross-polarized from a light source for use in optical disk system. 5,151,889, Cl. 369-44.370.

St. Denis, Lucen, to E. R. St. Denis & Sons, Limited. Hemming machine and method. 5,150,508, Cl. 29-463.000.

St-Germain, Jean. Wind machine with electric generators and secondary rotors located on rotating vertical blades. 5,151,610, Cl. 290-55.000

St. Pierre, Richard C.: *See*—
Serkes, Jonathan M.; and St. Pierre, Richard C., 5,151,366, Cl 435-285.000

Saita, Seiji, to Kabushiki Kaisha Yamada Corp. Reciprocating actuator 5,150,643, Cl. 91-229.000.

Saito, Akira: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000

Saito, Tomoki: *See*—
Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, 5,151,122, Cl. 106-35.000.

Saito, Yutaka: *See*—
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000

Saitoh, Shin'ichiro: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000

Sakaguchi, Katsuyoshi: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000

Sakaguchi, Kazuhiko: *See*—
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610

Sakai, Hideyuki, to Nichidai Industrial Co. Ltd.; and Daiwa Paint Trading Co. Ltd. Horizontally flexible rail. 5,150,655, Cl. 104-89.000

Sakai, Hiroyuki: *See*—
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000

Sakai, Katsuyuki: *See*—
Kida, Shigeru; and Sakai, Katsuyuki, 5,150,630, Cl. 74-354.000

Sakai, Tatsuro: *See*—
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Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, to Mazda Motor Corporation. Air bag system for vehicle 5,150,919, Cl. 280-732.000

Sakama, Masao: *See*—
Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, 5,151,553, Cl. 84-600.000

Sakamoto, Masahiro; and Kataoka, Junnosuke, to Canon Kabushiki Kaisha. Scanning device having a memory for storing driving steps for a stepping motor. 5,151,640, Cl. 318-696.000.

Sakamoto, Nobuyuki: *See*—
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, 5,150,702, Cl. 128-6.000

Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada. Pyridine derivatives and their compositions for the control of insect pests. 5,151,428, Cl. 514-277.000

Sakamoto, Shuji: *See*—
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 5,151,531, Cl. 552-115.000

Sakane, Katsunobu: *See*—
Fujita, Yoshiyuki; and Sakane, Katsunobu, 5,150,920, Cl. 280-777.000

Sakanoue, Kei; and Hirano, Tsumoru, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,151,356, Cl. 430-548.000

Sakashita, Takeshi; and Shimoda, Tomoaki, to GE Plastics Japan, Ltd Catalytic melt condensation preparation of polycarbonate. 5,151,491, Cl. 528-199.000

Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, to Sony Corporation. Method for manufacturing a magnetic transducer head 5,150,511, Cl. 29-603.000

Sakita, Yuzo: *See*—
Eguchi, Takaaki; and Sakita, Yuzo, 5,150,764, Cl. 180-141.000

Saklad, Betty E., to Selandia Designs. Drink container. 5,150,815, Cl. 220-708.000

Sakuhara, Hirohiko: *See*—
Shinji, Yasuhisa; Hasegawa, Toshiaki; Akune, Shinichi; and Sakuhara, Hirohiko, 5,151,053, Cl. 439-610.000

Sakuma, Isao: *See*—
Suzuki, Shohei; and Sakuma, Isao, 5,151,982, Cl. 395-425.000.

Sakurai, Hiromi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Revolute welding robot. 5,151,570, Cl. 219-86.250.

Sakurai, Tomohisa; and Gotanda, Masakazu, to Olympus Optical Co., Ltd. Apparatus for generating ultrasonic oscillation. 5,151,085, Cl. 604-22.000

Salamy, Thomas E.; Love, Marvin L., Jr.; and Towner, Mark E., to OCG Microelectronic Materials, Inc. Use of particular mixtures of ethyl lactate and methyl ethyl ketone to remove undesirable peripheral material (e.g. edge beads) from photoresist-coated substrates 5,151,219, Cl. 252-364.000

Salbaum, Johannes M. H.; Masters, Colin L.; and Beyreuter, Konrad T., to Molecular Therapetuics, Inc. Promoter region for DNA sequences which encode the precursor of the human A4 amyloid protein. 5,151,508, Cl. 536-27.000

Salidrigas, Cecilia. Restraining apparatus for small animals. 5,150,667, Cl. 119-96.000

Saltman, Paul D.; and Smith, Kenneth T., to Procter & Gamble Company, The; and University of California, Regents of the. Calcium and trace mineral supplements. 5,151,274, Cl. 424-630.000

Salzmann, Thomas N.: *See—*
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., 5,151,512, Cl. 540-302.000.
Steinberg, Nathan G.; Rasmusson, Gary H.; and Salzmann, Thomas N., 5,151,430, Cl. 514-284.000.
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, to Centre National de la Recherche Scientifique. Particulate vector useful in particular for the transport of molecules with biological activity and process for its preparation. 5,151,264, Cl. 424-1.100.
Samsung Electronics Co., Ltd.: *See—*
Jeong, Ho-sun; and Han, Hyo-jin, 5,151,874, Cl. 364-752.000.
Kim, Jong-Hae, 5,151,668, Cl. 332-12[illegible].000.
Park, Young-Jun, 5,151,787, Cl. 358-132.000.
Suh, Young S., 5,151,569, Cl. 219-10.5F
Samukawa, Koji: *See—*
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 5,151,864, Cl. 364-474.230.
Sanborn, Charles H., III: *See—*
Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J. Dwight, 5,151,077, Cl. 493-353.000
Sander, Brian: *See—*
Sander, Wendell; and Sander, Brian, 5,151,985, Cl. 395-500.000
Sander, Wendell; and Sander, Brian, to Apple Computer, Inc. Disk drive controller. 5,151,985, Cl. 395-500.000.
Sanders, Ian L.: *See—*
Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., 5,151,294, Cl. 427-11.000
Sanders, Joseph; Mafoti, Robson; and Marcusch, Peter H., to Miles Inc. Aminocrotonates as curing agents for epoxy resins. 5,151,470, Cl. 525-407.000
Sanderson, Allan; and Ribton, Colin N. to Welding Institute, The. Electron beam welding. 5,151,571, Cl. 219-121.130.
Sanderson, John R.: *See—*
Marquis, Edward T.; Sanderson, John R.; and Meyer, Robert A., 5,151,530, Cl. 549-529.000.
Sandhu, Gurtej S., to Micron Technology, Inc. Method to form self-aligned tips for flat panel displays. 5,151,061, Cl. 445-24.000.
Sandoz Ltd.: *See—*
Henrick, Clive A., 5,151,443, Cl. 514-486.000.
Sandvik AB: *See—*
Haglund, Bengt O.; and During, Bengt N., 5,151,247, Cl. 419-13.000
Sanetra, Jurgen; and Schug, Heinrich, to Minnesota Mining and Manufacturing Company. Sensitizer for ferromagnetic markers used with electromagnetic article surveillance systems. 5,151,843, Cl. 361-149.000.
Sanger, Joseph M.: *See—*
Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., 5,150,991, Cl. 406-67.000.
Sankyo Company, Limited: *See—*
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000
Sano, Shoichi: *See—*
Yoshida, Suguru; Tsunoda, Isao; and Sano, Shoichi, 5,150,944, Cl. 296-203.000.
Sanofi: *See—*
Garcia, Georges; Di Malta, Alain; and Soubrie, Philippe, 5,151,442, Cl. 514-456.000
Sanshin Kogyo Kabushiki Kaisha: *See—*
Hoshiba, Akihiro; Okazaki, Masaki; and Hasegawa, Junichi, 5,150,673, Cl. 123-179.150.
Santangelo, Francesco: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000.
Sante Corporation: *See—*
Roesky, Werner; Deffner, Dieter; and Wolter, Manfred, 5,150,985, Cl. 405-128.000.
Santel, Hans-Joachim: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000
Santerre, Robert F.: *See—*
Bang, Nils U.; Beckmann, Robert [illegible].; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., 5,151,268, Cl. 424-94.60.
Sanwa Electronics Instrument Co., Ltd. *See—*
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.
Sanz, Gerard C.: *See—*
Venet, Marc G.; Sanz, Gerard C.; Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., 5,151,421, Cl. 514-249.000.
Sanzen, Satoru: *See—*
Hanatani, Tadashi; Sanzen, Satoru; and Deguchi, Jichio, 5,151,324, Cl. 428-323.000.
Saotome, Shigeru, to Fuji Photo Film Co., Ltd. Method and apparatus for detecting the location of a pattern in a radiation image stored on a stimulable phosphor sheet. 5,151,596, Cl. 250-327.200.
Sarasmo, Jukka: *See—*
Vaisanen, Risto; Sarasmo, Jukka; and Pekkarinen, Vesa, 5,152,004, Cl. 455-68.000
Sarich, Ralph T.: *See—*
McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., 5,150,836, Cl. 239-5.000
Sarter, Celia; and Sarter, Rick. Training cap for nursing bottles. 5,150,800, Cl. 215-11.400.
Sarter, Rick: *See—*
Sarter, Celia; and Sarter, Rick, 5,150,800, Cl. 215-11.400.
Sarubbi, Thomas R., to OCG Microelectronic Materials, Inc. Photoresist composition containing diazoquinone photosensitizer and novalak resin characterized by the complete and selective removal of dimeric species from the novolak resin. 5,151,339, Cl. 430-192.000.
Saruta, Masahiro: *See—*
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.
Sasaki, Akira; Kato, Takeshi; and Hakoyama, Akiyoshi, to Hitachi, Ltd. Printing apparatus and information processing apparatus using the same. 5,151,973, Cl. 395-109.000.
Sasaki, Hideaki: *See—*
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000
Sasaki, Hidemi, to Fuji Photo Film Co., Ltd. Battery coupler. 5,151,727, Cl. 354-76.000.
Sasaki, Kunitsuna: *See—*
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Sasaki, Seiji: *See—*
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000.
Sasaki, Shinichi: *See—*
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Sasaki, Yoshihiro: *See—*
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Sasaki, Yoshio, to Pioneer Electronic Corporation. Circuit for muting noises for an audio amplifier. 5,151,942, Cl. 381-94.000.
Sasaki, Yoshiro: *See—*
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshiro, 5,151,033, Cl. 439-95.000.
Sasama, Kazuo: *See—*
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Sasanami, Hiromitsu: *See—*
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, 5,151,118, Cl. 65-18.100.
Sasano, Akira: *See—*
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.
Sasashige, Hiroaki: *See—*
Seki, Yukuharu; Sasashige, Hiroaki; and Ohkawa, Haruo, 5,150,514, Cl. 29-824.000.
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, to Eisai Co., Ltd. 3-substituted vinyl cephalosporin derivatives. 5,151,417, Cl. 514-202.000.
Sassy, Inc.: *See—*
Cohen, Carl M., 5,150,504, Cl. 24-302.000.
SAT (Societe Anonyme de Telecommunications): *See—*
Baillet, Gerard, 5,151,815, Cl. 359-220.000.
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, to Sankyo Company, Limited. Platelet activating factor antagonists, named "the phomactins" their preparation and use. 5,151,529, Cl. 549-354.000.
Sato, Hiroshi; and Yoshioka, Hiroshi, to Sumitomo Chemical Co., Ltd. Process for producing organic carboxylic acid esters. 5,151,547, Cl. 560-205.000.
Sato, Kaoru: *See—*
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.
Sato, Kazuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Diversity reception control circuit. 5,152,009, Cl. 455-134.000.
Sato, Kensaku, to Hirose Electric Co., Ltd. Failsafe electrical connector. 5,151,048, Cl. 439-357.000.
Sato, Maki: *See—*
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000.
Sato, Masahiko: *See—*
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Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, to Kabushiki Kaisha Toshiba. Resin molding apparatus. 5,151,276, Cl. 425-110.000.
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, to Brother Kogyo Kabushiki Kaisha. Scanning exposure device provided with intensity correction to compensate for scan angle. 5,151,586, Cl. 250-205.000.
Sato, Shouichi, to Fujitsu Limited. Film resistance terminator. 5,151,676, Cl. 338-61.000.
Sato, Tai, to C-Cube Microsystems, Inc. MOS array multiplier cell. 5,151,875, Cl. 364-784.000.
Sato, Yasushi: *See—*
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000
Satoh, Ryohei: *See—*
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Satou, Hiroki; and Horinouchi, Kazuyuki, to Sharp Kabushiki Kaisha Large scale integrated circuit device for switching oscillation circuit 5,151,613, Cl. 307-243.000
Satoya, Koichi: *See—*
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300
Saturn Corporation: *See—*
Gray, Charles A.; Milunas, Rimas S.; and Nitz, Larry T., 5,151,855, Cl. 395-750.000.
Milunas, Rimas S.; and Nitz, Larry T., 5,151,858, Cl. 364-424.100
Saukel, Heinz: *See—*
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000.
Saulnier, Gary J.: *See—*
Chennakeshu, Sandeep; and Saulnier, Gary J., 5,151,926, Cl. 375-84.000
Savio S.p.A.: *See—*
Colli, Luigi; and Badiali, Roberto, 5,150,845, Cl. 242-35.50A
Savitsky, Wallace R.: *See—*
Warner, Gary N.; White, Jason L.; Haley, Edmund J.; Savitsky, Wallace R.; and Schaffer, Ronald R., 5,151,960, Cl. 385-53.000.
Sawada, Jiro: *See—*
Kajigaya, Kazuhiko; and Sawada, Jiro, 5,151,881, Cl. 365-233.000
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, to Sumitomo Electric Industries, Ltd. Laminated superconductor. 5,151,406, Cl. 505-1.000
Sawada, Kikuzo, to Rohm Co., Ltd. Semiconductor memory device having self-correcting function. 5,151,906, Cl. 371-51.100.
Sawada, Tomoyuki: *See—*
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000
Sawada, Tsuguo: *See—*
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.
Sawano, Tetuya: *See—*
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.
Sawdon, Edwin G., to BTM Corporation. Apparatus for joining sheet material. 5,150,513, Cl. 29-798.000
Sayad, Fouad-Michel. Combination bottle carrier and rack. 5,150,784, Cl. 206-202.000
Scaramucci, John P. Compact swing check valve. 5,150,733, Cl. 137-454.200.
Scaros, Mike G.: *See—*
Behling, James R.; Farid, Payman, Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.
Schaefer, Rolf: *See—*
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, 5,151,522, Cl. 548-112.000.
Schaffer, Ronald R.: *See—*
Warner, Gary N.; White, Jason L.; Haley, Edmund J.; Savitsky, Wallace R.; and Schaffer, Ronald R., 5,151,960, Cl. 385-53.000.
Schaper & Bruemmer GmbH & Co. KG: *See—*
Beuscher, Norbert; and Scheit, Karl-Heinz, 5,151,498, Cl. 530-372.000
Schasfoort, Egbertus F. P.: *See—*
Szabo, Georges; Schasfoort, Egbertus F. P.; and Milan, Alain, 5,151,400, Cl. 502-203.000
Scheit, Karl-Heinz: *See—*
Beuscher, Norbert; and Scheit, Karl-Heinz, 5,151,498, Cl. 530-372.000.
Schering Aktiengesellschaft: *See—*
Buback, Michael; Hader, Josef; Voegele, Hans-Peter; and Al-Massri, ZaKarya, 5,151,533, Cl. 552-625.000.
Schering Corporation: *See—*
Piwinski, John J.; Green, Michael J.; and Wong, Jesse, 5,151,423 Cl. 514-254.000
Schiehser, Guy A.: *See—*
Caufield, Craig E.; and Schiehser, Guy A., 5,151,413, Cl. 514-63.000
Schiel, Christian, to J. M. Voith GmbH. Suction roll with deflector pieces in the holes, for a dryer group of a paper making machine. 5,151,156, Cl. 162-368.000.
Schiettecatte, Patrice J. C., to Moulinex (Societe Anonyme). Filter holder for a coffee machine of the "espresso" type. 5,150,645, Cl. 99-295.000
Schlecht, Klaus; and Wehrspann, Olaf, to Nestec S.A. Process for increasing coffee extraction yield. 5,151,287, Cl. 426-432.000.
Schlecker, Rainer; Teschendorf, Hans-Juergen; and Unger, Liliane, to BASF Aktiengesellschaft. Benzofurancarboxamides having basic substituents and therapeutic agents containing the same. 5,151,437, Cl. 514-320.000
Schlegel Corporation: *See—*
Burnett, Viola C., 5,150,544, Cl. 49-493.000.
Schleicher, Bernd: *See—*
Faerber, Manfred; Wienchol, Otto; and Schleicher, Bernd 5,150,631, Cl. 74-422.000
Schlumberger Industries: *See—*
Vinals, Manuel, 5,150,805, Cl. 220-217.000
Schlumberger Industries, Limited: *See—*
Turner, John T.; and Popiel, Czeslaw O., 5,150,619, Cl. 73-861.220.
Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, to Bayer Aktiengesellschaft. Isocyanate prepolymers containing ether and ester groups a process for their preparation and their use for the production of coating, sealing or casting composition. 5,151,484, Cl. 528-45.000.
Schmid, Rosemarie: *See—*
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie 5,151,329, Cl. 428-423.400
Schmidely, Herve: *See—*
Poulin, Jean-Marc; and Schmidely, Herve, 5,151,199, Cl 210-773.000
Schmidt, Annette M.: *See—*
Tomasov, Glenn E.; and Schmidt, Annette M., 5,150,584, Cl 62-209.000
Schmidt, Hans-Werner: *See—*
Beck, Karin H.; Etzbach, Karl-Heinz; and Schmidt, Hans-Werner. 5,151,516, Cl. 546-37.000.
Schmidt, Robert R.: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl 544-212.000
Schmucki, Peter, to Geberit AG. Support footing for toilet. 5,150,480 Cl. 4-252.300.
Schnitzer, Tadeusz E., to Du Pont de Nemours, E. I., and Company High-speed cutter for yarns. 5,150,640, Cl. 83-583.000.
Scholl, Stephen R.: *See—*
Valentine, Michael D.; Groth, Clarence R.; Scholl, Stephen R.; and Nusair, Marwan E., 5,151,701, Cl. 342-20.000.
Scholtissek, Stephan: *See—*
Rindt, Klaus-Peter; and Scholtissek, Stephan, 5,151,367, Cl 435-288.000
Scholz, Christoph; and Sefalidis, Yassilios, to CS Halbleiter- und Solartechnologie GmbH. Sorption column for waste-gas cleaning. 5,151,116, Cl. 55-387.000
Scholz, James P.; and Stahl, Daniel E., to AMP Incorporated. Cable assembly. 5,151,050, Cl. 439-456.000
Schonenberger, Eric: *See—*
Pantale, David; and Schonenberger, Eric, 5,150,772, Cl. 188-72.400.
Valmir, Francis; Mazon, Yves; and Schonenberger, Eric, 5,151,681 Cl. 340-454.000
Schoutteten, Bruno, to Schoutteten & Froidure S.A.; and S.A. Copel Industrie. Electrified tape for enclosure fences. 5,151,319, Cl 428-257.000
Schoutteten & Froidure S.A.: *See—*
Schoutteten, Bruno, 5,151,319, Cl. 428-257.000.
Schrader, Hartmut: *See—*
Baumeister, Joachim; and Schrader, Hartmut, 5,151,246, Cl 419-2.000
Schreck, John F.; and Truong, Phat C., to Texas Instruments Incorporated. Method and apparatus for determining the field position of an integrated circuit within a reticle area. 5,151,880, Cl. 365-201.000
Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., to Phillips Petroleum Company. Preparation of dehydrogenating catalyst 5,151,401, Cl. 502-329.000
Schug, Heinrich: *See—*
Sanetra, Jurgen; and Schug, Heinrich, 5,151,843, Cl. 361-149.000
Schulte-Elte, Karl-Heinrich: *See—*
Giersch, Wolfgang K.; Blanc, Pierre-Alain; and Schulte-Elte, Karl-Heinrich, 5,151,410, Cl. 512-9.000
Schulte, Steven A.: *See—*
Marfilius, Donald F.; and Schulte, Steven A., 5,150,946, Cl 297-194.000
Schultz, Garth J.: *See—*
Porter, Fred C.; and Schultz, Garth J., 5,150,685, Cl. 123-478.000
Schulz, Eberhard: *See—*
Findeis, Gunter; Jacob, Friedrich; and Schulz, Eberhard, 5,151,733, Cl. 355-45.000
Schuster, Gary B.: *See—*
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., 5,151,520, Cl. 548-110.000
Schutz, Jurg A.: *See—*
Bi, Junging; Beaud, Paul A.; Schutz, Jurg A.; Hodel, Walter, and Weber, Heinz P., 5,151,911, Cl. 372-32.000.
Schwabische Huttenwerke GmbH: *See—*
Zaoralek, Heinz-Michael, 5,151,576, Cl. 219-469.000
Schwarz, Ricardo B.; and Kuokkala, Veli-Tapani, to United States of America, Energy. Magnetostrictive resonance excitation. 5,150,617 Cl. 73-579.000
Schweitzer, Karl; and Zeindl, Gerhard, to Emhart, Inc. Tool exchange system for hybrid die bonder. 5,150,530, Cl. 33-626.000
Schwob, Pierre R. Broadcast receiver capable of automatic station identification and format-scanning based on an internal database updatable via data reception over the airwaves. 5,152,011, Cl 455-158.500.
Schwob, Pierre R. Broadcast receiver capable of automatically updating location and performing spiral searching. 5,152,012, Cl 455-158.500.
Scott, Bruce A.: *See—*
Meyerson, Bernard S.; Scott, Bruce A.; and Wolford, Donald J., Jr., 5,151,383, Cl. 437;101.
Scott Tech International, Inc.: *See—*
Bromley, Scott, 5,150,496, Cl. 29-33.00T
Sczomak, David P.: *See—*
Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., 5,150,694, Cl. 123-569.000.
Sears, Lawrence; and Wall, John T., to ITT Corporation. Variable speed hydromassage pump control. 5,151,017, Cl. 417-45.000

Seaworth, Brian: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary 5,150,748, Cl. 165-41.000.

Secci, Giovanni, to Contraves Italiana S.p.A. Recharge device, particularly for drive mechanisms for extending and withdrawing operative members of a space vehicle. 5,150,770, Cl. 185-40.00R.

Sedath, Robert H.; Taylor, Donald R.; and White, Lloyd S., to Allied-Signal Inc. Reduction of membrane fouling by surface fluorination. 5,151,183, Cl. 210-500.410.

Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, to General Instrument Corp. Surface mountable rectifier and method for fabricating same. 5,151,846, Cl. 361-306.000.

Sefalidis, Yassilios: *See—*
Scholz, Christoph; and Sefalidis, Yassilios, 5,151,116, Cl. 55-387.000.

Seiko Corporation: *See—*
Hoff, Don G., 5,150,954, Cl. 340-825.40

Seiko Epson Corp.: *See—*
Hoff, Don G., 5,150,954, Cl. 340-825.40.
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.
Miyazawa, Osamu, 5,151,886, Cl. 368-157.000.
Yamazaki, Katsunori, 5,151,690, Cl. 340-784.000.
Yonekubo, Masatoshi, 5,151,890, Cl. 369-44.110.

Seiko Instruments Inc.: *See—*
Machida, Satoshi; Kawahara, Yukito and Mukainakano, Hiroshi, 5,151,587, Cl. 250-208.100.
Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, 5,151,379, Cl. 427-39.000.

Seiryo, Furuto, to Ryoka Techno Engineering & Construction Co.; and Mitsubishi Kasei Corporation. Method for separating a liquid mixture. 5,151,190, Cl. 210-640.000.

Seiter, John J., to PPG Industries, Inc. Process for producing 2-oxo-1,3-dibenzyl-4,5-cis-imidazolidinedicarboxylic acid. 5,151,525, Cl. 548-321.000.

Seitz Enzinger Noll Maschinenbau Aktiengesellschaft: *See—*
Bernhard, Herbert, 5,150,558, Cl. 53-467.000.

Seki, Koichi: *See—*
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Seki, Masaki; Samukawa, Koji; and Hamaoka, Osamu, to Fanuc Ltd. Method of generating cutting passes of complex curved surface 5,151,864, Cl. 364-474.230.

Seki, Yasuharu: *See—*
Koyanagi, Osamu; Seki, Yasuharu and Tsukushi, Masanori, 5,151,566, Cl. 200-110.00A.

Seki, Yukuharu; Sasashige, Hiroaki; and Ohkawa, Haruo, to Mitsubishi Jukogyo Kabushiki Kaisha Corrugating roll unit exchanging apparatus for a single facer. 5,150,514, Cl. 29-124.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.

Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, to Hitachi, Ltd. Hot strip plant. 5,150,597, Cl. 72-29.000.

Seko, Tsuyoshi: *See—*
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.

Selandia Designs: *See—*
Saklad, Betty E., 5,150,815, Cl. 220-08.000.

Sellinger, Alan: *See—*
Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, 5,151,189, Cl 210-635.000.

Semeraro, Claudio: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei; and Sato, Masahiko, 5,151,808, Cl. 359-78.000

Sens, Ruediger: *See—*
Bach, Volker; Hansen, Guenter; Lahm, Gunther; and Sens, Ruediger, 5,151,506, Cl. 534-772.000

Seppen, Constance J. E.: *See—*
Rikken, Gerardus L. J. A.; and Seppen, Constance J. E., 5,151,965, Cl. 385-122.000

Serafin, Renato: *See—*
Tacchetto, Maurizio; Zorzi, Claudio De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.

Serkes, Jonathan M.; and St. Pierre, Richard C., to Invitro Scientific Products, Inc. Cell culture flask. 5,151,366, Cl. 435-285.000.

Servo Corporation of America: *See—*
Bambara, Joseph E., 5,150,618, Cl. 73-660.000.

Seto, Shunichi, to Fuji Photo Film Co., Ltd. Method for detecting defects in measurement means of biochemical analysis apparatuses. 5,151,755, Cl. 356-414.000

Sevenstrand Tackle Corporation: *See—*
Buchanan, William R., 5,150,538, Cl. 43-42.280.

Seyfried, Joseph A.; and Patel, Chetan G., to Xerox Corporation. Apparatus for storing marking particles. 5,150,807, Cl. 220-359.000

SGS-Thomson Microelectronics, Inc.: *See—*
Brady, James; Chan, Tsiu C.; and Culver, David S., 5,151,387, Cl 437-191.000.
Spinner, Charles R., III, 5,151,376, Cl. 437-47.000.

SGS-Thomson Microelectronics S.A.: *See—*
Artieri, Alain, 5,151,976, Cl. 395-166.000.

Shacklock, Frank W.: *See—*
Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., 5,150,589, Cl. 68-23.700.

Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., to Hoechst Celanese Corporation. Process for the production of 4-acetoxystyrene, its polymers and hydrolysis products. 5,151,546, Cl. 560-130.000

Shaheen-Gouda, Amal A.: *See—*
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., 5,151,989, Cl. 395-600.000.

Shal, David A.: *See—*
Hoptry, David A.; Petrofes, James M.; Shal, David A.; and Denton, Gary R., 5,150,915, Cl. 280-707.000.
Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., 5,150,916, Cl. 280-707.000.

Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, to Abbott Laboratories. Retroviral protease inhibiting compounds. 5,151,438, Cl. 514-357.000.

Shambrook, Kevin P.: *See—*
Bakhit, Gabriel G.; and Shambrook, Kevin P., 5,151,388, Cl. 437-209.000.

Shamoto, Sumikazu, to Toyota Jidosha Kabushiki Kaisha. Electric automobile driving apparatus. 5,151,641, Cl. 318-762.000.

Shanley and Baker: *See—*
McKie, R. Thomas, 5,150,844, Cl. 241-73.000

Shapiro, Leo. Bath chair swivel foot. 5,150,482, Cl. 4-562.100.

Sharp, Brian W.: *See—*
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.

Sharp Kabushiki Kaisha: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.
Kida, Shigeru; and Sakai, Katsuyuki, 5,150,630, Cl. 74-354.000.
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610
Koizumi, Satoru, 5,151,834, Cl. 360-97.000.
Kunikawa, Norihide; Yamada, Yoshikado; Mori, Yoshiteru; and Matsuo, Toshihisa, 5,150,890, Cl. 271-9.000
Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro, 5,151,298, Cl. 427-77.000.
Satou, Hiroki; and Horinouchi, Kazuyuki, 5,151,613, Cl. 307-243.000.
Shiraki, Tatsuya; and Kado, Makoto, 5,151,975, Cl. 395-153.000.
Tanaka, Masaru; and Ishii, Yutaka, 5,151,688, Cl. 340-707.000
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio; and Aramaki, Takashi, 5,151,951, Cl. 382-19.000.

Sharpe, David E., to Philip Morris Inc. Scintillation tube dynamic calibration monitor and feedback regulator. 5,151,648, Cl. 323-282.000.

Shaura, Hazime: *See—*
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, 5,151,276, Cl. 425-110.000.

Sheehan, Timothy G.: *See—*
Crowley, Carmel; Sheehan, Timothy G.; and Ward, Frederick G., 5,151,355, Cl. 435-214.000.

Sheih, Pong S.: *See—*
Treybig, Duane S.; Wang, David S.; Sheih, Pong S.; and Ho, Loan A., 5,151,485, Cl. 528-87.000.

Shekleton, Jack R., to Sundstrand Corporation. Unitized fuel manifold and injector for a turbine engine. 5,150,570, Cl. 60-39.360.

Shell Oil Company: *See—*
Job, Robert C., 5,151,399, Cl. 502-127.000.
Stevens, Craig A.; Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., 5,151,475, Cl. 526-83.000.

Shell Research Limited. *See—*
Briner, Paul H., 5,151,550, Cl. 562-468.000.

Shenoi, Kishan; Hanagan, Patrick L.; Ho, Helena S.; and Yu, Frank I., to DSC Communications Corporation. DS1 trunk packing and unpacking apparatus and method. 5,151,901, Cl. 370-110.100.

Shepard, Howard: *See—*
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Sheppard, Clyde H.: *See—*
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,151,487, Cl. 528-170.000.

Shibabuchi, Toshio: *See—*
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Shibata, Hiroki: *See—*
Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, 5,151,631, Cl. 315-127.000.

Shibata, Junichirou, to Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. IC sorting and receiving apparatus and method. 5,150,797, Cl. 209-573.000.

Shibata, Junichirou, to Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. Apparatus for testing IC elements. 5,151,651, Cl. 324-158.00P.

Shibata, Yoshitaka: *See—*
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Shibuya, Yoshiyuki: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.

Shichijo, Yasuhisa: *See—*
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, 5,150,649, Cl. 101-365.000.

Shier, Richard K.: *See—*
Rush, William B., II; Elder, Jack E.; and Shier, Richard K., 5,150,669, Cl. 123-52.0MF.

Shigekawa, Naoteru: *See—*
Enoki, Takatomo; Shigekawa, Naoteru; and Arai, Kunihiro, 5,151,757, Cl. 357-22.000

Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, to Idemitsu Kosan Co., Ltd. Dihydric phenols. 5,151,531, Cl 552-115.000

Shigeta, Kazuo: *See—*
Nishiyama, Yukio; and Shigeta, Kazuo, 5,151,327, Cl. 428-343.000.

Shigeta, Teruaki: *See—*
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.

Shih, Edward: *See—*
Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, 5,151,846, Cl. 361-306.000.

Shikichi, Satoshi; and Nakahara, Takashi, to Canon Kabushiki Kaisha Optical information processing apparatus in which the output of an optical sensor is replaced by a reference signal during the occurrence of malfunction. 5,151,888, Cl. 369-44.320.

Shimada, Makoto: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, 5,151,861, Cl. 364-426.020.

Shimadzu Corporation: *See—*
Hirose, Hideo, 5,151,928, Cl. 378-119.000.
Kiri, Motosada; and Adachi, Susumu, 5,151,588, Cl. 250-208.100.

Shimanaka, Shigeki; and Kato, Yuji, to Nissan Motor Co., Ltd. Line pressure arrangement for automotive power train including traction company. 5,150,761, Cl. 180-197.000

Shimano Industrial Co., Ltd.: *See—*
Noda, Hideo, 5,150,854, Cl. 242-310.000.

Shimizu Construction Co.: *See—*
Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige and Nakajima, Hajime, 5,150,356, Cl. 52-639.000.

Shimizu, Hideaki: *See—*
Komuro, Kyozi; Hayakawa, Atsuya; and Shimizu, Hideaki, 5,151,863, Cl. 364-470.000.

Shimizu, Masahiko: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.

Shimizu, Norio: *See—*
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250

Shimizu, Satoshi: *See—*
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, 5,151,713, Cl. 346-108.000.

Shimizu, Tadafumi, to Minolta Camera Kabushiki Kaisha. Sheet feeding apparatus. 5,150,892, Cl. 271-98.000.

Shimizu, Yasuhiko, to Kabushiki Kaisha Toshiba. Wire bonding method and apparatus for same capable of packaging semiconductor device into thin package. 5,150,828, Cl. 228-102.000.

Shimoda, Tomoaki: *See—*
Sakashita, Takeshi; and Shimoda, Tomoaki, 5,151,491, Cl 528-199.000

Shimomoto, Yasuharu: *See—*
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Shindo, Atsunori: *See—*
Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000

Shinji, Yasuhisa; Hasegawa, Toshiaki; Akune, Shinichi; and Sakuhara, Hirohiko, to Yazaki Corporation. Electrical connector for shielding cable. 5,151,053, Cl. 439-610.000.

Shinka, Michitoshi: *See—*
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.

Shinohara, Takayuki: *See—*
Mori, Yoshihide; and Shinohara, Takayuki, 5,151,774, Cl 357-79.000.

Shinwa Sangyo Co., Ltd.: *See—*
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Shirai, Mitugu: *See—*
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.

Shirakawa, Junji: *See—*
Uno, Kazuo; and Shirakawa, Junji, 5,150,893, Cl. 271-157.000.

Shiraki, Tatsuya; and Kado, Makoto, to Sharp Kabushiki Kaisha. Word processor with text layout display function. 5,151,975, Cl 395-153.000.

Shire, Michael H., to Quake Industries, Inc. Scope cover. 5,150,528, Cl 33-244.000.

Shirota, Koromo: *See—*
Fukushima, Kyouko; Shirota, Koromo; and Koike, Shouji, 5,151,128, Cl. 106-20.000.

Shirouzu, Shunji: *See—*
Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, 5,151,659, Cl. 324-458.000.

Shiseido Company, Ltd.: *See—*
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.

Shishido, Kouji: *See—*
Kitahara, Motohide; Ozaki, Hiroshi; and Shishido, Kouji, 5,151,108, Cl. 51-296.000

Shockley, Thomas H.: *See—*
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.

Shoji, Yoshio: *See—*
Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100.

Shop Vac Corporation: *See—*
Berfield, Robert C., 5,150,499, Cl. 15-327.100.

Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, to Centre International de Recherches Dermatologiques (CIRD). Sulphur-containing eicosanoides and their application in pharmacy and in cosmetics. 5,151,534, Cl. 554-88.000

Shutoku, Ryuji: *See—*
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,151,683, Cl. 340-518.000.

Shyr, Richard: *See—*
Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell Muni, 5,151,846, Cl. 361-306.000.

Sibigtroth, James M.: *See—*
Langan, John A.; and Sibigtroth, James M., 5,151,986, Cl 395-550.000

Sideman, Samuel: *See—*
Halmann, Menachem; Azhari, Haim; Beyar, Rafael; Sideman, Samuel; and Dinnar, Uri, 5,151,856, Cl. 364-413.030

Siebert, Edward T., to Hughes Danbury Optical Systems, Inc. Coherent radiation detector. 5,151,585, Cl. 250-201.900

Siefken, Allen J., to RAJ Industries, Inc. Switch protection circuit 5,151,840, Cl. 361-13.000.

Siemens Aktiengesellschaft: *See—*
Biehl, Wilfried; and Kleine-Onnibrink, Bernhard, 5,151,675, Cl 335-78.000
Boy, Jurgen; and Jacubeit, Matthias, 5,151,630, Cl. 313-602.000
Grallert, Hans-Joachim, 5,151,902, Cl. 371-51.000
Hagl, Ernst, 5,151,930, Cl. 379-57.000.
Moschuering, Hugo, 5,151,652, Cl. 324-158.00P.
Mueller, Gustav; and Stoll, Lothar, 5,151,959, Cl. 385-50.000
Riedle, Ulrich, 5,151,936, Cl. 379-403.000.
Stegherr, Michael; and Pfaffel, Bruno, 5,151,624, Cl. 307-498.000.

Siemens Corporate Research Inc.: *See—*
Petsche, Thomas, 5,151,969, Cl. 395-24.000.

Siemens Energy & Automation, Inc.: *See—*
Morgan, Robert W., 5,151,043, Cl. 439-212.000

Siemens Nixdorf Informationssystem AG: *See—*
Busch, Peter; Rettenmaier, Helmut; and Sterzik, Willi, 5,151,851, Cl. 363-25.000

Siemens-Nixdorf Informationssysteme AG: *See—*
Hilkenmeier, Jurgen; and Volke, Hans-Werner, 5,150,976, Cl 400-124.000

Sigai, A. Gary, to GTE Products Corporation. Pre-water-based suspension alumina coated phosphor treatment process. 5,151,215, Cl. 252-301.60F

Sillitto, Hilary G.; and Lessels, Alison B., to GEC Ferranti Defence Systems Limited. Zoom lens. 5,151,820, Cl. 359-354.000.

Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., to DowBrands Inc. Liquid spray dispenser. 5,150,841, Cl. 239-332.000.

Silzer, Elmar; and Leung, Emil Y., to Arvan, Inc. Side window air deflector incorporating a side view mirror. 5,150,941, Cl 296-152.000

Simeroth, David L.; Brink, David S.; Willis, Reid S.; and Backlund, Dale J., to Dow Chemical Company, The. Fluid sampling for gas chromatograph with modified sampling valve. 5,150,601, Cl 73-23.410.

SIMES Societa Italiana Medicinali e Sintetici S.p.A.: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000

Simin, Gerald L., to General Motors Corporation. Swing-out tail lamp 5,150,939, Cl. 296-37.100.

Simon Marketing, Inc.: *See—*
Filo, Andrew S., 5,151,595, Cl. 250-316.100.

Simpson, Edwin K. Package integrity detection method. 5,150,605, Cl. 73-49.300.

Simpson, James L., to Hemox, Inc. Method of manufacturing medical appliance disposal container. 5,151,074, Cl. 493-133.000.

Simpson, Jay R.: *See—*
Krol, Denise M.; and Simpson, Jay R., 5,151,817, Cl. 359-328.000

Simpson, Stephen J.: *See—*
Quinlan, Roger J., Jr.; and Simpson, Stephen J., 5,150,554, Cl 52-282.000

Simpson, Stewart A.; and Dicke, Rock D., to Hydrocarbon Filtration Systems, Inc. Filter for removing liquid hydrocarbons from water and process of removing gaseous and/or hydrocarbons from water 5,151,194, Cl. 210-680.000

Simpson Strong-Tie Company, Inc.: *See—*
Commins, Alfred D.; and Romeo, Ernest A., 5,150,553, Cl. 52-264.000.
Gilb, Tyrell T., 5,150,982, Cl. 403-232.100.

Sindelar, Joseph L. Golf putting training device. 5,150,904, Cl. 273-192.000

Singh, Anand K.: *See—*
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.

Singh, Devinder; Hardaway, Anthony H.; Euler, John W.; and Pastryk, Jim J., to Whirlpool Corporation. Concentrate wash automatic washer with reciprocating basket. 5,150,588, Cl. 68-23.500.

Sirany, Dallas. Method of treating a papova-type viral infection. 5,151,415, Cl. 514-163.000.

Siskin, Michael: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Colucci, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000

Sivacoe, Orlande. Pipeline pig. 5,150,493, Cl. 15-104.061.

Skalka, Gerald P., to Recreation Technology, Inc. Playground equipment. 5,151,069, Cl. 482-35.000.

SKC Limited: *See—*
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.

Skinner, William O., to Press Seal Gasket Corporation. Expandable seal arrangement. 5,150,927, Cl. 285-189.000.

Slattery, William J.: *See—*
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.

Slife, Jimmy D.; and Farrell, David L, to XEL Communications, Inc. Programmable universal signaling circuit for a telephone network. 5,151,935, Cl. 379-240.000

Sloan Valve Company: *See—*
Whiteside, John F.; and Richardson, Bradley S., 5,150,877, Cl. 251-40.000.

Smejkal, Hellmuth: *See—*
Auer, Johann; Pirklbauer, Wilfried; Ramaseder, Norbert; and Smejkal, Hellmuth, 5,151,243, Cl. 266-78.000.

Smit, Gerrit: *See—*
Haagh, Johannes P. N.; van Driest, Hans; and Smit, Gerrit, 5,151,920, Cl. 375-1.000.

Smith, Alan J.; and Quinn, Jennifer L., to Thames Water Utilities Limited. Fluid treatment. 5,151,197, Cl. 210-758.000.

Smith, Connie M.: *See—*
DeLuca, Hector F.; and Smith, Connie M., 5,151,416, Cl. 514-167.000.

Smith, Douglas D.: *See—*
Hsueh, Paul W.; and Smith, Douglas D., 5,151,879, Cl. 365-190.000.

Smith, Gary A.: *See—*
Farling, Duane J.; and Smith, Gary A., 5,150,533, Cl. 34-62.000.

Smith, Glenn W., to Baltimore Air Coil Company. Head pressure controller for air conditioning and refrigeration systems. 5,150,581, Cl. 62-115.000.

Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, to Huls Aktiengesellschaft. Radiation-cured film web and a process for its preparation. 5,151,493, Cl. 528-272.000

Smith, Kenneth T.: *See—*
Saltman, Paul D.; and Smith, Kenneth T., 5,151,274, Cl. 424-630.000

Smith, Michael G.; Jacks, Wendy S.; Lo, William C.; and Ehr, Robert J., to DowElanco. Herbicidal 2-(phenoxy or phenylthio)-2-(pyrimidinyloxy or 1,3,5-triazinyloxy)-alkanoic acids. 5,151,113, Cl. 71-92.000

Smith, Sherman: *See—*
Spiegel, Si; and Smith, Sherman, 5,150,874, Cl. 248-514.000.

Smith, Stanley E.: *See—*
Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., 5,150,886, Cl. 267-220.000.

Smith, Thane, to Comasat. Planar doped valley field effect transistor (PDVFET). 5,151,758, Cl. 357-23.000.

Smith, Todd A.: *See—*
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., 5,151,989, Cl. 395-600.000.

Smiths Industries Public Limited Company: *See—*
Fox, Neil A., 5,150,965, Cl. 362-260.000.

Snead, Wilford A., to Minnesota Mining and Manufacturing Company Triple passage orthodontic buccal tube. 5,151,028, Cl. 433-17.000.

Snyder, Dane T.: *See—*
Law, Robert J.; Robles, Michael N.; and Snyder, Dane T., 5,151,244, Cl. 376-245.000.

Snyder, Lawrence; and Konstantinidou, Smaragda, to Washington Research Foundation. Chaos router system. 5,151,900, Cl. 370-94.300.

Societa' Cavi Pirelli S.p.A.: *See—*
Boero, Paolo; and Bortolin, Bruno, 5,150,516, Cl. 29-877.000.

S.A. Copel Industrie: *See—*
Schoutteten, Bruno, 5,151,319, Cl. 428-257.000.

Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle: *See—*
Gaide, Pierre, 5,150,856, Cl. 244-3.200.
Valy, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, 5,150,741, Cl. 141-18.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Azzara, Sauveur A.; and Coutant, Herve G. F., 5,151,236, Cl. 264-257.000

Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, to Sumitomo Rubber Industries, Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Method for vulcanizing elastomer products and apparatus therefor. 5,151,242, Cl. 264-572.000.

Soffer, Bernard H.: *See—*
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.

Soga, Hiroo: *See—*
Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100

Solcia, Carolina; and Succi, Marco, to SAES Getters SpA. Gas purifier having end of life detector. 5,151,251, Cl. 422-119.000.

Solomon, Donald D.: *See—*
Lambert, James M.; and Solomon, Donald D., 5,151,231, Cl. 264-108.000.

Somar Corporation: *See—*
Hamamura, Fumio; and Watanabe, Katsuyoshi, 5,150,639, Cl. 83-39.000.

Somfy: *See—*
Giust, Henri; and Cippelletti, Ennio, 5,150,846, Cl. 242-54.00R.

Sony Corporation: *See—*
Nagasawa, Tsuyoshi, 5,151,832, Cl. 360-85.000.
Nishiguchi, Masayuki; Fujiwara, Yoshihito; and Umezawa, Tomoko, 5,151,941, Cl. 381-46.000.
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.
Tamamura, Koushi; and Iwamoto, Hiroyuki, 5,151,912, Cl. 372-46.000.
Yamamoto, Masanobu; and Itoh, Kazumine, 5,151,813, Cl. 359-202.000.
Yokono, Shigeru; and Tobita, Minoru, 5,151,905, Cl. 371-39.100.
Yoshikawa, Takao; and Masuda, Isao, 5,151,792, Cl. 358-327.000.

Sony Magnescale Inc.: *See—*
Okubo, Hiroyuki, 5,151,798, Cl. 359-1.000.

Sorola, Bret S. Swivel construction. 5,150,539, Cl. 43-43.100.

Soubrie, Philippe: *See—*
Garcia, Georges; Di Malta, Alain; and Soubrie, Philippe, 5,151,442, Cl. 514-456.000.

Souliere, Joseph M.: *See—*
Veltri, Jeffrey A.; and Souliere, Joseph M., 5,151,678, Cl. 340-321.000

Sounik, David F.: *See—*
Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., 5,151,483, Cl. 528-44.000.

Southco, Inc.: *See—*
Bisbing, Robert H., 5,150,500, Cl. 16-239.000.

Southern Mills, Inc.: *See—*
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., 5,150,476, Cl. 2-93.000.

Southwest Research Institute: *See—*
Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl. 340-870.330.

Souza, Lawrence M.; and Boone, Thomas C., to Amgen Inc. DNA encoding avian growth hormones. 5,151,511, Cl. 536-27.000.

Souza, Robert J.: *See—*
Thomas, Robert E.; Varghese, George; Souza, Robert J.; and Harvey, George A., 5,151,899, Cl. 370-94.100.

SpaceLabs, Inc.: *See—*
Brooks, Robert J., 5,150,708, Cl. 128-419.00D.

Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, to United Technologies Corporation. Method of cooling with an endothermic fuel. 5,151,171, Cl. 208-48.00Q.

Spears, Steven A.: *See—*
Walker, David L.; and Spears, Steven A., 5,150,957, Cl. 358-347.000.

Spencer, Richard H.: *See—*
Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., 5,150,841, Cl. 239-332.000.

Spicer, Warren R.: *See—*
Spicer, William W.; and Spicer, Warren R., 5,151,685, Cl. 340-605.000.

Spicer, William W.; and Spicer, Warren R. Water level alarm apparatus. 5,151,685, Cl. 340-605.000.

Spiegel, Si; and Smith, Sherman, to Hudson Valley Tree, Inc. Apparatus for mounting foldable branches to an artificial tree. 5,150,874, Cl. 248-514.000.

Spigner, Kenneth W. Can collection apparatus. 5,151,005, Cl. 414-437.000.

Spinner, Charles R., III, to SGS-Thomson Microelectronics, Inc. Method of making polycrystalline silicon resistors for integrated circuits. 5,151,376, Cl. 437-47.000.

Spitz, Roger; Malinge, Jean; and Joly, Jean-Francois, to Atochem. Process for the polymerization of ethylene and catalytic component therefor. 5,151,396, Cl. 502-104.000.

Spoonmore, Robert T.: *See—*
Bandy, Michael J.; Byerly, Roy H.; and Spoonmore, Robert T., 5,150,735, Cl. 137-614.060

Sprenger, Kurt: *See—*
Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, 5,150,688, Cl. 123-506.000.

Spring, David J.: *See—*
Mitchell, Mark D.; and Spring, David J., 5,150,577, Cl. 62-18.000.

Springer, Helmut: *See—*
Lappe, Peter; and Springer, Helmut, 5,151,537, Cl. 556-136.000.

Square D Company: *See—*
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., 5,151,978, Cl. 395-200.000.

SRI International: *See—*
Green, Philip S., 5,150,714, Cl. 128-660.060.

Staff GmbH & Co. KG: *See—*
Range, Helmut; and Beigel, Gerhard, 5,151,037, Cl. 439-110.000.
Range, Helmut; Beigel, Gerhard; Lotsch, Friedemann; and Debie, Peter, 5,151,038, Cl. 439-122.000.

Stahl, Daniel E.: *See—*
Scholz, James P.; and Stahl, Daniel E., 5,151,050, Cl. 439-456.000

Stammberger, Willi: *See—*
Fulbreth, Werner; Leeb, Richard; Radau, Manfred; and Stammberger, Willi, 5,151,433, Cl. 514-299.000.

Stamper, Christopher T. J.: *See—*
Hochberg, Joel; Stamper, Timothy D. J.; and Stamper, Christopher T. J., 5,150,898, Cl. 273-85.00C.

Stamper, Timothy D. J.: *See—*
Hochberg, Joel; Stamper, Timothy D. J.; and Stamper, Christopher T. J., 5,150,898, Cl. 273-85.00C.

Standard Products Company, The: *See—*
Jackson, Norman C., 5,151,307, Cl. 428-31.000.

Stanhope, Michael T.: *See—*
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., 5,150,476, Cl. 2-93.000.

Stanton plc: *See—*
Greatorex, Cyril B., 5,150,929, Cl. 285-231.000.

Stark, Catherine. Umbrella with magnetic fasteners. 5,150,728, Cl. 135-16.000

Starr, Stephen G.: *See—*
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.

Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., to Southern Mills, Inc. Insulating fabric and method of producing same 5,150,476, Cl. 2-93.000.

Stauffer, Harold F., Jr.: *See—*
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N. and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000.

Stawicki, Raymond J. Golf swing training device. 5,150,901, Cl. 273-186.200

Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., to Applied Biosystems, Inc. Method of synethesizing sulfurized oligonucleotide analogs 5,151,510, Cl. 536-27.000.

Stegeman, Aaron H.; and Bechler, Ronald F., to Ranger All Season Corp. Personal mobility vehicle. 5,150,762, Cl. 180-208.000.

Stegherr, Michael; and Pfaffel, Bruno, to Siemens Aktiengesellschaft. Multiplier circuit. 5,151,624, Cl. 307-498.000.

Steimel, James M.: *See—*
Kaczmarek, James S.; and Steimel, James M., 5,150,624, Cl. 73-865.900.

Stein, Stuart D.: *See—*
McCullough, Francis P., Jr.; and Stein, Stuart D., 5,151,198, Cl. 210-767.000

Steinberg, Nathan G.; Rasmusson, Gary H.; and Salzmann, Thomas N., to Merck & Co., Inc. Specific 17β-thiobenzoyl-4-aza-5α-androst-1-en-3-ones as antiandrogen agents. 5,151,430, Cl. 514-284.000.

Steinemann, Werner: *See—*
Gernet, Pierre; Steinemann, Werner; and Margot, Paul-Andre, 5,151,677, Cl. 338-99.000

Steiner, Manfred: *See—*
Leiber, Heinz; Steiner, Manfred; and Klinkner, Walter, 5,150,951, Cl. 303-100.000.

Stengel, Robert E.: *See—*
Balzano, Quirino; and Stengel, Robert E., 5,151,709, Cl. 343-741.000.

Stenmans, Heinz, to Palitex Project Company GmbH. Thread processing machine spindle assembly having mechanical adjustment mechanisms for devices within a rotating thread balloon. 5,150,566, Cl. 57-58.830.

Stephansky, John J.; and Sutton, John P., to Dresser Industries, Inc. High aluminia tar-impregnated pressure pouring tubes. 5,151,200, Cl. 222-590.000.

Stephens, Richard B., to General Atomics. Barrier for scattering electromagnetic radiation. 5,151,819, Cl. 359-350.000.

Sterzik, Willi: *See—*
Busch, Peter; Rettenmaier, Helmut; and Sterzik, Willi, 5,151,851 Cl. 363-25.000

Steuri, Christian; and Williams, Theresa B., to Procter & Gamble Company, The. Shampoo compositions. 5,151,210, Cl. 252-174.017

Stevens, Craig A.; Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., to Shell Oil Company. Termination of anionic polymerization. 5,151,475, Cl. 526-83.000.

Stevens, William: *See—*
Greenwald, C. Kent; Gray, Leslie M.; Read, R. Bart; and Stevens, William, 5,151,014, Cl. 416-237.000.

Stewart, Bryan J.; and Stewart, Victoria J. Wax applicator with rubber bumper end. 5,150,978, Cl. 401-14.000.

Stewart, Victoria J.: *See—*
Stewart, Bryan J.; and Stewart, Victoria J., 5,150,978, Cl. 401-14.000

Stewen, Wilhelm: *See—*
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Stiles, Steven D.: *See—*
Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., 5,150,692, Cl. 123-533.000

Stinson, Randy L. Apparatus and method for irradiating cells. 5,150,705, Cl. 128-396.000

Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co.: *See—*
Rautenberg, Paul-Georg, 5,151,847, Cl. 361-395.000

Stoll, James R.: *See—*
Foehse, Karen B.; Efstathiou, John D.; and Stoll, James R., 5,151,283, Cl. 426-93.000.

Stoll, Lothar: *See—*
Mueller, Gustav; and Stoll, Lothar, 5,151,959, Cl. 385-50.000

Stoltman, Donald D.: *See—*
Kabasin, Daniel F.; and Stoltman, Donald D., 5,150,696, Cl. 123-571.000.

Stommels, Franciscus J.: *See—*
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Stone & Webster Engineering Corporation: *See—*
Bowen, Colin P.; and Brewer, John R., 5,151,158, Cl. 196-110.000.

Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., to Reed Manufacturing. Particulate-material gun with improved sealing system. 5,150,991, Cl. 406-67.000

Stork, Harry R.: *See—*
Wetzel, Charles M.; Ritt, Peter M.; Roberts, Owen H., Jr.; and Stork, Harry R., 5,151,337, Cl. 430-28.000

Storopack Hans Reichenecker GmbH & Co.: *See—*
Busch, Waldemar; and Lutz, Norbert, 5,150,490, Cl. 12-146.00M

Stossel, Richard: *See—*
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000.

Stout, Douglas W.: *See—*
Austin, John S.; Piro, Ronald A.; and Stout, Douglas W., 5,151,619, Cl. 307-473.000

Strand, Olaf, to Norsk Hydro A.S. Manufacturing method for a flexible container. 5,151,076, Cl. 493-186.000.

Strang, Harry: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, to Ciba-Geigy Corporation. Reinforcing material. 5,151,318, Cl. 428-246.000

Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., to Hollenberg, Cornelius. Fermentation processes using amylolytic enzyme producing microorganisms. 5,151,354, Cl. 435-161.000

Straumann, Fritz: *See—*
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000

Strid, Kent; Karlsson, Hans A.; and Larsson, Per. Filter for continuous filtration. 5,151,176, Cl. 210-178.000.

Strom, E. Thomas: *See—*
Phelps, Craig H.; and Strom, E. Thomas, 5,150,754, Cl. 166-294.000

Strong, Kathleen M.; and Matusewicz, Richard S., to Beckman Instruments, Inc. Diagnostic specimen mailing device. 5,150,971, Cl. 383-84.000.

Strong, Molly. Winter weather footwear article. 5,150,536, Cl. 36-7.10R.

Strong, Russell C.: *See—*
Majestic, Veronica K.; and Strong, Russell C., 5,151,220, Cl. 252-392.000.

Struglinski, Mark J., to Exxon Chemical Patents Inc. Oleaginous compositions containing novel ethylene alpha-olefin polymer viscosity index improver additive. 5,151,204, Cl. 252-52.00R.

Stutzle, Siegfried: *See—*
Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, 5,151,068, Cl. 475-322.000

Succi, Marco; and Doni, Fabrizio, to SAES Getters SpA. Method for determining the end of useful life of an inert gas purifier and apparatus therefore. 5,150,604, Cl. 73-38.000

Succi, Marco: *See—*
Solcia, Carolina; and Succi, Marco, 5,151,251, Cl. 422-119.000

Suda, Yasuo: *See—*
Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, 5,151,583, Cl. 250-201.200.

Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Low-distortion radio-frequency amplifying apparatus. 5,151,664, Cl. 330-149.000.

Suetsugu, Toshio: *See—*
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, 5,151,893, Cl. 369-116.000

Suga, Seiji, to Atsugi Unisia Corporation. Intake- and/or exhaust-valve timing control system for internal combustion engine. 5,150,671, Cl. 123-90.170.

Suganami, Hideki: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000

Sugano, Michihiro: *See*—
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Sugii, Takesi: *See*—
Matsuda, Genichi; and Sugii, Takesi, 5,151,326, Cl. 128-336.000

Sugimura, Naomi, to Murakami Kaimeido Co., Ltd. Inside rear view mirror for a vehicle. 5,151,828, Cl. 359-871.000.

Sugimura, Tohru: *See*—
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.

Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, to Seiko Instruments Inc. Method for manufacturing a color filter. 5,151,379, Cl. 427-39.000.

Sugita, Koichi, to Kabushiki Kaisha Toop. Combination container and pump having a conical piston for venting. 5,150,823, Cl. 222-386.000.

Sugiyama, Genroku: *See*—
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000.

Sugiyama, Isao: *See*—
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Sugiyama, Yoshiaki: *See*—
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,151,726, Cl. 354-75.000

Suh, Young S., to Samsung Electronics Co., Ltd. Microwave cooker having a rotary stirrer and a rotary food support. 5,151,569, Cl. 219-10.55F

Sullivan, James J.: *See*—
Quimby, Bruce D.; and Sullivan, James J., 5,151,371, Cl. 436-127.000

Sumitomo Chemical Co., Ltd.: *See*—
Kurimoto, Isao; and Minai, Masayoshi, 5,151,542, Cl. 558-277.000.
Sato, Hiroshi; and Yoshioka, Hiroshi, 5,151,547, Cl. 560-205.000

Sumitomo Electric Industries, Ltd.: *See*—
Osawa, Masahiko, 5,151,628, Cl. 313-499.000.
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, 5,151,406, Cl. 505-1.000
Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo, 5,151,408, Cl. 505-1.000

Sumitomo Heavy Industries, Ltd.: *See*—
Washio, Masakazu; and Kawanishi, Syun-ichi, 5,151,486, Cl. 528-124.000

Sumitomo Rubber Industries, Ltd.: *See*—
Hayashi, Nobuharu; and Tanaka, Hiroji, 5,150,744, Cl. 114-230.000.
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Takada, Yoshiyuki, 5,151,139, Cl. 152-454.000.

Sun, Xianyi: *See*—
Lee, George C.; and Sun, Xianyi, 5,151,945, Cl. 382-1.000

Sunaoka, Yoshio; Kitazato, Keisuke and Tsuda, Satoru, to Japan Organo Co., Ltd. Filtration process using hollow fiber membrane module. 5,151,191, Cl. 210-644.000.

Sundstrand Corporation: *See*—
Ransick, Thomas F., 5,150,859, Cl. 244-58.000.
Shekleton, Jack R., 5,150,570, Cl. 60-39.360
White, Robert C., 5,150,568, Cl. 60-39.310.

Sung, Chien-Min: *See*—
Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, 5,151,107, Cl. 51-295.000.

Suntory Limited: *See*—
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.

Suroff, Leonard W. Ultrasonic toothbrush. 5,150,492, Cl. 15-22.100.

Suson, Jolinda K.: *See*—
Burkhalter, John; and Suson, Jolinda K., 5,151,131, Cl. 106-822.000.

Sutter, Franz: *See*—
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.

Sutton, Christopher K.: *See*—
Lorenz, Alan S.; and Sutton, Christopher K., 5,151,972, Cl. 379-93.000.

Sutton, John P.: *See*—
Stephansky, John J.; and Sutton, John P., 5,151,200, Cl. 222-590.000.

Suwabe, Shigekazu: *See*—
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, 5,151,137, Cl. 148-313.000.

Suzue, Masayoshi: *See*—
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Suzuka, Takashi: *See*—
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi, Yasuyuki, to Ricoh Company, Ltd. Thermosensitive recording paper. 5,151,404, Cl. 503-200.000.

Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro, to Tomoegawa Paper Co., Ltd. Thermal printing medium, and label and tag incorporating the same. 5,151,40[illegible], Cl. 503-200.000.

Suzuki, Atsushi: *See*—
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl 29-603.000.

Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, to Yamaha Corporation. Musical tone control apparatus employing palmar member. 5,151,553, Cl 84-600.000.

Suzuki, Hideo, to Fujitsu Limited. Inter-LAN connection apparatus and inter-LAN connection method. 5,151,897, Cl. 370-85.130.

Suzuki, Hiroshi: *See*—
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Arai, Hideki; Kawai, Makoto; and Miyai, Kenji, 5,151,254, Cl. 422-180.000.

Suzuki, Kiyomi; and Chijiiwa, Masaru, to Pioneer Electronic Corporation. Method and apparatus for correcting the output of an onboard vehicle terrestrial magnetism sensor. 5,151,872, Cl. 364-571.050.

Suzuki, Maki: *See*—
Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000.

Suzuki, Masaki: *See*—
Ishida, Toshimichi; and Suzuki, Masaki, 5,151,008, Cl. 414-744.500.

Suzuki, Migaku: *See*—
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.

Suzuki, Shohei; and Sakuma, Isao, to Kabushiki Kaisha Toshiba. Data processing system. 5,151,982, Cl. 395-425.000.

Suzuki, Shoichi: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Suzuki, Tadashi: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Suzuki, Takanori: *See*—
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, 5,151,528, Cl. 549-31.000.

Suzuki, Tatsuyuki: *See*—
Kawaguchi, Akira; Suzuki, Tatsuyuki; and Yoshida, Michihito, 5,151,001, Cl. 414-225.000

Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, to Nippondenso Co., Ltd. Semiconductor device. 5,151,764, Cl. 357-27.000.

Svedala Industries, Inc.: *See*—
Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., 5,150,656, Cl. 104-162.000.

Svyatsky, Eduard M.; Paroubek, George; and Hegland, Frederick P., to Bell & Howell Company. Shingle device for use in multi-pass sorting machine. 5,150,891, Cl. 271-35.000.

Swanson, Roger M.: *See*—
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., 5,151,745, Cl. 355-313.000.

Swapp, Mavin C.: *See*—
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., 5,151,650, Cl. 324-158.00F.

Swars, Helmut: *See*—
Maus, Wolfgang; and Swars, Helmut, 5,150,573, Cl. 60-299.000

Swartz, Henry D., to Entwistle Corporation, The. Apparatus for bonding or melt fusing plastic and plastic matrix composite materials. 5,151,149, Cl. 156-379.800.

Swartz, Jerome: *See*—
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Sylva, Frank W.: *See*—
Bottari, Frank J.; Hanoka, Jack; and Sylva, Frank W., 5,151,386, Cl. 437-187.000.

Symbol Technologies, Inc.: *See*—
Krichever, Mark; and Metlitsky, Boris, 5,151,581, Cl. 235-467.000.
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Synermed, Inc.: *See*—
Denney, Jerry W., 5,151,370, Cl. 436-74.000.

Synthes (U.S.A.): *See*—
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.

Systems Control, Inc.: *See*—
Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., 5,151,654, Cl. 324-160.000.

Szabo, Georges; Schasfoort, Egbertus F. P.; and Milan, Alain, to Compagnie de Raffinage et de Distribution Total France. Process for the activation of halogenated catalysts and catalysts obtained by said process for utilization in hydrocarbon conversion processes. 5,151,400, Cl. 502-203.000.

Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, to Nordica S.p.A. Securing and adjuster device, particularly for ski boots. 5,150,537, Cl. 36-50.500.

Tada, Shoichiro: *See*—
Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, 5,151,700, Cl. 341-156.000.

Tadros, Sobhy, to OCG Microelectronic Materials, Inc. Selected photoactive methylolated cyclohexanol compounds and their use in radiation-sensitive mixtures. 5,151,340, Cl. 430-192.000.

Tagawa, Kenichi: *See*—
Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, 5,151,240, Cl. 264-284.000.

Tagawa, Yoichi: *See*—
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.

Taguchi, Keiichi, to Mita Industrial Co., Ltd. Sorter for stapling 5,150,889, Cl. 270-53.000.

Taguchi, Minoru, to Harada Industry Co., Ltd. Automobile antenna and method of manufacturing the same. 5,151,711, Cl. 343-715.000.

Tahara, Hideo; and Makihara, Nobuo, to Nissan Motor Co., Ltd. Supporting device for outboard motor. 5,151,058, Cl. 440-61.000

Taiwan Fu Hsing Industry Co., Ltd.: *See*—
Lin, Jui C., 5,150,592, Cl. 70-190.600.

Tajiri, Akira. Multifocal contact lens. 5,151,723, Cl. 351-161.000.

Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, to Hitachi, Ltd.; and Hitachi Taga Engineering Co., Ltd. Deceleration apparatus for motor and drive circuit for use in motor deceleration apparatus or control apparatus for use in sewing machine. 5,151,637, Cl. 318-376.000.

Takada, Yoshiyuki, to Sumitomo Rubber Industries, Ltd. Heavy duty radial tire having durable buttress portion. 5,151,139, Cl. 152-454.000.

Takagi, Makoto, to Yokohama Rubber Co., Ltd., The. Heavy-duty pneumatic radial tire. 5,151,140, Cl. 152-543.000.

Takagi, Tadashi: *See*—
Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, 5,151,664, Cl. 330-149.000.

Takagi, Yukio: *See*—
Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, 5,150,715, Cl. 128-662.060.

Takahama, Yoshihiro: *See*—
Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, 5,150,556, Cl. 52-639.000.

Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, to Nohmi Bosai Co., Ltd. Power supply control device in fire alarm system. 5,151,683, Cl. 340-518.000.

Takahashi, Toshihiro: *See*—
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor integrated circuit device. 5,151,772, Cl 357-71.000.

Takahata, Toshiya: *See*—
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.

Takai, Kazuhito; and Kimura, Yukihiro, to NEC Corporation. Device capable of modifying a character according to a selected attribute code. 5,151,954, Cl. 382-41.000.

Takaishi, Kazuhiko: *See*—
Hasegawa, Susumi; Mizoshita, Yoshifumi; and Takaishi, Kazuhiko. 5,151,639, Cl. 318-568.180.

Takaku, Masato: *See*—
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi. 5,151,457, Cl. 524-157.000.

Takamaru, Kiyomi: *See*—
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, to Shiseido Company, Ltd. Photoacoustic cell and photoacoustic measuring device. 5,151,590, Cl. 250-215.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, to Victor Company of Japan, Ltd. Method of recording color image information 5,151,781, Cl. 358-45.000

Takano, Satoshi: *See*—
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, 5,151,406, Cl 505-1.000

Takashima, Junko: *See*—
Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000

Takasugi, Shinji: *See*—
Muramatsu, Shigeki; Takasugi, Shinji; and Osato, Kazumi 5,151,658, Cl. 324-346.000.

Takatori, Naoki; and Orimoto, Masaaki, to Fuji Photo Film Co., Ltd. Image pickup device for stabilizing optical aberrations. 5,151,790, Cl. 358-225.000.

Takayama, Shinji: *See*—
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.

Takayama, Toru, to Nikon Corporation. Zoom lens barrel. 5,151,729. Cl. 354-195.120.

Takebuchi, Masataka, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device with isolated gate electrodes. 5,151,761, Cl 357-23.500.

Takechi, Kazuo: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000

Takeda Chemical Industries, Ltd.: *See*—
Goto, Jugo; Kubota, Tsutomu; Kotani, Reiichi; and Miyaji, Masuo. 5,151,454, Cl. 522-93.000.

Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, to Matsushita Electric Industrial Co., Ltd. Capacitively coupled driving method for TFT-LCD to compensate for switching distortion and to reduce driving power. 5,151,805, Cl. 359-57.000.

Takegahara, Toshiyuki: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu, Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, to Minolta Camera Kabushiki Kaisha. Device for conveying developer in a developing device. 5,151,738, Cl. 355-245.000.

Takenouchi, Hidemi: *See*—
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.

Takeshita, Sachio: *See*—
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio. 5,151,234, Cl. 264-176.100.

Takeuchi, Atsushi, to Fujitsu Limited. Optical system using spin-dependent optical nonlinearity. 5,151,589, Cl. 250-213.00A

Takeuchi, Hiroshi: *See*—
Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, 5,151,947, Cl. 382-6.000.

Takeuchi, Kouji: *See*—
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.

Takeuchi, Tatsuo; and Amemiya, Koji, to Canon Kabushiki Kaisha. Output sheet for image forming device and image forming device by use of the sheet. 5,151,313, Cl. 428-192.000

Talwar, Ashok K., to American Nucleonics Corporation. Highly directive radio receiver employing relatively small antennas. 5,152,010, Cl 455-136.000.

Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, to NTN Corporation. Grease-sealed bearing with oxide layers. 5,150,974, Cl. 384-463.000.

Tamagawa, Akio, to NEC Corporation. Oscillation stoppage detection circuit. 5,151,666, Cl. 331-64.000.

Tamai, Kiminori, to TDK Corporation. Magnetic powder for magnetic recording media and method for producing same. 5,151,115, Cl. 75-348.000.

Tamamura, Koushi; and Iwamoto, Hiroyuki, to Sony Corporation Semiconductor laser. 5,151,912, Cl. 372-46.000

Tamura, Kozaburo: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo and Isoda, Takeshi, 5,151,390, Cl. 501-95.000

Tamura, Sachio: *See*—
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, 5,151,118, Cl. 65-18.100.

Tanaka, Hideaki: *See*—
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita Yusuke, 5,150,574, Cl. 60-465.000.

Tanaka, Hiroji: *See*—
Hayashi, Nobuharu; and Tanaka, Hiroji, 5,150,744, Cl. 114-230.000.

Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, to Zexel Corporation. Air conditioning distribution system 5,151,063, Cl. 454-258.000

Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, to Kabushiki Kaisha Toshiba. Surface potential measuring system. 5,151,659, Cl. 324-458.000

Tanaka, Masaaki: *See*—
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl 123-559.300.

Tanaka, Masaru; and Ishii, Yutaka, to Sharp Kabushiki Kaisha. Input-/output display panel with light pen. 5,151,688, Cl. 340-707.000.

Tanaka, Masato: *See*—
Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato 5,151,538, Cl. 556-431.000

Tanaka, Mitsuho, to Kel Corporation. Electrical connector for repeated connection to integrated circuit grid array devices. 5,151,040, Cl 439-73.000.

Tanaka, Morimasa, to Ichikoh Industries, Ltd. Remote control switch for posture adjustment of automotive mirrors. 5,151,563, Cl. 200-6.00A.

Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo, to Sumitomo Electric Industries, Ltd. Process for preparing a-axis oriented high-temperature superconducting thin films. 5,151,408, Cl. 505-1.000

Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo, and Nakazato, Hiroshi, to Suntory Limited. Method for expressing polypeptide having anti-tumor activity. 5,151,349, Cl. 435-69.100

Tanaka, Toshihiro: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000

Tanaka, Toshizumi: *See—*
Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, 5,150,715, Cl. 128-662.060.

Tanaka, Yasundo: *See—*
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, 5,150,702, Cl. 128-6.000

Tanaka, Yoshikazu: *See—*
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,151,991, Cl. 395-700.000.

Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, to Fuji Xerox Co. Limited. Vector quantization encoder and vector quantization decoder. 5,151,968, Cl. 395-2.000

Tanaka, Yutaka: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, to Hitachi, Ltd Data display method. 5,151,974, Cl. 395-128.000.

Tanifuji, Shinya: *See—*
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl. 395-128.000

Taniguchi, Tomohiko: *See—*
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000.

Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, to Jidoshi Kiki Co., Ltd.; and Fujitsu, Ltd. Control method for electric power steering apparatus for vehicle. 5,151,860, Cl. 364-424.050.

Tanimoto, Akikazu; and Kamiya, Saburo, to Nikon Corporation. Method of and apparatus for measuring coordinate position and positioning an object. 5,151,749, Cl. 356-375.000.

Tannenbaum, Michael A., to PCI/Delwood, Inc. Device for inhibiting removal of an article from a blister type container. 5,150,793, Cl 206-531.000

Tardy, Andre : *See—*
Brehm, Claude; Boniort, Jean-Yves; Tardy, Andre ; and Com-Nougue, Jacques, 5,151,966, Cl. 395-128.000.

Tarlow, Kenneth A.: *See—*
Benveniste, Edgar R.; Tarlow, Kenneth A.; Goodman, Harold; and Benveniste, Gloria H., 5,150,953, Cl. 312-9.580.

Tashjian, Michael D. Underground pipe locating apparatus. 5,151,657, Cl 324-326.000

Tatara, Shinji; and Okayasu, Masami, to Kabushiki Kaisha Toshiba. Cycloconverter and the method of controlling the same. 5,151,853, Cl. 363-160.000.

Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, to Fuji Electric Co., Ltd. Laser therapeutic apparatus. 5,150,704, Cl. 128-395.000.

Tateishi, Megumi: *See—*
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, 5,151,276, Cl. 425-110.300.

Tatsu, Haruyoshi: *See—*
Abe, Masatoshi; and Tatsu, Haruyoshi, 5,151,492, Cl. 526-206.000.

Tatsu, Saneharu: *See—*
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.

Tayama, Suehiro: *See—*
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700

Taylor, Bruce G.: *See—*
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210-264.000

Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., to A. H. Robins Company, Incorporated. Method of treating muscular tension, muscle spasticity and anxiety with 3-aryloxy and 3-arylthioazetidinecarboxamides. 5,151,418, Cl. 514-210.000

Taylor, Colin M.: *See—*
Emerson, Terence P.; Bescoby, Frank A.; Taylor, Colin M.; and Payne, George K., 5,151,022, Cl. 423-245.300

Taylor, Donald R.: *See—*
Sedath, Robert H.; Taylor, Donald R.; and White, Lloyd S., 5,151,183, Cl. 210-500.410.

Taylor, John N.: *See—*
Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., 5,151,179, Cl. 210-250.000.

Taylor, Raymond L.: *See—*
Goela, Jitendra S.; Pickering, Michael; and Taylor, Raymond L., 5,150,507, Cl. 29-460.000

Taylor, Terrance N.: *See—*
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N., and Nagele, Albert L., 5,151,643, Cl. 320-2.000.

TDK Corporation: *See—*
Tamai, Kiminori, 5,151,115, Cl. 75-348.000.

Technical Research Associates, Inc.: *See—*
Brimhall, Owen D.; Bowers-Irons Gail A.; and Weeks, Joseph K., Jr., 5,151,368, Cl. 435-312.000.

Technion R & D Found. Ltd.: *See—*
Halmann, Menachem; Azhari, Haim; Beyar, Rafael; Sideman, Samuel; and Dinnar, Uri, 5,151,556, Cl. 364-413.030.

Techno Roll Co. Ltd.: *See—*
Nishiwaki, Hiroshi, 5,150,738, Cl. 139-420.00R

Technophone Limited: *See—*
Martensson, Nils E., 5,151,946, Cl. 379-38.000.

Tecnol Medical Products, Inc.: *See—*
Hubbard, Vance M.; and Brunson, Welton K., 5,150,703, Cl. 128-206.120

Teeple, Edward, Jr. Laser shield with indicator means. 5,151,095, Cl. 606-2.000

Tees, Alistair A.; and Kenney, Glen E., to Fina Technology, Inc. Vapor recovery system for vehicle loading operation. 5,151,111, Cl. 55-164.000

Tegth, Ulf: *See—*
Gunmar, Krister; and Tegth, Ulf, 5,151,704, Cl. 342-360.000.

Tektronix, Inc.: *See—*
Hadwin, Matthew J., 5,151,775, Cl. 357-80.000.

Telemecanique: *See—*
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.

Telettra S.p.A.: *See—*
Vidimari, Fabio; and Pellegrino, Sergio, 5,151,914, Cl. 372-46.000.

Televerket: *See—*
Gunmar, Krister; and Tegth, Ulf, 5,151,704, Cl. 342-360.000.

Temay S.p.A.: *See—*
Contursi, Luigi; and Beaulardi, Leandro, 5,151,260, Cl 423-412.000.

Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, to Synthes (U.S.A.). Point contact bone compression plate. 5,151,103, Cl. 606-69.000.

Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, to Fuji Photo Film Co. Ltd. Process for preparing a silver halide emulsion. 5,151,346, Cl. 430-546.000.

Teramoto, Takayuki: *See—*
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.

Terao, Hidetoshi: *See—*
Miyazawa, Kenji; and Terao, Hidetoshi, 5,150,958, Cl. 362-66.000.

Terashi, Kozo; and Oba, Toshio, to Kabushiki Kaisha Toshiba. Therapeutic bed of radiotherapeutic system. 5,151,931, Cl. 378-65.000.

Terex Corporation: *See—*
Fujan, Steven J.; and Loeber, Frederick W., 5,150,942, Cl. 296-190.000.

Terumo Kabushiki Kaisha: *See—*
Nakamura, Hideki, 5,151,603, Cl. 250-458.100.

Teschendorf, Hans-Juergen: *See—*
Schlecker, Rainer; Teschendorf, Hans-Juergen; and Unger, Liliane, 5,151,437, Cl. 514-320.000.

Teshima, Nobue: *See—*
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.

Texaco Chemical Company: *See—*
Marquis, Edward T.; Sanderson, John R.; and Meyer, Robert A., 5,151,530, Cl. 549-529.000

Texaco, Inc.: *See—*
Campbell, Teddy G., 5,150,730, Cl. 137-364.000.
Culpon, Douglas H., Jr., 5,151,205, Cl. 252-56.00R.

Texas Instruments Incorporated: *See—*
Gill, Manzur; and McElroy, David J., 5,151,760, Cl. 357-23.500.
Hynecek, Jaroslav, 5,151,380, Cl. 437-53.000.
Mydill, Marc R.; and O'Keefe, Sheila, 5,151,903, Cl. 371-27.000.
Nelson, William E., 5,151,718, Cl. 346-160.000.
Schreck, John F.; and Truong, Phat C., 5,151,880, Cl. 365-201.000.

Thames Water Utilities Limited: *See—*
Smith, Alan J.; and Quinn, Jennifer J., 5,151,197, Cl. 210-758.000.

Thayer, Edward B.: *See—*
Cockerham, Jefre H.; and Thayer, Edward B., 5,150,862, Cl. 244-110.00B

Theeuwes, Felix; and Yum, Su I., to Alza Corporation. Osmotically driven syringe with programmable agent delivery. 5,151,093, Cl. 604-892.100.

Theissing, Gerhard: *See—*
Damman, Martin; and Theissing, Gerhard, 5,151,064, Cl. 460-23.000.

Theobald, Hans: *See—*
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000

Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Freight car for bulk material. 5,151,002, Cl. 414-339.000.

Thijs, Petrus J. A.; and Tiemeijer, Lukas F., to U.S. Philips Corp. Semiconductor optical amplifier. 5,151,818, Cl. 359-344.000.

Thinking Machines Corporation: *See—*
Hillis, Daniel W., 5,152,000, Cl. 395-800.000.
Hillis, W. Daniel, 5,151,996, Cl. 395-800.000

Thiokol Corporation: *See—*
Grosgebauer, Roger A.; and White, C. Max, 5,150,654, Cl. 102-202.000.

Thomas, Charles L.: *See—*
Bur, Anthony J.; Lowry, Robert E.; Roth, Steven C.; Thomas, Charles L.; and Wang, Francis W., 5,151,748, Cl. 356-32.000.

Thomas, Robert E.; Varghese, George; Souza, Robert J.; and Harvey, George A., to Digital Equipment Corporation. Tracking sequence numbers in packet data communication system. 5,151,899, Cl. 370-94.100.

Thompson, Duncan C. Weather resistant, fire retardant preservative and protective compositions for the treatment of wood and cellulose products. 5,151,127, Cl. 106-15.050.

Thompson, Ian R.: *See—*
McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., 5,150,836, Cl. 239-5.000.

Thomson-CSF: *See—*
Couturier, Alain, 5,151,802, Cl. 359-51.000
Nicolas, Christophe, 5,151,825, Cl. 359-634.000.

Thornthwaite, John B.; and Naismith, Robert, to Games Workshop Limited. Injection moulding process. 5,151,232, Cl. 264-130.000.

Thoroughman, Glenn R. Keyway broach guide assembly. 5,150,996, Cl. 409-259.000

Thrower, Craig S.; and Wang, King C., to Vitelic Corporation. CMOS logic circuit with output coupled to multiple feedback paths and associated method. 5,151,622, Cl. 307-475.000

Thunderbird Technologies, Inc.: *See—*
Vinal, Albert W., 5,151,759, Cl. 357-23.300.

Thuries, Edmond, to GEC Alsthom SA. Circuit breaker control apparatus. 5,151,567, Cl. 200-148.00F.

Tice, Robert J., Jr.: *See—*
Eitner, Joseph G., Jr.; and Tice, Robert J., Jr., 5,150,822, Cl 222-145.000

Tiemeijer, Lukas F.: *See—*
Thijs, Petrus J. A.; and Tiemeijer, Lukas F., 5,151,818, Cl 359-344.000.

Tinsley, Timothy M.: *See—*
Adams, John T.; and Tinsley, Timothy M., 5,151,854, Cl 364-184.000.

Titan Corporation, The: *See—*
Reiner, Thomas C.; Lindsey, Mark J.; and Kelkar, Krishnanand, 5,151,904, Cl. 371-43.000

Titchener, Paul F.: *See—*
Newman, William C.; Titchener, Paul F.; and Powell, Douglas B., 5,151,984, Cl. 395-500.000.

TMC Corporation: *See—*
Hoelzl, Klaus, 5,150,913, Cl. 280-612.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Tobita, Hideyuki: *See—*
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Tobita, Minoru: *See—*
Yokono, Shigeru; and Tobita, Minoru, 5,151,905, Cl. 371-39.100

Tod, Michel: *See—*
Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, 5,151,517, Cl. 546-66.000.

Toda, Atsushi: *See—*
Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, 5,151,631, Cl. 315-127.000.

Togai, Kazuhide: *See—*
Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, 5,151,861, Cl. 364-426.020

Togawa, Fumio: *See—*
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio; and Aramaki Takashi, 5,151,951, Cl. 382-19.000.

Tohyama, Noboru: *See—*
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl 346-1.100.

Tokairin, Shigeru; and Nishimaki, Tetsuo, to Nisshin Flour Milling Co., Ltd.; and Tsukishima Foods Co., Ltd. Glycerides of eicosapentaenoic acid, processes for preparing the same and oil and fat products containing the same. 5,151,291, Cl. 426-581.000.

Toki, Shigeyuki: *See—*
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000

Tokuda, Shoichi: *See—*
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.

Tokui, Yasuyuki: *See—*
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl 273-218.000

Tokunaga, Hiroyuki, to Canon Kabushiki Kaisha. Method for forming polycrystalline film by chemical vapor deposition process. 5,151,296, Cl. 427-38.000.

Tokunaga, Katsushi: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.

Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, to Canon Kabushiki Kaisha. Focus adjustment device having restricting means for restricting a selecting action according to the degree of nearness of a distance measurement 5,151,583, Cl. 250-201.200.

Tokyo Electric Co., Ltd.: *See—*
Yamaguchi, Yasuyoshi, 5,151,742, Cl. 355-285.000.

Tokyo Electron Kyushu Limited: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000

Tokyo Electron Limited: *See—*
Kaneko, Satoshi, 5,150,882, Cl. 251-193.000.
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000
Shibata, Junichirou, 5,150,797, Cl. 209-573.000.
Shibata, Junichirou, 5,151,651, Cl. 324-158.00P.

Tokyo Electron Yamanashi Limited: *See—*
Shibata, Junichirou, 5,150,797, Cl. 209-573.000
Shibata, Junichirou, 5,151,651, Cl. 324-158.00P

Tokyo Tanabe Company, Limited: *See—*
Murakami, Kiyokazu; and Yokura, Susumu, 5,151,450, Cl 514-690.000

Tokyo Tatsuno Co., Ltd.: *See—*
Motohashi, Toshiaki; Harada, Yooichi; and Yanagihara, Tsuyoshi, 5,150,742, Cl. 141-59.000

Tom, Glenn M., to Novapure Corporation. Bulk gas sorption and apparatus, gas containment/treatment system comprising same, and sorbent composition therefor. 5,151,395, Cl. 502-67.000.

Tomasov, Glenn E.; and Schmidt, Annette M., to General Motors Corporation. Method and apparatus for detecting low refrigerant charge. 5,150,584, Cl. 62-209.000.

Tomoe Technical Research Co.: *See—*
Jiro, Kamezawa, 5,150,731, Cl. 137-375.000.

Tomoegawa Paper Co., Ltd.: *See—*
Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro 5,151,403, Cl. 503-200.000

Toray Industries, Inc.: *See—*
Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio 5,151,322, Cl. 428-303.000

Torii, Nobutoshi; and Wakio, Hiroshi, to Fanuc Ltd. Optical distance sensor using a laser beam and processing means. 5,151,608, Cl. 250-561.000

Toso Susteel Co., Ltd.: *See—*
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara Kensuke, 5,151,495, Cl. 528-388.000.

Tosoh Corporation: *See—*
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara Kensuke, 5,151,495, Cl. 528-388.000
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, 5,150,821, Cl. 222-132.000

Toto Ltd.: *See—*
Watanabe, Toshiya; and Kitabayashi, Tetsuo, 5,151,845, Cl. 361-234.000

Tour-Mate Systems Canada Limited: *See—*
Poch, Neil, 5,152,003, Cl. 455-18.000.

Towner, Mark E.: *See—*
Salamy, Thomas E.; Love, Marvin L., Jr.; and Towner, Mark E 5,151,219, Cl. 252-364.000.

Townsend, Peter K.: *See—*
Fusselman, David F.; and Townsend, Peter K., 5,151,036, Cl 439-108.000

Toyoda, Eiji: *See—*
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000.

Toyoda Gosei Co., Ltd.: *See—*
Fujita, Yoshiyuki; and Sakane, Katsunobu, 5,150,920, Cl 280-777.000

Toyoda, Takashi: *See—*
Yamada, Minoru; and Toyoda, Takashi, 5,151,731, Cl. 354-324.000

Toyoshi, Naoki: *See—*
Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, 5,151,738, Cl 355-245.000.

Toyoshima, Isao: *See—*
Noto, Kazuyuki; and Toyoshima, Isao, 5,151,672, Cl. 333-189.000

Toyota Jidosha Kabushiki Kaisha: *See—*
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl 123-559.300
Okawa, Koji; and Norota, Kazuhiko, 5,150,686, Cl. 123-698.000
Shamoto, Sumikazu, 5,151,641, Cl. 318-762.000

Tozu, Kenji: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; and Tozu, Kenji, 5,150,952, Cl. 303-109.000

Trahan, Paul A.: *See—*
Maher, David L.; Rodriquez, Calista M.; and Trahan, Paul A 5,151,556, Cl. 89-35.010

Trainor, George L.: *See—*
Hobbs, Frank W., Jr.; and Trainor, George L., 5,151,507, Cl 536-23.000.

Tran, Dung Q.: *See—*
Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., 5,151,546, Cl. 560-130.000

Treybig, Duane S.; Wang, David S.; Sheih, Pong S.; and Ho, Loan A., to Dow Chemical Company, The. Advanced epoxy compositions, curable compositions and cured products. 5,151,485, Cl. 528-87.000

Troilo, Joseph A., Jr.: *See—*
Davis, Archie B.; and Troilo, Joseph A., Jr., 5,151,150, Cl 156-384.100.

Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., to General Motors Corporation. System for controlling air supply pressure in a pneumatic direct fuel injected internal combustion engine. 5,150,692, Cl. 123-533.000.

Trommer, Gert: *See—*
Buhler, Wolfhardt; Poisel, Hans; and Trommer, Gert, 5,150,956, Cl 356-350.000

Troncoso, Vincent F., to Golden Key Fusara, Inc. Archery bow assembly. 5,150,700, Cl. 124-44.500.

Trowbridge, Christian A.: *See—*
Kofsky, Irving L.; and Trowbridge Christian A., 5,151,746, Cl 356-1.000

Troxell, John R., to General Motors Corporation. Flat panel emissive display with redundant circuit. 5,151,612, Cl. 315-169.100.

Troxler Electronic Laboratories, Inc.: *See—*
Regimand, Ali, 5,151,601, Cl. 250-391.040.

True Pitch, Inc.: *See—*
Kviesitis, Boris, 5,151,123, Cl. 106-2[illegible]7.170.

Trunk, Reinhard: *See—*
Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, 5,150,688, Cl. 123-5[illegible]6.000.

Truong, Hieu C.; and Dilay, Maria, to Royal Canadian Mint. Coins coated with nickel, copper and nickel and process for making such coins. 5,151,167, Cl. 205-102.000.

Truong, Phat C.: *See—*
Schreck, John F.; and Truong, Phat C., 5,151,880, Cl. 365-201.000.

Tsuda, Hiroshi: *See—*
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000

Tsuda, Satoru: *See—*
Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, 5,151,191, Cl. 210-644.000.

Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, to Canon Kabushiki Kaisha. Process cartridge detachably mountable to image forming apparatus featuring a peripherally supported image bearing drum. 5,151,734, Cl. 355-200.000.

Tsu, Pui-Hing. Joy light structure. 5,150,964, Cl. 362-251.000.

Tsujimoto, Masafumi: *See—*
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.

Tsukada, Toshihisa: *See—*
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Tokairin, Shigeru; and Nishimaki, Tetsuo, 5,151,291, Cl. 426-581.000.

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Ueno, Ryuji: *See—*
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Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.

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Cook-Martin, David M., 5,150,883, Cl. 251-367.000.

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Air Force: *See—*
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Ryan, David M., 5,151,335, Cl. 429-223.000.
America: *See—*
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Army: *See—*
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Bracuti, Arthur J.; and Bottei, Louis A., 5,151,557, Cl 102-435.000
Hsu, Fu-Lian; and Ashman, William P., 5,151,526, Cl. 548-335.000
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Energy: *See—*
Schwarz, Ricardo B.; and Kuokkala, Veli-Tapani, 5,150,617, Cl. 73-579.000.
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Pemsler, J. Paul; and Litchfield, John K., 5,151,262, Cl 423-561.100.
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Bergmans, Johannes W. M., 5,151,891, Cl. 369-59.000.
Chapman, David M., 5,151,780, Cl. 358-21.00R.
Gelin, Benoit; and Lebourg, Michel, 5,151,925, Cl. 375-82.000.
Josquin, Wilhelmus J. M. J.; Peters, Wilhelmus C. M.; and Van De Goor, Albertus T. M., 5,151,382, Cl. 437-74.000.
Jousselin, Christian P. M.; and Duranton, Marc A. G., 5,151,971, Cl. 395-27.000
Kuijk, Karel E., 5,151,691, Cl. 340-784.000.
Politiek, Jarig; and Ligthart, Henricus J., 5,151,605, Cl 250-492.200.
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Thijs, Petrus J. A.; and Tiemeijer, Lukas F., 5,151,818, Cl 359-344.000
Van Nes, Johannes C. A.; and Penninga, Johannes, 5,151,627, Cl 313-477.00R.
Verhulst, Antonius G. H.; Hartmann, Wilbert J. A. M.; Stommels, Franciscus J.; and Luyckx-Smolders, Ann M. M., 5,151,804, Cl 359-56.000.

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Cockerham, Jefre H.; and Thayer, Edward B., 5,150,862, Cl. 244-110.00B.
Moffitt, Robert C.; and Owen, Stephen J., 5,150,857, Cl. 244-12.200
Moore, Jerry H., 5,151,013, Cl. 416-221.000.
Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, 5,151,171, Cl. 208-48.00Q.

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University of New Mexico: *See—*
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Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick David, 5,151,267, Cl. 424-89.000.

University of Washington, Board of Regents of the: *See—*
Bunton, Suzanne, 5,151,697, Cl. 341-51.000.

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Uno, Yoshio: *See—*
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Johnson, Kenneth L.; and Updike, William A., 5,150,572, Cl 60-272.000

Urasaki, Shuji: *See—*
Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, 5,151,664, Cl. 330-149.000.

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Fuchikami, Takamasa; and Urata, Hisao, 5,151,535, Cl. 554-226.000.

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Uytterhoeven, Herman J.: *See—*
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Brown, Charles R.; and Wilding, Peter, 5,151,451, Cl. 514-773.000.
Norton, Ian T.; and Underdown, Jeffrey, 5,151,290, Cl 426-576.000.
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van Driest, Hans: *See—*
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Venet, Marc G.; Sanz, Gerard C.; Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., to Janssen Pharmaceutica N.V. (1H-azol-1-ylmethyl) substituted quinoxaline derivatives. 5,151,421, Cl. 514-249.000.

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Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., 5,151,201, Cl. 222-600.000.

Vetter, Walter: *See—*
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Victor Company of Japan, Ltd.: *See—*
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Visser, John A.: *See—*
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Webber, Roy A.: *See—*
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Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., to Fisher & Paykel Limited. Laundry machine. 5,150,589, Cl. 68-23.700.

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Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Yajima, Makoto: *See—*
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000.

Yajima, Ryoichi: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Yakou, Takeshi, to Canon Kabushiki Kaisha. Work pickup apparatus. 5,150,937, Cl. 294-119.100.

Yakushiji, Yasuhiro: *See—*
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Yamada, Minoru; and Toyoda, Takashi, to Fuji Photo Film Co., Ltd. Processing solution replenishment. 5,151,731, Cl. 354-324.000.

Yamada, Tamotsu: *See—*
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, 5,151,248, Cl. 420-35.000.

Yamada, Toshio; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device. 5,151,878, Cl. 365-189.010.

Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, to Shimizu Construction Co. Chord truss roof structure. 5,150,556, Cl. 52-639.000.

Yamada, Yasutoshi: *See—*
Akagi, Motonobu; Oota, Nobuyuki; and Yamada, Yasutoshi, 5,150,697, Cl. 123-643.000.

Yamada, Yoshikado: *See—*
Kunikawa, Norihide; Yamada, Yoshikado; Mori, Yoshiteru; and Matsuo, Toshihisa, 5,150,890, Cl. 271-9.000.

Yamagami, Hiroyuki: *See—*
Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, 5,151,346, Cl. 430-546.000.

Yamagishi, Mamio, to Hitachi, Ltd. Intersystem data base sharing journal merge method. 5,151,988, Cl. 395-600.000.

Yamaguchi, Chizo: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000.

Yamaguchi, Hiroshi: *See—*
Uenishi, Akio; Yamaguchi, Hiroshi; and Fukumochi, Yasuaki, 5,151,762, Cl. 357-23.400.

Yamaguchi, Shuichiroh: *See—*
Idaka, Yukio; Yamaguchi, Shuichiroh; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, 5,151,602, Cl. 250-551.000.

Yamaguchi, Yasuyoshi, to Tokyo Electric Co., Ltd. Fixing device sheet guide apparatus. 5,151,742, Cl. 355-285.000.

Yamaha Corporation: *See—*
Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, 5,151,553, Cl. 84-600.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Jun, Taue, 5,150,684, Cl. 123-446.000.
Kobayashi, Noboru, 5,150,663, Cl. 116-209.000.
Kobayashi, Noboru; and Futaki, Yoshiki, 5,151,057, Cl. 440-38.000.

Yamahata, Hitoshi, to NEC Corporation. Data processor performing operation on data having length shorter than one-word length. 5,151,993, Cl. 395-775.000.

Yamamoto, Akio. Rail support adjusting and fastening device. 5,150,835, Cl. 238-50.000.

Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, to Hitachi, Ltd. Method of manufacturing a metallic silicide transparent electrode. 5,151,385, Cl. 437-181.000.

Yamamoto, Hiroshi; and Hanato, Mitsuhiro, to Fuji Kikai Kogyo Kabushiki Kaisha; and Dainippon Ink and Chemicals, Inc. Device for pushing printing material for use in a printing apparatus. 5,150,652, Cl. 101-232.000.

Yamamoto, Ichiro: *See—*
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Yamamoto, Masahiro: *See—*
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.

Yamamoto, Masanobu; and Itoh, Kazumine, to Sony Corporation. Method and apparatus for producing three-dimensional objects. 5,151,813, Cl. 359-202.000.

Yamamura, Souhei, to Matsushita Electric Industrial Co., Ltd. Headrest and mobile body equipped with same. 5,151,944, Cl. 381-151.000.

Yamanaka, Motosuke: *See—*
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Yamanashi, Hidenori, to Mitsubishi Corporation; and Yazaki Corporation. Method of producing bromine-treated graphite fibers. 5,151,261, Cl. 423-448.000.

Yamanashi, Yasuhiro: *See—*
Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro, 5,151,403, Cl. 503-200.000.

Yamasaki, Koji, to NEC Corporation. Speaker driver. 5,151,680, Cl. 340-384.00E.

Yamasaki, Koji, to NEC Corporation. Paging receiver capable of preventing unauthorized access to message meant therefor. 5,151,694, Cl. 340-825.440.

Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, to Matsushita Electric Industrial Co., Ltd. Optical data recording and reproducing apparatus. 5,151,893, Cl. 369-116.000.

Yamashita, Hiroki; and Emori, Kiyoshi, to Minolta Camera Kabushiki Kaisha. Sheet storing apparatus with a plurality of trays. 5,151,735, Cl. 355-207.000.

Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, to Aisin AW Co., Ltd. Wiring and piping arrangement for a vehicle motor. 5,150,763, Cl. 180-252.000.

Yamashita, Yoshiro: *See—*
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Yamauchi, Kiyotaka: *See—*
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Yamauchi, Tunenori, to Fujitsu Limited. Semiconductor device comprising high-speed and high-current transistors formed in a common substrate and having matched characteristics. 5,151,765, Cl. 357-34.000.

Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Circuit having charge compensation and an operation method of the same. 5,151,614, Cl. 307-272.300.

Yamazaki, Atsushi, to NEC Corporation. Buffer control circuit for data processor. 5,151,980, Cl. 395-375.000.

Yamazaki, Etsuo: *See—*
Iehisa, Nobuaki; and Yamazaki, Etsuo, 5,151,916, Cl. 372-61.000.

Yamazaki, Katsunori, to Seiko Epson Corporation. Method and apparatus for driving a liquid crystal display panel. 5,151,690, Cl. 340-784.000.

Yamazaki, Shiro: *See—*
Arahori, Hideo; Yamazaki, Shiro; Arahira, Masato; and Murakami, Aiko, 5,151,114, Cl. 71-92.000.

Yamazaki, Shunpei; and Sato, Masahiko, to Semiconductor Energy Laboratory Co., Ltd. Chiral smectic liquid crystal electro-optical device having domains for alignment smaller than a pixel. 5,151,808, Cl. 359-78.000.

Yanagihara, Tsuyoshi: *See—*
Motohashi, Toshiaki; Harada, Yooichi; and Yanagihara, Tsuyoshi, 5,150,742, Cl. 141-59.000.

Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, to Pioneer Electronic Corporation; and Nitto Denko Corporation. Information recording medium. 5,151,310, Cl. 428-64.000.

Yanagita, Tomoatsu: *See—*
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000.

Yanase, Nobuyuki: *See—*
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.

Yang, Lau S., to Arco Chemical Technology, L.P. Miscible polyblends of acid-and anhydride-containing copolymers. 5,151,464, Cl. 524-449.000.

Yano, Hirofumi; and Yokoi, Seiji, to Nissan Motor Co., Ltd. Fuel tank vapor control system with means for warning of malfunction of canister. 5,150,689, Cl. 123-519.000.

Yano, Kazuyuki: *See—*
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Yasuda, Akihiro: *See—*
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.

Yasumoto, Hiroshige: *See—*
Hayafune, Koji; Naemura, Shinichi; Yasumoto, Hiroshige; and Amemiya, Hideo, 5,151,463, Cl. 524-430.000.

Yates, John B., III; Pratt, Charles F.; and McHale, Angelika H., to General Electric Co. Olefinic impact modifiers for compatible blends of polyphenylene ethers and linear polyester resins. 5,151,460, Cl. 524-291.000.

Yazaki Corporation: *See—*
Shinji, Yasuhisa; Hasegawa, Toshiaki; Akune, Shinichi; and Sakuhara, Hirohiko, 5,151,053, Cl. 439-610.000.
Yamanashi, Hidenori, 5,151,261, Cl. 423-448.000.

Yee, Jimmy: *See—*
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Ying, Gu Z.: *See—*
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Yokohama Rubber Co., Ltd., The: *See—*
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Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, to Bridgestone Flowtech Corporation. Hose fitting. 5,150,924, Cl. 285-101.000.

Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, to Bridgestone Flowtech Corporation. Hose fitting. 5,150,925, Cl. 285-101.000.

Yokono, Shigeru; and Tobita, Minoru, to Sony Corporation. Data recording method. 5,151,905, Cl. 371-39.100.

Yokosuka, Toshie, to Kimoto Co., Ltd. Masking material. 5,151,336, Cl. 430-7.000.

Yokoyama, Kazumasa: *See—*
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000.

Yokoyama, Naoki; and Imamura, Kenichi, to Fujitsu Limited. Resonant-tunneling heterojunction bipolar transistor device. 5,151,618, Cl. 307-471.000.

Yokoyama, Takanori: *See—*
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Yonekubo, Masatoshi, to Seiko Epson Corporation. Optical system for optical memory device. 5,151,890, Cl. 369-44.110.

Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., to SKC Limited. Method for cleaning filter disks and system therefor. 5,151,186, Cl. 210-541.000.

Yoppolo, Robert A.: *See—*
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York Products Inc.: *See—*
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Yoshida, Michihito: *See*—
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Yoshida, Narutaka: *See*—
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Yoshida, Suguru; Tsunoda, Isao; and Suno, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Joint structure for sandwiched structural body. 5,150,944, Cl. 296-203.000

Yoshida, Tsuyoshi: *See*—
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Yoshii, Makoto: *See*—
Miyata, Shigeo; and Yoshii, Makoto, 5,151,455, Cl. 523-200.000.

Yoshikawa, Junichi, to Canon Kabushiki Kaisha. Recording apparatus with detector for paper edge and end of ribbon sensing. 5,150,977, Cl. 400-703.000

Yoshikawa, Takao; and Masuda, Isao to Sony Corporation. Video signal reproducing apparatus with means for producing a crosstalk eliminated luminance output signal. 5,151,792, Cl. 358-327.000.

Yoshikawa, Toshiyuki: *See*—
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.

Yoshimitsu, Koichi: *See*—
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Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, to Honda Giken Kogyo Kabushiki Kaisha. Legged walking robot and system for controlling the same. 5,151,859, Cl. 364-424.020.

Yoshioka, Hiroshi: *See*—
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Yoshioka, Kazumi: *See*—
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Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu to Hitachi Metals Ltd. Soft magnetic alloy with ultrafine crystal grains and method of producing same. 5,151,137, Cl. 148-313.000.

Yoshotomi Pharmaceutical Industries, Ltd.: *See*—
Uchida, Itsuo; Saito, Akira; Yasuoka, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000

Yotsumoto, Toshihiro: *See*—
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You, Young S.; and Meyer, John D., to Hewlett-Packard Company Solid ink compositions for thermal ink-jet printing having improved printing characteristics. 5,151,120, Cl. 106-27.000.

Young, Manley A., to Boeing Company, The. Air vehicle launching device. 5,150,860, Cl. 244-63.000.

Young, Michael J. R.; and Bradnock, Brian R. D. Tool for removal of plastics material. 5,151,099, Cl. 606-7.000

Young, Patrick, to Insight Telecast, Inc. System and method for automatic, unattended recording of cable television programs. 5,151,789, Cl. 358-194.100

Younger, George G. Apparatus for logging electronic media-taped material. 5,151,687, Cl. 340-706.000

Yu, Frank L.: *See*—
Shenoi, Kishan; Hanagan, Patrick ...; Ho, Helena S.; and Yu, Frank L., 5,151,901, Cl. 370-110.100.

Yuan, Gu F.; Yuen, Kou M.; Wei, Zhao Q.; and Ying, Gu Z., to Neng-Shi (Hong Kong) Industrial Co. Multifunctional tool. 5,150,488, Cl. 7-137.000

Yuasa, Toshiya: *See*—
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.

Yuen, Kou M.: *See*—
Yuan, Gu F.; Yuen, Kou M.; Wei, Zhao Q.; and Ying, Gu Z., 5,150,488, Cl. 7-137.000.

Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, to Asics Corporation; and Otsuka Chemical Company, Limited. Rubber composition and golf ball comprising it. 5,150,905, Cl. 273-218.000.

Yum, Su I.: *See*—
Theeuwes, Felix; and Yum, Su I., 5,151,093, Cl. 604-892.100.

Yumoto, Atsushi: *See*—
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.

Yun, Chung J., to Crown Cork & Seal Company, Inc. Filling valve. 5,150,740, Cl. 141-6.000

Yutori, Toshiaki; and Kanetsuki, Yutaka, to Kabushiki Kaisha Kobe Seiko Sho. Inspection probe having thin metal wires with self resiliency. 5,151,653, Cl. 324-158.00P.

Zabinski, Thomas E.: *See*—
Hales, Crispin; and Zabinski, Thomas E., 5,151,303, Cl. 427-178.000.

Zaha, Juergen H.: *See*—
Best, Robert J.; Larkin, Mark E.; and Zaha, Juergen H., 5,151,090, Cl. 604-192.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, 5,151,068, Cl. 475-322.000.

Zak, Henry C.: *See*—
Bell, Jack H.; Zak, Henry C.; and De Santis, Dominick A., 5,151,212, Cl. 252-186.380.

Zamb, Tim: *See*—
Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, 5,151,267, Cl. 424-89.000

Zaoralek, Heinz-Michael, to Schwabische Huttenwerke GmbH. Roll having heating means. 5,151,576, Cl. 219-469.000.

Zappella, Pierino I., to Rockwell International Corporation. Method for dicing semiconductor substrates using an excimer laser beam 5,151,389, Cl. 437-226.000

Zarabadi, Seyed R.; El-Naggar, Mohammed I.; and Khachab, Nabil I., to Ohio State University, The. High frequency BiMOS linear V-I converter, voltage multiplier, mixer. 5,151,625, Cl. 307-529.000.

Zeindl, Gerhard: *See*—
Schweitzer, Karl; and Zeindl, Gerhard, 5,150,530, Cl. 33-626.000.

Zenith Electronics Corporation: *See*—
Citta, Richard W., 5,151,785, Cl. 358-141.000.

Zenon Environmental, Inc.: *See*—
Behmann, Henry, 5,151,187, Cl. 210-607.000

Zeuschner, Ulrich: *See*—
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Zexel Corporation: *See*—
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000.

Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., to Hoechst Celanese Corporation. Method for purification of ibuprofen comprising mixtures. 5,151,551, Cl. 562-494.000.

Zhao, Chen: *See*—
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.

Ziemecki, Stanislaw B., to Du Pont de Nemours, E. I., and Company. Selective low pressure hydrogenation of a dinitrile to an aminonitrile 5,151,543, Cl. 558-459.000.

Zimmer, Johannes. Arrangement for applying substances to a web of material. 5,151,132, Cl. 118-126.000.

Zimmerman, Jeffrey M.: *See*—
Gubanc, David M.; Liston, Larry J.; and Zimmerman, Jeffrey M., 5,151,258, Cl. 423-235.000.

Zorn, Bruno: *See*—
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400.

Zorzi, Claudio: *See*—
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500

Zschoche, Robert A., to Paulson, Eric W. Universal aircraft nosewheel cradle and tug assembly. 5,151,003, Cl. 414-428.000.

Zwikstra, Nico, to Van den Bergh Foods Co., Division of Conopco Inc. Fatblend and process of producing. 5,151,292, Cl. 426-601.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Burndy Corporation: *See*—
Noschese, Rocco J., Re. 34,084, Cl. 439-66.000.

Canon Kabushiki Kaisha: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi. Re. 34,083, Cl. 354-173.110.

Chasteen, Ronald E.: *See*—
Gatza, Ward K.; and Chasteen, Ronald E., Re. 34,079, Cl 123-632.000.

Gatza, Ward K.; and Chasteen, Ronald E., to Pacer Industries Inc. Method and apparatus for conserving battery power in a snowmobile electrical system. Re. 34,079, Cl. 123-632.000.

Greene, Leonard M., to Safe Flight Instrument Corporation. Variable threshold wind shear warning system. Re. 34,082, Cl. 340-968.000

Harada, Yoshihito: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi. Re. 34,083, Cl. 354-173.110.

Hesseltine, Dennis R. Method and means for measuring plate structures Re. 34,078, Cl. 33-803.000

Imperial Chemical Industries: *See*—
Rose, John B., and Staniland, Philip A., Re. 34,085, Cl 528-125.000

Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Camera with motorized film rewinding device Re. 34,083, Cl. 354-173.110.

Kobayashi, Ryuichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi Re. 34,083, Cl. 354-173.110.

Lucero, James L. Drive-through credit card payment device Re. 34,081, Cl. 235-381.000.

New Tek Manufacturing, Inc.: *See*—
Schmidt, Eugene H., Re. 34,080, Cl. 172-5.000.

Noschese, Rocco J., to Burndy Corporation. Vertical action contact spring. Re. 34,084, Cl. 439-66.000

Ohara, Tsunemasa: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi Re. 34,083, Cl. 354-173.110.

Pacer Industries Inc.: *See*—
Gatza, Ward K.; and Chasteen, Ronald E., Re. 34,079, Cl. 123-632.000

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Winder, Thelma C., to Winder, Thelma C. Glove for a transit card. 329,926, 9-29-92, Cl. D29-22.000
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Beaver, Theodore L.; Pinson, Diane J.; and Wissman, Craig A., 329,815, Cl. D9-528.000
Beaver, Theodore L.; Pinson, Diane J.; and Wissman, Craig A., 329,816, Cl. D9-528.000
Wolff, Douglas F.: *See—*
Foster, Donald D.; and Wolff, Douglas F., 329,802, Cl. D9-300.000.
Wong, Joseph F., to Motor Electric Mfg. C., Ltd. Ice cream scoop. 329,784, 9-29-92, Cl. D7-681.000
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Woodrum, Byron: *See—*
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Wyatt Technology Corporation: *See*—
Wyatt, Philip J.; and Shuck, Richard F., 29,821, Cl. D10-103.000.
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Yamaguchi, Tetsuo: *See*—
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Yamanashi, Makoto, 329,841, Cl. D13-147.000.
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Watanabe, Kenji; Kameda, Takanobu; Yokota, Hideto; Yamaguchi, Tetsuo; Yamaguchi, Tomoyuki; Taniguchi, Yuichiro; and Yamaguchi, Atsuko, 329,862, Cl. D16-208.000.
Yoo, Seon I., to Goldstar Co., Ltd. Portable cassette tape recorder. 329,851, 9-29-92, Cl. D14-165.000.
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Hanasaki, Yoshio; Sawatani, Masaharu; and Yoshida, Toshiya, 329,870, Cl. D18-55.000.
Yost, Holly K., to Emhart Inc. Faucet knob. 329,911, 9-29-92, Cl. D23-250.000.
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Jahn, Gerhard, 329,919, Cl. D26-77.000.

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Strahle, Robert, to Carlton Rose Nurseries, Inc. Floribunda rose plant Carale. 7,988, 9-29-92, Cl. 15.000.
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Terra Nigra BV: *See*—
Stravers, Lambertus J. M., 7,991, Cl. 68.100.
Weeks Wholesale Rose Grower, Inc.: *See*—
Carruth, Thomas F., 7,986, Cl. 7.100.
Yoder Brothers, Inc.: *See*—
Hesse, Peter S., 7,992, Cl. 78.000
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 29, 1992

NOTE—First number, class; second number, subclass; third number, patent number

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93 5,150,476
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252.3 5,150,480
300.3 5,150,481
562.1 5,150,482

CLASS 5

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417 5,150,485
460 5,150,486
625 5,150,487

CLASS 7

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CLASS 8

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CLASS 12

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159.1 5,150,494
167.1 5,150,495
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250.42 5,150,498
327.1 5,150,499

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272 5,150,501

CLASS 19

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CLASS 24

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603 5,150,511
5,150,512
623.2 5,150,602
798 5,150,513
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888.04 5,150,517
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890.14 5,150,519

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382 5,150,524

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18.1 5,150,525
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244 5,150,528
503 5,150,529
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5,150,535

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7.10 R 5,150,536
50.5 5,150,537

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387 5,1 1,116

CLASS 56

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102 5,1 0,565

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58.83 5,1 0,566

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39.31 5,1 0,568
39.36 5,1 0,570
200.1 5,1 0,571
272 5,1 0,572
299 5,1 0,573
465 5,1 0,574
547.1 5,1 0,575

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47.1 5,1 0,578
51.2 5,1 0,579
86 5,1 0,580
115 5,1 0,581
155 5,1 0,582
179 5,1 0,583
209 5,1 0,584
467 5,1 0,585
468 5,1 0,586

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186 5,150,596
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399 5,150,599
426 5,150,600

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31.05 5,150,603
35 5,150,606
38 5,150,604
49.3 5,150,605
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117.3 5,150,609
118.1 5,150,610
204.14 5,150,611
253 5,150,612
291 5,150,613
308 5,150,614
313 5,150,615
517 R 5,150,616
579 5,150,617
660 5,150,618
861.22 5,150,619
862.59 5,150,620
863.91 5,150,621
864.74 5,150,622
865.8 5,150,623
865.9 5,150,624

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530 5,150,632
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CLASS 83

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583 5,150,640
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CLASS 84

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395 5,150,644

CLASS 99

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CLASS 100

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425 5,150,650

483 5,150,653

CLASS 102

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435 5,151,557
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CLASS 105

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218.1 5,150,658
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27 5,150,646
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287.17 5,151,124
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623 5,151,126
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CLASS 112

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CLASS 114

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68 5,150,662
230 5,150,744

CLASS 116

209 5,150,663

CLASS 118

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CLASS 119

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182.1 5,150,674
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195 R 5,150,676
302 5,150,677
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660.06 5,150,714
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774 5,150,716
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832 5,150,718

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CLASS 175

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44.7 5,150,827
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104 5,150,829
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125.15 5,150,833

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469 5,151,582

CLASS 238

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585.4 5,150,842

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73 5,150,844

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153 5,151,233
176.1 5,151,234
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572 5,151,242

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71 5,150,887
254 CS 5,150,888

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302 5,150,894

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605 5,150,912
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189 5,150,927
205 5,150,928
231 5,150,929
319 5,150,930
381 5,150,931

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CLASS 292

202 5,150,932
216 5,150,933
288 5,150,934

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136 5,150,935

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104 5,150,936
119.1 5,150,937
131 5,151,162
156 5,150,938

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37.1 5,150,939
39.2 5,150,940
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190 5,150,942
201 5,150,943
203 5,150,944

CLASS 297

184 5,150,945
194 5,150,946
229 5,150,947
301 5,150,948

CLASS 301

37 S 5,150,949

CLASS 303

100 5,150,950
5,150,951
109 5,150,952

CLASS 307

202.1 5,151,611
234 5,151,612
243 5,151,613
272.3 5,151,614
443 5,151,615
451 5,151,616
462 5,151,617
465 5,151,623
471 5,151,618
473 5,151,619
475 5,151,620
5,151,621
5,151,622
498 5,151,624
529 5,151,625

CLASS 310

331 5,151,626

CLASS 312

9.58 5,150,953

CLASS 313

477 R 5,151,627
499 5,151,628
504 5,151,629
602 5,151,630

CLASS 315

127 5,151,631
169.1 5,151,632
248 5,151,633
307 5,151,634
370 5,151,635

CLASS 318

272 5,151,636
376 5,151,637
434 5,151,638
568.18 5,151,639
696 5,151,640

762 5,151,641
779 5,151,642

CLASS 320

2 5,151,643
14 5,151,644
23 5,151,645

CLASS 322

28 5,151,646
99 5,151,647

CLASS 323

282 5,151,648

CLASS 324

127 5,151,649
158 F 5,151,650
158 P 5,151,651
5,151,652
5,151,653
160 5,151,654
309 5,151,655
5,151,656
326 5,151,657
346 5,151,658
458 5,151,659
689 5,151,660

CLASS 328

14 5,151,661
127 5,151,662

CLASS 330

41 5,151,663
149 5,151,664

CLASS 331

8 5,151,665
64 5,151,666
117 R 5,151,667

CLASS 332

124 5,151,668

CLASS 333

81 R 5,151,669
126 5,151,670
189 5,151,672
249 5,151,673

CLASS 335

16 5,151,674
78 5,151,675
172 5,151,671

CLASS 338

61 5,151,676
99 5,151,677

CLASS 340

310 R 5,151,838
321 5,151,678
326 5,151,679
384 E 5,151,680
454 5,151,681
514 5,151,682
518 5,151,683
572 5,151,684
605 5,151,685
703 5,151,686
706 5,151,687
707 5,151,688
784 5,151,689
5,151,690
5,151,691
825.28 5,151,692
825.3 5,151,693
825.44 5,150,954
5,151,694
870.33 5,151,695
968 Re.34,082

CLASS 341

22 5,151,696
51 5,151,697
52 5,151,698
58 5,151,699
156 5,151,700

CLASS 342

20 5,151,701
134 5,151,702
199 5,151,703
360 5,151,704
368 5,151,705
372 5,151,706

CLASS 343

705 5,151,707
715 5,151,711
722 5,151,708
741 5,151,709
766 5,151,710

CLASS 346

1.1 5,151,712
108 5,151,713
5,151,714

140 R 5,151,715
5,151,716
157 5,151,717
160 5,151,718
160.1 5,151,719

CLASS 351

46 5,151,720
121 5,151,721
156 5,151,778
158 5,151,722
161 5,151,723

CLASS 352

129 5,151,725

CLASS 354

75 5,151,726
76 5,151,727
83 5,151,728
173.11 Re.34,083
195.12 5,151,729
275 5,151,730
321 5,150,955
324 5,151,731
402 5,151,732

CLASS 355

45 5,151,733
200 5,151,734
207 5,151,735
208 5,151,736
211 5,151,737
245 5,151,738
5,151,739
246 5,151,740
257 5,151,741
285 5,151,742
288 5,151,743
296 5,151,744
313 5,151,745

CLASS 356

1 5,151,746
5 5,151,747
32 5,151,748
128 5,151,752
142 5,151,753
350 5,150,956
356 5,151,754
375 5,151,749
401 5,151,750
402 5,151,751
414 5,151,755

CLASS 357

17 5,151,724
5,151,756
22 5,151,757
5,151,758
23.3 5,151,759
23.4 5,151,762
23.5 5,151,760
5,151,761
26 5,151,763
27 5,151,764
34 5,151,765
38 5,151,766
43 5,151,767
51 5,151,768
53 5,151,769
5,151,770
70 5,151,771
71 5,151,772
74 5,151,773
79 5,151,774
80 5,151,775
81 5,151,776
5,151,777

CLASS 358

12 5,151,779
21 R 5,151,780
45 5,151,781
86 5,151,782
133 5,151,783
136 5,151,784
141 5,151,785
148 5,151,786
162 5,151,787
188 5,151,788
194.1 5,151,789
225 5,151,790
261.2 5,151,791
327 5,151,792
335 5,151,793
347 5,150,957
447 5,151,794
448 5,151,795
461 5,151,796
474 5,151,797

CLASS 359

3 5,151,798
11 5,151,799
14 5,151,800

40 5,151,801
51 5,151,802
56 5,151,803
5,151,804
57 5,151,805
59 5,151,806
5,151,807
78 5,151,808
198 5,151,810
5,151,811
201 5,151,812
202 5,151,813
209 5,151,814
220 5,151,815
275 5,151,816
328 5,151,817
344 5,151,818
350 5,151,819
354 5,151,820
462 5,151,821
559 5,151,822
565 5,151,823
604 5,151,824
634 5,151,825
742 5,151,826
846 5,151,809
848 5,151,827
871 5,151,828
886 5,151,829

CLASS 360

32 5,151,830
39 5,151,831
85 5,151,832
5,151,833
92 5,151,834
96.5 5,151,835
99.08 5,151,836
103 5,151,837
108 5,151,839

CLASS 361

13 5,151,840
86 5,151,841
93 5,151,842
149 5,151,843
179 5,151,844
234 5,151,845
306 5,151,846
395 5,151,847
502 5,151,848

CLASS 362

61 5,151,849
66 5,150,958
75 5,151,850
80 5,150,959
83.2 5,150,960
5,150,961
101 5,150,962
123 5,150,963
251 5,150,964
260 5,150,965
337 5,150,966

CLASS 363

25 5,151,851
131 5,151,852
160 5,151,853

CLASS 364

184 5,151,854
413.03 5,151,856
419 5,151,857
424.02 5,151,859
424.05 5,151,860
424.1 5,151,858
426.02 5,151,861
454 5,151,862
470 5,151,863
474.23 5,151,864
483 5,151,865
5,151,866
489 5,151,867
490 5,151,868
497 5,151,869
556 5,151,870
557 5,151,871
571.05 5,151,872
710.12 5,151,873
752 5,151,874
784 5,151,875

CLASS 365

94 5,151,876
145 5,151,877
189.01 5,151,878
190 5,151,879
201 5,151,880
233 5,151,881

CLASS 366

206 5,150,967
288 5,150,968

CLASS 367

82 5,151,882
138 5,151,883

CLASS 368

10 5,151,884
110 5,151,885
157 5,151,886

CLASS 369

44.110 5,151,890
44.32 5,151,887
5,151,888
44.37 5,151,889
59 5,151,891
109 5,151,892
116 5,151,893
291 5,151,894

CLASS 370

85.1 5,151,895
85.13 5,151,896
5,151,897
85.15 5,151,898
94.1 5,151,899
94.3 5,151,900
110.1 5,151,901

CLASS 371

27 5,151,903
39.1 5,151,905
43 5,151,904
51 5,151,902
51.1 5,151,906
66 5,151,907

CLASS 372

6 5,151,908
22 5,151,909
31 5,151,910
32 5,151,911
46 5,151,912
5,151,913
27 5,151,914

CLASS 373

5,151,915

CLASS 374

128 5,150,599

CLASS 375

1 5,151,919
5,151,920
5,151,921
5 5,151,922
5,151,923
12 5,151,924
82 5,151,925
84 5,151,926
119 5,151,927

CLASS 376

245 5,151,,44
271 5,151,,45

CLASS 378

65 5,151,,31
119 5,151,,28

CLASS 379

38 5,151,,46
57 5,151,,29
5,151,,30
5,151,,32
106 5,151,,33
159 5,151,,34
5,151,,35
240 5,151,,36
403 5,151,,37
410

CLASS 380

43 5,151,,38

CLASS 381

5,151,939
15 5,151,940
43 5,151,941
46 5,151,942
94 5,151,943
151 5,151,944
189 5,151,945

CLASS 382

1 5,151,945
6 5,151,947
7 5,151,948
9 5,151,949
13 5,151,950
19 5,151,951
29 5,151,952
41 5,151,953
5,151,954

CLASS 383

76 5,150,970
84 5,150,971

CLASS 384

97 5,150,972
448 5,150,973
463 5,150,974
465 5,150,975

CLASS 385

5,151,955
5,151,956
41 5,151,957
50 5,151,958
5,151,959
53 5,151,960
60 5,151,961
86 5,151,962
88 5,151,963
98 5,151,964
122 5,151,965
128 5,151,966
138 5,151,967

CLASS 395

2 5,151,968
24 5,151,969
5,151,970
27 5,151,971
109 5,151,973
128 5,151,974
153 5,151,975
166 5,151,976
200 5,151,977
5,151,978
325 5,151,979
375 5,151,980
5,151,981
425 5,151,982
5,151,983
500 5,151,984
5,151,985
550 5,151,986
575 5,151,987
600 5,151,988
5,151,989
650 5,151,990
700 5,151,991
750 5,151,855
5,151,992
775 5,151,993
800 5,151,994
5,151,995
5,151,996
5,151,997
5,151,998
5,151,999
5,152,000
5,152,001

CLASS 400

124 5,150,976
703 5,150,977

CLASS 401

14 5,150,978
209 5,150,979

CLASS 403

24 5,150,980
122 5,150,981
232.1 5,150,982
402 5,150,983

CLASS 404

26 5,150,984

CLASS 405

128 5,150,985
223 5,150,986
224 5,150,987
258 5,150,988
303 5,150,989

CLASS 406

50 5,150,990
67 5,150,991

CLASS 407

110 5,150,992

CLASS 408

5,150,993

CLASS 409

135 5,150,994
234 5,150,995
259 5,150,996

CLASS 411

511 5,150,997

CLASS 412

14 5,150,998

CLASS 414

24.5 5,150,999
187 5,151,000
225 5,151,001
339 5,151,002
428 5,151,003
437 5,151,005
495 5,151,004
626 5,151,006
744.2 5,151,007
744.5 5,151,008
793.5 5,151,009

CLASS 415

169.1 5,151,010

CLASS 416

5 5,151,011
95 5,151,012
221 5,151,013
237 5,151,014

CLASS 417

32 5,151,016
45 5,151,017
312 5,151,018
415 5,151,015
474 5,151,019

CLASS 418

55.2 5,151,020
93 5,151,021

CLASS 419

2 5,151,246
13 5,151,247

CLASS 420

35 5,151,248
445 5,151,249

CLASS 422

2 5,151,250
119 5,151,251
179 5,151,253
180 5,151,254
186.05 5,151,255
186.3 5,151,252

CLASS 423

210 5,151,256
230 5,151,257
235 5,151,258
245.3 5,151,022
328 5,151,259
412 5,151,260
448 5,151,261
561.1 5,151,262
659 5,151,263

CLASS 424

1.1 5,151,264
85.5 5,151,265
85.8 5,151,266
89 5,151,023
94.64 5,151,267
401 5,151,268
5,151,269
5,151,270
443 5,151,271
450 5,151,272
465 5,151,273
630 5,151,274

CLASS 425

84 5,151,275
110 5,151,276
112 5,151,277
130 5,151,278
141 5,151,024
178 5,151,279
186 5,151,280
199 5,151,025
204 5,151,026
505 5,151,281
562 5,151,282

CLASS 426

93 5,151,283
106 5,151,284
241 5,151,285
324 5,151,286
432 5,151,287
474 5,151,288
557 5,151,289
576 5,151,290
581 5,151,291
601 5,151,292
614 5,151,293

CLASS 427

11 5,151,294
12 5,151,295
38 5,151,296
39 5,151,379
46 5,151,297
77 5,151,298
96 5,151,299
5,151,300
140 5,151,302
178 5,151,303
250 5,151,304
252 5,151,305
294 5,151,301
434.5 5,151,306

CLASS 428

31 5,151,307
35.8 5,151,308
40 5,151,309
64 5,151,310
116 5,151,311
156 5,151,312
192 5,151,313
198 5,151,314
212 5,151,315
213 5,151,316
216 5,151,317
246 5,151,318
257 5,151,319
284 5,151,320
286 5,151,321
303 5,151,322
323 5,151,323
5,151,324
325 5,151,325
343 5,151,327
351 5,151,328
423.4 5,151,329
425.9 5,151,330
475.5 5,151,331
650 5,151,332
694 5,151,333

CLASS 429

32 5,151,334
223 5,151,335

CLASS 430

7 5,151,336
28 5,151,337
106 5,151,338
192 5,151,339
5,151,340
270 5,151,341
271 5,151,342
382 5,151,343
383 5,151,344
525 5,151,345
546 5,151,346
548 5,151,356
610 5,151,357

CLASS 433

1 5,151,027
17 5,151,028
29 5,151,029
118 5,151,030
226 5,151,031
229 5,151,044

CLASS 434

409 5,151,032

CLASS 435

3 5,151,347
7.92 5,151,348
69.1 5,151,349
5,151,350
122 5,151,351
123 5,151,352
147 5,151,353
161 5,151,354
214 5,151,355
226 5,151,358
5,151,359
240.2 5,151,360
5,151,361
240.25 5,151,362
252.33 5,151,364
252.5 5,151,363
254 5,151,365
285 5,151,366
288 5,151,367
312 5,151,368

CLASS 436

67 5,151,369
74 5,151,370
127 5,151,371
164 5,151,372

CLASS 437

2 5,151,373
5,151,377
31 5,151,378
40 5,151,374
43 5,151,375
47 5,151,376
53 5,151,380
69 5,151,381
74 5,151,382
170 5,151,384
181 5,151,385
187 5,151,386
191 5,151,387
209 5,151,388
226 5,151,389

CLASS 439

66 Re.34,084
70 5,151,039
73 5,151,040
79 5,151,034
95 5,151,033
5,151,035
108 5,151,036
110 5,151,037
122 5,151,038
157 5,151,041
169 5,151,042
212 5,151,043
271 5,151,045
326 5,151,046
333 5,151,047
353 5,151,049
357 5,151,048
456 5,151,050
557 5,151,051
598 5,151,052
610 5,151,053
620 5,151,054
784 5,151,055
851 5,151,056

CLASS 440

38 5,151,057
61 5,151,058
75 5,151,059

CLASS 441

62 5,151,060

CLASS 445

24 5,151,061

CLASS 452

179 5,151,062

CLASS 454

258 5,151,063

CLASS 455

11.1 5,152,002
18 5,152,003
68 5,152,004
76 5,152,005
89 5,152,006
116 5,152,007
127 5,152,008
134 5,152,009
136 5,152,010
158.5 5,152,011
5,152,012

CLASS 460

23 5,151,064

CLASS 464

68 5,151,065

CLASS 474

206 5,151,066

CLASS 475

43 5,151,067
322 5,151,068

CLASS 482

35 5,151,069
99 5,151,070
101 5,151,071
104 5,151,072

CLASS 493

79 5,151,073
133 5,151,074
179 5,151,075
186 5,151,076
353 5,151,077
405 5,151,078

CLASS 494

27 5,151,079

CLASS 501

95 5,151,390

CLASS 502

27 5,151,391
37 5,151,392
53 5,151,393
65 5,151,394
67 5,151,395
104 5,151,396
107 5,151,397
117 5,151,398
127 5,151,399
203 5,151,400
329 5,151,401
401 5,151,402

CLASS 503

200 5,151,403
5,151,404
227 5,151,405

CLASS 505

1 5,151,406

5,151,407
5,151,408
5,151,409

CLASS 512

9 5,151,410
15 5,151,411

CLASS 514

5,151,412
63 5,151,413
114 5,151,414
163 5,151,415
167 5,151,416
202 5,151,417
210 5,151,418
226.2 5,151,419
247 5,151,420
249 5,151,421
252 5,151,422
254 5,151,423
258 5,151,424
261 5,151,425
262 5,151,426
269 5,151,427
277 5,151,428
284 5,151,429
5,151,430
292 5,151,431
299 5,151,432
5,151,433
300 5,151,434
303 5,151,435
314 5,151,436
320 5,151,437
357 5,151,438
376 5,151,439
377 5,151,440
378 5,151,441
456 5,151,442
486 5,151,443
530 5,151,444
557 5,151,445
617 5,151,446
627 5,151,447
651 5,151,448
654 5,151,449
690 5,151,450
773 5,151,451

CLASS 521

48 5,151,452

CLASS 522

14 5,151,453
93 5,151,454

CLASS 523

200 5,151,455

CLASS 524

60 5,151,456
157 5,151,457
190 5,151,458
255 5,151,459
291 5,151,460
387 5,151,461
405 5,151,462
430 5,151,463
449 5,151,464
549 5,151,465

CLASS 525

177 5,151,466
215 5,151,467
332.7 5,151,468
354 5,151,469
407 5,151,470
423 5,151,471
432 5,151,472
474 5,151,473

CLASS 526

60 5,151,474
83 5,151,475
93 5,151,476
206 5,151,492
216 5,151,477
258 5,151,478
277 5,151,479
279 5,151,480
298 5,151,481
329.7 5,151,482

CLASS 528

44 5,151,483
45 5,151,484
87 5,151,485
124 5,151,486
125 Re.34,085
170 5,151,487
179 5,151,488
183 5,151,489
5,151,490
199 5,151,491
272 5,151,493
287 5,151,494
388 5,151,495
500 5,151,496

CLASS 530

331 5,151,497
372 5,151,498
381 5,151,499
385 5,151,500
399 5,151,501
402 5,151,502
412 5,151,503
413 5,151,504

CLASS 534

728 5,151,505
772 5,151,506

CLASS 536

23 5,151,507
27 5,151,508
5,151,509
5,151,510
5,151,511

CLASS 540

302 5,151,512

CLASS 544

139 5,151,513
212 5,151,514

CLASS 546

12 5,151,515
37 5,151,516
66 5,151,517
107 5,151,518
219 5,151,519

CLASS 548

110 5,151,520
112 5,151,521
5,151,522
217 5,151,523
307 5,151,524
321 5,151,525
335 5,151,526
451 5,151,527
530 5,151,536

CLASS 549

31 5,151,528
354 5,151,529
529 5,151,530

CLASS 552

115 5,151,531
308 5,151,532
625 5,151,533

CLASS 554

88 5,151,534
226 5,151,535

CLASS 556

136 5,151,537
431 5,151,538

CLASS 558

128 5,151,539
232 5,151,540
5,151,541
459 5,151,542
5,151,543

CLASS 560

10 5,151,544
60 5,151,545
130 5,151,546
205 5,151,547
255 5,151,548

CLASS 562

467 5,151,549
468 5,151,550
494 5,151,551

CLASS 600

28 5,151,080

CLASS 602

27 5,151,081

CLASS 604

4 5,151,082
22 5,151,083
5,151,084
5,151,085
51 5,151,086
164 5,151,087
192 5,151,088
5,151,089
5,151,090
385.1 5,151,091
385.2 5,151,092
892.1 5,151,093
902 5,151,094

CLASS 606

2 5,151,095
15 5,151,096
5,151,097
16 5,151,098
27 5,151,099
28 5,151,100
46 5,151,101
51 5,151,102
69 5,151,103
73 5,151,104

CLASS 623

5,151,105

CLASSIFICATION OF DESIGNS

D2— 248 329,729
329,730
270 329,731
277 329,732
314 329,733
329,734
329,735
329,736
329,737
329,738
318 329,739
320 329,740
329,741
329,742
D3— 36 329,743
37 329,744
56 329,745
329,746
78 329,747
105 329,748
106 329,749
329,750
D4— 104 329,751
129 329,752
D6— 311 329,753
326 329,754
329,755
338 329,756
348 329,757
381 329,758
385 329,759
397 329,760
416 329,761
419 329,762
429 329,763
462 329,764
465 329,765
467 329,766
486 329,767
495 329,768
497 329,769
501 329,770
502 329,771
329,772
508 329,774
520 329,773
551 329,775
570 329,776
601 329,777
D7— 323 329,778
351 329,779
329,780
619 329,781
629 329,782
641 329,783
681 329,784
D8— 13 329,785
14 329,786
329,787
17 329,788
33 329,789
50 329,790
329,824
106 329,825
57 329,792
60 329,793
68 329,794
70 329,795
80 329,796
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	5,151,956		5,150,99		5,151,723		5,151,293		5,150,959		5,150,603
02	5,150,962		5,151,01		5,151,724		5,151,348		5,150,979		5,150,705
04	5,150,670		5,151,02		5,151,725		5,151,464		5,151,059		5,150,740
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	5,151,560		5,151,08		5,151,819		5,150,551		5,151,172		5,151,353
	5,151,650		5,151,08		5,151,823		5,150,667		5,151,183		5,151,407
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	5,151,879		5,151,09		5,151,904		5,150,884		5,151,303		5,151,611
	5,152,005		5,151,11		5,151,907		5,150,898		5,151,308		5,151,654
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	5,150,771		5,151,37		5,150,626		5,151,225		5,151,849		5,151,262
	5,150,815		5,151,38		5,150,700		5,151,306		5,151,939		5,151,277
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	5,150,683		5,150,660		5,151,302		5,151,092		5,151,447		5,151,695
	5,150,685		5,150,717		5,151,304		5,151,141		5,151,465		5,151,718
	5,150,692		5,150,722		5,151,311		5,151,148		5,151,483		5,151,760
	5,150,694		5,150,767		5,151,328		5,151,209		5,151,657		5,151,838
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	5,150,802		5,150,832		5,151,361		5,151,258		5,151,960		5,151,964
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	5,151,647		5,151,512		5,151,776		5,151,161		5,150,703		5,151,150
	5,151,800		5,151,513		5,151,782		5,151,203		5,150,751		5,151,159
	5,151,816		5,151,536		5,151,810		5,151,235		5,150,756		5,151,175
	5,151,824		5,151,557		5,151,821		5,151,257		5,150,760		5,151,331
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	5,150,787		5,151,969		5,151,977		5,150,880		5,150,843		5,150,860
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	5,150,867		5,150,618		5,151,759		5,150,707		5,151,282		5,150,674
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30	5,150,536		5,150,788		5,150,575		5,150,888		5,151,399		5,151,316
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	5,150,484		5,150,811		5,150,776		5,151,036		5,151,485		5,151,656
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	329,828		329,798		329,764		329,919		329,758		329,846
	329,835		329,819		329,792	36 :	329,754		329,775		329,849
	329,863		329,836		329,847		329,755		329,799		329,896
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	329,900		329,885		329,837		329,766		329,817	50 :	329,789
	329,911	17 :	329,767		329,875		329,768		329,857	51	329,810
	329,916		329,782		329,889		329,783		329,876		329,930
	329,923		329,812		329,890		329,787		329,933	55	329,774
	329,925		329,814		329,915						

PLANT PATENTS

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MasterCard VISA

$36

Please Choose Method of Payment:

☐ Check Payable to the Superintendent of Documents
☐ GPO Deposit Account ☐☐☐☐☐☐ – ☐
☐ VISA or MasterCard Account

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☐☐☐☐ (Credit card expiration date)

To fax your orders (202) 512–2233

Thank you for your order!

(Authorizing Signature) 11/91

Mail To: New Orders, Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

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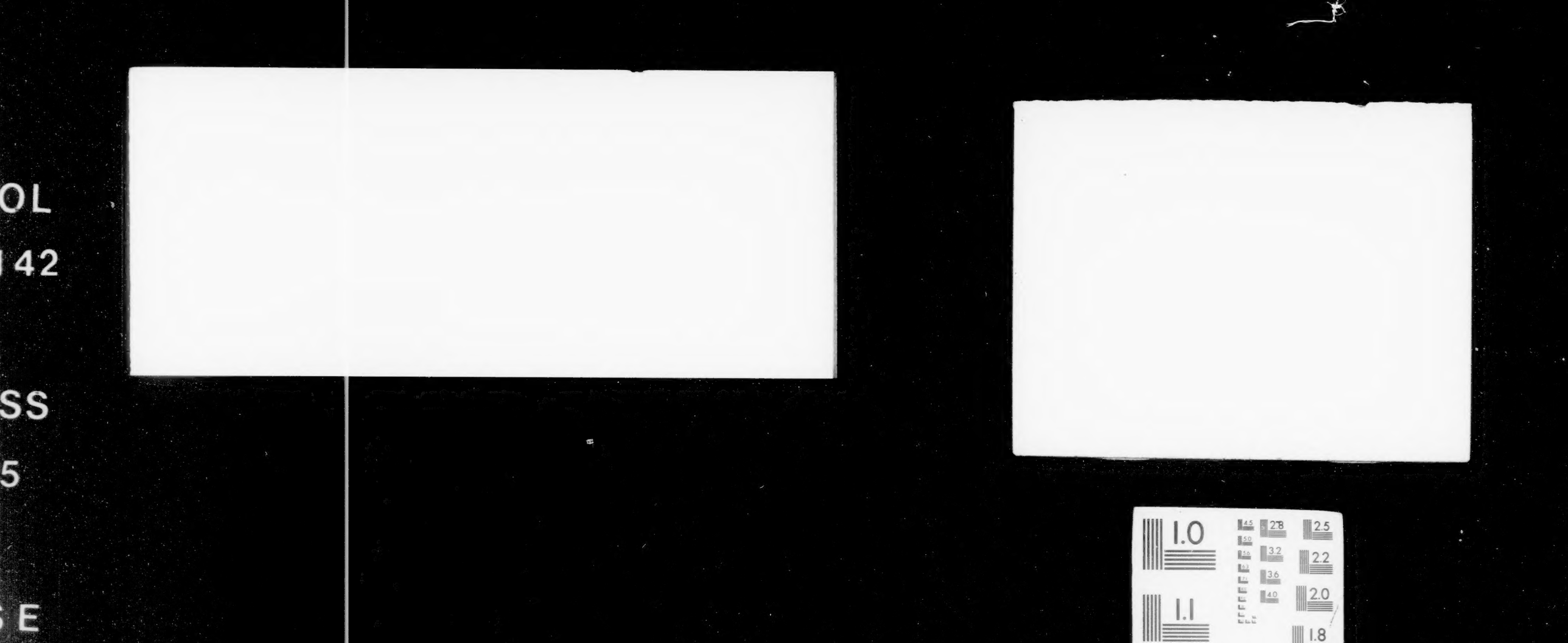
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END